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A. G.*	Arthur Gamgee, M.D., F.R.S., F.R.C.P., LL.D., D.Sc. (1841–1909). Formerly Fullerian Professor of Physiology, Royal Institution of Great Britain, and Professor of Physiology in the University of Manchester. Author of *Text-Book of the Physiological Chemistry of the Animal Body*; &c.	**Respiratory System:** *Movements of Respiration.*
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A. Ha.	Adolf Harnack, D.Ph. See the biographical article: Harnack, Adolf.	**Sabellius.**
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A. H. Sm.	Arthur Hamilton Smith, M.A., F.S.A. Keeper of the Department of Greek and Roman Antiquities in the British Museum. Member of the Imperial German Archaeological Institute. Author of *Catalogue of Greek Sculpture in the British Museum*; &c.	**Ring** (*in part*).
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A. S. P.-P.	Andrew Seth Pringle-Pattison, M.A., LL.D., D.C.L. Professor of Logic and Metaphysics in the University of Edinburgh. Gifford Lecturer in the University of Aberdeen, 1911. Fellow of the British Academy. Author of *Man's Place in the Cosmos*; *The Philosophical Radicals*; &c.	**Reid, Thomas** (*in part*).
A. S. Wo.	Arthur Smith Woodward, LL.D., F.R.S. Keeper of Geology, Natural History Museum, South Kensington. Secretary of the Geological Society, London.	**Reptiles:** *History* (*in part*) *and General Characters.*

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[1] A complete list, showing all individual contributors, appears in the final volume.

24047

A. W. H.*	Arthur William Holland. Formerly Scholar of St John's College, Oxford. Bacon Scholar of Gray's Inn, 1900.	**Regicide; Rienzi, Cola di.**
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C. R. B.	Charles Raymond Beazley, M.A., D.Litt., F.R.G.S., F.R.Hist.S. Professor of Modern History in the University of Birmingham. Formerly Fellow of Merton College, Oxford, and University Lecturer in the History of Geography. Lothian Prizeman, Oxford, 1889. Lowell Lecturer, Boston, 1908. Author of *Henry the Navigator*; *The Dawn of Modern Geography*; &c.	**Rubruquis, William of** (*in part*).
C. We.	Cecil Weatherly. Formerly Scholar of Queen's College, Oxford. Barrister-at-Law, Inner Temple.	**Saddlery and Harness.**
D. B. Ma.	Duncan Black Macdonald, M.A., D.D. Professor of Semitic Languages, Hartford Theological Seminary, Hartford, Conn. Author of *Development of Muslim Theology, Jurisprudence and Constitutional Theory*; *Selections from Ibn Khaldun*; *Religious Attitude and Life in Islam*; &c.	**Rum, or Roum.**
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D. H. M.	David Heinrich Müller, D.Ph. Professor of Semitic Languages in the University of Vienna. Hofrat of the Austrian Empire. Knight of the Order of Leopold. Author of *Die Gesetze Hammurabi*; &c.	**Sabaeans.**
D. Ll. T.	Daniel Lleufer Thomas. Barrister-at-Law, Lincoln's Inn. Stipendiary Magistrate at Pontypridd and Rhondda.	**Rhondda.**
D. M. W.	Sir Donald Mackenzie Wallace, K.C.I.E., K.C.V.O. Extra Groom of the Bedchamber to H.M. King George V. Director of the Foreign Department of *The Times*, 1891–1899. Member of Institut de Droit International and Officier de l'Instruction Publique of France. Joint-editor of New Volumes (10th ed.) of the *Encyclopaedia Britannica.* Author of *Russia*; *Egypt and Egyptian Question*; *The Web of Empire*; &c.	**Russia:** *History* (*in part*).
D. R.-M.	David Randall-MacIver, M.A., D.Sc. Curator of Egyptian Department, University of Pennsylvania. Formerly Worcester Reader in Egyptology, University of Oxford. Author of *Medieval Rhodesia*; &c.	**Rhodesia:** *Archaeology.*
E. B.	Edward Breck, M.A., Ph.D. Formerly Foreign Correspondent of the *New York Herald* and the *New York Times.* Author of *Fencing*; *Wilderness Pets*; *Sporting in Nova Scotia*; &c.	**Sabre-fencing.**
E. Cu.	Edmund Curtis, M.A. Keble College, Oxford. Lecturer on History in the University of Sheffield.	**Robert Guiscard;** **Roger I. of Sicily;** **Roger II. of Sicily.**
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E. F. S.	Edward Fairbrother Strange. Assistant Keeper, Victoria and Albert Museum, South Kensington. Member of Council, Japan Society. Author of numerous works on art subjects. Joint-editor of Bell's "Cathedral" Series.	**Repin, Ilja.**
E. G.	Edmund Gosse, LL.D., D.C.L. See the biographical article: Gosse, Edmund	**Rhyme; Rhythm** *(in verse)*; **Rimbaud, Jean;** **Rivers, Anthony Woodville, Earl;** **Rossetti, Christina;** **Runes, Runic Language and Inscriptions;** **Rydberg, Abraham; Saga.**
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E. H. M.	Ellis Hovell Minns, M.A. University Lecturer in Palaeography, Cambridge. Lecturer and Assistant Librarian at Pembroke College, Cambridge. Formerly Fellow of Pembroke College.	**Russian Language.**
E. L. B.	Edward Livermore Burlingame, A.M., Ph.D. Editor of *Scribner's Magazine.* Formerly on the Staff of *New York Tribune.*	**Ripley, George.**
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E. Pr.	Edgar Prestage. Special Lecturer in Portuguese Literature in the University of Manchester. Examiner in Portuguese in the Universities of London, Manchester, &c. Commendador, Portuguese Order of S. Thiago. Corresponding Member of Lisbon Royal Academy of Sciences, Lisbon Geographical Society; &c. Editor of *Letters of a Portuguese Nun*; Azurara's *Chronicles of Guinea*; &c.	**Resende, André de;** **Resende, Garcia de;** **Ribeiro, Bernardim;** **Sá de Miranda, Francisco de.**
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F. J. H.	Francis John Haverfield, M.A., LL.D., F.S.A. Camden Professor of Ancient History in the University of Oxford. Fellow of Brasenose College. Fellow of the British Academy. Formerly Censor, Student, Tutor and Librarian of Christ Church, Oxford. Ford's Lecturer, 1906–1907. Author of Monographs on Roman History, especially Roman Britain; &c.	**Roman Army.**
F. J. S.	Frederick John Snell, M.A. Balliol College, Oxford. Author of *The Age of Chaucer*; &c.	**Robin Hood** *(in part)*.
F. Ll. G.	Francis Llewellyn Griffith, M.A., Ph.D., F.S.A. Reader in Egyptology, Oxford University. Editor of the Archaeological Survey and Archaeological Reports of the Egypt Exploration Fund. Fellow of Imperial German Archaeological Institute.	**Rosetta.**
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G. Du.	George Duthie, M.A., F.R.S. (Edin.). Director of Education, Southern Rhodesia.	**Rhodesia:** *Geography and Statistics.*
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G. Sn.	Grant Showerman, A.M., Ph.D. Professor of Latin at the University of Wisconsin. Member of the Archaeological Institute of America. Member of the American Philological Association. Author of *With the Professor*; *The Great Mother of the Gods*; &c.	**Rhea** (*Mythology*).
H. B.	Hilary Bauermann, F.G.S. (d. 1909). Formerly Lecturer on Metallurgy at the Ordnance College, Woolwich. Author of *A Treatise on the Metallurgy of Iron.*	**Safety-Lamp.**
H. Br.	Henry Bradley, M.A., Ph.D. Joint-editor of the *New English Dictionary* (Oxford). Fellow of the British Academy. Author of *The Story of the Goths*; *The Making of English*; &c.	**Riddles.**
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H. E.	Karl Hermann Ethé, M.A., Ph.D. Professor of Oriental Languages, University College, Aberystwyth (University of Wales). Author of *Catalogue of Persian Manuscripts in the India Office Library, London* (Clarendon Press); &c.	**Rūmī;** **Saʿdi.**
H. F. G.	Hans Friedrich Gadow, F.R.S., Ph.D. Strickland Curator and Lecturer on Zoology in the University of Cambridge. Author of "Amphibia and Reptiles," in the *Cambridge Natural History.*	**Reptiles:** *Anatomy and Distribution.*
H. F. P.	Henry Francis Pelham, LL.D., D.C.L. See the biographical article: Pelham, H. F.	**Rome:** *Ancient History (in part).*
H. Go.	Henry Goudy, M.A., D.C.L., LL.D. Regius Professor of Civil Law, Oxford, and Fellow of All Souls' College. Author of *The Law of Bankruptcy in Scotland*; &c.	**Roman Law.**
H. H.	Henri Simon Hymans, Ph.D. Keeper of the Bibliothèque Royale de Belgique, Brussels. Author of *Rubens: sa vie et son œuvre.*	**Rubens** (*in part*).
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H. M. V.	Herbert M. Vaughan, F.S.A. Keble College, Oxford. Author of *The Last of the Royal Stuarts*; *The Medici Popes*; *The Last Stuart Queen.*	**St Davids.**
H. R. T.	Henry Richard Tedder, F.S.A. Secretary and Librarian of the Athenaeum Club, London.	**Rymer, Thomas.**
H. St.	Henry Sturt, M.A. Author of *Idola Theatri*; *The Idea of a Free Church*; *Personal Idealism.*	**Relativity of Knowledge.**
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H. S.-K.	Sir Henry Seton-Karr, C.M.G., M.A. M.P. for St Helen's, 1885–1906. Author of *My Sporting Holidays*; &c.	**Rifle.**

H. Tr.	Sir Henry Trotter, K.C.M.G., C.B. Lieutenant-Colonel, Royal Engineers. H.B.M. Consul-General for Roumania, 1894–1906, and British Delegate on the European Commission of the Danube. Victoria Medallist, Royal Geographical Society, 1878.	**Rumania:** *History* (*in part*).
H. W. C. D.	Henry William Carless Davis, M.A. Fellow and Tutor of Balliol College, Oxford. Fellow of All Souls' College, Oxford, 1895–1902. Author of *England under the Normans and Angevins*; *Charlemagne*.	**Richard, Earl of Cornwall;** **Richard I.;** **Richard of Devizes;** **Robert of Gloucester;** **Roger of Hoveden;** **Roger of Wendover.**
H. W. S.	H. Wickham Steed. Correspondent of *The Times* at Vienna. Correspondent of *The Times* at Rome, 1897–1902.	**Ricasoli, Baron.**
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I. A.	Israel Abrahams, M.A. Reader in Talmudic and Rabbinic Literature in the University of Cambridge. Formerly President, Jewish Historical Society of England. Author of *A Short History of Jewish Literature*; *Jewish Life in the Middle Ages*; *Judaism*; &c.	**Ritual Murder;** **Sabbatai Sebi;** **Sabbation;** **Sachs, Michael.**
J. A. H.	John Allen Howe, B.Sc. Curator and Librarian of the Museum of Practical Geology, London. Author of *The Geology of Building Stones*.	**Rhaetic.**
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J. Bt.	James Bartlett. Lecturer on Construction, Architecture, Sanitation, Quantities, &c., at King's College, London. Member of Society of Architects. Member of Institute of Junior Engineers.	**Roofs.**
J. B. B.	John Bagnall Bury, D.Litt., D.C.L. See the biographical article: Bury, J. B.	**Roman Empire, Later.**
J. B. M.	James Bass Mullinger, M.A. Lecturer in History, St John's College, Cambridge. Formerly University Lecturer in History and President of the Cambridge Antiquarian Society. Birkbeck Lecturer in Ecclesiastical History at Trinity College, Cambridge, 1890–1894. Author of *History of the University of Cambridge*; *The Schools of Charles the Great*; &c.	**Richard of Cirencester.**
J. D. B.	James David Bourchier, M.A., F.R.G.S. King's College, Cambridge. Correspondent of *The Times* in South-Eastern Europe. Commander of the Orders of Prince Danilo of Montenegro and of the Saviour of Greece, and Officer of the Order of St Alexander of Bulgaria.	**Ristitch, Jovan.**
J. E. C.	Rev. Joseph Estlin Carpenter, M.A., D.Litt., D.D., D.Th. Principal of Manchester College, Oxford. Author of *The First Three Gospels, their Origin and Relations*; *The Bible in the Nineteenth Century*; &c.	**Religion.**
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J. F.-K.	James Fitzmaurice-Kelly, Litt.D., F.R.Hist.S. Gilmour Professor of Spanish Language and Literature, Liverpool University. Norman McColl Lecturer, Cambridge University. Fellow of the British Academy. Member of the Royal Spanish Academy. Knight Commander of the Order of Alphonso XII. Author of *A History of Spanish Literature*; &c.	**Ruiz, Juan.**
J. F. M.	James Fullarton Muirhead, LL.D. Editor of many of Baedeker's Guide Books. Author of *America, the Land of Contrasts*.	**Rhine** (*in part*).
J. F. W.	John Forbes White, M.A., LL.D. (d. 1904). Joint-author of the *Life and Art of G. P. Chalmers, R.S.A.*; &c.	**Rembrandt** (*in part*).
✠J. G.	His Eminence Cardinal James Gibbons. See the biographical article: Gibbons, James.	**Roman Catholic Church:** *United States*.
J. G. H.	Joseph G. Horner, A.M.I.Mech.E. Author of *Plating and Boiler Making*; *Practical Metal Turning*; &c.	**Rolling-mill.**
J. H. A. H.	John Henry Arthur Hart, M.A. Fellow, Theological Lecturer and Librarian, St John's College, Cambridge.	**Sadducees.**
J. H. M.	John Henry Middleton, M.A., Litt.D., F.S.A., D.C.L. (1846–1896). Slade Professor of Fine Art in the University of Cambridge, 1886–1895. Director of the Fitzwilliam Museum, Cambridge, 1889–1892. Art Director of the South Kensington Museum, 1892–1896. Author of *The Engraved Gems of Classical Times*; *Illuminated Manuscripts in Classical and Mediaeval Times*.	**Rietschel, Ernst;** **Ring** (*in part*); **Rome:** *The Ancient City* (*in part*); *and Christian Rome* (*in part*); **Round Towers.**
J. H. R.	John Horace Round, M.A., LL.D. Balliol College, Oxford. Author of *Feudal England*; *Studies in Peerage and Family History*; *Peerage and Pedigree*.	**Register.**

J. H. R.*	James Harvey Robinson, A.M., Ph.D. Professor of History, Columbia University, New York. Author of *Petrarch, the First Modern Scholar*; *History of Western Europe*; &c.	**Reformation, The.**
J. Hl. R.	John Holland Rose, M.A., Litt.D. Christ's College, Cambridge. Lecturer on Modern History to the Cambridge University Local Lectures Syndicate. Author of *Life of Napoleon I.*; *Napoleonic Studies*; *The Development of the European Nations*; *The Life of Pitt*; &c.	**Reichstadt, Duke of.**
J. H. V. C.	John Henry Verrinder Crowe. Lieut.-Colonel, Royal Artillery. Commandant of the Royal Military College of Canada. Formerly Chief Instructor in Military Topography and Military History and Tactics at the Royal Military Academy, Woolwich. Author of *Epitome of the Russo-Turkish War, 1877–78*; &c.	**Russo-Turkish War:** *(1877–78).*
J. J. L.*	Rev. John James Lias, M.A. Chancellor of Llandaff Cathedral. Formerly Hulsean Lecturer in Divinity and Lady Margaret Preacher, University of Cambridge. Author of *Miracles, Science and Prayer*; &c.	**Reusch, Franz H.**
J. J. T.	Sir Joseph John Thomson, D.Sc., LL.D., Ph.D., F.R.S. Cavendish Professor of Experimental Physics and Fellow of Trinity College, Cambridge. President of the British Association, 1909–1910. Author of *A Treatise on the Motion of Vortex Rings*; *Application of Dynamics to Physics and Chemistry*; *Recent Researches in Electricity and Magnetism*; &c.	**Röntgen Rays.**
J. L. W.	Jessie Laidlay Weston. Author of *Arthurian Romances unrepresented in Malory.*	**Round Table, The.**
J. Mt.	James Moffatt, M.A., D.D. Minister of the United Free Church of Scotland. Jowett Lecturer, London, 1907. Author of *Historical New Testament*; &c.	**Romans, Epistle to the.**
J. S. F.	John Smith Flett, D.Sc., F.G.S. Petrographer to the Geological Survey. Formerly Lecturer on Petrology in Edinburgh University. Neill Medallist of the Royal Society of Edinburgh. Bigsby Medallist of the Geological Society of London.	**Rhyolite.**
J. S. H.	John Scott Haldane, M.A., M.D., LL.D., F.R.S. Fellow of New College, Oxford, and University Reader in Physiology. Metropolitan Gas Referee to the Board of Trade. Joint-editor and founder of the *Journal of Hygiene.* Author of Blue-books on "The Causes of Death in Colliery Explosions"; &c.	**Respiratory System:** *Physiology.*
J. S. R.	James Smith Reid, M.A., LL.M., Litt.D., LL.D. Professor of Ancient History and Fellow and Tutor of Gonville and Caius College, Cambridge. Hon. Fellow, formerly Fellow and Lecturer, of Christ's College. Editor of Cicero's *Academica*; *De Amicitia*; &c.	**Ritschl, Friedrich W.;** **Ruhnken, David;** **Rutilius, Claudius Namatianus.**
J. T. Be.	John Thomas Bealby. Joint-author of Stanford's *Europe.* Formerly Editor of the *Scottish Geographical Magazine.* Translator of Sven Hedin's *Through Asia, Central Asia and Tibet*; &c.	**Riga** *(in part)*; **Russia:** *Geography and Statistics (in part).*
J. T. S.*	James Thomson Shotwell, Ph.D. Professor of History in Columbia University, New York City.	**Richelieu, Cardinal;** **Sacrilege.**
J. W.	James Williams, M.A., D.C.L., LL.D. All Souls' Reader in Roman Law in the University of Oxford, and Fellow of Lincoln College. Barrister-at-Law of Lincoln's Inn. Author of *Law of the Universities*; &c.	**Roman Catholic Church:** *English Law.*
J. Wal.*	James Walker, M.A. Christ Church, Oxford. Demonstrator in the Clarendon Laboratory. Formerly Vice-President of the Physical Society. Author of *The Analytical Theory of Light*; &c.	**Refraction:** *Double Refraction.*
J. We.	Julius Wellhausen, D.D. See the biographical article: Wellhausen, Julius.	**Reiske, Johann Jacob**
J. W. H.	John Wesley Hales, M.A. Emeritus Professor of English Literature at King's College, London. Hon. Fellow, formerly Fellow and Tutor, of Christ's College, Cambridge. Clark Lecturer in English Literature at Trinity College, Cambridge. Author of *Shakespeare Essays and Notes*; *Folia Litteraria*; &c.	**Robin Hood** *(in part).*
K. S.	Kathleen Schlesinger. Editor of the *Portfolio of Musical Archaeology.* Author of *The Instruments of the Orchestra.*	**Regal; Rotta;** **Sackbut.**
L. F. A.	Lawrence F. Abbott. President of *The Outlook* Company, New York.	**Roosevelt, Theodore.**
L. F. V.-H.	Leveson Francis Vernon-Harcourt, M.A., M.Inst.C.E. (1839–1907). Professor of Civil Engineering at University College, London, 1882–1905. Author of *Rivers and Canals*; *Harbours and Docks*; *Civil Engineering as applied in Construction*; &c.	**River Engineering.**
L. J. S.	Leonard James Spencer, M.A. Assistant in Department of Mineralogy, British Museum. Formerly Scholar of Sidney Sussex College, Cambridge, and Harkness Scholar. Editor of the *Mineralogical Magazine.*	**Rutile.**
L. L. S.	Lionel Lancelot Shadwell, M.A. Barrister-at-Law, Lincoln's Inn. One of H.M. Commissioners in Lunacy.	**Registration.**
M. A.	Matthew Arnold. See the biographical article: Arnold, Matthew.	**Sainte-Beuve.**

M. Cr.	Francis Marion Crawford. See the biographical article: Crawford, F. Marion.	**Rome:** *The Modern City.*
M. G.	Moses Gaster, Ph.D. Chief Rabbi of the Sephardic Communities of England. Vice-President, Zionist Congress, 1898, 1899, 1900. Ilchester Lecturer at Oxford on Slavonic and Byzantine Literature, 1886 and 1891. President, Folk-lore Society of England. Vice-President, Anglo-Jewish Association. Author of *History of Rumanian Popular Literature*; &c.	**Rumania:** ***Literature.***
M. Ha.	Marcus Hartog, M.A., D.Sc., F.L.S. Professor of Zoology, University College, Cork. Author of "Protozoa," in *Cambridge Natural History*; and papers for various scientific journals.	**Rhizopoda;** **Rotifera.**
M. H. S.	Marion H. Spielmann, F.S.A. Formerly Editor of the *Magazine of Art*. Member of Fine Art Committee of International Exhibitions of Brussels, Paris, Buenos Aires, Rome and the Franco-British Exhibition, London. Author of *History of "Punch"*; *British Portrait Painting to the Opening of the Nineteenth Century*; *Works of G. F. Watts, R.A.*; *British Sculpture and Sculptors of To-day*; *Henriette Ronner*; &c.	**Relief;** **Repoussé;** **Roubiliac, Louis F.**
M. O. B. C.	Maximilian Otto Bismarck Caspari, M.A. Reader in Ancient History at London University. Lecturer in Greek at Birmingham University, 1905–1908.	**Rhodes** (*in part*); **Romanus I.-IV.** (*Eastern Emperors*).
M. P.*	Léon Jacques Maxime Prinet. Formerly Archivist to the French National Archives. Auxiliary of the Institute of France (Academy of Moral and Political Sciences). Author of *L'Industrie du sel en Frenche-Comté*; *François I et le comté de Bourgogne*; &c.	**Retz, Seigneurs and Dukes of;** **Rouault, Joachim.**
N. W. T.	Northcote Whitridge Thomas, M.A. Government Anthropologist to Southern Nigeria. Corresponding Member of the Société d'Anthropologie de Paris. Author of *Thought Transference*; *Kinship and Marriage in Australia*; &c.	**Sacrifice.**
O. A.	Osmund Airy, M.A., LL.D. H.M. Divisional Inspector of Schools and Inspector of Training Colleges, Board of Education. Author of *Louis XIV. and the English Restoration*; *Charles II.*; &c. Editor of the *Lauderdale Papers*; &c.	**Russell, Lord William.**
O. Ba.	Oswald Barron, F.S.A. Editor of *The Ancestor*, 1902–1905. Hon. Genealogist to Standing Council of the Honourable Society of the Baronetage.	**Russell** (*Family*).
O. M.*	Octave Maus, LL.D. Advocate of the Court of Appeal at Brussels. Director of *L'Art Moderne* and of the *Libre Esthétique*. President of the Association of Belgian writers. Officer of the Legion of Honour. Author of *Le Théâtre de Bayreuth*; *Aux Ambassadeurs*; *Malta, Constantinople et la Crimée*; &c.	**Rops, Félicien.**
P. A. A.	Philip A. Ashworth, M.A., Doc.Juris. New College, Oxford. Barrister-at-Law. Translator of H. R. von Gneist's *History of the English Constitution.*	**Rhine** (*in part*).
P. A. K.	Prince Peter Alexeivitch Kropotkin. See the biographical article: Kropotkin, Prince P. A.	**Riga** (*in part*); **Russia:** *Geography and Statistics* (*in part*).
P. C. M.	Peter Chalmers Mitchell, M.A., F.R.S., F.Z.S., D.Sc., LL.D. Secretary of the Zoological Society of London. University Demonstrator in Comparative Anatomy and Assistant to Linacre Professor at Oxford, 1888–1891. Author of *Outlines of Biology*; &c.	**Regeneration of Lost Parts;** **Reproduction:** *of Animals.*
P. Gi.	Peter Giles, M.A., LL.D., Litt.D. Fellow and Classical Lecturer of Emmanuel College, Cambridge, and University Reader in Comparative Philology. Formerly Secretary of the Cambridge Philological Society.	**S.**
P. G. K.	Paul George Konody. Art Critic of the *Observer* and the *Daily Mail.* Formerly Editor of *The Artist.* Author of *The Art of Walter Crane*; *Velasquez: Life and Work*; &c.	**Rembrandt** (*in part*); **Rubens** (*in part*).
P. V.	Pasquale Villari. See the biographical article: Villari, Pasquale.	**Rimini; Rome:** *Roman Republic in the Middle Ages.*
R. A. N.	Reynold Alleyne Nicholson, M.A., Litt.D. Lecturer in Persian in the University of Cambridge. Sometime Fellow of Trinity College, Cambridge, and Professor of Persian at University College, London. Author of *Selected Poems from the Dīvāni Shamsi Tabrīz*; *A Literary History of the Arabs*; &c.	**Ṣābians.**
R. C. J.	Sir Richard Claverhouse Jebb, LL.D., D.C.L. See the biographical article: Jebb, Sir Richard Claverhouse.	**Rhetoric.**
R. H. C.	Rev. Robert Henry Charles, M.A., D.D., D.Litt. Grinfield Lecturer, and Lecturer in Biblical Studies, Oxford. Fellow of Merton College. Fellow of the British Academy. Formerly Professor of Biblical Greek, Trinity College, Dublin. Author of *Critical History of the Doctrine of a Future Life*; *Book of Jubilees*; &c.	**Revelation, Book of.**

R. J. M	Ronald John McNeill, M.A. Christ Church, Oxford. Barrister-at-Law. Formerly Editor of the *St James's Gazette*, London.	**Richmond, Earls and Dukes of;** **Richmond and Lennox, Duchess of;** **Sacheverell, William.**
R. L.*	Richard Lydekker, F.R.S., F.Z.S., F.G.S. Member of the Staff of the Geological Survey of India, 1874–1882. Author of *Catalogues of Fossil Mammals, Reptiles and Birds in the British Museum*; *The Deer of all Lands*; &c.	**Reindeer; Rhinoceros** (*in part*); **Rhytina; River-hog;** **Rocky Mountain Goat;** **Rodentia; Roe-buck;** **Rorqual.**
R. N. B.	Robert Nisbet Bain (d. 1909). Assistant Librarian, British Museum, 1883–1909. Author of *Scandinavia: the Political History of Denmark, Norway and Sweden, 1513–1900*; *The First Romanovs, 1613–1725: Slavonic Europe: the Political History of Poland and Russia from 1469 to 1796*; &c.	**Repnin;** **Reuterholm, Baron;** **Sadolin, Jörgen.**
R. R. M.	Robert Ranulph Marett, M.A. Reader in Social Anthropology, Oxford University, and Fellow and Tutor of Exeter College. Formerly Dean and Sub-Rector of Exeter College. Author of *The Threshold of Religion*.	**Religion:** *Primitive Religion*; **Ritual.**
R. S. C.	Robert Seymour Conway, M.A., D.Litt. Professor of Latin and Indo-European Philology in the University of Manchester. Formerly Professor of Latin in University College, Cardiff, and Fellow of Gonville and Caius College, Cambridge. Author of *The Italic Dialects*.	**Rome:** *Ancient History* (*in part*); **Rutuli; Sabellic;** **Sabini.**
R. W. F. H.	Robert William Frederick Harrison. Barrister-at-Law, Inner Temple. Assistant Secretary of the Royal Society, London.	**Royal Society, The.**
S. A. C.	Stanley Arthur Cook, M.A Lecturer in Hebrew and Syriac, and formerly Fellow, Gonville and Caius College, Cambridge. Editor for the Palestine Exploration Fund. Author of *Glossary of Aramaic Inscriptions*; *The Law of Moses and the Code of Hammurabi*; *Critical Notes on Old Testament History*; *Religion of Ancient Palestine*; &c.	**Ruth, Book of** (*in part*); **Sabbath** (*in part*).
St C.	Viscount St Cyres. See the biographical article: Iddesleigh, 1st Earl of.	**Roman Catholic Church** (*in part*).
S. H. V.*	Sydney Howard Vines, M.A., D.Sc., F.R.S. Sherardian Professor of Botany, Oxford University, and Fellow of Magdalen College. Fellow of the University of London. Hon. Fellow, formerly Fellow and Lecturer, of Christ's College, Cambridge. President of the Linnean Society, 1900–1904. Author of *A Student's Text-Book of Botany*; &c.	**Reproduction:** *of Plants*; **Sachs, Julius von.**
S. N.	Simon Newcomb, D.Sc., L.L.D. See the biographical article: Newcomb, Simon.	**Refraction:** *Astronomical Refraction*.
T. As.	Thomas Ashby, M.A., D.Litt. (Oxon.). Director of British School of Archaeology at Rome. Formerly Scholar of Christ Church, Oxford. Craven Fellow, 1897. Conington Prizeman, 1906. Member of the Imperial German Archaeological Institute. Author of *The Classical Topography of the Roman Campagna*	**Regillus;** **Regium; Rovigo;** **Rusellae; Ruvo;** **St Bernard Passes** (*in part*).
T. A. I.	Thomas Allan Ingram, M.A., LL.D. Trinity College, Dublin.	**Sacrilege:** *English Law*.
T. Ba.	Sir Thomas Barclay. Member of the Institute of International Law. Officer of the Legion of Honour. Author of *Problems of International Practice and Diplomacy*; &c. M.P. for Blackburn, 1910.	**Reprisals.**
T. B. L.	Thomas Bell Lightfoot, M.Inst.C.E., M.Inst.Mech.E. Author of *Preservation of Foods by Cold*; &c.	**Refrigerating.**
T. H.*	Thomas Harris, M.D., F.R.C.P. Formerly Hon. Physician to Manchester Royal Infirmary, and Lecturer on Diseases of the Respiratory Organs at Owens College, Manchester. Author of numerous articles on diseases of the respiratory organs.	**Respiratory System:** *Pathology* (*in part*).
T. Wo.	Thomas Woodhouse. Head of the Weaving and Textile Designing Department, Technical College, Dundee.	**Rope and Rope-making;** **Sacking and Sack Manufacture; Sailcloth.**
T. W.-D.	Walter Theodore Watts-Dunton. See the biographical article: Watts-Dunton, Walter Theodore.	**Rossetti, Dante Gabriel.**
W. A. B. C.	Rev. William Augustus Brevoort Coolidge, M.A., F.R.G.S., Ph.D. Fellow of Magdalen College, Oxford. Professor of English History, St David's College, Lampeter, 1880–1881. Author of *Guide du Haut Dauphiné*; *The Range of the Todi*; *Guide to Grindelwald*; *Guide to Switzerland*; *The Alps in Nature and in History*; &c. Editor of the *Alpine Journal*, 1880–1881; &c.	**Referendum and Initiative;** **Reschen Scheideck;** **Rhine:** *Swiss Portion*; **Rhone; Rorschach;** **Rosa, Monte; Rovereto;** **St Bernard Passes** (*in part*).
W. A. P.	Walter Alison Phillips, M.A. Formerly Exhibitioner of Merton College and Senior Scholar of St John's College, Oxford. Author of *Modern Europe*; &c.	**Rochet:** *Church of England*; **Roman Catholic Church** (*in part*); **Russia:** *Government and Administration*.

W. E. A. A.	William Edmund Armytage Axon, LL.D. Formerly Deputy Chief Librarian of the Manchester Free Libraries. On Literary Staff of *Manchester Guardian*, 1874–1905. Member of the Gorsedd, with the bardic name of Manceinion. Author of *Annals of Manchester*; &c.	**Roscoe, William.**
W. H. F.	Sir William H. Flower, F.R.S. See the biographical article: Flower, Sir W. H.	**Rhinoceros** (*in part*).
W. J. H.*	William James Hughan. Past S.G.D. of the Grand Lodge of England. Author of *Origin of the English Rite of Freemasonry*.	**Rosicrucianism.**
W. M.-L.	Wilhelm Meyer-Lübke, Ph.D. Hofrat of the Austrian Empire. Professor of Romance Philology in the University of Vienna. Author of *Grammatik der Romanischen Sprachen*; &c.	**Romance Languages.**
W. M. R.	William Michael Rossetti. See the biographical article: Rossetti, Dante G.	**Ribera, Giuseppe;** **Rosa, Salvator.**
W. P. C.	William Prideaux-Courtney. See the biographical article: Courtney, Baron.	**Rosslyn, Earl of;** **Russell, 1st Earl.**
W. P. P. L.	William Pitt Preble Longfellow. Fellow of the American Institute of Architects. Editor of the *American Architect*. Author of *Cyclopaedia of Architecture in Italy, Greece and the Levant*; &c.	**Richardson, Henry Hobson.**
W. R. D.	Wyndham Rowland Dunstan, M.A., LL.D., F.R.S., F.C.S. Director of the Imperial Institute. President of the International Association of Tropical Agriculture. Member of the Advisory Committee for Tropical Agriculture, Colonial Office.	**Rubber.**
W. R. K.	Rt. Hon. Sir William Rann Kennedy, LL.D. Lord of Appeal. Hon. Fellow of Pembroke College, Cambridge. Fellow of the British Academy. Judge of King's Bench Division of High Court of Justice, 1892–1907.	**Russell of Killowen, Lord.**
W. R. M.	William Richard Morfill, M.A. (d. 1910). Formerly Professor of Russian and the other Slavonic Languages in the University of Oxford. Curator of the Taylorian Institution, Oxford. Author of *Russia*; *Slavonic Literature*; &c.	**Russian Literature.**
W. R. S.	William Robertson Smith, LL.D. See the biographical article: Smith, William Robertson.	**Reuchlin;** **Ruth, Book of** (*in part*); **Sabbath** (*in part*).

PRINCIPAL UNSIGNED ARTICLES

Reflection of Light.
Regensburg.
Regent.
Reims.
Renfrewshire.
Rennes.
Reporting.
Republic.
Resorcin.
Retainer.
Réunion.
Reuss.
Reynard the Fox.
Rhine Province.
Rhode Island.
Rhodium.
Rhubarb.
Rice.
Richmond (Surrey).
Richmond (Va.).
Rickets.
Riding.
Riesengebirge.
Rinderpest.
Rio de Janeiro.
Rio Grande do Sul (State).
Riot.
Ripon.
Roads and Streets.
Rochester (Kent).
Rochester (N.Y.).
Rodney.
Rodriguez.
Roland, Legend of.
Rome (N.Y.).
Romulus.
Root.
Rosaceae.
Roscommon, Co.
Rose.
Roses, Wars of the.
Ross and Cromarty.
Rostock.
Rothschild.
Rotterdam.
Rouen.
Roulette.
Roussillon.
Roxburghshire.
Rubidium.
Rubinstein.
Rügen.
Running.
Russo-Japanese War.
Rutebeuf.
Ruthenium.
Rutland.
Ryazan.
Sacramento (Cal.).
Saffron.
Saint Albans.
Saint Andrews.
St Augustine (Fla.).
St Denis.

THE
ENCYCLOPÆDIA BRITANNICA

VOLUME 23

REFECTORY TO SAINTE-BEUVE

REFECTORY (med. Lat. *refectorium*, from *reficere*, to refresh), the hall of a monastery, convent, &c., where the religious took their chief meals together. There frequently was a sort of ambo, approached by steps, from which to read the *legenda sanctorum*, &c., during meals. The refectory was generally situated by the side of the S. cloister, so as to be removed from the church but contiguous to the kitchen; sometimes it was divided down the centre into two aisles, as at Fountains Abbey in England, Mont St Michel in France and at Villiers in Belgium, and into three aisles as in St Mary's, York, and the Bernardines, Paris. The refectory of St Martin-des-Champs in Paris is in two aisles, and is now utilized as the library of the École des Arts et Métiers. Its wall pulpit, with an arcaded staircase in the thickness of the wall, is still in perfect preservation.

REFEREE, a person to whom anything is referred; an arbitrator. The court of referees in England was a court to which the House of Commons committed the decision of all questions as to the right of petitioners to be heard in opposition to private bills. As originally constituted the referees consisted of the chairman of ways and means, and other members, the Speaker's counsel and several official referees not members of the House of Commons. In 1903 the appointment of official referees was discontinued. The court now consists of the chairman of ways and means, the deputy chairman and not less than seven other members of the House appointed by the Speaker, and its duty, as defined by a standing order, is to decide upon all petitions against private bills, or against provisional orders or provisional certificates, as to the rights of the petitioners to be heard upon such petitions. In the high court of justice, under the Judicature Act 1873, cases may be submitted to three official referees, for trial, inquiry and report, or assessment of damages. Inquiry and report may be directed in any case, trial only by consent of the parties, or in any matter requiring any prolonged examination of documents or accounts, or any scientific or local investigation which cannot be tried in the ordinary way.

REFERENDUM and **INITIATIVE,** two methods by which the wishes of the general body of electors in a constitutional state may be expressed with regard to proposed legislation. They are developed to the highest extent in Switzerland, and are best exemplified in the Swiss federal and cantonal constitutions. By these two methods the sovereign people in Switzerland (whether in the confederation or in one of its cantons) approve or reject the bills and resolutions agreed upon by the legislative authority (Referendum), or compel that authority to introduce bills on certain specified subjects (Initiative)—in other words, exercise the rights of the people as regards their elected representatives at times other than general elections. The *Referendum* means "that which is referred" to the sovereign people, and prevailed (up to 1848) in the federal diet, the members of which were bound by instructions, all matters outside which being taken "ad referendum." A similar system obtained previously in the formerly independent confederations of the Grisons and of the Valais, in the former case not merely as between the Three Leagues, and even the bailiwicks of each within its respective league, but also (so far as regards the upper Engadine) the communes making up a bailiwick, though in the Valais the plan prevailed only as between the seven *Zehnten* or bailiwicks. The *Initiative*, on the other hand, is the means by which the sovereign people can compel its elected representatives to take into consideration either some specified object or a draft bill relating thereto, the final result of the deliberations of the legislature being subject by a referendum vote to the approval or rejection of the people. These two institutions therefore enable the sovereign people to control the decisions of the legislature, without having recourse to a dissolution, or waiting for the expiration of its natural term of office.

As might have been expected, both had been adopted by different cantons before they found their way into the federal constitution, which naturally has to take account of the sovereign rights of the cantons of which it is composed. Further, they (at any rate the referendum) were employed in the case of constitutional matters relating to cantonal constitutions before being applied to all or certain specified laws and resolutions. Finally, the action of both has been distinctly conservative in the case of the confederation, though to a less marked degree in the case of the cantons.

Two forms of the Referendum should be carefully distinguished: the *facultative* or optional (brought into play only on the demand of a fixed number of citizens), and the *obligatory* or compulsory (which obtains in all cases that lie within its sphere as defined in the constitution). The Initiative exists only in the facultative form, being exercised when a certain number of citizens demand it. Both came into common use during the Liberal reaction in Switzerland after the Paris revolution of July 1830. In 1831 St Gall first adopted the "facultative referendum" (then and for some time after called the "Veto"), and its example was followed by several cantons before 1848. The "obligatory referendum" appears first in 1852 and 1854 respectively in the Valais and the Grisons, when the older system was reformed, but in its modern form it was first adopted in 1863 by the canton of rural Basel. The Initiative was first adopted in 1845 by Vaud. Of course the cantons with *Landsgemeinden*, Uri, Unterwalden, Appenzell and Glarus (where the citizens appear in person) possessed both from time immemorial. Excluding these there were at the end of 1907 9½ cantons, which had the "obligatory referendum" (Aargau, rural Basel, Bern, the Grisons, Schaffhausen, Schwyz, Soleure, Thurgau, the Valais and Zürich), while 7½ cantons possess only the "facultative referendum" (Basel town, Geneva, Lucerne, Neuchâtel, St Gall, Ticino, Vaud and Zug). Fribourg alone had neither, save an obligatory referendum (like all the rest) as to the revision of the cantonal constitution. As regards the Initiative, all the cantons have it as to the revision of the cantonal constitution; while all but Fribourg have it also as to bills or legislative projects. In the case both of the facultative referendum and of the Initiative each canton fixes the number of citizens who have a right to exercise this power. The constitution of the Swiss confederation lags behind those of the cantons. It is true that both in 1848 (art. 113) and in 1874 (art. 120) it is provided that a vote on the question whether the constitution shall be revised must take place if either house of the federal legislature or 50,000 qualified voters demand it—of course a popular vote (obligatory referendum) must take place on the finally elaborated project of revision. But as regards bills the case is quite different. The "facultative referendum" was not introduced till 1874 (art. 89) and then only as regards all bills and resolutions not being of a pressing nature, 8 cantons or 30,000 qualified voters being entitled to ask for such a popular vote. But the Initiative did not appear in the federal constitution till it was inserted in 1891 (art. 121), and then merely in the case of a partial (not a total) revision of the constitution, if 50,000 qualified voters require it, whether as regards a subject in general or a draft bill,—of course the federal legislature had an Initiative in this matter in 1848 already. The results of the working of these two institutions in federal matters up to the end of 1908 are as follows. Excluding the votes by which the two federal constitutions of 1848 and 1874 were adopted, there have been 30 (10 of them between 1848 and 1874) votes (obligatory referendum) as to amendments of the federal constitution; in 15 cases only (of which only one was before 1874) did the people accept the amendment proposed. In the case of bills there have been 30 votes (very many bills have not been attacked at all), all of course since the facultative referendum was introduced in 1874; in 11 cases only have the people voted in the affirmative. Finally, with regard to the Initiative, there have been 7 votes, of which two only were in the affirmative. Thus, between 1874 and 1907, of 57 votes 27 only were in the affirmative, while if we include the 10 votes between 1848 and 1874 the figures are respectively 67 and 28, one only having been favourable during that period. The result is to show that the people, voting after mature reflection, are far less radically disposed than has sometimes been imagined.

The method of referendum by itself is also in use in some of the states of the American Union (see UNITED STATES) and in Australia, and under the name of *plébiscite* has been employed in France; but it is best studied in the Swiss constitution.

AUTHORITIES.—W. A. B. Coolidge, "The Early History of the Referendum" (article in the *English Historical Review* for October 1891); T. Curti, *Die schweizerischen Volksrechte, 1848 bis 1900* (Bern, 1900) (Fr. trans. by J. Ronjat with additions by the author, Paris, 1905)—Curti's earlier work, *Geschichte d. schweiz. Volksgesetzgebung* (Bern, 1882), is not entirely superseded by his later one; S. Deploige, *The Referendum in Switzerland*, Engl. trans. with additional notes (London, 1898); N. Droz, "The Referendum in Switzerland" (article in the *Contemporary Review*, March 1895); J. M. Vincent, *Government in Switzerland*, chaps. v. and xiv. (New York and London, 1900). See also, for the United States and generally, the American works on the Referendum by E. P. Oberholtzer (1893 and 1900). (W. A. B. C.)

REFLECTION OF LIGHT. When a ray of light in a homogeneous medium falls upon the bounding surface of another medium, part of it is usually turned back or reflected and part is scattered, the remainder traversing or being absorbed by the second medium. The scattered rays (also termed the irregularly or diffusely reflected rays) play an important part in rendering objects visible—in fact, without diffuse reflection non-luminous objects would be invisible; they are occasioned by irregularities in the surface, but are governed by the same law as holds for regular reflection. This law is: the incident and reflected rays make equal angles with the normal to the reflecting surface at the point of incidence, and are coplanar with the normal. This is equivalent to saying that the path of the ray is a minimum.[1] In fig. 1, MN represents the section of a plane mirror; OR is the incident ray, RP the reflected ray, and TR the normal at R. Then the law states that the angle of incidence ORT equals the angle of reflection PRT, and that OR, RT and RP are in the same plane.

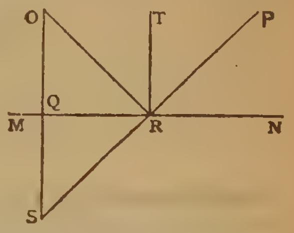

FIG. 1.

This natural law is capable of ready experimental proof (a simple one is to take the altitude of a star with a meridian circle, its depression in a horizontal reflecting surface of mercury and the direction of the nadir), and the most delicate instruments have failed to detect any divergence from it. Its explanation by the Newtonian corpuscular theory is very simple, for we have only to assume that at the point of impact the perpendicular velocity of a corpuscle is reversed, whilst the horizontal velocity is unchanged (the mirror being assumed horizontal). The wave-theory explanation is more complicated, and in the simple form given by Huygens incomplete. The theory as developed by Fresnel shows that regular reflection is due to a small zone in the neighbourhood of the point R (above), there being destructive interference at all other points on the mirror; this theory also accounts for the polarization of the reflected light when incident at a certain angle (see POLARIZATION OF LIGHT). The smoothness or polish of the surface largely controls the reflecting power, for, obviously, crests and furrows, if of sufficient magnitude, disturb the phase relations. The permissible deviation from smoothness depends on the wave-length of the light employed: it appears that surfaces smooth to within $\frac{1}{8}$th of a wave-length reflect regularly; hence long waves may be regularly reflected by a surface which diffuses short waves. Also the obliquity of the incidence would diminish the effect of any irregularities; this is experimentally confirmed by observing the images produced by matt surfaces or by smoked glass at grazing incidence.

We now give some elementary constructions of reflected rays, or, what comes to the same thing, of images formed by mirrors.

1. If O be a luminous point and OR a ray incident at R on the plane mirror MN (fig. 1) to determine the reflected ray and the image of O. If RP be the reflected ray and RT perpendicular

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[1] This principle of the minimum path, however, only holds for plane and convex surfaces; with concave surfaces it may be a maximum in certain cases.

to MN, then, by the law of reflection, angle ORT=TRP or ORM=PRN. Hence draw OQ perpendicular to MN, and produce it to S, making QS = OQ; join SR and produce to P. It is easily seen that PR and OR are equally inclined to RT (or MN). A point-eye at P would see a point object O at S, *i.e.* at a distance below the mirror equal to its height above. If the object be a solid, then the images of its corners are formed by taking points at the same distances below as the corners are above the mirror, and joining these points. The eye, however, sees the image perverted, *i.e.*, in the same relation as the left hand to the right. Fig. 2 shows how an extended object is viewed in a mirror by a natural eye.

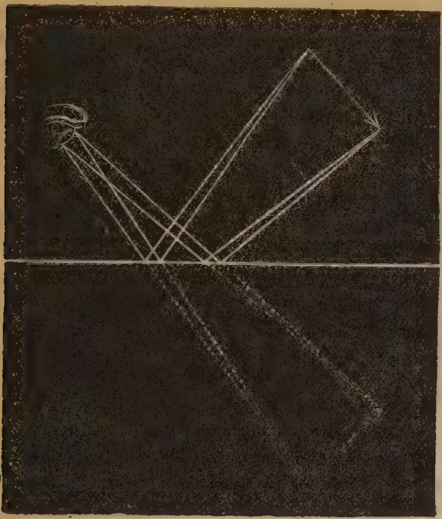

FIG. 2.

2. If A, B be two parallel plane mirrors and O a luminous point between them (fig. 3) to determine the images of O all the images must lie on the line (produced) PQ passing through O and perpendicular to the mirrors. Let OP = p, OQ = q. Then if O′ be the image of O in A, OO′=$2p$; now O′ has an image O″ in B, such that OO″=OQ+QO″=$q+q+2p=2p+2q$; similarly O″ has an image O‴ in A, such that OO‴=$4p+2q$. In the same way O forms an image O_1 in B such that $OO_1=2q$; O_1 has an image O_{11} in A, such that $OO_{11}=2p+2q$; O_{11} has an image O_{111} in B, such that $OO_{111}=2p+4q$, and so on. Hence there are an infinite number of images at definite distances from the mirrors. This explains the vistas as seen, for example, between two parallel mirrors at the ends of a room.

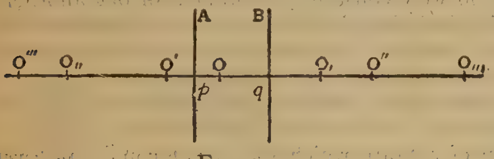

FIG. 3.

3. If A, B be two plane mirrors inclined at an angle θ, and intersecting at C, and O a luminous point between them, determine the position and number of images.

Call arc OA=α, OB=β. The image of O in A, *i.e.* a', is such that Oa' is perpendicular to CA, and O$a'=2\alpha$. Also Ca'=CO; and it is easily seen that all the images lie on a circle of centre C and radius CO. The image a' forms an image a'' in B such that Oa'' =OB+Ba''=β+Ba'=β+OB+Oa'=$2\beta+2\alpha=2\theta$. Also a'' forms an image a''' in A such that Oa'''=OA+Aa'=$2\alpha+2\theta$. And generally $Oa^{2n}=2n\theta$, $Oa^{2n+1}=2n\theta+2\alpha$. In the same way it can be shown that the image first formed in B gives foci of the general distances: $Ob^{2n}=2n\theta$, $Ob^{2n+1}=2n\theta+2\beta$. The number of images is limited, for when any one falls on the arc ab between the mirrors produced, it lies behind both mirrors, and hence no further image is possible. Suppose a^{2n} be the first image to fall on this arc, then arc $Oa^{2n}>OBa$, *i.e.* $2n\theta>\pi-\alpha$ or $2n>(\pi-\alpha)/\theta$. Similarly if a^{2n+1} be the first to fall on ab, we obtain $2n+1>(\pi-\alpha)/\theta$. Hence in both cases the number of images is the integer next greater than $(\pi-\alpha)/\theta$. In the same way it can be shown that the number of images of the b series is the integer next greater than $(\pi-\beta)/\theta$. If π/θ be an integer, then the number of images of each series is π/θ, for α/θ and β/θ are proper fractions. But an image of each series coincides; for if $\pi/\theta=2n$, we have $Oa^{2n}+Ob^{2n}=2n\theta+2n\theta=2\pi$ *i.e.* a^{2n} and b^{2n} coincide; and if $\pi/\theta=2n+1$, we have $Oa^{2n+1}+Ob^{2n+1}=4n\theta+2(\alpha+\beta)=(4n+2)\theta=2\pi$, *i.e.* a^{2n+1} and b^{2n+1} coincide. Hence the number of images, including the luminous point, is $2\pi/\theta$. This principle is utilized in the *kaleidoscope* (*q.v.*), which produces five images by means of its mirrors inclined at 60° (fig. 4). Fig. 5 shows the seven images formed by mirrors inclined at 45°.

4. To determine the reflection at a spherical surface. Let APB (fig. 6) be a section of a concave spherical mirror through its centre O and luminous point U. If a ray, say UP, meet the surface, it will be reflected along PV, which is coplanar with UP and the normal PO at P, and makes the angle VPO=UPO. Hence VO/VP=OU/UP. This expression may be simplified if we assume P to be very close to A, *i.e.* that the ray UP is very slightly inclined to the axis. Writing A for P, we have VO/AV=OU/AU; and calling AU=u, AV=v and AO=r, this reduces to $u^{-1}+v^{-1}=2r^{-1}$. This formula connects the distances of the object and image formed by a spherical concave mirror with the radius of the mirror. Points satisfying this relation are called "conjugate foci," for obviously they are reciprocal, *i.e.* u and v can be interchanged in the formula.

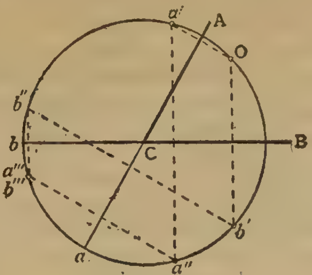

FIG. 4.

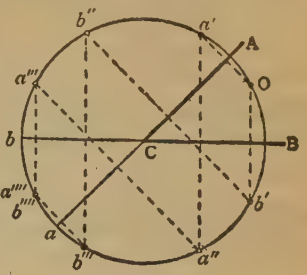

FIG. 5.

If u be infinite, as, for example, if the luminous source be a star, then $v^{-1}=2r^{-1}$, *i.e.* $v=\frac{1}{2}r$. This value is called the focal length of the mirror, and the corresponding point, usually denoted by F, is called the "principal focus." This formula requires modification for a convex mirror. If u be always considered as positive (v may be either positive or negative), r must be regarded as positive with concave mirrors and negative with convex. Similarly the focal length, having the same sign as r, has different signs in the two cases.

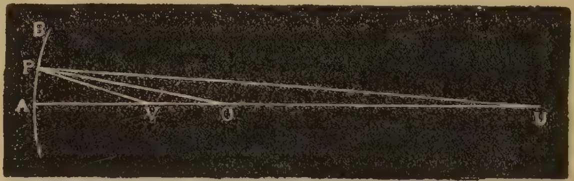

FIG. 6.

In this formula all distances are measured from the mirror; but it is sometimes more convenient to measure from the principal focus. If the distances of the object and image from the principal focus be x and y, then $u=x+f$ and $v=y+f$ (remembering that f is positive for concave and negative for convex mirrors). Substituting these values in $u^{-1}+v^{-1}=f^{-1}$ and reducing we obtain $xy=f^2$. Since f^2 is always positive, x and y must have the same sign, *i.e.* the object and image must lie on the same side of the principal focus.

We now consider the production of the image of a small object placed symmetrically and perpendicular to the axis of a concave (fig. 7) and a convex mirror (fig. 8). Let PQ be the object and A the vertex of the mirror. Consider the point P. Now a ray through P and parallel to the axis after meeting the mirror at M is reflected through the focus F. The line MF must therefore contain the image of P. Also a ray through P and also through the centre of curvature C of the mirror is reflected along the same path; this also contains the image of P. Hence the image is at P, the intersection of the lines MF and PC. Similarly the image of any other point can be found, and the final image deduced. We notice that in fig. 6 the image is inverted and real, and in fig. 7 erect and virtual. The "magnification" or ratio of the size of the image to the object can be deduced from the figures by elementary geometry; it equals the ratio of the distances of the image and object from the mirror or from the centre of curvature of the mirror.

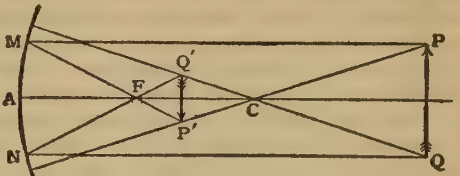

FIG. 7.

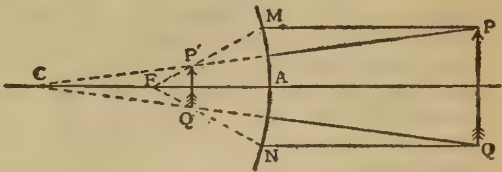

FIG. 8.

The positions and characters of the images for objects at varying distances are shown in the table (F is the principal focus and C the centre of curvature of the mirror MA).

CONCAVE MIRROR

Position of Object.	Position of Image.	Character of Image.
∞	F	Real.
Between ∞ and C	Between F and C	Real, inverted, diminished
C	C	,, ,, same size
Between C and F	Between C and ∞	,, ,, magnified
Between F and A	Between A and −∞	Virtual, erect, magnified
A	A	Erect, same size

CONVEX MIRROR

Position of Object.	Position of Image.	Character of Image.
∞	F	Virtual
Between ∞ and A	Between F and A	Virtual, erect, diminished
A	A	Erect, same size

The above discussion of spherical mirrors assumes that the mirror has such a small aperture that the reflected rays from any point unite in a point. This, however, no longer holds when the mirror has a wide aperture, and in general the reflected rays envelop a caustic (*q.v.*, see also ABERRATION). The only mirror which can sharply reproduce an object-point as an image-point has for its section an ellipse, which is so placed that the object and image are at its foci. This follows from a property of the curve, viz. the sum of the focal distances is constant, and that the focal vectores are equally inclined to the normal at the point. More important than the elliptical mirror, however, is the parabolic, which has the property of converting rays parallel to the axis into a pencil through its focus; or, inversely, rays from a source placed at the focus are converted into a parallel beam; hence the use of this mirror in searchlights and similar devices.

REFORMATION, THE. The Reformation, as commonly understood, means the religious and political revolution of the 16th century, of which the immediate result was the partial disruption of the Western Catholic Church and the establishment of various national and territorial churches. These agreed in repudiating certain of the doctrines, rites and practices of the medieval Church, especially the sacrifice of the Mass and the headship of the bishop of Rome, and, whatever their official designations, came generally to be known as "Protestant." In some cases they introduced new systems of ecclesiastical organization, and in all they sought to justify their innovations by an appeal from the Church's tradition to the Scriptures. The conflicts between Catholics and Protestants speedily merged into the chronic political rivalries, domestic and foreign, which distracted the European states; and religious considerations played a very important part in diplomacy and war for at least a century and a half, from the diet of Augsburg in 1530 to the English revolution and the league of Augsburg, 1688–89. The terms "Reformation" and "Protestantism" are inherited by the modern historian; they are not of his devising, and come to him laden with reminiscences of all the exalted enthusiasms and bitter antipathies engendered by a period of fervid religious dissension. The unmeasured invective of Luther and Aleander has not ceased to re-echo, and the old issues are by no means dead.

The Reformation not exclusively a Religious Revolution.

The heat of controversy is, however, abating, and during the past thirty or forty years both Catholic and Protestant investigators have been vying with one another in adding to our knowledge and in rectifying old mistakes; while an ever-increasing number of writers pledged to neither party are aiding in developing an idea of the scope and nature of the Reformation which differs radically from the traditional one. We now appreciate too thoroughly the intricacy of the medieval Church; its vast range of activity, secular as well as religious; the inextricable interweaving of the civil and ecclesiastical governments; the slow and painful process of their divorce as the old ideas of the proper functions of the two institutions have changed in both Protestant and Catholic lands: we perceive all too clearly the limitations of the reformers, their distrust of reason and criticism—in short, we know too much about medieval institutions and the process of their disintegration longer to see in the Reformation an abrupt break in the general history of Europe. No one will, of course, question the importance of the schism which created the distinction between Protestants and Catholics, but it must always be remembered that the religious questions at issue comprised a relatively small part of the whole compass of human aspirations and conduct, even to those to whom religion was especially vital, while a large majority of the leaders in literature, art, science and public affairs went their way seemingly almost wholly unaffected by theological problems.

That the religious elements in the Reformation have been greatly overestimated from a modern point of view can hardly be questioned, and one of the most distinguished students of Church history has ventured the assertion that "The motives, both remote and proximate, which led to the Lutheran revolt were largely secular rather than spiritual." "We may," continues Mr H. C. Lea, "dismiss the religious changes incident to the Reformation with the remark that they were not the object sought, but the means for attaining the object. The existing ecclesiastical system was the practical evolution of dogma, and the overthrow of dogma was the only way to obtain permanent relief from the intolerable abuses of that system" (*Cambridge Modern History*, i. 653). It would perhaps be nearer the truth to say that the secular and spiritual interests intermingled and so permeated one another that it is almost impossible to distinguish them clearly even in thought, while in practice they were so bewilderingly confused that they were never separated, and were constantly mistaken for one another.

Resemblance of the medieval Church to the State.

The first step in clarifying the situation is to come to a full realization that the medieval Church was essentially an international *state*, and that the character of the Protestant secession from it was largely determined by this fact. As Maitland suggests: "We could frame no acceptable definition of a State which would not comprehend the Church. What has it not that a State should have? It has laws, law givers, law courts, lawyers. It uses physical force to compel men to obey the laws. It keeps prisons. In the 13th century, though with squeamish phrases, it pronounced sentence of death. It is no voluntary society; if people are not born into it they are baptized into it when they cannot help themselves. If they attempt to leave they are guilty of *crimen laesae majestatis*, and are likely to be burned. It is supported by involuntary contributions, by tithe and tax" (*Canon Law in the Church of England*, p. 100). The Church was not only organized like a modern bureaucracy, but performed many of the functions of a modern State. It dominated the intellectual and profoundly affected the social interests of western Europe. Its economic influence was multiform and incalculable, owing to its vast property, its system of taxation and its encouragement of monasticism. When Luther made his first great appeal to the German people in his *Address to the German Nobility*, he scarcely adverts to religious matters at all. He deals, on the contrary, almost exclusively with the social, financial, educational, industrial and general moral problems of the day. If Luther, who above all others had the religious issue ever before him, attacks the Church as a source of worldly disorder, it is not surprising that his contemporary Ulrich von Hutten should take a purely secular view of the issues involved. Moreover, in the fascinating collection of popular satires and ephemeral pamphlets made by Schade, one is constantly impressed with the absence of religious fervour, and the highly secular nature of the matters discussed. The same may be said of the various *Gravamina*, or lists of grievances against the papacy drafted from time to time by German diets.

Historic continuity of the Reformation.

But not only is the character of the Reformation differently conceived from what it once was; our notions of the process of change are being greatly altered. Formerly, writers accounted for the Lutheran movement by so magnifying the horrors of the pre-existing regime that it appeared intolerable, and its abolition consequently inevitable. Protestant writers once contented themselves with a brief caricature of the Church, a superficial account of the traffic in indulgences, and a rough and ready assumption, which even Köstlin makes, that the darkness was greatest just before the dawn. Unfortunately this crude solution of the problem proved too much; for conditions were no worse immediately before the revolt than they had been for centuries, and German complaints of papal tyranny go back to Hildegard of Bingen and Walther von der Vogelweide, who antedated Luther by more than three centuries. So a new theory is logically demanded to explain why these conditions, which were chronic, failed to produce a change long before it actually occurred. Singularly enough it is the modern Catholic scholars, Johannes Janssen above all, who, in their efforts further to discredit the Protestant revolt by rehabilitating the institutions which the reformers attacked, have done most to explain the success of the Reformation. A humble, patient Bohemian priest, Hasak, set to work toward half a century ago to bring together the devotional works published during the seventy years immediately succeeding the invention of printing. Every one knows that one at least of these older books, *The German Theology*, was a great favourite of Luther's; but there are many more in Hasak's collection which breathe the same spirit of piety and spiritual emulation. Building upon the foundations laid by Hasak and other Catholic writers who have been too much neglected by Protestant historians, Janssen produced a monumental work in defence of the German Church before Luther's defection. He exhibits the great achievements of the latter part of the 15th and the early portion of the 16th centuries; the art and literature, the material prosperity of the towns and the fostering of the spiritual life of the people. It may well be that his picture is too bright, and that in his obvious anxiety to prove the needlessness of an ecclesiastical revolution he has gone to the opposite extreme from the Protestants. Yet this rehabilitation of pre-Reformation Germany cannot but make a strong appeal to the unbiased historical student who looks to a conscientious study of the antecedents of the revolt as furnishing the true key to the movement.

Revolt of the various European governments from the papal monarchy.

Outwardly the Reformation would seem to have begun when, on the 10th of December 1520, a professor in the university of Wittenberg invited all the friends of evangelical truth among his students to assemble outside the wall at the ninth hour to witness a pious spectacle—the burning of the "godless book of the papal decrees." He committed to the flames the whole body of the canon law, together with an edict of the head of the Church which had recently been issued against his teachings. In this manner Martin Luther, with the hearty sympathy of a considerable number of his countrymen, publicly proclaimed and illustrated his repudiation of the papal government under which western Europe had lived for centuries. Within a generation after this event the states of north Germany and Scandinavia, England, Scotland, the Dutch Netherlands and portions of Switzerland, had each in its particular manner permanently seceded from the papal monarchy. France, after a long period of uncertainty and disorder, remained faithful to the bishop of Rome. Poland, after a defection of years, was ultimately recovered for the papacy by the zeal and devotion of the Jesuit missionaries. In the Habsburg hereditary dominions the traditional policy and Catholic fervour of the ruling house resulted, after a long struggle, in the restoration of the supremacy of Rome; while in Hungary the national spirit of independence kept Calvinism alive to divide the religious allegiance of the people. In Italy and Spain, on the other hand, the rulers, who continued loyal to the pope, found little difficulty in suppressing any tendencies of revolt on the part of the few converts to the new doctrines. Individuals, often large groups, and even whole districts, had indeed earlier rejected some portions of the Roman Catholic faith, or refused obedience to the ecclesiastical government; but previously to the burning of the canon law by Luther no prince had openly and permanently cast off his allegiance to the international ecclesiastical state of which the bishop of Rome was head. Now, a prince or legislative assembly that accepted the doctrine of Luther, that the temporal power had been "ordained by God for the chastisement of the wicked and the protection of the good" and must be permitted to exercise its functions "unhampered throughout the whole Christian body, without respect to persons, whether it strikes popes, bishops, priests, monks, nuns, or whoever else"—such a government could proceed to ratify such modifications of the Christian faith as appealed to it in a particular religious confession; it could order its subject to conform to the innovations, and could expel, persecute or tolerate dissenters, as seemed good to it. A "reformed" prince could seize the property of the monasteries, and appropriate such ecclesiastical foundations as he desired. He could make rules for the selection of the clergy, disregarding the ancient canons of the Church and the claims of the pope to the right of ratification. He could cut off entirely all forms of papal taxation and put an end to papal jurisdiction. The personnel, revenue, jurisdiction, ritual, even the faith of the Church, were in this way placed under the complete control of the territorial governments. This is the central and significant fact of the so-called Reformation. Wholly novel and distinctive it is not, for the rulers of Catholic countries, like Spain and France, and of England (before the publication of the Act of Supremacy) could and did limit the pope's claims to unlimited jurisdiction, patronage and taxation, and they introduced the *placet* forbidding the publication within their realms of papal edicts, decisions and orders, without the express sanction of the government—in short, in many ways tended to approach the conditions in Protestant lands. The Reformation was thus essentially a stage in the disengaging of the modern state from that medieval, international ecclesiastical state which had its beginning in the *ecclesia* of the Acts of the Apostles. An appreciation of the issues of the Reformation—or Protestant revolt, as it might be more exactly called—depends therefore upon an understanding of the development of the papal monarchy, the nature of its claims, the relations it established with the civil powers, the abuses which developed in it and the attempts to rectify them, the sources of friction between the Church and the government, and finally the process by which certain of the European states threw off their allegiance to the Christian commonwealth, of which they had so long formed a part.

Character of the papal monarchy and its claims.

It is surprising to observe how early the Christian Church assumed the form of a state, and how speedily upon entering into its momentous alliance with the Roman imperial government under Constantine it acquired the chief privileges and prerogatives it was so long to retain. In the twelfth book of the Theodosian Code we see the foundations of the medieval Church already laid; for it was the 4th, not the 13th century that established the principle that defection from the Church was a crime in the eyes of the State, and raised the clergy to a privileged class, exempted from the ordinary taxes, permitted under restrictions to try its own members and to administer the wealth which flowed into its coffers from the gifts of the faithful. The bishop of Rome, who had from the first probably enjoyed a leading position in the Church as "the successor of the two most glorious of the apostles," elaborated his claims to be the divinely appointed head of the ecclesiastical organization. Siricius (384–389), Leo the Great (440–461), and Gelasius I. (492–496) left little for their successors to add to the arguments in favour of the papal supremacy. In short, if we recall the characteristics of the Church in the West from the times of Constantine to those of Theodoric—its reliance upon the civil power for favours and protection, combined with its assumption of a natural superiority over the civil power and its innate tendency to monarchical unity—it becomes clear that Gregory VII. in his effort in the latter half of the 11th century to establish the papacy as the great central power of western Europe was in the main only reaffirming and developing old claims in a new world. His brief statement of the papal powers as he conceived them is found in his *Dictatus*. The bishop of Rome, who enjoys a unique title, that of "pope," may annul the decrees of all other powers, since he judges all but is judged by none. He may depose emperors and absolve the subjects of the unjust from their allegiance. Gregory's position was almost inexpugnable at a time when it was conceded by practically all that spiritual concerns were incalculably more momentous than secular, that the Church was rightly one and indivisible, with one divinely revealed faith and a system of sacraments absolutely essential to salvation. No one called in question the claim of the clergy to control completely all "spiritual" matters. Moreover, the mightiest secular ruler was but a poor sinner dependent for his eternal welfare on the Church and its head, the pope, who in this way necessarily exercised an indirect control over the civil government, which even the emperor Henry IV. and William the Conqueror would not have been disposed to deny. They would also have conceded the pope the right to play the rôle of a secular ruler in his own lands, as did the German bishops, and to dispose of such fiefs as reverted to him. This class of prerogatives, as well as the right which the pope claimed to ratify the election of the emperor, need not detain us, although they doubtless served in the long run to weaken the papal power. But the pope laid claim to a direct power over the civil governments. Nicholas II. (1058–1061) declared that Jesus had conferred on Peter the control (*jura*) of an earthly as well as of a heavenly empire; and this phrase was embodied in the canon law. Innocent III., a century and a half later, taught that James the brother of the Lord left to Peter not only the government of the whole Church, but that of the whole world (*totum seculum gubernandum*).[1] So the power of the pope no longer rested upon his headship of the Church or his authority as a secular prince, but on a far more comprehensive claim to universal dominion. There was no reason why the bishop of Rome should justify such acts as Innocent himself performed in deposing King John of England and later in annulling Magna Carta; or Gregory IV. when he struck out fourteen articles from the *Sachsenspiegel*; or Nicholas V. when he invested Portugal with the right to subjugate all peoples on the Atlantic coast; or Julius II. when he threatened to transfer the kingdom of France to England; or the conduct of those later pontiffs who condemned the treaties of Westphalia, the Austrian constitution of 1867 and the establishment of the kingdom of Italy. The theory and practice of papal absolutism was successfully promulgated by Gratian in his *Decretum*, completed at Bologna about 1142. This was supplemented by later collections composed mainly of papal decretals. (See CANON LAW and DECRETALS, FALSE.) As every fully equipped university had its faculty of canon law in which the *Corpus juris canonici* was studied, Rashdall is hardly guilty of exaggeration when he says: "By means of the happy thought of the Bolognese monk the popes were enabled to convert the new-born universities—the offspring of that intellectual new birth of Europe which might have been so formidable an enemy to the papal pretensions—into so many engines for the propagation of Ultramontane ideas." Thomas Aquinas was the first theologian to describe the Church as a divinely organized absolute monarchy, whose head concentrated in his person the entire authority of the Church, and was the source of all the ecclesiastical law (*conditor juris*), issuing the decrees of general councils in his own name, and claiming the right to revoke or modify the decrees of former councils—indeed, to make exceptions or to set aside altogether anything which did not rest upon the dictates of divine or natural law. In practice the whole of western Europe was subject to the jurisdiction of one tribunal of last resort, the Roman Curia. The pope claimed the right to tax church property throughout Christendom. He was able to exact an oath of fidelity from the archbishops, named many of the bishops, and asserted the right to transfer and dispose them. The organs of this vast monarchy were the papal Curia, which first appears distinctly in the 11th century (see CURIA ROMANA), and the legates, who visited the courts of Europe as haughty representatives of the central government of Christendom.

Relations of the ecclesiastical and civil governments.

It should always be remembered that the law of the Church was regarded by all lawyers in the later middle ages as the law common to all Europe (*jus commune*). The laws of the Carolingian empire provided that one excommunicated by the Church who did not make his peace within a year and a day should be outlawed, and this general principle was not lost sight of. It was a capital offence in the eyes of the State to disagree with the teachings of the Church, and these, it must be remembered, included a recognition of the papal supremacy. The civil authorities burnt an obstinate heretic, condemned by the Church, without a thought of a new trial. The emperor Frederick II.'s edicts and the so-called *établissements* of St Louis provide that the civil officers should search out suspected heretics and deliver them to the ecclesiastical judges. The civil government recognized monastic vows by regarding a professed monk as civilly dead and by pursuing him and returning him to his monastery if he violated his pledges of obedience and ran away. The State recognized the ecclesiastical tribunals and accorded them a wide jurisdiction that we should now deem essentially secular in its nature. The State also admitted that large classes of its citizens—the clergy, students, crusaders, widows and the miserable and helpless in general—were justiceable only by Church tribunals. By the middle of the 13th century many lawyers took the degree of doctor of both laws (J.U.D.), civil and canon, and practised both. As is well known, temporal rulers constantly selected clergymen as their most trusted advisers. The existence of this theocratic international state was of course conditioned by the weakness of the civil government. So long as feudal monarchy continued, the Church supplied to some extent the deficiencies of the turbulent and ignorant princes by endeavouring to maintain order, administer justice, protect the weak and encourage learning. So soon as the modern national state began to gain strength, the issue between secular rulers and the bishops of Rome took a new form. The clergy naturally stoutly defended the powers which they had long enjoyed and believed to be rightly theirs. On the other hand, the State, which could count upon the support of an ever-increasing number of prosperous and loyal subjects, sought to protect its own interests and showed itself less and less inclined to tolerate the extreme claims of the pope. Moreover, owing to the spread of education, the king was no longer obliged to rely mainly upon the assistance of the clergy in conducting his government.

The chief sources of friction between Church and State were four in number. First, the growth of the practice of "reservation" and "provision," by which the popes assumed the right to appoint their own nominees to vacant sees and other benefices, in defiance of the claims of the crown, the chapters and private patrons. In the case of wealthy bishoprics or abbacies this involved a serious menace to the secular authority. Both pope and king were naturally anxious to place their own friends and supporters in these influential positions. The pope, moreover, had come to depend to a considerable extent for his revenue upon the payments made by his nominees, which represented a corresponding drain on the resources of the secular states. Secondly, there was the great question, how far the lands and other property of the clergy should be subject to taxation. Was this vast amount of property to increase indefinitely without contribution to the maintenance of the secular government? A decretal of Innocent III. permitted the clergy to make voluntary contributions to the king when there was urgent necessity, and the resources of the laity had proved inadequate. But the pope maintained that, except in the most critical cases, his consent must be obtained for such grants. Thirdly, there was the inevitable jealousy between the secular and ecclesiastical courts and the serious problem of the exact extent of the original and appellate jurisdiction of the Roman Curia. Fourthly, and lastly, there was the most fundamental difficulty of all, the extent to which the pope, as the universally acknowledged head of the Church, was justified in interfering in the internal affairs of particular states. Unfortunately, most matters could be viewed from both a secular and religious standpoint; and even in purely secular affairs the claims of the pope to at least indirect control were practically unlimited. The specific nature of the abuses which flourished in the papal monarchy, the unsuccessful attempts to remedy them, and the measures taken by the chief European states to protect themselves will become apparent as we hastily review the principal events of the 14th and 15th centuries.

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[1] See further, Innocent III.

The papacy in the 14th century.

As one traces the vicissitudes of the papacy during the two centuries from Boniface VIII. to Leo X. one cannot fail to be impressed with the almost incredible strength of the ecclesiastical state which had been organized and fortified by Gregory VII., Alexander III., Innocent III. and Gregory IX. In spite of the perpetuation of all the old abuses and the continual appearance of new devices for increasing the papal revenue; in spite of the jealousy of kings and princes, the attacks of legists and the preaching of the heretics; in spite of seventy years of exile from the holy city, forty years of distracting schism and discord, and thirty years of conflict with stately œcumenical councils deliberating in the name of the Holy Spirit and intent upon permanently limiting the papal prerogatives; in spite of the unworthy conduct of some of those who ascended the papal throne, their flagrant political ambitions, and their greed; in spite of the spread of knowledge, old and new, the development of historical criticism, and philosophical speculation; in spite, in short, of every danger which could threaten the papal monarchy, it was still intact when Leo X. died in 1521. Nevertheless, permanent if partial dissolution was at hand, for no one of the perils which the popes had seemingly so successfully overcome had failed to weaken the constitution of their empire; and it is impossible to comprehend its comparatively sudden disintegration without reckoning with the varied hostile forces which were accumulating and combining strength during the 14th and 15th centuries. The first serious conflict that arose between the developing modern state and the papacy centred about the pope's claim that the property of the clergy was normally exempt from royal taxation. Boniface VIII. was forced to permit Edward I. and Philip the Fair to continue to demand and receive subsidies granted by the clergy of their realms. Shortly after the bitter humiliation of Boniface by the French government and his death in 1303, the bishop of Bordeaux was elected pope as Clement V. (1305). He preferred to remain in France, and as the Italian cardinals died they were replaced by Frenchmen. The papal court was presently established at Avignon, on the confines of France, where it remained until 1377. While the successors of Clement V. were not so completely under the control of the French kings as has often been alleged, the very proximity of the curia to France served inevitably to intensify national jealousies. The claims of John XXII. (1316–1334) to control the election of the emperor called forth the first fundamental and critical attack on the papal monarchy, by Marsiglio of Padua, who declared in his *Defensor pacis* (1324) that the assumed supremacy of the bishop of Rome was without basis, since it was very doubtful if Peter was ever in Rome, and in any case there was no evidence that he had transmitted any exceptional prerogatives to succeeding bishops. But Marsiglio's logical and elaborate justification for a revolt against the medieval Church produced no perceptible effects. The removal of the papal court from Rome to Avignon, however, not only reduced its prestige but increased the pope's chronic financial embarrassments, by cutting off the income from his own dominions, which he could no longer control, while the unsuccessful wars waged by John XXII., the palace building and the notorious luxury of some of his successors, served enormously to augment the expenses. Various devices were resorted to, old and new, to fill the treasury. The fees of the Curia were raised for the numberless favours, dispensations, absolutions, and exemptions of all kinds which were sought by clerics and laymen. The right claimed by the pope to fill benefices of all kinds was extended, and the amount contributed to the pope by his nominees amounted to from a third to a half of the first year's revenue (see ANNATES). Boniface VIII. had discovered a rich source of revenue in the jubilee, and in the jubilee indulgences extended to those who could not come to Rome. Clement VI. reduced the period between these lucrative occasions from one hundred to fifty years, and Urban VI. determined in 1389 that they should recur at least once in a generation (every thirty-three years). Church offices, high and low, were regarded as investments from which the pope had his commission.

England and the papacy in the 14th century.

England showed itself better able than other countries to defend itself against the papal control of church preferment. From 1343 onward, statutes were passed by parliament forbidding any one to accept a papal provision, and cutting off all appeals to the papal curia or ecclesiastical courts in cases involving benefices. Nevertheless, as a statute of 1379 complains, benefices continued to be given "to divers people of another language and of strange lands and nations, and sometimes to actual enemies of the king and of his realm, which never made residence in this same, nor cannot, may not, nor will not in any wise bear and perform the charges of the same benefice in hearing confessions, preaching or teaching the people." When, in 1365, Innocent VI. demanded that the arrears of the tribute promised by King John to the pope should be paid up, parliament abrogated the whole contract on the ground that John had no right to enter into it. A species of anti-clerical movement, which found an unworthy leader in John of Gaunt, developed at this time. The Good Parliament of 1376 declared that, in spite of the laws restricting papal provisions, the popes at Avignon received five times as much revenue from England as the English kings themselves. Secularization was mentioned in parliament. Wycliffe began his public career in 1366 by proving that England was not bound to pay tribute to the pope. Twelve years later he was, like Marsiglio, attacking the very foundations of the papacy itself, as lacking all scriptural sanction. He denounced the papal government as utterly degraded, and urged that the vast property of the Church, which he held to be the chief cause of its degradation, should be secularized and that the clergy should consist of "poor priests," supported only by tithes and alms. They should preach the gospel and encourage the people to seek the truth in the Scriptures themselves, of which a translation into English was completed in 1382. During the later years of his life he attacked the doctrine of transubstantiation, and all the most popular institutions of the Church—indulgences, pilgrimages, invocation of the saints, relics, celibacy of the clergy, auricular confession, &c. His opinions were spread abroad by the hundreds of sermons and popular pamphlets written in English for the people (see WYCLIFFE). For some years after Wycliffe's death his followers, the Lollards, continued to carry on his work; but they roused the effective opposition of the conservative clergy, and were subjected to a persecution which put an end to their public agitation. They rapidly disappeared and, except in Bohemia, Wycliffe's teachings left no clearly traceable impressions. Yet the discussions he aroused, the attacks he made upon the institutions of the medieval Church, and especially the position he assigned to the Scriptures as the exclusive source of revealed truth, serve to make the development of Protestantism under Henry VIII. more explicable than it would otherwise be.

The Great Schism (1377-1417).

Wycliffe's later attacks upon the papacy had been given point by the return of the popes to Rome in 1377 and the opening of the Great Schism which was to endure for forty years. There had been many anti-popes in the past, but never before had there been such prolonged and genuine doubt as to which of two lines of popes was legitimate, since in this case each was supported by a college of cardinals, the one at Rome, the other at Avignon. Italy, except Naples, took the side of the Italian pope; France, of the Avignon pope; England, in its hostility to France, sided with Urban VI. in Rome, Scotland with Clement VII., his rival; Flanders followed England; Urban secured Germany, Hungary and the northern kingdoms; while Spain, after remaining neutral for a time, went over to Clement. Western Christendom had now two papal courts to support. The schism extended down to the bishoprics, and even to the monasteries and parishes, where partisans of the rival popes struggled to obtain possession of sees and benefices. The urgent necessity for healing the schism, the difficulty of uniting the colleges of cardinals, and the prolonged and futile negotiations carried on between the rival popes inevitably raised the whole question of the papal supremacy, and led to the search for a still higher ecclesiastical authority, which, when the normal system of choosing the head of the Church broke down, might re-establish that ecclesiastical unity to which all Europe as yet clung. The idea of the supreme power on earth of a general council of Christendom, deliberating in the name of the Holy Spirit, convoked, if necessary, independently of the popes, was defended by many, and advocated by the university of Paris. The futile council of Pisa in 1409, however, only served to increase to three the number of rival representatives of God on earth. The considerable pamphlet literature of the time substantiates the conclusion of an eminent modern Catholic historian, Ludwig Pastor, who declares that the crisis through which the church passed in this terrible period of the schism was the most serious in all its history. It was at just this period, when the rival popes were engaged in a life-and-death struggle, that heretical movements appeared in England, France, Italy, Germany, and especially in Bohemia, which threatened the whole ecclesiastical order.

The councils of Constance and Basel.

The council of Constance assembled in 1414 under auspices hopeful not only for the extinction of the schism but for the general reform of the Church. Its members showed no patience with doctrinal innovations, even such moderate ones as John Huss represented. They turned him over to the secular arm for execution, although they did not thereby succeed in checking the growth of heresy in Bohemia (see Huss). The healing of the schism proved no very difficult matter; but the council hoped not only to restore unity and suppress heresy, but to re-establish general councils as a regular element in the legislation of the Church. The decree *Sacrosancta* (April 1415) proclaimed that a general council assembled in the Holy Spirit and representing the Catholic Church militant had its power immediately from Christ, and was supreme over every one in the Church, not excluding the pope, in all matters pertaining to the faith and reformation of the Church of God in head and members. The decree *Frequens* (October 1417) provided for the regular convocation of councils in the future. As to ecclesiastical abuses the council could do very little, and finally satisfied itself with making out a list of those which the new pope was required to remedy in co-operation with the deputies chosen by the council. The list serves as an excellent summary of the evils of the papal monarchy as recognized by the unimpeachably orthodox. It included: the number, character and nationality of the cardinals, the abuse of the "reservations" made by the apostolic see, the annates, the collation to benefices, expectative favours, cases to be brought before the papal Curia (including appeals), functions of the papal chancery and penitentiary, benefices *in commendam*, confirmation of elections, income during vacancies, indulgences, tenths, for what reasons and how is a pope to be corrected or deposed. The pope and the representatives of the council made no serious effort to remedy the abuses suggested under these several captions; but the idea of the superiority of a council over the pope, and the right of those who felt aggrieved by papal decisions to appeal to a future council, remained a serious menace to the theory of papal absolutism. The decree *Frequens* was not wholly neglected; though the next council, at Siena, came to naught, the council at Basel, whose chief business was to put an end to the terrible religious war that had been raging between the Bohemians and Germans, was destined to cause Eugenius IV. much anxiety. It reaffirmed the decree *Sacrosancta*, and refused to recognize the validity of a bull Eugenius issued in December 1431 dissolving it. Two years later political reverses forced the pope to sanction the existence of the council, which not only concluded a treaty with the Bohemian heretics but abolished the papal fees for appointments, confirmation and consecration—above all, the annates—and greatly reduced papal reservations; it issued indulgences, imposed tenths, and established rules for the government of the papal states. France, however, withdrew its support from the council, and in 1438, under purely national auspices, by the famous Pragmatic Sanction of Bourges, adjusted the relations of the Gallican Church to the papacy; and Eugenius soon found himself in a position to repudiate the council and summoned a new one to assemble in 1438 at Ferrara under his control to take up the important question of the pending union with the Greek Church. The higher clergy deserted the council of Basel, and left matters in the hands of the lower clergy, who chose an anti-pope; but the rump council gradually lost credit and its lingering members were finally dispersed. The various nations were left to make terms with a reviving papacy. England had already taken measures to check the papal claims. France in the Pragmatic Sanction reformulated the claim of the councils to be superior to the pope, as well as the decision of the council of Basel in regard to elections, annates and other dues, limitations on ecclesiastical jurisdiction, and appeals to the pope. While the canonical elections were re-established, the prerogatives of the crown were greatly increased, as in England. In short, the national ecclesiastical independence of the French Church was established. The German diet of Regensburg (1439) ratified in the main the decrees of the council of Basel, which clearly gratified the electors, princes and prelates; and Germany for the first time joined the ranks of the countries which subjected the decrees of the highest ecclesiastical instance to the *placet* or approval of the civil authorities. But there was no strong power, as in England and France, to attend to the execution of the provisions.

Germany and the papacy in the 15th century.

In 1448 Eugenius's successor, Nicholas V., concluded a concordat with the emperor Frederick III. as representative of the German nation. This confined itself to papal appointments and the annates. In practice it restored the former range of papal reservations, and extended the papal right of appointment to all benefices (except the higher offices in cathedrals and collegiate churches) which fell vacant during the odd months. It also accorded him the right to confirm all newly elected prelates and to receive the annates. Nothing was said in the concordat of a great part of the chief subjects of complaint. This gave the princes an excuse for the theory that the decrees of Constance and Basel were still in force, limiting the papal prerogatives in all respects not noticed in the concordat. It was Germany which gave the restored papacy the greatest amount of anxiety during the generation following the dissolution of the council of Basel. In the "recesses" or formal statements issued at the conclusion of the sessions of the diet one can follow the trend of opinion among the German princes, secular and ecclesiastical. The pope is constantly accused of violating the concordat, and constant demands are made for a general council, or at least a national one, which should undertake to remedy the abuses. The capture of Constantinople by the Turks afforded a new excuse for papal taxation. In 1453 a crusading bull was issued imposing a tenth on all benefices of the earth to equip an expedition against the infidel. The diet held at Frankfort in 1456 recalled the fact that the council of Constance had forbidden the pope to impose tenths without the consent of the clergy in the region affected, and that it was clear that he proposed to "pull the German sheep's fleece over its ears." A German correspondent of Aeneas Sylvius assures him in 1457 that "thousands of tricks are devised by the Roman see which enables it to extract the money from our pockets very neatly, as if we were mere barbarians. Our nation, once so famous, is a slave now, who must pay tribute, and has lain in the dust these many years bemoaning her fate." Aeneas Sylvius issued, immediately after his accession to the papacy as Pius II. the bull *Execrabilis* forbidding all appeals to a future council. This seemed to Germany to cut off its last hope. It found a spokesman in the vigorous Gregory of Heimburg, who accused the pope of issuing the bull so that he and his cardinals might conveniently pillage Germany unhampered by the threat of a council. "By forbidding appeals to a council the pope treats us like slaves, and wishes to take for his own pleasures all that we and our ancestors have accumulated by honest labour. He calls me a chatterer, although he himself is more talkative than a magpie." Heimburg's denunciations of the pope were widely circulated, and in spite of the major excommunication he was taken into the service of the archbishop of Mainz and was his representative at the diet of Nuremberg in 1462. It is thus clear that motives which might ultimately lead to the withdrawal of a certain number of German princes from the papal ecclesiastical state were accumulating and intensifying during the latter half of the 15th century.

Conditions in Germany at the opening of the 16th century.

It is impossible to review here the complicated political history of the opening years of the 16th century. The names of Charles VIII. and Louis XII. of France, of Ferdinand and Isabella of Spain, of Henry VII. and Henry VIII. of England, of Maximilian the German king, of Popes Alexander VI., Julius II. and Leo X., stand for better organized civil governments, with growing powerful despotic heads; for a perfectly worldly papacy absorbed in the interests of an Italian principality, engaged in constant political negotiations with the European powers which are beginning to regard Italy as their chief field of rivalry, and are using its little states as convenient counters in their game of diplomacy and war. It was in Germany, however, seemingly the weakest and least aggressive of the European states, that the first permanent and successful revolts against the papal monarchy occurred. Nothing came of the lists of German *gravamina*, or of the demands for a council, so long as the incompetent Frederick III. continued to reign. His successor, Maximilian, who was elected emperor in 1493, was mainly preoccupied with his wars and attempts to reform the constitution of the empire; but the diet gave some attention to ecclesiastical reform. For instance, in 1501 it took measures to prevent money raised by the granting of a papal indulgence from leaving the country. After the disruption of the league of Cambray, Maximilian, like Louis XII., was thrown into a violent anti-curial reaction, and in 1510 he sent to the well-known humanist, Joseph Wimpheling, a copy of the French Pragmatic Sanction, asking his advice and stating that he had determined to free Germany from the yoke of the Curia and prevent the great sums of money from going to Rome. Wimpheling in his reply rehearsed the old grievances and complained that the contributions made to the pope by the archbishops on receiving the pallium was a great burden on the people. He stated that that of the archbishop of Mainz had been raised from ten to twenty-five thousand gulden, and that there had been seven vacancies within a generation, and consequently the subjects of the elector had been forced to pay that amount seven times. But Wimpheling had only some timid suggestions to make, and, since Maximilian was once more on happy terms with the pope, political considerations served to cool completely his momentary ardour for ecclesiastical reform. In 1514 the archbishopric of Mainz fell vacant again, and Albert of Brandenburg, already archbishop of Magdeburg and administrator of Halberstadt, longing to add it to his possessions, was elected. After some scandalous negotiations with Leo X. it was arranged that Albert should pay 14,000 ducats for the papal confirmation and 10,000 as a "composition" for permission to continue to hold, against the rules of the Church, his two former archbishoprics. Moreover, in order to permit him to pay the sums, he was to have half the proceeds in his provinces from an indulgence granted to forward the rebuilding of St Peter's. A Dominican monk, Johann Tetzel, was selected to proclaim the indulgence (together with certain supplementary graces) in the three provinces of the elector. This suggestion came from the curia, not the elector, whose representatives could not suppress the fear that the plan would arouse opposition and perhaps worse. Tetzel's preaching and the exaggerated claims that he was reported to be making for the indulgences attracted the attention of an Augustinian friar, Martin Luther, who had for some years been lecturing on theology at the university of Wittenberg. He found it impossible to reconcile Tetzel's views of indulgences with his own fundamental theory of salvation. He accordingly hastily drafted ninety-five propositions relating to indulgences, and posted an invitation to those who wished to attend a disputation in Wittenberg on the matter, under his presidency. He points out the equivocal character of the word *poenitentia*, which meant both "penance" and "penitence"; he declared that "true contrition seeks punishment, while the ampleness of pardons relaxes it and causes men to hate it." Christians ought to be taught that he who gives to a poor man or lends to the needy does better than if he bought pardons. He concludes with certain "keen questionings of the laity," as, Why does not the pope empty purgatory forthwith for charity's sake, instead of cautiously for money? Why does he not, since he is rich as Croesus, build St Peter's with his own money instead of taking that of poor believers? It was probably these closing reflections which led to the translation of the theses from Latin into German, and their surprising circulation. It must not be assumed that Luther's ninety-five theses produced any considerable direct results. They awakened the author himself to a consciousness that his doctrines were after all incompatible with some of the Church's teachings, and led him to consider the nature of the papal power which issued the indulgence. Two or three years elapsed before Luther began to be generally known and to exercise a perceptible influence upon affairs.

The diet of Augsburg of 1518.

In July 1518 a diet assembled in Augsburg to consider the new danger from the Turks, who were making rapid conquests under Sultan Selim I. The pope's representative, Cardinal Cajetan, made it clear that the only safety lay in the collection of a tenth from the clergy and a twentieth from laymen; but the diet appointed a committee to consider the matter and explain why they proposed to refuse the pope's demands. Protests urging the diet not to weaken came in from all sides. There was an especially bitter denunciation of the Curia by some unknown writer. He claims that "the pope bids his collectors go into the whole world, saying, 'He that believeth, and payeth the tenths, shall be saved.' But it is not necessary to stand in such fear of the thunder of Christ's vicar, but rather to fear Christ Himself, for it is the Florentine's business, not Christ's, that is at issue." The report of the committee of the diet was completed on the 27th of August 1518. It reviews all the abuses, declares that the German people are the victims of war, devastation and dearth, and that the common man is beginning to comment on the vast amount of wealth that is collected for expeditions against the Turk through indulgences or otherwise, and yet no expedition takes place. This is the first recognition in the official *gravamina* of the importance of the people. Shortly after the committee submitted its report the clergy of Liége presented a memorial which, as the ambassador from Frankfort observed, set forth in the best Latin all the various forms of rascality of which the *curtizanen* (i.e. *curiales*, officials of the curia) were guilty. From this time on three new streams begin to reinforce the rather feeble current of official efforts for reform. The common man, to whom the diet of Augsburg alludes, had long been raising his voice against the "parsons" (*Pfaffen*); the men of letters, Brand, Erasmus, Reuchlin, and above all Ulrich von Hutten, contributed, each in their way, to discredit the Roman Curia; and lastly, a new type of theology, represented chiefly by Martin Luther, threatened to sweep away the very foundations of the papal monarchy.

Hostility of the masses to the clergy in Germany.

The growing discontent of the poor people, whether in country or town, is clearly traceable in Germany during the 15th century, and revolutionary agitation was chronic in southern Germany at least during the first two decades of the 16th. The clergy were satirized and denounced in popular pamphlets and songs. The tithe was an oppressive form of taxation, as were the various fees demanded for the performance of the sacraments. The so-called "Reformation of Sigismund," drawn up in 1438, had demanded that the celibacy of the clergy should be abandoned and their excessive wealth reduced. "It is a shame which cries to heaven, this oppression by tithes, dues, penalties, excommunication, and tolls of the peasant, on whose labour all men depend for their existence." In 1476 a poor young shepherd drew thousands to Nicklashausen to hear him denounce the emperor as a rascal and the pope as a worthless fellow, and urge the division of the Church's property among the members of the community. The "parsons" must be killed, and the lords reduced to earn their bread by daily labour. An apocalyptic pamphlet of 1508 shows on its cover the Church upside down, with the peasant performing the services, while the priest guides the plough outside and a monk drives the horses. Doubtless the free peasants of Switzerland contributed to stimulate disorder and discontent, especially in southern Germany. The conspiracies were repeatedly betrayed and the guilty parties terribly punished. That discovered in 1517 made a deep impression on the authorities by reason of its vast extent, and doubtless led the diet of Augsburg to allude to the danger which lay in the refusal of the common man to pay the ecclesiastical taxes. "It was into this mass of seething discontent that the spark of religious protest fell—the one thing needed to fire the train and kindle the social conflagration. This was the society to which Luther spoke, and its discontent was the sounding board which made his words reverberate."[1]

Attitude of the humanists.

On turning from the attitude of the peasants and poorer townspeople to that of the scholars, we find in their writings a good deal of harsh criticism of the scholastic theology, satirical allusions to the friars, and, in Germany, sharp denunciations of the practices of the Curia. But there are many reasons for believing that the older estimate of the influence of the so-called Renaissance, or "new learning," in promoting the Protestant revolt was an exaggerated one. The class of humanists which had grown up in Italy during the 15th century, and whose influence had been spreading into Germany, France and England during the generation immediately preceding the opening of the Protestant revolt, represented every phase of religious feeling from mystic piety to cynical indifference, but there were very few anti-clericals among them. The revival of Greek from the time of Chrysoloras onward, instead of begetting a Hellenistic spirit, transported the more serious-minded to the nebulous shores of Neo-Platonism, while the less devout became absorbed in scholarly or literary ambitions, translations, elegantly phrased letters, clever epigrams or indiscriminate invective. It is true that Lorenzo Valla (d. 1457) showed the Donation of Constantine to be a forgery, denied that Dionysius the Areopagite wrote the works ascribed to him, and refuted the commonly accepted notion that each of the apostles had contributed a sentence to the Apostles' Creed. But such attacks were rare and isolated and were not intended to effect a breach in the solid ramparts of the medieval Church, but rather to exhibit the ingenuity of the critic. In the libraries collected under humanistic influences the patristic writers, both Latin and Greek, and the scholastic doctors are conspicuous. Then most of the humanists were clerics, and in Italy they enjoyed the patronage of the popes. They not unnaturally showed a tolerant spirit on the whole toward existing institutions, including the ecclesiastical abuses, and, in general, cared little how long the vulgar herd was left in the superstitious darkness which befitted their estate, so long as the superior man was permitted to hold discreetly any views he pleased. Of this attitude Mutian (1471–1526), the German humanist who perhaps approached most nearly the Italian type, furnishes a good illustration. He believed that Christianity had existed from all eternity, and that the Greeks and Romans, sharing in God's truth, would share also in the celestial joys. Forms and ceremonies should only be judged as they promoted the great object of life, a clean heart and a right spirit, love to God and one's neighbour. He defined faith as commonly understood to mean "not the conformity of what we say with fact, but an opinion upon divine things founded upon credulity which seeks after profit." "With the cross," he declares, "we put our foes to flight, we extort money, we consecrate God, we shake hell, we work miracles."

Erasmus (1464-1536).

These reflections were, however, for his intimate friends, and like him, his much greater contemporary, Erasmus, abhorred anything suggesting open revolt or revolution. The extraordinary popularity of Erasmus is a sufficient indication that his attitude of mind was viewed with sympathy by the learned, whether in France, England, Germany, Spain or Italy. He was a firm believer in the efficacy of culture. He maintained that old prejudices would disappear with the progress of knowledge, and that superstition and mechanical devices of salvation would be insensibly abandoned. The laity should read their New Testament, and would in this way come to feel the true significance of Christ's life and teachings, which, rather than the Church, formed the centre of Erasmus's religion. The dissidence of dissent, however, filled him with uneasiness, and he abhorred Luther's denial of free will and his exaggerated notion of man's utter depravity; in short, he did nothing whatever to promote the Protestant revolt, except so far as his frank denunciation and his witty arraignment of clerical and monastic weaknesses and soulless ceremonial, especially in his *Praise of Folly* and *Colloquies*, contributed to bring the faults of the Church into strong relief, and in so far as his edition of the New Testament furnished a simple escape from innumerable theological complications.

A peculiar literary feud in Germany served, about 1515, to throw into sharp contrast the humanistic party, which had been gradually developing during the previous fifty years, and the conservative, monkish, scholastic group, who found their leader among the Dominicans of the university of Cologne. Johann Reuchlin, a well-known scholar, who had been charged by the Dominicans with heresy, not only received the support of the newer type of scholars, who wrote him encouraging letters which he published under the title *Epistolae clarorum virorum*, but this collection suggested to Crotus Rubianus and Ulrich von Hutten one of the most successful satires of the ages, the *Epistolae obscurorum virorum*. As Creighton well said, the chief importance of the "Letters of Obscure Men" lay in its success in popularizing the conception of a stupid party which was opposed to the party of progress. At the same time that the Neo-Platonists, like Ficino and Pico de la Mirandola, and the pantheists, whose God was little more than a reverential conception of the universe at large, and the purely worldly humanists, like Celtes and Bebel, were widely diverging each by his own particular path from the ecclesiastical *Weltanschauung* of the middle ages, Ulrich von Hutten was busy attacking the Curia in his witty *Dialogues*, in the name of German patriotism. He, at least, among the well-known scholars eagerly espoused Luther's cause, as he understood it. A few of the humanists became Protestants—Melanchthon, Bucer, Oecolampadius and others—but the great majority of them, even if attracted for the moment by Luther's denunciation of scholasticism, speedily repudiated the movement. In Socinianism (see below) we have perhaps the only instance of humanistic antecedents leading to the formation of a religious sect.

The new theology and Martin Luther.

A new type of theology made its appearance at the opening of the 16th century, in sharp contrast with the Aristotelian scholasticism of the Thomists and Scotists. This was due to the renewed enthusiasm for, and appreciation of, St Paul with which Erasmus sympathized, and which found an able exponent in England in John Colet and in France in Lefèvre of Étaples (Faber Stapulensis). Luther was reaching somewhat similar views at the same time, although in a strikingly different manner and with far more momentous results for the western world. Martin Luther was beyond doubt the most important single figure in the Protestant revolt. His influence was indeed by no means so decisive and so pervasive as has commonly been supposed, and his attacks on the evils in the Church were no bolder or more comprehensive than those of Marsiglio and Wycliffe, or of several among his contemporaries who owed nothing to his example. Had the German princes not found it to their interests to enforce his principles, he might never have been more than the leader of an obscure mystic sect. He was, moreover, no statesman. He was recklessly impetuous in his temperament, coarse and grossly superstitious according to modern standards. Yet in spite of all these allowances he remains one of the great heroes of all history. Few come in contact with his writings without feeling his deep spiritual nature and an absolute genuineness and marvellous individuality which seem never to sink into mere routine or affectation. In his more important works almost every sentence is alive with that autochthonic quality which makes it unmistakably his. His fundamental religious conception was his own hard-found answer to his own agonized question as to the nature and assurance of salvation. Even if others before him had reached the conviction that the Vulgate's word *justitia* in Romans i. 16–17 meant "righteousness" rather than "justice" in a juridical sense, Luther exhibited supreme religious genius in his interpretation of "God's righteousness" (*Gerechtigkeit*) as over against the "good works" of man, and in the overwhelming importance he attached to the promise that the just shall live by faith. It was his anxiety to remove everything that obscured this central idea which led him to revolt against the ancient Church, and this conception of faith served, when he became leader of the German Protestants, as a touchstone to test the expediency of every innovation. But only gradually did he come to realize that his source of spiritual consolation might undermine altogether the artfully constructed fabric of the medieval Church. As late as 1516 he declared that the life of a monk was never a more enviable one than at that day. He had, however, already begun to look sourly upon Aristotle and the current scholastic theology, which he believed hid the simple truth of the gospel and the desperate state of mankind, who were taught a vain reliance upon outward works and ceremonies, when the only safety lay in throwing oneself on God's mercy. He was suddenly forced to take up the consideration of some of the most fundamental points in the orthodox theology by the appearance of Tetzel in 1517. In his hastily drafted Ninety-five Theses he sought to limit the potency of indulgences, and so indirectly raised the question as to the power of the pope. He was astonished to observe the wide circulation of the theses both in the Latin and German versions. They soon reached Rome, and a Dominican monk, Prierius, wrote a reply in defence of the papal power, in an insolent tone which first served to rouse Luther's suspicion of the theology of the papal Curia. He was summoned to Rome, but, out of consideration for his patron, the important elector of Saxony, he was permitted to appear before the papal legate during the diet of Augsburg in 1518. He boldly contradicted the legate's theological statements, refused to revoke anything and appealed to a future council. On returning to Wittenberg, he turned to the canon law, and was shocked to find it so completely at variance with his notions of Christianity. He reached the conclusion that the papacy was but four hundred years old. Yet, although of human origin, it was established by common consent and with God's sanction, so that no one might withdraw his obedience without offence.

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[1] Lindsay.

It was not, however, until 1520 that Luther became in a sense the leader of the German people by issuing his three great pamphlets, all of which were published in German as well as in Latin—his *Address to the Christian Nobility of the German Nation*, his *Babylonish Captivity of the Church*, and his *Freedom of the Christian*. In the first he urged that, since the Church had failed to reform itself, the secular government should come to the rescue. "The Romanists have with great dexterity built themselves about with three walls, which have hitherto protected them against reform; and thereby is Christianity fearfully fallen. In the first place, when the temporal power has pressed them hard, they have affirmed and maintained that the temporal power has no jurisdiction over them—that, on the contrary, the spiritual is above the temporal. Secondly, when it was proposed to admonish them from the Holy Scriptures they said, 'It beseems no one but the pope to interpret the Scriptures,' and, thirdly, when they were threatened with a council, they invented the idea that no one but the pope can call a council. Thus they have secretly stolen our three rods that they may go unpunished, and have entrenched themselves safely behind these three walls in order to carry on all the rascality and wickedness that we now see."

He declares that the distinction between the "spiritual estate," composed of pope, bishops, priests and monks, as over against the "temporal estate" composed of princes, lords, artisans and peasants, is a very fine hypocritical invention of which no one should be afraid. "A cobbler, a smith, a peasant, every man has his own calling and duty, just like the consecrated priests and bishops, and every one in his calling or office must help and serve the rest, so that all may work together for the common good." After overthrowing the other two walls, Luther invites the attention of the German rulers to the old theme of the pomp of the pope and cardinals, for which the Germans must pay. "What the Romanists really mean to do, the 'drunken Germans' are not to see until they have lost everything. . . . If we rightly hang thieves and behead robbers, why do we leave the greed of Rome unpunished? for Rome is the greatest thief and robber that has ever appeared on earth, or ever will; and all in the holy names of the Church and St Peter." After proving that the secular rulers were free and in duty bound to correct the evils of the Church, Luther sketches a plan for preventing money from going to Italy, for reducing the number of idle, begging monks, harmful pilgrimages and excessive holidays. Luxury and drinking were to be suppressed, the universities, especially the divinity schools, reorganized, &c.

Apart from fundamental rejection of the papal supremacy, there was little novel in Luther's appeal. It had all been said before in the various protests of which we have spoken, and very recently by Ulrich von Hutten in his *Dialogues*, but no one had put the case so strongly, or so clearly, before. In addressing the German nobility Luther had refrained from taking up theological or religious doctrines; but in September 1520 he attacked the whole sacramental system of the medieval Church in his *Babylonish Captivity of the Church*. Many reformers, like Glapion, the Franciscan confessor of Charles V., who had read the *Address* with equanimity if not approval, were shocked by Luther's audacity in rejecting the prevailing fundamental religious conceptions. Luther says: "I must begin by denying that there are seven sacraments, and must lay down for the time being that there are only three—baptism, penance and the bread, and that by the court of Rome all these have been brought into miserable bondage, and the Church despoiled of her liberty." It is, however, in the *Freedom of the Christian* that the essence of Luther's religion is to be found. Man cannot save himself, but *is* saved then and there so soon as he believes God's promises, and to doubt these is the supreme crime. So salvation was to him not a painful *progress* toward a goal to be reached by the sacraments and by right conduct, but a *state* in which man found himself so soon as he despaired absolutely of his own efforts, and threw himself on God's assurances. Man's utter incapacity to do anything to please God, and his utter personal dependence on God's grace seemed to render the whole system of the Church well-nigh gratuitous even if it were purged of all the "sophistry" which to Luther seemed to bury out of sight all that was essential in religion. Luther's gospel was one of love and confidence, not of fear and trembling, and came as an overwhelming revelation to those who understood and accepted it.

The old question of Church reform inevitably reappeared

The edict of Worms, 1521.

when the young emperor Charles V. opened his first imperial diet at Worms early in 1521, and a committee of German princes drafted a list of *gravamina*, longer and bitterer than any preceding one. While the resolute papal nuncio Aleander was indefatigable in his efforts to induce the diet to condemn Luther's teachings, his curious and instructive despatches to the Roman Curia complain constantly of the ill-treatment and insults he encountered, of the readiness of the printers to issue innumerable copies of Luther's pamphlets and of their reluctance to print anything in the pope's favour. Charles apparently made up his mind immediately and once for all. He approved the *gravamina*, for he believed a thorough reform of the Church essential. This reform he thought should be carried out by a council, even against the pope's will; and he was destined to engage in many fruitless negotiations to this end before the council of Trent at last assembled a score of years later. But he had no patience with a single monk who, led astray by his private judgment, set himself against the faith held by all Christians for a thousand years. "What my forefathers established at the council of Constance and other councils it is my privilege to maintain," he exclaims. Although, to Aleander's chagrin, the emperor consented to summon Luther to Worms, where he received a species of ovation, Charles readily approved the edict drafted by the papal nuncio, in which Luther is accused of having "brought together all previous heresies in one stinking mass," rejecting all law, teaching a life wholly brutish, and urging the lay people to bathe their hands in the blood of priests. He and his adherents were outlawed; no one was to print, sell or read any of his writings, "since they are foul, harmful, suspected, and come from a notorious and stiff-necked heretic." The edict of Worms was entirely in harmony with the laws of Western Christendom, and there were few among the governing classes in Germany at that time who really understood or approved Luther's fundamental ideas; nevertheless—if we except the elector of Brandenburg, George of Saxony, the dukes of Bavaria, and Charles V.'s brother Ferdinand—the princes, including the ecclesiastical rulers and the towns, commonly neglected to publish the edict, much less to enforce it. They were glad to leave Luther unmolested in order to spite the "Curtizanen," as the adherents of the papal Curia were called. The emperor was forced to leave Germany immediately after the diet had dissolved, and was prevented by a succession of wars from returning for nearly ten years. The governing council, which had been organized to represent him in Germany, fell rapidly into disrepute, and exercised no restraining influence on those princes who might desire to act on Luther's theory that the civil government was supreme in matters of Church reform.

Wide divergence of opinion in Germany.

The records of printing indicate that religious, social and economic betterment was the subject of an ever-increasing number of pamphlets. The range of opinion was wide. Men like Thomas Murner, for instance, heartily denounced "the great Lutheran fool," but at the same time bitterly attacked monks and priests, and popularized the conception of the simple man with the hoe (Karsthans). Hans Sachs, on the other hand, sang the praises of the "Wittenberg Nightingale," and a considerable number of prominent men of letters accepted Luther as their guide—Zell and Bucer, in Strassburg, Eberlin in Ulm, Oecolampadius in Augsburg, Osiander and others in Nuremberg, Pellicanus in Nördlingen. Moreover, there gradually developed a group of radicals who were convinced that Luther had not the courage of his convictions. They proposed to abolish the "idolatry" of the Mass and all other outward signs of what they deemed the old superstitions. Luther's colleague at Wittenberg, Carlstadt (*q.v.*), began denouncing the monastic life, the celibacy of the clergy, the veneration of images; and before the end of 1521 we find the first characteristic outward symptoms of Protestantism. Luther had meanwhile been concealed by his friends in the Wartburg, near Eisenach, where he busied himself with a new German translation of the New Testament, to be followed in a few years by the Old Testament. The Bible had long been available in the language of the people, and there are indications that the numerous early editions of the Scriptures were widely read. Luther, however, possessed resources of style which served to render his version far superior to the older one, and to give it an important place in the development of German literature, as well as in the history of the Protestant churches. During his absence two priests from parishes near Wittenberg married; while several monks, throwing aside their cowls, left their cloisters. Melanchthon, who was for a moment carried away by the movement, partook, with several of his students, of the communion under both kinds, and on Christmas Eve a crowd invaded the church of All Saints, broke the lamps, threatened the priests and made sport of the venerable ritual. Next day, Carlstadt, who had laid aside his clerical robes, dispensed the Lord's Supper in the "evangelical fashion." At this time three prophets arrived from Zwickau, eager to hasten the movement of emancipation. They were weavers who had been associated with Thomas Münzer, and like him looked forward to a very radical reform of society. They rejected infant baptism, and were among the forerunners of the Anabaptists.

The Protestant Revolt begins in Saxony, 1522.

In January 1522, Carlstadt induced the authorities of Wittenberg to publish the first evangelical church ordinance. The revenues from ecclesiastical foundations, as well as those from the industrial gilds, were to be placed in a common chest, to be in charge of the townsmen and the magistrates. The priests were to receive fixed salaries; begging, even by monks and poor students, was prohibited; the poor, including the monks, were to be supported from the common chest. The service of the Mass was modified, and the laity were to receive the elements in both kinds. Reminders of the old religious usages were to be done away with, and fast days were to be no longer observed. These measures, and the excitement which followed the arrival of the radicals from Zwickau, led Luther to return to Wittenberg in March 1522, where he preached a series of sermons attacking the impatience of the radical party, and setting forth clearly his own views of what the progress of the Reformation should be. "The Word created heaven and earth and all things; the same Word will also create now, and not we poor sinners. Faith must be unconstrained and must be accepted without compulsion. To marry, to do away with images, to become monks and nuns, or for monks and nuns to leave their convent, to eat meat on Friday or not to eat it, and other like things—all these are open questions, and should not be forbidden by any man. . . . What we want is the heart, and to win that we must preach the gospel. Then the Word will drop into one heart to-day and to-morrow into another, and so will work that each will forsake the Mass." Luther succeeded in quieting the people both in Wittenberg and the neighbouring towns, and in preventing the excesses which had threatened to discredit the whole movement.

Adrian VI. 1522–1523.

In January 1522, Leo X. had been succeeded by a new pope, Adrian VI., a devout Dominican theologian, bent on reforming the Church, in which, as he injudiciously confessed through his legate to the diet at Nuremberg, the Roman Curia had perhaps been the chief source of "that corruption which had spread from the head to the members." The Lutheran heresy he held to be God's terrible judgment on the sins of the clergy. The diet refused to accede to the pope's demand that the edict of Worms should be enforced, and recommended that a Christian council should be summoned in January, to include not only ecclesiastics but laymen, who should be permitted freely to express their opinions. While the diet approved the list of abuses drawn up at Worms, it ordered that Luther's books should no longer be published, and that Luther himself should hold his peace, while learned men were to admonish the erring preachers. The decisions of this diet are noteworthy, since they probably give a very fair idea of the prevailing opinion of the ruling classes in Germany. They refused to regard Luther as in any way their leader, or even to recognize him as a discreet person. On the other hand, they did not wish to take the risk of radical measures against the new doctrines, and were glad of an excuse for refusing the demands of the pope. Adrian soon died, worn out by his futile attempts to correct the abuses at home, and was followed by Clement VII., a Medici, less gifted but not less worldly in his instincts than Leo X.

Beginning of the religious cleft between the German states of the north and south in 1524.

Clement sent one of his ablest Italian diplomatists, Campeggio, to negotiate with the diet which met at Spires in 1524. He induced the diet to promise to execute the edict of Worms as far as that should be possible; but it was generally understood that it was impossible. The diet renewed the demand for a general council to meet in a German town to settle the affairs of the Church in Germany, and even proposed the convocation of a national council at Spires in November, to effect a temporary adjustment. In this precarious situation Campeggio, realizing the hopelessness of his attempt to induce all the members of the diet to co-operate with him in re-establishing the pope's control, called together at Regensburg a certain number of rulers whom he believed to be rather more favourably disposed toward the pope than their fellows. These included Ferdinand, duke of Austria, the two dukes of Bavaria, the archbishops of Salzburg and Trent, the bishops of Bamberg, Spires, Strassburg and others. He induced these to unite in opposing the Lutheran heresy on condition that the pope would issue a decree providing for some of the most needed reforms. There was to be no more financial oppression on the part of the clergy, and no unseemly payments for performing the church services. Abuses arising from the granting of indulgences were to be remedied, and the excessive number of church holidays, which seriously interfered with the industrial welfare of Germany, was to be reduced. The states in the Catholic League were permitted to retain for their own uses about one-fifth of the ecclesiastical revenue; the clergy was to be subjected to careful discipline; and only authorized preachers were to be tolerated, who based their teachings on the works of the four Latin Church fathers. Thus the agreement of Regensburg is of great moment in the development of the Protestant revolt in Germany. For Austria, Bavaria and the great ecclesiastical states in the south definitely sided with the pope against Luther's heresies, and to this day they still remain Roman Catholic. In the north, on the other hand, it became more and more apparent that the princes were drifting away from the Roman Catholic Church. Moreover, it should be noted that Campeggio's diplomacy was really the beginning of an effective betterment of the old Church, such as had been discussed for two or three centuries. He met the long-standing and general demand for reform without a revolution in doctrines or institutions. A new edition of the German Bible was issued with the view of meeting the needs of Catholics, a new religious literature grew up designed to substantiate the beliefs sanctioned by the Roman Church and to carry out the movement begun long before toward spiritualizing its institutions and rites.

The Peasant Revolt, 1525.

In 1525 the conservative party, which had from the first feared that Luther's teaching would result in sedition, received a new and terrible proof, as it seemed to them, of the noxious influence of the evangelical preachers. The peasant movements alluded to above, which had caused so much anxiety at the diet of Augsburg in 1518, culminated in the fearful Peasant Revolt in which the common man, both in country and town, rose in the name of "God's justice" to avenge long-standing wrongs and establish his rights. Luther was by no means directly responsible for the civil war which followed, but he had certainly contributed to stir up the ancient discontent. He had asserted that, owing to the habit of foreclosing small mortgages, "any one with a hundred gulden could gobble up a peasant a year." The German feudal lords he pronounced hangmen, who knew only how to swindle the poor man—"such fellows were formerly called scoundrels, but now we must call them 'Christians and revered princes.'" Yet in spite of this harsh talk about princes, Luther relied upon them to forward the reforms in which he was interested, and he justly claimed that he had greatly increased their powers by reducing the authority of the pope and subjecting the clergy in all things to the civil government.

The best known statement of the peasants' grievances is to be found in the famous "Twelve Articles" drawn up in 1524. They certainly showed the unmistakable influence of the evangelical teaching. The peasants demanded that the gospel should be taught them as a guide in life, and that each community should be permitted to choose its pastor and depose him if he conducted himself improperly. "The pastor thus chosen should teach us the gospel pure and simple, without any addition, doctrine or ordinance of man." The old tithe on grain shall continue to be paid, since that is established by the Old Testament. It will serve to support the pastor, and what is left over shall be given to the poor. Serfdom is against God's word, "since Christ has delivered and redeemed us all without exception, by the shedding of his precious blood, the lowly as well as the great." Protests follow against hunting and fishing rights, restrictions on wood-cutting, and excessive demands made on peasants. "In the twelfth place," the declaration characteristically concluded, "it is our conclusion and final resolution that if one or more of the articles here set forth should not be in agreement with the word of God, as we think they are, such articles will we willingly retract if it be proved by a clear explanation of Scripture really to be against the word of God." More radical demands came from the working classes in the towns. The articles of Heilbronn demanded that the property of the Church should be confiscated and used for the community; clergy and nobility alike were to be deprived of all their privileges, so that they could no longer oppress the poor man. The more violent leaders, like Münzer, renewed the old cry that the parsons must be slain. Hundreds of castles and monasteries were destroyed by the frantic peasantry, and some of the nobles were murdered with shocking cruelty. Luther, who believed that the peasants were trying to cloak their dreadful sins with excuses from the gospel, exhorted the government to put down the insurrection. "Have no pity on the poor folk; stab, smite, throttle, who can!" To him the peasants' attempt to abolish serfdom was wholly unchristian, since it was a divinely sanctioned institution, and if they succeeded they would "make God a liar." The German rulers took Luther's advice with terrible literalness, and avenged themselves upon the peasants, whose lot was apparently worse afterwards than before.

Appearance of an evangelical party.

The terror inspired by the Peasant War led to a new alliance, the League of Dessau, formed by some of the leading rulers of central and northern Germany, to stamp out the "accursed Lutheran sect." This included Luther's old enemy, Duke George of Saxony, the electors of Brandenburg and Mainz, and two princes of Brunswick. The rumour that the emperor was planning to return to Germany in order to root out the growing heresy, led a few princes who had openly favoured Luther to unite also. Among these the chief were the new elector of Saxony, John (who, unlike his brother, Frederick the Wise, had openly espoused the new doctrines), and the energetic Philip, landgrave of Hesse. The emperor did not return, and since there was no one to settle the religious question in Germany, the diet of Spires (1526) determined that, pending the meeting of the proposed general council, each prince, and each knight and town owing immediate allegiance to the emperor, should decide individually what particular form of religion should prevail within the limits of their territories. Each prince was "so to live, reign and conduct himself as he would be willing to answer before God and His Imperial Majesty." While the evangelical party still hoped that some form of religion might be agreed upon which would prevent the disruption of the Church, the conservatives were confident that the heretics would soon be suppressed, as they had so often been in the past. The situation tended to become more, rather than less, complicated, and there was every variety of reformer and every degree of conservatism, for there were no standards for those who had rejected the papal supremacy, and even those who continued to accept it differed widely. For example, George of Saxony viewed Aleander, the pope's nuncio, with almost as much suspicion as he did Luther himself.

Zwingli and the Reformation in Switzerland.

Zwingli and Luther. The Marburg Articles.

The religious ideas in South Germany were affected by the development of a reform party in Switzerland, under the influence of Zwingli, who claimed that at Einsiedeln, near the lake of Zürich, he had begun to preach the gospel of Christ in the year 1516 "before any one in my locality had so much as heard the name of Luther." Three years later he became preacher in the cathedral of Zürich. Here he began to denounce the abuses in the Church, as well as the traffic in mercenaries which had so long been a blot upon his country's honour. From the first he combined religious and political reform. In 1523 he prepared a complete statement of his beliefs, in the form of sixty-seven theses. He maintained that Christ was the only high priest and that the gospel did not gain its sanction from the authority of the Church. He denied the existence of purgatory, and rejected those practices of the Church which Luther had already set aside. Since no one presented himself to refute him, the town council ratified his conclusions, so that the city of Zürich practically withdrew from the Roman Catholic Church. Next year the Mass, processions and the images of saints were abolished. The shrines were opened and the relics burned. Some other towns, including Bern, followed Zürich's example, but the Forest cantons refused to accept the innovations. In 1525 a religious and political league was arranged between Zürich and Constance, which in the following year was joined by St Gallen, Biel, Mühlhausen, Basel and Strassburg. Philip of Hesse was attracted by Zwingli's energy, and was eager that the northern reformers should be brought into closer relations with the south. But the league arranged by Zwingli was directed against the house of Habsburg, and Luther did not deem it right to oppose a prince by force of arms. Moreover, he did not believe that Zwingli, who conceived the eucharist to be merely symbolical in its character, "held the whole truth of God." Nevertheless, Philip of Hesse finally arranged a religious conference in the castle of Marburg (1529) where Zwingli and Luther met. They were able to agree on fourteen out of the fifteen "Marburg Articles," which stated the chief points in the Christian faith as they were accepted by both. A fundamental difference as to the doctrine of the eucharist, however, stood in the way of the real union.

The diet of Spires, 1529, and the "Protestants."

The diet of Spires (1529) had received a letter from the emperor directing it to look to the enforcement of the edict of Worms against the heretics. No one was to preach against the Mass, and no one was to be prevented from attending it freely. This meant that the evangelical princes would be forced to restore the most characteristic Catholic rite. As they formed only a minority in the diet, they could only draw up a protest, which was signed by John Frederick of Saxony, Philip of Hesse, and fourteen of the three towns, including Strassburg, Nuremberg and Ulm. In this they claimed that the majority had no right to abrogate the stipulations of the former diet of Spires, which permitted each prince to determine religious matters provisionally for himself, for all had unanimously pledged themselves to observe that agreement. They therefore appealed to the emperor and to a future council against the tyranny of the majority. Those who signed this appeal were called *Protestants*, a name which came to be generally applied to those who rejected the supremacy of the pope, the Roman Catholic conceptions of the clergy and of the Mass, and discarded sundry practices of the older Church, without, however, repudiating the Catholic creeds.

The diet and confession of Augsburg, 1530.

During the period which had elapsed since the diet of Worms, the emperor had resided in Spain, busy with a series of wars, waged mainly with the king of France.[1] In 1530 the emperor found himself in a position to visit Germany once more, and summoned the diet to meet at Augsburg, with the hope of settling the religious differences and bringing about harmonious action against the Turk. The Protestants were requested to submit a statement of their opinions, and on June 25th the "Augsburg Confession" was read to the diet. This was signed by the elector of Saxony and his son and successor, John Frederick, by George, margrave of Brandenburg, two dukes of Lüneburg, Philip of Hesse and Wolfgang of Anhalt, and by the representatives of Nuremberg and Reutlingen. The confession was drafted by Melanchthon, who sought consistently to minimize the breach which separated the Lutherans from the old Church. In the first part of the confession the Protestants seek to prove that there is nothing in their doctrines at variance with those of the universal Church "or even of the Roman Church so far as that appears in the writings of the Fathers." They made it clear that they still held a great part of the beliefs of the medieval Church, especially as represented in Augustine's writings, and repudiated the radical notions of the Anabaptists and of Zwingli. In the second part, those practices of the Church are enumerated which the evangelical party rejected; the celibacy of the clergy, the Mass, as previously understood, auricular confession, and monastic vows, the objections to which are stated with much vigour. "Christian perfection is this: to fear God sincerely, to trust assuredly that we have, for Christ's sake, a gracious and merciful God; to ask and look with confidence for help from him in all our affairs, accordingly to our calling, and outwardly to do good works diligently, and to attend to our vocation. In these things doth true perfection and a true worship of God consist. It doth not consist in going about begging, or in wearing a black or a grey cowl." The Protestant princes declared that they had no intention of depriving the bishops of their jurisdiction, but this one thing only is requested of them, "that they would suffer the gospel to be purely taught, and would relax a few observances in which we cannot adhere without sin."

Course of events in Germany, 1531–1540.

The confession was turned over to a committee of conservative theologians, including Eck, Faber and Cochlaeus. Their refutation of the Protestant positions seemed needlessly sharp to the emperor, and five drafts were made of it. Charles finally reluctantly accepted it, although he would gladly have had it milder, for it made reconciliation hopeless. The majority of the diet approved a recess, allowing the Protestants a brief period of immunity until the 15th of April 1531, after which they were to be put down by force. Meanwhile, they were to make no further innovations, they were not to molest the conservatives, and were to aid the emperor in suppressing the doctrines of Zwingli and of the Anabaptists. The Lutheran princes protested, together with fourteen cities, and left the diet. The diet thereupon decided that the edict of Worms should at last be enforced. All Church property was to be restored, and, perhaps most important of all, the jurisdiction of the Imperial court (*Reichskammergericht*), which was naturally Catholic in its sympathies, was extended to appeals involving the seizure of ecclesiastical benefices, contempt of episcopal decisions and other matters deeply affecting the Protestants. In November the Protestants formed the Schmalkaldic League, which, after the death of Zwingli, in 1531, was joined by a number of the South German towns. The period of immunity assigned to the Protestants passed by; but they were left unmolested, for the emperor was involved in many difficulties, and the Turks were threatening Vienna. Consequently, at the diet of Nuremberg (1532) a recess was drafted indefinitely extending the religious truce and quashing such cases in the *Reichskammergericht* as involved Protestant innovations. The conservatives refused to ratify the recess, which was not published, but the Protestant states declared that they would accept the emperor's word of honour, and furnished him with troops for repelling the Mahommedans. The fact that the conservative princes, especially the dukes of Bavaria, were opposed to any strengthening of the emperor's power, and were in some cases hereditary enemies of the house of Habsburg, served to protect the Protestant princes. In 1534 the Schmalkaldic League succeeded in restoring the banished duke of Württemberg, who declared himself in favour of the Lutheran reformation, and thus added another to the list of German Protestant states. In 1539 George of Saxony died, and was succeeded by his brother Henry, who also accepted the new faith, and in the same year the new elector of Brandenburg became a Protestant. Indeed, there was reason to believe at this time that the archbishops of Mainz, Trier and Cologne, as well as some other bishops, were planning the secularization of their principalities.

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[1] In 1527 the pope's capital was sacked by Charles's army. This was, of course, but an incident in the purely political relations of the European powers with the pope, and really has no bearing upon the progress of the Protestant revolt.

Denmark, Norway and Sweden become Protestant.

To the north, Lutheran influence had spread into Denmark; Sweden and Norway were also brought within its sphere. Christian II. of Denmark, a nephew of the elector of Saxony, came to the throne in 1513, bent on bringing Sweden and Norway, over which he nominally ruled in accordance with the terms of the Union of Kalmar (1397), completely under his control. In order to do this it was necessary to reduce the power of the nobility and clergy, privileged classes exempt from taxation and rivals of the royal power. Denmark had suffered from all the abuses of papal provisions, and the nuncio of Leo X. had been forced in 1518 to flee from the king's wrath. Christian II. set up a supreme court for ecclesiastical matters, and seemed about to adopt a policy similar to that later pursued by Henry VIII. of England, when his work was broken off by a revolt which compelled him to leave the country. Lutheranism continued to make rapid progress, and Christian's successor permitted the clergy to marry, appropriated the annates and protected the Lutherans. Finally Christian III., an ardent Lutheran, ascended the throne in 1536; with the sanction of the diet he severed, in 1537, all connexion with the pope, introducing the Lutheran system of Church government and accepting the Augsburg Confession.[1] Norway was included in the changes, but Sweden had won its independence of Denmark, under Gustavus Vasa, who, in 1523, was proclaimed king. He used the Lutheran theories as an excuse for overthrowing the ecclesiastical aristocracy, which had been insolently powerful in Sweden. In 1527, supported by the diet, he carried his measures for secularizing such portions of the Church property as he thought fit, and for subjecting the Church to the royal power (Ordinances of Vesteräs); but many of the old religious ceremonies and practices were permitted to continue, and it was not until 1592 that Lutheranism was officially sanctioned by the Swedish synod.[2]

The Council of Trent.

Charles V., finding that his efforts to check the spread of the religious schism were unsuccessful, resorted once more to conferences between Roman Catholic and Lutheran theologians, but it became apparent that no permanent compromise was possible. The emperor then succeeded in disrupting the Schmalkaldic League by winning over, on purely political grounds, Philip of Hesse and young Maurice of Saxony, whose father, Henry, had died after a very brief reign. Charles V. had always exhibited the greatest confidence in the proposed general council, the summoning of which had hitherto been frustrated by the popes, and at last, in 1545, the council was summoned to meet at Trent, which lay conveniently upon the confines of Italy and Germany (see TRENT, COUNCIL OF). The Dominicans and, later, members of the newly born Order of Jesus, were conspicuous, among the theological deputies, while the Protestants, though invited, refused to attend. It was clear from the first that the decisions of the council would be uncompromising in character, and that the Protestants would certainly refuse to be bound by its decrees. And so it fell out. The very first anathemas of the council were directed against those innovations which the Protestants had most at heart. The emperor had now tried threats, conferences and a general council, and all had failed to unify the Church.

Events culminating in the religious peace of Augsburg, 1555.

Maurice of Saxony, without surrendering his religious beliefs, had become the political friend of the emperor, who had promised him the neighbouring electorate of Saxony. John Frederick, the elector, was defeated at Mühlberg, April 1547, and taken prisoner. Philip of Hesse also surrendered, and Charles tried once more to establish a basis of agreement. Three theologians, including a conservative Lutheran, were chosen to draft the so-called "Augsburg Interim." This reaffirmed the seven sacraments, transubstantiation and the invocation of saints, and declared the pope head of the Church, but adopted Luther's doctrine of justification by faith in a conditional way, as well as the marriage of priests, and considerably modified the theory and practice of the Mass. For four years Charles, backed by the Spanish troops, made efforts to force the Protestant towns to observe the Interim, but with little success. He rapidly grew extremely unpopular, and in 1552 Maurice of Saxony turned upon him and attempted to capture him at Innsbruck. Charles escaped, but Maurice became for the moment leader of the German princes who gathered at Passau (August 1552) to discuss the situation. The settlement, however, was deferred for the meeting of the diet, which took place at Augsburg, 1555. There was a general anxiety to conclude a peace—"*beständiger, beharrlicher, unbedingter, für und für ewig währender.*" There was no other way but to legalize the new faith in Germany, but only those were to be tolerated who accepted the Augsburg Confession. This excluded, of course, not only the Zwinglians and Anabaptists, but the ever-increasing Calvinistic or "Reformed" Church. The principle *cujus regio ejus religio* was adopted, according to which each secular ruler might choose between the old faith and the Lutheran. His decision was to bind all his subjects, but a subject professing another religion from his prince was to be permitted to leave the country. The ecclesiastical rulers, however, were to lose their possessions if they abandoned the old faith.[3] Freedom of conscience was thus established for princes alone, and their power became supreme in religious as well as secular matters. The Church and the civil government had been closely associated with one another for centuries, and the old system was perpetuated in the Protestant states. Scarcely any one dreamed that individual subjects could safely be left to believe what they would, and permitted, so long as they did not violate the law of the land, freely to select and practise such religious rites as afforded them help and comfort.

Religious situation in England at the opening of the 16th century.

During the three or four years which followed the signing of the Augsburg Confession in 1530 and the formation of the Schmalkaldic League, England, while bitterly denouncing and burning Lutheran heretics in the name of the Holy Catholic Church, was herself engaged in severing the bonds which had for well-nigh a thousand years bound her to the Apostolic See. An independent national Church was formed in 1534, which continued, however, for a time to adhere to all the characteristic beliefs of the medieval Catholic Church, excepting alone the headship of the pope. The circumstances which led to the English schism are dealt with elsewhere (see ENGLAND, CHURCH OF), and need be reviewed here only in the briefest manner. There was some heresy in England during the opening decades of the 16th century, survivals of the Lollardy which now and then brought a victim to the stake. There was also the old discontent among the orthodox in regard to the Church's exactions, bad clerics and dissolute and lazy monks. Scholars, like Colet, read the New Testament in Greek and lectured on justification by faith before they knew of Luther, and More included among the institutions of Utopia a rather more liberal and enlightened religion than that which he observed around him. Erasmus was read and approved, and his notion of reform by culture no doubt attracted many adherents among English scholars. Luther's works found their way into England, and were read and studied at both Oxford and Cambridge. In May 1521 Wolsey attended a pompous burning of Lutheran tracts in St Paul's churchyard, where Bishop Fisher preached ardently against the new German heresy. Henry VIII. himself stoutly maintained the headship of the pope, and, as is well known, after examining the arguments of Luther, published his *Defence of the Seven Sacraments* in 1521, which won for him from the pope the glorious title of "Defender of the Faith." The government and the leading men of letters and prelates appear therefore to have harboured no notions of revolt before the matter of the king's divorce became prominent in 1527.

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[1] The episcopal office was retained, but the "succession" broken, the new Lutheran bishops being consecrated by Buggenhagen, who was only in priest's orders.

[2] The episcopal system and succession were maintained, and the "Mass vestments" (*i.e.* alb and chasuble) remain in use to this day.

[3] This so-called "ecclesiastical reservation" was not included in the main peace.

Henry VIII. and the divorce case.

Henry's elder brother Arthur, a notoriously sickly youth of scarce fifteen, had been married to Catherine, daughter of Ferdinand and Isabella, but had died less than five months after the marriage (April 1502), leaving doubts as to whether the union had ever been physically consummated. Political reasons dictated an alliance between the young widow and her brother-in-law Henry, prince of Wales, nearly five years her junior; Julius II. was induced reluctantly to grant the dispensation necessary on account of the relationship, which, according to the canon law and the current interpretation of Leviticus xviii. 16, stood in the way of the union. The wedding took place some years later (1509), and several children were born, none of whom survived except the princess Mary. By 1527 the king had become hopeless of having a male heir by Catherine. He was tired of her, and in love with the black-eyed Anne Boleyn, who refused to be his mistress. He alleged that he was beginning to have a horrible misgiving that his marriage with Catherine had been invalid, perhaps downright "incestuous." The negotiations with Clement VII. with the hope of obtaining a divorce from Catherine, the reluctance of the pope to impeach the dispensation of his predecessor Julius II., and at the same time to alienate the English queen's nephew Charles V., the futile policy of Wolsey and his final ruin in 1529 are described elsewhere (see ENGLISH HISTORY; HENRY VIII.; CATHERINE OF ARAGON). The king's agents secured the opinion of a number of prominent universities that his marriage was void, and an assembly of notables, which he summoned in June 1530, warned the pope of the dangers involved in leaving the royal succession in uncertainty, since the heir was not only a woman, but, as it seemed to many, of illegitimate birth.

Beginning of England's revolt against papacy.

Henry's next move was to bring a monstrous charge against the clergy, accusing them of having violated the ancient laws of *praemunire* in submitting to the authority of papal legates (although he himself had ratified the appointment of Wolsey as legate *a latere*). The clergy of the province of Canterbury were fined £100,000 and compelled to declare the king "their singular protector and only supreme lord, and, as far as that is permitted by the law of Christ, the supreme head of the Church and of the clergy." This the king claimed, perhaps with truth, was only a clearer statement of the provisions of earlier English laws. The following year, 1532, parliament presented a petition to the king (which had been most carefully elaborated by the monarch's own advisers) containing twelve charges against the bishops, relating to their courts, fees, injudicious appointments and abusive treatment of heretics, which combined to cause an unprecedented and "marvellous disorder of the godly quiet, peace and tranquillity" of the realm. For the remedy of these abuses parliament turned to the king, "in whom and by whom the only and sole redress, reformation and remedy herein absolutely rests and remains." The ordinaries met these accusations with a lengthy and dignified answer; but this did not satisfy the king, and convocation was compelled on the 15th of May 1532, further to clarify the ancient laws of the land, as understood by the king, in the very brief, very humble and very pertinent document known as the "Submission of the Clergy." Herein the king's "most humble subjects daily orators, and bedesmen" of the clergy of England, in view of his goodness and fervent Christian zeal and his learning far exceeding that of all other kings that they have read of, agree never to assemble in convocation except at the king's summons, and to enact and promulgate no constitution or ordinances except they receive the royal assent and authority. Moreover, the existing canons are to be subjected to the examination of a commission appointed by the king, half its members from parliament, half from the clergy, to abrogate with the king's assent such provisions as the majority find do not stand with God's laws and the laws of the realm. This appeared to place the legislation of the clergy, whether old or new, entirely under the monarch's control. A few months later Thomas Cranmer, who had been one of those to discuss sympathetically Luther's works in the little circle at Cambridge, and who believed the royal supremacy would tend to the remedying of grave abuses and that the pope had acted *ultra vires* in issuing a dispensation for the king's marriage with Catherine, was induced by Henry to succeed Warham as archbishop of Canterbury. About the same time parliament passed an interesting and important statute, forbidding, unless the king should wish to suspend the operation of the law, the payment to the pope of the annates. This item alone amounted during the previous forty-six years, the parliament declared, "at the least to eight score thousand pounds, besides other great and intolerable sums which have yearly been conveyed to the said court of Rome by many other ways and means to the great impoverishment of this realm." The annates were thereafter to accrue to the king; and bishops and archbishops were thenceforth, in case the pope refused to confirm them,[1] to be consecrated and invested within the realm, "in like manner as divers other archbishops and bishops have been heretofore in ancient times by sundry the king's most noble progenitors." No censures, excommunications or interdicts with which the Holy Father might vex or grieve the sovereign lord or his subjects, should be published or in any way impede the usual performance of the sacraments and the holding of the divine services. In February parliament discovered that "by divers sundry old authentic histories and chronicles" it was manifest that the realm of England was an empire governed by one supreme head, the king, to whom all sorts and degrees of people—both clergy and laity—ought to bear next to God a natural and humble obedience, and that to him God had given the authority finally to determine all causes and contentions in the realm, "without restraint, or provocation to any foreign princes or potentates of the world." The ancient statutes of the *praemunire* and provisors are recalled and the penalties attached to their violation re-enacted. All appeals were to be tried within the realm, and suits begun before an archbishop were to be determined by him without further appeal. Acting on this, Cranmer tried the divorce case before his court, which declared the marriage with Catherine void and that with Anne Boleyn, which had been solemnized privately in January, valid. The pope replied by ordering Henry under pain of excommunication to put away Anne and restore Catherine, his legal wife, within ten days. This sentence the emperor, all the Christian princes and the king's own subjects were summoned to carry out by force of arms if necessary.

Secession of England from the papal monarchy, 1534.

As might have been anticipated, this caused no break in the policy of the English king and his parliament, and a series of famous acts passed in the year 1534 completed and confirmed the independence of the Church of England, which, except during five years under Queen Mary, was thereafter as completely severed from the papal monarchy as the electorate of Saxony or the duchy of Hesse. The payment of annates and of Peter's pence was absolutely forbidden, as well as the application to the bishop of Rome for dispensations. The bishops were thereafter to be elected by the deans and chapters upon receiving the king's *congé d'eslire* (*q.v.*). The Act of Succession provided that, should the king have no sons, Elizabeth, Anne's daughter, should succeed to the crown. The brief Act of Supremacy confirmed the king's claim to be reputed the "only supreme head in earth of the Church of England"; he was to enjoy all the honours, dignities, jurisdictions and profits thereunto appertaining, and to have full power and authority to reform and amend all such errors, heresies and abuses, as by any manner of spiritual authority might lawfully be reformed, or amended, most to the pleasure of Almighty God, and the increase of virtue in Christ's religion, "foreign authority, prescription, or any other thing or things to the contrary hereof, notwithstanding." The Treasons Act, terrible in its operation, included among capital offences that of declaring in words or writing the king to be "a heretic, schismatic, tyrant, infidel or usurper." The convocations were required to abjure the papal supremacy by declaring "that the bishop of Rome has not in Scripture any greater jurisdiction in the kingdom of England than any other foreign bishop." The king had now clarified the ancient laws of the realm to his satisfaction, and could proceed to abolish superstitious rites, remedy abuses, and seize such portions of the Church's possessions, especially pious and monastic foundations, as he deemed superfluous for the maintenance of religion.

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[1] Cranmer himself had taken the oath of canonical obedience to the Holy See and duly received the pallium.

The reform of the English Church under Henry VIII.

In spite of the fact that the separation from Rome had been carried out during the sessions of a single parliament, and that there had been no opportunity for a general expression of opinion on the part of the nation, there is no reason to suppose that the majority of the people, thoughtful or thoughtless, were not ready to reconcile themselves to the abolition of the papal supremacy. It seems just as clear that there was no strong evangelical movement, and that Henry's pretty consistent adherence to the fundamental doctrines of the medieval Church was agreeable to the great mass of his subjects. The ten "Articles devised by the Kyng's Highnes Majestie to stablysh Christen quietness" (1536), together with the "Injunctions" of 1536 and 1538, are chiefly noteworthy for their affirmation of almost all the current doctrines of the Catholic Church, except those relating to the papal supremacy, purgatory, images, relics and pilgrimages, and the old rooted distrust of the Bible in the vernacular. The clergy were bidden to exhort their hearers to the "works of charity, mercy and faith, specially prescribed and commanded in Scripture, and not to repose their trust or affiance in any other works devised by men's phantasies beside Scripture; as in wandering to pilgrimages, offering of money, candles or tapers to images or relics, or kissing or licking the same, saying over a number of beads, not understood or minded on, or in such-like superstition." To this end a copy of the whole English Bible was to be set up in each parish church where the people could read it. During the same years the monasteries, lesser and greater, were dissolved, and the chief shrines were despoiled, notably that of St Thomas of Canterbury. Thus one of the most important of all medieval ecclesiastical institutions, monasticism, came to an end in England. Doubtless the king's sore financial needs had much to do with the dissolution of the abbeys and the plundering of the shrines, but there is no reason to suppose that he was not fully convinced that the monks had long outlived their usefulness and that the shrines were centres of abject superstition and ecclesiastical deceit. Henry, however, stoutly refused to go further in the direction of German Protestantism, even with the prospect of forwarding the proposed union between him and the princes of the Schmalkaldic League. An insurrection of the Yorkshire peasants, which is to be ascribed in part to the distress caused by the enclosure of the commons on which they had been wont to pasture their cattle, and in part to the destruction of popular shrines, may have caused the king to defend his orthodoxy by introducing into parliament in 1539 the six questions. These parliament enacted into the terrible statute of "The Six Articles," in which a felon's death was prescribed for those who obstinately denied transubstantiation, demanded the communion under both kinds, questioned the binding character of vows of chastity, or the lawfulness of private Masses or the expediency of auricular confession. On the 30th of July 1540 three Lutheran clergymen were burned and three Roman Catholics beheaded, the latter for denying the king's spiritual supremacy. The king's ardent desire that diversities of minds and opinions should be done away with and unity be "charitably established" was further promoted by publishing in 1543 *A Necessary Doctrine and Erudition for any Christian Man, set forth by the King's Majesty of England*, in which the tenets of medieval theology, except for denial of the supremacy of the bishop of Rome and the unmistakable assertion of the supremacy of the king, were once more restated.

England becomes Protestant under Edward VI., 1547-1553.

Henry VIII. died in January 1547, having chosen a council of regency for his nine-year-old son Edward, the members of which were favourable to further religious innovations. Somerset, the new Protector, strove to govern on the basis of civil liberty and religious tolerance. The first parliament of the reign swept away almost all the species of treasons created during the previous two centuries, the heresy acts, including the Six Articles, all limitations on printing the Scriptures in English and reading and expounding the same—indeed "all and every act or acts of parliament concerning doctrine or matters of religion." These measures gave a great impetus to religious discussion and local innovations. Representatives of all the new creeds hastened from the Continent to England, where they hoped to find a safe and fertile field for the particular seed they had to plant. It is impossible exactly to estimate the influence which these teachers exerted on the general trend of religious opinion in England; in any case, however, it was not unimportant, and the Articles of Religion and official homilies of the Church of England show unmistakably the influence of Calvin's doctrine. There was, however, no such sudden breach with the traditions of the past as characterized the Reformation in some continental countries. Under Edward VI. the changes were continued on the lines laid down by Henry VIII. The old hierarchy continued, but service books in English were substituted for those in Latin, and preaching was encouraged. A royal visitation, beginning in 1547, discovered, however, such a degree of ignorance and illiteracy among the parish clergy that it became clear that preaching could only be gradually given its due place in the services of the Church. Communion under both kinds and the marriage of the clergy were sanctioned, thus gravely modifying two of the fundamental institutions of the medieval Church. A conservative *Book of Common Prayer and Administration of the Sacraments and other Rites and Ceremonies after the Use of the Church of England*—commonly called the First Prayer Book of Edward VI.—was issued in 1549. This was based upon ancient "uses," and represented no revolutionary change in the traditions of the "old religion." It was followed, however, in 1552 by the second Prayer Book, which was destined to be, with some modifications, the permanent basis of the English service. This made it clear that the communion was no longer to be regarded as a propitiatory sacrifice, the names "Holy Communion" and "Lord's Supper" being definitively substituted for "Mass" (*q.v.*), while the word "altar" was replaced by "table." In the Forty-two Articles we have the basis of Queen Elizabeth's Thirty-nine Articles. Thus during the reign of Edward we have not only the foundations of the Anglican Church laid, but there appears the beginning of those evangelical and puritanical sects which were to become the "dissenters" of the following centuries.

Catholic reaction under Mary, 1553-1558.

With the death of Edward there came a period of reaction lasting for five years. Queen Mary, unshaken in her attachment to the ancient faith and the papal monarchy, was able with the sanction of a subservient parliament to turn back the wheels of ecclesiastical legislation, to restore the old religion, and to reunite the English Church with the papal monarchy; the pope's legate, Cardinal Pole, was primate of all England. Then, the ancient heresy laws having been revived, came the burnings of Rogers, Hooker, Latimer, Ridley, Cranmer and many a less noteworthy champion of the new religion. It would seem as if this sharp, uncompromising reaction was what was needed to produce a popular realization of the contrast between the *Ecclesia anglicana* of Henry VIII. and Edward VI., and the alternative of "perfect obedience to the See Apostolic."

Settlement under Elizabeth.

Elizabeth, who succeeded her sister Mary in 1558, was suspected to be Protestant in her leanings, and her adviser, Cecil, had received his training as secretary of the Protector Somerset; but the general European situation as well as the young queen's own temperament precluded any abrupt or ostentatious change in religious matters. The new sovereign's first proclamation was directed against all such preaching as might lead to contention and the breaking of the common quiet. In 1559 ten of Henry VIII.'s acts were revived. On Easter Sunday the queen ventured to display her personal preference for the Protestant conception of the eucharist by forbidding the celebrant in her chapel to elevate the host. The royal supremacy was reasserted, the title being modified into "supreme governor"; and a new edition of Edward VI.'s second Prayer Book, with a few changes, was issued. The Marian bishops who refused to recognize these changes were deposed and imprisoned, but care was taken to preserve the "succession" by consecrating others in due form to take their places.[1] Four years later the Thirty-nine Articles imposed an official creed upon the English nation. This was Protestant in its general character: in its appeal to the Scriptures as the sole rule of faith (Art. VI.), its repudiation of the authority of Rome (Art. XXXVII.), its definition of the Church (Art. XIX.), its insistence on justification by faith only (Art. XI.) and repudiation of the sacrifice of the Mass (Arts. XXVIII. and XXXI.). As supreme governor of the Church of England the sovereign strictly controlled all ecclesiastical legislation and appointed royal delegates to hear appeals from the ecclesiastical courts, to be a "papist" or to "hear Mass" (which was construed as the same thing) was to risk incurring the terrible penalties of high treason. By the Act of Uniformity (1559) a uniform ritual, the Book of Common Prayer, was imposed upon clergy and laity alike, and no liberty of public worship was permitted. Every subject was bound under penalty of a fine to attend church on Sunday. While there was in a certain sense freedom of opinion, all printers had to seek a licence from the government for every manner of book or paper, and heresy was so closely affiliated with treason that the free expression of thought, whether reactionary or revolutionary, was beset with grave danger.

Attempts to estimate the width of the gulf separating the Church of England in Elizabeth's time from the corresponding institution as it existed in the early years of her father's reign are likely to be gravely affected by personal bias. There is a theory that no sweeping revolution in dogma took place, but that only a few medieval beliefs were modified or rejected owing to the practical abuses to which they had given rise. To Professor A. F. Pollard, for example, "The Reformation in England was mainly a domestic affair, a national protest against national grievances rather than part of a cosmopolitan movement toward doctrinal change" (*Camb. Mod. Hist.* ii. 478–9). This estimate appeals to persons of widely different views and temperaments. It is as grateful to those who, like many "Anglo-Catholics," desire on religious grounds to establish the doctrinal continuity of the Anglican Church with that of the middle ages, as it is obvious to those who, like W. K. Clifford, perceive in the ecclesiastical organization and its influence nothing more than a perpetuation of demoralizing medieval superstition. The nonconformists have, moreover, never wearied of denouncing the "papistical" conservatism of the Anglican establishment. On the other hand, the impartial historical student cannot compare the Thirty-nine Articles with the contemporaneous canons and decrees of the council of Trent without being impressed by striking contrasts between the two sets of dogmas. Their spirit is very different. The unmistakable rejection on the part of the English Church of the conception of the eucharist as a sacrifice had alone many wide-reaching implications. Even although the episcopal organization was retained, the conception of "tradition," of the conciliar powers, of the "characters" of the priest, of the celibate life, of purgatory, of "good works," &c.—all these serve clearly to differentiate the teaching of the English Church before and after the Reformation. From this standpoint it is obviously unhistorical to deny that England had a very important part in the cosmopolitan movement toward doctrinal change.

The Reformation in Scotland, 1560.

The little backward kingdom of Scotland definitely accepted the new faith two years after Elizabeth's accession, and after having for centuries sided with France against England, she was inevitably forced by the Reformation into an alliance with her ancient enemy to the south when they both faced a confederation of Catholic powers. The first martyr of Luther's gospel had been Patrick Hamilton, who had suffered in 1528; but in spite of a number of executions the new ideas spread, even among the nobility. John Knox, who, after a chequered career, had come under the influence of Calvin at Geneva, returned to Scotland for a few months in 1555, and shortly after (1557) that part of the Scottish nobility which had been won over to the new faith formed their first "covenant" for mutual protection. These "Lords of the Congregation" were able to force some concessions from the queen regent. Knox appeared in Scotland again in 1559, and became a sort of second Calvin. He opened negotiations with Cecil, who induced the reluctant Elizabeth to form an alliance with the Lords of the Congregation, and the English sent a fleet to drive away the French, who were endeavouring to keep their hold on Scotland. In 1560 a confession of faith was prepared by John Knox and five companions. This was adopted by the Scottish parliament, with the resolution "the bishops of Rome have no jurisdiction nor authoritie in this Realme in tymes cuming." The alliance of England and the Scottish Protestants against the French, and the common secession from the papal monarchy, was in a sense the foundation and beginning of Great Britain. Scottish Calvinism was destined to exercise no little influence, not only on the history of England, but on the form that the Protestant faith was to take in lands beyond the seas, at the time scarcely known to the Europeans.

Beginnings of the Protestant movement in France.

While France was deeply affected during the 16th century by the Protestant revolt, its government never undertook any thoroughgoing reform of the Church. During the latter part of the century its monarchs were engaged in a bloody struggle with a powerful religious-political party, the Huguenots, who finally won a toleration which they continued to enjoy until the revocation of the edict of Nantes in 1685. It was not until 1789 that the French Church of the middle ages lost its vast possessions and was subjected to a fundamental reconstruction by the Civil Constitution of the Clergy (1791).[2] Yet no summary of the Protestant revolt would be complete without some allusion to the contrast between the course of affairs in France and in the neighbouring countries. The French monarchy, as we have seen, had usually succeeded in holding its own against the centralizing tendencies of the pope. By the Pragmatic Sanction of Bourges (1438) it had secured the advantages of the conciliar movement. In 1516, after Francis I. had won his victory at Marignano, Leo X. concluded a new concordat with France, in which, in view of the repudiation of the offensive Pragmatic Sanction, the patronage of the French Church was turned over, with scarce any restriction, to the French monarch, although in another agreement the annates were reserved to the pope. The encroachments—which had begun in the time of Philip the Fair—of the king's lawyers on the ancient ecclesiastical jurisdiction, had reached a point where there was little cause for jealousy on the part of the State. The *placet* had long prevailed, so that the king had few of the reasons, so important in Germany and England, for quarrelling with the existing system, unless it were on religious grounds. France had been conspicuous in the conciliar movement. It had also furnished its due quota of heretics, although no one so conspicuous as Wycliffe or Huss. Marsiglio of Padua had had Frenchmen among his sympathizers and helpers. The first prominent French scholar to "preach Christ from the sources" was Jacques Lefèbvre of Etaples, who in 1512 published a new Latin translation of the epistles of St Paul. Later he revised an existing French translation of both the New Testament (which appeared in 1523, almost contemporaneously with Luther's German version) and, two years later, the Old Testament. He agreed with Luther in rejecting transubstantiation, and in believing that works without the grace of God could not make for salvation. The centre of Lefèbvre's followers was Meaux, and they found an ardent adherent in Margaret of Angoulême, the king's sister, but had no energetic leader who was willing to face the danger of disturbances. Luther's works found a good many readers in France, but were condemned (1521) by both the Sorbonne and the parlement of Paris. The parlement appointed a commission to discover and punish heretics; the preachers of Meaux fled to Strassburg, and Lefèbvre's translation of the Bible was publicly burned. A council held at Sens, 1528–29, approved all those doctrines of the old Church which the Protestants were attacking, and satisfied itself with enumerating a list of necessary conservative reforms.

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[1] Only one of the Marian bishops, Kitchin of Llandaff, was found willing to conform.

[2] In 1795 the National Convention gruffly declared that the Republic would no longer subsidize any form of worship or furnish buildings for religious services. "The law recognizes no minister of religion, and no one is to appear in public with costumes or ornaments used in religious ceremonies." Bonaparte, in the Concordat which he forced upon the pope in 1801, did not provide for the return of any of the lands of the Church which had been sold, but agreed that the government should pay the salaries of bishops and priests, whose appointment it controlled. While the Roman Catholic religion was declared to be that accepted by the majority of Frenchmen, the state subsidized the Reformed Church, those adhering to the Augsburg Confession and the Jewish community. Over a

John Calvin and his "Institutes of the Christian Religion."

After a fierce attack on Protestants caused by the mutilation of a statue of the Virgin, in 1528, the king, anxious to conciliate both the German Protestants and anti-papal England, invited some of the reformers of Meaux to preach in the Louvre. An address written by a young man of twenty-four, Jean Cauvin (to become immortal under his Latin name of Calvinus) was read by the rector of the university. It was a defence of the new evangelical views, and so aroused the Sorbonne that Calvin was forced to flee from Paris. In October 1534, the posting of placards in Paris and other towns, containing brutal attacks on the Mass and denouncing the pope and the "vermin" of bishops, priests and monks as blasphemers and liars, produced an outburst of persecution, in which thirty-five Lutherans were burned, while many fled the country. The events called forth from Calvin, who was in Basel, the famous letter to Francis which forms the preface to his *Institutes of the Christian Religion.* In this address he sought to vindicate the high aims of the Protestants, and to put the king on his guard against those mad men who were disturbing his kingdom with their measures of persecution. The *Institutes*, the first great textbook of Protestant theology, was published in Latin in 1536, and soon (1541) in a French version. The original work is much shorter than in its later editions, for, as Calvin says, he wrote learning and learned writing. His address had little effect on the king. The parlements issued a series of edicts against the heretics, culminating in the very harsh general edict of Fontainebleau, sanctioned by the parlement of Paris in 1543. The Sorbonne issued a concise series of twenty-five articles, refuting the *Institutes* of Calvin. This statement, when approved by the king and his council, was published throughout France, and formed a clear test of orthodoxy. The Sorbonne also drew up a list of prohibited books, including those of Calvin, Luther and Melanchthon; and the parlement issued a decree against all printing of Protestant literature. The later years of Francis's reign were noteworthy for the horrible massacre of the Waldenses and the martyrdom of fourteen from the group of Meaux, who were burnt alive in 1546. When Francis died little had been done, in spite of the government's cruelty, to check Protestantism, while a potent organ of evangelical propaganda had been developing just beyond the confines of France in the town of Geneva.

Geneva becomes a centre of propaganda.

In its long struggle with its bishops and with the dukes of Savoy, Geneva had turned to her neighbours for aid, especially to Bern, with which an alliance was concluded in 1526. Two years later Bern formally sanctioned the innovations advocated by the Protestant preachers, and although predominantly German assumed the rôle of protector of the reform party in the Pays de Vaud and Geneva. William Farel, one of the group of Meaux, who had fled to Switzerland and had been active in the conversion of Bern, went to Geneva in 1531. With the protection afforded him and his companions by Bern, and the absence of well-organized opposition on the part of the Roman Catholics, the new doctrines rapidly spread, and by 1535 Farel was preaching in St Pierre itself. After a public disputation in which the Catholics were weakly represented, and a popular demonstration in favour of the new doctrines, the council of Geneva rather reluctantly sanctioned the abolition of the Mass. Meanwhile Bern had declared war on the duke of Savoy, and had not only conquered a great part of the Pays de Vaud, including the important town of Lausanne, but had enabled Geneva to win its complete independence. In the same year (September 1536), as Calvin was passing through the town on his way back to Strassburg after a short visit in Italy, he was seized by Farel and induced most reluctantly to remain and aid him in thoroughly carrying out the Reformation in a city in which the conservative sentiment was still very strong. As there proved to be a large number in the town councils who did not sympathize with the plans of organization recommended by Calvin and his colleagues, the town preachers were, after a year and a half of unsatisfactory labour, forced to leave Geneva. For three years Calvin sojourned in Germany; he signed the Augsburg Confession, gained the friendship of Melanchthon and other leading reformers, and took part in the religious conferences of the period. In 1541 he was induced with great difficulty to surrender once more his hopes of leading the quiet life of a scholar, and to return again to Geneva (September 1541), where he spent the remaining twenty-three years of his life. His ideal was to restore the conditions which he supposed prevailed during the first three centuries of the Church's existence; but the celebrated Ecclesiastical Ordinances adopted by the town in 1541 and revised in 1561 failed fully to realize his ideas, which find a more complete exemplification in the regulations governing the French Church later. He wished for the complete independence and self-government of the Church, with the right of excommunication to be used against the ungodly. The Genevan town councils were quite ready to re-enact all the old police regulations common in that age in regard to excessive display, dancing, obscene songs, &c. It was arranged too that town government should listen to the "Consistory," made up of the "Elders," but the Small Council was to choose the members of the Consistory, two of whom should belong to the Small Council, four to the Council of Sixty, and six to the Council of Two Hundred. One of the four town syndics was to preside over its sessions. The Consistory was thus a sort of committee of

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century elapsed before the Concordat was abrogated by the Separation Law of 1905 which suppressed all government appropriations for religious purposes and vested the control of Church property in "associations for public worship" (*associations cultuelles*), to be composed of from seven to twenty-five members according to the size of the commune.

the councils, and it had no power to inflict civil punishment on offenders. Thus "we ought," as Lindsay says, "to see in the disciplinary powers and punishments of the Consistory of Geneva not an exhibition of the working of the Church organized on the principles of Calvin, but the ordinary procedure of the town council of a medieval city. Their petty punishments and their minute interferences with private life are only special instances of what was common to all municipal rule in the 16th century." This is true of the supreme crime of heresy, which in the notorious case of Servetus was only an expression of rules laid down over a thousand years earlier in the Theodosian Code. Geneva, however, with its most distinguished of Protestant theologians, became a school of Protestantism, which sent its trained men into the Netherlands, England and Scotland, and especially across the border into France. It served too as a place of refuge for thousands of the persecuted adherents of its beliefs. Calvin's book furnished the Protestants not only with a compact and admirably written handbook of theology, vigorous and clear, but with a system of Church government and a code of morals.

Origin of Huguenot party under Henry II.

After the death of Francis I., his successor, Henry II., set himself even more strenuously to extirpate heresy; a special branch of the parlement of Paris—the so-called *Chambre ardente* (*q.v.*)—for the trial of heresy cases was established, and the fierce edict of Chateaubriand (June 1551) explicitly adopted many of the expedients of the papal inquisition. While hundreds were imprisoned or burned, Protestants seemed steadily to increase in numbers, and finally only the expostulations of the parlement of Paris prevented the king from introducing the Inquisition in France in accordance with the wishes of the pope and the cardinal of Lorraine. The civil tribunals, however, practically assumed the functions of regular inquisitorial courts, in spite of the objections urged by the ecclesiastical courts. Notwithstanding these measures for their extermination, the French Protestants were proceeding to organize a church in accordance with the conceptions of the early Christian communities as Calvin described them in his *Institutes*. Beginning with Paris, some fifteen communities with their consistories were established in French towns between 1555 and 1560. In spite of continued persecution a national synod was assembled in Paris in 1559, representing at least twelve Protestant churches in Normandy and central France, which drew up a confession of faith and a book of church discipline. It appears to have been from France rather than from Geneva that the Presbyterian churches of Holland, Scotland and the United States derived their form of government. A reaction against the extreme severity of the king's courts became apparent at this date. Du Bourg and others ventured warmly to defend the Protestants in the parlement of Paris in the very presence of the king and of the cardinal of Lorraine. The higher aristocracy began now to be attracted by the new doctrines, or at least repelled by the flagrant power enjoyed by the Guises during the brief reign of Francis II. (1559–1560). Protestantism was clearly becoming inextricably associated with politics of a very intricate sort. The leading members of the Bourbon branch of the royal family, and Gaspard de Coligny, admiral of France, were conspicuous among the converts to Calvinism. Persecution was revived by the Guises; Du Bourg, the brave defender of the Protestants, was burned as a heretic; yet Calvin could in the closing years of his life form a cheerful estimate that some three hundred thousand of his countrymen had been won over to his views. The death of Francis II. enabled Catherine de' Medici, the queen mother, to assert herself against the Guises, and become the regent of her ten-year-old son Charles IX. A meeting of the States General had already been summoned to consider the state of the realm. Michel de l'Hôpital, the chancellor, who opened the assembly, was an advocate of toleration; he deprecated the abusive use of the terms "Lutherans," "Papists" and "Huguenots," and advocated deferring all action until a council should have been called. The deputies of the clergy were naturally conservative, but advocated certain reforms, an abolition of the Concordat, and a re-establishment of the older Pragmatic Sanction. The noblesse were divided on the matter of toleration, but the *cahiers* (lists of grievances and suggestions for reform) submitted by the Third Estate demanded, besides regular meetings of the estates every five years, complete toleration and a reform of the Church. This grew a little later into the recommendation that the revenues and possessions of the French Church should be appropriated by the government, which, after properly subsidizing the clergy, might hope, it was estimated, that a surplus of twenty-two millions of livres would accrue to the State. Two hundred and thirty years later this plan was realized in the Civil Constitution of the Clergy. The deliberations of 1561 resulted in the various reforms, the suspension of persecution and the liberation of Huguenot prisoners. These were not accorded freedom of worship, but naturally took advantage of the situation to carry on their services more publicly than ever before. An unsuccessful effort was made at the conference of Poissy to bring the two religious parties together; Beza had an opportunity to defend the Calvinistic cause, and Lainez, the general of the Order of Jesus, that of the bishop of Rome. The government remained tolerant toward the movement, and in January 1562 the Huguenots were given permission to hold public services outside the walls of fortified towns and were not forbidden to meet in private houses within the walls. Catherine, who had promoted these measures, cared nothing for the Protestants, but desired the support of the Bourbon princes. The country was Catholic, and disturbances inevitably occurred, culminating in the attack of the duke of Guise and his troops, on the Protestants at Vassy, less than two months after the issuing of the edict.

The French Wars of Religion and the edict of Nantes, 1562-1598.

It is impossible to review here the Wars of Religion which distracted France, from the "massacre of Vassy" to the publication of the edict of Nantes, thirty-six years later. Religious issues became more and more dominated by purely political and dynastic ambitions, and the whole situation was constantly affected by the policy of Philip II. and the struggle going on in the Netherlands. Henry IV. was admirably fitted to reunite France once more, and, after a superficial conversion to the Catholic faith, to meet the needs of his former co-religionists, the Huguenots. The edict of Nantes recapitulated and codified the provisions of a series of earlier edicts of toleration, which had come with each truce during the previous generation. Liberty of conscience in religious matters was secured and the right of private worship to those of the "so-called Reformed religion." Public worship was permitted everywhere where it had existed in 1596–1597, in two places within each *bailliage* and *sénéchaussée*, and in the châteaux of the Protestant nobility, with slight restrictions in the case of lower nobility. Protestants were placed upon a political equality and made eligible to all public offices. To ensure these rights, they were left in military control of two hundred towns, including La Rochelle, Montauban and Montpellier. Jealous of their "sharing the State with the king," Richelieu twenty-five years later reduced the exceptional privileges of the Huguenots, and with the advent of Louis XIV. they began to suffer renewed persecution, which the king at last flattered himself had so far reduced their number that in 1685 he revoked the edict of Nantes and reduced the Protestants to the status of outlaws. It was not until 1786 that they were restored to their civil rights, and by the Declaration of the Rights of Man, in 1789, to their religious freedom.

The United Netherlands and their importance in the history of toleration.

Contemporaneously with the Wars of Religion in France a long and terrible struggle between the king of Spain and his Dutch and Belgian provinces had resulted in the formation of a Protestant state—the United Netherlands, which was destined to play an important rôle in the history of the Reformed religion. Open both to German and French influences, the Netherlands had been the scene of the first executions of Lutherans; they had been a centre of Anabaptist agitation; but Calvinism finally triumphed in the Confession of Dordrecht, 1572, since Calvin's system of church government did not, like

Luther's, imply the sympathy of the civil authorities. Charles V. had valiantly opposed the development of heresy in the Netherlands, and nowhere else had there been such numbers of martyrs, for some thirty thousand are supposed to have been put to death during his reign. Under Philip II. it soon became almost impossible to distinguish clearly between the religious issues and the resistance to the manifold tyranny of Philip and his representatives. William of Orange, who had passed through several phases of religious conviction, stood first and foremost for toleration. Indeed, Holland became the home of modern religious liberty, the haven of innumerable free spirits, and the centre of activity of printers and publishers, who asked for no other *imprimatur* than the prospect of intelligent readers.

The Anabaptists.

It is impossible to offer any exhaustive classification of those who, while they rejected the teachings of the old Church, refused at the same time to conform to the particular types of Protestantism which had found favour in the eyes of the princes and been imposed by them on their subjects. This large class of "dissenters" found themselves as little at home under a Protestant as under a Catholic regime, and have until recently been treated with scant sympathy by historians of the Church. Long before the Protestant revolt, simple, obscure people, under the influence of leaders whose names have been forgotten, lost confidence in the official clergy and their sacraments and formed secret organizations of which vague accounts are found in the reports of the 13th-century inquisitors, Rainerus Sacchoni, Bernard Gui, and the rest. Their anti-sacerdotalism appears to have been their chief offence, for the inquisitors admit that they were puritanically careful in word and conduct, and shunned all levity. Similar groups are mentioned in the town chronicles of the early 16th century, and there is reason to assume that informal evangelical movements were no new things when Luther first began to preach. His appeal to the Scriptures against the traditions of the Church encouraged a more active propaganda on the part of Balthasar Hubmaier, Carlstadt, Münzer, Johann Denk (d. 1527) and others, some of whom were well-trained scholars capable of maintaining with vigour and effect their ideas of an apostolic life as the high road to salvation. Münzer dreamed of an approaching millennium on earth to be heralded by violence and suffering, but Hubmaier and Denk were peaceful evangelists who believed that man's will was free and that each had within him an inner light which would, if he but followed it, guide him to God. To them persecution was an outrage upon Jesus's teachings. Luther and his sympathizers were blind to the reasonableness of the fundamental teachings of these "brethren." The idea of adult baptism, which had after 1525 become generally accepted among them, roused a bitterness which it is rather hard to understand nowadays. But it is easy to see that informal preaching to the people at large, especially after the Peasant Revolt, with which Münzer had been identified, should have led to a general condemnation, under the name "Anabaptist" or "Catabaptist," of the heterogeneous dissenters who agreed in rejecting the State religion and associated a condemnation of infant baptism with schemes for social betterment. The terrible events in Münster, which was controlled for a short time (1533–34) by a group of Anabaptists under the leadership of John of Leiden, the introduction of polygamy (which appears to have been a peculiar accident rather than a general principle), the speedy capture of the town by an alliance of Catholic and Protestant princes, and the ruthless retribution inflicted by the victors, have been cherished by ecclesiastical writers as a choice and convincing instance of the natural fruits of a rejection of infant baptism. Much truer than the common estimate of the character of the Anabaptists is that given in Sebastian Franck's Chronicle: "They taught nothing but love, faith and the crucifixion of the flesh, manifesting patience and humility under many sufferings, breaking bread with one another in sign of unity and love, helping one another with true helpfulness, lending, borrowing, giving, learning to have all things in common, calling each other 'brother.'" Menno Simons (b. *circ.* 1500) succeeded in bringing the scattered Anabaptist communities into a species of association; he discouraged the earlier apocalyptic hopes, inculcated non-resistance, denounced the evils of State control over religious matters, and emphasized personal conversion, and adult baptism as its appropriate seal. The English Independents and the modern Baptists, as well as the Mennonites, may be regarded as the historical continuation of lines of development going back to the Waldensians and the Bohemian Brethren, and passing down through the German, Dutch and Swiss Anabaptists.

Socinians or Anti-Trinitarians.

The modern scholar as he reviews the period of the Protestant Revolt looks naturally, but generally in vain, for those rationalistic tendencies which become so clear in the latter part of the 17th century. Luther found no intellectual difficulties in his acceptance and interpretation of the Scriptures as God's word, and in maintaining against the Anabaptists the legitimacy of every old custom that was not obviously contrary to the Scriptures. Indeed, he gloried in the inherent and divine unreasonableness of Christianity, and brutally denounced reason as a cunning fool, "a pretty harlot." The number of questions which Calvin failed to ask or eluded by absolutely irrational expedients frees him from any taint of modern rationalism. But in Servetus, whose execution he approved, we find an isolated, feeble revolt against assumptions which both Catholics and Protestants of all shades accepted without question. It is pretty clear that the common accounts of the Renaissance and of the revival of learning grossly exaggerate the influence of the writers of Greece and Rome, for they produced no obvious rationalistic movement, as would have been the case had Plato and Cicero, Lucretius and Lucian, been taken really seriously. Neo-Platonism, which is in some respects nearer the Christian patristic than the Hellenic spirit, was as far as the radical religious thinkers of the Italian Renaissance receded. The only religious movement that can be regarded as even rather vaguely the outcome of humanism is the Socinian. Faustus Sozzini, a native of Sienna (1539–1603), much influenced by his uncle Lelio Sozzini, after a wandering, questioning life, found his way to Poland, where he succeeded in uniting the various Anabaptist sects into a species of church, the doctrines of which are set forth in the Confession of Rakow (near Minsk), published in Polish in 1605 and speedily in German and Latin. The Latin edition declares that although this new statement of the elements of the Christian faith differs from the articles of other Christian creeds it is not to be mistaken for a challenge. It does not aim at binding the opinions of men or at condemning to the tortures of hell-fire those who refuse to accept it. *Absit a nobis ea mens, immo amentia.* "We have, it is true, ventured to prepare a catechism, but we force it on no one; we express our opinions, but we coerce no one. It is free to every one to form his own conclusions in religious matters; and so we do no more than set forth the meaning of divine things as they appear to our minds without, however, attacking or insulting those who differ from us. This is the golden freedom of preaching which the holy words of the New Testament so strictly enjoin upon us. . . . Who art thou, miserable man, who would smother and extinguish in others the fire of God's Spirit which it has pleased him to kindle in them?" The Socinian creed sprang from intellectual rather than religious motives. Sufficient reasons could be assigned for accepting the New Testament as God's word and Christ as the Christian's guide. He was not God, but a divine prophet born of a virgin and raised on the third day as the first-fruits of them that slept. From the standpoint of the history of enlightenment, as Harnack has observed, "Socinianism with its systematic criticism (tentative and imperfect as it may now seem) and its rejection of all the assumptions based upon mere ecclesiastical tradition, can scarcely be rated too highly. That modern Unitarianism is all to be traced back to Sozzini and the Rakow Confession need not be assumed. The anti-Trinitarian path was one which opened invitingly before a considerable class of critical minds, seeming as it did to lead out into a sunny open, remote from the unfathomable depths of mystery and clouds of religious emotion which beset the way of the sincere Catholic and Protestant alike.

The Catholic Reformation.

The effects of the Protestant secession on the doctrines, organization and practices of the Roman Catholic Church are difficult to estimate, still more so to substantiate. It is clear that the doctrinal conclusions of the council of Trent were largely determined by the necessity of condemning Protestant tenets, and that the result of the council was to give the Roman Catholic faith a more precise form than it would otherwise have had. It is much less certain that the disciplinary reforms which the council, following the example of its predecessors, re-enacted, owed anything to Protestantism, unless indeed the council would have shown itself less intolerant in respect to such innovations as the use of the vernacular in the services had this not smacked of evangelicalism. In the matter of the pope's supremacy, the council followed the canon law and Thomas Aquinas, not the decrees of the council of Constance. It prepared the way for the dogmatic formulation of the plenitude of the papal power three centuries later by the council of the Vatican. The Protestants have sometimes taken credit to themselves for the indubitable reforms in the Roman Catholic Church, which by the end of the 16th century had done away with many of the crying abuses against which councils and diets had so long been protesting. But this conservative reformation had begun before Luther's preaching, and might conceivably have followed much the same course had his doctrine never found popular favour or been ratified by the princes.

The place of the Reformation in the history of progress.

In conclusion, a word may be said of the place of the Reformation in the history of progress and enlightenment. A "philosopher," as Gibbon long ago pointed out, who asks from what articles of faith *above* and *against* reason the early Reformers enfranchised their followers will be surprised at their timidity rather than scandalized by their freedom. They remained severely orthodox in the doctrines of the Fathers—the Trinity, the Incarnation, the plenary inspiration of the Bible—and they condemned those who rejected their teachings to a hell whose fires they were not tempted to extenuate. Although they surrendered transubstantiation, the loss of one mystery was amply compensated by the stupendous doctrines of original sin, redemption, faith, grace and predestination upon which they founded their theory of salvation. They ceased to appeal to the Virgin and saints, and to venerate images and relics, procure indulgences and go on pilgrimages, they deprecated the monastic life, and no longer nourished faith by the daily repetition of miracles, but in the witch persecutions their demonology cost the lives of thousands of innocent women. They broke the chain of authority, without, however, recognizing the propriety of toleration. In any attempt to determine the relative importance of Protestant and Catholic countries in promoting modern progress it must not be forgotten that religion is naturally conservative, and that its avowed business has never been to forward scientific research or political reform. Luther and his contemporaries had not in any degree the modern idea of progress, which first becomes conspicuous with Bacon and Descartes, but believed, on the contrary, that the strangling of reason was the most precious of offerings to God. "Free-thinker" and "rationalist" have been terms of opprobrium whether used by Protestants or Catholics. The pursuit of salvation does not dominate by any means the whole life and ambition of even ardent believers; statesmen, philosophers, men of letters, scientific investigators and inventors have commonly gone their way regardless of the particular form of Christianity which prevailed in the land in which they lived. The Reformation was, fundamentally, then, but one phase, if the most conspicuous, in the gradual decline of the majestic medieval ecclesiastical State, for this decline has gone on in France, Austria, Spain and Italy, countries in which the Protestant revolt against the ancient Church ended in failure.

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REFORMATORY SCHOOL, an institution for the industrial training of juvenile offenders, in which they are lodged, clothed and fed, as well as taught. They are to be distinguished from "industrial schools," which are institutions for potential and not actual delinquents. To reformatory schools in England are sent juveniles up to the age of sixteen who have been convicted of an offence punishable with penal servitude or imprisonment. The order is made by the court before which they are tried; the limit of detention is the age of nineteen. Reformatory schools are regulated by the Children Act 1908, which repealed the Reformatory Schools Act 1866, as amended by acts of 1872, 1874, 1891, 1893, 1899 and 1901. See further JUVENILE OFFENDERS.

REFORMED CHURCHES, the name assumed by those Protestant bodies who adopted the tenets of Zwingli (and later of Calvin), as distinguished from those of the Lutheran or Evangelical divines. They are accordingly often spoken of as the Calvinistic Churches, Protestant being sometimes used as a synonym for Lutheran. The great difference is in the attitude towards the Lord's Supper, the Reformed or Calvinistic Churches repudiating not only transubstantiation but also the Lutheran consubstantiation. They also reject the use of crucifixes and other symbols and ceremonies retained by the Lutherans.

Full details of these divergences are given in M. Schneckenburger, *Vergleichende Darstellung des lutherischen und reformierten Lehrbegriffs* (Stuttgart, 1855); G. B. Winer, *Comparative Darstellung* (Berlin, 1866; Eng. tr., Edinburgh, 1873). See also REFORMATION; PRESBYTERIANISM; CAMERONIANS.

REFORMED CHURCH IN AMERICA, until 1867 called officially "The Reformed Protestant Dutch Church in North America," and still popularly called the Dutch Reformed Church, an American Calvinist church, originating with the settlers from Holland in New York, New Jersey and Delaware, the first permanent settlers of the Reformed faith in the New World. Their earliest settlements were at Manhattan, Wallabout and Fort Orange (now Albany), where the West India Company formally established the Reformed Church of Holland.

Their first minister was Jonas Michaelius, pastor in New Amsterdam of the "church in the fort" (now the Collegiate Church of New York City). The second *domine*, Everardus Bogardus (d. 1647), migrated to New York in 1633 with Governor Wouter van Twiller, with whom he quarrelled continually; in the same year a wooden church "in the fort" was built; and in 1642 it was succeeded by a stone building. A minister, John van Mekelenburg (Johannes Megapolensis) migrated to Rensselaerwyck manor in 1642, preached to the Indians—probably before any other Protestant minister—and after 1649 was settled in New Amsterdam. With the access of English and French settlers, Samuel Drisius, who preached in Dutch, German, English and French, was summoned, and he laboured in New Amsterdam and New York from 1652 to 1673. On Long Island John T. Polhemus preached at Flatbush in 1654–76. During Peter Stuyvesant's governorship there was little toleration of other denominations, but the West India Company reversed his intolerant proclamations against Lutherans and Quakers. About 1659 a French and Dutch church was organized in Harlem. The first church in New Jersey, at Bergen, in 1661, was quickly followed by others at Hackensack and Passaic. After English rule in 1664 displaced Dutch in New York, the relations of the Dutch churches there were much less close with the state Church of Holland; and in 1679 (on the request of the English governor of New York, to whom the people of New Castle appealed) a classis was constituted for the ordination of a pastor for the church in New Castle, Delaware. The Dutch strongly opposed the establishment of the Church of England, and contributed largely toward the adoption (in October 1683) of the Charter of Liberties which confirmed in their privileges all churches then "in practice" in the city of New York and elsewhere in the province, but which was repealed by James II. in 1686, when he established the Church of England in New York but allowed religious liberty to the Dutch and others. The Dutch ministers stood by James's government during Leisler's rebellion. Under William III., Governors Sloughter and Fletcher worked for a law (passed in 1693 and approved in 1697) for the settling of a ministry in New York, Richmond, Westchester and Queen's counties; but the Assembly foiled Fletcher's purpose of establishing a Church of England clergy, although he attempted to construe the act as applying only to the English Church. In 1696 the first church charter in New York was granted to the Reformed Protestant Dutch Church (now the Collegiate Church) of New York City; at this time there were Dutch ministers at Albany and Kingston, on Long Island and in New Jersey; and for years the Dutch and English (Episcopalian) churches alone received charters in New York and New Jersey—the Dutch church being treated practically as an establishment—and the church of the fort and Trinity (Episcopalian; chartered 1697) were fraternally harmonious. In 1700 there were twenty-nine Reformed Dutch churches out of a total of fifty in New York. During the administration of Governor Edward Hyde, Lord Cornbury, many members joined the Episcopal Church and others removed to New Jersey. The Great Awakening crowned the efforts of Theodore J. Frelinghuysen, who had come over as a Dutch pastor in 1720 and had opposed formalism and preached a revival. The Church in America in 1738 asked the Classis of Amsterdam (to whose care it had been transferred from the West India Company) for the privilege of forming a Coetus or Association with power to ordain in America; the Classis, after trying to join the Dutch with the English Presbyterian churches, granted (1747) a Coetus first to the German and then to the Dutch churches, which therefore in September 1754 organized themselves into a classis. This action was opposed by the church of New York City, and partly through this difference and partly because of quarrels over the denominational control of King's College (now Columbia), five members of the Coetus seceded, and as the president of the Coetus was one of them they took the records with them; they were called the Conferentie; they organized independently in 1764 and carried on a bitter warfare with the Coetus (now more properly called the American Classis), which in 1766 (and again in 1770) obtained a charter for Queen's (now Rutgers) College at New Brunswick. But in 1771–72 through the efforts of John H. Livingston (1746–1825), who had become pastor of the New York City church in 1770, on the basis of a plan drafted by the Classis of Amsterdam Coetus and Conferentie were reunited with a substantial independence of Amsterdam, which was made complete in 1792 when the Synod (the nomenclature of synod and classis had been adopted upon the declaration of American Independence) adopted a translation of the eighty-four Articles of Dort on Church Order with seventy-three "explanatory articles."[1] In 1800 there were about forty ministers and one hundred churches. In 1819 the Church was incorporated as the Reformed Protestant Dutch Church; and in 1867 the name was changed to the Reformed Church in America. Preaching in Dutch had nearly ceased in 1820, but about 1846 a new Dutch immigration began, especially in Michigan, and fifty years later Dutch preaching was common in nearly one-third of the churches of the country, only to disappear almost entirely in the next decade. Union with other Reformed churches was planned in 1743, in 1784, in 1816–20, 1873–78 and 1886, but unsuccessfully; however, ministers go from one to another charge in the Dutch and German Reformed, Presbyterian, and to a less degree Congregational churches.

A conservative secession "on account of Hopkinsian errors" in 1822 of six ministers (five then under suspension) organized a General Synod and the classes of Hackensack and Union (central New York) in 1824; it united with the Christian Reformed Church, established by immigrants from Holland after 1835, to which there was added a fresh American secession in 1882 due to opposition (on the part of the seceders) to secret societies.

The organization of the Church is: a General Synod (1794); the (particular) synods of New York (1800), Albany (1800), Chicago (1856) and New Brunswick (1869); classes, corresponding to the presbyteries of other Calvinistic bodies; and the churches, numbering, in 1906, 659. The agencies of the Church are: the Board of Education, privately organized in 1828 and adopted by the General Synod in 1831; a Widows' Fund (1837) and a Disabled Ministers' Fund; a Board of Publication (1855); a Board of Domestic Missions (1831; reorganized 1849) with a Church Building Fund and a Woman's Executive Committee; a Board of Foreign Missions (1832) succeeding the United Missionary Society (1816), which included Presbyterian, Dutch Reformed and Associate Reformed Churches, and which was merged (1826) in the American Board of Commissioners for Foreign Missions, from which the Dutch Church did not entirely separate itself until 1857; and a Woman's Board of Foreign Missions (1875). The principal missions are in India at Arcot (1854; transferred in 1902 to the Synod of S. India) and at Amoy in China (1842); and the work of the Church in Japan was very successful, especially under Guido Fridolin Verbeck[2] (1830–1898), and 1877 native churches built up by Presbyterian and Dutch Reformed missionaries were organized as the United Church of our Lord Jesus Christ in Japan. There is also an Arabian mission, begun privately in 1888 and transferred to the Board in 1894.

The colleges and institutions of learning connected with the Church are: Rutgers, already mentioned; Union College (1795), the outgrowth of Schenectady Academy, founded in 1785 by Dirck Romeyn, a Dutch minister; Hope College (1866; coeducational) at Holland, Michigan, originally a parochial school (1850) and then (1855) Holland Academy; the Theological Seminary at New Brunswick (*q.v.*); and the Western Theological Seminary (1869) at Holland, Michigan.

In 1906 (according to *Bulletin 103* (1909) of the Bureau of the U.S. Census) there were 659 organizations with 773 church edifices reported and the total membership was 124,938. More than one-half of this total membership (63,350) was in New York state, the principal home of the first great Dutch immigration; more than one-quarter (32,290) was in New Jersey; and the other states were: Michigan (11,260), Illinois (4962), Iowa (4835), Wisconsin (2312), and Pennsylvania (1979). The Church was also represented in Minnesota, S. Dakota, Oklahoma, Nebraska, Indiana, Ohio, Kansas, N. Dakota, S. Carolina, Washington and Maryland—the order being that of rank in number of communicants.

The Christian Reformed Church, an "old school" secession, had in 1906, 174 organizations, 181 churches and a membership of 26,669, of which more than one-half (14,779) was in Michigan, where many of the immigrants who came after 1835 belonged to the secession church in Holland. There were 2990 in Iowa, 2392 in New Jersey, 2332 in Illinois, and smaller numbers in Wisconsin, Indiana, Minnesota, S. Dakota, Ohio, New York, Washington, Kansas, Massachusetts, Montana, N. Dakota, New Mexico, Nebraska and Colorado.

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[1] In 1832 the articles of Church government were rearranged and in 1872–74 they were amended.

[2] See W. E. Griffis, *Verbeck of Japan* (New York, 1900).

See D. D. Demarest, *The Reformed Church in America* (New York, 1889); E. T. Corwin, *The Manual of the Reformed Church in America* (*ibid.*, 4th ed., 1902), his sketch of the history of the Church in vol. viii. (*ibid.*, 1895) of the American Church History Series, and his *Ecclesiastical Records of the State of New York* (Albany, 1901 sqq.), published by the State of New York.

REFORMED CHURCH IN THE UNITED STATES, a German Calvinistic church in America, commonly called the German Reformed Church. It traces its origin to the great German immigration of the 17th century, especially to Pennsylvania, where, although the German Lutherans afterwards outnumbered them, the Reformed element was estimated in 1730 to be more than half the whole number of Germans in the colony. In 1709 more than 2000 Palatines emigrated to New York with their pastor, Johann Friedrich Hager (d. *c.* 1723), who laboured in the Mohawk Valley. A church in Germantown, Virginia, was founded about 1714. Johann Philip Boehm (d. 1749), a school teacher from Worms, although not ordained, preached after 1725 to congregations at Falckner's Swamp, Skippack, and White Marsh, Pennsylvania, and in 1729 he was ordained by Dutch Reformed ministers in New York. Georg Michael Weiss (*c.* 1700–*c.* 1762), a graduate of Heidelberg, ordained and sent to America by the Upper Consistory of the Palatinate in 1727, organized a church in Philadelphia; preached at Skippack; worked in Dutchess and Schoharie counties, New York, in 1731–46; and then returned to his old field in Pennsylvania. Johann Heinrich Goetschius, was pastor (*c.* 1731–38) of ten churches in Pennsylvania, and was ordained by the Presbyterian Synod of Philadelphia in 1737. A part of his work was undertaken by Johann Conrad Wirtz, who was ordained by the New Brunswick (New Jersey) Presbytery in 1750, and in 1761–63 was pastor at York, Pennsylvania. A church was built in 1736 at Lancaster, Pennsylvania, where Johann Bartholomaeus Rieger (1707–1769), who came from Germany with Weiss on his return in 1731, had preached for several years. Michael Schlatter (1716–1790), a Swiss of St Gall, sent to America in 1746 by the Synods (Dutch Reformed) of Holland, immediately convened Boehm, Weiss and Rieger in Philadelphia, and with them planned a Coetus, which first met in September 1747; in 1751 he presented the cause of the Coetus in Germany and Holland, where he gathered funds; in 1752 came back to America with six ministers, one of whom, William Stoy (1726–1801), was an active opponent of the Coetus and of clericalism after 1772. Thereafter Schlatter's work was in the charity schools of Pennsylvania, which the people thought were tinged with Episcopalianism. Many churches and pastors were independent of the Coetus, notably John Joachim Zubly (1724–1781), of St Gall, who migrated to S. Carolina in 1726, and was a delegate to the Continental Congress from Georgia, but opposed independence and was banished from Savannah in 1777. Within the Coetus there were two parties. Of the Pietists of the second class one of the leaders was Philip William Otterbein (1726–1813), born in Dillenburg, Nassau, whose system of class-meetings was the basis of a secession from which grew the United Brethren in Christ, commonly called the "New Reformed Church," organized in 1800. During the War of Independence the Pennsylvania members of the Church were mostly attached to the American cause, and Nicholas Herkimer and Baron von Steuben were both Reformed; but in New York and in the South there were many German Loyalists.

Franklin College was founded by Lutherans and Reformed, with much outside help, notably that of Benjamin Franklin, at Lancaster, Pennsylvania, in 1787.

The Coetus had actually assumed the power of ordination in 1772 and formally assumed it in 1791; in 1792 a synodical constitution was prepared; and in 1793 the first independent synod met in Lancaster and adopted the constitution, thus becoming independent of Holland. Its churches numbered 178, and there were about 15,000 communicants. The strongest churches were those of Philadelphia, Lancaster and Germantown in Pennsylvania, and Frederick in Maryland. The German Reformed churches in Lunenburg county, Nova Scotia, became Presbyterian in 1837; a German church in Waldoboro, Maine, after a century, became Congregational in 1850. The New York churches became Dutch Reformed. The New Jersey churches rapidly fell away, becoming Presbyterian, Dutch Reformed, or Lutheran. In Virginia many churches became Episcopalian and others United Brethren. By 1825, 13 Reformed ministers were settled W. of the Alleghanies. The Synod in 1819 divided itself into eight Classes. In 1824 the Classis of Northampton, Pennsylvania (13 ministers and 80 congregations), became the Synod of Ohio, the parent Synod having refused to allow the Classis to ordain. In 1825 there were 87 ministers, and in the old Synod about 23,300 communicants.

A schism over the establishment of a theological seminary resulted in the organization of a new synod of the "Free German Reformed Congregations of Pennsylvania," which returned to the parent synod in 1837.

John Winebrenner (*q.v.*), pastor in Harrisburg, Pennsylvania, left the Church in 1828, and in 1830 organized the "Church of God"; his main doctrinal difference with the Reformed Church was on infant baptism.

In 1825 the Church opened a theological seminary at Carlisle, Pennsylvania, affiliated with Dickinson College. James Ross Reily (1788–1844) travelled in Holland and Germany, collecting money and books for the seminary. It was removed in 1829 to York, where an academy was connected with it; in 1835 the academy (which in 1836 became Marshall College) and in 1837 the seminary removed to Mercersburg, where, in 1840, John W. Nevin (*q.v.*) became its president, and with Philip Schaff (*q.v.*) founded the Mercersburg theology, which lost to the Church many who objected to Nevin's (and Schaff's) Romanizing tendencies. The seminary was removed in 1871 from Mercersburg to Lancaster, whither the college had gone in 1853 to form, with Franklin College, Franklin and Marshall College.

In 1842 the Western Synod (*i.e.* the Synod of Ohio) adopted the constitution of the Eastern, and divided into classes. It founded in 1850 a theological school and Heidelberg University at Tiffin, Ohio. The Synods organized a General Synod in 1863. New German Synods were: that of the North-West (1867), organized at Fort Wayne, Ind.; that of the East (1875), organized at Philadelphia; and the Central Synod (1881), organized at Galion, Ohio. New English Synods were: that of Pittsburg (1870); that of the Potomac (1873); and that of the Interior (1887), organized at Kansas City, Missouri. In 1894 there were eight district synods.

After a long controversy over a liturgy (connected in part with the Mercersburg controversy) a *Directory of Worship* was adopted in 1887.

The principal organizations of the Church are: the Board of Publication (1844); the Society for the Relief of Ministers and their Widows (founded in 1755 by the Pennsylvania Coetus; incorporated in 1810; transferred to the Synod in 1833); a Board of Domestic Missions (1826); a Board of Foreign Missions (1838; reorganized in 1873), which planted a mission in Japan (1879), now a part of the Union Church of Japan, and one in China (1900). The Church has publishing houses in Philadelphia (replacing that of Chambersburg, Pa., founded in 1840 and destroyed in July 1864 by the Confederate army) and in Cleveland, Ohio.

Colleges connected with the Church, besides the seminary at Lancaster, Franklin and Marshall College and Heidelberg University, are: Catawba College (1851) at Newton, North Carolina; and Ursinus College (1869), founded by the Low Church wing, at Collegeville, Pennsylvania, which had, until 1908, a theological seminary, then removed to Dayton, Ohio, where it united with Heidelberg Theological Seminary (until 1908 at Tiffin) to form the Central Theological Seminary.

In 1906, according to *Bulletin 103* (1909) of the Bureau of the United States Census, the Church had 1736 organizations in the

United States, 1740 churches and 292,654 communicants, of whom 177,270 were in Pennsylvania, and about one-sixth (50,732) were in Ohio. Other states in which the Church had communicants were: Maryland (13,442), Wisconsin (8386), Indiana (8289), New York (5700), North Carolina (4718), Iowa (3692), Illinois (2652), Virginia (2288), Kentucky (2101), Michigan (1666), Nebraska (1616), and (less than 1500 in each of the following arranged in rank) S. Dakota, Missouri, New Jersey, Connecticut, Kansas, W. Virginia N. Dakota, Minnesota, District of Columbia, Oregon, Massachusetts, Tennessee, California, Colorado, Arkansas and Oklahoma.

See James I. Good, *History of the Reformed Church in the United States, 1725–1792* (Reading, Pa., 1899), and *Historical Handbook* (Philadelphia, 1902); and the sketch by Joseph Henry Dubbs in vol. viii. (New York, 1895) of the American Church History Series.

REFORMED EPISCOPAL CHURCH, a Protestant community in the United States of America, dating from December 1873. The influence of the Tractarian movement began to be felt at an early date in the Episcopal Church of the United States, and the ordination of Arthur Carey in New York, July 1843, a clergyman who denied that there was any difference in points of faith between the Anglican and the Roman Churches and considered the Reformation an unjustifiable act, brought into relief the antagonism between Low Church and High Church, a struggle which went on for a generation with increasing bitterness. The High Church party lost no opportunity of arraigning any Low Churchman who conducted services in non-episcopal churches, and as the Triennial Conference gave no heed to remonstrances on the part of these ecclesiastical offenders they came to the conclusion that they must either crush their consciences or seek relief in separation. The climax was reached when George D. Cummins (1822–1876), assistant bishop of Kentucky, was angrily attacked for officiating at the united communion service held at the meeting of the Sixth General Conference of the Evangelical Alliance in New York, October 1873. This prelate resigned his charge in the Episcopal Church on November 11th, and a month later, with seven other clergymen and a score of laymen, constituted the Reformed Episcopal Church. Cummins was chosen as presiding officer of the new body, and consecrated Charles E. Cheney (b. 1836), rector of Christ Church, Chicago, to be bishop. The following Declaration of Principles (here abridged) was promulgated:—

I. An expression of belief in the Bible as the Word of God, and the sole rule of faith and practice, in the Apostles' Creed, in the divine institution of the two sacraments and in the doctrines of grace substantially as set out in the 39 Articles.

II. The recognition of Episcopacy not as of divine right but as a very ancient and desirable form of church polity.

III. An acceptance of the Prayer Book as revised by the General Convention of the Protestant Episcopal Church in 1785, with liberty to revise it as may seem most conducive to the edification of the people.

IV. A condemnation of certain positions, viz.:—

- (*a*) That the Church of God exists only in one form of ecclesiastical polity.
- (*b*) That Christian ministers as distinct from all believers have any special priesthood.
- (*c*) That the Lord's Table is an altar on which the body and blood of Christ are offered anew to the Father.
- (*d*) That the presence of Christ is a material one.
- (*e*) That Regeneration is inseparably connected with Baptism.

The Church recognizes no orders of ministry, presbyters and deacons; the Episcopate is an office, not an order, the bishop being the chief presbyter, *primus inter pares*. There are some 7 bishops, 85 clergy and about 9500 communicants. £1600 annually is raised for foreign missionary work in India. The Church was introduced into England in 1877, and has in that country a presiding bishop and about 20 organized congregations. The Church has a theological seminary in Philadelphia.

REFRACTION (Lat. *refringere*, to break open or apart), in physics, the change in the direction of a wave of light, heat or sound which occurs when such a wave passes from one medium into another of different density.

I. Refraction of Light

When a ray of light traversing a homogeneous medium falls on the bounding surface of another transparent homogeneous medium, it is found that the direction of the transmitted ray in the second medium is different from that of the incident ray; in other words, the ray is refracted or bent at the point of incidence. The laws governing refraction are: (1) the refracted and incident rays are coplanar with the normal to the refracting surface at the point of incidence, and (2) the ratio of the sines of the angles between the normal and the incident and refracted rays is constant for the two media, but depends on the nature of the light employed, *i.e.* on its wave length. This constant is called the relative refractive index of the second medium, and may be denoted by μ_{ab}, the suffix *ab* signifying that the light passes from medium *a* to medium *b*; similarly μ_{ba} denotes the relative refractive index of *a* with regard to *b*. The absolute refractive index is the index when the first medium is a vacuum. Elementary phenomena in refraction, such as the apparent bending of a stick when partially immersed in water, were observed in very remote times, but the laws, as stated above, were first grasped in the 17th century by W. Snell and published by Descartes, the full importance of the dependence of the refractive index on the nature of the light employed being first thoroughly realized by Newton in his famous prismatic decomposition of white light into a coloured spectrum. Newton gave a theoretical interpretation of these laws on the basis of his corpuscular theory, as did also Huygens on the wave theory (see LIGHT, II. *Theory of*). In this article we only consider refractions at plane surfaces, refraction at spherical surfaces being treated under LENS. The geometrical theory will be followed, the wave theory being treated in LIGHT, DIFFRACTION and DISPERSION.

Refraction at a Plane Surface.—Let LM (fig. 1) be the surface dividing two homogeneous media A and B; let IO be a ray in the first medium incident on LM at O, and let OR be the refracted ray. Draw the normal POQ. Then by Snell's law we have invariably sin IOP/sin QOR $=\mu_{ab}$. Hence if two of these quantities be given the third can be calculated. The commonest question is: Given the incident ray and the refractive index to construct the refracted ray. A simple construction is to take along the incident ray OI, unit distance OC, and a distance OD equal to the refractive index in the same units. Draw CE perpendicular to LM, and draw an arc with centre O and radius OD, cutting CE in E. Then EO produced downwards is the refracted ray. The proof is left to the reader.

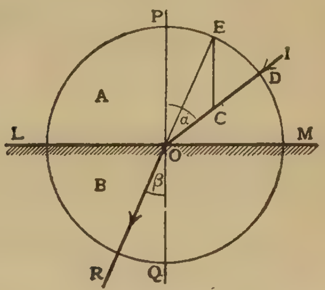


FIG. 1.

In the figure the given incident ray is assumed to be passing from a less dense to a denser medium, and it is seen by the construction or by examining the formula $\sin\beta=\sin\alpha/\mu$ that for all values of α there is a corresponding value of β. Consider the case when the light passes from a denser to a less dense medium. In the equation $\sin\beta=\sin\alpha/\mu$ we have in this case $\mu<1$. Now if $\sin\alpha<\mu$, we have $\sin\alpha/\mu<1$, and hence β is real. If $\sin\alpha=\mu$, then $\sin\beta=1$, *i.e.* $\beta=90°$; in other words, the refracted ray in the second medium passes parallel to and grazes the bounding surface. The angle of incidence, which is given by $\sin\delta=1/\mu$, is termed the *critical angle*. For greater values it is obvious that $\sin\alpha/\mu>1$ and there is no refraction into the second medium, the rays being totally reflected back into the first medium; this is called *total internal reflection*.

Images produced by Refraction at Plane Surfaces.—If a luminous point be situated in a medium separated from one of less density by a plane surface, the ray normal to this surface will be unrefracted, whilst the others will undergo refraction according to their angles of emergence. If the rays in the less dense medium be produced into the denser medium, they envelop a caustic, but by restricting ourselves to a small area about the normal ray it is seen that they intersect this ray in a point which is the geometrical image of the luminous source. The position of this point can be easily determined. If l be the distance of the source below the surface, l' the distance of the image, and μ the refractive index, then $l' = l/\mu$. This theory provides a convenient method for determining the refractive index of a plate. A micrometer microscope, with vertical motion, is focused on a scratch on the surface of its stage; the plate, which has a fine scratch on its upper surface, is now introduced, and the microscope is successively focused on the scratch on the stage as viewed through the plate, and on the scratch on the plate. The difference between the first and third readings gives the thickness of the plate, corresponding to l above, and between the second and third readings the depth of the image, corresponding to l'.

Refraction by a Prism.—In optics a prism is a piece of transparent material bounded by two plane faces which meet at a definite angle, called the refracting angle of the prism, in a straight line called the edge of the prism; a section perpendicular to the edge is called a principal section. Parallel rays, refracted successively at the two faces, emerge from the prism as a system of parallel rays, but the direction is altered by an amount called the *deviation*. The deviation depends on the angles of incidence and emergence; but, since the course of a ray may always be reversed, there must be a stationary value, either a maximum or minimum, when the ray traverses the prism symmetrically, *i.e.* when the angles of incidence and emergence are equal. As a matter of fact, it is a minimum, and the position is called the angle of minimum deviation. The relation between the minimum deviation D, the angle of the prism i, and the refractive index μ is found as follows. Let in fig. 2, PQRS be the course of the ray through the prism; the internal angles ϕ', ψ' each equal $\frac{1}{2}i$, and the angles of incidence and emergence ϕ, ψ are each equal and connected with ϕ' by Snell's law, *i.e.* $\sin\phi = \mu \sin\phi'$. Also the deviation D is $2(\phi - \phi')$. Hence $\mu = \sin\phi/\sin\phi' = \sin\frac{1}{2}(D+i)/\sin\frac{1}{2}i$.

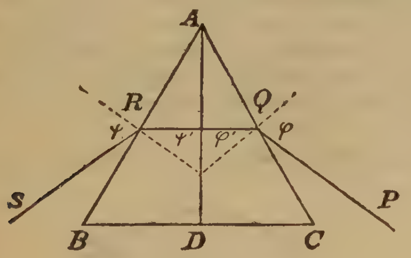


FIG. 2.

Refractometers.—Instruments for determining the refractive indices of media are termed refractometers.

The simplest are really spectrometers, consisting of a glass prism, usually hollow and fitted with accurately parallel glass sides, mounted on a table which carries a fixed collimation tube and a movable observing tube, the motion of the latter being recorded on a graduated circle. The collimation tube has a narrow adjustable slit at its outer end and a lens at the nearer end, so that the light leaves the tube as a parallel beam. The refracting angle of the prism, i in our previous notation, is determined by placing the prism with its refracting edge towards the collimator, and observing when the reflections of the slit in the two prism faces coincide with the cross-wires in the observing telescope; half the angle between these two positions gives i. To determine the position of minimum deviation, or D, the prism is removed, and the observing telescope is brought into line with the slit; in this position the graduation is read. The prism is replaced, and the telescope moved until it catches the refracted rays. The prism is now turned about a vertical axis until a position is found when the telescope has to be moved towards the collimator in order to catch the rays; this operation sets the prism at the angle of minimum deviation. The refractive index μ is calculated from the formula given above.

More readily manipulated and of superior accuracy are refractometers depending on total reflection. The Abbe refractometer (fig. 3) essentially consists of a double Abbe prism AB to contain the substance to be experimented with; and a telescope F to observe the border line of the total reflection. The prisms, which are right-angled and made of the same flint glass, are mounted in a hinged frame such that the lower prism, which is used for purposes of illumination, can be locked so that the hypothenuse faces are distant by about 0·15 mm., or rotated away from the upper prism. The double prism is used in examining liquids, a few drops being placed between the prisms; the single prism is used when solids or plastic bodies are employed. The mount is capable of rotation about a horizontal axis by an alidade *J*. The telescope is provided with a reticule, which can be brought into exact coincidence with the observed border line, and is rigidly fastened to a sector S graduated directly in refractive indices. The reading is effected by a lens L. Beneath the prisms is a mirror for reflecting light into the apparatus. To use the apparatus, the liquid having been inserted between the prisms, or the solid attached by its own adhesiveness or by a drop of monobromnaphthalene to the upper prism, the prism case is rotated until the field of view consists of a light and dark portion, and the border line is now brought into coincidence with the reticule of the telescope. In using a lamp or daylight this border is coloured, and hence a compensator, consisting of two equal Amici prisms, is placed between the objective and the prisms. These Amici prisms can be rotated, in opposite directions, until they produce a dispersion opposite in sign to that originally seen, and hence the border line now appears perfectly sharp and colourless. When at zero the alidade corresponds to a refractive index of 1·3, and any other reading gives the corresponding index correct to about 2 units in the 4th decimal place. Since temperature markedly affects the refractive index, this apparatus is provided with a device for heating the prisms. Figs. 4 and 5 show the course of the rays when a solid and liquid are being experimented with. Dr R. Wollny's butter refractometer, also made by Zeiss, is constructed similarly to Abbe's form, with the exception that the prism casing is rigidly attached to the telescope, and the observation made by noting the point where the border line intersects an appropriately graduated scale in the focal plane of the telescope objective, fractions being read by a micrometer screw attached to the objective. This apparatus is also provided with an arrangement for heating.

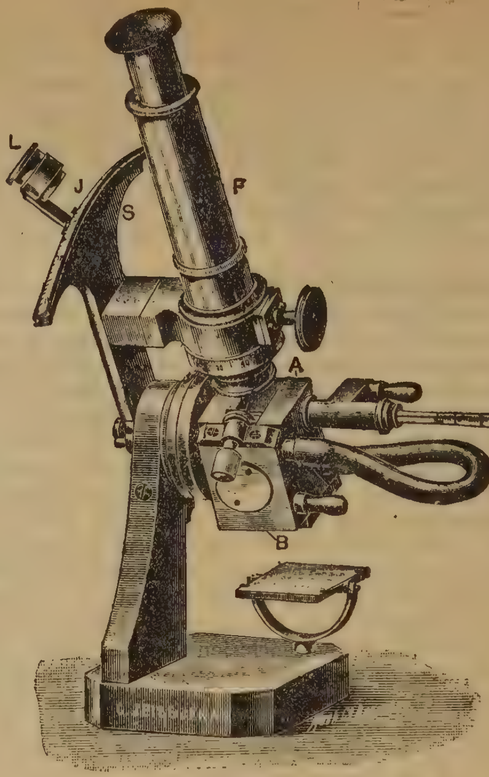


FIG. 3.

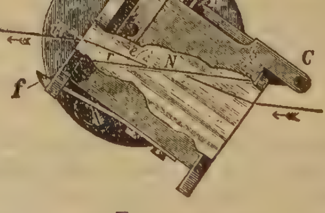


FIG. 4.

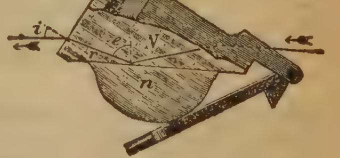


FIG. 5.

This method of reading is also employed in Zeiss's "dipping refractometer" (fig. 6). This instrument consists of a telescope R having at its lower end a prism P with a refracting angle of 63°, above which and below the objective is a movable compensator A for purposes of annulling the dispersion about the border line. In the focal plane of the objective O there is a scale Sc, exact reading being made by a micrometer Z. If a large quantity of liquid be available it is sufficient to dip the refractometer perpendicularly into a beaker containing the liquid and to transmit light into the instrument by means of a mirror. If only a smaller quantity be available, it is enclosed in a metal beaker M, which forms an extension of the instrument, and the liquid is retained there by a plate D. The instrument is now placed in a trough B, containing water and having one side of ground glass G; light is reflected into the refractometer by means of a mirror S outside this trough. An accuracy of 3·7 units in the 5th decimal place is obtainable.

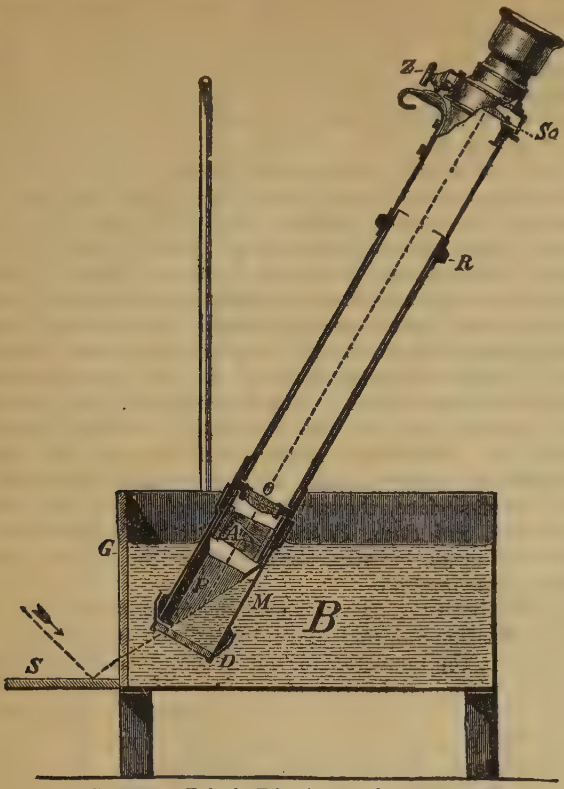


Fig. 6.—Zeiss's Dipping Refractometer.

The Pulfrich refractometer is also largely used, especially for liquids. It consists essentially of a right-angled glass prism placed on a metal foundation with the faces at right angles horizontal and vertical, the hypothenuse face being on the support. The horizontal face is fitted with a small cylindrical vessel to hold the liquid. Light is led to the prism at grazing incidence by means of a collimator, and is refracted through the vertical face, the deviation being observed by a telescope rotating about a graduated circle. From this the refractive index is readily calculated if the refractive index of the prism for the light used be known: a fact supplied by the maker. The instrument is also available for determining the refractive index of isotropic solids. A little of the solid is placed in the vessel and a mixture of monobromnaphthalene and acetone (in which the solid must be insoluble) is added, and adjustment made by adding either one or other liquid until the border line appears sharp, *i.e.* until the liquid has the same index as the solid.

The Herbert Smith refractometer (fig. 7) is especially suitable for determining the refractive index of gems, a constant which is most valuable in distinguishing the precious stones. It consists of a hemisphere of very dense glass, having its plane surface fixed at a certain angle to the axis of the instrument. Light is admitted by a window on the under side, which is inclined at the same angle, but in the opposite sense, to the axis. The light on emerging from the hemisphere is received by a convex lens, in the focal plane of which is a scale graduated to read directly in refractive indices. The light then traverses a positive eye-piece. To use the instrument for a gem, a few drops of methylene iodide (the refractive index of which may be raised to 1·800 by dissolving sulphur in it) are placed on the plane surface of the hemisphere and a facet of the stone then brought into contact with the surface. If monochromatic light be used (*i.e.* the D line of the sodium flame) the field is sharply divided into a light and a dark portion, and the position of the line of demarcation on the scale immediately gives the refractive index. It is necessary for the liquid to have a higher refractive index than the crystal, and also that there is close contact between the facet and the lens. The range of the instrument is between 1·400 and 1·760, the results being correct to two units in the third decimal place if sodium light be used. (C. E.*)

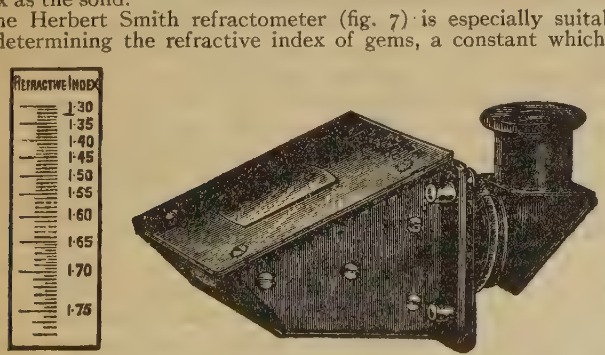


Fig. 7.

II. Double Refraction

That a stream of light on entry into certain media can give rise to two refracted pencils was discovered in the case of Iceland spar by Erasmus Bartholinus, who found that one pencil had a direction given by the ordinary law of refraction, but that the other was bent in accordance with a new law that he was unable to determine. This law was discovered about eight years later by Christian Huygens. According to Huygens' fundamental principle, the law of refraction is determined by the form and orientation of the wave-surface in the crystal—the locus of points to which a disturbance emanating from a luminous point travels in unit time. In the case of a doubly refracting medium the wave-surface must have two sheets, one of which is spherical, if one of the pencils obey in all cases the ordinary law of refraction. Now Huygens observed that a natural crystal of spar behaves in precisely the same way whichever pair of faces the light passes through, and inferred from this fact that the second sheet of the wave-surface must be a surface of revolution round a line equally inclined to the faces of the rhomb, *i.e.* round the axis of the crystal. He accordingly assumed it to be a spheroid, and finding that refraction in the direction of the axis was the same for both streams, he concluded that the sphere and the spheroid touched one another in the axis.

So far as his experimental means permitted, Huygens verified the law of refraction deduced from this hypothesis, but its correctness remained unrecognized until the measures of W. H. Wollaston in 1802 and of E. T. Malus in 1810. More recently its truth has been established with far more perfect optical appliances by R. T. Glazebrook, Ch. S. Hastings and others.

In the case of Iceland spar and several other crystals the extraordinarily refracted stream is refracted away from the axis, but Jean Baptiste Biot in 1814 discovered that in many cases the reverse occurs, and attributing the extraordinary refractions to forces that act as if they emanated from the axis, he called crystals of the latter kind "attractive," those of the former "repulsive." They are now termed "positive" and "negative" respectively; and Huygens' law applies to both classes, the spheroid being prolate in the case of positive, and oblate in the case of negative crystals. It was at first supposed that Huygens' law applied to all doubly refracting media. Sir David Brewster, however, in 1815, while examining the rings that are seen round the optic axis in polarized light, discovered a number of crystals that possess two optic axes. He showed, moreover, that such crystals belong to the rhombic, monoclinic and anorthic (triclinic) systems, those of the tetragonal and hexagonal systems being uniaxal, and those of the cubic system being optically isotropic.

Huygens found in the course of his researches that the streams that had traversed a rhomb of Iceland spar had acquired new properties with respect to transmission through a second crystal. This phenomenon is called polarization (*q.v.*), and the waves are said to be polarized—the ordinary in its principal plane and the extraordinary in a plane perpendicular to its principal plane, the principal plane of a wave being the plane containing its normal and the axis of the crystal. From the facts of polarization Augustin Jean Fresnel deduced that the vibrations in plane polarized light are rectilinear and in the plane of the wave, and arguing from the symmetry of uniaxal crystals that vibrations perpendicular to the axis are propagated with the same speed in all directions, he pointed out that this would explain the existence of an ordinary wave, and the relation between its speed and that of the extraordinary wave. From these ideas Fresnel was forced to the conclusion, that he at once verified experimentally, that in biaxal crystals there is no spherical wave, since there is no single direction round which such crystals are symmetrical; and, recognizing the difficulty of a direct determination of the wave-surface, he attempted to represent the laws of double refraction by the aid of a simpler surface.

The essential problem is the determination of the propagational speeds of plane waves as dependent upon the directions of their normals. These being known, the deduction of the wave-surface follows at once, since it is to be regarded as the envelope at any subsequent time of all the plane waves that at a given instant may be supposed to pass through a given point, the ray corresponding to any tangent plane or the direction of transport of energy being by Huygens' principle the radius-vector from the centre to the point of contact. Now Fresnel perceived that in uniaxal crystals the speeds of plane waves in any direction are by Huygens' law the reciprocals of the semi-axes of the central section, parallel to the wave-fronts, of a spheroid, whose polar and equatorial axes are the reciprocals of the equatorial and polar axes of the spheroidal sheet of Huygens' wave-surface, and that the plane of polarization of a wave is perpendicular to the axis that determines its speed. Hence it occurred to him that similar relations with respect to an ellipsoid with three unequal axes would give the speeds and polarizations of the waves in a biaxal crystal, and the results thus deduced he found to be in accordance with all known facts. This ellipsoid is called the ellipsoid of polarization, the index ellipsoid and the indicatrix.

We may go a step further; for by considering the intersection of a wave-front with two waves, whose normals are indefinitely near that of the first and lie in planes perpendicular and parallel respectively to its plane of polarization, it is easy to show that the ray corresponding to the wave is parallel to the line in which the former of the two planes intersects the tangent plane to the ellipsoid at the end of the semi-diameter that determines the wave-velocity; and it follows by similar triangles that the ray-velocity is the reciprocal of the length of the perpendicular from the centre on this tangent plane. The laws of double refraction are thus contained in the following proposition. The propagational speed of a plane wave in any direction is given by the reciprocal of one of the semi-axes of the central section of the ellipsoid of polarization parallel to the wave; the plane of polarization of the wave is perpendicular to this axis; the corresponding ray is parallel to the line of intersection of the tangent plane at the end of the axis and the plane containing the axis and the wave-normal; the ray-velocity is the reciprocal of the length of the perpendicular from the centre on the tangent plane. By reciprocating with respect to a sphere of unit radius concentric with the ellipsoid, we obtain a similar proposition in which the ray takes the place of the wave-normal, the ray-velocity that of the wave-slowness (the reciprocal of the velocity) and vice versa. The wave-surface is thus the apsidal surface of the reciprocal ellipsoid; this gives the simplest means of obtaining its equation, and it is readily seen that its section by each plane of optical symmetry consists of an ellipse and a circle, and that in the plane of greatest and least wave-velocity these curves intersect in four points. The radii-vectors to these points are called the ray-axes.

When the wave-front is parallel to either system of circular sections of the ellipsoid of polarization, the problem of finding the axes of the parallel central section becomes indeterminate, and all waves in this direction are propagated with the same speed, whatever may be their polarization. The normals to the circular sections are thus the optic axes. To determine the rays corresponding to an optic axis, we may note that the ray and the perpendiculars to it through the centre, in planes perpendicular and parallel to that of the ray and the optic axis, are three lines intersecting at right angles of which the two latter are confined to given planes, viz. the central circular section of the ellipsoid and the normal section of the cylinder touching the ellipsoid along this section: whence by a known proposition the ray describes a cone whose sections parallel to the given planes are circles. Thus a plane perpendicular to the optic axis touches the wave-surface along a circle. Similarly the normals to the circular sections of the reciprocal ellipsoid, or the axes of the tangent cylinders to the polarization-ellipsoid that have circular normal sections, are directions of single-ray velocity or ray-axes, and it may be shown as above that corresponding to a ray-axis there is a cone of wave-normals with circular sections parallel to the normal section of the corresponding tangent cylinder, and its plane of contact with the ellipsoid. Hence the extremities of the ray-axes are conical points on the wave-surface. These peculiarities of the wave-surface are the cause of the celebrated conical refractions discovered by Sir William Rowan Hamilton and H. Lloyd, which afford a decisive proof of the general correctness of Fresnel's wave-surface, though they cannot, as Sir G. Gabriel Stokes (*Math. and Phys. Papers*, iv. 184) has pointed out, be employed to decide between theories that lead to this surface as a near approximation.

In general, both the direction and the magnitude of the axes of the polarization-ellipsoid depend upon the frequency of the light and upon the temperature, but in many cases the possible variations are limited by considerations of symmetry. Thus the optic axis of a uniaxal crystal is invariable, being determined by the principal axis of the system to which it belongs: most crystals are of the same sign for all colours, the refractive indices and their difference both increasing with the frequency, but a few crystals are of opposite sign for the extreme spectral colours, becoming isotropic for some intermediate wave-length. In crystals of the rhombic system the axes of the ellipsoid coincide in all cases with the crystallographic axes, but in a few cases their order of magnitude changes so that the plane of the optic axes for red light is at right angles to that for blue light, the crystal being uniaxal for an intermediate colour. In the case of the monoclinic system one axis is in the direction of the axis of the system, and this is generally, though there are notable exceptions, either the greatest, the least, or the intermediate axis of the ellipsoid for all colours and temperatures. In the latter case the optic axes are in the plane of symmetry, and a variation of their acute bisectrix occasions the phenomenon known as "inclined dispersion": in the two former cases the plane of the optic axes is perpendicular to the plane of symmetry, and if it vary with the colour of the light, the crystals exhibit "crossed" or "horizontal dispersion" according as it is the acute or the obtuse bisectrix that is in the fixed direction.

The optical constants of a crystal may be determined either with a prism or by observations of total reflection. In the latter case the phenomenon is characterized by two angles—the critical angle and the angle between the plane of incidence and the line limiting the region of total reflection in the field of view. With any crystalline surface there are four cases in which this latter angle is 90°, and the principal refractive indices of the crystal are obtained from those calculated from the corresponding critical angles, by excluding that one of the mean values for which the plane of polarization of the limiting rays is perpendicular to the plane of incidence. A difficulty, however, may arise when the crystalline surface is very nearly the plane of the optic axes, as the plane of polarization in the second mean case is then also very nearly perpendicular to the plane of incidence; but since the two mean refractive indices will be very different, the ambiguity can be removed by making, as may easily be done, an approximate measure of the angle between the optic axes and comparing it with the values calculated by using in turn each of these indices (C. M. Viola, *Zeit. für Kryst.*, 1902, 36, p. 245).

A substance originally isotropic can acquire the optical properties of a crystal under the influence of homogeneous strain, the principal axes of the wave-surface being parallel to those of the strain, and the medium being uniaxal, if the strain be symmetrical. John Kerr also found that a dielectric under electric stress behaves as an uniaxal crystal with its optic axis parallel to the electric force, glass acting as a negative and bisulphide of carbon as a positive crystal (*Phil. Mag.*, 1875 (4), L. 337).

Not content with determining the laws of double refraction, Fresnel also attempted to give their mechanical explanation. He supposed that the aether consists of a system of distinct material points symmetrically arranged and acting on one another by forces that depend for a given pair only on their distance. If in such a system a single molecule be displaced, the projection of the force of restitution on the direction of displacement is proportional to the inverse square of the parallel radius-vector of an ellipsoid; and of all displacements that can occur in a given plane, only those in the direction of the axes of the parallel central section of the quadric develop forces whose projection on the plane is along the displacement. In undulations, however, we are concerned with the elastic forces due to relative displacements, and, accordingly, Fresnel assumed that the forces called into play during the propagation of a system of plane waves (of rectilinear transverse vibrations) differ from those developed by the parallel displacement of a single molecule only by a constant factor, independent of the plane of the wave. Next, regarding the aether as incompressible, he assumed that the components of the elastic forces parallel to the wave-front are alone operative, and finally, on the analogy of a stretched string, that the propagational speed of a plane wave of permanent type is proportional to the square root of the effective force developed by the vibrations. With these hypotheses we immediately obtain the laws of double refraction, as given by the ellipsoid of polarization, with the result that the vibrations are perpendicular to the plane of polarization.

In its dynamical foundations Fresnel's theory, though of considerable historical interest, is clearly defective in rigour, and a strict treatment of the aether as a crystalline elastic solid does not lead naturally to Fresnel's laws of double refraction. On the other hand, Lord Kelvin's rotational aether (*Math. and Phys. Papers*, iii. 442)—a medium that has no true rigidity but possesses a quasi-rigidity due to elastic resistance to absolute rotation—gives these laws at once, if we abolish the resistance to compression and, regarding it as gyrostatically isotropic, attribute to it aeolotropic inertia. The equations then obtained are the same as those deduced in the electro-magnetic theory from the circuital laws of A. M. Ampère and Michael Faraday, when the specific inductive capacity is supposed aeolotropic. In order to account for dispersion, it is necessary to take into account the interaction with the radiation of the intra-molecular vibrations of the crystalline substance: thus the total current on the electro-magnetic theory must be regarded as made up of the current of displacement and that due to the oscillations of the electrons within the molecules of the crystal.

Bibliography.—An interesting and instructive account of Fresnel's work on double refraction has been given by Émile Verdet in his introduction to Fresnel's works: *Œuvres d'Augustin Fresnel*, i. 75 (Paris, 1866); *Œuvres de É. Verdet*, i. 360 (Paris, 1872). For an account of theories of double refraction see the reports of H. Lloyd, Sir G. G. Stokes and R. T. Glazebrook in the *Brit. Ass. Reports* for 1834, 1862 and 1885, and Lord Kelvin's *Baltimore Lectures* (1904). An exposition of the rotational theory of the aether has been given by H. Chipart, *Théorie gyrostatique de la lumière* (Paris, 1904); and P. Drude's *Lehrbuch der Optik*, 2^{te} Auf. (1906), the first German edition of which was translated by C. Riborg Mann and R. A. Milliken in 1902, treats the subject from the standpoint of the electro-magnetic theory. The methods of determining the optical constants of crystals will be found in Th. Liebisch's *Physikalische Krystallographie* (1891); F. Pockel's *Lehrbuch der Kristalloptik* (1906); and J. Walker's *Analytical Theory of Light* (1904). A detailed list of papers on the geometry of the wave-surface has been published by E. Wöllfing, *Bibl. Math.*, 1902 (3), iii. 361; and a general account of the subject will be found in the following treatises: L. Fletcher, *The Optical Indicatrix* (1892); Th. Preston, *The Theory of Light*, 3rd ed. by C. J. Joly (1901); A. Schuster, *An Introduction to the Theory of Optics* (1904); R. W. Wood, *Physical Optics* (1905); E. Mascart, *Traité d'optique* (1889); A. Winkelmann, *Handbuch der Physik*. (J. Wal.*)

III. Astronomical Refraction

The refraction of a ray of light by the atmosphere as it passes from a heavenly body to an observer on the earth's surface, is called "astronomical." A knowledge of its amount is a necessary datum in the exact determination of the direction of the body. In its investigation the fundamental hypothesis is that the strata of the air are in equilibrium, which implies that the surfaces of equal density are horizontal. But this condition is being continually disturbed by aerial currents, which produce continual slight fluctuations in the actual refraction, and commonly give to the image of a star a tremulous motion. Except for this slight motion the refraction is always in the vertical direction; that is, the actual zenith distance of the star is always greater than its apparent distance. The refracting power of the air is nearly proportional to its density. Consequently the amount of the refraction varies with the temperature and barometric pressure, being greater the higher the barometer and the lower the temperature.

At moderate zenith distances, the amount of the refraction varies nearly as the tangent of the zenith distance. Under ordinary conditions of pressure and temperature it is, near the zenith, about 1″ for each degree of zenith distance. As the tangent increases at a greater rate than the angle, the increase of the refraction soon exceeds 1″ for each degree. At 45° from the zenith the tangent is 1 and the mean refraction is about 58″. As the horizon is approached the tangent increases more and more rapidly, becoming infinite at the horizon; but the refraction now increases at a less rate, and, when the observed ray is horizontal, or when the object appears on the horizon, the refraction is about 34′, or a little greater than the diameter of the sun or moon. It follows that when either of these objects is seen on the horizon their actual direction is entirely below it. One result is that the length of the day is increased by refraction to the extent of about five minutes in low latitudes, and still more in higher latitudes. At 60° the increase is about nine minutes.

The atmosphere, like every other transparent substance, refracts the blue rays of the spectrum more than the red; consequently, when the image of a star near the horizon is observed with a telescope, it presents somewhat the appearance of a spectrum. The edge which is really highest, but seems lowest in the telescope, is blue, and the opposite one red. When the atmosphere is steady this atmospheric spectrum is very marked and renders an exact observation of the star difficult.

Bibliography.—Refraction has been a favourite subject of research. See Dr. C. Bruhns, *Die astronomische Strahlenbrechung* (Leipzig, 1861), gives a *résumé* of the various formulae of refraction which had been developed by the leading investigators up to the date 1861. Since then developments of the theory are found in: W. Chauvenet, *Spherical and Practical Astronomy*, i.; F. Brünnow, *Sphärischen Astronomie*; S. Newcomb, *Spherical Astronomy*; R. Radau, "Recherches sur la théorie des réfractions astronomiques" (*Annales de l'observatoire de Paris*, xvi., 1882), "Essai sur les réfractions astronomiques" (ibid., xix., 1889).

Among the tables of refraction which have been most used are Bessel's, derived from the observations of Bradley in Bessel's *Fundamenta Astronomiae*; and Bessel's revised tables in his *Tabulae Regiomontanae*, in which, however, the constant is too large, but which in an expanded form were mostly used at the observatories until 1870. The constant use of the Poulkova tables, *Tabulae refractionum*, which is reduced to nearly its true value, has gradually replaced that of Bessel. Later tables are those of L. de Ball, published at Leipzig in 1906. (S. N.)

REFRESHER, in English legal phraseology, a further or additional fee paid to counsel where a case is adjourned from one term or sittings to another, or where it extends over more than one day and occupies, either on the first day or partly on the first and partly on a subsequent day or days, more than five hours without being concluded. The refresher allowed for every clear day subsequent to that on which the five hours have expired is five to ten guineas for a leading counsel and from three to seven guineas for other counsel, but the taxing master is at liberty to allow larger fees in special circumstances. See *Rules of the Supreme Court*, O. 65, r. 48.

REFRIGERATING and **ICE-MAKING.** "Refrigeration" (from Lat. *frigus*, frost) is the cooling of a body by the transfer of a portion of its heat to another and therefore a cooler body. For ordinary temperatures it is performed directly with water as the cooling agent, especially when well water, which usually has a temperature of from 52° to 55° F., can be obtained. There are, however, an increasingly large number of cases in which temperatures below that of any available natural cooling agent are required, and in these it is necessary to resort to machines which are capable of producing the required cooling effect by taking in heat at low temperatures and rejecting it at temperatures somewhat above that of the natural cooling agent, which for obvious reasons is generally water. The function of a refrigerating machine, therefore, is to take in heat at a low temperature and reject it at a higher one.

This involves the expenditure of a quantity of work W, the amount in any particular case being found by the equation $W = Q_2 - Q_1$, where W is the work, expressed by its equivalent in British thermal units; Q_2 the quantity of heat, also in B.Ther.U., given out at the higher temperature T_2; and Q_1 the heat taken in at the lower temperature T_1. It is evident that the discharged heat Q_2 is equal to the abstracted heat Q_1, plus the work expended, seeing that the work W, which causes the rise in temperature from T_1 to T_2, is the thermal equivalent of the energy actually expended in raising the temperature to the level at which it is rejected. The relation then between the work expended and the actual cooling work performed denotes the efficiency of the process, and this is expressed by $Q_1/(Q_2 - Q_1)$; but as in a perfect refrigerating machine it is understood that the whole of the heat Q_1 is taken in at the absolute temperature T_1, and the whole of the heat Q_2, is rejected at the absolute temperature T_2, the heat quantities are proportional to the temperatures, and the expression $T_1/(T_2 - T_1)$ gives the ideal coefficient of performance for any stated temperature range, whatever working substance is used. These coefficients for a number of cases met with in practice are given in the following table. They show that in all cases the heat abstracted exceeds by many times the heat expended. As an instance, when heat is taken in at 0° and rejected at 70°, a perfect refrigerating machine would abstract 6·6 times as much heat as the equivalent of the energy to be applied. If, however, the heat is to be rejected at 100°, then the coefficient is reduced to 4·6.

TABLE I.

T_1. Temperature at which Heat is extracted in Degrees Fahr.	T_2. Temperature at which Heat is rejected in Degrees Fahr.					
	50°	60°	70°	80°	90°	100°
−10°	7·5	6·4	5·6	5·0	4·5	4·1
0°	9·2	7·7	6·6	5·8	5·1	4·6
10°	11·7	9·4	7·8	6·7	5·9	5·2
20°	16·0	12·0	9·6	8·0	6·8	6·0
30°	24·5	16·3	12·2	9·8	8·2	7·0
40°	50·0	25·0	16·7	12·5	10·0	8·3

By examining Table I. it will be seen how important it is to reduce the temperature range as much as possible, in order to obtain the most economical results. No actual refrigerating machine does, in fact, take in heat at the exact temperature of the body to be cooled, and reject it at the exact temperature of the cooling water, but, for economy in working, it is of great importance that the differences should be as small as possible.

There are two distinct classes of machines used for refrigerating and ice-making. In the first refrigeration is produced by the expansion of atmospheric air, and in the second by the evaporation of a more or less volatile liquid.

Compressed-air Machines.—A compressed-air refrigerating machine consists in its simplest form of three essential parts—a compressor, a compressed-air cooler, and an expansion cylinder. It is shown diagrammatically in fig. 1 in connexion with a chamber which it is keeping cool. The compressor draws in air from the room and compresses it, the work expended in compression being almost entirely converted into heat. The compressed air, leaving the compressor at the temperature T_2, passes through the cooler, where it is cooled by means of water, and is then admitted to the expansion cylinder, where it is expanded to atmospheric pressure, performing work on the piston. The heat equivalent of the mechanical work performed on the piston is abstracted from the air, which is discharged at the temperature T_1. This temperature T_1 is necessarily very much below the temperature to be maintained in the room, because the cooling effect is produced by transferring heat from the room or its contents to the air, which is thereby heated. The rise in temperature of the air is, in fact, the measure of the cooling effect produced. If such a machine could be constructed with reasonable mechanical efficiency to compress the air to a temperature but slightly above that of the cooling water, and to expand the air to a temperature but slightly below that required to be maintained in the room, we should of course get a result approximating in efficiency somewhat nearly to the figures given in Table I. Unfortunately, however, such results cannot be obtained in practice, because the extreme lightness of the air and its very small heat capacity (which at constant pressure is ·2379) would necessitate the employment of a great volume, with extremely large and mechanically inefficient cylinders and apparatus. A pound of air, representing about 12 cub. ft., if raised 10° F. will only take up about 2·4 B.T.U. Consequently, to make such a machine mechanically successful a comparatively small weight of air must be used, and the temperature difference increased; in other words, the air must be discharged at a temperature very much below that to be maintained in the room.

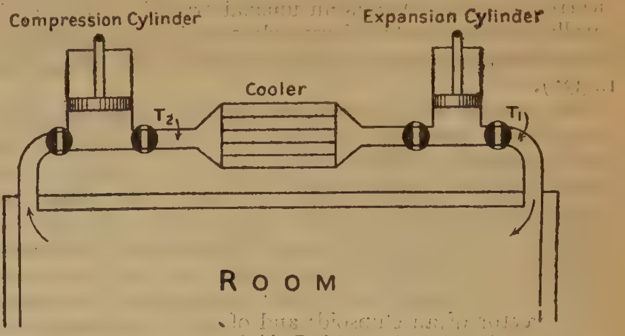


FIG. 1.—Compressed-Air Refrigerating Machine.

This theory of working is founded on the Carnot cycle for a perfect heat motor, a perfect refrigerating machine being simply a reversed heat motor. Another theory involves the use of the Stirling regenerator, which was proposed in connexion with the Stirling heat engine (see AIR ENGINES). The air machine invented by Dr. A. Kirk in 1862, and described by him in a paper on the "Mechanical Production of Cold" (*Proc. Inst. C.E.*, xxxvii., 1874, 244), is simply a reversed Stirling air engine, the air working in a closed cycle instead of being actually discharged into the room to be cooled, as is the usual practice with ordinary compressed-air machines. Kirk's machine was used commercially with success on a fairly large scale, chiefly for ice-making, and it is recorded that it produced about 4 lb of ice for 1 lb of coal. In 1868 J. Davy Postle read a paper before the Royal Society of Victoria, suggesting the conveyance of meat on board ship in a frozen state by means of refrigerated air, and in 1869 he showed by experiment how it could be done; but his apparatus was not commercially developed. In 1877 a compressed-air machine was designed by J. J. Coleman of Glasgow, and in the early part of 1879 one of his machines was fitted on board the Anchor liner "Circassia," which successfully brought a cargo of chilled beef from America—the first imported by the aid of refrigerating machinery, ice having been previously used. The first successful cargo of frozen mutton from Australia was also brought by a Bell-Coleman machine in 1879. In the Bell-Coleman machine the air was cooled during compression by means of an injection of water, and further by being brought into contact with a shower of water. Another, perhaps the principal, feature was the interchanger, an apparatus whereby the compressed air was further cooled before expansion by means of the comparatively cold air from the room in its passage to the compressor, the same air being used over and over again. The object of this interchanger was not only to cool the compressed air before expansion, but to condense part of the moisture in it, so reducing the quantity of ice or snow produced during expansion. A full description of the machine may be found in a paper on "Air-Refrigerating Machinery" by J. J. Coleman (*Proc. Inst. C.E.* lxviii., 1882). At the present time the Bell-Coleman machine has practically ceased to exist. In such compressed-air machines as are now made there is no injection of water during compression, and the compressed air is cooled in a surface cooler, not by actual mixture with a shower of cold water. Further, though the interchanger is still used by some makers, it has been found by experience that, with properly constructed valves and passages in the expansion cylinder, there is no trouble from the formation of snow, when, as is the general practice, the same air is used over and over again, the compressor taking its supply from the insulated room. So far as the air discharged from the expansion cylinder is concerned, its humidity is precisely the same so long as its temperature and pressure are the same, inasmuch as when discharged from the expansion cylinder it is always in a saturated condition for that temperature and pressure.

The ideal coefficient of performance is about 1, but the actual coefficient will be about $\frac{5}{8}$, after allowing for the losses incidental to working. In practice the air is compressed to about 50 lb per square inch above the atmosphere, its temperature rising to about 300° F. The compressed air then passes through coolers in which it is cooled to within about 5° of the initial temperature of the cooling water, and is deprived of a portion of its moisture, after which it is admitted into the expansion cylinder and expanded nearly to atmospheric pressure. The thermal equivalent of the power exerted on the piston is taken from the air, which, with cooling water at 60° F. and after allowing for friction and other losses, is discharged at a temperature of 60° to 80° below zero F. according to the size of the machine. The pistons of the compression and expansion cylinders are connected to the same crankshaft, and the difference between the power expended in compression and that restored in expansion, plus the friction of the machine, is supplied by means of a steam engine coupled to the crankshaft, or by any other source of power. For marine purposes two complete machines are frequently mounted on one bed-plate and worked either together or separately.

In some machines used in the United States the cold air is not discharged into the rooms but is worked in a closed cycle, the rooms being cooled by means of overhead pipes through which the cold expanded air passes on its way back to the compressor.

Liquid Machines.—Machines of the second class may conveniently be divided into three types: (*a*) Those in which there is no recovery of the refrigerating agent, water being the agent employed; they will be dealt with as "Vacuum machines." (*b*) Those in which the agent is recovered by means of mechanical compression; they are termed "Compression machines." (*c*) Those in which the agent is recovered by means of absorption by a liquid; they are known as "Absorption machines."

Vacuum machines. In the first class, since the refrigerating liquid is itself rejected, the only agent cheap enough to be employed is water. The boiling point of water varies with pressure; thus at one atmosphere or 14·7 lb per square inch it is 212° F., whereas at a pressure of ·085 lb per square inch it is 32°, and at lower pressures there is a still further fall in temperature. This property is made use of in vacuum machines. Water at ordinary temperature, say 60°, is placed in an air-tight glass or insulated vessel, and when the pressure is reduced by means of a vacuum pump it begins to boil, the heat necessary for evaporation being taken from the water itself. The pressure being still further reduced, the temperature is gradually lowered until the freezing-point is reached and ice formed, when about one-sixth of the original volume has been evaporated.

The earliest machine of this kind appears to have been made in 1755 by Dr. William Cullen, who produced the vacuum by means of a pump alone. In 1810 Sir John Leslie combined with the air pump a vessel containing strong sulphuric acid for absorbing the vapour from the air, and is said to have succeeded in producing 1 to $1\frac{1}{2}$ lb of ice in a single operation. E. C. Carré later adopted the same principle. In 1878 F. Windhausen patented a vacuum machine for producing ice in large quantities, and in 1881 one of these machines, said to be capable of making about 12 tons of ice per day, was put to work in London. The installation was fully described by Carl Pieper (*Trans. Soc. of Engineers*, 1882, p. 145) and by Dr. John Hopkinson (*Journal of Soc. of Arts*, 1882, vol. xxxi. p. 20). The process, however, not being successful from a commercial point of view, was abandoned. At the present time vacuum machines are only employed for domestic purposes. The hand apparatus invented by H. A. Fleuss consists of a vacuum pump capable of reducing the air pressure to a fraction of a millimetre, the suction pipe of which is connected first with a vessel containing sulphuric acid, and second with the vessel containing the water to be frozen. Both these vessels are mounted on a rocking base, so that the acid can be thoroughly agitated while the machine is being worked. As soon as the pump has sufficiently exhausted the air from the vessel containing the water, vapour is rapidly given off and is absorbed by the acid until sufficient heat has been abstracted to bring about the desired reduction in temperature, the acid becoming heated by the absorption of water vapour, while the water freezes. The small Fleuss machine will produce about $1\frac{1}{4}$ lb of ice in one operation of 20 minutes. Iced water in a carafe for drinking purposes can be produced in about three minutes. The acid vessel holds 9 lb of acid, and nearly 3 lb of ice can be made for each 1 lb of acid before the acid has become too weak to do further duty. Another machine, which can be easily worked by a boy, will produce 20 to 30 lb of ice in one hour, and is perhaps the largest size practicable with this method of freezing. The temperature attainable depends on the strength and condition of the sulphuric acid; ordinarily it can be reduced to zero F., and temperatures 20° lower have frequently been obtained.

Compression machines. Though prior to 1834 several suggestions had been made with regard to the production of ice and the cooling of liquids by the evaporation of a more volatile liquid than water, the first machine actually constructed and put to work was made by John Hague in that year from the designs of Jacob Perkins (*Journal of Soc. of Arts*, 1882, vol. xxxi. p. 77). This machine, though never used commercially, is the parent of all modern compression machines. Perkins in his patent specification states that the volatile fluid is by preference ether. In 1856 and 1857 James Harrison of Geelong, Victoria, patented a machine embodying the same principle as that of Perkins, but worked out in a much more complete and practical manner. It is stated that these machines were first made in New South Wales in 1859, but the first Harrison machine adopted successfully for industrial purposes in England was applied in the year 1861 for cooling oil in order to extract the paraffin. In Harrison's machine the agent used was ether $(C_2H_5)_2O$. Improvements were made by Siebe & Company of London, and a considerable number of ether machines both for ice-making and refrigerating purposes were supplied by that firm and others up to the year 1880. In 1870 the subject of refrigeration was investigated by Professor Carl Linde of Munich, who was the first to consider the question from a thermodynamic point of view. He dealt with the coefficient of performance as a common basis of comparison for all machines, and showed that the compression vapour machine more nearly reached the theoretic maximum than any other (*Bayerisches Industrie und Gewerbeblatt*, 1870 and 1871). Linde also examined the physical properties of various liquids, and, after making trials with methylic ether in 1872, built his first ammonia compression machine in 1873. Since then the ammonia compression machine has been most widely adopted, though the carbonic acid machine, also compression, which was first made in 1880 from Linde's designs, is now used to a considerable extent, especially on board ship.

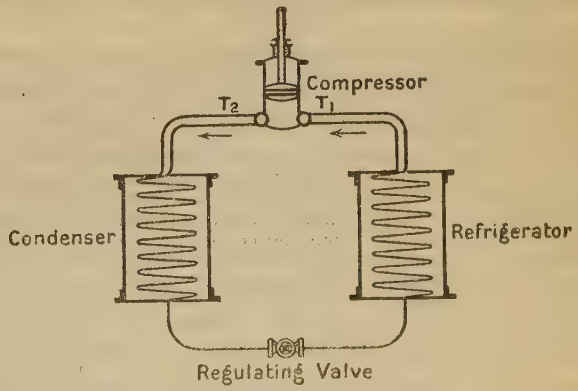


FIG. 2.—Vapour Compression Machine.

A diagram of a vapour compression machine is shown in fig. 2. There are three principal parts, a refrigerator or evaporator, a compression pump, and a condenser. The refrigerator, which consists of a coil or series of coils, is connected to the suction side of the pump, and the delivery from the pump is connected to the condenser, which is generally of somewhat similar construction to the refrigerator. The condenser and refrigerator are connected by a pipe in which is a valve named the regulator. Outside the refrigerator coils is the air, brine or other substance to be cooled, and outside the condenser is the cooling medium, which, as previously stated, is generally water. The refrigerating liquid (ether, sulphur dioxide, anhydrous ammonia, or carbonic acid) passes from the bottom of the condenser through the regulating valve into the refrigerator in a continuous stream. The pressure in the refrigerator being reduced by the pump and maintained at such a degree as to give the required boiling-point, which is of course always lower than the temperature outside the coils, heat passes from the substance outside, through the coil surfaces, and is taken up by the entering liquid, which is converted into vapour at the temperature T_1. The vapours thus generated are drawn into the pump, compressed, and discharged into the condenser at the temperature T_2, which is somewhat above that of the cooling water. Heat is transferred from the compressed vapour to the cooling water and the vapour is converted into a liquid, which collects at the bottom and returns by the regulating valve into the refrigerator. As heat is both taken in and discharged at constant temperature during the change in physical state of the agent, a vapour compression machine must approach the ideal much more nearly than a compressed-air machine, in which there is no such change.

This will be seen by taking as an example a case in which the cold room is to be kept at 10° F., the cooling water being at 60°. Under these conditions, the actual evaporating temperature T_1, in a well-constructed ammonia compression machine, after allowing for the differences necessary for the exchange of heat, would be about 5° below zero, and the discharge temperature T would be about 75°. An ideal machine, working between 5° below zero and 75° above, has a coefficient of about 5·7, or nearly six times that of an ideal compressed-air machine of usual construction performing the same useful cooling work.

A vapour compression machine does not, however, work precisely in the reversed Carnot cycle, inasmuch as the fall in temperature between the condenser and the refrigerator is not produced, nor is it attempted to be produced, by the adiabatic expansion of the agent, but results from the evaporation of a portion of the liquid itself. In other words, the liquid-refrigerating agent enters the refrigerator at the condenser temperature and introduces heat which has to be taken up by the evaporating liquid before any useful refrigerating effect can be performed. The extent of this loss is determined by the relation between the liquid heat and the latent heat of vaporization at the refrigerator temperature. If r represents the latent heat of the vapour, and q_2 and q_1 the amounts of heat contained in the liquid at the respective temperatures of T_2 and T_1, then the loss from the heat carried from the condenser into the refrigerator is shown by $(q_2-q_1)/r$ and the useful refrigerating effect produced in the refrigerator is $r-(q_2-q_1)$. Assuming, as in the previous example, that T_2 is 75° F., and that T_1 is 5° below zero, the results for various refrigerating agents are as follows:—

TABLE II.

	Latent Heat. r	Liquid Heat. q_2-q_1	Net Refrigeration. $r-(q_2-q_1)$	Proportion of Loss. $(q_2-q_1)/r$
Anhydrous ammonia	590·33	72·556	517·774	0·1225
Sulphurous acid .	173·13	29·062	144·068	0·168
Carbonic acid . .	119·85	47·35	72·50	0·395

The results show that the loss is least in the case of anhydrous ammonia and greatest in the case of carbonic acid. At higher condenser temperatures the results are even much more favourable to ammonia. As the critical temperature (88·4° F.) of carbonic acid is approached, the value of r becomes less and less and the refrigerating effect is much reduced. When the critical point is reached the value of r disappears altogether, and a carbonic-acid machine is then dependent for its refrigerating effect on the reduction in temperature produced by the internal work performed in expanding the gaseous carbonic acid from the condenser pressure to that in the refrigerator. The abstraction of heat does not then take place at constant temperature. The expanded vapour enters the refrigerator at a temperature below that of the substance to be cooled, and whatever cooling effect is produced is brought about by the superheating of the vapour, the result being that above the critical point of carbonic acid the difference T_2-T_2 is increased and the efficiency of the machine is reduced. The critical temperature of anhydrous ammonia is about 266° F., which is never approached in the ordinary working of refrigerating machines. Some of the principal physical properties of sulphurous acid, anhydrous ammonia, and carbonic acid are given in Tables III., IV. and V.

TABLE III.—*Ledoux's Table for Saturated Sulphur Dioxide Vapour* (SO_2).

t Temp. of Ebullition. Degs. Fahr.	Vapour-tension in Pounds per sq. in. Absolute.	q Heat of Liquid from 32° Fahr. B.T.U.	r Latent Heat of Evaporation. B.T.U.	u Volume of one Pound of Saturated Vapour. Cub. ft.
−22	5·546	−19·55	176·98	13·168
−13	7·252	−16·31	174·94	10·268
− 4	9·303	−13·05	172·91	8·122
5	11·803	− 9·79	170·82	6·504
14	14·789	− 6·85	168·75	5·254
23	18·544	− 3·26	166·63	4·293
32	22·468	0·00	164·47	3·540
41	27·445	3·27	162·39	2·931
50	33·275	6·55	160·24	2·451
59	39·958	9·83	158·08	2·066
68	47·637	13·10	155·89	1·746
77	56·311	16·38	153·67	1·490
86	66·407	19·69	151·49	1·266
95	77·641	22·99	149·27	1·089
104	90·297	26·28	147·02	0·913

TABLE IV.—*Mollier's Table for Saturated Anhydrous Ammonia Vapour* (NH_3).

t Temp. of Ebullition. Degs. Fahr.	Vapour-tension in Pounds per sq. in. Absolute.	q Heat of Liquid from 32° Fahr. B.T.U.	r Latent Heat of Evaporation. B.T.U.	u Volume of one Pound of Saturated Vapour. Cub. ft.
−40	10·238	−60·048	600·00	25·630
−31	13·324	−53·064	597·24	20·120
−22	16·920	−45·918	595·08	15·971
−13	21·472	−38·646	593·00	12·783
− 4	27·000	−31·212	590·00	10·316
5	33·701	−23·634	586·82	8·394
14	41·522	−15·894	581·00	6·888
23	50·908	− 8·028	576·00	5·703
32	61·857	0·000	571·00	4·742
41	74·513	8·172	562·50	3·973
50	89·159	16·506	555·48	3·364
59	105·939	24·966	550·00	2·851
68	124·994	33·588	541·00	2·435
77	146·908	42·354	531·00	2·098
86	170·782	51·282	523·00	1·810
95	197·800	60·336	512·50	1·570
104	227·662	69·552	501·50	1·361

TABLE V.—*Mollier's Table for Saturated Carbon Dioxide Vapour* (CO_2).

t Temp. of Ebullition. Degs. Fahr.	Vapour-tension in Pounds per sq. in. Absolute.	q Heat of Liquid from 32° Fahr. B.T.U.	r Latent Heat of Evaporation. B.T.U.	u Volume of one Pound of Saturated Vapour. Cub ft.
−22	213·345	−24·80	126·72	·4330
−13	248·903	−21·06	123·25	·3670
− 4	288·727	−17·19	119·43	·3130
5	334·240	−13·17	115·25	·2680
14	385·443	− 9·00	110·65	·2295
23	440·913	− 4·63	105·53	·1955
32	503·497	0·00	99·81	·1670
41	573·187	4·93	93·35	·1430
50	649·991	10·28	85·93	·1202
59	733·906	16·22	77·40	·1010
68	826·356	23·08	66·47	·0833
77	930·184	31·63	51·80	·0673
86	1039·701	45·45	27·00	·0481
87·8	1062·458	51·61	15·12	·0416
88·43	1070·991	59·24	0·00	·0352

The action of a vapour compression machine is shown in fig. 3. Liquid at the condenser temperature being introduced into the refrigerator through the regulating valve, a small portion evaporates and reduces the remaining liquid to the temperature T_1. This is shown by the curve AB, and is the useless work represented by the expression $(q_2-q_1)/r$. Evaporation then continues at the constant temperature T, abstracting heat from the substance outside the refrigerator as shown by the line BC. The vapour is then compressed along the line CD to the temperature T_2, when, by the action of the cooling water in the condenser, heat is abstracted at constant temperature and the vapour condensed along the line DA.

In a compression machine the refrigerator is usually a series of iron or steel coils surrounded by the air, brine or other substance it

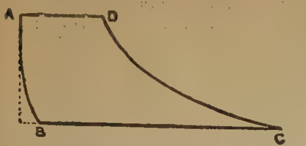


FIG. 3.—Action of Vapour Compression Machine.

is desired to cool. One end (generally the bottom) of the coils is connected to the liquid pipe from the condenser and the other end to the suction of the compressor. Liquid from the condenser is admitted to the coils through an adjustable regulating valve, and by taking heat from the substance outside is evaporated, the vapour being continually drawn off by the compressor and discharged under increased pressure into the condenser. The condenser is constructed of coils like the refrigerator, the cooling water being contained in a tank; frequently, however, a series of open coils is employed, the cooling water falling over the coils into a collecting tray below, and this form is perhaps the most convenient for ordinary use as it affords great facilities for inspection and painting. The compressor may be driven by a steam engine or in any other convenient manner. The pressure in the condenser varies according to the temperature of the cooling water, and that in the refrigerator is dependent upon the temperature to which the outside substance is cooled. In an ammonia machine copper and copper alloys must be avoided, but for carbonic acid they are not objectionable.

The compression of ammonia is sometimes carried out on what is known as the Linde or "wet" system, and sometimes on the "dry" system. When wet compression is used the regulating valve is opened to such an extent that a little more liquid is passed than can be evaporated in the refrigerator. This liquid enters the compressor with the vapour, and is evaporated there, the heat taken up preventing the rise in temperature during compression which would otherwise take place. The compressed vapour is discharged at a temperature but little above that of the cooling water. With dry compression, vapour alone is drawn into the compressor, and the temperature rises to as much as 180 or 200 degrees. Wet compression theoretically is not quite so efficient as dry compression, but it possesses practical advantages in keeping the working parts of the compressor cool, and it also greatly facilitates the regulation of the liquid, and ensures the full duty of the machine being continuously performed. Very exact comparative trials have been made by Professor M. Schroeter and others with compression machines using sulphur dioxide and ammonia. The results are published in *Vergleichende Versuche an Kältemaschinen*, by Schroeter, Munich, 1890, and in Nos. 32 and 51 of *Bayerisches Industrie und Gewerbeblatt*, 1892. Some of the results obtained by Schroeter in 1893 with an ordinary brine cooling machine on the Linde ammonia system are given in Table VI.:—

TABLE VI.

Temperature reduction in refrigerator. Degs. Fahr.	42·8 to 37·4	28·4 to 23	14 to 8·6	–0·4 to –5·8
I.H.P. in steam cylinder	15·79	16·48	15·29	14·25
I.H.P. in compressor	14·32	14·3	13·54	11·98
Pressure in refrigerator in pounds per sq. in. above atmosphere	45·2	32·6	19·8	9·9
Pressure in condenser in pounds per sq. in. above atmosphere	116·0	115·0	110·0	108·0
Heat abstracted in refrigerator. B.T.U. per hour	342192	263400	171515	121218
Heat rejected in condenser. B.T.U. per hour	377567	301200	214347	158594

Absorption machines. The principle of the absorption process is chemical or physical rather than mechanical; it depends on the fact that many vapours of low boiling-point are readily absorbed in water, and can be separated again by the application of heat. In its simplest form an absorption machine consists of two iron vessels connected together by a bent pipe. One of these contains a mixture of ammonia and water, which on the application of heat gives off a mixed vapour containing a large proportion of ammonia, a liquid containing but little ammonia being left behind. In the second vessel, which is placed in cold water, the vapour rich in ammonia is condensed under pressure. To produce refrigeration the operation is reversed. On allowing the weak liquor to cool to normal temperature, it becomes greedy of ammonia (at 60° F. at atmospheric pressure water will absorb about 760 times its own volume of ammonia vapour), and this produces an evaporation from the liquid in the vessel previously used as a condenser. This liquid, containing a large proportion of ammonia, gives off vapour at a low temperature, and therefore becomes a refrigerator abstracting heat from water or any surrounding body. When the ammonia is evaporated the operation as described must be again commenced. Such an apparatus is not much used now. Larger and more elaborate machines were made by F. P. E. Carré in France; but no very high degree of perfection was arrived at, owing to the impossibility of getting an anhydrous product of distillation. In 1867 Rees Reece, taking advantage of the fact that two vapours of different boiling-points, when mixed, can be separated by means of fractional condensation, brought out an absorption machine in which the distillate was very nearly anhydrous. By means of vessels termed the analyser and the rectifier, the bulk of the water was condensed at a comparatively high temperature and run back to the generator, while the ammonia passed into a condenser, and there assumed the liquid form under the pressure produced by the heat in the generator and the cooling action of water circulating outside the condenser tubes.

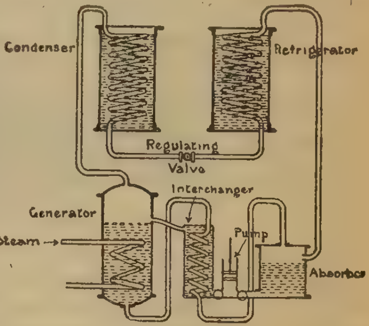


FIG. 4.

Fig. 4 is a diagram of an absorption apparatus. The ammonia vapour given off in the refrigerator is absorbed by a cold weak solution of ammonia and water in the absorber, and the strong liquor is pumped back into the generator through an interchanger through which also the weak hot liquor from the generator passes on its way to the absorber. In this way the strong liquor is heated before it enters the generator, and the weak liquor is cooled before it enters the absorber. The generator being heated by means of a steam coil, ammonia vapour is driven off at such a pressure as to cause its condensation in the condenser. From the condenser it passes into the refrigerator through a regulating valve in the usual manner. The process is continuous, and is identical with that of the compression machine, with the exception of the return from the temperature T_1 to the temperature T_2, which is brought about by the direct application of heat instead of by means of mechanical compression. With the same temperature range, however, the same amount of heat has to be acquired in both cases, though from the nature of the process the actual amount of heat demanded from the steam is much greater in the absorption system than in the compression. This is chiefly due to the fact that in the former the heat of vaporization acquired in the refrigerator is rejected in the absorber, so that the whole heat of vaporization has to be supplied again by the steam in the generator. In the latter the vapour passes direct from the refrigerator to the pump, and power has to be expended merely in raising the temperature to a sufficient degree to enable condensation to occur at the temperature of the cooling water. On the other hand, a great advantage is gained in the absorption machine by using the direct heat of the steam, without first converting it into mechanical work, for in this way its latent heat of vaporization can be utilized by condensing the steam in the coils and letting it escape in the form of water. Each pound of steam can thus be made to give up some 950 units of heat; while in a good steam engine only about 200 units are utilized in the steam cylinder per pound of steam, and in addition allowance has to be made for mechanical inefficiency. In the absorption machine the cooling water has to take up about twice as much heat as in the compression system, owing to the ammonia being twice liquefied—namely, once in the absorber and once in the condenser. It is usual to pass the cooling water first through the condenser and then through the absorber.

The absorption machine is not so economical as the compression; but an actual comparison between the two systems is difficult to make. Information on this head is given in papers read by Dr. Linde and by Professor J. A. Ewing before the Society of Arts (*Journal of the Society of Arts*, vol. xlii., 1894, p. 322, and Howard Lectures, January, February and March 1897).

An absorption apparatus as applied to the cooling of liquids consists of a generator containing coils to which steam is supplied at suitable pressure, an analyser, a rectifier, a condenser either of the submerged or open type, a refrigerator in which the nearly anhydrous ammonia obtained in the condenser is allowed to evaporate, an absorber through which the weak liquor from the generator continually flows and absorbs the anhydrous vapour produced in the refrigerator, and a pump for forcing the strong liquor produced in the absorber back through an economizer into the analyser where, meeting with steam from the generator, the ammonia gas is again driven off, the process being thus carried on continuously. Sometimes an additional vessel is employed for heating liquor by means of the exhaust steam from the engine driving the ammonia pump. Absorption machines are also made without a pump for returning the strong liquor to the generator. In these cases they work intermittently. In some machines the same vessel is used alternately as a generator and absorber, while in others in order to minimize the loss of time, two vessels are provided which can be used alternately as generators and absorbers.

Applications.—Apart from the economical working of the machine itself, whatever system may be adopted, it is of importance that cold once produced should not be wasted, and it is therefore necessary to use some form of insulation to protect the vessels in which liquids are being cooled, or the rooms of ships' holds in which the freezing or storage processes are being carried on. This insulation generally consists of materials such as charcoal, silicate cotton, granulated cork, small pumice, hair-felt, sawdust, &c., held between layers of wood or brick, and forming a more or less heat-tight box. There is no recognized standard of insulation. For a cold store to be erected inside a brick or stone building, and to be maintained at an internal temperature of from 18° to 20° F., a usual plan is shown in fig. 5. The same insulation is used for the floors and ceilings, except that the wearing surface of the floor is generally made thicker than the inside lining of the sides. Should the walls or floor be damp, waterproof paper is added. Granulated cork has practically the same insulating properties as silicate cotton, and the same thicknesses may be used. About 10 in. of flake charcoal and vegetable silica, or 11 of small pumice, are required to give the same protection as 7 in. of good silicate cotton. Cork bricks made of compressed granulated cork are frequently used, a thickness of about 5 in. giving the same protection as 7 in. of silicate cotton. The walls and ceilings are finished off with a smooth coating of hard cement and the floors are protected by cement or asphalt, according to the nature of the traffic on them. For lager-beer cellars and fermenting rooms, for bacon-curing cellars, and for similar purposes, brick walls with single or double air spaces are used, and sometimes a space filled with silicate cotton or other insulating material. In Australia and New Zealand pumice, which is found in enormous quantities in the latter country, takes the place of charcoal and silicate cotton. In Canada air spaces are largely used either alone or in combination with silicate cotton or planer shavings. The air spaces, two or three in number, are formed between two layers of tongued and grooved wood, and the total thickness of the insulation is about the same as when silicate cotton alone is used. On board ship charcoal has been almost entirely employed, but silicate cotton and granulated cork are sometimes used. The material is either placed directly up to the skin of the vessel, and kept in place by a double lining of wood inside, in which case a thickness of about 10 in. is used depending upon the depth of the frames, or it is placed between two layers of wood, with an air space next the skin, in which case about 6 in. of flake charcoal is generally sufficient for the insulation of the holds, though for deck-houses and other parts exposed to the sun the thickness must be greater. A layer of sheet zinc or tin has frequently to be used as protection from rats. Given a certain allowable heat transmission, the principal points to be considered in connexion with insulation are, first cost, durability, weight and space occupied, the two last named being specially important factors on board ship. No exact rules can be laid down, as the conditions vary so greatly; and though experiments have been made to determine the actual heat conduction of various materials per unit of surface, thickness and temperature difference, the experience of actual practice is at present the only accepted guide.

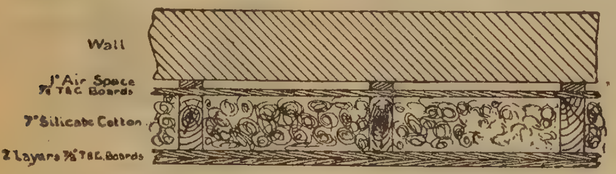


FIG. 5.—Insulation of a Cold Store.

With compressed-air machines which discharge the cold air direct into the insulated room or hold, a snow box is provided close to the outlet of the expansion cylinder to catch the snow and congealed oil. The air is distributed by means of wood air trunks with openings controlled by slides, and similar trunks are provided in connexion with the suction of the compresser to conduct the air back to the machine. With liquid machines of the compression and absorption system, the rooms are either cooled by means of cold pipes or surfaces placed in them, or by a circulation of air cooled in an apparatus separated from the rooms. The cold pipes may be direct-expansion pipes in which the liquid evaporates, or they may be pipes or walls through which circulates an uncongealable brine previously cooled to the desired temperature. The pipes are placed on the ceilings or sides according to circumstances, but they must be arranged so as to induce a circulation of air throughout the compartment and ensure every part being cooled. With what is termed the air circulation system the air is generally circulated by means of a fan, being drawn from the rooms through ducts, passed over a cooler, and returned again to the rooms by other ducts. In some coolers the cooling surfaces consist of direct-expansion pipes placed in clusters of convenient form; in others brine pipes are used; in others there is a shower of cold brine, and in some cases combinations of cold pipes and brine showers. Whether pipes in the rooms or air circulation give the best results is to some extent a matter of opinion, but at the present time the tendency is decidedly in favour of air circulation, at any rate for general cold storage purposes. Whichever system be adopted, it is important for economical reasons that ample cooling surface be allowed, and that all surfaces be kept clean and active, to make the difference between the temperature of the evaporating liquid and the rooms as small as possible. Small surfaces reduce first cost, but involve higher working expenses by decreasing the value of $T_1/(T_2-T_1)$, and thus demanding more energy, and consequently more fuel, to effect the given result than if larger surfaces were employed.

The general arrangement of an ice factory for producing can ice is shown in fig. 6. The water to be frozen is contained in galvanized or terned steel moulds suspended in a tank filled to the proper level with brine maintained at the desired temperature. The moulds are frequently arranged in frames, so that by means of an overhead crane one complete row is lifted at a time. When the water is frozen the moulds are dipped in a tank containing warm water, and on being tipped the blocks of ice fall out. Ordinary water contains air, and ice made from it is generally opaque, due to the inclusion of numerous small air-bubbles. To produce clear ice the water must be agitated during the freezing process, or previously boiled to get rid of the air. Distilled water is frequently used, as well as the water produced by the condensation of the steam from the engine, which of course must be thoroughly purified and filtered. It should be noted, however, that with an ice-making plant of moderate size and a steam-engine of good construction the weight of steam used will not nearly equal the weight of ice produced, so that the difference must be made up either by distillation, which is a costly process, or by ordinary water. Can ice is usually made in blocks weighing 56, 112 or 224 lb, and from 4 to 8 in. thick. For cell ice ordinary water is used, agitated

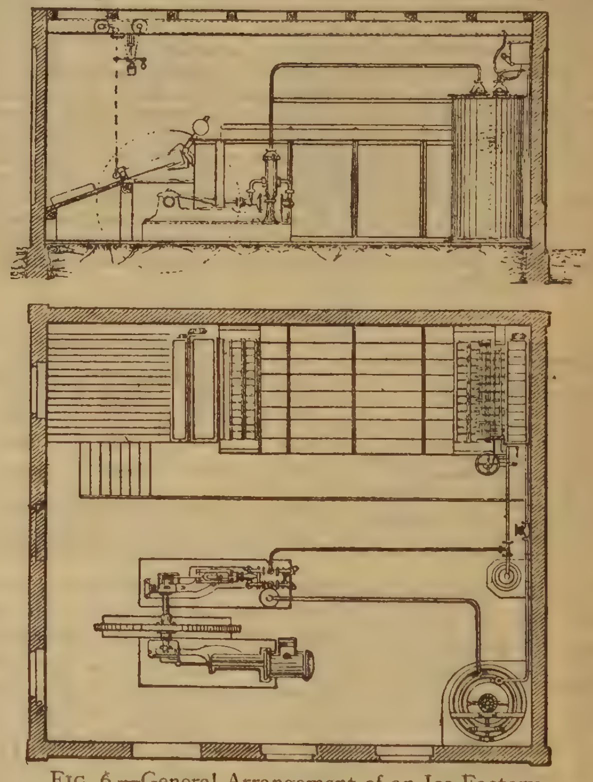


FIG. 6.—General Arrangement of an Ice Factory.

during freezing. The cells are flat and constructed of galvanized iron, so as to form a hollow space of about 2 in. in width, through which cold brine is circulated by a pump. They are placed vertically in a tank, the distance between them being from 8 to 14 in., according to the thickness of the ice to be produced. The tank is filled with water, which is kept in agitation by means of a reciprocating paddle or piston; in this way the air escapes, and with proper care a block of great transparency is produced. To thaw it off, warm brine is circulated through the cells. A usual size for cell ice is 4 ft. by 3 ft. by 1 ft. mean thickness, the weight being about 6 cwt. If perfectly transparent ice is required, the two sides of the block are not allowed to join up, and it is then called plate ice, which is often made in very large blocks, afterwards divided by saws or steam cutters. In such cases the evaporation of the ammonia or other refrigerating liquid frequently takes place in the cells themselves, brine being dispensed with. With a well-constructed can ice-plant of say 25 tons capacity per day, from 15 to 16 tons of ice should be made in Great Britain to a ton of best steam coal. For cell and plate ice the production is considerably below this, and the first cost of the plant is much greater than that for can ice.

Fig. 7 shows an arrangement of cold storage on land, refrigerated on the air circulation system. The insulated rooms, on two floors, are approached by corridors, so as to exclude external air, which if allowed to enter would deposit moisture upon the cold goods. The air cooler is placed at the end, and the air is distributed by means of wood ducts furnished with slides for regulating the temperature of the rooms, which are insulated according to the method shown in fig. 5. In some cases, instead of the entrance being at the sides or ends, it is at the top, all goods being raised to the top floor in lifts and lowered by lifts into the rooms. With good machinery the cost of raising is not great, and is probably equalled by the saving in refrigeration, since the rooms hold the heavy cold air as a glass holds water.

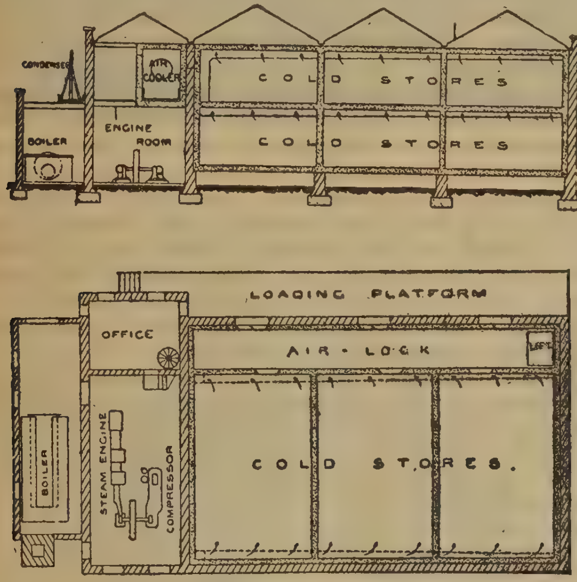


Fig. 7.—Cold Stores.

Large passenger vessels and yachts are now generally fitted with refrigerating machinery for preserving provisions, cooling water and wine, and making ice. Usually two insulated compartments are provided, one for frozen meats at about 20° F., and one for vegetables, &c., at about 40°. They have a capacity of from 1500 to 3000 cub. ft. or more, according to the number of passengers carried, and they are generally cooled by means of brine pipes, though direct expansion and air circulation are sometimes adopted. A passenger vessel requires from 2 to 4 cwt. of ice per day. On battleships and cruisers the British Admiralty use small compressed-air machines for ice-making, and larger machines, generally on the carbonic-acid system, for cooling the magazines. A modern frozen-meat-carrying vessel will accommodate as much as 120,000 carcases, partly sheep and partly lambs, requiring a hold capacity of about 300,000 cub. ft. In some vessels both fore and aft holds and 'tween decks are insulated. Lloyd's Committee now issue certificates for refrigerating installations, if constructed according to their rules, and most modern cargo-carrying vessels have their refrigerating machinery classed at Lloyd's. In the meat trade between the River Plate, the United States, Canada and Great Britain, ammonia or carbonic acid machines are now exclusively used, but for the Australian and New Zealand frozen-meat trade compressed-air machines are still employed to a small extent. The holds of meat-carrying vessels are refrigerated either by cold air circulation or by brine pipes.

Though the adoption of refrigerating and ice-making machinery for industrial purposes practically dates from the year 1880, the manufacture of these machines has already assumed very great proportions; indeed, in no branch of mechanical engineering, with the exception of electrical machinery, has there been so remarkable a development in recent years. The sphere of application is extending year by year. The cooling of residential and public buildings in hot countries, though attempted in a few cases in the United States and elsewhere, is yet practically untouched, the manufacture of ice and the preservation of perishable foods (apart from the frozen and chilled meat trades) have in many countries hardly received serious consideration, but in breweries, dairies, margarine works and many other industries there is a large and increasing field for refrigerating and ice-making machinery. A recent application is in the cooling and drying of the air blast for blast furnaces. Though this matter had been discussed for some years, it was only in 1904 that the first plant was put to work at Pittsburg.

For further information reference may be made to the following: Siebel, *Compend. of Mechanical Refrigeration* (Chicago); Redwood, *Theoretical and Practical Ammonia Refrigeration* (New York); Stephansky, *Practical Running of an Ice and Refrigerating Plant* (Boston); Ledoux, *Ice-Making Machines* (New York); Wallis-Taylor, *Refrigerating and Ice-Making Machines* (London); Ritchie Leask, *Refrigerating Machinery* (London); De Volson Wood, *Thermodynamics, Heat Motors and Refrigerating Machinery* (New York); Linde, *Kälteerzeugungsmaschine Lexikon der gesamten Technik*; Behrend, *Eis und Kälteerzeugungs-Maschinen* (Halle); De Marchena, *Kompressions Kältemaschinen* (Halle); Theodore Koller, *Die Kälteindustrie* (Vienna); Voorhees, *Indicating the Refrigerating Machine* (Chicago); Norman Selfe, *Machinery for Refrigeration* (Chicago); Hans Lorenz, *Modern Refrigerating Machinery* (London); Lehnert, *Moderne Kältetechnik* (Leipzig); L. Marchis, *Production et utilisation du froid* (Paris); C. Heinel, *Bau und Betrieb von Kältemaschinen Anlagen* (Oldenburg); R. Stetefeld, *Eis und Kälteerzeugungs-Maschinen* (Stuttgart). (T. B. L.)

REGAL, a small late-medieval portable organ, furnished with beating-reeds and having two bellows like a positive organ; also in Germany the name given to the reed-stops (beating-reeds) of a large organ, and more especially the "vox humana" stop. The name was not at first applied to the small table instrument, but to certain small brass pipes in the organ, sounded by means of beating-reeds, the longest of the 8-ft. tone being but 5½ in. long. Praetorius (1618) mentions a larger regal used in the court orchestras of some of the German princes, more like a positive, containing 4-ft., 8-ft. and even sometimes 16-ft. tone reeds, and having behind the case two bellows. These regals were used not only at banquets but often to replace positives in small and large churches. The very small regal, sometimes called *Bible-regal*, because it can be taken to pieces and folded up like a book, is also mentioned by the same writer, who states that these little instruments, first made in Nuremberg and Augsburg, have an unpleasantly harsh tone, due to their tiny pipes, not quite an inch long. The pipes in this case were not intended to reinforce the vibrations of the beating-reed or of its overtones as in the reed pipes of the organ, but merely to form an attachment for keeping the reed in its place without interfering with its functions. The beating-reed itself in the older organs of the early middle ages, many of which undoubtedly were reed organs, was made of wood; those of the regal were mostly of brass (hence their "brazen voices"). The length of the vibrating portion of the beating-reed governed the pitch of the pipe and was regulated by means of a wire passing through the socket, the other end pressing on the reed at the proper distance. Drawings of the reeds of regals and other reed-pipes, as well as of the instrument itself, are given by Praetorius (pl. iv., xxxviii.).

There is evidence to show that in England, and France also, the word "regal" was applied to reed-stops on the organ; Mersenne (1636) states that "now the word is applied to the vox humana stop on the organ." In England, as late as the reign of George III., there was the appointment of "tuner of the regals" to the Chapel Royal.

The reed-stops required constant tuning, according to Praetorius, who lays special emphasis on the fact that the pitch of the reed-pipes alone falls in summer and rises in winter.

During the 16th and 17th centuries the regal was a very great favourite, and although, owing to the civil wars and the ravages of time, very few specimens now remain, the regals are often mentioned in old wills and inventories, such as the list of Henry VIII.'s musical instruments made after his death by Sir Philip Wilder (Brit. Mus. Harleian MS. 1415, fol. 200 seq.), in which no fewer than thirteen pairs of single and five pairs of double regals are mentioned. Monteverde scored for the regals in his operas, and the instrument is described and figured by S. Virdung in 1511, Martin Agricola in 1528, and Ottmar Luscinius in 1536, as well as by Michael Praetorius in 1618. (K. S.)

REGALIA (Lat. *regalis*, royal, from *rex*, king), the ensigns of royalty. The crown (see CROWN and CORONET) and sceptre (see SCEPTRE) are dealt with separately. Other ancient symbols of royal authority are bracelets, the sword, a robe or mantle, and, in Christian times, a ring. Bracelets, as royal emblems, are mentioned in the Bible in connexion with Saul (2 Sam. i. 10), and they have been commonly used by Eastern monarchs. In Europe their later use seems to have been fitfully confined to England, although they were a very ancient ornament for kings among the Teutonic races. Two coronation bracelets are mentioned among the articles of the regalia ordered to be destroyed at the time of the Commonwealth, and two new ones were made at the Restoration. These are of gold, 1½ in. in width, and ornamented with the rose, thistle, harp and fleur-de-lis in enamel round them. They have not been used for modern coronations.

The sword is one of the usual regalia of most countries, and is girded on to the sovereign during the coronation. In England the one sword has been developed into five. The Sword of State is borne before the sovereign on certain state occasions, and at the coronation is exchanged for a smaller sword, with which the king is ceremonially girded. The three other swords of the regalia are the "Curtana," the Sword of Justice to the Spirituality, and the Sword of Justice to the Temporality. The Curtana has a blade cut off short and square, indicating thereby the quality of mercy.

The mantle, as a symbol of royalty, is almost universal, but in the middle ages other quasi-priestly robes were added to it (see CORONATION). The English mantle was formerly made of silk; latterly cloth of gold has been used. The ring, by which the sovereign is wedded to his kingdom, is not of so wide a range of usage. That of the English kings held a large ruby with a cross engraved on it. Recently a sapphire has been substituted for the ruby. Golden spurs, though included among the regalia, are merely used to touch the king's feet, and are not worn.

The orb and cross was not anciently placed in the king's hands during the coronation ceremony, but was carried by him in the left hand on leaving the church. It is emblematical of monarchical rule, and is only used by a reigning sovereign. The idea is undoubtedly derived from the globe with the figure of Victory with which the Roman emperors are depicted. The larger orb of the English regalia is a magnificent ball of gold, 6 in. in diameter, with a band round the centre edged with gems and pearls. A similar band arches the globe, on the top of which is a remarkably fine amethyst 1½ in. in height, upon which rests the cross of gold outlined with diamonds. There is a smaller orb made for Mary II., who reigned jointly with King William III.

The English regalia, with one or two exceptions, were made for the coronation of Charles II. by Sir Robert Vyner. The Scottish regalia preserved at Edinburgh comprise the crown, dating, in part, from Robert the Bruce, the sword of state given to James IV. by Pope Julius II., and two sceptres.

Besides regalia proper, certain other articles are sometimes included under the name, such as the ampulla for the holy oil, and the coronation spoon. The ampulla is of solid gold in the form of an eagle with outspread wings. It weighs 10 oz., and holds 6 oz. of oil. The spoon was not originally used for its present purpose. It is of the 12th or 13th century, with a long handle and egg-shaped bowl. Its history is quite unknown.

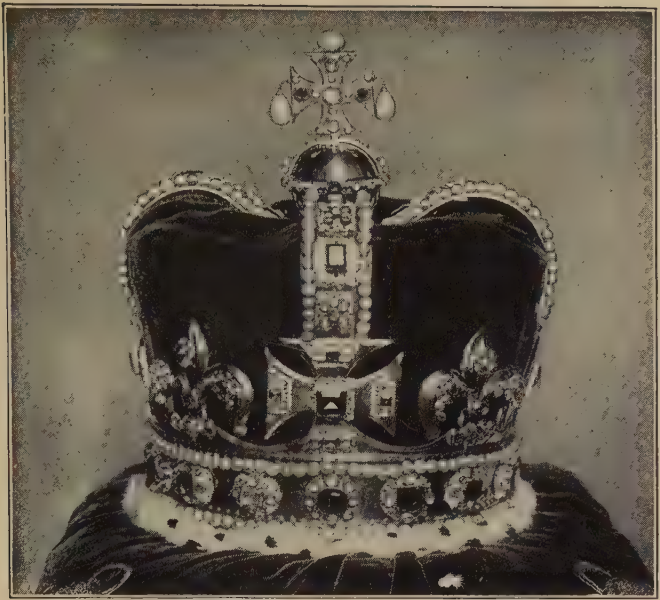
See Cyril Davenport, *The English Regalia*, with illustrations in colour of all the regalia; Leopold Wickham Legg, *English Coronation Records*; *The Ancestor*, Nos. 1 and 2 (1902); Menin, *The Form, &c., of Coronations* (translated from French, 1727).

REGENERATION OF LOST PARTS. A loss and renewal of living material, either continual or periodical, is a familiar occurrence in the tissues of higher animals. The surface of the human skin, the inner lining of the mouth and respiratory organs, the blood corpuscles, the ends of the nails, and many other portions of tissues are continuously being destroyed and replaced. The hair of many mammals, the feathers of birds, the epidermis of reptiles, and the antlers of stags are shed and replaced periodically. In these normal cases the regeneration depends on the existence of special formative layers or groups of cells, and must be regarded in each case as a special adaptation, with individual limitations and peculiarities, rather than as a mere exhibition of the fundamental power of growth and reproduction displayed by living substance. Many tissues, even in the highest animals, are capable of replacing an abnormal loss of substance. Thus in mammals, portions of muscular tissue, of epithelium, of bone, and of nerve, after accidental destruction or removal, may be renewed. The characteristic feature of such cases appears to be, in the higher animals at any rate, that lost cells are replaced only from cells of the same morphological order—epiblastic cells from the epiblast, mesoblastic from the mesoblast, and so forth. It is also becoming clear that, at least in the higher animals, regeneration is in intimate relation with the central nervous system. The process is in direct relation to the general power of growth and reproduction possessed by protoplasm, and is regarded by pathologists as the consequence of "removal of resistances to growth." It is much less common in the tissues of higher plants, in which the adult cells have usually lost the power of reproduction, and in which the regeneration of lost parts is replaced by a very extended capacity for budding. Still, more complicated reproductions of lost parts occur in many cases, and are more difficult to understand.

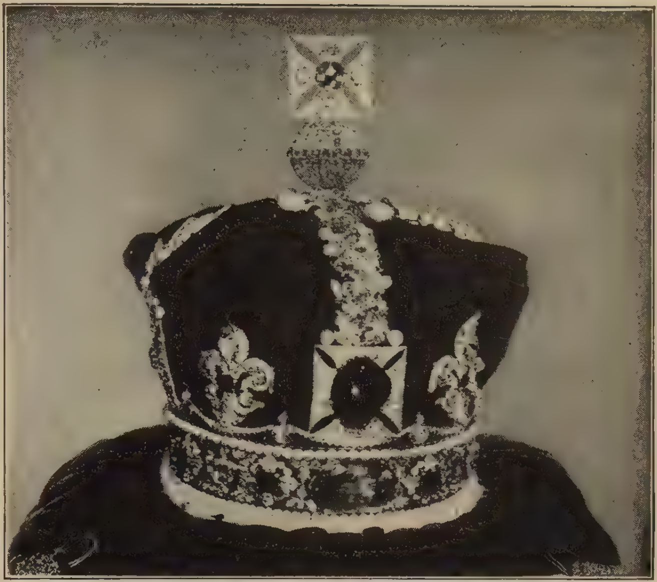
In Amphibia the entire epidermis, together with the slime-glands and the integumentary sense-organs, is regenerated by the epidermic cells in the vicinity of the defect. The whole limb of a Salamander or a Triton will grow again and again after amputation. Similar renewal is either rarer or more difficult in the case of Siren and Proteus. In frogs regeneration of amputated limbs does not usually take place, but instances have been recorded. Chelonians, crocodiles and snakes are unable to regenerate lost parts to any extent, while lizards and geckoes possess the capacity in a high degree. The capacity is absent almost completely in birds and mammals. In coelenterates, worms, and tunicates the power is exhibited in a very varying extent. In Hydra, Nais, and Lumbriculus, after transverse section, each part may complete the whole animal. In most worms the greater, and in particular the anterior part, will grow a new posterior part, but the separated posterior portion dies. In Hydra, sagittal and horizontal amputations result in the completion of the separated parts. In worms such operations result in death, which no doubt may be a mere consequence of the more severe wound. Extremely interesting instances of regeneration are what are called "Heteromorphoses," where the removed part is replaced by a dissimilar structure. The tail of a lizard, grown after amputation, differs in structure from the normal tail: the spinal cord is replaced by an epithelial tube which gives off no nerves; the vertebrae are replaced by an unsegmented cartilaginous tube; very frequently "super-regeneration" occurs, the amputated limb or tail being replaced by double or multiple new structures.

J. Loeb produced many heteromorphoses on lower animals. He lopped off the polyp head and the pedal disc of a *Tubularia*, and supported the lopped stem in an inverted position in the sand; the original pedal end, now superior, gave rise to a new polyp head, while the neck-end, on regeneration, formed a pedal disc. In *Cerianthus*, a sea-anemone, and in *Cione*, an ascidian, regeneration after his operations resulted in the formation of new mouth-openings in abnormal places, surrounded by elaborate structures characteristic of normal mouths. Other observers have recorded heteromorphoses in Crustacea, where antennulae have been regenerated in place of eyes. It appears that, in the same fashion as more simply organized animals display a capacity for reproduction of lost parts greater than that of higher animals, so embryos and embryonic structures generally have a higher power of renewal than that displayed by the corresponding adult organs or organisms. Moreover, experimental work on the young stages of organisms has revealed a very striking series of phenomena, similar to the heteromorphoses in adult tissues, but more extended in range. H. Driesch, O. Hertwig and others, by separating the segmentation spheres, by destroying some of them, by compressing young embryos by glass plates, and by many other means, have caused cells to develop

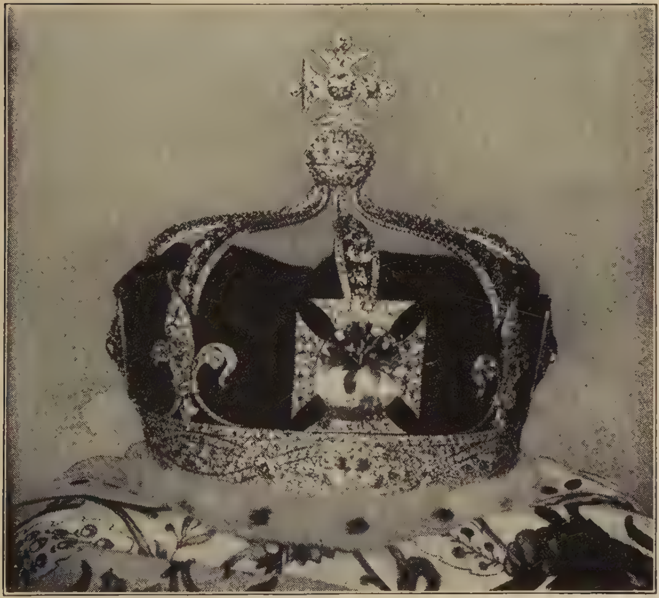
REGALIA



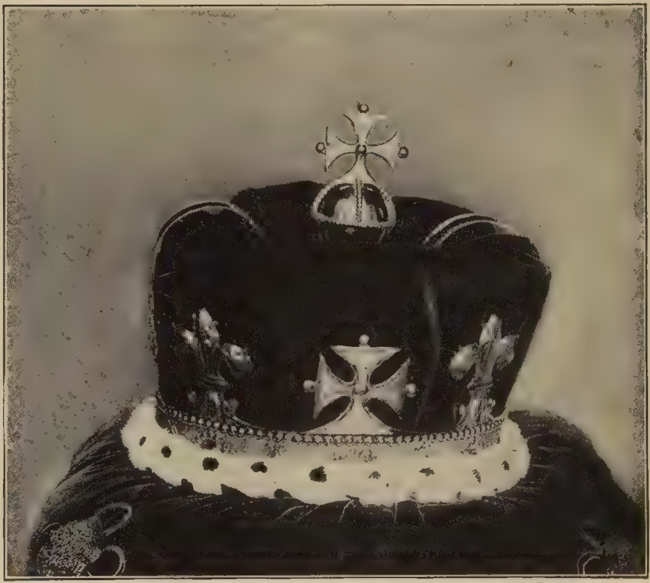
1.—ST EDWARD'S CROWN. The ancient crown was destroyed at the Commonwealth, and a model made for Charles II's coronation.



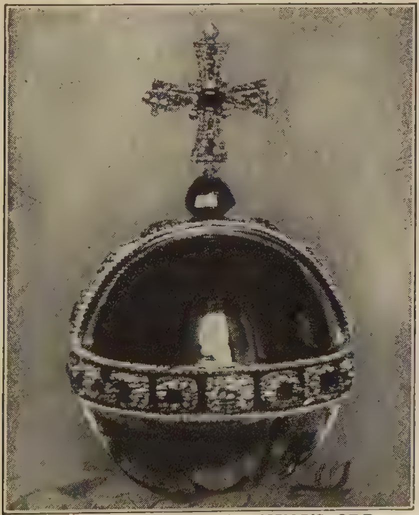
2.—THE IMPERIAL STATE CROWN, as worn by Queen Victoria. The Black Prince's ruby is in the centre. Modifications in the cap were made for the coronation of King Edward VII. and the smaller "Cullinan" diamond substituted for the sapphire below the ruby.



3.—QUEEN ALEXANDRA'S CORONATION CROWN, with the Koh-i-Noor in centre.



4.—THE CORONET OF THE PRINCE OF WALES.



5.—THE LARGER OR KING'S ORB.

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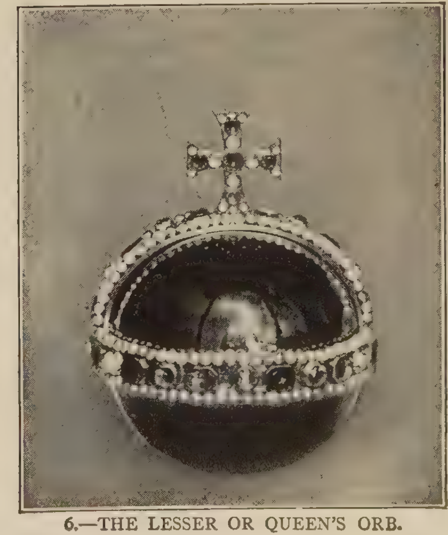
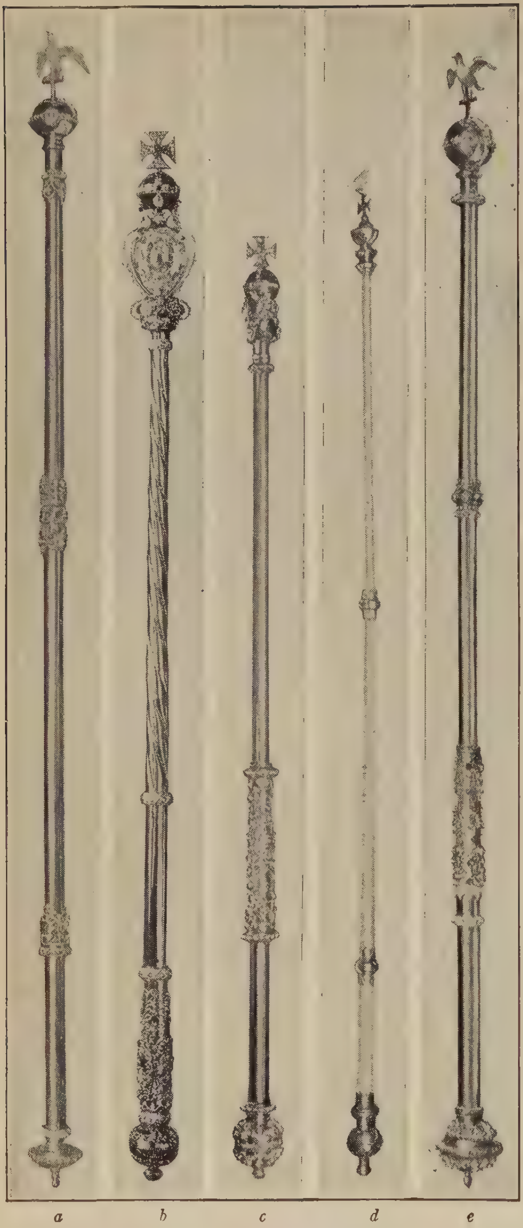


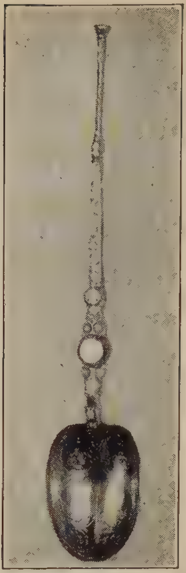
6.—THE LESSER OR QUEEN'S ORB.

PLATE II.

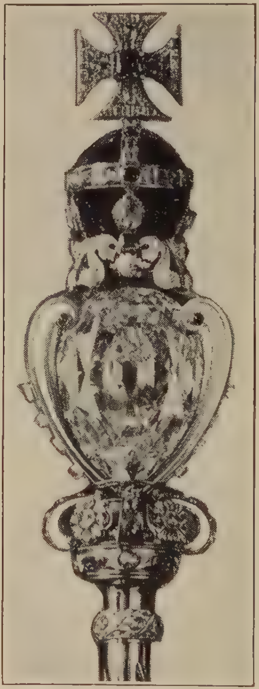
REGALIA



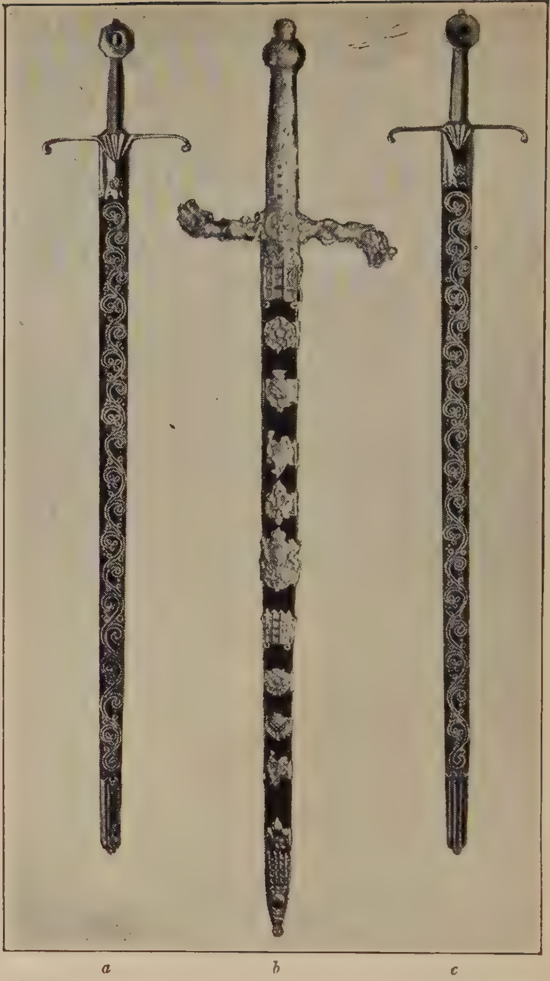
1.—THE SCEPTRES: (*a*) The Scepter with the Dove; (*b*) The Royal Sceptre with the Cross (*cf.* Fig. 3); (*c*) The Queen's Sceptre with the Cross; (*d*) The Queen's Ivory Rod; (*e*) The Queen's Sceptre with the Dove.



2.—THE CORONATION SPOON.

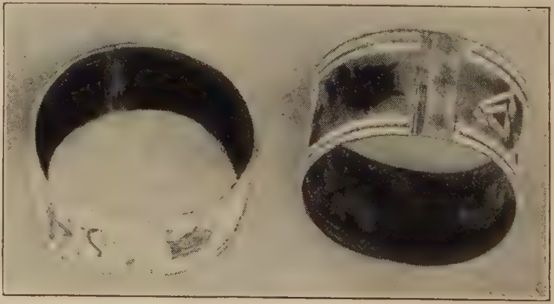


3.—THE HEAD OF THE ROYAL SCEPTRE with the largest of the "Star of Africa" (Cullinan) Diamonds. *Photo, W. E. Gray.*

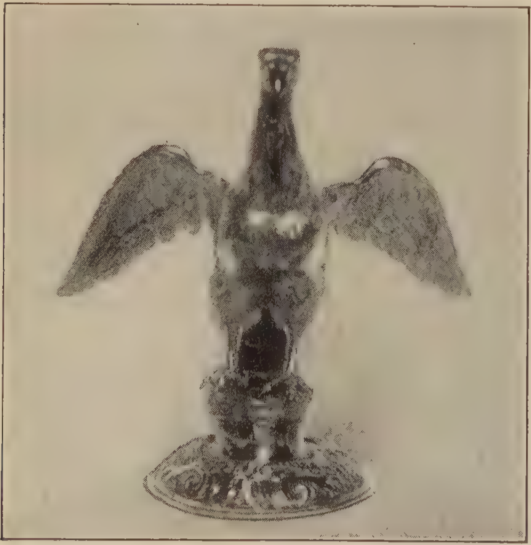


4.—THE SWORDS: (*a*) The Spiritual Sword of Justice; (*b*) The Sword of State; (*c*) The Temporal Sword of Justice.

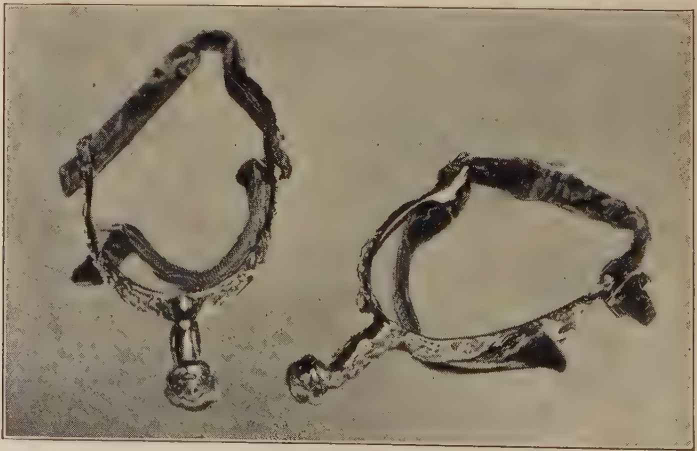
Photo, W. E. Gray.



5.—THE BRACELETS.



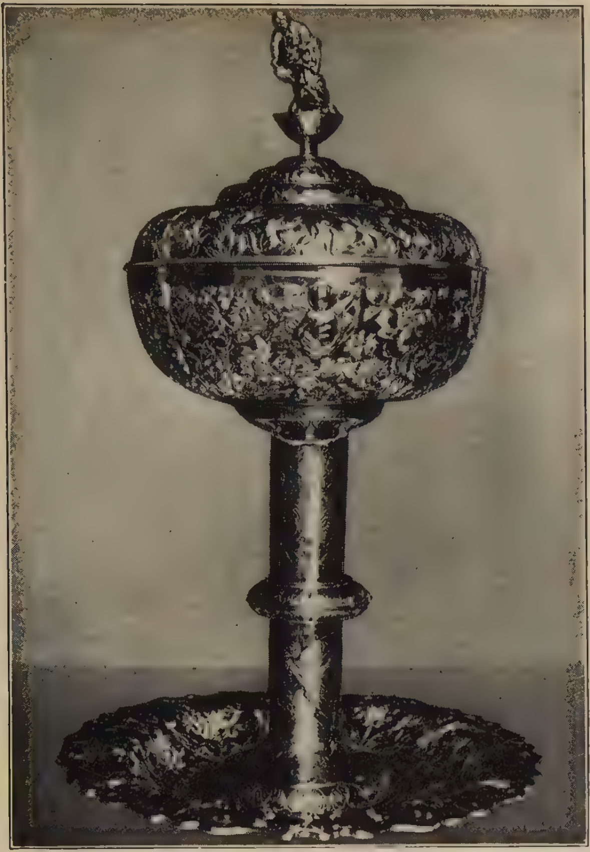
6.—THE AMPULLA.



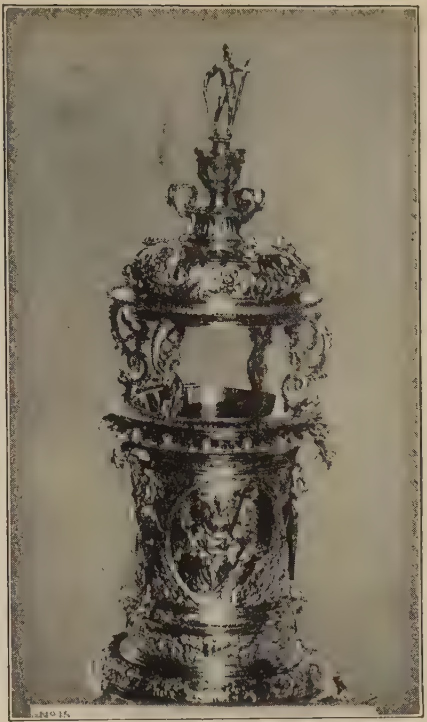
7.—THE ST GEORGE'S SPURS.

REGALIA

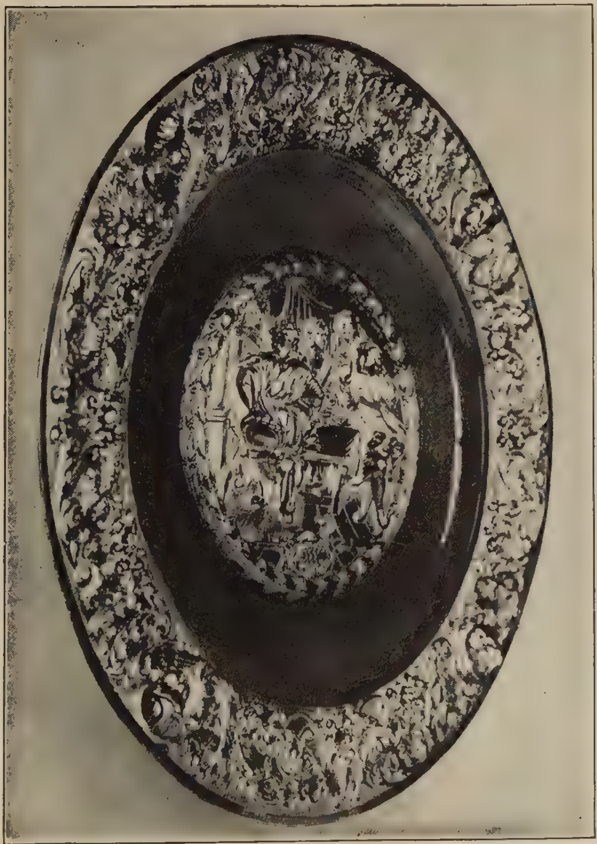
PLATE III.



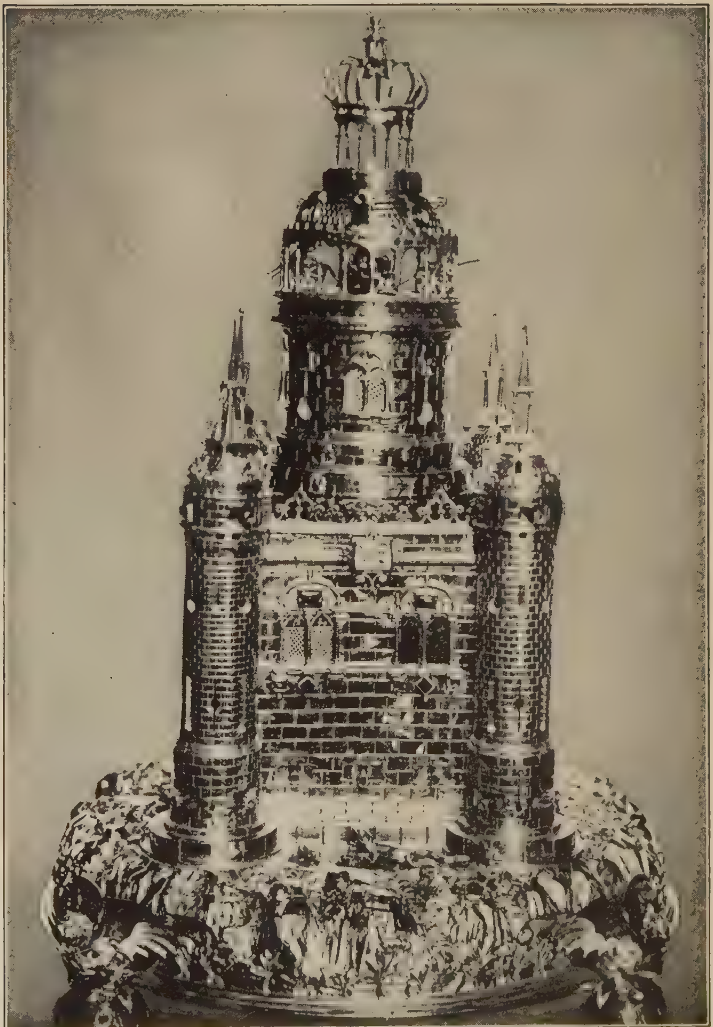
1.—THE SILVER-GILT CHRISTENING FONT, made for Charles II.



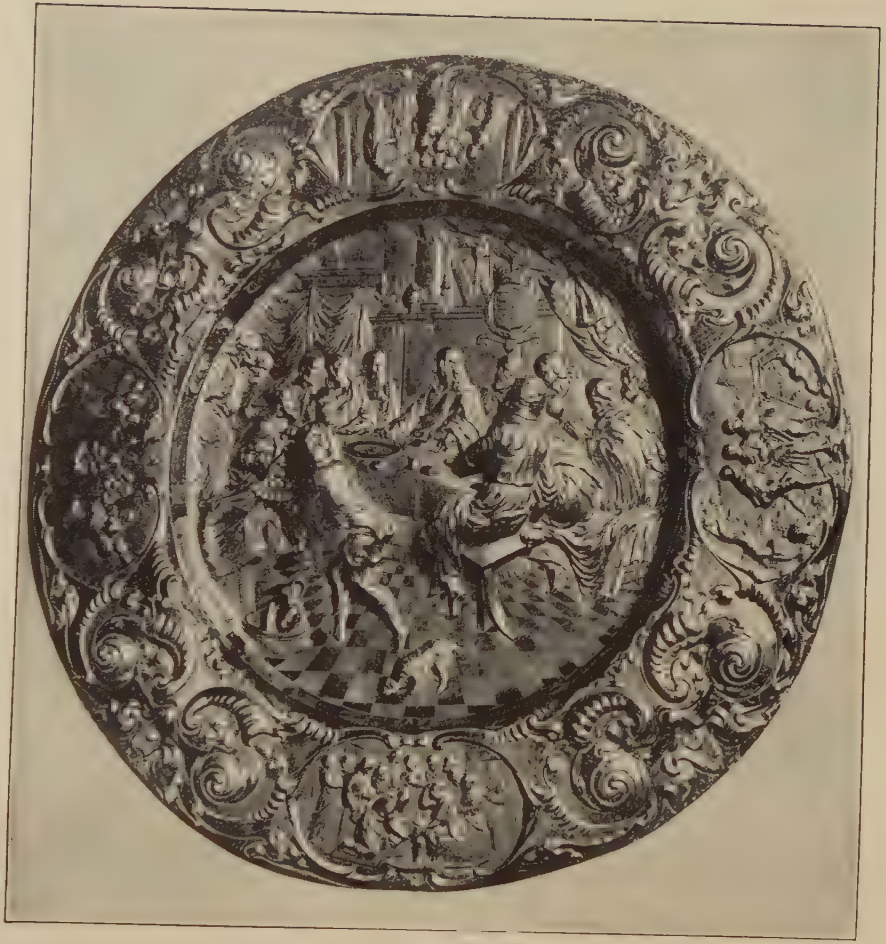
2.—QUEEN ELIZABETH'S SALT-CELLAR.



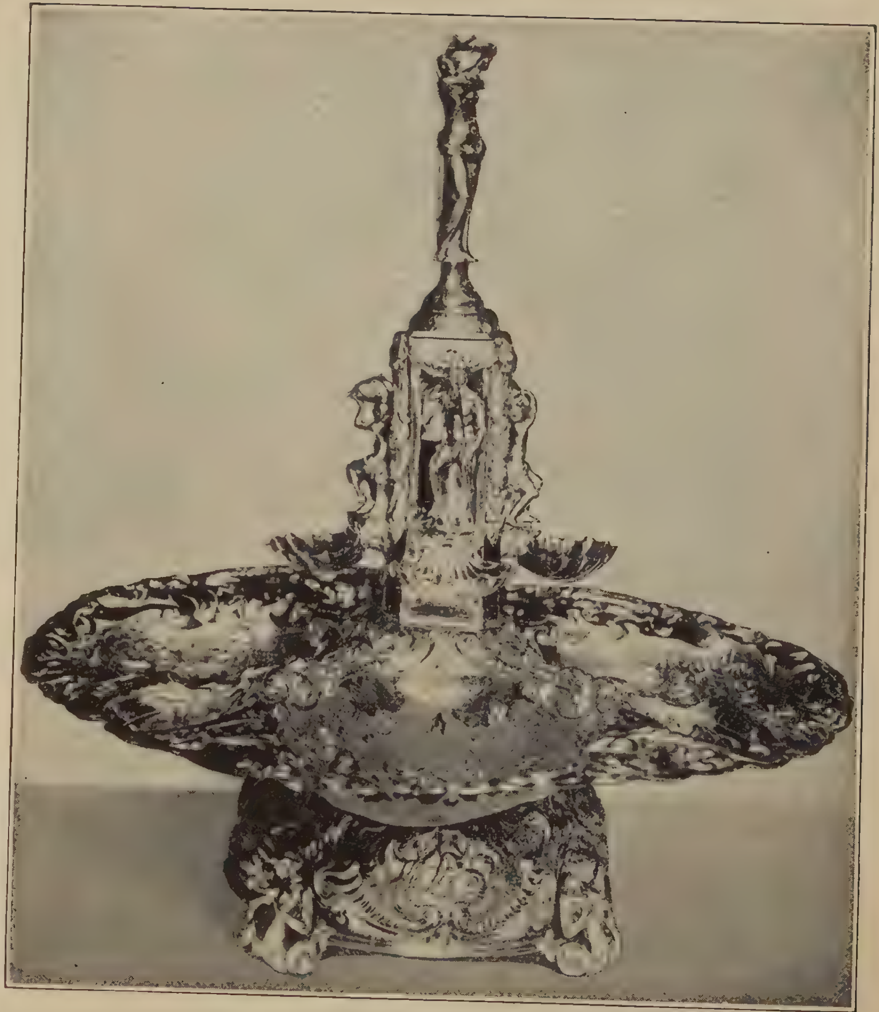
3.—SILVER-GILT ALTAR DISH, used at Christmas and Easter in the Chapel of St Peter ad Vincula, Tower of London.



4.—THE GOLD SALT-CELLAR presented to the Crown by the City of Exeter.



1.—SILVER GILT ALTAR DISH, dated 1660, with representation of the Last Supper; it forms part of the Altar plate at the Coronation and is in the custody of the Sub-Dean of the Chapels Royal.



2.—THE WINE FOUNTAIN, presented to Charles II. by the Corporation of Plymouth.

so as to give rise to structures which in normal development they would not have formed.

It is clear that there are at least three kinds of factors involved in regeneration. There are: (1) Regenerations due to the presence of undifferentiated, or little differentiated, cells, which have retained the normal capacity of multiplication when conditions are favourable. (2) Regenerations due to the presence of special complicated rudiments, the stimulus to the development of which is the removal of the fully formed structure. (3) Regeneration involving the general capacity of protoplasm to respond to changes in the surroundings by changes of growth. The most general view is to regard regenerations as special adaptations; and A. Weismann, following in this matter Arnold Lang, has developed the idea at considerable length, and has found a place for regenerations in his system of the germ-plasm (see HEREDITY) by the conception of the existence of "accessory determinants." Hertwig, on the other hand, attaches great importance to the facts of regeneration as evidence for his view that every cell of a body contains a similar essential plasm.

In E. Schwalbe's *Morphologie der Minbildungen* (1904), part i. chap. v., an attempt is made to associate the facts of regeneration with those of embryology and pathology. Our knowledge of the facts, however, is not yet systematic enough to allow of important general conclusions. The power of regeneration appears to be in some cases a special adaptation, but more often simply an expression of the general power of protoplasm to grow and to reproduce its kind. It has been suggested that regenerated parts always represent ancestral stages, but there is no conclusive evidence for this view. (P. C. M.)

REGENSBURG (RATISBON), a city and episcopal see of Germany, in the kingdom of Bavaria, and the capital of the government district of the Upper Palatinate. Pop. (1905) 48,412. It is situated on the right bank of the Danube, opposite the influx of the Regen, 86 m. by rail N.E. from Munich, and 60 m. S.E. of Nuremberg. On the other side of the river is the suburb Stadt-am-Hof, connected with Regensburg by a long stone bridge of the 12th century, above and below which are the islands of Oberer and Unterer Wörth. In appearance the town is quaint and romantic, presenting almost as faithful a picture of a town of the early middle ages as Nuremberg does of the later. One of the most characteristic features in its architecture is the number of strong loopholed towers attached to the more ancient dwellings. The interesting "street of the envoys" (*Gesandtenstrasse*) is so called because it contained the residences of most of the envoys to the German diet, whose coats-of-arms may still be seen on many of the houses.

The cathedral, though small, is a very interesting example of pure German Gothic. It was founded in 1275, and completed in 1634, with the exception of the towers, which were finished in 1869. The interior contains numerous interesting monuments, including one of Peter Vischer's masterpieces. Adjoining the cloisters are two chapels of earlier date than the cathedral itself, one of which, known as the "old cathedral," goes back perhaps to the 8th century. The church of St James—also called Schottenkirche—a plain Romanesque basilica of the 12th century, derives its name from the monastery of Irish Benedictines ("Scoti") to which it was attached; the principal doorway is covered with very singular grotesque carvings. The old parish church of St Ulrich is a good example of the Transition style of the 13th century, and contains a valuable antiquarian collection. Examples of the Romanesque basilica style are the church of Obermünster, dating from 1010, and the abbey church of St Emmeran, built in the 13th century, and remarkable as one of the few German churches with a detached belfry. The beautiful cloisters of the ancient abbey, one of the oldest in Germany, are still in fair preservation. In 1809 the conventual buildings were converted into a palace for the prince of Thurn and Taxis, hereditary postmaster-general of the Holy Roman Empire. The town hall, dating in part from the 14th century, contains the rooms occupied by the imperial diet from 1663 to 1806. An historical interest also attaches to the *Gasthof zum Goldenen Kreuz* (Golden Cross Inn), where Charles V. made the acquaintance of Barbara Blomberg, the mother of Don John of Austria (b. 1547). The house is also shown where Kepler died in 1630. Perhaps the most pleasing modern building in the city is the Gothic villa of the king of Bavaria on the bank of the Danube. At Kumpfmühl, in the immediate neighbourhood of the city, was discovered, in 1885, the remains of a Roman camp with an arched gateway; the latter, known as the *Porta Praetoria*, was cleared in 1887. Among the public institutions of the city should be mentioned the public library, picture gallery, botanical garden, and the institute for the making of stained glass. The educational establishments include two *gymnasia*, an episcopal clerical seminary, a seminary for boys and a school of church music. Among the chief manufactures are iron and steel wares, pottery, parquet flooring, tobacco, and lead pencils. Boat-building is also prosecuted, and a brisk transit trade is carried on in salt, grain and timber.

Near Regensburg are two very handsome classical buildings, erected by Louis I. of Bavaria as national monuments of German patriotism and greatness. The more imposing of the two is the Walhalla, a costly reproduction of the Parthenon, erected as a Teutonic temple of fame on a hill rising from the Danube at Donaustauf, 6 m. to the east. The interior, which is as rich as coloured marbles, gilding, and sculptures can make it, contains the busts of more than a hundred German worthies. The second of King Louis's buildings is the Befreiungshalle at Kelheim, 14 m. above Regensburg, a large circular building which has for its aim the glorification of the heroes of the war of liberation in 1813.

The early Celtic settlement of *Radespona* (L. Lat. *Ratisbona*) was chosen by the Romans, who named it *Castra Regina*, as the centre of their power on the upper Danube. It is mentioned as a trade centre as early as the 2nd century. It afterwards became the seat of the dukes of Bavaria, and one of the main bulwarks of the East Frankish monarchy; and it was also the focus from which Christianity spread over southern Germany. St Emmeran founded an abbey here in the middle of the 7th century, and St Boniface established the bishopric about a hundred years later. Regensburg acquired the freedom of the empire in the 13th century, and was for a time the most flourishing city in southern Germany. It became the chief seat of the trade with India and the Levant, and the boatmen of Regensburg are frequently heard of as expediting the journeys of the Crusaders. The city was loyally Ghibelline in its sympathies, and was a favourite residence of the emperors. Numerous diets were held here from time to time, and after 1663 it became the regular place of meeting of the German diet. The Reformation found only temporary acceptance at Regensburg, and was met by a counter-reformation inspired by the Jesuits. Before this period the city had almost wholly lost its commercial importance owing to the changes in the great highways of trade. Regensburg had its due share in the Thirty Years' and other wars, and is said to have suffered in all no fewer than seventeen sieges. In 1807 the town and bishopric were assigned to the prince primate Dalberg, and in 1810 they were ceded to Bavaria. After the battle of Eggmühl in 1809 the Austrians retired upon Regensburg, and the pursuing French defeated them again beneath its walls and reduced a great part of the city to ashes.

See Gemeiner, *Chronik der Stadt und des Hochstifts Regensburg* (4 vols., Regensburg, 1800–24); *Chroniken der deutschen Städte*, vol. xv. (Leipzig, 1878); Count v. Waldersdorf, *Regensburg in seiner Vergangenheit und Gegenwart* (4th ed., Regensburg, 1896); Fink, *Regensburg in seiner Vorzeit und Gegenwart* (6th ed., Regensburg, 1903); and Schratz, *Führer durch Regensburg* (5th ed., G. Dengler, Regensburg, 1904).

REGENT (from Lat. *regere*, to rule), one who rules or governs, especially one who acts temporarily as an administrator of the realm during the minority or incapacity of the king. This latter function, however, is one unknown to the English common law. "In judgment of law the king, as king, cannot be said to be a minor, for when the royal body politic of the king doth meet with the natural capacity in one person the whole body shall have the quality of the royal politic, which is the greater and more worthy and wherein is no minority. For *omne majus continet in se minus*" (Coke upon Littleton, 43a). But for reasons of necessity a regency, however anomalous it may be in strict law, has frequently been constituted both in England and Scotland. The earliest instance in English history is the appointment of the earl of Pembroke with the assent of the loyal barons on the accession of Henry III.

Whether or not the sanction of parliament is necessary for the appointment is a question which has been much discussed. Lord Coke recommends that the office should depend on the will of parliament (*Inst.*, vol. iv. p. 58), and in modern times provision for a regency has always been made by act of parliament. In Scotland the appointment of regents was always either by the assent of a council or of parliament. Thus in 1315 the earl of Moray was appointed regent by Robert I. in a council. At a later period appointment by statute was the universal form. Thus by an act of 1542 the earl of Arran was declared regent during the minority of Mary. By an act of 1567 the appointment by Mary of the earl of Moray as regent was confirmed. As late as 1704 provision was made for a regency after the death of Anne. The earliest regency in England resting upon an express statute was that created by 28 Hen. VIII. c. 7, under which the king appointed his executors to exercise the authority of the crown till the successor to the crown should attain the age of eighteen if a male or sixteen if a female. They delegated their rights to the protector Somerset, with the assent of the lords spiritual and temporal. No other example of a statutory provision for a regency occurs till 1751. In that year the act of 24 Geo. II. c. 24 constituted the princess-dowager of Wales regent of the kingdom in case the crown should descend to any of her children before such child attained the age of eighteen. A council, called the council of regency, was appointed to assist the princess. A prescribed oath was to be taken by the regent and members of the council. Their consent was necessary for the marriage of a successor to the crown during minority. It was declared to be unlawful for the regent to make war or peace, or ratify any treaty with any foreign power, or prorogue, adjourn or dissolve any parliament without the consent of the majority of the council of regency, or give her assent to any bill for repealing or varying the Act of Settlement, the Act of Uniformity, or the Act of the Scottish parliament for securing the Protestant religion and Presbyterian church government in Scotland (1707, c. 6). The last is an invariable provision, and occurs in all subsequent Regency Acts. The reign of George III. affords examples of provision for a regency during both the infancy and incapacity of a king.

The act of 5 Geo. III. c. 27 vested in the king power to appoint a regent under the sign manual, such regent to be one of certain named members of the royal family. The remaining provisions closely followed those of the act of George II. In 1788 the insanity of the king led to the introduction of a Regency bill. In the course of the debate in the House of Lords the duke of York disclaimed on behalf of the prince of Wales any right to assume the regency without the consent of parliament. Owing to the king's recovery the bill ultimately dropped. On a return of the malady in 1810 the act of 51 Geo. III. c. 1 was passed, appointing the prince of Wales regent during the king's incapacity. The royal assent was given by commission authorized by resolution of both Houses. By this act no council of regency was appointed. There was no restriction on the regent's authority over treaties, peace and war, or parliament, as in the previous acts, but his power of granting peerages, offices and pensions was limited. At the accession of William IV. the duchess of Kent was, by 1 Will. IV. c. 2, appointed regent, if necessary, until the Princess Victoria should attain the age of eighteen. No council of regency was appointed. By 1 Vict. c. 72 lords justices were nominated as a kind of regency council without a regent in case the successor to the crown should be out of the realm at the queen's death. They were restricted from granting peerages, and from dissolving parliament without directions from the successor. By 3 & 4 Vict. c. 52 Prince Albert was appointed regent in case any of Queen Victoria's children should succeed to the crown under the age of eighteen. The only restraint on his authority was the usual prohibition to assent to any bill repealing the Act of Settlement, &c. When George V. came to the throne a Regency Bill was again required, as his eldest son was under age, and Queen Mary was appointed. By 10 Geo. IV. c. 7 the office of regent of the United Kingdom cannot be held by a Roman Catholic. A similar disability is imposed in most, if not all, Regency Acts.

REGGIO CALABRIA (anc. *Regium*, *q.v.*), a town and archiepiscopal see of Calabria, Italy, capital of the province of Reggio, on the Strait of Messina, 248 m. S.S.E. from Naples by rail. Pop. (1906) 39,941 (town); 48,362 (commune). It is the terminus of the railways from Naples along the west coast, and from Metaponto along the east coast of Calabria. The straits are here about 7 m. wide, and the distance to Messina nearly 10 m. The ferryboats to Messina therefore cross by preference from Villa S. Giovanni, 8 m. N. of Reggio, whence the distance is only 5 m. In 1894 the town suffered from an earthquake, though less severely than in 1783. It was totally destroyed, however, by the great earthquake of December 1908; in the centre of the town about 35,000 out of 40,000 persons perished. The cathedral, which dated from the 17th century, and the ancient castle which rose above it, were wrecked. Great damage was done by a seismic wave following the shock. The sea front was swept away, and the level of the land hereabouts was lowered. (See further MESSINA.)

REGGIO NELL' EMILIA, a city and episcopal see of Emilia, Italy, the capital of the province of Reggio nell' Emilia (till 1859 part of the duchy of Modena), 38 m. by rail N.W. of Bologna. Pop. (1906) 19,681 (town); 64,548 (commune). The cathedral, originally erected in the 12th century, was reconstructed in the 15th and 16th; the façade shows traces of both periods, the Renaissance work being complete only in the lower portion. S. Prospero, close by, has a façade of 1504, in which are incorporated six marble lions belonging to the original Romanesque edifice. The Madonna della Ghiara, built in 1597 in the form of a Greek cross, and restored in 1900, is beautifully proportioned and finely decorated in stucco and with frescoes of the Bolognese school of the early 17th century. There are several good palaces of the early Renaissance, a fine theatre (1857) and a museum containing important palaeo-ethnological collections, ancient and medieval sculptures, and the natural history collection of Spallanzani. Lodovico Ariosto, the poet (1474–1533), was born in Reggio, and his father's house is still preserved. The industries embrace the making of cheese, objects in cement, matches, and brushes, the production of silkworms, and printing; and the town is the centre of a rich agricultural district. It lies on the main line between Bologna and Milan, and is connected by branch lines with Guastalla and Sassuolo (hence a line to Modena).

Regium Lepidi or Regium Lepidum was probably founded by M. Aemilius Lepidus at the time of the construction of the Via Aemilia (187 B.C.). It lay upon this road, half-way between Mutina and Parma. It was during the Roman period a flourishing municipium, but perhaps never became a colony; and it is associated with no event more interesting than the assassination of M. Brutus, the father of Cæsar's friend and foe. The bishopric dates perhaps from the 4th century A.D. Under the Lombards the town was the seat of dukes and counts; in the 12th and 13th centuries it formed a flourishing republic, busied in surrounding itself with walls (1229), controlling the Crostolo and constructing navigable canals to the Po, coining money of its own, and establishing prosperous schools. About 1290 it first passed into the hands of Obizzo d'Este, and the authority of the Este family was after many vicissitudes more formally recognized in 1409. In the contest for liberty which began in 1796 and closed with annexation to Piedmont in 1859, Reggio took vigorous part.

REGICIDE (Lat. *rex*, a king, and *caedere*, to kill), the name given to any one who kills a sovereign. Regicides is the name given in English history at the Restoration of 1660 to those persons who were responsible for the execution of Charles I. On the 4th of April 1660 Charles II. in the Declaration of Breda promised a free pardon to all his subjects "excepting only such persons as shall hereafter be excepted by parliament," and on the 14th of May the House of Commons ordered the immediate arrest of "all those persons who sat in judgment upon the late king's majesty when sentence was pronounced." The number of regicides was estimated at 84, this number being composed of the 67 present at the last sitting of the court of justice, 11 others who had attended earlier sittings, 4 officers of the court and the 2 executioners. Many of them were arrested or surrendered themselves, and the House of Commons in considering the proposed bill of indemnity suggested that only twelve of the regicides, who were named, should forfeit their lives; but the House of Lords urged that all the king's judges, with three exceptions, and some others, should be treated in this way.

Eventually a compromise was agreed upon, and the bill as passed on the 29th of August 1660 divided the regicides into six classes for punishment: (1) Four of them, although dead—Cromwell, Ireton, Bradshaw and Pride—were to be attainted for high treason. (2) The estates of twenty others, also dead, were to be subjected to fine or forfeiture. (3) Thirty living regicides were excepted from all indemnity. (4) Nineteen living regicides were also excepted, but with a saving clause that their execution was to be suspended until a special act of parliament was passed for this purpose. (5) Six others were to be punished, but not capitally. (6) Two, Colonels Hutchinson and Thomas Lister, were simply declared incapable of holding any office. Two regicides—Ingoldsby, who declared he had only signed the warrant under compulsion, and Colonel Matthew Thomlinson—escaped without punishment. A court of thirty-four commissioners was then appointed to try the regicides, and the trial took place in October 1660. Twenty-nine were condemned to death, but only ten were actually executed, the remaining nineteen with six others being imprisoned for life. The ten who were executed at Charing Cross or Tyburn, London, in October 1660, were Thomas Harrison, John Jones, Adrian Scrope, John Carew, Thomas Scot, and Gregory Clement, who had signed the death-warrant; the preacher Hugh Peters; Francis Hacker and Daniel Axtel, who commanded the soldiers at the trial and the execution of the king; and John Cook, the solicitor who directed the prosecution. In January 1661 the bodies of Cromwell, Ireton, and Bradshaw were exhumed and hanged at Tyburn, but Pride's does not appear to have been treated in this way. Of the nineteen or twenty regicides who had escaped and were living abroad, three, Sir John Barkstead, John Okey and Miles Corbet, were arrested in Holland and executed in London in April 1662; and one, John Lisle, was murdered at Lausanne. The last survivor of the regicides was probably Edmund Ludlow, who died at Vevey in 1692.

Ludlow's *Memoirs*, edited by C. H. Firth (Oxford, 1894), give interesting details about the regicides in exile. See also D. Masson, *Life of Milton*, vol. vi. (1880), and M. Noble, *Lives of the English Regicides* (1798). (A. W. H.*)

REGILLUS, an ancient lake of Latium, Italy, famous in the legendary history of Rome as the lake in the neighbourhood of which occurred (496 B.C.) the battle which finally decided the hegemony of Rome in Latium. During the battle, so runs the story, the dictator Postumius vowed a temple to Castor and Pollux, who were specially venerated in Tusculum, the chief city of the Latins (it being a Roman usage to invoke the aid of the gods of the enemy), who appeared during the battle, and brought the news of the victory to Rome, watering their horses at the spring of Juturna, close to which their temple in the Forum was erected. There can be little doubt that the lake actually existed. Of the various identifications proposed, the best is that of Nibby, who finds it in a now dry crater lake (Pantano Secco), drained by an *emissarium*, the date of which is uncertain, some 2 m. N. of Frascati. Along the south bank of the lake, at some 30 or 40 ft. above the present bottom, ran the aqueducts of the Aqua Claudia and Anio Novus. Most of the other sites proposed are not, as Regillus should be, within the limits of the territory of Tusculum.

See T. Ashby in *Rendiconti dei Lincei* (1898), 103 sqq., and *Classical Review*, 1898. (T. As.)

REGIMENT (from Late Latin *regimentum*, rule, *regere*, to rule, govern, direct), originally government, command or authority exercised over others, or the office of a ruler or sovereign; in this sense the word was common in the 16th century. The most familiar instance is the title of the tract of John Knox, the *First Blast of the Trumpet against the Monstrous Regiment of Women*. The term as applied to a large body of troops dates from the French army of the 16th century. In the first instance it implied "command," as nowadays we speak of "General A's command," meaning the whole number of troops under his command. The early regiments had no similarity in strength or organization, except that each was under one commander. With the regularization of armies the commands of all such superior officers were gradually reduced to uniformity, and a regiment came to be definitely a colonel's command. In the British infantry the term has no tactical significance, as the number of battalions in a regiment is variable, and one at least is theoretically abroad at all times, while the reserve or territorial battalions serve under a different code to that governing the regular battalions. The whole corps of Royal Artillery is called "the Royal Regiment of Artillery." In the cavalry a regiment is tactically as well as administratively a unit of four squadrons. On the continent of Europe the regiment of infantry is always together under the command of its colonel, and consists of three or four battalions under majors or lieutenant-colonels.

REGINA, the capital city of the province of Saskatchewan, Canada, situated at 104° 36′ W. and 50° 27′ N., and 357 m. W. of Winnipeg. Pop. (1907) 9804. After the Canadian Pacific railway was completed in 1885, the necessity for a place of government on the railway line pressed itself upon the Dominion government. The North-West Territories were but little settled then, but a central position on the prairies was necessary, where the mounted police might be stationed and where the numerous Indian bands might be easily reached. The minister of the interior at Ottawa, afterwards Governor Dewdney, chose this spot, and for a number of years Regina was the seat of the Territorial government. The governor took up his abode on the adjoining plain, and the North-West Council met each year, with a show of constitutional government about it. On the formation of the province of Saskatchewan in 1905 the choice of capital was left to the first legislature of the province. Prince Albert, Moose Jaw and Saskatoon all advanced claims, but Regina was decided on as the capital. It probably doubled in population between 1905 and 1907. Its public buildings, churches and residences are worthy of a place of greater pretensions. It is the centre for a rich agricultural district, and for legislation, education, law and other public benefits. It remains the headquarters of the mounted police for the western provinces, and near it is an Indian industrial school of some note.

REGINON, or REGINO OF PRÜM, medieval chronicler, was born at Altripp near Spires, and was educated in the monastery of Prüm. Here he became a monk, and in 892, just after the monastery had been sacked by the Danes, he was chosen abbot. In 899, however, he was deprived of this position and he went to Trier, where he was appointed abbot of St Martin's, a house which he reformed. He died in 915, and was buried in the abbey of St Maximin at Trier, his tomb being discovered there in 1581.

Reginon wrote a *Chronicon*, dedicated to Adalberon, bishop of Augsburg (d. 909), which deals with the history of the world from the commencement of the Christian era to 906, especially the history of affairs in Lorraine and the neighbourhood. The first book (to 741) consists mainly of extracts from Bede, Paulus Diaconus and other writers; of the second book (741–906) the latter part is original and valuable, although the chronology is at fault and the author relied chiefly upon tradition and hearsay for his information. The work was continued to 967 by a monk of Trier, possibly Adalbert, archbishop of Magdeburg (d. 981). The chronicle was first published at Mainz in 1521; another edition is in Band I. of the *Monumenta Germaniae historica. Scriptores* (1826); the best is the one edited by F. Kurze (Hanover, 1890). It has been translated into German by W. Wattenbach (Leipzig, 1890). Reginon also drew up at the request of his friend and patron Radbod, archbishop of Trier (d. 915), a collection of canons, *Libri duo de synodalibus causis et disciplinis ecclesiasticis*, dedicated to Hatto I., archbishop of Mainz; this is published in Tome 132 of J. P. Migne's *Patrologia Latina*. To Radbod he wrote a letter on music, *Epistola de harmonica institutione*, with a *Tonarius*, the object of this being to improve the singing in the churches of the diocese. The letter is published in Tome I. of Gerbert's *Scriptores ecclesiastici de musica sacra* (1784), and the *Tonarius* in Tome II. of Coussemaker's *Scriptores de musica medii aevi*. See also H. Ermisch, *Die Chronik des Regino bis 813* (Göttingen, 1872); P. Schulz, *Die Glaubwürdigkeit des Abtes Regino von Prüm* (Hamburg, 1894); C. Wawra, *De Reginone Prumensis* (Breslau, 1901); A. Molinier, *Les Sources de l'histoire de France*, Tome I. (1901); and W. Wattenbach, *Deutschlands Geschichtsquellen*, Band I. (1904).

REGIOMONTANUS (1436–1476), German astronomer, was born at Königsberg in Franconia on the 6th of June 1436. The son of a miller, his name originally was Johann Müller, but he called himself, from his birthplace, Joh. de Monteregio, an appellation which became gradually modified into Regiomontanus. At Vienna, from 1452, he was the pupil and associate of George Purbach (1423–1461), and they jointly undertook a reform of astronomy rendered necessary by the errors they detected in the Alphonsine Tables. In this they were much hindered by the lack of correct translations of Ptolemy's works; and in 1462 Regiomontanus accompanied Cardinal Bessarion to Italy in search of authentic manuscripts. He rapidly mastered Greek at Rome and Ferrara, lectured on Alfraganus at Padua, and completed at Venice in 1463 Purbach's *Epitome in Cl. Ptolemaei magnam compositionem* (printed at Venice in 1496), and his own *De Triangulis* (Nuremberg, 1533), the earliest work treating of trigonometry as a substantive science. A quarrel with George of Trebizond, the blunders in whose translation of the *Almagest* he had pointed out, obliged him to quit Rome precipitately in 1468. He repaired to Vienna, and was thence summoned to Buda by Matthias Corvinus, king of Hungary, for the purpose of collating Greek manuscripts at a handsome salary. He also finished his *Tabulae Directionum* (Nuremberg, 1475), essentially an astrological work, but containing a valuable table of tangents. An outbreak of war, meanwhile, diverted the king's attention from learning, and in 1471 Regiomontanus settled at Nuremberg. Bernhard Walther, a rich patrician, became his pupil and patron; and they together equipped the first European observatory, for which Regiomontanus himself constructed instruments of an improved type (described in his posthumous *Scripta*, Nuremberg, 1544). His observations of the great comet of January 1672 supplied the basis of modern cometary astronomy. At a printing-press established in Walther's house by Regiomontanus, Purbach's *Theoricae planetarum novae* was published in 1472 or 1473; a series of popular calendars issued from it, and in 1474 a volume of *Ephemerides* calculated by Regiomontanus for thirty-two years (1474–1506), in which the method of "lunar distances," for determining the longitude at sea, was recommended and explained. In 1472 Regiomontanus was summoned to Rome by Pope Sixtus IV. to aid in the reform of the calendar; and there he died, most likely of the plague, on the 6th of July 1476.

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REGISTER, a record of facts, proceedings, acts, events, names, &c., entered regularly for reference in a volume kept for that purpose, also the volume in which the entries are made. The Fr. *registre* is taken from the Med. Lat. *registrum* for *registum*, Late Lat. *regesta*, things recorded, hence list, catalogue, from *regerere*, to carry or bear back, to transcribe, enter on a roll. For the keeping of public registers dealing with various subjects see REGISTRATION and the articles there referred to, and for the records of baptisms, marriages and burials made by a parish clergyman, see section *Parish Registers* below. The keeper of a register was, until the beginning of the 19th century, usually known as a "register," but that title has in Great Britain now been superseded by "registrar"; it still survives in the Lord Clerk Register, an officer of state in Scotland, nominally the official keeper of the national records, whose duties are performed by the Deputy Clerk Register. In the United States the title is still "register." The term "register" has also been applied to mechanical contrivances for the automatic registration or recording of figures, &c. (see CASH REGISTER), to a stop in an organ, to the compass of a voice or musical instrument, and also to an apparatus for regulating the in- and outflow of air, heat, steam, smoke or the like. Some of these instances of the application of the term are apparently due to a confusion in etymology, with Lat. *regere*, to rule, regulate.

PARISH REGISTERS were instituted in England by an order of Thomas Cromwell, as vicegerent to Henry VIII., "supreme hedd undre Christ of the Church of Englande," in September 1538. The idea appears to have been of Spanish origin, Cardinal Ximenes having instituted, as archbishop of Toledo, registers of baptisms in 1497. They included, under the above order, baptisms, marriages and burials, which were to be recorded weekly. In 1597 it was ordered by the Convocation of Canterbury that parchment books should be provided for the registers and that transcripts should be made on parchment of existing registers on paper, and this order was repeated in the 70th canon of 1603. The transcripts then made now usually represent the earliest registers. It was further provided at both these dates that an annual transcript of the register should be sent to the bishop for preservation in the diocesan registry, which was the origin of the "bishop's transcripts." The "Directory for the publique worship of God," passed by parliament in 1645, provided for the date of birth being also registered, and in August 1653, an Act of "Barebones' Parliament" made a greater change, substituting civil "parish registers" (*sic*) for the clergy, and ordering them to record births, banns, marriages and burials. The "register" was also to publish the banns and a justice to perform the marriage. The register books were well kept under this civil system, but at the Restoration the old system was resumed.

A tax upon births, marriages and burials imposed in 1694 led to the clergy being ordered to register all births, apart from baptisms, but the act soon expired and births were not again registered till 1836. Lord Hardwicke's Marriage Act (1754), by its rigid provisions, increased the registration of marriages by the parochial clergy and prescribed a form of entry. In 1812 parish registers became the subject of parliamentary enactment, owing to the discovery of their deficiencies. Rose's Act provided for their safer custody, for efficient bishops, transcripts, and for uniformity of system. This act continued to regulate the registers till their supersession for practical purposes, in 1837, by civil registration under the act of 1836.

In age, completeness and condition they vary much. A blue book on the subject was published in 1833, but the returns it contains are often inaccurate. A few begin even earlier than Cromwell's order, the oldest being that of Tipton, Staffs, (1513). Between 800 and 900, apparently, begin in 1538 or 1539. The entries were originally made in Latin, but this usage died out early in the 17th century: decay and the crabbed handwriting of the time render the earlier registers extremely difficult to read. There is general agreement as to the shocking neglect of these valuable records in the past, and the loss of volumes appears to have continued even through the 19th century. Their custody is legally vested in the parochial clergy and their wardens, but several proposals have been made for their removal to central depositories. The fees for searching them are determined by the act of 1836, which prescribes half a crown for each certified extract, and sixpence a year for searching, with a shilling for the first year.

The condition of the "bishops' transcripts" was, throughout, much worse than that of the parish registers, there being no funds provided for their custody. The report on Public Records in 1800 drew attention to their neglect, but, in spite of the provisions in Rose's Act (1812), little or nothing was done, and, in spite of their importance as checking, and even sometimes supplementing deficient parish registers, they remained "unarranged, unindexed and unconsultable." Of recent years, however, some improvement has been made. It has also been discovered that transcripts from "peculiars" exist in other than episcopal registries

Outside the parochial registers, which alone were official in character, there were, till 1754, irregular marriage registers, of which those of the Fleet prison are the most famous, and also registers of private chapels in London. Those of the Fleet and of Mayfair chapel were deposited with the registrar-general, but not authenticated. The registers of dissenting chapels remained unofficial till an act of 1840 validated a number which had been authenticated, and was extended to many others in 1858. Useful information on these registers, now mostly deposited with the registrar-general, will be found in Sims' *Manual*, which also deals with those of private chapels, of English settlements abroad preserved in London, and with English Roman Catholic registers. These last, however, begin only under George II. and are restricted to certain London chapels.

The printing of parish registers has of late made much progress, but the field is so vast that the rate is relatively slow. There is a Parish Register Society, and a section of the Harleian Society engaged on the same work, as well as some county societies and also one for Dublin. But so many have been issued privately or by individuals that reference should be made to the lists in Marshall's *Genealogist's Guide* (1893) and Dr Cox's *Parish Registers* (1910), and even this last is not perfect. The Huguenot Society has printed several registers of the Protestant Refugees, and Mr Moens that of the London Dutch church. There are also several registers of marriages alone now in print, such as that of St Dunstan's, Stepney, in 3 vols. Colonel Chester's extensive MS. collection of extracts from parish registers is now in the College of Arms, London, and the parishes are indexed in Dr Marshall's book. MS. extracts in the British Museum are dealt with in Sims' *Manual.*

In Scotland registers of baptisms and marriages were instituted by the clergy in 1551, and burials were added by order of the Privy Council in 1616; but these were very imperfectly kept, especially in rural parishes. Yet it was not till 1854 that civil registration was introduced, by act of parliament, in their stead. Some 900 parish registers, beginning about 1563, have been deposited in the Register House, Edinburgh, under acts of parliament which apply to all those prior to 1819. Mr Hallen has printed the register of baptisms of Muthill Episcopal Church.

In Ireland, parish registers were confined to the now disestablished church, which was that of a small minority, and were, as in Scotland, badly kept. Although great inconvenience was caused by this system, civil registration of marriages, when introduced in 1844, was only extended to Protestants, nor was it till 1864 that universal civil registration was introduced, great difficulty under the Old Age Pensions Act being now the result. No provision was made, as in Scotland, for central custody of the registers, which, both Anglican and Nonconformist, remain in their former repositories. Roman Catholic registers in Ireland only began, apparently, to be kept in the 19th century.

In France registers, but only of baptism, were first instituted in 1539. The Council of Trent, however, made registers both of baptisms and of marriages a law of the Catholic Church in 1563, and Louis XIV. imposed a tax on registered baptisms and marriages in 1707.

See Burn, *The History of Parish Registers* (1829, 1862); Sims, *Manual for the Genealogist* (1856, 1888); Chester Waters, *Parish Registers in England* (1870, 1882, 1887); Marshall, *Genealogist's Guide* (1893); A. M. Burke, *Key to the Ancient Parish Registers* (1908); J. C. Cox, *Parish Registers of England* (1910); W. D. Bruce, *Account . . . of the Ecclesiastical Courts of Record* (1854); Bigland, *Observations on Parochial Registers* (1764); *Report of the Commissioners on the state of Registers of Births, &c.* (1838); *Lists of Non-parochial Registers and Records in the custody of the Registrar-General* (1841); *Report on Non-parochial Registers* (1857); *Detailed List of the old Parochial Registers of Scotland* (1872). (J. H. R.)

REGISTRATION. In all systems of law the registration of certain legal facts has been regarded as necessary, chiefly for the purpose of ensuring publicity and simplifying evidence. Registers, when made in performance of a public duty, are as a general rule admissible in evidence merely on the production from the proper custody of the registers themselves or (in most cases) of examined or certified copies. The extent to which registration is carried varies very much in different countries. For obvious reasons, judicial decisions are registered in all countries alike. In other matters no general rule can be laid down, except perhaps that on the whole registration is not as fully enforced in the United Kingdom and the United States as in continental states. The most important uses of registration occur in the case of judicial proceedings, land, ships, bills of sale, births, marriages and deaths, companies, friendly and other societies, newspapers, copyrights, patents, designs, trade marks and professions and occupations. In England registrars are attached to the privy council, the Supreme Court and the county courts. In the king's bench division (except in its bankruptcy jurisdiction) the duty of registrars is performed by the masters. Besides exercising limited judicial authority, registrars are responsible for the drawing up and recording of various stages of the proceedings from the petition, writ or plaint to the final decision.[1] With them are filed affidavits, depositions, pleadings, &c., when such filing is necessary. The difference between filing and registration is that the documents filed are filed without alteration, while only an epitome is usually registered. The Judicature Act 1873 created district registries in the chief towns, the district registrar having an authority similar to that of a registrar of the Supreme Court. In the admiralty division cases of account are usually referred to the registrar and merchants. The registration in the central office of the supreme court of judgments affecting lands, writs of execution, recognizances and *lites pendentes* in England, and the registration in Scotland of abbreviates of adjudications and of inhibitions, are governed by special legislation. All these are among the incumbrances for which search is made on investigating a title. Decisions of criminal courts are said to be recorded, not registered, except in the case of courts of summary jurisdiction, in which, by the Summary Jurisdiction Act 1879, a register of convictions is kept. Probates of wills and letters of administration, which are really judicial decisions, are registered in the principal or district registries of the probate division. In Scotland registration is used for giving a summary remedy on obligations without action by means of the fiction of a judicial decision having been given establishing the obligation.

See also the separate articles LAND REGISTRATION; SHIPPING; BILL OF SALE; COMPANIES; FRIENDLY SOCIETIES; BUILDING SOCIETIES; PRESS LAWS; COPYRIGHT; TRADE MARKS; PATENTS, &c.

Registration of Voters.—Prior to 1832 the right of parliamentary electors in England was determined at the moment of the tender of the vote at the election, or, in the event of a petition against the return, by a scrutiny, a committee of the House of Commons striking off those whose qualification was held to be insufficient, and, on the other hand, adding those who, having tendered their votes at the poll, with a good title to do so, were rejected at the time. A conspicuous feature of the Reform Act of that year was the introduction of a new mode of ascertaining the rights of electors by means of an entirely new system of published lists, subject to claims and objections, and after due inquiry and revision forming a register of voters. Registration was not altogether unknown in Great Britain in connexion with the parliamentary franchise before the Reform Acts of 1832. Thus in the Scottish counties the right to vote depended on the voter's name being upon the roll of freeholders established by an act of Charles II.; a similar register existed in Ireland of freeholders whose freeholds were under £20 annual value; and in the universities of Oxford and Cambridge the rolls of members of Convocation and of the Senate were, as they still are, the registers of parliamentary voters. But except in such cases as the above, the right of a voter had to be determined by the returning officer upon the evidence produced before him when the vote was tendered at a poll. This necessarily took time, and the result was that a contested election in a large constituency might last for weeks. The celebrated Westminster election of 1784, in which the poll began on the 1st of April and ended on the 17th of May, may be mentioned as an illustration. Moreover, the decision of the returning officer was not conclusive; the title of every one who claimed to vote was liable to be reconsidered on an election petition, or, in the case of a rejected vote, in an action for damages by the voter against the returning officer.

The inconvenience of such a state of things would have been greatly aggravated had the old practice continued after the enlargement of the franchise in 1832. The establishment of a general system of registration was therefore a necessary and important part of the reform then effected. It has enabled an election in the most populous constituency to be completed in a single day. It has also been instrumental in the extinction of the "occasional voter," who formerly gave so much trouble to returning officers and election committees—the person, namely, who acquired a qualifying tenement with the view of using it for a particular election and then disposing of it. The period of qualification now required in all cases, being fixed with reference to the formation of the register, is necessarily so long anterior to any election which it could effect, that the purpose or intention of the voter in acquiring the qualifying tenement has ceased to be material, and is not investigated.

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[1] The antiquity of registration of this kind is proved by the age of the *Registrum Brevium*, or register of writs, called by Lord Coke "a most ancient book of the Common Law" (Coke upon Littleton, 159a).

England.—The reform of parliamentary representation in 1832 was followed in 1835 by that of the constitution of municipal corporations, which included the creation of a uniform qualification (now known as the old burgess qualification) for the municipal franchise. In 1888 the municipal franchise was enlarged, and was at the same time extended to the whole country for the formation of constituencies to elect county councils; and in 1894 parochial electors were called into existence for the election of parish councils and for other purposes. Inasmuch as provision was made for the registering of persons entitled to votes for the above purposes, there are now three registers of voters, namely, the parliamentary register, the local government register (*i.e.* in boroughs under the Municipal Corporation Acts, the burgess rolls, and elsewhere the county registers) and the register of parochial electors. Under the Municipal Corporations Act 1835 the registration of burgesses, though on similar lines to that of parliamentary voters, was entirely separate from it. Since, however, the qualification for the municipal franchise covered to a great extent the same ground as that for the parliamentary franchise in boroughs which sent members to parliament, a considerable number of voters in such boroughs were entitled in respect of the same tenement to be upon both parliamentary register and burgess roll. The waste of labour involved in settling their rights twice over was put an end to in 1878, when the system of parliamentary registration was extended to the boroughs in question for municipal purposes, and the lists were directed to be made out in such a shape that the portion common to the two registers could be detached and combined with the portion peculiar to each, so as to form the parliamentary register and the burgess roll respectively. This system of registration was extended to the non-parliamentary boroughs and to the whole country in 1888, the separate municipal registration being completely abolished.

Procedure.

The procedure of parliamentary registration is to be found in its main lines in the Parliamentary Registration Act 1843, which superseded that provided by the Reform Act of 1832, and has itself been considerably amended by later legislation. The acts applying and adapting the system to local government and parochial registration are the Parliamentary and Municipal Registration Act 1878, the County Electors Act 1888, and the Local Government Act 1894. Registration is carried out by local machinery, the common-law parish being taken as the registration unit; and the work of preparing and publishing the lists, which when revised are to form the register, is committed to the overseers. The selection of these officers was no doubt due to their position as the rating authority, and to their consequent opportunities for knowing the ownership and occupation of tenements within their parish. They do not always perform the duties themselves, other persons being empowered to act for them in many parishes by general or local acts of parliament; but in all or almost all cases they are entitled to act personally if they think fit, they sign the lists, and the proceedings are conducted in their name.

In order to render intelligible the following summary of the procedure, it will be necessary to divide the voters to be registered into classes based on the nature of their qualification, since the practice differs in regard to each class. The classes are as follows: (1) Owners, including the old forty-shilling freeholders, and the copyholders, long leaseholders and others entitled under the Reform Act of 1832 to vote at parliamentary elections for counties; (2) occupiers, including those entitled to (*a*) the £10 occupation qualification, (*b*) the household qualification and (*c*) the old burgess qualification; (3) lodgers, subdivided into (*a*) old, *i.e.* those on the previous register for the same lodgings, and (*b*) new; (4) those entitled to reserved rights, *i.e.* in addition to those (if any still remain) who were entitled to votes before the Reform Act of 1832 in respect of qualifications abolished by that act, (*a*) freehold and burgage tenants in Bristol, Exeter, Norwich, and Nottingham, and (*b*) liverymen of the City of London and freemen of certain old cities and boroughs, whose right to the parliamentary franchise was permanently retained by the same act. In regard to these classes it may be said that the general scheme is that owners must make a claim in the first instance before they can get their names upon the register, but that, once entered on the register, the names will be retained from year to year until removed by the revising barrister; that the lists of occupiers and of freehold and burgage tenants are made out afresh every year by the overseers from their own information and inquiries, without any act being required on the part of the voters, who need only make claims in case their names are omitted; that lodgers must make claims every year; and that liverymen and freemen are in the same position as occupiers, except that the lists of liverymen are made out by the clerks of the several companies, and those of freemen by the town clerks, the overseers having nothing to do with these voters, whose qualifications are personal and not locally connected with any parish.

The overseers and other officers concerned are required to perform their duties in connexion with registration in accordance with the instructions and precepts, and to use the notices and forms prescribed by Order in Council from time to time. The Registration Order, 1895, directs the clerk of every county council, on or within seven days before the 15th of April in every year, to send to the overseers of each parish in his county a precept with regard to the registration of ownership electors, and to every parish not within a parliamentary or municipal borough a precept with regard to the registration of occupation electors (which expression for this purpose includes lodgers as well as occupiers proper). The town clerk of every borough, municipal or parliamentary, is to send to the overseers of every parish in his borough a precept with regard to the registration of occupation electors. These precepts are set out in the Registration Order, and those issued by the town clerks differ according as the borough is parliamentary only, or municipal only, or both parliamentary and municipal; in the cases of Bristol, Exeter, Norwich and Nottingham they contain directions as to freehold and burgage tenants. The duties of the overseers in regard to registration are set out in detail in the precepts. Along with the precepts are forwarded forms of the various lists and notices required to be used, and with the ownership precept a certain number of copies of that portion of the parliamentary register of the county at the time in force which contains the ownership voters for the parish, the register being so printed that the portion relating to each parish can be detached. It is the duty of the overseers to publish on the 20th of June, in manner hereinafter described, the portion of the register so received, together with a notice to owners not already registered to send in claims by the 20th of July. Meanwhile the overseers are making the inquiries necessary for the preparation of the occupier list. For this purpose they may require returns to be furnished by owners of houses let out in separate tenements, and by employers who have servants entitled to the service franchise. The registrars of births, deaths and marriages are required to furnish the overseers with returns of deaths, as must the assessed tax collectors with returns of defaulters; the relieving officers are to give information as to recipients of parochial relief. On or before the 31st of July the overseers are to make out and sign the lists of voters. These are the following: the list of ownership electors, consisting of the portion of the register previously published with a supplemental list of those who have sent in claims by the 20th of July; the occupier list; and the old lodger list, the last being formed from claims sent in by the 25th of July. The overseers do not select the names in the first and last of these lists; they take them as supplied in the register and claims. It is, however, their duty to write "dead" or "objected" in the margin against the names of persons whom they have reason to believe to be dead or not entitled to vote in respect of the qualification described. The ownership and old lodger lists will be divided into two parts, if the register contains names of owners entitled to a parochial vote only, or if claims by owners or old lodgers have been made limited to that franchise. The occupier list contains the names of persons whom the overseers believe to be qualified, and no others, and therefore will be free from marginal objections. Except in the administrative county of London, it is made out in three divisions—division 1 giving the names of occupiers of property qualifying for both parliamentary and local government votes, divisions 2 and 3 those of occupiers of property qualifying only for parliamentary and only for local government votes respectively. It happens so frequently that a tenement, if not of sufficient value to qualify for the £10 occupation franchise (parliamentary and local government), qualifies both for the household franchise (parliamentary) and for the old burgess franchise (local government), that division 1 would in most cases be the whole list, but for two circumstances. The service franchise is a special modification of the household franchise only; and the service occupants, being therefore restricted to the parliamentary vote, form the bulk of division 2; while peers and women, being excluded from the parliamentary vote, are consequently relegated to division 3. In the administrative county of London the local government register, being coextensive with the register of parochial electors, includes the whole of the parliamentary register. The occupier lists are consequently there made out in two divisions only, the names which would elsewhere appear in division 2 being placed in division 1. The lists of freehold and burgage tenants in Bristol, Exeter, Norwich and Nottingham are to be made out and signed by the same date. The overseers have also to make out and sign a list of persons qualified as occupiers to be elected aldermen or councillors, but as non-residents disqualified from being on the local government register. By the same date also the clerks of the livery companies are to make out, sign and deliver to the secondary (who performs in the City of London the registration duties which elsewhere fall on the town clerk) the lists of liverymen entitled as such to the parliamentary vote; and the town clerks are to make out and sign the lists of freemen so entitled in towns where this franchise exists.

On the 1st of August all the above lists are to be published, the livery lists by the secondary, lists of freemen by the town clerks and the rest by the overseers. In addition the overseers may have to publish a list of persons disqualified by having been found guilty of corrupt or illegal practices; this list they will receive, when it exists, from the clerk of the county council or town clerk with the precept. Publication of lists and notices by overseers is made by affixing copies on the doors of the church and other places of worship of the parish (or, if there be none, in some public or conspicuous situation in the parish), and also, with the exception to be mentioned, in the case of a parish wholly or partly within a municipal borough or urban district, in or near every public or municipal or parochial office and every post and telegraph office in the parish. The exception is that lists and notices relating to ownership electors need not be published at the offices mentioned when the parish is within a parliamentary borough. Publication by the secondary is made by affixing copies outside the Guildhall and Royal Exchange; publication by town clerks is made by affixing copies outside their town hall, or, where there is none, in some public or conspicuous place in their borough. From the 1st to the 20th of August inclusive is allowed for the sending in of claims and objections. Those whose names have been omitted from the occupier or reserved rights lists, or the non-resident list, or whose names, place of abode or particulars of qualification have been incorrectly stated in such lists, may send in claims to have their names registered; lodgers who are not qualified as old lodgers, or who have omitted to claim as such, may claim as new lodgers; persons whose names are on the corrupt and illegal practices list may claim to have them omitted. Any person whose name is on the list of parliamentary, local government or parochial electors for the same parliamentary county, administrative county, borough or parish, may object to names on the same lists. Notices of claim and objection in the case of liverymen and freemen are to be sent to the secondary and town clerk, and in other cases to the overseers; and notices of objection must also in all cases be sent to the person objected to. All notices must be sent in by the 20th of August, and on or before the 25th of August the overseers, secondary and town clerks are to make out, sign and publish lists of the claimants and persons objected to. It remains to be added that any person on a list of voters (*i.e.* on one of the lists published on the 1st of August) may make a declaration before a magistrate or commissioner for oaths correcting the entry relating to him. In the case of ownership electors the correction can only deal with the place of abode; in the case of other lists it extends to all particulars stated, and is useful inasmuch as it enables the revising barrister to make corrections as to the qualification which he could not make in the absence of a declaration. The declarations must be delivered to the clerk of the county council or town clerk on or before the 5th of September.

Revising barristers.

The next stage is the revision of the lists. For this purpose revising barristers are appointed yearly. The period within which revision courts can be held is from the 8th of September to the 12th of October, both days inclusive. The clerk of the county council attends the first court held for each parliamentary division of his county, and the town clerk the first court held for his city or borough; and they respectively produce all lists, notices and declarations in their custody, and answer any questions put to them by the revising barrister. The overseers also attend the courts held for their parish, produce the rate books, original notices of claim and objection, &c., and answer questions. The claimants, objectors and persons objected to appear personally or by representative to support their several contentions. Any person qualified to be an objector may also appear to oppose any claims, upon giving notice to the barrister before such claims are reached. The powers of the revising barristers are as follows: As regards persons whose names are on the lists of voters published on the 1st of August, he is to expunge the names, whether objected to or not, of those who are dead or subject to personal incapacity, such as infants and aliens, and for parliamentary purposes peers and women. If an entry is imperfect, the name must be removed, unless the particulars necessary for completing it are supplied to the barrister. All names marginally objected to by overseers must be expunged, unless the voters prove to the barrister that they ought to be retained. Objections made by other objectors must be supported by prima facie proof, and if this is not rebutted the name is struck out. Claimants must be ready to support their claims. The declaration attached to a lodger claim is indeed prima facie proof of the facts stated in it, but other claimants require evidence to make out even a prima facie case, and if they fail to produce it their claims will be disallowed. The barrister is required to correct errors in the lists of voters, and has a discretion to rectify mistakes in claims and objections upon evidence produced to him, although his power in this respect is limited. Lastly, the barrister has to deal with duplicates, as a voter is entitled to be on the register once, but not more than once, as a parliamentary voter for each parliamentary county or borough, as a burgess for each municipal borough, as a county elector for each electoral division, and as a parochial elector for each parish in which he holds a qualification. Consequently, he deals with duplicate entries by expunging or transferring them to separate parochial lists. The decision of the revising barrister is final and conclusive on all questions of fact; but an appeal lies from him on questions of law at the instance of any person aggrieved by the removal of his name from a list of voters, by the rejection of his claim or objection or by the allowance of a claim which he has opposed. Notice of the intention to appeal must be given to the barrister in writing on the day when his decision is given. The barrister may refuse to state a case for appeal; but if he does so without due cause he may be ordered by the High Court to state a case. The appeal is heard by a divisional court, from whose decision an appeal lies (by leave either of the divisional court or of the court of appeal) to the court of appeal, whose decision is final.

On the completion of the revision the barrister hands the county and borough lists (every page signed and every alteration initialled by him) to the clerk of the county council and the town clerk respectively, to be printed. With the following exceptions the revised lists are to be made up and printed by the 20th of December, and come into force as the register for all purposes on the 1st of January. In the boroughs created by the London Government Act 1899, the whole register is to be made up and printed by the 20th of October, and to come into force for the purpose of borough elections under the act on the 1st of November. In boroughs subject to the Municipal Corporations Acts, divisions 1 and 3 of the occupiers' list are to be made up and printed by the 20th of October, and come into force for the purpose of municipal and county council elections on the 1st of November. Corrections ordered in consequence of a successful appeal from a revising barrister are to be made by the officers having the custody of the registers, but a pending appeal does not affect any right of voting. The register in its final form will consist of the lists published on the 1st of August as corrected, with the claims which have been allowed on revision incorporated with them. It is printed in such form that each list and each division of a list for every parish can be separated from the rest for the purpose of making up the parliamentary, local government and parochial registers respectively. The alphabetical order is followed, except in London and some other large towns, where street order is adopted for all except the ownership lists and lists of liverymen and freemen. The parliamentary register for a parliamentary county will consist of the ownership lists for all parishes in the county, and of the lodger lists and divisions 1 and 2 of the occupier lists for parishes within the county and not within a parliamentary borough. The parliamentary register for a parliamentary borough will consist of the lodger lists, of the lists of freehold and burgage tenants (if any), and of divisions 1 and 2 of the occupier lists for all parishes within the borough, and also of the borough lists (if any) of liverymen or freemen. The local government register for an administrative county will consist of divisions 1 and 3 of the occupier lists for all parishes in the county, and the burgess roll for a municipal borough of divisions 1 and 3 of the occupier lists for all parishes in the borough. It will be seen, therefore, that, except in county boroughs, the burgess roll is also a part of the local government register of the administrative county within which the borough is situate. The register of parochial electors consists of the complete set of lists for each parish; but this does not include the lists of liverymen and freemen, which, as has been stated, are not parish lists.

No one whose name is not on the register can vote at an election. The fact that a man's name is on the register is now so far conclusive of his right that the returning officer is bound to receive his vote. Only two questions may be asked of him when he tenders his vote, namely, whether he is the person whose name is on the register, and whether he has voted before at the election. The Reform Act 1832 allowed him to be asked at parliamentary elections whether he retained the qualification for which he had been registered; but the Registration Act 1843 disallowed the question, and made the register conclusive as to the retention of the qualification. When, however, a petition is presented against an election, the register, although conclusive as to the retention of the qualification, does not prevent the court from inquiring into the existence of personal incapacities, arising in connexion with the election or otherwise, and striking off on scrutiny the votes of persons subject thereto, *e.g.* aliens, infants, or in parliamentary elections peers, &c.

The City of London is not within the Municipal Corporations Acts, and is not subject to the general registration law in the formation of its roll of citizens for municipal purposes. But a register of parliamentary, county and parochial electors is made in the ordinary way. The universities are also exempt from the general law of registration. At Oxford and Cambridge the members of Convocation and the Senate respectively have always formed the parliamentary constituencies; and, as has been already stated, the registers of those members were before 1832, and still are, the parliamentary registers. Similarly, the Reform Act of 1867, which gave parliamentary representation to the university of London, simply enacted that the register of graduates constituting the Convocation should be the parliamentary register of that body.

Scotland.—In Scotland the qualifications for local government and parish electors are the same as those for parliamentary voters, the only difference in the registers being in respect of personal incapacities for the parliamentary franchise, incapacity for the other franchises by reason of non-payment of rates, and duplicates. The principal act regulating registration in burghs is 19 & 20 Vict. c. 58, amended in some particulars as to dates by 31 & 32 Vict. c. 48, § 20. County registration, formerly regulated by 24 & 25 Vict. c. 83, has been assimilated to burgh registration by 48 & 49 Vict. c. 3, § 8 (6). The procedure consists, as in England, of the making and publication of lists of voters, the making of claims and objections and the holding of revision courts; but there are important differences of detail. Though the parish is the registration unit, parochial machinery is not used for the formation of the register. The parliamentary lists for a county are made up yearly by one or more of the assessors of the county, and those for a burgh by one or more of the assessors for the burgh, or by the clerk of the commissioners. They are published on the 15th of September; and claims and objections must be sent in by the 21st and are published on the 25th of the same month. Publication is made in burghs by posting on or near the town hall, or in some other conspicuous place, in counties by posting the part relating to each parish on the parish church door, and in both cases giving notice by newspaper advertisement of a place where the lists may be perused. The revision is conducted by the sheriff, the time within which his courts may be held being from the 25th of September to the 16th of October, both days inclusive. An appeal lies to three judges of the Court of Session, one taken from each division of the Inner House, and one from the Lords Ordinary of the Outer House. The revised lists are delivered in counties to the sheriff clerk, in burghs to the town clerk, or person to whom the registration duties of town clerk are assigned. The register comes into force for all purposes on the 1st of November.

The municipal register of a royal burgh which is coextensive, or of that part of a royal burgh which is coextensive with a parliamentary burgh, consists of the parliamentary register with a supplemental list of women who but for their sex would be qualified for the parliamentary vote. The municipal register for a burgh, or for that part of one which is not within a parliamentary burgh, consists of persons possessed of qualifications within the burgh which, if within a parliamentary burgh, would entitle them, or but for their sex would entitle them, to the parliamentary vote. The register of county electors consists of the parliamentary register for a county with the supplemental list hereafter mentioned; but inasmuch as exemption from or failure to pay the consolidated county rate is a disqualification for the county electors' franchise, the names of persons so disqualified are to be marked with a distinctive mark on the register; as are also the names of persons whose qualifications are situated within a burgh, such marks indicating that the persons to whose names they are attached are not entitled to vote as county electors. Every third year, in preparation for the triennial elections of county and parish councils (casual vacancies being filled up by co-optation), a supplemental list is to be made of peers and women possessed of qualifications which but for their rank and sex would entitle them to parliamentary votes. The register of county electors in a county and the municipal register in a burgh form the registers of parish electors for the parishes comprised in each respectively. Inasmuch, however, as a man is entitled to be registered as a parish elector in every parish where he is qualified, duplicate entries are, when required, to be made in the register, with distinctive marks to all but one, to indicate that they confer the parish vote only. These distinctive marks and those previously mentioned are to be made in the lists by the assessors, subject to revision by the sheriff. The register is conclusive to the same extent as in England, except that the vote of a parish elector who is one year in arrear in payment of a parish rate is not to be received. The clerk of the parish council is to furnish the returning officer one week before an election with the names of persons so in arrear; and the returning officer is to reject their votes except upon the production of a written receipt. Provision is made by 31 & 32 Vict. c. 48, §§ 27–41, for the formation of registers of parliamentary electors for the universities. The register for each university is to be made annually by the university registrar, with the assistance of two members of the council, from whose decisions an appeal lies to the university court.

Ireland.—There are no parish councils in Ireland, and no parochial electors. There are therefore but two registers of voters, the parliamentary and the local government registers, the latter of which consists of the former with a local government supplement containing the names of those excluded from the parliamentary register by reason of their being peers or women, and duplicate entries relating to those whose names are registered elsewhere for the same parliamentary constituency. The principal acts regulating registration are 13 & 14 Vict. c. 69, 31 & 32 Vict. c. 112, 48 & 49 Vict. c. 17, and 61 & 62 Vict. c. 2. The lord lieutenant is empowered to make by Order in Council rules for registration, and to prescribe forms; and under this power has made the Registration (Ireland) Rules 1899, now in force. The registration unit is not the parish, but the district electoral division, except where such division is subdivided into wards, or is partly within and partly without any town or ward of a borough or town, in which cases each ward of the division or part of a division is a separate registration unit.

The procedure is as follows, subject to variation in cases where there are clerks of unions who held office on the 31st of March 1898, and have not agreed to transfer their registration duties. The clerk of the peace sends out on the 1st of June a precept in the form prescribed for county registration to the secretary of the county council and clerks of urban district councils, together with a copy of the existing register for their county or district; and a precept in the form prescribed for borough registration to town clerks of boroughs. As regards registration units not in a parliamentary or municipal borough, the secretary of the county council or clerk of the urban district council is to put marginal objections, "dead" or "objected," where required, to £10 occupiers and householders in the copy of the register, both in the parliamentary list and in the local government supplement. He is also to make out supplemental parliamentary and local government lists of £10 occupiers and householders not on the existing register, and to put marginal objections where required to these. He is to verify on oath before a magistrate the copy of the register and supplemental lists, and to return them to the clerk of the peace by the 8th of July. As regards registration units in a parliamentary borough, but outside a municipal borough, the secretary of the county council or clerk of the urban district council is to make out lists of £10 occupiers and householders with local government supplement, and transmit them to the town clerk of the municipal borough or town. The clerk of the peace is to publish the copy of the register, after himself placing marginal objections where required to voters other than £10 occupiers and householders, and the supplemental lists as received, and also the corrupt and illegal practices list, if any, on the 22nd of July. On the same day the town clerk will publish the lists received as aforesaid for registration units outside the municipal borough, and the lists, which he will have made out himself for the municipal borough, including the freemen's list and corrupt and illegal practices list. Freemen being entitled to the local government vote will, if resident, be placed on the list of the registration unit where they reside, and will, if non-resident, be allotted by the revising barrister among the registration units of the borough for local government purposes in proportion to the number of electors in each registration unit. Claims are to be sent in to the clerk of the peace and town clerk by the 4th of August, including old lodger claims and, in the case of the clerk of the peace, ownership claims. Lists of claimants with marginal objections, where required, are to be published by the clerk of the peace and town clerk by the 11th of August. Notices of objection to voters or claimants may be given by the 20th of August; and lists of persons objected to are to be published by the clerk of the peace and town clerk by the 24th of the same month. Publication of lists and notices by a clerk of the peace is made by posting copies of those relating to each registration unit outside every court-house, petty sessions court, and other public offices in the unit; publication by a town clerk is made by posting copies outside the town hall, or, if there be none, in some public and conspicuous place in the borough.

Revising barristers are specially appointed for the county and city of Dublin by the lord lieutenant; elsewhere the county court judges and chairmen of quarter sessions act as such *ex officio*, assisted, when necessary, by additional barristers appointed by the lord lieutenant. The time for the holding of revision courts is from the 8th of September to the 25th of October inclusive. An appeal lies to the court of appeal, whose decision is final. The revised lists are handed to the clerk of the peace; they are to be made up by him by the 31st of December, and come into force on the 1st of January.

The registrar of the university of Dublin is to make out in December a list of the persons entitled to the parliamentary vote for the university, and to print the same in January, and to publish a copy in the university calendar, or in one or more public journals circulating in Ireland. He is to revise the list annually, and expunge the names of those dead or disqualified; but an elector whose name has been expunged because he was supposed to be dead is entitled, if alive, to have his name immediately restored and to vote at any election. (L. L. S.)

REGIUM (Gr. ‘Ρήγιον: in Latin the aspirate is omitted), a city of the territory of the Bruttii in South Italy, on the east side of the strait between Italy and Sicily (Strait of Messina).

A colony, mainly of Chalcidians, partly of Messenians from the Peloponnesus, settled at Regium in the 8th century B.C. About 494 B.C. Anaxilas, a member of the Messenian party, made himself master of Regium (apparently—from numismatic evidence, for the coins assignable to this period are modelled on Samian types—with the help of the Samians: see MESSINA) and about 488 joined with them in occupying Zancle (Messina). Here they remained. (See C. H. Dodd in *Journal of Hellenic Studies*, xxviii. (1908) 56 sqq.) This coinage was resumed after the establishment of the democracy about 461 B.C., when Anaxilas' sons were driven out. In 433 Regium made a treaty with Athens, and in 427 joined the Athenians against Syracuse, but in 415 it remained neutral. An attack which it made on Dionysius I. of Syracuse in 399 was the beginning of a great struggle which in 387 resulted in its complete destruction and the dispersion of its inhabitants as slaves. Restored by the younger Dionysius under the name of Phoebias, the colony soon recovered its prosperity and resumed its original designation. In 280, when Pyrrhus invaded Italy, the Regines admitted within their walls a Roman garrison of Campanian troops; these mercenaries revolted, massacred the male citizens, and held the city till in 270 they were besieged and put to death by the Roman consul Genucius. The city remained faithful to Rome throughout the Punic wars, and Hannibal never succeeded in taking it. Up till the Social War it struck coins of its own, with Greek legends. Though one of the cities promised by the triumvirs to the veterans, Regium escaped through the favour of Octavius (hence it took the name Regium Julium). It continued, however, to be a Greek city even under the Empire, and never became a colony. Towards the end of the Empire it was made the chief city of the Bruttii.

Of ancient buildings hardly anything remains at Regium, and nothing of the archaic Greek period is *in situ*, except possibly the remains of a temple of Artemis Phacelitis, which have not yet been explored, though various inscriptions relative to it have been found. The museum, however, contains a number of terra-cottas, vases, inscriptions, &c., and a number of Byzantine lead seals. Several baths of the Greek period, modified by the Romans, have been found, and the remains of one of these may still be seen. A large mosaic of the 3rd or 4th century A.D. with representations of wild animals and the figure of a warrior in the centre was found in 1904 and covered up again. The aqueduct and various cisterns connected with it have been traced, and some tombs of the 5th or 4th century B.C. (or even later) were found in 1907.

See *Notizie degli scavi, passim*; P. Larizza, *Rhegium Chalcidense* (Rome, 1905). (T. As.)

REGIUM DONUM, or ROYAL GIFT, an annual grant formerly made from the public funds to Presbyterian and other Nonconformist ministers in Great Britain and Ireland. It dates from the reign of Charles II., who, according to Bishop Burnet, after the declaration of indulgence of 1672 ordered sums of money to be paid to Presbyterian ministers. These gifts or pensions were soon discontinued, but in 1690 William III. made a grant of £1200 a year to the Presbyterian ministers in Ireland as a reward for their services during his struggle with James II. Owing to the opposition of the Irish House of Lords the money was not paid in 1711 and some subsequent years, but it was revived in 1715 by George I., who increased the amount to £2000 a year. Further additions were made in 1784 and in 1792, and in 1868 the sum granted to the Irish Presbyterian ministers was £45,000. The Regium Donum was withdrawn by the act of 1869 which disestablished the Irish church. Provision was made, however, for existing interests therein, and many Presbyterian ministers commuted these on the same terms as the clergy of the church of Ireland.

In England the Regium Donum proper dates from 1721, when Dr Edmund Calamy (1671–1732) received £500 from the royal bounty "for the use and behalf of the poor widows of dissenting ministers." Afterwards this sum was increased to £1000 and was made an annual payment "for the assisting either ministers or their widows," and later it amounted to £1695 per annum. It was given to distributors who represented the three denominations, Presbyterians, Baptists and Independents, enjoying the grant. Among the Nonconformists themselves, however, or at least among the Baptists and the Independents, there was some objection to this form of state aid, and in 1851 the chancellor of the exchequer announced that it would be withdrawn. This was done six years later.

See J. Stoughton, *History of Religion in England* (1901); J. S. Reid, *History of the Presbyterian Church in Ireland* (Belfast, 1867); and E. Calamy, *Historical Account of my own Life*, edited by J. T. Rutt (1829–30).

REGLA, formerly an important suburb of Havana, Cuba, opposite that city, on the bay; now a part of Havana. Pop. (1899) 11,363. It was formerly the scene of the Havana bullfights. The church is one of the best in Cuba; the building dates substantially from 1805, but the church settlement goes back to a hermitage established in 1690. Regla is the shipping-point of the Havana sugar trade. It has enormous sugar and tobacco warehouses, fine wharves, a dry dock, foundries and an electric railway plant. It is the western terminus of the eastern line of the United Railways of Havâna, and is connected with the main city of Havana by ferry. A fishing village was established here about 1733. At the end of the 18th century Regla was a principal centre of the smuggling trade, and about 1820 was notorious as a resort of pirates. It first secured an *ayuntamiento* (city council) in 1872, and after 1899 was annexed to Havana.

REGNARD, JEAN FRANÇOIS (1655–1709), French comic dramatist, was born in Paris on the 7th of February 1655. His father, a rich shopkeeper, died when Regnard was about twenty, leaving him master of a considerable fortune. He set off at once for Italy, and, after a series of romantic adventures, he journeyed by Holland, Denmark and Sweden to Lapland, and thence by Poland, Turkey, Hungary and Germany back to France. He returned to Paris at the end of 1683, and bought the place of treasurer of France in the Paris district; he had a house at Paris in the Rue Richelieu; and he acquired the small estate of Grillon near Dourdan in the department of Seine-et-Oise, where he hunted, feasted and wrote comedies. This latter amusement he began in 1688 with a piece called *Le Divorce*, which was performed at the Théâtre Italien. In four slight pieces of the same nature he collaborated with Charles Rivière Dufresny. He gained access to the Théâtre Français on the 19th of May 1694 with a piece called *Attendez-moi sous l'orme*, and two years later, on the 19th of December 1696, he produced there the masterly comedy of *Le Joueur*. The idea of the play was evolved in collaboration with Dufresny, but the authors disagreed in carrying it out. Finally they each produced a comedy on the subject, Dufresny in prose, and Regnard in verse. Each accused the other of plagiarism. The plot of Regnard's piece turns on the love of two sisters for Valère, the gambler, who loves one and pretends to love the other, really deceiving them both, because there is no room for any other passion in his character except the love of play. Other of his plays were *La Sérénade* (1694), *Le Bourgeois de Falaise* (1696), *Le Distrait* (1697), *Démocrite* (1700), *Le Retour imprévu* (1700), *Les Folies amoureuses* (1704), *Les Ménechmes* (1705), a clever following of Plautus, and his masterpiece, *Le Légataire universel* (1708).

Regnard's death on the 4th of September 1709 renews the doubtful and romantic circumstances of his earlier life. Some hint at poison, but the truth seems to be that his death was hastened by the rate at which he lived.

Besides the plays noticed above and others, Regnard wrote miscellaneous poems, the autobiographical romance of *La Provençale*, and several short accounts in prose of his travels, published posthumously under the title of *Voyages*. Regnard had written a reply to the tenth satire of Boileau, *Contre les femmes*, and Boileau had retorted by putting Regnard among the poets depreciated in his epistle *Sur mes vers*. After the appearance of *Le Joueur* the poet altered his opinion and cut out the allusion. The saying attributed to Boileau when some one, thinking to curry favour, remarked that Regnard was only a mediocre poet, "*Il n'est pas médiocrement gai*," is both true and very appropriate. His French style, especially in his purely prose works, is not considered faultless. He is often unoriginal in his plots, and, whether Dufresny was or was not justified in his complaint about *Le Joueur*, it seems likely that Regnard owed not a little to him and to others; but he had a thorough grasp of comic situation and incident, and a most amusing faculty of dialogue.

The first edition of Regnard's works was published in 1731 (5 vols., Rouen and Paris). There is a good selection of almost everything important in the Collection Didot (4 vols., 1819), but there is no absolutely complete edition. The best is that published by Crapelet (6 vols., Paris, 1822). A selection by L. Moland appeared in 1893. See also a *Bibliographie et iconographie des œuvres de J. F. Regnard* (Paris, Rouquette, 1878); *Le Poëte J. F. Regnard en son chasteau de Grillon*, by J. Guyot (Paris, 1907).

REGNAULT, HENRI (1843–1871), French painter, born at Paris on the 31st October 1843, was the son of Henri Victor Regnault (*q.v.*). On leaving school he successively entered the studios of Montfort, Lamothe and Cabanel, was beaten for the *Grand Prix* (1863) by Layraud and Montchablon, and in 1864 exhibited two portraits in no wise remarkable at the Salon. In 1866, however, he carried off the *Grand Prix* with a work of unusual force and distinction—"Thetis bringing the Arms forged by Vulcan to Achilles" (School of the Fine Arts). The past in Italy did not touch him, but his illustrations to Wey's *Rome* show how observant he was of actual life and manners; even his "Automedon" (School of Fine Arts), executed in obedience to Academical regulations, was but a lively recollection of a carnival horse-race. At Rome, moreover, Regnault came into contact with the modern Hispano-Italian school, a school highly materialistic and inclined to regard even the human subject only as one amongst many sources whence to obtain amusement for the eye. The vital, if narrow, energy of this school told on Regnault with ever-increasing force during the few remaining years of his life. In 1868 he had sent to the Salon a life-size portrait of a lady in which he had made one of the first attempts to render the actual character of fashionable modern life. While making a tour in Spain, he saw Prim pass at the head of his troops, and received that lively image of a military demagogue which he afterwards put on canvas, somewhat to the displeasure of his subject. But this work made an appeal to the imagination of the public, whilst all the later productions of Regnault were addressed exclusively to the eye. After a further flight to Africa, abridged by the necessities of his position as a pensioner of the school of Rome, he painted "Judith," then (1870) "Salome," and, as a work due from the Roman school, despatched from Tangier the large canvas, "Execution without Hearing under the Moorish Kings," in which the painter had played with the blood of the victim as if he were a jeweller toying with rubies. The war arose, and found Regnault foremost in the devoted ranks of Buzenval, where he fell on the 19th of January 1871.

See *Correspondance de H. Regnault*; Duparc, *H. Regnault, sa vie et son œuvre*; Cazalis, *H. Regnault, 1843–1871*; Baillière, *Les Artistes de mon temps*; C. Blanc, *H. Regnault*; P. Mantz, *Gazette des Beaux Arts* (1872).

REGNAULT, HENRI VICTOR (1810–1878), French chemist and physicist, was born on the 21st of July 1810 at Aix-la-Chapelle. His early life was a struggle with poverty. When a boy he went to Paris and obtained a situation in a large drapery establishment, where he remained, occupying every spare hour in study, until he was in his twentieth year. Then he entered the École Polytechnique, and passed in 1832 to the École des Mines, where he developed an aptitude for experimental chemistry. A few years later he was appointed to a professorship of chemistry at Lyons. His most important contribution to organic chemistry was a series of researches, begun in 1835, on the haloid and other derivatives of unsaturated hydrocarbons. He also studied the alkaloids and organic acids, introduced a classification of the metals according to the facility with which they or their sulphides are oxidized by steam at high temperatures, and effected a comparison of the chemical composition of atmospheric air from all parts of the world. In 1840 he was recalled to Paris by his appointment to the chair of chemistry in the École Polytechnique; at the same time he was elected a member of the Académie des Sciences, in the chemical section, in room of P. J. Robiquet (1780–1840); and in the following year he became professor of physics in the Collège de France, there succeeding P. L. Dulong, his old master, and in many respects his model. From this time Regnault devoted almost all his attention to practical physics; but in 1847 he published a four-volume treatise on *Chemistry* which has been translated into many languages.

Regnault executed a careful redetermination of the specific heats of all the elements obtainable, and of many compounds—solids, liquids and gases. He investigated the expansibility of gases by heat, determining the coefficient for air as 0·003665, and showed that, contrary to previous opinion, no two gases had precisely the same rate of expansion. By numerous delicate experiments he proved that Boyle's law is only approximately true, and that those gases which are most readily liquefied diverge most widely from obedience to it. He studied the whole subject of thermometry critically; he introduced the use of an accurate air-thermometer, and compared its indications with those of a mercurial thermometer, determining the absolute dilatation of mercury by heat as a step in the process. He also paid attention to hygrometry and devised a hygrometer in which a cooled metal surface is used for the deposition of moisture.

In 1854 he was appointed to succeed J. J. Ebelmen (1814–1852) as director of the porcelain manufactory at Sèvres. He carried on his great research on the expansion of gases in the laboratory at Sèvres, but all the results of his latest work were destroyed during the Franco-German War, in which also his son Henri (noticed above) was killed. Regnault never recovered from the double blow, and, although he lived until the 19th of January 1878, his scientific labours ended in 1872. He wrote more than eighty papers on scientific subjects, and he made important researches in conjunction with other workers. His greatest work, bearing on the practical treatment of steam-engines, forms vol. xxi. of the *Mémoires de l'Académie des Sciences*.

REGNAULT, JEAN BAPTISTE (1754–1829), French painter, was born at Paris on the 9th of October 1754, and died in the same city on the 12th of November 1829. He began life at sea in a merchant vessel, but at the age of fifteen his talent attracted attention, and he was sent to Italy by M. de Monval under the care of Bardin. After his return to Paris, Regnault, in 1776, obtained the *Grand Prix*, and in 1783 he was elected Academician. His diploma picture, the "Education of Achilles by Chiron," is now in the Louvre, as also the "Christ taken down from the Cross," originally executed for the royal chapel at Fontainebleau, and two minor works—the "Origin of Painting" and "Pygmalion praying Venus to give Life to his Statue." Besides various small pictures and allegorical subjects, Regnault was also the author of many large historical paintings; and his school, which reckoned amongst its chief attendants Guérin, Crepin, Lafitte, Blondel, Robert Lefevre and Menjaud, was for a long while the rival in influence of that of David.

REGNAULT DE SAINT JEAN D'ANGÉLY, MICHEL LOUIS ÉTIENNE, Comte (1761–1819), French politician, was born at Saint Fargeau (Yonne) on the 3rd of December 1761. Before the Revolution he was an *avocat* in Paris and lieutenant of the maritime provostship of Rochefort. In 1789 he was elected deputy to the States General by the Third Estate of the *sénéchaussée* of Saint Jean d'Angély. His eloquence made him a prominent figure in the Constituent Assembly, where he boldly attacked Mirabeau, and settled the dispute about the ashes of Voltaire by decreeing that they belonged to the nation. But the moderation shown by the measures he proposed at the time of the flight of the king to Varennes, by his refusal to accede to the demands for the king's execution, and by the articles he published in the *Journal de Paris* and the *Ami des patriotes*, marked him out for the hostility of the advanced parties. He was arrested after the revolution of the 10th of August 1792, but succeeded in escaping, and during the reaction which followed the fall of Robespierre was appointed administrator of the military hospitals in Paris. His powers of organization brought him to Bonaparte's notice, and he took part in the *coup d'état* of 18 Brumaire, year VIII. (9th of November 1799). Under the Empire he enjoyed the confidence of Bonaparte, and was made councillor of state, president of section in the Council of State, member of the French Academy, *procureur général* of the high court, and a count of the Empire. He was dismissed on the first restoration of the Bourbons, but resumed his posts during the Hundred Days, and after Waterloo persuaded the emperor to abdicate. He was exiled by the government of the second Restoration, but subsequently obtained leave to return to France. He died on the day of his return to Paris (11th of March 1819). *Les Souvenirs du Comte Regnault de St Jean d'Angély* (Paris, 1817) are spurious. His son, Auguste Michel Étienne Regnault de Saint Jean d'Angély (1794–1870), an army officer, was dismissed from the army by the Restoration government, fought for the Greeks in the Greek War of Independence, and rejoined the French army in 1830. In 1848 he was elected deputy and sat on the right. Under the Second Empire he went through the Crimean and Italian campaigns, and was made senator and marshal for bravery at the battle of Magenta.

RÉGNIER, HENRI FRANÇOIS JOSEPH DE (1864–), French poet, was born at Honfleur (Calvados) on the 28th of December 1864, and was educated in Paris for the law. In 1885 he began to contribute to the Parisian reviews, and his verses found their way into most of the French and Belgian periodicals favourable to the symbolist writers. Having begun, however, to write under the leadership of the Parnassians, he retained the classical tradition, though he adopted some of the innovations of Moréas and Gustave Kahn. His gorgeous and vaguely suggestive style shows the influence of Stéphane Mallarmé, of whom he was an assiduous disciple. His first volume of poems, *Lendemains*, appeared in 1885, and among numerous later volumes are *Poèmes anciens et romanesques* (1890), *Les Jeux rustiques et divins* (1890), *Les Médailles d'argent* (1900), *La Cité des eaux* (1903). He is also the author of a series of realistic novels and tales, among which are *La Canne de jaspe* (2nd ed., 1897), *La Double Maîtresse* (5th ed., 1900), *Les Vacances d'un jeune homme sage* (1904), and *Les Amants singuliers* (1905). M. de Régnier married Mlle. Marie de Hérédia, daughter of the poet, and herself a novelist and poet under the name of Gérard d'Houville.

See E. Gosse, *French Profiles* (1905), and *Poètes d'aujourd'hui* (6th ed., 1905), by van Bever and Léautaud.

RÉGNIER, MATHURIN (1573–1613), French satirist, was born at Chartres on the 21st of December 1573. His father, Jacques Régnier, was a bourgeois of good means and position; his mother, Simone Desportes, was the sister of the poet Desportes. Desportes, who was richly beneficed and in great favour at court, seems to have been regarded as Mathurin Régnier's natural protector and patron; and the boy himself, with a view to his following in his uncle's steps, was tonsured at eight years old. Little is known of his youth, and it is chiefly conjecture which fixes the date of his visit to Italy in a humble position in the suite of the cardinal, François de Joyeuse, in 1587. The cardinal was accredited to the papal court in that year as "protector" of the royal interests. Régnier found his duties irksome, and when, after many years of constant travel in the cardinal's service, he returned definitely to France about 1605, he took advantage of the hospitality of Desportes. He early began the practice of satirical writing, and the enmity which existed between his uncle and the poet Malherbe gave him occasion to attack the latter. In 1606 Desportes died, leaving nothing to Régnier, who, though disappointed of the succession to Desportes's abbacies, obtained a pension of 2000 livres, chargeable upon one of them. He was also made in 1609 canon of Chartres through his friendship with the lax bishop, Philippe Hurault, at whose abbey of Royaumont he spent much time in the later years of his life. But the death of Henry IV. deprived him of his last hope of great preferments. His later life had been one of dissipation, and he died at Rouen at his hotel, the Écu d'Orléans, on the 22nd of October 1613.

About the time of his death numerous collections of licentious and satirical poems were published, while others remained in manuscript. Gathered from these there has been a floating mass of licentious epigrams, &c., attributed to Régnier, little of which is certainly authentic, so that it is very rare to find two editions of Régnier which exactly agree in contents. His undoubted work falls into three classes: regular satires in alexandrine couplets, serious poems in various metres, and satirical or jocular epigrams and light pieces, which often, if not always, exhibit considerable licence of language. The real greatness of Régnier consists in the vigour and polish of his satires, contrasted and heightened as that vigour is with the exquisite feeling and melancholy music of some of his minor poems. In these Régnier is a disciple of Ronsard (whom he defended brilliantly against Malherbe), without the occasional pedantry, the affectation or the undue fluency of the Pléiade; but in the satires he seems to have had no master except the ancients, for some of them were written before the publication of the satires of Vauquelin de la Fresnaye, and the *Tragiques* of D'Aubigné did not appear until 1616. He has sometimes followed Horace closely, but always in an entirely original spirit. His vocabulary is varied and picturesque, and is not marred by the maladroit classicism of some of the Ronsardists. His verse is extraordinarily forcible and nervous, but his chief distinction as a satirist is the way in which he avoids the commonplaces of satire. His keen and accurate knowledge of human nature and even his purely literary qualities extorted the admiration of Boileau. Régnier displayed remarkable independence and acuteness in literary criticism, and the famous passage (Satire ix., *À Monsieur Rapin*) in which he satirizes Malherbe contains the best denunciation of the merely "correct" theory of poetry that has ever been written. Lastly, Régnier had a most unusual descriptive faculty, and the vividness of what he called his narrative satires was not approached in France for at least two centuries after his death. All his merits are displayed in the masterpiece entitled *Macette ou l'Hypocrisie déconcertée*, which does not suffer even on comparison with *Tartuffe*; but hardly any one of the sixteen satires which he has left falls below a very high standard.

Les Premières Œuvres ou satyres de Régnier (Paris, 1608) included the *Discours au roi* and ten satires. There was another in 1609, and others in 1612 and 1613. The author had also contributed to two collections—*Les Muses gaillardes* in 1609 and *Le Temple d'Apollon* in 1611. In 1616 appeared *Les Satyres et autres œuvres folastres du sieur Régnier*, with many additions and some poems by other hands. Two famous editions by Elzevir (Leiden, 1642 and 1652) are highly prized. The chief editions of the 18th century are that of Claude Brossette (printed by Lyon & Woodman, London, 1729), which supplies the standard commentary on Régnier, and that of Lenglet Dufresnoy (printed by J. Tonson, London, 1733). The editions of Prosper Poitevin (Paris, 1860), of Ed. de Barthélemy (Paris, 1862), and of E. Courbet (Paris, 1875), may be specially mentioned. The last, printed after the originals in italic type, and well edited, is perhaps the best. See also Vianey's *Mathurin Régnier* (1896); M. H. Cherrier, *Bibliographie de Mathurin Régnier* (1884).

REGNITZ, a river of Germany, and a left-bank tributary of the Main, the most important river of the province of Lower Bavaria. It is formed by the confluence, near Fürth, of the Rednitz and Pegnitz. The united river flows north through an undulating vine-clad country, past Erlangen, Baiersdorf and Forchheim, from which point it is navigable, and falls into the Main at Bischberg, just below Bamberg, after a course of 126 m. Near Bamberg it is joined by the Ludwigskanal, which, running parallel to it from Fürth and separated by the railway, forms the water-connexion between the Main and the Danube. Its main tributaries from the right are the Gründlach and the Wiesent, and from the left the Zenn, the Aurach and the Aisch.

REGRATING (O.Fr. *regrater*, to sell by retail), in English criminal law, was the offence of buying and selling again in the same market, or within four miles thereof. (See Engrossing.)

REGULA, the Latin word for a rule, hence particularly applied to the rules of a religious order (see Monasticism). In architecture the term is applied to a rule or square, the short fillet or rectangular block, under the taenia (*q.v.*) on the architrave of the Doric entablature.

REGULAR, orderly, following or arranged according to a rule (Lat. *regula*, whence O.Fr. *reule*, whence English "rule"), steady, uniform, formally correct. The earliest and only use in English until the 16th century was in the Med. Lat. sense of *regularis*, one bound by and subject to the rule (*regula*) of a monastic or religious order, a member of the "regular" as opposed to the "secular" clergy, and so, as a substantive, a regular, *i.e.* a monk or friar. Another specific application is to that portion of the armed forces of a nation which are organized on a permanent system, the standing army, as opposed to "irregulars," levies raised on a voluntary basis and disbanded when the particular campaign or war for which they were raised is at an end. In the British army, the forces were divided into regulars, militia and volunteers, until 1906, when they were divided into regular and territorial forces.

REGULUS, MARCUS ATILIUS, Roman general and consul (for the second time) in the ninth year of the First Punic War (256 B.C.). He was one of the commanders in the Punic naval expedition which shattered the Carthaginian fleet at Ecnomus, and landed an army on Carthaginian territory (see Punic Wars). The invaders were so successful that the other consul, L. Manlius Vulso, was recalled to Rome, Regulus being left behind to finish the war. After a severe defeat at Adys near Carthage, the Carthaginians were inclined for peace, but the terms proposed by Regulus were so harsh that they resolved to continue the war. In 255, Regulus was completely defeated and taken prisoner by the Spartan Xanthippus. There is no further trustworthy information about him. According to tradition, he remained in captivity until 250, when after the defeat of the Carthaginians at Panormus he was sent to Rome on parole to negotiate a peace or exchange of prisoners. On his arrival he strongly urged the senate to refuse both proposals, and returning to Carthage was tortured to death (Horace, *Odes*, iii. 5). This story made Regulus to the later Romans the type of heroic endurance; but most historians regard it as insufficiently attested, Polybius being silent. The tale was probably invented by the annalists to excuse the cruel treatment of the Carthaginian prisoners by the Romans.

See Polybius i. 25–34; Florus ii. 2; Cicero, *De Officiis*, iii. 26; Livy, *Epit.* 18; Valerius Maximus ix. 2; Sil. Ital. vi. 299–550; Appian, *Punica*, 4; Zonaras viii. 15; see also O. Jäger, *M. Atilius Regulus* (1878).

REHAN, ADA (1860–), American actress, whose real name was Crehan, was born in Limerick, Ireland, on the 22nd of April 1860. Her parents removed to the United States when she was five years old, and it was in Newark, N.J., that in 1874 she made her first stage appearance in a small part in *Across the Continent.* She was with Mrs John Drew's stock company in Philadelphia, John W. Albaugh's in Albany and Baltimore, and other companies for several seasons, playing every kind of minor part, until she became connected with Augustin Daly's theatrical management in 1879. Under his training she soon showed her talents for vivid, charming portrayal of character, first in modern and then in older comedies. She was the heroine in all the Daly adaptations from the German, and added to her triumphs the parts of Peggy in Wycherly's *Country Girl*, Julia in the *Hunchback*, and especially Katharina in *The Taming of the Shrew*, besides playing Rosalind and Viola. Miss Rehan accompanied Daly's company to England (first in 1884), France and Germany (1886). Her life-size portrait as Katharina is in the picture-gallery, and her bust, with Ellen Terry's, at the entrance to the theatre in the Shakespeare Memorial at Stratford-on-Avon.

REHEARSAL (from "rehearse," to say over again, repeat, recount, O.Fr. *rehercer*, from *re*, again, and *hercer*, to harrow, cf. "hearse," the original meaning being to rake or go over the same ground again as with a harrow), a recital of words or statements, particularly the trial performance in private of a play, musical composition, recitation, &c., for the purpose of practice preparatory to the performance in public. In the theatre a "full rehearsal" is one in which the whole performance is gone through with all the performers, a "dress rehearsal" one in which the performance is carried out with scenery, costumes, properties, &c., exactly as it is to be played in public.

REHOBOAM (Heb. *reḥab'ām*, probably "the clan is enlarged," see Ecclus. xlvii. 23; although on the analogy of Reḥabiah and Bab. *ra'bi-ilu*, *'Am* may represent some god; Septuagint reads *ροβοαμ*), son of Solomon and first king of Judah. On the events which led to his accession and the partition of the Hebrew monarchy, see Jeroboam, Solomon. Although his age is given as forty-one (1 Kings xiv. 21), the account of his treatment of the Israelite deputation (1 Kings xii.), as also 2 Chron. xiii. 7, give an impression of youth. He was partly of Ammonite origin (1 Kings xiv. 21), and, like his father, continued the foreign worship which his connexions involved. The chief event of his reign was the incursion of Egypt under Sheshonk (Shishak) I., who came up against Judah and despoiled the temple about 930 B.C. (see Egypt, *History*, § "Deltaic Dynasties"). That this invasion is to be connected with the friendly relations which are said to have subsisted between the first of the Libyan dynasty and Rehoboam's rival is unlikely. Sheshonk has figured his campaign outside the great temple of Karnak with a list of some 150 places which he claims to have conquered, but it is possible that these were only tributary, and the names may be largely based upon older lists. Towns of both Judah and Israel are incorporated, and it is possible that Jerusalem once stood where now the stone is mutilated.[1] The book of Chronicles enumerates several Judaean cities fortified by Rehoboam (not necessarily connected with Sheshonk's campaign), and characteristically regards the invasion as a punishment (2 Chron. xi. 5 sqq., xii. 1–15; for the prophet Shemaiah see 1 Kings xii. 21–24). Of Rehoboam's successor Abijah (or Abijam) little is known except a victory over Jeroboam recorded in 2 Chron. xiii. See further Asa, Omri, and Jews (*History*), §§ 7, 9.

REICHA, ANTON JOSEPH (1770–1836), French musical theorist and teacher of composition, was born at Prague on the 27th of February 1770, and educated chiefly by his uncle, Joseph Reicha (1746–1795), a clever violoncellist, who first received him into his house at Wallerstein in Bohemia, and afterwards carried him to Bonn. Here, about 1789, he was made flutist in the orchestra of the elector. In 1794 he went to Hamburg and gave music lessons there, also producing the opera *Godefroid de Montfort.* He was in Paris in 1799 and in Vienna from 1802 to 1808, during which period he saw much of Beethoven and Haydn. In the latter year he returned to Paris, where he produced three operas without much success. In 1817 he succeeded Méhul as professor of counterpoint at the Conservatoire. In 1829 he was naturalized as a Frenchman, and in 1835 he was admitted as a member of the Institute in the place of Boieldieu. He died in Paris on the 28th of May 1836. He produced a vast quantity of church music, five operas, a number of symphonies, oratorios and many miscellaneous works. Though clever and ingenious, his compositions are more remarkable for their novelty than for the beauty of the ideas upon which they are based. His fame is, indeed, more securely based upon his didactic works. His *Traité de mélodie* (Paris, 1814), *Cours de composition musicale* (Paris, 1818), *Traité de haute composition musicale* (Paris, 1824–26), and *Art du compositeur dramatique* (Paris, 1833), are valuable and instructive essays for the student, though many of the theories they set forth are now condemned as erroneous.

REICHENAU, a picturesque island in the Untersee or western arm of the lake of Constance, 3 m. long by 1 broad, and connected with the east shore by a causeway three-quarters of a mile long. It belongs to the grand duchy of Baden. The soil is very fertile, and excellent wine is produced in sufficient quantity for exportation. The Benedictine abbey of Reichenau, founded in 724, was long celebrated for its wealth and for the services rendered by its monks to the cause of learning. In 1540 the abbey, which had previously been independent, was annexed to the see of Constance, and in 1799 it was secularized. The abbey church, dating in part from the 9th century, contains the tomb of Charles the Fat (d. 888), who retired to this island in 887, after losing the empire of Charlemagne. It now serves as the parish church of Mittelzell, while the churches of Oberzell and Unterzell are also interesting buildings of the Carolingian era.

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[1] The once popular view that "king of Judah" stands in no. 29 is untenable. See Petrie, *Hist. of Egypt*, ii. p. 235; L. B. Paton, *Syria and Pal.* p. 193 sq.; W. M. Müller, *Mitteil. Vorderasiat. Gesell.*, 1900, p. 19 sq., and *Ency. Bib.* col. 4486. Breasted (*Amer. Journ. of Sem. Lang.*, 1904, p. 36) has made the interesting observation that the list mentions "the field of Abram" (nos. 71 and 72): see further, *id.*, *Egypt Hist. Records*, iv. pp. 348–357.

REICHENBACH, GEORG VON (1772–1826), German astronomical instrument maker, was born at Durlach in Baden on the 24th of August 1772. From 1796 he was occupied with the construction of a dividing engine; in 1804, with Joseph, Liebherr and Joseph Utzschneider, he founded an instrument-making business in Munich; and in 1809 he established, with Joseph Fraunhofer and Utzschneider, optical works at Benedictbeuern, which were moved to Munich in 1823. He withdrew from both enterprises in 1814, and founded with T. L. Ertel a new optical business, from which also he retired in 1821, on obtaining an engineering appointment under the Bavarian government. He died at Munich on the 21st of May 1826.

Reichenbach's principal merit was that he introduced into observatories the meridian or transit circle, combining the transit instrument and the mural circle into one instrument. This had already been done by O. Römer about 1704, but the idea had not been adopted by any one else, except in the transit circle constructed by Edward Troughton for Stephen Groombridge in 1806. The transit circle in the form given it by Reichenbach had one finely divided circle attached to one end of the horizontal axis and read by four verniers on an "alidade circle," the unaltered position of which was tested by a spirit level. The instrument came almost at once into universal use on the continent of Europe (the first one was made for F. W. Bessel in 1819), but in England the mural circle and transit instrument were not superseded for many years.

REICHENBACH, a town of Germany, in the Prussian province of Silesia, situated on the Peile, at the foot of the Eulengebirge, a spur of the Riesengebirge, 30 m. S.W. of Breslau by rail. Pop. (1905) 15,984. Among its industries are weaving, spinning, dyeing, brewing and machine building, and there is a considerable trade in grain and cattle. Reichenbach is memorable for the victory gained here on the 16th of August 1762 by the Prussians over the Austrians. Here was held the congress which resulted in the convention of Reichenbach—signed on the 27th of July 1790 between Great Britain, Prussia, Austria, Poland and Holland—guaranteeing the integrity of Turkey. Here, too, in June 1813, was signed the treaty of alliance between Austria and the Allies for the prosecution of the war against France.

See the *Kurze Geschichte der Stadt Reichenbach* (Reichenbach, 1874).

REICHENBACH, a town in the kingdom of Saxony, situated in a hilly district, known as the Vogtland, 11 m. S.W. of Zwickau, at the junction of the main lines of railway Dresden-Leipzig-Hof. Pop. (1905) 24,915. It contains a handsome town-hall rebuilt in 1833, and a natural history museum. The industries embrace the manufacture of cloth, machinery and carriages, also dyeing and bleaching. The earliest mention of the town occurs in a document of 1212, and it acquired municipal rights in 1367. The woollen manufacture was introduced in the 15th century, and took the place of the mining industry which had been established earlier.

REICHENBERG (Czech, *Liberec*), a town of Bohemia, 87 m. N.E. of Prague by rail. Pop. (1900) 34,099, chiefly German. The most prominent buildings are the new town-hall (1893); the castle of Count Clam Gallas, built in the 17th century, with additions dating from 1774 and 1850; the Erzdekanatskirche, of the 16th century; the Protestant church, a handsome modern Romanesque edifice (1864–68) and the hall of the cloth-workers. Reichenberg is one of the most important centres of trade and industry in Bohemia, its staple industry being the cloth manufacture. Next in importance comes the spinning and weaving of wool, cotton, linen and carpet manufactures, and dyeing.

Reichenberg is first mentioned in a document of 1348, and from 1622 to 1634 was among the possessions of the great Wallenstein, since whose death it has belonged to the Gallas and Clam Gallas families, though their jurisdiction over the town has long ceased. The cloth-making industry was introduced in 1579.

REICHENHALL, a town and watering-place in the kingdom of Bavaria, finely situated in an amphitheatre of lofty mountains, on the river Saalach, 1570 ft. above sea-level, 9 m. S.W. of Salzburg. Pop. (1900) 4927, excluding visitors. Reichenhall possesses several copious saline springs, producing about 8500 tons of salt per annum. The water of some of the springs, the sources of which are 50 ft. below the surface, is so strongly saturated with salt (up to 24%) that it is at once conducted to the boiling houses, while that of the others is first submitted to a process of evaporation. Reichenhall is the centre of the four chief Bavarian salt-works, which are connected with each other by brine conduits having an aggregate length of 60 m. The surplus brine of Berchtesgaden is conducted to Reichenhall, and thence, in increased volume, to Traunstein and Rosenheim, which possess larger supplies of timber for use as fuel in the process of boiling. Since 1846 Reichenhall has become one of the most fashionable spas and climatic health resorts in Germany, and it is now visited annually by about ten thousand patients, besides many thousand passing tourists. The saline springs are used both for drinking and bathing, and are said to be efficacious in scrofula and incipient tuberculosis.

The brine springs of Reichenhall are mentioned in a document of the 8th century and were perhaps known to the Romans; but almost all trace of antiquity of the town was destroyed by a conflagration in 1834. The brine conduit to Traunstein dates from 1618. The environs abound in numerous charming Alpine excursions.

See G. von Liebig, *Reichenhall, sein Klima und seine Heilmittel* (6th ed., Reichenhall, 1889); and Goldschmidt, *Der Kurort Bad Reichenhall und seine Umgebung* (Vienna, 1892).

REICHENSPERGER, AUGUST (1808–1895), German politician, was born at Coblenz on the 22nd of March 1808, studied law and entered government service, becoming counsellor to the court of appeal (*Appellationsgerichtsrat*) at Cologne in 1849. He was a member of the German parliament at Frankfort in 1848, when he attached himself to the Right, and of the Erfurt parliament in 1850, when he voted against the Prussian Union. From 1850 to 1863 he sat in the Prussian Lower House, from 1867 to 1884 in the Reichstag, and from 1879 onwards also in the Prussian Chamber of Deputies. Originally of Liberal tendencies, he developed from 1837 onwards ultramontane opinions, founded in 1852 the Catholic group which in 1861 took the name of the Centre party (*Centrum*) and became one of its most conspicuous orators. He died on the 16th of July 1895 at Cologne. He published a considerable number of works on art and architecture, including *Die christlich-germanische Baukunst* (Trier, 1852, 3rd ed., 1860); *Fingerzeige auf dem Gebiete der christlichen Kunst* (Leipzig, 1854); *Augustus Pugin, der Neubegründer der christlichen Kunst in England* (Freiburg, 1877).

See L. v. Pastor, *August Reichensperger*, 2 vols. (Freiburg-im-Breisgau, 1899).

His brother, PETER REICHENSPERGER (1810–1892), counsellor to the appeal court at Cologne (1850) and until 1879 to the *Obertribunal* at Berlin, was elected to the Reichstag in 1867 as a member of the Liberal Opposition, but subsequently joined the Centre party. In the *Kulturkampf* he took an active part on the ultramontane side. He had been a member of the Prussian National Assembly in 1848, and in 1888 he published his *Erlebnisse eines alten Parlamentariers im Revolutionsjahr 1848*.

REICHSTADT, NAPOLEON FRANCIS JOSEPH CHARLES, DUKE OF (1811–1832), known by the Bonapartists as Napoleon II., was the son of the Emperor Napoleon I. and Marie Louise, archduchess of Austria. He was born on the 20th of

March 1811, in Paris at the Tuileries palace. He was at first named the king of Rome, after the analogy of the heirs of the emperors of the Holy Roman Empire. By his birth the Napoleonic dynasty seemed to be finally established; but in three years it crumbled in the dust. At the time of the downfall of the empire (April 1814) Marie Louise and the king of Rome were at Blois with Joseph and Jerome Bonaparte, who wished to keep them as hostages. This design, however, was frustrated. Napoleon abdicated in favour of his son; but events prevented the reign of Napoleon II. from being more than titular. While Napoleon repaired to Elba, his consort and child went to Vienna; and they remained in Austria during the Hundred Days (1815), despite efforts made by the Bonapartists to carry off the prince to his father at Paris.

Meanwhile the congress of Vienna had carried out the conditions of the treaty of Fontainebleau (March 1814) whereby the duchies of Parma and Guastalla were to go to the ex-Empress Marie Louise and her son, although much opposition was offered to this proposal by Louis XVIII. and even (so it now appears) by Metternich. The secret treaty of the 31st of May 1815 between Austria, Russia and Prussia secured those possessions to her, her son bearing the title Prince of Parma, with hereditary rights for his descendants. But after the second abdication of Napoleon in favour of his son (22nd of June 1815)—a condition which was wholly nugatory—the powers opposed all participation of the prince in the affairs of Parma. He therefore remained in Austria, while Marie Louise proceeded to Parma. From this time onward he became, as it were, a pawn in the complex game of European politics, his claims being put forward sometimes by Metternich, sometimes by the unionists of Italy, while occasionally malcontents in France used his name to discredit the French Bourbons. The efforts of malcontents increased the resolve of the sovereigns never to allow a son of Napoleon to bear rule; and in November 1816 the court of Vienna informed Marie Louise that her son could not succeed to the duchies. This decision was confirmed by the treaty of Paris of the 10th of June 1817. Marie Louise demanded as a slight compensation that he should have a title derived from the lands of the "Bavarian Palatinate" in northern Bohemia, and the title of "duke of Reichstadt" was therefore conferred on him on the 22nd of July 1818. Thus Napoleon I., who once averred that he would prefer that his son should be strangled rather than brought up as an Austrian prince, lived to see his son reduced to a rank inferior to that of the Austrian archdukes.

His education was confided chiefly to Count Dietrichstein, who found him precocious, volatile, passionate and fond of military affairs. The same judgment was given by Marshal Marmont, duke of Ragusa, who recognized the warlike strain in his character. His nature was sensitive, as appeared on his receiving the news of the death of his father in 1821. The upheaval in France in 1830 and the disturbances which ensued led many Frenchmen to turn their thoughts to Napoleon II.; but though Metternich dallied for a time with the French Bonapartists, he had no intention of inaugurating a Napoleonic revival. By this time, too, the duke's health was on the decline; his impatience of all restraint and his indulgence in physical exercise far beyond his powers aggravated a natural weakness of the chest, and he died on the 22nd of July 1832.

See A. M. Barthelemy and J. P. A. Méry, *Le Fils de l'homme* (Paris, 1829); Baron G. I. Comte de Montbel, *Le Duc de Reichstadt* (Paris, 1832); J. de Saint-Félix, *Histoire de Napoléon II.* (Paris, 1853); Guy de l'Hérault, *Histoire de Napoléon II.* (Paris, 1853); Count Anton von Prokesch-Osten, *Mein Verhältniss zum Herzog von Reichstadt* (Stuttgart, 1878); H. Welschinger, *Le Roi de Rome* (Paris, 1897); E. de Wertheimer, *The Duke of Reichstadt* (Eng. ed., London, 1905); M. Rostand's play *L'Aiglon* is a dramatic setting of the career of the prince. (J. Hl. R.)

REID, SIR GEORGE (1841–), Scottish artist, was born in Aberdeen on the 31st of October 1841. He developed an early passion for drawing, which led to his being apprenticed in 1854 for seven years to Messrs Keith & Gibb, lithographers in Aberdeen. In 1861 Reid took lessons from an itinerant portrait-painter, William Niddrie, who had been a pupil of James Giles, R.S.A., and afterwards entered as a student in the school of the Board of Trustees in Edinburgh. He returned to Aberdeen to paint landscapes and portraits for any trifling sum which his work could command. His first portrait to attract attention, from its fine quality, was that of George Macdonald, the poet and novelist, now the property of the university of Aberdeen. His early landscapes were conscientiously painted in the open air and on the spot. But Reid soon came to see that such work was inherently false, painted as the picture was day after day under varying conditions of light and shade. Accordingly, in 1865 he proceeded to Utrecht to study under A. Mollinger, whose work he admired, from its unity and simplicity. This change in his method of viewing Nature was looked on as revolutionary by the Royal Scottish Academy, and for some years his work found little favour in that quarter; but other artists gradually adopted the system of tone-studies, which ultimately prevailed. Reid went to Paris in 1868 to study under the figure painter Yvon; and he worked in 1872 with Josef Israëls at the Hague. From this time forward Reid's success was continuous and marked. He showed his versatility in landscape, as in his "Whins in Bloom," which combined great breadth with fine detail; in flower-pieces, such as his "Roses," which were brilliant in rapid suggestiveness and force; but most of all in his portraits, which are marked by great individuality, and by fine insight into character. His work in black-and-white, his admirable illustrations in brushwork of Edinburgh and its neighbourhood, and also his pen-drawings, about which it has been declared that "his work contains all the subtleties and refinements of a most delicate etching," must also be noted. Elected Associate of the Royal Scottish Academy in 1870, Reid attained full membership in 1877, and took up his residence in Edinburgh in 1882. In 1891 he was elected President—a post which he held until 1902—receiving also the honour of knighthood, and he was awarded a gold medal at the Paris Exhibition of 1900. His brother Samuel (b. 1854) was also a painter and a writer of tales and verse.

REID, ROBERT (1862–), American artist, was born at Stockbridge, Mass., on the 29th of July 1862. He studied at the art schools of the Boston Museum of Fine Arts, the Art Students' League, New York, and under Boulanger and Lefebvre in Paris. His early pictures were figures of French peasants, painted at Étaples, but subsequently he became best known for mural decoration and designs for stained glass. He contributed with others to the frescoes of the dome of the Liberal Arts Building at the Columbian Exposition, Chicago, in 1893. Other work is in the Congressional Library, Washington, the Appellate Court House, New York, and the State House, Boston, where are his three large panels, "James Otis Delivering his Speech against the Writs of Assistance," "Paul Revere's Ride" and the "Boston Tea Party." He executed a panel for the American Pavilion at the Paris Exhibition, 1900, and in 1906 he completed a series of ten stained glass windows for a church at Fairhaven, Mass., for the Rogers Memorial. In 1906 he became a full member of the National Academy of Design.

REID, SIR ROBERT GILLESPIE (1840–1908), Canadian railway contractor, was born at Coupar-Angus, Scotland. When a young man he spent a few years in Australia gold-mining, and in 1871 he settled in America, where he began his career as a contractor. He built one section of the Canadian Pacific railway, and was responsible for the erection of the international bridge over the Niagara river, the international railway bridge over the Rio Grande river and the Lachine bridge over the St Lawrence. In 1893 Reid signed a contract with the government of Newfoundland by which he undertook to construct a railway from St John's to Port-aux-Basques and to work the line for ten years in return for a large grant of land. In 1898 he further contracted to work all the railways in Newfoundland for fifty years on condition that at the end of this time they should become his property. This bargain, which included other matters such as steamers, docks and telegraphs, was extraordinarily favourable to Reid, who, by further enormous grants of land, became one of the largest landed proprietors in the world; public opinion was aroused against it, and at first the governor, Sir Herbert Murray, refused to ratify it. After the premier, Sir James Winter, had been replaced by Mr (afterwards Sir) Robert Bond, the terms of the contract were revised, being made more favourable to Newfoundland, and Reid's interests were transferred to a company, the Reid Newfoundland Company, of which he was the first president (see NEWFOUNDLAND, *Roads and Railways*). Reid was knighted in 1907, and he died on the 3rd of June 1908.

REID, THOMAS (1710–1796), Scottish philosopher, was born at Strachan in Kincardineshire, on the 26th of April 1710. His father was minister of the place for fifty years, and traced his descent from a long line of Presbyterian ministers on Deeside. His mother belonged to the brilliant Gregory family (*q.v.*), which, in the 18th century, gave so many representatives to literature and science in Scotland. Reid graduated at Aberdeen in 1726, and remained there as librarian to the university for ten years, a period which he devoted largely to mathematical reading. In 1737 he was presented to the living of Newmachar near Aberdeen. The parishioners, violently excited at the time about the law of patronage, received him with open hostility; and tradition asserts that his uncle defended him on the pulpit stair with a drawn sword. Though not distinguished as a preacher, he was successful in winning the affections of his people. The publication of Hume's treatise turned his attention to philosophy, and in particular to the theory of external perception. His first publication, however, dealt with a question of philosophical method suggested by the reading of Hutcheson. The "Essay on Quantity, occasioned by reading a Treatise in which Simple and Compound Ratios are applied to Virtue and Merit," denies the possibility of a mathematical treatment of moral subjects. The essay appeared in the *Transactions* of the Royal Society (1748). In 1740 Reid married a cousin, the daughter of a London physician. In 1752 the professors of King's College, Aberdeen, elected him to the chair of philosophy, which he held for twelve years. The foundation of the Aberdeen Philosophical Society (the "Wise Club"), which numbered among its members Campbell, Beattie, Gerard and Dr John Gregory, was mainly owing to the exertions of Reid, who was secretary for the first year (1758). Many of the subjects of discussion were drawn from Hume's speculations; and during the last years of his stay in Aberdeen Reid propounded his new point of view in several papers read before the society. The results of these papers were embodied in the *Enquiry into the Human Mind on the Principles of Common Sense* (1764). The *Enquiry* does not go beyond an analysis of sense perception, and is therefore more limited in scope than the later *Essays*; but if the latter are more mature, there is more freshness about the earlier work. In this year, Reid succeeded Adam Smith as professor of moral philosophy in the university of Glasgow. After seventeen years of active teaching, he retired in order to complete his philosophical system. As a lecturer, he was inferior in charm and eloquence to Brown and Stewart; the latter says that "silent and respectful attention" was accorded to the "simplicity and perspicuity of his style" and "the gravity and authority of his character." His philosophical influence was exerted largely through the writings of Dugald Stewart and Sir William Hamilton. The *Essays on the Intellectual Powers of Man* appeared in 1785, and their ethical complement, the *Essays on the Active Powers of the Human Mind*, in 1788. These, with an account of Aristotle's *Logic* appended to Lord Kames's *Sketches of the History of Man* (1774), conclude the list of works published in Reid's lifetime. Hamilton's edition of Reid also contains an account of the university of Glasgow and a selection of Reid's letters, chiefly addressed to his Aberdeen friends the Skenes, to Lord Kames, and to Dr James Gregory. With the two last named he discussed the materialism of Priestley and the theory of necessitarianism. He reverted in his old age to the mathematical pursuits of his earlier years, and his ardour for knowledge of every kind remained fresh to the last. He died of paralysis on the 7th of October 1796, his wife and all his children save one having predeceased him. His portrait by Raeburn is the property of Glasgow University, and in the National Portrait Gallery, Edinburgh, there is a good medallion by Tassie, taken in his eighty-first year. His character was marked by independence, economy and generosity.

Common Sense.

The key to Reid's philosophy is to be found in his revulsion from the sceptical conclusions of Hume. In several passages of his writings he expressly dates his philosophical awakening from the appearance of the *Treatise of Human Nature*. In the dedication of the *Enquiry*, he says: "The ingenious author of that treatise upon the principles of Locke—who was no sceptic—hath built a system of scepticism which leaves no ground to believe any one thing rather than its contrary. His reasoning appeared to me to be just; there was, therefore, a necessity to call in question the principles upon which it was founded, or to admit the conclusion." Reid thus takes Hume's scepticism as, on its own showing, a *reductio ad impossibile* (see HUME, *ad fin.*) of accepted philosophical principles, and refuses, accordingly, to separate Hume from his intellectual progenitors. From its origin in Descartes and onwards through Locke and Berkeley, modern philosophy carried with it, Reid contends, the germ of scepticism. Embracing the whole philosophic movement under the name of "the Cartesian system," Reid detects its fundamental error in the unproved assumption shared by these thinkers "that all the objects of my knowledge are ideas in my own mind." This doctrine or hypothesis he usually speaks of as "the ideal system" or "the theory of ideas"; and to it he opposes his own analysis of the act of perception. In view of the results of this analysis, Reid's theory (and the theory of Scottish philosophy generally) has been dubbed natural realism or natural dualism, in contrast to theories like subjective idealism and materialism or to the cosmothetic idealism or hypothetical dualism of the majority of philosophers. But this unduly narrows the scope of Scottish philosophy, which does not exhaust itself, as is sometimes supposed, in uncritically reasserting the independent existence of matter and its immediate presence to mind. The real significance of Reid's doctrine lies in its attack upon Hume's fundamental principles, (1) that all our perceptions are distinct existences, and (2) that the mind never perceives any real connexion among distinct existences (cf. Appendix to the third volume of the *Treatise*, 1740). It is here that the danger of "the ideal system" really lies—in its reduction of reality to "particular perceptions," essentially unconnected with each other. This theory admitted, nothing is left for philosophy save to explain the illusion of necessary connexion. Reid, however, attacks the fundamental assumption. In logical language, he denies the actuality of the abstract particular. The unit of knowledge is not an isolated impression but a judgment; and in such a judgment is contained, even initially, the reference both to a permanent subject and to a permanent world of thought, and, implied in these, such judgments, for example, as those of existence, substance, cause and effect. Such principles are not derived from sensation, but are "suggested" on occasion of sensation, in such a way as to constitute the necessary conditions of our having perceptive experience at all. Thus we do not start with "ideas," and afterwards refer them to objects; we are never restricted to our own minds, but are from the first immediately related to a permanent world. Reid has a variety of names for the principles which, by their presence, lift us out of subjectivity into perception. He calls them "natural judgments," "natural suggestions," "judgments of nature," "judgments immediately inspired by our constitution," "principles of our nature," "first principles," "principles of common sense." The last designation, which became the current one, was undoubtedly unfortunate, and has conveyed to many a false impression of Scottish philosophy. It has been understood as if Reid had merely appealed from the reasoned conclusions of philosophers to the unreasoned beliefs of common life. But Reid's actions are better than his words; his real mode of procedure is to redargue Hume's conclusions by a refutation of the premises inherited by him from his predecessors. For the rest, as regards the question of nomenclature, Reid everywhere unites common sense and reason, making the former "only another name for one branch or degree of reason." Reason, as judging of things self-evident, is called common sense to distinguish it from ratiocination or reasoning. And in regard to Reid's favourite proof of the principles in question by reference to "the consent of ages and nations, of the learned and unlearned," it is only fair to observe that this argument assumes a much more scientific form in the *Essays*, where it is almost identified with an appeal to "the structure and grammar of all languages." "The structure of all languages," he says, "is grounded upon common sense." To take but one example, "the distinction between sensible qualities and the substance to which they belong, and between thought and the mind that thinks, is not the invention of philosophers; it is found in the structure of all languages, and therefore must be common to all men who speak with understanding" (Hamilton's *Reid*, pp. 229 and 454).

Reid and Kant.

The principles which Reid insists upon as everywhere present in experience evidently correspond pretty closely to the Kantian categories and the unity of apperception. Similarly, Reid's assertion of the essential distinction between space or extension and feeling or any succession of feelings may be compared with Kant's doctrine in the *Aesthetic*. "Space," he says, "whether tangible or visible, is not so properly an object [Kant's "matter"] as a necessary concomitant of the objects both of sight and touch." Like Kant, too, Reid finds in space the source of a necessity which sense, as sense, cannot give (Hamilton's *Reid*, p. 323). In the substance of their answer to Hume, the two philosophers have therefore much in common. But Reid lacked the art to give due impressiveness to the important advance which his positions really contain. Although at times he states his principles with a wonderful degree of breadth and insight, he mars the effect by looseness of statement, and by the incorporation of irrelevant psychological matter. And, if Kant was overridden by a love of symmetry, Reid's indifference to form and system is an even more dangerous defect. Further, Reid is inclined to state his principles dogmatically rather than as logical deductions. The transcendental deduction, or proof from the possibility of experience in general, which forms the vital centre of the Kantian scheme, is wanting in Reid; or, at all events, if the spirit of the proof is occasionally present, it is nowhere adequately developed. Nevertheless, Reid's insistence on judgment as the unit of knowledge and his sharp distinction between sensation and perception must still be recognized as of the highest importance.

The Scottish School.

The relativism or phenomenalism which Hamilton afterwards adopted from Kant and sought to engraft upon Scottish philosophy is wholly absent from the original Scottish doctrine. One or two passages may certainly be quoted from Reid in which he asserts that we know only properties of things and are ignorant of their essence. But the exact meaning which he attaches to such expressions is not quite clear; and they occur, moreover, only incidentally and with the air of current phrases mechanically repeated. Dugald Stewart, however, deliberately emphasizes the merely qualitative nature of our knowledge as the foundation of philosophical argument, and thus paves the way for the thoroughgoing philosophy of nescience elaborated by Hamilton. But since Hamilton's time the most typical Scottish thinkers have repudiated his relativistic doctrine, and returned to the original tradition of the school. For Reid's ethical theory, see ETHICS.

The complete edition of the works by Sir William Hamilton, published in two volumes with notes and supplementary dissertations by the editor (6th ed. 1863), has superseded all others. For Reid's life see D. Stewart's *Memoir* prefixed to Hamilton's edition of Reid's works. See also McCosh, *Scottish Philosophers* (1875); Rait, *Universities of Aberdeen*, pp. 199–203, 223; A. C. Fraser, *Monograph* (1898); A. Bain, *Mental Science*, p. 207, p. 422 (for his theory of free will), and Appendix, pp. 29, 63, 88, 89.

(A. S. P.-P.; X.)

REID, THOMAS MAYNE (1818–1883), better known as MAYNE REID, British novelist, the son of a Presbyterian minister, was born at Ballyroney, Co. Down, Ireland, on the 4th of April 1818. His own early life was as adventurous as any boy reader of his novels could desire. He was educated for the church, but did not take orders, and when twenty years old went to America in search of excitement and fortune. He made trading excursions on the Red river, studying the ways of the red man and the white pioneer. He made acquaintance with the Missouri in the same manner, and roved through all the states of the Union. In Philadelphia, where he was engaged in journalism from 1843 to 1846, he made the acquaintance of Edgar Allan Poe. When the war with Mexico broke out in 1846 he obtained a captain's commission, was present at the siege and capture of Vera Cruz, and led a forlorn hope at Chapultepec, where he sustained such severe injuries that his life was despaired of. In one of his novels he says that he believed theoretically in the military value of untrained troops, and that he had found his theories confirmed in actual warfare. An enthusiastic republican, he offered his services to the Hungarian insurgents in 1849, raised a body of volunteers, and sailed for Europe, but arrived too late. He then settled in England, and began his career of a novelist with the publication, in 1850, of the *Rifle Rangers*. This was followed next year by the *Scalp Hunters*. He never surpassed his first productions, except perhaps in *The White Chief* (1859) and *The Quadroon* (1856); but he continued to produce tales of self-reliant enterprise and exciting adventure with great fertility. Simplicity of plot and easy variety of exciting incident are among the merits that contribute to his popularity with boys. His reflections are not profound, but are frequently more sensible than might be presumed at first from his aggressive manner of expressing them. He died in London on the 22nd of October 1883.

See *Memoir* (1890) by his widow, Elizabeth Mayne Reid.

REID, WHITELAW (1837–), American journalist and diplomatist, was born of Scotch parentage, near Xenia, Ohio, on the 27th of October 1837. He graduated at Miami University in 1856, and spoke frequently in behalf of John C. Frémont, the Republican candidate for the presidency in that year; was superintendent of schools of South Charleston, Ohio, in 1856–58, and in 1858–59 was editor of the Xenia *News*. In 1860 he became legislative correspondent at Columbus for several Ohio newspapers, including the Cincinnati *Gazette*, of which he was made city editor in 1861. He was war correspondent for the *Gazette* in 1861–62, serving also as volunteer aide-de-camp (with the rank of captain) to General Thomas A. Morris (1811–1904) and General William S. Rosecrans in West Virginia. He was Washington correspondent of the *Gazette* in 1862–68, acting incidentally as clerk of the military committee of Congress (1862–63) and as librarian of the House of Representatives (1863–66). In 1868 he became a leading editorial writer for the New York *Tribune*, in the following year was made managing editor, and in 1872, upon the death of Horace Greeley, became the principal proprietor and editor-in-chief. In 1905 Reid relinquished his active editorship of the *Tribune*, but retained financial control. He declined an appointment as United States minister to Germany in 1877 and again in 1881, but served as minister to France in 1889–92, and in 1892 was the unsuccessful Republican candidate for vice-president on the ticket with Benjamin Harrison. In 1897 he was special ambassador of the United States on the occasion of Queen Victoria's jubilee; in 1898 was a member of the commission which arranged the terms of peace between the United States and Spain; in 1902 was special ambassador of the United States at the coronation of King Edward VII., and in 1905 became ambassador to Great Britain. He was elected a life member of the New York State Board of Regents in 1878; and in 1902 he became vice-chancellor and, in 1904, chancellor of the university of the state of New York. In 1881 he married a daughter of Darius Ogden Mills (1825–1910), a prominent financier.

His publications include *After the War* (1867), in which he gives his observations during a journey through the Southern States in 1866; *Ohio in the War* (2 vols., 1868); *Some Consequences of the Last Treaty of Paris* (1899); *Our New Duties* (1899); *Later Aspects of Our New Duties* (1899); *Problems of Expansion* (1900); *The Greatest Fact in Modern History* (1906), and *How America faced its Educational Problem* (1906).

REID, SIR WILLIAM (1791–1858), Scottish administrator and man of science, was born on the 25th of April 1791 at the manse of Kinglassie, Fifeshire, and entered the Royal Engineers in 1809. He saw active service in the Peninsula under Wellington, and took part in the bombardment of Algiers in 1816. In 1835 and 1836 he again saw active service, in Spain against Don Carlos. In 1838 he published his *Attempt to develop the Law of Storms*, which obtained wide popularity. In 1839 he was appointed governor of the Bermudas, where he did much to develop the agricultural resources of the islands, and in 1846 he was transferred to Barbados. In 1850–51 he was chairman of the executive committee of the Great Exhibition; on the completion of the work he was made a K.C.B. and appointed governor of Malta. He died in London on the 31st of October 1858.

REIGATE, a market town and municipal borough in the Reigate parliamentary division of Surrey, England, 24 m. S. by W. of London by the South-Eastern & Chatham railway. Pop. (1901) 25,993. It is situated at the head of the long valley of Holmsdale Hollow, beneath the North Downs. A very fine prospect over a great part of Surrey and Sussex, and extending to Hampshire and Kent, is obtained from the neighbouring Reigate Hill. Of the old castle, supposed to have been built before the Conquest to command the pass through the valley, there only remains the entrance to a cave beneath, 150 ft. long and from 10 to 12 ft. high, excavated in the sandstone, which was used as a guardroom. The grounds are laid out as a public garden. Near the market house is the site of an ancient chapel dedicated to Thomas à Becket. In the chancel of the parish church of St Mary, a building ranging from Transitional Norman to Perpendicular, is buried Lord Howard, the commander of the English navy against the Spanish Armada. Above the vestry there is a library containing choice manuscripts and rare books. The grammar school was founded in 1675. Among the other public buildings are the town hall, the public hall, the market hall, and the working men's institute. The borough includes the township of Redhill, adjacent on the east. The town has some agricultural trade, and in the neighbourhood are quarries for freestone, hearthstone and white sand. The borough is under a mayor, 6 aldermen and 18 councillors. Area, 5994 acres.

Reigate (*Cherchefelle*, *Regat*, *Reygate*) owed its first settlement to its situation at a cross-road on the Pilgrim's Way, at the foot of the North Downs; and its early importance to the castle which was the stronghold of the De Warennes in the 12th, 13th and 14th centuries. On the death of Edith, the widow of Edward the Confessor, to whom it belonged, William I. secured the manor of Cherchefelle, as it was then called. It was granted by William Rufus to Earl Warenne, through whose family it passed in 1347 to the earls of Arundel. The name Reigate occurs in 1199. Burgesses of Reigate are mentioned in a close roll of 1348, but no early charter is known. The town was incorporated in 1863. It returned two members to parliament from 1295 till 1831, and afterwards one member only until 1867, when it was disfranchised for corruption. In the reign of Edward I. Earl Warenne held a weekly market on Saturdays, and fairs on Tuesday in Whitsun-week, the eve and day of St Lawrence, and the eve and day of the Exaltation of the Cross, by prescriptive right. Edward II. granted a market on Tuesdays, which is still held. The fair days are now Whit-Tuesday and the 9th of December.

REIMARUS, HERMANN SAMUEL (1694–1768), German philosopher and man of letters, was born at Hamburg, on the 22nd of December 1694. He was educated by his father and by the famous scholar J. A. Fabricius, whose son-in-law he subsequently became. He studied theology, ancient languages, and philosophy at Jena, became *Privatdozent* in the university of Wittenberg in 1716, and in 1720–21 visited Holland and England. In 1723 he became rector of the high school at Wismar in Mecklenburg, and in 1727 professor of Hebrew and Oriental languages in the high school of his native city. This post he held till his death, though offers of more lucrative positions were made to him. His duties were light, and he employed his leisure in the study of philology, mathematics, philosophy, history, political economy, natural science and natural history, for which he made large collections. His house was the centre of the highest culture of Hamburg, and a monument of his influence in that city still remains in the *Haus der patriotischen Gesellschaft*, where the learned and artistic societies partly founded by him still meet. He had seven children, only three of whom survived him—the distinguished physician Johann Albrecht Heinrich, and two daughters, one of them being Elise, Lessing's friend and correspondent. He died on the 1st of March 1768.

Reimarus's reputation as a scholar rests on the valuable edition of Dio Cassius (1750–52) which he prepared from the materials collected by J. A. Fabricius. He published a work on logic (*Vernunftlehre als Anweisung zum richtigen Gebrauche der Vernunft*, 1756, 5th ed., 1790), and two popular books on the religious questions of the day. The first of these was a collection of essays on the principal truths of natural religion (*Abhandlungen von den vornehmsten Wahrheiten der natürlichen Religion*, 1755, 7th ed., 1798); the second (*Betrachtungen über die Triebe der Thiere*, 1760, 4th ed., 1798) dealt with one particular branch of the same subject. His philosophical position is essentially that of Christian Wolff. But he is best known by his *Apologie oder Schutzschrift für die vernünftigen Verehrer Gottes* (carefully kept back during his lifetime), from which, after his death, Lessing published certain chapters under the title of the *Wolfenbüttel Fragments* (see Lessing). The original MS. is in the Hamburg town library; a copy was made for the university library of Göttingen, 1814, and other copies are known to exist. In addition to the seven fragments published by Lessing, a second portion of the work was issued in 1787 by C. A. E. Schmidt (a pseudonym), under the title *Uebrige noch ungedruckte Werke des Wolfenbüttelschen Fragmentisten*, and a further portion by D. W. Klose in *Niedner's Zeitschrift für historische Theologie*, 1850–52. Two of the five books of the first part and the whole of the second part, as well as appendices on the canon, remain unprinted. But D. F. Strauss has given an exhaustive analysis of the whole work in his book on Reimarus.

The standpoint of the *Apologie* is that of pure naturalistic deism. Miracles and mysteries are denied, and natural religion is put forward as the absolute contradiction of revealed. The essential truths of the former are the existence of a wise and good Creator and the immortality of the soul. These truths are discoverable by reason, and are such as can constitute the basis of a universal religion. A revealed religion could never obtain universality, as it could never be intelligible and credible to all men. Even supposing its possibility, the Bible does not present such a revelation. It abounds in error as to matters of fact, contradicts human experience, reason and morals, and is one tissue of folly, deceit, enthusiasm, selfishness and crime. Moreover, it is not a doctrinal compendium, or catechism, which a revelation would have to be. What the Old Testament says of the worship of God is little, and that little worthless, while its writers are unacquainted with the second fundamental truth of religion, the immortality of the soul. The design of the writers of the New Testament, as well as that of Jesus, was not to teach true rational religion, but to serve their own selfish ambitions, in promoting which they exhibit an amazing combination of conscious fraud and enthusiasm. It is important, however, to remember that Reimarus attacked atheism with equal effect and sincerity, and that he was a man of high moral character, respected and esteemed by his contemporaries.

Modern estimates of Reimarus may be found in the works of B. Pünjer, O. Pfleiderer and H. Höffding. Pünjer states the position of Reimarus as follows: "God is the Creator of the world, and His wisdom and goodness are conspicuous in it. Immortality is founded upon the essential nature of man and upon the purpose of God in creation. Religion is conducive to our happiness and alone brings satisfaction. Miracles are at variance with the divine purpose; without miracles there could be no revelation" (Pünjer, *History of Christian Philosophy of Religion since Kant*, Engl. trans., pp. 550–57, which contains an exposition of the *Abhandlungen* and *Schutzschrift*). Pfleiderer says the errors of Reimarus were that he ignored historical and literary criticism, sources, date, origin, &c., of documents, and the narratives were said to be either purely divine or purely human. He had no conception of an immanent reason (*Philosophy of Religion*, Eng. trans., vol. i. p. 102). H. Höffding also has a brief section on the *Schutzschrift*, stating its main position as follows: "Natural religion suffices; a revelation is therefore superfluous. Moreover, such a thing is both physically and morally impossible. God cannot interrupt His own work by miracles; nor can He favour some men above others by revelations which are not granted to all, and with which it is not even possible for all to become acquainted. But of all doctrines that of eternal punishment is most contrary, Reimarus thinks, to true ideas of God, and it was this point which first caused him to stumble" (*History of Modern Phil.*, Eng. trans. (1900), vol. ii. pp. 12, 13).

See the "Fragments" as published by Lessing, reprinted in vol. xv. of *Lessing's Werke*, Hempel's edition; D. F. Strauss, *H. S. Reimarus und seine Schutzschrift für die vernünftigen Verehrer Gottes* (1862, 2nd ed. 1877); Charles Voysey, *Fragments from Reimarus* (London, 1879) (a translation of the life of Reimarus by Strauss, with the second part of the seventh fragment, on the "Object of Jesus and his Disciples"); the *Lives* of Lessing by Danzel and G. E. Guhrauer, Sime, and Zimmern; Kuno Fischer, *Geschichte der neuern Philosophie* (vol. ii. pp. 759–72, 2nd ed. 1867); Zeller, *Geschichte der deutschen Philosophie* (2nd ed., 1875, pp. 243–46).

REIMS (Rheims), a city of north-eastern France, chief town of an arrondissement of the department of Marne, 98 m. E.N.E. of Paris, on the Eastern railway. Pop. (1906) 102,800. Reims is situated in a plain on the right bank of the Vesle, a tributary of the Aisne, and on the canal which connects the Aisne with the Marne. South and west rise the "montagne de Reims" and vine-clad hills. Reims is limited S.W. by the Vesle and the canal, N.W. by promenades which separate it from the railway and in other directions by boulevards lined with fine residences. Beyond extend large suburbs, the chief of which are Cérès to the N.E., Coutures to the E., Laon to the N. and Vesle to the W. Of its squares the principal are the Place

Royale, with a statue of Louis XV., and the place du Parvis, with an equestrian statue of Joan of Arc. The rue de Vesle, the chief street, continued under other names, traverses the town from S.W. to N.W., passing through the Place Royale.

The oldest monument in Reims is the Mars Gate (so called from a temple to Mars in the neighbourhood), a triumphal arch 108 ft. in length by 43 in height, consisting of three archways flanked by columns. It is popularly supposed to have been erected by the Remi in honour of Augustus when Agrippa made the great roads terminating at the town, but probably belongs to the 3rd or 4th century. In its vicinity a curious mosaic, measuring 36 ft. by 26, with thirty-five medallions representing animals and gladiators, was discovered in 1860. To these remains must be added a Gallo-Roman sarcophagus, said to be that of the consul Jovinus (see below) and preserved in the archaeological museum in the cloister of the abbey of St Remi. The cathedral of Notre-Dame, where the kings of France used to be crowned, replaced an older church (burned in 1211) built on the site of the basilica where Clovis was baptized by St Remigius. The cathedral, with the exception of the west front, was completed by the end of the 13th century. That portion was erected in the 14th century after 13th-century designs—the nave having in the meantime been lengthened to afford room for the crowds that attended the coronations. In 1481 fire destroyed the roof and the spires. In 1875 the National Assembly voted £80,000 for repairs of the façade and balustrades. This façade is the finest portion of the building, and one of the most perfect masterpieces of the middle ages. The three portals are laden with statues and statuettes. The central portal, dedicated to the Virgin, is surmounted by a rose-window framed in an arch itself decorated with statuary. The “ gallery of the kings ” above has the baptism of Clovis in the centre and statues of his successors. The towers, 267 ft. high, were originally designed to rise 394 ft.; that on the south contains two great bells, one of which, named “ Charlotte ” by Cardinal de Lorraine in 1570, weighs more than 11 tons. The façades of the transepts are also decorated with sculptures—that on the north with statues of the principal bishops of Reims, a representation of the Last Judgment and a figure of Christ (*le Beau Dieu*) while that on the south side has a beautiful rose-window with the prophets and apostles. Of the four towers which flanked the transepts nothing remains above the height of the roof since the fire of 1481. Above the choir rises an elegant bell-tower in timber and lead, 59 ft. high, reconstructed in the 15th century. The interior of the cathedral is 455 ft. long, 98 ft. wide in the nave, and 125 ft. high in the centre, and comprises a nave with aisles, transepts with aisles, a choir with double aisles, and an apse with deambulatory and radiating chapels. It has a profusion of statues similar to those of the outside, and stained glass of the 13th century. The rose-window over the main portal and the gallery beneath are of rare magnificence. The cathedral possesses fine tapestries. Of these the most important series is that presented by Robert de Lenoncourt, archbishop under Francis I., representing the life of the Virgin. The north transept contains a fine organ in a Flamboyant Gothic case. The choir clock is ornamented with curious mechanical figures. Several paintings, by Tintoretto, Nicolas Poussin, and others, and the carved woodwork and the railings of the choir, also deserve mention. The treasury contains the Sainte Ampoule, or holy flask, the successor of the ancient one broken at the Revolution (see below), a fragment of which it contains.

The archiepiscopal palace, built between 1498 and 1509, and in part rebuilt in 1675, was occupied by the kings on the occasion of their coronation. The saloon (salle du Tau), where the royal banquet was held, has an immense stone chimney of the 15th century, medallions of the archbishops of Reims, and portraits of fourteen kings crowned in the city. Among the other rooms of the royal suite, all of which are of great beauty and richness, is that now used for the meetings of the Reims Academy; the building also contains a library. The chapel of the archiepiscopal palace consists of two storeys, of which the upper still serves as a place of worship. Both the chapel and the salle du Tau are decorated with tapestries of the 17th century, known as the Perpersack tapestries, after the Flemish weaver who executed them.

After the cathedral, which it almost equals in size, the most celebrated church is St Remi, once attached to an important abbey, the buildings of which are used as a hospital. St Remi dates from the 11th, 12th, 13th and 15th centuries. The nave and transepts, Romanesque in style, date mainly from the earliest, the façade of the south transept from the latest, of those periods, the choir and apse chapels from the 12th and 13th centuries. The valuable monuments with which the church was at one time filled were pillaged during the Revolution, and even the tomb of the saint is a modern work; but there remain the 12th-century glass windows of the apse and tapestries representing the history of St Remigius, given by Robert de Lenoncourt. The churches of St Jacques, St Maurice (partly rebuilt in 1867), St André, and St Thomas (erected from 1847 to 1853, under the patronage of Cardinal Gousset, now buried within its walls), are all of minor interest. Of the fine church of St Nicaise only insignificant remains are to be seen.

The town hall, erected in the 17th and enlarged in the 19th century, has a pediment with an equestrian statue of Louis XIII. and a tall and elegant campanile. It contains a picture gallery, ethnographical, archaeological and other collections, and the public library. There are many old houses, the House of the Musicians (13th century) being so called from the seated figures of musicians which decorate the front.

In 1874 the construction of a chain of detached forts was begun in the vicinity, Reims being selected as one of the chief defences of the northern approaches of Paris. The ridge of St Thierry is crowned with a fort of the same name, which with the neighbouring work of Chenay closes the west side of the place. To the north the hill of Brimont has three works guarding the Laon railway and the Aisne canal. Farther east, on the old Roman road, lies the fort de Fresnes. Due east the hills of Arnay are crowned with five large and important works which cover the approaches from the upper Aisne. Forts Pompelle and Montbré close the south-east side, and the Falaise hills on the Paris side are open and unguarded. The perimeter of the defences is not quite 22 m., and the forts are a mean distance of 6 m. from the centre of the city.

Reims is the seat of an archbishop, a court of assize and a sub-prefect. It is an important centre for the combing, carding and spinning of wool and the weaving of flannel, merino, cloth and woollen goods of all kinds, these industries employing some 24,000 hands; dyeing and “ dressing ” are also carried on. It is the chief wool market in France, and has a “ conditioning house ” which determines the loss of weight resulting from the drying of the wool. The manufacture of and trade in champagne is also very important. The wine is stored in large cellars tunnelled in the chalk. Other manufactures are machinery, chemicals, safes, capsules, bottles, casks, candles, soap and paper. The town is well known for its cakes and biscuits.

History.—Before the Roman conquest Reims, as *Durocortorum*, was capital of the Remi, from whose name that of the town was subsequently derived. The Remi made voluntary submission to the Romans, and by their fidelity throughout the various Gallic insurrections secured the special favour of their conquerors. Christianity was established in the town by the middle of the 3rd century, at which period the bishopric was founded. The consul Jovinus, an influential supporter of the new faith, repulsed the barbarians who invaded Champagne in 336; but the Vandals captured the town in 406 and slew St Nicasus, and Attila afterwards put it to fire and sword. Clovis, after his victory at Soissons (486), was baptized at Reims in 496 by St Remigius. Later kings desired to be consecrated at Reims with the oil of the sacred phial which was believed to have been brought from heaven by a dove for the baptism of Clovis and was preserved in the abbey of St Remi. Meetings of Pope Stephen III. with Pippin the Short, and of Leo III. with Charlemagne, took place at Reims; and here Louis the Debonnaire was crowned by Stephen IV. Louis IV. gave the town and countship of Reims to the archbishop Artaldus in 940. Louis VII. gave the title of duke and peer to William of Champagne, archbishop from 1176 to 1202, and the archbishops of Reims took precedence of the other ecclesiastical peers of the realm. In the 10th century Reims had become a centre of intellectual culture, Archbishop Adalberon, seconded by the monk Gerbert (afterwards Pope Silvester II.), having founded schools where the “ liberal arts ” were taught. Adalberon was also one of the prime authors of the revolution which put the Capet house in the place of the Carolingians. The most important prerogative of the archbishops was the consecration of the kings of France—a privilege which was exercised, except in a few cases, from the time of Philip Augustus to that of Charles X. Louis VII. granted the town a communal charter in 1139. The treaty of Troyes (1420) ceded it to the English, who had made a futile attempt to take it by siege in 1360; but they were expelled on the approach of Joan of Arc, who in 1429 caused Charles VII. to be consecrated in the cathedral. A revolt at Reims, caused by the salt tax in 1461, was cruelly repressed by Louis XI. The town sided with the League (1585), but submitted to Henry IV. after the battle of

Ivry. In the foreign invasions of 1814 it was captured and recaptured; in 1870–71 it was made by the Germans the seat of a governor-general and impoverished by heavy requisitions.

See G. Marlot, *Histoire de la ville, cité et université de Reims*, 4 vols. (Reims, 1843–46); J. Justinus (Baron I. Taylor), *La Ville de Reims* (Paris, 1854).

REIN, a guiding or controlling leather strap or thong, attached to the bit of a ridden or driven horse (see SADDLERY). The word is taken from the O. Fr. *rene*, modern *rêne*, and is usually traced to a supposed Late Latin substantive *retina* formed from *retinere*, to hold back, restrain, cf. classical Latin *retinaculum*, halter. The word, usually in the plural, has been often used figuratively, as a type of that which guides, restrains or controls, *e.g.* in such phrases as the "reins of government," &c. The "reins," *i.e.* the kidneys (Lat. *renes*, cf. Gr. *φρήν*, the midriff), or the place where the kidneys are situated, hence the loins, also, figuratively, the seat of the emotions or affections, must be distinguished.

REINACH, JOSEPH (1856–   ), French author and politician, was born in Paris on the 30th of September 1856. After leaving the Lycée Condorcet he studied for the bar, being called in 1887. He attracted the attention of Gambetta by articles on Balkan politics published in the *Revue bleue*, and joined the staff of the *République française*. In Gambetta's *grand ministère* M. Reinach was his secretary, and drew up the case for a partial revision of the constitution and for the electoral method known as the *scrutin de liste*. In the *République française* he waged a steady war against General Boulanger which brought him three duels, one with Edmond Magnier and two with Paul Déroulède. Between 1889 and 1898 he sat for the Chamber of Deputies for Digne. As member of the army commission, reporter of the budgets of the ministries of the interior and of agriculture he brought forward bills for the better treatment of the insane, for the establishment of a colonial ministry, for the taxation of alcohol, and for the reparation of judicial errors. He advocated complete freedom of the theatre and the press, the abolition of public executions, and denounced political corruption of all kinds. He was indirectly implicated in the Panama scandals through his father-in-law, Baron de Reinach, though he made restitution as soon as he learned that he was benefiting by fraud. But he is best known as the champion of Captain Dreyfus. At the time of the original trial he attempted to secure a public hearing of the case, and in 1897 he allied himself with Scheurer-Kestner to demand its revision. He denounced in the *Siècle* the Henry forgery, and Esterhazy's complicity. His articles in the *Siècle* aroused the fury of the anti-Dreyfusard party, especially as he was himself a Jew and therefore open to the charge of having undertaken to defend the innocence of Dreyfus on racial grounds. He lost his seat in the Chamber of Deputies, and, having refused to fight Henri Rochefort, eventually brought an action for libel against him. Finally, the "affaire" being terminated and Dreyfus pardoned, he undertook to write the history of the case, the first four volumes of which appeared in 1901. This was completed in 1905. In 1906 M. Reinach was re-elected for Digne. In that year he became member of the commission of the national archives, and next year of the council on prisons. Reinach was a voluminous writer on political subjects. On Gambetta he published three volumes in 1884, and he also edited his speeches. For the criticisms of the anti-Dreyfusard press see Henri Dutrait-Croyon, *Joseph Reinach, historien* (Paris, 1905), a violent criticism in detail of Reinach's history of the "affaire."

His brother, the well-known *savant*, SALOMON REINACH (1858–   ), born at St Germain-en-Laye on the 29th of August 1858, was educated at the École normale supérieure, and joined the French school at Athens in 1879. He made valuable archaeological discoveries at Myrina near Smyrna in 1880–82, at Cyme in 1881, at Thasos, Imbros and Lesbos (1882), at Carthage and Meninx (1883–84), at Odessa (1893) and elsewhere. He received honours from the chief learned societies of Europe, and in 1886 received an appointment at the National Museum of Antiquities at St Germain; in 1893 he became assistant keeper, and in 1902 keeper of the national museums. In 1903 he became joint editor of the *Revue archéologique*, and in the same year officer of the Legion of Honour. The lectures he delivered on art at the École du Louvre in 1902–3 were published by him under the title of *Apollo*. This book has been translated into most European languages, and is one of the most compact handbooks of the subject.

His first published work was a translation of Schopenhauer's *Essay on Free Will* (1877), which passed through many editions. This was followed by many works and articles in the learned reviews of which a list—up to 1903—is available in *Bibliographie de S. R.* (Angers, 1903). His *Manuel de philologie classique* (1880–1884) was crowned by the French association for the study of Greek; his *Grammaire latine* (1886) received a prize from the Society of Secondary Education; *La Nécropole de Myrina* (1887), written with E. Pottier, and *Antiquités nationales* were crowned by the Academy of Inscriptions. He compiled an important *Répertoire de la statuaire grecque et romaine* (3 vols., 1897–98); also *Répertoire de peintures du moyen âge et de la Renaissance 1280–1580* (1905, &c.); *Répertoire des vases peints grecs et étrusques* (1900). In 1905 he began his *Cultes, mythes et religions*; and in 1909 he published a general sketch of the history of religions under the title of *Orpheus*. He also translated from the English H. C. Lea's *History of the Inquisition*.

A younger brother, THEODORE REINACH (1860–   ), also had a brilliant career as a scholar. He pleaded at the Parisian bar in 1881–86, but eventually gave himself up to the study of numismatics. He wrote important works on the ancient kingdoms of Asia Minor—*Trois royaumes de l'Asie Mineure, Cappadoce, Bithynie, Pont* (1888), *Mithridate Eupator* (1890); also a critical edition and translation with H. Weil of Plutarch's Treatise on Music; and an *Histoire des Israélites depuis la ruine de leur indépendance nationale jusqu'à nos jours* (2nd ed., 1901). From 1888 to 1897 he edited the *Revue des études grecques*.

REINAUD, JOSEPH TOUSSAINT (1795–1867), French orientalist, was born on the 4th of December 1795 at Lambesc, Bouches du Rhône. He came to Paris in 1815, and became a pupil of Silvestre de Sacy. In 1818–19 he was at Rome as an attaché to the French minister, and studied under the Maronites of the Propaganda, but gave special attention to Mahommedan coins. In 1824 he entered the department of oriental MSS. in the Royal Library at Paris, and in 1838, on the death of De Sacy, he succeeded to his chair in the school of living oriental languages. In 1847 he became president of the Société Asiatique, and in 1858 conservator of oriental MSS. in the Imperial Library. His first important work was his classical description of the collections of the duc de Blacas (1828). To history he contributed an essay on the Arab invasions of France, Savoy, Piedmont and Switzerland (1836), and various collections for the period of the crusades; he edited (1840) and in part translated (1848) the geography of Abulfeda; to him too is due a useful edition of the very curious records of early Arab intercourse with China of which Eusèbe Renaudot had given but an imperfect translation (*Relation des voyages*, &c., 1845), and various other essays illustrating the ancient and medieval geography of the East. Reinaud died in Paris on the 14th of May 1867.

REINDEER, in its strict sense the title of a European deer distinguished from all other members of the family Cervidae (see DEER), save those of the same genus, by the presence of antlers in both sexes; but, in the wider sense, including Asiatic and North American deer of the same general type, the latter of which are locally designated caribou. Reindeer, or caribou, constitute the genus *Rangifer*, and are large clumsily built deer, inhabiting the sub-Arctic and Arctic regions of both hemispheres. As regards their distinctive features, the antlers are of a complex type and situated close to the occipital ridge of the skull, and thus far away from the sockets of the eyes, with the brow-tines in adult males palmated, laterally compressed, deflected towards the middle of the face, and often unsymmetrically developed. Above the brow-tine is developed a second palmated tine, which appears to represent the bez-tine of the red-deer; there is no trez-tine, but some distance above the bez the beam is suddenly bent forward to form an "elbow," on the posterior side of which is usually a short back-tine; above the back-tine the beam is continued for some distance to terminate in a large expansion or palmation. The antlers of females are simple and generally smaller. The muzzle is entirely hairy; the ears and tail are short; and the throat is maned. The coat is unspotted at all ages, with a whitish area in the region of the tail. The main hoofs are short and rounded and the lateral hoofs very large. There is a tarsal, but no metatarsal gland and tuft. In the skull the gland-pit is shallow, and the vacuity of moderate size; the nasal bones are well developed, and much expanded at the upper end. Upper canines are wanting; the cheek-teeth are small and low-crowned, with the third lobe of the last molar in the lower jaw minute. The lateral metacarpal bones are represented only by their lower extremities; the importance of this feature being noticed in the article DEER.

In spite of the existence of a number of more or less well-marked geographical forms, reindeer from all parts of the northern hemisphere present such a marked similarity that it seems preferable to regard them as all belonging to a single widespread species, of which most of the characters will be the same as those of the genus. American naturalists, however, generally regard these as distinct species. The coat is remarkable for its density and compactness; the general colour of the head and upper parts being clove-brown, with more or less white or whitish grey on the under parts and inner surfaces of the limbs, while there is also some white above the hoofs and on the muzzle, and there may be whitish rings round the eyes; there is a white area in the region of the tail, which includes the sides but not the upper surface of the latter; and the tarsal tuft is generally white. The antlers are smooth, and brownish white in colour, but the hoofs jet black. Albino varieties occasionally occur in the wild state. A height of 4 ft. 10 in. at the shoulder has been recorded in the case of one race.

The wild Scandinavian reindeer (*Rangifer tarandus*) may be regarded as the typical form of the species. It is a smaller animal than the American woodland race, with antlers approximating to those of the barren-ground race, but less elongated, and with a distinct back-tine in the male, the brow-tines moderately palmated and frequently nearly symmetrical, and the bez-tine not excessively expanded. Female antlers are generally much smaller than those of males, although occasionally as large, but with much fewer points. The antlers make their appearance at an unusually early age.

Mr Madison Grant considers that American reindeer, or caribou, may be grouped under two types, one represented by the barren-ground caribou *R. tarandus arcticus*, which is a small animal with immense antlers characterized by the length of the beam, and the consequent wide separation of the terminal palmation from the brow-tine; and the other by the woodland-caribou (*R. t. caribou*), which is a larger animal with shorter and more massive antlers, in which the great terminal expansions are in approximation to the brow-tine owing to the shortness of the beam. Up to 1902 seven other American races had been described, four of which are grouped by Grant with the first and three with the second type. Some of these forms are, however, more or less intermediate between the two main types, as is a pair of antlers from Novaia Zemlia described by the present writer as *R. t. pearsoni*. The Scandinavian reindeer is identified by Mr Grant with the barren-ground type.

Reindeer are domesticated by the Lapps and other nationalities of northern Europe and Asia, to whom these animals are all-important. Domesticated reindeer have also been introduced into Alaska.

See Madison Grant, "The Caribou," *7th Annual Report, New York Zoological Society* (1902); J. G. Millais, *Newfoundland and its Untrodden Ways* (1908). (R. L.*)

REINECKE, CARL HEINRICH CARSTEN (1824–1910), German composer and pianist, was born at Altona on the 23rd of June 1824; his father, Peter Reinecke (who was also his teacher), being an accomplished musician. At the age of eleven he made his first appearance as a pianist, and when scarcely eighteen he went on a successful tour through Denmark and Sweden. After a stay in Leipzig, where he studied under Mendelssohn and under Schumann, Reinecke went on tour with Königslöw and Wasielewski, Schumann's biographer, in North Germany and Denmark. From 1846 to 1848 Reinecke was court pianist to Christian VIII. of Denmark. After resigning this post he went first to Paris, and next to Cologne, as professor in the Conservatorium. From 1854 to 1859 he was music director at Barmen, in the latter year filling this post at Breslau University; in 1860 he became conductor of the famous Leipzig Gewandhaus, a post which (together with that of professor at the Conservatorium) he held with honour and distinction for thirty-five years. He finally retired into private life in 1902 and died in March 1910. During this time Reinecke continually made concert tours to England and elsewhere. His pianoforte playing belonged to a school now almost extinct. Grace and neatness were its characteristics, and at one time Reinecke was probably unrivalled as a Mozart player and an accompanist. His grand opera *König Manfred*, and the comic opera *Auf hohen Befehl*, were at one time frequently played in Germany; and his cantata *Hakon Jarl* is melodiously beautiful, as are many of his songs; while his Friedensfeier overture was once quite hackneyed. By far his most valuable works are those written for educational purposes. His sonatinas, his "Kindergarten" and much that he has ably edited will keep his name alive.

REINHART, CHARLES STANLEY (1844–1896), American painter and illustrator, was born at Pittsburg, Pennsylvania, and after having been employed in railway work and at a steel factory, studied art in Paris and at the Munich Academy under Straehuber and Otto. He afterwards settled in New York, but spent the years 1882–1886 in Paris. He was a regular exhibitor at the National Academy in New York, and contributed illustrations in black and white and in colours to the leading American periodicals. He died in 1896. Among his best-known pictures are: "Reconnoitring," "Caught Napping," "September Morning," "Mussel Fisherwoman," "At the Ferry," "Normandy Coast," "Gathering Wood," "The Old Life Boat," "Sunday," and "English Garden"; but it is as an illustrator that he is best known.

REINHART, JOACHIM CHRISTIAN (1761–1847), German painter and etcher, was born at Hof in Bavaria in 1761, and studied under Oeser at Leipzig and under Klingel at Dresden. In 1789 he went to Rome, where he became a follower of the classicist German painters Carstens and Koch. He devoted himself more particularly to landscape painting and to aquatint engraving. Examples of his landscapes are to be found at most of the important German galleries, notably at Frankfort, Munich, Leipzig and Gotha. In Rome he executed a series of landscape frescoes for the Villa Massimi. He died in Rome in 1847.

REINHOLD, KARL LEONHARD (1758–1823) German philosopher, was born at Vienna. At the age of fourteen he entered the Jesuit college of St Anna, on the dissolution of which (1774) he joined a similar college of the order of St Barnabas. Finding himself out of sympathy with monastic life, he fled in 1783 to North Germany, and settled in Weimar, where he became Wieland's *collaborateur* on the *German Mercury*, and eventually his son-in-law. In the *German Mercury* he published, in the years 1786–87, his *Briefe über die Kantische Philosophie*, which were most important in making Kant known to a wider circle of readers. As a result of the *Letters*, Reinhold received a call to the university of Jena, where he taught from 1787 to 1794. In 1789 he published his chief work, the *Versuch einer neuen Theorie des menschlichen Vorstellungsvermögens*, in which he attempted to simplify the Kantian theory and make it more of a unity. In 1794 he accepted a call to Kiel, where he taught till his death in 1823, but his independent activity was at an end. In later life he was powerfully influenced by Fichte, and subsequently, on grounds of religious feeling, by Jacobi and Bardili. His historical importance belongs entirely to his earlier activity. The development of the Kantian standpoint contained in the "New Theory of Human Understanding" (1789), and in the *Fundament des philosophischen Wissens* (1791), was called by its author *Elementarphilosophie*.

"Reinhold lays greater emphasis than Kant upon the unity and activity of consciousness. The principle of consciousness tells us that every idea is related both to an object and a subject, and is partly to be distinguished, partly united to both. Since form cannot produce matter nor subject object, we are forced to assume a thing-in-itself. But this is a notion which is self-contradictory if consciousness be essentially a relating activity. There is there-for something which must be thought and yet cannot be thought" (Höffding, *History of Modern Philosophy*, Eng. trans., vol. ii.).

See R. Keil, *Wieland und Reinhold* (2nd ed., Leipzig, 1890); J. E. Erdmann, *Grundriss der Geschichte der Philosophie* (Berlin, 1866); histories of philosophy by R. Folckenberg and W. Windelband.

REINKENS, JOSEPH HUBERT (1821–1896), German Old Catholic bishop, was born at Burtscheid, near Aix-la-Chapelle, on the 1st of March 1821, his father being a gardener. In 1836, on the death of his mother, he took to manual work in order to support his numerous brothers and sisters, but in 1840 he was able to go to the gymnasium at Aix, and he afterwards studied theology at the universities of Bonn and Munich. He was ordained priest in 1848, and in 1849 graduated as doctor in theology. He was soon appointed professor of ecclesiastical history at Breslau, and in 1865 he was made rector of the university. During this period he wrote, among other treatises, monographs on Clement of Alexandria, Hilary of Poitiers and Martin of Tours. In consequence of an essay on art, especially in tragedy, after Aristotle, he was made doctor in philosophy in the university of Leipzig. When, in 1870, the question of papal infallibility was raised, Reinkens attached himself to the party opposed to the proclamation of the dogma. He wrote several pamphlets on church tradition relative to infallibility and on the procedure of the Council. When the dogma of infallibility was proclaimed, Reinkens joined the band of influential theologians, headed by Döllinger, who resolved to organize resistance to the decree. He was one of those who signed the Declaration of Nüremberg in 1871, and at the Bonn conferences with Orientals and Anglicans in 1874 and 1875 he was conspicuous. The Old Catholics having decided to separate themselves from the Church of Rome, Reinkens was chosen their bishop in Germany at an enthusiastic meeting at Cologne in 1873 (see OLD CATHOLICS). On the 11th of August of that year he was consecrated by Dr Heykamp, bishop of Deventer. Reinkens devoted himself zealously to his office, and it was due to his efforts that the Old Catholic movement crystallized into an organized church, with a definite status in the various German states. He wrote a number of theological works after his consecration, but none of them so important as his treatise on Cyprian and the Unity of the Church (1873). The chief act of his episcopal career was his consecration in 1876 of Dr Edward Herzog to preside as bishop over the Old Catholic Church in Switzerland. In 1881 Reinkens visited England, and received Holy Communion more than once with bishops, clergy and laity of the Church of England, and in 1894 he defended the validity of Anglican orders against his co-religionists, the Old Catholics of Holland. He died at Bonn on the 4th of January 1896.

See *Joseph Hubert Reinkens*, by his nephew, J. M. Reinkens (Gotha, 1906).

REISKE, JOHANN JACOB (1716–1774), German scholar and physician, was born on the 25th of December 1716 at Zörbig in Electoral Saxony. From the Waisenhaus at Halle he passed in 1733 to the university of Leipzig, and there spent five years. He tried to find his own way in Greek literature, to which German schools then gave little attention; but, as he had not mastered the grammar, he soon found this a sore task and took up Arabic. He was very poor, having almost nothing beyond his allowance, which for the five years was only two hundred thalers. But everything of which he could cheat his appetite was spent on Arabic books, and when he had read all that was then printed he thirsted for manuscripts, and in March 1738 started on foot for Hamburg, joyous though totally unprovided, on his way to Leiden and the treasures of the Warnerianum. At Hamburg he got some money and letters of recommendation from the Hebraist Wolf, and took ship to Amsterdam. Here d'Orville, to whom he had an introduction, proposed to retain him as his amanuensis at a salary of six hundred guilders. Reiske refused, though he thought the offer very generous; he did not want money, he wanted manuscripts. When he reached Leiden (June 6, 1738) he found that the lectures were over for the term and that the MSS. were not open to him. But d'Orville and A. Schultens helped him to private teaching and reading for the press, by which he was able to live. He heard the lectures of A. Schultens, and practised himself in Arabic with his son J. J. Schultens. Through Schultens too he got at Arabic MSS., and was even allowed *sub rosa* to take them home with him. Ultimately he seems to have got free access to the collection, which he re-catalogued—the work of almost a whole summer, for which the curators rewarded him with nine guilders.

Reiske's first years in Leiden were not unhappy, till he got into serious trouble by introducing emendations of his own into the second edition of Burmann's *Petronius*, which he had to see through the press. His patrons withdrew from him, and his chance of perhaps becoming professor was gone; d'Orville indeed soon came round, for he could not do without Reiske, who did work of which his patron, after dressing it up in his own style, took the credit. But A. Schultens was never the same as before to him; Reiske indeed was too independent, and hurt him by his open criticisms of his master's way of making Arabic mainly a handmaid of Hebrew. Reiske, however, himself admits that Schultens always behaved honourably to him. In 1742 by Schultens's advice Reiske took up medicine as a study by which he might hope to live if he could not do so by philology. In 1746 he graduated as M.D., the fees being remitted at Schultens's intercession. It was Schultens too who conquered the difficulties opposed to his graduation at the last moment by the faculty of theology on the ground that some of his theses had a materialistic ring. On the 10th of June 1746 he left Holland and settled in Leipzig, where he hoped to get medical practice.

But his shy, proud nature was not fitted to gain patients, and the Leipzig doctors would not recommend one who was not a Leipzig graduate. In 1747 an Arabic dedication to the electoral prince of Saxony got him the title of professor, but neither the faculty of arts nor that of medicine was willing to admit him among them, and he never delivered a course of lectures. He had still to go on doing literary task-work, but his labour was much worse paid in Leipzig than in Leiden. Still he could have lived and sent his old mother, as his custom was, a yearly present of a piece of leather to be sold in retail if he had been a better manager. But, careless for the morrow, he was always printing at his own cost great books which found no buyers. His academical colleagues were hostile; and Ernesti, under a show of friendship, secretly hindered his promotion. His unsparing reviews made bad blood with the pillars of the university.

At length in 1758 the magistrates of Leipzig rescued him from his misery by giving him the rectorate of St Nicolai, and, though he still made no way with the leading men of the university and suffered from the hostility of men like Ruhnken and J. D. Michaelis, he was compensated for this by the esteem of Frederick the Great, of Lessing, Karsten Niebuhr, and many foreign scholars. The last decade of his life was made cheerful by his marriage with Ernestine Müller, who shared all his interests and learned Greek to help him with collations. In proof of his gratitude her portrait stands beside his in the first volume of the *Oratores Graeci*. Reiske died on the 14th of August 1774, and his MS. remains passed, through Lessing's mediation, to the Danish minister Suhm, and are now in the Copenhagen library.

Reiske certainly surpassed all his predecessors in the range and quality of his knowledge of Arabic literature. It was the history, the *realia* of the literature, that always interested him; he did not care for Arabic poetry as such, and the then much praised Harīrī seemed to him a grammatical pedant. He read the poets less for their verses than for such scholia as supplied historical notices. Thus for example the scholia on Jarīr furnished him with a remarkable notice of the prevalence of Buddhist doctrine and asceticism in 'Irāk under the Omayyads. In the *Adnotationes historicae* to his Abulfeda (*Abulf. Annales Moslemici*, 5 vols., Copenhagen, 1789–91), he collected a veritable treasure of sound and original research; he knew the Byzantine writers as thoroughly as the Arabic authors, and was alike at home in modern works of travel in all languages and in ancient and medieval authorities. He was interested too in numismatics, and his letters on Arabic coinage (in Eichhorn's *Repertorium*, vols. ix.–xi.) form, according to De Sacy, the basis of that branch of study. To comprehensive knowledge and very wide reading he added a sound historical judgment. He was not, like Schultens, deceived by the pretended antiquity of the Yemenite Kasidas.[1] Errors no doubt he made, as in the attempt to ascertain the date of the breach of the dam of Marib.

Though Abulfeda as a late epitomator did not afford a starting-point for methodical study of the sources, Reiske's edition with his version and notes certainly laid the foundation for research in Arabic history. The foundation of Arabic philology, however, was laid not by him but by De Sacy. Reiske's linguistic knowledge was great, but he used it only to understand his authors; he had no feeling for form, for language as language, or for metre.

In Leipzig Reiske worked mainly at Greek, though he continued to draw on his Arabic stores accumulated in Leiden. Yet his merit as an Arabist was sooner recognized than the value of his Greek work. Reiske the Greek scholar has been rightly valued only in recent years, and it is now recognized that he was the first German since Sylburg who had a living knowledge of the Greek tongue. His reputation does not rest on his numerous editions, often hasty or even made to booksellers' orders, but in his remarks, especially his conjectures. He himself designates the *Animadversationes in Scriptores Graecos* as *flos ingenii sui*, and in truth these thin booklets outweigh his big editions. Closely following the author's thought he removes obstacles whenever he meets them, but he is so steeped in the language and thinks so truly like a Greek that the difficulties he feels often seem to us to lie in mere points of style. His criticism is empirical and unmethodic, based on immense and careful reading, and applied only when he feels a difficulty; and he is most successful when he has a large mass of tolerably homogeneous literature to lean on, whilst on isolated points he is often at a loss. His corrections are often hasty and false, but a surprisingly large proportion of them have since received confirmation from MSS. And, though his merits as a Grecian lie mainly in his conjectures, his realism is felt in this sphere also; his German translations especially show more freedom and practical insight, more feeling for actual life, than is common with the scholars of that age.[2]

For a list of Reiske's writings see Meusel, xi. 192 seq. His chief Arabic works (all posthumous) have been mentioned above. In Greek letters his chief works are *Constantini Porphyrogeniti libri II. de ceremoniis aulae Byzant.*, vols. i. ii. (Leipzig, 1751–66), vol. iii. (Bonn, 1829); *Animadv. ad Graecos auctores* (5 vols., Leipzig, 1751–66) (the rest lies unprinted at Copenhagen); *Oratorum Graec. quae supersunt* (8 vols., Leipzig, 1770–73); *App. crit. ad Demosthenem* (3 vols., *ib.*, 1774–75); *Maximus Tyr.* (*ib.*, 1774); *Plutarchus* (11 vols., *ib.*, 1774–79); *Dionys Italic.* (6 vols., *ib.*, 1774–77); *Libanius* (4 vols., Altenburg, 1784–97). Various reviews in the *Acta eruditorum* and *Zuverl. Nachrichten* are characteristic and worth reading. Compare *D. Johann Jacob Reiskens von ihm selbst aufgesetzte Lebensbeschreibung* (Leipzig, 1783). (J. We.)

RÉJANE, GABRIELLE [Charlotte Réju] (1857–   ), French actress, was born in Paris, the daughter of an actor. She was a pupil of Regnier at the Conservatoire, and took the second prize for comedy in 1874. Her *début* was made the next year, during which she played attractively a number of light—especially soubrette—parts. Her first great success was in Henri Meilhac's *Ma camarade* (1883), and she soon became known as an emotional actress of rare gifts, notably in *Décoré*, *Germinie Lacerteux*, *Ma cousine*, *Amoureuse* and *Lysistrata*. In 1892 she married M. Porel, the director of the Vaudeville theatre, but the marriage was dissolved in 1905. Her performances in *Madame Sans Gêne* (1893) made her as well known in England and America as in Paris, and in later years she appeared in characteristic parts in both countries, being particularly successful in *Zaza* and *La Passerelle*. She opened the Théâtre Réjane in Paris in 1906. The essence of French vivacity and animated expression appeared to be concentrated in Madame Réjane's acting, and made her unrivalled in the parts which she had made her own.

RELAND, ADRIAN (1676–1718), Dutch Orientalist, was born at Ryp, studied at Utrecht and Leiden, and was professor of Oriental languages successively at Harderwijk (1699) and Utrecht (1701). His most important works were *Palaestina ex veteribus monumentis illustrata* (Utrecht, 1714), and *Antiquitates sacrae veterum Hebraeorum*. (See also Burman, *Traj. Erud.*, p. 296 seq.).

RELAPSING FEVER (*Febris recurrens*), the name given to a specific infectious disease occasionally appearing as an epidemic in communities suffering from scarcity or famine. It is characterized mainly by its sudden invasion, with violent febrile symptoms, which continue for about a week and end in a crisis, but are followed, after another week, by a return of the fever.

This disease has received many other names, the best known of which are famine fever, seven-day, bilious relapsing fever, and spirillum fever. As in the case of typhoid, relapsing fever was long believed to be simply a form of typhus. The distinction between them appears to have been first clearly established in 1826, in connexion with an epidemic in Ireland.

Relapsing fever is highly contagious. With respect to the nature of the contagion, certain important observations have been made (see also Parasitic Diseases). In 1873 Obermeier discovered in the blood of persons suffering from relapsing fever minute organisms in the form of spiral filaments of the genus *Spirochaete*, measuring in length $\frac{1}{500}$ to $\frac{1}{1000}$ inch and in breadth $\frac{1}{40000}$ to $\frac{1}{50000}$ inch, and possessed of rotatory or twisting movements. This organism received the name of *Spirillum obermeieri*. Fritz Schaudinn has brought forward evidence that it is an animal parasite. The most constantly recognized factor in the origin and spread of relapsing fever is destitution; but this cannot be regarded as more than a predisposing cause, since in many lands widespread and destructive famines have prevailed without any outbreak of this fever. Instances, too, have been recorded where epidemics were distinctly associated with overcrowding rather than with privation. Relapsing fever is most commonly met with in the young. One attack does not appear to protect from others, but rather, according to some authorities, engenders liability.

The incubation of the disease is about one week. The symptoms of the fever then show themselves with great abruptness and violence by a rigor, accompanied with pains in the limbs and severe headache. The febrile phenomena are very marked, and the temperature quickly rises to a high point (105°–107° Fahr.), at which it continues with little variation, while the pulse is rapid (100–140), full and strong. There is intense thirst, a dry brown tongue, bilious vomiting, tenderness over the liver and spleen, and occasionally jaundice. Sometimes a peculiar bronzy appearance of the skin is noticed, but there is no characteristic rash as in typhus. There is much prostration of strength. After the continuance of these symptoms for a period of from five to seven days, the temperature suddenly falls to the normal point or below it, the pulse becomes correspondingly slow, and a profuse perspiration occurs, while the severe headache disappears and the appetite returns. Except for a sense of weakness, the patient feels well and may even return to work, but in some cases there remains a condition of great debility, accompanied with rheumatic pains in the limbs. This state of freedom from fever continues for about a week, when there occurs a well-marked relapse with scarcely less abruptness and severity than in the first attack, and the whole symptoms are of the same character, but they do not, as a rule, continue so long, and they terminate in a crisis in three or four days, after which convalescence proceeds satisfactorily. Second, third and even fourth relapses, however, may occur in exceptional cases.

The mortality in relapsing fever is comparatively small, about 5% being the average death-rate in epidemics (Murchison). The fatal cases occur mostly from the complications common to continued fevers. The treatment is essentially the same as that for typhus fever. Löwenthal and Gabritochewsky by using the serum of an immune horse succeeded in averting the relapse in 40% of cases.

RELATIVITY OF KNOWLEDGE, a philosophic term which was much used by the philosophers of the middle of the 19th century, and has since fallen largely into disuse. It deserves explanation, however, not only because it has occupied so large a space in the writings of some great British thinkers, but also because the main question for which it stands is still matter of eager debate. We get at the meaning of the term most easily by considering what it is that "relativity" is opposed to. "Relativity" of knowledge is opposed to absoluteness or positiveness of knowledge. Now there are two senses in which knowledge may claim to be absolute. The knower may say, "I *know* this absolutely," or he may say, "I know *this* absolutely." With the emphasis upon the "know" he asserts that his knowledge of the matter in question cannot be affected by anything whatever. "I know absolutely that two and two are four" makes an assertion about the knower's intellectual state: he is convinced that his certain knowledge of the result of adding two to two is independent of any other piece of knowledge. With the emphasis upon the object of knowledge, "I know *this*;" we have the other sense of absoluteness of knowledge: it is an assertion that the knower knows the "this," whatever it may be, in its essence or as it truly is in itself. The phrase "relativity of knowledge" has therefore two meanings: (*a*) that no portion of knowledge is absolute, but is always affected by its relations to other portions of knowledge; (*b*) that what we know are not absolute things in themselves, but things conditioned in their quality by our channels of knowledge. Each of these two propositions must command assent as soon as uncritical ignorance gives place to philosophic reflection; but each may be exaggerated, indeed has currently been exaggerated, into falsity. The simplest experience—a single note struck upon the piano—would not be what it is to us but for its relation by contrast or comparison with other experiences. This is true; but we may easily exaggerate it into a falsehood by saying that a piece of experience is entirely constituted by its relation to other experiences. Such an extreme relativity, as advocated by T. H. Green in the first chapter of his *Prolegomena to Ethics*, involves the absurdity that our whole experience is a tissue of relations with no points of attachment on which the relations depend. The only motive for advocating it is the prejudice of absolute idealism which would deny that sensation has any part whatever in the constitution of experience. As soon as we recognize the part of sensation, we have no reason to deny the common-sense position that each piece of experience has its own quality, which is modified indefinitely by the relations in which it stands.

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[1] "Animadvers. criticae in Hamzae hist. regni Joctanidarum," in Eichhorn's *Mon. Ant. Hist. Ar.*, 1775.

[2] For this estimate of Reiske as a Greek scholar the writer is indebted to Prof. U. v. Wilamowitz-Moellendorff.

The second sense of relativity, that which asserts the impossibility of knowing things except as conditioned by our perceptive faculties, is more important philosophically and has had a more interesting history. To apprehend it is really the first great step in philosophical education. The unphilosophical person assumes that a tree as he sees it is identical with the tree as it is in itself and as it is for other percipient minds. Reflection shows that our apprehension of the tree is conditioned by the sense-organs with which we have been endowed, and that the apprehension of a blind man, and still more the apprehension of a dog or horse, is quite different from ours. What the tree is in itself—that is, for a perfect intelligence—we cannot know, any more than a dog or horse can know what the tree is for a human intelligence. So far the relativist is on sure ground; but from this truth is developed the paradox that the tree has no objective existence at all and consists entirely of the conscious states of the perceiver. Observe the parallelism of the two paradoxical forms of relativity: one says that things are relations with nothing that is related; the other says that things are perceptive conditions with nothing objective to which the conditions apply. Both make the given nothing and the work of the mind everything.

To see the absurdity of the second paradox of relativity is easier than to refute it. If nothing exists but the conscious states of the perceiver, how does he come to think that there is an objective tree at all? Why does he regard his conscious states as produced by an object? And how does he come to imagine that there are other minds than his own? In short, this kind of relativity leads straight to what is generally known as "the abyss of solipsism." But, like all the great paradoxes of philosophy, it has its value in directing our attention to a vital, yet much neglected, element of experience. We cannot avoid solipsism (*q.v.*) so long as we neglect the element of force or power. If, as Hegel asserted, our experience is all knowledge, and if knowledge is indefinitely transformed by the conditions of knowing, then we are tempted to regard the object as superfluous, and to treat our innate conviction that knowledge has reference to objects as a delusion which philosophical reflection is destined to dispel. The remedy for the paradox is to recognize that the foundation for our belief in the existence of objects is the force which they exercise upon us and the resistance which they offer to our will. What the tree is in regard to its specific qualities depends on what faculties we have for perceiving it. But, whatever specific qualities it may have, it will still exist as an object, so long as it comes into dynamic relations with our minds.

In the history of thought the relativity of knowledge as just described begins with Descartes, the founder of modern philosophy: the characteristic of modern philosophy is that it lays more stress upon the subjective than upon the objective side of experience. It is a mistake to refer it back to the Greeks. The maxim of Protagoras, for example, "Man is the measure of all things," has a different purpose; it was meant to point to the truth that man rather than nature is the primary object of human study: it is a doctrine of humanism rather than of relativism. To appreciate the relativistic doctrines we find in various thinkers we must take account of the use to which they were put. By Descartes the principle was used as an instrument of scepticism, the beneficent scepticism of pulling down medieval philosophy to make room for modern science; by Berkeley it was used to combat the materialists; by Hume in the cause of scepticism once more against the intellectual dogmatists; by Kant to prepare a justification for a noumenal sphere to be apprehended by faith; by J. S. Mill and Herbert Spencer to support their derivation of all our experience from sensation. It is in Mill's *Examination of Sir William Hamilton's Philosophy* that the classical statement of the Relativity of Knowledge is to be found. The second chapter of that book sets forth the various forms of the doctrine with admirable lucidity and precision, and gives many references to other writers.

For the sake of clearness it seems desirable to keep for the future the term "relativity of knowledge" to the first meaning explained above: for the second meaning it has been superseded in contemporary philosophizing by the terms "subjectivism," "subjective idealism," and, for its extreme form, "solipsism" (*q.v.*). (H. St.)

RELEASE (O.Fr. *reles*, variant of *relais*, from *relaisser*, to release, let go, Lat. *relaxare*), freedom or deliverance from trouble, pain or sorrow, the freeing or discharge from some obligation or debt, the action of letting go or releasing something fixed or set in position. In law, the term is applied to the discharge of some obligation, by which it is extinguished (see Debt), and to the conveyance of an estate or interest in real or personal property to one who has already some estate or interest therein. For the special form of conveyancing known as "lease and release," see Conveyancing.

RELICS (Lat, *reliquiae*, the equivalent of the English "remains" in the sense of a dead body), the name given in the Catholic Church to,(1) the bodies of the saints, or portions of them,(2) such objects as the saints made use of during their lives, or as were used at their martyrdom. These objects are held by the Church in religious veneration, and by their means it hopes to obtain divine grace and miraculous benefits (*Conc. Trid.* sess. 24).

These ideas had taken shape, in all essentials, during the early days of the Church, underwent further development in the middle ages, and were maintained by the Catholic Church in the face of the opposition of the Reformers, while all the Protestant Churches rejected them.

The origins of the veneration of relics lie in the anxiety for the preservation of the bodies of the martyrs. Nothing is more natural than that the pious solicitude felt by all men for the bodies of their loved ones should in the primitive Christian Churches have been turned most strongly towards the bodies of those who had met with death in confessing their faith. The account given by the church at Smyrna of the death of their bishop Polycarp (155) gives us an insight into these feelings. The church collected and buried the remains of the martyr, who had been burnt, in order duly to celebrate the anniversary of the martyrdom at the place of burial. The possession of the relics seemed to assure the continuation of the common life of the church with their bishop, of the living with the dead (*Mart. Polyc.* c. 17).

The custom of which we have here for the first time an account had become universal by the 3rd century. In all parts the Christians assembled on the anniversary of the martyrs' death at their graves, to celebrate the Agape and the Eucharist at this spot. It was a favourite custom to bury the dead near the graves of the martyrs; and it was the highest wish of many to "rest with the saints." It was the body lying in the tomb which was venerated (see Euseb. *Hist. eccl.* vii. 11, 24; viii. 6, 7).

But these customs soon underwent a further development. About the end of the 3rd and the beginning of the 4th century it became customary for the bodies of the martyrs not to be buried, but preserved for the purpose of veneration. Already individual Christians began to possess themselves of portions of the bodies of martyrs, and to carry them about with them. Both these practices met with criticism and opposition, especially from the leading men of the Church. According to the testimony of Athanasius of Alexandria, the hermit Anthony decided that it should be held to be unlawful and impious to leave the bodies of the martyrs unburied (*Vita Ant.* 90). In Carthage the archdeacon and later the bishop Caecilianus severely blamed a certain Lucilla for carrying about with her a relic which she used to kiss before receiving the Eucharist (Optatus, *De schism. Donat.* i. 16). The compiler of the *Acta S. Fructuosi*, a Spanish ecclesiastic, represents the martyred bishop as himself requesting the burial of his relics. But energetic as the opposition was, it was unsuccessful, and died out. For in the meantime opinion as to the efficacy of relics had undergone a transformation, parallel with the growth of the theory, which soon predominated in the Church, that material instruments are the vehicles of divine grace. When the Christians of Smyrna decided that the bones of the martyrs were of more worth than gold or gems, and when Origen (*Exh. ad mart.* 50) spoke of the precious blood of the martyrs, they were thinking of the act of faith which the martyrs had accomplished by the sacrifice of their life. Now, on the other hand, the relic came to be looked upon as in itself a thing of value as the channel of miraculous divine powers. These ideas are set forth by Cyril of Jerusalem. He taught that a certain power dwelt in the body of the saint, even when the soul had departed from it; just as it was the instrument of the soul during life, so the power passed permanently into it (*Cat.* xviii. 16). This was coming very near to a belief that objects which the saints had used during their life had also a share in their miraculous powers. And this conclusion Cyril had already come to (*loc. cit.*).

We can see how early this estimate of relics became general from the fact that the former hesitation as to whether they should be venerated as sacred died out during the 4th century. The Fathers of the Greek Church especially were united in recommending the veneration of relics. All the great theologians of the 4th and 5th centuries may be quoted as evidence of this: Eusebius of Caesarea (*Praep. Ev.* xiii.11), Gregory of Nazianzus (*Orat. in Cypr.* 17), Gregory of Nyssa (*Orat. de S. Theod. mart.*), Basil of Caesarea (*Ep.* ii. 197), Chrysostom (*Laud. Drosidis*), Theodoret of Cyrus (*Inps. 67*, 11), &c. John of Damascus, the great exponent of dogma in the 8th century, gave expression to the result of a uniform development which had been going on for centuries when he taught that Christ offers the relics to Christians as means of salvation. They must not be looked upon as something that is dead; for through them all good things come to those who pray with faith. Why should it seem impossible to believe in this power of the relics, when water could be made to gush from a rock in the desert? (*De fide orthod.* iv. 15).

Such was the theory; and the practice was in harmony with it. Throughout the whole of the Eastern Church the veneration of relics prevailed. Nobody hesitated to divide up the bodies of the saints in order to afford as many portions of them as possible. They were shared among the inhabitants of cities and villages, Theodoret tells us, and cherished by everybody as healers and physicians for both body and soul (*De cur. Graec. aff.* 8). The transition from the true relic to the hallowed object was especially common. Jerusalem, as early as the time of Eusebius, rejoiced in the possession of the episcopal chair of James the Just (*Hist. eccl.* vii. 19); and as late as the 4th century was discovered the most important of the relics of Christ, the cross which was alleged to have been His. Cyril of Jerusalem already remarks that the whole world was filled with portions of the wood of the cross (*Cat.* iv. 10).

The development which the veneration of relics underwent in the West did not differ essentially from that in the East. Here also the idea came to prevail that the body of the saint, or a portion of it, was possessed of healing and protective power (Paulinus of Nola, *Poem.* xix. 14 et seq.; xxvii. 443). The objection raised by the Aquitanian presbyter Vigilantius (c. 400) to the belief that the souls of the martyrs to a certain extent clung to their ashes, and heard the prayers of those who approached them, appeared to his contemporaries to be frivolous; and he nowhere met with any support.

The only doubt which was felt was as to whether the bodies of the saints should be divided, and removed from their original resting-place. Both practices were forbidden by law under the emperor Theodosius I. (*Cod. Theodos.* ix. 17, 7), and the division of the bodies of martyrs into pieces was prohibited for centuries. Even Pope Gregory I., in a letter to the empress Constantia, disapproved it (*Ep.* iv. 30). Ambrose of Milan, by the discovery of the relics of Protasius and Gervasius (cf. *Ep.* 22 and Augustine, *Confess.* ix. 7), started in the West the long series of discoveries and translations of hitherto unknown relics. His example was followed, to name only the best known instances, by Bishop Theodore of Octodurum (now Martigny in the Vaud), who discovered the relics of the Theban legion which was alleged to have been destroyed by the emperor Maximian on account of its belief in the Christian faith (see *Passio Acaun. Mart.* 16), and by Clematius, a citizen of Cologne, to whom the virgin martyrs of this city revealed themselves (Kraus, *Inschriften der Rheinlande*, No. 294), afterwards to be known as St Ursula and her eleven thousand virgins.

The West was much poorer in relics than the East. Rome, it is true, possessed in the bodies of Peter and Paul a treasure the virtue of which outshone all the sacred treasures of the East. But many other places were entirely wanting in relics. By the discoveries which we have mentioned their number was notably increased. But the longing for these pledges of the divine assistance was insatiable. In order to satisfy it relics were made by placing pieces of cloth on the graves of the saints, which were afterwards taken to their homes and venerated by the pilgrims. The same purpose was served by oil taken from the lamps burning at the graves, flowers from the altars, water from some holy well, pieces of the garments of saints, earth from Jerusalem, and especially keys which had been laid on the grave of St Peter at Rome. All these things were not looked upon as mementoes, but the conviction prevailed that they were informed by a miraculous power, which had passed into them through contact with that which was originally sacred (cf. Greg. Tur. *De Glor. mart.* i. 25; Greg. I. *Ep.* iv. 29, No. 30). A dishonest means of satisfying the craving for relics was that of forging them, and how common this became can be gathered from the many complaints about spurious relics (Sulp. Sev. *Vita Mart.* 8; Aug. *De op. mon.* 28; Greg. I. *Ep.* iv. 30, &c.).

But in the long run these substitutes for relics did not satisfy the Christians of the West, and, following the example of the Eastern Church, they took to dividing the bodies of the saints. Medieval relics in the West also were mostly portions of the bodies of saints or of things which they had used during their lives. The veneration of relics also received a strong impulse from the fact that the Church required that a relic should be deposited in every altar. Among the first of those whom we know to have attached importance to the placing of relics in churches is Ambrose of Milan (*Ep.* 22), and the 7th general council of Nicaea (787) forbade the consecration of churches in which relics were not present, under pain of excommunication. This has remained part of the law of the Roman Catholic Church.

The most famous relics discovered during the middle ages were those of the apostle James at St Jago de Compostella in Spain (see PILGRIMAGE), the bodies of the three kings, which were brought from Milan to Cologne in 1164 by the emperor Frederick I. (*Chron. reg. Colon.* for the year 1164), the so-called *sudarium* of St Veronica, which from the 12th century onwards was preserved in the Capella Santa Maria ad praesepe of St Peter's in Rome (see Dobschütz, *Christusbilder*, p. 218 seq.), and the seamless robe of Christ, the possession of which lent renown to the cathedral of Trier since the beginning of the 12th century (*Gesta Trevir.*, *Mon. Germ. Scr.* viii. p. 152).

The number of relics increased to a fabulous extent during the middle ages. There were churches which possessed hundreds, even thousands, of relics. In the cathedral of Eichstätt were to be found, as early as 1071, 683 relics (Gundech, *Lib. pont. Eist.*, *Mon. Germ. Scr.* vii. p. 246 seq.); the monastery of Hirschau had 222 in the year 1091 (*De cons. mai. mon.*, *Mon. Germ. Scr.* xiv. p. 261); the monastery of Stedernburg 515 in the year 1166 (*Ann. Sted. Scr.* xvi. p. 212 seq.). But these figures are trifling compared with those at the end of the middle ages. In the year 1520 could be counted 19,013 in the Schlosskirche at Wittenberg, and 21,483 in the Schlosskirche at Halle in 1521 (Köstlin, *Friedrich der W., und die Schlosskirche zu Wittenberg*, p. 58 seq.; Redlich, *Cardinal Albrecht und das Neue Stift zu Halle*, p. 260). There were also collections on the same scale belonging to individuals; a patrician of Nuremberg named Muffel was able to gain possession of 308 relics (*Chroniken der deutschen Städte*, xi. p. 745).

It is curious that while the popular craving for relics had passed all bounds, medieval theology was very cautious in its declarations on the subject of the veneration of relics. Thomas Aquinas based his justification of them on the idea of reverent commemoration; since we venerate the saints, we must also show reverence for their relics, for whoever loves another does honour to that which remains of him after death. On this account it is our duty, in memory of the saints, to pay due honour to their relics and especially to their bodies, which were the temples and dwellings of the Holy Ghost in which He dwelt and worked, and which in the resurrection are to be made like to the body of Christ; and in likewise because God honours them, in that He works wonders in their presence (*Summa theol.* iii. qu. 25, art. 6). The great scholastic philosopher abandoned the theory that the relics in themselves are vessels and instruments of the divine grace and miraculous power. But these ideas were revived, on the other hand, by the Catholicism of the counter-Reformation, which again taught and teaches that God grants many benefits to mankind through the sacred bodies of the martyrs (*Conc. Trid.* sess. xxv.). The doctrine has adapted itself to the popular belief. (A. H.*)

RELIEF (through Fr. from Lat. *relevare*, to lift up), an act of raising or lifting off or up. Apart from the general sense of a mitigation, cessation or removal of pain, sorrow, discomfort, &c., and the artistic use (It. *relievo*) of the projection of a figure or design in sculpture from the ground on which it is formed, which is treated below, the term "relief" is used in the following senses; it was one of the feudal incidents between lord and vassal, and consisted of a payment to the lord in kind or money made by the heir on the death of the ancestor for the privilege of succession, for, fiefs not being hereditary, the estate had lapsed to the lord; by this payment the heir *caducum praedium relevabat* (Du Cange, *Gloss.* s.v. *Relevare*). The word is also generally used, in law, for any exemption granted by a court from the strict legal consequences of an act, &c., *e.g.* to a parliamentary candidate from the penal consequences ensuing from breaches of the regulations of the Corrupt and Illegal Practices Acts. Relief is also the term used in English law for the assistance given to the indigent poor by the Poor Law authorities (see Poor Law).

RELIEF, a term in sculpture signifying ornament, a figure or figures raised from the ground of a flat surface of which the sculptured portion forms an inherent part of the body of the whole. The design may be in high relief—"alto-relievo" (*q.v.*), or low relief— "bas-relief" or "basso-relievo" (*q.v.*); in the former case the design is almost wholly detached from the ground, the attachment, through "under-cutting," remaining only here and there; in the latter it is wholly attached and may scarcely rise above the surface (as in the modern medal), or it may exceed in projection to about a half the proportionate depth (or thickness) of the figure or object represented. Formerly three terms were commonly employed to express the degree of relief — alto-relievo, basso-relievo and mezzo-relievo (or half-relief); but the two last-named have been merged by modern custom into "low-relief," to the disadvantage of accurate description. The term relief belongs to modern sculpture. To low relief as understood by us Pliny applied the word *anaglypta*, but it is to be observed that embossing and chasing came within the same category. It may be considered that less sculptural skill (independently of manipulative skill) is needed in high relief than in low relief, because in the former the true relative proportions in the life (whether figure or other object) have to be rendered, while in the latter, although the true height and, in a measure, breadth can be given, the thickness of the object is reduced by at least one-half, sometimes to almost nothing; and yet in spite of this departure from actuality, this abandonment of fact for a pure convention, a true effect must still be produced, not only in respect to perspective, but also of the actual shadows cast. And insomuch as the compositions are often extremely complicated and have sometimes to suggest retreating planes, the true plane of the material affords little scope for reproducing the required effect. In the beginning the essential idea of the relief was always maintained: that is to say, the sense of the flatness of the slab from which it was cut was impressed throughout the design on the mind of the spectator. Thus the Egyptians merely sunk the outlines and scarcely more than suggested the modelling of the figures, which never projected beyond the face of the surrounding ground. The Persians, the Etruscans and the Greeks carried on the art to the highest perfection, alike in sculpture and architectural ornament, and they applied it to gem sculpture, as in the case of "cameo." Similarly, the inverse treatment of relief—that is, sunk *below* the surface, in order that when used for seals a true relief is obtained—was early brought to great completeness; this form of engraving is called "intaglio." The degree of projection in relief, broadly speaking, has varied greatly with the periods of art. Thus, in Byzantine and Romanesque art the relief was low. In Gothic it increased with the increased desire to render several planes one behind the other. With the advent of the Renaissance it became still more accentuated, the heads and figures projecting greatly; but such high relief is sometimes found in early work, especially in metal-work. Although we see a return to lower relief in the Henri II. period, it becomes stronger in the Louis XIII. style, very full in Louis XIV. and Louis XV., but in Louis XVI. is considerably reduced. (M. H. S.)

RELIGION. The origin of the Latin word *rĕligio* or *relligio* has been the subject of discussion since the time of Cicero. Two alternative derivations have been given, viz. from *rĕlĕgere*, to gather together, and *rĕligare*, to bind back, fasten. *Relegere* meant to gather together, collect, hence to go over a subject again in thought, from *re* and *legere*, to collect together, hence to read, collect at a glance. This view is that given by Cicero (*Nat. Deor.* ii. 28, 72). He says: "Qui omnia quae ad cultum deorum pertinerent diligenter retractarent et tanquam relegerent, sunt dicti religiosi ex relegendo," "men were called 'religious' from *relegere*, because they reconsidered carefully and, as it were, went over again in thought all that appertained to the worship of the gods." He compares *elegantes* from *eligere*, *diligentes* from *diligere*, and continues, "his enim in verbis omnibus inest vis legendi eadem quae in religioso." This view is supported by the form of the word in the verse quoted by Gellius (iv. 9), "religentem esse oportet, religiosum nefas," and by the use of the Greek ἀλέγειν, to pay heed to, frequently with a negative, in the sense of the Latin *negligere* (*nec-legere*), cf. Θεῶν ὄπιν οὐκ ἀλέγοντες (Homer, *Il.* xvi. 388), heeding not the visitation of the gods, or οὐ γὰρ Κύκλωπες Διὸς . . . ἀλέγουσιν (*Od.* ix. 275). The alternative derivation, from *religare*, to fasten, bind, is that adopted by Lactantius (*Inst.* iv. 28), "Vinculo pietatis obstricti, Deo religati sumus unde ipsa religio nomen cepit." He quotes in support the line from Lucretius (i. 931), "religionum nodis animos exsolvere." Servius (on Virgil, *Aen.* viii. 349) and St Augustine (*Retract.* i. 13) also take *religare* as the source of the word. It is one that has certainly coloured the meaning of the word, particularly in that use which restricts it to the monastic life with its binding rules. It also has appealed to Christian thought. Liddon (*Some Elements of Religion*, Lecture I. 19) says: "Lactantius may be wrong in his etymology, but he has certainly seized the broad popular sense of the word when he connects it with the idea of an obligation by which man is bound to an invisible God." Archbishop Trench (*Study of Words*) supposed that when "religion" became equivalent to the monastic life, and "religious" to a monk, the words lost their original meaning, but the *Ancren Riwle*, *ante* 1225, and the *Cursor Mundi* use the words both in the general and the more particular sense (see quotations in the *New English Dictionary*), and both meanings can be found in the *Imitatio Christi* and in Erasmus's *Colloquia*. (X.)

The study of the forms of belief and worship belonging to different tribes, nations or religious communities has only recently acquired a scientific foundation. The Greek historians early directed their attention to the ideas and customs of the peoples with whom they were brought into contact; and Herodotus has been called the "first anthropologist of religion." Theopompus described the Persian dualism in the 4th century B.C., and when Megasthenes was ambassador to the court of Chandragupta, 302 B.C., he noted the religious usages of the middle Ganges valley. The early Christian Fathers recorded many a valuable observation of the Gentile faiths around them from varying points of view, sympathetic or hostile; and Eusebius and Epiphanius, in the 4th century A.D., attributed to the librarian of Ptolemy Philadelphus the design of collecting the sacred books of the Ethiopians, Indians, Persians, Elamites, Babylonians, Assyrians, Romans, Phoenicians, Syrians and Greeks. The Mahommedan Bīrūnī (b. A.D. 973) compared the doctrines of the Greeks, Christians, Jews, Manichaeans and Sufis with the philosophies and religions of India. Akbar (1542–1605) gathered Brahmans and Zoroastrians, Jews, Christians and Mahommedans at his court, and endeavoured to get translations of their scriptures. In the next century the Persian author of the *Dabistan* exhibited the doctrines of no less than twelve religions and their various sects. Meanwhile the scholars of the West had begun to work. Thomas Hyde (1636–1703) studied the religion of the ancient Persians; John Spencer (1630–1693) analysed the laws of the Hebrews; and Lord Herbert of Cherbury (*De Religione Gentilium*, 1645) endeavoured to trace all religions back to five "truly Catholic truths" of primitive faith, the first being the existence of God. The doctrine of a primeval revelation survived in various forms for two centuries, and appeared as late as the *Juventus Mundi* of W. E. Gladstone (1868, p. 207 ff.). David Hume, on the other hand, based his essay on *The Natural History of Religion* (1757) on the conception of the development of human society from rude beginnings, and all modern study is frankly founded on the general idea of Evolution.[1]

The materials at Hume's command, however, were destined to vast and speedy expansion. The Jesuit missionaries had already been at work in India and China, and a brilliant band of English students, led by Sir William Jones and H. T. Colebrooke, began to make known the treasures of Sanskrit literature, which the great scholars of Germany and France proceeded to develop. In Egypt the discovery of the Rosetta stone placed the key to the hieroglyphics within Western reach; and the decipherment of the cuneiform character enabled the patient scholars of Europe to recover the clues to the contents of the ancient libraries of Babylonia and Assyria. With the aid of inscriptions the cults of Greece and Rome have been largely reconstructed. Travellers and missionaries reported the beliefs and usages of uncivilized tribes in every part of the world, with the result that "ethnography knows no race devoid of religion, but only differences in the degree to which religious ideas have developed" (Ratzel, *History of Mankind*, i. 40). Meanwhile philosophy was at work on the problem of the religious consciousness. The great series of German thinkers, Lessing, Herder, Kant, Hegel, Fichte, Schleiermacher and their successors, sought to explain religion by means of the phenomena of mind, and to track it to its roots in the processes of thought and feeling. While ethnography was gathering up the facts from every part of the globe, psychology began to analyse the forms of belief, of action and emotion, to discover if possible the key to the multitudinous variety which history revealed. From the historical and linguistic side attention was first fixed upon the myth, and the publication of the ancient hymns of the *Rig Veda* led Max Müller to seek in the common elements of Aryan thought for the secrets of primitive religion (essay on *Comparative Mythology*, 1856). The phenomena of day and night, of sunshine and storm, and other aspects of nature, were invoked by different interpreters to explain the conceptions of the gods, their origins and their relations. Fresh materials were gathered at the same time out of European folk-lore; the work begun by the brothers Grimm was continued by J. W. E. Mannhardt, and a lower stratum of beliefs and rites began to emerge into view beneath the poetic forms of the more developed mythologies. By such preliminary labours the way was prepared for the new science of anthropology.

Since the appearance of Dr E. B. Tylor's classical treatise on *Primitive Culture* (1871), the study of the origins of religion has been pursued with the utmost zeal. Comte had already described the primitive form of the religious consciousness as that in which man conceives of all external bodies as animated by a life analogous to his own (*Philos. Positive*, tome v., 1841, p. 30). This has been since designated as *polyzoism* or *panthelism* or *panvitalism*,[2] and represents the obscure undifferentiated groundwork out of which Tylor's *Animism* arises. Many are the clues by which it has been sought to explain the secret of primitive religion. Hegel, before the anthropological stage, found it in magic. Max Müller, building on philosophy and mythology, affirmed that "Religion consists in the perception of the infinite under such manifestations as are able to influence the moral character of man" (*Natural Religion*, 1899, p. 188). Herbert Spencer derived all religion from the worship of the dead (*Principles of Sociology*, i.), like Grant Allen, and Lippert in Germany. Mr Andrew Lang, on the other hand, supposes that belief in a supreme being came first in order of evolution, but was afterwards thrust into the background by belief in ghosts and lesser divinities (*Magic and Religion*, 1901, p. 224).[3] Dr Jevons finds the primitive form in totemism (*Introd. to the History of Religion*, 1896, chap. ix.). Mr J. G. Frazer regards religion (see his definition quoted below) as superposed on an antecedent stage of magic. In *The Tree of Life* (1905), Mr E. Crawley interprets it by the vital instinct, and connects its first manifestations with the processes of the organic life. The veteran Wilhelm Wundt (*Mythus und Religion*, ii. 1906, p. 177) recurs to the primitive conceptions of the soul as the source of all subsequent development. The origin of religion, however, can never be determined archaeologically or historically; it must be sought conjecturally through psychology. (J. E. C.)

A. Primitive Religion

There is a point at which the History of Religion becomes in its predominant aspect a History of Religions. The conditions that we describe by the comprehensive term "civilization" occasion a specification and corresponding differentiation of the life of societies; whence there result competing types of culture, each instinct with the spirit of propagandism and, one might almost say, of empire. It is an age of conscious selection as between ideal systems. Instead of necessitating a wasteful and precarious elimination of inadequate customs by the actual destruction of those who practise them—this being the method of natural selection, which, like some Spanish Inquisition, abolishes the heresy by wiping out the heretics one and all—progress now becomes possible along the more direct and less painful path of conversion. The heretic, having developed powers of rational choice, perceives his heresy, to wit, his want of adaptation to the moral environment, and turning round embraces the new faith that is the passport to survival.

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[1] This does not, of course, preclude the possibility of degeneration in particular instances.

[2] Comte's own term "fetishism" was most unfortunately misleading (see FETISHISM). Marett proposed the term "Animatism," *Folk Lore* (1900), xi. p. 171.

[3] See his treatise on *The Making of Religion* (1898), and Hartland's article on "The 'High Gods' of Australia," *Folk Lore* (1898), ix. p. 290.

Far otherwise is it with man at the stage of savagery—the stage of petty groups pursuing a self-centred life of inveterate custom, in an isolation almost as complete as if they were marooned on separate atolls of the ocean. Progress, or at all events change, does indeed take place, though very slowly, since the most primitive savage we know of has his portion of human intelligence, looks after and before, nay, in regard to the pressing needs of every day shows a quite remarkable shrewdness and resource. Speaking generally, however, we must pronounce him unprogressive, since, on the whole, unreflective in regard to his ends. It is the price that must be paid for social discreteness and incoherency. And the consequence of this atomism is not what a careless thinker might be led to assume, extreme diversity, but, on the contrary, extreme homogeneity of culture. It has been found unworkable, for instance, to classify the religions of really primitive peoples under a plurality of heads, as becomes necessary the moment that the presence of a distinctive basis of linked ideas testifies to the individuality of this or that type of higher creed. Primitive religions are like so many similar beads on a string; and the concern of the student of comparative religion is at this stage mainly with the nature of the string, to wit, the common conditions of soul and society that make, say, totemism, or taboo, very much the same thing all the savage world over, when we seek to penetrate to its essence.

This fundamental homogeneity of primitive culture, however, must not be made the excuse for a treatment at the hands of psychology and sociology that dispenses with the study of details and trusts to an a priori method. By all means let universal characterization be attempted—we are about to attempt one here, though well aware of the difficulty in the present state of our knowledge—but they must at least model themselves on the composite photograph rather than the impressionist sketch. An enormous mass of material, mostly quite in the raw, awaits reduction to order on the part of anthropological theorists, as yet a small and ill-supported body of enthusiasts. Under these circumstances it would be premature to expect agreement as to results. In regard to method, however, there is little difference of opinion. Thus, whereas the popular writer abounds in wide generalizations on the subject of primitive humanity, the expert has hitherto for the most part deliberately restricted himself to departmental investigations. Religion, for example, seems altogether too vast a theme for him to embark on, and he usually prefers to deal with some single element or aspect. Again, origins attract the *littérateur*; he revels in describing the transition from the pre-religious to the religious era. But the expert, confining his attention to the known savage, finds him already religious, nay, encumbered with religious survivals of all kinds; for him, then, it suffices to describe things as they now are, or as they were in the comparatively recent fore-time. Lastly, there are many who, being competent in some other branch of science, but having small acquaintance with the scientific study of human culture, are inclined to explain primitive ideas and institutions from without, namely by reference to various external conditions of the mental life of peoples, such as race, climate, food-supply and so on. The anthropological expert, on the other hand, insists on making the primitive point of view itself the be-all and end-all of his investigations. The inwardness of savage religion—the meaning it has for those who practise it—constitutes its essence and meaning likewise for him, who after all is a man and a brother, not one who stands really outside.

In what follows, then, we shall, indeed, venture to present a wholesale appreciation of the religious idea as it is for primitive man in general; but our account will respect the modern anthropological method that bids the student keep closely to the actualities of the religious experience of savages, as it can with reasonable accuracy be gathered from what they do and say. We have sought to render only the spirit of primitive religion, keeping clear both of technicalities and of departmental investigations. These are left to the separate articles bearing on the subject. There the reader will find the most solid results of recent anthropological research. Here is he merely offered a flimsy thread that, we hope, may guide him through the maze of facts, but alas! is only too likely to break off short in his hand.

Definition of Primitive Religion.—In dealing with a development of culture that has no immutable essence, but is intrinsically fluid and changing, definition must consist either in a definition of type, which indicates prevalence of relevant resemblance as between specimens more or less divergent, or in exterior definition, which delimits the field of inquiry by laying down within what extreme limits this divergence holds. Amongst the numberless definitions of religion that have been suggested, those that have been most frequently adopted for working purposes by anthropologists are Tylor's and Frazer's. Dr E. B. Tylor in *Primitive Culture* (1), i. 424, proposes as a "minimum definition" of religion "the belief in spiritual beings." Objections to this definition on the score of incompleteness are, firstly, that, besides belief, practice must be reckoned with (since, as Dr W. Robertson Smith has made clear in his *Lectures on the Religion of the Semites*, 18 sqq., ritual is in fact primary for primitive religion, whilst dogma and myth are secondary); secondly, that the outlook of such belief and practice is not exclusively towards the spiritual, unless this term be widened until it mean next to nothing, but is likewise towards the quasi-material, as will be shown presently. The merit of this definition, on the other hand, lies in its bilateral form, which calls attention to the need of characterizing both the religious attitude and the religious object to which the former has reference. The same form appears in Dr J. G. Frazer's definition in *The Golden Bough* (2nd ed.), i. 63. He understands by religion "a propitiation or conciliation of powers superior to man which are believed to direct and control the course of nature and of human life." He goes on to explain that by "powers" he means "conscious or personal agents." It is also to be noted that he is here definitely opposing religion to magic, which he holds to be based on the (implicit) assumption "that the course of nature is determined, not by the passions or caprice of personal beings, but by the operation of immutable laws acting mechanically." His definition improves on Tylor's in so far as it makes worship integral to the religious attitude. By regarding the object of religion as necessarily personal, however, he is led to exclude much that the primitive man undoubtedly treats with awe and respect as exerting a mystic effect on his life. Further, in maintaining that the powers recognized by religion are always superior to man, he leaves unclassed a host of practices that display a bargaining, or even a hectoring, spirit on the part of those addressing them (see PRAYER). Threatening or beating a fetish cannot be brought under the head of magic, even if we adopt Frazer's principle (*op. cit.* i. 64) that to constrain or coerce a personal being is to treat him as an inanimate agent; for such a principle is quite inapplicable to cases of mere terrorism, whilst it may be doubted if it even renders the sense of the savage magician's typical notion of his *modus operandi*, viz. as the bringing to bear of a greater *mana* or psychic influence (see below) on what has less, and must therefore do as it is bidden. Such definitions, then, are to be accepted, if at all, as definitions of type, selective designations of leading but not strictly universal features. An encyclopaedic account, however, should rest rather on an exterior definition which can serve as it were to pigeon-hole the whole mass of significant facts. Such an exterior definition is suggested by Mr E. Crawley in *The Tree of Life*, 209, where he points out that "neither the Greek nor the Latin language has any comprehensive term for religion, except in the one ἱερά, and in the other *sacra*, words which are equivalent to 'sacred.' No other term covers the whole of religious phenomena, and a survey of the complex details of various worships results in showing that no other conception will comprise the whole body of religious facts." It may be added that we have here no generalization imported from a higher level of culture, but an idea or blend of ideas familiar to primitive thought. An important consequence of thus giving the study of primitive religion the wide scope of a comparative hierology is that magic is no longer divorced from religion, since the sacred will now be found to be coextensive with the magico-religious, that largely undifferentiated plasm out of which religion and magic slowly take separate shape as society comes more and more to contrast legitimate with illicit modes of dealing with the sacred. We may define, then, the religious object as the sacred, and the corresponding religious attitude as consisting in such manifestation of feeling, thought and action in regard to the sacred as is held to conduce to the welfare of the community or to that of individuals considered as members of the community.

Aspects of the Nature of the Sacred.—To exhibit the general character of the sacred as it exists for primitive religion it is simplest to take stock of various aspects recognized by primitive thought as expressed in language. If some, and not the least essential, of these aspects are quasi-negative, it must be remembered that negations—witness the Unseen, the Unknown, the Infinite of a more advanced theology—are well adapted to supply that mystery on which the religious consciousness feeds with the slight basis of conceptual support it needs. (1) *The sacred as the forbidden.* The primitive notion that perhaps comes nearest to our "sacred," whilst it immediately underlies the meanings of the Latin *sacer* and *sanctus*, is that of a *taboo*, a Polynesian term for which equivalents can be quoted from most savage vocabularies. The root idea seems to be that something is marked off as to be shunned, with the added hint of a mystic sanction or penalty enforcing the avoidance. Two derivative senses of a more positive import call for special notice. On the one hand, since that which is tabooed is held to punish the taboo-breaker by a sort of mystic infection, taboo comes to stand for uncleanness and sin. On the other hand, since the isolation of the sacred, even when originally conceived in the interest of the profane, may be interpreted as self-protection on the part of the sacred as against defiling contact, taboo takes on the connotation of ascetic virtue, purity, devotion, dignity and blessedness. Primary and secondary senses of the term between them cover so much ground that it is not surprising to find taboo used in Polynesia as a name for the whole system of religion, founded as it largely is on prohibitions and abstinences. (2) *The sacred as the mysterious.* Another quasi-negative notion of more restricted distribution is that of the mysterious or strange, as we have it expressed, for example, in the Siouan *wakan*, though possibly this is a derivative meaning. Meanwhile, it is certain that what is strange, new or portentous is regularly treated by all savages as sacred. (3) *The sacred as the secret.* The literal sense of the term *churinga*, applied by the Central Australians to their sacred objects, and likewise used more abstractly to denote mystic power, as when a man is said to be "full of *churinga*," is "secret," and is symptomatic of the esotericism that is a striking mark of Australian, and indeed of all primitive, religion, with its insistence on initiation, its exclusion of women, and its strictly enforced reticence concerning traditional lore and proceedings. (4) *The sacred as the potent.* Passing on to positive conceptions of the sacred, perhaps the most fundamental is that which identifies the efficacy of sacredness with such mystic or magical power as is signified by the *mana* of the Pacific or *orenda* of the Hurons, terms for which analogies are forthcoming on all sides. Of *mana* Dr R. H. Codrington in *The Melanesians*, 119 *n.*, writes: "It essentially belongs to personal beings to originate it, though it may act through the medium of water, or a stone, or a bone. All Melanesian religion consists . . . in getting this *mana* for oneself, or getting it used for one's benefit." E. Tregear's *Maori-Polynesian Comparative Dictionary* shows how the word and its derivatives are used to express thought, memory, emotion, desire, will—in short, psychic energy of all kinds. It also stands for the vehicle of the magician's energy—the spell; which would seem likewise to be a meaning, perhaps the root-meaning, of *orenda* (cf. J. N. B. Hewitt, *American Anthropologist*, N.S., iv. 40). Whereas everything, perhaps, has some share of indwelling potency, whatever is sacred manifests this potency in an extraordinary degree, as typically the wonder-working leader of society, whose *mana* consists in his cunning and luck together. Altogether, in *mana* we have what is *par excellence* the primitive religious idea in its positive aspect, taboo representing its negative side, since whatever has *mana* is taboo, and whatever is taboo has *mana*. (5) *The sacred as the animate.* The term "animism," which embodies Tylor's classical theory of primitive religion, is unfortunately somewhat ambiguous. If we take it strictly to mean the belief in ghosts or spirits having the "vaporous materiality" proper to the objects of dream or hallucination, it is certain that the agency of such phantasms is not the sole cause to which all mystic happenings are referred (though ghosts and spirits are everywhere believed in, and appear to be endowed with greater predominance as religious synthesis advances amongst primitive peoples). Thus there is good evidence to show that many of the early gods, notably those that are held to be especially well disposed to man, are conceived rather in the shape of magnified non-natural men dwelling somewhere apart, such as the Mungan-ngaur of the Kurnai of S.E. Australia (cf. A. Lang, *The Making of Religion*^{2}, x. sqq.). Such anthropomorphism is with difficulty reduced to the Tylorian animism. The term, however, will have to be used still more vaguely, if it is to cover all attribution of personality, will or vitality. This can be more simply brought under the notion of *mana*. Meanwhile, since quasi-mechanical means are freely resorted to in dealing with the sacred, as when a Maori chief snuffs up the sanctity his fingers have acquired by touching his own sacred head that he may restore the virtue to the part whence it was taken (R. Taylor, *Te Ika a Maui*, 165), or when uncleanness is removed as if it were a physical secretion by washing, wiping and so forth, it is hard to say whether what we should now call a "material" nature is not ascribed to the sacred, more especially when its transmissibility after the manner of a contagion is the trait that holds the attention. It is possible, however, that the savage always distinguishes in a dim way between the material medium and the indwelling principle of vital energy, examples of a pure fetishism, in the sense of the cult of the purely material, recognized as such, being hard to find. (6) *The sacred as the ancient.* The prominence of the notion of the *Alcheringa* "dreamtime," or sacred past, in Central Australian religion illustrates the essential connexion perceived by the savage to lie between the sacred and the traditional. Ritualistic conservatism may be instanced as a practical outcome of this feeling. Another development is ancestor-worship, the organized cult of ancestors marking, however, a certain stage of advance beyond the very primitive, though the dead are always sacred and have *mana* which the living may exploit for their own advantage.

The Activity of the Sacred.—The foregoing views of the sacred, though starting from distinct conceptions, converge in a single complex notion, as may be seen from the many-sided sense borne by such a term as *wakan*, which may stand not only for "mystery," but also for "power, sacred, ancient, grandeur, animate, immortal" (W J McGee, *15th Report of U. S. Bureau of Ethnology*, 182). The reason for this convergence is that, whereas there is found great difficulty in characterizing the elusive nature of the sacred, its mode of manifesting itself is recognized to be much the same in all its phases. Uniform characteristics are the fecundity, ambiguity, relativity and transmissibility of its activity. (1) *Fecundity.* The mystic potency of the sacred is no fixed quantity, but is big with possibilities of all sorts. The same sacred person, object, act, will suffice for a variety of purposes. Even where a piece of sympathetic magic appears to promise definite results, or when a departmental god is recognized, there would seem to be room left for a more or less indefinite expectancy. It must be remembered that the meaning of a rite is for the most part obscure to the participants, being overlaid by its traditional character, which but guarantees a general efficacy. "Blessings come, evils go," may be said to be the magico-religious formula implicit in all socially approved dealings with the sacred, however specialized in semblance. (2) *Ambiguity.* Mystic potency, however, because of the very indefiniteness of its action, is a two-edged sword. The sacred is not to be approached lightly. It will heal or blast, according as it is handled with or without due circumspection. That which is taboo, for instance, the person of the king, or woman's blood, is poison or medicine according as it is manipulated, being inherently just a potentiality for wonder-working in any direction. Not but what primitive thought shows a tendency to mark off a certain kind of mystic power as wholly bad by a special name, *e.g.* the *arungquiltha* of Central Australia; and here, we may note, we come nearest to a conception of magic as something other than religion, the trafficker in *arungquiltha* being socially suspect, nay, liable to persecution, and even death (as amongst the Arunta tribe, see Spencer and Gillen, *Native Tribes of C. Australia*, 536), at the hands of his fellows. On the other hand, wholly beneficent powers seem hardly to be recognized, unless we find them in beings such as Mungan-ngaur ("father-our"), who derive an ethical character from their association with the initiation ceremonies and the moral instruction given thereat (cf. Lang, *l.c.*). (3) *Relativity.* So far we have tended to represent the activity of the sacred as that of a universal force, somewhat in the style of our "electricity" or "mind." It remains to add that this activity manifests itself at numberless independent centres. These differ amongst themselves in the degree of their energy. One spell is stronger than another, one taboo more inviolable than another. Dr W. H. R. Rivers (*The Todas*, 448) gives an interesting analysis of the grades of sanctity apparent in Toda religion. The gods of the hill-tops come first. The sacred buffaloes, their milk, their bells, the dairies and their vessels are on a lower plane; whilst we may note that there are several grades amongst the dairies, increase of sanctity going with elaboration of dairy ritual (cf. ibid. 232). Still lower is the dairyman, who is in no way divine, yet has sanctity as one who maintains a condition of ceremonial purity. (4) *Transmissibility.* If, however, this activity originates at certain centres, it tends to spread therefrom in all directions. Dr F. B. Jevons (in *An Introduction to the History of Religion*, vii.) distinguishes between "things taboo," which have the mystic contagion inherent in them, and "things tabooed," to which the taboo-infection has been transmitted. In the former class he places supernatural beings (including men with *mana* as well as ghosts and spirits), blood, new-born children with their mothers, and corpses; which list might be considerably extended, for instance, by the inclusion of natural portents, and animals and plants such as are strikingly odd, dangerous or useful. Any one of these can pass on its sacred quality to other persons and objects (as a corpse defiles the mourner and his clothes), nay to actions, places and times as well (as a corpse will likewise cause work to be tabooed, ground to be set apart, a holy season to be observed). Such transmissibility is commonly explained by the association of ideas, that becoming sacred which as it were reminds one of the sacred; though it is important to add, firstly, that such association takes place under the influence of a selective interest generated by strong religious feeling, and, secondly, that this interest is primarily a collective product, being governed by a social tradition which causes certain possibilities of ideal combination alone to be realized, whilst it is the chief guarantee of the objectivity of what they suggest.

The Exploitation of the Sacred. A. *Methods.*—It is hard to find terms general enough to cover dealings with the sacred that range from the manipulation of an almost inanimate type of power to intercourse modelled on that between man and man. Primitive religion, however, resorts to either way of approach so indifferently as to prove that there is little or no awareness of an inconsistency of attitude. The radical contrast between mechanical and spiritual religion, though fundamental for modern theology, is alien to the primitive point of view, and is therefore inappropriate to the purposes of anthropological description. (1) *Acquisition.* Mystic power may be regarded as innate so far as skill, luck or queerness are signs and conditions of its presence. On the whole, however, savage society tends to regard it as something acquired, the product of acts and abstinences having a traditional character for imparting magico-religious virtue. An external symbol in the shape of a ceremony or cult-object is of great assistance to the dim eye of primitive faith. Again, the savage universe is no preserve of man, but is an open field wherein human and non-human activities of all sorts compete on more or less equal terms, yet so that a certain measure of predominance may be secured by a judicious combination of forces. (2) *Concentration.* Hence the magico-religious society or individual practitioner piles ceremony on ceremony, name of power on name of power, relic on relic, to consolidate the forces within reach and assume direction thereof. The transmissibility of the sacred ensures the fusion of powers drawn from all sources, however disparate. (3) *Induction.* It is necessary, however, as it were to bring this force to a head. This would appear to be the essential significance of sacrifice, where a number of sacred operations and instruments are made to discharge their efficacy into the victim as into a vat, so that a blessing-yielding, evil-neutralizing force of highest attainable potency is obtained (see H. Hubert and M. Mauss, "Essai sur la nature et la fonction du sacrifice" in *L'Année sociologique*, ii.). (4) *Renovation.* An important *motif* in magico-religious ritual, which may not have been without effect on the development of sacrifice, is, as Dr Frazer's main thesis in *The Golden Bough* asserts, the imparting of reproductive energy to animals, plants and man himself, its cessation being suggested by such phenomena as old age and the fall of the year. To concentrate, induce and renovate are, however, but aspects of one process of acquisition by the transfusion of a transmissible energy. (5) *Demission.* Hubert and Mauss show in their penetrating analysis of sacrifice that after the rite has been brought to its culminating point there follows as a pendant a ceremony of re-entry into ordinary life, the idea of which is preserved in the Christian formula *Ite, missa est.* (6) *Insulation.* Such deposition of sacredness is but an aspect of the wider method that causes a ring-fence to be erected round the sacred to ward off casual trespassers at once in their own interest and to prevent contamination. We see here a natural outcome of religious awe supported by the spirit of esotericism, and by a sense of the need for an expert handling of that which is so potent for good or ill. (7) *Direction.* This last consideration brings to notice the fact that throughout magico-religious practice of all kinds the human operator retains a certain control over the issue. In the numberless transitions that, whilst connecting, separate the spell and the prayer we observe as the accompaniment of every mood from extreme imperiousness to extreme humility an abiding will and desire to help the action out. Even "Thy will be done" preserves the echo of a direction, and, needless to say, this is hardly a form of primitive address. At the bottom is the vague feeling that it is man's own self-directed mysterious energy that is at work, however much it needs to be reinforced from without. Meanwhile, tradition strictly prescribes the ways and means of such reinforcement, so that religion becomes largely a matter of sacred lore; and the expert director of rites, who is likewise usually at this stage the leader of society, comes more and more to be needed as an intermediary between the lay portion of the community and the sacred powers.

B. *Results.*—Hitherto our account of primitive religion has had to move on somewhat abstract lines. His religion is, however, anything but an abstraction to the savage, and stands rather for the whole of his concrete life so far as it is penetrated by a spirit of earnest endeavour. The end and result of primitive religion is, in a word, the consecration of life, the stimulation of the will to live and to do. This bracing of the vital feeling takes place by means of imaginative appeal to the great forces man perceives stirring within him and about him, such appeal proving effective doubtless by reason of the psychological law that to conceive strongly is to imitate. Meanwhile, that there shall be no clashing of conceptions to inhibit the tendency of the idea of an acquired "grace" to realize itself in action, is secured by the complete unanimity of public opinion, dominated as it is by an inveterate custom. To appreciate the consecrating effect of religion on primitive life we have only to look to the *churinga*-worship of the Central Australians (as described by Spencer and Gillen in *The Native Tribes of Central Australia* and *The Northern Tribes of Central Australia*). Contact with these repositories of mystic influence "makes them glad" (*Nat. Tr.* 165); it likewise makes them "good," so that they are no longer greedy or selfish (*North. Tr.* 266); it endows them with second sight (ibid.); it gives them confidence and success in war (*Nat. Tr.* 135); in fact, there is no end to its "strengthening" effects (ibid. *n.*). Or, again, we may note the earnestness and solemnity that characterize all their sacred ceremonies. The inwardness of primitive religion is, however, non-existent for those who observe it as uninitiated strangers; whilst, again, it evaporates as soon as native custom breaks down under pressure of civilization, when only fragments of meaningless superstition survive: wherefore do travesties of primitive religion abound.

It remains to consider shortly the consecration of life in relation to particular categories and departments. (1) *Education.* Almost every tribe has its initiation ceremonies, and in many tribes adult life may almost be described as a continuous initiation. The object of these rites is primarily to impart mystic virtue to the novice, such virtue, in the eyes of the primitive man, being always something more than social usefulness, amounting as it does to a share in the tribal luck by means of association with all it holds sacred. Incidentally the candidate is trained to perform his duties as a tribesman, but religion presides over the course, demanding earnest endeavour of an impressionable age. (2) *Government.* Where society is most primitive it is most democratic, as in Australia, and magico-religious powers are possessed by the whole body of fully initiated males, age, however, conferring increase of sacred lore and consequently of authority; whilst even at this stage the experts tend to form an inner circle of rulers. The man with *mana* is bound to come to the top, both because his gifts give him a start and because his success is taken as a sign that he has the gift. A decisive "moment" in the evolution of chiefship is the recognition of hereditary *mana*, bound up as this is with the handing on of ceremonies and cult-objects. Invested, as society grows more complex, with a sanctity increasingly superior to that of the layman, the priest-king becomes the representative of the community as repository of its luck, whilst, as controller of all sacred forces that bear thereon, he is, as Dr Frazer puts it, "dynamical centre of the universe" (*The Golden Bough* (2nd ed.), i. 233). Only when the holy man's duty to preserve his holiness binds him hand and foot in a network of taboos does his temporal power tend to devolve on a deputy. (3) *Food-supply.* In accordance with the principle of Renovation (see above), the root-idea of the application of religion to economics is not the extorting of boons from an unwilling nature, but rather the stimulation of the sources of life, so that all beings alike may increase and multiply. (4) *Food-taking.* Meanwhile, the primitive meal is always more or less of a sacrament, and there are many food-taboos, the significance of which is, however, not so much that certain foods are unclean and poisonous as that they are of special virtue and must be partaken of solemnly and with circumspection. (5) *Kinship.* It is hard to say whether the unit of primitive society is the tribe or the group of kinsmen. Both are forms of union that are consolidated by means of religious usages. Thus in Australia the initiation ceremonies, concerned as they partly are with marriage, always an affair between the kin-groups, are tribal, whilst the totemic rites are the prime concern of the members of the totem clans. The significance of a common name and a common blood is immensely enhanced by its association with mystic rights and duties, and the pulse of brotherhood beats faster. (6) *The Family.* Side by side with the kin there is always found the domestic group, but the latter institution develops fully only as the former weakens, so that the one comes largely to inherit the functions of the other, whilst the tribe too in its turn hands over certain interests. Thus in process of time birth-rites, marriage-rites, funeral-rites, not to mention subordinate ceremonies such as those of name-giving and food-taking, become domestic sacraments. (7) *Sex.* Woman, for certain physiological reasons, is always for primitive peoples hedged round with sanctity, whilst man does all he can to inspire awe of his powers in woman by keeping religion largely in his own hands. The result, so far as woman is concerned, is that, in company with those males who are endowed with sacredness in a more than ordinary degree, she tends as a sex to lose in freedom as much as she gains in respect. (8) *Personality.* Every one has his modicum of innate *mana*, or at least may develop it in himself by communicating with powers that can be brought into answering relation by the proper means. Nagualism, or the acquisition of a mystic guardian, is a widely distributed custom, the essence of which probably consists in the procuring of a personal name having potency. The exceptional man is recognized as having *mana* in a special degree, and a belief thus held at once by others and by himself is bound to stimulate his individuality. The primitive community is not so custom-bound that personality has no chance to make itself felt, and the leader of men possessed of an inner fund of inspiration is the wonder-worker who encourages all forms of social advance.

Psychology of the Primitive Attitude towards the Sacred.—We are on firmer ground when simply describing the phenomena of primitive religion than when seeking to account for these in terms of natural law—in whatever sense the conception of natural law be applicable to the facts of the mental life of man. One thing is certain, namely, that savages stand on virtually one footing with the civilized as regards the type of explanation appropriate to their beliefs and practices. We have no right to refer to "instincts" in the case of primitive man, any more at any rate than we have in our own case. A child of civilized parents brought up from the first amongst savages is a savage, neither more nor less. Though race may count for something in the matter of mental endowment—and at least it would seem to involve differences in weight of brain—it clearly counts for much less than does *milieu*, to wit, that social environment of ideas and institutions which depends so largely for its effectiveness on mechanical means of tradition, such as the art of writing. The outstanding feature of the mental life of savages known to psychologists as "primitive credulity" is doubtless chiefly due to sheer want of diversity of suggestiveness in their intellectual surroundings. Their notions stick fast because there are no competing notions to dislodge them. Society suffers a sort of perpetual obsession, and remains self-hypnotized as it were within a magic circle of traditional views. A rigid orthodoxy is sustained by means of purblind imitation assisted by no little persecution. Such changes as occur come about, not in consequence of a new direction taken by conscious policy, but rather in the way that fashions in dress alter amongst ourselves, by subconscious, hardly purposive drifting. The crowd rather than the individual is the thinking unit. A proof is the mysterious rapid extinction of savages the moment that their group-life is broken up; they are individually so many lost sheep, without self-reliance or initiative. And the thinking power of a crowd—that is, a mob, not a deliberative assembly—is of a very low order, emotion of a "panicky" type driving it hither and thither like a rudderless ship. However, as the students of mob-psychology have shown, every crowd tends to have its *meneur*, its mob-leader, the man who sets the cheering or starts the running-away. So too, then, with the primitive society. Grossly ignorant of all that falls outside "the daily round, the common task," they are full of panicky fears in regard to this unknown, and the primary attitude of society towards it is sheer avoidance, taboo. But the mysterious has another face. To the mob the mob-leader is mysterious in his power of bringing luck and salvation; to himself also he is a wonder, since he wills, and lo! things happen accordingly. He has *mana*, power, and by means of this *mana*, felt inwardly by himself, acknowledged by his fellows, he stems the social impulse to run away from a mystery. Not without nervous dread—witness the special taboo to which the leader of society is subject—he draws near and strives to constrain, conciliate or cajole the awful forces with which the life of the group is set about. He enters the Holy of Holies; the rest remain without, and are more than half afraid of their mediator. In short, from the standpoint of lay society, the manipulator of the sacred is himself sacred, and shares in all the associations of sacredness. An anthropomorphism which is specifically a " magomorphism " renders the sacred powers increasingly one with the governing element in society, and religion assumes an ethico-political character, whilst correspondingly authority and law are invested with a deeper meaning.

The Abuse of the Sacred.—Lest our picture of primitive religion appear too brightly coloured, a word must be said on the perversions to which the exploitation of the sacred is liable. Envy, malice and uncharitableness are found in primitive society, as elsewhere, and in their behoof the mystic forces are not unfrequently unloosed by those who know how to do so. To use the sacred to the detriment of the community, as does, for instance, the expert who casts a spell, or utters a prayer, to his neighbour's hurt, is what primitive society understands by magic (cf. *arungquiltha*, above), and anthropology has no business to attach any other meaning to the word if it undertakes to interpret the primitive point of view. On the other hand, if those in authority perpetrate in the name of what their society holds sacred, and therefore with its full approval, acts that to the modern mind are cruel, silly or revolting, it is bad science and bad ethics to speak of vice and degradation, unless it can be shown that the community in which these things occur is thereby brought nearer to elimination in the struggle for existence. As a matter of fact, the earlier and more democratic types of primitive society, uncontaminated by our civilization, do not present many features to which the modern conscience can take exception, but display rather the edifying spectacle of religious brotherhoods encouraging themselves by mystical communion to common effort. With the evolution of rank, however, and the concentration of magico-religious power in the hands of certain orders, there is less solidarity and more individualism, or at all events more opportunity for sectional interests to be pursued at other than critical times; whereupon fraud and violence are apt to infect religion. Indeed, as the history of the higher religions shows, religion tends in the end to break away from secular government with its aristocratic traditions, and to revert to the more democratic spirit of the primitive age, having by now obtained a clearer consciousness of its purpose, yet nevertheless clinging to the inveterate forms of human ritual as still adequate to symbolize the consecration of life—the quickening of the will to face life earnestly.

Bibliography.—The number of works dealing with primitive religion is endless. The English reader who is more or less new to the subject is recommended to begin with E. B. Tylor, *Primitive Culture* (4th ed., Lond. 1903), and then to proceed to J. G. Frazer, *The Golden Bough* (2nd ed., Lond. 1900). The latter author's *Lectures on the Early History of the Kingship* (Lond. 1905) may also be consulted. Only second in importance to the above are W. Robertson Smith, *Lectures on the Religion of the Semites* (2nd ed., Lond. 1904); A. Lang, *Myth, Ritual and Religion* (2nd ed., Lond. 1899), and *Magic and Religion* (Lond. 1902); E. S. Hartland, *The Legend of Perseus* (Lond. 1894–1896); F. B. Jevons, *An Introduction to the History of Religion* (2nd ed., 1902); E. Crawley, *The Mystic Rose* (Lond. 1902), and *The Tree of Life* (Lond. 1905). The two last-mentioned works perhaps most nearly represent the views taken in the text, which are also developed by the present writer in " Pre-Animistic Religion," *Folk-Lore* xi. (1900), " From Spell to Prayer," *Folk-Lore*, xv. (1904), and " Is Taboo a Negative Magic?" *Anthropological Essays presented to E. B. Tylor* (1907); L. R. Farnell, *The Evolution of Religion* (1905), follows similar lines. The present writer owes something to Goblet d'Alviella, *Hibbert Lectures* (Lond. 1891), and more to H. Hubert and M. Mauss, " Essai sur la nature et la fonction du sacrifice," *L'Année sociologique*, ii.; and " Esquisse d'une théorie générale de la magie," ibid. vii. If the reader wish to keep paçe with the output of literature on this vast subject, he will find *L'Année sociologique* (1896 onwards) a wonderfully complete bibliographical guide.

Side by side with works of general theory, first-hand authorities should be freely used. To make a selection from these is not easy, but the following at least are very important: R. H. Codrington, *The Melanesians* (Oxford, 1891); W. B. Spencer and F. J. Gillen, *The Native Tribes of Central Australia* (Lond. 1899); *The Northern Tribes of Central Australia* (Lond. 1904); A. W. Howitt, *The Native Tribes of South-Eastern Australia* (Lond. 1904); A. C. Haddon, *Reports of the Cambridge Anthropological Expedition to Torres Straits* (Cambridge, 1904, vol. v.); A. B. Ellis, *The Tshi-Speaking Peoples of the Gold Coast* (Lond. 1897); *The Ewe-Speaking Peoples of the Slave Coast* (Lond. 1890); *The Yoruba-Speaking Peoples of the Slave Coast* (Lond. 1894); Miss M. H. Kingsley, *Travels in West Africa* (Lond. 1898), and *West African Studies* (Lond. 1899); A. C. Hollis, *The Masai* (1905); W. Crooke, *The North-West Provinces of India* (Lond. 1897); W. H. R. Rivers, *The Todas* (1906). An immense amount of valuable evidence is to be obtained in the *Reports of the Bureau of Ethnology*, Smithsonian Institution, Washington. See Nos. 2, 5, 6, 7, 8, 9, 11, 13, 14, 15, 16, 18, 19, 21, 22, 23, and specially J. O. Dorsey, *A Study of Siouan Cults*, in No. 11; A. C. Fletcher, *The Hako*, in No. 22; and M. C. Stevenson, *The Zuñi Indians*, in No. 23. Though dealing primarily with a more advanced culture, J. J. M. de Groot, *The Religious System of China* (1892–1901), will be found to throw much light on primitive ideas. Finally let it be repeated that there is offered here no more than an introductory course of standard authorities suitable for the English reader. (R. R. M.)

B. The Higher Religions

Various phenomena associated with the religions of the lower culture will be found discussed in the articles on Animism; Fetishism; Magic; Mythology; Prayer; Ritual; Sacrifice; and Totemism. In this article religions are treated from the point of view of morphology, and no attempt can be made in the allotted limits to connect them with the phases of ritual, sociological or ethical development. See the separate articles on each religious system, and the separate headings for different forms of ritual.

1. *Developments of Animism.*—Animism is not, indeed, itself a religion; it is rather a primitive kind of philosophy which provides the intellectual form for the interpretation alike of Man and of Nature. It implies that the first great step has been taken for distinguishing between the material objects—whether the conscious body, or the rocks, trees and animals—and the powers that act in or through them. The Zuñis of New Mexico, U.S.A., supposed " the sun, moon and stars, the sky, earth and sea, in all their phenomena and elements, and all inanimate objects as well as plants, animals and men, to belong to one great system of all-conscious and interrelated life, in which the degrees of relationship seem to be determined largely, if not wholly, by the degrees of resemblance."[1] If the earliest conception is that of an obscure undifferentiated animation (*panvitalism*), the analysis of the human person into body and spirit with the corresponding doctrine of " object-souls " (*e.g.* the *tornait* or " invisible rulers " of every object among the Eskimo)[2] constitutes an important development. Matter is no longer animated or self-acting; it is subject to the will of an agent which can enter or quit it, perhaps at its own pleasure, perhaps at the compulsion of another. The transition has usually been effected ages before the higher religions come into view; but it has left innumerable traces in language and custom. Thus the Vedic hymns, which exhibit the deposits of so many stages of thought, are founded ultimately on the conception of the animation of nature. The objects of the visible world are themselves mighty to hurt or help. The springs and rivers, the wind, the sun, fire, the Earth-Mother, the Sky-Father, are all active powers. The animals, domesticated or wild, like the horse or cow, the guardian dog, the bird of omen, naturally share the same life, and are approached with the same invocation. The sacred energy is also discerned in the ritual implements, in the stones for squeezing the soma-juice, and the sacrificial post to which animals were bound; nay, it was even recognized in fabricated products like the plough (the " tearer " or " divider "), the

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[1] F. H. Cushing, on " Zuñi Fetiches " in *Second Annual Report of the Bureau of Ethnology*, Washington, 1883, p. 9.

[2] Dr. Franz Boas, in the *Sixth Annual Report of the Bureau of Ethnology*, 1888, p. 591.

war-car, the drum, quiver, bow and axe. The Earth-Mother and Sky-Father are to be found again and again in religions, at various stages of development, as co-ordinating conceptions which comprehend the universe.[1] Sometimes one is more prominent, sometimes the other. In many cases the Sky has been already resolved into the visible firmament and its lord and owner, like the Yoruban Olorun or the Finnic Ukko. The consort of Ukko is *Maan-emö*, "mother of the earth," or *maan emäntä*, "mistress of the earth." But the rare expression *maan-emä*, "Mother-earth," still used in the ancient lays,[2] points to the older type of belief in the animation of the productive soil. So the Peruvians designated the Earth as Pacha-mama, "mother of (all) things." In Egypt the relation was curiously reversed; the earth-god Keb was the husband of Nut, the sky, represented sometimes as a woman, overarching the earth and supported on hands and feet, sometimes as a gigantic cow, upheld on the outstretched hands of Shu, the atmosphere.[3] When earth and sky were still unseparated, Shu thrust himself between them and raised Nut to the heights. So in the New Zealand myth, Rangi and Papa, Sky and Earth, who once clave together in the darkness, were rent asunder by the forest-god Tane-mahuta, who forced up the sky far above him.[4] The most elaborate presentment of this mode of thought is to be seen in the organized animism of the ancient state religion of China, where the supreme power is lodged in the living sky (Tien).[5] Tien was originally the actual firmament. In the *Shi-King* it is addressed in prayer as "great and wide," as "vast and distant"; it is even "blue" (Pt. II. v. 6, 5). So it is the ancestor of all things; and Heaven and Earth are the father and mother of the world. From the imperial point of view the sky bore the name of Ti, "ruler," or Shang Ti, "supreme ruler" (emperor); and later commentators readily took advantage of this to discriminate between the visible expanse and the indwelling spirit, producing a kind of Theism. But the older conception still holds its own. "Why" (says Edkins, *Religion in China*, 95), "they have been often asked, should you speak of those things which are dead matter, fashioned from nothing by the hand of God, as living beings? And why not? they have replied. The Sky pours down rain and sunshine; the Earth produces corn and grass. We see them in perpetual movement, and we therefore say that they are living." *Tien Ti, Fu Mu*, "Heaven and Earth, Father and Mother," are conjoined in common speech, and are the supreme objects of imperial worship. The great altar to Heaven, round in shape like the circuit of the sky, and white as the symbol of the light principle (Yang), stands in the southern suburb of Peking in the direction of light and heat. The altar to the Earth is dark and square, on the north side of the city, the region of *yin*, the principle of cold and gloom. Associated with the Sky are tablets to the sun and moon, the seven stars of the Great Bear, the five planets, the twenty-eight constellations, and all the stars of heaven; tablets to clouds, rain, wind and thunder being placed next to that of the moon. With the Earth are grouped the tablets to the five lofty Mountains, the three Hills of perpetual peace and the four Seas, the five celebrated Mountains and the four great Rivers.[6] The ancient ritual (*Chow Li*) carefully graded the right of sacrifice from the viceroys of provinces down to the humblest district-superintendent who offered to the spirits of his district, the hills, lakes and grains. With these spirits ranged in feudal order in two vast groups beneath Heaven and Earth is associated a third class, those of human beings. They are designated by the same name, *shin*; and they are inextricably mingled with the operations of nature. So in the Vedic hymns the departed "Fathers" inhabit the three zones of earth, air and sky; they are invoked with the streams and mountains of this lower earth, as well as with the dawns and the sky itself; even cosmic functions are ascribed to them; and they adorn the heaven with stars. The Chinese conception of the *Shin* under the name of *Shin-to* (Chinese *tao*) or "spirits'-way" profoundly influenced Japanese thought from the 6th century A.D. onwards; and the great Shinto revival of the 18th century brought the doctrine again into prominence. The Japanese *Kami* are the "higher" powers, the *superi*, conceived as acting through nature on the one hand and government on the other. Just as the emperor is *kami*, and provincial officers of rank, so also mountains, rivers, the sea, thunder, winds, and even animals like the tiger, wolf or fox, are all *kami*.[7] The spirits of the dead also become *kami*, of varying character and position; some reside in the temples built in their honour; some hover near their tombs; but they are constantly active, mingling in the vast multitude of agencies which makes every event in the universe, in the language of Motowori (1730–1801), the act of the Kami. They direct the changing seasons, the wind and the rain; and the good and bad fortunes of individuals, families and states are due to them.[8] Everywhere from birth to death the entire life of man is encompassed and guided by the Kami, which are sometimes reckoned at 8,000,000 in number.

2. *Transition to Polytheism.*—In such ways does the Polydaemonism of early faith survive in the modern practice of religion. The process of enrolling the spirits of the dead in the ranks of what may be more or less definitely called "gods" may be seen in the popular usages of India at the present day, or traced in the pages of the *Peking Gazette* under the direction of the Board of Rites, one of the most ancient branches of Chinese administration. Whether the higher polytheisms were produced in this fashion out of the cultus of the dead, may, however, be doubted. Many influences have doubtless contributed, and different races have followed different lines of development. No definite succession like the series of ages marked by the use of stone, bronze and iron can be clearly marked. But there must always have been some correspondence between the stages of social advance (or, in certain cases, of degeneration) and the religious interpretation of the world. The formation of clans and tribes, the transitions from the hunting to the pastoral life, and from the pastoral to the agricultural—the struggle with forest and swamp, the clearings for settlement, the protection of the dwelling-place, the safety of flocks and herds, the production of corn,—the migration of peoples, the founding of colonies, the processes of conquest, fusion, and political union—have all reacted on the elaboration of the higher polytheisms, before bards and poets, priesthoods and theological speculators, began to systematize and regulate the relations of the gods. Certain phases of thought may be more or less clearly indicated; certain elements of race, of local condition, of foreign contact, may be distinguished with more or less historic probability; but no single key can explain all the wide diversity of phenomena. Broadly speaking it may be said that a distinction may be drawn between "spirits" and "gods," but it is a distinction of degree rather than of kind, obvious enough at the upper end, yet shading off into manifold varieties of resemblance in the lower forms. Some writers only recognize friendly agencies as gods; but destructive powers like the volcano, or the lords of the underworld, cannot be regarded as the protectors of the life of man, yet they seem in many mythologies to attain the full personalised stature of gods with definite names. Early Greek religion recognized a class of gods of Aversion and Riddance, ἀποτρόπαιοι and ἀποπομπαῖοι. Neither the spirit nor the god is conceived as

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[1] The Japanese name is *Ame-tsuchi*, "heaven and earth," a translation of the Chinese *ten-chi*, Aston, *Shinto* (1905), p. 35.

[2] Castrén, *Finnische Mythologie*, p. 86.

[3] Erman, *Handbook of Egyptian Religion* (1907), pp. 8, 12.

[4] Sir George Grey, *Polynesian Mythology* (1855), pp. 1–4.

[5] The English "Heaven" has acquired a quasi-personal meaning, and is usually employed as its equivalent, but, like the Jewish use (*e.g.* Luke xv. 18), tends to carry too definite religious associations with it.

[6] Blodget, on "The Chinese Worship of Heaven and Earth," *Journ. of the American Oriental Society*, xx. p. 58 ff.

[7] So the epithet *'êl* might be applied in Hebrew to men of might, to lofty cedars, or mountains of unusual height, as well as to the Supreme Being.

[8] See E. M. Satow, "Revival of Pure Shinto," *Trans. As. Soc. of Japan*, vol. iii. pt. 1 (1875), Appendix, p. 26.

immaterial. They can take food, though the crudest form of this belief soon passes into the more refined notion that they consume the impalpable essence of the meals provided for them. The ancient Indian ritual for the sacrifice to the Fathers required the officiating priest to turn away with bated breath that he might not see the spirits engaged upon the rice-balls laid out for them. The elastic impalpable stuff of the spirit-body is apparently capable of compression or expansion, just as Athena can transform herself into a bird. The spirits can pass swiftly through the air or the water; they can enter the stone or the tree, the animal or the man. The spirit-land of the Ibo on the Lower Niger had its rivers, forests or hills, its towns and roads, as upon earth:[1] the spirits of the Mordvinian mythology, created by Chkaï, not only resembled men, they even possessed the faculty of reproduction by multiplication.[2] The Finns ascribed a *haltia* or genius to each object, which could, however, guard other individuals of the same species. This is the beginning of the species-god, and implies a step of thought comparable to the production in language of general terms. These protecting spirits were free beings, having form and shape, but not individualized; while above them rose the higher deities like the forest-god Tapio and his maiden Hillervo, protectress of herds, or Ahto the water-god who gradually took the place of Vesi, the actual element originally conceived as itself divine, and ruled over the spirits of lakes and rivers, wells and springs.[3] The Finns came to apply to the upper gods the term Yumala which originally denoted the living sky; the Samoyedes made the same use of Num, and the Mongols of Tengri.[4] Above the innumerable *wongs* of the Gold Coast rose Nyongmo, the Sky-god, giver of the sunshine and the rain. The Yoruba-speaking peoples generalized the spirits of mountain and hill into Oke, god of heights; and the multitude of local sea-gods on the western half of the slave coast was fused into one god of the Ocean, Olokun.[5] The Babylonian theology recognized a *Zi* or "spirit" in both men and gods, somewhat resembling the Egyptian "double" or *ka*; spirits are classed as spirits of heaven and spirits of earth; but the original identity of gods and spirits may be inferred from the fact that the same sign stands before the names of both.[6] Out of the vast mass of undifferentiated powers certain functional deities appear; and the Kami of Japan to-day who preside over the gilds and crafts of industry and agriculture, over the trees and grasses of the field, the operations of the household, and even the kitchen-range, the saucepan, the rice-pot, the well, the garden, the scarecrow and the privy, have their counterparts in the lists of ancient Rome, the *indigitamenta* over whose contents Tertullian and Augustine made merry. The child was reared under the superintendence of *Educa* and *Potina*. *Abeona* and *Adeona* taught him to go out and in. *Cuba* guarded him when he was old enough to exchange a cradle for a bed. *Ossipaga* strengthened his bones; *Levāna* helped him to get up, and *Statina* to stand.[7] There were powers protecting the threshold, the door and the hinge: and the duties of the house, the farm, the mill, had each its appointed guardian. But such powers were hardly persons. The settler who went into the woods might know neither the name nor the sex of the indwelling *numen*; "si deus si dea," "sive mas sive femina," ran the old formulae.[8] So the Baals of the Semitic peoples constituted a group of powers fertilizing the land with water-springs, the givers of corn and wine and oil, out of which under conditions of superior political development a high-god like the Tyrian Baal, the majestic City-King, might be evolved. The Celts who saw the world peopled with the spirits of trees and animals, rocks, mountains, springs and rivers, grouped them in classes like the Dervonnae (oak-spirits), the Niskai (water-spirits), the Proximae, the Matronae (earth-goddesses)[9] and the like. Below the small band of Teutonic divinities were the elves of forest and field, the water-elves or nixes and spirits of house and home. The Vedic deities of the nobler sort, the shining *devas*, the *asuras* (the "breathers" or living, perhaps to be identified with the Scandinavian *æsir*) rose above a vast multitude of demonic powers, many of them doubtless derived from the local customs and beliefs of the native races whom the immigrant Aryans subdued. In the earliest literary record of Greek religion Homer distinguishes between the *θεός* and the *δαίμων*, the personalized god and the *numen* or divine power. In Homer the element of time is definitely recognized. The gods are the "Immortals." They are born, and their parentage is known, but they do not die. Zeus is not self-existent in the sense in which the Indian Brahmā is *svayambhū*, but certain questions have been by implication asked and answered, which the demonology of the savage has not yet raised. But behind Homer stretches the dim scene of pre-Hellenic religion, and the conflict of elements "Pelasgic," oriental and Hellenic, out of which the Homeric religion emerged; and beneath the Homeric religion how many features of the religion of ghosts and nature-spirits survived in popular usage and the lower cults![10] When Herodotus (ii. 53) tried to trace the origin of the beliefs around him, he found his way back to an age before Hesiod or Homer, when the gods were nameless. To that age the traditions preserved at Dodona bore witness; and the designations of special groups like the *θεοὶ μέγιστοι*, *θεοὶ μειλίχιοι*, *θεοὶ πραξιδίκαι*, or, possibly, the Venerable Goddesses (*θεαὶ σεμναί*) of Athens, point to a mode of thought when the divine Powers were not definitely individualized. They are just at the point of transition from the ranks of spirits to the higher classes of the gods. As they had no names, they had no relations. Nor had any images yet been made of them. They were associated with hallowed trees, with sacred stones and pillars, out of which came the square rough-hewn Hermae which were anointed with oil like the sacred stone attributed by legend to Jacob at Bethel.[11] By what processes the Hellenic immigration introduced new deities and the Greek pantheon was slowly formed, can only be conjecturally traced with the help of archaeology. But Herodotus and Aeschylus were well aware that the religion of Greece had not been uniformly the same; and the gods whom they knew had been developed out of intercourse with other peoples and the succession of races in the obscure and distant past.

3. *Polytheism.*—The lower and unprogressive religions practically remain in the polydaemonistic stage, though not without occasionally feeling the stimulus of contact with higher faiths, like some of the West African peoples in the presence of the Mahommedan advance. Among the more progressive races, on the other hand, continual processes of elevation and decline may be observed, and the activities of the greater gods are constantly being enriched with new functions. Personal or social experiences of the satisfaction of some desire or escape from some danger are referred to some particular deity. Elements of race-consciousness help to shape the outlook on nature or life: and slight differences of linguistic use in the coining of descriptive terms sometimes lead to the multiplication of divine forms. Exacter observation of nature; closer attention to its contrasts of life and death, or light and darkness, or male and

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[1] Leonard, *The Lower Niger and its Tribes* (1906), p. 186.

[2] Mainof, "Les Restes de la mythologie mordvine," *Journal de la Soc. Finno-Ougrienne*, v. (1889), p. 102.

[3] Castrén, *Finn. Mythol.* pp. 92 ff., 72.

[4] Ibid. pp. 7, 14, 17, 24.

[5] A. B. Ellis, *The Yoruba-speaking Peoples* (1894), p. 289.

[6] Jastrow, *Religion of Babylonia and Assyria* (1898), p. 181. The Zuñis applied the term *ā-hâi* "All-Life" or "the Beings" to all supernatural beings, men, animals, plants, and many objects in nature regarded as personal existences, as well as to the higher anthropomorphic powers known as "Finishers or Makers of the Paths of Life," *Report of Bureau of Ethnol.* (1883), p. 11. On the distinction between "gods" and "spirits," cf. Ed. Meyer, *Gesch. des Alterthums*, 2nd ed. Band i. erste Haelfte (1907), p. 97 ff.

[7] Tert. *De Anima*, 39 Aug. *De Civ. Dei*, iv. 11, &c.

[8] On the Dei Certi and the Dei Incerti, see von Domaszewski in the *Archiv für Religionswiss.*, x. (1907), pp. 1-17.

[9] Cf. the groups of "Mothers" in modern India, of various origins, Crooke, *Popular Religion and Folklore* (2), i. 111.

[10] Cf. Andrew Lang, *Myth, Ritual and Religion*; and Miss Harrison, *Prolegomena to the Study of Greek Religion.*

[11] Cf. A. J. Evans, on *The Mycenean Tree and Pillar Cult* (1901), and Sir W. M. Ramsay, "Religion of Greece and Asia Minor," in Hastings' *Dict. of the Bible*, extra vol.

female; the distinction between its permanent objects, and its occasional or recurring operations; the recognition that behind sudden manifestations of power, like the thunder-storm, there are steady forces and continuous cosmic agencies at work—lead to the gradual rise of the higher deities. And from the social side the development of law, the influence of city life, the formation of priesthoods, the connexion of particular deities with the fortunes of dynasties or the vicissitudes of nations, the processes of migration, of conquest and political fusion, the deportations of vanquished peoples, even the sale of slaves to distant lands and the growth of trade and travel, all contribute to the processes which expand and modify different pantheons, and determine the importance of particular deities. In the midst of the bewildering variety, where all types co-exist together and act and react on each other, it is impossible to do more than point out some obvious groups receiving their special forms chiefly from the side (1) of nature, (2) of human life, and (3) from moral or theological speculation. Divine persons, objects or powers, connected with ritual, are not here considered, such as the Brahman priests who claimed to be *manushyadevāh* (human-gods), or the sacred soma-juice which grew by strange analogies into a mysterious element, linking together heaven and earth.

I. On the side of Nature the lowest rank (1) seems to belong to what Usener has designated " momentary " or " occasional " gods.[1] They embody for the time being a vague consciousness of the divine, which is concentrated for some single act into an outward object, like a warrior's spear or the thunderbolt,[2] or the last sheaf of corn into which the Corn-Mother has been driven.[3] (2) Above these, to use again Usener's nomenclature,[4] are the " special " or " functional " gods, " departmental gods," as Mr Lang has called them. Such were some of the deities of the *Indigitamenta* already compared with the Japanese Kami. Among them, for example, were twelve deities of ploughing and harvest operations, who were invoked with Tellus and Ceres. (3) Another class may be seen in the species-deities previously named; the Samoan gods which could become incarnate as a heron or an owl, did not die with particular birds. A dead owl was not a dead god; he yet lived in all other owls.[5] (4) The worship of trees, plants and animals is a particular phase of the wider series of nature-cults, only named here because of its frequency and its obvious survivals in some of the higher polytheisms, where, as in Egypt, the Apis bulls were worshipped; or where, as in Mesopotamia, the great gods are partly symbolized by animal forms; or where, as in Israel, Yahweh might be represented as a bull; or where, as in Greece, such epithets as Dendrites and Endendros preserved traces of the association of Dionysus and Zeus with vegetation; while sacred animals like the serpents of Aesculapius were preserved in the temples.[6] (5) The higher elemental gods sometimes, like the sun, as the Indian Sūrya, the Egyptian Rê, the Babylonian Shamash (Samas), the Greek Helios, retain their distinct connexion with the visible object. It was naturally more easy for a relatively spiritual worship to gather round a god whose name did not immediately suggest a familiar body. No one ever thought of confessing sin, for instance, to a river. But the daily survey of the sun (occasionally also the function of the moon as measurer of time), together with his importance for life, secured him a high moral rank; and Rê, united with the Theban Ammon, became (under the New Empire) the leading god of Egypt for a thousand years, " He who hath made all, the sole One with many hands." Other deities, like Zeus, rise to the head of a monarchical polytheism, in which their physical base is almost, if not quite, forgotten in cosmic and moral grandeur. The gods are often arranged in groups, three, seven and twelve being frequent numbers. Egyptian summaries recognized gods in the sky, on earth and in the water; gods of the north and south, the east and west, gods of the field and the cities. Indian theologians classified them in three zones, earth, air and sky. Babylonian speculation embraced the world in a triad of divine powers, Anu the god of heaven, Bel of earth and Ea of the deep; and these became the symbols of the order of nature, the divine embodiments of physical law.[7] Sometimes the number three is reached by the distribution of the universe into sky, earth and underworld, and the gods of death claim their place as the rulers of the world to come. Among these deities all kinds of relationships are displayed; consorts must be provided for the unwedded, and the family conception, as distinct from the regal, presents a divine father, mother and child. The Ibani in Southern Nigeria recognized Adum the father-god, Okoba the mother-god and Eberebo the son-god.[8] In Egypt, Osiris, Isis and Horus proved an influential type. Perhaps at a relatively earlier stage maternity alone is emphatically asserted, as in the figure of the Cretan Mother, productive without distinctly sexual character.[9] Or, again, maternity disappears, while parenthood survives, and causation is embodied in a universal " Father of all that are and are to be," like the Indian Brahmā in the days of Gotama the Buddha."[10]

II. On the human side polytheism receives fresh groups in connexion with the development of social institutions and national feeling. (1) In the family the hearth-fire is the scene of the protecting care of deity; the gods of the household watch over its welfare. Each Roman householder had his *Genius*, the women their *Junones*. These stood at a higher level than the " occasional gods," having permanent functions of supervision. (2) From the household a series of steps embodied the divine power in higher forms for social and political ends. Hestia presided over cities; there was even a common Hestia for all Greece. The *fravashi* or ideal type, the genius of both men and gods in the Zend Avesta (possibly connected originally with the cultus of the dead[11]), rises in successive ranks from the worshipper's own person through the household, the village, the district and the province, up to the throne of Ahura himself.[12] The Chinese Shin were similarly organized; so (less elaborately) were the Japanese *Kami*;[13] and the Roman *lares*, the old local land-gods, found their highest co-ordinating term in the *Lares Augusti*, just as the Genius was extended to the legion and the colony, and finally to Rome itself. (3) In the case of national deities the tie between god and people is peculiarly close, as when Yahweh of Israel is pitted against Chemosh of Ammon (Judges xi. 24). The great gods of Greece, in their functions as "saviours" and city-guardians, acquire new moral characters, and become really different gods, though they retain the old names. Ashur rises into majestic sovereignty as the " Ruler of all the gods," the supreme religious form of Assyrian sway: when the empire falls beneath the revived power of Babylon, he fades away and disappears. (4) The earthly counterpart of the heavenly monarch is the divine king, who may be traced back in Egypt, for example, to the remotest antiquity,[14] and who survives to-day among the civilized powers in the emperor of Japan (anciently *Arahito-gami*, " incarnate Kami "). " To the end of time," said Motowori (18th century), "the Mikado is the child of the Sun-goddess." (5) The dead hero (historical or mythic) signalizes his power by gracious saving acts; and Heracles, Asclepius, Amphiaraus, and others pass into the ranks of the gods, which are thus continually recruited from below.

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[1] *Götternamen*, Bonn, 1896, p. 279 ff. But cp. Dr Farnell's essay " On the Place of the Sonder-Götter in Greek Polytheism," in *Anthropological Essays presented to Edward Burnett Tylor* (1907), p. 81.

[2] Ibid. pp. 285, 286.

[3] Frazer, *The Golden Bough* (2), ii. 170–1.

[4] *Götternamen*, p. 75.

[5] Turner, *Samoa*, 1884, p. 21.

[6] Cf. de Visser, *Die nicht Menschen-Gestaltigen Götter der Griechen* (Leiden, 1903).

[7] Jastrow, *Rel. of Babylonia*, p. 432.

[8] Leonard, *The Lower Niger and its Tribes*, p. 354.

[9] Cf. Farnell, *Cults of Greece*, iii. 295.

[10] *Dīgha Nikāya*, i. 18.

[11] This is denied by Tiele, *Religion im Altertum*, tr. Gehrich, ii. (1898), p. 259.

[12] Cf. *Yasna*, lxxi. 18; *S.B.E.* xxxi. p. 331; and Söderblom's essay in the *Rev. de l'hist. des religions*, xxxix. (1899), pp. 229, 373.

[13] Hirata's morning prayer in the last century included 800 myriads of celestial *kami*, 800 myriads of ancestral *kami*, the 1500 myriads to whom are consecrated the great and small temples in all provinces, all islands, and all places of the great land of eight islands, &c.

[14] Moret, *Du caractère religieux de la royauté pharaonique* (1902) For instances in the lower culture see Frazer, *Golden Bough* (2), i. 140 ff.

III. A third great group rises out of the sentiments and affections of man, or the moral energies which he sees working in human life. (1) The Vedic *Craddhā*, "faith," the Greek *Metameleia*, "repentance,"[1] the Latin *Spes*, and a band of other figures, represent the dispositions of the heart; Nemesis and Nikê and Concordia and their kin belong to a somewhat different sphere, the divine powers avenging, conquering, harmonizing the counterparts of the "departmental" gods in the field of moral agencies. (2) Over these theological speculation erects a few lofty and impressive forms; sometimes below the highest, like Vohu Mano, "the Good Mind" of Ahura Mazda; or the Bodhisattva Avalokiteçvara, who vowed not to enter into final peace till every creature had received the saving truth; sometimes supreme, like Brahmā or Prajāpati ("lord of creatures") in the early Brahmanic theology; or Ādi Buddha, or the Zervan Akarana, "boundless time," of a kind of Persian gnosticism; or the Θεὸς ὕψιστος whose worship appears among other syncretistic cults of the Roman empire.

4. *The Order of Nature.*—Polytheism is here on the way to monotheism, and this tendency receives significant support from the recognition of an order in nature which is the ground and framework of social ethics. Not only does a sky-god like Varuna, or a sun-god like the Babylonian Shamash, survey all human things, and take cognizance of the evil-doer, but the daily course of the world is itself the expression of an intellectual and moral power. In the Chinese combination of Heaven and Earth as the parents and nourishers of all things, the energy and action lie with Tien, Earth being docile and receptive. Tien is intelligent and all-observing, and its "sincerity" or steadfastness, displayed in the courses of the sun and moon and the succession of the seasons, becomes the basis of right human conduct, personal and social. The "way" of Heaven, the "course" of Heaven, the "lessons" of Heaven, the law or "decree" (*ming*) of Heaven, are constantly cited as the pattern for the emperor and his subjects. This conception is even reflected in human nature: "Heaven in giving birth to the multitude of the people, to every faculty and relationship affixed its laws" (*Shi King*, III. iii. 6; cf. IV. iii. 2, tr. Legge), and the "Grand Unity" forms the source of all moral order (*Li Ki*, in *Sacred Books of the East*, xxvii. p. 387). Indian thought presented this Order in a semi-personal form. The great elemental gods imposed their laws (*dhāman, dharman, vrata*) on the visible objects of nature, the flow of rivers, the march of the heavenly bodies across the sky. But the idea of Law was generalized in the figure of *Rita* (what is "fitted" or "fixed"; or the "course" or "path" which is traversed), whose Zend equivalent *asha* shows that the conception had been reached before the separation of the Eastern Aryans produced the migrations into India and Iran.[2] In the *Rig Veda* the gods (even those of storm) are again and again described as "born from the Rita," or born in it, according to it, or of it. Even Heaven and Earth rejoice in the womb or lap of the Rita. In virtue of the mystic identity between the cosmic phenomena and sacrifice, Rita may be also viewed as the principle of the cultus; and from that sphere it passes into conduct and acquires the meaning of morality and is equated with what is "true." The fundamental idea remains the same in the Zend Asha, its philological counterpart, but it is applied with a difference. Its form is more personal, for Asha is one of the six Holy Immortals round the throne of Ahura Mazda (Auramazda). In the primeval conflict between the powers of good and evil, the Bounteous Spirit chose Asha, the Righteous Order which knit the world together and maintained the stars.[3] The immediacy of the relation between Ahura and Asha is implied in the statements that Ahura created Asha and that he dwells in the paths which proceed from Asha; and when he created the inspired word of Reason, Asha consented with him in his deed. In its ritual form Asha becomes the principle of sacrifice, and hence of holiness, first ritual and then moral. Like Rita, it rises into an object of worship, and in its most exalted aspect (*Asha vahista*, the "best" Asha, most excellent righteousness) it is identified with Ahura himself, being fourth among his sacred names (*Ormazd Yasht*, § 7; *S.B.E.* xxiii. p. 25). Egyptian speculation, in like manner, impersonated the conceptions of physical and moral order as two sides of a fundamental unity in the goddess Maāt. Derived from the verb *mā*, "to stretch out," her name denoted the ideas of right and rule, and covered the notions of order, law, justice and truth, which remained steadfast and unalterable. Mythologically she was the daughter (or the eye) of the sun-god Rê; but she became Lady of Heaven and Queen of Earth, and even Lady of the land of the West, the mysterious habitation of the dead. Each of the great gods was said to be lord or master of Maāt; but from another point of view she "knew no lord or master," and the particular quality of deity was expressed in the phrase *anχ em maāt*, "living by Maāt," which was applied to the gods of the physical world, the sun and moon, the days and hours, as well as to the divine king. She was solemnly offered by the sovereign to his god; and the deity replied by laying her within the heart of his worshipper "to manifest her everlastingly before the gods." So in the famous scene of the weighing of the soul, which first appears pictorially under the New Empire, she introduces the deceased before the forty-two assessors of the heavenly judge, Osiris, and presides over the scale in which his actions and life are weighed. From the zenith to the realm of the departed she is the "queen of all gods and goddesses."[4] The Hellenic polytheism of Homer and Hesiod is already at work upon similar ideas, and a whole group of mythic personifications slowly rises into view representing different phases of the same fundamental conception. Themis (root θε = Sanskr. *dha*, as in *dhāman*) appears in Homer as the embodiment of what is fit or right;[5] she convenes or dismisses assemblies, she even keeps order at the banquet of the gods. Next, Hesiod supplies a significant biography. She is the daughter of Ouranos and Gaia; and after Metis she becomes the bride of Zeus.[6] Pindar describes her as born in a golden car from the primeval Oceanus, source of all things, to the sacred height of Olympus to be the consort of Zeus the saviour; and she bears the same august epithet, as the symbol of social justice and the refuge for the oppressed.[7] Law was thus the spouse of the sovereign of the sky, but Aeschylus identified her with the Earth (worshipped at Athens as Gē-Themis), not only the kindly Mother, but the goddess who bound herself by fixed rules or laws of nature and life.[8] For the cultus of the earth as the source of fertility was associated with the maintenance of the family, with the operations of agriculture and the social order of marriage. So Themis became the mother of the seasons; the regular sequence of blossom and fruit was her work; and Good Order, Justice and Peace were her offspring.[9] By such conceptions the Hellenic polytheism was moralized; the physical character of the greater gods fell into the background, and the sculptor's art came to the aid of the poet by completely enduing them with personality.

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[1] Worshipped at Argos. Usener, *Götternamen*, p. 366.

[2] Cf. Max Müller, *Lectures on the Origin and Growth of Religion* (Hibbert Lect., 1878), v., and the Vedic treatises of Ludwig, Bergaigne and Wallis.

[3] *Yasna*, xxx. 5; *Sacred Books of the East*, xxxi. p. 30; cf. pp. 44, 51, 248.

[4] Cf. Renouf, *Hibbert Lectures*, p. 119; Brugsch, *Rel. und Mythol.*, p. 477; Wiedemann, *Ann. du Musée Guimet*, x. p. 561; Budge, *Gods of Egypt*, i. p. 416.

[5] Cf. Διὸς Θέμιστες, Od. xvi. 403; cf. Apollo, *Hom. Hymn.* 394.

[6] *Theog.* 135, 901.

[7] *Fr.* 6, 7; *Ol.* viii. 29.

[8] Farnell, however, supposes that Gē acquired the cult-appellative through her prophetic character (*Cults of the Greek States*, iii. p. 12). The union of Zeus and Themis is, then, a later equivalent of the marriage of Zeus and Earth (ibid. p. 14).

[9] Paus. v. 17; Hes. *Theog.* 901; Pindar, *Ol.* xiii. 6; ix. 26.

5. *Transition to Monotheism.*—From the higher Polytheism an easy step leads to some form of Monotheism. The transition may be effected in various ways. Max Müller observed the Vedic poets addressing themselves to the several objects of their devotion, as if each occupied the field alone. Varuna or Indra was for the time being the only god within the worshipper's view; and to this mode of thought he gave the name Henotheism.[1] It obviously reappears elsewhere, as it is the natural attitude of prayer, and may be seen in the pious homage of the pilgrims to the Virgin of Loretto or Einsiedeln. Pfleiderer employed the word to denote a relative monotheism like that of the early religion of Israel, whose teachers demanded that the nation should worship but one god, Yahweh, but did not deny the existence of other gods for other peoples. Yet once again the term has been applied to characterize a whole group of religions, like the Indo-Germanic, which are ultimately founded on the unity of the divine nature in a plurality of divine persons. A designation of such doubtful meaning it seems better (with Chantepie de la Saussaye) to abandon. But the unifying process may advance along different lines. The deities of different local centres may be identified; many such combinations took place in Egypt, and Isis in late days served to her votaries as the unitary principle which appeared in one figure after another of whole pantheons. Again, the gods may be viewed as a collective totality, like the "All-gods" of the Vedic poets, or as at Olympia where there was a "common altar for all the gods" (cf. the frequent Roman dedication in later days, "Jovi optimo maximo caeterisque dis immortalibus"). Or the relation between the inferior deities and the most exalted may be conceived politically and explained by Tertullian's formula, "Imperium penes unum, officia penes multos." One particular god may be eminent enough, like Zeus, to rise above all others, and supply cultivated thought with a name for the supreme power; and this may be strengthened by the national motive as in the case of Israel. Or philosophic theology may penetrate to an abstract conception of deity, like the Babylonian *'iluth*, or the Vedic *devatva* and *asuratva*; and some seer may have the courage and insight to formulate the principle that "the great *asuratva* of the *devas* is one" (*R.V.* iii. 55. 1). "The One with many names" was recognized alike in India and in Greece; "*πολλῶν ὀνομάτων μορφὴ μία*," says Aeschylus, almost in the words of the Vedic poet.[2] Historians have usually recognized only three monotheistic religions, Judaism, Christianity and Islām. The Christian apologists of the 2nd century, however, found plenty of testimony to their doctrine of the unity of God in the writings of Greek poets and philosophers; it was a commonplace in the revival under the Empire; and among the group of religions embraced under the name Buddhism more than one form must be ranked as monotheistic. The idealist philosophy of the Prajña Pāramitā in the system of the "Great Vehicle" declared that "every phenomenon is the manifestation of mind" (Beal, *Catena*, p. 303). In the "Lotus of the Good Law" (*S.B.E.* xxi.) the Buddha is the "Father of the World," "Self-born" or Uncreate (like the eternal Brahmā of the Hindu theology), the protector of all creatures, the Healer (Saviour) of the sickness of their sins. These types have reappeared in Japan. Nichiren taught a philosophical monism in the 13th century which is the basis of a vigorous sect at the present day; and the "True Sect of the Pure Land," founded by his older contemporary Shin-ran, and now the most numerous, wealthy and powerful of the Buddhist denominations, has dropped the original Gotama altogether out of sight, and permits worship to Amida alone, the sublime figure of "Boundless Light," whose saving power is appropriated by faith. Here is a monotheism of a definite and clear-cut type, arising apparently by spontaneous development apart from any external impulse.[3] On the other hand, the monotheism of Judaism was subject to serious qualifications. An exuberant demonology admitted all kinds of interfering causes in the field of human life. Above man on earth rose rank after rank of angels in the seven heavens. These were of course created, but they were in their turn the agents of the phenomena of nature, "the angels of the spirit of fire and the angels of the spirit of the winds, and the angels of the spirits of the clouds and of darkness and of snow and of hail and of hoarfrost, and the angels of the voices and of the thunder and of the lightning, and the angels of the spirits of cold and of heat, and of winter and of spring and of autumn and of summer" (*Jubilees*, tr. R. H. Charles, ii. 2). These powers are of a well-marked animistic type, and correspond to the Chinese Shin, save that they were not incorporated in the cultus. Higher in rank came various mediating forms, like Wisdom, Memra (the Word) or Shekinah (the Presence), more or less definitely personalized. Mahommedanism still recognizes innumerable *jinn* peopling the solitudes of the desert, and over the grave of the deceased saint a little mosque is built, and prayers are offered and miracles performed.[4] Christianity has, in like manner, in the course of its long and eventful history, admitted numerous agencies within the sphere of superhuman causation. The Virgin, the angelic hierarchy, the saints, have received the believer's homage, and answered his petitions. Theology might draw subtle distinctions between different forms of devotion; but, tried by the comparisons of the anthropologist, the monotheism even of historical Christianity cannot be strictly maintained.

6. *Classification.*—In the panorama of religious development thus briefly sketched, the different stages constantly appear to shade off into one another, and any one of the higher seems to contain elements of all the rest. This is the great difficulty of classification. All religions, even the most conservative and traditional, are in constant flux, they either advance or decay. In these processes, which do not take place at equal rates in different cases, all kinds of survivals remain lodged, and embarrass every attempt to fix the place of specific religions in any general course of development. The theologian, the philosopher, the historian, have all tried their hands at distribution. (i.) The 18th-century divine who divided religions into True and False grimly remarked that the second chapter was much the longer of the two.[5] The corresponding distinction into Natural and Revealed breaks down in view of the fact that revelation by dream and oracle, by inspired seer or divine teacher and law-giver, is a practically universal phenomenon in more or less distinctly defined forms. (ii.) Philosophy, in the person of Hegel, classified religion in a threefold form: (*a*) the religion of Nature, (*b*) the religion of Spiritual Individuality, (*c*) the Absolute Religion (Christianity).[6] The subdivisions of this scheme have been long since abandoned, as the progress of knowledge rendered them untenable. K. F. A. Wuttke, however, adopted its fundamental idea[7] and distinguished three periods or phases: (1) the objective, producing the religions of nature; (2) the subjective, God as comprehended in the individual mind; (3) God as Absolute Spirit. In the same way Dr Edward Caird[8] recognizes three similar stages: (1) objective consciousness, the divine in nature; (2) self-consciousness, the divine in man (*e.g.* Judaism, Stoicism, and modern philosophy of the type of Kant); (3) God-consciousness, where God is above the contrast of subject and object, yet is revealed in both (Christianity). (iii.) On the historical side numerous bases have been suggested. (1) Max Müller proposed to group religions ethnologically by tests of language. This had the obvious advantage of lifting two great families into prominence, the Semitic and the Indo-Germanic. The Semitic peoples were closely bound together by common types of thought and civilization, and produced three of the leading religions of the world, Judaism, Christianity and Islām. But a glance at the table of Indo-Germanic religions

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[1] Or Kathenotheism, a term which did not succeed in gaining permanent support, *Hibbert Lect.*, p. 271.

[2] *R.V.* i. 164. 46, "Men call him Indra, Mitra, Varuna, Agni. . . . Poets name variously what is but one."

[3] Cf. Carpenter, "Japanese Buddhism," in *Hibbert Journal*, April 1906, p. 522.

[4] Cf. Goldziher, *Rev. de l'Hist. des Rel.* ii. 257; Weir, *The Shaikhs of Morocco* (1904).

[5] Broughton, *Dict. of all Religions* (1745), preface.

[6] *Philosophy of Religion* (Eng. trans.), i. p. 266.

[7] *Geschichte des Heidenthums* (1852), i. p. 95.

[8] *Evolution of Religion* (1893), lect. vii.

drawn up by Tiele (*Ency. Brit.*, 9th ed., vol. xx. p. 360) will show what diversified products are blended together. Why should philosophical Brahmanism, or the Buddhism which reacted against it, be associated with so undeveloped a form as the religion of the ancient Latin settlers in mid-Italy? And why, on the other hand, should the religions of the lower culture, which are practically of a common type, be separated genealogically into numerous independent families? (2) Whitney[1] found the most important distinction to lie between religions which were the collective product of the wisdom of the community, race-religions as they might be called, and those which proceeded from individual founders. But, as Tiele pointed out, the "individual" element cannot be eliminated from the "race-religion," where each myth has been first uttered, each rite first performed, by some single person. And the founder who enters history with an impressive personality can only do his work through the response made to him by the insight and feeling of his time. (3) Kuenen disengaged another characteristic, the scope and aim of any given religion; was it limited to a particular people, or could it be thrown open to the world? On this foundation the higher religions were classed as national or universal, the latter group being formerly supposed to include Buddhism, Christianity and Mahommedanism. Here, once more, the student is confronted with many qualifications. A missionary religion like Mithraism, which established itself all the way from Western Asia to the borders of Scotland, was certainly not "national." Judaism and Brahmanism both passed beyond the confines of race. The Confucian morality could be adopted without difficulty in Japan. In other words, there was either a definite tendency to expansion, or there was no impediment in the religion itself when circumstances promoted its transplantation. Further, there are elements of Islām, like the usages of the *hajj* (or pilgrimage to the sacred places at Mecca), the dryness of its official doctrine and the limitations of its real character as indicated in the Wahhābi revival, which so impair its apparent universalism that Kuenen found himself obliged to withdraw it from the highest rank of religions.[2] (4) Professor M. Jastrow, jun., starting from the relation of religion to life, distinguishes four groups, the religions of savages, the religions of primitive culture, the religions of advanced culture and the religions which emphasize as an ideal the coextensiveness of religion with life. It may, however, be doubted whether the fundamental assumption of such a scheme, viz. that in the life of the savage religion plays a comparatively small part, can be satisfactorily established. The evidence rather implies that, so far as the sanctions of religion affect the savage at all, they affect him with unusual force. In the absence of other competing interests his religious beliefs and duties occupy a much larger share of his attention than the votaries of many higher faiths bestow on theirs; and though his ethical range may be very limited, yet the total influence of his religion in determining for him what he may do and what he may not, brings the greater part of conduct under its control. The savage who finds himself encompassed by taboos which he dare not break, lives up to his religion with a faithfulness which many professing Christians fail to reach. (5) There remains a broad distinction between religions that are in the main founded on the relation of man to the powers of Nature, and those based on ethical ideas, which partly corresponds to the philosophical division already cited. This enabled Professor Tiele to arrange the chief religions in certain groups, starting from the primitive conception of the common life of the objects of the surrounding scene:—[3]

I. *Nature Religions*—
1. Polyzoic Naturalism (hypothetical).
2. Polydemonistic-magical religions under the control of Animism (religions of savages).
3. Purified or organized magical religions. Therianthropic Polytheism.
   (*a*) Unorganized (religions of the Japanese, Dravidians, Finns, Esths, the ancient Arabs, the ancient Pelasgi, the Old-Italian peoples, the Etruscans (?), the Old-Slavs).
   (*b*) Organized (religions of the half-civilized peoples of America, ancient Chinese state-religion, religion of the Egyptians).
4. Worship of beings in human form, but of superhuman power and half-ethical nature. Anthropomorphic polytheism (religions of the Vedic Indians, the ancient Persians, the later Babylonians and Assyrians, the advanced Semites, the Kelts, Germans, Hellenes, Greeks and Romans).

II. *Ethical Religions* (spiritualistic ethical religions of Revelation)—
1. National Nomistic (nomothetic) Religious Communions (Taoism and Confucianism, Brahmanism, Jainism, Mazdeism, Mosaism and Judaism, the two last already passing into 2).
2. Universalistic Religious Communions (Buddhism, Christianity: Islām with its particularistic and nomistic elements only partially belongs to this group).[4]

7. *Revelation.*—The second group in this division practically corresponds to the second stage recognized by Caird; but it rests upon a somewhat different basis, the conception of revelation addressed to the conscience in the form of religious law. Neither Taoism nor Confucianism, indeed, makes this claim. The *Tao-teh-king*, or book of aphorisms on "the Tao and virtue" ascribed to Lao Tsze, is wholly unlike such a composition as Deuteronomy; and the disciples of Confucius carefully refrained from attributing to him any kind of supernatural inspiration in his conversations about social and personal morality. The sacred literatures of India and Israel, however, present many analogies, and emerge out of a wide range of phenomena which have their roots in the practices of the lower culture. The belief that the Powers controlling man's life are willing upon occasion to disclose something of their purpose, has led to widespread rites of divination, which Plato described as the "art of fellowship between gods and men," and the Stoics defended on grounds of a priori religious expectation as well as of universal experience. Through the dream the living was put into communication with the dead, which sometimes embodied itself in peculiar and pathetic literary forms, such as the Icelandic dream-verses imparted by the spirits of those who had been lost at sea or overwhelmed by the snow; and a whole series of steps leads up from necromancy to prophecy and oracle, as the higher gods become the teachers of men. The gods of revelation are naturally not the highest, since they appear as the interpreters of one superior to themselves. The revealing agency may be only a voice like Aius Locutius, to which the Romans raised a temple; or, like Hermes, he may be the messenger of the gods; or, like Marduk, pre-eminently the god of oracles in Babylonia, he may be the son of Ea, the mighty deep encompassing the earth, source of all wisdom and culture. To Marduk the prophet-god Nabu in his turn became son, and his consort Tashmīt ("causing to hear") was the personification of Revelation. Egyptian thought ascribed this function to Thoth, who played somewhat different parts in different systems, but emerges as the representative of the immanent intelligence

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[1] *Princeton Review*, May 1881, quoted by Tiele, *Elements of the Science of Religion* (1897), i. p. 42.

[2] *National Religions and Universal Religions* (Hibbert Lectures, 1882).

[3] *Ency. Brit.*, 9th ed., art. "Religions"; *Elements of the Science of Religion*, vol. i. (1897), with some corrections communicated by letter to Professor Chantepie de la Saussaye, *Religionsgesch.* (3rd ed., 1905), vol. i. p. 11.

[4] For a long series of suggested bases of classification see Raoul de la Grasserie, *Des Religions Comparées au Point de Vue Sociologique* (1899), chap. xii.; cf. further E. von Hartmann, *Religionsphilosophie* (1888); Siebeck, *Lehrbuch der Religionsphilosophie* (1893); Dorner, *Grundriss der Religionsphilosophie* (1903). Siebeck proposed to distribute religions in three grades: (1) Nature-Religions, *i.e.* those of the lower culture; (2) Morality-Religions in various grades and stages, *e.g.* Mexicans and Peruvians, Arcadians, Chinese, Egyptians, Hindus, Persians, Germans, Romans, with the Greek religion in the highest rank; (3) Religions of Redemption (Judaism forming the transition from the second group), Buddhism in the sense of world-negation, and, positively, Christianity. Bousset, *What is Religion?* (1907) reckons Platonism along with Buddhism. For criticism of Siebeck's scheme see Tiele, *Elements of the Science of Religion*, vol. i. (1897), pp. 62, 65. Pfleiderer, *Religion and Historic Faiths* (1907), p. 88, recognizes more clearly the difficulty of carrying almost any division through the whole field, without frequent breach of historical connexions.

of the world, brother of Maāt and the giver of laws and culture to man.[1] Thoth "the thrice-great" passed into Hermes Trismegistus whom Christian fathers could recognize,[2] when the supremely beautiful figure of Greek theology, Apollo, had lost his dignity and ceased to be desired. Thoth was a voluminous author, and the collection of forty-two books which bore his name was a kind of primitive cyclopaedia of theology, astronomy, geography and physiology. Apollo proclaims at his birth that he will declare the counsel of Father Zeus to men.[3] But his utterances have been only casually preserved. A special literature of oracles did indeed arise; the divine words were collected and the circumstances which produced them were recorded; and had Delphi become in fact the centre of Greece, as Plato conceived it, here might have been the nucleus of a scripture. Theories of inspiration lurk behind the rich vocabulary of Greek prophecy; the seer is *ἔνθεος*, *θεόληπτος*, *θεόπνευστος*, *θεοφόρητος*, and Bakis and Musaeus give their names to sacred verses. The story of the Sibylline books in Rome, on the other hand, shows the growth of the idea of authority. They are deposited in a temple, in charge of a small sacred college; new deities and rites are introduced under their sanction; when they are accidentally destroyed, envoys are sent to the East and fresh collections are made; these are in their turn purged, the false are discarded and the true reverently preserved. By what method the books were consulted is not known; but they exhibit the idea of a sacred canon in process of formation. The theologians of India guarded their ancient hymns with the utmost care. A vast literary apparatus was devised for their protection. The famous Purusha-hymn (*R.V.* x. 90) already claimed a divine origin for the three Vedas, the Rik, the Sāman and the Yajush. The "triple knowledge" was sometimes derived from the "Lord of Creatures" Prajāpati—one of the unifying forms of Brahmanical theology—through Vāc or "speech." The Veda, that is to say, had existed in the divine mind ere it was made known to men, and as such it belonged to the realm of the deathless and the infinite. The tribal poets were supposed to have "seen" the heavenly originals; elaborate arguments were devised to explain how the names of particular objects like rivers and mountains could have existed in the Eternal; while the grounds of belief in the infallibility of the sacred verses were enforced with the double weight of philosophy and tradition. Buddhism repudiated the authority of the Veda, but found it needful to supply its place; and the word of the omniscient Teacher, faithfully reported by his disciples and guaranteed by concurrent traditions, became the rule of belief for the new Order. Nor were the authors of the scriptures whose fragments are preserved in the Zend Avesta less conscious of their divine value. The ancient Gāthās, which were supposed to be the composition of Zarathustra himself, received the homage of later worshippers.[4] Daena, the ideal personification of law and religion, is the object of praise and sacrifice. She dwells on high in the Heavenly Home, the radiant "Abode of song," but Zarathustra summons her thence, begs for her fellowship, and prays her for righteousness of thought, speech and deed.[5] She is produced by Vohu Mano, the "Good Thought" of Ahura, one of the six Holy Immortals; she thus belongs to the ideal creation before the earth and its inhabitants;[6] but how the heavenly Daena was wrought by Zarathustra into written form is nowhere stated. This conception of pre-existent spiritual counterparts was not without influence on the later theology of Israel. The sacred law (Torah) was the earthly reproduction of a heavenly Torah which had no origin in time, and constituted the sum of ideal wisdom into which God looked when he would create the world.[7] Even Mahommedanism felt the spell of the same modes of thought. The idea of revelation was expressed by "sending down" (from *nazala*, to descend); that which passed from heaven to earth was a pre-existent word, eternal as God Himself. Allusions in particular passages of the Koran to the "mother of the scripture," the invisible originals of the prophet's speech, led to the doctrine of its uncreated being. The whole history of religion presents perhaps no more singular spectacle than the mosques of Bagdad in the middle of the 9th century filled with vast crowds of twenty and thirty thousand of the faithful, assembled to discuss the dogmas of the created and the uncreated Koran.[8]

8. *Ethics and Eschatology.*—The second distinguishing mark in Tiele's higher group is implied in the term "Ethical." By this it is not intended to assert that moral ideas are wanting in the so-called "naturist" religions. Anthropologists have, it is true, taken widely different views of the relation of ethics and religion; and the stage at which an effective alliance between them might be recognized. Like all problems of origins, the question is necessarily extremely obscure, and cannot be definitely settled by historical evidence. Broadly speaking, however, it may be said that the attempt to show that certain savages are destitute of moral feeling cannot be sustained;[9] and evidence has been already cited above (in the section on Primitive Religion) proving the varied and immediate effects of religion on the life of the lowest tribes. Continuous interaction marks the slow courses of advance. At a very early period in social development the rules of conduct are referred to some higher source. Thus among the tribes of south-eastern Australia described by Mr Howitt,[10] the native rites and laws handed down from generation to generation were supposed to have been first imparted by some higher being such as Nurrundere, who made all things on the earth; or Nurelli, who created the whole country, with the rivers, trees and animals; or Daramulun, who (like Nurrundere) bestowed weapons on the men, and instituted the rites and ceremonies connected with life and death. As religion advances with improved social organization, a series of figures, partly human, partly divine, embodies the idea that the command of nature implied in the progress of the arts is due to some kind of instruction from above, and that the obligations of law are of more than human origin. The Algonquin Manibozho and Quetzalcoatl of Mexico stand for a whole group of typical personalities in North and Central America. The mysterious fish-man Oannes, who taught the primitive inhabitants of Babylonia, according to Alexander Polyhistor, has been identified with Ea, god of the deep, the source of wisdom, culture and social order. Zeus gave laws to Minos; Apollo revealed the Spartan constitution to Lycurgus; Zaleucus received the laws for the Locrians from Athena in a dream; Vishnu and Manu condescended to draw up law-books in India. The worship of ancestors has again and again gathered around it powerful and ethical influences, emphasizing the parental and filial relations, and strengthening the mutual obligations of communal life. Hirata answered by anticipation the modern reproach against Shinto, founded on the absence of any definite morality connected with it, by laying down the simple rule, "Act so that you need not be ashamed before the Kami of the unseen."[11] The mythological embodiments of the connexion of law in nature with the social and moral order have already been briefly noted: a few words may be said in conclusion on another product of the union of religion and ethics, viz. the doctrine of judgment after death. That this doctrine is not essential to a highly moralized religion is clear from the fact that it formed no part of the earlier Hebrew prophecy. Judgment, indeed, was an inevitable outcome of the sovereignty of Yahweh, but it would be passed upon the nation in the immediate scene of its misdoings; and even when the scope of the divine doom

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[1] Cf. Maspero, *Dawn of Civilization*, p. 204; Wiedemann, *Religion of the Ancient Egyptians*, p. 227; Budge, *Gods of Egypt*, i. p. 415.

[2] Aug. *De Civ. Dei*, xviii. 39, attributes the origin of philosophy to his era.

[3] *Hom. Hymn.* i.

[4] *Yasna*, lv.; *S.B.E.* xxxi. p. 294.

[5] *S.B.E.* xxiii. p. 264.

[6] *Bundahis*, i. 25; *S.B.E.* v. p. 9.

[7] *Midrash Bereshith Rabba*, tr. Wunsche, I. i. ver. i.

[8] Von Kremer, *Die Herrschenden Ideen des Islams*, p. 233 ff.

[9] See Westermarck, *Origin and Development of Moral Ideas*, vol. i. (1906), p. 125, on Lord Avebury's conclusions.

[10] *Native Tribes of S.E. Australia* (1904), pp. 488, 489, 495, 543.

[11] Satow, "Revival of Pure Shinto," *Trans. As. Soc. Japan*, vol. iii. Appendix, p. 87.

was extended to include the nations of the world, it was still upon the living that it would alight. The seers of Israel were content to dismiss their dead to a land of silence and darkness, the vast hollow gloom of the subterranean Sheol.[1] A far ruder outlook on life, however, which has again and again appealed to some form of the divine cognizance by means of the ordeal and the oath, frequently supplements the moral issues of this world by the judicial award of the next. Assuming the proper fulfilment of the ritual of death, ethics gradually extends its control over the future. At first the social distinctions of this life are simply continued hereafter: the chief remains a chief, the slave a slave; and the conditions of the future only prolong those of the present. In so far as tribal eminence depends on superior skill or courage or wisdom, the germs of ethical differentiation may be discovered even here. The process is carried further (1) in individual cases of retribution, when (as among the Kaupuis) crime within the tribe was punished, and a murderer becomes in the next life his victim's slave;[2] or (2) when service to the community received special reward, and warriors who had fallen in battle, women who had died in childbirth and merchants who had perished on a journey were sent in Mexico to the house of the sun.[3] As the social order acquires more definiteness and stability, the control of life by the gods tends to become more clearly moralized. This brings with it new standards independent of clan-customs or tribe-usage. Only the worst offences, however, at first draw down post-mortem punishment. The Homeric Erinyes chastise outrages on the poor, injuries to guests, failure to show the respect due to parents or to recognize the rights of age, in this life; only on perjury does the divine doom extend to the next.[4] On the other hand, the Egyptian version of "the whole duty of man" in the famous 125th chapter of the *Book of the Dead* embraces a singular complex of ritual, social and personal sins, in which the inward states of lying, anger and ill-will are condemned along with murder, theft and adultery, beside violation of the times of offerings to the gods, or interference with the food of the blessed dead. The great judgment of Osiris formulates with the utmost precision the alliance between morals and religion. The doctrine established itself in Greek theology under the influence of Orphism, and supplied Plato with mythic forms for his "criticism of life." In India the union of morality and religion was effected in another manner. True, Yama, first of men to enter the world beyond, became the "King of Righteousness" before whose tribunal the dead must appear. But a new agency began to engage the speculations of thinkers, the moral values of action embodied in the Deed. "The deed does not perish," ran an early formula.[5] "A man is born into the world that he has made," said another:[6] and what was laid down first as a ritual principle survived as an ethical. Buddhism conceived men as constantly making their own world for good and ill; it took over from Brahmanism a whole series of heavens and hells to provide an exact adjustment in the future for the virtue or vice of the present; and its eschatologic confidence was one of the potent instruments of its success in countries which, like China and Japan, had developed no theories of retribution or reward beyond the grave. Along a different line of thought the Iranian teachers, beholding the world divided between hostile powers, demanded, as the fundamental postulate of religion, the victory of the good. The conflict must end with the triumph of light, truth and right. The details of this remarkable scheme must be studied elsewhere (see ZOROASTER). The award of the angel-judges at the Bridge of Assembly, soon after death, despatched the individual to his appropriate lot in the homes of Good or Evil Thought, Word and Deed. But at length the long struggle would draw to an end. The great "divine event," the *frasho-kereti*, the renovation, would set in. A new heaven and a new earth would be created: a general resurrection should take place; the powers of evil should be overthrown and extinguished; and hell should be brought back for the enlargement of the world. Eschatology has again and again expressed the alliance between ethics and religion. It remains for the future to show how long that alliance will require its support.

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[1] Cf. Ezek. xxxii. 17–32; Ps. lxxxviii 3–4, 10, 11; Job x. 21–22, and many other passages.

[2] Watt, *Journ. Anthrop. Institute*, xvi p. 356. Cf. Codrington, *The Melanesians* (1891), p. 274.

[3] Bancroft, *Native Races of the Pacific States of N. America*, iii. p. 532.

[4] *Il.* iii. 278–79; xix. 258–60.

[5] *S.B.E.* ii. p. 271; xiv. pp. 116, 310.

[6] Ibid. xli. p. 181.

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REMAGEN, a town of Germany, in the Prussian Rhine Province, on the left bank of the Rhine, 12 m. above Bonn, by the railway from Cologne to Coblenz, and at the junction of the Ahr valley railway to Adenau. Pop. (1900) 3534. The (Roman Catholic) parish church is remarkable for a gate (Römertor) with grotesque sculptures of animals, dating from the 12th century. Archaeologists have variously interpreted its original purpose, whether as church door, city gate or palace gate. The industry of the place is almost wholly concerned with the preparation of wine, in which a large export trade is done. Just below the town, on a height overlooking the Rhine, stands the Apollinaris church, built 1839–53 on the site of a chapel formerly dedicated to St Martin, and containing the relics of St Apollinaris. It is a frequent place of pilgrimage from all parts of the lower Rhine. According to legend, the ship conveying the relics of the three kings and of Bishop Apollinaris from Milan to Cologne in 1164 could not be got to move away from the spot until the bones of St Apollinaris had been interred in St Martin's chapel.

Remagen (the *Rigomagus* of the Romans) originally belonged to the duchy of Jülich. Many Roman antiquities have been discovered here. In 1857 a votive altar dedicated to Jupiter, Mars and Mercury was unearthed, and is now in the Provincial Museum at Bonn.

See Kinkel, *Der Führer durch das Ahrthal nebst Beschreibung der Stadt Remagen* (2nd ed., Bonn, 1854).

REMAINDER, REVERSION. In the view of English law a remainder or reversion is classed either as an incorporeal hereditament or, with greater correctness, as an estate in expectancy. That is to say, it is a present interest subject to an existing estate in possession called the particular estate, which must determine before the estate in expectancy can become an estate in possession. A remainder or reversion is in strictness confined to real estate, whether legal or equitable, though a similar interest may exist in personalty. The particular estate and the remainder or reversion together make up the whole estate over which the grantor has power of disposition.[1] Accordingly a remainder or reversion limited on an estate in fee simple is void. The difference between a remainder and a reversion, stated as simply as possible, is that the latter is that undisposed-of part of the estate which after the determination of the particular estate will fall into the possession of the original grantor or his representative, while a remainder is that part of the estate which under the same circumstances will fall into the possession of a person other than the original grantor or his representative. A reversion, in fact, is a special instance of a remainder, distinguishable from it in two important respects: (1) a reversion arises by operation of law on every grant of an estate where the whole interest is not parted with, whereas a remainder is created by express words; (2) tenure exists between the reversioner and the tenant of the particular estate, but not between the latter and the remainderman. Accordingly rent service is said to be an incident of a reversion but not of a remainder, and a reversioner could distrain for it at common law. A reversion may be limited upon any number of remainders, each of them as it falls into possession becoming itself a particular estate. A remainder or reversion may be alienated either by deed or by will. A conveyance by the tenant of a particular estate to the remainderman or reversioner is called a surrender; a conveyance by the remainderman or reversioner to the tenant is a release.

Remainder.—Remainders are either vested or contingent. "An estate is vested in interest when there is a present fixed right of future enjoyment. An estate is contingent when a right of enjoyment is to accrue on an event which is dubious and uncertain. A contingent remainder is a remainder limited so as to depend on an event or condition which may never happen or be performed, or which may not happen or be performed till after the determination of the preceding estate" (Fearne, *Contingent Remainders*, 2, 3). Contingent remainders are of two kinds, those limited to uncertain persons and those limited on uncertain events. A grant by A to B for life, followed by a remainder in fee to the heir of C is an example of a contingent remainder.[2] Until the death of C he can have no heir. If C die during the lifetime of B, the contingent remainder of his heir becomes vested; if C survive B, the remainder is at common law destroyed owing to the determination of the particular estate, for every remainder must have a particular estate to support it. In the case of a contingent remainder, it must become vested during the continuance of the particular estate or at the instant of its determination. This rule of law no doubt arose from the disfavour shown by the law to contingent remainders on their first introduction. They were not firmly established even when Littleton wrote in the reign of Edward IV. (see Williams, *Real Property*). The inconveniences resulting from this liability of contingent remainders to destruction were formerly overcome by the device of appointing trustees to preserve contingent remainders at law. Equitable contingent remainders, it should be noticed, were indestructible, for they were supported by the legal estate. In modern times the matter has been dealt with by act of Parliament. By the Real Property Act 1845, § 8, a contingent remainder is rendered capable of taking effect notwithstanding the determination by forfeiture, surrender or merger of any preceding estate of freehold in the same manner as if such determination had not happened. The case of determination by any other means is met by the Contingent Remainders Act 1877. The act provides that a contingent remainder which would have been valid as a springing or shifting use or executory devise or other limitation had it not had a sufficient estate to support it as a contingent remainder is, in the event of the particular estate determining before the contingent remainder vests, to be capable of taking effect as though the contingent remainder had originally been created as a springing or shifting use or executory devise or other executory limitation. It will accordingly only be good if the springing use, &c. (for which see Trust), would be good. If the springing use be void as a breach of the rule against perpetuities (see Perpetuity), the remainder will likewise be void. Apart from this act, there is some uncertainty as to the application of the rule against perpetuities to remainders. The better opinion is that it applies to equitable remainders and to legal remainders expectant upon an estate for life limited to an unborn person. In the latter case the rule as applied to contingent remainders is somewhat different from that affecting executory interests. The period is different, the remainder allowing the tying up of property for a longer time than the executory interest. There is also the further difference that the rule does not affect a contingent remainder if it become vested before the determination of the particular estate. An executory interest is void if it may transgress the rule, even though it do not actually do so. For the rule in Shelley's case, important in connexion with remainders, see that title.

The state laws of the United States affecting remainders will be found in Washburn, *Real Property*, ii. bk. ii. As a general rule contingent remainders have been rendered of little practical importance by enactments that they shall take effect as executory devises or shall not determine on determination of the particular estate.

Reversion.—Unlike remainders, all reversions are present or vested estates. The law of reversion, like that of remainder, has been considerably modified by statute. It was formerly considered that on the grant of the reversion the tenant should have the opportunity of objecting to the substitution of a new landlord. It was therefore necessary that he should attorn tenant to the purchaser. Without such attornment the grant was void, unless indeed attornment were compelled by levying a fine. The necessity of attornment was abolished by 4 & 5 Anne c. 16. Its only use at present seems to be in the case of mortgage. A mortgagor in possession sometimes attorns tenant to the mortgagee in order that the latter may treat him as his tenant and distrain for his interest as rent. The legal view that rent was incident to the reversion led at common law to a destruction of the rent by destruction of the reversion. This would chiefly happen in the case of an under-tenant and his immediate reversioner, if the intermediate became merged in the superior reversion. To obviate this difficulty it was provided by the Real Property Act 1845, § 9, that, on surrender or merger of a reversion expectant on a lease, the rights under it should subsist to the reversion conferring the next vested right. The question as to what covenants run with the reversion is one of the most difficult in law. The rule of common law seems to have been that covenants ran with the land but not with the reversion, that is to say, the benefit of them survived to a new tenant but not to a new landlord. The effect of the act of 32 Hen. VIII. c. 34, and of the Conveyancing Act 1881, has been to annex to the reversion as a general rule the benefit of the rent and the lessee's covenants and the burden of the lessor's covenant. Merely collateral covenants, however, do not run with the reversion, but are regarded as personal contracts between lessor and lessee. At common law on the severance of a reversion a grantee of part of the reversion could not take advantage of any condition for re-entry, on the ground that the condition was entire and not severable. This doctrine was abolished by one of Lord St Leonard's Acts in 1859. The Conveyancing Act 1881, § 12, now provides in wider terms than those of the act of 1859 that on severance of the reversion every condition capable of apportionment is to be apportioned. In order to guard against fraudulent concealment of the death of a *cestui que vie*, or person for whose life any lands are held by another, it was provided by 6 Anne c. 18 that on application to the court of chancery by the person entitled in remainder, reversion or expectancy, the *cestui que vie* should be produced to the court or its commissioners, or in default should be taken to be dead. In Scotland reversion is generally used in a sense approaching that of the equity of redemption of English law. A reversion is either legal, as in an adjudication, or conventional, as in a wadset. Reversions are registered under the system established by the Act 1617 c. 16.

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[1] Compare the life-rent and fee of Scots law.

[2] A contingent remainder amounting to a freehold cannot be limited on a particular estate less than a freehold.

In the United States the act of 32 Hen. VIII. c. 34 "is held to be in force in Massachusetts, Pennsylvania, Illinois, and Connecticut, but was never in force in New York till re-enacted" (Washburn, *Real Property*, i.).

REMAND (Lat. *remandare*), a term of English law meaning the return of a prisoner by order of a court to the custody from which he came to the court. Thus where an application for release is unsuccessfully made by means of *habeas corpus*, the applicant is remanded to the custody which he has challenged as illegal. Where trials or indictments are not concluded at a single sitting the court of trial has power to remand the accused into proper custody during any necessary adjournment. Where a preliminary inquiry into an indictable offence is not completed at a single sitting, the prisoner, if not released on bail, may be remanded to prison or some other lawful place of custody for a period not exceeding eight days, and so on by further remands till the inquiry is completed and the accused is discharged, or committed to prison to await his trial, or released on bail to take his trial. If the remand is for more than three days the order must be in writing (Indictable Offences Act 1848, 11 & 12 Vict. c. 42, s. 21). Similar powers of remand or committal to prison during adjournments are given to justices in the exercise of their summary criminal jurisdiction, whether as to offences punishable only on summary conviction, or as to indictable offences with which it is proposed to deal summarily (Summary Jurisdiction Acts 1848, s. 16, and 1879, s. 24).

In the case of charges against children or young persons, where the justices commit for trial or order a remand pending inquiry, or with a view to sending a child to an industrial school or a reformatory, they may remand to the workhouse or to some fit custody instead of remanding to prison (Youthful Offenders Act 1901, s. 4). For this purpose remand homes have been established.

REMBRANDT (1606–1669). REMBRANDT HARMENS VAN RIJN, Dutch painter, was born in Leiden on the 15th of July 1606. It is only within the past fifty years that we have come to know anything of his real history. A tissue of fables formerly represented him as ignorant, boorish and avaricious. These fictions, resting on the loose assertions of Houbraken (*De Groote Schouburgh*, 1718), have been cleared away by the untiring researches of Scheltema and other Dutchmen, notably by C. Vosmaer, whose elaborate work (*Rembrandt, sa vie et ses œuvres*, 1868, 2nd ed., 1877) is the basis of our knowledge of the man and of the chronological development of the artist.[1] Rembrandt's high position in European art rests on the originality of his mind, the power of his imagination, his profound sympathy with his subjects, the boldness of his system of light and shade, the thoroughness of his modelling, his subtle colour, and above all on his intense humanity. He was great in conception and in execution, a poet as well as a painter, an idealist and also a realist; and this rare union is the secret of his power. From his dramatic action and mastery of expression Rembrandt has been well called "the Shakespeare of Holland."

In the beginning of the 17th century Holland had entered on her grand career of national enterprise. Science and literature flourished in her universities, poetry and the stage were favoured by her citizens, and art found a home not only in the capital but in the provincial towns. It was a time also of new ideas. Old conventional forms in religion, philosophy and art had fallen away, and liberty was inspiring new conceptions. There were no church influences at work to fetter the painter in the choice and treatment of his subject, no academies to prescribe rules. Left to himself, therefore, the artist painted the life of the people among whom he lived and the subjects which interested them. It was thus a living history that he painted—scenes from the everyday life and amusements of the people, as well as the civic rulers, the "regents" or governors of the hospitals and the heads of the guilds, and the civic guards who defended their towns. So also with religious pictures. The dogmas and legends of the Church of Rome were no longer of interest to such a nation; but the Bible was read and studied with avidity, and from its page the artist drew directly the scenes of the simple narrative. Perhaps the earliest trace of this new aspect of Bible story is to be found in the pictures painted in Rome about the beginning of the 17th century by Adam Elsheimer of Frankfort, who had undoubtedly a great influence on the Dutch painters studying in Italy. These in their turn carried back to Holland the simplicity and the picturesque effect which they found in Elsheimer's work. Among these, the precursors of Rembrandt, may be mentioned Moeyaert, Ravesteyn, Lastman, Pinas, Honthorst and Bramer. Influenced doubtless by these painters, Rembrandt determined to work out his own ideas of art on Dutch soil, resisting apparently every inducement to visit Italy. Though an admirer of the great Italian masters, he yet maintained his own individuality.

Rembrandt was born at No. 3 Weddesteg, on the rampart at Leiden overlooking the Rhine. He was the fourth son of Gerrit Harmens van Rijn, a well-to-do miller. As the older boys had been sent to trade, his parents resolved that he should enter a learned profession. With this view he was sent to the High School at Leiden; but the boy soon manifested his dislike of the prospect, and determined to be a painter. Accordingly he was placed for three years under Swanenburch, a painter of no great merit, who enjoyed some reputation from his having studied in Italy. His next master was Lastman of Amsterdam, a painter of very considerable power. In Lastman's works we can trace the germs of the colour and sentiment of his greater pupil, though his direct influence cannot have been great, as it is said by Orlers that Rembrandt remained with him only six months, after which time he returned to Leiden, about 1623. During the early years of his life at Leiden Rembrandt seems to have devoted himself entirely to studies, painting and etching the people around him, the beggars and cripples, every picturesque face and form he could get hold of. Life, character, and above all light were the aims of these studies. His mother was a frequent model, and we can trace in her features the strong likeness to her son, especially in the portraits of himself at an advanced age. In the collection of Rembrandt's works at Amsterdam in 1898 were shown three portraits of his father, who died about 1632; nine are catalogued altogether. The last portrait of his mother is that of the Vienna Museum, painted the year before her death in 1640. One of his sisters also frequently sat to him, and Bode suggests that she must have accompanied him to Amsterdam and kept house for him till he married. This conjecture rests on the number of portraits of the same young woman painted in the early years of his stay in Amsterdam and before he met his bride. Then, again, in the many portraits of himself painted in his early life we can see with what zeal he set himself to master every form of expression, now grave, now gay—how thoroughly he learned to model the human face not from the outside but from the inner man. Dr Bode gives fifty as the number of the portraits of himself (perhaps sixty is nearer the actual number), most of them painted in youth and in old age, the times when he had leisure for such work.

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[1] Vosmaer's first volume, on the precursors and apprenticeship of Rembrandt, was published in 1863. New light has since been thrown on important points by Dr Bode (*Holländische Malerei*, 1883), De Roever, De Vries and others.

Rembrandt's earliest pictures were painted at Leiden, from 1627 to 1631. Bode mentions about nine pictures as known to belong to these years, chiefly paintings of single figures, as "St Paul in Prison" and "St Jerome"; but now and then compositions of several, as "Samson in Prison" and "Presentation in the Temple." The prevailing tone of all these pictures is a greenish grey, the effect being somewhat cold and heavy. The gallery at Cassel gives us a typical example of his studies of the heads of old men, firm and hard in workmanship and full of detail, the effects of light and shade being carefully thought out. His work was now attracting the attention of lovers of art in the great city of Amsterdam; and, urged by their calls, he removed about 1631 to live and die there. At one bound he leaped into the position of the first portrait painter of the city, and received numerous commissions. During the early years of his residence there are at least forty known portraits from his hand, firm and solid in manner and staid in expression. It has been remarked that the fantasy in which he indulged through life was reserved only for the portraits of himself and his immediate connexions. The excellent painter Thomas de Keyser was then in the height of his power, and his influence is to be traced in some of Rembrandt's smaller portraits. Pupils also now flocked to his house in the Bloemgracht, among them Gerard Douw, who was nearly of his own age. The first important work executed by Rembrandt in Amsterdam is "Simeon in the Temple," of the Hague Museum, a fine early example of his treatment of light and shade and of his subtle colour. The concentrated light falls on the principal figure, while the background is full of mystery. The surface is smooth and enamel-like, and all the details are carefully wrought out, while the action of light on the mantle of Simeon shows how soon he had felt the magical effect of the play of colour. In the life-sized "Lesson in Anatomy" of 1632 we have the first of the great portrait subjects—Tulp the anatomist, the early friend of Rembrandt, discoursing to his seven associates, who are ranged with eager heads round the foreshortened body. The subject had been treated in former years by the Mierevelts, A. Pietersen and others, for the Hall of the Surgeons. But it was reserved for Rembrandt to make it a great picture by the grouping of the expressive portraits and by the completeness of the conception. The colour is quiet and the handling of the brush timid and precise, while the light and shade are somewhat harsh and abrupt. But it is a marvellous picture for a young man of twenty-five, and it is generally accepted as marking a new departure in the career of the painter.

About 700 pictures are known to have come from Rembrandt's own hand. It is impossible to notice more than the prominent works. Besides the Pellicorne family portraits of 1632 now in the Wallace Collection, we have the caligraphist Coppenol of the Cassel Gallery, interesting in the first place as an early example of Rembrandt's method of giving permanent interest to a portrait by converting it into a picture. He invests it with a sense of life by a momentary expression as Coppenol raises his head towards the spectator while he is mending a quill. The same motive is to be found in the "Shipbuilder," 1633 (Buckingham Palace), who looks up from his work with a sense of interruption at the approach of his wife. Coppenol was painted thrice and etched twice by the artist, the last of whose portrait etchings (1661) was *the* Coppenol of large size. The two small pictures of "The Philosopher" of the Louvre date from 1633, delicate in execution and full of mysterious effect.

The year 1634 is especially remarkable as that of Rembrandt's marriage with Saskia van Uylenborch, a beautiful, fair-haired Frisian maiden of good connexions. Till her death in 1642 she was the centre of his life and art, and lives for us in many a canvas as well as in her own portraits. On her the painter lavished his magical power, painting her as the Queen Artemisia or Bathsheba, and as the wife of Samson—always proud of her long fair locks, and covering her with pearls and gold as precious in their play of colour as those of the Indies. A joyous pair we see them in the Dresden Gallery, Saskia sitting on his knee while he laughs gaily, or promenading together in a fine picture of 1636, or putting the last touches of ornament to her toilette, for thus Bode interprets the so-called "Burgomaster Pancras and his Wife." These were his happy days when he painted himself in his exuberant fantasy, and adorned himself, at least in his portraits, in scarfs and feathers and gold chains. Saskia brought him a marriage portion of forty thousand guilders, a large sum for those times, and she brought him also a large circle of good friends in Amsterdam. She bore him four children, Rumbartus and two girls, successively named Cornelia after his beloved mother, all of whom died in infancy, and Titus, named after Titia a sister of Saskia. We have several noble portraits of Saskia, a good type of the beauty of Holland, all painted with the utmost love and care, at Cassel (1633), at Dresden (1641), and a posthumous one (1643) at Berlin. But the greatest in workmanship and most pathetic in expression seems to us, though it is decried by Bode, that of Antwerp (1641), in which it is impossible not to trace declining health and to find a melancholy presage of her death.

One of Rembrandt's greatest portraits of 1634 is the superb full-length of Martin Daey, which, with that of Madame Daey, painted according to Vosmaer some years later, formed one of the ornaments of the Van Loon collection at Amsterdam. Both now belong to Baron Gustave de Rothschild. From the firm detailed execution of this portrait one turns with wonder to the broader handling of the "Old Woman" (Françoise van Wasserhoven), aged eighty-three, in the National Gallery, of the same year, remarkable for the effect of reflected light and still more for the sympathetic rendering of character.

The life of Samson supplied many subjects in these early days. The so-called "Count of Gueldres threatening his Father-in-law" of the Berlin Gallery has been restored to its proper signification by M. Kolloff, who finds it to be Samson. It is forced and violent in its action. The greatest of this series, and one of the prominent pictures of Rembrandt's work, is the "Marriage of Samson," of the Dresden Gallery, painted in 1638. Here Rembrandt gives the rein to his imagination and makes the scene live before us. Except the bride (Saskia), who sits calm and grand on a dais in the centre of the feast, with the full light again playing on her flowing locks and wealth of jewels, all is animated and full of bustle. Samson, evidently a Rembrandt of fantasy, leans over a chair propounding his riddle to the Philistine lords. In execution it is a great advance on former subject pictures; it is bolder in manner, and we have here signs of his approaching love of warmer tones of red and yellow.

The story of Susannah also occupied him in these early years, and he returned to the subject in 1641 and 1653. "The Bather" of the National Gallery may be another interpretation of the same theme. In all of these pictures the woman is coarse in type and lumpy in form, though the modelling is soft and round, the effect which Rembrandt always strove to gain. Beauty of form was outside his art. But the so-called "Danae" (1636) at St Petersburg is a sufficient reply to those who deny his ability ever to appreciate the beauty of the nude female form. It glows with colour and life, and the blood seems to pulsate under the warm skin. In the picturesque story of Tobit Rembrandt found much to interest him, as we see in the beautiful small picture of the d'Arenberg Collection at Brussels. Sight is being restored to the aged Tobias, while with infinite tenderness his wife holds the old man's hand caressingly. The momentary action is complete, and the picture goes straight to the heart. In the Berlin Gallery he paints the anxiety of the parents as they wait the return of their son. In 1637 he painted the fine picture now in the Louvre of the "Flight of the Angel"; and the same subject is grandly treated by him.

apparently about 1645, in the picture exhibited in the winter exhibition at Burlington House in 1885. Reverence and awe are shown in every attitude of the Tobit family. A similar lofty treatment is to be found in the "Christ as the Gardener," appearing to Mary, of 1638 (Buckingham Palace).

We have now arrived at the year 1640, the threshold of his second manner, which extended to 1654, the middle age of Rembrandt. During the latter part of the previous decade we find the shadows more transparent and the blending of light and shade more perfect. There is a growing power in every part of his art. The coldness of his first manner had disappeared, and the tones were gradually changing into golden-brown. He had passed through what Bode calls his "Sturm-und-Drang" period of exaggerated expression, as in the Berlin Samson, and had attained to a truer, calmer form of dramatic expression, of which the "Manoah" of Dresden is a good example (1641). The portraits painted "to order" became more rare about this time, and those which we have are chiefly friends of his circle, such as the "Mennonite Preacher" (C. C. Ansloo) and the "Gilder," a fine example of his golden tone, formerly in the Morny collection and now in America. His own splendid portrait (1640) in the National Gallery illustrates the change in his work. It describes the man well—strong and robust, with powerful head, firm and compressed lips and determined chin, with heavy eyebrows, separated by a deep vertical furrow, and with eyes of keen penetrating glance—altogether a self-reliant man that would carry out his own ideas, careless whether his popularity waxed or waned. The fantastic rendering of himself has disappeared; he seems more conscious of his dignity and position. He has now many friends and pupils, and numerous commissions, even from the stadtholder; he has bought a large house in the Breedstraat, in which during the next sixteen years of his life he gathers his large collection of paintings, engravings, armour and costume which figure afterwards in his inventory. His taste was wide and his purchases large, for he was joint owner with picture-dealers of paintings by Giorgione and Palma Vecchio, while for a high-priced Marcantonio Raimondi print he gave in exchange a fine impression of his "Christ Healing the Sick," which has since been known as the "Hundred Guilder Print." The stadtholder was not a prompt payer, and an interesting correspondence took place between Rembrandt and Constantin **Huygens,** the poet and secretary of the prince. The **Rembrandt** letters which have come down to us are few, and these are therefore of importance. Rembrandt puts a high value on the picture, which he says had been painted "with much care and zeal," but he is willing to take what the prince thinks proper; while to Huygens he sends a large picture as a present for his trouble in carrying through the business. There is here no sign of the grasping greed with which he has been charged, while his unselfish conduct is seen in the settlement of the family affairs at the death of his mother in 1640.

The year 1642 is remarkable for the great picture formerly known as the "Night Watch," but now more correctly as the "Sortie of the Banning Cock Company," another of the landmarks of Rembrandt's career, in which twenty-nine life-sized civic guards are introduced issuing pell-mell from their club house. Such gilds of arquebusiers had been painted admirably before by Ravesteyn and notably by Frans Hals, but Rembrandt determined to throw life and animation into the scene, which is full of bustle and movement. The dominant colour is the citron yellow uniform of the lieutenant, wearing a blue sash, while a Titian-like red dress of a musketeer, the black velvet dress of the captain, and the varied green of the girl and drummer, all produce a rich and harmonious effect. The background has become dark and heavy by accident or neglect, and the scutcheon on which the names are painted is scarcely to be seen. It is to be observed that, as proved by the copy by Gerrit Lundens in the National Gallery, it represents not a "night watch," except in name, but a day watch.

But this year of great achievement was also the year of his great loss, for Saskia died in 1642, leaving Rembrandt her sole trustee for her son Titus, but with full use of the money till he should marry again or till the marriage of Titus. The words of the will express her love for her husband and her confidence in him. With her death his life was changed. Bode has remarked that there is a pathetic sadness in his pictures of the Holy Family—a favourite subject at this period of his life. All of these he treats with the naïve simplicity of Reformed Holland, giving us the real carpenter's shop and the mother watching over the Infant reverently and lovingly, with a fine union of realism and idealism.

The street in which he lived was full of Dutch and Portuguese Jews, and many a Jewish rabbi sat to him. He accepted or invented their turbans and local dress as characteristic of the people. But in his religious pictures it is not the costume we look at; what strikes us is the profound perception of the sentiment of the story, making them true to all time and independent of local circumstance. A notable example of this feeling is to be found in the "Woman Taken in Adultery" of the National Gallery, painted in 1644 in the manner of the "Simeon" of the Hague. Beyond the ordinary claims of art, it commands our attention from the grand conception of the painter who here, as in other pictures and etchings, has invested Christ with a majestic dignity which recalls Lionardo and no other. A similar lofty ideal is to be found in his various renderings of the "Pilgrims at Emmaus," notably in the Louvre picture of 1648, in which, as Mrs Jameson says, "he returns to those first spiritual principles which were always the dowry of ancient art." From the same year we have the "Good Samaritan" of the Louvre, the story of which is told with intense pathos. The helpless suffering of the wounded man, the curiosity of the boy on tiptoe, the excited faces at the upper window, are all conveyed with masterly skill. In these last two pictures we find a broader touch and freer handling, while the tones pass into a dull yellow and brown with a marked predilection for deep rich red. Whether it was that this scheme of colour found no favour with the Amsterdamers, who, as Hoogstraten tells us, could not understand the "Sortie," it seems certain that Rembrandt was not invited to take any leading part in the celebration of the congress of Westphalia (1648).

Rembrandt touched no side of art without setting his mark on it, whether in still life, as in his dead birds or the "Slaughtered Ox" of the Louvre (with its repetitions at Glasgow and Budapest), or in his drawings of elephants and lions, all of which are instinct with life. But at this period of his career we come upon a branch of his art on which he left, both in etching and in painting, the stamp of his genius, viz. landscape. Roeland Roghman, but ten years his senior, evidently influenced his style, for the resemblance between their works is so great that, as at Cassel, there has been confusion of authorship. Hercules Seghers also was much appreciated by Rembrandt, for at his sale eight pictures by this master figure in the inventory, and Vosmaer discovered that Rembrandt had worked on a plate by Seghers and had added figures to an etched "Flight into Egypt." The earliest pure landscape known to us from Rembrandt's hand is that at the Ryks Museum (1637–38), followed in the latter year by those at Brunswick, Cracow and Boston (U.S.A.), and that dated 1638 and belonging to Mr G. Rath in Budapest. Better known is the "Winter Scene" of Cassel (1646), silvery and delicate. As a rule in his painted landscape he aims at grandeur and poetical effect, as in the "Repose of the Holy Family" of 1647 (formerly called the "Gipsies"), a moonlight effect, clear even in the shadows. The "Canal" of Lord Lansdowne, and the "Mountain Landscape with Approaching Storm," the sun shining out behind the heavy clouds, are both conceived and executed in this spirit. A similar poetical vein runs through the "Castle on the Hill" of Cassel, in which the beams of the setting sun strike on the castle while the valley is sunk in the shades of approaching night. More powerful still is the weird effect of Lord Lansdowne's "Windmill," with its glow of light and darkening shadows. In all these pictures light with its magical influences is the theme of the poet-painter. From the number of landscapes by himself in the inventory of his sale, it would appear that these grand works were not appreciated by his contemporaries. The last of the landscape series dates from 1655 or 1656, the close of the middle age or manhood of Rembrandt, a period of splendid power. In the "Joseph Accused by Potiphar's Wife" of 1654 we have great dramatic vigour and perfect mastery of expression, while the brilliant colour and glowing effect of light and shade attest his strength. To this period also belongs the great portrait of himself in the Fitzwilliam Museum at Cambridge.

But evil days were at hand. The long-continued wars and civil troubles had worn out the country, and money was scarce. Rembrandt's and doubtless Saskia's means were tied up in his house and in his large collection of valuable pictures, and we find Rembrandt borrowing considerable sums of money on the security of his house to keep things going. Perhaps, as Bode suggests, this was the reason of his extraordinary activity at this time. Then, unfortunately, in this year of 1654, we find Rembrandt involved in the scandal of having a child by his servant Hendrickje Jaghers or Stoffels, as appears by the books of the Reformed Church at Amsterdam. He recognized the child and gave it the name of Cornelia, after his much-loved mother, but there is no proof that he married the mother, and the probability is against such a marriage, as the provisions of Saskia's will would in that case have come into force, and her fortune would have passed at once to her son Titus. Hendrickje seems to have continued to live with him, for we find her claiming a chest as her property at his sale in 1658. Doubtless she is the peasant girl of Rasdorf to whom Houbraken says Rembrandt was married. Sad as the story is, Hendrickje has an interest for us. Bode asserts that in his art there was always a woman in close relationship to Rembrandt and appearing in his work—his mother, his sister and then Saskia.

He also suggests that the beautiful portrait of the "Lady" in the Salon Carré of the Louvre and the "Venus and Cupid" of the same gallery may represent Hendrickje and her child. Both pictures belong to this date, and by their treatment are removed from the category of Rembrandt's usual portraits. But if this is conjecture, we get nearer to fact when we look at the picture exhibited at Burlington House in 1883 to which tradition has attached the name of "Rembrandt's Mistress," now in the Edinburgh National Gallery. At a glance one can see that it is not the mere head of a model, as she lies in bed raising herself to put aside a curtain as if she heard a well-known footstep. It is clearly a woman in whom Rembrandt had a personal interest. The date is clearly 165— the fourth figure being illegible; but the brilliant carnations and masterly touch connect it with the "Potiphar's Wife" of 1654 and the Jaghers period. In 1656 Rembrandt's financial affairs became more involved, and the Orphans' Chamber transferred the house and ground to Titus, though Rembrandt was still allowed to take charge of Saskia's estate. Nothing, however, could avert the ruin of the painter, who was declared bankrupt in July 1656, an inventory of all his property being ordered by the Insolvency Chamber. The first sale took place in 1657 in the Keizerskroon hotel; and the second in 1658, when the larger part of the etchings and drawings were disposed of—"collected by Rembrandt himself with much love and care," says the catalogue. The sum realized, under 5000 guilders, was but a fraction of their value. The time was unfavourable over the whole of Europe for such sales, the renowned collection of Charles I. of England having brought but a comparatively small sum in 1653. Driven thus from his house, stripped of everything he possessed, even to his table linen, Rembrandt took a modest lodging in the same Keizerskroon hostelry (the amounts of his bills are on record), apparently without friends and thrown entirely on himself.

But this dark year of 1656 stands out prominently as one in which some of his greatest works were produced, as, for example, "John the Baptist preaching in the Wilderness," of the Berlin Gallery, and "Jacob blessing the Sons of Joseph," of the Cassel Gallery. It is impossible not to respect the man who, amid the utter ruin of his affairs, could calmly conceive and carry out such noble work. Yet even in his art one can see that the tone of his mind was sombre. Instead of the brilliancy of 1654 we have for two or three years a preference for dull yellows, reds and greys, with a certain uniformity of tone. The handling is broad and rapid, as if to give utterance to the ideas which crowded on his mind. There is less caressing of colour for its own sake, even less straining after vigorous effect of light and shade. Still the two pictures just named are among the greatest works of the master. To the same year belongs the "Lesson in Anatomy of Johann Deyman." The subject is similar to the great Tulp of 1632, but his manner and power of colour had advanced so much that Sir Joshua Reynolds, in his visit to Holland in 1781, was reminded by it of Michelangelo and Titian.[1] Vosmaer ascribes to the same year, though Bode places it later, the famous "Portrait of Jan Six," the future burgomaster, consummate in its ease and character, as Six descends the steps of his house drawing on his glove. The connexion between Rembrandt and the great family of Six was long and close. In 1641, the mother of Six, Anna Wymer, had been painted with consummate skill by Rembrandt, who also executed in 1647 the beautiful etching of Six standing by a window reading his tragedy of *Medea*, afterwards illustrated by his friend. Now he paints his portrait in the prime of manhood, and in the same year of gloom paints for him the masterly "John the Baptist." Six, if he could not avert the disaster of Rembrandt's life, at least stood by him in the darkest hour, when certainly the creative energy of Rembrandt was in full play. The same period gives us the "Master of the Vineyard," and the "Adoration of the Magi" of Buckingham Palace.

After the sale of the house in the Breedstraat, Rembrandt retired to the Rosengracht, an obscure quarter at the west end of the city. We are now drawing to the splendid close of his career in his third manner, in which his touch became broader, his impasto more solid and his knowledge more complete. We may mention the "Old Man with the Grey Beard" of the National Gallery (1657) and the "Bruyningh, the Secretary of the Insolvents' Chamber," of Cassel (1658), both leading up to the great portraits of the "Syndics of the Cloth Hall" of 1661. Nearly thirty years separate us from the "Lesson in Anatomy," years of long-continued observation and labour. The knowledge thus gathered, the problems solved, the mastery attained, are shown here in abundance. Rembrandt returns to the simplest gamut of colour, but shows his skill in the use of it, leaving on the spectator an impression of absolute enjoyment of the result, unconscious of the means. The plain burghers dealing with the simple concerns of their gild arrest our attention as if they were the makers of history. They live for ever; and we close our eyes to the strange perspective of the table.

In his old age Rembrandt continued to paint his own portrait as assiduously as in his youthful and happy days. About twenty of these portraits are known; a typical one is to be found in the National Gallery. All show the same self-reliant expression, though broken down indeed by age and the cares of a hard life.

About the year 1663 Rembrandt painted the (so-called) "Jewish Bride" of the Ryks Museum in Amsterdam, and the "Family Group" of Brunswick, the last and perhaps the most brilliant works of his life, bold and rapid in execution and marvellous in the subtle mixture and play of colours in which he seems to revel. The woman and children are painted with such love that the impression is conveyed that they represent a fancy family group of the painter in his old age. This idea received some confirmation from the supposed discovery that he left a widow Catherine Van Wyck and two children, but this theory falls to the ground, for de Roever has shown (*Oud Holland*, 1883) that Catherine was the widow of a marine painter Theunisz Blanckerhoff, who died about the same time as Rembrandt. The mistake arose from a miscopying of the register. The subject of these pictures is thus more mysterious than ever.

In 1668 Titus, the only son of Rembrandt, died, leaving one child, and on the 8th of October 1669 the great painter himself passed away, leaving two children, and was buried in the Wester Kerk. He had outlived his popularity, for his manner of painting, as we know from contemporaries, was no longer in favour with a people who preferred the smooth trivialities of Van der Werff and the younger Mieris, the leaders of an expiring school.

We must give but a short notice of Rembrandt's achievements in etching. Here he stands out by universal confession as first, excelling by his unrivalled technical skill, his mastery of expression and the lofty conceptions of many of his great pieces, as in the "Death of the Virgin," the "Christ Preaching," the "Christ Healing the Sick" (the "Hundred Guilder Print"), the "Presentation to the People," the "Crucifixion" and others. So great is his skill simply as an etcher that one is apt to overlook the nobleness of the etcher's ideas and the depth of his nature, and this tendency has been doubtless confirmed by the enormous difference in money value between "states" of the same plate, rarity giving in many cases a factitious worth in the eyes of collectors. A single impression of one of his etchings—"Rembrandt with a Sabre"—realized £2000 at the Holford sale in 1893, when "Ephraim Bonus, with black ring" fetched £1950, and the "Hundred Guilder Print," £1750. The points of difference between these states arise from the additions and changes made by Rembrandt on the plate; and the prints taken off by him have been subjected to the closest inspection by Bartsch, Gersaint, Wilson, Daulby, De Claussin, C. Blanc, Willshire, Seymour Haden, Middleton and others, who have described them at great length, and to whom the reader is referred. The classification of Rembrandt's etchings adopted till lately was according to the subject, as Biblical, portrait, landscape, and so on; until Vosmaer attempted the more scientific and interesting line of chronology. This method has been developed by Sir F. Seymour Haden and Middleton. But even in 1873 C. Blanc, in his fine work *L'Œuvre complet de Rembrandt*, still adheres to the older and less intelligent arrangement, resting his preference on the frequent absence of dates on the etchings and more strangely still on the equality of the work. Sir Seymour Haden's reply is "that the more important etchings which may be taken as types are dated, and that, the style of the etchings at different periods of Rembrandt's career being fully as marked as that of his paintings, no more difficulty attends the classification of one than of the other.". Indeed Vosmaer points out in his Life of Rembrandt that there is a marked parallelism between Rembrandt's painted and etched work, his early work in both cases being timid and tentative, while he gradually gains strength and character both with the brush and the graver's tools.

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[1] This picture has had a strange history. It had suffered by fire and was sold to a Mr Chaplin of London in 1841, was exhibited in Leeds in 1868, and again disappeared, ultimately to be found in the storeroom of the South Kensington Museum as a doubtful Rembrandt. The patriotism of some Dutch lovers of art restored it to its native country; and it now hangs, a magnificent fragment, in the museum of Amsterdam.

In his *L'Œuvre complet de Rembrandt* (Paris, 1885), Eugène Dutuit rejects the classification of C. Blanc as dubious and unwarranted, dismisses the chronological arrangement proposed by Vosmaer and adopted by Seymour Haden and Middleton as open to discussion and lacking in possibility of proof, and reverts to the order established by Gersaint, ranging his materials under twelve heads: Portraits (real and supposed), Old Testament and New Testament subjects, histories, landscapes, &c. Sir Seymour Haden originated the theory that many of the etchings ascribed to Rembrandt up to 1640 were the work of his pupils, and seems to make out his case, though it may be carried too far. He argues (in his monograph on the *Etched Work of Rembrandt*, 1877) that Rembrandt's real work in etching began after Saskia's death, when he assumes that Rembrandt betook himself to Elsbroek, the country house of his "powerful friend" Jan Six. But it must be remembered that the future burgomaster was then but a student of twenty-four, a member of a great family it is true, but unmarried and taking as yet no share in public life. That Rembrandt was a frequent visitor at Elsbroek, and that the "Three Trees" and other etchings may have been produced there, may be admitted without requiring us to believe that he had left Amsterdam as his place of abode. The great period of his etching lies between 1639 and 1661, after which the old painter seems to have renounced the needle. In these twenty years were produced his greatest works in portraiture, landscape and Bible story. They bear the impress of the genius of the man.

In addition to the authors named, the reader is referred to W. Bürger, (the *nom de plume* of T. Thoré), *Musées de la Hollande* (1858–60), E. Fromentin, *Maîtres d'autrefois*; H. Havard, *L'École Hollandaise*; Scheltema, *Rembrandt, discours sur sa vie* (1866); Ath. Cocquerel fils, *Rembrandt, son individualisme dans l'art* (Paris, 1869); Dr Langbehn, *Rembrandt als Erzieher* (Leipzig, 1890); Emile Michel, *Rembrandt, sa vie, son œuvre, et son temps* (Paris, 1893); P. G. Hamerton, *Rembrandt's Etchings* (London, 1894); Malcolm Bell, *Rembrandt van Rijn and his Work* (London, 1899); Adolf Rosenberg, *Rembrandt, des Meisters Gemälde* (Stuttgart and Leipzig, 1906), a useful work, admirably reproducing 565 of the artist's pictures, and its companion volume, Hans Wolfgang Singer, *Rembrandt, des Meisters Radierungen* (Stuttgart and Leipzig, 1906), reproducing 402 etchings. The chronological, geographical and classifying indexes in both books are of particular utility.

(J. F. W.; P. G. K.)

REMEDIOS, or SAN JUAN DE LOS REMEDIOS, town of Santa Clara province, Cuba, in the municipality of San Juan de Los Remedios. Pop. of the town (1907), 6988; of the municipality, 21,573. The town is served by a branch of the Cuban Central railway, extending from Caibarién to Camajuani, where it connects with the main line. The site is low and flat, and unhealthily wet in the rainy season. The port of Remedios is Caibarién (pop. in 1907, 8333), on the N. coast, about 5 m. E. Both are in the sugar country, and sugar is the base of their economic interests. The first settlement on the site of the present town was made in 1515–16, and in 1545 Remedios was created a *villa* with an ayuntamiento (council).

REMEMBRANCER, the name originally of certain subordinate officers of the English Exchequer. The office itself is of great antiquity, the holder having been termed remembrancer, memorator, rememorator, registrar, keeper of the register, despatcher of business (Maddox, *History of the Exchequer*). There were at one time three clerks of the remembrance, styled king's remembrancer, lord treasurer's remembrancer and remembrancer of first-fruits. The latter two offices have become extinct, that of remembrancer of first-fruits by the diversion of the fund (Queen Anne's Bounty Act 1838), and that of lord treasurer's remembrancer on being merged in the office of king's remembrancer (1833). By the Queen's Remembrancer Act 1859 the office ceased to exist separately, and the queen's remembrancer was required to be a master of the court of exchequer. The Judicature Act 1873, s. 77, attached the office to the Supreme Court, and the Supreme Court of Judicature (Officers) Act 1879 transferred it to the central office of the Supreme Court. By s. 8 the king's remembrancer is a master of the Supreme Court, and the office is usually filled by the senior master. The king's remembrancer department of the central office is now amalgamated with the judgments and married women's acknowledgments department. The king's remembrancer still assists at certain ceremonial functions—relics of the former importance of the office—such as the nomination of sheriffs, the swearing-in of the lord mayor of London, the trial of the pyx and the acknowledgments of homage for crown lands. Other duties are set out in the *Second Report of the Legal Departments Commission*, 1874.

"Remembrancer" is also the title of an official of the corporation of the city of London, whose principal duty is to represent that body before parliamentary committees and at council and treasury boards.

REMIGIUS, ST (*c.* 437–533), bishop of Reims and the friend of Clovis, whom he converted to Christianity. According to Gregory of Tours, 3000 Franks were baptized with Clovis by Remigius on Christmas Day, 496, after the defeat of the Alamanni. With the growing power of the papacy a good many fictions grew up around his name, *e.g.* that he anointed Clovis with oil from the sacred ampulla, and that Pope Hormisdas had recognized him as primate of France. The *Commentary on the Pauline Epistles* (ed. Villalpandus, 1699) is not his work, but that of Remigius of Auxerre.

For authorities see H. Jadart, *Bibliographie des ouvrages conc. la vie et le culte de S. Remi* . . . (Reims, 1891), which contains 126 references.

REMINGTON, FREDERICK (1861–1909), American artist, was born at Canton, New York, on the 4th of October 1861. He was a pupil of the Yale Art School, and of the Art Students' League, New York, and became known as an illustrator, painter and sculptor. Having spent much time in the West, whither he went for his health, and having been with the United States troops in actual warfare, he made a specialty of rendering the North American Indian and the United States soldier as seen on the western plains. In the Spanish-American War he was with the army under General Shafter as war correspondent. He died on the 26th of December 1909, near Ridgefield, Connecticut. His statuettes of soldiers, Indians, cowboys and trappers are full of character, while his paintings have been largely reproduced. He wrote several volumes of stories, including *Pony Tracks* (1895), *Crooked Trails* (1898), *Sundown Leflare* (1899), and *John Ermine of the Yellowstone* (1902).

REMINISCENCE (from Lat. *reminisci*, to remember), the recognized translation of the Greek *ἀνάμνησις*, which is used technically by Plato in his doctrine that the soul recovers knowledge of which it had direct intuition in a former incorporeal existence. The doctrine may be regarded as the poetical precursor of modern a priori theories of knowledge and of "race-memory" and the like. In common language "reminiscence" is synonymous with "recollection."

REMIREMONT, a town of eastern France, capital of an arrondissement in the department of Vosges, 17 m. S.S.E. of Épinal by rail, on the Moselle, a mile below its confluence with the Moselotte. Pop. town, 8782; commune, 10,548. Remiremont is surrounded by forest-clad mountains, and commanded by Fort Parmont, one of the Moselle line of defensive works. The abbey church, consecrated in 1051, has a crypt of the 11th century in which are the tombs of some of the abbesses, but as a whole belongs to the late 13th century. The abbatial residence (which now contains the mairie, the court-house and the public library) has been twice rebuilt in modern times (in 1750 and again after a fire in 1871), but the original plan and style have been preserved in the imposing front, the vestibule and the grand staircase. Some of the houses of the canonesses dating from the 17th and 18th centuries also remain. Remiremont is the seat of a sub-prefect and has a tribunal of first instance, a communal college, a board of trade-arbitration and a chamber of arts and manufactures. Its industries include cotton-spinning and weaving, the manufacture of hosiery and embroidery, iron and copper founding and the manufacture of boots and shoes and brushes.

Remiremont (*Romarici Mons*) derives its name from St Romaric, one of the companions of St Columban of Luxeuil, who in the 7th century founded a monastery and a convent on the hills above the present town. In 910 the nuns, menaced by the invasion of the Hungarians, took refuge at Remiremont, which had grown up round a villa of the Frankish kings, and in the 11th century they permanently settled there. Enriched by dukes of Lorraine, kings of France and emperors of Germany, the ladies of Remiremont attained great power. The abbess was a princess of the empire, and received consecration at the hands of the pope. The fifty canonesses were selected from those who could give proof of noble descent. On Whit-Monday the neighbouring parishes paid homage to the chapter in a ceremony called the "Kyrioles"; and on their accession the dukes of Lorraine, the immediate suzerains of the abbey, had to come to Remiremont to swear to continue their protection. The "War of the Scutcheons" (Panonceaux) in 1566 between the duke and the abbess ended in favour of the duke; and the abbess never recovered her former position. In the 17th century the ladies of Remiremont fell away so much from the original monastic rule as to take the title of countesses, renounce their vows and marry. The town was attacked by the French in 1638 and ruined by the earthquake of 1682. With the rest of Lorraine it was joined to France in 1766. The monastery on the hill and the nunnery in the town were both suppressed in the Revolution.

REMONSTRANTS, the name given to those Dutch Protestants who, after the death of Arminius (*q.v.*), maintained the views associated with his name, and in 1610 presented to the states of Holland and Friesland a "remonstrance" in five articles formulating their points of departure from stricter Calvinism. These were: (1) that the divine decree of predestination is conditional, not absolute; (2) that the Atonement is in intention universal; (3) that man cannot of himself exercise a saving faith; (4) that though the grace of God is a necessary condition of human effort it does not act irresistibly in man; (5) that believers are able to resist sin but are not beyond the possibility of falling from grace. Their adversaries (the Gomarists) met them with a "counter-remonstrance," and so were known as the Counter-Remonstrants. Although the states-general issued an edict tolerating both parties and forbidding further dispute, the conflict continued, and the Remonstrants were assailed both by personal enemies and by the political weapons of Maurice of Orange, who executed and imprisoned their leaders for holding republican views. In 1618–19 the synod of Dort (see DORT, SYNOD OF), the thirteen Arminian pastors headed by Simon Episcopius (*q.v.*) being shut out, established the victory of the Calvinist school, drew up ninety-three canonical rules, and confirmed the authority of the Belgic Confession and the Heidelberg Catechism. The judgment of the synod was enforced by the deposition and in some cases the banishment of Remonstrant ministers; but the government soon became convinced that their party was not dangerous to the state, and in 1630 they were formally allowed liberty to reside in all parts of Holland and build churches and schools. In 1621 they had already received liberty to make a settlement in Schleswig, where they built the town of Friedrichstadt. This colony still exists. The doctrine of the Remonstrants was embodied in 1621 in a *confessio* written by Episcopius, their great theologian, while J. Uytenbogaert gave them a catechism and regulated their churchly order. The Remonstrants adopted a simple synodical constitution; but their importance was henceforth more theological than ecclesiastical. Their seminary in Amsterdam has boasted of many distinguished names—Curcellaeus, Limborch, Wetstein, Le Clerc; and their liberal school of theology, which naturally grew more liberal and even rationalistic, reacted powerfully on the state church and on other Christian denominations. The Remonstrants first received official recognition in 1795. As a church they now number 27 communities with about 12,500 members, in a flourishing condition and respected for their traditions of scholarship and liberal thought. Their chief congregation is in Rotterdam.

REMPHAN, the Authorized Version's rendering of the Greek word variously appearing in Acts vii. 48 as *ʽΡομφά*, *ʽΡεμφάν*, *ʽΡεμφάμ*, *ʽΡαιφάν*, *ʽΡεφάν*. It is part of a quotation from Amos v. 26, where the Septuagint *ʽΡαιφάν* or *ʽΡεφάν* stands for the Hebrew כִּיּוּן Chuin or Kewan. The Greek forms are probably simple mistakes for the Hebrew, k (כ) having been replaced by r (ר) and ph (*φ*) substituted for v (ו). Kewan is probably the old Babylonian *Ka(y)awanu*, the planet Saturn, another (the Akkadian) name for which is *Sakkut*, which appears as *Siccuth* in the earlier part of the verse.

REMSCHEID, a town of Germany, in the Prussian Rhine Province, situated on an elevated plateau, 1100 ft. above sea-level, 6 m. by rail S. of Barmen and 20 m. N.E. of Cologne. Pop. (1905) 64,340. Remscheid is a centre of the hardware industry, and large quantities of tools, scythes, skates and other small articles in iron, steel and brass are made for export to all parts of Europe, the East, and North and South America. The name of Remscheid occurs in a document of 1132, and the town received the first impulse to its industrial importance through the immigration of Protestant refugees from France and Holland.

RÉMUSAT, CHARLES FRANÇOIS MARIE, COMTE DE (1797–1875), French politician and man of letters, was born in Paris on the 13th of March 1797. His father, Auguste Laurent, Comte de Rémusat, of a good family of Toulouse, was chamberlain to Napoleon, but acquiesced in the restoration and became prefect first of Haute Garonne, and then of Nord. His mother's maiden name was Claire Élisabeth Jeanne Gravier de Vergennes, born in 1780. She married at sixteen, and was attached to Josephine as *dame du palais* in 1802. Talleyrand was among her admirers, and she was generally recognized as a woman of great intellectual capacity and personal grace. After her death (1824) an *Essai sur l'éducation des femmes* was published and received an academic *couronne*. But it was not until her grandson Paul de Rémusat published her *Mémoires* (3 vols., Paris, 1879–80), which have since been followed by some correspondence with her son (2 vols., 1881), that justice could be done to her literary talent. Much light was thrown on the Napoleonic court by this book, and on the youth and education of her son Charles. He early developed political views more liberal than those of his parents, and, being bred to the bar, published in 1820 a pamphlet on trial by jury. He was an active journalist, showing in philosophy and literature the influence of Cousin, and is said to have furnished to no small extent the original of Balzac's brilliant egoist Henri de Marsay. He signed the journalists' protest against the Ordinances of July 1830, and in the following October was elected deputy for Haute Garonne. He then ranked himself with the *doctrinaires*, and supported most of those measures of restriction on popular liberty which made the July monarchy unpopular with French Radicals. In 1836 he became for a short time under-secretary of state for the interior. He then became an ally of Thiers, and in 1840 held the ministry of the interior for a brief period. In the same year he became an Academician. For the rest of Louis Philippe's reign he was in opposition till he joined Thiers in his attempt at a ministry in the spring of 1848. During this time Rémusat constantly spoke in the chamber, but was still more active in literature, especially on philosophical subjects, the most remarkable of his works being his book on *Abélard* (2 vols., 1845). In 1848 he was elected, and in 1849 re-elected, for Haute Garonne, and voted with the Conservative side. He had to leave France after the *coup d'état*; nor did he re-enter political life during the Second Empire until 1869, when he founded a moderate opposition journal at Toulouse. In 1871 he refused the Vienna embassy offered him by Thiers, but in August he was appointed minister of foreign affairs in succession to M. Jules Favre. Although minister he was not a deputy, and on standing for Paris in September 1873 he was beaten by Désiré Barodet. A month later he was elected (having already resigned with Thiers) for Haute Garonne by a great majority. He died in Paris on the 6th of January 1875.

During his abstention from politics Rémusat continued to write on philosophical history, especially English. *Saint Anselme de Cantorbéry* appeared in 1854; *L'Angleterre au XVIIIème siècle* in 1856 (2nd ed. enlarged, 1865); *Bacon, sa vie,* *son temps, &c.*, in 1858; *Channing, sa vie et ses œuvres*, in 1862; *John Wesley* in 1870; *Lord Herbert de Cherbury* in 1874; *Histoire de la philosophie en Angleterre depuis Bacon jusqu' à Locke* in 1875; besides other and minor works. He wrote well, was a forcible speaker and an acute critic; but his adoption of the indeterminate eclecticism of Cousin in philosophy and of the somewhat similarly indeterminate liberalism of Thiers in politics probably limited his powers, though both no doubt accorded with his critical and unenthusiastic turn of mind.

His son Paul de Rémusat (1831–1897) became a distinguished journalist and writer. He was for many years a regular contributor to the *Revue des deux mondes*. He stood for election in Haute-Garonne in 1869 in opposition to the imperial policy and failed, but was elected to the National Assembly in 1871 and later. In 1890 he entered the Académie des sciences morales et politiques.

RÉMUSAT, JEAN PIERRE ABEL (1788–1832), French Chinese scholar, was born in Paris on the 5th of September 1788. He was educated for the medical profession, but a Chinese herbal in the collection of the Abbé Tersan attracted his attention, and he taught himself to read it by great perseverance and with imperfect help. At the end of five years' study he produced in 1811 an *Essai sur la langue et la littérature chinoises*, and a paper on foreign languages among the Chinese, which procured him the patronage of Silvestre de Sacy. In 1814 a chair of Chinese was founded at the Collège de France, and Rémusat was placed in it. From this time he gave himself wholly to the languages of the Far East, and published a series of useful works, among which his contributions from Chinese sources to the history of the Tatar nations claim special notice. Rémusat became an editor of the *Journal de savants* in 1818, and founder and first secretary of the Paris Asiatic Society in 1822; he also held various Government appointments. He died at Paris on the 4th of June 1832. A list of his works is given in Quérard's *France littéraire* s.v. Rémusat.

RENAISSANCE, THE.—The "Renaissance" or "Renascence" is a term used to indicate a well-known but indefinite space of time and a certain phase in the development of Europe.[1] On the one hand it denotes the transition from that period of history which we call the middle ages (*q.v.*) to that which we call modern. On the other hand it implies those changes in the intellectual and moral attitude of the Western nations by which the transition was characterized. If we insist upon the literal and etymological meaning of the word, the Renaissance was a re-birth; and it is needful to inquire of what it was the re-birth. The metaphor of Renaissance may signify the entrance of the European nations upon a fresh stage of vital energy in general, implying a fuller consciousness and a freer exercise of faculties than had belonged to the medieval period. Or it may mean the resuscitation of simply intellectual activities, stimulated by the revival of antique learning and its application to the arts and literatures of modern peoples. Upon our choice between these two interpretations of the word depend important differences in any treatment of the subject. The former has the disadvantage of making it difficult to separate the Renaissance from other historical phases—the Reformation, for example—with which it ought not to be confounded. The latter has the merit of assigning a specific name to a limited series of events and group of facts, which can be distinguished for the purpose of analysis from other events and facts with which they are intimately but not indissolubly connected. In other words, the one definition of Renaissance makes it denote the whole change which came over Europe at the close of the middle ages. The other confines it to what was known by our ancestors as the Revival of Learning. Yet, when we concentrate attention on the recovery of antique culture, we become aware that this was only one phenomenon or symptom of a far wider and more comprehensive alteration in the conditions of the European races. We find it needful to retain both terms, Renaissance and Revival of Learning, and to show the relations between the series of events and facts which they severally imply. The Revival of Learning must be regarded as a function of that vital energy, an organ of that mental evolution, which brought into existence the modern world, with its new conceptions of philosophy and religion, its reawakened arts and sciences, its firmer grasp on the realities of human nature and the world, its manifold inventions and discoveries, its altered political systems, its expansive and progressive forces. Important as the Revival of Learning undoubtedly was, there are essential factors in the complex called the Renaissance with which it can but remotely be connected. When we analyse the whole group of phenomena which have to be considered, we perceive that some of the most essential have nothing or little to do with the recovery of the classics. These are, briefly speaking, the decay of those great fabrics, church and empire, which ruled the middle ages both as ideas and as realities; the development of nationalities and languages; the enfeeblement of the feudal system throughout Europe; the invention and application of paper, the mariner's compass, gunpowder, and printing; the exploration of continents beyond the ocean; and the substitution of the Copernican for the Ptolemaic system of astronomy. Europe in fact had been prepared for a thorough-going metamorphosis before that new ideal of human life and culture which the Revival of Learning brought to light had been made manifest. It had recovered from the confusion consequent upon the dissolution of the ancient Roman empire. The Teutonic tribes had been Christianized, civilized and assimilated to the previously Latinized races over whom they exercised the authority of conquerors. Comparative tranquillity and material comfort had succeeded to discord and rough living. Modern nationalities, defined as separate factors in a common system, were ready to co-operate upon the basis of European federation. The ideas of universal monarchy and of indivisible Christendom, incorporated in the Holy Roman Empire and the Roman Church, had so far lost their hold that scope was offered for the introduction of new theories both of state and church which would have seemed visionary or impious to the medieval mind. It is therefore obvious that some term, wider than Revival of Learning, descriptive of the change which began to pass over Europe in the 14th and 15th centuries, has to be adopted. That of Renaissance, Rinascimento, or Renascence is sufficient for the purpose, though we have to guard against the tyranny of what is after all a metaphor. We must not suffer it to lead us into rhetoric about the deadness and the darkness of the middle ages, or hamper our inquiry with preconceived assumptions that the re-birth in question was in any true sense a return to the irrecoverable pagan past. Nor must we imagine that there was any abrupt break with the middle ages. On the contrary, the Renaissance was rather the last stage of the middle ages, emerging from ecclesiastical and feudal despotism, developing what was original in medieval ideas by the light of classic arts and letters, holding in itself the promise of the modern world. It was therefore a period and a process of transition, fusion, preparation, tentative endeavour. And just at this point the real importance of the Revival of Learning may be indicated. That rediscovery of the classic past restored the confidence in their own faculties to men striving after spiritual freedom; revealed the continuity of history and the identity of human nature in spite of diverse creeds and different customs; held up for emulation masterworks of literature, philosophy and art; provoked inquiry; encouraged criticism; shattered the narrow mental barriers imposed by medieval orthodoxy. Humanism, a word which will often recur in the ensuing paragraphs, denotes a specific bias which the forces liberated in the Renaissance took from contact with the ancient world,—the particular form assumed by human self-esteem at that epoch,—the ideal of life and civilization evolved by the modern nations. It indicates the endeavour of man to reconstitute himself as a free being, not as the thrall of theological despotism, and the peculiar assistance he derived in this effort from Greek and Roman literature, the *litterae humaniores*, letters leaning rather to the side of man than of divinity.

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[1] For a somewhat different view of the parcelling out into such periods, see the article Middle Ages.

Method of treatment.

In this article the Renaissance will be considered as implying a comprehensive movement of the European intellect and will toward self-emancipation, toward reassertion of the natural rights of the reason and the senses, toward the conquest of this planet as a place of human occupation, and toward the formation of regulative theories both for states and individuals differing from those of medieval times. The Revival of Learning will be treated as a decisive factor in this process of evolution on a new plan. To exclude the Reformation and the Counter-Reformation wholly from the survey is impossible. These terms indicate moments in the whole process of modern history which were opposed, each to the other, and both to the Renaissance; and it is needful to bear in mind that they have, scientifically speaking, a quite separate existence. Yet if the history of Europe in the 16th century of our era came to be written with the brevity with which we write the history of Europe in the 6th century B.C., it would be difficult at the distance of time implied by that supposition to distinguish the Italian movement of the Renaissance in its origin from the German movement of the Reformation. Both would be seen to have a common starting-point in the reaction against long dominant ideas which were becoming obsolete, and also in the excitation of faculties which had during the same period been accumulating energy.

Chronological limits.

The Renaissance, if we try to regard it as a period, was essentially the transition from one historical stage to another. It cannot therefore be confined within strict chronological limits. There is one date, however, which may be remembered with advantage as the starting-point in time of the Renaissance, after the departure from the middle ages had been definitely and consciously made by the Italians. This is the year 1453, when Constantinople, chosen for his capital by the first Christian emperor of Rome, fell into the hands of the Turk. One of the survivals of the old world, the shadow of what had been the Eastern Empire, now passed suddenly away. Almost at the same date that visionary revival of the Western Empire, which had imposed for six centuries upon the imagination of medieval Europe, hampering Italy and impeding the consolidation of Germany, ceased to reckon among political actualities; while its more robust rival, the Roman Church, seemed likely to sink into the rank of a petty Italian principality. It was demonstrated by the destruction of the Eastern and the dotage of the Western Empire, and by the new papal policy which Nicholas V. inaugurated, that the old order of society was about to be superseded. Nothing remained to check those centrifugal forces in state and church which substituted a confederation of rival European powers for the earlier ideal of universal monarchy, and separate religious constitutions for the previous Catholic unity. At the same time the new learning introduced by the earlier humanists awakened free thought, encouraged curiosity, and prepared the best minds of Europe for speculative audacities from which the schoolmen would have shrunk, and which soon expressed themselves in acts of cosmopolitan importance. If we look a little forward to the years 1492–1500, we obtain a second date of great importance. In these years the expedition of Charles VIII. to Naples opened Italy to French, Spanish and German interference. The leading nations of Europe began to compete for the prize of the peninsula, and learned meanwhile that culture which the Italians had perfected. In these years the secularization of the papacy was carried to its final point by Alexander VI., and the Reformation became inevitable. The same period was marked by the discovery of America, the exploration of the Indian seas, and the consolidation of the Spanish nationality. It also witnessed the application of printing to the diffusion of knowledge. Thus, speaking roughly, the half-century between 1450 and 1500 may be termed the culminating point of the Renaissance. The transition from the medieval to the modern order was now secured if not accomplished, and a Rubicon had been crossed from which no retrogression to the past was possible. Looking yet a little farther, to the years 1527 and 1530, a third decisive date is reached. In the first of these years happened the sack of Rome, in the second the pacification of Italy by Charles V. under a Spanish hegemony. The age of the Renaissance was now closed for the land which gave it birth. The Reformation had taken firm hold on northern Europe. The Counter-Reformation was already imminent.

Precursors of the Renaissance.

It must not be imagined that so great a change as that implied by the Renaissance was accomplished without premonitory symptoms and previous endeavours. In the main we mean by it the recovery of freedom for the human spirit after a long period of bondage to oppressive ecclesiastical and political orthodoxy—a return to the liberal and practical conceptions of the world which the nations of antiquity had enjoyed, but upon a new and enlarged platform. This being so, it was inevitable that the finally successful efforts after self-emancipation should have been anticipated from time to time by strivings within the ages that are known as dark and medieval. It is therefore part of the present inquiry to pass in review some of the claimants to be considered precursors of the Renaissance.

First of all must be named the Frank in whose lifetime the dual conception of universal empire and universal church, divinely appointed, sacred and inviolable, began to control the order of European society. Charles the Great (Charlemagne) lent his forces to the plan of resuscitating the Roman empire at a moment when his own power made him the arbiter of western Europe, when the papacy needed his alliance, and when the Eastern Empire had passed under the usurped regency of a female. He modelled an empire, Roman in name but essentially Teutonic, since it owed such substance as its fabric possessed to Frankish armies and the sinews of the German people. As a structure composed of divers ill-connected parts it fell to pieces at its builder's death, leaving little but the incubus of a memory, the fascination of a mighty name, to dominate the mind of medieval Europe. As an idea, the empire grew in visionary power, and remained one of the chief obstacles in the way of both Italian and German national coherence. Real force was not in it, but rather in that counterpart to its unlimited pretensions, the church, which had evolved it from barbarian night, and which used her own more vital energies for undermining the rival of her creation. Charles the Great, having proclaimed himself successor of the Caesars, was obscurely ambitious of imitating the Augusti also in the sphere of letters. He caused a scheme of humanistic education to be formulated, and gave employment at his court to rhetoricians, of whom Alcuin was the most considerable. But very little came of the revival of learning which Charles is supposed to have encouraged; and the empire he restored was accepted by the medieval intellect in a crudely theological and vaguely mystical spirit. We should, however, here remember that the study of Roman law, which was one important precursory symptom of the Renaissance, owed much to medieval respect for the empire as a divine institution. This, together with the municipal Italian intolerance of the Lombard and Frankish codes, kept alive the practice and revived the science of Latin jurisprudence at an early period.

Speculation and heresy in the middle ages.

Philosophy had attempted to free itself from the trammels of theological orthodoxy in the hardy speculations of some schoolmen, notably of Scotus Erigena and Abelard. These innovators found, however, small support, and were defeated by opponents who used the same logical weapons with authority to back them. Nor were the rationalistic opinions of the Averroists without their value, though the church condemned these deviators from her discipline as heretics. Such medieval materialists, moreover, had but feeble hold upon the substance of real knowledge. Imperfect acquaintance with authors whom they studied in Latin translations made by Jews from Arabic commentaries on Greek texts, together with almost total ignorance of natural laws, condemned them to sterility. Like the other schiomachists of their epoch, they fought with phantoms in a visionary realm. A similar judgment may be passed upon those Paulician, Albigensian, Paterine and Epicurean dissenters from the Catholic creed who opposed the phalanxes of orthodoxy with frail imaginative weapons, and alarmed established orders in the state by the audacity of their communistic opinions. Physical science struggled into feeble life in the cells of Gerbert and Roger Bacon. But these men were accounted magicians by the vulgar; and, while the one eventually assumed the tiara, the other was incarcerated in a dungeon. The schools meanwhile resounded still to the interminable dispute upon abstractions. Are only universals real, or has each name a corresponding entity? From the midst of the Franciscans who had persecuted Roger Bacon because he presumed to know more than was consistent with human humility arose John of Parma, adopting and popularizing the mystic prophecy of Joachim of Flora. The reign of the Father is past; the reign of the Son is passing; the reign of the Spirit is at hand. Such was the formula of the Eternal Gospel, which, as an unconscious forecast of the Renaissance, has attracted retrospective students by its felicity of adaptation to their historical method. Yet we must remember that this bold intuition of the abbot Joachim indicated a monastic reaction against the tyrannies and corruptions of the church, rather than a fertile philosophical conception. The Fraticelli spiritualists, and similar sects who fed their imagination with his doctrine, expired in the flames to which Fra Dolcino Longino and Margharita were consigned. To what extent the accusations of profligate morals brought against these reforming sectarians were justified remains doubtful; and the same uncertainty rests upon the alleged iniquities of the Templars. It is only certain that at this epoch the fabric of Catholic faith was threatened with various forms of prophetic and Oriental mysticism, symptomatic of a widespread desire to grasp at something simpler, purer and less rigid than Latin theology afforded. Devoid of criticism, devoid of sound learning, devoid of a firm hold on the realities of life, these heresies passed away without solid results and were forgotten.

Naturalism in medieval life and literature.

We are too apt to take for granted that the men of the middle ages were immersed in meditations on the other world, and that their intellectual exercises were confined to abstractions of the schools, hallucinations of the fancy, allegories, visions. This assumption applies indeed in a broad sense to that period which was dominated by intolerant theology and deprived of positive knowledge. Yet there are abundant signs that the native human instincts, the natural human appetites, remained unaltered and alive beneath the crust of orthodoxy. In the person of a pope like Boniface VIII. those ineradicable forces of the natural man assumed, if we may trust the depositions of ecclesiastics well acquainted with his life, a form of brutal atheistic cynicism. In the person of an emperor, Frederick II., they emerged under the more agreeable garb of liberal culture and Epicurean scepticism. Frederick dreamed of remodelling society upon a mundane type, which anticipated the large toleration and cosmopolitan enlightenment of the actual Renaissance. But his efforts were defeated by the unrelenting hostility of the church, and by the incapacity of his contemporaries to understand his aims. After being forced in his lifetime to submit to authority, he was consigned by Dante to hell. Frederick's ideal of civilization was derived in a large measure from Provence, where a beautiful culture had prematurely bloomed, filling southern Europe with the perfume of poetry and gentle living. Here, if anywhere, it seemed as though the ecclesiastical and feudal fetters of the middle ages might be broken, and humanity might enter on a new stage of joyous unimpeded evolution. This was, however, not to be. The church preached Simon de Montfort's crusade, and organized Dominic's Inquisition; what Quinet calls the "Renaissance sociale par l'Amour" was extirpated by sword, fire, famine and pestilence. Meanwhile the Provençal poets had developed their modern language with incomparable richness and dexterity, creating forms of verse and modes of emotional expression which determined the latest medieval phase of literature in Europe. The naturalism of which we have been speaking found free utterance now in the fabliaux of jongleurs, lyrics of minnesingers, tales of trouvères, romances of Arthur and his knights—compositions varied in type and tone, but in all of which sincere passion and real enjoyment of life pierce through the thin veil of chivalrous mysticism or of allegory with which they were sometimes conventionally draped. The tales of Lancelot and Tristram, the lives of the troubadours and the Wachtlieder of the minnesingers, sufficiently prove with what sensual freedom a knight loved the lady whom custom and art made him profess to worship as a saint. We do not need to be reminded that Beatrice's adorer had a wife and children, or that Laura's poet owned a son and daughter by a concubine, in order to perceive that the mystic passion of chivalry was compatible in the middle ages with commonplace matrimony or vulgar illegitimate connexions. But perhaps the most convincing testimony to the presence of this ineradicable naturalism is afforded by the Latin songs of wandering students, known as *Carmina Burana*, written by the self-styled Goliardi. In these compositions, remarkable for their facile handling of medieval Latin rhymes and rhythms, the allegorizing mysticism which envelops chivalrous poetry is discarded. Love is treated from a frankly carnal point of view. Bacchus and Venus go hand in hand, as in the ancient ante-Christian age. The open-air enjoyments of the wood, the field, the dance upon the village green, are sung with juvenile lightheartedness. No grave note, warning us that the pleasures of this earth are fleeting, that the visible world is but a symbol of the invisible, that human life is a probation for the life beyond, interrupts the tinkling music as of castanets and tripping feet which gives a novel charm to these unique relics of the 13th century. Goliardic poetry is further curious as showing how the classics even at that early period were a fountain-head of pagan inspiration. In the taverns and low places of amusement haunted by those lettered songsters, on the open road and in the forests trodden by their vagrant feet, the deities of Greece and Rome were not in exile, but at home within the hearts of living men. Thus, while Christendom was still preoccupied with the Crusades, two main forces of the Renaissance, naturalism and enthusiasm for antique modes of feeling, already brought their latent potency to light, prematurely indeed and precociously, yet with a promise that was destined to be kept.

Goliardic poetry.

Medieval attitude of mind.

When due regard is paid to these miscellaneous evidences of intellectual and sensual freedom during the middle ages, it will be seen that there were by no means lacking elements of native vigour ready to burst forth. What was wanting was not vitality and licence, not audacity of speculation, not lawless instinct or rebellious impulse. It was rather the right touch on life, the right feeling for human independence, the right way of approaching the materials of philosophy, religion, scholarship and literature, that failed. The courage that is born of knowledge, the calm strength begotten by a positive attitude of mind, face to face with the dominant over-shadowing Sphinx of theology, were lacking. We may fairly say that natural and untaught people had more of the just intuition that was needed than learned folk trained in the schools. But these people were rendered licentious in revolt or impotent for salutary action by ignorance, by terror, by uneasy dread of the doom declared for heretics and rebels. The massive vengeance of the church hung over them, like a heavy sword suspended in the cloudy air. Superstition and stupidity hedged them in on every side, so that sorcery and magic seemed the only means of winning power over nature or insight into mysteries surrounding human life. The path from darkness to light was lost; thought was involved in allegory; the study of nature had been perverted into an inept system of grotesque and pious parable-mongering; the pursuit of truth had become a game of wordy dialectics. The other world, with its imagined heaven and hell, haunted the conscience like a nightmare. However sweet this world seemed, however fair the flesh, both world and flesh were theoretically given over to the devil. It was not worth while to master and economize the resources of this earth, to utilize the good and ameliorate the evils of this life, while every one agreed, in theory at any rate, that the present was but a bad prelude to an infinitely worse or infinitely better future. To escape from these preoccupations and prejudices except upon the path of conscious and deliberate sin was impossible for all but minds of rarest quality and courage; and these were too often reduced to the recantation of their supposed errors no less by some secret clinging sense of guilt than by the church's iron hand. Man and the actual universe kept on reasserting their rights and claims, announcing their goodliness and delightfulness, in one way or another; but they were always being thrust back again into Cimmerian regions of abstractions, fictions, visions, spectral hopes and fears, in the midst of which the intellect somnambulistically moved upon an unknown way.

Italy—the Revival of Learning.

At this point the Revival of Learning intervened to determine the course of the Renaissance. Medieval students possessed a considerable portion of the Latin classics, though Greek had become in the fullest sense of the phrase a dead language. But what they retained of ancient literature they could not comprehend in the right spirit. Between them and the text of poet or historian hung a veil of mysticism, a vapour of misapprehension. The odour of unsanctity clung around those relics of the pagan past. Men bred in the cloister and the lecture-room of the logicians, trained in scholastic disputations, versed in allegorical interpretations of the plainest words and most apparent facts, could not find the key which might unlock those stores of wisdom and of beauty. Petrarch first opened a new method in scholarship, and revealed what we denote as humanism. In his teaching lay the twofold discovery of man and of the world. For humanism, which was the vital element in the Revival of Learning, consists mainly of a just perception of the dignity of man as a rational, volitional and sentient being, born upon this earth with a right to use it and enjoy it. Humanism implied the rejection of those visions of a future and imagined state of souls as the only absolute reality, which had fascinated the imagination of the middle ages. It involved a vivid recognition of the goodliness of man and nature, displayed in the great monuments of human power recovered from the past. It stimulated the curiosity of latent sensibilities, provoked fresh inquisition into the groundwork of existence, and strengthened man's self-esteem by knowledge of what men had thought and felt and done in ages when Christianity was not. It roused a desire to reappropriate the whole abandoned provinces of mundane energy, and a hope to emulate antiquity in works of living loveliness and vigour. The Italians of the 14th century, more precocious than the other European races, were ripe for this emancipation of enslaved intelligence. In the classics they found the food which was required to nourish the new spirit; and a variety of circumstances, among which must be reckoned the pride of a nation boasting of its descent from the Populus Romanus, rendered them apt to fling aside the obstacles that had impeded the free action of the mind through many centuries. Petrarch not only set his countrymen upon the right method of studying the Latin classics, but he also divined the importance of recovering a knowledge of Greek literature. To this task Boccaccio addressed himself; and he was followed by numerous Italian enthusiasts, who visited Byzantium before its fall as the sacred city of a new revelation. The next step was to collect MSS., to hunt out, copy and preserve the precious relics of the past. In this work of accumulation Guarino and Filelfo, Aurispa and Poggio, took the chief part, aided by the wealth of Italian patricians, merchant-princes and despots, who were inspired by the sacred thirst for learning. Learning was then no mere pursuit of a special and recluse class. It was fashionable and it was passionate, pervading all society with the fervour of romance. For a generation nursed in decadent scholasticism and stereotyped theological formulae it was the fountain of renascent youth, beauty and freedom, the shape in which the Helen of art and poetry appeared to the ravished eyes of medieval Faustus. It was the resurrection of the mightiest spirits of the past. "I go," said Cyriac of Ancona, the indefatigable though uncritical explorer of antiquities, "I go to awake the dead!" This was the enthusiasm, this the vitalizing faith, which made the work of scholarship in the 15th century so highly strung and ardent. The men who followed it knew that they were restoring humanity to its birthright after the expatriation of ten centuries. They were instinctively aware that the effort was for liberty of action, thought and conscience in the future. This conviction made young men leave their loves and pleasures, grave men quit their counting-houses, churchmen desert their missals, to crowd the lecture-rooms of philologers and rhetoricians. When Greek had been acquired, MSS. accumulated, libraries and museums formed, came the age of printers and expositors. Aldus Manutius in Italy, Froben in Basel, the Étiennes in Paris, committed to the press what the investigators had recovered. Nor were there wanting men who dedicated their powers to Hebrew and Oriental erudition, laying, together with the Grecians, a basis for those Biblical studies which advanced the Reformation. Meanwhile the languages of Greece and Rome had been so thoroughly appropriated that a final race of scholars, headed by Politian, Pontano, Valla, handled once again in verse and prose both antique dialects, and thrilled the ears of Europe with new-made pagan melodies. The church itself at this epoch lent its influence to the prevalent enthusiasm. Nicholas V. and Leo X., not to mention intervening popes who showed themselves tolerant of humanistic culture, were heroes of the classical revival. Scholarship became the surest path of advancement to ecclesiastical and political honours. Italy was one great school of the new learning at the moment when the German, French and Spanish nations were invited to her feast.

Nature of Italian humanism.

It will be well to describe briefly, but in detail, what this meeting of the modern with the ancient mind effected over the whole field of intellectual interests. In doing so, we must be careful to remember that the study of the classics did but give a special impulse to pent-up energies which were bound in one way or another to assert their independence. Without the Revival of Learning the direction of those forces would have been different; but that novel intuition into the nature of the world and man which constitutes what we describe as Renaissance must have emerged. As the facts, however, stand before us, it is impossible to dissociate the rejection of the other world as the sole reality, the joyous acceptance of this world as a place to live and act in, the conviction that "the proper study of mankind is man," from humanism. Humanism, as it actually appeared in Italy, was positive in its conception of the problems to be solved, pagan in its contempt for medieval mysticism, invigorated for sensuous enjoyment by contact with antiquity, yet holding in itself the germ of new religious aspirations, profounder science and sterner probings of the mysteries of life than had been attempted even by the ancients. The operation of this humanistic spirit has now to be traced.

Relation of Dante, Petrarch, Boccaccio and Villani to the Revival of Learning.

It is obvious that Italian literature owed little at the outset to the Revival of Learning. The *Divine Comedy*, the *Canzoniere* and the *Decameron* were works of monumental art, deriving neither form nor inspiration immediately from the classics, but applying the originality of Italian genius to matter drawn from previous medieval sources. Dante showed both in his epic poem and in his lyrics that he had not abandoned the sphere of contemporary thought. Allegory and theology, the vision and the symbol, still determine the form of masterpieces which for perfection of workmanship and for emancipated force of intellect rank among the highest products of the human mind. Yet they are not medieval in the same sense as the song of Roland or the Arthurian cycle. They proved that, though Italy came late into the realm of literature, her action was destined to be decisive and alterative by the introduction of a new spirit,—a firmer and more positive grasp on life and art. These qualities she owed to her material prosperity, to her freedom from feudalism, to her secularized church, her commercial nobility, her political independence in a federation of small states. Petrarch and Boccaccio, though they both held the medieval doctrine that literature should teach some abstruse truth beneath a veil of fiction, differed from Dante in this that their poetry and prose in the vernacular abandoned both allegory and symbol. In their practice they ignored their theory. Petrarch's lyrics continue the Provençal tradition as it had been reformed in Tuscany, with a subtler and more modern analysis of emotion, a purer and more chastened style, than his masters could boast. Boccaccio's tales, in like manner, continue the tradition of the fabliaux, raising that literary species to the rank of finished art, enriching it with humour and strengthening its substance by keen insight into all varieties of character. The *Canzoniere* and the *Decameron* distinguish themselves from medieval literature, not by any return to classical precedents, but by free self-conscious handling of human nature. So much had to be premised in order to make it clear in what relation humanism stood to the Renaissance, since the Italian work of Dante, Petrarch and Boccaccio is sufficient to indicate the re-birth of the spirit after ages of apparent deadness. Had the Revival of Learning not intervened it is probable that the vigorous efforts of these writers alone would have inaugurated a new age of European culture. Yet, while noting this reservation of judgment, it must also be remarked that all three felt themselves under some peculiar obligation to the classics. Dante, medieval as his temper seems to us, chose Virgil for his guide, and ascribed his mastery of style to the study of Virgilian poetry. Petrarch and Boccaccio were, as we have seen, the pioneers of the new learning. They held their writings in the vernacular cheap, and initiated that contempt for the mother tongue which was a note of the earlier Renaissance. Giovanni Villani, the first chronicler who used Italian for the compilation of a methodical history, tells us how he was impelled to write by musing on the ruins of Rome and thinking of the vanished greatness of the Latin race. We have therefore to recognize that the four greatest writers of the 14th century, while the Revival of Learning was yet in its cradle, each after his own fashion acknowledged the vivifying touch upon their spirit of the antique genius. They seem to have been conscious that they could not give the desired impulse to modern literature and art without contact with the classics; and, in spite of the splendour of their achievements in Italian, they found no immediate followers upon that path.

Relation of humanism to scholarship and literature.

The fascination of pure study was so powerful, the Italians at that epoch were so eager to recover the past, that during the 15th century we have before our eyes the spectacle of this great nation deviating from the course of development begun in poetry by Dante and Petrarch, in prose by Boccaccio and Villani, into the channels of scholarship and antiquarian research. The language of the *Canzoniere* and *Decameron* was abandoned for revived Latin and discovered Greek. Acquisition supplanted invention; imitation of classical authors suppressed originality of style. The energies of the Italian people were devoted to transcribing codices, settling texts, translating Greek books into Latin, compiling grammars, commentaries, encyclopaedias, dictionaries, epitomes and ephemerides. During this century the best histories—Bruno's and Poggio's annals of Florence, for example—were composed in Latin after the manner of Livy. The best dissertations, Landino's *Camaldunenses*, Valla's *De Voluptate*, were laboured imitations of Cicero's *Tusculans*. The best verses, Pontano's elegies, Politian's hexameters, were in like manner Latin; public orations upon ceremonial occasions were delivered in the Latin tongue; correspondence, official and familiar, was carried on in the same language; even the fabliaux received, in Poggio's *Facetiae.* a dress of elegant Latinity. The noticeable barrenness of Italian literature at this period is referable to the fact that men of genius and talent devoted themselves to erudition and struggled to express their thoughts and feelings in a speech which was not natural. Yet they were engaged in a work of incalculable importance. At the close of the century the knowledge of Greece and Rome had been reappropriated and placed beyond the possibility of destruction; the chasm between the old and new world had been bridged; medieval modes of thinking and discussing had been superseded; the staple of education, the common culture which has brought all Europe into intellectual agreement, was already in existence. Humanism was now an actuality. Owing to the uncritical veneration for antiquity which then prevailed, it had received a strong tincture of pedantry. Its professors, in their revolt against the middle ages, made light of Christianity and paraded paganism. What was even worse from an artistic point of view, they had contracted puerilities of style, vanities of rhetoric, stupidities of wearisome citation. Still, at the opening of the 16th century, it became manifest what fruits of noble quality the Revival of Letters was about to bring forth for modern literature. Two great scholars, Lorenzo de' Medici and Politian, had already returned to the practice of Italian poetry. Their work is the first absolutely modern work,—modern in the sense of having absorbed the stores of classic learning and reproduced those treasures in forms of simple, natural, native beauty. Boiardo occupies a similar position by the fusion of classic mythology with chivalrous romance in his *Orlando Innamorato*. But the victor's laurels were reserved for Ariosto, whose *Orlando Furioso* is the purest and most perfect extant example of Renaissance poetry. It was not merely in what they had acquired and assimilated from the classics that these poets showed the transformation effected in the field of literature by humanism. The whole method and spirit of medieval art had been abandoned. That of the Cinque Cento is positive, defined, mundane. The deity, if deity there be, that rules in it, is beauty. Interest is confined to the actions, passions, sufferings and joys of human life, to its pathetic, tragic, humorous and sentimental incidents. Of the state of souls beyond the grave we hear and are supposed to care nothing. In the drama the pedantry of the Revival, which had not injured romantic literature, made itself perniciously felt. Rules were collected from Horace and Aristotle. Seneca was chosen as the model of tragedy; Plautus and Terence supplied the groundwork of comedy. Thus in the plays of Rucellai, Trissino, Sperone and other tragic poets the nobler elements of humanism, considered as a revelation of the world and man, obtained no free development. Even the comedies of the best authors are too observant of Latin precedents, although some pieces of Machiavelli, Ariosto, Aretino, Cecchi and Gelli are admirable for vivid delineation of contemporary manners.

Fine arts.

The relation of the plastic arts to the revival of learning is similar to that which has been sketched in the case of poetry. Cimabue started with work which owed nothing directly to antiquity. At about the same time Niccola Pisano (d. 1278) studied the style of sculpture in fragments of Graeco-Roman marbles. His manner influenced Giotto, who set painting on a forward path. Fortunately for the unimpeded expansion of Italian art, little was brought to light of antique workmanship during the 14th and 15th centuries. The classical stimulus came to painters, sculptors and architects chiefly through literature. Therefore there was narrow scope for imitation, and the right spirit of humanism displayed itself in a passionate study of perspective, nature and the nude. Yet we find in the writings of Ghiberti and Alberti, we notice in the masterpieces of these men and their compeers Brunelleschi and Donatello, how even in the 15th century the minds of artists were fascinated by what survived of classic grace and science. Gradually, as the race became penetrated with antique thought, the earlier Christian motives of the arts yielded to pagan subjects. Gothic architecture, which had always flourished feebly on Italian soil, was supplanted by a hybrid Roman style. The study of Vitruvius gave strong support to that pseudo-classic manner which, when it had reached its final point in Palladio's work, overspread the whole of Europe and dominated taste during two centuries. But the perfect plastic art of Italy, the pure art of the Cinque Cento, the painting of Raphael, Da Vinci, Titian and Correggio, the sculpture of Donatello, Michelangelo and Sansovino, the architecture of Bramante, Omodeo and the Venetian Lombardi, however much imbued with the spirit of the classical revival, takes rank beside the poetry of Ariosto as a free intelligent product of the Renaissance. That is to say, it is not so much an outcome of studies in antiquity as an exhibition of emancipated modern genius fired and illuminated by the masterpieces of the past. It indicates a separation from the middle ages, inasmuch as it is permanently natural. Its religion is joyous, sensuous, dramatic, terrible, but in each and all of its many-sided manifestations strictly human. Its touch on classical mythology is original, rarely imitative or pedantic. The art of the Renaissance was an apocalypse of the beauty of the world and man in unaffected spontaneity, without side thoughts for piety or erudition, inspired by pure delight in loveliness and harmony for their own sakes.

Science and philosophy.

In the fields of science and philosophy humanism wrought similar important changes. Petrarch began by waging relentless war against the logicians and materialists of his own day. With the advance made in Greek studies scholastic methods of thinking fell into contemptuous oblivion. The newly aroused curiosity for nature encouraged men like Alberti, Da Vinci, Toscanelli and Da Porta to make practical experiments, penetrate the working of physical forces, and invent scientific instruments. Anatomy began to be studied, and the time was not far distant when Titian should lend his pencil to the epoch-making treatise of Vesalius. The middle ages had been satisfied with absurd and visionary notions about the world around them, while the body of man was regarded with too much suspicion to be studied. Now the right method of interrogating nature with patience and loving admiration was instituted. At the same time the texts of ancient authors supplied hints which led to discoveries so far-reaching in their results as those of Copernicus, Columbus and Galileo. In philosophy, properly so called, the humanistic scorn for medieval dullness and obscurity swept away theological metaphysics as valueless. But at first little beyond empty rhetoric and clumsy compilation was substituted. The ethical treatises of the scholars are deficient in substance, while Ficino's attempt to revive Platonism betrays an uncritical conception of his master's drift. It was something, however, to have shaken off the shackles of ecclesiastical authority; and, even if a new authority, that of the ancients, was accepted in its stead, still progress was being made toward sounder methods of analysis. This is noticeable in Pomponazzo's system of materialism, based on the interpretation of Aristotle, but revealing a virile spirit of disinterested and unprejudiced research. The thinkers of southern Italy, Telesio, Bruno and Campanella, at last opened the two chief lines on which modern speculation has since moved. Telesio and Campanella may be termed the predecessors of Bacon. Bruno was the precursor of the idealistic schools. All three alike strove to disengage their minds from classical as well as ecclesiastical authority, proving that the emancipation of the will had been accomplished. It must be added that their writings, like every other product of the Renaissance, except its purest poetry and art, exhibit a hybrid between medieval and modern tendencies. Childish ineptitudes are mingled with intuitions of maturest wisdom, and seeds of future thought germinate in the decaying refuse of past systems.

Criticism.

Humanism in its earliest stages was uncritical. It absorbed the relics of antiquity with omnivorous appetite, and with very imperfect sense of the distinction between worse and better work. Yet it led in process of time to criticism. The critique of literature began in the lecture-room of Politian, in the printing-house of Aldus, and in the school of Vittorino. The critique of Roman law started, under Politian's auspices, upon a more liberal course than that which had been followed by the powerful but narrow-sighted glossators of Bologna. Finally, in the court of Naples arose that most formidable of all critical engines, the critique of established ecclesiastical traditions and spurious historical documents. Valla by one vigorous effort destroyed the False Decretals and exposed the Donation of Constantine to ridicule, paving the way for the polemic carried on against the dubious pretensions of the papal throne by scholars of the Reformation. A similar criticism, conducted less on lines of erudition than of persiflage and irony, ransacked the moral abuses of the church and played around the very foundations of Christianity. This was tolerated with approval by men who repeated Leo X.'s witty epigram: "What profit has not that fable of Christ brought us!" The same critical and philosophic spirit working on the materials of history produced a new science, the honours of which belong to Machiavelli. He showed, on the one side, how the history of a people can be written with a recognition of fixed principles, and at the same time with an artistic feeling for personal and dramatic episodes. On the other side, he addressed himself to the analysis of man considered as a political being, to the anatomy of constitutions and the classification of governments, to the study of motives underlying public action, the secrets of success and the causes of failure in the conduct of affairs. The unscrupulous rigour with which he applied his scientific method, and the sinister deductions he thought himself justified in drawing from the results it yielded, excited terror and repulsion. Nevertheless, a department had been added to the intellectual empire of mankind, in which fellow-workers, like Guicciardini at Florence, and subsequently Sarpi at Venice, were not slow to follow the path traced by Machiavelli.

Education.

The object of the foregoing paragraphs has been to show in what way the positive, inquisitive, secular, exploratory spirit of the Renaissance, when toned and controlled by humanism, penetrated the regions of literature, art, philosophy and science. It becomes at this point of much moment to consider how social manners in Italy were modified by the same causes, since the type developed there was in large measure communicated together with the new culture to the rest of Europe. The first subject to be noticed under this heading is education. What has come to be called a classical education was the immediate product of the Italian Renaissance. The universities of Bologna, Padua and Salerno had been famous through the middle ages for the study of law, physics and medicine; and during the 15th and 16th centuries the first two still enjoyed celebrity in these faculties. But at this period no lecture-rooms were so crowded as those in which professors of antique literature and language read passages from the poets and orators, taught Greek, and commented upon the systems of philosophers. The medieval curriculum offered no defined place for the new learning of the Revival, which had indeed no recognized name. Chairs had therefore to be founded under the title of rhetoric, from which men like Chrysoloras and Guarino, Filelfo and Politian expounded orally to hundreds of eager students from every town of Italy and every nation in Europe their accumulated knowledge of antiquity. One mass of Greek and Roman erudition, including history and metaphysics, law and science, civic institutions and the art of war, mythology and magistracies, metrical systems and oratory, agriculture and astronomy, domestic manners and religious rites, grammar and philology, biography and numismatics, formed the miscellaneous subject-matter of this so-styled rhetoric. Notes taken at these lectures supplied young scholars with hints for further exploration; and a certain tradition of treating antique authors for the display of general learning, as well as for the elucidation of their texts, came into vogue, which has determined the method of scholarship for the last three centuries in Europe. The lack of printed books in the first period of the Revival, and the comparative rarity of Greek erudition among students, combined with the intense enthusiasm aroused for the new gospel of the classics, gave special value to the personal teaching of these professors. They journeyed from city to city, attracted by promises of higher pay, and allured by ever-growing laurels of popular fame. Each large town established its public study, academy or university, similar institutions under varying designations, for the exposition of the *literae humaniores*. The humanists, or professors of that branch of knowledge, became a class of the highest dignity. They were found in the chanceries of the republics, in the papal curia, in the council chambers of princes, at the headquarters of condottieri, wherever business had to be transacted, speeches to be made and the work of secretaries to be performed. Furthermore, they undertook the charge of private education, opening schools which displaced the medieval system of instruction, and taking engagements as tutors in the families of despots, noblemen and wealthy merchants. The academy established by Vittorino da Feltre at Mantua under the protection of Gian Francesco Gonzaga for the training of pupils of both sexes, might be chosen as the type of this Italian method. His scholars, who were lodged in appropriate buildings, met daily to hear the master read and comment on the classics. They learned portions of the best authors by heart, exercised themselves in translation from one language to another, and practised composition in prose and verse. It was Vittorino's care to see that, while their memories were duly stored with words and facts, their judgment should be formed by critical analysis, attention to style, and comparison of the authors of a decadent age with those who were acknowledged classics. During the hours of recreation suitable physical exercises, as fencing, riding and gymnastics, were conducted under qualified trainers. From this sketch it will be seen how closely the educational system which came into England during the reigns of the Tudors, and which has prevailed until the present time, was modelled upon the Italian type. English youths who spend their time at Eton between athletic sports and Latin verses, and who take an Ireland with a first class in "Greats" at Oxford, are pursuing the same course of physical and mental discipline as the princes of Gonzaga or Montefeltro in the 15th century.

Social manners.

The humanists effected a deeply penetrating change in social manners. Through their influence as tutors, professors, orators and courtiers, society was permeated by a fresh ideal of culture. To be a gentleman in Italy meant at this epoch to be a man acquainted with the rudiments at least of scholarship, refined in diction, capable of corresponding or of speaking in choice phrases, open to the beauty of the arts, intelligently interested in archaeology, taking for his models of conduct the great men of antiquity rather than the saints of the church. He was also expected to prove himself an adept in physical exercises and in the courteous observances which survived from chivalry. The type is set before us by Castiglione in that book upon the courtier which went the round of Europe in the 16th century. It is further emphasized in a famous passage of the *Orlando Innamorato* where Boiardo compares the Italian ideal of an accomplished gentleman with the coarser type admired by nations of the north. To this point the awakened intelligence of the Renaissance, instructed by humanism, polished by the fine arts, expanding in genial conditions of diffused wealth, had brought the Italians at a period when the rest of Europe was comparatively barbarous.

The moral defects of the Italian Renaissance.

This picture has undoubtedly a darker side. Humanism, in its revolt against the middle ages, was, as we have seen already, mundane, pagan, irreligious, positive. The Renaissance can, after all, be regarded only as a period of transition in which much of the good of the past was sacrificed while some of the evil was retained, and neither the bad nor the good of the future was brought clearly into fact. Beneath the surface of brilliant social culture lurked gross appetites and savage passions, unrestrained by medieval piety, untutored by modern experience. Italian society exhibited an almost unexampled spectacle of literary, artistic and courtly refinement crossed by brutalities of lust, treasons, poisonings, assassinations, violence. A succession of worldly pontiffs brought the church into flagrant discord with the principles of Christianity. Steeped in pagan learning, emulous of imitating the manners of the ancients, used to think and feel in harmony with Ovid and Theocritus, and at the same time rendered cynical by the corruption of papal Rome, the educated classes lost their grasp upon morality. Political honesty ceased almost to have a name in Italy. The Christian virtues were scorned by the foremost actors and the ablest thinkers of the time, while the antique virtues were themes for rhetoric rather than moving-springs of conduct. This is apparent to all students of Machiavelli and Guicciardini, the profoundest analysts of their age, the bitterest satirists of its vices, but themselves infected with its incapacity for moral goodness. Not only were the Italians vitiated; but they had also become impotent for action and resistance. At the height of the Renaissance the five great powers in the peninsula formed a confederation of independent but mutually attractive and repellent states. Equilibrium was maintained by diplomacy, in which the humanists played a foremost part, casting a network of intrigue over the nation which helped in no small measure to stimulate intelligence and create a common medium of culture, but which accustomed statesmen to believe that everything could be achieved by wire-pulling. Wars were conducted on a showy system by means of mercenaries, who played a safe game in the field and developed a system of bloodless campaigns. Meanwhile the people grew up unused to arms. When Italy between the years 1494 and 1530 became the battlefield of French, German and Spanish forces, it was seen to what a point of helplessness the political, moral and social conditions of the Renaissance had brought the nation.

Diffusion of the new learning from Italy throughout Europe.

It was needful to study at some length the main phenomena of the Renaissance in Italy, because the history of that phase of evolution in the other Western races turns almost entirely upon points in which they either adhered to or diverged from the type established there. Speaking broadly, what France, Germany, Spain and England assimilated from Italy at this epoch was in the first place the new learning, as it was then called. This implied the new conception of human life, the new interest in the material universe, the new method of education, and the new manners, which we have seen to be inseparable from Italian humanism. Under these forms of intellectual enlightenment and polite culture the renascence of the human spirit had appeared in Italy, where it was more than elsewhere connected with the study of classical antiquity. But that audacious exploratory energy which formed the motive force of the Renaissance as distinguished from the Revival of Learning took, as we shall see, very different directions in the several nations who now were sending the flower of their youth to study at the feet of Italian rhetoricians.

The Renaissance ran its course in Italy with strange indifference to consequences. The five great powers, held in equilibrium by Lorenzo de' Medici, dreamed that the peninsula could be maintained *in statu quo* by diplomacy. The church saw no danger in encouraging a pseudo-pagan ideal of life, violating its own principle of existence by assuming the policy of an aggrandizing secular state, and outraging Christendom openly by its acts and utterances. Society at large was hardly aware that an intellectual force of stupendous magnitude and incalculable explosive power had been created by the new learning. Why should not established institutions proceed upon the customary and convenient methods of routine, while the delights of existence were augmented, manners polished, arts developed, and a golden age of epicurean ease made decent by a state religion which no one cared to break with because no one was left to regard it seriously? This was the attitude of the Italians when the Renaissance, which they had initiated as a thing of beauty, began to operate as a thing of power beyond the Alps.

Revival of Learning in Germany.

Germany was already provided with universities, seven of which had been founded between 1348 and 1409. In these haunts of learning the new studies took root after the year 1440, chiefly through the influence of travelling professors, Peter Luder and Samuel Karoch. German scholars made their way to Lombard and Tuscan lecture-rooms, bringing back the methods of the humanists. Greek, Latin and Hebrew erudition soon found itself at home on Teutonic soil. Like Italian men of letters, these pioneers of humanism gave a classic turn to their patronymics; unfamiliar names, Crotus Rubeanus and Pierius Graecus, Capnion and Lupambulus Ganymedes, Oecolampadius and Melanchthon, resounded on the Rhine. A few of the German princes, among whom Maximilian, the prince cardinal Albert of Mainz, Frederick the Wise of Saxony, and Eberhard of Württemberg deserve mention, exercised a not insignificant influence on letters by the foundation of new universities and the patronage of learned men. The cities of Strassburg, Nuremberg, Augsburg, Basel, became centres of learned coteries, which gathered round scholars like Wimpheling, Brant, Peutinger, Schedel, and Pirckheimer, artists like Dürer and Holbein, printers of the eminence of Froben. Academies in imitation of Italian institutions came into existence, the two most conspicuous, named after the Rhine and the Danube, holding their headquarters respectively at Heidelberg and Vienna. Crowned poets, of whom the most eminent was Conrad Celtes Protucius (Pickel!), emulated the fame of Politian and Pontano. Yet, though the Renaissance was thus widely communicated to the centres of German intelligence, it displayed a different character from that which it assumed in Italy. Gothic art, which was indigenous in Germany, yielded but little to southern influences. Such work as that of Dürer, Vischer, Cranach, Schöngauer, Holbein, consummate as it was in technical excellence, did not assume Italian forms of loveliness, did not display the paganism of the Latin races. The modification of Gothic architecture by pseudo-Roman elements of style was incomplete. What Germany afterwards took of the Palladian manner was destined to reach it on a circuitous route from France. In like manner the new learning failed to penetrate all classes of society with the rapidity of its expansion in Italy, nor was the new ideal of life and customs so easily substituted for the medieval. The German aristocracy, as Aeneas Sylvius had noticed, remained for the most part barbarous, addicted to gross pleasures, contemptuous of culture. The German dialects were too rough to receive that artistic elaboration under antique influences which had been so facile in Tuscany. The doctors of the universities were too wedded to their antiquated manuals and methods, too satisfied with dullness, too proud of titles and diplomas, too anxious to preserve ecclesiastical discipline and to repress mental activity, for a genial spirit of humanism to spread freely. Not in Cologne or Tübingen but in Padua and Florence did the German pioneers of the Renaissance acquire their sense of liberal studies. And when they returned home they found themselves encumbered with stupidities, jealousies and rancours. Moreover, the temper of these more enlightened men was itself opposed to Italian indifference and immorality; it was pugnacious and polemical, eager to beat down the arrogance of monks and theologians rather than to pursue an ideal of aesthetical self-culture. To a student of the origins of German humanism it is clear that something very different from the Renaissance of Lorenzo de' Medici and Leo X. was in preparation from the first upon Teutonic soil. Far less plastic and form-loving than the Italian, the German intelligence was more penetrative, earnest, disputative, occupied with substantial problems. Starting with theological criticism, proceeding to the stage of solid studies in the three learned languages, German humanism occupied the attention of a widely scattered sect of erudite scholars; but it did not arouse the interest of the whole nation until it was forced into a violently militant attitude by Pfefferkorn's attack on Reuchlin. That attempt to extinguish honest thought prepared the Reformation; and humanism after 1518 was absorbed in politico-religious warfare.

Relation of humanism to the German Reformation.

The point of contact between humanism and the Reformation in Germany has to be insisted on; for it is just here that the relation of the Reformation to the Renaissance in general makes itself apparent. As the Renaissance had its precursory movements in the medieval period, so the German Reformation was preceded by Wickliffe and Huss, by the discontents of the Great Schism and by the councils of Constance and Basel. These two main streams of modern progress had been proceeding upon different tracks to diverse issues, but they touched in the studies stimulated by the Revival, and they had a common origin in the struggle of the spirit after self-emancipation. Johann Reuchlin, who entered the lecture-room of Argyropoulos at Rome in 1482, Erasmus of Rotterdam, who once dwelt at Venice as the house guest of the Aldi, applied their critical knowledge of Hebrew and of Greek to the elucidation and diffusion of the Bible. To the Germans, as to all nations of that epoch, the Bible came as a new book, because they now read it for the first time with eyes opened by humanism. The touch of the new spirit which had evolved literature, art and culture in Italy sufficed in Germany to recreate Christianity. This new spirit in Italy emancipated human intelligence by the classics; in Germany it emancipated the human conscience by the Bible. The indignation excited by Leo X.'s sale of indulgences, the moral rage stirred in Northern hearts by papal abominations in Rome, were external causes which precipitated the schism between Teutonic and Latin Christianity. The Reformation, inspired by the same energy of resuscitated life as the Renaissance, assisted by the same engines of the printing-press and paper, using the same apparatus of scholarship, criticism, literary skill, being in truth another manifestation of the same world-movement under a diverse form, now posed itself as an irreconcilable antagonist to Renaissance Italy. It would be difficult to draw any comparison between German and Italian humanists to the disparagement of the former. Reuchlin was no less learned than Pico; Melanchthon no less humane than Ficino; Erasmus no less witty, and far more trenchant, than Petrarch; Ulrich von Hutten no less humorous than Folengo; Paracelsus no less fantastically learned than Cardano. But the cause in which German intellect and will were enlisted was so different that it is difficult not to make a formal separation between that movement which evolved culture in Italy and that which restored religion in Germany, establishing the freedom of intelligence in the one sphere and the freedom of the conscience in the other. The truth is that the Reformation was the Teutonic Renaissance. It was the emancipation of the reason on a line neglected by the Italians, more important indeed in its political consequences, more weighty in its bearing on rationalistic developments than the Italian Renaissance, but none the less an outcome of the same ground-influences. We have already in this century reached a point at which, in spite of stubborn Protestant dogmatism and bitter Catholic reaction, we can perceive how the ultimate affranchisement of man will be the work of both.

The Catholic revival in Italy.

The German Reformation was incapable of propagating itself in Italy, chiefly for the reason that the intellectual forces which it represented and employed had already found specific outlet in that country. It was not in the nature of the Italians, sceptical and paganized by the Revival, to be keenly interested about questions which seemed to revive the scholastic disputes of the middle ages. It was not in their external conditions, suffering as they were from invasions, enthralled by despots, to use the Reformation as a lever for political revolution. Yet when a tumultuary army of so-called Lutherans sacked Rome in 1527 no sober thinker doubted that a new agent had appeared in Europe which would alter the destinies of the peninsula. The Renaissance was virtually closed, so far as it concerned Italy, when Clement VII. and Charles V. struck their compact at Bologna in 1530. This compact proclaimed the principle of monarchical absolutism, supported by papal authority, itself monarchically absolute, which influenced Europe until the outbreak of the Revolution. A reaction immediately set in both against the Renaissance and the Reformation. The council of Trent, opened in 1545 and closed in 1563, decreed a formal purgation of the church, affirmed the fundamental doctrines of Catholicism, strengthened the papal supremacy, and inaugurated that movement of resistance which is known as the Counter-Reformation. The complex onward effort of the modern nations, expressing itself in Italy as Renaissance, in Germany as Reformation, had aroused the forces of conservatism. The four main instruments of the reaction were the papacy, which had done so much by its sympathy with the revival to promote the humanistic spirit it now dreaded, the strength of Spain, and two Spanish institutions planted on Roman soil—the Inquisition and the Order of Jesus. The principle contended for and established by this reaction was absolutism as opposed to freedom—monarchical absolutism, papal absolutism, the suppression of energies liberated by the Renaissance and the Reformation. The partial triumph of this principle was secure, inasmuch as the majority of established powers in church and state felt threatened by the revolutionary opinions afloat in Europe. Renaissance and Reformation were, moreover, already at strife. Both, too, were spiritual and elastic tendencies toward progress, ideals rather than solid organisms.

Spain in the Renaissance period—arts and letters.

The part played by Spain in this period of history was determined in large measure by external circumstance. The Spaniards became one nation by the conquest of Granada and the union of the crowns of Castile and Aragon. The war of national aggrandizement, being in its nature a crusade, inflamed the religious enthusiasm of the people. It was followed by the expulsion of Jews and Moors, and by the establishment of the Inquisition on a solid basis, with powers formidable to the freedom of all Spaniards from the peasant to the throne. These facts explain the decisive action of the Spanish nation on the side of Catholic conservatism, and help us to understand why their brilliant achievements in the field of culture during the 16th century were speedily followed by stagnation. It will be well, in dealing with the Renaissance in Spain, to touch first upon the arts and literature, and then to consider those qualities of character in action whereby the nation most distinguished itself from the rest of Europe. Architecture in Spain, emerging from the Gothic stage, developed an Early Renaissance style of bewildering richness by adopting elements of Arabic and Moorish decoration. Sculpture exhibited realistic vigour of indubitably native stamp; and the minor plastic crafts were cultivated with success on lines of striking originality. Painting grew from a homely stock, until the work of Velazquez showed that Spanish masters in this branch were fully abreast of their Italian compeers and contemporaries. To dwell here upon the Italianizing versifiers, moralists and pastoral romancers who attempted to refine the vernacular of the *Romancero* would be superfluous. They are mainly noticeable as proving that certain coteries in Spain were willing to accept the Italian Renaissance. But the real force of the people was not in this courtly literary style. It expressed itself at last in the monumental work of *Don Quixote*, which places Cervantes beside Rabelais, Ariosto and Shakespeare as one of the four supreme exponents of the Renaissance. The affectations of decadent chivalry disappeared before its humour; the lineaments of a noble nation, animated by the youth of modern Europe emerging from the middle ages, were portrayed in its enduring pictures of human experience. The Spanish drama, meanwhile, untrammelled by those false canons of pseudo-classic taste which fettered the theatre in Italy and afterwards in France, rose to an eminence in the hands of Lope de Vega and Calderon which only the English, and the English only in the masterpieces of three or four playwrights, can rival. Camoens, in the *Lusiad*, if we may here group Portugal with Spain, was the first modern poet to compose an epic on a purely modern theme, vying with Virgil, but not bending to pedantic rules, and breathing the spirit of the age of heroic adventures and almost fabulous discoveries into his melodious numbers. What has chiefly to be noted regarding the achievements of the Spanish race in arts and letters at this epoch is their potent national originality. The revival of learning produced in Spain no slavish imitation as it did in Italy, no formal humanism, and, it may be added, very little of fruitful scholarship. The Renaissance here, as in England.

displayed essential qualities of intellectual freedom, delight in life, exultation over rediscovered earth and man. The note of Renaissance work in Germany was still Gothic. This we feel in the penetrative earnestness of Dürer, in the homeliness of Hans Sachs, in the grotesque humour of *Eulenspiegel* and the *Narrenschiff*, the sombre pregnancy of the Faust legend, the almost stolid mastery of Holbein. It lay not in the German genius to escape from the preoccupations and the limitations of the middle ages, for this reason mainly that what we call medieval was to a very large extent Teutonic. But on the Spanish peninsula, in the masterpieces of Velazquez, Cervantes, Camoens, Calderon, we emerge into an atmosphere of art, definitely national, distinctly modern, where solid natural forms stand before us realistically modelled, with light and shadow on their rounded outlines, and where the airiest creatures of the fancy take shape and weave a dance of rhythmic, light, incomparable intricacy. The Spanish Renaissance would in itself suffice, if other witnesses were wanting, to prove how inaccurate is the theory that limits this movement to the revival of learning. Touched by Italian influences, enriched and fortified by the new learning, Spanish genius walked firmly forward on its own path. It was only crushed by forces generated in the nation that produced it, by the Inquisition and by despotic Catholic absolutism.

Exploration of the ocean.

In the history of the Renaissance, Spain and Portugal represent the exploration of the ocean and the colonization of the other hemisphere. The voyages of Columbus and Vespucci to America, the rounding of the Cape by Diaz and the discovery of the sea road to India by Vasco da Gama, Cortes's conquest of Mexico and Pizarro's conquest of Peru, marked a new era for the human race and inaugurated the modern age more decisively than any other series of events has done. It has recently been maintained that modern European history is chiefly an affair of competition between confederated states for the possession of lands revealed by Columbus and Da Gama. Without challenging or adopting this speculation, it may be safely affirmed that nothing so pregnant of results has happened as this exploration of the globe. To say that it displaced the centre of gravity in politics and commerce, substituting the ocean for the Mediterranean, dethroning Italy from her seat of central importance in traffic, depressing the eastern and elevating the western powers of Europe, opening a path for Anglo-Saxon expansiveness, forcing philosophers and statesmen to regard the Occidental nations as a single group in counterpoise to other groups of nations, the European community as one unit correlated to other units of humanity upon this planet, is truth enough to vindicate the vast significance of these discoveries. The Renaissance, far from being the re-birth of antiquity with its civilization confined to the Mediterranean, with its Hercules' Pillars beyond which lay Cimmerian darkness, was thus effectively the entrance upon a quite incalculably wider stage of life, on which mankind at large has since enacted one great drama.

Dogmatic Catholicism.

While Spanish navies were exploring the ocean, and Spanish paladins were overturning empires, Charles V. headed the reaction of Catholicism against reform. Stronger as king of Spain than as emperor, for the Empire was little but a name, he lent the weight of his authority to that system of coercion and repression which enslaved Italy, desolated Germany with war, and drowned the Low Countries in blood. Philip II., with full approval of the Spanish nation, pursued the same policy in an even stricter spirit. He was powerfully assisted by two institutions, in which the national character of Spain expressed itself, the Inquisition and the Society of Jesus. Of the former it is not needful to speak here. But we have to observe that the last great phenomenon of the Spanish Renaissance was Ignatius Loyola, who organized the militia by means of which the church worked her Counter-Reformation. His motto, *Perinde ac cadaver*, expressed that recognition of absolutism which papacy and monarchy demanded for their consolidation (see JESUITS and LOYOLA).

France in the Renaissance period.

The logical order of an essay which attempts to show how Renaissance was correlated to Reformation and Counter-Reformation has necessitated the treatment of Italy, Germany and Spain in succession; for these three nations were the three main agents in the triple process to be analysed. It was due to their specific qualities, and to the diverse circumstances of their external development, that the re-birth of Europe took this form of duplex action on the lines of intellectual and moral progress, followed by reaction against mental freedom. We have now to speak of France, which earliest absorbed the influence of the Italian revival, and of England, which received it latest. The Renaissance may be said to have begun in France with Charles VIII.'s expedition to Naples, and to have continued until the extinction of the house of Valois. Louis XII. and Francis I. spent a considerable portion of their reigns in the attempt to secure possession of the Italian provinces they claimed. Henry II.'s queen was Catherine of the Medicean family; and her children, Charles IX. and Henry III., were Italianated Frenchmen. Thus the connexion between France and Italy during the period 1494–1589 was continuous. The French passed to and fro across the Alps on military and peaceful expeditions. Italians came to France as courtiers, ambassadors, men of business, captains and artists. French society assumed a strong Italian colouring, nor were the manners of the court very different from those of an Italian city, except that externally they remained ruder and less polished. The relation between the crown and its great feudatories, the military bias of the aristocracy, and the marked distinction between classes which survived from the middle ages, rendered France in many vital points unlike Italy. Yet the annals of that age, and the anecdotes retailed by Brantôme, prove that the royalty and nobility of France had been largely Italianized.

French architecture.

It is said that Louis XII. brought Fra Giocondo of Verona back with him to France, and founded a school of architects. But we need not have recourse to this legend for the explanation of such Italian influences as were already noticeable in the Renaissance buildings on the Loire. Without determining the French style, Italian intercourse helped to stimulate its formation and development. There are students of the 15th century in France who resent this intrusion of the Italian Renaissance. But they forget that France was bound by inexorable laws of human evolution to obey the impulse which communicated itself to every form of art in Europe. In the school of Fontainebleau, under the patronage of Francis I, that Italian influence made itself distinctly felt; yet a true French manner had been already formed, which, when it was subsequently applied at Paris, preserved a marked national quality. The characteristic of the style developed by Bullant, De l'Orme and Lescot, in the royal or princely palaces of Chenonceaux, Chambord, Anet, Écouen, Fontainebleau, the Louvre and elsewhere, is a blending of capricious fancy and inventive richness of decoration with purity of outline and a large sense of the beauty of extended masses. Beginning with the older castles of Touraine, and passing onward to the Tuileries, we trace the passage from the medieval fortress to the modern pleasure-house, and note how architecture obeyed the special demands of that new phenomenon of Renaissance civilization, the court. In the general distribution of parts these monumental buildings express the peculiar conditions which French society assumed under the influence of Francis I. and Diane de Poitiers. In details of execution and harmonic combinations they illustrate the precision, logic, lucidity and cheerful spirit of the national genius. Here, as in Lombardy, a feeling for serene beauty derived from study of the antique has not interrupted the evolution of a style indigenous to France and eminently characteristic of the French temperament.

French painting and sculpture.

During the reign of Francis I. several Italian painters of eminence visited France. Among these, Del Rosso, Primaticcio, Del Sarto and Da Vinci are the most famous. But their example was not productive of a really great school of French painting. It was left for the Poussins and Claude Lorraine in the next century, acting under mingled Italian and Flemish influences, to embody the still active spirit of the classical revival. These three masters were the contemporaries of Corneille, and do not belong to the Renaissance period. Sculpture, on the contrary, in which art, as in architecture, the medieval French had been surpassed by no other people of Europe, was practised with originality and power in the reigns of Henry II. and Francis I. Ponzio and Cellini, who quitted Italy for France, found themselves outrivalled in their own sphere by Jean Goujon, Cousin and Pilon. The decorative sculpture of this epoch, whether combined with architecture or isolated in monumental statuary, ranks for grace and suavity with the best of Sansovino's. At the same time it is unmistakably inspired by a sense of beauty different from the Italian—more piquant and pointed, less languorous, more mannered perhaps, but with less of empty rhythmical effect. All this while, the minor arts of enamelling, miniature, glass-painting, goldsmith's work, jewellery, engraving, tapestry, wood-carving, pottery, &c., were cultivated with a spontaneity and freedom which proved that France, in the middle point between Flanders and Italy, was able to use both influences without a sacrifice of native taste. It may indeed be said in general that what is true of France is likewise true of all countries which felt the artistic impulses of the Renaissance. Whether we regard Spain, the Netherlands, or Germany at this epoch, we find a national impress stamped upon the products of the plastic and the decorative arts, notwithstanding the prevalence of certain forms derived from the antique and Italy. It was only at a later period that the formalism of pseudo-classic pedantry reduced natural and national originality to a dead unanimity.

French literature.

French literature was quick to respond to Renaissance influences. De Comines, the historian of Charles VIII.'s expedition to Naples, differs from the earlier French chroniclers in his way of regarding the world of men and affairs. He has the perspicuity and analytical penetration of a Venetian ambassador. Villon, his contemporary, may rather be ranked, so far as artistic form and use of knowledge are concerned, with poets of the middle ages, and in particular with the Goliardi. But he is essentially modern in the vividness of his self-portraiture, and in what we are wont to call realism. Both De Comines and Villon indicate the entrance of a new quality into literature. The Rhétoriqueurs, while protracting medieval traditions by their use of allegory and complicated metrical systems, sought to improve the French language by introducing Latinisms. Thus the Revival of Learning began to affect the vernacular in the last years of the 15th century. Marot and his school reacted against this pedantry. The Renaissance displayed itself in their effort to purify the form and diction of poetry. But the decisive revolution was effected by Ronsard and his comrades of the Pléiade. It was their professed object to raise French to a level with the classics, and to acclimatize Italian species of verse. The humanistic movement led these learned writers to engraft the graces of the antique upon their native literature, and to refine it by emulating the lucidity of Petrarch. The result of their endeavour was immediately apparent in the new force added to French rhythm, the new pomp, richness, colouring and polish conferred upon poetic diction. French style gradually attained to fixity, and the alexandrine came to be recognized as the standard line in poetry. D'Aubigné's invective and Regnier's satire, at the close of the 16th century, are as modern as Voltaire's. Meanwhile the drama was emerging from the medieval mysteries; and the classical type, made popular by Garnier's genius, was elaborated, as in Italy, upon the model of Seneca and the canons of the three unities. The tradition thus formed was continued and fortified by the illustrious playwrights of the 17th century. Translation from Greek and Latin into French progressed rapidly at the commencement of this period. It was a marked characteristic of the Renaissance in France to appropriate the spoils of Greece and Rome for the profit of the mother tongue. Amyot's *Plutarch* and his *Daphnis and Chloe* rank among the most exquisite examples of beautiful French prose. Prose had now the charm of simplicity combined with grace. To mention Brantôme is to mention the most entertaining of gossips. To speak of Montaigne is to speak of the best as well as the first of essayists. In all the literary work which has been mentioned, the originality and freshness of the French genius are no less conspicuous than its saturation with the new learning and with Italian studies. But the greatest name of the epoch, the name which is synonymous with the Renaissance in France, has yet to be uttered. That, of course, is Rabelais. His incommensurable and indescribable masterpiece of mingled humour, wisdom, satire, erudition, indecency, profundity, levity, imagination, realism, reflects the whole age in its mirror of hyper-Aristophanic farce. What Ariosto is for Italy, Cervantes for Spain, Erasmus for Holland, Luther for Germany, Shakespeare for England, that is Rabelais for France. The Renaissance cannot be comprehended in its true character without familiarity with these six representatives of its manifold and many-sided inspiration.

French scholarship. The Reformation in France.

The French Renaissance, so rich on the side of arts and letters, was hardly less rich on the side of classical studies. The revival of learning has a noble muster-roll of names in France: Turnebus, the patriarch of Hellenistic studies; the Étiennes of Paris, equalling in numbers, industry and learning their Venetian rivals; the two Scaligers; impassioned Dolet; eloquent Muret; learned Cujas; terrible Calvin; Ramus, the intrepid antagonist of Aristotle; De Thou and De Bèze; ponderous Casaubon; brilliant young Saumaise. The distinguishing characteristics of French humanism are vivid intelligence, critical audacity and polemical acumen, perspicuity of exposition, learning directed in its applications by logical sense rather than by artistic ideals of taste. Some of the names just mentioned remind us that in France, as in Germany and Holland, the Reformation was closely connected with the revival of learning. Humanism has never been in the narrow sense of that term Protestant; still less has it been strictly Catholic. In Italy it fostered a temper of mind decidedly averse to theological speculation and religious earnestness. In Holland and Germany, with Erasmus, Reuchlin and Melanchthon, it developed types of character, urbane, reflective, pointedly or gently critical, which, left to themselves, would not have plunged the north of Europe into the whirlpool of belligerent reform. Yet none the less was the new learning, through the open spirit of inquiry it nourished, its vindication of the private reason, its enthusiasm for republican antiquity, and its proud assertion of the rights of human independence, linked by a strong and subtle chain to that turbid revolt of the individual consciousness against spiritual despotism draped in fallacies and throned upon abuses. To this rebellion we give the name of Reformation. But, while the necessities of antagonism to papal Rome made it assume at first the form of narrow and sectarian opposition, it marked in fact a vital struggle of the intellect towards truth and freedom, involving future results of scepticism and rationalistic audacity from which its earlier champions would have shrunk. It marked, moreover, in the condition of armed resistance against established authority which was forced upon it by the Counter-Reformation, a firm resolve to assert political liberty, leading in the course of time to a revolution with which the rebellious spirit of the Revival was sympathetic. This being the relation of humanism in general to reform, French learning in particular displayed such innovating boldness as threw many of its most conspicuous professors into the camp at war with Rome. Calvin, a French student of Picard origin, created the type of Protestantism to which the majority of French Huguenots adhered. This too was a moment at which philosophical seclusion was hardly possible. In a nation so tumultuously agitated one side or the other had to be adopted. Those of the French humanists who did not proclaim Huguenot opinions found themselves obliged with Muretus to lend their talents to the Counter-Reformation, or to suffer persecution for heterodoxy, like Dolet. The church, terrified and infuriated by the progress of reform, suspected learning on its own account. To be an eminent scholar was to be accused of immorality, heresy and atheism in a single indictment; and the defence of weaker minds lay in joining the Jesuits, as Heinsius was fain to do. France had already absorbed the earlier Renaissance in an Italianizing spirit before the Reformation made itself felt as a political actuality. This fact, together with the strong Italian bias of the Valois, serves to explain in some degree the reason why the Counter-Reformation entailed those fierce entangled civil wars, massacres of St Bartholomew, murders of the Guises, regicides, treasons and empoisonments that terminated with the compromise of Henry IV. It is no part of the present subject to analyse the political, religious and social interests of that struggle. The upshot was the triumph of the Counter-Reformation, and the establishment of its principle, absolutism, as the basis of French government. It was a French king who, when the nation had been reduced to order, uttered the famous word of absolutism, "L'État, c'est moi."

The Netherlands—Flemish and Dutch painting.

The Renaissance in the Low Countries, as elsewhere, had its brilliant age of arts and letters. During the middle ages the wealthy free towns of Flanders flourished under conditions not dissimilar to those of the Italian republics. They raised miracles of architectural beauty, which were modified in the 15th and 16th centuries by characteristic elements of the new style. The Van Eycks, followed by Memling, Metsys, Mabuse, Lucas van Leyden, struck out a new path in the revival of painting and taught Europe the secret of oil-colouring. But it was reserved for the 17th century to witness the flower and fruit time of this powerful art in the work of Porbus, Rubens and Vandyck, in the Dutch schools of landscape and home-life, and in the unique masterpieces of Rembrandt. We have a right to connect this later period with the Renaissance, because the distracted state of the Netherlands during the 16th century suspended, while it could not extinguish, their aesthetic development. The various schools of the 17th century, moreover, are animated with the Renaissance spirit no less surely than the Florentine school of the 15th or the Venetian of the 16th. The animal vigour and carnal enjoyment of Rubens, the refined Italianizing beauty of Vandyck, the mystery of light and gloom on Rembrandt's panels, the love of nature in Ruysdael, Cuyp and Van Hooghe, with their luminously misty skies, silvery daylight and broad expanse of landscape, the interest in common life displayed by Ter Borch, Van Steen, Douw, Ostade and Teniers, the instinct for the beauty of animals in Potter, the vast sea spaces of Vanderveldt, the grasp on reality, the acute intuition into character in portraits, the scientific study of the world and man, the robust sympathy with natural appetites, which distinguish the whole art of the Low Countries, are a direct emanation from the Renaissance.

Flemish and Dutch scholarship.

The vernacular in the Netherlands profited at first but little by the impulse which raised Italian, Spanish, French and English to the rank of classic languages. But humanism, first of all in its protagonist Erasmus, afterwards in the long list of critical scholars and editors, Lipsius, Heinsius and Grotius, in the printers Elzevir and Plantin, developed itself from the centre of the Leiden university with massive energy, and proved that it was still a motive force of intellectual progress. In the fields of classical learning the students of the Low Countries broke new ground chiefly by methodical collection, classification and comprehensive criticism of previously accumulated stores. Their works were solid and substantial edifices, forming the substratum for future scholarship. In addition to this they brought philosophy and scientific thoroughness to bear on studies which had been pursued in a more literary spirit. It would, however, be uncritical to pursue this subject further; for the encyclopaedic labours of the Dutch philologers belong to a period when the Renaissance was overpast. For the same reason it is inadmissible to do more than mention the name of Spinoza here.

Dutch wars of independence.

The Netherlands became the battlefield of Reformation and Counter-Reformation in even a stricter sense than France. Here the antagonistic principles were plainly posed in the course of struggle against foreign despotism. The conflict ended in the assertion of political independence as opposed to absolute dominion. Europe in large measure owes the modern ideal of political liberty to that spirit of stubborn resistance which broke the power of Spain. Recent history, and in particular the history of democracy, claims for its province the several stages whereby this principle was developed in England and America, and its outburst in the frenzy of the French Revolution. It is enough here to have alluded to the part played by the Low Countries in the genesis of a motive force which may be described as the last manifestation of the Renaissance striving after self-emancipation.

England in the Renaissance period.

Combined influences of Renaissance and Reformation.

The insular position of England, combined with the nature of the English people, has allowed us to feel the vibration of European movements later and with less of shock than any of the continental nations. Before a wave of progress has reached our shores we have had the opportunity of watching it as spectators, and of considering how we shall receive it. Revolutions have passed from the tumultuous stages of their origin into some settled and recognizable state before we have been called upon to cope with them. It was thus that England took the influences of the Renaissance and Reformation simultaneously, and almost at the same time found herself engaged in that struggle with the Counter-Reformation which, crowned by the defeat of the Spanish Armada, stimulated the sense of nationality and developed the naval forces of the race. Both Renaissance and Reformation had been anticipated by at least a century in England. Chaucer's poetry, which owed so much to Italian examples, gave an early foretaste of the former. Wickliffe's teaching was a vital moment in the latter. But the French wars, the Wars of the Roses and the persecution of the Lollards deferred the coming of the new age; and the year 1536, when Henry VIII. passed the Act of Supremacy through parliament, may be fixed as the date when England entered definitively upon a career of intellectual development abreast with the foremost nations of the continent. The circumstances just now insisted on explain the specific character of the English Renaissance. The Reformation had been adopted by consent of the king, lords and commons; and this change in the state religion, though it was not confirmed without reaction, agitation and bloodshed, cost the nation comparatively little disturbance. Humanism, before it affected the bulk of the English people, had already permeated Italian and French literature. Classical erudition had been adapted to the needs of modern thought. The hard work of collecting, printing, annotating and translating Greek and Latin authors had been accomplished. The masterpieces of antiquity had been interpreted and made intelligible. Much of the learning popularized by our poets and dramatists was derived at second hand from modern literature. This does not mean that England was deficient in ripe and sound scholars. More, Colet, Ascham, Cheke, Camden were men whose familiarity with the classics was both intimate and easy. Public schools and universities conformed to the modern methods of study; nor were there wanting opportunities for youths of humble origin to obtain an education which placed them on a level with Italian scholars. The single case of Ben Jonson sufficiently proves this. Yet learning did not at this epoch become a marked speciality in England. There was no class corresponding to the humanists. It should also be remembered that the best works of Italian literature were introduced into Great Britain together with the classics. Phaer's *Virgil*, Chapman's *Homer*, Harrington's *Orlando*, Marlowe's *Hero and Leander*, Fairfax's *Jerusalem Delivered*, North's *Plutarch*, Hoby's *Courtier*—to mention only a few examples—placed English readers simultaneously in possession of the most eminent and representative works of Greece, Rome and Italy. At the same time Spanish influences reached them through the imitators of Guevara and the dramatists; French influences in the versions of romances; German influences in popular translations of the Faust legend, *Eulenspiegel* and similar productions. The authorized version of the Bible had also been recently given to the people—so that almost at the same period of time England obtained in the vernacular an extensive library of ancient and modern authors. This was a privilege enjoyed in like measure by no other nation. It sufficiently accounts for the richness and variety of Elizabethan literature, and for the enthusiasm with which the English language was cultivated.

Arts, letters and the drama.

English reaction against Catholicism, monarchical absolutism, and Renaissance culture.

Speaking strictly, England borrowed little in the region of the arts from other nations, and developed still less that was original. What is called Jacobean architecture marks indeed an interesting stage in the transition from the Gothic style. But, compared with Italian, French, Spanish, German and Flemish work of a like period, it is both timid and dry. Sculpture was represented in London for a brief space by Torrigiani; painting by Holbein and Antonio More; music by Italians and Frenchmen of the Chapel Royal. But no Englishmen rose to European eminence in these departments. With literature the case was very different. Wyat and Surrey began by engrafting the forms and graces of Italian poetry upon the native stock. They introduced the sonnet and blank verse. Sidney followed with the sestine and terza rima and with various experiments in classic metres, none of which took root on English soil. The translators handled the octave stanza. Marlowe gave new vigour to the couplet. The first period of the English Renaissance was one of imitation and assimilation. Academies after the Italian type were founded. Tragedies in the style of Seneca, rivalling Italian and French dramas of the epoch, were produced. Attempts to Latinize ancestral rhythms, similar to those which had failed in Italy and France, were made. Tentative essays in criticism and dissertations on the art of poetry abounded. It seemed as though the Renaissance ran a risk of being throttled in its cradle by superfluity of foreign and pedantic nutriment. But the natural vigour of the English genius resisted influences alien to itself, and showed a robust capacity for digesting the varied diet offered to it. As there was nothing despotic in the temper of the ruling classes, nothing oppressive in English culture, the literature of that age evolved itself freely from the people. It was under these conditions that Spenser gave his romantic epic to the world, a poem which derived its allegory from the middle ages, its decorative richness from the Italian Renaissance, its sweetness, purity, harmony and imaginative splendour from the most poetic nation of the modern world. Under the same conditions the Elizabethan drama, which in its totality is the real exponent of the English Renaissance, came into existence. This drama very early freed itself from the pseudo-classic mannerism which imposed on taste in Italy and France. Depicting feudalism in the vivid colours of an age at war with feudal institutions, breathing into antique histories the breath of actual life, embracing the romance of Italy and Spain, the mysteries of German legend, the fictions of poetic fancy and the facts of daily life, humours of the moment and abstractions of philosophical speculation, in one homogeneous amalgam instinct with intense vitality, this extraordinary birth of time, with Shakespeare for the master of all ages, left a monument of the Renaissance unrivalled for pure creative power by any other product of that epoch. To complete the sketch, we must set Bacon, the expositor of modern scientific method, beside Spenser and Shakespeare, as the third representative of the Renaissance in England. Nor should Raleigh, Drake, Hawkins, the semi-buccaneer explorers of the ocean, be omitted. They, following the lead of Portuguese and Spaniards, combating the Counter-Reformation on the seas, opened for England her career of colonization and plantation. All this while the political policy of Tudors and Stewarts tended towards monarchical absolutism, while the Reformation in England, modified by contact with the Low Countries during their struggles, was narrowing into strict reactionary intolerance. Puritanism indicated a revolt of the religious conscience of the nation against the arts and manners of the Renaissance, against the encroachments of belligerent Catholicism, against the corrupt and Italianated court of James I., against the absolutist pretensions of his son Charles. In its final manifestation during the Commonwealth, Puritanism won a transient victory over the mundane forces of both Reformation and Renaissance, as these had taken shape in England. It also secured the eventual triumph of constitutional independence. Milton, the greatest humanistic poet of the English race, lent his pen and moral energies during the best years of his life to securing that principle on which modern political systems at present rest. Thus the geographical isolation of England, and the comparatively late adoption by the English of matured Italian and German influences, give peculiar complexity to the phenomena of Reformation and Renaissance simultaneously developed on our island. The period of our history between 1536 and 1642 shows how difficult it is to separate these two factors in the re-birth of Europe, both of which contributed so powerfully to the formation of modern English nationality.

New political relations in Europe dating from the Renaissance.

It has been impossible to avoid an air of superficiality, and the repetition of facts known to every schoolboy, in this sketch of so complicated a subject as the Renaissance,—embracing many nations, a great variety of topics and an indefinite period of time. Yet no other treatment was possible upon the lines laid down at the outset, where it was explained why the term Renaissance cannot now be confined to the Revival of Learning and the effect of antique studies upon literary and artistic ideals. The purpose of this article has been to show that, while the Renaissance implied a new way of regarding the material world and human nature, a new conception of man's destiny and duties on this planet, a new culture and new intellectual perceptions penetrating every sphere of thought and energy, it also involved new reciprocal relations between the members of the European group of nations. The Renaissance closed the middle ages and opened the modern era,—not merely because the mental and moral ideas which then sprang into activity and owed their force in large measure to the revival of classical learning were opposed to medieval modes of thinking and feeling, but also because the political and international relations specific to it as an age were at variance with fundamental theories of the past. Instead of empire and church, the sun and moon of the medieval system, a federation of peoples, separate in type and divergent in interests, yet bound together by common tendencies, common culture and common efforts, came into existence. For obedience to central authority was substituted balance of power. Henceforth the hegemony of Europe attached to no crown, imperial or papal, but to the nation which was capable of winning it, in the spiritual region by mental ascendancy, and in the temporal by force.

Conservative and progressive parties in modern Europe.

That this is the right way of regarding the subject appears from the events of the first two decades of the 16th century, those years in which the humanistic revival attained its highest point in Italy. Luther published his theses in 1517, sixty-four years after the fall of Constantinople, twenty-three years after the expedition of Charles VIII. to Naples, ten years before the sack of Rome, at a moment when France, Spain and England had only felt the influences of Italian culture but feebly. From that date forward two parties wrestled for supremacy in Europe, to which may be given the familiar names of Liberalism and Conservatism, the party of progress and the party of established institutions. The triumph of the former was most signal among the Teutonic peoples. The Latin races, championed by Spain and supported by the papacy, fought the battle of the latter, and succeeded for a time in rolling back the tide of revolutionary conquest. Meanwhile that liberal culture which had been created for Europe by the Italians before the contest of the Reformation began continued to spread, although it was stifled in Italy and Spain, retarded in France and the Low Countries, well-nigh extirpated by wars in Germany, and diverted from its course in England by the counter-movement of Puritanism. The *autos da fê* of Seville and Madrid, the flames to which Bruno, Dolet and Paleario were flung, the dungeon of Campanella and the seclusion of Galileo, the massacre of St Bartholomew and the faggots of Smithfield, the desolated plains of Germany and the cruelties of Alva in the Netherlands, disillusioned Europe of those golden dreams which had arisen in the earlier days of humanism, and which had been so pleasantly indulged by Rabelais. In truth the Renaissance was ruled by no *Astraea redux*, but rather by a severe spirit which brought no peace but a sword, reminding men of sternest duties, testing what of moral force and tenacity was in them, compelling them to strike for the old order or the new, suffering no lukewarm halting between two opinions. That, in spite of retardation and retrogression, the old order of ideas should have yielded to the new all over Europe,—that science should have won firm standing-ground, and political liberty should have struggled through those birth-throes of its origin,—was in the nature of things. Had this not been, the Renaissance or re-birth of Europe would be a term without a meaning. (J. A. S.)

Literature.—The special articles on the several arts and the literatures of modern Europe, and on the biographies of great men mentioned in this essay, will give details of necessity here omitted. Of works on the Renaissance in general may be mentioned Jacob Burckhardt, *Die Cultur der Renaissance in Italien* (Eng. trans., 1878); G. Voigt, *Wiederbelebung des Classischen Alterthums* (2 vols. 3rd ed., by M. Lehnerdt, 1893); J. A. Symonds, *Renaissance in Italy*; Marc Monnier, *Renaissance de Dante à Luther*; Eugène Müntz, *Précurseurs de la Renaissance* (1882), *Renaissance en Italie et en France* (1885), and *Hist. de l'art pendant la Renaissance* (1889–95); Ludwig Geiger, *Humanismus und Renaissance in Italien und Deutschland* (1882), and *Cambridge Modern History*, vol. i., "The Renaissance" (Cambridge, 1903), where full bibliographies will be found.

RENAIX, a town of Belgium in the province of East Flanders, 8 m. S. of Oudenarde. It has extensive dyeworks, bleaching grounds and manufactories for linen and woollen goods. Pop. (1904) 20,760.

RENAN, ERNEST (1823–1892), French philosopher and Orientalist, was born on the 27th of February 1823 at Tréguier. His father's people were of the fisher-clan of Renans or Ronans; his grandfather, having made a small fortune by his fishing smack, bought a house at Tréguier and settled there, and his father, captain of a small cutter and an ardent Republican, married the daughter of Royalist trading-folk from the neighbouring town of Lannion. All his life Renan was divided between his father's and his mother's political beliefs. He was only five years old when his father died, and his sister Henriette, twelve years older than Ernest, a girl of remarkable character, was henceforth morally the head of the household. Having in vain attempted to keep a school for girls at Tréguier, she left her native place and went to Paris as teacher in a young ladies' boarding-school. Ernest meanwhile was educated in the ecclesiastical seminary of his native place. His good-conduct notes for this period describe him as "docile, patient, diligent, painstaking, thorough." We do not hear that he was brilliant, but the priests cared little for such qualities. While the priests were grounding him in mathematics and Latin, his mother completed his education. She was only half a Breton. Her paternal ancestors came from Bordeaux, and Renan used to say that in his own nature the Gascon and the Breton were constantly at odds.

In the summer of 1838 Renan carried off all the prizes at the college of Tréguier. His sister in Paris told the doctor of the school in which she taught about the success of her brother, and he carried the news to F. A. P. Dupanloup, then engaged in organizing the ecclesiastical college of St Nicholas du Chardonnet, a school in which the young Catholic nobility and the most gifted pupils of the Catholic seminaries were to be educated together, with a view to cementing the bond between the aristocracy and the priesthood. Dupanloup sent for Renan at once. He was fifteen and a half. He had never been outside his Breton province. "I learned with stupor that knowledge was not a privilege of the church . . . I awoke to the meaning of the words talent, fame, celebrity." Above all, religion seemed to him wholly different in Tréguier and in Paris. The superficial, brilliant, pseudo-scientific Catholicism of the capital did not satisfy Renan, who had accepted the austere faith of his Breton masters.

In 1840 Renan left St Nicholas to study philosophy at the seminary of Issy. He entered with a passion for Catholic scholasticism. The rhetoric of St Nicholas had wearied him, and his serious intelligence hoped to satisfy itself with the vast and solid material of Catholic theology. Reid and Malebranche first attracted him among the philosophers, and after these he turned to Hegel, Kant and Herder. Renan began to perceive the essential contradiction between the metaphysics which he studied and the faith that he professed, but an appetite for truths that can be verified restrained his scepticism. "Philosophy excites and only half satisfies the appetite for truth; I am eager for mathematics," he wrote to his sister Henriette. Henriette had accepted in the family of Count Zamoyski an engagement more lucrative than her former place. She exercised the strongest influence over her brother, and her published letters reveal a mind almost equal, a moral nature superior, to his own.

It was not mathematics but philology which was to settle the gathering doubts of Ernest Renan. His course completed at Issy, he entered the college of St Sulpice in order to take his degree in philology prior to entering the church; and here he began the study of Hebrew. He saw that the second part of Isaiah differs from the first not only in style but in date; that the grammar and the history of the Pentateuch are posterior to the time of Moses; that the book of Daniel is clearly apocryphal. It followed from his training that, if you admit one error in a revealed text, you incriminate the whole. Secretly, Renan felt himself cut off from the communion of saints, and yet with his whole heart he desired to live the life of a Catholic priest Hence a struggle between vocation and conviction; owing to Henriette, conviction gained the day. In October 1845 Renan left the seminary of St Sulpice for Stavistas, a lay college of the Oratorians. Finding himself even there too much under the domination of the church, a few weeks later he reluctantly broke the last tie which bound him to the religious life and entered M. Crouzet's school for boys as an usher.

It is always dangerous to educate a really great mind in only one order of truth. Renan, brought up by priests in a world ruled by authority and curious only of feeling and opinion, was to accept the scientific ideal with an extraordinary expansion of all his faculties. He was henceforth ravished by the splendour of the cosmos. At the end of his life he wrote of Amiel, "The man who has time to keep a private diary has never understood the immensity of the universe." The certitudes of physical and natural science were revealed to Renan in 1846 by the chemist Marcellin Berthelot, then a boy of eighteen, his pupil at M. Crouzet's school. To the day of Renan's death their friendship continued. Renan was occupied as usher only in the evenings. In the daytime he continued his researches in Semitic philology. In 1847 he obtained the Prix Volney—one of the principal distinctions awarded by the Academy of Inscriptions—for the manuscript of his "General History of Semitic Languages." In 1847 he took his degree as Agrégé de Philosophie; that is to say, fellow of the university, and was offered a place as master in the lycée of Vendôme. In 1848 a small temporary appointment to the lycée of Versailles permitted him to return to the capital and resume his studies.

The revolution of 1848 aroused in Renan that side of him which loved the priesthood because "the priest lives for his fellows." He for the first time confronted the problems of Democracy. The result was an immense volume, *The Future of Science*, which remained in manuscript until 1890. *L'Avenir de la science* is an attempt to conciliate the privileges of a necessary *élite* with the diffusion of the greatest good of the greatest number. The difficulty haunted Renan throughout his life. By the time he had finished his elaborate scheme for regenerating society by means of a devoted aristocracy of knowledge, and the diffusion of culture, the year 1848 was past, and with it his fever of Democracy. In 1849 the French government sent him to Italy on a scientific mission. He remained eight months abroad, during which he forgot his anxiety about the toilers' lot. Hitherto he had known nothing of art. In Italy the artist in him awoke and triumphed over the savant and the reformer. On his return to Paris Renan lived with his sister Henriette. A small post at the National Library, together with his sister's savings, furnished him with the means of livelihood. In the evenings he wrote for the *Revue des deux mondes* and the *Débats* the exquisite essays which appeared in 1857 and 1859 under the titles *Études d'histoire religieuse* and *Essais de morale et de critique*. In 1852 his book on *Averroès* had brought him not only his doctor's degree, but his first reputation as a thinker. In his two volumes of essays Renan shows himself a Liberal, but no longer a Democrat. Nothing, according to his philosophy, is less important than prosperity. The greatest good of the greatest number is a theory as dangerous as it is illusory. Man is not born to be prosperous, but to realize, in a little vanguard of chosen spirits, an ideal superior to the ideal of yesterday. Only the few can attain a complete development. Yet there is a solidarity between the chosen few and the masses which produce them; each has a duty to the other. The acceptance of this duty is the only foundation for a moral and just society The aristocratic idea has seldom been better stated.

The success of the *Études d'histoire religieuse* and the *Essais de morale* had made the name of Renan known to a cultivated public. While Mademoiselle Renan remained shut up at home copying her brother's manuscripts or compiling material for his work, the young philosopher began to frequent more than one Parisian salon, and especially the studio of Ary Scheffer, at that time a noted social centre. In 1856 he proposed to marry Cornélie Scheffer, the niece and adopted daughter of the great Dutch painter. Not without a struggle Henriette consented not only to the marriage, but to make her home with the young couple, whose housekeeping depended on the sum that she could contribute. The history of this romance has been told by Renan in the memorial essay which he wrote some six years later, entitled *Ma Sœur Henriette*. His marriage brought much brightness into his life, a naturalness into his style and a greater attention to the picturesque. He did not forsake his studies in Semitic philology, and in 1859 appeared his translation of the *Book of Job* with an introductory essay, followed in 1859 by the *Song of Songs*.

Renan was now a candidate for the chair of Hebrew and Chaldaic languages at the Collège de France, which he had desired since first he studied Hebrew at the seminary of St Sulpice. The death of the scholar Quatremère had left this post vacant in 1857. No one in France save Renan was capable of filling it. The Catholic party, upheld by the empress, would not appoint an unfrocked seminarist, a notorious heretic, to a chair of Biblical exegesis. Yet the emperor wished to conciliate Ernest Renan. He offered to send the young scholar on an archaeological mission to Phoenicia. Renan immediately accepted. Leaving his wife at home with their baby son, Renan left France, accompanied by his sister, in the summer of 1860. Madame Renan joined them in January 1861, returning to France in July. The mission proved fruitful in Phoenician inscriptions which Renan published in his *Mission de Phénicie*. They form the base of that *Corpus Inscriptionum Semiticarum* on which he used in later years to declare that he founded his claim to remembrance. He wished to complete his exploration of the upper range of Lebanon; he remained, therefore, with Henriette to affront the dangerous miasma of a Syrian autumn. At Amshit, near Byblos, Henriette Renan died of intermittent fever on the 24th of September 1861. Her brother, himself at death's door, was carried unconscious on board a ship waiting in harbour and bound for France. The sea air revived him, but he reached France broken apparently in heart and health. His sister in her last days had entreated him not to give up his candidature for the chair of Hebrew, and on the 11th of January 1862 the Minister of Public Instruction ratified Renan's election to the post. But his opening lecture, in which, amid the applause of the students, Renan declared Jesus Christ "an incomparable Man," alarmed the Catholic party. Renan's lectures were pronounced a disturbance of the public peace, and he was suspended. On the 2nd of June 1864, on opening the newspaper, Renan saw that he had been transferred from the chair of Hebrew at the College of France to the post of sub-librarian at the National Library. He wrote to the Minister of Public Instruction: "Pecunia tua tecum sit!" He refused the new position, was deprived of his chair, and henceforth depended solely upon his pen.

Henriette had told him to write the life of Jesus. They had begun it together in Syria, she copying the pages as he wrote them, with a New Testament and a *Josephus* for all his library. The book bears the mark of its origin—it is filled with the atmosphere of the East. It is the work of a man familiar with the Bible and theology, and no less acquainted with the inscriptions, monuments, types and landscapes of Syria. But it is scarcely the work of a great scholar: Renan's debt to the school of Tübingen has been exaggerated, in so far as regards the *Life of Jesus*. The book appeared on the 23rd of June 1863; before November sixty thousand copies of it were in circulation. Renan still used his literary gifts to pursue a scientific ideal. In the days when he had composed his huge, immature treatise on the *Future of Science*, he had written: "I envy the man who shall evoke from the past the origins of Christianity. Such a writer would compose the most important book of the century." He set to work to realize this project, and produced the *Apostles* in 1866, and *St Paul* in 1869, after having visited Asia Minor with his wife, where he studied the scenes of the labours of St Paul as minutely as in 1861 he had observed the material surroundings of the life of Jesus.

Renan was not only a scholar. In *St Paul*, as in the *Apostles*, he shows his concern with the larger social life, his sense of fraternity, and a revival of the democratic sentiment which had inspired *L'Avenir de la science*. In 1869 he presented himself as the candidate of the liberal opposition at the parliamentary election for Meaux. While his temper had become less aristocratic, his Liberalism had grown more tolerant. On the eve of its dissolution Renan was half prepared to accept the Empire, and, had he been elected to the Chamber of Deputies, he would have joined the group of *l'Empire liberal*. But he was not elected. A year later war was declared with Germany, the Empire fell, and Napoleon III. went into exile. The Franco-German War was a turning-point in Renan's history. Germany had always been to him the asylum of thought and disinterested science. Now he saw the land of his ideal destroy and ruin the land of his birth; he beheld the German no longer as a priest, but as an invader. His heart turned to France. In *La Réforme intellectuelle et morale* (1871) he endeavoured at least to bind her wounds, to safeguard her future. Yet he was still under the influence of Germany. The ideal and the discipline which he proposed to his defeated country were those of her conqueror—a feudal society, a monarchical government, an *élite*, which the rest of the nation exists merely to support and nourish; an ideal of honour and duty imposed by a chosen few on the recalcitrant and subject multitude. The errors of the Commune confirmed Renan in this reaction. At the same time the irony always perceptible in his work grows more bitter. His *Dialogues philosophiques*, written in 1871, his *Ecclesiastes* (1882) and his *Antichrist* (1876) (the fourth volume of the *Origins of Christianity*, dealing with the reign of Nero) are incomparable in their literary genius, but they are examples of a disenchanted and sceptical temper. He had vainly tried to make his country follow his precepts. He resigned himself to watch her drift towards perdition. The progress of events showed him, on the contrary, a France which every day left a little stronger, and he aroused himself from his disbelieving, disillusioned mood. and observed with genuine interest the struggle for justice and liberty of a democratic society. For his mind was the broadest of the age. The fifth and sixth volumes of the *Origins of Christianity* (the *Christian Church* and *Marcus Aurelius*) show him reconciled with democracy, confident in the gradual ascent of man, aware that the greatest catastrophes do not really interrupt the sure if imperceptible progress of the world—reconciled also in some measure, if not with the truths, at least with the moral beauties of Catholicism, and with the remembrance of his pious youth.

On the threshold of old age the philosopher cast a glance at the days of his childhood. He was nearly sixty when, in 1883, he published those *Souvenirs d'enfance et de jeunesse* which, after the *Life of Jesus*, are the work by which he is chiefly known. They possess that lyric note of personal utterance which the public prizes in a man already famous. They showed the *blasé* modern reader that a world no less poetic, no less primitive than that of the *Origins of Christianity* exists, or still existed within living memory, on the north-western coast of France. They have the Celtic magic of ancient romance and the simplicity, the naturalness, the veracity which the 19th century prized so highly. But his *Ecclesiastes*, published a few months earlier, his *Drames philosophiques*, collected in 1888, give a more adequate image of his fastidious critical, disenchanted, yet not unhopeful spirit. These books are often bitter and melancholy, yet not destitute of optimism. They show the attitude towards uncultured Socialism of a philosopher liberal by conviction, by temperament an aristocrat. We learn in them how Caliban (democracy), the mindless brute, educated to his own responsibility, makes after all an adequate ruler; how Prospero (the aristocratic principle, or, if we will, the mind) accepts his dethronement for the sake of greater liberty in the intellectual world, since Caliban proves an effective policeman, and leaves his superiors a free hand in the laboratory; how Ariel (the religious principle) acquires a firmer hold on life, and no longer gives up the ghost at the faintest hint of change. Indeed, Ariel flourishes in the service of Prospero under the external government of the many-headed brute. For the one thing needful is not destined to succumb. Religion and knowledge are as imperishable as the world they dignify. Thus out of the depths rises unvanquished the essential idealism of Ernest Renan.

Renan was a great worker. At sixty years of age, having finished the *Origins of Christianity*, he began his *History of Israel*, based on a lifelong study of the Old Testament and on the *Corpus Inscriptionum Semiticarum*, published by the Académie des Inscriptions under Renan's direction from the year 1881 till the end of his life. The first volume of the *History of Israel* appeared in 1887, the third and finest volume in 1891, the last two only after the historian's decease. As a history of facts and theories the book has many faults; as an essay on the evolution of the religious idea it is (despite some passages of frivolity, irony, or incoherence) of extraordinary importance; as a reflection of the mind of Ernest Renan it is the most lifelike of images. In a volume of collected essays, *Feuilles détachées*, published also in 1891, we find the same mental attitude, an affirmation of the necessity of piety independent of dogma. On the 12th of October 1892 he died after a few days' illness. In his last years he received many marks of honour, being made an administrator of the Collège de France and grand officer of the Legion of Honour. Two volumes of the *History of Israel*, his correspondence with his sister Henriette, his *Letters to M. Berthelot*, and the *History of the Religious Policy of Philippe-le-Bel*, which he wrote in the years immediately before his marriage, all appeared during the last eight years of the 19th century.

See Desportes and Bournand, *E. Renan, sa vie et son œuvre* (1892); E. Grant Duff, *Ernest Renan, in memoriam* (1893); Séailles, *E. Renan, essai de biographie psychologique* (1894); G. Monod, *Les maîtres de l'histoire* (1894); Allier, *La Philosophie d'E. Renan* (1895); M. J. Darmesteter, *La vie de E. R.* (1898); Platzhoff, *E. Renan, ein Lebensbild* (1900); Brauer, *Philosophy of Ernest Renan* (1904); W. Barry, *Renan* (1905); Sorel, *Le Système historique de R.* (1905–1906). (A. M. F. D.; X.)

RENARD, ALPHONSE FRANÇOIS (1842–1903), Belgian geologist and petrographer, was born at Renaix, in Eastern Flanders, on the 27th of September 1842. He was educated for the church of Rome, and from 1866 to 1869 he was superintendent at the Collège de la Paix, Namur. In 1870 he entered the Jesuit Training College at the old abbey of Maria Laach in the Eifel, and there, while engaged in studying philosophy and science, he became interested in the geology of the district, and especially in the volcanic rocks. Thenceforth he worked at chemistry and mineralogy, and qualified himself for those petrographical researches for which he was distinguished. In 1874 he became professor of chemistry and geology in the college of the Belgian Jesuits at Louvain, a few years later he was appointed one of the curators of the Royal Natural History Museum at Brussels, and in 1882 he relinquished his post at Louvain. In 1888 he was chosen professor of geology at the university of Ghent, and retained the post until the close of his life. Meanwhile he had been ordained priest in 1877, and had intended to enter the Society of Jesus. He was known as the Abbé Renard; but, as remarked by Sir A. Geikie, "As years passed, the longing for mental freedom grew ever stronger, until at last it overmastered all the traditions and associations of a lifetime, and he finally separated himself from the church of Rome." His first work, written in conjunction with Charles de la Vallée-Poussin (1827–1904), was the *Mémoire sur les caractères mineralogiques et stratigraphiques des roches dites plutoniennes de la Belgique et de l'Ardenne française* (1876). In later essays and papers he dealt with the structure and mineral composition of many igneous and sedimentary rocks, and with the phenomena of metamorphism in Belgium and other countries. In acknowledgment of his work the Bigsby Medal was in 1885 awarded to him by the Geological Society of London. Still more important were his later researches connected with the Challenger Expedition. The various rock specimens and oceanic deposits were submitted to him for examination in association with Sir John Murray, and their detailed observations were embodied in the *Report on the Scientific Results of the Voyage of H.M.S. "Challenger." Deep Sea Deposits* (1891). The more striking additions to our knowledge included "the detection and description of cosmic dust, which as fine rain slowly accumulates on the ocean floor; the development of zeolitic crystals on the sea-bottom at temperatures of 32° and under; and the distribution and mode of occurrence of manganiferous concretions and of phosphatic and glauconite deposits on the bed of the ocean" (Geikie). Renard died at Brussels on the 9th of July 1903.

Obituaries by Sir A. Geikie in *Quart. Journ. Geol. Soc.*, lx. 1904, and in *Geol. Mag.*, Nov. 1903.

RENAUD DE MONTAUBAN (Rinaldo di Montalbano), one of the most famous figures of French and Italian romance. His story was attached to the *geste* of Doon of Mayence by the 13th-century *trouvère* who wrote the *chanson de geste* of *Renaus de Montauban*, better known perhaps as *Les quatre fils Aymon.* The four sons of Aymon give their name to inns and streets in nearly every town of France, and the numerous prose versions show what a hold the story gained on the popular imagination. Renaud's sword Floberge, and his horse Bayard passed with him into popular legend. The poem of *Renaus de Montauban* opens with the story of the dissensions between Charlemagne and the sons of Doon of Mayence, Beuves d'Aigremont, Doon de Nanteuil and Aymon de Dordone. The rebellious vassals are defeated by the imperial army near Troyes, and, peace established, Aymon rises in favour at court, and supports the emperor, even in his persecution of his four sons, Renaud, Alard, Guichard and Richard. A second feud arises from a quarrel between Renaud and Bertolai, Charlemagne's nephew, over a game of chess, in the course of which Renaud kills Bertolai with the chess-board. The hero then mounts his steed Bayard, and escapes with his brothers to the Ardennes, where they build the castle of Montessor overlooking the Meuse. At Château Renaud, near Sédan, there existed in the 18th century a ruined castle with a tower called the "tour Maugis" and the reputed stable of Bayard. The outlaws are eventually persuaded to seek their fortune outside Charlemagne's kingdom, and cross the Loire to take service with King Yon of Gascony against the Saracens, accompanied by their cousin, the enchanter Maugis. Yon, however, is compelled by Charlemagne to withdraw his protection, and the castle of Montauban, which the brothers have built on the Dordogne, is besieged by the emperor. They next seek refuge beyond the Rhine, and sustain a third siege at Trémoigne (Dortmund), after which the emperor is persuaded by the barons to make peace. Bayard is abandoned to Charlemagne, and thrown into the Meuse, only to rise again. He still gallops over the hills of the Ardennes on St John's Eve. Renaud, who throughout the story is a type of the Christian and chivalric virtues, makes a pilgrimage to the Holy Land and is invested with some of the exploits of Godfrey de Bouillon. On his return he gives himself up to religion, working as a mason on the church of St Peter at Cologne, where he receives martyrdom at the hands of his jealous fellow-labourers.

The story is closely connected with the legend of Girard de Roussillon. The *chanson de geste* of *Renaus de Montauban* falls into sections which had probably been originally the subject of separate recitals. These may have arisen at different dates, and were not necessarily told in the first instance of the same person, the account of Renaud on the crusade being obviously a late interpolation. The outlaw life of the brothers in the Ardennes bears the marks of trustworthy popular tradition, and it was even at one time suggested that the Gascon and Rhenish episodes were reduplications of the story of Montessor. The connexion of the four brothers with Montessor, Dortmund, Mayence and Cologne, and the abundant local tradition, mark the heroes as originating from the region between the Rhine and the Meuse. Nevertheless, their adventures in Gascony are corroborated by historical evidence, and this section of the poem is the oldest. The enemy of Renaud was Charles Martel, not Charlemagne; Yon was Odo of Gascony, known indifferently as duke, prince, or king; the victory over the Saracens at Toulouse, in which the brothers are alleged to have taken part, was won by him in 721, and in 719 he sheltered refugees from the dominions of Charles Martel, Chilperic II., king of Neustria, and his mayor of the palace, Raginfred, whom he was compelled to abandon. In a local chronicle of Cologne it is stated that Saint Reinoldus died in 697, and in the Latin rhythmical *Vita* his martyrdom is said to have taken place under Bishop Agilolf (d. 717). Thus the romance was evidently composite before it took its place in the Carolingian cycle.

In Italy Renaud had his greatest vogue. His connexion with the treacherous family of Mayence was thrust into the background, and many episodes were added, as well as the personage of the hero's sister, Bradamante. Rinaldo di Montalbano had been the subject of many Italian poems before *Il Rinaldo* of Tasso.

Bibliography.—The *chanson* of *Maugis d'Aigremont* and the prose romance of the *Conqueste de Trebizonde* belong to the same cycle. The prose *Ystoire de Regnault de Montauban* (Lyons, *c.* 1480) had a great vogue. It was generally printed as *Les quatre fils Aymon*, and was published in English, *The Foure Sonnes of Aymon*, by William Caxton, and subsequently by Wynkyn de Worde and William Copland. See *Hist. litt. de la France*, xxii., analysis by Paulin Paris; *Renaus de Montauban* (Stuttgart, 1862), edited by H. Michelant; F. Wulff, *Recherches sur les sagas de Magus et de Geirard* (Lund, 1873); *Magus saga*, ed. G. Cederschiöld (Lund, 1876); *Renout von Montalbaen*, ed. J. C. Matthis (Groningen, 1873); A. Longnon, in *Revue des questions historiques* (1879); R. Zwick, *Über die Sprache des Renaut von Montauban* (Halle, 1884); F. Pfaff, *Das deutsche Volksbuch von den Heymonskindern* (Freiburg in Breisgau, 1887), with a general introduction to the study of the saga; *The Four Sonnes of Aimon* (E. E. Text. Soc., ed. Octavia Richardson, 1884); a special bibliography of the printed editions of the prose romance in L. Gautier's *Bibl. des chansons de geste* (1897); rejuvenations of the story by Karl Simrock (Frankfort, 1845), and by Richard Steel (London, 1897); *Storia di Rinaldino*, ed. C. Minutoli (Bologna, 1865). Stage versions are: *Renaud de Montauban*, a play translated from Lope de Vega was played at the Théâtre italien, Paris, in 1717; *Les quatre fils Aymon*, opéra comique by MM. de Leuven and Brunswick, music by Balfe, in 1884.

RENAUDOT, EUSÈBE (1646–1720), French theologian and Orientalist, was born in Paris in 1646, and educated for the church. Notwithstanding his taste for theology and his title of abbé, much of his life was spent at the French court, where he attracted the notice of Colbert and was often employed in confidential affairs. The unusual learning in Eastern tongues which he acquired in his youth and maintained amid the distractions of court life did not bear fruit till he was sixty-two. His best-known books are *Historia Patriarcharum Alexandrinorum* (Paris, 1713) and *Liturgiarum orientalium collectio* (2 vols., 1715–16). The latter was designed to supply proofs of the "perpetuity of the faith" of the church on the subject of the sacraments, the topic on which most of his theological writings turned, and which was then, in consequence of the controversies attaching to Arnauld's *Perpétuité de la foi*, a burning one between French Catholics and Protestants. Renaudot was not a fair controversialist, but his learning and industry are unquestionable. He died in 1720.

RENAUDOT, THÉOPHRASTE (1586–1653), French physician and philanthropist, was born at Loudun (Vienna), and studied surgery in Paris. He was only nineteen when he received, by favour apparently, the degree of doctor at Montpellier. After some time spent in travel he began to practise in his native town. In 1612 he was summoned to Paris by

Richelieu, partly because of his medical reputation, but more because of his philanthropy. He received the titles of physician and councillor to the king, and was desired to organize a scheme of public assistance. Many difficulties were put in his way, however, and he therefore returned until 1624 to Poitou, where Richelieu made him "commissary general of the poor." It was six years before he was able to begin his work in Paris by opening an information bureau at the sign of the Grand Coq near the Pont Saint-Michel. This *bureau d'adresse* was labour bureau, intelligence department, exchange and charity organization in one; and the sick were directed to doctors prepared to give them free treatment. Presently he established a free dispensary in the teeth of the opposition of the faculty in Paris. The Paris faculty refused to accept the new medicaments proposed by the heretic from Montpellier, restricting themselves to the old prescriptions of blood-letting and purgation. In addition to his *bureau d'adresse* Renaud established a system of lectures and debates on scientific subjects, the reports of which from 1633 to 1642 were published in 1651 with the title *Recueil des conférences publiques.* Under the protection of Richelieu he started the first French newspaper, the *Gazette* (1631), which appeared weekly and contained political and foreign news. He also edited the *Mercure français* and published all manner of reports and pamphlets. In 1637 he opened in Paris the first Mont de Piété, an institution of which he had seen the advantages in Italy. In 1640 the medical faculty, headed by Guy Patin, started a campaign against the innovator of the Grand Coq. After the death of Richelieu and of Louis XIII. the victory of Renaudot's enemies was practically certain. The parlement of Paris ordered him to return the letters patent for the establishment of his bureau and his Mont de Piété, and refused to allow him to practise medicine in Paris. The *Gazette* remained, and in 1646 Renaudot was appointed by Mazarin historiographer to the king. During the first Fronde he had his printing presses at Saint-Germain. He died on the 25th of October 1653. His difficulties had been increased by his Protestant opinions. His sons Isaac (d. 1688) and Eusèbe (d. 1679) were students for ten years before they could obtain their doctorates from the faculty. They carried on their father's work, and defended the virtues of antimony, laudanum and quinine against the schools.

See E. Hatin, *Théodore Renaudot* (Poitiers, 1883), and *La Maison du Coq* (Paris, 1885); Michel Emery, *Renaudot et l'introduction de la médication chimique* (Paris, 1889); and G. Bonnefont, *Un Oublié. Théophraste Renaudot* (Limoges, n.d.).

RENDEZVOUS, a place of meeting appointed or arranged for the assembling of troops, ships or persons. The word was adopted in English at the end of the 16th century from the French substantival use of the imperative *rendez vous, i.e.* "render or betake yourselves."

RENDSBURG, a town of Germany, in the Prussian province of Schleswig-Holstein, situated on the Eider and on the Kaiser Wilhelm canal, in a flat and sandy district, 20 m. W. of Kiel, on the Altona-Vamdrup railway. Pop. (1905) 15,577. It consists of three parts—the crowded Altstadt, on an island in the Eider; the Neuwerk, on the south bank of the river; and the Kronwerk, on the north bank. Rendsburg is the chief place in the basin of the Eider, and when in the possession of Denmark was maintained as a fortress. Its present importance, however, rests on the commercial facilities afforded by its connexion with the North Sea and the Baltic through the Kaiser Wilhelm canal, by which transit trade is carried on in grain, timber, Swedish iron and coals. The principal industries are cotton-weaving, tanning and the manufacture of artificial manures.

Rendsburg came into existence under the shelter of a castle founded by the Danes about the year 1100 on an island of the Eider, and was an object of dispute between the Danish kings and the counts of Holstein. In 1252 it was adjudged to the latter. The town was surrounded with ramparts in 1539, but the fortifications of the Kronwerk were not constructed till the end of the 17th century. During the Thirty Years' War Rendsburg was taken both by the Imperialists and the Swedes, but in 1645 it successfully resisted a second siege by the latter. The war of 1848–50 began with the capture of Rendsburg by the Holsteiners by a *coup de main*, and it formed the centre of the German operations. On the departure of the German troops in 1852 the Danes demolished the fortifications on the north side. Immediately after the death of King Frederick VII. (15th of November 1863) the town was occupied by the Saxon troops acting as the executive of the German Confederation, and it was the base of the operations of the Austrians and Prussians against Schleswig in the spring of the following year. On the termination of the Danish war in 1864 Rendsburg was jointly occupied by Austrian and Prussian military until 1866, when it fell to Prussia.

See Warmstedt, *Rendsburg* (Kiel, 1850).

RENÉ I. (1409–1480), duke of Anjou, of Lorraine and Bar, count of Provence and of Piedmont, king of Naples, Sicily and Jerusalem, was born at Angers on the 16th of January 1409, the second son of Louis II., king of Sicily, duke of Anjou, count of Provence, and of Yolande of Aragon. Louis II. died in 1417, and his sons, together with their brother-in-law, afterwards Charles VII. of France, were brought up under the guardianship of their mother. The elder, Louis III., succeeded to the crown of Sicily and to the duchy of Anjou, René being known as the count of Guise. By his marriage treaty (1419) with Isabel, elder daughter of Charles II., duke of Lorraine, he became heir to the duchy of Bar, which was claimed as the inheritance of his mother Yolande, and, in right of his wife, heir to the duchy of Lorraine. René, then only ten, was to be brought up in Lorraine under the guardianship of Charles II. and Louis, cardinal of Bar, both of whom were attached to the Burgundian party, but he retained the right to bear the arms of Anjou. He was far from sympathizing with the Burgundians, and, joining the French army at Reims in 1429, was present at the coronation of Charles VII. When Louis of Bar died in 1430 René came into sole possession of his duchy, and in the next year, on his father-in-law's death, he succeeded to the duchy of Lorraine. But the inheritance was claimed by the heir-male, Antoine de Vaudémont, who with Burgundian help defeated René at Bulgnéville in July 1431. The Duchess Isabel effected a truce with Antoine de Vaudémont, but the duke remained a prisoner of the Burgundians until April 1432, when he recovered his liberty on parole on yielding up as hostages his two sons, Jean and Louis of Anjou. His title as duke of Lorraine was confirmed by his suzerain, the Emperor Sigismund, at Basel in 1434. This proceeding roused the anger of the Burgundian duke, Philip the Good, who required him early in the next year to return to his prison, from which he was released two years later on payment of a heavy ransom. He had succeeded to the kingdom of Naples through the deaths of his brother Louis III. and of Jeanne II. de Duras, queen of Naples, the last heir of the earlier dynasty. Louis had been adopted by her in 1431, and she now left her inheritance to René. The marriage of Marie de Bourbon, niece of Philip of Burgundy, with John, duke of Calabria, René's eldest son, cemented peace between the two princes. After appointing a regency in Bar and Lorraine, he visited his provinces of Anjou and Provence, and in 1438 set sail for Naples, which had been held for him by the Duchess Isabel. René's captivity, and the poverty of the Angevin resources due to his ransom, enabled Alphonso of Aragon, who had been first adopted and then repudiated by Jeanne II., to make some headway in the kingdom of Naples, especially as he was already in possession of the island of Sicily. In 1441 Alphonso laid siege to Naples, which he sacked after a six months' siege. René returned to France in the same year, and though he retained the title of king of Naples his effective rule was never recovered. Later efforts to recover his rights in Italy failed. His mother Yolande, who had governed Anjou in his absence, died in 1442. René took part in the negotiations with the English at Tours in 1444, and peace was consolidated by the marriage of his younger daughter, Margaret, with Henry VI. at Nancy. René now made over the government of Lorraine to John, duke of Calabria, who was, however, only formally installed as duke of Lorraine on the death of Queen Isabel in

1453. René had the confidence of Charles VII., and is said to have initiated the reduction of the men-at-arms set on foot by the king, with whose military operations against the English he was closely associated. He entered Rouen with him in November 1449, and was also with him at Formigny and Caen. After his second marriage with Jeanne de Laval, daughter of Guy XIV., count of Laval, and Isabel of Brittany, René took a less active part in public affairs, and devoted himself more to artistic and literary pursuits. The fortunes of his house declined in his old age. The duke of Calabria, after repeated misfortunes in Italy, was offered the crown of Aragon in 1467, but died, apparently by poison, at Barcelona on the 16th of December 1470; the duke's eldest son Nicholas perished in 1473, also under suspicion of poisoning; René's daughter Margaret was a refugee from England, her son Prince Edward was murdered in 1471, and she herself became a prisoner, to be rescued by Louis XI. in 1476. His only surviving male descendant was then René II., duke of Lorraine, son of his daughter Yolande, comtesse de Vaudémont, who was gained over to the party of Louis XI., who suspected the king of Sicily of complicity with his enemies, the duke of Brittany and the Constable Saint-Pol. René retired to Provence, and in 1474 made a will by which he left Bar to his grandson René II., duke of Lorraine; Anjou and Provence to his nephew Charles, count of Le Maine. Louis seized Anjou and Bar, and two years later sought to compel the king of Sicily to exchange the two duchies for a pension. The offer was rejected, but further negotiations assured the lapse to the crown of the duchy of Anjou, and the annexation of Provence was only postponed until the death of the count of Le Maine. René died on the 10th of July 1480, his charities having earned for him the title of "the good." He founded an order of chivalry, the Ordre du Croissant, which was anterior to the royal foundation of St Michael, but did not survive René.

The king of Sicily's fame as an amateur of painting has led to the attribution to him of many old paintings in Anjou and Provence, in many cases simply because they bear his arms. These works are generally in the Flemish style, and were probably executed under his patronage and direction, so that he may be said to have formed a school of the fine arts in sculpture, painting, gold work and tapestry. Two of the most famous works formerly attributed to René are the triptych, the "Burning Bush," in the cathedral of Aix, showing portraits of René and his second wife, Jeanne de Laval, and an illuminated Book of Hours in the Bibliothèque nationale, Paris. The "Burning Bush" was in fact the work of Nicolas Froment, a painter of Avignon. Among the men of letters attached to his court was Antoine de la Sale, whom he made tutor to his son, the duke of Calabria. He encouraged the performance of mystery plays; on the performance of a mystery of the Passion at Saumur in 1462 he remitted four years of taxes to the town, and the representations of the Passion at Angers were carried out under his auspices. He exchanged verses with his kinsman, the poet Charles of Orleans. The best of his poems is the idyl of Regnault and Jeanneton, representing his own courtship of Jeanne de Laval. *Le Livre des tournois*, a book of ceremonial, and the allegorical romance, *Conqueste qu'un chevalier nommé le Cuer d'amour espris feist d'une dame appelée Doulce Mercy*, with other works ascribed to him, were perhaps dictated to his secretaries, or at least compiled under his direction. His *Œuvres* were published by the comte de Quatrebarbes (4 vols., Paris and Angers, 1845–46).

See A. Lecoy de la Marche, *Le Roi René* (2 vols., 1875); A. Vallet de Viriville, in the *Nouvelle Biographie générale*, where there is some account of the MSS. of his works; and J. Renouvier, *Les Peintres et enlumineurs du roi René* (Montpellier, 1857).

RENÉE OF FRANCE (1510–1575), second daughter of Louis XII. and Anne of Brittany, was born at Blois on the 25th of October 1510. After being betrothed successively to Gaston de Foix, Charles of Austria (the future emperor Charles V.), his brother Ferdinand, Henry VIII. of England, and the elector Joachim II. of Brandenburg, she married in 1528 Hercules of Este, son of the duke of Ferrara, who succeeded his father six years later. Renée's court became a rendezvous of men of letters and a refuge for the persecuted French Calvinists. She received Clément Marot and Calvin at her court, and finally embraced the reformed religion. Her husband, however, who viewed these proceedings with disfavour, banished her friends, took her children from her, threw her into prison, and eventually made her abandon at any rate the outward forms of Calvinism. After his death in 1559, Renée returned to France and turned her duchy of Montargis into a centre of Protestant propaganda. During the wars of religion she was several times molested by the Catholic troops, and in 1562 her château was besieged by her son-in-law, the duke of Guise. She died at Montargis.

See B. Fontana, *Renata di Francia* (Rome, 1889 seq.); and E. Rodocanachi, *Renée de France* (Paris, 1896).

RENEVIER, EUGÈNE (1831–), Swiss geologist, was born at Lausanne on the 26th of March 1831. In 1857 he became professor of geology and palaeontology in the university at Lausanne. He is distinguished for his researches on the geology and palaeontology of the Alps, on which subjects he published numerous papers in the proceedings of the scientific societies in Switzerland and France. With F. J. Pictet he wrote a memoir on the *Fossiles du terrain aptien de la Perte-du-Rhone* (1854). In 1894 he was appointed president of the Swiss Geological Commission, and also of the International Geological Congress held that year at Zürich, in the previous meetings of which he had taken a prominent part. He published a noteworthy *Tableau des terrains sédimentaires* (1874); and a second more elaborate edition, accompanied by an explanatory article *Chronographe géologique*, was issued in 1897 as a supplement to the Report of the Zürich Congress. This new table was printed on coloured sheets, the colours for each geological system corresponding with those adopted on the International geological map of Europe.

RENFREW, a royal, municipal and police burgh and county town of Renfrewshire, Scotland, near the southern bank of the Clyde, 7 m. W. by N. of Glasgow, via Cardonald, by the Glasgow & South-Western and Caledonian railways (5 m. by road). Pop. (1891) 6777; (1901) 9296. Industries include shipbuilding (the construction of dredgers and floating docks is a speciality), engineering, dyeing, weaving, chemicals and cabinet-making. The Clyde trust has constructed a large dock here. Renfrew belongs to the Kilmarnock district group of parliamentary burghs (with Kilmarnock, Dumbarton, Rutherglen and Port Glasgow). Robert III. gave a charter in 1396, but it was a burgh (Renifry) at least 250 years earlier. About 1160 Walter Fitzalan, the first high steward of Scotland, built a castle on an eminence by the side of the Clyde (still called Castle Hill), the original seat of the royal house of Stewart. Close to the town, on the site of Elderslie House, Somerled, lord of the Isles, was defeated and slain in 1164 by the forces of Malcolm IV., against whom he had rebelled. In 1404 Robert II. bestowed upon his son James (afterwards James I.) the title of Baron of Renfrew, still borne by the prince of Wales.

RENFREWSHIRE, a south-western county of Scotland, bounded N. by the river and firth of Clyde, E. by Lanarkshire, S. and S.W. by Ayrshire and W. by the firth of Clyde. A small detached portion of the parish of Renfrew, situated on the northern bank of the Clyde, is surrounded on the landward side by Dumbartonshire. The county has an area of 153,332 acres, or 239·6 sq. m. Excepting towards the Ayrshire border on the south-west, where the principal heights are Hill of Stake (1711 ft.), East Girt Hill (1673), Misty Law (1663) and Creuch Hill (1446), and the confines of Lanarkshire on the south-east, where a few points attain an altitude of 1200 ft.—the surface is undulating rather than rugged. Much of the higher land in the centre is well wooded. The Clyde forms part of the northern boundary of the shire. In the N.W. Loch Thom and Gryfe Reservoir provide Greenock with water, and Balgray Reservoir and Glen Reservoir reinforce the water-supply of a portion of the Glasgow area. The other lakes are situated in the S. and S.E. and include Castle Semple Loch, Long Loch, Brother Loch, Black Loch, Binend Loch and Dunwan Dam. The Glasgow, Paisley and Johnstone canal has been converted since 1882 into the track of the Glasgow & South-Western railway. Strathgryfe is the only considerable vale in the shire. It extends from the reservoir to below Bridge of Weir, a distance of 10 m. The scenery at its head is somewhat wild and bleak, but the lower reaches are pasture land. The wooded ravine of Glenkillock, to the south of Paisley, is watered by Killock Burn, on which are three falls.

Geology.—Carboniferous rocks form the substratum of this county. The hilly ground from the neighbourhood of Eaglesham north-westward is formed of volcanic rocks, basalts, porphyrites, tuffs and agglomerates of the age of the Cementstone group of the Calciferous Sandstone series. Here and there the sites of the volcanic cones are distinguishable, the best being those between Misty Law and Queenside Muir. Beneath the volcanic rocks are some red sandstones and conglomerates which occupy a small tract between Loch Thom and the neighbourhood of Inverkip. Resting upon the volcanic rocks is the Carboniferous Limestone series which at the base consists of ashy sandstones and grits followed by the three subdivisions prevalent in southern Scotland. With unimportant exceptions, all the area north of the volcanic rocks is occupied by the Carboniferous Limestone series. The beds lie in a faulted basin around Linwood, and the following strata may be distinguished from below upwards: the Hurlet coal and limestone, Lillies oil shale, Hosie limestone, Johnstone clay ironstone and Cowglass limestone along with other beds of ironstone and coal. The sandstone of Giffnock, used for building; the limestone and coal of Orchard with a very fossiliferous shale bed; and the limestone and coal of Arden all belong to the same series. Besides the contemporaneous volcanic rocks numerous intrusive sheets are found in the Carboniferous rocks such as the large mass of basalt south of Johnstone; and doleritic sheet of Quarrelton and the similar sheets N.E. of Paisley. In the eastern part of the county, near the border the coals and ironstones of this series near Shawlands and Crossmyloof are faulted directly against the coal measures of Rutherglen. Tertiary basalt dikes cut the older rocks in a S.E.-N.W. direction, for example those on Misty Law. Glacial striae abound on the hilly ground, those in the north indicating that the ice took a south-easterly direction which farther south became south-westerly. Boulder clays, gravels and sands also cover considerable areas. Copper ore has been worked in the volcanic rocks near Lochwinnoch and in the grey sandstones near Gourock.

Climate and Agriculture.—The climate is variable. As the prevailing west and south-west winds come in from the Atlantic warm and full of moisture, contact with the land causes heavy rains, and the western area of the shire is one of the wettest districts in Scotland, the mean annual rainfall exceeding 60 in. The temperature for the year averages about 48° F., for January 38°·5 F., and for July 58°·5 F. The hilly tract contains much peat-moss and moorland, but over those areas which are not thus covered the soil, which is a light earth on a substratum of gravel, is deep enough to produce good pasture. In the undulating central region the soil is better, particularly in the basins of the streams, while on the flat lands adjoining the Clyde there is a rich alluvium which, except when soured by excessive rain, yields heavy crops. Of the total area three-fifths is under cultivation, more than half of this being permanent pasture. Oats are grown extensively, and wheat and barley are also cultivated. Potatoes, turnips and swedes, and beans are the leading green crops. Near the populous centres orchards and market gardens are found, and an increasing acreage is under wood. Horses are kept mostly for farming operations, and the bulk of the cattle are maintained in connexion with dairying. Sheep-farming, though on the increase, is not prosecuted so vigorously as in the other southern counties of Scotland, and pig-rearing is on the decline.

Other Industries.—Coal, iron, oil-shale and fireclay are the principal minerals. Limestone is largely quarried for smelting purposes, and for the manufacture of lime. Sandstone is also quarried. The thread industry at Paisley is the most important in the world. Cotton spinning, printing, bleaching and dyeing are carried on at Paisley, Pollokshaws, Renfrew, Barrhead and elsewhere; woollens and worsteds are produced at Paisley, Greenock and Renfrew. Engineering works and iron and brass foundries are found at Greenock, Port-Glasgow, Paisley, Renfrew, Barrhead and Johnstone. Sugar is a staple article of trade in Greenock and there are chemical works at Hurlet, Nitshill and Renfrew. Brewing and distilling are carried on at Greenock, Paisley and other places. Shipbuilding is especially important at Greenock and Port-Glasgow. Paper mills are established in Greenock, Cathcart and Johnstone, and tanneries in Paisley and Kilbarchan. Numerous miscellaneous industries—such as the making of starch, cornflour and preserves—have also grown up in Paisley and elsewhere. The sea and river ports are Greenock, Port-Glasgow and Renfrew.

Railway communication is ample in the north, the centre and towards the south-west. The Caledonian railway runs westwards from Glasgow by Paisley to Greenock, Gourock and Wemyss Bay; south-westwards to Barrhead and other stations; and southwards to Busby. The Glasgow & South-Western railway runs to Greenock by Paisley, Johnstone and Kilmalcolm; to Nitshill and other places south-westwards; by Lochwinnoch (for Dalry and Ardrossan in Ayrshire); and to Renfrew jointly with the Caledonian. The Clyde and the railway steamers call at Renfrew, Prince's Pier (Greenock), Gourock and Wemyss Bay.

Population and Administration.—In 1891 the population numbered 230,812, and in 1901 it was 268,980, or 1123 to the sq. m. In 1901 there were 40 persons who spoke Gaelic only and 5585 Gaelic and English. Thus though the shire is but twenty-seventh in point of size of the 33 Scottish counties, it is fifth in respect of population, and only Lanarkshire and Mid Lothian are more densely populated. The county is divided into the upper ward, embracing the easterly two-thirds, with Paisley as district centre, and the lower ward, consisting of the parishes of Inverkip, Greenock, Port-Glasgow and Kilmalcolm, with Greenock as district centre. The chief towns are Paisley (pop. 79,363), Greenock (68,142), Port-Glasgow (16,857), Pollokshaws (11,369), Johnstone (11,331), Barrhead (9855), Renfrew (9296), Gourock (5261), Cathcart (5808). The shire returns one member to parliament for the eastern, and another for the western division. Paisley and Greenock return each one member, and Renfrew and Port-Glasgow belong to the Kilmarnock district group of parliamentary burghs. Renfrewshire forms a sheriffdom with Bute, and there is a resident sheriff-substitute at Paisley and one at Greenock. The county is under school-board jurisdiction. For secondary and specialized education there are an academy at Greenock and a grammar school and technical school at Paisley, while some of the schools in the county earn grants for higher education. The county secondary committee also makes provision for the free education of Renfrewshire children in Glasgow High School and the Spier School at Beith. The Paisley Technical School and the Glasgow and West of Scotland Technical College are subsidized out of the "residue" grant, part of which also defrays the travelling expenses of students and supports science and art and technological classes in the burghs and towns in the county.

History.—At the time of the Roman advance from the Solway the land was peopled by the British tribe of Damnonii. To hold the natives in check the conquerors built in 84 the fort of Vanduara on high ground now covered by houses and streets in Paisley; but after the Romans retired (410) the territory was overrun by Cumbrian Britons and formed part of the kingdom of Strathclyde, the capital of which was situated at Alclyde, the modern Dumbarton. In the 7th and 8th centuries the region practically passed under the supremacy of Northumbria, but in the reign of Malcolm Canmore became incorporated with the rest of Scotland. During the first half of the 12th century, Walter Fitzalan, high steward of Scotland, ancestor of the royal house of Stuart, settled in Renfrewshire on an estate granted to him by David I. Till their accession to the throne the Stuarts identified themselves with the district, which, however, was only disjoined from Lanarkshire in 1404. In that year Robert III. erected the barony of Renfrew and the Stuart estates into a separate county, which, along with the earldom of Carrick and the barony of King's Kyle (both in Ayrshire), was bestowed upon his son, afterwards James I. From their grant are derived the titles of earl of Carrick and baron of Renfrew, borne by the eldest son of the sovereign. Apart from such isolated incidents as the defeat of Somerled near Renfrew in 1164, the battle of Langside in 1568 and the capture of the 9th earl of Argyll at Inchinnan in 1685, the history of the shire is scarcely separable from that of Paisley or the neighbouring county of Lanark.

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RENNELL, JAMES (1742–1830), British geographer, was born on the 3rd of December 1742, near Chudleigh in Devonshire. His father, an officer in the Artillery, was killed in action shortly after the birth of his son. He entered the navy as a midshipman in 1756, and was present at the attack on Cherbourg (1758), and the disastrous action of St Cast in the same year. At the end of the Seven Years' War, seeing no chance of promotion, he entered the service of the East India Company, and was appointed surveyor of the Company's dominions in Bengal (1764), with the rank of captain in the Bengal Engineers. To this work he devoted the next thirteen years. In 1766 he received a severe wound in an encounter with some Sannyasis, or religious fanatics, from which he never thoroughly recovered; and in 1777 he retired as major on a pension of £600 a year. The remaining fifty-three years of his life were spent in London, and were devoted to geographical research chiefly among the materials in the East India House. His most valuable works include the *Bengal Atlas* (1779), the first approximately correct map of India (1783), the *Geographical System of Herodotus* (1800), the *Comparative Geography of Western Asia* (1831), and important studies on the geography of northern Africa—in introductions to the *Travels* of Mungo Park and Hornemann—and the currents of the Atlantic and Indian Oceans. He also contributed papers to *Archaeologia* on the site of Babylon, the island of St Paul's shipwreck, and the landing-place of Caesar in Britain. He was elected F.R.S. in 1781; and he received the Copley medal of the Royal Society in 1791, and the gold medal of the Royal Society of Literature in 1825. While in India he had married (1772) Jane Thackeray, a great-aunt of the novelist. He died on the 29th of March 1830, and was buried in the nave of Westminster Abbey.

See Sir Clements Markham *Major James Rennell and the Rise of Modern English Geography* (London, 1895).

RENNES, a town of western France, formerly the capital of Brittany and now the chief town of the department of Ille-et-Vilaine. Pop. town, 62,024; commune, 75,640. Rennes is situated at the meeting of the Ille and the Vilaine and at the junction of several lines of railway connecting it with Paris (232 m. E.N.E.), St Malo (51 m. N.N.W.), Brest (155 m. W.N.W.). A few narrow winding streets with old houses are left in the vicinity of the cathedral, but the town was for the most part rebuilt on a regular plan after the seven days' fire of 1720. Dark granite was used as building material. The old town or Ville-Haute, where the chief buildings are situated, occupies a hill bounded on the south by the Vilaine, on the west by the canalized Ille. The Vilaine flows in a deep hollow bordered with quays and crossed by six bridges leading to the new town or Ville-Basse on its left bank. The cathedral of Rennes was rebuilt in a pseudo-Ionic style between 1787 and 1844 on the site of two churches dating originally from the 4th century. The west façade with its twin towers was finished in 1700 and is in the Renaissance style. The interior is richly decorated, a German altar-piece of the 15th century being conspicuous for its carving and gilding. The archbishop's palace occupies in part the site of the abbey dedicated to St Melaine, whose church is the sole specimen of 11–13th century architecture among the numerous churches in the town. A colossal statue of the Virgin was placed above its dome in 1867. The Mordelaise Gate, by which the dukes and bishops used to make their state entry into the town, is a curious example of 15th-century architecture, and preserves a Latin inscription of the 3rd century, a dedication by the Redones to the emperor Gordianus. The finest building in Rennes is the old parliament house (now the law-court), designed by Jacques Debrosse in the 17th century, and decorated with statues of legal celebrities, carving, and paintings by Jean Jouvenet and other well-known artists. The town hall was erected in the first half of the 18th century. It contains the library and the municipal archives, which are of great importance for the history of Brittany. In the Palais Universitaire, a modern building occupied by the university, there are scientific collections and important galleries of painting and sculpture, the chief work being the "Perseus delivering Andromeda" of Paul Veronese. About 2 m. from the town is the castle (16th century) of La Prévalaye, a hamlet famous for its butter.

Rennes is the seat of an archbishop and a prefect, headquarters of the X. army corps and centre of an *académie* (educational division). Its university has faculties of law, science and letters, and a preparatory school of medicine and pharmacy, and there are training colleges, a *lycée* and schools of agriculture, dairying, music, art, architecture and industry (*École pratique*). The town is also the seat of a court of appeal, of a court of assizes, of tribunals of first instance and commerce, and of a chamber of commerce, and has a branch of the Bank of France. Tanning, iron-founding, timber-sawing and the production of furniture and wooden goods, flour-milling, flax-spinning and the manufacture of tenting and other coarse fabrics, bleaching and various smaller industries are carried on. Trade is chiefly in butter made in the neighbourhood, and in grain, flour, leather, poultry, eggs and honey.

Rennes, the chief city of the Redones, was formerly (like some other places in Gaul) called Condate (hence *Condat*, Condé), probably from its position at the confluence of two streams. Under the Roman empire it was included in Lugdunensis Tertia, and became the centre of various Roman roads still recognizable in the vicinity. The name *Urbs Rubra* given to it on the oldest chronicles is explained by the bands of red brick in the foundations of its first circuit of walls. About the close of the 10th century Conan le Tort, count of Rennes, subdued the whole province, and his son and successor Geoffrey first took the title duke of Brittany. The dukes were crowned at Rennes, and before entering the city by the Mordelaise Gate they had to swear to preserve the privileges of the church, the nobles and the commons of Brittany. During the War of Succession the city more than once suffered siege, notably in 1356–57, when Bertrand du Guesclin saved it from capture by the English under Henry, first duke of Lancaster. The parlement of Brittany, founded in 1551, held its sessions at Rennes from 1561, they having been previously shared with Nantes. During the troubles of the League Philip Emmanuel, duke of Mercœur, attempted to make himself independent at Rennes (1589), but his scheme was defeated by the loyalty of the parlement. Henry IV. entered the city in state on the 9th of May 1598. In 1675 an insurrection at Rennes, caused by the taxes imposed by Louis XIV. in spite of the advice of the parlement, was cruelly suppressed by Charles, duke of Chaulnes, governor of the province. The parlement was banished to Vannes till 1689, and the inhabitants crushed with forfeits and put to death in great numbers. The fire of 1720, which destroyed eight hundred houses, completed the ruin of the town. At the beginning of the Revolution Rennes was again the scene of bloodshed, caused by the discussion about doubling the third estate for the convocation of the states-general. In January 1789, Jean Victor Moreau (afterwards general) led the law-students in their demonstrations on behalf of the parlement against the royal government. During the Reign of Terror Rennes suffered less than Nantes, partly through the courage and uprightness of the mayor, Jean Leperdit. It was soon afterwards the centre of the operations of the Republican army against the Vendeans. The bishopric, founded in the 5th century, in 1859 became an archbishopric, a rank to which it had previously been raised from 1790 to 1802. In 1899 the revision of the sentence of Captain Alfred Dreyfus was carried out at Rennes.

See Orain, *Rennes et ses environs* (Reims, 1904).

RENNEVILLE, RENÉ AUGUSTE CONSTANTIN DE (1650–1723), French writer, was born at Caen in 1650. In consequence of his Protestant principles, he left France for Holland in 1699, and on his return three years later he was denounced as a spy and imprisoned in the Bastille, where he remained until 1713. During his imprisonment he wrote on the margins of a copy of *Auteurs déguisés* (Paris, 1690) poems which he called *Otia bastiliaca*. These were rediscovered by Mr James Tregaski in 1906. Renneville was set at liberty through the intercession of Queen Anne, and made his way to England, where he published his *Histoire de la Bastille* (7 vols., 1713–24), dedicated to George I. At the time of his death in 1723 he was a major of artillery in the service of the elector of Hesse. His other important work is a *Recueil des voyages qui ont servi à l'établissement de la Compagnie des Indes Orientales aux Provinces Unies* (10 vols., new ed., Rouen, 1725).

RENNIE, JOHN (1761–1821), British engineer, was the youngest son of James Rennie, a farmer at Phantassie, Haddingtonshire, where he was born on the 7th of June 1761. On his way to the parish school at East Linton he used to pass the workshop of Andrew Meikle (1719–1800), the inventor of the threshing machine, and its attractions were such that he spent there much of the time that was supposed to be spent at school. In his twelfth year he was placed under Meikle, but after two years he was sent to Dunbar High School, where he showed marked aptitude for mathematics. On his return to Phantassie he occasionally assisted Meikle, and soon began to erect corn mills on his own account. In 1780, while continuing his millwright's business, he began to attend the classes on physical science at Edinburgh University. Four years later he was commissioned by Boulton and Watt, to whom he was introduced by Professor John Robison (1739–1805), his teacher at Edinburgh, to superintend the construction of the machinery for the Albion flour mills, which they were building at the south end of Blackfriars Bridge, London, and a feature of his work there was the use of iron for many portions of the machines which had formerly been made of wood. The completion of these mills established his reputation as a mechanical engineer, and soon secured him a large business as a maker of millwork of all descriptions. But his fame chiefly rests on his achievements in civil engineering. As a canal engineer his services began to be in request about 1790, and the Avon and Kennet, the Rochdale and the Lancaster canals may be mentioned among his numerous works in England. His skill solved the problem of draining and reclaiming extensive tracts of marsh in the eastern counties and on the Solway Firth. As a bridge engineer he was responsible for many structures in England and Scotland, among the most conspicuous being three over the Thames—Waterloo Bridge, Southwark Bridge and London Bridge—the last of which he did not live to see completed. A noteworthy feature in many of his designs was the flat roadway. Among the harbours and docks in the construction of which he was concerned may be mentioned those at Wick, Torquay, Grimsby, Holyhead, Howth, Kingstown and Hull, together with the London dock and the East India dock on the Thames, and he was consulted by the government in respect of improvements at the dockyards of Portsmouth, Sheerness, Chatham and Plymouth, where the breakwater was built from his plans. He died in London on the 4th of October 1821, and was buried in St Paul's. In person he was of great stature and strength, and a bust of him by Chantrey (now in the National Gallery), when exhibited at Somerset House, obtained the name of Jupiter Tonans. Of his family, the eldest son George, who was born in London on the 3rd of September 1791 and died there on the 30th of March 1866, carried on his father's business in partnership with the second son John, who was born in London on the 30th of August 1794 and died near Hertford on the 3rd of September 1874. George devoted himself especially to the mechanical side of the business. John completed the construction of London Bridge, and at its opening in 1831 was made a knight. He succeeded his father as engineer to the Admiralty, and finished the Plymouth breakwater, of which he published an account in 1848. He was also the author of a book on the *Theory, Formation and Construction of British and Foreign Harbours* (1851–54), and his *Autobiography* appeared in 1875. He was elected president of the Institution of Civil Engineers in 1845, and held the office for three years.

RENO, a city and the county-seat of Washoe county, Nevada, U.S.A., in the W. part of the state, on the Truckee river, and about 244 m. E. of San Francisco. Pop. (1890) 3563; (1900) 4500 (915 foreign-born); (1910 census) 10,867. It is served by the Southern Pacific, the Virginia & Truckee and the Nevada-California-Oregon railways. The city lies near the foot of the Sierra Nevada Mountains, 4484 ft. above the sea, and is in the most humid district of a state which has little rainfall. Among the public institutions are the university of Nevada (see NEVADA), a United States Agricultural Experiment Station, a public library (1903), the Nevada Hospital for Mental Diseases (1882), the City and County Hospital and the People's Hospital. At Reno are railway shops (of the Nevada-California-Oregon railway) and reduction works, and the manufactures include flour, foundry and machine-shop products, lumber, beer, plaster and packed meats. Farming and stock-raising are carried on extensively in the vicinity. On the site of the present city a road house was erected in 1859 for the accommodation of travellers and freight teams on their way to and from California. By 1863 this place had become known as Lake's Crossing, and five years later it was chosen as a site for a station by the Central (now the Southern) Pacific railway, then building through the Truckee Valley. The new station was then named Reno, in honour of Gen. Jesse Lee Reno (1823–1862), a Federal officer during the Civil War, who was commissioned brigadier-general of volunteers in November 1861 and major-general of volunteers in July 1862, and led the Ninth Corps at South Mountain, where he was killed. The city twice suffered from destructive fires, in 1873 and 1879. Reno was incorporated as a town in 1879 and chartered as a city in 1899. Its city charter was withdrawn in 1901, but it was rechartered in 1903.

RENOIR, FIRMIN AUGUSTE (1841–), French painter, was born at Limoges in 1841. In his early work he followed, with pronounced modern modifications, certain traditions of the French 18th-century school, more particularly of Boucher, of whom we are reminded by the decorative tendency, the pink and ivory flesh tints and the facile technique of Renoir. In the 'seventies he threw himself into the impressionist movement and became one of its leaders. In some of his paintings he carried the new principle of the division of tones to its extreme, but in his best work, notably in some of his paintings of the nude, he retained much of the refined sense of beauty of colour of the 18th century. Renoir has tried his skill almost in every genre—in portraiture, landscape, flower-painting, scenes of modern life and figure subject; and though he is perhaps the most unequal of the great impressionists, his finest works rank among the masterpieces of the modern French school. Among these are some of his nude "Bathers," the "Rowers' Luncheon," the "Ball at the Moulin de la Galette," "The Box," "The Terrace," "*La Pensée*," and the portrait of "Jeanne Samary." He is represented in the Caillebotte room at the Luxembourg, in the collection of M. Durand-Ruel, and in most of the collections of impressionist paintings in France and in the United States. Comparatively few of his works have come to England, but the full range of his capacity was seen at the exhibition of impressionist art held at the Grafton Galleries in London in 1905. At the Viau sale in Paris in 1907, a garden scene by Renoir, "*La Tonnelle*," realized 26,000 frs., and a little head, "*Ingénue*," 25,100 frs.

RENOUF, SIR PETER LE PAGE (1822–1897), Egyptologist, was born in Guernsey, on the 23rd of August 1822. He was educated at Elizabeth College there, and proceeded to Oxford, which, upon his becoming a Roman Catholic, under the influence of Dr Newman, he quitted without taking a degree. Like many other Anglican converts, he proved a thorn in the side of the Ultramontane party in the Roman Church, though he did not, like some of them, return to the communion of the Church of England. He opposed the promulgation of the dogma of Papal Infallibility, and his treatise (1868) upon the condemnation of Pope Honorius for heresy by the council of Constantinople in A.D. 680 was placed upon the index of prohibited books. He had been from 1855 to 1864 professor of ancient history and Oriental languages in the Roman Catholic university which Newman vainly strove to establish in Dublin, and during part of this period edited the *Atlantis* and the *Home and Foreign Review*, which latter had to be discontinued on account of the hostility of the Roman Catholic hierarchy. In 1864 he was appointed a government inspector of schools, which position he held until 1886, when his growing celebrity as an Egyptologist procured him the appointment of Keeper of Oriental Antiquities in the British Museum, in succession to Dr Samuel Birch. He was also elected in 1887 president of the Society of Biblical Archaeology, to whose *Proceedings* he was a constant contributor. The most important of his contributions to Egyptology are his Hibbert Lectures on "The Religion of the Egyptians," delivered in 1879; and the translation of *The Book of the Dead*, with an ample commentary, published in the *Transactions* of the society over which he presided. He retired from the Museum under the superannuation rule in 1891, and died in London on the 14th of October 1897. He had been knighted the year before his death. He married in 1857 Ludovica von Brentano, member of a well-known German literary family.

RENOUVIER, CHARLES BERNARD (1815–1903), French philosopher, was born at Montpellier on the 1st of January 1818, and educated in Paris at the École Polytechnique. In early life he took an interest in politics, and the approval extended by Hippolyte Carnot to his *Manuel républicain de l'homme et du citoyen* (1848) was the occasion of that minister's fall. He never held public employment, but spent his life writing, retired from the world. He died on the 1st of September 1903. Renouvier was the first Frenchman after Malebranche to formulate a complete idealistic system, and had a vast influence on the development of French thought. His system is based on Kant's, as his chosen term "Néo-criticisme" indicates; but it is a transformation rather than a continuation of Kantianism. The two leading ideas are a dislike to the Unknowable in all its forms, and a reliance on the validity of our personal experience. The former accounts for his acceptance of Kant's phenomenalism, combined with rejection of the thing in itself. It accounts, too, for his polemic on the one hand against a Substantial Soul, a Buddhistic Absolute, an Infinite Spiritual Substance; on the other hand against the no less mysterious material or dynamic substratum by which naturalistic Monism explains the world. He holds that nothing exists except presentations, which are not merely sensational, and have an objective aspect no less than a subjective. To explain the formal organization of our experience he adopts a modified version of the Kantian categories. The insistence on the validity of personal experience leads Renouvier to a yet more important divergence from Kant in his treatment of volition. Liberty, he says, in a much wider sense than Kant, is man's fundamental characteristic. Human freedom acts in the phenomenal, not in an imaginary noümenal sphere. Belief is not intellectual merely, but is determined by an act of will affirming what we hold to be morally good. In his religious views Renouvier makes a considerable approximation to Leibnitz. He holds that we are rationally justified in affirming human immortality and the existence of a finite God who is to be a constitutional ruler, but not a despot, over the souls of men. He would, however, regard atheism as preferable to a belief in an infinite Deity.

His chief works are: *Essais de critique générale* (1854–64), *Science de la morale* (1869), *Uchronie* (1876), *Esquisse d'une classification systématique des doctrines philosophiques* (1885–86), *Philosophie analytique de l'histoire* (1896–97), *Histoire et solution des problèmes métaphysiques* (1901); *Victor Hugo: Le Poète* (1893), *Le Philosophe* (1900); *Les Dilemmes de la métaphysique pure* (1901); *Le Personnalisme* (1903); *Critique de la doctrine de Kant* (1906, published by L. Prat).

See L. Prat, *Les Derniers entretiens de Charles Renouvier* (1904); M. Ascher, *Renouvier und der französische Neu-Kriticismus* (1900); E. Janssens, *Le Néocriticisme de C. R.* (1904); A. Darlu, *La Morale de Renouvier* (1904); G. Séailles, *La Philosophie de C. R.* (1905); A. Arnal, *La Philosophie religieuse de C. R.* (1907).

RENSSELAER, a city of Rensselaer county, New York, U.S.A., in the eastern part of the state, on the E. bank of the Hudson river, opposite Albany. Pop. (1900) 7466, of whom 1089 were foreign-born; (1910 census) 10,711. It is served by the New York Central and the Boston & Albany railways, which have shops here, and is connected with Albany by three bridges across the Hudson. Rensselaer, originally called Greenbush, was first settled in 1631, and the site formed part of the large tract bought from the Indians by the agents of Killian van Rensselaer and known as Rensselaerwyck. In 1810 a square mile of land within the present city limits was acquired by a land speculator, was divided into lots and offered for sale. Development followed, and five years later the village was incorporated. In 1897 Greenbush was chartered as a city, and its name was changed to Rensselaer. Its limits were extended in 1902 by the annexation of the village of Bath (pop. in 1900, 2504) and the western part of the township of East Greenbush. Rensselaer manufactures knit-goods, wool shoddy, felt, &c.

RENT. Various species of rent appear in Roman Law: rent (*canon*) under the long leasehold tenure of Emphyteusis; rent (*reditus*) of a farm; ground-rent (*solarium*); rent of state lands (*vectigal*); and the annual rent (*prensio*) payable for the *jus superficiarum* or right to the perpetual enjoyment of anything built on the surface of land. (See Roman Law.)

English Law. (As to the rent of apartments, &c., see Lodger and Lodgings.)—Rent is a certain and periodical payment or service made or rendered by the tenant of a corporeal hereditament and issuing out of (the property of) such hereditament. Its characteristics, therefore, are (1) certainty in amount; (2) periodicity in payment or rendering; (3) the fact that rent is *yielded* and is, therefore, said "to lie in *render*," as distinguished from *profits à prendre* in general, which are taken, and are, therefore, said to lie in *prendre*; (4) that it must issue out of (the profits of) a corporeal hereditament. A rent cannot be reserved out of incorporeal hereditaments such as advowsons (Co. *Litt.* 47a, 142a). But rent may be reserved out of estates in reversion or remainder (see Real Property) which are not purely incorporeal. It is not essential that rent should consist in a payment of money. Apart from the rendering of services, the delivery of hens, horses, wheat, &c., may constitute a rent. But, at the present day, rent is generally a sum of money paid for the occupation of land. It is important to notice that this conception of rent was attained at a comparatively late period in the history of the law. The earliest rent seems to have been a form of personal service, generally labour on land, and was fixed by custom. The exaction of a competition or rack rent beyond that limited by custom was, if one may judge from the old Brehon law of Ireland, due to the presence upon the land of strangers in blood, probably at first outcasts from some other group.[1] The strict feudal theory of rent admitted labour on the lord's land as a lower form, and developed the military service due to the crown or a lord as a higher form. Rent service is the oldest and most dignified kind of existing rent. It is the only one to which the power of distress attaches at common law, giving the landlord a preferential right over other creditors exercisable without the intervention of judicial authority (see Distress). The increasing importance of socage tenure, arising in part from the convenience of paying a certain amount, whether in money or kind, rather than comparatively uncertain services, led to the gradual evolution of the modern view of rent as a sum due by contract between two independent persons. At the same time the primitive feeling which regarded the position of landlord and tenant from a social rather than a commercial point of view is still of importance.

Classes of Rents.

Rents, as they now exist in England, are divided into two great classes—rent service and rent charge.

Rent Service.—A rent service is so called because by it a tenure by means of service is created between the landlord and the tenant. The service is now represented by fealty, and is nothing more than nominal. Rent service is said to be incident to the reversion—that is, a grant of the reversion carries the rent with it (see Remainder). A power of distress is incident at common law to this form of rent. Copyhold rents and rents reserved on lease fall into this class.

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[1] "The three rents are: rack rent from a person of a strange tribe, a fair rent from one of the tribe, and the stipulated rent which is paid equally by the tribe and the strange tribe."—*Senchus Mor*, p. 159, cited by Maine, *Village Communities*, p. 187. See also Vinogradoff, *Villainage in England* (Oxford, 1892), pp. 181, 188, 215; *The Growth of the Manor* (by the same author) (London, 1905), pp. 230, 328; Pollock and Maitland, *Hist. Eng. Law* (Cambridge, 1895), ii. 128–134.

Rent Charge.—A rent charge is a grant of an annual sum payable out of lands in which the grantor has an estate. It may be in fee, in tail, for life—the most common form—or for years. It must be created by deed or will, and may be either at common law or under the Statute of Uses (1536). The grantor has no reversion, and the grantee has at common law no power of distress, though such power may be given him by the instrument creating the rent charge. The Statute of Uses (1536) gave a power of distress for a rent charge created under the statute. The Conveyancing Act 1881, § 44, has given a power of distress for a sum due on any rent charge which is twenty-one days in arrear. By § 45 a power of redemption of certain perpetual rents in the nature of rent charges is given to the owner of the land out of which the rent issues. Rent charges granted since April 26th, 1855, otherwise than by marriage settlement or will for a life or lives or for any estate determinable on a life or lives must, in order to bind lands against purchasers, mortgagees or creditors, be registered in the Land Registry in Lincoln's Inn Fields (Judgments Act 1855 and Land Charges Act 1900). In certain other cases it is also necessary to register rent charges, for instance, under the Improvement of Land Act 1864 and the Land Transfer Acts 1875 and 1897. Rent charges are barred by non-payment or non-acknowledgment for twelve years. The period of limitation for the arrears of such rent is six years.

Various Forms of Rent Charge.—Forms of rent charge of special interest are *tithe rent charge* (see TITHES), and the rent charges formerly used for the purpose of creating "faggot votes." The device was adopted of creating parliamentary voters by splitting up freehold interests into a number of rent-charges of the annual value of 40s., so as to satisfy the freeholders' franchise. But such rent charges are now rendered ineffective by the Representation of the People Act 1884, § 4, which enacts (subject to a saving for existing rights and an exception in favour of owners of tithe rent charge) that a man shall not be entitled to be registered as a voter in respect of the ownership of any rent charge.

A rent charge reserved without power of distress is termed a *rent-seck* (*reditus siccus*) or "dry rent," from the absence of the power of distress. But, as power of distress for rents-seck was given by the Landlord and Tenant Act 1736, the legal effect of such rents has been since the act the same as that of a rent charge.

Other Varieties of Rent.—*Rents of assize or Quit rents* are a relic of the old customary rents. They are presumed to have been established by usage, and cannot be increased or diminished. A *Quit rent* (*quietus reditus*) is a yearly payment made from time immemorial by freeholders or copyholders of a manor to the lord. The term implies that the tenant thereby becomes free and quit from all other services. Owing to the change in the value of money, these rents are now of little value. Under the Conveyancing Act 1881 (s. 45) they may be compulsorily redeemed by the freehold tenant; and the Copyhold Act 1894 provides similarly for their extinction in the case of manors. Quit rents, like ordinary rent charges, are barred by non-payment, or non-acknowledgment, for twelve years. Those paid by freeholders are called *chief rents*. *Fee farm rents* are rents reserved on grants in fee. According to some authorities, they must be at least one-fourth of the value of the lands. They, like quit rents, now occur only in manors, unless existing before the Statute of *Quia Emptores* or created by the crown (see REAL PROPERTY). A rent which is equivalent or nearly equivalent in amount to the full annual value of the land is a *rack rent*. A rent which falls appreciably short of a rack rent is usually styled a *ground rent* (*q.v.*). It is generally reserved on land which the lessee agrees to cover with buildings, and is calculated on the value of the land, though the buildings to be erected increase the security for the rent and revert to the lessor at the end of the term. A *dead rent* is a fixed annual sum paid by a person working a mine or quarry, in addition to royalties varying according to the amount of minerals taken.

The object of a dead rent is twofold—first, to provide a specified income on which the lessor can rely; secondly (and this is the more important reason), as a security that the mine will be worked, and worked with reasonable rapidity. *Rents in kind* still exist to a limited extent; thus the corporation of London is tenant of some lands in Shropshire by payment to the crown of an annual rent of a fagot. All *peppercorn*, or nominal, rents seem to fall under this head.[1] The object of the peppercorn rent is to secure the acknowledgment by the tenant of the landlord's right. In modern building leases a peppercorn rent is sometimes reserved as the rent for the first few years. Services rendered in lieu of payment by tenants in *grand* and *petit* serjeanty may also be regarded as examples of rents in kind. Grand serjeanty is a form of tenure in chivalry under which the king's tenants (*servientes*) in chief owed special military or personal services to the king; *e.g.* carrying his banner. Petit serjeanty—a form of tenure in socage—was usually applied to tenure of the king or a mesne lord by some fixed service of trivial value, *e.g.* feeding his hounds. These forms of tenure were abolished in 1660. *Labour rents* are represented by those cases, not unfrequent in agricultural leases, where the tenant is bound to render the landlord a certain amount of team work or other labour as a part of his rent. It was held in the court of queen's bench in 1845 that tenants who occupied houses on the terms of sweeping the parish church and of ringing the church bell paid rent within the meaning of the Limitation Act of 1833 (see *Doe* v. *Benham* (1845), 7 Q.B. 976).

As to the apportionment of rents, see APPORTIONMENT.

Laws as to payment.

Payment of Rent.—Rent is due in the morning of the day appointed for payment, but a tenant is not in arrears until after midnight on that day. Rent made payable in advance by agreement between a landlord and his tenant is called *forehand rent*. It is not uncommon in letting a furnished house, or as to the last quarter of the term of a lease of unfurnished premises, to stipulate that the rent shall be paid in advance. As soon as such rent is payable under the agreement the landlord has the same rights in regard to it as he has in the case of ordinary rent. If a tenant pays his rent before the day on which it is due, he runs the risk of being called upon in certain circumstances to pay it over again. Such a payment is an advance to the landlord, subject to an agreement that, when the rent becomes due, the advance shall be treated as a fulfilment of the tenant's obligation to pay rent. The payment is, therefore, generally speaking, a defence to an action by the landlord or his heirs. But if the landlord mortgages his reversion, either before or after the advance, the assignee will, by giving notice to the tenant, before the proper rent-day, to pay rent to him, become entitled to the rent then falling due. Payment by cheque is conditional payment only, and if the cheque is dishonoured the original obligation revives. Where a cheque in payment of rent is lost in the course of transmission through the post, the loss falls on the tenant, unless the landlord has expressly or impliedly authorized it to be forwarded in that way: and the landlord's consent to take the risk of such transmission will not be inferred from the fact that payments were ordinarily made in this manner in the dealings between the parties. A tenant may deduct from his rent (i) the "landlord's property tax" (on the annual value of the premises for income tax purposes), which is paid by the tenant, if the statute imposing the tax authorizes the deduction (which should be made from the rent next due after the payment); (ii) taxes or rates which the landlord had undertaken to pay but had not paid, payment having thereupon been made by the tenant; (iii) payments made by the tenant which ought to have been made by the landlord, *e.g.* rent due to a superior landlord; (iv) compensation under the Agricultural Holdings Acts 1883–1900.

Remedies for Non-payment of Rent.—A landlord's main remedy for non-payment of rent is *distress* (Lat. *distringere*, to draw asunder, detain, occupy), *i.e.* the right to seize all goods found upon the demised premises, whether those of the tenant or of a stranger, except goods specially privileged, and to detain and, if need be, to sell them, in satisfaction of his claim. The requisites of a valid distress are these: (*a*) There must be "a certain and proper rent," *i.e.* rent due in respect of an actual tenancy of corporeal hereditaments: (*b*) the rent must be in arrear; (*c*) there must be a reversion in the person distraining; and (*d*) there must be goods on the premises liable to be distrained.

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[1] When peppercorn rents were instituted, in the middle ages, they were not, however, nominal, the cost of spices being then very great. A peppercorn rent, generally an obligation to pay 1 lb of pepper at the usual rent days, constituted a substantial impost even as late as the 18th century.

All personal chattels are distrainable with the following exceptions: (i) *Goods absolutely privileged*—(*a*) fixtures (*q.v.*); (*b*) goods sent to the tenant in the way of trade; (*c*) things which cannot be restored, *e.g.* meat and milk; growing corn and corn in sheaves formerly fell within this category, but the Distress for Rent Act 1737 (s. 8) abolished this exemption in the case of the former, and a statute of 1690 abolished it in that of the latter; (*d*) things in actual use, *e.g.* a horse while it is drawing a cart; (*e*) animals *ferae naturae* (dogs and tame deer or deer in an enclosed park may be distrained); (*f*) things in the custody of the law, *e.g.* in the possession of a sheriff under an execution (*q.v.*); (*g*) straying cattle; (*h*) in the case of agricultural holdings under the Agricultural Holdings Acts 1883–1900 hired agricultural machinery and breeding stock; (*i*) the wearing apparel and "bedding"—a term which includes "bedstead"—of tenant and his family, and the tools and implements of his trade to the value of £5 (Law of Distress Amendment Act 1888); (*j*) the goods of ambassadors and their suites (Diplomatic Privileges Act 1708). (ii) *Goods conditionally privileged*, *i.e.* privileged if there are sufficient goods of other kinds on the premises to satisfy the distress—(*a*) implements of trade not in actual use; (*b*) beasts of the plough and sheep; (*c*) agisted cattle; (*d*) growing crops sold under an execution (Landlord and Tenant Act 1851, s. 2); (*e*) lodgers' goods. The Lodgers' Goods Protection Act 1871 provides that where a lodger's goods have been seized by the superior landlord the lodger may serve him with a notice stating that the intermediate landlord had no interest in the property seized, but that it is the property, or in the lawful possession, of the lodger, and setting forth the amount of the rent due by the lodger to his immediate landlord. On payment or tender of such rent the landlord cannot proceed with the distress against the goods in question.

In general, a landlord cannot distrain except upon the premises demised, but he has a statutory right to follow things clandestinely or fraudulently removed from the premises within 30 days after their removal, unless they have been in the meantime sold *bona fide* and for valuable consideration. A landlord may, by statute (Landlord and Tenant Act 1709, s. 6), distrain within six months after the determination of the lease provided that the tenant has remained in possession. A distress must be made in the daytime, *i.e.* not before sunrise or after sunset. Six years' arrears of rent only are recoverable by distress (Real Property Limitation Act 1833, s. 12): the Real Property Limitation Act 1874 (s. 1), which bars distress for rent after twelve years, applies to rent-charges and not to rent under a lease, and the six years' arrears may be recovered in spite of the lapse of time. In the case of agricultural tenancies falling within the Agricultural Holdings Acts 1883–1900, the right of distress is confined to one year's arrears of rent. Where the tenant is bankrupt, a distress levied after the bankruptcy is limited to six months' rent accrued due prior to the date of adjudication; see Bankruptcy Act 1883 (s. 42) and 1890 (s. 28). Where a company is being wound up, the landlord may not distrain without the leave of the court. An extension of time is allowed in cases where in the ordinary course of dealing between landlord and tenant the payment of rent has been allowed to be deferred for a quarter or half year after the rent became legally due (act of 1883, s. 4). The landlord may distrain in person or may employ a certificated bailiff (Law of Distress Amendment Act 1888, s. 7). An uncertificated person levying a distress is liable to a fine of £10, without prejudice to his civil liability (Law of Distress Amendment Act 1895, s. 2). The seizure must not be excessive (statute of Henry III., 1267); but enough must be taken to satisfy the claim, for the landlord cannot distrain twice for the same rent where he could have taken sufficient in the first instance. After being seized, the goods must be impounded (Distress for Rent Act 1707, s. 10; and see the statute of 1690, s. 3, on impounding of corn, straw, hay; the Distress for Rent Act 1737, s. 8, on impounding of growing crops; and the statute of 1554 and the Cruelty to Animals Act 1849, s. 5, on impounding of cattle); and the landlord has a statutory power of sale (statute of 1690, s. 5). It is illegal to proceed with a distress if the tenant tenders the rent before the impounding; and a tenant has, by statute (1690, c. 5), five clear days' grace, excluding the date of seizure, between impounding and sale. On the written request of the tenant, this period will be extended to fifteen days (Law of Distress Amendment Act 1888, s. 6). A tenant may, before sale, recover goods illegally distrained by an action of *replevin* (L. Lat. *replegiare*, to redeem a thing taken by another). Where no rent was due to the distrainer the tenant may recover by action double the value of the goods sold (statute 1690, s. 5); and summary remedies for the recovery of the property have been created by modern enactments (Law of Distress Amendment Act 1895, s. 4, on distress of privileged goods; Agricultural Holdings Act 1883, s. 46). Where rent was due, but the distress was irregular, the tenant can only recover special damage (Distress for Rent Act 1737, s. 19).

Goods taken under an execution (*q.v.*) are not removable till one year's rent has been paid to the landlord (Landlord and Tenant Act 1709).

The landlord has, besides distress, his ordinary remedy by action. In addition, special statutory remedies are given in the case of tenants holding over after the expiration of their tenancy. By the Distress for Rent Act 1737 any tenant giving notice to quit, and holding over, is liable to pay double rent for such time as he continues in possession (see further under EJECTMENT).

Ireland.—The main differences between Irish and English law have been caused by legislation (see EJECTMENT; LANDLORD AND TENANT).

Scotland.—Rent is properly the payment made by tenant to landlord for the use of lands held under lease (see LANDLORD AND TENANT). In agricultural tenancies the legal terms for the payment of rent are at Whitsunday after the crop has been shown, and at Martinmas after it has been reaped. But a landlord and tenant may substitute conventional terms of payment, either anticipating (*fore*, or *forehand rent*) or postponing (*back*, or *backhand rent*) the legal term. The rent paid by vassal to superior is called *feu-duty* (see FEU). Its nearest English equivalent is the *fee farm rent.* The remedy of distress does not exist in Scots law. Rents are recovered (i) by summary diligence, proceeding on a clause, in the lease, of consent to registration for execution; (ii) by an ordinary petitory action; (iii) by an action of "maills and duties" (the rents of an estate in money or grain: "maills" was a coin at one time current in Scotland) in the Sheriff Court or the Court of Session; and (iv) in non-agricultural tenancies by procedure under the right of hypothec, where that still exists; the right of hypothec over land exceeding 2 acres in extent let for agriculture or pasture was abolished as from November 11, 1881 (see HYPOTHEC); (v) by action of removing (see EJECTMENT). Arrears of rent prescribe in five years from the time of the tenant's removal from the land.

Labour or service rents were at one time very frequent in Scotland. The events of 1715 and 1745 showed the vast influence over the tenantry that the great proprietors acquired by such means. Accordingly acts of 1716 and 1746 provided for the commutation of services into money rents. Such services may still be created by agreement, subject to the summary power of commutation by the sheriff given by the Conveyancing Act 1874 (§§ 20, 21). "In the more remote parts of Scotland it is understood that there still exist customary returns in produce of various kinds, which being regulated by the usage of the district or of the barony or estate cannot be comprehended under any general rule" (Hunter, *Landlord and Tenant*, ii. 298). Up to 1848 or 1850 there existed in Scotland "steelbow" leases—analogous to the *chetel de fer* of French law (see LANDLORD AND TENANT)—by which the landlord stocked the farm with corn, cattle, implements, &c., the tenant returning similar articles at the expiration of his tenancy and paying in addition to the ordinary rent a steelbow rent of 5 % on the value of the stock.

As to the rent of apartments, &c., see LODGER AND LODGINGS.

United States.—The law is in general accordance with that of England. The tendency of modern state legislation is unfavourable to the continuance of distress as a remedy. In the New England states, attachment on mesne process has, to a large extent, superseded it. In New York and Missouri it has been abolished by statute; in Mississippi the landlord has a claim for one year's rent on goods seized under an execution and a lien on the growing crop. In Ohio, Tennessee and Alabama it is not recognized, but in Ohio the landlord has a share in the growing crops in preference to the execution creditor. The legislatures of nearly all the states agree with the law of England as to the exemption from distress of household goods, wearing apparel, &c. (see Dillon's *Laws and Jurisprudence of England and America*, pp. 360, 361; also HOMESTEAD). As to the rent of apartments, &c., see LODGER AND LODGINGS. Fee farm rents exist in some states, like Pennsylvania, which have not adopted the statute of *Quia Emptores* as a part of their common law (Washburn's *Real Property*, ii. 252).

Other Laws.—Under the French Code Civil (art. 2102) the landlord is a privileged creditor for his rent. If the lease is by authentic act, or under private signature for a fixed term, he has a right over the year's harvest and produce, the furniture of the house and everything employed to keep it up, and (if a farm) to work it, in order to satisfy all rent due up to the end of the term. If the lease is not by authentic act nor for a specified term, the landlord's claim is limited to the current year and the year next following (see law of 12th Feb. 1872). The goods of a sub-lessee are protected: and goods bailed or deposited with the tenant are in general not liable to be seized. The French law is in force in Mauritius, and has been reproduced in substance in the Civil Codes of Quebec (arts. 2005 et seq.) and St Lucia (arts. 1888 et seq.). There are analogous provisions in the Spanish Civil Code (art. 1922). The subject of privileges and hypothecs is regulated in Belgium by a special law of the 16th Dec. 1851; and in Germany by ss. 1113 et seq. of the Civil Code. The law of British India as to rent (Transfer and Property Act 1882) and distress (cf., *e.g.*, Act 15 of 1882) is similar to English law. The British dominions generally tend in the same direction. See, *e.g.*, New South Wales (the consolidating Landlord and Tenant Act 1899); Newfoundland (Act 4 of 1899); Ontario (Act 1 of 1902, s. 22, giving a tenant five days for tender of rent and expenses after distress); Jamaica (Law 17 of 1900, certification of landlord's bailiffs); Queensland (Act 15 of 1904).

Authorities.—English Law: Woodfall, *Landlord and Tenant* (18th ed., London, 1907); Foa, *Landlord and Tenant* (4th ed., London, 1907); Fawcett, *Landlord and Tenant* (3rd ed., London, 1905); Gilbert on *Distress and Replevin* (London, 1823); Bullen, *Law of Distress* (2nd ed., London, 1899); Oldham and Foster, *Law of Distress* (2nd ed., London, 1889). Scots Law: Hunter on *Landlord and Tenant* (4th ed., Edin., 1876); Erskine's *Principles* (20th ed., by Rankine, Edin., 1903); Rankine's *Law of Landownership in Scotland* (3rd ed., Edin., 1891); Rankine's *Law of Leases in Scotland* (2nd ed., Edin., 1893). American Law: McAdam, *Law of Landlord and Tenant* (New York, 1900); Bouvier's *Law Dictionary* (ed. G. Rawle) (London and Boston, 1897), tit. "Distress" in "Ruling Cases"; *Landlord and Tenant* (American Notes) (London and Boston, 1894–1901). (A. W. R.)

RENTON, a manufacturing town of Dumbartonshire, Scotland. Pop. (1901) 5067. It is situated on the Leven, 2 m. N.N.W. of Dumbarton by the North British and Caledonian railways. The leading industry is Turkey red dyeing, and calico-printing and bleaching are also carried on. A parish church stands on the site of Dalquhurn House, the birthplace of Tobias Smollett the novelist, to whose memory a Tuscan column was erected in 1774, the inscription for which was revised by Dr Johnson when he visited Bonhill in that year with Boswell. The town was founded in 1782 by Mrs Smollett—previously Mrs Telfer—of Bonhill (sister of Tobias Smollett), who resumed her maiden name when she succeeded to the Smollett estates; it was named after Cecilia Renton, daughter of John Renton of Blackadder, who had married Mrs Smollett's son, Alexander Telfer.

RENWICK, JAMES (1662–1688), Scottish covenanting leader, was born at Moniaive in Dumfriesshire on the 15th of February 1662, being the son of a weaver, Andrew Renwick. Educated at Edinburgh University, he joined the section of the Covenanters known as the Cameronians about 1681 and soon became prominent among them. Afterwards he studied theology at the university of Groningen and was ordained a minister in 1683. Returning to Scotland "full of zeal and breathing forth threats of organized assassination," says Mr Andrew Lang, he became one of the field-preachers and was declared a rebel by the privy council. He was largely responsible for the "apologetical declaration" of 1684 by which he and his followers disowned the authority of Charles II.; the privy council replied by ordering every one to abjure this declaration on pain of death. Unlike some of his associates, Renwick refused to join the rising under the earl of Argyll in 1685; in 1687, when the declarations of indulgence allowed some liberty of worship to the Presbyterians, he and his followers, often called Renwickites, continued to hold meetings in the fields, which were still illegal. A reward was offered for his capture, and early in 1688 he was seized in Edinburgh. Tried and found guilty of disowning the royal authority and other offences, he refused to apply for a pardon and was hanged on the 17th of February 1688. Renwick was the last of the convenanting martyrs.

See R. Wodrow, *History of the Sufferings of the Church of Scotland*, vol. iv. (Glasgow, 1838); and A. Smellie, *Men of the Covenant* (1904); also Renwick's life by Alexander Shields in the *Biographia Presbyteriana* (1827).

REP, Repp, or Reps, a cloth made of silk, wool or cotton. The name is said to have been adapted from the French *reps*, a word of unknown origin; it has also been suggested that it is a corruption of "rib." It is woven in fine cords or ribs across the width of the piece. In silk it is used for dresses, and to some extent for ecclesiastical vestments, &c. In wool and cotton it is used for various upholstery purposes.

REPAIRS (from Lat. *reparare*, to make ready again), acts necessary to restore things to a sound state after damage; the question of repairs is important in the relations between landlord and tenant. (See the articles Flat; Landlord and Tenant.)

REPEAL (O.F. *rapel*, modern *rappel*, from *rapeler*, *rappeler*, revoke, *re* and *appeler*, appeal), the abrogation, revocation or annulling of a law (see Abrogation and Statute). The word is particularly used in English history of the movement led by Daniel O'Connell (*q.v.*) for the repeal of the act of Union between Great Britain and Ireland in 1830 and 1841–46, which in its later development became known as the Nationalist or Home Rule movement (see Ireland, *History*).

REPIN, ILJA JEFIMOVICH (1844–), Russian painter, was born in 1844 at Tschuguev in the department of Charkov, the son of parents in straitened circumstances. He learned the rudiments of art under a painter of saints named Bunakov, for three years gaining his living at this humble craft. In 1863 he obtained a studentship at the Academy of Fine Arts of St Petersburg, where he remained for six years, winning the gold medal and a travelling scholarship which enabled him to visit France and Italy. He returned to Russia after a short absence, and devoted himself exclusively to subjects having strong national characteristics. In 1894 he became professor of historical painting at the St Petersburg Academy. Repin's paintings are powerfully drawn, with not a little imagination and with strong dramatic force and characterization. A brilliant colourist, and a portrait-painter of the first rank, he also became known as a sculptor and etcher of ability. His chief pictures are "Procession in the Government of Kiev," "Home-coming," "The Arrest," "Ivan the Terrible's murder of his Son," and, best known of all, "The Reply of the Cossacks to Sultan Mahmoud IV." The portraits of the Baroness V. I. Ülskül, of Anton Rubinstein and of Count Leo Tolstoy are among his best achievements in this class. The Tretiakov gallery at Moscow contains a very large collection of his work.

See "Professor Repin," by Prince Bojidar Karageorgevich, in the *Magazine of Art*, xxiii. p. 783 (1899); "Russian Art," a paper by E. Brayley Hodgetts in the *Proceedings of the Anglo-Russian Literary Society* (5th of May 1896); "Ilja Jefimovich Repin," by Julius Norden, in Velhagen and Klasing's *Monatshefte*, xx. p. 1 (1905); also R. Muther, *History of Modern Painting* (ed. 1907), iv. 272. (E. F. S.)

REPINGTON (or Repyngdon), **PHILIP** (d. 1424), English bishop and cardinal, was educated at Oxford and became an Augustinian canon at Leicester before 1382. A man of some learning, he came to the front as a defender of the doctrines taught by John Wycliffe; for this he was suspended and afterwards excommunicated, but in a short time he was pardoned and restored by Archbishop William Courtenay, and he appears to have completely abandoned his unorthodox opinions. In 1394 he was made abbot of St Mary de Pré at Leicester, and after the accession of Henry IV. to the English throne in 1399 he became chaplain and confessor to this king, being described as "clericus specialissimus domini regis Henrici." In 1404 he was chosen bishop of Lincoln, and in 1408 Pope Gregory XII. made him a cardinal. He resigned his bishopric in 1419. Some of Repington's sermons are in manuscript at Oxford and at Cambridge.

REPLEVIN, an Anglo-French law term (derived from *replevir*, to replevy; see Pledge for further etymology) signifying the recovery by a person of goods unlawfully taken out of his possession by means of a special form of legal process; this falls into two divisions—(1) the "replevy," the steps which the owner takes to secure the physical possession of the goods, by giving security for prosecuting the action and for the return of the goods if the case goes against him, and (2) the "action of replevin" itself. The jurisdiction in the first case is in the County Court; in the second case the Supreme Court has also jurisdiction in certain circumstances. The proceedings are now regulated by the County Courts Act 1888. At common law, the ordinary action for the recovery of goods wrongfully taken would be one of detinue; but no means of immediate recovery was possible till the action was tried, and until the Common Law Procedure Act 1854 the defendant might exercise an option of paying damages instead of restoring the actual goods. The earliest regulations with regard to the action of replevin are to be found in the Statute of Marlborough (Marlebridge), 1267, cap. 21. For the early history, see Blackstone's *Commentaries*, iii. 145 seq. Only goods and cattle can be the subjects of an action for replevin. Although the action can be brought for the wrongful taking of goods generally, as long as the initial taking was wrongful and it was from the possession of the owner, it is practically confined to goods taken by an illegal as opposed to an excessive distress (see DISTRESS and RENT, § *Legal*).

REPNIN, the name of an old Russian princely family, the first of whom to gain distinction was

PRINCE ANIKITA IVANOVICH REPNIN (1668–1726), Russian general, and one of the collaborators of Peter the Great, with whom he grew up. On the occasion of the Sophian insurrection of 1689, he carefully guarded Peter in the Troitsa monastery, and subsequently took part in the Azov expedition, during which he was raised to the grade of general. He took part in all the principal engagements of the Great Northern War. Defeated by Charles XII. at Holowczyn, he was degraded to the ranks, but was pardoned as a reward for his valour at Lyesna and recovered all his lost dignities. At Poltava he commanded the centre. From the Ukraine he was transferred to the Baltic Provinces and was made the first governor-general of Riga after its capture in 1710. In 1724 he succeeded the temporarily disgraced favourite, Menshikov, as war minister. Catherine I. created him a field-marshal

See A. Bauman, *Russian Statesmen of the Olden Time* (Rus.), vol. i. (Petersburg, 1877).

His grandson, PRINCE NIKOLAI VASILEVICH REPNIN (1734–1801), Russian statesman and general, served under his father, Prince Vasily Anikitovich, during the Rhenish campaign of 1748 and subsequently resided for some time abroad, where he acquired "a thoroughly sound German education." He also participated in the Seven Years' War in a subordinate capacity. Peter III. sent him as ambassador in 1763 to Berlin. The same year Catherine transferred him to Warsaw as minister plenipotentiary, with especial instructions to form a Russian party in Poland from among the dissidents, who were to receive equal rights with the Catholics Repnin convinced himself that the dissidents were too poor and insignificant to be of any real support to Russia, and that the whole agitation in their favour was factitious. At last, indeed, the dissidents themselves even petitioned the empress to leave them alone. It is clear from his correspondence that Repnin, a singularly proud and high-spirited man, much disliked the very dirty work he was called upon to do. Nevertheless he faithfully obeyed his instructions, and, by means more or less violent or discreditable, forced the diet of 1768 to concede everything. The immediate result was the Confederation of Bar, which practically destroyed the ambassador's handiwork. Repnin resigned his post for the more congenial occupation of fighting the Turks. At the head of an independent command in Moldavia and Walachia, he prevented a large Turkish army from crossing the Pruth (1770); distinguished himself at the actions of Larga and Kagula; and captured Izmail and Kilia. In 1771 he received the supreme command in Walachia and routed the Turks at Bucharest. A quarrel with the commander-in-chief, Rumyantsev, then induced him to send in his resignation, but in 1774 he participated in the capture of Silistria and in the negotiations which led to the peace of Kuchuk-Kainarji. In 1775–76 he was ambassador at the Porte. On the outbreak of the war of the Bavarian Succession he led 30,000 men to Breslau, and at the subsequent congress of Teschen, where he was Russian plenipotentiary, compelled Austria to make peace with Prussia. During the second Turkish war (1787–92) Repnin was, after Suvarov, the most successful of the Russian commanders. He defeated the Turks at Salcha, captured the whole camp of the *seraskier*, Hassan Pasha, shut him up in Izmail, and was preparing to reduce the place when he was forbidden to do so by Potemkin (1789). On the retirement of Potemkin (*q.v.*) in 1791, Repnin succeeded him as commander-in-chief, and immediately routed the grand vizier at Machin, a victory which compelled the Turks to accept the truce of Galatz (31st of July 1791). In 1794 he was made governor-general of the newly acquired Lithuanian provinces. The emperor Paul raised him to the rank of field-marshal (1796), and, in 1798, sent him on a diplomatic mission to Berlin and Vienna in order to detach Prussia from France and unite both Austria and Prussia against the Jacobins. On his return unsuccessful, he was dismissed the service.

See A. Kraushar, *Prince Repnin in Poland, 1764–8* (Pol.) (Warsaw, 1900); "Correspondence with Frederick the Great and others" (Rus. and Fr.), in *Russky Arkhiv* (1865, 1869, 1874, Petersburg); M. Longinov, *True Anecdotes of Prince Repnin* (Rus.) (Petersburg, 1865). (R. N. B.)

REPORT (O.Fr. *report* or *raport*, modern *rapport*, from O.Fr. *reporter*, mod. *rapporter*, Lat. *reportare*, to bring back, in poetical use only, of bringing back an account, news, &c.), an account or statement of events, speeches, proceedings, the results of investigations, &c., "brought back" by one who was present either casually or sent for the specific purpose, hence reputation, rumour. A special sense, that of a loud noise, as of the explosion of firearms, appears as early as the end of the 16th century. For the reports of speeches, parliamentary debates, &c., in the daily press see REPORTING below, and for the particular form of law reporting see ENGLISH LAW; AMERICAN LAW.

REPORTING, the art or business of reproducing in readable form, mainly for newspapers, but also for such publications as the *Parliamentary* or *Law Reports*, the words of speeches, or describing in narrative form the events, in contemporary history, by means of the notes made by persons known generally as reporters. The special business of reporting is a comparatively modern one, since it must not be confounded with the general practice of quoting, or of mere narrative, which is as old as writing. There was no truly systematic reporting until the beginning of the 19th century, though there was parliamentary reporting of a kind almost from the time when parliaments began, just as law reporting (which goes back to 1292) began in the form of notes taken by lawyers of discussions in court. The first attempts at parliamentary reporting, in the sense of seeking to make known to the public what was done and said in parliament, began in a pamphlet published monthly in Queen Anne's time called *The Political State*. Its reports were mere indications of speeches. Later, the *Gentleman's Magazine* began to publish reports of parliamentary debates. Access to the Houses of Parliament was obtained by Edward Cave (*q.v.*), the publisher of this magazine, and some of his friends, and they took surreptitiously what notes they could. These were subsequently transcribed and brought into shape for publication by another hand. Dr Johnson for some years wrote the speeches, and he took care, as he admitted, not to let the "Whig dogs" get the best of it; the days of verbatim reporting were not yet come, and it was considered legitimate to make people say in print what substantially was supposed to represent their opinions. There was a strict parliamentary prohibition of all public reporting; but the *Gentleman's Magazine* appears to have continued its reports for some time without attracting the attention or rousing the jealousy of the House of Commons. The publisher, encouraged by immunity from prosecution by parliament, grew bolder, and began in his reports to give the names of the speakers. Then he was called to account. A standing order was passed in 1728, which declared "that it is an indignity to, and a breach of, the privilege of this House for any person to presume to give, in written or printed newspapers, any account or minute of the debates or other proceedings; that upon discovery of the authors, printers or publishers of any such newspaper this House will proceed against the offenders with the utmost severity." Under this and other standing orders, Cave's reports were challenged, with the result that they appeared without the proper names of the speakers, and under the guise of "Debates in the Senate of Lilliput," or some other like title. France was Blefuscu; London was Mildendo; pounds were sprugs; the duke of Newcastle was the Nardac secretary of state; Lord Hardwicke was the Hurgo Hickrad; and William Pulteney was Wingul Pulnub.

In the latter half of the century the newspapers began to report parliamentary debates more fully, with the result that, in 1771, several printers, including those of the *Morning Chronicle* and the *London Evening Post,* were ordered into custody for publishing debates of the House of Commons. A long and bitter struggle between the House and the public ensued. John Wilkes took part in it. The lord mayor of London and an alderman were sent to the Tower for refusing to recognize the Speaker's warrant for the arrest of certain printers of parliamentary reports. But the House of Commons was beaten. In 1772 the newspapers published the reports as usual; and their right to do so has never since been really questioned. Both Houses of Parliament, indeed, now show as much anxiety to have their debates fully reported as aforetime they showed resentment at the intrusion of the reporter. Elaborate provision is made in the House of Lords and in the House of Commons for reporters. They have a Press Gallery in which they may take notes, writing rooms in which those notes may be extended, and a special dining-room. Reporting is nowhere carried to such an extent as in the United Kingdom, since in most other countries the newspapers do not find it sufficiently interesting "copy" for their readers to justify the amount of space required. Consequently the verbatim reports, though now no longer hindered by law, and made possible by shorthand (which was first employed in the service of parliament in 1802) and by all the arts of communication and reproduction, are considerably restricted.

But parliamentary work is only a small part of newspaper reporting. The newspapers in the beginning of the 19th century rarely contained more than the barest outline of any speech or public address delivered in or in the neighbourhood of the towns where they were published. After the peace of 1815 a period of much political fermentation set in, and the newspapers began to report the speeches of public men at greater length. It was not, however, until well into what may be called the railway era that any frequent effort was made by English newspapers to go out of their own district for the work of reporting. The London newspapers had before this led the way. Early in the 19th century, greater freedom of access to both Houses was given, and the manager of the *Morning Chronicle* established a staff of reporters. Each reporter took his "turn"—that is, he took notes of the proceedings for a certain time, and then gave place to a colleague. The reporter who was relieved at once extended his notes, and thus prompt publication of the debates was made possible. The practice grew until there was a good deal of competition among the papers as to which should first issue a report of any speech of note in the country. Reporters had frequently to ride long distances in post-chaises, doing their best as they jolted along the roads to transcribe their notes, so that they might be ready for the printer on arrival at their destination. Charles Dickens, whose efforts in the way of reporting were celebrated, used to tell several stories of his adventures of this kind while he held an engagement on the *Morning Chronicle.* One result was that the provincial newspapers were stimulated to greater efforts, and as daily newspapers sprang up in all directions, and the electric telegraph provided greater facilities for reporting, the old supremacy of the London journals in this department of newspaper work gradually disappeared. No public man made a speech but it was faithfully reproduced in print. Local governing bodies, charitable institutions, political associations, public companies —all these came in a short time to furnish work for the reporter, and had full attention paid to them. By the second half of the 19th century, parliamentary reporting was a leading feature of the London newspapers. They had a monopoly of it. All the reporting arrangements in the House of Lords and in the House of Commons were made with sole regard to their requirements. There had indeed been a long battle between *The Times* and some of the other London newspapers as to which should have the best parliamentary report, and *The Times* had established its supremacy, which has never been shaken. The provincial newspapers were in the main obliged to copy the London reports, and rarely made any attempt to get reports of their own. When the electric telegraph came into use for commercial purposes a change began. The company which first carried wires from London to the principal towns in the country started a reporting service for the country newspapers. In addition, it procured admission to the parliamentary galleries for reporters in its employment, and began to send short accounts of the debates to the newspapers in the country. These newspapers were thus enabled to publish in the morning some account of the parliamentary proceedings of the previous night, instead of having to take like reports a day later from the London journals. The telegraph companies (not yet taken over by the state) for a long time could or would do no more than they had begun by doing; and they offered no inducements to the provincial newspapers to telegraph speeches. The public meanwhile wanted to know more fully what their representatives were saying in parliament, and gradually the leading provincial newspapers adopted the practice of employing reporters in the service of the London journals to report debates on subjects of special interest in localities; and these reports, forwarded by train or by post, were printed in full, but of course a day late. The London papers paid little attention to debates of local interest, and thus the provincial papers had parliamentary reporting which was not to be found elsewhere. Bit by bit this feature was developed. It was greatly accelerated by a movement which the *Scotsman* was the first to bring about. About 1865, a new company having come into existence, it was agreed that wires from London should be put at the disposal of such newspapers as desired them. Each newspaper was to have the use of a wire—of course on payment of a large subscription—from six o'clock at night till three o'clock in the morning. This was the beginning of the "special wire" which now plays so important a part in the production of almost all newspapers. The arrangement was first made by the *Scotsman* and by other newspapers in Scotland. The special wires were used to their utmost capacity to convey reports of the speeches of leading statesmen and politicians; and, instead of bare summaries of what had been done, the newspapers contained pretty full reports.

When the telegraphs were taken over by the state in 1870 the facilities for reporting were increased in every direction. The London papers, with the exception of *The Times,* had given less and less attention to parliamentary debates, while on the other hand several of the provincial newspapers were giving more space than ever to the debates. These newspapers had to get their reports as best they could. The demand for such reporting had led, on the passing of the telegraphs into the hands of the state, to the formation of news agencies, which undertook to supply the provincial papers. These agencies were admitted to the reporters' galleries in the Houses of Parliament, but the reports which any agency supplied were identical; that is to say, all the newspapers taking a particular class of report had exactly the same material supplied to them —the reporter producing the number of copies required by means of manifold copying paper. Accordingly attempts were made to get separate reports by engaging the services of some of the reporters employed by the London papers. The "gallery" was shut to all save the London papers and the news agencies. The *Scotsman* sought in vain to break through this exclusiveness. The line, it was said, must be drawn somewhere, and the proper place to draw it was at the London Press. Once that line was departed from every newspaper in the kingdom must have admission. But in 1880 a select committee of the House of Commons was appointed to consider the question. It took evidence, and it reported in favour of the extension of the gallery and of the admission of provincial papers. The result was that three or four papers which would be satisfied with the same report joined in providing the necessary reporting staff. In other cases individual newspapers put themselves on the same footing as the London newspapers by engaging separate staffs of reporters.

The effect of telegraphic improvements may be partially gauged by the fact that in 1871 the number of words handed in for transmission through the British Post Office for Press purposes (special rates being allowed) was 22,000,000, and that in 1900 it had risen to 835,000,000. Meanwhile the evolution of the modern newspaper had brought many other kinds of reporting, besides parliamentary, into play.

What is commonly called "descriptive reporting" has in some cases nearly shouldered the reporting of speeches out of newspapers. The special correspondent or the war correspondent is a "descriptive reporter." The "interviewer" came into great prominence during the "eighties" and "nineties," and the influence of American journalistic methods, which made smart reporting the most valuable commercial asset of the popular newspaper, and the reporter correspondingly important, spread to other countries. No daily newspaper now confines its reporting to the affairs of the part of the country in which it is published. The electric telegraph has made the work of the reporter more arduous and his responsibility greater. The variety of work open to reporting causes considerable difference, of course, in the professional status of the journalists who do such work. This subject generally is discussed in the article NEWSPAPERS, but one instance of the recognition of the modern reporter's responsibility is worth special mention. In the year 1900, in the English case of *Walter* v. *Lane* (see COPYRIGHT), it was decided, on the final appeal to the House of Lords, that the reporter of a speech, printed verbatim in a newspaper, was under the Copyright Act of 1842 to be considered the "author." Absurd as it might seem to call the reporter the author of another man's speech, the decision gave effect to the fact that it is his labour and skill which bring into existence the "copy" to which alone can right of property attach. Strictly speaking, he is the author of the *report* of the speech; but for literary purposes the report *is* the speech. It must, however, be borne in mind that there may be more than one verbatim report, and therefore more than one "author."

See also NEWSPAPERS; SHORTHAND; PRESS LAWS; TELEGRAPH.

REPOUSSÉ (Fr. "driven back"), the art of raising designs upon metal by hammering from the back, while the "ground" is left relatively untouched (see METAL WORK and PLATE). The term is often loosely used, being applied indifferently to "embossing." Embossing is also called "*repoussé sur coquille*" and "estampage," but the latter consists of embossing by mechanical means and is therefore not to be considered as an art process. Moreover, it reverses the method of repoussé, the work being done from the front, and by driving down the ground leaving the design in relief. Gold, silver, bronze, brass, etc., being easily malleable metals, are specially suitable to repoussé, which at the present day, in its finer forms, is mainly employed for silver-plate and jewelry. The silver-plate in repoussé of Gilbert Marks (d. 1905) in England, and the portrait-plaques from life by Stephan Schwartz (b. in Hungary, 1851) in Austria, are noteworthy modern examples of the art.

Repoussé—a term of relatively recent adoption, employed to differentiate the process from embossing—has been known from remote antiquity. Nothing has ever excelled, and little has ever approached, the perfection of the bronzes of Siris (4th century B.C., in the British Museum), of which the armour-plate—especially the shoulder-pieces—presents heroic figure-groups beaten up from behind with punches from the flat plate until the heads and other portions are wholly detached—that is to say, in high relief from the ground of which they form a part. Yet the metal, almost as thin as paper, is practically of constant thickness, and nowhere is there any sign of puncture. The "Bernay treasure," in the Bibliothèque Nationale, Paris, discovered in 1830, belongs to the 2nd century B.C., and includes silver vases of Roman execution decorated with groups in mezzo-relief, beaten up in sections and soldered together. The best of these, of which perhaps the finest is that known from its subject as "La nymphe de la fontaine Pirène et Pégase," belong to the noblest period of Roman art. The Hildesheim treasure (discovered 1868) comprises a *patera* on the ground of which is a superb *emblema* representing Minerva in high relief. These repoussé *emblemata* were usually of another metal and applied to the vase which they decorated; indeed repoussé was of leading importance in *caelatura*, or the metallic art (statuary excepted) of classic times. Thus the *patera* of Hildesheim, the *patera* of Rennes, and the earlier shoulder-plate of the Siris bronze may be accepted as illustrative of the highest development of repoussé.

The art was not only Greek and Graeco-Roman in its early practice; it was pursued also by the Assyrians, the Phoenicians, and other oriental peoples, as well as in Cyprus and elsewhere, and was carried forward, almost without a break, although with much depreciation of style and execution, into medieval times. In the 11th century the emperor Henry II. presented as a thank-offering to the Basel cathedral the altar-piece, in the Byzantine style, decorated with fine repoussé panels of gold (representing Jesus Christ with two angels and two saints), which is now in the Cluny Museum in Paris. Up to this time, also, repoussé instead of casting in metal was practised for large work, and Limoges became a centre for the manufacture and exportation of sepulchral figures in repoussé bronze. These were affixed to wooden cores. By the time of Benvenuto Cellini the art was confined almost entirely to goldsmiths and silversmiths (who, except Cellini himself, rarely cast their work); and to them the sculptors and artists of to-day are still content to relegate it.

The elementary principle of the method, after the due preparation and annealing of the plate, was to trace on the back of it the design to be beaten up, and to place it face downwards upon a stiff yet not entirely unresisting ground (in the primitive stage of development this was wood), and then with hammers and punches to beat up the design into relief. According to Cellini, his master Caradosso da Milano would beat up his plate on a metal casting obtained from a pattern he had previously modelled in wax; but he is not sufficiently explicit to enable us to judge whether this casting was hollow mould, which would result in true repoussé, or in the round, which is tantamount to *repoussé sur coquille*, or embossing.

Nowadays the plate is laid upon and affixed to a "pitch-block," a resinous ground docile to heat, usually composed of pitch mixed with pounded fire-brick, or, for coarser work such as brass, with white sand, with a little tallow and resin. This compound, while being sufficiently hard, is elastic, solid, adhesive and easy to apply and remove. Gold and silver are not only the densest and most workable but the most ductile metals, admitting of great expansion without cracking if properly annealed. The tools include hammers, punches (in numerous shapes for tracing, raising, grounding, chasing and texturing the surfaces), together with a special anvil called in French a *recingle* or *ressing*, in English "snarl." The *recingle*, or small anvil with projecting upturned point, was known in the 16th century. This point is introduced into the hollow of the vase or other vessel such as punch and hammer cannot freely enter, which it is desired to ornament with reliefs. A blow of a hammer on that part of the anvil where the prolongation first projects from it, produces, by the return spring, a corresponding blow at the point which the operator desires to apply within the vase. The same effect is produced by the modern "snarl" or "snarling iron"—a bar of steel, with an inch or two of the smaller end upturned and ending in a knob—held firmly in a tightly screwed-up vice, whereby the blow is similarly repeated or echoed by vibration. The repoussé work, when complete, is afterwards finished at the front and chased up. The same vase, to be worked up by embossing, would be filled with "cement" and laid on a sand-bag, and finally the whole would be heated and the cement run out. In the case of repoussé the vase itself may be beaten up out of the metal on the pitch-block. It must be understood that in order to obtain a result not merely excellent in technique but artistic and unmechanical in effect, the blows of the hammer must be made with feeling and "sentiment," otherwise the result cannot be a work of art.

See C. G. Leland, *Repoussé Work* (New York, 1885); and Gawthorp, *A Manual of Instruction in the Art of Repoussé* (London, 2nd ed., 1899). (M. H. S.)

REPRESENTATION, a term used in various senses in different connexions, but particularly in a political meaning, which has developed out of the others.

The word.

The word "represent" comes from Lat. *re-praesentare*, to "make present again," or "bring back into presence," and its history in English may be traced fairly well by the citations given in the *New English Dictionary* of its earliest uses in literature in senses which are still common. Thus we find the verb meaning (1380) simply to "bring into presence," and Barbour uses it (1375) in the sense of bringing clearly before the mind, whence the common sense of "explain," "exhibit," "portray." In 1513 it is used as synonymous with "describe," or "allege to be." In 1460 we find it employed for the performance of a play or a part in a play, whence comes the sense of symbolizing, standing in the place of some one, or corresponding to something; and in 1655 for acting as authorized agent or deputy of some one. This is a notable point in the development of the word. In Cromwell's speech to the parliament, January 22, 1655, he says: "I have been careful of your safety, and the safety of those you represented." This strictly political use of the verb developed, it will be seen, comparatively late.

The noun "representation" passed through similar stages. In 1425 we find it equivalent to "image," "likeness," "reproduction," "picture," from which is derived a meaning hardly distinguishable from "pretence." In 1553 it means a "statement" or "account," a sense which leads later (1679) to that of a formal and serious plea or remonstrance. In 1589 it occurs for a performance of a play. In 1647 it is used in psychology for the action of mental reproduction, a technical sense which applies especially to the "immediate object of imagination" (Sir W. Hamilton), and in Kantian language becomes the generic term for percepts, concepts and ideas. In 1624 it comes to mean "substitution of one thing or person for another," "substituted presence" as opposed to "actual presence," or "the fact of standing for, or in place of, some other thing or person," especially with a right or authority to act on their account. Its application to a political assembly then becomes natural, but for some time it is not so found in literature, the sense remaining rather formal. Good instances of this use are: Gataker, *Transubst.* 4: "The Rocke was Christ onely symbolically and sacramentally, by representation or resemblance"; and R. Coke, *Power and Subj.* iii.: "So cannot these members be formed into one body but by the king, either by his Royal Presence or representation." Thus "presence" and "representation" are used in distinctive meanings. In Scots law (1693) it obtains the technical meaning of the assumption by an heir of his predecessor's rights and obligations.

The term "representative," now specially applied to an elected member of a national or other assembly, deriving his authority from the constituency which returns him, appears to have been first used to denote not the member but the assembly itself. In the act abolishing the office of king, after Charles I.'s execution, 1649, section iv. runs: "And whereas by the abolition of the kingly office provided for in this Act, a most happy way is made for this nation (if God see it good) to return to its just and ancient right of being governed by its own Representatives or national meetings in council, from time to time chosen and entrusted for that purpose by the people, it is therefore resolved and declared by the Commons assembled in Parliament," &c., "and that they will carefully provide for the certain choosing, meeting and sitting of the next and future Representatives," &c. But the application of the term to the persons who sat in parliament was at all events very soon made, for in 1651 Isaac Penington the younger published a pamphlet entitled "The fundamental right, safety and liberty of the People; which is radically in themselves, derivatively in the Parliament, their substitutes or representatives."

It is worth while to dwell on the historical evolution of the various meanings of "represent," "representation" and "representative," because it is at least curious that it was not till the 17th century that the modern political or parliamentary sense became attached to them; and it is well to remember that though the idea of political representation is older and thus afterwards is expressed by the later meaning of the word, the actual use of "representation" in such a sense is as modern as that. In Burke's speeches of 1769[1] and 1774–1775, relating to taxation, we find the word in this sense already in common use, but the familiar modern doctrine of "no taxation without representation," however far back the idea may be traced, is not to be found in Burke in those very words. The "originator of that immortal dogma of our (*i.e.* American) national greatness" was, according to the American writer M. C. Tyler (*Amer. Lit.* i. 154), the politician and philanthropist Daniel Gookin (1612–1687), an Irish settler in Virginia, who, moving to Boston and becoming speaker of the Massachusetts legislature, became prominent in standing up for popular rights in the agitation which resulted in the withdrawal of the colonial charter (1686). But it was the vogue of the "dogma" in America, not its phrase, that he seems to have originated; and while the precise form of the phrase does not appear to be attributable to any single author, the principle itself was asserted in England long before the word "representation," in a political sense, was current. In English constitutional history the principle was substantially established in 1297 by the declaration *De Tallagio non concedendo*,[2] confirmed by the Petition of Right in 1628.

The idea of political representation.

The growth of the parliamentary system in England is traced in the article PARLIAMENT, but the account there given may be supplemented here by a more precise reference to the evolution of the idea of political "representation" as such, and of its embodiment in the word now employed to express it. The simple idea of the *substitution* of one person for another, in some connexion, *e.g.* hostage, pledge, victim, is so old as to be only describable as primitive; it is found in the proxy system, *e.g.* in marriage, and in diplomacy, the legate or ambassador being the *alter ego* of his sovereign; but, so far as general political legislative action, by one man in an assembly on behalf of others, is concerned, no systematic employment of a "deputy" (the word still used both in a general sense and in politics as a synonym for "representative") is known among the ancients. So long as political power rests in a small privileged class, such an idea must be slow to develop; and the primitive notion of a law-making body is that of all the members present in person, as in ancient Greece. But, as Stubbs (*Const. Hist.* i. 586) points out, the early English jury system (see JURY) shows the germ of the true idea of representation in England; it was the established practice of electing or selecting juries to present criminal matters before the king's judges, and assessors to levy taxes on the county, that suggested the introduction of popular representation in the English political system, and thus brought "the commons" into play in addition to the Crown and the nobles. Under Henry III., in 1254, we have the writ (see PARLIAMENT) requiring the sheriff of each county to "cause to come[3] before the King's Council two good and discreet Knights of the Shire, whom the men of the county shall have chosen for this purpose in the stead of all and of each of them, to consider along with knights of other shires what aid they will grant the king." But the definite establishment of the principle of political representation, in a shape from which the later English system of representation lineally descended, may be traced rather to the year 1295, in Edward I.'s famous writ of summons to parliament, of which the following is the important part. In the volume of *Select Documents of English Constitutional History* (1901), selected by G. B. Adams and H. M. Stephens, whose version from the Latin we quote, the section is headed (ante-dating the use of the vital word), "Summons of representatives of the counties and boroughs":—

> "The king to the sheriff of Northamptonshire. Since we intend to have a consultation and meeting with the earls, barons and other principal men of our kingdom with regard to providing remedies

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[1] The *New English Dictionary*, for its first citation of "representation" in an assembly, quotes Burke, *Late St Nat.*, Works, ii. 138, *i.e.* in 1769.

[2] "No tallage or aid shall be laid or levied by us or our heirs in our realm, without the goodwill and assent of the archbishops, bishops, earls, barons, knights, burgesses and other freemen of our realm."

[3] "Venire facias," not "elegi facias."

against the dangers which are in these days threatening the same kingdom: and on that account have commanded them to be with us on the Lord's Day next after the feast of St Martin in the approaching winter, at Westminster, to consider, ordain and do as may be necessary for the avoidance of these dangers: we strictly require you to cause two knights from the aforesaid county, two citizens from each city in the same county and two burgesses from each borough, of those who are especially discreet and capable of labouring, to be elected without delay, and to cause them to come to us at the aforesaid time and place. Moreover, the said knights are to have full and sufficient power for themselves and for the community of the aforesaid county, and the said citizens and burgesses for themselves and the communities of the aforesaid cities and boroughs separately, then and there, for doing what shall then be ordained according to the Common Council in the premises, so that the aforesaid business shall not remain unfinished in any way for defect of this power. And you shall have there the names of the knights, citizens and burgesses, and this writ."

The words "Elegi facias," instead of "venire facias" (which were retained in 1275; see PARLIAMENT), still appear to make the parliament of 1295 the model, rather than that of 1275, though in other respects the latter appears now to have established the summoning of county and borough representatives.

Growth of representation in England.

In this summoning by the king of the two knights and two burgesses with full and sufficient power *for themselves and for the community*, we find therefore the origin of political representation of the commons, as opposed to the actual presence and personal attendance of the peers. The older English national assemblies had consisted of the privileged class fully summoned as individuals. The change involved has been well explained by E. A. Freeman (*Ency. Brit.*, 9th ed., viii. 297), when he says: "The national assemblies changed their character . . . by no cause so much as by the growth of the practice of summons. . . . In the great assembly at Salisbury (1086), where all the landowners of England became the men of the king (William the Conqueror), we see the first germs of Lords and Commons. The Witan are distinguished from the 'land-sitting men.' By the Witan, so called long after the Conquest, we are doubtless to understand those great men of the realm who were usually summoned to every assembly. The vast multitude who came to do their homage to the king were summoned only for that particular occasion. The personal right of summons is the essence of the peerage. . . . The earls and bishops of England, by never losing their right to the personal summons, have kept that right to personal attendance in the national assembly which was once common to all freemen, but which other freemen have lost. The House of Lords represents[1] by unbroken succession the Witan of the assembly of Salisbury; that is, it represents by unbroken succession the old assemblies of the Teutonic democracy. . . . The 'land-sitting men,' on the other hand, not summoned personally or regularly, but summoned in a mass when their attendance was specially needed, gradually lost the right of personal attendance, till in the end they gained the more practical right of appearing by their representatives."

From the same authority the account of the intermediate stages in the adoption of the representative principle may be further quoted:—

> "By the time of Henry II. the force of circumstances, especially the working of the practice of summons, had gradually changed the ancient assembly of the whole nation into a mere gathering of the great men of the realm. . . . It is in the reign of Richard I. that we begin to see the first faint glimmerings of parliamentary representation. . . . The object of his wise ministers, of Archbishop Hubert among the first, was to gain the greatest amount of money for their master with the least amount of oppression towards the nation. Under Hubert's administration, chosen bodies of knights or other lawful men, acting in characters which became more and more distinctly representative, were summoned for every kind of purpose. How far they were nominated, how far freely elected, is not always clear. It seems most likely that in one stage they were nominated by the sheriff in the county court, while at a later stage they were chosen by the county court itself. In other words, the principle of representation was first established, and then the next stage naturally was that the representatives should be freely chosen. Summoned bodies of knights appear in characters which are the forerunners of grand jurors and of justices of the peace. They appear also in a character which makes them distinctly forerunners of the knights of the shire which were soon to come. A chosen body of knights have to assess the imposts on each shire. From assessing the taxes the next stage was to vote or to refuse them. In 1213 the sheriffs are called on to summon four discreet men from each shire, to come and speak with the king about the affairs of the realm. When we have reached this stage, we have come very near to a *parliament*, name and thing. The reign of John, in short, is marked by common consent as the time from which Englishmen date the birth of their national freedom in its later form. . . . The (Great) Charter (1215) is the first solemn act of the united English nation after Norman conquerors and Norman settlers had become naturalized Englishmen. . . . Representation was already fast growing up; but it had hardly yet reached such a stage that it could be ordained in legal form. But rules are laid down out of which, even if it had not begun already, representation in the strictest sense could not fail shortly to arise. The distinction which had been growing up ever since the Conquest, and indeed before, between the *Witan* and the *land-sitting men*, now receives a legal sanction. The practice of summons makes the distinction. Certain great men, prelates, earls and greater barons, are to receive the personal summons. The rest of the king's tenants-in-chief are to be summoned only in a body. Here we have almost come to a separation of Lords and Commons. But in modern ideas those names imply two distinct houses; and it was not yet settled, it had not yet come into men's minds to consider, whether the national council should consist of one house or a dozen. But it is decreed in so many words that the acts of those who came would bind those who stayed away. On such a provision, representation, and not only representation but election of the representatives, follows almost as a matter of course. The mass stay away: a few appear, specially commissioned to act in the name of the rest. The Charter mentions only the king's tenants-in-chief; so far had things been marred or feudalized by the influence of the Conquest. But as the election could only be made in the ancient county court, every freeholder at least, if not every freeman, won back his ancient right. If he could not come himself to say Yea or Nay, he at least had a voice in choosing those who could do so with greater effect."
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> (*Ibid.* pp. 307, 308.)

> "The constitution of the (national) assembly, as defined in the Great Charter, did not absolutely imply representation; but it showed that the full establishment of representation could not be long delayed. The work of the period 1217–1340 was to call up, alongside of the gathering of prelates, earls and other great men specially summoned, into which the ancient Witanagemot had shrunk up, another assembly directly representing all other classes of the nation which enjoyed political rights. This assembly, chosen by various local bodies, *communitates* or *universitates*, having a quasi corporate being, came gradually to bear the name of the *commons*. The knights of the shire, the barons, citizens and burgesses of the towns, were severally chosen by the *communa* or *communitas* of that part of the people which they represented."[2]

> "The notion of local representation, by which shires and boroughs chose representatives of their own communities, had to some extent to strive with another doctrine, that of the representation of *estates* or classes of men. The 13th century was the age when the national assemblies, not only of England but of most other European countries, were putting on their definite shape. And in most of them the system of *estates* prevailed. These in most countries were three,—clergy, nobles and commons. By these last were commonly meant only the communities of the chartered towns, while the *noblesse* of foreign countries answered to the lesser barons and knights, who in England were reckoned among the commons. The English system thus went far to take in the whole free population, while the estates of other countries, the commons no less than the clergy and nobles, must be looked on as privileged bodies. In England we had in truth no estates: we had no nobility in the foreign sense. . . . Yet the continental theory of estates so far worked in the development of our parliamentary system that the 'Three Estates of England' became a familiar phrase. It was meant to denote the lords, the commons and the clergy in their parliamentary character. For it is plain that it was the intention of Edward I. to organize the clergy as a parliamentary estate, alongside of the lords and commons. This scheme failed, mainly through the unwillingness of the clergy themselves to attend in a secular assembly. This left, so far as there were any estates at all, two estates only,—lords and commons. This led to the common

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[1] The inevitable use of the word "represent" in its wider sense ("corresponds to"), is worth noting in this passage from Freeman, side by side with the more technical one in "representative" ("chosen delegate").

[2] Professor Masterman, lecturing (1908) on the House of Commons, has pointed out how fortunate it was that this beginning of the organization of the communes into a central body did not come earlier than it did. Had there been one assembly representing the local *communitates* at any earlier time it would have been far too sectional in character and far too little conscious of any common interest. The organization did not begin till England had become a self-conscious body, realizing its common interests and the common destiny that belonged to it as a nation.

mistake of fancying the three estates to be king, lords and commons. The ecclesiastical members of the House of Lords kept their seats there; but the parliamentary representation of the clergy as an estate came to nothing. So far as the clergy kept any parliamentary powers, they exercised them in the two provincial convocations. These anomalous assemblies, fluctuating between the character of an ecclesiastical synod and of a parliamentary estate, kept, from Edward I. to Charles II., the parliamentary power of self-taxation. For a long time lords and commons taxed themselves separately. So did the clergy; so sometimes did other bodies. . . .

“During the reign of Henry III. assemblies were constantly held, and their constitution is often vaguely described. But in a great many cases phrases are used which, however vague, imply a popular element. We read of knights, of tenants in chief, of freemen, sometimes even of freemen and villeins, sometimes, more vaguely still, of ‘universi,’ ‘universitas Angliae,’ and the like. In some cases we are able better to interpret these vague phrases. For instance, in 1224 each shire sends four knights chosen by the ‘milites et probi homines.’ Whether these knights were or were not to vote along with the magnates, they were at all events to transact business with them. We must always remember that in these times formal voting in the modern sense is not to be looked for.”[1] (*Ibid.* pp. 314, 315.)

The Theory of Representation.

This summary shows clearly how the idea of “representation” as opposed to “presence in person” was applied to the English parliament, so as to give the commons a proper voice in it as well as the lords. It is unnecessary here to trace further the gradual increase in power of the House of Commons till it became the predominant partner in the English bicameral constitution (see PARLIAMENT). But from the point of view of historical theory it is important to note that its representative character does not essentially depend upon the particular method (election *by vote*) by which its members have for so long been chosen. It is a common error to regard the House of Commons as having a national authority higher than that of the House of Lords merely on the ground that it is composed of elected members, and to stigmatize the House of Lords as “unrepresentative” because it is not elected. But in strictness the question of election, as such, has nothing to do with the matter.[2] The proper distinction (ignoring for the moment the later inclusion in the House of Lords of a certain representative element—strictly so regarded—in the Scotch and Irish peers) is that the House of Lords, as still constituted in 1910, remained a *presentative* chamber, while the House of Commons was essentially a *representative* one; in the former the members, summoned personally as individuals, were entitled to speak in the great council of the nation, while in the latter the members were returned as the mouthpieces of whole *communitates*, to whom, in the person of the sheriffs, the summons had been directed to send persons to speak for them.[3] The preponderant authority of the House of Commons is due not to its members being elected—that is only one way of settling who the mouthpieces of the commons shall be—but to the progress of popular government. The two British houses have historically existed as assemblies of the separate estates of the realm—the House of Lords of the two estates of lords spiritual and temporal, and the House of Commons of the commons. The third estate has so increased in power as to become predominant in the country; but the authority of its own assembly simply depends on the powers of those it represents. If the balance of political power had not been shifted in the country itself, the authority and competence of the peers, speaking for themselves in a primary assembly, would in theory actually appear higher, so far as their order is concerned, than that of members of the House of Commons, who can only “represent” the popular constituencies. Moreover, the fact that most members of the House of Commons are elected by a party vote is apt to make them very often even less authoritative spokesmen of their constituencies—the *communitates*—than if they were selected by some method which would indicate that they had the full confidence of the whole body they “represent.” It is notorious that many members of a modern House of Commons, or of any other “representative” assembly, have only been elected by the votes of a minority of their constituency, or (where there have been more than two candidates) a minority even of those who voted; and there always comes a time when it is certain that if a representative has to come again before the electorate for their votes he will be defeated; he, in fact, no longer reflects their views, while he still sits and legislates. The real desires of the commons in a certain British constituency may even be more faithfully, even if only accidentally, reflected by a local peer whose only right to speak in parliament is technically presentative. In his *Vindication of the British Constitution* (1835), Disraeli, writing of the Reform Bill of 1832, observed that “in the effort to get rid of representation without election, it will be well if eventually we do not discover that we have only obtained election without representation.” A truer word was never spoken. A man may be representative, practically *consensu omnium*, although no vote, resulting from a division of opinion, has been taken for the purpose of selecting him. The vote is merely a method of selection when there is a definite division of opinion involving an uncertainty; and even in the modern House of Commons many members are returned “unopposed,” no actual voting taking place. A well-recognized representative character (as regards the functions involved) attaches, for instance, in British public life to other persons in whose selection the method of popular voting has had no place; such as the king himself, the Cabinet (in relation to the political party in power), or the bishops (as regards the Church of England).

The British Houses of Parliament.

The question of remodelling the constitution of the British House of Lords was prominently before the country in 1910; and a large number even of those who were prepared to defend its actions in the past were ready to accept changes which would make it in form and composition a Second Chamber representative of the nation rather than presentative of its historic order. But it is important to remember, in connexion with the House of Lords question, that, in a country like England, where the constitution has provided for a Second Chamber which is composed of members of an estate or estates distinct in the nation from the estate of the commons, these persons may to a predominant degree nevertheless be really representative men by common consent; while their being so, though not theoretically the reason for their legislative power, is substantially the reason why it has so long persisted. In the absence of a written constitution, theoretical considerations have in England always been second to the force of circumstances. Most people regarded the House of Lords, as still unreformed in 1910, as purely a *hereditary* body; its members had been summoned to parliament as peers (the important question of their right to a summons need not here be discussed), and most peers enjoyed their titles by hereditary succession. But the constant creation of peers by both political parties had in fact introduced even into the constitution of the House of Lords an essentially representative element (though not resulting from direct election), apart altogether from the fact that heredity maintained there a number of persons whose title had descended from men who were originally representative Englishmen, and whose successors, on the whole, were no less so. In the days when kings really governed in England, the most powerful check on the king, in the interest of the nation at large, was the peerage; the earls and barons, in parliament, were the chief bulwark of the people against tyranny. It was they who stood for the nation in extorting Magna Carta from King John; and as time went on, the representation of the commons in parliament was largely due, not to any direct popular pressure, but to the desire of the kings to influence the lower ranks of society independently of the nobles. Up to the reign of Charles I., at all events, the House of Lords was actually the predominant partner in parliament; the House of Commons was recruited from and returned by only a small section of the commons as now understood; and Oliver Cromwell—certainly a "popular" leader in the ordinary sense—made as short work of it as he did of the king himself. Up to 1832, when the first modern Reform Act was passed, the House of Commons was an oligarchical body, and the electors themselves were a small and privileged class. It is only since then—except in the granting of supplies—that first equality, and then predominance, in respect of the House of Lords, has been asserted by the House of Commons, owing to the fact that an extended suffrage has made the estate of the commons more adequately coincident with the nation as a whole. Prior to 1832 it was the king who directly made and unmade ministries; in 1835 for the first time the result of a general election caused a change of ministry; and the modern view of the House of Lords as purely a revising chamber dates only from then. But the very fact that the responsibility for creating new peerages now passed to ministers dependent on popular suffrage may well justify the contention that henceforth it indirectly included a select number of representative men of the nation, holding their seats in virtue of authoritative nomination and not by heredity. In the sixty years preceding 1906 no fewer than 419 new peerages were created, 238 by the Liberal party, 181 by the Conservative, or a balance of 57 creations on the Liberal side.[1] It is fair to assume that all these new peers were created as being representative men in the nation for one reason or another. And an analysis of the composition of the House of Lords in 1906 would have led an unprejudiced outside observer to suppose that its competence to speak on national affairs had not been weakened by any dependence on the hereditary title. It included 166 men who had been M.P.'s (*i.e.* had been elected by popular vote to the House of Commons), 172 who had held government office, 140 who had been mayors of county councils, 207 who had served in the army or navy, 40 who had been judges or lawyers, 7 ex-viceroys, 16 ex-governors of colonies, 50 who had been eminent in art, letters, manufactures or trade, and 21 archbishops or bishops (appointed by ministerial recommendation, but only after they had worked up to eminence from being curates, and therefore had wide experience of the social life of the people).

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[1] “Election” in these early times has its simple meaning of “choice.” “We must guard ourselves from supposing that the citizens and burgesses, who were summoned to Parliament, were absolutely elected by the inhabitants of the towns as their representatives. Their presence in Parliament is another instance of representation without election. They were often nominated by the sheriff of the county, and even when that great officer, from negligence or favour, permitted the return to be made by those interested in the transaction, the nomination was confined to the small governing body, who returned two of their members, in general very unwilling missionaries, to the great council” (Disraeli, *Vindication of the British Constitution*, 1835).

[2] In the American federal system the bicameral legislature is divided into a “House of Representatives,” composed of members elected by popular vote in each state, and a “Senate,” composed of members elected by the legislature in each state. In spite of the nomenclature, both houses are really composed of “representatives.” But under a republican system there is no room for a purely presentative assembly, and the term “representative” comes to imply a more direct choice by the “commons.”

[3] There was at one time, it may be noted, a sort of “representative” element even in the case of the House of Lords, in so far as peers (including peeresses in their own right, abbesses, &c.) could send deputies or proxies. But it must be remembered that the privilege flowed directly from the personal and presentative character of the summons to a peer, who as such could name a deputy. It is quite illegitimate to strain from it an analogy with the election of a representative by the commons, who had no personal right to a summons.

It is possible to compare a chamber so composed somewhat favourably with a modern House of Commons, if the point at issue—the provision of "representative men" (*i.e.* men generally accepted as national spokesmen)—be strictly considered, apart from the method of selecting them by direct popular vote.[2] In the House of Lords the method is heredity *plus* selection by the political party which the popular vote has put in power; while in the election of members of the House of Commons the popular choice is doubly limited—first, by the fact that only the enfranchised commons can vote (in 1910 about 7½ millions out of 43); and secondly, because the choice must be made from among candidates who are themselves not disqualified for various reasons (for instance they must not be clergymen, nor entitled to seats in the House of Lords). Now, to carry out the real "will of the nation" in parliament must require (1) a reasonable knowledge of the wishes of the nation, and (2) an understanding of the best ways of expressing those wishes in legislation and administration. In the case of the peers, those who sit as having been originally created and therefore selected for the purpose—a considerable section of those actively attending—the qualifications are obvious: and it is only necessary to deal with those qualified by inheritance of title. Here too, in a number of cases, preceding experience in the House of Commons, to which the popular vote has returned them while they were only in the succession to a peerage, is a frequent factor; but, apart from that, the art of legislation is one which may well be considered to require a certain special disposition and mental equipment. Though allowance must be made for exceptional cases, it is obvious that the son of a man who has been responsible for legislating, who has himself been brought up as one who will have to take his part in legislating, is most likely, in any society, to have qualified himself for the business, as in the case of any profession or trade. He has been accustomed to breathe the parliamentary atmosphere, and as one of a leisured class has had the opportunity to study the subject of legislation, and to obtain experience of its conditions. This is so generally accepted that, in fact, the same theory is commonly applied to candidates for the House of Commons, and predominantly to members of that House who are given office. The names of more than one generation are writ large in English history in the case of the Pitts, Foxes, Grenvilles, Cannings, Cecils, Stanleys and Cavendishes. The sons of famous political commoners, a Gladstone, a Harcourt, a Churchill, a Primrose, a Chamberlain, have by consent a superior claim, even within the radical or popular party, by no means resting originally or primarily on known personal merit or proved experience, for selection as candidates and then for preferment to office; and it is a very common occurrence for younger sons of peers to be selected as candidates (liberal as much as conservative) for parliament, even though from general intellectual considerations they may appear in no way the equals of other men. They have been brought up to the business; and they are therefore adapted for it by heredity. If the House of Commons were deprived of those members who obtained their seats or their offices primarily for reasons of heredity, it would lose many of its best men—as indeed it occasionally does, to its disadvantage and possibly to the chagrin of the individuals themselves, when succession to a peerage forces a prominent parliamentarian to relinquish his seat in the Lower House and to take his place in the "unrepresentative" chamber.

Expression of the "Will of the People."

It remains nevertheless the fact that, in politics, "representative" government means not so much government by men really representative of the nation as government in the name of the whole body of citizens (and predominantly the estate of the commons) through a chamber or chambers composed of elected deputies. The object in view is the expression of the "will of the people"—the people, that is, who are sovereign. Clearly the only pure case of such government can be in a republic, where there is only one "estate," the free citizens. The home and historical type of representative government, the United Kingdom, is strictly no such case, since the monarchy and the House of Lords exist and work on lines constitutionally independent of any direct contact with the electorate. British practice, however, is of vital importance for the theory of representative institutions, and it is worth while to point out that the "will of the people" may even so be effectively expressed—some people may think even more effectively expressed than in a pure republic. The king and the House of Lords, *quâ* estates of the realm, are just as much part of "the people," in the widest sense, as "the commons" are; they are an integral part of the nation. In a republic they would as individuals be equal citizens, able to become candidates for the representative chamber or chambers; but as it is, since they are expressly debarred from taking part in elections to the House of Commons, they remain entitled and expected to use their historic method of playing a part in the government of the state. They assist to constitute "the people" in the wider sense, and in the narrower sense "the people" (*i.e.* the commons) know it and rely on it. Under the British constitution the commons have habitually relied on the monarchy and the House of Lords to play their part in the state, and on many occasions it has been proved, by various methods by which it is open to the commons themselves to show their real feeling, that action on the part of the monarch (*e.g.* in foreign affairs) or the House of Lords (in rejecting or modifying bills sent up by the House of Commons), in which a popular vote has played no initiating or controlling part, is welcomed and ratified, by consent of a large majority, on the part of the nation at large. So much is this so that it is notorious, in the case of the House of Lords, that elected members of the House of Commons, tied by purely party allegiance and pledges, have constantly voted for a measure they did not want to see passed, relying on the House of Lords to throw it out. Ultimately, no doubt, the reconciliation of this "presentative" element in the British form of constitution with the growth of democracy and the predominance of the "representative" system depends purely on the waiving of historical theory both by king and peers, and its adaptation to the fact of popular government through the recognition that their action rests for its efficient authority upon conformity with the "will of the people." Thus it has become an established maxim in England that while it is the proper function of the House of Lords to reject a measure which in their opinion is not in accordance with the wishes of the nation, they could not repeat such a rejection after a general election had shown that its authors in the House of Commons were supported by the country. The experience of politics from 1832 to 1910 gave abundant justification to the House of Lords for supposing that in such cases they were interpreting the desire of the country better than the House of Commons; the case of the Irish Home Rule bill of 1893 is, of course, the classical example.[1] So that in practice the House of Lords only acts in opposition to the House of Commons, subject to the remedy of a dissolution of parliament (which depends strictly on the prerogative of the Crown, but in practice on the advice of the leader of the majority in the House of Commons), at which the view of the House of Commons might be confirmed and reasserted, and in that case would prevail. The violent attacks made on the House of Lords by the Liberal party, on occasions when that party has had a majority in the commons and has had its measures rejected or distastefully amended, have always been open to the criticism that if the majority in the House of Commons were really supported by the electorate in the country they had the remedy in their own hands. If it were shown by the result of a general election that their defeated measure were the "will of the people," the House of Lords, as was generally understood, must give way. Such a position, though naturally objectionable to a party in power in the House of Commons (because general elections are uncertain things in every respect but that of trouble and expense), could clearly be strong only in view of the confidence of the House of Lords in its action being more truly representative of public opinion. It therefore must be said to have acted, however clumsily and indirectly—and no direct way would be feasible except that of the Referendum—as a "representative" body, *i.e.* as carrying out what it judged to be the national will and not merely the will of the peers, although not constituted as such in the narrower sense. In practice, and in accordance with this view, it has on more than one occasion (*e.g.* in the case of the Trades Disputes Act of 1906) accepted and passed measures which it was notorious, and indeed avowed, that the peers themselves regarded as bad.

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[1] Between January 1906 and January 1910 thirty-five more new peers were created by Liberal premiers, and seven more in June 1910.

[2] Speaking at Oldham on December 15, 1909, Lord Curzon said: "I have taken out the figures of the past 200 years, and I tell you this, that during that time 41 of our prime ministers have sat in the Lords and only 17 in the Commons; of our foreign secretaries, 56 in the Lords and only 8 in the Commons; of our colonial secretaries, 46 in the Lords and 25 in the Commons; of our war ministers, 29 in the Lords and 31 in the Commons; of first lords of the Admiralty, 48 in the Lords and 28 in the Commons."

Difficulties in obtaining Representation by Election.

The immense extension of the "representative principle" in government, by means of popular election, and its adaptation to municipal as well as national councils, has in recent times resulted in attracting much attention to the problem of making such elected bodies more accurately representative of public opinion than they frequently are. There are three distinct problems involved—(1) that of making the number of enfranchised citizens correspond to a real embodiment of the nation; (2) that of getting candidates to stand for the office of representative who are competent and incorruptible exponents of the national will, and (3) that of adopting a system of voting which shall result in the elected representatives forming an assembly which shall adequately reflect the balance of opinion in the electorate.

The Suffrage.

(1) The history of the gradual extension of the franchise in the United Kingdom is given under PARLIAMENT, and the conditions for other countries under their respective headings. But while, in countries with a representative system at all, the question as to the extent to which the male citizens shall have the vote is mainly one of degree—as to property or other qualification, up to the inclusion of all adults (see VOTE AND VOTING)—the question of the incapacity of women, as a sex, raises a distinction which is more radical. The facts as to the progress of the movement for women's suffrage are given in the article WOMEN. It is only necessary to say here that, where the franchise is limited to the male sex, the theory of "no taxation without representation" is under modern conditions of life carried out in a decidedly one-sided way. The question of women's suffrage is, however, one of public policy, in whatever state it is raised; and even where, as in Great Britain, it has been adopted for municipal affairs, a distinction is commonly made as regards the national assembly. So far as the historical facts as to the disability of women are concerned, it has been unanimously decided in England by the highest law-court of the realm (judgment of the House of Lords in the Edinburgh University case, December 1908), presided over on this occasion by a Liberal Lord Chancellor (Lord Loreburn), that, according to their authoritative statement of the common law, women never had in earlier times any legal right to vote for members of parliament; this judgment is therefore entirely adverse to such ingenious arguments to the contrary as are ably expressed in Mrs Charlotte Carmichael Stopes's *British Freewomen* (1907).

Sex, however, apart, there are various interesting questions as to the principles which should govern the extension of the suffrage and its limitations, to which a brief reference may here be made. It is noteworthy that John Stuart Mill, the philosophical radical whose work on *Representative Government* (first published in 1861) is a classic on the subject, and who regarded the representative system as the highest ideal of polity, made a good many reservations which have been ignored by those who frequently quote him. Mill's ideal was by no means that popular government should involve a mere counting of heads, or absolute equality of value among the citizens. While holding that "no arrangement of the suffrage can be permanently satisfactory in which any person or class is peremptorily excluded, or in which the electoral privilege is not open to all persons of full age who desire to obtain it," he insisted on "certain exclusions." Thus he demanded that universal education should precede universal enfranchisement, and laid it down that if education to the required amount had not become universally accessible and thus a hardship arose, this was "a hardship that had to be borne." He would not grant the suffrage to any one who could not read, write and perform a sum in the rule of three. Further, he insisted on the electors being taxpayers, and emphasized the view that, as a condition annexed to representation, such taxation should descend to the poorest class

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[1] The result of the general election of January 1910, following on the rejection of the Budget by the House of Lords, cannot properly be said to show anything to the contrary. It was notorious that there was no genuine majority in the new House of Commons for the Budget, and that the Irish Nationalists only voted for it as part of an arrangement for ulterior purposes.

"in a visible shape," by which he explained that he did *not* mean "indirect taxes," a "mode of defraying a share of the public expenses which is hardly felt." He advocated for this purpose "a direct tax, in the simple form of a capitation" on every grown person. But even more than this, he was in favour of a form of plural voting, so that the intellectual classes of the community should have more proportionate weight than the numerically larger working-classes: "though every one ought to have a voice, that every one should have an equal voice is a totally different proposition." The well-informed and capable man's opinion being more valuable than that of the barely qualified elector, it should be given more effect by a system of plural voting, which should give him more votes than one. As to the test of value of opinion, Mill was careful to say he did not mean property—though the principle was so important that he would not abolish such a test where it existed—but individual mental superiority, which he would gauge by the rough indication afforded by occupation in the higher forms of business or profession, or by such a criterion as a university degree or the passing of an examination of a fairly high standard.

> "Until there shall have been devised some mode of plural voting, which may assign to education as such the degree of superior influence due to it, and sufficient as a counterpoise to the numerical weight of the least educated class, for so long the benefits of completely universal suffrage cannot be obtained without bringing with them, as it appears to me, more than equivalent evils." "Equal voting," he repeated, "is in principle wrong, because recognizing a wrong standard, and exercising a bad influence on the voter's mind. It is not useful, but hurtful, that the constitution of the country should declare ignorance to be entitled to as much political power as knowledge."

Modern democracy may ignore Mill's emphatic plea for plural voting, as it ignores his equally strong arguments against the ballot[1]—his contention being that secret voting violated the spirit of the suffrage, according to which the voter was a trustee for the public, whose acts should be publicly known—but Mill's discussion of the whole subject proceeds on high grounds which are still worth careful consideration. Where a representative system, as such, is extolled as the ideal polity, the reservations made by Mill, a liberal thinker who cannot be dismissed as a prejudiced reactionary, should be remembered. Mill postulated, in any event, a state of society which was worthy of such a system, no less than the necessary checks and balances which should make it correspond to the real conditions of rational government. "Representative institutions," he pointed out, "are of little value, and may be a mere instrument of tyranny or intrigue, when the generality of electors are not sufficiently interested in their own government to give their vote, or, if they vote at all, do not bestow their suffrages on public grounds, but sell them for money, or vote at the beck of some one who has control over them, or whom for private reasons they desire to propitiate. Popular election, as thus practised, instead of a security against misgovernment, is but an additional wheel in its machinery." When, in modern days, advocates of representative institutions seem ready to extend them to all countries, they become doctrinaires who depart widely from the standpoint of Mill, and forget that democracy is itself only a "form of government," as Sir Henry Maine insisted, for which all communities may not be ripe or fitted. The ideal form of government must be relative to a certain state of civilization and certain conditions of national life, and its advantages can only be tested by results and practical working.

Selection of Candidates.

(2) As regards the important question of the selection of candidates (which depends partly on their willingness to stand, and partly on the means available for discovering suitable persons), modern practice is entirely dominated by the organization of political parties and the requirements of party allegiance. Though much has been said as to the desirability or not of paying members for their services (see PAYMENT OF MEMBERS), this is certainly overshadowed by the question of the availability of really capable men at all to the number required, for all candidates become "professional" politicians, whether paid or not. The ideal of having a "representative man" in the broader sense as a "representative" in the narrower is only very roughly attained where the conditions of public life make a capacity for electioneering a necessity. To a large extent the political candidate depends purely upon the support of a party organization. His choice rests with party wire-pullers, and the average individual elector is confronted with the task of voting for some one of whom he may personally know very little, except that, if returned, the candidate will in parliament vote for measures embodying certain general principles as indicated in some vague party programme. Since the elector as a rule himself supports a party, he votes accordingly, but there are always a good many electors who under such a system fail to get a chance of voting for a candidate who fully represents their views. The supremacy of party interests, resulting from the difficulty of having any other form of electoral organization, is apt to bring many evils in its train, including the corruption of the electorate, and the practice of "lobbying," *i.e.* the pressure upon members in parliament of important "interests" whose electoral assistance is indispensable.

Systems of Voting.

(3) The more important point to be considered here is the third. When a representative assembly is to be elected by a direct popular vote, it is obviously necessary (*a*) that either there should be some system by which the whole body as a unit should elect all the members *en bloc*, or, as this usually appears impracticable, that the mass of electors should be divided within defined areas, or "constituencies"; and (*b*) that in the latter case voting shall take place for the purpose of electing one or more representatives of each such area according to some method by which due effect shall be given to the preferences of the electors. In theory there can be no perfectly fair arrangement as between constituency and constituency, where a single representative is to be returned, except on the terms that they are exactly equal in the number of electors; each elector's voice would then count equally with that of any other in the nation (or *mutatis mutandis* in the municipality, &c.). But in practice it is difficult to the point of impossibility to attempt more than an arbitrary distribution of electoral areas, more or less approximating to equality; and recourse is had to the formation of constituencies out of geographical districts taken as units for historical or practical reasons, and necessarily fluctuating from time to time in population or influence. It may become necessary periodically to revise these areas by what in England are called Redistribution Acts, but it has to be admitted that any perfect system of representation is always stultified by the necessary inequalities involved; and what is known as "gerrymandering" is sometimes the result, when a party in power so recasts the electoral districts as to give more opportunity for its own candidates to be returned than for those of its opponents. This flaw is particularly noticeable when the arrangement for the method of voting is that which allots only one member or representative to each district (*scrutin d'arrondissement*). The essential vice of this single-member system, which prevails in the United Kingdom[2] and the United States, is the lack of correspondence between the proportions in which the elected members of each party stand to one another and the proportions in which the numbers of the electors who returned them similarly stand; and it may well be that the minority party in the country obtains a majority of representatives in the assembly, or at any rate that a substantial minority obtains an absurdly small representation. "As a result of the district system," writes Professor J. R. Commons of Wisconsin (*Proportional Representation*, 1907), "the national House of Representatives (in America) is scarcely a representative body. In the Fifty-first Congress, a majority of representatives were elected by a minority of the voters"; the figures being 5,348,379 Republican votes with 164 elected, and 5,502,581 Democratic votes with 161 elected. In

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[1] Before 1872, when the Ballot Act was passed, voting was public.

[2] The House of Commons in 1910 was elected by 643 constituencies, of which 27 (including three universities) returned two members each, and the rest one; and the Royal Commission, which reported in that year, recommended the abandonment of the existing two member constituencies "at the earliest convenient opportunity."

the case of the Fifty-second Congress, the Democrats, with 50·6% of the votes, returned 71·1% of the representatives; the Republicans, with 42·9% of the votes, returning 26·5% of the representatives. Lord Avebury (*Proportional Representation,* 1890; new ed. 1906) has given various similar experiences in England; thus, at the general election of 1886, the Liberals, with 1,333,400 votes, only obtained 176 seats, while the Unionists, with 1,423,500, obtained 283 (not counting 99 unopposed returns on the Liberal side, and 111 on the Unionist). In the general election of 1895, at which 132 Unionist seats and 57 Liberal were unopposed, the result in the 481 seats contested was the return of 279 Unionists and 202 Liberals; yet the actual votes given were 1,800,000 for the Liberals, and 1,775,000 for the Unionists. Again, in 1906, the Unionist vote, though 44% of the total cast, returned only 28% of the members, and the Liberal majority, which in strict proportion would have been 68, actually was 256.

The establishment of mere party majority rule, which is characteristic of a representative system, is a necessity, no doubt, in popular government; but the way in which a substantial minority of voters may only obtain a contemptible minority of members, and may in practice be tyrannized over in consequence, somewhat detracts from its blessings, and leads to extreme party measures. The division of the whole electoral body into constituencies is, after all, only a device for getting over the difficulty of the electors voting *en bloc*, and it does not seem to justify the conversion of a real majority in the country into a minority as represented in parliament, nor the complete exclusion of a substantial number of the electorate from parliamentary representation—so far as their views are concerned—at all. Yet under the English system such results are possible as the capture of every seat in Wales (34), in 1906, by the Liberal party, with 217,462 votes, the 100,547 Unionist voters having no representation in parliament; while in Warwickshire, though 22,490 votes were given to the Unionist candidates against 22,021 for the Liberal, three Liberals were returned against one Unionist.

Proportional representation.

The attempt to rectify this flaw in the representative method has led to the suggestion of various devices by the adoption of which the elected members may correspond more equally to the divisions of opinion in the electorate. Under the plan of *scrutin de liste* (or "general ticket") larger districts are created, each returning several members, and each voter has as many votes as there are members to elect; but while this system apparently provides the opportunity for the return of candidates with different views, it only requires a solid party vote to capture the whole of the representation for a majority. What is known as the "limited vote" is a form of *scrutin de liste* by which the elector has less votes than there are seats to be filled; with (say) three to be elected, the elector has only two votes. Systems of "limited vote" are in force in Portugal, Spain and Japan. A somewhat better plan is the "cumulative vote," which gives each elector as many votes as there are members to be elected, but allows him to divide them as he pleases (instead of giving only one vote to any one candidate). This enables an organized minority, by concentrating their votes, to elect at all events some representative; but the "cumulative vote" works rather capriciously, and is commonly defeated by careful party organization.

A more elaborate plan, but depending like the "limited" vote and the "cumulative" vote on the formation of constituencies returning three or more members each, is that of the "transferable vote." By this device an elector can indicate on his ballot paper not only his first choice, but also his second or third, &c. To ensure election a candidate need not obtain a majority of the votes polled, but only a certain number, so fixed that it can be obtained by a number of candidates equal to the number of seats to be filled, but by no more; this number of votes is called the "quota." At the first count first choices only are reckoned, and those candidates who have received a "quota" or more are declared duly elected. If all the seats have not then been filled up, the surplus votes of those candidates who have received more than the "quota" are transferred according to the names marked (2) on them. If these transfers still do not bring the requisite number of candidates up to the "quota," the lowest candidate is eliminated and his votes transferred according to the next preferences, and so on till the seats are filled This system, which is the one usually associated with the term "proportional representation" was first suggested by Thomas Hare, who published in 1857 a pamphlet on *The Machinery of Representation,* and in 1859 a more complete scheme in his treatise on *The Election of Representatives.* John Stuart Mill, in *Representative Government* (1861) warmly endorsed Hare's proposal. Hare wished to treat the whole country as one constituency, but by later supporters of the "transferable vote" that plan was abandoned as impracticable; and the principle will work so long as the constituencies adopted each return several members. Lord Courtney, in his evidence before the British Royal Commission in 1909, said that his *minimum* constituency would be a three-membered one, but he would create a fifteen-membered constituency without hesitation. The simple "transferable vote" has been adopted in Tasmania for all elections (1907), after experimental adoption in the constituencies of Hobart and Launceston in 1896–1901, and in the election of the Tasmanian members of the Commonwealth leglislature in 1900. It was proposed in the draft of the South African constitution, but abandoned. The principle has also been adopted in the "list systems" of Belgium, some Swiss cantons, Sweden, Finland and parts of Denmark, Württemberg and Servia, where candidates are grouped in lists and all votes given to individual candidates on the list count first as votes for the list itself, the seats being divided among the lists in proportion to the total number of votes obtained by the list. The use of the general term "proportional representation" for all of these is, however, somewhat misleading; people often suppose that only one identical system of voting is meant, whereas in fact some 300 possible varieties have been proposed, and each of the states mentioned has a different one from all the others. The only common element is the device of the "transferable vote," *i.e.* the method of having an "electoral quota," and the filling up of seats, where a quota is not provided by the first choices, by votes transferred from the second choices, and so on. It may be noted here that the "transferable vote" is calculated to multiply candidates to a point at which the minds of the electorate may well be embarrassed as to their preferences (the largest Belgian constituency returns 22 members), and, while undoubtedly providing for "minority representation," to encourage what may be called "minority thinking" and particularist politics. The "transferable vote" is commonly objected to as puzzling to the electors and too complicated for the scrutineers, while it is not much favoured by "machine" party organizations, which generally prefer the simpler plan of rough-and-ready majorities; but it has received a growing amount of theoretical support, as well as success in practical experiment, in recent years.

The second ballot.

The "second ballot" is a device for securing absolute majority, instead of relative majority, representation. Where the two-party system prevails, it is usual for only two candidates, one for each party, to stand for each single-member constituency. But there is nothing to prevent a third or even a fourth candidate standing, and this multiplication of candidates becomes the more common in proportion as parliamentary organization is split up into groups. The consequence is that the candidate who heads the poll may well have only a relative, not an absolute, majority of votes, and to meet this objection the "second ballot" has been introduced, and is in operation in Austria-Hungary, France, Germany, Italy and Russia. Under this system, if no candidate receives an absolute majority of all the votes, a second election is held, at which, as a rule, only the two candidates compete who received most; or in cases where more than one seat is to be filled, twice as many candidates compete as there are seats. In principle the second ballot has much in its favour, though it does not necessarily reflect the real opinion of the electorate, but only what is practicable; and while leading to political bargaining it does nothing for minority representation.

In England the importance of the whole subject of the method of elections was recognized at the end of 1908 by the appointment of a Royal Commission to inquire and report. Its conclusions were published in 1910, after much interesting evidence had been taken, but they attracted little attention, being in the main adverse to innovation. The one positive recommendation was for the adoption of the "alternative vote" (already in use in Queensland and Western Australia) by which the electors might mark their choices 1, 2, 3, &c.; this would not be for the purpose already discussed as part of the method of the "transferable vote," but the indications of preference would only be used for the same purpose as the "second ballot," while saving the voters the trouble of further elections. One objection to this "alternative vote," however, as compared with the "second ballot," is that it does not allow the voter to change his mind as to his preference, as he well might do after he knew the result of the original voting.

It may be said broadly that all the devices which have been proposed for mitigating or redressing the defects of electoral methods ignore the essential fact that in any case a representative system can only result in a rather arbitrary approximation to correspondence with the opinions of the electorate. It is by no means certain even that "proportional representation" in any of its forms would always result in the return of a representative assembly reflecting with mathematical accuracy the balance of opinion in the electorate; and even if it did, the electors have a way of changing their opinions long before their representatives come up for re-election. It was stated before the British Royal Commission that in Belgium, in spite of "proportional representation," both in 1900 and in 1902 a majority of members was returned by a minority of votes. While under majority rule, as Mr Augustine Birrell once remarked, "minorities must suffer"—even large minorities—it is on the other hand not likely to conduce to the popularity of representative government that minorities should obtain too great a share of political power. The fact is that no "representation" can reflect the views of those "represented" as accurately as "presentation" by those entitled personally to speak. This conclusion, while in no necessary degree qualifying the importance of "popular government," undoubtedly detracts from the value of the representative method. The result is seen in the increasing desire in really democratic countries to supplement representative government by some form of Referendum, or direct appeal to the electors for their own personal opinion on a distinct issue—a method which involves fundamentally the addition of a "presentative" element to the representative system.

Literature.—The number of separate works on various aspects of the theory, history and practice of political representation—a much wider subject than representative government—is too large for detailed mention. A general reference can only be made here to the standard treatises on constitutional law. The chapter in Sir G. Cornewall Lewis's *Remarks on the Use and Abuse of some Political Terms* (Sir T. Raleigh's edition, 1898) should also be noted. In addition to works cited above, a valuable account of all parts of the electoral "machine" is given in M. Ostrogorski's *Democracy and the Organization of Political Parties* (1902). The Congressional Library, Washington, U.S.A., issued in 1904 a "List of Books relating to Proportional Representation," which constitutes a complete bibliography of that subject up to that date. The best discussion of the various methods for securing adequate representation is, however, now to be found in the *Report* (1910) of the British Royal Commission on Systems of Election (Parliamentary Paper, Cd. 5163). It is chiefly valuable for its description of the devices in use in different countries and for its weighty criticism of the proposals for minority representation. (H. Ch.)

REPRIEVE (*reprise*, from Fr. *reprendre*), in English law, a term which originally meant remand to prison: later and more usually, the suspension for a time of the execution of a sentence passed on conviction of crime. The term is now seldom or never used except with reference to sentences of death. In the case of capital felonies other than murder the recording of sentence of death has the effect of a reprieve by the court. The court which can award a sentence is said to possess as of common right a discretionary power of granting a reprieve. Courts of justice, however, do not grant reprieves by way of dispensation from the penalties of the law, which is not for the judicial department, but for temporary purposes, *e.g.* of appeal or inquiry as to the state of mind or health of the convict, or to enable him to apply for a pardon. Under the old system of transportation it was a common practice to reprieve convicted felons as a step to induce them to consent to transportation to the American colonies (see the *Old Bailey Regulations of 1662*, J. Kelyng, ed. 1873, p. 1). In cases of conviction of wilful murder the reprieve, if any, is granted by the home secretary on behalf of the crown, and on convictions of murder the court seems now to have no power to reprieve except in the case of a pregnant woman.

See Hawkins, *P.C.* bk. 2, c. 51; Blackstone, *Commentaries.*

REPRISALS (Fr. *représailles*, from *reprendre*; Lat. *reprehendere*, to take back), properly speaking, the act of forcibly seizing something belonging to another state by way of retaliation, but currently used for the retaliation itself. They are acts of violence which are a *casus belli* according to the manner in which the state against which they are exercised regards them and is able to resist or resent them. Two comparatively recent cases have occurred in which this form of redress was resorted to. In the one case a demand by the British government for an indemnity for injuries inflicted on the British vice-consul and certain other British subjects by Nicaraguan authorities in the Mosquito reserve not having been complied with, British naval forces were landed on April 27th, 1895, at Corinto, where they occupied the customs house and other public buildings till an agreement was arrived at. In the other case the French government in November 1901 ordered the occupation by French naval forces of the customs house at Mytilene until redress was obtained for divers claims of French citizens. A Hague Convention of 1907 now places limitations on the employment of force for the recovery of contract debts, and forbids recourse to armed force unless "the debtor state refuses or neglects to reply to an offer of arbitration, or after accepting the offer prevents any *compromise* from being agreed on, or after arbitration fails to submit to the award" (*art.* 1). (T. Ba.)

REPRODUCTION, in biology, the generation of new organisms from existing organisms more or less similar. It is a special case of growth, and consists of an increase of living substance in such fashion that the new substance is either set free as a new individual, or, whilst remaining attached to the parent organism, separated by some sort of partition so as to have a subordinate individuality. Y. Delage has distinguished as *multiplication* those cases in which the new individual arises from a mass of cells which remain a part of the maternal tissues during differentiation, reserving the term *reproduction* for those cases in which the spore or cell which is the starting-point of the new individual begins by separating from the maternal tissues; but the distinction is inconvenient in practice and does not appear to carry with it any fundamental biological significance. The general relation between parent and filial organisms is discussed under Heredity and Embryology; many of the details of the cellular processes are dealt with under Cytology, and the modes of reproduction exhibited by different kinds of animals and plants are treated of in the various articles describing individual groups. Finally, some of the special problems involved are discussed under the heading Sex. As reproduction is a general biological phenomenon, its manifestations should be dealt with simultaneously in the case of animals and plants, but many of the special details differ so much that it is practically convenient to make two headings.

Reproduction of Animals

A. Asexual.—Many animals possess a more or less limited capacity to repair portions of the body that have been accidentally removed (see Regeneration), and this capacity may be so extensive that, if the whole body be cut in pieces, each portion may grow into a new organism. Such a mode of artificial propagation, familiar in horticultural operations, has been made use of in such animals as sponges, and has been performed experimentally in hydroids and some worms. In many Protozoa asexual reproduction by simple division is a normal event. In Coelentera it is common, the plane of division usually passing through the long axis of the body, as in Actinians and many Hydroids, or being horizontal, as in the repeated divisions by which medusae are produced from an asexual polyp; the new individual may separate completely, or serve to build up a colonial or compound organism. In some Turbellarians (*Microstomum*) and Chaetopods (*Syllis*, *Myrianida*, *Nereis*, *Eunice viridis* (the palolo-worm of Samoa), asexual reproduction occurs in a form that is partly fission and partly budding; portions are constricted transversely or laterally, very much smaller than the whole animal, and these grow out into new animals which may separate or remain attached in chains. In Salps, chains are formed sometimes by transverse constriction, sometimes by budding. True budding is much more common than fission; it occurs in Protozoa, Coelentera, Sponges, Polyzoa, Tunicates and some Flatworms and Chaetopods, the bud being a multicellular portion of the tissues which is partly or completely separated from the parent before it proliferates into the new form. In various larval stages of many animals, asexual reproduction by fission or budding may be produced experimentally or may occur naturally. It has been suggested that cases of identical twins in vertebrates and many monstrous forms, including even dermoid cysts, are due to embryonic asexual fission or budding. The artificial subdivision of young embryos has been performed successfully by several investigators (see HEREDITY). In *Lumbricus trapezoides* the gastrula stage of the embryo divides and each half produces a complete individual; and multiplication by budding is common at various stages of the life-history of many parasitic worms. Spore formation, or cellular budding, appears to be limited to the Protozoa amongst animals.

B. Sexual.—Apart from the special and probably secondary cases presently to be considered under the subheading *parthenogenesis*, sexual reproduction or amphimixis may be defined as the production of a new organism from a zygote, and a zygote may be defined as the cell resulting from the conjugation of two gametes or sexual cells derived from the specialized reproductive tissue of the parent or parents. In asexual reproduction by spore formation, the spore proliferates without the aid of another spore; in true sexual reproduction the gametes may be regarded as special kinds of spores which appear in two forms, the egg-cell, ovum or female gamete not proceeding to proliferate into a new organism until it has been stimulated by partial or complete fusion with the other form, the spermatozoon or male gamete. The act of fusion or conjugation in question is usually spoken of as fertilization, and the zygote, or starting-point of the new organism, is the fertilized egg-cell. Among protozoa and the lower plants there occur a series of forms of conjugation leading towards the specialized form characteristic of the sexual reproduction of higher animals. The conjugation may be *isogamous*, that is to say the conjugating cells may be actually or at least apparently indistinguishable. The fusion between the cells may be complete, or may concern only the nuclei. The conjugation may be followed by reproduction, or may apparently have no relation to reproduction. In true sexual reproduction the conjugation is *heterogamous*, *i.e.* the gametes are unlike; the fusion is chiefly nuclear, and the process is the prelude of the development of the zygote into the new organism.

In all the Metazoa the gametes arise from special reproductive tissues which are supposed to contain (see HEREDITY) the reproductive material or germ-plasm. In the lower (or simpler and possibly degenerate Metazoa) the reproductive or germinal tissue consists of a few cells, sometimes in a group, sometimes scattered and sometimes migratory; in the vast majority of the Metazoa the germinal tissue becomes aggregated in distinct organs, of which those that give rise to ova or female gametes are known as the ovaries, and those that give rise to the spermatozoa or male gametes are known as the testes. The ovary and the testis are the primary reproductive organs; the details of their anatomy and position in the various groups need not be discussed here (see REPRODUCTIVE SYSTEM).

The male gamete or spermatozoon was first seen in 1677 by Ludwig van Hammen, a pupil of A. Leeuwenhoek, with the microscope that had been constructed by his master. Leeuwenhoek, under the influence of the current preformationist ideas, interpreted these actively moving bodies in the seminal fluids as preformed germs and described them as animalculae spermetia or spermatozoa. Throughout the 18th century the general tendency was to regard them as parasites of no consequence in fertilization. In 1837 R. Wagner established that they were present in all sexually mature males and absent in infertile male hybrids, and in 1841 A. Kölliker showed that they were cells proliferated in the testes. The spermatozoon is one of the smallest of known cells, frequently being no more than one hundred thousandth of the size of the ovum, although the extraordinary case of a small *Cypris* has been recorded in which the spermatozoa are longer than the animal. It is produced in enormous quantities and relatively to other minute cells is extremely tenacious of life. It may retain its vitality in the male organism for a long time after it has become a separate cell, and may exist for lengthy periods in the female organism. The queen-bee is impregnated only once, and the spermatozoa may remain functional within her body for three years. Lord Avebury (Sir J. Lubbock) has described the case of a female ant which laid fertile eggs thirteen years after she had been impregnated. It is undoubted that in snakes, birds and many mammals, fertilization may not take place for many days after impregnation. The spermatozoa, with a few exceptions, are actively motile, being elongated in shape, with a vibratile tail sometimes provided with a swimming membrane. In a few cases, chiefly of crustaceans, the spermatozoa are spherical with radiating processes, but are capable of amoeboid movements. The cell nucleus is generally situated near the rounded or pointed extremity, with a centrosome immediately behind it, whilst the scanty protoplasm forms the body and vibratile tail; but there appears to be no general significance in the various configurations that occur amongst different animals. The process of spermatogenesis, or production of spermatozoa from the permanent cells of the testis, varies extremely amongst different animals and has been the subject of many elaborate investigations and much confusing nomenclature. Two factors are involved: first, the arrangements to produce a very large crop of cells so to provide for the enormous numbers of spermatozoa produced by most animals; and second, the final changes of shape and of nucleus by which the ripe spermatozoa arise from the indifferent testis-cells, and these processes may to a certain extent overlap. The point of general significance relates to the nuclear changes. The nuclear matter that occurs in the tissue cells of animals, when these cells divide, breaks up into a number of chromosomes constant for each kind of animal, and the final stage of cell division is such that each chromosome splits and contributes a half to each daughter cell, so that the latter come to contain the number of chromosomes peculiar to the animal in which they occur. In the case of spermatozoa, however, a "reducing" division occurs, in which the chromosomes instead of dividing distribute themselves equally between the two daughter cells, with the result that each of the latter contains only half the number peculiar to the species. In its simplest form, what occurs in the last stage of spermatogenesis is that one cell breaks up into four spermatozoa by two successive divisions, the first of which is normal and the second reducing. The nuclear matter of spermatozoa, therefore, contains half the number of chromosomes normal to the tissue cells of the species, and we shall see later that a similar reduction takes place in the formation of the egg. Further complications, however, exist, at least in certain forms. In 1891 H. Henking showed that in a Hemipteran insect of the genus *Pyrrochoris*, two kinds of spermatozoa are produced in equal numbers, and F. C. Paulmier confirmed the observation in the case of some other insects a few years later, whilst other observers have extended the observation to over a hundred species. In all these cases half the spermatozoa differ from the other half by the presence of what E. B. Wilson calls the "X-element," and which, in the simplest cases, occurs as an unpaired chromosome of the mother cell which passes into one and not the other of the two spermatozoa formed from that mother cell. The matter is still obscure, and it is not certain whether the facts are peculiar to insects or have a parallel in spermatogenesis universally. According to E. B. Wilson, the facts demonstrate that eggs fertilized by spermatozoa with the X-element invariably produce females (see SEX). The female gamete or ovum is in a large number of cases expanded by the presence of food-yolk and protective swathings to form the visible mass known as an egg, and the production of embryos from eggs has been studied from the time of Aristotle and Pliny. Galen had described the human ovaries as *testes muliebres*, and W. Harvey in 1651 showed that the chick arose from the cicatricula of the yolk of the egg, compared these early stages with corresponding stages in the uterus of mammals, and laid down the general proposition—*ovum esse primordium commune omnibus animalibus*—that the ovum is a starting-point common to all animals. In 1664 N. Steno identified the sexual organ of the mammalian female with that of sharks, and first named it the ovary. In 1672 R. De Graaf described the structure of the ovary in birds and mammals, observed the ovum in the oviduct of the rabbit, and repeated Harvey's statement as to the universal occurrence of ova, although he mistook for ova the follicles that now bear his name. In 1825 J. E. Purkyne described the germinal vesicle in the chick, thus distinguishing between the structure of the egg as a whole and the essential germinal area, and in 1827 K. E. von Baer definitely traced the ovum back from the uterus to the oviduct and thence to its origin within the Graafian follicle in the ovary, and thus paved the way for identification of the ovum as a distinct cell arising from the germinal tissue of the ovary. The ovum or female gamete, unlike the spermatozoon, is a large cell, in most cases visible to the naked eye even in the ovary. Also, in definite contrast with the spermatozoon, it is a passive non-motile cell, although in certain cases it is capable of protruding pseudopodia. It is usually spherical, contains a large nucleus, a centrosome and abundant protoplasm, and is generally enclosed in a stout membrane which may or may not have a special aperture known as the micropyle. The protoplasm of all eggs contains nutritive material for the nourishment of the future embryo, and this material may be sufficient in quantity to make the whole cell, although remaining microscopic, conspicuously large, or to expand it to the relatively enormous mass of the yellow yolk of a fowl's egg. Finally, the cellular nature of the ovum is frequently further disguised by its being enclosed in a series of membranes such as the albumen and shell of the fowl's egg. Such complexities are ancillary to the growth or protection of the future embryo, and from the general biological point of view the ovum is to be regarded as a specialized cell derived from the germinal tissue of the ovary, just as the spermatozoon is a specialized cell derived from the corresponding stock of germinal material in the testis. The number of ova produced varies from a very few, as in mammals and birds, to a very large number, as in the herring and many invertebrates, but in all cases the number is relatively small compared with that of the spermatozoa produced by the male of the same species. The details of ovogenesis are more sharply divided than in the case of spermatogenesis into processes connected with the production of a crop of large cells bloated with food-yolk, and the peculiar nuclear changes. The latter changes are generally spoken of as the maturation of the ovum, and in most cases do not begin until the full size has been attained. As in the nuclear changes of spermatogenesis, the details differ in different animals, but the salient feature is that the mature ovum contains, like the ripe spermatozoon, half the number of chromosomes normal to the tissue cells of the animal to which it belongs. The simplest form in which the reduction takes place is that the nucleus of the ovum divides by an ordinary division, each chromosome splitting and sharing itself between the daughter nuclei. Of these nuclei one is extruded from the egg, forming what is called a polar body, and this polar body may again divide by a reducing division, so as to form two polar bodies, each with half the normal number of chromosomes. Finally, the daughter nucleus, remaining in the ovum, also divides by a reducing division, and one of the segments remains to form the nucleus of the ripe ovum, with half the normal number of chromosomes, whilst the other is extruded as a polar body. Very many suggestions as to the meaning of the extrusion of the polar bodies have been made, but the least fanciful of these is to regard the ovum ready for maturation as homologous with the cell about to divide into four spermatozoa; in each case the nucleus divides twice and one of the divisions is a reducing division, so that four daughter nuclei are formed each with half the normal number of chromosomes. Many spermatozoa are required, and each of the four becomes the nucleus of a complete active cell; relatively few ova are required, but each has a large protoplasmic body, and only one of the four becomes a functional mature egg, the other three being simply extruded and so to say wasted. It must be remembered, however, that there is no inherent probability in favour of the apparently simplest explanation of a very complex biological process. It is also to be noted that in many cases the first polar body does not divide, and it is not clearly established that when the first polar body remains single, it is always the result of a normal nuclear division.

When the mature ova and spermatozoa come together in one of the various ways to be discussed later, fertilization, the conjugation of the gametes to form the zygote, occurs. Alcmaeon (580 B.C.) is believed first to have laid down that fertilization in animals and plants consisted in the material union of the sexual products from both sexes, but it was not until 1761 that it was established experimentally by J. T. Kölreuter's work on the hybridization of plants. In 1780 L. Spallanzani artificially fertilized the eggs of the frog and tortoise, and successfully introduced seminal fluid into the uterus of the bitch, but came to the erroneous conclusion that it was the fluid medium and not the spermatozoa that caused fertilization. This error was corrected in 1824 by J. L. Prevost and J. B. Dumas, who showed that filtration destroyed the fertilizing power of the fluid. In 1843 M. Barry observed spermatozoa within the egg of the rabbit, whilst in 1849 R. Leuckart observed the fertilization of the frog's egg, and in 1851 H. Nelson noticed the entrance of spermatozoa to the egg of *Ascaris*, whilst in 1854 a series of observations published independently by T. L. W. Bischoff and Allen Thomson finally and definitely established the fact that ova were fertilized by the actual entrance of spermatozoa. Further advances in microscopical methods enabled a series of observers, of whom the most notable were E. van Beneden, H. Fol and O. Hertwig, to follow and record the details of the process. They made it clear that the chief event in fertilization was entrance into the ovum of the nucleus or head of the spermatozoon where it formed the "male pronucleus," which gradually approached and fused with the female pronucleus or residual nucleus of the ovum. Still later observers, of whom E. B. Wilson is the most conspicuous, have studied the details of the process in many different animals and have shown that the nucleus of the spermatozoon invariably enters the ovum, that the centrosome generally does so, and that the cytoplasm usually plays no part. The nucleus of the zygote or fertilized ovum, then, possesses the number of chromosomes normal in the tissue cells of the animal to which it belongs, but of these half belong to the female gamete and are derived from the germ plasm of the parental ovary, and half to the male gamete or spermatozoon, derived from the germ plasm of the parental testis. The stimulus which leads to and induces the conjugation of the gametes appears to be chemotactic and to consist of some substance positively attractive to the male gamete, liberated by the mature female gamete, but the attraction is mutual, and in the final stages of approach a protoplasmic outgrowth of the ovum towards the spermatozoon frequently occurs. The fertilized zygote proceeds to form the embryo (see EMBRYOLOGY).

Parthenogenesis is the production of the new organism from the female gamete without previous conjugation with the male gamete, and is to be regarded as secondary to and degenerate from true sexual reproduction. Aristotle recognized that it occurred in the bee. In 1745 C. Bonnet showed that it must occur in the case of Aphides or plant-lice, in which throughout the summer there were developed a series of generations consisting entirely of females. R. A. F. de Réaumur repeated the observations, but evaded the difficulty by suggesting that the Aphides were hermaphrodite, an explanation soon afterwards disproved by L. Dufour. In 1849 (Sir) R. Owen brought together the facts as they were then known and made a remarkable suggestion regarding them. "Not all the progeny of the primary impregnated germ cell are required for the formation of the body in all animals; certain of the derivative germ cells may remain unchanged and become included in that body which has been composed of their metamorphosed and diversely combined or confluent brethren; so included, any derivative germ cell or the nucleus of such may begin and repeat the same processes of growth by imbibition, and of propagation by spontaneous fission, as those to which itself owed its origin." Taking hold of the recently published views of J. J. S. Steenstrup on alternation of generations, he correlated the sexual and asexual alternation in hydroids and so forth with the virgin births of insects and Crustacea, and regarded the one and the other as instances of the subsequent proliferation of included germ cells, applying the word parthenogenesis to the phenomenon. His theory was a very remarkable anticipation of the germ-plasm theory of A. Weismann, but further knowledge showed that there was an important distinction between the reproduction of the asexual generations described by Steenstrup and the cases of Aphides and Crustacea, the germinal cells in the latter instances being true ova produced from the ovaries of true females, but capable of development without fertilization. In 1856 C. T. E. von Siebold established this fact and limited Owen's term parthenogenesis to the sense in which it is now used, the development without fertilization of ova produced in ovaries. True parthenogenesis occurs frequently amongst Rotifers, and in certain cases (Philodinadae) males either do not exist or are so rare that they have not been discovered. Amongst Crustaceans it is common in Branchiopods and Ostracods; in the case of Daphnids, large thick-shelled ova are produced towards winter, which develop only after fertilization and produce females; the latter, throughout summer, produce thin-shelled ova which do not require fertilization, and from which towards autumn both males and females are produced. Amongst insects it occurs in many forms in many different groups, sometimes occasional, sometimes as a regular occurrence. Apart from Aphides the classical instance is that of the bee, where eggs that are not fertilized develop parthenogenetically and produce only drones. What is known as pathological parthenogenesis has been observed occasionally in higher animals, *e.g.* the frog, the fowl and certain mammals, whilst in the case of human beings, ovarian cysts in which hair and other structures are produced have been attributed to the incomplete development of parthenogenetic ova. Finally, it has been shown in a number of different instances, notably by J. Loeb, that artificial parthenogenesis may be induced by various mechanical and chemical stimulations. It has been shown that ova may be induced to segment by the presence of spermatozoa belonging even to different classes of the animal kingdom—as, for instance, the ova of echinoderms by the spermatozoa of molluscs. In such cases the resulting embryos have purely maternal characters. A possible interpretation is that spermatozoa have two functions which may be exercised independently; they may act as stimulants to the ovum to segment, and they may convey the paternal qualities. The former function may be replaced by the chemical substances employed in producing artificial parthenogenesis. Juvenile or precocious parthenogenesis, in which there takes place reproduction without fertilization in immature larvae, has been observed chiefly in insects (Dipterous midges), and to this the term *paedogenesis* has been applied.

The theory of parthenogenesis remains doubtful. When Weismann and others began to study the polar bodies, they made the remarkable discovery that in some parthenogenetic eggs only one polar body was extruded, but the meaning of this distinction was blurred when other cases were described in which two polar bodies were formed. Later on, Weismann drew attention to the difference between normal and reducing divisions, and it now appears to be clear that, with one set of exceptions, ova which develop without fertilization are those in which no reducing division takes place and which, accordingly, contain the number of chromosomes normal to the tissue cells of the species. Such eggs, in fact, resemble the zygote except that all their chromosomes are of maternal origin and the centrosome which becomes active in the first segmentation is that of the ovum and not, as in normal fertilized eggs, that which came in with the spermatozoon. The case of the bee and other insects in which parthenogenetic development results in the production of males, is doubtful; it appears to be the case that a reduction division has taken place in the maturation of the egg. A. Petrunkévitch has made the ingenious suggestion, that after the reducing division the normal number of chromosomes is restored by the splitting of each into two. Cases of pathological and artificial parthenogenesis would fall into line, on the supposition that the stimulus acted by preventing the occurrence of a reducing division in an ovum otherwise mature. It is to be noticed, however, that such explanations of parthenogenesis are not much more than a formal harmonizing of the behaviour of the chromosomes in the respective cases of fertilized and parthenogenetic development; they do not provide a theory as to why the process occurs.

Accessory Reproductive Organs and Processes.—It has been already stated that the primary organs of reproduction in animals are the germinal tissues producing respectively spermatozoa and ova, and that in most cases these are aggregated to form testes and ovaries. In certain animals there are no accessory organs, and when the reproductive products are ripe, they are discharged directly to the exterior if the gonads are external, as in some Coelentera, or if they are internal, break through into some cavity of the body and escape by rupture of the body-wall or through some natural aperture. In a majority of cases, however, special ducts are developed, which in the male serve primarily for the escape of the spermatozoa, but secondarily may be associated with intromittent organs. Similarly, in the female, the primary function of the gonad ducts is to provide a passage for the ova, but in many cases they serve also for the reception of spermatozoa, for the development of embryos and for the subsequent exit of the young. Associated with the ovary and the oviducts are many kinds of yolk-glands and shell-glands, the function of which is to form nutritive material for the future embryo, to discharge this into or around the ovum, and to provide protective wrappings. Although, in the last resort, fertilization depends on impulses attracting the spermatozoa to the ova, probably chemical in their nature, the necessary proximity is secured in a number of ways. In many simple cases the ripe products are discharged directly into the surrounding water, and impregnation is a matter of accident highly probable because such animals discharge enormous quantities of ova and spermatozoa, are frequently sessile and live in colonies, and are mature about the same time. In other cases, as, for instance, Tunicates and many Molluscs, the spermatozoa are discharged, and, being drawn into the body of the female with the inhalent currents, there fertilize the ova. In yet a number of other cases, there is sexual congress without intromittence. The males of many fish, such as salmon, attend the females about to discharge their ova, and afterwards pour the male fluid over the liberated eggs; whilst amongst other fish the males seek out a suitable locality and prepare some kind of nest to which the female is enticed and which receives first the ova and then the milt. In many other animals, again, as for instance the frog, the male grasps the ripe female, embracing her firmly for a prolonged period, during which ova and spermatozoa are discharged simultaneously. Where internal fertilization occurs, there are usually special accessory organs. In the female, the terminal portion of the gonad-duct, or of the cloaca, is modified to receive the intromittent organ of the male, or to retain and preserve the seminal fluid. In the male, the terminal portion of the gonad-duct may be modified into an intromittent organ or penis, grooved or pierced to serve as a channel by which the semen is passed into the female. In arthropods, ordinary limbs may be modified for this purpose, or special appendages developed; in spiders, the terminal joints of the pedipalps, or second pair of appendages, are enlarged, and are dipped into the semen, which is sometimes shed into a special web, and are used as intromittent organs; in cuttlefish, one of the "arms" is charged with spermatozoa, is inserted into the mantle cavity of the female and there broken off. In many cases there is a temporary apposition of the apertures of the male and female, with an injection from the male without a special intromittent organ. The females are usually passive during coitus, and there are innumerable varieties of clasping organs developed by the male to retain hold of the female. Finally, the various secondary sexual characters which are developed in males and females and induce association between them by appeals to the senses, must be regarded as accessory reproductive organs and processes (see Sex).

Another set of accessory organs and processes are concerned with what may be termed in the widest sense of the phrase "brood-care." In many cases the relation between parent and offspring ceases with the extrusion of the fertilized ovum, whilst others display every possible grade of parental care. Many of the lower invertebrates choose special localities in which to deposit the ova or embryos, and glands, the viscid secretion of which serves to bind the ova together or to attach them to some external object, are frequently present. In many insects, elaborate preparations are made; special food-plants are selected, cocoons are woven, or, by means of the special organ known as the ovipositor, the eggs are inserted in the tissues of a living or dead host, or in other cases a supply of food is prepared and stored with the young larvae. The eggs or larvae may be attached to the parent and carried about with it, as in the gills of bivalves, the brood-pouches of the smaller Crustacea, the back of the Surinam toad, the vocal sacs of the frog *Rhinoderma*, the expanded ends of the oviducts or the marsupial pouch. In a large number of cases the young are nourished directly from the blood of the mother by some kind of placental connexion, as in some of the sharks, in *Anablebs*, a bony fish, in some lizards and in mammals. In other cases, the young after birth or hatching are fed by the parents, by the special secretion of the mammary glands in the case of mammals, by regurgitated food in many birds and mammals, by salivary secretions or by food obtained and brought to the young by the parents.

Reproductive Period.—In a general way, reproduction begins when the limit of growth has been nearly attained, and the instances of paedogenesis, whether that be parthenogenetic as in midges, or sexual as in the axolotl, must be regarded as an exceptional and special adaptation. In lower animals, where the period of growth is short or indefinite, reproduction begins earlier and is more variable. But, in all cases, surrounding conditions play a great part in hastening or retarding the onset of reproduction. Increased temperature generally accelerates reproductive maturity, excess of food retards it, and sudden privation favours it. In a majority of cases it endures to the end of life, but in some of the higher forms, such as birds and mammals, there is a marked decrease or a cessation of reproductive activity, especially in the case of females, as life advances. In most animals, moreover, periods of reproductive activity alternate with periods of quiescence in a rhythmical series. In its simplest form, the rhythm is seasonal; but although at first associated with actual seasonal changes, it persists in the absence or alteration of these. Many animals brought to Europe from the southern hemisphere come into reproductive activity at the time of year corresponding to the spring or summer of their native home. "Heat," menstruation and ovulation in the higher mammals, including man, are rhythmical, and probably physiologically linked, but the ancestral meaning of the periodicity is unknown.

Reproduction and Increase of the Race.—Two distinct factors are involved in this question—the potential fecundity of organisms, and the chances of the young reaching maturity. The first varies with the actual output of zygotes, and is determined partly by the reproductive drain on the individual, and especially the female in cases where the ova are provided with much food-yolk, partly on the duration of reproductive maturity, and partly on the various adaptive and environmental conditions which regulate the chances of the gametes meeting for fertilization. It is to be noted that as the gametes are simply cells proliferating from the germinal tissue, the potential number that can be produced is almost indefinite; and as it is found that in very closely allied forms the actual number produced varies within very wide limits, it may be assumed that potential fecundity is indefinite. The possibility of zygotes reaching maturity varies first with the individuation of the organism concerned—that is to say, the degree of complexity of its structure—and the duration of the period of its growth; and secondly, with the incidence of mortality on the eggs and immature young. It is plain that a parasite capable of living only on a particular host may give rise to myriads of progeny, and yet, from the difficulty of these reaching the only environment in which they can become mature, might not increase more rapidly than an elephant which carries a single foetus for about two years, and guards it for many years after birth. The probable adaptation of the variable reproductive processes to the average conditions of the race is discussed under the heading Longevity. It may be added here that the adaptation, in all successful cases, appears to be in excess of what would be required merely to replace the losses caused by death, and that there is ample scope for the Malthusian and Darwinian factors. The rate of reproduction tends to outrun the food-supply.

Literature.—Almost any zoological publication may contain matter relating to reproduction, but text-books on Embryology must be specially consulted. The annual volumes of the *Zoological Record*, under the heading "General Subject" until 1906, and thereafter under "Comprehensive Zoology," give a classified subject-index of the literature of the year in which references to the separate parts of the subject are given. Amongst the older memoirs referred to in this article the following are the most important: A. Leeuwenhoek, *Epistolae ad societatem regiam Angliam* (1719); R. A. F. de Réaumur, *Mémoires pour servir à l'histoire des insectes* (Paris, 1734–1742); C. Bonnet, *Œuvres d'histoire naturelle et de philosophie* (Neuchâtel, 1779–1783); L. Spallanzani, *Dissertations relative to the Natural History of Animals and Vegetables* (Eng. trans., 2nd ed., London, 1789); J. L. Prévost et J. B. Dumas, "Observations relatives à l'appareil générateur des animaux mâles," *Ann. Sci. Nat.* i. (1824); K. E. von Baer, *Epistola ad Academiam Scient. Petropolitanam*; Heusinger, *Zeitschrift*, ii. (1828); Léon Dufour, *Recherches anatomiques et physiologique sur les Hémiptères* (Paris 1833); R. Wagner, "Recherches sur la génération," *Ann. Sci. Nat.* viii. (1837); A. Kölliker, *Über das Wesen der sogenannten Saamenthiere*, Froriep, Notizen xix. (1841); M. Barry, "Spermatozoa observed within the Mammiferous Ovum," *Phil. Trans.* (1743); J. J. S. Steenstrup, *On the Alternation of Generations* (Eng. trans., Ray Society, London, 1845); R. Leuckart, *Beiträge zur Lehre der Befruchtung* (Göttingen Nachrichten, 1849); (Sir) R. Owen, *On Parthenogenesis* (London, 1849); H. Nelson, "The Reproduction of Ascaris mystax," *Phil. Trans.* (1852); C. T. E. von Siebold, *On a True Parthenogenesis in Moths and Bees* (Eng. trans., London, 1857); E. van Beneden, "Recherches sur la maturation de l'œuf et la fécondation," *Arch. de biol.* (1883); O. Hertwig, "Das Problem der Befruchtung," *Jen. Zeitsch.* xviii. (1885). (P. C. M.)

Reproduction of Plants

The various modes in which plants reproduce their species may be conveniently classified into two groups, namely, *vegetative propagation* and *true reproduction*, the distinction between them being roughly this, that whereas in the former the production of the new individual may be effected by the most various parts of the body, in the latter it is always effected by means of a specialised reproductive cell.

I. *Vegetative Propagation.*

The simplest case of vegetative multiplication is afforded by unicellular plants. When the cell which constitutes the body of the plant has attained its limit of size it gives rise to two either by division or gemmation; the two cells then grow, and at the same time become separated from each other, so that eventually two new distinct individuals are produced, each of which precisely resembles the original organism. A good example of this is to be found in the germination of the yeast plant. This mode of multiplication is simply the result of the ordinary processes of growth. All plant-cells grow and divide at some time or other of their life; but whereas in a multicellular plant the products of division remain coherent, and add to the number of the cells of which the plant consists, in a unicellular plant they separate and constitute new individuals. In more highly organized plants vegetative propagation may be effected by the separation of the different parts of the body from each other, each such part developing the missing members and thus constituting a new individual. This takes place spontaneously in rhizomatous plants, in which the main stem gradually dies away from behind forwards; the lateral branches thus become isolated and constitute new individuals.

The remarkable regenerative capacity of plant-members is largely made use of for the artificial propagation of plants. A branch removed from a parent-plant will, under appropriate conditions, develop roots, and so constitute a new plant; this is the theory of propagation by "cuttings." A portion of a root will similarly develop one or more shoots, and thus give rise to a new plant. An isolated leaf will, in many cases, produce a shoot and a root, that is, a new plant; it is in this way that new begonias, for instance, are propagated. The production of plants from leaves occurs also in nature, as, for instance, in certain so-called "viviparous" plants, of which *Bryophyllum calycinum* (Crassulaceae) and many ferns [*Nephrodium* (*Lastraea*) *Filix-mas*, *Asplenium* (*Athyrium*) *Filix-foemina* and other species of *Asplenium*] are examples. But it is in the mosses, of all plants, that the capacity for vegetative propagation is most widely diffused. Any part of a moss, whether it be the stem, the leaves, the rhizoids, or the sporogonium, is capable, under appropriate conditions, of giving rise to filamentous protonema, on which new moss-plants are then developed as lateral buds.

In a large number of plants provision is made for vegetative propagation by the development of more or less highly specialized organs. In lichens, for instance, there are the *soredia*, which are minute buds of the thallus containing both algal and fungal elements; these are set free on the surface in large numbers, and each grows into a thallus. In the Characeae there are the *bulbils* or "starch-stars" of *Chara stelligera*, which are underground nodes, and the branches with naked base and the pro-embryonic branches found by Pringsheim on old nodes of *Chara fragilis*. In the mosses small tuberous bulbils frequently occur on the rhizoids, and in many instances (*Bryum annotinum*, *Aulacomnion androgynum*, *Tetraphis pellucida*, &c.) stalked fusiform or lenticular multicellular bodies containing chlorophyll, termed *gemmae*, are produced on the shoots, either in the axils of the leaves or in special receptacles at the summit of the stem. Gemmae of this kind are produced in vast numbers in *Marchantia* and *Lunularia* among the liverworts. Similar gemmae are also produced by the prothallia of ferns. In some ferns (e.g. *Nephrolepis tuberosa* and *undulata*) the buds borne on the leaves or in their axils become swollen and filled with nutritive materials, constituting *bulbils* which fall off and give rise to new plants. This conversion of buds into bulbils, which subserve vegetative multiplication, occurs also occasionally among Phanerogams, as for instance in *Lilium bulbiferum*, species of *Poa*, *Polygonum viviparum*, &c. But many other adaptations of the same kind occur among Phanerogams. Bulbous plants, for instance, produce each year at least one bulb or corm from which a new plant is produced in the succeeding year. In the potato, tubers are developed from subterranean shoots, each of which in the following year gives rise to a new individual. In the dahlia, *Thladiantha dubia*, &c., tuberous swellings are found on the roots, from each of which a new individual may spring.

II. *True Reproduction.*

This is effected by cells formed by the proper reproductive organs. These cells are of two principal kinds. There are, first, those cells each of which is capable of developing by itself into a new organism: these are the *asexual* reproductive cells, known generally as *spores*. Secondly, there are the cells which are incapable of independent germination; it is not until these cells have fused together in pairs that a new organism can be developed: these are the *sexual* reproductive cells or *gametes*.

In some exceptional cases the normal mode of reproduction, sexual or asexual, does not take place: instead, the new organism is developed vegetatively from the parent. When sexual reproduction is suppressed the case is one of *apogamy*; when asexual reproduction by spores is suppressed the case is one of *apospory*. (Apogamy and apospory are discussed below in the section on *Abnormalities of Reproduction.*)

Asexual Reproduction.—Reproduction by means of some kind of spore (using the term in its widest sense, so as to include all asexually produced reproductive cells) is common to nearly all families of plants; it is wanting in certain Algae (Conjugatae, Fucaceae, Characeae), and in certain fungi (*e.g.* some Peronosporeae). The structure of a spore is essentially this: it consists of a nucleated mass of protoplasm, enclosing starch or oil as reserve nutritive material, usually invested by a cell-wall. In those cases in which the spore is capable of germinating immediately on its development the cell-wall is a single delicate membrane consisting of cellulose; but in those cases in which the spore may or must pass through a period of quiescence before germination the wall becomes thickened and may consist of two layers, an inner, the *endospore*, which is delicate and consists of cellulose, and an outer, the *exospore*, which is thick and rigid, frequently darkly coloured and beset externally with spines or bosses, and which consists of cutin. In some few cases among the fungi, multicellular or septate spores are produced; these approximate somewhat to the gemmae mentioned above as highly specialized organs for vegetative propagation. In some cases, particularly among the algae, and also in some fungi (Peronosporeae, Saprolegnieae, Chytridiaceae, and the Myxomycetes), spores are produced which are usually destitute of any cell-wall, and are further peculiar in that they are motile, and are therefore termed *zoospores*; they move sometimes in an amoeboid manner by the protrusion of pseudopodia, but more frequently they are provided with one, two, or many delicate vibratile protoplasmic filaments, termed *cilia*, by the lashing of which the spore is propelled through the water. The zoospore eventually comes to rest, withdraws its cilia, surrounds itself with a cell-wall, and then germinates.

In the simplest case a single spore is developed from the cell of the unicellular plant, the protoplasm of which surrounds itself with the characteristic thick wall. This occurs only in plants of low organization such as the Schizophyta.

In other cases the contents of the cell undergo division, each portion of the protoplasm constituting a spore. Examples of this are afforded, among unicellular plants, by yeast and the Protococcaceae; and in multicellular plants by the Pandorineae, Confervaceae, Ulvaceae, &c., where any cell of the body may produce spores.

In such cases the spore-producing cell may be regarded as a rudimentary reproductive organ of the nature of a *sporangium*. In more highly organized plants special organs are differentiated for the production of spores. In the majority of cases the special organ is a sporangium, that is, a capsule in the interior of which the spores are developed; but in many fungi the spores are formed by abstriction from an organ termed a *sporophore*. In the Thallophyta the sporangium is commonly a single cell. In the Bryophyta it is a multicellular capsule. In the Pteridophyta the sporangium is multicellular, but simple in structure, and this is true also of the Phanerogams.

It is important to note that in all the Bryophyta and in some of the Pteridophyta (most of the Filicinae, all existing Equisetinae, and the Lycopodiaceae and Psilotaceae) there is but one kind of sporangium and spore, the plants being *homosporous* or *isosporous*, whereas the rest of the Pteridophyta (Hydropterideae, Selaginellaceae) and the Phanerogams are *heterosporous*, having sporangia of two kinds; some produce one or a few large spores (*megaspores*), and are hence termed *megasporangia*, while others give rise to a larger number of small spores (*microspores*) and are hence termed *microsporangia*. In the Phanerogams the two kinds of sporangia have received special names: the megasporangium, which produces as a rule only one mature spore (*embryo-sac*), is termed the *ovule*; the microsporangium, which produces a large number of microspores (*pollen-grains*), is termed the *pollen-sac*.

The development of spores, except in the simpler Thallophyta, is more or less restricted to definite parts of the body. Thus in the Red Algae (Florideae) there are the organs known as *stichidia, nemathecia*. In the fungi the number and variety of such organs is very great; they may be described generally as simple and compound *sporophores*: but for a description the article FUNGI should be consulted. In the higher plants the organs are less various. In the Bryophyta the production of spores is restricted to the sporogonium. In the vascular plants (Pteridophyta, Phanerogams) the development of sporangia, speaking generally, is confined to the leaves. In most ferns the sporangiferous leaves (*sporophylls*) do not differ in appearance from the foliage leaves; but in other Pteridophyta (Equisetaceae, Marsiliaceae, some species of *Lycopodium* and *Selaginella*) they present considerable adaptation, and notably in the Phanerogams. In the Phanerogams the specialization is so great that the sporophylls have received special names; those which bear the microsporangia (pollen-sacs) are termed the *stamens*, and those which bear the megasporangia (ovules) are termed the *carpels*. The sporophylls are usually aggregated together on a short stem, forming a shoot that constitutes a flower.

Many terms are employed to indicate the nature of the various kinds of spores, especially among the fungi, but the endless varieties of asexual (and asexually produced) reproductive cells may be grouped under two heads—(1) *Gonidia*, (2) *Spores proper*.

The distinction between these two kinds of asexual reproductive cells is as follows.

The *gonidium* is a reproductive cell that gives rise, on germination, to an organism resembling the parent. For instance, among the algae, the "zoospore" of *Vaucheria* develops into a Vaucheria-plant. There is thus a close connexion between vegetative multiplication and multiplication by means of gonida. The production of gonida is entirely limited to the Thallophyta, and is especially marked in the fungi, though the nature of all the many kinds of reproductive cells formed in this group has not yet been fully investigated. It is, however, wanting in certain algae (Conjugatae, Fucaceae, Characeae) and fungi (some Peronosporeae and Ascomycetes).

The *spore proper* is a reproductive cell that as a rule gives rise, on germination, to an organism unlike that which produced it. For instance, the spore of a fern when it germinates gives rise, not to a fern-plant, but to a prothallium. The apparent exceptions to this rule occur only among the Thallophyta, and are explained below in the section on *Life-history*.

The true spore is developed, usually in a sporangium, after a process of division which presents certain features that call for special notice.

Observation of the process of division of the nucleus (*karyokinesis*) in plants generally has shown (for details see CYTOLOGY) that the linin-reticulum of the resting nucleus breaks up into a definite number of segments, the *chromosomes*, each of which bears a series of minute bodies, the *chromatin-disks* or *chromomeres*, consisting largely of a substance termed *chromatin*. In the ordinary *homotype* divisions of the nuclei the characteristic number of chromosomes is always observable: but when the spore-mother-cells are being formed the number of chromosomes is reduced to one-half. This, if the number of chromosomes of the parent plant be expressed as $2x$ the number in the spore will be x. To take a concrete case: it has been observed by Guignard and others that in the early divisions taking place in the developing anther and ovule of the lily the number of chromosomes is 24; whereas in the later divisions which give rise to the pollen-mother-cells in the one case and to the mother-cell of the embryo-sac in the other, the number of chromosomes is only 12. Thus the development of a spore (as distinguished from a gonidium) is always preceded by a *reducing-* or *heterotype-division*, a process now more generally termed *meiosis* (Farmer). The reduced number of chromosomes in the nucleus of the spore-mother-cell persists in the spore, and in all the cells of the organism to which the spore may give rise. (Meiosis is discussed below in the section on *Sexual Reproduction*.)

It should be explained that cells, to which the name "spore" has also been applied, are formed as the result of a sexual act: such are *zygospores*, *oospores*, and some *carpospores*. But these cells differ from spores proper not only in their mode of origin but also in that their nuclei contain the full double number ($2x$) of chromosomes; hence they may be distinguished as *diplospores*.

Sexual Reproduction.—Sexual reproduction involves the development of sexual organs (*gametangia*) and sexual cells (*gametes*). When the organism is unicellular, as in the lower Green Algae (*e.g.* Protococcaceae, Conjugatae), the cell becomes a sexual organ and its whole protoplasm gives rise to one or more sexual cells: in the higher forms certain parts of the body are specialized as sexual organs. In many of the lower plants the organs present no external distinction of sex (*e.g.* lower Green Algae: the Chytridiaceae, Mucorinae, and some Ascomycetes among the fungi): it is impossible to distinguish between the male and female organs, although it cannot be doubted that the essential physiological difference exists; consequently the organs are merely described as gametangia. The gap between these plants and those with differentiated sexual organs is, however, bridged over by intermediate forms, as explained in the article ALGAE.

When the sexual organs are more or less obviously differentiated into male and female, they present considerable variety of form in different groups of plants, and accordingly bear different names. Thus the male organ is a *pollinodium* in most of the fungi, a *spermogonium* in others (certain Ascomycetes, Uredineae); in all other plants it is an *antheridium*. Similarly the female organ is an *oogonium* in various Thallophyta (Green and Brown Algae: Oomycetous Fungi); a *procarp* in the Red Algae; an *archicarp* in certain Ascomycetous Fungi and in the Uredineae; an *archegonium* in all the higher plants.

It is generally the case that the protoplasm of the sexual organ is differentiated into one or more sexual cells. Thus the gametangium usually gives rise to cells which, as they are externally similar, are termed *isogametes* or simply *gametes*. Certain forms of the male organ, the spermogonium and the antheridium, give rise to male cells which are termed *spermatia* when they are nonciliate, *spermatozoids* when they are ciliated and free-swimming. Again, the female organs termed oogonia and archegonia produce one or more female cells called *oospheres*. But there are important exceptions to this rule. Thus the protoplasm is not differentiated into cells in the gametangium of the Mucorinae; in the male organ (pollinodium), of fungi generally; and in the female organ (procarp) of the Red Algae and (archicarp) of the Ascomycetes and Uredineae.

The immediate product of the fusion of cells, or of undifferentiated protoplasm, derived from sexual organs of opposite sex may be generally termed the *zygote*; but it is not always of the same kind. Thus when two isogametes, or the undifferentiated contents of two gametangia, fuse together, the process is designated *conjugation*, and the product is usually a single cell termed *zygospore*. When an oosphere fuses with a male cell, or with the undifferentiated contents of a male organ, the process is *fertilization*, and the product is a single cell termed *oospore*. When, finally, a female organ with undifferentiated contents receives a male cell, the process again is fertilization; here the product is not a single cell, but a fructification termed *cystocarp* (Red Algae), or *ascocarp* (Ascomycetes) or *aecidium* (Uredineae), containing many spores (*carpospores*).

As a consequence of the diversity in the sexual organs and cells, in the details of the sexual act, and in the product of it, several modes of the sexual process have to be distinguished, which may be conveniently summarized as follows:—

I. *Isogamy*: the sexual process consists in the fusion of either two similar sexual cells (*isogametes*), or two similar sexual organs (*gametangia*): it is termed conjugation, and the product is a *zygospore*. Its varieties are:—

(*a*) Gametes ciliated and free-swimming (*planogametes*), set free into the water where they meet and fuse: lower Green Algae (Protococcaceae, Pandorineae, most Siphonaceae and Confervaceae); some Brown Algae (Phaeosporeae):

(*b*) Gametangia fuse in pairs, and a gamete is differentiated in each: the gametes of each pair fuse, but are not set free and are not ciliated (the Conjugate Green Algae): or, no gametes are differentiated, the undifferentiated contents of the gametangia fusing (Mucorinae among the Fungi).

II. *Oogamy*: male and female organs distinct: the protoplasm of the female organ is differentiated into one or (rarely) more oospheres which usually remain enclosed in the female organ: the contents of the male organ are usually differentiated into one or more male cells: the process is fertilization, the product is an *oospore*.

(A) The sexual organs are unicellular (or coenocytic as in certain Siphonaceous Green Algae and in the Oomycetous Fungi); the female organ is an *oogonium*.

(*α*) The male organ is an *antheridium* giving rise to one or more free-swimming ciliated spermatozoids:

(1) The oogonium contains a single oosphere which is fertilized *in situ*: higher Green Algae (*Volvox*, *Vaucheria*, *Oedogonium*, *Coleochaete*, Characeae); some Brown Algae (*Tilopteris*); among the Fungi, *Monoblepharis*, the only fungus known to have spermatozoids:

(2) The oogonium produces a single oosphere which is extruded and is fertilized in the water: *Dictyota* and some Fucaceae (Brown Algae):

(3) The oogonium contains several oospheres which are fertilized *in situ*: *Sphaeroplea* (Siphonaceous Green Alga):

(4) The oogonium produces more than one oosphere (2–8) which are extruded and are fertilized in the water: certain Brown Algae (*Pelvetia*, *Ascophyllum*, *Fucus*):

(*β*) The male organ is a *pollinodium* which applies itself closely to the oogonium: the amorphous male cell is not ciliated and is not set free:

(1) The oogonium contains a single oosphere which is fertilized *in situ*: Peronosporaceae (Oomycetes):

(2) The oogonium contains several oospheres; Saprolegniaceae: but it is debated whether or not fertilization actually takes place.

(B) The male and female organs are (as a rule) multicellular; the male organ is an *antheridium*, the female an *archegonium*: the archegonium always contains a single oosphere which is fertilized *in situ*.

(*α*) The male cell is a free-swimming ciliated spermatozoid: the antheridium produces more than one (usually very many) spermatozoids, each of which is developed in a single cell: all Bryophyta (mosses, &c.) and Pteridophyta (ferns, &c.): the only Phanerogams in which spermatozoids have been observed are the gymnospermous species *Ginkgo biloba*, *Cycas revoluta*, *Zamia integrifolia*.

(*β*) The male cell is amorphous and passes directly from the pollen-tube into the oosphere (*siphonogamy*): all Phanerogams except the species just mentioned.

It must be explained that in the angiospermous Phanerogams, the male and female organs are so reduced that each is represented by only a single cell: the male, by the *generative cell*, formed in the pollen-grain, which usually divides into two male cells: the female, by the oosphere. The gradual reduction can be traced through the Gymnosperms.

Attention may here be drawn to the fact (see ANGIOSPERMS) that, in several cases, the second male cell has been seen to enter the embryo-sac from the pollen-tube, and its nucleus to fuse with the definitive nucleus (endosperm-nucleus) or with one of the polar nuclei. The significance of this remarkable observation is discussed in the section on the *Physiology of Reproduction*.

III. *Carpogamy*: the sexual organs are (as a rule) differentiated into male and female: the protoplasm of the unicellular or multicellular female organ (archicarp, procarp) is never differentiated into an oosphere: in many cases definite male cells, *spermatia*, are produced and are set free, but they are not ciliated, and frequently have a cell-wall: the process is *fertilization*: the product is a fructification derived essentially from the female organ containing several (sometimes very many) spores (*carpospores*): characteristic of the Red Algae and of the Ascomycetous Fungi.

(A) There are definite male cells (*spermatia*):

(*α*) The female organ is a *procarp*, consisting of an elongated, closed, receptive filament, the *trichogyne*, and of a basal fertile portion, the *carpogonium*: on fertilization the latter grows and gives rise directly or indirectly to a *cystocarp*: the spermatia are each formed in a unicellular antheridium and have no cell-wall at first: they fuse with the tip of the trichogyne: Red Algae (Rhodophyceae or Florideae):

(*β*) The female organ (*archicarp*) resembles the preceding: in fertilization the fertile portion (*ascogonium*) develops into an *ascocarp* containing one or more asci (sporangia) each containing usually eight *ascospores*: the spermatia are formed by abstriction from the filaments (*sterigmata*) lining special receptacles, the *spermogonia*, which are the male organs: certain Ascomycetous Fungi (*e.g.* Laboulbeniaceae, some Lichen-Fungi, *Polystigma*). For the Uredineae, see *Abnormalities of Reproduction*, below).

(B) There are no definite male cells: the more or less distinct male and female organs come into contact, and their undifferentiated contents fuse: the product is an *ascocarp*:

(*α*) The male and female organs are obviously different: the female organ is an *ascogonium*, the male a *pollinodium*: *e.g. Pyronema*, *Sphaerotheca* (Ascomycetes):

(*β*) The male and female organs are quite similar: *e.g. Eremascus*, *Dipodascus* (Ascomycetes).

It may be explained that carpogamy is the expression of sexual degeneration. In the cases last mentioned, when the sexual organs are quite similar, they have reverted to the condition of gametangia. Still further reduction is observable in other Ascomycetes in which one of the sexual organs, presumably the male, is either much reduced or is altogether wanting. Again in the rusts (Uredineae), there are spermatia, but they are functionless (see section on *Abnormalities of Reproduction*). In the highest Fungi, the Autobasidiomycetes, no sexual organs have been discovered.

Details of the Sexual Act.—It has been already stated that the sexual act consists in the fusion of two masses of protoplasm, commonly cells, derived from two organs of opposite sex: but this is only the first stage in the process. The second stage is the fusion of the nuclei, which usually follows quickly upon the fusion of the cells; but nuclear fusion may be postponed so that the two sexual nuclei may be observed in the zygote, as "conjugate" nuclei, and even in the cells of the organism developed from the zygote (*e.g.* Uredineae). The result of nuclear fusion is that the nucleus of the zygote contains the double number of chromosomes—that is, if the number of chromosomes in each of the fusing sexual nuclei be x, the number in the nucleus of the zygote will be $2x$. Moreover, this double number persists in all the cells of the organism developed from the zygote, until it is reduced to one-half by meiosis preceding either the development of the spores, or, less commonly, the development of the sexual cells. But there is yet a third stage, which consists in the temporary fusion of the chromosomes belonging to the two sexual nuclei. This always takes place as a preliminary to meiosis; it may be in the germinating zygote, or after many generations of cells have been formed from it. At the onset of meiosis the ($2x$) chromosomes are seen to be double, one of each pair having been derived from the male and the female cell respectively: the chromosomes of each pair then fuse so that their chromomeres unite along their length, constituting the *pseudo-chromosomes*. The paired chromosomes separate and eventually go to form the two daughter-nuclei, one to each, which thus have half (x) the original number of chromosomes. The daughter-nuclei at once divide homotypically, retaining the reduced (x) number of chromosomes to form the four nuclei of a tetrad of spores (more rarely, *e.g. Fucus*, of sexual cells).

III. *Life-history.*

It will have been gathered from the foregoing sections that plants generally are capable of both sexual and asexual reproduction; and, further, that in different stages of their life-history they possess the diploid ($2x$) number of chromosomes in their nuclei, or the haploid (x) number. It may be at once stated that, in all plants in which sexual reproduction and true meiotic spore-formation exist, these two modes of reproduction are restricted to distinct forms of the plant; the sexual form bears only the sexual organs and is haploid; the asexual form only produces spores and is diploid. Hence all such plants are to this extent *polymorphic*—that is, the plant assumes these two forms in the course of its life-history. When, as in many Thallophyta, one or other of these forms can reproduce itself by means of gonidia, additional forms may be introduced into the life-history, which becomes the more complicated the more pronounced the polymorphism.

The most straightforward life-histories are those presented by the Bryophyta and the Pteridophyta, where there are but the two forms, the sexual and the asexual. In the life-history of a moss, the plant itself bears only sexual organs: it is the sexual form, and is distinguished as the *gametophyte*. The zygote (oospore) formed in the sexual act develops into an organism, the *sporogonium*, which is entirely asexual, producing only spores: it is distinguished as the *sporophyte*. When these spores germinate, they give rise to moss-plants. Thus the two forms, the sexual and the asexual, regularly alternate with each other—that is, the life-history presents that simple form of polymorphism which is known as *alternation of generations*. Similarly, in the life-history of a fern, there is a regular alternation of a sporophyte, which is the fern-plant itself, with a gametophyte, which is the fern-prothallium.

It is pointed out in the preceding section that, as the result of the sexual act, the nucleus of the zygote contains twice as many chromosomes as those of the fusing sexual cells. This $2x$ number of chromosomes persists throughout all the cell-generations derived from the zygote, that is, in the cells constituting the sporophyte, up to the time that it begins to produce spores, when meiosis takes place. Again, the cell-generations derived from the spore, that is, the cells constituting the gametophyte, all have the reduced x number of chromosomes in their nuclei up to the sexual act. Hence the sporophyte may also be designated the *diplophyte* and the gametophyte the *haplophyte* (Strasburger): in other words, the sporophyte is the *pre-meiotic*, the gametophyte the *post-meiotic* generation. Twice in its life-history the plant is represented by a single cell: by the spore and by the zygote. The turning-points in the life-history, the transitions from the one generation to the other, are (1) meiosis, (2) the sexual act.

The course of the life-history in Phanerogams and in those Thallophyta which have been adequately investigated is essentially the same as that of the Bryophyta and of the Pteridophyta as described above, though it is less easy to trace on account of the peculiar relation of the two generations to each other in the Phanerogams and on account of various irregularities that present themselves in the Thallophyta.

In the Phanerogams, as in the Pteridophyta, the preponderating generation is the sporophyte, the plant itself. Inasmuch as they are heterosporous, the gametophyte is represented by a male and a female organism or prothallium, both rudimentary. The male prothallium consists of the few cells formed by the germinating pollen-grain (microspore); and though it is quite independent, since the microspores are shed, it grows parasitically in the tissues upon which the microspore has been deposited in pollination. The female prothallium may consist of many cells with well-developed archegonia, as in the Gymnosperms, or of only a few cells with the female organ reduced to the oosphere, as in the Angiosperms. In either case it is the product of the germination of a megaspore (embryo-sac) which is not shed from its sporangium (ovule): hence it never becomes an independent plant, and was long regarded as merely a part of the sporophyte until its true nature was ascertained, chiefly by the researches of Hofmeister, who first explained the alternation of generations in plants. This intimate and persistent connexion between the two generations affords the explanation of the characteristic features of the Phanerogams, the seed and the flower. The ovule containing the embryo-sac, which eventually contains the embryo, persists as the seed—a structure that is distinctive of Phanerogams, which have, in fact, on this account been also termed Spermatophyta. With regard to the flower, it has been already mentioned that it is, like the cone of an Equisetum or a Lycopodium, a shoot adapted to the production of spores. But it is something more than this: for whereas in Equisetum or Lycopodium the function of the cone comes to an end when the spores are shed, the flower of the Phanerogam has still various functions to perform after the maturation of the spores. It is the seat of the process of *pollination*—that is, the bringing of the pollen-grain by one of various agencies into such a position that a part (the pollen-tube) of the male prothallium developed from it may reach and fertilize the oosphere in the embryo-sac. Thus the flower of Phanerogams is a reproductive shoot adapted not only for spore-production, but also for pollination, for fertilization, and for the consequences of fertilization, the production of seed and fruit. However, in spite of these complications, it is possible to determine accurately the limits of the two generations by the observation of the nuclei. The meiosis preceding the formation of the spores marks the beginning of the (haploid) gametophyte, male and female; and the sexual act marks that of the (diploid) sporophyte.

The difficult task of elucidating the life-histories of the Thallophyta has been successfully performed in certain cases by the application of the method of chromosome-counting, with the result that alternation of generations has been found to be of general occurrence. To begin with the Algae. In the Dictyotaceae (Brown Algae) there are two very similar forms in the life-history, the one bearing asexual reproductive organs (tetrasporangia), the other bearing sexual organs (oogonia and antheridia). It has been shown (Lloyd Williams) that the former is undoubtedly the sporophyte and the latter the gametophyte, since the nuclei of the former contain 32 chromosomes, and those of the latter 16. Meiosis takes place in the mother-cell of the tetraspores, which, on germination, give rise to the sexual form. Quite a different life-history has been traced in *Fucus*, another Brown Alga. Here no spores are produced: there is but one form in the life-history, the *Fucus*-plant, which bears sexual organs and has, on that account, been regarded as a gametophyte. The investigation of the nuclei has, however, shown (Farmer) that the *Fucus*-plant is actually diploid, that it is, in fact, a sporophyte; but since there is no spore-formation, meiosis immediately precedes the development of the sexual cells, which alone represent the gametophyte (see below, *Apospory*).

Similarly, two types of life-history have been discovered in the Red Algae. In *Polysiphonia violacea*, a species in which the tetraspores and the sexual organs are borne by similar but distinct individuals, it has been ascertained (Yamanouchi) that, as in *Dictyota*, meiosis takes place in the mother-cell of the tetraspores, so that the nuclei of these spores, as also those of the sexual plants to which they give rise, contain 20 chromosomes: and further, that the nuclei of the carpospores (diplospores) produced in the cystocarp as the result of fertilization, contain 40 chromosomes, as do also those of the asexual plant to which the carpospores give rise. Hence the sporophyte is represented by the cystocarp and the resulting tetrasporangiate plants: the gametophyte, by the sexual plants. Though it is the rule in the Red Algae that the tetrasporangia and the sexual organs are borne on distinct individuals, yet cases are known in which both kinds of reproductive organs are borne upon the same plant; and to those the above conclusions obviously cannot apply. They have yet to be investigated.

The second type of life-history has been traced in *Nemalion*. Here there is no tetrasporangiate form, consequently meiosis takes place at a different stage in the life-history. It has been observed (Wolfe) that the nuclei of the sexual plant contain 8 chromosomes; those of the gonimoblast-filaments of the developing cystocarp contain 16, whilst those of the carpospores contain 8: hence meiosis takes place in the carposporangia. Here the plant is the gametophyte; the sporophyte is only represented by the cystocarp. The carpospores here are true spores (haplospores).

Among the Green Algae, *Coleochaete* is the only form that has been fully investigated (Allen). Here meiosis takes place in the germinating oospore: consequently the plant is the gametophyte, and the sporophyte is represented only by the oospore, so that the life-history resembles that of *Nemalion*. It is probable that this conclusion is generally true of the whole group; at any rate of those forms (Desmids, *Spirogyra*, *Oedogonium*, *Chara*) which have been more or less investigated.

Turning to the Fungi, somewhat similar results have been obtained in the few forms that have been studied from this point of view. In the sexual Ascomycetes it appears (Harper) that meiosis takes place in the ascocarp just before the development of the spores, so that the life-history essentially resembles that of *Nemalion*. Again, in certain Uredineae, having an aecidium-stage and a teleutospore-stage, which is apparently a sexual process has been observed (Blackman, Christman) which is described in the section on *Abnormalities of Reproduction*, and the life-history is as follows. The sexual act having taken place, a row of aecidiospores is developed in the aecidium, each of which contains two conjugate nuclei derived from the sexual nuclei. The mycelium developed from the aecidiospore, as well as the uredospores and the teleutospores that it bears, shows two conjugate nuclei. When, however, the teleutospore is about to germinate, the two nuclei fuse (thus completing the sexual act) and meiosis takes place. As a result the promycelium developed from the teleutospore, and the sporidia that it produces, are uninucleate: so are also the mycelium developed from the sporidium, and the female organs (archicarps) borne upon it. Hence the limits of the sporophyte are the aecidiospore and the teleutospore: those of the gametophyte, the teleutospore and the aecidiospore.

Similar observations have been made upon other Uredineae with a more contracted life-history. *Phragmidium Potentillae-canadensis* is a rust that has no aecidium-stage: consequently the primary uredospores are borne by the mycelium produced on infection of the host by a sporidium. It has been observed (Christman) that the sporogenous hyphae fuse in pairs, suggesting a sexual act; then the primary uredospores are developed in rows from the fused pairs of hyphae which thus behave as sexual organs (archicarps), and each such uredospore contains two conjugate nuclei. Although the research has not been carried beyond this point, it may be inferred that in this case, as in the preceding, nuclear fusion and meiosis take place in the teleutospore. Here the sporophyte is represented by the uredo-form.

Finally, in some of the fungi in which no sexual organs have yet been discovered, this method of investigation has made it probable that some kind of sexual act takes place nevertheless. Thus in the Uredine *Puccinia malvacearum*, which has only teleutospore- and sporidium-stages, it has been observed (Blackman) that the formation of the teleutospores is preceded by a binucleate condition of the hyphae. The same idea is suggested by the binucleate basidia of the Basidiomycetes, which correspond to the teleutospores of the Uredineae.

The life-histories sketched in the preceding paragraphs show that one of the complexities met with in the Thallophyta is that meiosis does not always take place at the same point in the life-history. In the higher plants the incidence of meiosis is generally, though not absolutely, constant: it may be stated as a rule that in the Bryophyta, Pteridophyta and Phanerogams it takes place in the spore-mother-cells. In the Thallophyta this rule does not hold. In some of them, it is true, meiosis immediately precedes, as in the higher plants, the formation of certain spores, the tetraspores (Dictyotaceae, *Polysiphonia*), the teleutospores (Uredineae): but in others it immediately precedes the development of the sexual organs (Fucaceae), or follows more or less directly upon the sexual act (Green Algae, *Nemalion*, Ascomycetes).

The life-history of most Thallophyta is further complicated by the capacity of the gametophyte of the sporophyte to reproduce themselves by cells termed gonidia, a capacity that is wholly lacking in the higher plants. The karyology of gonidia has not yet been sufficiently investigated: but when, as in the Green Algae and the Oomycetous Fungi, the gonidia are developed by and reproduce the gametophyte, it may be inferred that they, like the gametophyte, are haploid. One case, at any rate, of the reproduction of the sporophyte by gonidia is fully known, that of the Uredineae just described, in which the uredo-form, which is a phase of the sporophyte, is reproduced by the uredo-spores which are binucleate, that is diploid, and may be distinguished as *diplogonidia*. In any case the result is that whereas in the higher plants each of the alternating generations occurs but once in the life-history, in these Thallophyta the life-history may include a succession of gametophytic or of sporophytic forms. This is, in fact, a distinguishing feature of the group. The higher plants present a *regular* alternation of generations: whereas, in the Thallophyta, though they probably all present some kind of alternation of generations, yet it is *irregular* in the various ways and for the various reasons mentioned above.

Sufficient information has been given in the preceding pages to render possible the consideration of the *origin* of alternation of generations. To begin quite at the beginning, it may be assumed that the primitive form of reproduction was purely vegetative, merely division of the unicellular organism when it had attained the limits of its own growth. Following on this came reproduction by a gonidium: that is, the protoplasm of the cell, at the end of its vegetative life, became quiescent, surrounded itself with a proper wall, or was set free as a motile ciliated cell, having in some unexplained way become capable of originating a new course of life (*rejuvenescence*) on germination. Then, as can be well traced in the Brown and Green Algae (see ALGAE), these primitive reproductive cells (gonidia) began to fuse in pairs: in other words, they gradually became sexual. This stage can still be observed in some of these Algae (*e.g.* *Ulothrix*, *Ectocarpus*) where the zoospores (gonidia) may either germinate independently, or fuse in pairs to form a zygote. Gradually the sexuality of these cells became more pronounced: losing the capacity for independent germination, they acquired the external characters of more or less differentiated sexual cells, and the gametangia producing them developed into male and female sexual organs. But this advancing sexual differentiation did not necessarily deprive the plant of the primitive mode of propagation: the sexual organism still retained the faculty of reproduction by gonidia. The loss of this faculty only came with higher development: it is entirely wanting in some of the higher Thallophyta (*e.g.* Fucaceae, Characeae), and in all plants above them in the evolutionary series.

With the introduction of the sexual act, a new kind of reproductive cell made its appearance, the zygote. This cell, as already explained, differs from other kinds of spores and from the sexual cells, in that its necleus is diploid; and with it the sporophyte (diplophyte) was introduced into the life-history. It has been mentioned that in some plants (*e.g.* Green Algae) the zygote is all that there is to represent the sporophyte, giving rise, or germination and after meiosis, to one or more spores. Passing to the Bryophyta, in the simpler forms (*e.g.* *Riccia*), the zygote develops into a multicellular capsule (sporogonium); and in the higher forms into a more elaborate sporogonium, producing many spores. In the Pteridophyta and the Phanerogams, the zygote gives rise to the highly developed sporophytic plant.

Thus the evolution of the sporophyte can be traced from the unicellular zygote, gradually increasing in bulk and in independence until it becomes the equal of the gametophyte (*e.g.* in *Dictyota* and *Polysiphonia*), and eventually far surpasses it (Pteridophyta, Phanerogams). Moreover, the increase in size was attended by the gradual limitation of spore-production to certain parts only, the rest of the tissues being vegetative, assuming the form of stems, leaves, &c. These facts have been formulated in the theory of "progressive sterilization" (Bower), which states that the sporophytic form of the higher plants has been evolved from the simple, entirely fertile, sporophyte of the lower, by the gradually increasing development of the sterile vegetative tissue at the expense of the sporogenous, accompanied by increase in total bulk and in morphological and histological differentiation.

In connexion with the study of the evolution of the sporophyte.

the question arose as to its morphological significance; whether it is to be regarded as a modified form of the gametophyte, or as an altogether new form intercalated in the life-history: in other words, whether the alternation is "homologous" or "antithetic." In certain plants there is a succession of forms which are undoubtedly homologous: for instance, in *Coleochaete* where a succession of individuals without sexual organs is produced by zoospores (gonidia). The main fact that has been established is that the sporophyte, from the simple zygote of the Thallophyta to the spore-bearing plant of the Phanerogams, is characterized by its diploid nuclei; that it is a diplophyte, in contrast to the haplophytic gametophyte. Were these nuclear characters absolutely universal, there could be no question but that the sporophyte is an altogether new antithetic form, and not an homologous generation. But certain exceptions to the rule have been detected, which are described under *Abnormalities of Reproduction*: at present it will suffice to say that such things as a diploid gametophyte and a haploid sporophyte have been observed in certain ferns. It can only be inferred that alternation of generations is not absolutely dependent upon the periodic halving in meiosis and the subsequent doubling by a sexual act, of the number of chromosomes in the nuclei, though the two sets of phenomena usually coincide. It must not, however, be overlooked that these exceptional cases occur in plants presenting an abnormal life-history: the fact remains that where there is both normal spore-formation with meiosis, and a subsequent sexual act, the haploid form is the gametophyte, the diploid the sporophyte. But the actual observation of a haploid sporophyte and of a diploid gametophyte makes it clear that however generally useful the nuclear characters may be in the distinction of sporophyte and gametophyte, they do not afford an absolute criterion, and therefore their value in determining homologies is debatable.

IV. *Abnormalities of Reproduction.*

In what may be regarded as the type of normal life-history, the transition from the one generation to the other is marked by definite processes: there is the meiotic development of spores by the sporophyte, and the sexual production of a zygote, or something analogous to it, by the gametophyte. But it has been mentioned in the preceding pages that the transition may, in certain cases, be effected in other ways, which may be regarded as abnormal, though they are constant enough in the plants in which they occur, in fact as manifestations of reproductive degeneration.

In the first place, the sporophyte may be developed either after an abnormal sexual act, or without any preceding sexual act at all, a condition known as *apogamy*. In the second, the gametophyte may be developed otherwise than from a post-meiotic spore, a condition known as *apospory*.

Apogamy.—The cases to be considered under this head may be arranged in two groups:—

1. *Pseudapogamy: sexual act abnormal.*—The following abnormalities have been observed:—

   (*a*) Fusion of two female organs: observed (Christman) in certain Uredineae (*Caeoma nitens*, *Phragmidium speciosum*, *Uromyces Caladii*) where adjacent archicarps fuse: male cells (spermatia) are present but functionless.

   (*b*) Fusion between nuclei of the same female organ: observed in the ascogonium of certain Ascomycetes, *Humaria granulata* (Blackman), where there is no male organ; *Lachnea stercorea* (Fraser), where the male organ (pollinodium) is present but is apparently functionless.

   (*c*) Fusion of a female organ with an adjacent tissue-cell: observed (Blackman) in the archicarp of some Uredineae (*Phragmidium violaceum*, *Uromyces Poae*, *Puccinia Poarum*): male cells (spermatia) present but functionless.

   (*d*) There is no female organ: fusion takes place between two adjacent tissue-cells of the gametophyte; the sporophyte is developed from diploid cells thus produced, but there is no proper zygote as there is in *a*, *b* and *c*: observed (Farmer) in the prothallium of certain ferns (*Lastraea pseudo-mas*, var. *polydactyla*): male organs (and sometimes female) present but functionless. Another such case is that of *Humaria rutilans* (Ascomycete), in which nuclear fusion has been observed (Fraser) in hyphae of the hypothecium: the asci are developed from these hyphae, and in them meiosis takes place; there are no sexual organs.

2. *Eu-apogamy: no kind of sexual act*—

   (*a*) The gametophyte is haploid:

      (α) The sporophyte is developed from the unfertilized oosphere: no such case of *true parthenogenesis* has yet been observed.

      (β) The sporophyte is developed vegetatively from the gametophyte and is haploid: observed in the prothallia of certain ferns, *Lastraea pseudo-mas*, var. *cristata-apospora* (Farmer and Digby), and *Nephrodium molle* (Yamanouchi).

   (*b*) The gametophyte is diploid (see under *Apospory*):

      (α) The sporophyte is developed from the diploid oosphere: observed in some Pteridophyta, viz. certain ferns (Farmer), *Athyrium Filix-foemina*, var. *clarissima*, *Scolopendrium vulgare*, var. *crispum-Drummondae*, and *Marsilia* (Strasburger); also in some Phanerogams, viz. Compositae (*Taraxacum*, Murbeck; *Antennaria alpina*, Juel; sp. of *Hieracium* (Rosenberg): Rosaceae (*Eu-Alchemilla* sp., Murbeck, Strasburger): Ranunculaceae (*Thalictrum purpurascens*, Overton).

      (β) The sporophyte is developed vegetatively from the gametophyte: observed (Farmer) in the fern *Athyrium Filix-foemina*, var. *clarissima*.

   In all the cases enumerated under *Eu-apogamy*, apogamy is associated with some form of apospory except *Nephrodium molle*, full details of which have not yet been published.

   Many other ferns are known to be apogamous, but they are not included here because the details of their nuclear structure have not been investigated.

Apospory.—The known modes of apospory may be arranged as follows:—

1. *Pseudapospory: a spore is formed but without meiosis, so that it is diploid*—observed only in heterosporous plants, viz. certain species of *Marsilia* (*e.g. Marsilia Drummondii*) where the megaspore has a diploid nucleus (32 chromosomes) and the resulting prothallium and female organs are also diploid (Strasburger); and in various Phanerogams, some Compositae (*Taraxacum* and *Antennaria alpina*, Juel), some Rosaceae (*Eu-Alchemilla*, Strasburger), and occasionally in *Thalictrum purpurascens* (Overton), where the megaspore (embryo-sac) is diploid; in some species of *Hieracium* it has been found (Rosenberg) that adventitious diploid embryo-sacs are developed in the nucellus: these plants are also apogamous.

2. *Eu-apospory: no spore is formed*—of this there are two varieties:

   (*a*) With meiosis: this occurs in some Thallophyta which form no spores; the sporophyte of the Fucaceae bears no spores, consequently meiosis takes place in the developing sexual organs; the Conjugate Green Algae also have no spores, meiosis taking place in the germinating zygospore which develops directly into the sexual plant.

   (*b*) Without meiosis: the gametophyte is developed upon the sporophyte by budding; that is, spore-reproduction is replaced by a vegetative process: for instance, in mosses it has been found possible to induce the development of protonema, the first stage of the gametophyte, from tissue-cells of the sporogonium: similarly, in certain ferns (varieties of *Athyrium Filix-foemina*, *Scolopendrium vulgare*, *Lastraea pseudo-mas*, *Polystichum angulare*, and in the species *Pteris aquilina* and *Asplenium dimorphum*), the gametophyte (prothallium) is developed by budding on the leaf of the sporophyte, and in some of these cases it has been ascertained that the gametophyte so developed has the same number (2*x*) of chromosomes in its nuclei as the sporophyte that bears it—that is, it is diploid.

   Apospory has been found to be frequently associated with apogamy; in fact, in the absence of meiosis, this association would appear to be inevitable.

Combined Apospory and Apogamy.—Instances have been given of the occurrence of both apospory and apogamy in the same life-history; but in all of them there is a regular succession of sporophyte and gametophyte. The cases now to be considered are those in which one or other of the generations gives rise directly to its like, sporophyte to sporophyte, gametophyte to gametophyte, the normally intervening generation being omitted.

It is possible to conceive of this abbreviation of the life-history taking place in various ways. Thus, a sporophyte might be developed from a haploid spore instead of a gametophyte as is the normal case, but this has not been observed: again, a sporophyte might be developed from a diploid spore (as distinguished from a zygote or a diploid oosphere), a possibility that is to some extent realized in the life-history of some Uredineae in which successive forms of the polymorphic sporophyte are developed from diplogonidia. Similarly a gametophyte might be developed from a fertilized or an unfertilized female cell: the latter possibility is to some extent realized in those Algae (*e.g. Ulothrix, Ectocarpus*) in which the sexual cells (isogametes), if they fail to conjugate, germinate independently as gonidia, giving rise to gametophytes.

The more familiar mode is that of vegetative budding, as already mentioned. When a "viviparous" fern or Phanerogam reproduces itself by a bud or a bulbil, both spore-formation and the sexual act are passed over: sporophyte springs from sporophyte. Remarkable cases of this have been observed in certain Phanerogams (*Coelebogyne ilicifolia, Funkia ovata, Nothoscordum fragrans, Citrus*, sp. of *Euonymus, Opuntia vulgaris*) in the ovule of which adventitious embryos are formed by budding from cells of the nucellus: with the exception of *Coelebogyne*, it appears that this only takes place after the oosphere has been fertilized. In other plants it is the gametophyte that reproduces itself by means of gemmae or bulbils, as commonly in the Bryophyta, the prothallia of ferns, &c.

The abnormalities described are all traceable to reproductive degeneration; the final result of which is that true reproduction is replaced more or less completely by vegetative propagation. It may be inquired whether degeneration may have proceeded so far in any plant of sufficiently high organization to present spore-formation, or sexual reproduction, or both, as to cause the plant to reproduce itself entirely and exclusively by the vegetative method. The only such case that suggests itself is that of *Caulerpa* and possibly some other Siphonaceous Green Algae. In this plant no special reproductive organs have yet been discovered, and it certainly reproduces itself by the breaking off of portions of the body which become complete plants: but it is quite possible that reproductive organs may yet be discovered.

V. *Physiology of Reproduction.*

The reproductive capacity of plants, as of animals, depends upon the fact that the whole or part of the protoplasm of the individual can develop into one or more new organisms in one or other of several possible ways. Thus, in the case of unicellular plants, the whole of the protoplasm of the parent gives rise, whether by simple division or otherwise, to one or more new plants. Reproduction necessarily closes the life of the individual: here, as August Weismann long ago pointed out, there is no natural death, for the whole of the protoplasm of the parent continues to live in the progeny. In multicellular plants, on the contrary, the reproductive function is mainly discharged by certain parts of the body, the reproductive organs, the remainder of the body being essentially vegetative—that is, concerned with the maintenance of the individual. In these plants it is only a part of the protoplasm that continues to live in their progeny; the remainder, the vegetative part, eventually dies. It is therefore possible to distinguish in them, on the one hand, the essentially reproductive protoplasm, which may be designated by Weismann's term *germ-plasm*, though without necessarily adopting all that his use of it implies, and the essentially vegetative, mortal protoplasm, the *somatoplasm*, on the other. In the unicellular plant no such distinction can be drawn, for the whole of the protoplasm is concerned in reproduction. But even in the most highly organized multicellular plant this distinction is not absolute: for, as already explained, plants can, in general, be propagated by the isolation of almost any part of the body, that is vegetatively, and this implies the presence of germ-plasm elsewhere than in the special reproductive organs.

If the attempt be made to distinguish between the organs of vegetative propagation and those of true reproduction, the nearest approach would be the statement that the former contain both germ-plasm and somatoplasm, whereas the latter, or at least the reproductive cells, consist entirely of germ-plasm.

The question now arises as to the exact seat of the germ-plasm, and the answer is to be looked for in the results of the numerous researches into the structure and development of the reproductive cells that form so large a part of the biological work of recent years. The various facts already mentioned suffice to prove that the nucleus plays the leading part in the reproductive processes of whatever kind: the general conclusion is justified that no reproductive cell can develop into a new organism if deprived of its nucleus. It may be inferred that the nucleus either actually contains the germ-plasm, or that it controls and directs the activities of the germ-plasm present in the cell. It is not improbable that both these inferences may be true. At any rate there is no sufficient ground for excluding the co-operation of the cytoplasm, especially of that part of it distinguished as *kinoplasm*, in the reproductive processes.

Pursuing the ascertained facts with regard to the nucleus, it is established that the part of it especially concerned is the linin-network which consists of the chromosomes. The behaviour, as already described, of the chromosomes in the various reproductive processes has led to the conclusion that the hereditary characters of the parent or parents are transmitted in and by them to the progeny: that they constitute, in fact, the material basis of heredity (see HEREDITY). They can hardly, however, be regarded as the ultimate structural units, for the simple reason that their number is far too small in relation to the transmissible characters. It has been suggested (Farmer) that the chromomeres are the units, but the number of these would seem to be hardly sufficient. It seems necessary to fall back upon hypothetical ultimate particles, as suggested by Darwin, de Vries and Weismann, which may be generally termed *pangens*. The chromomeres may be regarded as aggregates of such particles, the "ids" of Weismann.

The foregoing considerations make it possible to attempt an explanation of the various reproductive processes.

Vegetative Propagation.—It is easily intelligible that the two individuals produced by the division of a unicellular plant should resemble the parent and each other; for, the division of the parent-nucleus being homotypic, the chromosomes which go to constitute the nucleus of each daughter-cell are alike both in number and in nature, and exactly repeat the constitution of the parent-nucleus.

In the more complicated cases of propagation by bulbils, cuttings, &c., the development of the new individual, or of the missing parts of the individual (roots, &c.), may be ascribed to the presence in the bulbil or cutting of the necessary pangens.

Reproduction by Gonidia.—In this case a single cell gives rise to a complete new organism resembling the parent. The inference is that the gonidium is a portion of the parental germ-plasm, in which all the necessary pangens have been accumulated.

Reproduction by Spores.—In this case, also, an entire organism is developed from a single cell, but with this peculiarity that the resulting organism is unlike that which bore the spore, a peculiarity which has not yet been explained. It has been already stated that the development of true spores involves meiosis, and this process is no doubt related to the behaviour of the spore on germination; but the nature of this relation remains obscure. It might be assumed that, as the result of meiosis, the nucleus of the spore receives only gametophytic pangens. But the assumption is rendered impossible by the fact that the spore gives rise to a sexual organism, the reproductive cells of which, after the sexual act, produce a sporophyte. Clearly sporophytic pangens must be present as well in the spore as in the gametophyte and in its sexual cells. It can only be surmised that they exist there in a latent condition, dominated, as it were, by the gametophytic pangens.

Sexual Reproduction.—Here, again, as yet unanswered questions present themselves. The essence of a sexual cell is that it cannot give rise by itself to a new organism, it is only truly reproductive after the sexual act: this peculiarity is just what constitutes its *sexuality*. Minute investigation has not yet detected any essential structural difference between a sexual cell and a spore; on the contrary, the results so far obtained have established that they essentially agree in being post-meiotic (haploid). Why then do they differ so fundamentally in their reproductive capacities? Again, sexual cells differ in *sex*; but there are as yet no facts to demonstrate any essential structural difference between male and female cells. What is known about them tends to prove their structural similarity rather than their difference. But it is possible that their difference may be chemical, and so not to be detected by the microscope.

The normal *sexual act* has been described as consisting in the fusion, first, of two cells, then of their nuclei, and finally, often after a long interval, of their chromosomes and of their chromomeres in meiosis. What causes determined these fusions is a question that is only partly answered. It is known in certain cases (*e.g.* ferns and mosses) that the male cell is attracted to the female by chemical substances secreted for the purpose by the female organ; that it is a case of *chemiotaxis*. Probably this is more common than experiment has yet shown it to be. It is quite conceivable that the consequent cell-fusion, as also the subsequent fusions of nuclei and of chromosomes, are likewise cases of chemiotaxis, depending upon chemical differences between the fusing structures.

The sexual process can only take place between cells which are related to each other in a certain degree (see HYBRIDISM); that is, it depends upon *sexual affinity*. It is the general rule that it takes place between cells derived from different individuals of the same species; that is, *cross-fertilization* is the rule. This is necessarily the case when the male and female organs are developed upon different individuals, when the plant is said to be *dioecious*. When both kinds of organs are developed upon the same individual (*monoecious*), self-fertilization may and often does occur; but it is commonly hindered by various special arrangements, of which *dichogamy* is the most common; that is, that the male and female organs are not mature at the same time. But though these arrangements favour cross-fertilization, they do not absolutely prevent self-fertilization. In some cases, *cleistogamic* flowers, for instance, self-fertilization alone is possible (see ANGIOSPERMS). The general conclusion is that though cross-fertilization is the more advantageous form of sexual reproduction, still self-fertilization is more advantageous to the species than no fertilization at all.

In considering this subject, it must be borne in mind that the terms used have different meanings when applied to certain heterosporous plants from those which they convey when applied to isosporus plants. In the latter cases their meaning is direct and simple: in the former it is indirect and somewhat complicated. In heterosporous plants generally the actual sexual organs are never borne upon the same individual, there is always necessarily a male and a female gametophyte; so that, strictly speaking, self-fertilization is impossible. But in the Phanerogams, where there is a process preliminary to fertilization, that of *pollination*, which is unknown in other plants, the terms and the conceptions expressed by them are applied, not to the real sexual organs, but to the spores. Thus a dioecious Phanerogam is one in which the microspores are developed by one individual, the megaspores by another; and again, self-fertilization is said to occur when the microspores (pollen) fall upon the stigma of the same flower (see ANGIOSPERMS); but this is really only *self-pollination*.

To return to the sexual process itself. Whatever its nature, two sets of results follow upon the sexual act—(1) a zygote is formed, which is capable of developing into a new organism, from two cells, neither of which could so develop; (2) the hereditary sporophytic characters of the two parents are possessed by the organism so developed. These two results will now be considered in some detail.

(1) *The Relation between the Sexual Act and Reproductive Capacity.*—In the early days of the discovery of the sexual process, it was thought that the capacity for development imparted to the female cell was to be attributed to the doubling of its nuclear substance by the fusion with the male cell. Reproductive capacity does not, however, depend upon the bulk of the nuclear substance, for a spore, like an unfertilized female cell, contains but the x number of chromosomes, and yet it can give rise to a new organism. Again, it has been observed (Winkler) that a non-nucleated fragment of an oosphere of *Cystoseira* (Fucaceae) can be "fertilized" by a spermatozoid and will then grow and divide to form a small embryo, though it necessarily contains only the x number of chromosomes. From this it would appear that some stimulating influence had been exerted by the male cell, and it is probably in this direction that the desired explanation is to be sought. Some important confirmatory facts have been recorded with regard to certain animals (sea-urchins). It has been observed (Loeb) that treatment with magnesium chloride will cause the ova to grow and segment; and similar results have been obtained (Winkler) by treating the ova with a watery extract of the male cells. Hence it may be inferred that the male cell carries with it, either in its cytoplasm (kinoplasm), or in its nucleus, extractable substances, perhaps of the nature of enzymes, that stimulate the female cell to growth.

It may be mentioned that the stimulating effect of fertilization is not necessarily confined to the female cell; very frequently adjacent tissues are stimulated to growth and structural change. In a Phanerogam, for instance, the whole ovule grows and develops into the seed: the development of endosperm in the embryo-sac is initiated by another nuclear fusion, taking place between the second male nucleus and the endosperm-nucleus: the ovary, too, grows to form the fruit, which may be dry and hard or more or less succulent: the stimulating effect may extend to other parts of the flower; to the perianth, as in the mulberry; to the receptacle, as in the strawberry and the apple: or even beyond the flower to the axis of the inflorescence, as in the fig and the pine-apple. Analogous developments in other groups are the calyptra of the Bryophyta, the cystocarps of the Red Algae, the ascocarps of the Ascomycetes, the aecidia of the Uredineae, &c.

(2) *The Relation of the Sexual Act to Heredity.*—The product of the sexual act is essentially a diploid cell, the zygote, which actually is or gives rise to a sporophyte. The sexual heredity of plants consequently presents the peculiar feature that the organism resulting from the sexual act is quite unlike its immediate parents, which are both gametophytes. But it is clear that the sporophytic characters must have persisted, though in a latent condition, through the gametophyte, to manifest themselves in the organism developed from the zygote.

The real question at issue is as to the exact means by which these characters are transmitted and combined in the sexual act. There is a considerable amount of evidence that the hereditary characters are associated with the chromomeres, and that it is rather their linin-constituent than their chromatin which is functional (Strasburger): that they constitute, in fact, the material basis of heredity. From this point of view it is probable that the last phase of the sexual act, the fusion of the chromomeres in meiosis, represents the combination of the two sets of parental characters. What exactly happens in the pseudo-chromosome stage is not known; at any rate this stage offers an opportunity for a complete redistribution of the substance of the chromomeres—in other words, of the parental pangens. It is a striking fact that, in the subsequent nuclear division, the distribution of the chromosomes derived from the male and female parents (when they can be distinguished) seems to be a matter of indifference: they are not equally distributed to the two daughter-nuclei. The explanation would appear to be this, that they are not any longer male and female as they were before meiotic fusion; and that it is because they now contain both male and female nuclear substance that their equal distribution to the daughter-nuclei is unimportant.

The nature of this redistribution of the substance of the chromomeres is still under discussion. Some regard it as essentially a chemical process, resulting in the formation of new compounds: others consider it to be rather a physical process, a new material system being formed in the rearrangement of the pangens; here it must be left for the present.

The various ways in which the parental characters manifest themselves in the progeny are fully dealt with in the articles HEREDITY, HYBRIDISM, MENDELISM. It will suffice to say that the progeny, though maintaining generally the characters of the species, do not necessarily exactly resemble either of the parents, nor do they necessarily present exactly intermediate characters:

they may vary more or less from the type. It is an interesting fact, the full significance of which has not yet been worked out, that, as a rule, plants that vary profusely are those in which the characteristic *2x* number of chromosomes is high (60–100).

Brief reference may be made to the cases of abnormal sexual or pseudo-sexual reproduction described above under *Apogamy*. Taking first the cases of true apogamy, there is clearly no need for any sexual process, for, since no meiotic division has taken place, the gametophyte is diploid; its cells, whether vegetative or contained in female organs, possess the capacity for both development and the transmission of the sporophytic characters. It is not remarkable that such a gametophyte should be able to give rise directly to a sporophyte; but it is remarkable, in the converse case of apospory, that a sporophyte should give rise to a diploid gametophyte rather than to another sporophyte. In the latter case the tendency to the regular development of the alternate form appears to override the influence of the diploid nucleus.

Turning to the various forms of pseudo-apogamy, there are first those in which fusion takes place between two apparently female organs (some Uredineae; Christman), and those in which it takes place between nuclei within the same female organ (*Humaria*; Blackman). If these are to be regarded physiologically as sexual acts, it must be inferred that the fusing organs or nuclei have come to differ from each other to some extent; for it is unthinkable that equivalent female organs or cells should be able to fertilize, or to be fertilized by, one another. There are finally those cases in which apparently vegetative cells take part in the sexual act, as in *Phragmidium* (Blackman), where the female organ fuses with an adjacent vegetative cell, and in the fern-prothallium (Farmer), where the nuclei of two vegetative cells fuse. They would seem to indicate that vegetative cells may, in certain circumstances, contain sufficient germ-plasm to act as sexual organs without being differentiated as such.

An interesting question is that of the origin of apogamy. It is no doubt the outcome of sexual degeneration; but this general statement requires some explanation. In certain cases apogamy seems to be the result of the degeneration of the male organ; as in *Humaria*, where there is no male organ, and in *Lachnea*, where the male organ is rudimentary. In others, as in the Uredineae, it is apparently the female organ that has degenerated, losing its receptive part, the trichogyne; the male cells (spermatia) are developed normally, and there is no reason to believe that they might not fertilize the female organ were there the means of penetrating it. In yet other cases the degeneration occurs at a different stage in the life-history, in the development of the spores. In the apogamous ferns investigated, meiosis is suppressed and apogamy results. In the heterosporous plants which have been investigated (*e.g. Marsilia, Eu-Alchemilla*) it has been observed that the microspores are so imperfectly developed as to be incapable of germinating, so that fertilization is impossible; and it is perhaps to this that the occurrence of apogamy is to be attributed. This abnormal development of the spores may be regarded as a variation; and in most cases it occurs in plants that are highly variable and often have a high *2x* number of chromosomes.

It will be observed that such physiological explanation as can be given of the phenomena of reproduction is based upon the results of the minute investigation of the changes in nuclear structure associated with them. The explanation is often rather suggested than proved, and some fundamental facts still remain altogether unexplained. But it may be anticipated that a method of research which has already so successfully justified itself will not fail in the future to elucidate what still remains obscure.

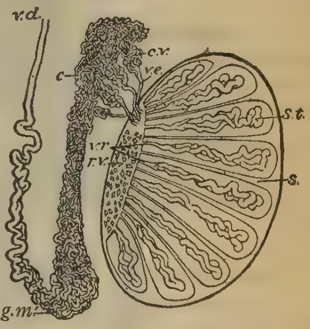
BIBLIOGRAPHY.—This article should be read in connexion with the following: ALGAE, ANGIOSPERMS, BRYOPHYTA, CYTOLOGY, FUNGI, GYMNOSPERMS, HEREDITY, HYBRIDISM, MENDELISM, PLANTS, PTERIDOPHYTA.

As the bibliographies to these articles include all the publications containing the facts and theories mentioned here, it will suffice to append only a few papers of general importance: Blackman and Fraser. "Further Studies on the Sexuality of the Uredineae," *Ann. Bot.* (1906) vol. xx.; Farmer, "On the Structural Constituents of the Nucleus, and their Relation to the Organization of the Individual" (Croonian Lecture), *Proc. Roy. Soc.* (1907) vol. 79, series B; Farmer and Digby, "Studies in Apospory and Apogamy in Ferns," *Ann. Bot.* (1907) vol. xxi.; Strasburger, *Die stofflichen Grundlagen der Vererbung* (1905); "*Apogamie bei Marsilia*," *Flora* (1907), vol. 97; D. M. Mottier, *Fecundation in Plants* (1904), Carnegie Institution, Washington. (S. H. V.*)

REPRODUCTIVE SYSTEM, IN ANATOMY.—The reproductive system in some parts of its course shares structures in common with the urinary system (*q.v.*). In this article the following structures will be dealt with. In the male the testes, epididymis, vasa deferentia, vesiculae seminales, prostate, penis and urethra. In the female the ovaries, Fallopian tubes, uterus, vagina and vulva.

Male Reproductive Organs.

The *testes* or *testicles* are the glands in which the male reproductive cells are formed. They lie, one on each side, in the scrotum surrounded by the tunica vaginalis (see COELOM and SEROUS MEMBRANES). Each is an oval gland about one and a half inches long with its long axis directed downward, backward and inward. There is a strong fibrous coat called the *tunica albuginea*, from which vertical and horizontal septa penetrate into the substance, thus dividing it into compartments or lobules in which the seminiferous tubes are coiled. It is estimated that the total length of these seminiferous tubes in the two glands is little short of a mile. (See fig. 1.)



From A. F. Dixon, Cunningham's *Text-book of Anatomy*.

FIG. 1.—Diagram to illustrate the structure of the testis and epididymis.

c.v.	Coni vasculosi.	*s.t.*	Seminiferous tubule.
c.	Globus major.	*v.d.*	Vas deferens.
g.m'.	Globus minor.	*v.e.*	Vas efferens.
r.v.	Rete testis	*v.r.*	Tubuli recti.
s.	Septula testis.		

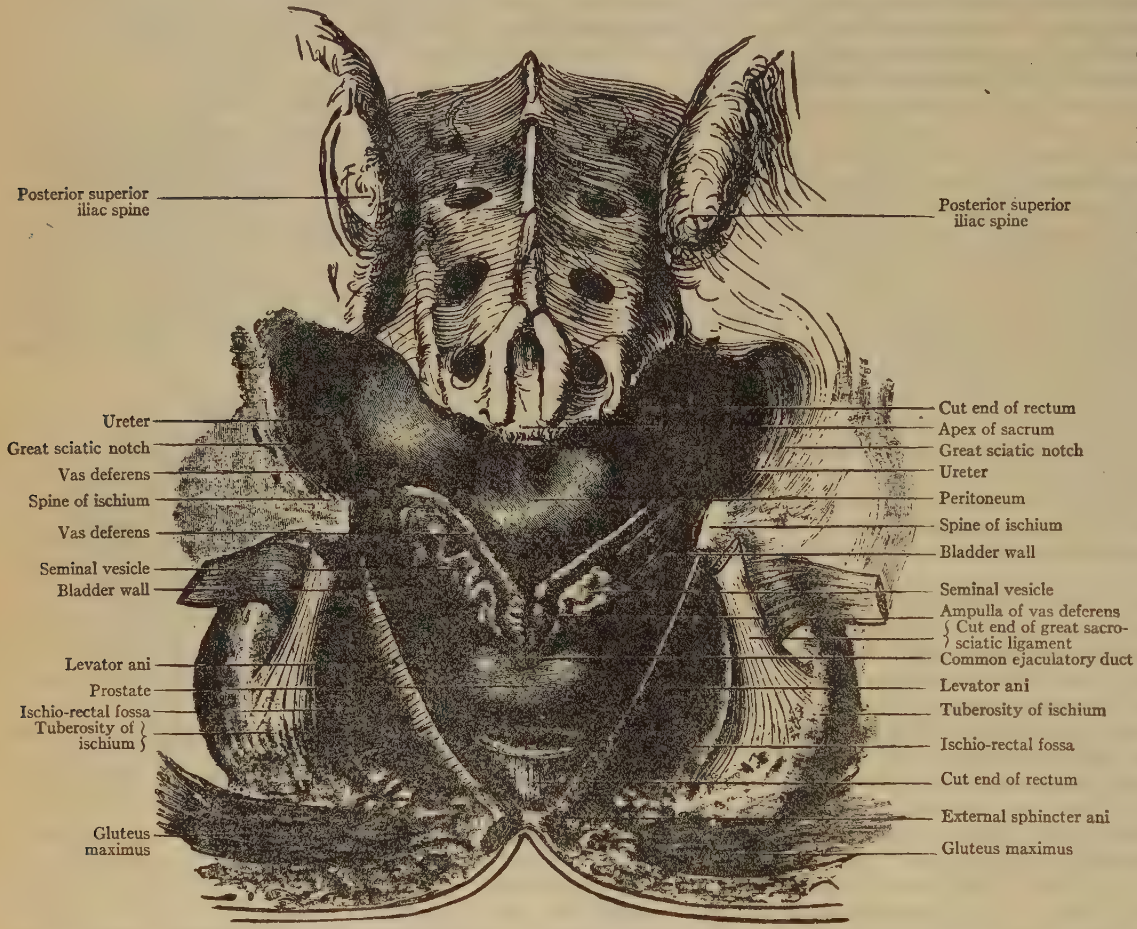
At the posterior part of the testis the fibrous sheath is greatly thickened to form the *mediastinum testis*, and contains a plexus of tubules called the *rete testis* (see fig. 1), into which the seminiferous tubes open. In this way the secretion of the gland is carried to its upper and back part, whence from fifteen to twenty small tubes (*vasa efferentia*) pass to the epididymis. Each of these is convoluted before opening, and forms what is known as a *conus vasculosus*.

Under the microscope the seminiferous tubules are seen to consist of a basement membrane surrounding several layers of epithelial cells, some of which are constantly being transformed into spermatozoa or male sexual cells.

The *epididymis* (see fig. 1) is a soft body lying behind the testis; it is enlarged above to form the *globus major* or head, while below is a lesser swelling, the *globus minor* or tail. The whole epididymis is made up of a convoluted tube about 20 ft. long, from which one long diverticulum (*vas aberrans*) comes off. Between the globus major and the testis two small vesicles called the *hydatids of Morgagni* are often found.

The *vas deferens* is the continuation of the tube of the epididymis and starts at the globus minor; at first it is convoluted, but soon becomes straight, and runs up on the inner (mesial) side of the epididymis to the external abdominal ring in the abdominal wall. On its way up it is joined by several other structures, to form the *spermatic cord*; these are the artery (spermatic) and veins (*pampiniform plexus*) of the testis, the artery of the vas, the ilio-inguinal, genito-crural and sympathetic nerves, and the testicular lymphatics. After entering the external abdominal ring, these structures pass obliquely through the abdominal wall, lying in the inguinal canal for an inch and a half, until the internal abdominal ring is reached. Here they separate and the vas passes down the side of the pelvis and turns inward to meet its fellow at the back of the bladder, just above the prostate. The whole length of the vas is 12 to 18 in. and it is remarkable for the great thickness of its muscular walls, which gives it the feeling of a piece of whipcord when rolled between the finger and thumb.

A little above the globus major a few scattered tubules are found in children in front of the cord; these form the rudimentary structure known as the *organ of Giraldès* or *paradidymis*. As the vas deferens approaches the prostate it enlarges and becomes slightly sacculated to act as a reservoir for the secretion of the testis; this part is the *ampulla* (see fig. 2).


Posterior superior iliac spine
Ureter
Great sciatic notch
Vas deferens
Spine of ischium
Vas deferens
Seminal vesicle
Bladder wall
Levator ani
Prostate
Ischio-rectal fossa
Tuberosity of ischium
Gluteus maximus
Posterior superior iliac spine
Cut end of rectum
Apex of sacrum
Great sciatic notch
Ureter
Peritoneum
Spine of ischium
Bladder wall
Seminal vesicle
Ampulla of vas deferens
Cut end of great sacro-sciatic ligament
Common ejaculatory duct
Levator ani
Tuberosity of ischium
Ischio-rectal fossa
Cut end of rectum
External sphincter ani
Gluteus maximus

From A. F. Dixon, Cunningham's *Text-book of Anatomy.*

FIG. 2.—View of the Base of the Bladder, Prostate, Seminal Vesicles and Vasa Deferentia from behind.

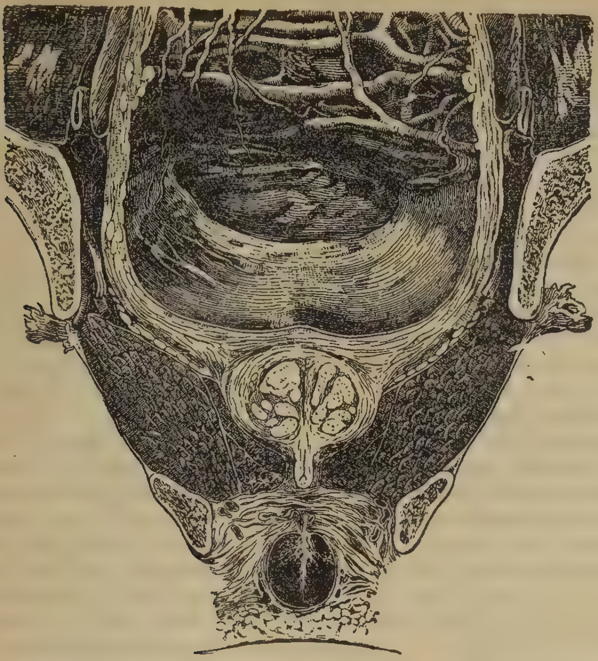
The coccyx and the sacro-sciatic ligaments, together with the muscles attached to them, have been removed. The levatores ani have been separated along the median raphe, and drawn outwards. A considerable portion of the rectum and the upper part of the right seminal vesicle have been taken away.

The *vesiculae seminales* are sac-like diverticula, one on each side, from the lower part of the ampullae of the vasa deferentia. They are about 2 in. long and run outward behind the bladder and parallel to the upper margin of the prostate for some little distance, but usually turn upward near their blind extremity. When carefully dissected and unravelled each is found to consist of a thick tube, about 5 in. long, which is sharply bent upon itself two or three times, and also has several short, sac-like pouches or diverticula. The vesiculae seminales are muscular sacs with a mucous lining which is thrown into a series of delicate net-like folds. The convolutions are held together by the pelvic cellular tissue, and by involuntary muscle continuous with that of the bladder. It is probable that these vesicles are not reservoirs, as was at one time thought, but form some special secretion which mixes with that of the testes. Where the vesiculae join the ampullae of the vasa deferentia the *ejaculatory ducts* are formed; these are narrow and thin-walled, and run, side by side, through the prostate to open into the floor of the prostatic urethra.

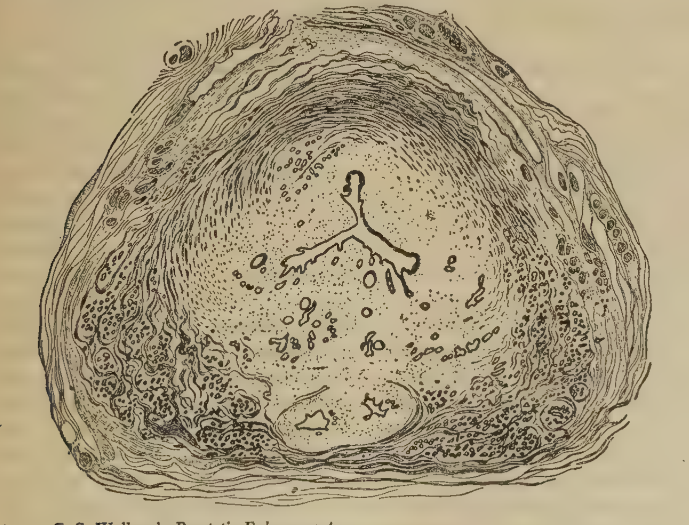
The *prostate* is partly a muscular and partly a glandular structure, situated just below the bladder and traversed by the urethra; it is of a somewhat conical form with the base upward in contact with the bladder. Both vertically and transversely it measures about an inch and a quarter, while antero-posteriorly it is only about three-quarters of an inch, though its size is liable to great variation. It is enclosed in a fibrous capsule from which it is separated by the *prostatic plexus of veins* anteriorly. It is often described as formed of three lobes two lateral and a median or posterior, but careful sections and recent research throw doubt on the existence of the last.

Microscopically the prostate consists of masses of long, slender, slightly branching glands, embedded in unstriped muscle and fibrous tissue; these glands open by delicate ducts (about twenty in number) into the prostatic urethra, which will be described later. In the anterior part of the gland are seen bundles of striped muscle fibres, which are of interest when the comparative anatomy of the gland is studied: they are better seen in young than in old prostates.

The *male urethra* begins at the bladder and runs through the prostate and perineum to the penis, which it traverses as far as the tip. It is divided into a prostatic, membranous and spongy part, and is altogether about 8 inches in length. The *prostatic urethra* runs downward through the prostate rather nearer the anterior than the posterior part. It is about an inch and a quarter long, and in the middle of the gland it bends forward forming an angle (see fig. 5); here it is from a third to half an inch wide, though at the base and apex of the prostate it is narrower. When it is slit open from in front a longitudinal ridge is seen in its posterior wall, which is called the *verumontanum* or *crista urethra*, and on each side of this is a longitudinal depression, the *prostatic sinus*, into which numerous ducts of the prostate open, though some of them open on to the antero-lateral surface. Near the lower part of the verumontanum is a little pouch, the *utriculus masculinus*, about one-eighth of an inch deep, the opening of which is guarded by a delicate membranous circular fold, the *male hymen*. Close to the opening of the utriculus the ejaculatory ducts, already mentioned, open into the urethra by very small apertures. The part of the urethra above the openings of these ducts really belongs to the urinary system only, though it is convenient to describe it here. After leaving the prostate the urethra runs more forward for about three-quarters of an inch, lying between the two layers of the triangular ligament, both of which it pierces. This is known as the *membranous urethra*, and is very narrow, being gripped by the compressor urethrae muscle.

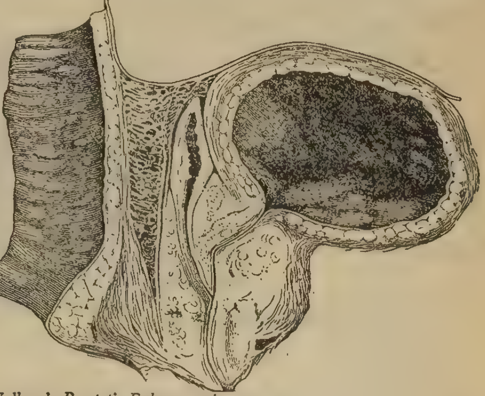

From C. S. Wallace's *Prostatic Enlargement.*[1]
FIG. 3.—Coronal Section through the Pelvis, showing the relations of the bladder above, prostate and bulb below.

The *spongy urethra* is that part which is enclosed in the penis after piercing the anterior layer of the triangular ligament. At first it lies in the substance of the bulb and, later, of the corpus spongiosum, while finally it passes through the glans. In the greater part of its course it is a transverse slit, but in traversing the glans it enlarges considerably to form the *fossa navicularis,* and here, in transverse section, it looks like an inverted T (⊥), then an inverted Y (⅄), and finally at its opening (external meatus) a vertical slit. Into the whole length of the urethra mucous glands (*glands of Littré*) open, and in the roof of the fossa navicularis the mouth of one of these is sometimes so large that it may engage the point of a small catheter and is known as the *lacuna magna.* As a rule the meatus is the narrowest part of the whole canal.


From C. S. Wallace's *Prostatic Enlargement.*
FIG. 4.—Transverse Section of a young Prostate, showing wavy striped muscle in front, urethra in the middle, and the two ejaculatory ducts behind.

Opening into the spongy urethra where it passes through the bulb are the ducts of two small glands known as Cowper's glands, which lie on each side of the membranous urethra and are best seen in childhood.

The *penis* is the intromittent organ of generation, and is made up of three cylinders of erectile tissue, covered by skin and subcutaneous tissue without fat. In a transverse section two of these cylinders (the *corpora cavernosa*) are placed above, side by side, while one, the *corpus spongiosum,* is below. Posteriorly, at what is known as the root of the penis, the two corpora cavernosa diverge, become more and more fibrous in structure, and are attached on each side to the rami of the ischium, while the corpus spongiosum becomes more vascular and enlarges to form the bulb. It has already been pointed out that the whole length of the corpus spongiosum is traversed by the urethra. The anterior part of the penis is formed by the *glans,* a bell-shaped structure, apparently continuous with the corpus spongiosum, and having the conical ends of the corpora cavernosa fitted into depressions on its posterior surface. On the dorsum of the penis the rim of the bell-shaped glans projects beyond the level of the corpora cavernosa, and is known as the *corona glandis.* The skin of the penis forms a fold which covers the glans and is known as the *prepuce* or foreskin; when this is drawn back a median fold, the *frenulum praeputii,* is seen running to just below the meatus. After forming the prepuce the skin is reflected over the glans and here looks like mucous membrane. The structure of the corpora cavernosa consists of a strong fibrous coat, the *tunica albuginea,* from the deep surface of which numerous fibrous trabeculae penetrate the interior and divide it into a number of spaces which are lined with endothelium and communicate with the veins. Between the two corpora cavernosa the sheath is not complete and, having a comb-like appearance, is known as the *septum pectinatum.* The structure of the corpus spongiosum and glans resembles that of the corpora cavernosa, but the trabeculae are finer and the network closer.


From C. S. Wallace's *Prostatic Enlargement.*
FIG. 5.—Sagittal Median Section of Bladder, Prostate and Rectum, showing one of the ejaculatory ducts.

Female Reproductive Organs.

The *ovary* is an organ which in shape and size somewhat resembles a large almond, though its appearance varies considerably in different individuals, and at different times of life. It lies in the side wall of the pelvis with its long axis nearly vertical and having its blunt end (tubal pole) upward. Its more pointed lower end is attached to the uterus by the ligament of the ovary, while its anterior border has a short reflection of peritoneum, known as the *mesovarium,* running forward to the broad ligament of the uterus. It is through this anterior border that the vessels and nerves enter and leave the gland.

Under the microscope the ovary is seen to be covered by a layer of cubical cells, which are continuous near the anterior border with the cells of the peritoneum. Deep to these is the ovarian stroma, composed of fibrous tissue, and embedded in it are numerous nests of epithelial cells, the *Graafian follicles*, in various stages of development. During the child-bearing period of life some of these will be nearing the ripe condition, and if one such be looked at it will be seen to contain one large cell, the *ovum*, surrounded by a mass of small cells forming the *discus proligerus*. At one point this is continuous with a layer of cells called the *stratum granulosum* which lines the outer wall of the follicle, but elsewhere the two layers are separated by fluid, the *liquor folliculi*. When the follicle bursts, as it does in time, the ovum escapes on to the surface of the ovary.

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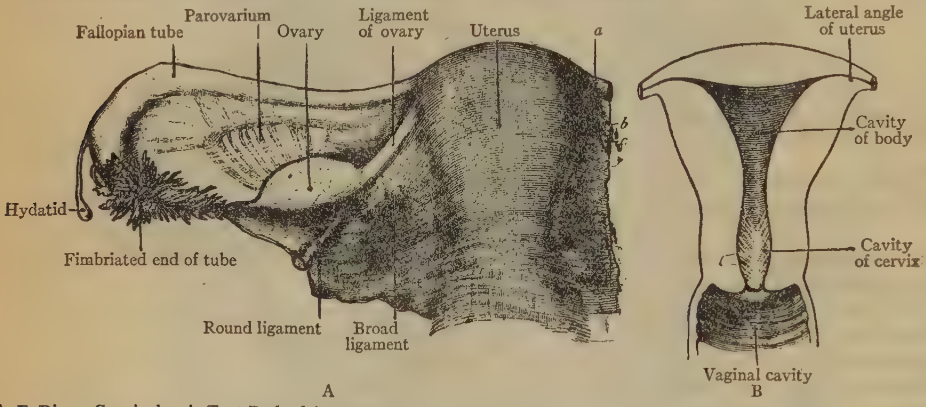
[1] Figs. 3, 4, 5 and 9 of this article are redrawn from Cuthbert S. Wallace's *Prostatic Enlargement* by permission of the managers of The Oxford Medical Publications.

The *Fallopian tubes* receive the ova and carry them to the uterus. That end of each which lies in front of the ovary is called the fimbriated extremity, and has a number of fringes (*fimbriae*) hanging from it; one of the largest of these is the ovarian fimbria and is attached to the upper or tubal pole of the ovary. The small opening among the fimbriae by which the tube communicates with the peritoneal cavity is known as the *ostium abdominale*, and from this the lumen of the tube runs from four to four and a half inches, until it opens into the cavity of the uterus by an extremely small opening. In the accompanying figure (fig. 6) the Fallopian tube and ovary are pulled out from the uterus; this, as has been explained, is not the position of the ovary in the living body, nor is it of the tube, the outer half of which lies folded on the front and inner surface of the ovary. The Fallopian tubes, like many other tubes in the body, are made chiefly of unstriped muscle, the outer layer of which is longitudinal and the inner circular; deep to this are the submucous and mucous coats, the latter being lined with ciliated epithelium (see EPITHELIAL TISSUES), and thrown into longitudinal pleats. Superficially the tube is covered by a serous coat of peritoneum. The calibre gradually contracts from the peritoneal to the uterine opening.



A. F. Dixon, Cunningham's *Text-Book of Anatomy*.

FIG. 6.—A. The Uterus and Broad Ligament seen from behind (the broad ligament has been spread out).

a, *b* and *c*, the isthmus tubae, the ligament of the ovary, and the round ligament of the right side cut short.

B. Diagrammatic Representation of the Uterine Cavity opened up from in front.

The *uterus* or *womb* is a pear-shaped, very thick-walled, muscular bag, lying in the pelvis between the bladder and rectum. In the non-pregnant condition it is about three inches long and two in its broadest part, which is above. The upper half or body of the uterus is somewhat triangular with its base upward, and has an anterior surface which is moderately flat, and a posterior convex. The lower half is the neck or cervix and is cylindrical; it projects into the anterior wall of the vagina, into the cavity of which it opens by the *os uteri externum*. This opening in a uterus which has never been pregnant is a narrow transverse slit, rarely a circular aperture, but in those uteri in which pregnancy has occurred the slit is much wider and its lips are thickened and gaping and often scarred. The interior of the body of the uterus shows a comparatively small triangular cavity (see fig. 6, B), the anterior and posterior walls of which are in contact. The base of the triangle is upward, and at each lateral angle one of the Fallopian tubes opens. The apex leads into the canal of the cervix, but between the two there is a slight constriction known as the *os uteri internum*. The canal of the cervix is about an inch long, and is spindle-shaped when looked at from in front; its anterior and posterior walls are in contact, and its lining mucous membrane is raised into a pattern which, from its likeness to a cypress twig, is called the *arbor vitae*. This arrangement is obliterated after the first pregnancy. On making a mesial vertical section of the uterus the cavity is seen as a mere slit which is bent about its middle to form an angle the opening of which is forward. A normal uterus is therefore bent forward on itself, or anteflexed. In addition to this, its long axis forms a marked angle with that of the vagina, so that the whole uterus is bent forward or anteverted. As a rule, in adults the uterus is more or less on one side of the mesial plane of the body. From each side of the uterus the peritoneum is reflected outward, as a two-layered sheet, to the side wall of the pelvis; this is the *broad ligament*, and between its layers lie several structures of importance. Above, there is the Fallopian tube, already described; below and in front is the round ligament; behind, the ovary projects backward, and just above this, when the broad ligament is stretched out as in fig. 6, are the epoöphoron and paroöphoron with the duct of Gärtner.

The *round ligament* is a cord of unstriped muscle which runs from the lateral angle of its own side of the uterus forward to the internal abdominal ring, and so through the inguinal canal to the upper part of the labium majus.

The *epoöphoron* or *parovarium* is a collection of short tubes which radiate from the upper border of the ovary when the broad ligament is pulled out as in fig. 6. It is best seen in very young children and represents the vasa efferentia in the male. Near the ovary the tubes are closed, but nearer the Fallopian tube they open into another tube which is nearly at right angles to them, and which runs toward the uterus, though in the human subject it is generally lost before reaching that organ. It is known as the duct of Gärtner, and is the homologue of the male epididymis and vas deferens. Some of the outermost tubules of the epoöphoron are sometimes distended to form hydatids. Nearer the uterus than the epoöphoron a few scattered tubules are occasionally found which are looked upon as the homologue of the organ of Giraldès in the male, and are known as the *paroöphoron*.

The *vagina* is a dilatable muscular passage, lined with mucous membrane, which leads from the uterus to the external generative organs; its direction is, from the uterus, downward and forward, and its anterior and posterior walls are in contact, so that in a horizontal section it appears as a transverse slit. As the orifice is neared the slit becomes H-shaped. Owing to the fact that the neck of the uterus enters the vagina from in front, the anterior wall of that tube is only about $2\frac{1}{2}$ in., while the posterior is $3\frac{1}{2}$. The mucous membrane is raised into a series of transverse folds or rugae, and between it and the muscular wall are plexuses of veins forming erectile tissue. The relation of the vagina to the peritoneum is noticed under COELUM and SEROUS MEMBRANES.

The *vulva* or *pudendum* comprises all the female external generative organs, and consists of the mons Veneris, labia majora and minora, clitoris, urethral orifice, hymen, bulbs of the vestibule, and glands of Bartholin. The *mons Veneris* is the elevation in front of the pubic bones caused by a mass of fibro-fatty tissue; the skin over it is covered by hair in the adult. The *labia majora* are two folds of skin, also containing fibro-fatty tissue and covered on their outer surfaces by hair, running down from the mons Veneris to within an inch of the anus and touching one another by their internal surfaces. They are the homologues of the scrotum in the male. The *labia minora* are two folds of skin containing no fat, which are usually hidden by the labia majora and above enclose the clitoris; they are of a pinkish colour and look like mucous membrane.

The *clitoris* is the representative of the penis, and consists of two corpora cavernosa which posteriorly diverge to form the crura clitoridis, and are attached to the ischium; the organ is about an inch and a half long, and ends anteriorly in a rudimentary glans which is covered by the junction of the labia minora; this junction forms the prepuce of the clitoris.

The *orifice of the urethra* is about an inch below the glans clitoridis and is slightly puckered.

The *hymen* is a fold of mucous membrane which surrounds the orifice of the vagina and is usually only seen in the virgin. As has been pointed out above, it is represented in the male by the fold at the opening of the uterus masculinus. Occasionally the hymen is imperforate and then gives rise to trouble in menstruation.

The *bulbs of the vestibule* are two masses of erectile tissue situated one on each side of the vaginal orifice: above they are continued up to the clitoris; they represent the bulb and the corpus spongiosum of the male, split into two, and the fact that they are so divided accounts for the urethra failing to be enclosed in the clitoris as it is in the penis.

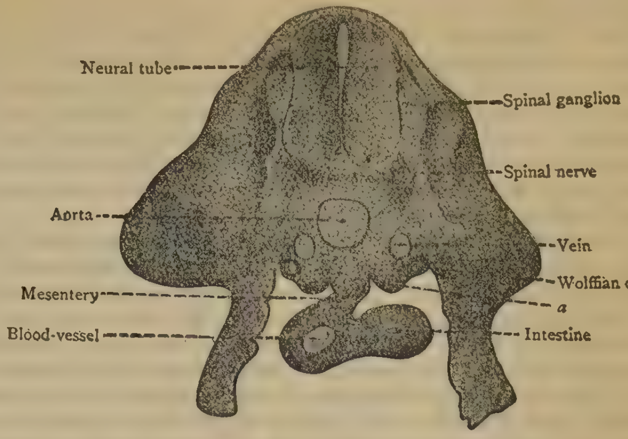
The *glands of Bartholin* are two oval bodies about half an inch long, lying on each side of the vagina close to its opening; they represent Cowper's glands in the male, and their ducts open by minute orifices between the hymen and the labia minora.

From the above description it will be seen that all the parts of the male external genital organs are represented in the female, though usually in a less developed condition, and that, owing to the orifice of the vagina, they retain their original bi-lateral form.

For further details see Quain's *Anatomy* (London: Longmans, Green & Co.); Gray's *Anatomy* (London: Longmans, Green & Co.); Cunningham's *Text-Book of Anatomy* (Edinburgh: Young J. Pentland), or Macalister's *Anatomy* (London: Griffin & Co.).

Embryology.

The development of the reproductive organs is so closely interwoven with that of the urinary that some reference from this article to that on the URINARY SYSTEM is necessary. It will here be convenient to take up the development at the stage depicted in the accompanying figure (fig. 7), in which the genital ridge (*a*) is seen on each side of the attachment of the mesentery; external to this, and forming another slight ridge of its own, is the Wolffian duct, while a little later the Müllerian duct is formed and lies ventral to the Wolffian. The early history of these ducts is indicated in the article on the URINARY SYSTEM. Until the fifth or sixth week the development of the genital ridge is very much the same in the two sexes, and consists of cords of cells growing from the epithelium-covered surface into the mesenchyme, which forms the interior of the ridge. In these cords are some large germ cells which are distinguishable at a very early stage of development. It must, of course, be understood that the germinal epithelium covering the ridge, and the mesenchyme inside it, are both derived from the mesoderm or middle layer of the embryo. About the fifth week of human embryonic life the tunica albuginea appears in the male, from which septa grow to divide the testis into lobules, while the epithelial cords form the seminiferous tubes, though these do not gain a lumen until just before puberty. From the adjacent mesonephros cords of cells grow into the attached part of the genital ridge, or testis, as it now is, and from these the rete testis is developed. Recent research, however, points to these cords of the rete testis et ovarii as being derived from the coelomic epithelium instead of from the mesonephros.



From A. F. Dixon, Cunningham's *Text-Book of Anatomy.*

FIG. 7.—Transverse Section through a Rat Embryo
a. shows position of germinal epithelium.

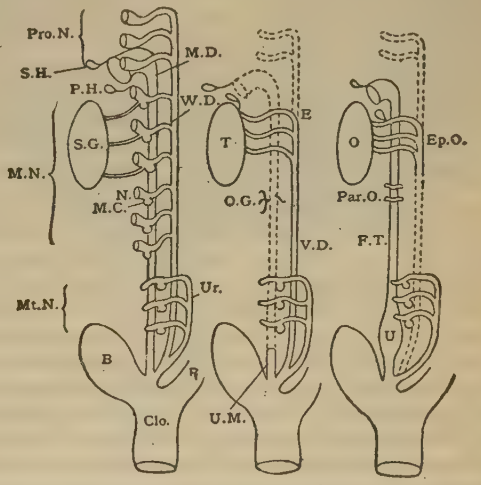


FIG. 8.—Diagram of the Formation of the Genito-Urinary Apparatus. The first figure is the generalized type, the second the male and the third the female specialized arrangements. Suppressed parts are dotted.

Pro. N.	Pronephros.	N.	Nephrostome.
M.N.	Mesonephros.	M.C.	Malpighian corpuscle.
Mt.N.	Metanephros.	T.	Testis.
B.	Bladder.	E.	Epididymis.
Clo.	Cloaca.	O.G.	Organ of Giraldès.
R.	Rectum.	V.D.	Vas deferens.
M.D.	Müllerian duct.	U.M.	Uterus masculinus.
W.D.	Wolffian duct.	O.	Ovary.
Ur.	Ureter.	Ep.O.	Epoöphoron.
S.H.	Sessile hydatid.	Par.O.	Paroöphoron.
P.H.	Pedunculated hydatid.	F.T.	Fallopian tube.
S.G.	Sexual gland.	U.	Uterus.

In the female the same growth of epithelial cords into the mesenchyme of the genital ridge takes place, but each one is distinguished by a bulging toward its middle, in which alone the large germ cells are found. Eventually this bulging part is broken up into a series of small portions, each of which contains one germ cell or ovum, and gives rise to a Graafian follicle. Mesonephric cords appear as in the male; they do not enter the ovary, however, but form a transitory network (*rete ovarii*) in the mesovarium. As each genital gland enlarges it remains attached to the rest of the intermediate cell mass by a constricted fold of the coelomic membrane, known as the *mesorchium* in the male, and the *mesovarium* in the female. Lying dorsal to the genital ridge in the intermediate cell mass is the *mesonephros*, consisting of numerous tubules which open into the Wolffian duct. This at first is an important excretory organ, but during development becomes used for other purposes. In the male, as has been shown, it may form the rete testis, and certainly forms the vasa efferentia and globus major of the epididymis: in addition to these, some of its separate tubes probably account for the vas aberrans and the organ of Giraldès (see fig. 8, E. and O.G.). In the female the tubules of the epoöphoron represent the main part, while the paroöphoron, like the organ of Giraldès in the male, is probably formed from some separate tubes (see fig. 8, Ep. O. and Par. O.).

The Wolffian duct, which, in the early embryo, carries the excretion of the mesonephros to the cloaca, forms eventually the body and tail of the epididymis, the vas deferens, and ejaculatory duct in the male, the vesicula seminalis being developed as a pouch in its course. In the female this duct is largely done away with, but remains as the collecting tube of the epoöphoron, and in some mammals as the duct of Gärtner, which runs down the side of the vagina to open into the vestibule.

The Müllerian duct, as it approaches the cloaca, joins its fellow of the opposite side, so that there is only one opening into the ventral cloacal wall. In the male the lower part only of it remains as the uterus masculinus (fig. 8, U.M.), but in the female the Fallopian tubes, uterus, and probably the vagina, are all formed from it (fig. 8, F.T. and U.). In both sexes a small hydatid or vesicle is liable to be formed at the beginning of both the Wolffian and Müllerian duct (fig. 8, P.H. and S.H.); in the male these are close together in front of the globus major of the epididymis, and are known as the sessile and pedunculated hydatids of Morgagni. In the female there is a hydatid among the fimbriae of the Fallopian tube which of course is Müllerian and corresponds to the sessile hydatid in the male, while another is often found at the beginning of the collecting tube of the epoöphoron and is probably formed by a blocked mesonephric tubule. This is the pedunculated hydatid of the male. The development of the vagina, as Berry Hart (*Journ. Anat. and Phys.* xxxv. 330) has pointed out, is peculiar. Instead of the two Müllerian ducts joining to form the lumen of its lower third, as they do in the case of the uterus and its upper two-thirds, they become obliterated, and their place is taken by two solid cords of cells, which Hart thinks are derived from the Wolffian ducts and are therefore probably of ectodermal origin, though this is open to doubt. These cords later become canalized and the septum between them is obliterated.

The common chamber, or cloaca, into which the alimentary, urinary and reproductive tubes open in the foetus, has the urinary bladder (the remains of the allantois) opening from its ventral wall (see PLACENTA and URINARY SYSTEM).

During development the alimentary or anal part of the cloaca is separated from the urogenital, and in the article ALIMENTARY SYSTEM the hitherto accepted method of this separation is described. The question has, however, lately been reinvestigated by F. Wood Jones, who says that the anal part is completely shut off from the urogenital and ends in a blind pouch which grows toward the surface and meets a new ectodermal depression, the main point being that the permanent anus is not, according to him, any part of the original cloacal aperture, but a new perforation. This description is certainly more in harmony with the malformations occurring in this region than the old one, and only awaits confirmatory evidence to be generally accepted.

The external generative organs have at first the same appearance in the two sexes, and consist of a swelling, the genital eminence, in the ventral wall of the cloaca. This in the male becomes the penis and in the female the clitoris. Throughout the generative system the male organs depart most from the undifferentiated type, and in the case of the genital eminence two folds grow together and enclose the urogenital passage, thus making the urethra perforate the penis, while in the female these two folds remain separate as the labia minora or nymphae. Sometimes in the male the folds fail to unite completely, and then there is an opening into the urethra on the under surface of the penis—a condition known as hypospadias.

In the undifferentiated condition the integument surrounding the genital opening is raised into a horseshoelike swelling with its convexity over the pubic symphysis and its concavity toward the anus; the lateral parts of this remain separate in the female and form the labia majora, but in the male they unite to form the scrotum. The median part forms the mons Veneris or mons Jovis.

The Descent of the Testis.—It has been shown that the testis is formed in the loin region of the embryo close to the kidney, and it is only in the later months of foetal life that it changes this position for that of the scrotum. In the lower part of the genital ridge a fibro-muscular cord is formed which stretches from the lower part of the testis to the bottom of the scrotum; it is known as the gubernaculum testis, and by its means the testis is directed into the scrotum. Before the testis descends, a pouch of peritoneum called the processus vaginalis passes down in front of the gubernaculum through the opening in the abdominal wall, which afterwards becomes the inguinal canal, into the scrotum, and behind this the testis descends, carrying with it the mesonephros and mesonephric duct. These, as has already been pointed out, form the epididymis and vas deferens. At the sixth month the testis lies opposite the abdominal ring, and at the eighth reaches the bottom of the scrotum and invaginates the processus vaginalis from behind. Soon after birth the communication between that part of the processus vaginalis which now surrounds the testis and the general cavity of the peritoneum disappears, and the part which remains forms the tunica vaginalis. Sometimes the testis fails to pass beyond the inguinal canal, and the term "cryptorchism" is used for such cases.

In the female the ovary undergoes a descent like that of the testis, but it is less marked owing to the fact that the gubernaculum becomes attached to the Müllerian duct where that duct joins its fellow to form the uterus; hence the ovary does not descend lower than the level of the top of the uterus, and the part of the gubernaculum running between it and the uterus remains as the ligament of the ovary, while the part running from the uterus to the labium is the round ligament. In rare cases the ovary may be drawn into the labium just as the testis is drawn into the scrotum.

Comparative Anatomy.—In the Urochorda, the class to which Salpa, Pyrosoma and the sea squirts (Ascidians) belong, male and female generative glands (*gonads*) are present in the same individual; they are therefore hermaphrodite.

In the Acrania (Amphioxus) there are some twenty-six pairs of gonads arranged segmentally along the side of the pharynx and intestine and bulging into the atrium. Between them and the atrial wall, however, is a rudimentary remnant of the coelom, through which the spermatozoa or ova (for the sexes are distinct) burst into the atrial cavity. There are no genital ducts.

In the Cyclostomata (lampreys and hags) only one median gonad is found, and its contents (spermatozoa or ova) burst into the coelom and then pass through the genital pores into the urogenital sinus and so to the exterior. It is probable that the single gonad is accounted for by the fact that its fellow has been suppressed.

In the Elasmobranchs or cartilaginous fishes there are usually two testes or two ovaries, though in the dogfish one of the latter is suppressed. From each testis, which in fish is popularly known as the soft roe, vasa efferentia lead into the mesonephros, and the semen is conducted down the vas deferens or mesonephric duct into the urogenital sinus, into which also the ureters open. Sometimes one or more thin-walled diverticula—the sperm sacs—open close to the aperture of the vas deferens. In the female the ova are large, on account of the quantity of yolk, and they burst into the coelum, from which they pass into the large Müllerian ducts or oviducts. In the oviparous forms, such as the common dogfish (Scyllium), there is an oviducal gland which secretes a horny case for the egg after it is fertilized, and these cases have various shapes in different species. Some of the Elasmobranchs, *e.g.*, the spiny dogfish (Acanthias), are viviparous, and in these the lower part of the oviduct is enlarged and acts as a uterus. In male elasmobranchs the anterior part of the Müllerian duct persists. Paired intromittent organs (claspers) are developed on the pelvic fins of the males; these conduct the semen into the cloaca of the female.

In the teleostean and ganoid fishes (Teleostomi) the nephridial ducts are not always used as genital ducts, but special coelomic ducts are formed (see COELOM and SEROUS MEMBRANES).

In the Dipnoi or mudfish long coiled Müllerian ducts are present, but the testes either pour their secretion directly into the coelom or, as in Protopterus, have ducts which are probably coelomic in origin.

In both the Teleostomi and Dipnoi the testes and ovaries are paired.

True hermaphroditism is known among fishes, the hag (Myxine) and the sea perch (Serranus) being examples. In many others it occurs as an abnormality.

In the Amphibia both ovaries and testes are symmetrical. In the snakelike forms which are found in the order Gymnophiona the testes are a series of separate lobules extending for a long distance, one behind the other, and joined by a connecting duct from which vasa efferentia pass into the Malpighian capsules of the kidneys, and so the sperm is conducted to the mesonephric duct, which acts both as vas deferens and ureter. The Müllerian ducts or oviducts are long and often coiled in Amphibia, and usually open separately into the cloaca. There is no penis, but in certain forms, especially the Gymnophiona, the cloaca is protrusible in the male and acts as an intromittent organ. Corpora adiposa or fat bodies are present in all Amphibians, and probably nourish the sexual cells during the hibernating period.

In Reptilia two testes and ovaries are developed, though they are often asymmetrical in position. In Lizards the vas deferens and ureter open into the cloaca by a common orifice; as they do in the human embryo. In these animals there are two penes, which can be protruded and retracted through the vent; but in the higher reptiles (Chelonia and Crocodilia) there is a single median penis rising from the ventral wall of the cloaca, composed of erectile tissue and deeply grooved on its dorsal surface for the passage of the sperm.

In birds the right ovary and oviduct degenerates, and the left alone is functional. In the male the ureter and vas deferens open separately into the cloaca, and in the Ratitae (ostriches) and Anseres (ducks and geese) a well-developed penis is present in the male. In the ostrich this is fibrous, and bifurcated at its base, suggesting the crura penis of higher forms.

Among the Mammalia the Monotremata (Ornithorhynchus and Echidna) have bird-like affinities. The left ovary is larger than the right, and the oviducts open separately into the cloaca and do not fuse to form a uterus. The testes retain their abdominal position; and the vasa deferentia open into the base of the penis, which lies in a separate sheath in the ventral wall of the cloaca, and shows an advance on that of the reptiles and birds in that the groove is now converted into a complete tunnel. In the female there is a well-developed clitoris, having the same relations as the penis.

In the marsupials the cloaca is very short, and the vagina and rectum open separately into it. The two uteri open separately and three vaginae are formed, two lateral and one median. The two lateral join together below to form a single median lower vagina, and it is by means of these that the spermatozoa pass up into the oviducts. The upper median vagina at first does not open into the lower one, but during parturition a communication is established which in some animals remains permanent (see J. P. Hill, *Proc. Linn. Soc. N.S. Wales*, 1899 and 1900). This tripartite arrangement of the upper part of the marsupial vagina is of especial interest in connexion with the views of the embryology of the canal detailed by Berry Hart and already referred to.

When, as in marsupials, the two uteri open separately into the vagina by two ora, the arrangement is spoken of as uterus duplex. When the two uteri join below and open by one os externum, it is known as uterus bipartitus. When the uterus bifurcates above and has two horns for the reception of the Fallopian tubes (oviducts), but is otherwise single, the term uterus bicornis is given to it, while the single uterus of man and other Primates is called uterus simplex. From the marsupials upward the ovarian end of the Fallopian tube has the characteristic fimbriated appearance noticed in human anatomy.

In some mammals, such as the sow and the cow, the Wolffian duct is persistent in the female and runs along the side of the vagina as the duct of Gärtner. It is possible that the lateral vaginae of the marsupials are of Wolffian origin.

In marsupials the testes descend into the scrotum, which lies in these animals in front of instead of behind the penis. In some mammals, such as the elephant, they never reach the scrotum at all; while in others, *e.g.* many rodents, they can be drawn up into the abdomen or lowered into the scrotum. The subject of the descent of the testicles has been very fully treated by H. Klaatsche, "Ueber den Descensus testiculorum," *Morph. Jahrb.*, Bd. xvi.

The prostate is met with in its most simple forms in marsupials, in which it is a mere thickening of the mucous membrane of the urethra; in the sheep it forms a bilateral elongated mass of gland tissue lying behind the urethra and surrounded by a well-developed layer of striped muscle. In the sloth it is said to be altogether absent, while in many of the insectivores and rodents it consists of many lobes which usually show a bilateral arrangement. The vesiculae seminales are usually present in the Eutheria or higher mammals, and sometimes, as in the hedgehog, are very large, though they are absent in the Carnivora. Cowper's glands are usually present and functional throughout life. The uterus masculinus is also usually present, but there is grave doubt whether the large organ called by this name in the rabbit should not rather be regarded as homologous with part of the vesiculae seminales. The penis shows many diversities of arrangement; above the marsupials its two crura obtain an attachment to the ischium. In many mammals it is quite hidden by the skin in the flaccid condition, and its external orifice may range from the perineum in the marsupials to the middle of the ventral wall of the abdomen in the ruminants. In the Marsupialia, Rodentia, Chiroptera, Carnivora and some Primates an os penis is developed in connexion with the corpora cavernosa.

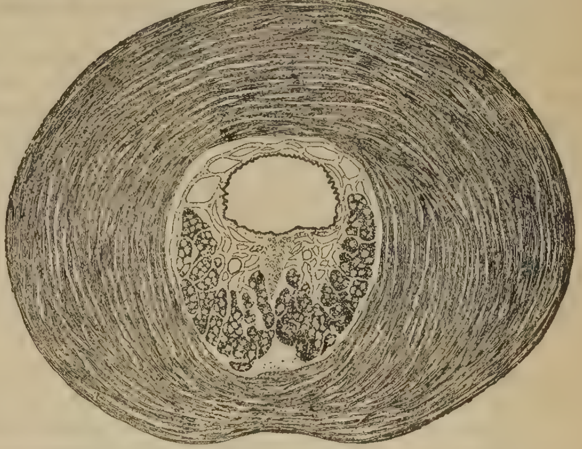

From C. S. Wallace's *Prostatic Enlargement.*

FIG. 9.—Transverse Section of Sheep's Prostate.

The clitoris is present in all mammals; sometimes, as in the female hyena, it is very large, and at others, as in the lemur, it is perforated by the urethra.

For further details and literature, see Oppel's *Lehrbuch der vergleich. mikroskop. Anatomie der Wirbelthiere*, Bd. iv. (Jena, 1904); also Gegenbaur's *Vergleich. Anat. der Wirbelthiere*, and Wiedersheim's *Comparative Anatomy of Vertebrates*, translated by W. N. Parker (London, 1907). (F. G. P.)

REPSOLD, JOHANN GEORG (1771–1830), German instrument maker, was born at Wremen in Hanover on the 23rd of September 1771, and became an engineer and afterwards chief of the fire brigade in Hamburg, where he started business as an instrument maker early in the 19th century. He was killed by the fall of a wall during a fire at Hamburg on the 14th of January 1830. The business was continued by his sons Georg (1804–1884) and Adolf (1806–1871), and his grandsons Johann Adolf and Oskar Philipp.

J. G. Repsold introduced essential improvements in the meridian circles by substituting microscopes (on Jesse Ramsden's plan) for the verniers to read the circles, and by making the various parts perfectly symmetrical. For a number of years the firm furnished meridian circles to the observatories at Hamburg, Königsberg, Pulkova, &c.; later on its activity declined, while Pistor and Martins of Berlin rose to eminence. But after the discontinuance of this firm that of Repsold again came to the front, not only in the construction of transit circles, but also of equatorial mountings and more especially of heliometers (see MICROMETER).

REPTILES (Lat. *Reptilia*, creeping things, from *reptilis*; *repere*, to creep; Gr. ἕρπειν, whence the term "herpetology," for the science dealing with them). In the days before Linnaeus, writers comprised the animals which popularly are known as tortoises and turtles, crocodiles, lizards and snakes, frogs and toads, newts and salamanders, under the name of oviparous quadrupeds or four-limbed animals which lay eggs. Linnaeus, desirous of giving expression to the extraordinary fact that many of these animals pass part of their life in the water and part on land,[1] substituted the name of Amphibia for the ancient term. Subsequent French naturalists (Lyonnet[2] and Brisson[3]) considered that the creeping mode of locomotion was a more general characteristic of the class than their amphibious habits, and consequently proposed the scarcely more appropriate name of *Reptiles*.

As naturalists gradually comprehended the wide gap existing between frogs, toads, &c., on the one hand, and the other oviparous quadrupeds on the other, they either adopted the name of Batrachia for the former and that of Amphibia for the latter, or they restricted the term Amphibia to Batrachians, calling the remainder of these creatures reptiles. Thus the term Amphibia, as used by various authors, may apply (1) to all the various animals mentioned, or (2) to Batrachians only (see BATRACHIA). The term Reptiles (Reptilia) is used (1) by some for all the animals mentioned above, and (2) by others, as in the present article, for the same assemblage of animals after the exclusion of Batrachians.

Equally varying are the limits of the term Saurians, which occurs so frequently in every scientific treatise on this subject. At first it comprised living crocodiles and lizards only, with which a number of fossil forms were gradually associated. As the characters and affinities of the latter became better known, some of them were withdrawn from the Saurians, and at present it is best to abandon the term altogether.

I. HISTORY OF HERPETOLOGY

Certain kinds of reptiles are mentioned in the earliest written records or have found a place among the fragments of the oldest relics of human art. Such evidences, however, form no part of a succinct review of the literature of the subject such as it is proposed to give here. We distinguish in it six periods: (1) the Aristotelian; (2) the Linnaean (formation of a class Amphibia, in which reptiles and Batrachians are mixed); (3) the period of the elimination of Batrachians as one of the reptilian orders (Brongniart); (4) that of the separation of reptiles and Batrachians as distinct subclasses; (5) that of the recognition of a class Reptilia as part of the Sauropsida (Huxley); (6) that of the discovery of fossil skeletons sufficiently well preserved to reveal, in its general outlines, the past history of the class.

Aristotle.

1. *The Aristotelian Period.*—Aristotle was the first to deal with the reptiles known to him as members of a distinct portion of the animal kingdom, and to point out the characteristics by which they resemble each other and differ from other vertebrate and invertebrate animals. The plan of his work, however, was rather that of a comparative treatise of the anatomical and physiological characters of animals than their systematic arrangement and definition, and his ideas about the various groups of reptiles are not distinctly expressed, but must be gleaned from the terms which he employs. Moreover, he paid less attention to the study of reptiles than to that of other classes. This is probably due to the limited number of kinds he could be acquainted with, to which only very few extra-European forms, like the crocodile, were added from other sources. But while we find in some respects a most remarkable accuracy of knowledge, there is sufficient evidence that he neglected everyday opportunities of information. Thus, he has not a single word about the metamorphoses of Batrachians, which he treats of in connexion with reptiles.

Aristotle makes a clear distinction between the scute or scale of a reptile, which he describes as φολίς, and that of a fish, which he designates as λεπίς. He mentions reptiles (1) as oviparous quadrupeds with scutes, viz. Saurians and Chelonians; (2) as oviparous apodals, viz. Snakes; (3) as oviparous quadrupeds without scutes, viz. Batrachians. He considered the first and second of these three groups as much more nearly related to each other than to the third. Accurate statements and descriptions are sadly mixed with errors and stories of, to our eyes, the most absurd and fabulous kind. The most complete accounts are those of the crocodile (chiefly borrowed from Herodotus) and of the chameleon, which Aristotle evidently knew from personal observation, and had dissected himself. The other lizards mentioned by him are the common lizards (σαύρα), the common seps (χαλκίς or ζιγνίς) and the gecko (ἀσκαλαβώτης or κορδύλος). Of snakes (of which he generally speaks as ὄφις) he knew the vipers (ἔχις or ἔχιδνα), the common snake (ὕδρος), and the blindworm (τυφλίνης ὄφις), which he regards as a snake; he further mentions the Egyptian cobra and dragons (δράκων)—North-African serpents of fabulous size. Of Chelonians he describes in a perfectly recognizable manner land tortoises (χελώνη), freshwater turtles (ἐμύς) and marine turtles (χελώνη ἡ θαλαττία).

Passing over eighteen centuries, we find the knowledge of reptiles to have remained as stationary as other branches of natural history, perhaps even more so. The reptile fauna of Europe was not extensive enough to attract the energy of a Belon or Rondelet; popular prejudice and the difficulty of preserving these animals deterred from their study; nor was man sufficiently educated not to give implicit credence to the fabulous tales of reptiles in the 15th and 16th centuries. The art of healing, however, was developing into a science based upon rational principles, and consequently not only those reptiles which formed part of the *materia medica* but also the venomous snakes became objects of study to the physician, though the majority of the writers were ignorant of the structure of the venom-apparatus, and of the distinction between non-venomous and venomous snakes.

Wotton.

Nothing can show more clearly the small advance made by herpetology in this long post-Aristotelian period than a glance at the celebrated work, *De Differentiis Animalium Libri decem* (Paris, 1552), by Edward Wotton (1492–1555). Wotton treats of the reptiles which he designates as *Quadrupedes oviparae et Serpentes* in the sixth book of his work. They form the second division of the *Quadrupedes quae sanguinem habent*, and are subdivided in the following "genera":—

> *Crocodilus et scincus* (cap. cv.); *Testudinum genera* (cvi.); *Ranarum genera* (cvii.); *Lacertae* (cviii.); *Salamandra et seps quadrupes* (cix.); *Stellio* (cx.); *Chamaeleo* (cxi.); *Serpentes* (cxii.), a general account, the following being different kinds of serpents: *Hydrus et alii quidam serpentes aquatiles* (cxiii.); *Serpentes terrestres et primo aspidum genera* (cxiv.); *Vipera, dipsas, cerastes, et hammodytes* (cxv.); *Haemorrhus, sepedon, seps, cenchris, et cenchrites* (cxvi.); *Basiliscus et alii quidam serpentes quorum venenum remedio caret* (cxvii.); *Draco, amphisbaena, et alii quidam serpentes quorum morsus minus affert periculi* (cxviii.).

Wotton's work might with propriety be termed "Aristoteles redivivus." The plan is the same, and the observations of the Greek naturalist are faithfully, sometimes literally, reproduced.

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[1] "Polymorpha in his amphibiis natura duplicem vitam plerisque concessit."

[2] *Théologie des insectes de Lesser* (Paris, 1745), i. 91, note 5.

[3] *Règne animal divisé en neuf classes* (Paris, 1756).

It is surprising that even the reptiles of his native country were most imperfectly known to the author.

Johnston.

With the enlargement of geographical knowledge that of reptiles was also advanced, as is sufficiently apparent from the large encyclopaedic works of Gesner, Aldrovandi and Johnston. The last-named author especially, who published the various portions of his Natural History in the middle of the 17th century, was able to embody in his compilations notices of numerous reptiles observed by Francisco Hernandez in Mexico and by Marcgrave and Piso in Brazil. As the author had no definite idea of the Ray-Linnaean term "species," it is not possible to give the exact number of reptiles mentioned in his work. But it may be estimated at about fifty, not including some marine fishes and fabulous creatures. He figures (or rather reproduces the figures of) about forty—some species being represented by several figures.

Precursors of Linnaeus.

2. *Linnaean Period: Formation of a Class Amphibia.*—Within the century which succeeded these compilatory works (1650–1750) fall the labours which prepared the way for and exerted the greatest influence on Ray and Linnaeus. Although original researches in the field of herpetology were limited in extent and in number, the authors had freed themselves from the purely literary or scholastic tendency. Men were no longer satisfied with reproducing and commenting on the writings of their predecessors; the pen was superseded by the eye, the microscope and the knife, and statements were tested by experiment. This spirit of the age manifested itself, so far as the reptiles are concerned, in Chara's and Redi's admirable observations on the viper, in Major's and Vallisnieri's detailed accounts of the anatomy of the chameleon, in the researches of Jacobaeus into the metamorphoses of the Batrachians and the structure of lizards, in Dufay's history of the development of the salamander (for Batrachians are invariably associated with reptiles proper); in Tyson's description of the anatomy of the rattlesnake, &c. The natural history collections formed by institutions and wealthy individuals now contained not merely skins of crocodiles or serpents stuffed and transformed into a shape to correspond with the fabulous descriptions of the ancient dragons, but, with the discovery of alcohol as a means of preserving animals, reptiles entire or dissected were exhibited for study; and no opportunity was lost of obtaining them from travellers or residents in foreign countries. Fossils also were now acknowledged to be remains of animals which had lived before the Flood, and some of them were recognized as those of reptiles.

Ray.

The contributions to a positive knowledge of the animal kingdom became so numerous as to render the need of a methodical arrangement of the abundance of new facts more and more pressing. Of the two principal systematic attempts made in this period the first ranks as one of the most remarkable steps of the progress of natural history, whilst the second can only be designated as a signal failure, which ought to have been a warning to all those who in after years classified animals in what is called an "artificial system." As the latter attempt, originating with Klein (1685–1759), did not exercise any further influence on herpetology, it will be sufficient to have merely mentioned it. John Ray (1628–1705) had recognized the necessity of introducing exact definitions for the several categories into which the animals had to be divided, and he maintained that these categories ought to be characterized by the structure of animals, and that all zoological knowledge had to start from the "species" as its basis. His definition of reptiles as "animalia sanguinea pulmone respirantia cor unico tantum ventriculo instructum habentia ovipara" fixed the class in a manner which was adopted by the naturalists of the succeeding hundred and fifty years. Nevertheless, Ray was not a herpetologist; his knowledge of reptiles is chiefly derived from the researches of others, from whose accounts, however, everything not based upon reliable demonstration is critically excluded. He begins with a chapter treating of frogs (*Rana*, with two species), toads (*Bufo*, with one species) and tortoises[1] (*Testudo*, with fourteen species). The second group comprises the *Lacertae*, twenty-five in number, and includes the salamander and newts; and the third the *Serpentes*, nine species, among which the limbless lizards are enumerated.

Linnaeus.

Except in so far as he made known and briefly characterized a number of reptiles, our knowledge of this class was not advanced by Linnaeus. That he associated in the 12th edition cartilaginous and other fishes with the reptiles under the name of *Amphibia Nantes* was the result of some misunderstanding of an observation by Garden, and is not to be taken as a premonitory token of the recent discoveries of the relation between Batrachians and fishes. Linnaeus places reptiles, which he calls Amphibia, as the third class of the animal kingdom; he divides the genera thus:—

ORDER 1. REPTILES.—*Testudo* (15 species); *Rana* (17 sp.); *Draco* (2 sp.); *Lacerta* (48 sp., including 6 Batrachians).

ORDER 2. SERPENTES.—*Crotalus* (5 species); *Boa* (10 sp.); *Coluber* (96 sp.); *Anguis* (15 sp.); *Amphisbaena* (2 sp.); *Caecilia* (2 sp.).

None of the naturalists who under the direction or influence of Linnaeus visited foreign countries possessed any special knowledge of or predilection for the study of reptiles; all, however, contributed to our acquaintance with tropical forms, or transmitted well-preserved specimens to the collections at home, so that Gmelin, in the 13th edition of the *Systema Naturae*, was able to enumerate three hundred and seventy-one species.

Laurenti.

The man who, with the advantage of the Linnaean method, first treated of reptiles monographically, was Laurenti. In a small book[2] he proposed a new division of these animals, of which some ideas and terms have survived into our times, characterizing the orders, genera and species in a much more precise manner than Linnaeus, giving, for his time, excellent descriptions and figures of the species of his native country. Laurenti might have become for herpetology what Artedi was for ichthyology, but his resources were extremely limited.

The circumstance that Chelonians are entirely omitted from his *Synopsis* seems due rather to the main object with which he engaged in the study of herpetology, viz. that of examining and distinguishing reptiles reputed to be poisonous, and to want of material, than to his conviction that tortoises should be relegated to another class. He divides the class into three orders:—

1. SALIENTIA, with the genera *Pipa*, *Bufo*, *Rana*, *Hyla*, and one species of "*Proteus*," viz. the larva of *Pseudis paradoxa*.
2. GRADIENTIA, the three first genera of which are Tailed Batrachians, viz. two species of *Proteus* (one being the *P. anguinus*), *Triton* and *Salamandra*; followed by true Saurians—*Caudiverbera*, *Gecko*, *Chamaeleo*, *Iguana*, *Basiliscus*, *Draco*, *Cordylus*, *Crocodilus*, *Scincus*, *Stellio*, *Seps*.
3. SERPENTIA, among which he continues to keep *Amphisbaena*, *Caecilia* and *Anguis*, but the large Linnaean genus *Coluber* is divided into twelve, chiefly from the scutellation of the head and form of the body.

The work concludes with an account of the experiments made by Laurenti to prove the poisonous or innocuous nature of those reptiles of which he could obtain living specimens.

Lacépède.

The next general work on reptiles is by Lacépède. It appeared in the years 1788 and 1790 under the title *Histoire naturelle des quadrupèdes ovipares et des serpens* (Paris, 2 vols. 4to). Although as regards treatment of details and amount of information this work far surpasses the modest attempt of Laurenti, it shows no advance towards a more natural division and arrangement of the genera. The author depends entirely on conspicuous external characters, and classifies the reptiles into (1) oviparous quadrupeds with a tail, (2) oviparous quadrupeds without a tail, (3) oviparous

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[1] In associating tortoises with toads, Ray could not disengage himself from the general popular view as to the nature of these animals, which found expression in the German *Schildkröte* ("Shield-toad").

[2] *Specimen medicum exhibens Synopsin Reptilium emendatam cum experimentis circa venena et antidota Reptilium Austriacorum* (Vienna, 1768, 8vo, pp. 214, with 5 plates).

bipeds (*Chirotes* and *Pseudopus*), (4) serpents,—an arrangement in which the old confusion of Batrachians and reptiles and the imperfect definition of lizards and snakes are continued, and which it is worthy of remark we find also adopted in Cuvier's *Tableau élémentaire de l'histoire naturelle des animaux* (1798), and nearly so by Latreille in his *Histoire naturelle des reptiles* (Paris, 1801, 4 vols. 12 mo). Lacépède's monograph, however, remained for many years deservedly the standard work on reptiles. The numerous plates with which the work is illustrated, are, for the time, well drawn, and the majority readily recognizable.

Brongniart.

3. *The Period of Elimination of Batrachians as one of the Reptilian Orders.*—A new period for herpetology commences with Alex. Brongniart,[1] who in 1799 first recognized the characters by which Batrachians differ from the other reptiles, and by which they form a natural passage to the class of fishes. *Caecilia* (as also *Langaha* and *Acrochordus*) is left by Brongniart with hesitation in the order of snakes, but newts and salamanders henceforth are no more classed with lizards. He leaves the Batrachians, however, in the class of reptiles, as the fourth order. The first order comprises the Chelonians, the second the Saurians (including crocodiles and lizards), the third the Ophidians—terms which have been adopted by all succeeding naturalists. Here, however, Brongniart's merit on the classification of reptiles ends, the definition and disposition of the genera remaining much the same as in the works of his predecessors.

Daudin.

The activity in France in the field of natural science was at this period, in spite of the political disturbances, so great that only a few years after Lacépède's work another, almost identical in scope and of the same extent, appeared, viz. the *Histoire naturelle générale et particulière des reptiles* of F. M. Daudin (Paris, 1802–3, 8 vols. 8vo). Written and illustrated with less care than that by Lacépède, it is of greater importance to the herpetologists of the present day, as it contains a considerable number of generic and specific forms described for the first time. Indeed, at the end of the work, the author states that he has examined more than eleven hundred specimens, belonging to five hundred and seventeen species, all of which he has described from nature. The system adopted is that of Brongniart, the genera are well defined, but ill arranged; it is, however, noteworthy that *Caecilia* takes now its place at the end of the Ophidians, and nearest to the succeeding order of Batrachians.

Duméril, Oppel and Cuvier.

The next step in the development of the herpetological system was the natural arrangement of the genera. This involved a stupendous amount of labour. Although many isolated contributions were made by various workers, this task could be successfully undertaken and completed in the Paris Museum only, in which, besides Seba's and Lacépède's collections, many other herpetological treasures from other museums had been deposited by the victorious generals of the empire, and to which, through Cuvier's reputation, objects from every part of the world were attracted in a voluntary manner. The men who devoted themselves to this task were A. M. C. Duméril, Oppel and Cuvier himself. Oppel was a German who, during his visit to Paris (1807–1808), attended the lectures of Duméril and Cuvier, and at the same time studied the materials to which access was given to him by the latter in the most liberal manner. Duméril [2] maintains that Oppel's ideas and information were entirely derived from his lectures, and that Oppel himself avows this to be the case. The passage,[3] however, to which he refers is somewhat ambiguous, and it is certain that there is the greatest possible difference between the arrangement published by Duméril in 1806 (*Zoologie Analytique*, Paris, 8vo) and that proposed by Oppel in his *Ordnungen, Familien, und Gattungen der Reptilien* (Munich, 1811, 4to). There is no doubt that Oppel profited largely by the teaching of Duméril; but, on the other hand, there is sufficient internal evidence in the works of both authors, not only that Oppel worked independently, but also that Duméril and Cuvier owed much to their younger fellow-labourer, as Cuvier himself indeed acknowledges more than once.

Oppel's classification may be shortly indicated thus:—

Order 1. TESTUDINATA or CHÉLONIENS.
Fam. 1. Chelonii (gen. *Mydas*, *Coriacea*).
Fam. 2. Amydae (gen. *Trionyx*, *Chelys*, *Testudo*, *Emys*).
Order 2. SQUAMATA.
Sect. A. Saurii.
Fam. 1. Crocodilini (gen. *Crocodilus*, *Gavialis*, *Alligator*).
Fam. 2. Geckoides (gen. *Gecko*, *Stellio*, *Agama*).
Fam. 3. Iguanoides (gen. *Camaeleo*, *Draco*, *Iguana*, *Basiliscus*, *Lophyrus*, *Anolis*).
Fam. 4. Lacertini (gen. *Tupinambis*, *Dracaena*, *Lacerta*, *Tachydromus*).
Fam. 5. Scincoides (gen. *Scincus*, *Seps*, *Scheltopusik*, *Anguis*).
Fam. 6. Chalcidici (gen. *Chalcides*, *Bimanus*, *Bipes*, *Ophisaurus*).
Sect. B. Ophidii.
Fam. 1. Anguiformes (gen. *Tortrix*, *Amphisbaena*, *Typhlops*).
Fam. 2. Constrictores (gen. *Boa*, *Eryx*).
Fam. 3. Hydri (gen. *Platurus*, *Hydrophis*).
Fam. 4. Pseudo-viperae (gen. *Acrochordus*, *Erpeton*).
Fam. 5. Crotalini (gen. *Crotalus*, *Trigonocephalus*).
Fam. 6. Viperini (gen. *Vipera*, *Pseudoboa*).
Fam. 7. Colubrini (gen. *Coluber*, *Bungarus*).
Order 3. NUDA or BATRACII.

In this classification we notice three points, which indicate a decided progress towards a natural system. (1) The four orders proposed by Brongniart are no more considered co-subordinate in the class, but the Saurians and Ophidians are associated as sections of the same order, a view held by Aristotle but abandoned by all following naturalists. The distinction between lizards and snakes is carried out in so precise a manner that one genus only, *Amphisbaena*, is wrongly placed. (2) The true reptiles have now been entirely divested of all heterogeneous elements by relegating positively *Caecilia* to the Batrachians, a view for which Oppel had been fully prepared by Duméril, who pointed out in 1807 that "les cécilies se rapprochent considérablement des batraciens auxquels elles semblent lier l'ordre entier des serpens."[4] (3) An attempt is made at arranging the genera into families, some of which are still retained at the present day.

In thus giving a well-merited prominence to Oppel's labours we are far from wishing to detract from the influence exercised by the master spirit of this period, Cuvier. Without his guidance Oppel probably never would have found a place among the promoters of herpetological science. But Cuvier's principal researches on reptiles were incidental or formed part of some more general plan; Oppel concentrated his on this class only. Cuvier adopts the four orders of reptiles proposed by Brongniart as equivalent elements of the class, and restores the blind-worms and allied lizards and, what is worse, also the Caecilias, to the Ophidians. The chameleons and geckos are placed in separate groups, and the mode of dividing the latter has been retained to the present day. Also a natural division of the snakes, although the foreign elements mentioned are admitted into the order, is sufficiently indicated by his arrangement of the "vrais serpens proprement dits" as (1) non-venomous snakes, (2) venomous snakes with several maxillary teeth, and (3) venomous snakes with isolated poison-fangs. He distinguishes the species of reptiles with a precision not attained in any previous work.

Cuvier's researches into the osteology of reptiles had also the object of discovering the means of understanding the fossil remains which now claimed the attention of French, English and German naturalists. Extinct Chelonian and Crocodilian remains, *Pterodactylus*, *Mosasaurus*, *Iguanodon*, *Ichthyosaurus*, *Teleosaurus*, became the subjects of Cuvier's classical treatises, which form the contents of the 5th volume (part 2) of his *Recherches sur les ossemens fossiles, où l'on rétablit les caractères des plusieurs animaux dont les révolutions du globe ont détruit les espèces* (new ed., Paris, 1824, 4to).

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[1] *Bull. Acad. Sci.* (1800), Nos. 35, 36.

[2] *Erpét. génér.*, i. p. 259.

[3] "Wäre es nicht die Ermunterung . . . dieser Freunde gewesen, so würde ich überzeugt von den Mängeln, denen eine solche Arbeit bei aller möglichen Vorsicht doch unterworfen ist, es nie gewagt haben, *meine* Eintheilung bekannt zu machen, obwohl *selbe* Herr Duméril in seinen Lectionen vom Jahre 1809 schon vorgetragen, und die Thiere im Cabinet darnach bezeichnet hat" (preface, p. viii). A few lines further on he emphatically declares that the classification is based upon his own researches.

[4] *Memoires de zoologie et d'anatomie comparée* (Paris, 1807, 8vo), p. 45.

Blainville.

All the succeeding herpetologists adopted either Oppel's or Cuvier's view as to the number of orders of reptiles, or as to the position Batrachians ought to take in their relation to reptiles proper, with the single exception of D. de Blainville. He divided the "oviparous subtype" of Vertebrates into four classes, Birds, Reptiles, Amphibians and Fishes,[1] a modification of the system which is all the more significant as he designates the reptiles "*Squammifères Ornithoides, écailleux,*" and the amphibians "*Nudipellifères, Ichthyoides nus.*" In these terms we perceive clear indications of the relations which exist to the class of birds on the one hand, and to that of fishes on the other; but, unfortunately, Blainville himself did not follow up the ideas thus expressed, and abandoned even the terms in a later edition of his systematic tables.

Merrem.

The direct or indirect influence of the work of French anatomists manifested itself in the systems of the other herpetologists of this period. The Crocodiles, especially, which hitherto (strange to say, even in Cuvier's classification) had been placed as one of the families of Saurians, now commence to be separated from them. Merrem (*Versuch eines Systems der Amphibien*, Marburg, 1820, 8vo) distinguishes two classes of "Amphibians," Pholidota and Batrachia.

The Pholidota (or Reptiles) are divided into three orders, distinguished chiefly by osteological and splanchnological characters:—

1. Testudinata.
2. Loricata (=Crocodiles).
3. Squamata (=Oppel's *Squamata*, excluding Crocodiles).

Merrem's subdivision of the *Squamata* into (1) *Gradientia* (=limbed *Lacertilia*), (2) *Repentia* (=limbless *Lacertilia*), (3) *Serpentia* (=Snakes and *Amphisbaena*), (4) *Incedentia* (=*Chirotes*), and (5) *Predentia* (=Chamaeleons) was based chiefly on the modifications of the limbs, and not adopted by his successors. The greater part of his work is occupied with a synopsis of all the species of Reptiles known, each being shortly characterized by a diagnosis; but, as only a small proportion (about one hundred and seventy) were known to him from autopsy, this synopsis has all the faults of a compilation.

Latreille.

Gray.

Latreille, who commenced the study of reptiles as early as 1801, had kept pace with the progress of science when he published, in 1825, his *Familles naturelles du règne animal* (Paris, 1825, 8vo). He separated the Batrachians as a *class* from the Reptiles, and the latter he divides into two sections only, Cataphracta and Squamosa—in the former Crocodiles being associated with the Chelonians. He bases this view on the development of a carapace in both, on the structure of the feet, on the fixed quadrate bone, on the single organ of copulation. None of the succeeding herpetologists adopted a combination founded on such important characters except J. E. Gray, who, however, destroyed Latreille's idea of Cataphracta by adding the Amphisbaenians[2] as a third order.

Wagler.

A mass of new materials now began to accumulate from all parts of the world in European museums. Among others, Spix had brought from Brazil a rich spoil to the Munich Museum, and the Bavarian Academy charged Joh. Wagler to prepare a general system of reptiles and batrachians. His work,[3] the result of ten years' labour, is a simple but lasting monument to a young naturalist,[4] who, endowed with an ardent imagination, only too frequently misinterpreted the evidence of facts, or forced it into the service of preconceived ideas. Cuvier had drawn attention to certain resemblances in some parts of the osseous structure of *Ichthyosaurus* and *Pterodactylus* to dolphins, birds, crocodiles, &c. Wagler, seizing upon such analogical resemblances, separated those extinct Saurians from the class of Reptiles, and formed of them and the Monotremes a distinct class of Vertebrates, intermediate between mammals and birds, which he called Gryphi. We must admit that he made free use of his imagination by defining his class of Gryphi as "vertebrates with lungs lying free in the pectoral cavity; oviparous development of the embryo (within or) without the parent; the young fed (or suckled?) by the parents." By the last character this Waglerian class is distinguished from the reptiles.

Reptiles (in which Wagler includes Batrachians) are divided into eight orders: Testudines, Crocodili, Lacertae, Serpentes, Angues, Caeciliae, Ranae and Ichthyodi. He has great merit in having employed, for the subdivision of the families of lizards, the structure of the tongue and the mode of insertion of the teeth in the jaws. On the other hand, Wagler entirely failed in arranging snakes in natural families, venomous and non-venomous types being mixed in the majority of his groups.

Fitzinger.

L. Fitzinger was Wagler's contemporary; his first work[5] preceded Wagler's system by four years. As he says in the preface, his object was to arrange the reptiles in "a natural system." Unfortunately, in order to attain this object, Fitzinger paid regard to the most superficial points of resemblance; and in the *tabula affinitatum generum* which he constructed to demonstrate "the progress of nature" he has been much more successful in placing closely allied generic forms in contiguity than in tracing the relationships of the higher groups. That table is prepared in the form of a genealogical tree, but Fitzinger wished to express thereby merely the amount of morphological resemblance, and there is no evidence whatever in the text that he had a clear idea of genetic affinity. The Batrachians are placed at the bottom of the scheme, leading through Hyla to the Geckos (clearly on account of the digital dilatations) and through Caecilia to Amphisbaena. At the top Draco leads through Pterodactylus to the Bats (Pteropus), Ichthyosaurus to the Cetaceans (Delphinus), Emys to the Monotremes, Testudo to Manis, and the Marine Turtles to the Divers and Penguins.

In Fitzinger's system the higher groups are, in fact, identical with those proposed by Merrem, while greater originality is shown in the subdivision of the orders. He differed also widely from Wagler in his views as to the relations of the extinct forms. The order of Loricata consists of two families, the Ichthyosauroidea and Crocodiloidea, the former comprising Iguanodon, Plesiosaurus, Saurocephalus and Ichthyosaurus. In the order Squamata Lacertilians and Ophidians are combined and divided into twenty-two families, almost all based on the most conspicuous external characters: the first two, viz. the Geckos and Chameleons, are natural enough, but in the three following Iguanoids and Agamoids are sadly mixed, Pterodactyles and Draco forming one family; Megalosaurus, Mosasaurus, Varanus, Tejus, &c., are associated in another named Ameivoidea; the Amphisbaenidae are correctly defined; the Colubroidea are a heterogeneous assemblage of thirty genera; but with his family of Bungaroidea Fitzinger makes an attempt to separate at least a part of the venomous Colubrine Snakes from the Viperines, which again are differentiated from the last family, that of Crotaloidea.

If this little work had been his only performance in the field of herpetology his name would have been honourably mentioned among his fellow-workers. But the promise of his early labours was not justified by his later work, and if we take notice of the latter here it is only because his name has become attached to many a reptile through the pedantic rules of zoological nomenclature. The labours of Wiegmann, Müller, Duméril and Bibron exercised no influence on him, and when he commenced to publish a new system of reptiles in 1843,[6] of which fortunately one fasciculus only appeared, he exhibited a classification in which morphological facts are entirely superseded by fanciful ideas of the vaguest kind of physiosophy, each class of vertebrates being divided into five "sense" series, and each series into three orders, one comprising forms of superior, the second of medium and the third of inferior development. In the generic arrangement of the species, to which Fitzinger devoted himself especially in this work, he equally failed to advance science.

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[1] *Bull. Sci. Soc. Philomat.*, July 1816.

[2] *Catalogue of the Tortoises, Crocodiles and Amphisbaenians in the Collection of the British Museum* (London, 1844, 16mo), p. 2.

[3] *Natürliches System der Amphibien mit vorangehender Classification der Säugethiere und Vögel—ein Beitrag zur vergleichenden Zoologie* (Munich, 1830, 8vo).

[4] Wagler was accidentally killed three years after the publication of his *System*.

[5] *Neue Classification der Reptilien nach ihren natürlichen Verwandtschaften* (Vienna, 1826, 4to).

[6] *Systema Reptilium* (Vienna, 1843, 8vo).

Duméril and Bibron.

We have now arrived at a period distinguished by the appearance of a work which superseded all its predecessors, which formed the basis for the labours of many succeeding years, and which will always remain one of the classical monuments of descriptive zoology—the *Erpétologie générale ou histoire naturelle complète des reptiles* of A. M. C. Duméril and G. Bibron (Paris, 8vo). The first volume appeared in 1834, and the ninth and last in 1854. No naturalist of that time could have been better qualified for the tremendous undertaking than C. Duméril, who almost from the first year of half a century's connexion with the then largest collection of Reptilia had chiefly devoted himself to their study. The task would have been too great for the energy of a single man; it was, therefore, fortunate for Duméril that he found a most devoted fellow-labourer in one of his assistants, G. Bibron, whose abilities equalled those of the master, but who, to the great loss of science, died (in 1848) before the completion of the work. Duméril had the full benefit of Bibron's knowledge for the volumes containing the Snakes, but the last volume, which treats of the Tailed Batrachians, had to be prepared by Duméril alone.

The work is the first which gives a comprehensive scientific account of reptiles generally, their structure, physiology and literature, and again each of the four orders admitted by the authors is introduced by a similar general account. In the body of the work 121 Chelonians, 468 Saurians, 586 Ophidians and 218 Batrachians are described in detail and with the greatest precision. Singularly enough, the authors revert to Brongniart's arrangement, in which the Batrachians are co-ordinate with the other three orders of reptiles. This must appear all the more strange as Von Baer[1] in 1828, and J. Müller[2] in 1831, had urged, besides other essential differences, the important fact that no Batrachian embryo possesses either an amnion or an allantois, like a reptile.

J. Müller and Stannius.

4. *Period of the Separation of Reptiles and Batrachians as Distinct Classes or Subclasses.*—In the chronological order which we have adopted for these historical notes, we had to refer in their proper places to two herpetologists, Blainville and Latreille, who advocated a deeper than merely ordinal separation of Reptiles from Batrachians, and who were followed by F. S. Leuckart. But this view only now began to find more general acceptance. J. Müller and Stannius were guided in their classification entirely by anatomical characters, and consequently recognized the wide gap which separates the Batrachians from the Reptiles; yet they considered them merely as subclasses of the class Amphibia. The former directed his attention particularly to those forms which seemed to occupy an intermediate position between Lacertilians and Ophidians, and definitely relegated Anguis, Pseudopus, Acontias to the former, and Typhlops, Rhinophis, Tortrix, but also the Amphisbaenoids to the latter. Stannius interpreted the characteristics of the Amphisbaenoids differently, as will be seen from the following abstract of his classification:[3]—

Subclassis: AMPHIBIA MONOPNOA (Leuckart).
Sect. 1. *STREPTOSTYLICA* (Stann.). Quadrate bone articulated to the skull; copulatory organs paired, placed outside the cloacal cavity.
  Ordo 1. OPHIDIA.
    Subordo 1. Eurystomata or Macrostomata (Müll.). The facial bones are loosely connected to admit of great extension of the wide mouth.
    Subordo 2. Angiostomata or Microstomata (Müll.). Mouth narrow, not extensile; quadrate bone attached to the skull and not to a mastoid.
  Ordo 2. SAURIA.
    Subordo 1. Amphisbaenoidea.
    Subordo 2. Kionocrania (Stann) = Lizards.
    Subordo 3. Chamaeleonidea.
Sect. 2. *MONIMOSTYLICA* (Stann.). Quadrate bone suturally united with the skull; copulatory organ simple, placed within the cloaca.
  Ordo 1. CHELONIA.
  Ordo 2. CROCODILIA.

This classification received the addition of a fifth Reptilian order which with many Lacertilian characters combined important Crocodilian affinities, and in certain other respects differed from both, viz. the New Zealand Hatteria, which by its first describers had been placed to the Agamoid Lizards. A. Günther,[4] who pointed out the characteristics of this reptile, considered it to be co-ordinate with the other four orders of reptiles, and characterizes it thus:—

Rhynchocephalia.—Quadrate bone suturally and immovably united with the skull and pterygoid; columella present. Rami of the mandible united as in Lacertilians. Temporal region with two horizontal bars. Vertebrae amphicoelian. Copulatory organs, none.

5. *Period of the Recognition of a Class of Reptilia as Part of the Sauropsida.*—Although so far the discovery of every new morphological and developmental fact had prepared naturalists for a class separation of Reptiles and Batrachians, it was left to T. H. Huxley to demonstrate, not merely that the weight of facts demanded such a class separation, but that the reptiles hold the same relation to birds as the fishes to Batrachians. In his *Hunterian Lectures* (1863) he divided the vertebrates into Mammals, Sauroids and Ichthyoids, subsequently substituting for the last two the terms Sauropsida and Ichthyopsida.[5] The Sauropsida contain the two classes of birds and reptiles, the Ichthyopsida those of Batrachians and fishes.

Owen.

6. *Period of the Consideration of Skeletons of Extinct Reptiles.*—Sir R. Owen, while fully appreciating the value of the osteological characters on which Huxley based his division, yet admitted into his consideration those taken from the organs of circulation and respiration, and reverted to Latreille's division of warm- and cold-blooded (haematothermal and haematocryal) vertebrates, thus approximating the Batrachians to reptiles, and separating them from birds.[6] The reptiles (or Monopnoa, Leuck.) thus form the highest of the five subclasses into which, after several previous classifications, Owen[7] finally divided the Haematocrya. His division of this subclass, however, into nine orders, makes a considerable step in the progress of herpetology, since it takes into consideration for the first time the many extinct groups whose skeletons are found fossil. He shows that the number of living reptilian types bears but a small proportion to that of extinct forms, and therefore that a systematic arrangement of the entire class must be based chiefly upon osteological characters. His nine orders are the following:

a. Ichthyopterygia (extinct)—*Ichthyosaurus*.
b. Sauropterygia (extinct)—*Plesiosaurus*, *Pliosaurus*, *Nothosaurus*, *Placodus*.
c. Anomodontia (extinct)—*Dicynodon*, *Rhynchosaurus*, *Oudenodon*.
d. Chelonia.
e. Lacertilia (with the extinct *Mosasaurus*).
f. Ophidia.
g. Crocodilia (with the extinct *Teleosaurus* and *Streptospondylus*).
h. Dinosauria (extinct)—*Iguanodon*, *Scelidosaurus* and *Megalosaurus*.
i. Pterosauria (extinct)—*Dimorphodon*, *Rhamphorhynchus* and *Pterodactylus*.

Owen was followed by Huxley and E. D. Cope, who, however, restricted still more the selection of classificatory characters by relying for the purposes of arrangement on a few parts of the skeleton only. They attempted a further grouping of the orders which in Owen's system were merely serially enumerated as cosubordinate groups. Huxley used for this purpose almost exclusively the position and character of the rib-articulations to the vertebral centra, the orders themselves being the same as in Owen's system:—

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[1] *Entwicklungsgeschichte der Thiere*, p. 262.

[2] Tiedemann's *Zeitschrift für Physiologie*, vol. iv. p. 200.

[3] Siebold and Stannius, *Handbuch der Zootomie—Zootomie der Amphibien* (2nd ed., Berlin, 1856. 8vo).

[4] "Contribution to the Anatomy of *Hatteria* (*Rhynchocephalus*, Owen)," in *Phil. Trans.* (1867), part ii.

[5] *An Introduction to the Classification of Animals* (London, 1869. 8vo), pp. 104 seq.

[6] *Anatomy of Vertebrates* (London, 1866, 8vo), vol. i. p. 6.

[7] *Op. cit.* p. 16.

Huxley.

A. *PLEUROSPONDYLIA.* Dorsal vertebrae devoid of transverse processes and not movable upon one another, nor are the ribs movable upon the vertebrae. A plastron. Order 1, Chelonia.

B. The dorsal vertebrae (which have either complete or rudimentary transverse processes) are movable upon one another, and the ribs upon them. No plastron.

- *a.* The dorsal vertebrae have transverse processes which are either entire or very imperfectly divided into terminal facets (*ERPETOSPONDYLIA*).
  - *α.* Transverse processes long; limbs well developed, paddles; sternum and sternal ribs absent or rudimentary. Order 2, Plesiosauria (=*Sauropterygia*, Ow.).
  - *β.* Transverse processes short.
    - *aa.* A pectoral arch and urinary bladder. Order 3, Lacertilia.
    - *bb.* No pectoral arch and no urinary bladder. Order 4, Ophidia.
- *b.* The dorsal vertebrae have double tubercles in place of transverse processes (*PEROSPONDYLIA*). Limbs paddle-shaped. Order 5, Ichthyosauria (=*Ichthyopterygia*, Ow.).
- *c.* The anterior dorsal vertebrae have elongated and divided transverse processes, the tubercular being longer than the capitular division (*SUCHOSPONDYLIA*).
  - *α.* Only two vertebrae in the sacrum. Order 6, Crocodilia.
  - *β.* More than two vertebrae in the sacrum.
    - *aa.* Manus without a prolonged ulnar digit.
      - *αα.* Hind limb Saurian. Order 7, Dicynodontia (=*Anomodontia*, Ow.).
      - *ββ.* Hind limb Ornithic. Order 8, Ornithoscelida (=*Dinosauria*, Ow.).
    - *bb.* Manus with an extremely long ulnar digit. Order 9, Pterosauria.

Cope.

Cope,[1] by combining the modifications of the quadrate and supporting bones with the characters used by Huxley, further developed Owen's classification, separating the *Pythonomorpha* and *Rhynchocephalia* as distinct orders from the Lacertilia. He eventually[2] elaborated the following classification, based entirely on osteological characters:—

I. The quadrate bone immovably fixed to the adjacent elements by suture.

- A. Scapular arch external to ribs; temporal region with a complex bony roof; no longitudinal postorbital bars.
  - A tabular and supramastoid bones and a presternum; limbs ambulatory; vertebrae amphicoelous. Order 1, Cotylosauria.
- AA. Scapular arch internal to ribs; temporal region with complex roof and no longitudinal bars.
  - A presternum; limbs ambulatory. Order 2, Chelydosauria.
- AAA. Scapular arch internal to ribs; sternum extending below coracoids and pelvis; one postorbital bar.
  - No supramastoid; a paroccipital; clavicle not articulating with scapula. Order 3, Testudinata.
- AAAA. Scapular arch external to ribs; one longitudinal postorbital bar (*Synaptosauria*).
  - A supramastoid and paroccipital bones; ribs two-headed on centrum; carpals and tarsals not distinct in form from metapodials; vertebrae amphicoelous. Order 4, Ichthyopterygia.
  - A supramastoid; paroccipital not distinct; a postorbitosquamosal arch; ribs two-headed; a clavicle; obturator foramen small or none; vertebrae amphicoelous. Order 5, Theromora.
  - No supramastoid; paroccipital not distinct; a quadratojugal arch; scapula triradiate; no clavicle; ribs one-headed. Order 6, Plesiosauria.
- AAAAA. Scapular arch external to ribs; two longitudinal postorbital bars (paroccipital arch distinct) (*Archosauria*).
  - *a.* A supramastoid bone.
    - Ribs two-headed; a clavicle and interclavicle; acetabulum closed; no obturator foramen; ambulatory; vertebrae amphicoelous. Order 7, Pelycosauria.
  - *aa.* No supramastoid.
    - Ribs two-headed; interclavicle not distinct; external digits greatly elongated to support a patagium for flight. Order 8, Ornithosauria.
    - Ribs two-headed; no interclavicle; acetabulum open; ambulatory. Order 9, Dinosauria.
    - Ribs two-headed; an interclavicle; acetabulum closed; ambulatory. Order 10, Loricata.
    - Ribs one-headed; an interclavicle; acetabulum closed, a large obturator foramen; ambulatory. Order 11, Rhynchocephalia.

II. The quadrate bone loosely articulated to the cranium and at the proximal end only (*Streptostylica*).

- No distinct supramastoid, nor opisthotic; one or no postorbital bar; scapular arch, when present, external to ribs; ribs one-headed. Order 12, Squamata.

While this classification was being considered and prepared, both Cope and G. Baur made a special study of the bones which surround the quadrate and arch over the biting muscles in the various groups of reptiles. This led to a series of discussions which ended in the idea, that the class could be most naturally divided into two great subclasses, the one culminating in tortoises and mammals, the other in crocodiles, lizards, snakes and birds. Professor H. F. Osborn in 1903[3] therefore proposed the following classification:—

Osborn.

Subclass Synapsida. Primarily with single or undivided temporal arches. Giving rise to the mammals through some unknown member of the *Anomodontia*.

Orders *Cotylosauria*, *Anomodontia*, *Testudinata* and *Sauropterygia*.

Subclass Diapsida. Primarily with double or divided temporal arches. Giving rise to the birds through some unknown type transitional between *Protorosauria* and *Dinosauria*.

Orders *Diaptosauria* (=*Protorosauria*, *Pelycosauria* and *Rhynchocephalia*), *Phytosauria* (=*Belodon*, &c.), *Ichthyosauria*, *Crocodilia*, *Dinosauria*, *Squamata* and *Pterosauria*.

The most exhaustive and modern general work on reptiles is by Dr C. K. Hoffmann in Bronn's *Klassen und Ordnungen des Thierreichs* (1879–90). A most useful and less technical treatise is the volume on Amphibia and Reptiles contributed by Dr H. Gadow to the *Cambridge Natural History* (London, 1902). (A. C. G.; A. S. Wo.)

Hoffmann.

II. General Characters of the Class Reptilia

Reptiles, as known in the existing world, are the modified, and in many respects degenerate, representatives of a group of lung-breathing vertebrate animals which attained its maximum development in the Mesozoic period. So far as can be judged from the skeleton, some of the members of this group then living might have become mammals by very slight change, while others might as readily have evolved into birds. It is therefore probable that the class Reptilia, as now understood, comprises the direct ancestors both of the Mammalia and Aves. Assuming that its extinct members, which are known only by skeletons, were organized essentially like its existing representatives, the class ranks higher than that of the lowest five-toed vertebrates (class Batrachia) in the investment of the foetus by two membranous envelopes (the amnion and allantois), and in the total absence of gills even in the earliest embryos. It ranks below both the Mammalia and Aves in the partial mixture of the arterial blood with the venous blood as it leaves the heart, thus causing the organism to be cold-blooded; it also differs both from Mammalia and Aves in retaining a pair of aortic arches, of which only the left remains in the former, while the right one is retained in the latter. No feature in the endoskeleton is absolutely distinctive, except possibly the degeneration of the parasphenoid bone, which separates the Reptilia from the Amphibia. In the exoskeleton, however, the epidermis forms horny scales, such as never occur in Amphibia, while there are no traces of any structures resembling either hairs or feathers, which respectively characterize Mammalia and Aves.

There is little doubt that true reptiles date back to the latter part of the Palaeozoic period, but at that epoch the Amphibia approached them so closely in the characters of the skeleton that it is difficult to distinguish the members of the two classes among the fossils. Some of the Palaeozoic Amphibia—a few of the so-called Labyrinthodonts—are proved to have had well-developed gill-arches in their immature state, while there are conspicuous marks of slime-canals on their skulls. Others are merely regarded as Amphibia because they closely resemble the genera which are proved to have been gill-breathers when immature. All these genera, however, so far as known, agree with the existing Amphibia in the production of their large parasphenoid bone as far forwards as the vomers to form a rigid and complete basicranial axis (fig. 1, A). Those genera which less resemble the typical Labyrinthodonts are characterized by the reduction of the parasphenoid bone so that it no longer reaches the vomers; in these animals the weakened skull exhibits a secondary basicranial axis formed by the approximation of the pterygoids to the median line (fig. 1, B). The latter condition is universal in existing reptiles, and may therefore perhaps be regarded as a diagnostic feature. If so, the oldest known undoubted reptile is *Palaeohatteria*, from the Lower Permian of Saxony.

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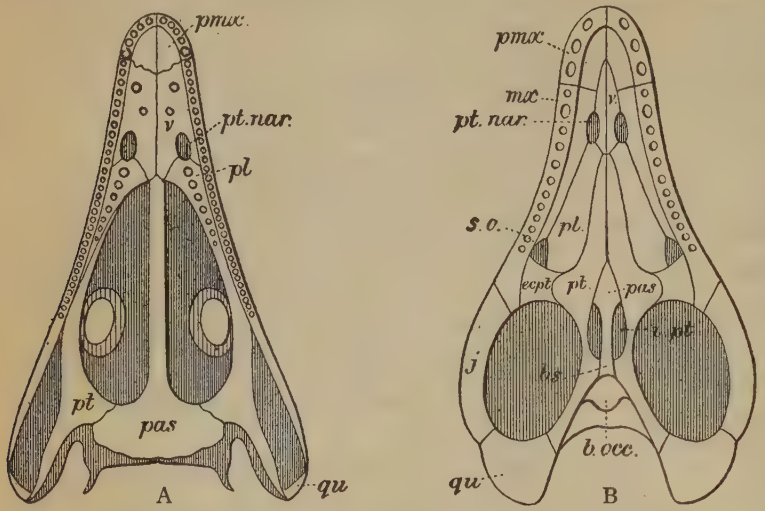
[1] *Proc. Amer. Assoc. for the Advancement of Science*, 10th meeting (Cambridge, 1871, 8vo), pp. 230 sq.; *Amer. Naturalist* (1889), vol. xxiii. p. 863.

[2] *Syllabus of Lectures on the Vertebrata* (Philadelphia, 1898, 8vo), p. 54.

[3] *Mem. American Mus. Nat. Hist.* (November 1903), vol. i. art. viii.



After Credner. After C. W. Andrews.

FIG. 1.—A, Palate of Palaeozoic Amphibian (*Archegosaurus decheni*). B, Palate of Mesozoic Reptile (*Plesiosaurus macrocephalus*).

b.occ, basioccipital; *bs*, basisphenoid; *ecpt*, ectopterygoid; *i.pt*, interpterygoid vacuity; *j*, jugal; *mx*, maxilla; *pas*, parasphenoid; *pl*, palatine; *pmx*, premaxilla; *pt*, pterygoid; *pt. nar*, posterior nares; *qu*, quadrate; *s.o*, suborbital vacuity; *v*, vomer.

In the structure of the skull *Palaeohatteria* is much like the existing *Sphenodon*, the cheek-plates which cover the temporal and masseter muscles on each side being pierced by two great vacuities, one superior-temporal, the other lateral-temporal. The majority of the earliest reptiles, however, either resemble the Labyrinthodonts in having the biting muscles completely covered with a roof of bony plates, or exhibit a slight shrinkage of this investment so that a superior-temporal vacuity appears. As the various groups or orders become differentiated, this shrinkage or reduction continues, while the shape of the ossifying ear-capsule changes, and the squamosal bone, which covers the organ of hearing in the fishes, and presumably also in the Palaeozoic Batrachia, is gradually thrust outwards from all connexion with this capsule except at its hinder angle. The resultant modifications are diagrammatically represented in fig 2. In one series of orders, comprising the Anomodontia, Chelonia, Sauropterygia and Ichthyopterygia (fig. 2, B, C), the superior-temporal vacuity (*s*) first appears, and the cheek-plates in the broad temporal arch thus formed may be variously fused together, sometimes even irregularly perforated—showing at first, indeed, the usual inconstancy of a new and not completely established feature. From the earliest members of this series of reptiles, palaeontology seems to demonstrate that the Mammalia (with one robust temporal arcade or zygomatic arch) arose. In a second series, comprising the orders Rhynchocephalia, Dinosauria, Crocodilia and Ornithosauria (fig. 2, D), the broad arch of cheek-plates is regularly pierced by a lateral-temporal vacuity, which leaves a narrow bar above, another narrow bar below, and uncovers the middle part of the quadrate bone. By the constant loss of the lower, and the frequent loss of the upper, bar, some members of this series eventually pass into the order Squamata (Lacertilia+Ophidia), in which the quadrate bone is completely exposed and loosely attached to the skull (fig. 2, E); other reptiles exhibiting a similar modification may readily have acquired the typical Avian skull (fig. 2, F) by the loss of the upper and the retention of the lower temporal bar in question.

In view of these and other palaeontological considerations, the Reptilia may be classified into orders as follows:—

ORDERS OF CLASS REPTILIA

1. **Anomodontia.**—Bones of postero-lateral region of skull forming a complete roof over the temporal and masseter muscles, or contracted into a single broad zygomatic arch, leaving a superior-temporal vacuity. Pineal foramen present. Ribs completely or imperfectly double-headed. No abdominal ribs. A large separately ossified epicoracoid. Limbs for support as well as progression; third and fourth digits with not more than three phalanges. Dermal armour feeble or absent. *Range.*—Permian and Triassic.

2. **Chelonia.**—Postero-lateral region of skull as in Anomodontia, except bones of ear-capsule more modified. No pineal foramen. Ribs single-headed. No sternum. Pectoral and pelvic arches unique in being situated completely inside the ribs. No epicoracoid. Abdominal ribs replaced by three or four pairs of large plates, which, with the clavicles and interclavicle, form a plastron. Limbs only for progression; third and fourth digits with not more than three phalanges. A regular dorsal carapace of bony plates intimately connected with the neural spines, and ribs of seven to nine dorsal vertebrae. *Range.*—Upper Triassic to Recent.

3. **Sauropterygia.**—Bones of postero-lateral region of skull contracted into a single broad zygomatic arch, leaving a superior-temporal vacuity. Pineal foramen present. No fused sacral vertebrae. All dorsal ribs single-headed, articulating with transverse processes of the neural arches. Abdominal ribs forming dense plastron. Apparently no sternum. Coracoid, pubis and ischium in form of much-expanded plates. Limbs modified as paddles, with not more than five digits, of which the third and fourth always have more than three phalanges; all digits usually consisting of numerous phalanges. No dermal armour. *Range.*—Upper Triassic to Cretaceous.

4. **Ichthyopterygia.**—Bones of postero-lateral region of skull contracted into a single broad zygomatic arch, leaving a superior-temporal vacuity. Pineal foramen present. Vertebral centra short and deeply biconcave, with feeble neural arches which are almost or completely destitute of zygapophyses. No fused sacral vertebrae. Cervical and dorsal ribs double-headed, articulating with tubercles on the vertebral centra. Abdominal ribs forming dense plastron. Apparently no sternum. Coracoid an expanded plate, probably with cartilaginous epicoracoid. Pelvis very small, not connected with vertebrae. Limbs modified as paddles, with digits of very numerous short phalanges, which are closely pressed together, sometimes with supplementary rows of similar ossicles. No dermal armour. A vertical triangular caudal fin, not supported by skeletal rays. *Range.*—Triassic to Cretaceous.

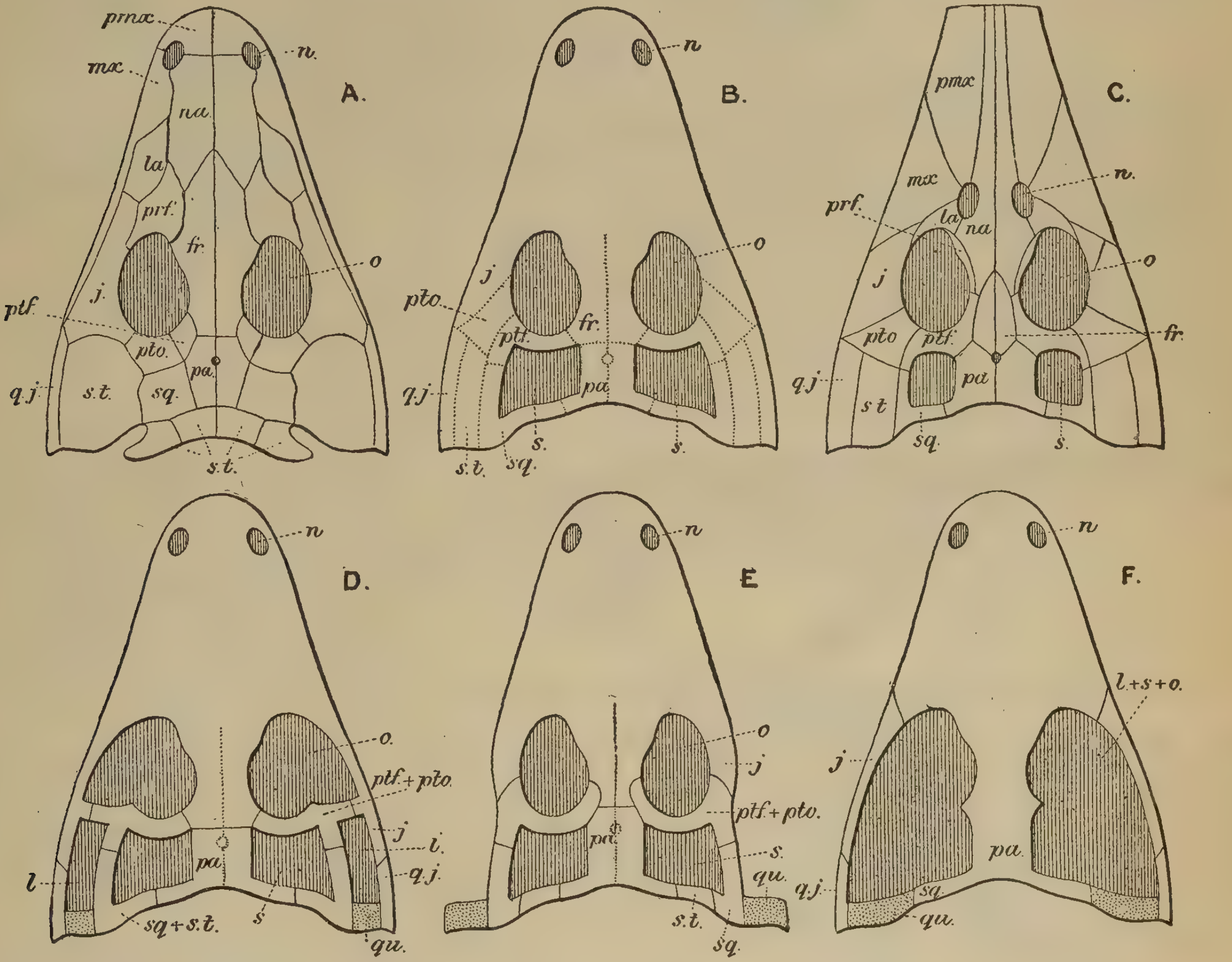
5. **Rhynchocephalia.**—Bones of postero-lateral region of skull contracted into two slender zygomatic bars, leaving a superior-temporal and a lateral-temporal vacuity, and partly exposing the quadrate bone from the side. Pineal foramen present or absent. Ribs single-headed. Abdominal ribs present. Sternum present. Epicoracoid cartilaginous. Limbs only for progression; third and fourth digits with four or five phalanges. Dermal armour feeble or absent. *Range.*—Lower Permian to Recent.

6. **Dinosauria.**—Postero-lateral region of skull as in Rhynchocephalia. No pineal foramen. Cervical and dorsal ribs double-headed. Rarely abdominal ribs. Sternum present, but apparently no clavicular arch. Limbs for support as well as progression; third and fourth digits with four and five phalanges respectively. Dermal armour variable. *Range.*—Triassic to Cretaceous.

7. **Crocodilia.**—Postero-lateral region of skull as in Rhynchocephalia. No pineal foramen. Cervical and dorsal ribs double-headed. Abdominal ribs present. Sternum present; also interclavicle, but no clavicles. Limbs only for progression on land or swimming; third and fourth digits with four or five phalanges. Dermal armour variable. *Range.*—Lower Jurassic to Recent.

8. **Ornithosauria.**—All bones extremely dense, light and hollow, the organism being adapted for flight. Postero-lateral region of skull as in Rhynchocephalia. No pineal foramen. Cervical and dorsal ribs double-headed. Abdominal ribs present. Sternum present, and keeled for attachment of pectoral muscles; no clavicular arch. Fifth digit of hand much elongated to support a wing-membrane, but with only four phalanges. Hind limb feeble. No dermal armour. *Range.*—Lower Jurassic to Cretaceous.

9. **Squamata.**—Bones of postero-lateral region of skull much reduced and partly absent, never forming more than a slender superior-temporal bar, thus completely exposing the quadrate, which is only loosely attached to the cranium at its upper end. Pineal foramen present. Ribs single-headed. No abdominal ribs. Sternum present when there are limbs. Limbs, when present, only for progression; third and fourth digits at least with more than three phalanges. Dermal armour feeble or absent. *Range.*—Cretaceous to Recent.



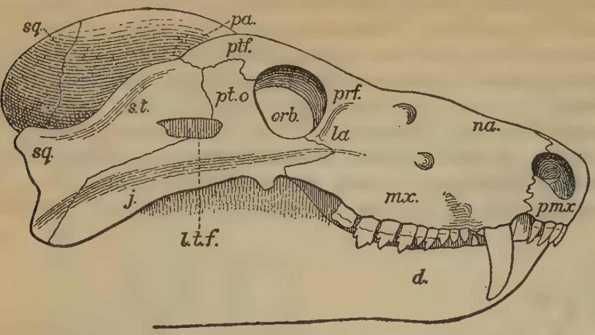
From A. S. Woodward, *Outlines of Vertebrate Palaeontology.*

Fig. 2.—Diagram of the Cranial Roof in a Labyrinthodont Amphibian, various types of Reptiles, and a Bird. A, Labyrinthodont Amphibian (*Mastodonsaurus giganteus*). B, Generalized Anomodont or Sauropterygian, passing with slight modification into the Chelonian (sutures dotted to denote inconstancy in fusion of elements). C, *Ichthyosaurus*. D, Generalized Rhynchocephalian, Dinosaurian, Crocodilian, or Ornithosaurian. E, Generalized Lacertilian, often losing even the arcade here indicated. F, Generalized Bird.

fr, frontal; *j*, jugal; *l*, lateral temporal vacuity; *la*, lachrymal; *mx*, maxilla; *n*, narial opening; *na*, nasal; *o*, orbit; *pa*, parietal; *pmx*, premaxilla; *prf*, prefrontal; *ptf*, postfrontal; *pto*, postorbital; *q.j*, quadrato-jugal; *qu*, quadrate; *s*, supratemporal vacuity; *s.t*, supratemporals and prosquamosal; *sq*, squamosal. Vacuities shaded with vertical lines, cartilage bones dotted.

Order 1. Anomodontia.—The Anomodonts are so named in allusion to the peculiar and unique dentition of the first-discovered genera. They are precisely intermediate between the Labyrinthodont Batrachia and the lowest or Monotreme Mammalia. They flourished at the period when the former are known to have reached their culmination, and when the latter almost certainly began to appear. Many of them would, indeed, be regarded as primitive Mammalia, if they did not retain a pineal foramen, a free quadrate bone, and a complex mandible. The term Theromorpha or Theromora is thus sometimes applied to the order they represent. So far as known, they are all land-reptiles, with limbs adapted for habitual support of the body, and their feet are essentially identical with those of primitive mammals. Most of them are small, and none attain a gigantic size. They first appear in the Permian of Europe and North America, and also occur in the Triassic both of Europe and India, but they are best represented in the Karoo formation (Permian and Triassic) of South Africa. The Pariasauria most closely resemble the Labyrinthodont Amphibia, but have a single occipital condyle. *Pariasauria* itself is a massive herbivorous reptile, with a short tail, and the limbs adapted for excavating in the ground. It is known by several nearly complete skeletons, about 3 metres in length, from South Africa and northern Russia. *Elginia*, found in the Elgin sandstones of Morayshire, Scotland, is provided with horn-like bony bosses on the skull. Another apparently allied genus (*Otocoelus*) has a carapace suggesting that it may be an ancestral Chelonian. The Theriodontia exhibit the marginal teeth differentiated (in shape) into incisors, canines and molars (fig. 3). They have two occipital condyles, as in mammals. They seem to have been all carnivorous, or at least insectivorous, but the malariform teeth vary much in shape in the different genera. *Cynognathus* (fig. 3) and *Lycosaurus* have cutting teeth, while *Tritylodon* and *Gomphognathus* possess powerful grinders. The *Dicynodontia* have one pair of upper tusks or are toothless: their occipital condyle is trefoil-shaped, as in Chelonia. *Dicynodon* itself occurs in the Karoo formation of S. Africa, while other genera are represented in India, N. Russia and Scotland.

Order 2. Chelonia.—This order occurs first in the Upper Triassic of Württemberg, where a complete "shell" has been found (*Proganochelys*). Its members are proved to have been toothless since the Jurassic period, and have only changed very slightly since their first appearance. The marine turtles seem to have first acquired elongated paddles and vacuities in the shell during the Cretaceous period, and the Trionychia, destitute of epidermal shields, apparently arose at the same time.



From A. S. Woodward, *Outlines of Vertebrate Palaeontology.*

FIG. 3.—Skull of an Anomodont (Theriodont) Reptile (*Cynognathus crateronotus*), about $/_5$ natural size.—Karoo formation (Permian or Triassic), South Africa.

d, dentary; *j*, jugal; *l.t.f*, incipient lateral temporal vacuity; *la*, lachrymal; *mx*, maxilla; *na*, nasal; *orb*, orbit; *pa*, parietal; *pmx*, premaxilla; *prf*, prefrontal; *pto.*, postorbital; *ptf*, postfrontal; *s.t*, supratemporal (prosquamosal); *sq*, squamosal.

Order 3. SAUROPTERYGIA.—These are amphibious or aquatic reptiles (fig. 4). The head is comparatively small in most genera, and the neck is usually elongated though not flexible. The tail is insignificant, generally short, and both pairs of paddles seem to have been concerned in progression. The order appears to have arisen from a group of land-reptiles, for its earliest members, from the Triassic of Europe (*Lariosaurus*) and from the Permo-Carboniferous of S. Africa (*Mesosaurus*) and Brazil (*Stereosternum*), are all amphibious animals. They are comparatively small, and their limbs are only just becoming paddle-like. The skull suggests affinities with the terrestrial Anomodontia, and the shape of the scapula seems to show some connexion with the Chelonia. The truly aquatic Sauropterygians of the Jurassic (fig. 4) and Cretaceous periods possess most effective paddles with elongated digits, and as the genera are traced upwards in the geological formations it is possible to observe how the arches supporting the limbs become more rigid until the maximum of strength is reached. A few genera, such as *Pliosaurus* from the Jurassic and *Polyptychodon* from the Cretaceous of Europe, are distinguished by their relatively large head and stout neck. Some of the largest Upper Jurassic and Cretaceous species must have been 10 metres in length. They were cosmopolitan in their distribution, but became extinct before the dawn of the Tertiary period.

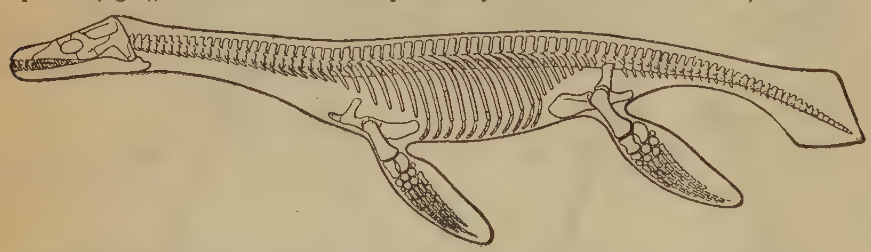


FIG. 4.—*Plesiosaurus rostratus*: restoration of skeleton by W. G. Ridewood.—Lower Lias, Dorsetshire.

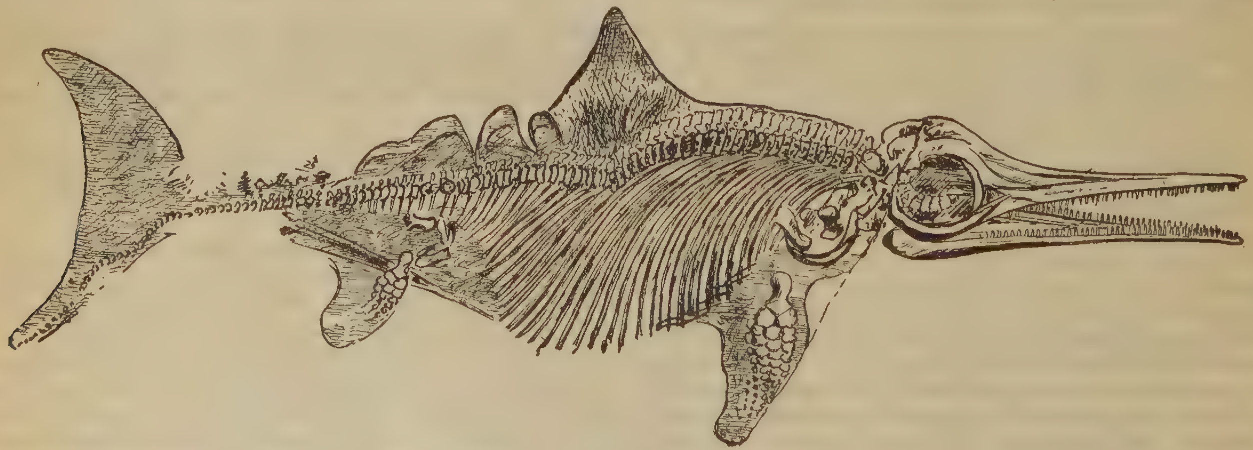
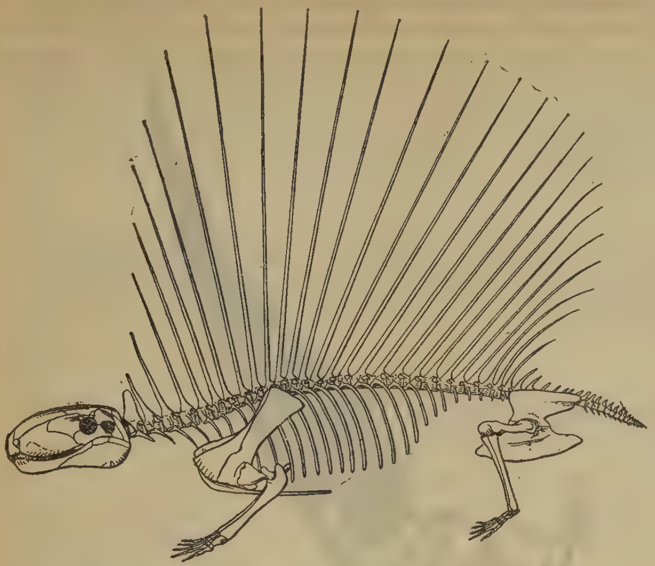


FIG. 5.—*Ichthyosaurus quadriscissus*: outline of specimen showing dorsal and caudal fins, about one-sixth natural size.—Upper Lias, Württemberg. (After E. Fraas.) The irregularities behind the triangular dorsal fin are torn pieces of skin.

Order 4. ICHTHYOPTERYGIA.—The Ichthyosaurians are all fish-shaped, with a relatively large head and very short neck. Both pairs of paddles are retained, but the hinder pair is usually very small, and locomotion seems to have been chiefly effected by a large caudal fin. This fin, as shown in impression by certain fossils from Württemberg and Bavaria, is a vertical, triangular, dermal expansion, without any skeletal support except the hindermost part of the attenuated vertebral column, which extends along the border of its lower lobe (fig. 5). Another triangular fin, without skeletal support, is known to occur on the back, at least in one species (fig. 5). Some of the genera are proved to have been viviparous. Like the Sauropterygia, the Ichthyopterygia appear to have originated from terrestrial ancestors, for their earliest Triassic representatives (*Mixosaurus*) have the teeth less uniform and the limbs slightly less paddle-shaped than the latter genera. In this connexion it is noteworthy that their hollow conical teeth exhibit curious infoldings of the wall, like those observed in many Labyrinthodonts, while their short, biconcave vertebrae almost exactly resemble those of the Labyrinthodont *Mastodonsaurus* and its allies. As the Ichthyosaurs are traced upwards in geological time, some genera become almost, or quite, toothless, while the paddles grow wider, and are rendered more flexible by the persistence of cartilage round their constituent bones (*Ophthalmosaurus*). They were cosmopolitan in distribution, but disappeared from all seas at the close of the Cretaceous period. The largest forms, with a skull 2 metres in length, occur in the Lower Lias.

Order 5. RHYNCHOCEPHALIA.—These are small lizard-shaped reptiles, which have scarcely changed since the Triassic period. Though now represented only by *Sphenodon* or *Hatteria*, which survives in certain islands off New Zealand, in the Mesozoic epoch they ranged at least over Europe, Asia and North America. They comprise the earliest known reptile, *Palaeohatteria*, from the Lower Permian of Saxony, which differs from the Triassic and later genera in having an imperfectly ossified pubis and ischium, more numerous abdominal ribs, and the fifth metatarsal bone normal. They are also represented in the Permian, chiefly of North America, by the so-called Pelycosauria, which have sharp teeth in sockets, and are remarkable for the extreme elongation of the spines of their cervical and dorsal vertebrae (*Dimetrodon*, fig. 6). They seem to include various Triassic genera (*e.g. Aetosaurus*, *Belodon*), which may perhaps belong to the ancestral stock of the Dinosauria and Crocodilia. Other Triassic genera (*Hyperodapedon*, *Rhynchosaurus*) scarcely differ from *Sphenodon*, except in the dentition and in the absence of the pineal foramen in the skull. In the late Cretaceous and early Eocene periods one genus (*Champsosaurus*) was truly aquatic, with gavial-shaped head.



From Prof. E. C. Case's *Revision of the Pelycosauria of North America*, by permission of the Carnegie Institution of Washington.

Fig. 6.—*Dimetrodon incisivus*: restoration of skeleton by E. C. Case, about one-eighteenth natural size.

Order 6. Dinosauria.—The dinosaurs are land reptiles which flourished on all the continents during the Jurassic and Cretaceous periods, in the interval between the decline of the Anomodontia and the dominance of the Mammalia. They first appeared as carnivorous reptiles in the Triassic period in Europe, India, S. Africa, and N. America, but afterwards comprised numerous massive herbivores in nearly all parts of the world except the Australian and New Zealand regions. The skeleton in the carnivorous dinosaurs, or Theropoda, is of very light construction, the vertebrae and limb bones being hollow, with thin, dense walls and often perfectly fitting joints. The fore limbs are small, and the hind limbs are adapted for running, jumping or hopping on the toes. The sabre-shaped cutting teeth are fixed in sockets, and all the claws are sharp. *Anchisaurus* and *Hallopus*, from the Trias of N. America, and *Scleromochlus* from the Elgin sandstones of Scotland, are comparatively small animals. *Ceratosaurus* and *Megalosaurus*, from the Jurassic of North America and western Europe respectively, must have attained a length of from 5 to 6 metres. *Tyrannosaurus*, from the Cretaceous of Montana, U.S.A., has a skull more than a metre in length. The herbivorous Dinosaurs of the suborder Ornithopoda resemble the Theropoda in general shape, but are heavier in build, with a pelvis constructed more nearly on the plan of that of a running bird. It has, indeed, been suggested that certain arboreal Dinosaurs of bipedal gait may have been the ancestors of the class Aves. The best-known Ornithopod is *Iguanodon* (fig. 7), from the Wealden of W. Europe, with species from 5 to 10 metres in length. *Claosaurus*, from the Cretaceous of N. America, is nearly similar, and is represented by at least one complete skeleton in the Yale University Museum. There are also members of the same group with a heavy armour of bony plates and spines, sometimes termed Stegosauria. *Stegosaurus* itself occurs in the Upper Jurassic of Colorado, and *Omosaurus*, from the Kimmeridge and Oxford clays of England, is a nearly similar reptile. *Polacanthus*, from the Wealden of the Isle of Wight, has the hip-region armoured with a continuous bony shield. *Triceratops* (fig. 8) and its allies, from the Upper Cretaceous (Laramie) of western N. America, are the latest members of the group, with a bony frill over the neck, a pair of bony horn-cores above the eyes, and a median bony horn-core on the nose. The skull with the bony frill sometimes measures nearly two metres in length. Another suborder of herbivorous Dinosaurs, that of Sauropoda, comprises the largest known land animals of any age, some measuring from 17 to 25 metres in total length. They have a small head, long neck, and long tail, and must have been quadrupedal in gait. Their teeth are adapted for feeding on succulent water weeds, perhaps with an admixture of small animals living among these; and their vertebrae are of very light construction, while the ribs are raised high on the neural arches to increase the size of the body cavity, perhaps for unusually large lungs or air sacs. Their massive limbs have five toes, of which the three inner alone bear outwardly curved claws. *Diplodocus* and *Brontosaurus*, from the Jurassic of Wyoming and Colorado, U.S.A., are the best-known genera. *Atlantosaurus*, from the same formation, is usually noteworthy for size. *Cetiosaurus*, from the Jurassic of England, is also known by large parts of the skeleton in the British Museum and the Oxford Museum, indicating species nearly 20 metres in length.

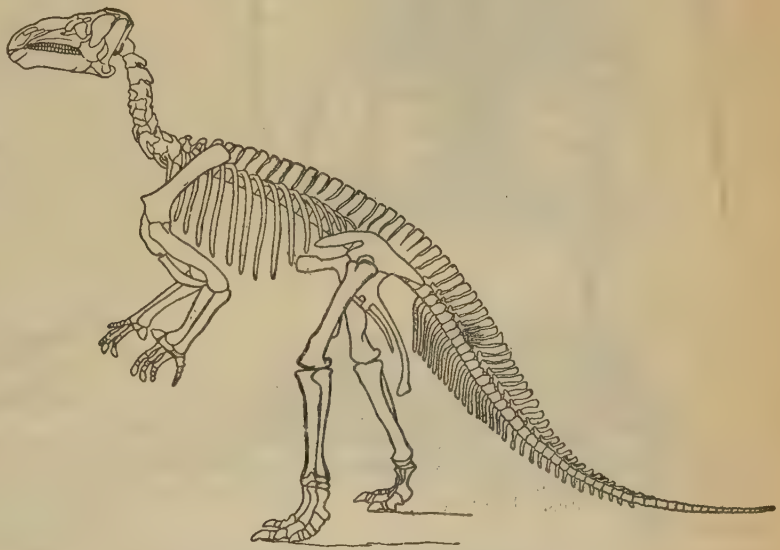


Fig. 7.—*Iguanodon bernissartensis*: restoration of skeleton by O. C. Marsh, about one-eightieth natural size.—Wealden, Bernissart, Belgium.

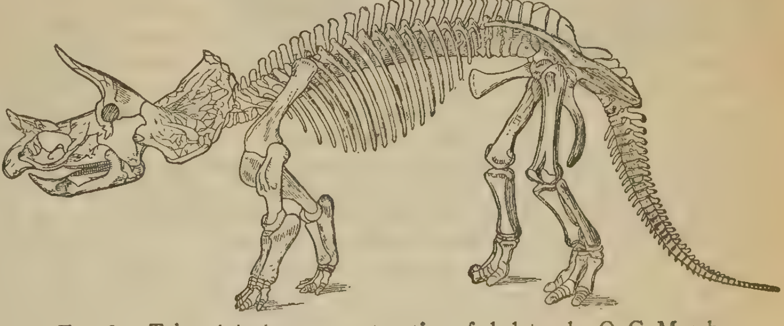


Fig. 8.—*Triceratops prorsus*: restoration of skeleton by O. C. Marsh, about one-eightieth natural size.—Cretaceous, Wyoming.

Order 7. Crocodilia.—Typical crocodiles can be traced downwards to the Lower Lias at the base of the Jurassic formations, but all the Jurassic and some of the Cretaceous genera have the secondary bony plate less extended backwards than that in the Tertiary and existing genera, while their vertebrae have flattened or concave ends, instead of exhibiting a ball-and-socket articulation. Some of the Upper Jurassic crocodiles (*Metriorhynchus*) were more truly aquatic than any now living, with the fore limbs degenerate, the hind limbs much enlarged for swimming, and the dermal armour lacking. The end of the vertebral column is bent downwards, as in *Ichthyosaurus*, so they doubtless possessed a similar triangular tail-fin. Typical crocodiles and alligators date back to the close of the Cretaceous period, and they did not become extinct in Europe until the beginning of the Miocene period. Remains of an extinct alligator (*Diplocynodon*) are common in the Upper Eocene sands of the Hordwell cliffs, Hampshire.

Order 8. ORNITHOSAURIA.—The flying reptiles or Pterodactyls (fig. 9) are completely evolved at their earliest known appearance in the Lower Lias (*Dimorphodon*), and exhibit little essential change as they are traced upwards through the Mesozoic formations. The latest Cretaceous genera, however, comprise the largest species, which have been found in Europe, N. America and Brazil. Some of these (*Pteranodon*) are toothless, and their wings are so large that for adequate support the pectoral arch is fixed to the vertebrae like a pelvis. The wings occasionally have a span of from 5 to 6 metres. The wing-membranes are only known in the European Jurassic genus, *Rhamphorhynchus* (fig. 10), found well preserved in the fine-grained lithographic stone of Bavaria. In this genus there is also a rhomboidal flap of membrane at the end of the tail.

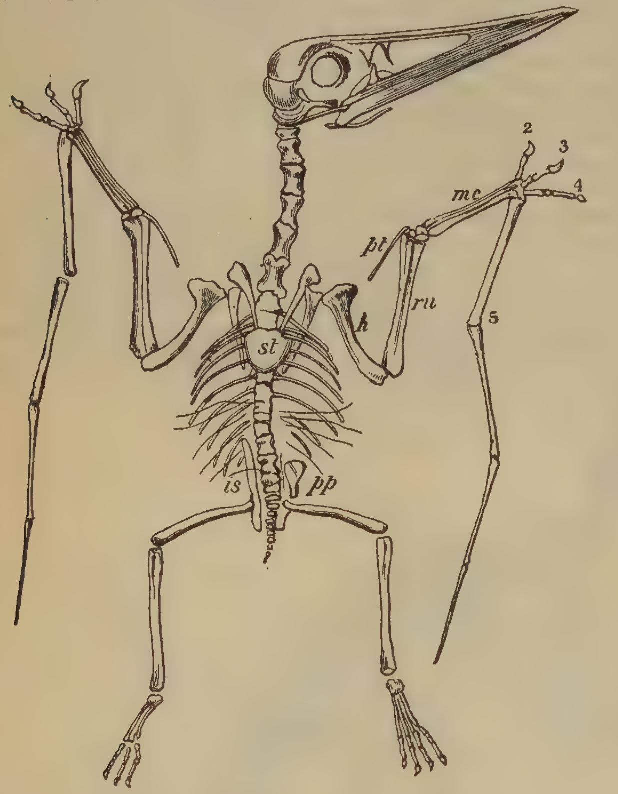


FIG. 9.—*Pterodactylus spectabilis*, natural size, from the Lithographic Stone. *h*, humerus; *ru*, radius and ulna; *mc*, metacarpals; *pt*, pteroid bone; 2, 3, 4, digits with claws; 5, elongated digit for support of wing-membrane; *st*, sternum, crest not shown; *is*, ischium; *pp*, prepubis. The teeth are not shown. (After H. von Meyer.)

Order 9. SQUAMATA.—The ancestors of the lizards and snakes can only be traced back definitely to the latter part of the Cretaceous period. They were then represented by two suborders of aquatic reptiles, the Dolichosauria and Pythonomorpha (or Mosasauria), which are in many respects intermediate between the existing Lacertilia and Ophidia. The Dolichosauria, from the Upper Cretaceous of Europe, are small and snake-like in shape, but with completely formed limbs. The Pythonomorpha are known from Europe, N. and S. America and New Zealand, and sometimes attained a very large size, the typical *Mosasaurus camperi* from Maastricht being about 15 metres in length. Their limbs are powerful paddles. Their trunk and tail are often much elongated, so that their shape is snake-like, as shown by *Clidastes* (fig. 11), from the Chalk of Kansas, U.S.A. The Lacertilia and Ophidia, so far as known, are exclusively Tertiary and Recent reptiles. Marine snakes (*Palaeophis*) occur in the Eocene of the London and Hampshire basins.

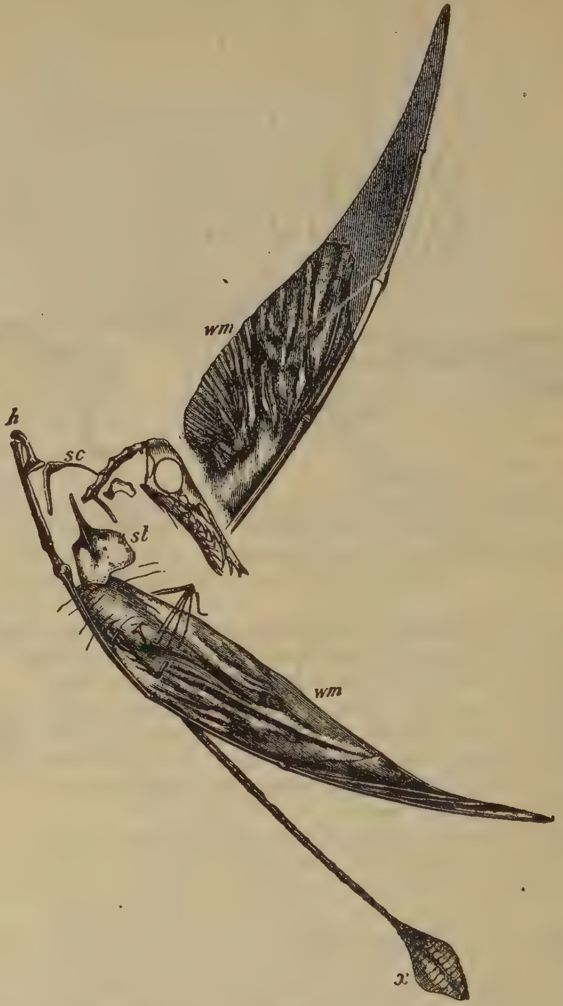


FIG. 10.—*Rhamphorhynchus phyllurus*, from the Solenhofen Lithographic Stone, about ¼ natural size, with the greater part of the wing-membranes preserved. *x*, caudal membrane; *st*, sternum; *h*, humerus; *sc*, scapula and coracoid; *wm*, wing-membrane. (After O. C. Marsh.)

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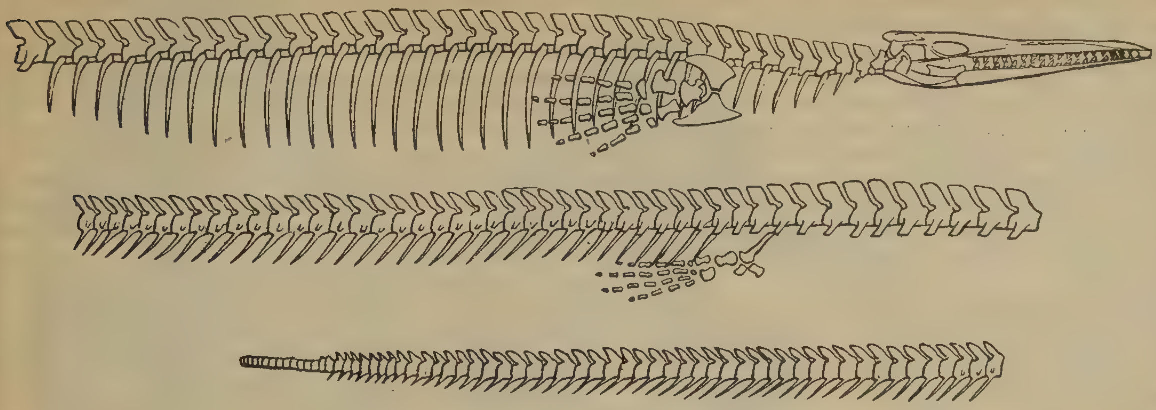
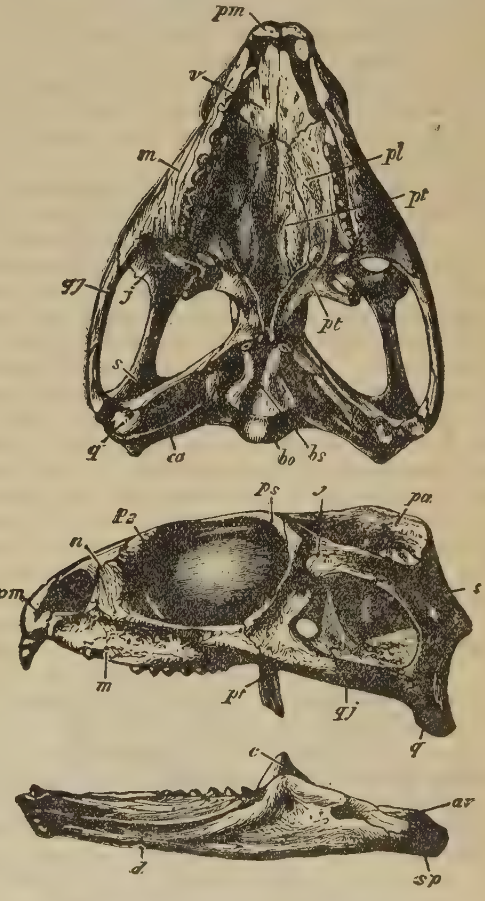


FIG. 11.— Skeleton of *Clidastes*. (After Cope.)

III. ANATOMY OF REPTILES

The Skull.

Sphenodon has the most primitive and still most complex skull, the salient features of which it is easy to derive from Stegocephalian and early, generalized reptilian conditions; whilst in other directions, mostly by reduction, the skull of this "living fossil" affords the key to that of all the other groups of at least recent reptiles. The main features are the following. There are, in the temporal region, three complete bony arches, the supra-, infra-, and post-temporal, which subdivide the whole temporal fossa into four foramina. The supratemporal bridge is formed by the squamosal and post-orbital, the latter (*j* in fig. 12) being continued forwards and fused with the post-frontal. These three bones, with the parietal, enclose the supratemporal foramen. The postorbital joins an ascending branch of the jugal, both together forming the hinder border of the orbit, and this is bordered below chiefly by the maxillary. The posteriortemporal bridge is formed by the parietal and squamosal, extends laterally over the quadrate and encloses a wide space between itself and the buttress-like transverse expansion of the lateral occipital bone (these "parotic processes" are made up of the lat. occipital, parotic and opisthotic bones); this is the post-temporal foramen. The space enclosed between this occipital buttress, the quadrate and the pterygoidal support of the latter represents the wide and large cavity of the middle ear,



After Günther. FIG. 12.—Skull of *Sphenodon*.

1, Ventral aspect; 2, lateral aspect; 3, lateral aspect of mandible. *ar*. articular; *bo*, basioccipital; *bs*, basisphenoid; *c*, coronoid; *ca*, columella auris; *d*, dentary; *j*, postorbital; *m*, maxilla; *n*, nasal; *pa*, parietal; *pl*, palatine; *pm*, premaxilla; *pr*, prefrontal; *ps*, postfrontal; *pt*, pterygoid; *q*, quadrate in the upper figure, quadrato-jugal in the middle figure; *qj*, jugal; *s*, squamosal; *sp*, splenial; *v*, vomer.

and as such is crossed by the auditory columellar chain. The infra-temporal bridge or jugal arch is formed by the jugal (*qj* in fig. 12), which joins the descending process of the squamosal, and the quadrato-jugal, which is very small and partly fused with the lateral side of the quadrate. Now, between the quadrate on the one side and the squamoso+quadrato-jugal+jugal on the other, is enclosed a gap, met with only in *Sphenodon* of recent reptiles. This fourth, or quadrato-squamosal foramen, with its squamoso-quadrato-jugal bridge, is, as a rule, not mentioned, being too small to be obvious. The quadrate is very firmly fixed. On the ventral side of the cranium we notice the broad and long bony palate, the large vomers, and the pterygoids meeting in the middle line; aside of the vomers are the long posterior nares; posteriorly the pterygoids diverge to rest upon short basi-sphenoid processes, and they articulate by short flanges with the quadrates.

The occipital condyle is kidney-shaped, triple, composed of the basi and the lateral occipitals. The dorsal median roof of the cranium is formed by the paired parietals, near their anterior symphysis with the large pineal foramen, the paired frontals, nasals and premaxillaries. The outer nares are surrounded by the premaxillaries, maxillaries and nasals. Prefrontals and postfrontals exist. There is a complete cartilaginous, inter-orbital septum, and a cranial columella, a pair of upright buttresses arising in the alisphenoidal walls, connecting the parietals with the pterygoids. The hyoid apparatus consists of a narrow base, with three pairs of arches; of these the first or hyoid arch is variously connected with the cranium near the paroccipital process, or with the extracolumella (see *Middle Ear*, below); the others are a long and stout pair of first and a smaller pair of second branchial arches.

Crocodiles.—The temporal region is still bridged over by three arches, dividing the whole fossa into three, very much as in *Sphenodon*. The supratemporal foramen is bordered by the parietal, postfrontal (postorbital absent) and squamosal. The posttemporal foramen is very much reduced, sometimes to a narrow passage between the parietal, occipitals and squamosal, because the latter bone forms an extensive suture with the paroccipital process. The infratemporal or lateral fossa is wide and rather shallow, bordered above by the postfrontal and squamosal, in front by the postfrontal and jugal, below by the jugal and quadrato-jugal, behind by the latter, the quadrate, tip of the paroccipital and the squamosal. The quadrato-jugal being long and in an almost horizontal position, being wedged in between the jugal and nearly the whole length of the lateral edge of the quadrate, and there being no squamoso-quadrato-jugal bridge, the fourth foramen of *Sphenodon* is absent. The middle-ear cavity is reduced to a complicated system of narrow passages; one for the passage of the extra-columellar-mandibular string of the auditory chain (see *Ear*, below), between the quadrate, paroccipital and lateral occipital bones; another passage (*Eustachian*) opens in the roof of the mouth, between basioccipital and basisphenoid; a third joins that of the other side and forms with it a median opening between the same bones, just behind the posterior pterygoid border of the choanae. These nares, being in the recent crocodiles shifted as far back as possible, communicate with the outer nostrils by very long passages, formed by the whole length of the pterygoids, palatines, maxillaries, vomers and pre-maxillaries, all of which form a long median suture. But this long bony palatal roof is interrupted by a pair of large palatal foramina, bordered usually by palatine, pterygoid, ectopterygoid, or transverse bone and maxillary. On the dorsal side of the cranium we notice the parietals fused into an unpaired bone, without a pineal hole and the likewise unpaired frontal. There are a pair of postfrontals, prefrontals and lacrymals perforated by the naso-lacrymal duct. The nasals vary much in length, mostly in conformity with that of the maxillaries; as a rule they reach the short premaxillaries, but not always the nasal groove. (For taxonomic detail see under CROCODILE.)

The occipital condyle is formed mainly by the basioccipital, which always borders part of the foramen magnum, but the lateral occipitals each send a flange to it, which in immature specimens still partakes of the articulation ~~with~~ the atlas. The opisthotic and epiotic bones fuse early with the lateral and with supraoccipital bones; only the proötic remains longer as a separate element, anteriorly with a large hole for the exit of the third branch of the trigeminal nerve. The basisphenoid is scarcely visible, being overlaid by the pterygoids. The pre-sphenoid is larger, continued forwards and upwards into the inter-orbital septum, which remains mostly cartilaginous. Near the anterior and upper margin of the pre-sphenoid is a large notch on either side for the passage of the optic nerve, the three eye-muscle nerves and the first branch of the trigeminal. The place of the orbitosphenoids is taken by membrane or cartilaginous continuations of the interorbital septum, but the alisphenoids are large and abut upwards against the frontals and with a lateral flange against the postfrontals. These send down a conspicuous process which forms sutures with an upward process of the jugal and another of the ectopterygoid; it is this compound pillar which partly divides the orbit from the infratemporal or lateral fossa. The size of these and the upper temporal fossae stand in an inverse ratio to each other. The upper fossae are still comparatively large in the long-snouted *Gavialis* and *Tomistoma*, whilst these holes almost completely disappear in the alligators, namely, in the broad- and short-snouted members of the order, which chew their prey. In extinct Crocodilians the upper fossae were the larger. The temporo-mandibular muscle which lifts or shuts the lower jaw arises from the walls of the upper fossa, passes beneath the jugal-arch and is inserted upon the supra-angular portion of the lower jaw. In the more recent crocodiles this muscle is more and more superseded by the pterygo-mandibular muscle, which, arising chiefly from the dorsal surface of the much-broadened pterygoid, fills the widened space between the latter and the quadrate, and is inserted into the outer surface of the angular bone. The arrangement of this muscle secures a more advantageous leverage of the jaw, and is capable of more powerful development than the other, which is consequently on the wane—a nice illustration of onward, orthogenetic evolution. The dentary bones of the under jaw form a suture, later a symphysis; this is very long in the long-snouted genera, in which the splenials likewise form a long symphysis; in the others the mandibular symphysis is much shorter and the splenials remain widely separated. The articular bone is short, forms a transverse cup for the quadrate, or a saddle-shaped cup, and is perforated by the *Siphonium* (see below under *Ear*). The angle is upturned, formed by the articular, angular and, laterally, by the supra-angular bone; the opercular or counterpart of the splenial lies on the outer side, forming part of the anterior border of the oval foramen in the jaw.

The Chelonian skull agrees in many important features with that of *Sphenodon* and of the crocodiles, but it is composed of fewer bones, the ectopterygoids, lacrymals and postorbitals being absent, often also the nasals, unless they are fused with the prefrontals. The vomer is unpaired and forms a septum between the nasal passages, which, except in *Sphargis*, are ventrally roofed over to a variable extent by wings sent out by the palatines, joining the sides of the vomer. Most of the configurations of the other cranial bones are well represented in the accompanying figures. The palatines form a continuous broad floor with the pterygoids, which are extensively and firmly joined to the quadrates and to the basisphenoid. There are no Eustachian tubes. The occipital condyle is distinctly triple and the basioccipital is frequently excluded from the foramen magnum. The lateral occipitals early send out a pair of stout wings, the ventral of which joins a stout ventrilateral process of the basioccipital, both forming a thick knob especially in *Chelone*, and a dorsolateral wing, which broadly joins the large opisthotic bone. This connects the lateral occipital and the supraoccipital with the upper portion of the quadrate. On the top of the quadrate and upon the lateral dorsal portion of this compound transverse process (which of course corresponds to the paroccipital process of crocodiles, &c.) lies the squamosal, about which more presently. The two wings of the lateral occipital, part of the opisthotic, the quadrate, and part of the pterygoids, form the bony borders of the middle ear-cavity,

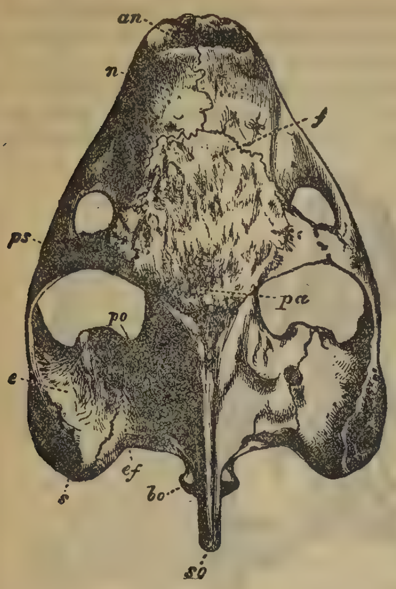


Fig. 13.—Dorsal aspect of skull of *Testudo tabulata* (from nature). *an*, anterior nares; *f*, frontal, on either side of which are the orbits, bounded behind by *ps*, the postfrontal; *bo*, basioccipital; *ep*, epiotic; *so*, supraoccipital; *q*, quadrate; *s*, squamosal; *pa*, parietal; *po*, periotic bones.

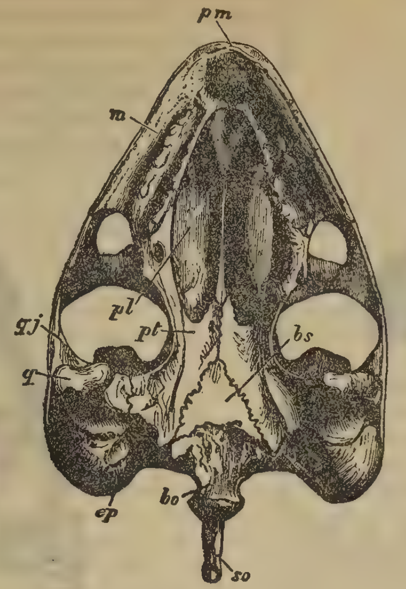


Fig. 14.—Ventral surface of skull of *Testudo tabulata* (from nature). *bo*, basioccipital; *bs*, basisphenoid; *ep*, epiotic; *m*, maxilla; *pl*, palatine; *pm*, premaxilla; *pt*, pterygoid; *q*, quadrate; *qj*, quadrato-jugal; *so*, supraoccipital.

which is open behind; through it extends horizontally the columellar rod, received with its outer portion by a notch on the posterior side of the quadrate. This is of very complicated shape. Its outer margins form most of the tympanic frame; the posterior margins being curved backwards leave a wide notch behind in the Cryptodira and in *Sphargis*, but in the Pleurodira this part of the quadrate is transformed into a trumpet, the rim of which, forming a complete ring, carries the tympanic membrane. The tympanic cavity thus formed often leads into a deep recess which extends into the hollowed-out squamosal (*e.g.* in *Testudo*) towards the opisthotic and bears some resemblance to the intricate tympanic recesses which pervade that region of the crocodile's skull. With its upper anterior and inner portion the quadrate joins the large proötic bone which is usually completely fused with the rest of the opisthotic, but in *Sphargis* it remains separate, and in this turtle the sutures between the otic bones and the supraoccipital also persist. In front of the proötics the bony lateral walls of the brain-case end in *Sphargis*, but in most of the other Chelonians bony alisphenoids are represented by a pair of epipterygoids which rest upon short upward processes of the pterygoids and are joined by much longer, rather thin, but broad descending lamellae from the parietals. They represent of course the columellae cranii or pterygoidal columellae; if they are of alisphenoidal origin the term epipterygoids is a misnomer; the same applies to these structures in other reptiles. Through the space enclosed by the pterygoid, basioccipital, opisthotic and quadrate, enters the cranial carotid artery, sometimes piercing the posterior rim of the pterygoid; then the canal runs along the dorsal side of this bone and opens near the cranial columella. The arcades over the temporal region are most variable. Potentially Chelonians possess all the three arcades of the crocodiles, but it so happens that never more than one fenestra is present. The false roof over the temporal region is most complete in *Sphargis* and in the *Chelonidae*. Excepting *Sphargis* the supraoccipital extends far beyond the back of the cranium in shape of a long unpaired crest, which never diverges, or sends out lateral processes, but it is joined, and partly overlaid for a great part of its length, by the parietals in *Chelonidae* and *Sphargis*. In these genera the much-enlarged parietal, the equally large postfrontal, with the squamosal behind, the jugal below, and a large quadrato-jugal, form one continuous bony roof over the whole temporal fossa, which is widely open behind, the space being bordered by supraoccipital, opisthotic, squamosal and parietal. All other Chelonians show a great reduction of this roof. The parietal does not send out dorsolateral expansions; and the postfrontal likewise forms no expansions. It joins the rather short malar, forming the posteriororbital bridge, which posteriorly is connected by the quadrato-jugal with the upper portion of the quadrate and with the squamosal. The latter rests upon the quadrate and is in no connexion with the parietal. Consequently the whole temporal fossa is quite open. The horizontal bridge or arcade is to a certain extent homologous with the infra-temporal arcade. All the bones which border the temporal fossa vary much in extent. The greatest reduction has taken place in *Cistudo* and in *Geoemyda*, the latter an Indian genus of Testudinidae, in which the quadrato-jugal is lost, leaving a wide gap in the horizontal arcade.—The Chelonians form an instructive parallel to mammalian conditions by the broad contact of the squamosal with the malar, *e.g.* in *Chelone*, whilst the quadrato-jugal, having in all Chelonians lost its original ventral connexion with the jugal, may actually get lost as in all the

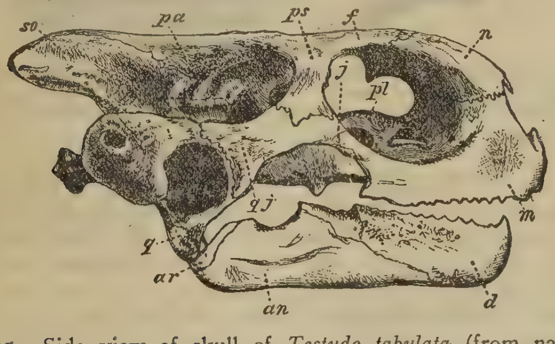


Fig. 15.—Side view of skull of *Testudo tabulata* (from nature). *an*, angular; *ar*, articular; *d*, dentary; *f*, frontal; *j*, jugal; *m*, mandible; *n*, naso-prefrontal; *pa*, parietal; *pl*, palatine; *ps*, postfrontal; *q*, quadrate; *qj*, quadrato-jugal.

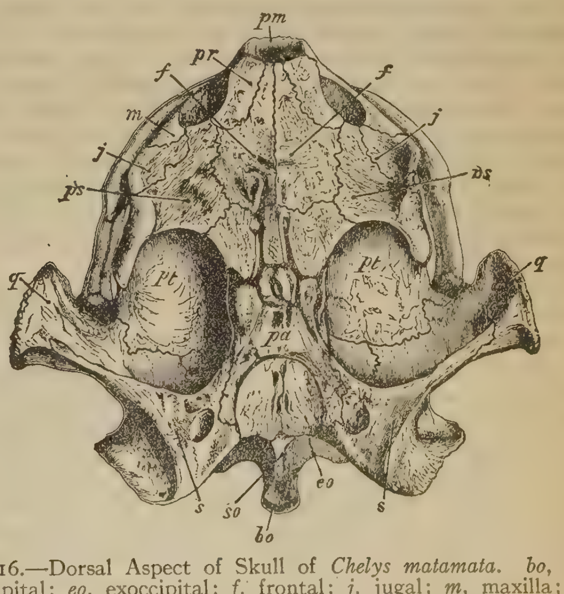


Fig. 16.—Dorsal Aspect of Skull of *Chelys matamata*. *bo*, basioccipital; *eo*, exoccipital; *f*, frontal; *j*, jugal; *m*, maxilla; *pm*, premaxilla; *pa*, parietal; *pr*, prefrontal; *ps*, postfrontal; *pt*, pterygoid; *q*, quadrate; *s*, squamosal; *so*, supraoccipital.

Lacertilia. The zygomatic arch of the Mammalia is formed (cf. also Agamidae) out of the supratemporal arch of *Sphenodon*, after the loss of the postorbital element and of the quadratojugal, the squamosal gaining connexion with the upper, not posterior and ventral, branch of the jugal or malar bone.

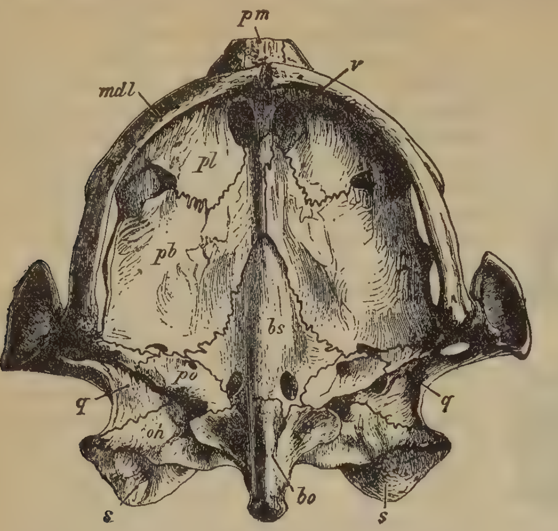


FIG. 17.—Ventral Aspect of Skull of *Chelys matamata*. *bo*, basioccipital; *bs*, basisphenoid; *mdl*, mandible; *oh*, opisthotic; *pl*, palatine; *pm*, premaxilla; *po*, proötic; *pb*, pterygoid; *q*, quadrate; *s*, squamosal; *v*, vomer.

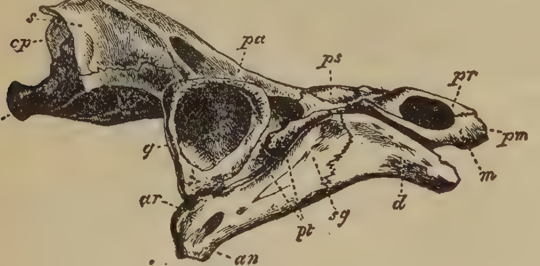


FIG. 18.—Lateral Aspect of Skull of *Chelys matamata*. *an*, angular; *ar*, articular; *bo*, basioccipital; *d*, dentary; *op*, opisthotic; *m*, maxilla; *pa*, parietal; *pm*, premaxilla; *pr*, prefrontal; *ps*, postfrontal; *pt*, pterygoid; *q*, quadrate; *s*, squamosal; *sg*, supra-angular.

The mandibular halves form a complete osseous symphysis, the only instance in reptiles; all the other elements retain their sutures. The articular portion of the articular bone forms several shallow cups and a slight anterior knob, best developed in *Chelone*. The angular bone does not help to form the posterior upper angle. The coronoid, or complementary element, is often small; the supra-angular and the splenial or opercular are always present, mostly also a pre-splenial wanting in Testudinidae (cf. G. Baur).

The hyoid apparatus is well developed, and sometimes assumes large dimensions, especially in *Chelys*. The two pairs of "horns" are the first and second branchial arches, whilst the hyoid arches are reduced to a pair of small, frequently only cartilaginous nodules, attached near the anterior corners of the basis linguae, which generally fuses with the os entoglossum in the tip of the tongue. In Chelydidae the long median basal or copular piece forms a semi-canal for the reception of the trachea.

In the skull of the Lacertilia the arcades over the temporal region vary much in composition and numbers. There are at most two arcades and two windows. First the posttemporal arcade, enclosing the posttemporal fenestra, which is framed mainly by the large paroccipital process below and the long parietal process above, both meeting distally, and the quadrate is carried by the paroccipital process. In the corner, in front, where the three bones meet, lies the squamosal, connecting parietal and quadrate. This squamosal, when not too much reduced, has an upper parietal and an anterior horizontal arm; the latter is essential for the formation of the second horizontal arcade, which makes the lower border of the supra-temporal window. The infra-temporal arcade, namely a quadrato-jugal +jugal arch, is absent in all Lacertilians owing to the complete absence of the quadrato-jugal element.

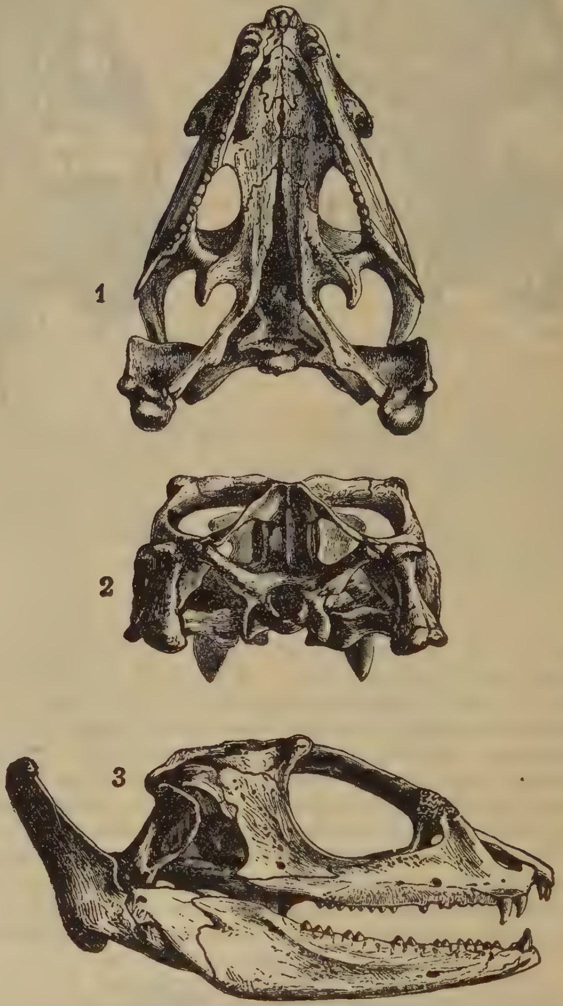


FIG. 19.—Skull of *Chlamydosaurus kingii* (old male), showing much differentiated teeth. 1, ventral aspect; 2, posterior; 3, profile, showing the enormous process at the hinder end of the lower jaw.

In *Heloderma* and Geckos the posttemporal is the only arcade. In the Amphisbaenids and in *Aniella*, practically also in *Anelytropsis*, all the arcades are lost. All the other families of lizards and the chameleons have two arcades. We begin the description of the horizontal arcade with those families in which it is most complete, and most like that of *Sphenodon*. In *Varanus* it is formed by four bones. The postfrontal is short; to it is attached the postorbital, which sends a long horizontal process to join the squamosal[1] splint, and this connects with the upper anterior end of the quadrate; between the quadrate, the squamosal and the long parietal process lies the likewise splint-like supratemporal, attached by most of its length to the parietal process. The jugal has only one arm, and this connects the maxilla with the postorbital, completing the posterior orbital border. There is a wide gap between jugal and quadrate. In Tejidae the arcade is the same, but the squamosal reaches the jugal, both meeting the postorbital. In *Lacerta* the arcade is essentially the same, but the window is completely filled up by the postfrontal, which extends so far back as to reach the supratemporal. In the Agamidae the arcade is strong and simplified. Postfrontal and postorbital are represented by one forked piece. This squamosal and the postfrontal mass are connected by the upper, much up-curved end of the jugal, which is thrust between them. This arrangement is further emphasized in *Iguana*, the upper end of the jugal being much enlarged so as to form the greater portion of the arcade, and keeping the postfrontal mass and the simple squamosal widely asunder. In Heloderma post- and prefrontals are in contact with each other, separating the frontal bone from the orbit; the jugal joins only the prefrontal, and there is no further arcade whatever. A vestige of a supratemporal (?) lies on the outside of the base of the squamosal, between *s* and *q* in fig. 20.

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[1] There is a much-debated question of the homologies of the one or two elements, both apparently membrane bones, which connect the upper end of the quadrate with the parietal and with the supratemporal arch. The question becomes acute in the snakes, whether the single element connecting skull and quadrate has to be called squamosal or supratemporal. Space forbids here to expound the matter, which has been very ably reviewed by S. W. Williston ("Temporal Arches in the Reptilia," *Biolog. Bulletin*, vii. No. 4, 1904, pp. 175–192; cf. also F. W. Thyng, *Tufts College Studies*, II. 2, 1906). About ten different names have been applied to these two elements, and two, namely, squamosal and supratemporal, are being used quite promiscuously. When only one element is present, the present writer uses the term squamosal, and there are reasons making it probable that this element is the squamosum of mammals. When both elements are present, the more ventral or lateral of the two is termed squamosal, that which always helps to form the

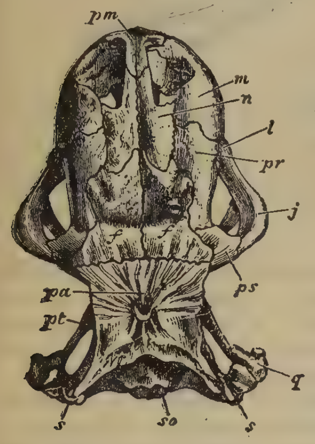

FIG. 20.—Dorsal aspect of skull of *Heloderma horridum*. *f*, frontal; *j*, jugal; *l*, lachrymal; *m*, maxilla; *n*, nasal; *pa*, parietal, *pm*, premaxilla; *pr*, prefrontal; *ps*, postfrontal; *pt*, pterygoid; *q*, quadrate; *s*, squamosal; *so*, supraoccipital.

The chameleons are peculiar. The posttemporal arcade, spanning a wide space, is formed by a long process of the supratemporal - squamosal, which is directed up- and backwards to join the parietal, which extends back by a long unpaired process. The horizontal arch is broad and short, squamosal and postfrontal, forming a broad suture; below they are joined by the jugal; above the suture lies, in chameleon, a tiny piece, perhaps a vestige of the dislodged postorbital.

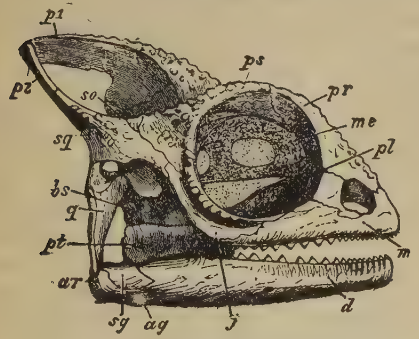

FIG. 21.—Skull of *Chamaeleon vulgaris*. *ag*, angular; *ar*, articular; *bs*, basisphenoid; *d*, dentary; *j*, jugal; *m*, maxilla; *me*, median ethmoid; p^1 and p^2, parietals; *pl*, palatine; *pr*, prefrontal; *pt*, pterygoid; *q*, quadrate; *sg*, supra-angular; *so*, supraoccipital; *sq*, squamosal.

The jugal bones, to continue the description of the appendicular parts of the skull, are firmly joined to lateral processes of the pterygoids by the ectopterygoids; further forwards they are extensively connected with the maxillaries. These rest against strong transverse palatine processes. The palatines form a medium symphysis; posteriorly they diverge together with the pterygoids, which articulate with the quadsupratemporal bridge, generally with the postorbital, sometimes also with the jugal. The more dorsal element is mentioned as supratemporal; it is always smaller, and mostly restricted to the corner between the squamosal and the parietal process against which it rests. Either of these two elements articulate with the quadrate. Both elements are present in Labyrinthodonts and in most of the extinct groups of reptiles; among recent forms in Lacertidae, Varanidae, Tejidae; one three-armed piece in *Sphenodon*, chameleons and crocodiles, without, in *Sphenodon* at least, any trace of a compound nature; one piece, forked, in Agamidae; one simple piece in most of the other Lacertilia, and in snakes. rates and with the basisphenoid by a pair of strong basipterygoid processes. A slender vertical rod of bone, the columella cranii, arises from the dorsal surface of each pterygoid and, passing at a distance from the cranial capsule, is sutured to a short lateroventral process of the parietals Such a pair of columellæ exists in nearly all Lacertilia (distinguished by many systematists as *Kionocrania*) with the exception of the chameleons and the Amphisbaenidae. In many lizards, however, this columella, or epipterygoid, does not quite reach the parietal, leaning instead against the proötic; possibly it has been evolved out of the alisphenoid, and Chelonians seem to support this view. The premaxillary bone is single, except in the Skinks and in some Geckos; ventrally it touches the vomers which vary much in size; they are always paired although suturally connected; posteriorly they pass into, and fuse with, the palatines before these send off their maxillary processes. Between the vomer and its maxillary is a longitudinal hole. Often, *e.g.* in *Lacerta*, the vomers enclose a median hole near their anterior end, for Jacobson's organ. Dorsally the premaxilla sends a median process backwards to the nasals. These are paired, and fuse together only in *Uroplates* and in *Varanus*. The external nasal fossae are sometimes very large, and their anterior half appears blocked by the ossified turbinals, *e.g.* in *Varanus* and *Tejus*. Prefrontals are always present, often fused with the lacrymals; in Heloderma, in Aniella and in chameleons the prefrontals extend so far back as to meet the postfrontals, excluding thereby the frontals from the orbital rim. The frontals are either paired, as in Varanus, Lacertidae, Heloderma, Anguidae, Scincidae, Anelytropsidae, Aniella, Amphisbaenidae, and in some Geckoninae; or they are fused into one bone, as in the Eublepharinae, chameleons, Tejidae, Iguanidae, Agamidae, *Xenosaurus*. The parietals are double in the Geckos, in *Uroplates* and *Xantusia*; in all the others they form one coössified mass, generally with a pineal foramen, except in Eublepharinae, Amphisbaenidae, Tejidae, in Aniella and other degraded forms. In the majority the pineal foramen lies in the middle of the parietal, but in the Iguanidae it is near the frontal, and actually in the frontal in chameleons.

As regards the brain-case, there is a cartilaginous interorbital septum, connected posteriorly with the slender, bony presphenoid; ventrally on to this is fused a vestige of the parasphenoid, a narrow and thin splint which sometimes can be dislodged. The whole of the anterior wall of the brain-case is membranous, excepting a pair of separate ossifications, which do but rarely touch any of the cranial bones, as frontal, parietal or proötics. The ossifications are irregular in shape, each sending out a downward process which curves inwards almost to meet its fellow; between these issue the olfactory lobes. W. K. Parker recognized them as the alisphenoids; E. D. Cope named them postoptics, and remarked that in *Sphenodon* they coexist with an orbitosphenoid bone. The proötic has a notch in its anterior lateral margin for the passage of the trigeminal nerve. The opisthotic portion of the petrosal mass is intimately fused with the lateral occipital bones and their paroccipital process, and sometimes, *e.g.* *Tejus*, encloses with them many intricate recesses of the middle ear-chamber, which extend also into hollow and swollen thick downward processes of the basioccipital. These cavities of both sides communicate with each other through the cancellous substance of the basioccipital and basisphenoid. There are no Eustachian tubes opening into the mouth through the base of the skull.

The occipital condyle is tripartite, the lateral occipitals partaking of the articulation; very rarely, *e.g.* in Amphisbaenidae (see fig. 22), the basioccipital portion is so much reduced that the skull articulates by two very broad condyles.

The halves of the under jaw are but loosely united, either by ligament only or by an at least very movable suture. The jaw is compound and the numerous constituent bones mostly retain their sutures. Besides the dentary and articular, angular and supra-angular on the lateral side, and the opercular or splenial on the inner side, there lies on the dorsal side the coronoid, six pairs in all. The posterior angle of the jaw is always formed by the articular bone, not by the angular which lies on the ventral side, about the middle of the jaw; it is fused with the articular in Geckos, some Tejidae, Amphisbaenidae, and some other burrowing kinds. The splenial is absent in chameleons; near the vanishing point in some of the Agamidae. The coronoid is always present, for the insertion of masseter muscles. In the pleurodont lizards the outer wall of the dentary forms a ledge, against the inner side of which are fixed the teeth with cementum.

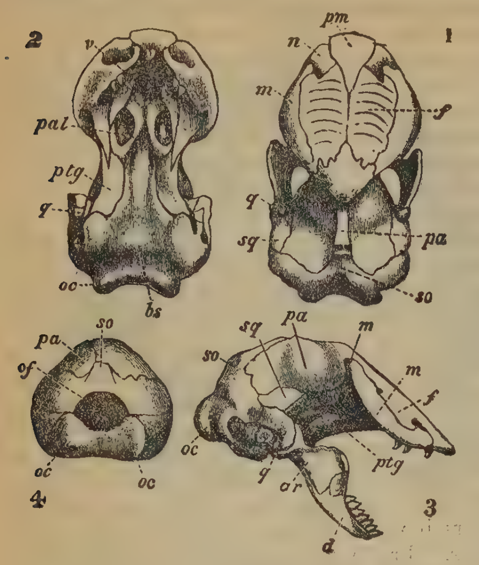

FIG. 22.—Skull of *Monopeltis sphenorhynchus*. 1, dorsal aspect; 2, ventral aspect; 3, lateral aspect; 4, posterior aspect. *ar* articular; *bs*, basisphenoid; *d*, dentary; *f*, frontal; *m*, maxilla; *n*, nasal; *oc*, *oc*, occipital condyles; *of*, occipital foramen; *pal*, palatine; *pa*, parietal; *pm*, premaxilla; *ptg*, pterygoid; *q*, quadrate; *so*, supraoccipital; *sq*, squamosal; *v*, vomer.

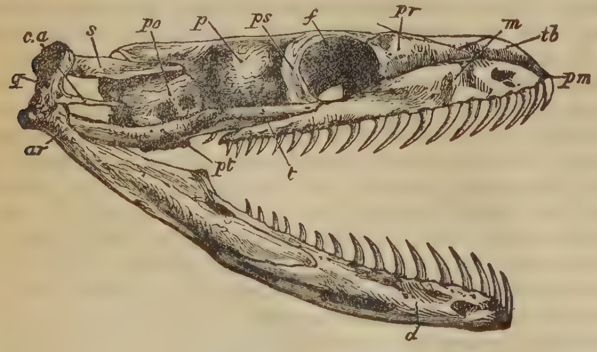

FIG. 23.—Skull of *Python sebae*. *ar*, articular; *ca*, columella auris; *d*, dentary; *f*, frontal; *m*, maxilla; *p*, parietal; *pm*, premaxilla; *po*, proötic; *pr*, prefrontal; *ps*, postfrontal; *pt*, pterygoid; *q*, quadrate; *s*, squamosal; *t*, transversum; *tb*, turbinal.

The snakes' skull shows many peculiarities, and most of the bones of the cranial capsule fuse together without sutures. The occipital condyle is triple, the lateral occipitals and the basioccipital taking equal share in its composition; the basioccipital is excluded from the foramen magnum; frequently one common epiphysial pad covers this tripartite condyle. The supraoccipital is likewise excluded from the margin of the foramen magnum by the lateral occipitals. The basisphenoid is prolonged forwards into a long presphenoidal rostrum, on the upper surface of which the trabeculae cranii, which persist as cartilages, extend forwards to blend with the median ethmoidal cartilage. There are no ali- and no orbitosphenoids, their places being taken by downward extensions of the frontal bones, which descend to this sphenoidal rostrum and then turn inwards to meet together on the floor of the cranial cavity. There is consequently no interorbital septum. The parietals also descend laterally, but unite with the basisphenoid by suture. On the base of the skull we note various processes for the insertion of ventral cervicooccipital muscles, much used during the act of vigorous striking. Boidae have a long sphenoidal ridge and thick basipterygoid processes; others have one or more median knobs or crests, and the Viperidae have a very prominent and large ridge. The parietals fuse together into an unpaired mass whence arises mostly a strong median crest which projects a little beyond the occiput; there is no parietal or pineal foramen. There are paired frontals, postfrontals, prefrontals and nasals; the latter are said to coössify in *Charina* only. The position of the prefrontals is variable. In the boas, for instance, they meet, separating the nasals from the frontals; they are in contact with the nasals in the boas, burrowing snakes and in *Xenopeltis*, but more or less widely separated from them, and often from each other, in the Colubridae and Viperidae. The premaxillary is single; and only in Glauconiidae connected with the maxillaries; in the others it is but loosely connected with the ethmoidal end of the skull, for instance, with the turbinals, which are osseous and well developed in pythons.

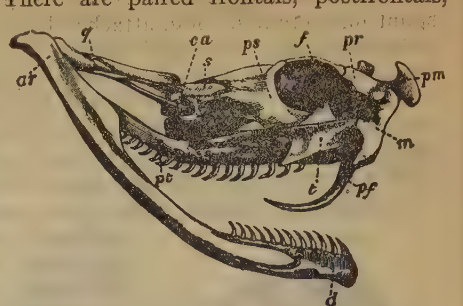

FIG. 24.—Skull of *Vipera nasicornis*. *ar*, articular; *ca*, columella auris; *d*, dentary; *f*, frontal; *m*, maxilla; *pf*, poison fang; *pm*, premaxilla; *pr*, prefrontal; *ps*, postfrontal; *pt*, pterygoid; *q*, quadrate; *s*, squamosal; *t*, transversum or ectopterygoid.

The whole appendicular apparatus is most loosely attached to the skull, at least in the typical snakes, and since they do not chew their prey but only hook it in, so to speak, during the act of swallowing, the whole apparatus is as movable as possible.

The whole palatal apparatus shows many modifications, but the maxillaries, palatines and pterygoids always remain widely asunder, and from the mid-line. Some of the modifications, so far as they are used for taxonomic purposes, are mentioned in the article SNAKES: *Classification*. In the majority of snakes the maxillaries form the borders of the mouth, and they are but loosely attached to the other bones, to their palatine processes, to the palatines, and with their posterior ends, by the ectopterygoids to the pterygoids. In the Viperidae the maxillaries are much shortened and articulate extensively with the prefrontals; they can be erected, or rather pushed forwards, by the ectopterygoids (see SNAKES); they are not connected with the palatines. The pterygoids diverge posteriorly and articulate loosely with the quadrates; in the original condition the articulation is near the distal end of the quadrate, *e.g.* in Boidae, and the pterygoids may form an additional attachment with the mandibles; in the Viperidae the pterygoids are somewhat shortened and are attached to about the middle of the quadrate shafts; in the Amblycephalidae they are still shorter and do not reach these bones. The ectopterygoids are lost by the burrowing Typhlopidae and Glauconiidae. The quadrate is always extremely movable; besides being in a most curious way connected with the outer end of the columellar rod (see below, *Ear*), it is suspended from the skull by the squamosal. The squamoso-quadrate connexion is very loose; that of the squamosal with the skull varies much. In the majority of snakes it slides quite freely upon the parietal; it is much longer than the quadrate in the boas, much shorter than the elongated and slender quadrate in most of the poisonous snakes. Lastly, in most of the ancient burrowing snakes, *e.g.* *Typhlops*, *Glauconia*, *Ilysia* and *Uropeltis*, the squamosal has worked its way into the cranial wall so that the quadrate, itself also much shortened, rests directly upon the cranium.

The Vertebral Column.

The vertebrae of all reptiles are gastrocentrous, that is to say, the centra or bodies of the vertebrae are formed by the originally paired, interventral cartilages, while the basiventrals are reduced, persisting either as so-called intercentra or wedge-bones, or as intervertebral pads, or disappearing altogether; the basidorsal elements form the neural arch. At the earlier stages of development the gastrocentrous vertebrae behave in the same way as in the Urodela, except that the interdorsal pair of elements is suppressed from the beginning (the very elements which in

Stegocephali and most Anura form the centre), therefore the typical batrachian vertebrae are notocentrous. If the remaining three pairs of constituent elements of each vertebra (the neural arch, the centrum and the intercentra) remain separate, the vertebrae are called temnospondylous (τέμνω, I cut, σπόνδυλος, a vertebra). If the neural arches and the centra are suturally united, or are fused with each other, the vertebrae are called stereospondylous (στερεός, solid). In many fossil reptiles most or many of the vertebrae are temnospondylous; in most of the recent Amniota[1] they are consolidated, but the atlas or first vertebra remains usually in a relatively primitive condition, and is temnospondylous but for the usual modification that its centrum becomes attached to that of the second vertebra and forms its odontoid process. The composition of gastrocentrous vertebrae is best illustrated by the first and second cervical vertebrae of crocodiles, whence by reduction and fusion the structure of every other vertebra can be explained. We have only to add that the ribs are genetically derived from lateral outgrowths of the basiventral elements, whilst the chevron bones are mere ventral outgrowths from the same basal cartilages. The most primitive vertebral column is that of the Geckos. The vertebra consists chiefly of a large neural arch which rests broadly upon the centrum; this is a tube, more or less calcified and ossified, with a narrow waist in the middle, widening head- and tailwards. The tube is hollow, the chorda dorsalis passing through the whole column, and there are no proper joints between the centra, which are amphicoelous. Between the centra lies a separate element, the so-called intercentrum, which is ring-shaped and acts as an interarticular pad instead of a joint. The first of these rings forms the ventral half of the atlas ring; the second is attached to the cranial surface of the second centrum, and produces, like some of the next following ones, a vertical median blade of bone, a true hypapophysis. Such intercentra exist throughout the length of the vertebral column; in the tail they are enlarged and carry a pair of chevrons, which are cartilaginous and have the tendency of fusing by superficial ossification on to the caudal ends of the centrum next in front, to which they do not belong genetically. Exactly in the middle of each vertebra the thin shell of the centrum forms a cartilaginous septum, of what is often wrongly called chordal cartilage. When this septum is complete, and this seems to be the normal condition in the tail, the chorda is here rent asunder, otherwise it is only constricted. This septum is but slightly invaded by ossification, and consists of large cells which retain the appearance of young or embryonic cartilage. It coincides exactly with the line of transverse division of most of the caudal vertebrae into an anterior and a posterior half, the division gradually extending right through the bone of the neural arch. The same kind of division, and from the same causes, exists in *Sphenodon* and in many lizards, in fact in all those reptiles which can reproduce their broken-off tail. It is from the septal cartilage that the regeneration starts[2] (fig. 26).

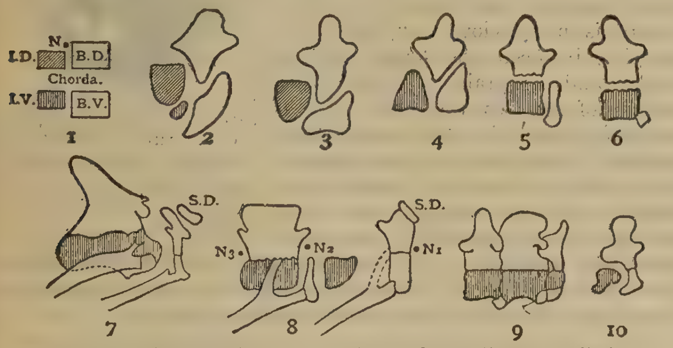

FIG. 25.—Composition of Vertebrae of Reptiles. In all the figures the right side looks towards the head.

1. Diagram showing the relative position of the four pairs of arcualia which constitute a complete quadripartite vertebra. B.D., Basidorsal; B.V., basiventral; I.D., interdorsal; I.V., interventral, shaded vertically in all figures; N., position of axil of the spinal nerve, *i.e.* behind the neural arch of its vertebra. 2, 3. Side views of the constituent cartilaginous blocks of a caudal vertebra (2) and a trunk vertebra (3) of Archegosaurus, as typical examples of temnospondylous quadripartite and tripartite vertebrae. For comparison with Reptilian vertebrae. 4. Temnospondylous tripartite vertebra of the trunk of *Eryops*, a Permian reptile. 5. Composition of the second vertebra of a crocodile. 6. A vertebra of which the vasiventrals are reduced to an "interventrum." 7. Side view of the first and second cervical vertebra of a crocodile. 8. The same analysed. N1, N2 and N3, position of the first, second and third spinal nerves; S.D., occasionally called Proatlas, the detached spinous process, or supradorsal, of the atlas or first vertebra. 9. The first three vertebrae of *Sphenodon*. 10. The complete atlas vertebra of an adult *Trionyx*, still typically temnospondylous.

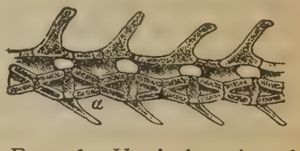

FIG. 26.—Vertical section of four (7th to 10th) caudal vertebrae of *Sphenodon*. *a*, line passing through the middle of centrum and through part of the neural arch, where the vertebrae break off. (After Günther.)

Sphenodon also has biconcave vertebrae owing to the persistence of the chorda dorsalis in the intervertebral region; otherwise the vertebrae are solid. Intercentra occur from the atlas regularly into the tail, where they carry chevron bones. The atlas-ring (fig. 25, 9) is composed of the first intercentrum and a pair of neural arches which remain quite separate and carry on the dorsal side a pair of ossicles, the disconnected supradorsal elements of the atlas, erroneously supposed to be the remnants of the "proatlas."

Crocodiles.—Remnants of the chorda persist in the middle of the centra, which, in recent species, are mostly procoelous, and with a convex knob behind, but the first caudal is strongly biconvex. Cartilaginous intercentral rings, pads or menisci, occur throughout the column; in the tail they carry chevrons. For the instructive detail of the composition of the first and second cervical vertebrae see fig. 25, 7 and 8. Some of the posterior neck and anterior thoracic vertebrae have an unpaired hypapophysis arising from the centrum. The vertebrae have the usual processes, viz. spinous process, a pair of anterior and posterior zygapophyses arising from the neural arch, diapophyses likewise from this arch for the articulation with the tubercular portion of the rib; short parapophyses from the centra for the capitular ends of the ribs; the transverse processes of the 12th vertebra, and following, carry the whole rib, and are like the processes of the lumbar vertebrae diapapophyses; the so-called transverse processes of the tail are mainly the anchylosed or fused ribs themselves.

Chelonians.—The vertebrae are sometimes in the various regions of the same column opistho-pro-or amphicoelous, or even biconvex. Intercentra occur regularly on the first two or three cervicals, and on the tail as paired or unpaired nodules, or as chevrons, which articulate mostly with the previous centra and occasionally fuse with them. Intercentral, fibrocartilaginous disks occur regularly, mostly in the shape of rings; the first is the transverse ligament of the atlas-ring. In the Trionychidae (fig. 25, 10), but also in some other tortoises, the various pieces of the atlas do not anchylose, and the first centrum remains also movably attached to the second, although it sometimes carries, and fuses with, the second intercentral piece. The entire atlas remains in a primitive, typically temnospondylous condition. On the other hand, in some Pleurodira, *e.g. Platemys* and *Chelys*, all the constituent parts of the atlas coössify and form a complete, solid vertebra, which articulates by a concave-convex joint with the true centrum of the second vertebra. The normal number of cervical vertebrae is eight in all Chelonians. The last cervical has sometimes, *e.g. Chelydra*, a very peculiar shape with strangely modified articular facets, in correlation with the retractile neck. The neural spines of the trunk vertebrae broaden out and fuse with the neural plates of the carapace. A tertiary modification takes place in many Pleurodira with the reduction of the neurals by the costal plates, which then meet in the dorsal line and cover the neural spinal processes. The caudal vertebrae are often much reduced in size, although not always in numbers, when the tail is very short, as in the marine turtles. In various species of *Testudo* about half a dozen of the last caudal vertebrae fuse together into a veritable urostyle, which is covered with a claw- or nail-shaped sheath of horn. In some of the gigantic tortoises of Mauritius this caudal vertebral complex is fully 3 in. long and 2 in. broad, of an extraordinary appearance.

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[1] There remained a flaw in the correctness of the view that the bodies of the amniotic vertebrae are formed by the paired interventral pieces, since the bodies were known always to appear from the first as unpaired, cartilaginous masses, until G. B. Howes found them to consist of a right and left pair in the embryos of *Sphenodon*.

[2] Regeneration of the tail can take place in *Sphenodon*, all Geckos, Anguidae, Gerrhosauridae, Lacertidae, most Scincidae, and in many Tejidae and Iguanidae; certainly not in chameleons, *Varanus*, Agamidae, snakes, crocodiles and tortoises. Often the tail is so brittle and the muscular cones are so loosely connected that part can be thrown off by the muscular exertion of the creature itself. The reproduced tail is, however, only a sham tail, since neither centra nor arches, but only a non-segmented rod or tube of fibrocartilage is produced. It is, however, invested with new muscles and with skin, but the scales often differ considerably from those of the normal organ, sometimes showing reversion to an ancestral form. For further detail see G. A. Boulenger, *P.Z.S.* (1888), p. 351, and (1891), p. 466.

The vertebrae of the *Lacertae*, or Lizards proper, are a direct further development of those of *Sphenodon*. The chorda disappears; the vertebrae are procoelous, with an articulating knob behind. Intercentrals, in the shape of osseous, unpaired nodules or wedges, persist on most of the cervical vertebrae; they are absent in the trunk and reappear in the tail, either as wedges or with chevrons. The first intercentral forms the central half of the atlas, with the neural half of which it is connected by suture. The second fuses mostly with the cranial end of the second centre and with the caudal and ventral surface of the odontoid, forming a downward-directed hook. Frequently the fusion remains incomplete, or the wedges may completely merge into the epistropheal mass without leaving any outward traces. Boulenger has made the important observation that the intercentra of the tail are sometimes paired, *e.g.* in *Heloderma*. When the caudal vertebrae are strongly procoelous, the knob is very long and the chevrons are attached to its neck, having shifted on to the vertebra in front, while their basal intercentral piece, or pieces, remain in the original position. In *Ophisaurus* the chevrons are absolutely fused with the caudal ends of the centra and thus assume a superficial resemblance to the vertebrae of Urodela. The splitting of the tail-vertebrae and regeneration have been described on a previous page. The trunk-vertebrae of the Tejidae and the larger Iguanidae possess additional articulating processes and facets, besides the usual processes. The *Zygosphene* is a wedge-shaped process with two articular facets, which projects forward from the anterior side of each neural arch. The *Zygantrum* forms a corresponding excavation with a pair of articular surfaces on the hinder side of the arch. The crests on the tail and trunk of many lizards, *e.g.* Iguanidae, are entirely tegumentary structures and not supported by the axial skeleton, except in some chameleons, *e.g. Ch. cristatus*, and in the peculiar genus *Brookesia*; in these the accessory much-complicated processes are enormously elongated and support the high cutaneous crest which arises from the back, especially in *B. ebenaud*.

The vertebrae of the snakes are procoelous (figs. 27, 28, 29). Besides the zygapophyses, they have zygosphenes on the neural arches; the ribs articulate with the parapophyses. Long, unpaired hypapophyses arise from the centre of the anterior neck and trunk vertebrae to a variable extent. In *Dasypeltis* and *Rhachiodon* a considerable number of these processes perforate the oesophagus and act as crushers of the shell of the eggs which these snakes swallow. The often-repeated statement that these processes are capped with enamel is erroneous. The caudal vertebrae are devoid of chevron bones, but they carry paired hypapophyses, and they have transverse processes which also are generally bent downwards.

Lastly, the numbers of vertebrae composing the whole column and its various regions. In the snakes we can distinguish only between atlas and epistropheus, trunk and tail. The numbers vary exceedingly, in the trunk up to several hundred.

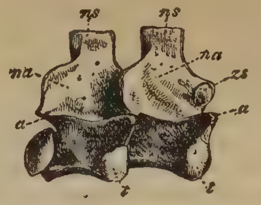

FIG. 27.—Lateral aspect of two trunk vertebrae of *Python*. *a*, articular processes of the zygapophyses; *na*, neural arches; *ns*, neural spines; *t*, parapophyses. *zs*, zygosphene.

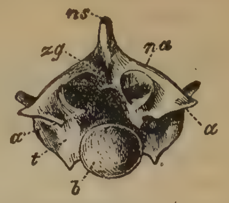

FIG. 28.—Posterior aspect of a trunk vertebra of *Python* (from nature). *a*, zygapophyses; *b*, ball on the surface of the centrum; *t*, parapophysis; *zg*, zygantrum.

The tail may contain only a few, *e.g.* in the burrowing *Typhlops*, *Glauconia*, *Uropeltis*; or it may be very long, as for instance in *Boa*. There is no obvious reciprocal correlation between the length of the trunk and the tail. In the other orders of reptiles the neck is well marked, except in the snake-shaped lizards. If we define as first thoracic vertebra that which is the first connected with the sternum, all those anterior being cervical, the neck-vertebrae number 5 in chameleons, 7 in *Sphenodon*, 8 in the Chelonians and in the lizards, with the exception of the majority of *Varanus*, which have 9 like the *Crocodilia*.

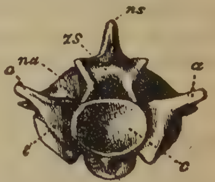

FIG. 29.—Anterior aspect of a trunk vertebra of *Python* (from nature). *a*, zygapophyses; *c*, cup on the surface of the centrum.

THE NUMBER OF VERTEBRAE OF SOME SPECIMENS IN THE MUSEUM OF ZOOLOGY, CAMBRIDGE, ENGLAND

	Cervical.	Thoracic.	Xiphoidal Ribs.	Floating Ribs.	Lumbar ribless.	Serial Numbers of the Sacral Vertebrae.	Caudal.
Sphenodon punctatum	7	3, 4	15 or 14 in all.			26, 27	±30
Crocodilus vulgaris .	9	5	3	2	5	25, 26	33
Alligator mississippien.	9	5	3	2	5	25, 26	40
Gavialis gangeticus .	9	7	2	3	3	25, 26	33
Chelone viridis . .	8	9	0	0	0	19,20,21	16+pygostyle
Macrolemys temmincki	8	9	0	0	1	19, 20	27
Chelys matamata .	8	8	0	0	0	17, 18	17
Varanus niloticus .	8	4	4	11	2	30, 31	75+
,, *giganteus* .	9	2	1	16	1	30, 31	99
Iguana tuberculata .	8	4	2–3	10–9	1	26, 27	46
Uromastix spinipes .	8	4	1	11	0	25, 26	24
Trachysaurus rugosus	6	4	1	25	0	37, 38	7+pygostyle of about 6
Cyclodus gigas . .	7	4	2	21	0	35, 36	0
Lacerta viridis . .	7	3	2	15	0	28, 29	40+
Ophisaurus apus .	0	0	0	0	0	55, 56	0
Chamaeleo vulgaris .	5	2	1	12	2	23, 24,	±50
Rhampholeon spectrum	5	1	3	8	2	20, 21	17

The *ribs*, having arisen as lateral, separated off processes from the basiventral elements, show many modifications in their proximal attachments. These can be best studied on the skeleton of a young crocodile (fig. 25, 7 and 8). The first pair of ribs is very long and broad, attached to the unpaired ventral piece of the atlas-ring; the tubercular portion is indicated by a very small rugosity. The second pair of ribs is still larger; the capitulum attached to the second intercentral piece which fuses with the odontoid process; the tubercular process is weak or represented only by a ligamentous connexion with a small knob of the odontoid process; consequently the tuberculum has shifted its attachment away from the second vertebra. The other cervical, and the anterior thoracic, ribs have complete capitular and tubercular processes, which, articulating with the bodies and with dorsolateral processes of the neural arches of their vertebrae, enclose typical transverse canals. In the posterior thoracic region the ribs are attached entirely to transverse processes of the neural arches, both capitular and tubercular portions having left the bodies or centra; the same arrangement prevails in the tail, but the ribs are very short and soon fuse with the processes. The two sacral ribs are very thick, articulating with the centra and the bases of their neural arch, and they even form part of the intervertebral joint! In *Sphenodon* the first three ribs are represented by bands of connective tissue only, with similar attachments as in crocodiles. The other cervical ribs are osseous; their short capitula retain their partly intercentral attachment, while the tubercula are carried by low processes of the centra. In the thorax both capitulum and tuberculum merge into one facet, which is gradually shifting farther tailwards and upwards until the attachment reaches them, and then lies upon the neuro-central suture. The first caudal vertebrae also possess ribs, very short and soon fusing with the diapophyses of the neural arches. In the cervical region of the *Chelonia* the ribs seem to be absent. In the thorax they retain their primitive intercentral position throughout life, assuming (except the first pair, which remains short and least modified) an absolutely intervertebral position. From the lumbar or presacral region backwards the capitula are gradually shifting upon short processes of the centra, until in the tail the vestigial ribs are carried by the diapophyses of the neural arches. In *Sphargis* (fig. 31) all the ribs are free; in the other Chelonians the ribs, generally in the recent species, flatten and become surrounded by the growing membrane bone of the dorsal plates, and the cartilage of the ribs (except the capitular and neck portion of the rib, which cannot be got at by the dermal bones) undergoes a process of calcification. Ultimately this is resorbed and its place is taken by the dermal bone, which forms, so to speak, a cast of the rib. Several of the short presacral ribs, and of course the postsacrals, are not drawn into these enormous changes, although the carapace covers, and indirectly affects, them.

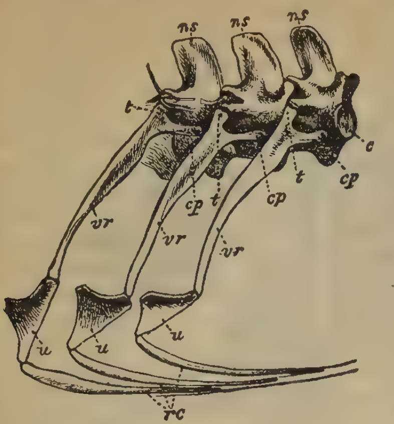

FIG. 30.—Lateral aspect of Three Thoracic Vertebrae of *Crocodilus vulgaris* (after Mivart). *c*, cup on the anterior surface of centrum; *cp*, capitula of ribs; *ns*, neural spines; *t*, tubercula of ribs; *u*, uncinate processes; *vr*, dorsal or vertebral portions of the ribs; *rc*, ventral or sternal cartilaginous portions of ribs.

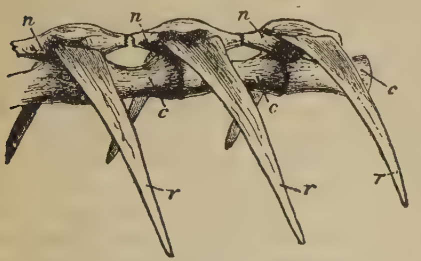

FIG. 31.—Three Vertebrae of *Sphargis coriacea.* *c*, vertebral centra; *n*, neural arches; *r*, ribs.

Certain changes initiated in *Sphenodon* are more marked in the ribs of the Lacertilia; cervical ribs are often long in the lower neck. In the trunk the capitular portions are often much reduced, and in these cases the ribs are suspended mainly by their tubercular portions, usually from the diapophyses of the neural arches near the anterior end.

In the snakes all the vertebrae, from the second cervical to the tail, carry ribs. These are very movable, articulating with a rather large, more or less vertically placed facet, which is borne by the parapophysis or transverse process; sometimes the rib retains traces of the original division into a capitular and tubercular portion. The ribs of the snakes, although long, consist only of their dorsal portions. In snake-shaped lizards, *e.g. Pseudopus*, rather long ribs begin with the fourth vertebra.

Uncinate processes are developed only in *Sphenodon* and in the Crocodilia. They are not homologous structures, arising in the former from the posterior margin of the middle of the dorsal portions of the ribs, overlapping the shaft of the next following rib; in the crocodiles they arise out of the middle portion of the ribs, remaining cartilaginous, whilst the middle portion coössifies with the dorsal. Only in *Sphenodon* and Crocodiles the thoracic ribs consist of three successive pieces; in the Lacertilia they consist only of the dorsal and the ventral or costosternal. The latter remain cartilaginous, or they calcify, but they never ossify.

The sternum and further modifications of the ribs of the trunk.—The sternum of most reptiles consists (1) of an anterior portion (presternum, Parker; prosternum, Fürbringer; mesosternum of Gegenbaur), which is generally broad, more or less rhomboid and carries the shoulder-girdle, and on its posterior sides several pairs of ribs; (2) of a posterior portion (mesosternum and xiphisternum of Parker; xiphisternum of Fürbringer; metasternum of Gegenbaur), which is narrow, sometimes metameric, carries several pairs of ribs, and generally divides into a right and left xiphoidal half, each of which is continued into one or more ribs. These ribs tend to lose their connexion, and in these cases the sternum ends in two typical xiphoid processes. The distinction between pre- and metasternum is arbitrary. In *Sphenodon* the broad sternal plate carries only three pairs of ribs, the 8th to 10th, and there is no xiphisternum. The other ribs of the trunk are long and compound, but they remain free and do not approach the mid-line. From the posterior edge of the sternum to the pelvis extends the complicated *parasternum*, embedded in the abdominal wall; it is composed of about two dozen sets of abdominal ribs, each set containing a right and a left and a median chevron-shaped piece. In the Crocodilia the presternum carries only two or one pair of ribs, always that of the 10th vertebra. The narrow, more or less metameric metasternum carries seven or eight ribs, the last one to three being xiphoidal. The post-thoracic ribs gradually decrease in length; about three presacral vertebrae have no ribs, and so are typically lumbar. The sacral ribs are generally the 25th and 26th in *Crocodilus* and *Alligator*; sometimes the 24th and 25th in *Gavialis*. The parasternum consists of only seven or eight transverse sets, each composed of two right and two left narrow splint-bones. All these parasternal elements belong to the category of dermal bones, together with those of the plastron of tortoises, inherited from Stegocephalian conditions.

The Lacertilia present an almost endless variety. The presternum is rhomboid and broad; it carries from three to six pairs of ribs, mostly four or five; the first thoracic rib is that of the 9th vertebra, the only exceptions being the chameleons with only five cervical vertebrae, and *Varanus*, which has usually nine cervicals like the crocodiles. The last cervical rib in these long-necked lizards is very long and has all the appearance of having but recently severed its connexion with the sternum. The presternum of Lacertilia sometimes has a window, *e.g.* some species of *Lacerta, Phrynosoma, Iguana,* or a pair of windows, *e.g. Agama, Liolepis, Goniocephalus.* The xiphisternum carries a variable number of ribs; it is either scarcely distinguished from the anterior plate, or it is long, and in these cases either double, *e.g. Iguana, Gerrhonotus, Varanus, Zonurus, Agama, Cyclodus, Lacerta*; or single, *e.g. Zonosaurus.* The post-sternal ribs shorten gradually in the majority of the Lacertae, and there is sometimes a ribless lumbar vertebra, *e.g.* in *Iguana*; in many Lacertilia, however, the ventral cartilaginous halves of the ribs are connected with those of the other side, either by ligaments, or they join together, forming complete hoops of thin cartilages. Such ribs occur in all Geckones and Chameleons, but also in many Iguanidae, Scincidae, and even in the Anelytropidae; their numbers vary much, from 27 in the Scincoid *Acontias meleagris*, 7–10 in *Polychrus*, 8 in *Chamaeleo* *vulgaris*, 4 or 5 in *Anolis*, to 1–3 in some other iguanids, skinks and geckos. *Uroplates fimbriatus* has 14, and the last four pairs are separated from the dorsal portions of their ribs; similar discontinuity occurs in geckos, the median portions bearing a striking. although not fundamental, resemblance to parasternal ribs.

In the lizards with much reduced fore limbs, the sternum loses its connexion with the ribs from behind forwards; two sternal ribs existing in the Tejid *Ophiodes* and in the Scincoid *Acontias*, one only in *Pygopus*, none in *Ophisaurus* s. *Pseudopus* and *Anguis* (in the latter one rib is still connected in the embryo). The sternum is likewise quite free in *Chirotes* in spite of its functional limbs; the sternum is still a large plate, with a window, and ending in two long, xiphoid processes.

Fig. 32.—Rudiments of pectoral arch—1, of *Acontias meleagris*; 2, of *Typhlosaurus aurantiacus* (after Fürbringer).

Lastly, the sternum has vanished without a trace, as in the snakes, in some species of *Acontias*, in the Anelytropidae, *Dibamus* and *Aniella* (Fürbringer). In the limbless genera of Amphisbaenidae the sternum is very much reduced; in *Trogonophis* alone it is still represented by a narrow transverse bar connecting the ossicular vestiges of the shoulder-girdle; in the other genera the sternum has shrunk to a pair of nodules or to a single nodule.

The *pectoral* or *shoulder-girdle* in its completest condition consists of a right and left scapula, coracoid, precoracoid and clavicles, and an unpaired interclavicle or episternum. The dorsal portion of the scapula remains cartilaginous, with or without calcification, and is usually distinguished as suprascapula. The ventral portion of the precoracoidal and coracoidal mass remains likewise more or less cartilaginous, rather unnecessarily distinguished as epicoracoid. Ossification begins near the glenoid cavity and thence spreads, eventually with the formation of a dorsal and a ventral centre. The resulting suture separates the dorsal or scapular from the ventral or coraco-precoracoidal mass. A kind of landmark, not always reliable, between coracoid and precoracoid is the exit of the supra-coracoidal nerve. The ventral margins of the coracoids articulate in tenon and mortice fashion with the antero-lateral margins of the sternum. The interclavicle, usually T-shaped, is a dermal bone and rests upon the ventral side of the girdle. The paired clavicles, sometimes fused together, rest upon the anterior end of the interclavicle and extend transversely to the acromial process of the scapula; the detail of the attachments varies much.

The girdle is most complete in *Sphenodon* and in Lacertilia. In *Sphenodon* the coracoid forms one continuous mass with the precoracoid, without further differentiation; the clavicles are fused with the interclavicle into one T-shaped mass, the cross-arms of which are attached to the acromia by ligaments. In the lizards (except *Heloderma*) the much-broadened central and anterior halves of the girdle are fenestrated; the windows, always closed by membranes, are bordered by bony processes, distally by unossified cartilage. The first window to appear, or the most constant, lies between the coracoid and its precoracoid; in *Anguis* it is the only window, in this case not a primary feature. In other lizards, *e.g. Uromastix*, a second window occurs between precoracoid and scapula, and even a third window can appear in the scapula itself, causing in many Iguanidae, *e.g. Amblyrhynchus* (see fig. 33, *ms.*), the so-called mesoscapula; an analogous window within the coracoid produces the mesocoracoid; unnecessary distinctions of little morphological value considering the great variability of these fenestrations in closely allied genera.

The chameleons have lost the clavicles and the interclavicle, and the scapula, which is very slender and long, is devoid of an acromial process. The coracoid forms one mass with the precoracoid, through the middle of which passes the supra-coracoidal nerve; the coracoids articulate by their whole bases with the sternum.

Geckos possess a complete shoulder-girdle; the ventral portion shows, *e.g. Hemidactylus*, three pairs of windows; only one in *Uroplates*. In the latter the interclavicle is much reduced; the clavicles meet each other and are slender rods. In the Geckoninae and Eublepharinae the ventral halves of the clavicles are dilated and possess each a foramen; the interclavicle is cross-shaped.

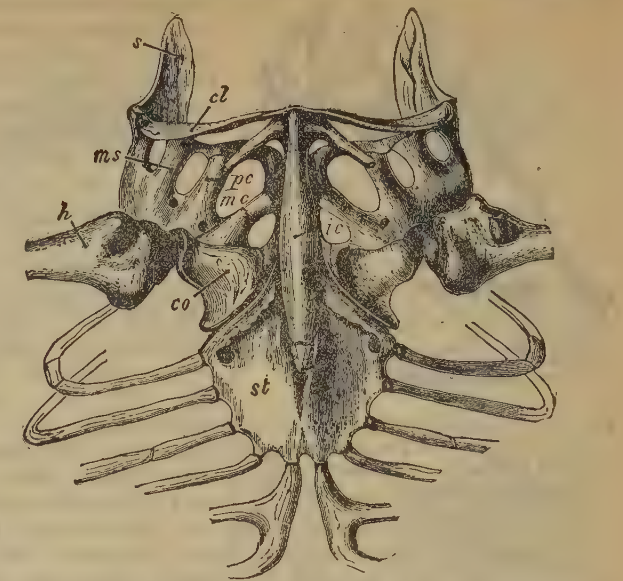

Fig. 33.—Sternum and Shoulder-Girdle of *Amblyrhynchus subcristatus* (after Steindachner). *cl*, clavicle; *co*, coracoid; *h*, humerus; *ic*, interclavicle; *mc*, mesocoracoid; *ms*, mesoscapula; *pc*, precoracoid; *s*, scapula; *st*, sternum.

In the more or less limbless genera of lizards the shoulder-girdle is much reduced. In *Chirotes*, which still has functional fore limbs, the clavicles and the interclavicle are absent, the coracoids are not divided from the precoracoids; in the limbless Amphisbaenidae the girdle is reduced to a pair of cylindrical ossicles in *Amphisbaena*, *Blanus* and *Trogonophis*; no vestiges exist in *Rhineura*, *Lepidosternon* and *Anops*.

Foramina in the broadened clavicles occur also in various Lacertae, for instance in the Iguanid *Laemanctus*, in the Scincoid *Trachysaurus*, in *Plestiodon*, *Zonosaurus* and in *Lacerta simonyi*, but not in *L. agilis*. In *Mabuia* the median portions are especially broad and show each two foramina. Their presence can be of but very doubtful taxonomic value.

The girdle of the Crocodiles is considerably simplified. Scapula and coracoidae, movably united, at least in younger specimens. The precoracoid is slightly indicated by a process of the coracoid, which is perforated by the supra-coracoidal nerve near the glenoid cavity. Clavicles are absent. The interclavicle is reduced to a long, flat splint-bone, which is firmly fused on to the sternal cartilage. The Chelonian shoulder-girdle shows several very remarkable modifications. Instead of lying outside the trunk, it has been transferred into the cavity of the trunk, the carapace with the ribs covering it from the outside. An explanation of the changes implied in this transposition is still extant. Chelonians are, moreover, the only reptiles besides Pterosauria in which the scapula is attached to the skeleton of the trunk. The scapulae stand in a more or less vertical position, and their dorsal end rests against the inside of the nuchal plate, where this is sutured to the first neural and the first costal plate, a little in front of and sidewards from the first short rib. From near its ventral end the scapula sends off a long process, which converges transversely with its fellow. This process, the clavicle(!) or the precoracoid of many authors, is the acromial process, the Plesiosauri giving the clue as to how an acromion can assume such an abnormal position. The coracoid, with a suture between it and the scapula, is very long and extends horizontally backwards, not meeting that of the other side. The sternum being absent, and clavicles and interclavicles forming the epi- and endo-plastral elements of the plastron, the shoulder-girdle is nowhere in contact with the skeleton except at its dorsal end.

The Fore Limbs.—The humerus has near its upper end a median process, and at a variable distance a lateral process, near which is the biceps-fossa. Above the radial or outer condyle exists a foramen for the passage of the radial nerve in *Sphenodon*, in the Lacertilia, and in many Chelonians, *e.g. Cholone* and *Sphargis*; such an ectepicondylar foramen is absent in crocodiles. Above the ulnar condyle exists, but only in *Sphenodon*, the entepicondylar foramen, for the passage of the nervus medianus and brachial vessels. Thus *Sphenodon* alone possesses both foramina, the crocodiles neither.

Ulna and radius always remain distinct; the former is generally the stouter although not always the larger bone. The carpus may contain as many as 12 separate elements: ulnare, intermedium, radiale, 2 centralia, a pisiform on the ulnar and a small nodule in a corresponding position on the medial side, and 5 distal carpals. In *Sphenodon* the centralia are sometimes fused into one, and the radial nodule is absent; the numbers of phalanges are, 2, 3, 4, 4 and 3 proceeding from the first to the fifth finger. The carpus of the Chelonia is likewise primitive, with various unimportant reductions; *Chelydra* possesses one or two centralia, whilst pisiform and extra radial are absent; both these bones are present in *Emys*, but the centrale fuses with the radial carpal, and the fourth and fifth distal carpal are fused together. In *Testudo* the pisiform is small; intermedium, centrale and radiale are represented by one bone only, and the first, second and third distal carpals are fused, whilst the two remaining are free. In the marine turtles the fore limbs are transformed into paddles; the ulna is considerably shorter than the radius; all the normal nine carpal elements remain distinct; the pisiform is much enlarged, helping to increase the paddling surface, and it has moved from the ulnar carpal to the side of the fifth distal carpal. The three middle fingers and toes have mostly 3 phalanges; the pollex and hallux have always 2; the number of phalanges of the fifth finger varies from 3 to 1, of the fifth toe from 2 to 0. The greatest reduction occurs in *Testudo* and its allied genera of typical land-tortoises, *Homopus*, *Pyxis* and *Cinixys*, the formula for the fingers being 2, 2, 2, 2, 2 or 1, and 2, 2, 2, 2, 0 for the toes. In *Pelomedusa* all the fingers possess 2 free phalanges only, owing to fusion of the first and second phalanges with each other.

Considerable advance is marked by the Crocodiles. The intermedium and centrale are lost, the pisiform is small, ulnar and radiale are considerably elongated and enlarged. Of the distal carpals the two last are fused into one bone, and the three first, together with the central, are transformed into a pad-like cartilaginous and ligamentous piece between the large radial and the first and second finger, to which the pad is firmly attached. The other fingers articulate with the "humatum." The result of the whole arrangement is the formation of two main joints, one between fore arm and carpus, the other intercarpal. The number of phalanges is 2, 3, 4, 4, 3.

The conditions prevailing in Lacertilia are connected with those of *Sphenodon*. The intermedium is lost, the other normal carpalia are present, also the pisiform; the first distal carpal is much reduced and the correspondingly enlarged radial carpal comes into articulating contact with the first metacarpal. The numbers of phalanges are 2, 3, 4, 4, and 2 or 3 for the fifth finger. The hand of the chameleons is most modified; the first three fingers form an inner bundle opposed to the outer or fourth and fifth fingers; in correlation herewith the third and fourth distal carpals are fused into one rather large mass; the other elements remain free, and A. Stecker has found a small intermedium present in the young, in a position which indicates that its subsequent absence is due to loss, not fusion with neighbouring elements.

The Pelvic Girdle.—The ilium is attached to the vertebral column by means of the two sacral ribs.[1] The ischia and the pubic bones join the ilium at the acetabulum, which is not perforated, except in crocodiles. The ischia and pubes invariably form symphyses at their ventral ends, except the so-called pubes of the crocodiles, and these two symphyses are further continuous with each other, dividing the pubo-ischiadic space into a right and left foramen obturatum of very variable size. They are small and round in *Testudo*, divided by a broad, bony bridge, larger in *Chelone*, separated by a chiefly ligamentous, partly cartilaginous string; largest they are in *Sphenodon* and in the Lacertilia. Frequently the symphysial portion at the anterior end of the pubic symphysis remains cartilaginous, unpaired, *e.g.* in most Chelonians and Lacertilians, comparable with the epipubis of Urodela. A corresponding cartilage, the os cloacae or hypoischium, is continued backwards, from the ischiadic symphysis towards the vent, serving for the attachment of sphincter muscles; it occurs in many lizards and tortoises. In the Chelonians the pubic bones are generally much stronger than the ischia, and they send out each a strong lateral pubic process, directed forwards and outwards; the obturator nerve passes through the wide obturator foramen. In the pleurodirous tortoises the ends of the ilia and those of the lateral processes of the pubes are much broadened and firmly anchylosed with the posterior costal plates and with the xiphiplastron respectively. The whole pelvis, like the shoulder-girdle, lies inside the body. The pelvis of *Sphenodon* is essentially like that of the Lacertilia. The pubes are slender; they send out a pair of lateral processes, near the base of which the obturator nerve pierces the shaft of its pubis. This lateral process is the homologue of the long, slender pubis of birds. The chameleons' pelvis is peculiar. The pubes are devoid of lateral processes, but from their anterior end arises a pair of small cartilages, in a transverse direction; their ends are connected by ligament with the median anterior portion of the ischiadic symphysis. The crocodilian pelvis is very aberrant. The ilium is broad and sends two processes to the acetabulum, which retains a foramen; the posterior process articulates movably with the ischium; the preacetabular process fuses in very young specimens with a separate, ossifying, cartilaginous piece, which then forms a rough joint with the anterior portion or process of the ischium, which closes the acetabulum on its ventral side. To this anterior ischiadic process is attached the freely-movable, club-shaped bone, generally called pubis. The homologies of these club-shaped bones and of the small bone mentioned above are not clear. The club-shaped bones remain asunder; the ischia form a long and firm symphysis. The obturator nerve passes out of the pelvis between the ischium and the club-shaped bone, close to the posterior margin of the latter.

The *posterior limbs* show essentially the same composition as the fore limbs, but the modifications in the various reptilian orders are much greater. The femur has generally a well-marked neck. Fibula and tibia remain distinct; the former usually shows a reduction in thickness. In the tarsus we observe never more than two proximal tarsal elements, a reduction due either to the suppression of the intermedium or to its enlargement and concomitant loss of the tibial element. The least-modified foot-skeleton is that of the Chelydridae, the lowest Chelonians. The proximal row is composed of a fibulare, and a much larger piece articulates with both tibia and fibula, the "astragalus"; the centrale is present; the first three distal tarsals remain separate, each carrying a toe. The fused fourth and fifth tarsals carry the fourth toe, and, laterally attached, the hook-shaped fifth metatarsal. *Chelone* shows the same arrangement, except that the centrale is fused with the astragalus; in *Testudo*, *Emys*, the fibulare, astragalus and centrale are fused into one broad mass, with the result of forming a crurotarsal and an intertarsal joint. The same arrangement reached by the Testudinidae is universal in the Lacertae, with the further modification that the three first distal tarsals fuse on to the proximal ends of their respective metatarsals. Most aberrant is the tarsus of Chameleons, in which the first and second toe form a bundle opposed to the rest; the fibulare and tibiale are fused into one bone; the fused fifth and fourth distal tarsals form a very large half-globular piece for the three outer toes, whilst the second toe is carried by the third distal tarsal, besides which there are three more small cartilages, one of which may be the displaced second tarsal or the still independent central. The tarsus of *Sphenodon* is like that of typical lizards, but none of its distal tarsals are fused on to metatarsals. The Crocodilian foot marks an advance. The astragalus is large, articulating well with tibia and fibula, and against the fibulare, which forms a typical, heel-shaped calcaneum. The fifth and fourth distal tarsals carry the fourth toe and the hook-shaped fifth metatarsal to which the fifth toe is reduced. The third, second and first distal tarsalia scarcely contain osseous nodules; they form together a wedge-shaped cartilaginous pad between the astragalus and the first and second toes. This attachment of the distal tarsals to the metatarsals reminds us of the Lacertilian condition, the result in either case being a still more marked intertarsal joint in addition to the cruro-tarsal.

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[1] In all reptiles, except a few fossil groups, the ilio-sacral connexion is post-acetabular, *i.e.* it lies in a transverse plane tailwards from one passing through the acetabulum. In birds it is likewise post- in mammals pre-acetabular.

Most well-footed reptiles retain all the five toes; only the crocodiles and a few tortoises have lost all the phalanges of the fifth toe. The phalangeal numbers are in the Lacertilia 2, 3, 4, 5 and 3 in the fifth toe; in chameleons 2, 3, 4, 4, 3; in most tortoises 2, 3, 3, 3, 2; but in *Homopus*, *Pyxis* and *Cinixys* 2, 2, 2, 2, 0; in the crocodiles 2, 3, 4, 4, 0. The embryos of crocodiles are said to be hyperphalangeal; *i.e.* as many as 7 phalanges on the fourth; 5 or 6 on the fifth finger; 6 on the fourth toe, and there are traces of the fifth toe. In the adult the fourth toe remains without a claw. Burrowing and living in sand, or humus, is in many lizards correlated with reduction of the limbs and their girdles. The vestiges of the hind limbs come to lie as near the vent as possible. The reduction occurs in various families, independently. In most cases the fore limbs disappear first, but in the Amphisbaenidae, cf. *Chirotes*, and in the Tejidae, the reverse takes place. Whilst degeneracy of the shoulder-girdle is delayed long after the loss of the anterior limbs, that of the pelvic arch precedes the loss of the hind limbs. Cope has drawn up a tabular statistic of the loss of digits, limbs and their girdles on pp. 202–3 of his work, *Crocodiles, Lizards and Snakes of North America* (Washington, 1900). The peculiar hind limbs of the Dibamidae are described in the article LIZARD.

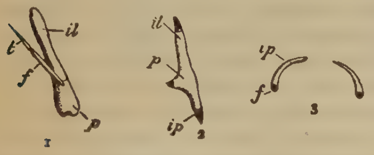

FIG. 34.—Vestiges of pelvic limb—1, of *Lialis bartonii*; 2, of *Anguis fragilis*; 3, of *Amphisbaena fuliginosa*. *f*, femur; *il*, ilium; *ip*, iliopectineum; *p*, pubis; *t*, tibia.

The majority of snakes have lost all traces of the limbs and their girdles, except the so-called Peropoda (see SNAKES: *Classification*). The vestiges of a *Boa* and of a *Glauconia* are shown in fig. 35.

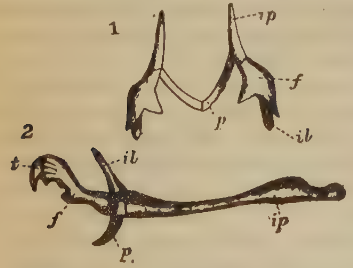

FIG. 35.—1, Vestigial pelvis and limb of *Glauconia macrolepis*. 2, The same parts of *Boa* (after Fürbringer). *f*, femur; *il*, ilium; *ip*, bone called "iliopectineum" by Fürbringer; *p*, pubis; *t*, tibia.

Tegumentary System.

The skin of reptiles is characterized by the strong development of its horny stratum; on the outside of it exists a thin cuticular or epitrichial layer. An important feature in most lizards and in the snakes is the existence of a "subepirdemoidal" or transitional layer which is produced by the migration of ectodermal cells into the cutis. The immigration takes place during the embryonic development, observed first by Kerschner, who, however, misinterpreted the process. Pigment cells, black chromatophores also, make their first appearance in the epiderm and then migrate into the transitional stratum, as has been first correctly stated by F. Maurer. The horny stratum is shed periodically, several times during the year, and as one entire piece in snakes and a few lizards, *e.g.* Anguidae; in most lizards, chameleons, geckos and in *Sphenodon* the thin, transparent colourless layer comes off in flakes. In crocodiles it is not shed except for the usual wear and tear, nor in tortoises, although in some *e.g. Chrysemys*, a periodical peeling of the large shields has been observed.

In all reptiles the cutis is raised into papillae, or folds. When the papillae are small the skin appears granular; when they are large, flat, mostly imbricating, they form scales; when they are very broad-based and still larger, they are called scutes or shields. The overlying epidermal covering partakes of these elevations, often *e.g.* in many snakes, with a very fine system of ridges of its own. Such a scale, cutis and horny sheath, may form spikes, or crests. They all have only basal growth. Thus, for instance, a shield of a tortoise-shell is a much flattened scale, or cone, with the apex more or less in the centre, surrounded by marginal ridges which indicate the continuous additional growth at the base. The central "areola" represents in fact the size of the shield at the time of hatching.

Of very common occurrence is the development of bone in the cutaneous portion of the scales; such osteoderms occur in many lizards, very strongly developed in the scutes of the crocodiles, especially on the back; they also occur in the skin of tortoises especially on their legs and on the tail, and they probably constitute the peculiar shell of *Sphargis*, the leathery turtle (see TORTOISE). *Sphenodon* and chameleons are devoid of such osteoderms, in geckos they are likewise absent, but calcifications occur in their tubercular skin. A similar process seems to have produced the egg-tooth of crocodiles and tortoises (see under *Teeth* below). Calcareous deposits, or at least deposits of guanine and more commonly of carbonate of lime, play a considerable rôle in the skin of lizards and snakes. These waste products of the metabolism are always deposited within cells, and a favourite place is the subepidermal layer. In combination with superimposed yellow or red pigment, and with the black chromatophores as a foil, partial or complete screen to the light, as the case may be, these mineral deposists are to a great extent answerable for the colours and their often marvellous changes in the skin (see CHAMELEON).

Peculiar pits in the scales of snakes and crocodiles are described under *Sense-Organs* below.

The skin of reptiles is very poor in glands, but the few which exist are well developed. Crocodiles possess a pair of glandular musk bags which open by rather large slits on the under jaw, against the inner side of the jaw. Another pair of musk glands are the anal glands. During great excitement all these glands can be everted by the crocodiles. *Sphenodon* and snakes have only the anal pair. Water tortoises have inguinal glands, which secrete a strongly scented fluid, opening near the posterior rim of the bridge. *Trionyx* has additional glands opening near the anterior part of the plastron. Peculiar glandular structures are the femoral pores of many lizards. They lie in a line from the inner side of the knee to the anterior margin of the anal region, to which they are restricted in the limbless Amphisbaenidae. Each pore leads into a subcutaneous pocket, sometimes with slightly acinous side chambers, the walls of which produce a smeary, yellowish matter consisting chiefly of the *débris* of disintegrated cells which dries or hardens on the surface in the shape of a little projecting rod. They occur in both sexes, but are most active in males during the pairing season. Their use is unknown. It would be far-fetched to liken them to forerunners of the sebaceous portions of milk glands, although not so imaginary as to see in them and in the sensory pits of snake scales the forerunners of the mammalian hairs!

Claws, scarcely indicated in Batrachia, are fully developed in all limbed reptiles. The base is sunk into the skin like our own finger nails; the dorsal and ventral halves are differentiated into a harder, more curved dorsal sheath-like portion, and into the beginning of a sole, especially in crocodiles and in blunt-toed tortoises. The first claw to be reduced is that of the fifth digit. The claws of many geckos are "retractile," like those of cats; the adhesive lamellae on the under side of their digits have already been described (see GECKO).

Nervous System.

The hemispheres are still much longer than broad, and pass, especially in lizards, gradually into the olfactory lobes, into which continue the ventricles of the hemispheres. The dorsal walls of these are thin, especially in crocodiles, although they possess already a considerable amount of grey matter. The basal masses of the fore-brain bulge into the roomy ventricles like cushions. Fibres referable to a corpus callosum are scarcely separated from those of the still much stronger anterior commissure. The epiphysis comes to the surface between the hinder parts of the hemispheres. The pineal eye is described below under *Sense Organs*. The hypophysis has but a shallow infundibulum. The mid-brain shows a pair of dorsal globular swellings, each with a cavity; they separate the hemispheres from the cerebellum. Of the hind-brain, the middle portion is by far the largest; although the dorsal wall of this cerebellum is thick, and rich in grey matter, its surface is still quite smooth and it shows no trace of an arbor vitae. It covers but a small portion of the wide fourth ventricle.

The spinal cord shows a brachial and a lumbar longitudinal swelling, especially marked in tortoises, but without a rhomboidal sinus. The cord is continued into the end of the tail.

The cranial nerves of the reptiles agree in their arrangement and distribution more with those of birds and mammals than with those of the Batrachia. The facial nerve sends a palatine branch to the palate and to the superior maxillary of the trigeminus, and a strong mandibular branch joins the third of the trigeminal, and further ramifications supply the sphincter muscle of the neck. The vagus and glossopharyngeus leave the cranium separately. The vagus then goes towards the heart, which in the Sauropsida is far removed from the head, and there possesses another ganglion, variously called ganglion trunci vagi or g. nodosum. It is connected by a nerve with the large ganglion supremum of the sympathetic. From the cardiac ganglion, and from the continuation of the vagus, are sent off several branches in succession, which, having to pass below or tailwards from the transverse carotic, aortic and Botallian vessels, have to take again a headward course to the larynx and pharynx; a side branch enters the heart by its truncus. The main mass of the vagus then supplies lungs, stomach and further viscera. The accessory or 11th cranial nerve arises with about half a dozen roots which extend often beyond the second cranial nerve; they collect into a thin stem which leaves the cranium together with the vagus, with which it is often fused; it supplies the cucullaris s. trapezius muscle.

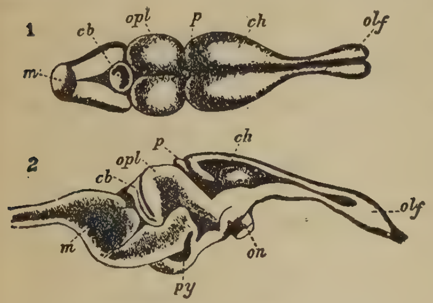

FIG. 36.—Brain of *Lacerta agilis*. (After Leydig.) 1, Dorsal aspect; 2, vertical longitudinal section. *cb*, cerebellum; *ch*, cerebral hemisphere; *m*, medulla oblongata; *olf*, olfactory lobes; *on*, optic nerve; *opl*, optic lobes; *p*, pineal body or epiphysis; *py*, base of pituitary body.

The hypoglossus arises by two ventral roots, leaving the skull by two holes through the lateral occipital bone, near the condyle. The united stem is invariably joined by strong branches from cervical nerves, always from the first, mostly also from the second, sometimes also from the third. The details vary much; occasionally there are three cranial roots and foramina, and then only the first cervical joins the hypoglossus; this often fuses with the glossopharyngeal or with the vagus. In the broad and well-muscularized tongue of the crocodiles the right and left hypoglossal branches form a complete ansa, an arrangement in which A. Schneider saw the infraoesophageal nerve ring of Invertebrata!

The spinal nerves each issue behind, or through, the neural arch of the vertebra to which they belong genetically. The first spinal, or suboccipital, nerve has no dorsal roots, and, having lost its vertebra, an apparently anomalous arrangement has come to pass, in this way, that there are x cervical vertebrae, but $x + 1$ cervical nerves, a condition prevailing in, and characteristic of, all Amniota. The hypoglossal-cervical plexus is separated from the brachial plexus by several metameres, according to the length of the neck. The brachial plexus is composed of about 5 nerves; the variations have been studied chiefly by M. Fürbringer. It is interesting to note that the brachial plexus still persists in snakes, although they have completely lost the anterior girdle and the limbs (Albertina Carlsson). A disturbance in the pelvic region likewise indicates in snakes the former existence of a pelvic or lumbo-sacral plexus, which in limbed reptiles is composed of about 5 nerves, the last of which is weak and in many cases (by no means the rule) issues between the two sacral vertebrae, sending one branch to the ischiadic, another to the public plexus which supplies the cloacal region. (For details of these plexuses see the papers by Mivart, Jhering and Gadow.)

The sympathetic system shows considerable modifications in the various orders and even families of the reptiles. In the neck region, in *Sphenodon* and most lizards it is, on the right and left side, composed of two portions. One, more lateral and placed deeply, runs along the side of the vertebral column, starting from the first and second spinal nerves, with which it is connected by so-called rami communicantes; it is not connected with the other spinal nerves until it reaches, in the thorax, the first stem of the brachial plexus, and hereabout lies the so-called second thoracic ganglion. The other, superficial and more ventral, portion arises from the petrosal ganglion of the glossopharyngeal, and from the vagus ganglion, and then forms a long loop which joins the second thoracic ganglion. In its long course it sometimes, *e.g.* in *Varanus*, forms one common stem with the vagus before it splits off. At a variable distance, but not far above the heart, the vagus possesses a big swelling, the ganglion trunci vagi, and the sympathetic stem, in the same level, or farther down, has likewise a large ganglion, the g. supremum vagi, or first thoracic ganglion. The vagus ganglion receives several nerve strands from this big sympathetic ganglion, and then divides as described above.

In the crocodiles the deep portion of the sympathetic begins at the vagus and extends in rope-ladder fashion into the thorax, there being, as in birds, regular transverse communicating branches with the spinal nerves, and the longitudinal strands run through the transverse foramina between the capitular and tubercular portions of the cervical ribs. The other, ventral, portion starts by a right and a left branch from the vagus ganglia, but both branches unite at once into one unpaired stem, which is deeply embedded in the middle line between the ventral muscles of the cervical vertebrae. Very thin branches connect this unpaired stem with the right and left sympathetic portions; small ganglia are embedded in the unpaired nerve.

The so-called second thoracic ganglion is in reality a compound of all the sympathetic ganglia of the four or five metameres of the brachial plexus. It forms the point of juncture of the deep and the superficial cervical sympathetic portions. From the posterior region of the thorax backwards the right and left strands run along their side of the vertebral column, with a communicating branch and a ganglion for each metamere; sometimes one or more successive ganglia are combined, for instance near the cloaca. After having supplied the latter, the sympathetic system appears exhausted and is continued into the tail by but a very thin strand, which runs between the caudal vein and artery. The best illustrations of the sympathetic system are those by Vogt (neck of crocodile), J. G. Fischer (many lizards), H. Gadow (cloaca of crocodile), J. F. v. Bemmelen (*Sphenodon* and others), W. H. Gaskell and H. Gadow (heart of tortoise).

Sense Organs.

1. *Tegumentary Organs of some Tactile or other Sense.*—Reptiles possess apparently no traces of those tegumentary sense organs which, belonging to the domains of the trigeminal and vagus nerves, have spread far over the body in fishes and batrachia. They were developed by those classes in correlation with their essentially aquatic life. This does not apply to the reptiles which, as a class, are of absolutely terrestrial origin. Nevertheless all recent reptiles possess numerous low sense-organs, "tactile bodies," in most parts of the skin, connected with the regional, spinal nerves. They are most obvious in snakes, appearing as one or more little colourless spots near the apex of each scale on the back. The spot is formed by a little cluster of epidermal cells, connected with a sensory nerve. Their lowest stage they show in *Sphenodon* and in lizards, whilst in crocodiles they have reached a higher stage, at the bottom of the pit, since the tactile bodies, mostly several together, have sunk into the cutis, below the epiderm, forming a little pit, mostly near to the anterior margin of the flat scutes. They are most obvious on the belly of crocodiles, whilst in the American alligator such pits are scarcer, not because the organs are absent, but because these have sunk still farther into the skin. The last stage is that met with in tortoises, which possess such tactile bodies in considerable numbers in the softer subepidermal layers, beneath the large horny shields which themselves show no traces of them.

2. *Taste.*—The respective organs do not seem to have been investigated. That they exist is amply proved by the careful predilection for certain kinds of food which is shown especially by vegetarian tortoises and lizards, independent of smell. Many lizards are, for instance, very fond of sugar.

3. *Nose.*—The sense of smell is well developed in all reptiles. In none is the olfactory organ degraded; that the nasal passages, the nose itself, are never degraded is explained by the fact that all reptiles invariably breathe through the nose, except snakes during the act of swallowing their prey. The nostrils, always paired, are frequently provided with valves, to shut out the water, or sand. In some water tortoises, *e.g.* *Trionyx*, *Chelys*, the nostrils are prolonged into a soft, unpaired proboscis. Double tubes exist in the snake *Herpeton* (see SNAKES, Opisthoglypha). The nostril leads into an antrum or vestibulum, this again into the nasal cavity proper, at the dorsal farther end enters the olfactory nerve, whilst ventrally it leads into the naso-laryngeal duct, with its posterior narial opening, or choana. The ducts are short in snakes and lizards, the choanae lying in the front part of the palate, but in tortoises and crocodiles they are placed far backwards, as has been described under *Skull* above. Into the nasal cavity projects, from the septum, a concha, least developed in tortoises, most in lizards and snakes. Crocodiles show a beginning of separation into several conchae as in birds and mammals. A large nasal gland lies against the lateral, or ventral, side of the outer wall of the nasal cavity, into which also opens the naso-lacrymal duct. Jacobson's organ, of uncertain function, is present in most reptiles. It is paired. In tortoises it is still placed within its nasal cavity, against the median wall, and is still nothing but a recess of the same and its mucous lining. In lizards and snakes the organ has become completely separated from the nasal cavity, lying below it and opening, each by a separate passage, into the palate mouth, close to or still within the choanae. In snakes it is mushroom-shaped, with a very short stalk. It lies immediately below the floor of the nasal capsule, and the membranous wall of the cavity on which it lies is covered and protected by a bone, commonly called the turbinal, which extends out from the median nasal system to the maxilla. In crocodiles these organs are vestigial and soon disappear.

4. *Ear.*—In crocodiles the outer ear lies in a recess, dorsally overhung by the lateral edge of the bony squamoso-frontal bridge; it carries a flap of skin, provided with muscles, to close the ear tightly. In lizards the outer ear is quite unprotected, and when the meatus is very short and wide, the drum is quite exposed. No reptiles possess cartilages comparable to the mammalian outer ear. *Sphenodon*, chameleons, snakes have no outer ear, the skin passing over the region. So also in tortoises, but in some of the aquatic kinds its position is well indicated by softer and thinner skin; in others, for instance marine turtles, a thick leathery plug, or a bigger scale marks the former position. In various lizards, chiefly burrowing in sand, the ear passage is very narrow, or closed. The middle ear or tympanic cavity is quite obliterated in snakes, Amphisbaenas and some other snake-shaped lizards. In *Anguis* may exist individual traces. The cavity communicates with the mouth. In lizards the communication is a wide recess, lined with black pigment, so that in these creatures the whole auditory chain can easily be inspected from the opened mouth. In tortoises the recesses are contracted into the Eustachian tubes, each of which opens by a separate aperture into the roof of the mouth. In the crocodiles part of the cavities is transformed into an intricate system of canals and passages. The two Eustachian tubes open together in the mid-lines protected by a valve, between the basioccipital and basisphenoid; thence arises a median passage which with lateral arms and loops extends upward through the occiput into the cranial roof, communicating with the tympanic cavity, and further continued through the quadrates and beyond into the mandibles, by the siphonium.

In spite of the obliterated tympanic cavity of snakes, and the closed up outer ear passage and absence of a tympanic membrane in snakes and tortoises, these creatures can hear very well. The same applies to *Sphenodon*, but it seems doubtful whether chameleons can hear.

Through the whole middle ear, from the fenestra ovalis to the drum-membrane, stretches the chain of auditory ossicles or cartilages, partly attached to the posterior wall by the common lining membrane. The arrangement appears simplest in snakes, in chameleons and in tortoises, not because it is primitive but because it is so much reduced, partly in correlation with the abolition of the outer ear. In these creatures the columella goes as a bony, slender rod straight to the middle of the quadrate, against which it leans, or with which it articulates by a short piece of cartilage, the extra-columella. Here the whole chain ends. It looks like a proof that columella = stapes, extra-columella = incus, and quadrate = malleus; or, with the usual ignoring of the little extra-columellar piece, that quadrate = incus, Gegenbaur's favourite impossibility. In those lizards which have a tympanic membrane conditions are far less reduced. The extra-columellar piece sends out three distal processes; one leans on to the middle of the tympanic membrane, the second usually is fastened to the bony dorsal rim of the meatus, the third is directed downwards and is continued as a thin ligament towards the inner angle of the articular of the mandible, but before reaching this it comes to grief, being squeezed in between the quadrate and the posterior end of the pterygoid. The hyoid proper is of no account in snakes and tortoises, since it is reduced to very short distal pieces attached to the base of the tongue; but in lizards it remains in its original length, or it even lengthens, and shows many vagaries in its position and attachments. In embryos of *Sphenodon* and lizards it arises from near the junction of the columella with the extra-columella. It becomes very long, too long for the available space (perhaps correlated with lingual functions), and it forms a high loop, thereby causing the peculiar loop of the chorda tympani; the upward bend of the hyoid becomes connected with the parotic process of the cranium. Next aborts the portion between this connexion and the original proximal end of the hyoid, near the columellar mass. The upper end of the hyoid *either* remains attached to the parotic process (various lizards and *Sphenodon*) whence the lingual apparatus remains suspended, *or* the hyoid, having broken loose, leaves a little cartilage, Versluy's cartilage, behind, at the end of the parotic process, and the hyoid horn remains free, in the majority of lizards. In *Sphenodon*, whilst passing the distal portion of the extra-columella, part of the hyoid fuses with it, often forming thereby a little hole, the remnant of imperfect fusion.

In the crocodiles the arrangement is at first complete and diagrammatically clear, not obscured by vagaries of the hyoid, which is free and much reduced. In the embryo the large extra-columellar cartilage, abutting against the tympanic membrane, and with another process against the quadrate, sends its third, downward, process as a thick rod of cartilage to the posterior inner angle of the mandible with which it is directly in cartilaginous continuity. It was W. K. Parker's mistake to call this cartilage the cerato-hyal. In young embryos it looks like an upward continuation of Meckel's cartilage, much resembling mammalian conditions. But in nearly ripe embryos this cartilage is already reduced to a string of connective tissue, cartilage remaining only at the upper end, and where this string enters the mandible lies the *siphonium*, the tube which connects the air cavities of the mandible with the Eustachian passages, the long connecting channel becoming—side by side with the extracolumellar-mandibular ligament—embedded into a canal of the quadrate, so that in older stages, and above all in the adult, the proper display of the whole arrangement requires a little anatomical skill. The whole string, whether cartilaginous or ligamentous, which connects the downward extracolumellar process with the articulare, is of course homologous with the continuation of Meckel's cartilage into the malleus of foetal and young mammals; and the chain of bones and cartilages between the auditory capsule, fenestra ovalis, and the proximal part of the mandible is also homologous wherever such a chain occurs; lastly, fenestra ovalis and membrana tympani are fixed points. Consequently columella=stapes, extracolumella of Sauropsida=lentiform+incus+malleus of Mammalia.

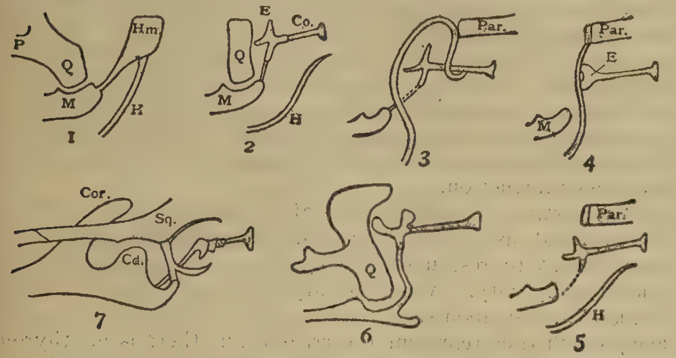

Fig. 37.—Diagram showing Evolution of the Ossicular Chain of the Ear. 1. Hyostylic Elasmobranch. H, hyoid; Hm, hyomandible; M, mandible; P Q, palatoquadrate. 2. Lacertilian. Co, columella or stapes; and E, extra-columella with supra-, extra- and infra- "stapedial" processes. 3. Hypothetic stage between 2 and 4, *Sphenodon*. Par=parotic bone. 5. Lacertilian. Parotic process with a piece of cartilage at its end, remnant of piece of the hyoid; connexion of intra-stapedial process with mandible vanishing. 6. Embryo of Crocodile. Continuous cartilaginous connexion of extra-columella with Meckel's cartilage. 7. Embryonic Mammal; for comparison. Cd, the new condyle, articulating with Sq, squamosal; Cor, coronoid process; quadrate transforming into tympanic ring.

The *inner ear* has been studied minutely and well by C. Hasse, E. Clason and G. Retzius. It is enclosed by the periotic bones. The fenestra rotunda is surmounted by the opisthotic, the fenestra ovalis by the same and by the pro-otic, and this protects also the anterior vertical semicircular canal. The posterior canal is opisthotic, the horizontal is pro- and opisthotic. The anterior canal is the largest of the three, a feature characteristic of the Sauropsida. The *lagena*, with its own acoustic papilla, begins to show a basilar membrane with papilla, at the expense of that in the sacculus. In *Sphenodon* and lizards a slight curving of the lagena indicates the beginning of a cochlea, and a scala is developed in crocodiles, but neither cochlea nor scala is specially twisted. The endo-lymphatic ducts end as closed sacs, in lizards and snakes, in the roof of the skull, between the occipital and parietal bones. They reach an enormous development in many geckos, where they form large twisted sacs beneath the skin, covering the sides of the neck, which then assumes a much swollen appearance. They contain white otolithic masses, with lymph. It is remarkable that the extent of these sacs varies not only in allied species, but even individually, independent of sex and age, although they are naturally liable to increase with age.

5. *Eyes* are present in all reptiles, although in many of the burrowing snakes and lizards they may be so completely covered by the skin as to have lost their function. Most reptiles have upper and lower lids, moved by palpebral muscles, and a third lid, the nictitating membrane, which can be drawn over the front of the cornea from the inner angle obliquely up and backwards. Its mechanism is simplest in lizards. A muscle, a split from the retractor muscle of the eyeball, arises from the posterior part of the orbit, is attached to the posterior wall of the eyeball, and there forms a pulley for the long tendon which arises from the median side of the orbit and passes over the back of the ball forwards into the nictitating membrane. Contraction of this muscle draws the membrane backwards and over the eye. In crocodiles and tortoises the tendon of the nictitating membrane broadens out into a muscle (*M. pyramidalis*), which arises from the median side of the posterior portion of the ball; above the optic nerve it crosses over the broad insertion of the retractor of the ball, without being much guided by it, although this muscle by its contraction slightly prevents the nictitating tendon and muscle from touching the optic nerve.

It is easy to recognize the mechanism of birds as a combination of the two types just described; their musc. quadrates s. bursalis is of course the single muscle of the lizards, but now restricted to, and broadened out upon, the eyeball.

Special Modifications of the Lids.—In the snakes the upper and lower lids are reduced to the rim, and the nictitating membrane has become the permanent cover, which protects the eye like a watch-glass, leaving between itself and the cornea a space, drained by the naso-lacrymal duct, and behind this space the eyeball moves as freely as in other animals. A similar arrangement exists in the true geckos, not in the Eublepharidae, which still possess the outer lids. In some lizards, especially such as live in deserts, the middle of the lower lid has a transparent disk, and it is always the lower lid which is drawn over the eye, the upper in nearly all Sauropsida being much smaller and less movable; for instance, some specimens of the Lacertine genus *Eremias* in Africa and India. In the Indian genus *Cabrita*, and in *Ophiops* of Africa and India, the lower lid is permanently fused with the rim of the shrunken upper lid and forms a transparent window superficially looking like that of the snakes. Exactly the same arrangement has been developed by *Ablepharus*, one of the Scincidae.

The eyeball is provided with the usual rectus and obliquus muscles, in addition to a retractor oculi. Apparently all reptiles possess a pair of Harderian or nictitating glands, which open in front, in the nasal, inner corner, and lacrymal glands which open likewise into the conjunctival sac, but near the outer or temporal corner. The secretion of both is drained off through the lacrymal canals, which in lizards open below in the outer wall of the posterior nares; in snakes they open into the mouth by a narrow aperture on the inner side of the palatine bone.

The walls of the anterior half of the sclerotic of lizards, tortoises and *Sphenodon* contain numerous cartilaginous or osseous plates, which imbricate in ring shape; they are absent in snakes and crocodiles. Internally the eye of most reptiles possesses at least traces of a pecten; very small indeed in tortoises, or in crocodiles where it is represented by only a few mosslike, pigmented vessels. In many lizards these vessels, arising from near the optic nerve, form a network which extends right up to the posterior side of the lens; in others, especially in Iguanidae, is developed a typical, large pecten, deeply pigmented with black, fan-shaped or umbrella-shaped, sometimes folded. In chameleons it is a short cone; apparently quite absent in *Sphenodon*. A falciform process and other remnants of a campanula are absent. In most of those reptiles which have but a rudimentary pecten, the retina is supplied by hyaloid vessels which spread over the surface of the vitreous body; such superficial vessels disappear with a greater development of the pecten, and the retina receives a choroid supply; special retinal arteries from the a. centralis retinae, and veins, exist in snakes.

Ciliary processes of the choroid are usually small, a proper ciliary body being least developed in crocodiles; all reptiles have a ciliary muscle. The shape of the contracted pupil varies from round to a vertical slit; the latter is most marked in *Sphenodon*.

The retina shows usually a fovea centralis, sometimes but slightly indicated by a shallow depression; it is well marked in chameleons. The retina contains only cones, rods being absent; fat-drops on the apex of the cones are common; their usual colours are green and blue.

6. *The pineal, median* or *parietal eye* is the terminal organ of the epiphysis of the brain, with which it is connected by a nerve-containing string. Among recent reptiles it exists in *Sphenodon* and in the Lacertilia, with vestiges in snakes. It is embedded in the median parietal foramen. Externally its presence is generally marked by the scales being arranged in a rosette, with a transparent central scale. The organ itself is distinctly a dioptric apparatus, with all the essential features of an eye; a pigmented retina of the arthropodous simple type surrounds an inner chamber which is nearly filled by a cellular globular mass which projects into it from above; this is the so-called lens, in reality much more like the corpus vitreum in its still cellular condition, while the real lens has to be looked for in the superimposed tissue. The whole organ is best developed in *Sphenodon*, even in the adult; but whether it is still functional, and what its function is, remain unknown. The throwing of a beam of light upon this eye, by means of a lens, produces no effect. Whilst in *Sphenodon* the "lens" is rather dull and the efferent nerve is still present, in various lizards the "lens" is more perfect, but the nerve is degenerated. We conclude that the whole organ is now without the least visual function, whilst in various extinct groups of reptiles and Stegocephali it was fully developed. It has been well investigated by de Graaff, W. B. Spencer and A. Dendy.

The Muscular System.

A useful account of the differentiation of the muscles in the main reptilian groups, with their almost endless modifications in correlation with walking, climbing, swimming, gliding and burrowing, with limbs complete or absent, would fill several pages of this article and would necessitate many illustrations. The literature is great; it comprises many good detailed descriptions of various kinds of reptiles, and several monographs. M. Fürbringer has devoted a whole series to the muscles of the neck, shoulder-girdle and fore limbs. Hand in hand with these investigations went that of the innervation, without which myology would lack scientific value. The present writer has devoted much time to the muscles and nerves of the pelvis and hind limbs, and has, in tabular form, compared them with those of other vertebrates. The results of all these labours are rather disappointing, except for the study of myology as such, which raises many interesting questions. Broadly speaking, the muscles of typical reptiles, crocodiles and lizards are more highly differentiated (by no means always more numerous, but more individualized by origin and insertion, the behaviour of the tendons), more effectively disposed according to mechanical principles, than in Batrachia, and less than in birds and mammals. This can easily be proved, whether we take for comparison the muscles of the neck, of the larynx or hyoid, or limbs. Lowest in general stands *Sphenodon*, next to it the lizards, highest the crocodiles, while tortoises and snakes show the greatest reduction and specialization. In the tortoises it is the non-yielding box of carapace and plastron which has caused great changes within the region of the trunk proper. First, all the epiaxial muscles have vanished; the same applies to the costal muscles; but traces of dorso-lateral muscles occur on the inside of the posterior half of the carapace, extending as a longitudinal system from one transverse process to the next in many of the lower aquatic tortoises, as perfectly useless vestiges; or more striking, these muscles exist in the young, and disappear with age, for instance in *Testudo*. Secondly, it is rather surprising that the rigid shell has offered so little or no inducement to the muscles of the girdles, neck and tail to transfer their origins upon it. Thirdly, the retractile neck of the typical cryptodirous tortoises is correlated with a pair of long retractor muscles, which in the shape of a pair of broad, vertical ribbons (between which is received the S-kinked neck) extend far back along the vertebral column, almost to the level of the pelvis.

In snakes, owing to the loss of limbs and girdles, only the spinal and costal muscles remain, besides of course those of the abdomen and the visceral arches. The vestigial muscles of the limbless lizards and of the peropodous snakes have been monographed by Fürbringer in much detail without great results.

Respiratory Organs.

All reptiles breathe by lungs, and they possess no vestiges of gills, not even during their embryonic stages, although gill clefts are invariably present in the embryo. Nor does any part of the outer skin assist respiration, as is so commonly the case in Batrachia; yet, strictly speaking, the lungs are not the only organs of respiration in the class of reptiles, since various tortoises possess additional breathing apparatus in the anal sacs and in certain recesses of the throat, to be mentioned farther on.

The *Larynx*, instead of lying at the bottom and far back in the throat, as in the Batrachia, is considerably moved forwards so as to rest upon the hyoid and to project into the pharyngeal cavity. A pair of arytenoid cartilages, enclosing the glottis, rest upon several more or less fused tracheal cartilages, which thus represent the cricoid, but there is no thyroid cartilage. A small process from the anterior median edge of the cricoid is the beginning of an epiglottis. Vocal chords are indicated by lateral projecting folds of the inner membranous lining of the larynx, and are in a few cases effective in producing a voice. Crocodiles and alligators have a powerful, loud, bellowing voice; many tortoises utter weak, piping sounds, especially during the pairing season; and also various lizards can emit a feeble squeak, for instance, *Psammodromus hispanicus*, and the geckos. *Sphenodon*, at least the males, can grunt. Snakes have no voice; they can only hiss like all other reptiles, but a curious modification exists in the larynx of the North American *Coluber s. Pityophis*, e.g. *C. melanoleucus*: the epiglottis is more enlarged, and laterally compressed so that the hissing sound is much strengthened by the vibration of the epiglottis. The larynx possesses a constrictor and a dilator muscle, which arise from the arytenoids and from the cricoid respectively, and are attached to the hyoid. Chameleons have bladder-shaped sacs which can be filled with air from a slit immediately below the larynx. For further modifications see G. Tornier.

The *Trachea* is furnished with cartilaginous rings and semi-rings, which extend to the lungs. As a rule the trachea is straight; in *Crocodilus americanus* it forms a loop; and similar curvings occur in various tortoises in correlation with the retractile neck. The two *bronchi* are shortest in *Sphenodon*, very long in most tortoises, where they begin frequently already half down the neck. In *Sphargis* most of the trachea is divided by a longitudinal partition. It is an advance upon amphibian conditions that the bronchus enters its lung no longer at its apex, since an anterior, pre-bronchial lung-portion has come into existence. This is still very short in *Sphenodon*, while in crocodiles, tortoises and in the highly developed Varanidae the bronchus enters near the middle of its lung, so that the anterior portion is nearly as long as the posterior. The shape of the trunk influences that of the lungs. In the snake-shaped forms, both snakes and lizards alike, the lungs have become very asymmetrical, one of them being much larger than the other, which is often quite aborted.

The simplest form of lungs is that of *Sphenodon*; the prebronchial part is still small. Each lung is still a sac with one large lumen, the walls being honeycombed. In the lizards the walls are more spongy, and several septa begin to extend more or less far from the walls into the lumen, towards each bronchus. Some of these septa begin to cut the lung into lobes, especially in *Varanus* and in chameleons. In the latter exists a further specialization, a side-departure, in the shape of several long, hollow processes which are sent out from the posterior portions of the lungs and extend far into the body-cavity and between the viscera. By means of them these creatures can "blow" themselves out. They are of morphological interest since they are first stages of air-sacs so marvellously developed in birds, and possibly also in various Dinosaurs. In the Amphisbaenids the left lung alone remains.

The lungs of crocodiles have reached a considerably higher stage. They alone in reptiles are, on the ventral side, completely shut off from the viscera by a pleural, partly muscularized, membrane. From each bronchus extend a number of broad septa towards the periphery, dividing the originally single lumen into many chambers, perhaps a dozen, from the walls of which wide secondary or parabronchial canals extend into the alveolar meshwork, in very regular arrangement, in series like organ-pipes.

The lungs of the tortoises are, in adaptation to the peculiar shape of the body, stowed away along the back, as far as the pelvis, and only their ventral surface is covered by a strong peritoneal membrane which receives muscular, diaphragmatic fibres. The inner division of the lungs into chambers has progressed so much that a sort of mesobronchus has become discernible; the arrangement of the side-bronchi is far less regular than in crocodiles; the whole lung is much more honeycombed, meshy and spongy.

The mechanism of breathing of tortoises is not such a puzzle as it is sometimes stated to be. Of course the rigid box of the trunk excludes any costal, or abdominal breathing, but by protruding the limbs or the neck, piston-like, an effective vacuum is produced in the box. Moreover, the throat is distended and worked considerably by the unusually large and very movable hyoid apparatus, by which air is pumped into the lungs.

The lungs of the snakes are very thin-walled, with a very wide lumen, and only for about the first half from the heart backwards the walls are alveolar enough for actual respiratory function, while towards the blind end the sacs are so thin and sparsely vascularized that they act mainly as reservoirs of a large amount of air. Frequently their posterior portions receive blood vessels not from the pulmonary arteries but directly from those of the trunk. In correlation with the long, cylindrical body, the lungs are much elongated and they are not equally developed. The asymmetry shows great differences in the various groups, consequently the asymmetry has been developed independently in those groups. It is usually stated that the left lung is much smaller than the right. This is but rarely the case. The most recent observations are those of E. D. Cope (*Proc. Am. Phil. Soc.* (1894), xxxiii. 217). In Boidae both lungs are large, although unequal: the left or more dorsally placed one being the larger. In *Ilysia* the right is functional, the left is ventral and vestigial. In *Rhinophis* the right is very small, the left larger. In *Glauconia* and *Typhlops* the right lung alone is developed: the left is quite aborted. In Colubridae the left lung alone is functional, while the right is vestigial. There is no trace of the right in Elapinae and Hydrophinae and most Viperidae. In the Colubridae the right, or ventral, lung is, when present at all, reduced to a length of from 2–5 mm., and it then communicates with the anterior portion of the left lung by a foramen, in level of the heart, whilst the right bronchus is aborted.

A further complication is the so-called tracheal lung, which is present in Typhlopidae, *Ungalia* of the Boidae, in *Chersydrus* of the Acrochordinae, in the Hydrophinae and Viperidae. This peculiar organ is a continuation of the anterior portion of the functional lung, extending far headwards, along the trachea, with the lumen of which it communicates by numerous openings. In *Chersydrus* this mysterious organ is "composed of coarse cells and without lumen, extends from the heart to the head, and is discontinuous with the true lung; the trachea communicates with it by a series of symmetrical pores on each side." In *Typhlops* it extends likewise from the heart to the throat, as a cellular body but without lumen or connexion with either trachea or lung.

Thyroid and Thymus.

The *Thyroid* of the reptiles is a single, unpaired organ, placed ventrally upon the trachea and one or other of the arterial trunks, more or less distant from the heart. In snakes it lies on the mid-line near the heart; a little farther up in *Sphenodon*; still farther in lizards, and chameleons near the root of their gular sac. In tortoises it is globular, at the division of the carotic trunk. In crocodiles it is bilobed.

The *Thymus* is paired. It is largest in crocodiles, extending on either side of nearly the whole neck, along the carotids and jugulars. In the tortoises they are much shorter; in *Sphenodon* and lizards are two pairs, more or less elongated; in the snakes are sometimes as many as three pairs, elongated but small, attached to the carotis near the heart. As usual the thymus bodies become much reduced with age.

The Spleen.

The *Spleen* varies much in shape and position. In lizards it is mostly roundish, elongated in *Sphenodon*, and placed near the stomach; in crocodiles it lies in the duodenal loop behind the pancreas; similarly situated in snakes, but in the tortoises it is much concentrated, large and attached to the hind-gut.

The Body Cavity.

The *body cavity* of the reptiles is subdivided into several sacs or cavities by serous membranes of peritoneal origin. The number of these subcavities differs much in the various groups. The pericardial sac is always complete. In tortoises the lungs are retro-peritoneal, a dense serous membrane spreading over their ventral surface from the walls of the carapace forwards to the liver and shutting off a saccus hepato-pulmonalis from the rest of the peritoneal cavity. Snakes possess, besides the modifications mentioned above, separate chambers for the stomach, right and left liver, and for the gut, whilst the pleural cavities as such have been destroyed. In lizards a "post-hepatic septum" divides liver, lungs and heart from the rest of the intestines. This transverse vertical septum is best developed, almost complete, in some of the Tejidae, in others it seems to be more imperfect, and it is probably a further development of the suspensorial ligament of the liver, which is ultimately inserted upon the ventral wall of the body.

The subdivisions have reached their highest development in the crocodiles, there being, besides the pericardial and the two pleural cavities and the usual peritoneal room, a right and left hepato-pericardiac, an hepato-gastric, and an hepato-pulmonal sac. The caudal and ventral edges of these liver-sacs are fused on to the ventral body-wall, thus producing a complete transverse partition, headwards of which lie the lungs, liver and heart. This partition, morphologically not homologous with the mammalian diaphragm, more resembling the imperfect structure in birds, acts, however, as a perfect diaphragm, since it is well furnished with muscular fibres. These are attached to its whole periphery, with centripetal direction, especially on the ventral half. These fibres are transgressors upon this septum from a broad sheet of muscles, which, inserted together with the septum upon the body-wall, arise from the iliac bones, the pubes, and the greater portion of the last pair of abdominal ribs. This broad muscular sheet, covering the intestines, is the so-called abdominal diaphragm or peritoneal muscle. Its continuation upon the transverse septum is the crocodilian musc. diaphragmaticus, and in functional effect very similar to that of the Mammalia, whilst the abdominal diaphragm undoubtedly causes abdominal respiration. We have seen that these crocodilian conditions do not stand quite alone, but are connected with simpler features in the other reptiles. Two recent, very lengthy papers have been written on this subject by I. Bromann (1904) and by F. Hochstetter (1906), besides two in 1902 by G. Butler.

The Heart.

The *Heart* of all reptiles is removed from the head and is placed well in the thorax, in the Varanidae even a little beyond it. Only in snakes the heart lies headwards from the hilus of the lungs, not caudalwards, generally at about the end of the first fifth of the body. The batrachian conus arteriosus is reduced, one set of semilunar valves guarding the entrances into the truncus arteriosus which now issues directly from the heart. A sinus venosus exists still in *Sphenodon* and Chelonians, in which it may even receive separate hepatic veins, but in crocodiles, lizards and snakes the sinus as such exists no longer, forming part of the right atrium. All the hepatic veins enter the stem of the posterior vena cava, which henceforth enters the heart as inferior vena cava. This, the largest, and the right and left anterior vena cavae, are the only three veins which enter the right atrium. Into the left open the two pulmonary veins. Right and left atrium have in all reptiles a complete septum between them. The ventricular portion shows considerable steps towards the differentiation into a right and a left ventricle, but the partition is very incomplete in tortoises, lizards and snakes, quite complete only in the crocodiles. The most important character of the reptilian heart, absolutely diagnostic of it, is the fact that the systemic vessel which leaves the right ventricle turns to the left to form the left aorta, while the stem which comes from the left ventricular half arches over to the right as the right aorta. It is not at all necessary to conclude that this fact excludes the reptiles from the mammalian ancestry and to hark back to conditions as indifferent as are those of the batrachia. The Foramen Panizzae shows the way to a solution, how ultimately all the arterial blood from the left ventricle may pass, first through the root of the right arch, then through this hole into the left, whilst the rest of the right arch, and the root of the left, obliterate. The difficulty is not much greater than that of deriving the birds' condition from the reptilian. The Foramen Panizzae, which exists only in the Crocodilia, lies exactly where the right crosses dorsally over the left aorta. The whole is *not* the last remnant of the originally undivided truncus, as is taught generally, but it is a new foramen, a hole dug by the left arterial blood into the venous right aorta. According to the recent observations made by F. Hochstetter the foramen comes into existence in a very late embryonic stage.

Whilst the batrachian single ventricle possesses only one ostium ventriculare or outlet into the truncus, in the reptiles the inter-atrial septum extends considerably downwards into the base of the ventricle, so as to produce a right and a left niche, and correspondingly two ostia instead of one. The atrio-ventricular valves are still membranous, even in crocodiles; attached to them are muscles, trabeculae carneae, from the very trabecular walls of the ventricle; they are especially spongy in tortoises. By means of the arrangement of some of these trabeculae, perhaps still more through the confluence of their basal portions, an imperfect ventricular septum is initiated. Certainly even in tortoises, which represent the lowest stage, the venous blood is received into and sent out by the same right side of the ventricle, while the arterial blood is correspondingly managed and dodged by the left side. That there is not very much mixture of the two kinds of blood, in spite of the wide communication in the ventricle, is further due to the peristaltic systole and diastole of the various divisions of the heart.—The heart of Chelonians is broader than long. In correlation with the very much flattened body of *Trionyx* and its allied genera, the whole heart is dislodged from the middle line, far over to the right side; the vessels of the left side are correspondingly much elongated and have to cross the neck, trachea and oesophagus.—The apex of the heart is attached to the pericardium by a special ligament in the Crocodilia and in many Chelonia, *e.g. Testudo*, but it is absent in *Clemmys*. Sometimes this little ligament sends a tiny blood vessel into the liver.

Arterial System.

Crocodiles.—The *left* aorta crosses obliquely beneath the right and gives off only the coeliac, just before joining the right aorta in the level of the eighth thoracic vertebra. The aorta descendens sends off, besides intercostals and other segmentals into the body-wall, the mesenteric, right and left iliac, a pair of renal and ischiadics, a cloacal and the caudal artery. The *right* aorta forms the main root of the a. descendens. Close to the heart it sends off two coronaries and a short carotis primaria which divides at once into two anonymae, the left of which is the stronger. The right anonyma divides into the subclavia and collateralis colli, the left into subclavia and carotis subvertebralis. Each subclavia sends off an a. vertebralis communis, which runs headwards and, with another longer branch, downwards, giving off intercostals, and then joins the descending aorta.

Tortoises.—The *left* aorta is rather more separated from the truncus, which it crosses ventrally in an oblique forward direction; it sends off a left cardiac to stomach and oesophagus, a coeliac and mesenteric, and then a communicating branch to the right aorta. The a. descendens gives off paired suprarenals, spermatics, very large iliacs, then a pair of renals, hypogastrics and the caudal. Each iliac artery divides into a recurrent intercostal anastomosing with the axillaries, an epigastric (sending off the crural and anastomosing with thoracics and humerals), and other arteries to abdominal muscles and to the shell. The hypogastrics supply the cloacal region and then continue as the ischiadics. But there are many anastomoses which cause great variation in the different tortoises. The *right* aorta sends off a right cardiac, the coronary, and the right and left anonymae which are quite symmetrical, each dividing into subclavia and carotis; in the angle lies the thymus.

Lizards.—Two common carotids arise either side by side, or by one carotis primaria, from the right aortic root. In the majority each common carotis ascends the neck and then divides into the vessels for the head and another branch which turns back and goes into the descending part of the aortic arch. In chameleons two carotid stems ascend the neck and there is no recurrent vessel. In the Varanidae the two common carotids start from a long carotis primaria; there is no recurrent vessel. The vertebral arteries come from the origin of the subclavians and run to the head in a very lateral position. The subclavian arteries (which occur also in limbless lizards) arise far away from the carotids out of the descending arch of the right aorta, in a level often far behind the heart. "Anonymous" arteries are consequently absent in lizards.

Snakes.—The left aorta is stronger than the right, both combining soon to form the descending aorta. Owing to the absence of fore limbs and shoulder-girdle the conditions are much simplified. In most snakes the right aorta sends off but one strong carotic vessel which represents the left carotis communis whilst the right is much reduced or even quite absent; further, there is only one vertebral artery, which either runs along the right side of the vertebral column or it divides soon into a right and a left vessel along the neck. In conformity with the reduction of one lung there is usually but one pulmonary vessel.

Venous System.

Crocodiles.—Each, right and left, anterior vena cava is composed of a subclavian (axillary and external jugular), an internal jugular, common vertebral and an internal mammary vein. The posterior vena cava is composed of the two revehent renals, veins from the genital glands and ducts, revehent veins of the suprarenals (which, like birds, still have a portal system), and the big vein from the fat body. Thus the vena cava posterior perforates the right liver, receiving from it many hepatic revehent veins and also the big revehent vessel from the left lobe; next it receives the coronary vein and then enters the heart as inferior vena cava. The portal vein arises out of the coccygo-mesenteric (which comes out of the bifurcation of the caudal), collecting the blood from most abdominal viscera and from the thorax and breaks up in the right liver. The rest of the venous system is rather complicated. The big caudal vessel divides near the vent, receives an unpaired cloacal and a rectal vessel, and goes off to the right and left, each of which trunks receives an ischiadic and an inter-sacral vein and then divides into the v. renalis advehens which breaks up in the kidney, and the abdominal vein. The latter are interesting; they run in the abdominal wall, receive the obturator and other pelvic veins, intervertebrals and intercostals, the crurals, and the epigastrics out of the body-wall. Then these two abdominals (Rathke's internal epigastrics) go to the liver, which they enter to either side of the gall bladder, collecting also blood from the stomach and from the vertebral column. Both break up in the liver. Consequently all the blood from "below the heart" passes through some portal system—renal or hepatic—except that which comes from the genital glands and ducts and from the fat body.

Tortoises.—The venous system much resembles that of the crocodiles, but many and wide anastomoses, especially on the inside of the carapace and plastron, exist between often distant vessels, so that one lucky injection may fill the whole system. There are three advehent renal veins which collect on the back of their kidney into one stem; they dissolve completely into a portal system, and leave the kidney on its ventral surface as one v. renalis revehens. The right and left then form the v. c. posterior which perforates the posterior margin of the right liver, then headwards of the liver takes up the hepatic and enters the heart. The three pairs of afferent renal veins are composed as follows. The externa collects from the shell and the abdominal muscles; the posterior collects along the rectum from the genital glands, the bladder, and from parts of other pelvic viscera; the anterior comes from the anterior part of the shell and runs backwards to the kidney, with frequent anastomoses with the other advehent renal veins. The abdominals arise, as in the crocodiles, with the external advehent renal from the lateral continuation of the bifurcated caudal, which takes up vessels from the pelvis, the shell and the crural. The abdominal itself takes up a femoral vein, vessels from the abdominal and pelvic muscles, and from the plastron, and then dives into the body-cavity, receives veins from the fore limbs, and enters the right lobe of the liver, there to break up. The hepatic portal collects from the intestinal tract, spleen and pancreas. Consequently in tortoises all the blood from below the heart passes through some portal system.

The most important peculiarity of the Lizards is the condition of the abdominal veins; they combine into a single stem (after having collected the blood from the fat body and from the ventral body-wall of the pelvic region) which dives into the body-cavity to join, embedded in the ventral hepatic ligament, the left branch of the portal vein. The chief characteristic of the abdominal is that it does not communicate directly with the caudal, and that it forms an unpaired stem. The renal portal system receives its blood from the tail, the hind limbs, the abdominal wall and the urino-genital organs, all the blood passing into a right and a left advehent vein. The suprarenal portal system drains from the abdominal wall and the suprarenal bodies, and issues into the revehent renals. These, with some intervertebrals and with hepatics, constitute the inferior vena cava.

Lymphatic System.

The lymphatic vessels frequently accompany the big arteries of the trunk, either surrounding them with a meshwork or ensheathing them completely, especially in tortoises. The lymphatics from the head and neck combine with stems which accompany the veins of the fore limbs; they join the thoracic ducts and these open into the brachio-cephalic veins, as they do in birds. The lymph from the tail flows into the ischiadic veins or into the advehent renal veins. Reptiles possess only a posterior pair of lymph-hearts; they are placed near the root of the tail against the ends of one of the transverse processes. In snakes they lie in a space protected by the ribs and transverse processes of the original sacral vertebrae. Lymph glands proper are not developed in reptiles, except in the shape of the so-called mesenteric gland of crocodiles.

Blood.

The red corpuscles are invariably oval, and, since they still possess a nucleus, biconvex. Numerous measurements have been made by G. Gulliver (*P.Z.S.*, 1845, pp. 93–102), their long and short axes range between 0·015–0·023 and 0·009–0·21 mm. respectively. That means to say they are very much larger than those of mammals, considerably larger than those of most birds, and in turn much smaller than those of amphibia.

Digestive System.

Teeth.—All the groups of recent reptiles have teeth, except the tortoises, which have lost even embryonic traces of them. In the under jaw they are restricted to the dentary bones. In the upper they are almost universal in the maxilla and premaxilla, although the latter has lost them in most of the snakes. The pterygoids are toothed in most snakes and in a few lizards, *e.g. Lacerta* and *Iguana*. The palatines are toothed in *Sphenodon* and in some lizards.

Only the young of *Sphenodon* and the chameleons have a few small teeth on the vomer. The teeth themselves consist of dentine with a cap of enamel and with cementum around their base. In the crocodiles they are planted into separate alveoles in the maxilla, premaxilla and under jaw. In lizards they are either pleurodont, *i.e.* they stand in a series upon a longitudinal ridge which projects from the lingual side of the supporting bone, or they stand upon the upper rim of the bone, acrodont. In either case they are, when full grown, cemented on to the bone. Acrodont are amongst lizards only the Agamidae; the Tejidae are intermediate, almost acrodont. All the snakes and *Sphenodon* are acrodont. The latter is in so far peculiar as its broad-based, somewhat triangular teeth are much worn down in old specimens; originally there are several in the premaxilla, but the adults bite with the somewhat curved-down portions of the premaxillaries themselves, or with what remains of the anchylosed bases of the original teeth, which then, together with the bone, look like a pair of large chisel-shaped incisors. The lateral edges of the palatines of *Sphenodon* likewise carry teeth, those of the mandibles fit into a long slit-like space between the palatine and the maxillary teeth. This is a unique arrangement. Further, it is surprising that in this old, Rhynchocephalian type the supply of teeth has become exhausted, whilst in the other recent reptiles the supply is continuous and apparently inexhaustible. The new teeth lie on the lingual side of the old set, and long before the new tooth is finished part of the base of its older neighbour is absorbed, so that the pulp-cavity which persists in nearly all reptilian teeth becomes free. Ultimately the old tooth is pushed off and the new is cemented into its place. In the crocodiles it has come to pass that several sets of teeth are lodged more or less into one another's bases. Where crocodiles and alligators collect habitually the ground is sometimes found strewn with thousands of teeth, large and small, every creature shedding about seventy teeth many times during its long life.

Some or all teeth of various families of lizards and snakes have a more or less pronounced groove or furrow along their anterior convex curve. The usefulness of this furrow in facilitating the entering of saliva into the bitten wound is merely incidental, but this preformed feature has in many snakes been improved into a fearful weapon. In the Opisthoglypha a few of the most posterior teeth in the maxilla are enlarged, have deeper furrows, and lie in the vicinity of the poison ducts. In the Proteroglypha one or two of the most anterior maxillary teeth are enlarged and furnished with a deep groove for the reception of poison. In the Solenoglypha or Viperidae the enlarged teeth of the Opisthoglypha have moved to the front, owing to reduction of the anterior portion of the maxilla. The latter, much shortened, moves with the firmly anchylosed poison fang upon the prefrontal as its pivot, being pushed forward, or "erected," by the ectopterygoid bone, which connects it with the pterygoid, and this in turn can be moved forwards and backwards, together with the quadrate. (See fig. 24, skull of *Vipera nasicornis* and the diagram of the mechanism in article SNAKES.) In the still unfinished fang the furrow is open, later the edges close together and the end of the duct of the gland itself is surrounded by the substance of the growing basal portion of the tooth, so that the furrow is converted into a canal continuous with that of the gland. The poison is now sure to be projected into the very deepest part of the wound with the precision of a surgical instrument. The Proteroglypha, with their long, non-erectile maxillae, bite, or, like *Elaps*, deliberately chew their victim; the Viperidae rather strike with the mouth widely open. The teeth of snakes and lizards are often of irregular size; but it is rare that a kind of differentiation into incisors, canines and molars occurs. In many lizards, especially in Iguanidae, some teeth are multicuspid, trilobed, or somewhat serrated; in *Tiliqua*, universally known as *Cyclodus*, most of the hinder teeth are roundish crushers.

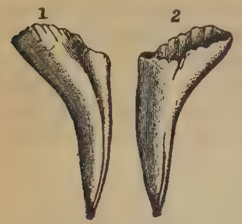

FIG. 38.—Two Aspects of a Tooth of *Heloderma horridum* (after Bocourt). 1, antero-internal aspect of the tooth, showing a very deep longitudinal groove; 2, postero-external aspect of the same tooth, showing a very faint longitudinal groove.

Lizards and snakes are born with an "egg-tooth" which is lost a day or two after hatching. Its function is the filing through of the eggshell. This tooth, always unpaired, is in *Tropidonotus natrix* one millimetre long and half a millimetre broad at its base, which rests upon a middle depression of the premaxillary bone; it stands forward above the mouth and is curved upwards. In crocodiles and tortoises the same effect is produced by another organ, which, as in birds, lies well outside the mouth on the top of the end of the snout and consists of a little cone of calcified epidermis.

Tongue.—The tongue of the crocodiles is very broad and flat, and with nearly its whole broad base attached to the floor of the mouth; however, in its whole circumference its edge is well marked, and it arises on its hinder border as a transverse fold which meets a similar fold descending from the palate in front of the posterior nares. By these folds the mouth can be completely shut off from the nasal passages into the trachea. The upper surface of the tongue contains several dozen large flat papillae, each with a central pit-like opening; it is not known whether they are gustatory organs. Besides scarce mucous glands on the tongue, there is an absence of salivary glands in the mouth. The tongue of tortoises is likewise short, broad, and not protractile, and there appears to be only a sublingual gland; the surface of the tongue is covered with velvety papillae in the terrestrial, with larger folds in the marine Chelonians. In the Lacertilia the tongue presents a number of variations which have been referred to as diagnostic characters of the various families of LIZARDS (*q.v.*). The chief modifications are the following: Either flat and broad, not protractile, *e.g.* Agamidae; or the body of the tongue is somewhat cylindrical, elongated, and the whole organ can be protruded; lastly, the anterior half of the tongue, which can be protruded, is retractile or telescoped into the posterior portion, *e.g.* Anguidae. In nearly all cases the posterior dorsal end of the body of the tongue is well marked off by a margin raised above the root, a character which does not occur in any snake. The upper surface is either smooth or curved with velvety, flat, or scaly, always soft, papillae. In the majority the tip of the tongue is bifid, either slightly niched or deeply bifid. The tips contain tactile corpuscles, although sometimes covered with a horny epithelium. The most specialized is the tongue of the chameleon. The body of this tongue is very thick, club-shaped, fleshy and full of large mucous glands which cover it with a sticky secretion. The base or root is very narrow, composed of extremely elastic fibres and supported by a much elongated copular piece of the hyoid. This elastic part is, so to speak, telescoped over the style-shaped copula, and the whole apparatus is kept in a contracted state like a spring in a tube. A pair of wide blood vessels and elastic bands extend from the base into the thick end, which in an ordinary chameleon can be shot out to a distance of about 8 in.

The tongue of the snakes is invariably slender, smooth and almost entirely retractile into its posterior sheath-like portion. It is always bifid and contains many tactile and other sensory corpuscles by which these creatures seem to investigate. The tongue is always protruded during excitement. How this is done is not very obvious, since the hyoid apparatus itself is much reduced. There is a niche in the middle of the rostral shield to permit protrusion of the tongue whilst the mouth is shut, and probably herewith is correlated the almost universal absence of teeth in the premaxilla. The tongue and the larynx are placed very far forwards in the mouth and, during the act of swallowing, the larynx approaches the chin, or it may even protrude out of the mouth to secure breathing during the often painfully protracted act.

Of *Glands*, sublingual glands are of general occurrence in reptiles; they open near the root or in the sheath of the tongue. Labial glands seem to be absent in crocodiles and tortoises, but upper and lower labial glands exist in lizards and snakes, generally in considerable numbers. *Heloderma* is the only lizard in which some of these glands—those along the lower jaw—produce a poisonous secretion, each small gland conducting its secretion towards the base of one of the somewhat furrowed teeth. In the snakes, upper and lower labial glands are well developed for salivation. It is the upper series which attracts our interest by its eventual modification into the deadly poison glands. Probably the saliva of most snakes, like their serum, possesses toxic properties. In most of the harmless Colubrine snakes the glands extend in a continuous series from behind the premaxilla along the whole of the upper jaw, with numerous openings. In the Opisthoglypha a gradual differentiation takes place into an anterior, middle and posterior portion; the middle, extending from below and behind the eye backwards, is the thickest and yellowish in colour; behind it follows a small portion, reddish grey like the anterior portion, with which it is more or less continuous below the middle complex. Thus, still rather indifferent, is *Dryophis*. In *Dipsas*, *e.g. D. fusca*, the middle portion has become predominant; some of its enlarged ducts lead to the pair of posterior, enlarged and well-grooved, maxillary teeth. It is this middle portion which becomes the characteristic poison gland with one long duct. The gland itself retains its position; all the other upper labials, except the anterior series, abort. In the Viperidae the poison duct opens near the base of the perforated fangs, which, owing to the shortening of the anterior portion of the maxilla with its teeth, have come to be the only teeth in the upper jaw. In the Elapine, still more in the Hydrophine snakes, the position of the gland and its duct is the same, but the duct has been carried past the smaller harmless teeth which stand in the maxilla and open at the base of the anterior maxillary teeth. The effect is the same, although the poison fangs are not homologous, in the one case the most posterior, in the other the most anterior, of the maxillary series. In *Doliophis*, one of the Malay genera of Elapine snakes, each poison gland sends an enormously elongated recess far into the body-cavity. (For some other details see SNAKES; VIPER; and RATTLESNAKE. The best account of the buccal glands and teeth of poisonous snakes is that by G. S. West, *P.Z.S.*, 1895, pp. 812–826.)

Stomach, &c.—In lizards and in *Sphenodon* the wide pharynx and oesophagus passes gradually into the stomach, which is more or less spindle-shaped, never transversely placed. The walls of the stomach are thrown into longitudinal folds which contain the specific gastric glands, whilst glands are absent in the oesophagus, excepting scattered and very simple slime glands. The circular muscular fibres of the stomach are much stronger than the longitudinal fibres. The end of the stomach is generally marked by a pyloric valve. The walls of the mid gut are said to be devoid of glands. The end gut, marked by a circular valve, is considerably wider and there is a caecum, mostly left-sided, largest in leaf-eating lizards, rarely absent, as, for instance, in *Anguis*. The absorbent portion of the rectum is always strongly marked off from the cloaca by a circular fold or sphincter, which projects into the widened coprodaeum of the cloaca. In those lizards which, like *Varanus*, have no urinary bladder, there are two successive sphincters, marking off two chambers, one, the upper or innermost, for the reception of the faeces, the lower for that of the urine. In adult crocodiles the stomach is transformed into a gizzard; it is more or less oval, with a wide fundus and with two opposite apo-neurotic or tendinous disks whence radiate the muscular fibres. The muscular walls remain, however, comparatively thin, like those of birds of prey. There is a distinct pyloric stomach and then follows the pylorus. The inner lining of the stomach is velvet-like with numerous gastric glands which form groups with net-like interstices. There is a distinct duodenal loop which contains the pancreas. The more convoluted mid gut is lined with net-like meshes which farther back assume a longitudinal zigzag arrangement; towards the end gut the walls become quite smooth, but in the end gut the walls again show a very narrow-meshed structure. None of these folds of the mid and hind gut is said to contain digestive glands; they seem to be entirely absorbent. The oesophagus of most tortoises shows longitudinal folds with very numerous mucous glands. In the Chelonidae the pharynx and adjoining part of the gullet are covered with little tubercles upon each of which opens a small gland. Farther down they give way to large, more or less conical papillae, which assume a considerable size, point backwards, and are covered with a somewhat horny epithelium. Similar conical, horny papillae exist also in *Sphargis*, in which the oesophagus, moreover, makes a long loop half round the stomach before passing into it, an absolutely unique feature. The transition into the stomach is quite gradual. The latter is strongly muscular, partly transversely placed, and possesses often a very distinct pyloric stomach. In *Chelone* conical papillae extend into the cardiac portion. In the majority of tortoises the inner lining shows longitudinal folds with numerous small glands, mucous and gastric, but their distribution differs much in the various families and even genera. The lining of the mid gut shows either longitudinal folds or a network, without glands, except in some cases, Lieberkühn crypts, *e.g.* in *Trionyx*, not in *Testudo* and *Chelone*. The hind gut begins suddenly, but there is no caecum; its inner walls contain numerous glands in *Testudo*, *Emys*, not in *Chelys*, *Trionyx*, *Cinosternum*.

In the snakes the oesophagus is very thin-walled and passes imperceptibly into the stomach, which continues in a longitudinal direction, scarcely wider in the middle. Its muscular coating is surprisingly weak. There is a small pyloric portion. Mucous and especially long-bodied gastric glands are numerous. The wall of the mid gut carries numerous papillae variably arranged, velvet-like, or densely crowded little blades supported by longitudinal or by meshy folds. The hind gut is short, often constricted into several successive chambers, mostly smooth inside; there is a short, rather wide caecum which seems best developed in Viperidae; sometimes absent. The total length of the snakes' gut is always short, there being only short folds possible or necessary in the body cavity, which itself is of extraordinary length. Yet, while in *Typhlops* the gut is almost straight, it forms numerous convolutions in *Tortrix*.

Whilst in all other reptiles the gut, at least stomach, liver and mid gut, are suspended by the mesentery from the vertebral column and hang free into the body cavity, in some snakes, especially often described in *Boa* and *Python*, the body cavity is cut up into numerous spaces, by peritoneal folds which connect neighbouring twists of the canal into bundles and attach them to the ventral surface of the body-wall. Probably the gut is thereby secured against dislocations in adaptation to the peculiar twisting contortions of the body, especially in the act of climbing. The mesentery of reptiles is remarkable for the possession of smooth, non-striated, muscular fibres. In most lizards, not in other orders, the peritoneum so far as it covers the abdominal cavity shows a deep black pigmentation; this pigment is situated in the connective tissue, not in the epithelial layer; it stops suddenly towards the thorax. In some lizards, *e.g.* in *Anguis*, the black pigment extends, more or less scattered, upon the mesentery and thence upon the intestines. The same pigment colours the pharynx with its recesses entirely black in many lizards. There is no compensating correlation between this internal pigment and that in the outer skin.

The *Liver* of lizards is more or less bilobed; more so in crocodiles; while in tortoises the broad right and left lobes are connected by a narrow isthmus. In the snakes it is much elongated and extends from the heart backwards along the right side of the oesophagus, closely connected in its long course with numerous short branches into, or from, the inferior vena cava and the portal vein. A gall bladder is always present. The ducts into and from the cyst sometimes form a complicated network, for instance in *Varanus* (F. E. Beddard); the bile is carried by one or more ducts into the duodenal portion of the mid gut. The microscopic structure of the reptilian liver has been compared with that of monotremes by M. Fürbringer.

The *Pancreas* is a compact body attached to the duodenal region, which surrounds it by a loop in the crocodiles, as is the case in birds and mammals.

The *Cloaca* of the reptiles shows a great advance upon the simple batrachian arrangement. It is no longer one common chamber, but consists of three successive chambers with the further tendency of separating the temporary retention and the passage of the faecal, urinary and genital products from each other. The arrangement is simplest and most typical in the lizards. There is first the *proctodaeum* or vestibulum of the cloaca, epiblastic in origin. Its outer boundary is formed by the cloacal lips, covered so far by the usual scaly integument. Just within this chamber arise the paired copulatory organs, and, when they are present, as in *Sphenodon* and snakes, the two anal glands. Secondly, the *urodaeum*, middle or urino-genital chamber, hypoblastic in origin. It is separated from the proctodaeum by a more or less circular fold which is provided with sphincter muscles, which form the true vent, and this is always round; whilst the outermost opening in lizards and snakes is a transverse slit. Farther inwards, headwards, the urodaeum is shut off by another circular fold, generally very well marked, especially in its dorsal half, which is higher and thicker. Into the dorsal, and innermost, recess of this urodaeum open the genital and urinary ducts; on the ventral side arises the urinary bladder. The whole chamber is always empty, being only a passage room, and in the female the copulatory chamber. The urine is of course collected in the bladder; when this is absent the fluid is pressed into the third chamber, the *coprodaeum*, which is often subdivided into two, or even three, successive rooms by circular folds. This coprodaeum serves for the temporary storage of the faeces, eventually mixed with the urine. Micturition and defaecation are in most lizards two successive separate acts.

The snake's arrangement is a side-departure of that prevailing in lizards. The urodaeum is transformed into a dorsal recess into which open above the oviducts, while the ureters open below, in the caudal corner. A horizontal fold imperfectly shuts off the wide urino-genital chamber or recess from the ventral half of the original urodaeum. The coprodaeum is marked above and below by strong sphincters. There is no urinary bladder.

In crocodiles the protodaeum is rather shallow, but long; from its ventral wall arises the unpaired copulatory organ, the basal investing membranes of which continue into the ventral half of the uro-proctodaeal fold, near which open the male ducts. Very young crocodiles possess a typical middle chamber or urodaeum, into the dorso-lateral corners of which open the ureters, but soon the strong circular fold between urodaeum and coprodaeum disappears completely, so that both chambers now form one large oval room, which is used solely for the storage of the urine, there being no bladder. The faeces are kept in the not specially dilated rectum.

The cloacal arrangement of the Chelonia is a further development of early crocodilian conditions, but it has become rather complicated and shows a surprising resemblance to that which still prevails in the Monotremes. The proctodaeum is deep and very long, especially in the males. From its innermost and ventral walls arises the large copulatory organ. From the urodaeum is separated off a deep ventral recess into which open the ureters and the genital ducts, and it is continued by a long neck into the large bladder. Between the dorsal wall of this recess and the ventral wall of the main portion of the urodaeum arises a horizontal fold which, diverging, is continued on to the investing skin of the penis, helping to form the edges of the deep longitudinal furrow on its morphologically dorsal surface. If the lips of this furrow were closed, urine and all the genital products would pass through this urethral canal, but in reality only the semen is conducted through it (the furrow during the state of turgescence being transformed into a closed tube), whilst urine and eggs escape through the wide slit near its inner end. This is an arrangement almost the same as that of *Ornithorhynchus*. The urodaeum is separated from the rectum by a strong sphincter, and there is, as in the crocodiles and mammals, no special coprodaeum. The Chelonian urodaeum is further complicated by the occurrence of a pair of large anal sacs, thin-walled diverticula on the dorsal side. Such sacs, not to be confounded with the anal glands of other reptiles, exist in many water tortoises, especially in the Chelydidae, also in various aquatic Testudinidae, *e.g. Emys*, in *Platysternum*, and sometimes in *Trionyx*; they are absent in the Chelonidae and in the typically terrestrial tortoises. These sacs have highly vascularized walls and a considerable layer of circular and longitudinal non-striped muscular fibres; their inside is sometimes villous, never glandular. They are incessantly filled and emptied with water through the vent, and act as additional respiratory organs, like a kind of water lungs. When such a tortoise is suddenly taken out of the water it squirts out a stream of water, which is not, as is usually supposed, the urine from the bladder.

In connexion with the cloaca may be mentioned the frequent occurrence of *peritoneal* canals. In the tortoises their abdominal openings are situated in a recess of the peritoneal cavity close to either side of the neck of the bladder; in the females they extend as funnels, generally blind, into the cloaca on or near the base of the clitoris. In the males they extend, without having communication with the cavities of the corpora cavernosa, and without ramifications, as canals along the dorsum penis and *either* terminate blindly in the glans (*Testudo*, *Chelone*), *or* they open, each by a small orifice, in the groove at the base of the glans. In crocodiles these canals are short and open near the base of the copulatory organ, protected by a small papilla. They are present in both sexes, but are still closed in newly hatched and very immature specimens. In an adult Nile crocodile they are wide enough to pass an ordinary lead pencil. The function of these outlets from the body cavity is obscure. In *Sphenodon* the writer has found them as closed funnels which project as soft papillae into the proctodaeum a little to the right and left and caudalwards from the urino-genital papillae.

Urinary Organs.

The *kidneys* of the reptiles show, like those of the birds and mammals, a considerable advance upon those of the Batrachia. They are, in the adult, represented entirely by the metanephros; the segmental tubes have no longer any nephrostomes opening into the body cavity, not even during any time of their development, and it has come to a complete separation of the efferent genital ducts from the kidneys and from their ureters. Yet these differences are but of degree, there being a continuous bridge from Batrachian to Lacertilian conditions. In *Lacerta*, for instance, in which these features have been studied most thoroughly, the mesonephros continues as the only functional excretory organ during the first year of the young creature until and during its first hibernation, when the formation of the metanephros takes place, and with it the complete separation of the vasa deferentia from the kidneys. Until then the segmental canals remain in the male as common carriers of semen and urine, at least morphologically, not physiologically, since in the immature there is no occasion for the conduction of semen. The kidneys of these young lizards show precisely the same arrangement as that of the Batrachia, excluding the Discoglossidae.

Clearly the metanephros is developed from, and is part of, the posterior portion of the mesonephros, the glomeruli of which no longer open into the segmental duct, but become connected with a new canal, the future ureter, which sprouts from the distal portion of the segmental duct and grows headwards. Or let us put these important changes in another way. Since there are originally several segmental ducts (permanent in the male newt) which tailwards more and more lose their connexion with the testes, until—in the posterior portion of the mesonephros—they become entirely urinary ducts, the hindmost of these sprouts (in lizards postembryonic, much earlier in birds and mammals) independently, but at the same time as the neighbouring mass of the mesonephros, the growing glomeruli of which then connect with the sprouting processes of the ureter. Phylogenetically and ontogenetically it is evident enough that the kidneys are essentially one organ, the anterior portion of which is the oldest and decays, whilst farther backwards new and more differentiated portions continue to grow. Pro-, meso- and metanephros and successive wave-like stages of the same organ with morphological and functional continuity, until the next, improved portion is ready. It is important that in the Discoglossidae, especially in the male *Alytes*, an arrangement has come to pass which much resembles that of the Amniota. The mesonephros has, by a simple contrivance, become a metanephros, provided we define the former as a kidney which is still connected with true segmental ducts.

The *supra-renal bodies*, adrenals, head-kidneys or Nebennieren, are yellowish bodies which lie more in connexion with the generative glands than with the kidneys, always closely attached to the vena cava posterior just above the kidneys. They are very elongated in the snakes, in a 10-foot python they measure about one inch in length; they are flattened in tortoises, roundish in crocodiles.

In all reptiles the kidneys are retroperitoneal, and they do not project into the body cavity. Their position is different in the various groups, and their general shape is much affected by the shape of the body. In the *Ophidia* they are much elongated, and of course far in front of the pelvic region, which has been moved to the cloaca. They are placed asymmetrically, the right extending farthest forwards. They consist of many transverse lobes, sometimes in such a way as to appear spirally twisted. Each terminates considerably in front of the cloaca. Each ureter begins at the anterior end of the kidney, and thence proceeds on its inner and dorsal border, receiving ducts from the interspaces of the numerous lobes. In the male each ureter opens upon a papilla, together with the vas deferens; in the female the ureter is joined by a blind canal, the vestige of the male duct. No snake has a urinary bladder. The urinary excretion is white, chalky, consisting mainly of uric acid in crystals, with very little fluid.

In the *Lacertilia* the kidneys are more posteriorly placed than in snakes. They lie between the pelvis and the cloaca and are generally close together, sometimes partly fused with each other. Only in the Amphisbaenids the right kidney extends more forwards. They are usually transversely furrowed. The ureters open dorso-laterally into the urodaeum upon papillae as in the snakes. In the females the remnants of the segmental ducts, or vestigial representatives of the vasa efferentia, are often of considerable length, persistent in chameleon and *Uromastix*, much reduced in geckos, or disappearing with age as in *Lacerta*. The urine of most lizards contains much solid uric acid, which is retained in the urodaeum and voided as a rather solid, white mass, not united with the faeces. Those which have a greater amount of fluid urine have a bladder which receives the fluid portion. The opening of this bladder is on the ventral side of the cloaca, not in direct connexion with the ureters. The bladder is very rarely absent, *e.g.* in Varanidae and Amphisbaenidae.

The *Crocodilia* have the kidneys placed below the pelvis; their surface shows meandering convolutions separated by furrows. The ureters are for the greater part of their length deeply sunk into the substance of the kidneys, which they leave near the hinder ends, to run freely for a short distance along the dorsal sides of the cloaca, and they open, each separately, and away from the vasa deferentia, into the dorsal side of the urodaeum, which, together with the coprodaeum, forms a large oval chamber, and this being filled with the very fluid urine, functionizes instead of the absent bladder.

In *Chelonia* the kidneys lie in the pelvis, short and thick, more or less trihedral; the surface is marked with many shallow meandering grooves and fewer deeper furrows. Each ureter, composed of several large successive canals, leaves its kidney near the inner hinder end, and then runs free for a short space, crossing the gut to open into the neck of the urinary bladder, which arises ventrally out of the urodaeum, which itself has become a recess of the cloaca. The bladder is large, often more or less two-horned, attached to the pelvic wall by a peritoneal fold, and it contains very fluid urine.

The kidneys of *Sphenodon* are very small and far removed from the generative organs. The ureters open, each close to the vas deferens of its side, beneath a little papilla, on the dorsal side, rather near the midline of the urodaeum, whence arises a long-necked bladder.

Reproductive System.

The *Ovaries* are always in pairs, placed headwards at a distance from the kidneys in *Sphenodon*, lizards and snakes; in the latter the right ovary lies farther forward. In tortoises, and especially in the crocodiles, where they are very long and much twisted or lobated, they are situated close to the kidneys and even accompany them. The ovaries of lizards and snakes contain many and large lymph spaces; those of the other reptiles are much denser in structure. The ripening eggs always cause them to assume the shape of a bunch of grapes. The *oviducts* are each held by a peritoneal fold which arises from near the dorsal midline. The abdominal ostia are long slits and are turned towards the side, away from the ovaries. The walls of the ducts gradually become thicker, glandular and much folded. Whilst the ripe eggs, often in considerable numbers, receive their shell, each egg lies in a separate chamber; in the geckos, which lay only one pair of eggs, the two respective chambers have become permanent features. In *Sphenodon* each oviduct opens together with the ureter of its side near the dorsomedian line of the urodaeum. In most lizards the two oviducts and the two ureters have four separate openings in the dorsal wall of the rather deep dorsal recess of the urodaeum. But in *Lophura* both oviducts unite (like the ureters) and have only one opening, which is placed a little nearer towards the pelvis than the urinary opening, but they are divided by a longitudinal septum which extends almost to their common orifice. In the snakes the oviducts likewise open into the dorsal recess, sometimes by a common ostium, which is provided with a strong sphincter. The whole recess acts like a vagina for the reception of one of the copulatory organs. The oviducts of the crocodiles open in a decidedly ventral position, on either side close to the base of the clitoris, a considerable distance from the openings of the ureters. In the tortoises the oviducts open separately into a wide ventral urino-genital sinus, at the base of the neck of the bladder.

The *Testes* correspond in position with the ovaries; in snakes and Amphisbaenids the right is placed farther headwards than the left. The usual shape is elongated, sometimes pointed forwards. The *Epididymis* is sometimes of the same size as the testis and then consists of many meandering convolutions of the vas deferens which is composed of several canals from the testis. The convolutions are held together by a peritoneal lamella. Towards the cloaca they become much smaller and shorter, and the vas deferens passes along the median side of the ureter. In *Sphenodon* these open separately, each near and below the same papilla near which opens the ureter of the same side. In most lizards the vas deferens unites with its ureter into one short canal which opens beneath or upon a small papilla in the upper corner of the urodaeal recess, far away from the penis. In snakes vas deferens and ureter of each side are likewise commonly united. In the crocodiles each vas deferens passes from the dorsal side of the cloaca to the ventral side, not accompanied by the ureter, and opens into the blind sac which forms the basal continuation of the deep groove on the dorsal side of the penis. In the tortoises the epididymis is very large and the vas deferens is also much convoluted; each opens separately near the neck of the large urinary bladder close to the backward continuation of the deep longitudinal groove of the copulatory organ.

Remnants of the Müllerian ducts run parallel with the vasa deferentia, and similar remnants of the Wolffian ducts accompany the oviducts in crocodiles and tortoises, least degenerated of course in young specimens. Such reciprocal vestiges occur most likely also in lizards, and in female snakes a vestige of the male duct joins its ureter. In a nearly adult male *Sphenodon* the present writer missed the female remnants.

The copulatory organs show very important modifications. *Sphenodon* is the only recent reptile which is devoid of such an organ; its imperfect substitute is an unpaired, thin, but high membranous fold which arises from the dorsal middle of the circular fold between urodaeum and coprodaeum. During copulation this part of the cloaca is probably everted to secure conception, a striking resemblance to the arrangement found in the Caecilia. The organs of all lizards and snakes are paired, in their quiescent state withdrawn into deep pockets which open on the right and left posterior corners of the proctodaeum or outer chamber of the cloaca, which for this reason has assumed the shape of a transverse slit in all lizards and snakes. Hence these have sometimes been called *Plagiotremata*. Each organ can be everted and tucked in like the finger of a glove, a muscle being attached to the inside of the apex; when everted, the muscle extends through the length of the organ; each muscle arises from the ventral side of several transverse processes of the tail vertebrae, at a considerable distance from the cloaca. In the embryo each organ arises as a conical protuberance, or papilla, which projects out of the vent. Later it becomes inverted. Probably this ontogenetic feature recapitulates the phylogeny of these organs, which have to be looked upon as swelling flaps or portions of the walls of the cloaca which were protruded during copulation, and which in time borrowed, and specialized, muscular fibres from the ventral tail muscles. On the outer everted side of each organ is a furrow for the reception of the semen. The apex is either single or more or less deeply bifurcated, each arm being followed by the likewise divided furrow. The outer investing membrane of these very muscular erectile bodies is epidermal; often, especially in snakes, provided with numerous papillae, folds or other excrescences. In

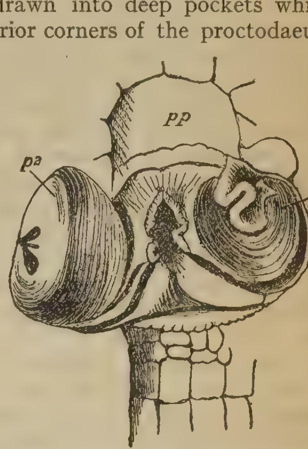

FIG. 39.—Male copulatory organs of *Lacerta agilis* (after Leydig). p_1, p_2, organs of right and left sides—between them is the anal aperture; *pp*, preanal plate.

many snakes these are spiny and hard, but according to Leydig this hardness is not due to a horny substance but to the deposition of calcifying matter. E. D. Cope has investigated the almost endless minor modifications of these penial features and uses them for taxonomic purposes in the snakes. Vestiges of these organs occur in females of snakes and lizards. Close to these organs of the snakes lies a pair of anal glands of some size, which pour their very offensive secretion through an opening close to the base of each penis. The same glands occur in the same position in *Sphenodon*, which has no copulatory organs, and in crocodiles they appear as evertible musk glands. Hence J. E. V. Boas, not knowing of their existence in both sexes of snakes, tried to homologize them with the paired penes of reptiles, an error which has been repeated in C. Gegenbaur's *Lehrbuch*, vol. ii. p. 533.

The crocodiles and tortoises possess a single, median copulatory organ; it lies on the ventral or anterior end of the cloaca, the outer opening of which is therefore a longitudinal slit, hence the term *ucthotremata*. In the crocodiles the organ is attached to the caudal corner of the ischiadic symphysis by a strong and roundish fibrous band, which arises single from the ventral sides and forms partly the continuation of the two fibrous halves of the organ; the bulk of the crura, comparable to corpora cavernosa, is not attached to the pelvis, as generally stated, but projects backwards towards and into the pelvic cavity. This portion is especially rich in venous cavernosities. The outer coating of the glans possesses various papillary projections, which are furnished with sensory, hedonic corpuscles. On the morphologically dorsal side of the organ, not on the dorsum penis, is a deep groove which ends towards the crura in a blind sac, into the farther corner of which open the vasa deferentia. In a full-grown Nile crocodile the whole organ is about 10 in. long. In young females up to a total length of 3 or 4 ft. the clitoris is nearly of the same size as the male organ, but it remains stationary and appears very small in large specimens.

The organ of the tortoises is essentially of the same type as that of the crocodiles, but it is nowhere directly attached to the pelvis or to any other skeletal part. The whole organ, when withdrawn, lies in a ventral, long recess of the wide outer cloacal chamber, and its crura extend so far back as to form the continuation of the ventral and lateral walls of the recessus which is continued into the neck of the urinary bladder. Its orifice and those of the seminal ducts are enclosed by the walls of the deep groove which runs along the underside of the organ. This is always of considerable size, surprisingly large in *Trionyx*. The clitoris is small, sometimes tiny.

The sexual act is extremely prolonged in Chelonians and still more so are the preliminaries, but in crocodiles it is the deed of a few seconds. Lizards and snakes insert only one side.

There remains the question whether the unpaired organ of the crocodiles and tortoises, which is the prototype of the mammalian organ in every essential point, and the paired organs of the lizards and snakes, are to a certain extent homologous organs in so far as they can both be derived from the same indifferent condition. With this view we assume that originally the protrusible walls of the outer cloacal chamber became specialized into a right and left imperfect intromittent organ, that subsequently, in lizards, those hemipenes were shifted back towards the tail and were henceforth bound to develop separately, while in the crocodiles, tortoises, mammals and birds the two primitive lateral evertile flaps approached each other towards the ventral anterior side of the cloaca, and that this led to a fusion, beginning probably at the basal part, which at the same time was farther withdrawn from the surface and secured the reception of the sperma from both vasa deferentia into one canal. This hypothesis has been objected to by Boas, but accepted by Gegenbaur (p. 538) after having been rejected on p. 533 of his *Lehrbuch*.

The *Fat bodies* belong at least physiologically to the generative system. They are placed outside the peritoneum. In lizards they appear as two masses in the pelvic region, the black peritoneal lining covering only their dorsal side. They consist of a network of arteries and connective tissue, the meshy spaces of which are filled with "fat"; they each receive an artery from the femoral vessel which enters them in the inguinal region; the veins collect into the abdominal. In snakes the fat bodies are very long, extending from the cloaca to the liver. Tortoises seem to have only traces of them, but in *Sphenodon* and in crocodiles they resemble those of lizards.—The peculiar organ suspended from the right abdominal wall of crocodiles, variously mentioned as mesenteric gland or body, or fatty spleen, by Butler, is possibly related to the same category. The fat bodies of reptiles are sometimes vaguely alluded to as hibernating bodies; like the fat bodies which are attached to the generative glands of Amphibia they do not become reduced during the eventual hibernation but are largest before the pairing season, by the end of which they are exhausted, looking reddish or grey after the loss of their stores of fat and probably other important contents

The Embryonic Development.

Fertilization of the egg always takes place internally, and the egg containing a large amount of food-yolk is of course meroblastic. It is sufficient to mention that many lizards, some chameleons and many snakes (not *Sphenodon*, geckos, crocodiles and Chelonians) retain their, in these cases very thin-shelled, eggs in the oviducts until the embryo is ready to burst the egg-membrane during the act of parturition or immediately after it. Such species are usually called ovoviviparous, although there is no difference between them and other viviparous creatures, for instance the marsupials. The majority of reptiles are oviparous and the egg is enclosed in a strong parchment shell, with or without calcareous deposits. Only gas exchange can take place between such an egg and the outside, and it loses by evaporation, whilst in the batrachian egg various other exchanges are easy through the thin membrane. The salamander embryo, within its thin egg-membrane, even grows to a size many times larger than the original egg, it does not only breathe, but it is also nourished through the gills, and by some means or other the waste products are partly eliminated without filling the bladder. The amphibia are born as larvae and live as such for a long time, often in a most imperfect condition. Nothing of all this applies to the reptile, which leaves the egg as a perfect little imago. A great amount of yolk supplying the material, and a large "bladder" to receive the waste products and to act as respiratory organ, have made this possible. That the allantois and the amnion behave precisely in the same way in the mammals with their much reduced yolk, only testifies to the superior value of these organs, and after all there is no difference in this respect between a monotreme and a reptile. These two organs seem to have come into existence with the reptiles and constitute the most reliable diagnostic feature between higher and lower vertebrates. All reptiles, birds and mammals have a navel, a feature unknown and impossible in Batrachia and fishes. A few remarks on these important embryonic organs may not be superfluous, especially concerning their possible origin.

Whilst the urinary bladder of the Batrachia remains within the body throughout the embryonic stage, this organ undergoes in the higher vertebrates, reptiles, birds and mammals, considerable modifications, and it assumes, henceforth as *Allantois*, new important functions besides that of being the receptacle of the embryonic urine. The development of the Allantois is in intimate causal connexion with that of the *Amnion*. All the *Allantoidea* are also *Amniota* and vice versa, but the term Amniota is preferable, since the basal portion of the Allantois remains in the adult as the urinary bladder, as an organ henceforth equivalent to and homologous with that of the Anamnia. The primary feature seems to be the allantois which leaves the body cavity, remains without the amniotic folds, even after these have enclosed the body within the amniotic bag, and then spreads nearly all over the inner side of the egg-shell. Having thus come into the closest possible contact with the atmospheric air, the vessels of the allantois can exchange their carbon dioxide for oxygen and the allantois becomes the respiratory organ of the embryo. Herewith stands in direct correlation the complete absence of any internal and of external gills in the embryonic reptiles. The blood vessels of the allantois are fundamentally the same as those of the batrachian bladder, namely, branches from the pelvic arteries (later hypogastrics) and veins which return from the base of the bladder to the abdominal wall and thence to the liver.

In the normal reptilian egg, surrounded by its non-yielding shell, space is absolutely limited, and whilst the yolk is being diminished and increased secretion of urine distends the bladder, this soon protrudes out of the body cavity proper into the extra-embryonal coelomatic space between the true amnion and the false amnion or serous membrane. It fills this space so far as the yolk-sac allows it. It seems reasonable to suppose that this growth of the allantois has been one of the causes of the caudal amniotic fold; the sinking of the embryo into the space of the diminishing yolk-sac is no doubt another cause, but the fact remains that the amnion is the chief hindrance to the closing of the body-wall at the region of the future navel.

The life-histories of embryonic development are the domain of the embryographers. They are the imperfect accounts of the ways and means (often crooked and blurred, owing to short cuts and in adaptation to conditions which prevail during the embryonic period) by which the growing creature arrives at those features which form the account of the anatomical structure of the adult. Comparative anatomy, with physiology, alone lead through the maze of the endless embryonic vagaries and afford the clues for the reconstruction of the real life-history of an animal and its ancestry. For detail the reader is referred to numerous papers quoted in the list of literature, and to the various text-books, above all to the *Handbuch d. vergleichenden Entwicklungsgeschichte d. Wirbelthiere*, edited by O. Hertwig, Berlin.

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IV. Distribution in Space

This zoo-geographical review deals only with modern reptiles. We begin with a survey of the faunas of some of the most obvious land-complexes which bear close resemblance to the now classical "regions" of P. L. Sclater and A. R. Wallace. None of these "regions" has definable frontiers, and what acts as a bar to one family may be totally ignored by another. According to the several orders of reptiles the world is mapped out in very different ways. The African fauna does not stop at the Suez Canal, nor even at the Red Sea; there is a transitional belt noticeable in the countries from Syria to Arabia, Persia and India. To the north, Indian influence extends right into Turkestan, or vice versa; the Central Asiatic fauna passes into that of India. On the Chinese side prevailing conditions are still almost unknown; Wallace's line is more or less rigidly respected by Trionychidae, hooded *Elaps*, vipers and Lacertidae, while it has not the slightest influence upon crocodiles, pit vipers, Varanidae, Agamidae, &c. In the western hemisphere we have a grand illustration of the interchange of two faunas and of the fact that it is neither a narrow strait nor an equally narrow isthmus which decides the limitation of two regions. Central America and the Antilles form one complex with S. America. The nearctic region ends at the edge of the great Mexican plateau, which itself is a continuation of the north continent. Many nearctic forms have passed southwards into the tropics, even into far-off S. America, but the majority of the southerners, in their northern extension, have been checked by this plateau and have surged to the right and left along the Pacific and Atlantic tropical coastlands. The present writer happens to have made a special study of this part of the world (cf. "The Distribution of Mexican Amphibians and Reptiles," *P.Z.S.*, 1905, pp. 191–294); the N. and S. American faunas have therefore been more fully treated in the following review of the various faunas. No doubt others can be treated in a similar manner, but the physical features between N. and S. America are unique, and the results are closely paralleled by those of the fauna of birds. The narrow and long neck of the isthmus of Panama (once no doubt much broader) is no boundary; if the meeting of N. and S. had taken place there, that narrow causeway would be crowded, and this is not the case.

New Zealand.—The only recent reptiles are *Sphenodon* (*q.v.*), which testifies to the great age of these islands; about half a dozen Scincidae of the genus *Lygosoma*, members of a cosmopolitan family; and some few geckos, *e.g.* *Naultinus*, of a family of great age, world-wide distribution and with exceptional facilities of distribution.

AUSTRALIAN REGION.—Of crocodiles only *C. johnstoni* in N. Australia and Queensland; *C. porosus* on the N. coast, and occurring on various Pacific islands, as far E. as the Fiji Islands. Tortoises are represented only by the pleurodirous Chelydidae, *e.g. Chelodina*; they are absent in Tasmania and on the Pacific islands. New Guinea possesses the aquatic *Carettochelys*, sole type of a family.

The bulk of the Lacertilian fauna is composed of skinks, geckos, agamoids and Varanidae, with the addition of a small family which is peculiar to the region, the Pygopodidae. A peculiar type, *Dibamus*, inhabits the borderlands, namely, New Guinea, the Moluccas, Celebes and the Nicobar Islands; and, finally, a single iguanoid, *Brachylophus*, is common in the Fiji Islands; how it came there, or how it survived its severance from the American stock, is a mystery. The skinks are in this region more highly developed and more specialized than in any other part of the world; they exceed in numbers the geckos, which generally accompany the skinks in their range over the smaller islands of the Pacific; in these islands members of these two families represent the whole of the Lacertilian fauna. The Australian agamoids are chiefly peculiar and partly much differentiated forms (*e.g. Moloch* and *Chlamydosaurus*), but some have distinct affinities to, or are even identical with, Indian genera. The Varanidae are also closely allied to Indian species.

Of snakes, amounting to about one hundred species only, we note about one dozen Typhlopidae, and of Pythoninae simply *Python*, and the Boine *Enygrus* on the islands from New Guinea to Fiji. There are but surprisingly few innocuous colubrine snakes, scarcely a dozen, and all belonging to Indian genera. The bulk of the snakes belong to the poisonous Elapinae, all of genera peculiar to the region, *e.g. Acanthophis, Pseudechis, Notechis*. Such a preponderance of poisonous over harmless snakes is found nowhere else in the world. Tasmania is tenanted by poisonous snakes only. In Australia we meet, therefore, with the interesting fact that, whilst it is closely allied to S. America, but totally distinct from India by its Chelonians, its lizards and colubrine snakes connect it with this latter region. With regard to the other Ophidians, they have their nearest allies partly in India, partly in Madagascar, partly in S. America; and the character of the Australian snake fauna consists chiefly in its peculiar composition, differing thereby more from the other equatorial regions than those do among themselves. Wallace's line marks the boundary between India and Australia only as far as Chelonians are concerned, but it is quite effaced by the distribution of lizards and snakes. Thus in New Guinea lizards of the Indian region are mixed with Pygopodidae, and an island as far E. as Timorlaut is inhabited by snakes, some of which are peculiarly Indian, whilst the others are as decidedly Australian. The islands N. of New Guinea and of Melanesia are not yet occupied by the Ophidian type, and only species of *Enygrus* have penetrated eastwards as far as the Low Archipelago, whilst the Fiji Islands and the larger islands of Melanesia have sufficiently long been raised above the level of the sea to develop quite peculiar genera of snakes.

INDIAN REGION.—Of Crocodilia *C. palustris*, the "mugger" or marsh crocodile, and *C. porosus*; *Gavialis gangeticus*; *Tomistoma schlegeli* in Borneo, Malacca and Sumatra. Of tortoises *Platysternum megacephalum*, type of a family from Siam to S. China; many Trionychidae and Testudinidae, mostly aquatic; whilst the terrestrial *Testudo* is very scantily represented. One species which is common in the Indian peninsula (*T. stellata*) is so similar to an African species as to have been considered identical with it; the Burmese tortoise is also closely allied to it, and the two others extend far into western-central Asia. Thus this type is to be considered rather an immigrant from its present headquarters, Africa, than a survivor of the Indian Tertiary fauna, which comprised the most extraordinary forms of land tortoises. Wallace's line marks the E. boundary of *Trionyx*; species of this genus are common in Java and Borneo, and occur likewise in the Philippine Islands, but are not found in Celebes, Amboyna or any of the other islands E. of Wallace's line. Agamidae are exceedingly numerous, and are represented chiefly by arboreal forms, *e.g. Draco* (*q.v.*) is peculiar to the region, *Ceratophora* and *Lyriocephalus* exclusively Ceylonese; terrestrial forms, like *Agama* and *Uromastix*, inhabit the hot and sandy plains in the N.W., and pass uninterruptedly into the fauna of western-central Asia and Africa. The Geckonidae, Scincidae and Varanidae are likewise well represented, but without giving a characteristic feature to the region by special modification of the leading forms except the gecko *Ptychozoon homalocephalum* in Malaya. The Lacertidae are represented by one characteristic genus, *Tachydromus*—*Ophiops* and *Cabrita* being more developed beyond the limits assigned to this region. Finally, the Eublepharidae and Anguidae, families whose living representatives are probably the scattered remains of once widely and more generally distributed types, have retained respectively two species in W. India, and one in the Khasi Hills, whilst the presence of a single species of chameleon in S. India and Ceylon reminds us again of the relations of this part of the fauna to that of Africa.

The Indian region excels all the other tropical countries in the great variety of genuine types and numbers of species of snakes. Boulenger[1] recognizes 267 species, *i.e.* about one-fifth of the total number of snakes known. India is the only country in the world possessing viperine, crotaline and elapine poisonous snakes (their proportion to harmless snakes being about 1 : 10), *e.g. Vipera russelli*, the "daboia" (see VIPER); *Lachesis*, *e.g. gramineus*, an arboreal pit viper; *Naja tripudians*, the cobra; *Bungarus coeruleus*, the "krait"; *Callophis*; and Hydrophinae along the coasts of the whole region. Several sub-families and families are peculiar to the region: the Uropeltidae with *Rhinophis* in southern India, and *Uropeltis* confined to Ceylon; Ilysiidae in Ceylon and Malay Islands, elsewhere only in S. America; the opisthoglyphous *Elachistodon westermanni* of Bengal; the Homalopsinae, with many species from Bengal to N. Australia; further the Amblycephalidae; *Xenopeltis unicolor*, sole type of a family; and the Acrochordinae, a sub-family of aglyphous Colubridae, ranging from the Khasi Hills to New Guinea. Of other Colubridae, we notice numerous *Tropidonotus*, *Coronella* and *Zamenis*, the latter one of the most characteristic types of the warmer parts of Eurasia. Tree-snakes, *e.g. Dipsas* and *Dendrophis*, are common. Of other families we note a great number of Typhlopidae, of which *T. braminus* occurs even on Christmas Island. Lastly various species of *Python*, but no Glauconiidae, the only family not represented in the Indian region, which claims the Uropeltidae, Xenopeltidae and Amblycephalidae as peculiar to itself.

Günther remarks that to this region Japan has to be referred. This is clearly shown by the presence of species of *Ophites*, *Callophis*, *Trimeresurus* s. *Lachesis*, *Tachydromus*, characteristically Indian forms, with which species of *Clemmys*, *Trionyx*, *Gecko*, *Halys*, and some Colubrines closely allied to Chinese and Central Asiatic species are associated. *Halys* is a central Asiatic pit viper. The few reptiles inhabiting the northern part of Japan are probably of palaearctic origin.

THE AFRICAN CONTINENT.—Of crocodiles, *C. vulgaris* in the E., *C. cataphractus* and *Osteolaemus tetraspis* in the W. There are many Chelonians, especially small land tortoises of *Testudo*, and with *Cinyxis* which is peculiar to this continent; the freshwater *Clemmys* only in the N.W. corner; several genera of the pleurodirous Pelomedusidae, *Pelomedusa galeata*, which is equatorial and southern, with an outlying occurrence in the Sinai peninsula, and *Sternothaerus* with several tropical and southern species; of Trionychidae the tropical *Cycloderma* and *Cyclanorbis* peculiar to the country, and the large *Trionyx triunguis* which ranges from the Senegal and Congo into the Nile system with its big lakes, but occurring also in Syria.

Of Lacertilia the geckos and skinks, and the typically old world families of Lacertidae and Varanidae are well represented; also Amphisbaenidae; Gerrhosauridae and Zonuridae, peculiar to Africa and Madagascar; a few Eublepharinae and a few of the so-called Anelytropidae in West Africa. But the most important feature of this Lacertilian fauna is the almost universal distribution of chameleons in numerous and some highly specialized forms, *Chameleon* and *Rhampholeon*. We note the entire absence of Iguanidae and of Anguidae, the latter represented by *Ophisaurus* only in the north-western corner.

Of snakes only one sub-family is peculiar, the Rhachiodontinae with the sole species *Dasypeltis scabra*, the egg-swallowing snake. Many Typhlopidae and Glauconiidae, but no Ilysiidae; large pythons, *Eryx* in the N., and a boa, *Pelophilus fordi* in the W. of Africa. Of poisonous snakes there is an abundance, notably the Viperinae have their centre in this continent; besides *Echis*, which is also Indian, there are peculiar to the continent *Bitis*, the puff-adder, *Causus*, *Atractaspis*, *Cerastes*, and *Atheris* which is an arboreal genus, all of which see under VIPER. The pit vipers are entirely absent. Elapinae are numerous, *e.g.* hooded cobras like *Naja haje* and *Sepedon* the "ringhals." Many opisthoglyphous tree snakes and a considerable number of innocuous colubrines, *e.g. Lycodon*, *Psammophis* and *Coronella* or closely allied genera all also in India, but *Coluber*-like forms and *Tropidonotus* are very scantily represented, chiefly in the N.

On the whole the reptilian fauna of Africa is not rich, considering the huge size of the continent, but this may be accounted for by the great expanse of desert in the N. half and of veld in the S. Lastly, the enormous central forests are still scarcely explored.

MADAGASCAR and certain other islands have a fauna which is as remarkable for its deficiencies as it is for its present forms. The following well-defined groups are absent: Trionychidae and Chelydidae; Agamidae, Lacertidae, Anguidae, Amphisbaenidae, Varanidae and Eublepharinae; all the Viperidae and Elapinae, so that this large island enjoys perfect absence of poisonous snakes, not counting the practically harmless opisthoglyphous tree snakes; there are further no pythons and no ilysias.

The actual fauna consists of: *Crocodilus vulgaris*, which is said to be extremely abundant; of Chelonians, *Pelomedusa galeata* and

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[1] The same authority enumerates 536 species of reptiles for British India, *i.e.* about one-sixth of all the recent species of reptiles (*Fauna of British India*, edit. W. T. Blanford, London, 1890).

Sternothaerus, both also in Africa, *Podocnemis*, which elsewhere occurs in South America only, and several Testudinidae; of these *Pyxis* is peculiar to Madagascar, while *Testudo* has furnished the gigantic tortoises of Aldabra, the Seychelles, and recently extinct in Mauritius and Madagascar. Of lizards are present a few Gerrhosauridae and Zonuridae, both African types; the remarkable occurrence of two iguanid genera *Chalarodon* and *Hoplurus*, both peculiar to the island; skinks, many geckos, and *Uroplates*, sole type of the Uroplatinae and an abundance of chameleons, of the genera *Chameleon*, with *Ch. parsoni*, the giant of the family, and the small species of *Brookesia*, a genus peculiar to Madagascar. Of snakes we note Typhlopidae and Glauconiidae, and the remarkable occurrence of Boinae, two of the genus *Boa* (*Pelophilus*), one of *Corallus* on the main island and *Casarea* on Round Island. There are opisthoglyphous mostly arboreal snakes, and the rest are innocuous colubrines, some few with Indian and African affinities, *e.g. Zamenis* s. *Ptyas*, more with apparently S. American relationship, or at least with resemblance in taxonomic characters.

An analysis of this peculiarly compound and deficient fauna gives surprising results, namely, the almost total absence of affinity with the Indian region, close connexion with Africa by the possession of Gerrhosauridae, Zonuridae, Chameleons and Pelomedusidae; lastly, the presence of several tree boas, of *Podocnemis* and of Iguanidae, *i.e.* families and genera which we are accustomed to consider as typically neo-tropical. Peculiar to Madagascar, autochthonous and very ancient, is only *Uroplates*. Ancient are also the tortoises, chameleons, geckos, boas, typhlops, gerrhosaurids and zonurids. The absent families may be as ancient as the others, but most of them, notably *Varanus*, lacertids and agamids are of distinctly northern, palaeotropical origin, and we can conclude with certainty that they had not spread into S. Africa before Madagascar and its satellites became severed from the continent.

EUROPE AND TEMPERATE ASIA.—The present reptilian fauna of this vast area is composed almost entirely of the leavings of those groups which are now flourishing with manifold differentiations under more genial climes, in Africa and India. Fossils, none too numerous, tell us that it was not always thus, since crocodiles, alligators and long-snouted gavials, all the main groups of chelonians, iguanoids, &c., existed in England, the crocodilians persisting even towards the end of the Tertiary period.

There are no crocodiles now in the Eurasian sub-region, excepting small survivors in the Jordan basin, on the borderland of Africa; but the Yang-tse-Kiang is inhabited by an alligator, *A. sinensis*, while all its congeners are now in America. This finds, to a certain extent, a parallel in *Trionyx*, of which one species lives in the Euphrates basin, likewise borderland, and another, *T. maacki*, in rivers of N. China, *e.g.* in the Amoor. Of other Chelonians we note several species of *Testudo*, two of them European; *Emys europaea*, chiefly in Europe, with the other species *E. blandingi* in the eastern United States; and a few species of *Clemmys*, a truly periarctic genus.

Of Lacertilia we exclude the chameleon. Of geckos *Hemidactylus turcicus* extends from Portugal to Karachi; *Platydactylus facetanus* is at home in most S. Mediterranean countries; *Teratoscincus* is peculiar to the steppes and deserts of Turkestan and Persia; other geckos in the transitional region from Asia Minor to India. Of Lacertae we have Anguidae, Agamidae, Lacertidae, Amphisbaenidae and Scincidae, most of them in Europe represented by but one or two species. Thus *Blanus cinereus* in Mediterranean countries, Asia Minor and Syria, represents the Amphisbaenidae which are found nowhere else in Europe or Asia, but plentiful in Africa and both Americas. Of the Anguidae, *Anguis fragilis* is peculiar to Europe, *Ophisaurus apus* in S.E. Europe, another in Indo-Burman countries, with the rest of the species in N. America. Of Scincidae few in Europe, *e.g. Chalcides* s. *Seps* s. *Gongylus*, others from Asia Minor eastwards, *e.g. Scincus*, and *Ablepharus* in Turkestan. Agamidae do not occur in Europe but they exist in considerable numbers from Asia Minor and Turkestan to China, with *Phrynocephalus* peculiar to central Asia. Lastly, the Lacertidae, of which several species of *Lacerta*, *Psammodromus*, *Acanthodactylus* in Europe, but the majority in Africa and warmer parts of India; in a similar manner the Manchurian forms are related to Chinese.

The total number of palaearctic snakes amounts to about sixty, the majority living in the Mediterranean countries and in W. Asia. One *Typhlops* in the Balkan peninsula and in W. Asia, in Persia also *Glauconia*; *Eryx jaculus* extends into Greece from S.W. Asia as sole representative of the Boidae. Several vipers, the common viper, *V. berus*, from Wales to Saghalien Island, *V. aspis*, *V. latastei* and *V. ammodytes* in S. Europe; a pit viper, *Ancistrodon*, *e.g. halys*, in the Caspian district, thence this genus through China and again in N. America. *Echis* extends N. into Turkestan. The Indian cobra ranges N. to Transcaspia and far into China. All the other snakes belong to the aglyphous and opisthoglyphous Colubridae; of the latter *Coelopeltis* is peculiar to S. Europe and S.W. Asia; *Macroprotodon cucullatus* to S. Spain, the Balearic Islands and N. Africa; *Tephrometopon* peculiar to Turkestan and neighbouring countries; none extending into E. Asia. Of the aglyphous colubrines the most characteristic genus is *Zamenis* incl. *Zaocys*, very widely spread and including more species than any other palaearctic genus; several species of the wide-ranging genus *Tropidonotus*, besides *Coluber*, with *Rhinechis scalaris* in S.W. Europe. There are, besides, other genera, especially in the debatable countries ~~of~~ S.W. Asia, Persia and Afghanistan, and speaking generally the colubrines show less affinity to African than to Indian forms, just as we should expect from the prevailing geographical conditions. If it were not for the N.W. corner of Africa and portion of its N. coast, the European fauna would have very little in common with Africa.

NORTH AMERICA.—Of this huge continent only the United States and Mexico come into consideration, since N. of 45° latitude reptilian life is very scarce. The area, however, with these restrictions, is larger than the Indian and Malay countries, and larger than the Australian region. Yet the fauna is comparatively poor, very poor indeed, if it were not for Mexico and the Sonoran province, which seems to be the ancient centre of distribution of much of the present typically N. American fauna.

Characteristic of the area is the abundance of Chelonians and Iguanidae, to which Tejidae have to be added in the S.; equally characteristic is the complete absence of Pleurodirous Chelonians, of Chameleons, Agamidae, Lacertidae, Varanidae and Viperinae. The fauna is composed as follows: Crocodilia, with *Crocodilus americanus* and *Alligator mississippiensis* in the S. Of Chelonians the Chelydridae, peculiar to the E. half but for the reappearance of a species of *Chelydra* in Central America; many Cinosternidae likewise almost peculiar to the area; of Testudinidae an abundance of freshwater forms, notably *Chrysemys*, and *Emys* in common with Europe, whilst terrestrial tortoises are extremely scanty, namely one species of *Testudo*, *T. polyphemus*, the gopher, and two of *Cistudo*, *e.g. C. carolina*; lastly, two *Trionyx* in the whole of the Mississippi basin and thence N. into Lake Winnipeg, 51° N. *Lacertilia*: Geckos are very scarce; N. America has received only *Sphaerodactylus notatus* from the Antilles into Florida, and *Phyllodactylus tuberculosus* into California from the Pacific side of Mexico; Eublepharinae are absent. Of Iguanidae we have a typically Sonoran set, *e.g. Crotaphytus*, *Holbrookia*, *Uta*, *Phrynosoma*, *Sceloporus*, and a S. set of which only *Anolis* extends out of the tropics. It is significant that only a few species of *Sceloporus* and *Phrynosoma* extend into the United States, although far N.; of the large genus *Anolis* only *A. carolinensis* enters Texas to Carolina. *Sceloporus* may be called the most characteristic genus of Sonoraland and Mexico. Of the tropical family of Tejidae only *Cnemidophorus*, with many species in Mexico, a few in the adjoining N. states, and with *C. sexlineatus* over the greater part of the Union. *Anguidae*: *Ophisaurus ventralis* in the United States; the other species in the Old World. *Diploglossus* peculiar to mountains of Mexico. *Gerrhonotus*, the main genus, centred in Mexico, but *G. coeruleus* ranges from Costa Rica along the Pacific side right into British Columbia, the most northern instance of a New World reptile.

Xenosaurus grandis of Mexican mountains is the monotype of a family, and the same would apply to *Heloderma* (*H. suspectum*, the Gila monster of the hottest lowland parts of Arizona and New Mexico; and *H. horridum* of Mexico) if it were not for *Lanthanotus* of Borneo. *Scincidae*: of this cosmopolitan family America possesses the smallest number, and it is significant that the number of species decreases from N. to S.; *Eumeces* from Minnesota and Massachusetts through Mexico, with many species, and *Lygosoma* s. *Mocoa laterale* from S.E. and Central States to Mexico. Xantusiidae, a small family, is composed of a N. or Sonoran and a S. or Central American-Antillean group; *e.g. Xantusia* of the deserts of Nevada and California. *Aniella*, monotype of a family of California to El Paso, Texas, *i.e.* peculiar to Sonoraland, Amphisbaenidae with *Rhineura* in Florida and the marvellous *Chirotes* in Lower California and the Pacific side of Mexico; the other members of this family are tropical so far as America is concerned.

Snakes: of Typhlopidae only *Anomalepis mexicana*, peculiar to Nuevo Leon; of Glauconiidae several extending N. into Texas and Florida. Boinae continue N. as the arenicolous *Lichanura* of Lower California and Arizona, and the likewise arenicolous *Charina bottae* which extends from California to the state of Washington; the other members of the family are all tropical, extra-regional. Of Viperidae only pit vipers occur, but of them rattlesnakes cover the whole of the habitable area; *Ancistrodon*, without a rattle, *e.g.* the moccasin snake and the water viper, has other species in central and E. Asia. Of Elapinae, far into the E. United States only the genus *Elaps* with a few species, of which *E. fulvius*, the commonest, ranges from S. Brazil far into the S. and E. states. A few opisthoglyphous, terrestrial, snakes just enter the United States from Mexico, *e.g. Trimorphodon*. Of aglyphous colubrines species of genera like or resembling *Tropidonotus*, *Coronella* and *Coluber*, including *Pityophis* and *Spilotes*, are abundant, the latter being very characteristic; *Ischnognathus* and *Contia*, *Ficimia* and *Zamenis* likewise are clearly nearctic, or Sonoran.

The *Greater Antilles* have essentially neotropical, *i.e.* Central American and S. American affinities, but there is also some Sonoran infusion.—There is *Crocodilus americanus*; no Chelonians are natives except one or two *Chrysemys*. Of Lacertilia, geckos are abundant; of Iguanidae several arboreal forms, notably the large *Iguana*, and *Metopoceras* of Haiti, and *Cyclura*, both peculiar; of Anguidae *Celestus*, peculiar, but closely allied to *Diploglossus*; of Xantusiidae the peculiar genus *Cricosaura* s. *Cricolepis*. Of

Amphisbaenidae *Amphisbaena* itself occurs in Puerto Rico and on the Virgin Islands. Of Tejidae only *Ameiva*, not *Cnemidophorus*. Snakes: a *Typhlops* in Puerto Rico; of boas *Epicrates*, *Ungalia* and *Corallus*, the latter re-occurring in Madagascar. Absent are: Viperidae, Elapinae and Opisthoglyphs; of aglyphous colubrines the Central American genera *Urotheca*, *Dromicus*, *Drymobius* and *Leptophis*; the genera of distinctly northern origin.

South and Central America.—The fauna is very rich. It is advisable first to mention those groups which are either confined to Central America (including the hot lowlands of Mexico), *e.g.* the Dermatemydidae, Eublepharinae, Anelytropsis and the aglyphous colubrines: *Urotheca*, *Dromicus*, *Drymobius*, *Leptophis*, *Rhadinea*, *Streptophorus*, or which, from their N. centre have sent some genera into Central America, or beyond into the S. continent: *e.g. Chelydra rossignoni*, ranging from Guatemala to Ecuador; one *Cinosternum* extending into Guiana; *Testudo tabulata*, the only terrestrial tortoise of S. America, besides the gigantic creatures of the Galapagos Islands; a few Eublepharinae reaching Ecuador; of Anguidae *Gerrhonotus coeruleus*, extending S. to Costa Rica; of Scincidae, *Mabuia* and *Lygosoma*, which extend far into S. America, and the same applies to the Amphisbaenidae. Immigrants from the N. are probably also the Iguanidae, although they have found a congenial home in the S. countries, where they are now represented by an abundance of genera and species, *e.g. Laemanctus* and *Corythophanes* of Mexico, *Anolis*, *Iguana*, *Basiliscus*, *Ctenosaura*, *Polychrus*, *Hoplurus*, *Chalarodon*. Amongst snakes the following appear to be of N. origin: Boidae (with the Pythonine *Loxocaemus bicolor* in Mexico), in spite of their great development of boas and anacondas in the S.; certainly Crotalinae, of which only one species, *C. terrificus*, is found in S. America; further, some aglyphous colubrines, which have sent a few species only into Central, and still fewer into S. America,* *e.g. Tropidonotus*, *Ischnognathus*, *Contia*,* *Ficimia*, *Coluber*, *Spilotes*, *Pityophis*, *Coronella** and *Zamenis*.

After these numerous restrictions we should expect the genuine autochthonous fauna of the S. American continent to be very scanty, especially if we remember those important Old World groups which are absent in America, *e.g.* Varanidae, Lacertidae, Agamidae and chameleons, and that Central and S. America have no Trionychidae. The oldest S. American reptilian fauna is composed as follows. It is the only part of the world which possesses Chelydidae in abundance, *e.g.* of *Chelys* the *Matamata*, *Hydromedusa*, and of Pelomedusidae, *Podocnemis*, which re-occurs in Madagascar. Crocodilia are represented by *Crocodilus americanus* and *C. moreleti* in the N. and by about five species of *Caiman*. Of Lacertilia geckos are rather few, mostly in the N.W. of the continent, more numerous in Central America and the Antilles. The Tejidae are clearly a neotropical family, with several dozen genera in S. America; of all these, only *Ameiva* and the closely allied *Cnemidophorus* extend through and beyond Central America: *Ameiva* into the E. and W. hot lands of Mexico and into the Antilles, *Cnemidophorus* through Mexico far into most of the United States with a few species. Of snakes there is an abundance. Typhlopidae and Glauconiidae are well represented. Of aglyphous colubrines many genera, some of these extending northwards into Mexico, but not to the Antilles, *e.g. Atractes*, *Tropidodipsas*, *Dirosema*, *Geophis*, *Xenodon*.

Opisthoglypha are very numerous in genera and species both in S. and Central America, whence many of the arboreal forms extend into the hot countries of Mexico, while a few terrestrials have spread over the plateau and thence into the United States, none entering the Antilles; such typical neotropical genera are *Himantodes*, *Leptodira*, *Oxyrhopus*, *Erythrolamprus*, *Conophis*, *Scolecophis*, *Homalocranium*, *Petalognathus*, *Leptognathus*. Most of the Amblycephalidae are neotropical, the others in S.E. Asia. Of Elapinae only the genus *Elaps* occurs, but with many species. Of the Crotalinae, *Lachesis* is the essentially neotropical genus, with many species, some of which enter the hot lands of Mexico, *e.g. L. lansbergi s. lanceolatus*, a very widely distributed species, the only pit viper which has entered the Lower Antilles.

The above survey of the world shows that but very few of the principal families of reptiles are peculiar to only one of the main "regions." The occurrence of some freak, constituting a little family or sub-family by itself in some small district, and therefore put down as peculiar to a whole wide region, cannot be much of a criterion, *e.g. Rhachiodon*, *Elachistodon*, Acrochordinae, *Uroplates*, *Xenosaurus*, *Heloderma*, Aniellidae, *Dibamus*, Anelytropidae, *Platysternum*. They are not characteristic of large countries, but rather local freaks. Quite a number of very ancient families have such a wide distribution that they also are of little critical value, notably the peropodous snakes, which have survivors in almost any tropical country; such cosmopolitans are also geckos and skinks.

A difficulty which is ever present in such zoogeographical investigations is the uncertainty as to whether our zoological families and sub-families and even genera are genuine units, or heterogeneous compounds, as for instance the Anelytropidae, of which degraded skinks there is one in Mexico, two others in W. Africa. *Heloderma* in Mexico and *Lanthanotus* in Borneo are both without much doubt descendants of some Anguid stock, but when we now combine them, in deference to our highest authority, as one family, we thereby raise the tremendous problem of the present distribution of this family. Boas and pythons are likewise not above suspicion, cf. some boas in Madagascar and the python *Loxocaemus* in Mexico. The opisthoglyphous colubrines are almost certainly not a natural group, not to speak of numerous genera of the aglyphous assembly. To avoid arguing in a circle, such doubtful units had better be avoided whilst building hypotheses.

G. Pfeffer has recently endeavoured to show by an elaborate careful paper ("Zoogeographische Beziehungen Südamerikas," *Zool. Jahrb.*, Suppl. viii., 1905), "that nearly all the principal groups of reptiles, amphibians and fishes had formerly a universal or sub-universal distribution, and that therefore it is not necessary to assume a direct land connexion of S. America with either Africa or Australia, with or without an Antarctic." Many cases of such a former universal distribution are undoubtedly true, but the question remains how the respective creatures managed to attain it.

For true characterization of large areas we must resort to the combination of some of the large wide-ranging families, and equally important is the absence of certain large groups; both to be selected from the following table.

	Antilles.	South America.	North America.	Eurasia.	Africa.	Madagascar.	Indo-Malay.	Australia.
Chelydridae[1]	o	+	+	o	o	o	o	o
Testudinidae	o[2]	+	+	+	+	+	+	o
Chelydidae	o	+	o	o	o	o	o	+
Pelomedusidae	o	+	o	o	+	+	o	o
Trionychidae	o	o	+	+	+	o	+	o
Chamaeleonidae	o	o	o	o	+	+	o	o
Varanidae	o	o	o	o[3]	+	o	+	+
Agamidae	o	o	o	+	+	o	+	+
Iguanidae	+	+	+	o	o	+	o	o
Lacertidae	o	o	o	+	+	o	+	o
Zonuridae Gerrhosauridae	o	o	o	o	+	+	o	o
Anguidae	+	+	+	+	+[3]	o	+	o
Amphisbaenidae	+	+	+[5]	+[4]	+	o	o	o
Tejidae	+	+	o	o	o	o	o	o
Pygopodidae	o	o	o	o	o	o	o	+
Viperinae	o	o	o	+	+	o	+	o
Crotalinae	o	+	+	+[6]	o	o	+	o
Elapinae	o	+	+	+[6]	+	o	+	+

[1] Including the related Dermatemydidae and Cinosternidae.
[2] With an exception.
[3] Entering, or in the borderland.
[4] Mediterranean countries.
[5] Rhineura; formerly wider distribution.
[6] In Asia.

Deductions from this table show, for instance, that Australia is quite sufficiently characterized by the possession of Chelydidae and Varanidae; Madagascar by the presence of chameleons and Pelomedusidae. On the other hand, the separation of the whole of Africa from Asia, or the diagnosis of the palaearctic "region," would require the combination of several positive and negative characters.

Chelonians are very diagnostic, expressed by the following combinations of families:—

America as a whole: Chelydridae and Cinosterridae and Dermatemydidae.

N. America: Chelydridae and Trionychidae, but only E. of the Rockies.

S. America: Chelydidae and Pelomedusidae.

Africa: Trionychidae and Pelomedusidae.

Madagascar: Pelomedusidae and Testudinidae.

India and Eurasia: Trionychidae and Testudinidae.

Australia: Chelydidae only.

That the Chelonians are regionally so very diagnostic that their main families are still in rational agreement with the main divisions of land, is perhaps due, first, to their being an ancient group; secondly, to their limited means of distribution (none across the seas, omitting of course Cheloniidae, &c.); and lastly, to their being rather indifferent to climate. Note, for instance, *Trionyx ferox* from the Canadian lakes to the Gulf of Mexico, *Cinosternum pennsylvanicum* from New York to New Orleans. It may be taken for certain that wherever a *Testudo* occurs as a genuine native, it has got there by land, be the locality the Galapagos, Aldabra, Madagascar or some Malay islands. The Trionychidae reveal themselves as of periarctic origin, being debarred from Australia, Madagascar and the neotropical region (alleged from Eocene Patagonia). Testudinidae are cosmopolitan, excluding Australia, and practically also the Antilles; and *Testudo* is most instructive with its almost similar distribution; but something has gone wrong with this genus in America, where it flourished in mid-Tertiary times.

Pleurodira are less satisfactory than they appear to be from a merely statistical point of view. The Pelomedusidae, being known from European Trias and from nearctic cretaceous formations, may have had a world-wide distribution; but Chelydidae may well have centred in an antarctic continent. Chelydridae were periarctic and have disappeared from Eurasia; N. American offshoots are the Cinosterridae and Dermatemydidae, the latter now restricted to Central American countries.

Crocodilia, probably once universal, afford through the Chinese *alligator* an instance of the original intimate connexion of the whole holarctic region, paralleled by many other animals which now happen to be restricted to E. Asia and to eastern N. America.

Lacertilia are less satisfactory for short diagnoses. America alone combines Iguanidae and Tejidae:—

N. America: Iguanidae, Anguidae, Tejidae (and Rhineura in Florida).
S. America: Iguanidae, Anguidae, Tejidae and many Amphisbaenidae.
Africa and Madagascar: Chameleons and Zonuridae and Gerrhosauridae.
Madagascar: Chameleons and Iguanidae.
India: Varanidae, Agamidae and Lacertidae, all of which also in Africa.
Australia alone has Pygopodidae.

The Lacertilia are now distributed upon principles very different from those of the tortoises. According to the lizards the world is divided into an E. and a W. half. The W. alone has Iguanidae and Tejidae, the E. alone that important combination of Varanidae and Agamidae. Further subdivision is in most cases possible only by exclusion, *e.g.* exclusion of Lacertilia and chameleons from Australia; of Varanidae and Agamidae from Madagascar. Lizards are rather susceptible to climatic conditions, infinitely more than water tortoises.

As regards *Ophidia*, America has Crotalinae and Elapinae, but no Viperinae. Eurasia and India alone combines Viperinae, Crotalinae and Elapinae. Africa, Viperinae and Elapinae but no Crotalinae. Australia only Elapinae. Madagascar none of these groups.

The Viperinae must have had their original centre in the palaearctic countries, and they have been debarred only from Australia and Madagascar. Both vipers and pit vipers are still in Asia, but true vipers are absent in America, with their fullest development now in Africa, whilst pit vipers went E., covering now the whole of America, and having developed the rattlesnakes in Sonoraland. The Elapinae are undoubtedly of Asiatic origin; they have overrun Africa, were too late for Madagascar, but early enough for Australia, where they are only poisonous snakes; and only one genus, *Elaps*, has got into, or rather, has differentiated in America, in the S. of which it is abundant.

Opisthoglypha are useless for our purpose; they are cosmopolitan, with the exception of Australia, but probably they have one ancient centre in S. America, and another in the old world.

Amblycephalidae afford another of those curious instances of apparent affinity between S.E. Asia and Central America; paralleled by *Pelamis bicolor*, which ranges from Madagascar to Panama, while all the other Hydrophinae belong to the Indian Ocean and the E. Asiatic seas. Aglyphous Colubrines show undoubted affinity between N. America and Eurasia; the whole group is absolutely cosmopolitan, and many of the genera, *e.g.* *Coluber*, *Tropidonotus* and *Coronella*, have proved their success by having acquired an enormous range. Snakes have comparatively few enemies, and they possess exceptional means of distribution. It is rare for a terrestrial species to have such a wide range as *Crotalus terrificus*, from Arizona to Argentina, or as the India cobra, which, like the tiger, is equally at home in Malay islands, Manchuria and Turkestan.

The tortoises divide the habitable world into a S. and a N. world, much as do the anurous Batrachians; the lizards split it into an E. and a W. hemisphere. The poisonous snakes, the most recent of reptiles in their full development and distribution, allow us to distinguish between Australia, America and the rest of the world.

(H. F. G.)

REPTON, a village in the S. parliamentary division of Derbyshire, England, 8 m. S.W. of Derby, on the Midland railway. Pop. (1901) 1695. It is famous for its school, founded in 1557 by Sir John Port, of the neighbouring village of Etwall, which has valuable entrance scholarships, and two leaving exhibitions to the universities annually. The number of boys is about 300. The school buildings are modern, but incorporate considerable portions of an Augustinian priory established in 1172. There was an ecclesiastical establishment on this site in the 7th century, the first bishop of Mercia being established here. This was destroyed by the Danes in 874. In the second half of the 10th century, during the reign of Edgar, another church was founded. The existing parish church of St Wystan retains pre-Conquest work in the chancel, beneath which is a remarkably fine vaulted crypt, probably dating from the reign of Edgar, its roof supported on fluted columns. The monastery was dissolved by Henry VIII.

REPUBLIC (Lat. *respublica*, a commonweal or commonwealth), a term now universally understood to mean a state, or polity, in which the head of the government is elective, and in which those things which are the interest of all are decided upon by all. This is notoriously a very modern interpretation of the term. In the ancient world of Greece and Rome the franchise was in the hands of a minority, who were surrounded by, and who governed, a majority composed of men personally free but not possessed of the franchise, and of slaves. Modern writers have often used *respublica*, and literal translation, as meaning only the state, even when the head was an absolute king, provided that he held his place according to law and ruled by law. "Republic," to quote one example only of many, was so used by Jean Bodin, whose treatise, commonly known by its Latin name *De Republica Libri Sex*, first appeared in French in 1577. Englishmen of the middle ages habitually spoke of the commonwealth of England, though they had no conception that they could be governed except by a king with hereditary right. The coins of Napoleon bear the inscription "*République française, Napoléon Empereur.*" Except as an arbitrary term of art, or as a rhetorical expression, "republic" has, however, always been understood to mean a state in which the head holds his place by the choice of his subjects. Poland was a republic because its king had in earlier times to be accepted, and in later times was chosen by a democracy composed of gentry. Venice was a republic, though after the "closing of the great council" the franchise was confined to a strictly limited aristocracy, which was itself in practice dominated by a small oligarchy. The seven states which formed the confederation of the United Netherlands were republics from the time they renounced their allegiance to Philip II., though they chose to be governed by a stadtholder to whom they delegated large powers, and though the choice of the stadtholder was made by a small body of burghers who alone had the franchise. The varieties are many. What, however, is emphatically not a republic is a state in which the ruler can truly tell his subjects that the sovereignty resides in his royal person, and that he is king, or tsar, "pure and absolute," by the grace of God, even though he may hasten to add that "absolute" is not "despotic," which means government without regard to law. The case of Great Britain, where the king reigns theoretically by the grace of God, but in fact by a parliamentary title and under the Act of Settlement, is, like the whole British constitution, unique.

There is in fact a fundamental incompatibility between the conceptions of government as a commonwealth and as an institution based on a right superior to the people's will. Where the two views endeavour to live together one of two things must happen. The ruler will confiscate the rights of the community to himself and will become the embodiment of sovereignty, which is what happened in most of the states of Europe at the close of the middle ages; or the community, acting through some body politic which is its virtual representative, will confine the head of the government to defined functions.

The question of representation is dealt with separately (see REPRESENTATION), but the conception of a republic in which all males, who do not belong to an inferior and barbarous race, share in the suffrage is one which would never have been accepted in the ancient or medieval world, for it is based on a foundation of which they knew nothing,—the political rights of man. When the Scottish reformer John Knox based his claim to speak on the government of the realm on the fact that he was "a subject born within the same" he advanced a pretension very new to his generation. But it was one which was fated to achieve a great fortune. The right of the subject, simply as a member of the community, to a voice in the community in which he was born, and on which his happiness depended, implied all "the rights of man" as they were to be stated by the American Declaration of Independence, and again by the French in 1789. As they could be vindicated only by revolt against monarchical governments in the old world and the new, and as they were incompatible with all the convictions which make monarchy possible, they embodied themselves in the modern democratic republics of Europe and America. It is a form of government not much more like the republic of antiquity and the middle ages than the French *sans-culottes* was like Harmodius and Aristogeiton, whom he admired for being what they most decidedly were not—believers in equality and fraternity. But it does, subject to the imperfections of human nature, set up a government in which all, theoretically at least, have a voice in what concerns all.

REPUBLICAN PARTY. Of the three important American parties which have called themselves Republican,[1] this article deals only with that one which was organized during the years 1854 to 1856 and has been in control of the government of the United States during the larger portion of the half century since the presidential election of 1860

Origin and Character.—Sectionalism, the movement which tended to break the Union into two separate republics, one based on free labour, the other on that of slaves, had gained before the middle of the 19th century such headway as to compel a reconstruction of the party system. The beginning of this reconstruction was heralded by the rise of the Liberty party (*q.v.*), in 1840, its completion by the disruption in 1860 of the Democratic party along sectional lines, and the election of Abraham Lincoln by a sectional vote.

The event which determined the date of the birth of the Republican party was the repeal by the Kansas-Nebraska Bill of 1854 of that provision of the Compromise of 1820 which excluded slavery from national territory N. of the geographical line 36° 30′ and the formal substitution in that bill of "squatter" for national sovereignty, in deciding the question of slavery in the Territories. The enactment of this bill introduced a new and highly critical stage in the relations between North and South. Down to 1850 the differences of the two sections over slavery had always been arranged by mutual concessions. In 1854 this expedient was set aside. Without giving anything in return, Douglas and his supporters took from the free-labour section an invaluable barrier against the extension of slavery: and through the doctrine of "squatter sovereignty" denied to Congress the power to erect such barriers in the future. But this only hastened a crisis that could not have been greatly delayed. Calhoun had already discerned the true source and deadly nature of the growing sectional estrangement, and Lincoln was soon to utter the prophetic words: "This government cannot endure permanently, half slave and half free."

The immediate result of the agitation over the repeal was to convince a large number—which soon became a majority—of the best citizens of the North, irrespective of party, that the restriction of slavery was essential to the well-being both of the North and of the Union as a whole. In order to give effect to this conviction it was necessary to form a new party. The agitation which prepared the way for its rise began in Congress during the debates on the Kansas-Nebraska Bill, and spread thence throughout the North. The West was more quickly responsive than the East. But everywhere large elements of the existing parties came together and agreed to unite in resisting the extension of slavery. Before the discussion of the repeal in Congress had reached its later stages, a mass meeting of Whigs, Democrats and Free Soilers at Ripon, Wisconsin, resolved that if the Kansas-Nebraska Bill should pass: "They would throw old party organizations to the winds and organize a new party on the sole issue of the non-extension of slavery." The name Republican was formally adopted at a state convention of the new party held at Jackson, Michigan, on the 6th of July 1854, and by other Western state conventions on the 13th of the same month.

The great majority of the new party had been either Whigs or Democrats. In two cardinal points they were agreed, namely, opposition to slavery and belief in the national, as opposed to the federative, nature of the Union. In other points there was at the beginning much disagreement. Fortunately the issues on which there was agreement overshadowed all others long enough to bring about a fusing of the two elements. It was the union of the Whig who believed in making government strong and its sphere wide, with the Democrat who believed in the people and the people's control of government, that made the Republican party both efficient and popular.

History.—Before its advent to power, from 1854 to 1860, the tasks of the Republican party were three: to propagate the doctrine of slavery restriction by Congressional action; to oppose the extension of slavery under the operation of the doctrine of squatter sovereignty; and to obtain control of the Federal government. In each it was successful. Throughout the North and under such leaders as Seward, Lincoln, Chase, Sumner, Henry Ward Beecher and Horace Greeley, all the resources of the press, the platform, the pulpit and (an institution then powerful but now forgotten) the lyceum or citizens' debating club, were fully enlisted in the propaganda. Other events that turned to the advantage of the Republicans were the brutal assault upon Charles Sumner in the Senate Chamber in 1856, the Ostend Manifesto, advising in the interest of slavery the acquisition of Cuba by force if Spain should refuse to sell, the enforcement—sometimes brutal and always hateful—of the Fugitive Slave Law (*q.v.*), and the quarrel of Douglas with the administration and the South over the application of squatter sovereignty to Kansas. On the other hand, the decision of the Supreme Court in the case of Dred Scott, which the Republicans refused to accept as good law, and the raid of John Brown at Harper's Ferry, which they condemned, brought them into serious embarrassment.

In the prosecution of the third task, the attainment of office, the party followed wise counsels and was fortunate. In its first national platform, that of 1856, the party affirmed its adherence to the principles of Washington and Jefferson, denied the constitutional right of Congress or a Territory to establish slavery, and declared that it was "both the right and duty of Congress to prohibit in the Territories those twin relics of barbarism, polygamy and slavery." At the close of the resolutions there was a demand for government aid to a Pacific railway and for the improvement of rivers and harbours.

The platform of 1860 was more comprehensive. It added to the planks of the first, an arraignment of the administration and the Dred Scott decision, and demands for a protective tariff and a homestead act. Although the popular vote for Abraham Lincoln was more than a half-million greater than that for John C. Frémont, the party's candidate in 1856, nevertheless it was the disruption of the Democratic party that made the Republican triumph possible. On the other hand, the Republican party was the strongest member of the new party system as reorganized on the sectional principle. Moreover, in character and purpose, as well as numerical strength, it was better qualified than its rivals to meet the impending crisis.

The War Period, 1861–1865.—Between the election of Mr Lincoln in November 1860, and his inauguration on the following 4th of March, seven of the slave-holding states seceded, formed a Confederacy and withdrew their representatives from the national legislature. All attempts to arrange a compromise failed. The vacillation of President Buchanan, and the position taken in his annual message that the national government had no right to coerce a seceding state, gave strong support to the disunion movement. These events forced upon the Republican party a change of policy. Hitherto its efforts had been directed chiefly to excluding slavery from the Territories. Now the first duty was to save the Union from disruption. In order to do this it was necessary to unite the North, and to bring to the support of the Union a large proportion of those border slave states, Delaware, Maryland, Virginia, Kentucky, Tennessee and Missouri, in which there was considerable Union sentiment. Hence the party laid aside completely the earlier issue of slavery restriction and accepted as the sole issue of the hour the maintenance of the Union. Indeed, in order to secure more easily the co-operation of loyal Democrats, it even gave up its own name for a time and called itself the Union party.

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[1] The party organized by Thomas Jefferson; the National Republicans, 1824–1834; and the Republican party of the present.

During the early period of the war the President checked all efforts on the part of zealous subordinates, civil and military, to make the war for the Union even incidentally a war upon slavery. In his efforts to unionize the border states Mr Lincoln in March 1862 urged that Congress should co-operate with any state in providing for a voluntary, gradual and compensated emancipation. Congress acceded, but not one of the border states would undertake emancipation. Many of the Republican leaders rejected the border state policy of the President and urged a more radical course towards slavery. In replying to Horace Greeley, who voiced the discontent in a public letter, to which he gave the title, *The Prayer of Twenty Millions of People*, Mr Lincoln in August 1862 wrote: "*My paramount object is to save the Union and not either to save or destroy slavery.*"

But as evidence accumulated that slavery was a strong military support of the Confederacy the policy of destroying slavery as a means of saving the Union grew in favour. To this policy Mr Lincoln on the 22nd of September 1862 committed himself, the Republican party and the cause of the Union. The first response was distinctly unfavourable. The immediate effect was "to unite the South and divide the North." A considerable element of the Democratic party became disloyal, while the party as a whole opposed all measures looking to the destruction of slavery. The autumn elections greatly reduced the Republican majority in Congress. But the new policy steadily gained ground until the Republican party in its third national convention, which met on the 7th of June 1864, resolved: "that as slavery was the cause and now constitutes the strength of this rebellion, justice and national safety demand its utter and complete extirpation from the soil of the republic." In the following year slavery was finally abolished by the Thirteenth Amendment.

On the Republican party, since it had an effective majority in each house of Congress, rests the responsibility for the legislation of the war period. The theory of loose construction of the Constitution was accepted. Throughout the Civil War, Congress, proceeding upon this theory, made prompt provision for the prosecution of the war. It passed Legal Tender Acts; it established a system of national banks; greatly raised the tariff rates; and in order to hasten the settlement of the Far West and to make that section an integral part of the Union, it passed a Homestead Act and an act providing for a railway to the Pacific. For a time, while disloyalty was most rife in the North, there was a sharp curtailment of the rights of the individual citizen through the suspension, initiated by the President and approved by Congress, of the writ of Habeas Corpus. Most of the acts, which their opponents held to be violations of the Constitution, were in general acts of questionable utility. The results of the war, which came to a close early in 1865, vindicated in a signal way the principles, policies and leadership of the Republican party. It had saved the Union; it had established the national character of the Union so firmly as to bring to an end the doctrine of the right of secession; and it had destroyed slavery.

The party had been singularly fortunate in its founders and leaders. Of these three were pre-eminent: Horace Greeley, William H. Seward and Abraham Lincoln—Greeley in the field of journalism, Seward in the two realms of idealistic and practical politics, and, greatest of all, Abraham Lincoln who won and held the people.

Reconstruction.—The larger tasks of the period from the close of the Civil War in 1865 to the inauguration of Rutherford B. Hayes in 1877 were three: first, to accomplish with the least possible disturbance the transition from war to peace; second, to settle certain matters of dispute with France and England that had arisen during the progress of the war; and third, to reconstruct the South. Full responsibility for the way in which these tasks were discharged rests upon the Republican party, for it was in control of the presidency and the Senate throughout the period and of the House until December 1875. In the first and second it was notably successful. The soldiers of North and South returned at once to the fields of productive labour. The colossal war establishment was quickly reduced to the requirements of peace. The French withdrew from Mexico. The Alabama Claims were submitted to arbitration. But the reconstruction of the South proved difficult in the extreme. The strain of a prolonged and exhausting war, the upheaval of emancipation, and the utter collapse of the Confederate government, had thrown the elements of social, economic and civil life in the South into almost hopeless disorder. To restore these to normal relations and working was but part of the task; the other and more important part was to apply those methods of reconstruction which would tend to make one nation out of hitherto discordant sections. In his third annual message, Dec. 8th, 1863, Lincoln brought forward the so-called presidential plan of reconstruction. This was rejected on the ground that reconstruction was a Congressional rather than an executive function; and on the 4th of July 1864 Congress passed a bill making Congress instead of the president the chief agent in the work of reconstruction. President Johnson adopted Lincoln's plan, and put it into operation with such vigour that when Congress met in December 1865 all the states that had seceded were quite or nearly ready to demand the readmission of their representatives to the House and Senate.

From the standpoint of party the situation was highly critical. The men whom the newly reconstructed states had sent to Washington represented the old South and would naturally join the opposition. Although the ratification of the Thirteenth Amendment, which abolished slavery, was assured, and a fortnight later was officially proclaimed, nevertheless the reconstructed legislatures were busy enacting police regulations which, in the opinion of most Republicans, threatened to re-enslave the freedmen. With an earnestness like that which the party in earlier days had shown in opposing the extension of slavery, it now resolved to secure full civil rights to the freedmen. Another consideration of great weight in shaping party policy was the need of maintaining the rights of Congress against executive encroachment. Owing to the war and Lincoln's masterful personality, the presidency had gained in prestige at the expense of Congress. The tendency thus established would be strengthened to a dangerous degree, it was thought, if the President were to take the leading part in reconstructing as well as in saving the Union. There now took place within the party a change of great importance. Hitherto the conservatives, represented by such leaders as Lincoln and Seward, had always won in struggles with the radical elements; but now the tide changed, and the radicals who were more narrowly national and more strongly partisan gained control, and ruled the party to the end of the period. This revolution within the Republican party between the years 1865 and 1867 was fostered by a marked recrudescence of sectional feeling in the North, and by the character of the successor of President Lincoln and of the party leaders in Congress. President Johnson while eminently patriotic and courageous, was tactless and imprudent to the last degree. Mr Sumner, the leader of the Senate, was not conciliatory in manner, and while incapable of revengeful feeling seemed more considerate of the freedman than of the Southern white. Thaddeus Stevens, whose influence over the House of Representatives was stronger than that of Sumner over the Senate, regarded the South as "a conquered province," and his personal feelings towards the ruling class of the South were harshly vindictive. The policy adopted by the Republican majority in each house of Congress was to refuse admission to the men chosen by the states that had been reconstructed under the presidential plan, until a joint-committee of both houses should investigate conditions in the South. In this rebuff there was distinct intimation of a purpose to set aside altogether the reconstructive work of the President. Congress proceeded at once to enact measures to continue and extend the earlier temporary provision for helpless freedmen whom emancipation had set adrift, and to give them full civil rights. By passing the Fourteenth Amendment in June 1866 Congress committed itself to the policy of securing the civil rights of the negro by constitutional guarantee. Each of these acts was vetoed by the President, between whom and

Congress political disagreement ripened soon into bitter enmity. As the quarrel developed Congress ignored the recommendations of the President, repassed by the requisite majority and without due consideration of his objections each measure that he vetoed, took from him the power to remove subordinates which had been exercised by his predecessors, deprived him of his constitutional rights as commander-in-chief of the army, and finally in 1868 undertook to drive him from office by impeachment.

In 1867 Congress, under the control of the radical wing of the Republican party, set aside nearly all reconstructive work that had been accomplished previously and put into execution a plan of its own, under which the Southern States were reconstructed anew and admitted to representation in Congress between the years 1867 and 1870. Inevitable consequences of the Congressional plan of reconstruction were: first, the erection of state governments that were inefficient, corrupt, ruinously wasteful and shamefully oppressive; second, the extreme demoralization of the freedmen suddenly transformed from slaves into rulers of their former masters; third, the demoralization, in many cases also extreme, of the great body of the Southern whites by the expedients to which they resorted in order to escape from the rule of the freedman, led by the "Carpet Bagger" his Northern, and the "Scalawag" his Southern, white ally; fourth, the alienation of the white and coloured races in the South,—an alienation which was to each a source of immeasurable evils; fifth, the speedy overthrow on the withdrawal of military support of the governments set up under the Congressional plan, and the creation of a South "solid" in resentful opposition to the North and the Republican party. And sixth, as the outcome of all these results, an unfortunate delay in reuniting North and South. The Republican party suffered during this period a moral decline, seen in the frequent efforts to gain party advantage by kindling anew the earlier sectional animosities, a growing arrogance, the increasing weight of the partisan and spoilsman in party management, and the widespread corruption that came to light in the "scandals" of the second administration of General Grant. The mismanaged Liberal Republican movement of 1870–1872 was a reaction against this moral decline and a protest against the Southern policy of the party and its support of the "Spoils" system. The service of the Liberal Republicans consisted mainly in the aid they gave to the reform of the Republican party and in the influence they exerted to induce the Democratic party to accept the results of the war.

But despite the warnings it received, the prestige it had gained during the war and the popularity of President Grant, the Republican party lost ground steadily during the second half of the period. In the election of 1874 the Democratic party gained control of the House of Representatives; and in the election of 1876 came within a hair's breadth of winning the presidency.

Election of Mr Hayes to that of Mr McKinley, 1876–1896.—During these twenty years the subsidence of old and the rise of new issues led to a reconstruction of the party system, which, although less radical than that of 1840 to 1860, brought into existence several new parties and changed in important respects the character and policies of those already in the field. From the standpoint of party history the chief interest of these twenty years lies in the answer to the question, How did the discredited Republican party secure in 1896 a new and prolonged lease of power? The task was not easy. The reconstruction policy of the party had alienated many Northern supporters and had made the South solidly Democratic. The prevalence of the spoils system and the scandals of the second administration of General Grant had hurt the prestige of the party as a guardian of public morals and of the national honour. What gave the Republicans a fighting chance were: its record down to the close of the Civil War; its proven aptitude for the tasks of government; and the growth among the people of a more vital national feeling which turned instinctively to the party that had saved the nation. Despite these substantial advantages over their Democratic rivals the Republicans lost the presidential elections of 1884 and 1892, and the entire Democratic party—some Republicans agreeing—has always held that a just decision of the contested election of 1876 would have seated Samuel J. Tilden, the Democratic candidate, instead of Mr Hayes. In the Senate the Republicans were in a majority during fourteen years. In the House, whose members are chosen by popular vote, these figures were reversed, the Democrats having control during fourteen years. In each of five successive presidential elections, those of 1876, 1880, 1884, 1888 and 1892, the Democratic popular vote was larger than the Republican. Marked features of the party situation were the apparent similarity for a time of the principles of the two great parties, the influence on their policy exerted by the stronger minor parties, and the rise of the Mugwumps (not strictly a party), who claimed the right to vote for the best candidate independently of party and were in the main of Republican origin.

Of the issues of the period one, the reform of the civil service, was served by both of the great parties with imperfect fidelity. Each of the Republican presidents, Hayes, Garfield, Arthur and Harrison gave it efficient and steadfast support; and so did Cleveland, the Democratic president, although under stronger pressure from party hunger. The same was true in the case of the more important questions of foreign policy and, to a degree in its early stage, of the question of silver coinage. It was not so with the treatment of the South. President Hayes withdrew the national troops from S. Carolina and Louisiana and thus brought to an end Federal military interference with state governments. For this course a considerable section of the Republican party gave him thereafter a support which was half-hearted and inconstant. Further disaffection resulted from efforts to reform the civil service of New York which brought the President into conflict with the powerful Republican party machine in that state.[1] The high character of the President and his firm, wise and upright course raised the reputation of the party. His veto of the Silver Bill and the resumption of specie payments tended to the same result. The failure in 1889 of the third term movement for General Grant worked for the health of the party. The struggle of President Garfield with New York spoilsmen and his assassination by a disappointed office-seeker, gave a fresh impetus to the movement for the reform of the civil service. President Arthur maintained the high standard established by Presidents Hayes and Garfield.

In the election of 1884 the old parties were competitors for the confidence of the conservative and reforming elements of the country. Mr Blaine, the Republican candidate, who in brilliancy, popularity, patriotism, and disappointing personal fortunes recalled the Whig leader, Henry Clay, lost the election by a narrow margin because, while meeting the requirements of the conservatives, he had lost in a measure the confidence of the reformers.

In the election of 1888 Mr Cleveland, by making tariff reform the issue, turned the manufacturing interests to the support of Mr Harrison, the candidate of the Republicans, who thereby won the election. Mr Harrison, while not personally popular, maintained the best traditions of his Republican predecessors. The highly protective McKinley tariff, framed in obedience to the people's mandate in 1888, proved somewhat disappointing, and in the election of 1892, Mr Cleveland, as the champion of lower tariff rates, was successful for the second time. Mr Cleveland, at the beginning of his second term, secured the repeal of the act for the purchase of silver, and thus strengthened himself with the conservatives of both parties. Democratic defection in the Senate nullified largely the downward revision of the tariff urged by the President and supported by the House.

The election of 1896 marked the close of the period of party readjustment. The leading issue was the free coinage of silver under conditions which would have made the monetary standard silver instead of gold, and would have lowered its value. The Democratic convention repudiated Mr Cleveland, accepted free coinage, and nominated W. J. Bryan. The Republicans, at the cost of a formidable party defection, endorsed the gold standard and a highly protective tariff, and nominated William McKinley, whose record and character made him an exceptionally strong candidate. In doing this the Democratic organization became the party of radicalism, the Republican, the party of conservatism. The committal of the Republican party to the maintenance of the gold standard far more than its continued support of high protection, established its position in the reconstructed party system. In doing this it allied its fortunes with those of all the property-holding classes of the country, while retaining in a high degree the confidence of the wage-earners.

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[1] In the course of this conflict, which continued to disturb the harmony of the Republican party until the death of President Garfield, the term "Stalwarts" was used to designate the supporters of Senator Conkling, who was in control of the Republican machine in New York state, and the term "Half-Breeds" to designate the supporters of the administration.

Period 1897–1910.—During this period there was first a rapid recovery from economic depression, and then ten years of almost unexampled prosperity, followed by two years of moderate depression. But the period is chiefly memorable for the war of 1898 with Spain; for the oversea territorial expansion that followed; for the rise of the so-called policy of imperialism; for the assumption of a far more prominent international rôle; for wide-reaching measures of internal reform; and, lastly, for the establishment of the policy of conserving the natural resources of the nation.

Throughout this period the Republican party had undisputed control of the national government. One of the earliest acts in the administration of Mr McKinley was the enactment in 1897 of the highly protective Dingley Tariff. The provision for Reciprocity proved at first of little use. But the need of foreign markets for the rapidly growing output of manufactured products, the rising demand that the interests of the home consumer, as well as those of the producer, should be considered, and the conviction that high protection fostered monopolies, brought about a change of sentiment in the party. Mr McKinley, in his last speech, made at the Buffalo Exposition on the 5th of September 1901, gave voice to this change: "The period of exclusiveness is past. The expansion of our trade and commerce is the pressing problem. Commercial wars are unprofitable. A policy of good will and friendly trade relations will prevent reprisals. Reciprocity treaties are in harmony with the spirit of the times. Measures of retaliation are not." These views gained headway against the strenuous opposition of the "stand-patters,"[1] until revision of the tariff downward was demanded in the platform of 1908, and achieved to a moderate degree in the Tariff Act of 1909. The party has also fulfilled its promise to establish the gold monetary standard on a firm basis. During the war with Spain and in meeting the new problems of colonial empire, the Republican party has again justified its reputation for efficiency. Not less noteworthy has been the policy of the party initiated and urged by President Theodore Roosevelt and developed by President W. H. Taft for the regulation of railways and all corporations and trusts engaged in interstate business. The latest important event in the history of the Republican party is the rise of the "Insurgents," a group of senators and congressmen whose professed aims are to resist centralization in both party and national government, to lessen the influence of the money power over public policy, to regulate tariff schedules largely in the interest of the consumer, and in brief to emphasize anew the subordination of party and government to the will and service of the people.

Bibliography.—See Francis Curtis, *History of the Republican Party* (2 vols., New York, 1904); J. F. Rhodes, *History of the United States from the Compromise of 1850* (*ibid.*, 1893–1904); J. W. Burgess, *The Middle Period* (New York, 1897), *The Civil War and the Constitution* (*ibid.*, 1899), and *Reconstruction and the Constitution* (*ibid.*, 1902); T. C. Smith, *The Parties and Slavery, 1851–1859* (*ibid.*, 1906); Henry Wilson, *Rise and Fall of the Slave Power in America* (3 vols., Boston, 1872–77); J. G. Blaine, *Twenty Years of Congress* (2 vols., Norwich, Conn., 1884–1886); Horace Greeley, *The American Conflict* (2 vols., Hartford, 1864–66); J. G. Nicolay and John Hay, *Abraham Lincoln, A History* (10 vols., New York, 1890); J. T. Morse, *Life of Lincoln* (2 vols., Boston, 1893); F. Bancroft, *Life of W. H. Seward* (New York, 1900); H. E. Von Holst, *Political and Constitutional History of the United States* (Chicago, 1899); and E. Stanwood, *History of the Presidency* (Boston, 1898). (A. D. Mo.)

REQUENA, a town of E. Spain, in the province of Valencia; on the left bank of the river Magro, and on the railway from Valencia to Utiel. Pop. (1900) 16,236. The town was formerly a Moorish fortress, occupying a strong position in the mountainous region of Las Cabrillas (3400 ft). It is dominated by the ancient citadel of the Moors, and still has traces of the original town walls. There are three ancient parish churches; San Nicolas, the oldest, dates from the 13th century, but was partly restored in 1727. Near the town are the sulphurous springs of Fuentepodrida. The chief industries are the cultivation of grain, fruit and saffron, and the manufacture of wine and silk.

REQUESENS, LUIS DE ZUNIGA Y (? –1576), Spanish governor of the Netherlands, had the misfortune to succeed the duke of Alva (*q.v.*) and to govern amid hopeless difficulties under the direction of Philip II. His early career was that of a government official and diplomatist. In 1563 he gained the king's confidence as his representative at Rome. In 1568 he was appointed lieutenant-general to Don John of Austria during the suppression of the Morisco revolt in Granada, and he also accompanied Don John during the Lepanto campaign, his function being to watch and control his nominal commander-in-chief, whose excitable temperament was distrusted by the king. Philip must have been satisfied with Requesens, for he named him viceroy in Milan, a post usually given to a great noble. Requesens was only "a gentleman of cloak and sword" (*caballero de capa y espada*), though by the king's favour he was "grand commander" of the military order of Santiago in Castile. He was credited with having shown moderation at Milan, but it is certain that he came into sharp collision with the archbishop, Saint Charles Borromeo, who took up the cause of his flock. His docility rather than his capacity marked him out to succeed Alva. The king wished to pursue a more conciliatory policy, without, however, yielding any one of the points in dispute between himself and the revolted Netherlanders. Requesens came to Brussels on the 17th of November 1573, and till his death on the 5th of March 1576 was plunged into insuperable difficulties. With an empty treasury and unpaid mutinous troops, no faculty could have helped Requesens to succeed; and he was only an honest official who was worn out in trying to do the impossible.

Authorities.—*Documentos Inéditos para la historia de España* (Madrid, 1892); and *Nueva Coleccion de documentos*, vols. iv. and v. (Madrid).

REQUEST, LETTERS OF. The legal terms "letters rogatory," or "of request" (*commission rogatoire*), express a request made by one judge for the assistance of another in serving a citation, taking the deposition of a witness, executing a judgment, or the performance of any other judicial act. The later law of Rome imposed a duty of mutual assistance on the courts of the Empire, and this was extended to the courts of different states when, and so far as, Roman law came to rule the modern world. Consequently, outside ecclesiastical law (see below), the only trace of such a practice to be found in England or the United States, independent of statutory enactment, is in the admiralty doctrine that the sentence of a foreign court of admiralty may be executed on letters of request from the foreign judge or on a libel by a party for its execution. See the authorities collected by Sir R. Phillimore in *The City of Mecca*, 5 P.D. 28. The need of assistance in taking the depositions of witnesses outside their jurisdiction was long in being felt by the British and United States courts, because they issued commissions for that purpose to private persons, sometimes to foreign judges in their private capacities. But an increasing sensitiveness as to the rights of sovereignty led to objection being taken to the execution of such commissions by persons who in that employment were officers of courts foreign to the countries in which they acted, besides which those commissions could give no power to compel the attendance of witnesses abroad. Consequently both in the mother country and in the United States acts have been passed empowering the courts to issue commissions for taking evidence to colonial or foreign courts, and to execute such commissions when received by them from the courts of the colonies or of foreign countries. The British statutes are 13 Geo. III. c. 63; 1 Will. IV. c. 22; 3 & 4 Vict. c. 105, 6 & 7 Vict. c. 82, 22 Vict. c. 20 and 48 & 49 Vict. c. 74. But neither in England nor in the United States have commissions of the old kind been entirely disused. In the practice under the Anglo-American statutes, the leading rules are that all the acts of the judge whose services are required, and all things done before him, are governed by the law of the country in which the execution takes place (*locus regit actum*), while the admissibility of the evidence and all else which concerns the conduct of the action is governed by the law of the country in which it is pending (*lex fori*). Details may be seen for England and the United States in the usual books of practice, and in Wharton's *Conflict of Laws* (2nd ed., 1881), §§ 722–31, and Sir R. Phillimore's *International Law* (3rd ed., 1889), v. 4, §§ 882–85; for other countries in von Bar's *Private International Law*, translated by Guthrie (2nd ed., 1892), §§ 391, 392, 409, 410. In ecclesiastical law, letters of request are issued for the purpose of sending causes from one court to another. Where a diocesan court within a province has jurisdiction over the parties concerned, the plaintiff may apply to the judge of such court for letters of request, in order that the cause may be instituted either in the court of arches or the chancery court of York, as the case may be. When the judge of the diocesan court consents to sign such letters and they have been accepted by the judge of the higher court, a decree issues under his seal, calling upon the defendant to answer to the plaintiff in the suit instituted against him. Letters of request are also issued for other purposes, being sometimes sent from one judge to another to request him to examine witnesses who are out of the jurisdiction of the former, but in that of the latter; to enforce a monition, &c.

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[1] Those members of the Republican party who would maintain as far as possible the high protective duties of the Dingley Tariff.

REQUESTS, COURT OF, a minor court of the king's council in England, under the presidency of the lord keeper of the privy seal. Its possible origin has been assigned to an order in council of 1390 directing the lords of the council to form a committee to examine the petitions of the humble people. Its jurisdiction was chiefly equitable, and owing to the small expenses of procedure it grew in popularity, especially for cases not of sufficient importance to bring into the court of chancery itself. Under Wolsey the court was fixed permanently at Whitehall. The judges of the court were styled masters of requests. In the reign of Queen Elizabeth there were two masters ordinary and two masters extraordinary. In James I.'s reign there were four masters ordinary. In Henry VIII.'s reign the judges of the court had ceased to be privy councillors, and towards the end of Elizabeth's reign the court incurred the hostility of the common law courts, as having neither a statutory nor prescriptive title to jurisdiction. Notwithstanding a decision in 1598 as to the illegality of its jurisdiction, and subsequent decisions to the same effect in the reigns of James I. and Charles I., it continued to flourish until the suppression of the Star Chamber in 1640 virtually put an end to it. Although it sat until 1642, and masters of requests were appointed even after the Restoration, it ceased to exercise judicial functions. There were also courts of requests or, as they were sometimes called, courts of conscience, established in London in the reign of Henry VIII. with jurisdiction in matters of debt under forty shillings. These courts were extended in the reigns of George I. and George II. to various places in England, but they were abolished by an act of 1846 (County Courts Act), which established in their place the tribunal of the county court (*q.v.*).

REQUIEM, the name of a solemn mass for the dead (*Missa pro defunctis*) in the Roman Church, appointed to be sung on All Souls' Day, in memory of all "faithful departed," at funeral services, and at the anniversaries of the death of particular persons. The name is taken from the first words of the Introit, *Requiem aeternam dona eis, Domine.* The term is specially applied to the musical setting of the mass. The most celebrated Requiem Masses are those of Palestrina, Mozart and Cherubini The word has been also used of memorial services held in honour of a deceased person in churches other than the Roman.

REREDOS (Anglo-Fr. *areredos*, from *arere*, behind, and *dos*, back), an ornamental screen of stone or wood built up, or forming a facing to the wall behind an altar in a church. Reredoses are frequently decorated with representations of the Passion, niches containing statues of saints, and the like. In England these were for the most part destroyed at the Reformation or by the Puritans later; a few medieval examples, however, survive, *e.g.* at Christchurch, Hants. In some large cathedrals *e.g.* Winchester, Durham, St Albans, the reredos is a mass of splendid tabernacle work, reaching nearly to the groining. In small churches the reredos is usually replaced by a hanging or parament behind the altar, known as a dossal or dorsal. (See also ALTAR.) For the legality of images on reredoses in the Church of England, see IMAGE.

The use of the word reredos for the iron or brick back of an open fire-place is all but obsolete.

RESCHEN SCHEIDECK. This Alpine pass is in some sort the pendant of the Brenner Pass, but leads from the upper valley of the Inn or Engadine to the upper valley of the Adige. It is but 4902 ft. in height. Near the summit is the hamlet of Reschen, while some way below is the former hospice of St Valentin auf der Haid, mentioned as early as 1140. Starting from Landeck, the carriage road runs up the Inn valley to Pfunds, whence it mounts above the gorge of Finstermünz to the village of Nauders (27¼ m.) where the road from the Swiss Engadine falls in (53½ m. from St Moritz). Thence the road mounts gently to the pass, and then descends, with the infant Adige, to Mals (15½ m.), whence the pass is sometimes wrongly named Malserheide. The road now descends the upper Adige valley, or Vintschgau, past Meran (37¼ m.) to Botzen (20 m. from Meran, or 100 m. from Landeck) where the Brenner route is joined. (W. A. B. C.)

RESCUE (in Middle Eng. *rescous*, from O. Fr. *recousse*, Low Lat. *rescussa*, from *reexcussa*, *reexcutere*, to shake off again, *re*, again, *ex*, off, *quatere*, to shake), the forcible setting at liberty of a person or thing. To constitute the legal offence of rescue, the person rescued must be in the custody of a constable or private individual, but in the latter case the rescuer must know that the prisoner is in lawful custody. The punishment for the offence is fine and imprisonment, with or without hard labour, if the party rescued has not been convicted of the offence for which he was in custody. But if the prisoner has been imprisoned on a charge of, or under sentence for, high treason, felony or misdemeanour, the rescue is high treason, felony or misdemeanour. The punishment for a felonious rescue may be penal servitude for not more than seven or less than three years, or imprisonment for not more than two years, with or without hard labour. The forcible rescue of goods legally distrained or the rescuing of cattle by pound breach are misdemeanours indictable at common law, but the more usual procedure is a civil action under 2 W. & M. c. 5, s. 3 (1690), which makes an offender liable for treble damages.

RESEARCH (O. Fr. *recerche*, from *recercher*, *re-* and *cercer*, mod. *chercher*, to search; Late Lat. *circare*, to go round in a circle, to explore), the act of searching into a matter closely and carefully, inquiry directed to the discovery of truth, and in particular the trained scientific investigation of the principles and facts of any subject, based on original and first-hand study of authorities or experiment. Investigations of every kind which have been based on original sources of knowledge may be styled "research," and it may be said that without "research" no authoritative works have been written, no scientific discoveries or inventions made, no theories of any value propounded; but the word also has a somewhat restricted meaning attached to it in current usage. It is applied more particularly to the investigations of those who devote themselves to the study of pure as opposed to applied science, to the investigation of causes rather than to practical experiment; thus while every surgeon or physician who treats an individual case of cancer may add to our sum of knowledge of the disease, the body of trained investigators which is endowed by the Cancer Research Fund are working on different lines. Again, the practical engineers who are building aeroplanes, and those who are making practical tests by actual flight in those machines, cannot be called "researchers"; that term should be confined to the members, for example, of the scientific committee appointed by the British Government in 1909 to make investigations regarding aerial construction and navigation. Further, the term is particularly used of a course of post-graduate study at a university, for which many universities have provided special Research Studentships or Fellowships. These act as endowments for a specific period, and are conditional on the holder devoting his time to the investigation at first hand of some specified subject.

RESENDE, ANDRÉ DE (1498–1573), the father of archaeology in Portugal, began life as a Dominican friar, but about 1540 passed over to the ranks of the secular clergy. He spent many years travelling in Spain, France and Belgium, where he corresponded with Erasmus and other learned men. He was also intimate with King John III. and his sons, and acted as tutor to the Infante D. Duarte. Resende enjoyed considerable fame in his lifetime, but modern writers have shown that he is neither accurate nor scrupulous. In Portuguese he wrote: (1) *Historia da antiguidade da cidade de Evora* (*ibid.* 1553); (2) *Vida do Infante D. Duarte* (Lisbon, 1789). His chief Latin work is the *De Antiquitatibus Lusitaniae* (Evora, 1593).

See the "Life" of Resende in Farinha's *Collecção das antiguidades de Evora* (1785), and a biographical-critical article by Rivara in the *Revista Litteraria* (Oporto, 1839), iii. 340–62; also Cleynarts, *Latin Letters*. (E. Pr.)

RESENDE, GARCIA DE (1470–1536), Portuguese poet and editor, was born at Evora, and began to serve John II. as a page at the age of ten, becoming his private secretary in 1491. He was present at his death at Alvor on the 25th of October 1495. He continued to enjoy the same favour with King Manoel, whom he accompanied to Castile in 1498, and from whom he obtained a knighthood of the Order of Christ. In 1514 Resende went to Rome with Tristão da Cunha, as secretary and treasurer of the famous embassy sent by the king to offer the tribute of the East at the feet of Pope Leo X. In 1516 he was given the rank of a nobleman of the royal household, and became *escrivão de fazenda* to Prince John, afterwards King John III., from whom he received further pensions in 1525. Resende built a chapel in the monastery of Espinheiro near Evora, the pantheon of the Alemtejo nobility, where he was buried.

He began to cultivate the making of verses in the palace of John II., and he tells us how one night when the king was in bed he caused him (Resende) to repeat some "trovas" of Jorge Manrique, saying it was as needful for a man to know them as to know the Pater Noster. Under these conditions, Resende grew up no mean poet, and moreover distinguished himself by his skill in drawing and music; while he collected into an album the best court verse of the time. The *Cancioneiro Geral*, probably begun in 1483 though not printed until 1516, includes the compositions of some three hundred *fidalgos* of the reigns of kings Alphonso V., John II. and Manoel. The main subjects of its pieces are love, satire and epigram, and most of them are written in the national redondilha verse, but the metre is irregular and the rhyming careless. The Spanish language is largely employed, because the literary progenitors of the whole collection were Juan de Mena, Jorge Manrique, Boscan and Garcilasso. As a rule the compositions were improvised at palace entertainments, at which the poets present divided into two bands, attacking and defending a given theme throughout successive evenings. At other times these poetical soirées took the form of a mock trial at law, in which the queen of John II. acted as judge. Resende was much twitted by other rhymesters on his corpulence, but he repaid all their gibes with interest.

The artistic value of the *Cancioneiro Geral* is slight. Conventional in tone, the greater part are imitations of Spanish poets and show no trace of inspiration in their authors. The *Cancioneiro* is redeemed from complete insipidity by Resende himself, and his fine verses on the death of D. Ignez de Castro inspired the great episode in the *Lusiads* of Camoens (*q.v.*). Resende is the compiler of a gossiping chronicle of his patron John II., which, though plagiarized from the chronicle by Ruy de Pina (*q.v.*), has a value of its own. The past lives again in these pages, and though Resende's anecdotes may be unimportant in themselves, they reveal much of the inner life of the 15th century. Resende's *Miscellanea*, a rhymed commentary on the most notable events of his time, which is annexed to his *Chronicle*, is a document full of historical interest, and as a poem not without merit. The editions of his *Chronicle* are those of 1545, 1554, 1596, 1607, 1622, 1752 and 1798.

His *Cancioneiro* appeared in 1516, and was reprinted by Kausler at Stuttgart in 3 vols., 1846–52. A new edition has recently come from the university press at Coimbra. For a critical study of his work, see *Excerptos, seguidos de uma noticia sobre sua vida e obras, um juizo critico, apreciação de bellezas e defeitos e estudo da lingua*, by Antonio de Castilho (Paris, 1865). Also *As sepulturas do Espinheiro*, by Anselmo Braamcamp, Freire Lisbon, 1901, *passim*, especially pp. 67–80, where the salient dates in Resende's life are set out from documents recently discovered; and Dr Sousa Viterbo, *Diccionario dos Architectos . . . Portuguezes*, ii. 361–74. (E. Pr.)

RESERVATION (Lat. *reservare*, to keep back), the act or action of keeping back or withholding something. There are some technical uses of the term. In English law "reservation" is used of the retention by the vendor or lessor, in a conveyance or lease, of some right or interest, which without such reservation would have passed to the purchaser or tenant; such "reservations" usually are concerned with rights of way or other easements or sporting rights. In ecclesiastical usage, the term is applied to the practice of preserving unconsumed a portion of the consecrated elements after the celebration of the Eucharist. For the history of this practice and its usage in the Roman, Greek and English churches, see Eucharist, § *Reservation of the Eucharist*. In the Roman Church, where the pope retains for himself the right to nominate to certain benefices, that action is termed, technically, "reservation." When in making a statement, taking an oath, &c., a person qualifies that statement in his mind, or withholds some fact, word or expression which, if expressed, would materially alter the effect of his statement or oath, such qualification is termed a "mental reservation," or, in the technical language of casuistry, "mental restriction" (see Liguori). The system of providing special tracts of land exclusively for the tribes of American Indians, adopted in the United States of America and in Canada, is known as the Reservation system, and such tracts are styled Indian Reservations. (See United States and Canada.)

RESHT, the capital of the province of Gilan in Persia, in 37° 17′ N., and 49° 36′ E., on the left bank of the Siah-rud (Black river), which is a branch of the Sefid-rud (White river), and flows into the Murdab, lagoon of Enzeli. The distance from Enzeli, the port of disembarcation from Russia, on the S. shore of the Caspian, to Resht is 14 m. in a direct line, and is accomplished in an open boat, or (since 1892), depth of water permitting, in a small steamboat to Pir-i-Bazar and thence 6 m. on a good road by carriage. Resht has a population of 60,000 and is the residence of English, Russian, French and Turkish consuls and the seat of the governor-general of the province of Gilan. The town is situated in low, malarious ground, and was originally buried in jungle, but the Russians during their occupation of the place in 1723–34 cleared much timber and jungle and made some open spaces. The houses are red-tiled and raised from the ground, with broad verandahs and overhanging eaves. Conflagrations are frequent, particularly in the months of January and December, when hot, dry winds resembling the Föhn of the Alps come down from the snow-capped Elburz. A good carriage road constructed and worked by a Russian company and opened to traffic in 1899 connects Resht with Teheran via Kazvin.

The value of trade probably exceeds £2,000,000, principal exports being rice, raw silk, dry fruit, fish, sheep and cattle, wool and cotton, and cocoons, the principal imports sugar, cotton goods, silkworm "seed" or eggs (£70,160 worth in 1906–7), petroleum, glass and china. The trade in dried silkworm cocoons has increased remarkably since 1893, when only 76,150 lb valued at £6475 were exported; during the year 1906–7 ending 20th March, 2,717,540 lb valued at £238,000 were exported. There are telegraph and post offices and branches of the Imperial Bank of Persia and Banque d'Escompte.

Enzeli, the port of Resht in the S.E. corner of the Caspian, is 14 m. N. of Resht, in 37° 29′ N., 49° 28′ E. Pop. 4000. Between it and other ports in the Caspian communication is maintained by the mail-steamers of the Caucasus and Mercury Steam Navigation Company and many vessels of commercial firms with head offices chiefly at Baku. (A. H.-S.)

RESIDENCE (Latin *residere*, to remain behind, to dwell, reside), in general, a place of abode. In law, it usually means continuance in a place. The ordinary meaning of the word has been defined as "the place where an individual eats, drinks and sleeps, or where his family or his servants eat, drink and sleep" (*R.* v. *North Curry*, 1825, 4 B. & C. 959). For certain purposes, however, a man may be said to have his residence not only where he sleeps, but also at his place of business. See Abode; Domicile. In ecclesiastical law residence is the continuance of a spiritual person upon his benefice. As a general rule, it is necessary for every rector or vicar to reside within his parish, even though there may be no house of residence annexed to the benefice. But under certain circumstances the bishop of the diocese may grant a licence of non-residence (Pluralities Act 1838).

RESIDENT, a political agent or officer representing the Indian government in certain native states in India. He resides in the state and advises on all matters of government, legislative or executive. Residents are divided into three classes or ranks. In certain other dependencies or protectorates of the British Empire the representative of the government is termed a resident or political agent, notably in Nepaul, Aden, Sarawak, British North Borneo, &c. In general, where the state to which a resident is attached is not an independent one, he exercises consular and magisterial functions.

For "Resident" as the title of a diplomatic agent see Diplomacy.

RESIDUE (through the French, from the Lat. *residuum*, a remainder, from *residere*, to remain), in law, that which remains of a testator's estate after all debts and legacies are discharged, and funeral, administration and other expenses paid. The person to whom this residue or surplus is left is termed the residuary legatee; should none be mentioned in the will the residue goes to the next of kin (see Executors and Administrators; Legacy; Will).

RESIN (through O.Fr. *resine*, modern *résine*, from Lat. *resina*, probably Latinized from Greek ῥητίνη, resin), a secretion formed in special resin canals or passages of plants, from many of which, such as, for example, coniferous trees, it exudes in soft tears, hardening into solid masses in the air. Otherwise it may be obtained by making incisions in the bark or wood of the secreting plant. It can also be extracted from almost all plants by treatment of the tissue with alcohol. Certain resins are obtained in a fossilized condition, amber being the most notable instance of this class; African copal and the kauri gum of New Zealand are also procured in a semi-fossil condition. The resins which are obtained as natural exudations are in general mixtures of different, peculiar acids, named the *resin acids*, which dissolve in alkalis to form resin soaps, from which the resin acids are regenerated by treatment with acids. They are closely related to the terpenes, with which they occur in plants and of which they are oxidation products. Examples of resin acids are abietic (sylvic) acid, $C_{19}H_{28}O_2$, occurring in colophony, and pimaric acid, $C_{20}H_{30}O_2$, a constituent of gallipot resin. Abietic acid can be extracted from colophony by means of hot alcohol; it crystallizes in leaflets, and on oxidation yields trimellitic, isophthalic and terebic acid. Pimaric acid closely resembles abietic acid into which it passes when distilled in a vacuum; it has been supposed to consist of three isomers. Resins when soft are known as oleo-resins, and when containing benzoic or cinnamic acid they are called balsams. Other resinous products are in their natural condition mixed with gum or mucilaginous substances and known as gum-resins. The general conception of a resin is a noncrystalline body, insoluble in water, mostly soluble in alcohol, essential oils, ether and hot fatty oils, softening and melting under the influence of heat, not capable of sublimation, and burning with a bright but smoky flame. A typical resin is a transparent or translucent mass, with a vitreous fracture and a faintly yellow or brown colour, inodorous or having only a slight turpentine odour and taste. Many compound resins, however, from their admixture with essential oils, are possessed of distinct and characteristic odours. The hard transparent resins, such as the copals, dammars, mastic and sandarach, are principally used for varnishes and cement, while the softer odoriferous oleo-resins (frankincense, turpentine, copaiba) and gum-resins containing essential oils (ammoniacum, asafoetida, gamboge, myrrh, scammony) are more largely used for therapeutic purposes and incense. Amber (*q.v.*) is a fossil resin.

RESOLUTION, a word used in the two main senses, separation and decision, of the verb "to resolve" (Lat. *resolvere*, to loose, unfasten), to separate anything into its constituent elements or component parts, hence, through the subsidiary meaning of to clear up doubts or difficulties, to settle, determine. The principal applications of the term in its first sense are to the separation of a body into its component parts by chemical process, or, to the eye, by the lens of a microscope or telescope; similarly, in mathematics, to the analysis of a velocity, force, &c., into components. In the second sense, beyond the general meaning of determination, firmness of character, a "resolution" is specifically a decision of opinion formally submitted to a legislative or other assembly and adopted or rejected by votes.

RESORCIN (meta-dioxybenzene), $C_6H_4(OH)_2$, one of the dihydric phenols. It is obtained on fusing many resins (galbanum, asafoetida, &c.) with caustic potash, or by the distillation of Brazil-wood extract. It may be prepared synthetically by fusing meta-iodophenol, phenol meta-sulphonic acid, and benzene meta-disulphonic acid with potash; by the action of nitrous acid on meta-aminophenol; or by the action of 10% hydrochloric acid on meta-phenylene diamine (J. Meyer, *Ber.*, 1897, 30, p. 2569). Many ortho and para-compounds of the aromatic series (for example, the brom-phenols, benzene para-disulphonic acid) also yield resorcin on fusion with caustic potash. It crystallizes from benzene in colourless needles which melt at 119° C. and boil at 276·5° C. (L. Calderon), or 280° C. (C. Graebe), and is readily soluble in water, alcohol and ether, but insoluble in chloroform and carbon bisulphide. It reduces Fehling's solution, and ammoniacal silver solutions. It does not form a precipitate with lead acetate solution, as the isomeric pyrocatechin does. Ferric chloride colours its aqueous solution a dark violet, and bromine water precipitates tribromresorcin. Sodium amalgam reduces it to dihydroresorcin, which when heated to 150–160° C. with concentrated baryta solution gives γ-acetylbutyric acid (D. Vorländer); when fused with caustic potash, resorcin yields phloroglucin, pyrocatechin and diresorcin. It condenses with acids or acid chlorides, in the presence of dehydrating agents, to oxyketones, *e.g.* with zinc chloride and glacial acetic acid at 145° C. it yields resacetophenone $(HO)_2C_6H_3\cdot CO\cdot CH_3$ (M. Nencki and N. Sieber, *Jour. prak. Chem.*, 1881 [2], 23, p. 147). With the anhydrides of dibasic acids it yields fluoresceins (*q.v.*). When heated with calcium chloride-ammonia to 200° C. it yields meta-dioxydiphenylamine (A. Seyewitz, *Bull. Soc. Chim.*, 1890 [3], 3, p. 811). With sodium nitrite it forms a water-soluble blue dye, which is turned red by acids, and is used as an indicator, under the name of *lacmoid*

(M. C. Traub and C. Hock, *Ber.*, 1884, 17, p. 2615). It condenses readily with aldehydes, yielding with formaldehyde, on the addition of a little hydrochloric acid, methylene diresorcin $[(HO)_2\cdot C_6H_3]_2\cdot CH_2$, whilst with chloral hydrate, in the presence of potassium bisulphate, it yields the lactone of tetra-oxydiphenyl methane carboxylic acid (J. T. Hewitt and F. G. Pope, *Jour. Chem. Soc.*, 1897, 71, p. 1084). In alcoholic solution it condenses with sodium acetoacetate to form β-methylumbelliferone, $C_{10}H_8O_3$ (A. Michael, *Jour. prak. Chem.*, 1888 [2], 37, 470). With concentrated nitric acid, in the presence of cold concentrated sulphuric acid, it yields *trinitro-resorcin* (*styphnic acid*), which forms yellow crystals, exploding violently on rapid heating.

In medicine, resorcin, which is official in the United States under the name of resorcinol, was formerly used as an antipyretic, but it has been given up. The dose is 2 to 8 grs. Used externally it is an antiseptic and disinfectant, and is used 5 to 10% in ointments in the treatment of chronic skin diseases such as psoriasis and eczema of a sub-acute character. Weak, watery solutions of resorcin (10 or 15 grs. to the ounce) are useful in allaying the itching in erythematous eczema. A 2% solution used as a spray has been used with marked effect in hay fever and in whooping-cough. In the latter disease 10 minims of the 2% solution has been given internally. It has also been employed in the treatment of gastric ulcer in doses of 2 to 4 grs. in pill, and is said to be analgesic and haemostatic in its action. In large doses it is a poison causing giddiness, deafness, salivation, sweating and convulsions. It is also worked up in certain medicated soaps. Mono-acetyl resorcin, $C_6H_4(OH)\cdot O\cdot COCH_3$, is used under the name of "euresol."

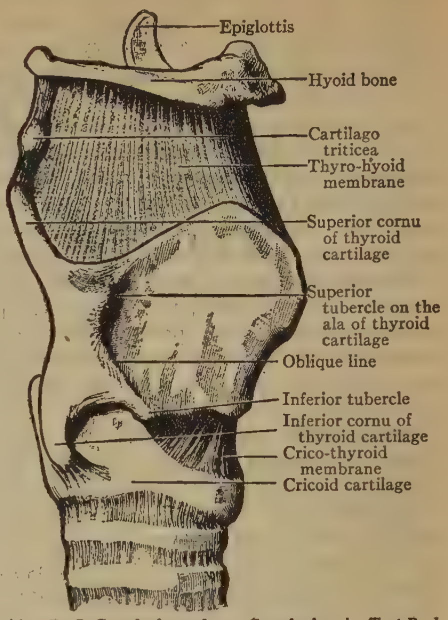
Resazurin, $C_{12}H_7NO_4$, obtained by the action of nitrous acid on resorcin (P. Weselsky and R. Benedikt, *Monats.*, 1880, 1, p. 889), forms small dark red crystals possessing a greenish metallic glance. When dissolved in concentrated sulphuric acid and warmed to 210° C., the solution on pouring into water yields a precipitate of *resorufin*, $C_{12}H_7NO_3$, an oxyphenoxazone, which is insoluble in water, but is readily soluble in hot concentrated hydrochloric acid, and in solutions of caustic alkalis. The alkaline solutions are of a rose-red colour and show a cinnabar-red fluorescence. A tetrabromresorufin is used as a dye-stuff under the name of *Fluorescent Resorcin Blue*.

Thioresorcin is obtained by the action of zinc and hydrochloric acid on the chloride of benzene meta-disulphonic acid. It melts at 27° C. and boils at 243° C. *Resorcin disulphonic Acid* $(HO)_2C_6H_2(HSO_3)_2$, is a deliquescent mass obtained by the action of sulphuric acid on resorcin (H. Fischer, *Monats.*, 1881, 2, p. 321). It is easily soluble in water and decomposes when heated to 100° C.

RESPIRATORY SYSTEM. (1). Anatomy—The respiratory tract consists of the nasal cavities, the pharynx, the larynx, the trachea, the bronchi and the lungs, but of these the two first parts have been treated in separate articles (see Olfactory System and Pharynx).

The *larynx* is the upper part of the air tube which is specially modified for the production of notes of varying pitch, though it is not responsible for the whole of the voice. Its framework is made up of several cartilages which are moved on one another by muscles, and it is lined internally by mucous membrane which is continuous above with that of the pharynx and below with that of the trachea or windpipe. The larynx is situated in the front of the neck and corresponds to the fourth, fifth and sixth cervical vertebrae. For its superficial anatomy see Anatomy, *Superficial and Artistic.*

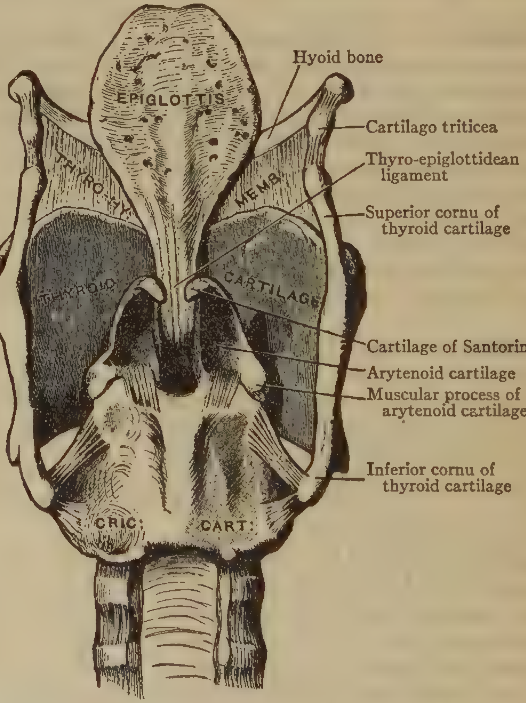
The *thyroid cartilage* (see fig. 1) is the largest, and consists of two plates or *alae* which are joined in the mid-ventral line. At the upper part of their junction is the *thyroid notch* and just below that is a forward projection, the *pomum Adami*, best marked in adult males. From the upper part of the posterior border of each ala the *superior cornu* rises up to be joined to the tip of the great cornu of the hyoid bone by the *lateral thyro-hyoid ligament*, while from the lower part of the same border the *inferior cornu* passes down to be fastened to the cricoid cartilage by the *crico-thyroid* capsule. From the upper border of each ala the *thyro-hyoid membrane* runs up to the hyoid bone, while near the back of the outer surface of each the *oblique line of the thyroid cartilage* runs downward and forward.



After D. J. Cunningham, from Cunningham's *Text-Book of Anatomy.*

Fig. 1.—Profile View of the Cartilages and Ligaments of the Larynx.

The *cricoid cartilage* (see figs. 1 and 2) is something like a signet ring with the seal behind; its lower border, however, is horizontal. To the mid-ventral part of its upper border is attached the mesial part of the *crico - thyroid membrane*, which attaches it to the lower border of the thyroid cartilage though the lateral parts of this membrane pass up internally to the thyroid cartilage and their upper free edges form the true *vocal cords*. On the summit of the signet part of the cricoid are placed the two *arytenoid cartilages* (see fig. 2), each of which forms a pyramid with its apex upward and with an anterior posterior and internal or mesial surface. The base articulates with the cricoid by a concave facet, surrounded by the *crico-arytenoid capsule*, and the two arytenoids are able to glide toward or away from one another, in addition to which each can rotate round a vertical axis. From the front of the base a delicate process projects which, as it is attached to the true vocal cord, is called the *vocal process*, while from the outer part of the base another stouter process

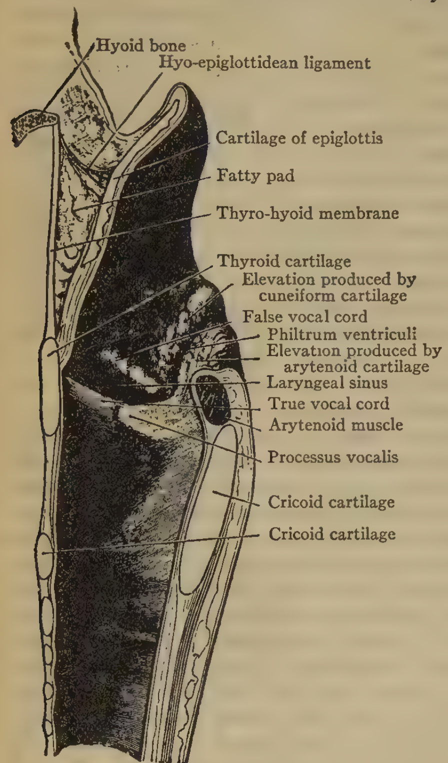

Hyoid bone
EPIGLOTTIS
Cartilago triticea
Thyro-epiglottidean ligament
Superior cornu of thyroid cartilage
THYRO
MEMB
THYROID
CARTILAGE
Cartilage of Santorini
Arytenoid cartilage
Muscular process of arytenoid cartilage
Inferior cornu of thyroid cartilage
CRIC.
CART.

After D. J. Cunningham, from Cunningham's *Text-book of Anatomy.*

Fig. 2.—Cartilages and Ligaments of Larynx, as seen from behind.

attaches the two crico-arytenoid muscles and so is known as the *muscular process*. Above each arytenoid are two smaller cartilages known as the *cornicula laryngis* or *cartilages of Santorini* and the *cuneiform cartilages*, but they are not of any practical importance.

The *epiglottis* (see fig. 3), on the other hand, is a very important structure, since it forms a lid to the larynx in swallowing: only the box moves up to the lid instead of the lid moving down to the box. It is leaf-shaped, the stalk (thyro-epiglottidean ligament) being attached to the junction of the thyroid cartilages inside the larynx, while the anterior surface of the leaf is closely attached to the root of the tongue and body of the hyoid bone. The posterior or laryngeal surface is pitted for glands, and near the point where the stalk joins the leaf is a convexity which is known as the *cushion of the epiglottis*. All the cartilages of the larynx are of the hyaline variety except the epiglottis, the cornicula laryngis and the cuneiform cartilages, which are yellow elastic. The result is that all except these three tend to ossify as middle age is approached.

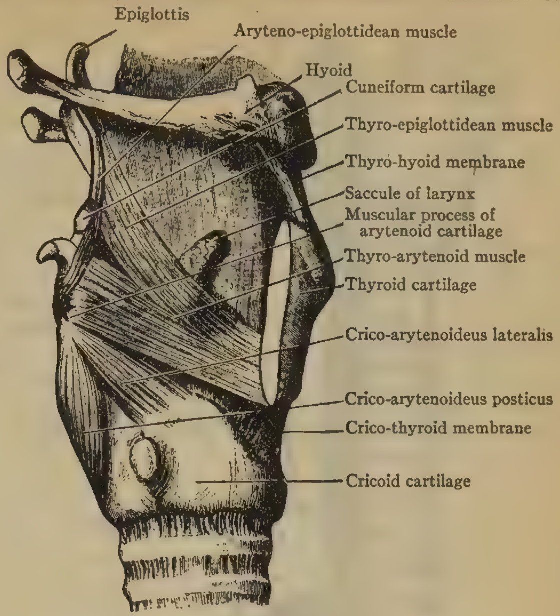

Hyoid bone
Hyo-epiglottidean ligament
Cartilage of epiglottis
Fatty pad
Thyro-hyoid membrane
Thyroid cartilage
Elevation produced by cuneiform cartilage
False vocal cord
Philtrum ventriculi
Elevation produced by arytenoid cartilage
Laryngeal sinus
True vocal cord
Arytenoid muscle
Processus vocalis
Cricoid cartilage
Cricoid cartilage

After D. J. Cunningham, from Cunningham's *Text-Book of Anatomy*.

FIG. 3.—Mesial Section through Larynx to show the outer wall of the right half.

The *muscles of the larynx* are: (1) the *crico-thyroids*, which are attached to the lower border of the thyroid and the anterior part of the cricoid, by pulling up which they make the upper part of the signet, with the arytenoids attached to it, move back and so tighten the vocal cords. (2) The *thyro-arytenoids* (see fig. 4), which run back from the junction of the thyroid alae to the front of the arytenoids and side of the epiglottis; they pull the arytenoids toward the thyroid and so relax the cords. (3) The single *arytenoideus* muscle, which runs from the back of one arytenoid to the other and approximates these cartilages. (4) The *lateral crico-arytenoids* (see fig. 4) which draw the muscular processes of the arytenoids forward toward the ring of the cricoid and, by so doing, twist the vocal processes, with the cords attached, inward toward one another; and (5) the *posterior crico-arytenoids* (see fig. 4) which run from the back of the signet part of the cricoid to the back of the muscular processes of the arytenoid and, by pulling these backward, twist the vocal processes outward and so separate the vocal cords. All these muscles are supplied by the recurrent laryngeal nerve, except the crico-thyroid which is innervated by the external branch of the superior laryngeal (see NERVES, *Cranial*).

The *mucous membrane of the larynx* is continuous with that of the pharynx at the *aryteno-epiglottidean folds* which run from the sides of the epiglottis to the top of the arytenoid cartilages (see (fig. 3). To the outer side of each fold is the *sinus pyriformis* (see PHARYNX). From the middle of the junction of the alae of the thyroid cartilage to the vocal processes of the arytenoids the mucous membrane is reflected over, and closely bound to, the true vocal cords which contain elastic tissue and, as has been mentioned, are the upper free edges of the lateral parts of the crico-thyroid membrane. The chink between the two true vocal cords is the *glottis* or *rima glottidis*. Just above the true vocal cords is the opening into a recess on each side which runs upward and backward and is known as the *laryngeal saccule*; its opening is the *laryngeal sinus*. The upper lip of this slit-like opening is called the *false vocal cord*.


Epiglottis
Aryteno-epiglottidean muscle
Hyoid
Cuneiform cartilage
Thyro-epiglottidean muscle
Thyro-hyoid membrane
Saccule of larynx
Muscular process of arytenoid cartilage
Thyro-arytenoid muscle
Thyroid cartilage
Crico-arytenoideus lateralis
Crico-arytenoideus posticus
Crico-thyroid membrane
Cricoid cartilage

After D. J. Cunningham, from Cunningham's *Text-Book of Anatomy*.

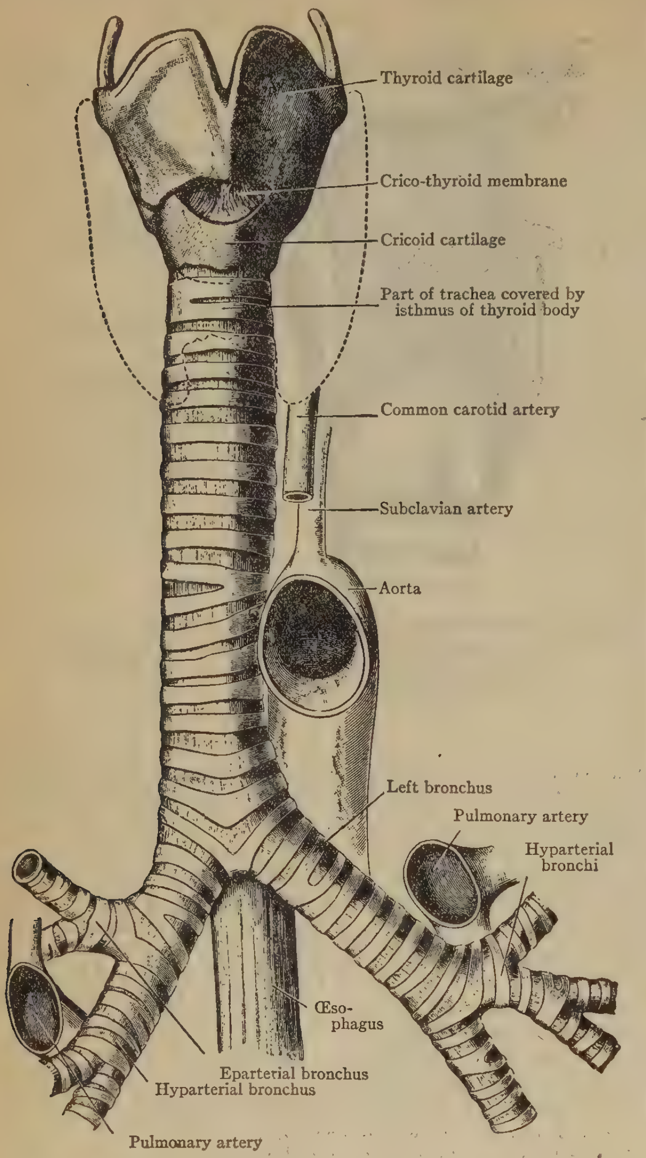
FIG. 4.—Dissection of the Muscles in the Lateral Wall of the Larynx. The right ala of the thyroid cartilage has been removed.

The mucous membrane is closely bound down to the epiglottis and to the true vocal cords, elsewhere there is plenty of submucous tissue in which the products of inflammation may collect and cause "oedema laryngis," a condition which is mechanically prevented from passing the true vocal cords. In the upper part of the front and sides of the larynx and over the true vocal cords the mucous membrane is lined by squamous epithelium, but elsewhere the epithelium is of the columnar ciliated variety: it is supplied by the superior laryngeal branch of the vagus nerve and above the glottis is peculiarly sensitive.

The *Trachea* or windpipe (see fig. 5) is the tube which carries the air between the larynx and the bronchi; it is from four to four and a half inches long and lies partly in the neck and partly in the thorax. It begins where the larynx ends at the lower border of the sixth cervical, and divides into its two bronchi opposite the fifth thoracic vertebra. The tube is kept always open by rings of cartilage, which, however, are wanting behind, and, as it passes down, it comes to lie farther and farther from the ventral surface of the body, following the concavity of the thoracic region of the spinal column. In the whole of its downward course it has the oesophagus close behind it, while in front are the isthmus of the thyroid, the left innominate vein, the innominate artery and the arch of the aorta. On each side of it and touching it is the vagus nerve.

The cervical part of the tube is not much more than an inch in length, but it can be lengthened by throwing back the head. This, of course, is the region in which tracheotomy is performed, and it should be remembered that in children, and sometimes in adults, the great left innominate vein lies above the level of the top of the sternum.

In transverse section the trachea is rather wider from side to side than from before backward. In life the former measurement is said to be about 12·5 mm. and the latter 11 mm. It is made up of an external fibro-elastic membrane in which the cartilaginous rings lie, while behind, where these rings are wanting, is a layer of unstriped muscle which, when it contracts, draws the hind ends of the rings together and so diminishes the calibre of the tube. Inside these is plentiful submucous tissue containing mucous glands and quantities of lymphoid tissue, while the whole is lined internally by columnar ciliated epithelium.



After D. J. Cunningham, from Cunningham's *Text-Book of Anatomy.*

FIG. 5.—The Trachea and Bronchi. The thyroid body is indicated by a dotted line.

The *Bronchi* (see fig. 5) are the two tubes into which the trachea divides, but, since the branches, which these tubes give off later, are also called bronchi, it may be clearer to speak of primary, secondary and tertiary bronchi. Each primary bronchus runs downward and outward, but the right one is more in a line with the direction of the trachea than the left. The right primary bronchus has also a greater calibre than the left because the right lung is the larger, and for these two reasons when a foreign body enters the trachea it usually enters the right bronchus.

The first secondary bronchus comes off about an inch from the bifurcation of the trachea on the right side and, as it lies above the level of the pulmonary artery, it is known as the *eparterial bronchus*. On the left side the first branch is about two inches from the bifurcation and, like all the remaining secondary bronchi, is hyparterial: the left primary bronchus is therefore twice as long as the right. After the eparterial secondary bronchus is given off the direction of the right primary bronchus is carried on by the hyparterial secondary bronchus, and this, just before reaching the hilum of the lung, divides into upper and lower tertiary bronchi, while the left lower secondary hyparterial bronchus does not divide before reaching the hilum of its lung. Into the hilum or root of the right lung, therefore, three bronchial tubes enter, while on the left side there are only two. The firmly rooted habit of associating the term bronchi with those parts of the main tubes which lie between the bifurcation of the trachea and the point where the first branch comes off makes it very difficult to suggest a nomenclature which calls up any picture of the actual state of things to the mind. Certainly the classification into primary, secondary and tertiary bronchi only goes a very little way toward this, and it should be realized that, call them what we may, there are two long tapering tubes which run from the bifurcation of the trachea to the lower and back part of each lung, and give off a series of large ventral and small dorsal branches. The upper part of each of these long tubes or *stem bronchi* is outside the lung and in the middle mediastinum of the thorax, the lower part embedded in the substance of the lung. The structure of the bronchi is practically identical with that of the trachea. (See G. S. Huntington's "Eparterial Bronchial System of the Mammalia," *Am. Journ. Med. Sci.* (Phila. 1898). See also Quain's *Anatomy*, London, last edition.)

The *Lungs* are two pyramidal, spongy, slate-coloured, very vascular organs in which the blood is oxygenated. Each lies in its own side of the thorax and is surrounded by its own pleural cavity (see COELOM and SEROUS MEMBRANES), and has an *apex* which projects into the side of the root of the neck, a *base* which is hollowed for the convexity of the diaphragm, an outer surface which is convex and lies against the ribs, an inner surface concave for the heart, pericardium and great vessels, a sharp anterior border which overlaps the pericardium and a broad, rounded posterior border which lies at the side of the spinal column. Each lung is nearly divided into two by a *primary fissure* which runs obliquely downward and forward, while the right lung has a *secondary fissure* which runs horizontally forward from near the middle of the primary fissure. The left lung has therefore an *upper* and *lower or basal lobe*, while the right has *upper*, *middle* and *lower lobes*. On the inner surface of each lung is the *root* or *hilum* at which alone its vessels, nerves and ducts (bronchi) can enter and leave it. The structures contained in the root of each lung are the branches and tributaries of (1) the *pulmonary artery*, (2) the *pulmonary veins*, (3) the *bronchi*, (4) the *bronchial arteries*, (5) the *bronchial veins*, (6) the *bronchial lymphatic vessels and glands*, (7) the *pulmonary plexuses of nerves*. Of these the first three are the largest and, in dividing the root from in front, the veins are first cut, then the arteries and last the bronchi. As has been pointed out already, the eparterial bronchus on the right side is above the level of the artery, but all the others (hyparterial) are on a lower level.

The *bronchial arteries* supply the substance of the lung; there are usually two on each side, and they lie behind the bronchi. The blood which they carry is chiefly returned by the pulmonary veins bringing oxidized blood back to the heart, so that here there is a normal and harmless mixture of arterial and venous blood. If there are any *bronchial veins* (their presence is doubted by some, and the writer has himself carefully but unsuccessfully searched for them several times), they open into the azygos veins of their own side. The *bronchial lymphatic vessels* lie behind the pulmonary vessels and open into several large glands which are black from straining off the carbon left in the lungs from the atmosphere.

There is an *anterior* and *posterior pulmonary plexus of nerves* on each side, the fibres of which are derived from the vagus and the upper thoracic ganglia of the sympathetic.

Structure of the Lungs.—As the bronchi become smaller and smaller by repeated division, the cartilage completely surrounds them and tends to form irregular plates instead of rings—they are therefore cylindrical, but when the terminal branches (*lobular bronchi*) are reached, the cartilage disappears and hemispherical bulgings called alveoli occur (fig. 6 A). At the very end of each lobular bronchus is an irregular chamber, the *atrium* (fig. 6 At), and from this a number of thin-walled sacs, about 1 mm. in diameter, open out. These are called the *infundibula* (fig. 6 I), and their walls are pouched by hemispherical air-cells or alveoli like those in the lobular bronchi. Each lobular bronchus with its atrium and infundibula forms what is known as a *lobule* of the lung, and these lobules are separated by connective tissue, and their outlines are evident on the surface of the lung.

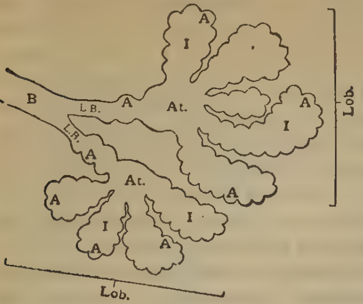


Fig. 6.—Diagram of Two Lobules of the Lung. B. Bronchus. A. Alveolus. I. Infundibulum. L.B. Lobular bronchus. At. Atrium. Lob. Lobule.

The muscular tissue, which in the larger tubes was confined to the dorsal part, forms a complete layer in the smaller; but when the lobular bronchi are reached, it stops and the mucous membrane is surrounded by the elastic layer. In the lobular bronchi, too, the lining epithelium gradually changes from the ciliated to the stratified or pavement variety, and this is the only kind which is found in the infundibula and alveoli. Surrounding each alveolus is a plexus of capillary vessels so rich that the spaces between the capillaries are no wider than the capillaries themselves, and it is here that the exchange of gases takes place between the air and the blood.

Embryology.—The respiratory system is developed from the ventral surface of the foregut as a long gutter-like pouch which reaches from just behind the rudiment of the tongue to the stomach. Limiting the anterior or cephalic end of this is a ∩-shaped elevation in the ventral wall of the pharynx which separates the ventral ends of the third and fourth visceral bars and is known as the *furcula*; it is from this that the epiglottis, aryteno-epiglottidean folds and arytenoid cartilages are developed. Later on the respiratory tube is separated from the digestive by two ridges, one on each side, which, uniting, form a transverse partition. In the region of the furcula, however, the partition stops and here the two tubes communicate. The caudal end of the respiratory tube buds out into the two primary bronchi, and the right one of these, later on, bears three buds, while the left has only two; these are the secondary bronchi, which keep on dividing into two, one branch keeping the line of the parent stem to form the stem bronchus, while the other goes off at an angle. By the repeated divisions of these tubes the complex "bronchial tree" is formed and from the terminal shoots the infundibula bud out. The alveoli only develop in the last three months of foetal life. The thyroid cartilage is probably formed from the fourth and fifth branchial bars, while the cricoid seems to be the enlarged first ring of the trachea. Before birth the lungs are solid and much less vascular than after breathing is established. Their slaty colour is gradually gained from the deposit of carbon from the atmosphere. (For further details see Quain's *Anatomy*, vol. i., Lond. 1908.)

Comparative Anatomy.—It has been shown (see Pharynx) that in the lower vertebrates respiration is brought about by the blood vessels surrounding the gill clefts. In the higher fishes (Ganoids and Teleosteans) the "*swim bladder*" appears as a diverticulum from the dorsal wall of the alimentary canal, and its duct (*d. pneumaticus*) sometimes remains open and at others becomes a solid cord. In the former case it is probable that the blood is to some extent oxidized in the vascular wall of this bladder. In the Dipnoi (mud-fish) the opening of the swim bladder shifts to the ventral side of the pharynx and the bladder walls become sacculated and very vascular, so that, when the rivers are dried up, the fish can breathe altogether by means of it. In the S. American and African species of mud-fish the bladder or lung, as it may now be called, is divided by a longitudinal septum in its posterior (caudal) part into right and left halves. In this sub-class of Dipnoi, therefore, a general agreement is seen with the embryology or ontogeny of Man's lungs. In the Amphibia the two lungs are quite separate though they are mere sacculated bags without bronchi. A trachea, however, appears in some species (*e.g.* Siren) and a definite larynx with arytenoid cartilages, vocal cords and complicated muscles is established in the Anura (frogs and toads). In most of the Reptilia the bag-like lungs are elaborated into spongy organs with arborizing bronchi in their interior. From the crocodiles upward a main or stem bronchus passes to the caudal end of the lung, and from this the branches or lateral bronchi come off. The larynx shows little advance on that of the Anura.

The respiratory organs of birds are highly specialized. The larynx is rudimentary, and sound is produced by the *syrinx*, a secondary larynx at the bifurcation of the trachea; this may be tracheal, bronchial or, most often, tracheo-branchial. The lungs are small and closely connected with the ribs, while from them numerous large air sacs extend among the viscera, muscles and into many of the bones, which, by being filled with hot air, help to maintain the high temperature and lessen the specific gravity of the body. This pneumaticity of the bones is to a certain extent reproduced by the air sinuses of the skull in crocodiles and mammals, and it must be pointed out that the amount of air in the bones does not necessarily correspond with the power of flight, for the Ratitae (ostriches and emeus) have very pneumatic bones, while in the sea-gulls they are hardly pneumatic at all.

In mammals the thyroid cartilage becomes an important element in the larynx, and in the Echidna the upper and lower parts of it, derived respectively from the fourth and fifth branchial bars, are separate (R. H. Burne, *Journ. Anat. and Phys.* xxxviii. p. xxvii.). The whole larynx is much nearer the head than in Man, and in young animals the epiglottis is intra-narial, *i.e.* projects up behind the soft palate. This prevents the milk trickling into the larynx during suckling, and is especially well seen in the Marsupials and Cetacea, though evidences of it are present in the human embryo. In the lower mammals an inter-arytenoid cartilage is very frequent (see J. Symington, "The Marsupial Larynx," *J. Anat. and Phys.* xxxiii. 31, also "The Monotreme Larynx," *ib.* xxxiv. 90).

The lungs show a good deal of variation in their lobulation; among the porcupines as many as forty lobes have been counted in the right lung, while in other mammals no lobulation at all could be made out. The *azygous lobe* of the right lung is a fairly constant structure and is situated between the post-caval vein and the oesophagus. It is supplied by the terminal branch of the right stem bronchus and, although it is usually absent in Man, the bronchus which should have supplied it is always to be found. (F. G. P.)

(2) Physiology

So far as is known, the intake of oxygen, either free or combined, and the output of carbon dioxide, are an essential part of the life of all organisms. The two processes are so closely associated with one another that they are always included together under the designation of respiration, which may thus be defined as the physiological process which is concerned in the intake of oxygen and output of carbon dioxide. According to the evidence at present available, it is only within living cells that the respiratory oxygen is consumed and the carbon dioxide formed. The mere conveying of oxygen from the surrounding air or water to these cells, and of carbon dioxide from them to the air or water, is, however, in itself a complex process in the higher animals; and accordingly an account of animal respiration naturally falls into two divisions, the first of which (I.) is concerned with the manner in which oxygen and carbon dioxide are conveyed to and from the living tissues, and the second (II.) with the consumption of oxygen and formation of carbon dioxide by the living tissues themselves.

I. In all the more highly organized animals there are special respiratory organs: the lungs in the higher vertebrates; the gills in fishes; the tracheae in insects; and various rudimentary forms of lungs or gills in other higher invertebrates. In the present article attention will be specially confined to the case of the higher vertebrates, and in particular to man.

Air is brought into the lungs by the movements of breathing (see above, *Movements of Respiration*). Oxygen from this air passes through the delicate lining membrane of the air-cells of the lungs into the blood, where it enters into loose chemical combination with the haemoglobin of the red corpuscles (see Blood). In this form it is conveyed onwards to the heart, and thence through the arteries to the capillaries, where it again parts from the haemoglobin, and passes through the capillary walls to the tissues, where it is consumed. Carbon dioxide passes out from the tissues into the blood in a corresponding manner, enters into loose combination as bicarbonate, and possibly in other ways, in the blood, and is conveyed by the veins to the lungs, whence it passes out in the expired air. Pure atmospheric air contains 20·93% of oxygen, ·03% of carbon dioxide and 79·04% of nitrogen (with which is mixed about 0.9% of argon). The dried expired air in man contains about 3·5% of carbon dioxide and 17% of oxygen, so that roughly speaking the carbon dioxide is increased by about 3·5% and the oxygen diminished by 4%. Expired air as it leaves the body contains about 6% of moisture, compared with usually about 1% in the inspired air. The added moisture and higher temperature of expired air make it decidedly lighter than pure air.

Owing to the unpleasant effects often produced in badly ventilated rooms it was for long supposed that some poisonous volatile "organic matter" is also given off in the breath. Careful investigation has shown that this is not the case. The unpleasant effects are partly due to heat and moisture, and partly to odours which are usually not of respiratory origin. The carbon dioxide present in the air of even very badly ventilated rooms is present in far too small proportions to have any sensible effect.

The average volume of air inspired per minute by healthy adult men during rest is about 7 litres or ·25 cub. ft. In different individuals the frequency of breathing varies considerably—from about 7 to 25 per minute, the depth of each breath varying about inversely as the frequency. During muscular work the volume of air breathed may be six or eight times as much as during rest. The volume of carbon dioxide given off varies from about half a cubic foot per hour during complete rest to 5 cub. ft. during severe exertion, but averages about 0·9 cub. ft. per hour, and will reach or exceed 1 cub. ft. per hour during even very light exertion. The volume of oxygen consumed is about a seventh greater than that of the carbon dioxide given off.

The breathing is regulated from a nervous centre situated in the medulla oblongata, which is the lowest part of the brain. If this centre is destroyed or injured the breathing stops and death rapidly results. From the respiratory centre rhythmic efferent impulses proceed down the motor nerves supplying the diaphragm, intercostals and other respiratory muscles. Afferent impulses through various nerves may temporarily affect the rhythm of the respiratory centre. Of these afferent impulses by far the most important are those which proceed up the vagus nerve from the lungs themselves. On distention of the lungs with air the inspiratory impulses from the respiratory centre are suddenly arrested or "inhibited"; on the other hand, collapse of the lung strongly excites to inspiratory effort. On section of the vagus nerve these effects disappear, and the breathing becomes less frequent and much more laboured. The vagus nerve is thus the carrier of both inhibitory and exciting stimuli.

As the physiological function of breathing is to bring oxygen to and remove carbon dioxide from the blood, it would naturally be expected that breathing would be regulated in accordance with the amount of oxygen required and of carbon dioxide formed; but until quite recently the actual mode of regulation was by no means clear. It was commonly supposed that afferent nervous impulses in some way regulated the otherwise automatic action of the centre, want of oxygen or excess of CO_2 in the blood being only an occasional and relatively unimportant factor in the regulations. The phenomenon of "apnoea" or complete cessation of natural breathing which occurs after forced breathing, was attributed mainly to the already mentioned distension effect through the vagus nerves. To go further back still, it was even supposed that the rate and depth of breathing, and the percentage of oxygen in the inspired air, determine the consumption of oxygen and formation of carbon dioxide in the body, just as the air-supply to a fire determines the rate of its combustion. This old belief is still often met with—for instance, in the reasons given for recommending "breathing exercises" as a part of physical training.

It is evident that if the breathing did not increase correspondingly with the greatly increased consumption of oxygen and formation of CO_2 which occurs, for instance during muscular work, the percentage of oxygen in the air contained in the lung cells or alveoli (alveolar air) would rapidly fall, and the percentage of carbon dioxide increase. The inevitable result would be a very imperfect aeration of the blood. Investigation of the alevolar air has furnished the key to the actual regulation of breathing. Samples of this air can be obtained by making a sudden and deep expiration through a piece of long tube, and at once collecting some of the air contained in the part of this tube nearest the mouth. By this means it has been found that during normal breathing at ordinary atmospheric pressure the percentage of carbon dioxide (about 5·6% on an average for men) is constant for each individual, though different persons vary slightly as regards their normal percentage. The breathing is thus so regulated as to keep the percentage of carbon dioxide constant; and under normal conditions this regulation is surprisingly exact. The ordinary expired air is a mixture of alveolar air and air from the "dead space" in the air passages. The deeper the breathing happens to be, the more alveolar air there will be in the expired air, and the higher, therefore, the percentage of carbon dioxide in it, so that the expired air is not constant in composition, though the alveolar air is. If air containing 2 or 3% of carbon dioxide is breathed, the breathing at once becomes deeper, in such a way as to prevent anything but a very slight rise in the alveolar carbon dioxide percentage. The difference is scarcely appreciable subjectively, except during muscular exertion. The effect of 1% of carbon dioxide in the inspired air is so slight as to be negligible, and there is no foundation for the popular belief that even very small percentages of carbon dioxide are injurious. With 4 or 5% or more of carbon dioxide, however, much panting is produced, and the alveolar carbon dioxide percentage begins to rise appreciably, since compensation is no longer possible. As a consequence, headache and other symptoms are produced. If, on the other hand, the percentage of carbon dioxide in the alveolar air is abnormally reduced by forced breathing, the condition of apnoea is produced and lasts until the percentage again rises to normal, but no longer. Forced breathing with air containing more than about 4% of carbon dioxide causes no apnoea, as the alveolar carbon dioxide does not fall.

If oxygen is breathed instead of air there is no appreciable change in the percentage of carbon dioxide in the alveolar air, and no tendency towards apnoea. Want of oxygen is thus not a factor in the regulation of normal breathing. During muscular work the depth and frequency of breathing increase in such a way as to prevent the alveolar carbon dioxide from rising more than very slightly. It is still the carbon dioxide stimulus that regulates the breathing, although with excessive muscular work other accessory factors may come in to some extent.

Under increased barometric pressure the percentage of carbon dioxide in the alveolar air no longer remains constant; it diminishes in proportion to the increase of pressure. For instance, at a pressure of 2 atmospheres it is reduced to half, and at 6 atmospheres to a sixth; while at less than normal atmospheric pressure it rises correspondingly unless symptoms of want of oxygen begin to interfere with this rise. These results show that it is not the mere percentage, but the pressure (or "partial pressure") of carbon dioxide in the alveolar air that regulates breathing. The pressure exercised by the carbon dioxide in the alveolar air is of course proportional to its percentage, multiplied by the total atmospheric pressure. It follows from this law that at a pressure of 6 atmospheres 1% of carbon dioxide in the inspired air would have the same violent effect as 6% at the normal pressure of 1 atmosphere. To take a concrete practical application, if a diver whose head was just below water were supplied with sufficient air to keep the carbon dioxide percentage in the air of his helmet down to 3% at most, he would be quite comfortable. But if, with the same air supply as measured at surface, he went down to a depth of 170 ft., where the pressure is 6 atmospheres, he would at once experience great distress culminating in loss of consciousness, owing, not to the pressure of the water, which has trifling effects, but to the pressure of carbon dioxide in the air he was breathing. The air supply must be increased in proportion to the increase of pressure if these effects are to be avoided, and ignorance of this has led to the common failure of diving work at considerable depths.

The foregoing facts enable us to understand the regulation of breathing under normal conditions. The pressure of carbon dioxide in the alveolar air evidently determines that of the carbon dioxide in the arterial blood, and the latter in its turn determines the carbon dioxide pressure in the respiratory centre, which is very richly supplied with blood. The centre itself is extremely sensitive to the slightest increase or diminution in carbon dioxide pressure; and thus it is that the alveolar carbon dioxide pressure is so important. That the stimulus of carbon dioxide is from the blood and not through nerves is proved by many experiments. The function of the vagus nerves in regulating the breathing is apparently to, as it were, guide the centre in the expenditure of each separate inspiratory or expiratory effort; for as soon as inspiration or expiration is completed the inspiratory or expiratory effort is cut short by impulse proceeding up the vagus nerve, and much waste of muscular work and risk of injury to the lungs is thereby prevented.

Under ordinary conditions the regulation of carbon dioxide pressure in the alveolar air ensures at the same time a normal pressure of oxygen, since absorption of oxygen and giving off of carbon dioxide normally run parallel to one another. If, however, air containing abnormally little oxygen is breathed, the normal relation between oxygen and carbon dioxide in the alveolar air is disturbed. A similar state of affairs is brought about by any considerable diminution of atmospheric pressure. Not only does the partial pressure of oxygen in the inspired air fall, but this fall is proportionally much greater in the alveolar air; and the effects of want of oxygen depend on its partial pressure in the alveolar air. It has been known for long that any great deficiency in the proportion of oxygen in the air breathed increases the depth and frequency of the breathing; but this effect is not apparent until the percentage of oxygen or the barometric pressure is reduced by more than a third, which corresponds to a reduction of more than half in the alveolar oxygen pressure. In contrast with this an increase of a fiftieth in the alveolar carbon dioxide pressure has a marked effect on the breathing. Along with the increased breathing caused by deficiency of oxygen there is more or less blueness of the skin and abnormal effects of various kinds, such as partial loss of sensibility, memory and power of thinking. Long exposure often causes headache, nausea, sleeplessness, &c.—a train of symptoms known to mountaineers as "mountain sickness." That the primary cause of "mountain sickness" is lack of oxygen owing to the low atmospheric pressure there is not the slightest doubt. Lack of oxygen is thus not only an important, but also an abnormal form of stimulus to the respiratory centre, since it is accompanied by quite abnormal symptoms. A further analysis of the special effect of lack of oxygen on the respiratory centre has shown that this effect still depends on the partial pressure of carbon dioxide in the alveolar air. The lack of oxygen appears, in fact, to have simply increased the sensitiveness of the centre to carbon dioxide, so that a lower partial pressure of carbon dioxide excites the centre, and the breathing is correspondingly increased. By prolonged forced breathing so much carbon dioxide is washed out of the body that the subsequent apnoea lasts until the oxygen in the alveolar air is nearly exhausted. The subject of the experiment becomes very blue in the face and is partially stupefied by want of oxygen before he has any desire to breathe. The probable explanation of these facts is that want of oxygen does not itself excite the centre, but that some substance—very probably lactic acid, which is known to be formed abundantly—is produced abnormally in the body during exposure to want of oxygen and aids the carbon dioxide in exciting the centre. It is known that the blood becomes less alkaline at high altitudes, and that acids in general excite the centre. A person on a high mountain thus gets out of breath much more easily than at sea-level. The extra stimulus to the centre during work still comes from the extra carbon dioxide formed, but has a greater effect than usual on the breathing. If the extra stimulus came directly from want of oxygen the person on the mountain would probably turn blue and lose consciousness on the slightest exertion. By analysing the alveolar air it can be shown that after a time even a height of 5000 to 6000 ft., or a diminution of only a sixth in the barometric pressure, distinctly increases the sensitiveness of the respiratory centre to carbon dioxide, so that there seems to be a slow accumulation of acid in the blood. The effect also passes off very slowly on returning to normal pressure, although the lack of oxygen is at once removed.

The blueness of the skin ("cyanosis") produced by lack of oxygen is due to the fact that the haemoglobin of the red corpuscles is imperfectly saturated with oxygen. Haemoglobin which is fully saturated with oxygen has a bright red colour, contrasting with the blue colour which it assumes when deprived of oxygen. According to the existing evidence the saturation of the haemoglobin is practically complete under normal conditions in the lungs, or when thoroughly shaken at the body temperature and normal atmospheric pressure with air of the same composition as normal alveolar air. As the partial pressure of the oxygen in this air falls, however, the saturation of the haemoglobin becomes less and less complete, and the arterial blood assumes a more and more blue tinge, which imparts a blue or leaden colour to the skin, accompanied by the symptoms, already referred to, of lack of oxygen. Normal arterial blood in man yields about 19 volumes of physiologically available oxygen for each 100 volumes of blood. Of these 19 volumes about 18½ are loosely combined with the haemoglobin of the red corpuscles, the small remainder being in simple solution in the blood. Venous blood, on the other hand, yields only about 12 volumes. The combination of haemoglobin with oxygen is only stable in the presence of free oxygen at a pressure of about that in normal alveolar air. As this pressure falls the compound is progressively dissociated. From this it can be readily understood why the blood loses its oxygen in passing through the tissues, which are constantly absorbing free oxygen, and regains it in the lungs. The marked effects produced by abnormal deficiency in the pressure of oxygen in the alveolar air are also readily intelligible; for even although the arterial blood still contains sufficient oxygen to cover the normal difference between the oxygen content of arterial and that of venous blood, yet this oxygen is given off to the tissues less readily—*i.e.* at a lower pressure, and thus fails to supply their demands completely. It is evident also that in pure air at normal pressure increased ventilation of the lungs does not appreciably increase the supply of oxygen to the blood, whereas in air largely deprived of its oxygen, or at low pressure, the increased alveolar oxygen pressure produced by deep breathing helps greatly in saturating the blood with oxygen, and may thus relieve the symptoms of want of oxygen. Hence it is that the increased sensitiveness of the respiratory centre to carbon dioxide, and consequent increased depth of breathing, at high altitudes compensates to a large extent for deficiency in the oxygen pressure. Addition of carbon dioxide to the inspired air produces exactly the same result. Indeed

Professor Angelo Mosso was led by observation of the beneficial effects of carbon dioxide at low atmospheric pressure to attribute mountain sickness to lack of carbon dioxide, a condition which he designated by the word "acapnia." When impure air is vitiated, not only by deficiency of oxygen, but also by carbon dioxide, the carbon dioxide causes panting, which not only gives warning of any danger, but prevents the alveolar oxygen percentage from falling in the way it would do if the carbon dioxide were absent. In this way the carbon dioxide greatly lessens the danger. To give instances, air progressively and very highly vitiated by respiration is much less likely to cause danger if the carbon dioxide is not artificially absorbed, and not nearly so dangerous as the great diminution of atmospheric pressure (and consequently of oxygen pressure) which occurs in a very high balloon ascent. Indeed the dangers of a very high balloon ascent are notorious, and a number of deaths or very narrow escapes are on record.

Just as oxygen forms a dissociable compound with the haemoglobin of the blood, so does carbon dioxide form dissociable compounds. One of these compounds appears to be with haemoglobin itself, and another is sodium bicarbonate, which is far more easily dissociated in the blood than in a simple watery solution, owing to the presence of proteid and possibly other substances which act as weak acids and thus help the dissociation process. The whole of the carbon dioxide can therefore be removed from the blood by a vacuum pump, just as the whole of the oxygen can. Venous blood contains roughly speaking about 40 volumes of carbon dioxide per 100 of blood, and arterial blood about 34 volumes. Of this carbon dioxide only about 3 volumes can be in free solution, the rest being loosely combined. The conveyance of carbon dioxide from the blood to the lungs is thus readily intelligible, as well as the fact that any increase or diminution of the pressure of carbon dioxide in the alveolar air will naturally lead to a damming back or increased liberation of carbon dioxide from the blood, and that by forced breathing carbon dioxide can be washed out of the blood to such an extent that a prolonged cessation of natural breathing (*apnoea*) follows, since even in the venous blood the partial pressure of carbon dioxide has become too low to excite the respiratory centre.

It will be evident from the foregoing that in order to supply efficiently the respiratory requirements of the tissues not only must the breathing, but also the circulation, be suitably regulated. In hard muscular work the consumption of oxygen and output of carbon dioxide may be increased eight or ten times beyond those of rest. Unless, therefore, the blood supply to the active tissues were correspondingly increased, deficiency of oxygen would at once arise, since the amount of oxygen carried by a given volume of the arterial blood is very limited, as already explained. It is known that the supply of blood to each organ is always increased during its activity. This increase can, for instance, readily be seen and measured in the case of contracting muscles or secreting glands; and the volume and frequency of the pulse are greatly increased during muscular work. But while it is evident enough that the flow of blood through the body is determined in accordance with the metabolic activities of each tissue, our knowledge is as yet very scanty as to the means by which this determination is brought about. Probably, however, carbon dioxide may be nearly as important a factor in the regulation of the circulation as in that of breathing. Just as the rate of breathing was formerly supposed to determine, and not to be determined by, the fundamental metabolic processes of the body, so the circulation was supposed to be another independent determining factor; and under the influence of these mechanistic conceptions the direction of investigation into the phenomena of respiration and circulation has been largely diverted to side issues.

Since the circulation, no less than the breathing, is concerned in the supply of oxygen to and removal of carbon dioxide from the tissues, it can readily be understood that defective circulation, such as occurs, for instance, in uncompensated valvular affections of the heart, may affect the breathing and hinder the normal respiratory exchange. Conversely, also, defects in the aeration or oxygen-carrying power of the blood may be compensated for by increase in the circulation. For instance, in the very common condition known as anaemia, where the percentage of haemoglobin, and consequently the oxygen-carrying power of the blood, is often reduced to a third or less, the respiratory disturbances may be so slight that the patient is going about his or her ordinary work. A miner suffering from the now well-known "worm-disease," or ankylostomiasis (*q.v.*), may be working underground, or a housemaid suffering from chlorosis may be doing her work, with only a third of the normal oxygen-carrying power of the blood. There seems to be no doubt that in such cases an increased rate of blood circulation compensates for the diminished oxygen-carrying power of the blood. It is well known that at high altitudes a gradual process of adaptation to the low pressure occurs, and the shortness of breath and other symptoms experienced for the first few days gradually become less and less. This adaptation is partly, at least, due to a marked increase in the percentage of haemoglobin in the blood, though probably circulatory and perhaps other compensatory changes are also involved.

In connexion with respiration the action of certain poisons is of great interest. One of these, carbon monoxide, is of very common occurrence, and causes numerous cases of poisoning. Like oxygen, it has the property of combining with the haemoglobin of the blood, but its affinity for haemoglobin is far more strong than that of oxygen. In presence of air containing as little as ·05% of carbon monoxide, the haemoglobin will become about equally shared between oxygen and carbon monoxide, so that, since air contains 20.9% of oxygen, the affinity of carbon monoxide for haemoglobin may be regarded as about 400 times greater than that of oxygen. The blood of a person breathing even a small percentage of carbon monoxide may thus become gradually saturated to a dangerous extent, since the haemoglobin engaged by the carbon monoxide is for the time useless as an oxygen-carrier. Air containing more than about 0.1% of carbon monoxide is thus more or less dangerous if breathed for long; but the blood completely recovers in the course of a few hours if pure air is again breathed. The poisonous action of carbon monoxide can be abolished by placing the animal exposed to it in oxygen at an excess pressure of about an atmosphere. The reason for this is that, in consequence of the increased partial pressure of the oxygen, the amount of this gas in free solution in the blood is greatly increased in accordance with Dalton's law, and becomes sufficient to supply the tissues with oxygen quite independently of the haemoglobin. Even at ordinary atmospheric pressure the extra oxygen dissolved in the blood when pure oxygen is breathed is of considerable importance. Carbon-monoxide poisoning is the chief cause of death in colliery explosions and fires, and the sole cause in poisoning by lighting gas and fuel gas of various kinds. Its presence in dangerous proportions may be readily detected with the help of a small bird, mouse or other small warm-blooded animal. In such animals the respiratory exchange is so rapid that symptoms of carbon-monoxide poisoning are shown far more quickly than in man. The small animal can thus be employed in mines, &c., to indicate danger from carbon monoxide. A lamp is useless for this purpose. There are various other poisons, such as nitrites, chlorates, dinitrobenzol, &c., which act by disabling the haemoglobin, and so cutting off the oxygen supply to the tissues.

Between the air in the air-cells of the lungs and the blood of the lung capillaries there intervenes nothing but a layer of very thin, flattened cells, and until recently it was very generally believed that it was by diffusion alone that oxygen passes inwards and carbonic acid outwards through this layer. Similar simple physical explanations of processes of secretion and absorption through living cells have, however, turned out to be incorrect in the case of other organs. It is known, moreover, that in the case of the swimming-bladder of fishes oxygen is secreted into the interior against enormous pressure. Thus, in the case of a fish caught at a depth of 4500 ft., the partial pressure of the oxygen present in the swimming bladder at this depth was 127 atmospheres, whereas the partial pressure of oxygen in sea-water is only about 0·2 atmosphere. Diffusion can therefore have nothing to do with the passage of gas inwards, which is known to be under the control of the nervous system. The cells lining the interior of the swimming bladder are developed from the same part of the alimentary tract as those lining the air-cells of the lungs, so that it seems not unlikely that the lungs should possess the power of actively secreting or excreting gases. The question whether such a power exists, and is normally exercised, has been investigated by more than one method; and although it is not possible to go into the details of the experiments, there can be no doubt that the balance of the evidence at present available is in favour of the view that diffusion alone is incapable of explaining either the absorption of oxygen or the excretion of carbon dioxide through the lining cells of the lungs. The partial pressure of oxygen appears to be always higher, and of carbon dioxide often lower, in the blood leaving the lungs than in the air of the air-cells; and this result is inconsistent with the diffusion theory. As to the causes of the passage of oxygen and carbonic acid through the walls of the capillaries of the general circulation, we are at present in the dark. Possibly diffusion may explain this process.

II. Although we cannot trace the exact changes which occur when oxygen passes into living cells, yet it is possible to obtain a clear general view of the origin and destiny of the material concerned in the process, and of the physiological conditions which determine it.

The oxidizable material within the body consists, practically speaking, of proteids (albumen-like substances, with which the collagen of connective tissue may be included), fats and carbohydrates (sugars and glycogen). All of these substances contain carbon, hydrogen and oxygen in known, though different, proportions, and the former also contains a known amount of nitrogen and a little sulphur. Nitrogen is constantly leaving the body as urea and other substances in the urine and faeces; and a small but easily measurable proportion of carbon passes off in the same manner. The rest of the carbon passes out as carbon dioxide in respiration. Now carbohydrates and fats are oxidized completely in the body to carbon dioxide and water. This follows from the fact that, practically speaking, no other products into which they might have been converted leave the body except carbon dioxide and water. Moreover, a given weight of carbohydrate requires for its oxidation a definite weight of oxygen, and produces a definite weight of carbon dioxide. There is thus a definite relation between the weight of oxygen used up and the weight of carbon dioxide formed in this oxidation. The same is true for the oxidation of fat and of proteid, allowing in the latter case for the fact that the nitrogen, together with part of the carbon and hydrogen, passes out as urea, &c., in an incompletely oxidized form. From all this it follows that if we measure over a given period (1) the discharge of nitrogen from the body, (2) the intake of oxygen and (3) the output of carbonic acid, we can easily calculate exactly what the ultimate destiny of the oxygen has been, and at the ultimate expense of what material the carbonic acid has been formed. What the intermediate stages may have been we cannot say, but this in no way affects the validity of the calculation. If, during the period of measurement, food is taken, the basis of the calculation is still substantially the same, as the oxidizable material in food consists of practically nothing else except proteids, carbohydrates and fats.

Liberation of Energy.—From experiments made outside the body, we know that in the oxidation of a given weight of proteid, carbohydrate or fat, a definite amount of energy is liberated. In the article on DIETETICS it is shown that precisely the same liberation of energy occurs in the living body, due allowance being made for the fact that the oxidation of proteid is not quite complete. The following table shows the respiratory quotients (the respiratory quotient being the ratio between the volume of carbon dioxide formed and that of oxygen used up) and energy expressed in units of heat (calories) liberated per gramme of carbon dioxide produced and oxygen consumed in the living body during the oxidation of proteid, fat and a typical carbohydrate:—

Substance oxidized.	Respiratory quotient.	Calories per gramme of CO_2 produced.	Calories per gramme of oxygen consumed.
Proteid . .	·78	2·78	3.00
Fat . . .	·71	3·35	3·27
Cane-sugar . .	1·00	2·59	3·56

In the oxidation of non-living substances the rate varies, within wide limits, according to that at which oxygen is supplied. Thus a fire burns the faster the more air is supplied, and the higher the percentage of oxygen in the air. It was for long believed that in the living body also the rate of oxidation must vary according to the oxygen supply. It has been found, however, that this is not the case. Provided that a certain minimum of oxygen is present in the air breathed, or in the blood supplied to the tissues, it is, practically speaking, indifferent whether the oxygen supply be increased or diminished: only a certain amount is consumed. It might be supposed that the reason for this is that the available oxidizable material in the body is limited, and that if the food supply were increased there would be a corresponding increase in the rate of oxidation. This hypothesis is apparently supported by the fact that, when an increased supply of proteid is given as food, the amount of nitrogen discharged in the urine is almost exactly correspondingly increased, so that evidently the oxidation of proteid increases correspondingly with the supply. Similarly, when carbohydrate food is given, the alteration in the respiratory quotient shows that more carbohydrate than before is being oxidized. Closer investigation in recent times has, however, brought out the very striking fact that, if oxidation be measured in terms of energy liberated by it in the body, it makes but little difference, other things being equal, whether the animal is fasting or not. If more proteid or carbohydrate is oxidized at one time, correspondingly less fat is oxidized, but the total energy liberated as heat, &c., in the body is about the same, unless the diet is very excessive, when there is a slight increase of oxidation. Even after many days of starvation, the rate of oxidation per unit of body weight has been found to remain sensibly the same in man. When more food is taken than is required, the excess is stored up, chiefly in the form of fat, into which carbohydrate and possibly also proteid are readily converted in the body. When less food is taken than is needed, the stock of fat is drawn upon, and supplies by far the greater proportion of the energy requirements of the body.

During the performance of muscular work oxidation is greatly increased, and may amount to ten times the normal or more. Even the slight exertion of easy walking increases oxidation to three times. When the energy represented by the external work done in muscular exertion is compared with the extra energy liberated by oxidation in the body, it is found, as would be expected, that the latter value largely exceeds the former. In other words, much of the energy liberated is wasted as heat. Nevertheless the muscles are capable of working with less waste than any steam or gas engine. In the work of climbing, for instance, it has been found in the case of man that 35 % of the energy liberated is represented in the work done in raising the body. Muscular work, if at all excessive, leads to fatigue, and consequent rest. On the other hand, unnatural abstinence from muscular activity leads to restlessness and consequent muscular work. Hence on an average of the twenty-four hours the expenditure of energy by different individuals, with different modes of life, does not as a rule differ greatly.

The rate of oxidation per unit of body weight varies considerably according to size and age. If we compare different warm-blooded animals, we find that the rate of oxidation is relatively to their weight far higher in the smaller ones. In a mouse or small bird, for instance, the rate is about twenty times as great as in a man. The difference is in part due to the fact that the smaller an animal is the greater is its surface relatively to its mass, and consequently the more heat does it require to keep up its temperature. The smaller animal must therefore produce more heat. Even in cold-blooded animals, however, oxidation appears to be more rapid the smaller the animal. In the case of man, oxidation is relatively more than twice as rapid in children than in adults, and the difference is greater than would be accounted for by the difference in the ratio of surface to mass. Allowing for differences in size, oxidation is about equally rapid in men and women.

It was for long believed that the special function of respiratory oxidation was (1) the production of heat, and (2) the destruction of the supposed "waste products." Further investigation has, however, tended to show more and more clearly that in reality respiratory oxidation is an essential and intimate accompaniment of all vital activity. To take one example, secretion and absorption, which were formerly explained as simple processes of filtration and diffusion, are now known to be accompanied, and necessarily so, by respiratory oxidation in the tissues concerned. The respiratory oxidation of an animal is thus a very direct index of the activity of its vital processes as a whole. Looking at what is known with regard to respiratory oxidation, we see that what is most striking and most characteristic in it is its tendency to persist—to remain on the whole at about a normal level for each animal, or each stage of development of an animal. The significance of this cannot be over-estimated. It indicates clearly that just as an organism differentiates itself from any non-living material system by the manner in which it actually asserts and maintains its specific anatomical structure, so does it differentiate itself from any mere mechanism by the manner in which it asserts and maintains its specific physiological activities.

AUTHORITIES.—For further general information the reader may be referred to the sections by Pembrey and by Gamgee in Schäfer's *Handbook of Physiology*, vol. i., and by Bohr in Nagel's *Handbuch der Physiologie*, vol. i. The following additional references are to recent investigations: **Regulation of Breathing,** Haldane and Priestley, *Journal of Physiology*, xxxii. 225 (1905). **Respiration at High Altitudes** and **Effects of Want of Oxygen,** Zuntz, Loewy, Caspari, and Müller, *Das Höhenklima* (1905); Boycott and Haldane, Ward, and Haldane and Poulton, *Journal of Physiology*, xxxvii. (1908). **Respiration at High Pressures,** "Report to the Admiralty of the Committee on Deep Diving" (1907). **Respiratory Exchange and Secretion,** Barcroft, *Journal of Physiology*, xxvii. 31 (1901); Barcroft and Brodie, *Journal of Physiology*, xxvii. 18, and xxxiii. 52 (1905). **Excretion of CO_2 by the Lung Epithelium,** Bohr, *Zentralblatt für Physiologie*, xxi. 337 (1907). "Normal Alveolar CO_2 Pressure in Man," Mabel Fitzgerald and J. Haldane in *Physiological Journal* (1905). (J. S. H.)

(3) MOVEMENTS OF RESPIRATION

Normal Respiration.—If the naked body of a person asleep or in perfect inactivity be carefully watched, it will be found that the anterior and lateral walls of the chest move rhythmically up and down, while air passes into and out of the nostrils (and mouth also if this be open) in correspondence with the movement. If we look more closely we shall find that with every uprising of the chest walls the membranous intercostal portions sink slightly as if sucked in, while at the same time the flexible walls of the abdomen bulge as if protruded by some internal force. If respiration be in the slightest degree hurried, these motions become so marked as to escape the attention of no one. The elevation of the chest walls is called *inspiration*, their depression *expiration*. Inspiration is slightly shorter than expiration, and usually there is a slight pause or momentary inaction of the chest between expiration and the following inspiration. Apparatuses for measuring the excursion of a given point of the chest wall during respiration are called *thoracometers* or *stethometers*. Apparatuses for recording the movements of the chest are called *stethographs* or *pneumographs*.

Frequency of Respiration.—The frequency of respiration during perfect rest of the body is 16 to 24 per minute, the pulse rate being usually four times the rate of respiration; but the respiratory rhythm varies in various conditions of life. The following are the means of many observations made by Lambert Adolphe Quételet (1796–1874): at the age of one year the number of respirations is 44 per minute; at 5 years, 26; from 15 to 20 years, 20; from 25 to 30, 16; from 30 to 50, 18·1. Muscular exertion always increases the frequency of respiration. The higher the temperature of the environment the more frequent is the respiration. Paul Bert (1833–1886) has shown that with higher atmospheric pressures than the normal the frequency of respiration is diminished while the depth of each inspiration is increased. The frequency of respiration diminishes until dinner-time, reaches its maximum within an hour of feeding, and thereafter falls again; if dinner is omitted, no rise of frequency occurs. The respiratory act can be interrupted at any stage, reversed, quickened, slowed and variously modified at will, so long as respiration is not stopped entirely for more than a short space of time; beyond this limit the will is incapable of suppressing respiration.

Depth of Respiration.—The depth of respiration is measured by the quantity of air inspired or expired in the act; but the deepest expiration possible does not suffice to expel all the air the lungs contain. The following measurements have been ascertained, and are here classified according to the convenient terminology proposed by John Hutchinson (1811–1861). (1) *Residual air*, the volume of air remaining in the chest after the most complete expiratory effort, ranges from 100 to 130 cub. in. (2) *Reserve* or *supplemental air*, the volume of air which can be expelled from the chest after an ordinary quiet expiration, measures about 100 cub. in. (3) *Tidal air*, the volume of air taken in and given out at each ordinary respiration may be stated at about 20 cub. in. (4) *Complemental air*, the volume of air that can be forcibly inspired over and above what is taken in at a normal inspiration, ranges from about 100 to 130 cub. in. By *vital capacity*, which once had an exaggerated importance attached to it, is meant the quantity of air which can be expelled from the lungs by the deepest possible expiration after the deepest possible inspiration; it obviously includes the complemental, tidal and reserve airs, and measures about 230 cub. in. in the Englishman of average height, *i.e.* 5 ft. 8 in. (Hutchinson). It varies according to the height, body weight, age, sex, position of the body and condition as to health of the subject of observation.

Vital capacity is estimated by means of a *spirometer*, a graduated gasometer into which air may be blown from the lungs. The residual air, which for obvious reasons cannot be actually measured, may be estimated in the following way (Emil Harless, 1820–1862; Louis Gréhant, b. 1838). At the end of ordinary expiration, apply the mouth to a mouthpiece communicating with a vessel filled with pure hydrogen, and breathe into and out of this vessel half a dozen times—until, in fact, there is reason to suppose that the air in the lungs at the time of the experiment has become evenly mixed with hydrogen. Then ascertain by analysis the proportion of hydrogen to expired air in the vessel and estimate the amount of the air which the lungs contained by the following formula:—

$$v : V+v = p : 100 ;$$
$$V = \frac{v(100-p)}{p};$$

where V = volume of air in the lungs at the time of experiment, v = volume of the vessel containing hydrogen, p = proportion of air to hydrogen in the vessel at the end of the experiment. V, then, is the volume of air in the lungs after an *ordinary* expiration; that is, it includes the residual and the reserve air; if we subtract from this the amount of reserve air ascertained by direct measurement, we obtain the 100–130 cub. in. which Hutchinson arrived at by a study of the dead body.

Volume of Respiration.—It is clear that the ventilation of the lungs in ordinary breathing does not merely depend on the quantity of air inspired at each breath, but also on the number of inspirations in a given time. If these two values be multiplied together we get what might be called the *volume* of respiration (*Athmungsgrösse*, Isidore Rosenthal, b. 1836), in contradistinction to depth of respiration and frequency of respiration. Various instruments have been devised to measure the volume of respiration, all more or less faulty for the reason that they compel respiration under somewhat abnormal conditions (Rosenthal, Gad, Peter Ludwig, Panum (1820–1885), Ewald, Hering (b. 1834). From the data obtained we may conclude that the respiratory volume per minute in man is about 366 cub. in. (6000 cub. centim.). In connexion with this subject it may be stated that, after a single ordinary inspiration of hydrogen gas, 6–10 respirations of ordinary air must occur before the expired air ceases to contain some trace of hydrogen.

Types of Respiration.—The visible characters of respiration in man vary considerably according to age and sex. In men, while there is a moderate degree of upheaval of the chest, there is a considerable although not preponderating degree of excursion of the abdominal walls. In women the chest movements are decidedly most marked, the excursion of the abdominal walls being comparatively small. Hence we may distinguish two types of respiration, the costal and the abdominal, according to the preponderance of movement of one or the other part of the body wall. In forced respiration the type is costal in both sexes, and so it is also in sleep. The cause of this difference between men and women has been variously ascribed (*a*) to constriction of the chest by corsets in women, (*b*) to a natural adaptation to the needs of child-bearing in women, and (*c*) to the greater relative flexibility of the ribs in women permitting a wider displacement under the action of the inspiratory muscles.

Certain Concomitants of Normal Respiration.—If the ear be placed against the chest wall during ordinary respiration we can hear with every inspiration a sighing or rustling sound, called "vesicular," which is probably caused by the expansion of the air vesicles; and with every expiration a sound of a much softer sighing character. In children the inspiratory rustle is sharper and more pronounced than in adults. If a stethoscope be placed over the trachea, bronchi or larynx, so that the sounds generated there may be separately communicated to the ear, there is heard a harsh to-and-fro sound during inspiration and expiration which has received the name of "bronchial."

In healthy breathing the mouth should be closed and the ingoing current should all pass through the nose. When this happens the nostrils become slightly expanded with each inspiration, probably by the action of the M. dilatatores naris. In some people this movement is hardly perceptible unless breathing be heavy or laboured. As the air passes at the back of the throat behind the soft palate it causes the velum to wave very gently in the current; this is a purely passive movement. If we look at the glottis or opening into the larynx during respiration, as we may readily do with the help of a small mirror held at the back of the throat, we may notice that the glottis is wide open during inspiration and that it becomes narrower by the approximation of the vocal chords during expiration. This alteration is produced by the action of the laryngeal muscles. Like the movements of the nostril, those of the larynx are almost imperceptible in some people during ordinary breathing, but are very well marked in all during forced respiration.

The Mechanics of Respiration.—The thorax is practically a closed box entirely filled by the lungs, heart and other structures contained within it. If we were to freeze a dead body until all its tissues were rigid, and then were to remove a portion of the chest wall, we should observe that every corner of the thorax is accurately filled by some portion or other of its contents. If we were to perform the same operation of removing a part of the chest wall in a body not first frozen we should find, on the other hand, that the contents of the thorax are not by any means in such circumstances bulky enough to fill up the space provided for them. If we were to measure the organs carefully we should find that those which are hollow and whose cavities communicate with the regions outside the thorax are all larger in the frozen corpse than in that which was not frozen. In other words, the organs in the thorax are distended somewhat in order that they may completely fill the chest cavity; and the nature of this curious and important condition may best be illustrated by the simple diagrams, figs. 7 and 8 (from Hermann's *Physiologie des Menschen*),—where *t* is the trachea, *l* the lung, *v* the auricle of the heart, *k* the ventricle, *i* an intercostal space with its flexible membranous covering. When the interior of the vessel is rendered vacuous by exhaustion through the tube *o*, the walls of the lungs and heart are expanded until the limits of the containing vessel are accurately filled, while all flexible portions of the walls of the vessel (corresponding to the intercostal membranes and the diaphragm of the thorax) are sucked inwards.

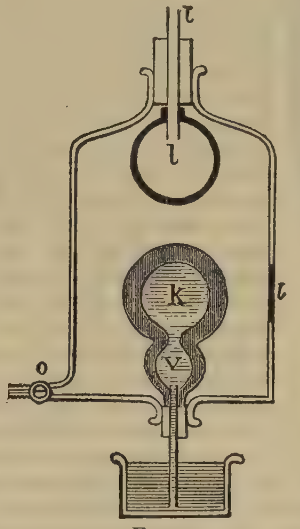


FIG. 7.

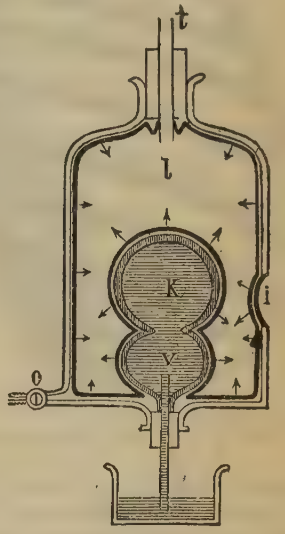
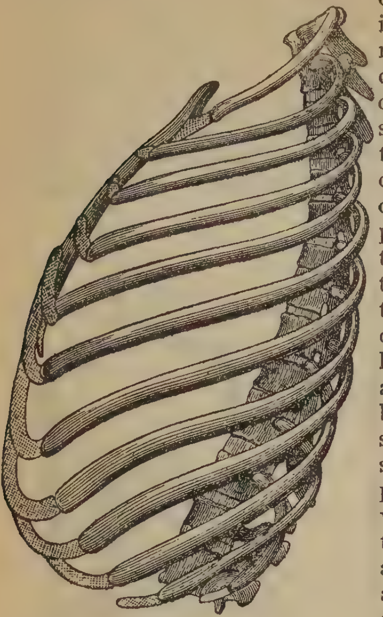


FIG. 8.

From this description it follows that the lungs, even when the thorax is most contracted, are constantly over-distended, and that, when the cause of this over-distension is removed, the lungs, being elastic, collapse. It further follows that if the thorax is dilated, the flexible hollow organs it contains must perforce be still more distended—a distension which in the case of the lungs is followed by an indrawing of air through the trachea in all cases where the trachea is open. Thus, as the act of respiration is primarily a dilatation of the thorax, the part played by the lungs is, as Galen knew, a purely passive one.

How is dilatation of the thorax effected? It has been pointed out that the rib-planes decline from the horizontal in two directions, viz. from behind forwards, and from the antero-posterior mesial plane outwards; a glance at fig. 9 will make this double sloping clear to the reader. It has, moreover, been explained that the diaphragm arches upwards into the thorax in such a manner that the lateral parts of the arch are vertical and in contact with the inner face of the thoracic walls. This being the structure of the thorax, the enlargement of its cavity is brought about (1) by raising the rib-planes until they approach the horizontal, and (2) by depressing the diaphragm and making its rounded dome more cone-like in outline. A moment's consideration will show how these actions enlarge the boundaries of the thorax. (*a*) When the postero-anterior slope of the rib-planes is diminished by the raising of the anterior ends of the ribs, the whole sternum is thrust upwards and forwards, and the antero-posterior diameter of the thorax is increased. (*b*) When the lateral slope of the rib-planes is diminished by the ribs being moved upwards about an axis passing through their sternal and vertebral extremities, it is evident that the lateral diameter of the thorax must be increased. (*c*) When the muscular portion of the diaphragm contracts, the curves of its dome-like shape are straightened, the whole diaphragm comes to look more conical on section, and the apposition of its lateral parts to the inner surface of the thorax is destroyed; the two apposed surfaces are drawn apart much as the leaves of a book might be, and a space is formed between them, into which some portion of the lung slips. (*d*) When the diaphragm descends it draws with it the whole contents of the thorax; inasmuch as the contents as a whole are conical in shape with the apex upward and are fitted into the conical space of the thoracic cavity, it is clear that the descent of the contents will tend to create a space between them and the thoracic walls; for each stratum of lung, &c., which is adapted to fit a certain level of thorax, will thereby be brought into a lower and (as the thorax is conical) a more spacious level. Hence the descent of the diaphragm causes a much greater enlargement of the thorax than is measured by the mere elongation of the vertical diameter. In this manner the thorax is distended and air is drawn into the lungs. The contraction of the thorax in expiration is brought about by the return of the ribs and diaphragm to their original position of rest.



From Hermann's *Handbuch*.

FIG. 9.—Showing Slope of Ribs.

How the Inspiratory Movements are Produced.—The Rib Movements.—These are caused by the contraction of muscles which are fixed either to the central axis of the body (including under that term the head and vertebral column) or to some point rendered sufficiently stable for the purpose by the action of other adjuvant muscles. Thus the M. levatores costarum arise from the transverse processes of the 7th cervical and eleven upper dorsal vertebrae, and are attached to the ribs below in series; the M. scaleni spring from the cervical vertebrae, and are attached to the anterior parts of the first and second ribs; the M. sternocleido-mastoidei arise from the side and back of the skull, and are inserted into the upper part of the sternum and the clavicle; the M. pectoralis minor arises from the coracoid process of the scapula, and is inserted into the anterior ends of some of the ribs; the M. serratus posticus superior arises from certain of the cervical and dorsal vertebrae, and is inserted into the posterior part of certain of the ribs; the M. cervicalis ascendens (part of the M. erector spinae) arises from certain of the cervical vertebrae, and is inserted into the posterior part of certain ribs. The M. serratus magnus and the M. pectoralis major, which are affixed on the one hand to the upper arm and to the scapula respectively, and on the other to the ribs and to the sternum respectively, may in certain elevated positions of the arm and shoulder act as inspiratory muscles. When all these muscles contract, the ribs are raised in the twofold way already described, some pulling up the anterior ends of the ribs, and others causing the arched ribs to rotate about an axis passing through their vertebral and sternal joints.

In addition to the muscles just enumerated, the M. intercostales externi are undoubtedly inspiratory muscles. Every external intercostal muscular fibre between a pair of ribs must, when it contracts, of necessity raise *both* ribs, as is clearly shown by the accompanying diagram (fig. 10). Here $a'b'$ must be shorter than ab, for if angle $BAa = x$, then

$$ab^2 = AB^2 + (Bb - Aa)^2 + 2AB(Bb - Aa)\cos x;$$

hence ab will be larger the smaller the angle x, for the cosine increases as the angle diminishes.

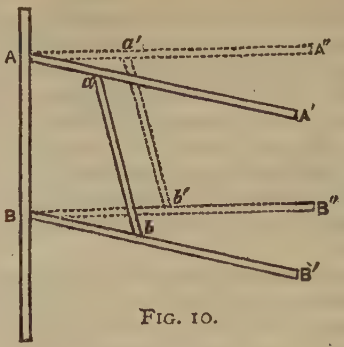


FIG. 10.

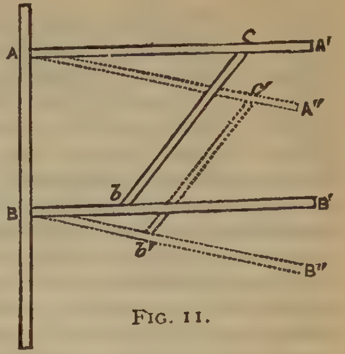


FIG. 11.

By a similar geometrical treatment of the question it may be shown that the internal intercostal muscles when they contract must of necessity depress both the ribs to which they are attached. If the angle $BAc' = x$ (fig. 11), then

$$c'd'^2 = AB^2 + (Ac' - Bd')^2 - 2AB(Ac' - Bd')\cos x;$$

hence $c'd'$ will be larger the larger the angle x.

The case, however, is not so clear with reference to the anterior portions of the internal intercostals which lie between the cartilages; for it is evident that these fibres have the same direction with regard to the sternum as an axis as the external intercostals have with regard to the vertebral column as an axis; that is to say, the geometrical diagram in fig. 10 applies to the inter-cartilaginous internal intercostals as perfectly as it does to the inter-osseous parts of the external intercostals, the inference being that the inter-cartilaginous internal intercostals tend to elevate the pair of ribs between which they stretch. The geometrical argument is, however, overborne by physiological experiment: Martin and Hartwell have observed in the dog and the cat that the internal intercostals throughout their whole extent contract (not synchronously) but alternately with the diaphragm; hence we must conclude that their function throughout is not inspiratory like that of the diaphragm, but expiratory.

The Movements of the Diaphragm.—The muscular fibres of the diaphragm are arranged in a radial manner, or, more strictly speaking, in a manner like the lines of longitude on a terrestrial globe. The central tendon of the diaphragm corresponds to the pole of such a globe. The contraction of the fibres is expended on straightening the longitudinal curves rather than on pulling down the central tendon to a lower level; in fact, the central tendon moves very little in ordinary respiration.

How the Expiratory Movements are Produced.—The action of inspiration disturbs many organs from the position of rest into which gravity and their own physical properties have thrown them. The ribs and sternum are raised from the position of lowest level; the elastic costal cartilages are twisted; the elastic lungs are put upon the stretch; the abdominal organs, themselves elastic, are compressed and thrust against the elastic walls of the belly, causing these to bulge outwards. In short the very act of inspiration stores up, as it were, in sundry ways the forces which make for expiration. As soon as the inspiratory muscles cease to act these forces come into play, and the position of rest or equilibrium is regained. It is very doubtful whether any special expiratory muscles are called into action during ordinary respiration. The internal intercostals may in man be exercised in ordinary expiration (although they are certainly not so exercised in the dog and the cat); but in laboured expiration many muscles assist in the expulsive effort. The muscles forming the belly-walls contract and force the abdominal contents against the relaxed diaphragm in such a manner as to drive it farther and farther into the thorax. At the same time by their attachment to the lower edge of the thorax these same muscles pull down the ribs and sternum. The M. triangularis sterni, which arises from the back or thoracic aspect of the sternum and lower costal cartilages and is inserted into the costal cartilages higher up, can obviously depress the ribs. So also can the M. serratus posticus inferior, which arises from the thick fascia of the loins and is inserted into the last four ribs. So also can the M. quadratus lumborum, which springs from the pelvis and is attached to the last rib. Indeed there is hardly a muscle of the body but may be called into play during extremely laboured respiration, either because it acts on the chest, or because it serves to steady some part and give a better purchase for the action of direct respiratory muscles.

Certain Abnormal Forms of Respiration.

Coughing.—There is first a deep inspiration followed by closure of the glottis. Then follows a violent expiratory effort which bursts open the glottis and drives the air out of the lungs in a blast which carries away any light irritating matter it may meet with. The act is commonly involuntary, but may be imitated exactly by a voluntary effort.

Hawking, or Clearing the Throat.—In this act a current of air is driven from the lungs and forced through the narrow space between the root of the tongue and the depressed soft palate. This action can only be caused voluntarily.

Sneezing.—There is first an inspiration which is often unusually rapid; then follows a sudden expiration, and the blast is directed through the nose. The glottis remains open all the time. The act is generally involuntary, but may be more or less successfully imitated by a voluntary effort.

Snoring is caused by unusually steady and prolonged inspirations and expirations through the open mouth,—the soft palate and uvula being set vibrating by the currents of air.

Crying consists of short deep inspirations and prolonged expirations with the glottis partially closed. Long-continued crying leads to sobbing, in which sudden spasmodic contractions of the diaphragm cause sudden inspirations and inspiratory sounds generated in larynx and pharynx.

Sighing is a sudden and prolonged inspiration following an unusually long pause after the last expiration.

Laughing is caused by a series of short expiratory blasts which provoke a clear sound from the vocal chords kept tense for the purpose, and at the same time other inarticulate but very characteristic sounds from the vibrating structures of the larynx and pharynx. The face has a characteristic expression. This act is essentially involuntary, and often is beyond control; it can only be imitated very imperfectly.

Yawning is a long deep inspiration followed by a shorter expiration, the mouth, fauces and glottis being kept open in a characteristic fashion. It is involuntary, but may be imitated.

Hiccough is really an inspiration suddenly checked by closure of the glottis; the inspiration is due to a spasmodic contraction of the diaphragm. The closure of the glottis generally leads to a characteristic sound. (A. G.*)

(4) PATHOLOGY OF THE RESPIRATORY SYSTEM

In the following article we have to give an account of the more important pathological processes which affect the lungs, pleurae and bronchial tubes. In the aetiology of pulmonary affections, the relations between the lungs and the external air, and also between them and the circulatory system, are important. The lungs are, so to speak, placed between the right and left cavities of the heart, and the only way for the blood to pass from the right ventricle to the left side of the heart, except in cases of a patent foramen ovale or other congenital defect forming a communication between the two sides of the organ, is by passing through them. The result is that not only may they become diseased by foreign material carried into them by the blood, but any obstruction to the flow of blood through the left side of the heart tends sooner or later to engorge or congest them, and lead to further changes. Through the nose and mouth they are in direct connexion with the external atmosphere. Hence the variable condition of the air as regards temperature, degree of moisture, and density, is liable to produce directly various changes in the lungs, or to predispose them to disease; and the contamination of the air with various pathogenic germs and irritating particles in the shape of dust, is a direct source of many lung affections.

Bronchitis, or inflammation of the mucous membrane of the bronchial tubes, has been generally attributed to exposure to atmospheric changes. It occurs with great frequence in the extremes of life, and it is in early childhood and in old age that it is more liable to be fatal. Bronchitis may often follow exposure to cold, but that low temperature in itself is not sufficient to cause it is shown by the fact that the crews of arctic expeditions have been singularly free from diseases usually attributed to cold, but on their return to moist germ-laden atmospheres have at once been affected. Children reared in heated rooms with lack of ventilation are peculiarly susceptible to attacks on the slightest change of temperature. Bronchitis is also frequently caused by cardiac and renal diseases, and by the extension of inflammatory diseases of the upper air passages (as rhinitis, laryngitis or pharyngitis), while blockage of the nasal passages by adenoid or other growths may, by causing persistent mouth-breathing, lead to bronchial infection. Before the bacterial origin of disease was understood, bronchitis was attributed solely to what is termed "catching cold," and the exact relation of the chill to the bacterial infection is still unknown. It is probable that the chilling of the surface of the body by exposure causes congestion of the mucous membrane, the presence of a virulent micro-organism being then all that is required to produce bronchitis. It is generally accepted that in persons living in the pure air of the country the small bronchi and air-cells are sterile (Barthel in the *Zentralblatt für Bakteriologie*, vol. xxiv.). Bacteria are arrested on their way by the leucocytes of the nasal mucous membrane and by the vibration of the ciliated epithelium of the upper air passages. The mucous membrane of the upper bronchi is, however, tenanted by various micro-organisms such as the diplo-bacillus of Friedländer, bacillus coli communis, micrococcus tetragenus, &c., and it is considered by William Ewart that these organisms may in certain conditions of their host become virulent. "Specific" bronchitis occurs in the course of a specific infective disease (*e.g.* influenza, measles or whooping cough) and is due to the specific micro-organism gaining access by the mucous membrane of the respiratory tract. Cases have been known in which the diphtheria bacillus has been so localized. In glanders, small-pox, syphilis and pemphigus, the infective micro-organism is carried to the bronchi by the blood stream. In common or "non-specific" bronchitis, streptococci, pneumococci and staphylococci are found in the sputum together with Friedländer's bacillus and the bacillus coli communis. Microscopically the bronchi show hyperaemia of the mucous and submucous coats, and the whole wall becomes infiltrated with polymorphonuclear leucocytes and round cells. Many cells undergo mucoid degeneration, and there is abundant epithelial proliferation. A large quantity of mucus is secreted by the glands, and the lumen of the bronchi contains an exudate consisting of mucus, degenerated leucocytes and cast-off epithelial cells.

In the rare form of bronchitis known as fibrinous or plastic bronchitis a membranous exudate is formed which forms casts of the bronchi, which may be coughed up. The casts vary from an inch to six or seven inches in length, with branches corresponding to the divisions of the bronchi from which they come. The cast consists of mucus and fibrin in varying proportions. The exact pathology of this variety is still undetermined.

Bronchitis may affect the whole bronchial tract, or more especially the larger or the smaller tubes. It may occur as an acute or as a chronic affection. In the acute form the inflammation may remain limited to the bronchial tubes and gradually subside, or it may lead to inflammation of the surrounding lung tissue, giving rise to disseminated foci of inflammation of greater or less extent throughout the lungs (catarrhal or bronchopneumonia). This is a common complication of bronchitis, especially where the smaller tubes are affected, and is more frequently seen in children than adults. In cases of chronic bronchitis the affection, as a rule, begins as a slight ailment during the winter, and recurs in succeeding winters. The intervals of freedom from the trouble get shorter, and in the course of a few years it persists during the summer as well as the winter months. A condition of chronic bronchitis is thus established. The persistent cough which this occasions is one of the chief causes of the development of the condition of *emphysema*, where there is a permanent enlargement of the air-cells of the lungs with an atrophy of the walls of the air vesicles. The emphysema occasions an increase in the shortness of breath from which the person had previously suffered, and later, in consequence of the greater difficulty with which the blood circulates through the emphysematous lungs, the right side of the heart becomes dilated, and from that we have the development of a general dropsy of the subcutaneous tissues, and less and less perfect aeration of the blood.

The death rate from bronchitis in England and Wales during 1908 was: males 1102, females 1083 per million living. The death rate for the five years 1901–1905 was 1237 per million for all sexes. The death rate for the twenty years 1888–1908 consistently showed a slight decline.

Diseases of Occupations.—We all inhale a considerable amount of carbonaceous and other foreign particles, which in health are partly got rid of by the action of the ciliated cells lining the bronchial tubes, and are partly absorbed by cells in the wall of the tubes, and carried in the lymph channels to the bronchial lymphatic glands, where they are deposited, and cause a more or less marked pigmentation of the tissues. Part of such pigment is also deposited in the walls of the bronchial tubes and the interstitial tissue of the lungs, giving rise to the grey appearance presented by the lungs of all adults who live in large cities. In certain dusty occupations, such as those of stone masons, knife-grinders, colliers, &c., the foreign particles inhaled cause trouble. The most common affection so produced is chronic bronchitis, to which becomes added emphysema. In some cases not only is bronchitis developed, but the foreign particles lead to an increase of the fibrous tissue round the bronchi and in the interstitial tissue of the lungs, and so to a greater or lesser extent of fibroid consolidation. As this fibrous tissue may later undergo softening and cavities be formed, a form of consumption is produced, which is named according to the particular occupation giving rise to it; *e.g.* stonemasons' phthisis, knife-grinders' phthisis, colliers' phthisis. It should, however, be pointed out that these dusty occupations are probably not so frequently the cause as was at one time taught of these simple inflammatory fibroid changes in the lungs with their subsequent cavity formation; individuals engaged in such occupations are apt to suffer from a chronic tuberculosis of the lung associated with the formation of much fibrous tissue, and the occupation simply predisposes the lung to the attacks of the tubercle bacillus.

Pneumonia.

The term pneumonia is frequently used of different forms of inflammation of the lungs, and includes affections which run different clinical courses, present diverse appearances after death, and probably have different exciting causes. It would be better if the term *acute pneumonia* or *pneumonic fever* were reserved for that form of acute inflammation of the lungs which is usually characterized by sudden onset, and runs an acute course, which terminates generally by crisis from the fifth to the tenth day, the inflammation leading to the consolidation by fibrinous effusion of the greater part or whole of one lobe of a lung. Acute pneumonia usually occurs in a sporadic form, and is most prevalent in the United Kingdom from November to March. Occasionally it is epidemic, and there is evidence to show that sometimes it is an infective disease. There is great difficulty, however, in being quite certain that the occurrence of the disease in those who have been attending upon or brought into intimate connexion with sufferers from pneumonia is the result of infection, for such cases may be due to an epidemic of the disease, or to the various individuals attacked having been exposed to the same cause.

Formerly acute croupous or lobar pneumonia was thought to be due to "catching cold"; we now know it to be an infectious disease resultant on the invasion of one or more specific micro-organisms. The chief micro-organisms which have been found to be present during an attack of acute pneumonia are the micrococcus lanceolatus or pneumococcus of Fränkel and Weichselbaum, which is found in the inflamed lung in a large majority of cases and is capable of producing pneumonia when inoculated into guinea-pigs. Sternberg demonstrated the presence of the pneumococcus in the saliva of healthy individuals; it tends, however, in this case to vary in form. The micro-organism differs in virulence in given strains; thus one epidemic may be more severe than another; and it tends to increase in virulence in its passage through the human subject. The exact conditions necessary for the production of increased virulence in the organism causing an attack of lobar pneumonia are not yet determined, but are usually ascribed to lowered states of the health and to atmospheric conditions. The pneumococcus produces in the human organism an intracellular toxin, but the question as to whether it can also produce a soluble toxin in the living body is still debated. The difficulty of obtaining sufficient quantities of the toxins of this organism has prevented the production of antisera of high potency. In lower animals, less potent sera have proved successful in protecting against a fatal dose of pneumococci. The change effected by the administration of a serum is produced by causing a change in the pneumococci, which causes them to be more easily destroyed by the phagocytes. The element which brings about this change is termed an opsonin; see BLOOD and BACTERIOLOGY (ii). The bacillus pneumoniae of Friedländer is also said to be found in a certain percentage of cases, but a number of observers deny its presence in pure culture in primary croupous pneumonia.

Unlike many acute diseases, pneumonia does not render a person less liable to future attacks; on the contrary, those who have been once attacked must be looked upon as more prone to be affected again. Acute pneumonia usually attacks the whole or greater part of one lobe of one lung, but more than one lobe may be affected, or both lungs may be involved. The disease produces a solid and airless condition of the affected part owing to a fibrinous exudation taking place into the air-cells and smaller bronchial passages. In favourable cases the exudation is partly absorbed and partly expectorated, and the lung returns to its normal healthy condition; in others, death may ensue from the extent of lung affected, or from the spread of the inflammation to other parts, as for instance the pericardium or meninges of the brain. In such cases it is interesting to note that the same micro-organism has been found in the inflammatory exudation in the pericardium or on the meninges as in the pneumonic lung; probably the organism had been absorbed from the lung, and was the cause of the secondary inflammations. In cases of death from uncomplicated pneumonia a very variable extent of lung is involved. In some cases this result may be ascribed to the weakness of the individual and especially of the heart, but in others the virulence of the micro-organisms and the toxins which they have produced is probably the more correct explanation. The improvement in a patient suffering from pneumonia usually commences suddenly, with a rapid fall in the temperature. The day on which this "crisis" takes place varies, but most commonly it appears to be the seventh from the initial rigor (22 % of the cases, Jürgensen). It may, however, occur a few days earlier or later, being observed in about 74 % between the fifth and the ninth day of the disease (Jürgensen). The disease occasionally ends in the formation of an abscess, in gangrene, or in fibroid induration of the lung, but these terminations are rare.

The death rate of acute pneumonia for England and Wales in 1908 was 1383 per million living of the population.

Broncho-pneumonia.—It is usual to recognize a form of inflammation of the lungs which differs from the above lobar pneumonia.

and in which small patches of consolidation are usually scattered throughout the lower lobes of both lungs. This broncho- or catarrhal[1] pneumonia is usually preceded by an attack of bronchitis, to which it bears an intimate relation. In some cases the small foci of inflammation may run together so as to affect the greater part of a lobe of a lung, and the distinction between such a form of broncho-pneumonia and lobar pneumonia presents such difficulties in the view of some observers, that they have refused to recognize any essential difference between the two. Usually, however, it is not difficult to distinguish the two affections both clinically and anatomically. Broncho-pneumonia is especially seen as a complication of bronchitis, and while it more frequently attacks children than young adults, it is not uncommon in old people, especially secondary to bronchitis. It is frequent in children after acute infectious fevers, especially measles and diphtheria, and in cases of whooping-cough. It differs from the above-mentioned pneumonia in that it does not usually attack the whole of a lobe of a lung, but occurs in small disseminated patches more especially throughout the lower lobe of both lungs. The accompanying fever is more irregular than in the preceding form, and the disease usually runs a more prolonged course. It is an extremely fatal affection in both the very young and old. Young persons who have suffered from it are not unfrequently attacked by pulmonary tuberculosis subsequently. It must be admitted that we are even less certain of its bacteriology than we are of that of lobar pneumonia. In some cases Fränkel's pneumococcus is found, and in others various other micro-organisms. Many of the latter are doubtless saprophytic, and are not the essential cause of the disease, but it is not probable that any one particular form of organism accounts for all forms of broncho-pneumonia.

The bacteriology of broncho-pneumonia presents no one micro-organism which can be definitely said to cause the disease. The micro-organism most frequently found, either alone or associated with other bacteria, is the pneumococcus, which occurred in 67% of a series investigated by Wollstein. Other organisms found are the streptococcus, particularly in broncho-pneumonia following infectious fevers, the staphylococcus aureus and albus, and Friedländer's bacillus. In some cases the bacillus influenzae alone has been found, and the Klebs-Löffler bacillus in cases following upon diphtheria. When the disease is associated with pulmonary tuberculosis the tubercle bacillus is found.

Tuberculosis.

The tuberculous virus, the tubercle bacilli, may gain entrance to the lungs through the inspired air or by means of the blood or lymph currents. Also in some cases it has been demonstrated that tubercle bacilli may infect the glands of the mesentery following the ingestion of the milk of tuberculous cattle. In this the Government Commissions of Great Britain and Germany as well as the United States Bureau of Animal Industry confirm the findings of private investigators. It may be well here to summarize the views generally held as to infection. In the first place, the doctrine of inherited disease is discredited, and the doctrine of specific susceptibility is in doubt. Infants are known to be extremely susceptible, and this susceptibility lessens with increasing age, adults requiring prolonged exposure. As a mode of infection the sputum of diseased persons is of great importance. Infected food, especially milk, comes next, together with food infected by flies; and the mother's milk is a minor source. Infection is not often received through the skin, but most frequently through the mucous membrane of the mouth, air passages and intestine; occasionally the infection is alveolar. Pulmonary tuberculosis is often secondary to a latent lymphatic form. The tubercle bacillus was discovered by Koch in 1882, and since then it has become generally accepted that the bacillus varies in type. The bacilli have been classified by A. G. Foullerton into (*a*) occurring in fishes and cold-blooded animals, (*b*) in birds, (*c*) in rats, (*d*) in cattle, (*e*) in man. Exactly how far they are interchangeable and can affect the human race is not definitely settled. They may be different varieties of the same species caused by differentiated strains of a common stock, or may be distinct but generically allied species. Von Behring considers that the bovine type may undergo modification in the human body, a theory which may lead to a complete change in our beliefs in the mode of entry of the bacillus. Recent investigators have put forward the view that the tubercle bacillus is not a bacterium, but belongs to the higher group known as streptotricheae or mould fungi.

The action of the tubercle bacillus upon the tissues, like most other infectious agents, gives rise to inflammatory processes and anatomical changes, varying with the mode of entry and virulence of the micro-organism. The most characteristic result is the formation throughout the lungs in the form of small scattered foci forming the so-called miliary tubercles. Such miliary tuberculosis of the lungs is frequently only a part of a general tuberculosis, a similar tuberculous affection being found in other organs of the body. In other cases the lungs may be the only or the principal seat of the affection. The source whence the tuberculous virus is derived varies in different cases. Old tubercular glands in the abdomen, neck and elsewhere, and tuberculous disease of bones or joints, are common sources whence tubercule bacilli may become absorbed, and occasion a general dissemination of miliary tubercles in which the lungs participate. Where the source of infection is an old tuberculous bronchial gland or a focus of old tubercle in the lung, the pulmonary organs may be the only seat of the development of miliary tuberculosis for a time; but even then, if life is sufficiently prolonged, other parts of the body become involved. Acute miliary tuberculosis of the lungs is not infrequently a final stage in the more chronic tuberculous lesions of the different forms of pulmonary phthisis.

In pulmonary phthisis, or consumption, the disease usually commences at the apex of one lung, but runs a very variable course. In a large majority of cases it remains confined to one small focus, and not only does not spread, but undergoes retrograde changes and becomes arrested. In such cases fibrous tissue develops round the focus of disease and the tuberculous patch dries up, often becoming the seat of the deposit of calcareous salts. This arrest of small tuberculous foci in the lung is doubtless of very frequent occurrence, and in *post mortem* examinations of persons who have died from injuries or various diseases other than tubercle it is common to find in the lungs arrested foci of tubercle, which in the majority of instances have never been suspected during life, and probably have occasioned few, if any, symptoms. It has been shown that in more than 37% of persons, over 21 years of age, dying in a general hospital of various diseases, there is evidence of arrested tubercle in the lungs. As such persons are chiefly drawn from the poorer classes, among whom tubercle is more common than among the well-to-do, this high percentage may not be an accurate indication of the frequency with which pulmonary tubercle does become arrested. It does, however, show that the arrest and the healing of tuberculosis of the lungs is by no means unfrequent, and that it occurs among those who are not only prone to become infected, but whose circumstances are least favourable to the arrest of the disease. These facts indicate that the human organism does offer a resistance to the growth of the tubercle bacilli.

A focus of pulmonary tubercle may become arrested for a time and then resume activity. In many cases it is difficult to say why this is so, but often it is clearly associated with a lowering in the general health of the individual. It cannot be too strongly insisted that the arrest of a tuberculous focus in the lung is a slow process and requires a long time. Commonly a person in the early stage of phthisis goes away to a health resort, and in the course of a few weeks or months improves so much that he returns to a densely populated town and resumes his former employment. In a short time the disease shows renewed activity, because the improved conditions were not maintained long enough to ensure the complete arrest of the disease.

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[1] The term catarrhal pneumonia has been usually regarded as synonymous with the term broncho-pneumonia, and this usual nomenclature has been maintained in the present article. We must, however, recognize that all simple acute broncho-pneumonias are not purely catarrhal in the strict pathological sense. For instance, a considerable amount of fibrinous exudation is not unfrequently present in the patches of broncho-pneumonia, and some of the cases of septic broncho-pneumonia can scarcely be accurately termed *catarrhal*.

Instead of the tuberculous focus becoming arrested, it may continue to spread. The original focus and the secondary ones are at first patches of consolidated lung. Later, their central parts soften and burst into a bronchus; then the softened portion is coughed up, and a small cavity is left, which tends gradually to increase in size by peripheric extension and by merging with other cavities. This process is repeated again and again, and sooner or later the other lung becomes similarly affected. At any stage of the softening process the blood vessels may become involved and give rise by rupture to a large or a small haemorrhage (*haemoptysis*). It not unfrequently happens that such haemoptysis may be the first symptom that seriously attracts attention. At a later period haemorrhage frequently takes place in large or small amounts from the rupture of vessels, which frequently are dilated and form small aneurysms in the walls of cavities. A fatal termination may be hastened by the absorption by means of the blood vessels and lymphatics of the tuberculous virus from some of the foci of disease, and the occurrence therefrom of a local miliary tuberculosis of the lungs or a general tuberculosis of other organs. The rapidity with which the destructive process spreads throughout the lung varies considerably. We therefore recognize acute phthisis, or galloping consumption, and chronic phthisis. In the acute cases the softening progresses rapidly and is associated with the development of very little fibrous tissue; probably various forms of micro-organisms other than the tubercle bacilli assist in the rapid softening. In the more chronic cases there is development of much fibroid tissue, and the disease is associated with periods of temporary arrest of the tubercular process.

The expectoration from cases of pulmonary phthisis contains tubercle bacilli, and is a source of danger to healthy individuals, in whom it may produce the disease. Attendance on persons suffering from pulmonary phthisis involves very little risk of infection if proper care is taken to prevent the expectoration becoming dry and disseminated as dust; perfect cleanliness is therefore to be insisted upon in the rooms inhabited by a phthisical person. The tubercle bacilli soon lose their virulence in the presence of fresh air and sunshine, and therefore these agents are not only desirable for the direct benefit of the phthisical patient, but also are agents in preventing the development of fresh disease in healthy individuals.

Although the tubercle bacilli are the essential agents in the development of pulmonary tuberculosis, there are other conditions which must be present before they will produce the disease. It is probable that large numbers of individuals are exposed to the action of tubercle bacilli which gain entrance to the pulmonary tract, and yet do not give rise to the disease, because the conditions of their growth and multiplication do not exist. In such cases we may consider that the seed is present, but that the soil is unsuitable for its growth. Certain families appear more predisposed to tuberculosis than others.

Congestion. The most important circulatory disturbances met with in the lungs are those seen in cases of dilated heart, with or without disease of the mitral valve, when engorgement of the pulmonary vessels sets up a condition of venous engorgement of the lungs. This may lead to various changes. After it has lasted a variable time, and if it is very intense, serous transudation occurs into the substance of the lung and the alveoli, and thus a condition of pulmonary dropsy or oedema is established. The venous engorgement also predisposes the subjects of such heart affections to bronchitis and pneumonia. In disease of the mitral valve, in cardiac dilatation and in simple feebleness of the heart, such as is seen in old age and after debilitating fevers, especially typhoid, there is commonly developed a venous congestion of the bases of the lungs, forming the so-called hypostatic congestion of those organs, and to this is frequently added pneumonia. In long-standing cases of pulmonary congestion brought about by disease of the mitral valve and dilatation of the heart, a certain amount of fibrous tissue may be found in the interstitial tissue of the lungs, and from transudation of certain elements of the blood we get the formation in the newly formed fibrous tissue of blood pigment. In these cases blood pigment is found in the cells, in the pulmonary alveoli, and such cells also carry the pigment into the interstitial tissue. This condition constitutes the state known as *brown induration of the lungs*. Acute congestion of the lungs occurs as part of the first stage of pneumonia. It also probably exists during violent exertion, and may possibly be brought about by excitement.

Embolism and Thrombosis. Another circulatory disturbance of great importance is that arising from blocking of the pulmonary artery or its branches by an embolus or a thrombus. Where the obstruction takes place in the main vessel, death rapidly ensues. Where, however, a small branch of the vessel is occluded, as frequently occurs from a coagulum forming in the right side of the heart, or in the pulmonary vessels in cases of disease of the mitral valve, or in dilatation of the heart, or from the detachment of a small vegetation from disease of the tricuspid or pulmonary valves, a haemorrhagic exudation takes place, forming a patch of consolidation in the lung (*haemorrhagic infarct*). As this haemorrhagic exudation takes place not only into the substance of the lung, but also into the bronchial tubes, such lesions are usually associated with spitting of blood (*haemoptysis*). The increased tension produced in the pulmonary vessels in cases of mitral disease may also probably lead to the formation of haemorrhagic exudations into the lungs, apart from the occurrence of embolism or thrombosis. Usually the occurrence of pulmonary embolism and the formation of haemorrhagic infarcts in the lungs mark an important epoch in the course of a case of heart disease. It usually occurs at a late stage of the affection, and not unfrequently contributes materially to a fatal termination. It is probable that many of the cases of pneumonia and pleuritic effusion, coming on in cases of valvular heart disease and of cardiac dilatation, owe their origin to an embolus and to the formation of a haemorrhagic infarct.

Asthma. The term asthma is commonly applied to a paroxysmal dyspnoea of a special type which is associated with a variety of conditions. In true spasmodic asthma there may be no detectable organic disease, and the paroxysms are generally believed to be due to a nervous influence which, acting upon the bronchial muscles, produces a spasm of the tubes, or, acting through the vaso-motor branches of the sympathetic, produces a congestion of the bronchial mucous membrane. The most probable theory is that lately advanced, that it is caused by a profound toxaemia. An organism has been isolated, which is said to be the cause of certain cases of asthma, and the fact that benefit has been said to follow treatment by a vaccine is in favour of this view. The exciting cause may not be at all apparent, even on the most careful observation and examination of the sufferer, but in other cases the attacks may be brought about by some reflex irritation. Nasal polypi and other diseases of nasal mucous membrane have been shown in some cases to be a cause of asthma. Irritation of the bronchial mucous membrane appears to be one of the most common, but it is usually difficult to say exactly in what the irritation consists.

The sputum in true asthma is typical, consisting of white translucent pellets like boiled tapioca. These pellets consist of mucus arranged in a twisted manner and known as Curschmann spirals; they also contain Charcot-Leyden crystals, degenerated epithelium and leucocytes, of which the majority are eosinophiles. The spirals consist of a central solid thread round which the mucus is arranged in spiral form. The twisting has been attributed to a rotatory motion of the cilia, helped by the spasm of the bronchial muscles. Allied to true asthma is the bronchial asthma frequently met with in the subjects of bronchitis and emphysema. In such cases the irritation evidently proceeds from the inflamed bronchial mucous membrane. Hay asthma is the variety in which the pollen of certain plants, especially grasses, is the exciting cause of the paroxysms. In cardiac feebleness, in valvular disease of the heart, and in cardiac dilatation, we may get dyspnoeic attacks of a more or less paroxysmal nature, to which the term cardiac asthma has been applied. Similarly, to a form of dyspnoea met with occasionally as a manifestation of uraemia in chronic Bright's disease the term of renal asthma has been given.

Pleurisy.

Pleurisy, or inflammation of the pleura, is a very common affection, and is met with under different forms. In many instances we have simply the pouring out, over a greater or less area of the surface of the pleura, of a fibrinous exudation which may become absorbed or undergo organisation, a certain amount of thickening of the pleura, and adhesions of the two layers resulting. Such cases form the group known as cases of dry pleurisy. In other instances a greater or lesser amount of serous exudation takes place into one or other pleural cavity, forming the cases of serous pleuritic effusion. In others the exudation into the pleural cavity is purulent, giving rise to the condition known as empyema or purulent pleuritic effusion. The occurrence of dry pleurisy is probably very frequent, and leads to small pleural adhesions which cause little or no inconvenience. In post-mortem examinations of persons who have died from various diseases it is common to find such pleural adhesions present, although they have never been suspected during life. Pleurisy in one or other of the above forms may come on in a person apparently in good health (idiopathic pleurisy), or it may follow a fracture of the ribs or other injury to the chest. It is not uncommonly secondary to some other disease; thus it is almost a constant accompaniment of acute lobar pneumonia. In such cases the effusion is most commonly a simple fibrinous one, which with the subsidence of the primary disease is in great part absorbed. In other cases of pneumonia we get a certain amount of serous effusion into the pleura; and sometimes, especially in children, the pneumonia is followed by the development of an empyema. Pleurisy with effusion is also frequently a complication of valvular heart disease and dilatation of the heart, and in such cases is often associated with the formation of superficial pulmonary infarcts. It is also seen in many other diseases of the lungs. For instance, in chronic pulmonary phthisis pleuritic adhesions over various parts of the lungs are the rule; and we also frequently get serous effusion into the pleura as a complication of the various forms of pulmonary tuberculosis. Purulent effusion is less common in phthisis, but it is the rule where the pleura is perforated by the necrosis of a tuberculous focus in the lung and the establishment of a communication between the pleura and a tuberculous cavity and the bronchial tubes (*pyopneumonothorax*), a combination in which there is both air and pus in the pleural cavity. Secondary pleurisy is also seen in an extension of the disease from neighbouring parts, as from peritonitis, sub-diaphragmatic abscess, and suppuration in the liver or spleen. As a secondary disease, pleurisy is also known in the course of various forms of nephritis, rheumatism, and the acute specific diseases.

Cases formerly classed as idiopathic pleurisy are now known to be caused by certain micro-organisms. These vary in relation to the character of the effusion. The most frequent is the tubercle bacillus, which is generally present in sero-fibrinous effusions. In this case the pleurisy is really secondary to a possibly unrecognized tuberculous infection either of the lung or pleura. In purulent effusions the pneumococcus may occur as a pure infection, or the streptococcus pyogenes or the staphylococcus may be present. Mixed infections occur in 21% of purulent effusions, and varieties of other organisms, such as the influenza bacillus, the typhoid bacillus, the Klebs-Löffler bacillus and the colon bacillus, have been occasionally found.

There are at least five types of pulmonary emphysema; (1) hypertrophic, idiopathic or large-lunged emphysema; (2) senile or small-lunged emphysema; (3) compensatory emphysema; (4) acute vesicular emphysema; (5) interstitial or interlobular emphysema. Two points are usually admitted: that emphysema appears only in lungs that are congenitally weak, and that the exciting cause is increased intravesicular tension. When one or more lobules are cut off from the working part of the lung the neighbouring vesicles become distended. Should the plugging of the lobule remain permanent, typical emphysema results. This happens in illnesses inducing violent respiratory efforts, such as chronic bronchitis, whooping cough and asthma. In large-lunged emphysema the lung is excessively large, and does not collapse on opening the chest wall. Microscopically two lesions are notable. The septa between the vesicles are atrophied, many have disappeared and the vesicles have coalesced; the loss in lung tissue diminishes the vascular field of the lung and tends to imperfect aeration, whence the dyspnoea. The elastic tissue of the lung is also lost. In small-lunged emphysema there is a condition of senile atrophy. The lung is smaller than normal, and the intravesicular septa are destroyed. In this case the primary cause is atrophy of the bronchi, and increased air pressure is not a factor. Compensatory emphysema is that which develops in a portion of a lung in which the other portion is the seat of a lesion, such as pneumonia. Occasionally it is merely physiological, but sometimes here too the septa undergo atrophic changes. Acute vesicular emphysema is hardly a pathological variety, and is really rapid distension coming on during an attack of asthma or angina pectoris. The variety is temporary only. Interstitial emphysema is characterized by the presence of air in the interstitial connective tissue of the lung. It is usually due to rupture of the air vesicles during paroxysms of coughing.

(T. H.*; H. L. H.)

(5) Surgery of the Respiratory System

About the middle of the 19th century, Manuel Garcia demonstrated the working of the vocal cords in the living subject, by placing a flat mirror of about the size of a shilling at the back of the mouth, and throwing strong light on to it from a concave mirror fixed upon the observer's forehead. By the use of a laryngoscope and a cocaine spray the most irritable throat can now be made tolerant of the presence of the small mirror, and thus the medical man is enabled to make a prolonged and thorough examination of the interior of the larynx and even to perform delicate operations upon it. Foreign bodies which have become caught in the larynx can thus be seen and extracted, and small growths can be satisfactorily removed even from the vocal cords themselves.

A foreign body in the air-passages may be impacted above the vocal cords, and the prompt thrusting down of a finger may dislodge it and save the person from death by suffocation. If there is doubt as to the site of the impaction, and the symptoms are urgent (as is likely to be the case) immediate *laryngotomy* should be done. In this operation a tube is introduced through the crevice which can easily be felt in the middle line of the neck, between the thyroid and cricoid cartilages. The procedure is easily and quickly accomplished. It is, moreover, often resorted to when the surgeon is about to perform some extensive operation in the mouth which must needs be accompanied by free haemorrhage. Laryngotomy having been done, and the pharynx having been plugged with gauze, the air passages can be kept free of blood during the whole operation.

If the foreign body be such a thing as a button, cherry-stone, sugar-plum or coin, it may at once set up alarming symptoms of spasmodic suffocation. But when the first alarm has quieted down, the attacks are likely to be only occasional, as when the article, drawn up with the expired air, comes in contact with the under aspect of the vocal cords. It may be that in a violent fit of coughing it will be expelled, but, if not, the surgeon must be at hand ready to perform tracheotomy when the urgency of the symptoms demands it. *Tracheotomy* is the making of an opening into the trachea, the air-tube below the larynx. It is unsafe to leave a child with a foreign body loose in its windpipe, on account of the risk of sudden and fatal asphyxia. Possibly the X-rays may show its exact position and give help in its removal. But, in any case, the safest thing will be to perform tracheotomy and to leave the edges of the opening into the windpipe wide asunder, so that the object may be coughed out —the nurse being on guard all the while. The operation of tracheotomy is sometimes urgently called for in the case in which the air-way has become blocked by a child having sucked hot water from the spout of a kettle or teapot, or in the case of obstruction by the swelling of the acute inflammation of laryngitis or of diphtheria. Should the air-way through the larynx become narrowed by the presence of a growth which does not diminish under the influence of iodide of potassium, the question may arise as to whether it should be dealt with by splitting the thyroid cartilage and holding the wings apart, or by the removal of the whole larynx. For such growths are often malignant. If the wide infection of the lymphatic glands of the neck suggests that no radical operation should be undertaken, a bent silver tube may be introduced below the growth (tracheotomy) in order to provide for the entrance of air. This will get over the difficulty of breathing, but it cannot, of course, do more than that.

Acute laryngitis is very often due to diphtheria. The symptoms are those of laryngeal obstruction, together with constitutional disturbances of various kinds. The old-fashioned nurse called the disease "croup"—a term devoid of scientific meaning (see DIPHTHERIA). In an ordinary catarrhal case, leeches and fomentations may suffice, though sometimes tracheotomy or intubation is called for. But if bacteriological examination shows the presence of diphtheritic bacilli, antitoxin must at once be injected. (See also LUNG.) (E. O.*)

RESPITE (O. Fr. *respit*, modern *répit*, Lat. *respectus*, regard, consideration, *respicere*, to look back at), properly a delay, given for the further consideration of some matter, hence relief. In law the term is used of the postponement of the immediate execution of the law in criminal cases, *e.g.* by binding a convicted prisoner over to come up for judgment when called upon, or when a case is "respited" from one quarter sessions to another. The word is loosely used in the sense of a "reprieve" (*q.v.*).

RESPOND, in architecture, the term given to the half-pier or semi-detached column at the end of a range of piers or columns carrying an architrave or arcade. In Greek temples the respond is known as the *anta*. The term is also given to the wall pilaster which in Roman and Renaissance work is frequently placed behind the detached columns forming the decoration of a wall.

RESPONDENT (from Lat. *respondere*, to answer), strictly, one who answers; in law one called upon to answer a petition or other proceeding. In a matrimonial cause the defendant in the suit is called the respondent. The defendant to a quarter sessions appeal is called the respondent, and so generally in appeals is the party, whether plaintiff or defendant, against whom the appeal is brought.

REST (O. Eng. *ræst*, *reste*, bed, cognate with other Teutonic forms, *e.g.* Ger. *Rast*, *Rüste*, rest, and probably Gothic *Rasta*, league, *i.e.* resting or stopping place), a cessation from active or regular work, hence a time of relief from mental or manual labour. Specific meanings are for an interval of silence in music, marked by a sign indicating the length of the pause; for the forked support with iron-shod spike carried by the soldier till the end of the 17th century as a rest for the heavy musket; and for the support for the cue in billiards to be used when the striking ball is out of reach of the natural rest formed by the hand. In the medieval armour of the horsed man-at-arms, and later in the armour of the tournament, a contrivance was fixed to the side of the body-armour near the right arm-pit, in which the butt-end of the lance was placed to prevent the lance being driven back after striking the opponent at full charge; hence a knight, as a preliminary to the charge, "laid his lance in rest." This "rest" is a shortened form of "arrest," to check, stop, as is seen by the French equivalent, *arrêt*. Further, "rest," that which remains over and above, is derived from the French *rester*, to remain over, Lat. *restare*, to remain, literally, to stay behind. The principal specific use of this word is in commerce for the balance of undivided profit; it has thus always been the term used by the Bank of England for that which in other banks and companies is called the "reserve" (Hartley Withers, *The Meaning of Money* (1909), p. 298). The Bank of England "rest" is never allowed to fall below £3,000,000 (see BANKS AND BANKING).

RESTIF, NICOLAS EDME (1734–1806), called RESTIF DE LA BRETONNE, French novelist, son of a farmer, was born at Sacy (Yonne) on the 23rd of October 1734. He was educated by the Jansenists at Bicêtre, and on the expulsion of the Jansenists was received by one of his brothers, who was a curé. Owing to a scandal in which he was involved, he was apprenticed to a printer at Auxerre, and, having served his time, went to Paris. Here he worked as a journeyman printer, and in 1760 he married Anne or Agnes Lebègue, a relation of his former master at Auxerre. It was not until five or six years after his marriage that Restif appeared as an author, and from that time to his death, on the 2nd of February 1806, he produced a bewildering multitude of books, amounting to something like two hundred volumes, many of them printed with his own hand, on almost every conceivable variety of subject. Restif suffered at one time or another the extremes of poverty and was acquainted with every kind of intrigue. He drew on the episodes of his own life for his books, which, in spite of their faded sentiment, contain truthful pictures of French society on the eve of the Revolution. The most noteworthy of his works are *Le Pied de Fanchette*, a novel (1769); *Le Pornographe* (1769), a plan for regulating prostitution which is said to have been actually carried out by the Emperor Joseph II., while not a few detached hints have been adopted by continental nations; *Le Paysan perverti* (1775), a novel with a moral purpose, though sufficiently horrible in detail; *La Vie de mon père* (1779); *Les Contemporaines* (42 vols., 1780–1785), a vast collection of short stories; *Ingénue Saxancour*, also a novel (1785); and, lastly, the extraordinary autobiography of *Monsieur Nicolas* (16 vols., 1794–1797; the last two are practically a separate and much less interesting work), in which at the age of sixty he has set down his remembrances, his notions on ethical and social points, his hatreds, and above all his numerous loves, real and fancied. The original editions of these, and indeed of all his books, have long been bibliographical curiosities owing to their rarity, the beautiful and curious illustrations which many of them contain, and the quaint typographic system in which most are composed. In 1795 he received a gratuity of 2000 francs from the government, and just before his death Napoleon gave him a place in the ministry of police, which he did not live to take up.

Restif de la Bretonne undoubtedly holds a remarkable place in French literature. He was inordinately vain, of extremely relaxed morals, and perhaps not entirely sane. His books were written with haste, and their licence of subject and language renders them quite unfit for general perusal.

The works of C. Monselet, *Rétif de la Bretonne* (1853), and P. Lacroix, *Bibliographie et iconographie* (1875), J. Assézat's selection from the *Contemporaines*, with excellent introductions (3 vols., 1875), and the valuable reprint of *Monsieur Nicolas* (14 vols., 1883–1884), will be sufficient to enable even curious readers to form a judgment of him. His life, written by his contemporary Cubières-Palmezeaux, was republished in 1875. See also Eugen Dühren, *Rétif de la Bretonne, der Mensch, der Schriftsteller, der Reformator* (Berlin, 1906), and a bibliography, *Rétif-Bibliothek* (Berlin, 1906), by the same author.

RESTOUT, JEAN (1692–1768), French painter, born at Rouen on the 26th of March 1692, was the son of Jean Restout, the first of that name, and of Marie M. Jouvenet, sister and pupil of the well-known Jean Jouvenet. In 1717, the Royal Academy having elected him a member on his work for the *Grand Prix*, he remained in Paris, instead of proceeding to Italy, exhibited at all the salons, and filled successively every post of academical distinction. He died on the 1st of January 1768. His works, chiefly altar-pieces (Louvre Museum), ceilings and designs for Gobelin tapestries, were engraved by Cochin, Drevet and others; his diploma picture may still be seen at St Cloud.

His son, JEAN BERNARD RESTOUT (1732–1797), won the *Grand Prix* in 1758, and on his return from Italy was received into the Academy; but his refusal to comply with rules led to a quarrel with that body. Roland appointed him keeper of the Garde Meuble, but this piece of favour nearly cost him his life during the Terror. The St Bruno painted by him at Rome is in the Louvre.

RESTRAINT (from "to restrain," Lat. *restringere*, to hold back, prevent), in law, a restriction or limitation. The word is used particularly in three connexions: 1. *Restraint on Anticipation.* Although it is a principle of English law that there can be no restriction of the right of alienation of property vested in any person under an instrument, equity makes an exception in the case of a married woman, and has laid down the rule that property may be so settled to the separate use of a married woman that she cannot, during coverture, alienate it or anticipate the income. Restraint on anticipation attaches only during coverture and is therefore removed on widowhood, but it may attach again on remarriage. By the Conveyancing Act 1881, s. 39, a court may however, if it thinks fit, by judgment or order bind a married woman's interest in her property, with her consent, if it appears to be for her benefit, notwithstanding that she is restained from anticipating.

2. *Restraint of Marriage.*—A gift or bequest to a person may have a condition attached in restraint of marriage. This condition may be either general or partial. A condition in general restraint of marriage is void, as being contrary to public policy, although a condition in restraint of a second marriage is not void. A condition in partial restraint of marriage is valid, and may be either to restrain marriage with a particular class of persons, *e.g.* a papist, a domestic servant, or a Scotsman, or under a certain age.

3. *Restraint of Trade.*—A contract in general restraint of trade is void as being against public policy. In the leading case of *Mitchell* v. *Reynolds*, 1711, 1 Smith L.C., it was laid down that "it is the privilege of a trader in a free country, in all matters not contrary to law, to regulate his own mode of carrying it on according to his own discretion and choice. If the law has regulated or restrained his mode of doing this, the law must be obeyed. But no power short of the general law ought to restrain his free discretion." It has been suggested that the rule dates from a time when a covenant by a man not to exercise his own trade meant a covenant not to exercise any trade at all—every man being obliged to confine himself to the trade to which he had been apprenticed. However, contracts which are only in partial restraint of trade are good. A contract not to carry on the business of an ironmonger would be bad; but a contract made by the seller of an ironmonger's business not to compete with the buyer would be good. To make such a contract binding it must be founded on a valuable consideration and must not go beyond what is reasonably necessary for the protection of the other party. This is the tendency also of the law in the United States.

See Matthew on *Restraint of Trade* (1907).

RESZKE, JEAN DE (1850–), operatic singer, was born at Warsaw on the 14th of January 1850. His parents were Poles; his father was a state official and his mother a capable amateur singer, their house being a recognized musical centre. After singing as a boy in the Cathedral of Warsaw, he studied law in the university there, but in a few years he abandoned this and went to Italy to study singing. He made his first public appearance, as a baritone, at Venice in January 1874, as Alfonso in *La Favorita*, and in the following April he sang for the first time in London, appearing at Drury Lane Theatre, and a little later in Paris. He was not entirely successful and retired for a further period of study, during which his voice gained remarkably in the upper register; so that when he made his first reappearance at Madrid in 1879 it was as a tenor, in the title-rôle of *Robert le Diable*. Jean de Reszke's great fame as a singer dates from this time. For several seasons he sang regularly in Paris, and he reappeared at Drury Lane in 1887 as Radames. In the next year he was again in London, this time at Covent Garden as Vasco da Gama; this appearance was mainly responsible for the revival of the opera as a fashionable amusement in London. He appeared in London nearly every year from this date until 1900. In 1891 he visited America, and from 1893 to 1899 he was welcomed each year at the Metropolitan Opera House in New York. Jean de Reszke's most successful parts were the title-rôle of *Le Cid*, which was written for him by Massenet, and those of Romeo, Lancelot in *Elaine*, and Lohengrin, Walther von Stolzing, Siegfried and Tristan in Wagner's operas. In 1904 illness compelled him to retire from the stage, and he subsequently divided his time between teaching singing in Paris and breeding race-horses in Poland.

Jean de Reszke's younger brother, EDOUARD, born at Warsaw on the 23rd of December 1855, is also famous as an operatic singer. He appeared for the first time in Paris in April 1896, and has since sung with his brother for many seasons both in London and in New York. His magnificent bass voice and admirable technique earned him fame in such parts as those of Mephistopheles in *Faust*, Charles V. in Marchetti's *Don Giovanni d' Austria*, Walter in *Tell*, the Count in *Sonnambula*, Prince Gudal in *Demonio*, and Hans Sachs, King Mark, Hunding and Hagen in Wagner's operas.

RETABLE (Fr. *rétable*, a shortened form derived from Med. Lat. *retrotabulum*), a term of ecclesiastical art and architecture, applied in modern English usage to an altar-ledge or shelf, raised slightly above the back of the altar or communion table, on which are placed the cross, ceremonial candlesticks and other ornaments. Retables may be lawfully used in the church of England (*Liddell & Beale*, 1860, 14 P.C.).

Foreign usage of the term, as in French, is different, and where the word is kept with this foreign application, the distinction should be observed. The Med. Lat. *retrotabulum* (modernized *retabulum*) was applied to an architectural feature set up at the back of an altar, and generally taking the form of a screen framing a picture, carved or sculptured work in wood or stone, or mosaic, or of a movable feature such as the famous *Pala d' Oro* in St Mark's, Venice, of gold, jewels and enamels. The foreign "rétable" is, therefore, what should in English be called a "reredos" (*q.v.*), though that is not in modern usage a movable feature.

RETAIL, the sale of goods or commodities in small quantities to the immediate consumer, opposed to a sale wholesale or in gross. The O. Fr. *retaille*, from which the word is taken, meant a piece cut off, from *tailler*, to cut, Med. Lat. *taleare*, Lat. *talea*, a rod, cutting for planting. The English meaning appears in Anglo-French and in the Italian *retaglio*, selling by the piece. The other meaning of "retail," to repeat a story, is a transferred sense of an early meaning, "to sell at second hand." The Latin source is also seen in the related words "entail," "tailor," "detail" and "tally."

RETAINER (from "retain," Lat. *retinere*, to hold back, keep), properly the act of retaining or keeping for oneself, or a person or object which retains or keeps; historically, a follower of a house or family, and particularly used of armed followers attached to the barons of the middle ages. John Cowell, in *The Interpreter* (1607), defines "retainer" as a "servant not meniall nor familiar, that is, not continually dwelling in the house of his lord or master, but onely using or bearing his name or livery."

Retainer of Counsel.—When it is considered desirable by a litigant that the services of any particular counsel (barrister) should be obtained for the conduct of his case, it is necessary to deposit with counsel a form of retainer together with the necessary fee in cash, from which time counsel is bound to give the party who has thus retained him the first call on his services in the matter in which he has been retained. Retainers are either *general* or *special*. A general retainer is one which retains counsel for all proceedings in which the person retaining is a party, and lasts for the joint lives of client and counsel. If any other person offers a special retainer or brief against the general retainer, counsel must give the general retainer notice of such offer—and if after a reasonable time the general retainer does not himself specially retain or brief counsel, the general retainer is forfeited. A special retainer is one which only applies to some particular cause or action. It can only be delivered after the action is begun, and gives the client a right to the services of counsel throughout the course of the action, and counsel is entitled to be briefed on all occasions to which the retainer applies. Retainer rules were drawn up in 1901 by the Bar Committee, read by the Bar Council and approved by the Attorney-General and the Council of the Incorporated Law Society in 1902. They may be found in the *Annual Practice.*

Retainer of Debt.—In connexion with the administration of an estate under a will, it is the right of the personal representative—whether executor or administrator—of a deceased person to retain legal assets which have come into his hands towards the payment of a debt due to himself as against creditors of an equal degree, and this even though his debt is barred by the Statutes of Limitation. The privilege arose in all probability from the inability of the representative to sue himself, though it has been suggested that it is merely a corollary to the right of the representative to prefer one creditor to another of equal degree.[1] The principle of retainer is not looked upon with favour by courts of equity, and consequently it has long been the rule that there is no right to retain out of equitable assets. It was thought that the effect of the Land Transfer Act 1897 was to make all the assets of the deceased legal assets, and so extend the privilege to reality which had till then been exempt; this view, however, has been repudiated by the courts of equity, and it must now be taken that there is still no right to retain out of real estate.[2] It is a rule of the probate division to require a creditor administrator, to whom letters of administration are granted, to enter into a bond with two sureties not to prefer himself. This course, however, is not followed where administration is granted to a person as next of kin who happens also to be a creditor.

The privilege is not lost by judgment for an account being given in a suit by other creditors for the administration of assets; and the representative may retain out of assets which come to his hand subsequent to such judgment. On the other hand, the appointment of a receiver deprives the representative of his right except as regards assets which come to his hands prior to the appointment of the receiver.

RETALIATION, repayment of like with like, especially the return of hostile action, injuries or wrongs by similar action or injury, as in the primitive theory of punishment, an "eye for an eye," "tooth for a tooth." The Late Lat. *retaliare* was formed from *talis*, such as, of the same quality as; and this source also gave *talio*, *talionis*, the name of this type of punishment. (See PUNISHMENT, THEORY OF, and ROMAN LAW, § *The Twelve Tables.*) A special form of retaliation is familiar in the imposition of differential import duties against the goods of a particular country (see TARIFFS and PROTECTION).

RETENE (methyl isopropyl phenanthrene), $C_{18}H_{18}$, a hydrocarbon present in the coal-tar fraction, boiling above 360° C.; it also occurs in the tars obtained by the distillation of resinous woods. It crystallizes in large plates, which melt at 98·5° C. and boil at 390° C. It is readily soluble in warm ether and in hot glacial acetic acid. Sodium and boiling amyl alcohol reduce it to a tetrahydroretene, whilst if it be heated with phosphorus and hydriodic acid to 260° C. a dodecahydride is formed. Chromic acid oxidizes it to retene quinone, phthalic acid and acetic acid. It forms a picrate which melts at 123–124° C.

RETFORD (officially EAST RETFORD), a market town and municipal borough in the Bassetlaw parliamentary division of Nottinghamshire, England, 138½ m. N. by W. from London by the Great Northern railway, the station being a junction with the Great Central railway. Pop. (1901) 12,340. The church of St Swithin dates from the 13th century, but was rebuilt in 1658 by a brief granted by Richard Cromwell. Modern buildings are the town hall, the corn exchange, the court house, and the covered markets. There is a large trade in corn and cheese, and the town possesses iron foundries, paper and corn mills, and india-rubber works. The town is governed by a mayor, 6 aldermen, and 18 councillors. Area, 4656 acres.

The situation of Retford (*Redforde*, *Ratford*), near one of the Roman roads and on the river Idle, where there was possibly a ford, may account for its origin. In 1086 the archbishop of York owned a mill at Retford, and Roger de Busli had rights here. Retford was a borough by prescription, and was in the hands of the crown when, in 1276, Edward I. granted it to the burgesses in fee-farm with the right of electing bailiffs. This charter was confirmed by Edward III., Henry VI. and Elizabeth. In 1607 James I. granted a charter of incorporation to the bailiffs and burgesses, under which the town was governed until 1835, when it was reincorporated under a mayor. East Retford returned two members to parliament in 1315, and again from 1572 till 1885, when it was disfranchised. Henry III. granted the burgesses an eight-days' fair at Holy Trinity, altered by Edward II. to St Gregory. Edward III. granted a six-days' fair at St Margaret, and Henry VI. a four-days' fair at St Matthew. Fairs are now held in March, June, July and December. The market held on Saturdays by prescription was sanctioned by Edward III. and still exists.

RETHEL, ALFRED (1816–1859), German historical painter, was born at Aix-la-Chapelle in 1816. He very early showed an interest in art, and at the age of thirteen he executed a drawing which procured his admission to the academy of Düsseldorf. Here he studied for several years, and produced, among other works, a figure of St Boniface which attracted much attention. At the age of twenty he removed to Frankfort, and was selected to decorate the walls of the imperial hall in the Römer with figures of famous men. At the same period he produced a series of designs illustrative of Old Testament history. Four years later he was the successful competitor for the work of ornamenting the restored council house of his native city with frescoes depicting prominent events in the career of Charlemagne, but the execution of this work was delayed for some six years. Meanwhile Rethel occupied himself with the production of easel pictures and of drawings; and in 1842 he began a striking series of designs dealing with the "Crossing of the Alps by Hannibal," in which the weird power which animates his later art becomes first apparent. In 1844 Rethel visited Rome, executing, along with other subjects, an altar-piece for one of the churches of his native land. In 1846 he returned to Aix, and commenced his Charlemagne frescoes. But mental derangement, remotely attributable, it is believed, to an accident from which he suffered in childhood, began to manifest itself. While he hovered between madness and sanity, Rethel produced some of the most striking, individual and impressive of his works. Strange legends are told of the effect produced by some of his weird subjects. He painted "Nemesis pursuing a Murderer"—a flat stretch of landscape, with a slaughtered body, while in front is the assassin speeding away into the darkness, and above an angel of vengeance. The picture, so the story goes, was won in a lottery at Frankfort by a personage of high rank, who had been guilty of an undiscovered crime, and the contemplation of his prize drove him mad. Another design which Rethel executed was "Death the Avenger," a skeleton appearing at a masked ball, scraping daintily, like a violinist, upon two human bones. The drawing haunted the memory of his artist friends and disturbed their dreams; and, in expiation, he produced his pathetic design of "Death the Friend." Rethel also executed a powerful series of drawings—"The Dance of Death"—suggested by the Belgian insurrections of 1848. It is by such designs as these, executed in a technique founded upon that of Dürer, and animated by an imagination akin to that of the elder master, that Rethel is most widely known. He died at Düsseldorf on the 1st of December 1859.

His picture of "Peter and John at the Beautiful Gate of the Temple," is preserved in the Leipzig Museum, and his "St Boniface" and several of his cartoons for the frescoes at Aix in the Berlin National Gallery. His Life, by Wolfgang Müller von Königswinter, was published in 1861. See also *Art Journal*, November 1865.

RETHEL, a town of N. France, capital of an arrondissement in the department of Ardennes, on the right bank of the Aisne and the Ardennes canal, 31 m. S.W. of Mézières by rail. Pop. (1906) 5254. The church of St Nicholas was formed by the amalgamation of two churches, the oldest of which dates from the 13th century. Rethel has a subprefecture, a tribunal of first instance, a board of trade arbitration, a chamber of arts and manufactures and a school of agriculture, and carries on wool-spinning, the weaving of light woollen fabrics, and the manufacture of millboard and farm implements.

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[1] Per Jessel, M.R. *Talbot* v. *Frere* (1879), L.R. 9. C.D. 568, 574.

[2] *In re Williams; Holder* v. *Williams* (1904), 1 Ch. 52.

Rethel (*Castrum Retectum*), of Roman origin, was from the end of the 10th century the seat of a countship which passed successively to the families of Flanders, Burgundy, Cleves, Foix and Gonzaga. In 1581 it was erected into a duchy in favour of the latter. In 1663 it was sold by Charles VI. de Gonzaga to Mazarin, whose family held it till the Revolution.

RETINITE (Gr. ῥητίνη, resin), a general name applied to various resins, particularly those from beds of brown coal, which are near amber in appearance, but contain little or no succinic acid. It may conveniently serve as a generic name, since no two independent occurrences prove to be alike, and the indefinite multiplication of names, no one of them properly specific, is not to be desired.

RETINUE (O. Fr. *retenue*, from *retenir*, Lat. *retenere*, hold back, retain), a body of persons "retained" in the service of a noble or royal personage, a suite of "retainers." Such retainers were not in the domestic service of their lord, but were his "livery" and claimed his protection. They were a source of trouble and abuse in the 15th and early 16th century (see Livery and Maintenance).

RETORT (Lat. *retorquere*, to twist or turn back), a word used in two distinct meanings: (1) a sharp reply, answer to an argument, statement or charge; (2) a vessel used in chemistry and manufacture. The chemical retort is a flask-shaped or bulbous vessel made of glass, earthenware or metal, with a neck, bent downwards, which leads to a receiver; such vessels are particularly used for distillation (*q.v.*). The name is also given to the apparatus, varying in size and shape, used in the distinctive distillation of various substances, such as coal, in the manufacture of gas (*q.v.*).

RETREAT (O. Fr. *retrete*, mod. *retraite*, from Lat. *retrahere*, to draw back), a withdrawal, especially of a body of troops after a defeat or in face of a superior enemy. In military usage "retreat" is also the term for a signal, given by bugle and drum at or about sunset. It is the last general signal before "tattoo." In religious usage, a "retreat" is a period and place set apart for prayer, self-examination and other spiritual exercises. Such "retreats" conducted by a director have long been the practice in the Roman Church. They were introduced into the English Church by Pusey. The word is also used of an institution or home where insane persons or habitual inebriates may be treated. For the law relating to "licensed retreats" for inebriates, see Inebriety, Law of.

RETRENCHMENT (Fr. *retrenchement*, an old form of *retranchement*, from *retrancher*, to cut down, cut short), an act of cutting down or reduction, particularly of expenditure; the word is familiar in this, its most general sense, from the motto of the Gladstonian Liberal party in British politics, "Peace, Retrenchment and Reform." A special technical use of the term is in fortification, where it is applied to a work or series of works constructed in rear of existing defences in order to bar the further progress of the enemy should he succeed in breaching or storming these. A modern example may be found in the siege of Port Arthur in 1904. When early in the siege Fort Panlung fell into the hands of the Japanese, the Russians connected up the two adjacent first-line forts to a fort in the rear by means of new works, the whole forming a rough semicircle facing the lost fort. This retrenchment prevented the Japanese from advancing, and remained in the hands of the defenders up to the fall of the whole line of forts.

RETRO-COGNITION (from Lat. *retro*, back, *cognitio*, the acquiring of knowledge), a word invented by F. W. H. Myers to denote a supposed faculty of acquiring direct knowledge of the past beyond the reach of the subject's ordinary memory. The alleged manifestations of the faculty are of several kinds, of which the most important are as follows: (1) There are many recorded cases in which an impression has been received in dream or vision representing some recent event—shipwreck, death-bed scene, railway accident—outside the knowledge of the percipient. (2) Analogous to the transmission of habits and physical peculiarities in particular families, it is alleged that there are also cases of the transmission of definite memories of scenes and events in the life of some ancestor. (3) It is asserted that pictures of past scenes may be called up in certain cases by the presence of a material object associated with those scenes—*e.g.* a vision of the destruction of Pompeii by a piece of cinder from the buried city, or the scene of a martyrdom by a charred fragment of bone—the percipient being unaware at the time of the nature of the object. For this supposed faculty the American geologist, Professor Denton, has suggested the name "psychometry." There are also cases recorded in which pictures of historical scenes unknown to the seer have been described in the crystal. (4) Some spirit mediums profess to realise incidents belonging to their previous incarnation. Thus Flournoy's medium, Hélène Smith, represented herself as having been successively incarnated as a Hindoo Princess, Simandini, and as Marie Antoinette, and gave vivid descriptions of scenes in which she had figured in these capacities.

It will be gathered that the facts afford little warrant for the assumption of a faculty of retro-cognition. The cases described in the first class, though apparently exhibiting knowledge not within the range of the percipient's ordinary faculties, hardly call for such an extreme hypothesis. In the other cases the result recorded may plausibly be attributed to the imagination of the percipient, working upon hints given by bystanders, or aided by the emergence of forgotten knowledge.

Bibliography.—See W. Denton, *The Soul of Things* (Wellesley, Mass., U.S.A., 1863); F. W. H. Myers, article "The Subliminal Self" in *Proc. S. P. R.* vol. xi.; *Human Personality* (London, 1903); Th. Flournoy, *Des Indes à la planète Mars* (Geneva, 1900).

(F. P.)

RETROGRADE (from the Lat. *retro*, backwards, *gradiri*, to go), in astronomy, the direction of the apparent motion of a planet from E. to W.; the opposite of its regular motion around the sun, and due to the motion of the earth.

RETZ, SEIGNEURS AND DUKES OF. The district of Retz or Rais, in S. Brittany, belonged in early times to a house which bore its name, and of which the eldest branch became extinct in the 13th century in the Chabot family. From the Chabot family the lordship passed to the Lavals. Gilles de Laval, sire de Retz (1404–1440), the comrade-in-arms of Joan of Arc and marshal of France, gave himself over to the most revolting debauchery, and was strangled and burned at Nantes. The barony of Retz passed successively to the families of Tournemine, Annebaut and Gondi. In 1581 it was erected into a duchy in the peerage of France (*duché-pairie*) for Albert de Gondi, marshal of France and general of the galleys. Pierre de Gondi, brother of the first duc de Retz, became bishop of Paris in 1570 and cardinal in 1587. He was succeeded by his nephews, Henri (d. 1622) and Jean François de Gondi (d. 1654), for whom the episcopal see of Paris was erected into an archbishopric in 1622, and by his great-nephew, Jean François Paul de Gondi, the famous cardinal de Retz. With the death of the last male of the house of Gondi in 1676 the *duché-pairie* became extinct; the lordship passed to the house of Neuville-Villeroy.

(M. P.*)

RETZ, JEAN FRANÇOIS PAUL DE GONDI, Cardinal de (1614–1679), French churchman and agitator, was born at Montmirail in 1614. The family was one of those which had been introduced into France by Catherine de' Medici, but it acquired great estates in Brittany and became connected with the noblest houses of the kingdom. It may be added that Retz himself always spelt his designation "Rais." He was the third son, and according to Tallemant des Réaux was made a knight of Malta on the very day of his birth. The death of his second brother, however, destined him for a closer connexion with the church. The family of Retz had military traditions, but it had also much church influence, and, despite the very unclerical leanings of the future cardinal, which were not corrected by the teachings of his tutor St Vincent de Paul, the intentions of his family never varied respecting him. By unanimous consent his physical appearance was not that of a soldier. He was short, near-sighted, ugly and exceptionally awkward. Retz, however, despite the little inclination which he felt towards clerical life, entered into the disputes of the Sorbonne with vigour, and when he was scarcely eighteen wrote the remarkable *Conjuration de Fiesque*, a little historical essay, of which he drew the material from the Italian of Augustino Mascardi, but which is all his own in the negligent vigour of the style and the audacious insinuation, if nothing more, of revolutionary principles. Retz received no preferment of importance during Richelieu's life, and even after the minister's death, though he was presented to Louis XIII. and well received, he found a difficulty in attaining the coadjutorship with reversion of the archbishopric of Paris. But almost immediately after the king's death Anne of Austria appointed him to the coveted post on All Saints' Eve, 1643. Retz, who had, according to some accounts, already plotted against Richelieu, set himself to work to make the utmost political capital out of his position. His uncle, who was old, indolent and absurdly proud, had lived in great seclusion; Retz, on the contrary, gradually acquired a very great influence with the populace of the city. This influence he gradually turned against Mazarin. No one had more to do than Retz with the outbreak of the Fronde in October 1648, and his history for the next four years is the history of that confused and, as a rule, much misunderstood movement. Of the two parties who joined in it Retz could only depend on the bourgeoisie of Paris. The fact, moreover, that although he had some speculative tendencies in favour of popular liberties, and even perhaps of republicanism, he represented no real political principle, inevitably weakened his position, and when the break up of the Fronde came he was left in the lurch, having more than once in the meanwhile been in no small danger from his own party. One stroke of luck, however, fell to him before his downfall. He was made cardinal almost by accident, and under a misapprehension on the pope's part. Then, in 1652, he was arrested and imprisoned, first at Vincennes, then at Nantes; he escaped, however, after two years' captivity, and for some time wandered about in various countries. He made his appearance at Rome more than once, and had no small influence in the election of Alexander VII. He was at last, in 1662, received back again into favour by Louis XIV. and on more than one occasion formally served as envoy to Rome. Retz, however, was glad in making his peace to resign his claims to the archbishopric of Paris. The terms were, among other things, his appointment to the rich abbacy of St Denis and his restoration to his other benefices with the payment of arrears.

The last seventeen years of Retz's life were passed partly in his diplomatic duties (he was again in Rome at the papal election of 1668), partly at Paris, partly at his estate of Commercy, but latterly at St Mihiel in Lorraine. His debts were enormous, and in 1675 he resolved to make over to his creditors all his income except twenty thousand livres, and, as he said, to "live for" them. This plan he carried out, though he did not succeed in living very long, for he died at Paris on the 24th August 1679. One of the chief authorities for the last years of Retz is Madame de Sévigné, whose connexion he was by marriage.

Retz and La Rochefoucauld, the greatest of the Frondeurs in literary genius, were personal and political enemies, and each has left a portrait of the other. La Rochefoucauld's character of the cardinal is on the whole harsh but scarcely unjust, and one of its sentences formulates, though in a manner which has a certain recoil upon the writer, the great defect of Retz's conduct: "Il a suscité les plus grands désordres dans l'état sans avoir un dessein formé de s'en prévaloir." He would have been less, and certainly less favourably, remembered if it had not been for his *Memoirs*. They were certainly not written till the last ten years of his life, and they do not go further than the year 1655. They are addressed in the form of narrative to a lady who is not known, though guesses have been made at her identity, some even suggesting Madame de Sévigné herself. In the beginning there are some gaps. They display, in a rather irregular style and with some oddities of dialect and phrase, extraordinary narrative skill and a high degree of ability in that special art of the 17th century—the drawing of verbal portraits or characters. Few things of the kind are superior to the sketch of the early barricade of the Fronde in which the writer had so great a share, the hesitations of the court, the bold adventure of the coadjutor himself into the palace and the final triumph of the insurgents. Dumas, who has drawn from this passage one of his very best scenes in *Vingt ans après*, has done little but throw Retz into dialogue and amplify his language and incidents. Besides these memoirs and the very striking youthful essay of the *Conjuration de Fiesque*, Retz has left diplomatic papers, sermons, Mazarinades and correspondence in some considerable quantity.

The *Memoirs* of the cardinal de Retz were first published in a very imperfect condition in 1717 at Nancy. The first satisfactory edition was that which appeared in the twenty-fourth volume of the collection of Michaud and Poujoulat (Paris, 1836). They were then re-edited from the autograph manuscript by Géruzez (Paris, 1844), and by Champollion-Figeac with the Mazarinades, &c. (Paris, 1859). In 1870 a complete edition of the works of Retz was begun by M. A. Feillet in the collection of *Grands Écrivains*. The editor dying, this passed into the hands of M. Gourdault and then into those of M. Chantelauze, who had already published studies on the connexion of St Vincent de Paul with the Gondi family, &c. (1882). (G. Sa.)

REUBEN, a tribe of Israel named after the eldest "son" of Jacob and of Leah. Both the meaning of the name (see Gen. xxix. 32) and the history of the tribe are extremely obscure. In one version of the story of Joseph, Reuben appears in a somewhat favourable light (Gen. xxxvii. 22, 29, xlii. 37), but in Gen. xxxv. 22 he is charged with a grave offence, which in Gen. xlix. 4 is given as a reason why the tribe which called him father did not take in Hebrew history the place proper to its seniority (cp. 1 Chron. v. 1). Dathan and Abiram were Reubenites (Num. xvi.; Deut. xi. 6), and in Deut. xxxiii. 6 the tribe appears as threatened with extinction. In Judg. v. 15 seq. it is described as a pastoral tribe which took no share in the patriotic movement under Barak and Deborah. The district allotted to Reuben (Josh. xiii. 15–23; Num. xxxii. 37 seq.) is detailed in late passages which have little historical value for the age to which they are attributed. The tribe is represented as settled E. of the Jordan on the Moabite border, but no mention is made of it in the inscription of the Moabite king Mesha (see Gad; Moab). The references to the tribe's wars against Arabians (1 Chron. v. 10, 18 sqq.) in the time of Saul have caused much fruitless speculation.

For mythological elements in the tribe's history, see especially E. Stucken, *Mittheil. d. vorderasiat. Gesell.* (1902), pt. iv. pp. 46 sqq.; and for a full discussion of the biblical data, see H. W. Hogg, *Ency. Bib. s.v.*, also E. Meyer, *Die Israeliten und ihre Nachbarstämme*, pp. 530 sqq.

REUCHLIN, JOHANN (1455–1522), German humanist and Hebraist, was born on the 22nd of February 1455 at Pforzheim in the Black Forest, where his father was an official of the Dominican monastery. In the pedantic taste of his time the name was graecicized by his Italian friends into Capnion, a form which Reuchlin himself uses as a sort of transparent mask when he introduces himself as an interlocutor in the *De Verbo Mirifico*. For his native place Reuchlin always retained an affection; he constantly writes himself Phorcensis, and in the *De Verbo* he does not forget to ascribe to Pforzheim his first disposition to letters. Here he began his Latin studies in the monastery school, and, though in 1470 he was a short time in Freiburg, that university seems to have taught him little. Reuchlin's career as a scholar appears to have turned almost on an accident; his fine voice gained him a place in the household of Charles I., margrave of Baden, and by-and-by, having already some reputation as a Latinist, he was chosen to accompany to the university of Paris Frederick, the third son of the prince, a lad some years his junior, who was destined for an ecclesiastical career. This new connexion lasted but a year or so, but it determined the course of Reuchlin's life. He now began to learn Greek, which had been taught in the French capital since 1470, and he also attached himself to the leader of the Paris realists, Jean Heynlin, or à Lapide (d. 1496), a worthy and learned man, whom he followed to the vigorous young university of Basel in 1474. At Basel Reuchlin took his master's degree (1477), and began to lecture with success, teaching a more classical Latin than was then common in German schools, and also explaining Aristotle in Greek. His studies in this language had been continued at Basel under Andronicus Contoblacas, and here too he formed the acquaintance of the bookseller, Johann Amorbach, for whom he prepared a Latin lexicon (*Vocabularius Breviloquus*, 1st ed., 1475–76), which did good service in its time and ran through many editions. This first publication and Reuchlin's account of his teaching at Basel in a letter to Cardinal Adrian (Adriano Castellesi) in February 1518 show that he had already found the work which in a larger sphere occupied his whole life. He was no original genius, but a born teacher. But this work of teaching was not to be done mainly from the professor's chair. Reuchlin soon left Basel to seek further Greek training with George Hieronymus at Paris, and to learn to write a fair Greek hand that he might support himself by copying MSS. And now he felt that he must choose a profession. His choice fell on law, and he was thus led to the great school of Orleans (1478), and finally to Poitiers, where he became licentiate in July 1481. From Poitiers Reuchlin went in December 1481 to Tübingen with the intention of becoming a teacher in the university, but his friends recommended him to Count Eberhard of Württemberg, who was about to journey to Italy and required an interpreter. Reuchlin was selected for this post, and in February 1482 left Stuttgart for Florence and Rome. The journey lasted but a few months, but it brought the German scholar into contact with several learned Italians, especially at the Medicean Academy in Florence; his connexion with the count became permanent, and after his return to Stuttgart he received important posts at Eberhard's court. About this time he appears to have married, but little is known of his married life. He left no children; but in later years his sister's grandson Melanchthon was almost as a son to him till the Reformation estranged them. In 1490 he was again in Italy. Here he saw Pico della Mirandola, to whose Cabbalistic doctrines he afterwards became heir, and also made the friendship of the pope's secretary, Jakob Questenberg, which was of service to him in his later troubles. Again in 1492 he was employed on an embassy to the emperor Frederick at Linz, and here he began to read Hebrew with the emperor's Jewish physician Jakob ben Jehiel Loans. He knew something of this language before, but Loans's instruction laid the basis of that thorough knowledge which he afterwards improved on his third visit to Rome in 1498 by the instruction of Obadja Sforno of Cesena. In 1494 his rising reputation had been greatly enhanced by the publication of *De Verbo Mirifico*.

In 1496 Eberhard of Württemberg died, and enemies of Reuchlin had the ear of his successor, Duke Eberhard. He was glad, therefore, hastily to follow the invitation of Johann von Dalberg (1445–1503), the scholarly bishop of Worms, and flee to Heidelberg, which was then the seat of the "Rhenish Society." In this court of letters Reuchlin's appointed function was to make translations from the Greek authors, in which his reading was already extremely wide. Though Reuchlin had no public office as teacher, and even at Heidelberg was prevented from lecturing, he was during a great part of his life the real centre of all Greek teaching as well as of all Hebrew teaching in Germany. To carry out this work he found it necessary to provide a series of helps for beginners and others. He never published a Greek grammar, though he had one in MS. for use with his pupils, but he put out several little elementary Greek books. Reuchlin, it may be noted, pronounced Greek as his native teachers had taught him to do, *i.e.* in the modern Greek fashion. This pronunciation, which he defends in *Dialogus de Recta Lat. Graecique Serm. Pron.* (1519), came to be known, in contrast to that used by Erasmus, as the Reuchlinian.

At Heidelberg Reuchlin had many private pupils, among whom Franz von Sickingen is the best known name. With the monks he had never been liked; at Stuttgart also his great enemy was the Augustinian Conrad Holzinger. On this man he took a scholar's revenge in his first Latin comedy *Sergius*, a satire on worthless monks and false relics.

Through Dalberg, Reuchlin came into contact with Philip, elector palatine of the Rhine, who employed him to direct the studies of his sons, and in 1498 gave him the mission to Rome which has been already noticed as fruitful for Reuchlin's progress in Hebrew. He came back laden with Hebrew books, and found when he reached Heidelberg that a change of government had opened the way for his return to Stuttgart, where his wife had remained all along. His friends had now again the upper hand, and knew Reuchlin's value. In 1500, or perhaps in 1502, he was given a very high judicial office in the Swabian League, which he held till 1512, when he retired to a small estate near Stuttgart.

For many years Reuchlin had been increasingly absorbed in Hebrew studies, which had for him more than a mere philological interest. Though he was always a good Catholic, and even took the habit of an Augustinian monk when he felt that his death was near, he was too thorough a humanist to be a blind follower of the church. He knew the abuses of monkish religion, and was interested in the reform of preaching as shown in his *De Arte Predicandi* (1503)—a book which became a sort of preacher's manual; but above all as a scholar he was eager that the Bible should be better known, and could not tie himself to the authority of the Vulgate. The key to the *Hebraea veritas* was the grammatical and exegetical tradition of the medieval rabbins, especially of David Kimhi, and when he had mastered this himself he was resolved to open it to others. In 1506 appeared his epoch-making *De Rudimentis Hebraicis*—grammar and lexicon—mainly after Kimhi, yet not a mere copy of one man's teaching. The edition was costly and sold slowly. One great difficulty was that the wars of Maximilian I. in Italy prevented Hebrew Bibles coming into Germany. But for this also Reuchlin found help by printing the Penitential Psalms with grammatical explanations (1512), and other helps followed from time to time. But his Greek studies had interested him in those fantastical and mystical systems of later times with which the Cabbala has no small affinity. Following Pico, he seemed to find in the Cabbala a profound theosophy which might be of the greatest service for the defence of Christianity and the reconciliation of science with the mysteries of faith—an unhappy delusion indeed, but one not surprising in that strange time of ferment. Reuchlin's mystico-cabbalistic ideas and objects were expounded in the *De Verbo Mirifico*, and finally in the *De Arte Cabbalistica* (1517).

Unhappily many of his contemporaries thought that the first step to the conversion of the Jews was to take from them their books. This view had for its chief advocate the bigoted Johann Pfefferkorn (1469–1521), himself a baptized Hebrew. Pfefferkorn's plans were backed by the Dominicans of Cologne; and in 1509 he got from the emperor authority to confiscate all Jewish books directed against the Christian faith. Armed with this mandate, he visited Stuttgart and asked Reuchlin's help as a jurist and expert in putting it into execution. Reuchlin evaded the demand, mainly because the mandate lacked certain formalities, but he could not long remain neutral. The execution of Pfefferkorn's schemes led to difficulties and to a new appeal to Maximilian. In 1510 Reuchlin was summoned in the name of the emperor to give his opinion on the suppression of the Jewish books. His answer is dated from Stuttgart, October 6, 1510; in it he divides the books into six classes—apart from the Bible which no one proposed to destroy—and, going through each class, he shows that the books openly insulting to Christianity are very few and viewed as worthless by most Jews themselves, while the others are either works necessary to the Jewish worship, which was licensed by papal as well as imperial law, or contain matter of value and scholarly interest which ought not to be sacrificed because they are connected with another faith than that of the Christians. He proposed that the emperor should decree that for ten years there be two Hebrew chairs at every German university for which the Jews should furnish books. The other experts proposed that all books should be taken from the Jews; and, as the emperor still hesitated, the bigots threw on Reuchlin the whole blame of their ill success. Pfefferkorn circulated at the Frankfort fair of 1511 a gross libel (*Handspiegel wider und gegen die Juden*) declaring that Reuchlin had been bribed; and Reuchlin retorted as warmly in the *Augenspiegel* (1511). His adversary's next move was to declare the *Augenspiegel* a dangerous book; the Cologne theological faculty, with the inquisitor Jakob von Hochstraten (d. 1527) took up this cry, and on the 7th of October 1512 they obtained an imperial order confiscating the *Augenspiegel*. Reuchlin was timid, but he was honesty itself. He was willing to receive corrections in theology, which was not his subject, but he could not unsay what he had said; and as his enemies tried to press him into a corner he met them with open defiance in a *Defensio contra Calumniatores* (1513). The universities were now appealed to for opinions, and were all against Reuchlin. Even Paris (August 1514) condemned the *Augenspiegel*, and called on Reuchlin to recant. Meantime a formal process had begun at Mainz before the grand inquisitor, but Reuchlin by an appeal succeeded in transferring the question to Rome. Judgment was not finally given till July 1516; and then, though the decision was really for Reuchlin, the trial was simply quashed. The result had cost Reuchlin years of trouble and no small part of his modest fortune, but it was worth the sacrifice. For far above the direct importance of the issue was the great stirring of public opinion which had gone forward. And if the obscurantists escaped easily at Rome, with only a half condemnation, they received a crushing blow in Germany. No party could survive the ridicule that was poured on them in the *Epistolae Obscurorum Virorum*, the first volume of which written chiefly by Crotus Rubeanus appeared in 1514, and the second by Ulrich von Hutten in 1517. Hutten and Franz von Sickingen did all they could to force Reuchlin's enemies to a restitution of his material damages; they even threatened a feud against the Dominicans of Cologne and Spires. In 1520 a commission met in Frankfort to investigate the case. It condemned Hochstraten. But the final decision of Rome did not indemnify him. The contest ended, however; public interest had grown cold, absorbed entirely by the Lutheran question, and Reuchlin had no reason to fear new attacks. Reuchlin did not long enjoy his victory in peace. In 1519 Stuttgart was visited by famine, civil war and pestilence. From November of this year to the spring of 1521 the veteran statesman sought refuge in Ingolstadt and taught there for a year as professor of Greek and Hebrew. It was forty-one years since at Poitiers he had last spoken from a public chair; but the old man of sixty-five had not lost his gift of teaching, and hundreds of scholars crowded round him. This gleam of autumn sunshine was again broken by the plague; but now he was called to Tübingen and again spent the winter of 1521–22 teaching in his own systematic way. But in the spring he found it necessary to visit the baths of Liebenzell, and here he was seized with jaundice, of which he died on the 30th of June 1522, leaving in the history of the new learning a name only second to that of his younger contemporary Erasmus.

The authorities for Reuchlin's life are enumerated in L. Geiger, *Johann Reuchlin* (1871), which is the standard biography. The controversy about the books of the Jews is well sketched by D. F. Strauss, *Ulrich von Hutten*. See also S. A. Hirsch, "John Reuchlin, the Father of the Study of Hebrew among the Christians," and his "John Pfefferkorn and the Battle of Books," in his *Essays* (London, 1905). Some interesting details about Reuchlin are given in the autobiography of Conrad Pellicanus (*q.v.*), which was not published when Geiger's book appeared. See also the article on Reuchlin in Herzog-Hauck, *Realencyklopädie*, and literature there cited.

(W. R. S.)

REUMONT, ALFRED VON (1808–1887), German scholar and diplomatist, the son of Gerhard Reumont (1765–1829), was born on the 15th of August 1808 and was named Alfred after the English king, Alfred the Great. Educated at the universities of Bonn and Heidelberg, he obtained a position in Florence through the influence of an Englishman, William Craufurd, but soon he entered the Prussian diplomatic service and was employed in Florence, in Constantinople and in Rome. He also spent some time in the Foreign Office in Berlin. From 1851 to 1860 he represented his country in Florence. Reumont was the friend and adviser of Frederick William IV. In 1879 he founded the *Aachener Geschichtsverein*, and having spent his concluding years at Bonn and at Aix-la-Chapelle, he died in the latter city on the 27th of April 1887.

Reumont's numerous writings deal mainly with Italy, in which country he passed many years of his life. On the history of Florence and of Tuscany he wrote *Tavole cronologiche e sincrone della storia fiorentina* (1841; Supplement, 1875); *Geschichte Toscanas seit dem Ende des florentinischen Freistaats* (Gotha, 1876–77); and *Lorenzo de' Medici* (Leipzig, 1874, and again 1883). This last book has been translated into English by R. Harrison (1876). He remembered his connexion with Florence when he wrote *Römische Briefe von einem Florentiner* (Leipzig, 1840–44), and his residence in Rome was also responsible for his *Geschichte der Stadt Rom* (3 vols., 1867–70). Turning his attention to the history of Naples, he wrote *Die Carafa von Maddaloni: Neapel unter spanischer Herrschaft* (1851; Eng. trans., 1854), and more general works on Italian history are: *Beiträge zur italienischen Geschichte* (6 vols., Berlin, 1853–57), and *Charakterbilder aus der neueren Geschichte Italiens* (1886). More strictly biographical in their nature are: *Die Jugend Caterinas de' Medici* (1854), which has been translated into French by A. Baschet (1866); *Die Gräfin von Albany* (1860) and a life of his close friend Capponi, *Gino Capponi, ein Zeit- und Lebensbild* (Gotha, 1880). His *Ganganelli: Papst Clemens XIV., seine Briefe und seine Zeit* (Berlin, 1847) is valuable for the relations between this pope and the Jesuits. Other works which may be mentioned are *Zeitgenossen, Biografien und Charakteristiken* (Berlin, 1862); *Bibliografia dei lavori pubblicati in Germania sulla storia d'Italia* (Berlin, 1863); *Biographische Denkblätter nach persönlichen Erinnerungen* (Leipzig, 1878); and *Saggi di storia e letteratura* (Florence, 1880). Reumont's other important work, one which he was peculiarly fitted to write, was his *Aus Friedrich Wilhelms IV. gesunden und kranken Tagen* (Leipzig, 1885).

See H. Hüffer, *Alfred von Reumont* (Cologne, 1904); and the same writer's article in the *Allgemeine Deutsche Biographie*, Band xxviii. (1889).

RÉUNION, known also by its former name Bourbon, an island and French colony in the Indian Ocean, 400 m. S.E. of Tamatave, Madagascar, and 130 S.W. of Port Louis, Mauritius. It is elliptic in form; its greatest length is 45 m. and its greatest breadth 32 m., and it has an area of 965 sq. m. It lies between 20° 51′ and 21° 22′ S. and 55° 15′ and 55° 54′ E.

The coast-line (about 130 m.) is little indented, there are no natural harbours and no small islets round the shore. The narrow coast-lands are succeeded by hilly ground which in turn gives place to mountain masses and tableland, which occupy the greater part of the island. The main axis runs N.W. and S.E., and divides the island into a windward (E.) district and a leeward (W.) district, the dividing line being practically that of the watershed. The form of the mountains is the result of double volcanic action. First there arose from the sea a mountain whose summit is approximately represented by Piton des Neiges (10,069 ft.), a denuded crater of immense proportions, and at a later date another crater opened towards the E., which, piling up the mountain mass of Le Volcan, turned what was till then a circle into an ellipse. The oldest erupted rocks belong to the type of the andesites; the newest are varieties of basalt. The two massifs are united by high tablelands. In the older massif the most striking features are now three areas of subsidence—the cirques of Salazie, Rivière des Galets and Cilaos—which lie N.W. and S. of the Piton des Neiges. The first, which may be taken as typical, is surrounded by high almost perpendicular walls of basaltic lava, and its surface is rendered irregular by hills and hillocks of débris fallen from the heights. Towards the S. lies the vast stratum of rocks (150 to 200 ft. deep) which, on the 26th of November 1875, suddenly sweeping down from the Piton des Neiges and the Gros Morne (a "shoulder" of the *piton*), buried the little village of Grand Sable and nearly a hundred of its inhabitants. Besides the Piton des Neiges and the Gros Morne the chief heights in this part of the island are the pyramidical Cimandef (7300 ft.), another shoulder of the piton, and the Grand Bernard (9490 ft.), separating the cirques of Mafate and Cilaos.

The second massif, Le Volcan, is cut off from the rest of the island by two "enclosures," each about 500 or 600 ft. deep.

The outer enclosure runs across the island in a N. and S. direction; the inner forms a kind of parabola with its arms (Rempart du Tremblet on the S. and Rempart du Bois Blanc on the N.) stretching E. to the sea and embracing not only the volcano proper but also the great eastward slope known as the Grand Brûlé. The 30 m. of mountain wall round the volcano is perhaps unique in its astonishing regularity. It encloses an area of about 40 sq. m. known as the Grand Enclos. There are two principal craters, each on an elevated cone,—the more westerly, now extinct, known as the Bory Crater (8612 ft.), after Bory de St Vincent, the geologist, and the more easterly called the Burning Crater or Fournaise (8294 ft.). The latter is partially surrounded by an "enclosure" on a small scale with precipices 200 ft. high. Eruptions, though not infrequent (thirty were registered between 1735 and 1860), are seldom serious; the more noteworthy are those of 1745, 1778, 1791, 1812, 1860, 1870, 1881. Hot mineral springs are found on the flanks of the Piton des Neiges; the Source de Salazie (discovered in 1831) lies 2860 ft. above sea-level, has a temperature of 90°, and discharges 200 to 220 gallons per hour of water impregnated with bicarbonate of soda, and carbonates of magnesium and lime, iron, &c.; that of Cilaos (discovered in 1826) is 3650 ft. above the sea with a temperature of 100°; and that of Mafate 2238 ft. and 87°.

Vertically Réunion may be divided into five zones. The first or maritime zone contains all the towns and most of the villages, built on the limited areas of level alluvium occurring at intervals round the coast. In the second, which lies between 2600 and 4000 ft., the sugar plantations made a green belt round the island and country houses abound. The third zone is that of the forests; the fourth that of the plateaus, where European vegetables can be cultivated; and above this extends the region of the mountains.

Climate.—The year divides into two seasons—that of heat and rain from November to April, that of dry and more bracing weather from May to October. The prevailing winds are from the S.E., sometimes veering round to the S., and more frequently to the N.E.; the W. winds are not so steady (three hundred and seven days of E. to fifty-eight of W. wind in the course of the year). It is seldom calm during the day, but there is usually a period of complete repose before the land wind begins in the evening. Several years sometimes pass without a cyclone visiting the island; at other times they occur more than once in a single "winter." The *raz de marée* occasionally does great damage. On the leeward side of the island the winds are generally from the W. and S.W., and bring little rain. Mist hangs almost all day on the tops of the mountains, but usually clears off at night. On the coast and lower zones on the windward side the mean temperature is about 73° F. in the "winter" and 78° F. in the "summer." On the leeward side the heat is somewhat greater. In the Salazie cirque the mean annual average is 66° F.; at the Plaine des Palmistes 62° F. The rainfall is very heavy on the windward side, some stations registering 160 in. a year, while on the "dry" side of the island not more than 50 in. are registered. On the mountain heights snow falls every year, and ice is occasionally seen. In general the island is healthy, but fever is prevalent on the coast.

Fauna and Flora.—The fauna of Réunion is not very rich in variety of species. The mammals are a brown maki (*Lemur mongoz*, Linn.) from Madagascar, *Pteropus edwardsii* now nearly extinct, several bats, a wild cat, the tang or tamec (*Centetes setosus*, Denn.), several rats, the hare, and the goat. Among the more familiar birds are the "oiseau de la vierge" (*Muscipeta borbonica*), the tec-tec (*Pratincola sybilla*), *Certhia borbonica*, the cardinal (*Foudia madagascariensis*), various swallows, ducks, &c. The visitants from Madagascar, Mauritius and even India, are very numerous. Lizards and frogs of more than one species are common, but there is only one snake (*Lycodon aulicum*) known in the island. Various species of *Gobius*, a native species of mullet, *Nestis cyprinoides*, *Osphronamus olfax* and *Doules rupestris* are among the freshwater fishes. Turtles, formerly common, are now very rare.

In the forest region of the island there is a belt, 4500–5000 ft. above the sea, characterized by the prevalence of dwarf bamboo (*Bambusa alpina*); and above that is a similar belt of *Acacia heterophylla*. Besides this last the best timber-trees are *Casuarina laterifolia*, *Foetida mauritiana*, *Imbricaria petiolaris*, *Elaeodendron orientale*, *Calophyllum spurium* (red tacamahac), *Terminalia borbonica*, *Parkia speciosa*. The gardens of the coast districts display a marvellous wealth of flowers and shrubs, partly indigenous and partly gathered from all parts of the world. Among the indigenous varieties may be noted the vacoa (*Pandanus utilis*) and the aloe. A species of coffee plant is also indigenous. Fruits grown in the island are: the banana, the coco-nut, bread-fruit and jack-fruit, the bilimbi, the carambola, the guava, the litchi, the Japanese medlar, the mango-steen, the tamarind, the *Abelmoschus esculentus*, the chirimoya, the papaya, &c. Forests originally covered nearly the whole island; the majority of the land has been cleared by the inhabitants, but there are still some 200 sq. m. of forest land and the administration has in part replanted the higher districts, such as Salazie, with eucalyptus and caoutchouc trees.

Inhabitants.—The inhabitants are divided into various classes, the creoles, the mulattoes, the negroes, and Indians and other Asiatics. The creole population is descended from the first French settlers, chiefly Normans and Bretons, who married Malagasy women. Later settlers included European women, but the presence of non-European blood is so common among the creoles that the phrase "Bourbon white" was given in Mauritius to linen of doubtful cleanness. Three kinds of creoles are recognized—those of the towns and coasts, those of the mountains, and the *petits créoles*, originally a class of small farmers living in the uplands, now reduced to a condition of poverty and dependence on the planters. The *créoles blancs de villes*, the typical inhabitants of the island, are in general of a somewhat weak physique, quick-witted and of charming manners, brave and very proud of their island, but not of strong character. The mixed races tend to approximate to a single type, one in which the European strain predominates. The creole patois is French mixed with a considerable number of Malagasy and Indian words, and containing many local idioms. The population, about 35,000 towards the close of the 18th century, was in 1849, at the period of the liberation of the slaves, 120,000, of whom 60,800 were newly freed negroes. Thereafter coolies were introduced from India, and in 1870 the population had increased to 212,000. In 1882 the government of India ceased to authorize the emigration of coolies to Réunion, and in consequence of that and other economic causes the population decreased. In 1902 the inhabitants numbered 173,315. Of these 13,492 were British Indians, 4496 Malagasy, 9457 foreign-born negroes, and 1378 Chinese. Of the native born the creoles numbered about 3000, the remainder being negroes or of mixed race. Among the Indian population the males are as three to one to the females, and the birth-rate is lower than the death-rate.

Towns and Communication.—St Denis, the capital of the island, lies on the N. coast. It had in 1902 a population of 27,392. It is built in the form of an amphitheatre, and has several fine public buildings and centrally situated botanic gardens. It is the seat of a bishopric, a court of first instance and an appeal court. It has an abundant supply of pure water. The only anchorage for vessels is an open roadstead. St Pierre (pop. 28,885), the chief town on the leeward side of the island, has a small artificial harbour. Between St Pierre and St Denis, and both on the leeward shore, are the towns of St Louis (pop. 12,541) and St Paul (pop. 19,617). A few miles N. of St Paul on the S. side of Cape Pointe des Galets is the port of the same name, the only considerable harbour in the island. It was completed in 1886 at a cost of £2,700,000, covers 40 acres, is well protected, and has 28 ft. of water. A railway serving the port goes round the coast from St Pierre, by St Paul, St Denis, &c., to St Benoît (a town on the E. side of the island with a pop. of 12,523), a distance of 83¼ m. This line is carried through a tunnel nearly 6½ m. long between La Possession and St Denis. Besides the railway the lower parts of the island are well provided with roads. There is regular steamship communication between Pointe des Galets, Marseilles, Havre and Madagascar. Telegraphic communication with all parts of the world was established in 1906 when a cable connecting Réunion with Tamatave and Mauritius was laid.

Industries.—The Sugar Plantations.—The area of the cultivated lands is estimated at 148,200 acres (or 230 sq. m.), of which 86,450 acres are under sugar-cane, the remainder being under either maize, manioc, potatoes, haricots, or coffee, vanilla and cocoa. The sugar-cane, introduced in 1711 by Pierre Parat, is now the staple crop. In the 18th century the first place belonged to coffee (introduced from Arabia in 1715) and to the clove tree, brought from the Dutch Indies by Poivre at the risk of his life. Both are now cultivated on a very limited scale. Vanilla, introduced in 1818, was not extensively cultivated till about 1850. Bourbon vanilla, as it is called, is of high character, and next to sugar is the most important article of cultivation in the island. There are small plantations of cocoa and cinchona; cotton-growing was tried, but proved unsuccessful.

The sugar industry has suffered greatly from the competition with beet sugar and the effects of bounties, also from the scarcity of labour, from the ravages of the phylloxera (which made its appearance in 1878) and from extravagant methods of manufacture. It was not until 1906 that steps were taken for the creation of central sugar mills and refineries, in consequence of the compulsory shutting down of many small mills. Rum is largely distilled and forms an important article of export. There are also manufactories for the making of geranium essence, St Pierre being the centre of this industry. Other articles exported are aloe fibre and vacoa casks. The mineral wealth of the island has not been exploited, except for the mineral springs which yield waters highly esteemed. Almost all the products of the island are exported, so that the import trade is very varied. Cattle are imported from Madagascar; rice, the chief article of food, from Saigon and India; petroleum, largely used in manufactories, from America and Russia; almost everything else comes from France, to which country go the great majority of the exports. Over 75% of the shipping is under the French flag.

Commerce.—The total trade amounted in 1860 to the value of £4,464,000 (the highest during the century); in 1900, to £1,533,240. In 1905 the imports were valued at £727,000 and the exports at £428,000. Of the imports £500,000 were from France or French colonies: of the exports £388,000 went to France or French colonies. The currency consists of notes of the Banque de la Réunion (guaranteed by the government) and nickel token money. Neither the notes nor the nickel money have any currency outside Réunion; the rate of exchange varies from 5 to 20%.

Administration and Revenue.—Réunion is regarded practically as a department of France. It sends two deputies and one senator to the French legislature, and is governed by laws passed by that body. All inhabitants, not being aliens, enjoy the franchise, no distinction being made between whites, negroes or mulattoes, all of whom are citizens. At the head of the local administration is a governor who is assisted by a secretary-general, a *procureur général*, a privy council and a council-general elected by the suffrages of all citizens. The governor has the right of direct communication and negotiation with the government of South Africa and all states east of the Cape. The council-general has wide powers, including the fixing of the budget. For administrative purposes the island is divided into two arrondissements, the Windward, with five cantons and nine communes, and the Leeward, with four cantons and seven communes. The towns are subject to the French municipal law. The revenue, largely dependent on the prosperity of the sugar trade, declined from an average of £163,765 in the five years 1895–99 to an average of £147,225 in the five years 1900–4. For the same periods the average colonial expenditure, which includes the loss incurred in maintaining the harbour and railway, increased from £224,508 to £225,088. Deficits are made good by grants from France.

History.—Réunion is usually said to have been first discovered in April 1513 by the Portuguese navigator Pedro Mascarenhas, and his name, or that of Mascarene Islands, is still applied to the archipelago of which it forms a part; but it seems probable that it must be identified with the island of Santa Apollonia discovered by Diego Fernandes Pereira on the 9th of February 1507. It was visited by the Dutch towards the close of the 16th century, and by the English early in the 17th century. When in 1638 the island was taken possession of by Captain Gaubert, or Gobert, of Dieppe, it was still uninhabited; a more formal annexation in the name of Louis XIII. was effected in 1643 by Jacques Pronis, agent of the *Compagnie des Indes* in Madagascar; and in 1649 Étienne de Flacourt, Pronis's more eminent successor, repeated the ceremony at a spot which he named La Possession. He also changed the name of the island from Mascarenhas to Bourbon. By decree of the Convention in 1793, Bourbon in turn gave place to Réunion, and, though during the empire this was discarded in favour of Île Bonaparte, and at the Restoration people naturally went back to Bourbon, Réunion has been the official designation since 1848.

The first inhabitants were a dozen mutineers deported from Madagascar by Pronis, but they remained only three years (1646–49). Other colonists went thither of their own will in 1654 and 1662. In 1664 the *Compagnie des Indes orientales de Madagascar*, to whom a concession of the island was granted, initiated a regular colonization scheme. Their first commandant was Étienne Régnault, who in 1689 received from the French crown the title of governor. The growth of the colony was very slow, and in 1717 there were only some 2000 inhabitants. It is recorded that they lived on excellent terms with the pirates, who from 1684 onward infested the neighbouring seas for many years. In 1735 Bourbon was placed under the governor of the Île de France (Mauritius), at that time the illustrious Mahé de Labourdonnais. The *Compagnie des Indes orientales* gave up its concession in 1767, and under direct administration of the crown liberty of trade was granted. The French Revolution effected little change in the island and occasioned no bloodshed; the colonists successfully resisted the attempts of the Convention to abolish slavery, which continued until 1848 (when over 60,000 negroes were freed), the slave trade being, however, abolished in 1817. During the Napoleonic wars Réunion, like Mauritius, served the French corsairs as a rallying place from which attacks on Indian merchantmen could be directed. In 1809 the British attacked the island, and the French were forced to capitulate on the 8th of July 1810; the island remained in the possession of Great Britain until April 1815, when it was restored to France. From that period the island has had no exterior troubles. The negro population, upon whom in 1870 the Third Republic conferred the full rights of French citizenship including the vote, being unwilling to labour in the plantations, the immigration of coolies began in 1860, but in 1882 the government of India prohibited the further emigration of labourers from that country, in consequence of the inconsiderate treatment of the coolies by the colonists. Réunion has also suffered from the disastrous effects of cyclones. A particularly destructive storm swept over the island in March 1879, and in 1904 another cyclone destroyed fully half of the sugar crop and 75% of the vanilla crop.

See A. G. Garsault, *Notice sur la Réunion* (Paris, 1900), a monograph prepared for the Paris exhibition of that year; E. Jacob de Cordemoy, *Étude sur l'île de la Réunion, geographie, richesses naturelles*, &c. (Marseilles, 1905); W. D. Oliver, *Crags and Craters; Rambles in the island of Réunion* (London, 1896); C. Keller, *Natur und Volksleben der Insel Réunion* (Basel, 1888); J. D. Brunet, *Histoire de l'association générale des francs créoles de l'île Bourbon* (St Denis, Réunion, 1885); Trouette, *L'Île Bourbon pendant la période révolutionnaire* (Paris, 1888). Of earlier works consult Demanet, *Nouv. Hist. de l'Afrique française* (1767); P. U. Thomas, *Essai de statistique de l'île Bourbon* (1828); Dejean de la Batie, *Notice sur l'île Bourbon* (1847); J. Mauran, *Impressions dans un voy. de Paris à Bourbon* (1850); Maillard, *Notes sur l'île de la Réunion* (1862); Azéma, *Hist. de l'île Bourbon* (1862). The geology and volcanoes of Réunion were the object of elaborate study by Bory de St Vincent in 1801 and 1802 (*Voyages dans les quatre principales îles des mers d'Afrique*, Paris, 1804), and have since been examined by R. von Drasche (see *Die Insel Réunion*, &c., Vienna, 1878, and C. Vélain, *Descriptions géologique de . . . l'île de la Réunion* . . ., Paris, 1878). The best map is Pau Lépervanche's *Carte de la Réunion 1·100,000* (Paris, 1906).

REUS, a city of N.E. Spain, in the province of Tarragona, on the Saragossa-Tarragona railway, 4 m. N. of Salou, its port on the Mediterranean. Pop. (1900) 26,681. Reus consists of two parts, the old and the new, separated by the Calle Arrabal, which occupies the site of the old city wall. The old town centres in the Plaza del Mercado, from which narrow and tortuous lanes radiate in various directions; the new one dates from about the middle of the 18th century, and its streets are wide and straight. There is an active trade in the agricultural products of the fertile region around the city. The local industries developed considerably between 1875 and 1905, and the city has important flour, wine and fruit export houses. There is a model farm belonging to the municipality in the suburbs. Reus has excellent primary, normal and higher-grade state schools, many private schools, an academy of fine arts and a public library. The hospitals and foundling refuge, the institute and the town hall are handsome modern buildings.

The earliest records of Reus date from about the middle of the 13th century. Its modern prosperity is traced to about the year 1750, when a colony of English settled here and established a trade in woollens, leather, wine and spirits. The principal incidents in its political history arose out of the occurrences of 1843 (see SPAIN, *History*), in connexion with which the town received the title of city, and Generals Zurbano and Prim were made counts of Reus. The city was the birthplace of General Prim (1814–1870) and of the painter Mariano Fortuny (1839–1874).

REUSCH, FRANZ HEINRICH (1823–1900), Old Catholic theologian, was born at Brilon, in Westphalia, on 4th December 1823. He studied general literature at Paderborn, and theology at Bonn, Tübingen and Munich. The friend and pupil of Döllinger, he took his degree of Doctor in Theology at Munich, the university of which Döllinger was so long an ornament. He was ordained priest in 1849, and was immediately afterwards made chaplain at Cologne. In 1854 he became *Privatdozent* in the exegesis of the Old Testament in the Catholic Theological Faculty at Bonn; in 1858 he was made extraordinary, and in 1861 ordinary, professor of theology in the same university. From 1866 to 1877 he was editor of the *Bonner Theologisches Literaturblatt.* In the controversies on the Infallibility of the Pope, Reusch attached himself to Döllinger's party, and he and his colleagues Hilgers, Knoodt and Langen were interdicted by the archbishop of Cologne in 1871 from pursuing their courses of lectures. In 1872 he was excommunicated. For many years after this he held the post of Old Catholic *curé* of Bonn, as well as the position of vicar-general to the Old Catholic Bishop Reinkens, but resigned both in 1878, when, with Döllinger, he disapproved of the permission to marry granted by the Old Catholic Church in Germany to its clergy. From that time he retired into lay communion, but continued to give lectures as usual in the Old Catholic Faculty of Theology in the university of Bonn, and to write on theological subjects. He was made rector of that university in 1873. In 1874 and 1875 he was the official reporter of the memorable Reunion Conferences held at Bonn in those years and attended by many distinguished theologians of the Oriental and Anglican communions.

Reusch was a profound scholar, an untiring worker and a man of lovable character. Among his voluminous works were contributions to the *Revue internationale de théologie*, a review started at Bern at the instance of the Old Catholic Congress at Lucerne. He wrote also works on the Old Testament; a pamphlet on *Die Deutschen Bischöfe und der Aberglaube*; and another on the falsifications to be found in the treatise of Aquinas against the Greeks; as well as essays on the history of the Jesuit Order, and a book of prayers. But his fame will mainly rest on the works which he and Döllinger published jointly. These consisted of a work on the Autobiography of Cardinal Bellarmine, the *Geschichte der Moralstreitigen in der Römisch-Katholischen Kirche seit dem XVI. Jahrhundert*, and the *Erörterungen über Leben und Schriften des hl. Liguori.* During the last few years of his life he was smitten with paralysis. He died on the 3rd of March 1900, leaving behind him in manuscript a collection of letters to Bunsen about Roman cardinals and prelates, which has since been published. (J. J. L. *)

REUSCH, HANS HENRIK (1852–), Norwegian geologist, was born at Bergen on the 5th of September 1852. He was educated at Christiania, Leipzig and Heidelberg, and graduated Ph.D. at Christiania in 1883. He joined the Geological Survey of Norway in 1875, and became Director in 1888. He is distinguished for his researches on the crystalline schists and the Palaeozoic rocks of Norway. He discovered Silurian fossils in the highly altered rocks of the Bergen region; and in 1891 he called attention to a palaeozoic conglomerate of glacial origin in the Varanger Fiord, a view confirmed by Mr A. Strahan in 1896, who found glacial striae on the rocks beneath the ancient boulder-bed. Reusch has likewise thrown light on the later geological periods, on the Pleistocene glacial phenomena and on the sculpturing of the scenery of Norway. Among his separate publications are *Silur fossiler og pressede Konglomerater* (1882); *Det nordlige Norges Geologi* (1891).

REUSS, AUGUST EMANUEL VON (1811–1873), Austrian geologist and palaeontologist, the son of Franz Ambrosius Reuss (1761–1830), was born at Bilin in Bohemia on the 8th of July 1811. He was educated for the medical profession, graduating in 1834 at the university of Prague, and afterwards practising for fifteen years at Bilin. His leisure was devoted to mineralogy and geology, and the results of his researches were published in *Geognostische Skizzen aus Böhmen* (1840–44) and *Die Versteinerungen der Böhmischen Kreideformation* (1845–46). In 1849 he gave up his medical practice, and became professor of mineralogy at the university of Prague. There he established a fine mineralogical collection, and he became the first lecturer on geology. In 1863 he was appointed professor of mineralogy in the university of Vienna. He investigated the Cretaceous fauna of Gosau, and studied the Crustacea, including entomostraca, the corals, bryozoa, and especially the foraminifera of various geological formations and countries. He died at Vienna on the 26th of November 1873.

REUSS, ÉDOUARD GUILLAUME EUGÉNE (1804–1891), Protestant theologian, was born at Strassburg on the 18th of July 1804. He studied philology in his native town (1819–22), theology at Göttingen under J. G. Eichhorn; and Oriental languages at Halle under Wilhelm Gesenius, and afterwards at Paris under Silvestre de Sacy (1827–28). In 1828 he became *Privatdozent* at Strassburg. From 1829 to 1834 he taught Biblical criticism and Oriental languages at the Strassburg Theological School; he then became assistant, and afterwards, in 1836, regular professor of theology at that university. The sympathies of Reuss were German rather than French, and after the annexation of Alsace to Germany he remained at Strassburg, and retained his professorship till, in 1888, he retired on a pension. Amongst his earliest works were: *De libris veteris Testamenti apocryphis plebi non negandis* (1829), *Ideen zur Einleitung in das Evangelium Johannis* (1840) and *Die Johanneische Theologie* (1847). In 1852 he published his *Histoire de la théologie chrétienne au siècle apostolique*, which was followed in 1863 by *L'Histoire du canon des saintes écritures dans l'église chrétienne.* In 1874 he began to publish his translation of the Bible, *La Bible, nouvelle traduction avec commentaire.* It was the criticism and exegesis of the New Testament which formed the subject of Reuss's earlier labours—in 1842, indeed, he had published in German a history of the books of the New Testament, *Geschichte der heiligen Schriften N. Test.*; and though his own views were liberal, he opposed the results of the Tübingen school. After a time he turned his attention also to Old Testament criticism, for which he was especially fitted by his sound knowledge of Hebrew. In 1881 he published in German his *Geschichte der heiligen Schriften A. Test.*, a veritable encyclopaedia of the history of Israel from its earliest beginning till the taking of Jerusalem by Titus. He died at Strassburg on the 15th of April 1891.

Reuss belonged to the more modern section of the Liberal party in the Lutheran Church. His critical position was to some extent that of K. H. Graf and J. Wellhausen, allowing for the circumstances that he was in a sense their forerunner, and was actually for a time Graf's teacher. Indeed, he was really the originator of the new movement, but hesitated to publish the results of his studies. For many years Reuss edited with A. H. Cunitz (b. 1812) the *Beiträge zu den theologischen Wissenschaften.* With A. H. Cunitz and J. W. Baum (1809–1878), and after their death alone, he edited the monumental edition of Calvin's works (38 vols., 1863 ff.). His critical edition of the Old Testament appeared a year after his death. His son, Ernst Rudolf (b. 1841), was in 1873 appointed city librarian at Strassburg.

See the article in Herzog-Hauck, *Realencyklopädie*, and cf. Otto Pfleiderer, *Development of Theology in Germany since Kant* (1890).

REUSS, the name of two small principalities of the German empire, called Reuss, elder line, or Reuss-Greiz, and Reuss, younger line, or Reuss-Schleiz-Gera. With a joint area of 441 sq. m. they form part of the complex of Thuringian states, and consist, roughly speaking, of two main blocks of territory, separated by the Neustadt district of the duchy of Saxe-Weimar. The more southerly, which is much the larger of the two portions, belongs to the bleak, mountainous region of the Frankenwald and the Vogtland, while the northern portion is hilly, but fertile. The chief rivers are the Weisse Elster and the Saale. About 35% of the total surface is occupied by forests, while about 40% is under tillage and about 19% under meadow and pasture. Wheat, rye and barley are the principal crops grown, and the breeding of cattle is an important industry.

Reuss-Greiz, with an area of 122 sq. m., belongs to the larger of the two divisions mentioned above, and consists of three large and several small parcels of land. On the whole, the soil is not favourable for agriculture, but the rearing of cattle is carried on with much success. About 63% of the inhabitants maintain themselves by industrial pursuits, the chief products of which are the making of woollen fabrics at Greiz, the capital, and of stockings at Zeulenroda. Other industries are machine-building, printing and the making of paper and porcelain. In 1905 the population of the principality was 70,603. The constitution of Reuss-Greiz dates from 1867, and provides for a representative chamber of twelve members, of whom three are appointed by the prince, while two are chosen by the landed proprietors, three by the towns and four by the rural districts. The revenue and expenditure amount to about £76,000 a year, and there is no public debt. The reigning prince is Henry XXIV. (b. 1878), but as he is incapable of discharging his duties, these are now undertaken by a regent.

Reuss-Schleiz-Gera, with an area of 319 sq. m., includes part of the southern and the whole of the northern of the two main divisions mentioned above; it touches Bavaria on the south and Prussian Saxony on the north. The former portion is known as the Oberland and the latter as the Unterland. Owing to the fertility of the Unterland, quite one-quarter of the people are supported by agricultural pursuits, although there is also much industrial activity. The chief industrial product consists of woollen goods, and the manufacture centres in the capital Gera, the largest of the six towns of the principality. Other industries are jute-spinning, dyeing and brewing, and the manufacture of musical instruments, chemicals, tobacco, cigars, porcelain and machinery. A considerable trade is carried on in these goods and also in timber, cattle and slate. Iron is mined in the Oberland, and large quantities of salt are yielded by the brine springs of Heinrichshall. In 1905 Reuss-Schleiz contained 144,584 inhabitants. Its annual revenue and expenditure amount to about £129,000, and in 1908 it had a public debt of £52,027. The constitution, which rests on laws of 1852 and 1856, provides for a representative assembly of 16 members which possesses limited legislative powers, the administrative duties being discharged by a cabinet of three members. The reigning prince is Henry XIV. (b. 1832), but since 1892 his duties have been undertaken by a regent. The states of Reuss return one member each to the Bundesrat, and one each to the Reichstag of the German empire.

History.—The history of Reuss stretches back to the times when the German kings appointed vogts, or bailiffs (*advocati imperii*), to administer their lands. One of these vogts was a certain Henry, who died about 1120, after having been entrusted by the emperor Henry IV. with the vogtship of Gera and of Weida, and he is generally recognized as the ancestor of the princes of Reuss. His descendants called themselves lords of Weida, and some of them were men of note in their day, serving the emperors and German kings and distinguishing themselves in the ranks of the Teutonic order. The land under their rule gradually increased in size, and it is said that the name of Reuss was applied to it owing to the fact that one of its princes married a Russian princess, their son being called "der Russe," or the Russian. Another version is that the prince received this sobriquet because he passed many years in Russia. The district thus called Reuss was at one time much more extensive than it is at present, and for some years its rulers were margraves of Meissen. In 1564 the family was divided into three branches by the sons of Henry XVI. (d. 1535). One of these became extinct in 1616, but the remaining ones are those of Reuss-Greiz and Reuss-Schleiz-Gera, which are flourishing to-day. Although there have been further divisions these have not been lasting, and the lands of the former family have been undivided since 1768 and those of the latter since 1848. The lords of Reuss took the title of count in 1673; and the head of the elder line became a prince of the Empire in 1778, and the head of the younger line in 1806. In 1807 the two princes joined the Confederation of the Rhine and in 1815 the German confederation. In 1866 Reuss-Greiz was compelled to atone for its active sympathy with Austria by the payment of a fine. In 1871 both principalities became members of the new German empire. The princes of Reuss are very wealthy, their private domain including a great part of the territory over which they rule. In the event of either line becoming extinct, its possessions will fall to the other.

A curious custom prevails in the house of Reuss. The male members of both branches of the family all bear the name of Henry (Heinrich), the individuals being distinguished by numbers. In the elder line, according to an arrangement made in 1701, the enumeration continues until the number one hundred is reached when it begins again. In the younger line the first prince born in a new century is numbered I., and the numbers follow on until the end of the century when they begin again. Thus Henry XIV. of Reuss younger line, who was born in 1832, was the son of Henry LXVII. (1789–1867), the former being the 14th prince born in the 19th century, and the latter the 67th prince born in the 18th.

See B. Schmidt, *Die Reussen, Genealogie des Gesamthauses Reuss* (Schleiz, 1903); H. von Voss, *Die Ahnen des reussischen Hauses* (Lobenstein, 1882); C. F. Collmann, *Reussische Geschichte. Das Vogtland im Mittelalter* (Greiz, 1892), and O. Liebmann, *Das Staatsrecht des Fürstenthums Reuss* (1884).

REUTER, FRITZ (1810–1874), German novelist, was born on the 7th of November 1810, at Stavenhagen, in Mecklenburg-Schwerin, a small country town where his father was burgomaster and sheriff (*Stadtrichter*), and in addition to his official duties carried on the work of a farmer. He was educated at home by private tutors and subsequently at the gymnasiums of Friedland in Mecklenburg-Strelitz, and of Parchim. In 1831 he began to attend lectures on jurisprudence at the university of Rostock, and in the following year went to the university of Jena. Here he was a member of the political students' club, or German Burschenschaft, and in 1833 was arrested in Berlin by the Prussian government; although the only charge which could be proved against him was that he had been seen wearing its colours, he was condemned to death for high treason. This monstrous sentence was commuted by King Frederick William III. of Prussia to imprisonment for thirty years in a Prussian fortress. In 1838, through the personal intervention of the grand-duke of Mecklenburg, he was delivered over to the authorities of his native state, and the next two years he spent in the fortress of Dömitz, but in 1840 was set free, an amnesty having been proclaimed after the accession of Frederick William IV. to the Prussian throne.

Although Reuter was now thirty years of age, he went to Heidelberg to resume his legal studies; but he soon found it necessary to return to Stavenhagen, where he aided in the management of his father's farm. After his father's death, however, he abandoned farming, and in 1850 settled as a private tutor at the little town of Treptow in Pomerania. Here he married Luise Kunze, the daughter of a Mecklenburg pastor. Reuter's first publication was a collection of miscellanies, written in Plattdeutsch, and entitled *Läuschen un Riemels* ("anecdotes and rhymes," 1853; a second collection followed in 1858). The book, which was received with encouraging favour, was followed by *Polterabendgedichte* (1855), and *De Reis' nah Belligen* (1855), the latter a humorous poem describing the adventures of some Mecklenburg peasants who resolve to go to Belgium (which they never reach) to learn the secrets of an advanced civilization. In 1856 Reuter left Treptow and established himself at Neubrandenburg, resolving to devote his whole time to literary work. His next book (published in 1858) was *Kein Hüsung*, an epic in which he presents with great force and vividness some of the least attractive aspects of village life in Mecklenburg. This was followed, in 1860, by *Hanne Nüte un de lütte Pudel*, the best of the works written by Reuter in verse. In 1861 Reuter's popularity was largely increased by *Schurr-Murr*, a collection of tales, some of which are in High German, but this work is of slight importance in comparison with the series of stories, entitled *Olle Kamellen* ("old stories of bygone days"). The first volume, published in 1860, contained *Woans ick tau'ne Fru kam* and *Ut de Franzosentid. Ut mine Festungstid* (1861) formed the second volume; *Ut mine Stromtid* (1864) the third, fourth and fifth volumes; and *Dörchläuchting* (1866) the sixth volume—all written in the Plattdeutsch dialect of the author's home. *Woans ick tau 'ne Fru kam* is a bright little tale, in which Reuter tells, in a half serious half bantering tone, how he wooed the lady who became his wife. In *Ut de Franzosentid* the scene is laid in and near Stavenhagen in the year 1813, and the characters of the story are associated with the great events which then stirred the heart of Germany to its depths. *Ut mine Festungstid* is of less general interest than *Ut de Franzosentid*, a narrative of Reuter's hardships during the term of his imprisonment, but it is not less vigorous either in conception or in style. *Ut mine Stromtid* is by far the greatest of Reuter's writings. The men and women he describes are the men and women he knew in the villages and farmhouses of Mecklenburg, and the circumstances in which he places them are the circumstances by which they were surrounded in actual life. As in *Ut de Franzosentid* he describes the deep national impulse in obedience to which Germany rose against

Napoleon, so in *Ut mine Stromtid* he presents many aspects of the revolutionary movement of 1848.

In 1863 Reuter transferred his residence from Neubrandenburg to Eisenach; and here he died on the 12th of July 1874. In the works produced at Eisenach he did not maintain the high level of his earlier writings.

Reuter's *Sämtliche Werke*, in 13 vols., were first published in 1863–68. To these were added in 1875 two volumes of *Nachgelassene Schriften*, with a biography by A. Wilbrandt; and in 1878 two supplementary volumes to the works appeared. A popular edition in 7 vols. was published in 1877–78 (last edition, 1902); there are also editions by K. F. Müller (18 vols., 1905), and W. Seelmann (7 vols., 1905–6). See O. Glagau, *F. Reuter und seine Dichtungen* (1866; 2nd ed., 1875); H. Ebert, *F. Reuter und seine Werke* (1874); F. Latendorf, *Zur Erinnerung an F. Reuter* (1879); K. T. Gädertz, *Reuter-Studien* (1890); by the same, *Aus Reuters alten und jungen Tagen* (3 vols., 1894–1900); *Briefe F. Reuters an seinen Vater*, edited by F. Engel (2 vols., 1895); A. Römer, *F. Reuter in seinem Leben und Schaffen* (1895); G. Raatz, *Wahrheit und Dichtung in Reuters Werken* (1895); E. Brandes, *Aus F. Reuters Leben* (1899); K. F. Müller, *Der Mecklenburger Volksmund und F. Reuters Schriften* (1902). A complete bibliography of F. Reuter will be found in the *Niederdeutsche Jahrbuch* for 1896 and 1902.

REUTER, PAUL JULIUS, Baron de (1821–1899), founder of Reuter's News Agency, was born at Cassel, Germany. At the age of thirteen he became a clerk in his uncle's bank at Göttingen, where he chanced to make the acquaintance of Professor Gauss, whose experiments in telegraphy were then attracting some attention. Reuter's mind was thus directed to the value of the speedy transmission of information, and in 1849, on the completion of the first telegraph lines in Germany and France, he found an opportunity of turning his ideas to account. There was a gap between the termination of the German line at Aix-la-Chapelle and that of the French and Belgian lines at Verviers. Reuter organized a news-collecting agency at each of these places, his wife being in charge of one, himself at the other, and bridged the interval by a pigeon-post. On the establishment of through telegraphic communication, Reuter endeavoured to start a news agency in Paris, but finding that the French government's restrictions would render the scheme unworkable, removed in 1851 to England and became a naturalized British subject. The first submarine cable—between Dover and Calais—had just been laid, and Reuter opened an office in London for the transmission of intelligence between England and the continent. At first, however, his business was practically confined to the transmission of private commercial telegrams to places not connected with the new telegraph system. He appointed agents at the various telegraph termini on the continent to take these despatches off the wires and forward them by rail or pigeon-post to the addresses. Simultaneously he endeavoured to induce the English papers to publish the foreign news telegrams supplied by his various agents. These efforts were for some years unsuccessful, until in 1858 *The Times* published the report of an important speech by Napoleon III. forwarded by Reuter's Paris agent. Reuter now extended his sphere of operations all over the world, and in 1859 obtained leave for the presence of representatives at the headquarters of the Austrian and French armies during the war. In 1866 he laid down a special cable from Cork to Crookhaven, which enabled him to circulate news of the American Civil War several hours before the steamer could reach Liverpool. A concession for a cable beneath the North Sea to Cuxhaven was granted him by the king of Hanover in 1865, and in the same year a concession was granted him for a cable between France and the United States, the line being worked jointly by Reuter (whose business had just been converted into a limited liability company) and the Anglo-American Telegraph Company. In 1872 he obtained from the shah of Persia an exclusive concession to develop the internal resources of that country, but the concession was annulled and its privileges transferred to the Imperial Bank of Persia. Reuter was in 1871 given the title of baron by the duke of Saxe-Coburg and Gotha, and by a special grant of Queen Victoria he and his heirs were authorized to have the privileges of this rank in England. Baron Reuter died at Nice on the 25th of February 1899.

REUTERHOLM, GUSTAF ADOLF, Baron (1756–1813), Swedish statesman. After a brief military career he was appointed *Kammerherr* to Sophia Magdalena, queen consort of Gustavus III., and subsequently became intimately connected with the king's brother, Charles, then duke of Sudermania. He remained in the background throughout the reign of Gustavus III., whom he constantly opposed and by whom he was imprisoned along with the other malcontents in 1789. He was abroad at the time of the king's death, but a summons from his friend, now duke regent, speedily recalled him, and in 1793 he was made a member of the council of state and one of the "lords of the realm." At first he seemed inclined to adopt a liberal system, and reintroduced the freedom of the press. He did this solely, however, to reverse the Gustavian system, and persecuted the stalwarts of the late king (*e.g.* G. M. Armfelt, J. K. Toll) with a petty vindictiveness which excited general disgust. Towards the end of the regency, Reuterholm inclined towards an alliance with Russia on the basis of a marriage between the young king, Gustavus IV., and the empress Catherine's granddaughter, Alexandra Pavlovna, an alliance frustrated by the bigotry of the intended groom. At home the Swedish government ended as ultra-reactionary, owing to an insignificant riot in Stockholm which so alarmed Reuterholm that he threatened all printers who printed anything relating to the constitutions of the French republic or the United States of America with the loss of their privileges. In March 1795 he closed the Swedish Academy because A. G. Silfverstolpe in his inaugural address had ventured to disapprove of the *coup d'état* of 1789. On the accession of Gustavus IV. (November 1st, 1796) Reuterholm was expelled from Stockholm. For the next twelve years he lived abroad under the name of Tempelcrentz. After the revolution of 1809 he returned to Sweden, but was denied all access to Charles XIII., and quitted his country for good. He died in Schleswig on the 27th of December 1813.

See *Sveriges Historia* (Stockholm, 1877–1881), vol. v. (R. N. B.)

REUTLINGEN, a town of Germany, in the kingdom of Württemberg, situated on the Echatz, an affluent of the Neckar, near the base of the Achalm and 36 m. by rail S. of Stuttgart. Pop. (1905) 23,850. It is a quaintly built town, with many picturesque houses and a fine Gothic church of the 13th and 14th centuries dedicated to St Mary, which was restored in 1893–1901; it contains in the choir a replica of the Holy Sepulchre and a sculptured stone font, and has a tower 240 ft. high. Reutlingen has three other Evangelical churches, a Roman Catholic church, a town hall, and several monuments, including one to the emperor William I. and another to Friedrich List. The industries of the town are numerous, and include the spinning and weaving of cotton, dyeing and bleaching; also the manufacture of leather, machinery, furniture, shoes, paper, clothing, hardware, bricks, beer and woollen goods. Hops, vines and fruit are grown in the neighbourhood. Reutlingen has several schools and educational establishments, including a celebrated pomological institute. It is also famous as the place where Pastor Gustav Werner (1809–1887) founded his Christian Socialist refuge, which has become widely known in philanthropic circles.

Reutlingen, which is first mentioned in 1213, became a free imperial town in the 13th century and was fortified by the emperor Frederick II., remaining loyal to him and to his son, Conrad IV. A member of the league of Swabian towns, its citizens defeated Count Ulrich of Württemberg on the 14th of May 1377. Later it joined the Swabian League and was favoured by the emperor Maximilian I. It came into the possession of Württemberg in 1802. An explosion which took place on the 27th of December 1852 destroyed many houses in the town.

See Rupp, *Aus der Vorzeit Reutlingens und seiner Umgegend* (Stuttgart, 1869); Hochstetter, *Führer durch Reutlingen und Umgebung* (Reutlingen, 1901); and Zwiesele, *Geognostischer Führer in der Umgegend von Reutlingen* (Stuttgart, 1897).

REVAL, or Revel (Russ. *Revel*, formerly *Kolyvañ*; Esthonian, *Tallina* and *Tannilin*), a fortified seaport town of Russia, capital of Esthonia, situated on a bay on the S. coast of the gulf of Finland, 230 m. W. of St Petersburg by rail. Pop. (1900) 66,292, of whom half were Esthonians and 30%

Germans. The city consists of two parts—the Domberg or Dom, which occupies a hill, and the lower town on the beach. The Dom contains the castle (first built in the 13th century, rebuilt in 1772), where the provincial administration has its seat, and a cathedral (1894–1900) with five gilded domes. It has its own administration, separate from that of the lower town. The church of St Nicholas, built in 1317, contains many antiquities of the former Roman Catholic times and old German paintings. The Dom church contains many interesting shields, as also the graves of the circumnavigator Baron A. J. von Krusenstern (1770–1846), of the Swedish soldiers Pontus de la Gardie (d. 1585) and Carl Horn (d. 1601), and of the Bohemian Protestant leader Count Matthias von Thurn (1580–1640). The church of St Olai, first erected in 1240, and often rebuilt, was completed in 1840 in Gothic style; it has a bell tower 456 ft. high. The oldest church is the Esthonian, built in 1219. The public institutions include a good provincial museum of antiquities; an imperial palace, Katharinenthal, built by Peter the Great in 1719; and very valuable archives, preserved in the town hall (14th century). The pleasant situation of the town attracts thousands of people for sea-bathing. It is the seat of a branch board of the Russian admiralty and of the administration of the Baltic lighthouses. Its port has a depth of 4 to 6 fathoms, and a roadstead 3½ m. wide, which freezes nearly every winter. The exports consist chiefly of grain, timber, flax, hides, wool, a species of anchovy, and hemp, and the imports of manufactured goods and machinery. The value of the aggregate trade amounts to an average of seven to nine millions sterling annually. There is considerable trade with Finland. Baltic Port, 30 m. W., is a sort of annex to the port of Reval.

The high Silurian crag now known as Domberg was early occupied by an Esthonian fort, Lindanissa. In 1219 the Danish king Valdemar II. erected here a strong castle and founded the first church. In 1228 the castle was taken by the Livonian Knights, but nine years later it returned to the Danes. About the same time Lübeck and Bremen merchants settled there, and their settlement became an important seaport of the Hanseatic League. It was fortified early in the 14th century, and in 1343 sustained a siege by the revolted Esthonians. Valdemar III. sold Reval and Esthonia to the Teutonic Knights in 1346, but on the dissolution of the order, in 1561, Esthonia and Reval surrendered to the Swedish king Erik XIV. A great conflagration in 1433, the pestilence of 1532, the bombardment by the Danes in 1569, and the Russo-Livonian War, destroyed its trade. The Russians besieged Reval twice, in 1570 and 1577. It was still an important fortress, having been enlarged and fortified by the Swedes. In 1710 it was surrendered to Peter the Great, who immediately began the erection of a military port for his Baltic fleet. His successors continued to fortify the access to Reval from the sea, large works being undertaken, especially in the early years of the 19th century.

REVEILLÉ (Fr. *réveillez*, imperative of *réveiller*, to awaken, Lat. *re-* and *vigilare*, to watch), the signal by call of bugle or beat of drum to announce to soldiers the time to awake and begin duty.

REVELATION, BOOK OF, in the Bible, the last book of the New Testament.

Title.—According to the best authorities ℵ CA (in the subscription) 2, 8, 82, 93, the title of this book is *ἀποκάλυψις Ἰωάννου*. Some cursives (1, 14, 17, 25, 28, 31, 38, 51, 90, 91, 94, 97) read *ἀπ.* (+ *τοῦ ἁγίου* 1, 25, 28, 31, 38, 51, 90, 94) *Ἰωάννου τοῦ θεολόγου*; Q and 12, *ἀπ. Ἰ. τοῦ θεολ. καὶ εὐαγγελίστου*; P and 42, *ἡ ἀπ. τοῦ ἀποστόλου Ἰ. καὶ εὐαγγελίστου*. The word "apocalypse" gives the current title not only to this book, but to a large body of Jewish and Christian writings. This is one of the first instances of its use in this sense in existing literature. An earlier use is probably to be found in the title of the Syriac Apocalypse of Baruch, which = *γραφὴ τῆς ἀποκαλύψεως τοῦ βαροὺχ υἱοῦ τοῦ Νηρίου*. The title is different from what the New Testament use of the term would have led us to expect, *i.e.* *Ἀποκάλυψις Ἰησοῦ*, which are indeed the opening words of this book. With the latter phrase we might compare Gal. i. 12, where we have *ἀποκαλύψεως Ἰησοῦ Χριστοῦ*, "revelation from Jesus Christ." For the book is a revelation made by God to Jesus Christ, who through His angel made it known to John for transmission to the churches. Instead of this the Church substituted the name of the disciple through whom the message was delivered for that of his Master, and designated our Apocalypse "The Apocalypse of John." This title was familiar before the end of the 2nd century.

MSS. and Versions.—There are six uncials, ℵ, A, C, P, Q, ℶ, the last of which has not been edited or collated. Of the rest, P and Q are imperfect. The known cursives amount to 229, according to von Soden (*Die Schriften des Neuen Testamentes*, I. i. 289). There are six ancient versions of various values. (*a*) The best is the Latin, which is found in the Old Latin (*g h m* and the text used by Primasius) and the Vulgate, of which there are eight MSS. written between the 6th and 15th centuries. (*b*) The Syriac version appears in two forms, the Philoxenian (A.D. 508), recently discovered and edited by Gwynn, and the Harclean (A.D. 616). The true Peshitta did not contain the Apocalypse. (*c*) The Armenian version. The Apocalypse was admitted to the canon, according to Conybeare, in the 12th century through the influence of Nerses, who revised an older version traceable to the opening of the 5th century. (*d*) The Egyptian version is found in two forms, *i.e.* the Bohairic and Sahidic. The former has been edited by Horner, who is now also engaged on an edition of the latter. (*e, f*) The Ethiopic and Arabic versions have not yet been critically edited.

External Evidence and Canonicity, 2nd Century.—It is possible that the Apocalypse was known to Ignatius, *Eph.* xv. 3 (Rev. xxi. 3); *Philad.* vi. 1 (Rev. iii. 12). Some have thought also that Barnabas (vi. 13, xxi. 3) was acquainted with our text, but this is highly improbable. Andreas of Caesarea mentions Papias as attesting the credibility of Revelation, and cites two of his remarks on Rev. xii. 7. The fact that Eusebius does not mention Revelation among the New Testament books known to Papias (*H.E.* iii. 39) may be due to the historian's unfriendly attitude to the book. Moreover, Papias may be one of the presbyters to whom, as having actually seen John, Irenaeus (v. 30 = Eusebius, *H.E.* v. 8) appeals on behalf of the number 666. From these possible and highly probable references we pass on to the clear testimony of Justin Martyr, who is the first to declare that Revelation is by "John, one of the Apostles of Christ" (*Dial.* lxxxi. 15), and a book of canonical standing (i. 28). In the latter half of this century it meets with very wide recognition. Thus a treatise of some description was written upon it by Melito of Sardis in Asia Minor (Eus. *H.E.* iv. 26), and quoted by the anti-Montanist Apollonius (*H.E.* v. 18) and Theophilus of Antioch (*H.E.* iv. 24). In Carthage its currency is proven by the references of Tertullian, and the phraseology of the Acts of Perpetua and Felicitas (§§ 4, 12); in Alexandria by the citations of Clement (*Paed.* i. 6. 36; ii. 10. 108, &c.); in Rome by its inclusion in the Muratorian canon, and in Gaul by its use in the Epistle of the churches of Vienne and Lyons (Eus. *H.E.* v. 10. 58), and in Irenaeus, who defends the apostolic authorship of the Revelation of John (*Haer.* iv. 14. 1, 17. 6, 18. 6, 20. 11, 21. 3; v. 26. 1, &c.).

But in certain quarters the authority of the book was denied. Thus Marcion rejected it on the ground of its Jewish character (Tertullian, *c. Marcion*, iv. 5), and the Alogi assigned both Revelation and the Gospel to Cerinthus (Epiphanius, *Haer.* li. 3). This attitude is more widely represented in the next century.

Third Century.—The attack on Revelation was resumed by abler antagonists in this century. The objections of the Alogi were restated and maintained by the Roman presbyter Caius in his controversy with the Montanist Proclus (Eus. *H.E.* ii. 25. 6; iii. 28. 2), but met with such overwhelming refutation at the hands of Hippolytus (see Gwynn, *Hermathena*, vi. 397–418) that no church writer in the West subsequently except Jerome seriously called in question the authorship of our book.

Dionysius of Alexandria (A.D. 255) wrote a moderate and effective criticism, in which he rejects the hypothesis of the

Cerinthian authorship and urges that it was not written by the apostle, on the ground of its difference in language, style and contents from the other Johannine writings. Its author was some inspired man bearing the same name as the son of Zebedee. The arguments of Dionysius were repeated by Eusebius, who ascribed the work to the presbyter John mentioned by Papias (Eus. *H.E.* iii. 39) and was in doubt whether he should place Revelation among the spurious (νόθα) works (*H.E.* iii. 25. 4) or the accepted (ὁμολογούμενα).

Eastern Church.—In the Eastern Church the views of Dionysius and Eusebius were generally accepted. With the exception of Methodius and Pamphilus the book was not received by Eastern scholars. Thus it was either not mentioned or disowned by Cyril of Jerusalem, Chrysostom, Theodore of Mopsuestia, Theodoret and Amphilochus of Iconium. It is absent from the so-called Synopsis of Athanasius, the Stichometry of Nicephorus, the List of Sixty Books and other authoritative documents. It formed no part of the Peshitta New Testament. It was apparently unknown to Ephraem. Even when later it found a place in the Philoxenian and Harclean versions it never became a familiar book to the Syrian Churches, while it was unhesitatingly rejected by the Nestorian and Jacobite Churches.

But though the Syrian Church maintained this unconciliatory attitude to the book, opposition to it began gradually to disappear in the rest of the East. Thus it came to be acknowledged by Athanasius, Isidore of Pelusium, Gregory of Nyssa, and others. Commentaries on the book were written by Andreas, archbishop of Caesarea, in the 5th century, and Arethas in the 9th.

Western Church.—In the Western Church, Revelation was accepted by all writers from Hippolytus onward with the exception of Jerome, who relegated it to the class lying between the canonical and apocryphal. The authenticity of the book was unquestioned thenceforward till the Reformation, when the view of Jerome was revived by Erasmus, Carlstadt, Luther and others under various forms. In the Lutheran Church this opposition lasted into the next century, but in the Reformed it gave way much earlier. That Revelation has retained its place in the canon is due not to its extravagant claims to inspiration or its apocalyptical disclosures, but to its splendid faith and unconquerable hope, that have never failed to awake the corresponding graces in every age of the Church's history.

The History of Interpretation.—This is a most fruitful subject, and the study of it helps to settle other related questions. We first of all might divide the methods of interpretation into two classes: I. Methods which presuppose the literal unity of the book; II. Methods which presuppose some breach of this unity either in the plan of the book as a whole or in some of its details.

I. *Methods presupposing the Literal Unity of the Book.*—Where the book was accepted the problem of its interpretation was differently dealt with according to the age and environment of the interpreter. The book was first taken in a severely literal sense, and particularly in its chiliastic doctrine.

i. *Chiliastic Interpretation.*—Revelation was held to teach chiliasm, or the doctrine of the literal reign of 1000 years Amongst the chiliasts were Cerinthus, Papias, Justin, Irenaeus, Hippolytus, Tertullian and Victorinus.[1] When the Church obtained the mastery of the world this method came naturally to be abandoned in favour of a spiritualistic interpretation, to which we shall presently refer. But the growing secularism of the Church led to a revival of the former method in the beginning of the 13th century amongst the Franciscans. Thus Joachim of Floris in his *Expositio magni abbatis Ioachimi in Apoc.* teaches that Babylon is Rome, the Beast from the Sea Islam, the False Prophet the heretical sects of the day, and that on the close of the present age which was at hand the millennium would ensue. This method of interpretation was pursued to extravagant lengths by other Franciscans and was subsequently adopted by the Protestant reformers, who could justify their identification of the papacy with the Antichrist from books written within the Roman communion. Joachim was the first to apply the "recapitulation" theory to Revelation.

ii. *Spiritualistic Interpretation.*—The founder of this school of interpretation was Ticonius the Montanist (*floruit* A.D. 380), though he followed therein the precedent set by Origen. His interpretation is on the whole mystical. Historical fulfilments, if not excluded, are not sought for. The millennium is the period between the first and second comings of Christ. The method of Ticonius was dominant in the Church down to the middle ages, amongst his followers being such notable churchmen as Augustine, Primasius, Cassiodorus, Bede, Anselm.

iii. *Universal Historical Method of Interpretation.*—A counter-attempt over against Joachim to interpret Revelation in the light of history was made by Nicolas of Lyra (1329, in his *Postilla*), following (?) therein the lead of Petrus Aureolus (1317). Here for the first time a consistently elaborated world-historical interpretation is carried out from the reign of Domitian to Lyra's own period. Under this method might be classed the expositions of Luther, Osiander, Striegel, Flacius, Gerhard and Calovius; and English writers such as Napier, Mede and Newton. Throughout these later commentaries a strong antipapal interest which identified the pope with the Antichrist holds a central place—a doctrine which, as we have seen, goes back historically to the immediate disciples of Joachim and like-minded Franciscans.

iv. *Contemporary-Historical Method.*—Under the stress of the Protestant attack there arose new methods on the papal side, and their authors were the Spanish Jesuits, Ribeira (*ob.* 1591) and Alcasar (*ob.* 1614). With these writers we have the beginning of a scientific method of interpretation. They approach the book from the standpoint of the author and seek the clue to his writings in the events of his time. It is from these scholars that subsequent writers of Revelation have learnt how to study this book scientifically.[2] This method was adopted and developed by Grotius,[3] Hammond, Clericus, Semler, Corredi and Eichhorn, Lücke, Bleek and Ewald, and the consciousness that Rome and not Jerusalem was the object of attack in Revelation became increasingly clear in the works of these scholars. The work of Ramsay, *The Letters to the Seven Churches* (1904), is a pure representative of this method.

v.–vii. *Continuously Historical, Eschatological*[4] *and Symbolical Methods.*—These methods are now generally regarded as unscientific, and call for no further notice here save to mention that the first was upheld by Hengstenberg, Ebrard, Maitland, Elliott, &c.; the second by Kliefoth, Beck, Zahn, and the third by Auberlen, Luthardt, Milligan and Benson.

The learned Cambridge Commentary by Swete (*The Apocalypse of John*, 2nd ed., 1907) makes use of several of the methods of interpretation enumerated above. Thus Dr Swete writes (p. ccxviii) of his work: "With the 'preterists' (contemporary-historical) it will take its stand on the circumstances of the age and locality to which the book belongs, and will connect the greater part of the prophecy with the destinies of the empire under which the prophet lived; with the 'futurists' (eschatological) it will look for fulfilments of St John's pregnant words in times yet to come. With the school of Auberlen and Benson it will find in the Apocalypse a Christian philosophy of history; with the 'continuous-historical' school it can see in the progress of events ever new illustrations of the working of the great principles which are revealed. And . . . it will gladly accept all that research and discovery can yield for the better understanding of the conditions under which the book was written." The chief value of this very scholarly book is to be found in its textual side.

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[1] The oldest Latin commentary was written by this scholar (*ob.* 303). He was the first in extant literature to interpret certain passages in Revelation of Nero.

[2] The Jesuit Juan Mariana was the first after Victorinus to explain "the wounded head" as referring to Nero. This interpretation was introduced into Protestant exegesis by Corrodi.

[3] The beginnings of the literary-critical method are to be found in Grotius. Starting from the different dates assigned by tradition to the exile to Patmos and the different chronological relations implied in the book itself, he conjectured that the Apocalypse was composed of several works of St John, written in different places and at different times, some before, some after A.D. 70. Herein he was followed by Hammond and Lakemacher, but the idea was before its time and practically died stillborn.

[4] Or *futurist.* While it is impossible to interpret the Apocalypse scientifically as a whole by the eschatological method, there are undoubtedly some sections in it which must be so interpreted.

The greater number of the methods discussed above have made no permanent contribution to the exegesis of Revelation; the method among them that has done most in this direction is the contemporary-historical. But, though this method has been applied in its fullness, and that by the keenest exegetes, there remains a consciousness that it has failed to solve many of the problems of the book. In many important points, however, its upholders are agreed, *i.e.* that the book is directed against Rome, that Nero *redivivus* is to be recognized in the wounded head, that the number 666 denotes Nero Caesar, and that in chap. xi. the preservation of the temple is foretold. Consequently the date of the composition of the book is placed before A.D. 70. Against the date assigned to the opening verses of this chapter modern scholars can make no objection, but, if this be the date of the entire work, then many passages in it are hopelessly inexplicable; for the latter just as certainly demand a date subsequent to A.D. 70 as xi. 1–2, a date prior to it. If, therefore, the possibilities of exegesis were exhausted in the list of methods already enumerated, science would have to put the New Testament Apocalypse aside as a hopeless enigma. But there is no such *impasse*. For in the New Testament Apocalypse there is not that rigid consistency and unity in detail that the past presupposed. The critical studies of recent years have shown that most of the Old Testament prophetical books are composite. And this holds true in no less a degree of most of the Jewish apocalypses. Such works are to be explained on what might be called the "fragmentary hypothesis." Other books, like the Ethiopic Enoch, exhibit a series of independent sources connected more or less loosely together. Such are to be explained on the "sources hypothesis." Others, like the Ascension of Isaiah, betray the handiwork of successive editors, and are accordingly to be explained on the "redaction hypothesis." Now modern scholars have with varying success used in turn these three hypotheses with a view to the solution of the problems of the New Testament Apocalypse. To these we shall now address ourselves.

II. *Methods—Literary-Critical—presupposing some Degree of Compositeness in the Book.*

i. *Redaction Hypothesis.*—Suggestions, as we have already observed, had been made in this direction, but it was not till Weizsäcker (*Theol. Litteraturzeitung*, 1882, p. 78 seq.) reopened the question that the problem was seriously undertaken. In the same year his pupil Völter (*Die Entstehung der Apok.*, 1882, 1885) put forward the bold theory that the original Apocalypse consisted of i. 4–6, iv. 1–v. 10, vi. 1–17, vii. 1–8, viii. 1–13, ix. 1–21, xi. 14–19, xiv. 1–3, 6, 7, xiv. 14–20, xviii. 1–24, xix. 1–4, xix. 5–10a, which he assigned to the year A.D. 66 (so the second edition). To this the original author added as an appendix x. 1–xi. 13, xiv. 8, xvii. 1–18, in A.D. 68–70. The work underwent three later redactions at the hands of successive editors in the reigns of Trajan and Hadrian. Instead of the above complex theory this writer now offers another (*Die Offenbarung Johannis*, 1904),[1] in which he distinguishes an apocalypse of John, A.D. 65, i. 4–6, iv. 1–v. 10, vi. 1–vii. 8, viii.–ix., xi. 14–19, xiv. 1–3, 6–7, xiv. 14–20, xviii. 1–xix. 4, xix. 5–10 (pp. 3–56), an apocalypse of Cerinthus A.D. 70, x. 1–11, xvii. 1–18, xi. 1–13, xii. 1–16, xv. 5–6, 8, xvi. 1–21, xix. 11–xxi. 8, xxi. 9–xxii. 6 (pp. 56–129), a redaction of the work in A.D. 114–15, i. 7–8, v. 6b, 11–14, vii. 9–17, xii. 11, 18–xiii. 18, xiv. 4–5, 9–12, xv. 1–4, 7, xvi. 19b, xvii. 14, 16, 17, xxi. 14, 22–27, xxii. 1–2, 8–9 (pp. 129–48), and certain additions, i. 1–3, 9–iii. 22, xiv. 13, xvi. 15, xxii. 7, 10–20, made in the time of Hadrian (pp. 148–171). First of all it should be observed that Völter was the first to call attention to the radical difference in outlook between vii. 1–8 and vii. 9–17—a difference now generally recognized. Next it is noteworthy that in the second scheme here given Völter has abandoned his theory of a redaction hypothesis in favour of a sources hypothesis+a redactor. The earlier view of Völter was rejected on every side: the later will not prove more acceptable, though individual suggestions of this scholar will be occasionally helpful. The problem was next dealt with by Vischer (*Die Offenbarung Johannis, eine Jüdische Apokalypse in Christlicher Bearbeitung*, 1886, 2nd ed., 1895), who took iv. 1–xxii. 5 to be a Jewish apocalypse revised and edited by a Christian, to whom he assigned i.–iii., v. 9–14, vii. 9–17, xi. 8b, xii. 11, xiii. 9, 10, xiv. 1–5, 12, 13, xvi. 15, xvii. 14, xix. 9, 10, 13b, xx. 4b–5a, 6, xxi. 5b–8, 14b, xxii. 6–21, together with some isolated expressions and all references to the Lamb. This scheme met with a better reception than that of Völter, but it also has failed to solve the problem. In 1891 Erbes (*Offenbarung Johannis*, 1891) maintained that the book was entirely of Christian origin. The groundwork was written about A.D. 62. In this an editor incorporated a Caligula apocalypse, and a subsequent editor revised the existing work in many passages and made considerable additions, especially in the later chapters. Another attempt, mainly from this standpoint, has recently been made by J. Weiss of Marburg (*Offenbarung des Johannis*, 1904). This writer seeks to establish the existence of an original Christian apocalypse written before A.D. 60. This included (see p. 111) i. 4–6 (7, 8), 9–19, ii.–vii., ix., xii. 7–12, xiii. 11–18, xiv. 1–5, 14–20, xx. 1–15, xxi. 1–4, xxii. 3–5, 8 sqq. With this a Jewish apocalypse (x.–xi. 13, xii. 1–6, 14–17, xiii. 1–7, xv.–xix., xxi. 9–27—see p. 115), written A.D. 70, was incorporated by the redactor. This latter apocalypse consisted of a series of independent prophecies which appeared to have the same crisis in view. This redactor, moreover, was the first who gave to the Apocalypse the character of an attack on the Roman Empire and the imperial cult by means of a series of small additions. In the above work we have a combination of the redaction and sources hypotheses.

ii. *Sources Hypothesis.*—The same year Weyland (*Theol. Tijdsch.*, 1886, 454–70; *Omwerkings en Compilatie-Hypothesen toegepast op de Apoc. van Johannis*, 1888) advanced the theory of two Jewish sources (א and ב), which were subsequently worked over by a Christian redactor. Such a theory as that just mentioned hopelessly fails to account for the linguistic unity of the book.

A very elaborate form of this theory was issued in 1884 (*Offenbarung Johannis*) by Spitta, who found three main sources in the Apocalypse. First, there was the primitive Christian apocalypse embracing the letters and the seals written by John Mark soon after A.D. 60,—i. 4–6, 9–19, ii. 1–iii. 22, iv.–vi., viii. 1, vii. 9–17, xix. 9b, 10, xxii. 8, 10–13, 16a, 17, 18a, 20b–21. Secondly, the trumpet source of the time of Caligula (*circa* 40),—vii. 1–8, viii. 2–ix., x. 1–7, xi. 15, 19, xii.–xiii. 18, xiv. 1–11, xvi. 13–20, xix. 11–21, xx. 1–3, 8–15, xxi. 1, 5a, 6a. Thirdly, the vials source from the time of Pompey (*circa* 63),—x. 1b, 2a, 8a, 9b, 10–11, xi. 1–13, 15b, 17, 18, xiv. 14–20, xv. 2–6, 8, xvi. 1–12, 17a, 21, xvii. 1–6a, xviii. 1–23, xix. 1–8, xxi. 9–xxii. 3a, 15. The rest of the book is from the hands of the redactor.

In 1891 Schmidt resolved the book into three independent sources which were put together by a redactor (*Anmerkungen über d. Komposition der Offenb. Johannis*).

In 1895 Briggs (*Messiah of the Apostles*, 1895) developed this theory to a still more extreme degree.

iii. *Fragment Hypothesis.*—The previous theories have brought to light and emphasized the fact that within the Apocalypse there are passages inconsistent with the tone and character of the whole. But, notwithstanding this fact, the Apocalypse gives a strong impression of its unity. Thus apparently the only remaining theory which can account for both these phenomena is that at which we have now arrived, *i.e.* the fragment hypothesis. To Weizsäcker we owe the first statement of this theory. In 1882 (*Theol. Litteraturz.* pp. 78–9) he suggested that while the book is a unity the author made free use of older materials. Later, in his *Apostolic Age* (1886, 2nd ed. 1892), he specifies these additions as vii. 1–8 (A.D. 64–66), x.–xi. 1–13 (*circa* A.D. 67), xii. 1–11, 12–17 (*circa* 69), xiii. (time of Vespasian), xvii. (time of Domitian).

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[1] Besides the works mentioned here Völter wrote two other works on the Apocalypse: *Die Offenbarung Johannis*, 1886; *Das Problem der Apokalypse*, 1893.

Sabatier (*Les Origines littéraires . . . de l'apocalypse*, 1888) regards the book as a unity into which its author had introduced older Jewish materials not always consistent with their new contexts, such as xi. 1–13, xii.–xiii., xiv. 6–20, xvi. 13, 14, 16, xvii. 1–xix. 2, xix. 11–xx. 10, xxi. 9–xxii. 5. The author wrote x. with a view to adapting xi. 1–13 to its new context. Schoen (*L'Origine de l'apocalypse*, 1887) attached himself in the main to the scheme of Sabatier. Both these writers assign the Apocalypse to the reign of Domitian.

The labours of these scholars, though to the superficial student they seem to prove that everything is possible and nothing certain, have certainly thrown great light on the literary character of the Apocalypse. Though differing in detail, they tend to show that, while the book is the production of one author, all its parts are not of the same date, nor are they one and all his first-hand creation. For many of the facts, the discovery of which we owe to the literary critics, have made the assumption of an absolute unity in the details of the Apocalypse a practical impossibility. Incongruities manifest themselves not only between certain sections and the main scheme of the book, but also between these and their immediate contexts. These sections are vii. 1–8a, xi. 1–13, xii., xiii., xvii., xviii., xx., xxi. 9–xxii. 5. Some of these sections (xi., xii., xiii., xvii.) contain elements that cannot be explained from any of the above methods. The symbols and myths in these are not the creation of the writer, but borrowed from the past, and in not a few instances the materials are too foreign to his subject to lend themselves to his purpose without the help of artificial and violent expedients. For the elucidation of these foreign elements a new method—the traditional-historical—is necessary, and to the brilliant scholar Gunkel we owe its origination.

iv. *Traditional-historical Method.*—Gunkel (*Schöpfung und Chaos in Urzeit und Endzeit; eine religionsgeschichtliche Untersuchung über Gen. 1 und Joh. 12*, 1895) opened up new lines of investigation. He criticizes sharply (pp. 173 sqq., 233 sqq.) former methods of interpretation, and with the ardour of a discoverer of a new truth seeks to establish its currency throughout the entire field of apocalyptic. To such an extreme does he carry his theory that he denies obvious references to historical personages in the Apocalypse, when these are clothed in apocalyptic language. Thus he refuses to recognize Nero in the beast and its number. But apart from its extravagances, his theory has undoubted elements of truth. It is true that tradition largely fixes the form of figures and symbols in apocalyptic. Yet each new apocalypse is to some extent a reinterpretation of traditional material, which the writer uses not wholly freely but with reverence from the conviction that they contained the key to the mysteries of the present and the past. From this standpoint it may be argued that every apocalypse is in a certain sense pseudonymous; for the materials are not the writer's own, but have come down to him as a sacred deposit —full of meaning for the seeing eye and the understanding heart. On the other hand, since much of the material of an apocalypse is a reinterpretation, it is necessary to distinguish between its original meaning and the new turn given to it in the Apocalypse. At times details in the transmitted material are unintelligible to our author, and these in some cases he omits referring to in his interpretation. The presence of such details is strong evidence of the writer's use of foreign material.

As an illustration of his theory Gunkel seeks at great length to establish the Babylonian origin of chap. xii. of the Apocalypse. His investigation tends to show that in the course of tradition cosmological myths are transformed into eschatological dogmas.

The above method was adopted by Bousset in his work *Der Antichrist in der Überlieferung des Judenthums, des Neuen Testaments, und der alten Kirche* (1895), in which he sought to show that a fixed tradition of the Antichrist originating in Judaism can be traced from New Testament times down to the middle ages, and that this tradition was in the main unaffected by the Apocalypse, though in chap. xi. the Apocalypse shows dependence on it. Next in 1896 he published his commentary *Die Offenbarung Johannis* (2nd ed. 1906). In this work he availed himself of the results of the past and followed the three approved methods—the contemporary-historical, the fragmentary and the traditional-historical.

Julicher (*Einleitung in das Neue Testament*^{4}, 1901, pp. 204–29) adopts the same three methods of interpretation.

Holtzmann (*Einleitung in das N.T.*^{2}, 1892; *Hand-Commentar*^{2}, 1893; *Lehrbuch der NTlichen Theol.*, i. 463–76) holds mainly to the contemporary-historical method in his earlier works, though recognizing signs of a double historical background; but in his last work the importance of tradition as a source of the writer's materials is fully acknowledged.

In 1902 O. Pfleiderer in the second edition of his *Urchristentum* (1902, pp. 281–335) abandoned his former view on the Apocalypse and followed essentially the lines adopted by Bousset, though the details are differently treated.

In the same year Porter's able article on "Revelation" appeared in Hastings' *Bible Dictionary* (iv. 239–66), and in 1905 his still fuller treatment of the same theme in *The Messages of the Apocalyptical Writers*, 169–294. To these works the present writer is indebted for many a suggestion.

A small commentary (no date) by Anderson Scott follows in some measure the lines laid down in Bousset and Porter.

Psychological Method.—It might be supposed that all possible methods had now been considered, and that a combination of the three methods which have established their validity in relation to the interpretation of the Apocalypse would be adequate to the solution of all the problems of the book, but this is not so; for even when each in turn has vindicated the provinces in the book that rightly belong to it, and brought intelligibility into these areas, there still remain outlying regions which they fail to illumine. It is not indeed that these methods have not claimed to solve the questions at issue, but that their solutions have failed to satisfy the larger body of reasonable criticism. The main problem, which so far has not been satisfactorily solved, may be shortly put as follows: Are the visions in the Apocalypse the genuine results of spiritual experiences, or are they artificial productions, mere literary vehicles of the writer's teaching? Weizsäcker unhesitatingly advocates the latter view. But the serious students of later times find themselves unable to follow in his footsteps. The writer's belief in his prophetic office and his obvious conviction of the inviolable sanctity of his message make it impossible to accept Weizsäcker's opinion. Nor is it possible to accept Gunkel's theory in *Schöpfung und Chaos* as an adequate explanation, who explained the author's conviction of the truth of his message as springing always from the fact that he was dealing with traditional material. This theory, which we have already dealt with in other connexions, is undoubtedly helpful, but here we require something more, and Gunkel has in consequence of Weinel's work (*Wirkungen des Geistes und der Geister*, 1899) subsequently acknowledged that actual spiritual experiences lie behind some of the visions in apocalyptic (Kautzsch, *Pseud. des A.T.*, ii. 341 sqq.). The fact of such visionary experience can hardly be questioned: the only difficulty lies in determining to what extent it underlies the revelations of apocalyptic. For a short discussion of this question we might refer to Bousset's *Offenbarung Johannis*^{2}, pp. 8 sqq., and Porter's article on "Revelation" in Hastings' *Bible Dictionary*, iv. 248 sqq.

Methods of Interpretation.—As a result of the preceding inquiry we conclude that the student of the Apocalypse must make use of the following methods—the contemporary-historical, the literary-critical (fragmentary hypothesis), the traditional-historical and the psychological. Each of these has its legitimate province, and the extent of this province can in most cases be defined with reasonable certainty.

Plan and Detailed Criticism of the Book.—Two theories have been advanced to explain the plan and order of the book. The first of these is the *recapitulation theory* which Tyconius originated and Augustine adopted, and which has been revived in later times by Hofmann, Hengstenberg and others. This theory holds that no progress is designed in the successive visions of the seven seals, the seven trumpets and the seven bowls; for that in the vision of the seals we have already an account of the last judgment (vi. 12–17) and the blessed consummation (vii. 9–17). Thus the three groups form parallel accounts and contain the same or closely related material. But such a view is in conflict with the fact that the Apocalypse exhibits a steady movement from a detailed account of the condition of actual individual churches on an ever-widening sweep to the catastrophes that will befall every nation and country till at last evil is finally overthrown and the blessedness of the righteous consummated. Accordingly later exegetes[1] hold that the seventh in each series is unfolded in the series of seven that follows. But to this theory also it has been objected (Holtzmann, *Hand-Commentar.* p. 294) that the bowls are in the main a repetition—in parts weaker, in others stronger—of what has already been put forward in the trumpets; that before the seventh member of each hebdomad there is a pause occasioned by the insertion of visions of a different nature; that the final judgment has already been depicted in vi. 17, and yet further descriptions recur in x. 6, 7, xi. 15–18, xiv. 7, xix. 11: the temple in heaven is opened in xi. 19 and yet again in xv. 5: heaven itself has already been rent in sunder in vi. 12–17, and yet in viii. 7–12 is supposed to be in its ancient order: all green grass is burnt up in viii. 7, yet in ix. 4 the locusts are not permitted to injure the grass, and other like inconsistencies.

The impossibility of logically carrying out either theory has given rise to doubts as to the unity of the book. Holtzmann (*Hand-Comment.* 295) represents its structure as follows:—

i. 1–8	Introduction.		
i. 9–iii. 22	Group of seven letters.		
iv.–v. 14	Heavenly scene of the Vision.		
vi. 1–17	Six seals.		
		vii. 1–17	The sealed and the blessed.
viii. 1–5	The emergence of the trumpets from the seventh seal.		
viii. 6.–ix. 21	Six trumpets.		
		x. 1–xi. 14	Destiny of Jerusalem.
xi. 15–19	The seventh trumpet.		
		xii. 1–xiv. 5	The great visions of the three chief enemies and of the Kingdom of the Messiah.
xiv. 6–20	Return to the earlier connexion.		
xv. 1–xvi. 1	Transition to the bowls.		
xvi. 2–21	Seven bowls.		
		xvii. 1–xix. 10	The great Babylon.
xix. 11–xx. 15	Final catastrophes.		
		xxi.–xxii. 5	The New Jerusalem.
xxii. 6–21	Conclusion.		

It is noteworthy that the sections on the right hand correspond in the main to the elements which have been those to which the latest critics have assigned either an earlier date or a different authorship.

Chaps. i.–iii.—These chapters open with a prologue, i. 1–3, which defines the source, character and contents of the book, followed by a greeting, i. 4–8, in which the writer salutes the Seven Churches of Asia. Having so introduced his work the author describes a vision of the ascended Christ, i. 9–20, who sends His messages to the angels of the Seven Churches, ii.–iii. With the conclusion of these epistles the Apocalypse proper really begins. But the way has been prepared for it. Its contents are "the things which must quickly happen," i. 1. The visions are not for John's personal benefit, but for transmission to the church at large, i. 11, and the writer is bidden to write down what he has seen and "the things which are and the things which shall be hereafter," i. 19.

iv.–vi.—The first three chapters show great artistic skill, and the power of the artist is no less conspicuous in what follows. First of all John is bidden to come up into heaven and see the things that should be hereafter, the vision of iv. 1. Then he beholds the Almighty on His throne surrounded by the four and twenty elders and the four living creatures. Before Him they all bow in worship and acknowledge that by Him were created all things and of His own free will were all created. In the next chapter (v.) the seer has a vision of a roll in the hand of Him that sat on the throne which none could open or look upon, till the Lion of the tribe of Judah, the mighty one with seven horns and seven eyes, appeared. Before Him all the elders and the living creatures fell down and acknowledged that He had power to open the seven seals thereof, and their song was re-echoed by every thing alike in heaven and earth. The contrast between these two chapters and those that follow is striking in the extreme. The time of the seer's vision is one of direst need. The life and death struggle between the church and the empire has now entered on its final stage, and fear and trouble and woe are rife in the hearts of the faithful. But when the seer is exalted to heaven he sees no trace of the turmoil on earth. The vision of the Almighty is full of majesty and peace. All things do Him service; for all are the free creation of His will. The next vision serves to connect the Source and Sustainer of all things with the world and its history. The closing of the intermediate stage of the history of created things is committed to the Christ who will also be Lord of the age to come. The future of the saints is assured: what can avail against Him that hath "glory and dominion for ever and ever" the wild attacks of Rome and even of Satan and his hosts? The Lamb that was slain has taken upon Himself the burden of the world's history.

In vi. we have the opening of the six seals, and the horrors of the future begin. The choice of three series of seven seals, seven trumpets and seven bowls, to form the framework in which the history of the last woes is to be given, shows the same hand that addressed the churches as seven. But between the sixth and seventh seals and the sixth and seventh trumpets the connexion is more or less disturbed by the insertion of certain interludes containing material foreign in certain aspects to the Apocalypse. These are vii. 1–17 and x. 1–xi. 14.

vii. 1–17.—These verses, which interrupt the plan of the book, fall into two independent fragments, 1–8 and 9–17, which are inconsistent in their original meaning with each other. For while 1–8 was most probably a Jewish apocalyptical fragment and strongly particularistic, 9–17 is clearly universalist in character and is probably from the hand of our author. The foreign origin of vii. 1–8 may be concluded with Spitta, Bousset and others from the fact that the four winds, which in vii. 1 are said to be held fast lest they should break in elemental fury on land and sea, are not let loose or referred to in the subsequent narrative, and also from the mention of the 144,000 Israelites of the twelve tribes, to whom no further reference is made; for these can no more be identified with the countless multitudes in vii. 9–17 than with those who are "sealed" in ix. 4 sq. nor with the 144,000 in xiv. 1; for in both these cases the sealed are not Jews but elect Christians. The object of both fragments was to encourage the faithful in the face of the coming strife. In the latter, in which the Apocalyptist looks forward prophetically to the issue, the assurance held out is of ultimate victory, but of victory through death or martyrdom. In the former (Jewish or Christian-Jewish fragment) the sealing seemed to have carried with it the assurance of deliverance from physical death, as in Ezek. ix. 4 sqq. But in its *new* context this meaning can hardly be retained. Not improbably the sealing means to our author the preservation not from death, but through death from unfaithfulness, and the number 144,000 would signify mystically the entire body of true Christians, which formed the true people of God.

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[1] Swete divides the Apocalypse first of all into forty-two minor sections. Next he groups these sections into fourteen larger masses of apocalyptic matter, and by a process of synthesis seeks to arrive at the plan on which the author constructed his book. In so doing he points out that we become conscious of a great cleavage which practically divides the book into two parts, i. 9–xi. 14 and xii. 1–xxii. 5, independently of the prologue and greeting, i. 1–8, and the epilogue and benediction, xxii. 6–21. A further study of the leading thoughts of the above parts enables him to set forth the scheme of the book as follows:—

PROLOGUE AND GREETING, i. 1–8.
Part I. Vision of Christ in the midst of the churches, i. 9–iii. 22.
  Vision of Christ in Heaven, iv. 1–v. 14.
  Preparations for the End, vi. 1–xi. 19.
Part II. Vision of the Mother of Christ (*i.e.* the Church) and her enemies, xii. 1–xiii. 18.
  Preparations for the End, xiv. 1–xx. 15.
  Vision of the Bride of Christ arrayed for her husband, xxi. 1–xxii. 5.
  Epilogue and benediction, xxii. 6–21.

Chapter vii., then, interrupts the development of the author's plan, but the interruption is deliberate. He wishes to encourage the persecuted church not only to face without fear, but also to meet with triumphant assurance the onset of those evils which would bring panic and despair on the unbelieving world.

viii.–ix.—These chapters, though presenting some minor difficulties, do not call for discussion here. They recount the six partial judgments which followed the opening of the seventh seal and the blasts of the six trumpets.

x.–xi. 1–13.—This section bristles with difficulties. Chapter x. forms an introduction to xi. 1–13. In it the prophet receives a new commission, x. 11: "Thou must prophesy again over many peoples and nations and tongues and kings." This new commission explains his departure from the plan pursued in the earlier chapters of developing the seventh in each series into a new series of seven. The seer has a vision of the seven thunders, but these he is bidden to seal and not commit to writing. He is instead to write down the new book of prophecies. The end is at hand. It is noteworthy that in the earlier visions it was Christ who spoke to the seer. Here and in the later visions, especially those drawn from foreign sources, it is an angel.

In xi. 1–13 we have a characteristic illustration of our author's dependence on traditional materials and his free adaptation of them to meanings other than originally belonged to them. For it is generally agreed among critics that xi. 1–13 is borrowed from Jewish sources, and that this fragment really consists of two smaller fragments, xi. 1–2 and xi. 3–13. The former oracle referred originally to the actual Temple, and contained a prediction of the preservation of the Temple. It must have been written before A.D. 70 and probably by a Zealot.[1] But our author could not have taken it in this literal sense if he wrote after A.D. 70 or even anterior to that date, owing to the explicit declaration of Christ as to the coming destruction of Jerusalem. The passage, then, must have a spiritual meaning, and its purpose is the encouragement of the faithful by the assurance of their deliverance not necessarily from physical death but from the dominion of the evil one. In xi. 3–13 we have another Jewish fragment of a very enigmatic character. Bousset has shown with much probability that it is part of the Antichrist legend. The prophecy of the two witnesses and their martyrdom belongs to this tradition. The fragment was apparently written before A.D. 70, since it speaks of the fall of only a tenth of the city, xi. 13.[2] The significance of this fragment in our author's use of it is similar to that of xi. 1–2. The details defy at present any clear interpretation, but the incorporation of the fragment may be due in general to the emphasis it lays on the faithful witness, martyrdom and resurrection of the saints.

xi. 14–19.—The seventh trumpet, xi. 15, ushers in the third woe, xi. 14. Its contents are given in xii.–xx. In xi. 15–19 the seer hears great voices in heaven singing a triumphal song in anticipation of the victory that is speedily to be achieved. This song forms a prelude to the chapters that follow.

xii.—This is the most difficult chapter in the book. Its main intention in its present context is apparently to explain Satan's dominion over the world and the bitterness of his rage against the church and against Christ. Christ, indeed, escapes him and likewise the Jewish Christians ("the woman," xii. 16) but "the rest of her seed," xii. 17 (the Gentile Christians?), are exposed to his fury. But his time is at hand; together with his hosts he has been cast down from heaven, and on the earth he "hath but a short time." The attribution of the seven heads and ten horns to the dragon, xii. 3, points forward to Rome, which is regarded as a temporary incarnation of Satan, xiii. 1, xvii. 3.

But, though a few of the leading thoughts of this chapter may be obvious, we are plunged into problems that all but defy solution when we essay to discover its origin or interpret its details. Most scholars are agreed that this chapter is not, except in the case of a few sentences, the work of our author. In other words, it has been taken over from pre-existing material—either Christian or Jewish—and the materials of which it is composed are ultimately derived from non-Jewish sources—either Babylonian, Greek or Egyptian—and bore therein very different meanings from those which belong to them in their present connexion. Furthermore, the materials are fragmentary and the order irregular.

(*a*) First of all, the chapter is not the free creation of a Christian writer. Such an one could never have so represented the life of Christ—a child persecuted by a dragon and carried off to God's throne. No mention of Christ's earthly life and crucifixion. Furthermore, the victory over Satan is ascribed to Michael. Again, a Christian could not represent Christ as the son of the wife of the sun-god; for such is the natural interpretation of the woman crowned with the twelve stars and with her feet upon the moon. Finally, even if "the woman" who is the mother of Christ be taken to be the ideal Israel in the beginning of the chapter, at its close she is clearly the Christian community founded by Him. We conclude, therefore, that the present chapter is not the work of our author. There are, however, traces of his hand. Thus 7–12, which is really a Jewish fragment recounting the victory of Michael over Satan, has to a certain degree been adapted to a Christian environment by the insertion of the 10b–11.

(*b*) The order is not original. The flight of the woman is mentioned in verse 6 to a place of refuge prepared for her by God. Then comes an account of the casting down of Satan from heaven. Then again in 13–16 the flight of the woman is described. This fact has been variously accounted for by different critics. Wellhausen regards 1–6 and 7–14 as doublets, and differentiates two actions in the original account which are here confused. Spitta takes verse 6 to be an addition of the redactor, which describes proleptically what follows, while Gunkel sees in 6 and 7–16 parallel accounts. In any case we should probably agree with the contention of J. Weiss, supported by Bousset in the second edition of his commentary, that 7–12 is a fragment of a Jewish apocalypse, of which 10b–11 is an addition of our author. Next that 6 is a doublet of 13 sqq. What then is to be made of 1–5, 13–17? Different explanations have been offered. Gunkel[3] traces it to a Babylonian origin. He urges that an adequate explanation is impossible on the assumption of a Jewish or Christian origin. At the base of this account lies the Babylonian myth of the birth of the sun-god Marduk, his escape from the dragon who knows him to be his destined destroyer, and the persecution of Marduk's mother by the dragon. But Gunkel's explanation is an attempt to account for one *ignotum per ignotius*; for hitherto no trace of the myth of the sun-god's birth and persecution and the flight into the wilderness has been found in Babylonian mythology. Moreover, Gunkel no longer lays emphasis on the Babylonian, but merely on the mythical origin of the details. A more satisfactory explanation has been offered by Dieterich (*Abraxas*, 117 sqq.), who finds in this chapter an adaptation of the birth of Apollo and the attempt of the dragon Pytho to kill his mother

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[1] The Zealots occupied the inner court of the Temple during its siege by the Romans.

[2] The linguistic evidence, as Bousset has pointed out, confirms the critical conclusion that xi. 1–13 were independent sources. For whereas in ix.–x. the verb almost regularly begins the sentence and the object follows the verb, in xi. 1–13 the object frequently precedes the verb and the subject nearly always. The order of the genitive in xi. 4 is elsewhere unknown in the Apocalypse, and in xi. 2, 3 the construction of διδόναι followed by καὶ instead of infinitive or ἵνα is unique in this book.

[3] *Schöpfung und Chaos* § 3, *Religionsgesch. Verständniss d. N.T.*, 54 sqq.

Leto, because it was foretold that Leto's son would kill the dragon. Leto escapes to Ortygia, which Poseidon covers with the sea in order to protect Leto. Here Apollo is born, who four days later slays the dragon. Yet another explanation from Egyptian mythology is given by Bousset (*Offenbarung Johannis*, 2nd ed., pp. 354, 355) in the birth of the sun-god Horus. Here the goddess mother is represented with a sun upon her head. Typhon slays Horus. Hathor, his mother, is persecuted by Typhon and escapes to a floating island with the bones of Horus, who revives and slays the dragon.[1] There are obvious points of similarity, possibly of derivation, between the details in our text and the above myths, but the subject cannot be further pursued here, save that we remark that in the sun myth the dragon tries to kill the mother before the child's birth, whereas in our text it is after his birth, and that neither in the Egyptian nor in the Greek myth is there any mention of the flight into the wilderness.

The insertion of the alien matter 7–12 between 1–5 and 13–17 may be due to our author's wish to show that the expulsion of Satan from heaven after Christ's birth and ascension to heaven was owing in some measure to Christ, although he has allowed Michael's name to remain in the borrowed passage, 7–12—a fact which shows how dependent the writer was on tradition.

xiii.—In this chapter we have the two beasts[2] which symbolize respectively Rome and the Roman provincial priesthood of the imperial cult. Thus the world powers of heathen statesmanship and heathen religion are leagued in a confederacy against the rising Christian Church. Against these the church is not to attempt to use physical force; its only weapon is to be passive endurance and loyalty to God.

That this chapter must be interpreted by the contemporary-historical method is now generally admitted. Even Gunkel is obliged to abandon his favourite theory here, though he contests strongly the recognition of any allusion to Nero. Various solutions have been offered as to the seven emperors designed by the seven heads of the beast, xiii. 1. But the details of this passage are not sufficiently definite to determine the question here. It will return in chapter xvii. There are, however, two facts pointing to a late date. The first is the advanced stage of development of this, the Neronic-Antichrist legend. One of the heads "is smitten unto death," but is healed of the death stroke. This points, we may here assume, to the Nero *redivivus* legend, which could not have arisen for a full generation after Nero's death, and the assumption receives large confirmation from the most probable interpretation of the enigmatical words, xiii. 18, "the number of the beast . . . is six hundred and sixty six." Four continental scholars, Fritzsche, Benary, Hitzig and Reuss, independently recognized that Nero was referred to under the mystical number 666. For by transliterating Καῖσαρ Νερῶν into Hebrew קסר נרון and adding together the sums denoted by the Hebrew letters we obtain the number 666. This solution is confirmed by the fact that it is possible to explain by it an ancient (Western?) variant for the number 666, *i.e.* 616. This latter, which is attested by Irenaeus (v. 30. 1), the commentary of Ticonius, and the uncial C, can be explained from the Latin form of the name Nero, which by its omission of the final *n* makes the sum total 616 instead of 666.

The above solution may be regarded as established, though several scholars, as Oscar Holtzmann (Stade's *Geschichte des Volkes Israel*, ii. 661), Spitta and Erbes, have contended that 616 was the original reading (Γάϊος Καῖσαρ=616) and that chapter xiii. was part of a Jewish apocalypse written under Caligula between the years 39 and 41. ~~But~~ this Caligula hypothesis cannot be carried out unless by a vigorous use of the critical knife, in the course of which more than a third of the chapter is excised. Moreover the number 616 is too weakly supported to admit of its being recognized as the original.

The figure of the first beast presents many difficulties, owing to the fact that it is not freely invented but largely derived from traditional elements and is by the writer identified with the seventh wounded head. The second beast, signifying the pagan priesthood of the imperial cult, called "the false prophet" in xvi. 13, appears to be an independent development of the Antichrist legend.

xiv.–xvi.—These chapters contain a vision of Christ on Mount Zion and the 144,000 of the undefiled that follow Him, xiv. 1–5, the last warnings relating to the harvest and vintage of the world, xiv. 6–20: the vision of the wrath of God in the outpouring of the seven bowls containing the seven last plagues, xv.–xvi.

In the above section most critics are agreed that xiv. 14–20 originally represented the final judgment and was removed from its rightful place at the close of an apocalypse to its present position. In its original setting "the one like unto a Son of Man, having on his head a golden crown" (xiv. 14), undoubtedly designated the Messiah, but the transformation of the final judgment into a preliminary act of judgment by a redactor, necessarily brought with it the degradation of the Son of Man to the level of a mere angel. Some critics hold that this apocalypse was the apocalyptic groundwork, but Bousset is of opinion that it stood originally in connexion with xi. 1–13.

As regards xvi. the views of critics take different directions, but that of Bousset followed by Porter seems the most reasonable. This is that this chapter forms an introduction to xvii., which was an independent fragment. The writer throws this introduction into his favourite scheme of seven acts, in this case symbolized by seven bowls. The earlier verses, 2–11, do not amount to much beyond a repetition of what is found in viii.–ix., save that as a preparation for xvii. references are inserted to the beast and his worshippers (ver. 2) and to Rome (ver. 10). In xvi. 12–16 is a revised form of an older tradition.

xvii.—This chapter presents great difficulties, especially if with the older and some of the recent exegetes we regard it as written at the same time and by the same author. Even so strong an upholder of the unity of the book as Swete is ready to admit that portions of xvii., as well as of xiii., show signs of an earlier date than the rest of the book. He writes: "The unity of the Book . . . cannot be pressed so far as to exclude the possibility that the extant book is a second edition of an earlier work, or that it incorporates earlier materials, and either hypothesis would sufficiently account for the few indications of a Neronic or Vespasianic date that have been found in it" (*Apoc. of St John*², p. civ.). This chapter cannot be interpreted apart from the Neronic myth. Of this there appear to be two stages attested here. Of the earlier we have traces in xvii. 16–17 and xvi. 12, where there are allusions to Nero's confederacy with the Parthian kings with a view to the destruction of Rome. Of the later stage, when the myth of Nero *redivivus* was fused with that of the Antichrist, we have attestation in xvii. 8, 12–14, where Nero is regarded as a demon coming up from the abyss to war not with Rome but with Christ and the elect. This development of the Neronic myth belongs to the last years of the 1st century, and is decidedly against a Vespasianic date. To meet this difficulty a recent interpreter—Anderson Scott—though he assigns the book to the year A.D. 77, is yet willing to admit that the book though composed in the reign of Vespasian was "reissued with additions by the same hand after the death of Domitian" (*Revelation*, p. 56). Our author represents himself as writing under the sixth emperor. Five have already died, the seventh is yet to come, to be followed by yet an eighth, who is one of the seven (*i.e.* Nero). In order to arrive at the date here implied, we can begin the reckoning from Julius Caesar or Augustus, we can include or exclude Galba, Otho and Vitellius, and, finally, when we have drawn our conclusions from these data, there remains the possibility that the book was after all not written under the sixth emperor, but was really a *vaticinium ex eventu.* According to the different methods pursued, some have concluded that Nero was the sixth emperor, and thus dated the Apocalypse before A.D. 70; others Vespasian, and yet others Domitian. No solution of the difficulties of the chapter is wholly satisfactory, but the best yet offered seems to be that of Bousset (*Offenbarung*^{2}, 410–18). He holds that 1–7, 9–11, 15–18, belong to an original source, which was written in the reign of Vespasian and represents the earlier stage of the Neronic myth. To a reviser in Domitian's reign we owe 8, 12–14 and 6b, a clause in 9, *ἑπτὰ ὄρη . . . αὐτῶν*, and another in 11, *ὃ ἦν καὶ οὐκ ἔστιν.* If the clause *καὶ ἐκ τοῦ αἵματος τῶν μαρτύρων* Ἰησοῦ in 6 is an addition, then he thinks the source was Jewish and the "blood of the saints" was that shed at the destruction of Jerusalem, and the forecast of the author related to the destruction of Rome. When the reviser recast the passage it dealt not with the destruction of Jerusalem, but with the persecution of the Christians. Nero was now a demonic monster from the abyss, and the ten kings no longer Parthians but ghostly helpers of Nero. The destruction of Rome has now become a secondary event: the reviser's thought is fixed on the final strife between the Lamb and the Antichrist.

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[1] On the possibility of other points of contact between the Apocalypse and Egyptian mythology, see Mrs Grenfell's article, "Egyptian Mythology and the Bible," in the *Monist* (1906), pp. 169–200.

[2] In xiii. 2 the description of the beast unites the features of the four beasts in Daniel's vision (vii.). It is clear that our author identified the fourth beast (vii. 23) with Rome, as did also the author of 4 Ezra xii. 10. But this was not the original significance of the fourth beast, for the author of Daniel referred thereby to the Greek empire; but, since the prophecy was not realized, it was subsequently reinterpreted, and applied, as we have observed, to Rome.

xviii.–xix. 10.—This section describes in prophetic language borrowed almost wholly from Isaiah and Jeremiah the coming judgment of Rome, and gives the ten lamentations of the kings and the merchants and the seamen over her, and the thanksgivings in heaven for her overthrow.

xix. 11–21.—The victory of the warrior Messiah over the two beasts, the Roman Empire and the imperial cultus and the kings of the earth. Many of the ideas set forth in earlier chapters here coalesce and find their consummation. The Messiah, whose birth and escape from the dragon was recounted in xii. 5, and who was to rule the nations with a rod of iron, at last appears in discharge of His office. The beast and the false prophet who are described in xiii. are cast alive into the lake of fire, and the kings of the earth who had assembled for this conflict, xvi. 14, xvii. 14, were slain by the sword of Him that sat on the horse.

The conception of the Messiah may be Jewish: at all events it is not distinctively Christian. The title "Word of God" can hardly be said to establish any connexion with the prologue of the Fourth Gospel; for the conceptions of the Messiah in that Gospel and in these chapters belong to different worlds of thought.

It is to be observed that our author follows the apocalyptic scheme of two judgments which is first attested about 100 B.C. The first judgment precedes the establishment of the temporary Messianic kingdom, as here in xix. 19–21; and the final judgment follows at its close, as here in xx. 7–10.

xx. 1–6.—The millennium, or the period between the first and final judgments, when Christ, with His chosen, reigns and Satan is imprisoned. Rome has been overthrown, but, as Rome is only the last secular manifestation of Satan, there is yet the final struggle with Satan and his adherents. But the time for this struggle has not yet arrived. Satan is bound[1] and cast into the abyss, and the kingdom of Christ and of the martyrs and faithful confessors established for a thousand years. Thus it is shown that evil will be finally overcome; for that the true and ultimate power even in this world belongs to Christ and those that are His.

The main features of this section have been borrowed from Judaism. The Messianic kingdom was originally conceived of as of everlasting duration on the present earth, but about 100 B.C. this idea was abandoned and the hopes of the faithful were directed to a temporary earthly kingdom of 400 or 1000 years or of indefinite duration (see R. H. Charles, *Critical History of the Doctrine of a Future Life*, pp. 201–4, 261, 286, 288). Moreover, the expectation that the saints would rise to share in the blessedness of this kingdom is also found in Judaism, 4 Ezra vii. 28 (*op. cit.* p. 285).

xx. 7–10.—Release of Satan and final assault on the city of God by the hosts of Gog and Magog at the instance of Satan. Satan and the beasts condemned to eternal torment.

xx. 11–14.—The Final Resurrection and Judgment.

xxi. 1–8.—The new heavens and the new earth. The language in this and the following section is highly figurative; but as Porter has well remarked: "Figurative language is the only language in which we can express our hope of heaven, and no figures can have greater power to suggest this hope than those taken from the literal longings of exiled Israel for the recovery of its land and city."

xxi. 9–xxii. 5.—The vision of the New Jerusalem. There are several grounds for regarding this section as an independent source possibly of Jewish origin and subsequently submitted to a Christian revision. This view is taken by Vischer, Weyland, Spitta, Sabatier, J. Weiss, Bousset and others. Our author has incorporated it as describing the consummation of the prevision contained in xi. 15–18, in which he foresaw the time when the kingdom of the world would become the kingdom of our Lord and of His Christ, and the saints should enter on their reward. Moreover, he has already hinted at its contents in xix. 7 and xxi. 2, where he speaks of the church as a bride and the marriage supper of the Lamb. But the section betrays inconsistent conceptions. The standpoint of the heavenly Jerusalem is abandoned in xxi. 24–27, xxii. 2, and the context implies an earthly Jerusalem to which the Gentiles go up as pilgrims. Outside the gates of this city are unclean and abominable things. These inconsistencies are best explained by the hypothesis that our author was drawing upon a literary fixed tradition. The doublets in xxi. 23 and xxii. 5b, in xxi. 25 and xxii. 5a, and in xxi. 27 and xxii. 3, point in the same direction. Various additions were introduced, according to Bousset, by the last redactor, such as the frequently recurring reference to the Lamb, xxi. 9, 22, 23, 27, xxii. 1, 3. In xxii. 3 the fact that the words "of the Lamb" are an addition is clear from the context; for, after the clause "the throne of God and of the Lamb shall be therein" the singular follows, "His servants shall do Him service."

xxii. 6–21.—The conclusion. The promises are sure, the end is near and the judgment at hand. The words of the book are the message of Christ Himself and are inviolable.

Unity.—From the preceding sections it follows that we cannot ascribe a strict literary unity to the book. The book is most probably the work of a single author, but it was not written wholly at one date, nor have all the parts come directly from one brain. We have several good grounds for regarding vii. 1–8, xi. 1–13, xii., xiii., xvii., as wholly or in part independent sources, which our author has laid under contribution and adapted more or less adequately to his purpose. He appears to have taken over with but slight modification xx. and xxi. 9–xxii. 5. Furthermore, while certain fragments such as xi. 1–2 presuppose a date anterior to A.D. 70, others, as xvi. 12 and xvii. 12, require a date not later than Vespasian's time; other parts of xvii. postulate a Vespasianic date as the earliest admissible, and, finally, the composition of the book in its present form cannot be placed before the closing years of Domitian. But to this question we shall return presently.

Nevertheless, the book exhibits a relative unity; for, whatever digressions occur in the development of its theme, the main object of the writer is never lost sight of. This relative unity is manifested also in the uniform character of the language, a uniformity, however, which is occasionally conspicuous by its absence in the case of independent sources, as in xi. 1–13. The author or the final redactor has impressed a certain linguistic character on the book, which differentiates it not only from all secular writings of the time, but also from all the New Testament books, including the Johannine. And yet the Apocalypse shows in many of its phrases an undoubted affinity to the latter—

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[1] This idea appears as early as the 2nd century B.C. Cf. Test. Levi xviii. 12.

a fact which requires for its explanation the assumption that the book emanated from certain literary circles influenced by John.

Date.—There are many indications of the date, which may be summarized as follows: (*a*) Condition of the Asian churches. (*b*) Persecution of the church. (*c*) Attitude of the author to Rome. (*d*) The Antichrist legend. (*e*) Primitive tradition and its confirmation through the discovery of references in the text to certain edicts of Domitian. As a result of these considerations we may arrive at the date of the work with almost greater certainty than that of any other New Testament book.

(*a*) *Condition of the Churches.*—Christianity appears to have already had a long history behind it. The fact that St Paul founded the church of Ephesus seems to have been forgotten. The earliest zeal has passed away and heathen ways of thought and life are tolerated and practised at Pergamum and Ephesus, and faith is dying or dead at Laodicea and Sardis. These phenomena belong to a period considerably later than the time of Nero.

(*b*) *Persecution of the Church.*—Persecution is the order of the day. Each of the seven letters concludes with praise of those who have been victorious therein. There had been isolated instances of persecution at Ephesus, ii. 3, Philadelphia, iii. 8, 10, and at Smyrna, ii. 9, and of an actual martyrdom at Pergamum, ii. 13. But now a storm of persecution was about to break upon the universal church, iii. 10, and in the immediate future. Already the seer beholds the destined number of the martyrs complete, vi. 9–11: the great multitude whom no man could number, clothed in white before the throne of God, vii. 9: he exhorts his readers to patient endurance unto death, xiv. 12, and already sees them as victors in heaven, xv. 2. Over the true witnesses and martyrs he pronounces the final beatitude of the faithful: "Blessed are those who die in the Lord," xiv. 13.

Such an expectation of persecution is inexplicable from Nero's time. There is not a trace of any declaration of war on the universal church in his period such as the Apocalyptist anticipates and in part experiences. Christian persecution under Nero was an imperial caprice. The Christians were attacked on slanderous charges of superstition and secret abominations, but not as a church. Not till the last years of Domitian is it possible to discover conditions which would explain the apprehensions and experiences of our writer. So far as we can discover, no persecution was directed against Christians as Christians till Domitian's time. In the year A.D. 92 Flavius Clemens was put to death and his wife banished, on the ground that they were adherents of the new faith. Thus the temper of the book on this question demands some date after A.D. 90. It marks the transition, from the earlier tolerant attitude of Rome towards Christianity, to its later hostile attitude.

(*c*) *Attitude of the Author towards Rome.*—In earlier times the church had strongly impressed the duty of loyalty to Rome, as we see from the Epistle to the Romans and 1 Peter. This was before the pressure of the imperial cult was felt by the Christian church. But in the Apocalypse we have the experiences of a later date. The writer manifests the most burning hatred towards Rome and the worship of its head—the beast and the false prophet, who are actual embodiments of Satan. Such an attitude on the part of a Christian is not explicable before the closing years of Domitian; for, apart from Caligula, he was the first Roman emperor who consistently demanded divine honours.

(*d*) *The Antichrist Legend.*—We find at least two stages of the Neronic and Antichrist myth in the Apocalypse. The earliest form is not attested here, that Nero had not really been slain, but would speedily return and destroy his enemies. The first pretender appeared in A.D. 69, and was put to death in Cythnus. The second stage of this legend was that Nero had taken refuge in the Far East, and would return with the help of his Eastern subjects for the overthrow of Rome. Two pretenders arose in conformity with this expectation among the Parthians in A.D. 80 and 88. This widespread expectation has left its memorial in our book in xvi. 12 and in xvii. 16–17, which point to the belief that Rome would be destroyed by Nero and the Parthian kings. Finally, in xiii. and xvii. 8, 12–14, we have a later phase of the myth, in which there is a fusion of the Antichrist myth with that of Nero *redivivus*. This fusion could hardly have taken place before the first half of Domitian's reign, when the last Neronic pretender appeared. As soon as the hope of the living Nero could no longer be entertained, the way was prepared for this transformation of the myth. The living Nero was no longer expected to return from the East, but Nero was to be restored to life from the abyss by the dragon, *i.e.* Satan. This expectation is recounted in xiii., but it appears most clearly in the additions to xvii. Thus in xvii. 8 the reference to Nero *redivivus* as the Antichrist is manifest: "The beast that thou sawest was, and is not, and is about to come up out of the abyss and to go into perdition."[1] Thus again we are obliged to postulate a date not earlier than A.D. 90 for the book in its present form.

(*e*) *Primitive Church Tradition and its Confirmation through the Discovery of References in the Text to Certain Edicts of Domitian.*—The earliest external evidence is practically unanimous in ascribing the Apocalypse to the last years of Domitian. The oldest testimony is that of Irenaeus v. 30. 3: *δι' ἐκείνου ἂν ἐρρέθη τοῦ καὶ τὴν 'Αποκάλυψιν ἑωρακότος οὐδὲ γὰρ πρὸ πολλοῦ χρόνου ἑωράθη, ἀλλὰ σχεδὸν ἐπὶ τῆς ἡμετέρας γενεᾶς, πρὸς τῷ τέλει τῆς Δομετιανοῦ ἀρχῆς.* The rest of the patristic evidence from Clement of Alexandria, Origen, Victorinus, Eusebius and Jerome will be found in Swete's *Apocalypse of St John*^{2}, xcix. seq. Though a few later authorities, such as Epiphanius and Theophylact, assign the book to earlier or later periods, the main body of early Christian tradition attests the date of its composition in the closing years of Domitian. Notwithstanding, on various critical grounds, Baur, Hilgenfeld, Lightfoot, Westcott, Hort and Beyschlag assigned the book to the reign of Nero, or to the years immediately following his death, while Weiss, Dusterdieck and Mommsen assign it to the time of Vespasian. When, however, we combine the preceding arguments with that of the early church tradition, the evidence for the Domitian date outweighs that for any other. And this conclusion receives remarkable confirmation from a recent fact brought forward by S. Reinach in an article in the *Revue archéologique*, sér. III. t. xxxix. (1901), pp. 350–74, and reprinted in *Cultes, mythes et religions*, ii. 356–80 (1906). This fact explains a passage which has hitherto been a total enigma to every expounder, *i.e.* vi. 6: "A choenix of wheat for a denarius, and three choenikes of barley for a denarius, and the oil and the wine hurt thou not." Swete writes here: "The voice fixes a maximum price for the main food-stuffs. The denarius . . . was the daily wage . . . and a choenix of wheat the average daily consumption of the workman. . . . Barley was largely the food of the poor.” According to the words just quoted from the Apocalypse, there was to be a dearth of grain and a superfluity of wine; the price of the wheat was to be seven times the ordinary, according to Reinach’s computation, and that of the barley four times. This strange statement suggested some historical allusion, and the discovery of the allusion was made by Reinach, who points out that Domitian by an edict in A.D. 92 prohibited the planting of new vineyards in Italy, and ordered the reduction of those in the provinces by one-half. As Asia Minor suffered specially under this edict, an agitation was set on foot which resulted in the revocation of the edict. In this revocation the Apocalyptist saw the menace of a famine of the necessaries of life, while the luxuries would remain unaffected. From his ascetic standpoint the revocation of the edict could only pander to drunkenness and immorality. Reinach’s explanation of this ancient *crux interpretum*, which has been accepted by Harnack, Bousset, Porter, Sanday, Swete and others, fixes the earliest date of the composition of the Apocalypse as A.D. 93. Since Domitian died in 96, the book was therefore written between A.D. 93 and 95.

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[1] Verse 11 postulates either a Vespasianic or Domitianic date: "And the beast that was, and is not, is himself also an eighth, and is of the seven; and he goeth into perdition." In verse 10 it is stated that five of the seven had fallen, "the one is and another is not yet come, and when he cometh he must continue a little while." If we reckon from Augustine and omit Galba, Otho and Vitellius, each of whom reigned only a few months, we arrive at Vespasian. The vision, therefore, belongs to his reign, A.D. 69–79. Verse 11, with the exception of the words "which was and is not," leads to the identification of the eighth with Nero *redivivus*. But what then is to be made of the above reckoning when it was taken over by the Apocalyptist who wrote in Domitian's reign? Some scholars are of opinion that this writer identified Domitian with the eighth emperor, the Nero *redivivus*, the beast from the abyss. But this is unlikely, notwithstanding the fact that even some pagan writers, such as Juvenal, Pliny and Martial (?), traced a resemblance between Domitian and Nero. On the other hand, if we refuse to accept this identification, and hold that the beast from the abyss is yet to come, any attempt at a strict exegesis of the text plunges us in hopeless difficulties. For Domitian in that case would be the sixth, and the preceding five would have to begin with Galba—a most improbable supposition. But futhermore, since this new reckoning would exclude Nero, how could the eighth be said to be one of the seven, *i.e.* Nero? Bousset thinks that the Apocalyptist, knowing not what to make of this reckoning, left it standing as it was and attempted a new interpretation of the seven heads by taking them to refer to the seven hills of Rome in the addition he made to verse 9.

Author.—Before entering on the chief data which help towards the determination of this question, we shall first state the author’s standpoint. His book exhibits a Christianity that is—as Harnack (*Ency. Brit.*^{9}, xx. 498) writes—“ free from the law, free from national prejudices, universal and yet a Christianity which is independent of Paul. . . . The author speaks not at all of the law[1]—the word does not occur in his work; he looks for salvation from the power and grace of God and Christ alone . . . nowhere has he made a distinction between Gentile and Jewish Christians. . . . The author of the Apocalypse has cast aside all national religious prejudices.” The writer is not dependent, consciously or unconsciously, on the Pauline teaching. He has won his way to universalism, not through the Pauline method, but through one of his own. He has no serious preference for the people of Israel as such, but only for the martyrs and confessors, who shall belong to every tribe and tongue and people and nation (vii. 9 seq.). The unbelieving Jews are “ a synagogue of Satan ” (ii. 9).

Yet, on the other hand, our author’s attitude to the world reflects the temper of Judaism rather than that of Christianity. He looks upon the enemies of the Christian Church with unconcealed hatred. No prayer arises within his work on their behalf, and nothing but unalloyed triumph is displayed over their doom. The Christian duty of love to those that wrong us does not seem to have impressed itself on our Apocalyptist.

Is the Apocalypse pseudonymous?—All the Jewish apocalypses are pseudonymous, and all the Christian with the exception of the *Shepherd of Hermas*. Since our book undoubtedly belongs to this category, the question of its pseudonymity must arise. In the articles on Apocalyptic Literature and Apocryphal Literature (*qq.v.*) we have shown the large lines of differentiation between apocalyptic and prophecy. The chief ground for resorting to pseudonymous authorship in Judaism was that the belief in prophecy was lost among the people. Hence any writer who would appeal to them was obliged to do so in the name of some great figure of the past. Furthermore, this belief that prophecy had ceased led the religious personalities of the later time to authenticate their message by means of antedated prophecy. They procured confidence in their actual predictions by appealing to the literal fulfilment of such antedated prophecy. In such literature we find the characteristic words or their equivalents: “ Seal up the prophecy: it is not for this generation,” which are designed to explain the late appearance of the works in which they are found. But this universal characteristic of apocalyptic is almost wholly lacking in the New Testament Apocalypse. The *vaticinium ex eventu* plays but a very small part in it. Moreover, the chief ground for the development of a pseudonymous literature was absent in the early Christian church. For with the advent of Christianity prophecy had sprung anew into life, and our author distinctly declares that the words of the book are for his own generation (xxii. 10). Hence we conclude that the grounds are lacking which would entitle our assuming a priori that the Apocalypse is pseudonymous.

Was the Author the Son of Zebedee, the Apostle?—The evidence of the book is against this assumption. The writer demands a hearing as a prophet (xxii. 6), and in no single passage makes any claim to having been an apostle. Nay more, the evidence of the text, so far as it goes, is against such a view. He never refers to any previous intercourse with Christ such as we find frequently in the Fourth Gospel, and when he speaks of “ the twelve apostles of the Lamb ” (xxi. 14) he does so in a tone that would seem to exclude him from that body. Here internal and external evidence are at strife; for from the time of Justin onwards the Apocalypse was received by the church as the work of the Apostle John (see Swete, *op. cit.*^{2}, p. clxxv). If the writer of the Fourth Gospel was the Apostle John, then the difficulties for the assumption of an apostolic authorship of the Apocalypse become well-nigh insuperable. Nay more, the difficulties attending on the assumption of a common authorship of the Gospel and Apocalypse, independently of the question of the apostolic authorship of the Gospel, are practically insuperable. Some decades ago these difficulties were not insurmountable, when critics assigned a Neronic date to the Apocalypse and a Domitianic or later date to the Gospel. It was from such a standpoint conceivable that the thoughts and diction of the writer had undergone an entire transformation in the long interval that intervened between the composition of the two books, on the supposition that both were from the same hand. But now that both books are assigned to the last decade of the 1st century A.D. by a growing body of critics, the hypothesis of a common authorship can hardly be sustained. The validity of such an hypothesis was attacked as early as the 4th century by Dionysius of Alexandria in the fragment of his treatise *περὶ ἐπαγγελιῶν*, in Eusebius, *H.E.* vii. 24 seq. His arguments, as summed up by Swete (*op. cit.*, p. cxiv seq.), are as follows: “ John the Evangelist abstains from mentioning his own name, but John the Apocalyptist names himself more than once at the very outset of his book, and again near its end. Doubtless there were many who bore the name of John in the early Christian communities; we read, for instance, of ‘ John, whose surname was Mark,’ and there may have been a second John in Asia, since at Ephesus, we are told, there were two tombs said to be John’s. . . . Again, while the Gospel and the Epistle of John show marks of agreement which suggest a common authorship, the Apocalypse differs widely from both in its ideas and in its way of expressing them; we miss in it the frequent references to ‘ life,’ ‘ light,’ ‘ truth,’ ‘ grace ’ and ‘ love ’ which are characteristic of the Apostle and find ourselves in a totally different region of thought. . . . Lastly, the linguistic eccentricities of the Apocalypse bar the way against the acceptance of the book as the work of the Evangelist. The Gospel and the First Epistle are written in correct and flowing Greek, and there is not a barbarism, a solecism, or a provincialism in them; whereas the Greek of the Apocalypse is inaccurate, disfigured by unusual or foreign words and even at times by solecisms.”

All subsequent criticism has more or less confirmed the conclusions of Dionysius. On the other hand, it is impossible to ignore the signs of a relationship between the Apocalypse and the Gospel in the minor peculiarities of language.[2] These, Swete holds, “ create a strong presumption of affinity ” between the two books, while Bousset infers that they “ justify the assumption that the entire circle of Johannine writings spring from circles which stood under the influence of the John of Asia Minor.”

We conclude, therefore, that the Gospel and the Apocalypse are derived from different authors who moved in the same circles.[1]

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[1] His freedom from legal bondage is as undeniable as his universalism. He lays no further burden on his readers than those required by the Apostolic Decree of Acts xv. 28 seq.

[2] See Bousset, *Offenbarung Johannis*^{2}, pp. 177–179; Swete^2, pp. cxxv–cxxix.

As regards the John mentioned in the Apocalypse, he is now identified by a majority of critics with John the Presbyter, and further the trend of criticism is in favour of transferring all the Johannine writings to him, or rather to his school in Asia Minor.[2]

For an independent discussion of the authorship of the Fourth Gospel, see John, Gospel of St. (R. H. C.)

REVELS, MASTER OF THE.[3]—The history of the Revels office has an interesting place in that of the English stage (see also Drama, and Theatre). Among the expenses of the royal Wardrobe we find provision made for *tunicae* and *viseres* in 1347 for the Christmas *ludi* of Edward III.; during the reign of Henry VII. payments are also recorded for various forms of court revels; and it became regular, apparently, to appoint a special functionary, called Master of the Revels, to superintend the royal festivities, quite distinct from the Lord of Misrule (*q.v.*). In Henry VII.'s time he seems to have been a minor official of the household. In Henry VIII.'s time, however, the post became more important, and an officer of the Wardrobe was permanently employed to act under the Master of the Revels. With the patent given to John Farlyon in 1534 as Yeoman of the Revels, what may be considered as an independent office of the Revels (within the general sphere of the lord chamberlain) came into being; and in 1544 Sir Thomas Cawarden received a patent as Master of the Revels, he being the first to become head of an independent office, *Magister Jocorum, Revelorum et Mascorum omnium et singularium nostrorum vulgariter nuncupatorum Revells and Masks*. Cawarden was Master till 1559. Soon after his appointment, the office and its stores were transferred to a dissolved Dominican monastery at Blackfriars, having previously been housed at Warwick Inn in the city, the Charterhouse, and then at the priory of St John of Jerusalem in Clerkenwell, to which a return was made after Cawarden's death. Sir Thomas Benger succeeded Cawarden, and Edmund Tylney followed him (1579–1610); it was the appointment of the latter's nephew, Sir George Buck, as deputy-master, with the reversion to the mastership, which led to so much repining on the part of the dramatist, John Lyly, who was himself a candidate. Under Tylney, the functions of Master of the Revels gradually became extended to a general censorship of the stage, which in 1624 was put directly in the hands of the lord chamberlain, thus leading to the licensing act of 1737 (see Drama).

See E. K. Chambers, *The Mediaeval Stage* (1904); and his *Notes on the History of the Revels Office under the Tudors* (1906), with authorities quoted.

REVELSTOKE, an incorporated town of British Columbia, on the Columbia river and the Canadian Pacific railway, 381 m. E. of Vancouver. Pop. (1907) 3526. It is the capital of Kootenay county, and the shipping centre for the mining and lumbering district. It contains large railway shops, several breweries, and saw and shingle mills.

REVENTLOW, CHRISTIAN DITLEV FREDERICK, Count (1748–1827), Danish statesman and reformer, the son of Privy Councillor Christian Ditlev Reventlow, born on March 11, 1748. After being educated at the academy of Sorö and at Leipzig, Reventlow, in company with his younger brother Johan Ludwig and the distinguished Saxon economist Carl Wendt (1731–1815), the best of cicerones on such a tour, travelled through Germany, Switzerland, France and England, to examine the social, economical and agricultural conditions of civilized Europe. A visit to Sweden and Norway to study mining and metallurgy completed the curriculum, and when Reventlow in the course of 1770 returned to Denmark he was an authority on all the economic questions of the day. In 1774 he held a high position in the *Kammerkollegiet*, or board of trade, two years later he entered the Department of Mines, and in 1781 he was a member of the *Overskattedirectionen*, or chief taxing board. He had, in 1774, married Frederica Charlotte von Beulwitz, who bore him thirteen children, and on his father's death in 1775 inherited the family estate in Laaland. Reventlow overflowed with progressive ideas, especially as regards agriculture, and he devoted himself, heart and soul, to the improvement of his property and the amelioration of his serfs. Fortunately, the ambition to play a useful part in a wider field of activity than he could find in the country ultimately prevailed. His time came when the ultra-conservative ministry of Hoegh Guldberg was dismissed (April 14th, 1784) and Andreas Bernstorff, the statesman for whom Reventlow had the highest admiration, returned to power.

Reventlow was an excellently trained specialist in many departments, and was always firm and confident in those subjects which he had made his own. Moreover, he was a man of strong and warm feelings, and deeply religious.

The condition of the peasantry especially interested him. He was convinced that free labour would be far more profitable to the land, and that the peasant himself would be better if released from his thraldom.

His favourite field of labour was thrown open to him when, on the 6th of August 1784, he was placed at the head of the *Rentekammeret*, which took cognisance of everything relating to agriculture. His first step was to appoint a small agricultural commission to better the condition of the crown serfs, and amongst other things enable them to turn their leaseholds into freeholds. Observing that the Crown Prince Frederick was also favourably disposed towards the amelioration of the peasantry, Reventlow induced him, in July 1786, to appoint a grand commission to take the condition of all the peasantry in the kingdom into immediate consideration. This celebrated agricultural commission continued its labours for many years, and introduced a whole series of reforms of the highest importance. Thus the ordinance of 8th June 1787 modified the existing leaseholds, greatly to the advantage of the peasantry; the ordinance of 20th June 1788 abolished villenage and completely transformed the much-abused *hoveri* system whereby the feudal tenant was bound to cultivate his lord's land as well as his own; and the ordinance of 6th December 1799, which did away with *hoveri* altogether. Reventlow was also instrumental in starting the public credit banks, for enabling small cultivators to borrow money on favourable terms. In conjunction with his friend, Heinrich Ernst Schimmelmann (1747–1831), he also procured the passing of the ordinances permitting free trade between Denmark and Norway, the free importation of corn from abroad, and the abolition of the mischievous monopoly of the Iceland trade.

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[1] There are several analogies in Jewish literature. Thus the *Testaments of the XII. Patriarchs*—a universalist work—and the *Book of Jubilees*—a particularistic work—are from different authors, though they are written within a few years of each other by Pharisees and use much common material. Similarly with regard to the Apocalypse of Baruch and 4 Ezra.

[2] Several converging lines of testimony tend to prove that John the son of Zebedee was, like his brother James, put to death by the Jews. First, we have the express testimony of Papias to this effect, which is preserved in George Hamartolus and in an epitome of Philip of Side. Attempts have been made to explain away this testimony by Lightfoot, Harnack, Drummond, and Bernard (*Irish Church Quarterly*, 1908, 52 sqq.). Secondly, Papias's testimony receives support from Jesus's own words in Mark x. 39; for, as Wellhausen remarks on this passage, "the prophecy refers not only to James but also to John; and if it had remained only half fulfilled, it would hardly have kept its place in the Gospel." The third strand of evidence is found in the Martyrologies, Carthaginian, Armenian and Syrian. Bernard (*op. cit.*) has tried to prove that the Martyrologies do not imply the martyrdom but only the faithful witness of John. Finally, Clement of Alexandria (Bousset, *Die Offenbarung*, p. 38) furnishes evidence in the same direction; for in Clem. Alex. *Strom.* iv. 9, 71, the Gnostic Heracleon gives a list of the Apostles who had not been martyred, and these were: "Matthew, Philip, Thomas and Levi" (corrupt for Lebbaeus). If we accept this evidence, the martyrdom cannot have been later than A.D. 69, and may have been considerably earlier. In either case such a fact, if it is a fact, is against an Apostolic origin of the Johannine writings. John the Presbyter is in that case "the disciple whom Jesus loved" and the founder of the Johannine school in Asia Minor. But the question is still at issue.

[3] The word "revel" meant properly a noisy or riotous tumult or merry-making, and is derived from O. Fr. *reveler*, to rebel, to riot, make a noise; Lat. *rebellare*.

But the financial distress of Denmark, the jealousy of the duchies, the ruinous political complications of the Napoleonic period, and, above all, the Crown Prince Frederick's growing jealousy of his official advisers, which led him to rule, or rather misrule, for years without the co-operation of his Council of State—all these calamities were at last too much even for Reventlow. On 7th December 1813 he received his dismissal and retired to his estates, where, after working cheerfully among his peasantry to the last, he died on the 11th of October 1827.

See Adolph Frederik Bergsöe, *Grev. C. D. F. Reventlows Virksomhed* (Copenhagen, 1837); Louis Theodor Alfred Bobe, *Efterl. Papirer fra den Reventlowske Familiekreds* (Copenhagen, 1895–97).

REVENUE (O. Fr. *revenu*, from *revenir*, to return), income, return, or profit; more particularly the receipts from all sources of a government or state. The revenue of a state is largely made up of taxation, and the general principles of taxes are discussed in TAXATION and FINANCE. In some countries the public or state domain may contribute substantially to the revenue, as do the crown forests in Russia, while in other countries important contributions are made from the state railways, post and telegraph services, &c. For the historical development of the English revenue see ENGLISH FINANCE, and for other countries see the sections on finance in the articles dealing with the various countries. In the United Kingdom the term inland revenue is used to denote that part of the revenue which is derived from death duties, stamps and other taxes, such as income tax, land tax, inhabited house duty, &c. The Board of Inland Revenue is a special department of the English civil service, with headquarters at Somerset House. The Board consists of a chairman, deputy chairman, and two commissioners, with joint secretaries, assistant secretaries and a staff of officials. The other important department engaged in the collection of the English revenue is the Board of Customs and Excise. The excise department was formerly a branch of the inland revenue, but was amalgamated with the customs department on the 1st of April 1909. The Board of Customs and Excise is constituted as is the Board of Inland Revenue.

In the United States the greater proportion of the national revenue ($547,086,992 out of $663,217,677 in 1909) is derived from customs and internal revenue. The internal revenue consists for the most part of receipts from taxes on spirits, tobaccos and fermented liquors. In 1909 the amount derived from customs revenue was $300,977,438, and internal revenue, $246,109,554.

REVERE, PAUL (1735–1818), American engraver and patriot, was born in Boston, Massachusetts, on the 1st of January 1735. He had a meagre schooling, and in his father's shop learned the trade of a gold- and silversmith. In 1756 he was second lieutenant of artillery in the expedition against Crown Point, and for several months was stationed at Fort Edward, in New York. He became a proficient copper engraver, and engraved several anti-British caricatures in the years before the War of Independence. He was one of the Boston grand jurors who refused to serve in 1774 because parliament had made the justices independent of the people for their salaries; was a leader in the Boston Tea Party; was one of the thirty North End mechanics who patrolled the streets to watch the movements of the British troops and Tories; and in December 1774 was sent to Portsmouth, New Hampshire, to urge the seizure of military stores there, and induced the colonists to attack and capture Fort William and Mary—one of the first acts of military force in the war. His midnight ride from Charlestown to Lexington on the 18th–19th of April 1775, to give warning of the approach of British troops from Boston, is Revere's most famous exploit; it is commemorated by Longfellow, who, however, has "paid little attention to exactness of fact" (Justin Winsor). In 1775 Revere was sent by the Massachusetts provincial congress to Philadelphia to study the working of the only powder mill in the colonies, and although he was allowed only to pass through the building, obtained sufficient information to enable him to set up a powder mill at Canton. He was commissioned a major of infantry in the Massachusetts militia in April 1776; was promoted to the rank of lieutenant-colonel of artillery in November; was stationed at Castle William, defending Boston harbour, and finally received command of this fort. He served in an expedition to Rhode Island in 1778, and in the following year participated in the unsuccessful Penobscot expedition. After his return he was accused of having disobeyed the orders of the commanding officer, was tried by court-martial, and was acquitted. After the war he engaged in the manufacture of gold and silver ware, and became a pioneer in the production in America of copper plating and copper spikes for ships. In 1795, as grandmaster of the Masonic fraternity, he laid the cornerstone of the new State House in Boston, and in this year also founded the Massachusetts Charitable Mechanic Association, becoming its first president. He died in Boston on the 10th of May 1818.

See Charles F. Gettemy, *The True Story of Paul Revere* (Boston, 1905).

REVERE, a township and a coast resort of Suffolk county, Massachusetts, U.S.A., immediately N.E. of Boston on Massachusetts Bay. Pop. (1910, U.S. census), 18,219. Area, 4·56 sq. m. The township is served by the Boston & Maine and the Boston, Revere Beach & Lynn railways, and by several electric railways connecting with Boston, Chelsea, Lynn, Malden, and Medford. Revere Beach, a crescent-shaped beach of white sand extending from the promontory of Winthrop on the S. to the Point of Pines on the N., is a popular bathing resort, and has been called the Coney Island of Boston. The township has a Carnegie library and a handsome town hall. The first settlement here was made about 1626, and, under the name of Rumney Marsh, it was a part of Boston until 1739, when it became a part of the new township of Chelsea. The northern part of Chelsea was organized as the township of North Chelsea in 1846; part of it was separated as Winthrop in 1852; and in 1871 the name North Chelsea was changed to Revere, in honour of Paul Revere.

REVEREND (Lat. *reverendus*, gerundive of *revereri*, to revere, pay respect to), a term of respect or courtesy, now especially used as the ordinary prefix of address to the names of ministers of religion of all denominations. The uses of Med. Lat. *reverendus* do not confine the term to those in orders; Du Cange (*Gloss. s.v.*) defines it as *titulus honorarius, etiam mulieribus potioris dignitatie concessus*, and in the 15th century in English it is found as a general term of respectful address. The usual prefix of address of a parson was "sir," representing Lat. *dominus* (see SIR), or "master." It has been habitually used of the parochial clergy of the Church of England since the end of the 17th century. It is not, however, a title of honour or dignity, and no denomination has any exclusive right to use it. A faculty was ordered to be issued for the erection of a tombstone, the inscription on which contained the name of a Wesleyan minister prefixed by "reverend"; this the incumbent had refused (*Keat* v. *Smith*, 1876, 1 P.D. 73). In the Church of England deans are addressed as "very reverend," bishops as "right reverend," archbishops as "most reverend." The Moderator of the Church of Scotland is also styled "right reverend."

REVERIE, a condition of mental abstraction, a fit of musing, a "brown study" ("brown" in the sense of "gloomy," and not to be referred to Germ. *Braune*, brow). The word appears in the 14th or 15th centuries in its original meaning in Old French, of joy, delight, also wildness, anger. The French *rever*, later *resver*, modern *rêver*, to dream, meant originally to wander in speech or thought, and is derived from the Lat. *rabiare*, cf. "rabies," "rage" and "rave." The French *rêverie* (*resverie*) was adopted again in the 17th and 18th centuries as meaning a state of dreaminess; thus Locke (*Essay on the Human Understanding*, 1695, ii. xix.) says: "When ideas float in our minds without any reflection or regard of the understanding, it is that which the French call *resvery*; our language has scarce a word for it."

REVIEW (Fr. *revue*, from *revoir*, to see again, Lat. *re* and *videre*), an inspection or critical examination; it is chiefly used as a military or naval term for an inspection on a large or formal scale of a fleet or body of troops by the sovereign or other person holding a high official position, or for a critical account of a recently published literary work in a magazine or periodical. The earliest use of the word for the title of such a periodical was in the paper begun by Defoe in 1704, the full title of which was *A Review of the Affairs of France and of all Europe, as influenced by that Nation* (see PERIODICALS and NEWSPAPERS). In France there is a particular application of the term *revue* or, more fully, *revue de fin d'année* to a form of dramatic performance, acted or sung, in which the chief events of the past year, and the personages who have been prominently before the public, are satirically and critically passed under review. Attempts have been made to trace such performances to an early origin. In their modern form, however, they date from the reign of Louis Philippe. *L'An 1841 et l'an 1941*, by the brothers Cogniard, was one of the earliest.

REVILLAGIGEDO, an isolated, uninhabited group of rocky islands in the N. Pacific, lat. 18° N., long. 112° W., belonging to Mexico, and forming part of the state of Colima. They are about 420 m. from the Mexican coast and comprise the large island of Socorro (San Tomás), 24 m. long by an average of 9 m. wide, and the three widely separated islets of San Benedicto, Roca Partida and Clarion, with a total area of 320 sq. m. The island of Socorro has an extinct volcano 3660 ft. high. The islands have certain remarkable zoological features, comprising several birds and reptiles allied to those of the Mexican mainland but differing from them in species. The archipelago derives its name from the Spanish viceroy who governed Mexico from 1746 to 1755.

RÉVILLE, ALBERT (1826–), French Protestant theologian, was born at Dieppe on the 4th of November 1826. After studying at Geneva and Strassburg, he became in 1849 pastor at Lunerai near Dieppe, and in 1851 of the Walloon Church at Rotterdam, where he remained until 1872. In 1880 he was made professor of the history of religions in the Collège de France at Paris. Six years later he was appointed president of the section of religious studies in the École des hautes études at the Sorbonne. He is one of the leaders of the French school of advanced critical theology.

Works.—Besides contributing to the *Revue de théologie* (Paris), the *Revue de l'histoire des religions* (Paris), the *Revue des deux mondes*, the following works are important: *Manuel d'histoire comparée de la philosophie et de la religion* (1859; Eng. trans., 1864); *Histoire du dogme de la divinité de Jésus Christ* (1869, 3rd ed., 1904; Eng. trans., 1905); *Prolegomènes de l'histoire des religions* (1881, 4th ed., 1886; Eng. trans., 1884); *Théodore Parker, sa vie et ses œuvres* (1865; Eng. trans., 1865, 2nd ed., 1877); *Lectures on the Origin and Growth of Religion as illustrated by the native religions of Mexico and Peru* (the "Hibbert Lectures" for 1884); *Jésus de Nazareth* (1897, 12th ed., 1906).

His son, JEAN RÉVILLE, was born on the 6th of November 1854, studied at Geneva, Paris, Berlin and Heidelberg, and became professor of patristic literature and secretary of the section of religious studies in the École des hautes études at the Sorbonne. In 1884 he became co-editor of the *Revue de l'histoire des religions* (Paris).

His books include: *La Doctrine du logos* (1881); *La Religion à Rome sous les Sévères* (1886); *Les Origines de l'épiscopat* (1895); and *Le Protestantisme libéral, ses origines, sa nature, sa mission* (1903; Eng. trans., 1903).

REVOLUTIONARY TRIBUNAL, THE (*le tribunal révolutionnaire*), a court which was instituted in Paris by the Convention during the French Revolution for the trial of political offenders, and became one of the most powerful engines of the Terror. The news of the failure of the French arms in Belgium gave rise in Paris to popular movements on the 9th and 10th of March 1793, and on the 10th of March, on the proposal of Danton, the Convention decreed that there should be established in Paris an extraordinary criminal tribunal, which received the official name of the Revolutionary Tribunal by a decree of the 29th of October 1793. It was composed of a jury, a public prosecutor, and two substitutes, all nominated by the Convention; and from its judgments there was no appeal. With M. J. A. Hermann as president and Fouquier-Tinville as public prosecutor, the tribunal terrorized the royalists, the refractory priests and all the actors in the counter-revolution. Soon, too, it came to be used for personal ends, particularly by Robespierre, who employed it for the condemnation of his adversaries. The excesses of the Revolutionary Tribunal increased with the growth of Robespierre's ascendancy in the Committee of Public Safety; and on the 10th of June 1794 was promulgated, at his instigation, the infamous Law of 22 Prairial, which forbade prisoners to employ counsel for their defence, suppressed the hearing of witnesses and made death the sole penalty. Before 22 Prairial the Revolutionary Tribunal had pronounced 1220 death-sentences in thirteen months; during the forty-nine days between the passing of the law and the fall of Robespierre 1376 persons were condemned, including many innocent victims. The lists of prisoners to be sent before the tribunal were prepared by a popular commission sitting at the museum, and signed, after revision, by the Committee of General Security and the Committee of Public Safety jointly. Although Robespierre was the principal purveyor of the tribunal, we possess only one of these lists bearing his signature. The Revolutionary Tribunal was suppressed on the 31st of May 1795. Among its most celebrated victims may be mentioned Marie Antoinette, the Hébertists, the Dantonists and several of the Girondists. Similar tribunals were also in operation in the provinces.

See H. A. Wallon, *Histoire du tribunal révolutionnaire de Paris* (Paris, 6 vols., 1880–82); E. Campardon, *Le Tribunal révolutionnaire de Paris* (Paris, 2nd ed., 2 vols., 1866); C. Berriat Saint-Prix, *La Justice révolutionnaire à Paris, Bordeaux, Brest, Lyon, Nantes*, . . . (Paris, 1861), and *La Justice révolutionnaire (août 1792–prairial an II.) d'après des documents originaux* (Paris, 1870); also G. Lenôtre, *Le Tribunal révolutionnaire* (1908). For a bibliography of its records see M. Tourneux, *Bibliog. de la ville de Paris* . . . (1890, vol. i. Nos. 3925–3974).

REWA, or RIWA, a native state of Central India in the Bagelkhand agency. It is the only large state in Bagelkhand, and the second largest in Central India, having an area of about 13,000 sq. m. It is bounded N. by the United Provinces, E. by Bengal and S. by the Central Provinces. On the W. it meets other petty states of Bagelkhand. Rewa is divided into two well-defined portions. The northern and smaller division is the plateau lying between the Kaimur range of hills and that portion of the Vindhyas known as Binjh, which overlook the valley of the Ganges. This plateau is for the most part cultivated and well peopled; rich harvests both of *kharif* and *rabi* crops are generally obtained. Water is plentiful, and the country is full of large tanks and reservoirs, which, however, are not used for irrigation purposes; the only system of wet cultivation which has any favour with the villagers is that of *bunds*, or mounds of earth raised at the lower ends of sloping fields to retain the rain water for some time after the monsoon rains cease. The country to the S. of the Kaimur hills comprises by far the largest portion of the state; but here cultivation is restricted to the valley between the hills and the Sone river, and to a few isolated patches in scattered parts of the forest wastes. The principal river is the Sone, which flows through the state in a N.E. direction into Mirzapur district. Another important river is the Tons, but neither is navigable. The annual rainfall averages about 41 in. The population in 1901 was 1,327,385, showing a decrease of 12% in the decade. Many of the inhabitants of the hilly tracts are Gonds and Kols. Estimated revenue, £200,000. The staple crops are rice, millets and wheat; but more than one-third of the area is covered with forests, yielding timber and lac.

The S. of the state is crossed by the branch of the Bengal-Nagpur railway from Bilaspur to Katni, which taps the Umaria coal-field. The state suffered from famine in 1896–97, and again to a less extent in 1899–1900; but on both occasions adequate measures of relief were provided.

The state first came under British influence in 1812. The chief, Venkat Raman Singh, was born in 1876, succeeded in 1880 and was created G.C.S.I. in 1897. During his minority the administration was reformed. He is Rajput of the Baghela branch of the Solanki race, and is descended from the founder of the Anhilwara Patan dynasty in Gujarat.

The town of Rewa is 131 m. S. of Allahabad. Pop. (1901) 24, 608. It has a high school, also the Victoria and zenana hospitals and a model gaol. The political agent for Bagelkhand resides at Satna, on the East Indian railway: pop. (1901) 7471.

REWA KANTHA, a political agency or collection of native states in India, subordinate to the government of Bombay. It stretches for about 150 m. between the plain of Gujarat and the hills of Malwa, from the river Tapti to the Mahi, crossing the Nerbudda or Rewa, from which it takes its name. The number of separate states is 61, many of which are under British jurisdiction. The only important one is Rajpipla (*q.v.*). It includes also five second-class states entitled Chota Udaipur, Bariya, Sunth, Lunawada and Balaimor. Total area, 4972 sq. m. In 1901 the population was 479,065, showing a decrease of 35 % in the decade, due to the results of famine. Estimated revenue, £140,000; tribute (mostly to the gaekwar of Baroda), £10,000. Many of the inhabitants belong to the wild tribes of Bhils and Kolis. The political agent, who is also collector of the British district of the Panch Mahals, resides at Godhra.

REWARD, recompense, a gift or payment in return for services rendered. "Reward" and "regard" are forms of the same word. Old French, from which both words came into English, also had *rewarder* and *regarder* (the latter form only surviving in modern French), from *re-*, back, in return, and *warder, garder*, to watch, protect—ultimately a Teutonic word, from the base *war-*, to defend; cf. "ward" and "guard," which are thus also doublets. In early use in English, "reward" and "regard" were interchangeable in meaning; thus in *Piers Plowman*, xi. 129, "Reson rod forth and tok reward of no man," cf. "The towne doth receave . . . an annuall regard for the same" (a 16th-century reference quoted by the *New English Dictionary* from R. Willis and J. W. Clark, *Archit. Hist. of Univ. of Cambridge*, 1886). In use the words are now distinct, "regard" being restricted to such meanings as attention, respect, esteem, consideration.

In English law the offering of rewards presents two distinct aspects: (1) with reference to the nature of the information or act for the giving or doing whereof the reward is offered; (2) with reference to the nature of the relation created between the person offering and the person claiming the reward.

1. Courts of assize and quarter sessions are empowered to order the payment of rewards to persons who have been active in or towards the apprehension of persons charged with certain specified crimes against person and property (Criminal Law, 1826, ss. 28, 29; Criminal Justice Administration Act 1851, ss. 7, 8). The rewards are payable according to a scale fixed by the home secretary. In the case of courts of quarter sessions the maximum is £5. Courts of assize may award a larger sum where extraordinary courage and diligence have been shown towards the apprehension. The sums awarded are paid out of the rate or fund chargeable with the costs of assizes and sessions. It is illegal to advertise for the recovery of stolen property (including dogs) on terms of not asking questions (Larceny Act 1861, s. 102; Larceny Advertisements Acts 1870, s. 3). The advertiser and the newspaper which publishes it incur a penalty of £50. (See *Mirams* v. *Our Dogs Publishing Co.*, 1901, 2 K.B. 564.) It is a criminal offence at common law to offer any reward on terms leading to compounding a felony or sheltering the offender (*R.* v. *Burgess*, 1886, 16 Q.B.D. 141), and under the Larceny Act 1861 (ss. 20, 101) it is criminal to accept a reward for recovery of stolen property without bringing the thief to justice.

2. Where a reward is lawfully offered for information the person who first supplies the required information, *i.e.* satisfies the conditions on which the reward is payable, is entitled to recover by action the reward offered. Performance of the conditions is an acceptance of the offer (*Carlill* v. *Carbolic Smoke Ball Co.*, 1893, 1 Q.B. 256, 270). Thus on an advertisement for information leading to the arrest and conviction of shop-breakers, T. gave information which led to the arrest of R., who while in prison told the police where to find the thieves. T. was held entitled to the reward (*Tarner* v. *Walker*, 1866, L.R. 1 Q.B. 641). This rule applies even where the offer is general to all the world (*Williams* v. *Carwardine*, 1833, 4 B. & Ad. 621; *Spencer* v. *Harding*, 1870, L. R. 5 C.P. 561). It would seem that on grounds of public policy an offender could not claim the reward on surrendering himself to justice (*Bent* v. *Wakefield &c. Bank*, 1878, 4 C.P.D. 1, 4). It is not clear whether officers of justice are by their office and duty debarred from claiming rewards offered for the arrest of offenders (Ibid. p. 5).

REWARI, a town of British India, in Gurgaon district of the Punjab, 32 m. S.W. of Gurgaon, on the Rajputana-Malwa railway. Pop. (1901) 27,295. It is an important centre of trade, being the junction for the Rewari-Bhatinda branch of the Rajputana railway. The chief manufacture is that of brassware for cooking utensils.

REWBELL, JEAN FRANÇOIS (1747–1807), French politician, was born at Colmar (then in the department of Haut-Rhin) on the 8th of October 1747. He was president (*bâtonnier*) of the order of *avocats* in Colmar, and in 1789 was elected deputy to the States-General by the Third Estate of the *bailliage* of Colmar-Schlestadt. In the Constituent Assembly his oratorical gifts, legal knowledge and austerity of life gave him much influence. During the session of the Legislative Assembly he exercised the functions of *procureur syndic* and was subsequently secretary-general of the department of Haut-Rhin. In the Convention he was a zealous promoter of the trial of Louis XVI., but was absent on mission at the time of the king's condemnation. He took part in the reactionary movement which followed the fall of Robespierre, and became a member of the reorganized Committees of Public Safety and General Security. The moderation he displayed caused his election by seventeen departments to the Council of Five Hundred. Appointed a member of the Directory on the 1st of October 1795, he became its president in 1796, and retired by ballot in 1799. He then entered the Council of Ancients. After the *coup d'état* of 18 Brumaire he retired from public life, and died at Colmar on the 23rd of November 1807.

See L. Sciout, *Le Directoire* (Paris, 1895–97).

REYBAUD, MARIE ROCH LOUIS (1799–1879), French writer, economist and politician, was born at Marseilles on the 15th of August 1799. After travelling in the Levant and in India, he settled in Paris in 1829. Besides writing for the Radical press, he edited the *Histoire scientifique et militaire de l'expédition française en Egypte* in ten volumes (1830–36) and Dumont d'Urville's *Voyage autour du monde* (1833). In 1840 he published *Études sur les reformateurs ou socialistes modernes* (see SOCIALISM) which gained him the Montyon prize (1841) and a place in the Académie des sciences morales et politiques (1850). In 1843 he published *Jérôme Paturot à la recherche d'une position sociale*, a clever social satire that had a prodigious success. In 1846 he abandoned his democratic views, and was elected liberal deputy for Marseilles. His *Jérôme Paturot à la recherche de la meilleure des républiques* (1848) was a satire on the new Republican ideas. After the *coup d'état* of 1849 he ceased to take part in public life, and devoted himself entirely to the study of political economy. To this period belong his *La Vie de l'employé* (1855); *L'Industrie en Europe* (1856); and *Études sur le régime de nos manufactures* (1859). He died in Paris on the 28th of October 1879.

REYER, ERNEST (1823–), French composer, was born at Marseilles on the 1st of December 1823. At the age of sixteen he went to Algeria, and remained there some years. The outcome of his residence there was a symphonic ode entitled *Le Sélam*, the musical orientalism of which had, unluckily for him, already been anticipated by Félicien David in *Le Désert*. *Maître Wolfram*. a one-act opera, was produced at the Opéra comique in 1854; and in 1858 *Sacuntala*, a ballet, at the Opéra. It was the production of *La Statue* at the Théâtre lyrique in 1861 that brought Reyer's name prominently before the public. But Reyer had to wait several years before obtaining a real and permanent success. *Erostrate*, an opera produced at Baden-Baden in 1862, and given at the Paris Opéra some ten years later, was a failure. The composer had in the meanwhile set to work on *Sigurd*, the subject of which is the same that inspired Wagner in *Siegfried* and *Götterdämmerung*. It was at last produced in Brussels in 1884, and subsequently brought out at the Paris Opéra. *Sigurd* is a work of great value, displaying its composer's elevated notions as regards the form of the "lyrical drama." *Salammbô*, founded upon Flaubert's romance, was successfully produced at Brussels in 1890. Gluck, Weber, Berlioz and Wagner exercised most influence over Reyer. As a musical critic (preceding Berlioz in that capacity for the *Journal des débats*) Reyer was a well-known writer; and he became librarian of the Paris Opéra, and a member of the Institute. His *Quarante Ans de musique* (with biographical notice by E. Henriot) was published in 1909.

REYNARD THE FOX, a beast-epic, current in French, Dutch and German literature. The cycle of animal stories collected round the names of Reynard the Fox and Isengrim the Wolf in the 12th century seems to have arisen on the borderland of France and Flanders. Much of the material may be found in Aesop, in *Physiologus*, and in the 12th-century *Disciplina Clericalis* of Petrus Alfonsus. But the difference is very great. The intention of the *trouvères* who recited the exploits of Reynard was, in the earlier stages, in no sense didactic. The tales, like those of "Uncle Remus," were amusing in themselves; they were based on widely diffused folklore, and Reynard and his companions were not originally men disguised as animals. Jacob Grimm (*Reinhart Fuchs*, 1834) maintained their popular origin; his theories, which have been much contested, have received additional support from the researches of K. Krohn, who discovered many of the stories most characteristic of the cycle in existing Finnish folklore, where they can hardly have arrived through learned channels.

There is abundant evidence that Isengrim and Reynard were firmly established in the popular imagination in the 13th century, and even earlier. Guibert de Nogent (*De Vita sua*, book 3, chap. viii., printed Paris, 1651), in referring to the disturbances at Laon in 1112, says that the bishop Gaudri was accustomed to call one of his enemies Isengrim, and it is obvious from the context that the taunt was perfectly understood by the popular mind. Philip the Fair is said to have annoyed Pope Boniface III., who died in 1303, by the representation of the "Procession Renart"; and in 1204–1206 in Flanders two opposing parties were designated Isangrini and Blavotini (blue-footed). The principal names of the Reynard cycle, and the earliest in use, were German. Reynard himself (Raginohardus, strong in counsel), Bruin the Bear, Baldwin the Ass, Tibert the Cat, Hirsent the She-wolf, had German names, most of which were used as person-names in Lorraine. Whatever the sources of the stories, it was in France that the cycle obtained its greatest vogue. The *Roman de Renart* as printed by Méon (Paris, 4 vols., 1826) runs to over 40,000 lines, and contains a great number of detached episodes or branches, to which the *trouvères* gave a certain unity by attaching them to the traditionary feud between Reynard and Isengrim. This rapidly became symbolic of the triumph of craft and eloquence over brute strength. *Renart* was a popular epic parodying feudal institutions as represented in the romances of chivalry, and readily adapting itself to satire of the rich, of the forms of justice, and of the clergy.

The early French originals are lost, the most ancient existing fragments being in Latin. The fable of the lion's sickness and his cure by the wolf's skin occurs in the *Ecbasis cujusdam captivi per Tropologiam* (ed. E. Voigt; Strassburg, 1875), written by a monk of St Evre at Toul (Meurthe-et-Moselle) about 940. *Ysengrimus* (ed. E. Voigt; Halle, 1884), a clerical satire written by Nivard of Ghent about 1148, includes the story of the lion's sickness and the pilgrimage of Bertiliana the Goat. Another Latin poem, *Reinardus vulpes* (ed. ~~F. J.~~ Mone; Stuttgart, 1832), contains in addition the theft of the bacon, and how Isengrim is induced to fish with his tail. A simpler version, derived probably from a French original, is *Isingrînes nôt*, written in German about 1180 by the Alsatian Heinrich der Glîchezäre. Only fragments of this poem are preserved, but about a quarter of a century later it was re-written with little change in the subject matter as *Reinhart Fuchs* (ed. J. Grimm, Berlin, 1834; and K. Reissenberger, Halle, 1886). Most later versions of Reynard have been derived, however, from the Flemish *Reinaert de vos* (ed. J. F. Willems, Ghent, 1836; and E. Martin, Paderborn, 1874), written about 1250 in East Flanders by Willem. *Reinaert* is a poem of 3474 lines. The corresponding branch of the French *Roman de Renart* (for which and its satirical sequels, *Le Couronnement Renart*, *Renart le nouveau*, and *Renart le contrefait*, see FRENCH LITERATURE) is one of the earliest and best of the great French cycle.

The fable was, like other French works, known in England, but did not at once pass into the popular stock. Odo of Cheriton, who died in 1247, used the Reynard stories in his sermons, and many of them occur in his collection of *Parabolae* (ed. Hervieux, *Fabulistes latins*, 1884, vol. i.). The English poem of the *Vox and the Wolf* dates from the 13th century; and the "Nonne Preestes Tale" of Chaucer, in which, however, the fox is Rossel and the ass Brunel, is a genuine Reynard history.

Willem's *Reinaert de Vos* was left incomplete, and the continuation—about 4000 lines in a more didactic vein—was added by an unknown writer of West Flanders about 1370. The first copy printed in any language was the Dutch prose version, *Hystorie van Reynaert de Vos*, printed at Gouda by Gheraert Leeuw in 1479. On this Caxton based his *Historye of reynart the foxe* (reprinted by E. Arber, 1878), which he finished on the 6th of June 1481. As a satire on the church, especially on monks and nuns, *Reynard* became popular with reformers, and numerous versions followed in England and Germany. A Low German version, *Reineke Fuchs*, with a prose commentary by Hinrek Alckmer (Henry of Alkmaar), was issued from the Antwerp press of Gheraert Leeuw in 1487. From this *rifacimento* was derived the Low German *Reynke de Vos* (ed. Hoffmann von Fallersleben, Breslau, 1834; and Friedrich Prien, Halle, 1887), which was printed at Lübeck in 1498. Michael Beuther is said to have been the translator into High German (*Reiniken Fuchs*, 1544); and the book was made available to the general European public in the Latin version of Hartmann Schopper, *Opus Poeticum de admirabili fallacia et astutia Vulpeculae Reinikes Libros quatuor* (Frankfort, 1567). The modern German version (1794) of Goethe has been often reprinted, notably in 1846 with illustrations by Wilhelm von Kaulbach.

Reynard is dealt with by Carlyle in an essay "On German Literature of the Fourteenth and Fifteenth Centuries" in the *Foreign Quarterly Review* (1831). An admirable account of the Reynard cycle is given by W. J. Thoms in his edition of Caxton's version for the Percy Society (1844). Prien's edition of *Reynke de Vos* contains bibliographical particulars of the German, Danish, Swedish, Icelandic and English editions (cp. Brunet, *Manuel du libraire*, *s.v.* Renart). The best edition of the *Roman de Renart* is by Ernest Martin (3 vols., Strassburg and Paris, 1881–1887). See also Léopold Sudre, *Les Sources du roman de Renard* (Paris, 1890); Jacob Grimm, *Sendschreiben an C. Lachmann über Reinhart Fuchs* (Leipzig, 1840); Gaston Paris, "Le Roman de Renard" in the *Journal des savants* (Dec. 1894 and Feb. 1895); Kaarle Krohn, *Bär und Fuchs* (Helsingfors, 1888), and the editions mentioned above. The story is told in modern French by Paulin Paris, *Les Aventures de Maître Renart et d'Ysengrin son compère* (1861), and in English by Joseph Jacobs, following a modernized text of Caxton made by "Felix Summerley" (Sir H. Cole), in *The Most Delectable History of Reynard the Fox* (1895), with a valuable introduction.

REYNOLDS, JOHN FULTON (1820–1863), American soldier, was born at Lancaster, Pennsylvania, on the 20th of September 1820, and graduated at West Point in 1841. He became first lieutenant of artillery in 1846, and was breveted captain and major for gallantry in the Mexican War. He took part in the Utah expedition under Brigadier-General Albert Sidney Johnston. In 1859 he was made commandant of cadets at West Point, where he was stationed at the outbreak of the Civil War in 1861. He was made a lieutenant-colonel of infantry in May and brigadier-general of volunteers in August of that year. In the Peninsular campaign, after taking part in the battles of Beaver Dam Creek and Gaines' Mill, he was taken prisoner in the hard-fought action of Glendale or Frazier's Farm. Exchanged after six weeks' captivity, he commanded a division with conspicuous ability and courage in the second battle of Bull Run. Shortly after this he was placed in command of the militia of his native state when Lee's invasion threatened it. In November 1862 he was commissioned major-general of volunteers, and appointed to command the I. Corps of the Army of the Potomac, and took part in the battle of Fredericksburg. At the time of General Meade's appointment to command the Army of the Potomac many desired to see Reynolds selected for that post, but he gave Meade his whole-hearted support in the three critical days preceding the battle of Gettysburg (*q.v.*). He was placed by Meade in command of the left wing (I., III. and XI. corps and Buford's cavalry division) and thrown forward to Gettysburg to cover the concentration of the Army of the Potomac. The battle which ensued there, on the 1st of July 1863, took its shape from Reynolds's resolution to support Buford's cavalry with the I. and XI. crops. Meade was notified, and hurried forward the right wing under Hancock. Reynolds himself was killed very early in the day by a rifle bullet. A bronze statue was placed on the field of Gettysburg and a portrait in the library at West Point by the men of the I. Corps. The state of Pennsylvania erected a granite shaft on the spot where he fell, and an equestrian bronze statue stands in Philadelphia.

His elder brother WILLIAM (1815–1879), a naval officer, served afloat in the Civil War, effected many useful reforms while acting secretary of the navy in 1873 and 1874, and retired from the United States navy in 1877 as a rear-admiral.

REYNOLDS, SIR JOSHUA (1723–1792), the most prominent figure in the English school of painting, was born at Plympton Earl, in Devonshire, on the 16th of July 1723. He received a fairly good education from his father, who was a clergyman and the master of the free grammar school of the place. At the age of seventeen, the lad, who had already shown a fondness for drawing, was apprenticed in London to Thomas Hudson, a native of Devonshire, who, though a mediocre artist, was popular as a portrait painter. Reynolds remained with Hudson for only two years, and in 1743 he returned to Devonshire, where, settling at Plymouth Dock, he employed himself in portrait painting. By the end of 1744 he was again in London. He was well received by his old master, from whom he appears previously to have parted with some coldness on both sides. Hudson introduced him to the artists' club that met in Old Slaughter's, St Martin's Lane, and gave him much advice as to his work. Reynolds now painted a portrait of Captain the Hon. John Hamilton, the first that brought him any notice, with those of other people of some repute; but on the death of his father in 1746 he established himself with two of his sisters at Plymouth Dock, where he painted numerous portraits, and it was here that he came under the influence of the works of one of the painters who materially affected his art. This was William Gandy of Exeter, who had died in 1730, and whose painting, derived through his father from Van Dyck, was pronounced by Northcote to come nearer to nature in the texture of flesh than that of any artist who ever lived. The influence on him of Gandy may be seen in the early self-portrait of the National Portrait Gallery, so rich in impasto and strong in light and shade, in which he is seen shading his eyes with his hand.

Meanwhile the pleasant urbanity of manner which distinguished Reynolds throughout life had been winning for him friends. He had made the acquaintance of Lord Edgcumbe, and by him was introduced to Captain (afterwards Viscount) Keppel. Keppel was made aware of Reynolds's ardent desire to visit Italy; and, as he had just been appointed to the command of the Mediterranean squadron, he gracefully invited the artist to accompany him in his own ship, the "Centurion." The offer was gladly accepted. While Keppel was conducting his tedious negotiations with the dey of Algiers, relative to the piracy with which that potentate was charged, Reynolds resided at Port Mahon, the guest of the governor of Minorca, painting portraits of the principal inhabitants; and in December 1749 he sailed for Leghorn, and thence, with all eagerness, made his way to Rome.

He has confessed that his first sight of the works of Raphael was a grievous disappointment, but he recognized afterwards, as he said, that the fault was in himself, and he brought his mind ultimately into the fitting posture of reverence. The fact is significant of Reynold's attitude towards the older masters. It has been often noticed that in his "Discourses" and elsewhere he praises just the very masters whose practice his own work implicitly condemns. The truth is that Reynolds was naturally a good critic, but was not strong enough to believe in his own opinions if they ran counter to the prevailing taste of his times. Of the early Italians he praises the "simplicity and truth" and observes that they "deserve the attention of a student much more than many later artists." In Venice he adopted a method of study that only a born painter could have thought of, making memoranda of the gradations of light and shade in the pictures, "and this without any attention to the subject, or to the drawing of the figures." On the other hand, we find him lavishing both attention and eulogy on the later Italian mannerists, such as Guido and the Carracci, and even Salviati and Vasari.

After a residence of more than two years in Rome, where he caught a severe cold which resulted in the deafness that clung to him for the rest of his life, Reynolds, in the spring of 1752, spent five months in visiting Parma, Florence, Venice and other important cities of Italy. Returning to England by way of Paris, Reynolds, after a brief stay in Devonshire, established himself as a portrait painter in St Martin's Lane, London, whence he afterwards removed to Great Newport Street, and finally, in 1760, to Leicester Square, where he continued to paint till his death.

In London, Reynolds stepped at once and without a struggle into a foremost position as the fashionable portrait painter of the day. In this he was greatly helped by his success in society. Throughout his career his social occupations claimed the next place to his painting, and here it may be noticed that, though we read of some little ostentation in the form of a showy chariot and liveried lackeys, his good taste always kept him from any undue "push," or adulation of the great. At the outset Lord Edgcumbe played the part of the generous patron, and exerted himself to obtain commissions for his protégé, of whose ability the portraits which he now produced—especially the famous full-length of his old friend Keppel—were sufficient guarantee. The artist's painting room was thronged with the wealth and fashion of London. In 1755 his clients for the year numbered 120, and in 1757 the number of sittings recorded in his pocket-books reached a total of 677. He was not always so busy, but his popularity never really waned, though various other artists competed with him for popular applause. First the Swiss Liotard had his momemt of popularity; and at a later period there was Opie, and the more formidable and sustained rivalry of Gainsborough and of Romney; but in the midst of all Reynolds maintained his position unimpaired. During the first year of his residence in London he had made the acquaintance of Dr Johnson, which, diverse as the two men were, became a friendship for life. To him Burke and Goldsmith, Garrick, Sterne and Bishop Percy were before long added. At the hospitable dinner-table of Reynolds such distinguished men enjoyed the freest and most unconstrained companionship, and most of them were members of the "Literary Club," established, at the painter's suggestion, in 1764.

In 1760 the London world of art was greatly interested by the novel proposal of the Society of Artists to exhibit their works to the public. The hall of the society was at their disposal for the purpose; and in the month of April an exceedingly successful exhibition was opened, the precursor of many that followed. To this display Reynolds contributed four portraits

In 1765 the association obtained a royal charter, and became known as "The Incorporated Society of Artists"; but much rivalry and jealousy were occasioned by the management of the various exhibitions, and an influential body of painters withdrew from the society. They had access to the young king, George III., who promised his patronage and help. In December 1768 the Royal Academy was founded, and Reynolds, whose adhesion to the movement was for a time doubtful, was hailed by acclamation its first president, an honour which more than compensated for his failure to obtain the appointment of king's painter, which, the previous year, had been bestowed on Allan Ramsay. In a few months the king signified his approval of the election by knighting the new president, and intimating that the queen and himself would honour him with sittings for portraits to be presented to the Academy.

Reynolds was in every way fitted for his new position, and till the late Lord Leighton the Academy never had so good a figure-head. He did not take any part in the educational work of the new institution, but on the social side he set the Academy on the lines it has followed with the greatest worldly success ever since. It was at his suggestion that the annual banquet was instituted. To the specified duties of his post he added the delivery of a presidential address at the distribution of the prizes, and his speeches on these occasions form the well-known "Discourses" of Sir Joshua. These discourses alone would be sufficient to entitle their author to literary distinction; indeed, when they were first delivered, it was thought impossible that they could be the production of a painter, and Johnson and Burke have been credited with their composition, in spite of the specific denials of both, and of Dr Johnson's indignant exclamation— "Sir Joshua, sir, would as soon get me to paint for him as to write for him!"

Sir Joshua was too prosperous and successful an artist altogether to escape the jealousy of his less fortunate or less capable brethren, and it must on the other side be admitted that his attitude towards some of his contemporaries was wanting in generosity. His relations with Gainsborough, who on his part was in fault, would require more space for discussion than can here be afforded, but he was not just either to Hogarth or to Richard Wilson. It may be added that though Reynolds's friends were genuinely fond of him, his was not a nature that could inspire or feel any great warmth of personal feeling. Cosmo Monkhouse in the *Dictionary of National Biography* speaks of "the beauty of his disposition and the nobility of his character," but adds: "he was a born diplomatist." The latter phrase gives the real key to his character. Without going so far as fully to endorse the sentiment of Mrs Thrale's famous line about a "heart too frigid" and a "pencil too warm," we must agree with a recent writer that the attitude of Reynolds towards his fellow men and women was one of detachment. Hence we regard Reynolds as a man with tempered admiration, and reserve our enthusiasm for his art. In 1784, on the death of Ramsay, Reynolds was appointed painter to the king. Two years previously he had suffered from a paralytic attack; but, after a month of rest, he was able to resume his painting with unabated energy and power. In the summer of 1789 his sight began to fail; he was affected by the *gutta serena*, but the progress of the malady was gradual, and he continued occasionally to practise his art till about the end of 1790, delivering his final discourse at the Academy on the 10th of December. He was still able to enjoy the companionship of his friends, and he exerted himself in an effort to raise funds for the erection of a monument in St Paul's to Dr Johnson, who had died in 1784. Towards the end of 1791 it was evident to the friends of Reynolds that he was gradually sinking. For a few months he suffered from extreme depression of spirits, the result of a severe form of liver complaint, and on the 23rd of February 1792 this great artist and blameless gentleman passed peacefully away.

As a painter Reynolds stands, with Gainsborough, just behind the very first rank. There can be no question of placing him by the side of the greatest Venetians or of the triumvirate of the 17th century, Rubens, Rembrandt, Velasquez; but, if he fail also to equal either Hals or Van Dyck, this is due, not to any defect in his natural capacity, but to deficiencies in his education combined with the absence in his case of that splendid artistic tradition on which the others leaned. He could not draw the figure properly; nor could he as a rule compose successfully on anything like a monumental scale. English painters in his early days possessed a sound technique, and most of Hogarth's best pictures are perfectly well preserved as well as beautifully painted but Reynolds was not content with the tried methods Hudson could have taught him. In the desire to compass that creaminess, that juicy opulence in colour and texture, of which he conceived the idea before the Italian journey, and which he found realized in the works of the Venetians and Correggio, he embarked on all sorts of fantastic experiments in pigments and media, so that Haydon exclaimed, "The wonder is that the picture did not crack beneath the brush!" The result was the speedy ruin of many of his own productions, and he inaugurated an era of uncertainty in method which seriously compromised the efforts of his successors in the English school.

The motive for this procedure may explain if it do not justify it. He was all his life intensely in earnest about his art, devoured by what he himself calls "a perpetual desire to advance"; and he accounts for his own uncertainty partly from his want of training, and partly from his "inordinate desire to possess every kind of excellence" he saw in the works of others. Now if this mental energy led him into hazardous attempts to find a royal road to the painter's ideal, it acted well upon his design in lending to it a certain intellectual solidity, which gives it an advantage over the slighter, though at times more exquisite, productions of the pencils of Gainsborough or Romney. The weight and power of the art of Reynolds are best seen in those noble male portraits, "Lord Heathfield," "Johnson," "Sterne," "Goldsmith," "Gibbon," "Burke," "Fox," "Garrick," that are historical monuments as well as sympathetic works of art. In this category must be included his immortal "Mrs Siddons as the Tragic Muse."

In portraits of this order Reynolds holds the field, but he is probably more generally admired for his studies of women and of children, of which the Althorp portraits of the Spencer family are classic examples. Nature had singled out Sir Joshua to endow him with certain gifts in which he has hardly an equal. No portrait painter has been more happy in his poses for single figures, or has known better how to control by good taste the piquant, the accidental, the daring, in mien and gesture. "Viscountess Crosbie" is a striking instance. When dealing with more than one figure he was not always so happy, but the "Duchess of Devonshire and her Baby," the "Three Ladies decking a Figure of Hymen," and the "Three Ladies Waldegrave" are brilliant successes. He was felicitous too in his arrangement of drapery, often following his own fashion of investing his graceful dames in robes of ideal cut and texture, quite apart from the actual clothes worn at the time. Few painters, again, have equalled the president in dainty and at the same time firm manipulation of the brush. The richness of his deeper colouring is at times quite Venetian. For pure delight in the quality of paint and colour we cannot do better than go to the "Angels' Heads" of the National Gallery, or the "Nelly O'Brien" in the Wallace Collection.

It corresponds with what has been noted as Reynolds's habit of mind in regard to older art to find him throughout his life hankering after success in what he was fond of calling the "grand style" in "historical painting." His failure here is as notorious as his brilliant success in the field of art for which nature had equipped him. His "Ugolino," his "Macbeth," his "Cardinal Beaufort," have no real impressiveness, while his greatest effort in the "historic" style, the "Infant Hercules" at St Petersburg, resulted in his most conspicuous disaster.

It is in the "Discourses" that Reynolds unfolds these artistic theories that contrast so markedly with his own practice. The first discourse deals with the establishment of an academy for the fine arts, and of its value as being a repository of the traditions of the best of bygone practice, of "the principles which many artists have spent their lives in ascertaining." In the second lecture the study of the painter is divided into three stages,—in the first of which he is busied with processes and technicalities, with the grammar of art, while in the second he examines what has been done by other artists, and in the last compares these results with Nature herself. In the third discourse Reynolds treats of "the great and leading principles of the grand style"; and succeeding addresses are devoted to such subjects as "Moderation," "Taste," "Genius," and "Sculpture." The fourteenth has an especial interest as containing a notice of Gainsborough, who had died shortly before its delivery; while the concluding discourse is mainly occupied with a panegyric on Michelangelo.

The other literary works of the president comprise his three essays in *The Idler* for 1759–1760 ("On the Grand Style in Painting," and "On the True Idea of Beauty"), his notes to Du Fresnoy's *Art of Painting*, his *Remarks on the Art of the Low Countries*, his brief notes in Johnson's *Shakespeare*, and two singularly witty and brilliant fragments, imaginary conversations with Johnson, which were never intended by their author for publication, but, found among his papers after his death, were given to the world by his niece, the marchioness of Thomond.

The president left to his niece, Mary Palmer, the bulk of his property, about £100,000, with works of art that sold for £30,000 more. There were, besides, legacies amounting to about £15,000. His body rests in St Paul's.

See Northcote, *Memoirs of Sir Joshua Reynolds, Knight, &c.* (1813), and *Supplement* thereto (1815); Farrington, *Memoirs of the Life of Sir Joshua Reynolds* (1819); Cotton, *Sir Joshua Reynolds and his Works* (edited by Burnet, 1856); Leslie and Taylor, *Life and Times of Sir Joshua Reynolds* (2 vols., 1865); Redgrave, *A Century of English Painters* (1866), vol. i.; Graves and Cronin, *A History of the Works of Sir Joshua Reynolds, P.R.A.* (4 vols., 1899–1901); Sir Walter Armstrong, *Sir Joshua Reynolds, First President of the Royal Academy* (1900; also a shorter work, 1905); Lord Ronald Gower, *Sir Joshua Reynolds* (1902). For Reynolds's literary works, see Malone, *The Works of Sir Joshua Reynolds, Knight* (3 vols., 1798); Beechy, *Literary Works of Sir Joshua Reynolds* (1835); Leisching, *Sir J. Reynolds zur Aesthetik u. Technik der bildenden Künste* (Leipzig, 1893); *Discourses delivered to the Students of the Royal Academy by Sir Joshua Reynolds, Kt.*, with introductions and notes by Roger Fry (1905).

REYNOLDS, WALTER (d. 1327), archbishop of Canterbury, was the son of a Windsor baker, and became a clerk, or chaplain, in the service of Edward I. He held several livings and, owing perhaps to his histrionic skill, he became a prime favourite with the prince of Wales, afterwards Edward II. Just after the prince became king in 1307 Reynolds was appointed treasurer of England; in 1308 he became bishop of Worcester and in 1310 chancellor. When Robert Winchelsea, archbishop of Canterbury, died in May 1313 Edward II. prevailed upon Pope Clement V. to appoint his favourite to the vacant archbishopric, and Walter was enthroned at Canterbury in February 1314. Although the private life of the new archbishop appears to have been the reverse of exemplary he attempted to carry out some very necessary reforms in his new official capacity; he also continued the struggle for precedence, which had been carried on for many years between the archbishops of Canterbury and of York. In this connexion in 1317 he laid London under an interdict after William de Melton (d. 1340), archbishop of York, had passed through its streets with his cross borne erect before him. Reynolds remained in general loyal to Edward II. until 1324, when with all his suffragans he opposed the king in defence of the bishop of Hereford, Adam of Orlton. In the events which concluded Edward's life and reign the archbishop played a contemptible part. Having fled for safety into Kent he returned to London and declared for Edward III., whom he crowned in February 1327. He died at Mortlake on the 16th of November following.

REZÁNOV, NICOLAI PETROVICH DE (1764–1807), Russian nobleman and administrator under Catherine II., Paul I. and Alexander I., was one of the ten barons of Russia, and, for his services to the empire, was rewarded with the court title of chamberlain. In 1803 he was made a privy councillor and invested with the order of St Ann. He was also the author of a lexicon of the Japanese language and of several other works, which are preserved in the library of the St Petersburg Academy of Sciences, of which he was a member. He was the first Russian ambassador to Japan (1804), and instigated the first attempt of Russia to circumnavigate the globe (1803), commanding the expedition himself as far as Kamchatka. But Rezánov's monument for many years after his death was the great Russian American Fur Company; and his interest to students of history centres round the policy involved in that enterprise, which, thwarted by his untimely death, would have changed the destinies of Russia and the United States.

Meeting (in 1788) Shelikov, chief of the Shelikov-Golikov Fur Company, Rezánov became interested in the merchant's project to obtain a monopoly of the fur trade in those distant dependencies. Conscious of latent energies, and already tired of the pleasures of a dissolute court, he became a partner in the company, and rapidly developed into a keen and tireless man of business. At the death of Shelikov in 1795 he became the leading spirit of the wealthy and amalgamated but harassed companies, and resolved to obtain for himself and his partners privileges analogous to those granted by Great Britain to the East India Company. He had just succeeded in persuading Catherine to sign his charter when she died, and he was obliged to begin again with the ill-balanced and intractable Paul. For a time the outlook was hopeless; but Rezánov's skill, subtlety and address prevailed, and shortly before the assassination of the emperor Paul he obtained his signature to the momentous instrument which granted to the Russian-American Company, for a term of twenty years, dominion over the coast of N.W. America, from latitude 55 degrees northward; and over the chain of islands extending from Kamchatka northward and southward to Japan. This famous "Trust," which crowded out all the small companies and independent traders, was a source of large revenue to Rezánov and the other shareholders, including members of the Imperial family, until the first years of the 19th century, when mismanagement and scarcity of nourishing food threatened it with serious losses if not ultimate ruin. Rezánov, his humiliating embassy to Japan concluded, reached Kamchatka in 1805, and found commands awaiting him to remain in the Russian colonies as Imperial inspector and plenipotentiary of the company, and to correct the abuses that were ruining the great enterprise. He travelled slowly to Sitka by way of the Islands, establishing measures to protect the fur-bearing animals from reckless slaughter, punishing or banishing the worst offenders against the company's laws, and introducing the civilizing influence of schools and libraries, most of the books being his personal gifts. He even established cooking schools, which flourished briefly.

At the end of a winter in Sitka, the headquarters of the company, during which he half-starved with the others, he bought a ship from a Yankee skipper and sailed for the Spanish settlements in California, purposing to trade his tempting cargo of American and Russian wares for food-stuffs, and to arrange a treaty by whose terms his colonies should be provisioned twice a year with the bountiful products of New Spain. He cast anchor in the harbour of San Francisco early in April 1806, after a stormy voyage which had defeated his intention to take possession of the Columbia river in the name of Russia. Although he was received with great courtesy and entertained night and day by the gay Californians, no time was lost in informing him that the laws of Spain forbade her colonies to trade with foreign powers, and that the governor of all the Californias was incorruptible. Rezánov, had it not been for a love affair with the daughter of the comandante of San Francisco, Don José Arguëllo, and for his personal address and diplomatic skill, with which he won over the clergy to his cause, would have failed again. As it was, when he sailed for Sitka, six weeks after his arrival, the "Juno's" hold was full of bread-stuffs and dried meats, he had the promise of the perplexed governor to forward a copy of the treaty to Spain at once, and he was affianced to the most beautiful girl in California. Shortly after his arrival in Sitka he proceeded by water to Kamchatka, where he despatched his ships to wrest the island Sakhalen of the lower Kurile group from Japan, then started overland for St Petersburg to obtain the signature of the tsar to the treaty, and also personal letters to the pope and king of Spain that he might ask for the dispensation and the royal consent necessary to his marriage. He died of fever and exhaustion in Krasnoiarsk, Siberia, on the 8th of March 1807.

The treaty with California, the bare suggestion of which made such a commotion in New Spain, was the least of Rezánov's projects. It was sincerely conceived, for he was deeply and humanely concerned for his employees and the wretched natives who were little more than the slaves of the company; but its very obviousness raised the necessary amount of dust. His correspondence with the company, and with Zapinsky, betrays a clearly defined purpose to annex to Russia the entire western coast of North America, and to encourage immediate emigration from the parent country on a large scale. Had he lived, there is, all things considered, hardly a doubt that he would have accomplished his object. The treaty was never signed, the reforms of Rezánov died of discouragement, the fortunes of the colonies gradually collapsed, the Spanish girl who had loved Rezánov became a nun; and one of the ablest and most ambitious men of his time lies forgotten in the cemetery of a poor Siberian town.

See Bancroft's *History of California*, and *Alaska*; Tikménev's *Historical Review of the Origin of the Russian American Company; Rezánov-Zapisky Correspondence*; Travels of Krusenstern and Langsford, &c. (G. A.*)

RHACIS, or RACHIS (Gr. ῥάχις, a backbone), in botany the axis of an inflorescence or of a branched leaf; in zoology, the stem of a feather, as opposed to the vesillum, or web.

RHADAMANTHUS (Gr. Rhadamanthys), in Greek mythology, son of Zeus and Europa and brother of Minos, king of Crete. Driven out of Crete by his brother, who was jealous of his popularity, he fled to Boeotia, where he wedded Alcmene. Homer represents him as dwelling in the Elysian fields (*Odyssey*, iv. 564). According to later legends, on account of his inflexible integrity he was made one of the judges of the dead in the lower world, together with Aeacus and Minos. He was supposed to judge the souls of Asiatics, Aeacus those of Europeans, while Minos had the casting vote (Plato, *Gorgias*, 424A).

RHAETIC (Fr. *Rhétien* or *Rhœtien*; Ger. *Rhät* or *Rhätisch*; It. *Retico*), in geology, the assemblage of rocks classed by most English and German authorities in the Triassic system, and by most French geologists placed at the base of the Lias, in the Jurassic system. It has been called the Infra-Lias. This diversity of opinion is due to the fact that the Rhaetic formation presents the characters of a group of passage-beds, uniting certain features of the Trias with others of the Jurassic system; none the less, it has sufficient individuality to be recognized with tolerable certainty over a wide area in Europe and beyond. The name Rhaetic was first applied by C. W. Gümbel to the strata of this horizon in the Rhaetic Alps, where they are thickly developed and in parts fossiliferous. The labours of E. V. Mojsisovic and E. Suess have demonstrated that in the Alpine Rhaetic several distinct facies may be recognized, viz. a Swabian facies: shore and lagoon deposits with a pelecypod fauna, poor in species but rich in individuals; a Carpathian facies with corals, algae, *Terebratula gregaria* and *Plicatula intusstriata*, exemplified in the upper part of the Dachstein limestone; a Kössener facies: black limestones and marls, with a brachiopod fauna in which *Spirigera oxycolpos* is very noticeable; and a Salzburg facies, characterized by pelagic pelecypods and some ammonites (see table in TRIASSIC SYSTEM). The whole of the Rhaetic falls within Mojsisovic's zone of *Avicula contorta*. This epoch is marked off from the earlier Triassic period by a very general marine transgression which proceeded with minor irregularities and retrogressions over the whole area, until at its close it was followed by the more decided transgression which indicates the commencement of the Lias.

Among the marine fossils of the Rhaetic, *Avicula contorta*, the principal zone form, is very characteristic and has a wide range; *Myophoria inflata*, *Modiola minuta*, *Protocardium rhaeticum* and *Terebratula gregaria* are common species. True belemonites make their first appearance. Corals, *Thecosmilia*, &c., are common in some districts. Plant remains are abundant in certain areas, and in places give rise to beds of lignite and coal. The flora is more nearly akin to that of the Trias than to that of the Jurassic rocks. Vertebrate remains are fairly abundant in the form of teeth, isolated bones, scales and coprolites in what are known as "Bone Beds" (*q.v.*). These beds are a very characteristic feature; they occur on several horizons in many tracts of the European Rhaetic, and recur in beds of this age in America. In England there is usually a bone bed about the base of the formation; in Germany one occupies a similar position; a second occurs less constantly about the middle, and in the Württemberg district a third bed separates the Rhaetic and Lias, and constitutes the well-known manure bed of Bebenhausen. In these beds are found the bones of *Ichthyosaurus* and *Pliosaurus*, anticipating their great development in the Lias, while the remains of *Belodon* and *Mystriosuchus* serve to link this epoch with Triassic stegocephalian reptiles. Several coleopterous insects have been found in the same beds, but the most interesting feature of the bone-bed fauna is the first appearance in the northern hemisphere of true mammals: *Microlestes* in England and Württemberg, *Triglyphus* in Württemberg, *Dromatherium* and *Microconodon* in America.

In England the Rhaetic formation occurs as a thin but constant series of beds at the base of the Lias and above the Keuper marls. The upper part, often called the "White Lias," is a series of thin-bedded shales, limestone and marls, 1 to 25 ft. thick; the lower portion consists mainly of dark shales, sometimes with very perfect lamination—"paper shales." Below there are beds of grey and "tea-green" marls which are now usually regarded as the topmost Keuper beds, but they have often been included in the Rhaetic formation (see KEUPER). The best exposures in Britain are those between Penarth Head and Cavernock Point, Aust Cliff and Garden Cliff near Westbury-on-Severn, and Wainlode Cliff between Tewkesbury and Gloucester. From their excellent development near Penarth the Rhaetic beds have long been known in England as the Penarth Beds (H. W. Bristow, 1864). The more prominent beds in the White Lias of the west of England and Glamorganshire are the *Estheria* beds and the insect limestone or *Pseudomonotis*-bed, and on both of these horizons the limestone may assume the peculiar characters of landscape marble, sometimes called Cotham marble, from Cotham House near Bristol. A hard fine-grained limestone, known locally as the Sun-bed, occurs at the top of the series near Bath and Radstock; at Street, Wedmore and south of the Mendips generally it is called Jew stone. Wedmore stone is a tough, shelly and sandy limestone in the black shales at Wedmore, near Wells; it is employed in the neighbourhood as a building stone. North of Somersetshire the White Lias is poorly represented; in Glamorganshire it appears between Cardiff and Pyle, west of Bridgend and at Sutton and Southerndown. Rhaetic beds have been traced at Market Drayton, Salop; near Audlem, Cheshire; Rugby and Stratford-on-Avon in Warwickshire; Wigston in Leicestershire; Needham Forest in Staffordshire, and in Nottinghamshire and Yorkshire as far as the coast. They have not yet been proved beneath the Lias of Cumberland. Rhaetic fossils have been found in great numbers in fissures in the Carboniferous limestone of the Mendips. On the western side of Scotland Rhaetic rocks occur at Applecross, Ardnamurchan, Morven, Mull, Raasay and Skye. In Sutherlandshire sandstone and conglomerate and large transported masses occur; one of them, at Linksfield, carries a bone bed. Here the black shales of the English type fail; sandstones with coaly layers and yellowish-grey crystalline and oolitic limestones take their place. In Antrim a small outcrop of black shales with *Avicula contorta* occurs near Port Rush.

On the European continent the Rhaetic rocks are most thickly developed in the Alpine regions; and, as in the case of the older Triassic formations, calcareous and dolomitic strata predominate here and in the Mediterranean province. In the Alpine district the main divisions are the Rhaetic Dachstein limestone and the Kössener beds; shales, marls and limestones. In the northern tract the following subdivisions have been recognized in descending order: beds with *Choristeceros Marschi*; Starhem passage beds; *Rhynchonella fissicostata* beds; *Lithodendron* limestone; beds with *Terebratula gregaria*; beds with *Avicula contorta*; "Platten Kalk" with *Rhynchonella alpina*. In the southern tract the subdivisions are: Conchodus dolomite (*Conchodus infraliassicus = Lycodius cor.*), *Lithodendron* limestone, Azzarola beds, *Contorta* marls, "Plattenkalk." Much limestone is of the "reef" type. In Germany the rocks are mainly fine, clean yellow sands, suggesting littoral or dune conditions, with bituminous clays and marls. The formation is often missing in south-west Germany. Similar beds occur in Lorraine and Luxembourg (gres de Vic, gres de Kédange, gres de Mortinsart). In Cotentin are dolomitic sandstones and marl; round the central plateau of France the rocks are coarse sands, arkoses, and conglomerates; while in the south of France the sandy and calcareous facies occur intermixed. In Spain limestones and dolomites occur up to 100 metres in thickness; in Portugal sandy beds recur. The Rhaetic of Scania, south Sweden, consists mainly of sandstone and shales with beds of coal up to one metre thick. Only the upper beds contain marine fossils; the bulk of the formation is of lacustrine or estuarine origin, with plant remains and insects. In Italy the formation is well developed in the north and at Rotzo, Spezzia and Carrara; and yields the famous statuary marble and the black variety known as *portor*. Rhaetic beds have been recognized in Sardinia, Corsica, Sicily, in the Balkan Peninsula and Greece; in Asia Minor, Afghanistan, Turkistan, Persia, Siberia and India (limestones and dolomites of Niti and the Mahaveda beds, sandstones and conglomerates, nearly 10,000 feet thick in Satpura); in China, Japan and Tongking (with coal beds). In Australasia the Wianamatta beds of New South Wales, the Bellarine beds of Victoria, the Ipswich and Tivoli beds of Queensland, and the Jerusalem beds of Tasmania, and beds on a similar horizon in New Zealand, have been regarded as equivalents of the Rhaetic. In Africa the Stormberg beds of the Karoo series and the Molteno beds of the Cape have been assigned to this epoch. In America Rhaetic rocks are recognized in N. Carolina, Connecticut, California, Mexico, Bolivia and Chile; the formation is also recorded from Spitzbergen, Franz Joseph Land and elsewhere in the Arctic regions.

For the English Rhaetic see L. Richardson, "The Rhaetic Rocks of North-west Gloucestershire," *Proc. Cotteswold Club*, xiv. p. 127 (Glos. 1901–1903). (J. A. H.)

RHAMNUS PURSHIANA, or Californian buckthorn, a plant the bark of which is used in medicine under the name of cascara sagrada. An active principle anthra-gluco-sagradin has been isolated by Tschirch. The preparations of it contained in the British pharmacopoeia are: (1) *Extractum cascarae sagradae* (extractum rhamni purshianae, United States pharmacopoeia), dose 2 to 8 grs.; (2) *Extractum cascarae sagradae liquidum*, dose ½ to 1 fl. dr. From the latter is prepared *syrupus cascarae aromaticus*, dose ½ to 2 fl. dr. In this preparation the bitter taste of the cascara sagrada is disguised by the addition of tincture of orange, cinnamon water and syrup. In the United States pharmacopoeial preparation *Fluid extractum rhamni purshianae aromaticum*, does 10 to 30 minims, the taste is similarly obscured. Cascara sagrada is one of the most useful of all laxatives, since not only does it empty the bowel of faecal matter, but it acts as a tonic to the intestine and tends to prevent future constipation. It is largely used in the treatment of chronic constipation. A single full dose of the liquid extract may be taken at bedtime, or divided doses, 10 to 15 minims, three times a day before meals. When a strong purgative is required some drug other than cascara sagrada should be employed, but its use in gradually decreasing doses is indicated after evacuation has been effected by podophyllin or rhubarb. Cascara sagrada is the principal constituent of most of the proprietary laxatives on the market.

RHAMPSINITUS, a Greek corruption of Ra-messu-pa-neter, the popular name of Rameses III., king of Egypt of the XXth Dynasty. He is well known in connexion with the story of his treasure house told by Herodotus (ii. 121), which greatly resembles that of Agamedes and Trophonius. (See Egypt, *History*.)

RHANKAVÊS (commonly also Rhangabe), **ALEXANDROS RHIZOS** (1810–1892), Greek savant, poet and statesman, was born at Constantinople of a Phanariot family on the 25th of December 1810. He was educated at Odessa and the military school at Munich. Having served as an officer of artillery in the Bavarian army, he returned to Greece, where he held several high educational and administrative appointments. He subsequently became ambassador at Washington (1867), Paris (1868), and Berlin (1874–1886), and was one of the Greek plenipotentiaries at the congress of 1878. After his recall he lived at Athens, where he died on the 29th of June 1892. He was the chief representative of a school of literary men whose object was to restore as far as possible the ancient classical language. Of his various works, *Hellenic Antiquities* (1842–1855, of great value for epigraphical purposes), *Archaeologia* (1865–1866), an illustrated *Archaeological Lexicon* (1888–1891), and a *History of Modern Greek Literature* (1877) are of the most interest to scholars. He wrote also the following dramatic pieces: *The Marriage of Kutrules* (comedy), *Dukas* (tragedy), the *Thirty Tyrants*, *The Eve* (of the Greek revolution); the romances, *The Prince of Morea*, *Leila*, and *The Notary of Argostoli*; and translated portions of Dante, Schiller, Lessing, Goethe and Shakespeare.

A complete edition of his philological works in nineteen volumes was published at Athens (1874–1890), and his ’Απομνημονεύματα (Memoirs) appeared posthumously in 1894–1895.

RHAPSODIST (Gk. *Rhapsōdos*), originally an epic poet who recited his own poetry; then, one who recited the poems of others (see Homer).

RHATANY or **KRAMERIA ROOT,** in medicine, the dried root either of Para rhatany or of Peruvian rhatany. The action of rhatany is due to the rhatania-tannic acid, and resembles that of tannic acid, being a powerful astringent. An infusion is used as a gargle for relaxed throats; and lozenges, particularly those containing rhatany and cocaine, are useful in similar cases. Like tannic acid, the powdered extract may be applied as a local haemostatic. All preparations of rhatany taken internally are powerful astringents in diarrhoea and intestinal haemorrhage.

RHAYADER (*Rhaiadr-Gwy*), a market town of Radnorshire, Wales, situated amid wild and beautiful scenery on the left bank of the Wye, about 1½ m. above its confluence with the Elan. Pop. (1901) 1215. Rhayader is a station on the Cambrian railway. A stone bridge over the Wye connects the town with the village and parish church of Cwmdauddwr. Rhayader has for some centuries been an important centre for Welsh mutton and wool, and its sheep fairs are largely attended by drovers and buyers from all parts. Near Rhayader are the large reservoirs constructed (1895) by the corporation of Birmingham in the Elan and Claerwen valleys.

Rhayader, built close to the Falls of the Wye (whence its name), owes its early importance to the castle erected here by Prince Rhys ap Griffith of South Wales, *c.* 1178, in order to check the English advance up the Wye Valley. Seized by the invaders, castle and town were later retaken in 1231 by Prince Llewelyn ap Iorwerth, who burned the fortress and slew its garrison. Scarcely a trace of the castle exists, although its site near St Clement's church is locally known as Tower Hill. With the erection of Maesyfed into the shire of Radnor in 1536 Rhayader was named as assize-town for the newly formed county in conjunction with New Radnor; but in 1542, on account of a local riot, the town was deprived of this privilege in favour of Presteign. Rhayader constituted one of the group of boroughs comprising the Radnor parliamentary district until the Redistribution Act of 1885.

RHEA, a goddess of the Greeks known in mythology as the daughter of Uranus and Gaia, the sister and consort of Kronos, and the mother of Zeus. In Homer she is the mother of the gods, though not a universal mother like Cybele, the Phrygian Great Mother, with whom she was later identified. The original seat of her worship was in Crete. There, according to legend, she saved the new-born Zeus, her sixth child, from being devoured by Kronos by substituting a stone for him and entrusting the infant god to the care of her attendants the Curetes (*q.v.*). These attendants afterwards became the bodyguard of Zeus and the priests of Rhea, and performed ceremonies in her honour. In historic times the resemblances between Rhea and the Asiatic Great Mother, Phrygian Cybele, were so noticeable that the Greeks accounted for them by regarding the latter as only their own Rhea, who had deserted her original home in Crete and fled to the mountain wilds of Asia Minor to escape the persecution of Kronos (Strabo 469, 12). The reverse view was also held (Virgil, *Aen.* iii. 111), and it is probably true that a stock of Asiatic origin formed part of the primitive population of Crete and brought with them the worship of the Asiatic Great Mother, who became the Cretan Rhea. (See Great Mother of the Gods.) (G. Sn.)

RHEA, the name given in 1752 by P. H. G. Möhring[1] to a South American bird which, though long before known and described by the earlier writers—Nieremberg, Marcgrav and Piso (the last of whom has a recognizable but rude figure of it)—had been without any distinctive scientific appellation. Adopted a few years later by M. J. Brisson, the name has since passed into general use, especially among English authors, for what their predecessors had called the American ostrich; but on the European continent the bird is commonly called *Nandu*,[2] a word corrupted from a name it is said to have borne among the aboriginal inhabitants of Brazil, where the Portuguese settlers called it *ema* (see Emeu). The resemblance of the rhea to the ostrich (*q.v.*) was at once perceived, but the differences between them are also very evident. The former, for instance, has three instead of two toes on each foot, it has no apparent tail, its wings are far better developed, and when folded cover the body, and its head and neck are clothed with feathers, while internal distinctions of still deeper significance have since been dwelt upon by T. H. Huxley (*Proc. Zool. Society*, 1867, pp. 420–422) and W. A. Forbes (*op. cit.*, 1881, pp. 784–87). There can be little doubt that they should be regarded as types of as many orders—*Struthiones* and *Rheae*—of the subclass Ratitae. Structural characters no less important separate the rheas from the emeus; the former can be readily recognized by the rounded form of their contour-feathers, which want the *hyporrhachis* or after-shaft that in the emeus and cassowaries is so long as to equal the main shaft, and contributes to give these latter groups the appearance of being covered with shaggy hair. The feathers of the rhea have a considerable market value, and for the purpose of trade in them it is annually killed by thousands, so that[1] its total extinction as a wild animal is probably only a question of time. It is polygamous, and the male performs the duty of incubation, brooding more than a score of eggs, the produce of several females—facts known to Nieremberg more than two hundred and fifty years since, but hardly accepted by naturalists until recently. No examples of this bird seem to have been brought to Europe before the beginning of the present century, and accordingly the descriptions previously given of it by systematic writers were taken at second hand and were mostly defective if not misleading. In 1803 J. Latham issued a wretched figure of the species from a half-grown specimen in the Leverian Museum, and twenty years later said he had seen only one other, and that still younger, in Bullock's collection (*Gen. Hist. Birds*, viii. p. 379).[2] A bird living in confinement at Strassburg in 1806 was, however, described and figured by Hammer in 1808 (*Ann. du Muséum*, xii. pp. 427–433, pl. 39). In England the *Report* of the Zoological Society for 1833 announced the rhea as having been exhibited for the first time in its gardens during the preceding twelvemonth. Since then many other living examples have been introduced, and it has bred both there and in many private parks in Britain.

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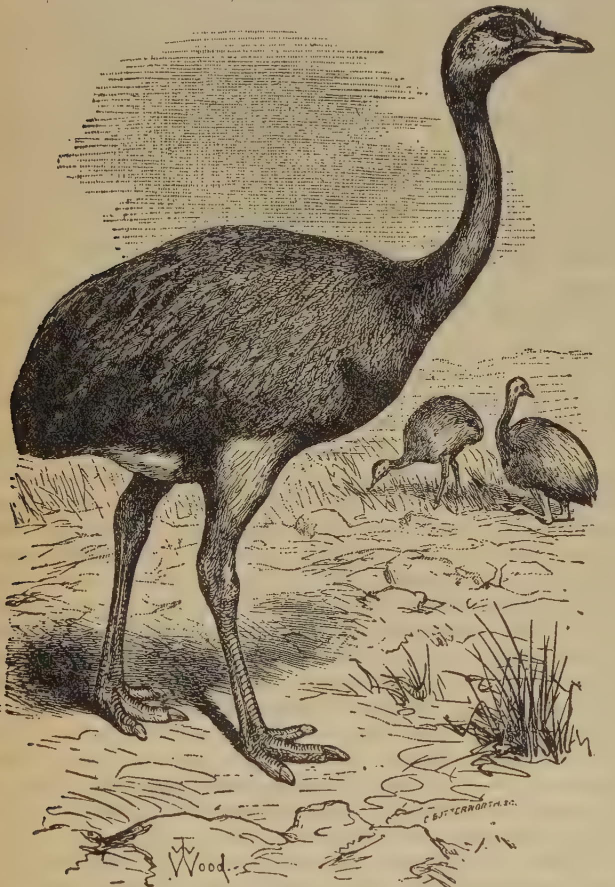
[1] What prompted his bestowal of this name, so well known in classical mythology, is not apparent.

[2] The name *Touyou*, also of South American origin, was applied to it by Brisson and others, but erroneously, as Cuvier shows, since by that name, or something like it, the jabiru (*q.v.*) is properly meant.



Rhea.

Though considerably smaller than the ostrich, and wanting its fine plumes, the rhea in general aspect far more resembles that bird than the other Ratitae. The feathers of the head and neck, except on the crown and nape, where they are dark brown, are dingy white, and those of the body ash-coloured tinged with brown, while on the breast they are brownish-black, and on the belly and thighs white. In the course of the memorable voyage of the "Beagle," C. Darwin came to hear of another kind of rhea, called by his informants *Avestruz petise*, and at Port Desire on the east coast of Patagonia he obtained an example of it, the imperfect skin of which enabled J. Gould to describe it (*Proc. Zool. Society*, 1837, p. 35) as a second species of the genus, naming it after its discoverer. *Rhea darwini* differs in several well-marked characters from the earlier known *R. americana*. Its bill is shorter than its head; its tarsi are reticulated instead of scutellated in front, with the upper part feathered instead of being bare; and the plumage of its body and wings is very different, each feather being tipped with a distinct whitish band, while that of the head and neck is greyish-brown. A further distinction is also asserted to be shown by the eggs—those of *R. americana* being of a yellowish-white, while those of *R. darwini* have a bluish tinge. Some years afterwards P. L. Sclater described (*op. cit.*, 1860, p. 207) a third and smaller species, closely resembling the *R. americana*, but having apparently a longer bill, whence he named it *R. macrorhyncha*, more slender tarsi, and shorter toes, while its general colour is very much darker, the body and wings being of a brownish-grey mixed with black. The precise geographical range of these three species is still undetermined. While *R. americana* is known to extend from Paraguay and southern Brazil through the La Plata region to an uncertain distance in Patagonia, *R. darwini* seems to be the proper inhabitant of the country last named, though M. Claraz asserts (*op. cit.*, 1885, p. 324) that it is occasionally found to the northward of the Rio Negro, which had formerly been regarded as its limit, and, moreover, that flocks of the two species commingled may be very frequently seen in the district between that river and the Rio Colorado. On the "pampas" *R. americana* is said to associate with herds of deer (*Cariacus campestris*), and *R. darwini* to be the constant companion of guanacos (*Lama huanaco*)—just as in Africa the ostrich seeks the society of zebras and antelopes. As for *R. macrorhyncha*, it was found by W. A. Forbes (*Ibis*, 1881, pp. 360, 361) to inhabit the dry and open "sertoēs" of north-eastern Brazil, a discovery the more interesting since it was in that part of the country that Marcgrav and Piso became acquainted with a bird of this kind, though the existence of any species of rhea in the district had been long overlooked by or unknown to succeeding travellers.

Besides the works above named and those of other recognized authorities on the ornithology of South America such as Azara, Prince Max of Wied, Professor Burmeister and others, more or less valuable information on the subject is to be found in Darwin's *Voyage*, Dr Böcking's "Monographie des Nandu" in (Wiegmann's) *Archiv für Naturgeschichte* (1863, i. pp. 213–41); R. O. Cunningham's *Natural History of the Strait of Magellan* and paper in the Zoological Society's *Proceedings* for 1871 (pp. 105–110), as well as H. F. Gadow's still more important anatomical contributions in the same journal for 1885 (pp. 308 seq.). (A. N.)

RHEINBERGER, JOSEPH GABRIEL (1839–1901), German composer, was born at Vaduz, Liechtenstein, on the 17th of March 1839. His musical abilities were manifested so early that he was appointed organist of the parish church when he was but seven years old. A three-part Mass composed by him was performed in the following year. He was taught at first by Philipp Schmutzer, choir director at Feldkirch; he entered the Munich Conservatorium in 1851, and remained there till 1854 as a pupil of Professor E. Leonhard for piano, Professor Herzog for organ and J. J. Maier for counterpoint. After leaving the school he had private lessons from Franz Lachner, and was appointed a professor in the conservatorium in succession to Leonhard in 1859. In 1860 he became professor of composition, and was appointed organist of the Michelskirche, a post he held till 1866. In 1877 he succeeded Wüllner as Hofkapellmeister, and from that time his attention was largely devoted to sacred music. His compositions include works of importance in every form, from the operas *Die sieben Raben* (Munich, 1869) and *Türmers Töchterlein* (Munich, 1873) and the oratorio *Christoforus*, op. 120, to the well-known quartet for piano and strings in E flat, op. 38, the nonet for wind and strings, op. 139, and the seventeen organ sonatas, which form notable additions to the literature of the instrument. He died in November 1901.

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[1] J. E. Harting, in his and De Mosenthal's *Ostriches and Ostrich Farming*, from which the woodcut here introduced is by permission copied, gives (pp. 67–72) some portentous statistics of the destruction of rheas for the sake of their feathers, which, he says, are known in the trade as "Vautour" to distinguish them from those of the African bird.

[2] The ninth edition of the *Companion* to this collection (1810, p. 121) states that the specimen "was brought alive" [?to England].

RHEINE, a town of Germany, in the Prussian province of Westphalia, situated on the Ems, at the point where it becomes navigable, 29 m. W. by rail of Osnabrück, and at the junction of main lines to Münster, Rotterdam and Emden. Pop. (1905) 12,801. It is an old-fashioned town with a pronounced Dutch aspect, and has pretty gardens and promenades. Rheine is the seat of cotton industries, has manufactures of jute, machinery, tobacco and flour, and a considerable river trade in agricultural produce. It received municipal rights in 1327. About a mile north of Rheine is the castle of Bentlage, the family seat of the princes of Rheina-Wolbeck.

RHENANUS, BEATUS (1485–1547), German humanist, was born in 1485 at Schlettstadt in Alsace, where his father, named Bild, a native of Rheinau (hence the surname *Rhenanus*), was a prosperous butcher. He received his early education at the famous Latin school of Schlettstadt, and afterwards (1503) went to Paris, where he came under the influence of Jacobus Faber Stapulensis, an eminent Aristotelian. In 1511 he removed to Basel, where he became intimate with Desiderius Erasmus, and took an active share in the publishing enterprises of Joannes Froben (*q.v.*). In 1526 he returned to Schlettstadt, and devoted himself to a life of learned leisure, enlivened with epistolary and personal intercourse with Erasmus (the printing of whose more important works he personally superintended) and many other scholars of his time. He died at Strassburg on the 20th of July 1547.

His earliest publication was a biography of Geiler of Kaisersberg (1510). Of his subsequent works the principal are *Rerum Germanicarum Libri III.* (1531), and editions of *Velleius Paterculus* (ed. princeps, from a MS. discovered by himself, 1522); *Tacitus* (1519, exclusive of the *Histories*); *Livius* (1535); and *Erasmus* (with a life, 9 vols. fol., 1540–41).

See A. Horawitz, *Beatus Rhenanus* (1872), and by the same, *Des Beatus Rhenanus literarische Tätigkeit* (2 vols., 1872); also the notice by R. Hartfelder in *Allgemeine Deutsche Biographie.*

RHETICUS, or RHAETICUS (1514–1576), a surname given to GEORGE JOACHIM, German astronomer and mathematician, from his birth at Feldkirch in that part of Tirol which was anciently the territory of the Rhaeti. Born on the 15th of February 1514, he studied at Tiguri with Oswald Mycone, and afterwards went to Wittenberg where he was appointed professor of mathematics in 1537. Being greatly attracted by the new Copernican theory, he resigned the professorship in 1539, and went to Frauenberg to associate himself with Copernicus (*q.v.*), and superintended the printing of the *De Orbium Revolutione* which he had persuaded Copernicus to complete. Rheticus now began his great treatise, *Opus Palatinum de Triangulis*, and continued to work at it while he occupied his old chair at Wittenberg, and indeed up to his death at Cassovia in Hungary, on the 4th of December 1576. The *Opus Palatinum* of Rheticus was published by Valentine Otho, mathematician to the electoral prince palatine, in 1596. It gives tables of sines and cosines, tangents, &c., for every 10 seconds, calculated to ten places. He had projected a table of the same kind to fifteen places, but did not live to complete it. The sine table, however, was afterwards published on this scale under the name of *Thesaurus Mathematicus* (Frankfort, 1613) by B. Pitiscus (1561–1613), who himself carried the calculation of a few of the earlier sines to twenty-two places. He also published *Narratio de Libris Revolutionum Copernici* (Gedenum, 1540), which was subsequently added to editions of Copernicus's works; and *Ephemerides* until 1551, which were founded on the Copernican doctrines. He projected numerous other works, as is shown by a letter to Peter Ramus in 1568, which Adrian Romanus inserted in the preface to his *Idea of Mathematics.*

RHETORIC (Gr. ῥητορικὴ τέχνη, the art of the orator), the art of using language in such a way as to produce a desired impression upon the hearer or reader. The object is strictly persuasion rather than intellectual approval or conviction; hence the term, with its adjective "rhetorical," is commonly used for a speech or writing in which matter is subservient to form or display. So in grammar, a "rhetorical question" is one which is asked not for the purpose of obtaining an answer, but simply for dramatic effect. The power of eloquent speech is recognized in the earliest extant writings. Homer describes Achilles as a "speaker of words, as well as a doer of deeds": Nestor, Menelaus and Odysseus are all orators as well as statesmen and soldiers. Again the brilliant eloquence of Pericles is the theme of Aristophanes and Eupolis. Naturally the influence wielded by the great orators led to an investigation of the characteristics of successful rhetoric, and especially from the time of Aristotle the technique of the art ranked among the recognized branches of learning.

Early Greek rhetoric—Corax.

The topic of εἰκός.

Tisias.

Gorgias.

A lost work of Aristotle is quoted by Diogenes Laërtius (viii. 57) as saying that Empedocles "invented" (εὑρεῖν) rhetoric; Zeno, dialectic (*i.e.* logic, the art of making a logical argument, apart from the style). This is certainly not to be understood as meaning that Empedocles composed the first "art" of rhetoric. It is rather to be explained by Aristotle's own remark, cited by Laërtius from another lost treatise, that Empedocles was "a master of expression and skilled in the use of metaphor"—qualities which may have found scope in his political oratory, when, after the fall of Thrasydaeus in 472 B.C., he opposed the restoration of a tyranny at Agrigentum. The founder of rhetoric as an art was Corax of Syracuse (*c.* 466 B.C.). In 466 a democracy was established in Syracuse. One of the immediate consequences was a mass of litigation on claims to property, urged by democratic exiles who had been dispossessed by Thrasybulus, Hiero or Gelo. Such claims, going many years back, would often require that a complicated series of details should be stated and arranged. It would also, in many instances, lack documentary support, and rely chiefly on inferential reasoning. Hence the need of professional advice. The facts known as to the "art" of Corax perfectly agree with these conditions. He gave rules for arrangement, dividing the speech into five parts,—proem, narrative, arguments (ἀγῶνες), subsidiary remarks (παρέκβασις) and peroration. Next he illustrated the topic of general probability (εἰκός), showing its two-edged use: *e.g.*, if a puny man is accused of assaulting a stronger, he can say, "Is it likely that I should have attacked him?" If vice versa, the strong man can argue, "Is it likely that I should have committed an assault where the presumption was sure to be against me?" This topic of εἰκός, in its manifold forms, was in fact the great weapon of the earliest Greek rhetoric. It was further developed by Tisias, the pupil of Corax, as we see from Plato's *Phaedrus*, in an "art" of rhetoric which antiquity possessed, but of which we know little else. Aristotle gives the εἰκός a place among the topics of the fallacious enthymeme which he enumerates in *Rhet.* ii. 24, remarking that it was the very essence of the treatise of Corax; he points out the fallacy of omitting to distinguish between abstract and particular probability, quoting the verses of Agatho,—"Perhaps one might call this very thing a probability, that many improbable things will happen to men." Gorgias (*q.v.*) of Leontini captivated the Athenians in 427 B.C. by his oratory (Diod. xii. 53), which, so far as we can judge, was characterized by florid antithesis, expressed in short jerky sentences. But he has no definite place in the development of rhetoric as a system. It is doubtful whether he left a written "art"; and his mode of teaching was based on learning prepared passages by heart,—diction (λέξις), not invention or arrangement, being his great object.

Antiphon.

The first extant Greek author who combined the theory with the practice of rhetoric is the Athenian Antiphon (*q.v.*), the first of the Attic orators, and the earliest representative at Athens of a new profession created by the new art of rhetoric—that of the λογογράφος, the writer of forensic speeches for other men to speak in court. His speeches show the art of rhetoric in its transition from the technical to the practical stage, from the school to the law court and the assembly. The organic lines of the rhetorical pleader's thought stand out in bold relief, and we are enabled to form a clear notion of the logographer's method. We find a striking illustration of the fact that the topic of "probability" is the staple of this early forensic rhetoric. Viewed generally, the works of Antiphon are of great interest for the history of Attic prose, as marking how far it had then been influenced by a theory of style. The movement of Antiphon's prose has a certain grave dignity, "impressing by its weight and grandeur," as a Greek critic in the Augustan age says, "not charming by its life and flow." Verbal antithesis is used, not in a diffuse or florid way, but with a certain sledge-hammer force, as sometimes in the speeches of Thucydides. The imagery, too, though bold, is not florid. The structure of the periods is still crude; and the general effect of the whole, though often powerful and impressive, is somewhat rigid.

Isocrates.

Antiphon represents what was afterwards named the "austere" or "rugged" style (αὐστηρὰ ἁρμονία), Lysias was the model of an artistic and versatile simplicity. But while Antiphon has a place in the history of rhetoric as an art, Lysias, with his more attractive gifts, belongs only to the history of oratory. Ancient writers quote an "art" of rhetoric by Isocrates, but its authenticity was questioned. It is certain, however, that Isocrates taught the art as such. He is said to have defined rhetoric "as the science of persuasion" (Sext. Empir. *Adv. Mathem.* ii. § 62, p. 301 seq.). Many of his particular precepts, both on arrangement and on diction, are cited, but they do not give a complete view of his method. The φιλοσοφία ("theory of culture") which Isocrates expounds in his discourses *Against the Sophists* and on the *Antidosis*, was in fact rhetoric applied to politics. First came technical expositions: the pupil was introduced to all the artificial resources which prose composition employs (τὰς ἰδέας ἁπάσας αἷς ὁ λόγος τυγχάνει χρώμενος, *Antid.* § 183). The same term (ἰδέαι) is also used by Isocrates in a narrower sense, with reference to the "figures" of rhetoric, properly called σχήματα (*Panath.* § 2); sometimes, again, in a sense still more general, to the several branches or styles of literary composition (*Antid.* § 11). When the technical elements of the subject had been learned, the pupil was required to apply abstract rules in actual composition, and his essay was revised by the master. Isocrates was unquestionably successful in forming speakers and writers. His school was famous during a period of some fifty years (390 to 340 B.C.). Among the statesmen whom it trained were Timotheus, Leodamas of Acharnae, Lycurgus and Hyperides; among the philosophers or rhetoricians were Speusippus, Plato's successor in the Academy, and Isaeus; among the historians, Ephorus and Theopompus. Cicero and through him all subsequent oratory owed much to the ample prose of the Isocratean school.

In the person of Isocrates the art of rhetoric is thus thoroughly established, not merely as a technical method, but also as a practical discipline of life. If Plato's mildly ironical reference in the *Euthydemus* to a critic "on the borderland between philosophy and statesmanship" was meant, as is probable, for Isocrates, at least there was a wide difference between the measure of acceptance accorded to the earlier Sophists, such as Protagoras, and the influence which the school of Isocrates exerted through the men whom it had trained. Rhetoric had won its place in education. It kept that place through varying fortunes to the fall of the Roman empire, and resumed it, for a while, at the revival of learning.

Aristotle's "Rhetoric."

Plato in the *Gorgias* and the *Phaedrus* satirized the ordinary textbooks of rhetoric, and himself gave directions for a higher standard of work; but the detailed study of the art begins with Aristotle. Aristotle's *Rhetoric* belongs to the generation after Isocrates, having been composed (but see ARISTOTLE) between 330 and 322 B.C. As controversial allusions sometimes hint it holds Isocrates for one of the foremost exponents of the subject. From a purely literary point of view Aristotle's *Rhetoric* (with the partial exception of book iii.) is one of the driest works in the world. From the historical or scientific point of view it is one of the most interesting. If we would seize the true significance of the treatise it is better to compare rhetoric with grammar than with its obvious analogue, logic. A method of grammar was the conception of the Alexandrian age, which had lying before it the standard masterpieces of Greek literature, and deduced the "rules" of grammar from the actual practice of the best writers. Aristotle in the latter years of the 4th century B.C. held the same position relatively to the monuments of Greek oratory which the Alexandrian methodizers of grammar held relatively to Greek literature at large. Abundant material lay before him, illustrating how speakers *had* been able to persuade the reason or to move the feelings. He therefore sought thence to deduce rules and so construct a true art. Aristotle's practical purpose was undoubtedly real. If we are to make persuasive speakers, he believed, this is the only sound way to set about it. But the enduring interest of his *Rhetoric* is mainly retrospective. It attracts us as a feat in analysis by an acute mind—a feat highly characteristic of that mind itself, and at the same time strikingly illustrative of the field over which the materials have been gathered.

The *Rhetoric* is divided into three books. It deals in great detail with the minutiae of the rhetorical craft. Book i. discusses the nature and object of rhetoric. The means of persuasion (πίστεις) are classified into "inartificial" (ἄτεχνοι), *i.e.* the facts of the case external to the art, documents, laws, depositions,—and "artificial" (ἔντεχνοι), the latter subdivided into logical (the popular syllogism or "enthymeme," the "example," &c.), ethical, and emotional. Aristotle next deals with the "topics" (τόποι), *i.e.* the commonplaces of rhetoric, general or particular arguments which the rhetorician must have ready for immediate use. Rhetoric is then broadly divided into :—(1) *deliberative* (συμβουλευτική), concerned with exhortation or dissuasion, and with future time, its end (τέλος) being the advantage or detriment of the persons addressed; (2) *forensic* (δικανική), concerned with accusation and defence, and with time past, its standard being justice; (3) *epideictic*, the ornamental rhetoric of display, concerned with praise and blame, usually with the present time, its standard being honour and shame. Each of these kinds is discussed, and the book ends with a brief analysis of the "inartificial proofs." In book ii. Aristotle returns to the "artificial" proofs—those which rhetoric itself provides. The "logical" proof having been discussed in book i., he turns to the "ethical." He shows how the speaker may so indicate his own character and the goodness of his motive as to prepossess the audience in his favour, and proceeds to furnish materials to this end. The "emotional" proof is then discussed, and an analysis is given of the emotions on which the speaker may play. A consideration follows of the "universal commonplaces" (κοινοὶ τόποι) which are suitable to all subjects. The book ends with an appendix dealing with the "example" (παράδειγμα), the general moral sentiments (γνῶμαι) and the enthymeme. In book iii. Aristotle considers expression (λέξις), including the art of delivery (ὑπόκρισις), and arrangement (τάξις). Composition, the use of prose rhythm, the periodic style (the "periodic" style, κατεστραμμένη, being contrasted with the "running" (εἰρομένη)) are all analysed, and the types of style literary (γραφική) and oral (ἀγωνιστική) are differentiated. Under "arrangement" he concludes with the parts of a speech, proem, narrative, proofs and epilogue.

It is necessary briefly to consider Aristotle's general view of rhetoric as set forth in book i. Rhetoric is properly an art. This is the proposition from which Aristotle sets out. It is so because when a speaker persuades, it is possible to find out why he succeeds in doing so. Rhetoric is, in fact, the popular branch of logic. Hitherto, Aristotle says, the essence of rhetoric has been neglected for the accidents. Writers on rhetoric have hitherto concerned themselves mainly with "the exciting of prejudice, of pity, of anger, and such-like emotions of the soul." All this is very well, but "it has nothing to do with the matter in hand; it has regard to the judge." The true aim should be to *prove* your point, or seem to prove it.

Here we may interpolate a comment which has a general bearing on Aristotle's *Rhetoric*. It is quite true that, if we start from the conception of rhetoric as a branch of logic, the phantom of logic in rhetoric claims precedence over appeals to passion. But Aristotle does not sufficiently regard the question—What, as a matter of experience, is most persuasive? Logic may be more persuasive with the more select hearers of rhetoric; but rhetoric is for the many, and with the many appeals to passion will sometimes, perhaps usually, be more effective than syllogism. No formulation of rhetoric can correspond with fact which does not leave it absolutely to the genius of the speaker whether reasoning (or its phantom) is to be what Aristotle calls it, the "body of proof" (σῶμα πίστεως), or whether the stress of persuading effort should not be rather addressed to the emotions of the hearers.

But we can entirely agree with Aristotle in his next remark, which is historical in its nature. The deliberative branch of rhetoric had hitherto been postponed, he observes, to the forensic. We have, in fact, already seen that the very origin of rhetoric in Hellas was forensic. The relative subordination of deliberative rhetoric, however unscientific, had thus been human. Aristotle's next statement, that the master of logic will be the master of rhetoric, is a truism if we concede the essential primacy of the logical element in rhetoric. Otherwise it is a paradox; and it is not in accord with experience, which teaches that speakers incapable of showing even the ghost of an argument have sometimes been the most completely successful in carrying great audiences along with them. Aristotle never assumes that the hearers of his rhetorician are as οἱ χαρίεντες, the cultivated few; on the other hand, he is apt to assume tacitly—and here his individual bent comes out—that these hearers are not the great surging crowd, the ὄχλος, but a body of persons with a decided, though imperfectly developed, preference for sound logic.

Uses of rhetoric.

What is the use of an art of rhetoric? It is fourfold, Aristotle replies. Rhetoric is useful, first of all, because truth and justice are naturally stronger than their opposites. When awards are not duly given, truth and justice must have been worsted by their own fault. This is worth correcting. Rhetoric is then (1) *corrective*. Next, it is (2) *instructive*, as a popular vehicle of persuasion for persons who could not be reached by the severer methods of strict logic. Then it is (3) *suggestive*. Logic and rhetoric are the two impartial arts; that is to say, it is a matter of indifference to them, as arts, whether the conclusion which they draw in any given case is affirmative or negative. Suppose that I am going to plead a cause, and have a sincere conviction that I am on the right side. The art of rhetoric will suggest to me what might be urged on the other side; and this will give me a stronger grasp of the whole situation. Lastly, rhetoric is (4) *defensive*. Mental effort is more distinctive of man than bodily effort; and "it would be absurd that, while incapacity for physical self-defence is a reproach, incapacity for mental defence should be no reproach." Rhetoric, then, is corrective, instructive, suggestive, defensive. But what if it be urged that this art may be abused? The objection, Aristotle answers, applies to all good things, except virtue, and especially to the most useful things. Men may abuse strength, health, wealth, generalship.

Rhetoric defined.

The function of the medical art is not necessarily to cure, but to make such progress towards a cure as each case may admit. Similarly it would be inaccurate to say that the function of rhetoric was to persuade. Rather must rhetoric be defined as "the faculty of discerning in every case the available means of persuasion." Suppose that among these means of persuasion is some process of reasoning which the rhetorician himself knows to be unsound. That belongs to the province of rhetoric all the same. In relation to logic, a man is called a "sophist" with regard to his moral purpose (προαίρεσις), *i.e.* if he knowingly used a fallacious syllogism. But rhetoric takes no account of the moral purpose. It takes account simply of the faculty (δύναμις)—the faculty of discovering any means of persuasion.

The Rhetoric "to Alexander."

Aristotle's *Rhetoric* is incomparably the most scientific work which exists on the subject. It may also be regarded as having determined the main lines on which the subject was treated by nearly all subsequent writers. The extant treatise on rhetoric (also by Aristotle?) entitled Ῥητορικὴ πρὸς Ἀλέξανδρον, formerly ascribed to Anaximenes of Lampsacus, was written at latest by 340 B.C. The introductory letter prefixed to it is probably a late forgery. Its relation towards Aristotle's *Rhetoric* is discussed in the article on ARISTOTLE.

The period from Alexander to Augustus.

During the three centuries from the age of Alexander to that of Augustus the fortunes of rhetoric were governed by the new conditions of Hellenism. Aristotle's scientific method lived on in the Peripatetic school. Meanwhile the fashion of florid declamation or strained conceits prevailed in the rhetorical schools of Asia, where, amid mixed populations, the pure traditions of the best Greek taste had been dissociated from the use of the Greek language. The "Asianism" of style which thus came to be constrasted with "Atticism" found imitators at Rome, among whom must be reckoned the orator Hortensius (*c.* 95 B.C.). Hermagoras of Temnos in Aeolis (*c.* 110 B.C.) claims mention as having done much to revive a higher conception. Using both the practical rhetoric of the time before Aristotle and Aristotle's philosophical rhetoric, he worked up the results of both in a new system,—following the philosophers so far as to give the chief prominence to "invention." He thus became the founder of a rhetoric which may be distinguished as the scholastic. Through the influence of his school, Hermagoras did for Roman eloquence very much what Isocrates had done for Athens. Above all, he counteracted the view of "Asianism," that oratory is a mere knack founded on practice, and recalled attention to the study of it as an art.[1]

Hermagoras.

Cicero.

Cicero's rhetorical works are to some extent based on the technical system to which he had been introduced by Molon at Rhodes. But Cicero further made an independent use of the best among the earlier Greek writers, Isocrates, Aristotle and Theophrastus. Lastly, he could draw, at least in the later of his treatises, on a vast fund of reflection and experience. Indeed, the distinctive interest of his contributions to the theory of rhetoric consists in the fact that his theory can be compared with his practice. The result of such a comparison is certainly to suggest how much less he owed to his art than to his genius. Some consciousness of this is perhaps implied in the idea which pervades much of his writing on oratory, that the perfect orator is the perfect man. The same thought is present to Quintilian, in whose great work, *De Institutione Oratoria*, the scholastic rhetoric receives its most complete expression (*c.* A.D. 90). Quintilian treats oratory as the end to which the entire mental and moral development of the student is to be directed. Thus he devotes his first book to an early discipline which should precede the orator's first studies, and his last book to a discipline of the whole man which lies beyond them. Some notion of his comprehensive method may be derived from the circumstance that he introduces a succinct estimate of the chief Greek and Roman authors, of every kind, from Homer to Seneca (bk. x. §§ 46–131). After Quintilian, the next important name is that of Hermogenes of Tarsus, who under Marcus Aurelius made a complete digest of the scholastic rhetoric from the time of Hermagoras of Temnos (110 B.C.). It is contained in five extant treatises, which are remarkable for clearness and acuteness, and still more remarkable as having been completed before the age of twenty-five. Hermogenes continued for nearly a century and a half to be one of the chief authorities in the schools. Longinus (*c.* A.D. 260) published an *Art of Rhetoric* which is still extant; and the more celebrated treatise *On Sublimity* (περὶ ὕψους), if not his work, is at least of the same period. In the later half of the 4th century Aphthonius (*q.v.*) composed the "exercises" (προγυμνάσματα) which superseded the work of

Quintilian.

Hermogenes.

Other writers.

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[1] See Jebb's *Attic Orators*, ii. 445.

Hermogenes. At the revival of letters the treatise of Aphthonius once more became a standard text-book. Much popularity was enjoyed also by the exercises of Aelius Theon (of uncertain date; see THEON). (See further the editions of the *Rhetores Graeci* by L. Spengel and by Ch. Walz.)

Practice of Rhetoric under the Empire.

The "Sophists."

During the first four centuries of the empire the practice of the art was in greater vogue than ever before or since. First, there was a general dearth of the higher intellectual interests: politics gave no scope to energy; philosophy was stagnant, and literature, as a rule, either arid or frivolous. Then the Greek schools had poured their rhetoricians into Rome, where the same tastes which revelled in coarse luxury welcomed tawdry declamation. The law-courts of the Roman provinces further created a continual demand for forensic speaking. The public teacher of rhetoric was called "sophist," which was now an academic title, similar to "professor" or "doctor." In the 4th century B.C. Isocrates had taken pride in the name of σοφιστής, which, indeed, had at no time wholly lost the good, or neutral, sense which originally belonged to it. The academic meaning which it acquired under the early empire lasted into the middle ages (see Du Cange, *s.v.*, who quotes from Baldricus, "Egregius Doctor magnusque Sophista Geraldus"). While the word *rhetor* still denoted the faculty, the word *sophistes* denoted the office or rank to which the rhetor might hope to rise. So Lucian ("Teacher of Rhetoricians," § 1) says: "You ask, young man, how you are to become a rhetor, and attain in your turn to the repute of that most impressive and illustrious title, sophist." Lucian also satirizes the discussions of the nature of rhetoric in his parody the *Parasite* (cf. also his *Bis Accusatus*).

Chairs of Rhetoric.

Declamations.

Vespasian (70–79 A.D.), according to Suetonius, was the first emperor who gave a public endowment to the teaching of rhetoric. Under Hadrian and the Antonines (A.D. 117–180) the public chairs of rhetoric became objects of the highest ambition. The complete constitution of the schools at Athens was due to Marcus Aurelius. The Philosophical school had four chairs (θρόνοι)—Platonic, Stoic, Peripatetic, Epicurean. The Rhetorical school had two chairs, one for "sophistic," the other for "political" rhetoric. By "sophistic" was meant the academic teaching of rhetoric as an art, in distinction from its "political" application to the law-courts. The "sophistical" chair was superior to the "political" in dignity as in emolument, and its occupant was invested with a jurisdiction over the youth of Athens similar to that of the vice-chancellor in a modern university. The Antonines further encouraged rhetoric by granting immunities to its teachers. Three "sophists" in each of the smaller towns, and five in the larger, were exempted from taxation (*Dig.* xxvii. 1, 6, § 2). The wealthier sophists affected much personal splendour. Polemon (*c.* A.D. 130) and Adrian of Tyre (*c.* A.D. 170) are famous examples of extravagant display. The aim of the sophist was to impress the multitude. His whole stock-in-trade was style, and this was directed to astonishing by *tours de force*. The scholastic declamations were chiefly of two classes. (1) The *suasoriae* were usually on historical or legendary subjects, in which some course of action was commended or censured (cf. Juv. *Sat.*). These *suasoriae* belonged to deliberative rhetoric (the βουλευτικὸν γένος, *deliberativum genus*). (2) The *controversiae* turned especially on legal issues, and represented the forensic rhetoric (δικανικὸν γένος, *judiciale genus*). But it was the general characteristic of this period that all subjects, though formally "deliberative" or "forensic," were treated in the style and spirit of that third branch which Aristotle distinguished, the rhetoric of ἐπίδειξις or "display." The oratory produced by the age of the academic sophists can be estimated from a large extant literature. It is shown under various aspects, and presumably at its best, by such writers as Dio Chrysostom at the end of the 1st century, Aelius Aristides (see ARISTIDES, AELIUS) in the 2nd, the chief rhetorician under the Antonines, Themistius, Himerius and Libanius in the 4th. Amid much which is tawdry or vapid, these writings occasionally present passages of true literary beauty, while they constantly offer matter of the highest interest to the student.

Medieval study of Rhetoric.

In the medieval system of academic studies, grammar, logic and rhetoric were the subjects of the trivium, or course followed during the four years of undergraduateship. Music, arithmetic, geometry and astronomy constituted the quadrivium, or course for the three years from the B.A. to the M.A. degree. These were the seven liberal arts. In the middle ages the chief authorities on rhetoric were the latest Latin epitomists, such as Martianus Capella (5th cent.), Cassiodorus (5th cent.) or Isidorus (7th cent.).

Rhetoric at the Universities.

After the revival of learning the better Roman and Greek writers gradually returned into use. Some new treatises were also produced. Leonard Cox (d. 1549) wrote *The Art or Craft of Rhetoryke*, partly compiled, partly original, which was reprinted in Latin at Cracow. The *Art of Rhetorique*, by Thomas Wilson (1553), afterwards secretary of state, embodied rules chiefly from Aristotle, with help from Cicero and Quintilian. About the same time treatises on rhetoric were published in France by Tonquelin (1555) and Courcelles (1557). The general aim at this period was to revive and popularize the best teaching of the ancients on rhetoric. The subject was regularly taught at the universities, and was indeed important. At Cambridge in 1570 the study of rhetoric was based on Quintilian, Hermogenes and the speeches of Cicero viewed as works of art. An Oxford statute of 1588 shows that the same books were used there. In 1620 George Herbert was delivering lectures on rhetoric at Cambridge, where he held the office of public orator. The decay of rhetoric as a formal study at the universities set in during the 18th century. The function of the rhetoric lecturer passed over into that of correcting written themes; but his title remained long after his office had lost its primary meaning. If the theory of rhetoric fell into neglect, the practice, however, was encouraged by the public exercises ("acts" and "opponencies") in the schools. The college prizes for "declamations" served the same purpose.

Modern Writers on Rhetoric.

The fortunes of rhetoric in the modern world, as briefly sketched above, may suffice to suggest why few modern writers of ability have given their attention to the subject. Perhaps one of the most notable modern contributions to the art is the collection of commonplaces framed (in Latin) by Bacon, "to be so many spools from which the threads can be drawn out as occasion serves," a truly curious work of that acute and fertile mind. He called them "Antitheta." A specimen is subjoined:—

UXOR ET LIBERI

For.	*Against.*
"Attachment to the state begins from the family."	"He who marries, and has children, has given hostages to fortune."
"Wife and children are a discipline in humanity. Bachelors are morose and austere."	"The immortality of brutes is in their progeny; of men, in their fame, services, and institutions."
"The only advantage of celibacy and childlessness is in case of exile."	"Regard for the family too often overrides regard for the state."

Whately.

This is quite in the spirit of Aristotle's treatise. The popularity enjoyed by Blair's *Rhetoric* in the latter part of the 18th and the earlier part of the 19th century was merited rather by the form than by the matter. Campbell's *Philosophy of Rhetoric*, which found less wide acceptance than its predecessor, was superior to it in depth, though often marred by an imperfect comprehension of logic. But undoubtedly the best modern book on the subject is Whately's *Elements of Rhetoric*. Starting from Aristotle's view, that rhetoric is "an offshoot from logic," Whately treats it as the art of "argumentative composition." He considers it under four heads: (1) the address to the understanding (=Aristotle's λογικὴ πίστις); (2) the address to the will, or persuasion (=Aristotle's ἠθικὴ and *παθητικὴ πίστις*); (3) style; (4) elocution, or delivery. But when it is thus urged that—

> "All a rhetorician's rules
> But teach him how to name his tools,"

the assumption is tacitly made that an accurate nomenclature and classification of these tools must be devoid of practical use. The conditions of modern life, and especially the invention of printing, have to some extent diminished the importance which belonged in antiquity to the art of speaking, though modern democratic politics and forensic conditions still make it one which may be cultivated with advantage.

Among more modern works are J. Bascom, *Philosophy of Rhetoric* (New York, 1885); and numerous books on voice culture, gesture and elocution. For ancient rhetoric see Sir R. C. Jebb's translation of Aristotle's *Rhetoric* (ed. J. E. Sandys, 1909), and his *Attic Orators* (1876); also Spengel, *Artium Scriptores* (1828); Westermann, *Gesch. der Beredtsamkeit* (1833–35;) Cope, in the *Cambridge Journal of Classical and Sacred Philology* (1855–57); introductions to Cicero's *De Oratore* (A. S. Wilkins) and *Orator* (J. E. Sandys); Volkmann, *Die Rhetorik der Griechen und Römer in system. Übersicht* (ed. 2, 1885). (R. C. J.; X.)

RHEUMATISM (from Gr. *ῥεῦμα*, flux), a general term for various forms of disease, now subdivided more accurately under separate names.

Acute Rheumatism or Rheumatic Fever is the name given to a disease having for its chief characteristics inflammatory affections of the joints, attended by severe constitutional disturbances and frequently associated with inflammation of the pericardium and valves of the heart. The acute rheumatism of childhood differs materially from that of adults in that the articular manifestations and constitutional disturbance are usually much less severe, whereas the heart and pericardium are especially liable to be attacked. It will be advisable, therefore, in discussing the symptoms, to deal separately with the rheumatism of adults and that of childhood. There are certain points of importance in connexion with its causation which are generally agreed upon. It is essentially a disease of childhood and early adult life, being most commonly met with between the ages of ten and twenty-five and comparatively rarely after forty. Heredity is unquestionably an important predisposing cause. Climate is also a factor of considerable importance, cold and damp with sudden and wide fluctuations of temperature being especially conducive to an attack. While perhaps more common in Great Britain than elsewhere, it is met with in most parts of the globe. Exposure to cold and wet, and especially a chill after free perspiration and fatigue, are among the most common exciting causes of an attack.

Of recent years much evidence has accumulated tending to show that rheumatism is a specific infective disease due to a micro-organism, and this is now generally recognized. There is still, however, some difference of opinion as to the nature of the micro-organism by which it is produced. In 1900 F. J. Poynton and Paine isolated from eight cases of acute rheumatism in children a minute diplococcus similar to that previously described by Triboulet and by A. Wasserman, which inoculated into rabbits produced lesions of the joints and of the heart indistinguishable from those met with in acute rheumatism. They have since obtained the same micro-organism from a further large number of cases of acute rheumatism, and their results have been confirmed by Walker, Beattie and others. They therefore claim that this micro-organism, to which they have given the name *Diplococcus rheumaticus*, is the specific cause of acute rheumatism. The objections which have been raised by other competent observers against this view are: (1) That this diplococcus is not found in all cases of acute rheumatism. (2) That certain other micro-organisms when inoculated into animals will produce joint and heart affections similar to those produced by the aforesaid *Diplococcus rheumaticus*. It would be out of place here to enter into the merits of this controversy; suffice it to say that the objections raised do not appear to be cogent enough to invalidate the conclusions arrived at by the authors of the germ theory. The matter is, however, still to a certain extent *sub judice*.

Symptoms.

In *adults* the affection of the joints is the most striking feature. The attack is usually ushered in by a feeling of chilliness or malaise, with pain or stiffness in one or more joints, generally those of large or medium size, such as the knees, ankles, wrists or shoulders. At first the pain is confined to one or two joints, but others soon become affected, and there is a tendency to symmetry in the order in which they are attacked, the inflammation in one joint being followed by that of the same joint on the opposite side. The affected joints are swollen, hot and excessively tender, and the skin over them is somewhat flushed. The temperature is raised, ranging from about 101° to 103° F., the pulse rapid, full and soft; the face is flushed, the tongue coated with a thick white fur, and there is thirst, loss of appetite, and constipation. The body is bathed in a profuse perspiration, which has a characteristic sour, disagreeable odour. The urine is diminished, acid and loaded with urates. The attack is of variable duration, and may pass off in a few days or last for some weeks. Relapses are not uncommon when convalescence appears to have been established. Among the complications which may arise are hyperpyrexia, or rapid and extreme rise of temperature, which may run up as high as 110° F., when death will speedily ensue unless prompt and energetic treatment by cold baths or icepacks is resorted to. Affections of the heart, pericarditis (inflammation of the fibro-serous sac investing the heart) and endocarditis (inflammation of the lining membrane and the valves of the heart), which are so frequently associated with rheumatism, should be regarded as part of the disease, rather than as complications of rheumatism. They are far more common in children than in adults, and it is the damage to the valves of the heart in children by rheumatism which lays the foundation of much chronic heart disease in later life.

In *childhood* the affection of the joints is usually slight, and may be confined to a little pain or stiffness in one or two joints, and is sometimes attributed by parents to "growing pains." The constitutional symptoms are also ill-marked and there are no acid sweats, the temperature is not as a rule very high, the tongue not heavily coated, and the child does not appear to be very ill. The heart and pericardium are, however, especially liable to attack, and this may be so insidious in its onset that attention is not called to it till considerable damage has been done to the heart. It is of importance, therefore, that in children the heart should be frequently examined by a physician, when there is the slightest suspicion of an attack of rheumatism. *Chorea* or St Vitus's dance is a common manifestation of rheumatism in children. *Subcutaneous fibrous nodules*, attached to tendons or fibrous structures beneath the skin, are a special feature of the rheumatism of childhood. They are painless, and vary in size from one-eighth to half an inch in diameter. They are not very common, but when present indicate that the rheumatism has a firm hold and that cardiac complications are to be apprehended.

Treatment.

The patient should be placed in bed between blankets, and should wear a light flannel or woollen shirt. The affected joints should be kept at rest as far as possible, and enveloped in cotton-wool. Salicylate of soda or salicin, first suggested by Dr Maclagan in 1876, appear to exercise a specific influence in acute rheumatism. They have a powerful effect not only in reducing the temperature, but in relieving the pain and cutting short the attack. Frequent and fairly large doses of salicylate of soda should be administered for the first twenty-four hours: the dose and interval at which it is given should then be gradually reduced till the symptoms subside. In conjunction with this, alkalies such as bicarbonate or citrate of potash should also be administered. The effect of the salicylate should be carefully watched, and the dose reduced if toxic symptoms such as delirium, deafness, and noises in the ears occur. These drugs are of less service in the rheumatism of children than in that of adults, as they do not appear to exercise any specific influence in arresting the cardiac inflammation to which children are specially liable, though they have a marked effect on the joint affections. Aspirin has recently come into use as a substitute for salicylates, and may succeed when salicylates fail.

Subacute rheumatism.—This term is sometimes applied to attacks of the disease of a less severe type in which the symptoms, though milder in character, are usually of longer duration and more intractable than in the acute form. It is difficult, however, to draw a hard-and-fast line between the two, but the term may perhaps be most appropriately applied to the repeated and protracted attacks of cardiac rheumatism in children.

Chronic Rheumatism.—This term has been somewhat loosely applied to various chronic joint affections, sometimes of gouty origin or the result of rheumatoid arthritis. Strictly speaking, it may be applied to cases in which the joint lesions persist after an attack of rheumatism, and chronic inflammatory thickening of the tissues takes place, so that they become stiff and deformed. It is also appropriate to certain joint affections occurring in later life in rheumatic subjects, who are liable to repeated attacks of pain and stiffness in the joints, usually induced by exposure to cold and wet. This form of rheumatism is less migratory than the acute, and is commonly limited to one or two of the larger joints. After repeated attacks the affected joints may become permanently stiff and painful, and crackling or creaking may occur on movement. There is seldom any constitutional disturbance, and the heart is not liable to be affected.

Muscular Rheumatism.—By this is understood a painful affection of certain groups of muscles attributable to inflammation of their fibrous and tendinous attachments. It is commonly brought on by exposure to cold and wet, and especially by a chill after violent exercise and free perspiration when the clothes are not changed. Any movement of the affected muscles gives rise to severe and sharp pain which may induce a certain degree of spasm and rigidity at the time. The pain usually subsides and passes off completely while the patient is at rest, but occurs on the slightest movement of the affected muscles.

The chief varieties of muscular rheumatism are:—

1. Lumbago, in which the muscles of the lower part of the back are affected so that stooping, particularly the attempt to rise again to the erect position, induces severe pain.
2. Intercostal rheumatism, affecting the muscles between the ribs, so that taking a deep breath and certain movements of the arms give rise to pain.
3. Torticollis or stiff neck, affecting the muscles of one side of the neck.

Treatment.—Salicylates, which are of service in acute rheumatism, are not so reliable in the chronic varieties, but are sometimes of service. Aspirin, salicin, quinine and iodide of potassium may be more successful, but other active treatment is usually required. The application of heat in the form of poultices or fomentations, counter irritation by mustard leaves or blisters, are indicated in some cases. In others massage, hot douches, or electricity may be required. Mineral waters and baths of various health resorts are often of great benefit in obstinate cases, such as those of Buxton, Bath, Harrogate, Woodhall Spa, &c., in England, or of Aix-les-Bains, Wiesbaden, Wildbad, &c., and many others on the continent of Europe. Wintering abroad in warm, dry and sunny climates may be advisable in some cases when this is practicable.

(J. F. H. B.)

RHEUMATOID ARTHRITIS (OSTEO-ARTHRITIS, ARTHRITIS DEFORMANS), terms employed to designate a disease or group of diseases characterized by destructive changes in the joints. Though it is only in comparatively recent times that the disease was definitely recognized as separate clinically from either rheumatism or gout, it is certain that it prevailed in ancient times. Characteristic changes in the bones have been found in remains in tombs in Egypt attributed by Petrie to 1300 B.C., and ancient Roman as well as British graves have held bones showing distinct traces of the diseases. Of early medical writers, Paulus Aeginata observed the lesions and seemed to consider them distinctive. Landré Beauvais in 1800 published a description of the disease under the title of *Goutte asthenique primitif*. The first endeavour, however, to separate rheumatoid arthritis as a distinct disease was made by William Heberden in 1803; while in 1805 John Haygarth recognized the difference between it and rheumatism, and suggested the term "nodosity of the joints." A wide divergence of opinion during the 19th century as to its relation to rheumatism and to gout gave rise to the unfortunate term "rheumatic gout." The name *arthritis deformans* was suggested by Virchow in 1859. Various causes, such as nervous origin, inherited arthritic diathesis, a relationship to rheumatism or gout, and reflex irritation, have been put foward as giving rise to the disease, but in the present state of medical knowledge two are most favoured. The first ascribes the disease to an infective process arising from micro-organisms. Several observers have found bacteria in the synovial fluid and membranes of affected joints,—Max Schüller finding both bacilli and cocci, while in 1896 Gilbert Bannatyne, Wohlmann and Blaxall isolated a micro-organism, a bacillus with a bipolar staining, which they stated to be almost constantly present in the joints of patients with true rheumatoid arthritis. The second view is that the disease is the result of a chronic toxaemia produced by absorption of toxines from the intestine, with perhaps some error in metabolism. In many cases there seems to be a distinct evidence of a local infection, injury being a determining factor, and some families seem to have joints which are specially liable to degeneration. The disease may begin at any age, for there is no doubt that persistent cases have been met with in quite young children; but it usually begins in early middle-age, and statistics seem to confirm the impression of the greater liability of females. Conditions which tend to lower the general health seem to act as a predisposing cause to rheumatoid arthritis, *e.g.* mental worry, uterine disorders and various lowering diseases, prominent among which are influenza and tonsillitis. In a number of cases in women the onset occurs about the time of the menopause.

The method of onset varies according to the form. There are four well-marked types—(1) the peri-articular form, in which the most marked changes are in the synovial membrane and peri-articular tissues, and the cartilage may be involved to a lesser degree. In this variety is found every grade of severity. The onset may be acute, resembling an attack of rheumatic fever, for which it may be mistaken; the joints, one or more, are swollen, tender and painful to the touch; the temperature elevated to 100°; 101°; but unlike rheumatic fever, sweating and hyperpyrexia are uncommon. The acute stage may then subside, a slight thickening remaining in the capsule of the joint, and the contours of the limb scarcely regaining the normal; or the attack may gradually develop into the chronic form. The pain varies greatly, and is not necessarily in ratio to the amount of arthritis present. Various joints may be involved, the spinal vertebrae not infrequently sharing in an arthritis; the most usual joints to be attacked, however, are the knee and shoulder. When the knee is attacked there is commonly effusion into the joint. Muscular atrophy is usually present, but varies greatly in its extent. In most cases it is present to a much greater degree than can be accounted for by disuse of the muscles. The skin has in these cases a curious glossy appearance, and pigmentations may be noticed. In chronic forms the onset is gradual, one joint becoming painful and swelling, and then the others successively; in these slow forms the outlook for the recovery of the joint is not so good as in the acute, and some cases may proceed to extreme deformity with little or no pain. Gradually the shape of the joint is altered; this is in a great measure due to synovial thickening, and partly to the presence of osteophytes in the joint. When the affected joint is moved a distinct crepitation can be felt. The muscles about the joint atrophy often to an extreme degree, and contractures supervene, flexing the leg upon the thigh if the knees should be affected, and the thigh upon the abdomen should the hip be affected. In extreme degrees the patient may become a complete cripple. Later, in many cases a quiescent stage of the disease is reached, the patients cease to suffer pain, and are inconvenienced only by the deformities in the limbs, in which a considerable degree of motion may be retained. Remarkable deformities are seen in hands in which a considerable amount of usefulness still remains. Dyspepsia and anaemia are frequently associated with arthritis. Monarticular arthritis more particularly affects the aged; and when it affects the hip is known as *morbus coxae senilis.*

(2) The atrophic form of arthritis is not very common. The chief anatomical change is due to atrophy in the bone and cartilage. The disease occurs at an earlier period in life than the peri-articular form, from which the initial symptoms do not markedly differ; but the disorganization in the joint is greater, dislocations frequently occur, and ankylosis of the joints follows. This is the most serious form of arthritis.

(3) In the hypertrophic form the anatomical changes include the formation of new bone as well as changes in the cartilage. This new-bone formation may lead to progressive ankylosis in the joints. Should the vertebral column be affected a rigid condition of the spine known as *spondylitis deformans* ("poker back") may ensue. What are termed "Heberden's nodes" are small hard knobs about the size of a pea frequently found upon the fingers near the terminal phalangeal joints; they rarely give rise to symptoms. Popularly ascribed to gout, these nodes are in reality a manifestation of arthritis.

(4) A variety of arthritis occurring in children is known as Still's disease; in which the swelling of the joints is associated with swelling of the lymph glands and of the spleen. The onset is often acute, with fever and rigors; sweating is profuse and the joints are enlarged and painful. There may be much muscular wasting and limitation of movement in the joints, and anaemia is associated with the disease.

The treatment of rheumatoid arthritis is rarely curative, once the disease has been permanently established; and it is therefore important to begin treatment before destructive changes have taken place in the joints. In the acute febrile form, which is frequently taken for rheumatism, the essential treatment is rest to the affected joints, with the application of oil of wintergreen; the joint should not be fixed but supported. In the more chronic forms medicinal treatments are usually of little value. Potassium iodide is useful in some cases by promoting absorption of the hypertrophied fibrous tissue, and guaiacol if administered for a sufficiently long time is said to be capable of arresting the disease, diminishing the size of the joint and helping movement. Where anaemia accompanies the disease iron and arsenic are of value. The general health of a patient suffering from rheumatoid arthritis must be maintained, and he should live upon a dry soil. Visits to Aix-les-Bains, Buxton, Bath or Droitwich, with their baths and shampooings, often prove useful, particularly when combined with gentle massage. It is a mistake to keep the joints entirely at rest in the chronic forms, as this tends to the formation of contractures and ankylosis. Moderate exercise without undue fatigue is desirable. Patients should go early to bed and have plenty of rest, sunshine and fresh air. It is important that the diet should be nourishing and plentiful, and should there be intestinal putrefaction fermented milk is useful. As regards the local treatment, it will be well in the majority of cases to determine by the X-rays the exact state of the affected joints. Radiant heat, vibration and hot-air baths are among the best treatments. The active hyperaemia induced by hot air favours restoration of movement and alleviates pain, but where there is pronounced destruction of bone and cartilage full restoration of a joint cannot take place. Systematic exercises of the joints tend to prevent the atrophy of the adjacent muscles, and Bier's passive hyperaemia induced by the temporary use of an elastic bandage has the same results. Should an X-ray photograph reveal the presence of spurs or loose bodies in the joints interfering with free movement their removal is called for. Sometimes the breaking down of adhesions under an anaesthetic is necessary, and gentle passive and later active movements of the joints should follow if freedom of use is to be gained. Recently treatment by radium has taken a definite place in the therapeutics of chronic arthritis, its analgesic properties seeming of great benefit. (H. L. H.)

RHEYDT, a town of Germany, in the Prussian Rhine province, situated on the Niers, 19 m. W. of Düsseldorf, on the main line of railway to Aix-la-Chapelle, and at the junction of lines to Crefeld and Stolberg. Pop. (1905) 40,149. It has two Roman Catholic and two Evangelical churches, a handsome new town hall (1895), a gymnasium, and several technical schools. The principal products of its numerous factories are silk, cotton, woollen and mixed fabrics, velvet, iron goods, machinery, shoes, cables, soap and cigars. Dyeing and finishing, brewing and distilling, are also carried on. Rheydt is an ancient place, but its industrial importance is of very recent growth, and it only received municipal rights in 1856.

See *Rheyter Chronik. Geschichte der Herrschaft und Stadt Rheydt* (2 vols., Rheydt, 1897); and Strauss, *Geschichte der Stadt Rheydt* (Rheydt, 1897).

RHĪANUS, Greek poet and grammarian, a native of Crete, friend and contemporary of Eratosthenes (275–195 B.C.). Suïdas says he was at first a slave and overseer of a palaestra, but obtained a good education later in life, and devoted himself to grammatical studies, probably in Alexandria. He prepared a new recension of the *Iliad* and *Odyssey*, characterized by sound judgment and poetical taste. His bold atheteses are frequently mentioned in the scholia. He also wrote epigrams, eleven of which, preserved in the Greek anthology and Athenaeus, show elegance and vivacity. But he was chiefly known as a writer of epics (mythological and ethnographical), the most celebrated of which was the *Messeniaca* in six books, dealing with the second Messenian war and the exploits of its central figure Aristomenes, and used by Pausanias in his fourth book as a trustworthy authority. Other similar poems were the *Achaica*, *Eliaca*, and *Thessalica*. The *Heracleia* was a long mythological epic, probably an imitation of the poem of the same name by Panyasis, and containing the same number of books (fourteen).

Fragments in A. Meineke, *Analecta Alexandrina* (1843); for Rhianus's work in connexion with Homer, see C. Mayhoff, *De Rhiani Studiis Homericis* (Dresden, 1870); also W. Christ, *Geschichte der griechischen Litteratur* (1898).

RHIGAS, CONSTANTINE, known as Rhigas of Velestinos (Pherae), or Rhigas Pheraios (1760–1798), Greek patriot and poet, was born at Velestinos, and was educated at Zagora and at Constantinople, where he became secretary to Alexander Ypsilanti. In 1786 he entered the service of Nicholas Mavrogenes, hospodar of Wallachia, at Bucharest, and when war broke out between Turkey and Russia in 1787 he was charged with the inspection of the troops at Craiova. Here he entered into close and friendly relations with a Turkish officer named Osman Passvan-Oglou (1758–1807), afterwards the famous governor of Widin, whose life he saved from the vengeance of Mavrogenes. After the death of his patron Rhigas returned to Bucharest to serve for some time as interpreter at the French Consulate. At this time he wrote the famous Greek version of the *Marseillaise*, well known in Byron's paraphrase as "sons of the Greeks, arise." He was the founder of the Hetaireia, a society formed to organize Greek patriotic sentiment and to provide the Greeks with arms and money. Believing that the influence of the French Revolution would spread to the Near East, he betook himself to Vienna to organize the movement among the exiled Greeks and their foreign supporters in 1793, or possibly earlier. He published in Vienna many Greek translations of foreign works, and presently founded a Greek press there, but his chief glory was the collection of national songs which, passed from hand to hand in MS., roused patriotic enthusiasm throughout Greece. They were only printed posthumously at Jassy in 1814. While at Vienna Rhigas entered into communication with Bonaparte, to whom he sent a snuff-box made of the root of a laurel tree taken from the temple of Apollo, and eventually he set out with a view to meeting the general of the army of Italy in Venice. But before leaving Vienna he forwarded papers, amongst which is said to have been his correspondence with Bonaparte, to a compatriot at Istria. The papers were betrayed by Demetrios Oikonomos Kozanites into the hands of the Austrian government, and Rhigas was arrested at Trieste and handed over with his accomplices to the Turkish authorities at Belgrade. Immediately on arrest he attempted suicide. His Turkish friend, Passvan-Oglou, sought to secure his escape, and the government apparently consented to release him on the payment of a ransom of about £6000; but meanwhile the Turkish pasha commanding at Belgrade had taken the law into his own hands. Rhigas's five companions were secretly drowned, but he himself offered so violent a resistance that he was shot by two Turkish soldiers. His last words are reported as being: "I have sown a rich seed; the hour is coming when my country will reap its glorious fruits." Rhigas, writing in the popular dialect instead of in classical Greek, aroused the patriotic fervour of his contemporaries and his poems were a serious factor in the awakening of modern Greece.

See Rizos Nérofilos, *Histoire de la révolution grecque* (Paris, 1829); I. C. Bolanachi, *Hommes illustres de la Grèce moderne* (Paris, 1875); and Mrs E. M. Edmonds, *Rhigas Pheraios* (London, 1890).

RHINE (Lat. *Rhenus*, Ger. *Rhein*, Fr. *Rhin*, Dutch *Rhyn*, or *Rijn*), the chief river of Germany and one of the most important in Europe. It is about 850 m. in length and drains an area of 75,000 sq. m. The distance in a direct line between its source in the Alps and its mouth in the German Ocean is 460 m. Its general course is north-north-west, but it makes numerous deflexions and at one point is found running in a diametrically opposite direction. The name Rhine, which is apparently of Celtic origin, is of uncertain etymology, the most favoured derivations being either from *der Rinnende* (the flowing), or from *Rein* (the clear), the latter being now the more generally accepted.

1. *The Swiss Portion.*—The Rhine rises in the mountains of the Swiss canton of the Grisons, and flows for 233 m. in Swiss territory, within which its drainage basin includes about 14,059 sq. m., and every canton save Geneva. The two main branches of the Rhine, the Hinter Rhine and the Vorder Rhine, unite at Reichenau, 6 m. S.W. of Coire. (1) The principal stream is considered to be that of the *Hinter Rhine*, which issues (7271 ft.) from the glaciers of the Rheinwaldhorn group, and then flows first N.E. through the Rheinwald valley, and next N. through the Schams valley, which communicates by the well-known gorge of the Via Mala with the Tomleschg valley at Thusis, whence the stream continues its N. course to Reichenau; total length 35½ m., total fall 3711 ft. It receives a number of mountain torrents during its course, the most important being that from the Avers glen, and the Albula, both on the right, which is itself formed by many mountain streams. (2) The *Vorder Rhine* rises in the small Toma lake (7691 ft.), S. of the Oberalp Pass, not far from the St. Gotthard Pass, and then flows N.E. past Disentis and Ilanz, which claims the honour of being the "first town on the Rhine," to Reichenau; total length 42 m., total fall 3492½ ft. Its chief affluents are the stream dignified by the name of the *Medels Rhine*, that rises in the Cadlimo glen, W. of the Lukmanier Pass, and, after flowing through the Medels glen, joins the Vorder Rhine at Disentis, and the Glenner, flowing from the Lugnetz glen, both on the right. From Reichenau the united streams flow N.E. to Coire, the capital of the canton of the Grisons, and then turn towards the N., past Ragatz, the valley broadening out, and the river being joined on the right by the Landquart and the Ill, before it expands into the Lake of Constance. Extensive "corrections" of the river bed, especially the canal of Diepoldsau, have been carried out in the lower bit of this part of the valley, while from a little north of Ragatz the right bank belongs first to Liechtenstein and then to the Austrian province of the Vorarlberg. On issuing from the Lake of Constance at Constance, the Rhine flows nearly due west to Basel, where it leaves Swiss territory, the south bank during this portion of the river being entirely Swiss, save the town of Constance, but the north shore belongs to Baden, save in the case of the Swiss town of Stein-am-Rhein and the Swiss canton of Schaffhausen. The chief towns on its banks are Constance (S.), Schaffhausen (N.), Waldshut (N.), Laufenburg (S.), Säckingen (N.), Rheinfelden (S.), and Basel (both banks). About 1½ m. below Schaffhausen the river forms the famous Falls of the Rhine, or Falls of Schaffhausen (60 ft. high), while at Coblenz, opposite Waldshut, it receives its chief affluent, the Aar, recently swollen by the Reuss and the Limmat, and of greater volume than the river in which it loses its identity. (W. A. B. C.)

2. *The German and Dutch Portion.*—After Basel, when the Rhine turns to the north and enters Germany, its breadth is between 550 and 600 ft., while its surface now lies not more than 800 ft. above the sea, showing that the river has made a descent of 6900 ft. by the time it has traversed a third of its course. From Basel to Mainz the Rhine flows through a wide and shallow valley, bordered on the east and west by the parallel ranges of the Black Forest and the Vosges. Its banks are low and flat, and numerous islands occur. The tendency to divide into parallel branches has been curbed in the interests of navigation, and many windings have been cut off by leading the water into straight and regular channels. At Mannheim the river is nearly 1500 ft. in width, and at Mainz, where it is diverted to the west by the barrier of the Taunus, it is still wider. It follows the new direction for about 20 m., but at Bingen it again turns to the north and begins a completely new stage of its career, entering a narrow valley in which the enclosing rocky hills abut so closely on the river as often barely to leave room for the road and railway on either bank; during this portion of its course the speed of the current at a normal state of the water exceeds 6 m. an hour. This is the most beautiful part of the whole course of the river, abounding in ruined castles, romantic crags and sunny vineyards. At Coblenz the valley widens and the river is 1200 ft. broad, but the hills close in again at Andernach, and this ravine-like part of its course cannot be considered as ending till below the Siebengebirge (Seven Mountains), where the river once more expands to a width of 1300–1600 ft. Beyond Bonn and Cologne the banks are again flat and the valley wide, though the hills on the right bank do not completely disappear till the neighbourhood of Düsseldorf. Farther on the country traversed by the Rhine is perfectly level, and the current becomes more and more sluggish. On entering Holland, which it does below Emmerich, its course is again deflected to the west. Within Holland the banks are so low as to require at places to be protected by embankments against inundations. Almost immediately after entering Holland the stream divides into two arms, the larger of which, carrying off about two-thirds of the water, diverges to the west, is called the Waal, and soon unites with the Maas. The smaller branch to the right retains the name of Rhine and sends off another arm, called the Yssel, to the Zuider Zee. The Rhine now pursues a westerly course almost parallel with that of the Waal. At Wijk another bifurcation takes place, the broad Lek diverging on the left to join the Maas, while the "Kromme Rijn" to the right is comparatively insignificant. Beyond Utrecht, where it is again diminished by the divergence of the Vecht to the Zuider Zee, the river under the name of the "Oude Rijn," or Old Rhine, degenerates into a sluggish and almost stagnant stream, which requires the artificial aid of a canal and of sluices in finding its way to the sea. In Roman times the Rhine at this part of its course seems to have been a full and flowing river, but by the 9th century it had lost itself in the sands of Katwijk, and it was not until the beginning of the 19th century that its way to the sea was re-opened. Though the name Rhine thus at last attaches to a very insignificant stream, the entire district between the Waal on one side and the Yssel on the other, the *Insula Batavorum* of Caesar, in reality belongs to the delta of the famous river.

Tributaries.—The Rhine is said to receive, directly or indirectly, the waters of upwards of 12,000 tributaries of all sizes. Leaving out of account the innumerable glacier streams that swell its volume above the Lake of Constance, the most important affluents to its upper course are the Wutach, the Alb and the Wiese, descending on the right from the Black Forest, and the Aar, draining several Swiss cantons on the left. In the upper Rhenish basin, between

Basel and Mainz. the tributaries, though numerous, are mostly short and unimportant. The Ill and the Nahe on the left and the Neckar and the Main on the right are, however, notable exceptions. Before joining the Rhine the Ill runs almost parallel with it and at no great distance for upwards of 50 m. In the narrow part of the valley, between Bingen and Cologne, the Rhine receives the waters of the Lahn and the Sieg on the right, and those of the Mosel, bringing with it the Saar, and the Ahr on the left. Still lower down, but before the Dutch frontier is reached, come the Ruhr and the Lippe on the right, and the Erft on the left. The numerous arms into which the Rhine branches in Holland have already been noticed.

Physical Geography.—The Rhine connects the highest Alps with the mud banks of Holland, and touches in its course the most varied geological periods; but the river valley itself is, geologically speaking, of comparatively recent formation. Rising amid the ancient gneiss rocks of the St Gotthard, the Rhine finds its way down to the Lake of Constance between layers of Triassic and Jurassic formation; and between that lake and Basel it penetrates the chalk barrier of the Jura. The upper Rhenish valley is evidently the bed of an ancient lake, the shores of which were formed by the gneiss and granite of the Black Forest on the one side and the granite and sandstone of the Vosges on the other. Within the valley all the alluvial deposits are recent. Between Bingen and Bonn the Rhine forces its way through a hilly and rocky district belonging to the Devonian formation. The contorted strata of slate and greywacke rock must have been formed at a period vastly anterior to that in which the lake of the upper valley managed to force an outlet through the enclosing barriers. Probably this section may be looked upon as the oldest portion of the river course proper, connecting the upper Rhenish lake with the primeval ocean at Bonn. In this district, too, as has already been remarked, is the finest scenery of the Rhine, a fact due in great part to the grotesque shapes of the quartzose rocks, left denuded of the less durable slate and sandstone. All the strata intersected by the Rhine between Bingen and Bonn contain fossils of the same classes. The deposits of the actual valley here, belonging to the Miocene group of the Tertiary system, are older than the deposits either farther up or farther down the river; but they are contemporaneous with the basalts of the Rhine, which at Coblenz and in the peaks of the Seven Mountains also contribute to the scenic charm of the river. The very extensive pumice deposits at Neuwied and the lava and other volcanic rocks belong to a more recent epoch. Below Bingen the formations belong almost entirely to the Post-Tertiary period. Numerous extinct volcanoes rise near Neuwied. In the flatter parts of the valley occur large beds of loam and rubble, sometimes in terraces parallel with, but several hundred feet above, the river, proving by their disposition and appearance that the valley has been formed by the action of water.

Navigation.—The Rhine has been one of the chief waterways of Europe from the earliest times; and, as its channel is not exposed to the danger of silting up like those of the Elbe and the Oder, it has always been comparatively easy to keep it open. The Romans exerted themselves to improve the lower navigation of the river, and appointed prefects of the Rhine to superintend the shipping and to exact the moderate dues imposed to keep the channel in repair. The Franks continued the same policy and retained a system of river-dues. Afterwards, as the banks became parcelled out among a host of petty princelings, each of whom arrogated the right of laying a tax on passing vessels, the imposts became so prejudicial as seriously to hamper the development of the shipping. Many of the riparian potentates derived the bulk of their revenue from this source, and it is calculated that in the 18th century the Rhine yielded a total revenue of £200,000, in spite of the comparatively insignificant amount of the shipping. The first proposal for a free Rhine was mooted by the French at the congress of Rastatt (1797–1799), but Holland, commanding the mouth of the river, placed every obstacle in the way of the suggestion. In 1831, on the separation of Holland and Belgium, the former had become more amenable to reason; and a system was agreed upon which practically gave free navigation to the vessels of the riverine states, while imposing a moderate tariff upon foreign ships. After the war of 1866, Prussia negotiated with Baden, Bavaria and Hesse-Darmstadt with a view to the removal of all tolls. It was not, however, till 1868 (see *Die Rhein-Schiffahrts Akte vom 17ten Okt., 1868*) that the last vestige of a toll disappeared and the river was thrown open without any restriction. The management of the channel and navigation is now vested in a central commission, meeting at Mannheim on the 1st of July in each year. The channel has been greatly improved and in many places made more direct since the beginning of the 19th century, large sums being annually spent in keeping it in order. Capacious river harbours have been formed at various points, twenty-nine of these being in Germany and eight in Holland. The position of the river is highly favourable for the development of its trade. It flows through the most populous regions of the continent of Europe, to discharge into one of the most frequented seas opposite Great Britain, and, besides serving as a natural outlet for Germany, Belgium and Holland, is connected with a great part of central and southern France by the Rhine-Rhone and the Rhine-Marne canals, and with the basin of the Danube by the Ludwigs-Canal.

The introduction of steam has greatly increased the shipping on the Rhine; and small steamers ply also on the Main, the Neckar, the Maas and the Mosel. The first Rhine steamer was launched in 1817; and now the river is regularly traversed by upwards of a hundred, from the small tug up to the passenger saloon-steamer. The steamboat traffic has especially encouraged the influx of tourists, and the number of passing travellers may now be reckoned as between one and two millions annually. The river is navigable without interruption from Basel to its mouth, a distance of 550 miles, of which 450 lie within Germany. Above Spires, however, the river craft are comparatively small, but lower down vessels of 500 and 600 tons burden find no difficulty in plying. Between Basel and Strassburg the depth of water is sometimes not more than 3 ft.; between Strassburg and Mainz it varies from 5 to 25 ft.; while below Mainz it is never less than 9 or 10 ft. The deepest point is opposite the Lorelei (Lurlei) Rock near St Goar, where it is 75 ft. in depth; at Düsseldorf the depth is about 50 ft.

London, Hamburg, Bremen and the chief Baltic ports as far as Riga and St Petersburg participate in the traffic on the Rhine. The boats which ply up and down the river itself, without venturing upon the open sea, are mostly craft of 100 to 200 tons, owned in the great majority of cases by their captains, men principally of German or Dutch nationality. This fleet is computed to number some 8500 craft, with an aggregate capacity of over 2 million tons, of which about one-tenth are steamships. The traffic at the chief German ports of the river aggregated 4,489,000 tons in 1870, but by 1900 this had grown to a total of 17,000,000 tons, thus distributed: Ruhrort, 6,512,000 tons; Duisburg, 3,000,000 tons; Cologne, 1,422,000 tons; and Mannheim, 6,021,000 tons. These are not the only ports on the river; a large trade is also done at Kehl, Maxau (for Karlsruhe), Ludwigshafen, Mainz, Bonn, Rotterdam and a host of smaller places. The amount of traffic which passed the town of Emmerich near the Dutch frontier, both ways, increased from an annual average of about 6 million tons in 1881–85 to over 21½ million tons in 1899. Notwithstanding the inherent difficulties of construction caused by the great variations in the level of the stream, amounting sometimes to 20 ft. or more, the chief ports of the Rhine are admirably constructed, and well equipped with modern contrivances for loading and unloading vessels. Boats carrying as much as 600 tons are often able to proceed as far up stream as Strassburg, and smaller craft get as far as Hüningen, a little above Basel. Large passenger boats ply regularly between Mainz and Düsseldorf, and sometimes extend their journeys as high up as Mannheim, and as far in the other direction as Rotterdam. The efforts of the river authorities are being directed to the deepening and improvement of the navigable channel from the sea to Strassburg, the low-water depths aimed at being 10 ft. from Rotterdam to the German frontier, and 10 ft. thence to Cologne; 8 ft. 3 in. from Cologne to St Goar, and 6 ft. 6 in. from St Goar to Mannheim. At present the Rhine in Holland has a depth of about 9 ft. and a width of 1200 to 1300 ft., though the Merwede branch exceeds this depth by 8 in. Altogether a sum approaching £2,500,000 was spent in Holland within the latter part of the 19th century on the improvement of the Rhine and its principal arteries. Above Mannheim the depth of the stream is always less than 5 ft., and generally varies between that figure and 4 ft. 6 in. The difficulty of ascending the rapids near Bingen is usually surmounted by the help of steam hauling machinery placed on the bank, though powerful tugs have also come into use for this purpose. The work of blasting out the rocks which at that spot projected in the bed of the river, begun in 1830, was continued down to the year 1887, so that now there are two navigable channels of sufficient depth for all vessels which ply up and down that part of the stream. One of the most interesting features of the Rhine navigation is afforded by the huge rafts of timber that are floated down the river. Single tree trunks sent down to the Rhine by the various tributaries are united into small rafts as they reach the main stream; and these again are fastened together to form one large raft about Andernach. Though not so large as formerly, these timber rafts are still sometimes 400 or 500 ft. in length, and are navigated by 200 to 400 men, who live in little huts on the raft, forming actual floating villages. On reaching Dort the rafts are broken up and sold, a single raft sometimes producing as much as £30,000. The voyage from Bingen to Dort takes from one to six weeks, and the huge unwieldy structures require to be navigated with great care. The commerce carried on by the river itself is supplemented by the numerous railways, which skirt its banks and converge to its principal towns. Before the introduction of railways there were no permanent bridges across the Rhine below Basel; but now trains cross it at about a dozen different points in Germany and Holland.

History.—Politically the Rhine has always played a great part. The whole valley seems to have been originally occupied by Celtic tribes, who have left traces of their presence on the contents of tombs and in the forms of names (Moguntiacum or Mainz, Borbetomagus or Worms); but at the beginning of the historical period we find the Celts everywhere in retreat before the advancing Teutons. Probably the Teutonic pressure began as early as the 4th century before Christ, and the history of the next few hundred years may be summed up as the gradual substitution of a Germanic for a Celtic population along the banks of the Rhine. Its second historical period begins with the advent of the Romans, who stemmed the advancing Teutonic tide. Augustus and his successors took good care to fortify the Rhine carefully, and a large proportion of the Roman legions were constantly in garrison here. For two hundred years the Rhine formed the boundary between the Roman empire and the Teutonic hordes; and during that period the left or Roman bank made prodigious strides in civilization and culture. The wonderful Roman remains at Trier and elsewhere, the Roman roads, bridges and aqueducts, are convincing proofs of what the Rhine gained from Roman domination. This Roman civilization was, however, destined to be swamped by the current of Teutonic immigration, which finally broke down the barriers of the Roman empire and overwhelmed the whole of the Rhenish district. Under Charlemagne, whose principal residence was in Aix-la-Chapelle, the culture of the Rhine valley again began to flourish, its results being still to be traced in the important architectural remains of this period. At the partition of the domains of Charlemagne in A.D. 843 the Rhine formed the boundary between Germany and the middle kingdom of Lotharingia; but by 870 it lay wholly within the former realm. For nearly eight hundred years it continued in this position, the frontier of the German empire coinciding more or less with the line of the Rhone. During the early middle ages the bank of the Rhine formed the most cultured part of Germany, basing its civilization on its Roman past. The Thirty Years' War exercised a most prejudicial effect upon the district of the Rhine; and the peace of Westphalia gave France a footing on the left bank of the hitherto exclusively German river by the acquisition of Alsace. The violent seizure of Strassburg by France in 1681 was ratified by the peace of Ryswick in 1697, which recognized the Rhine as the boundary between Germany and France from Basel to about Germersheim. It was an easy inference for the French mind that the Rhine should be the boundary throughout and the Gaul of Caesar restored. This ideal was realized in 1801, when the whole of the left bank of the Rhine was formally ceded to France. The congress of Vienna (1815) restored the lower part of the Rhenish valley to Germany, but it was not till the war of 1870–71 that the recovery of Alsace and Lorraine made the Rhine once more "Germany's river, not Germany's frontier." In the military history of all these centuries constant allusion is made to the Rhine, its passages and its fortresses. Every general who has fought in its neighbourhood has at one time or another had to provide for a crossing of the Rhine, from Julius Caesar, who crossed it twice, down to our own time. The wars carried on here by Louis XIV. are still remembered in the Rhine district, where the devastations of his generals were of the most appalling description; and scarcely a village or town but has a tale to tell of the murder and rapine of this period.

The Rhine in Literature.—The Rhine has always exercised a peculiar sort of fascination over the German mind, in a measure and in a manner not easily paralleled by the case of any other river. "Father Rhine" is the centre of the German's patriotism and the symbol of his country. In his literature it has played a prominent part from the *Nibelungenlied* to the present day; and its weird and romantic legends have been alternately the awe and the delight of his childhood. The Rhine was the classic river of the middle ages; and probably the Tiber alone is of equal historical interest among European rivers. But of late years the beauties of the Rhine have become sadly marred; the banks in places, especially between Coblenz and Bonn, disfigured by quarrying, the air made dense with the smoke of cement factories and steam-tugs, commanding spots falling a prey to the speculative builder and villages growing into towns.

See Daniel, *Deutschland*: Beyerhaus, *Der Rhein von Strassburg bis zur holländischen Grenze* (Coblenz, 1902); Mohr, *Die Flösserei auf dem Rhein* (Mannheim, 1897); C. Eckert, *Rheinschiffahrt im 19ten Jahrhundert*; Horn, *Der Rhein, Geschichte und Sagen seiner Burgen* (Stuttgart, 1893); Treutlein, *Die neueren Deutschen Rheinstromstudien und ihre Ergebnisse* (in *Ausland*, 1893); A. Chambalu, *Die Stromveränderungen des Niederrheins seit der vorrömischen Zeit* (Cologne, 1892), and handbooks of Baedeker, Meyer and Woerl.

(J. F. M.; P. A. A.)

RHINE PROVINCE, or RHINELAND, the most westerly province of the kingdom of Prussia, bounded on the N. by Holland, on the E. by the Prussian provinces of Westphalia and Hesse-Nassau, and the grand duchy of Hesse-Darmstadt, on the S.E. by the Bavarian Palatinate, on the S. and S.W. by Lorraine, and on the W. by Luxemburg, Belgium and Holland. The small district of Wetzlar in the midst of the province of Hesse also belongs to the Rhine Province, which, on the other hand, surrounds the Oldenburg principality of Birkenfeld. The extent of the province is 10,423 sq. m.; its extreme length, from north to south, is nearly 200 m., and its greatest breadth is just under 90 m. It includes about 200 m. of the course of the Rhine, which forms the eastern frontier of the province from Bingen to Coblenz, and then flows through it in a northwesterly direction.

The southern and larger part of the Rhine province, belonging geologically to the Devonian formations of the lower Rhine, is hilly. On the left bank are the elevated plateaus of the Hunsrück and the Eifel, separated from each other by the deep valley of the Mosel, while on the right bank are the spurs of the Westerwald and the Sauerland, the former reaching the river in the picturesque group known as the Seven Mountains (*Siebengebirge*). The highest hill in the province is the Walderbeskopf (2670 ft.) in the Hochwald, and there are several other summits above 2000 ft. on the left bank, while on the right there are few which attain a height of 1600 ft. Most of the hills are covered with trees, but the Eifel (*q.v.*) is a barren and bleak plateau. To the north of a line drawn from Aix-la-Chapelle to Bonn the province is flat, and marshy districts occur near the Dutch frontier. The climate varies considerably with the configuration of the surface. That of the northern lowlands and of the sheltered valleys is the mildest and most equable in Prussia, with a mean annual temperature of 50° Fahr., while on the hills of the Eifel the mean does not exceed 44°. The annual rainfall varies in the different districts from 18 to 32 inches. Almost the whole province belongs to the basin of the Rhine, but a small district in the north-west is drained by affluents of the Meuse. Of the numerous tributaries which join the Rhine within the province, the most important are the Nahe, the Mosel and the Ahr on the left bank, and the Sieg, the Wupper, the Ruhr and the Lippe on the right. The only lake of any size is the Laacher See, the largest of the "maare" or extinct crater lakes of the Eifel.

Of the total area of the Rhine province about 45% is occupied by arable land, 16% by meadows and pastures, and 31% by forests. Little except oats and potatoes can be raised on the high-lying plateaus in the south of the province, but the river-valleys and the northern lowlands are extremely fertile. The great bulk of the soil is in the hands of small proprietors, and this is alleged to have had the effect of somewhat retarding the progress of scientific agriculture. The usual cereal crops are, however, all grown with success, and tobacco, hops, flax, rape, hemp and beetroot (for sugar) are cultivated for commercial purposes. Large quantities of fruit are also produced. The vine-culture occupies a space of about 30,000 acres, about half of which are in the valley of the Mosel, a third in that of the Rhine itself, and the rest mainly on the Nahe and the Ahr. The choicest varieties of Rhine wine, however, such as Johannisberger and Steinberger, are produced higher up the river, beyond the limits of the Rhine province. In the hilly districts more than half the surface is sometimes occupied by forests, and large plantations of oak are formed for the use of the bark in tanning. Considerable herds of cattle are reared on the rich pastures of the lower Rhine, but the number of sheep in the province is comparatively small, and is, indeed, not greatly in excess of that of the goats. The wooded hills are well stocked with deer, and a stray wolf occasionally finds its way from the forests of the Ardennes into those of the Hunsrück. The salmon fishery of the Rhine is very productive, and trout abound in the mountain streams.

The great mineral wealth of the Rhine province probably furnishes its most substantial claim to the title of the "richest jewel in the crown of Prussia." Besides parts of the carboniferous measures of the Saar and the Ruhr, it also contains important deposits of coal near Aix-la-Chapelle. Iron ore is found in abundance near Coblenz, the Bleiberg in the Eifel possesses an apparently inexhaustible supply of lead, and zinc is found near Cologne and Aix-la-Chapelle. The mineral products of the district also include lignite, copper, manganese, vitriol, lime, gypsum, volcanic stones (used for millstones) and slates. By far the most important item is coal. Of the numerous mineral springs the best known are those of Aix-la-Chapelle and Kreuznach.

The mineral resources of the Prussian Rhine province, coupled with its favourable situation and the facilities of transit afforded by its great waterway, have made it the most important manufacturing district in Germany. The industry is mainly concentrated round two chief centres, Aix-la-Chapelle and Düsseldorf (with the valley of the Wupper), while there are naturally few manufactures in the hilly districts of the south or the marshy flats of the north. The largest iron and steel works are at Essen, Oberhausen, Duisburg, Düsseldorf and Cologne, while cutlery and other small metallic wares are extensively made at Solingen, Remscheid and Aix-la-Chapelle. The cloth of Aix-la-Chapelle and the silk of Crefeld form important articles of export. The chief industries of Elberfeld-Barmen and the valley of the Wupper are cotton-weaving, calico-printing and the manufacture of turkey red and other dyes. Linen is largely made at Gladbach, leather at Malmedy, glass in the Saar district and beetroot sugar near Cologne. Though the Rhineland is *par excellence* the country of the vine, beer is largely produced; distilleries are also numerous, and large quantities of sparkling Moselle are made at Coblenz, chiefly for exportation to England. Commerce is greatly aided by the navigable rivers, a very extensive network of railways, and the excellent roads constructed during the French régime. The imports consist mainly of raw material for working up in the factories of the district, while the principal exports are coal, fruit, wine, dyes, cloth, silk and other manufactured articles of various descriptions.

The population of the Rhine province in 1905 was 6,435,778, including 4,472,058 Roman Catholics, 1,877,582 Protestants and 55,408 Jews. The Roman Catholics muster strongest on the left bank, while on the right bank about half the population is Protestant. The great bulk of the population is of Teutonic stock, and about a quarter of a million are of Flemish blood. On the north-west frontier reside about 10,000 Walloons, who speak French or Walloon as their native tongue. The Rhine province is the most thickly populated part of Prussia, the general average being 617 persons per sq. m. The province contains a greater number of large towns than any other province in Prussia. Upwards of half the population are supported by industrial and commercial pursuits, and barely a quarter by agriculture. There is a university at Bonn, and elementary education is especially successful. For purposes of administration the province is divided into the five districts of Coblenz, Düsseldorf, Cologne, Aix-la-Chapelle and Trier. Coblenz is the official capital, though Cologne is the largest and most important town. Being a frontier province the Rhineland is strongly garrisoned, and the Rhine is guarded by the three strong fortresses of Cologne with Deutz, Coblenz with Ehrenbreitstein, and Wesel. The province sends 35 members to the German Reichstag and 62 to the Prussian house of representatives.

History.—The present Prussian Rhine province was formed in 1815 out of the duchies of Cleves, Berg, Gelderland and Jülich, the ecclesiastical principalities of Trier and Cologne, the free cities of Aix-la-Chapelle and Cologne, and nearly a hundred small lordships and abbeys. At the earliest historical period we find the territories between the Ardennes and the Rhine occupied by the Treviri, the Eburones and other Celtic tribes, who, however, were all more or less modified and influenced by their Teutonic neighbours. On the right bank of the Rhine, between the Main and the Lahn, were the settlements of the Mattiaci, a branch of the Germanic Chatti, while farther to the north were the Usipetes and Tencteri. Julius Caesar conquered the tribes on the left bank, and Augustus established numerous fortified posts on the Rhine, but the Romans never succeeded in gaining a firm footing on the right bank. As the power of the Roman empire declined the Franks pushed forward along both banks of the Rhine, and by the end of the 5th century had regained all the lands that had formerly been under Teutonic influence. The German conquerors of the Rhenish districts were singularly little affected by the culture of the provincials they subdued, and all traces of Roman civilization were submerged in a new flood of paganism. By the 8th century the Frankish dominion was firmly established in central Germany and northern Gaul. On the division of the Carolingian realm the part of the province to the east of the river fell to the share of Germany, while that to the west remained with the evanescent kingdom of Lotharingia. By the time of Otto I. (d. 973) both banks of the Rhine had become German, and the Rhenish territory was divided between the duchies of Upper and Lower Lorraine, the one on the Mosel and the other on the Meuse. Subsequently, as the central power of the German sovereign became weakened, the Rhineland followed the general tendency and split up into numerous small independent principalities, each with its separate vicissitudes and special chronicles. The old Lotharingian divisions passed wholly out of use, and the name of Lorraine became restricted to the district that still bears it. In spite of its dismembered condition, and the sufferings it underwent at the hands of its French neighbours in various periods of warfare, the Rhenish territory prospered greatly and stood in the foremost rank of German culture and progress. Aix-la-Chapelle was fixed upon as the place of coronation of the German emperors, and the ecclesiastical principalities of the Rhine bulk largely in German history. Prussia first set foot on the Rhine in 1609 by the joint occupation of Cleves; and about a century later Upper Gelderland and Mörs also became Prussian. At the peace of Basel in 1795 the whole of the left bank of the Rhine was resigned to France, and in 1806 the Rhenish princes all joined the Confederation of the Rhine. The congress of Vienna assigned the whole of the lower Rhenish districts to Prussia, which had the tact to leave them in undisturbed possession of the liberal institutions they had become accustomed to under the republican rule of the French.

RHINOCEROS, the designation for such perissodactyle (odd-toed) ungulate mammals as carry one or more horns on the head, and their extinct relatives (see PERISSODACTYLA). Rhinoceroses are of large size and massive build, but have little intelligence, and are generally timid in disposition, though ferocious when wounded or brought to bay. The African species use the nasal horns as weapons, with which they strike and toss their assailant, but the Asiatic rhinoceroses employ their sharp lower tusks much as does a boar. Rhinoceroses are dull of sight, but their hearing and scent are remarkably acute. They feed on herbage, shrubs and leaves of trees, and, like so many other large animals which inhabit hot countries, sleep the greater part of the day, and are most active in the cool of the evening or even during the night. Some are found in more or less open plains, while others inhabit swampy districts. Members of the group have existed in both east and west hemispheres since the beginning of the Miocene period; but in America they all became extinct before the end of the Pliocene period, and in the Old World their distribution has become greatly restricted. They are, for instance, no longer found in Europe and North Asia, but only in Africa and in portions of the Indian and Indo-Malayan regions. Living rhinoceroses may be arranged in three groups: (1) With a single nasal horn, and very thick skin, which is raised into strong, definitely arranged ridges or folds. In this group there are two well-marked species. The Indian rhinoceros (*Rhinoceros unicornis*), the largest of the Asiatic forms, is the most widely known, from its being exhibited in zoological gardens. A famous rhinoceros presented to the Zoological Society of London in July 1864 lived till December 1904. This species stands from 5 ft. to 5 ft. 9 in. at the shoulder and is blackish grey in colour; the horn rarely exceeds a foot in length, but one in the British Museum measures 19 in. This species is now only met with in a wild state in the Assam plain, though it formerly had a wider range.

The first rhinoceros seen alive in Europe since the time when these animals, in common with nearly all the large remarkable beasts of both Africa and Asia, were exhibited in the Roman shows, was of this species. It was sent from India to Emmanuel, king of Portugal, in 1513; and from a sketch taken in Lisbon, Albert Dürer composed his celebrated but fanciful engraving, which was reproduced in so many old books on natural history. This species chiefly frequents swampy grass jungle and is fond of a mud-bath. According to General A. H. Kinloch, it is hunted by "tracking the animal on a single elephant until he is at last found in his lair, or perhaps standing quite unconscious of danger; or by beating him out of the jungle with a line of elephants, the guns being stationed at the points where he is most likely to break cover. In the latter case it is necessary to have reliable men with the beaters, who can exercise authority and keep them in order, for both *mahouts* and elephants have the greatest dread of the huge brute, who appears to be much more formidable than he really is." The Javan rhinoceros (*Rhinoceros sondaicus*) is distinguished by its smaller size, and a different arrangement of the skin-folds (as may be seen by comparing figs. 1 and 2). The horn in the female is little developed, if not altogether absent. This species has a more extensive geographical range than the last, being found in the Bengal Sundarbans near Calcutta, Burma, the Malay Peninsula, Java, Sumatra and Borneo. The colour is uniform dusky grey. A female obtained in the Sundarbans stood 5 ft. 6 in. high. This species is more an inhabitant of tree-forest than of grass jungle, and its usual habitat appears to be in hilly countries.

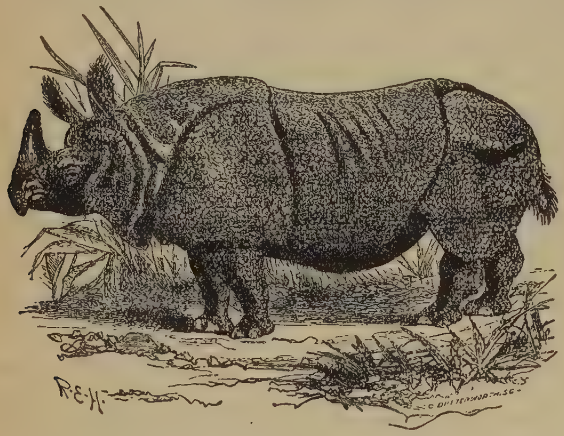


Fig. 1.—Indian Rhinoceros (*Rhinoceros unicornis*). This and the following illustrations are reduced from drawings by J. Wolf, from animals in the London Zoological Society's Gardens.

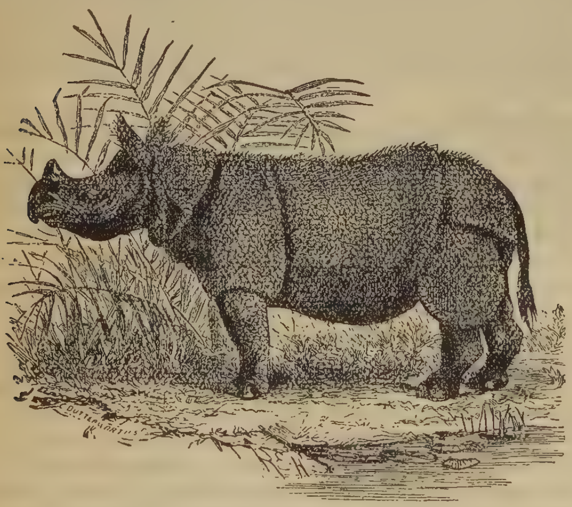


Fig. 2.—Javan Rhinoceros (*Rhinoceros sondaicus*).

In the second section there is a well-developed nasal, and a small frontal horn separated by an interval. The skin is thrown into folds, but these are not strongly marked, and lower tusks are present. This group or genus is represented at the present day only by the Sumatran rhinoceros, *Rhinoceros* (*Dicerorhinus*) *sumatrensis*, with its sub-species. It is the smallest of all the species, and its geographical range is nearly the same as that of the Javan species, though not extending into Java; it has been found in Assam, Chittagong, Burma, the Malay Peninsula, Sumatra and Borneo. The colour varies from earthy brown to blackish, and the greater part of the body is thinly covered with hair, and the ears and tail are fringed. The average height of adults is from 4 ft. to 4 ft. 6 in. This species inhabits forests, and ascends hills to considerable elevations; it is shy and timid, but easily tamed even when adult. A specimen from Chittagong acquired in 1872 by the Zoological Society of London was named *R. lasiotis*, as it differed from the typical form by its larger size, paler and browner colour, smoother skin, longer, finer and redder hair, and the long fringe of hair on the ears. It is now recognized as a local race.

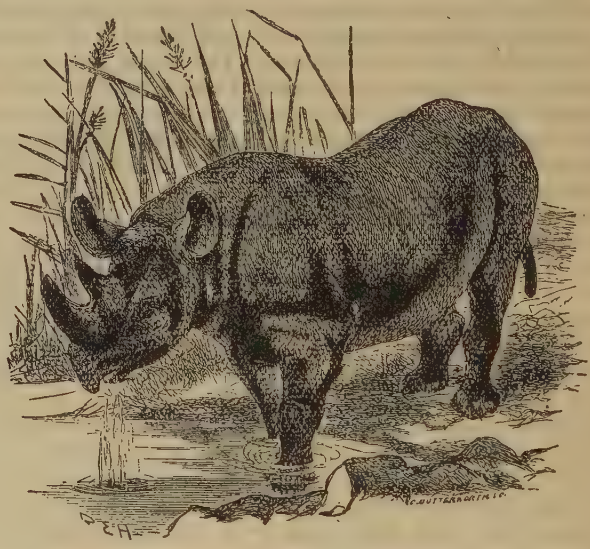


Fig. 3.—Black or common African Rhinoceros (*Rhinoceros* (*Diceros*) *bicornis*).

To the third group or genus (*Diceros*) belong the two African rhinoceroses, which have two horns, the skin without definite folds, and no lower tusks. The black rhinoceros (*Rhinoceros* (*Diceros*) *bicornis*) is the smaller of the two, and has a pointed prehensile upper lip. It ranges through the wooded and watered districts of Africa, from Abyssinia in the north to the Cape Colony, but its numbers are yearly diminishing, owing to the opening up of the country. It feeds exclusively on leaves and branches of bushes and small trees, and chiefly frequents the sides of wood-clad rugged hills. Specimens in which the posterior horn has attained a length as great as or greater than the anterior have been separated under the name of *R. keitloa*, but the characters of these appendages are too variable for specific distinctions. The black rhinoceros is more rarely seen in menageries in Europe than either of the Asiatic species, but one lived in the gardens of the London Zoological Society from 1868–1891.

Lastly we have the white—Burchell's, or square-mouthed—rhinoceros (*Rhinoceros* (*Diceros*) *simus*), the largest of the five, and differing from the other species in having a square truncated upper lip. In conformity with the structure of the mouth, this species lives entirely by browsing on grass, and is therefore more partial to open countries or districts where there are broad grassy valleys between the tracts of bush. In its old haunts in the south it is practically extinct; but ten were reported from a reserve in Zululand in 1902. A detached colony exists, however, near Lado, on the Upper Nile. No specimen of this species has ever been brought alive to Europe. Mr F. C. Selous gives the following description of its habits:—

"The square-mouthed rhinoceros is a huge, ungainly looking beast, with a disproportionately large head, a large male standing 6 ft. 6 in. at the shoulder. Like elephants and buffaloes they lie asleep during the heat of the day, and feed during the night and in the cool hours of early morning and evening. Their sight is very bad; but they are quick of hearing, and their scent is very keen; they are, too, often accompanied by rhinoceros birds, which, by running about their heads, flapping their wings, and screeching at the same time, frequently give them notice of the approach of danger. When disturbed they go off at a swift trot, which soon leaves all pursuit from a man on foot far behind; but if chased by a horseman they break into a gallop, which they can keep up for some distance. However, although they run very swiftly, when their size and heavy build is considered, they are no match for an average good horse. They are, as a rule, very easy to shoot on horseback, as, if one gallops a little in front of and on one side of them, they will hold their course, and come sailing past, offering a magnificent broadside shot, while under similar circumstances a prehensile-lipped rhinoceros will usually swerve away in such a manner as only to present his hind-quarters for a shot. When either walking or running, the square-mouthed rhinoceros holds its head very low, its nose nearly touching the ground. When a small calf accompanies its mother, it always runs in front and she appears to guide it by holding the point of her horn upon the little animal's rump; and it is perfectly wonderful to note how in all sudden changes of pace, from a trot to a gallop, or vice versa, the same position is always exactly maintained. During the autumn and winter months (*i.e.* from March to August) the square-mouthed rhinoceros is usually very fat; and its meat is then most excellent, being something like beef, but yet having a peculiar flavour of its own. The part in greatest favour among hunters is the hump, which, if cut off whole and roasted just as it is in the skin, in a hole dug in the ground, would, I think, be difficult to match either for juiciness or flavour." (W. H. F.; R. L.*)

RHINTHON (*c.* 323–285 B.C.), Greek dramatist, son of a potter. He was probably a native of Syracuse and afterwards settled at Tarentum. He invented the *hilarotragoedia*, a burlesque of tragic subjects. Such travesties were also called *phlyaces* ("fooleries") and their writers *phlyacographi*. He was the author of thirty-eight plays, of which only a few titles (*Amphitryon*, *Heracles*, *Orestes*) and lines have been preserved, chiefly by the grammarians, as illustrating dialectic Tarentine forms. The metre is iambic, in which the greatest licence is allowed. The *Amphitruo* of Plautus, although probably imitated from a different writer (Archippus of the Middle Comedy), may be taken as a specimen of the manner in which such subjects were treated. There is no doubt that the hilarotragoedia exercised considerable influence on Latin comedy, the *Rhinthonica* (*i.e.* fabula) being mentioned by various authorities amongst other kinds of drama known to the Romans. Scenes from these travesties are probably represented in certain vase paintings from Lower Italy, for which see H. Heydemann, "Die Phlyakendarstellungen auf bemalten Vasen," in *Jahrbuch des archäologischen Instituts*, i. (1886).

Fragments in monograph by E. Völker (Leipzig, 1887); see also E. Sommerbrodt, *De Phlyacographia Graecorum* (Breslau, 1875); W. Christ, *Geschichte der griechischen Litteratur* (1898).

RHIZOPODA, the name given by Dujardin (*pro parte*, 1838) to a group of Sarcodine Protozoa. They are distinguished by their pseudopods, simple or branched, passing by wide bases into the general surface, never fine radial nor fusing into complex networks; skeleton absent or a simple shell ("test," "theca"), never (?) a calcareous shell, nor represented by a siliceous network, nor spicules. Reproduction by binary fission; by division or abstriction of buds after the body has become multi-nucleate; or by the resolution of the body into numerous uninucleate zoospores (amœbulæ or flagellulæ) which may conjugate as gametes; plasmodium formation unknown; encystment (in "resting cysts" or "hypnocysts") common. Without a knowledge of the history it is impossible to distinguish a naked Lobose from the Amoebula (pseudopodiospore) of a Myxomycete or Proteomyxan. As to the name, Dujardin included the thecate Lobosa, the Filosa, and the Reticularia or Foraminifera (*q.v.*). The latter had already received the name Foraminifera (for their shells) from d'Orbigny; and as it is impossible to separate naked from thecate Lobosa we have merged his Amoebina (Amibiens) in the larger group. The Filosa were removed by Lang from the Reticularia; in habit and test they are inseparable from the Lobosa; and though their cytoplasm approximates to that of Reticularia, their ectosarc is much less granular, though not free from granules as stated by Lang.

The majority of Rhizopoda are fresh-water forms, some occurring in the film of water on mosses, among Sphagnum, or about the bases of grass-haulms; many, however, are exclusively marine. The aquatic forms generally may lurk among Confervae or higher weeds, or lie in the bottom of decomposing or excrementitious matter in still or slow-flowing waters. Of these some may become temporarily pelagic, floating up by the formation of gas vacuoles (containing probably CO_2) in the cytoplasm. It is easy to verify this by placing *Arcella* (fig. 1, 7) in a drop of water on a glass cover and inverting this over a glass ring; the *Arcella* sink to the free convex surface of the drop and escape from this most unnatural position by secreting gas-vacuoles; when they float up to contact with the glass cover, so as to touch it by the convex back of the shell, they put forth long pseudopodia which attach themselves to the glass and by their contraction turn the animal over, so that it can crawl over (*i.e.* under) the glass. *Amoeba* (*Entamoeba*) *histolytica*, Schaudinn, is the cause of tropical dysentery and hepatic abscess in man. *Pelomyxa* (fig. 1, 5–6) is remarkable for containing symbiotic bacteria. *Zooxanthellae* (symbiotic green cells—Algae or Flagellates) occur in several species; and *Paulinella* contains two sausage-shaped blue-green bodies, "chromatophores," which are probably symbiotic Cyanophyceae. The shell, even when not a simple membrane, has always a continuous inner membrane of a complex nitrogenous substance containing sulphur, allied to keratin and termed pseudochitin. The outer layer when present is composed of little hollow prisms (*Arcella*, fig. 1, 7), sand, or inorganic matter first swallowed by the animal (*Difflugia*, *Pseudodifflugia*), sometimes partially digested (Lecquereuxia), or else of plates secreted as "reserve plates" within the cytoplasm of the animal *Cyphoderia* (fig. 6, B), *Quadrula*, *Nebelia*, *Euglypha* (figs. 4, 6, A), &c. In *Quadrula irregularis* alone are the plates said to be calcareous; elsewhere they are always siliceous and simply refractive, so that the silica is probably hydrated (opal). The cement is possibly of silicified pseudochitin. This material is often permeated by a ferric oxide or hydrate, even when it is not coloured rusty brown. Shell formation of the membranous test is by simple surface-excretion; under budding we describe its accomplishment in the aggregated shells.

The "pylome," or aperture for the protrusion of the protoplasm, is usually single. There are two pylomes at opposite poles in several Filosa (*Ditrema*), hence united by some authors into a distinct family (fig. 7, 1, 5, 11), and in the gelatinous theca of *Trichosphaerium* (fig. 5) are numerous permanent pylomic pores. The nucleus is variable in form and character. In *Amoeba binucleata* two nuclei are always present; and some genera are permanently plurinucleate (*Pelomyxa*, *Arcella*, fig. 1, 7). It often gives forth fragments into the cytoplasm, the "chromidia" of R. Hertwig, which, as in Foraminifera (*q.v.*), may play an important part in reproductive processes. The contractile vacuole (there are two in *Arcella*, fig. 1, 7) in actively progressing Rhizopods always discharges at the hinder end. Absent or sluggish in marine forms, it is of constant occurrence in all fresh-water Rhizopods except *Pelomyxa*.

The pseudopods vary greatly in type. In *Amoeba princeps* (fig. 1, 4) they are mere promontory-like extensions of the body; in *A. radiosa* (fig. 1, 1–3) and *Trichosphaerium* (fig. 5) they are distinct slender processes, tapering, and either blunt or finely pointed at the apex; in *Pelomyxa* (fig. 1, 5, 6) as in *A.* (*Lithamoeba*) *discus* (fig. 2) they are "eruptive," hemispherical, formed apparently by the rupture of the ectoplasm, and the outpouring of the endoplasm which at once differentiates a clear outer layer as a new ectoplasm; in *Amoeba limax* during progression the body is roughly oval with the apex truncated posteriorly and the wide anterior end forming a single anterior pseudopod. Progression chiefly takes place by a rolling over of the anterior end (fig. 3—see also AMOEBA); but it may take place by the extension of a pseudopod, its attachment at the tip, followed by its contraction to pull up the rest of the animal; this is well shown in the thecate species. Another mode is that of *A. radiosa* (fig. 1, 1–3), which can roll over on the tips of its stiff pseudopods. The pseudopods of the Filosa (figs. 6, 7) are branched, but less rich in granules, and less viscid than those of Foraminifera; they rarely anastomose, and never coalesce to form perforated plates.

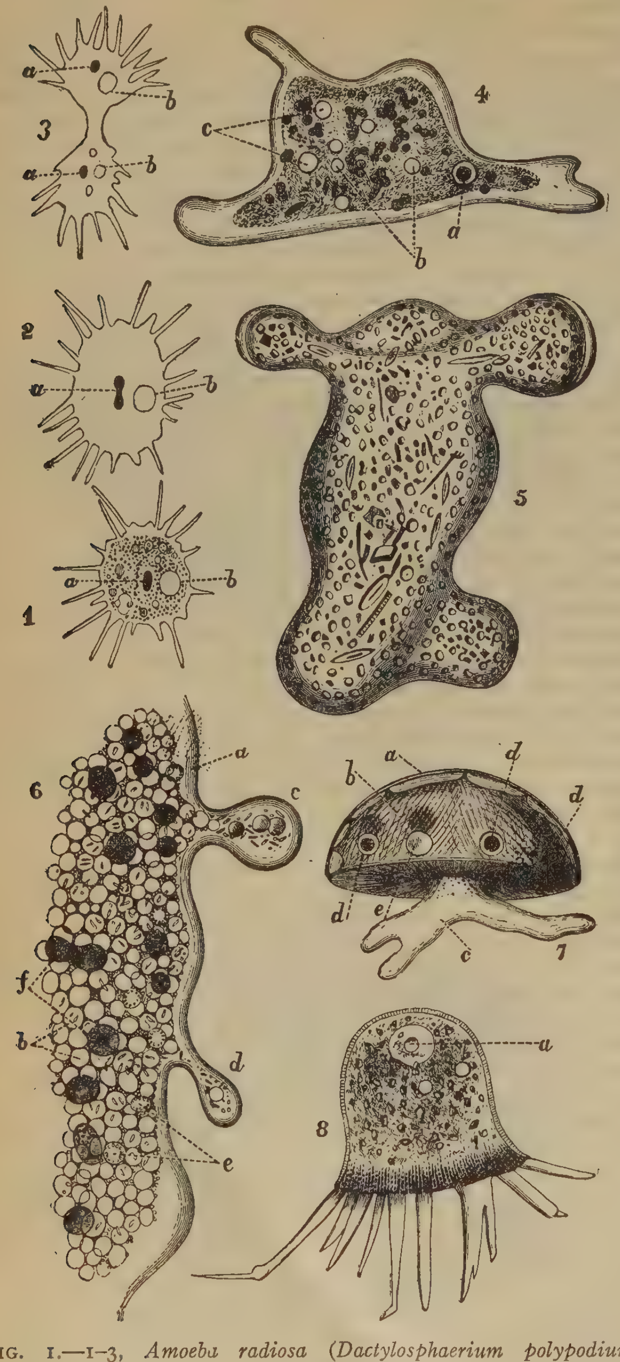


FIG. 1.—1–3, *Amoeba radiosa* (*Dactylosphaerium polypodium*), M. Schultze, in three stages of equal binary fission during fifteen minutes; *a*, nucleus; *b*, contractile vacuole (after M. Schultze). 4, *Amoeba princeps*, Ehr.; *a*, nucleus; *b*, *c*, vacuoles; food vacuoles shaded (after Auerbach). 5, 6, *Pelomyxa palustris*: 5, a small example $\frac{1}{20}$ in. in diameter, moderately extended; 6, a portion more highly magnified; *a*, ectosarc; *b*, vacuoles; *c*, *d*, pseudopods formed by eruption and containing endosarc; *e*, vesicles containing a solution of glycogen; *f*, nuclei; the numerous little pods are symbiotic bacteria. 7, *Arcella vulgaris*: *a*, shell; *b*, cytoplasm; *c*, lobose pseudopods; *d*, *d*, *d*, 3 nuclei; *e*, one of the contractile vacuoles; the dark shaded circles represent bubbles or gas vacuoles. 8, *Cochliopodium pellucidum*: *a*, "vesicular" nucleus, with dense central mass or "karyosome" (a frequent type of Protistic nucleus). (From Lankester.)

A process whose relations to reproduction are not fully made out is that of "plastogamy," where two or more individuals unite completely by their cytoplasm, the nuclei remaining distinct; it may be temporary or permanent: in the latter case determining, of course, a much more rapid increase of size than that due to growth. Thanks to the labours of F. Schaudinn, we now know the full life cycles of at least half a dozen species; previously we only knew with certainty of two modes of fission—equal constriction (*Amoeba*—fig. 1, 1–3) and bud-fission (*Difflugia*). As in other Sarcodina, chromidia, or fragments of nuclear substance budded off from the nucleus into the endoplasm, play an important part in many reproductive processes. Equal binary fission is common. In the thecate forms, *e.g.* *Difflugia*, *Euglypha* (fig. 4), this is replaced by bud-fission; half the cytoplasm passes out through the pylome, and becomes invested with its covering there; the enclosed "reserve" skeletal elements pass to the surface in order, so that the pylome of the new shell faces that of the old; the original nucleus divides *in situ* and one daughter nucleus passes into what we may call the bud-cytoplasm; the two daughters of the original cell, which we may call the "bud-sister" and the "stock-sister" respectively, now separate. In the plurinucleate forms a true bud-formation takes place, nucleate masses of cytoplasm being constricted off at the surface. A simultaneous resolution into uninucleate cells may affect the multinucleate species (or the multinucleate state of habitually uninucleate species); this is termed schizogony.

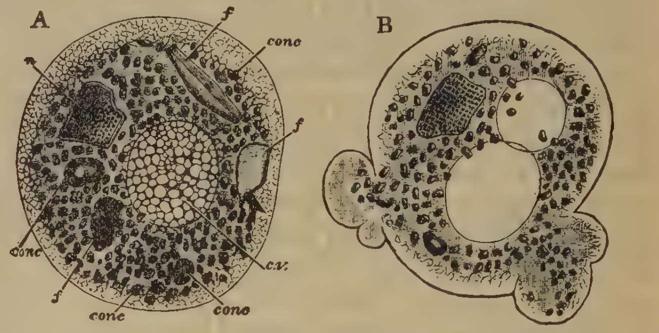
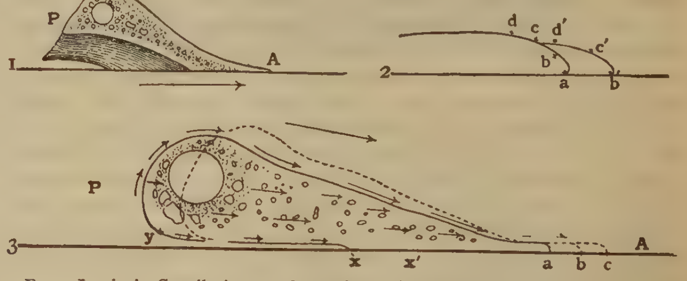


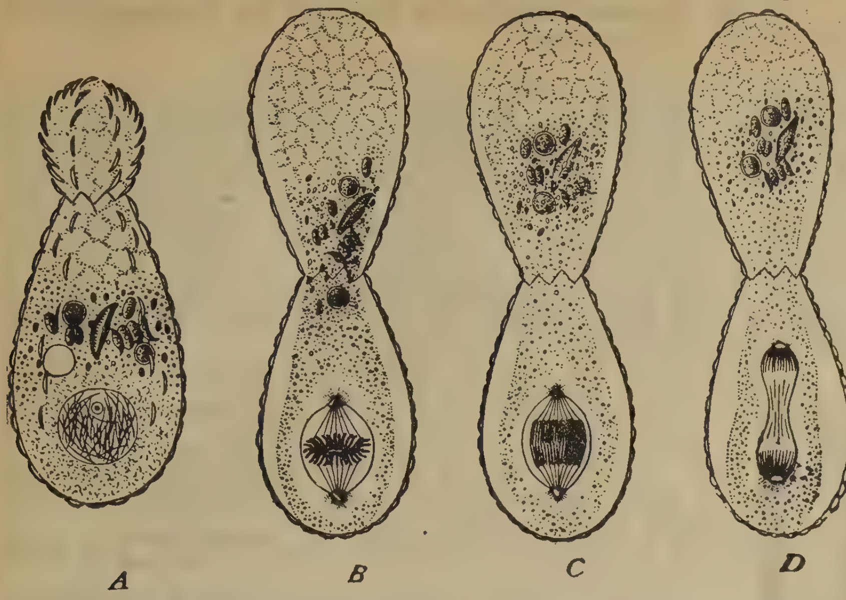
FIG. 2.—*Amoeba* (*Lithamoeba*) *discus* (after Lankester). A, quiescent; B, putting forth eruptive pseudopods. *c.v.*, contractile vacuole through which the richly vacuolated cytoplasm is seen; *f*, food particles; *conc.*, concretions, insoluble in dilute HCl and KHO, soluble in strong HCl; *n*, nucleus.



From Jenning's *Contributions to the Study of the Behavior of Lower Organisms*, by permission of the Carnegie Institution of Washington, D.C.

FIG. 3.—1, ideal perspective view of left half of a crawling Amoeba; 2, diagram showing successive position of marked points on anterior end; 3, diagrammatic section, the arrows showing directions of *absolute* motion—the rate being indicated by the length of the shaft.

In *Trichosphaerium* (fig. 5) it occurs at the close of two



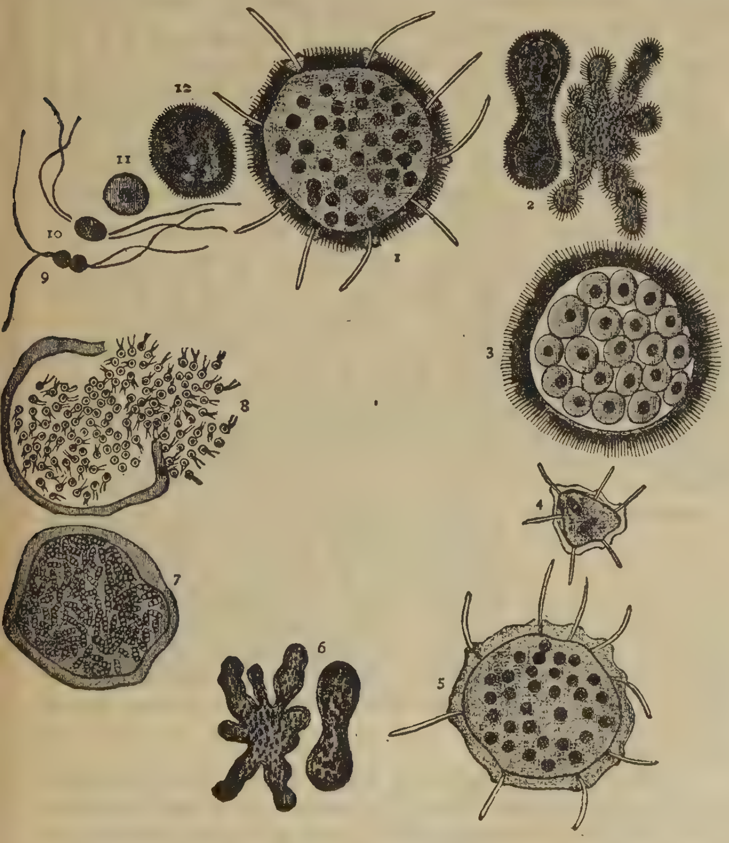
From Calkin's *Protozoa*, by permission of the Macmillan Co., New York.

FIG. 4.—Bud-fission of *Euglypha alveolata*. *A*, passing out of secreted plates to surface of bud. *B*, bud completely invested; nucleus preparing to divide by mitosis. *C*, *D*, later stages.

distinct periods in the life cycle which we may call A and B; the individuals of the A period being distinguished by the presence of radiating spicules of $MgCO_3$ in the gelatinous theca; the resolution of period A is simple (fig. 5, 3) and the uninucleate brood-cells are amoebulae (pseudopodiospores) (fig. 5, 4) which grow into the multinucleate B type, with a nonspiculate theca (fig. 5, 5). The resolution of the B type is preceded by rapid multiplication of the nuclei by mitosis (fig. 5, 7), and the uninucleate cells are 2-flagellate zoospores (fig. 5, 9). These pair with zoospores of a different brood to their own (fig. 5, 10) (*i.e.* they are exogamous gametes); and the fusion cell (fig. 5, 11) so formed is the starting-point of the A type (fig. 5, 12). Brood formation by resolution of a multinucleate individual has been observed or conjectured in Amoeba, &c.

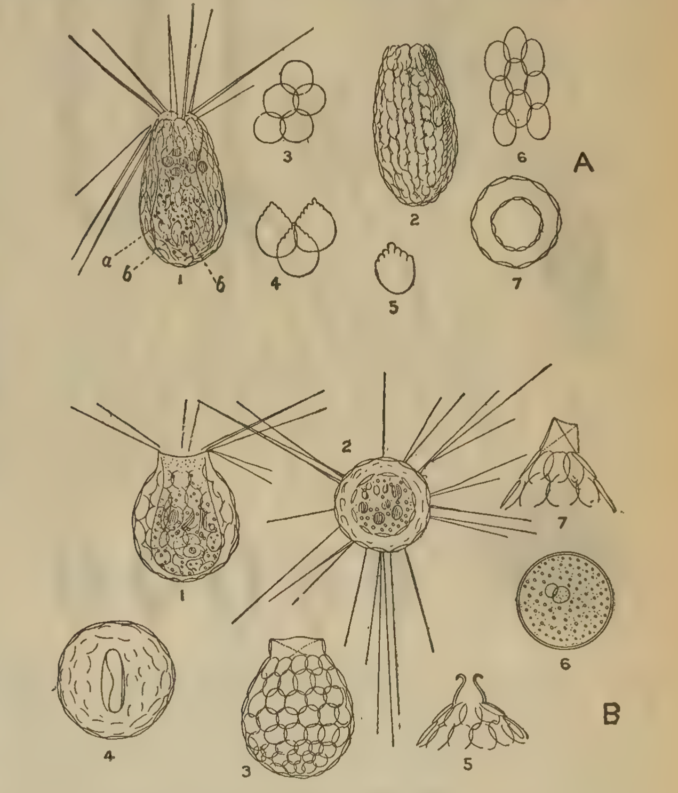
A formation of numerous pseudopodiospores within *Pelomyxa* has been repeatedly described, and these have been seen to conjugate equally, the zygote becoming multinuclear. But the possibility of the alleged reproductive cells being parasites has not yet been fully excluded.

Chlamydophrys stercorea is a small Filose, occurring in the faeces of several mammals, but only forming its characteristic shell outside the body; plastogamic monstrosities are frequent. The nucleus degenerates, and is expelled with some plasm. The chromidia remain inside the shell, and differentiate or aggregate into about eight nuclei; the cell is then resolved into as many 2-flagellate swarmers, which escape as isogamous exogametes. The zygote becomes surrounded by a brown cyst. When



From *The Cambridge Natural History*, after Schaudinn, vol. i., Protozoa, by permission of Macmillan & Co. Ltd.

FIG. 5.—*Trichosphaerium sieboldii*. 1, Adult of "A" form; 2, its multiplication by fission and gemmation; 3, resolution into uninucleate amoeboid zoospores; 4, development (from zoospores of "A") into "B" form (5); 6, its multiplication by fission and gemmation; 7, its resolution after nuclear bipartition into minute 2-flagellate zoospores (or exogametes); 8, liberation of gametes; 9, 10, more highly magnified pairing of gametes of different origin; 11, 12, zygote developing into "A" form.



From Eugene Penard, *Faune rhizopodique du bassin du Léman*.

FIG. 6.—A, *Euglypha alveolata*. 1, Living animal; *a*, guitar-shaped outline of body, retracted from shell for emission of pseudopods; *b*, *b*, reserve plates in body for offspring in next bud-fission; 2, empty shell; 3, round plates; 4, 5, adoral plates with more or less marked denticulations; 6, oval plates; 7, transverse section of shell, showing circle of reserve plates within.

B, *Sphenoderia lenta*. 1, Animal, lateral view; 2, same from above; 3, shell, lateral view; 4, shell, oral view of the pylome; 5, optical section through empty shell and pylome; 6, nucleus; 7, surface view of pylome (dotted lines represent its opposite side as seen at a lower focus).

swallowed by a mammal it develops, and the ordinary form is found in the excreta.

Centropyxis aculeata is closely allied to *Difflugia*. It divides by fission and also at the end of a cycle by schizogony, the offspring being amoebulae. In some these acquire a shell directly; in others a second brood division into four takes place, and it is only then that shells are formed. The latter conjugate as males with the former as females; and the fusion cell encysts within the approximated shells; it emerges as a naked amoeba after a period of rest, forms a shell and assumes the type of the species. Other types of reproduction are known, *Amoeba coli*, an inhabitant of the gut of man, showing an endogamous pairing of closely related nuclei similar to that of *Actinosphaerium* (see HELIOZOA).

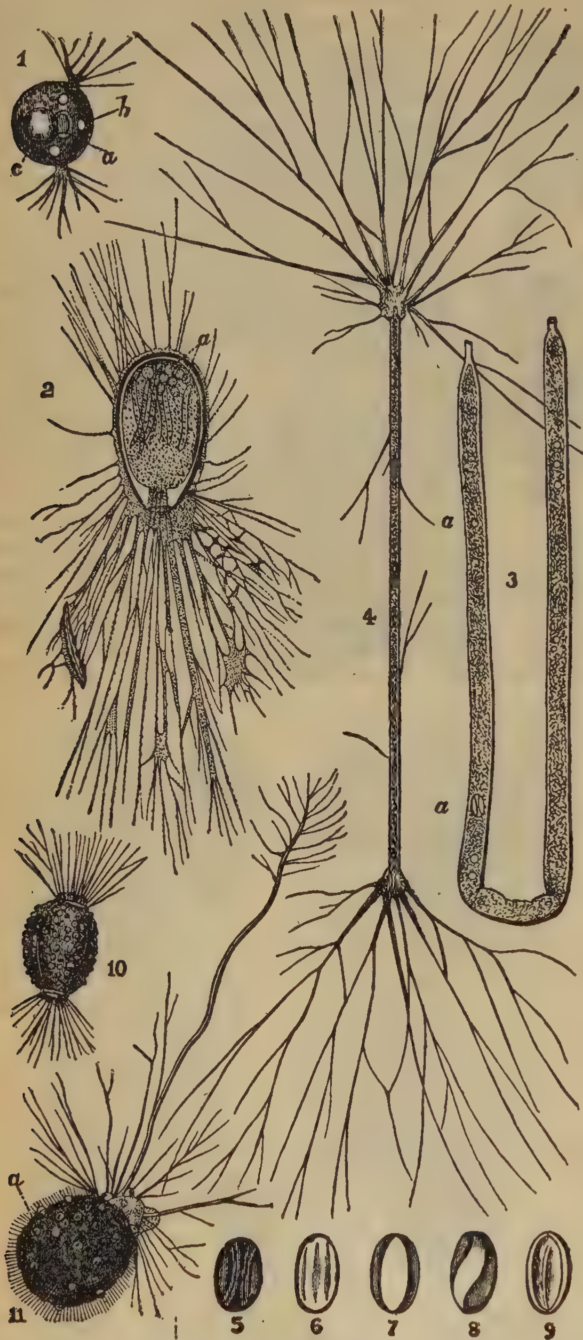


FIG. 7.—Filosa and Foraminifera of similar habit. 1. *Diplophrys archeri* (moor pools); *a*, nucleus; *b*, contractile vacuoles; *c*, oil drop. 2. *Allogromia fluviatilis* (freshwater Foraminifer); *a*, numerous nuclei; the elongated bodies are ingested diatoms. 3. *Shepheardella taeniformis* (marine Foraminifer), with retracted protoplasm; *a*, nucleus. 4. The same with expanded pseudopods. 5-9. Nucleus of same in various aspects as carried along in streaming protoplasm. 10. *Amphitrema wrightianum* (moor pools); shell membranous, encrusted with foreign bodies. 11. *Diaphorodon mobile* (moor pools); *a*, nucleus.

CLASSIFICATION

Lobosa.—W. B. Carpenter. Cytoplasm with a clear ectosarc, not wetted by the medium; pseudopods never finely branching, usually rounded at the apex; nucleus single or multiple; shell (" test," " theca ") absent, gelatinous, membranous or of cemented granules of ingested sand, &c., or plates secreted in the endosarc.

Selected genera: § 1. Naked Amoeba (*q.v.*) (" *Amibe*," Bory), with the subgenera *Dactylosphaerium*, Hertwig and Lesser (fig. 1, 1–3), with slender, pointed pseudopods; *Lithamoeba*, Lankester, always containing inorganic granules (fig. 2). *Pelomyxa*, Greeff (fig. 1, 5, 6), with blunt, eruptive pseudopods and numerous nuclei, $\frac{1}{12}$ in. or more in diameter when contracted. *Arcuothrix*, Claparède and Lachmann, with one or more slender, very mobile, flagelliform pseudopods as well as the lobose ones.

§ 2. Test gelatinous, perforated by pseudopods: *Amphizonella*, Greeff; *Trichosphaerium*, Schneider (fig. 5).

§ 3. Test membranous: *Cochliopodium*, Hertwig and Lesser (fig. 1, 8).

§ 4. Test " chitinous," shagreened: *Arcella*, Stein (fig. 1, 7).

§ 5. Test of ingested particles: *Difflugia*, Leclerc; *Centropyxis*, Stein; *Lecqueureuxia*, Schlumberger (shell material of diatomaceous tests fused into sausage-shaped masses).

§ 6. Test of secreted siliceous or chitinous plates: *Quadrula*, F. E. Schultze. (In *Q. irregularis* the plates are said to be calcareous.)

Filosa.—A. Lang. Cytoplasm without definite ectosarc; pseudopods branching, tapering to fine tips, somewhat granular; test present in all known species and varying as in the Lobosa.

Selected genera: § 1. Test membranous: *Gromia*, Dujardin (*pro parte*); *Mikrogromia*, Hertwig; *Diplophrys*, Barker (fig. 7, 1); *Ditrema*, Archer; *Amphitrema*, Archer (fig. 7, 11); the last three have a mouth-like aperture (pylome) at either end of the test.

§ 2. Test of ingested or incrusted particles: *Pseudodifflugia*, Schlumberger; *Diaphorodon*, Archer (fig. 7, 12).

§ 3. Test of secreted plates: *Euglypha*, Dujardin (figs. 4, 6, A); *sphenoderia lenta* (fig. 6, B); *Paulinella*, Lauterborn.

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RHODE ISLAND, a North Atlantic state of the American Union, belonging to the New England group, and lying between 41° 18′ and 42° 3′ N. lat. and 71° 8′ and 71° 53′ W. long.[1] It is bounded, N. and E., by the state of Massachusetts; S., by the Atlantic Ocean; and W., by the state of Connecticut, from which it is separated in part by the Pawcatuck river. Rhode Island is the smallest state in the Union, having an extreme length, N. and S., of 48 m., an extreme width, E. and W., of 37 m., and a total area of 1248 sq. m., of which 181 sq. m. are water-surface.

Topography.—The region of which Rhode Island is a part was at one time worn down to a gently rolling plain near sea-level, but has since been uplifted and somewhat dissected by stream action. As a result the topography is characterized by low, rounded hills, but is nowhere mountainous. Since the uplift and stream dissection a slight depression has allowed the sea to invade the lower portions of the river valleys, forming the bays known as Narragansett Bay, Providence "river," Sakonnet " river," &c. Glaciation has disturbed the river systems, causing the formation of numerous lakes and of the waterfalls which determined the situation of many of the manufacturing cities of the state.

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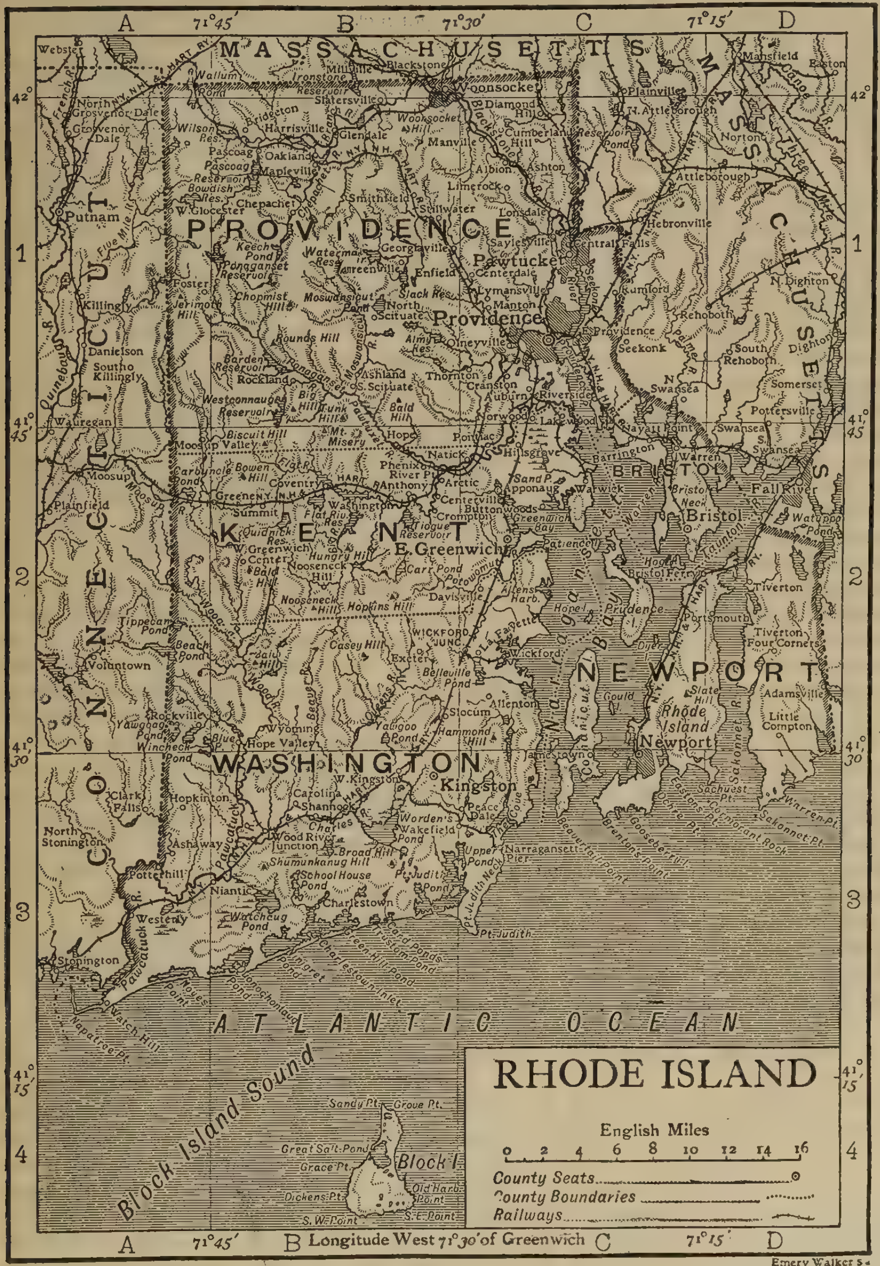
[1] Block Island, over which the jurisdiction of the state extends, lies 10 m. off the coast, and is not included within these limits.

In the N.W. is Durfee Hill, which attains an elevation of 805 ft., and is the highest point within Rhode Island. The mean elevation for the entire state is 200 ft. The coast-line, including the shores of the bays and islands, is extensive; its western portion is only slightly indented, but its eastern portion is deeply indented by Narragansett Bay, a body of water varying in width from 3 to 12 m., and extending inland for about 28 m. The land surface E. of this bay is very gently rolling, but to the W. it consists of a somewhat more rugged upland which slopes gradually southward. Over the whole state there is a layer of drift deposited by the glaciers which once covered this region. This glacial material is in the form of a till or boulder clay, but in the lowlands, and especially along Narragansett Bay, it is generally overlaid by stratified drift deposited by glacial streams. Within Narragansett Bay are the numerous islands characteristic of an area which has suffered comparatively recent depression, the largest being Rhode Island (or Aquidneck), Conanicut Island and Prudence Island. Of these the most important is Rhode Island, 15 m. long and 3 m. wide, which has given the state its name. Lying about 10 m. off the coast and S. of the central part of the state is Block Island, a sandy tract 6 m. long and from 1 to 4 m. wide, with a rolling surface.


A
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1
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MASSACHUSETTS
CONNECTICUT
PROVIDENCE
KENT
BRISTOL
NEWPORT
WASHINGTON
Webster
Woonsocket
Blackstone
Millville
Slatersville
Harrisville
Pascoag
Chepachet
Putnam
Danielson
Killingly
Manville
Cumberland Hill
Diamond Hill
Plainville
N. Attleborough
Attleborough
Mansfield
Norton
Lonsdale
Central Falls
Pawtucket
Providence
East Providence
Seekonk
Rehoboth
Cranston
Scituate
Thornton
Riverside
Barrington
Warren
Bristol
Swansea
Fall River
Somerset
Dighton
Warwick
Apponaug
Coventry
Phenix
Anthony
E. Greenwich
Wickford
Prudence
Portsmouth
Tiverton
Little Compton
Newport
Jamestown
Kingston
Wakefield
Peace Dale
Narragansett Pier
Charlestown
Westerly
Stonington
Hopkinton
Ashaway
Carolina
Shannock
Wood River Junction
Exeter
Slocum
Point Judith
Sakonnet Pt.
Block I.
Sandy Pt.
Grove Pt.
Great Salt Pond
Grace Pt.
Old Harb. Point
Dickens Pt.
S.W. Point
S.E. Point
Watch Hill
Napatree Pt.
ATLANTIC OCEAN
Block Island Sound
RHODE ISLAND
English Miles
0 2 4 6 8 10 12 14 16
County Seats
County Boundaries
Railways
Longitude West 71°30′ of Greenwich

Emery Walker sc.

The rivers of the state are short and of no great volume, but they flow swiftly and are useful in supplying power for manufactories. The Providence river is really an arm of Narragansett Bay, into which flow the waters of the Pawtuxet and the Blackstone rivers. The latter stream at Pawtucket has a fall of about 50 ft., and the Pawtuxet river also has a number of falls along its course. Mount Hope Bay is a north-eastern arm of Narragansett Bay, and is also the estuary of the Taunton river. The Sakonnet river is a long bay separating Aquidneck or Rhode Island from the mainland on the E. The Pawcatuck river is the largest stream in the western half of the state, and along the lower part of its course it forms the boundary between Rhode Island and Connecticut.

Fauna and Flora.—The fauna of the state does not differ from that of southern Connecticut and eastern Massachusetts. The marine fauna is of economic importance. The woodland area of the state has been estimated (census of 1900) at 400 sq. m., or about 37% of the land area, but the trees are generally too small for timber. The most common varieties of trees are the oak, walnut and chestnut. There are a few stretches of pine forest, and in the S. the swamps are sometimes overgrown with cedar.

Climate.—Rhode Island has a more moderate climate than that of the northern sections of New England. There are no great extremes of either heat or cold, and a number of the towns and cities, especially Newport and Narragansett Pier, have become noted summer resorts. Narragansett Pier has a mean annual temperature of 49°, a mean summer temperature (for June, July and August) of 68°, and a mean winter temperature (for December, January and February) of 29°. The mean annual temperature at Providence is 50°; the mean for the summer, 72°; and for the winter, 30°; while the highest and lowest temperatures ever recorded are respectively 102° and −9°. The mean annual rainfall is about 50 in., ranging from 47·4 in. at Narragansett Pier to 53·2 in. at Kingston.

Soils.—The boulder clay or "hard pan" of which most of the surface lands are composed, forms a very indifferent support for vegetation, and consequently the state is not well adapted for the growing of crops.

Agriculture.—The acreage of improved farm land in Rhode Island decreased from 356,487 in 1850 to 137,354 in 1900, but the value of farm property (including land with improvements, implements, machinery and live stock) increased in the same period from $19,100,640 to $26,989,189. The number of farms remained about the same—5385 in 1850 and 5498 in 1900; but the average area decreased from 102·9 acres to 82·9 acres. The value of farm products increased from $3,670,135 in 1879 to $6,333,864 in 1899. The average value of farms increased from $3547 in 1850 to $4909 in 1900. The number of persons engaged in agricultural pursuits in 1880 was 10,986, and in 1900, 10,957.

The total acreage of cereals (barley, buckwheat, Indian corn, oats, rye and wheat) decreased from 19,575 acres in 1879 to 10,552 acres in 1899, and the total product of these crops decreased from 801,111 bu. in 1849 to 350,110 bu. in 1899.

The total number of neat cattle on farms decreased from 36,262 in 1850 to 30,696 in 1900, but the number of dairy cows increased from 18,698 to 23,660.

Fisheries.—Whaling was an established industry in Rhode Island as early as 1723, and in 1731 the colonial assembly provided a bounty of five shillings a barrel for whale oil, and a penny a pound for whalebone. About 1750 sperm candles were first manufactured. In 1846 about 50 whaling vessels sailed from Rhode Island ports; but by the close of the century the industry had become practically extinct. In 1905 the number of persons employed in the general fisheries industry was 2212; and the value of the catch was $1,546,658, the largest items being: lobsters, $64,358; squeteague (weakfish), $86,478; scup, $138,030; and oysters (for market), $874,232.

Minerals.—Rhode Island's mineral wealth is relatively slight. The total value[1] of all the mineral products of the state in 1907 was $937,384, and in 1908, $708,694, and of these totals granite was valued in 1908 at $556,774. The value of the clay products, lime and talc, decreased from $245,378 in 1907 to $112,815 in 1908. The mining of iron ore was begun about 1767 in the vicinity of the present Cranston, and much of the metal was used in the making of cannon during the War of Independence, but the supply was soon exhausted. Near Tiverton and Cranston graphite has been quarried.

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[1] United States Geological Survey, *Mineral Resources of the United States.*

Manufactures.—Rhode Island is essentially a manufacturing state; of the 191,923 persons in the state engaged in gainful occupations in 1900, 101,162 (or 52.7%) were employed in manufacturing and mechanical pursuits. By the middle of the 17th century boat-building had become an established industry, and large vessels were built at Newport. In 1777 the state offered a large premium for every pound of steel, similar to German steel, made within its boundaries; and in 1789 a rolling and slitting mill was built near Providence. Cotton was first imported to Providence from Spain in 1785; a company to carry on cotton-spinning, formed at Providence in 1786, established there in the following year a factory containing a spinning jenny of 28 spindles (the first machine of the kind to be used in the United States), and also a carding machine and a spinning frame with which was manufactured a kind of jean having a linen warp and a cotton filling. The fly shuttle was also apparently first introduced at Providence in 1788. The first calico printed in the United States was made at East Greenwich about 1794. The Providence Association of Mechanics and Manufacturers, incorporated in 1789, organized industrial development. The prohibition of the exportation from England of machinery, models or drawings retarded mechanical improvement, but in 1790 an industrial company was formed at Providence to carry on cotton spinning, and in December of that year there was established at Pawtucket a factory equipped with Arkwright machines constructed by Samuel Slater. This machinery was operated by water-power, then first used in the United States for the spinning of cotton thread; and from this may be dated the beginning of the factory system in Rhode Island. These machines were soon adapted to the spinning of wool, and in 1804 a woollen factory was built at Peacedale, South Kingston. The first power-loom used in the United States was invented about 1812, and was set up at Peacedale, in 1814, for the manufacture of woollen saddlegirths and other webbing. The first power-loom for cotton manufacture was set up in North Providence in 1817. Textile manufacturing by improved methods was hardly well established in Rhode Island before 1825. The manufacture of jewelry, which was established in Providence in 1784, was greatly promoted ten years later by Nehemiah Dodge's invention of the process of "gold-filling," still further improved in 1846 by Thomas H. Lowe. The manufacture of silverware was begun in Providence soon after the close of the War of Independence.

Rhode Island's water powers have been its only natural resources which have aided in the development of its manufactures, and its transportation facilities have always been inadequate, because of shallow water at Providence and scanty railway communication; but the state's manufacturing enterprises are of great importance.

In 1900 Rhode Island ranked 17th among the states in the value of its manufactured products, but led all of the states in the value per capita ($430). The total number of establishments in 1850 was 864; in 1890, 3377, and in 1900, 4189. In 1900 there were 1678 factories, and in 1905, 1617 factories.[1] The total capital invested in manufacturing in 1850 was $12,935,676; in 1890, $126,483,401, and in 1900, $183,784,587, of which $176,901,606 was in factories; in 1905 the capital invested in factories was $215,901,375. The value of all manufactured products in 1850 was $22,117,688; in 1890, $142,500,625, and in 1900, $184,074,378, of which $165,550,382 was the value of factory products; in 1905 the value of factory products was $202,109,583. The average number of *employés* in 1850 was 20,967; in 1890, 81,111; and in 1900, 98,813, of whom 88,197 were factory *employés*; in 1905 there were 97,318 factory *employés*.

Rhode Island ranked first in 1900 ($13,229,313) and in 1905 ($14,431,756) among the states of the United States in the value of jewelry, which was fourth in the value of the state's manufactures; second in worsted goods (1900, $33,341,329; 1905, $44,477,596), which were first in value in the state's manufactures; and third in dyeing and finishing textiles (1900, $8,484,878; 1905, $9,981,457), which ranked fifth among the state's manufactures; in the value of cotton goods (second in rank in the state) it fell from the fourth rank in 1900 ($24,056,175) to fifth rank in 1905 ($30,628,843), when the value of Rhode Island's product was less than that of Georgia. Other important manufactures were: combined textiles (not including flax, hemp and jute products) in 1900, $77,998,396; in 1905, $103,096,311; foundry and machine shop products in 1900, $13,269,086; in 1905, $16,338,512; woollen goods in 1900, $5,330,550; in 1905, $8,163,167; rubber boots and shoes in 1900, $8,034,417; electrical machinery, apparatus and supplies in 1900, $5,113,292; in 1905, $5,435,474; silversmithing and silverware in 1900, $4,249,190; in 1905, $5,323,264; gold and silver, reducing and refining (not from ore) in 1900, $3,484,454; in 1905, $4,260,698; cotton small wares in 1900, $2,379,500; in 1905, $3,944,607; hosiery and knit goods in 1900, $2,713,850; in 1905, $3,344,655; silk and silk goods in 1900, $1,311,333; in 1905, $2,555,986. In 1905, 1146 establishments reported power, as against 1360 in 1900—a decrease of 15·7%, but the total horsepower increased from 155,545 to 190,777, or 22·7%.

Transportation.—Steam railway mileage in Rhode Island increased from 68 m. in 1850 to 209 m. in 1900, and to 211 m. on the 1st of January 1909 (the New York, New Haven & Hartford being the only railway system of any importance in the state). In 1910 a charter was granted to the Grand Trunk system. In 1902 the mileage of street and electric railways (most of them interurban) operated in the state was 336·33 m. The state has a natural water outlet in the Providence river and Narragansett Bay, but there is lack of adequate dockage in Providence harbour, and insufficient depth of water for ocean traffic. The ports of entry are Providence (by far the largest, with imports valued at $1,893,551, and exports valued at $12,517 in 1909), Newport and Bristol.

Population.—The total population of Rhode Island in 1880 was 276,531; in 1890, 345,506; in 1900, 428,556; and in 1910, 542,610.[2] The increase from 1880 to 1890 was 24·9%, from 1890 to 1900 24%, and from 1900 to 1910, 26·6%. Of the total population in 1900, 285,278 were native whites, 134,519 were foreign-born, 9092 were negroes, 366 were Chinese, 35 were Indians and 13 were Japanese. Of the foreign-born, 35,501 were Irish, 31,533 were French-Canadians and 22,832 were English. Of the total population, 275,143 were of foreign parentage, *i.e.* either one or both parents were foreign-born—and 81,232 were of Irish parentage, both on the father's and mother's side, and, in the same sense, 49,427 were of French-Canadian and 32,007 of English parentage. Rhode Island in 1900 had the highest percentage of urban population of any state in the Union, 91·6% of the total population living in cities of 4000 or more inhabitants. From 1890 to 1900 the urban population increased from 310,335 to 392,509 or 26·5%; while the rural population (*i.e.* population outside of incorporated places), increased from 35,171 to 36,047—1·1% of the total increase in population. The cities of the state, with population in 1900,[3] are Providence, 175,597; Pawtucket, 39,231; Woonsocket, 28,204; Newport, 22,034; and Central Falls, 18,167. In 1906 there were in the state 264,712 communicants of various religious denominations, and of these 199,951 were Roman Catholics. Second in strength were the Baptists, who founded the colony; in 1906 they numbered 19,878, of whom 14,304 were of the Northern Convention. There were 15,443 Protestant **Episcopalians**, 9858 Congregationalists, 7892 Methodists. The Friends, whose influence was so strong in the early history of Providence, numbered in 1906 only 648 in the whole state.

Administration.—The state is governed under the constitution of 1842, with amendments adopted in 1854, 1864, 1886, 1888, 1889, 1892, 1893, 1900, 1903, 1909. All native or naturalized citizens of the United States residing in Rhode

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[1] The 1905 census of manufactures gives statistics only for establishments under the factory system, excluding the hand trades, and gives factory statistics for 1905 and for 1900. The statistics given above for 1900 in comparison with 1905 are for factory products.

[2] The populations in other census years were: (1790) 68,825; (1800) 69,122; (1810) 76,931; (1820) 83,059; (1830) 97,199; (1840) 108,830; (1850) 147,545; (1860) 174,620; (1870) 217,353.

[3] In 1910 the populations of the cities were: Providence, 224,326; Pawtucket, 51,622; Woonsocket, 38,125; Newport, 27,149; and Central Falls, 22,754.

Island are citizens of the state. Under an act of 1724 the suffrage was restricted to adult males who possessed a freehold of the value of $134 (see *History*). So far as state and national elections are concerned, the privilege was extended to native non-freeholders by the constitution of 1842, to naturalized foreigners who had served in the Civil War by an amendment of the 7th of April 1886, and to all adult male citizens by the amendment of the 4th of April 1888. A curious survival of the old system exists in the provision that only those who pay taxes on $134 worth of property may vote for members of city councils or on propositions to levy taxes or to expend public money. The working men are thus almost entirely excluded from participating in the government of the large factory towns.

Amendments to the constitution must be passed by both houses of the General Assembly at two consecutive sessions, and must then be ratified by three-fifths of the electors of the state present and voting thereon in town and ward meetings. Fifteen amendments have thus been added to the constitution of 1842. An amendment of the 7th of April 1886 forbade the manufacture and sale of intoxicating beverages, but it was badly enforced and was repealed by a subsequent amendment of the 20th of June 1889.

The powers of the governor are unusually small. Until 1909, when a constitutional amendment was adopted, he had no power of veto, and his very limited nominal powers of appointment and removal are controlled by a rotten-borough Senate. The other administrative officers are a secretary of state, an attorney-general, an auditor, a treasurer, a commissioner of public schools, a railroad commissioner, and a factory inspector, and various boards and commissions, such as the board of education, the board of agriculture, the board of health, and the commissioners of inland fisheries, commissioners of harbours and commissioners of pilots.

The legislative power is vested in the General Assembly,[1] which consists of a Senate made up of the lieutenant-governor and of one senator from each of the thirty-eight cities and townships in the state, and a House of Representatives of one hundred members, apportioned according to population, but with the proviso that each town or city shall have at least one member and none shall have more than one-fourth of the total (see *History*). Members of the legislature and all state officials are elected annually in November. A majority vote was formerly required, but since the adoption of the tenth amendment (Nov. 28, 1893) a plurality vote has elected.

At the head of the judicial system is the supreme court (1747), with final revisory and appellate jurisdiction. Below this are the superior court (1905), the twelve district courts, the town councils, probate courts in the larger towns, and justices of the peace. The five judges of the supreme court, the six judges of the superior court and the district judges are elected by the General Assembly; the supreme and the superior court justices hold office until dismissed by the General Assembly or found guilty of official misdemeanour, and the district judges have three-year terms.

The town (or township) is the unit of local government, the county being recognized only for judicial purposes and to a certain extent in the appointment by central administrative boards. There are five counties and thirty-eight towns. The municipal governments of Newport and Providence present interesting features, for which see the separate articles on these cities.

Education.—The public school system of Rhode Island was established in 1800, abolished in 1803, and re-established in 1828. At the head of it is a commissioner of education, appointed by the governor and the Senate, and a board of education, composed of the governor and the lieutenant-governor *ex officio* and six other members elected by the General Assembly. Under an act of the 12th of April 1883, as amended on the 4th of April 1902, education is compulsory for children between the ages of seven and fifteen, but the maximum limit is reduced to thirteen for children who are employed at lawful labour. The total enrolment in the public schools in 1905 was 71,425 and the total expenditure for public school purposes was $1,987,751. A considerable proportion of the Irish and the French Canadians send their children to the Roman Catholic parochial schools. The chief institutions for higher education are Brown University (1764), the State School of Design (1877), the State Normal School (reorganized 1898), and the Moses Brown School (1819), all at Providence (*q.v.*), and the State College of Agriculture and Mechanic Arts (1888) at Kingston, a land grant college under the Morrill Acts of 1862 and 1890, the Hatch Act of 1887 and the Adams Act of 1906. This institution was founded as an agricultural school in 1888 and became a college in 1892. It has departments of agriculture, engineering and science, a library of 15,000 volumes and an experiment station. There are state training-schools for teachers at Providence, Cranston, Bristol, Barrington, Central Falls, Warwick and Pawtucket.

Charitable and Penal Institutions.—A board of state charities and corrections, established in 1869, supervises and controls all of the penal, charitable and correctional institutions of the state at large and also the local almshouses. There were in 1910 nine members of the board, three from Providence county, one from each of the other counties, and one from the state at large; five were appointed by the governor with the consent of the Senate, and four were elected by the Senate. A group of institutions (under the control of the board) at Howard, in Cranston township, about 7 m. from Providence, including the Workhouse and House of Correction, the Hospital for the Insane (1869), the Almshouse, the State Prison and Providence County Jail, the Sockanosset School for Boys, and the Oaklawn School for Girls, are supported entirely or in part by the state. In addition to the institutions under the board of charities and corrections there are two under the board of education, and supported wholly or in part by the state, the School for the Deaf (1877) and the Home and School for Dependent and Neglected Children (1885) at Providence. The Soldiers' Home (1891) at Bristol, the Butler Hospital for the Insane (1847) at Providence, and a Sanitarium (1905) at Wallum Lake, in the township of Burrillville, also receive state aid.

Finance.—The chief sources of revenue in the order named are the general property tax, the tax on savings banks, the tax on insurance companies, and liquor licences. There is no corporation tax. The total receipts from all sources for the year 1909 were $2,317,512, the expenditures $2,345,359. The public debt, which originated in 1752, amounted to £70,000 sterling in 1764, to £4000 in 1775 and to $698,000 in 1783. Part of the Revolutionary debt was paid in depreciated paper, part was assumed by the United States government, part was paid at various rates of depreciation between 1803 and 1820, and the remainder, $43,971, was repudiated in 1847. Other obligations had accumulated in the meantime, however, so that the debt in 1848 amounted to $187,000. This was gradually reduced until the Civil War, when it was increased to $3,889,000 by 1865. A sinking fund commission was established in 1875, and the entire sum was extinguished by the 1st of August 1894. The issue of bonds for the construction of the new capitol building and other purposes has led, however, to a new debt, which at the beginning of 1910 amounted to $4,800,000. There was at the same time a sinking fund of $654,999. Before the adoption of the Federal constitution Rhode Island was badly afflicted with the paper money heresy. £5000 were printed in 1710, and from that time until 1751 there were nine separate issues. These were gradually retired, however, through the efforts of the mercantile classes, aided by the parliamentary statutes of 1751 and 1763, and by about 1763 the finances were again placed on a sound money basis. The influx of Continental currency gave some trouble during the War of Independence, but there were no further local issues until 1786, when £100,000 were issued.

The first banks organized in the state were the Providence Bank in 1791, the Bank of Rhode Island at Newport in 1795, and the Washington Bank at Westerly in 1800. Forty-four charters had been issued in 1826 and sixty in 1837. Partly through restrictive local legislation and partly as a result of the operation of the Suffolk system of redemption in Boston, these institutions were always conservative. During practically the entire period before the Civil War their note issues constituted a smaller proportion of the capital stock than those of any other state. By an act of 1858 which is still in force, annual reports must be presented to the state auditor. On the establishment of the national banking system, 1863–65, nearly all of the banks took out national charters. Since 1865 the most notable features have been the rise and decadence of the national banks and the rise of the trust companies. During the decade from 1890 to 1900 the deposits in the national banks increased only 5%, from $16,700,000 to $17,500,000; those of the trust companies increased 330%, from $12,000,000 to more than $40,000,000. During the period from 1890 to 1901 twenty national banks retired from business, and the total capital stock was reduced from about twenty millions to about thirteen millions of dollars.

History.—Rhode Island was founded by refugees from Massachusetts, who went there in search of religious and political freedom. The first settlements were made at Providence by Roger Williams (*q.v.*) in June 1636, and at Portsmouth on the island of Aquidneck by the Antinomians, William Coddington (1601–1678), John Clarke (1609–1676), and Anne Hutchinson (1591–1643), in March–April 1638.

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[1] Under the constitution of 1842 it was provided that there should be two sessions of the General Assembly annually: one at Newport in May, and the other in October to be held at South Kingstown once in two years, and the intermediate years alternately at Bristol and East Greenwich, an adjournment from the October session being held annually at Providence. In 1854 this was amended: one session was provided for to be held in Newport in May, an adjournment being held annually at Providence. And in 1900 by another amendment Providence became the only meeting-place of the General Assembly.

Becoming dissatisfied with conditions at Portsmouth, Coddington and Clarke removed a few miles farther south on the 29th of April 1639, and established a settlement at Newport. In a similar manner Warwick was founded in January 1643 by seceders from Providence under the lead of Samuel Gorton. The union of Portsmouth and Newport, March 12, 1640, was followed by the consolidation of all four settlements, May 19, 1647, under a patent of March 14, 1644, issued by the parliamentary board of commissioners for plantations. The particularistic sentiment was still very strong, however, and in 1651 the union split into two confederations, one including the mainland towns, Providence and Warwick; the other, the island towns, Portsmouth and Newport. A reunion was effected in 1654 through the influence of Roger Williams, and a charter was secured from Charles II. on the 8th of July 1663. In the patent of 1644 the entire colony was called Providence Plantations. On the 13th of March 1644 the Portsmouth-Newport General Court changed the name of the island from Aquidneck to the Isle of Rhodes or Rhode Island. The official designation for the province as a whole in the charter of 1663, therefore, was Rhode Island and Providence Plantations. The charter was suspended at the beginning of the Andros régime in 1686, but was restored again after the Revolution of 1689. The closing years of the 17th century were characterized by a gradual transition from the agricultural to the commercial stage of civilization. Newport became the centre of an extensive business in piracy, privateering, smuggling, and legitimate trade. Cargoes of rum, manufactured from West Indian sugar and molasses, were exported to Africa and exchanged for slaves to be sold in the southern colonies and the West Indies. The passage of the Sugar Act of April 5, 1764, and the steps taken by the British government to enforce the Navigation Acts seriously affected this trade. The people of Rhode Island played a prominent part in the struggle for independence. On the 9th of June 1772 the "Gaspee," a British vessel which had been sent over to enforce the acts of trade and navigation, ran aground in Narragansett Bay and was burned to the water's edge by a party of men from Providence. Nathanael Greene, a native of Rhode Island, was made commander of the Rhode Island militia in May 1775, and a major-general in the Continental army in August 1776, and in the latter capacity he served with ability until the close of the war. In the year 1776, General Howe sent a detachment of his army under General Henry Clinton to seize Newport as a base of operations for reducing New England, and the city was occupied by the British on the 8th of December 1776. To capture this British garrison, later increased to 6000 men, the co-operation of about 10,000 men (mostly New England militia) under Major-General John Sullivan, and a French fleet carrying 4000 French regulars under Count D'Estaing, was planned in the summer of 1778. On the 9th of August Sullivan crossed to the north end of the island of Rhode Island, but as the Frenchmen were disembarking on Conanicut Island, Lord Howe arrived with the British fleet. Count D'Estaing hastily re-embarked his troops and sailed out to meet Howe. For two days the hostile fleets manœuvred for positions, and then they were dispersed by a severe storm. On the 20th, D'Estaing returned to the port with his fleet badly crippled, and only to announce that he should sail to Boston to refit. The American officers protested but in vain, and on the 28th they decided to retreat to the north end of the island. The British pursued, and the next day there was a severe engagement in which the Americans were driven from Turkey and Quaker Hills. On the 30th the Americans, learning of the approach of Lord Howe's fleet with 5000 troops under Clinton, decided to abandon the island. The British evacuated Newport the 25th of October 1779, and the French fleet was stationed here from July 1780 to 1781.

The influence of Roger Williams's ideas and the peculiar conditions under which the first settlements were established have tended to differentiate the history of Rhode Island from that of the other New England states. In 1640 the General Court of Massachusetts declared that the representatives of Aquidneck were "not to be capitulated withal either for themselves or the people of the isle where they inhabit," and in 1644 and again in 1648 the application of the Narragansett settlers for admission to the New England Confederacy was refused except on condition that they should pass under the jurisdiction of either Massachusetts or Plymouth. Rhode Island was one of the first communities in the world to advocate religious freedom and political individualism.

The individualistic principle was shown in the jealousy of the towns toward the central government, and in the establishment of legislative supremacy over the executive and the judiciary. The legislature migrated from county to county up to 1854, and there continued to be two centres of government until 1900. The dependence of the judiciary upon the legislature was maintained until 1860, and the governor is still shorn of certain powers which are customary in other states (see *Administration*). In the main the rural towns have adhered most strongly to the old individualistic sentiment, whereas the cities have kept more in touch with the modern nationalistic trend of thought. This was shown, for example, in the struggle for the ratification of the Federal constitution. Under the Articles of Confederation it was principally Rhode Island that defeated the proposal to authorize Congress to levy an impost duty of 5% mainly as a means of meeting the debts of the Central government. When the constitutional convention met in Philadelphia in 1787 to frame a constitution for a stronger Federal government, the agriculturists of Rhode Island were afraid that the movement would result in an interference with their local privileges, and especially with their favourite device of issuing paper money, and the state refused to send delegates, and not until the Senate had passed a bill for severing commercial relations between the United States and Rhode Island, did the latter, in May 1790, ratify the Federal constitution, and then only by a majority of two votes. Rhode Island, like the rest of New England, was opposed to the War of 1812 and the Mexican War. During the Civil War it sent 23,457 men into the service of the Union.

The economic transition of the later 17th century from the agricultural to the commercial régime was followed by a further transition to the manufacturing régime during the closing years of the 18th and the early years of the 19th centuries. Commercial interests have been almost entirely destroyed, partly because of the abolition of the slave trade and partly because of the embargo and the war of 1812, but mainly because the cities of the state are unfavourably situated to be the termini of interstate railway systems. Providence, owing to its superior water-power facilities, has therefore become one of the leading manufacturing centres of New England, whereas Newport is now known only as a fashionable summer resort. The movement as a whole was of exactly the same character as the industrial revolution in England, and it led to the same result, a struggle for electoral reform. The system of apportionment and the franchise qualifications were worked out to meet the needs of a group of agricultural communities. The charter of 1663 and the franchise law of 1724 established substantial equality of representation among the towns, and restricted the suffrage to freeholders. In the course of time, therefore, the small towns came to be better represented proportionally than the large cities, and the growing class of artisans was entirely disfranchised. The city of Providence issued a call for a constitutional convention in 1796, and similar efforts were made in 1799, 1817, 1821, 1822 and 1824, but nothing was accomplished. About 1840 Thomas W. Dorr (1805–1854), a young lawyer of Providence, began a systematic campaign for an extension of the suffrage, a reapportionment of representation and the establishment of an independent judiciary. The struggle, which lasted for several years, and in fact is not yet entirely over, was one between the cities and the country, between the manufacturers and the agriculturists. It was also complicated by racial and religious prejudices, a large proportion of the factory operatives being foreigners and Roman Catholics, and most of the country people native Protestants. The former were in general associated with the Democratic party, the latter with the Whigs. A convention summoned without any authority from the legislature, and elected on the principle of universal manhood suffrage, met at Providence, October 4–November 18, 1841, and drafted a frame of government which came to be known as the People's Constitution. A second convention met on the call of the legislature in February 1842 and adopted the so-called Freeman's Constitution. On being submitted to popular vote the former was ratified by a large majority (December 27, 28, 29, 1841), while the latter was rejected by a majority of 676 (March 21, 22, 23, 1842). At an election held on the 18th of April 1842 Dorr was chosen governor. The supreme court of the state and the president of the United States (Tyler) both refused to recognize the validity of the People's Constitution, whereupon Dorr and a few of his more zealous adherents decided to organize a rebellion. They were easily repulsed in an attack upon the Providence town arsenal, and Dorr, after a brief period of exile in Connecticut, was convicted of high treason on the 26th of April 1844, and was sentenced to imprisonment for life. He was released by act of the Assembly in June 1845, and was restored to the full rights of citizenship in May 1851. The Freeman's Constitution, modified by another convention, which held its session at Newport and East Greenwich, September 12–November 5, 1842, was finally adopted by popular vote on November 21–23, 1842. Only a partial concession was made to the demand for reform. The suffrage was extended to non-freeholders, but only to those of American birth. Representation in the lower house of the legislature was apportioned according to population, but only on condition that no city or town should ever elect more than one-sixth of the total number of members. Each city and town without regard to population was to elect one senator. In order to perpetuate this system the method of amending the constitution was made extremely difficult (see *Administration*). Since the adoption of the constitution the conditions have become worse owing to the extensive immigration of foreigners into the large cities and the gradual decay of the rural towns. From about 1845 to 1880 most of the immigrants were Irish, but since 1880 the French-Canadians have constituted the chief element. In 1900 over 30% of the population of the state was foreign-born. A constitutional amendment of 1888 extended to them the right of suffrage in state and national elections, and an amendment of 1909 partially remedied the evils in the system of apportionment. When the last Federal census was taken in 1910, Providence, Pawtucket, Woonsocket and Newport, with a combined population of 341,222, had four senators, whereas the remainder of the state, with a population of 201,452, had thirty-four. Providence, with a population of 224,326 out of a total of 542,674, had one member in a Senate of thirty-eight and twenty-five members in a House of Representatives of one hundred. The Republican machine finds it easy with the support of the millionaire summer colony at Newport and the street railway corporations to corrupt the French-Canadians and a portion of the native element in the rural towns and maintain absolute control of the state government. The majority has occasionally protested by electing a Democratic governor, but he has not been able to accomplish a great deal, because until 1909 he did not have veto power nor effectual means to induce the Senate to ratify his appointments. Bonds were issued on the 8th of November 1892 for the construction of a new state house at Providence, the corner stone was laid in October 1896, and the building was thrown open to use on the 1st of January 1901. A constitutional amendment of 1900 dispensed with the session of the legislature at Newport.

In presidential campaigns the state has been Federalist, 1792–1800; Democratic Republican, 1804; Federalist, 1808–1812; Democratic Republican, 1816–1820; Adams (Republican), 1824–1828; National Republican, 1832; Democratic, 1836; Whig, 1840–1848; Democratic, 1852; and Republican since 1856.

GOVERNORS OF RHODE ISLAND

Portsmouth		
William Coddington	Judge,	1638–1639
William Hutchinson	„	1639–1640
Newport		
William Coddington	Judge,	1639–1640
Portsmouth and Newport		
William Coddington	Governor,	1640–1647
PRESIDENTS UNDER THE PATENT OF 1644		
John Coggeshall		1647–1648
Jeremy Clarke		1648–1649
John Smith		1649–1650
Nicholas Easton		1650–1651
Providence and Warwick[1]		
Samuel Gorton	President,	1651–1652
John Smith	„	1652–1653
Gregory Dexter	„	1653–1654
Portsmouth and Newport		
John Sanford	President,	1653–1654
PRESIDENTS UNDER THE PATENT OF 1644		
Nicholas Easton		1654
Roger Williams		1654–1657
Benedict Arnold		1657–1660
William Brenton		1660–1662
Benedict Arnold		1662–1663
GOVERNORS UNDER THE CHARTER OF 1663		
Benedict Arnold		1663–1666
William Brenton		1666–1669
Benedict Arnold		1669–1672
Nicholas Easton		1672–1674
William Coddington		1674–1676
Walter Clarke		1676–1677
Benedict Arnold		1677–1678
William Coddington		1678
John Cranston		1678–1680
Peleg Sanford		1680–1683
William Coddington, 2nd		1683–1685
Henry Bull		1685–1686
Walter Clarke		1686[2]
John Coggeshall (acting)		1689–1690
Henry Bull		1690
John Easton		1690–1695
Caleb Carr		1695
Walter Clarke		1696–1698
Samuel Cranston		1698–1727
Joseph Jencks		1727–1732
William Wanton		1732–1733
John Wanton		1734–1740
Richard Ward		1740–1743
William Greene		1743–1745
Gideon Wanton		1745–1746
William Greene		1746–1747
Gideon Wanton		1747–1748
William Greene		1748–1755
Stephen Hopkins		1755–1757
William Greene		1757–1758
Stephen Hopkins		1758–1762
Samuel Ward		1762–1763
Stephen Hopkins		1763–1765
Samuel Ward		1765–1767
Stephen Hopkins		1767–1768
Josias Lyndon		1768–1769
Joseph Wanton		1769–1775
Nicholas Cooke		1775–1778
William Greene, 2nd		1778–1786
John Collins		1786–1790
Arthur Fenner,[3] Federalist and Democratic Republican		1790–1805
Paul Mumford (acting), Democratic Republican		1805
Henry Smith, „ „ „		1805–1806
Isaac Wilbour, „ „ „		1806–1807
James Fenner, Democratic Republican		1807–1811
William Jones, Federalist		1811–1817
Nehemiah R. Knight, Democratic Republican		1817–1821
William C. Gibbs, „ „		1821–1824
James Fenner[4] (Democratic Republican and National Republican)		1824–1831

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[1] A separation occurred in 1651 between the towns of Providence and Warwick on one side and Portsmouth and Newport on the other. They were reunited in 1654.

[2] The charter was suspended from 1686 to 1689, during which time the province was under the supervision of Sir Edmund Andros.

[3] Arthur Fenner became a Democratic Republican about 1800.

[4] James Fenner was a Democratic Republican to 1826, a National Republican (Adams) to 1829 and a Democrat (Jackson) to 1831.

Lemuel H. Arnold, National Republican	1831–1833
John B. Francis, Democrat and Anti-Masonic	1833–1838
William Sprague, Whig	1838–1839
Samuel W. King, Whig	1839–1843

Under the Constitution of 1842

James Fenner, Whig	1843–1845
Charles Jackson,[1] Democrat	1845–1846
Byron Diman, Whig	1846–1847
Elisha Harris, Whig	1847–1849
Henry B. Anthony, Whig	1849–1851
Philip Allen, Democrat	1851–1853
Francis M. Dimond (acting), Democrat	1853–1854
William W. Hoppin, Whig and American	1854–1857
Elisha Dyer, Republican	1857–1859
Thomas G. Turner, Republican	1859–1860
William Sprague,[2] Unionist	1860–1863
William C. Cozzens (acting), Unionist	1863
James Y. Smith, Republican	1863–1866
Ambrose E. Burnside, „	1866–1869
Seth Padelford, „	1869–1873
Henry Howard, „	1873–1875
Henry Lippitt, „	1875–1877
Charles C. Van Zandt, „	1877–1880
Alfred H. Littlefield, „	1880–1883
Augustus O. Bourn, „	1883–1885
George P. Wetmore, „	1885–1887
John W. Davis, Democrat,	1887–1888
Royal C. Taft, Republican,	1888–1889
Herbert W. Ladd, „	1889–1890
John W. Davis, Democrat	1890–1891
Herbert W. Ladd, Republican	1891–1892
D. Russell Brown, „	1892–1895
Charles W. Lippitt, „	1895–1897
Elisha Dyer, „	1897–1900
William Gregory, „	1900–1901
Charles Dean Kimball, Republican	1901–1903
L. F. C. Garvin, Democrat	1903–1905
George H. Utter, Republican	1905–1907
James H. Higgins, Democrat	1907–1909
Aram J. Pothier, Republican	1909–

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RHODES, CECIL JOHN (1853–1902), British colonial and Imperial statesman, was born on the 5th of July 1853, at Bishop Stortford, in Hertfordshire. His father was a clergyman, but he claimed descent from yeoman stock. Cecil John Rhodes was the fifth son in a large family of sons and daughters. At the time of his birth his father held the living of Bishop Stortford. The boy was educated at Bishop Stortford grammar school with the intention of preparing for the Church; but at the age of sixteen his health broke down, and in the latter part of 1870 he was sent to join an elder brother, then engaged in farming in Natal. In that year diamonds were discovered in the Kimberley fields. By the end of 1871 Mr Rhodes and his brother were among the successful diggers. The dry air of the interior restored Mr Rhodes's health, and before he was nineteen he found himself financially independent, physically strong and free to devote his life to any object which commended itself to his choice.

Rhodes has left behind him an interesting record of the manner in which he was affected by the situation. He determined to return to England, and to complete his education by reading for a degree at Oxford; but before doing so, he spent eight months in a solitary journey through the then little known parts of the country lying to the north of the Orange and Vaal rivers. He went through Bechuanaland to Mafeking, thence to Pretoria, Murchison, Middelburg and back through the Transvaal to Kimberley. The journey, made in an ox-wagon at a rate of progression of some 15 to 20 miles a day, represented a walking tour of eight months through the vast spaces of rolling veld which at that time filled those regions of Southern Africa. He saw one of the healthiest countries in the world barely occupied. He knew the agricultural possibilities of Natal. He knew its mineral wealth. The effect of the combined influences on his mind, in the circumstances in which he found himself, was profound. The idea took passionate possession of him that the fine country through which he moved ought to be secured for occupation by the British race, and that no power but Great Britain should be allowed to dominate in the administration of South Africa. When he brought his self-imposed pilgrimage to an end, he had found an object to which he proposed to devote his life. It was nothing less than the governance of the world by the British race. A will exists written in Mr Rhodes's own handwriting a couple of years later, when he was still only twenty-two, in which he states his reasons for accepting the aggrandizement and service of the British empire as his highest ideal of practical achievement. It ends with a single bequest of everything of which he might die possessed, for the furtherance of this great purpose. Five-and-twenty years later his final will carried out, with some difference of detail, the same intention.

The share which he allotted to himself in the general scheme was the extension of the area of British settlement in Africa, but he did not attempt to address himself immediately to public work. He returned, in accordance with his first resolve, to Oxford, where he matriculated at Oriel. In 1873 his health again failed, and he was sent back to South Africa under what was practically a death sentence. Years afterwards he saw the entry of his own case in the diary of the eminent physician whom he consulted, with a note, "Not six months to live." South Africa again restored him to health. Three years later he was back at Oxford, and from 1876 to 1878 he kept his terms. During this period he spent the Long Vacation each year in South Africa, where his large financial interests were daily increasing in importance. He was a member of the Cape ministry when, after a further lapse of years, he kept his last term and took his degree. He did not read hard at Oxford, and was more than once remonstrated with in the earlier terms for non-attendance at lectures. But he passed his examinations; and though he was never a student in the university sense of the term, he was to the end of his life a keen devourer of books. He kept always a special liking for certain classic authors. Aristotle was the guide whom as a lad he followed in seeking the "highest object" on which to exercise the

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[1] Jackson was a Liberation Whig—favouring the liberation of Dorr from prison—but he was elected on the Democratic ticket.

[2] Sprague was elected over the radical Republican candidate through a coalition of Democrats and conservative Republicans.

"highest activity of the soul." Marcus Aurelius was his constant companion. There exists at Grote Schuur a copy of the *Meditations* deeply scored with Mr Rhodes's marks.

During this Oxford time, and on to 1881, Mr Rhodes was occupied with the amalgamation of the larger number of the diamond mines of Kimberley with the De Beers Company, an operation which established his position as a practical financier and gave him an important connexion and following in the business world. To many admirers who shared his ideas on public questions his connexion with the financial world and his practical success were a stumbling-block. It was often wished for him that he had "kept himself clear of all that." But this was not his own view. His ideals were political and practical. To him the making of money was a necessary preliminary to their realization, and he was proud of his practical ability in this direction. He was personally a man of most simple tastes. His immense fortune was spent in the execution of his ideals, and it has been justly said of him that he taught the world a new chapter of the romance of wealth.

In 1881 Mr Rhodes entered public life as a member of the Cape assembly. It was the year of the Majuba settlement. South Africa was convulsed with questions which had arisen between the British and the Dutch, and leaders of Dutch opinion at the Cape ventured to speak openly of the formation of a United States of South Africa under its own flag. The British party needed a rallying-ground, and Mr Rhodes took his stand on a policy of local union combined with the consolidation and expansion of Imperial interests. He offered to Dutch and British alike the ideal of a South African Federation governing itself within the empire, and extending, by its gradual absorption of native territories, the range of Imperial administration. Local self-government was, in his opinion, the only enduring basis on which the unity of the empire could be built, and throughout his life he was as keen a defender of local rights as he was of Imperial unity. There was a period somewhat later in his career when this attitude on his part gave rise to a good deal of misapprehension, and his advocacy of the elimination of direct Imperial interference in local affairs caused him to be viewed in certain quarters with suspicion as a Separatist and Independent. Those who were inclined to take this view were greatly strengthened in their suspicions by the fact that at a critical moment in the struggle for Home Rule in Ireland Mr Rhodes contributed £10,000 to the funds of the Separatist party. The subsequent publication of his correspondence on the subject with Mr Parnell, who was at that time leading the Home Rule party, demonstrated, however, the essential fact that, whatever might have been the secret intentions of the extreme Irish Home Rulers, Mr Rhodes's contribution was made strictly subject to the retention of the Irish members at Westminster. He remained of the opinion that the Home Rule movement, wisely treated, would have had a consolidating and not a disruptive effect upon the organization of the empire.

In South Africa the influence which he acquired over the local independents and over the Dutch vote was subsequently an important factor in enabling him to carry out the scheme of northern expansion which he had at heart, and which he had fully developed in his own mind at Oxford in 1878. In 1881 the Bechuana territory was a sort of no man's land through which ran the trade routes to the north. It was evident that any power which commanded the trade routes would command the unknown northern territory beyond. The Pretoria Convention of 1881 limited the westward extension of the Transvaal to a line east of the trade routes. Nevertheless, the reconstituted republic showed itself anxious to encroach by irregular overflow into native territories, and Mr Rhodes feared to see the extension of the British colonies permanently blocked by Dutch occupation. One of his first acts as a member of the Cape assembly was to urge the appointment of a delimitation commission. He served in person on the commission, and obtained from the chief Mankoroane, who claimed about half of Bechuanaland, a formal cession of his territories to the British government of the Cape. The Cape government refused to accept the offer. In February 1884 a second convention signed in London again defined the western frontier of the Transvaal, Bechuanaland being left outside the republic. With the consent of Great Britain, Germany had occupied, almost at the same time, the territory on the Atlantic coast now known as German South-West Africa. In August 1884 Mr Rhodes was appointed resident deputy commissioner in Bechuanaland, where, notwithstanding the conventions to the contrary, Boers had ousted the natives from considerable areas and set up the so-called republics of Goshen and Stellaland. An old Dutchman who knew the value of the position said privately to Mr Rhodes, "This is the key of South Africa." The question at issue was whether Great Britain or the Transvaal was to hold the key. It was a question about which at that time the British public knew nothing and cared nothing. Mr Rhodes made it his business to enlighten them. President Kruger, speaking for the government of the Transvaal, professed to regard the Dutch commandoes as freebooters, and to be unable to control them. It devolved upon Great Britain to oblige them to evacuate the territory. Largely as the result of Mr Rhodes's exertions the necessary step was taken. The Warren expedition of 1884–85 was sent out. In the presence of British troops upon the frontier President Kruger recovered his controlling power over the Transvaal burghers, and without any fighting the commandoes were withdrawn. Thereupon southern Bechuanaland was declared to be British territory, while a British protectorate was declared over the northern regions up to the 22nd parallel (September 1885).

It was the first round in the long duel fought on the field of South Africa between Mr Rhodes, as the representative of British interests, and President Kruger, as the head of the militant Dutch party. The score on this occasion was to Mr Rhodes, and the entrance to the interior was secured. But the 22nd parallel was far short of the limits to which Mr Rhodes hoped to see British influence extend, and he feared lest Germany and the Transvaal might yet join hands in the native territory beyond, and bar his farther progress towards the north. The discovery of gold on the Witwatersrand in 1886, by adding to the wealth and importance of the Transvaal, gave substance to this fear.

The territory to the north of the 22nd parallel was at that time under the domination of Lobengula, chief of the Matabele, a native potentate celebrated alike for his ability and for the despotic character of his rule. There were rumours of Dutch and German emissaries at the kraal of Lobengula, engaged in persuading that chief to cede certain portions of his territory. Portugal also was putting forward shadowy claims to the country. It was in these circumstances that Mr Rhodes conceived the idea of forming a British Chartered Company, which should occupy the territory for trading and mining purposes as far as the Zambezi, and bring the whole under the protection of Great Britain. The idea took shape in 1887, in which year Mr Rhodes's first emissaries were sent to Lobengula. The charter of the British South Africa Company was granted in October 1889. Between the two dates his conception of the possibilities to be achieved by the Company had expanded. Mr Rhodes no longer limited the sphere of his operations to the Zambezi, but, crossing the river at the back of the Portuguese settlements at its mouth, he obtained permission to extend the territories of the Chartered Company to the southern end of Lake Tanganyika, including within the sphere of its operations the British settlements already made in Nyasaland. He hoped to go farther still, and to create a connected chain of British possessions through the continent which might eventually justify the description, "Africa British from the Cape to Cairo." The treaty negotiated between Great Britain and Germany in 1890 extended the German sphere of influence from the East Coast to the frontier of the Congo Free State, and defeated this hope. But Mr Rhodes did not wholly renounce the idea. In 1892, when the question of the retention or abandonment of Uganda hung in the balance at home, he threw all the weight of his influence into the scale of retention, and undertook at his own personal expense to connect that territory by telegraph with British possessions in the south. In the following year, 1893, it was found inevitable to fight the Matabele, and a war, prosecuted with a success that is perhaps unique of its kind, placed the country entirely in British hands. The territory thus added to the British empire covered an extent of 450,000 square miles, of which large portions consist of healthy uplands suitable for white colonization. The pioneer party who constructed the first road and founded the first British stations in the country received their orders to cross the frontier in the end of 1889. By the end of 1899, before the outbreak of the South African War, though the country had passed through the trial of a war, two native rebellions, and the scourge of rinderpest, it had become, under the name of Rhodesia, a well-settled province of the British empire, with a white population of some 12,000 to 13,000 persons.

The six years which followed the granting of the charter may be regarded as the most successful of a singularly successful life. In 1890, not many months after the granting of the charter, Mr Rhodes accepted the position of prime minister of the Cape. He was maintained in power very largely by the Dutch vote, which he spared no pains to conciliate; and having the confidence of both political sections of the colony, he found himself practically in a position to play the part of benevolent despot in South Africa. He used the position well so far as the public was concerned. While his scheme of northern expansion was making the rapid progress which has been indicated, he did much to elevate and to enlarge the field of local politics. He frankly declared and worked for the policy of uniting British and Dutch interests in South Africa; he took a keen interest in local education. He also during this period carried through some important reforms in native policy. He had the courage to restrict the franchise, introducing an educational test and limiting the exercise of voting power to men enjoying an income equal to a labourer's wage—thus abolishing, without making any distinction of colour, the abuses of what was known as the "blanket" vote.

But his native policy was far from being one of simple restriction. He liked the natives; he employed them by thousands in the mining industry, he kept native servants habitually about his person he seemed to understand their peculiarities and was singularly successful in dealing with them. The first canon of his native policy was that liquor should be kept from them; the second, that they should be encouraged to labour, and guaranteed the full possession of their earnings; the third, that they should be educated in the practical arts of peace. He appreciated the full importance of raising their territorial condition from one of tribal to individual tenure; and while he protested against the absurdity of permitting the uncivilized Kaffir to vote on questions of highly civilized white policy, he believed in applying to the native for his own native affairs the principle of self-government. Of these views some received practical embodiment in the much-disputed act known as the Glen Grey Act of 1894. In this connexion it may also be noted that he was one of the warmest and most convinced supporters of Lovedale, the very successful missionary institution for the education of natives in South Africa.

The position of benevolent despot has obvious drawbacks. In Mr Rhodes's case the dependence which the populations of Cape Colony were led to place on him had its reaction on the public in a demoralizing loss of self-reliance, and for himself it must be admitted that the effect on the character of a man already much disposed to habits of absolutism in thought and action was the reverse of beneficial. Mr Rhodes felt himself to be far stronger than any man in his own surroundings; he knew himself to be actuated by disinterested motives in the aims which he most earnestly desired to reach. He was profoundly impressed by a sense of the shortness of life, and he so far abused his power as to become intolerant of any sort of control or opposition. The inevitable result followed, that though Mr Rhodes did much of great and good work during the six years of his supreme power, he entirely failed during that period to surround himself, as he might have done, by a circle of able men fit to comprehend and to carry on the work to which his own best efforts were directed. To work with him was practically impossible for those who were not willing to accept without demur the yoke of dogmatic authority. He had a few devoted personal friends, who appreciated his aims and were inspired by his example; but he was lacking in regard for individuals, and a great part of his daily life was spent in the company of satellites and instruments, whom he used with cynical unconcern for the furtherance of his ends.

In 1896 the brilliant period of his premiership was brought to an end by the incident which became famous under the name of the Jameson Raid. The circumstances which led to the Raid belong properly to the history of the Transvaal. It is enough to say briefly here that the large alien population which had been attracted to the Transvaal by the phenomenal wealth of the Johannesburg goldfields, conceiving themselves to have reason to revolt against the authority of the Transvaal government, resolved towards the end of 1895 to have recourse to arms in order to obtain certain reforms. Mr Rhodes, as a large mine-owner, was theoretically a member of the mining population. In this capacity he was asked to give his countenance to the movement. But as prime minister of a British colony he was evidently placed in a false position from the moment in which he became cognizant of a secret attempt to overturn a neighbouring government by force of arms. He did more than become cognizant. The subsequent finding of a Cape committee, which he accepted as accurate, was to the effect that "in his capacity as controller of the three great joint-stock companies, the British South Africa Company, the De Beers Consolidated Mines, and the Gold Fields of South Africa, he directed and controlled the combination which rendered such a proceeding as the Jameson Raid possible." He gave money, arms and influence to the movement; and as the time fixed for the outbreak of the revolution approached, he allowed Dr Jameson, who was then administrator of the British South Africa Company in Rhodesia, to move an armed force of some 500 men upon the frontier. Here Mr Rhodes's participation in the movement came to an end. It became abundantly clear from subsequent inquiry that he was not personally responsible for what followed. A cipher correspondence, seized and published by the Boers, left the civilized world in no doubt as to Mr Rhodes's share in the previous preparation, and he was for a time believed to be responsible for the Raid itself. Subsequent inquiries held by committees of the Cape parliament and of the British House of Commons acquitted him entirely of responsibility for Dr Jameson's final movement, but both committees found that he had acted in a manner which was inconsistent with his duty as prime minister of the Cape and managing director of the British South Africa Company.

He displayed, in the circumstances, characteristic qualities of pluck and candour. He made no concealment of his own share in the catastrophe; he took full responsibility for what had been done in his name by subordinates, and he accepted all the consequences which ensued. He resigned his premiership of the Cape (January 1896); and, recognizing that his presence was no longer useful in the colony, he turned his attention to Rhodesia. His design was to live in that country, and to give all the stimulus of his own presence and encouragement to the development of its resources. The Matabele rebellion of March 1896 intervened to prevent the immediate realization of his plans. In June Imperial troops were sent up, and by the end of July the result of the military operations had driven the natives to the Matoppo Hills, where they held a practically impregnable position. The prospect was of continued war, with a renewal of a costly campaign in the following year. Mr Rhodes conceived the idea that he might effect single-handed the pacification which military skill had failed to compel. To succeed, it was essential that he should trust and be trusted. He accordingly moved his tent away from the troops to the base of the Matoppo Hills. He lay there quietly for six weeks, in the power of the enemy if they had chosen to attack. Word was circulated among the natives that he had come alone and undefended to hear their side of the case. A council was held by them in the very depths of the hills, where no armed force could touch them. He was invited to attend it. It was a case of staking his life on trust. He displayed no hesitation, but mounted and rode unarmed with the messenger. Three friends rode with him. The confidence was justified. They met the assembled chiefs at the place appointed. The native grievances were laid before Mr Rhodes. At the end of a long discussion Mr Rhodes, having made and exacted such concessions as he thought fit, asked the question, "Now, for the future is it peace or is it war?" And the chiefs, laying down their sticks as a symbol of surrendered arms, declared, "We give you one word: it is peace." The scene, as described by one of the eye-witnesses, was very striking. Mr Rhodes, riding away, characterized it simply as "one of the scenes which make life worth living."

His life was drawing towards its end. He had still a few years, which he devoted with success to the development of the country which bore his name. The railway was brought to Bulawayo, and arrangements were made for carrying the line on in sections as far as the south end of Lake Tanganyika, a construction which was part of his pet scheme for connecting the Cape by a British line of communication with Cairo. He also concluded arrangements for carrying a telegraphic land line through to Egypt, and had the satisfaction of seeing the mineral development of the country fairly started. But the federal union of South Africa, to which he had always worked as the secure basis of the extension of British rule in the southern half of the continent, was not for him to see. The South African War broke out in 1899. Mr Rhodes took his part at Kimberley in sustaining the hardships of a siege; but his health was broken, and though he lived to see victory practically assured to British arms, peace had not been concluded when, on the 26th of March 1902, he died at Muizenberg, near Cape Town.

His life's work did not end actually with his death. He left behind him a will in which he dedicated his fortunes, as he had dedicated himself, exclusively to the public service. He left the bulk of his vast wealth for the purpose of founding scholarships at Oxford of the value each of £300 a year, to be held by students from every important British colony, and from every state and Territory of the United States of America. The sum so bequeathed was very large; but it was not for the munificence of the legacy that the will was received with acclamation throughout the civilized world: it was for the striking manifestation of faith which it embodied in the principles that make for the enlightenment and peace and union of mankind, and for the fine constancy of Mr Rhodes's conviction that the unity of the British Empire, which he had been proud to serve, was among the greatest of organized forces uniting for universal good. The will was drawn up some years before his death. A codicil, signed during the last days of his life, gave evidence of some enlargement of his views as to the association of races necessary in order to secure the peace of the world, and added to the original scheme a certain number of scholarships to be held at the disposal of German students.

The publication of the will silenced Mr Rhodes's detractors and converted many of his critics. It set a seal which could not be mistaken upon his completed life. The revulsion of sentiment towards him was complete, and his name passed at once in the public estimation to the place which it is probably destined to take in history, as one which his countrymen are proud to count among the great makers of the British Empire.

See the *Life* by Sir Lewis Michell (2 vols., London, 1910); consult also Sir T. E. Fuller, *Cecil John Rhodes: A Monograph and a Reminiscence* (London, 1910), and "Vindex," *Cecil Rhodes: His Political Life and Speeches* (London, 1900). (F. L. L.)

The Rhodes Scholarships.—The scholarship system founded by the will of Cecil Rhodes provides in perpetuity for the support at Oxford, for a term of three years each, of about 175 selected scholars. Each scholar from the colonies and the United States has an allowance of £300 per annum during the continuance of his scholarship; those from Germany, as being nearer to Oxford, an allowance of £250 each. In each province of Canada, in each state of Australia, in the four collegiate schools of Cape Colony (Rondebosch, Stellenbosch, South African College, and St Andrew's College, Grahamstown), in the dominion of New Zealand, and in the colonies of Natal, Jamaica, Bermuda and Newfoundland, a scholar is elected each year. Three scholarships annually are assigned to Rhodesia. Each state and Territory of the American Union is entitled to have two scholars in residence, so that an election takes place in two years out of three. Five scholarships are provided annually for scholars from Germany.

In his will Rhodes mentions the objects he had in view in founding the different scholarships:—

1. *Colonial.*—"I consider that the education of young colonists at one of the universities in the United Kingdom is of great advantage to them for giving breadth to their views, for their instruction in life and manners, and for instilling into their minds the advantage to the colonies as well as to the United Kingdom of the retention of the unity of the empire."

2. *American.*—"I also desire to encourage and foster an appreciation of the advantages which I implicitly believe will result from the union of the English-speaking people throughout the world, and to encourage in the students from the United States of North America who will benefit from the American scholarships to be established for the reason above given at the university of Oxford under this my will an attachment to the country from which they have sprung, but without, I hope, withdrawing them or their sympathies from the land of their adoption or birth."

3. *German.*—"I note the German emperor has made instruction in English compulsory in German schools. I leave five yearly scholarships at Oxford of £250 per annum to students of German birth, the scholars to be nominated by the German emperor for the time being. Each scholarship to continue for three years, so that each year after the first three there will be fifteen scholars. The object is that an understanding between the three Great Powers will render war impossible and educational relations make the strongest tie."

He defines as follows the principles on which he wished his scholars to be selected:—

"My desire being that the students who shall be elected to the scholarships shall not be merely bookworms, I direct that in the election of a student to a scholarship regard shall be had to (1) his literary and scholastic attainments; (2) his fondness for and success in manly outdoor sports such as cricket, football and the like; (3) his qualities of manhood, truth, courage, devotion to duty, sympathy for and protection of the weak, kindliness, unselfishness and fellowship; and (4) his exhibition during school days of moral force of character and of instincts to lead and to take an interest in his schoolmates, for those latter attributes will be likely in after life to guide him to esteem the performance of public duties as his highest aim."

The trustees named in the will for the management of the trust were Lord Rosebery, Lord Grey, Lord Milner, Sir Lewis Michell, Dr L. S. Jameson, Mr Alfred Beit and Mr Bourchier F. Hawksley.

After consultation with the educational authorities of all the communities to which scholarships are assigned, the trustees arranged a system for the selection of scholars. This system, which is subject to such changes as experience suggests, may be summarized as follows. Every candidate, in order to become eligible, is required to pass the Responsions examination of the university of Oxford, or some examination accepted by the university as an equivalent. In the case of communities possessing universities or colleges in affiliation with Oxford, a certain standing at those universities is accepted in lieu of Responsions. Examinations are held in two years out of three in each state of the American Union, and annually in colonies which do not have the affiliated universities or colleges referred to. German scholars are nominated by his majesty the emperor of Germany. Candidates must be unmarried—must be between the ages of 19 and 25 (in Jamaica and Queensland, 18–25; in Newfoundland, 18–21; in Western Australia, 17–25), and they must be, in the colonies, British subjects—in the United States and Germany, subjects of those countries. In each British colony electing scholars and in each state of the Union there is a committee of selection, composed commonly of leading educational authorities or high public officials. To these committees all candidates who have passed the qualifying tests submit their claims. The committees are entrusted with the power of selection, but are expected to exercise this power, as closely as circumstances permit, in accordance with the suggestions made by Rhodes. The trust arranges for the distribution of elected scholars among the colleges of Oxford, each of which has agreed to receive a limited number of approved candidates. (G. R. P.)

RHODES, JAMES FORD (1848–), American historian, was born in Cleveland, Ohio, on the 1st of May 1848. He entered the university of New York as a special student in 1865, studied at the university of Chicago in 1866–67, and at the Collège de France in 1867–68, and in 1868 served as occasional Paris correspondent to the Chicago *Times.* He then took a course in metallurgy in the School of Mines, at Berlin; subsequently inspected iron and steel works in western Germany and in Great Britain; and in 1870 joined his father in the iron, steel and coal business in Cleveland, becoming a member of the firm in 1874. He retired from business with an ample fortune in 1885, and after two years devoted to general reading and travel he began his *History of the United States from the Compromise of 1850*, which, closing the narrative with the year 1877, was published in seven volumes in 1893–1906. In recognition of the merit of his work he received honorary degrees from various American universities, was elected president of the American Historical Association in 1899, and received the Loubat prize of the Berlin Academy of Sciences in 1901. In 1909 he published a volume of *Historical Essays.*

RHODES, the most easterly of the islands of the Aegean Sea, about 10 m. S. of Cape Alypo in Asia Minor. It forms, with the islands of Syme, Casos, Carpathos, Castelorizo, Telos and Charki, one of the four sanjaks into which the Archipelago vilayet of Turkey is divided. The governor-general of the vilayet resides at the town of Rhodes. The length of the island is about 45 m. from N.E. to S.W., its greatest breadth 22 m., and its area nearly 424 sq. m. The population of the island comprises 7000 Moslems, 21,000 Christians, and 2000 Jews.

The island is diversified in its surface, and is traversed from north to south by an elevated mountain range, the highest point of which is called Atairo (anc. *Atabyris* or *Atabyrium*) (4560 ft.). It commands a view of the elevated coast of Asia Minor towards the north, and of the Archipelago, studded with its numerous islands, on the north-west; while on the south-west is seen Mount Ida in Crete, often veiled in clouds, and on the south and south-east the vast expanse of waters which wash the African shore. The rest of the island is occupied in great part by ranges of moderately elevated hills, on which are found extensive woods of ancient pines, planted by the hand of nature. These forests were formerly very thick, but they are now greatly thinned by the Turks, who cut them down and take no care to plant others in their place. Beneath these hills the surface of the island falls lower, and several hills in the form of amphitheatres extend their bases as far as the sea.

Rhodes was famed in ancient times for its delightful climate, and it still maintains its former reputation. The winds are liable to little variation; they blow from the west, often with great violence, for nine months in the year, and at other times from the north; and they moderate the summer heats, which are chiefly felt during the months of July and August, when the hot winds blow from the coast of Anatolia.

Rhodes, in addition to its fine climate, is blessed with a fertile soil, and produces a variety of the finest fruits and vegetables. Around the villages are extensive cultivated fields and orchards, containing fig, pomegranate and orange trees. On the sloping hills carob trees, and others both useful and agreeable, still grow abundantly; the vine also holds its place, and produces a species of wine which was highly valued by the ancients, though it seems to have degenerated greatly in modern times. The valleys afford rich pastures, and the plains produce every species of grain.

The commerce of the island has been of late years increasing at a rapid rate. Many British manufactures are imported by indirect routes, through Smyrna, Constantinople, Beyrout and other places. Cotton stuffs, calicoes and grey linen are among the goods most in demand; they are exported to the neighbouring coast of Anatolia, between Budrum and Adalia, and thence conveyed into the interior. The expansion of the trade has been very much owing to the establishment of steam navigation direct to the island, which is now visited regularly by French and Austrian steamers, as well as by some from England to Symrna.

The only town of any importance in the island is the capital, Rhodes, which stands at the north-east extremity. It rises in an imposing manner from the sea, on a gentle slope in the form of an amphitheatre. It is surrounded with walls and towers, and defended by a large moated castle of great strength. These fortifications are all the work of the Knights of St John. The interior of the city does not correspond to its outward appearance. No trace exists of the splendour of the ancient city, with its regular streets, well-ordered plan and numerous public buildings. The modern city of Rhodes is in general the work of the Knights of St John, and has altogether a medieval aspect. The picturesque fortifications also by which the city is surrounded remain almost unaltered as they were in the 15th century. The principal buildings which remain are the church of St John, which is become the principal mosque; the hospital, which has been transformed into public granaries; the palace of the grand master, now the residence of the pasha; and the senate-house, which still contains some marbles and ancient columns. Of the streets, the best and widest is a long street which is still called the Street of the Knights. It is perfectly straight, and formed of old houses, on which remain the armorial bearings of the members of the order. On some of these buildings are still seen the arms of the popes and of some of the royal and noble houses of Europe.

The only relics of classical antiquity are the numerous inscribed altars and bases of statues, as well as architectural fragments, which are found scattered in the courtyards and gardens of the houses in the extensive suburbs which now surround the town, the whole of which were comprised within the limits of the ancient city. The foundations also of the moles that separate the harbours are of Hellenic work, though the existing moles were erected by the Knights of St John.

Rhodes has two harbours. The lesser of these lies towards the east, and its entrance is obstructed by a barrier of rocks, so as to admit the entrance of but one ship at a time. It is sufficiently sheltered, but by the negligence of the Turks the sand has been suffered to accumulate until it has been gradually almost choked up. The other harbour is larger, and also in a bad condition; here small ships may anchor, and are sheltered from the west winds, though they are exposed to the north and north-east winds. The two harbours are separated by a mole which runs obliquely into the sea. At the eastern entrance is the fort of St Elmo, with a lighthouse.

History.—It is as yet difficult to determine the part which Rhodes played in prehistoric days during the naval predominance of the neighbouring island of Crete; but archaeological remains dating from the later Minoan age prove that the early Aegean culture maintained itself there comparatively unimpaired until the historic period. A similar conclusion may be drawn from the legend which peopled primitive Rhodes with a population of skilful workers in metal, the "Telchines." Whatever the racial affinities of the early inhabitants may have been, it is certain that in historic times Rhodes was occupied by a Dorian population, reputed to have emigrated mainly from Argos subsequently to the "Dorian invasion" of Greece. The three cities founded by these settlers—Lindus, Ialysus and Camirus—belonged to the "League of Six Cities," by which the Dorian colonists in Asia Minor sought to protect themselves against the barbarians of the neighbouring mainland. The early history of these towns is a record of brisk commercial expansion and active colonization. The position of Rhodes as a distributing centre of Levantine and especially of Phoenician goods is well attested by archaeological finds. Its colonies extended not only eastward along the southern coast of Asia Minor, but also linked up the island with the westernmost parts of the Greek world. Among such settlements may be mentioned Phaselis in Lycia, perhaps also Soli in Cilicia, Salapia on the east Italian coast, Gela in Sicily, the Lipari islands, and Rhoda in north-east Spain. In home waters the Rhodians exercised political control over Carpathos and other islands.

The history of Rhodes during the Persian wars is quite obscure. In the 5th century the three cities were enrolled in the Delian League, and democracies became prevalent. In 412 the island revolted from Athens and became the headquarters of the Peloponnesian fleet. Four years later the inhabitants for the most part abandoned their former residences and concentrated in the newly founded city of Rhodes. This town, which was laid out on an exceptionally fine site according to a scientific plan by the architect Hippodamus of Miletus, soon rose to considerable importance, and attracted much of the Aegean and Levantine commerce which had hitherto been in Athenian hands. In the 4th century its political development was arrested by constant struggles between oligarchs and democrats, who in turn brought the city under the control of Sparta (412–395, 391–378), of Athens (395–391, 378–357), and of the Carian dynasty of Maussollus (357–340). It seems that about 340 the island was conquered for the Persian king by his Rhodian admiral Mentor; in 332 it submitted to Alexander the Great. Upon Alexander's death the people expelled their Macedonian garrison, and henceforth not only maintained their independence but acquired great political influence. The expansion of Levantine trade which ensued in the Hellenistic age brought especial profit to Rhodes, whose standard of coinage and maritime law became widely accepted in the Mediterranean. Under a modified type of democracy, in which the chief power would seem to have rested normally with the six *πρυτάνεις*, or heads of the executive, the city enjoyed a long period of remarkably good administration. The chief success of the government lay in the field of foreign politics, where it prudently avoided entanglement in the ambitious schemes of Hellenistic monarchs, but gained great prestige by energetic interference against aggressors who threatened the existing balance of power or the security of the seas. The chief incidents of Rhodian history during this period are a memorable siege by Demetrius Poliorcetes in 304, who sought in vain to force the city into active alliance with King Antigonus by means of his formidable fleet and artillery; a severe earthquake in 227, the damages of which all the other Hellenistic states contributed to repair, because they could not afford to see the island ruined; some vigorous campaigns against Byzantium, the Pergamene and the Pontic kings, who had threatened the Black Sea trade-route (220 sqq.), and against the pirates of Crete. In accordance with their settled policy the Rhodians eagerly supported the Romans when these made war upon Philip V. of Macedon and Antiochus III. of Syria on behalf of the minor Greek states. In return for their more equivocal attitude during the Third Macedonian War they were deprived by Rome of some possessions in Lycia, and damaged by the partial diversion of their trade to Delos (167). Nevertheless during the two Mithradatic wars they remained loyal to the republic, and in 88 successfully stood a siege by the Pontic king. The Rhodian navy, which had distinguished itself in most of these wars, did further good service on behalf of Pompey in his campaigns against the pirates and against Julius Caesar. A severe blow was struck against the city in 43 by C. Cassius, who besieged and ruthlessly plundered the people for refusing to submit to his exactions. Though Rhodes continued a free town for another century, its commercial prosperity was crippled and a series of extensive earthquakes after A.D. 155 completed the ruin of the city.

In the days of its greatest power Rhodes became famous as a centre of pictorial and plastic art; it gave rise to a school of eclectic oratory whose chief representative was Apollonius Molon, the teacher of Cicero; it was the birthplace of the Stoic philosopher Panaetius; the home of the poet Apollonius Rhodius and the historian Posidonius. Protogenes embellished the city with his paintings, and Chares of Lindus with the celebrated colossal statue of the sun-god, which was 105 ft. high. The colossus stood for fifty-six years, till an earthquake prostrated it in 224 B.C. Its enormous fragments continued to excite wonder in the time of Pliny, and were not removed till A.D. 656, when Rhodes was conquered by the Saracens, who sold the remains for old metal to a dealer, who employed nine hundred camels to carry them away. The notion that the colossus once stood astride over the entrance to the harbour is a medieval fiction. During the later Roman empire Rhodes was the capital of the province of the islands. Its history under the Byzantine rule is uneventful, but for some temporary occupations by the Saracens (653–658, 717–718), and the gradual encroachment of Venetian traders since 1082. In the 13th century the island stood as a rule under the control of Italian adventurers, who were, however, at times compelled to acknowledge the overlordship of the emperors of Nicaea, and failed to protect it against the depredations of Turkish corsairs. In 1309 it was conquered by the Knights Hospitallers of St John of Jerusalem at the instigation of the pope and the Genoese, and converted into a great fortress for the protection of the southern seas against the Turks. Under their mild and just rule both the native Greeks and the Italian residents were able to carry on a brisk trade. But the piratical acts of these traders, in which the knights themselves sometimes joined, and the strategic position of the island between Constantinople and the Levant, necessitated its reduction by the Ottoman sultans. A siege in 1480 by Mahomet II. led to the repulse of the Turks with severe losses; after a second investment, during which Sultan Suleiman I. is said to have lost 90,000 men out of a force of 200,000, the knights evacuated Rhodes under an honourable capitulation (1522). The population henceforth dwindled in consequence of pestilence and emigration, and although the island recovered somewhat in the 18th century under a comparatively lenient rule it was brought to a very low ebb owing to the severity of its governor during the Greek revolution. The sites of Lindus, Ialysus, and Camirus, which in the most ancient times were the principal towns of the island, are clearly marked, and the first of the three is still occupied by a small town with a medieval castle, both of them dating from the time of the knights, though the castle occupies the site of the ancient acropolis, of the walls of which considerable remains are still visible. There are no ruins of any importance on the site of either Ialysus or Camirus, but excavations at the latter place have produced valuable and interesting results in the way of ancient vases and other antiquities, which are now in the British Museum. Rhodes was again famous for its pottery in medieval times; this was a lustre ware at first imitated from Persian, though it afterwards developed into an independent style of fine colouring and rich variety of design.

See Pindar, *7th Olympian Ode*; Diodorus v. 55–59, xiii.–xx. *passim*; Polybius iv. 46–52, v. 88–90, xvi. 2–9, xxvii.-xxix. *passim*; C. Torr, *Rhodes in Ancient Times* (Cambridge, 1885), *Rhodes in Modern Times* (Cambridge, 1887); C. Schumacher, *De republica Rhodiorum commentatio* (Heidelberg, 1886); H. van Gelder, *Geschichte der alten Rhodier* (Hague, 1900); B. V. Head, *Historia Numorum* (Oxford, 1887), pp. 539–542; and Baron de Balabre, *Rhodes of the Knights* (1909).

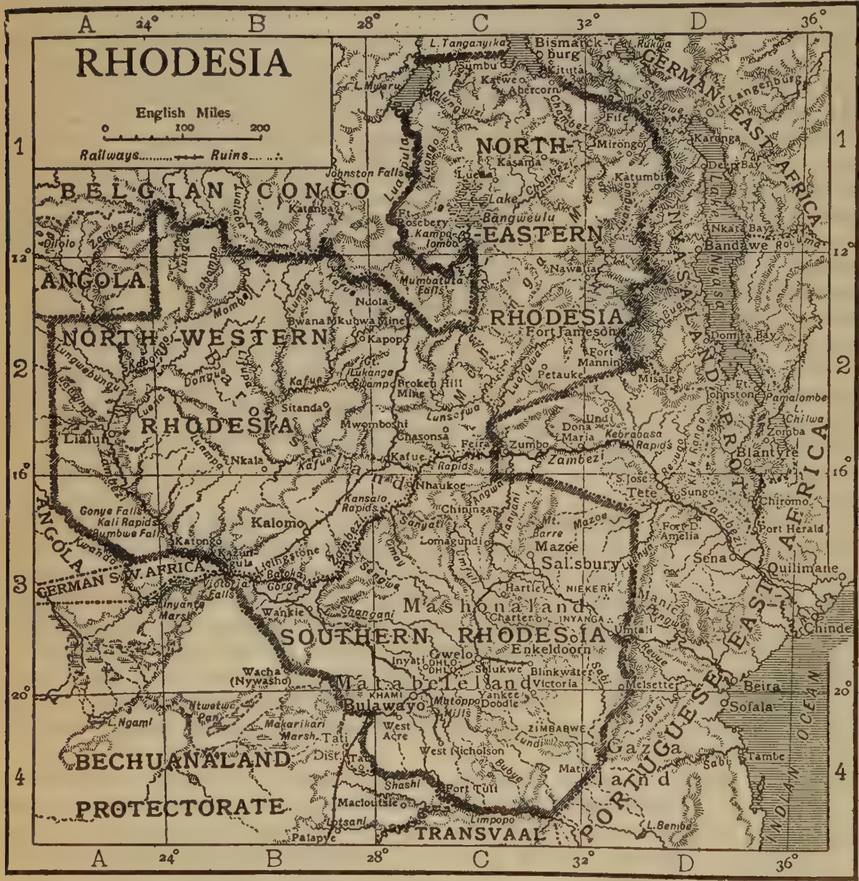
(E. H. B.; E. Gr.; M. O. B. C.)

RHODESIA (so named after Cecil Rhodes), an inland country and British possession in South Central Africa, bounded S. and S.W. by the Transvaal, the Bechuanaland Protectorate and German South-West Africa; W. by Portuguese West Africa. N.W. by Belgian Congo; N.E. by German East Africa; E. by the British Nyasaland Protectorate and Portuguese East Africa. It covers an area of about 450,000 sq. m., being larger than France, Germany and the Low Countries combined. It is divided into two parts of unequal size by the middle course of the Zambezi.

Southern Rhodesia, with an area of 148,575 sq. m., consists of Matabeleland and Mashonaland, the western and eastern provinces, while the trans-Zambezi regions are divided into North-Western Rhodesia (or Barotseland) and North-Eastern Rhodesia.

Physical Features.—Rhodesia forms part of the high tableland which constitutes the interior of Africa south of the Congo basin. Hydrographically the greater part of the country belongs to the basin of the Zambezi (*q.v.*), but in the N.E. it includes the eastern headstreams of the Congo, and in the S. and S.E. it is drained by the tributaries of the Limpopo, the Sabi and the Pungwe The Limpopo forms the boundary between Southern Rhodesia and the Transvaal. The north-western regions, drained by the upper Zambezi and its affluents, are described under Barotseland, and North-Eastern Rhodesia, together with the adjacent Nyasaland Protectorate, under British Central Africa. The highest portion of the tableland of Southern Rhodesia runs from the S.W. to the N.E. and forms a broad watershed between the tributaries of the Zambezi flowing north and the rivers flowing south and east. It is along this high plateau that the railway runs from Bulawayo to Salisbury and onwards to Portuguese East Africa. The elevation of the railway varies from 4500 ft. to 5500 ft. There is a gradual sloping away of the plateau to the N.W. and S.E., so that only a small portion of Southern Rhodesia is under 3000 ft. The eastern boundary, along Portuguese East Africa, forms the edge of the tableland; the height of the edge is accentuated by a series of ridges, so that the country here assumes a mountainous appearance, the grass-clad heights being reminiscent of the Cheviot Hills of Scotland or the lower Alps of Switzerland.

Geology.—The geology of this region is very imperfectly known. Metamorphic rocks extend over immense areas, but these and the other formations are to a great extent hidden beneath superficial deposits. Conglomerates and banded ironstone rocks are found in the metamorphic areas around Bulawayo and the borders of Katanga; but to what extent these represent the different formations older than the Karroo and newer than the Swaziland schists (see TRANSVAAL) has not been satisfactorily determined. Certain gold-bearing conglomerates are regarded as the equivalents of the Witwatersrand series, but the main sources of gold are the veins of quartz and igneous rocks developed in the metamorphic series. The Karroo formation is well represented, and covers extensive areas in the Zambezi basin. The Dwyka conglomerate appears to be developed in the Tuli district. The coal-bearing strata of Tuli and Wankies are certainly of Karroo age. They have yielded the fossil remains of fishes *Acrolepis molyneuxi*, the fresh-water mollusc *Palaeomutela*, a few reptilian bones, and species of *Glossopteris* among plants.



Emery Walker sc.

The age of a widely distributed series of red-white sandstones, named by Molyneux the Forest Sandstone, remains uncertain. Molyneux considers them Tertiary, but it is not improbable that sandstones of various ages from Karroo to those of Recent date are represented. They contain numerous interbedded sheets of basalt, but it is doubtful if any of these are of so recent a date as Tertiary. Rocks of Karroo age occur round Lake Bangweulu, and contain numerous fossil plants and a few small shells. The age of the wide, thick sheet of basalt, through which the Zambezi has cut the Batoka gorge between the Victoria Falls and Wankies, remains uncertain.[1]

Climate.—As Southern Rhodesia extends between 16° S. and 22° S., and is thus within the tropics, it might be expected that the climate would be trying for Europeans, but owing to the elevation of the country the temperature is rarely too high for comfort. Another factor that renders the climate equable is that the rainy season coincides with the summer months, and the winter months are dry. The nights are always cool, so that the climate approximates to the ideal. On the high tableland which forms the great proportion of the country the temperature in the shade rarely reaches 100° and there is just sufficient frost in the winter to be useful to farmers. The winter months are June, July and August, and the hottest months are the spring months of September, October and November, just before the rains begin. A temperature of 110° is sometimes reached in the low-lying district of Tuli (elevation 1890 ft.) and in the Zambezi valley. There is a striking difference between the minimum temperatures on the ground and those registered 4 ft. from the ground. The latter rarely reach freezing-point, but the ground temperature is sometimes as low as 24°. Hoar frost is most noticeable in the vleis and low-lying areas. The period known as the rainy season extends from September to March, but the greatest amount falls in the last three months of that period. The mean annual rainfall for various stations in the eastern half of Rhodesia ranges from 24 to 44 in., the greatest rainfall being along the eastern border. For the western half the mean ranges from 19 to 27 in., but in the south-west corner it is much drier, the rainfall so far recorded never reaching 18 in. There is a sufficiency of rain for all summer crops, but winter crops, such as wheat, must be assisted by irrigation. Malaria is prevalent in certain districts during the wet season, but this is now preventable and the country is very healthy, children, especially in towns and on the high veld, growing sturdily. The death-rate amongst Europeans is only about 15 per 1000.

Fauna.—Rhodesia is rich in the larger graminivorous animals, especially in antelope, which number about twenty-five varieties, including kudu, eland, hartebeeste, roan, sable, wildebeeste and impala. The most common are the duiker, the stembok and the rietbok. Other herbivorous animals found in the country are the buffalo, giraffe, zebra, elephant, hippopotamus, rhinoceros (black and white), warthog, and various baboons and monkeys. The buffalo is now rare, having been almost exterminated by the rinderpest in 1896. The carnivora include the lion, leopard, cheetah, and various wild cats, foxes, wolves, jackals and dogs. There are at least five varieties of the mongoose. Amongst the rodents are squirrels, dormice, rats (eleven kinds), the porcupine, the Cape hare and the rock hare. Of insectivora the ant-eater, the ant-bear, the hedgehog and various shrews may be mentioned. Bats number eleven varieties. Snakes are numerous, the most important being the python, the puff-adder and the cobra. Crocodiles and iguanas are found in most of the rivers, and chameleons and lizards are very common. Rhodesia abounds in beetles, butterflies and moths, and new varieties are frequently discovered in the wet season. Mention ought to be made of white ants (termites) and locusts. The ants are a serious pest, attacking all cut timber resting in or on the ground. They gradually envelop the dead wood in a mound of earth and consume it wholly, so that all poles and house-timber have to be carefully protected either by chemical preparations or by raising them clear from contact with the earth. The mounds which the white ants erect often reach a height of many feet. There are several kinds, the black-headed nipper ant, chiefly found in the west, being the most destructive. Locusts are particularly dreaded in their wingless state, when they clean off every green leaf, every bit of vegetation, as they march on in their hundreds of thousands. The rivers are not very plentiful in fish, but occasional sport is afforded by barbel, bream and tiger-fish.

Birds to the number of about 400 varieties have been found in Rhodesia. The largest of these are the ostrich, the secretary-bird, the paauw, the koorhaan, cranes (three varieties), storks (four), vultures (six) and eagles (eight). The chief birds that attract sportsmen, besides the paauw and the koorhaan already mentioned, are the guinea-fowl (three kinds), partridge and francolin (seven kinds), wild goose, duck and teal. Some of the most interesting birds are the weaver-birds (eighteen), the ox-peckers, which find their food on the backs of cattle, the kingfishers (eight), the hornbills (five), the parrots, lovebirds, the polygamous widow birds—whose females are of insignificant appearance, but whose males develop a brilliant plumage and lengthy tails during the breeding season, when they are on guard over their harems of from ten to fifteen wives—the sunbirds, with their long curved beaks that search out the nectar of flowers, and the honey-guides, which, with their agitated "chuck, chuck," lead the wayfarer to bees' nests with expectation of joining in the plunder. The small birds of Rhodesia are usually very brilliantly coloured, the most distinguished being what is known as the blue jay, with its bright, iridescent, light blue plumage.

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[1] For geology see F. H. Hatch, "Notes on the Geology of Mashonaland and Matabeleland," *Geol. Mag.*, 1895; A. J. C. Molyneux, "The Sedimentary Deposits of Rhodesia," *Quart. Journ. Geol. Soc.*, vol. lix. (1903); F. P. Mennel, "Geology of Rhodesia," *British Association Handbook* (Cape Town, 1905); G. W. Lamplugh, *British Assoc. Rep.*, South African Meeting, 1905.

Flora.—The vegetation of the territory is luxurious and mainly subtropical, but in the lower valleys the flora assumes a tropical aspect. The country is well wooded and in this respect differs from the high tablelands farther south. The trees as a rule attain no greater height than about 20 ft., but in some districts, such as South Melsetter and Wankies, there are remains of forests of large timber. The small growth of the trees is said to be due to the annual veld fires, and it is noticeable that native trees that are protected attain a much greater height. As a rule the wood is either very hard or very soft, so that timber for building has still to be imported, although the existing timber is useful for mining purposes. One of the hardest woods is the so-called Rhodesian teak (native Ikusi), which is about 50% harder than real teak (*Tectona grandis*). The trees most commonly met with are mapane, used for poles; umkamba, resembling mahogany; m'lanji cedar, chiefly found along the eastern border; umsasa, used for firewood; impachla, the native wisteria. Among other trees are the baobab with enormous very soft trunk, the fruit being a large nut containing citrate of magnesia, which natives use to make a cooling drink; the umvagaz—or blood-wood—which issues a blood-coloured juice when cut, and the umkuna, or hissing tree, which hisses when an incision is made. The barks of the umsasa, the umhondo, and the umgosa are much used by natives for binding fibres in making huts and are also used for tanning. The bark of the baobab yields a fine fibre which natives use in making excellent game nets and fishing nets. The native fruit-bearing trees are the fig (many varieties), the mahobohobo or umjanje, resembling the loquat, the Kaffir plum, very sour and totally different from the Kaffir plum of Cape Colony, and the Kaffir orange. Among the shrubs the proteas, or sugar bushes, with their nectar-stored flowers, are the most frequent. The mimosa thorn, although more of the nature of a tree, grows in dense masses, chiefly in the western province.

The period of the year when flowers begin to bloom is rather remarkable. After the long spell of dry weather, lasting from five to seven months, and before any rain has fallen, blooms appear all over the veld. Most of such flowers are those of bulbous plants or plants with large roots that have been stored with nourishment during the previous growing wet season. The flowers are sustained by this stock of food until the rains appear again to replenish the roots. Even grass sprouts green over the earth before the rains appear, and the hard-baked veld is pierced by the shoots of the gladiolus, the orchid, the asparagus, the solanum, the convolvulus and many other flowers. When the rains are far advanced, the annuals shoot rapidly and make a second show of bloom. A peculiarity of the early spring shoots on trees and shrubs is that they have not the green tints of the colder regions, but are all shades of brown and orange and red and yellow.

One of the chief features of Rhodesia is the vast stretches of grass-covered veld, the grasses varying from a few inches to 15 ft. in height and numbering about 100 different varieties. Along the rivers are to be found palms, tree ferns, bananas, dracaenas and other hot climate plants. Rubber, indigo and cotton are indigenous and there are groves of lemon trees, but these were most probably introduced by early settlers. Tobacco, which grows luxuriantly, may also have been introduced.

Inhabitants.—In Southern Rhodesia about half the European population, which in 1909 was approximately 16,500, is British born or born of British parents, and about one-third is South African born. There are about 11,500 males and 5000 females, and the population is equally divided between the urban and rural areas. In rural areas the chief occupations are mining and agriculture. Industrial pursuits, including mining, engage about 25% of the population, 8% are employed in agriculture, and 15% in commerce. Mashonaland has 7500 white inhabitants, and Matabeleland 9000. There are about 2000 Asiatics in Southern Rhodesia.

The *Natives* of Rhodesia belong to the Bantu-Negro stock and are roughly divisible into two groups; those long settled in the country, and the Amazulu, who during the 19th century left Zululand and, passing through the more southern regions, overran Rhodesia and settled in Matabeleland. The Barotse (*q.v.*) are mainly settled in North-West Rhodesia. In Southern Rhodesia, in spite of incursions from Portuguese territory and from the north, the natives can be still clearly divided into Mashona and Matabele, living in the eastern and western provinces respectively. The name Mashona is not used by the natives but is useful as distinguishing the allied tribes of the eastern division from the Matabele in the west. The languages of the Mashona tribes are allied and are distinct from that of the Matabele (or Zulu), but it is uncertain whether these Mashona tongues should be regarded merely as different dialects, or languages as different as those of the various nations of Europe (but see BANTU LANGUAGES). The tribes round Salisbury and extending as far as Marondella in the east and about 100 m. north are clearly branches of the Vasezuru people, that is, the people from "higher up," the "higher up" being a region in the south-east. Their history can be traced from about the beginning of the 18th century; but there is a great lack of tradition amongst this class of native, which is distinctly inferior in type to the Matabele in the west.

Farther north there are the Makorikori and the Mabudja or Mabushla. It would appear that the country in which these people now dwell was formerly in the possession of the Barotse, and some of the present chiefs obtained their positions by permission of the Barotse. Previously, according to Portuguese documents of the 16th and 17th centuries, the Makaranga or Makalanga now located in the south round about Victoria had possession of the country as far north as the Zambezi. Their language is allied to that of the present inhabitants, but in many respects is widely different and of late has become more so owing to intercourse with the Matabele. Along the eastern border two more tribes can be differentiated, namely, Umtasa's people in the north and those speaking the Chindawo language in the south. Their languages are merely variants of the language spoken in the Salisbury and Mazoe districts.

All the tribes in the eastern province have very similar habits and customs. Their huts are circular with a wall a foot or two high, made of poles and *daga* (mud) surmounted by a conical thatched roof. They thus differ from the beehive huts of the Zulus. They are built indiscriminately together and are not surrounded by stockades. The whole family dwells in the same hut along with dogs, goats and fowls, and sometimes even with cattle, though there are usually separate kraals for their cattle. The kraals are as a rule filthy, but the inside of the hut is kept clean. There is a special place for a fire, and a raised portion of the mud floor on which to sleep, but no furniture. Their mealie fields are usually some distance from the place of abode, but their tobacco gardens are near their huts. Their main object in life seems to be to grow sufficient grain for food and beer. The grain they store in granaries, resembling small huts, placed on rocks or on stakes, out of the reach of white ants and secure from the depredations of animals. They amuse themselves occasionally by making earthenware pots which are very soft and easily broken, or by engaging in iron-work or brass-wire work for ornamentation. In the south they are quite clever in making water-tight baskets from rushes grown by the Sabi river. In their religious beliefs spirits play a great part. Above all there is a vague idea of a Supreme Being whom they call *Mwari*. They have a fixed belief in the spirits of their ancestors, the spirits of the witch-doctors, the spirits of the Matabele, the spirits of old women, the spirits of the foolish, the spirits of baboons, &c. Every occurrence is attributed to the influence of a spirit, and if the occurrence is an evil one a feast and dance of propitiation are held. Feasts of thanksgiving are also held on such occasions as the gathering of the first-fruits, the harvest festival, or on the return from a long and dangerous journey. Of the tribes already mentioned the most advanced are Umtasa's people and the Makaranga. The probable connexion of the tribes now inhabiting Mashonaland with the architects of the ancient stone buildings which are scattered over the country is discussed in the section *Archaeology*. Of these ruins the most extensive are situated near Victoria and are known as Zimbabwe (*q.v.*).

In the western province the Matabele, or rather Amandabele, are the descendants of the Zulus who trekked under the leadership of the famous Mosilikatze up through the Transvaal, whence they were driven by the Boers. Mosilikatze died in 1868, and his son Lobengula, after a fight with a brother, assumed sway in 1870. His people were divided into three main sections: the Abezansi (who were the aristocrats), the Abenhla and the Amaholi. The Amaholi or Holi were the inhabitants of the land at the time of the invasion and thereafter were practically in the position of bondsmen and rarely allowed to possess cattle. The great spirit of the Holis was the Mlimo, who was practically the spirit of the nation. Among the Holi tribes are the Abashangwe, the Abanyai, the Batonke (near the Zambezi), the Abananzwa of the Wankie district, the Ababiro of the Tuli district, and the Abasili, a nomadic tribe chiefly subsisting on game. There is a small tribe in the Belingwe district called the Abalemba, which would appear to have been in touch with the Arabs in early times. Their customs include circumcision and the rejection of pork as food.

The natives in Southern Rhodesia number about 700,000, and of these 10,000 work on the mines and 20,000 are engaged in farm, railway and household work under Europeans.

Chief Towns.—Salisbury, which lies 4880 ft. above the sea, is the capital of Southern Rhodesia, being the seat of government, and is situated in the eastern province (Mashonaland). There are about 1700 white inhabitants and 3000 natives. It is the commercial centre for an extensive mining and farming district. The principal buildings include churches, public library, hospital, schools, banks, post office and numerous hotels. There are a considerable number of government offices, and the administrator and resident commissioner live here. The only industries are a brewery and a tobacco factory for grading and packing the tobaccos of the local growers.

Bulawayo (*q.v.*), situated 4469 ft. above the sea, is the largest town and is in the western province, Matabeleland. It is 301 m. by rail S.W. of Salisbury, and 1362 m. N.E. of Cape Town. The population is some 4000 Europeans and about the same number of natives. The town has the advantage of a good pipe water supply and a service of electric light. It was the ancient capital of the Matabele king, Lobengula. There is a Government house which is occasionally occupied, and was the residence of Cecil Rhodes. It is from Bulawayo that the World's View, the burial-place of Rhodes in the Matoppo Hills, is usually visited.

The other towns are Umtali, on the eastern border, pop. 800 whites, railway works, centre for numerous large and small gold mines; Gwelo, the central town, about midway between Salisbury and Bulawayo, 370 whites; Victoria and Melsetter in the south, centres of farming districts. Victoria, near which are the famous Zimbabwe ruins, is reached by mail cart (80 m.) from Selukwe, and Melsetter by mail cart (95 m.) from Umtali. There are also small townships at Hartley, Selukwe, Enkeldoorn and Gwanda. Bulawayo and Salisbury are managed by town councils, the other towns have sanitary boards.

Communications.—The Rhodesian railway system connects the chief towns and mining centres with one another and all the other South African countries. The main line is a continuation of the railway from Cape Town through Kimberley and Mafeking. It runs from Mafeking in a general N.E. direction to Bulawayo, whence it goes N.W. to the Zambezi, which is crossed a little below the Victoria Falls. The bridging of the river was completed in April 1905. Thence the railway is continued N.E. (92 m.) to Kalomo, Barotseland, and onward to the Katanga district of Belgian Congo. The section from Kalomo to Broken Hill (261 m.) was completed in 1907, and the extension to the frontier of Belgian Congo (126 m.) in 1909. This main line forms the southern link in the Cape to Cairo railway and steamboat service. From Bulawayo a line goes N.E. by Gwelo to Salisbury and thence S.E. to the Portuguese port of Beira. From Bulawayo another line (120 m. long) runs S.E. to the West Nicholson Mine. From Gwelo a railway (40 m.) goes S.E. to Yankee Doodle, and from this there branches a line (50 m. long) in an easterly direction to Blinkwater. From Salisbury a line runs N.W. to Lomagundi (84 m.). The last-named has a 2 ft. gauge. The other railways are of the standard gauge of South Africa—3 ft. 6 in. The distances from Bulawayo to the following places are:—Gwelo, 113 m.; Salisbury, 301 m.; Umtali, 471 m.; Beira, 675 m.; Mafeking, 490 m.; Kimberley, 713 m.; Cape Town, 1362 m.; Port Elizabeth, 1199 m.; East London, 1260 m.; Bloemfontein, 800 m.; Johannesburg, 931 m.; Pretoria, 977 m.; Lourenço Marques, 1307 m.; Durban, 1238 m. (the last four places all via Fourteen Streams, a junction 48 m. N. of Kimberley), and Victoria Falls, 282 m.

About 4000 m. of roads have been built and are maintained by government. The telegraph and telephone system is very complete, there being for the whole of Rhodesia about 8000 m. of wires. This total includes the police telephone wires and part of the African Transcontinental system, and is served by about ninety telegraph offices. In Southern Rhodesia there are about eighty post offices. A post office savings bank was brought into operation on the 1st of January 1905. Over 2,500,000 letters, post-cards and parcels are despatched annually.

Agriculture.—The country is well adapted for agriculture. Chief attention has been paid by farmers to the growing of maize, the annual produce being about half a million bushels. It is a very easily grown cereal, especially in such a fertile country as Rhodesia, and is extensively grown by natives, but the improved methods of the whites easily secure a yield of from twice to eight times that of the native. The average yield by European farmers is about eight bags of 200 lb per acre, but ten to fifteen bags is quite a common crop. Wheat, barley and oats are grown with success under irrigation in the winter time, but the moisture with attendant rust is too excessive for these crops in summer. Tobacco promises to be a great source of wealth to the territory. Both the Turkish and Virginian tobaccos have been raised and cured and put on the market, where they were easily disposed of. They are of better quality than those grown elsewhere in South Africa. In 1908 only about 500 acres were under cultivation, but there are large tracts of land suitable for this industry.

Fruits of very extensive variety thrive in Rhodesia; they include plums, bananas, grapes, guavas, paupaus, figs, loquats, pine-apples, Cape gooseberries, mulberries, tree tomatoes, rosellas, granadillas, all kinds of citrus fruits. The most flourishing are the citrus fruits and the Japanese plums, but in the higher altitudes pears and apples are also very successful. Vegetables of nearly all kinds can be grown, especially potatoes, tomatoes, asparagus, sweet potatoes, yams, &c. Coffee produces as much as 4 lb of beans to the shrub in certain parts.

Cattle thrive well in Rhodesia, and stock-raising promises to be the chief agricultural industry of the future. During the early period of European occupation rinderpest and at a later date East Coast fever decimated the country, but the prevention of these diseases is now thoroughly understood and, since the rinderpest of 1896 swept away large herds, cattle have been increasing rapidly in number. There is hardly any portion of the territory which is not suitable for cattle, and the rapid natural increase indicates a speedy prosperity in cattle ranching. Goats and woolless sheep number about 800,000 in the territory. Donkeys and mules thrive, but horses are very liable to horse-sickness towards the end of the rainy season.

Mining.—When Rhodesia was first opened up to European occupation, attention was immediately called to the large number of gold workings made by unknown former inhabitants of the country. These workings were only carried on to a limited extent, being stopped probably by the presence of water and the lack of suitable machinery. European enterprise has resulted in the discovery of a large number of mines situated in widely scattered areas. The chief mines are the Globe and Phoenix, the Selukwe and the Wanderer in the Gwelo district; the Giant in the Hartley district; the Jumbo in the Mazoe district; the Ayrshire in the Lomagundi district; the Penhalonga and the Rezende in the Umtali district, while there are numerous smaller mines in the Gwanda, Insiza, Gwelo, Hartley and Umtali districts. The output of gold increased in value from £308,000 in 1900 to £2,623,000 in 1909, about one-third of this being produced by small workers whose individual output is not over 1500 oz. a month. As efforts have been restricted mainly to extracting the ore indicated by ancient workings, it is probable that many gold reefs still await discovery. The mineral wealth of Rhodesia is very varied and includes silver, of which 262,000 oz. were produced in 1909; coal, 170,000 tons (1909), and lead, 965 tons. Extensive discoveries of chrome iron have been made in the Selukwe district. There is a steady export of this metal, of which the output in 1909 was over 25,000 tons. Besides these, small quantities of copper, wolframite and diamonds have been exported, while scheelite and asbestos have been discovered in payable quantities.

Commerce.—Taking the average for a series of years ending 1908, the total imports amounted to about £1,500,000 per annum, 55% of which were manufactured articles, including £250,000 textile goods and wearing apparel, and £120,000 machinery. Imports of food and drink amounted to £330,000. In 1909 the imports amounted to £2,214,000, the chief items being food and drink (£422,000), machinery, animals and cotton goods. Exports consist almost entirely of minerals. In 1909 they were valued at £3,178,000. Included in the total is £342,000 goods imported and re-exported.

Administration.—The administration of Rhodesia is carried on by the British South Africa Company under an order in council of 1898, amended by orders in council of 1903 and 1905. The company is called upon to appoint for Southern Rhodesia an administrator or administrators. The company also appoints an executive council of not fewer than four members to advise the administrator upon all matters of importance in administration. An order in council of 1903 provided for a legislative council consisting of the administrator, who presides, seven nominees of the company approved by the secretary of state, and seven members elected by registered voters (the number of registered voters in 1908 was 5291). In 1907 it was agreed to reduce the company's nominees by one, so that the elected members should form the majority of the council. The secretary of state appoints a resident commissioner, who sits on both executive and legislative councils without vote. The duty of the resident commissioner is to report to the high commissioner upon all matters of importance. Ordinances passed by the legislative council are submitted to the high commissioner for consent or otherwise, but may be disallowed by the secretary of state.

For the administration of justice there is a High Court with two judges having civil and criminal jurisdiction. There are seven magistrates' courts throughout the territory. For the administration of native affairs there are appointed a secretary for native affairs, two chief native commissioners, twenty-eight native commissioners and six assistant native commissioners. Natives suffer no disabilities or restrictions which do not equally apply to Europeans except in respect of the supply of arms, ammunition and liquor. Native commissioners may exercise jurisdiction in native affairs not exceeding that exercisable by magistrates. The company has to provide land, usually termed Native Reserves, sufficient and suitable for occupation by natives and for their agricultural and industrial requirements.

Revenue.—The administrative revenue of Southern Rhodesia was at first much less than the cost of administration. The figures for 1899–1900 were: revenue, £325,000; expenditure, £702,000. Since that date revenue has increased and expenditure decreased, and from 1905–6 (in which year the revenue exceeded £500,000) the cost of administration has been met out of revenue. For 1909–10 the revenue was approximately £600,000, the two main items being customs duty, £190,000, and native tax, £200,000. The native tax is £1 per head for every adult male and 10s. for every wife after the first.

Education.—Besides a few private schools, there were in 1909 34 schools for Europeans, 26 of which were wholly financed by government, the remainder being aided. The aided schools are as a rule connected with some religious body, and aid is given to the extent of half the salaries of the teachers and half the cost of school requisites. Loans are also given to assist in school building. A system of boarding grants has been instituted to enable children in the outlying districts to attend school. Education is not free except for poor children, but the fees in government schools do not exceed £6 a year. In 1910 several schools had reached the stage of preparing pupils for matriculation at the Cape University and similar examinations. The number of pupils in 1909 in European schools was 1212, being more than double what it had been four years previously. The education of natives is in the hands of various religious bodies, but financial aid is given by government to native schools which comply with certain easy conditions. In 1909, 80 native schools with an enrolment of 7622 pupils earned grants.

Military Forces.—The military force in Southern Rhodesia is styled the British South African Police, and numbers about 40 officers, 400 non-commissioned officers and men, and 550 native police. The force is under a commandant-general, who, with the subordinate officers, is appointed by the secretary of state, and is under the direct control and authority of the high commissioner. The commandant-general is paid by the British parliament. The offices of commandant-general and resident commissioner were combined in 1905.

The Southern Rhodesia Volunteers, in two divisions, eastern and western, under command of colonels, number altogether 86 officers and 1700 non-commissioned officers and men.

Medical.—There are, including cottage hospitals, ten hospitals in towns and townships, and thirteen district surgeries have been established. (G. Du.)

Archaeology.—Between the Zambezi and the Limpopo, and extending from the coast to at least 27° E., may be found the traces of a large population which inhabited Southern Rhodesia and Portuguese East Africa in bygone times. Apart from numerous mines, some of which are being successfully reworked at the present day, ruins of stone buildings have been found in several hundred distinct places. Few of these have been explored systematically, but investigations in 1905, though confined to a small number of sites, determined at least the main questions of date and origin. The fanciful theories of popular writers, who had ascribed these buildings to a remote antiquity, and had even been so audacious as to identify their founders with the subjects of King Solomon or of his contemporary the queen of Sheba, are now seen to be untenable. J. T. Bent's *Ruined Cities of Mashonaland* (1892) is now interesting only for its illustrations, and his theories are obsolete. Positive archaeological evidence demonstrates that the "Great Zimbabwe" itself, the most famous and the most imposing of the misnamed "Ruined Cities," was not built before medieval times, and that the earliest date which can be assigned to any of the sites explored is subsequent to the 11th century A.D. Moreover, the complete identity of custom, revealed no less by the details of the dwellings than by the type of the articles found within them, proves that the tribe that built these structures was one closely akin to if not actually identical with the present Bantu inhabitants of the country.

These ruins, even when stripped of their false romance, are of extreme interest; but their nature and appearance have been much misunderstood, and the skill and intelligence required for their erection have been grossly overestimated. It should be clearly stated, therefore, that the methods of the old Rhodesians evince their complete ignorance of all the devices employed in the architecture of civilized peoples. They have not attempted to solve the problems of supporting weight and pressure by the use of pillar, arch or beam; the ingenuity of the builders goes no further than the dexterous heaping up of stones. Indeed, their most finished and elaborate work must be compared with nothing more ambitious than the dry-built walls which serve to enclose the fields in certain parts of England. The material is the local granite or diorite obtainable in the immediate neighbourhood. Stone-hewing has not been practised; and was unnecessary, since the natural flaking of the boulders provides an abundance of ready-made slabs which need only be detached from the parent rock and broken to the required size. At most the blocks thus obtained have been very roughly trimmed with one or two blows, and any apparent regularity in the fitting has been obtained merely by judicious selection. Mortar has seldom been used; the courses are never laid with any approach to exactness; walls merely abut on one another without being bonded, and the same line often varies greatly in thickness at different parts.

The main principle of the ground plan is invariably circular or elliptical, though it is carried out with a conspicuous lack of symmetry or exactness. Straight lines are unknown, and even accidental approximations to an angle are rare. This is eminently characteristic of the Bantu, whose huts are commonly built in circular form. Indeed, it is the round Bantu hut which has been the original model for even the finest of these stone constructions. The connexion between the two, however, goes beyond mere resemblance. The stone walls are always accompanied by huts; they are mere partitions or ring-fences enclosing and structurally inseparable from platforms of clay or cement on which stand the remains of precisely the same dwellings that the Makalanga make at the present day. Buildings such as those at Dhlo Dhlo, Nanatali and Khami in Matabeleland, or at Zimbabwe in southern Mashonaland, are merely fortified *kraals*; remarkable indeed as the work of an African people, but essentially native African in every detail, not excepting the ornamentation.

The best-known and the most attractive of the Rhodesian ruins are those situated in the more central and southern region. In the north-east, however, the remains are even more numerous, though the single units are less remarkable. Over the whole of Inyanga and the Mazoe region are distributed hill-forts, pit-dwellings and intrenchments which are more primitive in character though of the same generic type as those found farther south. The inhabitants of these northern districts were occupied more in agriculture than in gold-mining, and one of the most striking features of their settlements is the irrigation system. There are no aqueducts such as Europeans or Arabs might have built, but water furrows have been carried on admirably calculated gradients for miles along the hill-sides. The amount of labour which has been expended on the great villages between Inyanga and the Zambezi is astounding. On one site, the Niekerk Ruins, an area of fully 50 sq. m. is covered with uninterrupted lines of walls. It is an interesting question which may be solved by future explorations whether these settlements do not extend north of the Zambezi. Intrenchments like those of the Niekerk Ruins have been reported from the south-east of Victoria Nyanza, and Major Powell Cotton has published a photograph from the Nandi country which exhibits a structure precisely similar to the hill forts of Inyanga. (See also Zimbabwe; Monomotapa.)

See D. Randall-MacIver, *Mediaeval Rhodesia* (London, 1906); R. N. Hall and W. G. Neal, *The Ancient Ruins of Rhodesia* (London, 1902); *Zeitschrift für Ethnologie*, 1875 and 1876; *Journal of the R.G.S.*, 1890, 1893, 1899, 1906; *Journal of Anthropl. Inst.*, vols. xxxi., xxxv. (D. R.-M.)

History.—There is evidence that from the 10th or 11th centuries onward the lands now forming Rhodesia were inhabited by Bantu-negroes who had made some progress in civilization and who traded with the Arab settlements at Sofala and elsewhere on the east coast (see *Archaeology* above). From the 15th century, if not earlier, until about the close of the 18th century, a considerable part of this area was ruled by a hereditary monarch known as the Monomotapa, whose *zimbabwe* (capital) was, in the earlier part of the period indicated, in what is now Mashonaland. Some of the Monomotapas during the 16th and 17th centuries entered into political and commercial relations with the Portuguese (see Monomotapa and Zimbabwe). The Monomotapa “empire” included many vassal states, and probably fell to pieces through intertribal fighting, which greatly reduced the number of inhabitants. In the early years of the 19th century the tribes appear to have lost all cohesion. The people were mainly agriculturists, but the working of the gold-mines, whence the Monomotapas had obtained much of their wealth, was not wholly abandoned.

The modern history of the country begins with its invasion by the Matabele, an offshoot of the Zulus. Mosilikatze, their first chief, was a warrior and leader who served under the Zulu despot Chaka. Being condemned to death by Chaka, Mosilikatze fled, with a large division of the Zulu army. About 1817 he settled in territories north of the Vaal, not far from the site of Pretoria; and in 1836 a treaty of friendship was entered into with him by the governor of Cape Colony. In the same year a number of the “trek Boers” had crossed the Vaal river, and came in contact with the Matabele, who attacked and defeated them, capturing a large number of Boer cattle and sheep. In November 1837 the Boers felt themselves strong enough to assail Mosilikatze, and they drove him and his tribe north of the Limpopo, where they settled and occupied the country subsequently known as Matabeleland. In 1868 Mosilikatze died. Kuruman, son and recognized heir of the old chieftain, had disappeared years before, and though a Matabele who claimed to be the missing heir was brought from Natal he was not acknowledged by the leading indunas, who in January 1870 invested Lobengula, the next heir, with the chieftainship. Those Matabele who favoured the supposed Kuruman were defeated in one decisive battle, and thereafter Lobengula, whose kraal was at Bulawayo, reigned unchallenged. At this time the Matabele power extended north to the Zambezi, and eastward over the land occupied by the Mashona and other Makalanga tribes. North of the Zambezi the western districts were ruled by the Barotse (*q.v.*), while the eastern portion had been overrun by other tribes of Zulu-Xosa origin, among whom the Agoni were the most powerful. The explorations of David Livingstone, Thomas Baines (1822–1875), Karl Mauch, and other travellers, had made known to Europe the general character of the country and the existence of great mineral wealth. Lobengula was approached by several “prospectors” for the grant of concessions; among them two Englishmen, Baines in 1871 and Sir John Swinburne in 1872, obtained cessions of mineral rights, but little effort was made to put them in force. In 1882 President Kruger, who was then bent on extending the boundaries of the Transvaal in every direction, endeavoured to make a treaty with Lobengula, but without success. The Warren expedition of 1884 to Bechuanaland (*q.v.*), while it checked for a time the encroachments of the Transvaal Boers, and preserved to Great Britain the highway to the north through Bechuanaland, also served to encourage colonists to speculate as to the future of the interior. At this time, too, the struggle between the nations of western Europe for the unappropriated portions of Africa had begun, and while the Boers, foiled in Matabeleland, endeavoured to get a footing in Mashonaland, both Portuguese and Germans were anxious to secure for their countries as much of this region as they could. In 1887 a map was laid before the Portuguese cortes showing the territories in Africa claimed by Portugal. They stretched across the continent from sea to sea, and included almost the whole of what is now Rhodesia, as well as the British settlements on Lake Nyasa. To the claim of a transcontinental domain Portugal had succeeded in gaining the assent of Germany and France, though Germany, which had secured a footing in south-west Africa, still dreamed of extending her sway over Matabeleland. By the instructions of Lord Salisbury, then foreign secretary, the British representative at Lisbon informed the Portuguese government that except on the seacoast and on portions of the Zambezi river there was not a sign of Portuguese authority or jurisdiction in the districts claimed by them, and that the British government could not recognize Portuguese sovereignty in territory not effectively occupied by her.

The country secured for Great Britain.

This protest, so far as southern Rhodesia is concerned, might have been ineffective save for the foresight, energy and determination of Cecil Rhodes, who had been instrumental in saving Bechuanaland from the Boers, and who as early as 1878 had conceived the idea of extending British influence over central Africa.[1] At this time gold prospecting was being feverishly undertaken all over South Africa as a result of the discoveries at Barberton and on the Rand, and Lobengula was besieged for all sorts of concessions by both Portuguese and Boers, as well as by other adventurers from all parts of the world. If the country was to be secured for Britain immediate action was necessary. Sir Sidney Shippard, who had succeeded Rhodes as commissioner in Bechuanaland and who shared his views, kept up a friendly correspondence with Lobengula, while at Bulawayo Mr J. S. Moffat was British resident. At the end of 1887 Sir Sidney urged the high commissioner, Lord Rosmead (then Sir Hercules Robinson), to allow him to conclude a treaty with Lobengula, but unavailingly, until Rhodes, by taking upon himself all pecuniary responsibility, succeeded in obtaining the required sanction. On the 11th of February 1888, Moffat and Lobengula signed an agreement, whereby the Matabele ruler agreed that he would refrain from entering into any correspondence or treaty with any foreign state or power without the previous knowledge and sanction of the British high commissioner for South Africa. Shortly after the conclusion of this treaty, representatives of influential syndicates directed by Rhodes, in which Alfred Beit and C. D. Rudd were large holders, were sent, with the knowledge of the British government and the high commissioner, to negotiate with Lobengula, and on the 30th of October of the same year he concluded an arrangement with Messrs Rudd, Rochfort Maguire and F.R. Thomson, by which, in return for the payment of £100 a month, together with 1000 Martini-Henry rifles and 100,000 rounds of ammunition, he gave the syndicate complete control over all the metals and minerals in his kingdom, with power to exclude from his dominions “all persons seeking land, metals, minerals or mining rights therein,” in which action, if necessary, he promised to render them assistance. The position of the envoys was one of considerable danger, as Lobengula had around him many white advisers strongly antagonistic to

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[1] See article “Bechuanaland” by Sir Henry Shippard in *British Africa* (London, 1899).

Rhodes's scheme. The arrival at Bulawayo of Dr L. S. Jameson, who had previously attended Lobengula professionally, and who strongly supported Rudd and his companions, appears to have been the factor which decided Lobengula to sign the concession. This concession once obtained, Rhodes proceeded with rapidity to prosecute his great enterprise. He extinguished the claims of earlier concessionaires by purchase (giving, for instance, £10,046 for the Baines and Swinburne grants), and united all interests in the British South Africa Company, with a share capital of £1,000,000.

The B.S.A. Co.'s charter.

Following the example of Sir George Goldie in West Africa and of Sir William Mackinnon in East Africa, Rhodes determined to apply to the British government for a charter for the newly formed company, whose original directors were, in addition to Rhodes and Beit, the duke of Abercorn, the duke of Fife, Lord Gifford, Albert (afterwards 4th earl) Grey and George Cawston. In applying for a charter (in April 1889) the founders of the company stated their objects to be the following: (1) To extend northwards the railway and telegraph systems in the direction of the Zambezi; (2) to encourage emigration and colonization; (3) to promote trade and commerce; (4) to develop and work minerals and other concessions under the management of one powerful organization, thereby obviating conflicts and complications between the various interests that had been acquired within these regions, and securing to the native chiefs and their subjects the rights reserved to them under the several concessions. In making this application the boundaries in which they proposed to work were purposely left somewhat vague. They were described to be the region of South Africa lying immediately north of British Bechuanaland, north and west of the South African Republic, and west of the Portuguese dominions on the east coast. The government, having ascertained the substantial nature of the company's resources and the composition of the proposed directorate, and also that they were prepared to begin immediately the development of the country, granted the charter, dated the 29th of October 1889. From this date onward the company was commonly known as "the Chartered Company."

A few points in the charter itself deserve to be noted. In the first place, it gave considerable extension to the terms of the original concessions by Lobengula. In short, it transformed the rights of working minerals and metals, and preventing others from doing so, into rights practically sovereign over the regions in which the company's activity was to be employed. These rights the crown granted directly itself, not merely confirming a previous grant from another source. By Article X. the company was empowered to make ordinances (to be approved by the secretary of state), and to establish and maintain a force of police. A strict supervision was provided for, to be exercised by the secretary of state over the relations between the company and the natives. The British government reserved to itself entire power to repeal the charter at any time that it did not consider the company was fulfilling its obligations or endeavouring duly to carry out the objects for which the charter was granted. The sphere of operations of the company was not stated with any greater precision than had been indicated in the application for the charter; but by agreements concluded with Germany in 1900, with Portugal in 1891 and with the Congo State in 1894, the international boundaries were at length defined (see Africa, § 5). The agreements, while they took the British sphere north to Lake Tanganyika, disappointed Rhodes in that they prevented the realization of the scheme he had formed by the time the charter was granted, namely, for securing a continuous strip of British territory from the Cape to Egypt—a scheme which was but an enlargement of his original conception as formulated in 1878.

Much, however, had happened before the boundaries of the British sphere were fixed. While the railway from Cape Town was being continued northward as rapidly as possible, the determination was taken to occupy immediately part of the sphere assigned to the company, and Mashonaland was selected as not being in actual occupation by the Matabele but the home of more peaceful tribes. A pioneer force was sent up in June 1890 under Colonel Pennefather, consisting of five hundred mounted police and a few hundred pioneers. Accompanying this force as guide was the well-known traveller, F. C. Selous. The work of transport was attended with considerable difficulty, and roads had to be cut as the expedition advanced. Nevertheless, in a few months the expedition, without firing a shot, had reached the site of what is now the town of Salisbury, and had also established on the line of march small forts at Tuli, Victoria and Charter. Archibald Ross Colquhoun was chosen as the first administrator. He had not long been in office when, in May 1891, difficulties arose with the Portuguese on their north-west frontier, both parties claiming a tract of territory in which a Portuguese trading station had been established. The result was a skirmish, in which a small company of British South Africa police were victorious. In 1891 Dr Jameson, who had joined the pioneer force, was appointed administrator in succession to Colquhoun. The Boers for several years had been planning a settlement north of the Limpopo, and they now determined, in spite of the Moffat treaty and the British occupation, to carry out their object. An expedition known as the Banyailand Trek was organized under the leadership of Colonel Ferreira, and two large parties of Boers proceeded to the banks of the Limpopo. Information of the intended trek had been conveyed to Cape Town, and Sir Henry (afterwards Lord) Loch (the high commissioner) at once sent a strong protest to President Kruger, informing him that any attempt to invade the Chartered Company's territories would be an act of hostility against the British Crown; and Kruger issued a proclamation forbidding the trekkers to proceed. Meanwhile, however, a party had already reached the Limpopo, where they were met by Jameson in command of the British South Africa Company's forces. He told them that they would not be allowed to proceed except as private individuals, who might obtain farms on application to the Chartered Company. Colonel Ferreira was arrested and detained for a few days, and the expedition then broke up and dispersed.

Mashonaland occupied—A Boer trek prevented.

The pioneers, who were granted farms and mining claims, having been settled in Mashonaland, Rhodes recognized the extreme importance of giving the country a port nearer than that provided by Cape Town. On his initiative proposals were made to Portugal, and the treaty concluded in 1891 between Great Britain and Portugal provided that a railway might be built from Beira in Portuguese territory to Salisbury, on condition that Portugal received a duty not exceeding 3% on the value of the goods imported. The treaty further stipulated for the free navigation of the Zambezi and the construction of telegraphs. Prospecting operations were at once started, and various gold mines were discovered containing traces of old workings. Fresh gold reefs were also opened up. The prospects of the country seemed promising, and although a good deal of fever occurred in the low-lying valleys under the conditions of camp life, the health of the community soon improved as more suitable habitations were erected. In two years a white population of 3000 people had settled in the newly opened country.

Though the company was now free from international rivalry it was soon faced by serious native trouble. The first pioneers had deliberately chosen Mashonaland as their place of settlement. Ever since the advent of Mosilikatze north of the Limpopo the unfortunate Mashonas had been the prey of the Matabele; they therefore readily accepted the British occupation. The Matabele, however, were loth to abandon their predatory excursions among the Mashonas, and in July 1893 a large *impi* (native force) was sent into Mashonaland, and entered not only native kraals, but also the streets of the new township of Victoria. An attempt was made to preserve the peace, but it was evident from the attitude taken by the Matabele that nothing short of the authority which only superior force could command would settle the question. The Matabele were a proud and fearless race of warriors; the men of that generation had never come in conflict with Europeans, and had never been defeated in their conflicts with native foes. Jameson's forces were slender, and Rhodes, on being consulted, urged him by telegram to "Read Luke fourteen, thirty-one." On obtaining a Bible, Jameson read the words: "Or what king, going to make war against another king, sitteth not down first, and consulteth whether he be able with ten thousand to meet him that cometh against him with twenty thousand?" He telegraphed in reply: "All right. I have read Luke fourteen, thirty-one." The position, though dangerous, admitted of no delay, and Jameson determined to risk an expedition with the forces at his command. His success on this occasion doubtless weighed with him on another and less fortunate one. The force available consisted of about 700 volunteers and 225 British Bechuanaland police, with some 700 natives. Jameson determined to march to Bulawayo, the headquarters of Lobengula and the capital of Matabeleland. The force was divided into two columns, and was to be met by a further column of Bechuanas marching from the south under Khama, the most influential of the Bechuan chiefs and a loyal friend of the British. The first engagement took place on the Shangani river, where the two columns which had started from Fort Charter and Fort Victoria were both engaged. Majors Forbes and Allan Wilson commanded in these engagements; and after a hot contest with between 4000 and 5000 Matabele, the latter were repulsed, machine guns being used with terrible effect upon the enemy. On the 1st of November a second fight occurred on the high ground, in which it was estimated that 7000 of the Matabele attacked the laager of the two columns. The oldest and most tried regiments of Lobengula dashed right up to the muzzles of the guns, but were swept down before the modern rifles and machine guns with which the invaders were armed. Meanwhile the column of Khama's men from the south had reached the Tati, and won a victory on the Singuesi river on the 2nd of November. On the 3rd of November Bulawayo was reached, and the columns from Mashonaland, accompanied by Jameson and Sir John Willoughby, entered the town, Lobengula, and his followers being in full flight towards the Zambezi. An endeavour was made to induce Lobengula to surrender; but as no replies were received to the messages, Major Forbes, on the 13th of November, organized a column and started in pursuit.[1] The pursuing party were delayed by difficult roads and heavy rains, and did not come up with Lobengula until the 3rd of December. Major Allan Wilson, in command of thirty-four troopers, crossed the Shangani river in advance, and bivouacked close to Lobengula's quarters. In the night the river rose, and reinforcements were unable to join him. During the early morning the Matabele surrounded the little band, and after fighting most gallantly to the last, Major Allan Wilson and all his followers, with the exception of three messengers, who had been sent back, were killed.

Matabeleland conquered.

In January 1894 Lobengula died—from fever, or as the result of a wound, accounts differ—at a spot about forty miles south of the Zambezi. After his death his *indunas* submitted to the Chartered Company's forces, and the war, which cost the company over one hundred lives and £110,000, was thus ended. An order in council of the 18th of July following defined the administrative power of the company over Matabeleland. Charges were made against the company of having provoked the Matabele in order to bring on the war and thus secure their territory, but after inquiry the company was expressly exonerated from the charge by Lord Ripon, then colonial secretary. With the close of the war the Matabele appeared to be crushed, and for over two years there was no serious trouble with the natives. The country was at once thrown open to white settlers. Close to the site of Lobengula's kraal the new town of Bulawayo was founded, ~~and~~ rapidly grew in importance. Among the new settlers were many Dutch farmers. The Roman-Dutch law was chosen as that of the new colony, a land commission was established and commissioners appointed to look after the interests of the natives.

Considerable development in the part of the company's territory north of the Zambezi had meantime taken place. Between 1889 and 1891 a large number of tribes in the region between lakes Nyasa and Tanganyika and the Zambezi had entered into treaty relations with the company, and a settlement named Abercorn had been founded at the south end of Tanganyika. This work was undertaken in part to forestall German action, as before the signature of the agreement of July 1890 German agents entertained the design of penetrating west of Lake Nyasa to the Congo State frontier. The company further acquired the property of the African Lakes Company—which had done much to secure British predominance in the Nyasa region—and on the organization of Nyasaland as an imperial protectorate the South Africa Company contributed £10,000 a year for three years (1891–92–93) towards the cost of the administration, the imperial commissioner during this period acting as administrator for the adjacent territories belonging to the company (see British Central Africa). Farther west, Lewanika, the king of the Barotse, signed, on the 27th of June 1890, a treaty placing his country under the protection of the Chartered Company, which, while obtaining all mineral rights, undertook not to interfere in the internal administration of Barotseland. In securing a position thus early in Barotseland, Rhodes's aim was to prevent the farther extension eastward of the Portuguese province of Angola. The subsequent development of Barotseland had little direct connexion with the events in other parts of Rhodesia (see Barotse and Lewanika). The growth of territory and the outlay on Matabeleland led to a great increase of expenditure, and the capital of the company was raised to £2,000,000 in November 1893, and to £2,500,000 in July 1895.

In every step taken by the company the guiding hand was that of Cecil Rhodes, a fact which received recognition when, by a proclamation of the 3rd of May 1895, the company's territory received officially the name of "Rhodesia." During this year there was great activity in exploiting Matabeleland. "Stands" or plots were sold at extraordinary prices in Bulawayo; 539 fetched a total of £153,312, about £285 a stand. In within nine months Bulawayo had a population of 1900 whites, and in the various goldfields there were over 2000 prospectors. The construction of telegraphs proceeded with rapidity and by the end of 1895, 500 m. of new lines had been constructed, making about 1500 in all. A new company, the African Transcontinental Company, had been founded under the auspices of Rhodes, with the ultimate purpose of connecting the Cape with Cairo. By the end of 1895, 133 m. of these lines had been laid. At this time too, the railway from Cape Town had passed Mafeking and was approaching the Rhodesian frontier, while on the east coast the line to connect Salisbury with Beira was under construction.

In November 1895 the crown colony of British Bechuanaland was annexed to Cape Colony, and the Chartered Company desired to take over the administration of the Bechuanaland protectorate, which stretched between the newly annexed portion of Cape Colony and Matabeleland, and through which the railway to Bulawayo had to pass. The British government consented, and arrangements were made for the transfer. The company's police were moved down to a camp in the protectorate at Pitsani Potlogo. It was from this place that on the 29th of December Jameson crossed the Transvaal border and marched on Johannesburg, in his disastrous attempt to upset President Kruger's administration. The "Jameson Raid" put an end to the proposed transfer of the protectorate to the Chartered Company, and caused a serious crisis in its affairs. Rhodes resigned his position as managing director, and Alfred Beit retired from the directorate in London. Jameson was, on the 9th of January 1896, officially removed from his office of administrator of the company's territories, and was succeeded by Earl Grey. Just at this time rinderpest made its appearance in southern Rhodesia, carrying off large herds of cattle, and this was followed in March 1896 by a revolt of the Matabele, while in June the Mashona also rebelled. The occasion, but not the cause, of the Matabele rising was the withdrawal of the greater part of the company's force to take part in the Jameson Raid. The Matabele had various grievances, chiefly that after the war of 1893 they were treated as a conquered people. All able-bodied young men were required to work for the white farmers and miners a certain number of months per annum at a fixed rate of pay—a most irksome regulation, enforced, on occasions, by the native police in a tyrannical fashion. Another grievance was the seizure by the company, after the death of Lobengula, of the cattle of the Matabele—their chief source of wealth. Not only was there a first confiscation after the war, but subsequently there was a periodical taking away of cattle in small numbers—the company acting under the belief that nearly all the cattle in Matabeleland belonged to the king and were therefore lawfully theirs. However, before the end of 1895 the company had settled the question in agreement with the indunas, two-fifths of the cattle to go to the company and the remainder to become the absolute property of the natives. But it was neither the action of the company in the confiscation of cattle, nor the labour regulations, that induced the mass of the people to rebel; they were induced to act by chiefs who chafed under their loss of power and position and imagined themselves strong enough to throw off the yoke of the conquerors.

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[1] Lobengula had in fact sent to the Forbes patrol gold dust worth about £1000, and intimated his desire to surrender; but two troopers to whom the gold and message were entrusted kept the gold and suppressed the message. Their crime was afterwards discovered and the troopers sentenced to fourteen years' penal servitude.

The rebellions of 1896.

In the manner customary among savages the Matabele began hostilities by the murder of defenceless white settlers—men, women and children. Bulawayo was threatened, and soon all the country south of the Zambezi was in a state of rebellion. Imperial troops under Sir Frederick Carrington were hurried up to the assistance of such police as the British South Africa Company still had at its command. Volunteers were enrolled, and much fierce fighting followed. Rhodes hastened to Bulawayo, and after conferences with the military and other authorities he determined to go, with Dr Hans Sauer and Mr J. Colenbrander, a well-known hunter and pioneer intimately acquainted with the natives, and interview the chiefs. They went (September 1896) unarmed into the heart of the Matoppo Hills, and there arranged terms of peace with the indunas. The interview involved grave danger to the emissaries, and depended for its success entirely upon Rhodes's personality and influence over the native races, but it terminated what promised to be a long and disastrous native war. The Matabele, whose legitimate grievances were acknowledged and met, ceased the war after the indaba with Rhodes; the Mashona revolt continued, and was not finally crushed until October 1897, though all danger to settlers was over six months previously. At this time the rinderpest had carried off nearly all the cattle in the country—a disaster which, together with the destruction of grain during the war, had brought the natives almost to starvation—and steps had to be taken to supply their needs. Many of the white settlers too were reduced to sore straits and required assistance. The rebellions had cost the company fully £2,500,000, and to meet the debt incurred an additional capital of £1,500,000 was raised in 1898. At the meeting of the company in April 1898, at which this step was taken, Rhodes was re-elected a director.

The events of 1896—the Jameson Raid and the rebellions—caused the imperial government to remodel the constitution of Rhodesia. The armed forces of the company had already been placed under the direct control of the crown, and on the 20th of October 1898 an order in council was passed providing for the future regulation of the country. An imperial resident commissioner was appointed, who was also to be *ex officio* a member of the executive and legislative councils; and there was to be a legislative council, consisting of five nominated and four elected members. The first meeting of the newly appointed council took place at Salisbury on the 15th of May 1899. Other changes, in the direction of giving more power to the non-official element, were made subsequently (see above, *Administration*).

While these political changes were being made the company and the settlers set to work to repair the losses by war and plague. In particular the policy of railway development was pushed forward, and in November 1897 the line from Cape Town reached Bulawayo. The Mashonaland railway connecting Salisbury with Beira was completed in May 1899. In the same year gold-mining on a considerable scale began, the output for the year being over 65,000 oz. In the early part of 1899 Rhodes visited London and Berlin in furtherance of his schemes for the transcontinental telegraph extension from Cape Town to Cairo, and the transcontinental railway. He endeavoured to obtain from the British Government the guarantee of a loan for extending the railway, to be raised at 3%, but was unsuccessful. He received, however, the support of various companies in Rhodesia, who amongst them subscribed £252,800 at 3% for the immediate extension of the railway for 150 miles; and in May he stated, at a meeting of the Chartered Company, that the Rhodesia Railways Limited would raise another £3,000,000 at 4%, to be guaranteed by the Chartered Company. In this way he hoped that the remaining 1050 miles of railway from Bulawayo to the frontier of German East Africa might be constructed. In Berlin, Rhodes had an interview with the German Emperor, when arrangements were arrived at for the passage of telegraph lines over German territory, and also in certain contingencies for the continuation of the transcontinental railway through German East Africa.

In many respects the country recovered rapidly from the disasters of 1896, one of the most important measures taken being the compulsory inoculation for rinderpest, which finally stamped out the disease in 1898–99. By the last balance-sheet issued by the company previous to the outbreak of the Boer War it would appear that the revenue of Rhodesia for the year ending the 31st of March 1898 amounted to £260,516 net, of which amount the sale of land plots accounts for £63,628; stamps and licences, £69,658; and posts and telegraphs, £46,745; so that the machinery of civilized life was already in full activity where eight years previously the only white inhabitants had been a few missionaries, hunters and traders. The government buildings were estimated in March 1898 to be worth £165,672, and the assessed value of the town property at Bulawayo was £2,045,000 and that at Salisbury £750,000. (Both those towns had been granted municipal government in 1897.) Education was arranged under the supervision of government inspectors, and various religious communities were also engaged in educational work. The country appeared indeed in 1899 to be starting on the road to industrial and agricultural prosperity, but an almost complete stop to progress resulted from the outbreak of the Boer War in October of that year. The company could point with satisfaction to the fact that Rhodesia contributed nearly 1500 men to the forces serving in the war, 12½% of the European population. Rhodesia itself was not subjected to invasion, but the withdrawal of so large a number of able-bodied men seriously interfered with the development of the country, the war not ending until June 1902. Throughout this period the natives, with few exceptions, remained peaceful and gave the administration no serious trouble.

Agitation for self-government.

Before the war ended, Cecil Rhodes, whose chief work during the period since the Raid had been the building up of the country which bore his name, was dead (26th of March 1902). Alfred Beit, who had in 1898 refused to rejoin the directorate, now consented (June 1902) to return to the board of the Chartered Company, on which he remained until his death in July 1906. The loss of Rhodes's guiding mind and inspiring personality was, however, manifest, and among the Rhodesians there arose a feeling of discontent at the company's conduct of affairs. The company was willing on proper terms to hand over the administration to the colonists, and they secured the services of Sir George Goldie to examine the situation and report on what terms the transfer could be made. Sir George visited Rhodesia in 1903–4, and drew up a scheme which included the taking over by Rhodesia of the administrative liabilities incurred by the company, which would thus become a public debt. After consultation between leading Rhodesians and the directors of the company the scheme was abandoned, the Rhodesians considering the financial burden proposed too great for an infant colony. The company therefore continued the administration, devoting attention to the development of agriculture and mining. The two railway systems were linked together by a line from Bulawayo to Salisbury, and several short lines to mining properties were built. From Bulawayo the main line was continued to the Wankie coalfields, thence to the Zambezi, bridged in 1905 just below the Victoria Falls. From the Zambezi the line went north-east, so as to render accessible the mineral wealth of Barotseland and that of Katanga on the Rhodesian-Congo frontier. Although Rhodesia was affected by the commercial depression which prevailed in South Africa for some years after the close of the war, its industries showed considerable vitality. In 1906 the gold output exceeded 500,000 oz., and in the financial year 1905–6 the revenue of Southern Rhodesia slightly exceeded the expenditure.

Only once (1895–96) in the first fifteen years following the settlement of the country had the company's annual revenue exceeded the amount expended in the same period. As a commercial undertaking, the company therefore was during this period of no pecuniary advantage to the shareholders. This was due in part to unforeseen and unavoidable causes, but it is also true that the founders of the company had other than commercial aims. Rhodes's chief ambition was to secure the country for Britain and to open it up to the energies of her peoples, and he succeeded in this aim. He acted more quickly, and in many ways more effectively, than the imperial government would have been able to act had it at the outset taken over the country. To the sturdy colonists Rhodes made available a land rich not only in gold, but in coal and other minerals, and with very great agricultural and pastoral resources, and all this was done without the cost of a penny to the imperial exchequer. Despite all drawbacks, an area (reckoning Southern Rhodesia only) considerably larger than that of the United Kingdom had in less than twenty years been endowed with all the adjuncts of civilization and made the home of thousands of settlers.

The progress made by the country in the five years 1906–10 demonstrated that the faith Rhodes and his colleagues had placed in it was not ill-founded. Although the white population increased but slowly, in all other respects healthy development took place, the element of speculation which had characterized many of the first attempts to exploit the land being largely eliminated. In 1906 Lord Selborne (the high commissioner) visited Rhodesia. He inquired into the various grievances of the settlers against the Chartered Company; held an indaba with Matabele indunas in the Matoppo Hills, and at Bulawayo had a conference with Lewanika, the paramount chief of the Barotse. In 1907 Dr Jameson and other directors of the Chartered Company travelled through Rhodesia, and the result was to clear up some of the matters in dispute between the settlers and the company. Southern Rhodesia had become self-supporting, and the essentially temporary nature of the existing system of government was recognized. But the company held that the time was not yet ripe for Southern Rhodesia to become a self-governing colony. The directors, however, adopted a more liberal land policy, the increased attention given to agriculture being a marked and satisfactory feature of the situation. Mining and railway development were also pushed on vigorously.

The movement for the closer union of the British South African colonies excited lively interest in Southern Rhodesia. The territory, not possessing self-government, could not take part in the national convention which met at Durban in October 1908 on equal terms with the delegates of the Cape, &c. It was, however, represented by three delegates on the understanding that Rhodesia would not, for the time being at least, be included in any agreement which might be reached. The convention resulted in the union (on the 31st of May 1910) under one government of the Cape, Transvaal, Natal and Orange River colonies. The position of Rhodesia with respect to the Union was set forth in the South Africa Act 1909. It provides that "the king, with the advice of the Privy Council, may on addresses from the Houses of Parliament of the Union admit into the Union the territories administered by the British South Africa Company on such terms and conditions as to representation and otherwise in each case as are expressed in the addresses and approved by the king."

In Rhodesia itself at this time there was a widespread feeling that there was no urgency as to the territory joining the Union, and the opinion was held by many that a separate existence as a self-governing community would be preferable. A section of the settlers were content for the present to remain under the government of the Chartered Company.

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For general works including Rhodesia see South Africa, § *Bibliography*. See also authorities cited under British Central Africa, Barotse, &c. (A. P. H.; F. R. C.)

RHODIUM [symbol Rh; atomic weight 102·9 (O=16)], in chemistry, a metallic chemical element found, associated with the other elements of the platinum group, in crude platinum ore, wherein it was discovered in 1803 by W. H. Wollaston (*Phil. Trans.*, 1804, p. 419). It may be obtained from the residues of platinum ore after treatment with aqua regia and removal of the platinum as chlorplatinate. The mother liquors are decomposed by treatment with metallic iron, the precipitate obtained being warmed with concentrated nitric acid and heated in an iron crucible with concentrated caustic potash. The residue thus obtained is mixed with salt and heated in a current of chlorine, any iridium present being converted into its chloride by treatment with nitric acid and precipitated by ammonium chloride, whilst rhodium ammonium chloride goes into solution with its characteristic rose-red colour (C. E. Claus, *Jour. prakt. Chem.*, 1843–1845). For other methods of extraction see Gibbs, ib., 1861, 84, p. 65; 1865, 94, p. 10; T. Wilm, *Bull. soc. chim.*, 1880 (2), 34, p. 679; E. Frémy, *Comptes rendus*, 1854, 38, p. 1008, &c.). The metal itself is best obtained by the reduction of chlorpurpureo rhodium chloride, $(Cl_2Rh_2 \cdot 10NH_3) \cdot Cl_4$, in a current of hydrogen, the metal after reduction being cooled in a stream of carbon dioxide (S. M. Jorgensen, *Zeit. anorg. Chem.*, 1903, 34, p. 82). It somewhat resembles aluminium in colour; its specific gravity varies from 11 to 12·1; and its specific heat is 0·05527 (V. H. Regnault, *Ann. chim. phys.*, 1861, 63, p. 15). It is less fusible than platinum. It oxidizes superficially when heated, and may be distilled in the electric furnace. It is insoluble in acids, but forms a soluble sulphate when fused with potassium bisulphate (a reaction which distinguishes it from the other metals of the platinum group). It oxidizes when fused with potassium hydroxide and potassium nitrate, to the dioxide, RhO_2. It absorbs hydrogen readily. Rhodium black is obtained by reducing rhodium salts with formic acid; by alcohol in the presence of alkali; or by precipitation with zinc and iron. A colloidal rhodium may be prepared by reducing the sesquichloride with hydrazine hydrate. Rhodium salts may be recognized by their characteristic reaction with freshly prepared sodium hypochlorite solution. A yellow precipitate is obtained, which on shaking for some time with acetic acid gradually dissolves to an orange-coloured solution. This solution after a short time deposits a grey precipitate, and the supernatant liquid becomes azure blue in colour (E. Demarçay, *Comptes rendus*, 1885, 101, p. 951).

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[1] Unless otherwise stated, the place of publication is London.

Several oxides of rhodium are known. The monoxide, RhO, formed when the hydrated sesquioxide is heated (Claus) or when finely divided rhodium is heated in a current of air (Wilm), is a grey powder which is insoluble in acids. The sesquioxide, Rh_2O_3, is a black insoluble powder, formed when the corresponding hydrate is heated. This hydrate, $Rh_2(OH)_6$, is obtained as a yellow powder, by decomposing rhodium salts (not the sulphate) with dilute solutions of the caustic alkalis. It is soluble in acids, and in the moist condition is also soluble in concentrated alkalis. A hydrated rhodium dioxide, $RhO_2 \cdot 2H_2O$, is formed when chlorine is passed into a solution of the sesquioxide in concentrated caustic potash, or by adding an alkaline hypochlorite to a concentrated alkaline solution of rhodium and sodium chlorides. It is a greenish-black powder which is soluble in hydrochloric acid. Rhodium chloride, Rh_2Cl_6, is obtained impure by heating the metal to dull redness in a current of chlorine, or, purer, by heating an alloy of rhodium and tin in chlorine or by heating the double ammonium rhodium chloride in chlorine at 440° C. (E. Leidié, *Ann. chim. phys.*, 1889, (6), 17, p. 265; *Comptes rendus*, 1899, 129, p. 1249). It is a red powder, which decomposes at a red heat, leaving a residue of the metal. It is insoluble in water and acids, but dissolves in concentrated solutions of potassium cyanide. The hydrated form $Rh_2Cl_6 \cdot 8H_2O$ is obtained impure by dissolving the hydrated sesquioxide in hydrochloric acid, by the action of hydrofluosilicic acid on potassium rhodium chloride, and by the action of chlorine on rhodium in the presence of sodium chloride. In the last method the product is dissolved in a dilute hydrochloric acid (1:1), and the solution saturated with hydrochloric acid gas at 0° C., allowed to stand for some time, decanted, and finally evaporated in vacuo (Leidié, *loc. cit.*). It forms a very deliquescent, red, amorphous mass, which decomposes on exposure. It is very soluble in water, forming a yellow solution. It forms double salts with the alkaline chlorides.

Rhodium monosulphide, RhS, is formed when rhodium or rhodium ammonium chloride are heated with sulphur, and also by precipitating rhodium salts with sulphuretted hydrogen, the precipitate being dissolved in ammonium sulphide and thrown down again by dilute sulphuric acid (Lecoq de Boisbaudran, *Ber.*, 1883, 16, p. 579). It is a dark-coloured powder which is insoluble in acids and other solvents. It loses all its sulphur when heated in air. The sesquisulphide, Rh_2S_3, is prepared by heating anhydrous rhodium chloride, Rh_2Cl_6, in a current of sulphuretted hydrogen at 360° C., or by passing the gas into a boiling solution of the chloride. It is a black powder which is insoluble in acids and in alkaline sulphides. It decomposes when strongly heated. Rhodium sulphate, $Rh_2(SO_4)_3$, is prepared by oxidizing the sulphide, by fusing the metal with acid potassium sulphate, or by the action of concentrated sulphuric acid on an alloy of rhodium and lead, or on the hydrated sesquioxide. It is a red powder which decomposes when heated or when boiled with much water. It forms alums (Leidié, *Comptes rendus*, 1888, 107, p. 234). Rhodium potassium alum, $Rh_2(SO_4)_3 \cdot K_2SO_4 \cdot 24H_2O$, is obtained by dissolving the sesquioxide in sulphuric acid and adding two-thirds of the calculated amount of potassium sulphate to the solution (A. Piccini and L. Marino, *Zeit. anorg. Chem.*, 1901, 27, p. 62). It crystallizes in cubes. Rhodium cyanide, $Rh_2(CN)_6$, is a carmine-red powder formed when rhodium potassium cyanide is boiled with acetic acid. Rhodium potassium cyanide, $K_6Rh_2(CN)_{12}$, is formed when the sesquioxide is dissolved in caustic potash and an excess of hydrocyanic acid added gradually, the solution being then evaporated in vacuo. It is a colourless crystalline solid soluble in water, and isomorphous with the corresponding iron, cobalt, chromium and manganese compounds.

The rhodium ammonia salts correspond almost with the similar cobalt compounds and may be divided into three series—namely, hexammine salts (luteo-salts), $[Rh(NH_3)_6]X_3$; aquopentammine salts (roseo-salts), $[Rh(NH_3)_5 \cdot H_2O]X_3$; and pentammine salts (purpureo-salts), $[Rh(NH_3)_5X]X_2$. (See S. F. Jorgensen, C. W. Blomstrand, *Jour. prak. Chem.*, 1882, et seq.)

The atomic weight of rhodium has been determined by S. F. Jorgensen (*Jour. prakt. Chem.*, 1883, 27, p. 486), by the analysis of chlorpurpureo rhodium chloride, the mean value obtained being 103; whilst K. Seubert and K. Kobbé (*Ann.*, 1890, 260, p. 314), by analysis of the double chloride and sulphate, obtained as a mean value 102·86.

RHODOCHROSITE, a mineral species consisting of manganese carbonate, $MnCO_3$, crystallizing in the rhombohedral system and isomorphous with calcite. It usually occurs as cleavable, compact or botryoidal masses, distinct crystals being somewhat rare; these often have the form of the primitive rhombohedron, parallel to the faces of which there are perfect cleavages. When pure, the mineral contains 47·7% of manganese, but this is usually partly replaced by varying amounts of iron, and sometimes by calcium, magnesium, zinc, or rarely cobalt (cobalt-manganese-spar). With these variations in chemical composition the specific gravity varies from 3·45 to 3·60; the hardness is 4. The colour is usually rose-red, but may sometimes be grey to brown. The name rhodochrosite, from the Greek ῥόδο-χρως (rose-coloured), has reference to the characteristic colour of the mineral: manganese-spar and dialogite are synonyms. It is found in mineral veins with ores of silver, lead, copper, &c., or in deposits of manganese ore. Crystals have been met with in the mines at Kapnik-Bánya and Nagyág near Déva in Transylvania and at Diez in Nassau, but by far the best specimens are from Colorado. The mineral is used to a limited extent in the manufacture of spiegeleisen and ferromanganese.

RHODODENDRON. Classical writers, such as Dioscorides and Pliny, seem, from what can be ascertained, to have called the oleander (*Nerium Oleander*) by this name, but in modern usage it is applied to a large genus of shrubs and trees belonging to the order of heaths (Ericaceae). No adequate distinction can be drawn between this genus and *Azalea* (*q.v.*)—the proposed marks of distinction, however applicable in particular cases, breaking down when tested more generally. The rhododendrons are trees or shrubs, never herbs, with simple, evergreen or deciduous leaves, and flowers in terminal clusters surrounded in the bud by bud-scales but not as a rule by true leaves. The flowers are remarkable for the frequent absence or reduced condition of the calyx. The funnel- or bell-shaped corolla, on the other hand, with its five or more lobes, is usually conspicuous, and in some species so much so as to render these plants greatly prized in gardens. The free stamens are usually ten, with slender filaments and anthers opening by pores at the top. The ovary is five- or many-celled, ripening into a long woody pod which splits from top to bottom by a number of valves, which break away from the central placenta and liberate a large number of small bran-like seeds provided with a membranous wing-like appendage at each end. The species are for the most part natives of the mountainous regions of the northern hemisphere, extending as far south as the Malay Archipelago and New Guinea, but not hitherto found in South America or Australia. None are natives of Britain. They vary greatly in stature, some of the alpine species being mere pygmies with minute leaves and tiny blossoms, while some of the Himalayan species are moderate-sized trees with superb flowers. Some are epiphytal, growing on the branches of other trees, but not deriving their sustenance from them. The varieties grown in gardens are mostly grafted on the Pontic species (*R. ponticum*) and the Virginian *R. catawbiense*. The common Pontic variety is excellent for game-covert, from its hardiness, the shelter it affords, and the fact that hares and rabbits rarely eat it. Variety of colour has been infused by crossing or hybridizing the species first named, or their derivatives, with some of the more gorgeously coloured Himalayan-American varieties. In many instances this has been done without sacrifice of hardihood.

Some of the finest hybrids for the open air, especially in favoured spots, are *altaclerense* (scarlet); *Harrisi* (rosy crimson); *Kewense* (rose); *Luscombei* (rose-pink); *Manglesi* (white); *nobleanum* (crimson), one of the first to flower after Christmas; *praecox* (rose-purple); and *Shilsoni* (crimson). There are almost countless colour variations of these, but one of the most exquisite of late years is that known as *Pink Pearl*, with large clear rosy-pink blossoms of great purity. What are termed greenhouse rhododendrons are derivatives from certain Malayan and Javanese species, and are consequently much more tender. They are characterized by the possession of a cylindrical (not funnel-shaped) flower-tube and other marks of distinction. The foliage of rhododendrons contains much tannin, and has been used medicinally. Whether the honey mentioned by Xenophon as poisonous was really derived from plants of this genus as alleged is still an open question.

Cultivation.—The hardy evergreen kinds are readily propagated by seed, by layers, and by grafting. Grafting is resorted to only for the propagation of the rarer and more tender kinds. Loamy soil containing a large quantity of peat or vegetable humus is essential, the roots of all the species investigated being associated with a fungus partner (*mycorhiza*). An excess of lime or chalk in the soil proves fatal to rhododendrons and their allies sooner or later—a fact overlooked by many amateurs. The hardy deciduous kinds are valuable for forcing, and withstand cold-storage treatment well. The tender Malayan and Javanese species thrive in warm greenhouse temperature, but are difficult to cultivate where the water is very alkaline.

RHODONITE, a member of the pyroxene group of minerals, consisting of manganese metasilicate, $MnSiO_3$, and crystallizing in the anorthic system. It commonly occurs as cleavable to compact masses with a rose-red colour; hence the name, from the Greek ῥόδον (a rose). Crystals often have a thick tabular habit; there are perfect cleavages parallel to the prism faces with an angle of $87° 31\frac{1}{2}'$. The hardness is $5\frac{1}{2}$–$6\frac{1}{2}$, and the specific gravity 3·4–3·68. The manganese is often partly replaced by iron and calcium, which may sometimes be present in considerable amounts; a greyish-brown variety containing as much as 20% of calcium oxide is called "bustamite"; "fowlerite" is a zinciferous variety containing 7% of zinc oxide. Rhodonite is a mineral liable to alteration, with the formation of manganese carbonate, hydrous silicate or oxides. The compact material, which is cut and polished for ornamental purposes, is often marked in a striking manner by veins and patches of these black alteration products. At Syedelnikova, near Ekaterinburg in the Urals, compact material of a good colour occurs in a clay-slate and is extensively quarried: boulders of similar material found at Cummington in Massachusetts ("cummingtonite") have also been worked as an ornamental stone. In the iron and manganese mines at Pajsberg near Filipstadt and Långban in Vermland, Sweden, small brilliant and translucent crystals ("pajsbergite") and cleavage masses occur. Fowlerite occurs as large, rough crystals, somewhat resembling pink felspar, with franklinite and zinc ores in granular limestone at Franklin Furnace in New Jersey.

RHOECUS, a Samian sculptor of the 6th century B.C. He and his son Theodorus were especially noted for their work in bronze. Herodotus says that Rhoecus built the temple of Hera at Samos. In the temple of Artemis at Ephesus was a marble figure of night by Rhoecus. His name has been found on a fragment of a vase which he dedicated to Aphrodite at Naucratis. His sons Theodorus and Telecles made a statue of the Pythian Apollo for the Samians.

RHONDDA (formerly YSTRADYFODWG), an urban district and parliamentary division of Glamorganshire, South Wales. It is 12 m. long by about $4\frac{3}{4}$ m. across at its widest part, and comprises two main valleys, named after their respective rivers, Rhondda Fawr ($9\frac{1}{2}$ m.) and Rhondda Fach, or the lesser ($6\frac{1}{2}$ m.), running S.E. and S.W. respectively till their junction at Porth, and thence the single valley for upwards of a mile farther down the boundary of the Pontypridd urban district at Trehafod. The valleys are narrow and tortuous, and their lateral boundaries are formed by steep hills varying in height from about 560 ft. on either side of Trehafod to 1340 ft. on the N.E. of Maerdy in the lesser Rhondda and 1742 ft. on the S.W. of Treherbert in the main valley, while the mountains at the upper end of the latter valley culminate in Carn Moesen (1950 ft.). The two valleys are separated by the steep ridge of Cefn-rhondda, which ranges from 600 ft. high above Porth to 1690 ft. near the upper end of the district. There are a few tributary valleys of which Cwmparc, Clydach Vale and Cymmer are the chief. Though the urban district measures 23,884 acres, the area built upon is generally a narrow strip on either side of each river except at Treorky and Ton, where the valley of the Rhondda Fawr opens out a little. In 1877 the ancient parish of Ystradyfodwg (with the omission of the township of Rhigos, which lies beyond the mountains to the north) was formed into an urban district bearing the parish name, the area having previously been part of a rural district under the Pontypridd rural sanitary authority. In October 1879, portions of the parishes of Llanwonno and Llantrisant, comprising over 5000 acres, were added to the urban area, the whole being consolidated in 1894 into one civil parish. In 1897, the name of the urban district was changed into Rhondda. The Taff Vale railway runs up each of the two valleys from a junction at Porth (16 m. N.W. of Cardiff), and has five stations in the main valley and four in the lesser one. From Porth it runs to Pontypridd, whence there is communication with Cardiff, Barry and Newport. The Rhondda and Swansea Bay railway (authorized in 1882, opened in 1890, and now worked by the Great Western) connects the upper end of the main valley, where it has a station, Blaen-rhondda, with Port Talbot, Neath and Swansea (31 m. distant) by means of a line which has a tunnel 3443 yds. long.

The district occupies almost the centre of the eastern division of the South Wales coal-field, and its coal, upon which the inhabitants are almost entirely dependent, is unsurpassed for its steam-raising properties. In common with other East Glamorgan coal it became commercially known as Cardiff coal from the fact that Cardiff was at first its only port of shipment. The development of the Rhondda coal-field was later in date than those of Aberdare and Merthyr, and it received its chief impetus from the American Civil War. Thus the population of the parish (excluding Rhigos), which was 576 in 1811, 951 in 1851 and 3035 in 1861, increased to 16,914 in 1871. When the boundaries of the district were extended in 1879 the population of the enlarged area was calculated by the registrar-general to be 23,950 in 1871, but it reached 55,632 in 1881, and 113,735 in 1901, showing an increase of 104% in the previous twenty years. In 1901, 35·4% of the population of three years of age and upwards spoke English only, 11·4% spoke Welsh only, the remainder being bilingual.

Ecclesiastically the parish of Ystradyfodwg was an ancient chapelry dependent on Llantrisant. The old parish church at Ton Pentre (in substitution for which a new church was built in 1893–94) served the whole parish till past the middle of the 19th century. Between 1879 and 1900 the ancient parish (excluding Rhigos) was divided into seven ecclesiastical parishes, the six new ones being Llwyn-y-pia (1879), Tylorstown (1887), Ynyshir (1887), Treherbert (1893), Cwmparc (1898) and Ferndale (1900). The additional area brought into the urban district in 1879 comprises two other ecclesiastical parishes, Cymmer and Porth (1894), and Dinas and Penygraig (1901). These nine parishes, comprised in the urban district, have twenty churches and eighteen mission-rooms, with accommodation for about 12,000 persons. This area, together with Pontypridd, Glyntaff and Llanwonno, form the rural deanery of Rhondda in the archdeaconry and diocese of Llandaff. There were at the end of 1905 over one hundred and fifty nonconformist chapels and mission rooms, with accommodation for over 85,000 persons, of which provision nearly two-thirds was in chapels with Welsh services. There is a Roman Catholic church at Tonypandy. The public buildings include the council house and offices of the district council, erected in 1883–84 for the local board at Pentre, libraries and workmen's institutes at Ystrad (1895), and Cymmer

(1893), Maerdy (1905), Dinas (1893), and Ferndale public halls, the property of a private company at Treherbert (1872), and Tonypandy (1891) and a county intermediate school at Porth. By means of a tunnel about 2100 yds. long water is obtained for the greater part of the main valley from the lake of Llyn Fawr on the Neath side of the mountain range which shuts in the valley on the north. This lake has been converted into a storage reservoir of about 167 million gallons capacity. The rest of the district is supplied from the Pontypridd Water Company's works above Maerdy in the lesser valley.

The ancient parish (excluding Rhigos) was formed into a parliamentary constituency with one member in 1885. The present urban district substantially corresponds to the ancient territorial division of Glyn-rhondda, one of the four commotes of the cantred of Penychen, and subsequently, in Norman times, one of the twelve "members" of the lordship of Glamorgan. Its Welsh lords enjoyed a large measure of independence and had their own courts, in which Welsh law was administered down to 1535, when the lordship was fully incorporated in the county of Glamorgan. On the ridge of Cefn-rhondda between the two valleys was the Franciscan monastery of Penrhys, famous for its image of the Virgin and for its holy well which attracted large pilgrimages. It was dissolved about 1415, probably owing to its having supported Glyndwr in his rebellion. Edward II. came here from Neath Abbey and was captured on the 16th of November 1326, either at Penrhys, or between it and Llantrisant. (D. Ll. T.)

RHONE (Fr. *Rhône*, Lat. *Rhodanus*), one of the most important rivers in Europe, and the chief of those which flow directly into the Mediterranean. It rises at the upper or eastern extremity of the Swiss canton of the Valais, flows between the Bernese Alps (N.) and the Lepontine and Pennine Alps (S.) till it expands into the Lake of Geneva, winds round the southernmost spurs of the Jura range, receives at Lyons its principal tributary, the Saône, and then turns southward through France till, by many mouths, it enters that part of the Mediterranean which is rightly called the Golfe du Lion (sometimes wrongly the Gulf of Lyons). Its total length from source to sea is 504½ m. (of which the Lake of Geneva claims 45 m.), while its total drainage area in 37,798 sq. m., of which 2772 sq. m. are in Switzerland (405 sq. m. of the Swiss portion being composed of glaciers), and its total fall 5898 ft. Its course (excluding the Lake of Geneva, *q.v.*) naturally falls into three divisions: (1) from its source to the Lake of Geneva, (2) from Geneva to Lyons, and (3) from Lyons to the Mediterranean.

1. From its source to the lake the Rhone is a purely Alpine river, flowing through the great trench which it has cut for itself between two of the loftiest Alpine ranges, and which (save a bit at its north-west end) forms the Canton of the Valais. Its length is 105½ m., while its fall is 4679 ft. It issues as a torrent, at the height of 5909 ft., from the great Rhone glacier at the head of the Valais, the recent retreat of this glacier having proved that the river really flows from beneath it, and does not take its rise from the warm springs that are now at some distance from its shrunken snout. It is almost immediately joined on the left by the Mutt torrent, coming from a small glacier to the S.E., and then flows S.W. for a short distance past the well-known Gletsch Hotel (where the roads from the Grimsel and the Furka Passes unite). But about half a mile from the glacier the river turns S.E. and descends through a wild gorge to the more level valley, bending again S.W. before reaching the first village, Oberwald. It preserves this south-westerly direction till Martigny. The uppermost valley of the Rhone is named Goms (Fr. *Conches*), its chief village being Münster, while Fiesch, lower down, is well known to most Swiss travellers. As the river rolls on, it is swollen by mountain torrents, descending from the glaciers on either side of its bed—so by the Geren (left), near Oberwald, by the Eginen (left), near Ulrichen, by the Fiesch (right), at Fiesch, by the Binna (left), near Grengiols, by the Massa (right), flowing from the great Aletsch glaciers, above Brieg. At Brieg the Rhone has descended 3678 ft. from its source, has flowed 28 m. in the open, and is already a considerable stream when joined (left) by the Saltine, descending from the Simplon Pass. Its course below Brieg is less rapid than before and lies through the alluvial deposits which it has brought down in the course of ages. The valley is wide and marshy, the river frequently overflowing its banks. Further mountain torrents (of greater volume than those higher up) fall into the Rhone as it rolls along in a south-westerly direction towards Martigny: the Visp (left), coming from the Zermatt valley, falls in at Visp, at Gampel the Lonza (right), from the Lötschen valley, at Leuk the Dala (right), from the Gemmi Pass, at Sierre the Navizen (left), from the Einfisch or Anniviers valley, at Sion, the capital of the Valais, the Borgne (left) from the Val d'Hérens; soon the Rhone is joined by the Morge (right), flowing from the Sanetsch Pass, and the boundary in the middle ages between Episcopal Valais to the east and Savoyard Valais to the west, and at Martigny by the Dranse (left), its chief Alpine tributary, from the Great St Bernard and the Val de Bagnes. At Martigny, about 50 m. from Brieg, the river bends sharply to the N.W., and runs in that direction to the Lake of Geneva. It receives the Salanfe (left), which forms the celebrated waterfall of Pissevache, before reaching the ancient town and abbey of St Maurice (9½m.). Henceforward the right bank is in the canton of Vaud (conquered from Savoy in 1475) and the left bank in that of the Valais (conquered similarly in 1536), for St Maurice marks the end of the historical Valais. Immediately below that town the Rhone rushes through a great natural gateway, a narrow and striking defile (now strongly fortified), which commands the entrance of the Valais. Beyond, the river enters the wide alluvial plain, formerly occupied by the south-eastern arm of the Lake of Geneva, but now marshy and requiring frequent "correction." It receives at Bex the Avançon (right), flowing from the glaciers of the Diablerets range, at Monthey the Vièze (left), from Champéry and the Val d'Illiez, and at Aigle the Grande Eau (right), from the valley of Ormonts-dessus. It passes by the hamlet of Port Valais, once on the shore of the lake, before expanding into the Lake of Geneva, between Villeneuve (right) and St Gingolph (left). During all this portion of its course the Rhone is not navigable, but a railway line runs along it from Brieg in about 72 m. to either Villeneuve or Le Bouveret.

2. On issuing at Geneva from the lake the waters of the Rhone are very limpid and blue, as it has left all its impurities in the great settling vat of the lake, so that Byron might well speak of the "blue rushing of the arrowy Rhone" (*Childe Harold*, canto iii. stanza 71). But about half a mile below Geneva this limpidity is disturbed by the pouring in of the turbid torrent of the Arve (left), descending from the glaciers of the Mont Blanc range, the two currents for some distance refusing to mix. The distance from Geneva to Lyons by the tortuous course of the Rhone is about 124 m., the fall being only about 689 ft. The characteristic feature of this portion of the course of the Rhone is the number of narrow gorges or *cluses* through which it rushes, while it is forced by the southern spur of the Jura to run in a southerly direction, till, after rounding the base of that spur, it can flow freely westwards to Lyons. About 12 m. S. of Geneva the Rhone enters French territory, and henceforth till near Lyons forms first the eastern, then the southern boundary of the French department of the Ain, dividing it from those of Haute Savoie and Savoie (E.) and that of the Isère (S.). Soon after it becomes French the river rushes furiously through a deep gorge, being imprisoned on the north by the Crédo and on the south by the Vuache, while the great fortress of l'Écluse guards this entrance into France. The railway pierces the Crédo by a tunnel. In the narrowest portion of this gorge, not far from Bellegarde at its lower end, there formerly existed the famous *Perte du Rhône* (described by Saussure in his *Voyages dans les Alpes*, chapter xvii.), where for a certain distance the river disappeared in a subterranean channel; but this natural phenomenon has been destroyed, partly by blasting, and partly by the diversion of the water for the use of the factories of Bellegarde. At Bellegarde the Valserine flows in (right), and then the river resumes its southerly direction, from which the great gorge had deflected it for a while. Some way below Bellegarde, between Le Parc and Pyrimont, the

Rhone becomes officially "navigable," though as far as Lyons the navigation now consists all but wholly of the floating of flat-bottomed boats, named *rigues*, laden chiefly with stone quarried from the banks of the river. Above Seyssel (11 m. from Bellegarde) the Usses (left) joins the Rhone, while just below that village the Fier (left) flows in from the Lake of Annecy. Below the junction of the Fier the hills sink on either side, the channel of the river widens, and one may say that it leaves the mountains for the plains. At Culoz (41½ m. by rail from Geneva) the railway from Geneva to Lyons (105 m.) quits the Rhone in order to run west by a direct route past Ambérieu. The Rhone continues to roll on southwards, but no longer (as no doubt it did in ancient days) enters the Lac du Bourget, of which it receives the waters through a canal, and then leaves it on the east in order to run along the foot of the last spur of the Jura. It flows past Yenne (left) and beneath the picturesque fortress (formerly a Carthusian monastery) of Pierre Châtel (right) before it attains the foot of the extreme southern spur of the Jura, at a height of 696 ft., not far from the village of Cordon, and just where the Guiers flows in (left) from the mountains of the Grande Chartreuse. This is nearly the last of the *cluses* through which the river has to make its way. The very last is at the Pont du Saut or Sault, a little S. of Lagnieu. The river now widens, but the neighbouring country is much exposed to inundations. It receives (right) its most important tributary in this part of its course, the Ain, which descends from the French slope of the Jura and is navigable for about 60 m. above its junction with the Rhone. Farther down the Rhone meanders for a time with shifting channels in a bed about 2 m. broad, but it gathers into a single stream before its junction with the Saône, just below Lyons. The Saône (*q.v.*), which has received (left) the Doubs, is the real continuation of the Rhone, both from a geographical and a commercial point of view, and it is by means of canals branching off from the course of the Saône that the Rhone communicates with the basins of the Loire, the Seine, the Rhine and the Moselle. In fact, up to Lyons, the Rhone (save when it expands into the Lake of Geneva) is a huge and very unruly mountain torrent rather than a great European river.

3. Below Lyons, however, the Rhone becomes one of the great historical rivers of France. It was up its valley that first Greek, then Latin civilization penetrated from the Mediterranean to Lyons, as well as in the 10th century the Saracen bandits from their settlement at La Garde Freinet, near the coast of Provence. Then, too, from Lyons downwards, the Rhone serves as a great medium of commerce by which central France sends its products to the sea. Its length from Lyons to the sea is some 230 m., though its fall is but 530 ft. But during this half of its course it can boast of having on its left bank (the right bank is very poor in this respect) such historical cities as Vienne, Valence, Avignon, Tarascon and Arles, while it receives (left) the Isère, the Drôme and the Durance rivers, all formed by the union of many streams, and bringing down the waters that flow from the lofty snowy Dauphiné Alps. The Ardèche is the only considerable affluent from the right. Near Arles, about 25 m. from the sea, and by rail 175¼ m. from Lyons, the river breaks up into its two main branches, the Grand Rhone running S.E. and the Petit Rhone S.W.; they enclose between them the huge delta of the Camargue, which is cultivated on the banks of the river only, but elsewhere is simply a great alluvial plain, deposited in the course of ages by the river, and now composed of scanty pasturages and of great salt marshes. Between Lyons and the sea, the Rhone divides four departments on its right bank (Rhône, Loire, Ardèche and Gard) from as many on its left bank (Isère, Drôme, Vaucluse and Bouches du Rhône).

Consult in general Ch. Lenthéric, *Le Rhône—histoire d'un fleuve*, 2 vols. (Paris, 1892). (W. A. B. C.)

RHÔNE, a department of south-eastern France, formed in 1793 from the eastern portion of the department of Rhône-et-Loire, and comprising the old districts of Beaujolais, Lyonnais, Franc-Lyonnais, Forez and a small portion of Dauphiné. Pop. (1906) 858,907. Area, 1104 sq m. Rhône is bounded N. by the department of Saône-et-Loire, E. by Ain and Isère and S. and W. by Loire. The Saône and the Rhone form its natural boundary on the east. The department belongs almost entirely to the basin of the Rhone, to which it sends its waters by the Saône and its tributary the Azergues, and by the Gier. The mountains which cover the surface of the department constitute the watershed between the Rhone and the Loire, and from north to south form four successive groups—the Beaujolais Mountains, the highest peak of which is 3320 ft.; the Tarare group; the Lyonnais Mountains (nearly 3000 ft.); and Mont Pilat, the highest peak of which belongs to the department of Loire. The lowest point of the department (460 ft. above sea-level) is at the egress of the Rhone. The meteorological conditions vary greatly with the elevation and exposure. Snow sometimes lies in the mountains from November to April, while at Lyons and in the valleys the mean temperature in winter is 36° F. and in summer 70°, the annual mean being 53°. The average rainfall is somewhat higher than is general over France owing to the amount of the precipitation on the hilly region.

Good agricultural land is found in the valleys of the Saône and Rhone, but for the most part the soil is stony and only moderately fertile. Wheat, oats, rye and potatoes are extensively cultivated, but their importance is less than that of the vine, the hills of the Beaujolais on the right bank of the Saône producing excellent wines. Fruit trees, such as peaches, apricots, walnuts and chestnuts, grow well, but the wood in general is little more than copse and brushwood. Good pasture is found in the valleys of the Azergues and its affluents. Mines of iron-pyrites and coal and quarries of freestone are worked. The production of silk fabrics, the chief branch of manufacture, that of chemicals and machinery, together with most of the other industries of the department, are concentrated in Lyons (*q.v.*) and its vicinity. Tarare is a centre for the manufacture of muslin and embroidery. Oullins has large railway workshops belonging to the Paris-Lyon-Méditerranée railway, and there are important glass works at Givors. Cotton-spinning and weaving are carried on in several localities. The products of its manufactures, together with wine and brandy, form the bulk of the exports of the department; its imports comprise chiefly the raw material for its industries. It is served by the Paris-Lyon railway. The Rhone and the Saône and in the extreme south the canal of Givors are its navigable waterways. Lyons the capital is the seat of an archbishop and of a court of appeal and centre of an educational division (*académie*). The department is divided amongst the districts of the VII., VIII., XII., XIII. and XIV. army corps. There are two arrondissements (Lyons and Villefranche) subdivided into 29 cantons and 269 communes. The principal places besides Lyons are Givors, Tarare and Villefranche, which receive separate treatment.

RHÖNGEBIRGE, or DIE RHÖN, a mountain-chain of central Germany, running in a north-westerly direction from the Bavarian province of Lower Franconia to the Prussian province of Hesse-Nassau and the grand duchy of Saxe-Weimar, and divided by the Werra from the Thuringian Forest on the N. The other sides are bounded by the Fulda on the W. and the Sinn and Frankish Saab on the E. and S. Its length is 50 m., breadth 5–7 m., and its mean elevation 1900 ft. This district is divided into three groups—the southern, the high (Hohe) and the nearer (Vordere) Rhön. Of these the southern, a continuation of the Spessart, largely consists of flat conical masses and reaches its highest point in the Heiliger Kreuzberg (2900 ft.). The Hohe Rhön, beginning immediately to the north-west of the latter mountain, is a high plateau of red sandstone, covered with fens and basalt peaks. It is a wild, dreary, inclement tract of country, covered with snow for six months in the year and visited by frequent fogs and storms. It is said of it that whoever desires to experience a northern winter can spare himself a journey to the North Cape or Siberia, and find it in his native Rhön. There is little vegetation, and the inhabitants eke out a scanty sustenance from the cultivation of potatoes and flax. The highest inhabited place is Frankenhausen, lying at a height of 2350 ft. with 6383 inhabitants (1900). The nearer (Vordere) Rhön, forming the northern side of the range, is more attractive, with forests and deep and fertile valleys.

See Lenk, *Zur geologischen Kenntnis der südlichen Rhön* (Würzburg, 1887); Scheidtweiler, *Die Rhön und ihre wirthschaftlichen Verhältnisse* (Frankfort, 1887); and Daniel, *Deutschland* (5th ed., Leipzig, 1878).

RHOXOLANI, a Sarmatian tribe defeated in the Crimea by Diophantus, general of Mithradates, *c.* 100 B.C., and by the Romans on the lower Danube *c.* A.D. 60, and also under M. Aurelius. They seem to have finally succumbed to the Goths.

RHUBARB. This name is applied both to a drug and to a vegetable.

1. The drug has been used in medicine from very early times, being described in the Chinese herbal *Pen-king*, which is believed to date from 2700 B.C. The name seems to be a corruption of *Rheum barbarum* or *Reu barbarum*, a designation applied to the drug as early as the middle of the 6th century, and apparently identical with the *ρῆον* or *ρᾶ* of Dioscorides, described by him as a root brought from beyond the Bosporus. In the 14th century rhubarb appears to have found its way to Europe by way of the Indus and Persian Gulf to the Red Sea and Alexandria, and was therefore described as "East Indian" rhubarb. Some also came by way of Persia and the Caspian to Syria and Asia Minor, and reached Europe from the ports of Aleppo and Smyrna, and became known as "Turkey" rhubarb. Subsequently to the year 1653, when China first permitted Russia to trade on her frontiers, Chinese rhubarb reached Europe chiefly by way of Moscow; and in 1704 the rhubarb trade became a monopoly of the Russian government, in consequence of which the term "Russian" or "crown" rhubarb came to be applied to it. Urga was the great depot for the rhubarb trade in 1719, but in 1728 the depot was transferred to Kiachta. All rhubarb brought to the depot passed through the hands of the government inspector; hence Russian rhubarb was invariably good and obtained a remarkably high price. This severe supervision naturally led, as soon as the northern Chinese ports were thrown open to European trade, to a new outlet being sought; and the increased demand for the drug at these ports resulted in less care being exercised by the Chinese in the collection and curing of the root, so that the rhubarb of good quality offered at Kiachta rapidly dwindled in quantity, and after 1860 Russian rhubarb ceased to appear in European commerce. Owing to the expense of carrying the drug across the whole breadth of Asia, and the difficulty of preserving it from the attacks of insects, rhubarb was formerly one of the most costly of drugs. In 1542 it was sold in France for ten times the price of cinnamon and four times that of saffron, and in an English price list bearing date of 1657 it is quoted at 16s. per ℔, opium being at that time only 6s. and scammony 12s. per ℔.

The dose of rhubarb is anything from ½ up to 30 grains, according to the action which is desired. The British Pharmacopeia contains seven preparations, only one of which is of any special value. This is the Pulvis Rhei Compositus, or Gregory's powder, which is composed of 2 parts of rhubarb, 6 of heavy or light magnesia and 1 of ginger. The dose is 20 to 60 gr.

Rhubarb is used in small doses—½ to 2 gr.—as an astringent tonic, since it stimulates all the functions of the upper part of the alimentary canal. In many cases of torpid dyspepsia it is very efficient when combined with the subnitrate of bismuth and the bicarbonate of sodium. The more characteristic action of rhubarb, however, is purgation, which it causes in doses of 15 gr. and upwards. The action occurs within seven or eight hours, a soft, pulpy motion of a yellow colour being produced. The colour is due to the chrysarobin, which is also the purgative constituent of the drug. Rhubarb is also a secretory cholagogue, increasing the amount of bile formed by the liver. The drug is apt to cause colic, and should therefore never be given alone. The ginger in Gregory's powder averts this unpleasant consequence of the aperient properties of rhubarb. The drug is peculiar in that the purgation is succeeded by definite constipation, said to be due to the rheotannic acid. This explanation is hardly satisfactory, however, since it is difficult to see how the rheotannic acid can be retained in the bowel during the process of purgation. Rhubarb has, therefore, definite indications and contra-indications. It is obviously worse than useless in the treatment of chronic constipation, which it only aggravates. On the other hand, it is very valuable in children and others, when diarrhoea has been caused by an unsuitable dietary. The drug removes the indigestible residue of the food and then gives the bowel rest. Rhubarb is also useful in the weaning of infants, since it is partly excreted in the maternal milk, and gives it a bitter taste which the baby dislikes.

Some chrysarobin is absorbed and is excreted in the urine, which it slightly increases and colours a reddish brown. The colour is discharged by the addition of a little dilute hydrochloric acid to the urine.

The botanical source of Chinese rhubarb cannot be said to have been as yet definitely cleared up by actual identification of plants observed to be used for the purpose. *Rheum palmatum*, *R. officinale*, *R. palmatum*, var. *tanguticum*, *R. colinianum* and *R. Franzenbachii* have been variously stated to be the source of it, but the roots produced by these species under cultivation in Europe do not present the characteristic network of white veins exhibited by the best specimens of the Chinese drug.

Chemistry.—The most important constituent of this drug, giving it its purgative properties and its yellow colour, is chrysarobin, $C_{30}H_{36}O_7$, formerly known as rhein or chrysophan. The rhubarb of commerce also contains chrysophanic acid, a dioxymethyl anthraquinone, $C_{14}H_5(CH_3)O_2(OH)_2$, of which chrysarobin is a reduction product. Nearly 40% of the drug consists of calcium oxalate, which gives it the characteristic grittiness. There is also present rheotannic acid, which is of some practical importance. There are numerous other constituents, such as emodin, $C_{15}H_{10}O_5$, mucilage, resins, rheumic acid, $C_{20}H_{16}O_9$, aporrhetin, &c.

Production and Commerce.—Rhubarb is produced in the four northern provinces of China proper (Chih-li, Shan-se, Shen-se and Ho-nan), in the north-west provinces of Kan-suh, formerly included in Shen-se, but now extending across the desert of Gobi to the frontier of Tibet, in the Mongolian province of Tsing-hai, including the salt lake Koko-nor, and the districts of Tangut, Sifan and Turfan, and in the mountains of the western provinces of Sze-chuen.[1] Two of the most important centres of the trade are Sining-fu in the province of Kan-suh, and Kwanhien in Sze-chuen. From Shen-se, Kan-suh and Sze-chuen the rhubarb is forwarded to Hankow, and thence carried to Shanghai, whence it is shipped to Europe. Lesser quantities are shipped from Tien-tsin, and occasionally the drug is exported from Canton, Amoy, Fuh-chow and Ning-po.

Very little is known concerning the mode of preparing the drug for the market. According to Mr Bell, who on a journey from St Petersburg to Peking had the opportunity of observing the plant in a growing state, the root is not considered to be mature until it is six years old. It is then dug up, usually in the autumn, and deprived of its cortical portion and smaller branches, and the larger pieces are divided in half longitudinally; these pieces are bored with holes and strung up on cords to dry, in some cases being previously subjected to a preliminary drying on stone slabs heated by fire underneath. In Bhutan the root is said to be hung up in a kind of drying room, in which a moderate heat is regularly maintained. The effect produced by the two drying processes is very different: when dried by artificial heat, the exterior of the pieces becomes hardened before the interior has entirely lost its moisture, and consequently the pieces decay in the centre, although the surface may show no change. These two varieties are technically known as kiln-dried and sun-dried; and it was on account of this difference in quality that the Russian officer at Kiachta had every piece examined by boring a hole to its centre.

European Rhubarb.—As early as 1608 Prosper Alpinus of Padua cultivated as the true rhubarb a plant which is now known as *Rheum rhaponticum*, a native of southern Siberia and the basin of the Volga. This plant was introduced into England through Sir Matthew Lister, physician to Charles I., who gave seed obtained by him in Italy to the botanist Parkinson. The culture of this rhubarb for the sake of the root was commenced in 1777 at Banbury, in Oxfordshire, by an apothecary named Hayward, the plants being raised from seed sent from Russia in 1762, and with such success that the Society of Arts awarded him a silver medal in 1789 and a gold one in 1794. The cultivation subsequently extended to Somersetshire, Yorkshire, and Middlesex, but is now chiefly carried on at Banbury. English rhubarb root is sold at a cheaper rate than the Chinese rhubarb, and forms a considerable article of export to America, and is said to be used in Britain in the form of powder, which is of a finer yellow colour than that of Chinese rhubarb. The Banbury rhubarb appears to be a hybrid between *R. rhaponticum* and *R. undulatum*—the root, according to E. Colin, not presenting the typical microscopic structure of the former. More recently very good rhubarb has been grown at Banbury from *Rheum officinale*, but these two varieties are not equal in medicinal strength to the Chinese article, yielding less extract—Chinese rhubarb affording, according to H. Seier, 58%, English rhubarb 21% and *R. officinale* 17%. In France the cultivation of rhubarb was commenced in the latter half of the 18th century—*R. compactum*, *R. palmatum*, *R. rhaponticum* and *R. undulatum* being the species grown. The cultivation has, however, now nearly ceased, small quantities only being prepared at Avignon and a few other localities.

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[1] According to Mr F. Newcombe, *Med. Press and Circ.*, August 2, 1882, the Chinese esteem the Shen-se rhubarb as the best, that coming from Kanchow being the most prized of all; Sze-chuen rhubarb has a rougher surface and little flavour, and brings only about half the price; Chung-chi rhubarb also is greatly valued, while the Chi-chuang, Tai-huang and Shan-huang varieties are considered worthless.

The culture of *Rheum compactum* was begun in Moravia in the beginning of the present century by Prikyl, an apothecary in Austerlitz, and until about fifty years ago the root was largely exported to Lyons and Milan, where it was used for dyeing silk. As a medicine 5 parts are stated to be equal to 4 of Chinese rhubarb. Rhubarb root is also grown at Auspitz in Moravia and at Ilmitz, Kremnitz and Frauenkirchen in Hungary; *R. emodi* is said to be cultivated for the same purpose in Silesia.

Rhubarb is also prepared for use in medicine from wild species in the Himalayas and Java.

2. The rhubarb used as a vegetable consists of the leaf stalks of *R. rhaponticum* and its varieties, and *R. undulatum*. It is known in America as pie-plant. Plants are readily raised from seed, but strong plants can be obtained in a much shorter time by dividing the roots. Divisions or seedlings are planted about 3 ft. apart in ground which has been deeply trenched and manured, the crowns being kept slightly above the surface. Rhubarb grows freely under fruit-trees, but succeeds best in an open situation in rich, rather light soil. The stalks should not be pulled during the first season. If a top-dressing of manure be given each winter a plantation will last good for several years. Forced rhubarb is much esteemed in winter and early spring, and forms a remunerative crop. Forcing under glass or in a mushroom house is most satisfactory, but open-ground forcing may be effected by placing pots or boxes over the roots and burying in a good depth of stable litter and leaves. Several other species, such as *R. palmatum*, *R. officinale*, *R. nobile* and others, are cultivated for their fine foliage and handsome inflorescence, especially in wild gardens, margins of shrubberies and similar places. They succeed in most soils, but prefer a rich soil of good depth. They are propagated by seeds or by division.

RHYL, a watering-place and urban district of Flint, N. Wales, practically equidistant by rail from Bangor (29½ m.) and Chester (30 m.), and 209 m. from London on the London & North-Western railway. Pop. (1901) 8473. It is situated near the mouth of the Clwyd. Formerly, like Llandudno, a small fishing village, the town has now all the appointments of a popular resort. In winter the gales often fill the streets to the depth of several feet, with drifts of sand from the surrounding dunes, which, however, are noted in summer for the dry and bracing air. The neighbouring country is interesting from its scenery and antiquities. Among the institutions of the town may be mentioned the Queen Alexandra Hospital (1902), and several hydropathic establishments and convalescent homes. The estuary harbours coasting vessels, and some shipbuilding is carried on. On the beach towards Prestatyn can be seen the remains of a submerged forest.

RHYME, more correctly spelt RIME, from a Provençal word *rim* (its customary English spelling is due to a confusion with *rhythm*), a literary ornament or device consisting of an identity of sound in the terminal syllables of two or more words. In the art of versification it signifies the repetition of a sound at the end of two or more lines in a single composition. This artifice was practically unknown to the ancients, and, when it occurs, or seems to occur, in the works of classic Greek and Latin poets, it must be considered to be accidental. The natural tendency of the writer of verse unconsciously to repeat a sound, however, is shown by the fact that there have been discovered nearly one thousand lines in the writings of Virgil where the final syllable rhymes with a central one, thus—

> Bella per Emathios plus quam civilia campos.

It is more than doubtful, however, whether the difference of stress would not prevent this from sounding as a rhyme in an antique ear, and the phenomenon results more from the contingencies of grammar than from intention on the part of the poet. Conscious rhyme belongs to the early medieval periods of monkish literature, and the name given to lines with an intentional rhyme in the middle is *Leonine verse*, the invention being attributed to a probably apocryphal monk Leoninus or Leonius, who is supposed to be the author of a history of the Old Testament preserved in the Bibliothèque Nationale of Paris. This "history" is composed in Latin verses, all of which rhyme in the centre. Another very famous poem in Leonine rhyme is the "De Contemptu Mundi" of Bernard of Cluny, which was printed at Bremen in 1595. Rhyme exists to satisfy the ear by the richness of repeated sound. In the beginnings of modern verse, alliteration, a repetition of a consonant, satisfied the listener. A further ornament was discovered when assonance, a repetition of the vowel-sounds, was invented. Finally, both of these were combined to procure a full identity of sound in the entire syllable, and rhyme took its place in prosody. When this identity of sound occurs in the last syllable of a verse it is the typical end-rhyme of modern European poetry. Recent criticism has been inclined to look upon the African church-Latin of the age of Tertullian as the starting-point of modern rhyme, and it is probable that the ingenuities of priests, invented to aid worshippers in hearing and singing long pieces of Latin verse in the ritual of the Catholic church produced the earliest conscious poems in rhyme. Moreover, not to give too great importance to the Leonine hexameters which have been mentioned above, it is certain that by the 4th century a school of rhymed sacred poetry had come into existence, classical examples of which we still possess in the "Stabat Mater" and the "Dies Irae." In the course of the middle ages, alliteration, assonance and end-rhyme held the field without a rival in vernacular poetry. There is no such thing, it may broadly be said, as medieval verse in which one or other of these distinguishing ornaments is not employed. After the 14th century, in the north of Europe, and indeed everywhere except in Spain, where assonance held a powerful position, end-rhyme became universal and formed a distinctive indication of metrical construction. It was not until the invention of Blank Verse (*q.v.*) that rhyme found a modern rival, and in spite of the successes of this instrument rhyme has held its own, at all events for non-dramatic verse, in the principal literature of Europe. Certain forms of poetry are almost inconceivable without rhyme. For instance, efforts have been made to compose rhymeless sonnets, but the result has been, either that the piece of blank verse produced is not in any sense a sonnet, or else that by some artifice the appearance of rhyme has been retained. In the heyday of Elizabethan literature a serious attempt was made in England to reject rhyme altogether, and to return to the quantitative measures of the ancients. The prime mover in this heresy was not a poet at all, but a pedantic grammarian of Cambridge, Gabriel Harvey (1545?–1630). He considered himself a great innovator, and for a short time he actually seduced no less melodious a poet than Edmund Spenser to abandon rhyme and adopt a system of accented hexameters and trimeters. Spenser even wrote largely in those measures, but the greater portion of his experiments in this kind, of which *The Dying Pelican* is supposed to have been one, have disappeared. From 1576 to 1579 the genius of Spenser seems to have been obscured by this error of taste, but he shook it off completely when he composed *The Shepherd's Calendar*. Harvey considered Richard Stonyhurst (1547–1618) the most loyal of his disciples, and this author published in 1582 four books of the *Aeneid* translated into rhymeless hexameters on Harvey's plan. The result remains, a portent of ugliness and cacophony. A far greater poet, Thomas Campion (1575–1620), returned to the attack, and in a tract published in 1602 advocated the remission of rhyme from lyrical poetry. He, by dint of a prodigious effort, produced some unrhymed odes which were not without charm, but the best critics of the time, such as Daniel, repudiated the innovation, and rhyme continued to have no serious rival except blank verse.

There have, from time to time, been made experiments of a similar nature, notably by Tennyson, but rhyme has retained its sway as an essential ornament of all English poetry which is not in blank verse. There have been not a few poems composed, principally in the nineteenth century, in rhymeless hexameters, and even the elegiac couplet has been attempted. The experiments of Longfellow, Clough, Kingsley and others demand respectful notice, but it is more than doubtful whether any one of these, even the mellifluous *Andromeda* of the last-named writer, is really in harmony with the national prosody.

In Germany a very determined attack on rhyme was made early in the seventeenth century, particularly by a group of aesthetic critics in the Swiss universities. They attacked rhyme as an artless species of sing-song, which deadened and destroyed the true movement of melody in the rhythm. The argument of this group of critics had a deep influence in German practice, and led to the composition of a vast number of works in unrhymed measures, in few of which, however, is now found a music which justifies the experiment. Lessing recalled the German poets to a sense of the beauty and value of rhyme, but the popularity of Klopstock and his imitators continued to exercise a great influence. Goethe and Schiller, without abandoning rhyme altogether, permitted themselves a great liberty in the employment of unrhymed measures and in imitation of classic metres. This was carried to still greater lengths by Platen and Heine, the rhymeless rhythm of the last of whom was imitated in English verse by Matthew Arnold and others, not without an occasional measure of success. In France, on the other hand, the empire of rhyme has always been triumphant, and in French literature the idea of rhymeless verse can scarcely be said to exist. There the *rime pleine* or *riche*, in which not merely the sound but the emphasis is perfectly identical, is insisted upon, and a poet who rhymed as Mrs Browning did, or made “ flying ” an equivalent in sound to “ Zion,” would be deemed illiterate.

In French, two species of rhyme are accepted, the feminine and the masculine. Feminine rhymes are those which end in a mute *e*, masculine those which do not so end. The Alexandrine, which is the classical metre in French, is built up on what are known as *rimes croisées*, that is to say a couplet of masculine rhymes followed by a couplet of feminine, and that again by masculine. This rule is unknown to the medieval poetry of France.

In Italian literature the excessive abundance and facility of rhyme has led to a rebellion against its use, which is much more reasonable than that of the Germans, whose strenuous language seems to call for an emphatic uniformity of sound. But it was the influence of German aesthetics which forced upon the notice of Leopardi the possibility of introducing rhymeless lyrical measures into Italian verse, an innovation which he carried out with remarkable hardihood and success. The rhymeless odes of Carducci are also worthy of admiration, and may be compared by the student with those of Heine and of Matthew Arnold respectively. Nevertheless, in Italian also, the ear demands the pleasure of the full reiterated sound, and the experiments of the eminent poets who have rejected it have claimed respect rather than sympathy or imitation. At the close of the 19th century, particularly in France, where the rules of rhyme had been most rigid, an effort to modify and minimise these restraints was widely made. There is no doubt that the laws of rhyme, like other artificial regulations, may be too severe, but there is no evidence that the natural beauty which pure rhyme introduces into poetry is losing its hold on the human ear or is in any real danger of being superseded by accent or rhythm.

See Joseph B. Mayer, *A Handbook of Modern English Metre* (Cambridge, 1903); J. Minor, *Neuhochdeutsche Metrik* (Strassburg, 1893); J. B. Schutze, *Versuch einer Theorie des Reimes nach Inhalt und Form* (Magdeburg, 1802). (E. G.)

RHYMNEY, an urban district in the western parliamentary division of Monmouthshire, England, on the borders of Glamorganshire, 22 m. N. by W. of Cardiff, on the Rhymney, the London & North-Western, and the Brecon & Merthyr railways. Pop. (1901), 7915. The Rhymney river, in the upper valley of which this town lies, forms almost throughout its course, to the estuary of the Severn near Cardiff, the boundary between England and Wales (Monmouthshire and Glamorganshire). In its upper part the valley, like others adjacent and parallel to it, is populous with mining townships, and the town of Rhymney owes its importance to the neighbouring coal-mines and to its iron and steel works, which employ nearly the whole population. The works of the Rhymney Iron Company, including blast furnaces and rolling mills, are among the largest of the kind in England.

RHYOLITE (Gr. ῥεῖν, to flow, because of the frequency with which they exhibit fluxion structures), the group name of a type of volcanic rock, occurring mostly as lava flows, and characterized by a highly acid composition. They are the most siliceous of all lavas, and, with the exception of the dacites, are the only lavas which contain free primary quartz. In chemical composition they very closely resemble the granites which are the corresponding rocks of plutonic or deep-seated origin; their minerals also present many points of similarity to those of granite though they are by no means entirely the same. Quartz, orthoclase and plagioclase felspars, and biotite are the commonest ingredients of both rocks, but the quartz of rhyolites is full of glass enclosures and the potash felspar is pellucid sanidine, while the quartz of granite contains dust-like fluid cavities of very minute size and its potash felspar is of the turbid variety which is properly called orthoclase. The granites also are holocrystalline, while in the rhyolites there are usually porphyritic crystals floating in a fine ground-mass. Rhyolites have also been called liparites because many of the lavas of the Lipari Islands are excellent examples of this group. Above all rocks they have a disposition to assume vitreous forms, as when fused they crystallize with great difficulty. Hence it has long baffled experimenters to produce rhyolite synthetically by fusion; it is stated that these difficulties have now been overcome, but geologists believe that the presence of steam and other gases in the natural state expedites crystallization. In crucibles these cannot be retained at the temperatures employed; when the rocks are melted the gases escape and on cooling a pure glass is formed. The vitreous forms of rhyolite are known as obsidian, perlite and pumice (*qq.v.*).

The minerals of the first generation, or phenocrysts, of rhyolite are generally orthoclase, oligoclase, quartz, biotite, augite or hornblende. The felspars are usually glassy clear, small but of well-developed crystalline form: the potash felspar is sanidine, usually Carlsbad twinned; the soda-lime felspar is almost always oligoclase, with characteristic polysynthetic structure. Both of these may be corroded and irregular in their outlines; their cleavage and twinning then distinguish them readily from quartz. Glass enclosures, sometimes rectangular with small immobile bubbles, are frequent. The quartz occurs as blebs or sub-rounded grains, which are corroded double hexagonal pyramids. Its glass enclosures are many and nearly always rounded or elliptical in section. No proper cleavage is seen in the quartz, though arcuate (conchoidal) fractures may often be noticed; they may have been produced by strain on cooling. Phenocrysts of micropegmatite are known in some rhyolites; they may have the shape of felspar or of quartz crystals; in the former case Carlsbad twinning is by no means uncommon, but in other cases hour-glass structure is very conspicuous. Biotite is always deep brown or greenish brown, in small hexagonal tablets, generally blackened at their edges by magmatic corrosion. Muscovite is not known in rhyolites. Hornblende may be green or brown; in the quartz-pantellarites it sometimes takes the form of strongly pleochroic brown cossyrite. Like biotite it is eumorphic but often corroded in a marked degree. Augite, which is equally common or more common than the other ferro-magnesian minerals, is always green; its crystals are small and perfectly shaped, and corrosion phenomena are very rarely seen in it. Zircon, apatite and magnetite are always present in rhyolites, their crystals being often beautifully perfect though never large. Olivine is never a normal ingredient, but occurs in the hollow spherulites or lithophysae of some rhyolites with garnet, tridymite, topaz and other minerals which indicate pneumatolytic action. Among the less common accessory minerals of the rhyolites are cordierite in crystals which resemble hexagonal prisms but break up under polarized light into six radiating sectors owing to complicated twinning: they weather to green aggregates of chlorite and muscovite (pinite); garnet, sphene and orthite may also be met with in rhyolites.

The ground-mass of rhyolitic rocks is of three distinct types which are stages in crystalline development, viz. the vitreous, the felsitic or cryptocrystalline, and the microcrystalline. Hence some authorities have proposed to subdivide the group into the *vitrophyres*, the *felsophyres* and the *granophyres*, but this is not now in use, and the last of these terms has obtained a signification quite different from that originally assigned to it. Mixtures of the different kinds occur; thus a vitreous rhyolite has often felsitic areas in its ground-mass, and in the same lava flow some parts may be vitreous while others are felsitic. The vitreous rhyolites are identical in most respects with the obsidians, from which they can only be separated in an artificial classification; and in their glassy base the banded or eutaxitic, spherulitic and perlitic structures of pure obsidians are very frequently present (see Obsidian; Perlite). The felsoliparites or liparites with stony ground-mass are especially common among the pre-Tertiary igneous rocks (see Quartz-porphyry), as liparite glass is unstable and experiences devitrification in course of time. Many of these felsites have fluxion banding, spherulites and even perlitic cracks, which are strong evidence that they were originally glassy. In other cases a hyaloliparite, obsidian, or pitchstone becomes felsitic along its borders and joint planes, or even along perlitic cracks, and we may assume that the once fibrous rock has changed into felsite under the action of percolating moisture or even by atmospheric decomposition. In many rhyolites the felsite is original and represents an incipient crystallization of the vitreous material which took place before the rock was yet cold. The felsite in turn is liable to change; it becomes a fine mosaic of quartz and alkali felspar; and in this way a matrix of the third type, the microcrystalline, may develop. This is proved by the occurrence of the remains of spherulitic and perlitic structures in rocks which are no longer felsitic or glassy. Many microcrystalline rhyolites have a ground-mass in which much felsitic matter occurs; but as this tends to recrystallize in course of time, the older rocks of this group show least of it. Whilst no quartz-bearing rhyolites are known to have been erupted in recent years, Lacroix proved that portions of the "dome" which rose as a great tower or column out of the crater of Mont Pelée after the eruption in 1906 contained small crystals of quartz in the ground-mass. The rock was an acid andesite, and it was ascribed by Lacroix to the action of steam retained in the rock under considerable pressure. The microcrystalline ground-mass of rhyolites is never micrographic as in the porphyries (granophyres); on the other hand it is often micropoikilitic, consisting of small felspars, often sub-rectangular, embedded in little rounded or irregular plates of quartz.

The ground-mass of rhyolites is liable to other changes, of which the most important are silicification, kaolinization and sericitization. Among the older rocks of this group it is the exception to find that secondary quartz has not been deposited in some parts of them. Often indeed the matrix is completely replaced by silica in the form of finely crystalline quartz or chalcedony; and these rocks on analysis prove to contain over 90% of silica. In the recent rhyolites of Hungary, New Zealand, &c., the deposit of coarse opal in portions of the rock is a very common phenomenon.

Kaolinization may be due to weathering, and the stony dull appearance of the matrix of many microcrystalline rhyolites is a consequence of the decomposed state of the felspar grains in them; it is even more typically developed by fumarole action, which replaces the felspars with soft, cloudy white products which belong to a mineral of the kaolin group. Sericitization, or the development of fine white mica after felspar, is usually associated with shearing, and is commonest in the older rhyolites.

Vesicular structure is very common in rhyolites; in fact the pumiceous obsidians have this character in greater perfection than any other rocks (see Pumice); but even the felsorhyolites are very often vesicular. The cavities are usually lined with opal and tridymite; in the older rocks they may be filled with agate and chalcedony. The "mill-stone porphyries," extensively used in Germany for grinding corn, are porous rhyolites; the abundance of quartz makes them hard, and their rough surfaces render them peculiarly suitable for this purpose. In some of them the cavities are partly secondary. These rocks are obtained in the Odenwald, Thuringerwald and Fichtelgebirge.

In Britain a pale grey Tertiary rhyolite occurs at Tardree, Antrim (the only British rock containing tridymite), and in Skye. Felsitic rhyolites occur among the Old Red rocks of Scotland (Pentland Hills, Lorne, &c.), in Devonshire, and in large numbers in North Wales. The Carnarvonshire rhyolites are often much altered and silicified; many of them have a nodular structure which is very conspicuous on weathered surfaces. The spheroids may be two or three inches in diameter; some of them are built up of concentric shells. Rhyolites are also known from Fishguard, Malvern, Westmorland and Co. Waterford. One of the oldest volcanic rocks of Britain (pre-Cambrian, Uriconian) is the spherulitic rhyolite of the Lea Rock near Wellington in Shropshire. It shows bright red spherulites in great numbers and is probably an obsidian completely devitrified. Perlitic structure is also visible in it.

In other parts of Europe rhyolites have a fairly wide distribution though they are not very numerous. In Hungary (Hlinik, &c.) there are many well-known examples of this class. They extend along the margin of the Carpathians and are found also in Siebenburgen. In Italy they occur in the Euganean Hills and in the Lipari Islands; the latter being the principal source of pumice at the present day. Rhyolites of Recent age occur in Iceland (Myvatn, &c.), where they are characterized by the frequent absence of quartz, and the presence of much plagioclase and pyroxene. Some of these rocks have been called trachyte-obsidians, but they seem to be rhyolites which contain an exceptionally large amount of soda. The older rhyolites, which are generally called quartz-porphyries in Germany, are mostly of Permian or Carboniferous age and are numerous in the Vosges, Odenwald, Thuringerwald, &c. They are often accompanied by basic rocks (melaphyres). Permian rhyolites occur also at Lugano in Italy. Rhyolites are known also in Asia Minor and the Caucasus, in New Zealand, Colorado, Nevada and other parts of western North America. In the Yellowstone National Park there is a well-known cliff of obsidian which shows remarkably perfect columnar jointing. Some of the rhyolites of Nevada are exceedingly rich in porphyritic minerals, so that they appear at first sight to be holocrystalline rocks, since the ground-mass is scanty and inconspicuous. To this type the name nevadite has been given, but it is rare and local in its distribution.

In the island of Pantellaria, which lies to the south-west of Sicily, there are rocks of rhyolitic affinities which present so many unusual features that they have been designated pantellarites. They contain less silica and alumina and more alkalis and iron than do ordinary rhyolites. Their felspars are of the anorthoclase group, being rich in soda together with potash, and are very variable in crystalline development. Aegirine-augite and forms of soda-amphibole are also characteristic of these rocks: dark brown aenigmatite or cossyrite often occur in them. Quartz is not very plentiful; other ingredients are olivine, arfvedsonite and tridymite. The ground-mass varies much, being sometimes quite vitreous, at other times a glass filled with swarms of microliths, while in certain pantellarites it is a microcrystalline aggregate of quartz and alkali felspar. The absence of plagioclase and biotite are marked distinctions between these rocks and the rhyolites, together with the scarcity of quartz and the prevalence of soda-bearing pyroxenes and amphiboles.

Among the Palaeozoic volcanic rocks of Germany there is a group of lavas, the quartz-keratophyres, which are of acid composition and rich in alkali felspar. Their dominant alkali is soda: hence their felspars are albite and cryptoperthite, not sanidine as in rhyolites. Quartz occurs sometimes as corroded phenocrysts, but is often scarce even in the ground-mass. Porphyritic biotite or augite are very rare, but occur in the matrix along with felspars and quartz. Micropegmatite is not infrequent in these rocks, and they may be silicified like the rhyolites. As quartz-keratophyres mostly occur in districts where there has been a good deal of folding, they are often crushed and more or less sericitized. They are best known from the Devonian rocks of Westphalia and the Harz, but are also found in Queensland, and similar rocks have been described (as soda-felsites) from Ireland. The rocks which they accompany are usually diabases and spilites.

The other group of rhyolitic rocks rich in alkali felspars and soda pyroxenes and amphiboles are the comendites. They are often porphyritic, with crystals of quartz, sanidine, microperthite or albite: the ground-mass is microcrystalline or rarely micrographic, and often filled with spongy growths of aegirine and riebeckite. They are known from the recent eruptive districts of East Africa, from Sardinia and Texas, and very similar rocks occur as intrusive masses which may be grouped with the porphyries.

The following analyses show the composition of some of the principal types of rhyolites:—

	SiO_2	Al_2O_3	Fe_2O_3	FeO	CaO	MgO	K_2O	Na_2O	H_2O
I.	76·34	13·22	1·93		1·85	0·21	3·67	2·84	0·61
II.	72·15	13·50	3·12		0·93	0·16	4·54	4·20	0·85
III.	77·59	12·75	0·67	n.f.	0·04	0·16	3·99	2·56	1·54
IV.	67·48	9·70	7·42	2·21	1·45	0·77	2·94	7·21	0·96
V.	70·97	13·84	3·21	0·78	1·26	0·20	1·57	6·27	0·74
VI.	74·76	11·60	3·50	0·19	0·07	0·18	4·92	4·35	0·64

I. Rhyolite, Telki Banya, Hungary.
II. do. Mafahlid, Iceland.
III. do. Omahu, New Zealand.
IV. Pantellarite, Pantellaria.
V. Quartz-keratophyre, Muhlenthal, Harz.
VI. Comendite, Sardinia.

We note in the rhyolites I.–III. the very high silica, with alkalis and alumina also in considerable amount, while lime, magnesia and iron are very low. In the pantellarite, keratophyre and comendite the silica tends to be less abundant, while the alkalis, especially soda, increase; they have less alumina but are richer in iron and magnesia. It is easy to see why the latter types contain less quartz, felspars often very rich in soda, and femic minerals which contain iron and alkalis in notable amounts such as aegirine, riebeckite and arfvedsonite. (J. S. F.)

RHYTHM (Greek ῥυθμός, from ῥεῖν, to flow), the measured flow of movement, or beat, in verse, music or by analogy in other connexions, *e.g.* "rhythm of life." The early critic of prosody, Aristoxenus, distinguished as the three elements out of which rhythm is composed, the spoken word, λέξις, the tune of music and song, μέλος, and the bodily motion, κίνησις σωματική. The art of the early Greek poets was devoted to a harmonious combination of these three elements, language, instrument and gesture uniting to form perfect rhythm. Aristoxenus proceeds to define the rhythm so produced as an arrangement of time-periods, τάξιν χρόνων, but other early theorists make not the time but the syllable the measurement of poetic speech. Both music and poetry depend, and have depended from the earliest times, on rhythm. But in music melody and harmony have to be taken into consideration, whereas in poetry the rhythmical value of the tone is modified by the imaginative value and importance of the words themselves. In earliest times the fundamental unity of the two arts was constantly manifest, but as the world has progressed, and they have ramified into countless forms, the difference between them has been emphasized more and more.

Rhythm in Verse.—Professor Jakob Minor has adduced a figure, valuable in helping us to realize what poetic rhythm is, when he remarks that to strike a bell twelve times, at exactly equal intervals, is to produce what may be called, indeed, a rhythmic effect, but not to awaken anything resembling the sensation of poetical rhythm. Into the idea of poetic rhythm enters an element of life, of pulse, of a certain inequality of time based upon an equality of tone. Rhythm ceases to be poetic rhythm if it is mechanical or lifeless. Aristotle, from whom a definition might be expected, is very vague in dealing with the subject, and most of the old rhetorical writers darken counsel with statements that are obscure or irrational. The fact is that rhythm is an expression of the instinct for order in sound which naturally governs the human ear, and little practical knowledge is gained by following Suidas when he says that rhythm is the father of metre, or Quintilian in his epigram that rhythm is male and metre is female. These definitions arise from a rhetorical desire to measure a delicate instinct by rule of three, and, as a matter of fact, Greek criticism on this subject often lost itself in arithmetical absurdities. It is sufficient to say that rhythm is the law which governs the even and periodical progress of sounds, in harmony with the exigencies of human emotion. For the passions, as expressed in verse, various movements are appropriate. Joy demands that the voice should leap and sing; sorrow that it should move solemnly and slowly; and poetry, which is founded on rhythm, requires that the movement of words should respond to this instinctive gradation of sounds. The finer the genius of the metrist the more exquisitely does his rhythm convey, as upon an instrument, the nature of the passion which burdens his verses. Ecstasy takes a quick, eager, rising movement:—

"Give him the nectar!
Pour out for the poet,
Hebe, pour free!
Quicken his eyes with celestial dew,
That Styx the detested no more he may view."

Mystery and suspense demand a faint, languid and throbbing movement:—

"There is not wind enough in the air
To move away the ringlet curl
From the lovely lady's cheek—
There is not wind enough to twirl
The one red leaf, the last of its clan,
That dances as often as dance it can."

An overpowering sadness interprets itself in rhythm that is full and slow and emphatic:—

"My genial spirits fail,
And what can these avail
To lift the smothering weight from off my breast?
It were a vain endeavour,
Though I should gaze for ever
On that green light that lingers in the west:
I may not hope from outward forms to win
The passion and the life, whose fountains are within."

The rhythm so produced, intimately linked, almost beyond the disintegrating power of analysis, with human feeling, may depend either on *accentuation* or *quantity*. The latter forms the principle upon which all classic metre was composed, while the former is dominant in nearly every description of modern verse. Greek and Latin verse depends entirely upon the relation of syllables, long or short. It was a question of time with the ancients, of stress or weight with us. It is an error to say, as is often done, that ancient verse did not recognize accent, and that in modern verse there is no place for quantity. These statements are generally true, but there are various exceptions to both rules. Schipper, in his *Englische Metrik*, specially points out that "long and short syllables have no constant length, no constant relation, but they depend on their place in the verse, and on the context; though they do not determine the rhythm of verse, they still act as regulators of our metre in a very important degree." *Pauses* take an essential importance in the construction of modern rhythm, of the variety and vitality of which they are the basis. They are introduced for the purpose of relieving the monotony of successive equal groups of syllables. The pause often takes the place of a light syllable, and there are instances in the verse of Shakespeare and Milton where it is even allowed to fill up the space of a heavy syllable. But still more often the pause does not imply the dropping of a syllable at all, but simply dictates a break in the sound, equivalent to a break in the sense. The following extract from a "Psalm" in Crashaw's *Steps to the Temple* (1646), in which the pauses are numerous and energetic, will exemplify the variety of this artifice:—

"On the proud banks of great Euphrates' flood, |
There we sate | and there we wept: |
Our harps | that | now | no music understood, |
Nodding | on the willows slept |
While | unhappy captiv'd | we
Lovely Sion | thought on thee."

In the blank verse of Milton the free use of pauses constitutes the principal element in the amazing metrical art of the poet, and is the source of the sublime originality of his music. In speaking of rhythm, it is customary to think of the formal rules which govern the fixed cadence of feet in poetry, but there is also a rhythm in prose, which imitates the measured movements of the body in stately speech. According to Renan, the rhythm of the ancient poetry of the Hebrews is solely founded on this prose movement, which differs, in fact, from that of modern European poetry merely in its undefined and indeterminate character.

See J. Minor, *Neuhochdeutsche Metrik* (Strassburg, 1893); W. Christ, *Die Metrik der Greichen* (Leipzig, 1874); Roderick Benadix, *Das Wesen des deutschen Rhythmus* (Leipzig, 1862); Jakob Schipper, *Englische Metrik* (Leipzig, 1895); Edwin Guest, *History of English Rhythms* (London, 1838; 2nd ed., 1882); Théodore de Banville, *Petit Traité de la poésie française* (Paris, 1881); F. B. Gummere, *Handbook of Poetics* (Boston, 1902). (E. G.)

Rhythm in Music.—The rhythm of modern music began to develop through the attempts of learned medieval musicians to adapt the rhythms of spoken language to the necessities of choral singing; but before the process had gone far, certain much more ancient and powerful principles, always manifest in folk-song and dance, gained ascendancy, so that even the simplest classical music has a rhythm for which no criteria of poetic metre can be made adequate. From the musical point of view, the rhythm of speech, whether in prose or verse, is very subtle and almost uniformly fluent. The metrical feet which constitute the details of poetic rhythm are musically very minute; and the exaggerated forms in which music represents them are many and varied. On the other hand, the groups of metrical feet which constitute any one kind of verse are of a uniformity which for music on a large scale would be intolerable. Artistic music is soon compelled to draw upon infinite resources of its own, which preserve an appropriate accentuation of the sense and feeling, while obliterating or hugely exaggerating the poet's rhythmic effects. Musical rhythm cannot be studied on a sound basis unless its radical divergences from speech-rhythm are recognized from the outset.

In the earliest extant musical settings of poetry the treatment of accent and quantity was strictly arithmetical; and purely aesthetic requirements were satisfied by *ex post facto* inference from the arithmetical laws, rather than treated as the basis of the laws. Accent, when translated into music, is a rhythmic sensation resembling the stress we put on the left foot in marching; while quantity rarely suggests any bodily movement at all, since it can correspond only to variations in the length of steps. Now in modern music a sense akin to that of bodily movement is of overwhelming importance. Changes of *tempo*, and of the grouping of musical beats, are incidents as obvious in their effect as changes in the pace of a running horse. One consequence is that the laws of musical accent are simple and cogent, while the laws of musical quantity, if such exist, are far beyond analysis. Fluent speech and energetic physical exercise cannot be carried on simultaneously by the same person; and hence the laws of quantity belong to speech rather than to dance. Before we could form adequate notions of the musical rhythms of classical Greece, we should need to settle, firstly, how far the dancing in Greek drama included movements other than idealized dramatic gesticulation; secondly, how much bodily energy was involved in all dancing that may have gone beyond this; and lastly, how much dancing of any kind was executed by the singers while singing. What is certain is that ancient Greek musical rhythms were exact translations of verse rhythms, with the quantities interpreted arithmetically.

The extant fragments of Greek music are, whether we have read them correctly or not, undoubtedly very different in rhythm from the system of discant on which European music of the 12th and 13th centuries first developed; but they resemble discant in so far as the modern sense of rhythm is absent and its place is supplied by a sense of the rhythmic expression of unusually slow and emphatic speech. In ordinary speech there is an important difference between long syllables and short; but it is not naturally regulated by an exact rhythm, and the art by which it is organized in verse admits (or indeed demands) considerable freedom on the part of the reciter in varying his pace within such limits as do not destroy the structure of the lines. But when a chorus is made to sing words, it must, if the words are to reach the hearer, sing them slowly; and moreover, it must sing them exactly together, unless, as in much classical music, it can repeat them until they are either understood or dismissed from the mind as a mere pretext for the employment of voices in a merely musical design. In any case, if a chorus is to sing well together, the contrast between short and long syllables must be placed on an arithmetical basis, the simpler the better. Now the sole function of ancient Greek music was to enhance the emotional effect of poetic words by regulating their rise and fall in a musical scale and their length in a metrical scheme; and it was natural and right that its rhythms should, though accurate, have no stronger ictus than those of the words. To make them as rigid and forcible as the rhythms of a non-vocal music would produce an effect as intolerable to a Greek ear as a schoolboy's worst jog-trotting scansion of poetry. We need not, then, imagine that the human sense of rhythm has suffered any mysterious change, when our best attempts at deciphering the extant fragments of ancient Greek music yield us a rhythm which scholars can explain by the structure of Greek verse, but which gives us no musical sense. Neither here nor in such strange harmonic phenomena as our complete inversion of medieval harmonic ideas as to the treatment of "perfect concords" (see HARMONY) do we find any principle involved which is not as true at the present day as it ever was. Ancient musical rhythm shared in the general qualities of that "Flatland" which we know ancient music to have been; modern musical rhythm, like harmony, belongs, as it were, to a three-dimensioned musical space with the vast artistic resources of a consistent perspective.

Indeed, we need much the same kind of mental gymnastic in studying the origins of musical rhythm as we need for the much more abstruse subject of harmonic origins. The two subjects soon begin to show interaction. During the period of discant we find metrical conceptions already strongly modified by two purely musical factors. Firstly, the attempt to make voices produce a harmony from different simultaneous melodies (instead of from combinations conceived as disguised unison) brought with it the necessity for differences of length enormously larger than any possible metrical differences. The metrical influence, however, still so predominated, even in the 14th century, as to produce a rhythm based almost exclusively on what would now be called triple time. Secondly, that sense of bodily movement, for which the less clumsy term "dance-rhythm" is far too narrow, gained ground as the only means powerful enough to hold the various rhythms of the new and growing polyphony together. In the later stages of discant the old metrical conceptions struggled against the grain of the polyphony for awhile, only to succumb in a tangle of inextricable technicality: and the new art, which became coherent in the 15th century, disregarded poetic metre, with little or no loss in capacity to interpret words if the composer had leisure or desire to do so; since, after all, poetic rhythm in its highest forms has a subtle freedom which renders mechanical musical translation worse than useless, while the rhythmic swing of the lighter forms of poetry was soon discovered by the composers of the "Golden Age" to be practically identical with the refined dance-rhythm which they in their lighter moments idealized from folk-music.[1]

By the middle of the 15th century polyphony attained such independence that the only rhythms which would hold the flow of independent melodious voices together were those in which a steadily duple or steadily triple rhythm (either of which might be subdivided by the other or by itself) could be felt as an absolutely regular musical tread. Such a rhythm is capable of expressing every poetic foot, either by the difference of stress between notes or by a difference in their length. Moreover, emphasis may be obtained by the pitch of the note, or, again, by its harmonic significance. All these forms of emphasis combine and counteract each other in an infinite variety, till the sense of musical movement becomes as remote from crude dance-rhythm as it is from poetic metre. But though the part thus played by accent was already of paramount importance in the "Golden Age" of music, it was not allowed to become evident to the ear except in the lighter and more coarse-grained art-forms. Its highest purpose was served as soon as the listener was able to lose all crude rhythmic impulses in a secure feeling that the mass of polyphonic harmony was held together by a general grouping of the rhythmic beats in fours or threes; and individual parts were at least as free to indulge in other rhythms across the main rhythm as they are in the most complex modern music, so long as the harmony was held together by the average grouping, or "time," as we now call it. Hence the rhythmic variety of 16th-century music is exactly like the harmonic variety, and the limitations and waywardness of the one are no more archaic than those of the other.

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[1] It would be interesting and fruitful to consider how far the growing preference, in modern European languages, of accent to quantity, may not only have modified the conception of musical rhythm, but may itself have been enhanced by the rhythmic tendencies of popular song, which had so great an influence on the learned music of the middle ages. And it can hardly be said that the subject of musical rhythm has yet been so clearly treated on these lines as to shed the light it seems capable of shedding upon many vexed questions in poetic rhythm.

When the resources of later music and the treatment of instruments necessitated the publishing of music in score as well as in separate parts, it became necessary to guide the eye by drawing vertical lines ("bars") at convenient distances. Hence the term "score" (Ger. *Partitur*, Fr. *partition*). These divisions naturally coincided with the main rhythmic groups, and eventually became equidistant. This purely practical custom has co-operated with the great increase of rhythmic firmness necessary for the coherence of those large modern forms which decree the shape rather than the texture of the music, until our notions of rhythm may fairly be described as bar-ridden. And, since the vast majority of our musical rhythms absorb the utmost complexity of detail into the most square and symmetrical framework possible, we are taught to regard the "4–bar period" as a normal (or even ultimate) rhythmic principle, instead of contenting ourselves with broader conceptions which treat symmetry and proportion in time as freely as they are treated in space. It cannot be too strongly emphasized that the bar indicates no universal musical principle. The havoc wrought by mechanical teaching on this point is incalculable, especially in the childish crudeness of current ideas as to the declamation of words in classical and modern music: ideas which mislead even some composers who might have been expected to know better.

As rhythm is contemplated in larger measures, it becomes increasingly difficult to say where the sense of rhythm ends and the sense of proportion begins. The same melody that may be felt as a square and symmetrical piece of proportion in four-bar rhythm if it is taken slowly, will be equally rational as a single bar of "common time" (see below) if it is taken very quickly; and between these two extremes there may be insensible gradations. All that can be laid down is that composers are apt to use short bars where they demand constant strong accent, while long bars will imply smoother rhythms. For example, if the scherzo of Beethoven's Ninth Symphony were written in $\frac{12}{4}$ instead of $\frac{3}{4}$ bars, then the passages now marked *Ritmo di tre battute* would have to appear in $\frac{9}{4}$ time, and so the changes of rhythm would be much more visible on paper. But the tendency to put a strong accent on the first beat of every bar would make this notation an undesirable substitute for Beethoven's, since it would lead to a neglect of the subordinate accents (all of them bar-accents, as Beethoven writes them). The trio of this scherzo shows the opposite case in the fact that Beethoven first intended to write it in $\frac{2}{4}$ time, but, in order to indicate a more tranquil flow at the same pace, doubled the quantity contained in a bar, substituting *alla breve* bars, each equal to two of the preceding $\frac{3}{4}$ bars. The alteration produced a discrepancy in the metronome marks, which has always caused controversy among conductors, but the facts admit of only one interpretation. It is clear, then, that the only sound theory of musical rhythm will be that in which accent, beat, bar, and even form and proportion are relative terms.

The kinds of *time* (*i.e.* rhythmic groups forming, as it were, invariable molecules in the structure of any continuous piece of music) that are used in all music from the 15th century onwards are nowadays classified as *duple* and *triple*, and each of these may be *simple* or *compound*. Simple time is that in which the normal subdivision of its beats is by two, whether the number of the beats themselves is duple or triple. Compound time is that in which the beats are regularly divided by three, which three subdivisions are reckoned as subordinate beats. The beats are in all kinds of time reckoned as halves, quarters, 8ths, 16ths or even 32nds of the standard note in modern music, the semibreve: and the time-signature placed at the beginning of a piece of music is really a fraction, of which the numerator expresses the number of beats in a bar, while the denominator expresses the size of a beat. Thus $\frac{3}{4}$ signifies three crotchets in a bar. Compound time is expressed, not by using normal fractions of a semibreve as main beats and dividing them into *triplets*,[1] but by using *dotted* beats. A dot after a note adds another half to its value, and so not only do we obtain the means of expressing a great variety of rhythmic effects (especially quantitative effects of iambic and trochaic character) in all kinds of time, but we are able to use normal fractions of a semibreve as the subordinate beats of compound time. Thus $\frac{6}{8}$ is the compound time obtained by dotting the two crotchets of $\frac{2}{4}$ time, and is thus totally different in accent and meaning from $\frac{3}{4}$ time though that also contains six quavers in a bar. The most highly compound times in classical music are to be found in the last movement of Beethoven's Sonata, Op. 111. He begins by dividing bars of $\frac{3}{8}$ into their usual compound time $\frac{9}{16}$. He then divides the six half-beats of $\frac{3}{8}$ time by three, producing $\frac{18}{32}$ (which he incorrectly calls $\frac{6}{16}$), and lastly he divides the 12 quarter-beats by 3, producing $\frac{36}{64}$ (which he calls $\frac{12}{32}$). The special signatures C for $\frac{4}{4}$ time, and C for $\frac{2}{2}$ time are the last survivals of the time system of the middle ages (see MUSICAL NOTATION). That complicated system of *mood*, *time* and *prolation* was capable of expressing even more highly compound rhythms than our usual time-signatures, though the complexity was in most cases unreal, since the small rhythmic ictus of ecclesiastical polyphony renders little but the general distinction between duple and triple rhythm audible: especially as the more compound rhythms were not subdivisions but multiples, involving lengths better measurable by an eight-day clock than by human ears. The second Kyrie of Palestrina's *Missa L'Homme Armé* is one of the rare cases which remain both rhythmic and complex when transcribed in modern score.[2] For genuine articulate complexity the ballroom scene in Mozart's *Don Giovanni* has never been surpassed. So real are its three simultaneous rhythms of minuet, contredanse and waltz that the persons on the stage actually dance to whichever suits their character. Anomalous measures such as $\frac{5}{4}$ and $\frac{7}{4}$ time, whether divisible into alternations of $\frac{2}{4}$ and $\frac{3}{4}$ or not, are aesthetically best regarded not as rhythmic units, but as extreme cases of unsymmetrical phrase-rhythm erected into a system for special effect. They tend, however, to group themselves into musical sentences of reactionary squareness; and the $\frac{5}{4}$ movement of Tschaikovsky's *Pathetic Symphony* consists of twenty 8-bar periods (twenty-four, counting the repeats) before an unpaired 4-bar phrase is heard in the short coda. Even the last bar is not odd, though it is the 179th, for the rhythm ends with an unwritten 180th bar of silence.

There is, no doubt, a germ of truth in current doctrine as to the fundamental character of 4-bar phrase-rhythms, inasmuch as the human anatomy has a bilateral symmetry with either limb on one side slightly stronger than that on the other. This is probably the basis of our natural tendency to group rhythmic units in pairs, with a stress on the first of each pair; and hence, if our attention is drawn to larger groups, we put more stress on the first of the first pair than on the first of the second; and so with still greater groups, until our immediate and unanalysed sense of rhythm merges into a sense of proportion distributed through time with a clear consciousness of past, present and future. The point at which this merging takes place depends on the extent to which these larger groups can dominate the details of the rhythm, and this again depends on the listener's capacity for grasping large and slow rhythms. In any case, the only "ultimate" rhythmic element is the tendency to mark off rhythmic beats into pairs, with a stress on the first of each pair. Where this tendency is resisted, the mind will follow the line of least resistance, which will vary according to the pace and detail of the music. Thus in rapid triple time it is easier to seek duple rhythm in the grouping of bars than in the details within the bars; but if the groups of bars are also triple, or irregular, the mind will fix on the first recurring salient feature for a secondary beat, regardless of inequality in length; rather than, so to speak, hop on one leg indefinitely. On this principle there is a distinct tendency in moderate and slow triple times to throw a secondary accent on the third beat; or sometimes on the second, as in the springing step of the mazurka, where the spring gives energy to the first beat and the descent from it gives poise to the second.

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[1] Triplets are groups of three equal notes crowded into the time normally taken by two. Binary and ternary subdivision answer every ordinary purpose of musical rhythm, being capable of expressing clear distinctions far more minute than have ever been regulated in speech. It is impossible to pronounce a syllable in less than a tenth of a second; but it is easy to play 16 notes in a second on the pianoforte. (That is to say, musical rhythm continues to be measurable up to the point at which atmospheric vibrations coalesce in the ear as low musical notes!) In a series of such rapid notes a single break twice in a second would have a very obvious rhythmic effect directly *measured* by the ear. If the broken series were levelled into an even series of fourteen notes a second, the rhythmic effect would be entirely different, though the actual difference of pace would be only $\frac{1}{56}$ of a second. The special sign for triplets is readily adapted to other subdivisions where necessary; but such adaptation generally indicates rather a freedom of declamatory rhythm than any abstruse arithmetical accuracy. Among the worst barbarisms in musical editing is the persistent reduction of Chopin's septoles, groups of 13 and other indeterminables, into mutton-cutlet frills. A natural freedom in performance is as necessary for the minutiae of musical rhythm as it is in speech; but where all but the finest players fail is in basing this freedom on the superlative accuracy of the rhythmic notation of the great composers.

[2] In the critical edition of Palestrina's complete works, vol. xii. p. 177 (Breitkopf and Härtel), the editor has violently simplified it. He is justified in using the ordinary ₵ bars to hold the piece together, and he is not called upon to reproduce the riddles of the original notation; but some secondary time signatures ought to have been added to indicate the strong swing of the tune in its conflicting shapes; and there is no justification, in a full score intended for scholars, in supplanting the true rhythm of the *quintus* by a rough practical compromise.

The tendency of small rhythmic groups to build themselves into large and square ones, such as 8-bar, 16-bar and even 32-bar periods, is doubtless important; but the converse tendency of large phrase-rhythms to break up in a tapering series is far more significant, since even in its most regular forms it not only produces more variety the further it goes, but always increases in obvious effect, until the subdivisions attain the minuteness (and therewith the expression) of speech rhythms. (A crude example of the device is Diabelli's waltz, on which Beethoven wrote his gigantic 33 variations. See Variations, where the point is illustrated by a diagram.) Regularly expanding rhythm, on the other hand, not only becomes imperceptible as it is carried further, but tends merely to make musical proportions resemble those of a chess-board. In great music the expanding principle is therefore always contrasted with or modified by the tapering principle, which can indeed exist simultaneously with it and with any other. For, to take only three categories, the harmonic changes of a passage may be designed in tapering rhythm while the melodic phrases expand, and the entries of instruments or parts occur on some third principle, regular or irregular. Such interplay need produce no feeling of complexity; indeed, it is an art most neglected by those composers who most rely on the effect of complex rhythm. It is the main discoverable source of that almost dramatic sense of movement that distinguishes the great musical styles from the academic methods which play for safety, and from the anti-academic novelties which end in monotony.

Square rhythms become desirable at climaxes where physical energy dominates thought. Strong final cadences accordingly require that the last chord should fall on an accent; and if the pace is rapid the final chord will probably be not only on an accented beat but on an accented bar. Thus it is quite obvious that there is by a mere oversight one bar too many in the four bars of tremolo quavers at the end of the first movement of Beethoven's Fourth Symphony; for they are followed by an important bar leading to the last three chords, which chords can only mean (counting bars as beats)—"One, two, Three" ("four" being silent and therefore unwritten). A fifth bar of tremolo would correct the rhythm in a more vigorous but more vulgar way by bringing the last chord onto "One" of the next imaginary group of four. The former correction is so obviously right that the imagination makes it in spite of the presence of the superfluous bar, which is instinctively ignored as an accidental prolongation of the tremolo. Where the composer writes in bars so short as to be permanently less than the phrases of the piece (as in Beethoven's scherzos), or in bars that are frequently longer than the phrases (as in most of Mozart's movements in slow or moderate common time), it sometimes becomes impossible to construe the music without carefully calculating where the accents come; and this calculation is most easily made on the assumption that the strongest cadences bring the tonic chord on an accent. Thus, in Beethoven's Sonata in E flat, Op. 27, No. 1, the first bar of the second movement must be preliminary and the first accent must come on the second bar, since the piece refuses to make sense in any other way. Indeed, Beethoven has written some notes twice over in order to bring his double-bars and repeat-marks where they will indicate the true rhythmic joints to the eye. (A double-bar is a mere graphic indication of some important sectional division, not necessarily rhythmic or even coincident with a normal bar-stroke.)

Theorists, however, have developed a tendency to assume that all cadences must be strong. More than one critic has told us that the scherzo of Beethoven's Sonata, Op. 28, is in the same predicament as that of Op. 27, No. 1; though it not only makes excellent sense with its cadences in the light and weak form in which they appear, but, when reconstrued on the "strong cadence" theory, entirely fails in its middle portion to uphold that theory or to make any other rhythmic sense. And when Professor Prout tells us that the overture to *Figaro* begins with a silent bar, and that Schubert's *Impromptu* in B flat is positively ungrammatical in its cadences unless it is entirely rebarred, and when Dr Riemann turns half the ritornello of a Bach concerto from $\frac{4}{4}$ into $\frac{3}{2}$ time, simply in order to make the sequences coincide with the hardest possible accents; then we can only protest that this is regulating musical aesthetics by criteria too crude for the aesthetics of bricklaying. An edition of *Paradise Lost*, in which the lines were so rearranged as to bring all punctuation marks (except perhaps commas) at the end of the line, would be on precisely the same level of ingenious barbarity.

Few technical terms are entirely peculiar to the subject of musical rhythm; but some obvious terms of syntax, such as *phrase*, *period* and *section* are used with varying degrees of system by all writers on music; and the whole terminology of prosody has been annexed—with such success that we are told in Grove's *Dictionary* (article "Metre") that "the theme of Weber's *Rondo brillante* in E flat (Op. 62) is in Anapaestic Tetrameter Brachycatalectic, very rigidly maintained."

One important term has acquired a special significance in music: viz. *Syncopation.* It means a cross-accent of such strength as to equal or even suppress the main accent; but the use of the term is generally restricted to cases in which the cross-accent is produced by shifting the notes of a melody or a formula so that they fall between the beats instead of upon them. From what we have said as to the almost physical energy of musical rhythm it is obvious that such a phenomenon is of far greater effect and importance in music than it could possibly be in verse; and, to whichever subject the term may belong by priority, extreme caution is needed in extending any musical notion of it to the structure of poetry. (D. F. T.)

RHYTINA, a name applied to the northern sea-cow (*Rhytina gigas*, or *stelleri*), a gigantic relative of the manati and dugong, which formerly inhabited Bering and Copper Islands, in the North Pacific, where it was discovered during Bering's voyage in 1741, and subsequently described by Steller, who accompanied that expedition as a naturalist. Bering's half-starved sailors soon reduced the numbers of these comparatively helpless creatures; and it was not long after—probably about the year 1768—that the species, which was the sole representative of its genus, became completely exterminated. The *Rhytina* was the largest member of the order Sirenia, attaining a length of nearly twenty feet; and had a very thick, rugged, bark-like skin. The jaws, which are bent downwards to a moderate extent, are unprovided with teeth, but in life carried ridged horny plates. The tail was very deeply forked; and the flippers were short and truncated, lacking apparently the terminal joints of the digits.

When first discovered, this Sirenian was extremely numerous in the bays of Bering Island, where it browsed upon the abundant sea-tangle. Its extirpation is due to the Russian sailors and traders who visited the island in pursuit of seals and sea-otters, and who subsisted on its flesh. Numbers of bones have been discovered in the soil of Bering and Copper Islands, from which more or less nearly perfect skeletons have been reconstructed, so that the osteology of this interesting animal is well represented in most of the larger museums. (R. L.*)

RIANSARES, AUGUSTIN FERNANDEZ MUÑOZ, Duke of (1808 or 1810–1873), morganatic husband of Maria Christina, queen and regent of Spain, was born at Tarancón, in the province of Cuenca, in New Castile. His father was the keeper of an "*estanco*" or office for the sale of the tobacco of the government monopoly. He enlisted in the bodyguard, and attracted the attention of the queen. According to one account, he distinguished himself by stopping the runaway horses of her carriage; according to another, he only picked up her handkerchief; a third and scandalous explanation of his fortune has been given. It is certain that the queen married him privately, very soon after the death of her husband on the 29th of September 1833. By publishing her marriage, Maria Christina would have forfeited the regency; but her relations with Muñoz were perfectly well known. When on the 13th of August 1836 the soldiers on duty at the summer palace, La Granja, mutinied and forced the regent to grant a constitution, it was generally, though wrongly, believed that they overcame her reluctance by seizing Muñoz, whom they called her "*guapo*," or fancy man, and threatening to shoot him. When in 1840 the queen found her position intolerable and fled the country, Muñoz went with her and the marriage was published, and on the overthrow of Espartero in 1843 the couple returned. In 1844 Queen Isabella II., who was now declared to be of age, gave her consent to her mother's marriage, which was publicly performed. Muñoz was created duke of Riansares and made a knight of the Golden Fleece. By Louis Philippe, king of the French, he was created duke of Mont-Morot and Grand Cross of the Legion of Honour. Until his wife was finally driven from Spain by the revolutionary movement of 1854, the duke is credibly reported to have applied himself to making a large fortune out of railway concessions and by judicious stock exchange speculations. Political ambitions he had none, and it is said that he declined the offer of the crown of Ecuador. All authorities agree that he was not only good-looking, but kindly and well-bred. He died five years before his wife at L'Adresse, near Havre, on the 11th of September 1873. Several children were born of the marriage.

RIAZ PASHA (*c.* 1835–), Egyptian statesman, born about 1835, was of a Circassian family, but said to be of Hebrew extraction. Little is known of his early life save that until the accession of Ismail Pasha to the vice-royalty of Egypt in 1863 he occupied a humble position. Ismail, recognizing in this obscure individual a capacity for hard work and a strong will, made him one of his ministers, to find, to his chagrin, that Riaz was also an honest man possessed of a remarkable independence of character. When Ismail's financial straits compelled him to agree to a commission of inquiry Riaz was the only Egyptian of known honesty sufficiently intelligent and patriotic to be named as a vice-president of the commission. He filled this office with distinction, but not to the liking of Ismail. The khedive, however, felt compelled, when as a sop to his European creditors he assumed the position of a constitutional monarch, to nominate Riaz as a member of the first Egyptian cabinet. For the few months this government lasted (September 1878 to April 1879) Riaz was minister of the interior. When Ismail dismissed the cabinet and attempted to resume autocratic rule, Riaz had to flee the country. Upon the deposition of Ismail, June 1879, Riaz was sent for by the British and French controllers, and he formed the first ministry under the khedive Tewfik. His administration, marked by much ability, lasted only two years, and was overthrown by the agitation which had for figure-head Arabi Pasha (*q.v.*). The beginnings of this movement Riaz treated as of no consequence. In reply to a warning of what might happen he said, "But this is Egypt; such things do not happen; you say they have happened elsewhere, perhaps, but this is Egypt." On the evening of the 9th of September 1881, after the military demonstration in Abdin Square, Riaz was dismissed; broken in health he went to Europe, remaining at Geneva until the fall of Arabi. After that event Riaz, subordinating his vanity to his patriotism, accepted office as minister of the interior under Sherif Pasha (*q.v.*). Had Riaz had his way Arabi and his associates would have been executed forthwith, and when the British insisted that clemency should be extended to the leaders of the revolt Riaz refused to remain in office, resigning in December 1882. He took no further part in public affairs until 1888, when, on the dismissal of Nubar Pasha (*q.v.*), he was summoned to form a government. He now understood that the only policy possible for an Egyptian statesman was to work in harmony with the British agent (Sir Evelyn Baring—afterwards Lord Cromer). This he succeeded in doing to a large extent, witnessing if not initiating the practical abolition of the *corvée* and many other reforms. The appointment of an Anglo-Indian official as judicial adviser to the khedive was, however, opposed by Riaz, who resigned in May 1891. In the February following he again became prime minister under Abbas II., being selected as comparatively acceptable both to the khedivial and British parties. In April 1894 Riaz finally resigned office on account of ill-health. Superior, probably, both intellectually and morally to his great rival Nubar, he lacked the latter's broad statesmanship as well as his pliability. Riaz's standpoint was that of the benevolent autocrat; he believed that the Egyptians were not fitted for self-government and must be treated like children, protected from ill-treatment by others and prevented from injuring themselves. In 1889 he was made an honorary G.C.M.G. A worthy tribute to Riaz was paid by Lord Cromer in his farewell speech at Cairo on the 4th of May 1907. "Little or no courage is now required," said Lord Cromer, "on the part of a young Egyptian who poses as a reformer, but it was not always so. Ismail Pasha had some very drastic methods of dealing with those who did not bow before him. Nevertheless, some thirty years ago Riaz Pasha stood forth boldly to protest against the maladministration that then prevailed in Egypt. He was not afraid to bell the cat."

RIB (from O. Eng. *ribb*; the word appears in many Teutonic languages, cf. Ger. *Rippe*, Swed. *reb*), in anatomy, the primary meaning, one of the series of elastic arched bones (*costae*) which form the casing or framework of the thorax (see Skeleton: *Axial*). The word is in meaning transferred to many objects resembling a rib in shape or function. In architecture, it is thus used of the arches of stone which in medieval work constitute the skeleton of the vault, and carry the shell or web. Although in the Roman vault the rib played an important element in its construction, it was generally hidden in the thickness of the vault and was made subservient to its geometrical surfaces. The Gothic masons, on the other hand, reversed the process, and not only made the vaulting surface subservient to the rib, but by mouldings rendered the latter a highly decorative feature. The principal ribs are the transverse (*arc doubleau*), the diagonal (*arc ogive*) and the wall rib (*formeret*). Those of less importance are the intermediate, the ridge and lierne ribs. The ridge-rib is one first introduced into the vault to resist the thrust of the intermediate ribs between the wall and diagonal ribs; it also served to mark the junction of the filling-in or web of vaults in those cases where the courses dipped toward the diagonal rib. (See Vault.) A lierne rib (the term is borrowed from the French) is a short rib, introduced into the vaulting in the Early Perpendicular period, which coupled together the transverse and intermediate ribs; in the later period the "lierne" rib becomes one of the chief features of the "stella" vault (see further Vault).

RIBADENEIRA, PEDRO A. (1527–1611), hagiologist, was born at Toledo on the 1st of November 1527. As a lad he repaired to Rome for study, and there on the 18th of September 1540 was admitted by Ignatius Loyola, in his thirteenth year, as one of the Society of Jesus, which had not yet received papal sanction. He pursued his studies at Paris (1542) in philosophy and theology. Loyola, in 1555, sent him on a mission to Belgium; in pursuance of it he visited England in

1558. A later result of his visit was his *Historia Ecclesiastica del scisma del Reyno de Inglaterra* (1588–1594), often reprinted, and used in later editions of N. Sander's *De Origine et Progressu Schismatis Anglicani.* In 1560 he was made Provincial of the Society of Jesus in Tuscany, thence transferred as Provincial to Sicily in 1563, again employed in Flanders, and from 1571 in Spain. In 1574 he settled in Madrid, where he died on the 10th of September 1611. His most important work is the *Life of Loyola* (1572), which he was the first to write. In his first edition of the Life, as also in the second enlarged issue (1587), Ribadeneira affirmed that Loyola had wrought no miracle, except the foundation of his Society (thus making his claim parallel with that of Mahomet, whose only miracle, originally, was the Koran). In the process for the canonization of Loyola, a narrative published by Ribadeneira in 1609 exhibited miracles; and these are recorded in an abridgment of the Life by Ribadeneira (published posthumously in 1612) with a statement by Ribadeneira that he had known of them in 1572 but was not then satisfied of their proof. For this change of opinion he is taken to task by Bayle. That Ribadeneira was, though an able, a very credulous writer, is shown by his lives of the successors of Loyola in the generalship of the Society, Lainez and Borgia; and especially by his *Flos Sanctorum* (1599–1610), a collection of saints' lives, entirely superseded by the labours of the Bollandists. His other works are numerous but of little moment, including his *Tratado de la religion* (1595), intended as a refutation of Machiavelli's *Prince.*

See his autobiography in his *Bibliotheca Scriptorum Societatis Jesu* (1602 and 1608, supplemented by P. Alegambe and N. Sotwell in 1676); N. Antonio, *Biotheca Hispana Nova* (1788); *Biographie Universelle* (Michaud) (1842–1865). (A. Go.*)

RIBALD, a word now only used in the sense of jeering, irreverent, abusive, particularly applied to the uses of low, offensive or mocking jests. It has an interesting early history, of which Du Cange (Gloss. s.v. *Ribaldi*) gives a full account. It is one of those words, like the Greek *τύραννος*, an unconstitutional ruler, and the Latin *latro*, a hired soldier, mercenary, later robber, which have acquired a degraded and evil significance. The *ribaldi* were light-armed soldiers, on whom fell the duty of being first in attack, the *enfans perdus* or "forlorn hope" of the armies of the French kings; thus Rigordus, in his contemporary history of the reign of Philip Augustus, for the year 1189, speaks of the *Ribaldi . . . qui primos impetus in expuguandis munitionibus facere consueverunt.* Later we find the *ribaldi* among the rabble of camp-followers of an army, and Giovanni Villani, in his 16th-century *Chronicle* (11, 139), speaks of *ribaldi et i raguazzi del hoste*, and Froissart of the *ribaux* as the lowest ranks in an army. *Ribaldus* (*ribaut*) was thus a common name for everything ruffianly and abandoned, and Matthew Paris (*Ann.* 1251) says: *Fures, exules, fugitivi, excommunicati, quos omnes Ribaldos Francia vulgariter consuevit appellare.* The name (*ribaldae* or *ribaldi*) was particularly applied to prostitutes, brothel-keepers and all who frequent haunts of vice, and there was at the French court from the 12th century an official, known as *Rex Ribaldorum*, king of the ribalds, changed in the reign of Charles VI. to *Praepositus Hospitii Regis*, whose duty was to investigate and hold judicial inquiry into all crimes committed within the precincts of the court, and control vagrants, prostitutes, brothels and gambling-houses. The etymology of the word has been much discussed, and no certainty can be arrived at. The termination —*ald*—points to a Teutonic origin, and connexion has been suggested with O.H.Ger. *Hripâ*, M.H.Ger. *Ribe*, prostitute, with Ger. *reiben*, rub, or with *rauben*, rob. Neither Skeat nor the *New English Dictionary* find any relation to the English "bawd," procuress, pander.

RIBAULT (or Ribaut), **JEAN** (*c.* 1520–1565), French navigator, famous for his connexion with the early settlement of Florida, was born at Dieppe, probably about 1520. Appointed by Admiral Coligny to the command of an expedition to prepare an asylum for French Protestants in America, Ribault sailed on the 18th of February 1562, with two vessels, and on the 1st of May landed in Florida at St John's river, or, as he called it, Rivière de Mai. Having settled his colonists at Port Royal Harbour (now Paris Island, South Carolina), and built Fort Charles for their protection, he returned to France to find the country in the throes of the Civil War. In 1563 he appears to have been in England and to have issued *True and Last Discoverie of Florida* (Hakluyt Soc., vol. vii.). In April 1564 Coligny was in a position to despatch another expedition under René de Laudonnière, but meanwhile Ribault's colony had come to an untimely end—the unfortunate adventurers, destitute of supplies from home, having revolted against their governor and attempted to make their way back to Europe in a boat which was happily picked up, when they were in the last extremities, by an English vessel. In 1565 Ribault was again sent out to satisfy Coligny as to Laudonnière's management of his new settlement, Fort Caroline, on the Rivière de Mai. While he was still there the Spaniards, under Menendez de Aviles, though their country was at peace with France, attacked the French ships at the mouth of the river. Ribault set out to retaliate on the Spanish fleet, but his vessels were wrecked by a storm near Matanzas Inlet and he had to attempt to return to Fort Caroline by land. The fort had by this time fallen into the hands of the Spaniards, who had slaughtered all the colonists except a few who got off with two ships under Ribault's son. Induced to surrender by false assurances of safeguard, Ribault and his men were also put to the sword in October 1565. The massacre was avenged in kind by Dominique de Gourgues (d. 1583) two years later.

See E. and E. Haag, *La France protestante* (1846–1859); and F. Parkman, *Pioneers of France in the New World* (new ed., 1899).

RIBBECK, JOHANN CARL OTTO (1827–1898), German classical scholar, was born at Erfurt in Saxony on the 23rd of July 1827. Having held professorial appointments at Kiel and Heidelberg, he succeeded his tutor Ritschl in the chair of classical philology at Leipzig, where he died on the 18th of July 1898. Ribbeck was the author of several standard works on the poets and poetry of Rome, the most important of which are the following: *Geschichte der römischen Dichtung* (2nd ed., 1894–1900); *Die römische Tragödie im Zeitalter der Republik* (1875); *Scaenicae Romanorum Poesis Fragmenta*, including the tragic and comic fragments (3rd ed., 1897). As a textual critic he was distinguished by considerable rashness, and never hesitated to alter, rearrange or reject as spurious what failed to reach his standard of excellence. These tendencies are strikingly shown in his editions of the *Epistles* and *Ars Poetica* of Horace (1869), the *Satires* of Juvenal (1859) and in the supplementary essay *Der echte und unechte Juvenal* (1865). In later years, however, he became much more conservative. His edition of Virgil (2nd ed., 1894–1895), although only critical, is a work of great erudition, especially the Prolegomena. His biography of Ritschl (1879–1881) is one of the best works of its kind. The influence of his tutor may be seen in Ribbeck's critical edition of the *Miles Gloriosus* of Plautus, and *Beiträge zur Lehre von den lateinischen Partikeln*, a work of much promise, which causes regret that he did not publish further results of his studies in that direction. His miscellaneous *Reden und Vorträge* were published after his death (Leipzig, 1899). He took great interest in the monumental *Thesaurus Linguae Latinae*, and it was chiefly owing to his efforts that the government of Saxony was induced to assist its production by a considerable subsidy.

The chief authority for his life is *Otto Ribbeck; ein Bild seines Lebens aus seinen Briefen* (1901), ed. by Emma Ribbeck.

RIBBON-FISHES (Trachypteridae), a family of marine fishes readily recognized by their long, compressed, tape-like body, short head, narrow mouth and feeble dentition. A high dorsal fin occupies the whole length of the back; an anal is absent, and the caudal, if present, consists of two fascicles of rays of which the upper is prolonged and directed upwards. The pectoral fins are small, the ventrals composed of several rays, or of one long ray only. Ribbon-fishes possess all the characteristics of fishes living at very great depths. They are extremely fragile when found floating on the surface or thrown ashore, and rarely in an uninjured condition; the rays of their fins especially, and the membrane connecting them, are of a very delicate and brittle structure. In young ribbon-fishes some of the fin-rays are prolonged in an extraordinary degree, and sometimes provided with appendages (see fig. 2). There are only two genera in the family, *Regalecus*, the oar-fish, and *Trachypterus*. In the former the length of the body is about fifteen times its depth. The head likewise is compressed, short, resembling in its form that of a herring; the eye is large; the mouth is small, and provided with very feeble teeth. A long many-rayed dorsal fin, of which the very long anterior rays form a kind of high crest, extends from the top of the head to the end of the tail; the anal and perhaps the caudal fins are absent; but the ventrals (and by this the oar-fish is distinguished from the other ribbon-fishes) are developed into a pair of long filaments, which terminate in a paddle-shaped extremity, but are too flexible to assist in locomotion. The whole body is covered with a layer of silvery epidermoid substance, which easily comes off and adheres to other objects.

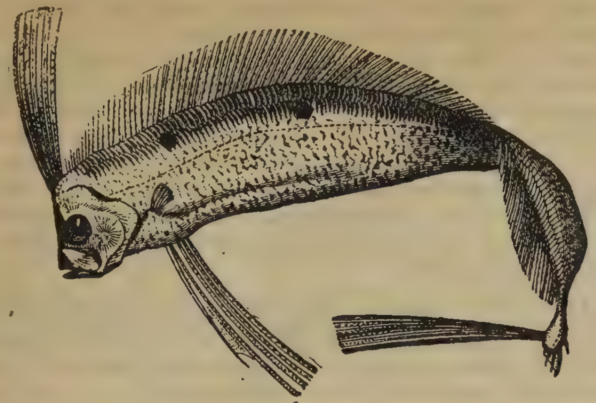

FIG. 1.—*Trachypterus taenia.*

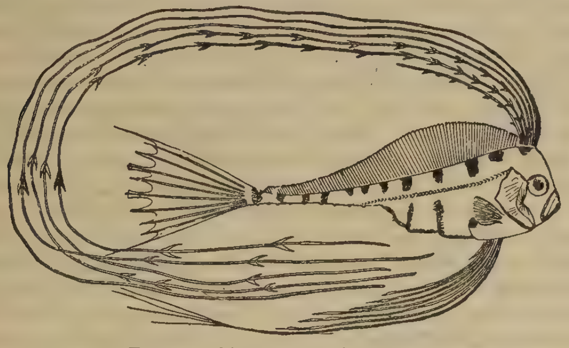

FIG. 2.—Young *Trachypterus.*

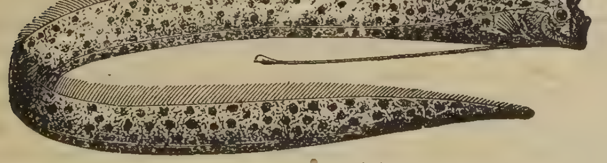

FIG 3.—Oar-fish.

Oar-fishes are the largest deep-sea fishes known, the majority of the specimens observed measuring 12 ft. in length; but some are recorded to have exceeded 20 ft. Their range in the great depths of the ocean seems to extend over all seas, but, however numerous they may be in the depths which are their home, it is only by rare accident that specimens reach the surface. Thus from the coasts of Great Britain only about twenty captures are known in the long space of a century and a half, and not more than thirteen from those of Norway. Oar-fishes have been considered by naturalists to have given rise to some of the tales of "sea-serpents," but their size as well as the facility with which they are secured when observed render this solution of the question of the existence of such a creature improbable. When they rise to the surface of the water they are either dead or in a helpless and dying condition. The ligaments and tissues by which the bones and muscles were held together whilst the fish lived under the immense pressure of great depths have then become loosened and torn by the expansion of the internal gases; and it is only with difficulty that the specimens can be taken entire out of the water, and preserved afterwards. Every specimen found has been more or less mutilated; and especially the terminal portion of the tail, which seems to end in a delicate tapering filament, has never been perfect;—it is perhaps usually lost as a useless appendage at a much earlier period of the life of the fish. Of *Trachypterus*, specimens have been taken in the Atlantic, the Mediterranean, at Mauritius and in the Pacific. The species from the Atlantic has occurred chiefly on the northern coasts, Iceland, Scandinavia, Orkneys and Scotland. It is known as *T. arcticus*, in English the deal-fish; its Icelandic name is *Vagmaer*. Its length is 5 to 8 ft. Specimens seem usually to be driven to the shore by gales in winter, and are sometimes left by the tide. S. Nilsson, however, in Scandinavia observed a living specimen in two or three fathoms of water moving something like a flat-fish with one side turned obliquely upwards.

RIBBONISM, the name given to an Irish secret-society movement, which began at the end of the 18th century in opposition to the Orangemen (*q.v.*), and which was represented by various associations under different names, organized in lodges, and recruited all over Ireland from the lowest classes of the people. The actual name of Ribbonism (from a green badge worn by its members) became attached to the movement later, about 1826; and, after it had grown to its height about 1855, it declined in force, and was practically at an end in its old form when in 1871 the Westmeath Act declared Ribbonism illegal. See also under IRELAND: *History.*

RIBBONS. By this name are designated narrow webs, properly of silk, not exceeding nine inches in width, used primarily for binding and tying in connexion with dress, but also now applied for innumerable useful, ornamental and symbolical purposes. Along with that of tapes, fringes and other smallwares, the manufacture of ribbons forms a special department of the textile industries. The essential feature of a ribbon loom is the simultaneous weaving in one loom frame of two or more webs, going up to as many as forty narrow fabrics in modern looms. To effect the conjoined throwing of all the shuttles and the various other movements of the loom, the automatic action of the power-loom is necessary; and it is a remarkable fact that the self-acting ribbon loom was known and extensively used more than a century before the famous invention of Cartwright. A loom in which several narrow webs could be woven at one time is mentioned as having been working in Dantzig towards the end of the 16th century. Similar looms were at work in Leiden in 1620, where their use gave rise to so much discontent and rioting on the part of the weavers that the states-general had to prohibit their use. The prohibition was renewed at various intervals throughout the century, and in the same interval the use of the ribbon loom was interdicted in most of the principal industrial centres of Europe. About 1676, under the name of the Dutch loom or engine loom, it was brought to London; and, although its introduction there caused some disturbance, it does not appear to have been prohibited. In 1745, John Kay, the inventor of the fly-shuttle, obtained, conjointly with Joseph Stell, a patent for improvements in the ribbon loom; and since that period it has benefited by the inventions applied to weaving machinery generally.

Ribbon-weaving is known to have been established near St Étienne (dep. Loire) so early as the 11th century, and that town has remained the headquarters of the industry. During the Huguenot troubles, ribbon-weavers from St Étienne settled at Basel and there established an industry which in modern times has rivalled that of the original seat of the trade. Crefeld is the centre of the German ribbon industry, the manufacture of black velvet ribbon being there a specialty. In England Coventry is the most important seat of ribbon-making, which is also prosecuted at Norwich and Leicester.

RIBEIRA, a town of north-western Spain, in the province of Corunna, on the extreme south-west of the peninsula formed between the river of Muros y Noya and Arosa Bay. Pop. (1900) 12,218. Ribeira is in a hilly country, abounding in wheat, wine, fruit, fish and game. Its port is Santa Eugenia de Ribeira, on Arosa Bay. The population is chiefly occupied in agriculture, cattle-breeding and fisheries.

RIBEIRO, BERNARDIM (1482–1552), the father of bucolic prose and verse in Portugal, was a native of Torrão in the Alemtejo. His father, Damião Ribeiro, was implicated in the conspiracy against King John II. in 1484, and had to flee to Castile, whereupon young Bernardim and his mother took refuge with their relations Antonio Zagalo and D. Ignez Zagalo at the Quinta dos Lobos, near Cintra. When King Manoel came to the throne in 1495, he rehabilitated the families persecuted by his predecessor, and Ribeiro was able to leave his retreat and return to Torrão. Meanwhile D. Ignez had married a rich landowner of Estremoz, and in 1503 she was summoned to court and appointed one of the attendants to the Infanta D. Beatriz. Ribeiro accompanied her, and through her influence the king took him under his protection and sent him to the university of Lisbon, where he studied from 1506 to 1512. When he obtained his degree in law, the king showed him further favour by appointing him to the post of *Escrivão da Camara*, or secretary, and later by bestowing on him the habit of the military order by São Thiago. Ribeiro's poetic career commenced with his coming to court, and his early verses are to be found in the *Cancioneiro Geral* of Garcia de Resende (*q.v.*). He took part in the historic *Serões do Paço*, or palace evening entertainments, which largely consisted of poetical improvisations; there he met and earned the friendship of the poets Sá de Miranda (*q.v.*) and Christovão Falcão (*q.v.*), who became his literary comrades and the confidants of his romance, in which hope deferred and bitter disappointment ended in tragedy. Ribeiro had early conceived a violent passion for his cousin, D. Joanna Zagalo, the daughter of his protectress, D. Ignez; but, though she seems to have returned it, her family opposed her marriage to a singer and dreamer with small means and prospects, and finally compelled her to wed a rich man, one Pero Gato. When the latter met a violent death shortly afterwards, D. Joanna retired to a house in the country, and it is alleged that Ribeiro visited her, and that their amour resulted in the birth of a child. All we know positively, however, is that in 1521 the lady went into seclusion in the convent of St Clare at Estremoz, where she fell a victim to a violent form of insanity, and that she died there some years later. It is further alleged that Ribeiro's conduct had caused a scandal which led the king to deprive him of his office and exile him. But the loss of position and income can have added very little to the poignant grief of such a true lover and profound idealist as Bernardim Ribeiro. He had poured out his heart in five beautiful eclogues, the earliest in Portuguese, written in the popular octosyllabic verse; and now, hopeless of the future and broken in spirit, he decided to go to Italy, for a poet the land of promise. He started early in 1522, and travelled widely in the peninsula, and during his stay he wrote his moving knightly and pastoral romance *Menina e Moça*, in which he related the story of his unfortunate passion, personifying himself under the anagram of "Bimnarder," and D. Ignez under that of "Aonia." When he returned home in 1524, the new king, John III., restored him to his former post, and it is said that he paid a last visit to his love at St Clare's convent and found her in a fit of raving madness. This no doubt preyed on a mind already unhinged by trouble, and hastened the decline of his mental powers, which had already commenced. About 1534 a long illness supervened, and the years that elapsed between that year and his death may be described as the night of his soul. He was quite unable to fulfil the duties of his office, and in 1549 the king bestowed upon him a pension for his support; but he did not live long to enjoy it, for in 1552 he died insane in All Saints Hospital in Lisbon.

The *Menina e Moça* was not printed until after Ribeiro's death, and then first in Ferrara in 1554. On its appearance the book made such a sensation that its reading was forbidden, because, though it contained nothing heterodox, it disclosed a family tragedy which the allegory could not hide. It is divided into two parts, the first of which is certainly the work of Ribeiro, while as to the second opinion is divided, though Dr Theophilo Braga considers it genuine and explains its progressive lack of lucidity and order by the mental illness of the author. The first part has been ably edited by Dr José Pessanha (Oporto, 1891). Ribeiro's verses, including his five eclogues, which for their sincerity of feeling, simple diction and chaste form are unsurpassed in Portuguese literature, were reprinted in a limited édition de luxe by Dr Xavier da Cunha (Lisbon, 1886).

Authorities.—Visconde Sanches de Baena, *Bernardim Ribeiro* (Lisbon, 1895); Dr Theophilo Braga, *Bernardim Ribeiro e o Bucolismo* (Oporto, 1897), containing a full analysis of Ribeiro's novel (sometimes called the *Saudades*, though it is more commonly described, as here, by the initial words of the story, *Menina e Moça*). (E. Pr.)

RIBERA, GIUSEPPE (1588–1656), commonly called Lo Spagnoletto, or the Little Spaniard, a leading painter of the Neapolitan or partly of the Spanish school, was born near Valencia in Spain, at Xativa, now named S. Felipe, on 12th January 1588. His parents intended him for a literary or learned career; but he neglected the regular studies, and entered the school of the Spanish painter Francisco Ribalta. Fired with a longing to study art in Italy, he somehow made his way to Rome. Early in the 17th century a cardinal noticed him in the streets of Rome drawing from the frescoes on a palace façade; he took up the ragged stripling and housed him in his mansion. Artists had then already bestowed upon the alien student, who was perpetually copying all sorts of objects in art and in nature, the nickname of Lo Spagnoletto. In the cardinal's household Ribera was comfortable but dissatisfied, and one day he decamped. He then betook himself to the famous painter Michelangelo da Caravaggio, the head of the naturalist school, called also the school of the Tenebrosi, or shadow-painters, owing to the excessive contrasts of light and shade which marked their style. The Italian master gave every encouragement to the Spaniard, but not for long, as he died in 1609. Ribera, who had in the first instance studied chiefly from Raphael and the Caracci, had by this time acquired so much mastery over the tenebroso style that his performances were barely distinguishable from Caravaggio's own. He now went to Parma, and worked after the frescoes of Correggio with great zeal and efficiency: in the museum of Madrid is his "Jacob's Ladder," which is regarded as his *chef-d'œuvre* in this manner. From Parma Spagnoletto returned to Rome, where he resumed the style of Caravaggio, and shortly afterwards he migrated to Naples, which became his permanent home.

Ribera was as yet still poor and inconspicuous, but a rich picture-dealer in Naples soon discerned in him all the stuff of a successful painter, and gave him his daughter in marriage. This was the turning-point in the Spaniard's fortunes. He painted a "Martyrdom of St Bartholomew," which the father-in-law exhibited from his balcony to a rapidly increasing and admiring crowd. The popular excitement grew to so noisy a height as to attract the attention of the Spanish viceroy, the Count de Monterey. From this nobleman and from the king of Spain, Philip IV., commissions now flowed in upon Ribera. With prosperity came grasping and jealous selfishness. Spagnoletto, chief in a triumvirate of greed, the "Cabal of Naples," his abettors being a Greek painter, Belisario Corenzio, and a Neapolitan, Giambattista Caracciolo, determined that Naples should be an artistic monopoly; by intrigue, terrorizing and personal violence on occasion they kept aloof all competitors. Annibale Caracci, the Cavalier d'Arpino, Guido, Domenichino, all of them successively invited to work in Naples, found the place too hot to hold them. The cabal ended at the time of Caracciolo's death in 1641.

The close of Ribera's triumphant career has been variously related. If we are to believe Dominici, the historian of Neapolitan art, he totally disappeared from Naples in 1648 and was no more heard of—this being the sequel of the abduction by Don John of Austria, son of Philip IV., of the painter's beautiful only daughter Maria Rosa. But these assertions have not availed to displace the earlier and well-authenticated statement that Ribera died peaceably and wealthy in Naples in 1656. His own signature on his pictures is constantly "Jusepe de Ribera, Español." His daughter, so far from being disgraced by an abduction, married a Spanish nobleman who became a minister of the viceroy.

The pictorial style of Spagnoletto is extremely powerful. In his earlier style, founded (as we have seen) sometimes on Caravaggio and sometimes on the wholly diverse method of Correggio, the study of Spanish and Venetian masters can likewise be traced. Along with his massive and predominating shadows, he retained from first to last great strength of local colouring. His forms, though ordinary and partly gross, are correct; the impression of his works gloomy and startling. He delighted in subjects of horror. Salvator Rosa and Luca Giordano were his most distinguished pupils; also Giovanni Do, Enrico Fiammingo, Michelangelo Fracanzani, and Aniello Falcone, who was the first considerable painter of battle-pieces. Among Ribera's principal works should be named "St Januarius Emerging from the Furnace," in the cathedral of Naples; the "Descent from the Cross," in the Neapolitan Certosa, generally regarded as his masterpiece; the "Adoration of the Shepherds" (a late work, 1650), now in the Louvre; the "Martyrdom of St Bartholomew," in the museum of Madrid; the "Pietà," in the sacristy of S. Martino, Naples. His mythologic subjects are generally unpleasant—such as the "Silenus," in the Studj Gallery of Naples, and "Venus Lamenting over Adonis," in the Corsini Gallery of Rome. The Louvre contains altogether twenty-five of his paintings; the National Gallery, London, two—one of them, a "Peità," being an excellent though not exactly a leading specimen. He executed several fine male portraits; among others his own likeness, now in the collection at Alton Towers. He also produced twenty-six etchings, ably treated. For the use of his pupils, he drew a number of elementary designs, which in 1650 were etched by Francisco Fernandez, and which continued much in vogue for a long while among Spanish and French painters and students.

Besides the work of Dominici already referred to (1840–46), the *Diccionario Historico* of Cean Bermudez is a principal authority regarding Ribera and his works; also E. de Lalaing, "Ribera" (in *Histoire de quatre grands peintres*), 1888. (W. M. R.)

RIBOT, ALEXANDRE FÉLIX JOSEPH (1842–), French statesman, was born at St Omer on 7th February 1842. After a brilliant career at the university of Paris, where he was *lauréat* of the faculty of law, he rapidly made his mark at the bar. He was secretary of the conference of advocates and one of the founders of the *Société de législation comparée.* During 1875 and 1876 he was successively director of criminal affairs and secretary-general at the ministry of justice. In 1877 he made his entry into political life by the conspicuous part he played on the committee of legal resistance during the Broglie ministry, and in the following year he was returned to the chamber as a moderate republican member for Boulogne, in his native department of Pas-de-Calais. His impassioned yet reasoned eloquence gave him an influence which was increased by his articles in the *Parlement* in which he opposed violent measures against the unauthorized congregations. He devoted himself especially to financial questions, and in 1882 was reporter of the budget. He became one of the most prominent republican opponents of the Radical party, distinguishing himself by his attacks on the short-lived Gambetta ministry. He refused to vote the credits demanded by the Ferry cabinet for the Tongking expedition, and shared with M. Clémenceau in the overthrow of the ministry in 1885. At the general election of that year he was one of the victims of the Republican rout in the Pas-de-Calais, and did not re-enter the chamber till 1887. After 1889 he sat for St Omer. His fear of the Boulangist movement converted him to the policy of "Republican Concentration," and he entered office in 1890 as foreign minister in the Freycinet cabinet. He had an intimate acquaintance and sympathy with English institutions, and two of his published works—an address, *Biographie de Lord Erskine* (1866), and *Étude sur l'acte du 5 avril 1873 pour l'établissement d'une cour suprême de justice en Angleterre* (1874)—deal with English questions; he also gave a fresh and highly important direction to French policy by the understanding with Russia, which was declared to the world by the visit of the French fleet to Cronstadt in 1891, and which subsequently ripened into a formal treaty of alliance. He retained his post in the Loubet ministry (February–November 1892), and on its defeat became himself president of the council, retaining the direction of foreign affairs. The government resigned in March 1893 on the refusal of the chamber to accept the Senate's amendments to the budget. On the election of Félix Faure as president of the Republic in January 1895, M. Ribot again became premier and minister of finance. On the 10th of June he was able to make the first official announcement of a definite alliance with Russia. On the 30th of October the government was defeated on the question of the Chemin de fer du Sud, and resigned office. The real reason of its fall was the mismanagement of the Madagascar expedition, the cost of which in men and money exceeded all expectations, and the alarming social conditions at home, as indicated by the strike at Carmaux. After the fall of the Méline ministry in 1898 M. Ribot tried in vain to form a cabinet of "conciliation." He was elected, at the end of 1898, president of the important commission on education, in which he advocated the adoption of a modern system of education. The policy of the Waldeck-Rousseau ministry on the religious teaching congregations broke up the Republican party, and M. Ribot was among the seceders; but at the general election of 1902, though he himself secured re-election, his policy suffered a severe check. He actively opposed the policy of the Combes ministry and denounced the alliance with M. Jaurès, and on the 13th of January 1905 he was one of the leaders of the opposition which brought about the fall of the cabinet. Although he had been most violent in denouncing the anti-clerical policy of the Combes cabinet, he now announced his willingness to recognize a new régime to replace the Concordat, and gave the government his support in the establishment of the *Associations cultuelles*, while he secured some mitigation of the severities attending the separation. He was re-elected deputy for St Omer in 1906. In the same year he became a member of the French Academy in succession to the duc d'Audiffret-Pasquier; he was already a member of the Academy of Moral and Political Science. In justification of his policy in opposition he published in 1905 two volumes of his *Discours politiques*.

RIBOT, THÉODULE (1823–1891), French painter, was born at Breteuil, in Eure, in 1823, and died at Bois Colombes, near Paris, in September 1891. A pupil nominally of Glaize, but more really of Ribera, of the great Flemings and of Chardin, Théodule Ribot had yet conspicuously his own noble and personal vision, his own intensity of feeling and rich sobriety of performance. Beginning to work seriously at art when he was no longer extremely young, and dying before he was extremely old, Ribot crowded into some thirty or thirty-five years of active practice very varied achievements; and he worked in at least three mediums, oil paint, pencil or crayon draughtsmanship and the needle of the etcher. His drawings were sometimes "complete in themselves," and sometimes fragmentary but powerful preparations for painted canvases. The etchings, of which there are only about a couple of dozen, are of the middle period of his practice; they show a diversity of method as well as of theme; the work in the well-nigh Velazquez-like "Prière"—a group of girl children—contrasting strongly with that process almost of outline alone, which he employed in the brilliant little group of prints which record his vision of the character and humours of cooks and kitchen-boys. In etching, the method varied with the theme—not with the period. It is quite otherwise with the paintings. Here the earlier work, irrespective of its subject, is the drier and the more austere; the later work, irrespective of its subject, the freer and broader. But even in that which is quite early there is a curious and impressive intensity of conception and presentation. His visions of elderly women and young girls remain upon the memory. His women, wrinkled and worn, have had the experience of a hard and grinding world; his children, his young girls, are the quintessence of innocence and happy hopefulness, and life is a jest to his boys. His religious pieces, in which Ribera affected him, have conviction and force. Into portraits and into character studies, but more especially into *genre* subjects, Ribot was apt to introduce Still-life, and to make much of it. Herein, as in his sense of homeliness, he resembled Chardin. But again, Chardin-like, he painted Still-life for its own sake, by itself, and always with an extraordinary sense of the solidity and form, the texture and the hue, and, it must be added also, the very charm of matter. (F. WE.)

RIBOT, THÉODULE ARMAND (1839–), French psychologist, was born at Guingamp on the 18th of December 1839, and was educated at the Lycée de St Brieuc. In 1856 he began to teach, and was admitted to the École Normale Supérieure in 1862. In 1885 he gave a course of lectures on "Experimental Psychology" at the Sorbonne, and in 1888 was appointed professor of that subject at the College of France. His thesis for his doctor's degree, republished in 1882, *Hérédité: étude psychologique* (5th ed., 1889), is his most important and best known book. Following the experimental and synthetic methods, he has brought together a large number of instances of inherited peculiarities; he pays particular attention to the physical element of mental life, ignoring all spiritual or non-material factors in man. In his work on *La Psychologie anglaise contemporaine* (1870), he shows his sympathy with the sensationalist school, and again in his translation of Herbert Spencer's *Principles of Psychology*. Besides numerous articles, he has written on Schopenhauer, *Philosophie de Schopenhauer* (1874; 7th ed., 1896), and on the contemporary psychology of Germany (*La Psychologie allemande contemporaine*, 1879; 13th ed., 1898), also four little monographs on *Les Maladies de la mémoire* (1881; 13th ed., 1898); *De la volonté* (1883; 14th ed., 1899); *De la personnalité* (1885; 8th ed., 1899); and *La Psychologie de l'attention* (1888), which supply useful data to the student of mental disease.

Other works by him are:—*La Psychologie des sentiments* (1896); *L'Évolution des idées générales* (1897); *Essai sur l'imagination créatrice* (1900); *La Logique des sentiments* (1904); *Essai sur les passions* (1906). Of the above the following have been translated into English:—*English Psychology* (1873); *Heredity: a Psychological Study of its Phenomena, Laws, Causes, and Consequences* (1875); *Diseases of Memory: An Essay in the Positive Psychology* (1882); *Diseases of the Will* (New York, 1884); *German Psychology of to-day*, tr. J. M. Baldwin (New York, 1886); *The Psychology of Attention* (Open Court Publishing Company, Chicago, 1890); *Diseases of Personality* (Chicago, 1895); *The Psychology of the Emotions* (1897); *The Evolution of General Ideas*, tr. F. A. Welby (Chicago, 1899); *Essay on the Creative Imagination*, tr. A. H. N. Baron (1906).

RICARD, LOUIS GUSTAVE (1823–1873), French painter, was born in Marseilles in 1823, and studied first under Auber in his native town, and subsequently under Coignet in Paris. The formation of his masterly, distinguished style in portraiture was, however, due rather to ten years' intelligent copying of the old masters at the Louvre and at the Italian galleries, than to any school training. He was a master of technique, and his portraits—about two hundred—reveal an extraordinary insight into the character of his sitters. Nevertheless, for some time after his death his name was almost forgotten by the public, and it is only of quite recent years that he has been conceded the position among the leading masters of the modern French school which is his due. A portrait of himself, and one of Alfred de Musset, are at the Luxembourg Gallery. Among his best known works are the portrait of his mother, and those of the painters Fromentin, Heilbuth and Chaplin.

See *Gustave Ricard*, by Camille Mauclair (Paris, *Librairie de l'art*).

RICARDO, DAVID (1772–1823), English economist, was born in London on the 19th of April 1772, of Jewish origin. His father, who was of Dutch birth, bore an honourable character and was a successful member of the Stock Exchange. At the age of fourteen Ricardo entered his father's office, where he showed much aptitude for business. About the time when he attained his majority he abandoned the Hebrew faith and conformed to the Anglican Church, a change which seems to have been connected with his marriage to Miss Wilkinson, which took place in 1793. In consequence of the step thus taken he was separated from his family and thrown on his own resources. His ability and uprightness were known, and he at once entered on such a successful career in the profession to which he had been brought up that at the age of twenty-five, we are told, he was already rich. He now began to occupy himself with scientific pursuits, and gave some attention to mathematics as well as to chemistry and mineralogy; but, having met with Adam Smith's great work, he threw himself with ardour into the study of political economy.

His first publication (1809) was *The High Price of Bullion a Proof of the Depreciation of Bank Notes.* This tract was an expansion of a series of articles which the author had contributed to the *Morning Chronicle*. It gave a fresh stimulus to the controversy, which had for some time been discontinued, respecting the resumption of cash payments, and indirectly led to the appointment of a committee of the House of Commons, commonly known as the Bullion Committee, to consider the whole question. The report of the committee asserted the same views which Ricardo had put forward, and recommended the repeal of the Bank Restriction Act. Notwithstanding this, the House of Commons declared in the teeth of the facts that paper had undergone no depreciation. Ricardo's first tract, as well as another on the same subject, attracted much attention.

In 1811 he made the acquaintance of James Mill, whose introduction to him arose out of the publication of Mill's tract entitled *Commerce Defended.* Whilst Mill doubtless largely affected his political ideas, he was, on his side, under obligations to Ricardo in the purely economic field; Mill said in 1823 that he himself and J. R. M'Culloch were Ricardo's disciples, and, he added, his only genuine ones.

In 1815, when the Corn Laws were under discussion, he published his *Essay on the Influence of a Low Price of Corn on the Profits of Stock.* This was directed against a recent tract by Malthus entitled *Grounds of an Opinion on the Policy of Restraining the Free Importation of Foreign Corn.* The reasonings of the essay are based on the theory of rent which has often been called by the name of Ricardo; but the author distinctly states that it was not due to him. "In all that I have said concerning the origin and progress of rent I have briefly repeated, and endeavoured to elucidate, the principles which Malthus has so ably laid down on the same subject in his *Inquiry into the Nature and Progress of Rent.*" We now know that the theory had been fully stated, before the time of Malthus, by Anderson; it is in any case clear that it was no discovery of Ricardo. Ricardo states in this essay a set of propositions, most of them deductions from the theory of rent, which are in substance the same as those afterwards embodied in the *Principles*, and regarded as characteristic of his system, such as that increase of wages does not raise prices; that profits can be raised only by a fall in wages and diminished only by a rise in wages; and that profits, in the whole progress of society, are determined by the cost of the production of the food which is raised at the greatest expense. It does not appear that, excepting the theory of foreign trade, anything of the nature of fundamental doctrine, as distinct from the special subjects of banking and taxation, is laid down in the *Principles* which does not already appear in this tract. We find in it, too, the same exclusive regard to the interest of the capitalist class, and the same identification of their interest with that of the whole nation, which are generally characteristic of his writings.

In the *Proposals for an Economical and Secure Currency* (1816) he first disposes of the chimera of a currency without a specific standard, and pronounces in favour of a single metal, with a preference for silver, as the standard.

Ricardo's chief work, *Principles of Political Economy and Taxation*, appeared in 1817. The fundamental doctrine of this work is that, on the hypothesis of free competition, exchange value is determined by the labour expended in production,—a proposition not new, nor, except with considerable limitation and explanation, true, and of little practical use, as "amount of labour" is a vague expression, and the thing intended is incapable of exact estimation. Ricardo's theory of distribution has been briefly enunciated as follows: "(1) The demand for food determines the margin of cultivation; (2) this margin determines rent; (3) the amount necessary to maintain the labourer determines wages; (4) the difference between the amount produced by a given quantity of labour at the margin and the wages of that labour determines profit." These theorems are too absolutely stated, and require much modification to adapt them to real life. His theory of foreign trade has been embodied in the two propositions: "(1) International values are not determined in the same way as domestic values; (2) the medium of exchange is distributed so as to bring trade to the condition it would be in if it were conducted by barter."

A considerable portion of the work is devoted to a study of taxation, which requires to be considered as a part of the problem of distribution. A tax is not always paid by those on whom it is imposed; it is therefore necessary to determine the ultimate, as distinguished from the immediate, incidence of every form of taxation. Smith had already dealt with this question; Ricardo develops and criticizes his results. The conclusions at which he arrives are in the main as follows: a tax on raw produce falls on the consumer, but will also diminish profits; a tax on rents on the landlord; taxes on houses will be divided between the occupier and the ground landlord; taxes on profits will be paid by the consumer, and taxes on wages by the capitalist.

In 1819 Ricardo, having retired from business and become a landed proprietor, entered parliament as member for Portarlington. He was at first diffident and embarrassed in speaking, but gradually overcame these difficulties, and was heard with much attention and deference, especially when he addressed the House on economic questions. He probably contributed in a considerable degree to bringing about the change of opinion on the question of free trade which ultimately led to the legislation of Sir Robert Peel on that subject.

In 1820 he contributed to the supplement of the *Encyclopaedia Britannica* (6th ed.) an "Essay on the Funding System." In this besides giving an historical account (founded on Dr Robert Hamilton's valuable work *On the National Debt*, 1813, 3rd ed., 1818) of the several successive forms of the sinking fund, he urges that nations should defray their expenses, whether ordinary or extraordinary, at the time when they are incurred, instead of providing for them by loans.

In 1822 he published a tract *On Protection to Agriculture*, which is an able application to controversy of the general principles laid down in his systematic work. Its arguments and conclusions are therefore subject to the same limitations which those fundamental principles require.

In his *Plan for the Establishment of a National Bank*, published posthumously in 1824, he proposes that the issue of the paper currency should be taken out of the hands of the Bank of England and vested in commissioners appointed by the government. The tract describes in detail the measures to be adopted for the introduction and working of the system. A certain step towards realizing the objects of his scheme, though on different lines from Ricardo's, was taken in Sir Robert Peel's act of 1844, by which the discount business of the bank was separated from the issue department.

Ricardo died on the 11th of September 1823, at his seat (Gatcomb Park) in Gloucestershire, from a cerebral affection resulting from disease of the ear. James Mill, who was intimately acquainted with him, says (in a letter to Napier of November 1818) that he knew not a better man, and on the occasion of his death published a highly eulogistic notice of him in the *Morning Chronicle*. A lectureship on political economy, to exist for ten years, was founded in commemoration of him, M'Culloch being chosen to fill it.

In forming a general judgment respecting Ricardo, we must have in view not so much the minor writings as the *Principles*, in which his economic system is expounded as a whole. By a study of this work we are led to the conclusion that he was an economist only, not at all a social philosopher in the wider sense, like Adam Smith or John Mill. He had great acuteness, but little breadth. For any large treatment of moral and political questions he seems to have been alike by nature and preparation unfitted; and there is no evidence of his having had any but the most ordinary and narrow views of the great social problems. He shows no trace of that hearty sympathy with the working classes which breaks out in several passages of the *Wealth of Nations*; we ought, perhaps, with Held, to regard it as a merit in Ricardo that he does not cover with fine phrases his deficiency in warmth of social sentiment. The idea of the active capitalist having any duties towards his employés never seems to occur to him; the labourer is, in fact, merely an instrument in the hands of the capitalist, a pawn in the game he plays.

He first introduced into economics on a great scale the method of deduction from a priori assumptions. The conclusions so arrived at have often been treated as if they were directly applicable to real life, and indeed to the economic phenomena of all times and places. But the truth of Ricardo's theorems is now by his warmest admirers admitted to be hypothetical only. Bagehot seems right in believing that Ricardo himself had no consciousness of the limitations to which his doctrines are subject. Be this as it may, we now see that the only basis on which these doctrines could be allowed to stand as a permanent part of economic science is that on which they are placed by Roscher, namely, as a stage in the preparatory work of the economist, who, beginning with such abstractions, afterwards turns from them, not in practice merely, but in the completed theory, to real life and men as they actually are or have been.

The criticisms to which Ricardo's general economic scheme is open do not hold with respect to his treatment of the subjects of currency and banking. These form precisely that branch of economics into which moral ideas (beyond the plain prescriptions of honesty) can scarcely be said to enter, and where the operation of purely mercantile principles is most immediate and invariable. They were, besides, the departments of the study to which Ricardo's early training and practical habits led him to give special attention; and they have a lasting value independent of his systematic construction.

Ricardo's collected works were published, with a notice of his life and writings, by J. R. M'Culloch in 1846.

The *Principles* have been edited (with an introduction, bibliography and notes) by E. C. K. Gonner, 1891. See also *Letters to H. Trower and Others*, ed. J. Bonar and J. H. Hollander, 1899; *Letters to J. R. M'Culloch*, ed. J. H. Hollander, 1895; *Letters to T. R. Malthus*, ed. J. Bonar, 1887. A French translation of the *Principles* by Constancio, with notes by Say, appeared in 1818; the whole works, translated by Constancio and Fonteyraud, form vol. xiii. (1847) of the *Collection des principaux économistes*, where they are accompanied by the notes of Say, Malthus, Sismondi, Rossi, &c. The *Principles* was first "naturalized" in Germany, says Roscher (though another version by Von Schmid had previously appeared), by Edward Baumstark in his *David Ricardo's Grundgesetze der Volkswirthschaft und der Besteuerung übersetzt und erläutert* (1837), which Roscher highly commends, not only for the excellence of the rendering, but for the value of the explanations and criticisms which are added.

RICASOLI, BETTINO, Baron (1809–1880), Italian statesman, was born at Broglio on the 19th of March 1809. Left an orphan at eighteen, with an estate heavily encumbered, he was by special decree of the grand duke of Tuscany declared of age. and entrusted with the guardianship of his younger brothers. Interrupting his studies, he withdrew to Broglio, and by careful management disencumbered the family possessions. In 1847 he founded the journal *La Patria*, and addressed to the grand duke a memorial suggesting remedies for the difficulties of the state. In 1848 he was elected Gonfaloniere of Florence, but resigned on account of the anti-Liberal tendencies of the grand duke. As Tuscan minister of the interior in 1859 he promoted the union of Tuscany with Piedmont, which took place on the 12th of March 1860. Elected Italian deputy in 1861, he succeeded Cavour in the premiership. As premier he admitted the Garibaldian volunteers to the regular army, revoked the decree of exile against Mazzini, and attempted reconciliation with the Vatican; but his efforts were rendered ineffectual by the *non possumus* of the pope. Disdainful of the intrigues of his rival Rattazzi, he found himself obliged in 1862 to resign office, but returned to power in 1866. On this occasion he refused Napoleon III.'s offer to cede Venetia to Italy, on condition that Italy should abandon the Prussian alliance, and also refused the Prussian decoration of the Black Eagle because Lamarmora, author of the alliance, was not to receive it. Upon the departure of the French troops from Rome at the end of 1866 he again attempted to conciliate the Vatican with a convention, in virtue of which Italy would have restored to the Church the property of the suppressed religious orders in return for the gradual payment of £24,000,000. In order to mollify the Vatican he conceded the *exequatur* to forty-five bishops inimical to the Italian régime. The Vatican accepted his proposal, but the Italian Chamber proved refractory, and, though dissolved by Ricasoli, returned more hostile than before. Without waiting for a vote, Ricasoli resigned office and thenceforward practically disappeared from political life, speaking in the Chamber only upon rare occasions. He died at Broglio on the 23rd of October 1880. His private life and public career were marked by the utmost integrity, and by a rigid austerity which earned him the name of the "iron baron." In spite of the failure of his ecclesiastical scheme, he remains one of the most noteworthy figures of the Italian Risorgimento.

See Tabarrini and Gotti, *Lettere e documenti del barone Bettino Ricasoli*, 10 vols. (Florence, 1886–1894); Passerini, *Genealogia e storia della famiglia Ricasoli* (*ibid.* 1861); Gotti, *Vita del barone Bettino Ricasoli* (*ibid.* 1894). (H. W. S.)

RICCATI, JACOPO FRANCESCO, Count (1676–1754), Italian mathematician, was born at Venice on the 8th of May 1676, and died at Treviso on the 15th of April 1754.

He studied at the university of Padua, where he graduated in 1696. His favourite pursuits were scientific, and his authority on all questions of practical science was referred to by the senate of Venice. He corresponded with many of the European savants of his day, and contributed largely to the *Acta Eruditorum* of Leipzig. He was offered the presidency of the academy of science of St Petersburg; but he declined, preferring the leisure and independence of life in Italy. Riccati's name is best known in connexion with his problem called Riccati's equation, published in the *Acta Eruditorum*, September 1724. A very complete account of this equation and its various transformations was given by J. W. L. Glaisher in the *Phil. Trans.* (1881).

After Riccati's death his works were collected by his sons and published (1758) in four volumes. His sons, Vincenzo (1707–1775) and Giordano (1709–1790), inherited his talents. The former was professor of mathematics at Bologna, and published, among other works, a treatise on the infinitesimal calculus. Giordano was distinguished both as a mathematician and an architect.

RICCI, MATTEO (1552–1610), Italian missionary to China, was born of a noble family at Macerata in the March of Ancona on the 7th of October 1552. After some education at a Jesuit college in his native town he went to study law at Rome, where in 1571, in opposition to his father's wishes, he joined the Society of Jesus.

In 1577 Ricci and other students offered themselves for the East Indian missions. Ricci, without visiting his family to take leave, proceeded to Portugal. His comrades were Rudolfo Acquaviva, Nicolas Spinola, Francesco Pasio and Michele Ruggieri, all afterwards, like Ricci himself, famous in the Jesuit annals. They arrived at Goa in September 1578. After four years spent in India, Ricci was summoned to the task of opening China to evangelization.

Several fruitless attempts had been made by Xavier, and since his death, to introduce the Church into China,—as by Melchior Nunes of the Jesuit Society operating from Sanchian[1] in 1555; by Gaspar da Cruz, a Dominican, in that or the following year; by the Augustinians under Martin Herrada, 1575; and in 1579 by the Franciscans led by Pedro d'Alfaro. In 1571 a house of the Jesuits had been set up at Macao (where the Portuguese were established in 1557), but their attention was then occupied with Japan, and it was not till the arrival at Macao of Alessandro Valignani on a visitation in 1582 that work in China was really taken up. For this object he had obtained the services first of M. Ruggieri and then of Ricci. After various disappointments they found access to Chow-king-fu on the Si-Kiang or West River of Canton, where the viceroy of the two provinces of Kwang-tung and Kwang-si then had his residence, and by his favour were able to establish themselves there for some years. Their proceedings were very cautious and tentative; they excited the curiosity and interest of even the more intelligent Chinese by their clocks, their globes and maps, their books of European engravings, and by Ricci's knowledge of mathematics, including dialling and the projection of maps. They conciliated some influential friends, and their reputation spread widely in China. This was facilitated by the Chinese system of transfer of public officers from one province of the empire to another, and in the later movements of the missionaries they frequently met with one and another of their old acquaintances in office, who were more or less well disposed. Eventually troubles at Chow-king compelled them to seek a new home; and in 1589, with the viceroy's sanction, they migrated to Chang-chow in the northern part of Kwang-tung, not far from the well-known Meiling Pass.

During his stay here Ricci was convinced that a mistake had been made in adopting a dress resembling that of the bonzes, a class who were the objects either of superstition or of contempt. With the sanction of the visitor it was ordered that in future the missionaries should adopt the costumes of Chinese literates, and, in fact, they before long adopted Chinese manners altogether.

Chang-chow, as a station, did not prove a happy selection, but it was not till 1595 that an opportunity occurred of travelling northward. For some time Ricci's residence was at Nan-chang-fu, the capital of Kiang-si; but in 1598 he was able to proceed under favourable conditions to Nan-king, and thence for the first time to Peking, which had all along been the goal of his missionary ambition. But circumstances were not then propitious, and the party had to return to Nan-king. The fame of the presents which they carried had, however, reached the court, and the Jesuits were summoned north again, and on the 24th of January 1601 they entered the capital. Wan-li, the emperor of the Ming dynasty, in those days lived in seclusion, and saw no one but his women and the eunuchs. But the missionaries were summoned to the palace; their presents were immensely admired, and the emperor had the curiosity to send for portraits of the fathers themselves.

They obtained a settlement, with an allowance for subsistence, in Peking, and from this time to the end of his life Ricci's estimation among the Chinese was constantly increasing, as was at the same time the amount of his labours. Visitors thronged the mission house incessantly; and inquiries came to him from all parts of the empire respecting the doctrines which he taught, or the numerous Chinese publications which he issued. This in itself was a great burden, as Chinese composition, if wrong impressions are to be avoided, demands extreme care and accuracy. As head of the mission, which now had four stations in China, he also devoted much time to answering the letters of the priests under him, a matter on which he spared no pains or detail. New converts had to be attended to—always welcomed, and never hustled away. Besides these came the composition of his Chinese books, the teaching of his people and the maintenance of the record of the mission history which had been enjoined upon him by the general of the order, and which he kept well up to date. Thus his labours were wearing and incessant. In May 1610 he broke down, and after an illness of eight days died on the 11th of that month. His colleague Pantoja applied to the emperor for a burying-place outside the city. This was granted, with the most honourable official testimonies to the reputation and character of Ricci; and a large building in the neighbourhood of the city was at the same time bestowed upon the mission for their residence.

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[1] The island (properly Chang-chuen) on which the Portuguese had a temporary settlement before they got Macao, and on which F. Xavier died in 1552.

Ricci's work was the foundation of the subsequent success attained by the Roman Catholic Church in China. When the missionaries of other Roman Catholic orders made their way into China, twenty years later, they found great fault with the manner in which certain Chinese practices had been dealt with by the Jesuits, a matter in which Ricci's action and policy had given the tone to the mission in China—though in fact that tone was rather inherent in the Jesuit system than the outcome of individual character, for controversies of an exactly parallel nature arose two generations later in southern India, between the Jesuits and Capuchins, regarding what were called "Malabar rites." The controversy thus kindled in China burned for considerably more than a century with great fierceness.[1] The chief points were (1) the lawfulness and expediency of certain terms employed by the Jesuits in naming God Almighty, such as *Tien*, "Heaven," and *Shang-ti*, "Supreme Ruler" or "Emperor," instead of *Tien-Chu*, "Lord of Heaven," and in particular the erection of inscribed tablets in the churches, on which these terms were made use of;[2] (2) in respect to the ceremonial offerings made in honour of Confucius, and of personal ancestors, which Ricci had recognized as merely "civil" observances; (3) the erection of tablets in honour of ancestors in private houses; and (4), more generally, sanction and favour accorded to ancient Chinese sacred books and philosophical doctrine, as not really trespassing on Christian faith.

Probably no European name of past centuries is so well known in China as that of *Li-ma-teu*, the form in which the name of Ricci (*Ri-cci Mat-teo*) was adapted to Chinese usage, and by which he appears in Chinese records.[3] The works which he composed in Chinese are numerous; a list of them (apparently by no means complete, however) will be found in Kircher's *China Illustrata*, and also in Abel Rémusat's *Nouveaux Mélanges Asiatiques* (ii. 213–15). They are said to display an aptitude for clothing ideas in a Chinese dress very rare and remarkable in a foreigner. One of the first which attracted attention and reputation among Chinese readers was a Treatise upon Friendship, in the form of a dialogue containing short and pithy paragraphs; this is stated in the *De Expeditione* to have been suggested during Ricci's stay at Nan-chang by a conversation with the prince of Kien-ngan, who asked questions regarding the laws of friendship in the West.

In the early part of his residence at Peking, when enjoying constant intercourse with scholars of high position, Ricci brought out the *T'ien-chu shih-i*, or "Veritable Doctrine of the Lord of Heaven," which deals with the divine character and attributes under eight heads. "This work," says A. Wylie, "contains some acute reasoning in support of the propositions laid down, but the doctrine of faith in Christ is very slightly touched upon. The teachings of Buddhism are vigorously attacked, whilst the author tries to draw a parallel between Christianity and the teachings of the Chinese literati."

In 1604 Ricci completed the *Erh-shih-wu yen*, a series of short articles of moral bearing, but exhibiting little of the essential doctrines of Christianity. *Chi-jên shih pien* is another of his productions, completed in 1608, and consisting of a record of ten conversations held with Chinese of high position. The subjects are: (1) Years past no longer ours; (2) Man a sojourner on earth; (3) Advantage of frequent contemplation of eternity; (4) Preparation for judgment by such contemplation; (5) The good man not desirous of talking; (6) Abstinence, and its distinction from the prohibition to take life; (7) Self-examination and self-reproof inconsistent with inaction; (8) Future reward and punishment; (9) Prying into futurity hastens calamity; (10) Wealth with covetousness more wretched than poverty with contentment. To this work is appended a translation of eight European hymns, with elucidations, written in 1609.

Some of the characteristics thus indicated may have suggested the bitterness of attacks afterwards made upon Ricci's theology. An example of these is found in the work called *Anecdotes sur l'état de religion dans la Chine* (Paris, 1733–35), the author of which (Abbé Villers) speaks of the *T'ien-chu shih-i* in this fashion: "The Jesuit was also so ill versed in the particulars of the faith that, as the holy bishop of Conon, Monsgr. Maigrot, says of him, one need merely read his book on the true religion to convince oneself that he had never imbibed the first elements of theology." . . .

Ricci's pointed attacks on Buddhism, and the wide circulation of his books, called forth the opposition of the Buddhist clergy. One of the ablest who took their part was Chu-hang, a priest of Hang-chow, who had abandoned the literary status for the Buddhist cloister. He wrote three articles against the doctrine of the missionaries. These were brought to Ricci's notice in an ostensible tone of candour by Yu-chun-he, a high mandarin at the capital. This letter, with Ricci's reply, the three Buddhist declamations and Ricci's confutation, were published in a collected form by the Christian Sen-Kwang-K'e.

Another work of Ricci's which attracted attention was the *Hsi-kuo fa*, or "Art of Memory as practised in the West." Ricci was himself a great expert in *memoria technica*, and astonished the Chinese by his performances in this line. He also wrote or edited various Chinese works on geography, the celestial and terrestrial spheres, geometry and arithmetic. And the detailed history of the mission was drawn out by him, which after his death was brought home by P. Nicolas Trigault, and published at Augsburg, and later in a complete form at Lyons under the name *De Expeditione Christiana apud Sinas Suscepta, ab Soc. Jesu*, Ex P. Mat. Ricci ejusdem Societatis *Commentariis*, Trigault himself adding many interesting notes on China and the Chinese.

Among the scientific works which Ricci took into China was a set of maps, which at first created great interest, but afterwards disgust when the Chinese came to perceive the insignificant place assigned to the "Middle Kingdom," thrust, as it seemed, into a corner, instead of being set in the centre of the world like the gem in a ring. Ricci, seeing their dissatisfaction, set about constructing a map of the hemisphere on a great scale, so adjusted that China, with its subject states, filled the central area, and, without deviating from truth of projection, occupied a large space in proportion to the other kingdoms gathered round it. All the names were then entered in Chinese calligraphy. This map obtained immense favour, and was immediately engraved at the expense of the viceroy and widely circulated.

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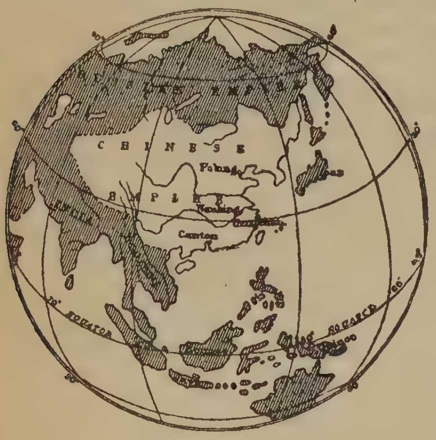
[1] The list of the literature of this controversy occupies forty-one columns in M. Cordier's excellent *Bibliographie de la Chine*.

[2] Compare Browning, *The Ring and the Book*, x., The Pope, 1589–1603.

[3] The name comes forward prominently in the mouth of the emperor Kang-hi, in a dialogue which took place between him and Monsgr. Maigrot, the leader of the anti-Jesuit movement (mentioned in Browning's lines referred to above), at the summer residence in Tartary, August 1706—a dialogue which the Jesuits have reported with not a little malice:—

"*Emperor*, 'Tell me why do the people call me *Van-sui* (10,000 years).' *The Most Reverend* (*i.e.* Maigrot), 'To express their desire for your Majesty's long life.' *Emp.* 'Good. You see, then, Chinese words are not always to be taken literally. We pay cult to Confucius and to the dead to express our respect for them. How is that inconsistent with your religion? When did it begin to be so? Is it since Ly-Mattheu's time? Hast thou ever read Ly-Mattheu?' *The Most Reverend*, turning to P. Parenin, whispers, 'Who's he?' and learning that it was P. Matteo Ricci, . . . answered the emperor: 'I have not read that book.' *Emp.* 'Ly-Mattheu and his fellows came hither some two centuries ago; and before their time China never heard anything of the Incarnation, anything of *Tien-chu*, who had not become incarnate in this part of the world. Why then, if it was lawful to call God *Tien* before Ly-Mattheu's time, should it be improper now?'"—*Epistola de Eventu Apostolicae Legationis, scripta a PP. Missionariis . . . ad Praepositum Generalem S. J.*, An. 1706, 1 Novembris.

In the accompanying cut we have endeavoured to portray this map. The projection adopted is a perspective of the hemisphere as viewed from a point at the distance of one diameter from the surface, and situated on the production of the radius which passes through the intersection of 115° E. long. (Greenwich) with 30° N. lat. Something near this must have been Li-ma-teu's projection. With a vertex much more distant the desired effect would be impaired, and with one nearer neither of the poles would be seen, whilst the exaggeration of China would have been too gross for a professed representation of the hemisphere.



The chief facts of Ricci's career are derived from Trigault; some contemporary works on the rites controversy have also been consulted; in the notice of Ricci's Chinese writings valuable matter has been derived from *Notes on Chinese Literature* by A. Wylie (London and Shanghai, 1867). A number of Ricci's letters are extant in the possession of the family, and access to them was afforded to Giuseppe La Farina, author of the work called *La China, considerata nella sua Storia*, &c. (Florence, 1843), by the Marchese Amico Ricci of Macerata, living at Bologna. La Farina's quotations contain nothing of interest. There is a curious Chinese account of Ricci published by Dr Breitschneider in the *China Review*, iv. 391 sq. (H. Y.)

RICCIARELLI, DANIELE (1509–1566), Italian artist, generally called, from the place of his birth, DANIELE DA VOLTERRA, studied painting under Sodoma and Peruzzi. Settling in Rome, he received abundant encouragement. His constant friend, Michelangelo, recommended him on all possible occasions, and he was commissioned to beautify with works of art a chapel in the church of the Trinità, to paint in the Farnese Palace, to execute certain decorations in the Palazzo de' Medici at Navona, and to begin the stucco work and the pictures in the Hall of the Kings. Towards the close of his life he turned his attention to statuary. His last work was a bronze horse intended for an equestrian statue of Henry II. of France. He died in 1566. The principal extant works of Ricciarelli are at Rome. These are a "St John the Baptist" in the picture gallery of the Capitol, a "Saviour bearing the Cross" in the Palazzo Rospigliosi, and a "Descent from the Cross," his masterpiece, in the church of Trinità de Monti. There is also an "Elijah" at Volterra.

RICCOBONI, MARIE JEANNE (1714–1792), whose maiden name was Laboras de Mézières, was born at Paris in 1714. She married in 1735 Antoine François Riccoboni, a comedian and dramatist, from whom she soon separated. She herself was an actress, but did not succeed on the stage. Her works are *Lettres de mistress Fanny Butler* (1757); the remarkable *Histoire du marquis de Cressy* (1758); *Milady Juliette Catesby* (1759–1760), like her other books, in letter form; *Ernestine* (1798), which La Harpe thought her masterpiece; and three series of *Lettres* in the names of *Adelaide de Dammartin* (*comtesse de Sancerre*) (2 vols., 1766), *Elizabeth Sophie de Vallière* (2 vols., 1772), and *Milord Rivers* (2 vols., 1776). She obtained a small pension from the crown, but the Revolution deprived her of it, and she died on the 6th of December 1792 in great indigence. Besides the works named, she wrote a novel (1762) on the subject of Fielding's *Amelia*, and supplied in 1765 a continuation (but not the conclusion sometimes erroneously ascribed to her) of Marivaux's unfinished *Marianne*.

All Madame Riccoboni's work is clever, and there is real pathos in it. But it is among the most eminent examples of the "sensibility" novel, of which no examples but Sterne's have kept their place in England, and that not in virtue of their sensibility. A still nearer parallel may be found in the work of Mackenzie. Madame Riccoboni is an especial offender in the use of mechanical aids to impressiveness—italics, dashes, rows of points and the like. The principal edition of her complete works is that of Paris (6 vols., 1818). The chief novels appear in a volume of Garnier's *Bibliothèque amusante* (Paris, 1865).

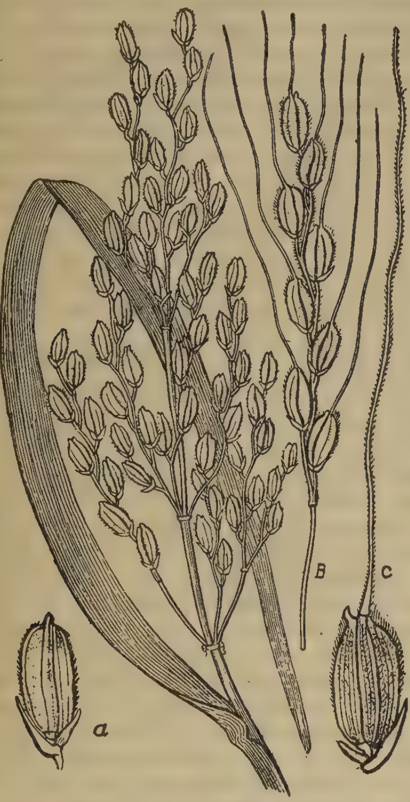
See Julia Kavanagh, *French Women of Letters* (2 vols., 1862), where an account of her novels is given; J. Fleury, *Marivaux et le marivaudage* (Paris, 1881); J. M. Quérard, *La France littéraire* (vol. vii., 1835); and notices by La Harpe, Grimm and Diderot prefixed to her *Œuvres* (9 vols., Paris, 1826).

RICE, EDMUND IGNATIUS (1762–1844), Irish philanthropist, founder of the "Irish Christian Brothers," was born at Westcourt, near Callen, Kilkenny, on the 1st of June 1762. He entered the business of his uncle, an export provision merchant in Waterford, in 1779 and succeeded him in 1790. In 1796 he established an organization for visiting and relieving the poor, and in 1802 began to educate the poor children of Waterford, renting a school and supporting two teachers. In 1803 he gave up his business and, joined by a number of friends, began to systematize his plans. Others, like-minded, opened schools at Dungarvan and Carrick-on-Suir. The little society numbered nine in 1808, and meeting at Waterford took religious vows from their bishop, assumed a "habit" and adopted an additional Christian name, by which, as by the collective title "Christian Brothers," they were thenceforth known. Schools were established in Cork (1811), Dublin (1812), and Thurles and Limerick (1817). In 1820 Pope Pius VII. issued a brief sanctioning the order of "Religious Brothers of the Christian Schools (Ireland)," the members of which were to be bound by vows of obedience, chastity, poverty and perseverance, and to give themselves to the free instruction, religious and literary, of male children, especially the poor. The heads of houses were to elect a superior general, and Rice held this office from 1822 to 1838, during which time the institution extended to several English towns (especially in Lancashire), and the course of instruction grew out of the primary stage. Rice died on the 29th of August 1844. The Irish Christian Brothers have some hundred houses in Ireland with 300 attached schools and over 30,000 pupils. There are also industrial schools and orphanages, and the institute has branches in Australia, India, Gibraltar and Newfoundland.

RICE, JAMES (1843–1882), English novelist, was born at Northampton on the 26th of September 1843. Educated at Queens' College, Cambridge, where he graduated in law in 1867, he was called to the bar at Lincoln's Inn in 1871. In the meantime (1868) he had bought *Once a Week*, which proved a losing venture for him, but which brought him into touch with Walter Besant, a contributor [see Besant's preface to the Library Edition (1887) of *Ready-money Mortiboy*]. There ensued a close friendship and a literary partnership between the two men which lasted ten years until Rice's death, and resulted in a large number of successful novels. The first of them, published anonymously, Rice being responsible for the central figure and the leading situation, was *Ready-money Mortiboy* (1782), dramatized by them later and unsuccessfully produced at the Court Theatre in 1874. In rapid succession followed *My Little Girl* (1873); *With Harp and Crown* (1874); *This Son of Vulcan* (1876); *The Golden Butterfly* (1876), the most popular of their joint productions; *The Monks of Thelema* (1878); *By Celia's Arbour* (1878); *The Seamy Side* (1880); *The Chaplain of the Fleet* (1881); *Sir Richard Whittington* (1881), and a large number of short stories, some of them reprinted in *The Case of Mr Lucraft*, &c. (1876), *'Twas in Trafalgar's Bay*, &c. (1879), and *The Ten Years' Tenant*, &c. (1881).

James Rice died at Redhill on the 26th of April 1882.

RICE (Greek ὀρύζα, Latin *oryza*, French *riz*, Italian *riso*, Spanish *arroz*, derived from the Arabic), a well-known cereal, botanical name *Oryza sativa*. According to Roxburgh, the great Indian botanist, the cultivated rice with all its numerous varieties has originated from a wild plant, called in India Newaree or Nivara, which is indigenous on the borders of lakes in the Circars and elsewhere in India, and is also native in tropical Australia. The rice plant is an annual grass with long linear glabrous leaves, each provided with a long sharply pointed ligule. The spikelets are borne on a compound or branched spike, erect at first but afterwards bent downwards. Each spikelet contains a solitary flower with two outer small barren glumes, above which is a large tough, compressed, often awned, flowering glume, which partly encloses the somewhat similar pale. Within these are six stamens, a hairy ovary surmounted by two feathery styles which ripens into the fruit (grain), and which is invested by the husk formed by the persistent glume and pale. The cultivated varieties are extremely numerous, some kinds being adapted for marshy land, others for growth on the hill-sides. The cultivators make two principal divisions according as the sorts are early or late. Rice has been cultivated from time immemorial in tropical countries. According to Stanislas Julien a ceremonial ordinance was established in China by the emperor Chin-nung 2800 years B.C., in accordance with which the emperor sows the rice himself while the seeds of four other kinds may be sown by the princes of his family. This fact, joined to other considerations, induced Alphonse de Candolle to consider rice as a native of China. It was very early cultivated in India, in some parts of which country, as in tropical Australia, it is, as we have seen, indigenous. It is not mentioned in the Bible, but its culture is alluded to in the Talmud. There is proof of its culture in the Euphrates valley and in Syria four hundred years before Christ. Crawfurd, on philological grounds, considers that rice was introduced into Persia from southern India. The Arabs carried the plant into Spain. Rice was first cultivated in Italy near Pisa in 1468. It was not introduced into S. Carolina until 1700, and then, it is said, by accident, although at one time the southern United States furnished a large proportion of the rice introduced into commerce. Rice sports into far more varieties than any of the corns familiar to Europeans; for some varieties grow in the water and some on dry land; some come to maturity in three months, while others take four and six months to do so. A very full account of the cultivation of rice in India will be found in Sir George Watt's *Dictionary of the Economic Products of India*.



Rice (*Oryza sativa*).
A, spikelet (enlarged); B, bearded variety; C, spikelet of B (enlarged).

Rice constitutes one of the most important articles of food in all tropical and subtropical countries, and is one of the most prolific of all crops. The rice yields best on low lands subject to occasional inundations, and thus enriched by alluvial deposits. An abundant rainfall during the growing season is also a desideratum. Rice is sown broadcast, and in some districts is transplanted after a fortnight or three weeks. No special rotation is followed: indeed the soil best suited for rice is ill adapted for any other crop. In some cases little manure is employed, but in others abundance of manure is used. No special tillage is required, but weeding and irrigation are requisite. Rice in the husk is known as "paddy." On cutting across a grain of rice and examining it under the microscope, first the flattened and dried cells of the husk are seen, and then one or two layers of cells elongated in a direction parallel to the length of the seed, which contain the gluten or nitrogenous matter. Within these, and forming by far the largest part of the seed, are large polygonal cells filled with very numerous and very minute angular starch grains. Rice is not so valuable as a food as some other cereals, inasmuch as the proportion of nitrogenous matter (gluten) is less. Payen gives only 7% of gluten in rice as compared with 22% in the finest wheat, 14 in oats and 12 in maize. The percentage of potash in the ash is as 18 to 23 in wheat. The fatty matter is also less in proportion than in other cereals. Rice, therefore, is chiefly a farinaceous food, and requires to be combined with fatty and nitrogenous substances, such as milk or meat gravy, to satisfy the requirements of the system.

A large proportion of the rice brought to Europe is used for starch-making, and some is taken by distillers of alcohol. Rice is also the source of a drinking spirit in India, known as arrack, and the national beverage of Japan—saké—is prepared from the grain by means of an organic ferment.

RICE PAPER. The substance which has received this name in Europe, through the mistaken notion that it is made from rice, consists of the pith of a small tree, *Aralia papyrifera*, which grows in the swampy forests of Formosa. The cylindrical core of pith is rolled on a hard flat surface against a knife, by which it is cut into thin sheets of a fine ivory-like texture. Dyed in various colours, rice paper is extensively used for the preparation of artificial flowers, while the white sheets are employed by native artists for water-colour drawings.

RICH, BARNABE (*c.* 1540–1617), English author and soldier, was a distant relative of Lord Chancellor Rich. He fought in the Low Countries, rising to the rank of captain, and afterwards served in Ireland. He shared in the colonization of Ulster, and spent the latter part of his life near Dublin. In the intervals of his campaigns he produced many pamphlets on political questions and romances. In 1606 he was in receipt of a pension of half a crown a day, and in 1616 he was presented with a gift of £100 as being the oldest captain in the service. He died on the 10th of November 1617. His best-known work is *Riche his Farewell to Militarie Profession conteining verie pleasaunt discourses fit for a peaceable tyme* (1581). Of the eight stories contained in it, five, he says, "are forged only for delight, neither credible to be believed, nor hurtful to be perused." The three others are translations from the Italian. He claims as his own invention the story of *Apolonius and Silla*, the second in the collection, from which Shakespeare took the plot of *Twelfth Night*. It is, however, founded on the tale of Nicuola and Lattantio as told by Matteo Bandello. The eighth, *Phylotus and Emilia*, a complicated story arising from the likeness and disguise of a brother and sister, is identical in plot with the anonymous play, *Philotus*, printed in Edinburgh in 1603. Both play and story were edited for the Bannatyne Club in 1835. In the conclusion to his collection Rich tells a story of a devil named Balthaser, who possesses a king of Scots, prudently changed after the accession of James I. to the "Grand Turk." The *Strange and Wonderful Adventures of Don Simonides* (1581), with its sequel (1584), is written in imitation of Lyly. Among his other romances should be mentioned *The Adventures of Brusanus, prince of Hungaria* (1592). His authenticated works number twenty-four, and include works on Ireland, the troubles of which were, according to him, due to the religion of the people and to the lack of consistency and firmness on the part of the English government. Such are: *Allarme to England* (1578); *A New Description of Ireland* (1610); *The Irish Hubbub, or the English Hue and Crie* (1617), in which he also inveighs against the use of tobacco.

See "Introduction" to the Shakespeare Society's reprint of *Riche his Farewell* (1846); P. Cunningham's "Introduction" to Rich's *Honesty of this Age* (reprinted for the Percy Society, 1844); and the life by S. Lee in the *Dictionary of National Biography*.

RICH, CLAUDIUS JAMES (1787–1821), English traveller and scholar, was born near Dijon on the 28th of March 1787. His youth was spent at Bristol. He early developed a gift for languages, becoming familiar not only with Latin and Greek but also with Hebrew, Syriac, Persian, Turkish and other Eastern tongues. In 1804 Rich went to Constantinople, where, and at Smyrna, he stayed some time, perfecting himself in Turkish. Proceeding to Alexandria as assistant to the British consul-general there, he devoted himself to Arabic and its various dialects, and made himself master of Eastern manners and usages. On leaving Egypt he travelled by land to the Persian Gulf, disguised as a Mameluke, visiting Damascus, and entering the great mosque undetected. At Bombay, which he reached in September 1807, he was the guest of Sir James Mackintosh, whose eldest daughter he married in January 1808, proceeding soon after to Bagdad as resident. There he began his investigations into the geography, history and antiquities of the district. He explored the remains of Babylon, and projected a geographical and statistical account of the pashalic of Bagdad. The results of his work at Babylon appeared first in the Vienna serial *Mines de l'orient*, and in 1815 in England, under the title *Narrative of a Journey to the Site of Babylon in 1811*. In 1813–14 Rich spent some time in Europe, and on his return to Bagdad devoted himself to the study of the geography of Asia Minor, and collected much information in Syrian and Chaldaean convents concerning the Yezidis. During this period he made a second excursion to Babylon, and in 1820 undertook an extensive tour to Kurdistan—from Bagdad north to Sulimania, eastward to Sinna, then west to Nineveh, and thence down the Tigris to Bagdad. The narrative of this journey, which contained the first accurate knowledge (from scientific observation) regarding the topography and geography of the region, was published by his widow under the title, *Narrative of a Residence in Koordistan and on the site of Ancient Nineveh, &c.* (London, 1836). In 1821 Rich went to Basora, whence he made an excursion to Shiraz, visiting the ruins of Persepolis and the other remains in the neighbourhood. At Shiraz he died of cholera on the 5th of October 1821. His fine collections of manuscripts and coins was purchased by the British Museum.

RICH, JOHN (1692–1761), English actor, the "father of English pantomime," was the son of Christopher Rich (d. 1714), the manager of Drury Lane, with whose quarrels and tyrannies Colley Cibber's *Apology* is much occupied. John Rich opened the new theatre in Lincoln's Inn Fields left unfinished by his father, and here, in 1716, under the stage name of Lun, he first appeared as Harlequin in an unnamed entertainment which developed into an annual pantomine (*q.v.*). By this departure he made successful headway in his competition with the stronger company at Drury Lane, including Cibber, Wilks and Booth. Rich was less happy in his management of Covent Garden, which he opened in 1733, until Garrick's arrival (1746), when a most prosperous season ensued, followed by a bad one when Garrick went to Dury Lane. During Rich's management occurred the rival performances of *Romeo and Juliet*—Barry and Mrs Cibber at Covent Garden, and Garrick and Miss Bellamy at Dury Lane—and the subsequent competition between the two rival actors in *King Lear*. Rich died on the 26th of November 1761. Garrick's lines show that his acting was pantomime pure and simple, without words:—

> "When Lun appeared, with matchless art and whim,
> He gave the power of speech to every limb:
> Tho' masked and mute, conveyed his quick intent,
> And told in frolic gesture what he meant."

RICH, PENELOPE, Lady (*c.* 1562–1607), the Stella of Sir Philip Sidney's *Astrophel and Stella*, was the daughter of Walter Devereux, 1st Earl of Essex. She was a child of fourteen when Sir Philip Sidney accompanied the queen on a visit to Lady Essex in 1576, on her way from Kenilworth, and must have been frequently thrown into the society of Sidney, in consequence of the many ties between the two families. Essex died at Dublin in September 1576. He had sent a message to Philip Sidney from his death-bed expressing his desire that he should marry his daughter, and later his secretary wrote to the young man's father, Sir Henry Sidney, in words which seem to point to the existence of a very definite understanding. Penelope's great-grandmother was a sister of Anne Boleyn, and she and her brother Robert were therefore distantly connected with Elizabeth. Perhaps the marriage of Lady Essex with the earl of Leicester, which destroyed Sidney's prospects as his uncle's heir, had something to do with the breaking off of the proposed match with Penelope. Her relative and guardian, Henry Hastings, earl of Huntingdon, secured Burghley's assent in March 1581 for her marriage with Robert Rich, 3rd Baron Rich. Penelope is said to have protested in vain against the alliance with Rich, who is represented as a rough and overbearing husband. The evidence against him is, however, chiefly derived from sources as interested as Sir Philip Sidney's violent denunciation in the twenty-fourth sonnet of *Astrophel and Stella*, "Rich fooles there be whose base and filthy hart." Sidney's serious love for Penelope appears to date from her marriage with Rich. The earlier sonnets are in praise of her beauty, or treat of the conventional topic of the struggle between reason and love, while the later ones are marked by unmistakable passion. The eighth song of *Astrophel and Stella* narrates Stella's refusal to accept Sidney as a lover. Lady Rich was the mother of six children by her husband when she contracted in 1595 an open liaison with Charles Blount, 8th Lord Mountjoy, a brilliant courtier and favourite of Elizabeth, to whom she had long been attached. Rich took no steps against his wife during her brother's lifetime, and she nursed him through an illness in 1600, but they obtained a legal separation in 1601, and Mountjoy acknowledged her five children born after 1595. Mountjoy was created earl of Devonshire on the accession of James I., and Lady Rich was in high favour at court. In 1605, however, they legitimized their connexion by a marriage celebrated by William Laud, the earl's chaplain. This proceeding, carried out in defiance of canon law, was followed by the disgrace of both parties, who were banished from court. Devonshire died on the 3rd of April 1606, and his wife within a year of that date. Her eldest son by Lord Rich, who became earl of Warwick in 1618, was Robert Rich, 2nd earl of Warwick (1587–1658). The second, Henry Rich, earl of Holland, was beheaded in 1649 for his share in the second Civil War. Her eldest son by Mountjoy, Mountjoy Blount, Baron Mountjoy and earl of Newport (*c.* 1597–1665) also figured in the Civil War.

See the editions of *Astrophel and Stella* by Dr A. B. Grosart, E. Arber and A. W. Pollard; also the various lives of Sir Philip Sidney, and Mrs Aubrey Richardson's *Famous Ladies of the English Court* (London, 1899). John Ford's *Broken Heart* has been alleged to have been founded on the history of Lady Rich. Richard Barnfield dedicated his *Affectionate Shepherd* (1594) to her; Bartholomew Yonge his *Diana of George of Montemayor* (1598); and sonnets are addressed to her by John Davies of Hereford and by Henry Constable.

RICH, RICHARD (fl. 1610), English soldier and adventurer, the author of *Newes from Virginia*, sailed from England on the 2nd of June 1609 for Virginia, with Captain Christopher Newport and the three commissioners entrusted with the foundation of the new colony. In his verse pamphlet he relates the adventures undergone by the expedition, and describes the resources of the new country, with the advantages offered to colonists. The title runs: *Newes from Virginia. The lost Flocke Triumphant. With the happy Arrivall of that famous and worthy Knight Sr. Thomas Gates: and the well-reputed and valiant Captaine Mr Christopher Newport, and others, into England. With the maner of their distresse in the Iland of Devils (otherwise called Bermoothawes), where they remayned 42 weeks, and builded two Pynaces, in which they returned into Virginia.* By R. Rich, Gent., one of the Voyage (1610)." The only known copy of this tract is in the Huth Library. A reprint edited by J. O. Halliwell-Phillips appeared in 1865 (another ed., 1874). The adventures related by Rich are supposed to have been in Shakespeare's mind when he wrote *The Tempest*. Another tract by Rich mentioned in the Stationers' Register, *Good Speed to Virginia*, is unknown.

RICH, RICHARD, 1ST BARON RICH (1490?–1567), lord chancellor, was born of a Hampshire family about 1490, in the parish of St Laurence Jewry, London. His great-grandfather, Richard Rich, was a wealthy mercer and sheriff of the city of London in 1441. Probably Lord Rich's father was also a mercer, but he sent his son to the Middle Temple, where Sir Thomas More was among his acquaintances. More told him at the time of his trial that he was reputed light of his tongue, a great dicer and gamester, and not of any commendable fame; but he was a commissioner of the peace in Hertfordshire in 1528, and in the next autumn became reader at the Middle Temple. Other preferments followed, and in 1533 he was knighted and became solicitor-general, in which capacity he was to act under Thomas Cromwell as a "lesser hammer" for the demolition of the monasteries, and to secure the operation of Henry VIII.'s act of supremacy. He had an odious share in the trials of Sir Thomas More and Bishop Fisher. In both cases he made use in his evidence against the prisoner of admissions made in a professedly friendly conversation, and in More's case the words he had used were misreported and received a misconstruction that could hardly be other than wilful. More expressed his opinion of the witness in open court with a candour that might well have dismayed Rich. Rich became the first chancellor (April 19, 1536) of the Court of Augmentations established for the disposal of the monastic revenues. His own share of the spoil, acquired either by grant or purchase, included Leez (Leighs) Priory and about a hundred manors in Essex. He was Speaker of the House of Commons in the same year, and advocated the king's policy. In spite of the share he had taken in the suppression of the monasteries, and of the part he was to play under Edward VI., his religious convictions remained Roman Catholic. His testimony helped the conviction of Thomas Cromwell, and he was a willing agent in the Catholic reaction which followed. Anne Askew stated that the Chancellor Wriothesley and Rich screwed the rack at her torture with their own hands.

Rich was one of the executors of the will of Henry VIII., on which so much suspicion has been thrown, and on the 26th of February 1548 he became Baron Rich of Leez. In the next month he succeeded Wriothesley as chancellor, an office in which he found full scope for the business and legal ability he undoubtedly possessed. He supported Protector Somerset in his subversive reforms in church matters, in the prosecution of his brother Lord Seymour of Sudeley, and in the rest of his policy until the crisis of his fortunes in October 1549, when he deserted to Warwick (afterwards Northumberland), and presided over the trial of his former chief. His daughter had married Warwick's son, and both men were at heart no friends to the reformed religion. Nevertheless, Rich took part in the prosecution of bishops Gardiner and Bonner, and in the harsh treatment accorded to the Princess Mary. Possibly this harshness was exaggerated, for Mary on her accession showed no ill-will to Rich. He retired from the chancellorship on the ground of ill-health in the close of 1551, at the time of the final breach between Northumberland and Somerset. He was now sixty years old, and there is no reason to suspect the sincerity of his plea. There is an improbable story, however, to the effect that Rich warned Somerset of his danger in the Tower, and that the letter was delivered by mistake to the duke of Norfolk, who handed it to Northumberland.

Lord Rich took an active part in the restoration of the old religion in Essex under the new reign, and was one of the most active of persecutors. His reappearances in the privy council were rare during Mary's reign; but under Elizabeth he served on a commission to inquire into the grants of land made under Mary, and in 1566 was sent for to advise on the question of the queen's marriage. He died at Rochford, Essex, on the 12th of June 1567, and was buried in Felsted church. In Mary's reign he had founded a chaplaincy with provision for the singing of masses and dirges, and the ringing of bells in Felsted church. To this was added a Lenten allowance of herrings to the inhabitants of three parishes. These donations were transferred in 1564 to the foundation of a grammar-school at Felsted for instruction, primarily for children born on the founder's manors, in Latin, Greek and divinity. The patronage of the school remained in the family of the founder until 1851. By his wife Elizabeth Jenks, or Gynkes, he had fifteen children. The eldest son Robert (1537?–1581), second Baron Rich, supported the Reformation, and his grandson Robert, third lord, was created earl of Warwick in 1618.

The chief authorities are the official records of the period covered by his official life, calendared in the Rolls Series. See also A. F. Pollard, *England under Protector Somerset* (1900); P. Morant, *History of Essex* (2 vols., 1768); R. W. Dixon, *History of the Church of England* (6 vols., 1878–1902); and lives in J. Sargeaunt's *History of Felsted School* (1889), Lord Campbell's *Lives of the Lord Chancellors* (1845–69), and C. H. & T. Cooper's *Athenae Cantabrigienses* (2 vols., 1858–61).

RICHARD, ST, of Wyche (*c.* 1197–1253), English saint and bishop, was named after his birthplace, Droitwich in Worcestershire. Educated at Oxford, he soon began to teach in the university, of which he became chancellor, probably after he had studied in Paris and in Bologna. About 1235 he became chancellor of the diocese of Canterbury under Archbishop Edmund Rich, and he was with the archbishop during his exile in France. Having returned to England some time after Edmund's death in 1240 he became vicar of Deal and chancellor of Canterbury for the second time. In 1244 he was elected bishop of Chichester, being consecrated at Lyons by Pope Innocent IV. in March 1245, although Henry III. refused to give him the temporalities of the see, the king favouring the candidature of Robert Passelewe (d. 1252). In 1246, however, Richard obtained the temporalities. The new bishop showed much eagerness to reform the manners and morals of his clergy, and also to introduce greater order and reverence into the services of the church. His term of office was also marked by the favour which he showed to the Dominicans, a house of this order at Orleans having sheltered him during his stay in France, and by his earnestness in preaching a crusade. He died at Dover in April 1253. It was generally believed that miracles were wrought at his tomb in Chichester cathedral, which was long a popular place of pilgrimage, and in 1262 he was canonized at Viterbo by Pope Urban IV. Richard furnished the chronicler, Matthew Paris, with material for the life of Edmund Rich, and instituted the offerings for the cathedral at Chichester which were known later as "St Richard's pence."

His life by his confessor, Ralph Bocking, is published in the *Acta Sanctorum* of the Bollandists, where a later and shorter life by John Capgrave is also to be found.

RICHARD (d. 1184), archbishop of Canterbury, was a Norman, who became a monk at Canterbury, where he acted as chaplain to Archbishop Theobald and was a colleague of Thomas Becket. In 1173, more than two years after the murder of Becket, it was decided to fill the vacant archbishopric of Canterbury; there were two candidates, Richard, at that time prior of St Martin's, Dover, and Odo, prior of Canterbury, and in June Richard was chosen, although Odo was the nominee of the monks. Objections were raised against this election both in England and in Rome, but in April 1174 the new archbishop was consecrated at Anagui by Pope Alexander III., and he returned to England towards the close of the year. The ten years during which Richard was archbishop were disturbed by disputes with Roger, archbishop of York, over the respective rights of the two sees, and in 1175, at a council held in London, there was a free fight between their partisans. Henry II. arranged a truce for five years between the rival prelates, but Richard was soon involved in another quarrel, this being with Roger, abbot of St Augustine's, Canterbury, whose action also trenched upon the privileges of the archbishop. Richard was more acceptable to Henry II. than Becket had been; he attended the royal councils, and more than once he was with the king in Normandy. Henry probably preferred him because he insisted less on the rights of the clergy than his great predecessor had done; but the monastic writers and the followers of Becket regarded this attitude as a sign of weakness. Richard died at Rochester on the 16th of February 1184 and was buried in his cathedral. See the article by W. Hunt in the *Dict. Nat. Biog.* vol. xlviii. (1896); and W. F. Hook, *Lives of the Archbishops of Canterbury.*

RICHARD, earl of Cornwall and king of the Romans (1209–1272), was the second son of the English king John by Isabella of Angoulême. Born in 1209, Richard was the junior of his brother, Henry III., by fifteen months; he was educated in England and received the earldom of Cornwall in 1225. From this date to his death he was a prominent figure on the political stage. In the years 1225–27 he acted as governor of Gascony; between 1227 and 1238, owing to quarrels with his brother and dislike of the foreign favourites, he attached himself to the baronial opposition and bade fair to become a popular hero. But in 1240 he took the command of a crusade in order to escape from the troubled atmosphere of English politics. He was formally reconciled with Henry before his departure; and their amity was cemented on his return by his marriage with Sancha of Provence, the sister of Henry's queen (1243). Henceforward Richard, though by no means blind to the faults of the government, was among the most constant supporters of Henry III. While affecting to remain neutral in the quarrels of the barons with the Poitevins and Savoyards he constantly assisted the king with loans, and thus enabled him to withstand the pressure of the Great Council for reform. In 1257 a bare majority of the German electors nominated Richard as king of the Romans, and he accepted their offer at Henry's desire. He was elected partly on account of his wealth, but also because his family connexion with the Hohenstaufen and his friendly relations with the papacy made it probable that he would unite all German parties. In the years 1257–68 Richard paid four visits to Germany. He obtained recognition in the Rhineland, which was closely connected with England by trade relations. Otherwise, however, he was unsuccessful in securing German support. In the English troubles of the same period he endeavoured to act as a mediator. On the outbreak of civil war in 1264 he took his brother's side, and his capture in a windmill outside Lewes, after the defeat of the royalist army, is commemorated in the earliest of English vernacular satires; he remained a prisoner till the fall of Montfort. But after Evesham he exerted himself, not without success, to obtain reasonable terms for those who had suffered from the vengeance of the royalist party. He died on the 2nd of April 1272. His end is said to have been hastened by grief for his eldest son, Henry of Almain, who had been murdered in the previous year by the sons of Simon de Montfort at Viterbo. The earldom of Cornwall passed to Richard's eldest surviving son Edmund, who was guardian of England from 1286 to 1289. On Edmund's death, in October 1300, it became extinct.

Authorities.—The original sources and general works of reference are the same as for the reign of Henry III. G. C. Gebauer's *Leben und Thaten Herrn Richards von Cornwall* (Leipzig, 1744), H. Koch's *Richard von Cornwall, 1209–1257* (Strassburg, 1888), and A. Busson's *Doppelwahl des Jahres, 1257* (Münster, 1866) are useful monographs. (H. W. C. D.)

RICHARD I. (1157–1199), king of England, nicknamed "Cœur de Lion" and "Yea and Nay," was the third son of Henry II. by Eleanor of Aquitaine. Born in September 1157, he received at the age of eleven the duchy of Aquitaine, and was formally installed in 1172. In his new position he was allowed, probably from regard to Aquitanian susceptibilities, to govern with an independence which was studiously denied to his brothers in their shares of the Angevin inheritance. Yet in 1173 Richard joined with the young Henry and Geoffrey of Brittany in their rebellion; Aquitaine was twice invaded by the old king before the unruly youth would make submission. Richard was soon pardoned and reinstated in his duchy, where he distinguished himself by crushing a formidable revolt (1175) and exacting homage from the count of Toulouse. In a short time he was so powerful that his elder brother Henry became alarmed and demanded, as heir-apparent, that Richard should do him homage for Aquitaine. Richard having scornfully rejected the demand, a fratricidal war ensued; the young Henry invaded Aquitaine and attracted to his standard many of Richard's vassals, who were exasperated by the iron rule of the duke. Henry II. marched to Richard's aid; but the war terminated abruptly with the death of the elder prince (1183).

Richard, being now the heir to England and Normandy, was invited to renounce Aquitaine in favour of Prince John. The proposal led to a new civil war; and, although a temporary compromise was arranged, Richard soon sought the help of Philip Augustus, to whom he did homage for all the continental possessions in the actual presence of his father (Conference of Bonmoulins, 18th of November 1188) In the struggle which ensued the old king was overpowered, chased ignominiously from Le Mans to Angers, and forced to buy peace by conceding all that was demanded of him; in particular the immediate recognition of Richard as his successor.

But the death of Henry II. (1189) at once dissolved the friendship between Richard and Philip. Not only did Richard continue the continental policy of his father, but he also refused to fulfil his contract with Philip's sister, Alais, to whom he had been betrothed at the age of three. An open breach was only delayed by the desire of both kings to fulfil the crusading vows which they had recently taken. Richard, in particular, sacrificed all other interests to this scheme, and raised the necessary funds by the most reckless methods. He put up for auction the highest offices and honours; even remitting to William the Lion of Scotland, for a sum of 15,000 marks, the humiliating obligations which Henry II. had imposed at the treaty of Falaise. It is true that Richard indemnified himself on his return by resuming some of his most important grants and refusing to return the purchase money; but it is improbable that he had originally planned this repudiation of his ill-considered bargains. By such expedients he raised and equipped a force which may be estimated at 4000 men-at-arms and as many foot-soldiers, with a fleet of 100 transports (1191).

Richard did not return to his dominions until 1194. But his stay in Palestine was limited to sixteen months. On the outward journey he wintered in Sicily, where he employed himself in quarrelling with Philip and in exacting satisfaction from the usurper Tancred for the dower of his widowed sister, Queen Joanna, and for his own share in the inheritance of William the Good. Leaving Messina in March 1191, he interrupted his voyage to conquer Cyprus, and only joined the Christian besiegers of Acre in June. The reduction of that stronghold was largely due to his energy and skill. But his arrogance gave much offence. After the fall of Acre he inflicted a gross insult upon Leopold of Austria; and his relations with Philip were so strained that the latter seized the first pretext for returning to France, and entered into negotiations with Prince John (see John, king of England) for the partition of Richard's realm. Richard also threw himself into the disputes respecting the crown of Jerusalem, and supported Guy of Lusignan against Conrad of Montferrat with so much heat that he incurred grave, though unfounded, suspicions of complicity when Conrad was assassinated by emissaries of the Old Man of the Mountain. None the less Richard, whom even the French crusaders accepted as their leader, upheld the failing cause of the Frankish Christians with valour and tenacity. He won a brilliant victory over the forces of Saladin at Arsuf (1191), and twice led the Christian host within a few miles of Jerusalem. But the dissensions of the native Franks and the crusaders made it hopeless to continue the struggle; and Richard was alarmed by the news which reached him of John's intrigues in England and Normandy. Hastily patching up a truce with Saladin, under which the Christians kept the coast-towns and received free access to the Holy Sepulchre, Richard started on his return (9th October 1192).

His voyage was delayed by storms, and he appears to have been perplexed as to the safest route. The natural route overland through Marseilles and Toulouse was held by his enemies; that through the empire from the head of the Adriatic was little safer, since Leopold of Austria was on the watch for him. Having adopted the second of these alternatives, he was captured at Vienna in a mean disguise (December 20th, 1192) and strictly confined in the duke's castle of Dürenstein on the Danube. His mishap was soon known to England, but the regents were for some weeks uncertain of his whereabouts. This is the foundation for the tale of his discovery by the faithful minstrel Blondel, which first occurs in a French romantic chronicle of the next century. Early in 1193 Leopold surrendered his prize, under compulsion, to the emperor Henry VI., who was aggrieved both by the support which the Plantagenets had given to the family of Henry the Lion and also by Richard's recognition of Tancred in Sicily. Although the detention of a crusader was contrary to public law, Richard was compelled to purchase his release by the payment of a heavy ransom and by doing homage to the emperor for England. The ransom demanded was 150,000 marks; though it was never discharged in full, the resources of England were taxed to the utmost for the first instalments; and to this occasion we may trace the beginning of secular taxation levied on movable property.

Richard reappeared in England in March 1194; but his stay lasted only a few weeks, and the remainder of his reign was entirely devoted to his continental interests. He left England to be governed by Hubert Walter (*q.v.*), and his personal authority was seldom asserted except by demands for new subsidies. The rule of the Plantagenets was still popular in Normandy and Aquitaine; but these provinces were unable or unwilling to pay for their own defence. Though Richard proved himself consistently the superior of Philip in the field, the difficulty of raising and paying forces to resist the French increased year by year. Richard could only stand on the defensive; the keynote of his later policy is given by the building of the famous Château Gaillard at Les Andelys (1196) to protect the lower courses of the Seine against invasion from the side of France. He did not live to see the futility of such bulwarks. In 1199 a claim to treasure-trove embroiled him with the viscount of Limoges. He harried the Limousin and laid siege to the castle of Châlus; while directing an assault he was wounded in the shoulder by a crossbow bolt, and, the wound mortifying from unskilful treatment or his own want of care, he died on the 6th of April 1199. He was buried by his own desire at his father's feet in the church of Fontevrault. Here his effigy may still be seen.[1] Though contemporary, it does not altogether agree with the portraits on his Great Seal, which give the impression of greater strength and even of cruelty. The Fontevrault bust is no doubt idealized.

The most accomplished and versatile representative of his gifted family, Richard was, in his lifetime and long afterwards, a favourite hero with troubadours and romancers. This was natural, as he belonged to their brotherhood and himself wrote lyrics of no mean quality. But his history shows that he by no means embodied the current ideal of chivalrous excellence. His memory is stained by one act of needless cruelty, the massacre of over two thousand Saracen prisoners at Acre; and his fury, when thwarted or humbled, was ungovernable. A brave soldier, an experienced and astute general, he was never happier than when engaged in war. As a ruler he was equally profuse and rapacious. Not one useful measure can be placed to his credit; and it was by a fortunate accident that he found, in Hubert Walter, an administrator who had the skill to mitigate the consequences of a reckless fiscal policy. Richard's wife was Berengaria, daughter of Sancho VI., king of Navarre, whom he married in Cyprus in May 1191. She was with the king at Acre later in the same year, and during his imprisonment passed her time in Sicily, in Rome and in France. Husband and wife met again in 1195, and the queen long survived the king, residing chiefly at Le Mans. She died soon after 1230. Berengaria founded a Cistercian monastery at Espau.

Authorities.—The more important of the general chronicles are: the *Gesta Henrici Secundi*, ascribed to Benedict of Peterborough (Rolls Series, 2 vols., 1867); the *Chronica* of Roger of Hoveden (Rolls Series, 4 vols., 1868–71); the *Chronica* of Gervase of Canterbury (Rolls Series, 1879); the *Imagines Historiarum* of Ralph of Diceto (Rolls Series, 2 vols., 1876); the *Historia Rerum Anglicarum* of William of Newburgh (in *Chronicles of the Reigns of Stephen*, &c., Rolls Series, 2 vols., 1884–85); the *De rebus gestis Ricardi Primi* of Richard of Devizes (in *Chronicles of the Reigns of Stephen*, &c., vol. iii., Rolls Series, 1886); the *Chronicon Anglicanum* of Ralph of Coggeshall (Rolls Series, 1875); the *Flores Historiarum* of Roger of Wendover (Rolls Series, 3 vols., 1886–89); the *Gesta Philippi Augusti* of Rigord (*Société de l'histoire de France*, Paris, 1882) and of Guillaume le Breton (*op. cit.*). A detailed narrative of Richard's crusade is given in *L'Estoire de la guerre sainte*, a rhyming French chronicle by the minstrel Ambroise (ed. Gaston Paris, Paris, 1897), and in the Latin prose version known as the *Itinerarium O. Peregrinorum et gesta Regis Ricardi*; this last, with some valuable historical letters, is printed in W. Stubbs's *Chronicles and Memorials of the Reign of Richard I.* (Rolls Series, 2 vols., 1864–65). Of modern works the following are useful: W. Stubbs's preface to vols. iii. and iv. of Hoveden; the same author's *Constitutional History of England*, vol. i. (Oxford, 1897); Miss K. Norgate's *England under the Angevin Kings*, vol. ii. (London, 1887); Sir J. H. Ramsay's *Angevin Empire* (London, 1903); R. Röhricht's *Geschichte des Königreichs Jerusalem* (1898); W. B. Stevenson's *Crusaders in the East* (Cambridge, 1907); A. Cartellieri's *Philipp II. August* (Leipzig, 1899, &c.).

(H. W. C. D.)

RICHARD II. (1367–1400), king of England, younger son of Edward the Black Prince by Joan "the Fair Maid of Kent," was born at Bordeaux on the 6th of January 1367. He was brought to England in 1371, and after his father's death was, on the petition of the Commons in parliament, created prince of Wales on the 20th of November 1376. When Edward III. died, on the 21st of June 1377, Richard became king. Popular opinion had credited John of Gaunt with designs on the throne. This was not justified; nevertheless, the rivalry of the boy-king's uncles added another to the troubles due to the war, the Black Death and the prospect of a long minority. At first the government was conducted by a council appointed by parliament. The council was honest, but the difficulties of the situation were too great. The ill-considered poll-tax of 1381 was the occasion, though not the real cause, of the Peasants' Revolt in that year. The ministers were quite unequal to the crisis, and when Wat Tyler and his followers got possession of London, it was Richard who showed a precocious tact and confidence in handling it. It was the boy-king who met and temporized with the rebels on the 13th of June at Mile End, and again next day at Smithfield; and he who, with courageous presence of mind, saved the situation when Tyler was killed, by calling on them to take him for their leader. From this time Richard began to assert himself. His chief ministers, appointed by parliament in 1382, were the earl of Arundel and Michael de la Pole. Arundel Richard disliked, and dismissed next year, when he began his personal government. Pole, whom he retained as chancellor and made earl of Suffolk, was a well-chosen adviser. But others, and especially his youthful favourite Robert de Vere, promoted by unheard-of honour to be marquess of Dublin and duke of Ireland, were less worthy. Further, Richard made his own position difficult by lavish extravagance and unseemly outbursts of temper. He chafed under the restraint of his relatives, and therefore encouraged John of Gaunt in his Spanish enterprise. This gave the less scrupulous Thomas of Gloucester his opportunity. Gloucester, supported by Arundel, attacked his nephew's ministers in the parliament of 1386, and by open hints at deposition forced Richard to submit to a council of control. When Richard, with the aid of his friends and by the advice of subservient judges, planned a reversal of the parliament, Gloucester, at the head of the so-called lords appellant, anticipated him. Richard had been premature and ill-advised. Gloucester had the advantage of posing as the head of the constitutional party. The king's friends were driven into exile or executed, and he himself forced to submit to the loss of all real power (May 1388). Richard changed his methods, and when the lords appellant had lost credit, asserted himself constitutionally by dismissing Gloucester's supporters from office, and appointing in their place well-approved men like William of Wykeham. In the next parliament of 1390 the king showed himself ready to meet and conciliate his subjects. The simultaneous return of John of Gaunt from Spain put a check on Gloucester's ambition. For seven years Richard ruled constitutionally and on the whole well. The opposition was quiescent except for two outbreaks by Arundel: the first was a violent attack on John of Gaunt, which rather strengthened Richard's position; the second was a wanton insult to the king at the funeral of his queen.

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[1] The remains of Richard, together with those of Henry II. and his queen Eleanor, were removed in the 17th century from their tombs to another part of the church. They were rediscovered in 1910 during the restoration of the abbey undertaken by the French government.

In January 1383 Richard had married Anne of Bohemia (1366–1394), daughter of the emperor Charles IV. The marriage, though childless, was happy; had Anne lived or borne a son the course of events might have been different. Her death on the 7th of June 1394 was a great shock to Richard, and incidentally had important consequences. Richard sought distraction by an expedition to Ireland, the first visit of an English king for more than two centuries. In his policy there he showed a wise statesmanship. At the same time he was negotiating for a permanent peace with France, which was finally arranged in October 1396 to include his own marriage with Isabella, daughter of Charles VI., a child of seven. Gloucester criticized the peace openly, and there was some show of opposition in the parliament of February 1397. But there was nothing to foreshadow the sudden stroke by which in July Richard arrested Gloucester and his chief supporters, the earls of Arundel and Warwick. The others of the five lords appellant, Henry of Bolingbroke afterwards King Henry IV., and the earl of Nottingham, now supported the king. Richard's action was apparently in deliberate revenge for the events of 1387–88. Gloucester, after a forced confession, died in prison at Calais, smothered by his nephew's orders. Arundel in a packed parliament was condemned and executed; his brother Thomas archbishop of Canterbury was exiled. The king's friends, including Nottingham and Bolingbroke, made dukes of Norfolk and Hereford, were all promoted in title and estate. Richard himself was rewarded for ten years' patience by the possession of absolute power. He might perhaps have established it if he could have exercised it with moderation. But he declared that the laws of England were in his mouth, and supported his court in wanton luxury by arbitrary methods of taxation. By the exile of Norfolk and Hereford in September 1398 he seemed to have removed the last persons he need fear. He was so confident that in May 1399 he paid a second visit to Ireland, taking with him all his most trusted adherents. Thus when Henry landed at Ravenspur in July he found only half-hearted opposition, and when Richard himself returned it was too late. Ultimately Richard surrendered to Henry at Flint on the 19th of August, promising to abdicate if his life was spared. He was taken to London riding behind his rival with indignity. On the 30th of September he signed in the Tower a deed of abdication, wherein he owned himself insufficient and useless, reading it first aloud with a cheerful mien and ending with a request that his cousin would be good lord to him. The parliament ordered that Richard should be kept close prisoner, and he was sent secretly to Pontefract. There in February 1400 he died: no doubt of the rigour of his winter imprisonment, rather than by actual murder as alleged in the story adopted by Shakespeare. The mystery of Richard's death led to rumours that he had escaped, and an impostor pretending to be Richard lived during many years under the protection of the Scottish government. But no doubt it was the real Richard who was buried without state in 1400 at King's Langley, and honourably reinterred by Henry V. at Westminster in 1413.

Richard II. is a character of strange contradictions. It is difficult to reconcile the precocious boy of 1381 with the wayward and passionate youth of the next few years. Even if it be supposed that he dissembled his real opinions during the period of his constitutional rule, it is impossible to believe that the apparent indifference which he showed in his fall was the mere acting of a part. His violent outbursts of passion perhaps give the best clue to a mercurial and impulsive nature, easily elated and depressed. He had real ability, and in his Irish policy, and in the preference which he gave to it over continental adventure, showed a statesmanship in advance of his time. But this, in spite of his lofty theory of kingship, makes it all the more difficult to explain his extravagant bearing in his prosperity. His fall was due to the triumph of national right over absolute government, but it was his personal conduct which made it inevitable. In appearance Richard was tall and handsome, if effeminate. He had some literary tastes, which were shown in fitful patronage of Chaucer, Gower and Froissart. His fancy for splendid dress may have been due to an artistic sense, which found better expression in his great buildings of Westminster Hall and Abbey. Richard's second queen, Isabella (1389–1409), was born in Paris on the 9th of November 1389, and was married to the English king at Calais in October, or November, 1396, but on account of the bride's youth the marriage was never consummated. When Richard lost his crown in 1399 Isabella was captured by Henry IV.'s partisans and sent to Sonning, near Reading, while her father, Charles VI., asked in vain for the restoration of his daughter and of her dowry. In 1401 she was allowed to return to France; in 1406 she became the wife of the poet, Charles, duke of Orleans, and she died on the 13th of September 1409.

Bibliography.—The best contemporary authorities are the *Chronicon Angliae* down to 1388, Walsingham's *Historia Anglicana*, the *Annales Ricardi II.*, Knighton's *Chronicle* (all these in the Rolls Series), the *Vita Ricardi II.* by a Monk of Evesham (ed. T. Hearne), and the *Chronique de la traison et mort* (English Hist. Soc.). Froissart wrote from some personal knowledge. A metrical account of Richard's fall, probably written by a French knight called Creton, is printed in *Archaeologia*, xx. The chief collections of documents are the *Rolls of Parliament* and the *Calendar of Patent Rolls*. H. A. Wallon's *Richard II.* (Paris, 1864) is the fullest life, though now somewhat out of date. For other modern accounts see W. Stubbs, *Constitutional History*, and C. W. C. Oman, *The Political History of England*, vol. iv., and *The Great Revolt of 1381*. (C. L. K.)

RICHARD III. (1452–1485), king of England, youngest son of Richard, duke of York, by Cicely Neville, was born at Fotheringhay on the 2nd of October 1452. After the second battle of St Albans in February 1461, his mother sent him with his brother George for safety to Utrecht. They returned in April, and at the coronation of Edward IV. Richard was created duke of Gloucester. As a mere child he had no importance till 1469–1470, when he supported his brother against Warwick, shared his exile and took part in his triumphant return. He distinguished himself at Barnet and Tewkesbury; according to the Lancastrian story, after the latter battle he murdered the young Edward of Wales in cold blood; this is discredited by the authority of Warkworth (*Chronicle*, p. 18); but Richard may have had a share in Edward's death during the fighting. He cannot be so fully cleared of complicity in the murder of Henry VI., which probably took place at the Tower on the night of the 21–22 of May, when Richard was certainly present there. Richard shared to the full in his brother's prosperity. He had large grants of lands and office, and by marrying Anne (1456–1485), the younger daughter of Warwick, secured a share in the Neville inheritance. This was distasteful to George, duke of Clarence, who was already married to the elder sister, Isabel. The rivalry of the two brothers caused a quarrel which was never appeased. Richard does not, however, seem to have been directly responsible for the death of Clarence in 1478; Sir Thomas More, who is a hostile witness, says that he resisted it openly "howbeit somewhat (as men deemed) more faintly than he that were heartily minded to his wealth." Richard's share of the Neville inheritance was chiefly in the north, and he resided usually at Middleham in Yorkshire. In May 1480 he was made the king's lieutenant-general in the north, and in 1482 commanded a successful invasion of Scotland. His administration was good, and brought him well-deserved popularity. On Edward's death he was kept informed of events in London by William, Lord Hastings, who shared his dislike of the Woodville influence.

On the 29th of April 1483, supported by the duke of Buckingham, he intercepted his nephew at Stony Stratford and arrested Lord Rivers and Richard Grey, the little king's half-brother. It was in Richard's charge that Edward was brought to London on the 4th of May. Richard was recognized as protector, the Woodville faction was overthrown, and the queen with her younger children took sanctuary at Westminster. For the time the government was carried on in Edward's name, and the 22nd of June was appointed for his coronation. Richard was nevertheless gathering forces and concerting with his friends. In the council there was a party, of whom Hastings and Bishop Morton were the chief, which was loyal to the boy-king. On the 13th of June came the famous scene when Richard appeared suddenly in the council baring his withered arm and accusing Jane Shore and the queen of sorcery; Hastings, Morton and Stanley were arrested and the first-named at once beheaded. A few days later, probably on the 25th of June, Rivers and Grey were executed at Pontefract. On the 22nd of June Dr Shaw was put up to preach at Paul's Cross against the legitimacy of the children of Edward IV. On the 25th a sort of parliament was convened at which Edward's marriage was declared invalid on the ground of his precontract with Eleanor Talbot, and Richard rightful king. Richard, who was not present, accepted the crown with feigned reluctance, and from the following day began his formal reign.

On the 6th of July Richard was crowned at Westminster, and immediately afterwards made a royal progress through the Midlands, on which he was well received. But in spite of its apparent success the usurpation was not popular. Richard's position could not be secure whilst his nephews lived. There seems to be no reasonable doubt that early in August Edward V. and his brother Richard (whom Elizabeth Woodville had been forced to surrender) were murdered by their uncle's orders in the Tower. Attempts have been made to clear Richard's memory. But the report of the princes' death was believed in England at the time, "for which cause king Richard lost the hearts of the people" (*Chronicles of London*, 191), and it was referred to as a definite fact before the French states-general in January 1484. The general, if vague, dissatisfaction found its expression in Buckingham's rebellion. Richard, however, was fortunate, and the movement collapsed. He met his only parliament in January 1484 with some show of triumph, and deserves credit for the wise intent of its legislation. He could not, however, stay the undercurrent of disaffection, and his ministers, Lovell and Catesby, were unpopular. His position was weakened by the death of his only legitimate son in April 1484. His queen died also a year later (March 16, 1485), and public opinion was scandalized by the rumour that Richard intended to marry his own niece, Elizabeth of York. Thus the feeling in favour of his rival Henry Tudor strengthened. Henry landed at Milford Haven on the 7th of August 1485, and it was with dark forebodings that Richard met him at Bosworth on the 22nd. The defection of the Stanleys decided the day. Richard was killed fighting, courageous at all events. After the battle his body was carried to Leicester, trussed across a horse's back, and buried without honour in the church of the Greyfriars.

Richard was not the villain that his enemies depicted. He had good qualities, both as a man and a ruler, and showed a sound judgment of political needs. Still it is impossible to acquit him of the crime, the popular belief in which was the chief cause of his ruin. He was not a monster; but a typical man in an age of strange contradictions of character, of culture combined with cruelty, and of an emotional temper that was capable of high ends, though unscrupulous of means. Tradition represents Richard as deformed. It seems clear that he had some physical defect, though not so great as has been alleged. John Stow told Buck that old men who remembered Richard described him as in bodily form comely enough. Extant portraits show an intellectual face characteristic of the early Renaissance, but do not indicate any deformity.

Bibliography.—The chief original authorities are Sir Thomas More's *History of Richard III.*, based on information supplied by Archbishop Morton, and therefore to be accepted with caution; the more trustworthy *Continuation of the Croyland Chronicle* in Fulman's *Scriptores*, the *History* of Polydore Vergil, written in a Tudor spirit; the *Chronicle of London* (ed. C. L. Kingsford, 1905), and its biased expansion in Fabyan's *Chronicle*. See also *Letters and Papers Illustrative of the Reigns of Richard III. and Henry VII.*, ed. J. Gairdner, in Rolls Series. Of later accounts those in Stow's *Annales* (preserving some oral tradition) and George Buck's *Richard III.* ap. Kennet *History of England* deserve mention. Horace Walpole attempted a vindication in his *Historic Doubts* (1768). The best modern account is James Gairdner's *Life of Richard III.* (2nd ed., 1898). The latest and fullest defence is given in Sir Clements Markham's *Richard III., His Life and Character* (1906); G. B. Churchill's *Richard the Third up to Shakespeare* (*Palaestra* x., 1900) is a valuable digest of material. (C. L. K.)

RICHARD, FRANÇOIS MARIE BENJAMIN (1819–1908), archbishop of Paris, French prelate, was born at Nantes on the 1st of March 1819. Educated at the seminary of St Sulpice he became successively vicar-general of Nantes, bishop of Belley, and in 1875 coadjutor of Paris. In 1886 the death of Archbishop Guibert was followed by Mgr. Richard's appointment to the see of Paris, and in 1889 he received a cardinal's hat. In January 1900 the trial of the Assumptionist Fathers resulted in the dissolution of their society as an illegal association. Next day an official visit of the archbishop to the Fathers was noted by government as an act of a political character, and Mgr. Richard was officially censured. His attitude was in general exceedingly moderate, he had no share in the extremist policy of the Ultramontanes, and throughout the struggle over the law of Associations and the law of Separations he maintained his reasonable temper. He presided in September 1906 over an assembly of bishops and archbishops at his palace in the rue de Grenelle, a few days after the papal encyclical forbidding French Catholics to form associations for public worship, but it was then too late for conciliation. In December he gave up the archiepiscopal palace to the government authorities. He was then an old man of nearly ninety, and his "eviction" evoked great sympathy. Cardinal Richard died on the 29th of January 1908.

RICHARD, HENRY (1812–1888), Welsh politician, was the son of the Rev. Ebenezer Richard (1781–1837), a Calvinistic Methodist minister, and was born on the 3rd of April 1812. Educated at Llangeitho grammar school, he also studied at a college at Highbury, and in 1835 he became minister of a Congregational church in the Old Kent Road, London, a position which he retained for fifteen years. Richard is chiefly known as an advocate of peace and international arbitration. In 1848 he became secretary of the Peace Society, and in this capacity he helped to organize a series of congresses in the capitals of Europe, and was partly instrumental in securing the insertion of a declaration in favour of arbitration in the treaty of Paris in 1856. He resigned this post in 1885. In 1868 Richard was elected member of parliament for the Merthyr boroughs, and he remained in the House of Commons until his death at Treborth, near Bangor, on the 20th of August 1888. In parliament he was a leading member of the party which advocated the removal of Nonconformist grievances and the disestablishment of the church in Wales; in 1877 he was chairman of the Congregational Union of England and Wales. Among Richard's writings may be mentioned: *Defensive War* (1846, and again 1890); *Memoirs of Joseph Sturge* (1864); *Letters on the Social and Political Condition of the Principality of Wales* (1866, and again 1884); and *The Recent Progress of International Arbitration* (1884). He also prepared some of the material for the life of his friend and associate, Richard Cobden, which was written by Mr John, now Lord, Morley; and he did some journalistic work in the *Morning Star* and the *Evening Star*.

See C. S. Miall, *Henry Richard, M.P.* (1889); L. Appleton, *Memoirs of Henry Richard* (1889); and articles in *Cymru Fydd* for 1888.

RICHARD OF CIRENCESTER (*c.* 1335–*c.* 1401), historical writer, was a member of the Benedictine abbey at Westminster, and his name ("Circestre") first appears on the chamberlain's list of the monks of that foundation drawn up in the year 1355. In the year 1391 he obtained a licence from the abbot to go to Rome, and in this the abbot gives his testimony to Richard's perfect and sincere observance of religion for upwards of thirty years. In 1400 Richard was in the infirmary of the abbey, where he died in the following year. His only known extant work is *Speculum Historiale de Gestis Regum Angliae, 447–1066.* The MS. of this is in the university library at Cambridge, and has been edited for the Rolls Series (No. 30) by Professor J. E. B. Mayor (2 vols., London, 1863–69). It is in four books, and at the conclusion of the fourth book Richard expresses his intention of continuing his narrative from the accession of William I., and incorporating a sketch of the Conqueror's career from his birth. This design he does not, however, appear to have carried into effect. The value of the *Speculum* as a contribution to our historical knowledge is but slight, for it is mainly a compilation from other writers; while even in transcribing these the compiler is guilty of great carelessness. He gives, however, numerous charters relating to Westminster Abbey, and also a very complete account of the saints whose tombs were in the abbey church, and especially of Edward the Confessor. The work was, however, largely used by historians and antiquaries, until, with the rise of a more critical spirit, its value became more accurately estimated. Besides the *Speculum* Richard also wrote, according to the statement of William of Woodford in his *Answer* to Wycliffe (Edward Brown, *Fasciculus Rerum expetendarum*, p. 193), a treatise *De Officiis*; and there was formerly in the cathedral library at Peterborough another tractate from his pen, entitled *Super Symbolum.* Of neither of these works, however, does any known copy now exist.

The *Speculum* affords the most conclusive proof of the spuriousness of another work attributed to Richard and long accepted by the learned world as his. This was the *De Situ Britanniae*, an elaborate forgery relating to the antiquities of Roman Britain, which first appeared at Copenhagen in the year 1747. It was printed with the works of Gildas and Nennius, under the editorship of Charles Julius Bertram, professor of English in the academy of Copenhagen in the middle of the 18th century, with the following special title: "Richardi Corinensis monachi Westmonasteriensis de situ Britanniae libri duo. E. Codici MS. descripsit, Notisque et Indice adornavit Carolus Bertram."

This forgery was accepted as genuine by a well-known antiquary of the 18th century, Dr William Stukeley, and under the sanction of his authority continued for a long time to be regarded in the same light by numerous scholars and antiquaries, including Gibbon and Lingard. On the other hand, critics of a later date gave expression, on various grounds, to a contrary conclusion. All doubt on the subject may, however, be held to have been effectually set at rest by the masterly exposure of the whole fraud drawn up by Professor Mayor in the preface to the edition above referred to of the *Speculum.* He has there not only demonstrated, from the external and internal evidence alike, the spuriousness of the whole treatise, but in a collation (extending to nearly a hundred pages) of numerous passages with corresponding passages in classical medieval authorities, has also traced out the various sources whence Bertram derived the terminology and the facts which he reproduced in the *De Situ.* (J. B. M.)

RICHARD OF DEVIZES (fl. 1191), English chronicler, was a monk of St Swithin's house at Winchester. His birthplace is probably indicated by his surname, but of his life we know nothing. He is credited by Bale with the composition of the *Annales de Wintonia*, which are edited by Luard in the second volume of the *Annales Monastici.* If this statement be correct, then the chronicler survived King Richard I. But the *Chronicon de rebus gestis Ricardi Primi*, by which Richard of Devizes is chiefly known, only covers the first three years of that king's reign; it is practically an account of events in England and the Holy Land during the Third Crusade. For the events of the crusade itself, Richard is a poor authority. But his account of the preparations for the crusade, and of English affairs in the king's absence, is valuable, in spite of some inaccuracies. The author is intensely conservative, steeped in the prejudices of his order, and particularly hostile to the Jews and to the chancellor, William Longchamp. He writes in a vivid and epigrammatic style; his Latin shows the effect of the 12th-century renaissance in its polish and in its reminiscences of classical poets.

See the editions of the *Chronicon de rebus gestis Ricardi Primi* by J. Stevenson (Eng. Historical Soc., 1838) and by R. Howlett in *Chronicles of the Reigns of Stephen, Henry II. and Richard I.*, vol. iii. (Rolls Series, 1886); the *Annales de Wintonia* in H. R. Luard's *Annales Monastici*, vol. ii. (Rolls Series, London, 1864–69). (H. W. C. D.)

RICHARD OF HEXHAM (fl. 1141), English chronicler, became prior of Hexham about 1141, and died between 1163 and 1178. He wrote *Brevis Annotatio*, a short history of the church of Hexham from 674 to 1138, for which he borrowed from Bede, Eddius and Simeon of Durham. This is published by J. Raine in *The Priory of Hexham, its Chroniclers, Endowments and Annals* (Durham, 1864–65). More important is his *Historia de gestis regis Stephani et de bello Standardii*, very valuable for the history of the north of England during the earlier part of the reign of Stephen, and especially for the battle of the Standard. This history, which is a contemporary one, covers the period from the death of Henry I. in 1135 to early in 1139. It has been edited for the Rolls Series by R. Howlett in the *Chroniclers of the Reigns of Stephen, Henry II. and Richard I.*, vol. iii. (1886); and has been translated by J. Stevenson in the *Church Historians of England*, vol. iv. (1856).

RICHARD OF ILCHESTER (d. 1188), English statesman and prelate, was born in the diocese of Bath, where he obtained preferment. Early in the reign of Henry II., however, he is found acting as a clerk in the king's court, probably under Thomas Becket, and he was one of the officials who assisted Henry in carrying out his great judicial and financial reforms. In 1162, or 1163, he was appointed archdeacon of Poitiers, but he passed most of his time in England, although in the next two or three years he visited Pope Alexander III. and the Emperor Frederick I. in the interests of the English king, who was then engaged in his struggle with Becket. For promising to support Frederick against Alexander he was excommunicated by Becket in 1166. Before this event, however, Richard had been appointed a baron of the exchequer, his great industry and exceptional abilities as an accountant being recognized by giving him a special seat at the exchequer table, and from 1168 until his death he frequently acted as one of the itinerant justices. Although totally immersed in secular business he received several rich ecclesiastical offices, and in May 1173 he was elected bishop of Winchester, being consecrated at Canterbury in October 1174. Richard still continued to serve Henry II. In 1176 he was appointed justiciar and seneschal of Normandy, and was given full control of all the royal business in the duchy. He died on the 21st or 22nd of December 1188, and was buried in Winchester cathedral. Richard owes his surname to the fact that Henry II. granted him a mill at Ilchester; he is also called Richard of Toclyve.

See the article by Miss K. Norgate in the *Dict. Nat. Biog.*, vol. xlviii. (1896); and W. R. W. Stephens and W. W. Capes, *The Bishops of Winchester* (1907).

RICHARD OF ST VICTOR (d. 1173), theologian and mystic of the 12th century. Very little is known of his life; he was born in Scotland or in England, and went to Paris, where he entered the abbey of St Victor and was a pupil of the great mystic, Hugh of St Victor. He succeeded as prior of this house in 1162, and was continually contesting the tyrannical authority of the abbot Ervisius. His writings, some of which are still in manuscript, are very numerous, the best known being his mystical treatises: *De statu hominis interioris*, *De praeparatione animi ad contemplationem*, *De gratia contemplationis*, *De gradibus caritatis*, *De arca nuptica*, and his two works on the Trinity: *De trinitate libri sex*, *De tribus appropriatis personis in Trinitate.* As is the case with all the Victorines, his mysticism was a reaction against the philosophy of the schools of his time, a perpetual justification of contemplation as opposed to logical reasoning. According to him, six steps lead the soul to contemplation: (1) contemplation of visible and tangible objects; (2) study of the productions of nature and of art; (3) study of character; (4) study of souls and of spirits; (5) entrance to the mystical region which ends in (6) ecstasy. His theory of the Trinity is chiefly based on the arguments of Anselm of Canterbury, although a certain deification of the social sense is evident.

His style is most affected, and the influence of the neo-Platonist terminology as well as of the works of the pseudo-Dionysius can be clearly detected. In the *Paradis* Dante has placed Richard de St Victor, whose books were much read by his contemporaries, among the greatest teachers of the Church. His writings seem to have come into favour again in the 16th and 17th centuries, six editions of his works having been printed between 1506 and 1650.

Bibliography. *Œuvres*, edited in the *Patrologia latina* by Migne, vol. cxcvi.; W. Kaulich, "Die Lehren des Hugo und Richard von St Victor" (*Abhandlungen der K. böhmischen Gesellschaft der Wissenschaften.* V. Folge, vol. xiii. (2nd ed. Paris, 1905), p. 231 (Prague, 1864); P. C. F. Daunou, article in *Histoire littéraire de la France*, tome xiii. (Paris, 1869); G. Buonamici, *Riccardo da S. Vittore* (Alatri, 1899); DeWulf, *Histoire de la philosophie medievale* (2nd ed. Paris, 1905), p. 231.

RICHARDIA, a small genus of the nat. ord. Araceae, native in South Africa, to which the "arum lily" belongs. They are all greenhouse herbaceous plants of handsome appearance, with thick underground stems and large, more or less fleshy, long-stalked, arrow-shaped leaves and white or yellow flower spathes. They are readily propagated by division of the shoot, also by seed. Water should be given abundantly at all times, and the soil for potting should be rich and retentive. Potting is best effected in spring, and from the end of June to the end of August they should be plunged in a sunny spot out of doors. They will not withstand frost, and should be wintered in a warm greenhouse. They flower throughout the year.

RICHARDS, ALFRED BATE (1820–1876), English journalist, was born in Worcestershire on the 17th of February 1820, and was educated at Westminster School and Exeter College, Oxford. After taking his degree in 1841 he published, anonymously, *Oxford Unmasked*, a denunciation of abuses in the university. Between 1845 and 1848 he wrote several dramas and some poetry, and in the latter year became editor of a weekly newspaper, the *British Army Despatch.* His temperament was strongly Imperialist; he opposed Cobden and the Manchester school of politicians, and in a volume entitled *Britain Redeemed and Canada Preserved* predicted, thirty years before the event, the construction of the Canadian Pacific railway. In 1855 he was appointed the first editor of the London *Daily Telegraph*, and through the medium of that journal strongly urged the formation of volunteer rifle corps. The National and Constitutional Defence Association was established in 1858 to carry out the idea. Richards himself raised a regiment of a thousand working men in London, becoming major and subsequently colonel of the corps. In 1870 he was appointed editor of the London *Morning Advertiser*, and retained this position till his death on the 12th of June 1876.

RICHARDS, HENRY BRINLEY (1819–1865), English pianist and composer, was born at Carmarthen, and educated at the Royal Academy of Music in London, where later he was a professor. He took much interest in Welsh music and in the Eisteddfod gatherings. He was a prolific composer, but is perhaps principally remembered for writing the song "God bless the Prince of Wales" (1862), which has been adopted as an English national anthem.

RICHARDS, WILLIAM TROST (1833–1905), American marine painter, was born at Philadelphia, Pennsylvania, on the 14th of November 1833. He was a pupil of Paul Weber in his native city, and lived much in France, Italy and London. He was a member of the Pennsylvania Academy of the Fine Arts, and of the American Water Colour Society. Examples of his work are in the collections of the Pennsylvania Academy of the Fine Arts, Philadelphia, Penn.; the Metropolitan Museum of Art, New York, the Corcoran Art Gallery, Washington, D.C., and the Schaube Gallery, Hamburg. He died at Newport, Rhode Island, on the 8th of November 1905. His daughter Anna M. Richards (b. 1870), figure and landscape painter, was a pupil of John La Farge and Benjamin Constant.

RICHARDSON, GEORGE, English 18th-century architect and designer. The dates of birth and death of this distinguished contemporary and rival of the brothers Adam are not ascertained, but he is conjectured to have been born about 1736 and to have died in 1817. Richardson spent three years—from 1760 to 1763—travelling in Dalmatia and Istria, in the south of France and in Italy. During that period he imbibed the inspiration of a lifetime, and acquired the material for its practical application. He soon began to show remarkable skill in adapting classical ideals to the uses of his time, and in 1765 he won a premium offered by the Society of Arts for a design of a street in the classical manner. Richardson's work is so closely allied to that of the brothers Adam that it is often difficult to distinguish between them, and if it possessed less freedom and variety, and bore to a smaller extent the impress of an original mind, it was in the main exceedingly admirable and satisfying. Richardson was an especially successful designer of ceilings and chimneypieces. He published in 1776 a *Book of Ceilings in the Style of the Antique Grotesque.* Many of its drawings are of exquisite taste. Nor is his fireplace work, as represented by his *Collection of Chimneypieces Ornamented in the Style of the Etruscan, Greek and Roman Architecture* (1781), less attractive. Richardson's chimneypieces are still to be found in considerable numbers in town and country houses. They are mostly of marble, but examples in wood are not uncommon. He made extensive use of coloured marbles, and the effect is constantly that of the sumptuous balancing the austere. Like the Adams, Richardson often worked with composition enrichments, and his *New Designs in Architecture* (1792) contains many drawings of interior friezes and columns to be executed either in this medium or painted to suit the wall hangings. His versatility was considerable, as the titles of his works, a dozen in number, suggest. For many years he exhibited at the Royal Academy as well as in the Galleries of the Society of Arts. Why such a man should have fallen into penury in his old age we have no means of ascertaining, but we know that his necessities were relieved by Nollekens.

His principal works in addition to those already mentioned were, in chronological order: *Aedes Pembrochianae* (1774); *Iconology* (2 vols.), with plates by Bartolozzi and other engravers (1778–1779); *New Designs in Architecture* (1792); *Original Designs for Country Seats or Villas* (1795); *The New Vitruvius Britannicus*, a sequel to Colin Campbell's *Vitruvius Britannicus*, 2 vols. (1802); *Ornaments in the Grecian, Roman and Etruscan Tastes* (1816). He also published volumes dealing with vases and tripods, antique friezes and other architectural and decorative details.

RICHARDSON, HENRY HOBSON (1838–1886), American architect, was born in the parish of St James, Louisiana, on the 29th of September 1838, of a rich family, his mother being a granddaughter of the famous Dr Priestley, the English dissenting refugee and man of science. He was graduated from Harvard University in 1859, and going immediately to Paris to study architecture, entered the École des Beaux-Arts. The Civil War, which broke out in the United States while he was in the school, prevented his return to Louisiana, and stripped his family of their possessions, so that Richardson provided for his own support by working in the offices of practising architects in Paris, till the fall of 1865. Coming back, he established himself in New York, where he soon made his way into practice as an architect. In 1878 he moved to Boston, where he passed the remaining years of his life, designing there most of the work that made his reputation. He had married in 1867 Miss Julia Gorham Hayden of Boston; he died on the 27th of April 1886, not yet forty-eight years old.

Richardson's career was short, and the number of his works was small indeed compared with the attention they attracted and the influence he left behind him. The most important and characteristic are: Trinity church and the so-called Brattle Square church, in Boston; the alterations in the State Capitol at Albany; the county buildings at Pittsburg; town halls at Albany, Springfield and North Easton; town libraries at Woburn, North Easton, Quincy, Burlington and Malden; Sever Hall and Austin Hall at Harvard University; the Chamber of Commerce at Cincinnati. Trinity church, the Pittsburg buildings and the Capitol at Albany were works of great importance, which have had a strong influence on men who followed him and brought him wide acknowledgment. It is notable that American architects who have studied in Europe, especially in Paris, are apt to drift either into a pathless eclecticism or into the English current. Richardson did neither. The Romanesque that he saw in Europe, especially in the middle and south of France, appealed so strongly to his sense for mass and broad picturesqueness that he soon followed its leading, away from the style he had learned in Paris. His earliest work was modern French in style; his first church, in Springfield, a startlingly independent version of English Gothic. Yet half a dozen buildings made the transition to that derivative of Romanesque to which afterwards in all his buildings he steadfastly adhered. In Trinity church, his first monumental work, perhaps his finest, he broke away absolutely from the prevailing English Gothic fashion. Instead of the long Latin cross with aisles and transepts, he made a wide cross almost Greek in plan, with short arms fifty feet broad and aisles that are only passages, a narthex flanked by two western towers, a nave of one double bay, an eastern arm prolonged into a great apse of the full width of the crossing, over which sits a massive square tower. The arms of the church are barrel-vaulted in wood; under the great tower is a flat coffered ceiling a hundred feet above the floor. The style, though mixed, shows his surrender to the attraction of the churches in Auvergne, which have furnished the material for the design of the apse. The central tower is a reminiscence of the noble lantern of the old cathedral of Salamanca, but the square outline is insisted on instead of the polygonal, and the forms are in other ways much changed. The alteration of the Capitol at Albany, half a dozen years later, shared with Leopold Eidlitz, was a compromise in style, and so lacks the sure handling of his best work, except in that part of the interior in which he was untrammelled, the Senate Chamber and the great staircase. In the buildings at Pittsburg, on the other hand, he was free from interference, and these satisfied him more than any other of his buildings. His great design for the new cathedral at Albany, an adaptation of the Romanesque forms of Auvergne to a large modern problem, would have displayed his mature manner, and been perhaps his greatest work; but the plan did not lend itself to the tradition or the ritual of the Anglican Church, and it was rejected, to his great disappointment.

At first the breadth of his compositions was offset by a richness of ornament which he afterwards called flamboyant, but there was a continual growth in simplicity. Some of his imitators have abused his example, running into mere baldness and brutality, but his own work never lost the fineness of quality with which he began, nor the adequacy of its detail.

Richardson's uncommon personality so embodied itself in his works that it cannot be overlooked. He had an inexhaustible energy of body and mind, an enthusiasm more genial than combative, but so abounding and at times vehement that few men and few bodies of men could resist him.

Abounding energy he had, but not health. A serious bodily injury, and later a chronic malady, made his last years a constant struggle with suffering and infirmity, borne with indomitable cheerfulness, but at last fatal.

It is likely that the small number of his designs enhanced their quality. He put twice the labour into his work that the average architect would have given to it, and often twice the time, but the result was apt to be twice as good. He found American architecture restless, incoherent and exuberant; his example did much to turn it back to simplicity and repose. He came as near to establishing a style as it is given to any one man to come; but the tendency of the time was too strong, and the classic styles, reasserting themselves, once more drove out the medieval.

The best known book about Richardson is Mrs Schuyler van Rensselaer's *H. H. Richardson and his Works* (Boston, 1888).

(W. P. P. L.)

RICHARDSON, SIR JOHN (1787–1865), British naturalist, was born at Dumfries on the 5th of November 1787. He studied medicine at Edinburgh, and became a surgeon in the navy in 1807. In 1819 he was appointed surgeon and naturalist to Franklin's first arctic expedition (1819–22), and he served in the same capacity to the second (1825–26). The scientific results of these expeditions he described in contributions to Franklin's *Narratives*, and especially in the four quarto volumes of his *Fauna Boreali-Americana* (1829–37). He was knighted in 1846, and in the following year was chosen commander of the Franklin search expedition (1848–49), the journal of which he published in 1851 under the title of *An Arctic Searching Expedition*. In 1855 he retired to Grasmere, where he died on the 5th of June 1865. He also wrote accounts dealing with the natural history, and especially the ichthyology, of several other arctic voyages, and was the author of *Icones Piscium* (1843), *Catalogue of Apodal Fish in the British Museum, translated from the German MS.* (1856), the second edition of Yarrell's *History of British Fishes* (1860), and *The Polar Regions* (1861), expanded from an article with the same title which he wrote for the *Encyclopaedia Britannica*.

A *Life* by John MacIlraith was published in 1868.

RICHARDSON, SAMUEL (1689–1761), English novelist, is a notable example of that "late-flowering" sometimes applied to Oliver Goldsmith. Born under William and Mary, the reign of the second George was well advanced before, at fifty years of age, he made his first serious literary effort—an effort which was not only a success, but the revelation of a new literary form. He was the son of a London joiner, who, for obscure reasons, probably connected with Monmouth's rebellion, had retired to an unidentified town in Derbyshire, where, in 1689, Samuel was born. At first intended for holy orders, and having little but the common learning of a private grammar school—for the tradition that upon the return of the family to the metropolis he went to Christ's Hospital cannot be sustained—he was eventually, as some compensation for a literary turn, apprenticed at seventeen to an Aldersgate printer named John Wilde. Here, like the typical "good apprentice" of his century, he prospered; became successively compositor, corrector of the press, and printer on his own account; married his master's daughter according to programme; set up newspapers and books; dabbled a little in literature by compiling indexes and "honest dedications," and ultimately proceeded Printer of the Journals of the House of Commons, Master of the Stationers' Company, and Law-Printer to the King. Like all well-to-do citizens, he had his city house of business and his "country box" in the suburbs; and, after a thoroughly "respectable" life, died on the 4th of July 1761, being buried in St Bride's Church, Fleet Street, close to his shop (now demolished), No. 11 Salisbury Court.

To this uneventful and conventional career one would scarcely look for the birth and growth of a fresh departure in fiction. And yet, although Richardson's manifestation of his literary gift was deferred for half a century, there is no life to which the Horatian "qualis ab incepto" can be more appropriately applied. From his youth this moralist had moralized; from his youth—nay, from his childhood—this letter-writer had written letters; from his youth this supreme delineator of the other sex had been the confidant and counsellor of women. In his boyhood he was secretary-general to all the love-sick girls of the neighbourhood; at eleven he addressed a hortatory epistle, stuffed with texts, to a scandal-loving widow; and whenever it was possible to correspond with any one he was as "corresponding" as even Horace Walpole could have desired. At last, when he was known to the world only as a steady business man, who was also a "dab at an index" and an invaluable compiler of the "puff prefatory," it occurred to Mr Rivington of St Paul's Churchyard and Mr Osborn of Paternoster Row, two bookselling friends who were aware of his epistolary gifts, to suggest that he should prepare a little model letter-writer for such "country readers" as "were unable to indite for themselves." Would it be any harm, he suggested in answer, if he should also "instruct them how they should think and act in common cases"? His friends were all the more anxious that he should set to work. And thus originated his first novel of *Pamela; or, Virtue Rewarded.*

But not forthwith, as is sometimes supposed. Proceeding with the compilation of his model letter-writer, and seeking, in his own words, "to instruct handsome girls, who were obliged to go out on service . . . how to avoid the snares that might be laid against their virtue"—a danger which appears to have always abnormally preoccupied him—he came to recollect a story he had heard twenty years earlier, and had often proposed to other persons for fictitious treatment. It occurred to him that it would make a book of itself, and might moreover be told wholly in the fashion most congenial to himself, namely, by letters. Thereupon, with some domestic encouragement, he completed it in a couple of months, between the 10th of November 1739 and the 10th of January 1740. In November 1740 it was issued by Messrs Rivington & Osborn, who, a few weeks afterwards (January 1741), also published the model letter-writer under the title of *Letters written to and for Particular Friends, on the most Important Occasions.* Both books were anonymous. The letter-writer was noticed in the *Gentleman's Magazine* for January, which also contains a brief announcement as to *Pamela*, already rapidly making its way without waiting for the reviewers. A second edition, it was stated, was expected; and such was its popularity, that not to have read it was judged "as great a sign of want of curiosity as not to have seen the French and Italian dancers"—*i.e.* Mme Chateauneuf and the Fausans, who were then delighting the town. In February a second edition duly appeared, followed by a third in March and a fourth in May. At public gardens ladies held up the book to show they had got it; Dr Benjamin Slocock of Southwark openly commended it from the pulpit; Pope praised it; and at Slough, when the heroine triumphed, the enraptured villagers rang the church bells for joy. The other volume of "familiar letters'" consequently fell into the background in the estimation of its author, who, though it went into several editions during his lifetime, never acknowledged it. Yet it scarcely deserves to be wholly neglected, as it contains many useful details and much shrewd criticism of lower middle-class life.

For the exceptional success of *Pamela* there was the obvious excuse of novelty. People were tired of the old "mouthy" romances about impossible people doing impossible things. Here was a real-life story, which might happen to any one—a story which aroused curiosity and arrested attention—which was not exclusively about "high life," and which had, in addition, a moral purpose, since it was avowedly "published in order to cultivate the principles of virtue and religion in the minds of the youth of both sexes." Whether it had exactly this effect, or owed its good fortune chiefly to this proclamation, may be doubted. The heroine in humble life who resists the licentious advances of her master until he is forced to marry her, does not entirely convince us that her watchful prudence and keen eye for the main chance have not, in the long run, quite as much to do with her successful defence as her boasted innocence and purity. Nor is the book without passages which more than smack of an unpleasant pruriency. Nevertheless, in its extraordinary gift of minute analysis; in its intimate knowledge of feminine character; in the cumulative power of its shuffling, loose-shod style, and, above all, in the unquestionable earnestness and sincerity of the writer, *Pamela* had qualities which—particularly in a dead season of letters—sufficiently account for its favourable reception by the contemporary public.

Such a popularity, of course, was not without its drawbacks. That it would lead to *Anti-Pamelas*, censures of *Pamela* and all the spawn of pamphlets which spring round the track of a sudden success, was to be anticipated. One of the results to which its rather sickly morality gave rise was the *Joseph Andrews* (1742) of Fielding (*q.v.*). But there are two other works prompted by *Pamela* which need brief notice here. One is the *Apology for the Life of Mrs Shamela Andrews*, a clever and very gross piece of raillery which appeared in April 1741, and by which Fielding is supposed to have preluded to *Joseph Andrews*. Fielding's own works contain no reference to *Shamela*. But Richardson in his *Correspondence*, both printed and unprinted, roundly attributes it to the writer who was to be his rival; and it is also assigned to Fielding by other contemporaries (*Hist. MSS. Commn.*, Rept. 12, App. Pt. IX. p. 204). All that can be said is, that Fielding's authorship cannot be proved. If it could, it would go far to justify the after animosity of Richardson to Fielding—much farther, indeed, than what Richardson described as the "lewd and ungenerous engraftment" of *Joseph Andrews*. The second noteworthy result of *Pamela* was *Pamela's Conduct in High Life* (September 1741), a spurious sequel by John Kelly of the *Universal Spectator*. Richardson tried to prevent its appearance, and, having failed, set about two volumes of his own, which followed in December, and professed to depict his heroine "in her exalted condition." But the public interest in Pamela had practically ceased with her marriage, and the author's continuation, like other continuations—particularly continuations prompted by extraneous circumstances—attracted no permanent attention.

About 1744 we begin to hear something of the progress of Richardson's second and greatest novel, *Clarissa; or, the History of a Young Lady*, usually miscalled *Clarissa Harlowe.* The first edition was in seven volumes, two of which came out in November 1747, two more in April 1748 and the last three in December. Upon the title-page of this, of which the mission was as edifying as that of *Pamela*, its object was defined as showing the distresses that may attend the misconduct both of parents and children in relation to marriage. Virtue, in *Clarissa*, is not "rewarded," but hunted down and outraged. The heroine, no longer an opportunist servant-girl, is a most pure, refined and beautiful young woman, invested with every attribute to attract and charm, while her pursuer, Lovelace, the libertine hero of the book—a personage of singular dash and vivacity, in spite of his worthlessness—is drawn with extraordinary tenacity of power. The wronged Clarissa eventually dies of grief, and her cold-blooded betrayer, whom strict justice would have hanged, is considerately killed in a duel by her soldier cousin. Of the genius of the story there can be no doubt. Nor is there any doubt as to the ability shown in the delineation of the two chief characters, to whom the rest are merely subordinate. The chief drawbacks of *Clarissa* are its merciless prolixity (seven volumes, which only cover eleven months); the fact that (like *Pamela*) it is told by letters; and a certain haunting and uneasy feeling that many of the heroine's obstacles are only molehills which should have been readily surmounted. As to its success, accentuated as this was by its piecemeal method of publication, there has never been any question. Clarissa's sorrows set all England sobbing, and her fame and her fate spread rapidly to the Continent.

Between *Clarissa* and Richardson's next work appeared the *Tom Jones* of Fielding—a rival by no means welcome to the elder writer, although a rival who generously (and perhaps penitently) acknowledged *Clarissa's* rare merits.

> "Pectus inaniter angit
> Irritat, mulcet, falsis terroribus implet
> Ut Magus,"

Fielding had written in the *Jacobite's Journal.* But even this could not console Richardson for the popularity of the "spurious brat" whom Fielding had made his hero, and his next effort was the depicting of a genuine fine gentleman—a task to which he was incited by a chorus of feminine worshippers. In the *History of Sir Charles Grandison*, "by the Editor of *Pamela* and *Clarissa*" (for he still preserved the fiction of anonymity), he essayed to draw a perfect model of manly character and conduct. In the pattern presented there is, however, too much buckram, too much ceremonial—in plain words, too much priggishness—to make him the desired exemplar of propriety *in excelsis.* Yet he is not entirely a failure, still less is he to be regarded as no more than "the condescending suit of clothes" by which Hazlitt unfairly defines Miss Burney's Lord Orville. When Richardson delineated Sir Charles Grandison he was at his best, and his experiences and opportunities for inventing such a character were infinitely greater than they had ever been before. And he lost nothing of his gift for portraying the other sex. Harriet Byron, Clementina della Porretta and even Charlotte Grandison, are no whit behind Clarissa and her friend Miss Howe. *Sir Charles Grandison*, in fine, is a far better book than *Pamela*, although M. Taine regarded the hero as only fit to be stuffed and put in a museum.

Grandison was published in 1753, and by this time Richardson was sixty-four. Although the book was welcomed as warmly as its predecessors, he wrote no other novel, contenting himself instead with indexing his works, and compiling an anthology of the "maxims," "cautions" and "instructive sentiments" they contained. To these things, as a professed moralist, he had always attached the greatest importance. He continued to correspond relentlessly with a large circle of worshippers, mostly women, whose counsels and fertilizing sympathy had not a little contributed to the success of his last two books. He was a nervous, highly strung little man, intensely preoccupied with his health and his feelings, hungry for praise when he had once tasted it, and afterwards unable to exist without it; but apart from these things, well meaning, benevolent, honest, industrious and religious. Seven vast folio volumes of his correspondence with his lady friends, and with a few men of the Young and Aaron Hill type, are preserved in the Forster Library at South Kensington. Parts of it only have been printed. There are several good portraits of him by Joseph Highmore, two of which are in the National Portrait Gallery.

Richardson is sometimes styled the "Father of the English Novel," a title which has also been claimed for Defoe. It would be more accurate to call him the father of the novel of sentimental analysis. As Sir Walter Scott has said, no one before had dived so deeply into the human heart. No one, moreover, had brought to the study of feminine character so much prolonged research, so much patience of observation, so much interested and indulgent apprehension, as this twittering little printer of Salisbury Court. That he did not more materially control the course of fiction in his own country was probably owing to the new direction which was given to that fiction by Fielding and Smollett, whose method, roughly speaking, was synthetic rather than analytic. Still, his influence is to be traced in Sterne and Henry Mackenzie, as well as in Miss Burney and Miss Austen, both of whom, it may be noted, at first adopted the epistolary form. But it was in France, where the sentimental soil was ready for the dressing, that the analytic process was most warmly welcomed. Extravagantly eulogized by the great critic, Diderot, modified with splendid variation by Rousseau, copied (unwillingly) by Voltaire, the vogue of Richardson was so great as to tempt some modern French critics to seek his original in the *Marianne* of a contemporary analyst, Marivaux. As a matter of fact, though there is some unconscious consonance of manner, there is nothing whatever to show that the little-lettered author of *Pamela*, who was also ignorant of French, had the slightest knowledge of Marivaux or *Marianne*. In Germany Richardson was even more popular than in France. Gellert, the fabulist, translated him; Wieland, Lessing, Hermes, all imitated him, and Coleridge detects him even in the *Robbers* of Schiller. What was stranger still, he returned to England again under another form. Having given a fillip to the French *comédie larmoyante*, that comedy crossed the channel as the sentimental comedy of Cumberland and Kelly, which, after a brief career of prosperity, received its death-blow at the hands of Goldsmith and Sheridan.

A selection from Richardson's *Correspondence* was published by Mrs A. L. Barbauld in 1804, in six volumes, with a valuable Memoir. Recent lives are by Miss Clara L. Thomson, 1900, and by Austin Dobson ("Men of Letters"), 1902. A convenient reprint of the novels, with copies of the old illustrations by Stothard, Edward Burney and the rest, and an introducton by Mrs E. M. M. McKenna, was issued in 1901 in 20 volumes. (A. D.)

RICHELIEU, ARMAND EMMANUEL SOPHIE SEPTEMANIE DU PLESSIS, Duc de (1766–1822), French statesman, was born in Paris on the 25th of September 1766, the son of Louis Antoine du Plessis, duc de Fronsac and grandson of the marshal de Richelieu (1696–1788). The comte de Chinon, as the heir to the Richelieu honours was called, was married at fifteen to Rosalie de Rochechouart, a deformed child of twelve, with whom his relations were never more than formal. After two years of foreign travel he entered the Queen's dragoons and next year received a place at court, where he had a reputation for Puritan austerity. He left Paris in 1790 for Vienna, and in company with his friend Prince Charles de Ligne joined the Russian army as a volunteer, reaching the Russian headquarters at Bender on the 21st of November. He was present at the capture of Ismailia and received from the empress Catherine the cross of St George and a golden sword. By the death of his father in February 1791, he succeeded to the title of duc de Richelieu. He returned to Paris shortly afterwards on the summons of Louis XVI., but he was not sufficiently in the confidence of the court to be informed of the projected flight to Varennes. In July he obtained a passport from the National Assembly for service in Russia. In the Russian army he obtained the grade of general-major, only to be forced by the intrigues of his enemies to resign. The accession of Alexander I. brightened his prospects. His erasure from the list of *émigrés*, which he had failed to secure from Napoleon, was accorded on the request of the Russian government, and in 1803 he became governor of Odessa. Two years later he became governor general of the Chersonese, of Ekaterinoslav and the Crimea, then called New Russia. In the eleven years of his administration, Odessa rose from a miserable village to an important city. He commanded a division in the Turkish War of 1806–7, and was engaged in frequent expeditions to the Caucasus.

Richelieu returned to France in 1814; on the triumphant return of Napoleon from Elba he accompanied Louis XVIII. in his flight as far as Lille, whence he went to Vienna to join the Russian army, believing that he could best serve the interests of the monarchy and of France by attaching himself to the headquarters of the emperor Alexander. Richelieu's character and antecedents alike marked him out as valuable support of the monarchy after its second restoration. Though the bulk of his confiscated estates were lost beyond recall, he did not share the resentment of the mass of the returned *émigrés*, from whom and their intrigues he had held aloof during his exile, and was far from sharing their delusions as to the possibility of undoing the work of the Revolution. As the personal friend of the Russian emperor his influence in the councils of the Allies was likely to be of great service. He refused, indeed, Talleyrand's offer of a place in his ministry, pleading his long absence from France and ignorance of its conditions; but after Talleyrand's retirement he consented to follow him as prime minister, though—as he himself said—he did not know the face of one of his colleagues.

The events of Richelieu's tenure of office are noticed elsewhere (see France: *History*). Here it need only be said that it was mainly due to his efforts that France was so early relieved of the burden of the allied army of occupation. It was for this purpose mainly that he attended the congress of Aix-la-Chapelle in 1818. There he had been informed in confidence of the renewal by the Allies of their treaty binding them to interfere in case of a renewal of revolutionary trouble in France; and it was partly owing to this knowledge that he resigned office in December of the same year, on the refusal of his colleagues to support a reactionary modification of the electoral law. After the murder of the duc de Berry and the enforced retirement of Decazes, he again became president of the council (21st February 1821); but his position was untenable owing to the attacks of the "Ultras" on the one side and the Liberals on the other, and on the 12th of December he again resigned. He died of apoplexy on the 17th of May 1822.

Great part of Richelieu's correspondence with Pozzo di Borgo, Capo d'Istria and others, with his journal of his travels in Germany and the Turkish campaign, and a notice by the duchesse de Richelieu, is published by the Imperial Historical Society of Russia, vol. 54. There is an exhaustive study of his career by L. de Crousaz-Crétet, *Le Duc de Richelieu en Russie et en France* (1897), with which compare an article by L. Rioult de Neuville in the *Revue des questions historiques* (Oct. 1897). See also R. de Cisternes, *Le Duc de Richelieu, son action aux conférences d'Aix-la-Chapelle* (1898), containing copies of documents.

RICHELIEU, ARMAND JEAN DU PLESSIS DE, CARDINAL (1585–1642), French statesman, was born of an ancient family of the lesser nobility of Poitou. The original name of the family was Du Plessis, but in the 15th century a younger branch obtained by marriage the estate of Richelieu with its strong castle surrounded by the waters of the Mable, and took the name of Du Plessis de Richelieu. The family produced not a few turbulent warriors during the Hundred Years' War, and the cardinal's father, François du Plessis, seigneur de Richelieu, began his career by killing the murderer of his elder brother and then fighting through the wars of religion, first as a favourite of Henry III., and after his death under Henry IV. He was a typical fighting gentleman of the period. The mother of the cardinal, Susanne de La Porte, belonged to a family of the magistrature, her father, François de La Porte, being one of the first advocates of the parlement of Paris. Armand was the third son and was born in Paris on the 9th of September 1585. When he was five years old his father died while assisting at the siege of Paris (on the 10th of July 1590); and his mother was left with five children and the estate heavily in debt. By care and economy, however, aided by generous royal grants, she was enabled to pay off mortgages and to bring up the children in a way befitting their rank. At the age of nine Armand was sent to Paris to the College of Navarre, where he passed with credit the regular courses in grammar and philosophy, and then entered a "finishing academy" which prepared the sons of nobles for the life of a courtier or a cavalier. But his training for a military career was suddenly cut short by the refusal of his elder brother, Alphonse, to accept the office of bishop of Luçon. The right of preferment to that see had been given to the Richelieu family by Henry III. as a reward for the services of Armand's father, and the family drained its revenues for private use. When the cathedral chapter found courage to oppose this and opened suit to recover the ecclesiastical revenues for ecclesiastical purposes, Richelieu's mother proposed to make her second son, Alphonse, bishop. He defeated this scheme, however, by becoming a monk of the Grande Chartreuse, and Armand, whose health was rather feeble in any case for a military career, was induced to propose himself for the priesthood.

In 1606, at the age of twenty-one, Richelieu was nominated bishop of Luçon by Henry IV. As he was almost five years under the canonical age, he was obliged to go to Rome to obtain a dispensation and was consecrated there in April 1607. In the winter of 1608 Richelieu went out to his poverty-stricken little bishopric, and for the next six years devoted himself seriously to his episcopal duties. He became favourably known among the zealous reformers of the church, and it was during this stage of his career that he made a friend of Father Joseph. Meanwhile he was impatiently waiting for an opening to a larger career. This came in 1614 when he was elected by the clergy of Poitou to the last States-general which met before the Revolution. In this he attracted the favourable attention of Marie de' Medici, the queen-mother, and was chosen at its close to present the address of the clergy embodying its petitions and resolutions. After the States-general was dissolved he remained in Paris, and the next year he became almoner to Anne of Austria, the child-queen of Louis XIII. Then, by adroit courtly intrigue and faithful service to Concini, he was appointed in 1616 a secretary of state to the king. But he owed all to Concini, and his taste of power ended with the murder of his patron on the 24th of August 1617.

The reign which Richelieu was to dominate so absolutely began with his exile from the court. He had, however, already shown his ability, his firmness, and his diplomatic skill, and conducted the negotiations on the part of the queen-mother with Luynes, the king's representative. Then, as he had incurred too much of the odium of a creature of Concini to hope for royal favour, he resigned himself to the post of chief adviser to Marie de' Medici in her exile at Blois. Here he sought to ingratiate himself with Luynes and the king by reporting minutely the actions of Marie and by protestations of loyalty. As this ungrateful work brought no reward, Richelieu, in spite of the earnest entreaties of the queen-mother, retired once more to his bishopric. But the king, while approving his conduct, was still suspicious of him, and he was exiled to Avignon, along with his brother and brother-in-law, on the 7th of April 1618. There he lived in discreet, if melancholy retirement, writing "A Defence of the Main Principles of the Catholic Faith," and had apparently little hope of a further political career when the escape of Marie de' Medici from Blois, on the 22nd of February 1619, again opened paths for his ambition. Luynes and the king recalled him to the post at Angoulême with the queen-mother, who received him ungraciously but who soon yielded to his judgment and allowed him to sign the treaty of Angoulême with the Cardinal de la Rochefoucauld, acting for the king. By this treaty Marie was given liberty to live wherever she wished, and the government of Anjou and of Normandy with several castles was entrusted to her. The bishop of Luçon was led to believe that the king would recommend him for a cardinalate, but, if we may trust the evidence, Luynes secretly opposed the request, and it was not until after his death that Richelieu was made a cardinal by Pope Gregory XV., on the 5th of September 1622. His rank in the church was due to his skill in intrigue with Marie de' Medici.

Luynes's death on the 15th of December 1621 made possible a reconciliation a month later between the king and his mother. Although Louis still distrusted her at heart, and disliked her dominating minister more, he allowed her to take up her residence in the Luxembourg palace in Paris, thus rendering intercourse possible. Richelieu seized his opportunity. He furnished Marie de' Medici with political ideas and acute criticisms of the king's ministry, especially of the Brularts. Marie zealously pushed her favourite towards office, and had gone so far as to absent herself from court for three months on account of the king's persistent refusal, when Charles, duc de La Vieuville, then head of the council, in need of her aid in his negotiations with reference to the marriage of her daughter Henriette Marie, finally agreed to force Richelieu's appointment to office upon the king, Louis XIII. La Vieuville thought to compromise by forcing the cardinal into a "council of despatches," with merely the privilege of advising the king's council but entrusted with no power. Richelieu raised many objections to such a partial realization of his ambition, but the king ended them in April 1624 by naming him as a member of his council. By August Vieuville's worst fears were realized; he was arrested on the 13th of the month for corrupt practices in office, and the intriguing cardinal who had caused his overthrow became chief minister of Louis XIII. His advent was hailed with joy by both the Catholic party and the patriotic party, eager for the overthrow of Habsburg supremacy in Europe.

For the next eighteen years the biography of Richelieu is the history of France, and to a large degree that of Europe. His work was directed toward a twofold aim: to make the royal power—his power—absolute and supreme at home, and to crush the rival European power of the Habsburgs. At home there were two opponents to be dealt with: the Huguenots and the feudal nobility. The former were crushed by the siege of La Rochelle and the vigorous campaign against the duc de Rohan. But the religious toleration of the edict of Nantes was reaffirmed while its political privileges were destroyed, and Huguenot officers fought loyally in the foreign enterprises of the cardinal. The suppression of the independence of the feudal aristocracy was inaugurated in 1626 by an edict calling for the destruction of all fortified castles not needed for defence against invasion.

The local authorities proceeded to carry this out with a zeal due to long suffering, and the ruined medieval châteaus of France still bear witness to the action of Richelieu. Still there was no serious opposition to the new minister. The first serious conspiracy took place in 1626, the king's brother, Gaston of Orleans, being the centre of it. His governor, Marshal D'Ornano, was arrested by Richelieu's orders, and then his confidant, Henri de Talleyrand, marquis de Chalais and Vendôme, the natural sons of Henry IV. Chalais was executed and the marshal died in prison. The overthrow of the Huguenots in 1629 made Richelieu's position seemingly unassailable, but the next year it received its severest test. Marie de' Medici had turned against her "ungrateful" minister with a hatred intensified, it is said, by unrequited passion. In September 1630, while Louis XIII. was very ill at Lyons, the two queens, Marie and Anne of Austria, reconciled for the time, won the king's promise to dismiss Richelieu. He postponed the date until peace should be made with Spain. When the news came of the truce of Regensburg Marie claimed the fulfilment of the promise. On the 10th of November 1630 the king went to his mother's apartments at the Luxembourg palace. Orders were given that no one should be allowed to disturb their interview, but Richelieu entered by the unguarded chapel door. When Marie had recovered breath from such audacity she proceeded to attack him in the strongest terms, declaring that the king must choose between him or her. Richelieu left the presence feeling that all was lost. The king gave a sign of yielding, appointing the brother of Marillac, Marie's counsellor, to the command of the army in Italy. But before taking further steps he retired to Versailles, then a hunting lodge, and there, listening to two of Richelieu's friends, Claude de Saint-Simon, father of the memoir writer, and Cardinal La Valette, sent for Richelieu in the evening, and while the salons of the Luxembourg were full of expectant courtiers the king was reassuring the cardinal of his continued favour and support. The "Day of Dupes," as this famous day was called, was the only time that Louis took so much as a step toward the dismissal of a minister who was personally distasteful to him but who was indispensable. The queen-mother followed the king and cardinal to Compiègne, but as she refused to be reconciled with Richelieu she was left there alone and forbidden to return to Paris. The next summer she fled across the frontiers into the Netherlands, and Richelieu was made a duke. Then Gaston of Orleans, who had fled to Lorraine, came back with a small troop to head a rebellion to free the king and country from "the tyrant." The only great noble who rose was Henri, duc de Montmorenci, governor of Languedoc, and his defeat at Castelnaudary on the 1st of September 1632 was followed by his speedy trial by the parlement of Toulouse, and by his execution. Richelieu had sent to the block the first noble of France, the last of a family illustrious for seven centuries, the feudal head of the nobility of Languedoc; then, unmoved by threats or entreaties, inexorable as fate itself, he cowed all opposition by his relentless vengeance. He knew no mercy. The only other conspiracy against him which amounted to more than intrigue was that of Cinq Mars in 1642, at the close of his life. This vain young favourite of the king was treated as though he were really a formidable traitor, and his friend, De Thou, son of the historian, whose sole guilt was not to have revealed the plot, was placed in a boat behind the stately barge of the cardinal and thus conveyed up the Rhone to his trial and death at Lyons. The voyage was symbolical of Richelieu's whole pitiless career.

Richelieu's foreign policy was as inflexible as his home policy. To humble the Habsburgs he aided the Protestant princes of Germany against the emperor, in spite of the strong opposition of the disappointed Catholic party in France, which had looked to the cardinal as a champion of the faith. The year of Richelieu's triumph over the Huguenots (1629) was also that of the Emperor Ferdinand's triumph in Germany, marked by the Edict of Restitution, and France was threatened by a united Germany. Richelieu, however, turned against the Habsburgs young Gustavus Adolphus of Sweden, paying him a subsidy of a million livres a year by the treaty of Bärwald of the 23rd of January 1631. The dismissal of Wallenstein, which is often attributed to the work of Father Joseph, Richelieu's envoy to the diet of Regensburg in July and August of 1630, was due rather to the fears of the electors themselves, but it was of double value to Richelieu when his Swedish ally marched south. After the treaty of Prague, in May 1635, by which the emperor was reconciled with most of the German princes, Richelieu was finally obliged to declare war, and, concluding a treaty of offensive alliance at Compiègne with Oxenstierna, and in October one at St Germain-en-Laye with Bernard of Saxe-Weimar, he proceeded himself against Spain, both in Italy and in the Netherlands. The war opened disastrously for the French, but by 1642, when Richelieu died, his armies—risen from 12,000 men in 1621 to 150,000 in 1638—had conquered Roussillon from Spain; they held Catalonia, which had revolted from Philip IV. of Spain, and had taken Turin and forced Savoy to allow French troops on the borders of the Milanese. In Germany Torstensson was sweeping the imperialist forces before him through Silesia and Moravia. The lines of the treaty of Westphalia, six years later, were already laid down by Richelieu; and its epochal importance in European history is a measure of the genius who threw the balance of power from Habsburg to Bourbon. The predominance of Louis XIV. in European politics was largely due to the statesman who prepared France for his absolutism at home.

The magnitude of Richelieu's achievement grows when one considers his relations with the king. Louis XIII. cordially disliked him, and would gladly have got rid of him if he had not been able to convince the king of the wisdom of everything he did. Thus obliged to assume the unpleasant rôle of tutor when delicate flattery was often most needful, the minister lectured and cajoled his master, always, until towards the last, giving credit to the king for his own successes, and overawing opposition by his imperious presence even when Louis was dabbling in plots against him (as in the case of Cinq Mars) behind his back. The king's consciousness of his weakness was combined with a sense of duty, and it was upon these two chords that Richelieu played. Besides, he was eternally on the alert. Spies in every salon in Paris and every court in Europe kept the grim courtier informed of every change in his master's disposition and every intrigue against himself. The piquant comments of his platonic friend, Mademoiselle de Hautefort, upon Richelieu were relished by the king until he was informed of others said to have been made by her upon himself. Then it was easy to supplant her with another favourite, Mademoiselle de Lafayette. When this devout maiden began to denounce the ungodly cardinal who was allied with heretics, her confessor—in Richelieu's service—succeeded in inducing her to become a nun. Father Caussin, the king's confessor, ventured the same comments, and Louis plotted like a schoolboy to turn his devotions into secret criticisms of state policies. Caussin was sent into Brittany, and the judicious and learned Jesuit, Jacques Sirmond, who succeeded him, kept clear of politics. Such was the atmosphere of the court in which Richelieu had to maintain his authority.

His own personality was his strongest ally. The king himself quailed before that stern, august presence. His pale, drawn face was set with his iron will. His frame was sickly and wasted with disease, yet when clad in his red cardinal's robes, his stately carriage and confident bearing gave him the air of a prince. His courage was mingled with a mean sort of cunning, and his ambition loved the outward trappings of power as well as its reality; yet he never swerved from his policy in order to win approbation, and the king knew that his one motive in public affairs was the welfare of the realm—that his religion, in short, was "reason of state." A clear conscience, not less than a sense of his own superiority to others at the court of Louis XIII., made the cardinal haughtily assert his ascendancy, and the king shared his belief in both.

No courtier was ever more assertive of his prerogatives. He claimed precedence over even princes of the blood, and one like Condé was content to draw aside the curtains for him to pass, and to sue for the hand of Richelieu's niece for his son, the "Great Condé." His pride and ambition were gratified by the foundation of a sort of dynasty of his nephews and nieces, whose hands were sought by the noblest in the realm. Like all statesmen of his time, Richelieu made money out of politics. He came to court in 1617 with an income of 25,000 livres from his ecclesiastical benefices. In the later years of his life it exceeded 3,000,000 livres. He lived in imperial state, building himself the great Palais Cardinal, now the Palais Royal, in Paris, another at Rueil near Paris, and rebuilding his ancestral château in Poitou. His table cost him a thousand crowns a day, although he himself lived simply. He celebrated his triumphs to the full with gorgeous fêtes in his palace, especially with lavish theatrical representations. In January 1641 the tragedy of *Mirame*, said to have been his own, was produced with great magnificence. Richelieu was anxious for literary fame, and his writings are not unworthy of him. But more important than his own efforts as an author were his protection and patronage of literary men, especially of Corneille, and his creation of the French Academy in 1635. His influence upon French literature was considerable and lasting. Hardly less important was his rebuilding of the Sorbonne and his endowments there. When he died, on the 4th of December 1642, he was buried in the chapel of the Sorbonne, which still stands as he built it. His tomb, erected in 1694, though rifled at the Revolution, still exists.

Many writings are attributed to Richelieu, although owing to his habit of working with substitutes and assistants it is difficult to settle how much of what passes under his name is authentic. *Les Thuileries*, *La Grande Pastorale*, *Mirame*, and the other plays, over whose fate he trembled as over the result of an embassy or a campaign, have long been forgotten; but a permanent interest attaches to his *Mémoires* and correspondence: *Mémoire d'Armand du Plessis de Richelieu, évêque de Luçon, écrit de sa main, l'année 1607 ou 1610, alors qu'il méditait de paraître à la cour*, edited by Armand Baschet (1880); *Histoire de la mère et du fils* (*i.e.* of Marie de Medici and Louis XIII.), sometimes attributed to Mézeray, published at Amsterdam in 1730 and, under the title *Histoire de la régence de reine Marie de Médicis, femme de Henry IV.*, at the Hague in 1743; *Mémoires sur la règne de Louis XIII.*, extending from 1610 to 1638, and of which the earlier portion is a reprint of the *Histoire de la mère et du fils*, published in Petitot's collection (Paris, 1823 seq.); *Testament politique d'Armand du Plessis, cardinal de Richelieu* (Amsterdam, 1687 seq.); *Journal de 1630–31* (Paris, 1645); "Lettres, instructions diplomatiques, et papiers d'état," published by G. d'Avenel in the *Coll. de doc. inéd.* (Paris, 1853–77); and "Maximes d'état et fragments politiques," published by G. Hanotaux in *Mélanges historiques: Choix de doc. iii.*, in the same collection.

See G. Hanotaux, *Cardinal Richelieu* (1893), one volume of the four then promised, an exhaustive history of the period down to 1614; and G. d'Avenel, *Richelieu et la monarchie absolue* (4 vols., 1895). The most important sources for Richelieu's statesmanship are the "Lettres, instructions diplomatiques, et papiers d'état," mentioned above, and Richelieu's *Mémoires* (1610–38) may be consulted in Petitot's and J. F. Michaud and J. Poujoulat's collections. Innumerable memoirs of the time also bear upon his life, *e.g.* those of Madame de Motteville, Mathieu Molé, De Brienne, and Bassompierre. In English there are short biographies by Richard Lodge (in the Foreign Statesmen series, 1896) and by J. B. Perkins (in Heroes of the Nations series, 1900). (J. T. S.*)

RICHELIEU, LOUIS FRANÇOIS ARMAND DU PLESSIS, Duc de (1696–1788), marshal of France, was a grandnephew of Cardinal Richelieu, and was born in Paris on the 13th of March 1696. Apart from his reputation as a man of exceptionally loose morals, he attained, in spite of a deplorably defective education, distinction as a diplomatist and general. As ambassador to Vienna (1725–29) he settled in 1727 the preliminaries of peace; in 1733–34 he served in the Rhine campaign. His real public career began ten years later. He fought with distinction at Dettingen and Fontenoy, where he directed the grapeshot upon the English columns, and three years afterwards he made a brilliant defence of Genoa; in 1756 he expelled the English from Minorca by the capture of the San Felipe fortress; and in 1757–58 he closed his military career by those pillaging campaigns in Hanover which procured him the sobriquet of *Petit Père de la Maraude*. After the wars he plunged again into court intrigue, favoured the comtesse du Barry and supported his nephew the duc d'Aiguillon. Louis XVI., however, was not favourably inclined to him. In his early days he was thrice imprisoned in the Bastille: in 1711 at the instance of his stepfather, in 1716 in consequence of a duel, and in 1719 for his share in Alberoni's conspiracy against the regent Orleans. He was thrice married: first, against his will, at the age of fourteen to Anne Catherine de Noailles; secondly, in 1734, by the intrigues (according to the witty Frenchman's own account) of Voltaire, to Marie Elisabeth Sophie, Mademoiselle de Guise; and thirdly, when he was eighty-four years old, to an Irish lady. He died in Paris on the 8th of August 1788. Marshal Richelieu's *Mémoires*, published by J. L. Soulavie in nine volumes (1790), are partially spurious.

See H. Noel Williams, *The Fascinating Duc de Richelieu* (1910).

RICHEPIN, JEAN (1849–), French poet, novelist and dramatist, the son of an army doctor, was born at Medea (Algeria) on the 4th of February 1849. At school and at the École normale he gave evidence of brilliant, if somewhat undisciplined, powers, for which he found physical vent in different directions—first as a *franc-tireur* in the Franco-German War, and afterwards as actor, sailor and stevedore—and an intellectual outlet in the writing of poems, plays and novels which vividly reflected his erratic but unmistakable talent. A play, *L'Étoile*, written by him in collaboration with André Gill (1840–1885), was produced in 1873; but Richepin was virtually unknown until the publication, in 1876, of a volume of verse entitled *Chanson des gueux*, when his outspokenness resulted in his being imprisoned and fined for *outrage aux mœurs*. The same quality has characterized his succeeding volumes of verse: *Les Caresses* (1877), *Les Blasphèmes* (1884), *La Mer* (1886), *Mes paradis* (1894), *La Bombarde* (1899). His novels have developed in style from the morbidity and brutality of *Les Morts bizarres* (1876), *La Glu* (1881) and *Le Pavé* (1883) to the more thoughtful psychology of *Madame André* (1878), *Sophie Monnier* (1884), *Césarine* (1888), *L'Aimé* (1893), *Grandes amoureuses* (1896) and *Lagibasse* (1899), and the more simple portrayal of life in *Miarka* (1883), *Les Braves Gens* (1886), *Truandailles* (1890), *La Miseloque* (1892) and *Flamboche* (1895). His plays, though occasionally marred by his characteristic proneness to violence of thought and language, constitute in many respects his best work. The most notable are *Nana Sahib* (1883), *Monsieur Scapin* (1886), *Le Filibustier* (1888), *Par le glaive* (1892), *Vers la joie* (1894), *Le Chemineau* (1897), *Le Chien de garde* (1898), *Les Truands* (1899), *Don Quichotte* (1905), most of which were produced at the Comédie française. He also wrote *Miarka* (1905), adapted from his novel, for the music of Alexandre Georges, and *Le Mage* (1897) for the music of Jules Massenet.

His son, Jacques Richepin (b. 1880), the author of *La Reine de Tyr* (1899), *La Cavalière* (1901), *Cadet-Roussel* (1903) and *Falstaff* (1904), based on Shakespeare's *Henry IV.*, gave promise of making his mark as a dramatist.

RICHERUS, monk of St Remi at Reims, and a chronicler of the 10th century, son of Rodulf, a trusty councillor and captain of Louis IV. He studied at Reims under Gerbert, afterwards Pope Silvester II., who taught him mathematics, history, letters and eloquence. He was also well versed in the medical science of his time, and in 991 travelled to Chartres to consult the medical MSS. there. He was still living in 998, but there is no mention of him after that date. In spite of his violent partisanship,—for Richerus was an ardent upholder of the Carolings and French supremacy,—of great defects of style, and of an utter disregard of accuracy and truth, his *Historiae* has a unique value as giving us the only tolerably full account by a contemporary of the memorable revolution of 987, which placed the Capets on the throne of France. The *History*, in four books, begins with Charles the Fat and Eudes, and goes down to the year 995. From 969 onwards Richerus had no earlier history before him, and his work is the chief source for the period. It was first edited in Pertz's *Monumenta Germaniae*, vol. iii.

There are French translations by Guadet (Paris, 1845, Soc. de l'hist. de France); Poinsignon (Reims, 1855, pub. de l'Academie de Rheims); and a German version by K. Freiherr v. der Osten-Sacken (Berlin 1854). Cf. Molinier, *Sources de l'histoire de France*, i. 284 (ed. 1901).

RICHFIELD SPRINGS, a village of Richfield township, Otsego county, New York, U.S.A., about 22 m. S.S.E. of Utica and ¾ m. N. of Schuyler (or Candarago) lake. Pop. (1890) 1623; (1900) 1537; (1905) 1684; (1910) 1503. It is served by the Delaware, Lackawanna & Western railway, and by the Oneonta & Mohawk Valley electric line connecting with the New York Central railway at Herkimer. The village is situated in a farming country, about 1700 ft. above sea-level. Knit goods are manufactured, but the importance of the place is due to its sulphur springs, the waters of which are used for the treatment of skin diseases, gout, rheumatism, etc., and to the tonic air and fine scenery. In 1908 a Welsh eisteddfod was held here in Earlington Park. The first hotels were built between 1820 and 1830. A post office was established here in 1829, and the village was incorporated in 1861.

RICH HILL, a city of Bates county, Missouri, U.S.A., situated near the Osage (Marais des Cygnes) river, in the west central part of the state, about 75 m. S. by E. of Kansas City. Pop. (1900) 4053, of whom 255 were foreign-born; (1910) 2755. It is served by the Missouri Pacific and the St. Louis & San Francisco railway systems. The city has two public parks, and is a trading centre for the surrounding fertile farming country. Coal is mined in the vicinity. There are lead and zinc smelters, and a large vitrified brick and tile factory. The municipality owns and operates its waterworks and gas and electric-lighting plants; the city is supplied with natural gas. The original Rich Hill was platted in 1867 somewhat north-west of the site of the present city, which was platted in 1880 by an association that bought out the old settlement. The new settlement was incorporated as a village in 1880, and chartered as a city in 1881.

RICHMOND, EARLS AND DUKES OF. The title earl of Richmond appears to have been in existence in England a considerable time before it was held in accordance with any strict legal principle. Alan, surnamed "Le Roux," and his brother Alan (*c.* 1040–1089), surnamed "Le Noir," relatives of Geoffrey, count of Brittany, and kinsman of William the Conqueror, took part in the latter's invasion of England; and Le Roux obtained grants of land in various parts of England, including manors formerly held by Earl Edwin in Yorkshire, on one of which he built the castle of Richmond, his possessions there being formed into the honour of Richmond, to which his brother Alan Le Noir, or Alan Niger (*c.* 1045–1093), succeeded in 1089. The latter was in turn succeeded as lord of the honour of Richmond by Stephen (d. 1137), count of Penthievre, who was either his son or another brother. These Breton counts, being territorial barons of great importance in England, and lords of the honour of Richmond where their castle was situated, are often reckoned as earls of Richmond, though they were not so in the strict and later sense. The same should perhaps be said of Stephen's son Alan Niger II. (*c.* 1116–1146), though he was styled earl of Richmond by John of Hexham. This Alan married Bertha, daughter and heiress of Conan, reigning count of Brittany; and his son Conan (*c.* 1138–1171), who married Margaret, sister of Malcolm IV. of Scotland, asserted his right to Brittany, and transferred it in his lifetime to his daughter Constance (*c.* 1162–1201). As he left no sons the honour of Richmond and his other English possessions passed to the king in 1171, though Constance is also loosely spoken of as countess of Richmond in her own right. Constance was three times married, and each of her husbands in turn assumed the title of earl of Richmond, in conjunction with that of count, or duke of Brittany. They were: Geoffrey Plantagenet (1158–1186), son of Henry II., king of England; Randolph de Blundevill, earl of Chester (*c.* 1172–1232), the marriage with whom Constance treated as null on the ground of consanguinity; and Guy de Thouars (d. 1213), who survived his wife for twelve years. The only son of the first marriage, Arthur of Brittany (1187–1203), was styled earl of Richmond in his mother's lifetime, and on his murder at the hands of his uncle, King John, the earldom was resumed by the crown.

By her third husband Constance had two daughters, the elder of whom, Alice, was given in marriage by Philip Augustus, king of France, to Peter de Braine in 1213, after which date Peter was styled duke of Brittany and earl of Richmond till about 1235, when he renounced his allegiance to the king of England and thereupon suffered forfeiture of his English earldom.

In 1241 Henry III. granted the honour of Richmond to Peter of Savoy (1203–1268), uncle of Queen Eleanor, who was thereafter described as earl of Richmond by contemporary chroniclers, though how far he was strictly entitled to the designation has been disputed. By his will he left the honour of Richmond to his niece, the queen consort, who transferred it to the crown. In the same year (1268) Henry III. granted the earldom specifically to John, duke of Brittany (1217–86), son of Peter de Braine, in whose family the title continued—though it frequently was forfeited or reverted to the crown and was re-granted to the next heir—till 1342, when it was apparently resumed by Edward III. and granted by that sovereign to his son John of Gaunt, who surrendered it in 1372. It was then given to John de Montfort, duke of Brittany, but on his death without heirs in 1399, or possibly at an earlier date through forfeiture, it reverted to the crown. The earldom now became finally separated from the duchy of Brittany, with which it had been loosely conjoined since the Conquest, although the dukes of Brittany continued to assume the title till a much later date. From 1414 to 1435 the earldom of Richmond was held by John Plantagenet, duke of Bedford, and in 1453 it was conferred on Edmund Tudor, uterine brother to King Henry VI., whose wife, Margaret Beaufort, was the foundress of St John's College, Cambridge, and of the "Lady Margaret" professorships of divinity at Oxford and Cambridge (see Richmond and Derby, Margaret, Countess of). When Edmund Tudor's son Henry ascended the throne as Henry VII. in 1485, the earldom of Richmond merged in the crown, and for the next forty years there was no further grant of the title; but in 1525 Henry Fitzroy, natural son of Henry VIII. by Elizabeth Blound, was created duke of Richmond and Somerset and earl of Nottingham, all these titles becoming extinct at his death without children in 1536.

Ludovic Stuart, 2nd duke of Lennox (1574–1624), who also held other titles in the peerage of Scotland, was created earl of Richmond in 1613 and duke of Richmond in 1623. These became extinct at his death in 1624, but his Scottish honours devolved on his brother Esmé, who was already earl of March in the peerage of England (see March, Earls of; and Lennox). Esmé's son, James, 4th duke of Lennox (1612–1655), was created duke of Richmond in 1641, the two dukedoms as well as the lesser English and Scottish titles thus becoming again united. In 1672, on the death of his nephew Charles, 3rd duke of Richmond and 6th duke of Lennox, whose wife was the celebrated beauty called "La Belle Stuart" at the court of Charles II. (see Richmond and Lennox, Frances Teresa, Duchess of), his titles became extinct.

In 1675 Charles II. created his illegitimate son Charles duke of Richmond, earl of March and baron Settrington, and a few weeks later duke of Lennox, earl of Darnley and baron Torboltoun. This Charles (1672–1723), on whom his father the king bestowed the surname of Lennox, was the son of the celebrated Louise de Keroualle, duchess of Portsmouth. His son Charles, 2nd duke (1701–1750), added to the titles he inherited from his father that of duke of Aubigny in France, to which he succeeded in 1734 on the death of his grandmother the duchess of Portsmouth; and all these honours are still held by his descendant the present duke of Richmond.

The seven dukes of Richmond of the Lennox line have all borne the Christian name of Charles. The 2nd duke, by his marriage with Sarah, daughter of the 1st Earl Cadogan, was father of Lady Caroline Lennox, who eloped with Henry Fox, and was the mother of Charles James Fox, and of the beautiful Lady Sarah Lennox (1745–1826) with whom George III. fell in love and contemplated marriage, and who afterwards married, first, Sir Thomas Bunbury, from whom she was divorced, and secondly, George Napier, by whom she was the mother of Generals Sir Charles and Sir William Napier.

Charles, 3rd duke of Richmond (1735–1806), was one of the most remarkable men of the 18th century, being chiefly famous for his advanced views on the question of parliamentary reform. Having succeeded to the peerage in 1750, he was appointed British ambassador extraordinary in Paris in 1765, and in the following year he became a secretary of state in the Rockingham administration, resigning office on the accession to power of the earl of Chatham. In the debates on the policy that led to the War of American Independence Richmond was a firm supporter of the colonists; and he initiated the debate in 1778 calling for the removal of the troops from America, during which Chatham was seized by his fatal illness. He also advocated a policy of concession in Ireland, with reference to which he originated the phrase "a union of hearts" which long afterwards became famous when his use of it had been forgotten. In 1779 the duke brought forward a motion for retrenchment of the civil list; and in 1780 he embodied in a bill his proposals for parliamentary reform, which included manhood suffrage, annual parliaments and equal electoral areas. Richmond sat in Rockingham's second cabinet as master-general of ordnance; and in 1784 he joined the ministry of William Pitt. He now developed strongly tory opinions, and his alleged desertion of the cause of reform led to a violent attack on him by Lauderdale in 1792, which nearly led to a duel between the two noblemen. Richmond died in December 1806, and, leaving no legitimate children, he was succeeded in the peerage by his nephew Charles, son of his brother, General Lord George Henry Lennox.

The 4th duke (1764–1819) and his wife Charlotte, daughter of the 4th duke of Gordon, were the givers of the famous ball at Brussels on the night before the battle of Quatre Bras, immortalized in Byron's *Childe Harold*. Their son, the 5th duke (1791–1860), while still known by the courtesy title of earl of March, served on Wellington's staff in the Peninsula, being at the same time member of parliament for Chichester. He was afterwards a vehement opponent in the House of Lords of Roman Catholic emancipation, and at a later date a leader of the opposition to Peel's free trade policy. In 1836, on inheriting the estates of his maternal uncle, the 5th and last duke of Gordon, he assumed the name of Gordon before that of Lennox. On his death in 1860 he was succeeded in his titles by his son Charles Henry, 6th duke of Richmond (1818–1903), a statesman who held various cabinet offices in the Conservative administrations of Lord Derby, Disraeli and the marquess of Salisbury; and who in 1876 was created earl of Kinrara and duke of Gordon. These honours in addition to the numerous family titles of more ancient creation passed on his death in 1903 to his son Charles Henry Gordon-Lennox (b. 1845), 7th duke of Richmond and Lennox and 2nd duke of Gordon.

See Sir Robert Douglas, *The Peerage of Scotland*, edited by Sir J. B. Paul; G. E. C., *Complete Peerage*, vol. vi. (London, 1895); Lady Elizabeth Cust, *Some Account of the Stuarts of Aubigny in France* (London, 1891). For the dukes of the creation of 1675 see also, Anthony Hamilton, *Memoirs of Grammont*, edited by Sir W. Scott, new edition (2 vols., London, 1885); Horace Walpole, *Letters*, edited by P. Cunningham (9 vols., London, 1891), and *Memoirs of the Reign of George III.*, edited by G. F. R. Barker (4 vols., London, 1894); the earl of Albemarle, *Memoirs of Rockingham and his Contemporaries* (2 vols., London, 1852); *The Grenville Papers*, edited by W. J. Smith (4 vols., London, 1852); Earl Stanhope, *Life of William Pitt* (4 vols., London, 1861); Lord Edmond Fitzmaurice, *Life of William Earl of Shelburne* (3 vols., London, 1875); the duke of Richmond, *The Right of the People to Universal Suffrage and Annual Parliaments* (London, 1817), being an edition of the 3rd duke's famous "Letter to Lieut.-Colonel Sharman," originally published in 1783; Lord William Pitt Lennox, *Memoir of Charles Gordon-Lennox, 5th Duke of Richmond* (London, 1862). (R. J. M.)

RICHMOND, LEGH (1772–1827), English divine, was born on the 29th of January 1772, at Liverpool. He was educated at Trinity College, Cambridge, and in 1798 was appointed to the joint curacies of Brading and Yaverland in the Isle of Wight. He was powerfully influenced by William Wilberforce's *Practical View of Christianity*, and took a prominent interest in the British and Foreign Bible Society, the Church Missionary Society and similar institutions. In 1805 he became assistant-chaplain to the Lock Hospital, London, and rector of Turvey, Bedfordshire, where he remained till his death on the 8th of May 1827. The best known of his writings is *The Dairyman's Daughter*, of which as many as four millions in nineteen languages were circulated before 1849. A collected edition of his stories of village life was first published in 1814 under the title of *Annals of the Poor*. He also edited a series of Reformation biographies called *Fathers of the English Church* (1807–12).

See *Memoirs* by T. S. Grimshawe (1828); *Domestic Portraiture* by T. Fry (1833).

RICHMOND, SIR WILLIAM BLAKE (1842–), English painter and decorator, was born in London on the 29th of November 1842. His father, George Richmond, R.A. (1809–1896), himself the son of a successful miniature painter, was a distinguished artist, who painted the portraits of the most eminent people of his day, and played an important part in society. At the age of fourteen William Richmond entered the Royal Academy schools, where he worked for about three years. A visit to Italy in 1859 gave him special opportunity for studying the works of the old masters, and had an important effect upon his development. His first Academy picture was a portrait group (1861); and to this succeeded, during the next three years, several other pictures of the same class. In 1865 he returned to Italy, and spent four years there, living chiefly at Rome. To this period belongs the large canvas. "A Procession in Honour of Bacchus," which he exhibited at the Academy in 1869 when he came back to England. His picture, "An Audience at Athens," was exhibited at the Grosvenor Gallery in 1885. He became Slade professor at Oxford, succeeding Ruskin, in 1878, but resigned three years later. He was elected an Associate of the Royal Academy in 1888 and Royal Academician in 1895; he received the degree of D.C.L. in 1896, and a knighthood of the Bath in 1897, and became professor of painting to the Royal Academy. Apart from his pictures, he is notable for his work in decorative art, his most conspicuous achievement being the internal decoration and the glass mosaics of St Paul's Cathedral. Sir William Richmond also took a keen interest in social questions, particularly in smoke-prevention in London.

RICHMOND, a city of Bourke county, Victoria, Australia, 2 m. S.E. of and suburban to Melbourne. It is one of the pleasantest of the metropolitan suburbs, having numerous parks and public gardens. There are a number of prosperous industries in the city. Pop. (1901) 37,722.

RICHMOND, a city and the county-seat of Wayne county, Indiana, U.S.A., on the E. branch of the Whitewater river, about 68 m. E. of Indianapolis. Pop. (1890) 16,608; (1900) 18,226, of whom 1467 were foreign-born and 1009 negroes; (1910 census) 22,324. It is served by the Chicago, Cincinnati & Louisville, the Grand Rapids & Indiana and the Pittsburg, Cincinnati, Chicago & St Louis railways, and by the Terre Haute, Indianapolis & Eastern and the Ohio electric interurban railways. Richmond has broad well-shaded streets, several parks, including Glen Miller (139 acres), and handsome public buildings. Its public institutions include the Morrisson-Reeves (public) Library (1864), one of the largest (39,000 volumes in 1909) and oldest in the state, an art gallery, the Reid Memorial Hospital, a Home for Friendless Women, the Margaret Smith Home for Aged Women (1888), the Wernle Orphans' Home (1879; Evangelical Lutheran), and the Eastern Indiana Hospital for the Insane (1890). Just west of the city limits is Earlham College (co-educational), opened in 1847, chartered in 1859 and controlled by the Society of Orthodox Friends; in 1908–9 it had 30 instructors, 620 students and a library of 18,000 bound volumes. Richmond was for many years the centre, west of Philadelphia, of the activities of the Society of Friends. It is an important railway and commercial centre, trade in hardware being especially large. Among its manufactures are agricultural machinery (especially seeding machines) and tools, automobiles, pianos, lawn-mowers, roller-skates, foundry and machine-shop products, furniture, burial caskets, and flour. In 1905 its factory product was valued at $6,731,740, an increase of 41·6% since 1900. Pipe lines supply the city with natural gas. The municipality owns and operates the electric-lighting plant. In 1806 Friends from North Carolina and Pennsylvania settled near here, and Richmond was platted in 1816. Its growth was slow until the opening of the National Road, which entered Indiana near the city, and the construction of railways. Richmond was incorporated as a village in 1818 and chartered as a borough in 1834 and as a city in 1840.

RICHMOND, a city and the county-seat of Madison county, Kentucky, U.S.A., about 95 m. S.E. of Louisville. Pop. (1890) 5073; (1900) 4653, of whom 2087 were negroes; (1910) 5340. It is served by the Louisville & Atlantic and the Louisville & Nashville railways. It is situated in the "Blue Grass Region," near the foothills of the Cumberland Mountains. It is the seat of Madison Institute for girls (1856) and of the Eastern Kentucky State Normal School (1906). From 1874 to 1901 it was the seat of Central University, which in the latter year was consolidated with Centre College at Danville, Ky. (*q.v.*). The surrounding country is devoted largely to the cultivation of tobacco, Indian corn and wheat, and the breeding of fine horses and cattle; and Richmond is an important live-stock market. Among the manufactures are bricks, flour, tobacco and cigars, and carriages. On the 30th of August 1862 a Confederate force of about 7000 men under General Edmund Kirby Smith won a decisive victory here over a Union force of a nearly equal number under Generals Mahlon D. Manson (1820–1895) and William Nelson.

RICHMOND, a municipal borough in the Kingston parliamentary division of Surrey, England, 9 m. W.S.W. of Charing Cross, London. Pop. (1891) 26,875; (1901) 31,672. It lies on the right bank of the Thames, which is here crossed by a bridge carrying the road to Twickenham. Through its pleasant situation Richmond has grown into a large residential suburb of the metropolis. The town was anciently called *Syenes* and afterwards *Schene* and *Sheen* (a name preserved in the village of East Sheen, adjacent on the London side) until the name was in 1500 changed to Richmond by command of Henry VII., who was earl of Richmond in Yorkshire. It grew up round the royal manor house, which became a frequent residence of sovereigns, but of which nothing more than a gateway remains. Edward I. received the Scotch commissioners at his manor of Sheen in 1300. The palace was rebuilt by Edward III., who died here in 1377. It was frequently used by Richard II., and here his wife Anne of Bohemia died, upon which he cursed the place and "caused it to be thrown down and defaced." By Henry V., however, it was rebuilt, and a great tournament was held here in 1492 by Henry VII., who after its destruction by fire in 1498 restored it. Henry VIII. gave it to Wolsey to reside in, after the latter presented him with the new palace of Hampton Court. James I. settled it on his son Henry, prince of Wales, who restored and embellished it at great expense. Charles I. added to it the new deer park generally known as Richmond Park, 2253 acres in extent, which is surrounded by a wall 11 m. in length. After the execution of the king, the parliament presented the park to the citizens of London, who again presented it to Charles II. at the Restoration. Though partly dismantled, the palace was the residence of the queen dowager till 1665, and by James II. it was used as a nursery for the young prince; but, gradually falling into decay, it was parcelled into tenements about 1720. In the old deer park extending northwards from the site of the palace, Kew Observatory was erected in 1769, occupying the site of a Carthusian convent founded by Henry V., and a dwelling-house in which Swift for some time resided. The White Lodge was built by George I., and has been a residence of various members of the royal family. To the south-east of the town, at the entrance to Richmond Park, is Richmond Hill, from which is seen a famous view of the Thames with the surrounding country to the west. This view was secured to the public by an agreement, sealed on the 7th of February 1896, between the corporation and the trustees of the earl of Dysart, by an act of Parliament of 1902, and by the acquisition in the same year, by the London County Council, with the assistance of the borough of Richmond and other interested local authorities, of the Marble Hill Estate and other property on the Middlesex shore. The church of St Mary Magdalen is of considerable antiquity, but almost entirely rebuilt; it contains a large number of monuments to celebrated persons. A theatre, first established in 1719, was during his later years leased by Edmund Kean. The town has a Wesleyan theological college, founded in 1834. Richmond, which was incorporated in 1890, is governed by a mayor, 10 aldermen and 30 councillors. The borough includes Kew (*q.v.*), Petersham and North Sheen. Area, 2491 acres.

RICHMOND, a market town and municipal borough in the Richmond parliamentary division of the North Riding of Yorkshire, England, 50 m. N.W. from York, the terminus of a branch of the North-Eastern railway. Pop. (1901) 3837. It is finely situated on the left bank of the Swale, the valley of which is narrow and the banks steep. The interest of the town centres in the castle founded about 1071 by Alan Rufus, a son of Odo, count of Penthièvre in Brittany, who is also said to have rebuilt the town on obtaining from William the Conqueror, among other possessions, the estates of the Saxon earl Edwin, embracing some two hundred manors of Richmond and extending over nearly a third of the North Riding. This tract, comprising five wapentakes, was called Richmondshire at this time, but the date of the creation of the shire is uncertain. When Henry VII. came to the throne these possessions reverted to the crown. Henry VIII. gave them to his son Henry, afterwards duke of Richmond, by a daughter of Sir John Blount, and Charles II. bestowed the title of duke of Richmond on his son by the duchess of Portsmouth. The castle is situated on a perpendicular rock rising about 100 ft. above the Swale, and from its great strength was considered impregnable. Originally it covered an area of 5 acres, but the only portions of it remaining are the Norman keep, with pinnacled tower and walls 100 ft. high by 11 ft. thick, and some other smaller towers. The view from the keep is very fine, extending westward up the bold valley and over the hills which wall it, and eastward over the rich plain of the centre of the county. The church of St Mary is transitional Norman, Decorated and Perpendicular, and is largely restored. The church of the Holy Trinity retains only the nave and the detached tower. The building is ancient but was restored to use from ruins. Close to the town are ruins of Easby Abbey, a Premonstratensian foundation by Roald, constable of Richmond Castle in 1152, beautifully situated by the river. The remains, which are considerable, include a Decorated gateway, an Early English chapel and fragments of the transepts and choir of the church, with sufficient portions of the domestic buildings to enable the complete plan to be traced. For the free grammar-school founded by Elizabeth a Gothic building was erected in 1850, in memory of the Rev. James Tate, a former master. The tower of a Franciscan abbey founded in 1258 remains. The chief modern buildings are the town hall, market hall and the mechanics' institute. The principal trade is in agricultural produce, but there are a paper mill and an iron and brass foundry. An annual meeting is held on the racecourse in September. In 1889 Richmond became the seat of a suffragan bishop in the diocese of Ripon. The town is governed by a mayor, 4 aldermen and 12 councillors. Area, 2520 acres.

The name of Richmond (*Richemont*, *Richemund*) has not been traced further back than 1145. But it is probable that there was a settlement on the site of the present town before that date Possibly it was the Hindrelaghe of the Domesday Survey, a place which, although large enough to have a church in 1086, appears to have vanished before the close of the 12th century As far as is known the earliest charter was granted in 1145. But a later charter (1146) shows that the burgesses had enjoyed some municipal liberties at an earlier period. The charter of 1145 gave the burgesses the borough of Richmond to hold for ever in fee farm at an annual rent of £29. Other charters were granted by Earl Conan in 1150, by Earl John II. in 1268 and by Edward III. (the first royal charter) in 1328, and confirmed in subsequent reigns. A charter of incorporation was granted by Queen Elizabeth under the title of aldermen and burgesses in 1576, and another by Charles II. in 1668 under the name of mayor and aldermen. This last, though superseded later, was restored in the reign of James II. and, until the passing of the Municipal Reform Act of 1835, was regarded as the governing charter of the borough. Although Richmond received a summons as early as 1328, it was not represented in parliament until 1584, from which time it usually sent two members. In 1867 the number was reduced to one. Since 1885 the representation has been merged in the Richmond division of the North Riding. The charter of Earl John II. points to the existence of a market before 1268, but there is no grant of it extant. In 1278, Edward I. granted the same earl a yearly fair to be held at Richmond from the 3rd to the 16th of September inclusive. Queen Elizabeth granted the burgesses a market every Saturday, a market every fortnight for animals and a fair each year on the vigil of Palm Sunday. At one time there appear to have been as many as four annual fairs. There is now only one, which takes place on the 2nd and 3rd of November. The weekly market is still held on Saturday, and there is a fortnightly market for cattle. In the middle ages Richmond had an important market for corn and wool. There is evidence later of traffic in lead, and also of a flourishing manufacture of hand-knitted stockings. As the town possesses the only railway station in Swaledale, the market is still of consequence. But the stocking industry decayed with the introduction of machinery. William the Lion of Scotland was imprisoned in the castle in the reign of Henry II., but otherwise the town owes its importance chiefly to its lords. The honour was a valuable possession in the middle ages, and it was usually in royal or semi-royal hands.

See R. Gale, *Registrum Honoris de Richemund* (London, 1722); C. Clarkson, *The History and Antiquities of Richmond* (Richmond, 1821); T. D. Whitaker, *A History of Richmondshire* (London, 1823); *Victoria County History, Yorkshire.*

RICHMOND, the capital of Virginia, U.S.A., the county-seat of Henrico county, and a port of entry, on the James river (at the head of navigation), about 100 m. S. by W. of Washington, D.C., and about 125 m. by water from the Atlantic Ocean. Pop. (1850) 27,570; (1860) 37,910; (1870) 51,038; (1880) 63,600; (1890) 81,388; (1900) 85,050, of whom 32,230 were negroes and 2865 were foreign-born; (1910 census) 127,628. Richmond is served by the Atlantic Coast Line, the Chesapeake & Ohio, the Seaboard Air Line, the Southern and the Richmond, Fredericksburg & Potomac railways, and by the Old Dominion, the Virginia Navigation and the Chesapeake steamship lines. The city has a beautiful situation on the hilly ground (maximum elevation, about 250 ft. above sea-level) along the north and east banks of the James, at a bend where the river changes its south-easterly course for one almost due south. It occupies seven hills, from which fact it has been called "the Modern Rome." The western stretch of the river, opposite the city, breaks into rapids which have a fall of about 116 ft. in 9 m. and provide abundant water power. Belle Isle (the site of a Confederate prison camp during the Civil War), about ½ m. long by about ¼ m. wide, is in this part of the river; a little farther down stream are a group of small islets, and opposite the south-eastern boundary of the city is Mayo's Island. Within the city's lines the river is crossed by two bridges (to Manchester) for vehicles and pedestrians, and three railway bridges. The river has been improved by Federal engineers since 1870; in June 1909 (up to which time $1,799,033 had been expended for improvements) there was a channel 100 ft. wide and 18 ft. deep, nearly continuously from Hampton Roads to the Richmond wharf, and the maximum draft at low water was 16·1 ft.

About three-fourths of the city's total street mileage (120 m.) is paved, Belgian block or macadam being used on the principal thoroughfares. About 637·8 acres are devoted to city parks, among which are William Byrd Park (300 acres), in the western part of the city, Joseph Bryan Park (262·6 acres), Chimborazo Park (29 acres), near its eastern boundary, Gambles Hill Park (8·8 acres), Monroe Square (7½ acres), Jefferson Park (6·3 acres) and Marshall Square (7 acres). The State Capitol Square (10 acres) is not owned by the city. Half a mile N.W. of the city are the Fair Grounds, where a state fair is held annually.

Of Richmond's public buildings, several have great historic interest. St John's Episcopal church, built in 1740 (and subsequently much enlarged), is noted especially as the meeting-place of the Virginia Convention of March 1775, before which Patrick Henry made a famous speech, ending, "I know not what course others may take, but as for me, Give me liberty, or give me death!" The Capitol (begun in 1785 and completed in 1792—the wings were added in 1906) was designed from a model and plans of the Maison Carrée, at Nîmes, supplied by Thomas Jefferson, while he was minister to France. Aaron Burr was tried for treason and then for misdemeanour in this building in 1807, the Virginia secession convention met here in 1861, and during the Civil War the sessions of the Confederate Congress were held here. In its rotunda is Jean Antoine Houdon's full-length marble statue of Washington, provided for by the Virginia General Assembly in 1784, and erected in 1796; its base bears a fine inscription written by James Madison. In a niche is a Houdon bust of Lafayette, a replica of the original presented to the city of Paris by the state of Virginia. The Old Stone House (the oldest building in the city) was erected as a residence in 1737, and is now used for a museum. Masons' Hall, whose corner-stone was laid in 1785, is said to be the oldest exclusively Masonic building in the United States. The Executive Mansion of the Confederate States of America, built in 1819, purchased by the city in 1862, and leased to the Confederate government and occupied by President Jefferson Davis in 1862–65, was acquired in 1890 by the Confederate Memorial Library Society, and is now a Confederate Museum with a room for each state of the Confederacy and a general library in the "Solid South" room; it has valuable historical papers, collected by the Southern Historical Society, and the society has published a *Calendar of Confederate Papers* (1908). The former residence of Chief-Justice John Marshall, built in 1795, is still standing; and the Lee Mansion, which was the war-time residence of General Robert E. Lee's family, has been occupied, since 1893, by the Virginia Historical Society (organized 1831; reorganized 1847) as the repository of a valuable library and collection of portraits of historical interest. Libby Prison, which stood on the northern bank of a canal, near the river, in the eastern part of the city, was taken down in 1888–89, and its materials removed to Chicago, where it was reconstructed, in as nearly as possible its original form, and became the Libby Prison War Museum.[1] The Valentine Museum is in a house on Eleventh and Clay Streets, in which Aaron Burr was entertained while he was on trial, and which with $50,000 and his collections was devised to a board of trustees in 1892 by Mann S. Valentine. The museum includes 3300 books, many being of the 15th and 16th centuries, a department of engravings, a Virginia Room with portraits and relics, some tapestries, an excellent collection of casts and valuable American archaeological specimens.

The more modern buildings include the City Hall, a fine granite structure (completed in 1893), with a tower 180 ft. tall; the Library building which houses the state library (about 80,000 volumes, with many portraits and a valuable collection of old manuscripts), the State Law Library and also the offices of most of the state officials; the Post-Office and Customs House; the State Penitentiary; the Chamber of Commerce; and, among the religious edifices, the Sacred Heart Cathedral (Roman Catholic), presented to the city by Mr and Mrs Thomas F. Ryan; the Monumental Church, built on the site of the Richmond Theatre, in the burning of which, in 1811, Acting-Governor George W. Smith and fifty-nine others lost their lives; and St Paul's Church, where Jefferson Davis was attending services, on the 2nd of April 1865, when he received news from

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[1] As built in Richmond in 1845 by Luther Libby, it was a brick structure, three storeys high in front and four in the rear. It had six rooms, each about 100×45 ft., was used as a tobacco warehouse and a ship-chandlery until 1861, and then until the capture of Richmond was used as a prison, chiefly for Federal officers. Frequently it was terribly overcrowded (by as many as 1200 prisoners at a time), the inmates often suffered great privations, and many died or were physically disabled for the remainder of their lives.

General Lee that General Grant had broken through the lines at Petersburg and that Richmond must be evacuated. Rosemary Library was given to the city by Thomas Nelson Page in memory of his wife, who died in 1888.

Richmond has many fine monuments and statues of historic interest and artistic merit, the most noteworthy of the former being the Washington Monument, in Capitol Square. In 1850 the commission accepted the model submitted by Thomas Crawford (1814–1857), an American sculptor, the corner-stone of the monument was laid in that year, and the equestrian statue of Washington, with sub-statues of Patrick Henry and Thomas Jefferson, was unveiled on the 22nd of February 1858. Thereafter were added sub-statues of Chief-Justice John Marshall and George Mason (1726–1792) by Crawford, and statues of Andrew Lewis (1730–1781) and Thomas Nelson (1738–1789), and six allegorical subjects, by Randolph Rogers (1825–1892), the monument being completed in 1869, at a cost of about $260,000, of which about $47,000 represented private gifts and the interest thereon. The greatest height of the monument is 60 ft., and the diameter of its base is 86 ft. In Capitol Square are also a marble statue of Henry Clay, by Joel T. Hart (1810–1877), a bronze statue of Stonewall Jackson, by John Henry Foley (1818–1874), an English sculptor, "presented to the city by English gentlemen" (Hon. A. J. Beresford-Hope and others) and unveiled in 1875; a statue of Hunter Holmes McGuire (1835–1900), a famous Virginia surgeon; and a statue of William Smith (1796–1887), governor of Virginia in 1846–49 and in 1864–65. In Monroe Park is a statue by E. V. Valentine of Brig.-General Williams Carter Wickham (1820–1888) of the Confederate army. Another noteworthy monument is the noble equestrian statue of General Robert E. Lee, surmounting a lofty granite pedestal at the head of Franklin Street. This statue, by Marius Jean Antonin Mercié (b. 1845), was unveiled in 1890. Adjacent is an equestrian statue of General J. E. B. Stuart, by Frederick Moynihan, and at the west end of Monument Avenue is the Jefferson Davis Monument, by W. C. Nowland, in front of which is a statue of Jefferson Davis, by E. V. Valentine. On Libby Hill, in the south-eastern part of the city, is a monument to the private soldiers and sailors of the Confederacy.

In Hollywood Cemetery (dedicated in 1849) are the graves of many famous men, including presidents James Monroe and John Tyler; Jefferson Davis, John Randolph of Roanoke, the Confederate generals, A. P. Hill, J. E. B. Stuart and George E. Pickett; Commodore Matthew F. Maury (1806–1873); James A. Seddon (1815–1880), Secretary of War of the Confederate States in 1862–64; and John R. Thompson (1823–1873), widely known in his day as a poet and as the editor of the *Southern Literary Messenger* in 1847–59. Here, too, are buried about 16,000 Confederate soldiers (to whose memory there is a massive pyramid of undressed granite, 40 ft. sq. at the base and 90 ft. high). In the north-eastern part of the city is Oakwood Cemetery, in which are the graves of about 18,000 Confederate soldiers. Two miles north-east of the city is the National Cemetery, with graves of 6571 Federal soldiers (5700 unknown) most of whom were killed in the actions near Richmond.

Richmond is the seat of Richmond College (opened in 1832; chartered in 1840; and co-educational since 1898), which in 1909–10 had 21 instructors and 341 students, of whom 55 were in the School of Law (established 1870; re-established 1890); the Woman's College (Baptist; opened in 1854), which in 1909–10 had 20 instructors and 275 students; the Virginia Mechanics' Institute (1856), including a Night School of Technology; the Union Theological Seminary in Virginia (Presbyterian; opened in 1824 and removed to Richmond in 1898 from Hampden-Sidney), which in 1909–10 had 7 instructors and 80 students; the Medical College of Virginia, (founded in 1838), which has medical, dental and pharmaceutical departments, and in 1909–10 had 50 teachers and 253 students; the University College of Medicine (1893), which has departments of medicine, dentistry and pharmacy, and in 1909–10 had 57 teachers and 220 students; the Hartshorn Memorial College (Baptist), for women; and, for negroes, Virginia Union University, founded in 1899.

Many periodicals (including several religious weeklies) are published in Richmond. The principal newspapers are the *Times-Dispatch* (Democratic; *Dispatch*, 1850; *Times*, 1886; consolidated in 1903) and the *News-Leader* (Democratic, 1899). Among the city's clubs are the Westmoreland and the Commonwealth.

The city's charitable institutions include the Memorial (1903), Virginia Sheltering Arms (1889) and St Luke's hospitals, the Retreat for the Sick (1877), the Eye, Nose, Ear and Throat Infirmary (1880), the Confederate Soldiers' Home (1884), supported jointly by the state and the city, a Home for Needy Confederate Women (1900), the City Almshouse and Hospital, and several orphanages and homes for the aged.

Richmond is the leading manufacturing city of Virginia, the value of its factory products in 1905 being $28,202,607, an increase of 22·4% since 1900 and nearly 19% of the value of the state's factory products in this year. The chief industry is the manufacture of tobacco for smoking and chewing, of cigars and cigarettes and of snuff. There are large iron and steel works here, notably the Tredegar Iron Works. Other important manufactures, with their product-values in 1905, are lumber and planing-mill products, $508,953; fancy and paper boxes and wooden packing boxes, $432,522; coffee and spices, $245,689; foundry and machine-shop products, $238,576; and saddlery and harness, $235,839. Richmond is the port of entry for the District of Richmond; in 1907 its imports were valued at $913,234 and its exports at $158,275; in 1909, its imports at $693,822 and its exports at $24,390. The city has a large jobbing and retail trade.

Richmond is governed under a charter of 1870 with amendments. The mayor is elected for two years and has the powers and authority in criminal cases of a justice of the peace. The city council is composed of a common council (five members from each ward, elected for two years) and of a board of aldermen (three members from each ward to be elected for four years). Other elective officers are the mayor, city treasurer, city sergeant, commonwealth attorney, city collector, city auditor, sheriff and high constable, elected for four years; and clerks of the various courts elected for eight years. The commissioner of the revenue is appointed for a term of four years by the judge of the corporation court. Three justices of the peace are elected from each ward for a term of two years. The city council appoints an attorney for the corporation, a city engineer, a city clerk, a police justice, a board of fire commissioners and a board of police commissioners, one from each ward, who have control of the fire and police departments, respectively, and a number of other officers. The city owns its gas works, water works and an electric-lighting plant (1910) for municipal lighting. The debt limit is set by the city charter at 18% of the assessed value of the taxable real estate of the city. In 1909 the taxable real estate and personal property was valued at $108,663,716, and the city had no floating debt; on the 1st of February 1910, there were $10,706,318 worth of bonds outstanding, and the sinking fund was $2,011,857.

An exploring party from Jamestown, under command of Captain Christopher Newport (*c.* 1565–1617), and including Captain John Smith, sailed up the James river in 1607, and on the 3rd of June erected a cross on one of the small islands opposite the site of the present city. The first permanent settlement within the present limits of the city was made in 1609 in the district long known as Rockett's. Later in the same year Captain Smith bought from the Indians a tract of land on the east bank of the river, about 3 m. below this settlement, and near the site of the present Powhatan. This tract he named "Nonesuch," and here he attempted to establish a small body of soldiers who had occupied a less favourable site in the vicinity; but they objected to the change and, being attacked by the Indians, sought the protection of Smith, who made prisoners of their leaders, with the result, apparently, that the settlement was abandoned. In 1645 Fort Charles was erected at the falls of the James as a frontier defence. In 1676, during "Bacon's Rebellion," a party of Virginians under Bacon's command killed about 150 Indians who were defending a fort on a hill a short distance east of the site of Richmond in the "Battle of Bloody Run," so called because the blood of the slain savages is said to have coloured the brook (or "run") at the base of the hill. Colonel William Byrd,[1] who owned much land along the

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[1] The Byrds and their ancestors, the Steggs, were conspicuous in the early history of Virginia. The first of the family was Thomas Stegg (or Stegge) (d. 1651), born in England, who became an Indian trader on the James river as early as 1637, and had his home near what is now the village of Westover, Charles City county. He left his estate to his son Thomas (d. 1670), who settled at the falls of the James in 1661, and was auditor-general in 1664–1670. He was succeeded by his nephew, William Byrd (1652–1704), who was born in London, went to Virginia about 1670, became a successful Indian trader, was a member of the House of Burgesses in 1677–1682, was a supporter of Nathaniel Bacon at the beginning of

James river, at the falls, visited the tract in September 1733, and decided to found there the town of Richmond, at the same time selecting and naming the present site of Petersburg. The name Richmond was suggested probably by the similarity of the site to that of Richmond on the Thames. The settlement was laid out in April 1737 by Major William Mayo (*c.* 1685–1744), and was incorporated as a town in 1742. The public records of the state were removed thither in 1777 from Williamsburg, and in May 1779 Richmond was made the capital. On the 5th of January 1781 the town was partly burned by a force of about 800 British troops under Gen. Benedict Arnold, the 200 or 300 Virginians offering little resistance, and much of the damage being done by Lieutenant-Colonel John G. Simcoe's celebrated Rangers. Richmond was first chartered as a city in 1782, and in 1788 it was allowed a representative in the House of Delegates.

The importance of Richmond during the Civil War was principally due to its having been made the capital of the Confederate States (by act of the Provisional Government on the 8th of May 1861). Its nearness to Washington, the material and manufacturing resources concentrated in it, and the moral importance attached to its possession by both sides, caused it to be regarded as the centre of gravity of the military operations in the east to which the greatest leaders and the finest armies were devoted from 1861 to 1865. (See AMERICAN CIVIL WAR.) The city's system of defences, which began to take form in May 1861, included a line of 17 heavy batteries, completely encircling it at an average distance of about 2 m.; another line of smaller batteries and trenches, from about a mile (or less) to about 2 m. beyond the heavy batteries, and practically unbroken from the north bank of the James (west of the city) to about 1 m. west of that river (south of the city); and the outer works, approximately paralleling the inner line, at distances of from 2 to 3 m. from this line north and east of the city. There was much confusion and lawlessness in Richmond during the earlier stages of the war. The city's police force was unable to cope with the situation created by the influx of soldiers, gamblers and adventurers, and on the 1st of March 1862 President Davis (by authority of a secret Act of the Confederate Congress passed on the 2nd of February) declared martial law in the city and the country within a radius of 10 m., suspended the writ of *habeas corpus*, and appointed General John H. Winder (1800-1865) to enforce military rule. General Winder's arbitrary exercise of his power was, however, resented so vigorously by the citizens that on the 19th of April the Confederate Congress materially modified the law under which he received these powers from the president. The opening of M'Clellan's Peninsula Campaign (see YORKTOWN; SEVEN DAYS, &c.) in 1862 caused great apprehension in Richmond, and in May 1862 some of the government records were packed up and preparations made to ship them to a place of safety. The approach of the "Monitor" and the Union gunboats up the James river caused a partial and temporary panic; President Davis appointed a day for prayer, and the families of some of the cabinet secretaries and many citizens fled the city precipitately; but confidence, restored by the checking of the fleet at Drewry's Bluff (Fort Darling), about 8 m. below the city, on the 15th of May 1862, was increased by the battle of Fair Oaks and the Seven Days, after which the Army of the Potomac retreated. Unsuccessful attempts were made in February and March 1864 to free the Federal prisoners in Richmond by means of cavalry raids. The most important of these was that of General H. Judson Kilpatrick, a portion of whose force, under Col. Ulric Dahlgren (b. 1842), was annihilated, Dahlgren being killed (2nd March).

General U. S. Grant began the final campaign against Richmond in May 1864 (see WILDERNESS and PETERSBURG). Sheridan's cavalry, during the "Richmond Raid," carried the city's outer defences (May 12), but found the river line too strong to be taken by assault and moved away. In June Grant's army crossed the James and attacked Lee in Petersburg. Then followed many months of unintermittent pressure upon both Petersburg and Richmond. General Benjamin F. Butler captured the southern outer line of the Richmond defences on the 29th of September 1864. On the 2nd of April 1865 Petersburg fell. Richmond was evacuated that night, after the ironclads, the bridges and many of the military and tobacco store-houses had been set on fire by order of General R. S. Ewell, so that when the Federal troops, under General Godfrey Weitzel (1835–1884) entered the city on the following morning (3rd April) a serious conflagration was under way, which was not extinguished until about one-third of the city, including several of its historic buildings, had been destroyed. During the war the principal iron foundry of the Confederacy (Tredegar Iron Works) was in Richmond, and here most of the cannon used by the Confederate armies were cast. In 1910 the city of Manchester was annexed.

See William W. Henry, "Richmond on the James" in *Historic Towns of the Southern States* (New York, 1900), edited by Lyman P. Powell; and Samuel Mordecai, *Richmond in By-Gone Days* (Richmond, 1856; 2nd ed., 1860).

RICHMOND AND DERBY, MARGARET, COUNTESS OF (1443–1509), mother of the English king, Henry VII., and foundress of St John's and Christ's colleges at Cambridge, was the daughter and heiress of John Beaufort, duke of Somerset, and was born on the 31st of May 1443. In 1455 she married Edmund Tudor, earl of Richmond, who died in the following year; she then took for her husband Henry (d. 1482), son of Humphrey Stafford, duke of Buckingham, and later Thomas Stanley, afterwards earl of Derby. She was in constant communication with her son, the future king, during his exile in Brittany, and with her husband, Lord Stanley, aided him to gain the crown in 1485. The countess was very pious and charitable, and under the influence of her confessor, John Fisher, afterwards bishop of Rochester, she founded the Lady Margaret professorships of divinity at the universities of Oxford and Cambridge. She completed the foundation of Christ's College, Cambridge, and after her death, in accordance with her wishes, much of her wealth was devoted to building and endowing St John's College in the same university. She survived her son, whose title to the English throne was derived through her, and died on the 29th of June 1509. The countess translated some devotional books into English, and Fisher said of her, "All England for her death had cause of weeping."

See C. H. Cooper, *Memoir of Margaret, Countess of Richmond and Derby* (1874).

RICHMOND AND LENNOX, FRANCES TERESA STEWART, DUCHESS OF (1648–1702), daughter of Walter Stewart, or Stuart, a physician in the household of Queen Henrietta Maria when in exile after 1649, was born in 1648 and was brought up in France. Notwithstanding the desire of Louis XIV. to keep her at his court, she was sent to England by Henrietta Maria in 1683, when she was appointed maid of honour to Catherine of Braganza, Queen of Charles II. Pepys describes her at this time as the greatest beauty he had ever seen, and Henrietta Maria called her the prettiest girl in the world. Charles II., who is said to have first seen "La belle Stewart" in the apartments of his mistress Lady Castlemaine (afterwards duchess of Cleveland), quickly became enamoured of her; but for some

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"Bacon's Rebellion," was auditor-general of the colony from 1687 until his death, and was a member of the committee which founded the College of William and Mary. His residence, within the limits of the present city of Richmond, was preserved until about 1850. His son William (1674–1744), the founder of Richmond—and above referred to—was educated in England; returned to Virginia in 1696; succeeded his father as auditor-general of the colony, and was receiver-general in 1705–1716. In 1727 he was appointed one of the commission (of which William Fitzwilliams and William Dandridge were the other members) to mark the boundary between North Carolina and Virginia, concerning which undertaking he wrote (probably in 1737) *The History of the Dividing Line.* This with his other publications, *A Journey to the Land of Eden* and *A Progress to the Mines*, was published at Petersburg, Va., in 1841, and again (New York, 1901) as *The Writings of Colonel William Byrd of Westover in Virginia*, edited by John S. Bassett, and including an extended sketch of the Byrd family. Concerning Byrd's style as a writer, Professor Bassett says: "It would be hard to find before Franklin a better master of the art of writing clear, forceful and charming English."

time Miss Stewart resisted the king's importunities, though her behaviour was far from modest and "she had no aversion to scandal." She had numerous suitors, including the duke of Buckingham and Francis Digby, son of the earl of Bristol, whose unrequited love for her was celebrated by Dryden. Her beauty appeared to her contemporaries to be only equalled by her childish silliness; but her letters to her husband, preserved in the British Museum, are not devoid of good sense and feeling. The king's infatuation was so great that when the queen's life was despaired of in 1663, it was reported that he intended to marry Miss Stewart, and four years later he was considering the possibility of obtaining a divorce to enable him to make her his wife. This was at a time when Charles feared he was in danger of losing her as his mistress, her hand being sought in marriage by Charles Stuart, duke of Richmond and Lennox. The duchess of Cleveland, who was losing her hold on the king's affections, is reported by Hamilton to have led the king to Miss Stewart's apartment at midnight when Richmond was closeted with her, and the duke was immediately expelled from court. In March 1667 the lady eloped from Whitehall with Richmond and married him secretly in the country. The king, who was greatly enraged, suspected Clarendon of being privy to the marriage, and, according to Burnet, deprived him of office for this offence. The duchess of Richmond, however, soon returned to court, where she remained for many years; and although she was disfigured by small-pox in 1668, she retained her hold on the king's affections. Her husband was sent as ambassador to Denmark, where he died in 1672. The duchess was present at the birth of the prince of Wales, son of James II., in 1688, being one of those who signed the certificate before the council. She died in 1702, leaving a valuable property to her nephew the earl of Blantyre, whose seat was named Lennoxlove after her.

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RICHTER, ADRIAN LUDWIG (1803–1884), German painter and etcher, was born at Dresden in 1803, the son of the engraver Karl August Richter, from whom he received his training; but he was strongly influenced by Erhard and Chodowiecki. He was the most popular, and in many ways the most typical German illustrator of the middle of the 19th century. His work is as typically German and homely as are the fairy-tales of Grimm. Richter visited Italy from 1823–26, and his "Thunderstorm in the Sabine Mountains" at the Staedel Institute in Frankfort is one of the rare Italian subjects from his brush. In 1828 he worked as designer for the Meissen factory, and in 1841 he became professor and head of the landscape atelier at the Dresden Academy. The Dresden Gallery owns one of his best and most characteristic paintings in the "Bridal Procession in a Spring Landscape." He died at Loschwitz near Dresden in 1884.

RICHTER, ERNST FRIEDRICH EDUARD (1808–1879), German musical theorist, was born at Grosschönau in Saxony, on the 24th of October 1808. He first studied music at Zittau, and afterwards at Leipzig, where he attained so high a reputation that in 1843 he was appointed professor of harmony and counterpoint at the conservatorium of music, then newly founded by Mendelssohn. On the death of Hauptmann on the 3rd of January 1868, he was elected cantor of the Thomasschule, which office he retained until his death on the 9th of April 1879. He is best known by three theoretical works—*Lehrbuch der Harmonie*, *Lehre vom Contrapunct* and *Lehre von der Fuge*—valuable textbooks known to English students through the excellent translation by Franklin Taylor.

RICHTER, EUGEN (1839–1906), German politician, was born on the 30th of July 1839 at Düsseldorf. After attending the universities of Bonn, Heidelberg and Berlin, he entered the government service, being stationed in his native town. In 1864 he was chosen burgomaster of Neuwied; but he was already known for his Liberal opinions, and the government refused to confirm the appointment. He was hereupon transferred to Bromberg, in East Prussia, which to an inhabitant of the Rhineland was the worst form of exile, and in consequence he resigned his place in the public service. He now went to Berlin, where he earned his living as a journalist. He was the most consistent advocate of those doctrines of *laissez faire* and individual liberty which the Germans call *Manchestertum*. He was also keenly interested in the attempts made at that period to create co-operative societies among the working men, and wrote a work on co-operative stores. It was not long before he came into conflict with the government; an electioneering pamphlet published in 1867 was confiscated; he was put on his trial but acquitted. In 1867 he was elected a member of the newly formed Reichstag, and in 1869 of the Prussian parliament. He soon became one of the most influential politicians in Germany. A member of the Progressive party, in 1880 one of the founders, and eventually the leader, of the Freisinnige, he was always in opposition. Next to Windthorst (*q.v.*) he was Bismarck's most dangerous opponent. After the great change of policy in 1878, for a time his influence was a great impediment to the government; as a consistent adherent to free trade, he was the leader of the opposition to the introduction of protection, to the new colonial policy, and to State Socialism. It was after 1880 that he raised the cry *Bismarck muss fort*. He always took a great part in debates on the military and naval establishments, in vain opposing the constant increase of army and navy. It was his refusal to support the government proposals in 1893 for an increase of the army which led to the break up of his party: he was left with only eleven followers; and, except among the middle class of Berlin and some other Prussian cities, the old Radical party, of which he was the chief representative, from that time had little influence in the country. In 1885 he founded the *Freisinnige Zeitung*, which he edited himself; of his numerous brochures the most successful was his attack on Socialism, entitled *Sozialdemokratische Zukunftsbilder* (Berlin, 1891), a clever and successful satire on the Socialist state of the future. This has been translated into the English. He also wrote much on Prussian finance, and under the title *Das politische A, B, C Buch* compiled a very useful political handbook for Radical voters. He also published in 1892 reminiscences of his youth (*Jugenderinnerungen*), and two volumes of parliamentary reminiscences (*Im alten Reichstag*, 1894–1896).

He died at Jena on the 26th of January 1906.

RICHTER, HANS (1843–), Hungarian musical conductor, born at Raab on the 4th of April 1843, was the son of the kapellmeister at the cathedral, and of his wife, *née* Josephine Csazinsky, who was the first to perform Venus in *Tannhäuser* at Vienna. Young Hans sang either soprano or alto in the cathedral choir, according to requirement, and occasionally played the organ. But his public *début* was made as a drummer in Haydn's *Paukenmesse*. In 1853, at the age of ten, he appeared in a concert as pianist in Hummel's E flat quintet; and in 1854, after his father's death, went to the choristers' school, the Convikt (where Schubert was educated) in Vienna, and there became chorister in the Court Chapel. For five years from 1860 Richter studied under Heissler and Sechter in the Vienna Conservatorium, and he learnt the horn under Kleinecke. A year and a half after his first lesson he became hornist in the old Kärnthnerthor Theatre at £3 a month. Meanwhile he had devoted time to conducting. It was not till August 1868 that Richter made his first appearance as a conductor, at the Hof Theater, Munich (where he had just been appointed), in *William Tell*; but in the next year he resigned this post, went first to Paris, then to Brussels, and finally to Triebschen, where he copied *Der Ring des Nibelungen* for Wagner. In April 1871 Richter took up his new duties as conductor of the Hungarian National Opera at Budapest, where he remained four years, until he began in May 1875 his long connexion with the Vienna Opera, which terminated only with the century. In 1876 Richter directed the rehearsals and performances of *Der Ring* at Bayreuth, and in 1877 paid his first visit to England to conduct the Wagner Festival at the Albert Hall. There in 1879 he founded the Richter Concerts, which were a revelation to London musical circles of the masterly personality of the conductor, and his influence upon the orchestra; in 1885 he became conductor of the Birmingham Triennial Festival, and was created Mus. Doc. Oxon. *honoris causa*. In 1882 Richter also conducted a famous series of performances of Wagner's works (including the first in England of *Die Meistersinger* and *Tristan*) at Drury Lane, and in 1900 became conductor of the Hallé Orchestra in Manchester. He had established his position as one of the most richly gifted and the most experienced of modern conductors, supreme in the interpretation of Beethoven, Wagner and Brahms.

RICHTER, JEREMIAS BENJAMIN (1762–1807), German chemist, was born at Hirschberg in Silesia on the 10th of March 1762, became a mining official at Breslau in 1794, and in 1800 was appointed assessor to the department of mines and chemist to the royal porcelain factory at Berlin, where he died on the 4th of April 1807. To him belongs the merit of carrying out some of the earliest determinations of the quantities by weight in which acids saturate bases and bases acids, and of arriving at the conception that those amounts of different bases which can saturate the same quantity of a particular acid are equivalent to each other. He was thus led to conclude that chemistry is a branch of applied mathematics and to endeavour to trace a law according to which the quantities of different bases required to saturate a given acid formed an arithmetical, and the quantities of acids saturating a given base a geometrical, progression. His results were published in his *Anfangsgründen der Stöchiometrie oder Messkunst chemischer Elemente* (1792–94), and *Über die neueren Gegenstände in der Chemie* (1792–1802), but it was long before they were properly appreciated, or he himself was accorded due credit for them. This was partly because some of his work was wrongly ascribed to C. F. Wenzel by Berzelius through a mistake which was only corrected in 1841 by Germain Henri Hess (1802–1850), professor of chemistry at St Petersburg, and author of "the laws of constant heat-sums and of thermoneutrality" (see THERMOCHEMISTRY).

RICHTER, JOHANN PAUL FRIEDRICH (1763–1825), usually called Jean Paul, famous German humorist, was born at Wunsiedel, in Bavaria, on the 21st of March 1763. His father was a schoolmaster and organist at Wunsiedel, but in 1765 he became a pastor at Joditz near Hof, and in 1776 at Schwarzenbach, where he died in 1779. After attending the gymnasium at Hof, Richter went in 1781 to the university of Leipzig. His original intention was to enter his father's profession, but theology did not interest him, and he soon devoted himself wholly to the study of literature. Unable to maintain himself at Leipzig he returned in 1784 to Hof, where he lived with his mother. From 1787 to 1789 he served as a tutor at Töpen, a village near Hof; and afterwards he taught the children of several families at Schwarzenbach.

Richter began his career as a man of letters with *Grönländische Prozesse* and *Auswahl aus des Teufels Papieren*, the former of which was issued in 1783–84, the latter in 1789. These works were not received with much favour, and in later life Richter himself had little sympathy with their satirical tone. His next book, *Die unsichtbare Loge*, a romance, published in 1793, had all the qualities which were soon to make him famous, and its power was immediately recognized by some of the best critics of the day. Encouraged by the reception of *Die unsichtbare Loge*, he sent forth in rapid succession *Hesperus* (1795), *Biographische Belustigungen unter der Gehirnschale einer Riesin* (1796), *Leben des Quintus Fixlein* (1796), *Blumen- Frucht- und Dornenstücke, oder Ehestand, Tod und Hochzeit des Armenadvokaten Siebenkäs* (1796–97), *Der Jubelsenior* (1797), and *Das Kampaner Tal* (1797). This series of writings won for Richter an assured place in German literature, and during the rest of his life every work he produced was welcomed by a wide circle of admirers.

After his mother's death he went in 1797 to Leipzig, and in the following year to Weimar, where he had much pleasant intercourse with Herder, by whom he was warmly appreciated. He did not become intimate with Goethe and Schiller, to both of whom his literary methods were repugnant; but in Weimar, as elsewhere, his remarkable conversational powers and his genial manners made him a favourite in general society. In 1801 he married Caroline Meyer, whom he met in Berlin in 1800. They lived first at Meiningen, then at Coburg; and finally, in 1804, they settled at Bayreuth. Here Richter spent a quiet, simple and happy life, constantly occupied with his work as a writer. In 1808 he was fortunately delivered from anxiety as to outward necessities by the prince-primate, K. T. von Dalberg, who gave him a pension of a thousand florins. Before settling at Bayreuth, Richter had published his most ambitious novel, *Titan* (1800–3); and this was followed by *Flegeljahre* (1804–5), two works which he himself regarded as his masterpieces. His later imaginative works were *Dr Katzenbergers Badereise* (1809), *Des Feldpredigers Schmelzle Reise nach Flätz* (1809), *Leben Fibels* (1812), and *Der Komet, oder Nikolaus Marggraf* (1820–22). In *Vorschule der Aesthetik* (1804) he expounded his ideas on art; he discussed the principles of education in *Levana, oder Erziehungslehre* (1807); and the opinions suggested by current events he set forth in *Friedenspredigt* (1808), *Dämmerungen für Deutschland* (1809), *Mars und Phöbus Thronwechsel im Jahre 1814* (1814), and *Politische Fastenpredigten* (1817). In his last years he began *Wahrheit aus Jean Pauls Leben*, to which additions from his papers and other sources were made after his death by C. Otto and E. Förster. In 1821 Richter lost his only son, a youth of the highest promise; and he never quite recovered from this shock. He died of dropsy, at Bayreuth, on the 14th November 1825.

Schiller said of Richter that he would have been worthy of admiration "if he had made as good use of his riches as other men made of their poverty." And it is true that in the form of his writings he never did full justice to his great powers. In working out his conceptions he found it impossible to restrain the expression of any powerful feeling by which he might happen to be moved. He was equally unable to resist the temptation to bring in strange facts or notions which occurred to him. Hence every one of his works is irregular in structure, and his style lacks directness, precision and grace. But his imagination was one of extraordinary fertility, and he had a surprising power of suggesting great thoughts by means of the simplest incidents and relations. The love of nature was one of Richter's deepest pleasures; his expressions of religious feelings are also marked by a truly poetic spirit, for to Richter visible things were but the symbols of the invisible, and in the unseen realities alone he found elements which seemed to him to give significance and dignity to human life. His humour, the most distinctive of his qualities, cannot be dissociated from the other characteristics of his writings. It mingled with all his thoughts, and to some extent determined the form in which he embodied even his most serious reflections. That it is sometimes extravagant and grotesque cannot be disputed, but it is never harsh nor vulgar, and generally it springs naturally from the perception of the incongruity between ordinary facts and ideal laws. Richter's personality was deep and many-sided; with all his wilfulness and eccentricity he was a man of a pure and sensitive spirit, with a passionate scorn for pretence and an ardent enthusiasm for truth and goodness.

Richter's *Sämtliche Werke* appeared in 1826–28 in 60 vols., to which were added 5 vols of *Literarischer Nachlass* in 1836–38; a second edition was published in 1840–42 (33 vols.); a third in 1860–62 (34 vols.). The last complete edition is that edited by R. Gottschall (60 parts, 1879). Editions of selected works appeared in 16 vols. (1865), in Kürschner's Deutsche Nationalliteratur (edited by P. Nerrlich, 6 vols., 1884–87). &c. The chief collections of Richter's correspondence are: *Jean Pauls Briefe an F. H. Jacobi* (1828); *Briefwechsel Jean Pauls mit seinem Freunde C. Otto* (1829–33); *Briefwechsel zwischen H. Voss und Jean Paul* (1833); *Briefe an eine Jugendfreundin* (1858); P. Nerrlich, *Jean Pauls Briefwechsel mit seiner Frau und seinem Freunde Otto* (1902). See further the continuation of Richter's autobiography by C. Otto and E. Förster (1826–33); H. Döring, *J. P. F. Richters Leben und Charakteristik* (1830–32); R. O. Spazier, *J. P. F. Richter: ein biographischer Kommentar zu dessen Werken* (5 vols., 1833): E. Förster, *Denkwürdigkeiten aus dem Legen von J. P. F. Richter* (1863); P. Nerrlich, *Jean Paul und seine Zeitgenossen* (1876); J. Firmery, *Étude sur la vie et les œuvres de J. P. F. Richter* (1886); P. Nerrlich, *Jean Paul, sein Leben und seine Werke* (1889); F. J. Schneider, *Jean Pauls Altersdichtung* (1901); by the same, *Jean Pauls Jugend und erstes Auftreten in der Literatur* (1906). All Richter's more important works have been translated into English, *Quintus Fixlein* and *Schmelzles Reise*, by Carlyle; see also Carlyle's two admirable essays on Richter.

RICHTHOFEN, FERDINAND, Baron von (1833–1905), German geographer and traveller, was born near Karlsruhe, Silesia, on the 5th of May 1833. He was educated at Breslau and Berlin, and in 1856 carried out geological investigations in the Tirol, subsequently extending them to Transylvania. In 1859 he accompanied as geologist the Prussian diplomatic mission to the Far East under Count von Eulenburg, and visited Ceylon, Japan, Formosa, the Philippines and Java, subsequently making an overland journey from Bangkok to Moulmein and reaching Calcutta in 1862. No important work resulted from these travels, for much of Richthofen's records and collections was lost. China was at the time inaccessible owing to the Taiping rebellion, but Richthofen was impressed with the desirability of exploring it, and after a visit to California, where he remained till 1868, he returned to the East. In a remarkable series of seven journeys he penetrated into almost every part of the Chinese Empire. He returned home in 1872, and a work comprising three large volumes and an atlas, which, however, did not cover the entire field or complete the author's plan, appeared at Berlin in 1877–85 under the title of *China; Ergebnisse eigner Reisen und darauf gegründeter Studien.* In this standard work the author deals not only with geology but with every subject necessary to a general geographical treatise. Notably he paid close attention to the economic resources of the country he traversed; he wrote a valuable series of letters to the Shanghai Chamber of Commerce, and first drew attention to the importance of the coalfields of Shantung, and of Kiaochow as a port. In 1875 Richthofen was elected professor of geology at Bonn, but being fully occupied with his work in China he did not take up professorial duties till 1879; in 1883 he became professor of geography at Leipzig, and in 1886 was chosen to the same office at Berlin, and held it till his death. His lectures attracted numerous students who subsequently became eminent in geographical work, and in order to keep in touch with them he established his weekly geographical "colloquium." Of his written works, besides that on China, there may be mentioned "Die Kalkalpen von Voralberg und Nordtirol" in *Jahrbuch der geologischen Reichsanstalt* (1859–1861); "Die Metallproduktion Kaliforniens" in *Petermanns Mitteilungen* (1865); *Natural System of Volcanic Rocks* (San Francisco, 1867); *Aufgaben und Methoden der heutigen Geographie* (an address delivered at Leipzig, 1883); *Führer für Forschungsreisende* (Berlin, 1886); *Triebkräfte und Richtungen der Erdkunde in neunzehnten Jahrhundert* (address on his election as rector, Berlin, 1903). He was for many years president of the German Geographical Society, and he founded the Berlin Hydrographical Institute. He died on the 16th of October 1905.

RICIMER (d. 472), master of the Roman Empire in the West during part of the 5th century, was the son of a prince of the Suebi and the daughter of Wallia, king of the Visigoths. His youth was spent at the court of Valentinian III., and he won distinction under Aetius. In 456 he defeated the Vandals in a sea-fight near Corsica, and on land near Agrigentum in Sicily, and backed by the popularity thus acquired, Ricimer then gained the consent of the Roman senate to an expedition against the emperor Avitus, whom he defeated in a bloody battle at Piacenza on the 16th of October 456. Avitus was taken prisoner and made bishop of Piacenza, and shortly afterwards sentenced to death. Ricimer then obtained from Leo I., emperor at Constantinople, the title patrician, but in 457 set up Majorianus as his own emperor in the West, and induced Leo to give his consent. When, however, Majorianus tried to rule by himself, Ricimer forced him to abdicate and caused his assassination on the 7th of August 461. The successor whom Ricimer placed upon the throne was Libius Severus, who proved to be more docile than Majorianus, but had to face the rivalry of Leo in the East and Aegidius in Gaul. Upon his death in 465—said to be due to the poison of Ricimer—this emperor-maker ruled the West for eighteen months without an emperor, and then accepted Leo's candidate Anthemius, diplomatically married his daughter, and for some time lived in peace with him. Before long, however, Ricimer moved to Milan, ready to declare war upon Anthemius. St Epiphanius, bishop of Milan, patched up a truce, but in 472 Ricimer was again before Rome with an army of Germans, proclaimed as emperor Olybrius, whom Leo had sent to pacify the two enemies, and after three months' siege took the city, on the 1st of July 472. Anthemius was massacred and Rome was a prey to Ricimer's soldiers. He himself, however, died on the 18th of August 472, of malignant fever.

RICINA, an ancient town of Picenum, Italy, 3 m. N.W. of the modern Macerata, on the banks of the river Potenza, in a fertile valley. It was probably a *municipium* until it was refounded by Pertinax and Septimius Severus, after which it bore the name Colonia Helvia Ricina Pertinax. The site is now deserted, but considerable ruins of a theatre and remains of baths and other buildings (all in brickwork of the imperial period) still exist; also the fragments of an ancient bridge over the Potenza.

RICKETS, a constitutional disease of childhood characterized chiefly by a softened condition of the bones and by other evidences of perverted nutrition. It was first described in 1649 by Arnold de Boot, a Frisian physician practising in Ireland. Its nature and causation are discussed under Metabolic Diseases. The name "rickets" is from the Old English *wrickken*, to twist; the more technical medical term, *rachitis*, which comes from Greek ῥάχις, the spine, was suggested by Francis Glisson in 1650, both from similarity of sound and from the part of the body which is one of the first to be affected.

Rickets can seldom be recognized until several months after birth, and it most commonly attracts attention at about the end of the first year. The symptoms which precede the outward manifestation of the disease are marked disorders of the digestive and alimentary functions. The child's appetite is diminished, and there is frequent vomiting, together with diarrhoea or irregularity of the bowels, the evacuations being clay-coloured and unhealthy. Along with this there is a falling away in flesh. Importance is to be attached to certain other symptoms present in the early stages, namely, profuse sweating of the head and upper parts of the body, particularly during sleep, with at the same time dry heat of the lower parts and a tendency in the child to kick off all coverings and expose the limbs. At the same time there is great tenderness of the bones, as shown by the pain produced on moving or handling the child. Gradually the changes in the shape of the bones become visible, at first chiefly noticed at the ends of the long bones, as in those of the arm, causing enlargements at the wrists, or in the ribs, producing a knobbed appearance at the junction of their ends with the costal cartilages. The bones also from their softened condition tend to become distorted and misshapen, both by the action of the muscles and by the superincumbent weight of the body. Those of the limbs are bent outwards and forwards, and the child becomes "bow-legged" or "in-kneed" often to an extreme degree. The trunk of the body likewise shows various alterations and deformities owing to curvatures of the spine, the flattening of the lateral curves of the ribs, and the projection forwards of the sternum. The cavity of the chest may thus be contracted and the development of the thoracic organs interfered with as well as their functions more or less embarrassed. The pelvis undergoes distortion, which may reduce its capacity to a degree that in the female may afterwards lead to serious difficulties in parturition. The head of the rickety child is large-looking in its upper part, the individual bones of the cranium sometimes remaining long ununited, while the face is small and ill-developed, and the teeth appear late and fall out or decay early. The constitutional conditions of ill-health continue, and the nutrition and development of the child are greatly retarded.

The disease may terminate in recovery, with more or less of deformity and dwarfing, the bones although altered in shape becoming firmly ossified, and this is the common result in the majority of instances. On the other hand, during the progress of the disease, various intercurrent ailments are apt to arise which may cause death, such as the infectious fevers, bronchitis and other pulmonary affections, chronic hydrocephalus, convulsions, laryngismus stridulus, &c.

An acute form of rickets of rare occurrence (really a form of *scurvy*, *q.v.*) has been described by writers on diseases of children, in which all the symptoms are of more rapid development and progress, the result in many instances being fatal.

The treatment of rickets is necessarily more hygienic than medicinal, and includes such preventive measures as may be exercised by strict attention to personal health and nutrition on the part of mothers, especially where there appears to be any tendency to a rickety development in any members of the family. Very important also is the avoidance of too prolonged nursing, which by its weakening effects upon the mother's health is calculated to engender the disease in any succeeding children. At the same time it must be admitted that, when the mother is healthy, her milk abundant, and nursing discontinued before the lapse of the first year, there is no better means of preventing the occurrence of rickets than this method of feeding an infant, the disease, as is well known, being far more frequently met with in children brought up by hand. The management of the child exhibiting any tendency to rickets is of great importance, but can only be alluded to in general terms. The digestive disorders characteristic of the setting in of the disease render necessary the greatest care and watchfulness as to diet. Thus, if the child be not nursed but fed artificially, fresh milk should be almost the only article of diet for at least the first year, and the chief element for the next. When not digested well, as may at times be shown by its appearance as a curd in the evacuations, it may be diluted with water or lime water, or else discontinued for a short time, carefully-made gruel or barley water being substituted. Many of the so-called "infants' foods" which are now so extensively used appear to be well adapted for their purpose, but when employed too abundantly and to the exclusion of the due amount of milk are often productive of digestive and intestinal disorders, probably from their containing a greater amount of starchy matter than can be utilized. From the end of the first year light animal soups may occasionally be given with advantage. The medicinal remedies most to be relied on are those which improve the digestive functions and minister to nutrition, and include such agents as the preparations of iron, quinine, and especially cod-liver oil and phosphorus, and the cautious use of extract of thyroid gland has been advocated by Henoch. Of no less importance, however, are abundance of fresh air, cleanliness, warm clothing, and attention to the general hygiene of the child and to regularity in all its functions.

When the disease is showing evidence of advancing, it is desirable to restrain the child from walking, as far as possible. But this precaution may be to some extent rendered unnecessary by the use of splints and other apparatus as supports for the limbs and body, enabling the child to move about without the risk of bending and deformity of the bones which otherwise would probably be the result.

The condition formerly known as foetal rickets (achondroplasia or chondrodystrophia foetalis) is now classed as a separate disease. Its chief characteristics are dwarfism with shortening of the limbs and enormous enlargment of the articulations.

RICKMAN, THOMAS (1776–1841), English architect, was born on the 8th of June 1776 at Maidenhead, Berkshire, where he assisted his father (a Quaker) in business as a grocer and druggist until 1797. He was then engaged in various businesses until 1818. All his spare time was spent in sketching and making careful measured drawings, till he gained a knowledge of architecture which was very remarkable at a time when little taste existed for the beauties of the Gothic styles. In 1811 alone he is said to have studied three thousand ecclesiastical buildings. When in 1818 a large grant of money was made by the government to build new churches, Rickman sent in a design of his own which was successful in an open competition; thus he was fairly launched upon the profession of an architect, for which his natural gifts strongly fitted him. Rickman then moved to Birmingham, and by 1830 became one of the most successful architects of his time. He built churches at Hampton Lucy, Ombersley, and Stretton-on-Dunsmore, St George's at Birmingham, St Philip's and St Matthew's in Bristol, two in Carlisle, St Peter's and St Paul's at Preston, St David's in Glasgow, Grey Friars at Coventry, and many others. He also designed the new court of St John's College, Cambridge, a palace for the bishop of Carlisle, and several large country houses. These are all in the Gothic style, but show more knowledge of the outward form of the medieval style than any real acquaintance with its spirit, and are little better than dull copies of old work, disfigured by much poverty of detail. Rickman nevertheless played an important part in the revival of taste for medievalism perhaps second only to Pugin. His *Attempt to discriminate the Styles of Architecture in England* shows painstaking research, and ran through many editions. Rickman died at Birmingham on the 4th of January 1841. He was married three times: first to his cousin, Lucy Rickman of Lewes; secondly to Christiana Hornor; thirdly to Elizabeth Miller of Edinburgh, by whom he had a son and a daughter.

RICKMANSWORTH, an urban district in the Watford parliamentary division of Hertfordshire, England; 17½ m. W.N.W. of London by the Metropolitan & Great Central joint railway; served also by a branch of the London & North Western railway from Watford. Pop. (1901) 5627. It lies in a pleasant valley at the junction of the Chess with the Colne, and on the Grand Junction canal. The church of St Mary, with the exception of the tower a modern reconstruction, contains some French stained glass of the 16th century. The chief industries are brewing and art-printing. The Colne here holds large trout, which are carefully preserved. The grounds of Moor Park to the south-east are finely wooded, and the mansion, belonging to Lord Ebury, is a good example of the period of George I. The estate counts among its former owners such famous names as the Botelers; George Neville, archbishop of York; John de Vere, earl of Oxford in Henry VII.'s time; Wolsey in the next reign; Robert Carey, earl of Monmouth, and the duke of Monmouth.

RICOCHET, a military term expressing the rebound of a projectile that strikes on a hard surface. The origin of the French word *ricochet* is unknown. Its earliest known use (14th and 15th centuries) was in the sense of "repetition," *e.g. chanson du ricochet*, "an oft-told tale." Hence it came to be applied to the rebound of a flat stone skimmed along the surface of water, known familiarly in English as "ducks and drakes," and so finally in the military sense defined above, which found its way into the English language.

The use of the now obsolete "ricochet fire" in war is well illustrated by "ducks and drakes." The shot, striking the ground at a small angle, described for the remainder of its course a succession of leaps and falls. The discovery of this species of fire, usually attributed to Vauban (siege of Ath in 1697), had the greatest influence both on sieges and on operations in the field. In siege warfare, ricochet, especially when combined with enfilade, *i.e.* when directed along the enemy's line of defence, soon became the principal weapon of the besieger, and with the system of parallels (*q.v.*) gave the attack a superiority so complete that a siege came to be considered as the most certain operation of war. Enfilade fire by itself was neutralized by traverses (*q.v.*) in the defences, but by the new method a shot could be so aimed as to skip over each successive traverse and thus to search ground that was immune from direct fire. The application of ricochet fire to operations in the field came somewhat later. In the 18th century field artillery, which was not, before Napoleon's time, sufficiently mobile to close with the enemy, relied principally upon the ricochet of round shot, which, sweeping a considerable depth of ground, took effect upon several successive lines of hostile troops. But once artillery was able to gallop up to the enemy and to use its far more terrible close-range projectile, case-shot, ricochet fire came to be used less and less, until finally, with the general adoption of shell (which, of course, burst at the first contact with the ground), the round shot disappeared altogether from the battlefield. Similarly in siege warfare, as soon as high-angle fire with shells became sufficiently accurate, there was no further need of round shot and ricochet.

The term "ricochet" is now only applied, in modern rifle shooting, to the graze of a bullet that has struck short. A modern bullet that has ricochetted inflicts a very severe wound, as its nickel or other hard envelope is torn and jagged by its contact with the ground. With its high remaining velocity it is dangerous even after more than one ricochet, except at extreme ranges.

RICOLD OF MONTE CROCE (1242–1320), Italian Dominican missionary, was born at Monte Croce, near Florence. In 1267 he entered the Dominican house of Santa Maria Novella in Florence, and in 1272 that of St Catherine in Pisa. He started for Acre with a papal commission to preach in 1286 or 1287: in 1288 or 1289 he began to keep a record of his experiences in the Levant; this record he probably reduced to final book form in Bagdad. Entering Syria at Acre, he crossed Galilee to the Sea of Tiberias; thence returning to Acre he seems to have travelled down the coast to Jaffa, and so up to Jerusalem. After visiting the Jordan and the Dead Sea he quitted Palestine by the coast road, retracing his steps to Acre and passing on by Tripoli and Tortosa into Cilicia. From the Cilician port of Lajazzo he started on the great high road to Tabriz in north Persia. Crossing the Taurus he travelled on by Sivas of Cappadocia to Erzerum, the neighbourhood of Ararat and Tabriz. In and near Tabriz he preached for several months, after which he proceeded to Bagdad via Mosul and Tekrit. In Bagdad he stayed several years, studying the Koran and other works of Moslem theology, for controversial purposes, arguing with Nestorian Christians, and writing. In 1301 Ricold again appeared in Florence: some time after this he proposed to submit his *Confutatio Alcorani* to the pope, but did not. He died on the 31st of October 1320. As a traveller and observer his merits are conspicuous. His account of the Tatars and his sketch of Moslem religion and manners are especially noteworthy. In spite of strong prejudice, he shows remarkable breadth of view and appreciation of merit in systems the most hostile to his own.

Of Ricold's *Itinerary* (*Itinerarius* [*sic*]) fifteen MSS. exist, of which the chief are: (1) Florence, Laurentian Library, Fineschi, 326; (2) Paris, National Library, Lat. 4955, fols. 46–55; (3) Wolfenbüttel, Cod. Weissenb. 40, fols. 73 B.–94 B. (all of 14th century). Of his *Epistles* there is one MS., viz. Rome, Vatican, 3717, fols. 249 A.–267 A. The best edition of the *Itinerary* is by J. C. M. Laurent, in *Peregrinatores Medii Aevi Quatuor*, pp. 105 (101)–41 (Leipzig, 1864 and 1873). The *Epistles* have been edited by R. Röhricht in *Archives de l'orient latin*, vol. ii. part ii. (Documents) pp. 258–96 (Paris, 1884). The *Confutatio Alcorani*, printed at Seville in 1500, at Venice in 1607, adds hardly anything to the sections of the *Itinerary* devoted to Moslem belief, &c. Ricold's *Libellus contra Nationes Orientales* and *Contra errores Judaeorum* have never been printed. See also C. Raymond Beazley, *Dawn of Modern Geography*, iii. 190–202, 218, 390–91, 547, 554, 564.

RICOTTI-MAGNANI, CESARE (1822–   ), Italian general and knight of the Annunziata, was born at Borgo Lavezzaro on the 30th of June 1822. As artillery lieutenant he distinguished himself and was wounded at the siege of Peschiera in 1848, and in 1852 gained further distinction by his efforts to prevent the explosion of a burning powder magazine. After serving from 1856 to 1859 as director of the Artillery School, he became general of division in 1864, commanding the 5th division at the battle of San Martino. In the war of 1866 he stormed Borgoforte, to open a passage for Cialdini's army. Upon the death of General Govone in 1872 he was appointed minister of war, and after the occupation of Rome bent all his efforts to army reform, in accordance with the lessons of the Franco-German War. He shortened the period of military service; extended conscription to all able-bodied men; created a permanent army, a mobile militia and a reserve; commenced the renewal of armaments; and placed Italy in a position to put 1,800,000 men on a war footing. Ricotti fell from power with the Right in 1876, but returned to office with Depretis in 1884, and amended his previous scheme of reform. Resigning in April 1887, he became a member of the senate in 1890, but took little part in public life until 1896, when, after the battle of Adowa, he was entrusted by King Humbert with the formation of a cabinet. Having constructed his ministry, he made over the premiership to the marquis di Rudini, retaining for himself the portfolio of war, and seeking to satisfy popular demands for the reduction of military expenditure by consolidating the tactical structure of the army without weakening its fighting power. Rudini, however, finding that Ricotti's ideas, which he himself shared, were not acceptable at court, obliged him to resign office. His prestige as creator of the modern Italian army remained unimpaired, and his views on army consolidation enjoyed a large measure of technical and public favour.

RIDDING, GEORGE (1828–1904), English headmaster and bishop, was born at Winchester College, of which his father, the Rev. Charles Ridding, vicar of Andover, was a fellow, on the 16th of March 1828. He was educated at Winchester and at Balliol College, Oxford. He became a fellow of Exeter College and was a tutor from 1853 to 1863. In 1853 he married Mary Louisa Moberly, who died within a year of her marriage. He was appointed second master of Winchester College in 1863, and on the retirement of his father-in-law, Dr Moberly, he succeeded to the headmastership. During the tenure of this office (1867–1884) he carried out successfully a series of radical reforms in the organization of the school, resulting in a great increase both in its reputation and numbers. In 1884 he became the first bishop of Southwell, and brought his powers of organization and conspicuous tact and moderation to bear on the management of the new diocese. He took an active share in its educational and social work, and was materially assisted in these respects by his second wife, Lady Laura Palmer, daughter of the 1st earl of Selborne. He resigned his see a short time before his death, which took place on the 30th of August 1904.

See *Church Quarterly Review* (July 1905).

RIDDLES (A.S. *raedan*, to interpret), probably the oldest extant form of humour. They spring from man's earliest perception that there are such things as analogies in nature. Man observes an example of analogy, puts his observations in the form of a question, and there is the riddle ready made. Some Boeotian humorist, for example, detected the analogy between the life of humanity—the child on all fours, the man erect on two legs, old age with its staff—on one side, and on the other the conception of an animal with a varying number of limbs. Put this in a question and it is the riddle of the Sphinx. Another instance is the question, "What we caught we threw away, what we could not catch we kept." Homer is said to have died of vexation at not being able to discover the answer to this riddle, still current on the coast of Brittany, in Germany and in Gascony. After inventing the riddle, men began to use it in a kind of game; bets were staked on the answer and sides were made, each side backing its champion. These sports in Marriner's time were common in Tonga; they are no less popular among the African Woloffs. Samson's riddle set to the Philistines is an instance of the sport in a Semitic country. In märchen and ballads, the hero's chance of winning his beloved, or of escaping threatened punishment, is often made to turn on his power of answering riddles. It follows from the artless and primitive character of the riddle that regular popular riddles (*Devinettes*) are widely distributed, like popular tales, popular songs and popular customs. The Woloffs ask, "What flies for ever and rests never?" Answer, The wind. The Basutos put this riddle, "What is wingless and legless, yet flies fast and cannot be imprisoned?" Answer, The voice. The German riddle runs, "What can go in face of the sun yet leave no shadow?" Answer, The wind. In riddles may perhaps be noticed the animistic or personalizing tendency of early human thought, just beginning to be conscious of itself. The person who asked these riddles had the old sense of wind, for example, as a person, yet probably, unlike the bushmen, he would never expect to see the personal wind. He knew the distinction between the personal and impersonal well enough to be sure that his enigma would present some difficulty. The riddle, to be brief, is an interrogatory form of the fable, and like the fable originates among rude people, and is perpetuated in the folklore of peasantry.

Probably the best book on the riddle (a subject less frequently studied than the märchen or the myth) is Eugène Rolland, *Devinettes ou énigmes populaires*, with a preface by M. Gaston Paris. The power of answering riddles among the people who invented the legend of Solomon and the queen of Sheba seems to have been regarded as a proof of great sagacity. The riddle proper is all but extinct outside folklore and savage life, and has been replaced by the conundrum, which is a pun in the interrogative form.

Old English Riddles.—A number of interesting poetical riddles in old English are contained in the *Exeter Book*, written about A.D. 1000. According to the numbering in the only complete edition (in Grein-Wülker, *Bibliothek der Angelsächsisches Poesie*, vol. iii. pp. 184–238), there would appear to be 95 of them; but No. 1 is the monodramatic lyric *Wulf and Eadwacer*, which was included among the riddles by a mistake of the first editor of the *Exeter Book*, B. Thorpe; No. 90 is not in Old English, but in Latin; and several others are mere unintelligible fragments. There remain about 85 that have been preserved either entire or with sufficient approach to completeness for their general drift to be perceived.

The riddles Nos. 2–60 occupy 15 folios in the middle of the MS.; Nos. 62–95 occupy the last 7 folios, and No. 61 and a mutilated and divergent copy of No. 31 are placed by themselves among poems of a different kind. Attempts have been made to show that the two main groups are distinguished from each other by special characteristics that may indicate difference of authorship or date; but there seems to be no good reason for attaching any significance to the arrangement of the MS. Some of the riddles almost certainly were written in Northumbria in the early part of the 8th century; a copy of one of them (No. 36), in Anglian dialect, has been preserved in a MS. at Leiden. Whether all the riddles are the work of one author, or whether they belong to different periods and districts, remains at present uncertain. For the reasons stated in the article Cynewulf the attribution of the whole collection to that poet, once almost universally accepted, is now no longer tenable; and there is no overwhelming probability that he is the author of any portion of it.[1]

The investigations of F. Dietrich and A. Ebert have established the fact that a few of the riddles are imitated from the Latin enigmas of Symphosius and Aldhelm. No. 36 is a translation of Aldhelm's riddle *De Lorica*, and No. 41 is founded on the same writer's riddle *De Creatura*. The dependence of the Old English riddles on Latin originals has, however, been greatly exaggerated, especially by A. Prehn (*Komposition und Quellen der Rätsel des Exeterbuches*, 1883), who goes so far as to maintain that every one of them contains reminiscences of one or more of the compositions of Symphosius, Aldhelm, Tatwine and Eusebius. The correspondences alleged are in most cases slight, if not purely fanciful, and it is even doubtful whether the two writers last named were known at all to the authors of the vernacular riddles. All the Englishmen who wrote riddles in the 8th and following centuries, whether they wrote in their native tongue or in Latin, may be said to belong to one school, and their work has many features in common. But except in a few instances the riddles written in Old English are probably not less but more original than those written in Latin. In poetical merit they are generally superior. A good notion of their character and style may be gained from Mr Stopford Brooke's spirited (though not minutely accurate) translations of many of them in his *History of Early English Literature*, vol. i. (1892). Mr Brooke's interpretation of No. 11 (the Barnacle Goose) is original, and no doubt correct: in some other instances the solutions he has adopted are somewhat more questionable than they would appear to be from his translations.

Unlike the Latin riddles of Aldhelm, the riddles of the Exeter Book are unaccompanied with solutions. In some of them, however, the answer is indicated by an anagram, usually expressed in runic characters. Thus No. 24 begins with the words "Agof is my name reversed," where the West Saxon scribe, in accordance with the phonetic laws of his own dialect, has substituted F for the final B of his Anglian original; the word is an anagram of *boga*, "bow." In No. 25 the mimic skill of the magpie is described, and at the conclusion the name of the bird (*higora*) is indicated by the six letters G, A, R, O, H, I.

The solution of nearly all the riddles was attempted by F. Dietrich, in the 11th and 12th volumes of Haupt's *Zeitschrift für deutsches Alterthum*. In many cases Dietrich was certainly right, but in many others his conjectures are strangely perverse, owing to misleading comparisons with supposed Latin originals. Subsequent scholars have been much more successful in refuting Dietrich's explanations than in replacing them by others more satisfactory. The most copious contributor of new interpretations has been Prof. M. Trautmann, in several articles in *Anglia*, and also in Bonner, *Beiträge zur Anglistik*, No. 19 (1905); but very few of his interpretations can be considered even plausible, and he sometimes rejects the solutions of his predecessors when they are probably right. One riddle (No. 51, Fire) was independently solved by Prof. Trautmann and G. Herzfeld (*Die Rätsel des Exeterbuches und ihr Verfasser*, 1890). The articles on the subject by F. Tupper, Jr., in *Modern Philology*, vol. ii. (1903), and in *Modern Language Notes* for 1903 and 1906, are extremely valuable, though the author's original explanations do not appear convincing. After all that has been done, the meaning of a considerable number of the riddles is still uncertain. In some instances this may be due to the corrupt state of the text; in others the terms in which the object is described are so vague that several solutions are equally plausible. (H. Br.)

RIDGE, WILLIAM PETT (1864–), English author, was born at Chartham, near Canterbury, and was educated at Marden, Kent, and at the Birkbeck Institute, London. He was for some time a clerk in the Railway Clearing House, and began about 1891 to write humorous sketches for the *St James's Gazette* and other papers. He secured his first striking success, in volume form, with *Mord Em'ly* (1898), an excellent example of his ability to draw humorous portraits of lower class life. His later books include *A Son of the State* (1899), *A Breaker of Laws* (1900), *Lost Property* (1902), *Erb* (1903), *Mrs Caler's Business* (1905), *The Wickhamses* (1906), &c.

RIDGE (a word common to many Teutonic languages, meaning "back," whether of a man or an animal, cf. German *Rücke*), the word applied to many objects resembling the projecting line of an animal's back, such as the strip of soil thrown up by a plough between furrows, the elevations or protuberances on bones which serve for the attachment of muscles or ligaments, &c. In architecture the ridge (Fr. *faite*, *crête*; Gr. *First*; Ital. *asinello*) is the highest portion of a roof, which is covered with lead, slate, or tiles, and sometimes decorated with a cresting in terra-cotta or metal-work. The term is also applied to the meeting of the common rafters on each side of a roof, which are sometimes butted against an upright board known as the ridge-piece. For the ridge-rib see Rib.

RIDING, the art or practice of locomotion on the back of an animal or in a vehicle (the verb *to ride* originally meant "to travel," or "go," as the derived noun *road* means "a way"). Where no vehicle is specified (*e.g.* "riding a bicycle"), the word is associated with horseback riding, for exercise or pleasure.

The origin of the use of the horse as a means of transport goes back to prehistoric times. The fable of the centaurs, if the derivation from κεντεῖν, to goad, ταῦρος, bull, be accepted (but see Centaur), would indicate the early existence of pastoral peoples living on horseback, like the modern cowboys (cp. "cow-punchers") or *gauchos* of North and South America. Archaeological discoveries in India, Persia, Assyria and Egypt show that in the polished stone age quaternary man had domesticated the horse, while a Chinese treatise, the *Goei-leaotse*, the fifth book of the Vouking, a sort of military code dating from the reign of the emperor Hoang-Ti (2637 years B.C.), places the cavalry on the wings of the army. The Hebrews understood the use of the horse in war (Job xxxix. 18–25), as did the Persians (Cyrus at the battle of Thymbra), Greeks and Romans. The Greeks and Romans, especially the former, were skilled horsemen, and feats on horseback were a feature of their games. They used no stirrup, but had both bridle and bit. They rode bareback, or on a cloth or skin strapped to the horse.

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[1] For the linguistic arguments against Cynewulf's authorship of the Riddles see especially A. Madert, *Die Sprache der altenglischen Rätsel des Exeterbuches und die Cynewulffrage* (1900).

When roads were poor and vehicles cumbersome horseback was almost the only method of travel for both sexes. With the introduction of steam-locomotion and the improvement of roads, however, riding has become to a large extent a sport, rather than a necessity. There are different styles of riding adapted to the different purposes for which horses are ridden—on the road, in the school, hunting, racing, steeple-chasing and in the cavalry service—just as there are different horses more suitable by conformation, breeding and training for each.

In western civilization there is a traditional difference between the riding of men and women, in this particular, that men ride astride and women on a side-saddle. But in the following observations we deal generally with the more important features of riding as practised astride.

After securing an animal of the right height, weight and disposition, with a saddle of a length of tree and a breadth of seat that fits the rider and that is lined to fit the back of the horse, with a bridle bitted to his mouth, the first step is to mount. Having taken up the reins, the rider should stand at his horse's near (left) shoulder, facing towards the tail, and in that position hold the stirrup with his right hand for the reception of his left foot. By standing at the shoulder the rider is out of harm's way in the event of the horse kicking while he mounts. Ladies generally have the aid of a block or a groom's or escort's hand beneath the left foot. But a woman should be able to mount without aid, by lowering her stirrup, so that she can reach it from the ground, and then raising it again when she is seated in the saddle. Riding astride is sometimes recommended for women. The chief argument in its favour—symmetrical development of the figure—is, however, lost if the growing girl be taught to ride on a side-saddle of which the pommels can be shifted to the off side on alternate days.

Having gained the saddle, the necessity arises for *seat* and *hands*. Here good instruction is imperative at the outset. The great desideratum in a seat on horseback is that it should be firm. A rider with an insecure seat is apt to be thrown by any unexpected movement the horse may make; and, without a firm seat, the acquirement of good hands is well-nigh hopeless, because, when the balance is once disturbed the insecure rider will have to depend on something else for the maintenance of his seat, and this generally takes the shape of "riding on the horse's mouth," a practice as cruel as it is ugly.

Having gained the saddle, the rider should adjust the stirrups to the proper length, depending on the kind of riding, the length of his leg and the roughness of the horse's trot. Sitting well in the middle of the saddle, the thighs turned in, and the heels drawn somewhat back, the stirrup leathers may be let out or taken up until the tread of the stirrup is on a level with the inner ankle bone, and at this length, when the rider stands up, his fork will easily clear the pommel of the saddle. For maintaining his seat the horseman should depend upon his thighs and knees only, and not upon the knee and calf; a proper seat should be a mixture of balance and grip; a man riding by balance only is sure to be thrown, while to grip with all one's might during an hour's ride is to undertake as much exertion as should last for a whole day. The position of the foot exercises much influence on the security of the seat; it should be opposite the girth, parallel with the barrel of the horse, with the heels depressed. A good seat on a horse should not be strong merely; it should be graceful; above the loins the body should be loose, so as readily to adapt itself to every motion of the horse, but it should be upright.

Beginners are advised to practise riding with and without stirrups; thus, let the pupil who has ridden half an hour in a saddle with stirrups have a cloth substituted for the saddle for about ten minutes, care being taken to observe the rules already laid down for the position of the legs; in this way the proper seat will be strengthened.

The proper adjustment of the reins is the next thing to be attended to, and as the management of these depends so much upon the seat being firm and independent of the bridle the acquisition of a firm seat is certainly half-way towards the acquirement of good hands. An excellent way to start a pupil is on a sure-footed horse without bridle, the master governing him by a leading rein until the pupil has acquired a firm seat and can be trusted with reins. Assuming that a double-reined bridle is used, the third finger of the left hand should be first inserted between the snaffle reins; then the little, third and second fingers should be between the curb reins, the two outside reins being the curb, and the two inside ones the snaffle. In this manner of holding the reins the snaffle is not so likely to slip, while the curb can be easily slackened or drawn tighter. As military riders use the curb only the position of snaffle and curb as just explained is reversed in the cavalry service. The snaffle reins should be drawn up gently until the rider feels that he has an equal and light hold of his horse's mouth on both sides, with just so much pressure that the slightest movement of the left or right rein would cause him to turn to the left or right respectively. The arms from the shoulder to the elbow should hang naturally, close to the sides, and the arms from elbow to wrist should be about parallel to the ground, the wrist being kept loose, so as to yield gently with every motion of the horse. The rider sitting in the position described, square to the front, with his shoulders well back, will be riding with fairly long reins, one of the secrets of good hands.

When the horse is in motion the hands should not be held rigid, as the horse's mouth would thereby become dead, and the horse would lean unpleasantly on the hand; but the rider should give and take, without, however, entirely relaxing the hold.

In order to encourage the horse to walk the head must not be confined, but a light feeling of the horse's mouth must be kept up. Should the horse, unasked, break into a trot, never snatch at his mouth, but restrain him gently. To trot, press the legs to the saddle, and raise the bridle hand a little, and, after a moment's sitting close, begin to rise ("pose") in cadence with the action of the horse. The rising to the trot should be performed easily; the legs must not swing backwards and forwards, nor should the hands be jerked up and down. To start the canter, which should always be done from the walk and not the trot, take up the curb rein a little and turn the horse's head slightly to the right, at the same time pressing the left leg behind the girth; the horse will then lead with the off (right) fore leg, which is generally preferred; but a well-broken hack should lead with either leg at command, and if he be cantered in a circle to the left he must lead with the near leg, as otherwise an ugly fall is likely to result from the leg being crossed. Galloping is a pace not to be generally indulged in by road or park riders; when it is, the hands should be kept low, the body thrown back, and an extra grip taken with the knees, as nearly all horses pull more or less when extended.

Hitherto only road or park riding has been considered. When a person has become a fair road rider he has made some progress towards being a hunting man. But if first principles are disregarded, and a follower of hounds believes in the system "it doesn't matter how you ride so long as you stick on," he will not only always be a "sight" but a menace in the hunting field. Few self-taught riders attain to excellence; they may keep a good place in hunting, if possessed of plenty of courage, and mounted on a bold and not too tender-mouthed horse, but they never will be riders in the proper sense of the word.

Hunting and Riding to Hounds.—For practical purposes the chief difference between a park seat and a hunting seat consists in the shortening of the stirrups some two or three holes. The seat of the hunting man is the most important of any connected with amusement; he must sit firm, so as not to be thrown off when his horse leaps, or makes a mistake, and he must be able to save his horse under all circumstances, and to make as much of him as possible. As with road riding, so with hunting, the actual length of the stirrups will depend a good deal upon the shape and action of the horse, but the nature of the animal and the peculiarities of the country ridden over will also have something to do with their adjustment. A puller will compel the rider to shorten his leathers one or perhaps two holes—a course that may also be rendered necessary in a hilly country, for, in going down hill, the stirrups, if kept at the ordinary length, will generally feel a great deal too long. The rider's body must be always close to the saddle in leaping, for if he were jerked up, the weight of say only a 10-stone man coming down on the horse a couple of seconds after he has negotiated a large fence is sufficient to throw the animal down. Nothing but actual practice with hounds can teach a man how to ride where all kinds of going and obstacles of various sorts, natural and artificial, have to be encountered in a day's hunting. For example, the country gone over is seldom level springy turf; it is up hill and down dale, across ridge and furrow, over ground studded with ant-hills (which, unlike mole-hills, are often very hard), over ploughed or boggy land. Each of these varieties requires a different method of riding over, and nearly every horse will require different handling under similar circumstances. It will therefore be seen that much depends on the rider having good hands. This qualification, though generally understood, is difficult to define. A rider with good hands never depends upon his reins for retaining his seat; nor does he pull at the horse's mouth so as to make him afraid to go up to his bit; nor again does he ever use more force than is necessary for the accomplishment of what he desires to perform. But besides all this, there is an unaccountable sympathetic something about the man with good hands that cannot be described. Pullers appear to renounce pulling, refusers take to jumping and clumsy horses become nearly as handy as a trick horse in a circus. Though hands can to a great extent be acquired by care and practice, yet in the highest form this is a gift and cannot be learned.

There are different kinds of "fences," as all obstacles are generically called. First, there is timber, such as gates, stiles and rails; the first two are, nine times out of ten, awkward jumps, as the take off is either poached by cattle, or else is on the ascent or descent. Hedges vary according to the custom of the country in which they are found: they either grow in the soil of the field, and are protected by a ditch on one side, or are planted on a bank with a ditch on one side or sometimes on both. Then again there are such large banks as are found in Wales, Devon and Cornwall. Lastly come water jumps, which are met with in two forms: the water is either within an inch or two of the top of the bank, so as to be about on a level with the field through which it flows, or there may be a space of some 6 or 7 ft. from the bank to the water. For the successful negotiation of brooks a bold horse is required, ridden by a bold man. No fence that is ever encountered stops such a large proportion of the field as water; even a clear 6 ft. of it will prove a hindrance to some, while anything over 10 or 12 ft. will in general be crossed only by a very few. Some horses, good performers over any description of fence, will not jump water under any circumstances; while the chance of a ducking deters many from riding at it; and, however bold the horse may be, he will soon refuse water if his rider be perpetually in two minds when approaching it.

The pace at which a hunter should be ridden at his fences depends upon the nature of the fence, and the peculiarities of each individual horse. With some very good jumpers—they can hardly be called good hunters—to steady them is to bid for a fall, while with some very clever hunters to hurry them is to bring them to grief. With ordinary horses, however, it is a good general rule to ride at fences of all descriptions as slowly as the nature of the obstacle admits. In grass countries, where "flying fences" are found, the rate of speed must of necessity be quicker than when about to take a Devonshire bank of some 7 ft. high, but even at a flying fence the rider should steady his horse so as to contract the length of his stride, in order that he may measure the distance for taking off with greater accuracy. Flying fences consist of a hedge with or without a post and rail, and with or without a ditch on one or both sides; consequently a horse has to jump both high and wide to clear them. But in jumping a gate, or a flight of rails, as ordinarily situated, there is no width to be covered, and to make a horse go through the exertion of jumping both high and wide when he need only do one is to waste his power, added to which to ride fast at timber, unless very low with a ditch on the landing side, is highly dangerous.

All hedges on banks, banks and doubles must be ridden at slowly; they are usually of such a size as to make flying them impossible, or at least undesirable. Horses jump them on and off, and in taking them at a moderate pace there is a chance of stopping on the top and choosing a better place to jump from, or, if needs be, of returning and taking the fence at another place. Cramped places will have to be jumped from a walk or even at a stand; for instance, a tree may be in a line with and close to the only practicable place in a fence; it then becomes necessary to go round the tree before a run at the place can be managed. So, too, with places that have to be crawled over between trees, or with dykes to be crawled down.

In jumping an ordinary hedge or ditch at moderate speed, there is of course a moment of time during which the horse is on his hind legs, and in theory the rider should then lean forward, but in practice, this position is so momentary, and the lash out of the hind legs in the spring is so powerful, that it is best not to lean forward at all, because of the difficulty, if not impossibility, of getting back in time for the reverse movement, when the rider should be preparing to render the horse some assistance with the bridle as his feet touch the ground.

When a line of willows indicates the whereabouts of a brook, the horse should be well collected, a clear place selected, so far as circumstances allow, and the pace increased, though in short strides, up to the very brink. If the hounds jump at the brook, even though they fail to clear it, the rider may take it for granted that at that place the leap is within the capacity of any ordinary hunter in his stride; hence if, when going at three parts speed, a horse's feet come just right to take off, the mere momentum of his body would take him over a place 15 ft. wide.

The experience of a single day's hunting will teach the novice that gates are far oftener opened than jumped; it is therefore necessary that a hunter should be handy at opening them. Many accidents have arisen from horses rushing through a gateway directly the latch is released, or from their jumping a gate at which they have been pulled up to enable the rider to open it. The horse should be taught to obey the leg as well as the hand, and, by a slight pressure of the leg, should throw his haunches round to the left or right as occasion may require.

Racing (see also HORSE-RACING).—The qualities possessed by a good jockey, either on the flat or across country, show the value of early instruction in riding. After having been some time in a training stable, a lad is put on a quiet horse at exercise; his stirrups are adjusted, and the reins knotted for him at a proper length. He subsequently rides other horses, each with some peculiarity perhaps, and, to keep his place in the string, a sluggard must be kept going, and an impetuous one restrained; they cannot both be ridden alike, but they must both be ridden as a jockey should ride them. In this way the lad learns the principle of holding a puller, getting pace out of a lazy one, and leaving well alone with a nice free but temperate mover; he learns to do everything in a horsemanlike manner, and when he has raised himself to the pitch of a "fashionable" jockey, he will frequently be called upon to ride several horses a day at race meetings. A jockey must therefore, more than any other civilian rider, have a hand for all sorts of horses, and in the case of two and three year olds a very good hand it must be. The same ability to adapt himself to circumstances must be possessed by the steeple-chase jockey, who should possess fine hands to enable him to handle his horse while going at his fences at three-quarter speed. In most details the nearer a hunting man approaches to a steeple-chase jockey the better; but in the matter of the seat it must be remembered that a jockey's exertions last but a few minutes, while none can tell when the hunting man may finish his day's work; the jockey can therefore ride with more absolute grip during his race than the rider to hounds.

See also HORSEMANSHIP; HUNTING; CAVALRY; RACING AND STEEPLE-CHASE; and POLO.

RIDINGS are the three districts into which from ancient times Yorkshire has been divided for administrative purposes. Formerly there were similar districts in Lindsey in Lincolnshire. The word riding was originally written as *thrithing* or *thriding*, but the initial *th* has been absorbed in the final *th* or *t* of the words north, south, east and west, by which it was normally preceded. Ridings are Scandinavian institutions. In Iceland the third part of a *thing* which corresponds roughly to an English county was called *thrithjungr*; in Norway, however, the *thrithjungr* seems to have been an ecclesiastical division. According to the 12th-century compilation known as the "laws of Edward the Confessor," the riding was the third part of a county (*provincia*); to it causes were brought which could not be determined in the wapentake, and a matter which could not be determined in the riding was brought into the court of the shire. There is abundant evidence that riding courts were held after the Norman Conquest. A charter which Henry I. granted to the Church of St Peter's at York mentions wapentacmot, tridingmot and shiresmot, and exemptions from suit to the thriding or riding may be noticed frequently in the charters of the Norman kings. As yet, however, the jurisdiction and functions of these courts have not been ascertained. It seems probable from the silence of the records that they had already fallen into disuse early in the 13th century.

Each of the ridings of Yorkshire has its own lord lieutenant and commission of the peace, and under the Local Government Act of 1888 forms a separate administrative county. They are distinguished as the north, east and west ridings, but the ancient divisions of Lindsey were known as the north, south and west ridings respectively.

See Felix Liebermann, *Die Gesetze der Angelsachsen* (Halle, 1888–89); William Stubbs, *Constitutional History of England*; Richard Cleasby, *Icelandic Dictionary; New English Dictionary*; and William Dugdale, *Monasticon Anglicanum*, vol. vi., edited by John Caley and others (1846). (G. J. T.)

RIDLEY, NICHOLAS (*c.* 1500–1555), English bishop and martyr, was descended from an old Northumberland family. The second son of Christopher Ridley of Unthank Hall, near Willemoteswick, in that county, he was born in the beginning of the 16th century. From a school at Newcastle-on-Tyne he was sent about 1518 to Pembroke Hall, Cambridge, being supported there by his uncle, Dr Robert Ridley (d. 1536), and specially distinguishing himself in Greek. Having graduated M.A. in 1526, he went to study at the Sorbonne in Paris and at Louvain, and on his return to Cambridge he was appointed junior treasurer of his college. In 1534 he was one of the university proctors, and he signed the decree of the university against the jurisdiction of the pope in England. About this time Ridley, who was now chaplain to the university, began to distinguish himself as an orator and a disputant, and to show leanings to the reformed faith. Having proceeded B.D. in 1537, he was appointed by Thomas Cranmer, archbishop of Canterbury, one of his chaplains, and in April 1538 the same prelate instituted him to the vicarage of Herne in Kent. In 1540 he was chosen master of Pembroke Hall; in 1541 he became chaplain to Henry VIII. and canon of Canterbury. In 1543 he was accused of heretical teaching and practices, but he managed to allay the suspicions of the royal commissioners, although just after his exculpation he finally abandoned the doctrine of transubstantiation.

In 1547 Ridley was presented by his college to the Cambridgeshire living of Soham, and in September of the same year he was nominated bishop of Rochester. Edward VI. was now on the throne and the new bishop was in high favour. He was one of the visitors who were appointed to establish protestantism in the university of Cambridge; in 1548 he helped to compile the English prayer book; and in 1549 he was one of the commissioners who examined Bishops Gardiner and Bonner. He concurred in their deprivation and succeeded Bonner in the see of London. Having signed the letters patent settling the English crown on Lady Jane Grey, Ridley, in a sermon preached at St Paul's cross on the 9th of July 1553, affirmed that the princesses Mary and Elizabeth were illegitimate and that the succession of the former would be disastrous to the religious interests of England. When Lady Jane's cause was lost, however, he went to Framlingham to ask Queen Mary's pardon, but at once he was arrested and sent to the Tower of London. From his prison he wrote in defence of his religious opinions, and early in 1554 he, with Cranmer and Latimer, was sent to Oxford to be examined. He defended himself against a number of divines, but was declared a heretic, and this was followed by his excommunication. He refused to recant, and in October 1555 he was tried for heresy under the new penal laws, being degraded and sentenced to death. With Cranmer and Latimer he met his end at the stake in Oxford on the 16th of October 1555.

Ridley was a voluminous writer, but many of his writings have been lost. The *Works of Nicholas Ridley D.D.* were edited for the Parker Society by the Rev. Henry Christmas in 1841. His *Life* was written by Dr Gloucester Ridley in 1763, and there is a memoir of him in H. C. G. Moule's edition of the bishops' *Declaration of the Lord's Supper* (1895). See also John Foxe's *Acts and Monuments* (new ed., 1877); J. Strype's *Memorials of Cranmer* (new ed., Oxford, 1840); G. Burnet's *History of the Reformation* (new ed., Oxford, 1865); J. A. Froude's *History of England* (1881 fol.); and J. Lingard's *History of England* (1854–55).

RIDOLFI, or RIDOLFO, **ROBERTO DI** (1531–1612), Italian conspirator, belonged to a famous family of Florence, where he was born on the 18th of November 1531. As a banker he had business connexions with England, and about 1555 he settled in London, where he soon became a person of some importance, and consorted with William Cecil and other prominent men. During the early years of Elizabeth's reign he began to take a more active part in politics, associating with the discontented Roman Catholics in England and communicating with their friends abroad. In 1570 he set to work on the plot against the queen which is usually associated with his name. His intention was to marry Mary, queen of Scots, to the duke of Norfolk and to place her on the English throne. With the aid of John Lesley, bishop of Ross, he gained the consent of these high personages to the conspiracy, and then in 1571 he visited the duke of Alva at Brussels, Pius V. at Rome, and Philip II. at Madrid to explain to them his scheme and to gain their active assistance thereto. His messenger, by name Charles Baillie (1542–1625), was, however, seized at Dover, and in other ways the English government heard of the intended rising. Consequently, Norfolk and Lesley were arrested, the former being condemned to death in January 1572. Ridolfi, who was then in Paris, could do nothing when he heard this news, and his scheme collapsed. Afterwards he served the pope, but much of his later life was spent in Florence, where he became a senator and where he died on the 18th of February 1612.

RIEGER, PHILIPP FRIEDRICK VON (1818–1903), Bohemian politician and publicist, was born on the 18th of December 1818 at Semil in the circle of Jičin, Bohemia. He first came into prominence as one of the Czech leaders in the revolution of 1848. He was returned by seven constituencies to the *Reichstag* at Vienna, where he was the leader of the Czech party. In 1853 he married a daughter of the historian Palacky. In 1858 he started the *Slovnik naučny*, the Czech national encyclopaedia, the first volume of which was published in 1859, the 11th and last in 1874. He was also instrumental in founding the first Czech political daily newspaper published in Prague, which appeared on the 1st of January 1861, and of which he was for awhile the editor. After the issue of the "October diploma" of 1860, Rieger, with his father-in-law, Palacky, undertook the leadership of the reconstituted Czech party, and after the decision of this party in 1863 no longer to attend the Austrian *Reichsrath*, he led the agitation in favour of the restoration of the Bohemian kingdom. In 1871 he conducted the negotiations with the Hohenenwarth ministry for a federal constitution of the empire, which broke down owing to his extreme attitude in the matter of Bohemian independence. On the reappearance of the Czechs in the Bohemian diet (1878) and the Austrian *Reichsrath* (1879) Rieger was one of the leaders of the federalist majority supporting Count Taaffe's government and the chief of the so-called "Old Czechs." On his seventieth birthday (December 10, 1888) he received a national gift of 100,000 gulden; but, in spite of this evidence of his popularity, his conservatism, his close connexion with the Bohemian nobility and his clerical tendencies brought him into conflict with the growing influence of the radical "Young Czech" party, and in 1891, together with the other "Old Czechs," he was defeated at the poll. In March 1897 he was created a baron (*Freiherr*) and given a seat in the Upper House. He continued occasionally to interfere in politics; but his influence was now at an end, though when he died, on the 3rd of March 1903, his funeral at Prague was made the occasion of a magnificent demonstration of respect.

RIEGO NUÑEZ, RAFAEL DEL (1784–1823), Spanish army officer, who has the melancholy distinction of having begun the long series of political military mutinies—*pronunciamientos*—in Spain, was born at Santa Maria de Tuna in Asturias on the 2nd of April 1784. He was educated for the legal profession at Oviedo, and passed the necessary examinations. But in 1807 he enlisted in the guard. When the French invasion took place in 1808 he was employed by the junta of Asturias and placed in command of a newly raised battalion. He was taken prisoner at the battle of Espinosa de los Monteros, on the 10th and 11th of November 1808, and was sent to France. During his years of imprisonment he, like many others of his countrymen, was converted to liberalism on the French model. Riego had the good fortune to escape and to reach England after various wanderings in Switzerland and Germany. In England he was incorporated with other rescued or escaped Spaniards, in a corps equipped by the British government, and was sent to Spain in 1814. He continued in service as a military officer, and was commandant of the second battalion of the regiment "Asturias," which formed part of the army collected at Cadiz to be sent to South America in 1819. Service in America was unpopular with the soldiers, and there was much discontent in the country with the government of King Ferdinand VII. A conspiracy was formed among the officers to use the army for the purpose of forcing the king to grant a constitution. They were betrayed by a general who at first professed to sympathize with them, and many were arrested. Riego was apparently not suspected, and he decided to act on his own account. On New Year's Day 1820 he made his *pronunciamiento* with his regiment at the village of Cabezas de San Juan. He proclaimed for the constitution drawn up by the Cortes in 1812, which was unworkable, and which the chiefs of the conspiracy did not propose to restore. He hoped to seize Cadiz, but it was held by a loyal officer, and for a time no popular movement took place. Riego now started on a revolutionary propaganda through Andalusia at the head of his regiment. The country proved hostile or at the best indifferent. His following gradually melted away, and he was about to flee to Portugal when Galicia revolted. The rebellion extended rapidly, and the king was compelled to yield. When the liberals were in possession of power they would gladly have kept Riego in a subordinate place. But he came to the capital, where he was soon the most popular spokesman of the extreme parties. There he discredited himself by his vanity, and shocked even the populace of Madrid by appearing drunk at the theatre. He was at last persuaded to accept the military command in Aragon, which he thought below his merits. He began intrigues and agitations. The government was strong enough to put him under arrest at Lérida. When the new Cortes was elected in 1822, he was chosen deputy for his native city Oviedo, and the radicals selected him as president of the chamber on the 17th of February 1823. The unceasing intrigues of the king, the incapacity of the moderate parties and the hysterical excitement of the mob combined to make anarchy worse daily. Riego was the noisiest shouter of all. When the French intervention took place, he helped to carry the king to Cadiz, and he fought a few unsuccessful skirmishes with the invaders. He was at last captured at a farmhouse near Arguillos in the province of Jaen. Unfortunately for him, he fell into the hands of the royalist volunteers, by whom he was carried to the capital. On his way he was repeatedly mobbed and had many narrow escapes from being torn to pieces. He was hanged at Madrid in the Plaza de la Cebada on the 7th of November 1823. At the end he professed abject repentance for his impiety and disloyalty. The popular revolutionary tune of Spain, the "himno de Riego," is named after him, and his picture is hung in the Cortes, but he was a poor creature, and a bad example of the light-headed military agitators who have caused Spain much misery.

H. Baumgarten, *Geschichte Spaniens* (Berlin, 1865–1871).

RIEHM, EDUARD KARL AUGUST (1830–1888), German Protestant theologian, was born at Diersburg in Baden on the 20th of December 1830. He studied theology and philology at Heidelberg and later at Halle under Hermann Hupfeld, who persuaded him to include Arabic, Syriac and Egyptian. Entering the ministry in 1853, he was made vicar at Durlach soon afterwards, and became a licentiate in the theological faculty at Heidelberg. In 1854 he was appointed garrison-preacher at Mannheim; and in 1858 he was licensed to lecture at Heidelberg, where in 1861 he was made professor extraordinarius. In 1862 he obtained a similar post at Halle, and in 1866 was promoted to the rank of professor ordinarius. Throughout his life he followed Hupfeld's plan in his scientific treatment of the Old Testament—that of reconciling the results of a free criticism with a belief in divine revelations. His practical experience of pastoral work also proved of service to him when he became a professor of theology, for "if there is one quality more striking than another in the writings of Riehm, it is that of sympathy with orthodox believers" (T. K. Cheyne). In 1865 Riehm was made a member of the commission for the revision of Luther's translation of the Bible, and became one of the editors of the quarterly review, *Theologische Studien und Kritiken.* He died on the 5th of April 1888.

His works include: *Die Gesetzgebung Mosis im Lande Moab* (1854), in which the Deuteronomic law book is assigned to the second half of the reign of Manasseh; *Der Lehrbegriff des Hebräerbriefs* (1858–59, 2nd ed. 1867); Hermann Hupfeld, *Lebens-und Charakterbild eines deutschen Professors* (1867); *Die Messianische Weissagung* (1875, 2nd ed. 1883; Eng. trans. 1890); *Religion und Wissenschaft* (1881); and the well-known *Handwörterbuch des biblischen Altertums* (2 vols., 1884; 2nd. ed. revised by F. Baethgen, 1892–94). After his death were published the *Einleitung in das Alte Testament* (1889, ed. by A. Brandt), in which the date of the Deuteronomic law book is placed earlier than in his book on the legislation of Moses—shortly before or at the beginning of the reign of Hezekiah; and his *Alttestamentliche Theologie* (1889, ed. by Pahncke). See Herzog-Hauck, *Realencyklopädie*, and T. K. Cheyne, *Founders of Old Testament Criticism.*

RIEL, LOUIS (1844–1885), Canadian agitator, son of Louis Riel and Julie de Lagemaundière, was born at St Boniface, on the 23rd of October 1844, according to his own account, though others place his birth in 1847. Though known as a half-breed, or Métis, and though with both Indian and Irish ancestors, his blood was mainly French. From July 1866 he worked for two years at various occupations in Minnesota, returning in July 1868 to St Vital, near St Boniface. In 1869 the transfer of the territorial rights of the Hudson's Bay Company to the dominion of Canada gave great uneasiness to the Métis, and in October 1869 a party led by Riel turned back at the American frontier the newly appointed Canadian governor; in November they captured Fort Garry (Winnipeg), the headquarters of the Company, and called a convention which passed a bill of rights. In December a provisional government was set up, of which on the 29th of December Riel was made president, and which defeated two attacks made on it by the English-speaking settlers of the vicinity. So far the Métis had been within their rights, but Riel was flighty, vain and mystical, and his judicial murder on the 4th of March 1870 of Thomas Scott, an Orangeman from Ontario, roused against him the whole of English-speaking Canada. An expedition was equipped and sent out under Colonel Garnet, later Lord, Wolseley, which captured Fort Garry on the 24th of August 1870, Riel decamping. (See STRATHCONA, LORD.) He was not arrested, and on the 4th of August 1871 urged his countrymen to combine with the Canadians against a threatened attack from American Fenians, for which good service he was publicly thanked by the lieutenant-governor. In 1872 for religious reasons he changed his name to Louis David Riel. In October 1873 he became member of the Dominion parliament for Provencher, came to Ottawa and took the oath, but did not sit. On the 16th of April 1874 he was expelled the House, but in September was again elected for Provencher; on the 10th of February 1875 he was outlawed, and the seat thereby again vacated. In 1877–78 he was for over a year a patient in the Beauport asylum for the insane, but from 1879 to 1884 he lived quietly in Montana, where in 1881 he married Marguerite Bellimeure. In 1884 in response to a deputation from the Métis, who had moved west to the forks of the Saskatchewan river, he returned to Canada to win redress for their wrongs. His own rashness and the ineptitude of Canadian politicians and officials brought on a rising, which was crushed after some hard fighting, and on the 15th of May 1885 Riel surrendered. He was imprisoned at Regina, was tried and on the 1st of August found guilty of treason, and on the 16th of November was hanged at Regina, meeting his fate with courage. His death was the signal for a fierce outburst of racialism in Quebec and Ontario, which nearly overthrew the Conservative government of the Dominion.

See J. S. Willison, *Sir Wilfrid Laurier*, vol. i.; George Bryce, *History of the Hudson's Bay Company* (1900); and the Canadian daily press for 1885.

RIEMANN, GEORG FRIEDRICH BERNHARD (1826–1866), German mathematician, was born on the 17th of September

1826, at Breselenz, near Dannenberg in Hanover. His father, Friedrich Bernhard Riemann, came from Mecklenburg, had served in the war of freedom, and had finally settled as pastor in Quickborn. Here with his five brothers and sisters Riemann spent his boyhood and received, chiefly from his father, the elements of his education. He showed at an early age well-marked mathematical powers, and his progress was so rapid in arithmetic and geometry that he was soon beyond the guidance not only of his father but of schoolmaster Schulz, who assisted in the mathematical department of his training.

In 1840 he went to Hanover, where he attended the lyceum, and two years later he entered the Johanneum at Lüneburg. The director, Schmalfuss, encouraged him in his mathematical studies by lending him books (among them Leonhard Euler's works and Adrien Marie Legendre's *Theory of Numbers*), which Riemann read, mastered and returned within a few days. In 1846 Riemann entered himself as a student of philology and theology in the university of Göttingen. This choice of a university career was dictated more by the natural desire of his father to see his son enter his own profession, and by the poverty of his family, than by his own preference. He attended lectures on the numerical solution of equations and on definite integrals by M. A. Stern, on terrestrial magnetism by Goldschmidt, and on the method of least squares by K. F. Gauss. It soon became evident that his mathematical studies, undertaken at first probably as a relaxation, were destined to be the chief business of his life. He proceeded in the beginning of 1847 to Berlin, attracted thither by that brilliant constellation of mathematical genius whose principal stars were P. G. L. Dirichlet, C. G. J. Jacobi, J. Steiner and F. G. M. Eisenstein. He appears to have attended Dirichlet's lectures on theory of numbers, theory of definite integrals, and partial differential equations, and Jacobi's on analytical mechanics and higher algebra. It was during this period that he first formed those ideas on the theory of functions of a complex variable which led to most of his great discoveries. One stirring social incident at least marked this part of his life, for, during the revolutionary insurrection in March 1848, the young mathematician, as a member of a company of student volunteers, kept guard in the royal palace from 9 o'clock on the morning of the 24th of March till 1 o'clock on the afternoon of the following day.

In 1850 he returned to Göttingen and began to prepare his doctor's dissertation, busying himself meanwhile with "Naturphilosophie" and experimental physics. This double cultivation of his scientific powers had the happiest effect on his subsequent work; for the greatest achievements of Riemann were effected by the application in pure mathematics generally of a method (theory of potential) which had up to this time been used solely in the solution of certain problems that arise in mathematical physics.

In November 1851 he obtained his doctorate, the thesis being "Grundlagen für eine allgemeine Theorie der Functionen einer veränderlichen complexen Grösse." This memoir excited the admiration of Gauss, and at once marked its author's rank as a mathematician. The fundamental method of research which Riemann employed has just been alluded to; the results will be best indicated in his own words:—

> "The methods in use hitherto for treating functions of a complex variable always started from an expression for the function as its definition, whereby its value was given for every value of the argument; by our investigation it has been shown that, in consequence of the general character of a function of a complex variable, in a definition of this sort one part of the determining conditions is a consequence of the rest, and the extent of the determining conditions has been reduced to what is necessary to effect the determination. This essentially simplifies the treatment of such functions. Hitherto, in order to prove the equality of two expressions for the same function, it was necessary to transform the one into the other, *i.e.* to show that both expressions agreed for every value of the variable; now it is sufficient to prove their agreement to a far less extent" [merely in certain critical points and at certain boundaries].

The time between his promotion to the doctorate and his habilitation as *Privatdozent* was occupied by researches undertaken for his Habilitationsschrift, by "Naturphilosophie," and by experimental work. The subject he had chosen for his Habilitationsschrift was the "Representation of a Function by Means of a Trigonometrical Series," a subject which Dirichlet had made his own by a now well-known series of researches. It was fortunate, no doubt, for Riemann that he had the kind advice and encouragement of Dirichlet himself, who was then on a visit at Göttingen during the preparation of his essay; but the result was a memoir of such originality and refinement as showed that the pupil was fully the equal of the master. Of the customary three themes which he suggested for his trial lecture, that "On the Hypotheses which form the Foundation of Geometry" was chosen at the instance of Gauss, who was curious to hear what so young a man had to say on this difficult subject, on which he himself had in private speculated so profoundly (see GEOMETRY, NON-EUCLIDIAN).

In 1855 Gauss died and was succeeded by Dirichlet, who along with others made an effort to obtain Riemann's nomination as extraordinary professor. In this they were not successful; but a government stipend of 200 thalers was given him, and even this miserable pittance was of great importance, so straitened were his circumstances. But this small beginning of good fortune was embittered by the deaths of his father and his eldest sister, and by the breaking up of the home at Quickborn. Meantime he was lecturing and writing the great memoir (*Borchardt's Journal*, vol. liv., 1857) in which he applied the theory developed in his doctor's dissertation to the Abelian functions. It is amusing to find him speaking jubilantly of the unexpectedly large audience of eight which assembled to hear his first lecture (in 1854) on partial differential equations and their application to physical problems.

Riemann's health had never been strong. Even in his boyhood he had shown symptoms of consumption, the disease that was working such havoc in his family; and now under the strain of work he broke down altogether, and had to retire to the Harz with his friends Ritter and R. Dedekind, where he gave himself up to excursions and "Naturphilosophie." After his return to Göttingen (November 1857) he was made extraordinary professor, and his salary raised to 300 thalers. As usual with him, misfortune followed close behind; for he lost in quick succession his brother Wilhelm and another sister. In 1859 he lost his friend Dirichlet; but his reputation was now so well established that he was at once appointed to succeed him. Well-merited honours began to reach him; and in 1860 he visited Paris, and met with a warm reception there. He married Elise Koch in June 1862, but the following month he had an attack of pleurisy which proved the beginning of a long illness that ended only with his death. His physician recommended a sojourn in Italy, for the benefit of his health, and Weber and Sartorius von Waltershausen obtained from the government leave of absence and means to defray the cost of the journey. At first it seemed that he would recover; but on his return in June 1863 he caught cold on the Splügen Pass, and in August of the same year had to go back to Italy. In November 1865 he returned again to Göttingen, but, although he was able to live through the winter, and even to work a few hours every day, it became clear to his friends, and clearest of all to himself, that he was dying. In order to husband his few remaining days he resolved in June 1866 to return once more to Italy. Thither he journeyed through the confusion of the first days of the Austro-Prussian War, and settled in a villa at Selasca near Intra on Lago Maggiore. Here his strength rapidly ebbed away, but his mental faculties remained brilliant to the last. On the 19th of July 1866 he was working at his last unfinished investigation on the mechanism of the ear. The day following he died. Few as were the years of work allotted to him, and few as are the printed pages covered by the record of his researches, his name is, and will remain, a household word among mathematicians. Most of his memoirs are masterpieces—full of original methods, profound ideas and far-reaching imagination.

The collected works of Riemann were published by H. Weber, assisted by R. Dedekind (8vo, Leipzig, 1876; 2nd ed., 1892).

At the end of this volume there is a touching account of his life by the latter. (G. Ch.)

RIENZI, COLA DI (*c.* 1313–1354), tribune of the Roman people, was born in Rome, being the son of a tavern-keeper named Lorenzo Gabrini. His father's Christian name was shortened to Rienzo, and his own, Nicholas, to Cola; hence the Cola di Rienzi, or Rienzo, by which he is generally known. His early years were passed at Anagni. Having devoted much time to the study of the Latin writers, historians, orators and poets, and filled his mind with stories of the glories and the power of ancient Rome, he turned his thoughts to the task of restoring his native city to its pristine greatness, his zeal for this work being quickened by the desire to avenge his brother, who had been killed by a noble, a member of the ruling class. He became a notary and a person of some importance in the city, and was sent in 1343 on a public errand to Pope Clement VI. at Avignon. He discharged his duties with ability and success, and although the boldness with which he denounced the aristocratic rulers of Rome drew down upon him the enmity of powerful men, he won the favour and esteem of the pope, who gave him an official position at his court. Returning to Rome about April 1344 he worked for three years at the great object of his life, the restoration of the city to its former position of power. He gathered together a band of supporters, plans were drawn up, and at length all was ready for the rising. On the 19th of May 1347 heralds invited the people to a parliament on the Capitol, and on the 20th, the day being Whit-Sunday, the meeting took place. Dressed in full armour and attended by the papal vicar, Cola headed a procession to the Capitol; here he addressed the assembled crowd, speaking "with fascinating eloquence of the servitude and redemption of Rome." A new series of laws was published and accepted with acclaim, and unlimited authority was given to the author of the revolution. Without striking a blow the nobles left the city or went into hiding, and a few days later Rienzi took the title of tribune (*Nicholaus, severus et clemens, libertatis, pacis justiciaeque tribunus, et sacre Romane Reipublice liberator*).

His authority quickly and quietly accepted by all classes, the new ruler governed the city with a stern justice which was in marked contrast to the recent reign of licence and disorder. In great state the tribune moved through the streets of Rome, being received at St Peter's with the hymn *Veni Creator spiritus*, while in a letter the poet Petrarch urged him to continue his great and noble work, and congratulated him on his past achievements, calling him the new Camillus, Brutus and Romulus. In July in a sonorous decree he proclaimed the sovereignty of the Roman people over the empire, but before this he had set to work upon his task of restoring the authority of Rome over the cities and provinces of Italy, of making the city again *caput mundi*. He wrote letters to the cities of Italy, asking them to send representatives to an assembly which would meet on the 1st of August, when the formation of a great federation under the headship of Rome would be considered. On the appointed day a number of representatives appeared, and after some elaborate and fantastic ceremonials Rienzi, as dictator, issued an edict citing the emperor Louis the Bavarian and his rival Charles, afterwards the emperor Charles IV., and also the imperial electors and all others concerned in the dispute, to appear before him in order that he might pronounce judgment in the case. On the following day the festival of the unity of Italy was celebrated, but neither this nor the previous meeting had any practical result. Rienzi's power, however, was recognized in Naples, whence both Queen Joanna and her bitter foe, King Louis of Hungary, appealed to him for protection and aid, and on the 15th of August he was crowned tribune with great pomp, wreaths of flowers being placed on his head. Gregorovius says this ceremony "was the fantastic caricature in which ended the imperium of Charles the Great. A world where political action was represented in such guise was ripe for overthrow, or could only be saved by a great mental reformation." He then seized, but soon released, Stephen Colonna and some other barons who had spoken disparagingly of him. But his power was already beginning to wane. His extravagant pretensions only served to excite ridicule. His government was costly, and to meet its many expenses he was obliged to lay heavy taxes upon the people. He offended the pope by his arrogance and pride, and both pope and emperor by his proposal to set up a new Roman empire, the sovereignty of which would rest directly upon the will of the people. In October Clement gave power to a legate to depose him and bring him to trial, and the end was obviously in sight. Taking heart, the exiled barons gathered together some troops, and war began in the neighbourhood of Rome. Rienzi obtained aid from Louis of Hungary and others, and on the 20th of November his forces defeated the nobles in a battle just outside the gates of Rome, a battle in which the tribune himself took no part, but in which his most distinguished foe, Stephen Colonna, was killed. But this victory did not save him. He passed his time in feasts and pageants, while in a bull the pope denounced him as a criminal, a pagan and a heretic, until, terrified by a slight disturbance on the 15th of December, he abdicated and fled from Rome. He sought refuge in Naples, but soon he left that city and spent over two years in an Italian mountain monastery.

Emerging from his solitude Rienzi journeyed to Prague, which he reached in July 1350, and threw himself upon the protection of the emperor Charles IV. Denouncing the temporal power of the pope he implored the emperor to deliver Italy, and especially Rome, from their oppressors; but, heedless of his invitations, Charles kept him in prison for more than a year in the fortress of Raudnitz, and then handed him over to Clement, who had been clamouring for his surrender. At Avignon, where he appeared in August 1352, Rienzi was tried by three cardinals, and was sentenced to death, but this judgment was not carried out, and he remained in prison in spite of appeals from Petrarch for his release. Freedom, however, was at hand. In December 1352 Clement died, and his successor, Innocent VI., anxious to strike a blow at the baronial rulers of Rome, and seeing in the former tribune an excellent tool for this purpose, pardoned and released his prisoner. Giving him the title of senator, he sent him to Italy with the legate, Cardinal Albornoz, and having collected a few mercenary troops on the way, Rienzi entered Rome in August 1354. He was received with great rejoicings and quickly regained his former position of power. But this latter term of office was destined to be even shorter than his former one had been. Having vainly besieged the fortress of Palestrina, he returned to Rome, where he treacherously seized the soldier of fortune, Fra Monreale, who was put to death, and where, by other cruel and arbitrary deeds, he soon lost the favour of the people. Their passions were quickly aroused and a tumult broke out on the 8th of October. Rienzi attempted to address them, but the building in which he stood was fired, and while trying to escape in disguise he was murdered by the mob. Rienzi was the hero of one of the finest of Petrarch's odes, *Spirito gentil*, and also of some beautiful verses by Lord Byron. He was a man of vivid, but disordered, imagination, without possessing any conception of statesmanship. In 1887 a statue of the tribune was erected at the foot of the Capitoline Hill in Rome.

Rienzi's life and fate have formed the subject of a famous novel by Bulwer Lytton, of an opera by Wagner and of a tragedy by Julius Mosen. His letters, edited by A. Gabrielli, are published in vol. vi. of the *Fonti per la storia d'Italia* (Rome, 1890). See also Papencordt, *Cola di Rienzo und seine Zeit* (Hamburg, 1841); Auriac, *Étude historique sur N. Rienzi* (Amiens, 1885); E. Rodocanachi, *Cola di Rienzi* (Paris, 1888); Kühn, *Die Entwickelung der Bündnispläne Cola di Rienzos im Jahre 1347* (Berlin, 1905); A. von Reumont, *Geschichte der Stadt Rom* (1867–70); and F. Gregorovius, *Geschichte der Stadt Rom im Mittelalter*, vol. vi. (Eng. trans., by A. Hamilton, 1898). (A. W. H.*)

RIESA, a town of Germany, in the kingdom of Saxony, pleasantly situated on the left bank of the Elbe, 30 m. N.W. of Dresden, on the main line of railway to Leipzig, and at the junction of lines to Chemnitz, Elsterwerda and Nossen. Pop. (1905) 14,073. The river is here crossed by a fine bridge, a sandstone and iron structure, carrying both railway and road, and replacing the one carried away by floods in 1875. The town contains two Evangelical churches, a castle, formerly a convent and now used as a town hall, and several schools. There is a harbour with quays and a dockyard, also rolling-mills and saw-mills, ironworks and sandstone quarries. Other industries are the manufacture of furniture, beer, soap, carriages and bricks. The most important shipping station on the Elbe in Saxony, Riesa is the lading-place for goods to and from Bavária, and a mart for herrings, petroleum, wood, coal and grain. A constant passenger steamboat communication is maintained with Meissen and Dresden; and, owing to the artillery practice ranges at Zeithain, on the right bank of the Elbe, Riesa has become of recent years one of the chief depots of the Saxon army. Riesa received municipal rights in 1632, and after a period of decay was again raised to the rank of a town in 1859.

RIESENER, JEAN HENRI (1734–1806), French cabinet-maker of the Louis XVI. period, was born at Gladbach near Cologne. At an early age he went to Paris, where he entered the workshop in the Arsenal of Jean François Oeben (*q.v.*). When that great master died, Riesener became foreman of the works; two years later he married Mme. Oeben, and in 1768 was admitted "maître-menuisier-ébéniste." His wife died in 1776, and in 1782 he espoused, as his second wife, Anne Grezel, daughter of a *bourgeois* of Paris. The union was unhappy, and when, under the first Republic, divorce was legalized, the marriage was dissolved. When Riesener contracted his first marriage he possessed little or nothing; his second contract of marriage recited that in cash and in the money due to him by Louis XVI. he was worth more than £20,000, without counting the finished work in hand, bronze models, jewels and personal effects and invested funds. Thus in fifteen years he had accumulated a fortune amounting in all to about £40,000. By that time there had been conferred upon him the title, formerly enjoyed by Oeben, of "Ébéniste du Roi." He died on the 6th of January 1806, in the Enclos des Jacobins, leaving an only son, Henri François (1767–1828), a distinguished portrait-painter of the First Empire. Riesener was unquestionably the greatest of the Louis Seize cabinet-makers. His name is stamped upon the Bureau du Roi in the Louvre, and although the original conception of that master-work was due to Oeben, it cannot be doubted that its consummate finish and perfect achievement must in great measure be attributed to the man who completed it. Occasionally there may, perhaps, be some lack of spontaneity in his forms, but his work is generally at once bold and graceful. His marquetry presents an extraordinary finish; his chiselled bronzes are of the first excellence. He was especially distinguished for his cabinets, in which he employed many European as well as exotic woods. Wreaths and bunches of flowers form the centres of the panels; on the sides are often diaper patterns in quiet colours. Yet despite his distinction as a maker of cabinets his high-water mark was reached in the Bureau du Roi, finished in 1769 and consequently belonging rather to the Louis Quinze than the Louis Seize period, and a not altogether dissimilar cylinder bureau believed to have been made for Stanislas Leszczynski, king of Poland, now in the Wallace Collection. Stanislas died in 1766, but the desk was not completed until February 20, 1769, as appears by the inscription accompanying the maker's signature. Upon its completion it passed into the possession of the French crown and was included in a sale of the royal furniture which took place in Holland. It was purchased by Sir William Hamilton, then British Minister at the Hague, and appears to have passed out of his hands when he left Naples, where it was purchased by Sir Richard Wallace. At Buckingham Palace there is a third bureau on the same lines. These pieces are triumphs of marquetry. They are inlaid with trophies of musical instruments, doves, bouquets and garlands of flowers; the bronze vases and "galleries" are exquisite—they may possibly be the work of Gouthière, but are more probably from the hands of Duplessis. For several years this great artist appears to have used the models of his master Oeben, but there was a gradual transition to a style more individual, more delicately conceived, with finer but hardly less vigorous lines. By the time he had been working alone for ten years he had completely embraced the Louis Seize manner—he had, perhaps, some responsibility for it. One of the most distinguished of his achievements for the court was the famous flat writing-table now at the Petit Trianon, for which he received only £200. The extent of these royal orders may be gauged from the fact that between 1775 and 1785 Riesener received 500,000 livres from the Garde Meubles, notwithstanding that during the whole of this period Gondouin the architect was the official designer of furniture for the royal palaces. Like so many other artists he was condemned in the end to sacrifice to the false taste of his day, and a certain number of his creations, otherwise delightful, were vitiated by being mounted with panels of Sèvres, Wedgwood and other china. The beautiful little secretaire in the Jones collection in the Victoria and Albert Museum suffers seriously by this lapse.

RIESENGEBIRGE (Bohemian *Krkonose*), or Giant Mountains, a lofty and rugged group on the boundary of Silesia and Bohemia, between the upper courses of the Elbe and the Oder. They form the highest portion of the Sudetic system which separates south-east Prussia from the Austrian empire, and finds its natural continuation towards the N.W. in the Erzgebirge, the Thuringian Forest and the Harz Mountains. Adjoining the Isergebirge and the Lausitzergebirge on the W., and the Eulengebirge and the Adlergebirge on the E. and S.E., the Riesengebirge proper run S.E. and N.W. between the sources of the Zacken and the Bober, for a distance of 23 m., with a breadth of 14 m. They cover an area of about 425 sq. m., three-fourths of which is in Austrian, and the remainder in Prussian territory. The boundary line follows the crest of the principal chain or ridge (Riesenkamm), which stretches along the northern side of the group, with an average height of over 4000 ft. The principal peaks are the Reifträger (4430 ft.), the Hohe Rad (4968 ft.), the Great Sturmhaube (4862 ft.), the Little Sturmhaube (4646 ft.), and, near the east extremity, the Schneekoppe or Riesenkoppe (5266 ft.), the loftiest mountain in northern or central Germany. Roughly parallel to this northern ridge, and separated from it by a long narrow valley known as the Siebengründe, there extends on the S. a second and lower chain, of broad massive "saddles," with comparatively few peaks. The chief heights here are Kesselkoppe (4708 ft.), the Krkonose (4849 ft.), the Ziegenrücken and the Brunnenberg (5072 ft.). From both ridges spurs of greater or less length are sent off at various angles, whence a magnificent view is obtained from Breslau to Prague; the lowlands of Silesia, watered by the Oder, and those of Bohemia, intersected by the Elbe and the Moldau, appearing to lie mapped in relief. The summit is crowned by a chapel dedicated to St Lawrence, which once also served as a traveller's shelter. Since 1850 the chapel has been restored to its religious use, and a hotel for the accommodation of tourists is built close by. A remarkable group of isolated columnar rocks are those known as the *Adersbacher Felsen* in a valley on the Bohemian side of the Riesengebirge, 9 m. W.N.W. of Braunau.

On its northern side this mountain group rises ruggedly and precipitously from the Hirschberg valley; but on its southern side its slope towards Bohemia is very much more gradual. The scenery is in general bold and wild. The Bohemian ridge is cleft about the middle by a deep gorge through which pour the headwaters of the river Elbe, which finds its source in the Siebengründe. The Iser, Bober, Aupa, Zacken, Queiss, and a great number of smaller streams also rise among these mountains or on their skirts; and small lakes and tarns are not unfrequent in the valleys. The Great and Little Schneegruben—two deep rocky gorge-like valleys in which snow remains all the year round—lie to the north of the Hohe Rad.

Nearly the whole of the Riesenkamm and the western portion of the southern chain are granite; the eastern extremity of the main ridge and several mountains to the south-east are formed of a species of gneiss; and the greater part of the Bohemian chain, especially its summits, consists of mica-slate. Blocks of these minerals lie scattered on the sides and ridges of the mountains and in the beds of the streams; and extensive turf moors occupy many of the mountain slopes and valleys. The lower parts of the Riesengebirge are clad with forests of oak, beech, pine and fir; above 1600 ft. only the last two kinds of trees are found, and beyond about 3950 ft. only the dwarf pine (*Pinus Pumilio*). Various alpine plants are found on the Riesengebirge, some of them having been artificially introduced on the Schneekoppe. Wheat is grown at an elevation of 1800 ft. above the sea-level, and oats as high as 2700 ft. The inhabitants of this mountain region, who are tolerably numerous, especially on the Bohemian side, live for the most part, not in villages, but in scattered huts called "Bauden." They support themselves by the rearing of cattle, tillage, glass-making and linen-weaving. Mining is carried on only to a small extent for arsenic, although there are traces of former more extensive workings for other metals.

The Riesengebirge has of late years been made easily accessible by railway, several branches from the main lines, both on the Silesian and Bohemian side, penetrating the valleys, and thus many spots in the Riesengebirge are a good deal frequented in the summer. The Schneekoppe and other summits are annually visited by a considerable number of travellers, notably the spas of Warmbrunn (near Hirschberg) and Flinsberg on the Gneis, and Görbersdorf, known as a climate health resort for consumptives. The Riesengebirge is the legendary home of Number Nip (Rübezahl), a half-mischievous, half-friendly goblin of German folklore, and various localities in the group are more or less directly associated with his name.

See Beemann's *Oratio de monte Giganteo* (Frankfort a. O. 1679); Daniel, *Deutschland*, vol. i. pp. 277–78; and Gebauer, *Länder- und Völkerkunde*, vol. i.

RIETI (anc. *Reate*), a city and episcopal see of Italy, in the province of Perugia, 25½ m. by rail and 15 m. direct S.S.E. of Terni, which is 70 m. by rail from Rome. Pop. (1901) 14,145 (town), 17,716 (commune). It occupies a fine position 1318 ft. above sea-level on the right bank of the Velino (a torrent subtributary to the Tiber), which at this point issues from the limestone plateau; the old town occupies the declivity and the new town spreads out on the level. While with its quaint red-roofed houses, its old town walls (restored about 1250), its castle, its cathedral (13th and 15th centuries), its episcopal palace (1283), and its various churches and convents Rieti has no small amount of medieval picturesqueness; it also displays a good deal of modern activity in vine and olive growing and cattle-breeding. The fertility of the neighbourhood is celebrated both by Virgil and by Cicero. A Roman bridge over the Turano, and the Palazzo Vincentini by Vignola deserve to be mentioned.

Reate was reached from Rome by the Via Salaria (*q.v.*), which may originally have ended there, and a branch road ran from it to Interamna. While hardly mentioned in connexion with the Punic or Civil Wars, Reate is described by Strabo as exhausted by these long contests. Its inhabitants received the Roman franchise at the same time with the rest of the Sabines (290 B.C.), but it appears as a praefectura and not as a municipium down to the beginning of the empire. It was never made a colonia, though veterans of the Praetorian guard and of the eighth (Augusta) and ninth legions were settled there by Vespasian, who belonged to a Reatine family and was born in the neighbourhood. For the contests of the Reatines with the people of Interamna see TERNI. In 1148 the town was besieged and captured by Roger I. of Sicily. In the struggle between church and empire it always held with the former; and it defied the forces of Frederick II. and Otho IV. Pope Nicholas IV. long resided at Rieti, and it was there he crowned Charles II. of Anjou king of the Two Sicilies. In the 14th century Robert, and afterwards Joanna, of Naples managed to keep possession of Rieti for many years, but it returned to the States of the Church under Gregory IX. About the year 1500, the liberties of the town, long defended against the encroachments of the popes, were entirely abolished. An earthquake in 1785 was in 1799 followed by the much more disastrous pillage of Rieti by the papal troops for a space of fourteen days.

RIETSCHEL, ERNST FRIEDRICH AUGUST (1804–1861), German sculptor, was born at Pulsnitz in Saxony. At an early age he became an art student at Dresden, and subsequently a pupil of Rauch in Berlin. He there gained an art studentship, and studied in Rome in 1827–28. After returning to Saxony he soon brought himself into notice by a colossal statue of Frederick Augustus, king of Saxony; was elected a member of the academy of Dresden, and thenceforth became one of the chief sculptors of his country. In 1832 he was elected to the Dresden professorship of sculpture, and had many foreign orders of merit conferred on him by the governments of different countries. He died at Dresden in 1861.

Rietschel's style was very varied; he produced works imbued with much religious feeling, and to some extent he occupied the same place as a sculptor that Overbeck did in painting. Other important works by him were purely classical in style. He was specially famed for his portrait figures of eminent men, treated with much idealism and dramatic vigour; among the latter class his chief works were colossal statues of Goethe and Schiller for the town of Weimar, of Weber for Dresden and of Lessing for Brunswick. He also designed the memorial statue of Luther for Worms, but died before he could carry it out. The principal among Rietschel's religious pieces of sculpture are the well-known Christ-Angel, and a life-sized Pietà, executed for the king of Prussia. He also worked a great deal in rilievo, and produced many graceful pieces, especially a fine series of bas-reliefs representing Night and Morning, Noon and Twilight, designed with much poetical feeling and imagination.

For a good biography of Rietschel and account of his works see Appermann, *Ernst Rietschel* (Leipzig, 1863). (J. H. M.)

RIEU, CHARLES PIERRE HENRI (1820–1902), Swiss Orientalist, was born at Geneva in 1820. He studied at Bonn University, where he received his doctor's degree in 1843. He entered the British Museum in 1847, and after twenty years of service, a new post, that of keeper of Oriental manuscripts, was created for him. He completed in 1871 the second part, dealing with Arabian MSS., of the *Catalogus codicum manuscriptorum orientalium*, which had been begun by William Cureton, and he issued a supplementary volume in 1894. He also drew up a *Catalogue of the Turkish Manuscripts* (1888) and a *Catalogue of the Persian Manuscripts* (4 vols., 1879–95), the latter being a storehouse of information on the books and their authors. In 1895 he was made professor of Arabic in the university of Cambridge in succession to Robertson Smith. He died in London on the 19th of March 1902.

RIEVAULX, a village in the North Riding of Yorkshire, England, 3 m. W. by N. of the small town of Helmsley, which is served by a branch of the North-Eastern railway. Here, exquisitely situated in a deep wooded valley, are the ruins of Rievaulx Abbey, a foundation by Walter l'Espec in 1131 for Cistercians. The principal remains are those of the cruciform church, mainly Early English in date, and of the finest workmanship. There are considerable fragments of the refectory, and all the important domestic buildings may be traced. A beautiful prospect over the ruins and the valley is seen from the terrace on the eastern flanking hill.

RIFFIANS, the name given to the Berbers of the Rîf district of Morocco, the mountain region bordering the north coast from Ceuta eastward nearly to the borders of Algeria and forming part of the Atlas range. The name, it has been suggested, is identical with Libyan or Lîbi. A peculiarity of the Rîf dialect is the change of the Arabic "l" to "r," and this would seem to support this derivation, "b" and "f" being interchangeable through "v." The Riffians are only nominally subject to the sultan of Morocco, against whose authority they are in constant revolt. They are typical Berbers in physique, tall, well made and muscular, with European features and fair skins bronzed by the sun. In morality they are singularly superior to their neighbours. In order to prevent youthful unchastity, marriages are contracted between children of eight years old, the girl being brought home to live with the lad at his parents' home till a child is born, when a separate dwelling is provided for the youthful couple. The women are noted for their beauty. The Riffians understand and speak Arabic very little. They were among the fiercest and most cruel of the pirates of the north coast of Africa. Even now they are entirely untrustworthy in this respect. See further BERBERS, MOROCCO, MOORS, KABYLES, MZABITES.

RIFLE, a firearm which may be shortly defined as a musket in which, by grooves (cf. Ger. *riffeln*, to groove) in the bore or otherwise, the projectile is forced to rotate before leaving the barrel. This rotatory motion, maintained during flight, equalizes any irregularities in the form or weight of the bullet, and so lessens the tendency to depart from a straight line, and also in a measure overcomes atmospheric resistance. Rifling was invented about 1520, by Gaspard Koller or Kollner, a gunmaker of Vienna, according to some authorities; by August Kotter of Nuremberg, according to others. It has been said that at first the grooves were made straight, with the object of admitting a tight-fitting bullet and relieving the effects of fouling, and that the virtue of spiral grooving was subsequently discovered by accident. But this theory is unsupported. The earliest known rifle barrels have spiral grooving. The amount of turn varied in old rifles from a half or three-quarters turn to one turn in two to three feet. The form and depth of the grooving and the number of grooves also greatly varied.

Historical Development of Military Rifles.—For the chief infantry firearms that preceded the modern military rifle, see Gun, Arms and Armour (firearms), Arquebus, &c. Rifles were at first used for amusement. There are, however, instances of their occasional employment in war in the 17th and 18th centuries. In 1631 the landgrave of Hesse had a troop of riflemen. Ten years later Maximilian of Bavaria had several troops armed with rifled arquebuses. Louis XIII. armed his bodyguard with rifles. Napoleon withdrew the rifle from those of his troops to whom it had been issued during the wars of the Republic, nor did the French make any considerable use of it again until 1830, when the Chasseurs d'Orléans were armed with it for the invasion of Algeria. The British learnt the value of rifles during the American War of Independence, when the government subsidized continental *Jägers* armed with rifles to oppose the American riflemen. After the war these corps disappeared, and though they are now represented by the 60th (King's Royal) Rifles, the senior rifle corps in the British Army is the Rifle Brigade, raised in 1800 as the 95th Regiment and armed with a flint-lock weapon known as "Baker's Rifle," which weighed 9½ lb. The barrel was 2½ ft. long, its calibre 20-bore, with seven grooves making a quarter-turn in its length. A small wooden mallet was at first supplied with this rifle to make the ball enter the barrel, and it was loaded with great difficulty. In 1826 Delvigne, a French infantry officer, invented a breech with abrupt shoulders on which the spherical bullet was rammed down until it expanded and filled the grooves. The objection was that the deformed bullet had an erratic flight. Delvigne's system was subsequently improved upon by Thouvenin, who introduced into the breech an iron stem, upon which the bullet, now of conical form, rested, and was expanded by a sharp blow with the iron ramrod when loading. In William IV.'s reign the Brunswick percussion rifle[1] was introduced into the British rifle regiments. Its weight with bayonet was 11 lb 5½ oz.; length of barrel, 2 ft. 6 in., with two grooves making one turn in the length of the barrel; weight of spherical belted bullet, 557 grs.; diameter, ·704 in.; charge of powder, 2½ drs. This rifle was not easily loaded, soon fouled, and shot wild beyond 400 yds.

In 1835 W. Greener produced a new expansive bullet, an oval ball, a diameter and a half in length, with a flat end, perforated, in which a cast metallic taper plug was inserted. The explosion of the charge drove the plug home, expanded the bullet, filled the grooves and prevented windage. A trial of the Greener bullet in August 1835 proved successful. The range and accuracy of the rifle were retained, while the loading was made as easy as with a smooth-bore musket. The invention was, however, rejected by the military authorities on the ground that the bullet was a compound one. In 1852 the Government awarded Minié, a Frenchman, £20,000 for a bullet of the same principle adopted into the British service. In 1857 Greener received a belated reward of £1000 for "the first public suggestion of the principle of expansion." The Minié bullet contained an iron cup in a cavity at the base of the bullet. In 1851 a rifled musket of the Minié pattern was introduced into the British army, and, though not generally issued, was used in the Kaffir War of 1851, and in the Crimea. Its weight with bayonet was 10 lb 8¾ oz., length of barrel 3 ft. 3 in., with four grooves making one turn in 72 in.; diameter of bore ·702 inch; charge of powder 2½ drs., and sighted from 100 to 1000 yds. The form of its bullet was at first conoidal, afterwards changed to cylindro-conoidal, with a hemispherical iron cup. In 1855 the Enfield rifle, having in a series of trials competed favourably with the Minié and Lancaster rifles, was introduced into the British army; it was used during the latter part of the Crimean war, having there replaced the Minié rifle and the percussion musket, and remained the general weapon of the entire infantry until the introduction of the breech-loader in the year 1867. This rifle weighed, with bayonet, 9 lb 3 oz., barrel 39 in.; diameter of bore ·577 in.; three-grooved, with one turn in 78 in. It fired a bullet of cylindro-conoidal form with hollow base, weighing 530 grains, made up into cartridges and lubricated as for the Minié rifle, adapted to this rifle by Pritchett, who was awarded £1000 by the Government. This bullet was wrapped in greased paper round the cylindrical part half-way up its length. Short rifles of the same pattern, with five-grooved barrels 2 ft. 9 in. long and a sword bayonet, were supplied to the 60th Rifles and to the Rifle Brigade. Two small carbines of the same principle were at this time introduced for the cavalry and artillery, also a rifled pistol.

In 1854, on the suggestion of General Lord Hardinge, Sir Joseph Whitworth, the first mechanician of the day, began to consider the subject of rifling, and after a long series of experiments the Whitworth rifle was produced with hexagonal bore, ·45-in. calibre, and with one turn in 20 in. It was tried at Hythe in 1857, and completely defeated the Enfield rifle up to 1800 yds. upon a fixed rest. This trial and Whitworth's experiments proved the advantages of a sharp twist, a smaller bore, and elongated projectile; but Whitworth's rifle was never adopted into the Government service, probably because the hexagonal rifling wore badly, and owing to the difficulty of equal mechanical perfection in all similar rifles and ammunition. Several improvements were subsequently made in the sighting, grooving and some other details of the Enfield rifle. In 1855 a boxwood plug to the bullet was used.

Between 1857 and 1861 four breech-loading carbines were experimentally introduced in the cavalry—viz. Sharp's, Terry's, Green's, and Westley-Richards'. Sharp's and other breech-loading carbines and also Spencer repeating carbines were used by the Federal cavalry in the American Civil War. The general adoption of the breech-loading principle may be said to date from 1867. The Prussians were the first to see its great advantages, and about 1841 had adopted the celebrated needle-gun (*q.v.*), a bolt-action weapon. In 1864 and 1866 committees were appointed by the British War Office to report on breech-loading arms, and after protracted experiments, Jacob Snider's method of conversion of the muzzle-loading Enfield to a breech-loader (fig. 1) was adopted, with the metallic cartridge-case improved in 1867 by Colonel Boxer, R.A. All available Enfield rifles were thus converted, and new arms made with steel barrels instead of iron. Great Britain was the first to adopt for her army a breech-loading

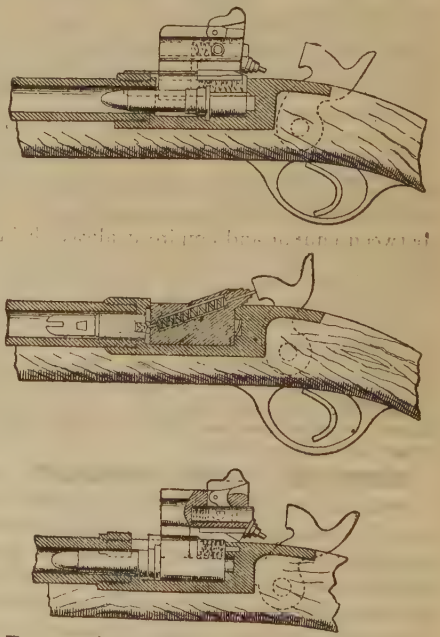

Fig. 1.—Snider Rifle. (*Text Book of Small Arms*, by permission of the Controller, H.M. Stationery Office.)

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[1] The percussion principle, invented by the Rev. Alexander John Forsyth (1768–1843) in 1805, was not accepted for military arms until the introduction of this rifle. A small and belated money grant was made to Forsyth in 1843. See Major-General A. J. F. Reid's memoir of Forsyth (1910).

rifle with metallic cartridge-case, which secured the perfect obturation of the breech. The Snider breech was a hinged block, a type much in favour at the time. The French similarly converted their muzzle-loaders, the converted weapon being known as the Tabatière or snuff-box. Other breech actions on the same principle were the Austrian Werndl and the Bavarian Podewils and Werder rifles. But these were only transitional arms. In 1866 France adopted the bolt-action Chassepôt (*q.v.*); in 1867 Sweden the Hagström, and Russia the Carte; in 1868 Italy the Carcano. All these were breech-loaders firing paper cartridges containing their own means of ignition. After further experiments by a fresh committee the Martini-Henry rifle (fig. 2) was definitely adopted by the British Government in 1871, with the short chamber Boxer-Henry ammunition. This rifle was a combination of Martini's block-action breech mechanism with Henry's barrel of ·45-in. calibre, firing a *papered* bullet of 480 grains from Boxer cases with a wad of wax lubrication at base of bullet, as proposed by Henry. The Henry rifling had seven grooves with one turn in 22 in.; the lands and the centres of the grooves were contained in the same circle. About the same time or a little later the various powers re-armed their infantry with breech-loaders of different patterns and names, all of which were of about 11 mm. (·433 in.) calibre, and nearly all of the bolt-action type.

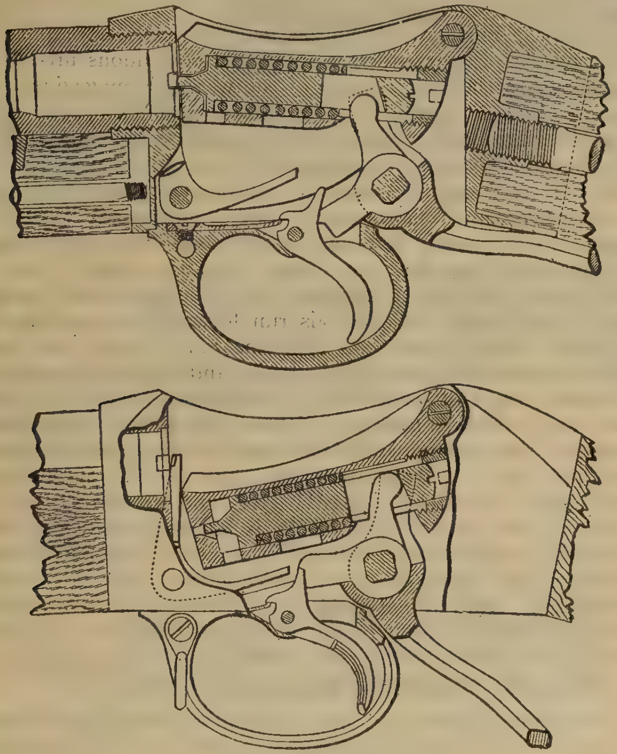

Fig. 2.—Martini-Henry.

The next stage in the history of military firearms was the introduction of the repeating or magazine system. The Winchester rifle, an American invention which appeared in 1865, was one of the earliest magazine rifles. This weapon was used by Turkey to some extent in the Russo-Turkish War of 1877–78, but Germany was the first great power to provide its army with a magazine rifle. In 1884 it converted the 1871 pattern Mauser of ·443-in. bore into a magazine rifle, holding eight cartridges in a tube magazine in the fore end. In 1885 France followed with the Lebel, which had an enormous advantage in its smokeless powder. In 1886 the question of the best calibre for small arms was reopened in England. In this year, 1886, Austria had adopted a Mannlicher rifle, ·433 bore, with a straight-pull bolt. This rifle was the first adopted by any European nation embodying Lee's box magazine, an invention patented in 1879 and 1882, and consisting of a box, in rear of and below the entrance to the chamber, containing the cartridges. Another important improvement, the steel clip loader containing five cartridges, was also introduced with this rifle. In 1888 these rifles were converted to ·315 bore, firing black powder cartridges; and in 1890, on the introduction of smokeless powder, the sights were re-graduated. In 1887 the British Small Arms Committee, after experiments with the small-calibre rifle invented in 1883 by the Swiss Major Rubin, director of the Federal laboratory at Thun, recommended the small calibre for adoption into the British service. The essential features of Rubin's system were the employment of a compound bullet with a leaden core in a copper envelope, and the use of a compressed charge of black powder. In 1888 a pattern of ·303-in. calibre rifle, rifled on the Metford system and with the improved Lee bolt and magazine, was approved for trial by British troops. The Metford rifling is as follows:—diameter of bore, ·303 in.; depth of rifling, ·004 in.; width of lands, ·023 in.; twist of rifling, one turn in 10 in. (left-hand); radial grooves, seven in number. About 1862, and later, W. E. Metford had carried out an exhaustive series of experiments on bullets and rifling. He invented the important system of light rifling, with increasing spiral with a hardened bullet. The Metford match rifle was prominent in all N.R.A. competitions from 1871 to 1894. In 1887 he laid down for the Small Arms Committee the proper proportions for the grooving, spiral and cartridge chamber of the ·303 military rifle. This weapon proved satisfactory and was adopted by the War Office as the Lee-Metford rifle, Mark I., in December 1888. It had a magazine of eight cartridges. In 1891 the Mark II. pattern was approved, with a ten-cartridge magazine, a simplified bolt, and many minor improvements. A magazine carbine with barrel 21 in. long and a six-cartridge magazine, otherwise identical with the Lee-Metford Mark II., was also approved. The Lee-Metford Mark II. rifle was subsequently further improved in its rifling to resist the wear of smokeless powder, and also in its bolt action, and became known as the Lee-Enfield rifle, and under that name was officially adopted as the rifle of the British army. The number of grooves were reduced from seven to five. Neither the Lee-Metford nor the Lee-Enfield has increasing spiral grooves, which are found inconvenient for military arms from a manufacturing point of view.[1] The L.M. and L.E. carbines are similar to the shorter models of the rifles, but are covered for the whole length of the barrel by a wooden handguard and take only six cartridges; the fore-sights are protected by wings on the nose-cap, and the long-range sights are omitted. These, as also the Martini-Metford and Martini-Enfield carbines (falling-block action small-bores), have practically been replaced by the "short" rifle described below.

The efficiency of the modern small-bore magazine rifle is largely due to the production of smokeless nitro-compound powder. France was the first country to adopt, about 1885, a smokeless powder with the Lebel magazine rifle. It was known as "Vieille" powder, or "Poudre B" (after General Boulanger). Since then smokeless explosives have been universally adopted in all small-bore magazine military rifles. The smokeless explosive known as "Cordite" or "Cordite M.D." (see Cordite) is used for the cartridges of the Lee-Metford and Lee-Enfield rifles and rifle-calibre machine guns. (H. S.-K.)

Military Rifles of To-day.—About 1900, the various armies were equipped with weapons of nearly equal efficiency. The weights varied between $8\frac{1}{4}$ and $9\frac{1}{4}$ lb, the lengths between 49 and 52 in.; the calibres were ·315, ·311, ·303, with one or two ·256. None of the rifles were sighted to less than 2000 yds., and nearly all had a "fixed" or "battle" sight. All were bolt-action rifles, and had a muzzle velocity of about 2000 f.s. (the ·256 Mannlichers, about 2300 f.s.). Except France, with the tube-magazine Lebel, Denmark and the U.S.A. with the horizontal-box Krag-Jörgensen, and Great Britain, all nations used multiple-loading by clip or charger. With Lebel and Krag-Jörgensen weapons, multiple-loading is a practical impossibility, but in Great Britain the charger was deliberately rejected. It was desired to use the rifle normally as a single-loader, and to reserve the magazine (which held ten cartridges, or twice as many as the multiple-loading Mausers, Mannlichers, &c.) for emergencies. But from about 1903 this equivalence of infantry weapons began to be disturbed by two new influences: the tendency towards a "short" rifle, and the introduction of the pointed bullet.

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[1] Of all modern military rifles, the Italian 1891 weapon alone has an increasing twist.

In the first, Switzerland took the lead with the short Schmidt-Rubin in 1900. But amongst the greater powers, England and the United States alone have followed her example. At the close of the South African War Great Britain issued 1000 short Lee-Enfield rifles experimentally, and in 1903 the "short rifle" was actually approved and issued generally. Since then it has been improved in details. The barrel was shortened by 5 in., multiple-loading by charger was introduced, and by the *Musketry Regulations* of 1909 magazine fire was laid down as the normal, single-loading being forbidden. The change met with very considerable opposition, especially from target-shooting experts, who maintained that a long rifle, so perfected in details as to be equal to the short in every point except in length, must be more accurate. The view of the military authorities, which was maintained in spite of criticism, was that for service purposes, and especially for prolonged snap-shooting, the handier weapon was preferable. One important factor in the decision was the desire to give the cavalry a weapon with which, when dismounted, it could fight the infantry rifle on equal terms. A more serious objection than that of want of superfine accuracy in bull's-eye shooting was the loss of 5 in. of reach in bayonet fighting. This objection was met in 1907 by the introduction of a new pattern bayonet with a blade 5 in. longer. In 1908 the long Lee-Enfield and Lee-Metford rifles in store were converted for charger-loading (fig. 3), fitted with safety catches and new sights, and issued to the infantry of the Territorial Force in 1909 and 1910. For target purposes many rifle shots prefer this converted weapon to the short rifle (fig. 4).

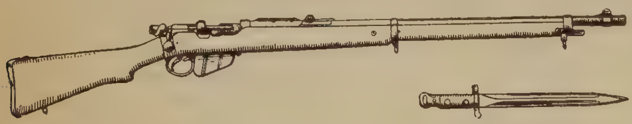

FIG. 3.—Charger-loading L.E. (*Text Book of Small Arms*, by permission.)

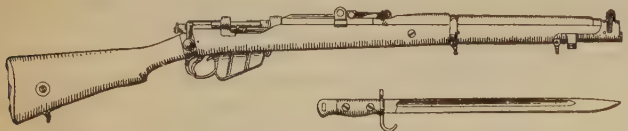

FIG. 4.—L.E. Short Rifle. (*Text Book of Small Arms*, by permission.)

The United States in 1904 replaced the Krag-Jörgensen (hand-loading horizontal magazine) by the short Springfield. A sort of spring bayonet was at first fitted to this rifle, but it was soon replaced by an ordinary sword bayonet.

The pointed bullet ("Spitz-geschoss" or "S") was introduced by Germany in 1905, and her example was quickly followed by France (balle D) and other powers. Its advantage is a considerable flattening of the trajectory, chiefly on account of the lessened resistance of the air. This latter allows of a reduction in the sectional density and consequently in the weight of the bullet. Thus velocities up to 2900 foot-seconds are realized, which enables the "dangerous space" to be very greatly augmented (see fig. 20). The "fixed sight" range with the "S" bullet is 700 yds., as against the Lee-Enfield's 500. It was announced in the House of Commons in 1910 that a modified bullet was being experimented with, and that some increase in the fixed-sight range was expected to be obtained, but the relatively weak breech action of the Lee-Enfield—which is due chiefly to the rearward position of the locking lugs—does not allow designers much freedom in the matter of increasing velocities, as the chamber pressure has to be kept low. It will be seen from the table that other rifles are constructed to stand a much higher pressure.

But both these improvements are destined to be eclipsed in importance by the adoption of the automatic rifle. The application of the automatic principle to the modern high-velocity small-arm of precision has been occupying the attention of the small-arms experts of all armies and of numerous private inventors for some years past. These numerous attempts have, in the case of the rifle, been largely doomed to failure because of the necessary limitations of space and weight; although the automatic principle has been successfully applied both to machine guns (*q.v.*) and to pistols (*q.v.*). In these weapons the work of extracting the empty cartridge-case, re-loading and re-cocking, is accomplished either by the motive power of the recoil or of the gas generated by the explosion of the powder, thus enabling a rapid and continuous fire to be maintained to the full capacity of the weapon's magazine. In the case of machine guns the firing also is automatic, but self-firing rifles are not very desirable as infantry weapons and in addition are so heavy as to approximate to machine guns.

Of the recoil-operated class of automatic rifles there are two subdivisions, "short-recoil" and "long-recoil." In the former, which is most favoured by inventors, the barrel, body and bolt recoil together for a short distance, about ¼ in., in which space the bolt is unlocked, and the bolt then recoils freely in the body. The bolt is run forward in reloading by a spring. In the long-recoil type the barrel, body and bolt recoil the whole distance, and the barrel and body are run up by one spring, the bolt by another. Several such rifles have been shown at the N.R.A. meetings at Bisley; the Rexer, Mauser and Woodgate rifles being on the long-recoil, the Hallé on the short-recoil principle. Gas-operated rifles, like the Hotchkiss and Colt machine guns, have fixed barrels and are worked by a portion of the powder-gases which is allowed to escape from the barrel through a small hole near the muzzle, thence entering a cylinder and working a piston in connexion with the breech mechanism. No automatic rifle has as yet (August 1910) been issued as a service weapon by any power, the problem of ensuring certainty in action under service conditions—*i.e.* with grit and dirt in the working parts—being the principal difficulty.

Great Britain.—There are two principal types of Lee-Metford and Lee-Enfield rifles in the service, the "short" and the "charger-loading." The former is carried by all units (cavalry included) of the regular army, by the yeomanry cavalry of the Territorial Force, and by units of the Officers' Training Corps. The latter is used by the infantry of the Territorial Force. There exist, further, the older, non-charger-loading Lee-Metford and Lee-Enfield rifles, a few carbines of the same type, and some Martini-Metford and Martini-Enfield carbines which have the ·303 barrel and cartridge with the falling-block Martini action. ·45 Martini-Henry rifles and carbines, and even Sniders, are still used by local police forces in some of the smaller colonies.

The "long" charger-loading Lee-Enfield is converted from earlier patterns by the addition of a charger guide, the stripping of the bolt-cover, and improvements in the sighting. The action of the breech mechanism[1] is as follows (the breech mechanism of the "short" rifle being practically the same): The breech is closed by a bolt (I) which slides in a bolt-way cut in the body; the bolt-head (Io) abuts against the base of the cartridge when the rifle is loaded, and when the knob is turned down the whole is locked. On the right side of the bolt is a solid rib, and on the left side a lug; these support the bolt on firing by contact with the "resisting shoulder" on the right, and the rear face of the "lug seating" on the left of the body. Underneath the bolt there are two recesses and two studs. The bolt-head is screwed to the bolt and is fitted with an extractor claw. The bolt-head, instead of being rigidly attached to the bolt, is so far independent that it remains stationary while the bolt is revolved. Inside the bolt is the arrangement of striker (V) and spring (W), and at its rear end, forming the working connexion between trigger and striker, is the "cocking-piece" (X) which is fitted with a safety-catch (not in the old pattern rifle illustrated). This cocking-piece (which cannot turn) has a long tongue projecting to the front, lying along the under side of the bolt, and the front end of this tongue (Y), called the "full-bent," engages the nose of the trigger sear when the weapon is loaded (a groove in the tongue, called the " half-bent " (Z), serves as a half-cock arrangement, and could be used as a safety-catch if the proper safety-catch were damaged). The trigger sear (K) is a bell-crank lever, the upper long arm of which is put in and out of contact with the " full-bent," and the lower or short arm is connected to the trigger. The magazine holds ten cartridges, which rest on a platform, underneath which is the magazine spring that pushes the platform and cartridges up. A " cut-off " is fitted in the " long " and in some marks of the " short " rifle. This is a sort of lid to the magazine, enabling the magazine to be kept full while the rifle is being used as a single loader. But the present musketry regulations forbid single-loading, and the cut-off is now only closed for special purposes, such as unloading a single cartridge (miss-fire, &c.) without unloading the magazine. The magazine is loaded by inserting a charger in the " charger guides " (these, attached to the body, form a sort of bridge over the bolt) and forcing down the strip of cartridges into the magazine (charger guides not shown in diagrams). The action of the mechanism is as follows: Suppose that the rifle has been fired and the magazine is full. On beginning to turn up the knob of the bolt, the latter is revolved, but the cocking-piece (the tongue being held by a groove in the body) and the bolt-head remain stationary. Soon, however, a cam on the bolt comes in contact with a stud on the cocking-piece and the latter is brought slightly to the rear, pulling in the point of the striker and partly compressing the spring. At the same time the lug on the left of the bolt, in contact with the front face of a recess in the body (both being cut slantwise to a screw pitch), forces the bolt and with it the claw of the extractor, which grips the base of the cartridge-case, to slide backwards a little. As the bolt continues to turn the rib on the right of it comes up clear of the body and the whole bolt, with the bolt-head, can thus be drawn back until the bolt-head comes against the resisting shoulder on the right of the body and the extractor attached to it flings out the fired cartridge-case. Another cartridge then comes up from the magazine and lies in front of the bolt-head ready to be pushed home. At this moment (the beginning of loading) the stud on the cocking-piece has fallen into one of the grooves on the bolt, and as the bolt is pushed forward the tongue or full-bent comes against the nose of the trigger sear and is held there, while the rest of the bolt mechanism goes on. Thus between the moving bolt and the fixed cocking-piece the striker spring is further compressed, and when the sloping faces of the bolt lugs and ribs engage the resisting portions of the body a last forward push is given to the bolt and the spring is completely compressed, ready to propel the striker forward when the full-bent is released from the nose of the sear. Figs. 5–8 of the older pattern rifle show the working of the breech mechanism. Instead of the older single pull-off of the trigger the "short" rifle, like many Continental weapons, has a double pull-off. This is provided for by suitably shaping the portion of the trigger which is in contact with the short arm of the sear. The " short " rifle has also a somewhat different pattern of safety-catch.

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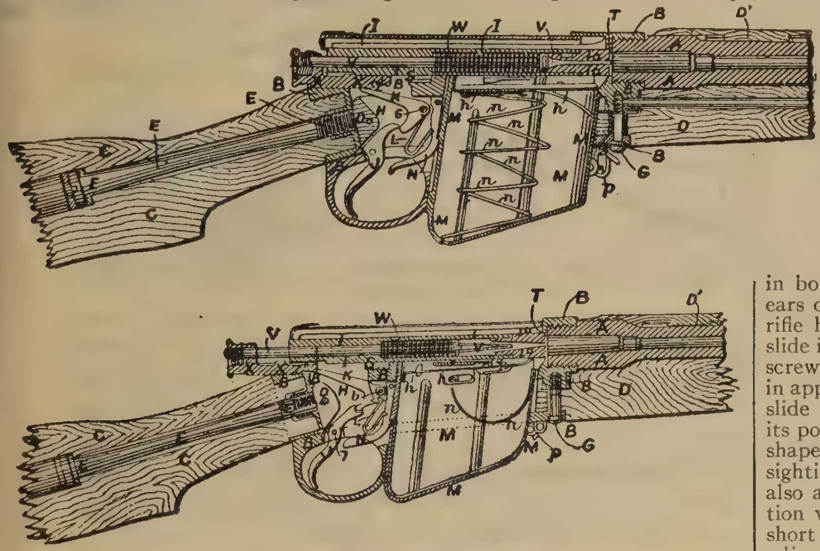
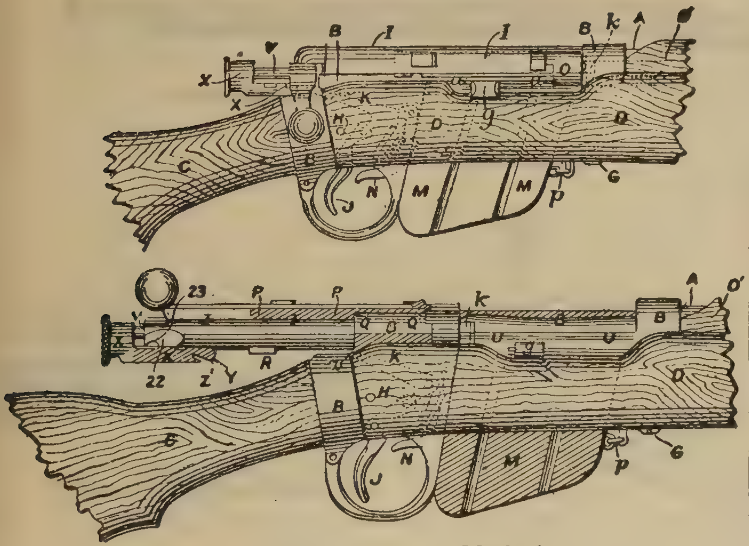
[1] The annexed figures show the old pattern weapon. In both the existing patterns a safety catch is fitted, the magazine spring is of a different shape and there is no bolt-cover. But the essential parts of the action remain the same.



FIGS. 5 and 6.—Lee-Metford.



FIGS. 7 and 8.—Lee-Metford.

The sights of British service rifles up to 1903 were of a very simple type, the fore-sight a " barleycorn " of triangular shape, and the back-sight a plain leaf with sliding bar into which a V was cut, the tip of the fore-sight seen in the middle of the V being brought on to the mark. In the long charger-loader this form of back-sight has been greatly modified, and in the " short " rifle it has been altogether abolished. The barleycorn fore-sight has been replaced in both cases by an upright blade, protected from injury by two ears or wings, and the V by a U aperture. For elevation the long rifle has still a slide on a vertical leaf, but the movement of this slide is controlled no longer merely by its tight fit but by a clamping screw. The sight of the short rifle is larger and also quite different in appearance and principle. There is a leaf and on it a slide, but the slide (controlled by clamping studs) works on a cam-shaped bed; its position on the leaf, affecting the point of contact with the cam-shaped bed, elevates the leaf to the required amount, the actual sighting U being on the extremity of the leaf. The short rifle has also a " fine adjustment " which admits of minor changes of elevation within the usual 50 yds. graduation. Both the long and the short rifles have " wind-gauges," or mechanisms for fine lateral adjustment of the central U sighting aperture, so as to point the axis of the barrel a little to the left or the right of the line of sight to compensate for wind, error of the individual rifle, &c. In both rifles, on the left side of the stock, is a long-distance sight (graduated to 2800 yds.), which consists of an aperture sight near the bolt and a dial and movable pointer near the hand-guard. The short rifle is cased from breech to muzzle in a wooden hand-guard; all patterns of long rifle have only a short wooden hand-guard just behind the back-sight bed. The bayonet in the long rifle is secured to the fore-end by a spring catch and to the barrel by a ring passing over the muzzle. This traditional, and still usual, arrangement has been abandoned in the short rifle, as the vibration of the barrel on discharge is more or less checked by the extra weight of the bayonet, and therefore the shooting of the rifle differs according as it is fired with or without the bayonet fixed. With the short rifle the bayonet is fixed to two metal fastenings, a plug for the ring and a catch for the handle.

Continental European Rifles.—These are for the most part of the Mauser and the Mannlicher types. The Mauser is a bolt weapon with box magazine. The bolt is simple, without separate bolt-head, and is held by two bolt-lugs at its front end engaging with recesses in the body (the German Mauser has an extra lug near the rear end). Near the rear end there is a cam-shaped recess, which, engaging with a stud on the cocking-piece, partially forces back the cocking-piece and spring when the bolt is revolved. When the bolt lever is turned up and the bolt begins to revolve, the cocking-piece and bolt plug, which together form the connexion between the bolt and the trigger, do not revolve, but are forced back slightly, so as to begin the compression of the striker spring. Then, the bolt lever being so shaped as to bear against an inclined-plane edge on the body, the bolt comes back a little, and with it the extractor jaw and the empty cartridge-case. Lastly, when the bolt has turned through a right angle, all studs are opposite their slots and ways in the body, and the bolt can be drawn back. At the farthest rearward position of the bolt the cocking-stud on the cocking-piece is well behind the nose of the trigger sear, and is thus held when the bolt is pushed forward again, the spring being thereby compressed. All Mauser rifles have a safety-catch and a double pull-off. None have cut-offs except the Turkish pattern. All are constructed for clip or charger loading, but the box magazine contains only five cartridges as against the Lee-Enfield's ten. Mauser rifles, which are perhaps the strongest and least complicated of magazine arms, are used in the German, Belgian, Spanish, Portuguese and Turkish armies, and were also used by the Boers in the South African War. The type adopted by each of these nations differs from the rest in details only. The German rifle has a long guardless sword bayonet, fixed to the fore-end only and not connected with the barrel, and a peculiar form of back-sight, which bears some resemblance to the slide and bed arrangement of the British "short" rifle. The special feature of the Belgian Mauser is a thin steel casing for the barrel,

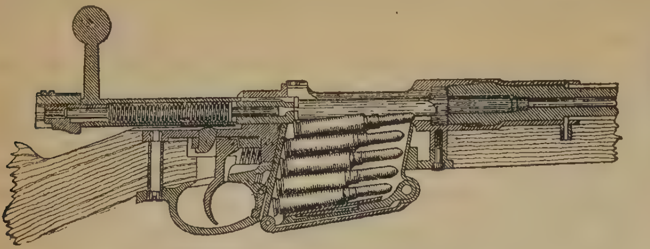


FIG. 9.—Belgian Mauser. (*Text Book of Small Arms*, by permission.)

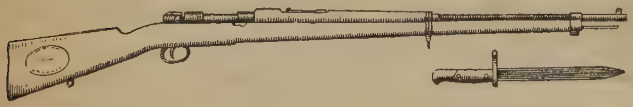


FIG. 9*a*.—Spanish Mauser. (*Text Book of Small Arms*, by permission.)

which is supposed to act as a hand-guard or cooler and to free the barrel from disturbing influences due to its connexion with the fore-end; but it is expensive, and if strong adds unduly to the weight

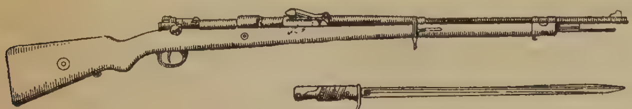


FIG. 10.—German Mauser, 1898. (*Text Book of Small Arms*, by permission.)

of the weapon. The older German magazine rifle, pattern 1888, had a barrel casing, but this was given up when the new 1898 pattern was introduced. The bayonets of the Belgian and Spanish patterns are very short knives.

The Mannlicher rifle, which is extensively used for sporting and target work, has been adopted for military purposes by various states, notably Austria-Hungary. Both the 1890 and 1895 patterns of Austrian Mannlicher have "straight-pull" bolts; that is, bolts which are not turned for locking. The bolts are in two parts, which "telescope" into each other. In the 1890 pattern (see fig. 12), when the bolt I is home against the cartridge and the "lever cylinder" I′, which carries the bolt knob, is further pushed forward, the hinged block R is caused to drop in front of the resistance-piece Q, and so locks the bolt I against the cartridge. In the 1895 pattern (see fig. 13), the final pushing forward of the lever cylinder causes the head of the bolt I to turn and projections on its head to lock into recesses SS just in rear of the breech. The turning is due to helical feathers (20) on the inside of the lever cylinder I′ working in grooves in the rear of the bolt I. The 1890 pattern has a double pull-off. It will be seen from the figure that as the trigger is pulled the bearing is taken first at (8) and then at (9). This gives, owing to the change of leverage, power at the commencement and rapidity at the end of the pull. The weapon is a clip loader. The Dutch, Rumanian and other Mannlichers have not straight-pull bolts, but the usual turn-over levers and locking-lugs.

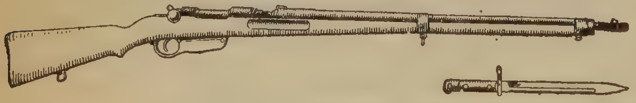


FIG. 11.—Austrian Mannlicher, 1895. (*Text Book of Small Arms*, by permission.)

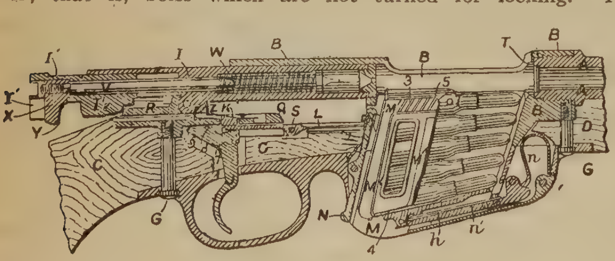


FIG. 12.—Mannlicher, 1890.

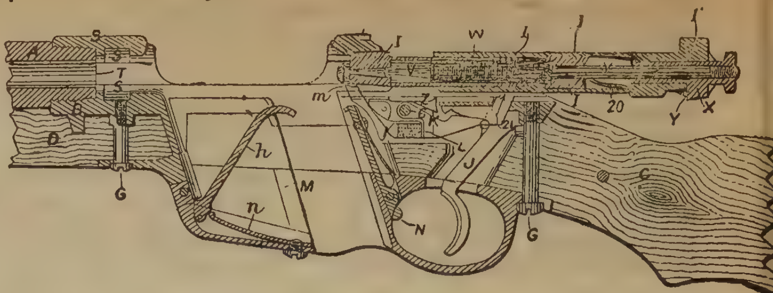


FIG. 13.—Mannlicher, 1895.

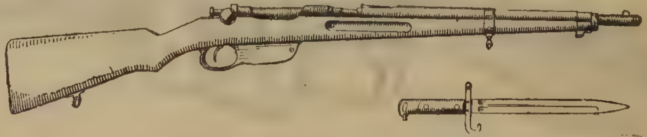


FIG. 14.—Austrian Mannlicher Carbine. (*Text Book of Small Arms*, by permission.)

France.—The breech mechanism of this rifle (see fig. 15) calls for no special remark. Its bolt is very similar to that of the British rifle. Its special peculiarity is the once popular tube magazine under the fore-end. This has many defects as compared with the box magazine. It is more cumbrous for the same number of cartridges; its feed and cut-off mechanism is very complicated; the balance of the rifle is altered as the magazine empties; the placing of the cartridges base to point, even when the bullet has a flat point, is not unattended with danger, especially when the magazine is full and the spiral spring strongly compressed; lastly, loading by any form of charger is practically impossible.

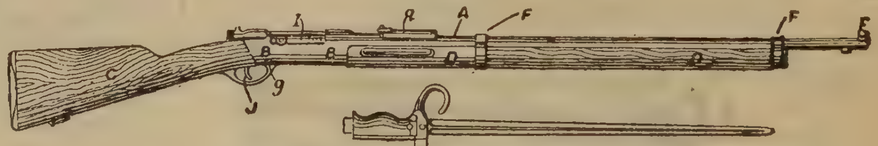


FIG. 15.—Lebel Rifle.

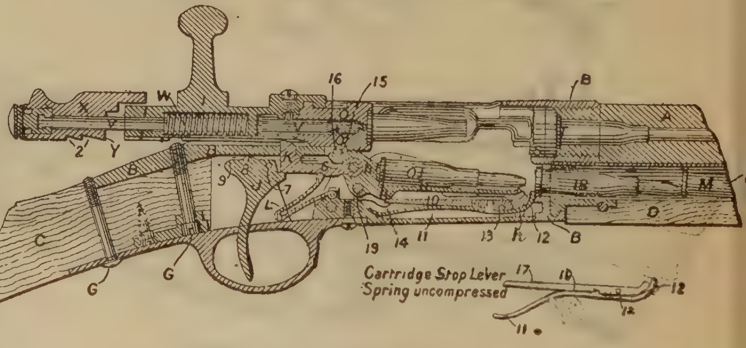


FIG. 16.—Lebel Rifle.

United States.—Up to 1904 the U.S. army had the Krag-Jörgensen rifle, in which, as shown in fig. 17, the magazine was placed horizontally under the breech action. At this time most of the second line troops had still the old-fashioned (black powder) Springfield rifle, a single loader with a hinged block similar to the rifles of the "sixties" in Europe, such as the Snider, the Tabatière and the Werndl.[1] Since 1904, however, the regular army has been re-armed with a short rifle (fig. 18) which in its action has a general resemblance to a Mauser. As at first issued, the new Springfield had a rod bayonet which, when not in use, lay within the fore-end of the stock, and when required was run forward and fastened by a catch. This novelty was, however, soon discarded in favour of a sword bayonet 16 in. long. The United States navy had until about 1900 the Lee "straight-pull" rifle. The *Russian* "3-line" and the *Japanese*

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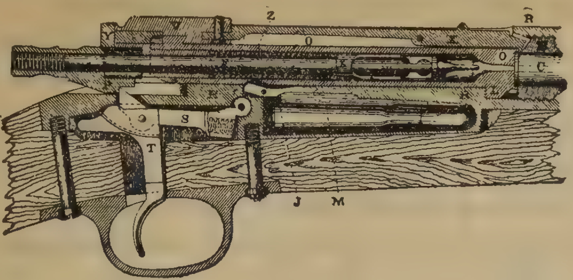
[1] The Springfield was, however, a much improved model of this kind of weapon, dating from 1884 only.

"30th year" (1900) and "38th year" (1907) rifles are bolt-action weapons, with no special peculiarities. The *Swiss* rifle (Schmidt-Rubin) is a remarkable weapon of the straight-pull type, short, and possessing a relatively low velocity. (X.)



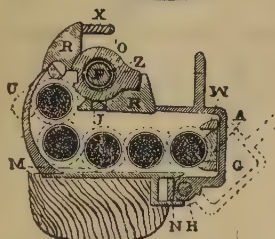


FIG. 17.—Krag-Jörgensen.

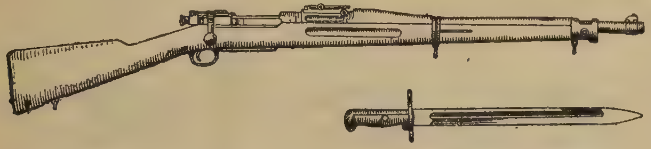


FIG. 18.—U.S. Short Rifle. (*Text Book of Small Arms*, by permission.)

The Use of the Rifle in War.—The study of "musketry" as distinct from target shooting may be said to date from the Franco-German War. Previously military students and practical soldiers concerned themselves rather with the tactical question of fire-power—fire *versus* shock, bullet *versus* bayonet and so on—than with the technical question of its application. This was natural enough in the days of short-range fighting. But when bullets began to cause losses at 1000 yds. and more from the firing point, formations that presented the least vulnerable target had to be discovered and tested, aiming grew more difficult as the range increased, and firing by word of command in large units became practically impossible. The very accuracy and range of modern weapons involved new problems. The necessity, in the larger area of effective fire, of setting the sights to the distance of the mark made further demands on fire-discipline and brought up the difficult problem of judging distance. The possibilities of varying the rate of fire conferred by the magazine rifle also demanded close study. Each war, as it came, produced fresh evidence as to what was possible and what was not in matters of fire-control, the best rate of fire for effect, the range at which fire should be opened, and other half-tactical, half-technical problems. Thus, although many points still remain in the region of controversy, certain ideas and principles are almost universally accepted as the basis of service musketry.

The leading idea is that of the "cone of dispersion." A modern rifle, even fired from a fixed rest under good conditions, will not place shot after shot in the same spot, but the shot-marks on the target form a more or less close "group." When to this error of the rifle and the ammunition there is added the personal error of the marksman, the group is larger, and in the collective fire of a squad it is larger still. Now the trajectories of bullets that do not strike in the same place naturally do not coincide, and the group on the target is represented in the air by a cone or sheaf of trajectories. The bullets of this sheaf striking the ground on either side of the target form on the ground a much elongated ellipse. The ellipse containing 90% of the bullets fired is called the *beaten zone*. It is usual, however, to calculate from the "effective" zone, or that which contains 75% of bullets. Within the "effective" zone, and at its centre, is found the closely grouped "nucleus" of 50% of bullets. With the British ·303 rifle in collective fire, the depths of these zones are:—

	Nucleus.	Effective.	Beaten.
500 yds.	120 yds.	220 yds.	320 yds.
1000 ,,	70 ,,	120 ,,	170 ,,
1500 ,,	60 ,,	100 ,,	140 ,,

The target aimed at and sighted for is at the centre of the zone (see fig. 19). The height of the grouping on a vertical target compared to the depth of the grouping on the ground is of course proportionate to the tangent of the angle of descent; hence, small as is the group on a vertical target at 500 yds., the beaten zone is no less than 320 yds. deep. For the same reason, as the range, and consequently the angle of descent, increases, the beaten zone diminishes in depth. Another factor is the "dangerous space." This is the space between "first catch," *i.e.* the point at which the bullet (in a sheaf, the lowest bullet) comes low enough to catch a man's head, and "first graze," that at which it strikes the ground. The extent of this dangerous space varies of course with the height of the man's head. In the case of a mounted man, at 1000 yds., it is 105 yds., while in that of a sharpshooter lying down, it is only 13 yds. (in addition of course to the beaten zone). As nowadays nearly all targets, on service, are lying or three-quarters concealed figures, the dangerous space as compared with the beaten zone is at such a range too small to count as a factor. It is, however, important at shorter ranges, 500 yds. and under (700 and under with the new pointed bullets). Here the advantages of flat trajectory make themselves felt. Within this distance the bullet is at no point in its career too high to be dangerous to a standing man or a horseman. A lying figure is in danger at any distance beyond 350 yds. if the sights are set to 500 yds. (front half of effective zone 110 yds., dangerous space 52 yds.). This is the theory underlying the 500 yds. "fixed sight" or "battle-sight," a setting which holds good for all less ranges, and can be put on the rifle instantly and without looking at the back-sight graduations.

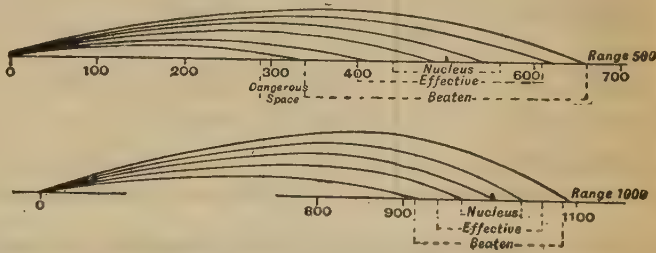


FIG. 19.—Beaten Zone.

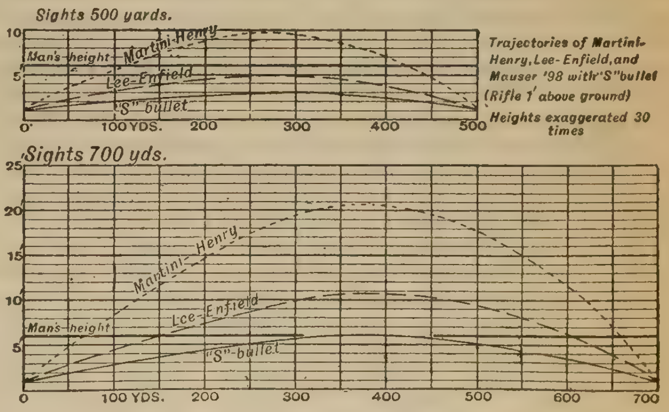


FIG. 20.—Trajectories.

These facts, taken in conjunction with the imperfections of the most skilful individual marksmanship and the chances of wrong estimation of distance, are the basis of the musketry training and practice of to-day. At the School of Musketry, Hythe, the standard of judging distance is "not more than

DETAILS OF MODERN

(From the British official

Country	AUSTRIA AND BULGARIA.	BELGIUM.	DENMARK.	GREAT BRITAIN.		FRANCE.		GERMANY.	
Pattern of the Year	1895.	1889.	1889.	1907.	1907.	1886.		1898.	
Designation	MANNLICHER.	MAUSER.	KRAG-JORGENSEN.	CHARGER LOADING LEE-ENFIELD, MARK I.	SHORT LEE-ENFIELD, MARK III.	LEBEL.		MAUSER.	
Magazine System	Box	Box	Horizontal-box	Box	Box	Tube		Box	
Number of Cartridges in Magazine	5	5	5	10	10	8		5	
Charger or Clip	Clip	Ch.	Ch.	Ch.	Ch.	No		Ch.	
Cut off	No	No	Yes	Yes	Yes	Yes		No	
Safety Bolt	Yes	Yes	No	Yes	Yes	No		Yes	
Weight:— Without bayonet	8 lb 5½ oz.	8 lb ½ oz.	9 lb 11¾ oz.	9 lb 4 oz.	8 lb 2½ oz.	9 lb 3½ oz.		9 lb.	
With bayonet	8 lb 15¾ oz.	9 lb 9½ oz.	10 lb 4½ oz.	10 lb 3½ oz.	9 lb 10½ oz.	10 lb 1½ oz.		9 lb 14 oz.	
Length:— Without bayonet	4 ft. 2 in.	4 ft. 2·25 in.	4 ft. 4·75 in.	4 ft. 1·5 in.	3 ft. 8·5 in.	4 ft. 3·12 in.		4 ft. 1·4 in.	
With bayonet	4 ft. 11·5 in.	4 ft. 11·75 in.	5 ft. 3 in.	5 ft. 1·5 in.	5 ft. 1·7 in.	5 ft. 11·84 in.		5 ft. 9·75 in.	
Barrel:— Length in.	30·12	30·67	32·9	30·19	25·19	31·496		29·05	
mm.	8	7·65	8	7·7	7·7	8		7·9	
Calibre in.	·315	·301	·315	·303	·303	·315		·311	
Rifling:— Number of grooves	4	4	6	5	5	4		4	
Twist (to right, except in Lee-Enfield and Lebel) 1 turn in calibres	31	32·5	37·5	33		30		30·2	
Sights:— Lowest for	500 paces (410 yds.)	500 m. (547 yds.)	300 m. (328 yds.)	183 m. (200 yds.)		250 m. (273 yds.)		200 m. (219 yds.)	
Highest for	2600 paces (2132 yds.)	2000 m. (2187 yds.)	1900 m. (2078 yds.)	2560 m. (2800 yds.)		2000 m. (2187 yds.)		2000 m. (2187 yds.)	
Cartridge:— Length in.	3·0	3·055	3·0	3·05		2·95		3·22	3·18
Weight grs.	455	441	460	415		447	415	431	369·9
Bullet:— Shape of point	Round	Round	Round	Round		Round	Pointed	Round	Pointed
Material of envelope	Steel, lubricated	C.N.	C.N.	C.N.		C.N.	Copper zinc, no envelope	Steel, coated with C.N.	Steel, coated with C.N.
Length in.	1·24	1·205	1·187	1·25		1·221	1·625	1·235	1·105
Diameter (max.)	·3228	·31	·323	·311		·3228	·327	·3189	·323
Weight grs.	244	219	237	215		231	198	227	154·5
Charge:— Weight grs.	42·44	37	33·95	31·5		42·43	46·2	40·75	48·4
Propellant.	N.C.	N.G. and N.C.	N.C.	Cordite		N.C.	N.C.	N.C.	N.C.
Muzzle Velocity f.s.	2034	2034	1968	2060		2073	2380	2093	2882
Chamber Pressure:— Tons on sq. in.	19·7	19·7	15·1	15·5		17·75	17·75	21	17·5

NOTE.—C.N. = Cupro-nickel. N.G. = Nitro-glycerine.

100 yds. wrong at any range." Now at 1000 yds. an error in judging distance of 13 yds. above or below the true range will cause all the shots of a particular rifle to fall away from the target, and the better the marksman—*i.e.* the closer his group—the more necessary is perfection in judging distance, a perfection which in reality seems unattainable. The British musketry regulations therefore lay it down that the individual marksman's fire at service targets is unprofitable at ranges of more than 600 yds. Beyond that distance collective fire, controlled and directed by an officer or non-commissioned officer, is the rule. The question as to whether fire is to be opened in any given set of circumstances is decided by the fire-director, who considers first whether the probable error in judging distance is greater than half of the effective zone for the estimated range. If it is so, he must order "combined sights," *i.e.* half of the units under his command use one elevation, the rest another, which method artificially increases the dispersion of the bullets and thereby the probability of the target being included in the zone. This, however, makes the fire less effective, and in practice cannot profitably be used by any body of rifles of less than 80 or 100. The commander of only a single section, therefore, however tempting the target, must refrain from opening fire at all. At medium ranges, however, controlled and directed fire is effective, and at such ranges troops should still be sufficiently in hand to execute the fire-director's orders. Within decisive ranges fire-direction has to give place to fire-control. All that the strongest commander can enforce is the opening and ceasing of fire when he gives the order, and success is sought through making the individual soldier skilful at rapid and snap shooting. Black bull's-eyes on white targets are now used only to teach men to make uniformly good shooting, which is shown by the closeness of the shot-grouping. The rest of the musketry course is fired against grey-green "head and shoulders" targets or brown silhouettes, and consists of slow, rapid and snap shooting, from behind cover, at disappearing or running targets, &c. In 1909 special attention began to be paid to visual training, both as an aid to judging distance and as an actual ingredient of fire-discipline. A method of indicating targets which originated in the French army was adopted and improved upon, consisting essentially of giving two or three conspicuous "auxiliary marks," in artillery language, and naming the target with reference to them. Judging distance is generally associated with fire-discipline practices, and men are frequently exercised in locating and ranging upon a hidden skirmisher, 300–800 yds. away. Perhaps the most important modification of musketry training, within recent years, has been the adoption of rapid fire in "bursts," as the normal procedure for infantry, instead of slow continuous fire. The complete cessation of fire at intervals enables the leaders to observe the

MILITARY MAGAZINE RIFLES.

Text Book of Small Arms, 1909.)

GREECE.	HOLLAND.	ITALY.	JAPAN.	PORTUGAL.	RUMANIA.	RUSSIA.	SPAIN.	SWITZERLAND.	TURKEY.	UNITED STATES.
1903.	1895.	1891.	1907.	1904.	1893.	1894.	1896.	1900.	1893.	1904.
MANNLICHER-SCHONAUER.	MANNLICHER.	MANNLICHER-CARCANO.	YEAR '38.	MAUSER-VERGUIERO.	MANNLICHER.	"3-LINE" NAGANT.	MAUSER.	SCHMIDT-RUBIN SHORT RIFLE.	MAUSER.	SHORT SPRINGFIELD.
Box	Box	Box	Box	Box	Box	Box	Box	Box	Box	Box
5	5	6	5	5	5	5	5	6	5	5
Ch. No Yes	Clip No Yes	Clip No Yes	Ch. No Yes	Ch. No Yes	Clip No Yes	Ch. No Yes	Ch. No Yes	Ch. No Yes	Ch. Yes Yes	Ch. Yes Yes
8 ℔ 5½ oz. 9 ℔	9 ℔ 11 oz. 10 ℔ 6¾ oz.	8 ℔ 6½ oz. 9 ℔ 3 oz.	8 ℔ 10 oz. 9 ℔ 9 oz.	8 ℔. 13 oz. 9 ℔. 9½ oz.	8 ℔ 12¾ oz. 9 ℔ 9½ oz.	8 ℔ 15¼ oz. 9 ℔ 11¼ oz.	9 ℔ 6¾ oz. 10 ℔ 5½ oz.	8 ℔ ½ oz. 8 ℔ 10¼ oz.	9 ℔ 1 oz. 10 ℔ 8 oz.	8 ℔ 8 oz. 9 ℔ 8 oz.
4 ft. 4 ft. 10 in.	4 ft. 3 in. 5 ft. 0·75 in.	4 ft. 2·75 in. 5 ft. 2·375 in.	4 ft. 2·75 in. 5 ft. 5·75 in.	4 ft. 4 ft. 11¼ in.	4 ft. 0·5 in. 4 ft. 10·25 in.	4 ft. 3·875 in. 5 ft. 9 in.	4 ft. 0·625 in. 4 ft. 10·5. in.	3 ft. 7·12 in. 4 ft. 10·75 in.	4 ft. 0·6 in. 5 ft. 6·6 in.	3 ft. 7·21 in. 4 ft. 11·21 in.
28·56 6·5 ·256	31·125 6·5 ·256	30·75 6·5 ·256	31·3 6·5 ·256	29·08 6·5 ·256	28·56 6·5 ·256	31·5 7·62 ·3	29·031 7 ·276	23·33 7·5 ·295	29·134 7·65 ·301	23·79 7·62 ·30
4	4	4	4	4	4	4	4	3	4	4
..	30·8	32·2	30·7	30·76	30·8	31·6	31·4	36	33·2	..
200 m. (219 yds.) 2000 m. (2187 yds.)	200 m. (219 yds.) 2000 m. (2187 yds.)	600 m. (656 yds.) 2000 m. (2187 yds.)	400 m. (437 yds.) 2000 m. (2187 yds.)	200 m. (219 yds.) 2000 m. (2187 yds.)	500 m. (547 yds.) 2000 m. (2187 yds.)	400 paces (310 yds.) 2700 paces. (2096 yds.)	400 m. (437 yds.) 2000 m. (2187 yds.)	300 m. (328 yds.) 1200 m. (1312 yds.)	250 m. (273 yds.) 2000 m. (2187 yds.)	183 m. (200 yds.) 2187 m. (2850 yds.)
3·05 348	3·05 338	3·0 331·8	2·98 348·5	3·26	3·05 350	3·025 363	3·08 373·5	3·043 424	3·07 416	3·33 392
Round	Round	Round	Round	Round	Round	Round	Round	Round	Round	Pointed
Steel, coated with C. N.	Steel, coated with C. N.	C.N.	Copper	..	C.N.	C.N.	C.N.	Nickel plated, steel envelope over point	Steel, coated with C. N.	C.N. pointed
1·124 ·263 159·3	1·23 ·2637 162·	1·182 ·266 163·0	1·28 ·26 162·9	.. .. 155·3	1·244 ·2637 162	1·194 ·308 214	1·21 ·2843 172·8	1·18 ·319 212·5	1·212 ·311 211·3	1·08 ·308 150
36 N.C.	36·26 N.C.	30·09 Balistite	32·0 N.C.	31·8 N.G. and N.C.	36 N.C.	33 Pyroxiline	38·35 N.C.	30·7 N.C.	40·2 N.C.	50 Pyro-cellulose
2223	2433	2395	2396	2347	2400	1985	2296	1920	2066	2600
20·18	..	17·1	..	..	..	17·47	22·3	17·1	19·7	19·78

N.C. = Nitro-cellulose.

progress of the engagement, to change their target, to economize ammunition, to select the ground for the next rush and the next burst of fire, and to regain control of the men, whom a prolonged fire-fight hypnotizes and rivets to the ground. The chief use of "slow" fire, which is generally employed by skirmishers working in pairs, is to keep the enemy under; the storm of well-directed "rapid fire" the fire-director should hold in his own hands, ready to release it at the right moment. Slow fire averages 3 rounds a minute, rapid (aimed) 8–12. The configuration of the ground has often a great influence on fire effect. If the target is on a sharp forward slope, the beaten zone is greatly diminished in depth, ranging errors are no longer neutralized by the flatness of trajectory and (the bullets meeting the ground at a steeper angle) the dangerous space is reduced; if, on the other hand, the slope descends gently in rear of the target so that the falling bullets instead of making a pattern upon the ground, skim along parallel to the surface, the zone is increased. For instance, at 1500 yds., if there is a reverse slope of about 5° in rear of the target the depth of the beaten zone is tenfold that of the zone for the same range on level ground. Similarly if the target is on the crest of a hill and the firers below, the "over" half of the cone of fire may graze the reverse slope or pass far above, according as the reverse slope is gentle or sharp with respect to the line of sight.

The normal position for the firing infantryman in action is lying; the kneeling position is used for firing from behind cover, the sitting for firing down hill. Standing, formerly the usual position, is now employed chiefly for firing behind cover with the rifle rested, and for snap-shooting during an advance when it is undesirable to halt and lie down. As regards cover, it may be mentioned that well-covered or intrenched troops generally shoot less accurately than troops in the open, the soldier in security being loth to expose himself long enough to take careful aim. This was particularly noticeable in the Russo-Turkish War, and its effect is to create a zone of unaimed fire behind the assailants' fighting line, which sometimes causes serious losses to his supports and reserves. The relation between the cone of dispersion of peace-time experiments, even when these are specially designed to establish that relation (for example, series fired in France by third-class shots, after a long march without food), has never been satisfactorily established. An arbitrary figure of one-tenth or one-twentieth of peace-time effect has generally been assumed as representing war results, but some think that however the normal cone may be multiplied or divided, no relation can be found between peace and war effect, and that in battle the brave men aim and fire as if on the practice range, and the rest fire absolutely at hazard. From a musketry point of view, this brings again into the foreground the question of distance-judging, as, if the sights be wrongly set, the more accurate the fire the less its effect, and a mistake would nullify even the small amount of aimed fire that can be reckoned upon. Peace-time experiments have their value—and it is very great—in establishing data as to the effect of fire on troops in different formations, the limits of permissible error in ranging, &c., on the principle that of two methods, that which is proved to be better in peace would in much the same proportion be found better in war. (C. F. A.)

See T. F. Fremantle, *The Book of the Rifle*; W. W. Greener, *The Gun and its Development*; the British official *Text Book of Small Arms* (1909); and *Musketry Regulations* (1909); C. B. Mayne, *Infantry Fire Tactics*; and Taffin, "Tir de Combat" (*Revue d'infanterie*, 1909).

Match or Target Rifle.—The sport or pastime of target shooting has many times changed its character, owing to the steady improvement in the rifle and the different ranges or distances at which shooting is practised. Range usually governs the construction of the target rifle, long-range rifles not being necessarily the best weapons for a short range of, say, 200 yds. Limitations—such as the amount of powder charge, weight of bullet and rifle—are also usually imposed in order to place all competitors on equal terms. The long-range match rifle is not the superior of the military rifle as a weapon, but as a scientific shooting instrument is the best small-arm produced. The ordinary target rifle is a hybrid arm, combining the points of the long-range match, modern military and best sporting rifles. The miniature match rifle is used for short-range practice.

Shooting at fixed marks has been practised continuously in Switzerland from medieval times. A club ("Societé de l'harquebuse et de la Navigation") has existed in Geneva since 1474; and the Zürich "Schützen-Gesellschaft" since about the same date. It is not clear at what period rifles were introduced in these clubs. From the beginning of the 19th century up to 1844 the rifle generally used in Great Britain had a polygrooved barrel ·630 in. in diameter, with spherical ball, and the arm weighed from 11 to 15 ℔. It was not fired in military fashion, but had a handle extending downwards fixed in front of the trigger-guard, which was grasped by the left hand, the left arm being steadied against the body. This method of shooting is still sometimes followed by Swiss and German riflemen. Target shooting as a sport or business was rarely practised in Great Britain until after the formation of the Volunteer Force in 1859. The inauguration of the "National Rifle Association" in 1860 opened a new and most important era in the history and development of the rifle. This institution was established "for the encouragement of rifle corps and the promotion of rifle shooting throughout Great Britain. . . . As a national pastime to make the rifle what the bow was in the days of the Plantagenets, the familiar weapon of those who stand forth in the defence of their country." The first meeting of the N.R.A. was held at Wimbledon in 1860. The first shot was fired by Queen Victoria[1] from a Whitworth rifle on a machine rest, at 400 yds., and struck the bull's-eye. The Whitworth muzzle-loading rifle won many of the important prizes at this and subsequent meetings prior to 1871. Its most important features, arrived at after exhaustive experiments, were a smaller bore of ·450 in., with a twist of rifling of one turn in 20 in., and an elongated mechanically fitting projectile. Long-range rifle construction is also largely indebted to Whitworth for the highly accurate and superior tools and processes introduced by him in this branch of manufacture.

In 1866 and after, Metford's system of hardened expanding bullets and shallow rifling gradually superseded the mechanically fitting system of Whitworth, and the Whitworth rifle gradually lost its position. In 1861, the Henry grooving for a cylindrical bullet, a modification of the Whitworth, first appeared. In 1864, Rigby, with a five-grooved rifle and a mechanically fitting bullet, tied with the Whitworth rifle in the preliminary rifle trial of the N.R.A. at 1000 yds., and in a subsequent trial took the first place. By 1871 the Whitworth rifle had given place to the Metford system with hardened cylindrical bullets, shallow rifling and increasing spiral. In 1867 the modern breech-loading rifle with a metallic cartridge was first introduced. The Metford system of rifling greatly assisted its development. In this year Rigby also produced a new model long-range rifle designed on the lines followed by Metford. In 1869 the Henry barrel came to the front. In 1870 the Martini-Henry, the new service arm, won the duke of Cambridge's prize, the extreme range in this competition being 800 yds. In 1871 the Snider breech-loader replaced the Enfield muzzle-loader, and the Martini-Henry replaced the Whitworth in the later stages—800, 900 and 1000 yds.—of the Queen's prize. The Metford barrel was also used in breech-loaders, and the duke of Cambridge's prize—for the first time fired at 1000 yds.—fell to it. During the twenty-three years from 1871 to 1894 the Metford military match rifle only four times failed to win this prize, while it took a preponderating share of other prizes. The years 1872 and 1873 marked a decided advance in the military breech-loader, though for fine shooting the muzzle-loader still seemed hard to equal. In 1875 a team of American riflemen first visited Wimbledon with "army-pattern" breech-loading rifles, which were cleaned out after every shot, and met with considerable success. A feature of their shooting was the "back position," then a novelty. In 1877 the superiority of the cleansable and cleansed breech-loader over the increased fouling of the muzzle-loader was clearly demonstrated, though the muzzle-loader did not at once disappear. In 1878 the highest scores ever made with the muzzle-loader in Great Britain were recorded, greater care in cleaning the rifle after every shot being observed.

In 1883 the N.R.A. Council altered the conditions, wiping out after every shot was forbidden, but muzzle-loaders were not disqualified. The result was that the American type of rifle disappeared. The poor shooting of the Martini at 1000 yds. induced the Council to take the retrograde step of reducing the maximum range for the Queen's prize to 900 yds. In 1890 the N.R.A. first met at the new ranges at Bisley. This year was noticeable for the excellent shooting made in the "any" rifle competitions by the Gibbs-Metford match rifle, particularly at 1000 yds. range. The accepted type was ·461 calibre; 7 grooves ·0045 in. in depth; 80 grains of special black gunpowder, and a bullet of 570 grains. In 1892 and 1893 the Lee-Metford ·303 rifle with cordite ammunition was first used by the army teams. In 1890 and later the Hon. T. F. Fremantle, Captain Gibbs and some others used Metford's copper-coated bullets in the Gibbs-Metford rifle with success. In 1895 many match rifle shots followed their example. In 1895 and 1896 the ·303 was equalled, and in some instances beaten, by the smaller-calibre Mannlicher rifle. This was partly due to faulty Lee-Metford ammunition. The ·303 now proved its superiority to the ·450 Martini, especially at the longer ranges. The Bisley meeting of 1896 practically closed the series of contests with both the Martini and the military match rifles. The Volunteers were thenceforth armed with the ·303.

The results of the Bisley meetings since 1895 have proved that rifles of the ·303 class, the British ·303 rifle particularly, are not so good for match rifles pure and simple as the larger bores using black powder. The light bullets are more subject to deflection by the wind at long ranges than the heavier speed-retaining bullets of the larger bores. No nitro-powder used appears to have equalled the black powder in regularity of shooting. At the same time the object of the N.R.A. competitions is to encourage the use of the military service rifle in the first place, and in the case of the "any" rifle competitions to encourage the production of weapons of the highest efficiency for military purposes. Acting on these principles the rifles allowed by the N.R.A. regulations (1907) are classed as follows:—*Class I.*—Service rifle (S.R.): government pattern ·303 magazine rifles;

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[1] The "Queen's" or "King's" prize is the highest distinction to which a rifle shot can attain. The competition is one of three stages, the first and second eliminating all but the best 100 competitors. The bronze medal of the N.R.A. is awarded to the highest scorer in the first stage, the silver medal to the leader in the second, and the King's prize and N.R.A. gold medal to the winner in the last stage: 71 shots in all are fired at distances up to 1000 yds., and the winners' scores of late years have been 320 to 325 out of a possible 355. Only the service rifle is allowed.

sights strictly in accordance with service pattern.[1] *Class II.*—Match rifles (M.R.): any breech-loading rifle complying with the following conditions: maximum weight of barrel, 3¼ lb; maximum calibre, ·325; stock sufficiently strong for service purposes, and without pad or shoe on the heelplate; minimum pull of trigger, 4 lb; sights, of any description. *Class III.*—Military breech-loading rifles (M.B.L.); any rifle, that is either (*a*) the regulation military rifle of any country; or (*b*) a breech-loading rifle complying with the following conditions: maximum weight, exclusive of bayonet, 8¾ lb; maximum calibre, ·315; minimum pull of trigger, 4 lb. Sights may be of any description except telescopic or magnifying, but must be fixed to the barrel and must be strong enough for military purposes. *Class IV.*—Sporting rifles; calibre, any; minimum pull of trigger, 3 lb; sights, open or such as are sanctioned by the council or committee. The Lyman back-sight and the Beech combination fore-sight have been sanctioned. No lateral adjustment of fore- or back-sight is permitted. The miniature rifles allowed fall into two classes, "military," with open sights, only, and "any," with no restrictions as to sights except that magnifying and telescopic sights are forbidden.

Modern American Target Rifles.—In America, according to some authorities, there are three recognized departments of target shooting—namely off-hand shooting; shooting from a simple rest; and shooting from a machine rest, with telescopic or any other sight. For the first two classes small-bore rifles of ·380 calibre or under only are used. The usual weight is from 8 to 10 lb, with 28- or 30-in. barrel. Light charges for the shorter ranges are used. In the ·380 bore only 55 grains of powder with a 330-grain bullet is employed. In the second-class contests, from a simple rest, the barrel is longer and the weight increased to just under 12 lb. The bore is generally ·380. The usual range is 200 yds. The third-class shooting from a machine rest, generally with telescopic sights, is not much practised. Every kind of rifle is employed, usually of large bore and weighing from 20 to 60 lb. The long-range breech-loading match rifle, with which so much fine shooting was done when wiping out after each shot was allowed, weighed about 10 lb; the breech mechanism, any falling block, as the Sharp, Farquharson, Deeley, and Edge or Wiley, that admitted the insertion of the cleaning rod at the breech; length of barrel, 32 to 34 in.; seven or more grooves ·003 to ·005 in depth with a complete turn in 20 in. A sharp continual spiral and very shallow grooves constituted the feature of the American plan. Rigby's plan was similar, with one turn in 18 in. and eight grooves, the lands being about half the width of the grooves. In the Wiley the grooves were fewer and wider. The Metford is an increasing twist, starting with one turn in 60 in. and finishing with one in 20, or sharper. The usual bore of the American long-range rifle was ·458 or ·461; powder, 76 grains of special "fouling" rifle powder; elongated cylindrical bullet of 540 grains. The pull-off was under 3 lb. During recent years smaller-bore smokeless-powder rifles have also been used.

Continental Match Rifles.—The target rifle used by continental marksmen for medium ranges is a modification of the old pattern Swiss rifle, with scroll guard, hollowed butt plate and hair trigger. This latter, a mechanical device to free the tumbler from the sear without sufficient pull on the trigger to influence the aim, is disallowed in military arms.

Sporting Rifles.—Prior to 1845 smooth-bore guns with double charge of powder and an ounce spherical ball were generally preferred to rifles for sporting purposes and for large game; 16-bore muzzle-loading rifles were occasionally used by British sportsmen in the East Indies before that date, firing 1½ drs. of powder with a spherical ounce ball. These rifles were sighted to 200 yds., but the trajectory was high and the penetration weak; they were also difficult to load when foul. The twist of the rifling was also too rapid, causing the bullet to strip with heavy charges of powder. According to Captain Forsyth and others, up to 1860 there was no known rifle suitable for sporting purposes in India. Rifles of 12-bore gauge, firing a spherical ball, were subsequently made, with broad and shallow grooves making one turn in 10 ft. The bullet, of the same diameter as the bore, was loaded with a thin patch that took the grooving. These rifles proved very successful, possessing velocity equal to a smooth-bore of the same calibre, accuracy for sporting distances, flat trajectory and great striking power. In 1855 W. Greener produced the "Cape rifle" for South African sport, calibre ·450 or ·500; rifling, two deep grooves with one turn in 26 in., with a flanged bullet to fit the grooves; weight, 12 lb; sighted up to 1200 yds. This rifle was successful, and others were built by Purdey, who in 1856 named the pattern "Express Train." Since that date the word "express" has been generally used to denote a rifle possessing high velocity, flat trajectory and long fixed-sight range.[2] In America small-bore rifles were used earlier in the 19th century. The celebrated Kentucky rifles were of various sizes, firing spherical balls of 90, 60 and 40 to the lb, and were renowned for their accuracy and fixed-sight range up to 100 yds. Some maintain that the express rifle was developed from the Kentucky model. The modern express rifle may be defined as a breech-loading rifle with a height of trajectory not exceeding 4½ in. at 150 yds., with a muzzle velocity of at least 1750 f.s. These rifles are usually 5- to 7-grooved, double-barrelled, with 26- to 28-in. barrels of ·360, ·400, ·450, ·500 and ·577 bores, weighing respectively from 6½ to 7 lb, 7 to 8 lb, 7¾ to 9 lb, 8¼ to 10 lb and 10¼ to 12 lb. The respective average charges are: bullet, 150 grains; powder, 50 grains; 209 and 82; 270 and 110; 340 and 130; 520 and 160; the fixed-sight ranges, 130, 160, 150, 130 and 120 yds. Double and single express rifles of ·303 bore with 26-in. barrels are also made.

Since the invention of cordite powder and the advent of the small-bore high-velocity rifle for military purposes, the variety of sporting rifles with different-sized bores has increased. Sporting cordite express rifles are now made, both single- and double-barrelled, of the following calibres: ·256, ·265, ·276, ·303, ·310, ·360, ·370, ·375, ·400, ·450, ·500, ·577 and ·600. Some of these calibres, such as ·500, ·577 and ·600, are seldom used with cordite. The ·450 cordite express is the largest bore high-velocity rifle recommended.

The modern small-bore military rifle already described possesses all the best qualities of an express sporting rifle—namely accuracy, flat trajectory, high muzzle velocity and long point-blank or fixed-sight range up to 200 yds. The muzzle velocity of the ·303 bore with black powder is 1850 f.s.; with cordite, 2100 f.s. The hollow-pointed or slit expanding bullet is generally used in these high-velocity rifles, as in the black-powder express, for ordinary sporting purposes, with the solid metal cartridge-case. The pointed bullet is also sometimes used, generally with the ·375 and ·475 calibre rifles, and gives an increased muzzle velocity of 2500 f.s. The trajectory of the cordite rifle is stated to be 10 in. flatter at 200 yds. than that of a black-powder rifle of similar calibre and corresponding charge. The variety of bores in sporting rifles is due largely to restrictions on the importation of arms of the military calibres (especially ·303) into India and South Africa.

The sights of sporting express rifles are of some variety, and are usually designed and made with special care. The open V back-sight on an ivory pyramid with two or three leaves up to 300 yds., and the enamelled bead fore-sight, are the most usual form. The more elaborate Lyman and Beech peep-sights are also popular. One or two varieties of telescope sight, attachable to the barrel, are also made by some leading gunmakers, and have been used with success in the field. Solid-drawn brass cartridge-cases are now always used for sporting rifles, except occasionally for some of the larger bores, in which paper cartridges may be used. The peculiarity of the express bullet is its hollow point, which is intended to ensure the expansion of the projectile on impact. This diminishes its penetration, but translates its velocity or energy into "shock." If greater penetration is needed, the leaden bullet is hardened with mercury or tin, or the military nickel-coated bullet is used. Explosive bullets filled with detonating powder were at one time used in express and large-bore rifles for large game. These are now practically abandoned, owing to their uncertainty of action and the danger in handling them. The use of the large 4- and 8-bore black-powder rifles is restricted to the hunting of large and dangerous game. These are usually double-barrelled. The 4-bore weighs from 14 to 18 ℔ with 20-in. barrels, and fires a charge of 12 to 14 drs. of powder, with a spherical bullet of 1510 grs. The great weight of this rifle is against its general use. The 8-bore rifle weighs from 11½ to 15 ℔ with 20- to 24-in. barrels, with a charge of 8 to 12 drs. of powder with a spherical ball. These rifles are accurate and effective up to 120 yds. Rook and rabbit rifles are usually single-barrel breech-loading rifles of from ·220 to ·380 bore, hammerless, ejectors. The range is ordinarily restricted to 200 yds.

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[1] The N.R.A. have recently sanctioned the use of the aperture sight in service rifles, provided it be attached to the weapon by the hinge-pin which fastens the ordinary folding leaf.

[2] The term "point-blank range" is often used in this connexion. Strictly speaking, there is no such thing as "point-blank range," the bullet commencing to drop immediately it leaves the muzzle of the rifle. The path or trajectory of the bullet if fired horizontally is therefore always a downward curve. The higher the muzzle velocity the flatter is this curve. The "fixed-sight," or so-called "point-blank" range, is usually taken at such range, generally 100 yds. with black powder, and with such elevation as render the amount of drop of the bullet or curve of its path practically immaterial for sporting purposes, say a maximum of 4½ in. At shorter range this curve would therefore take the bullet so much above the line of fixed-sight aim, and must where necessary be allowed for. With the high-velocity small-bore rifle the fixed-sight range can be increased to 200 yds. for the sporting rifle; and for military purposes in the field to 500 yds. and (with pointed bullets) even more.

Combined rifles and shot-guns are generally used in countries where the kind of game to be met with is not known beforehand, and by emigrants who can only afford one gun. These weapons are double-barrelled (·450 rifle barrel and 16-bore short barrel; or ·500 rifle and 12-bore shot). Such a gun has many drawbacks, being too heavy for a shot-gun and too light for a rifle, with a bad balance. More modern combinations of the rifle and shot-gun are Holland's "Paradox," a smooth bore with the last three inches of the barrel ratchet-rifled, Lancaster's "Colindian" twisted oval bore, and Bland's "Euoplia" with "invisible" undulating rifling. All these weapons fire heavy bullets more or less accurately up to 100 yds., are also used as shot-guns, and are made double- or single-barrelled and of various calibres, 12-bore being the most common. There is also Greener's "under and over," the rifle barrel being topmost (usually 16-bore shot-gun barrel and ·450 rifle barrel). The Morris tube also enables a shot-gun to be utilized as a small-bore rifle or a large rifle as a saloon rifle for gallery practice. The automatic principle has not yet been applied to sporting rifles.

Miniature Rifles.—In 1905 a War Office miniature or cadet rifle for instruction purposes was officially adopted by the British military authorities. The details of this rifle were determined by a committee, upon which the National Rifle Association and the Society of Miniature Rifle Clubs were represented. It is a single-loading bolt-action rifle of ·22 calibre with military sights (the aperture sight being barred), shooting a rim-fire cartridge having a 40-gr. bullet propelled by 5 grs. of black gunpowder or its equivalent in some smokeless explosive. It is used at ranges from 25 yds. up to a maximum of 200 yds. The official adoption of such a rifle was largely due to the civilian rifle club movement, which was the outcome of the South African War, and in which the Society of Miniature Rifle Clubs has played an important part. Until the recent official adoption of the miniature rifle, the council of the N.R.A. regarded marksmanship with the service rifle as its main object of encouragement, and the service rifle itself as the orthodox weapon. The Society of Miniature Rifle Clubs, on the other hand, makes the encouragement of the use of low-power rifles its special object, with few restrictions as to type of sights, rifle or ammunition. Numerous civilian rifle clubs have adopted the ·22 calibre rifle, in many cases with aperture sights, with marked success, and British rifle-makers were encouraged to cater for this new demand for low-power rifles. Such weapons can be far more widely and generally used than the ordinary service weapon, owing to their smaller cost, cheaper ammunition, absence of recoil, and their convenience for use at short covered ranges in crowded centres of population. In many parts of Great Britain there is practically no alternative between low-power short-range practice and no shooting at all. The N.R.A. has now admitted the miniature ·22 calibre rifle upon equal terms with the service rifle. The miniature rifle has, to some extent, taken the place of the Morris tube and "adaptors" previously used for rifle practice at short ranges.[1] The Morris tube consists of a small-rifled barrel, usually chambered for the 297/230-bore cartridge, and capable of being fitted inside the barrel of the ordinary service weapon, which thus becomes available as a miniature rifle for short-range practice. The Morris tube has been adopted by the British War Office, and affords an excellent means of training the recruit. "Adaptors" are dummy cartridge-cases fitted into the breech of the ordinary rifle, by means of which a shorter cartridge firing a lighter charge of powder, but with a bullet of the same calibre as the rifle, can be used for short-range practice. One of the first English miniature target rifles was the "Sharpshooters' Club" rifle, on the Martini principle, of ·310 calibre, manufactured and introduced by W. W. Greener, and suitable for ranges from 50 to 300 yds. This rifle was adopted by many rifle clubs, and in 1901 established a record in the miniature rifle competition at Bisley. Miniature rifle shooting has been much encouraged throughout the United Kingdom by the establishment of the Light Rifle Championship competition under the auspices of the Society of Miniature Rifle Clubs. In 1907 Queen Alexandra presented a cup for this event. (H. S-K.)

RIFLEMAN-BIRD, or RIFLE-BIRD, names given by the English in Australia to a very beautiful inhabitant of that country,[2] probably because in coloration it resembled the well-known uniform of the rifle-regiments of the British army, while in its long and projecting hypochondriac plumes and short tail a further likeness might be traced to the hanging pelisse and the jacket formerly worn by the members of those corps. The cock bird is clothed in velvety-black generally glossed with rich purple, but having each feather of the abdomen broadly tipped with a chevron of green bronze, while the crown of the head is covered with scale-like feathers of glittering green, and on the throat gleams a triangular patch of brilliant bluish emerald, a colour that reappears on the whole upper surface of the middle pair of tail-quills. The hen is greyish-brown above, the crown striated with dull white; the chin, throat and a streak behind the eye are pale ochreous, and the lower parts deep buff, each feather bearing a black chevron. According to James Wilson (*Ill. Zoology*, pl. xi.), specimens of both sexes were obtained by Sir T. Brisbane at Port Macquarie, whence, in August 1823, they were sent to the Edinburgh Museum, where they arrived the following year; but the species was first described by W. Swainson in January 1825 (*Zool. Journal*, i. 481) as the type of a new genus *Ptiloris*, more properly written *Ptilorrhis*,[3] and it is generally known in ornithology as *P. paradisea*. It inhabits the northern part of New South Wales and southern part of Queensland as far as Wide Bay, beyond which its place is taken by a kindred species, the *P. victoriae* of J. Gould, which was found by John Macgillivray on the shores and islets of Rockingham Bay. Farther to the north, in York Peninsula, occurs what is considered a third species, *P. alberti*, very closely allied to and by some authorities thought to be identical with the *P. magnifica* (Vieillot) of New Guinea—the "Promerops" of many writers. From that country a fifth species, *P. wilsoni*, has also been described by Mr Ogden (*Proc. Acad. Philadelphia*, 1875, p. 451, pl. 25). Little is known of the habits of any of them, but the rifleman-bird proper is said to get its food by thrusting its somewhat long bill under the loose bark on the boles or boughs of trees, along the latter of which it runs swiftly, or by searching for it on the ground beneath. During the pairing-season the males mount to the higher branches and there display and trim their brilliant plumage in the morning sun, or fly from tree to tree uttering a note which is syllabled "yass" greatly prolonged, but at the same time making, apparently with their wings, an extraordinary noise like that caused by the shaking of a piece of stiff silk stuff. Verreaux informed D. G. Elliot that he believed they breed in the holes of trees and lay white eggs; but on that score nothing is really known. The genus *Ptilorrhis*, thought by Gould to be allied to *Climacteris*, has been generally placed near *Epimachus*, which is now considered, with *Drepanornis* and *Seleucides*, to belong to the Passerine Paradiseidae, or birds-of-paradise, and in his *Monograph* of that family all the species then known are beautifully figured by D. G. Elliot. (A. N.)

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[1] In the military forces short-range practice now takes two forms—practice with Morris tube or miniature rifle, and practice with the full-sized rifle and ammunition on specially protected 30-yd. ranges.

[2] Curiously enough, its English name seems to be first mentioned in ornithological literature by Frenchmen—R. P. Lesson and Garnot—in 1828, who say (*Voy. "Coquille," Zoologie*, p. 669) that it was applied "pour rappeler que ce fut un soldat de la garnison [of New South Wales] qui le tua le premier"—which seems to be an insufficient reason, though the statement as to how the first specimen was obtained may be true.

[3] Some writers have amended Swainson's faulty name in the form *Ptilornis*, but that is a mistake.

RIGA (Esth. *Ria-Lin*), a seaport of Russia, 366 m. by rail S.W. of St Petersburg, the capital of the government of Livonia. The Gulf of Riga, 100 m. long and 60 m. in width, with shallow waters of inconsiderable salinity (greatest depth, 22 fathoms), freezes to some extent every year. The town is situated at the southern extremity of the gulf, 8 m. above the mouth of the Dvina, which brings Riga, by means of inland canals, into water communication with the basins of the Dnieper and the Volga. Below the town the river divides into several branches, among islands and sandbanks, receiving before it enters the sea the Bolderaa river, and expanding towards the east into wider lacustrine basins. Having direct railway communication with the fertile parts of southern and south-eastern Russia, Riga has become the second port for foreign trade on the Baltic, ranking next after St Petersburg. The port freezes on an average 127 days every year. The larger ships cannot reach Riga, and are unloaded at Ust-Dvinsk (formerly Dunamünde). By no means all the trade with the interior is transported by the railways; no inconsiderable portion of the goods is carried by water.

Riga consists of four parts—the old town and the St Petersburg and Moscow suburbs on the right bank of the Dvina, and the Mitau suburb on the left bank, the two sides being connected by a floating bridge, which is removed in winter, and by a viaduct, 820 ft. long. The old town still preserves its Hanseatic features—high storehouses, with spacious granaries and cellars, flanking the narrow, winding streets. The only open spaces are the market-place and two other squares, one of which, facing the citadel, is adorned with a granite column erected (1818) in commemoration of the defeat of Napoleon I. in 1812. The suburbs, with their broad and quiet boulevards on the site of the former fortifications, are steadily growing. The St Petersburg suburb is the seat of the German aristocracy and merchant community.

Few antiquities of the medieval town remain. The oldest church, the Dom (St Mary's), founded in 1215, was burned in 1547, and the present building dates from the second half of the 16th century, but has been thoroughly restored since 1883. Its organ, dating from 1883, is one of the largest in the world. St Peter's church, with a beautiful tower 412 ft. high, was erected in 1406–9. The castle, built in 1494–1515 by the master of the Knights of the Sword, Walter von Plettenberg—a spacious building often rebuilt—is the seat of the Russian authorities. The "House of the Black Heads," a corporation or club of foreign merchants, was founded in 1330, and subsequently became the meeting-place of the wealthier youth of the place. Of the recent erections, the polytechnic, the exchange, the monument of the German writer, Johann Gottfried von Herder, who lived at Riga towards the end of the 18th century, the gymnasiums (schools) of Lomonosov and Alexander I. and the large bonded warehouse are worthy of notice. The esplanade (where a Greek cathedral built in 1877–84 now stands), the Wöhrmann Park and the Imperial Park are much visited. Riga gives name to an archiepiscopal see of the Orthodox Greek Church and to an episcopal see of the Roman Catholic Church, and is the headquarters of the XX. army corps. In the environs, Dubbeln and the sea-bathing resorts of Bilderlingshof and Majorenhof have numerous visitors in summer.

The population, which was 102,590 in 1867, increased to 168,728 in 1881 and to 282,943 in 1897, so that Riga now ranks seventh in the empire in order of population; 47% of the inhabitants are Germans, 25% Russians and 23% Letts, with a small admixture of Esthonians, Jews, &c. The city has a commercial school (1903), a municipal library, the Dom museum, an art museum with picture gallery (1904–5), technical and theological middle schools and a pilot and navigation school. Industrial activity has developed and includes railway-carriage works, works for the manufacture of machinery, oil mills and breweries. Owing to its communication by water and rail with the forests of White Russia and Volhynia, Riga is a great mart for timber. Flax and linseed also occupy a prominent place, Riga being the chief Russian port for the extensive flax-producing region of north-west Russia. Owing to the great railway which crosses the country from Riga to Smolensk, afterwards dividing into two branches, to Orenburg and Tsaritsyn on the lower Volga respectively, Riga is the storehouse and place of export for hemp coming by rail from west central Russia, and for corn, Riga merchants sending their buyers as far east as Tambov. Oats, in particular, are extensively exported to England from the central provinces. Wheat, barley, eggs, butter, oilcake, hides, tallow, leather, tobacco, rugs, feathers and other items add considerably to the total value of the exports, which increased from $1\frac{3}{4}$ million sterling in 1851–60 to 8–14 millions sterling in 1901–5. The imports, consisting chiefly of salt, fish, wine, cotton, metals, machinery, coal, oils, fruits and tobacco, are also rapidly increasing: whereas in 1851–60 they were valued at about $\frac{1}{2}$ million sterling, in 1901–5 they reached 6–$11\frac{1}{4}$ millions sterling.

History.—Riga was founded in 1158, as a storehouse at the mouth of the Düna (Dvina), by a few Bremen merchants. About 1190 the Augustinian monk Meinhard erected a monastery there, and in 1199–1201 Bishop Albert I. of Livonia obtained from Pope Innocent III. permission for German merchants to land at the new settlement, and chose it for his seat, exercising his power over the neighbouring district in connexion with the Teutonic Knights. As early as the first half of the 13th century the young city obtained the right of electing its own magistracy, and enlarged the walls erected during Albert I.'s time. It joined the Hanseatic League, and from 1253 refused to recognize the rights of the bishop and the knights. In 1420 it fell once more under the rule of the bishop, who maintained his authority until 1566, when it was abolished in consequence of the Reformation. Sigismund II., king of Poland, took Riga in 1547, and in 1558 the Russians burned its suburbs and many ships in the river. In 1561 Gotthard Ketteler publicly abdicated his mastership of the order of the Teutonic Knights, and Riga, together with southern Livonia, became a Polish possession; after some unsuccessful attempts to reintroduce Roman Catholicism, Stephen Bathory, king of Poland, recognized the religious freedom of the Protestant population. Throughout the 17th century Riga was a bone of contention between Sweden, Poland and Russia. In 1621 Gustavus Adolphus, king of Sweden, took it from Poland, and held it against the Poles and the Russians, who besieged it in 1656. During the Northern War between Sweden and Russia, it was courageously defended (1700), but after the battle of Poltava it succumbed, and was taken in July 1710 by the Russians. In 1781 it was made by Russia the capital of the Riga viceroyalty, but fifteen years later, the viceroyalty having been abolished, it was made the capital of Livonia. In 1812, the approach of the French being apprehended, the suburbs were burned. (P. A. K.; J. T. Be.)

RIGAUD, HYACINTHE (1659–1743), French painter, born at Perpignan on the 20th of July 1659, was the descendant of a line of artists. Having early lost his father, he was sent by his mother to Montpellier, where he studied under Pezet and was helped by Ranc, then to Lyons, and in 1681 to Paris. There, whilst following the regular course of academical instruction, Rigaud produced a great number of portraits so good that Le Brun advised him to give up going to Rome and to devote himself wholly to this class of work. Rigaud, although he had obtained the Grand Prix, followed this advice, and for sixty-two years painted at the rate of thirty to forty portraits a year, all carried through with infinite care by his own hand. His portraits of himself, of the sculptor Desjardins (Louvre), of Mignard and of Le Brun (Louvre) may be cited as triumphs of a still more attractive, if less imposing, character than that displayed in his grand representations of Bossuet (Louvre) and Louis XIV. (Louvre), while his beautiful portraits of his mother, Marie Serre (Louvre), must for ever remain amongst the masterpieces of French art. Rigaud, although the great successes to which he owed his fame were won without exception in portrait-painting, persisted in pressing the Academy to admit him as an historical painter. This delayed his reception, and it was not until January 1700 that he succeeded in obtaining his desire. He presented as his diploma works a St Andrew (Louvre) and the portrait of Desjardins already mentioned, exhibited at the salon of 1704, and filled in turn all the various posts of academical distinction. He died on the 27th of December 1743, having never recovered from the shock of losing his wife in the previous year. He had many pupils, and his numerous works had the good fortune to be reproduced by the greatest of French engravers—Edelinck, Drevet, Wille, Audran and others.

RIGBY, RICHARD (1722–1788), English politician, was the only son of Richard Rigby (d. 1730) of Mistley Hall, Essex, a merchant who made a fortune through his connexion with the South Sea Company. Young Rigby became an associate of Frederick, prince of Wales, and entered parliament in 1745. He is chiefly known to fame through his connexion with John Russell, 4th duke of Bedford, and the "Bloomsbury gang," his audacity earning for him the title of the "brazen boatswain" of the "crew." In 1758 he became secretary to Bedford, who was lord lieutenant of Ireland, and in the following year he was given the sinecure office of master of the rolls for Ireland. Following the political fortunes of the duke he became vice-treasurer of Ireland in 1765, and in 1768 he obtained the lucrative position of paymaster-general of the forces. Rigby often spoke in parliament, and in 1769 he shared in the opposition to Wilkes. In 1784 he was obliged to resign his position as paymaster-general, and he was somewhat surprised and embarrassed when he was requested to pay over the large sum of public money which was in his possession. He left a great fortune when he died at Bath on the 8th of April 1788. A rapacious and unscrupulous politician, Wraxall says Rigby "possessed talents for addressing a popular assembly which were sustained by a confidence that nothing could abash."

RIGG, JAMES HARRISON (1821–1909), English Nonconformist divine, was born at Newcastle-on-Tyne on the 16th of January 1821. His father was a Wesleyan minister and sent his son to the Old Kingswood School, Bristol, where he subsequently became an assistant teacher. In 1845 he entered the Wesleyan ministry, and during the agitation of 1849–52 wrote successfully in exposition and defence of the polity of Methodism. In 1857 he published *Modern Anglican Theology*, an acute criticism of the writings of Coleridge, Hare, Maurice, Kingsley and Jowett. The book was timely and well received, and though Kingsley at first resented the criticism he afterwards became a cordial friend of the writer. Rigg had now become a leading figure in his own church, and in 1868 was appointed Principal of the Westminster Wesleyan Training College for day-school teachers, a post which he held with growing distinction for 35 years. In 1870 he was elected on the first School Board for London, one of the most remarkable assemblies of modern times, and took an important part in providing the syllabus of religious instruction and framing the religious settlement for teachers.

In 1873 he wrote *National Education in its Social Conditions and Aspects*. A resolute opponent of secular education, he maintained that the state ought not to compete with the churches, but welcome their aid in the work of national education. He was also strongly against the adoption of a rigid universal code. In 1886 he sat on the Royal Commission of Education, and was brought into close contact with Matthew Arnold, and with Dean Stanley, Bishop Temple and other Anglican prelates, who held him in high esteem. In 1877 he became chairman of the second London district of Methodism, and for fourteen years helped to make the history of his church in the home counties. In 1878 he was elected president of conference—and again in 1892. From 1881 he was ministerial treasurer of the Wesleyan Missionary Society, taking an active part in its work. He resigned his principalship in 1903 and died at Brixton on the 17th of April 1909. Dr Rigg was universally honoured as the Nestor of Wesleyan Methodism, in the development of which he had taken a foremost part for over 60 years. His *Connexional Economy* is a standard work, and his *Living Wesley* a most discriminating study of the character and work of its subject. His *Oxford High Anglicanism* (1895) showed how keenly he followed modern developments in the Church of England. His lifelong principle was that Methodism is "a church friendly to all, but owing allegiance to none."

See *Life* by John Telford (London, 1909).

RIGGING (A.S. *wrigan* or *wrihan*, to clothe), the general term, in connexion with ships, for the whole apparatus of spars (including both masts and yards), sails and cordage, by which the force of the wind is utilized to move the hull against the resistance, and with the support, of the water. (See also SHIP and SHIPBUILDING). The word is often used as meaning the cordage only, but this is a too limited, and even an irrational, use of the term. A ship is not rigged until she is provided with all the spars, sails and cordage required to move and control the hull. The straight or curved pieces of wood or metal, called davits, from which the boats carried along the bulwarks are hung, belong to the rigging. All are fastened directly or indirectly to the hull, and all are required to complete her "clothing." Vessels of all classes, from the smallest sailing-boat up to the largest ship, are classed according to the particular combination of their spars, sails and cordage. "Cutter," "brig," or "ship," are only convenient abbreviations for "cutter-rigged," "brig-rigged," or "ship-rigged." They are of such or such a "rig." It is strictly correct to speak of the rigging of a mast or a yard, or of a boom, when all that is meant is the special set of ropes, of whatever size or material, required to keep them in their place, or withdraw them from it, when they have to be moved in the ship. In such cases the part is looked upon as a whole, and is mentally abstracted from the total of the vessel's rigging.

The basis of all rigging is the mast (*q.v.*), whether it be composed of one or of many pieces of wood or metal. The mast is held up and controlled by ropes, which are classed together as the "standing rigging," because they are "that part (of the whole rigging) which is made fast, and not hauled upon" (Admiral Smyth, *Sailor's Word-Book*). This must be understood subject to the restriction that in the case of a mast composed of several parts, including topmast and topgallant mast, these subdivisions may be, and often are, lowered. The backstays, and other ropes which keep the top and topgallant masts in place, are therefore only "comparative fixtures." The bowsprit, though it does not rise from the deck but projects from the bow, is in fact a mast. The masts, including the bowsprit, support all the sails, whether they hang from the "yards," which are spars slung to the mast, or from "gaffs," which are spars projecting from the mast, or, as in the case of the "jibs," are triangular sails, travelling on ropes called "stays," which go from the foremast to the bowsprit and suspended by halliards. The bowsprit is subdivided like other masts. The bowsprit proper corresponds to the lower fore-, main- or mizzen-mast. The jib-boom, which is movable and projects beyond the bowsprit, corresponds to a topmast; the flying jib-boom, which also is movable and projects beyond the jib-boom, answers to a topgallant mast. The whole body of ropes by which the yards, booms and sails are manipulated constitute the "running rigging," since they are "in constant use, to trim yards, and make or shorten sail" (Admiral Smyth, *op. cit.*). The rigging must also provide the crew with the means of going aloft, and with standing ground to do their work when aloft. Therefore the shrouds (see below) are utilized to form ladders of rope, of which the steps are called ratlines, by which the crew can mount. Near the heads of the lower masts are the tops—platforms on which men can stand—and in the same place on the topmasts are the "cross-trees," of which the main function is to extend the topgallant shrouds. The yards are provided with ropes, extending from the middle to the extremities or arms, called horses, or foot-ropes, which hang about 2 or 3 ft. down, and on which men can stand. The material of which the cordage is made has differed, and still differs greatly. Leather has been used. During historic times, however, the prevailing materials have been hemp or esparto grass (*Machroeloa*, or *Stipa tenacissima*), and in recent days chain and wire. As the whole of the rigging is divided into standing and running, so a rope forming part of the rigging is divided into the "standing part" and the "fall." The standing part is that which is made fast to the mast, deck or block. The fall is the loose end or part on which the crew haul. The block is the pulley through which the rope runs. "Standing" in sea language means "fixed"—thus the standing part of a hook is that which "is attached to block, chain or anything which is to heave the hook up, with a weight hanging to it; the part opposite the point" (Smyth, *sub voce*). "Tackle" is the combination of ropes and blocks; the combination of cables and anchors constitutes the "ground tackle."

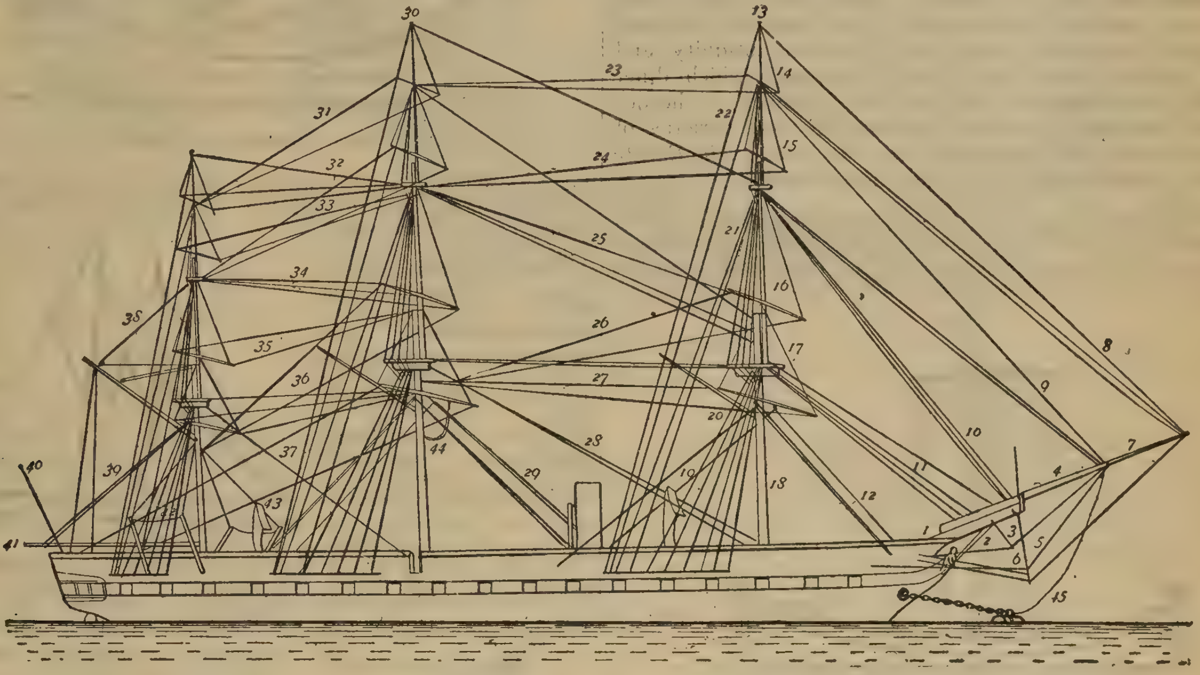


FIG. 1.—The Spars and Rigging of a Frigate. References are not repeated for each mast where the names and functions are identical. 1, bowsprit; 2, bobstays, three pairs; 3, spritsail-gaffs, projecting on each side of the bowsprit—the ropes at the extremities are jib-guys and flying jib-guys; 4, jib-boom; 5, martingale-stay, and below it the flying-jib martingale; 6, back-ropes; 7, flying jib-boom; 8, fore-royal stay, flying jib-stay and halliards; 9, fore-topgallant-stay, jib-stay and halliards; 10, two fore-topmast-stays and fore-topmast staysail halliards; 11, the foretop-bowlines, stopped into the top and two fore-stays; 12, two fore-tacks; 13, fore-truck; 14, fore-royal mast, yard and lift; 15, topgallant mast, yard and lift; 16, fore-top mast, topsail-yard, lift and reef-tackle; 17, foretop, fore-lift, and topsail-sheet; 18, foremast and fore-shrouds, nine pairs; 19, fore-sheets; 20, fore-gaff; 21, fore-topmast backstays and topsail tye; 22, royal and topgallant backstays; 23, fore-royal-braces and main-royal-stay; 24, fore-topgallant braces and main-topgallant-stay; 25, standing parts or fore-topsail-braces and main-topmast-stays; 26, hauling parts of fore-topsail-braces and main-top-bowlines; 27, fore parts of fore-braces; 28, mainstays; 29, main-tacks; 30, main-truck; 31, main-royal-braces; 32, mizzen-royal-stay and mizzen-royal-braces; 33, main-topgallant-braces and mizzen-topgallant-braces; 34, standing parts of main-topsail-braces and mizzen-topmast-stay; 35, mizzen-topsail-braces; 36, hauling parts of main-topsail-braces, mizzen-top-bowlines and cross-jack-braces; 37, main-braces and mizzen-stay; 38, standing part of peak halliards; 39, vangs, similar on each gaff; 40, ensign staff; 41, spanker-boom; 42, quarter-boat's davits; 43, one of the davit topping-lifts and wind-sail; 44, main-yard-tackle; 45, a bull-rope.

The function of all cordage may be said to be to pull, for the purpose either of keeping the masts in their places, or of moving spars and sails. The standing rigging which supports the masts must be adapted to resist two kinds of pressure, the longitudinal, whether applied by the wind or by the motion of the vessel when pitching (*i.e.* plunging head and stern alternately into the hollow of the sea), and the lateral, when the wind is blowing on the side and she is rolling. The longitudinal pressure is counteracted by the bobstays, stays and backstays. A reference to fig. 1 will show that the bobstays hold down the bowsprit, which is liable to be lifted by the tug of the jibs, and of the stays connecting it with the fore-topmast. If the bowsprit is lifted the fore-topmast loses part of its support. In the case of a small vessel, the lifting of a bowsprit would wreck her whole system of rigging in an instant. If fig. 1 is followed from the bow to the mizzenmast, it will be seen that a succession of stays connect the masts with the hull of the ship or with one another. All pull together to resist pressure from in front. Pressure from behind is met by the backstays, which connect the topmasts and topgallant masts with the sides of the vessel. Lateral pressure is met by the shrouds and breast-backstays. A temporary or "preventer" backstay is used when great pressure is to be met. Seamen have at all times had recourse to special devices to meet particular dangers. When Dundonald, then captain of the "Pallas" frigate, was chased by a French squadron in stormy weather, he fortified his masts by ordering "all the hawsers" (large ropes a little less strong than the cables which hold the anchor) "in the ship to be got up to the mast heads, and hove taut," *i.e.* made fast to the side. Thus she was able to carry more sail than would have been possible with her normal rigging. The running rigging by which all spars and sails are hoisted, or lowered and spread or taken in, may be divided into those which lift and lower—the lifts, jeers, halliards (haulyards)—and those which hold down the lower corners of the sails—the tacks and sheets. A long technical treatise would be required to name the many combinations of cordage and spars which make up the total rigging. All that is attempted here is to give the main lines and general principles or divisions.

The vessel dealt with here is the fully rigged ship of three or more masts. But she includes all the others and the principles are the same. The simplest of all forms of rigging is the dipping lug, a quadrangular sail hanging from a yard, and always hoisted on the side of the mast opposite to that on which the wind is blowing (the lee side). When the boat is to be tacked so as to bring the wind on the other side, the sail is lowered and rehoisted. One rope can serve as halliard to hoist the sail and as a stay when it is made fast on the weather side on which the wind is blowing. The difference between such a craft and the fully rigged ship is that between a simple organism and a very complex one; but it is one of degree, not of kind. The steps in the scale are innumerable. Every sea has its own type. Some in eastern waters are of extreme antiquity, and even in Europe vessels are still to be met with which differ very little if at all from the ships of the Norsemen of the 9th and 10th centuries. For a full account of these varieties of rigging the reader may be referred to *Mast and Sail in Europe and Asia* (London, 1906), by H. Warington Smyth.

When the finer degrees of variation are neglected the types of rigging may be reduced to comparatively few, which can be classed by the shape of their sail and the number of their masts. At the bottom of the scale is such a craft as the Norse herring boat (fig. 2).

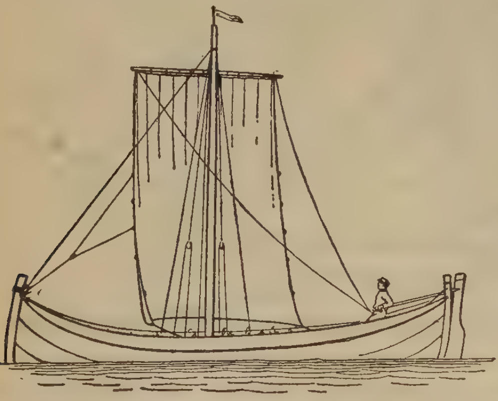


FIG. 2.—Norse Herring Boat.

She has one quadrangular sail suspended from a yard which is hung (or slung) by the middle to a single mast which is placed (or stepped) in the middle of the boat. She is the direct representative of the ships of the Norsemen. Her one sail is a "course" such as is still used on the fore and mainmasts of a fully developed ship; a topsail may be added (as in fig. 3) and then we have the beginning of a fully clothed mast.

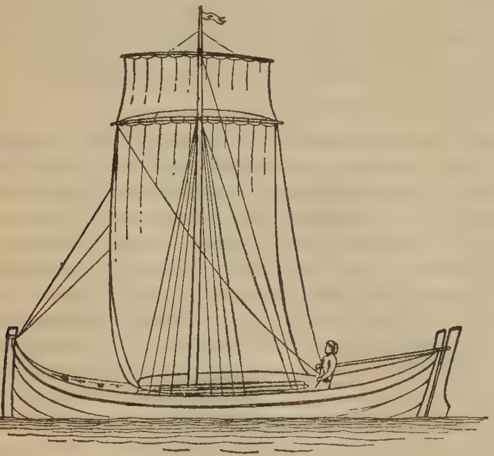


FIG. 3.—Nordland Boat.

A very similar craft called a Humber keel is used in the north of England. The lug sail is an advance on the course, since it is better adapted for sailing on the wind, with the wind on the side. When the lug is not meant to be lowered, and rehoisted on the lee side, as in the dipping lug mentioned above, it is slung at a third from the end of the yard, and is called a standing lug. A good example of the lug is the Chinese junk (fig. 4).

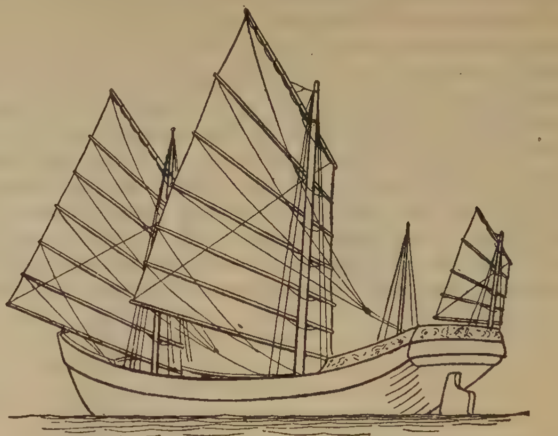


FIG. 4.—Four-masted Junk.

The lug is a "lifting sail," and does not tend to press the vessel down as the fore and aft sail does. Therefore it is much used by fishing vessels in the North Sea. The type of the fore and aft rig is the schooner (fig. 5).

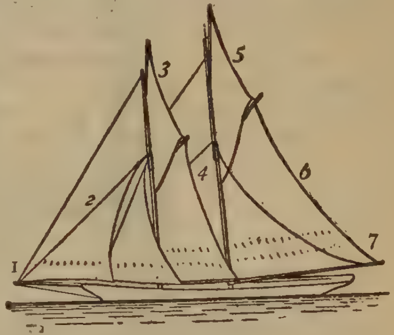


FIG. 5.—Schooner. 1, bowsprit, with martingale to the stem; 2, fore-topmast-stay, jib and stay-foresail; 3, fore-gaff-topsail; 4, foresail and mainstays; 5, main-gaff-topsail; 6, mainsail; 7, end of boom.

The sails on the masts have a gaff above and a boom below. These spars have a prong called "the jaws," which fit to the mast, and are held in place by a "jaw rope" on which are threaded beads called trucks. Sails of this shape are carried by fully rigged ships on the mizzen-mast, and can be spread on the fore and main. They are then called try-sails and are used only in bad weather when little sail can be carried, and are hoisted on the trysail mast, a small mast attached to the great one. The Lateen (Latin) sail (fig. 6) is a triangular sail akin to the lug, and is the prevailing type of the Mediterranean.

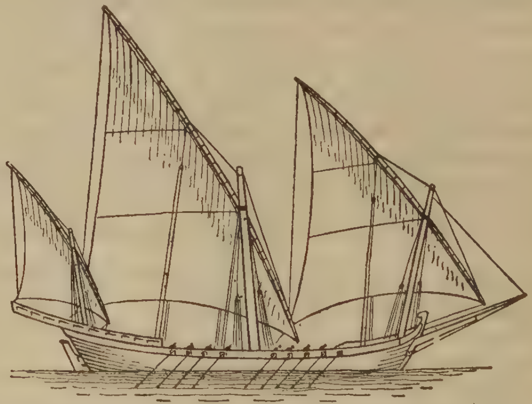


FIG. 6.—Lateen Rig.

These original types, even when unmodified by mixture with any other, permit of large variations. The number of masts of a lugger may vary from one to five, and of a schooner from two to five or even seven. A small lug may be carried above the large one, and a gaff topsail added to the sails of a schooner. A small-masted fore-and-aft-rigged vessel may be a cutter (fig. 7) or sloop. But the pure types may be combined, in topsail schooner, brigantines, barquentines and barques, when the topsail, a quadrangular sail hanging from and fastened to a yard, slung by the middle, is combined with fore and aft sails. The lateen rig has been combined with the square rig to make such a rigging as the xebec—a three-masted vessel square rigged on the main, and lateen on the fore and mizzen. Triangular sails of the

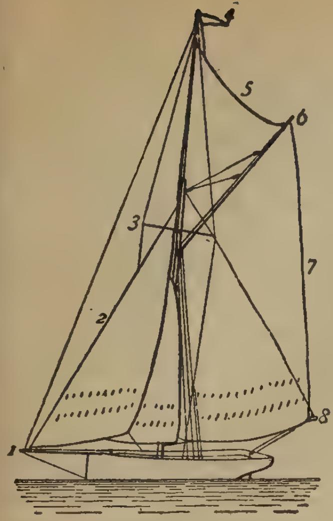
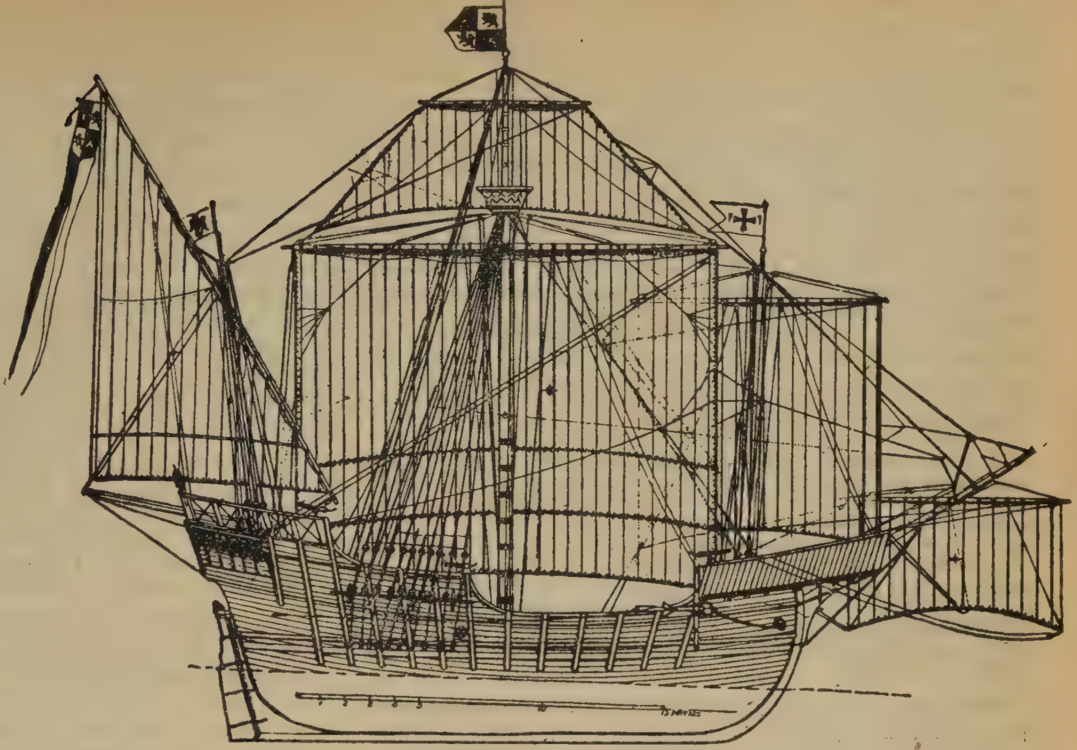


FIG. 7.—Cutter Yacht. 1, bowsprit and martingale; 2, jib—behind it is the foresail; 3, cross-trees and topmast-shroud; 4, pennant designating the club to which she belongs; 5, gaff-topsail; 6, peak of gaff, hoisted by peak and throat halyards; 7, mainsail; 8, end of boom and topping-lift.



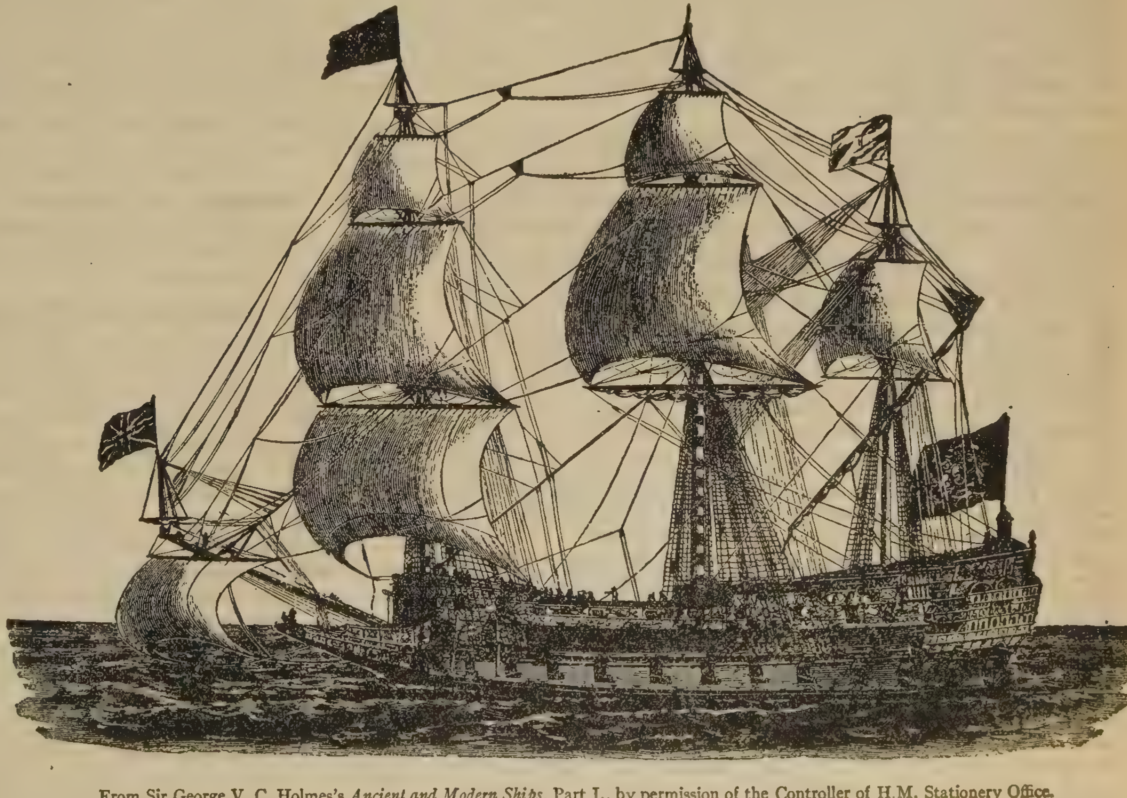
From Sir George V. C. Holmes's *Ancient and Modern Ships*, Part I., by permission of the Controller of H.M. Stationery Office.

FIG. 8.—Sail Plan of the "Santa Maria."

same type as the jibs can be set on the stays between the masts of a fully rigged ship, and are then known as staysails. But it can only be repeated that the variations are innumerable. Studding-sails are pieces added to increase the breadth (spread) of sails, and require the support of special yards, booms and tackle.

The development of the rigging of ships is a very obscure subject. It was the work of centuries, and of practical men who wrote no treatises. It has never been universal. A comparison of the four-masted junk given above with the figures of ships on medieval seals shows at least much similarity. Yet by selecting a few leading types of successive periods it is possible to follow the growth of the fully rigged ship, at least in its main lines, in modern times.

Fig. 8 gives the sail plan of the "Santa Maria," the flagship of Columbus. It is a modern reconstruction, made in 1893 in Spain at the Carraca arsenal, but is based on good authority. She has only the fixed bowsprit, with a yard and a sail hanging from it, the spritsail yard and spritsail. The foremast has one course, the mainmast a course and topsail, the mizzen a lateen sail. Fig. 9 is the "Sovereign of the Seas," a British warship of 1637. She still has only the fixed bowsprit, but a small upright mast has been erected at the end, which serves to spread a sprit topsail. In some cases at least a sprit topgallant sail was used. The mizzenmast still carries a lateen sail, but topsails have been added, and the whole rigging has multiplied and developed. Between the "Sovereign of the Seas" and the fully developed ship given in fig. 1 the most apparent differences are in the rigging of the bowsprit and the mizzenmast. The sprit topmast has disappeared, and is replaced



From Sir George V. C. Holmes's *Ancient and Modern Ships*, Part I., by permission of the Controller of H.M. Stationery Office.

FIG. 9.—The "Sovereign of the Seas."

by the jib-boom. The square spritsail, which could not be trained fore and aft, and was of feeble effect in keeping the ship's head from turning to windward, has been replaced by the jib. The spritsail yard (which continued in use till after 1850) has disappeared and has been replaced by the spritsail gaffs, two fixed spars which slope downwards and help to support the "jib-guys," the lateral supports of the booms. For a time, and after the use of spritsails had been given up, the spritsail yard continued to be used to discharge the function now given to the gaffs (see Smyth, *Sailor's Word-Book*, *sub voce*). The changes in the mizzen have an obscure history. About the middle of the 18th century it ceased to be a pure lateen. The yard was retained, but no sail was set on the forearm. Then the yard was given up and replaced by a gaff and a boom. The new sail was called the spanker. It was, however, comparatively narrow, and when a greater spread of sail was required, a studding-sail (at first called a "driver") was added. At a later date "spanker" and "driver" were used as synonymous terms, and the studding-sail was called a "ringtail." The studding-sails are the representatives of a class of sail once more generally used. In modern times a sail is cut of the extreme size which is capable of being carried in fine weather, and when the wind increases in strength it is reefed—*i.e.* part is gathered up and fastened by reef points, small cords attached to the sail. Till the 17th century at least the method was often to cut the courses small, so that they could be carried in rough weather. When a greater spread of sail was required, a piece called a bonnet was added to the foot of the sail, and a further piece called a drabbler could be added to that. It is an example of the tenacious conservatism of the sea that this practice is still retained by the Swedish small craft called "lodjor" in the Baltic and White Sea. It will be easily understood that no innovation was universally accepted at once. Jib and sprit topsail, lateen, mizzen and spanker, and so forth, would be found for long on the sea together.

The history of the development of rigging is one of adjustment. The size of the masts had to be adapted to the ship, and it was necessary to find the due proportion between yards and masts. As the size of the medieval ship increased, the natural course was to increase the height of the mast and of the sail it carried. Even when the mast was subdivided into lower, top and topgallant, the lower mast was too long, and the strain of the sail racked the hull. Hence the constant tendency of the ships to leak. Sir Henry Manwayring, when giving the proper proportions of the masts, says that the Flemings (*i.e.* the Dutch) made them taller ("taller" and "taunt" were for long used to mean the same thing) than the English, which again forced them to make the sails less wide. A tall sail could not be cut so wide as a lower one without putting an excessive strain on the mast. He says that the Flemings found an advantage in working to windward, but that they "wronged" (*i.e.* racked) their ships. The English preferred a less lofty mast and a wider spread of sail.

It is very difficult to say what changes in the proportions of masts and yards took place in English ships between the early 17th and the 19th centuries. The difficulty arises largely not only from insufficient knowledge of the earlier period, but from the fact that a scale was fixed only after trials, and by degrees. Manwayring, for instance, when giving the proportion of the topmasts to lower masts, says: "The topmasts are ever half so long as the masts into which they belong; but there is no absolute proportion in these, and the like things, for if a man will have his mast short, he may the bolder make his topmast long." In some respects the change was certainly slight. In the early 17th century, in England at least, the length of the mainmast was fixed by taking four-fifths of the breadth of the ship and multiplying by three. Two centuries later the method was to take the length of the lower deck and the extreme breadth, add them together, and divide by two. If we take a 74-gun ship of about the year 1820, which was 176 ft. long on the lower deck and 48 ft. 8 in. wide, she would have, by the system then used, a mainmast of 112 ft. Manwayring's system would have given her one of 117 ft. But in the proportions of the masts to one another there was a change. In the 17th century the foremast was four-fifths of the main, and the bowsprit was of the same length as the foremast. In the 19th the foremast was eight-ninths of the mainmast, while the bowsprit was seven-elevenths of the mainmast in the largest ships, and three-fifths in the others. When we come to the relative proportions of masts and yards the difficulty increases, for the standard was not the same. The seamen of the 17th century calculated the length of the mainyard not by the size of the mast but by the length of the keel. The mainyard, which was the standard for the others, ought according to "the best and most absolute" estimate to be five-sixths of the length of the keel. But Manwayring again explains that "the proportion is not absolute." If it was followed, the yards of a 17th-century ship must have been rather longer than in a vessel of a hundred and fifty and two hundred years later, when the mainyard was eight-ninths of the mainmast, and a regular scale was fixed throughout. Even so Manwayring's warning that "the proportion was not absolute" must be borne in mind. Changes were constant. The development of the famous American clippers made a considerable one. So has the growth of the vast four- and five-masted iron sailing ships of recent days. Individual captains have fitted ships according to ideas of their own. It has always happened that extra sails have been invented and set by ingenious devices for particular purposes. One large sail requires more men to handle it than several small ones. For this reason it is that in recent times the topsails of merchant ships have been divided into upper and lower, with a great loss of beauty, but an increase of convenience. To the same cause, the wish to economize in the size of the crew, is to be attributed the introduction of machinery for reefing sail from the deck, which is also an easier and a safer process than going aloft to reef them by hand. In a general way it may be said that the development of the rigging has been towards establishing a fair balance between the fore and after spread of canvas. Until the jib was invented in the 18th century, a ship which was sailing on the wind was subject to a disproportionate pressure aft. If she was at all given to "griping"—that is to say, inclined to turn head to wind (and all ships are liable to have ways and manners which are mysterious in origin and not seldom incurable), the mizzen-sail could not be used, for if it had been she would never have been "out of the wind." Therefore when close-hauled (sailing with the wind on the side and somewhat from before her centre) she lost the use of part of her sail. The spritsail which could not be trained fore and aft was no use "on the wind."

A few words may be added concerning the tops. In the earlier form of ships the top was a species of crow's nest placed at the head of the mast to hold a look-out, or in military operations to give a place of advantage to archers and slingers. They appear occasionally as mere bags attached to one side of the mast. As a general rule they are round. In the 16th century there were frequently two tops on the fore- and main-masts, one at the head of the lower, another at the head of the topmast, where in later times there have only been the two traverse beams which make the crosstrees. The upper top dropped out by the 17th century. The form was round, and so continued to be till the 18th century when the quadrangular form was introduced. In quite recent times the military tops of warships have resumed the circular form.

Authorities.—The present writer is indebted to Admiral Sir Cyprian A. G. Bridge, G.C.B., whose practical acquaintance with the older type of sailing ship as well as with the modern steamship makes his authority specially valuable, for the correction or confirmation of the technical details in the above article. Among the literature of the subject, reference may be made to the following works: Sir Henry Manwayring, *The Seaman's Dictionary* (London, 1644); Darcy Lever, *The Young Sea Officer's Sheet Anchor* (London, 1808); Sir George Nares, *Seamanship* (Portsmouth, 1882); Vice-Admiral Edmond Paris, *La Musée de marine du Louvre* (Paris, 1883). (D. H.)

RIGHT ASCENSION, in astronomy, that co-ordinate of a heavenly body defined by the angle which the meridian passing through it makes with the prime meridian through the vertical equinox (see Astronomy).

RIGHTS OF MAN AND OF THE CITIZEN, DECLARATION OF, a sort of manifesto issued in 1789 by the Constituent Assembly in the French Revolution, to be inscribed at the head of the constitution when it should be completed. It stated the fundamental principles which inspired the revolution. Historians have traced a connexion with the declarations of rights which preceded the constitution of some of the states of the American Union, especially of Virginia, but the situation in France at the time, and the influence of the writings of the *philosophes* made the proposal for such a statement very natural. The declaration overturned the political and social principles upon which the existent régime stood. It has served as a base for modern civil legislation and is still a force in European history. The final text voted by the Assembly was accepted by the king on the 5th of October 1789, at first conditionally, then with modifications. It contains a preamble and 17 articles. They proclaim and define political equality and liberty in its various manifestations, determine the character of the law and the conditions of its application, and state at the same time the restrictions upon the individual will which are necessary for the benefit of society. Similar declarations were attached to the constitution of 1793 and to that of the year III.

See E. Blum, *La Déclaration des droits de l'homme et du citoyen*, text with commentary (Paris, 1902); L. Bourgeois and A. Metin, *Déclaration des droits de l'homme et du citoyen, 1789* (Paris, 1901); G. Jellinck, *Die Erklärung der Menschen und Bürgerrechte* (Leipzig, 1895). This study has been translated into English by Rudolf Tombo (New York), and has aroused considerable controversy; see E. Boutmy, "La Déclaration des droits de l'homme et du citoyen et M. Jellinck," in *Annales des sciences politiques* for the 15th of July 1902; also E. Walsh, *La Déclaration des droits de l'homme et du citoyen et l'assemblée constituant, Travaux préparatoires* (Paris, 1903).

RIGORD (*c.* 1150–*c.* 1209), French chronicler, was probably born near Alais in Languedoc, and became a physician. Afterwards becoming a monk he entered the monastery of Argenteuil, and then that of St Denis, and described himself as *regis Francorum chronographus*. Rigor wrote the *Gesta Philippi Augusti*, dealing with the life of the French king, Philip Augustus, from his coronation in 1179 until 1206. The work, which is very valuable, was abridged and continued by William the Breton (*q.v.*). The earlier part of the *Gesta* speaks of the king in very laudatory terms, but in the latter part it is much less flattering in its tone. It is published in tome xvii. of Dom Bouquet's *Recueil des historiens des Gaules et de la France* (Paris, 1738–1876); and with introduction by H. F. Delaborde (Paris, 1882–85). A French translation of the *Gesta* is in tome xi. of Guizot's *Collection des mémoires relatifs à l'histoire de France* (Paris, 1825). Rigord also wrote a short chronicle of the kings of France.

See A. Potthast, *Bibliotheca historica* (Berlin, 1896); and A. Molinier, *Les Sources de l'histoire de France*, tome iii. (Paris, 1903).

RIGORISM (Lat. *rigor*, stiffness, firmness), a philosophical term applied by Kant specially to those moralists who take up an anti-hedonist or ascetic standpoint. In general the term is opposed to "latitudinarianism" or "indifferentism,"—respectively a morality of compromise and a morality of pure indifference,—and signifies insistence upon the strictest interpretation of a principle, rule or criterion. Thus, in Roman Catholic theology, a rigorist holds that in cases of conscience the proper course is to adhere to the strict wording of the law in question.

RILEY, JAMES WHITCOMB (1853–), American poet, was born in Greenfield, Indiana, in 1853. He spent several years as an itinerant sign-painter, actor and musician. During this vagabond experience he had opportunities to revise plays and compose songs, and was brought into close touch with the rural folk of Indiana, becoming familiar with their life and speech. About 1873 he first contributed verses, especially in the Hoosier dialect, to the papers, and he soon became local editor of the Anderson (Ind.) *Democrat*. In August 1877, over the initials "E.A.P.," he printed in the Kokomo (Indiana) *Dispatch* a poem, *Leonainie*, in the manner of Poe.[1] The press throughout the country copied the poem, and many critics of acknowledged authority believed it to have been actually written by Poe, until the hoax was explained by the paper in which it first appeared. To the Indianapolis *Daily Journal* Riley contributed many poems, the best known being a series in dialect which purported to have been written by one "Benjamin F. Johnson, of Boone," a farmer. These he published in book form, under the same pen-name, as *The Old Swimmin' Hole and 'Leven More Poems* (1883). He wrote short stories and sketches, some of unusual merit, but is known almost exclusively as a poet. Of his poems some are in conventional English, many others in the Hoosier dialect of the Middle-West. His materials are the homely incidents and aspects of village and country life, especially of Indiana, and his manner is marked by delicate imagination and naïve humour and tenderness.

The bulk of his work appeared in *The Boss Girl and Other Sketches* (1886), republished in 1891 as *Sketches in Prose; Afterwhiles* (1887); *Pipes o' Pan at Zekesbury* (1888); *Rhymes of Childhood* (1890); *Neighborly Poems* (1891); *The Flying Islands of the Night* (1891), a fantastic blank verse drama; *Green Fields and Running Brooks* (1892); *Poems Here at Home* (1893); *Armazindy* (1894), which contains the poem "Leonainie"; *A Child-World* (1896), reminiscent of his own boyhood; *The Rubáiyát of Doc Sifers* (1897); *Home Folks* (1900); *The Book of Joyous Children* (1902); *His Pa's Romance* (1903); *A Defective Santa Claus* (1904); and in several books of selections, such as *Old Fashioned Roses* (1889), published in England; *Child Rhymes* (1898); *Love Lyrics* (1899); *The Golden Year* (1899), published in England; *Farm Rhymes* (1901); *An Old Sweetheart of Mine* (1902); *Out to Old Aunt Mary's* (1904); *Songs o' Cheer* (1905); *Morning* (1907); and *Songs of Summer* (1908).

RIMBAUD, JEAN ARTHUR (1854–1891), French poet and adventurer, was born at Charleville, in the Ardennes, on the 20th of October 1854. He was the second son of a captain in the French army, who in 1860 abandoned his wife and family. From early childhood Arthur Rimbaud, who was severely brought up by his mother, displayed rich intellectual gifts and a sullen, violent temperament. He began to write when he was ten, and some of the poems which now appear in his works belong to his fifteenth year. Before he was sixteen, in consequence of a violent quarrel with his mother, the boy escaped from Charleville with a packet of his verse, was arrested as a vagabond, and for a fortnight was locked up in the Mazas prison, Paris. A few days after being taken home Rimbaud escaped again, into Belgium, where he lived for some time as a tramp, almost starved, but writing verses with feverish assiduity. In February 1871 he left his mother for a third time, and made his way to Paris, where he knew no one, and whence, after very nearly dying of hunger and exposure, he begged his way back to Charleville. There he wrote in the same year the extraordinary poem of *Le Bateau ivre*, which is now hailed as the pioneer of the entire "symbolist" or "decadent" movement in French literature in all its forms. He sent it to Verlaine, who encouraged the boy of seventeen (whom he supposed to be a man of thirty) to come again to Paris. Rimbaud spent from October 1871 to July 1872 in the capital, partly with Verlaine, partly as the guest of Théodore de Banville, and served in the army of the Commune. With Verlaine he travelled for thirteen months, after the fall of the Commune, through England and Belgium, where in 1873 he published the only work which he ever printed, *Une Saison en Enfer*, in prose; in this he gives an allegorical account of his extravagant relations with Verlaine, which ended at Brussels by a double attempt of the latter to murder his young companion. On the second occasion Rimbaud was dangerously wounded by Verlaine's revolver, and the elder poet was imprisoned at Mons for two years. Meanwhile Rimbaud, deeply disillusioned, determined to abandon Europe and literature, and he ceased at the age of nineteen to write poetry. He settled for a while at Stuttgart, studying German, and in 1875 he disappeared. He set out on foot for Italy, and after extraordinary adventures found employment as a day-labourer in the docks at Leghorn. Returning to Paris, he obtained a little money from his mother, and then definitely vanished. For sixteen years nothing whatever was heard of him, but it is now known that he embarked as a Dutch soldier for the Sunda Isles, and, presently deserting, fled to Sumatra and then to Java, where he lived for some time in the forest. Returning to Europe, after a vagabond life in every capital, he obtained in 1880 some menial employment in the quarries of Cyprus, and then worked his way to Aden and up into Abyssinia, where he was one of the pioneers of European commercial adventure. Here he settled, at Harrar, as a trader in coffee and perfumes, to which he afterwards added gold and ivory; for the next eleven years, during which he led many commercial expeditions into unknown parts of northern Africa, Shoa and Harrar were his headquarters, and he lived almost entirely with the natives, and as one of themselves. From 1888 to 1891, having prospered greatly as a merchant, he became a sort of semi-independent chieftain, intriguing for France, just outside the borders of civilization. From documents which were first produced in 1902 it appears that from 1883 to 1889 Rimbaud was in close relations with the Ras Makonnen and with Menelek, then only king of Shoa. At the death of the Negus John, in 1888, he was concerned in the formation of the empire of Ethiopia. From this time Rimbaud had a palace in the town of Harrar, and intrigued with the French government in favour of Menelek and against Italy. Meanwhile, in 1886, believing Rimbaud to be dead, Verlaine had published his poems, under the title of *Les Illuminations*, and they had created a great sensation in Paris. In this collection appeared the sonnet on the vowels, attributing a different colour to each: "*A noir, E blanc, I rouge, U vert, O bleu voyelles.*" But the author, in his Abyssinian hut of palm-leaves, was, and remained, quite unconscious of the fact. In March 1891 a tumour in his knee obliged Rimbaud to leave Harrar and go to Europe for surgical advice. He reached Marseilles, but the case was hopeless; the leg had to be amputated, and Rimbaud died there in hospital on the 10th of November 1891. The poems of Rimbaud all belong to his earliest youth. Their violent originality, the influence which they have exercised upon younger writers, the tumultuous existence of their author, and the strange veil of mystery which still hangs over his character and adventures, have given to Rimbaud a remarkable fascination. His life has been written by M. Paterne Berrichon (1897), and valuable reminiscences by his sister, Mlle Isabella Rimbaud. His *Œuvres* were collected in 1898 by MM. Berrichon and Delahaye, and in 1901 his statue was unveiled at Charleville. (E. G.)

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[1] The poem was accompanied by a statement from the editor of the paper that it was "from the gifted pen of the erratic poet, Edgar Allan Poe," and by a circumstantial story to the effect that the poem had been found written on the fly-leaf of an old Latin-English dictionary then owned by "an uneducated and illiterate man" in Kokomo, who had received it from his grandfather, in whose tavern, near Richmond, Va., it had been left by "a young man who showed plainly the marks of dissipation."

See also *Lettres de Jean Arthur Rimbaud* (*Égypte, Arabie, Éthiopie*), 1899, edited by P. Berrichon; Paul Verlaine, *Les Poètes maudits* (1884); George Moore, *Impressions and Opinions: Two Unknown Poets* (1891); and A. Symons, *The Symbolist Movement in Literature* (1900).

RIME ROYAL, the name given to a strophe or stanza-form, which is of Italian extraction, but is almost exclusively identified with English poetry from the fourteenth to the early seventeenth centuries. It appears to be formed out of the stanza called Ottava rima (*q.v.*), by the omission of the fifth line, which reduces it to seven lines of three rhymes, arranged ababbcc. It was earliest employed with skill, if not, as seems probable, invented, by Chaucer, who composed his long romantic poem of *Troilus and Cressida* in rime royal, of which the following is an example:—

> " And as the new-abashéd nightingale,
> Thet stinteth first when she beginneth sing,
> When that she heareth any herdë tale,
> Or in the hedges any wight stirring,
> And, after, siker doth her voice out-ring,—
> Right so Cresseyda, when her dredë stint,
> Opened her heart, and told all her intent."

The "Prioress' Tale," in the *Canterbury Tales*, offers another particularly beautiful proof of Chaucer's skill in the use of the rime royal. In the fifteenth century this stanza was habitually used, in preference to heroic verse, by Hoccleve and Lydgate, and, with more melody and grace, by the unknown writer of *The Flower and the Leaf*. In the sixteenth century, rime royal was chosen by Hawes as the vehicle of his *Pastime of Pleasure* (1506) and by Barclay in his *Ship of Fools* (1509); it was now regarded as the almost exclusive classical form for heroic poetry in England, and it had long been so accepted in Scotland, where *The King's Quair* of King James I., the *Fables* of Henryson and *The Thistle and the Rose* of Dunbar had closely followed Chaucer's pattern. The greater part of that huge poetic miscellany, *The Mirror for Magistrates* (1559–1610), was written in rime royal, Sackville's momentous *Induction* among the rest. The seven-line stanza began to go out of fashion with the revival of Elizabethan poetry, but we find it still used in Spenser's *Hymn of Heavenly Beauty*, Shakespeare's *Lucrece* and the *Orchestra* of Sir John Davys. After the first decade of the seventeenth century rime royal went out of fashion. Since then it has been occasionally revived, but not in poems of great length or particular importance. Rime royal should always be written in iambic metre, and be formed of seven lines of equal length, each containing ten syllables.

RIMINI, a town and bishop's see of Italy, in the province of Forli, Emilia, on the Adriatic coast, 69 m. S.E. of Bologna by rail. Pop. (1901) town, 18,022; commune, 46,801. The city is bounded on three sides by water. It faces the Adriatic to the north, has the torrent Aprusa, now called Ausa, on the east and the river Marecchia on the west. It stands in a fertile plain, which on the southern side soon swells into pleasant slopes backed by the jagged peaks of the Umbrian Apennines. The foremost foothill of the range is the steep crag of Mons Titanus, crowned by the towers of the republic of San Marino. Rimini attracts numerous visitors for the sea-bathing at Porta Marina. It has mineral springs, and the industries comprise fisheries, ironworks and foundries, sulphur furnaces, silk-mills, rope walks, match factories, brickworks, flourmills and furniture. Its main interest, however, is historical. Apart from the ancient buildings, &c., referred to below, Rimini can boast of a good public library, founded by the jurist Gambalunza in 1617, a municipal picture gallery, an archaeological museum, a technical school (1882) and a bronze statue of Pope Paul V. The ancient castle of Sigismondo Malatesta, now dilapidated, has in recent years been used as a prison.

History.—Rimini is the ancient Ariminum (*q.v.* for its early history and remains). During the middle ages the history of Rimini has no importance. Alternately captured by Byzantines and Goths, it was rigorously besieged by the latter in A.D. 538. They were, however, compelled to retreat before the reinforcements sent by Belisarius and Narses; thus the Byzantines, after various vicissitudes, became masters of the town, appointed a duke as its governor, and included it in the exarchate of Ravenna. It afterwards fell into the power of the Longobards, and then of the Franks, who yielded it to the pope, for whom it was governed by counts to the end of the 10th century. Soon after this period the imperial power became dominant in Rimini. In 1157 Frederick I. gave it, by imperial patent, the privilege of coining money and the right of self-government; and in the 13th century we find Rimini an independent commune waging war on the neighbouring cities.

In the year 1216, Rimini, being worsted by Cesena, adopted the desperate plan of granting citizenship to two members of the powerful Malatesta tribe, Giovanni and Malatesta, for the sake of their aid and that of their vassals in the defence of the state and the conduct of the war. This family quickly struck root in the town and gave birth to future tyrants; for in 1237 Giovanni was named podestà, and this office was the first step towards the sovereign power afterwards assumed by his descendants. Meanwhile, Rimini was torn by the feuds of Guelf and Ghibelline. The latter were the dominant party in the days of Frederick II., although very unpopular on account of the grievous taxes imposed by the empire. Accordingly, the majority of the urban nobles joined the Guelfs and were driven into exile. But before long, as the Swabian power declined in Italy, the Guelf party was again predominant.

Then followed a long period of confusion, in which, by means of conspiracies and crimes of every kind, the Malatesta succeeded in becoming masters and tyrants of Rimini. Giovanni Malatesta had died in 1247 and been succeeded by his son Malatesta, born in 1212, and surnamed Malatesta da Verrucchio. This chieftain, who lived to be a hundred years old, had ample time to mature his ambitious designs, and was the real founder of his house. Seizing the first suitable moment, he placed himself at the head of the exiled Guelfs, and restored them to Rimini. Then, as the empire acquired fresh strength in Italy, he quietly bided his time and, on the descent of the Angevins, again assumed the leadership of the Guelfs who now had the upper hand for a long time. Being repeatedly elected podestà for lengthy terms of office, he at last became the virtual master of Rimini. Nor was he checked by Rome. Pope Boniface VIII. was fully aware of the rights and traditional pretensions of the Holy See, but preferred to keep on good terms with one who had so largely contributed to the triumph of the Guelfs in Romagna. Accordingly he not only left Malatesta unmolested, but in 1299 conferred on him fresh honours and estates, so that his power went on increasing to the day of his death in 1312.

Four sons had been born to Malatesta—Malatestino, Giovanni the Lame, Paolo the Handsome, and Pandolfo; but only the oldest and youngest survived him. Giovanni the Lame (*Sciancato*), a man of a daring impetuosity only equalled by his ugliness, had proved so useful a general to Giovanni da Polenta of Ravenna as to win in reward the hand of that potentate's beautiful daughter, known to history as Francesca da Rimini. But her heart had been won by the handsome Paolo, her brother-in-law; and the two lovers, being surprised by Giovanni, were murdered by him on the spot (1285). This episode of the story of the Malatesta has been immortalized in Dante's *Inferno*. Giovanni died in 1304. Thus in 1312 Malatestino became lord of Rimini, and on his decease in 1317 bequeathed the power to his brother Pandolfo.

Pandolfo died in 1326, leaving two heirs, Malatesta and Galeotto. The former was nicknamed Guastafamiglia, because, although at first willing to let his brother share his power, he rid himself by violence and treachery of other kinsmen who claimed their just rights to a portion of the state. His intent was to become sole lord and to aggrandize his tiny principality. But the reigning pope, Innocent VI., despatched the terrible Cardinal Albornoz to Romagna, and it was speedily reduced by fire and sword. In 1355 the Malatesta shared the fate of the other potentates of the land. Nevertheless, it was the cardinal's policy to let existing governments stand, provided they promised to act in subordination to the papal see. Thus he granted the Malatesta brothers the investiture of Rimini, Pesaro, Fano and Fossombrone, and they arranged a division of the state. Guastafamiglia took Pesaro, which was held by his descendants down to the brothers Carlo and Galeazzo. The former of these, who died in 1439, was father to the Parisina beheaded in Ferrara, whose tragic love story has been sung by Byron. The latter won the title of "l'Inetto" (the Incapable) by the foolish sale of his rights over Pesaro to the Sforza in 1447.

Galeotto, on the other hand, retained the lordship of Rimini, ruling tranquilly and on good terms with the popes, who allowed him to add Cervia, Cesena and Bertinoro to his states. Dying in 1385 at the age of eighty, he left two sons—Carlo, who became lord of Rimini, and Pandolfo, who had Fano for his share. Carlo (1364–1429) was energetic, valiant and a friend of the popes, who named him vicar of the church in Romagna. He was a patron of letters and the arts, and during his reign his court began to be renowned for its splendour. As he left no issue, his inheritance was added to that of his brother Pandolfo, and Fano was once more united to Rimini. Pandolfo (1370–1427) had led the life of a condottiere, taking a prominent part in the Lombard wars following on the death of Galeazzo Maria Visconti, and held rule for some time in Brescia and Bergamo. He left three natural sons who were declared legitimate by Pope Martin V. The eldest, Galeotto (1411–1432), was an ascetic, gave little or no attention to public business, and, dying early, bequeathed the state to his brother Sigismondo Pandolfo. The third son, Novello Malatesta (1418–1465) ruled over Cesena.

Sigismondo (1417–1468) is the personage to whom Rimini owes its renown during the Renaissance, of which indeed he was one of the strangest and most original representatives. He was born in Brescia, and when called to the succession, at the age of fifteen, had already given proofs of valour in the field. His knowledge of antiquity was so profound as to excite the admiration of all the learned men with whom he discoursed, even when, as in the case of Pius II., they chanced to be his personal enemies. To him is due the erection of the church of St Francis, or temple of the Malatesta, one of the rarest gems of the Renaissance and the greatest of Rimini's treasures (see below for description).

Of so dissolute a life that, although married, he had children by several mistresses at the same time, he gave vent to all his passions with a ferocity that was bestial rather than human. And—as the crowning contradiction of his strange nature—from his youth to the day of his death he remained the devoted lover of the woman for whose sake he became a poet, whom he finally made his wife, and whom he exalted in every way, even to the point of rendering her almost divine honours. Yet this love never availed to check his excesses. On assuming power in 1432, Sigismondo was already affianced to the daughter of Count Carmagnola; but when that famous leader was arraigned as a traitor by the Venetians, and ignominiously put to death, he promptly withdrew from his engagement, under the pretext that it was impossible to marry the child of a criminal. In fact, he aimed at a higher alliance, for he espoused Ginevra d'Este, daughter of the duke of Ferrara, and his entry into Rimini with his bride in 1434 was celebrated by splendid festivities. In 1437 a son was born to him, but died within the year, and in 1440 the young mother followed it to the grave. Every one declared that she died by poison administered by her husband. This, however, was never proved. The duke of Ferrara remained his friend, nor is it known what motive Sigismondo could have for wishing to get rid of his wife. Two years afterwards he married Polissena, daughter of the famous condottiere Francesco Sforza, who in 1443 bore him a son named Galeotto Roberto. But by this time he was already madly in love with Isotta degli Atti, and this was the passion that endured to his death. The lady succeeded in gaining an absolute ascendancy over him, which increased with time. She bore him several children, but this did not prevent his having others by different concubines. Such being the nature of the man, it is not astonishing that, as his ardour for Isotta increased, he should have little scruple in ridding himself of his second wife. On the 1st June 1450 Polissena died by strangling, and on the 30th of the same month Isotta's offspring were legitimated by Nicholas V.

It is only just to record that, although Malatesta's intrigue with Isotta had long been notorious to all, and he had never sought to conceal it, no one ever accused her of either direct or indirect complicity in her lover's crimes. Isotta's history, however, is a strange one, and opens up many curious questions. She was of noble birth and seems to have attracted Sigismondo's notice as early as 1438, for at the age of twenty he produced verses of some merit in praise of her charms. She was indeed widely celebrated for her beauty and intellect, culture, firmness and prudence; and even Pope Pius II. proclaimed her worthy to be greatly loved. When Sigismondo was absent she governed Rimini wisely and well, and proved herself a match for the statesmen with whom she had to deal. The leading poets of the court dedicated to her a collection of verses entitled *Isottaei*, styled her their mistress and the chosen of Apollo. Artists of renown perpetuated her features on canvas, on marble and on many exquisite medals, one of which has a closed book graven on the reverse, with the inscription "Elegiae" in allusion to poems she was said to have written. Nevertheless, Yriarte, in his book on the Malatesta and Rimini, asserted that there was documentary evidence to prove that Isotta was unable to sign her own name. But it is not at all surprising that Isotta should have her letters written and signed by another hand, when such was by no means an uncommon practice among the princes and nobilities of her day. Lucrezia Borgia, for instance, frequently did the same. It is besides simply incredible that a woman of the Italian Renaissance of Isotta's birth, standing and reputation should have been unable to write.

Her marriage with Malatesta did not take place until 1456; but of the ardent affection that had long bound them together there are stronger proofs than the lover's juvenile verses, or than even the children Isotta had borne to him. For, more than all else, the temple of St Francis has served to transmit to posterity the history of their loves. Malatesta decided on building this remarkable church as a thankoffering for his safety during a dangerous campaign undertaken for Pope Eugenius IV. about the year 1445.

The first stone was laid in 1446, and the work was carried on with so much alacrity that mass was performed in it by the close of 1450. Sigismondo entrusted the execution of his plans to Leo Battista Alberti, who had to encase in a shell of classic architecture a 13th-century Franciscan church. The original edifice being left intact, it was a difficult question how to deal with the windows and the Gothic arches of the interior. Alberti solved the problem with marvellous skill, blending the old architecture with the new style of the Renaissance, and giving it variety without destroying its unity of effect.

Being eager to adorn his temple with the most precious marbles, Sigismondo's veneration for antiquity did not prevent him from pillaging many valuable classical remains in Rimini, Ravenna and even in Greece. Such was the zeal with which Alberti pursued his task that the exterior of the little Rimini church is one of the finest and purest achievements of the Renaissance, and surpasses in beauty and elegance all the rest of his works. But it is much to be deplored that he should have left the upper part of the façade unfinished. Alberti came to Rimini, made his design, saw the work begun and then left it to be carried out by very skilful artists, on whom he impressed the necessity of faithfully preserving its general character so as "not to spoil that music."

The internal decorations, especially the enormous quantity of wall ornaments, consisting chiefly of scrolls and bas-reliefs, were executed by different sculptors under the personal direction of Malatesta, who, even when engaged in war, sent continual instructions about their work. It is difficult to give an exact idea of this extraordinary church to those who have no personal acquaintance with it. The vault was never finished, and still shows its rough beams and rafters. The eight side chapels alone are complete, and their pointed arches spring from Renaissance pilasters planted on black marble elephants, the Malatesta emblems, or on baskets of fruit held by children. The surface of the pilasters is divided into compartments encrusted with bas-reliefs of various subjects and styles. Everywhere—on the balustrades closing the chapels, round the base of the pilasters, along the walls, beneath the cornice of both the exterior and the interior of the church—there is one ornament that is perpetually repeated, the interwoven initials of Sigismondo and Isotta. This monogram is alternated with the portrait and arms of Malatesta; and these designs are enwreathed by festoons linked together by the tyrant's second emblem, the rose. The most singular and characteristic feature of this edifice is the almost total absence of every sacred emblem. Rather than to St Francis and the God of the Christians it was dedicated—and that while Sigismondo's second wife still lived—to the glorification of an unhallowed attachment. Nature, science and antiquity were summoned to celebrate the tyrant's love for Isotta. The bas-reliefs of one of the chapels represent Jupiter, Venus, Saturn, Mars and Diana, together with the signs of the zodiac. And these subjects are derived, it appears, from a poem in which Sigismondo had invoked the gods and the signs of the zodiac to soften Isotta's heart and win her to his arms. The pageants of Mars and Diana seem to have been suggested by the *Trionfi* of Petrarch. Elsewhere we see prophets and sibyls, personifications of the theological virtues and of the sciences. The delicate bas-reliefs of botany and medicine, history and astronomy, have been judged by some writers to be Grecian, on account of the ancient appearance of their marble, their inscriptions in Greek and Latin, and others that have never been deciphered. But a moment's examination of the sculptures is enough to destroy this hypothesis. Besides, some of the inscriptions are very easily read and record "Apollo Ariminaeus" and "Jupiter Ariminaeus."

In the first chapel on the left is the family tomb of the Malatesta, with sculptured records of their triumphs and of their alleged descent from Scipio Africanus. Better worthy of notice is the third chapel to the right, known as that of the Angels, on account of the angels and children carved on its pillars. It is nominally dedicated to the archangel Michael, whose statue is enshrined in it; but the figure has the face of Isotta, the ruling deity of this portion of the church. For here is the splendid and fantastic tomb erected to this lady, during her life and previous to the death of Sigismondo's second wife. No monument, be it remarked, is raised over the burial-place of Ginevra and Polissena. The urn of Isotta's sarcophagus is supported by two elephants, and bears the inscription, "D. Isottae Ariminensi B. M. Sacrum, MCCCCL." The "D." has been generally interpreted as "Divae" and the "B. M." as "Beatae Memoriae." But some, unwilling to credit such profanity, allege that the letters stand for "Bonae Memoriae." Nevertheless, all who have seen the church must admit the improbability of similar scruples.

The numerous artists employed on the interior of the church were under the direction of the *proto-maestro* Matteo de Pasti the celebrated medallist. And indeed the peculiar and fantastic character of the sculptures in this chapel frequently recalls the designs of his famous works. All this decoration is in strange contrast with the grandly austere simplicity of the façade and outer walls of the church. There no ornament disturbs the harmony of the lines. The frieze beneath the cornice, reproducing the lovers' initials and the Malatestian ensigns, is in such very low relief that it only enhances the perfection of "that music" produced by the marvellous skill of Alberti. Also the colour of the stone, a soft creamy white, adds to the general beauty of effect. And everything both within and without contributes to the profane and pagan character which it was Sigismondo's purpose to impress on the Christian church. On each of its outer walls are seven arched recesses, intended to contain the ashes of the first literati and scientists of his court. In the first, to the right, is the urn of the poet Basinio, one of his pensioners, in the second that of Giusto de' Conti, author of some rhymes on the *Bella Mano*, while the third bore the more famous name of Gemisthus Pletho. This well-known Byzantine philosopher was the diffuser of Platonism in Florence during the time of Cosimo de' Medici, and had faith in the revival of paganism. Returning to his own people, he had died in the Morea. Sigismondo, having gone there in command of the Venetian expedition against the Turks, exhumed the philosopher's bones as holy relics, and brought them to Rimini for worthy sepulture in his Christian pantheon. All this is solemnly recorded in the inscription, which is dated 1465. The fourth sarcophagus was that of Roberto Valturio (d. 1489), the engineer, author of *De Re Militari*, who had been Sigismondo's minister and had aided him in the construction of the castle of Rimini. The other urns on this side were placed by Malatesta's successors, and the arches on the left wall remained untenanted.

Sigismondo understood the science of fortification. He was also the first to discard the use of wooden bomb-shells, and substitute others cast in bronze. As a soldier his numerous campaigns had shown him to be possessed of all the best qualities and worst defects of the free captains of his time. He began his military career in 1432 in the service of Eugenius IV.; but, when this pope doubted his good faith and transferred the command to another, he sided with the Venetians against him, though at a later date he again served under him. On the decease of Filippo Maria Visconti in 1447 he joined the Aragonese against Venice and Florence; but, presently changing his flag, fought valiantly against Alphonso of Aragon and forced him to raise the siege of Piombino. In 1454 he accepted a command from the Sienese; but suddenly, after his usual fashion, he made peace with the enemies of the republic, and had to save himself by flight from arrest for his perfidy. It was then that the letters from Isotta were confiscated. After this he began scheming to hasten the coming of the Angevins, and took part in new and more hazardous campaigns against adversaries such as the duke of Urbino, Sforza of Milan, Piccinino, and, worst of all, the Sienese pope, Pius II., his declared and mortal foe. This time Sigismondo had blundered; for the cause of Anjou was hopelessly ruined in Italy. He was therefore driven to make his submission to the pope, but, again rebelling, was summoned to trial in Rome (1460) before a tribunal of hostile cardinals. All the old charges against him were now revived and eagerly confirmed. He was pronounced guilty of rapine, incendiarism, incest, assassination and heresy. Consequently he was sentenced to the deprivation of his state (which was probably the main object of the trial), and to be burnt alive as a heretic.

This sentence, however, could not easily be executed, and Sigismondo was only burnt in effigy. But the pope marked the intensity of his hatred by causing the dummy to be carved and dressed with such lifelike resemblance that he was almost able to persuade himself that his hated enemy was really consumed in the flames. Malatesta could afford to laugh at this farce, but he nevertheless prepared in haste for a desperate defence (1462). He knew that the bishop Vitelleschi, together with the duke of Urbino and his own brother Novello Malatesta, lord of Cesena, were advancing against him in force; and, being defeated by them at Pian di Marotta, he was driven to Rome in 1463 to again make submission to the pope. This time he was stripped of all his possessions excepting the city of Rimini and a neighbouring castle, but the sentence of excommunication was withdrawn. The once mighty tyrant of Rimini found himself reduced to penury with a state chiefly composed of a single town. He therefore took service with the Venetians, and in 1464 had the command of an expedition to the Morea. Here his movements were so hampered by the interference of the commissioners of the republic that, with all his valour, he could achieve no decisive success. In 1466 he was able to return to Rimini, for Pius II. was dead, and the new pope, Paul II., was less hostile to him. Indeed, the latter offered to give him Spoleto and Foligno, taking Rimini in exchange; but Malatesta was so enraged by the proposal that he went to Rome with a dagger concealed on his person, on purpose to kill the pope. But, being forewarned, Paul received him with great ceremony, and surrounded by cardinals prepared for defence; whereupon Sigismondo changed his mind, fell on his knees and implored forgiveness. His star had now set for ever. For sheer subsistence he had to hire his sword to the pope and quell petty rebellions with a handful of men. At last, his health failing, he returned to his family, and died in Rimini on the 7th of October 1468, aged fifty-one years.

He was succeeded, according to his desire, by Isotta and his son Sallustio. But there was an illegitimate elder son by another mother, named Roberto Malatesta, a valiant and unscrupulous soldier. Befriended by the pope, this man undertook to conquer Rimini for the Holy See, but came there to further his own ends instead (20th October 1469), and, while feigning a desire to share the government with Isotta and her son, resolved, sooner or later, to seize it for himself. This aroused the pope's wrath, and Roberto instantly prepared for defence. Finding an ally in the duke of Urbino, whose eyes were now opened to the aggressive policy of the church, he was able to repulse its forces. Paul II. died soon after, and was succeeded by Sixtus IV. Roberto's position was now more secure, and in order to strengthen his recent alliance he betrothed himself to the daughter of the duke of Urbino. The next step was to dispose of his rival kindred. On the 8th of August 1470 Isotta's son was found murdered in a well belonging to the Marcheselli family; and a bloodstained sword, placed in their courtyard by Roberto, made it appear as though they had been guilty of the crime. Towards the end of the same year Isotta died also, apparently of a slow fever, but really, it was believed, by poison. Another of her sons, Valerio, born in 1453, still lived, but he was openly put to death by Roberto on a trumped-up charge of treason. In 1475 the new tyrant celebrated his nuptials with the duke of Urbino's daughter, and, being again taken into favour by the pope, valiantly defended him in Rome against the attacks of the duke of Calabria, and died there in 1482 of the hardships endured in the war. His widow was left regent during the minority of his son Pandolfo, who was nicknamed Pandolfaccio on account of his evil nature. Directly he was of age, he seized the reins of government by killing some relations who had plotted against him, and crushed another conspiracy in the same way. A daring soldier, he distinguished himself at the battle of the Taro against the French; but his tyranny made him hated by his subjects. In 1500, when Cesare Borgia fell on Romagna with violence and fraud, this Malatesta shared the fate of other petty tyrants and had to fly for his life. After the fall of the Borgia he returned, but, being bitterly detested by his people, decided to sell his rights to the Venetians, who had long desired to possess Rimini, and who gave him in exchange the town of Cittadella, some ready money, and a pension for life.

This arrangement was naturally disapproved by Rome, and especially by Julius II.; he therefore contrived the league of Cambray on purpose to ruin the Venetians, who were crushingly defeated in 1509. Thereupon the pope, having accomplished his own ends, made alliance with the Venetians, who were now prostrate at his feet, and, with them, the Spaniards and the Swiss, fought against the French at Ravenna in 1512. Here the French were victors, but owing to their heavy losses and the death of their renowned leader, Gaston de Foix, were compelled to retreat. Thus Julius became master of Rimini and the other coveted lands. Malatesta made more than one attempt to win back his city, but always in vain, for his subjects preferred the papal rule, and in 1528 Pope Clement VII. became definite master of the town. Thus, after two hundred and fifty years, the sway of the Malatesta came to an end, and Pandolfo was reduced to beggary. He died in 1534, leaving a daughter and two sons in great poverty. The elder, Sigismondo, after various military adventures, died at Reggio d'Emilia in 1543; and Malatesta, the younger, went to fight in the Scotch and English wars, and was never heard of again. Sigismondo had left male heirs who made another attempt to regain Rimini in 1555, but Pope Paul IV. declared them deposed in perpetuity in punishment of Pandolfaccio's misdeeds.

From that time the Malatesta became citizens of Venice; their names were inscribed in the Golden Book, and they were admitted to the grand council. With the death, in 1716, of Christina Malatesta, the wife of Niccolo Boldu, the Rimini branch of the family became extinct. The descendants of Giovanni, brother of Malatesta da Verrucchio, who married one of the Sogliano, were known as the Sogliano-Malatesta. The representatives of this branch settled in Rome.

The history of Rimini practically ends with its independence. It fell into obscurity under the rule of the popes, and was not again mentioned in history until, in 1831 and 1845, it began taking a prominent part in the revolutionary movements against papal despotism and in favour of Italian independence.

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RIMMER, WILLIAM (1816–1879), an American artist, was born in Liverpool, England, on the 20th of February 1816. He was the son of a French refugee, who emigrated to Nova Scotia, where he was joined by his wife and child in 1818, and who in 1826 removed to Boston, where he earned a living as a shoe-maker. The son learned the father's trade; at fifteen became a draughtsman and sign-painter; then worked for a lithographer; opened a studio and painted some ecclesiastical pictures; in 1840 made a tour of New England painting portraits; lived in Randolph, Mass., in 1845–55 as a shoemaker, for the last years of the decade practising medicine; practised in East Chelsea and received a diploma from the Suffolk County Medical Society; and in 1855 removed to East Milton, where he supplemented his income by carving busts from blocks of granite. In 1860 he made his head of St Stephen (now in the Boston Athenaeum) and in 1861 his "Falling Gladiator" (since 1880 in the Boston Museum of Fine Arts), which Truman H. Bartlett calls "the most remarkable work of sculpture that has yet [1882] been produced in this country . . . powerful, wonderful, but not alluring." Rimmer's sculptures, except those mentioned and "The Fighting Lions" (now in the Boston Art Club), "A Dying Centaur" (in the Boston Museum of Fine Arts), and a statue of Alexander Hamilton (made in 1865 for the city of Boston), were soon destroyed. He worked in clay, not modelling but building up and chiselling; almost always without models or preliminary sketches; and always under technical disadvantages and in great haste; but his sculpture is anatomically remarkable and has an "early-Greek," simplicity and strength. He published *Elements of Design* (1864) and *Art Anatomy* (1877), but his great work was in the class-room, where his lectures were illustrated with blackboard sketches. His studies in line suggest William Blake in their imaginative power. He died on the 20th of August 1879.

See Truman H. Bartlett, *The Art Life of William Rimmer* (Boston, 1882).

RIMSKY-KORSAKOV, NICOLAS ANDREIEVICH (1844–1908), Russian composer, was born at Tikhvin, Novgorod, on the 18th (N.S.) of March 1844. He was one of the musical amateurs who, with Borodin, Cui and Moussorsky, gathered round Balakirev in St Petersburg in the days when Wagner was still unknown. By 1865 he had written a symphony (in E minor) which in that year was performed—the first by a Russian composer—under Balakirev's direction, and in 1873 he definitely retired from the navy, having been appointed a professor in the St Petersburg Conservatoire. The same year witnessed his marriage to a talented pianist, Nadejda Pourgold, and the production of his first opera, Pskovitianka. This was followed by *May Night* (1878), *The Snow Maiden* (1880), *Mlada* (1892), *Christmas Eve* (1894), *Sadko* (1895), *Mozart and Salieri* (1898), *The Tsar's Bride* (1899), *Tsar Saltana* (1900), *Servilia* (1902), *Kostchei the Immortal* (1902), *Kites* (1905). But his operas attracted less attention abroad than his symphonic compositions, which show a mastery of orchestral effect combined with a fine utilization of Russian folk-melody and a happy feeling for "programme music," his writing being peculiarly individual and distinctive in its restraint and avoidance of violent methods. Notable among these works are his first symphony, his second (Op. 9) *Antar*, his third (Op. 32), and his orchestral suites and overtures, his Spanish *Capriccio* (1887) being particularly appreciated. He also wrote a number of beautiful songs, pianoforte pieces, &c., and he eventually took Balakirev's place as the leading conductor in St Petersburg, never sparing himself in assisting in the musical development of the Russian school. He died there on the 20th of June 1908.

RINDERPEST (German for "cattle-plague," which is the English synonym), one of the most infectious and fatal diseases of oxen, sheep, goats, camels, buffaloes, yaks, deer, &c.; a virulent eruptive fever which runs its course so rapidly and attacks such a large percentage of ruminants when it is introduced into a country, that from the earliest times it has excited terror and dismay. It is an Asiatic malady, and has prevailed extensively in south Russia, central Asia, China, Indo-China, Burma, India, Persia, Ceylon and the Malay Archipelago. Thence it has at times been carried into Europe, and towards the end of the 19th century into South Africa. It appeared in Egypt in 1844 and 1865, Abyssinia in 1890, Japan in 1892, and the Philippines in 1898.

It has been noted that its irruptions into Europe in the earlier centuries of our era always coincided with invasions of barbarous tribes in the east of Europe; and even at a later period the disease accompanied the events of war, when troops with their commissariat moved from the east towards the west, or cattle, when they were carried in the same direction. One of the earliest recorded irruptions of cattle-plague into western Europe occurred in the 5th century after the sanguinary invasion of the Huns under Attila, the expulsion of the Goths from Hungary, and the fierce internecine wars of the whole Germanic population. The disease appears then to have been carried from Hungary through Austria to Dalmatia, while by Brabant it obtained access to the Low Countries, Picardy, and so on to the other provinces of France. In the curious poem *De Mortibus Bovum* written by St Severus, who lived at that period, the course and destructiveness of the disease are specially alluded to. Many invasions of Europe are described, and in several of these Britain was visited by it—as in 809–10, 986–87, 1223–25, 1513–14, and notably in 1713, 1745, 1774, 1799. In 1865 and 1872 it was imported direct from Russia. In 1870–71 it destroyed 70,000 cattle in France, 30,000 in Alsace-Lorraine, and 10,000 in Germany. In England an outbreak occurred in 1877, when it was imported from Germany, where the disease continued until 1879.

The infective agent has not been positively identified, but it is known to exist in all the various secretions and excretions, in the flesh, blood and various organs of the body. Contagion may be direct or indirect, and the disease may be conveyed to healthy cattle by contaminated fodder, litter, water, clothing, pasture, sheds, railway wagons, hides, horns and hoofs. Attendants, cats, dogs, birds, vermin and flies may spread the infection. Definite symptoms of the disease may not be recognized until the expiration of three to six days after exposure, the period of incubation.

Symptoms.—Like some other general diseases, this does not offer any exclusive or pathognomonic symptoms, but is rather characterized by a group of functional and anatomical alterations. An exact knowledge of its symptoms and necroscopical appearances is of the utmost importance, as its extension and consequent ravages can only be arrested through its timely recognition and the immediate adoption of the necessary sanitary measures. Intense fever, diarrhœa or dysentery, croupous inflammation of the mucous membranes in general, sometimes a cutaneous papular eruption, and great prostration mark the course of the affection, which is frequently most difficult to diagnose during life, especially if its presence is not suspected. Its introduction and mode of propagation can, in many instances, be ascertained only at a late period, and when great loss may already have been sustained. In the majority of cases the examination of the carcase of an animal which has died or been purposely killed is the best way to arrive at a correct diagnosis. Indeed, this is practically the only certain means of concluding as to the presence of the malady, as there are considerable variations in the chief symptoms with regard to their intensity as well as in the secondary symptoms or epiphenomena.

Among cattle indigenous to the regions in which this malady may be said to be enzootic the symptoms are often comparatively slight, and the mortality not great. So much is this the case that veterinary surgeons who can readily distinguish the disease when it affects the cattle of western Europe, can only with difficulty diagnose it in animals from Hungary, Bessarabia, Moldavia, or other countries where it is always more or less prevalent. In these the indications of fever are usually of brief duration, and signs of lassitude and debility are, in some instances, the only marks of the presence of this virulent disorder in animals which may, nevertheless, communicate the disease in its most deadly form to the cattle of other countries. Slight diarrhœa may also be present, and a cutaneous eruption, accompanied by gastric disturbance, running at the eyes, and occasional cough. In the more malignant form the fever runs high, 106° to 107° Fahr., and all the characteristic symptoms are well marked: dulness, sunken eyes, eruption on the skin, discharges from eyes, nose and mouth, shivering fits, difficult breathing, dry, harsh cough, miliary eruptions on the gums, accumulation of bran-like exudate within the lips, fetid breath, with certain nervous phenomena, and dysenteric dejections. Death generally occurs in four or five days, the course of the disorder being more rapid with animals kept in sheds than with those living in the open, and in summer than in winter. The post-mortem appearances are most marked in the digestive canal, and comprise red spots and erosions on the palate, lips, tongue and pharynx; intense congestion of the lining of the fourth stomach, which in places is covered with a grey or reddish pultaceous deposit, under which the membrane is deeply ulcerated. Similar lesions are seen in the small intestine, caecum and rectum. The membrane lining the air passages is congested throughout, and the lungs are emphysematous.

In recent years much has been done in Russia and India towards the prevention of rinderpest by inoculation and the use of immunizing sera. In South Africa the bile method (or the injection of bile obtained from cattle dead of rinderpest), discovered by Koch, in 1896; bile with admixture of glycerine, recommended by Edington; the simultaneous injection of serum and rinderpest blood, introduced by Turner and Kolle in 1897, and repeated injection of fortified serum alone, have been employed, more or less successfully, in conferring immunity. But elsewhere the main line of action has been in the direction of preventing the introduction of the disease by prohibiting the importation of cattle from infected countries.

RING (O.E. *hring*; a word common to Teutonic languages,[1] and probably cognate with the Lat. *circus*, Gr. κίρκος or κρίκος, Skt. *chakra*, wheel, circle, cf. also "harangue"), in art, a band of circular shape of varying sizes, made of any material and used for various purposes, but, particularly, a circular band of gold, silver or other precious or decorative material used as an ornament, not only for the finger, but also for the ear (see EARRING), or even for the nose, where it is still worn by certain races in India and Africa. The word is also used of many objects which in structure take the shape of a circle or hoop, such as the tracheal rings, the circular-shaped bands of cartilage in the walls of the windpipe, the "annual rings," or concentric layers of wood produced each year in the trunks of trees, &c. In transferred senses "ring" is also applied to an enclosed space, whether circular, oval or otherwise: hence to the arena of a circus or hippodrome, the enclosure for a boxing contest, or to the place on a racecourse reserved for the bookmakers for the purpose of betting. A particular application in a transferred sense is that to a combination of persons in trade for the purpose of controlling markets, prices, etc.

In the art sense (see also GEMS), the English and German "ring" corresponds to the Gr. δακτύλιος, Lat. *annulus*, Fr. *anneau*. The enlarged part of a ring on which the device is engraved is called the "bezel," the rest of it being the "hoop." To decorate the human finger with a ring, if possible with one combining beauty, value and a distinctive character, was a widely spread natural impulse. At an early period, when the art of writing was known to but very few, it was commonly the custom for men to wear rings on which some distinguishing sign or badge was engraved (ἐπίσημον), so that by using it as a seal the owner could give a proof of authenticity to letters or other documents. Thus, when some royal personage wished to delegate his power to one of his officials, it was not unusual for him to hand over his signet ring, by means of which the full royal authority could be given to the written commands of the subordinate (cf. Gen. xli. 42; Esth. viii. 2). Among the Battas of Sumatra rings of a certain form are used to this day as passports.

Egyptian rings.

The earliest existing rings are naturally those found in the tombs of ancient Egypt. The finest examples date from about the XVIIIth to the XXth Dynasty; they are of pure gold, simple in design, very heavy and massive, and have usually the name and titles of the owner deeply sunk in hieroglyphic characters on an oblong gold bezel. Rings worn in Egypt by the poorer classes were made of less costly materials, such as silver, bronze, glass or pottery covered with a siliceous glaze and coloured brilliant blue or green with various copper oxides. Some of these had hieroglyphic inscriptions impressed while the clay was moist. Other examples have been found made of ivory, amber and hard stones, such as carnelian. Another form of ring used in the XIIth and subsequent dynasties of Egypt had a scarab in place of the bezel, and was mounted on a gold hoop which passed through the hole in the scarab and allowed it to revolve.

Cylinders.

In ancient Babylonia and Assyria finger rings do not appear to have been used. In those countries the signet took a different form, namely, that of a cylinder cut in crystal or other hard stone, and perforated from end to end. A cord was passed through it, and it was worn on the wrist like a bracelet. This way of wearing the signet is more than once alluded to in the Old Testament (Gen. xxxviii. 18, R.V., and Cant. viii. 6).

Within the limits necessarily imposed by its purpose the finger ring assumed a considerable variety of form, according to its date and place of origin.

In the Cretan and Mycenaean periods a characteristic form of ring had a broad flat bezel, not organically connected with the hoop, and having an incised design in the gold. The use of inset stones hardly occurs, but rings from Enkomi and Aegina of the late Mycenaean period have inset paste decorations.

The Phoenician type of ring was primarily intended to carry a scarab or scarabaeoid, usually in a box setting on a swivel, called for by the fact that the flat base of the scarab would be wanted for sealing purposes, but in wear would be most conveniently turned inwards. Strength being necessary, the hoop became massive. A similar arrangement of the signet-scarab is found attached to a twisted ring, which, from its shape, must have been meant to be suspended, and which is shown thus worn on some of the Cypriote terra-cottas.

The Greek ring of an early period has a characteristic flattened bezel, for an intaglio design in the gold. Such engravings attained great freedom and beauty in the 5th and 4th centuries B.C. An alternative form was a swivel ring for a scarab or scarabaeoid, imitating the Phoenician shape. When the stone was flat and inset the bezel became a mass of metal to hold it securely.

Greek rings.

Among the Greeks signet rings were very largely worn. In Sparta a sumptuary law was passed at an early time to forbid any substance more valuable than iron to be used for signet rings; but in other parts of the Hellenic world there appears to have been no restriction of this sort. In some of the numerous tombs of Etruria and Kertch (Panticapaeum) in the Cimmerian Bosphorus gold rings of great magnificence have been discovered, apparently of the finest Greek workmanship.

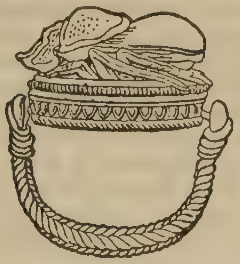

FIG. 1.[2]

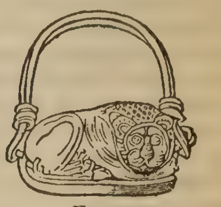

FIG. 2.

Fig. 1 shows a ring from the Crimea with a finely engraved scarabaeus in gold, with an intaglio engraving on the base.

Fig. 2, also from the Crimea, has a cornelian carved in lion form in place of the scarab, and has an intaglio figure on the base of a running lion.

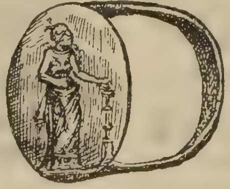

FIG. 3.

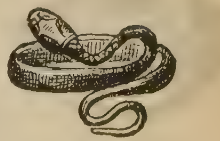

FIG. 4.

Fig. 3 shows a Greek ring with an incised design in a plain bezel.

Fig. 4 is a ring from which the idea of a signet is entirely wanting.

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[1] "To ring," in the sense of to make a bell sound, is a different word. It also appears in various Teutonic languages and is probably of onomatopoeic origin, and may be akin to Lat. *clangor*.

[2] Figs. 1–6, 8 and 9 are from Dr Robert Forrer's *Reallexikon*, by permission of W. Spemann, Berlin and Stuttgart.

Etruscan rings.

The Etruscans used very largely the gold swivel ring mounted with a scarab, a form of signet probably introduced from Egypt. Some found in Etruscan tombs have real Egyptian scarabs with legible hieroglyphs; others, probably the work of Phoenician or native engravers, have rude copies of hieroglyphs, either quite or partially illegible. A third and more numerous class of Etruscan signet rings have scarabs, cut usually in sard or carnelian, which are a link between the art of Egypt and that of Greece, the design cut on the flat side being Hellenic in style, while the back is shaped like the ordinary Egyptian scarabaeus beetle. One from Etruria, now in the British Museum, is formed by two minutely modelled lions whose bodies form the hoop, while their paws hold the bezel, a scarab engraved with a lion of heraldic character. An alternative type of Etruscan ring (as in fig. 5) has an incised design on the gold bezel, or a flat stone set in the rigid bezel. In either case the Etruscan rings tend to extravagance in size and elaboration.

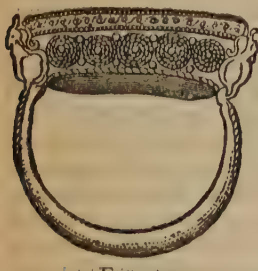


FIG. 5.

Roman rings.

The Romans appear to have imitated the simplicity of Lacedaemonia. Throughout the republic none but iron rings were worn by the bulk of the citizens, and even these were forbidden to slaves. Ambassadors were the first who were privileged to wear gold rings, and then only while performing some public duty. Next senators, consuls, equites and all the chief officers of state received the *jus annuli aurei*. In the Augustan age many valuable collections of antique rings were made, and were frequently offered as gifts in the temples of Rome. One of the largest and most valuable of the *dactyliothecae* was dedicated in the temple of Apollo Palatinus by Augustus's nephew Marcellus (Pliny, *H.N.* xxxvii. 5). The temple of Concord in the Forum contained another; in this collection was the celebrated ring of Polycrates, king of Samos, the story of which is told by Herodotus; Pliny, however, doubts the authenticity of this relic (*H.N.* xxxvii. 2).

Different laws as to the wearing of rings existed during the empire: Tiberius made a large property qualification necessary for the wearing of gold rings in the case of those who were not of free descent (Pliny, *H.N.* xxxiii. 8); Severus conceded the right to all Roman soldiers; and later still all free citizens possessed the *jus annuli aurei*, silver rings being worn by freedmen and iron by slaves. Under Justinian even these restrictions passed away.

In the rings of the Roman period the decoration is no longer an accessory of the bezel alone. It modifies the form of the hoop, which may be polygonal or angular (see fig. 6). The ring here figured is set with an eye, as an amulet, capable of turning on a swivel.

In the 3rd and 4th centuries Roman rings were made engraved with Christian symbols. Fig. 7 shows two silver rings of the latter part of the 4th century which were found in 1881 concealed in a hole in the pavement of a Roman villa at Fifehead Neville, Dorset, together with some coins of the same period. Both have the monogram of Christ, and one has a dove within an olive wreath rudely cut on the silver bezel. These rings are of special interest, as Roman objects with any Christian device have very rarely been found in Britain.

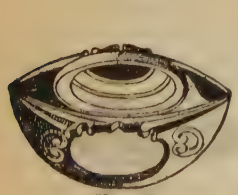


FIG. 6.

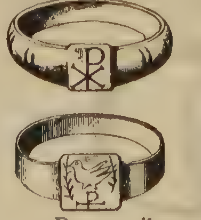


FIG. 7.—Roman silver rings.

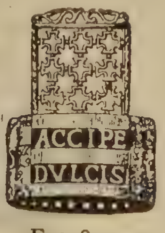
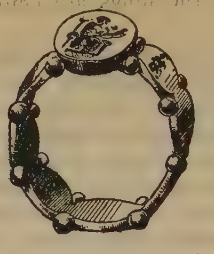
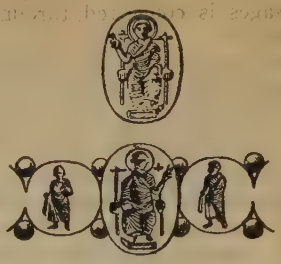


FIG. 8.

Fig. 8 is a choice example of a gold key-ring of the Christian period, with good wishes inscribed in pierced gold work—*accipe dulcis, multis annis* (Brit. Mus.).



Part of FIG. 9.



Part of FIG. 9.

Fig. 9 is a gold ring from Smyrna (Brit. Mus.) with seven incised intaglio medallions, with a figure of Christ on the bezel. Assigned to the 5th century.

Celtic rings.

Large numbers of gold rings have been found in many parts of Europe in the tombs of early Celtic races. They are usually of very pure gold, often penannular in form—with a slight break, that is, in the hoop so as to form a spring. They are often of gold wire formed into a sort of rope, or else a simple bar twisted in an ornamental way. Some of the quite plain penannular rings were used in the place of coined money.

Throughout the Middle Ages the signet ring was a thing of great importance in religious, legal, commercial and private matters.

Episcopal rings.

The episcopal ring[1] was solemnly conferred upon the newly made bishop together with his crozier, a special formula for this being inserted in the Pontifical. In the earliest references to rings worn by bishops, there is nothing to distinguish them from other signet rings. In A.D. 610 the first mention has been found of the episcopal ring as a well-understood symbol of dignity. It is clear that it was derived from the signet. It was only in the 12th century and onwards that it was brought into mystical connexion with the marriage ring. In the time of Innocent III. (1194) the ring was ordered to be of pure gold mounted with a stone that was not engraved; but this rule appears not to have been strictly kept. Owing to the custom of burying the episcopal ring in its owner's coffin, a great many fine examples still exist. Among the splendid collection of rings formed by the distinguished naturalist Edmund Waterton, and now in the South Kensington Museum, is a fine gold episcopal ring decorated with niello, and inscribed with the name of Alhstan, bishop of Sherborne from 824 to 867 (see fig. 10). In many cases an antique gem was mounted in the bishop's ring, and often an inscription was added in the gold setting of the gem to give a Christian name to the pagan figure. The monks of Durham, for example, made an intaglio of Jupiter Serapis into a portrait of St Oswald by adding the legend CAPVT S. OSWALDI. In other cases the engraved gem appears to have been merely regarded as an ornament without meaning—as, for example, a magnificent gold ring found in the coffin of Seffrid, bishop of Chichester (1125–1151), in which is mounted a Gnostic intaglio. Another in the Waterton collection bears a Roman cameo in plasma of a female head in high relief; the gold ring itself is of the 12th century. More commonly the episcopal ring was set with a large sapphire, ruby or other stone cut *en cabochon*, that is, without facets, and very magnificent in effect (see fig. 11). It was

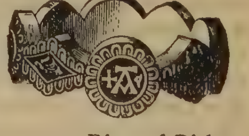


FIG. 10.—Ring of Bishop Alhstan.

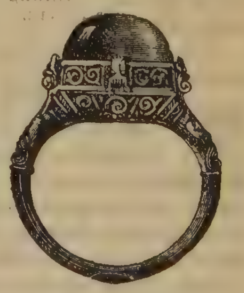


FIG. 11.—13th-century episcopal ring of Italian workmanship, of gold, set with a sapphire *en cabochon*.

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[1] See a paper by Edm. Waterton in *Arch. Jour.* xx. p. 224, also Cabrol, *Dict. d'arch. chrétienne*, s.v. "Anneaux."

worn over the bishop's gloves, usually on the forefinger of the right hand; and this accounts for the large size of the hoop of these rings. In the 15th and 16th centuries bishops often wore three or four rings on the right hand in addition to a large jewel which was fixed to the back of each glove.

"Ring of the Fisherman."

The papal "Ring of the Fisherman" (*annulus piscatoris*) bears the device of St Peter in a boat, drawing a net from the water. The first mention of it, as the well-understood personal signet ring of the pope, that has been found, occurs in a letter of Clement IV. in 1265. After the middle of the 15th century it was no longer used as the private seal of the popes, but was always attached to briefs. After the death of a pope the ring is broken. A new ring with the space for the name left blank is taken into the conclave, and placed on the finger of the newly elected pontiff, who thereupon declares what name he will assume, and gives back the ring to be engraved (see Waterton, *Archaeologia*, 40, p. 138).

Papal rings.

The so-called papal rings, of which many exist dating from the 15th to the 17th centuries, appear to have been given by the popes to new-made cardinals. They are very large thumb rings, usually of gilt bronze coarsely worked, and set with a foiled piece of glass or crystal. On the hoop is usually engraved the name and arms of the reigning pope, the bezel being without a device. They are of little intrinsic value, but magnificent in appearance.

Betrothal and wedding rings.

The giving of a ring to mark a betrothal was an old Roman custom. The ring was probably a mere pledge, *pignus*, that the contract would be fulfilled. In Pliny's time conservative custom still required a plain ring of iron, but the gold ring was introduced in the course of the 2nd century. This use of the ring, which was thus of purely secular origin, received ecclesiastical sanction, and formulae of benediction of the ring exist from the 11th century. The exact stages by which the wedding ring developed from the betrothal ring can no longer be traced.

Gemel rings.

Gemel or gimmel rings, from the Latin *gemellus*, a twin, were made with two hoops fitted together, and could be worn either together or singly; they were common in the 16th and 17th centuries, and were much used as betrothal rings.

Posy rings.

Posy rings, so called from the "poesy" or rhyme engraved on them, were specially common in the same centuries. The name "posy ring" does not occur earlier than the 16th century. A posy ring inscribed with "Love me and leave me not" is mentioned by Shakespeare (*Mer. of Ven.*, act v. sc. 1). The custom of inscribing rings with mottoes or words of good omen dates from a very early time. Greek and Roman rings exist with words such as ΖΗϹΑΙϹ, ΧΑΙΡΕ, ΚΑΛΗ, or *votis meis Claudia vivas*. In the Middle Ages many rings were inscribed with words of cabalistic power, such as *anam zapta*, or Caspar, Melchior and Balthasar, the supposed names of the Magi. In the 17th century they were largely used as wedding rings, with such phrases as "Love and obaye," "Fear God and love me," "No gift can show the love I owe," "God above increase our love" or "Mulier viro subjecta esto."

Memorial rings.

In the same century memorial rings with a name and date of death were frequently made of very elaborate form, enamelled in black and white; a not unusual design was two skeletons bent along the hoop, and holding a coffin which formed the bezel.

Cramp rings.

Cramp rings were much worn during the Middle Ages as a preservative against cramp. They derived their virtue from being blessed by the king; a special form of service was used for this, and a large number of rings were consecrated at one time, usually when the sovereign touched patients for the king's evil.

Decade rings.

Decade rings were not uncommon, especially in the 15th century; these were so called from their having ten knobs along the hoop of the ring, and were used, after the manner of rosaries, to say nine aves and a paternoster. In some cases there are only nine knobs, the bezel of the ring being counted in, and taking the place of the *gaude* in a rosary. The bezel of these rings is usually engraved with a sacred monogram or word.

Merchants' rings.

In the 15th and 16th centuries signet rings engraved with a badge or trademark were much used by merchants and others; these were not only used to form seals, but the ring itself was often sent by a trusty bearer as the proof of the genuineness of a bill of demand.[1] At the same time private gentlemen used massive rings wholly of gold with their initials cut on the bezel, and a graceful knot of flowers twining round the letters. Other fine gold rings of this period have coats of arms or crests with graceful lambrequins.

Poison rings.

Poison rings with a hollow bezel were used in classical times; as, for example, that by which Hannibal killed himself, and the poison ring of Demosthenes. Pliny records that, after Crassus had stolen the gold treasure from under the throne of Capitoline Jupiter, the guardian of the shrine, to escape torture, "broke the gem of his ring in his mouth and died immediately." The medieval *anello della morte*, supposed to be a Venetian invention, was actually used as an easy method of murder. Among the elaborate ornaments of the bezel a hollow point made to work with a spring was concealed; it communicated with a receptacle for poison in a cavity behind, in such a way that the murderer could give the fatal scratch while shaking hands with his enemy. This device was probably suggested by the poison fang of a snake.

Hebrew rings.

A very large and elaborate form of ring is that used during the Jewish marriage service. Fine examples of the 16th and 17th centuries exist. In the place of the bezel is a model, minutely worked in gold or base metal, of a building with high gabled roofs, and frequently movable weathercocks on the apex. This is a conventional representation of the temple at Jerusalem.

Perhaps the most magnificent rings from the beauty of the workmanship of the hoop are those of which Benvenuto Cellini produced the finest examples. They are of gold, richly chased and modelled with caryatides or grotesque figures, and are decorated with coloured enamels in a very skilful and elaborate way. Very fine jewels are sometimes set in these magnificent pieces of 16th-century jewellery.

Thumb rings.

Thumb rings were commonly worn from the 14th to the 17th century. Falstaff boasts that in his youth he was slender enough to "creep into any alderman's thumb ring" (Shakes., *Hen. IV.*, *Pt. I.*, act ii. sc. 4).

The finest collections of rings formed in Britain have been those of Lord Londesborough, Edmund Waterton (now in the Victoria and Albert Museum) and the collection in the British Museum, which was greatly augmented in 1897 by the bequest of the late Sir A. W. Franks.

Bibliography.—Licetus, *De Anulis antiquis* (Udine, 1645); Kirchmann, *De Annulis* (Schleswig, 1657); King, *Antique Gems and Rings*, 1872; Marshall, *Catalogue of Finger Rings in the British Museum*, 1907; Cabrol, *Dictionnaire d'archéologie chrétienne*, *s.v.* "Anneaux"; articles of Waterton in *Archaeologia* and *Archaeological Journal*. (J. H. M.; A. H. Sm.)

RING-GOAL, a game for two persons played on a ground, or indoor rink, 78 ft. long by 10 ft. wide, with a ring of split cane about $7\frac{1}{2}$ in. in diameter and weighing about $3\frac{1}{2}$ oz., which is propelled in the air by means of two sticks, resembling miniature billiard-cues, which are held inside the ring. The goals consist of two uprights 8 ft. high and 10 ft. apart, from which a net is stretched on an incline, so that its base will be a few feet behind the goal-line, and the object of the game is to drive the ring into these goals, each goal made scoring one point. The ring must be propelled by the server and caught by his opponent, on one or both of his sticks, if he can, and so returned alternately, and a point is scored for either player if it be stopped by his opponent in any other manner. A point is also scored for the receiver if the server, who begins the game, throw the ring so that it falls to the ground before the receiver can catch it between the creases, which are lines drawn across the court 6 ft. from the goal-lines, or the ring be driven out of court. Eleven points constitute a game. Ring-goal was invented by an under-graduate of Keble College, Oxford, about 1885, and was played at Oxford, but without attracting any wide popularity.

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[1] The celebrated ring given to Essex by Queen Elizabeth was meant to be used for a similar purpose. It is set with a fine cameo portrait of Elizabeth cut in sardonyx, of Italian workmanship.

RINGWOOD, a market town in the New Forest parliamentary division of Hampshire, England, 103½ m. S.W. by W. from London by the London & South-Western railway. Pop. (1901) 4629. It lies pleasantly on the river Avon, which here divides into numerous branches, flowing through flat meadow land. The church of SS. Peter and Paul, which was almost entirely reconstructed in 1854, the town hall and corn exchange are the chief buildings. A large agricultural trade and manufactures of agricultural implements, linen goods and woollen gloves are carried on.

RINGWORM (or TINEA TONSURANS), a disease of the scalp (especially common within the tropics); it consists of bald patches, usually round, and varying in diameter from half an inch up to several inches, the surface showing the broken stumps of hairs and a fine whitish powdering of desquamated epidermic scales. In scrofulous subjects matter is sometimes produced, which forms crusts, or glues the hair together, or otherwise obscures the characteristic appearance. The disease is due to a parasite, *Trichophyton tonsurans*, which exists mostly in the form of innumerable spores (with hardly any mycelium), and is most abundant within the substance of the hairs, especially at their roots. If a piece of the hair near the root be soaked for a time in dilute liquor potassae and pressed flat under a cover-glass, the microscope will show it to be occupied by long rows of minute oval spores, very uniform in size, and each bearing a nucleus.

The same fungus sometimes attacks the hairs of the beard, producing a disease called "sycosis." Sometimes it invades the hairless regions of skin, forming "tinea circinata"; circular patches of skin disease, if they be sharply defined by a margin of papules or vesicles, may be suspected of depending on the tinea-fungus. Interesting varieties of tinea are found in some of the Pacific and East Indian islands. Among the best remedial agents are various mercurial preparations. But in modern practice much success has been found in X-raying the patch in order to remove the dead and diseased hairs, thus leaving a free channel for the passage of antiseptic applications to the follicles. The exposures are followed by inunction of a mercurial preparation or of a lotion of tincture of iodine with methylated spirit.

See also FAVUS.

RINTOUL, ROBERT STEPHEN (1787–1858), British journalist, was born at Tibbermore, Perthshire, in 1787, and educated at the Aberdalgie parish school. After serving his apprenticeship to the printing trade he became the printer and subsequently the editor of the *Dundee Advertiser*. In 1826 he came to London, and in July 1828, with the assistance of friends, founded *The Spectator*. In it Rintoul strongly supported the Reform Bill, and to him was due the catch-phrase "The bill, the whole bill, and nothing but the bill." After conducting *The Spectator* for more than thirty years, he sold it shortly before his death, which occurred on the 22nd of April 1858.

RINUCCINI, GIOVANNI BATTISTA (1592–1653), archbishop of Fermo, was born in Rome on the 15th of September 1592, being the son of a senator. He studied at several Italian universities, became chamberlain to Pope Gregory XV., and in 1625 was made archbishop of Fermo. His participation in Irish politics, which is his chief title to fame, began during the later stages of the Civil War when Ireland was the scene of universal disorder. In 1645 Pope Innocent X. despatched him to that country as papal nuncio; he landed at Kenmare with arms and money in October 1645, and took up his residence at Kilkenny. Before this time the Roman Catholics had banded themselves together for defence. Called the Confederate Catholics, they had set up a provisional government, and when the nuncio reached Kilkenny they were engaged in negotiating for peace with the lord lieutenant, the marquess, afterwards duke, of Ormonde. Rinuccini took part in the proceedings, but as his demands were ignored he refused to recognize the peace which was concluded in March 1646, and gaining the support of the Irish general, Owen Roe O'Neill, he used all his influence, both ecclesiastical and political, to prevent its acceptance by others. To a large extent he succeeded. Meeting at Waterford, the clergy condemned the treaty and several towns took up the same attitude. The nuncio's most pliant helper was now Edward Somerset, earl of Glamorgan, afterwards marquess of Worcester, who had been sent to Ireland by Charles I., and who had entered into communication with Rinuccini when the latter first arrived in that country. Glamorgan bound himself to carry out all the wishes of the nuncio, who intended that he should supplant Ormonde. In September 1646 Rinuccini took over the conduct of affairs. He imprisoned his opponents on the council and tried to arrange for an attack on Dublin. But there was no harmony among his subordinates, his military plans failed and soon all parties were tacitly ignoring him. Leaving Kilkenny he stayed for some time in Galway, and in February 1649 he left Ireland. After visiting Rome he returned to Fermo in 1650 and died on the 5th of December 1653.

See G. Aiazzi, *La Nunziatura in Irlanda* (Florence 1844), English translation as *The Embassy in Ireland*, by A. Hutton (Dublin, 1873); and S. R. Gardiner, *History of the Great Civil War*, vols. iii. and iv. (1905).

RIOBAMBA or ROYABAMBA, a town of Ecuador, capital of the province of Chimborazo, on the railway between Guayaquil and Quito, about 85 m. E.N.E. of the former. Pop. (1900, estimate) 12,000. It stands in a barren, sandy basin of the great central plateau, drained by the Chambo, a tributary of the Pastaza, on the old road running southward from Quito into Peru, 9039 ft. above sea-level, and in full view of the imposing heights of Chimborazo, Carahuairazo (Carguairazo), Tunguragua and Altar. Though 300 ft. lower than Quito, its climate is considerably colder, owing, perhaps, to its more exposed situation and the vicinity of so many snow-clad peaks. It is a town of unusually wide streets and one-storeyed adobe houses, being so laid out and built because of earthquakes. It has very little importance as a commercial or industrial centre, having only a small trade and a few unimportant industries. The present town dates from 1797, when the great earthquake of that year destroyed the old town then situated 12 m. W., near the existing village of Cajabamba. The ruins of the old town indicate that it was much larger and finer than its successor.

RIO CUARTO, a town of Argentina in the province of Cordoba, 119 m. S. of the city of that name, and about 500 m. N.W. of Buenos Aires. Pop. (1904, estimate) 12,000. It stands 1440 ft. above sea-level and about half-way across the great Argentine pampas, on the banks of a river of the same name which finds an outlet through the Carcarañal into the Parana near Rosario. The town is built on the open plain and is surrounded with attractive suburbs. It is the commercial centre of a large district and has a large and lucrative trade. Its geographical position gives it great strategical importance, and the government maintains here a large arsenal and a garrison of the regular army. The surrounding country belongs to the partially arid pampa region and is devoted to stock-raising—cattle, horses, sheep and goats. Irrigation is employed in its immediate vicinity. Previous to 1872 this region was overrun by the Ranqueles, a warlike tribe of Indians, but the vigorous reprisals of General Ivanovski in that year, supplemented by the tactful intervention of the Franciscan missionaries, who have a convent in this town, put an end to these hostile forays and gave full opportunity for the industrial development of the country. There are some manufacturing industries in the town. The National Andine railway passes through Rio Cuarto, and branch lines connect with the Buenos Aires and Pacific line—all of which give railway communication with Buenos Aires, Rosario, Tucuman, Cordoba, San Luis and Mendoza.

RIO DE CONTAS, or Villa de Contas, a town of Brazil in the state of Bahia, 230 m. S.W. from the city of Bahia, on the Brumado (Contas-Pequeno), a head stream of the Rio de Contas (Jussiape), which rises on the eastern slope of the neighbouring Serra das Almas, and flows S.E. and E. to the Atlantic coast at Barra do Rio de Contas. Pop. (1890), including rural districts, 17,318. The surrounding country is fertile and produces sugar, cotton, mandioca and tobacco, but has lost much of its prosperity through the droughts that have devastated the interior of the state, and because of the costs of transporting produce to market. Stock-raising was at one time an important industry here. The town was founded in 1715 by some "Paulistas" who discovered gold there in the sands of the river. It became a "villa" in 1724, but was soon afterward moved down the river 5 m. to a more convenient site on the high road between Bahia and Goyaz.

RIO DE JANEIRO, a maritime state of Brazil, bounded N. by Minas Geraes, E. by Espirito Santo and the Atlantic, S. by the Atlantic, and W. by São Paulo. It is one of the smaller states of the republic and has an area of 26,635 sq.m.; pop. (1900) 926,585. The state is traversed longitudinally by the Serra do Mar, which divides it into a low, narrow, irregular coastal zone, and a broad elevated river valley through which the Parahyba flows eastward to the Atlantic. The eastern part of this valley widens out into a great alluvial plain on which are to be found some of the richest sugar estates of Brazil. The central mountainous region is heavily wooded, the coast region is hot and in places malarial, but the valleys are fertile and well watered. The Parahyba valley has long been celebrated for its fertility, and was for many years the centre of the coffee-producing industry. The exhaustion of the soil and antiquated methods of cultivation have caused a great decline in this industry, and many of its coffee plantations are now either abandoned or are producing but a fraction of earlier crops. Stock-raising has been slowly developing since the abolition of slavery (1888) and the decline in coffee production, and the state now possesses large herds of cattle and droves of swine.

The state's agricultural and pastoral products are coffee, sugar, rum, Indian corn, mandioca (both bitter and sweet), cotton, tropical fruits, cattle, hogs, butter, cheese, fresh milk and lard. The state is well watered by the Parahyba (*q.v.*) and its tributaries and by numerous short streams flowing from the Serra do Mar to the coast. Manufacturing has been developed largely because of the fine water power supplied by the mountain streams, and among the manufactures are cotton, woollen, silk and jute fabrics, brick, tile and rough pottery, sugar, rum, vehicles, furniture, beer and fruit conserves. The state is well provided with railways, which include the Central do Brazil, Leopoldina, Melhoramentos and Rio do Ouro. The Central line runs from the city of Rio de Janeiro N.N.W. across the Serra do Mar to the Parahyba valley, where it divides into two branches at the station of Barra do Pirahy, one running westward to São Paulo, and the other eastward and northward into Minas Geraes. Besides these there are a number of short railways called the Theresopolis, União Valenciana, Rio das Flores, Bananal, and Vassourense lines. The total extension of these railways in the state in 1907 was 1445 m. Other than Nictheroy, the ports of the state are São João da Barra, Macahé or Imbetiba, Cabo Frio and Paraty, but they are visited only by the smaller coasting vessels.

The capital of the state is Nictheroy on the E. side of the Bay of Rio de Janeiro, and other cities and towns, with their populations in 1890 except where otherwise stated, are: Campos (estimate, in 1907, 35,000), on the lower Parahyba in the midst of a rich sugar-producing region; Rio Bonito (19,321); Itaborahy (17,817); Barra Mansa (14,449), on the upper Parahyba; Rezende (14,370), in a fertile district of the upper Parahyba; Petropolis (*q.v.*); Cantagallo (about 9000), in a rich coffee district of the Serra do Mar; Paraty (10,765), a small port on the W. side of the bay of Angra dos Reis; Valença (11,965); Vassouras (9666); São Fidelis (11,770), a river port on the lower Parahyba having steamboat communication with Campos; Macahé (about 7000 in 1900), an old port on the eastern coast of the state at the mouth of the Macahé river whose original anchorage has been filled with silt, and that of Imbetiba, in the vicinity, with which it is connected by tramway, is now used by vessels both for the town and the Macahé and Campos railway; Barra do Pirahy (7750), an important station and junction of the Central do Brazil railway on the N. side of the Serra do Mar, with large manufacturing and commercial interests; Parahyba do Sul (7343), in a fertile, long-settled district in the N.E. part of the state; Maricá (10,373); Cabo Frio (10,382); Pirahy (10,429); Saquarema (12,489); Nova Friburgo (9857); and Araruama (9087).

RIO DE JANEIRO (in full, São Sebastião do Rio de Janeiro, colloquially shortened to Rio), a city and port of Brazil, capital of the republic, and seat of an archbishopric, on the western side of the Bay of Rio de Janeiro, or Guanabara, in lat. 25°54′23″S., long. 43°8′34″W. (the position of the Observatory). The city is situated in the S.E. angle of the Federal District (*Districto Federal*) formerly known as the Neutral Municipality (*Municipio Neutro*), an independent district or commune with an area of 538 sq. m., which was detached from the province of Rio de Janeiro in 1834. The city stands in great part on an alluvial plain formed by the filling in of the western shore of the bay, which extends inland from the shore-line in a north-westerly direction between a detached group of mountains on the S. known as the Serra da Carioca, and the imposing wooded heights of the Serra do Mar on the N. The spurs of the Carioca range project into this plain, in some places, closely up to the margin of the bay, forming picturesque valleys within the limits of the city. Some of the residential quarters follow these valleys up into the mountains and extend up their slopes and over the lower spurs, which, with the hills covered with buildings rising in the midst of the city, give a picturesque appearance. At the entrance to the bay is the Sugar Loaf (*Pão de Assucar*), a conical rock rising 1212 ft. above the water-level and forming the terminal point of a short range between the city and the Atlantic coast. The culminating point of that part of the Carioca range which projects into and partly divides the city is the Corcovado (Hunchback), a sharp rocky peak 2329 ft. high overlooking the Botafogo suburb and approachable only on the wooded N.W. side. These spurs are covered with luxuriant vegetation, excepting their perpendicular faces and the slopes occupied by the suburbs. Considerably beyond the limits of the city on its S.W. side, but within the municipality, is the huge isolated flat-topped rock known as the Gavea, 2575 ft. high, which received its name from its resemblance to the square sail used on certain Portuguese craft. The sky-line of this range of mountains, as seen by the approaching traveller some miles outside the entrance to the bay, forms the rough outline of a huge reclining figure called "the sleeping giant," the facial profile of which is also known as "Lord Hood's nose."

The entrance to the bay, between the Sugar Loaf on the W. and the Pico on the E., with fortress of Santa Cruz on one side and the fort of São João on the other, is about a mile wide and free from obstructions. Almost midway in the channel are the little island and fort of Lage, so near the level of the sea that the spray is sometimes carried completely over it. On the W. is the semicircular bay of Botafogo, round which are grouped the residences of one of the richest suburbs; on the E., the almost land-locked bay of Jurujuba (see Nictheroy). The bay extends northward nearly 16½ nautical miles, with a maximum breadth of 11 m. and a minimum, between the arsenal of war (*Ponta do Calabouço*) and the opposite Ponta da Gravatá, of about 3500 yds. The shore-line is irregular, and has been modified by the construction of sea-walls and the filling in of shallow bays. Close to the shore are the islands of Villegaignon (occupied by a fort), Cobras (occupied by fortifications, naval storehouses, hospital and dry docks), Santa Barbara and Enxadas, the site of the Brazilian naval school. A small island just above the lower anchorage, which is occupied by port officials, was once known as Rat island, and is now called Ilha Fiscal. There is one lake within the urban limits, the Lagôa de Rodrigo de Freitas, near the Botanical Garden, separated from the sea by a narrow sand beach, which is being gradually filled in. Several small streams from the hills are conspicuous only in times of heavy rains.

The oldest part of the city, which includes the commercial section, lies between Castle and Santo Antonio hills on the S. and São Bento, Conceicão and Livramento hills on the N., and extends inland to the Praça da Republica, though the defensive works in colonial times followed a line much nearer the bay. This section during the past century has extended southward along the bay shore in a string of suburbs known as the Cattete and Botafogo, with that of Larangeiras behind the Cattete in a pretty valley of the same name, and thence on or near the Atlantic coast as Largo dos Leoes, Copacabana and Gavea, the last including the Botanical Garden. The greatest development has been northward and westward, where are to be found the suburbs of Cidade Nova, São Christovão, Engenho Novo, Praia Formoso, Pedregulho, Villa Isabel, Tijuca, and a number of smaller places extending far out on the line of the Central railway. The extreme length of the city along lines of communication is little less than 20 m.

Streets.—Some of the most modern streets on the plain have been laid out with Spanish-American regularity, but much the greater part seems to have sprung into existence without any plan. Most of the streets of the old city are parallel and cross at right angles, but they are narrow and enclose blocks of unequal size. Each suburb is laid out independently, with straight streets where the ground permits, and crooked ones where the shore-line or mountain contour compels. Since the beginning of the 20th century large sums have been borrowed and expended on new avenues, the widening and straightening of old streets, and the improvement of the water-front between the Passeio Publico and the southern extremity of the Praia de Botafogo by the construction of a grand boulevard, partly on reclaimed land. One of these improvements consists of a central avenue cut across the old city from a point on the water-front near the Passeio Publico northward to the Saúde water-front. The shore-line boulevard, called the Avenida Beira-Mar, is about 4⅓ m. long, the wider parts being filled in with gardens. It was undertaken in 1903, during the administration of President Rodrigues Alves, as part of a vast scheme to improve the sanitary and traffic conditions of the city, including the construction of a new shore-line and filling in the shallow parts of the shore, which had long been considered one of the prime causes of the unhealthy state of the city. Another improvement was the completion and embellishment of the Mangue canal, originally designed as an entrance to a central market for the boats plying on the bay, but now destined for drainage purposes and as a public pleasure ground. This canal, as completed, is nearly 2 m. long, enclosed with stone walls, crossed by a number of iron bridges and bordered by lines of royal palms. The most famous street of the old city is the Rua do Ouvidor, running westward from the market-place to the Largo de São Francisco de Paula, and lined with retail shops, cafés and newspaper offices. It has long been a favourite promenade, and fills an important part in the social and political life of the city. The principal business street is the Rua Primeiro de Março, formerly called Rua Direita, which extends from the Praça 15 de Novembro northward to São Bento Hill. All these old streets, excepting the last, are narrow and paved with squared granite blocks, and have their vehicle traffic regulated to go in one direction only. The side walks are very narrow, and the gas lamps are attached to the walls of the buildings. The streets and suburbs are served by five groups of tramway lines—Jardim Botanico, Santa Thereza, São Christovão, Villa Isabel, and Carris Urbanos—all using electric traction but the last. The streets are lighted with electricity and gas, the Ouvidor and some other narrow streets having a great number of gas-pipe arches across them for decorative illumination on festal occasions.

Parks.—The public parks and gardens are numerous and include the Botanical Garden with its famous avenue of royal palms (*Oreodoxa regia*); the Passeio Publico (dating from 1783), a small garden on the water-front facing the harbour entrance; the Jardim d'Acclamação, forming part of the Praça da Republica (once known as the Campo de Sant' Anna) with its artistic walks and masses of shrubbery; the Praça Tiradentes (the old Largo do Rocio, afterwards rechristened Praça da Constituição) with its magnificent equestrian statue of Dom Pedro I. executed by the French sculptor Luiz Rochet; the Praça 15 de Novembro on the water-front facing the old city palace; and a number of smaller squares with and without gardens.

Water Supply and Sewerage Drainage.—The water supply is derived from three sources: the small streams flowing down the mountain sides which serve small localities; the old Carioca aqueduct, dating from colonial times, which collects a considerable supply from the small streams of the Serra da Carioca and brings it into the city through a covered conduit which once crossed the gap between Santa Thereza and Santo Antonio hills on two ranges of stone arches (now used as a viaduct by the Santa Thereza Tramway Company); and the modern Rio do Ouro waterworks, which brings in an abundant supply from the Serra do Tinquá, N.W. of the city—the length of the iron mains being 33 m. between the principal collecting reservoir and the main distributing reservoir at Pedregulho, near the Ponta do Cajú. There are three other distributing reservoirs in different parts of the city, and the supply, which has been augmented since the works were inaugurated in 1885, is good and ample. An extensive system of sewers was constructed by the City Improvements Co., an English corporation, which initiated the work in 1853; and a separate system of rain-water drains. The Leicester system is used because the greater part of the sewers are below sea-level, and it is necessary to use powerful pumps.

Climate.—The climate of Rio de Janeiro is hot, humid and debilitating, the temperature ranging from 50° to 99·5° F. in the shade, with an average for the year of 74°, and the rainfall being about 44 in. The greater part of the city is only 2 or 3 ft. above sea-level, is surrounded by mountains, and has large areas of water, swamp and wet soil in its vicinity. But the unhealthiness of Rio de Janeiro in past years may be charged to insanitary conditions and not to the climate. Yellow fever, whose first recorded appearance was in December 1849, was for many years almost a regular yearly visitant, and the mortality from it has been terrible. Smallpox also is practically endemic, owing in great part to negligent sanitary supervision. Since 1900 there have been several mild outbreaks of bubonic plague. These dangerous diseases are slowly disappearing as sanitary conditions are improved. The death-rate from tuberculosis, however, is high, and apparently shows no abatement. This is undoubtedly due to constitutional weakness arising from bad nutrition and the habit of sleeping in closed or badly ventilated apartments. Malarial fevers are also common, and diseases of the digestive organs, in great part easily preventible, figure among the principal causes of death. According to official returns for the five years 1900–1905, the average number of deaths was 15,926, or 20·4 per 1000. Among the deaths 2789 were from tuberculosis, 1200 from smallpox, 778 from malarial diseases, 331 from *la grippe*, and 106 from beri-beri. There were no unusual epidemics during those years, and the rate given may be considered normal.

Buildings.—There remain many public edifices and dwellings of the colonial period, severely plain in appearance, with heavy stone walls and tile roofs. The old city palace facing upon Praça 15 de Novembro, once the residence of the fugitive Portuguese sovereign Dom João VI., is a good example. The 19th century brought no important modifications until near its close, when French and Italian styles began to appear, both in exterior decoration and in architectural design. The new Praça do Commercio (Merchants' Exchange) and Post Office on Rua 1° de Março, and the national printing office near the Largo da Carioca, are notable examples. Since then exterior ornamentation and architectural eccentricities have run riot, and the city is now a mixture of the plain one-storey and two-storey buildings of the Portuguese type, and fanciful modern creations, embellished with stucco and overtopping the others by many storeys. Although a metropolitan see, Rio has no cathedral, the old imperial chapel facing the Praça 15 de Novembro being used for that purpose. The foundations were once laid for a great cathedral on the Largo de São Francisco de Paula, but the building stone was taken for a neighbouring theatre, and the foundations were afterwards used for the Polytechnic School. The most noteworthy church is the Candelaria church, in the commercial district, whose twin towers and graceful dome form one of the most conspicuous landmarks of the city. It was begun in 1775, but was not finished until near the end of the 19th century. Its fine proportions, however, are concealed by commercial buildings and by the narrow streets. Among many other churches, usually plain and bare of interior decoration, are the popular São Francisco de Paula church, on the square of that name; the Carmo church in Rua 1° de Março; the Cruz dos Militares church in the same street; the Rosario church in the street of that name, belonging to a fraternity of negroes and once occupied by the episcopal chapter; and the prettily situated octagonal Gloria church on a hill of that name overlooking the lower bay. Another church of the same name faces on the Largo do Machado and shows the peculiar combination of a Greek temple surmounted by a modern spire. The British residents have an unpretentious chapel in Rua Evaristo da Veiga, the Methodists a more modern structure on the Largo do Cattete and the Presbyterians a chapel near Praça Tiradentes. There is religious toleration in Brazil, but down to the organization of the republic no non-Catholic church or chapel was permitted to have a spire or other outward symbol of a place of worship.

Among public buildings of an official character the following are noteworthy. The old city palace facing on Praça 15 de Novembro dates from 1743 and was the residence of the royal governors and Dom João VI., but is now used by the national telegraph offices. The São Christovão palace, in the suburb of that name, was the residence of the Emperor Dom Pedro II. It is a rambling structure now occupied by the National Museum. The Cattete palace, on the street of that name, originally a private residence, is now the official residence of the President, richly decorated within and partly surrounded by a handsome park. The Itamaráty palace near the Praça da Republica, a typical private residence of the better class, was purchased for and occupied by the first presidents and is now occupied by the ministry of foreign affairs. The palace of justice, on Rua Primeiro de Março, is one of the finest edifices in the city; and the ministry of industry and public works, on the south side of the Praça 15 de Novembro may be noticed. The ministry of war has its offices in the immense military *quartel* (barracks) on the north side of the Praça da Republica, and the ministry of marine in the naval arsenal at the foot of São Bento Hill. The ministry of finance is in the Treasury building on Rua do Sacramento—an immense structure of no special architectural merit. The Senate occupies a plain unattractive building on the west side of the Praça da Republica, and the Chamber of Deputies an ugly colonial building in Rua da Misericordia, originally used as a city hall and jail. A new legislative palace is designed to occupy the block on the west side of the Praça Tiradentes. There are a number of theatres, but the city had no large theatre of architectural merit previous to the construction of the Municipal Theatre at the intersection of the Avenida Central with Rua 13 de Maio, with an elegant marble façade in the French Renaissance style. Bull-fights have never been popular in Rio de Janeiro, but horse-racing is a favourite sport, and the Jockey Club maintains a racecourse in the São Francisco Xavier suburb. Other notable buildings are the ornate Monroe palace at the intersection of the Central and Beira-Mar avenues, the Praça do Commercio (Commercial Exchange) on Rua 1° de Março, the Caixa da Amortização on the Avenida Central, the custom-house with its extensive warehouses, the terminal station of the Central railway at the N.W. angle of the Praça da Republica, and the library building of the Gabinete Portuguez da Leitura with its exquisite "Manuelino" façade of Lisbon marble.

Education.—Although much money is given to hospitals and asylums, Rio de Janeiro has no great educational institutions either public or private. The Medical School may be considered the only distinctively professional school in the city. The Polytechnic School, occupying an interesting old building on the Largo de São Francisco de Paula, is chiefly devoted to civil engineering. The Gymnasio Nacional, formerly the Collegio D. Pedro II., is a boys' college of a high school grade, located on Rua Floriano Peixoto, with an *internato* or boarding-school in Rua de S. Francisco Xavier. The college dates from 1735, when it was founded as an asylum for orphan boys destined for the Church. In 1837 it became a state institution and took the name of the Emperor Dom Pedro II. One of the most noteworthy schools of the city is the Lycen de Artes e Officios, located on Rua 13 de Maio, opposite the opera-house; it dates from 1858 and has been the means of giving instruction to a multitude of clerks, artisans and others, through its night classes. Another important school, partly of this class, is the Instituto Benjamin Constant, located in a fine new edifice on the Praia da Saudade, Botafogo. The public schools of Rio de Janeiro are defective both in organization and administration; the non-attendance of children from the higher classes, and the antagonism of the Church to schools under purely secular administration, must be held responsible for the backwardness of these schools. The episcopal seminary on Castle Hill, called the "Seminario Episcopal de São José," founded in 1739 and devoted exclusively to the education of priests, is the best classical school in the city. There are a number of charitable institutions devoted to the education of orphans, the blind and the deaf and dumb, which are admirably equipped and administered. Among other educational institutions are a conservatory of music, school of fine arts, normal school, a national library with upwards of 260,000 volumes and a large number of manuscripts, maps, medals and coins, the national observatory on Castle Hill, the national museum now domiciled in the São Christovão palace in the midst of a pretty park, a zoological garden in the suburb of Villa Isabel, and the famous Botanical Garden founded by Dom João VI. in 1808 and now a horticultural experiment station.

Hospitals, &c.—Rio de Janeiro is well provided with hospitals, asylums and benevolent institutions. Chief of these is the Misericordia Hospital, popularly known as the "Santa Casa," belonging to a religious brotherhood dating from 1591. In addition to a large income from rentals, the Santa Casa receives the product of certain port taxes in return for opening its wards to the crews of all vessels in port. Other public hospitals are a lepers' hospital in São Christovão, the military and naval hospitals, the São Sebastião hospital and the isolation and contagious diseases hospitals in Jurujuba. There are also a number of private hospitals maintained by church brotherhoods and charitable associations; among them are the Portuguese hospital in Rua de Santo Amaro and the Strangers' Hospital (American and British) in Botafogo. Most prominent among the asylums is the Hospicio Nacional for the insane, on the Praia da Saudade, Botafogo, which was erected 1842–52, and is one of the most completely equipped institutions of its class in the world. There are two public cemeteries: São Francisco de Xavier, in São Christovão, and São João Baptista, in Botafogo, the former having an unconsecrated section for Protestants. Besides these there are five private cemeteries, the one belonging to the British colony being on a hill overlooking the Gambôa shore-line.

Harbour, Communications and Commerce.—The port and harbour of Rio de Janeiro are the largest and most important in the republic. The entrance is open to vessels of the largest draught, and there is sufficient deep-water anchorage inside for the navies of the world. The lower anchorage, where the officers of health visit vessels, is below Ilha Fiscal, and the upper, or commercial anchorage, is in the broad part of the bay above Ilha das Cobras, the national coasting vessels occupying the shallower waters near the Saúde and Gambôa districts. The custom-house occupies a considerable part of the shore-line in front of the old city, and has a protected basin for the discharge of lighters. The new port works, under construction since 1903, consist of a new water-front for the Saúde, Gambôa and Sacco de Alferes districts, in which the shipping interests are centred, and a continuation of the sea-wall across the shallow São Christovão bay to the Ponta do Cajú, the large reclaimed area to be filled in by the removal of some small hills. The commercial quays are built in deep water and permit the mooring alongside of the largest vessels. The total length of the commercial quays is about 3800 yds. Railway and tramway connexions are provided and both electric and hydraulic power are available. Special surtaxes are levied on imports to meet the interest and redemption charges on the loans raised for the execution of these important works. Another improvement is the extension of the sea-wall southward from the ferry-slips (Praça 15 de Novembro) to the Ponta do Calabouço (war arsenal), providing protected basins for the arsenal and enclosing small reclaimed areas. With the completion of these improvements the water-front of the city will consist entirely of deep-water walls from Botafogo to the Ponta do Cajú, with the exception of a short section between the Ponta do Calabouço and the Avenida Central. The port is in regular communication with the principal ports of Europe and America. The coastwise service is good, though rates are high. Railway communication with the interior is maintained by the Central do Brazil (formerly the Dom Pedro II.), Leopoldina and Melhoramentos lines, besides which there is a short passenger line up to the Corcovado about 2⅓ m. long, an electric line to Tijuca, and a narrow-gauge line running out to the Rio do Ouro waterworks. There is daily communication with Petropolis by a branch line of the Leopoldina system, and also by a steamer to the head of the bay and thence by rail up the serra. Ferryboats cross the bay to Nictheroy at intervals of 20 minutes, and smaller craft provide communication with the islands of Gobernador and Paqueta.

Rio de Janeiro is the seaport for a large area of the richest, most productive and most thickly settled parts of Brazil, including the states of Rio de Janeiro and Minas Geraes and a small part of eastern São Paulo. Its exports include coffee, sugar, hides, cabinet woods, tobacco and cigars, tapioca, gold, diamonds, manganese and sundry small products. Rio is also a distributing centre in the coasting trade, and many imported products, such as jerked beef (*carne secca*), hay, flour, wines, &c., appear among the coastwise exports, as well as domestic manufactures. The total exports for 1905 were officially valued at 62,572,033 *milreis* gold, or a little over one-sixth the exportation of the whole country. Formerly Rio led all other ports in the export of coffee, but the enormous increase in production in the state of São Paulo has given Santos the lead. The exports of coffee from Rio in 1908 amounted to 3,062,268 bags of 60 kilogrammes each, officially valued at about $27,846,000. The coffee-producing area tributary to this port is slowly decreasing, owing to the exhaustion of the soil and the greater productiveness of São Paulo. The imports include wheat, flour, Indian corn, jerked beef (*carne secca*), lard, bacon, wines and liquors, butter, cheese, conserves of all kinds, coal, cotton, woollen, linen and silk textiles, boots and shoes, earthen- and glasswares, railway material, machinery, furniture, building material, including pine lumber, drugs and chemicals, and hardware. The imports for 1905 aggregated 103,874,724 *milreis* gold, or about two-fifths the importation of the whole republic. The shipping arrivals in 1908 were as follows: from foreign ports, 1195 steamers of 3,479,357 tons and 75 sailing vessels of 84,474 tons; from national ports, 243 foreign steamers of 582,633 tons, 773 national steamers of 475,587 tons and 294 national sailing vessels of 20,250 tons—in all 2580 vessels of 4,642,301 tons.

Manufactures.—The industrial activities of Rio Janeiro have been largely increased since the organization of the republic through increased import duties on foreign products. There were a number of protected industries before this, but they made slight impression on imports. Rio de Janeiro has manufactures of flour from imported wheat, cotton, woollen and silk textiles, boots and shoes, ready-made clothing, furniture, vehicles, cigars and cigarettes, chocolate, fruit conserves, refined sugar, biscuits, macaroni, ice, beer, artificial liquors, mineral waters, soap, stearine candles, perfumery, feather flowers, printing type, &c. There are numerous machine and repair shops, the most important of which are the shops of the Central railway. One of the most important industrial enterprises in the city is the electric plant belonging to the Rio de Janeiro Light and Power Company, which supplies electric currents for public and private lighting, and power for the tramways and many industries. The hydro-electric works are situated about 50 m. N.W. of the city in a valley of the Serra do Mar, where a large reservoir has been created by building a dam across the Rio das Lages.

Government.—Rio de Janeiro is governed by a prefect, who represents the national government, and a municipal council which represents the people. The prefect is appointed by the President of the republic for a term of four years, and the appointment must be confirmed by the Senate. There are seven *directorias*, or boards, under the prefect, each one assigned to a special field of work, chief among which are education, health and public assistance, public works and transportation, and finance. The municipal council is elected by direct suffrage for a term of two years, and is composed of 15 members. The funded debt of the city on the 30th of June 1907 was £7,000,677, a part of which is guaranteed by the national government. There is some confusion in administration and accounts, however, and it is sometimes difficult to determine the exact situation. The Federal District is represented in Congress by 2 senators and 10 deputies, and is credited with the rights and privileges of citizenship. On the other hand, the city is a garrison town and a district under the direct administration of the national executive, who appoints its chief executive, controls its police force, and exercises part control over its streets, squares and water front. In the work of improving the city, the national government assumed the expense of the commercial quays, the filling of the São Christovão bay, the opening of the Mangue canal and its embellishment, the opening of the Avenida Central, the extension of the sewage system and the addition of new sources to the water supply, while the city was responsible for the Avenida Beira-Mar, the opening of a new avenue from the Largo da Lapa westward to Rua Frei Caneca, the removal of the Morro do Senado, the widening of some streets crossing the Avenida Central and the opening and straightening of other streets.

History.—The discovery of the Bay of Rio de Janeiro is attributed by many Portuguese writers to André Gonçalves, who entered its waters on the 1st of January 1502, and believed that it was the mouth of a great river, hence the name Rio de Janeiro (River of January). Another Portuguese navigator, Martim Affonso de Souza, visited it in 1531, but passed on to São Vicente, near Santos, where he established a colony. The first settlement in the bay was made by an expedition of French Huguenots under the command of Nicholas Durand Villegaignon, who established his colony on the small island that bears his name. In 1560 their fort was captured and destroyed by a Portuguese expedition from Bahia under Mem de Sá, and in 1567 another expedition under the same commander again destroyed the French settlements, which had spread to the mainland. The victory was won on the 20th of January, the feast-day of St Sebastian the Martyr, who became the patron saint of the new settlement and gave it his name—São Sebastião do Rio de Janeiro. The French had named their colony La France Antarctique, and their island fort had been called Fort Coligny. In 1710 a French expedition of five vessels and about 1000 men under Duclerc attempted to regain possession, but was defeated; its commander was captured and later assassinated. This led to a second French expedition, under Duguay Trouin, who entered the bay on the 12th of September 1711, and captured the town on the 22nd. Trouin released Duclerc's imprisoned followers, exacted a heavy ransom and then withdrew. The discovery of gold in Minas Geraes at the end of the 17th century greatly increased the importance of the town. It had been made the capital of the southern captaincies in 1680, and in 1762 it became the capital of all Brazil. In 1808 the fugitive Portuguese court, under the regent Dom João VI., took refuge in Rio de Janeiro, and gave a new impulse to its growth. It was thrown open to foreign commerce, foreign mercantile houses were permitted to settle there, printing was introduced, industrial restrictions were removed, and a college of medicine, a military academy and a public library were founded. Dom João VI. returned to Portugal in 1821, and on the 7th of September 1822 Brazil was declared independent and Dom Pedro I. became its first emperor. There was no resistance to this declaration in Rio de Janeiro. There were some political disorders during the reign of Dom Pedro I., who was finally harassed into an abdication in favour of his son, Dom Pedro II., on the 7th of April 1831. The regency that followed was one of many changes, and led in July 1840 to a declaration of the young prince's majority at the age of fifteen. A long and peaceful reign followed, disturbed only by the struggles of rival political factions. In 1839 a steamship service along the coast was opened, but direct communication with Europe was delayed until 1850, and with the United States until 1865. These services added largely to the prosperity of the port. The first section of the Dom Pedro II. railway was opened in 1858, and the second or mountain section in 1864, which brought the city into closer relations with the interior. In 1874 submarine communication with Europe was opened, which was soon afterwards extended southward to the Platine republics. The first coffee tree planted in Brazil was in a convent garden of Rio de Janeiro. On the 15th of November 1889 a military revolt in the city under the leadership of General Deodoro da Fonseca led to the declaration of a republic and the expulsion of the imperial family, which was accomplished without resistance or loss of life. Disorders followed, a naval revolt in 1891 causing the resignation of President Deodoro da Fonseca, and another in 1893–94 causing a blockade of the port for about six months and the loss of many lives and much property from desultory bombardments. There have been since that time some trifling outbreaks on the part of agitators allied with the extreme republican element, but at no time was the security of the government in danger.

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RIO DE ORO, a Spanish possession on the N.W. coast of Africa. It is bounded W. by the Atlantic, E. and S. by Saharan territory under French protection. The northern frontier, where the protectorate adjoins the territory of the semi-independent tribes south of Morocco, is undefined. The most northerly point claimed by Spain on the coast is Cape Bojador. The southern and eastern boundaries were defined by a Franco-Spanish convention in 1900. The frontier traverses the middle of the Cape Blanco promontory, then runs eastward along the parallel of 21° 20′ N. till it meets the meridian of 13° W., whence it turns first N.W. and afterwards N.E., meeting the tropic of Cancer at 12° W. and thereafter runs due N. Forming part of the Sahara, Rio de Oro is nearly waterless. Oases are few and the sparse population consists almost entirely of nomad Arabs and Berbers. They are Mahommedans. In the south is the hilly country called Adrar Suttuf, not to be confounded with Adrar Temur (see ADRAR and SAHARA). The estimated area of the protectorate is 70,000 sq. m.

The peninsula of Rio de Oro, where is the principal Spanish settlement, occupies the central part of the coast-line in 23° 50′ N., 16° W., and is united to the mainland by a sandy isthmus. Its length is 23 m., its breadth $1\frac{1}{4}$ to 2 m. and it is on an average about 20 ft. above sea-level. The bay between peninsula and mainland—the so-called Rio de Oro—is 22 m. long, 5 broad, navigable over two-thirds of its extent, with good anchorage in most of the channel, but the bar at its mouth is not always easy to pass in rough weather. The peninsula has very sparse vegetation, except in its southernmost part near Cape Durnford. At the head of the bay is a small island—Isla Herne.

The climate is generally temperate, and not unhealthy except in the autumn. Esparto grass and manzanilla are grown in many places, but European plants are not easily acclimatized. On the peninsula and in the neighbouring country there are many wolves, foxes, hyenas, gazelles, lizards, hares, pelicans and large crows. The natives rear cattle, sheep, camels, and have but few horses. In contrast with the sterility of the land the sea throughout the coast of Rio de Oro abounds in fish, especially cod. The fishing industry is in the hands of the Canary Islanders and of the French.

The estuary between the mainland and the peninsula was taken by its Portuguese discoverers in the middle of the 15th century for a river, and, obtaining there a quantity of gold dust from the natives, they named it Rio d'Ouro (Gold River), Rio de Oro being the Spanish form. At a spot about 50 m. inland from the head of the estuary a Portuguese trading station was established, of which ruins exist, but the activity of the Portuguese was before long transferred to the true auriferous regions of the Gulf of Guinea.

Spain's interest in the Saharan coast dates from the 13th century, but was particularly directed to that part nearest the Canary Islands, a strip of coast over which she now exercises no sovereignty. The site of the fort of Santa Cruz de Mar Pequeña, established in 1476, though not identified, was north of Cape Bojador. The protection of the Canary Islanders engaged in the fisheries south of that point occasioned, however, the presence of Spanish warships in these waters, and small trading stations were formed at Rio de Oro, Cape Blanco and elsewhere. To preserve the interests thus acquired, Spain in January 1885 took the territories on the coast between capes Blanco and Bojador under her protection. The year before the Hispano-American Company had built a trading station on Rio de Oro peninsula, but in 1885 it was destroyed by the natives. The company renewed its operations, but subsequently ceded its rights to the Transatlantic Company of Barcelona. The extension inland of Spanish influence was opposed by France, which claimed a protectorate over the Sahara. The conflicting claims of the two powers were finally settled by the convention of 1900, which fixed the frontier in the manner stated. The administration is carried on under the control of the captain-general of the Canary Islands.

RIO GRANDE, a North American river, which rises in the San Juan Mountains of southern Colorado, flows S.E. and S. in Colorado, S. by W. and S.E. through New Mexico, and S.E. between Texas and Mexico to the Gulf of Mexico. Its length is approximately 2200 m., and for about 1300 m. it forms the international boundary between the United States and Mexico. It presents many features of a complex physiographic type, being first a river of the Rocky Mountains, then of the interior deserts and then of the Atlantic Coastal Plain. It also presents a complicated geological history, as it includes what were originally several distinct streams. The Mexicans call it the Rio del Norte in its upper course, the Rio Bravo in the "Big Bend," from the mouth of the Conchas river to the mouth of the Devils river, and the Rio Grande only in its course through the Coastal Plain. From its headwaters, 12,000 ft. above the sea, it rushes rapidly down a mountain canyon to San Luis Valley, in Colorado. It flows with moderate speed through this broad valley, enters a long canyon with a maximum depth of 400 ft., about 4 m. above the boundary between Colorado and New Mexico, and is hemmed in between canyon walls rising as high as 1000 ft. or between the sides of narrow mountain valleys throughout its course through New Mexico. It passes through a series of picturesque canyons, some of them 1750 ft. in depth, in the "Big Bend," and becomes a silt-laden stream with a shifting channel in its passage through the Coastal Plain. Except in the flood season of May and June, the quantity of water which, for irrigation and by evaporation, is taken from the Rio Grande between its entrance to the San Luis Valley and the mouth of the Conchas, is greater than that received, and as a consequence it is an intermittent stream in this region. The flow of the Conchas is constant, and in the "Big Bend" the volume of the Rio Grande is enhanced by springs which break out in the bed. The total flow of the Rio Grande is ten times greater in some years than in others, and when its waters have been highest there have been great floods in its lower course and so much shifting of its banks as to cause international complications. Even in its course through the Coastal Plain its channel is so much obstructed by sand bars that it is of little importance for navigation. As the increasing diversion of the water of the Upper Rio Grande for irrigation in Colorado and New Mexico resulted in a scarcity of water for this purpose in Mexico, that country complained, and to remedy the evil the Reclamation Service of the United States proposed the construction by the United States of a storage dam across the river near Engle, New Mexico, which would form a storage reservoir having a capacity of 2,000,000 acre-feet and from which Mexico should be furnished with 60,000 acre-feet of water annually. Mexico agreed to this proposal and a treaty covering the matter was proclaimed in January 1907. The principal towns and cities on the river are: Brownsville, Texas; Matamoros, Mexico; Laredo, Texas; El Paso, Texas; and Ciudad Juarez, Mexico.

RIO GRANDE DO SUL, a southern frontier state of Brazil, bounded N. by the state of Santa Catharina, E. by the Atlantic, S. by Uruguay and W. by Uruguay and Argentina—the Uruguay river forming the boundary line with the latter. Area, 91,333 sq. m. Pop. (1900) 1,149,070, an increase of 251,615 since 1890. The northern part of the state lies on the southern slopes of the elevated plateau extending southward from São Paulo across the states of Paraná and Santa Catharina, and is much broken by low mountain ranges whose general direction across the trend of the slope gives them the appearance of escarpments. A range of low mountains extends southward from the Serra do Mar of Santa Catharina and crosses the state into Uruguay. West of this range is a vast grassy plain devoted principally to stock-raising—the northern and most elevated part being suitable in pasturage and climate for sheep, and the southern for cattle. East of it is a wide coastal zone only slightly elevated above the sea; within it are two great tide-water lakes—Lagôa dos Patos and Lagôa Mirim—which are separated from the ocean by two sandy, partially barren peninsulas. The coast is one great sand beach, broken only at one point—that of the outlet of the two lakes, called the Rio Grande, which affords an entrance to navigable inland waters and several ports. There are two distinct river systems in Rio Grande do Sul—that of the eastern slope draining to the tide-water lakes, and that of the La Plata basin draining westward to the Uruguay. Fully one-third of the state belongs to the La Plata drainage basin. The larger rivers of the eastern group are the Jacuhy, Sinos, Cahy, Gravatahy and Camaquam, which flow into the Lagôa dos Patos, and the Jaguarão which flows into the Lagôa Mirim. All of the first named, except the Camaquam, discharge into one of the two arms or estuaries opening into the northern end of Lagôa dos Patos, which is called the Rio Guahyba, though in reality it is not a river. It is broad, comparatively deep and about 35 m. long, and with the rivers discharging into it affords upwards of 200 m. of fluvial navigation. The Jacuhy is one of the most important rivers of the state, rising in the ranges of the Coxilha (Cuchilla) Grande of the North and flowing S. and S.E. to the Guahyba estuary, with a course of nearly 300 m. It has two large tributaries—the Vaccacahy from the S. and the Taquary from the N.—besides many small streams. The Jaguarão, which forms part of the boundary line with Uruguay, is navigable 26 m., up to and beyond the town of Jaguarão. Of the many streams flowing northward and westward to the Uruguay, the largest are the Ijuhy-guassú, of the plateau region, the Ibicuhy, which has its source in the central part of the state, near Santa Maria, and flows westward to the Uruguay a short distance above Uruguayana and the Quarahim, or Quarahy, which forms part of the boundary line with Uruguay. The Uruguay river itself is formed by the confluence of the Rio das Canôas and Rio Pelotas in about long. 51° 30′ W. With its southern confluent, the Rio Pelotas, which has its source in the Serra do Mar, on the Atlantic coast, it forms the northern and western boundary line of the state down to the mouth of the Quarahim, on the Uruguayan frontier. In addition to the Lagôa dos Patos and Lagôa Mirim there are a number of small lakes on the sandy, swampy peninsulas that lie between the coast and these two, and there are others of a similar character along the northern coast. The largest lake is the Lagôa dos Patos (Lake of the Patos—an Indian tribe inhabiting its shores at the time of the discovery), which lies parallel with the coast-line, N.E. and S.W., and is about 133 m. long exclusive of the two arms at its northern end, 25 and 35 m. long respectively, and of its outlet, the Rio Grande, about 24 m. long. Its width varies from 22 to 36 m. The lake is comparatively shallow and filled with sand banks, making its navigable channels tortuous and difficult. The Lagôa Mirim occupies a similar position farther S., on the Uruguayan frontier, and is about 108 m. long by 6 to 22 m. wide. It is more irregular in outline and discharges into Lagôa dos Patos through a navigable channel known as the Rio São Gonçalo. A part of the lake lies in Uruguayan territory, but its navigation, as determined by treaty, belongs exclusively to Brazil. Both of these lakes are evidently the remains of an ancient depression in the coast-line shut in by sand beaches built up by the combined action of wind and current. They are of the same level as the ocean, but their waters are affected by the tides and are brackish only a short distance above the Rio Grande outlet.

Rio Grande lies within the South Temperate zone and has a mild, temperate climate, except in the coastal zone where it is semi-tropical. There are only two well-marked seasons, though the transition periods between them (about two months each) are sometimes described as spring and autumn. The winter months, June to September, are characterized by heavy rains and by cold westerly winds, called *minuanos*, which sometimes lower the temperature to the freezing point, especially in the mountainous districts. Snow is unknown, but ice frequently forms on inland waters during cold winter nights, only to disappear with the first rays of the sun. In summer, which is nominally a dry season, light rains are common, northerly and easterly winds prevail, and the temperature rises to 95° in the shade. Cases of insolation are not rare. Malaria is unusual and the state has a high reputation for healthiness, though insanitary conditions are responsible for various diseases in large communities.

The principal industry of the state is stock-raising, especially on the southern plains, where large *estancias* (ranches) are to be found. This industry originated with the Jesuit missions on the Uruguay early in the 17th century, and its development here has been much the same as in Argentina and Uruguay. No general effort was made before the 20th century to improve the herds by the importation of better breeds, and the industry was practically in a state of decay until higher tariff rates were imposed on imported *carne secca* (jerked beef) toward the end of the 19th century. The export of live-stock is insignificant, the practice being to sell the cattle to the *xarqueadas* or *saladeros* where they are slaughtered for *xarque*, *charqui* or *carne secca*, which is usually prepared by salting and drying in the sun. The jerked beef is largely exported to other Brazilian states for consumption, while the hides and other by-products are exported to Europe and the United States. The importance of the industry is shown in the exports of 1905, in kilogrammes, viz.: jerked beef, 37,555,951; dry hides, 4,735,987; salted hides, 12,141,779; beef extract, 16,712; ox-tongues, 498,577; tallow, 6,174,189; and large quantities of leather, horns, hoofs, bone-ash and preserved meats. Horses, mules, sheep, goats and swine are also raised; the raising of sheep being fostered by the building of woollen factories, and that of swine by the higher duties on imported pork and lard. In some parts of the state agriculture claims much attention, especially in the forested districts of the north where colonies of foreign immigrants have been established. The principal products are wheat, Indian corn, rice, beans, pease, onions, garlic, *farinha de mandioca* (cassava flour), potatoes, tomatoes, cabbage, fruit, tobacco and peanuts—all of which find a ready market on the coast. Grapes are grown in several localities (São Leopoldo, Alegrete, Bagé, &c.) for wine-making, and the industry has become important—the export in 1905 being 2,092,417 litres. The forest products include *herva matte* or Paraguay tea (*Ilex paraguayensis*), timbers and lumber, and vegetable fibre (*crina vegetal*). Coal of an inferior quality is mined at São Jeronymo, on a small tributary (Arroio dos Ratos) of the Jacuhy river, and has been discovered in other localities. Lime is burned at Caçapava, and at some other places. Gold, copper and iron are said to exist, but are not mined. Considerable progress has been made in manufacturing industries, among whose products are: woollen, cotton and jute textiles, leather, wheat, flour, boots, shoes and sandals (*tamnacos*), wines and liquors, beer, macaroni, biscuits and other prepared foods, cigars and cigarettes, hats, matches, soap, candles and wrapping paper. Much of this diversity in production is due to the foreign element in the population.

The railway lines in the state are: the Porto Alegre to Novo Hamburgo (27 m.), with an extension to Taquary (28 m.); Porto Alegre to Uruguayana, completed from Margem do Taquary (Bank of the Taquary) to Cacequy (232 m.); Santa Maria to Passo Fundo (221 m.); Rio Grande to Bagé (175 m.), with 14 m. in branches at Rio Grande; an extension from Cacequy to Bagé (129 m.); and the Quarahim to Itaquy (109 m.). All these except the last have been taken over by the national government and leased to the Belgian "Compagnie auxiliare de Chemin de Fer au Brésil," which has undertaken to complete the line from Cacequy to Uruguayana (161 m.), from Margem do Taquary to Neustadt, on the Novo Hamburgo line (60 m.), and some other branches. The Quarahim to Itaquy line belongs to an English company and runs from the Uruguayan frontier, where it connects with the North-Western of Uruguay, northward to Uruguayana and the naval station of Itaquy.

The population in 1900 was 1,149,070. There is a large foreign element: in 1905 the total number of foreigners residing in the state was estimated at 400,000 (not including children born in the country), and of Germans at 250,000. The first German colony was founded in 1824 and settled in 1825 in the rich forested country N. of Porto Alegre, and many large and prosperous communities have been established since then in spite of the wars and political agitations in the state. Several of these colonies, such as São Leopoldo, Novo Hamburgo and Conde d'Eu (now Garibaldi), have become important towns and are no longer under colonial administration. Italian colonies were subsequently established, also with good results, but an Irish colony founded at Monte Bonito, near Pelotas, about 1851, failed completely. The capital of Rio Grande do Sul is Porto Alegre at the northern extremity of Lagôa dos Patos, and its two next most important cities are Rio Grande and Pelotas, both at the southern extremity of the same lake. Among other important cities and towns, with population returns for 1900, are Alegrete (11,438), prettily situated in the W. part of the state on the Porto Alegre to Uruguayana railway; Bagé (13,463), about 173 m. by rail N.W. of Rio Grande in a picturesque mountainous region, 702 ft. above sea-level; Jaguarão (9000), on a river of the same name and opposite the Uruguayan town of Artigas, with steamboat communication with Rio Grande; Caçapava (8781 in 1890) in a fine grazing district in the central part of the state, 1732 ft. above sea-level; Quarahim, or Quarahy (about 6500), a town of much commercial importance on the Quarahim river opposite the Uruguayan town of Santo Eugenio, and surrounded by a rich grazing country which supports one of the largest *saladeros* in the state; São Leopoldo; Santa Maria da Bocca do Monte; and Uruguayana.

The territory was first settled along the Uruguay river by the Jesuits when they were compelled to abandon their missions on the upper Paraná. Between 1632 and 1707, they founded on the E. side of the Uruguay seven missions—all under Spanish jurisdiction—which became highly prosperous, and at the time of their transfer from Spanish to Portuguese rule by a treaty of 1750 had an aggregate population of about 14,000, living in villages and possessing large herds of cattle and many horses. A joint effort of the two powers in 1753 to enforce the treaty, remove the Indians to Spanish territory, and mark the boundary line, led to resistance and a three years' war, which ended in the capture and partial destruction of the missions. On the coast the first recognized settlement—a military post at Estreito, near the present city of Rio Grande—was made in 1737. Before this, and as early as 1680, according to some chroniclers, the region S. of Santa Catharina was occupied by settlements, or penal colonies, of *degradados* (banished men) and immoral women from Santos, São Vicente and São Paulo, and was known as the "Continente de São Pedro." In 1738 the territory (which included the present state of Santa Catharina) became the Capitania d'El Rei and was made a dependency of Rio de Janeiro. Territorial disputes between Spain and Portugal led to the occupation by the Spanish of the town of Rio Grande (then the capital of the *capitania*) and neighbouring districts from 1763 to 1776, when they reverted to the Portuguese. The capture of Rio Grande in 1763 caused the removal of the seat of government to Viamão at the head of Lagôa dos Patos; in 1773 Porto dos Cazaes, renamed Porto Alegre, became the capital. In 1801 news of war between Spain and Portugal led the inhabitants of Rio Grande to attack and capture the seven missions and some frontier posts held by the Spaniards since 1763; since 1801 the boundary lines established by treaty in 1777 have remained unchanged. The districts of Santa Catharina and Rio Grande had been separated in 1760 for military convenience, and in 1807 the latter was elevated to the category of a *capitania-geral*, with the designation of "São Pedro do Rio Grande," independent of Rio de Janeiro, and with Santa Catharina as a dependency. In 1812 Rio Grande and Santa Catharina were organized into two distinct *comarcas*, the latter becoming an independent province in 1822 when the empire was organized. In 1835 a separatist revolution broke out in the province and lasted ten years. It was reduced more through the use of money and favours than by force of arms; but the province had suffered terribly in the struggle and did not recover its losses for many years. An incident in this contest was the enlistment of Garibaldi for a short time with the forces of the separatists. In 1865 a Paraguayan army invaded the state and on the 5th of August occupied the town of Uruguayana. On the 18th of September following, the Paraguayan general (Estigarribia) surrendered without a fight—an unusual occurrence in the remarkable war that followed. Political agitations have been frequent in Rio Grande do Sul, whose people have something of the temperament of their Spanish neighbours, but no important revolution occurred after the "ten years' war" (1835–45) until the presidency at Rio de Janeiro of General Floriano Peixoto, whose ill-considered interference with the state governments led to the revolt of 1892–94, under Gumersindo Saraiva. In this struggle the revolutionists occupied Santa Catharina and Paraná, capturing Curityba, but were eventually overthrown through their inability to obtain munitions of war. An incident in this struggle was the death of Admiral Saldanha da Gama, one of the most brilliant officers of the Brazilian navy and one of the chiefs of the naval revolt of 1893–94, who was killed in a skirmish on the Uruguayan frontier at the close of the war.

RIO GRANDE DO SUL, or São Pedro do Rio Grande do Sul (sometimes São Pedro and commonly Rio Grande), a city and port of the state of Rio Grande do Sul, Brazil, on the western side of the Rio Grande (as the outlet of the Lagôa dos Patos is called), about 6 m. from its mouth and nearly 780 m. S.W. of Rio de Janeiro, in lat. 32° 7′ S., long. 52° 8′ W. Pop. (1890) of the municipio (area, about 656 sq. m.) 24,653; of the city, including its suburbs, 20,193; (1900, estimate) of the city, 22,000, and of the city and its suburbs, 30,000. Rio Grande is the coast terminus of the Rio Grande to Bagé railway, which now forms part of the railway system of the state leased to the Belgian Compagnie Auxiliare de Chemin de Fer au Brésil. Some of the principal streets are served by tramways, and the Rio Grande to Bagé railway has an extension to its shipping wharf called "Estação Maritima" (1½ m.), a branch to some points on the river (1½ m.), and a branch to Costa do Mar, on the ocean coast (11 m.). The city is a port of call for several steamship lines, and has direct communication with European ports. The bar at the mouth of the river, however, restricts traffic to vessels of light draught, not exceeding 12 to 15 ft. Extensive improvements, at an estimated cost of about 13½ millions of dollars, were undertaken in 1908 for deepening the bar to admit vessels of 30 ft. draught.

The city is built on a low sandy peninsula, barely 5 ft. above sea-level, formed by two arms of the Rio Grande projecting westward from the main channel, the peninsula being part of a large sandy plain extending southward along the coast to Lagôa Mirim. The level of the plain is broken by ranges of sand dunes, some of which rise not far from the city on the south and south-east. The openness of the surrounding country and the proximity of the sea give to Rio Grande unusually healthy conditions, which, however, are largely counteracted by defective sanitary arrangements. Not infrequently the deaths exceed the births, and epidemics of contagious diseases make deadly inroads upon the population. The city has been developed irregularly, but the streets are for the most part broad, and the principal ones are well paved. Gas lighting was introduced about 1871, and in 1908 acetylene was used for public lighting. In one of the public squares is a shaft commemorating the abolition of slavery, and said to be the only monument in Brazil of that character. There is a notable scarcity of shade trees in the streets and squares, though flowers, shrubbery and some kinds of fruit trees are grown. In pleasing contrast to the drifting sands which surround the city is the fertile Ilha dos Marinheiros (Sailor's Island) lying directly in front of the port; it is highly cultivated and supplies the market with fruit and vegetables. The water-front has been improved by substantial stone walls, which permit the mooring of light-draught vessels alongside.

Among noteworthy public buildings and institutions are the municipal palace, the parochial church of São Pedro, dating from the 18th century, the modern church of N.S. de Bomfim, the beautiful Protestant Episcopal church (Gothic), the public hospital (Hospital de Caridade), the hospital of the Beneficencia Portugueza, the public library (Bibliotheca Riograndense), created and maintained by private effort and containing about 30,000 volumes, the old custom-house and the *quartel-geral* (military barracks). Rio Grande is wholly a commercial and industrial city. Its exports include salted jerked beef (*carne secca*, or *xarque*), preserved meats, tongues, hides, horns, hoofs, woollen fabrics, Paraguay tea, beans, onions, fruit, flour, *farinha de mandioca* (cassava flour), lard, soap, candles and leather. Its manufactures include cotton, woollen and jute fabrics, wheat flour, biscuits, cigars and cut tobacco, beer, artificial drinks, boots, shoes and sandals (*alpergatas*), soap and candles, fireworks, ice, earthenware, hats, cast-iron and leather. The pioneer woollen factory in Brazil, and one of the largest in the country, is in Rio Grande.

Rio Grande was founded in 1737 by José da Silva Paes, who built a fort on the river near the site of the present city and called it Estreito. In 1745 the garrison and settlement was removed by Gomes Freire d'Andrade to its present site, which became a "villa," in 1751, with the name of São Pedro do Rio Grande, and a "cidade" (city) in 1807. It was the capital of the captaincy down to 1763, when it was captured by a Spanish force from Buenos Aires under the command of its governor, Don Pedro Zeballos, the seat of government being then removed to Viamão at the northern end of Lagôa dos

Patos. The city was occupied by the national forces in the ten years' war which began in 1835, and in 1894 it was unsuccessfully besieged by a small insurgent force that had attempted to overthrow the government at Rio de Janeiro.

RIOJA, LA, an Andine province of Argentina, bounded N. by Catamarca, E. by Catamarca and Cordoba, S. by San Luis and San Juan and W. by San Juan and Chile. Area, 34,546 sq. m. Pop. (1895) 69,502; (1902, estimate) 82,090. The province is traversed from N. to S. by eastern ranges of the Andes and is separated from Chile by the Cordillera itself. The western part of the province is drained by the Bermejo, which flows southward into the closed lacustrine basin of Mendoza. The eastern side of the province is arid, but in the extreme N. some small streams flow northward into Catamarca. The scanty waters of these streams are used for irrigation purposes. The principal industry of the province is that of mining, its mineral resources including gold, silver, copper, nickel, tin, cobalt, coal, alum and salt. Its best known mines are those of the Sierra de Famatina, 16,400 ft. above sea-level, where an aerial wire line is used for transportation to Chilecito in the valley below. The development of mining industries is seriously hindered by lack of water. For the same reason, agriculture is in a very backward condition. The climate is hot and dry, and there is no cultivation of the soil except in the valleys of the Cordillera and a few other places where irrigation is possible. Under these conditions, there are grown wheat (a limited extent), grapes, oranges, olives and tobacco. Alfalfa is grown to a considerable extent and is used for feeding the herds of cattle driven across country to Chile. The capital of the province is La Rioja (pop., 1904, about 6000), on the eastern flank of the Sierra de Velasco, about 1770 ft. above sea-level and near the gorge of Sanagasta, through which a small stream, also called Rioja, flows northward and affords water for the gardens, vineyards and orchards that surround it. The wines of Rioja are highly esteemed and are an important source of income for the district. The town is connected by rail with Cordoba and Catamarca. It was founded in 1591 by Velasco and in 1894 was destroyed by an earthquake from which it has only partially recovered. The most important town in the province is the mining centre of Chilecito, or Villa Argentina (pop., 1904, about 4000), about 2950 ft. above sea-level near the Famatina mines.

RIOM, a town of central France, capital of an arrondissement in the department of Puy-de-Dôme, 8 m. N. by E. of Clermont-Ferrand by rail. Pop., town, 7839; commune, 10,627. Riom is situated on the left bank of the Ambène, on an eminence rising above the fertile plain of Limagne. It is surrounded with boulevards and has wide streets, but the houses, being built of black lava, have a sombre appearance. Some belong to the 15th and 16th centuries, and have turrets and carved stonework. The church of St Amable, of Romanesque and early Gothic architecture, dates from the 12th century, but has been restored in modern times. It has fine carved woodwork of the 17th century. The church of Notre-Dame du Marthuret (15th century) has a well-known statue of the Virgin at its western entrance. The Sainte-Chapelle of the 14th and 15th centuries is a relic of the palace of Jean de Berry, duke of Auvergne, and contains fine stained glass. Near it stands a statue of the chancellor Michel de l'Hôpital, who was born near Riom. The rest of the site of the palace is occupied by the law courts. Other interesting buildings are the belfry of the 16th century and a mansion of the same period known as the Maison des Consuls. The town possesses numerous fountains, some of which are of the Renaissance period.

Riom is the seat of a court of appeal, a court of assizes and a sub-prefect, and has tribunals of first instance and commerce and a communal college. It has a state manufactory of tobacco, and carries on the preparation of fruit preserves. Trade is in grain, wine, vegetables, fruit, nut-oil and Volvic stone.

Riom (*Ricomagus* or *Ricomum* of the Romans) was long the rival of Clermont. Along with Auvergne it was seized for the crown by Philip Augustus, and it was the capital of this province under the dukes of Berry and Bourbon.

RIO NEGRO, a territory of Argentina lying between the Colorado river and the 42nd parallel S. lat., within the geographical area formerly known as Patagonia, bounded N. by the territories of Neuquen and La Pampa, E. by the province of Buenos Aires and the Atlantic, S by the territory of Chubut and W. by Chile and Neuquen. Area, about 75,924 sq. m.; pop. (1895) 9241; (1904, estimate) 18,648. That part of it lying between the Colorado and Negro rivers has much of the formation and characteristics of the "sterile pampas," but with irrigation the greater part of it can be utilized for agriculture and grazing. South of the Negro the country is arid, barren and lies in great shingle-covered terraces sloping eastward to the Atlantic; its larger part is practically uninhabitable, only the river valleys and the foot-hills of the Andes having a regular water supply. The rivers of the territory are the Colorado, which forms a part of its northern boundary, and the Negro, formed by the confluence of the Limay (which forms part of the western boundary) and Neuquen on the boundary between Rio Negro territory and the territory of Neuquen. These rivers have no tributaries of importance within the territory, but the Limay receives some small streams from the Andean slopes. Lake Nahuel-Huapi lies partly in this territory (see Neuquen), and there are several small lakes scattered over the shingly steppes. The Atlantic coast-line of the territory has one deep indentation—the Gulf of San Matias—but, owing to the arid surroundings, there are no ports or towns upon it. The only industry of importance is grazing, cattle being raised for export to Chile, and a few sheep for their wool. The capital is Viedma (pop. in 1895, estimate, 1500), on the right bank of the Rio Negro, 22 m. from its mouth and opposite Carmen de Patagones, a town and port of Buenos Aires. There are other small settlements on the Rio Negro, which is navigable up to the Neuquen frontier (about 450 m.), but the only place of importance is General Roca (about 2300), a military and supply station situated a few miles below the confluence of the Limay and Neuquen rivers and connected with Bahia Blanca and Buenos Aires by a branch of the Great Southern railway.

RIO PARDO (formerly Villa do Rio Pardo), a town of Brazil in the state of Rio Grande do Sul, on the left bank of the Jacuhy at its confluence with the Pardo. Area (of the municipality) 1737 sq. m. Pop. (1890) of the municipality, 19,346; (1908, estimated) of the town, 3500. The town is about 80 m. due west of Porto Alegre, with which it is connected by rail and steamer. The Jacuhy is navigable by small steamers to this place, which was once an important military station and commercial centre. Its military importance has considerably declined through railway extension. The surrounding districts are fertile but only slightly cultivated, and stock-raising is its chief industry. The town had its origin in a frontier fort built at this point by the Portuguese in 1751, but did not reach the dignity of a "villa" until 1809.

RIOT (O. Fr. *riote*, of uncertain etymology), the gravest kind of breach of the peace, short of treason, known to the English law. It consists in a tumultuous disturbance of the peace by an assemblage of three or more persons who, with intent to help one another against any one who opposes them in the execution of some enterprise, actually execute that enterprise in a violent and turbulent manner, to the terror of the people. It is not necessary that violence should be used to any person or damage done to any property. Whether the enterprise itself is lawful or unlawful is not material, the gist of the offence lying in the mode in which the enterprise is carried out (*The Trafalgar Square Riots*, 1888, 16 Cox. Cr. Cas. 420, 427; Stephen, *Dig. Crim. Law*, 6th ed., art. 77). Nor is it material whether the enterprise is of a private or a public nature, though in the latter case the rioters may also be guilty of sedition or treason. An assembly in its inception perfectly lawful may become a riot if the persons assembled proceed to form and execute a common purpose in the manner above stated, although they had no such purpose when they first assembled. Riot differs from "Affray" in the number of persons necessary to constitute the offence, from an "Unlawful Assembly" in that actual tumult or violence is an essential element, and from "Rout," which may be described as a beginning or endeavour to create a riot. It was considered as early as the 14th century that the English common law gave an insufficient remedy against riot. In 1360 the statute of 34 Edward III. gave jurisdiction to justices to restrain, arrest and imprison rioters. In 1393 the statute of 17 Richard II. conferred similar powers on the sheriff and *posse comitatus*. Numerous other acts extending the common law were passed, especially in the Tudor reigns (see Stephen, *History of the Criminal Law*, vol. i. p. 202). Both these acts above mentioned are still on the statute book, but the earliest act now in force of real importance as to this offence is the Riot Act (1716), which creates certain statutory offences for riot attended by circumstances of aggravation. That act makes it the duty of a justice, sheriff, mayor or other authority, wherever twelve persons or more are unlawfully, riotously and tumultuously assembled together, to the disturbance of the public peace, to resort to the place of such assembly and read the following proclamation: "Our Sovereign Lord the King chargeth and commandeth all persons being assembled immediately to disperse themselves, and peaceably to depart to their habitations or to their lawful business, upon the pains contained in the act made in the first year of King George for preventing tumultuous and riotous assemblies. God save the King." It is a felony to obstruct the reading of the proclamation or to remain or continue together unlawfully, riotously and tumultuously for one hour after the proclamation was made or for one hour after it would have been made but for being hindered. The act requires the justices to seize and apprehend all persons continuing after the hour, and indemnifies them and those who act under their authority from liability for injuries caused thereby. The punishment for the felony is penal servitude for life or for a term of not less than three years, or imprisonment with or without hard labour for not more than two years. Prosecutions for an offence against the act must be commenced within twelve months after the offence.

By s. 11 of the Malicious Damage Act 1861 (which is a re-enactment of a similar provision made in 1827 in consequence of the frame-breaking riots), it is a felony for persons riotously and tumultuously assembled together to the disturbance of the public peace to unlawfully and with force demolish or begin to demolish or pull down or destroy any building, public building, machinery or mining plant. The punishment is the same as for a felony under the Riot Act. By s. 12 it is a misdemeanour to injure or damage such building, &c. The punishment is penal servitude from three to seven years, or imprisonment as in the case of the two felonies above described. Under the Shipping Offences Act (1793) a riotous assemblage of three or more seamen, ship's carpenters and other persons, unlawfully and with force preventing and hindering or obstructing the loading or unloading or the sailing or navigation of any vessel, or unlawfully and with force boarding any vessel with intent to prevent, &c., is punishable on a first conviction as a misdemeanour by imprisonment from six to twelve months, and on a second conviction as a felony by penal servitude from three to fourteen years. And under the Offences against the Person Act 1861 (s. 40) summary penalties are provided for forcible interference with seamen in the exercise of their lawful occupation.

Besides these enactments there are others aimed at similar offences, such as smuggling, forcible entry and detainer, tumultuous petitioning (1661, 13 Charles II.), holding large political meetings within a certain distance of Westminster Hall during the sitting of parliament (Seditious Meetings Act 1817). For these offences see Stephen, *Dig. Cr. Law*, 6th ed., arts. 81–87.

It is the duty of a magistrate at the time of a riot to assemble subjects of the realm, whether civil or military, for the purpose of quelling the riot. In this duty he is aided by the common law, and a statute of 1414 (Henry V.), under which all subjects of the realm are bound to assist on reasonable warning, and by various enactments enabling the authorities to call out the militia, yeomanry and reserve forces for the suppression of riot, and to close public-houses where a riot is apprehended (Licensing Act 1872). It is his duty to keep the peace; if the peace be broken, honesty of intention will not avail him if he has been guilty of neglect of duty. The question is whether he did all that he knew was in his power and which could be expected from a man of ordinary prudence, firmness and activity. The law as thus stated is gathered from the opinions of the judges on the trials of the lord mayor of London and the mayor of Bristol on indictments for neglect of duty at the time of the Gordon riots of 1780 and the Bristol riots in 1831.[1] In addition to his liability to an indictment at common law, a defaulting magistrate is subject under the provisions of acts of 1411 (Henry IV.) and 1414 (Henry V.) to a penalty of £100 for every default, the default to be inquired of by commission under the great seal. A matter of interest is the extent of the protection afforded by the Riot Act to soldiers acting under the commands of their officers. The question was dealt with by Lord Bowen and his fellow-commissioners in the report on the Featherstone riots (Parl. Paper, 1893–1894, c. 7234). The substance of their views is as follows:—

By the law of England every one is bound to aid in the suppression of riotous assemblages. The degree of force, however, which may be lawfully employed in their suppression depends on the nature of each riot, for the force used must always be moderated and proportioned to the circumstances of the case and to the end to be attained. The taking of life can only be justified by the necessity for protecting persons or property against various forms of violent crime, or by the necessity of dispersing a riotous crowd which is dangerous unless dispersed, or in the case of persons whose conduct has become felonious through disobedience to the provisions of the Riot Act, and who resist the attempt to disperse or apprehend them. The necessary prevention of such outrage on person or property justifies the guardians of the peace in the employment against a crowd of even deadly weapons. Officers and soldiers are under no special privileges and subject to no special responsibilities as regards the principle of the law. A soldier for the purpose of establishing civil order is only a citizen armed in a particular manner. He cannot because he is a soldier be exonerated if without necessity he takes human life. The duty of magistrates and peace officers to summon or abstain from summoning the assistance of the military depends in like manner on the necessities of the case. A soldier can act only by using his arms. The weapons he carries are deadly. They cannot be employed at all without danger to life or limb, and in these days of improved rifles and perfected ammunition without some risk of danger to distant and possibly innocent bystanders. To call for assistance against rioters from those who can interfere only under such grave conditions ought, of course, to be the last expedient of the civil authorities. But when the call for help is made and a necessity for assistance from the military has arisen, to refuse such assistance is in law a misdemeanour. The whole action of the military when once called in ought from first to last to be based on the principle of doing, and doing without fear, that which is absolutely necessary to prevent serious crime, and of exercising care and skill with regard to what is done. No set of rules exists which governs every instance or defines beforehand any contingency that may arise. The presence of a magistrate is not essential, but is usual, and of the highest value to aid the commander of the troops by local knowledge. But his presence or absence has no legal effect on the duties or responsibilities of the military to use their arms when it becomes necessary to do so, and without recklessness or negligence and with reasonable care and caution; and where they have so acted the killing of a rioter is justifiable homicide, and the killing of an innocent bystander is homicide by misadventure. It is not usual to resort to extremities with rioters until after reading the proclamation under the Riot Act (1716), but this preliminary is by no means a condition precedent to the exercise of the common-law powers of suppressing riots.

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[1] Reports of these trials will be found in the State Trials, New Series, vol. iii. pp. 1, 11. Most of the important cases of riot are collected or referred to in that series.

The crown cannot charge upon the local rates the expense of maintaining soldiers called into a district by the magistrates to suppress a riot (*re* Glamorgan County Council, L.R. 1899, 2 Q.B. 536); but the cost of extra police drafted in for the like purpose falls on the rates of the district into which they are drafted (see Police Act 1890, s. 25). Until 1886 persons whose property was damaged by riot had a civil remedy of an exceptional character by action against the hundred in which the riot took place. This remedy was a survival of the pre-Conquest liability of the hundred to guarantee the orderly conduct of its inhabitants. The hundred was made liable in case of robbery by the Statute of Winchester (1285).[1] That and subsequent acts were repealed in the reign of George IV., and their provisions were consolidated by an act of 1827 which gave a remedy against the hundred in the case of felonious demolition of churches, chapels, houses, machinery, &c., being feloniously demolished by rioters. The last instance of the use of this exceptional remedy was in the case of a riot at Worthing, and the remedy was abolished in 1886. When the Piccadilly riots occurred in that year no one knew that the injured shops were in the hundred of Ossulston, and difficulties arose in applying the old procedure. So an *ex post facto* statute was passed (the Metropolitan Police Compensation Act 1886) for a special settlement of the claims, and the old statutes were repealed and replaced by the Riot Damage Act 1886. Under this act compensation is payable where rioters have injured or destroyed houses, shops, buildings, fixed or movable machinery and appliances prepared or used for or in connexion with manufactures or agriculture, or for mines or quarries, or vessels stranded or in distress (see WRECK), or have injured, stolen, or destroyed property in houses, shops or buildings. The compensation is payable out of the police rate for the district in which the damage is done; or if it was done afloat, for the district nearest to the scene of action. The claim is made on the police authority for the district. The time and form for making claims and the mode of fixing the amount of compensation is regulated by rules made by the Home Secretary on the 30th of June 1894 (Stat. R. and O. 1894, No. 636). In adjusting the amount regard is had to the conduct of the claimant, viz. as to precautions taken by him, his share, if any, in the riot, or provocation offered to the rioters. Failure to carry out a programme for athletic sports has been held to debar a claimant from compensation for damage done by a riot among the disappointed spectators who had paid to see the sports. The claimant must give credit for insurance money, or any other compensation received in respect of the damage; but the insurers or persons who paid such compensation may file a claim against the police rate for the amount paid by them. Persons dissatisfied with the award of the police authority may sue for the recovery of their claim subject to a liability to pay all the costs if they do not get judgment for more than the amount awarded. The action, if it is not for more than £100, is to be brought in the county court. The remedy is available in the case of stranded ships plundered by rioters (s. 515 of the Merchant Shipping Act 1894).

The Riot Act does not extend to Ireland, but similar provisions are contained in an act of the Irish Parliament passed in 1787 as amended by acts of 1831 and 1842. These acts create a special offence punishable by penal servitude for life, viz. sending notices, letters or messages inciting or tending to riot. Under the Criminal Procedure Ireland Act 1887 (a temporary act) summary proceedings may be taken against rioters. The civil remedy against the county or borough for malicious injury to property, real or personal, including ships in distress and their cargo, is wider than in England or Scotland, but it includes malicious injury by rioters where the injury is a crime within the Malicious Damage Act of 1861. Claims are now dealt with in the county court, and not as formerly by the grand jury and judge of assize (Local Government Ireland Act 1898, s. 5).

In Scotland a riot may be either "rioting and mobbing" or "rioting and breach of the peace." The first is much the same as riot in English law. Mobbing consists in the assembling of a number of people and then combining against order or peace to the alarm of the lieges (Alison, *Cr. Law of Scotland*, vol. i. p. 509; Macdonald, *Criminal Law*, 180). The second offence occurs when concourse or a common purpose are wanting. Numerous acts against rioting and unlawful convocation were passed by the Scottish parliament, beginning in 1487. The Riot Act (1716) applies to Scotland. There is a civil remedy against the county or burgh in which a riot takes place in respect of damage done by the rioters to houses, churches, buildings and ships, and buildings or engines used in trade or manufacture. The remedy is given by a series of statutes of 1716, 1812, 1816, 1817 and 1894. The procedure for its enforcement is now regulated by the Riotous Assemblies (Scotland) Act 1822, and amending statutes. The county or burgh authorities may adjust claims without litigation, and pay them out of the general assessments.

British Dominions.—In India the offence of riot, as defined by s. 146 of the Penal Code, consists in the use of force or violence by an unlawful assembly (which must consist of at least five persons, s. 141), or by any member thereof in the prosecution of the common object of such assembly (see Mayne, *Ind. Criminal Law*, ed. 1896, p. 489). In Ceylon and the Straits Settlements provisions based on the Indian Code are in force. In most of the settled Colonies the English law as to riot applies subject to local legislation. The Criminal Codes of Canada (1892, ss. 79–86), New Zealand (1893, ss. 83–89) and Queensland (1899, ss. 61–67) adopt the substance of the English law as to riot, in terms borrowed from the English draft Code of 1880. In those of the West Indies whose common law is based on that of France, Holland or Spain, the English law as to riot has been applied by ordinance, *e.g.* in British Guiana (Criminal Code 1893, tit. xix), and St Lucia (Criminal Code 1888, tit. xxv). In the South African colonies the English law of riot does not apply, but under the Dutch Roman law there exists a similar offence, known as "public violence" (*vis publica*), *i.e.* the use of violence and force by which the public rest and order is endangered and the authority of the lawful authorities and officials is set at naught. The offence was capital (see Van Leeuwen, *Roman-Dutch Law*, tr. by Kotze, 1886, vol. ii. p. 294; Morice, *English and Roman-Dutch Law*, 1903, p. 334). Similar provisions based on the French Penal Code are in force in Mauritius (Penal Code of 1838).

United States.—In the United States the law is based upon that of England (see Bishop, *Amer. Cr. L.*, 8th ed., 1892, vol. i. s. 534, vol. ii. ss. 1143 et seq.). In some states there is a statutory proclamation for the dispersion of rioters in terms almost identical with those of the British Riot Act. The city, town, or county is by the statutes of many states rendered liable for damage caused by rioters, with or without a remedy over against the persons who did the damage (see revised Laws of Massachusetts, ed. 1902, chap. 211, sects. 2, 8).

RIO TINTO (MINAS DE RIO TINTO), a mining town of south-western Spain, in the province of Huelva; near the source of the river Tinto, and at the terminus of a light railway from the port of Huelva. Pop. (1900) 11,603. Rio Tinto is one of the greatest copper-mining centres in the world; and it is from the discoloration of its waters by copper ore that the river derives its name. Besides the town of Minas, several villages are peopled by the native miners, whose numbers exceed 10,000; and one is occupied solely by British mine officials. The surrounding country is covered for miles with heaps of slag, and has been reduced to a desert. In 1903 the output of the mines included 840,000 tons of copper ore, worth more than £500,000, besides a relatively small quantity of iron and manganese. Almost the entire product is despatched to Huelva for shipment to Great

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[1] There is a curious exception still on the Statute-book depriving persons robbed while travelling on the Lord's Day of any right to compensation from the hundred (Lord's Day Act 1677, s. 5).

Britain. Rio Tinto was probably first exploited by the Carthaginians; vestiges of later Roman workings may still be seen. After the Moorish conquest, in 711, it was neglected until 1725, when the mines were leased to a Swede named Wolters. Their modern importance dates from 1872, when a syndicate of London and Bremen capitalists purchased them from the Spanish government for nearly £4,000,000.

RIOU, EDWARD (1758?–1801), British sailor, entered the navy at an early age. In 1780 he was promoted lieutenant, and nine years later he was in command of the "Guardian" when that vessel, crowded with convicts, struck a hidden rock off the African coast. Riou, after parting with as many of his men as the boats would hold, not only successfully navigated his half-sinking ship 400 leagues to the Cape of Good Hope, but kept order amongst the panic-stricken convicts, an achievement which had few parallels in naval annals, and won Lieutenant Riou's immediate promotion. He did not long remain a commander and in 1791 he was posted. Under Sir John Jervis he was present at the operations about Martinique and Guadeloupe in 1794, and in the "Amazon" he accompanied the expedition under Sir Hyde Parker to the Baltic in 1801. His frigate led the way through the Channel at Copenhagen, and in the battle he was attached as commodore of a light squadron to Nelson's division. Through the grounding of three ships of the line, Riou and his frigates found themselves opposed to the full force of the great Trekroner battery. Early in the fight he was wounded, but refused to leave the deck, and, as he was sitting on a gun-carriage and directing his men's fire, he was cut in two by a cannon ball. Nelson, who had not known him before this expedition, had conceived a great affection for Riou, and spoke of his loss as "irreparable." Brenton, the naval historian, declared that he had all the qualities of a perfect officer. Parliament commemorated the memory of the "gallant good Riou" by a memorial in St Paul's Cathedral.

RIOUW, Rhiouw or Bintang, an archipelago of the Dutch East Indies, E. of Sumatra, and separated from the Malay Peninsula by the Straits of Singapore. With the Lingga, Karimon, Tambelan, Anambas and Natuna Islands, to the N.E., E. and S., and the territory of Indragiri in Sumatra, it forms the Dutch residency of Riouw and dependencies. The seat of government is at Tanjong Pinang, a small port of 4000 inhabitants (including 160 Europeans and about 2000 Chinese), on the S.W. coast of the chief island, Bintang or Riouw. The total area of the residency is about 17,550 sq. m., and its population (1905) 112,216, of whom considerably over a quarter are Chinese. These cultivate gambier and pepper successfully in Bintang, and there is a considerable trade in wood. Bintang has an area of about 440 sq m., and is surrounded by many rocks and small islands, making navigation dangerous. The soil is not fertile, and much of it is swampy. There is an assistant residency of Lingga, to which belongs the island of Singkep, where extensive tin-deposits are worked. Geologically the Riouw and Lingga Islands are appendages of the Malay Peninsula, not of Sumatra. Bintang is mentioned by Marco Polo under the name of *Pentam*, which is not far from the genuine Malay name *Bentān*, said to mean a half-moon. After the Portuguese conquest of Malacca (1511), the expelled Mahommedan dynasty took up its residence on Bintang, where it long fostered piracy.

RIPLEY, GEORGE (1802–1880), American critic and man of letters, was born at Greenfield, Massachusetts, on the 3rd of October 1802. He graduated first in his class at Harvard in 1823. From 1826 to 1840 he was pastor of a Unitarian church in Boston, subsequently retiring from the active ministry altogether. It was during those years that there grew up in New England that form of thought or philosophy known as Transcendentalism. Ripley was prominent, if not the leader, in all practical manifestations of the movement; and it was largely by his earnestness and practical energy that certain of its more tangible results were brought about. The first meeting of the Transcendental Club was held at his house in September 1836. He was a founder and a chief supporter of the magazine, the *Dial*, which was the organ of the school from 1841 to 1844. Most important of all, however, he was the originator of "The Brook Farm Institute of Education and Agriculture." Until the abandonment of this experiment in 1847, Ripley was its leader, cheerfully taking upon himself all kinds of tasks, teaching mathematics and philosophy in the school, milking cows and attending to other bucolic duties, and after June 1845 editing the weekly *Harbinger*, an organ of "association," which he continued to edit in New York from 1847 until it was discontinued in 1849. The failure of Brook Farm (*q.v.*) left Ripley poor and feeling keenly the defeat of his project; but the event forced him at last to devote himself to that career of literary labour in which the real success of his life was achieved. In 1849 he joined the staff of the *New York Tribune*, and in a short time became its literary editor. This position, which, through his steadiness, scholarly conservatism and freedom from caprice as a critic, soon became one of great influence, he held until his death in New York City on the 4th of July 1880.

During the greater part of the time of his connexion with the *Tribune*, Ripley was also an adviser of a prominent publishing house, an occasional contributor to the magazines, and a co-operator in several literary undertakings. The chief of these was the *American Cyclopaedia*, which as the *New American Cyclopaedia*—so named to distinguish it from Francis Lieber's *Encyclopaedia Americana*—was issued, under the editorship of Ripley and Charles A. Dana, in 1857–63, a revised edition, with the word "new" dropped from the title, being issued under the same editorship in 1873–76. He also issued, in translation, a series of *Specimens of Foreign Standard Literature* (14 vols., 1838–42). Ripley was twice married, first in 1827 to Miss Sophia Willard Dana (d. 1861), a daughter of Francis Dana and a conspicuous figure at Brook Farm; and second, in 1865, to a young German widow, Mrs Augusta Schlossberger, who survived him and subsequently married Alphonse Pinede.

A biography of Ripley (Boston, 1882), written by the Rev. O. B. Frothingham, forms one of the volumes of the "American Men of Letters" series. (E. L. B.)

RIPLEY, a market town in the Ilkeston parliamentary division of Derbyshire, England, 10 m. N. by E. of Derby, on a branch of the Midland railway. Pop. of urban district (1901) 10,111. It lies on high ground between the valleys of the Derwent and the Erewash. In the neighbourhood there are extensive collieries, and coke is largely manufactured. Besides iron foundries, blast furnaces and boiler works, the town possesses silk and cotton mills. The charter for the market was granted by Henry III. The district has a large industrial population. To the west of Ripley lies the township of Heage (pop. 2889).

RIPON, GEORGE FREDERICK SAMUEL ROBINSON, 1st Marquess of (1827–1909), British statesman, only son of the 1st earl of Ripon and his wife Lady Sarah, daughter of Robert Hobart, 4th earl of Buckinghamshire, was born in London on the 24th of October 1827. The Robinson family was descended from an eminent Hamburg merchant, William Robinson (1522–1616), who represented York in parliament in Elizabeth's reign. His great-grandson was in 1660 created a baronet. Thomas Robinson, 1st Baron Grantham (1695–1770), son of a later holder of the baronetcy, was created a peer in 1761, having been an indefatigable diplomatist plenipotentiary at the peace of Aix-la-Chapelle, and secretary of state. The 2nd Baron Grantham (1738–1786), ambassador at Madrid, and foreign secretary under Lord Shelburne, had two sons. The elder of these, succeeding as 3rd Baron Grantham (1781–1859), became in 1833 2nd Earl de Grey, in right of his maternal aunt, and assumed the surname of de Grey; he was lord-lieutenant of Ireland (1841–44). The younger, Frederick John (1782–1859), created Viscount Goderich in 1827 and earl of Ripon in 1833, was the well-known "Prosperity Robinson" who was chancellor of the exchequer from 1823 to 1827; as Lord Goderich he became prime minister (and a peculiarly weak one) from August 1827 to January 1828, colonial secretary in 1831 and 1832, lord privy seal (1833–34), president of the Board of Trade (1841–43), and president of the India board (1843–46).

His son, the future marquess, began his political life as *attaché* to a special mission to Brussels in 1849. In 1851 he married Henrietta Vyner (d. 1907), and their eldest son, afterwards known as Earl de Grey, was born in 1852. Under his courtesy title of Viscount Goderich he was returned to the House of Commons for Hull in 1852 as an advanced Liberal. In 1853 he was elected for Huddersfield, and in 1857 for the West Riding of Yorkshire. In January 1859 he succeeded to his father's title, and in November of the same year to that of his uncle, Earl de Grey. A few months after entering the Upper House he was appointed under-secretary for war, and in February 1861 under-secretary for India. Upon the death of Sir George Cornewall Lewis in April 1863 he became secretary for war, with a seat in the cabinet. In 1866 he was appointed secretary of state for India. On the formation of the Gladstone administration in December 1868, Lord Ripon was appointed lord president of the council, and held that office until within a few months of the fall of the government in 1873, when he resigned on purely private grounds. In 1869 he was created a Knight of the Garter. In 1871 Lord Ripon was appointed chairman of the High Joint-Commission on the Alabama claims, which arranged the treaty of Washington. In recognition of his services he was elevated to a marquessate (1871). In 1874 he became a convert to Roman Catholicism, and this involved his resignation of the office of grand master of the English Freemasons. On the return of Gladstone to power in 1880 Lord Ripon was appointed viceroy of India, the appointment exciting a storm of controversy, the marquess being the first Roman Catholic to hold the viceregal office. He went out to reverse the Afghan policy of Lord Lytton, and Kandahar was given up, the whole of Afghanistan being secured to Abdur Rahman. The new viceroy was also called upon to decide grave questions between the native population and the resident British, and he resolved upon a liberal policy towards the former, among his measures being the repeal of the Vernacular Press Act, the extension of local government and the appointment of an Education Commission. He extended the rights of the natives, and in certain directions curtailed the privileges of Europeans. Several of the viceroy's measures, notably the Ilbert Bill of 1883—so named after its author Sir Courtenay Ilbert—irritated the Anglo-Indian population, and it was fiercely assailed. The purpose of this bill was disclosed in the statement that "the government of India had decided to settle the question of jurisdiction over European British subjects in such a way as to remove from the code, at once and completely, every judicial disqualification which is based merely on race distinctions," in fact to subject Europeans in certain cases to trial by native magistrates. This announcement raised a storm of indignation among the European community in India, and the government were obliged virtually, though not avowedly, to abandon their measure. Act III. of 1884 was a compromise, which, while subjecting Europeans to the jurisdiction of native district magistrates or sessions judges, reserved to them the right to demand trial by a jury of which at least half should be Europeans. There probably never was a viceroy so unpopular among Anglo-Indians or so popular with the natives. On Lord Ripon's departure from India in November 1884 there were extraordinary manifestations in his favour on the part of the Hindu population of Bengal and Bombay, and more than a thousand addresses were presented to him. On his arrival in England the marquess delivered a number of vigorous speeches in defence of his adminstration. In 1886 he became first lord of the admiralty in the third Gladstone ministry; and on the return of the Liberals to power in 1892 he was appointed colonial secretary, which post he continued to hold until the resignation of the government in 1895. He was included in Sir Henry Campbell-Bannerman's cabinet at the close of 1905 as lord privy seal, an office which he retained in 1908 when Mr Asquith formed his new ministry, but which he resigned later in the same year. He died at his seat, Studley Royal, near Ripon, on the 9th of July 1909, when his only son, Earl de Grey, who has been treasurer of the queen's household since 1901, became the 2nd marquess. For many years Lord Ripon was president of the Yorkshire College of Science at Leeds, and chairman of the West Riding County Council.

RIPON, a cathedral city and municipal borough in the Ripon parliamentary division of the West Riding of Yorkshire, England, 214 m. N.N.W. from London, on the North-Eastern railway. Pop. (1901) 8230. It is pleasantly situated at the confluence of the streams Laver and Skell with the river Ure, which is crossed by a fine bridge of nine arches. The streets are for the most part narrow and irregular, and, although most of the houses are comparatively modern, some of them retain the picturesque gables characteristic of earlier times. The cathedral, although not ranking among those of the first class, is celebrated for its fine proportions, and is of great interest from the various styles of architecture which it includes. Its entire length from E. to W. is 266 ft., the length of the transepts 130 ft., and the width of the nave and aisles 87 ft. Besides a large square central tower, there are two western towers. The cathedral was founded on the ruins of St Wilfrid's abbey about 680, but of this Saxon building nothing now remains except the crypt, called St Wilfrid's Needle. The present building was begun by Archbishop Roger (1154–81), and to this Transition period belong the transepts and portions of the choir. The western front and towers, fine specimens of Early English, were probably the work of Walter de Grey, archbishop of York (d. 1255), and about the close of the century the eastern portion of the choir was rebuilt in the Decorated style. The nave, portions of the central tower, and two bays of the choir are Perpendicular, having been rebuilt towards the close of the 15th century. Earlier than the rest of the fabric (except the crypt) is part of the chapter-house and the vestry, adjoining the south side of the choir, and terminating eastward in an apse. This is pure Norman work, and there is a crypt of that period beneath, which was formerly filled with unburied bones. There are a number of monuments of historical and antiquarian interest. The diocese includes rather less than one-third of the parishes of Yorkshire, and also a small part of Lancashire. The bishop's palace, a modern building in Tudor style, is situated in extensive grounds about a mile from the town. In the vicinity is the domain of Studley Royal, the seat of the marquess of Ripon, which contains the celebrated ruins of Fountains Abbey (*q.v.*). The principal secular buildings are the town hall, the public rooms, and the mechanics' institution (1894) where technical and other classes are held. There are several old charities, including the hospital of St John the Baptist, founded in 1109 but modernized; the hospital of St Anne, founded probably in the reign of Henry VI. by an unknown benefactor; and the hospital of St Mary Magdalene for women. This last was founded by Thurstan, archbishop of York (1114–41), as a secular community, one of the special duties of which was to minister to lepers. In the 13th century a master and chaplain took the place of the lay brethren, and in 1334 a chantry was founded. The chapel remains, with its interesting Norman work, its low side-windows, said to have allowed the lepers to follow the services, and its pre-Reformation altar of stone, a rare example. There is a considerable trade in varnish, and the saddle-trees and other leather goods produced here are in high repute. The borough is under a mayor, 4 aldermen, and 12 councillors. Area, 1809 acres.

Ripon (*In Rhypum*, *Ad Ripam*) owed its origin to the monastery founded in the 7th century. A certain king, Alchfrith, is said to have given the site of the town to Eata, abbot of Melrose, to found a monastery, but before it was completed Eata was deposed for refusing to celebrate Easter according to the Roman usage, and St Wilfrid was appointed the first abbot. Another version of the story, however, says that the land was given to St Wilfrid, who himself built the monastery. Ripon is said to have been made a royal borough by Alfred the Great, and King Æthelstan, after his victory at Brunanburh in 937, is stated to have granted to the monastery sanctuary, freedom from toll and taxes, and the privilege of holding a court, although both charters attributed to him are known to be spurious. At the same time he is said to have given the manor to Wulfstan, archbishop of York. About 950 the monastery and town were destroyed by King Edred during his expedition against the Danes, but the monastery was rebuilt by the archbishops of York, and about the time of the Conquest was changed to a collegiate church. In 1318, when the Scots invaded England, Ripon only escaped being burnt a second time by the payment of 1000 marks. The custom of blowing the wakeman's horn every night at nine o'clock is said to have originated about A.D. 700. It was probably at first a means of calling the people together in case of a sudden invasion, but was afterwards a signal for setting the watch. A horn with a baldric and the motto "Except the Lord keep the city the watchman waketh but in vain" forms the mayor's badge. The archbishops of York as lords of the manor had various privileges in the town, among which were the right of holding a market and fair, and Archbishop John, being summoned in the reign of Henry I. to answer by what right he claimed these privileges, said that he held them by prescription and by the charter of King Æthelstan. Henry I. afterwards granted or confirmed to Archbishop Thomas a fair on the feast of St Wilfrid and four following days. The fairs and markets belonged to the archbishops of York until they were transferred to the bishop of Ripon in 1837. In 1857 they were transferred to the ecclesiastical commissioners, from whom they were purchased by the corporation of Ripon in 1880. From before the Conquest until the incorporation charter of 1604 Ripon was governed by a wakeman and 12 elders, or aldermen, but in 1604 the title of wakeman was changed to mayor, and 12 aldermen and 24 common councilmen were appointed. The manufacture of cloth was at one time carried on in Ripon, but was almost lost in the 16th century when the town was visited by Leland. The making of spurs succeeded the cloth manufacture and became so noted that the saying "as true as Ripon rowells" was a well-known proverb. This manufacture died out in the 18th century. Ripon was summoned to send two members to parliament in 1295, and occasionally from that time until 1328–29. The privilege was revived in 1553, after which the burgesses continued to send two members until 1867, when they were allowed only one. This latter privilege was taken away by the Redistribution Bill of 1885, and it now gives its name to one of the divisions of the county.

See *Victoria County History, Yorkshire*; and W. Harrison, *Ripon Millenary: a Record of the Festival and a History of the City, arranged under its Wakemen and Mayors from the year 1400* (1892).

RIPON, a city of Fond du Lac county, Wisconsin, U.S.A., on Silver Creek, about 22 m. W. of Fond du Lac, and about 75 m. N.W. of Milwaukee. Pop. (1890), 3358; (1900), 3818, of whom 885 were foreign-born; (1905), 3811; (1910), 3739. Ripon is served by the Chicago & North-Western, and the Chicago, Milwaukee & St Paul railways. The city has a Carnegie library, which also houses the library of the Ripon Historical Society, and is the seat of Ripon College (non-sectarian, co-educational), which was founded in 1850 as the Lyceum of Ripon, and was named Ripon College in 1864; in 1908 it had 23 instructors and 279 students. There are grain elevators and various manufactories, among the products of which are cheese and other creamery products, flour, knit goods, pickles and canned goods, woodenware, washing machines and gloves.

The site of Ripon was purchased in 1838 by John Scott Horner (1802–1883), of Virginia, secretary and acting-governor of Michigan Territory in 1835, and the first secretary of Wisconsin Territory in 1836–37, who named the village when it was established in 1849 from the seat of his ancestors in Yorkshire. In May 1844 a settlement, named Ceresco or "the Wisconsin Phalanx," a Fourierist community,[1] organized in Southport (now Kenosha), had been established in the vicinity. A "Long House," 400 ft. in length, was erected, which contained tenements, an amusement or lecture hall, and a dining-room where all ate at a common table, and where board was provided at cost, sometimes as low as sixty-three cents per week. The "class of usefulness" was divided into three groups, agricultural, mechanical and educational, with such subdivisions as necessity dictated, and an exact account of labour was kept. The community prospered materially from the start. In the second season it consisted of thirty families with property valued at $27,725; in 1846 there were 180 resident members, and the net profit for the year was $9029. Eventually differences of opinion arose as to the division of labour, and the common dining-hall did not prove popular. Rivalry developed with the village of Ripon, and the community gave up its charter at the close of 1850, dividing property valued at $40,000 among the shareholders. On the whole it was one of the most successful experiments in communism ever tried in America. In 1858 Ripon absorbed the village of Ceresco and was chartered as a city. At Ripon started one of the disconnected movements that resulted in the founding of the Republican party.

See D. P. Mapes, *History of Ripon* (Milwaukee, Wis., 1873); Consul W. Butterfield, *History of Fond du Lac County* (1880); W. A. Hinds, *American Communities and Co-operative Colonies* (3rd ed., Chicago, 1908), and F. A. Flower, *History of the Republican Party* (1884).

RIPPERDA, JOHN WILLIAM, BARON, and afterwards duke of (1680–1737), political adventurer and Spanish minister, was a native of Groningen in the Netherlands. According to a story which he himself set going during his adventures in Spain, his family was of Spanish origin. But there does not appear to be any foundation for this assertion. The name was not uncommon in Groningen, and was borne by several persons of some note in the 16th and 17th centuries, one of whom was a follower of William the Silent. They were people of some position, possessing "lordships" at Jansinia, Poëlgast, and other places, and some at least of them were Roman Catholics. John William, if he was, as he asserted, born a Roman Catholic, conformed to Dutch Calvinism in order to obtain his election as delegate to the states-general from Groningen. In 1715 he was sent by the Dutch government as ambassador to Madrid. Saint-Simon says that his character for probity was even then considered doubtful. The fortune of Orry, Alberoni and other foreigners in Spain, showed that the court of Philip V. offered a career to adventurers. Ripperda—whose name is commonly spelt Riperda by the Spaniards—devoted himself to the Spanish government, and professed himself a Roman Catholic. He first attached himself to Alberoni, and after the fall of that minister he became the agent of Elizabeth Farnese, the restless and intriguing wife of Philip V. Though perfectly unscrupulous in money matters, and of a singularly vain and blustering disposition, he did understand commercial questions, and he has the merit of having pointed out that the poverty of Spain was mainly due to the neglect of its agriculture. But his fortune was not due to any service of a useful kind he rendered his masters. He rose by undertaking to aid the queen, whose influence over her husband was boundless, in her schemes for securing the succession to Parma, Plasencia and Tuscany for her sons. Ripperda was sent as special envoy to Vienna in 1725. He behaved with ridiculous violence, but the Austrian government, which was under the influence of its own fixed idea, treated him seriously. The result of ten months of very strange diplomacy was a treaty by which the emperor promised very little, but

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[1] The charter, granted by the legislature in 1845, contained the following features: (1) property to be held in common; and shares to be sold at $25; (2) land to be limited to 40 acres for each member of the corporation; (3) a unanimous vote of the managers necessary for admission; (4) an annual settlement of profits on the basis of one-quarter credit to dividend on stock, and three-quarters credit to labour; (5) free public schools, capital paying three-quarters and labour one-quarter of cost; and (6) complete religious toleration and no involuntary taxation for church support.

Spain was bound to pay heavy subsidies, which its exhausted treasury was quite unable to afford. The emperor hoped to obtain money. Elizabeth Farnese hoped to secure the Italian duchies for her sons, and some vague stipulations were made that Charles VI. should give his aid for the recovery by Spain of Gibraltar and Minorca. When Ripperda returned to Madrid at the close of 1725 he asserted that the emperor expected him to be made prime minister. The Spanish sovereigns, who were overawed by this quite unfounded assertion, allowed him to grasp the most important posts under the crown. He excited the violent hostility of the Spaniards, and entered into a complication of intrigues with the French and English governments. His career was short. In 1726 the Austrian envoy, who had vainly pressed for the payment of the promised subsidies, came to an explanation with the Spanish sovereigns. It was discovered that Ripperda had not only made promises that he was not authorized to make, but had misappropriated large sums of money. The sovereigns who had made him duke and grandee shrank from covering themselves with ridicule by revealing the way in which they had been deceived. Ripperda was dismissed with the promise of a pension. Being in terror of the hatred of the Spaniards, he took refuge in the English embassy. To secure the favour of the English envoy, Colonel William Stanhope, afterwards Lord Harrington, he betrayed the secrets of his government. Stanhope could not protect him, and he was sent as a prisoner to the castle of Segovia. In 1728 he escaped, probably with the connivance of the government, and made his way to Holland. His last years are obscure. It is said that he reverted to Protestantism, and then went to Morocco, where he became a Mahommedan and commanded the Moors in an unsuccessful attack on Ceuta. But this story is founded on his so-called *Memoirs*, which are in fact a Grub-street tale of adventure published at Amsterdam in 1740. All that is really known is that he did go to Morocco, and that he died at Tetuan in 1737.

See Arnold Ritter von Arneth, *Prinz Eugen von Savoyen* (Vienna, 1864), for the negotiations of 1725, and Gabriel Syveton, *Une Cour et un aventurier au XVIII^e siècle* (Paris, 1896). His *Memoirs* were translated into English by J. Campbell, London, 1750.

RISHANGER, WILLIAM (*c.* 1250–*c.* 1312), English chronicler, made his profession as a Benedictine at St Alban's abbey in 1271, of which he perhaps became the official chronicler. The most important of his writings is the *Narratio de bellis apud Lewes et Evesham.* Though written many years afterwards and drawn from other sources, it is a spirited account of the barons' war. He is so great an admirer of Simon de Montfort that this work has been called a hagiography. He is credited with the authorship of a chronicle covering the period 1259–1306; this has been disputed, but the work is printed under his name by Riley. Another work of his, of not much importance, is a chronicle entitled *Recapitulatis brevis de gestis domini Edwardi, &c.* He is probably not the author of other works commonly attributed to him.

AUTHORITIES.—*Wilhelmi Rishanger chronica et annales*, Rolls Series, Introduction ed. H. T. Riley; the *Narratio de bellis apud Lewes et Evesham*, ed. J. O. Halliwell, Camden Society, 1840.

RISK, hazard, chance of danger or loss, especially the chance of loss to property or goods which an insurance company undertakes to make good to the insurer in return for the recurrent payment of a sum called the premium (see INSURANCE). The word appears late in English, and in the 17th century in the Fr. form *risque* or It. *risco* or *risgo*, for *risico*, *risigo*; cf. Sp. *riesgo*. The Med. Lat. *riscus*, *rischium*, and *risicum* are found, according to Du Cange (*Gloss.*, *qq.v.*), as early as the 13th century. Skeat (*Etym. Dict.*, 1910) accepts Diez's suggestion that the word is originally a sailor's term, and is to be referred to Sp. *risco*, a steep rock, from Lat. *resecare*, to cut back, shut off; thus Sp. *arriesgar*, to run into danger, means literally "to go against a rock."

RIST, JOHANN VON (1607–1667), German poet, was born at Ottensen in Holstein on the 8th of March 1607; the son of the Lutheran pastor of that place. He received his early training in Hamburg and Bremen; after studying theology at Rinteln and Rostock, he became in 1633 private tutor in a family of Heide, and two years later (1635) was appointed pastor of the village of Wedel on the Elbe, where he laboured until his death on the 31st of August 1667. Rist first made his name known to the literary world by a drama, *Perseus* (1634), which he wrote while at Heide, and in the next succeeding years he produced a number of dramatic works of which the allegory *Das friedewünschende Teutschland* (1647) and *Das friedejauchzende Teutschland* (1653) (new ed. of both by H. M. Schletterer, 1864) are the most interesting. Rist soon became the central figure in a school of minor poets, and honours were showered upon him from every side. The emperor Ferdinand III. crowned him laureate in 1644, ennobled him in 1653, and invested him with the dignity of a Count Palatine, an honour which enabled him to crown, and to gain numerous poets for the Elbschwanen order, a literary and poetical society which he founded in 1656. He had already, in 1645, been admitted, under the name "Daphnis aus Cimbrien," to the literary order of Pegnitz, and in 1647 he became, as "Der Rüstige," a member of the Fruchtbringende Gesellschaft. It is, however, as a writer of church hymns (see HYMNS) that Rist is best known to fame. Among these several are still retained in the evangelical hymn book: *e.g. O Ewigkeit, du Donnerwort* and *Ermunt're dich, mein schwacher Geist.* Collections of his poems appeared under the titles *Musa Teutonica* (1634) and *Himmlische Lieder* (1643).

Selections of Rist's writings have been published by W. Müller in vol. viii. of his *Bibliothek deutscher Dichter des 17. Jahrh.* (1822–1838), and by K. Goedeke and E. Goeze (1885). See T. Hansen, *Johann Rist und seine Zeit* (1872); K. T. Gaedertz, *J. Rist als niederdeutscher Dramatiker* (*Jahrb. f. niederdeutsche Sprache*, vol. vii., 1881); and M. von Waldberg's article in the *Allg. deutsche Biographie.*

RISTITCH (or RISTICH), **JOVAN** (1831–1899), Servian statesman, was born at Kragugevats in 1831. He was educated at Belgrade, Heidelberg, Berlin and Paris. After failing to obtain a professorship in the high school of Belgrade, he was appointed in 1861 Servian diplomatic agent at Constantinople. His reputation was enhanced by the series of negotiations which ended in the withdrawal of the Turkish troops from the Servian fortresses in 1867. On his return from Constantinople he was offered a ministerial post by Prince Michael, who described him as "his right arm," but declined office, being opposed to the reactionary methods adopted by the prince's government. He had already become the recognized leader of the Liberal party. After the assassination of Prince Michael in 1868, he was nominated member of the council of regency, and on the 2nd January 1869 the first Servian constitution, which was mainly his creation, was promulgated. When Prince Milan attained his majority in 1872, Ristitch became foreign minister; a few months later he was appointed prime minister, but resigned in the following autumn (1873). He again became prime minister in April 1876, and conducted the two wars against Turkey (July 1876–March 1877 and December 1877–March 1878). At the congress of Berlin he laboured with some success to obtain greater advantages for Servia than had been accorded to her by the treaty of San Stefano. The provisions of the treaty of Berlin, however, disappointed the Servians, owing to the obstacles now raised to the realization of the national programme; the Ristitch government became unpopular, and resigned in 1880. In 1887 King Milan (who had assumed the royal title in 1882), alarmed at the threatening attitude of the Radical party, recalled Ristitch to power at the head of a coalition cabinet; a new constitution was granted in 1888, and in the following year the king abdicated in favour of his son, Prince Alexander. Ristitch now became head of a council of regency, entrusted with power during the minority of the young king, and a Radical ministry was formed. In 1892, however, Ristitch transferred the government to the Liberal party, with which he had always been connected. This step and the subsequent conduct of the Liberal politicians caused serious discontent in the country. On the 1st (13th) of April 1893 King Alexander, by a successful stratagem, imprisoned the regents and ministers in the palace, and, declaring himself of age, recalled the Radicals to office. Ristitch now retired into private life. He died at Belgrade on 4th September 1899. Though cautious and deliberate by temperament, he was a man of strong will and firm character. He was the author of two published works: *The External Relations of Servia from 1848 to 1867* (Belgrade, 1887) and *A Diplomatic History of Servia* (Belgrade, 1896). (J. D. B.)

RISTORI, ADELAIDE (1822–1906), Italian actress, was born at Cividale del Friuli on the 30th of January 1822, the daughter of strolling players. As a child she appeared upon the stage, and at fourteen made her first success as Francesca da Rimini in Silvio Pellico's tragedy. She was eighteen when for the first time she played Mary Stuart in an Italian version of Schiller's play. She had been a member of the Sardinian company and also of the Ducal company at Parma for some years before her marriage (1846) to the marchese Giuliano Capranica del Grillo (d. 1861); and after a short retirement she returned to the stage and played regularly in Turin and the provinces. It was not until 1855 that she paid her first professional visit to Paris, where the part of Francesca was chosen for her *début*. In this she was rather coldly received, but she took Paris by storm in the title rôle of Alfieri's *Myrrha*. Furious partisanship was aroused by the appearance of a rival to the great Rachel. Paris was divided into two camps of opinion. Humble playgoers fought at gallery doors over the merits of their respective favourites. The two famous women never actually met, but the French actress seems to have been convinced that Ristori had no feelings towards her but those of admiration and respect. A tour in other countries was followed (1856) by a fresh visit to Paris, when Ristori appeared in Montanelli's Italian translation of Legouvé's *Medea*. She repeated her success in this in London. In 1857 she visited Madrid, playing in Spanish to enthusiastic audiences, and in 1866 she paid the first of four visits to the United States, where she won much applause, particularly in Giacometti's *Elizabeth*, an Italian study of the English sovereign. She finally retired from professional life in 1885, and died on the 9th of October 1906 in Rome. She left a son, the marchese Georgio Capranica del Grillo. Her *Studies and Memoirs* (1888) provide a lively account of an interesting career, and are particularly valuable for the chapters devoted to the psychological explanation of the characters of Mary Stuart, Elizabeth, Myrrha, Phaedra and Lady Macbeth, in her interpretation of which Ristori combined high dramatic instinct with the keenest and most critical intellectual study.

See also Kate Field, *Adelaide Ristori: A Biography* (New York, 1867); E. Peron Kingston, *Adelaide Ristori: A Sketch of her Life* (1856); *Daily Telegraph* (London, Oct. 10, 1906).

RITCHIE, CHARLES THOMSON RITCHIE, 1ST BARON (1838–1906), English politician, was born at Dundee, and educated at the City of London school. He went into business, and in 1874 was returned to parliament as Conservative member for the Tower Hamlets. In 1885 he was made secretary to the Admiralty, and from 1886 to 1892 president of the Local Government Board, in Lord Salisbury's administration, sitting as member for St George's in the East. He was responsible for the Local Government Act of 1888, instituting the county councils; and a large section of the Conservative party always owed him a grudge for having originated the London County Council. In Lord Salisbury's later ministries, as member for Croydon, he was president of the Board of Trade (1895–1900), and home secretary (1895–1900); and when Sir Michael Hicks-Beach retired in 1902, he became chancellor of the exchequer in Mr Balfour's cabinet. Though in his earlier years he had been a "fair-trader," he was strongly opposed to Mr Chamberlain's movement for a preferential tariff (see the articles on Balfour, A. J., and Chamberlain, J.), and he resigned office in September 1903. In December 1905 he was created a peer, but he was in ill-health, and he died at Biarritz on the 9th of January 1906.

RITCHIE, DAVID GEORGE (1853–1903), Scottish philosopher, was born at Jedburgh, son of the Rev. George Ritchie, D.D. He had a distinguished university career at Edinburgh, and Balliol College, Oxford, and after being fellow of Jesus and tutor of Balliol was elected professor of logic and metaphysics at St Andrews. He was president of the Aristotelian Society in 1898. Among his works are: *Darwinism and Politics* (1889); *Principles of State Interference* (1891); *Darwin and Hegel* (1893); *Natural Rights* (1895); a translation with R. Lodge and P. E. Matheson of Bluntschli's *Theory of the State* (1885); many articles in *Mind*, *Philosophical Review*, &c. His *Philosophical Studies* was edited with a memoir by R. Latta (1905).

RITSCHL, ALBRECHT (1822–1889), German theologian, was born at Berlin on the 25th of March 1822. His father, Georg Karl Benjamin Ritschl (1783–1858), became in 1810 pastor at the church of St Mary in Berlin, and from 1827 to 1854 was general superintendent and evangelical bishop of Pomerania. Albrecht Ritschl studied at Bonn, Halle, Heidelberg and Tübingen. At Halle he came under Hegelian influences through the teaching of Julius Schaller (1810–1868) and J. H. Erdmann (b. 1805). In 1845 he was entirely captivated by the Tübingen school, and in his work *Das Evangelium Marcions und das kanonische Evangelium des Lukas*, published in 1846, he appears as a disciple of F. C. Baur. This did not last long with him, however, for the second edition (1857) of his most important work, on the origin of the old Catholic Church (*Die Entstehung der alt-kathol. Kirche*), shows considerable divergence from the first edition (1850), and reveals an entire emancipation from F. C. Baur's method. Ritschl was professor of theology at Bonn (extraordinarius 1852; ordinarius 1859) and Göttingen (1864; *Consistorialrath* also in 1874), his addresses on religion delivered at the latter university showing the impression made upon his mind by his enthusiastic studies of Kant and Schleiermacher. Finally, in 1864, came the influence of Rudolf Lotze. He wrote a large work on the Christian doctrine of justification and atonement, *Die Christliche Lehre von der Rechtfertigung und Versöhnung*, published during the years 1870–74, and in 1880–86 a history of pietism (*Die Geschichte des Pietismus*). His system of theology is contained in the former. He died at Göttingen on the 20th of March 1889.

His son, Otto Ritschl (b. 1860), after studying at Göttingen, Bonn and Giessen, became professor at Kiel (extraordinarius) in 1889 and afterwards at Bonn (extraordinarius 1894; ordinarius 1897). He has published, amongst other works, *Schleiermachers Stellung zum Christentum in seinen Reden über die Religion* (1888), and a *Life* of his father (2 vols., 1829–96).

Ritschl claims to carry on the work of Luther and Schleiermacher, especially in ridding faith of the tyranny of scholastic philosophy. His system shows the influence of Kant's destructive criticism of the claims of Pure Reason, recognition of the value of morally conditioned knowledge, and doctrine of the kingdom of ends; of Schleiermacher's historical treatment of Christianity, regulative use of the idea of religious fellowship, emphasis on the importance of religious feeling; and of Lotze's theory of knowledge and treatment of personality. Ritschl's work made a profound impression on German thought and gave a new confidence to German theology, while at the same time it provoked a storm of hostile criticism: his school has grown with remarkable rapidity. This is perhaps mainly due to the bold religious positivism with which he assumes that spiritual experience is real and that faith has not only a legitimate but even a paramount claim to provide the highest interpretation of the world. The life of trust in God is a fact, not so much to be explained as to explain everything else. Ritschl's standpoint is not that of the individual subject. The objective ground on which he bases his system is the religious experience of the Christian community. The "immediate object of theological knowledge is the faith of the community," and from this positive religious datum theology constructs a "total view of the world and human life." Thus the essence of Ritschl's work is systematic theology. Nor does he painfully work up to his master-category, for it is given in the knowledge of Jesus Christ revealed to the community. That God is love and that the purpose of His love is the moral organization of humanity in the "Kingdom of God"—this idea, with its immense range of application—is applied in Ritschl's initial datum.

From this vantage-ground Ritschl criticizes the use of Aristotelianism and speculative philosophy in scholastic and Protestant theology. He holds that such philosophy is too shallow for theology. Hegelianism attempts to squeeze all life into the categories of logic: Aristotelianism deals with "things in general" and ignores the radical distinction between nature and spirit. Neither Hegelianism nor Aristotelianism is "vital" enough to sound the depths of religious life. Neither conceives "God" as correlative to human "trust" (cf. *Theologie und Metaphysik*, esp. p. 8 seq.). But Ritschl's recoil carries him so far that he is left alone with merely "practical" experience. "Faith" knows God in His active relation to the "kingdom," but not at all as "self-existent."

His limitation of theological knowledge to the bounds of human need might, if logically pressed, run perilously near phenomenalism; and his epistemology ("we only know things *in* their activities") does not cover this weakness. In seeking ultimate reality in the circle of "active conscious sensation," he rules out all "metaphysic." Indeed, much that is part of normal Christian faith—*e.g.* the Eternity of the Son—is passed over as beyond the range of his method. Ritschl's theory of "value-judgments" (*Werthurtheile*) illustrates this form of agnosticism. Religious judgments of value determine objects according to their bearing on our moral and spiritual welfare. They imply a lively sense of radical human need. This sort of knowledge stands quite apart from that produced by "theoretic" and "disinterested" judgments. The former moves in a world of "values," and judges things as they are related to our "fundamental self-feeling." The latter moves in a world of cause and effect. (*N.B.* Ritschl appears to confine Metaphysic to the category of Causality.) The theory as formulated has such grave ambiguities, that his theology, which, as we have seen, is wholly based on uncompromising religious realism, has actually been charged with individualistic subjectivism. If Ritschl had clearly shown that judgments of value enfold and transform other types of knowledge, just as the "spiritual man" includes and transfigures but does not annihilate the "natural man," then within the compass of this spiritually conditioned knowledge all other knowledge would be seen to have a function and a home. The theory of value-judgments is part too of his ultra-practical tendency: both "metaphysic" and "mysticism" are ruthlessly condemned. Faith-knowledge appears to be wrenched from its bearings and suspended in mid-ocean. Perhaps if he had lived to see the progress of will-psychology he might have welcomed the hope of a more spiritual philosophy.

A few instances will illustrate Ritschl's positive systematic theology. The conception of God as Father is given to the community in Revelation. He must be regarded in His active relationship to the "kingdom," as spiritual personality revealed in spiritual purposiveness. His "Love" is His will as directed towards the realization of His purpose in the kingdom. His "Righteousness" is His fidelity to this purpose. With God as "First Cause" or "Moral Legislator" theology has no concern; nor is it interested in the "speculative" problems indicated by the traditional doctrine of the Trinity. "Natural theology" has no value save where it leans on faith. Again, Christ has for the religious life of the community the unique value of Founder and Redeemer. He is the perfect Revelation of God and the Exemplar of true religion. His work in founding the kingdom was a personal vocation, the spirit of which He communicates to believers, "thus, as exalted king," sustaining the life of His Kingdom. His Resurrection is a necessary part of Christian belief (G. Ecke, pp. 198–99). "Divinity" is a predicate applied by faith to Jesus in His founding and redeeming activity. We note here that though Ritschl gives Jesus a unique and unapproachable position in His active relation to the kingdom, he declines to rise above this relative teaching. The "Two Nature" problem and the eternal relation of the Son to the Father have no bearing on experience, and therefore stand outside the range of theology.

Once more, in the doctrine of sin and redemption, the governing idea is God's fatherly purpose for His family. Sin is the contradiction of that purpose, and guilt is alienation from the family. Redemption, justification, regeneration, adoption, forgiveness, reconciliation all mean the same thing—the restoration of the broken family relationship. All depends on the Mediation of Christ, who maintained the filial relationship even to His death, and communicates it to the brotherhood of believers. Everything is defined by the idea of the family. The whole apparatus of "forensic" ideas (law, punishment, satisfaction, &c.) is summarily rejected as foreign to God's purpose of love. Ritschl is so faithful to the standpoint of the religious community, that he has nothing definite to say on many inevitable questions, such as the relation of God to pagan races. His school, in which J. G. W. Herrmann, Julius Kaftan and Adolf Harnack are the chief names, diverges from his teaching in many directions; *e.g.* Kaftan appreciates the mystical side of religion, Harnack's criticism is ~~very~~ different from Ritschl's arbitrary exegesis. They are united on the value of faith-knowledge as opposed to "metaphysic."

See A. Ritschl, *Die Christliche Lehre von der Rechtfertigung und Versöhnung* (3rd ed., 1889); *Unterricht in der Christlichen Lehre* (very many editions); and *Theologie und Metaphysik* (2nd ed., 1887), give his main position. Many historical and other works besides.—E. Bertrand, *Une nouvelle conception de la rédemption. La Doctrine de la justification et de la réconciliation dans le système de Ritschl* (1891); H. Schoen, *Les Origines historiques de la théologie de Ritschl* (1893); G. Ecke, *Die theologische Schule, A. Ritschl's und die evangelische Kirche der Gegenwart* (1897); James Orr, *The Ritschlian Theology and the Evangelical Faith* (London 1898); and A. E. Garvie, *The Ritschlian Theology* (Edinburgh 1899), in both of which the bibliography of the movement is given Cf. Otto Pfleiderer, *Development of Theology in Germany since Kant* (1890). The German literature on the subject is very large; see article in *Herzog-Hauck*, vol. xvii.

RITSCHL, FRIEDRICH WILHELM (1806–1876), German scholar, was born in 1806 in Thuringia. His family, in which culture and poverty were hereditary, were Protestants who had migrated several generations earlier from Bohemia. Ritschl was fortunate in his school training, at a time when the great reform in the higher schools of Prussia had not yet been thoroughly carried out. His chief teacher, Spitzner, a pupil of Gottfried Hermann, divined the boy's genius and allowed it free growth, applying only so much either of stimulus or of restraint as was absolutely needful. After a wasted year at the university of Leipzig, where Hermann stood at the zenith of his fame, Ritschl passed in 1826 to Halle. Here he came under the powerful influence of Reisig, a young "Hermannianer" with exceptional talent, a fascinating personality and a rare gift for instilling into his pupils his own ardour for classical study. The great controversy between the "Realists" and the "Verbalists" was then at its height, and Ritschl naturally sided with Hermann against Boeckh. The early death of Reisig in 1828 did not sever Ritschl from Halle, where he began his professorial career with a great reputation and brilliant success, but soon hearers fell away, and the pinch of poverty compelled his removal to Breslau, where he reached the rank of "ordinary" professor in 1834, and held other offices. The great event of Ritschl's life was a sojourn of nearly a year in Italy (1836–37), spent in libraries and museums, and more particularly in the laborious examination of the Ambrosian palimpsest of Plautus at Milan. The remainder of his life was largely occupied in working out the material then gathered and the ideas then conceived. Bonn, whither he removed on his marriage in 1839, and where he remained for twenty-six years, was the great scene of his activity both as scholar and as teacher. The philological seminary which he controlled, although nominally only joint-director with Welcker, became a veritable *officina litterarum*, a kind of Isocratean school of classical study; in it were trained many of the foremost scholars of the last forty years. The names of Georg Curtius, Ihne, Schleicher, Bernays, Ribbeck, Lorenz, Vahlen, Hübner, Bücheler, Helbig, Benndorf, Riese, Windisch, who were his pupils either at Bonn or at Leipzig, attest his fame and power as a teacher. In 1854 Otto Jahn took the place of the venerable Welcker at Bonn, and after a time succeeded in dividing with Ritschl the empire over the philological school there. The two had been friends, but after gradual estrangement a violent dispute arose between them in 1865, which for many months divided into two hostile forces the universities and the press of Germany. Both sides were steeped in fault, but Ritschl undoubtedly received harsh treatment from the Prussian government, and pressed his resignation. He accepted a call to Leipzig, where he died in harness in 1876.

Ritschl's character was strongly marked. The spirited element in him was powerful, and to some at times he seemed overbearing, but his nature was noble at the core; and, though intolerant of inefficiency and stupidity, he never asserted his personal claims in any mean or petty way. He was warmly attached to family and friends, and yearned continually after sympathy, yet he established real intimacy with only a few. He had a great faculty for organization, as is shown by his administration of the university library at Bonn, and by the eight years of labour which carried to success a work of infinite complexity, the famous *Priscae Latinitatis Monumenta Epigraphica* (Bonn, 1862). This volume presents in admirable facsimile, with prefatory notices and indexes, the Latin inscriptions from the earliest times to the end of the republic. It forms an introductory volume to the Berlin *Corpus Inscriptionum Latinarum*, the excellence of which is largely due to the precept and example of Ritschl, though he had no hand in the later volumes. The results of Ritschl's life are mainly gathered up in a long series of monographs, for the most part of the highest finish, and rich in ideas which have leavened the scholarship of the time.

As a scholar, Ritschl was of the lineage of Bentley, to whom he looked up, like Hermann, with fervent admiration. His best efforts were spent in studying the languages and literatures of Greece and Rome, rather than the life of the Greeks and Romans. He was sometimes, but most unjustly, charged with taking a narrow view of "Philologie." That he keenly appreciated the importance of ancient institutions and ancient art both his published papers and the records of his lectures amply testify. He devoted himself for the most part to the study of ancient poetry, and in particular of the early Latin drama. This formed the centre from which his investigations radiated. Starting from this he ranged over the whole remains of pre-Ciceronian Latin, and not only analysed but augmented the sources from which our knowledge of it must come. Before Ritschl the acquaintance of scholars with early Latin was so dim and restricted that it would perhaps be hardly an exaggeration to call him its real discoverer.

To the world in general Ritschl was best known as a student of Plautus. He cleared away the accretions of ages, and by efforts of that real genius which goes hand in hand with labour, brought to light many of the true features of the original. It is infinitely to be regretted that Ritschl's results were never combined to form that monumental edition of Plautus of which he dreamed in his earlier life. Ritschl's examination of the Plautine MSS. was both laborious and brilliant, and greatly extended the knowledge of Plautus and of the ancient Latin drama. Of this, two striking examples may be cited. By the aid of the Ambrosian palimpsest he recovered the name T. Maccius Plautus, for the vulgate M. Accius, and proved it correct by strong extraneous arguments. On the margin of the Palatine MSS. the marks C and DV continually recur, and had been variously explained. Ritschl proved that they meant "Canticum" and "Diverbium," and hence showed that in the Roman comedy only the conversations in iambic senarii were not intended for the singing voice. Thus was brought into strong relief a fact without which there can be no true appreciation of Plautus, viz. that his plays were comic operas rather than comic dramas.

In conjectural criticism Ritschl was inferior not only to his great predecessors but to some of his contemporaries. His imagination was in this field (but in this field only) hampered by erudition, and his judgment was unconsciously warped by the desire to find in his text illustrations of his discoveries. But still a fair proportion of his textual labours has stood the test of time, and he rendered immense service by his study of Plautine metres, a field in which little advance had been made since the time of Bentley. In this matter Ritschl was aided by an accomplishment rare (as he himself lamented) in Germany the art of writing Latin verse.

In spite of the incompleteness, on many sides, of his work Ritschl must be assigned a place in the history of learning among a very select few. His studies are presented principally in his *Opuscula* collected partly before and partly since his death. The *Trinummus* (twice edited) was the only specimen of his contemplated edition of Plautus which he completed. The edition has been continued by some of his pupils—Goetz, Loewe and others.

The facts of Ritschl's life may be best learned from the elaborate biography by Otto Ribbeck (Leipzig, 1879). An interesting and discriminating estimate of Ritschl's work is that by Lucian Mueller (Berlin, 1877). (J. S. R.)

RITSON, JOSEPH (1752–1803), English antiquary, was born at Stockton-on-Tees, of a Westmorland yeoman family, on the 2nd of October 1752. He was educated for the law, and settled in London as a conveyancer when twenty-two. He devoted his spare time to literature, and in 1782 published an attack on Warton's *History of English Poetry*. The fierce and insulting tone of his *Observations*, in which Warton was treated as a showy pretender, and charged with cheating and lying to cover his ignorance, made a great sensation in literary circles. In nearly all the small points with which he dealt Ritson was in the right, and his corrections have since been adopted, but the unjustly bitter language of his criticisms roused great anger at the time, much, it would appear, to Ritson's delight. In 1783 Johnson and Steevens were assailed in the same bitter fashion as Warton for their text of Shakespeare. Bishop Percy was next subjected to a furious onslaught in the preface to a collection of *Ancient Songs* (printed 1787, dated 1790, published 1792). The only thing that can be said in extenuation of Ritson's unmatchable acrimony is that he spared no pains himself to ensure accuracy in the texts of old songs, ballads and metrical romances which he edited. His collection of the Robin Hood ballads is perhaps his greatest single achievement. Scott, who admired his industry and accuracy in spite of his temper, was almost the only man who could get on with him. On one occasion, when he called in Scott's absence, he spoke so rudely to Mrs Scott that Leyden, who was present, threatened to "thraw his neck" and throw him out of the window. Spelling was one of his eccentricities, his own name being an example: Ritson is short pronunciation for Richardson. As early as 1796 Ritson showed signs of mental collapse, and on the 10th of September 1803 he became completely insane, barricaded himself in his chambers at Gray's Inn, made a bonfire of manuscripts, and was finally forcibly removed to Hoxton, where he died on the 23rd of the month.

RITTENHOUSE, DAVID (1732–1796), American astronomer, was born at Germantown, Pennsylvania, on the 8th of April 1732. First a watchmaker and mechanician he afterwards became treasurer of Pennsylvania (1777–89), and from 1792 to 1795 director of the U.S. mint (Philadelphia). He was largely occupied in 1763 and in 1779–86 in settling the boundaries of several of the states. He was a fellow of the Royal Society of London, and a member of the American Philosophical Society; and was elected president of the latter society in 1791. As an astronomer, Rittenhouse's principal merit is that he introduced in 1786 the use of spider lines in the focus of a transit instrument. His priority with regard to this useful invention was acknowledged by E. Troughton, who brought spider lines into universal use in astronomical instruments (see von Zach's *Monatliche Correspondenz*, vol. ii. p. 215), but Felice Fontana (1730–1805), professor of physics at the university of Pisa, and afterwards director of the museum at Florence, had already anticipated the invention in 1775, though no doubt this fact was unknown to Rittenhouse. His researches were published in the *Transactions of the American Philosophical Society* (1785–1799). He died at Philadelphia on the 26th of June 1796.

See *Memoir* (1813) by William Barton.

RITTER, HEINRICH (1791–1869), German philosopher, was born at Zerbst on the 21st of November 1791, and died at Göttingen on the 3rd of February 1869. He studied philosophy and theology at Göttingen and Berlin until 1815. In 1824 he became extraordinary professor of philosophy at Berlin, whence he was transferred to Kiel, where he occupied the chair of philosophy from 1833 to 1837. He then accepted a similar position at the university of Göttingen, where he remained till his death. His chief work was a history of philosophy (*Geschichte der Philosophie*) published in twelve volumes at Hamburg from 1829 to 1853. This book is the product of a wide and thorough knowledge of the subject aided by an impartial critical faculty, and its value is demonstrated by the fact that it has been translated into almost all the languages of Europe. He wrote also accounts of ancient schools of philosophy, the Ionians, the Pythagoreans and the Megarians. Beside these important historical works, he published a large number of treatises of which the following may be mentioned: *Versuch zur Verständigung über die neueste deutsche Philosophie zeit Kant* (1853); *Die christliche Philosophie bis auf die neuesten Zeiten* (2 vols., 1858–59), a work which supplemented the *Geschichte; Abriss der philosophischen Logik* (1824); *Ueber das Verhältnis der Philosophie zum Leben* (1835); *Historia philosophiae Graeco-Romanae* (in collaboration with Preller, 1838; 7th ed., 1888); *Kleine philosophische Schriften* (1839–40); *System der Logik und Metaphysik* (1856); *Encyklopädie der philosophischen Wissenschaften* (1862–64); *Ernest Renan, über die Naturwissenschaften und die Geschichte* (1865); *Ueber das Böse und seine Folgen* (1869). Of these latter, the one best known in England is the History of Greek and Roman Philosophy, which, by reason of the excellence of its arrangement and its judicious quotations and notes, is almost indispensable to the student of ancient philosophy.

RITTER, KARL (1779–1859), German geographer, was born at Quedlinburg on the 7th of August 1779, and died in Berlin on the 28th of September 1859. His father, a physician, left his family in straitened circumstances, and Karl was received into the Schnepfenthal institution then just founded by Christian Gotthilf Salzmann (1744–1811) for the purpose of testing his educational theories. The Salzmann system was practically that of Rousseau; conformity to natural law and enlightenment were its watchwords; great attention was given to practical life; and the modern languages were carefully taught, to the complete exclusion of Latin and Greek. Ritter already showed geographical aptitude, and when his schooldays were drawing to a close his future course was determined by an introduction to Bethmann Hollweg, a banker in Frankfort. It was arranged that Ritter should become tutor to Hollweg's children, but that in the meantime he should attend the university at his patron's expense. His duties as tutor in the Hollweg family began at Frankfort in 1798 and continued for fifteen years. The years 1814–19, which he spent at Göttingen in order still to watch over the welfare of his pupils, were those in which he began to devote himself exclusively to geographical inquiries. He had already travelled extensively in Europe when in 1817–18 he brought out his first masterpiece, *Die Erdkunde im Verhältnis zur Natur und zur Geschichte des Menschen* (Berlin, 2 vols., 1817–1818). In 1819 he became professor of history at Frankfort, and in 1820 professor extraordinarius of history at Berlin, where shortly afterwards he began also to lecture at the military college. He remained in this position till his death. The second edition of his *Erdkunde* (1822–58) was conceived on a much larger scale than the first, but he completed only the sections on Africa and the various countries of Asia. The service rendered to geography by Ritter was especially notable because he brought to his work a new conception of the subject. Geography was, to use his own expression, a kind of physiology and comparative anatomy of the earth: rivers, mountains, glaciers, &c., were so many distinct organs, each with its own appropriate functions; and, as his physical frame is the basis of the man, determinative to a large extent of his life, so the structure of each country is a leading element in the historic progress of the nation. Moreover, Ritter was a scientific compiler of the first rank. Among his minor works may be mentioned *Vorhalle europäischer Völkergeschichten vor Herodot* (Berlin, 1820); *Die Stupas . . . an der indobaktrischen Königsstrasse und die Kolosse von Bamiyan* (1838); *Einleitung zur allgemeinen vergleichenden Geographie* (Berlin, 1852); "Bemerkungen über Veranschaulichungsmittel räumlicher Verhältnisse bei graphischen Darstellungen durch Form u. Zahl," in the *Trans.* of the Berlin Academy, 1828. After his death selections from his lectures were published under the titles *Geschichte der Erdkunde* (1861), *Allgemeine Erdkunde* (1862), and *Europa* (1863). Several of his works (*e.g.* the "Palestine" volumes of his Erdkunde) were translated into English. "Karl Ritter" foundations were established in his memory at Berlin and Leipzig, for the furtherance of geographical study.

See G. Kramer, *Karl Ritter, ein Lebensbild* (Halle, 1864 and 1870; 2nd ed., 1875); W. L. Gage, *The Life of Karl Ritter* (London, 1867); F. Marthe, "Was bedeutet Karl Ritter für die Geographie," in *Zeitsch. der Ges. f. Erdk.* (Berlin, 1879). All Ritter's works mentioned above were published at Berlin.

RITUAL (from Lat. *ritus*, a custom, especially a religious rite or custom), a term of religion, which may be defined as the routine of worship. This is a "minimum definition"; "ritual" at least means so much, but may stand for more. Without some sort of ritual there could be no organized method in religious worship. Indeed, viewed in this aspect, ritual is to religion what habit is to life, and its *rationale* is similar, namely, that by bringing subordinate functions under an effortless rule it permits undivided attention in regard to vital issues. This analogy—for it is safer to regard such applications of individual psychology to social phenomena as only analogies—may be carried a step further. Just as the main business of habit is to secure bodily equilibrium in order to allow free play to the mental life, so the chief task of routine in religion is to organize the activities necessary to its stability and continuance as a social institution, in order that all available spontaneity and initiative may be directed into spiritual channels. Such organization will naturally affect far more than the forms of worship; but these at least, to judge from the past history of religion, cannot but submit extensively to its influence. The nature of religion, as the sociologist understands it, is bound up with its congregational character. In order that inter-subjective relations should be maintained between fellow-worshippers, the use of one or another set of conventional symbols is absolutely required; for example, an intelligible vocabulary of meet expressions, or (since this is, perhaps, not indispensable) at any rate sounds, sights, actions and so on, that have come by prescription to signify the common purpose of the religious society, and the means taken in common for the realization of that purpose. In this sense, the term "ritual," as meaning the prescribed ceremonial routine, is also extended to observances not strictly religious in character.

But, whilst ritual at least represents routine, it tends, historically speaking, to have a far deeper significance for the religious consciousness. A recurrent feature of religion, which many students of its phenomena would even consider constant and typical, is the attribution of a more or less self-contained and automatic efficacy to the ritual procedure as such. Before proceeding to considerations of genesis, it will be convenient briefly to analyse the notion as it appears in the higher religions. Two constituent lines of thought may be distinguished. Firstly, there is the tendency to pass beyond the purely petitionary attitude which as such can imply no more than the desire, hope or expectation of divine favour, and to take for granted the consummation sought, a deity that answers, a grace and blessing that are communicated. Only when such accomplishment of its end is assumed can efficacy be held to attach to the act of worship. Secondly, there is the tendency to identify such a self-accomplishing act of worship with its objective expression in the ritual that for purposes of mutual understanding makes the body of worshippers one.

The Magical Element in Ritual.—Exactly similar tendencies—to impute efficacy, and to treat the ritual procedure as the source of that efficacy—are typically characteristic of magic, and their reappearance in religion can hardly be treated as a coincidence, seeing that magic and religion would appear to have much in common, at any rate during the earlier stages of their development. In magic a suggestion is made orally, or by dramatic action, or most often in both ways together, that is held *ipso facto* to bring about its own accomplishment. A certain conditionality attaches to the magical operation, inasmuch as each magician is subject to interference on the part of other magicians who may neutralize his spell by a counter spell of equal or greater power; nevertheless, the intrinsic tone is that of a categorical assertion of binding force and efficacy. Again, in magic the self-realizing force is apt to seem to reside in the suggestional machinery rather than in the spiritual qualifications of the magician, though this is by no means invariably the case. On the whole, however, spells and ceremonies are wont to be regarded as an inheritable and transferable property containing efficacy in themselves. And what is true of magic is equally true of much of primitive, and even of relatively advanced, religion. Dr J. G. Frazer has pronounced the following to be marks of a primitive ritual: negatively, that there are no priests, no temples and no gods (though he holds that departmental, non-individual "spirits" are recognized); positively, that the rites are magical rather than propitiatory (*The Golden Bough*, 2nd ed. ii. 191). If we leave it an open question whether, instead of "spirits," it would not be safer to speak of "powers" (to which not a soul-like nature, but simply a capacity for exercising magic, is attributed), this characterization may be accepted as applying to many, if not to all, the rites of primitive religion. Thus the well-known totemic ceremonies of Central Australia afford a striking example of rites of a deeply religious import—in the sense that the purpose they embody is that of consecrating certain functions of the common life (see RELIGION)—yet almost wholly magical in form. They resolve themselves on analysis into (1) direct acts of magical suggestion, and (2) acts commemorative of the magical doings of mythical ancestors, the purport of which may be regarded as indirectly and constructively magical, on the principle that in magic to mention a thing's origin is to control it, to recount another's wonder-working is to reproduce his power, and so on. It is to be noted, however, that other Australian rites are found, notably those that accompany initiation in the south-eastern region, over which anthropomorphic beings having enough individuality to rank as "gods" undoubtedly preside; but even here, though traces of propitiatory worship may be discernible (the evidence being scanty and conflicting), acts of pure magic are decidedly to the fore. And what is true of the most primitive and unreflective forms of cult remains true of more advanced types which have become relatively self-conscious. There is little or no felt opposition between processes implying control and processes of a propitiatory character in the religion of the Pueblo Indians, which American ethnologists have been so successful in expounding, or, to mount to a still higher level, in the Vedic, Assyrian or Egyptian cults. The leading idea, we may even say, is that expressed so happily by a character in Renan's *Le Prêtre de Némi*: "L'ordre du monde dépend de l'ordre des rites qu'on observe" (cf. A. Lang, *Myth, Ritual and Religion*, 2nd ed. i. 251). As regards the most developed forms of religion, whilst the old procedure largely survives unchanged, its original intention is disowned by theologians, though it may be doubted if the popular mind is always strong enough to withstand the appeal of prima facie appearance.

This proneness to impute efficacy to ritual is immensely reinforced by another social proclivity, more or less distinct in its ultimate nature, which causes the rite to rank as a divine ordinance or command. Naturally if the god manifests himself by means of certain forms, if he is reputed to have founded or revealed them, or if he has been known to evince displeasure at departures from them, there is strong reason to think that such forms are efficacious, and that in a sense of themselves, namely, by being what they are. At the sociological level of thought this divine sanction has to be treated as the echo of a social sanction which ratifies and protects religious custom. In early society the influence of what Walter Bagehot (in *Physics and Politics*, 9th ed. p. 102) calls the "persecuting tendency" in enforcing custom is on the whole not markedly in evidence. The fact is that imitation in a homogeneous group produces such unanimity that, with the help of some education, notably the instruction given at the time of initiation, all non-conformity is nipped in the bud. Of the Central Australian ceremonies we read that they "had to be performed in precisely the same way in which they had been in the Alcheringa (lit. 'dream-time'=age of mythical tribal ancestors). Everything was ruled by precedent; to change even the decoration of a performer would have been an unheard-of thing; the reply, 'It was so in the Alcheringa,' was considered as perfectly satisfactory by way of explanation" (B. Spencer and F. Gillen, *The Native Tribes of Central Australia*, 324). Here we perceive the social sanction of public opinion insensibly merging in a supernatural sanction. The tribe is a religious partnership with a divine past with which it would not willingly break. As Mr Lang well puts it, "Ritual is preserved because it preserves luck" (*loc. cit.*). Given an intrinsic sacredness, it is but a step to associate definite gods with the origin or purpose of a rite, whose interest it thereupon becomes to punish omissions or innovations by the removal of their blessing (which is little more than to say that the rite loses its efficacy), or by the active infliction of disaster on the community. In the primitive society it is hard to point to any custom to which sacredness does not in some degree attach, but, naturally, the more important and solemn the usage, the more rigid the religious conservatism. Thus there are indications that in Australia, at the highly sacred ceremony of circumcision, the fire-stick was employed after stone implements were known; and we have an exact parallel at a higher level of culture, the stone implement serving for the same operation when iron is already in common use (Spencer and Gillen, ib. 401; cf. E. B. Tylor, *Early History of Mankind*, 3rd ed. p. 217).

The Interpretation of Ritual.—A valuable truth insisted on by the late W. Robertson Smith (*Religion of the Semites*, 17 sqq.) is that in primitive religion it is ritual that generates and sustains myth, and not the other way about. Sacred lore of course cannot be dispensed with; even Australian society, which has hardly reached the stage of having priests, needs its *Oknirabata* or "great instructor" (Spencer and Gillen, ib. 303). The function of such an expert, however, is chiefly to hand on mere rules for the performance of religious acts. If his lore include sacred histories, it is largely, we may suspect, because the description and dramatization of the doings of divine persons enter into ritual as a means of magical control. Similarly, the sacred books of the religions of middle grade teem with minute prescriptions as to ritual, but are almost destitute of doctrine. Even in the highest religions, where orthodoxy is the main requirement, and ritual is held merely to symbolize dogma, there is a remarkable rigidity about the dogma that is doubtless in large part due to its association with ritual forms many of them bearing the most primeval stamp. As regards the symbolic interpretation of ritual, this is usually held not to be primitive; and it is doubtless true that an unreflective age is hardly aware of the difference between "outward sign" and "inward meaning," and thinks as it were by means of its eyes. Nevertheless, it is easier to define fetishism (a fetish "differing from an idol in that it is worshipped in its own character, not as the symbol, image or occasional residence of a deity," *New English Dictionary*, Oxford, 1901) than it is to bring such a fetishism home to any savage people, the West African negroes not excluded (cf. A. B. Ellis, *The Tshi-speaking Peoples of the Gold Coast of W. Africa*, 192). It is the magic power, virtue or grace residing in, and proceeding from, the material object—a power the communicability of which constitutes the whole working hypothesis of the magico-religious performance—that is valued in those cases where native opinion can be tested. Moreover, it must be remembered that in the act of magic a symbolic method is consciously pursued, as witness the very formulas employed: "As I burn this image, so may the man be consumed," or the even more explicit, "It is not wax I am scorching; it is the liver, heart and spleen of So-and-so that I scorch" (W. W. Skeat, *Malay Magic*, 570), where appearance and reality are distinguished in order to be mystically reunited. Now it is important to observe that from the symbol as embodying an imperative to the symbol as expressing an optative is a transition of meaning that involves no change of form whatever; and, much as theorists love to contrast the suggestional and the petitionary attitudes, it is doubtful if the savage does not move quite indifferently to and fro across the supposed frontier-line between magic and religion, interspersing "bluff" with blandishment, spell with genuine prayer. Meanwhile the particular meanings of the detailed acts composing a complicated piece of ritual soon tend to lose themselves in a general sense of the efficacy of the rite as a whole to bring blessing and avert evil. Nay, unintelligibility is so far from invalidating a sacred practice that it positively supports it by deepening the characteristic atmosphere of mystery. Even the higher religions show a lingering predilection for cabalistic formulas.

Changes in Ritual.—Whilst ritual displays an extraordinary stability, its nature is of course not absolutely rigid; it grows, alters and decays. As regards its growth, there is hardly a known tribe without its elaborate body of magico-religious rites. In the exceptional instances where this feature is relatively absent (the Masai of E. Africa offer a case in point), we may suspect a disturbance of tradition due to migration or some similar cause. Thus there is always a pre-existing pattern in accordance with which such evolution or invention as occurs proceeds. Unconscious evolution is perhaps the more active factor in primitive times; imitation is never exact, and small variations amount in time to considerable changes. On the other hand, there is also deliberate innovation. In Australia councils of the older men are held day by day during the performance of their ceremonies, at which traditions are repeated and procedure determined, the effect being mainly to preserve custom but undoubtedly in part also to alter it. Moreover, the individual religious genius exercises no small influence. A man of a more original turn of mind than his fellows will claim to have had a new ceremony imparted to him in a vision, and such a ceremony will even be adopted by another tribe which has no notion of its meaning (Spencer and Gillen, ib. 272, 278, 281 n.). Meanwhile, since little is dropped whilst so much is being added, the result is an endless complication and elaboration of ritual. Side by side with elaboration goes systematization, more especially when local cults come to be merged in a wider unity. Thereupon assimilation is likely to take place to one or another leading type of rite—for instance, sacrifice or prayer. At these higher stages there is more need than ever for the expert in the shape of the priest, in whose hands ritual procedure becomes more and more of a conscious and studied discipline, the naïve popular elements being steadily eliminated, or rather transformed. Not but what the transference of ritualistic duties to a professional class is often the signal for slack and mechanical performance, with consequent decay of ceremonial. The trouble and worry of having to comply with the endless rules of a too complex system is apt to operate more widely—namely, in the religious society at large—and to produce an endless crop of evasions. Good examples of these on the part alike of priests and people are afforded by Toda religion, the degenerate condition of which is expressly attributed by Dr W. H. R. Rivers to "the over-development of the ritual aspect of religion" (*The Todas*, 454–55). It is interesting to observe that a religion thus atrophied tends to revert to purely magical practices, the use of the word of power, and so on (ib. ch. x.). It is to be noted, however, that what are known as ritual substitutions, though they lend themselves to purposes of evasion (as in the well-known case of the Chinese use of paper money at funerals), rest ultimately on a principle that is absolutely fundamental in magico-religious theory—namely, that what suggests a thing because it is like it or a part of it becomes that thing when the mystic power is there to carry the suggestion through.

The Classification of Rites.—More than one basis of division has suggested itself. From the sociological point of view perhaps the most important distinction in use is that between public and private rites. Whilst the former essentially belong to religion as existing to further the common weal, the latter have from the earliest times an ambiguous character, and tend to split into those which are licit—"sacraments," as they may be termed—and those which are considered anti-social in tendency, and are consequently put beyond the pale of religion and assigned to the "black art" of magic. Or the sociologist may prefer to correlate rites with the forms of social organization—the tribe, the phratry, the clan, the family and so on. Another interesting contrast (seeing how primary a function of religion it is to establish a calendar of sacred seasons) is that between periodic and occasional rites—one that to a certain extent falls into line with the previous dichotomy. A less fruitful method of classing rites is that which arranges them according to their inner meaning. As we have seen, such meaning is usually acquired *ex post facto*, and typical forms of rite are used for many different purposes; so that attempts to differentiate are likely to beget more equivocations than they clear up. The fact is that comparative religion must be content to regard all its classifications alike as pieces of mere scaffolding serving temporary purposes of construction.

Negative Rites.—A word must be added on a subject dealt with elsewhere (see TABOO, GENNA), but strictly germane to the matter in hand. What have the best, if not the sole, right to rank as taboos are ritual interdictions (see M. Mauss in *L'Année sociologique*, ix. 249). Taboo, as understood in Polynesia, the home of the word, is as wide as, and no wider than, religion, representing one side or aspect of the sacred (see RELIGION). The very power that can help can also blast if approached improperly and without due precautions. Taboos are such precautions, abstinences prompted, not by simple dread or dislike, but always by some sort of respect as felt towards that which in other circumstances or in other form has healing virtue. Thus the negative attitude of the observer of taboo involves a positive attitude of reverence from which it becomes in practice scarcely distinguishable. To keep a fast, for instance, is looked upon as a direct act of worship. It must be noted, too, that, whereas taboo as at first conceived belongs to the magico-religious circle of ideas, implying a quasi-physical transference of sacredness from what has it to one not fit to receive it, it is very easily reinterpreted as an obligation imposed by the deity on his worshippers. The law observed by a primitive religious community abounds in negative precepts, and if early religion tends to be a religion of fear it is because the taboo-breaker provides the most palpable objective for human and divine sanctions. In the higher religions, to be pure remains amongst the most laudable of aspirations, and, even though the ceremonial aversion of a former age has become moralized, and a purity of heart set up as the ideal, it is on "virtues of omission" that stress is apt to be laid, so that a timorous propriety is too often preferred to a forceful grappling with the problems of life. There are signs, however, that the religious consciousness has at length come to appreciate the fact that the function of routine in religion as elsewhere is to clear the way for action.

BIBLIOGRAPHY.—A comprehensive study of ritual as such from the comparative standpoint remains yet to be written. Some leading ideas on the subject are struck out by E. B. Tylor, *Primitive Culture*^{9} (1903), ch. 18; and A. Lang, *Myth, Ritual and Religion*^{2} (1899); whilst the whole of J. G. Frazer's vast collection of facts in *The Golden Bough*^{2} (1900) illustrates ritual, more especially on its magical side; see also W. Robertson Smith, *Lectures on the Religion of the Semites* (1889). A very valuable work of restricted range but embodying a method that might fruitfully be applied to the whole subject of ritual is H. Hubert and M. Mauss, "Essai sur la nature et sur la fonction du sacrifice" in *L'Année sociologique*, ii.; in close connexion with the above should be studied S. Lévi, *La Doctrine du sacrifice dans les Brâhmanas* (1899); W. Caland and V. Henry, *L'Agnistoma, description complète de la forme normale du sacrifice de Soma dans le culte védique* (1906); see also H. Oldenberg, *Die Religion des Veda* (1894); A. Hillebrant, *Ritual Litteratur: Vedische Opfer und Zauber* (1896). Admirable descriptions of Australian ritual are to be found in B. Spencer and F. J. Gillen, *The Native Tribes of Central Australia* (1899) and *The Northern Tribes of Central Australia* (1904). On North American rituals very excellent studies exist in A. C. Fletcher, "The Hako: A Pawnee Ceremony," in *22nd Report of Bureau of American Ethnology*; see also various papers by the same authoress in *Peabody Reports*; likewise in J. W. Fewkes, "Tusayan Katchinas," in *15th Rep. of B. of A. Eth.*; and *id.*, "Hopi Katchinas," in *21st Rep.*; M. C. Stevenson, "The Zuñi Indians," in *23rd Rep.*; cf. F. H. Cushing, "Zuñi Fetiches," in *2nd Rep.* The following works pay special attention to ritual

features: L. R. Farnell, *The Cults of the Greek States* (1896–1907); A. Moret, *Le Rituel du culte divin journalier en Égypte* (1902); A. de Marchi *Il culto privato di Roma antica* (1902). (R. R. M.)

RITUAL MURDER, a general term for human sacrifice in connexion with religious ceremonies. False accusations as to the practice of ritual murder by Jews and Christians have often been made. "The Christians of the second and third centuries suffered severely under them" (Strack). Justin Martyr (150–160) in his Second Apology (ch. 12) vigorously defends the Christian community against this charge; Octavius, Minucius Felix, Tertullian, Origen and other Church Fathers all refer to the subject and indignantly repudiate the atrocious libel that the Eucharist involved human sacrifice. The myth was revived against the Montanists, and in the later middle ages against various sects of heretical Christians. In recent years the accusation has been again levelled against "foreigners" during the disturbances in China. The chief sufferers, however, from the charge were the Jews. The charge was never coherently defined, but a notion prevailed that at the Passover Christian blood was used in Jewish rites. For this belief there is no foundation whatever, as is proved in the classical treatise[1] on the subject by Hermann L. Strack, Regius Professor of Theology at Berlin University. The first occasion on which the medieval Jews were accused of the murder of a Christian child was at Norwich in 1144. In the following century other instances of the charge occurred on the Continent, and by this time (middle of the 13th century) the legend had grown into a belief that "the Jews of every province annually decide by lot" which congregation or town is to be the scene of the mythical murder. It is easy to understand how in ages when the Jews were everywhere regarded with superstitious awe, such stories to their detriment would find ready credence, but the revival of the myth in recent times by the anti-Semite is a deplorable instance of degeneration. It is only necessary here to refer to the Lincoln case (1255), the Trent case (1475) and more recently the Damascus case (1840), the Tisza-Eszlar affair (1882), the Xanten charge (1891) and the Polna case (1899). All of these charges—sometimes invented by malicious seceders from the Jewish fold—were followed by spoliation and tragic persecution of the Jews. On the other hand many Jewish proselytes to Christianity have strenuously defended the Jews from the charge, among them may be particularly named Prof. D. Chwolson (*Blutanklage*, 1901). In 1840 a protest against the charge was signed by 58 Jewish-Christians, the list being headed by M. S. Alexander, Anglican bishop at Jerusalem. Further testimonies of a similar kind are collected in Strack (*op. cit.* p. 239). Many of the popes have issued bulls exonerating the Jews (cf. Strack, p. 250); similarly temporal princes have often taken a similar step (ibid. p. 260). Many Christian scholars and ecclesiastics have felt it their duty to utter protests in favour of the Jews. Among them have been the most eminent Christian students of Rabbinism of recent times, *e.g.* Professors Alexander McCaul, P. Lagarde, Franz Delitzsch, A. Merx, T. Nöldeke, C. Siegfried, A. Wünsche, G. H. Dalman and J. von Döllinger. A careful examination of the evidence (with a complete acquittal of the Jews) is contained in a notable work by a Catholic priest, F. Frank, *Der Ritualmord vor den Gerichtshöfen der Wahrheit und der Gerechtigkeit* (1901, 1902). The literature on the other side is entirely antisemitic and in no instance has it survived the ordeal of criticism. The most notorious exponent of the charge was A. Rohling, the worthlessness of whose writings on the subject is exposed by (among many others) Strack (*op. cit.* pp. 155 seq.).

A list of some of the most important of the cases is given by J. Jacob in the *Jewish Encyclopedia*, iii. 266–67. (I. A.)

RIVA, a fortified district town of Tirol, Austria, near the Italian frontier. Pop. (1900) 7550. It is a lake port and steamship station at the northern extremity of the Lago di Garda. There are two forts on the Monte Brione a little over a mile north-east of the town, and the old castle of La Rocca was reconstructed and extended in accordance with modern requirements in 1850. The Minorite Church (1603), with altar pictures by Guido Reni and other Italian painters, is much frequented as a place of pilgrimage. In addition to its transit trade and the entertainment of visitors, the principal resources of the town are the manufacture of paper, iron wares and pottery, the cultivation of the silk-worm and the olive tree, and a considerable commerce in timber, planks and coal. Riva is connected with the Ledro valley by a picturesque road which passes in a series of tunnels and galleries along the rocky and precipitous west shore of the lake.

RIVAL, one who competes with another, one who strives to out-do or excel another or to gain an object or end before or in preference to another. The Latin *rivalis*, which was in classical Latin used of a competitor in love, meant by derivation one who used the same brook or stream (*rivus*) as another, hence a neighbour; thus in the *Digest*, xliii. 20, i. 26, "si inter *rivales*, id est qui per eundem rivum aquam ducunt, sit contentio de aquae usu." The term naturally applied more particularly to those who lived on opposite sides of a stream which would be a frequent subject of dispute as to rights.

RIVAROL, ANTOINE DE (1753–1801), French writer and epigrammatist, was born at Bagnols in Languedoc on the 26th of June 1753, and died at Berlin on the 11th of April 1801. It seems that his father was an innkeeper but a man of cultivated tastes. The son assumed the title of comte de Rivarol, and asserted his connexion with a noble Italian family, but his enemies said that the name was really Riverot, and that the family was not noble. After various vicissitudes he appeared in Paris in 1777. After winning some academic prizes, Rivarol distinguished himself in the year 1784 by a treatise *Sur l'universalité de la langue française*, and by a translation of the *Inferno*. The year before the Revolution broke out he, with some assistance from a man of similar but lesser talent, Champcenetz,[2] compiled a lampoon, entitled *Petit Almanach de nos grands hommes pour 1788*, in which some writers of actual or future talent and a great many nobodies were ridiculed in the most pitiless manner. When the Revolution developed the importance of the press, Rivarol at once took up arms on the Royalist side, and wrote in the *Journal politique* of Antoine Sabatier de Castres (1742–1817) and the *Actes des Apôtres* of Jean Gabriel Peltier (1770–1825). But he emigrated in 1792, and established himself at Brussels, whence he removed successively to London, Hamburg and Berlin. Rivarol has had no rival in France except Piron in sharp conversational sayings. These were mostly ill-natured, and mostly have a merely local application. Their brilliancy, however, can escape no one. His brother, Claude François (1762–1848), was also an author. His works include *Isman, ou le fatalisme* (1795), a novel; *Le Véridique* (1827), comedy; *Essai sur les causes de la révolution française* (1827).

The works of Antoine de Rivarol were published in five volumes (Paris, 1805); selections (Paris, 1858) with introductory matter by Sainte-Beuve and others, and that edited in 1862 (2nd ed., 1880) by M. de Lescure, may be specified. See also M. de Lescure's *Rivarolet la société française pendant la révolution et l'émigration* (1882), and Le Breton's *Rivarol, sa vie, ses idées* (1895).

RIVE-DE-GIER, a town of east-central France, in the department of Loire, 14 m. E.N.E. of St Étienne, on the railway to Lyons. Pop. (1906) 15,338.

Situated on the Gier and the Canal de Givors, it is principally dependent on the coal industry, giving its name to a coal-basin which is a continuation of that of St Étienne. It has glass works, the products of which are celebrated on account of the fineness and purity of the sand found on the banks of the Rhone and the Saône. There are also iron and steel works where iron goods and ironmongery of all kinds are manufactured.

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[1] *Das Blut im Glauben und Aberglauben* (Eng. trans., *The Jew and Human Sacrifice*, London, 1909).

[2] Louis René Quantin de Richebourg, Chevalier de Champcenetz (1760–1794), died on the scaffold. He is not to be confounded with Louis Pierre, marquis de Champcenetz, governor of the Tuileries in 1789, who escaped in 1792 through the protection of Mme. Elliott, mistress of the duc d'Orléans.

Rive-de-Gier is a place of some antiquity, as appears from remains of Gallo-Roman buildings, and mosaics and coins found at various times. In the time of Henry IV. the working of the mines had already given to the locality a measure of importance.

RIVER, any considerable stream of water flowing in a defined channel. The origin and subsequent formation of rivers and the valleys along which they flow are considered under GEOGRAPHY, § *Principles of Geography*, and GEOLOGY, § viii. The word "river" is an adaptation of the O. Fr. *rivere* (mod. *rivière*), which descends through Med. Lat. *rivera*, Low. Lat. *riparia*, in the sense of river-bank and river, from *ripa*, bank. The Latin for a stream or river is *rivus*, whence *rivulas*, a small stream, Eng. "rivulet," which is, therefore, distinct in origin from "river," though probably the sense of *rivus* influenced the Med. Lat. *rivera*. The etymology of *rivus* and *ripa* is disputed; some scholars refer both to the root *ri-*, to drop, flow; others take *ripa* to be from the root seen in Gr. ἐρείπειν, to tear, English "rive," the sense being a broken cliff or steep bank.

RIVER BRETHREN, the name of a group of three Christian communities in the United States of America, descended from Swiss settlers near the Susquehanna river in Pennsylvania in 1750. The first pastor was Jacob Engle, who became head of the community in 1770. Their system is based on literal obedience to the commands of the New Testament, and they have points of similarity both with the Mennonites and with the Dunkards. They practise foot-washing and baptism by trine immersion; are strict sabbatarians and simple in their manner of life. The three branches are: (1) *The Brethren in Christ*, who are the most elaborately organized and are numerous in Ohio, Pennsylvania and Kansas; they have also formed churches in New York and in Canada, and missions in South Africa, India and Texas. In 1909 they had 174 ministers, and 65 churches with 3675 communicants. (2) *The Old Order*, or *Yorker Brethren*, consists of a small body which separated from the main body in 1843 and maintained more strictly the original practice. They are found specially in York county, Pennsylvania (whence the name "Yorkers"). In 1909 they had 24 ministers, 9 churches, and 423 communicants. (3) *The United Zion's Children* date from 1853, when a small body left the parent communion on minor questions of administration. They had in 1909 22 ministers and 28 churches with 749 communicants, all in Pennsylvania.

RIVER ENGINEERING. Before undertaking works for the improvement of rivers, either with the object of mitigating the effects of their inundations, or for increasing and extending their capabilities for navigation, it is most important that their physical characteristics should be investigated in each case, for these vary greatly in different rivers, being dependent upon the general configuration of the land, the nature of the surface strata and the climate of the country which the rivers traverse.

Physical Characteristics of Rivers

The size of rivers above any tidal limit and their average fresh-water discharge are proportionate to the extent of their basins, and the amount of rain which, falling over these basins, reaches the river channels in the bottom of the valleys, by which it is conveyed to the sea.

River Basins.—The basin of a river is the expanse of country, bounded by a winding ridge of high ground, over which the rainfall flows down towards the river traversing the lowest part of the valley; whereas the rain falling on the outer slope of the encircling ridge flows away to another river draining an adjacent basin. River basins vary in extent according to the configuration of the country, ranging from the insignificant drainage-areas of streams rising on high ground very near the coast and flowing straight down into the sea, up to immense tracts of great continents, when rivers, rising on the slopes of mountain ranges far inland, have to traverse vast stretches of valleys and plains before reaching the ocean. The size of the largest river basin of any country depends on the extent of the continent in which it is situated, its position in relation to the hilly regions in which rivers generally rise and the sea into which they flow, and the distance between the source and the outlet of the river draining it.

Great Britain, with its very limited area, cannot possess large river basins, its largest being that of the Thames with an area of 5244 sq. m. Even on the mainland of Europe, river basins augment in extent on proceeding eastwards with the increasing width of the continent; in France the largest basin is that of the Loire with an area of 45,000 sq. m., while the Rhine has a basin of 86,000 sq. m. with a length of 800 m., the Danube a basin of 312,000 sq. m. with a length of 1700 m., and the Volga a basin of 563,000 sq. m. with a length of 2000 m. The more extensive continents of Asia, Africa and North and South America possess still larger river basins, the Obi in Siberia having a basin of about 1,300,000 sq. m. and a length of 3200 m., the Nile a basin of 1,500,000 sq. m. with a length of over 4000 m., and the Mississippi, flowing from north to south, having a basin of 1,244,000 sq. m. with a length of 4200 m. The vast basin of the Amazon of 2,250,000 sq. m. is due to the chain of the Andes almost bordering the Pacific coast-line, so that the river rising on its eastern slopes has to traverse nearly the whole width of South America at its broadest part before reaching the Atlantic Ocean.

Available Rainfall.—The rainfall varies considerably in different localities, both in its total yearly amount and in its distribution throughout the year; also its volume fluctuates from year to year. Even in small river basins the variations in rainfall may be considerable according to differences in elevation or distance from the sea, ranging, for instance, in the Severn basin, with an area of only 4350 sq. m., from an average of under 30 in. in the year to over 80 in. The proportion, moreover, of the rain falling on a river basin which actually reaches the river, or the available rainfall in respect to its flow, depends very largely on the nature of the surface strata, the slope of the ground and the extent to which it is covered with vegetation, and varies greatly with the season of the year. The available rainfall has, indeed, been found to vary from 75% of the actual rainfall on impermeable, bare, sloping, rocky strata, down to about 15% on flat, very permeable soils.

Fall of Rivers.—The rate of flow of rivers depends mainly upon their fall, though where two rivers of different sizes have the same fall, the larger river has the quicker flow, as its retardation by friction against its bed and banks is less in proportion to its volume than that of the smaller river. The fall of a river corresponds approximately to the slope of the country it traverses; and as rivers rise close to the highest part of their basins, generally in hilly regions, their fall is rapid near their source and gradually diminishes, with occasional irregularities, till, in traversing plains along the latter part of their course, their fall usually becomes quite gentle. Accordingly, in large basins, rivers in most cases begin as torrents with a very variable flow, and end as gently flowing rivers with a comparatively regular discharge.

Variations in the Discharge of Rivers.—The irregular flow of rivers throughout their course forms one of the main difficulties in devising works, either for mitigating inundations or for increasing the navigable capabilities of rivers. In tropical countries, subject to periodical rains, the rivers are in flood during the rainy season and have hardly any flow during the rest of the year; whilst in temperate regions, where the rainfall is more evenly distributed throughout the year, evaporation causes the available rainfall to be much less in hot summer weather than in the winter months, so that the rivers fall to their low stage in the summer and are very liable to be in flood in the winter. In fact, with a temperate climate, the year may be divided into a warm and a cold season, extending from May to October and from November to April respectively; the rivers are low and moderate floods are of rare occurrence during the first period, and the rivers are high and subject to occasional heavy floods after a considerable rainfall during the second period in most years. The only exceptions are rivers which have their sources amongst mountains clad with perpetual snow, and are fed by glaciers; their floods occur in the summer from the melting of the snows and ice, as exemplified by the Rhone above the Lake of Geneva, and the Arve which joins it below. But even these rivers are liable to have their flow modified by the influx of tributaries subject to different conditions, so that the Rhone below Lyons has a more uniform discharge than most rivers, as the summer floods of the Arve are counteracted to a great extent by the low stage of the Saône flowing into the Rhone at Lyons, which has its floods in the winter when the Arve on the contrary is low.

Transportation of Materials by Rivers.—Another serious obstacle encountered in the improvement of rivers consists in the large quantity of detritus brought down by them in flood-time, derived mainly from the disintegration of the surface-layers of the hills and slopes in the upper parts of the valleys by glaciers, frost and rain. The power of a current to transport materials varies with its velocity, so that torrents with a rapid fall near the sources of rivers can carry down rocks, boulders and large stones, which are by degrees ground by attrition in their onward course into shingle, gravel, sand and silt, simultaneously with the gradual reduction in fall, and, consequently, in the transporting force of the current. Accordingly, under ordinary conditions, most of the materials brought down from the high lands by the torrential water-courses are carried forward by the main river to the sea, or partially strewn over flat alluvial plains during floods; and the size of the materials forming the bed of the river or borne along by the stream is gradually reduced on proceeding seawards, so that in the Po, for instance, pebbles and gravel are found for about 140 m. below Turin, sand along the next 100 m., and silt and mud in the last 110 m. When, however, the fall is largely and abruptly reduced, as in the case of rivers emerging straight from mountainous slopes upon flat plains, deposit necessarily occurs, from the materials being either too large or too great in volume to be borne along by the enfeebled current; and if the impeded river is unable to spread this detritus over the plains, its bed becomes raised by deposit, causing the river in flood-time to rise to a higher level. The materials, moreover, which are carried in suspension or rolled along the bed of the river to the sea, tend to deposit when the flow of the river slackens and is finally brought to rest on encountering the great inert mass of the sea, especially in the absence of a tide and any littoral current, and this is the cause of the formation of deltas with their shallow outlets, barring the approach to many large rivers.

Influence of Lakes on Rivers.—Sometimes a peculiar depression along part of a valley, with a rocky barrier at its lower end, causes the formation of a lake in the course of the river flowing down the valley. The intervention of a lake makes the river, on entering at the upper end, deposit all the materials with which it is charged in the still waters of the lake; and it issues at the lower end as a perfectly clear stream, which has also a very regular discharge, as its floods, in flowing into the lake, are spread over a large surface, and so produce only a very slight raising of the level. This effect is illustrated by the river Rhone, which enters the Lake of Geneva as a very turbid, torrential, glacier stream, and emerges at Geneva as a sparkling, limpid river with a very uniform flow, though in this particular case the improvement is not long maintained, owing to the confluence a short distance below Geneva of the large, rapid, glacial river, the Arve.

The influence of lakes on rivers is, indeed, wholly beneficial, in consequence of the removal of their burden of detritus and the regulation of their flow. Thus the Neva, conveying the outflow from Lake Ladoga to the Baltic, is relieved by the lake from the detritus brought down by the rivers flowing into the lake; and the Swine outlet channel of the Oder into the Baltic is freed from sediment by the river having to pass through the Stettiner Haff before reaching its mouth. The St Lawrence, again, deriving most of its supply from the chain of Great Lakes of North America, possesses a very uniform flow.

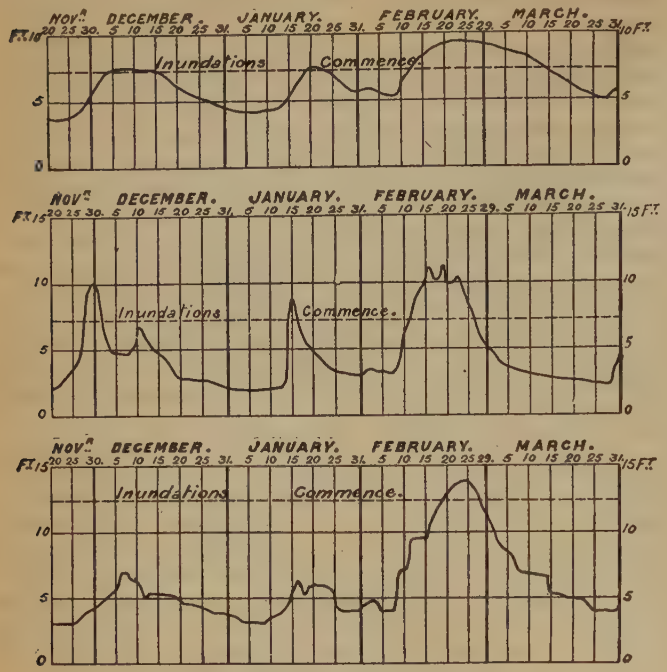
River Channels.—The discharge of the rainfall erodes the beds of rivers along the lowest parts of the valleys; but floods occur too intermittently to form and maintain a channel large enough to contain the flow. A river channel, indeed, generally suffices approximately to carry off the average flow of the river, which, whilst comprising considerable fluctuations in volume, furnishes a sufficiently constant erosive action to maintain a fairly regular channel; though rivers having soft beds and carrying down sediment erode their beds during floods and deposit alluvium in dry weather. As the velocity of a stream increases with its fall, the size of a channel conveying a definite average flow varies inversely with the fall, and the depth inversely with the width. A river channel, accordingly, often presents considerable irregularities in section, forming shallow rapids when the river flows over a rocky barrier with a considerable fall, and consisting of a succession of pools and shoals when the bed varies in compactness and there are differences in width, or when the river flows round a succession of bends along opposite banks alternately.

A river flowing through a flat alluvial plain has its current very readily deflected by any chance obstruction or by any difference in hardness of the banks, and generally follows a winding course, which tends to be intensified by the erosion of the concave banks in the bends from the current impinging against them in altering its direction round the curves. Sometimes also a large river, bringing down a considerable amount of detritus, shifts its course from time to time, owing to the obstruction produced by banks of deposit, as exemplified by the Po in traversing the portion of the Lombardy plains between Casale and the confluence of the Ticino.

Floods of Rivers.—The rise of rivers in flood-time depends not merely on the amount of the rainfall, but also on its distribution and the nature of the strata on which it falls. The upper hilly part of a river basin consists generally of impermeable strata, sometimes almost bare of vegetation; and the rain flowing quickly down the impervious, sloping ground into the water-courses and tributaries feeding the main river produces rapidly rising and high floods in these streams, which soon pass down on the cessation of the rain. The river Marne, draining an impermeable part of the Upper Seine basin, is subject to these sudden torrential floods in the cold season, as illustrated by a diagram of the variations in height of the river at St Dizier from November to March 1903–4 (fig. 2). On the contrary, rain falling on permeable strata takes longer in reaching the rivers; and the floods of these rivers rise more gradually, are less high, continue longer and subside more slowly than in rivers draining impervious strata, as indicated by the diagram of the Little Seine at Nogent during the same period, which has a permeable basin (fig. 1). A main river fed by several tributaries, some from impermeable and others from permeable strata, experiences floods of a mixed character, as shown by the diagram of the same floods in 1903–4 of the Seine at Paris, below the confluence of the torrential Marne and Yonne, where the floods of the gently flowing Upper Seine and other tributaries with permeable basins also contribute to the rise of the river (fig. 3).

High floods are caused by a heavy rainfall on land already sodden by recent rains at a period of the year when evaporation is inactive, and especially by rain falling on melting snow. A fairly simultaneous rainfall over the greater part of a moderate-sized river basin is a tolerably common occurrence; and under such conditions, the floods coming from the torrential tributaries reach their maximum height and begin to subside before the floods from the gently flowing tributaries attain their greatest rise. Exceptional floods, accordingly, only occur in a main river when a heavy rainfall takes place at such periods over different parts of the basin that the floods of the various tributaries coincide approximately in attaining their maximum at certain points in the main river.

Mitigation of Floods and Protection from Inundations.—As the size of the channel of a river is generally quite inadequate to carry down the discharge of floods, the river overflows its banks in flood-time and inundates the adjacent low-lying lands to an extent depending upon the level of the ground and the volume and height of the flood. An enlargement of the bed of the river, principally by deepening it, in order to increase its discharging capacity sufficiently to prevent inundations, is precluded by the cost, and also, in rivers bringing down sediment, by the large deposit that would take place in the enlarged channel from the reduction in the velocity of the current when the flood begins to subside. Where, however, the depth of a tidal river has been considerably increased by dredging for the extension of its sea-going trade, the enlargement of its channel and the lowering of its low-water line have greatly facilitated the passage of land floods from the river above for some distance up, and consequently reduced their height; for instance, the Glasgow quays along the deepened Clyde are no longer subject to inundation, and the lands and quays bordering the Tyne have been relieved from flooding for nearly 10 m. above Newcastle by the deepening of the river from Elswick to the sea (fig. 18).



Flood Diagrams, Seine basin, 1903–1904.
FIG. 1.—Little Seine at Nogent.
FIG. 2.—Marne at St Dizier.
FIG. 3.—Seine at Paris.

Sometimes works are carried out in a river valley for diminishing the height of floods by delaying the discharge of part of the rainfall into the main river; whilst others are designed to increase the discharging efficiency of the river channels. In certain cases, moreover, it is very important to restrict or to prevent the inundation of some riparian districts by embankments; and occasionally low-lying lands are so unfavourably situated that pumping has to be resorted to for the removal of their drainage waters.

Works in River Valleys for diminishing Floods.—Rain falling on bare, impervious, hilly slopes rapidly flows into the nearest water-course, carrying with it any loose soil or disintegrated materials met with in its rush down the ravines, thereby intensifying the torrential character of the river, increasing the height of its floods and adding to the sediment obstructing its course to the sea. By encouraging the growth of vegetation and restricting its use for pasturage, and by planting trees on the mountain slopes, which have often been denuded of their natural covering by the reckless clearing of forests, the flow of the rain off the slopes is retarded; the soil, moreover, is bound together by the roots of the plants, and the surface strata are protected from disintegration by the covering of grass and leaves, so that the amount of detritus carried down into the river is greatly reduced.

Proposals have sometimes been made to reduce the height of floods in rivers and restrict the resulting inundations by impounding some of the flood discharge by the construction of one or more dams across the upper valley of a river, and letting it out when the flood has passed down. This arrangement, however, is open to the objection that in the event of a second flood following rapidly on the first, there might not be time to empty the reservoir for its reception. The cost, moreover, of the formation of such reservoirs could rarely be justified merely for the purpose of reducing the flood-level along an ordinary river valley. Nevertheless, when this provision against floods can be combined with the storage of water-supply for a town, it becomes financially practicable. Thus two masonry dams erected across the narrow valley of the river Furens, a torrential tributary of the Loire, form two reservoirs for the supply of the town of St Étienne, in which the water is kept down several feet below the full level in order to provide for the reception of the surplus flood-waters, and thereby protect St Étienne from inundation. Storage reservoirs also, formed solely for water-supply or irrigation, provided adequate compensation water is discharged from them during dry weather, are advantageous, like lakes, in regulating the flow of the river below.

When a river flowing through flat plains has a very small fall, it requires a proportionately large channel to carry away the drainage waters of the valley; and, accordingly, the low-lying lands bordering the river are very subject to inundations if the rainfall over the higher ground is allowed to flow straight down into the bottom of the valley. By intercepting, however, the flow off the high parts of the valley in small channels excavated along the slopes, termed "catch-water drains," the ample fall available from this higher elevation can be utilized for conveying the flow farther down the valley; and the congested river is thereby relieved for a certain part of its length from the rainfall over the higher ground.

Methods of increasing the Discharging Efficiency of River Channels.—The discharging efficiency of a river within the limits of its bed depends on the fall and the cross-section of the channel. The only way of increasing the fall is to reduce the length of the channel by substituting straight cuts for a winding course. This involves some loss of capacity in the channel as a whole, and in the case of a large river with a considerable flow it is very difficult to maintain a straight cut, owing to the tendency of the current to erode the banks and form again a sinuous channel. Even if the cut is preserved by protecting the banks, it is liable to produce changes, shoals and a raising of the flood-level in the channel just below its termination. Nevertheless, where the available fall is exceptionally small, as in lands originally reclaimed from the sea, such as the English fen districts, and where, in consequence, the drainage is in a great measure artificial, straight channels have been formed for the rivers; and on account of the importance of preserving these fertile, low-lying lands from inundation, additional straight channels have been provided for the discharge of the rainfall, known as drains in the fens. Except where a town is exposed to inundations, a considerable modification of the course of a river and an enlargement of its channel do not produce a reduction in the damage from its floods commensurate with the expenditure involved.

The removal of obstructions, whether natural or artificial, from the bed of a river furnishes a simple and efficient means of increasing the discharging capacity of its channel, and, consequently, of lowering the height of floods; for every impediment to the flow, in proportion to its extent, raises the level of the river above it so as to produce the additional artificial fall necessary to convey the flow through the restricted channel, thereby reducing the total available fall. Accidental obstructions, brought down by floods, such as trunks of trees, boulders and accumulations of gravel, require to be periodically removed. In the absence of legal enactments for the conservancy of rivers, numerous obstructions have in many cases been placed in their channel, such as mining refuse, sluice-gates for mills, fish-traps, unduly wide piers for bridges and solid weirs, which impede the flow and raise the flood-level. Stringent prohibitions with regard to refuse, the enlargement of sluice-ways and the compulsory raising of their gates for the passage of floods, the removal of fish-traps which are frequently blocked up by leaves and floating rubbish, a reduction in the number and width of the piers of bridges when rebuilt, and the substitution of movable weirs for solid weirs, greatly facilitate the discharge of a river, and consequently lower its flood-level.

Prediction of Floods in Rivers.—By erecting gauges in a fairly large river and its tributaries at suitable points, and keeping continuous records for some time of the heights of the water at the various stations, the rise of the floods in the different tributaries, the periods they take in passing down to definite stations on the main river, and the influence they severally exercise on the height of the floods at these places, are ascertained. With the help of these records, by observing the times and heights of the maximum rise of a particular flood at the stations on the various tributaries, the time of arrival and height of the top of the flood at any station on the main river can be predicted with remarkable accuracy two or more days beforehand. By telegraphing these particulars about a high flood to places on the lower river, the weir-keepers are enabled to open fully beforehand the movable weirs for the passage of the flood, and the riparian inhabitants receive timely warning of the impending inundation.

Embankments along Rivers to prevent Inundations.—Where portions of a riverside town are situated below the maximum flood-level, or when it is important to protect land adjoining a river from inundations, the overflow of the river must be confined within continuous embankments on both sides. By placing these embankments somewhat back from the margin of the river-bed, a wide flood-channel is provided for the discharge of the river directly it overflows its banks, whilst leaving the natural channel unaltered for the ordinary flow. Low embankments may be sufficient where only exceptional summer floods have to be excluded from meadows. Occasionally the embankments are raised high enough to retain the floods during most years, whilst provision is made for the escape of the rare exceptionally high floods at special places in the embankments, where the scour of the issuing current is guarded against, and the inundation of the neighbouring land is least injurious. In this manner, the increased cost of embankments raised above the highest flood-level of rare occurrence is saved, and the danger of breaches in the banks from an unusually high flood-rise and rapid flow, with their disastrous effects, is avoided. Both the above methods afford the advantage of relieving the embanked channel of some of the sediment deposited in it by the confined flood-waters, when the surplus flow passes over the embankments.

When complete protection from inundations is required, the embankments have to be raised well above the highest flood-level, after allowing for the additional rise resulting from the confinement of the flood within the embankments, instead of spreading over the low-lying land; and they have to be made perfectly watertight and strong enough to resist the water-pressure and current of the highest floods. The system has been very extensively adopted where large tracts of fertile alluvial land below flood-level stretch for long distances away from the river. Thus the fens of Lincolnshire, Cambridgeshire and Norfolk are protected from inundations by embankments along their rivers and drains; a great portion of Holland is similarly protected; and the plains of Lombardy are shut off from the floods of the Po by embankments along each side of the river for a distance of about 265 m., extending from Cornale, 89 m. below Turin, to its outlet.

The system has been developed on a very extensive scale along the alluvial valley of the Mississippi, which is below the high flood-level of the river from Cape Girardeau, 45 m. above Cairo, to the Gulf of Mexico, and has a length of 600 m. in a straight line with a width ranging between 20 and 80 m., and an area of 29,790 sq. m. These embankments, having been begun by the French settlers in Louisiana, are called levees, and have a total length of 1490 m. They, however, do not afford complete protection from inundations, as they are not quite continuous and are not always strong enough to withstand the water-pressure of high floods, which have at Vicksburg a maximum rise of 59 ft. above the lowest stage of the river, and tend to increase in height owing to the improved drainage following on the extension of cultivation. Breaches, or crevasses as they are termed in the United States, resulting from a deficiency in the strength or consistency of the banks, or from their being overtopped or eroded by the current, produce a sudden rush of the flood-waters through the opening, which is much more damaging to the land in the neighbourhood of the breach than a gradual inundation. Moreover, the velocity of the outflowing water is intensified by the sloping down of the land on these alluvial plains for some distance away from the river, owing to the raising of the ground nearest the river by the gradual deposit of layers of sediment from the flood-waters when they begin to overflow the river banks. The levees on the Mississippi are breached in weak places every year during the spring floods, and are liable to be destroyed along considerable lengths by the rapid erosion resulting from their being overtopped by exceptional floods at intervals of about ten years; and in places they are undermined and overthrown by changes in the course of the river from the caving-in of concave banks at bends, necessitating reconstruction some distance back from the river at points thus threatened. When towns have been established below the flood-level of an adjoining river, like New Orleans on the Mississippi and Szegedin on the Theiss in Hungary, the channel of the river should be improved to facilitate the passage of floods past the town. The town also must be enclosed within very solid embankments, raised above the highest possible flood-level, to obviate the contingency of an exceptional flood, or a gradually raised flood-level, overtopping the protecting bank at a low part, leading to an inevitable breach and a catastrophe such as overwhelmed the greater part of Szegedin in March 1879.

Effect of Embankments in raising the River Bed.—A most serious objection to the formation of continuous, high embankments along rivers bringing down considerable quantities of detritus, especially near a part where their fall has been abruptly reduced by descending from mountain slopes on to alluvial plains, is the danger of their bed being raised by deposit, producing a rise in the flood-level, and necessitating a raising of the embankments if inundations are to be prevented. Longitudinal sections of the Po taken in 1874 and 1901 show that its bed was materially raised in this period from the confluence of the Ticino to below Caranella, in spite of the clearance of sediment effected by the rush through breaches; and therefore the completion of the embankments, together with their raising, would only eventually aggravate the injuries of inundations they have been designed to prevent, as the escape of floods from the raised river must sooner or later occur.

The periodical devastating floods of the Hwang Ho or Yellow River in China are due to the raising of the bed of its embanked channel by detritus brought down from the hills, followed by the raising of the banks, whereby the river is forced to flow above the level of the plains. When the river was first embanked, a considerable space was left between it and its banks on each side, which allowed for deviations in the channel, and also afforded a fair area for the deposit of detritus away from its bed, and a good width for the discharge of floods. Later, however, in order to appropriate and bring under regular cultivation the riparian land thus prudently left within the embankments and exposed to every flood, lines of inner embankments were formed close to the river, thereby greatly confining the flood-waters, and, consequently, raising the flood-level and the river-bed, besides exposing these embankments to undermining by merely a moderate change in position of the river channel. This reckless policy of securing additional land regardless of consequences has greatly contributed to the more frequent occurrence of the very widespread inundations resulting from the bursting of the vast volume of pent-up flood-waters through breaches in the banks, which descend with torrential violence upon the plains below, causing great destruction of life and property.

The restriction of the floods on the lower Mississippi by the levees, placed about double the width apart of the ordinary channel, has caused the river to enlarge its very soft alluvial bed, resulting in a lowering of the water-line at the low stage; and it is, therefore, anticipated that the further scour by floods when the levees have been made continuous will, in this instance, prevent any material raising of the flood-level by the levees.

Protection of Vessels during Floods.—On large open rivers, where vessels during high floods are exposed to injury from large floating *débris* and ice floes, shelter can be provided for them in refuge ports, formed in a recess at the side under the protection of a solid jetty or embankment constructed in the river parallel to the bank, these ports being closed against floods at their upper end and having their entrance at the lower end facing down-stream. Many such ports have been provided on several German and North American rivers; where the port, being near a town, is lined with quay walls, it can also be used for river traffic, a plan adopted at the refuge port on the Main just below Frankfort (fig. 8).

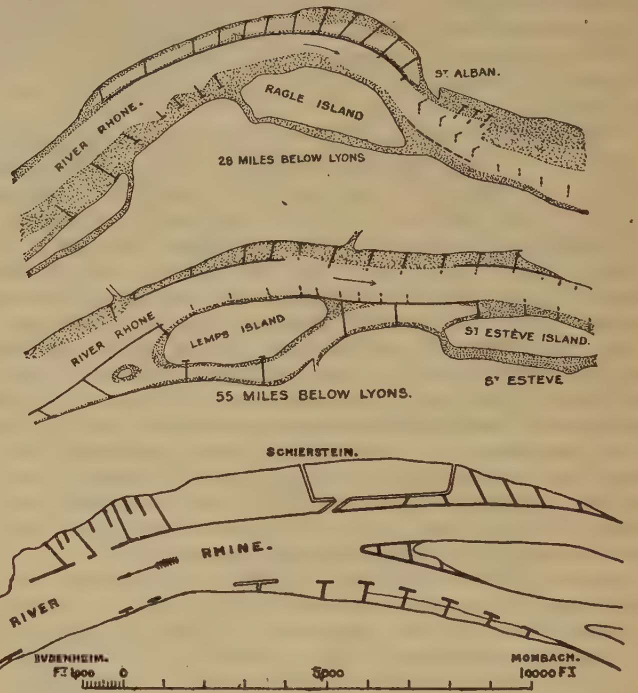
Regulation of Rivers for Navigation.

As rivers flow onward towards the sea, they experience a considerable diminution in their fall, and a progressive increase in the basin which they drain, owing to the successive influx of their various tributaries. Thus gradually their current becomes more gentle and their discharge larger in volume and less subject to abrupt variations; and, consequently, they become more suitable for navigation. Eventually, large rivers, under favourable conditions, often furnish important natural highways for inland navigation in the lower portion of their course, as, for instance, the Rhine, the Danube and the Mississippi; and works are only required for preventing changes in the course of the stream, for regulating its depth, and especially for fixing the low-water channel and concentrating the flow in it, so as to increase as far as practicable the navigable depth at the lowest stage of the water-level. Regulation works for increasing the navigable capabilities of rivers can only be advantageously undertaken in large rivers with a moderate fall and a fair discharge at their lowest stage; for with a large fall the current presents a great impediment to up-stream navigation, and there are generally great variations in water-level, and when the discharge becomes very small in the dry season it is impossible to maintain a sufficient depth of water in the low-water channel.

Removal of Shoals.—The possibility of securing uniformity of depth in a river by the lowering of the shoals obstructing the channel depends upon the nature of the shoals. A soft shoal in the bed of a river is due to deposit from a diminution in velocity of flow, produced by a reduction in fall and by a widening of the channel, or to a loss in concentration of the scour of the main current in passing over from one concave bank to the next on the opposite side. The lowering of such a shoal by dredging merely effects a temporary deepening, for it soon forms again from the causes which produced it. The removal, moreover, of the rocky obstructions at rapids, though increasing the depth and equalizing the flow at these places, produces a lowering of the river above the rapids by facilitating the efflux, which may result in the appearance of fresh shoals at the low stage of the river. Where, however, narrow rocky reefs or other hard shoals stretch across the bottom of a river and present obstacles to the erosion by the current of the soft materials forming the bed of the river above and below, their removal may prove a permanent improvement by enabling the river to deepen its bed by natural scour.

The deepening of the bed of a non-tidal river along a considerable length by dredging merely lowers the water-level of the river during the low stage; and though this deepening facilitates the passage of floods in the first instance, it does not constitute a permanent improvement even in this respect, for the deposit of the detritus brought down by the river as the floods abate soon restores the river to its original condition. Nevertheless, where sand-banks obstruct and divert the low-state channel of a river at its low stage, as in parts of the Mississippi below Cairo, it has been found possible before the river has fallen to its lowest level to form a channel through these sand-banks, with a depth of 9 or 10 ft. and 250 ft. wide, by suction dredgers, aided by revolving cutters or water-jets (see DREDGING), which discharge the sand through floating tubes into a part of the river away from the channel; and the navigation can thus be maintained throughout the low stage at a reasonable cost. Though, however, these channels across the shoals, connecting the deeper parts of the river, can be easily kept open on the Mississippi till the return of the floods, they are obliterated by the currents in flood-time, and have to be dredged out again afresh every year on the abatement of the floods.

Regulation of the Low-Water Channel.—The capability of a river to provide a waterway for navigation during the summer or throughout the dry season depends upon the depth that can be secured in the channel at the lowest stage. Owing to the small discharge and deficiency in scour during this period, it is important to restrict the width of the low-water channel, and concentrate the flow in it, and also to fix its position so that, forming the deepest part of the bed along the line of the strongest current, it ~~may be~~ scoured out every year by the floods, instead of remaining an undefined and shifting channel. This is effected by closing subsidiary low-water channels with dikes across them, and narrowing the channel at the low stage by low-dipping cross dikes extended from the river banks down the slope, and pointing slightly up-stream so as to direct the water flowing over them into a central channel (figs. 4 and 5). The contraction also of the channel is often still more effectually accomplished at some parts, though at a greater cost, by low longitudinal dikes placed along either side of the low-water channel, some distance forward from the banks but connected with them generally at intervals by cross dikes at the back to prevent the current from scouring out a channel behind them during floods (figs. 4 and 6). By raising these dikes only slightly above the surface of the bed of the river, except where it is expedient to produce accretion for closing an old disused channel or rectifying the course of the river, the capacity of the channel for discharging floods is not affected; for the slight obstruction to the flow produced by the dikes at the sides is fully compensated for by the deepening of the low-water channel in the central course of the river.



Regulation Works.
FIGS. 4 and 5.—River Rhone.
FIG. 6.—River Rhine.

This system of obtaining a moderate increase in depth during the low stage of a river, whilst leaving the river quite open for navigation, has been adopted with satisfactory results on several large rivers, of which the Rhone, the Rhine and the Mississippi furnish notable examples. Regulation works were preferred on the Rhone to canalization from Lyons nearly to its outlet, in spite of its large fall, which reaches in some places 1 in 250, on account of the considerable quantities of shingle and gravel carried down by the river; the comparative regularity of the discharge, owing to the flow being derived from tributaries having their floods at different times of the year, has aided the effects of the works, which have produced an increase of about 3⅔ ft. in the available navigable depth below Lyons at the lowest water-level. Owing, however, to the unfavourable natural condition of the river, the depth does not exceed 5 ft. at this stage; and the rapid current forms a serious impediment to up-stream navigation. The Rhine is much better adapted for improvement by regulation works than the Rhone, for it has a basin more than double the area of the Rhone basin, and its fall does not exceed 3·1 ft. per mile up at Strassburg and 2·5 ft. per mile through the rocky defile from Bingen to Kaub, and is much less along most of the length below Strassburg. These works systematically carried out in wide shallow reaches between the Dutch frontier and Mainz, aided by dredging where necessary, have secured a navigable depth at the low stage of the river of 10 ft. from the frontier to Cologne, 8½ ft. from Cologne to Kaub, and 6½ ft. through the rocky defile up to Bingen, beyond which the same depth is maintained up to Philippsburg, 22½ m. above Mannheim. Works, moreover, are in progress by which it is anticipated that the minimum depth of 6½ ft. will be extended up to Strassburg by 1916. The Mississippi also, with its extensive basin and its moderate fall in most parts, is well suited for having its navigable depth increased by regulation works, which have been carried out below St Paul in shallow and shifting reaches, with the object of obtaining a minimum navigable depth during the low stage of 6 ft. along the upper river from St Paul to St Louis just below the confluence of the Missouri, and 8 ft. thence to Cairo at the mouth of the Ohio.

Various materials are used for the regulation works according to the respective conditions and the materials available in the locality. On the Rhone below Lyons with its rapid current, the dikes have been constructed of rubble-stone, consolidated above low water with concrete. The dikes on the Rhine consist for the most part of earthwork mounds protected by a layer of rubble-stone or pitching on the face, with a rubble mound forming the toe exposed to the current; but occasionally fascines are employed in conjunction with stone or simple rubble mounds. The dams closing subsidiary channels on the Mississippi are almost always constructed of fascine mattresses weighted with stone; but whereas the regulating dikes on the upper river are usually similar in construction, a common form for dikes in the United States consists of two parallel rows of piles filled in between with brushwood or other materials not affected by water, and protected at the sides from scour by an apron of fascines and stone. Other forms of dikes sometimes used are timber cribs filled with stone, single rows of sheet piling, permeable dikes composed of piles supporting thin curtains of brushwood for promoting silting at the sides, and occasionally rubble-stone in places needing special protection.

Protecting and Easing Bends.—Unless the concave banks of a river winding through wide, alluvial plains are protected from the scour of the current, the increasing curvature presents serious impediments to navigation, sometimes eventually becoming so intensified that the river at last makes a short cut for itself across the narrow strip of land at the base of the loop it has formed. This, however, produces considerable changes in the channel below, and disturbances in the navigable depth. Protection, accordingly, of concave banks is necessary to prevent excessive curvature of the channel and changes in the course of a river. On the Mississippi the very easily eroded banks are protected along their upper, steeper part by stone pitching or a layer of concrete, and below low-water level by fascine mattresses weighted with stone, extended a short distance out on the bed to prevent erosion at the toe. Dikes, also, projecting into the channel from the banks reduce the curvature of the navigable channel by pushing the main current into a more central course; whilst curved longitudinal dikes placed in the channel in front of concave banks (figs. 4 and 6) are still more effective in keeping the current away from the banks, which is sometimes still further promoted by dipping cross dikes in front (fig. 5).

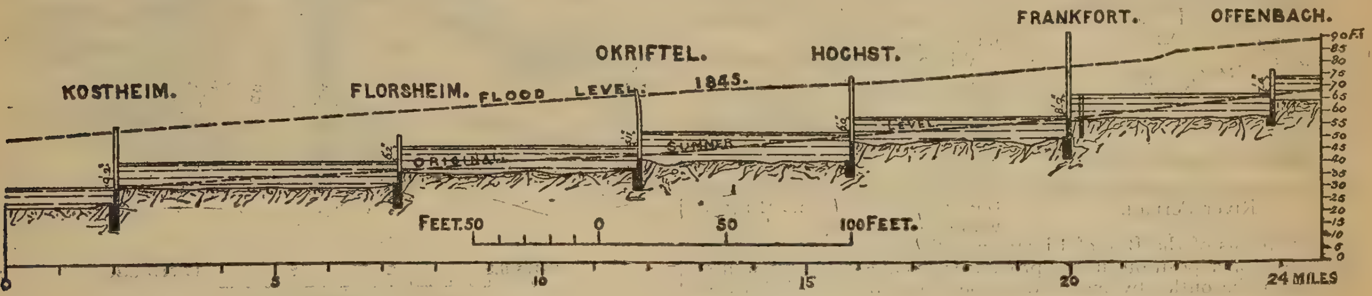


FIG. 7.—Canalized River Main.

Regulation of Depth.—The regulation works at bends, besides arresting erosion, also reduce the differences in depth at the bends and the crossings, since they diminish the excessive depth round the concave banks and deepen the channel along the crossings, by giving a straighter course to the current and concentrating it by a reduction in width of the channel between the bends (figs. 4 and 5). Where there are deep pools at intervals in a river, shoals are always found above them, owing to the increased fall which occurs in the water line on approaching the pool, to compensate for the very slight inclination of the water-line in crossing the pool, which serves for the discharge of the river through the ample cross-section of this part of the river-bed. These variable depths can be regulated to some extent by rubble dikes or fascine mattress sills deposited across the bed of the pool, so as to reduce its excessive depth, but not raised high enough to interfere at all with the navigable depth. These obstructions in the pool raise the water-line towards its upper end, in order to provide the additional fall needed to effect the discharge through the pool with its diminished cross section; and this raising of the water-line increases the depth over the shoal above the pool, so that the general depth in these irregular parts of a river is rendered more uniform, with benefit to navigation.

Canalization of Rivers.

Rivers whose discharge is liable to become quite small at their low stage, or which have a somewhat large fall, as is usual in the upper part of rivers, cannot be given an adequate depth for navigation by regulation works alone; and their ordinary summer level has to be raised by impounding the flow with weirs at intervals across the channel (see WEIR), while a lock (see CANAL and DOCK) has to be provided alongside the weir, or in a side channel, to provide for the passage of vessels (fig. 8). A river is thereby converted into a succession of fairly level reaches rising in steps up-stream, providing a comparatively still-water navigation like a canal; but it differs from a canal in the introduction of weirs for keeping up the water-level, in the provision for the regular discharge of the river at the weirs, and in the two sills of the locks being laid at the same level instead of the upper sill being raised above the lower one to the extent of the rise at the lock, as usual on canals. Canalization secures a definite available depth for navigation; and the discharge of the river generally is amply sufficient for maintaining the impounded water-level, as well as providing the necessary water for locking. The navigation, however, is liable to be stopped during the descent of high floods, which in many cases rise above the locks (fig. 7); and it is necessarily arrested in cold climates on all rivers by long, severe frosts, and especially on the break-up of the ice.

Instances of Canalized Rivers.—Many small rivers, like the Thames above its tidal limit, have been rendered navigable by canalization, and several fairly large rivers have thereby provided a good depth for vessels for considerable distances inland. Thus the canalized Seine has secured a navigable depth of 10½ ft. from its tidal limit up to Paris, a distance of 135 m., and a depth of 6½ ft. up to Montereau, 62 m. higher up. Regulation works for improving the river Main, from its confluence with the Rhine opposite Mainz up to Frankfort, having failed to secure a minimum depth of 3 ft. at the low stage of the river, canalization works were carried out in 1883–86 by means of five weirs in the 22 m. between the Rhine and Frankfort, and provided a minimum depth of 6½ ft. (figs. 7 and 8).

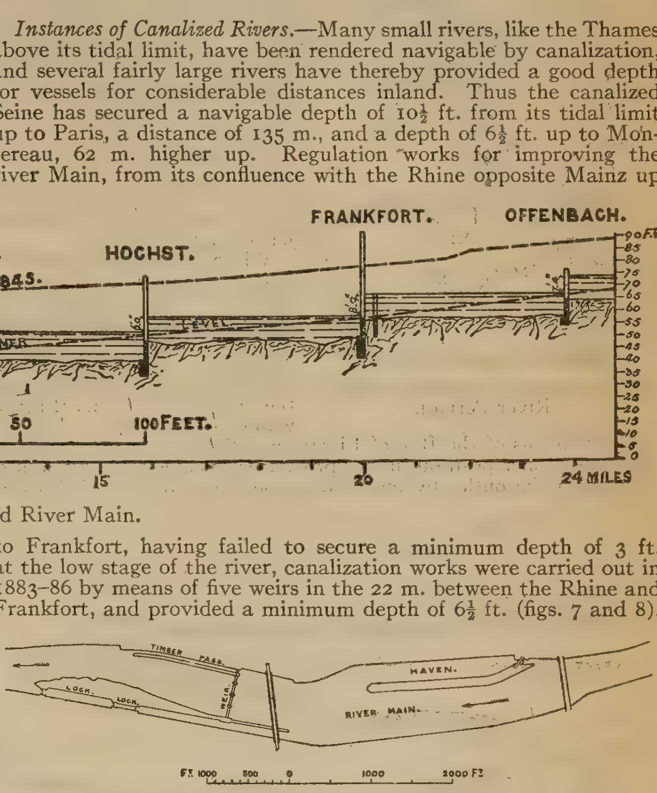


FIG. 8.—Locks, Weir and Haven near Frankfort.

This depth was subsequently increased by dredging the shoaler portion towards the upper end of each reach, due to the rise of the river-bed up-stream, so as to attain a minimum depth of 7⅔ ft. just below the lowest lock, and 7¾ to 8½ ft. in the other reaches; whilst a sixth weir was erected at Offenbach above Frankfort (fig. 7). The Great Kanawha, Ohio, and other rivers, furnish instances of canalization works in the United States.

Limits to Canalization.—On ascending a river it becomes increasingly difficult to obtain a good depth by canalization in the upper part, owing to the progressive inclination of the river-bed; thus, even on the Seine, with its moderate fall, whereas a depth of 10½ ft. has been obtained on the Lower Seine by weirs placed on the average 13½ m. apart, on the Upper Seine weirs are required at intervals of only about 4⅔ m. to attain a depth of 6½ ft. Accordingly, the higher parts of rivers are only suitable for floating down trunks of trees felled on the hills, or rough rafts of timber, conveying small loads of produce, which are broken up on reaching their destination. Moreover, sometimes an abrupt fall or rocky shoals make it necessary to abandon a section of the river and to continue the navigation by lateral canal.

Small River Outlets exposed to Littoral Drift.

Rivers with a small discharge flowing straight into the sea on an exposed coast are more or less obstructed at their outlet by drift of shingle or sand carried along the coast by the waves in the direction of the prevailing winds. When the flow falls very low in dry weather, the outlet of a river is sometimes completely closed by a continuous line of beach, any inland or tidal waters merely trickling through the obstruction; and it is only on the descent of floods that the outlet is opened out. In rivers which always have a fair fresh-water discharge, or a small fresh-water flow combined with a tidal flow and ebb, the channel sometimes has its direct outlet closed, and is deflected parallel to the shore till it reaches a weak place in the line of beach, through which a new outlet is formed; or, where the current is strong enough to keep the outlet open, a bar is formed across the entrance by the littoral drift, reducing the navigable depth.

Jetties at River Outlets.—The bar formed by littoral drift across the outlet of a river not charged with sediment and flowing into a tideless sea can be lowered by carrying out solid jetties on each side of the outlet across the foreshore, so as to scour the bar by concentrating the issuing current over it. Thus by means of jetties, aided by dredging, the depth at the entrance to the Swine mouth of the Oder has been increased from 7 ft. to 22½ ft.; the approach channels to the river Pernau (fig. 9) and other Russian rivers flowing into the Baltic have been deepened by jetties, and the outlet channels of some of the rivers flowing into the Great Lakes of North America have been improved by crib-work jetties and dredging.

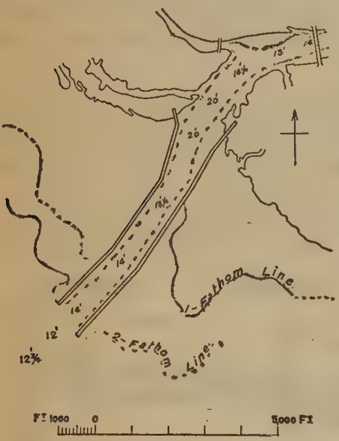


FIG. 9.—Jetty Outlet into Baltic: River Pernau.

Where the littoral drift is powerful enough to divert the outlet of a river, as in the case of the river Yare, which at one time was driven to an outlet 4 m. south of its direct course into the sea at Yarmouth, and the river Adour in France, whose outlet, owing to the violent storms of the Bay of Biscay, was liable to be shifted 18 m. from its proper position, it has proved practicable to fix as well as to deepen the outlet by means of jetties (fig. 10). In such cases, however, where the rivers flow into tidal seas, it is important to place the jetties sufficiently apart to avoid any loss of tidal influx, since the tidal flow assists the fresh-water discharge in keeping the outlet open; whereas, with rivers flowing into tideless seas, a moderate restriction of the width between the jetties increases the scour. The tortuous and somewhat shifting outlet channel of the Scheur branch of the river Maas, emerging on to a sandy coast where the rise of tide is small, and obstructed at its mouth by a bar, has been replaced by a straight cut across the Hook of Holland, and by an outlet guided across the foreshore and fixed in position by fascine mattress jetties (see JETTY), the maintenance of the depth at the mouth by the tidal and fresh waters being aided by frequent dredging (figs. 11 and 12).

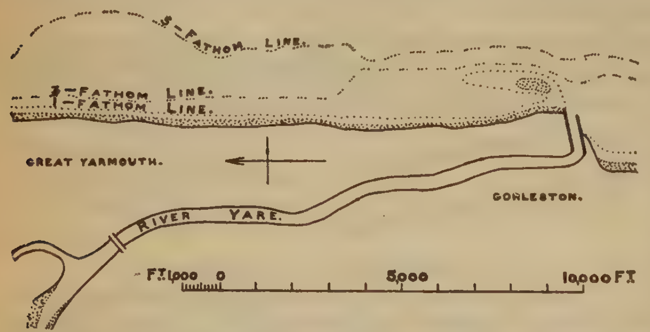
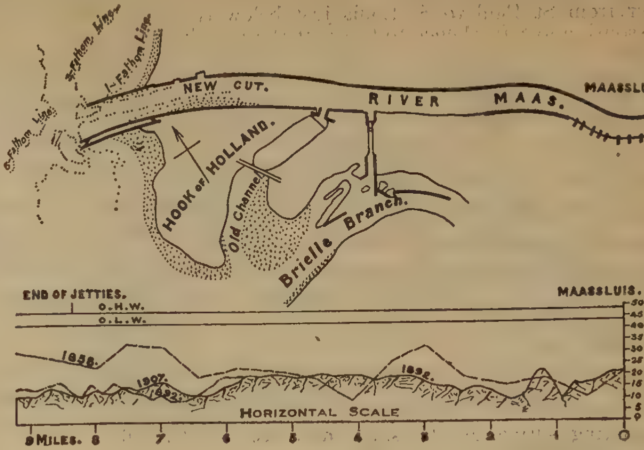


FIG. 10.—Shifting Outlet, fixed by Jetties: River Yare.

Deltaic Outlets of Tideless Rivers.

Large rivers heavily charged with sand and silt, when their current is gradually arrested on entering a tideless sea, deposit these materials as a constantly advancing fan-shaped shoal in front of their mouths, through which comparatively shallow diverging channels, almost devoid of fall, have to force their way in order to convey the fresh-water discharge into the sea (fig. 13). These deltaic channels deposit their burden of sediment in front of their outlets, forming bars which advance with the delta and whose rate of progress seawards and distance in front of each outlet are proportionate to the discharge of the several channels. A channel simply dredged on the bar in front of one of the outlets of a deltaic river is only maintained for a moderate period on account of the large volume of deposit continually accumulating at the outlet. Thus the channel in front of the outlet of the south-west pass of the Mississippi delta, when deepened from 13 ft. to 18 ft. over its bar by dredging many years ago, was soon silted up again on the discontinuance of the dredging; whilst the depth of the outlet channel of one of the branches of the Volga delta, which was increased from 4 ft. to 8 ft., could only be maintained by regular yearly dredging.



FIGS. 11 and 12.—Jetty Outlet into North Sea: River Maas.

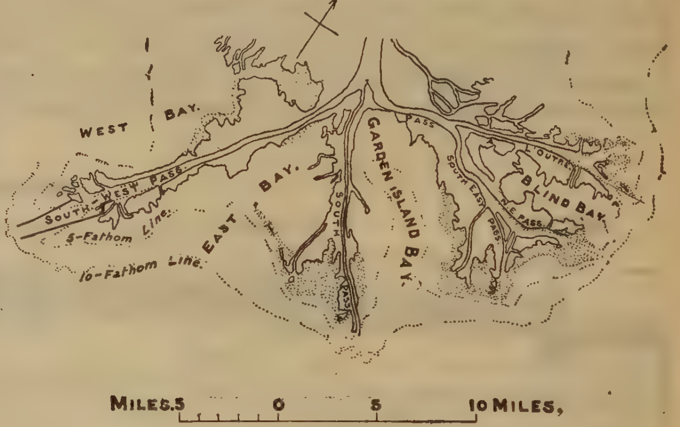


FIG. 13.—Mississippi Delta.

Parallel Jetties at Delta Outlets.—In order to procure and maintain for some time an adequate deepening across the bar in front of the outlets of delta channels, recourse has been had to the scour of the issuing current concentrated and extended out to the bar by parallel jetties, forming prolongations seawards of the banks of the channel. The requisite conditions for the success of this system of improvement are a good depth in the sea beyond the bar, allowing of a considerable deposit of alluvium before the increased depth is interfered with, and a littoral current carrying a portion of the alluvium away from the outlet, both of which retard the progression of the delta in front of the outlet and the inevitable eventual formation of a new bar farther out. The rate of advance of a delta depends also on the proportion of solid matter contained in the river water and on the specific gravity and size of the particles of alluvium discharged into the sea; for the heavier and coarser materials, and especially those which are rolled along the bed of the channels, come first to rest. Moreover, as the larger channels of a delta bring down a larger volume of alluvium on account of their larger discharge, and as their bars form farther seawards from their outlets owing to the issuing current being less rapidly arrested in proportion to the volume discharged, the rate of advance of the delta in front of an outlet is proportionate to the size of the channel, and the length of the jetties required for lowering the bar by scour in front of any channel is proportionate to the discharge of the channel. Consequently, the conditions are more unfavourable for the improvement of the outlets of the larger delta channels than of the smaller ones; though, on the other hand, the larger channels crossing the delta are generally more suitable for navigation on account of their size, and the natural depth over their bars is greater owing to the larger discharge.

Rhone. The discharge of the main branch of the Rhone, which formerly flowed into the Mediterranean and the Gulf of Foz through six mouths, was in 1852–57 concentrated in the direct eastern channel by embankments along sides, which closed all the lateral channels. The entire flow of the river, being thus discharged through the eastern outlets, increased for a time the depth over its bar from 4½ ft. to 9¾ ft.; but as the great volume of alluvium brought down, including an unusually large proportion of sand rolled along the bed of the river, was also all discharged through the one outlet, the bar soon formed again farther out, and naturally advanced with the delta in front of the outlet more rapidly than formerly when the deposit was distributed through six divergent mouths. Accordingly, the very moderate deepening produced by the embankments was not long maintained, and the average depth over the bar has not exceeded 6½ ft. for many years past; the St Louis Canal was constructed to provide a deeper outlet for the navigation.[1] This want of success was due to the selection of an outlet opening on a sheltered, somewhat shallow bay, instead of a southern outlet discharging into deep water in the Mediterranean and having a deep littoral current flowing across it, and also resulted from the closing of all the other outlets, whereby the whole of the deposit, as well as all the discharge, was concentrated in front of the badly situated eastern outlet. The southern Roustan branch was reopened in 1893 to prevent the silting-up of the outlet of the St Louis Canal.

Danube. The Danube traverses its delta in three branches, the northern one of which, though conveying nearly two-thirds of the discharge of the river, is unsuitable for improvement owing to its splitting up along portions of its course into several channels, and eventually flowing into the sea through twelve mouths of a small independent delta advancing about 250 ft. annually across a shallow foreshore. The central Sulina branch was selected for improvement in 1858 in preference to the southern St George's branch, which had a more favourably situated outlet and a better channel through the delta, on account of the much smaller expenditure required for carrying out jetties to the bar in front of the Sulina outlet, which was only half the distance from the shore of the bar of the St George's outlet, owing to the much smaller discharge of the Sulina branch.[2] The jetties, begun provisionally in 1858 and subsequently consolidated and somewhat extended, were finally completed in 1877. They increased the depth over the bar from an average of about 9 ft. previously to 1858 up to 20½ ft. in 1873, which was maintained for many years. In 1893, however, the increasing draught of vessels rendered a greater depth necessary; the wide inshore portion of the jetty channel was therefore narrowed by inner parallel jetties, and a powerful dredger was set to work in the jetty channel and outside, whereby the depth was increased to 24 ft. in 1897, and was fairly maintained up to 1907, when a second dredger became necessary to cope with the shoaling. The somewhat small ratio of sediment to discharge in the Danube, the fineness of the greater portion of this sediment, its comparatively moderate amount owing to the small proportion of the discharge flowing through the Sulina branch, and its partial dispersion by the southerly littoral current and wave action, have prevented the rapid formation of a shoal in front of the Sulina outlet. Nevertheless, the lines of soundings are gradually advancing seawards in the line of the outlet channel, and there are signs of the formation of a new bar farther out, whilst the deposit to the south by the current and waves has deflected the deepest channel northwards. Accordingly, a prolongation of the jetties will eventually be necessary, notwithstanding the removal of a portion of the deposit from the outlet channel by dredging.

Mississippi. The selection of the outlet of the south pass of the Mississippi delta for improvement by parallel jetties in 1876–79, in spite of the south-west pass possessing a larger channel and a better depth over its bar, was due, as at the Danube, to motives of economy, as the bar of the south-west pass was twice as far off from the shore as that of the south pass (fig. 13). There fascine mattress jetties, weighted with limestone, and with large concrete blocks at their exposed ends (see JETTY), 2¼ and 1½ m. long, and curved slightly southwards at their outer ends to direct the sediment-bearing current more directly at right angles to the westerly littoral current, increased the depth of 8 ft. over the bar in 1875 up to 31 ft. between the jetties and out to deep water (fig. 14). The prolonged current of the river produced by the jetties has, as at the Sulina outlet, carried the main portion of the heavier sediment into fairly deep water, so that the greatest advance of the foreshore in front of the south pass has occurred in the 70-ft. line of soundings, though the shallower soundings have also advanced.

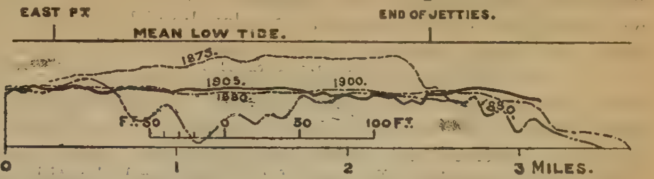


FIG. 14.—Deltaic Jetty Outlet, South Pass, Mississippi.

The shoaling, however, in the jetty channel necessitated its reduction in width by mattresses and spurs from 1000 ft. to 600 ft., and also dredging to maintain the stipulated central depth of 30 ft., and 26 ft. depth for a width of 200 ft., out to deep water; whilst the outer channel was deflected to the east and narrowed by the alluvium carried westwards by the littoral current and also deposited in front of the jetty outlet. Accordingly, dredging has been increasingly needed to straighten the channel outside and maintain its depth and width; and since the United States engineers took in hand its maintenance in 1901, the available depth of the outlet channel has been increased from 26 ft. up to 28 ft. by extensive suction dredging.

In order to provide for the increasing requirements of sea-going vessels, the dredging of a channel 35 ft. deep and 1000 ft. wide, cut from the large south-west pass outlet to deep water in the gulf, was begun at the end of 1903; and jetties of fascine mattresses weighted with stone and concrete blocks have been carried out about 4 and 3 m. respectively from the shore on each side of the outlet for maintaining the dredged channel[3] (fig. 15). These works differ from the prior improvement of the south pass in the adoption mainly of suction dredging for the formation of the channel in place of scour alone, so that it will be unnecessary to restrict the width of the jetty channel to secure the desired depth; whilst as the discharge through the south-west pass is rather more than three times the discharge through the south pass, and the bar is double the distance seawards of the outlet, the slightly converging jetties, in continuation of the south-west pass, are placed about 3400 ft. apart at their outer ends, and have been given about twice the length of the south pass jetties. As soon as the dredging of the channel has been completed (which depends on the appropriations granted by Congress) the south pass will be abandoned, and the south-west pass will form the navigable approach. Dredging will be required for preserving the depth of the outlet of the south-west pass; and when the large volume of sand and other alluvium discharged by the pass accumulates in front sufficiently to begin forming a bar farther out, an extension of the jetties will be necessary to maintain the elongated channel free from drift, and extend the scour, especially in flood-time.

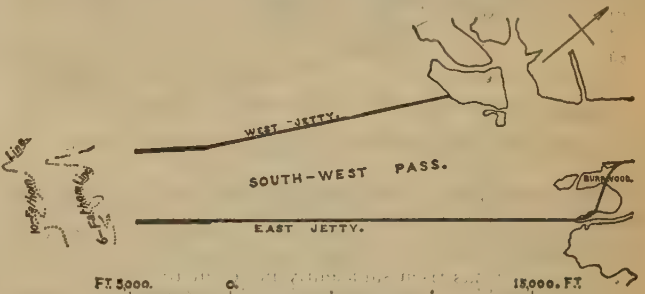


FIG. 15.—Deltaic Jetty Outlet, South-West Pass, Mississippi.

Improvement of Tidal Rivers for Navigation.

Whereas the size of tideless rivers depends wholly on their fresh-water discharge, the condition of tidal rivers is due to the configuration of their outlet, the rise of tide at their mouth, the distance the tide can penetrate inland, and the space available for its reception. Accordingly, tidal rivers sometimes, even when possessing a comparatively small fresh-water discharge, develop under favourable conditions into large rivers in their lower tidal portion, having a much better natural navigable channel at high tide than the largest deltaic rivers, as shown by a comparison of the Thames, the Humber and the Elbe with the Danube, the Nile and the Mississippi. Tidal water is, indeed, unlimited in volume; but, unlike the drainage waters which must be discharged into the sea, it only flows up rivers where there is a channel and space available for its reception. Consequently, it is possible to exclude the tide by injudicious works, such as the sluices which were erected long ago across the fen rivers to secure the low-lying lands from the inroads of the sea; the tidal influx is also liable to be reduced by accretion in an estuary resulting from training works. The great aim, on the contrary, of all tidal river improvement should be to facilitate to the utmost the flow of the flood-tide up a river, to remove all obstructions from the channel so as to render the scouring efficiency of the flood and ebb tides as great as possible, and by making the tidal flow extend as far up the river as possible to reduce to a minimum the period of slack tide when deposit takes place.

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[1] L. F. Vernon-Harcourt, *Rivers and Canals*, 2nd ed. pp. 187–90, plate 5, figs. 1 and 9.

[2] Ibid. plate 5, figs. 2, 3, 4 and 10.

[3] *Report of the Chief of Engineers for 1906*, pp. 382 and 1296 and charts.

Tidal Flow in a River.—The progress of the flood-tide up a river and the corresponding ebb are very clearly shown by a diagram giving a series of simultaneous tidal lines obtained from simultaneous observations of the height of the river Hugli during a high spring-tide in the dry season, taken at intervals at several stations along the river, and exhibiting on a very distorted scale the actual water-level of the river at these periods (fig. 16). The steep form assumed by the foremost part of the flood-tide lines from the entrance to beyond Chinsura, attaining a maximum in the neighbourhood of Konnagar and Chinsura, indicates the existence of a *bore*, caused by the sand-banks in the channel obstructing the advance of the flood-tide, till it has risen sufficiently in height to rush up the river as a steep, breaking wave, overcoming all obstacles and producing a sudden reversal of the flow and abrupt rise of the water-level, as observed on the Severn, the Seine, the Amazon and other rivers. A bore indicates defects in the tidal condition and the navigable channel, which can only be reduced by lowering the obstructions and by the regulation of the river. No tidal river of even moderate length is ever completely filled by tidal water; for the tide begins to fall at its mouth before the flood-tide has produced high water at the tidal limit, as most clearly shown in the case of a long tidal river by the Hugli tidal diagram. Every improvement of the channel, however, expedites and increases the filling of the river, whilst the volume of water admitted at each tide is further augmented by the additional capacity provided by the greater efflux of the ebb, as indicated by the lowering of the low-water line.

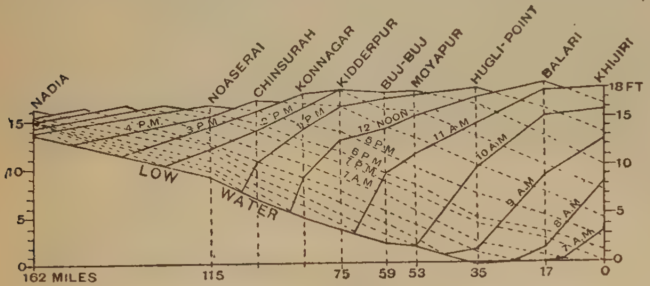
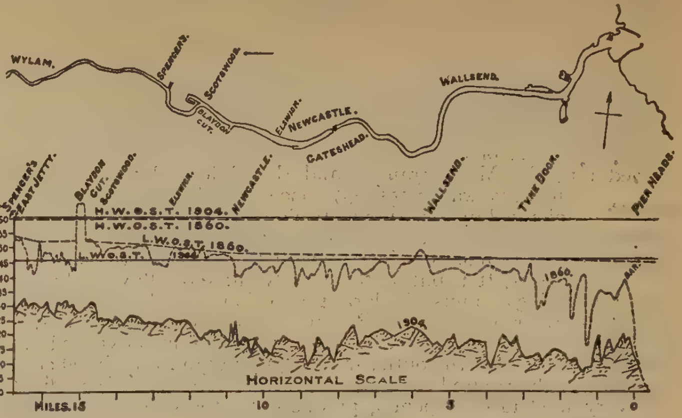


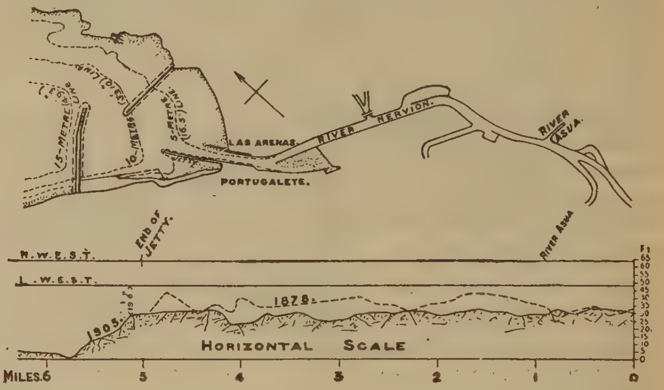
FIG. 16.—Simultaneous Tidal Lines: River Hugli.

Deepening Tidal Rivers by Dredging.—The improvement of tidal rivers mainly by dredging is specially applicable to small rivers which possess a sufficient navigable width, like the Clyde and the Tyne; for such rivers can be considerably deepened by an amount of dredging which would be quite inadequate for producing a similar increase in depth in a large, wide river, with shifting channels. Both the Clyde below Glasgow and the Tyne below Newcastle were originally insignificant rivers, almost dry in places at low water of spring-tides; and the earliest works on both rivers consisted mainly in regulating their flow and increasing their scour by jetties and training works. They have, however, been brought to their present excellent navigable condition almost wholly, since 1840 on the Clyde and 1861 on the Tyne, by continuous systematic dredging, rendered financially practicable by the growing importance of their sea-going traffic. The Clyde has been given a minimum depth of about 22 ft. at low water of spring-tides up to Glasgow, and can admit vessels of 27 to 28 ft. draught. In the Tyne (figs. 17 and 18), it was decided in 1902 to provide a minimum dredging depth in the river channel at low water of 25 ft. from the sea to the docks, of 20 ft. thence to Newcastle and of 18 ft. up to Scotswood, the rise of spring-tides increasing these depths by 15 ft. In 1906 it was determined to make the channel 30 ft. deep at low water of spring-tides from the sea to the docks, and in 1908 to deepen it between the docks and Newcastle swing bridge from 20 to 25 ft., and also between the swing bridge and Derwenthaugh from 18 to 25 ft. The natural scour of these rivers has been so much reduced by such an exceptional enlargement of their channels that a considerable amount of dredging will always be required to preserve the depth attained.

Regulation and Dredging of Tidal Rivers.—Considerable improvements in the navigable condition of tidal rivers above their outlet or estuary can often be effected by regulation works aided by dredging, which ease sharp bends, straighten their course and render their channel, depth and flow more uniform. Examples are the Nervion between Bilbao and its mouth (figs. 19 and 20), and the Weser from Bremen to Bremerhaven at the head of its estuary (figs. 21 and 22). These works resemble in principle the regulation works on large rivers with only a fresh-water discharge, previously described; but on tidal rivers the main low-water channel should alone be trained with an enlarging width seawards to facilitate the tidal influx, and the tidal capacity of the river above low water should be maintained unimpaired.



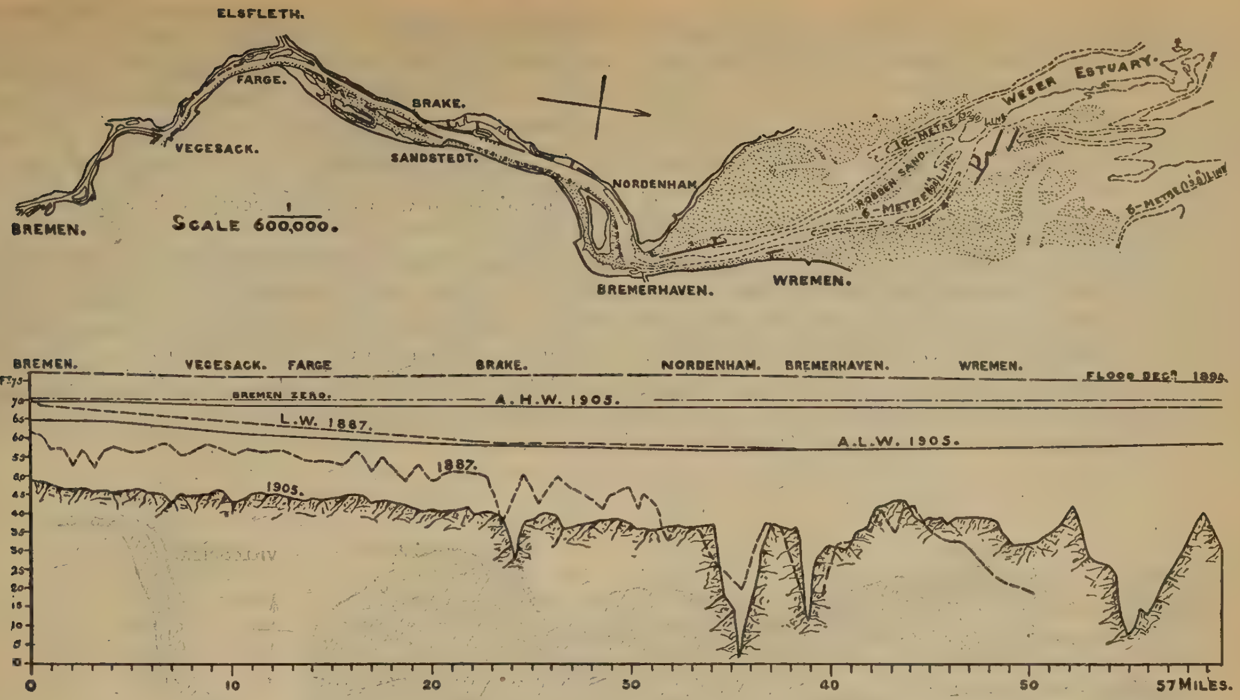
FIGS. 17 and 18.—Improvement of Tidal River by dredging: River Tyne.



FIGS. 19 and 20.—Training Tidal River and protection of Outlet: River Nervion.

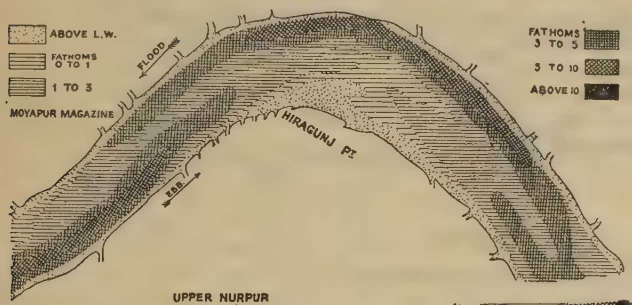
To secure a good and fairly uniform depth on a tidal river, it is essential that the flood and ebb tides should follow the same course, in order to combine their scouring efficiency, and form a single, continuous deep channel. In wide, winding reaches, however, the flood tide in ascending a river follows as direct a course as practicable; and on reaching a bend, the main flood-tide current, in being deflected from its straight course, hugs the concave bank, and, keeping close alongside the same bank beyond the bend, cuts into the shoal projecting from the convex bend of the bank higher up, forming a blind shoaling channel, as clearly indicated near the Moyapur Magazine in fig. 23, and a little below Shipgunj Point in fig. 24. This effect is due to the flood-tide losing its guidance, and consequently its concentration, at the change of curvature beyond the termination of the concave bank, where it spreads out and passes gradually over, in its direct course, to the next concave bend above along the opposite bank. The ebb tide, on the contrary, descending the river, follows the general course of the fresh-water discharge in all rivers, its main current in the Moyapur reach keeping close along the concave bank between Ulabaria and Hiragunj Point, and crossing over opposite the point to the next concave bank below (fig. 23); whilst in the James and Mary reach the main ebb-tide current runs alongside the concave bank in front of Ninan and Nurpur, and crosses over near Hugli Point to the opposite concave bank below Gewankhali (fig. 24). The main currents, accordingly, of the flood and ebb tides in such reaches act quite independently between the bends, forming channels on opposite sides of the river and leaving a central intervening shoal. The surveys of the two reaches of the Hugli, represented in figs. 23 and 24, having been taken in the dry season, exhibit the flood-tide channels at their deepest phase, and the ebb-tide channels in their worst and least continuous condition.

In tidal rivers the main ebb-tide current, being reinforced by


ELSFLETH.
FARGE.
BRAKE.
VEGESACK.
SANDSTEDT.
NORDENHAM
BREMEN.
SCALE 1/600,000.
BREMERHAVEN.
WREMEN.
WESER ESTUARY.
ROBBEN SAND
6-METRE
BREMEN. VEGESACK. FARGE BRAKE. NORDENHAM. BREMERHAVEN. WREMEN.
FLOOD DECR 1895.
BREMEN ZERO.
A.H.W. 1905.
L.W. 1887.
A.L.W. 1905.
1887.
1905.
Ft. 75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
0
10
20
30
40
50
57 MILES.

FIGS. 21 and 22.—Training Tidal River at Estuary: River Weser.

the fresh-water discharge, generally forms the navigable channel, which is scoured out during floods. Narrowing the river between the bends to bring the two channels together would unduly restrict the tidal flow; and in a river like the Hugli dependent on the tidal influx for the maintenance of its depth for two-thirds of the year, and with channels changing with the wet and dry seasons, so that deepening by dredging in the turbid river could not be permanent, training works below low water to bring the ebb-tide current into the flood-tide channel, which latter must not be obstructed at all, offer, aided by dredging, the best prospects of improvement.


ABOVE L.W.
FATHOMS 0 TO 1
1 TO 3
FATHOMS 3 TO 5
5 TO 10
ABOVE 10
FLOOD
EBB
MOYAPUR MAGAZINE
HIRAGUNJ PT.

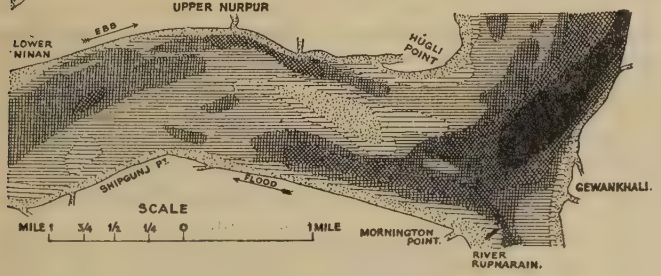

UPPER NURPUR
LOWER NINAN
EBB
HUGLI POINT
SHIPGUNJ PT.
FLOOD
GEWANKHALI.
SCALE
MILE 1 3/4 1/2 1/4 0 1 MILE
MORNINGTON POINT.
RIVER RUPNARAIN.

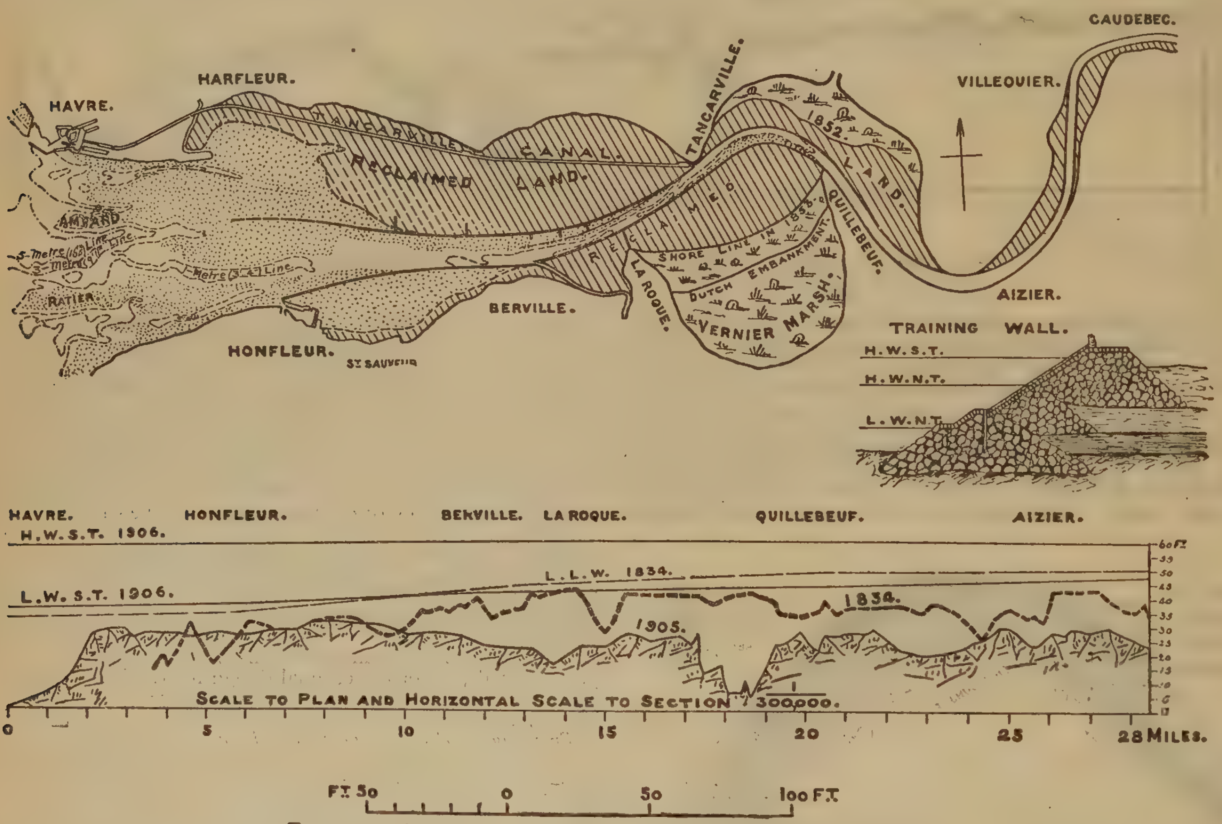
FIG. 23.—Moyapur Reach, River Hugli, Jan. 1896.
FIG. 24.—James and Mary Reach, River Hugli, April 1890.

The average rate of enlargement adopted for the trained channel of the Nervion, in proportion to its length, is 1 in 75 between Bilbao and its mouth, and 1 in 71 for the Weser from Bremen to Bremerhaven; and these ratios correspond very nearly to the enlargement of the regulated channel of the Clyde from Glasgow to Dumbarton of 1 in 83, and of the Tyne from Newcastle to its mouth of 1 in 75. Accordingly, a rate of enlargement comprised between 1 in 70 and 1 in 80 for the regulated or trained channel of the lower portion of a tidal river with a fairly level bed may be expected to give satisfactory results.

Works at the Outlet of Tidal Rivers.—Tidal rivers flowing straight into the sea, without expanding into an estuary, are subject to the obstruction of a bar formed by the heaping-up action of the waves and drift along the coast, especially when the fresh-water discharge is small; and the scour of the currents is generally concentrated and extended across the beach by parallel jetties for lowering the bar, as at the outlets of the Maas (figs. 11 and 12) and of the Nervion (figs. 19 and 20). In the latter case, however, the trained outlet was still liable to be obstructed by drift during north-westerly storms in the Bay of Biscay; and, except in the case of large rivers, the jetties have to be placed too close together, if the scour is to be adequate, to form an easily accessible entrance on an exposed coast. Accordingly, a harbour has been formed in the small bay into which the Nervion flows by two converging breakwaters, which provides a sheltered approach to the river and protects the outlet from drift (fig. 19), and a similar provision has been made at Sunderland for the mouth of the Wear; whilst the Tynemouth piers formed part of the original design for the improvement of the Tyne, under shelter of which the bar has been removed by dredging (fig. 17).

Training Works through Sandy Estuaries.—Many tidal rivers flow through bays, estuaries or arms of the sea before reaching the open sea, as, for instance, the Mersey through Liverpool Bay, the Tees through its enclosed bay, the Liffey through Dublin Bay, the Thames, the Ribble, the Dee, the Shannon, the Seine, the Scheldt, the Weser and the Elbe through their respective estuaries, the Yorkshire Ouse and Trent through the Humber estuary, the Garonne and Dordogne through the Gironde estuary, and the Clyde, the Tay, the Severn and the St Lawrence through friths or arms of the sea. These estuaries vary greatly in their tidal range, the distance inland of the ports to which they give access, and the facilities they offer for navigation. Some possess a very ample depth in their outer portion, though they generally become shallow towards their upper end; but dredging often suffices to remedy their deficiencies and to extend their deep-water channel. Thus the St Lawrence, which possesses an ample depth from the Atlantic up to Quebec, has been rendered accessible for sea-going vessels up to Montreal by a moderate amount of dredging; whilst dredging has been resorted to in parts of the Thames and Humber estuaries, and on the Elbe a little below Hamburg, to provide for the increasing draught of vessels; and the Mersey bar in Liverpool Bay, about 11 m. seawards of the actual mouth of the river, has been lowered by suction dredging from a depth of about 9 ft. down to about 27 ft. below low water of equinoctial spring tides, to admit Atlantic liners at any state of the tide.

Some estuaries, however, are so encumbered by sand banks that their rivers can only form shallow, shifting channels through them to the sea; and these channels require to be guided or fixed by longitudinal training walls, consisting of mounds of rubble stone, chalk, slag or fascines, in order to form sufficiently deep stable channels to be available for navigation. The difficulty in such works is to fix the wandering channel adequately, and to deepen it sufficiently by the scour produced between the training walls, without placing these walls so close together and raising them so high as to check the tidal influx and produce accretion behind them, thereby materially reducing the volume of tidal water entering and flowing out of the estuary at each tide. The high training works in the Dee estuary, carried out in the 18th century with the object of land reclamation, unduly narrowed the channel, and led it towards one side of the estuary; and though they effectually fixed the navigation channel, they produced very little increase in its depth, but caused a very large amount of sand to accumulate in the estuary beyond, owing to the great reduction in tidal volume by the reclamations, and diminished considerably the channel through the lower estuary in width and depth without checking its wanderings.[1] The training of the channel of the Ribble through its estuary below Preston, for improving its depth and rendering it stable, was begun in 1839, and has been gradually extended at intervals; but the works have not yet been carried out to deep water, and a shifting, shallow channel still exists through the sand banks, between the end of the training walls and the open sea. The high training walls adopted along the upper part of the channel enabled the upper end of the estuary on both sides to be reclaimed for a length of 4 m.; whilst the half-tide training walls below, placed unduly close together, have led to considerable accretion at the sides of the estuary and some extension of the sand banks seawards. Moreover, by fixing the channel near the northern shore they have enabled the landowners to carry out large reclamations on the southern foreshore. These works, however, besides fixing the navigable channel, have increased its depth, especially in the upper part, and augmented the tidal scour along it by lowering the low-water line; and the trained channel is further deepened by dredging. The training works in the Weser estuary have been confined to constructing a single low training wall at the upper end, which forms a trumpet-shaped outlet for the river below Bremerhaven, and to guiding the navigable channel by occasional low dikes at the side and closing minor channels, so as to concentrate the tidal scour and fresh-water discharge in it, whilst additional depth is obtained by dredging (fig. 21). A remarkable improvement has been effected in the navigable condition of the upper portion of the Seine estuary by training works, begun in 1848; for in place of a shallow, intricate channel through shifting sand banks, whose dangers were at times intensified by a *bore*, a stable deep channel has been provided down to about half-way between Berville and St Sauveur, rendering access easy to the river above at high tide (figs. 25 and 26). The channel, however, was made too narrow between Aizier and Berville and was subsequently enlarged, and large tracts of land were reclaimed in the upper estuary. The reduction in tidal capacity by the reclamations, together with the fixing and undue restriction in width of the channel, occasioned very large accretions at the back of the lower portions of the training walls and at the sides of the estuary beyond them, and an extension of the sand banks seawards. Moreover, the channel has always remained shallow and unstable beyond the ends of the training walls down to deep water near the mouth of the estuary.[2]



FIGS. 25 and 26.—Training Works in Sandy Estuary: River Seine.

Conclusions about Training Works in Estuaries.—Experience has proved that training works through sandy estuaries, by stopping the wanderings of the navigable channel, produce an increase in its depth, and, consequently, in the tidal scour for maintaining it. This scour, however, being concentrated in the trained channel, is withdrawn from the sides of the estuary, which in its natural condition is stirred up periodically by the wandering channel; and, therefore, accretion takes place in the parts of the estuary from which the tidal scour and fresh-water discharge have been permanently diverted, especially where an abundance of sand from outside, put in suspension by the action of the prevalent winds blowing into the estuary, is brought in by the flood-tide, as in the cases of the estuaries of the Dee, the Ribble and the Seine. This accretion reduces the tidal capacity of the estuary, and, producing a diminution in the tidal volume passing through the outlet, promotes the extension of the sand banks seawards, as indicated by the difference in the outer portions of the longitudinal sections of different dates of the Weser and Seine estuaries (figs. 22 and 26). To prevent as far as possible the reduction in tidal capacity, the training walls should not be raised more above low-water level than absolutely necessary to fix the channel; and the rate of enlargement of their width apart should not be less than 1 in 80 at the upper end, and should increase considerably towards the mouth of the estuary so as to form a trumpet-shaped outlet. The loss of scour in the channel resulting from this enlargement must be compensated for by dredging to attain the requisite depth. Training works partially carried out through an estuary have the advantage of reducing the length of shallow channel to be traversed between deep water and the entrance to the deepened river; but as these works produce no influence on the channel for any distance beyond their termination, a shallow, shifting channel is always found between the end of the trained channel and deep water. Accordingly, when training works are started at the head of a sandy estuary, provision should always be made in their design for their eventual prolongation to deep water at the mouth of the estuary, to ensure the formation of a stable, continuous, navigable channel. Experiments with a model, moulded to the configuration of the estuary under consideration and reproducing in miniature the tidal ebb and flow and fresh-water discharge over a bed of very fine sand, in which various lines of training walls can be successively inserted,[1] are capable in some cases of furnishing valuable indications of the respective effects and comparative merits of the different schemes proposed for works which have often evoked very conflicting opinions and have sometimes produced most unexpected results. (L. F. V.-H.)

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[1] L. F. Vernon-Harcourt, *Rivers and Canals*, 2nd ed. pp. 289–293, and plate 9, figs. 13 and 14.

[2] *Id.* pp. 293–300, and plate 9, figs. 11 and 12.

RIVER-HOG, a sportsman's name for the African wild pigs of which the southern representative is known to the Boers as the bosch-vark ("bush-pig"). They constitute a genus, *Potamochoerus*, nearly allied to the typical pigs of the genus *Sus* (see SWINE), from which they are distinguishable by the presence in the males of a long horny ridge below the eye; while they are further characterized by their thick coat of bristly and often brightly coloured hair, and by tufts of long bristles at the tips of the elongated and pointed ears. The southern *P. choeropotamus*, of southern and east Africa, is typically a greyish-brown animal, but one of its eastern representatives is orange-red. In north-east Africa occurs the allied *P. johnstoni*, while in Kordofan and Abyssinia this is in turn replaced by *P. hassama*. The most remarkable member of the group is, however, the red river-hog, *P. porcus*, which is a heavy, short-legged species remarkable for its bright red colour, the great length of the ear-tufts and the white rings round the eyes. It is a native of the great forest-tracts, extending from Senegambia, Liberia and Angola on the W., to Monbuttu in the E. Very noteworthy is the occurrence of a small yellow-haired representative of the group (*P. larvatus*) in Madagascar, which evidently must have reached its present habitat from the mainland. (R. L.*)

RIVERINA, a large tract of pastoral country between the rivers Murray and Darling in New South Wales, Australia. It gives name to the see of an Anglican bishop who has his seat at Hay. The chief towns are Deniliquin, Hay, Moulamein, Oxley and Booligal.

RIVERS, EARL, an English title held in succession by the families of Woodville or Wydeville, Darcy and Savage. In 1299 John Rivers, or de Ripariis, was summoned to parliament as a baron, and his son John was similarly summoned by Edward II. The earldom was created for Sir Richard Woodville in 1466 and remained in this family until 1491. (For the three earls of his line see below.) As borne by the Woodvilles the title was not derived from the name of a place, but from an ancient family name, Redvers, or Reviers, members of this family, whose arms are quartered on the Rivers shield, having been sometime earls of Devon.

From 1626 to his death in 1640 the earldom was held by Thomas Darcy, Viscount Colchester, from whom it descended by special remainder to his grandson John (*c.* 1610–1654), the son of his daughter Elizabeth (d. 1651) by her marriage with Sir Thomas Savage (d. 1635), who was created Viscount Savage in 1626. John's son Thomas (*c.* 1626–1694) was the 3rd earl, and his grandson Richard the 4th earl (see below). The title became extinct when John, the 5th earl, died about 1735.

A new barony of Rivers, held by the family of Pitt and its later representative, that of Pitt-Rivers, was in existence from 1776 to 1880.

RIVERS, ANTHONY WOODVILLE, or WYDEVILLE, 2ND EARL (*c.* 1442–1483), statesman and patron of literature, and author of the first book printed on English soil, was born probably in 1442. He was the son of Richard de Wydeville and his wife, Jacquetta de Luxemburg, duchess of Bedford. His father was raised to the peerage in his son's infancy, and was made earl of Rivers in 1466. Anthony, who was knighted before he became of age, and fought at Towton in 1461, married the daughter of Lord Scales, and became a peer *jure uxoris* in 1462, two years after the death of that nobleman. Being lord of the Isle of Wight at the time, he was in 1467 appointed one of the ambassadors to treat with the duke of Burgundy, and he exalted his office by challenging Anthony, comte de la Roche, the bastard of Burgundy, to single fight in what was one of the most famous tournaments of the age (see the elaborate narrative in Bentley's *Excerpta Historica*, 176–182). In 1469 Anthony was promoted to be lieutenant of Calais and captain of the king's armada, while holding other honorary posts. His father and brother were beheaded after the battle of Edgecot, and he succeeded in August of that year to the earldom. He accompanied Edward in his temporary flight to the Continent, and on his return to England had a share in the victory of Barnet and Tewkesbury and defended London from the Lancastrians. In 1473 he became guardian and governor to the young prince of Wales, and for the next few years there was no man in England of greater responsibility or enjoying more considerable honours in the royal service. It is now that for the first time we become aware of Lord Rivers's literary occupations. His mother, the duchess, died in 1472, and his first wife in 1473; in 1475 and the following year he went on pilgrimage to the holy places of Italy; from this time forth there was a strong tincture of serious reflection thrown over his character; he was now, as we learn from Caxton, nominated "Defender and Director of the Siege Apostolic for the Pope in England." Caxton had in 1476 rented a shop in the Sanctuary at Westminster, and here had set up a printing-press. The first MS. which he undertook in London was one sent to him by "the noble and puissant lord, Lord Antone, Erle of Ryvyers," consisting of a translation "into right good and fayr Englyssh" of Jean de Teonville's French version of a Latin work, "a glorious fair mirror to all good Christian people." In 1477 Caxton brought out this book, as *Dictes and Sayengis of the Philosophers*, and it is illustrious as the first production of an English printing-press. To this succeeded the *Moral Proverbs* of Christine de Pisan, in verse, in 1478, and a *Cordial*, in prose, in 1479. The original productions of Lord Rivers, and, in particular, his *Balades against the Seven Deadly Sins*, are lost. In 1478 a marriage was arranged between him and Margaret, sister of King James III. of Scotland, but it was mysteriously broken off. Rivers began to perceive that it was possible to rise too high for the safety of a subject, and he is now described to us as one who "conceiveth well the mutability and the unstableness of this life." After the death of Edward IV., he became the object of Richard III.'s peculiar enmity, and was beheaded by his orders at Pontefract on the 25th of June 1483. He was succeeded by his brother Richard, the 3rd and last earl of the Wydeville family, who died in 1491. Lord Rivers is spoken of by Commines as "un très-gentil chevalier," and by Sir Thomas More as "a right honourable man, as valiant of hand as politic in counsel." His protection and encouragement of Caxton were of inestimable value to English literature, and in the preface to the *Dictes* the printer gives an account of his own relations with the statesman which illustrates the dignity and modesty of Lord Rivers in a very agreeable way. Rivers was one of the purest writers of English prose of his time.

"Memoirs of Anthony, Earl Rivers" are comprised in the *Historical Illustrations of the Reign of Edward the Fourth* (ed. W. H. B[lack]). (E. G.)

RIVERS, RICHARD SAVAGE, 4TH EARL (*c.* 1660–1712), was the second son of Thomas, 3rd earl; and after the death about 1680 of his elder brother Thomas, styled Viscount Colchester, he was designated by that title until he succeeded to the peerage. Early in life Richard Savage acquired notoriety by his dare-devilry and dissipation, and he was, too, one of the most conspicuous rakes in the society of the period. After becoming Lord Colchester on his brother's death he entered parliament as member for Wigan in 1681 and procured a commission in the Horseguards under Sarsfield in 1686. He was "the first nobleman and one of the first persons" who joined the prince of Orange on his landing in England, and he accompanied William to London. Obtaining promotion in the army, he served with distinction in Ireland and in the Netherlands, and was made major-general in 1693 and lieutenant-general in 1702. In 1694 he succeeded his father as 4th Earl Rivers. He served abroad in 1702 under Marlborough, who formed a high opinion of his military capacity and who recommended him for the command of a force for an invasion of France in 1706. The expedition was eventually diverted to Portugal, and Rivers, finding himself superseded before anything was accomplished, returned to England, where Marlborough procured for him a command in the cavalry. The favour shown him by Marlborough did not deter Rivers from paying court to the Tories when it became evident that the Whig ascendancy was waning, and his appointment as constable of the Tower in 1710 on the recommendation of Harley and without Marlborough's knowledge was the first unmistakable intimation to the Whigs of their impending fall. Rivers now met with marked favour at court, being entrusted with a delicate mission to the elector of Hanover in 1710, which was followed by his appointment in 1711 as master-general of the ordnance, a post hitherto held by Marlborough himself. Swift, who was intimate with him, speaks of him as "an arrant knave"; but the dean may have been disappointed at being unmentioned in Rivers's will, for he made a fierce comment on the earl's bequests to his mistresses and his neglect of his friends. In June 1712 Rivers was promoted to the rank of general, and became commander-in-chief in England; he died a few weeks later, on the 18th of August 1712. He married in 1679 Penelope, daughter of Roger Downes, by whom he had a daughter Elizabeth, who married the 4th earl of Barrymore. He also left several illegitimate children, two of whom were by Anne, countess of Macclesfield. Rivers's intrigue with Lady Macclesfield was the cause of that lady's divorce from her husband in 1701. Richard Savage, the poet, claimed identity with Lady Macclesfield's son by Lord Rivers, but though his story was accepted by Dr Johnson and was very generally believed, the evidence in its support is faulty in several respects. As Rivers left no legitimate son the earldom passed on his death to his cousin, John Savage, grandson of the 2nd earl, and a priest in the Roman Catholic Church, on whose death, about 1735, all the family titles became extinct.

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[1] *Rivers and Canals*, 2nd ed. pp. 327–342, and plate 10.

See William Coxe, *Memoirs of Marlborough* (3 vols., London, 1818); *Letters and Despatches of Marlborough, 1702–1712*, vol. v., edited by Sir G. Murray (5 vols., London, 1845); Gilbert Burnet, *History of his own Time* (6 vols., Oxford, 1833); F. W. Wyon, *History of Great Britain during the Reign of Queen Anne* (2 vols., London, 1876); G. E. C., *Complete Peerage*, vol. vi. (London, 1895).

RIVERS, RICHARD WOODVILLE, or Wydeville, Earl (d. 1469), was a member of a family of small importance long settled at Grafton in Northamptonshire. His father, Richard Woodville, was a squire to Henry V., and afterwards the trusted servant of John of Bedford, in whose interest he was constable of the Tower during the troubles with Humphrey of Gloucester in 1425. The younger Richard Woodville was knighted by Henry VI. at Leicester in 1426. He served under Bedford in France, and after his master's death married his widow Jacquetta of Luxemburg. The mésalliance caused some scandal, but Woodville enjoyed the king's favour and continued to serve with honour in subordinate positions in France. He also distinguished himself at jousts in London (*Chronicles of London*, 146, 148). On the 9th of May 1448 Henry VI. created him Baron Rivers. His associations made him a strong Lancastrian. For some years he was lieutenant of Calais in Henry's interests. In 1459, when stationed at Sandwich to prevent a Yorkist landing, he was surprised by Sir John Dinham, and taken prisoner with his son Anthony to the earl of Warwick at Calais. He was, however, released in time to fight for Henry VI. at Towton. Early in the reign of Edward IV. Rivers recognized that the Lancastrian cause was lost and made his peace with the new king. The marriage of his eldest daughter, Elizabeth, widow of Sir John Grey of Groby, to Edward on the 1st of May 1464, secured the fortunes of his family. Rivers was appointed treasurer on the 4th of March 1466, and a little later created earl. Elizabeth found great alliances for her younger brothers and sisters, and the Woodville influence became all-powerful at court. The power of this new family was very distasteful to the old baronial party, and especially so to Warwick. Early in 1468 Rivers's estates were plundered by Warwick's partisans, and the open war of the following year was aimed to destroy the Woodvilles. After the king's defeat at Edgecot, Rivers and his second son, John, were taken prisoners at Chepstow and executed at Kenilworth on the 12th of August 1469. Rivers had a large family. His third son, Lionel (d. 1484), was bishop of Salisbury. All his daughters made great marriages: Catherine, the sixth, was wife of Henry Stafford, 2nd duke of Buckingham (*q.v.*).

Bibliography.—The chief contemporary authorities are the *Paston Letters*, ed. Dr James Gairdner, *The Chronicles of London*, ed. C. L. Kingsford (1905), and the *Chronicles* of Commines and Waurin. See also some notices in *Calendars of State Papers, Venetian*, ed. Rawdon Browne. For modern accounts see Sir James Ramsay's *Lancaster and York* (1892), *The Political History of England*, vol. iv., by Professor C. Oman, and *The Complete Peerage*, by G. E. C[okayne]. For Earl Anthony's connexion with Caxton consult William Blades's *Life of Caxton* (1861–63). (C. L. K.)

RIVERSIDE, a city of southern California, U.S.A., and the county-seat of Riverside county, situated on the Santa Ana river, in the San Bernardino valley. Pop. (1890) 4683; (1900) 7973 (1525 foreign-born); (1910) 15,212. It is served by the Atchison, Topeka & Santa Fé, the Southern Pacific and the San Pedro, Los Angeles & Salt Lake railways. The city occupies a slope (about 800–1000 ft. above sea-level), rising toward the east, is beautifully built and is a winter and health resort. In the Albert S. White Park there is a notable collection of cacti; and Huntington Park is high and rocky, is well planted with trees and has a finely shaded automobile drive. Magnolia Avenue, bordered with pepper-trees, is 10 m. long and 130 ft. wide; and Victoria Avenue is similarly parked and lined with semi-tropical trees. Riverside is the seat of an important (non-reservation) boarding-school for Indians, Sherman Institute (1903), which in 1908 had 699 students. Riverside is devoted to the cultivation of oranges, lemons and other subtropical fruits, and has a large trade in these products. It is in the centre of the finest orange district of the state; near Huntington Park is the state citrus experiment station (1906), with an experimental orchard of 20 acres. The cultivation of navel oranges was first introduced from Brazil into the United States at Riverside in 1873; the two original trees, protected by an iron railing, were still standing in 1909. The domestic water supply is obtained from artesian wells. In 1870 the site of the present city, then called Jurupa Rancho, the name of the old Spanish grant, was purchased by the Southern California Colony Association. The settlement was chartered in 1883 as a city, with limits including about 56 sq. m. Riverside county was not organized until ten years later. From 1895 there were no saloons in the city.

RIVES, WILLIAM CABELL (1793–1868), American political leader and diplomat, was born in Nelson county, Virginia, on the 4th of May 1793. He attended Hampden-Sidney and William and Mary colleges, was admitted to the bar, and practised in Nelson county (till 1821) and afterwards in Albemarle county. In politics a Democrat, he served in the state constitutional convention in 1816, in the Virginia House of Delegates in 1817–19 and in 1822, and in the Federal House of Representatives in 1823–29. From 1829 to 1832 he was minister to France; in 1833 he entered the United States Senate, but in the following year resigned. From 1836 to 1845 he again served in the Senate, and in 1849–53 he was again minister to France. In February 1861 he was a delegate to the Peace Conference in Washington; he opposed secession, but was loyal to his state when it seceded, and was one of its representatives in the Confederate Congress during the Civil War. He died at the country estate of Castle Hill, Albemarle county, Virginia, on the 25th of April 1868. Rives was the author of several books, the most important being his *Life and Times of James Madison* (3 vols., Boston, 1859–68), the completion of which was prevented by his death. He was the father of Alfred Landon Rives (1830–1903), an engineer of some prominence, whose daughter, Amélie Rives (1863–), became well known as a novelist, her best known book being *The*

Quick or the Dead? (1888); she married John A. Chanler in 1888, and after their divorce married in 1896 Prince Pierre Troubetzkoy of Russia.

RIVET (O. Fr. *rivet*, from *river*, to fix, fasten together, of unknown origin; Skeat compares Icel. *rifa*, to stitch together), a metal pin or bolt used to fasten metal plates together. A rivet, made of wrought iron, copper or other malleable substance, is usually made with a head at one end, the other end being hammered out after passing through the plates so as to keep them closely fastened together. A “bolt” differs from a rivet in that one or both ends have screw-threads to hold a nut (see SHIPBUILDING).

RIVIERA, the narrow belt of coast which lies between the mountains and the sea all round the Gulf of Genoa in the north of Italy, extending from Nice on the W. to Spezia on the E. It is usually spoken of as Riviera di Ponente (“the coast of the setting sun”), the portion between Nice and the city of Genoa; and as Riviera di Levante (“the coast of the rising sun”), the portion from Genoa to Spezia. All this district, being open to the S. and sheltered from the N. and E. winds, enjoys a remarkably mild climate (winter mean, about 49° Fahr.); so much so that the vegetation in many places partakes of a subtropical character (*e.g.* the pomegranate, agave, prickly pear, date, palm and banana). Large numbers of flowers, especially roses, violets, hyacinths, &c., are grown near Nice, Mentone, Bordighera and other towns, and sent to the London and Paris markets. Bordighera is particularly noted for its noble groves of date-palms, one of the few places in Europe where these trees grow. The uncommon mildness of the climate, conjoined with the natural beauty of the coast scenery,—the steep sea-crags, the ruined towers and the range of the Maritime Alps,—attracts thousands of invalids and convalescents to spend the winter in the chain of towns and villages which stretch from the one end of the Riviera to the other, while these resorts are frequented for sea-bathing in summer by the Italians. Proceeding from W. to E. the following are the places to which visitors principally resort: Nice, Monaco (an independent principality), Monte Carlo, Mentone (the last town on the French Riviera), Ventimiglia, Bordighera, Ospedaletti, San Remo, Porto Maurizio, Oneglia, Diano Marina, Alassio, Arenzano, Pegli (in the Riviera di Ponente), and Nervi, Santa Margherita, Rapallo, Chiavari, Sestri Levante, Levanto, Spezia, and San Terenzo (Lerici) in the Riviera di Levante. The Riviera labours, however, under the grave drawback of being liable to earthquakes. In the 19th century there were four such visitations, in 1818, 1831, 1854 and 1887, which especially affected the western Riviera. A railway runs close along the shore all through the Riviera, the distance from Nice to Genoa being 116 m., and the distance from Genoa to Spezia 56 m. In the latter stretch the line burrows through the many projecting headlands by means of more than eighty tunnels. The pearl of the eastern Riviera is the stretch (6 to 7 m.) between Rapallo and Chiavari. Lord Byron and Shelley both lived and wrote on the shores of the Gulf of Spezia, and Dickens wrote *The Chimes* at Genoa.

RIVIERE, BRITON (1840–   ), English artist, was born in London on the 14th of August 1840. His father, William Riviere, was for some years drawing-master at Cheltenham College, and afterwards an art teacher at Oxford. He was educated at Cheltenham College and at Oxford, where he took his degree in 1867. For his art training he was indebted almost entirely to his father, and early in life made for himself a place of importance among the artists of his time. His first pictures appeared at the British Institution, and in 1857 he exhibited three works at the Royal Academy, but it was not until 1863 that he became a regular contributor to the Academy exhibitions. In that year he was represented by “The Eve of the Spanish Armada,” and in 1864 by a “Romeo and Juliet.” Subjects of this kind did not, however, attract him long, for in 1865 he began, with a picture of a “Sleeping Deerhound,” that series of paintings of animal-subjects which has since occupied him almost exclusively. Among the most memorable of his productions are: “The Poacher's Nurse” (1866), “Circe” (1871), “Daniel” (1872), “The Last of the Garrison” (1875), “Lazarus” (1877), “Persepolis” (1878), “In Manus Tuas, Domine” (1879), “The Magician's Doorway” (1882), “Vae Victis” (1885), “Rizpah” (1886), “An Old-World Wanderer” (1887), “Of a Fool and his Folly there is no End” (1889), “A Mighty Hunter before the Lord” (1891), “The King's Libation” (1893), “Beyond Man's Footsteps” (1894), now in the National Gallery of British Art; “Phoebus Apollo” (1895); “Aggravation” (1896), “St George” (1900), and “To the Hills” (1901). He has also painted portraits; and at the outset of his career made some mark as an illustrator, beginning with *Punch*. He was elected an Associate of the Royal Academy in 1878, and R.A. in 1881, and received the degree of D.C.L. at Oxford in 1891.

See Sir Walter Armstrong, “Briton Riviere, R.A.; His Life and Work,” *Art Annual* (1891).

RIVINGTON, CHARLES (1688–1742), British publisher, was born at Chesterfield, Derbyshire, in 1688. Coming to London as apprentice to a bookseller, he took over in 1711 the publishing business of Richard Chiswell (1639–1711), and, at the sign of the Bible and the Crown in Paternoster Row, he carried on a business almost entirely connected with theological and educational literature. He also published one of Whitefield's earliest works, and brought out an edition of the *Imitation of Christ*. In 1736 Rivington founded the company of booksellers who called themselves the “New Conger,” in rivalry with the older association, the “Conger,” dating from about 1700. In 1741 he published the first volume of Richardson's *Pamela*. Charles Rivington died on the 22nd of February 1742, and was succeeded by his two sons, John (1720–1792) and James (1724–1802). James emigrated to America, and pursued his trade in New York (see NEWSPAPERS, *U.S.A.*); John carried on the business on the lines marked out by his father, and was the great Church of England publisher of the day. In 1760 he was appointed publisher to the Society for Promoting Christian Knowledge, and the firm retained the agency for over seventy years. Having admitted his sons Francis (1745–1822) and Charles (1754–1831) into partnership he undertook for the “New Conger” Association the issue of a standard edition of the works of Shakespeare, Milton, Locke and other British classics; also Cruden's *Concordance*. John Rivington died on the 16th of January 1792. In 1810 John (1779–1841), the eldest son of Francis, was admitted a partner. In 1827 George (1801–1858) and Francis (1805–1885), sons of Charles Rivington, joined the firm. Rivington contracted further ties with the High Church party by the publication (1833, &c.) of *Tracts for the Times*. John Rivington died on the 21st of November 1841, his son, John Rivington (1812–1886) having been admitted a partner in 1836. George Rivington died in 1858; and in 1859 Francis Rivington retired, leaving the conduct of affairs in the hands of John Rivington and his own sons, Francis Hansard (b. 1834) and Septimus (b. 1846). In 1890 the business was sold to Messrs Longmans (*q.v.*). A business of the same character was, however, carried on from 1889 to 1893 by Mr Septimus Rivington and Mr John Guthrie Percival, as Percival & Co. This was changed in 1893 to Rivington, Percival & Co.; and in 1897 the firm revived its earlier title of Rivington & Co., maintaining its reputation for educational works and its connexion with the Moderate and High Church party.

See *The House of Rivington*, by Septimus Rivington (1894); also the *Publishers' Circular* (15th January 1885, 2nd June 1890).

RIVOLI VERONESE, a village of Venetia, Italy, in the province of Verona, on a hill on the right bank of the Adige, 13 m. N.W. of Verona, 617 ft. above sea-level. Pop. (1901) 1340. It is celebrated as the scene of the battle in which, on the 15th of January 1797, Napoleon inflicted a decisive defeat upon the Austrians commanded by Josef Alvintzi, Baron von Barberek (1735–1810) (see FRENCH REVOLUTIONARY WARS). A famous street in Paris (Rue de Rivoli) commemorates the victory, and under the empire Marshal Masséna received the title of duke of Rivoli. The strong positions around Rivoli, which command the approaches from Tirol and the upper Adige into the Italian plain, have always been celebrated in military history as a formidable obstacle, and Charles V. and Prince Eugene of Savoy preferred to turn them by difficult mountain paths instead of attacking them directly. Minor engagements, such as rearguard actions and holding attacks, have consequently often taken place about them, notably in the campaign of 1796–97. An engagement of this character was fought here in 1848 between the Austrian and the Piedmontese troops.

RIXDORF, a town of Germany, lying immediately south of Berlin, of which it practically forms a suburb, though retaining its own civic administration. Pop. (1880) 18,729; (1895) 59,495; (1905) 153,650. It is connected with the metropolis by a railway (Ring-bahn) and by an electric tramway. It contains no public buildings of any interest, and is almost entirely occupied by a large industrial and artisan population, engaged in the manufacture of linoleum, furniture, cloth, pianos, beer, soap, &c.

Rixdorf is chiefly interesting as a foundation of Moravian Brethren from Bohemia, who settled here in 1737 under the protection of King Frederick William I. German Rixdorf, which is now united with Bohemian Rixdorf, was a much more ancient place, and appears as Richardsdorf in 1630 and as Riegenstorp in 1435. Before 1435 it belonged to the order of the Knights of St John.

RIZZIO, or RICCIO, **DAVID** (*c.* 1533–1566), secretary of Mary (*q.v.*), queen of Scots, was a native of Turin, and came to Scotland in 1561 in the train of the Piedmontese ambassador. The queen wanted a bass singer, and he entered her service as a musician, becoming also her *valet de chambre*, and in 1564 private foreign secretary. After her marriage to Darnley in 1565 his influence with Mary became paramount, and he gave himself great airs and affected considerable state, practically superseding Maitland of Lethington as secretary of state. His elevation aroused the active hostility of Darnley and the other nobles, and he was suspected of being the queen's lover. On the evening of the 9th of March 1566, the earls of Morton and Lindsay, with armed followers, entered Mary's supper chamber at Holyrood, seized Rizzio, hacked him to death with daggers, and threw his body into the courtyard.

See Ruthven's *Narrative of Riccio's Murder* (1836); and the articles on MARY, QUEEN OF SCOTS, and allied biographies.

ROACH (*Leuciscus rutilus*), a small fish belonging to the Cyprinid family, the genus *Leuciscus* having many representatives in Europe, in which the rudd, the chub and the dace are included. It may attain a length of over 12 in., but a roach of 2 ℔ is an unusually large one. It is good sport for anglers, but is not esteemed for the table. The general colour is silvery, with reddish fins. It does not occur in Ireland. In America, the "golden shiner" minnow (*Abramis chrysoleucus*) is sometimes called a roach.

See Greville Fennell's *Book of the Roach*, 1870.

ROADS AND STREETS. These words embrace the two divisions into which the lines of communication made by man for vehicular and pedestrian traffic between different places may be roughly classified. In current usage "road" is applied as a general term for all broad made ways from place to place, whether with separate side-paths for foot-passengers or not, while "street" is confined to the roads through towns, villages and other inhabited places, more or less lined by houses and other buildings on either side. The present article is confined to the methods adopted in making roads, from the first great road-makers, the Romans, down to modern times. The roadways of times anterior to the Romans, at least in Europe, were merely the tracks worn by the feet of pedestrians and animals, and the wheels of vehicular traffic.

Etymologically considered, "road" in its current usage is late in its appearance. The first quotation in the *New English Dictionary* is from Shakespeare (*1 Henry IV.* 2, i. 16). The true O.E. word was *weg*, way, common to Teut. languages, and probably allied to Lat. *via*. The O.E. *rād* meant the act of riding, and is formed from *ridan*, to ride, and is thus used of a journey on horseback, and in compounds of a track or course, cf. *swanrād*, the swan's track, a poetic word for the sea- or *streām-rād*, course of a stream, *hwēolrad*, wheel-track, &c. A special use of the word, occurring as early as the Anglo-Saxon *Chron.* c. 900, was for a hostile foray, an "inroad," a "raid," which is the N. Eng. doublet of "road," and has superseded it in general use. Another use, which still survives, and shows the origin, is that of a space of water where ships may "ride at anchor in security from stress of weather, a roadstead." "Street" (O.E. *strǣt*) represents the Lat. *strata via*, paved way (from *sternere*, to strew, pave). It is one of the few words adopted in O.E. from the Romans.

Roman roads.

The earliest roads about which anything definite is known, so far as construction is concerned, are those of ancient Rome, one of the oldest of which and the most celebrated for the grandeur of its works—the Appian Way—was commenced in 312 B.C. Roman roads are remarkable for preserving a straight course from point to point regardless of obstacles which might have been easily avoided. They appear to have been often laid out in a line with some prominent landmark, and their general straightness is perhaps due to convenience in setting them out. In solidity of construction they have never been excelled, and many of them still remain, often forming the foundation of a more modern road, and in some instances constituting the road surface now used. It is consequently possible, with the help of allusions of ancient writers, to follow the ideal mode of construction, though this was not always adopted. Two parallel trenches were first cut to mark the breadth of the road; loose earth was removed until a solid foundation was reached; and it was replaced by proper material consolidated by ramming, or other means were taken to form a solid foundation for the body of the road. This appears often to have been composed of four layers, generally of local materials, though sometimes they were brought from considerable distances. The lowest layer consisted of two or three courses of flat stones, or, when these were not obtainable, of other stones, generally laid in mortar; the second layer was composed of rubble masonry of smaller stones, or a coarse concrete; the third of a finer concrete, on which was laid a pavement of polygonal blocks of hard stone jointed with the greatest nicety. The four layers are found to be often 3 ft. or more in thickness, but the lower ones were dispensed with on rock, on which the paving stones were sometimes laid almost directly. The paved part of a great road appears to have been about 14 ft. wide, and on either side, and separated from it by raised stone edgings, were unpaved sideways, each of half the width of the paved road. Where, as on many roads, the surface was not paved, it was made of hard concrete, or pebbles or flints set in mortar. Sometimes clay and marl were used instead of mortar, and it would seem that where inferior materials were used the road was made higher above the ground and rounder in cross section. Streets were paved with large polygonal blocks laid as above described, and footways with rectangular slabs. Specimens are still to be seen in Rome and Pompeii, while in Britain many of the roads were of hard gravel or had a cobbled surface. There are no traces of Roman influence in the later roads in England, but in France the Roman method appears to have been followed to some extent when new roads were constructed about the beginning of the 18th century. A foundation of stones on the flat was laid, and over that two layers of considerable thickness, of larger and smaller stones, bordered by large stones on edge, which appeared on the surface of the road. In 1764 Trésaguet set the foundation-stones on edge and reduced the thickness of the upper layers, and his method was generally followed until the influence of John Loudon McAdam (1756–1836) began to be felt. A French chaussée with accotements still retains some resemblance to the old Roman roads.

English roads, 18th century.

The almost incredibly bad state of the roads in England towards the latter part of the 17th century appears from the accounts cited by Macaulay (*Hist.* c. iii.). It was due chiefly to the state of the law, which compelled each parish to maintain its own roads by statute labour, but the establishment of turnpike trusts and the maintenance of roads by tolls do not appear to have effected any great improvement. At the time of Arthur Young's six months' tour in 1770 the roads would seem to have been almost as bad as ever, and it is doubtful if there was much improvement up to the beginning of the 19th century. The turnpike roads were generally managed by ignorant and incompetent men until Telford and McAdam brought scientific principles and regular system to their construction and repair. The name of Telford is associated with a pitched foundation, which he did not always use, but which closely resembled that which had been long in use in France, and the name of McAdam often characterizes roads on which all his precepts are disregarded. Both insisted on thorough drainage and on the use of carefully prepared materials, and adopted a uniform cross section of moderate curvature instead of the exaggerated roundness given before; but, while Telford paid particular attention to a foundation for the broken stone, McAdam disregarded it, contending that the subsoil, however bad, would carry any weight if made dry by drainage and kept dry by an impervious covering. McAdam was engaged more with the repair of old roads than with the construction of new ones, and, though it is not possible to agree with all his doctrines, the improvement which he effected in road management and maintenance was great and lasting.

Gradient.

Construction of Roads.—A road should be as short as possible between two points to be connected, but straightness must often be sacrificed to avoid difficulties and expense and to secure good gradients. The latter should be as easy as practicable, having regard to the country to be traversed, and it is desirable that there should be a ruling gradient than which none should be steeper. On the level macadamized road in ordinary repair the force which the horse has to put forth to draw a load may be taken as one-thirtieth of the load. But in going uphill the horse has also to lift the load, and the additional force to be put forth on this account is very nearly equal to the load drawn, divided by the rate of gradient. Thus on a gradient of 1 in 30 the force spent in lifting is one-thirtieth of the load, and in ascending a horse has to exert twice the force required to draw the load on a level. In descending, on the other hand, on such a gradient, the vehicle, when once started, would just move of itself without pressing on the horse. A horse can without difficulty exert twice his usual force for a time, and can therefore ascend gradients of 1 in 30 on a macadamized surface without sensible diminution of speed, and can trot freely down them. These considerations have led to 1 in 30 being generally considered as the ruling gradient to be aimed at on first-class roads, though 1 in 40 has been advocated. Telford adopted 1 in 30 as the ruling gradient on the Holyhead road through North Wales, and there are only two gradients steeper, in places where they were unavoidable. All unnecessary rises and falls should be avoided, but a dead level is unfavourable for drainage, and on this account 1 in 100 to 1 in 150 is the flattest gradient that is desirable. Such slight rises and falls are probably rather favourable than otherwise to ease of draught by horses.

Cross section.

In transverse section, roads in the United Kingdom generally consist of a carriage-way, with spaces on each side, on one or both of which there may be a footpath, and fences and ditches. The width of the carriage-way may be from 15 ft., which allows of the easy passage of two vehicles, to 30 or 50 ft. for roads of importance near towns. The side spaces may be from 4 or 5 to 8 or 10 ft. wide; wide sides give the sun and air access to the road, and tend to keep it dry, and also afford space for the deposit of road materials and scrapings. In cuttings or on embankments the transverse section has of course to be modified. The road surface should have just enough convexity to throw the wet off freely, and a very moderate amount is sufficient when a good surface is maintained. On a too convex road the traffic keeps to the middle, and wears ruts which retain the water, so that the surface is not so dry as with a flatter section which allows the traffic to distribute itself over the whole width. Telford used a cross section differing slightly from an arc of a circle in being more convex in the middle than at the sides. J. Walker recommended two straight lines joined in the middle of the road by a curve, and inclined about 1 in 24 towards the sides, the objection to which is that the flat sides are liable to wear hollow. On the whole a curve of the form of a flat ellipse is the best; the rise in the curve from the sides to the centre need not exceed one-fortieth of the width, and one-sixtieth is generally enough on well-kept roads. It is generally best to obtain the requisite convexity by rounding the formation surface or seat of the road and giving a uniform thickness to the coating of stone, but often, especially in country roads where the traffic is not very heavy and keeps mainly to the centre, the formation is made level and the convexity is obtained by using more road material at the centre than the sides. When there is not a kerb there should be a "shouldering" of sods and earth on each side to keep the road materials in place, and to form with the finished surface the water tables or side channels in which the surface drainage is collected, to be conveyed by outlets at frequent intervals to the side ditches. The outlets are open cuts through the sides or drains beneath the footpaths. The side ditches should be deep enough thoroughly to drain the foundation of the road, and cross or mitre drains under the road communicating with the side ditches may be required in wet soil. A thorough drainage of the subsoil is of the greatest importance, and it is economical in the end to go to considerable expense to secure it. In a cutting, or where there are no side ditches, the surface water may be taken off by gratings and under drains beneath the side channels.

Macadam Roads.—The thickness to be given to a road made altogether of broken stone will depend on the traffic it is intended for. On a good well-drained soil a thickness of 6 in. will make an excellent road for ordinary traffic, and McAdam's opinion that 10 in. of well-consolidated material was sufficient to carry the heaviest traffic on any substratum if properly drained has proved to be generally correct. In a new road the loss of thickness during consolidation must be allowed for, and the materials should be laid about one-half thicker than the coating is intended to be. When the materials are not rolled, a thickness of 3 to 6 in. should be laid first, and when that has partly consolidated under the traffic other coats may be added to make up the full thickness. There is great wear and waste of the materials in consolidating if they are laid too thickly at once. Inferior material is sometimes used in the lower part of the road coating, especially when the surface is to be of granite or other hard expensive stone. Thus flints or gravel may be used for the lower 5 or 6 in. of a road to be coated with 3 or 4 in. of granite. Telford covered the broken stone of new roads with 1½ in. of gravel to act as a binding material. McAdam absolutely interdicted the use of any binding material, leaving the broken stone to work in and unite by its own angles under the traffic.

If the ideas of the inventor are strictly followed, macadam, when the fine network of joints is thinly masked with hardened mud worn from the stone, comes near to a perfect surface. But stones that will pass through a ring of a given size may be twice as much in length, and unless their form is about that of a cube not exceeding 1¼ in. on its longest side, they cannot be rammed or rolled into the regular mosaic characteristic of the true macadam. The best modern roads are of hand-broken stone dressed slightly on the surface with stone chips, while the mass of the road-metal is kept free from any kind of binding. Some roadmakers, however, have found the large irregularly shaped stones from the machine so difficult to consolidate that they have had to reconsider the question of binding. The engineer of Central Park, New York, found that, with the greatest care and attention to rolling, such stones would not consolidate properly without admixture; indeed they became more intractable the more they were abraded by rolling. G. F. Deacon of Liverpool advocated a binding composed of large chips of trap rock or else of siliceous gravel from the size of three-quarters of an inch down to that of a pin's head, together with about one-fourth part of macadam sweepings obtained in wet weather. This will enable the roller to consolidate the road-metal in a third of the time required for broken stone alone. The harder materials here suggested differ essentially from the sand and dirt formerly used for binding, since they fill up all the vacant spaces and cannot be washed down.

A new road is preferably finished by rolling, since in that way the materials are consolidated with less waste, and wear and tear of vehicles is saved. A 15-ton steam-roller, 7 ft. wide, giving upwards of 2 tons weight per foot can thoroughly consolidate 1000 to 2000 sq. yds. of newly laid materials per day.

A pitched foundation, as used by Telford, consists of flat stones set on edge in courses across the road with the broader edges downwards. All inequalities must be knocked off, and small stones and chips must be firmly pinned into the interstices with a hammer, so as to form a regular convex surface with every stone fixed firmly in place. A foundation of cement concrete 6 in. thick was used by Sir J. Macneill on the Highgate Archway (London) road on a bad clay bottom, and common lime concrete was subsequently used elsewhere. A bed of lias lime concrete 12 in. thick was laid as a foundation in Southwark Street and on the Thames Embankment, but it is too expensive for a macadamized road under ordinary circumstances. Foundations of large and rough hard-core should be rolled down to a surface close enough to keep the finer pieces of road-metal from dropping down, so as to create hollows which, though they may escape the roller, will be detected by the laden wheel and by the pounding of the heavy hoof. But there is no foundation equal to sand, which has the property of spreading pressure over an enlarged area. A 12-in. bed of sand rolled down to 8 in. has been recommended, but military engineers have found that a layer of so little as 3 or 4 in. is sufficient as a foundation for macadam in very bad ground that has been rolled, or on an embankment that has had time to settle.

Tar Macadam.—Broken stone mixed with some bituminous composition has been found very suitable for suburban roads, and for towns where the nature of the traffic requires smooth roadways reasonably free from noise and dust. In its simplest form, tar macadam is made from a good hard limestone broken into the usual sizes, the fine chips being used for top-dressing. In a shed a large hearth is formed of stone flagging, under which the flues of a furnace are constructed, and upon the hearth the broken stone is spread in a layer just as thick as the heat may be able to penetrate, to dry off the moisture and make the stones distinctly hot. The load of an ordinary barrow is tipped on an iron plate and gas tar is poured over it (from 8 to 12 gals. per cubic yard), while a couple of men with shovels turn it over exactly as they would turn concrete. No more tar should be used than is required completely to blacken the whole surface of every stone; and when this has been done, the stone can be thrown upon the heap, where it may be kept for one or two months, under cover, to allow the volatile oils to evaporate. Fine siftings are treated in the same way. When it has been properly seasoned, the mass should assume a greenish lustre; and when cut into by a shovel, the particles will cling together and creep down slowly so that the heap is said to be "alive." In that state it may be used. The tar ought to be boiled, and if too thin, a little pitch may be added to it, though not enough to make the heap consolidate. A mixture of tar with pitch and creosote oil is used by more precise makers, one formula being 12 gals. tar, ½ cwt. pitch and 2 gals. creosote oil to a ton of stone. But these ingredients differ considerably in their chemical composition, and the proportions have to be varied according to experience. Moreover, as regards the tar and pitch used in the manufacture of pavements, the varieties that come directly from a vegetable source are liable to melt in hot and to become brittle in cold weather; coal tar is only moderately proof against these extremes.

Tar macadam must be put down in dry weather. If the material seems too dry, hot tar may be applied as before, but only as an expedient, and with great economy, so that the pavement may not soften in the sun. Upon a well-rolled foundation of hard material a layer of the coarser macadam should be put and rolled, then a layer of the smaller grade. For a road of light traffic a coat of the fine siftings may be put down and heavily rolled to a finished surface. For a road of heavier traffic the second coat should be dressed before rolling with tarred stone of a gauge of three-quarters of an inch to an inch and a quarter, and rolled first with a roller of not more than 10 or 12 cwt., then with one of 30 cwt. After the traffic has been turned on the road for a few days it should again be rolled as heavily as may be necessary to restore any parts that have been disturbed. But such roads are often consolidated by steam-rollers of 10 or 15 tons. For refacing an old road the prongs attached to a steam-roller will easily lift the old layer. Small depressions may be well tarred and levelled up with fine stuff, and the whole surface may be dressed every three years with tar and a fresh coat of fine chips. If the surface of the road is irregular, water will hang upon it, and frost may cause it to become slippery. The lack of affinity between granite and bitumen prevents the use of tar macadam upon roads of heavy traffic.

Concrete Macadam.—Rocks like granite and syenite may be used in combination with Portland cement. The ingredients are mixed in about the proportion of four parts of broken stone that has first been well wetted, one and a quarter or two parts of clean sharp sand, and one of cement put on in two layers, the second being rolled by hand to the required shape and to a good surface. It should remain for two or three weeks to dry and set. Want of elasticity may be urged against concrete macadam, and it is productive of dust, but in some cases it has proved satisfactory.

Gravel Roads.—Smooth rounded gravel is unsuitable for roads unless a large proportion of it is broken, and about an eighth part of ferruginous clay added for binding. Rough pit gravel that will consolidate under the roller may be applied in two or more layers, but each must be of similar composition, or the smaller stuff will work downwards. A gravel road should be always under inspection, and repairs should be done without delay. A track for equestrian exercise should be made of hoggin or fine gravel, that will remain soft when raked or harrowed and watered. It should be well drained. A foundation of rough hard core will let the hoggin pass down into it, so that the hard core will appear at the surface. The best material is rough chalk sufficiently rolled to stop the gravel while draining off the surface water.

Stone Pavements.—Early pitched roadways consisted of pebbles or rounded boulders ("cobblestones") bedded in the natural surface or in sand or gravel. The next step in advance was to employ roughly squared blocks; but the wide and irregular joints admitted the water to the subsoil, and the mud worked up and the stones sank irregularly under the traffic. Telford, who was called upon to report on the street pavements of the parish of Hanover Square in 1824, saw the necessity of cutting off all connexion between the subsoil and the paving stones. He recommended a bed of about 6 in. of clean river ballast, rendered compact by being travelled upon for some time before the paving was laid, but he subsequently considered that nothing short of 12 in. of broken stone, put on in layers 4 in. thick and completely consolidated by carriages passing over them, would answer the purpose. He recommended paving stones of considerable depth and of from 4½ to 6 or 7½ in. in breadth for the greatest thoroughfares, and he pointed out the importance of working the stones flat on the face and square on all sides, so as to joint close and preserve the bed or base as nearly as possible of the same size as the face, and of carefully placing together in the same course stones of equal breadth. Many pavements thus laid with stones of considerable breadth still remain, but experience proved that it was a mistake to suppose that broad stones having a larger base would support better the weight and shocks of heavy traffic; on the contrary, a wide stone has a tendency to rock on its bed, and also to wear round on the top and become slippery. To obtain an evener surface and a better foothold for the horses the stones were reduced in width, and in 1840 a granite pavement was laid by Walker on Blackfriars Bridge, which may be considered the first of modern set pavements. The stones were 3 in. broad and 9 deep; they were laid on a bed of concrete 1 ft. thick and were jointed with mortar. The reduction of breadth to about 3 in. was generally followed, but it was some time before a concrete foundation was employed to any great extent, the frequent breaking up to which streets are subject having prevented it. In London a foundation of broken stone has been continued in some thoroughfares, the sets being evenly bedded in gravel upon it and rammed with a heavy wooden rammer. Hard core—a mixture of broken stone, clinker, brick rubbish and old building materials—has also been largely used to form a foundation. In the northern towns of England cinders have been employed, and where the traffic is exceptionally heavy a pitched foundation of stones on edge has been laid when the sets were not paved upon an old macadamized surface. The concrete for a foundation to a paved street should be made with the best Portland cement, thoroughly mixed in proper proportions with the sand and gravel or other materials used, water being added as sparingly as possible. A thickness of 6 in. of well-made cement concrete is sufficient for the heaviest traffic, and it can be cut out in slabs for pipe-laying or repairs and can be relaid and cemented in its place. To obtain the best result a new foundation should not be paved upon for a week. A foundation of bituminous concrete is sometimes used where only a thin bed can be laid, in consequence of there being an old foundation which it is undesirable to disturb. It is made by pouring a composition of coal-tar, pitch and creasote oil while hot over broken stone levelled and rolled to the proper form, and then spreading a thin layer of smaller broken stone over the surface and rolling it in. It has the advantage that it can be paved upon a few hours after it has been laid.

The best materials for pavement sets are the hard igneous and metamorphic rocks, though millstone grit and other hard sedimentary rocks of the same nature are used when the traffic is comparatively light. Excessively hard stone which wears smooth and slippery is objectionable in spite of its durability.

Joints simply filled in with gravel are of course pervious to water, and a grout of lime or cement does not make a permanently watertight joint, as it becomes disintegrated under the vibration of the traffic. Grouted joints, however, make a good pavement when there is a foundation of concrete or broken stone or hard core. Where there is not a regular foundation imperviousness in the joints is of great importance. In some of the Lancashire towns the joints have for many years past been made by first filling them with clean gravel, well shaken in by ramming, and then pouring in a composition of coal-tar, pitch and creasote oil, which is allowed to percolate and fill up the interstices, the pavement being finished by covering it with small gravel. Joints so formed are impervious to wet and have a certain amount of elasticity; the foundation is kept dry; and the pavement with bituminous grout of this kind keeps its form well for many years. The objection is made that in hot weather the composition runs from the joints and makes the streets unpleasant for foot-passengers.

A pavement consisting of broad, smooth, well-jointed blocks of granite for the wheel tracks, and pitching between for the horse track, was laid by Walker in Commercial Road (London) for the heavy traffic to the West India Docks in 1825, and similar pavements have been successfully used elsewhere, principally for heavy traffic, in streets only wide enough for one vehicle. In Milan, Turin and other towns of northern Italy tramways of the same sort are extensively used for the ordinary street traffic. The tractive force required is small, while the foothold on the horse track is good; but the tramstones are slippery for horses to pass over. The rigidity of the roadway renders it more suitable for slow heavy traffic than for light quick vehicles, and the improvement in other pavements has limited the application of this one in ordinary streets.

Brick Paving.—Since about 1885 brick as a paving for carriage-ways has been adopted to a considerable extent, chiefly in the form of shale bricks, in American cities. The clay is a hydrated silicate of alumina, containing about 24% of alumina with 15% of iron, lime, soda, potash and magnesia. Lime is injurious, but alkalis to the extent of 3% are needed to ensure a slight degree of vitrification. Various tests are used to determine their liability to absorb moisture and to be abraded. That for abrasion is made by rolling half-bricks in an iron barrel or rattler in company with pieces of cast-iron for a given time, and noting the effect on the surfaces, but particularly on the angles, which should be tough enough to resist chipping. Comparisons are also made with test pieces of granite that are mixed with the bricks. To guard against chipping, the best-made bricks are pressed over again, and the upper angles rounded to a radius of three-eighths of an inch. Upon a foundation of concrete or well-rolled ballast a cushion or bed of coarse sand from half an inch to 3 in. thick is laid, and on this the bricks are set. They are then rolled till level, or are heavily rammed, a plank being interposed between the bricks and the rammer. No channel-courses are used. Pitch is poured in at the joints, but by no means on the surface, as that would make them slippery. Brick roadways have stood well under hard wear for fourteen years. Although in the United Kingdom bricks are produced unequalled for hardness and finish, no serious attempt has been made to introduce a tough brick for roadways that will neither chip nor wear smoothly. In various experiments with bricks that seemed most suitable they stood hard traffic for about a year. Clay of absolutely uniform character, and kilns that will ensure perfect equality in firing, are requisite. Slag bricks, made to interlock in the form of a double hexagon, the surface being grooved to a small pattern, have stood good tests for wear and foothold on a perfectly level surface. Many attempts have been made to use compositions, into which asphalt or cement usually enters, for making blocks or slabs, square or hexagonal, that can be laid down on a concrete foundation. A mosaic of macadam set in an iron frame is fixed by running molten slag into the back of the block. Small square pieces of oak are formed into blocks, end-grain upwards. Staffordshire blue bricks, made with holes to hold wooden plugs, have been used with some success. Broad blocks not firmly fixed down usually become loose and tilt when subjected to traffic.

Asphalt Paving.—Asphalt was first used for street paving in Paris in 1854. It was introduced in London in 1869, when Threadneedle Street was paved by the Val de Travers Asphalt Company, and since then it has been extensively used for paving both streets and footways. The material is a hard limestone impregnated with bitumen in the proportion of from 6 to 8% in the Seyssel rock, and from 10 to 12 in that from Val de Travers. Asphalts containing less than the former proportion have not sufficient coherence for street pavements, and those containing more than the latter proportion soften from heat in the summer. Asphalt is employed either as a mastic or compressed. The mastic is previously prepared in cakes and is melted for use in caldrons with a small quantity of bitumen, and for a street pavement is thoroughly mixed with sand or grit. It is spread in one thickness on a concrete foundation, covered with sand, and beaten to an even surface. This material has not proved so successful for street surfaces as compressed asphalt. To produce this, the rock asphalt, previously reduced to a fine powder by mechanical means, is heated in revolving ovens to from about 220° to 250° F., spread while still hot, and compressed into a solid mass by hot disk-shaped rammers, and afterwards smoothed with irons heated to a dull redness. The original rock is thus, as it were, reconstructed by taking advantage of the power of coherence of the molecules under pressure when hot. In heating the powder the moisture combined in the limestone must be driven off without reducing the proportion of the bitumen more than is unavoidable. The powder cools very slowly, and may be conveyed long distances from the ovens; it may even be kept till the next day before use. When laid it should still retain a temperature of from 150° to 200°. It is spread evenly with a rake by skilled workmen for the whole width of the street to a thickness about two-fifths greater than the finished coating is intended to be. Ramming is commenced with light blows to ensure equality of compression throughout, and is continued with increased force until the whole is solidified. The ramming follows up the spreading, so that a joint is required only when the work is interrupted at the end of a day, or from some other cause. In a few hours after it has been laid an asphalt pavement may be used for traffic. When finished, its thickness may be from 1½ to 2¼ in., according to the traffic; a greater thickness than the latter cannot be evenly compressed with certainty. The asphalt loses thickness by compression under the traffic for a long time and to the extent, it is said, of one-fifth or one-fourth, but the wear appears to be very small. The wear-resisting power of the asphalt is due to its elasticity; tracks are made by the wheels at first, but when thoroughly compressed by the traffic the surface retains little or no trace of the heaviest loads. Repairs are easily and quickly made by cutting out defective places and ramming in fresh heated powder, which can be done in the early morning without stopping the traffic. An unyielding foundation is indispensable; it should be of the best Portland cement concrete, 6 in. in thickness, which must be well set and perfectly dry throughout before the asphalt is laid, or the steam generated on the application of the hot powder will prevent coherence and lead to cracks and holes in the asphalt, which quickly enlarge under the traffic. For the same reason the asphalt should be laid in dry weather. The concrete foundation must be carefully formed to the proper profile, with an inclination towards the sides of not more than 1 in 50, which is sufficient with so smooth a surface. About 1 in 50 is the steepest gradient at which an asphalt pavement can be safely laid. When either dry or wet it affords good foothold for horses, but when beginning to get wet, or drying, it is often extremely slippery. This is said to be due to dirt on the surface, and not to the nature of the material. Sand is strewed over the surface to remedy the slipperiness; it tends, however, to wear out the asphalt, and great cleanliness is the best preventive. An asphalt pavement can be kept cleaner than any other, is impervious to moisture, and dries quickly. While the road is kept clean, a very slight depression is made by the horse-shoe, which for foothold is a great advantage. The noise made on asphalt by horse-traffic is about the same as that made on hard wood, and is not much more than is necessary for the safety of foot-passengers. In American cities asphalt has been adopted in a totally different form. All asphalt pavements are composed of a very large proportion, perhaps five parts in six, of a hard non-bituminous material. In America it is found cheaper to get the purer bitumen of the island of Trinidad, and to procure in the localities the bulky material required for admixture—a coarse angular sand with a little pure carbonate of lime. An asphaltic cement is made from refined asphaltum. Of this, from 12 to 15% is used with 70 to 80% of sand and 5 to 15% of limestone dust. These materials are heated and stirred together into a stiff mastic paste to form the wearing surface of the road. Upon the concrete foundation is first spread a layer of fine bituminous concrete called "binder," 1½ in. thick, to unite the wearing surface to the concrete foundation. Upon the binder the asphalt is laid to a thickness of 2 in., being spread with iron rakes and brought to its finished surface by the steam roller. Obviously this is a process requiring great judgment and experience; but the system has become established in America, to the exclusion of European methods. Its great recommendation is the freedom from slipperiness that is said to result from the admixture of sharp sand, and this freedom is really the one quality in which asphalt pavement is seriously deficient. This system has been introduced into England.

Wood-Paving.—Wood pavements were introduced in England in 1839. Hexagonal blocks of fir, 6 to 8 in. across and 4 to 6 deep, were bedded in gravel laid on a foundation previously levelled and beaten. The blocks were either bevelled off at the edges or grooved across the face to afford foothold. Other wood pavements were tried in London about the same time, but they soon got out of order from unequal settlement of the blocks, and most of them lasted but a few years. The "improved wood pavement" was first used in London in 1871. After the foundation was formed to the proper cross-section a bed of sand 4 in. deep was laid, upon which came two layers of inch deal boards saturated with boiling tar, one layer across the other. The wooden blocks were 3 in. wide, 5 deep, and 9 long; they were dipped in tar and laid on the boards with the ends close together, but transversely the courses were spaced by fillets of wood three-fourths of an inch wide nailed to the floor and to the blocks. The joints were filled up with clean pebbles rammed in, and were run with a composition of pitch and tar, the surface being dressed with boiling tar and strewed with small sharp gravel and sand. In this pavement a somewhat elastic foundation was provided in the boards, which were also intended to prevent unequal settlement of the blocks; but the solidity of the pavement depended upon its water-tightness, for, when the surface water reached the sand, as it did sooner or later, settlement and dislocation of the blocks under the traffic arose. Pavements on this system were laid between 1872 and 1876, and were kept in repair and relaid from time to time, but about 1877 the plank foundation was abandoned for a foundation of cement concrete, which is now generally employed. Australian hard woods have to a large extent supplanted the fir and pine which were at one time used as the materials for wood-paving. The softer woods, which afford reasonably good foothold and are comparatively noiseless, wear rapidly under heavy traffic, and are very liable to decay. Moreover, the wood actually used has been of mixed qualities, and when a block fails, those near it suffer; thus holes are formed, so that the pavement has to be renewed before its time. English oak and beech, which are perhaps too hard, have been used with varying results; but the Australian woods of the genus *Eucalyptus* have been most extensively tried, and with the most satisfactory results. Those which are best known are jarrah and kauri, but tallow wood, black-butt, blue-gum, red-gum, and spotted-gum, with others, have been tried. Of these, one or two are too dense and hard to afford foothold, others are not easily procured, but jarrah and kauri are used extensively. When cut from the matured heart-wood they are uniform in quality, hard enough for durability, and rough enough to afford fairly good foothold. A very large quantity of wood has been used in London under the name of American red-gum. In substance it comes between the soft and hard woods above mentioned. Wood blocks for paving must be cut with the utmost precision as to the depth of 5 or 6 in. and the breadth of 3 in. The usual length of 8 or 9 in. should also be kept well enough for bond. A long block is liable to tilt. As to depth, although a slight depression may be of little account, the least projection in a block will be immediately noted as a jolt by the swift-moving wheel. The laying and jointing of wood blocks on concrete is still a matter of experiment. They may be set on a half-inch bed of sand, which is supposed to, though it is doubtful whether it actually does, make the pavement elastic to the tread. If the blocks are not accurately gauged, the sand enables the paviour to adjust them to a uniform surface. But the practice most approved is to pave directly upon the smoothly finished concrete, trusting for elasticity to the wood. On the revival of wood-paving it was thought necessary, for foothold, to leave wide joints filled with small gravel grouted with cement; but this is mischievous. The cement breaks up, and when the blocks shrink, the filling-in is driven downwards, and when they again get wet, they have less room to expand, the side kerbs are driven back, and the foot-pavements are displaced, so as to require relaying. To guard against this, a space of about 2 in. has been left between the pavement and the kerb, to be temporarily filled with clay or sand, which can be cleared out as the pavement expands. But cement has no affinity for wood, and its use, together with the wide joints that were thought necessary to give foothold, has been abandoned. They permitted the edge of the block to be beaten down below the centre, so as to produce a succession of ridges, having much of the character of a "corduroy" road. Asphalted felt placed in the joints has not succeeded. A method very successfully adopted is to leave the end joints slightly open, and to place strips or laths one-tenth of an inch thick between the courses, so that hot pitch can be poured down to fill the joint and cover the surface. The roadway is then strewn with fine sharp gravel. Hard-wood blocks so laid expand very slightly, so that a space of an inch and a quarter is sufficient between the kerb and the two courses of blocks that are usually laid parallel to it; this, when filled with pitch, is more than enough to allow for expansion. Paving has been laid with close joints, small vessels of hot pitch being provided, into which each paviour dips the blocks more or less completely before laying them; but wood blocks are more commonly laid dry, a little pitch being brushed over the surface. The gradual abandonment of the wide joints once considered necessary for foothold will be noticed. Soft wood seems to wear under very heavy traffic about five times as fast as hard wood.

Plank Roads.—In opening up a new country, roads, temporary or permanent, must be made with such materials as may happen to be at hand. The plank road often used in American forests makes an excellent track for all kinds of traffic. Upon that side of the space devoted to the road, which the heavy traffic leading to a town will use, two parallel rows of sills 15 to 20 ft. long, 12 in. wide and 4 deep are laid longitudinally flatwise 4 ft. from centre to centre, the earth being well packed and rammed to the level of their faces. The joints are not opposite; a short piece of sill is put either under or by the side of each joint. Cross-boards about 8 ft. 3 in. long and 3 in. thick are laid down loosely, so that groups of four boards together will project on alternate sides of the road 3 or 4 in., forming a shoulder to enable vehicles to get on to the track at any point. The remainder of the road space is formed as an earthen track, 12 ft. wide, for light vehicles. Its slope outwards may be 1 in 16, that of the plank road 1 in 32. If the soil is too bad for the earthen track, short lengths of plank road of double width are made at intervals to form passing places. The cross boards are spiked down on five sills, and are sprung so as to give a fall both ways.

Log Roads.—The log road is formed across swamps by laying young trees of similar length close together. This is ridiculed as a "corduroy" road, but it is better than the swamp. Good temporary roads may be made by laying down half logs roughly squared upon the ground, close together or with spaces between of a couple of inches, into which earth is well rammed. They may be 8 or 9 ft. long, alternate logs being made to project a foot on each side for convenience of driving on and off the track.

Charcoal Roads.—When fuel is available, good roads can be formed of burned materials. Clay is burned into ballast for foundations, or for a temporary track. In American forests charcoal roads have been largely used. Logs from 6 in. to 2 ft. in diameter are piled along the whole route, the stack being 9 ft. broad at the base, 6 ft. high and 2 ft. broad at the top. Dry materials for lighting are intermixed, and the stack is covered up with sods and earth from the side ditches. When burned, the charcoal is simply raked down so as to form a 15-ft. road of a well-rounded section. These roads are dry and hard, and otherwise satisfactory.

The mode of carrying a road across a bog upon a foundation of faggots or brushwood is well known. In India the native roads have been made equal to heavy traffic by laying branches of the mimosa across the track. And in the great plains, where the soil, when dry, would otherwise be made deep in dust, this is entirely prevented by laying across the track a coarse reed or grass like the pampas-grass, and covering it with 3 or 4 in. of loam.

Sand Dressing.—In carrying traffic over a clay soil a covering of 3 or 4 in. of coarse sand will entirely prevent the formation of the ruts which would otherwise be cut by the wheels; and if the ground has already been deeply cut up, a dressing of sand will so alter the condition of the clay that the ridges will be reduced by the traffic, and the ruts filled in.

Noiseless Roads.—A comparatively noiseless pavement may be formed with bricks made of cork granulated and mixed with fibre and asphalt; they are set in pitch, and seem to be suitable for rather steep gradients. For a perfectly noiseless pavement, such as is specially required where a carriage entrance under bedrooms is used by night, no substance is equal to indiarubber. For this purpose it is made in inch sheets about 3 ft. wide and as long as the width of the roadway; it is fixed over concrete and secured by iron clips. This arrangement carries the whole of the passenger traffic to St Pancras Station, London, and also a considerable amount of traffic passing under the Euston Square Station Hotel.

Dustless Roads.—The necessity for making roads dustless has been rendered urgent by the advent of the motor-car. The oldest and least efficacious method is to convert the dust into mud by the aid of the watering cart; at the best, however, the improvement is temporary, though attempts have been made to obtain more lasting results by using a solution of some hygroscopic salt such as calcium chloride. Various special preparations of petroleum and other oils have been introduced as palliatives, but the most promising treatment for existing macadam roads consists in distributing tar by hand or machine over the surface, care being taken to make the application in fine weather when the roads are dry. The radical solution of the problem, however, is to be sought in the adoption of improved methods and materials for construction, probably with a bituminous binding or matrix.

This same problem of the motor-car, which, by its rapidity of movement, rendered many of the old country roads in England (suitable, or at least tolerable, as they were for slow-moving traffic) positively dangerous for the new traffic by reason of their narrowness, sharp corners, &c., has been responsible for the passing by the legislature of a very important measure, the Development and Road Improvement Funds Act 1909. This act, in its second part, deals with the question of road improvement, and establishes a Road Board, making it a body corporate. The Board is given powers to make advances to county councils or other highway authorities for the construction of new roads or the improvement of existing roads, as well as itself to construct and maintain new roads. The expression "improvement of roads" is defined by the act as including the widening of a road, the cutting off corners, levelling, treating a road for mitigating dust nuisance, &c. Power is given to the Board to acquire land for the purposes of road improvements. The expenses of the Board are met out of a road improvement grant each year, the greater part of which it was proposed should be provided by diverting the tax on motor spirit and on motor vehicles levied under the Finance Act of 1909–10.

Watering.—On macadamized roads in Great Britain watering is only good for the road itself when the materials are of a very siliceous nature and in dry weather. With other materials the effect is to soften the road and increase wear. In and near towns watering is required for the comfort of the inhabitants, but it should not be more than enough to lay the dust without softening the road, and the amount required for this may be greatly reduced by keeping the surface free from mud, and by sweeping off the dust when slightly wetted. Pavements are watered to cleanse them as well as to lay the dust, but it must be remembered that both wood and asphalt are more slippery when wet, and that therefore watering should be obviated as far as possible by thorough cleansing. Hydrostatic vans, by improvements in the distributing pipes and regulating valves, water a wide track uniformly with an amount of water which can be regulated at pleasure. Where hydrants exist in connexion with a water supply at high pressure, street watering can be effected by a movable hose and jet, a method much more effective in cleansing the surface, but using a much larger quantity of water. Another method which has been tried, but not much used, is to lay perforated pipes at the back of the kerb on each side of the road, from which jets are thrown upon the surface. The first cost is considerable, and the openings for the jets are liable to choke and get out of order. Deliquescent salts have been used for street watering, by which the surface is kept moist, but at the expense of the moisture in the air. Sea water has the same effect in a less degree.

Cleansing.—The principal streets of a town are generally cleansed daily, either by hand-sweeping and hand-scraping or by machines. Sir Joseph Whitworth's machine consists of a series of revolving brooms on an endless chain, whereby the mud or dust is swept up an incline into the cart. A less costly and cumbersome machine consists of a revolving brush mounted obliquely, which sweeps a track 6 ft. wide and leaves the dust or mud on one side to be gathered up by hand. A horse scraping-machine which delivers the mud at the side is also used, the blades of the scrapers being mounted obliquely and covering a width of 6 ft. For general use, more especially in the country, scraping-machines, worked by a man from side to side of the road, and scraping a width of about 4 ft., are more convenient.

All street surfaces suffer from the constant breaking up and disturbance to which they are subjected for the purpose of laying and repairing gas and water pipes. Subways, either under the middle of the road or near the kerbs, in which the pipes may be laid and be always accessible, have often been advocated, and in a few instances have been constructed; but they have not hitherto found general favour.

Footways.—Gravel is the most suitable material for country or suburban footways; it should be bottomed with a coarser material, well drained and should be laid with a roller. An inclination towards the kerb of about half an inch in a foot may be given, or the surface may be rounded, to throw off the wet. Where greater cleanliness is desirable and the traffic is not too great a coal-tar concrete similar to that already described, but of smaller materials, makes a good and economical footway. The coating should be 2½ or 3 in. thick, composed of two or three layers each well rolled, the lower layer of materials of about 1¼ in. gauge, and the upper of a half or a quarter of an inch gauge, with Derbyshire spar or fine granite chippings over all. Concrete footways require to be carefully made and must be allowed to set thoroughly before they are used. Concrete has a tendency to crack from contraction, especially when in a thin layer, and it is better to lay a footway in sections, with joints at intervals of about 2 yds. Concrete slabs, especially when silicated and constituting artificial stone, make an excellent footway. The material is composed of crushed granite, gravel or other suitable material, mixed with Portland cement and cast in moulds, and when set saturated with silicate of soda. This paving has proved more durable than York stone flagging, but it is more slippery, especially when made with granite. York stone makes a good and pleasant foot pavement, but is somewhat expensive considering its durability; it is apt to wear unevenly and to scale off when the stone is not of the best quality. It should not be laid of a less thickness than 2 in.; 2½ or 3 in. are more usual. The flags should be square jointed, not under-cut at the edges, and should be well bedded and jointed with mortar. Caithness flag is much more durable than York stone and wears more evenly; it is impervious to wet and dries quickly by evaporation. The edges are sawn, and the hardness of the stone renders it difficult to cut it to irregular shapes or to fit openings. Staffordshire blue bricks and bricks made of scoria from iron furnaces are both very durable, though somewhat brittle. Asphalt either laid as mastic or compressed is extensively used for footways; the former is considered inferior in durability to York stone and the latter superior to it. Asphalt should not be laid less than three-fourths of an inch thick on 4 in. of cement concrete, and 1 in. of asphalt is desirable where there is great traffic.

Footways in a street must be retained by a kerbing of granite, York stone, Purbeck or other stone sufficiently strong to stand the blows from wheels to which it is subjected. It should be at least 4 in. wide and 9 deep and in lengths of not less than 3 ft. A granite kerb is usually about 12 by 6 in., either placed on edge or laid on the flat. When set on edge a kerb is generally bedded on gravel with a mall; when laid on the flat a concrete bed is desirable.

In a macadamized street pitched or paved water channels are required to prevent the wash of the surface water from undermining the kerb. The pitching consists of cubical blocks of hard stone about 4 in. deep, bedded on sand or mortar, or preferably on a bed of concrete. A paved channel consists of flat stones about 1 ft. wide inclining slightly towards the kerb. Moulded bricks and artificial stone are also used both for side channelling and for kerbing. Such an inclination must be given to the channel as will bring the surface water to gullies placed at proper intervals, and the level of the kerbing and consequently of the footway will depend to some extent on the surface drainage as well as on the levels of adjacent houses. To lay out a street satisfactorily the longitudinal and transverse sections must be considered in relation to these matters as well as to the levels of intersecting streets.

ROAN (O. Fr. *rouan, rouen*; Ital. *roano, rovano*; perhaps connected with *rufus*, red), a word applied to a variety of colour in an animal's coat, especially that of a horse, where there is a mixture of grey or white hair with the prevailing tint of bay, chestnut or sorrel. A sorrel when thus modified is either a strawberry-roan or a cream-roan. The term is also used of a soft, flexible kind of leather made of sheepskin, used in bookbinding as a substitute for or in imitation of morocco; but in this sense the origin is doubtful.

ROANNE, a town of east-central France, capital of an arrondissement in the department of Loire, on the left bank of the Loire, 54 m. N.W. of Lyons on the Paris-Lyons railway to Moulins. Pop. (1906) 33,981. The chief buildings are a modern town hall and the church of St Étienne (1835–1843), built in the Flamboyant Gothic style. The lycée occupies the buildings of the old college dating from the early 17th century. A fine bridge of seven arches connects Roanne with the industrial suburb of Le Côteau on the right bank of the river. The town is the seat of a sub-prefect, of tribunals of first instance and of commerce, of a chamber of commerce and a board of trade-arbitration, and has lycées for both sexes. Cotton goods form the staple manufacture, and cotton-spinning is also important. The making of knitted woollen articles gives employment to large numbers of women in the town and district. There are besides extensive engineering works, foundries, dye-works, tanneries, pottery and tile-works and other industrial establishments. As the centre of the Roannais coalfield, Roanne has trade in coal and coke. It is also the terminus of the Roanne-Digoin Canal and the real starting-point of the Loire navigation.

Roanne (*Rodomna*, or *Roidomna*) was an ancient city of the Segusiani and a station on the great Roman road from Lyons to the ocean. In 1447 the lordship of Roannais became the property of the celebrated banker Jacques Cœur, from whom it passed as the result of a law-suit to the family of Gouffier. In their favour the title was raised to the rank of marquisate and in 1566 to the rank of duchy; it became extinct in the first half of the 18th century.

ROANOKE, a river of the South Atlantic Slope, U.S.A. With the Staunton, which rises in the Appalachian Valley in south-western Virginia, it constitutes one river, and, flowing in a general south-easterly direction, crosses the boundary between Virginia and North Carolina just above the Fall Line and discharges into Albemarle Sound. It is nearly 400 m. long, with a drainage area of 9237 sq. m. The United States government adopted a project in 1871 for clearing a channel with a minimum depth of 5 ft. at low water from its mouth to Weldon, a distance of 129 m., and in 1909, when the project was 80% completed, vessels drawing 4 ft. of water could ascend at low stages nearly to Weldon. The main river and its principal tributary, the Dan, are also navigable, for many miles above the Fall Line, by pole boats. In 1829 the Weldon Canal, 12 m. long, was opened to afford a passage around the falls, but it was abandoned in 1850.

ROANOKE, a city in (but administratively independent of) Roanoke county, Virginia, on the Roanoke river, about 55 m. W.S.W. of Lynchburg. Pop. (1890) 16,159; (1900) 21,495, of whom 5834 were negroes; (1910 census) 34,874. Roanoke is served by the Virginian railway, by the main line and the Shenandoah and the Winston-Salem divisions of the Norfolk & Western railway, and by electric railway to Vinton and to Salem. The city is about 900 ft. above sea-level and is surrounded by high hills; its picturesque situation and its nearness to famous mineral springs make it a health resort. On a mountain slope, about ½ m. from the city limits, is the Virginia College for Young Ladies; 7 m. north of the city, at what was formerly called Botetourt Springs (there is a sulphur spring), is Hollins Institute (1842) for girls; and in the city are the National Business College, the City Hospital (1899), private hospitals, and St Vincent's Orphan Asylum (1893) for boys, under the Sisters of Charity. Stock-raising, tobacco-growing, and coal and iron-mining are the industries of the district. Roanoke's factory product in 1905 was valued at $5,544,907 (2·7% more than in 1900). Its railway car repair and construction shops, belonging to the Norfolk & Western railway, employed in that year 66.9% of the total number of factory wage-earners; pig-iron, structural iron, canned goods, bottles, tobacco, planing-mill products and cotton are among the manufactures. The municipal water supply comes from a reservoir at Crystal Springs at the foot of Mill Mountain near the city limits. Roanoke was the town of Big Lick (founded about 1852; incorporated in 1874; pop. in 1880, 669) until 1882, when it received its present name; in 1884 it was chartered as a city.

ROARING FORTIES, the name given to the zone in the southern hemisphere, near the 40th parallel of latitude, in which the north-westerly "anti-trade" winds attain their greatest development. Since the belt lies in the Great Southern Ocean (*q.v.*), and is little interrupted by land, the "planetary circulation" undergoes little modification and barometric gradients are steep. The "brave west winds" are accordingly of great strength, and, as in the corresponding belt of the northern hemisphere, the movement is largely broken up into the low and high pressure vortices known as cyclones and anticyclones.

ROBBEN ISLAND, an island at the entrance of Table Bay, 7 m. N.N.W. of Cape Town. It is some 4 m. long by 2 broad. At its southern end is a lighthouse with a fixed light visible for 20 m. It got its name (*robben*, Dutch for seal) from the seals which formerly frequented it, now only occasional visitants. The island when discovered was uninhabited. It is first mentioned by an English seaman named Raymond, who states that in 1591 seals and penguins were there in large numbers. In 1614 ten criminals from London were landed on the island to form a settlement and supply fresh provisions to passing ships. The attempt, which ended in failure, is interesting as the first recorded settlement of English in South Africa. In the 18th century the slate quarries of Robben Island were extensively worked by the Dutch of Cape Town. The island is now noted for its leper asylum and its convict establishment. For many years an asylum for lunatics was also maintained, but in 1904 the lunatics were removed to the mainland. The common rabbit, brought from England, abounds, but its introduction to the mainland is prohibited. As early as 1657 criminals were banished to the island by the Dutch authorities at Cape Town; it has also served as the place of detention of several noted Kaffir chiefs.

See G. F. Gresley, "The Early History of Robben Island," in *The Cape Illustrated Magazine* (Oct. 1895).

ROBBER SYNOD, the name given to an irregular ecclesiastical council held at Ephesus in A.D. 449. See EPHESUS, COUNCIL OF.

ROBBERY (from O. Fr. *rober*, to steal), the unlawful and forcible taking of goods or money from the person of another by violence or threatened violence. Robbery is larceny (*q.v.*) with violence. It is a specific offence under the Larceny Act 1861, and is punishable by penal servitude for any term not exceeding fourteen years and not less than three years, or imprisonment for any term not exceeding two years, with or without hard labour. Under the Garrotters Act 1863, whipping may be added as part of the sentence for robbery. In Scots law robbery is termed *stouthrief*.

United States.—The nature of the offence is practically the same in America as in England, but what constitutes robbery is provided by statute in each state, as is also the punishment. The chief difference between English and American law is that the latter often divides the offences into grades and takes a liberal view of what constitutes force or fear. Train robbery is specially dealt with in some states owing to the prevalence of that species of crime.

Federal Statute.—Congress has made it piracy punishable with death to commit robbery on the high seas or on shore or in any harbour out of the jurisdiction of any state by landing from a piratical vessel (U.S. Rev. St. § 1047).

In *Alabama* it is train robbery to "enter upon or go near to any locomotive, engine, or car, on any railroad and by threats or exhibition of a deadly weapon or discharging a pistol or gun on or near such engine or car induce or compel any one to deliver up anything of value. It is punishable at the discretion of the jury by *death* or imprisonment for not less than ten years. Any one who stops, impedes or detains any locomotive or car with intent to commit train robbery must be punished by imprisonment for not less than ten nor more than thirty years. Conspiring to commit train robbery is punishable to the same extent (Crim. Code, §§ 5480–5482).

In *Arizona*, *California* and *Missouri* the "fear" may be that of the person robbed or of any relative of his or member of his family or of any one in his company. The punishment is imprisonment for not less than five years.

In *Arkansas* and *Missouri* extorting money or property by blackmail is an "attempt to rob"; it is punishable by not less than one nor more than five years' imprisonment. In *Georgia* larceny from the person is statutory robbery (*Hickey* v. *State* (1906), 125, Ga. 145).

Louisiana.—Train robbery is punishable by imprisonment for not less than five nor more than ten years.

Missouri.—Train robbery is punishable by *death* or imprisonment for not less than ten years. It may consist in placing an obstruction on the line with intent to rob.

Massachusetts.—Robbery, committed when armed with a dangerous weapon, is punishable by imprisonment for *life* (*Rev. L.*, 1902, ch. 207, § 17).

Minnesota.—The extreme penalty for robbery is forty years' imprisonment (L. 1905, ch. 114).

New Jersey.—The extreme penalty is $3000 fine or twelve years' imprisonment.

Texas.—Falsely personating an officer and by means of arrest extorting money is robbery (*Burnside* v. *State* (1907), 102, S.W. Rep. 178).

ROBERT I., "THE BRUCE" (1274–1329), king of Scotland, was the son of the 7th Robert de Bruce, earl of Carrick by right of his wife Marjorie, daughter of Niel, or Nigel, earl of Carrick, and was the eighth in direct male descent from a Norman baron who came to England with William the Conqueror. After the death of Margaret, the "maid of Norway," in 1290, Bruce's grandfather, the 6th Robert de Bruce, lord of Annandale, claimed the crown of Scotland as the son of Isabella, the second daughter of David, earl of Huntingdon, and great-granddaughter of King David I.; but John de Baliol, grandson of Margaret, the eldest daughter of Earl David, was preferred by the commissioners of Edward I.

The birthplace of Bruce is not certainly known, but was probably Turnberry, his mother's castle on the coast of Ayr. The date is the 11th of July 1274. His youth is said by an English chronicler to have been passed at the court of Edward I. At an age when the mind is quick to receive the impressions which give the bent to life he must have watched the progress of the great suit for the crown of Scotland. Its issue in 1292 in favour of Baliol led his grandfather to resign Annandale to his son, the 7th Robert de Bruce, who either then or after the death of his father in 1295 assumed the title of lord of Annandale. Already on his wife's death in 1292 he had resigned the earldom of Carrick to his son, the future king, who presented the deed of resignation to Baliol at Stirling in August 1293, and offered the homage which his father, like his grandfather, was unwilling to render. Feudal law required that the king should take seisin of the earldom before regranting it and receiving the homage, and the sheriff of Ayr was directed to take it on Baliol's behalf. As the disputes between Edward I. of England and Baliol, which ended in Baliol losing his kingdom, commenced in this year, it is doubtful whether Bruce ever rendered homage; but he is henceforth known as earl of Carrick, though in a few instances this title is still given to his father. Both father and son sided with Edward against Baliol. In April 1294 the younger Bruce had permission to visit Ireland for a year and a half, and as a further mark of Edward's favour a respite of all debts owing by him to the exchequer.

In August 1296 Bruce and his father swore fealty to Edward I. at Berwick, but in breach of this oath, which had been renewed at Carlisle, the younger Robert joined Sir William Wallace, who raised the standard of Scottish independence in the name of Baliol after that king had surrendered his kingdom to Edward in 1296. Urgent letters were sent ordering Bruce to support John de Warenne, earl of Surrey, Edward's general, in the summer of 1297; but, instead of complying, he assisted to lay waste the lands of those who adhered to Edward. On the 7th of July Bruce and his friends were forced to make terms by a treaty called the capitulation of Irvine. The Scottish lords were not to serve beyond the sea against their will, and were pardoned for their recent violence, in return owning allegiance to Edward. The bishop of Glasgow, James the steward, and Sir Alexander Lindesay became sureties for Bruce until he delivered his daughter Marjorie as a hostage. Wallace almost alone maintained the struggle for freedom which the nobles, as well as Baliol, had given up, and Bruce had no part in the honour of Stirling Bridge in September 1297, or the reverse of Falkirk, where in July 1298 Edward in person recovered what his generals had lost, and drove Wallace into exile. Shortly afterwards Bruce appears again to have sided with his countrymen; Annandale was wasted, while he, as Walter of Hemingford says, "when he heard of the king's coming, fled from his face and burnt the castle of Ayr which he held." Yet, when Edward was forced by home affairs to quit Scotland, Annandale and certain earldoms, including Carrick, were excepted from the districts he assigned to his followers, Bruce and other earls being treated as waverers whose allegiance might still be retained. About 1299 a regency was appointed in Scotland in the name of Baliol, and a letter of Baliol mentions Robert Bruce, lord of Carrick, as regent, along with William of Lamberton, bishop of St Andrews, and John Comyn the younger, a strange combination—Lamberton the friend of Wallace, Comyn the enemy of Bruce, and Bruce a regent in name of Baliol. Comyn in his own interest as Baliol's nephew and heir was the active regent; the insertion of the name of Bruce was an attempt to secure his co-operation. For the next four years he kept studiously in the background, waiting his time. A statement of Peter Langtoft that he was at the parliament of Lincoln in 1301, when the English barons repudiated the claim of Pope Boniface VIII. to the suzerainty of Scotland, is not to be credited, though his father may have been there. In the campaign of 1304, when Edward renewed his attempt on Scotland and reduced Stirling, Bruce supported the English king, who in one of his letters to him says, "If you complete that which you have begun, we shall hold the war ended by your deed and all the land of Scotland gained." But, while apparently aiding Edward, Bruce had taken a step which bound him to the patriotic cause. On the 11th of June, five weeks before the fall of Stirling, he met Lamberton at Cambuskenneth and entered into a secret bond by which they were to support each other against all adversaries and undertake nothing without consulting together. The death of his father in 1304 may have determined his course, and led him to prefer the chance of the Scottish crown to his English estates and the friendship of Edward.

This determination closes the first chapter of his life; the second, from 1304 to 1314, is occupied by his contest for the kingdom, which was really won at Bannockburn, though disputed until the treaty of Northampton in 1328; the last, from 1314 to his death in 1329, was the period of the establishment of his government and dynasty by an administration as skilful as his generalship. It is to the second of these that historians, attracted by its brilliancy even amongst the many romances of history and its importance to Scottish history, have directed most of their attention, and it is during it that his personal character, tried by adversity and prosperity, gradually unfolds itself. But all three periods require to be kept in view to form a just estimate of Bruce. That which terminated in 1304, though unfortunately few characteristics, personal or individual, have been preserved, shows him by his conduct to have been the normal Scottish noble of the time. A conflict of interest and of bias led to contradictory action, and this conflict was increased in his case by his father's residence in England, his own upbringing at the English court, his family feud with Baliol and the Comyns, and the jealousy common to his class of Wallace, the mere knight, who had rallied the commons against the invader and taught the nobles what was required in a leader of the people. The merit of Bruce is that he did not despise the lesson. Prompted alike by patriotism and ambition, at the prime of manhood he chose the cause of national independence with all its perils, and stood by it with an unwavering constancy until he secured its triumph. Though it is crowded with incident, the main facts in the central decade of Bruce's life may be rapidly told. The fall of Stirling was followed by the capture and execution of Wallace in London in August 1305. Edward hoped still to conciliate the nobles and gain Scotland by a policy of clemency to all who did not dispute his authority. A parliament in London in September 1305 to which Scottish representatives were summoned, agreed to an ordinance for the government of Scotland, which, though on the model of those for Wales and Ireland, treating Scotland as a third subject province under an English lieutenant, was in other respects not severe. Bruce is reputed to have been one of the advisers who assisted in framing it; but a provision that his castle of Kildrummy was to be placed in charge of a person for whom he should answer shows that Edward, not without reason, suspected his fidelity. The details of his final breach with the English king are somewhat obscure. According to one account, the bond between Bruce and Lamberton was revealed to Edward by Comyn while Bruce was at the English court. Alarmed by a hint dropped by Edward, he left England secretly, and in the church of the Friars Minorite at Dumfries on the 10th of February 1306 met Comyn, whom he slew before the high altar for refusing to join in his plans. So much is certain, though the precise incidents of the interview are variously told. It was not their first encounter, for a letter of 1299 to Edward from Scotland describes Comyn as having seized Bruce by the throat at a meeting at Peebles, where they were with difficulty reconciled by the regents.

The bond with Lamberton was now sealed by blood, and the confederates lost no time in putting it into execution. Within little more than six weeks Bruce, collecting his adherents in the south-west, passed from Lochmaben to Glasgow and thence to Scone, where he was crowned king of Scotland on the 27th of March 1306. Two days later Isabella, countess of Buchan, claimed the right of her family, the Macduffs, earls of Fife, to place the Scottish king on his throne, and the ceremony was repeated with an addition flattering to the Celtic race. Though a king, Bruce had not yet a kingdom, and his efforts to obtain it were disastrous failures until after the death of Edward I. In June 1306 he was defeated at Methven, and on the 11th of August he was surprised in Strathfillan, where he had taken refuge. The ladies of his family were sent to Kildrummy in January 1307, and Bruce, almost without a follower, fled to the island of Rathlin. Edward came to the north in the following spring. On his way he granted the Scottish estates of Bruce and his adherents to his own followers, Annandale falling to Humphrey de Bohun, 4th earl of Hereford. At Carlisle there was published a bull excommunicating Bruce; and Elizabeth his wife, Marjorie his daughter, and Christina his sister, were captured in a sanctuary at Tain, while three of his brothers were executed. In a moment all was changed by the death of Edward I. on the 7th of July 1307. Instead of being opposed to the greatest, Bruce had now as his antagonist the feeblest of the Plantagenets. Quitting Rathlin, he had made a short stay in Arran, and before Edward's death had failed to take Ayr and Turnberry, although he defeated Aymer de Valence, earl of Pembroke, at Loudoun Hill in May 1306. After wasting the critical moment of the war in the diversions of court life, the new English king, Edward II., made an inglorious march to Cumnock and back without striking a blow; and then returned south, leaving the war to a succession of generals. Bruce, with the insight of military genius, seized his opportunity. Leaving Edward, now his only brother in blood and almost his equal in arms, in Galloway, he suddenly transferred his own operations to Aberdeenshire. He overran Buchan either once or twice, and after a serious illness defeated the earl of Buchan, one of his chief Scottish opponents, near Inverurie on the 22nd of May 1308. Then crossing to Argyllshire he surprised another body of his enemies in the pass of Brander early in 1309, took Dunstaffnage, and in March of this year held his first parliament at St Andrews. In 1309 a truce scarcely kept was effected by Pope Clement V. and Philip IV. of France, and in 1310, in a general council at Dundee, the clergy of Scotland, all the bishops being present, recognized Bruce as king. The support given to him by the national church in spite of his excommunication must have been of great importance in that age, and was probably due to the example of Lamberton. The next three years was signalized by the reduction one by one of the strong places still held by the English: Linlithgow towards the end of 1310, Dumbarton in October 1311, Perth, by Bruce himself, in January 1312. Previous to these two latter successes the king had made two raids into the north of England; after which Buittle, Dalswinton and Dumfries were reduced, and Berwick was threatened. In March 1313 his lieutenant Sir James Douglas surprised Roxburgh, and Thomas Randolph surprised Edinburgh. In May Bruce was again in England, and though he failed to take Carlisle, he subdued the Isle of Man. About the same time Edward Bruce took Rutherglen and laid siege to Stirling, whose governor, Sir Philip de Mowbray, agreed to capitulate if not relieved before the 24th of June 1314.

Bruce's rapidity of movement was one cause of his success. His sieges, the most difficult part of medieval warfare, though won sometimes by stratagem, prove that he and his followers had benefited from their early training in the wars of Edward I. We know that he had been employed by that king to prepare the siege-train for his attack on Stirling in 1304. By the close of 1313 Berwick, Stirling and Bothwell alone remained English. Edward II. felt that if Scotland was not to be lost a great effort must be made. With the whole available feudal levy of England, and a contingent from Ireland, he advanced from Berwick to Falkirk, which he reached on the 22nd of June 1314. After a preliminary skirmish on Sunday the 23rd, in which Bruce distinguished himself by a personal combat with Sir Henry de Bohun, whom he felled by a single blow of his axe, the battle of Bannockburn was fought on Monday the 24th; and the complete rout of the English determined the independence of Scotland and confirmed the title of Bruce. The details of the day, memorable in the history of war as well as of Scotland, have been singularly well preserved, and redound to the credit of Bruce, who had studied in the school of Wallace as well as in that of Edward I. He had chosen and knew his ground, lying between St Ninians and the Bannock, a petty burn, yet sufficient to produce marshes dangerous to heavily armed horsemen, while from the rising ground on his right the enemy's advance was seen. His troops were in four divisions: his brother Edward commanded the right, Randolph the centre, Douglas the left. Bruce with the reserve planted his standard at the Bore Stone, whence there is the best view of the field. His camp-followers on the Gillies' Hill appeared over its crest at the critical moment which comes in all battles. The plain on the right of the marshes was prepared with pits and spikes. But what more than any other point of strategy made the fight famous was that the Scots fought on foot in battalions with their spears outwards, in a circular formation serving the same purpose as the modern square. A momentary success of the English archers was quickly reversed by a flank movement on the part of Sir Robert Keith. The Scottish bowmen followed up this advantage, and the fight became general; the English horse, crowded into too narrow a space, were met by the steady resistance of the Scottish pikemen, who knew, as Bruce had told them truly, that they fought for their country, their wives, their children, and all that freemen hold dear. The English rear was either unable to come up in the narrow space, or got entangled in the broken ranks of the van. The first repulse soon passed into a rout, and from a rout into a headlong flight, in which the English king himself barely escaped. In the career of Bruce, Bannockburn was the turning-point. The enthusiasm of the nation he had saved forgot his tardy adhesion to the popular cause, and at the parliament of Ayr on the 25th of April 1315 the succession was settled by a unanimous voice on him, and, failing males of his body, on his brother Edward and his heirs male, or failing them on his daughter Marjorie and her heirs, if she married with his consent. Soon afterwards she married Walter the steward (d. 1326). As a result of Bannockburn, Bruce's queen was restored to her husband; Stirling was delivered up to the Scots; the north of England was ravaged, and Carlisle and Berwick were besieged.

The last part of Bruce's life, from 1315 to 1329, began with an attempt which was the most striking testimony that could have been given to the effect of Bannockburn, and which, had it succeeded, might have altered the future of the British Isles. This was no less than the rising of the whole Celtic race, who had felt the galling yoke of Edward I. and envied the freedom the Scots had won. In 1315 Edward Bruce crossed to Ireland on the invitation of the natives, and in the following year the Welsh became his allies. In the autumn of 1316 Robert came to his brother, and together they traversed Ireland to Limerick. Dublin was saved by its inhabitants committing it to the flames, and, though nineteen victories were won, of which that at Slane in Louth by Robert was counted the chief, the success was too rapid to be permanent. The brothers retreated to Ulster, and, Robert having left Ireland in May 1317 to protect his own borders, Edward, who had been crowned king of Ireland, was defeated and killed at Dundalk in October 1318. On his return Bruce addressed himself to the siege of Berwick, a standing menace to Scotland. While he was preparing for it two cardinals arrived in England with a mission from Pope John XXII. to effect a truce, or, failing that, to renew the excommunication of Bruce. The cardinals did not trust themselves across the border; their messengers, however, were courteously received by Bruce, but with a firm refusal to admit the papal bulls into his kingdom because not addressed to him as king. Another attempt by Adam Newton, guardian of the Friars Minorite at Berwick, had a more ignominious result. Bruce admitted Newton to his presence at Aldcamus or Old Cambus, and informed him that he would not receive the bulls until his title was acknowledged and he had taken Berwick. On his return Newton was waylaid and his papers seized, not without suspicion of Bruce's connivance. In March 1318 the town and soon afterwards the castle of Berwick capitulated, and Bruce wasted the English border as far as Ripon. In December he held a parliament at Scone, where he displayed the same wisdom as a legislator which he had shown as a general. The death of his brother and his daughter rendered a resettlement of the crown advisable, and it was settled on his grandson, Robert, son of Marjorie and Walter the steward, in case Bruce died without sons, with a provision as to the regency in case of a minor heir in favour of Randolph. The defence of the country was next cared for by regulations for the arming of the whole nation, down to every one who owned the value of a cow, a measure far in advance of the old feudal levy. Exports during war, and of arms at any time, were prohibited. Internal justice was regulated, and it was declared that it was to be done to poor and rich alike. Leasing-making—a Scottish term for seditious language—was to be sternly punished. The nobles were exhorted not to oppress the commons. Reforms were also made in the tedious technicalities of the feudal law. In September 1319 an attempt to recover Berwick was repelled by Walter the steward, and Bruce took occasion of a visit to compliment his son-in-law and raise the walls 10 ft.

The king's position was now so strong that foreign states began to testify their respect. Bruges and Ypres rejected a request of Edward II. to cut off the Scottish trade with Flanders. Pope John, who had excommunicated Bruce, was addressed by the parliament of Arbroath in April 1320 in a letter which compared Bruce to a Joshua or Judas Maccabaeus, who had wrought the salvation of his people, and declared they fought "not for glory, truth or honour, but for that liberty which no virtuous man will survive." Moved by this language and conscious of the weakness of Edward, the pope exhorted him to make peace with Scotland, and three years later Randolph, now earl of Moray, procured the recognition of Bruce as king from the papal see by promising aid for a crusade. In 1326 the French king, Charles IV., made a similar acknowledgment by the treaty of Corbeil. Meantime hostilities more or less constant continued with England, but, though in 1322 Edward made an incursion as far as Edinburgh, the internal weakness of his government prevented his gaining any real success, while in October of this year Bruce again ravaged Yorkshire, defeated the English near Byland, and almost captured their king. Some of his chief nobles—Thomas, earl of Lancaster, in 1321, and Sir Andrew Harclay, earl of Carlisle, in 1322—entered into correspondence with the Scots, and, though Harclay's treason was detected and punished by his death, Edward was forced to make a truce of thirteen years at Newcastle on the 30th of May 1323, which Bruce ratified at Berwick. In 1327 Edward III. became king of England, and one of the first acts of the new reign, after a narrow escape of the young king from capture by Moray, was the treaty of York, ratified at Northampton in April 1328, by which it was agreed that "Scotland, according to its ancient bounds in the days of Alexander III., should remain to Robert, king of Scots, and his heirs free and divided from England, without any subjection, servitude, claim or demand whatsoever." Joanna, Edward's sister, was to be given in marriage to David, the infant son of Bruce, born subsequent to the settlement of 1318 and now recognized as heir to the crown, and the ceremony was celebrated at Berwick on the 12th of July 1328.

The chief author of Scottish independence barely survived his work. He appears to have conducted an expedition to Ireland in 1327, and on his return led a foray into England. His last years were chiefly spent at the castle of Cardross on the Clyde, which he acquired in 1326, and the conduct of war, as well as the negotiations for peace, had been left to the young leaders, Moray and Sir James Douglas, whose training was one of Bruce's services to his country. Ever active, he employed himself in the narrower sphere of repairing the castle and improving its domains and gardens, in shipbuilding on the Clyde, and in the exercise of the virtues of hospitality and charity. The religious feeling, which had not been absent even during the struggles of manhood, deepened in old age, and took the form the piety of the times prescribed. He made careful provision for his funeral, his tomb, and masses for his soul. He procured from the pope a bull authorizing his confessor to absolve him even at the moment of death. He died at Cardross from leprosy, contracted in the hardships of earlier life, on the 7th of June 1329, and was buried at Dunfermline beside his second wife, Elizabeth (d. 1327), daughter of Richard de Burgh, earl of Ulster, whom he had married about 1304, and who bore him late his only son, David, who succeeded him. Of two surviving daughters, Matilda married Thomas Ysaak, a simple esquire, and Margaret became the wife of William, earl of Sutherland. Marjorie, an only child by his first wife, Isabella, daughter of Donald, earl of Mar, had predeceased him. Several children not born in wedlock have been traced in the records, but none of them became in any way famous.

In fulfilment of a vow to visit the Holy Sepulchre, which he could not accomplish in person, Bruce requested Douglas to carry his heart there, but his faithful follower perished on the way, fighting in Spain against the Moors, and the heart of Bruce, recovered by Sir William Keith, found its resting-place at Melrose. When his corpse was disinterred in 1821 the breast-bone was found severed to admit of the removal of the heart, thus confirming the story preserved in the verses of Barbour. That national poet collected in the earliest Scottish poem, written in the reign of Bruce's grandson, the copious traditions which clustered round his memory. It is a panegyric; but history has not refused to accept it as a genuine representation of the character of the great king, in spirit, if not in every detail. Its dominant note is freedom—the liberty of the nation from foreign bondage, and of the individual from oppression. It is the same note which Tacitus embodied in the speech of Galgacus at the dawn of Scottish history. Often as it has been heard before and since in the course of history, seldom has it had a more illustrious champion than Robert the Bruce.

Bibliography.—The chief contemporary authorities for the life of Bruce are coloured to some extent by the nationality of the writers. On the Scottish side *The Brus*, a poem by John Barbour, edited by W. W. Skeat (Edinburgh, 1894), and the *Chronica gentis Scotorum* of John of Fordun, edited by W. F. Skene (Edinburgh, 1871–72), are perhaps the most valuable. The *Chronicon de Lanercost*, edited by J. Stevenson (Edinburgh, 1839), is also very important. The English chronicles which may be consulted with advantage are those of Walter of Hemingford, edited by H. C. Hamilton (London, 1848–49); and of Peter Langtoft, edited by T. Wright (London, 1866–68), and the *Scalacronica* of Thomas Gray, edited by J. Stevenson (Edinburgh, 1836). For the documents of the time reference should be made to the *Calendar of Documents relating to Scotland*, edited by J. Bain (Edinburgh, 1881–88), *Documents and Records illustrating the History of Scotland*, vol. i., edited by F. Palgrave (London, 1837); the *Rotuli Scotiae* (London, 1814–19), and the *Foedera* of T. Rymer, vol. i. (London, 1704). The chief general histories are: Sir D. Dalrymple, Lord Hailes, *Annals of Scotland* (Edinburgh, 1819); P. F. Tytler, *History of Scotland* (Edinburgh, 1841–43); J. H. Burton, *History of Scotland*, vol. ii. (Edinburgh, 1905); A. Lang, *History of Scotland*, vol. i. (Edinburgh, 1904); R. Pauli, *Geschichte von England* (Hamburg, 1834–58). See also Sir H. Maxwell, *Robert the Bruce* (London, 1897).

ROBERT II. (1316–1390), called "the Steward," king of Scotland, was a son of Walter, the steward of Scotland (d. 1326), and Marjorie (d. 1316), daughter of King Robert the Bruce, and was born on the 2nd of March 1316. In 1318 the Scottish parliament decreed that if King Robert died without sons the crown should pass to his grandson; but the birth of a son, afterwards King David II., to Bruce in 1324 postponed the accession of Robert for nearly forty-two years. Soon after the infant David became king in 1329, the Steward began to take a prominent part in the affairs of Scotland. He was one of the leaders of the Scottish army at the battle of Halidon Hill in July 1333; and after gaining some successes over the adherents of Edward Baliol in the west of Scotland, he and John Randolph, 3rd earl of Moray (d. 1346), were chosen as regents of the kingdom, while David sought safety in France. The colleagues soon quarrelled; then Randolph fell into the hands of the English and Robert became sole regent, meeting with such success in his efforts to restore the royal authority that the king was able to return to Scotland in 1341. Having handed over the duties of government to David, the Steward escaped from the battle of Neville's Cross in 1346, and was again chosen regent while the king was a captive in England. Soon after this event some friction arose between Robert and his royal uncle. Accused, probably without truth, of desertion at Neville's Cross, the Steward as heir-apparent was greatly chagrined by the king's proposal to make Edward III. of England, or one of his sons, the heir to the Scottish throne, and by David's marriage with Margaret Logie. In 1363 he rose in rebellion, and after having made his submission was seized and imprisoned together with four of his sons, being only released a short time before David's death in February 1371. By the terms of the decree of 1318 Robert now succeeded to the throne, and was crowned at Scone in March 1371. His reign in unimportant. Some steps were taken by the nobles to control the royal authority. In 1378 a war broke out with England; but the king took no part in the fighting, which included the burning of Edinburgh and the Scottish victory at Otterbourne in 1388. As age and infirmity were telling upon him, the estates in 1389 appointed his second surviving son Robert, earl of Fife, afterwards duke of Albany, guardian of the kingdom. The king died at Dundonald on the 13th of May 1390, and was buried at Scone. His first wife was Elizabeth, daughter of Sir Robert Mure of Rowallan, a lady who had formerly been his mistress. By her he had at least four sons, the eldest of whom was his successor, King Robert III., and six daughters. By his second wife, Euphemia, daughter of Hugh, earl of Ross, and widow of Moray, formerly his colleague as regent, he had two sons and several daughters; and he had also many illegitimate children.

See Andrew of Wyntoun, *The Orygynale Cronykil of Scotland*, edited by D. Laing (Edinburgh, 1872–1879); John of Fordun, *Scotichronicon*, continued by Walter Bower, edited by T. Hearne (Oxford, 1722); John Major, *Historia majoris Britanniae*, translated by A. Constable (Edinburgh, 1892); and P. F. Tytler, *History of Scotland* (Edinburgh, 1841–1843).

ROBERT III. (*c.* 1340–1406), king of Scotland, was the eldest son of King Robert II. by his mistress, Elizabeth Mure, and was legitimatized when his parents were married about 1349. In 1368 he was created earl of Carrick, and he took some part in the government of the kingdom until about 1387, when he was disabled by the kick of a horse. It was probably in consequence of this accident that his brother Robert, earl of Fife, and not the crown prince himself, was made guardian of the kingdom in 1389; but the latter succeeded to the throne on his father's death in May 1390. At this time he changed his baptismal name of John, which was unpopular owing to its connexion with John de Baliol, for that of Robert, being crowned at Scone in August 1390 as King Robert III. Although he probably attended several parliaments the new king was only the nominal ruler of Scotland, the real power being in the hands of his brother, the earl of Fife. In 1399, however, owing to the king's "sickness of the body," his elder son, David, duke of Rothesay, was appointed lieutenant of the kingdom; but this event was followed by an English invasion of Scotland, by serious differences between Rothesay and his uncle, Robert, now duke of Albany, and finally in March 1402 by Rothesay's mysterious death at Falkland. Early in 1406 the king's only surviving son, afterwards King James I., was captured by the English; and on the 4th of April 1406 Robert died, probably at Rothesay, and was buried at Paisley. He married Annabella Drummond (*c.* 1350–1402), daughter of Sir John Drummond of Stobhall, and, in addition to the two sons already mentioned, had four daughters.

ROBERT I. (*c.* 865–923), king of France, or king of the Franks, was the younger son of Robert the Strong, count of Anjou, and the brother of Odo, or Eudes, who became king of the western Franks in 888. Appointed by Odo ruler of several counties, including the county of Paris, and abbot *in commendam* of many abbeys, Robert also secured the office of duke of the Franks, a military dignity of high importance. He did not claim the crown of France when his brother died in 898; but recognizing the supremacy of the Carolingian king, Charles III., the Simple, he was confirmed in his offices and possessions, after which he continued to defend northern France from the attacks of the Normans. The peace between the king and his powerful vassal was not seriously disturbed until about 921. The rule of Charles, and especially his partiality for a certain Hagano, had aroused some irritation; and, supported by many of the clergy and by some of the most powerful of the Frankish nobles, Robert took up arms, drove Charles into Lorraine, and was himself crowned king of the Franks at Reims on the 29th of June 922. Collecting an army, Charles marched against the usurper, and on the 15th of June 923, in a stubborn and sanguinary battle near Soissons, Robert was killed, according to one tradition in single combat with his rival. Robert left a son, Hugh the Great, duke of the Franks, and his grandson was Hugh Capet, king of France.

See F. Lot, *Les Derniers Carolingiens* (Paris, 1891); and E. Lavisse, *Histoire de France*, tome ii. (Paris, 1903).

ROBERT II. (*c.* 970–1031), king of France, was a son of Hugh Capet, and was born at Orleans. He was educated at Reims under Gerbert, afterwards Pope Silvester II. As the ideal of medieval Christianity he won his surname of "Pious" by his humility and charity, but he also possessed some of the qualities of a soldier and a statesman. His father associated him with himself in the government of France, and he was crowned in December 987, becoming sole king on Hugh's death in October 996. Robert's reign is chiefly remembered for its dramatic side. In 988 he had married Rosala, or Susanna, widow of Arnold II., count of Flanders. This lady, however, was much older than Robert, who repudiated her in 989, fixing his affections upon Bertha, daughter of Conrad the Peaceful, king of Burgundy, or Arles, and wife of Eudes I., count of Blois; and although the pair were related, and the king had been godfather to one of Bertha's children, they were married in 996, a year after the death of Eudes. Pope Gregory V., whose favour Robert vainly sought to win by allowing Arnulf, the imprisoned archbishop, to return to his see of Reims and forcing Gerbert to flee to the court of the emperor Otto III., excommunicated the king, and a council at Rome imposed a seven years' penance upon him. For five years the king braved all anathemas, but about 1002 he gave up Bertha and married Constance, daughter of a certain Count William, an intriguing and ambitious woman, who made life miserable for her husband, while the court was disturbed by quarrels between the partisans of the two queens. Still attached to Bertha, Robert took this lady with him to Rome in 1010, but the pope refused to recognize their marriage, and the king was forced to return to Constance. By this wife Robert had four sons, and in 1017, the eldest of these, Hugh, (1007–1025), was crowned as his father's colleague and successor. After Hugh's death the king procured the coronation of his second son, Henry, duke of Burgundy, afterwards king of France, a proceeding which displeased Constance, who wished her third son, Robert (d. 1075), afterwards duke of Burgundy, to receive the crown. Robert's concluding days were troubled by a rising on the part of these two sons, and after a short war, in which he was worsted, the king died at Melun on the 20th of July 1031. The notable gain to France during this reign was the duchy of Burgundy, which Robert claimed on the death of his uncle, Duke Henry, in 1001. The other claimant, however, Otto William, count of upper Burgundy, or Franche Comté, offered so stubborn a resistance that it was not until 1015 that the king secured the duchy, which he gave as an apanage to his son Henry. Nevertheless, Robert himself kept a close oversight over its government, and this was one reason which led to the revolt of his sons in 1030. Owing to family quarrels, he could not prevent the kingdom of Burgundy, or Arles, from passing into the hands of the emperor Conrad II., and no serious results followed his interference in Flanders or in Lorraine. Robert added to the royal domains, and was greatly aided by the support of Richard II. and Richard III., dukes of Normandy, the latter of whom was his son-in-law.

His life was written by his chaplain, Helgaud, and this panegyric, *Epitoma vitae Roberti regis*, is published by J. P. Migne in the *Patrologia Latina*, tome cxli. (Paris, 1844). See also C. Pfister, *Études sur le règne de Robert le Pieux* (Paris, 1885); and E. Lavisse, *Histoire de France*, tome ii. (Paris, 1901).

ROBERT (1275–1343), king of Naples, was the son of Charles II., duke of Anjou and king of Naples, and in his youth took part in several expeditions to Sicily with the object of wresting the island from Frederick III. of Aragon. But his efforts, like those of his father and grandfather, proved fruitless, and the Angevins were compelled at last to agree to the peace of Caltabellotta (1302). On the death of Charles in 1309 Robert succeeded to the throne, although his nephew Caroberto (Carlo Roberto), son of his elder brother Charles Martel, who had died before his father, had a prior claim. He was crowned by Pope Clement V. at Avignon, and on the descent into Italy of the emperor Henry VII. was appointed papal vicar in Romagna to resist the imperialists; thenceforth he became the recognized leader of the Guelphs or papal faction in Italy and took part in all the wars against the Ghibellines. On various occasions he obtained for himself or his sons the suzerainty over Rome, Florence, and other cities, and was regarded as the most powerful Italian prince of his day. Pope John XXII. created him papal vicar in Italy against the emperor Louis the Bavarian. In 1320 Robert summoned his kinsman Philip V. of France to Italy, and he waged war against Sicily once more from 1325 to 1341, but failed to drive out the Aragonese. He died in 1343, just as he was about to lead another expedition to the island. Robert was a man of learning, devoted to literature, and a generous patron of literary men: he befriended the poet Petrarch, who admired the king so greatly as to express the wish to see him lord of all Italy; while Boccaccio celebrated the virtues and charms of Robert's natural daughter Maria, under the name of Fiammetta. Dante was perhaps too severe on Robert, whom he described as a *re da sermone* (word king), and contemporary critics accused him of covetousness, a fault partly excused by his pressing need of money to pay the expenses of his perpetual wars. In spite of his power and influence, his position as a leader of the Guelphs was greatly shaken during the latter years of his reign, while at home he was never able completely to subjugate his rebellious barons.

See G. Villani, *Cronache*; M. Murena, *Vita di Roberto d'Angiò, re di Napoli* (Naples, 1770); and *Archivio storico Siciliano* (1884, viii. 511 seq.).

ROBERT, the name of two dukes of Normandy.

Robert I. (d. 1035), called Robert the Devil, was the younger son of Richard II., duke of Normandy (d. 1026), who bequeathed to him the county of Exmes. In 1028 he succeeded his brother, Richard III., whom he was accused of poisoning, as duke of Normandy. His time was mainly spent in fighting against his rebellious vassals. At his court Robert sheltered the exiled English princes, Edward, afterwards King Edward the Confessor, and his brother Alfred, and fitted out a fleet for the purpose of restoring them to their inheritance, but this was scattered by a storm. When returning from a pilgrimage to Jerusalem, he died at Nicaea on the 22nd of July 1035. His successor as duke was his natural son, William the Conqueror, afterwards king of England. In addition to winning for him his surname, Robert's strength and ferocity afforded material for many stories and legends, and he is the subject of several poems and romances (see Robert the Devil below).

Robert II. (*c.* 1054–1134) was the eldest son of William the Conqueror. Although recognized in boyhood as his father's successor in Normandy, he was soon dissatisfied with his position, and about 1078, following a quarrel between his brothers and himself, he revolted. He was obliged to fly from his own country, but after a period of exile he returned, raised some troops, and began to harry the duchy, wounding his father during a skirmish at Gerberoi early in 1079. He was, however, quickly forgiven, and passed two or three years in England and in Normandy until 1083, when he entered upon a second term of exile. When the Conqueror died in September 1087 Robert became duke of Normandy, but not king of England; although he received offers of help, he took no serious steps to displace his younger brother, King William II. In Normandy his rule was weak and irresolute. He lost the county of Maine, which for some years had been united with Normandy, and he was soon at variance with his brothers, the younger of whom, Henry, he seized and put into prison. In 1089 his duchy was invaded by William II., who soon made peace with Robert, the two agreeing to dispossess their brother Henry of his lands in Normandy. This peace lasted until 1094, when occasions of difference again arose and another struggle began, Robert being aided by King Philip I. of France.

This warfare ended in 1096, when Robert set out on the first crusade, having raised money for this purpose by pledging his duchy to William for 10,000 marks. With his followers he journeyed to Constantinople; then he took part in the siege of Nicaea, the battle of Dorylaeum, and the famous battle under the walls of Antioch in June 1098. He shared in the siege of Jerusalem and other exploits of the crusade, while one account says that he was offered and refused the crown of the new Latin kingdom. Having won a great reputation both for valour and for generosity, the duke left Palestine and arrived in Normandy in September 1100.

William Rufus died while Robert was on his homeward way, and in Italy the Norman duke was greeted as king of England; but when he reached Normandy he learned that the English throne was already in the possession of Henry I. In July 1101 he crossed over to England, intending to contest his brother's title, but Henry met him near Alton, in Hampshire, and an amicable arrangement was made between them. Having received presents and the promise of a pension, Robert went quietly home. But the fraternal strife was not allayed. Henry had interests in Normandy in addition to the county of Evreux, which Robert ceded to him about 1102. Visits were exchanged, but no lasting peace was made, and in 1106 the English king crossed over to Normandy, where Robert was in great extremities. At the battle of Tinchebrai, fought on the 28th of September 1106, Henry took his brother prisoner and carried him to England. For twenty-eight years the unfortunate duke was a captive, first in the Tower of London, and later in the castles of Devizes and Cardiff, but the evidence goes to show that he was not treated with cruelty. He died probably at Cardiff on the 10th of February 1134. Robert had a son, William, called the Clito, and several natural children. He was called Curthose, and also Gambaron, his figure being short and stout. Although wanting in decision of character, he was a skilled and able warrior, and the chroniclers tell many stories, some of them obviously legendary, of his exploits in the Holy Land.

The chief sources for the life of Robert II. are Ordericus Vitalis, William of Malmesbury and other chroniclers of the time. See E. A. Freeman, *History of the Norman Conquest* (1870–76), and *The Reign of Rufus* (1882).

ROBERT GUISCARD [*i.e.* "the resourceful"] (*c.* 1015–1085), the most remarkable of the Norman adventurers who conquered southern Italy. From 1016 to 1030 the Normans were pure mercenaries, serving either Greeks or Lombards, and then Sergius of Naples, by installing the leader Rainulf in the fortress of Aversa in 1030, gave them their first pied-à-terre and they began an organized conquest of the land. In 1030 there arrived William and Drogo, the two eldest sons of Tancred of Hauteville, a petty noble of Coutances in Normandy. The two joined in the organized attempt to wrest Apulia from the Greeks, who by 1040 had lost most of that province. In 1042 Melfi was chosen as the Norman capital, and in September of that year the Normans elected as their count William "Iron Arm," who was succeeded in turn by his brothers Drogo, "comes Normannorum totius Apuliae et Calabriae," and Humfrey, who arrived about 1044. In 1046 arrived Robert, the sixth son of Tancred of Hauteville. His tall stature, blonde colouring and powerful voice are strikingly described by Anna Comnena.

Guiscard soon rose to distinction. The Lombards turned against their allies and Leo IX. determined to expel the Norman freebooters. The army which he led towards Apulia in 1053 was, however, overthrown at Civitate on the Fortore by the Normans united under Humfrey, Guiscard and Richard of Aversa. In 1057 Robert succeeded Humfrey as count of Apulia and, in company with Roger his youngest brother, carried on the conquest of Apulia and Calabria, while Richard conquered the principality of Capua. The Papacy, foreseeing the breach with the emperor over investitures, now resolved to recognize the Normans and secure them as allies. Therefore at Melfi, on the 23rd of August 1059, Nicholas II. invested Robert with Apulia, Calabria, and Sicily, and Richard with Capua. Guiscard "by Grace of God and St Peter duke of Apulia and Calabria and future lord of Sicily" agreed to hold by annual rent of the Holy See and to maintain its cause. In the next twenty years he made an amazing series of conquests. Invading Sicily with Roger, the brothers captured Messina (1061) and Palermo (1072). Bari was reduced (April 1071) and the Greeks finally ousted from southern Italy. The territory of Salerno was already Robert's; in December 1076 he took the city, expelling its Lombard prince Gisulf, whose sister Sikelgaita he had married. The Norman attacks on Benevento, a papal fief, alarmed and angered Gregory VII., but pressed hard by the emperor, Henry IV., he turned again to the Normans, and at Ceprano (June 1080) reinvested Robert, securing him also in the southern Abruzzi, but reserving Salerno. Guiscard's last enterprise was his attack on the Greek Empire, a rallying ground for his rebel vassals. He contemplated seizing the throne of the Basileus and took up the cause of Michael VII., who had been deposed in 1078 and to whose son his daughter had been betrothed. He sailed with 16,000 men against the empire in May 1081, and by February 1082 had occupied Corfu and Durazzo, defeating the emperor Alexis before the latter (October 1081). He was, however, recalled to the aid of Gregory VII., besieged in San Angelo by Henry IV. (June 1083). Marching north with 36,000 men he entered Rome and forced Henry to retire, but an émeute of the citizens led to a three days' sack of the city (May 1084), after which Guiscard escorted the pope to Rome. His son Bohemund, for a time master of Thessaly, had now lost the Greek conquests. Robert, returning to restore them, occupied Corfu and Kephalonia, but died of fever in the latter on the 15th of July 1085, in his 70th year. He was buried in S. Trinità at Venosa. Guiscard was succeeded by Roger "Borsa," his son by Sikelgaita; Bohemund, his son by an earlier Norman wife Alberada, being set aside. At his death Robert was duke of Apulia and Calabria, prince of Salerno and suzerain of Sicily. His successes had been due not only to his great qualities but to the "entente" with the Papal See. He created and enforced a strong ducal power which, however, was met by many baronial revolts, one being in 1078, when he demanded from the Apulian vassals an "aid" on the betrothal of his daughter. In conquering such wide territories he had little time to organize them internally. In the history of the Norman kingdom of Italy Guiscard remains essentially the hero and founder, as his nephew Roger II. is the statesman and organizer.

The best modern authorities are F. Chalandon, *Histoire de la domination normande en Italie et en Sicile* (Paris, 1907), and L. von Heinemann, *Geschichte der Normannen in Unteritalien* (Leipzig, 1894). Contemporary authors: Amatus, *Ystoire de li Normant*, ed. Delarc (Rouen, 1892); Geoffrey Malaterra and William of Apulia, both in Muratori Rer. Ital. SS., vol. v., and Anna Comnena in *Corpus script. hist. Byz.* (Bonn, 1839). (E. Cu.)

ROBERT OF AUXERRE (*c.* 1156–1212), French chronicler, was an inmate of the monastery of St Marien at Auxerre. At the request of Milo de Trainel (1155–1202), abbot of this house, he wrote a *Chronicon*, or universal history, which covers the period between the creation of the world and 1211. For the years previous to 1181 this is merely a compilation from Prosper of Aquitaine, Sigebert of Gembloux and others, but it is an original authority for the period from 1181 to 1211. It is one of the most valuable sources for the history of France during the reign of Philip Augustus, and it also contains information about other European countries, the Crusades and affairs in the East. Molinier, in fact, describes the author as one of the best historians of the middle ages. Robert was evidently a man of great diligence and of sound judgment. Two continuators took the work down to 1228 and it was extensively used by later chroniclers. The original manuscript is now at Auxerre.

The *Chronicon* was first published by N. Camuzat at Troyes in 1608; the best edition is in Band xxvi. of the *Monumenta Germaniae historica. Scriptores*, with introduction by A. Holder-Egger. Robert has been identified, but on very questionable grounds, with a certain Robert Abolant, an official of the monastery of St Marien, who died in 1214. See A. Molinier, *Les Sources de l'histoire de France*, tomes iii. and iv. (1903–1904).

ROBERT OF COURTENAY (d. 1228), emperor of Romania, or Constantinople, was a younger son of the emperor Peter of Courtenay, and was descended from the French king, Louis VI., while his mother Yolande was a sister of Baldwin and Henry of Flanders, the first and second emperors of Constantinople. When it became known in France that Peter of Courtenay was dead, his eldest son, Philip, marquess of Namur, renounced the succession to the Latin empire of Constantinople in favour of his brother Robert, who set out to take possession of his distracted inheritance, which was then ruled by Conon of Béthune as regent. Crowned emperor on the 25th of March 1221, Robert, who was surrounded by enemies, appealed for help to the pope and to the king of France; but meanwhile his lands were falling into the hands of the Greeks. Some little aid was sent from western Europe, but soon Robert was compelled to make peace with his chief foe, John Ducas Vataces, emperor of Nicaea, who was confirmed in all his conquests. Robert promised to marry Eudoxia, daughter of the late emperor of Nicaea, Theodore Lascaris I., a lady to whom he had been betrothed on a former occasion; however, he soon repudiated this engagement, and married a French lady, already the fiancée of a Burgundian gentleman. Heading a conspiracy, the Burgundian drove Robert from Constantinople, and early in 1228 the emperor died in Achaia.

ROBERT OF GLOUCESTER, English chronicler, is known only through his connexion with the work which bears his name. This is a vernacular history of England, from the days of the legendary Brut to the year 1270, and is written in rhymed couplets. The lines are of fourteen syllables, with a break after the eighth syllable. The author gives his name as Robert; the dialect which he uses, and his acquaintance with local traditions, justify the supposition that he was a monk of Gloucester. He describes, from his own recollections, the bad weather which prevailed in the neighbourhood of Evesham on the day of the battle between the Montfortians and Prince Edward (1265). He also alluded to the canonization of Louis IX. of France, which took place in 1297. He probably wrote about the year 1300. The earlier part of his chronicle (up to 1135) may be from another hand, since it occurs in some manuscripts in a shorter form, and with an exceedingly brief continuation by an anonymous versifier. There is no good reason for the theory that this part was translated from a French original; nor does it contain any undoubted borrowings from French sources. The authorities employed for the earlier part were Geoffrey of Monmouth, Henry of Huntingdon, William of Malmesbury, the English Chronicles, and some minor sources; Robert, in making his recension of it, also used the *Brut* of Layamon. From 1135 to 1256 Robert is still a compiler, although references to oral tradition become more frequent as he approaches his own time. From 1256 to 1270 he has the value of a contemporary authority. But he is more important to the philologist than to the historian. His chronicle is one of the last works written in Old English.

Robert's chronicle was first edited by T. Hearne (2 vols., Oxford, 1724); but this text is now superseded by that of W. Aldis Wright (2 vols., Rolls Series, 1887). Minor works attributed to the author are: a *Life of St Alban* in verse (MS. Ashmole 43); a *Life of St Patrick*, also in verse (MS. Tanner 17); a *Life of St Bridget* (MS. C.C.C. Cambridge, 145); and a *Life of St Alphege* (MS. Cott., Julius D. ix). A *Martyrdom of St Thomas Becket* and a *Life of St Brendan*, both attributed to Robert, were printed by the Percy Society in 1845.

See T. D. Hardy's *Descriptive Catalogue of MSS.* i. 25, 68, iii. 181–9, 623; K. Brossman, *Über die Quellen der Chronik des R. von Gloucester* (Striegau, 1887); W. Ellmer in *Anglia* (1888), x. 1–37, 291–322; H. Strohmeyer, *Der Stil der Reimchronik R. von Gloucester* (Berlin, 1891). (H. W. C. D.)

ROBERT OF JUMIÉGES (d. *c.* 1070), archbishop of Canterbury, was a Norman who became prior of St Ouen at Rouen and then abbot of Jumiéges. A close friend of the future king of England, Edward the Confessor, he crossed over to England with Edward in 1042, and in 1044 became bishop of London. In English history Robert appears as the most trusted and the most prominent of the king's foreign friends, and as the leader of the party hostile to the influence of Earl Godwine. In 1051, although the chapter had already made an election, Edward appointed him archbishop of Canterbury. He seems to have been sent by the king on an errand to Duke William of Normandy, and on the return of Godwine from exile in 1052 he fled in great haste from England. He was outlawed and deposed, and he died at Jumiéges about 1070. The treatment of Robert by the English was put forward by William the Conqueror as a pretext for invading England.

See *Two Saxon Chronicles*, edited by J. Earle and C. Plummer (Oxford, 1892); and E. A. Freeman, *History of the Norman Conquest* (Oxford, 1870–76).

ROBERT OF TORIGNI (*c.* 1110–1186), medieval chronicler, was prior of Bec in 1149, and in 1154 became abbot of Mont

St Michel, whence he is also sometimes called Robertus de Monte. He died, according to Potthast, on the 29th of May 1186. He wrote additions and appendices to the chronicle of Sigebert of Genblours, covering the period A.D. 385–1100, and a chronicle in continuation of Sigebert, extending from 1100 to 1186, of great value for Anglo-Norman history. Robert was in a good position to obtain information, for the Mont St Michel was one of the four great centres of pilgrimage in Europe. But he was excessively timid and cautious, and hardly mentions events, like the murder of Becket, which were subjects of controversy. Besides, his style is that of the driest annalist. It is for continental affairs between 1154 and 1170 that his information is especially valuable. His notices of English affairs are slight and sometimes misleading.

The best modern editions are the *Chronique de Robert de Torigni, &c.*, edited by Léopold Delisle for the *Soc. de l'histoire de Normandie* (Rouen, 1872–1873), and *Chronicle of Robert of Torigni*, edited, with an introduction, by Richard Howlett (Rolls Series, No. 82, iv. 1889).

ROBERT THE DEVIL, hero of romance. He was the son of a duke and duchess of Normandy, and by the time he was twenty was a prodigy of strength, which he used, however, only for outrage and crime. At last he learnt from his mother, in explanation of his wicked impulses, that he was born in answer to prayers addressed to the devil. He was directed by the pope to a hermit, who imposed on him by way of penance that he should maintain absolute silence, feign madness, take his food from the mouth of a dog, and provoke ill-treatment from the common people without retaliating. He became court fool to the emperor at Rome, and delivered the city from Saracen invasions in three successive years in the guise of an unknown knight, having each time been bidden to fight by a celestial messenger. The emperor's dumb daughter recovered speech to declare the identity of the court fool with the deliverer of the city, but Robert refused the hand of the princess and the imperial inheritance, and ended his days in the hermitage of his old confessor.

The French romance of *Robert le Diable* is one of the oldest versions of the legend, and differs in detail from the popular tales printed in the 15th and 16th centuries. It was apparently founded on folk-lore, not on the wickedness of Robert Guiscard or any historical personage; but probably the name of Robert and the localization of the legend may be put down to the terror inspired by the Normans. In the English version the hero is called Sir Gowther, and the scene is laid in Germany. This metrical romance dates from the beginning of the 15th century, and is based, according to its author, on a Breton lay. The legend had undergone much change before it was used by E. Scribe and C. Delavigne in the libretto of Meyerbeer's opera of *Robert le Diable*.

See *Robert le Diable*, ed. E. Löseth (Paris, 1903, for the Soc. des anc. textes fr.); *Sir Gowther*, ed. K. Breul (Oppeln, 1886); M. Tardel, *Die Sage v. Robert d. Teufel in neueren deutschen Dichtungen* (Berlin, 1900). Breul's edition of the English poem contains an examination of the legend, and a bibliography of the literature dealing with the subject. The English prose romance of *Robert the Devyll* was printed (*c.* 1510) by Wynkyn de Worde.

ROBERT THE STRONG (le Fort) (d. 866), count of Anjou and of Blois, is said by Richerus to have been the son of a certain Witichin, but nothing definite is known about his parentage or early life. Quickly attaining a prominent position among the Frankish nobles, he appears as rector of the abbey of Marmoutier in 852, and as one of Charles the Bald's *missi dominici*, in 853; but soon afterwards he was among those who rebelled against Charles, and invited the king's half-brother, Louis the German, to invade West Francia. However, after the peace between Charles and Louis in 860 Robert came to terms with his sovereign, who made him count of Anjou and of Blois, and entrusted him with the defence of that part of his kingdom which lay between the Seine and the Loire, a district which had suffered greatly from the ravages of the Normans and the Bretons. By his conduct in many stubborn fights with these foes, Robert thoroughly earned his surname and gained the confidence of the king, who gave him the counties of Nevers and Auxerre. He was killed in battle at Brissarthe in October 866, leaving two sons, Odo, or Eudes, and Robert, both of whom became kings of the Franks. Robert has been compared to the Maccabees, and the fact that he was the ancestor of the Capetian kings of France has invested him with historical importance.

See K. von Kalekstein, *Robert der Tapfere* (Berlin, 1871); and E. Favre, *Eudes, comte de Paris et roi de France* (Paris, 1893).

ROBERT, HUBERT (1753–1808), French artist, born at Paris in 1753, deserves to be remembered not so much for his skill as a painter as for the liveliness and point with which he treated the subjects he painted. The contrast between the ruins of ancient Rome and the life of his time excited his keenest interest; and, although he had started for Italy on his own responsibility, the credit he there acquired procured him the protection of the minister Marigny and an official allowance. His incessant activity as an artist, his daring character, his many adventures, attracted general sympathy and admiration. In the fourth canto of his *L'Imagination* Delille celebrated Robert's miraculous escape when lost in the catacombs; later in life, when imprisoned during the Terror and marked for the guillotine, by a fatal accident another died in his place and Robert lived. The quantity of his work is immense; the Louvre alone contains nine paintings by his hand and specimens are frequently to be met with in provincial museums and private collections. Robert's work has more or less of that scenic character which justified his selection by Voltaire to paint the decorations of his theatre at Ferney. Robert died of apoplexy on the 15th of April 1808. His work was much engraved by the abbé Le Non, with whom he had visited Naples in the company of Fragonard during his early days; in Italy his work has also been frequently reproduced by Chatelain, Liénard, Le Veau, and others.

See C. Blanc, *Hist. des peintres*; Villot, *Notice des tableaux du Louvre*; Julius Meyer, *Gesch. mod. fr. Malerei.*

ROBERT, LOUIS LÉOPOLD (1794–1835), French painter, was born at Chaux de Fonds (Neuchâtel) in Switzerland on the 13th of May 1794, but left his native place with the engraver Girardet at the age of sixteen for Paris. He was on the eve of obtaining the *grand prix* for engraving when the events of 1815 blasted his hopes, for Neuchâtel was restored to Prussia, and Robert was struck off the list of competitors as a foreigner. Whilst continuing his studies under Girardet he had never ceased to frequent the studio of David, and he now determined to become a painter, and only returned to his native country when his master himself was exiled. At Neuchâtel he attracted the notice of Roullet de Mezerac, who enabled him by a timely loan to proceed to Rome. In depicting the customs and life of the people, of southern Italy especially, he showed peculiar feeling for the historical characteristics of their race. After executing many detached studies of Italian life Robert conceived the idea of painting four great works which should represent at one and the same time the four seasons in Italy and the four leading races of its people. In the "Return from the Fête of the Madonna dell' Arco" (Louvre) he depicted the Neapolitans and the spring. This picture, exhibited at the Salon of 1827, achieved undoubted success and was bought for the Luxembourg by Charles X.; but the work which appeared in 1831—the "Summer Reapers arriving in the Pontine Marshes" (Louvre), which became the property of Louis Philippe—established the artist's reputation. Florence and her autumn vineyards should now have furnished him with his third subject. He attempted to begin it, but, unable to conquer his passion for Princess Charlotte Napoleon (then mourning the violent death of her husband, Robert's devoted friend), he threw up his work and went to Venice, where he began and carried through the fourth of the series, the "Fishers of the Adriatic." This work was not equal to the "Reapers." Worn by the vicissitudes of painful feeling, and bitterly discouraged, Robert committed suicide before his easel on the 20th of March 1835, on the tenth anniversary of the melancholy suicide of a brother to whom he had been much attached.

See Villot, *Notice des tableaux du Louvre*; C. Blanc, *Hist. des peintres*; Feuillet de Conches, *Correspondance de L. L. Robert*; Julius Meyer, *Gesch. mod. fr. Malerei.*

ROBERT-FLEURY, JOSEPH NICOLAS (1797–1890), French painter, was born at Cologne. He was sent by his family to Paris, and after travelling in Italy returned to France and made his first appearance at the Salon in 1824; his reputation, however, was not established until three years later, when he exhibited "Tasso at the Convent of St Onophrius." Endowed with a vigorous original talent, and with a vivid imagination, especially for the tragic incidents of history, he soon rose to fame, and in 1850 succeeded Granet as member of the Académie des Beaux-Arts. In 1855 he was appointed professor and in 1863 director of the École des Beaux-Arts, and in the following year he went to Rome as director of the French Academy in that city. Among his chief works are: "A Reading at Mme. de Sévigné's," "Scene of St Bartholomew," "Henry IV. taken to the Louvre after his Assassination" (1836); "Triumphal Entry of Clovis at Tours" (1838), at the Versailles Museum; "Le Colloque de Poissy" (1840), at the Luxembourg Museum in Paris; "The Children of Louis XVI. in the Temple" (1840); "Marino Faliero"; "An Auto-da-fé," "Galileo before the Holy Office," at the Luxembourg Museum; "Christopher Columbus received by the Spanish Court" (1847), at the same gallery; "The Last Moments of Montaigne" (1853); and "Charles V. in the Monastery of Yuste" (1857). He died in Paris in 1890.

His son, Tony Robert-Fleury (1837–), French painter, was born in Paris, and studied under his father and under Delaroche and Léon Coignet. His first picture at the Salon, in 1866, was a large historical composition of the "Warsaw Massacres on April 8, 1861." In the following year his "Old Women in the Place Navone, Rome" was bought for the Luxembourg Museum, as was also the "Last Day of Corinth" in 1870. In 1880 he painted a ceiling for the Luxembourg, representing "The Glorification of French Sculpture." Tony Robert-Fleury became president of the Société des Artistes français in succession to Bouguereau. He acquired a great reputation for his historical compositions and portraits; and from his atelier have issued a great number of the best-known painters of our day.

ROBERTS, DAVID (1796–1864), Scottish painter, was born at Stockbridge, Edinburgh, on the 24th of October 1796. He was apprenticed by his father, a shoemaker, for seven years to a painter and house-decorator; and during this time he employed his evenings in the study of art. In 1820 he formed the acquaintance of Clarkson Stanfield, then painting at the Pantheon, Edinburgh, at whose suggestion he sent three pictures in 1822 to the Exhibition of Works by Living Artists, held in Edinburgh. In the same year he removed to London, where he worked for the Coburg Theatre, and was afterwards employed, along with Stanfield, at Drury Lane. In 1824 he exhibited at the British Institution a view of Dryburgh Abbey, and sent two works to the first exhibition of the Society of British Artists, of which he was elected president in 1831. In the same autumn he visited Normandy, and the works which were the results of this excursion began to lay the foundation of the artist's reputation—one of them, a view of Rouen Cathedral, being sold for eighty guineas. His scenes for an opera, *The Seraglio*, executed two years later, and the scenery for a pantomime dealing with the naval victory of Navarino, and two panoramas executed jointly by him and Stanfield, were among his last work for the theatres. In 1829 he exhibited the "Departure of the Israelites from Egypt," in which his style first becomes apparent; three years afterwards he travelled in Spain and Tangiers, returning in the end of 1833 with a supply of effective sketches, elaborated into attractive and popular paintings. His "Interior of Seville Cathedral" was exhibited in the British Institution in 1834, and sold for £300; and he executed a fine series of Spanish illustrations for the *Landscape Annual* of 1836, while in 1837 a selection of his *Picturesque Sketches in Spain* was reproduced by lithography.

In 1838 Roberts made a long tour in the East, and accumulated a vast collection of sketches of a class of scenery which had hitherto been hardly touched by British artists, and which appealed to the public with all the charm of novelty. The next ten years of his life were mainly spent in elaborating these materials. An extensive series of drawings was lithographed by Louis Haghe in *Sketches in the Holy Land and Syria*, 1842–1849. In 1851, and again in 1853, Roberts visited Italy, painting the "Ducal Palace, Venice," bought by Lord Londesborough, the "Interior of the Basilica of St Peter's, Rome," "Christmas Day, 1853," and "Rome from the Convent of St Onofrio," presented to the Royal Scottish Academy. His last volume of illustrations, *Italy, Classical, Historical and Picturesque*, was published in 1859. He also executed, by command of Queen Victoria, a picture of the opening of the Great Exhibition of 1851. In 1839 he was elected an associate and in 1841 a full member of the Royal Academy; and in 1858 he was presented with the freedom of the city of Edinburgh. The last years of his life were occupied with a series of views of London from the Thames. He had executed six of these, and was at work upon a picture of St Paul's Cathedral, when, on the 25th November 1864, he died suddenly of apoplexy.

A *Life* of Roberts, compiled from his journals and other sources by James Ballantine, with etchings and pen-and-ink sketches by the artist, appeared in Edinburgh in 1866.

ROBERTS, FREDERICK SLEIGH ROBERTS, Earl (1832–), British soldier, second son of General Sir Abraham Roberts, G.C.B., was born at Cawnpore, India, on the 30th of September 1832. Educated at Eton, Sandhurst and Addiscombe, he obtained a commission in the Bengal Artillery on 12th December 1851. In the following year he was posted to a field battery at Peshawar, where he also acted as aide-de-camp to his father, who commanded the Peshawar division. In 1856 Roberts was appointed to the quartermaster-general's department of the staff, in which he remained for twenty-two years, passing from one grade to another until he became quartermaster-general in India. On the outbreak of the Mutiny in 1857, Roberts, at first, was staff officer to the movable column operating against the mutineers in the Punjab, successively commanded by Colonels Neville Chamberlain and John Nicholson, but, towards the end of June, he joined the Delhi Field Force, and was deputy assistant quartermaster-general with the artillery during the operations against Delhi. He was wounded in the fight of the 14th of July, but was sufficiently recovered in September to take command as a regimental officer of the left half of No. 2 Siege Battery during the siege. He rejoined the headquarters staff for the assault, and took part in the storm and subsequent seven days' fighting in the city. He then accompanied Colonel Greathed's column to Cawnpore, and during September and October was present at the actions of Bulandshahr, Aligarh, Agra, Bithur and Kanauj. He served under Sir Colin Campbell at the second relief of Lucknow in November, at the battle of Cawnpore on the 6th of December, and the subsequent pursuit and defeat of the Gwalior contingent near Shinrajpur. Roberts distinguished himself at the engagement of Khudaganj, on the 2nd of January 1858, by capturing, in single-handed combat, a standard from two sepoys, and also by cutting down a sepoy about to kill a sowar. For these acts of gallantry he was recommended for the Victoria Cross. He was present at the reoccupation of Fatehgarh on the 6th of January, the storm of Mianganj in February, the siege and capture of Lucknow in March, and the action at Kursi on the 22nd of that month, after which he went home on sick leave. For his services in the Mutiny he was seven times mentioned in despatches, received the medal with three clasps, the Victoria Cross, and on his promotion to captain, in October 1860, a brevet majority. On the 17th of May 1859 he married, at Waterford, Miss Nora Bews, and on his return to India was entrusted with the organization of the viceroy's camps during the progresses through Oudh, the North-West Provinces, the Punjab and Central India in 1860 and 1861. In December 1863 he took part, under

Major-General Garvock, in the Umbeyla campaign among the mountains to the north of Peshawar, and was present at the storm of Lalu, the capture of Umbeyla, and the destruction of Mulka, receiving for his services the medal and clasp.

In 1867 Roberts was appointed assistant quartermaster-general to Sir Donald Stewart's Bengal Brigade for Abyssinia. He showed judgment in embarking each unit complete in every detail, instead of despatching camp equipage in one ship, transport in another, and so on, as was customary. He arrived at Zula, Annesley Bay, in the Red Sea, the base of the expedition, on the 3rd of February 1868, and remained there as senior base staff officer during the four months' campaign. At its close he superintended the re-embarkation of the whole army. His duties were so well performed that Sir Robert Napier sent him home with his final despatches. He was three times "mentioned," and received a brevet lieutenant-colonelcy and the war medal. He returned to India the following year as first assistant quartermaster-general. In the autumn of 1871 he made the arrangements for the expedition into Lushai, between south-east Bengal and Burma, fitted out two columns under Brigadiers-General Bourchier and Brownlow, and himself accompanied the first. A road, over 100 m. long, was cut through dense gloomy forests in stifling heat, and the column was attacked by cholera; but the object of the expedition was successfully accomplished, and Roberts, who was present at the capture of the Kholel villages and the action in the Northlang range, and commanded the troops at the burning of Taikum, was mentioned in despatches and made a Companion of the Bath. On his return in March 1872, he became deputy quartermaster-general in Bengal, and in 1875 quartermaster-general and colonel. He settled the details of the great camp of exercise at Delhi on the occasion of the visit of the prince of Wales in January 1876, and attended H.R.H. at the manœuvres. He also superintended the arrangements for the great durbar at Delhi on the 1st of January 1877, when Queen Victoria was proclaimed empress of India.

In 1878 Roberts was appointed to the command of the Frontier Field Force at Abbottabad, in Hazara; but in the autumn, on the repulse of the Chamberlain Mission by the Afghans, and the formation of three columns to advance into Afghanistan by the Khyber, the Bolan and the Kurram passes, he was given the command of the Kurram Field Force, with the rank of major-general. Concentrating his column at Thal, he advanced to Kurram towards the end of November, and having formed an advanced base there, moved on to Habib Kila. Under cover of preparations for a front attack on the Peiwar Kotal, he reconnoitred that formidable position, and on the night of the 1st of December moved part of his force to attack the Spingawi Kotal, in order to turn the Afghan left flank, leaving the remainder of the force to feign a front attack on the Peiwar, and to guard the camp. After a very difficult night march the Spingawi Kotal was carried at daybreak on the 2nd, and, later, the Afghans on the Peiwar Kotal, threatened in rear, abandoned the position. The next morning Roberts occupied the Peiwar, and on the 6th advanced to Ali Khel. He reconnoitred the Shutargardan and the Sapari passes, and made a strong reconnaissance through Khost, in which some fighting took place, and at the end of January returned to Hagir Pir, in Kurram, where his force remained in occupation. In July Major Cavagnari, the British envoy to the new amir, Yakub Khan, passed through Kurram on his way to Kabul, and, shortly afterwards, Roberts left his Kurram command and went to Simla to take his seat on the army commission, where he strongly advocated the abolition of the three Presidency armies, and the substitution for them of four army corps, a measure which was carried out sixteen years later. While he was at Simla, news arrived on the 5th of September of the murder of Cavagnari and his companions at Kabul. The Peshawar Valley Force had been broken up; Sir Donald Stewart was still at Kandahar, but most of his troops had started for India; Roberts, therefore, had the only force ready to strike rapidly at Kabul. It was hastily reinforced, and he hurried back to Kurram to take command, as a lieutenant-general, of the Kabul Field Force (7500 men and 22 guns). By the 19th of September a brigade was entrenched on the Shutargardan, and as Roberts advanced, the Amir Yakub Khan came into his camp. An Afghan force of 8000 men blocked the way in a strong position on the heights beyond Charasia, and on the 6th of October Roberts repeated the tactics that had done him such good service at the Peiwar in the previous year, and sending Brigadier-General T. D. Baker with the greater part of his force to turn the Afghan right flank, threatened the pass in front with the remainder. By the afternoon Baker had seized the position, and the enemy, severely defeated, were in full retreat. Kabul was occupied without further opposition.

The city was spared, but punishment was meted out to those convicted of complicity in the murder of the British Mission. Yakub Khan abdicated on the 12th of October, and was eventually deported to India. The troops occupied the Sherpur cantonments; but in November a religious war was proclaimed by the Mullahs, and early in December, in order to prevent a threatening combination of Afghan tribes against him, Roberts moved out two columns to attack them in detail. After considerable fighting around Kabul, the numbers of the enemy were so great that he was forced to concentrate his troops again at Sherpur, the defences of which had been greatly improved and strengthened. Sherpur was invested by the enemy, and early on the 23rd of December was attacked by over 100,000 Afghans. They were driven off with great loss; and on making a second attempt to storm the place, were met by Roberts, who moved out, attacked them in flank, and defeated them, when they broke and dispersed. Roberts now recommended the political dismemberment of Afghanistan, and negotiations were carried on with the northern tribes for the appointment of an amir for the Kabul district only. On the 5th of May Sir Donald Stewart arrived with his column from Kandahar and assumed the supreme command in Afghanistan, Roberts retaining, under Stewart, the command of the two Kabul divisions, and organizing an efficient transport corps under Colonel R. Low, which was soon to be of inestimable value. On the 22nd of July Abdur Rahman was proclaimed Amir of Kabul; and Roberts was preparing to withdraw his troops to India by the Kurram route, when news arrived that a British brigade had been totally defeated at Maiwand on the 27th of July, and that Lieutenant-General Primrose was besieged in Kandahar. Roberts was ordered to proceed thither at once with a specially selected column of 10,000 troops and his new transport corps. He started on his famous march on the 9th of August and arrived at Kandahar on the morning of the 31st, having covered 313 miles in twenty-two days. On the following day he fought the battle of Kandahar and gained a complete victory. His services in the Afghan campaigns of 1878 to 1880 are recorded in eight *Gazettes*, and were recognized by the thanks of both Houses of Parliament, of the Government of India, and of the Governor-General in Council. He was created K.C.B., G.C.B. and a baronet, received the medal with four clasps and the bronze star, and was given the command of the Madras army.

Before proceeding to Madras, Roberts went home on furlough, and when the news of the disaster at Majuba Hill in South Africa arrived in London at the end of February 1881, he was appointed governor of Natal and commander-in-chief in South Africa. He arrived at Cape Town to find that peace had been made with the Boers, and that instructions were awaiting him to return home. The same year he attended the autumn manœuvres in Hanover as the guest of the German emperor. He declined the post of quartermaster-general to the forces in succession to Sir Garnet Wolseley, and returned to India, arriving at Madras in November. The following year he visited Burma with the viceroy, and in 1885 attended the meeting between Abdur Rahman and Lord Dufferin at Rawalpindi at the time of the Panjdeh incident, in connexion with which he had been nominated to the command of an army corps in case of hostilities. In July he succeeded Sir Donald Stewart as commander-in-chief in India, and during his seven years' tenure of this high position instituted many measures for the benefit of the army, and greatly assisted the development of frontier communications and defence. At the end of 1886, at the request of the viceroy, he took personal command for a time of the forces in Burma, and organized measures for the suppression of dacoity. For his services he received the medal, was created G.C.I.E., and promoted supernumerary general. In 1890 he did the honours of the army to Prince Albert Victor at a standing camp at Muridki, and in 1891 his attention was occupied with the Zhob and Hunza Nagar frontier campaigns. On the 1st of January 1892 he was raised to the peerage as Baron Roberts of Kandahar and Waterford. In 1893 he left India for good, and the G.C.S.I. was bestowed upon him. He was promoted to be field-marshal in 1895, and in the autumn of that year succeeded Lord Wolseley in the Irish command and was sworn a privy councillor. At Queen Victoria's diamond jubilee in 1897 he was created K.P.

After the disastrous actions in the Boer war in South Africa in December 1899 at Magersfontein, Stormberg and Colenso, where his only son was killed, Lord Roberts was sent out as commander-in-chief. He arrived at Cape Town on the 10th of January 1900, and after organizing his force, advanced with sound strategy on Bloemfontein, the capital of the Orange Free State, and soon changed the aspect of affairs. The sieges of Kimberley and Ladysmith were raised, and the Boer general, Cronje, flying towards the capital, was overtaken at Paardeberg and, after a fine defence, compelled to surrender, with 5000 men, on the anniversary of Majuba Day, the 27th of February 1900. Roberts entered Bloemfontein on the 13th of March, and after six weeks' preparation, advanced on Pretoria, the capital of the Transvaal. Mafeking was relieved on the 17th of May, and Pretoria occupied on the 5th of June. The two Boer states were annexed, and the war gradually assuming a guerilla character, Roberts handed over the command to Lord Kitchener and returned to England to fill the office of commander-in-chief of the army in succession to Lord Wolseley.

He arrived in the Solent on the 2nd of January 1901, and the same day, at Osborne, had an audience of Queen Victoria, who handed him the insignia of the Order of the Garter. The next day he was received at Paddington by the prince and princess of Wales, and drove in procession to Buckingham Palace, where he was entertained as the guest of the queen. He again had an audience of the queen at Osborne on the 14th of January on his elevation to an earldom, the last audience given by her majesty before her death, which took place eight days later. When the German emperor came to London for the queen's funeral, he decorated Lord Roberts with the Order of the Black Eagle. Earl Roberts received the thanks of both Houses of Parliament and a grant of £100,000 for his services in South Africa. In 1905 he resigned his post on the Committee of National Defence, and devoted himself to attempting to rouse his countrymen to the necessity of cultivating rifle-shooting and of adopting systematic general military training and service. As an author he is known by his *Rise of Wellington* (1895), and his *Forty-One Years in India* (1897), an autobiography which has passed through numerous editions.

ROBERTSON, FREDERICK WILLIAM (1816–1853), English divine, known as Robertson of Brighton, was born in London on the 3rd of February 1816. The first five years of his life were passed at Leith Fort, where his father, a captain in the Royal Artillery, was then resident. The military spirit entered into his blood, and throughout life he was characterized by the qualities of the ideal soldier. In 1821 Captain Robertson retired to Beverley, where the boy was educated. At the age of fourteen he spent a year at Tours, from which he returned to Scotland and continued his education at the Edinburgh Academy and university. In 1834 he was articled to a solicitor in Bury St Edmunds, but the uncongenial and sedentary employment soon broke down his health. He was anxious for a military career, and his name was placed upon the list of the 3rd Dragoons, then serving in India. For two years he worked hard in preparing for the army, but, by a singular conjunction of circumstances and at the sacrifice of his own natural bent to his father's wish, he matriculated at Brasenose College, Oxford, just two weeks before his commission was put into his hands. Oxford he did not find wholly congenial to his intensely earnest spirit, but he read hard, and, as he afterwards said, "Plato, Aristotle, Butler, Thucydides, Sterne, Jonathan Edwards, passed like the iron atoms of the blood into my mental constitution." At the same time he made a careful study of the Bible, committing to memory the entire New Testament both in English and in Greek. The Tractarian movement had no attraction for him, although he admired some of its leaders. He was at this time a moderate Calvinist in doctrine, and enthusiastically evangelical. Ordained in July 1840 by the bishop of Winchester, he at once entered on ministerial work in that city, and during his ministry there and under the influence of the missionaries Henry Martyn and David Brainerd, whose lives he studied, he carried devotional asceticism to an injurious length. In less than a year he was compelled to seek relaxation; and going to Switzerland he there met and married Helen, third daughter of Sir George William Denys, Bart. Early in 1842, after a few months' rest, he accepted a curacy in Cheltenham, which he retained for upwards of four years. The questioning spirit was first aroused in him by the disappointing fruit of evangelical doctrine which he found in Cheltenham, as well as by intimacy with men of varied reading. But, if we are to judge from his own statement in a letter from Heidelberg in 1846, the doubts which now actively assailed him had long been latent in his mind. The crisis of his mental conflict had just been passed in Tirol, and he was now beginning to let his creed grow again from the one fixed point which nothing had availed to shift: "The one great certainty to which, in the midst of the darkest doubt, I never ceased to cling—the entire symmetry and loveliness and the unequalled nobleness of the humanity of the Son of Man." After this mental revolution he felt unable to return to Cheltenham, but after doing duty for two months at St Ebbe's, Oxford, he entered in August 1847 on his famous ministry at Trinity Chapel, Brighton. Here he stepped at once into the foremost rank as a preacher, and his church was thronged with thoughtful men of all classes in society and of all shades of religious belief. His fine appearance, his flexible and sympathetic voice, his manifest sincerity, the perfect lucidity and artistic symmetry of his address, and the brilliance with which he illustrated his points would have attracted hearers even had he had little to say. But he had much to say. He was not, indeed, a scientific theologian; but his insight into the principles of the spiritutal life was unrivalled. As his biographer says, thousands found in his sermons "a living source of impulse, a practical direction of thought, a key to many of the problems of theology, and above all a path to spiritual freedom." His closing years were full of sadness. His sensitive nature was subjected to extreme suffering, arising mainly from the opposition aroused by his sympathy with the revolutionary ideas of the 1848 epoch. Moreover, he was crippled by incipient disease of the brain, which at first inflicted unconquerable lassitude and depression, and latterly agonizing pain. On the 5th of June 1853 he preached for the last time, and on the 15th of August he died.

Robertson's published works include five volumes of sermons, two volumes of expository lectures, on Genesis and on the epistles to the Corinthians, a volume of miscellaneous addresses, and an *Analysis of "In Memoriam."* See *Life and Letters* by Stopford A. Brooke (1865).

ROBERTSON, GEORGE CROOM (1842–1892), Scottish philosopher, was born at Aberdeen on the 10th of March 1842. In 1857 he gained a bursary at Marischal College, and graduated M.A. in 1861, with the highest honours in classics and philosophy. In the same year he won a Fergusson scholarship of £100 a year for two years, which enabled him to pursue his studies outside Scotland. He went first to University

College, London; at Heidelberg he worked at German; at Berlin he studied psychology, metaphysics and also physiology under du Bois-Reymond, and heard lectures on Hegel, Kant and the history of philosophy, ancient and modern. After two months at Göttingen, he went to Paris in June 1863. In the same year he returned to Aberdeen and helped Alexander Bain with the revision of some of his books. In 1864 he was appointed to help Professor Geddes with his Greek classes, but he gave up the vacations to philosophical work. In 1866 he was appointed professor of philosophy of mind and logic at University College, London. This post he retained until ill-health compelled him to resign a few months before his death in 1892. He lectured on logic, deductive and inductive, systematic psychology and ethical theory. He left little published work. A comprehensive work on Hobbes was never completed, though part of the materials were used for an article in the *Encyclopaedia Britannica*, and another portion was published as one of Blackwood's "Philosophical Classics." Together with Bain, he edited Grote's *Aristotle*, and was the editor of *Mind* from its foundation in 1876 till 1891. He was keenly interested in German philosophy, and took every opportunity of making German works on English writers known in the United Kingdom. In philosophy he followed mainly Mill and Bain, but he was acquainted with all philosophical literature. He was associated with his wife (a daughter of Mr Justice Crompton) in many kinds of social work; he sat on the Committee of the National Society for Women's Suffrage, and was actively associated with its president, John Stuart Mill. He warmly supported the admission of women students to University College.

ROBERTSON, JOSEPH (1810–1866), Scottish antiquary, was born at Aberdeen on the 17th of May 1810, the son of a small shopkeeper. He was educated in Marischal College in Aberdeen and was for some years engaged in literary and newspaper work there and in Glasgow and Edinburgh. In 1839 he helped to found the Spalding Club, organized to publish the historical, genealogical, topographical and literary remains of the north-eastern counties of Scotland, and he edited eight of its thirty-eight volumes. In 1853 he was appointed curator of the historical and antiquarian department of the General Register House, Edinburgh, hitherto a subordinate and unimportant office, but which, in his hands, became of the first consequence to the interests of antiquarian literature in Scotland. His inventory of the personal property and jewels of Mary Queen of Scots, prefaced by a paper of great learning and research, and his essays on Scottish architecture, preceded his greatest work, published by the Bannatyne Club (1866), *Concilia Scotiae, Ecclesiae Scoticanae Statuta*. In 1864 the University of Edinburgh conferred upon him the honorary degree of LL.D. He died on the 13th of December 1866.

ROBERTSON, THOMAS WILLIAM (1829–1871), English actor and dramatist, was born at Newark on the 9th of January 1829. As a dramatist he had a brief but very brilliant career. The son of a provincial actor and manager, chief of a "circuit" that ranged from Bristol to Cambridge, Robertson was familiar with the stage from his childhood; he was the eldest of a large family, the actress Margaret (Madge) Robertson (Mrs Kendal) being the youngest. His success came late. A farcical comedy by him, *A Night's Adventure*, was produced at the Olympic under Farren's management as early as 1851, but this did not make good his footing, and he remained for some years longer in the provinces, varying his work as an actor with miscellaneous contributions to newspapers. In 1860 he went to London, and edited a mining journal to which he contributed a novel afterwards dramatized with the title *Shadow Tree Shaft*. He was at one time prompter at the Olympic under the management of Charles Mathews. He wrote a farce entitled *A Cantab*, which was played at the Strand Theatre in 1861. This brought him a reputation in a Bohemian clique, but so little practical assistance that he thought of abandoning the profession to become a tobacconist. Then, in 1864, came his first marked success, *David Garrick*, produced at the Haymarket with Edward Sothern in the principal character. It was not, however, till the production of *Society* at the Prince of Wales Theatre in 1865, under the management of Miss Marie Wilton, afterwards Mrs Bancroft, that the originality and cleverness of the dramatist were fully recognized. Play-writer and company were exactly suited one to another; the plays and the acting together—the small size of the playhouse being also in their favour—were at once recognized as a new thing. Although some critics sneered at the "cup-and-saucer comedy," voted it absurdly realistic, said there was nothing in it but commonplace life represented without a trace of Sheridanian wit and sparkle, all London flocked to the little house in Tottenham Street, and the stage was at once inundated with imitations of the new style of acting and the new kind of play. Robertson, although his health was already undermined, rapidly followed up *Society* with a series of characteristic plays which made the reputation of himself, the company and the theatre. All his best known plays (except *David Garrick*) were written for the old Prince of Wales's under the Bancrofts, and that régime is now an historical incident in the progress of the English stage. *Ours* was produced in 1866, *Caste* in 1867, *Play* in 1868, *School* in 1869, *M.P.* in 1870. Unhappily, Robertson enjoyed his success for but a short time. He died in London on the 3rd of February 1871. His work is notable for its masterly stagecraft, wholesome and generous humour, bright and unstrained dialogue, and high dramatic sense of human character in its theatrical aspects.

See *Principal Dramatic Works of Robertson; with Memoir by his son* (1889); and T. E. Pemberton, *Life and Writings of Robertson* (1893).

ROBERTSON, WILLIAM (1721–1793), Scottish historian, born at Borthwick, Mid Lothian, on the 19th of September 1721, was the eldest son of the Rev. William Robertson. He was educated at the school of Dalkeith and the university of Edinburgh. He was from the first intended for the ministry; in 1743 he was presented to the living of Gladsmuir in East Lothian, and two years later he lost both his father and his mother, who died within a few hours of each other. The support and education of a younger brother and six sisters then devolved upon him, though at that time his income was less than £100 a year. Robertson's inclination for study was never allowed to interfere with his duties as a parish minister, and his power as a preacher had made him a local celebrity while still a young man.

His energy and decision of character were brought out vividly by the rebellion of 1745. When Edinburgh seemed in danger of falling into the hands of the rebels he joined the volunteers in the capital. When the city was surrendered he was one of the small band who repaired to Haddington and offered their services to the commander of the royal forces. Such a man could not remain in obscurity, and in 1746 he was elected a member of the General Assembly, where his influence as leader of the "moderate" party was for many years nearly supreme (see PRESBYTERIANISM).

During all this period of prominent activity in the public life of Edinburgh, Robertson was busy with his historical labours. His *History of Scotland*, begun in 1753, was published in 1759. Till he had finished his book Robertson had never left his native country; but the publication of his history necessitated a journey to London, and he passed the early months of the year 1758 partly in the capital and partly in leisurely rambles in the counties of England. The success of the *History of Scotland* was immediate, and within a month a second edition was called for. Before the end of the author's life the book had reached its fourteenth edition; and it soon brought him other rewards than literary fame. In 1759 he was appointed chaplain of Stirling Castle, in 1761 one of His Majesty's chaplains in ordinary, and in 1762 he was chosen principal of the university of Edinburgh. In May 1763 he was elected Moderator of the General Assembly, and in August of the same year the office of king's historiographer was revived in his favour with a salary of £200 a year.

The rest of Robertson's life was uneventful. His *History of* *the Reign of the Emperor Charles the Fifth* occupied ten consecutive years of labour. It appeared in three volumes quarto in 1769. In 1777 he published his *History of America* and in 1791 his *Disquisition concerning the Knowledge which the Ancients had of India*, which concluded his historical labours and appeared only two years before his death, which occurred near Edinburgh on the 11th of June 1793. His fame had long been European, and he left no rival in the field of historical composition save Gibbon alone.

For an adequate appreciation of Robertson's position in British literature, and more especially of his rank as an historian, we have to consider the country and the age in which he was born and his own personal qualities and limits. Considering the small size and poverty of the country, Scotland had made a more than creditable figure in literature in the great age of the Reformation and the Renaissance, and Scottish contributions to British literature in the last half of the 18th century were distinctly superior to those produced in the southern portion of the island.

Of the three great British historians of the 18th century two were Scotsmen. The exact place of Robertson with regard to his two friends Hume and Gibbon, and to such historians as the rest of Europe had to offer, presents a question of some nicety, because it is complicated by extraneous considerations, so to speak, which should not weigh in an abstract estimate, but cannot be excluded in a concrete and practical one. If we regard only Robertson's potential historic power, the question is not so much whether he was equal to either of his two friends as whether he was not superior to both. The man who wrote the review of the state of Europe prefixed to the *History of Charles V.*, or even the first book of the *History of Scotland*, showed that he had a wider and more synthetic conception of history than either the author of the *Decline and Fall* or the author of the *History of England*. These two portions of Robertson's work, with all their shortcomings in the eye of modern criticism, have a distinctive value which time cannot take away. He was one of the first to see the importance of *general ideas* in history. He saw that the immediate narrative of events with which he was occupied needed a background of broad and connected generalizations, referring to the social state of which the detailed history formed a part. But he did more than this. In the appendix to the view of Europe called "Proofs and Illustrations" he enters into the difficult and obscure question of land tenure in Frankish times, and of the origin of the feudal system, with a sagacity and knowledge which distinctly advanced the comprehension of this period beyond the point at which it had been left by Du Bos, Montesquieu and Mably. He was well acquainted with the original documents,—many of them, we may conjecture, not easy to procure in Scotland. It must have been a genuine aptitude for historical research of a scientific kind which led Robertson to undertake the labour of these austere disquisitions of which there were not many in his day who saw the importance. Gibbon, so superior to him for wide reading and scholarship, has pointedly avoided them. Robertson's views are now out of date. But he deserves the honour of a pioneer in one of the most obscure if also important lines of inquiry connected with European history. On the other hand, it must be admitted that he showed himself only too tame a follower of Voltaire in his general appreciation of the middle ages, which he regarded with the mingled ignorance and prejudice common in the 18th century. In this particular he was not at all in advance of his age.

The neglect and gradual oblivion which have overtaken the greater part of Robertson's historical work are owing to no fault of his. He had not and could not have the requisite materials: they were not published or accessible. Justice requires that we should estimate his performance in view of the means at his command, and few critics would hesitate to subscribe to the verdict of Buckle, "that what he effected with his materials was wonderful." His style is singularly clear, harmonious and persuasive. The most serious reproach made against it is that it is correct to a fault and lacks idiomatic vigour, and the charge is not without foundation. But there can be no doubt that, if Robertson's writings are less read than they formerly were, the fact is to be attributed to no defects of style but to the growth of knowledge and to the immense extension of historical research which has inevitably superseded his initiatory and meritorious labours.

By his wife, Mary Nisbet, whom he married in 1751, Robertson left three sons: William (1753–1835), who in 1805 was raised to the Scottish bench as Lord Robertson; James, who became a general in the British army; and David, who in 1799 married Margaret, sister of Colonel Donald Macdonald and heiress of Kinloch-Moidart, whose surname he assumed.

There are lives of Robertson by Dugald Stewart (Edinburgh, 1801 and 1802), prefixed to most of the collective editions of his works; by George Gleig, bishop of Brechin (Edinburgh, 1812); and by Lord Brougham in *Lives of Men of Letters*, &c. (1845–1846).

ROBERTSON, WILLIAM BRUCE (1820–1886), Scottish divine, was born at Greenhill, St Ninians, Stirlingshire, on the 24th of May 1820, and was educated at Glasgow University and at the Secession Theological Hall, Edinburgh, where he made the acquaintance of Thomas de Quincey, and on his recommendation went to Halle and studied under Tholuck. After travelling in Italy and Switzerland he was licensed to preach by the presbytery of Stirling and Falkirk in 1843, and was soon after ordained at the Secession (after 1847, the United Presbyterian) Church in Irvine, Ayrshire. In this charge he remained for 35 years, exercising from his pulpit a truly magnetic influence, not so discernible in his published sermons. From 1871 his health failed, in spite of several visits to Florence and the Riviera. He resigned his charge in 1878 and died at Bridge of Allan on the 27th of June 1886.

He wrote many hymns, among them a version of "Dies Irae"; several of them, together with letters, &c., are to be found in the *Life* by James Brown. A volume containing Robertson's lectures on Martin Luther and other subjects was published in 1892.

ROBERVAL, GILLES PERSONNE (or Personier) **DE** (1602–1675), French mathematician, was born at Roberval, near Beauvais, on the 8th of August 1602. His name was originally Gilles Personne, that of Roberval, by which he is known, being taken from the place of his birth. Like René Descartes, he was present at the siege of La Rochelle in 1627. In the same year he went to Paris, where he was appointed to the chair of philosophy in the Gervais College in 1631, and two years later to the chair of mathematics in the Royal College of France. A condition of tenure attached to this chair was that the holder should propose mathematical questions for solution, and should resign in favour of any person who solved them better than himself; but, notwithstanding this, Roberval was able to keep the chair till his death, which occurred at Paris on the 27th of October 1675.

Roberval was one of those mathematicians who, just before the invention of the infinitesimal calculus, occupied their attention with problems which are only soluble, or can be most easily solved, by some method involving limits or infinitesimals, and in the solution of which accordingly the calculus is always now employed. Thus he devoted some attention to the quadrature of surfaces and the cubature of solids, which he accomplished, in some of the simpler cases, by an original method which he called the "Method of Indivisibles"; but he lost much of the credit of the discovery as he kept his method for his own use, while Bonaventura Cavalieri published a similar method which he himself had invented. Another of Roberval's discoveries was a very general method of drawing tangents, by considering a curve as described by a moving point whose motion is the resultant of several simpler motions. (See Infinitesimal Calculus.) He also discovered a method of deriving one curve from another, by means of which finite areas can be obtained equal to the areas between certain curves and their asymptotes. To these curves, which were also applied to effect some quadratures, Evangelista Torricelli gave the name of "Robervallian lines." Between Roberval and Descartes there existed a feeling of ill-will, owing to the jealousy aroused in the mind of the former by the criticism which Descartes offered to some of the methods employed by him and by Pierre de Fermat; and this led him to criticize and oppose the analytical methods which Descartes introduced into geometry about this time. As results of Roberval's labours outside the department of pure mathematics may be noted a work on the system of the universe, in which he supports the Copernican system and attributes a mutual attraction to all particles of matter;

and also the invention of a special kind of balance which goes by his name.

His works were published in 1693 by the Abbé Gallois, in the *Recueil* of the *Mémoires de l'Académie des Sciences.*

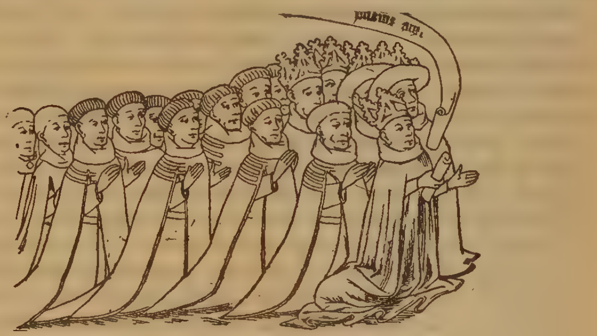
See J. A. N. de C. Condorcet, *Éloge de Roberval* (Paris, 1773); J. E. Montucla, *Histoire des mathématiques* (1802).

ROBES (Fr. *robe*, Late Lat. *roba*, *raupa*, meaning (1) spoils, (2) robe, stuff, cf. Mod. Ital. *roba*, connected with a Teutonic root *raup*, *raub*, German *rauben* and English *rob*), the name generally given to a class of official costume, especially as worn by certain persons or classes on occasions of particular solemnity. According to Du Cange, the word robe was earliest used, in the sense of a garment, of those given by popes and princes to the members of their household or their great officers. Thus Matthew Paris (*Chron. Majora*, Rolls Series, V. 38) tells how, in 1248, the pope gave to some Tatar envoys "vestes pretiosissimas quas Robas vulgariter appellamus, de escarleto praeelecto, cum pellibus et furruris," with which Du Cange compares the "festiva indumenta" given, *e.g.*, by King John *magnatum suorum multitudini* at Christmas time (1214, Matt. Paris, Rolls Series, II. 520) and the *raubae papales scutiferorum*, and the like, given by the popes to members of their households, after the fashion of a livery. It would, however, be perhaps going too far to assume that, *e.g.*, peers' robes were originally the king's livery, for there seems to be no proof that this was the case; but it is curious that in most early cases where robes are mentioned, if not of cloth of gold, &c., they are of scarlet, furred. A robe is properly a long garment, and the term "robes" is now applied only in those cases where a long garment forms part of the official costume, though in ordinary usage it is taken to include all the other articles of dress proper to the costume in question. The term "robes," moreover, connotes a certain degree of dignity or honour in the wearer. We speak of the king's robes of state, of peers' robes, of the robes of the clergy, of academic robes, judicial robes, municipal or civic robes; we should not speak of the robes of a cathedral verger, though he too wears a long gown of ceremony, and it is even only by somewhat stretching the term "robes" that we can include under it the ordinary academical dress of the universities. In the case of the official costume of the clergy, too, a distinction must be drawn. The *vestimenta sacra* are not spoken of as "robes"; a priest is not "robed" but "vested" for Mass; yet the rochet and chimere of an English bishop, even in church, are more properly referred to as robes than as vestments, and while the cope he wears in church is a vestment rather than a robe, the scarlet cope which is part of his parliamentary full dress is a robe, not a vestment. For the sake of convenience the official, non-liturgical costume of the clergy is dealt with under the general heading VESTMENTS and the subsidiary articles (*e.g.* COPE).

The coronation robes of emperors and kings, representing as they do the sacerdotal significance of Christian kingship, are essentially vestments rather than robes (see CORONATION). Apart from these, however, are the royal robes of state; in the case of the king of England a crimson velvet surcoat and long mantle, fastened in front of the neck, ermine lined, with a deep cape or tippet of ermine.[1]

The subject of official robes is too vast for any attempt to be made to deal with it comprehensively here. All countries, East and West, which boast an ancient civilization have retained them in greater or less degree, and the tendency in modern times has been to multiply rather than to diminish their number. Even in republican France they survived the Revolution, at least in the universities and the law courts. But nowhere has custom been so conservative in this matter as in the United Kingdom, where in this as in other matters the wise Machiavellian principle has been followed of changing the substance of institutions without altering their outward semblance. The present article, then, does not attempt to deal with any but British robes,[2] under the headings of (1) peers' robes, (2) robes in the House of Commons, (3) robes of the Orders of Knighthood, (4) judicial and forensic robes, (5) municipal and civic robes, (6) academic costume.

Peers' Robes.—As early as the end of the 14th century peers seem to have worn at their creation some kind of robe of honour; this we may conclude from the description of the investiture of the earl of Somerset in 1397 (*Rot. Parl.* iii. 343), which says: "le dit Monsieur John fut amesnée devant le Roy en Parlement entre deux Contes, c'est assavoir Huntyngdon et Mareschall, vestuz en un pane (Du Cange; *pannus* = 3. *habitus vestimentum*) come vesture de honor"; while in accounts of various creations of about the same time (*Rot. Parl.* iii. 205, 206) are used the words "advenienteque . . . prefato Duce honorifice . . . togato et ornato." An early illustration of their use is to be found in an illumination on the foundation charter of King's College, Cambridge (see fig. 1), which represents the peers as early as 1446 wearing gowns, mantles and hoods of scarlet, furred with miniver, the mantle opening on the right shoulder and guarded with two, three or four bars of miniver, in the form of short stripes high up on the shoulder. The origin of these is as yet unknown, and it is not certain precisely when the peers' velvet robe of estate was first used. At the coronation of Henry VI. the king's own parliament robe was of scarlet and miniver (Gregory's *Chronicle*, ed. Gairdner, Camden Soc. pp. 165–70), so the peers' robes were certainly not yet of velvet; at that of Henry VII. (see *Rutland Papers*, 1842; "Device for the Coronation of Henry VII.") the king had a robe of crimson velvet and ermine, but the "lords temporall" are only said to have been "in their robes"; at that of Henry VIII. (see Hall's *Chronicle*) the king in his progress through the city wore a crimson velvet robe furred with ermine, "his knights and esquires for his body" wore crimson velvet, and "all the gentlemen," &c., scarlet, while we hear of the "lords spiritual and temporal, and of their costly and rich apparel, of several devises and fashions," and notably of the duke of Buckingham's robe of gold and needlework (Stow's *Annals*, p. 813), which would show that the velvet robe of estate was not yet worn at the king's coronation. The duke of Richmond at his creation in 1525 (17 Henry VIII., see Brewer, *State Papers*, iv. 639) is described as clad in robes of estate, and the description of the investiture says that "the patent was read, the *robe*, sword, cap and circlet put on," and about this time references are found to the "parliament robes" of peers, implying that there were others.



From the foundation charter of King's College, Cambridge, 1446.

FIG. 1.—Peers spiritual and temporal.

An account of the coronation of Anne Boleyn in 1533, in J. Nichols, *Progresses of Queen Elizabeth*, vol. i. p. 1, says that in her progress through the city "all the lordes for the most part were clothed in crimson velvet," while at

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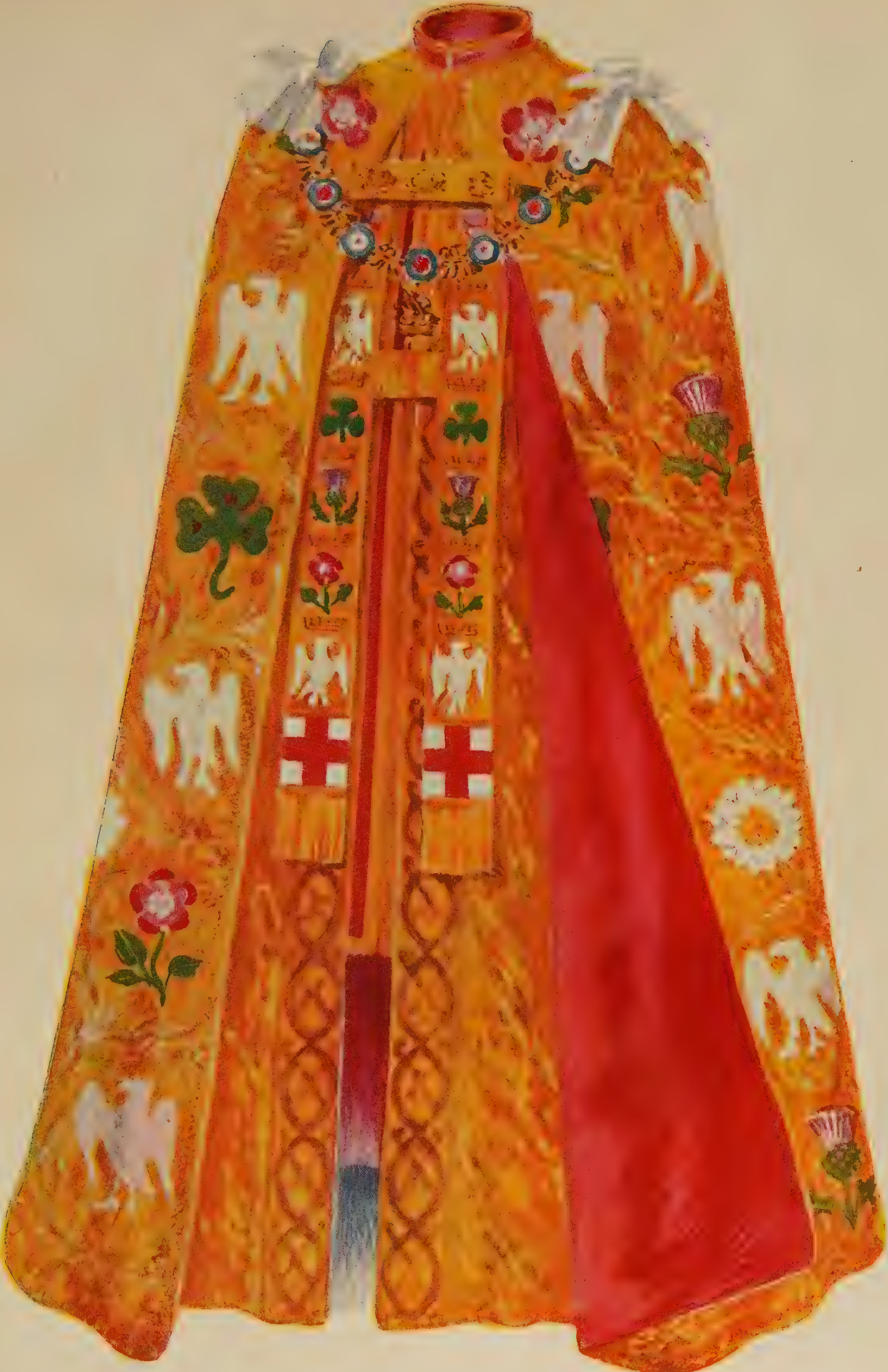
[1] For the sovereign's coronation robes, see "The King's Coronation Ornaments," by W. St John Hope, in *The Ancestor*, vols. i. and ii., also L. Wickham Legg, *English Coronation Records*, 1901. The "parliamentary robes" used to be of crimson or purple velvet, furred with ermine. See the above, also the inventories of the wardrobes of sovereigns, &c.

[2] In the United States few save Federal judges wear robes. The scarlet judicial robes were discarded at the Revolution. Those of black silk now worn are slightly modified academic gowns. John Jay, first Chief Justice of the Supreme Court (1787), set the fashion by sitting in the LL.D. gown granted him by Columbia University.

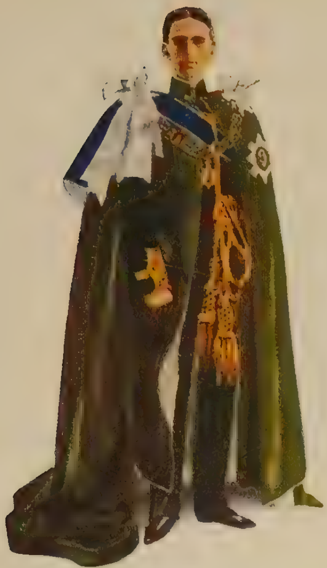


THE CORONATION ROBES

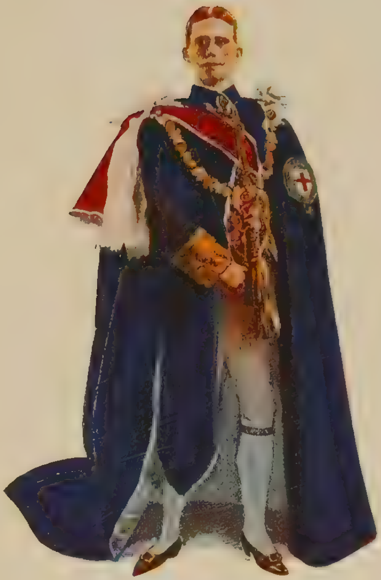
As worn by His Late Majesty King Edward VII.

By permission of His Majesty King George V.

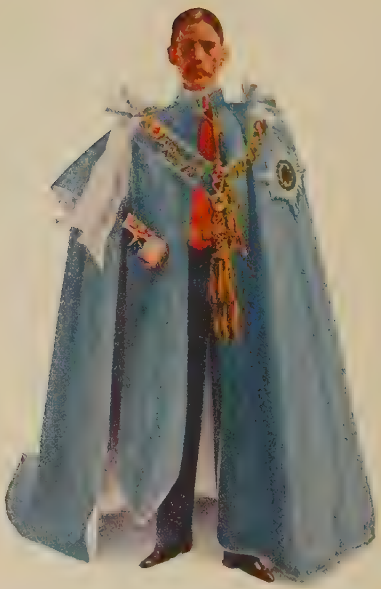
ROBES



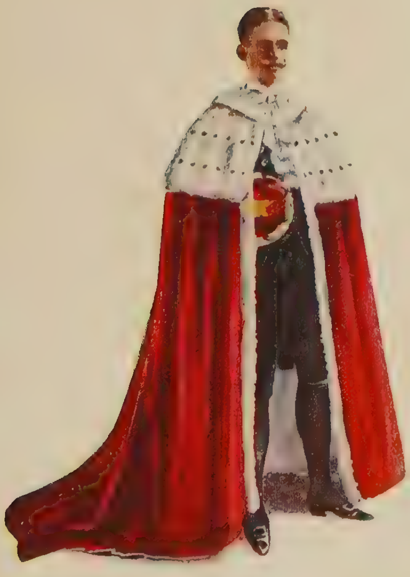
The Most Ancient Order of the Thistle.



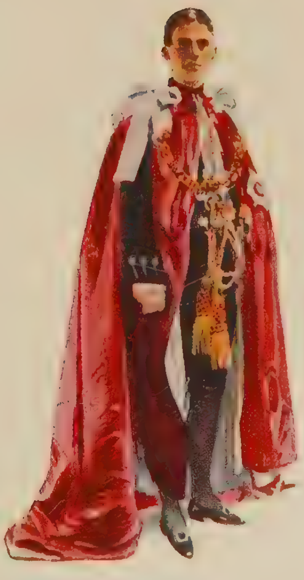
The Most Noble Order of the Garter.



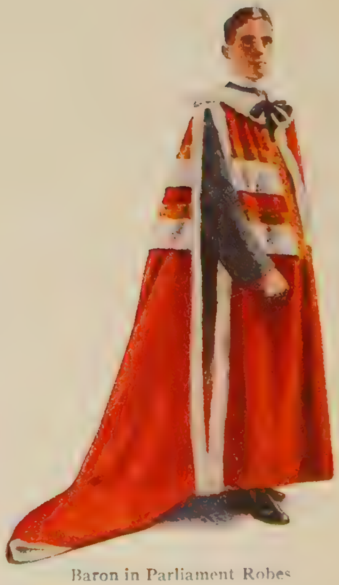
The Most Illustrious Order of St. Patrick.



Baron in Coronation Robes



The Most Honourable Order of the Bath.



Baron in Parliament Robes

Robes lent by Ede, Son & Ravenscroft, Chancery Lane, London

Westminster the barons and viscounts wore their parliament robes,[1] the earls, marquesses and dukes wearing their robes of estate of crimson velvet "furred with ermins, poudred according to their degrees." This was also the case at the coronation of James I.; and in Selden's *Titles of Honour* (3rd ed., 1672) the illustrations show the baron and viscount in parliamentary robes, the higher ranks in robes of estate. By the time of James II.'s coronation, however, the baron and viscount had the velvet robes of estate (see illustration on p. 188 of Perkins's *The Coronation Book*, 1902, where the surcoat also appears to have a pointed collar edged with white and to be sleeveless). The colour of these seems to have been crimson at first, sometimes varying to purple. They consisted of a long gown or surcoat with girdle, a mantle lined with ermine, a hood and a tippet of ermine, the rows being as follows: for a duke 4, a marquess 3½, an earl 3, a viscount 2½, and a baron 2.

Till late in the 18th century peers continued to attend the House of Lords in parliamentary robes, with the stars and ribbons of their orders, but robes are now only worn in the Hourse of Lords, *e.g.* at the opening of parliament, on occasions when the sovereign gives his assent to bills by "royal commission" (when five or six peers on the government side appear in robes, and the lord chancellor also wears his peer's robe of scarlet ermine), and at the introduction of a newly created peer, when the new peer and his two introducers wear their parliamentary robes (over morning dress) during the ceremony of introduction only. The mover and seconder of the Address no longer wear robes, but uniform. On all the above occasions, and when the peers as a body attend church or some other ceremony, the parliamentary robe of scarlet cloth is worn; in the present day it takes the form of a mantle opening on the right shoulder, with a collar of "ermine," and guarded with rows of ermine and gold lace round the right shoulder, varying in number according to the rank of the wearer. The modern coronation robes consist of a crimson velvet surcoat and a mantle with a tippet of ermine and with rows of ermine as in the parliamentary robes. The surcoat is no longer a gown, but a short sleeveless garment.

For Scotland, an order of James II. (1455) prescribed for earls "mantles of brown granick colour" open before, lined and faced in front, as far as the girdle, with white fur, and with hoods to match; for the other lords of parliament a red mantle lined with silk or fur, with a furred hood, while James I. (and VI.) in 1606 had to issue an order restraining the Scotch peers from wearing velvet robes in parliament, and confining them to those of scarlet cloth (*Miscellany of the Maitland Club*, vol. i. p. 147). The robes of the Scottish peers are now, of course, similar to those of the others.

The peeresses' robes at the coronation of Anne Boleyn are also described in the account mentioned above. The duchess of Norfolk, the train-bearer, was followed by "ladies being lords' wives" in scarlet robes furred with "lettice," while Wriothesley (*loc. cit.*) adds that the duchess was also in scarlet.[2] The order of the earl-marshal for the regulation of the peeresses' robes at the coronation of James II. (given in J. H. T. Perkins's *The Coronation Book*, 1902, pp. 202-5) shows that by then all peeresses wore the robes of state of crimson velvet, and minutely regulates all details, such as shape, powderings, length of train and width of the fur edging of the mantle. They have changed very little up to the present day.

Robes of the Orders of Knighthood.—The history of the robes of the two oldest orders is given in great detail in Ashmole's *Order of the Garter* (London, 1672) and Anstis's *Order of the Bath* (London, 1725); see also G. F. Beltz, *Memorials of the Order of the Garter* (London, 1841), p. l-lii. In each case the robes consisted of a mantle, surcoat and hood. The robes of the Garter were originally of blue woollen stuff, the surcoat and hood being powdered with garters embroidered in silk and gold. In the time of Henry VI. the mantle was first made of velvet, and between the time of Elizabeth and of Charles I. it seems to have been sometimes purple in colour. The surcoat varied in colour from year to year; in the reign of the founder alone, *e.g.*, it was first blue, then black (possibly as a sign of mourning for the plague), then "sanguine in grain." The hood was made of the same material as the surcoat, and when hats began to be worn, was carried hanging over the shoulder. The number of garters embroidered on the surcoat and hood came to be fixed by rank, but after Henry VI. the surcoat seems to have been made of plain velvet. Robes were sometimes granted to ladies in the early days (see Beltz, p. ccxxi., for a list of those ladies), in which case the robe and hood were of the colour of the surcoat worn by the knights that year, and powdered with garters. The last lady to receive the robes was Margaret, countess of Richmond, in 1488. At the present day the mantle is of dark blue velvet, of the same colour as the ribbon, lined with this taffeta, and with the star embroidered on the left shoulder, the hood and surcoat of crimson velvet lined with white taffeta, and with these are worn a doublet and trunk-hose of white satin and a plumed hat (see Lawrence-Archer, *The Orders of Chivalry*, p. 106).

The robes worn by the knights of the Bath created at the coronation of Henry IV. were green with furred hoods, and a white silk cord hanging from the left shoulder.[3] In the various accounts of later creations of knights of the Bath quoted by Anstis, the costume worn before the ceremonial bath seems to have been a priest-like garment of russet or grey, with a girdle and hood; after the bath, was put on a red surcoat and mantle, the latter with a lace of white silk, from which hung a pair of white gloves; and the final costume was a blue (later a purple) velvet or satin gown, with hood furred with miniver (later lined with sarcenet), and the white cord hanging from the shoulder, until it should be removed by the sovereign or a lady for some deed of valour. The mantle in the present day is of crimson velvet lined with white over a white satin under-coat and trunk-hose, and a plumed hat and white boots with red tops are worn. The mantle of the Thistle is of dark green velvet over surcoat, &c., of cloth of silver; that of St Patrick azure, with doublet and trunk-hose of white satin; that of St Michael and St George of Saxon blue satin lined with scarlet; and that of the Star of India of light blue satin lined with white.

House of Commons.—The speaker of the House of Commons wears on state occasions a black damask robe with gold lace and a full-bottomed wig; in the House itself he wears a black silk robe with train and a full-bottomed wig. The clerks at the table wear barristers' gowns and wigs.

Judicial and Forensic Robes.—It is frequently stated that judicial robes had their origin in the dress of ecclesiastics. But though ecclesiastics in early days frequently acted as judges, and though, as Fortescue says, the serjeant's long robe was "ad instar sacerdotis," judicial robes more probably arose from the ordinary civilian dress of the early 14th century. The chief argument for the ecclesiastical origin has been found in the coif (*tena, birretum album*), a cap of white linen or silk, tied under the chin, and described by Fortescue as "the principal or chief insignment and habit wherewith serjeants-at-law at their creation are decked," which is said to have been used by ecclesiastics to hide the tonsure when in court. This view is disposed of by Pulling (*The Order of the Coif*, London, 1884). More probably the coif was a head-dress in common use in the 13th century, which survived as the distinguishing mark of men of law.[4] As such it is found in a wardrobe-roll of

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[1] These are well described in the account of the opening of parliament by Henry VIII. in 1537 given in Wriothesley's *Chronicle of England* (Camden Soc., 1875, ed. W. Hamilton): "all erles marques and lordes, all in their Perliament robes of scarlett furred with white, and their hoodes about their neckes, which were forty in number; everie duke having fower barres of white fur alongest the right side of their robes, and everie earle having three bars, . . and everie lord two barres in likewise."

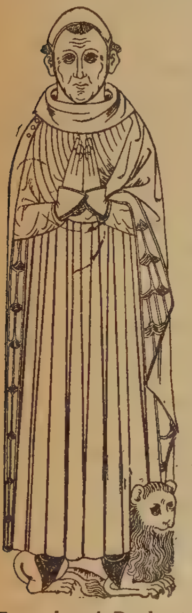
[2] "After her followed ladies being lordes' wives, which had circotes of scarlet, with narrow sleeves, the breast all lettice, with barres of pouders according to their degrees, and over that they had mantles of scarlet furred, and every mantle had lettice about the necke like a neckerchief, likewise poudered, so that by the pouderings their degrees might be known. Then followed ladies being knights' wives in gownes of scarlet."

[3] "Longues cottes vertes a estroictes manches fourres de menever, et chapperons pareil fourres de menever, en guise de prelats; et avoient les dits chevaliers sur la senestre espaule ung double cordeau de soye blanche a blanche houppettes pendans" (Froissart).

[4] Mr Oswald Barron, in *The Ancestor*, vols. v. (p. 105) and vii. (p. 108 seq., plate xii.), has given reproductions of figures from MSS.

Richard II. (1391, see Fairholt, ii. 341) in an entry for "twenty-one linen coifs for counterfeiting men of the law in the king's play at Christmas." The serjeant-at-law's "houve of silk" is also mentioned in *Piers the Plowman* (latter half of the 14th century)[1] together with his furred cloak. Chaucer, at the same period, describes his serjeant-at-law as wearing a party-coloured gown and girdle with bars.[2]

The earliest document quoted by Planché and others with reference to judges' costume is a Close-roll of 20 Edw. III. (1347). See also a wardrobe-roll of 21 Edw. III., and wardrobe accounts of 11 Richard II. and 22 Henry VI., all quoted in Dugdale's *Origines Juridiciales*, from which we gather that the robes of the judges varied in colour, in the 14th and 15th centuries, from scarlet to green or "violet in grain," and that their winter gowns were furred with budge or miniver.



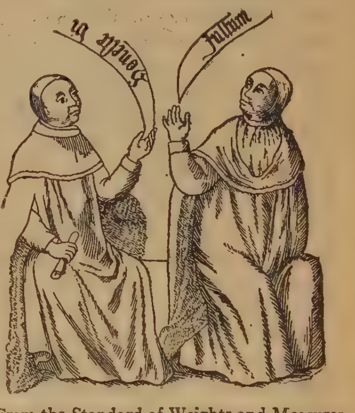
From a brass in Deerhurst church, Gloucestershire.

FIG. 2.—Sir John Cassy, chief baron of the Exchequer (*c.* 1400).

For the early 15th century there are more data. Firstly, there is the illumination of the serjeant-at-law in the Ellesmere MS. of *The Canterbury Tales* (reproduced in Furnivall's 6-text edition for the Chaucer Society), in which he is shown wearing a short, party-coloured rayed gown of red and blue, lined with white fur, a hood and tippet edged with white fur, and a white coif with two little bands showing below the hood. Secondly, there are a certain number of effigies or brasses of judges and serjeants belonging to the first half of the 15th century.[3] Of judges, an early brass is that of Sir John Cassy (*c.* 1400) (see fig. 2).[4]

For the second half of the 15th century the authority is Chief-Justice Fortescue, who, writing in the reign of Henry VI., describes the dress of the serjeant-at-law as follows:—"Roba longa ad instar sacerdotis cum capicio penulato circa humeros ejus, et desuper collobium, cum duobus labellulis, qualiter uti solent doctores legum in universitatibus quibusdam, cum supra descripto birreto vestiebatur." "He was clothed in a long robe, after the fashion of a priest, with a furred cape about his shoulders, and above it a hood, with two bands, such as are used by doctors of laws in some universities, with the coif as described above" (*De Laudibus Legum Angliae*, cap. li.). Fortescue continues: "But being once made a justice, instead of his hood, he shall wear a cloak closed upon his right shoulder, all the other ornaments of a serjeant still remaining; saving that a justice shall wear no party-coloured vesture, as a serjeant may, and his cape is furred with miniver, whereas the serjeant's cape is furred with white lamb (budge)."

This description of Fortescue's is borne out by some illuminations from a 15th-century MS. representing sittings of the four superior courts in the time of Henry VI. (reproduced in *Archaeologia*, vol. xxxix. p. 358, &c., with an article by G. R. Corner; see plate). In them we see the scarlet robes of the judges furred with miniver, and the party-coloured rayed gowns, tippets and hoods of the serjeants, besides the costume of the minor officials of the court. Both serjeants and judges wear the coif, certain of the judges also wearing furred caps or turban-like head-dresses. The colour of the serjeants' party-coloured robes seems to have varied;[5] in these illuminations they are blue and green, but by the 17th century, to quote Dugdale, *Origines Juridiciales*, cap. 38: "The robes they now use do still somewhat resemble those of the justices of either bench, and are of three distinct colours, viz. murrey, black, furred with white, and scarlet; but the robe which they usually wear at their creation only is of two colours, viz. murrey and mouse colour; whereunto they have a hood suitable, as also a coif of white silk or linen." (See also Pulling, p. 218, and Druitt, p. 225.) Sir E. Brabrook (*Proceedings of the Soc. of Antiquaries*, 2nd series, vol. iii. p. 414) quotes descriptions of calls of serjeants showing that as late as 1700 the serjeants wore party-coloured gowns at their creation and during the year following, and stating on what occasions they wore their black, scarlet or purple gowns (the last with scarlet or purple hoods). At the last general call (1736), and at the creation of a serjeant in 1762, party-coloured robes were still worn, but at a creation of 1809 they are no longer found. Until their final abolition the serjeants wore purple robes at their creation, and on ordinary occasions a black cloth or silk gown, with a scarlet robe for state occasions.



From the Standard of Weights and Measures (*temp.* Henry VIII.), in *Vetusta Monumenta* (Soc. of Antiquaries), vol. i.

FIG. 3.—Figures wearing coif.

Illustrations of judicial costumes in the 16th century are to be found in vol. i. of *Vetusta Monumenta* (Soc. of Antiquaries, 1747), in which are reproduced, firstly, a "painted table in the King's Exchequer," *temp.* Henry VII., on which the officials of the Exchequer are shown wearing long gowns, furred tippets and mantles, with coifs (see fig. 3); and secondly, a sitting of the Court of Wards and Liveries, *temp.* Elizabeth, in which are shown serjeants wearing party-coloured gowns, tippets, hoods and coifs (see also Pulling, facing pp. 86 and 214).

About this time the square cap, otherwise known as the cornered, black or sentence cap (the last from the fact of its being put on by the judge when pronouncing sentence of death), begins to be seen in monuments (cf. that of Sir Richard Harpur, *temp.* Mary; Fairhold, p. 223). Sometimes this cap is worn over the coif only, sometimes over the coif and skull-cap (cf. the portrait of Sir Edward Coke, in Pulling, facing p. 180). The form also varies; sometimes, as in the portrait of Coke, it has no ear-flaps, sometimes, as in its present form, it has. The form with ear-flaps is held by some to be a combination of the square cap and skull-cap. The square cap was a mark of dignity, worn or carried on solemn occasions, hence its use when pronouncing sentence of death, to mark the solemnity of the moment.

Among the State Papers of 1625 is a "Discourse on what robes and apparel the judges are to wear, and how the serjeants-at-law are to wear their robes, and when," and on the 4th of July 1635 there was a "solemn decree and rule made by all the judges of the courts at Westminster," which is quoted in Dugdale (*loc. cit.*) and Pulling (p. 215, footnote).

This costume is illustrated in Hollar's engraving of the coronation procession of Charles II. Towards the end of the 17th century the judges took to wearing wigs, and have continued to wear them ever since. The wearing of wigs naturally concealed the coif and velvet skull-cap, so a device had to be invented by which they could still be displayed. The expedient was hit upon of putting a round patch of white stuff, with a black spot in the middle of it, on the crown of the wig of certain of the judges, to represent the coif and skull-cap. The rank of serjeant no longer existing, this round patch has now disappeared, the only trace of it left being the circular depression on the crown of the wig.

The costume of judges of the High Court at the present day differs very little from that given in the order of 1635; but the cap is carried in the hand as a part of the full dress, and only worn when a judge is passing sentence of death.[6] The

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of the 13th and 14th century, showing the coif worn by both clerks and laymen.

[1] *Prol.* line 210 (ed. Skeat, Clarendon Press): "Jit houed there an hondreth in houues of silke, seriauntz it seemed that serveden atte barre"; and iii. 293: "Shal no seriaunt for here seruyse were a silk howue, Ne no pelure in his cloke, for pleding atte barre."

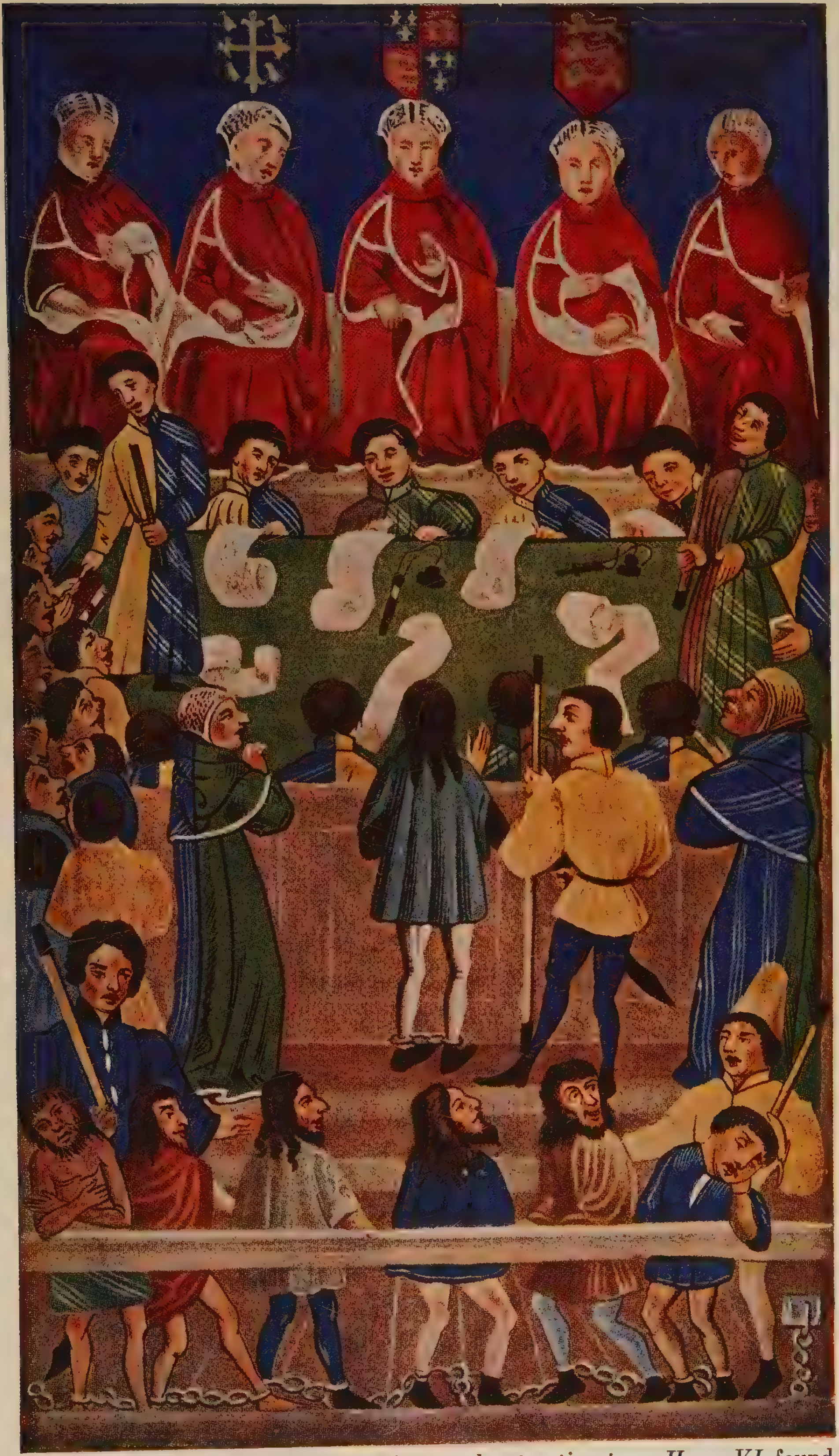
[2] *Prol.* line 382 (ed. Morris, Clarendon Press): "He rood but homely in a medlee cote Girt with a ceint of silk, with barres smale; of his array telle I no longer tale."

[3] The effigy "supposed to represent Sir Richard de Willoughby, chief justice of the king's bench" *temp.* Edward III., illustrated by Fairholt, p. 201, wears a long gown with girdle and skull-cap, no distinctively judicial dress. The figure of Robert Grymbald (*temp.* Henry II.), engraved from his seal by Dugdale, wears the ordinary dress of the time.

[4] See also that of Sir Hugh de Holes (1415; see Haines, *Brasses*, i. xc), and a stone effigy of Sir William Gascoigne in Harwood Church, Yorks (d. 1419, see Planché, *Cyclopaedia*, i. 427). Of serjeants-at-law, an early example is the brass of Nichol Rolond at Cople, Beds. (*c.* 1410, see Druitt, *Costume in Brasses*, p. 221); also that of Thomas Rolf at Gosfield, Essex (*c.* 1440, see Haines, p. 85), who wears a gown, tabard, tippet, hood and coif, with two bands showing below the hood, like the Ellesmere MS. figure. The inscription calls Rolf "legi professus," which Haines takes to mean "professor of law," Boutell and Clark (*Archaeological Journal*, vol. i. pp. 203–4) consider that he is a serjeant-at-law. Druitt (p. 224) remarks on the likeness of his tabard to that of a Master of Arts, but compares a figure on a 15th-century cope, who also appears to be a serjeant-at-law and wears a tabard. That a tabard sometimes formed part of the dress of a serjeant, can be seen in the extract from the *Liber famelicus* of Sir James Whitelocke, quoted by Druitt, p. 225, footnote.

[5] They were probably originally liveries; see G. R. Corner in *Archaeologia*, also Pulling, *op. cit.* pp. 211–12.

[6] See an essay by Sir Herbert Stephen in *Unwritten Laws and Ideals*, ed. E. H. Pitcairn (Smith, Elder, 1899), from which the following paragraph is largely condensed.



One of four illuminations belonging to a law treatise, *temp. Henry VI*, found at Whaddon Hall, Bucks, depicting five presiding judges of the Court of King's Bench, wearing coifs and scarlet robes; below the King's Coroner, Attorney and Masters of the Court; two ushers at table swearing the jury; a tipstaff in charge of a fettered prisoner, two sergeants at law in coif on either side; in foreground six prisoners.

From *Archæologia* XXXIX.

dress worn when trying criminal cases, attending church officially, and on "red letter days" in the courts, consists of a scarlet gown, with a broad black belt, a tippet trimmed with white fur, known by courtesy as "ermine" (this is worn only on state occasions), and a scarlet casting-hood, always worn with the scarlet gown, the end of which is passed under the belt. For summer the robes are of thinner stuff, faced with slate-coloured silk instead of ermine. The full-bottomed wig is worn on state occasions; at other times a wig is worn similar to that of barristers, except that it has one vertical curl just above the tail of the wig instead of the three rows of horizontal curls going all the way round.

The judges of the King's Bench Division have also a black gown, trimmed with ermine, which may be worn with the scarlet casting-hood when they sit two or more together. The summer equivalent of the black robes is in thin blue stuff, faced with silk. A costume like that of King's Counsel, namely, a black silk gown, with black cloth court suit, is the dress of judges when sitting alone to try civil actions, and of vice-chancellors and judges of the Chancery Division, but Sir Herbert Stephen remarks that of late years certain of the judges have preferred on grounds of comfort the black or blue gown with scarlet casting-hood. The court dress of the judges of the High Court and of Indian and colonial judges consists of a black damask tufted gown, without train, worn over a black velvet court suit, with full-bottomed wig, lace bands and three-cornered silk hat.[1]

The Lord Chancellor, when in the House of Lords, and sitting on Appeals, wears a black silk trained gown, over a black cloth court suit, with full-bottomed wig; he has also his peer's robe (see above), and his state robe of black damask with gold lace, worn over a velvet court suit, with full-bottomed wig, lace bands, &c.; the purse is carried on state occasions when in the royal presence. The state robe of the Master of the Rolls, the Lords Justices of the Court of Appeal, and the President of the Probate, Divorce and Admiralty Divisions is the same, except that they have not the purse, and similar to it is the full-dress gown of the Speaker of the House of Commons, the Chancellor of the Exchequer, &c. The Lords Justices of the Court of Appeal sit in court in a costume similar to that of King's Counsel.

The Lords of Appeal have no official robes, but sit in ordinary civilian dress. On state occasions they wear their peers' robes. The robes of state of the Lord Chief Justice of England are the same as those of the judges of the High Court, except that his are trained, and he wears the gold chain of office, the "collar of SS."

The Scottish judges have two sets of robes, one for Justiciary (*i.e.* the criminal court), which is also their full dress, and one for civil causes (Court of Session). The dress for the President and Ordinary Lords of Session was fixed in 1610 by an order of James I., and was of purple cloth, faced with crimson satin, with hood to match, the President's gown having crimson velvet instead of satin. The four "extraordinary Sessionaries" were to wear black velvet, satin, or silk gowns, lined with black. The Lord Justice General wore a scarlet gown lined with ermine and an ermine hood, the Lord Justice Deputy and Lord Justice Clerk black gowns with crimson satin facings and hoods (see *Register of the Privy Council of Scotland*, vol. viii. p. 612). At the foundation of the High Court of Justiciary (1672) it was enacted "that for the splendour of that court, all the judges sit in red robes, faced with white, that of the Justice Generalls being lined with ermine for distinction from the rest" (see *Acts of Parliament of Scotland*, vol. viii. p. 88). The present full dress of the Lord Justice General is a scarlet silk robe with tippet and hood, the hood falling down the back; the collar is of ermine, with which the tippet, sleeves and gown are edged and the hood lined. The Lord Justice Clerk wears a scarlet cloth robe and hood, and a white silk tippet lined with scarlet, the silk being perforated with small holes to imitate ermine, as also on the sleeves and edges of the gown. In front of the tippet on each side are two crosses in scarlet silk, and on each side of the gown six crosses. The ordinary Lords Commissioners of Justiciary have robes the same as those of the Lord Justice Clerk, except that the satin is not perforated. Instead of the bands worn by English judges, the Scottish judges wear a long fall in front.

The Bar.—There appears to have been no official costume for the bar until the end of the 17th century. Druitt (*Costume in Brasses*, pp. 232–33) gives a list of several brasses of *in lege periti*, or *apprenticii ad legem*, most of whom wear ordinary civilian costume, occasionally with the addition of a high cap. In the 16th and 17th centuries they wear the false-sleeved gown worn by civilians. Before the 17th century the costume worn by students at the Inns of Court and by "Utter Barristers" consisted of a stuff gown, and sometimes, in term-time, a round cap, which was worn in hall and in church (see Herbert, *History of the Inns of Court* (1804), p. 230). In Westminster Hall (see Pulling, p. 223) the same costume was worn, Benchers and Readers having a more elaborate gown with facings of black velvet and tufts of silk. Frequent laws were passed in the 16th century and later, forbidding the wearing of swords, cloaks, boots and spurs, &c., in hall, and insisting on the wearing of gowns by students of the Inns of Court when walking in the city. In the 17th century, barristers, like the judges, adopted wigs, the full-bottomed wigs being confined to judges, "King's Counsellors," &c., and ordinary counsellors wearing small wigs. In Hollar's engraving of the coronation of Charles II. the King's Counsel, the King's Attorney and Solicitor, and the Master of the Rolls wear a laced gown with hanging sleeves. The silk gown, full-bottomed wig and black court dress now worn by King's Counsel is generally held to date from the funeral of Queen Mary II., being the mourning dress worn by the wish of King William for a considerable period after the queen's death, and adopted as a convenient costume ever since. There is a well-known jest of Chief Baron Pollock to the effect that "the Bar went into mourning at the death of Queen Anne, and never came out again," which bears out this theory as to the origin of the costume. At the present time barristers wear black stuff gowns, with small wigs having three rows of curls round the head. King's Counsel wear black silk gowns over a cloth court suit (cp. the expression "to take silk," *i.e.* to become a K.C.); on full-dress occasions they wear a full-bottomed wig, and at court a black damask tufted gown over a velvet court suit. This is also the dress for state occasions of the Attorney-General, Solicitor-General, &c.

Municipal and Civic Robes.—The word "livery," the use of which is now practically confined to the costume of the "livery companies," the dress of men-servants, &c., originally meant an allowance of food or clothing granted to certain persons (Lat. *liberata*, Fr. *livrée*). It is still used of the allowances of food made to the fellows of certain colleges. As early as the 13th century, according to Matt. Paris (*Chron. Maj.*; Rolls Series, III. 337), we find the citizens of London assuming a uniform dress to do honour to some great occasion, as, *e.g.*, when in 1236 a body of them rode out to meet Henry III. and Queen Eleanor, "sericis vestimentis ornati, cicladibus auro textis circumdati, excogitatis mutatoriis amicti," or when 600 citizens rode out to meet Queen Margaret, wife of Edward I., "in one livery of red and white, with the cognizances of their misteries embroidered upon their sleeves" (see Stow's *Survey*, ed. Morley, p. 444). By the 14th century there is evidence of the adoption of liveries by the trades and fraternities. At the celebrations of the birth of Edward III. (see Riley's *Memorials*, p. 105) the mayor and aldermen were "richly arrayed in suits of robes," while the drapers, mercers and vintners were also "in costume." This need not, however, refer to liveries. G. Unwin (*The Gilds of London*, 1908) quotes a chronicler who records that by the year 1319 "many of the people of the trades of London were arrayed in livery," and an ordinance of 1347 of the fraternity of the Mercers commanding that "all those of the said mistery shall be clothed of one suit once a year at the feast of Easter," and Riley (*op. cit.* p. 516) quotes an order of 1389 allowing the sheriffs, on grounds of expense, to proceed to Westminster by boat instead of on horseback, "without there being any arraying of men of the trades in like suit for that purpose; except that such men of the trades as should wish to accompany them should walk in such suit of vestments of the livery of their respective trade as they might then have." As to the liveries of the religious fraternities, Chaucer (*Prol.* 361) describes:—

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[1] Minute details of court and levée dress, judicial and legal, will be found in *Dress worn at Court* (pp. 60–61), issued with the authority of the Lord Chamberlain, and ed. H. A. P. Trendell, of the Lord Chamberlain's department (London, 1908),—also details of mourning costume.

> "An Haberdasher and a Carpenter
> A Webbe, a Dyere, and a Tapicer,"
> As, "clothed alle in a liveree
> Of a solempne and greet fraternitee."

In 1389 there was a petition against the giving of liveries by the fraternities, on the ground that these gatherings were centres of political agitation, but in the statutes of Edward III. and Richard II. against liveries members of guilds were expressly excepted from these prohibitions. However, it was doubtless deemed prudent to make sure of the privilege, and so, when the livery companies were incorporated, they took care to have their liveries authorized by their charters.

These liveries consisted of a gown and hood, though the hood only was sometimes given; thus the Grocers' Company had in 1430 55 members in the full livery, 17 in hoods and 42 not in livery. It was also customary for such of the companies as wished it to present liveries to outsiders, for instance, to the mayor, should he belong to another company. Thus in 1399 the Tailors gave liveries to the king, the prince and the mayor, and hoods to the sheriffs. But in 1415 and 1423 the mayor and aldermen were forbidden to receive any livery except that of their own company. A similar custom was that by which a member of any company might send to the mayor a certain sum, receiving in return a suit of the livery of the mayor's company. The colours of the various liveries varied very much from time to time. Thus in 1414 the Grocers wore liveries of scarlet and green, which were changed in 1418 to scarlet and black, in 1428 to scarlet and blue and in 1450 to "violet in grain," with party-coloured hoods of violet and crimson. At first both gowns and hoods were party-coloured, but later a party-coloured hood was worn with a gown of one colour. The gowns were also lined and edged with fur. An early illustration of the liveries is to be found on the first charter of the Leathersellers' Company, granted them in 1444 by Henry VI., where the members of the company are depicted kneeling before the king in short party-coloured gowns of red and blue, edged at the neck, wrists and round the bottom with fur and with white girdles (see fig. 4, from a coloured reproduction in W. H. Black's *History and Antiquities of the Leathersellers' Co.*).

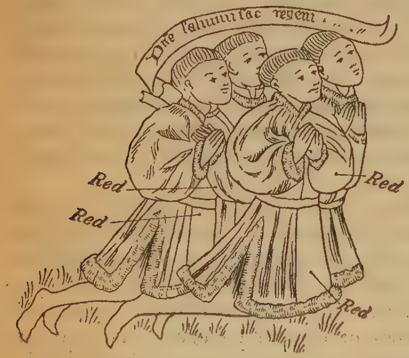


Fig. 4.—Liverymen of the Leathersellers' Company, from the charter of the Company granted by Henry VI. (1444).

In the reign of Henry VIII., Holbein's picture of the king giving a charter to the Barber-Surgeons' Company shows the members of the latter wearing gowns of rich stuff, with red and black party-coloured hoods, three of the figures also in coifs. The form of gown which has survived, practically unchanged, till the present day, may be seen on the second charter of the Leathersellers' Company, granted them by James I. in 1604 (see fig. 5, and for coloured plate see W. H. Black, *op. cit.*). Here we see them in flat caps, long black furred gowns, with false sleeves, and having on the right shoulder party-coloured hoods of scarlet and black, the end of which is cast over the left shoulder and hangs down nearly to the edge of the gown.

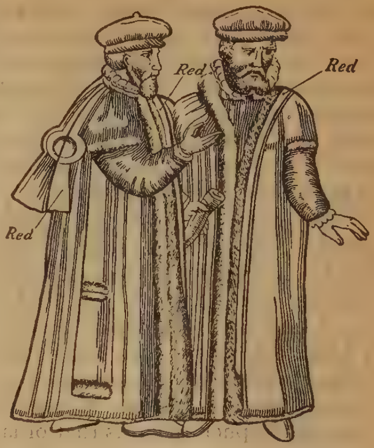


Fig. 5.—Liverymen of Leathersellers' Company, from a charter of James I. (1604).

Besides the liveries of the city companies, and those of the mayor and sheriffs, there was often a special livery adopted by all the citizens on some great occasion, such as a visit of the sovereign to the City. W. St John Hope (*Corporation Plate and Insignia*, ii. 141) quotes a number of such cases, showing that the city livery was sometimes green, sometimes blue, sometimes violet, sometimes red and white, the city colours *par excellence*.

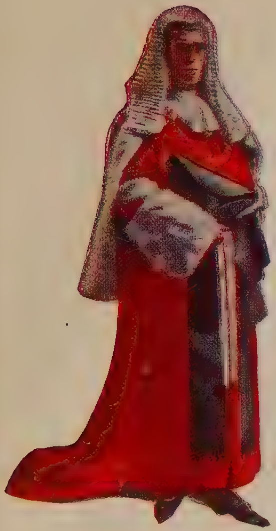
As to the costume of the mayor, aldermen, sheriffs, &c., we have seen above the mayor "richly costumed," and the aldermen "in like suits of robes," at the birth of Edward III., and Riley (*op. cit.*) gives an order of 1378, that the aldermen are to ride to Westminster in the mayor's procession, "arrayed in a cloak and hood at least, that are party-coloured with red, scarlet and white, the red on the right side"; while he quotes (from Letter-book H. fol. cxlvi) the amusing sentence passed by his fellow-aldermen in 1382 on one John Seley, for disregarding the order to have his green cloak for the Whitsuntide procession lined with green taffeta. Thus before the 15th century the aldermen apparently had not yet their scarlet robes, but on state occasions wore the ordinary city livery. For the early 15th century we have the *Liber Albus* (written *c.* 1419; Rolls Series, ed. Riley), where we are told (p. 35) that "The Mayor, Sheriff and Aldermen were wont to array themselves in like suits of robes twice in the year, viz. when the mayor rode to Westminster to take the oath, and on the day following the feast of SS. Simon and Jude; and this raiment was trimmed with fur as befitting their honourable rank; and they would also dress themselves in suits of robes against the feast of Pentecost, these robes having a lining of silk." The scarlet, violet and black robes, still worn by the Lord Mayor, aldermen, &c., were early in use. There is an order of 1421 (8 Henry V.) that the aldermen should use "togis et armilausis de scarleto," and in numerous accounts of royal receptions and other solemn occasions in the City we are told that the mayor and aldermen were in scarlet (W. St John Hope, in *Corporation Plate and Insignia*, i., Introd. lxxxv seq., and ii. 138–147, quotes a number of these, and treats the whole subject of mayors', &c., robes very fully). The *Liber Albus* (i. i, ch. vi.) also shows us the mayor and aldermen assembled at the Guildhall on the day of the election of the new mayor *induti togis de violet.* As to the form of the dress in the 14th and 15th century, we can see from brasses of lord mayors and aldermen (see Haines, *Manual*, pp. cc–cci; and Cotman, *Norfolk Brasses.* There is a fine series of brasses of mayors, &c., at Norwich) that it consisted of a long gown, a mantle fastened on the right shoulder and a hood.

As to the provincial mayors and aldermen there is evidence that at quite an early date many of them followed the fashion of London; *e.g.* the Royal Charter of Nottingham, of 1448, contains the words: "that the Aldermen of the same town forever . . . may use gowns, hoods and cloaks of one suit and one livery together with furs and linings suitable to these cloaks, in the same manner and form as the Mayor and Aldermen of our city of London do use, the Statute of Liveries . . . notwithstanding" (see *Nottingham Records*, ii. 205), while the charter granted by Henry VI. to Kingston-on-Hull in 1440 contains practically the same words (see St J. Hope, i. lxxxvi). The costume of provincial mayors, &c., is shown by St John Hope (*loc. cit.*) to have generally consisted of a scarlet furred gown and cloak, with tippet or scarf of black velvet. The colour was not, however, invariably scarlet, but varied to violet, blue and black, sometimes even for the mayor. An account of the robes of modern provincial mayors will be found in St J. Hope, p. lxxxix seq. and under the accounts of the various boroughs, *passim.*

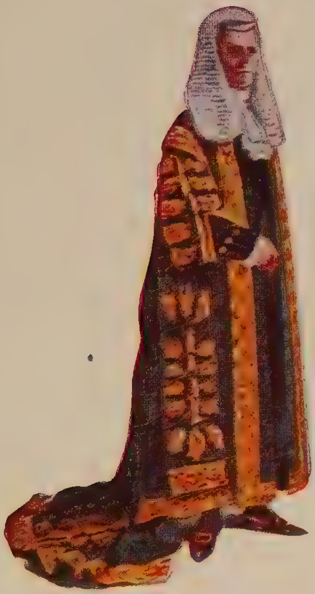
There is some doubt as to when the Lord Mayor first began to wear his robe of estate of crimson velvet. Stow (*Survey*, ed. Strype, 1720, ii. 165) says that at the reception of Henry VI. at Eltham the mayor was in crimson velvet, the aldermen in scarlet with "sanguine" hoods, but at the coronation of Edward V. (see St J. Hope) he wore scarlet. At the coronation of Anne Boleyn (see Wriothesley's *Chronicle, loc. cit. supr.*, and Hall's *Chronicle*) the mayor wore his crimson velvet robe of state, the aldermen and sheriffs scarlet; and at the entry of Anne of Cleves into London the mayor was again in his crimson velvet robe with his collar of gold, the aldermen and councilmen in robes of black velvet with chains of gold (but see

ROBES

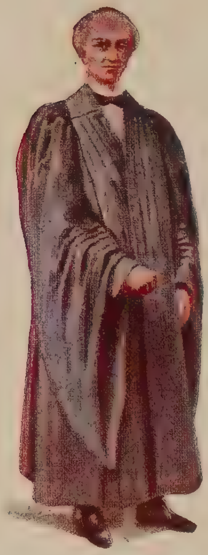
PLATE I



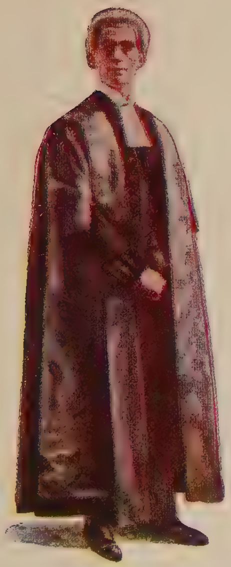
Lord Chief Justice of England in full robes, scarlet and ermine, with collar of S. S.



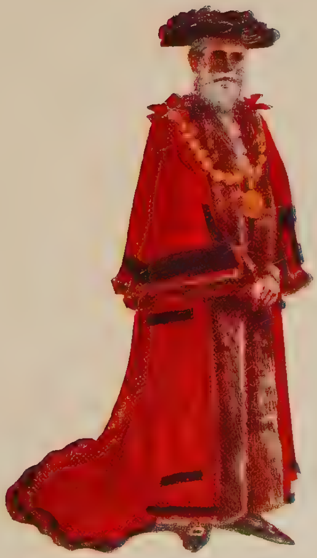
The Lord High Chancellor of England, in robes of State.



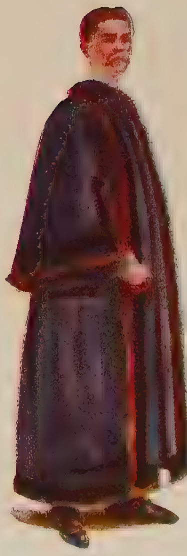
Judge of the Supreme Court of the United States of America.



Judge of the High Court, England, in black robes.



Lord Mayor of London, in full robes.



Alderman of the City of London, in bench robes.

Robes lent by Ede, Son & Ravenscroft, Chancery Lane, Londo

St J. Hope, ii. 144, who quotes the order for these same robes, from which it would appear that the mayor also wore black velvet).

About this period begin to occur notices of the wearing of official robes by the wives of mayors and aldermen; *e.g.* for Lincoln there is an entry in the corporation records in 1544: "Every alderman that hath not been mayor to prepare for himself and his wife gowns of crimson, and every one that hath been mayor to prepare for himself and his wife gowns of scarlet and tippets of velvet to be worn at all principal feasts" (see 14th report, *Hist. MSS. Commiss.* App. VIII). St John Hope (p. lxxxix) quotes numerous instances in the 16th century, in some of which the husband was liable to a heavy fine in the event of his wife's non-compliance with the rule.

In 1568 (see Stow, and J. G. Nichols, *Account of 55 Royal Processions and Entertainments*, pt. ii. p. 94) first appeared an "Order observed by my Lord Mayor, Aldermen and Sheriffs, for their meetings and wearing the apparel throughout the whole year, according as formerly it hath been used," which has been altered and revised from time to time by order of the Corporation, and is still issued under the name of the *Handbook of Ceremonials* to the officers of the City Corporation. In 1568 we find the aldermen and sheriffs going to Westminster in the Lord Mayor's procession in scarlet-furred gowns "and their cloaks borne with them," and in 1575 Nichols quotes a London citizen's description of the same procession; "they of the livery in their long gowns, with hood on the left shoulder, half black and half red. . . . The Mayor in a long gown of scarlet, and on his left shoulder a hood of black velvet, and a collar of SS. . . . The Aldermen in scarlet gowns, those having been mayors with chains of gold, the others with black velvet tippets." The Order of 1629 gives particulars of the various gowns; the cloaks are violet from Michaelmas to Whitsuntide, furred, for mayors and ex-mayors, with "amys," for aldermen with "calabre," and scarlet in summer, lined with "changeable taffety" and "green taffety" respectively.

After the 16th century the costume of the Lord Mayor can be studied in successive "Orders" or Ceremonial Books, accounts of coronations, &c., and in portraits and statues belonging to the various city companies. Early in the 19th century (1806) the Lord Mayor began to wear on some state occasions a black robe with gold lace, similar to that of the Lord Chancellor. The Ceremonial Book was thoroughly revised in 1864, and the latest edition is that issued in 1906 (*Handbook of Ceremonials*, &c., "issued under the direction and with the approval of the Privileges Committee of the Court of Aldermen").

At the present day the Lord Mayor has several sets of robes; a special coronation robe (see illustration in Naylor, *Book of the Coronation of George IV.*, 1837), a crimson velvet robe of state like that of an earl, worn with the chain and jewel, *e.g.* in the presence of the sovereign when in the city;[1] a black robe of state trimmed with gold, which is worn with the chain and jewel, *e.g.* at the Guildhall on Lord Mayor's Day; the scarlet robes, which are worn, with or without the chain, on most public occasions, such as the service at St Paul's on the first day of the Easter Law Term, audiences of the sovereign, the election of the Lord Mayor, the opening of the Central Criminal Court, &c.; a violet gown, which is worn, *e.g.*, when the Lord Mayor elect is presented to the king, when he is sworn in, at the election of sheriffs, &c., and a black gown worn in church on Good Friday, &c. The aldermen wear scarlet on most occasions of ceremony, ex-mayors "having the Cap of Dignity attached to their gown, and being entitled to introduce a sword and mace into their badges." Violet robes are also worn on certain occasions marked in the almanac of the *Alderman's Pocket-Book*; and black gowns when the Lord Mayor wears his. The sheriffs and recorders[2] have scarlet, violet and black gowns, and the members of the common council have deep mazarine blue gowns, which seem to have been first prescribed in 1761.

For Scotland an order of James I. and VI. of 1610 (see *Register of Privy Council, loc. cit.*) ordered that the provosts, aldermen, &c., of every borough should wear, for ordinary occasions, black furred gowns, the officers of the chief boroughs having also scarlet furred gowns for Sundays and other solemn occasions, when the provost of Edinburgh was to wear a gold chain.

Academic Costume.—No thorough study has so far been made of early English academic costume as compared with that of the continental universities—a study which ought to throw much light on the subject.[3] A vexed question is that of how far academic dress is derived from the ecclesiastical. Anthony Wood's view, that it was derived from the *tunica talaris* and *cucullus* of the Benedictines, would not now meet with much support; but many writers seem to be unnecessarily anxious to trace each item of the academic robes to some definite ecclesiastical garment. The medieval scholar was of course a clerk, and had to wear the clerkly gown and the tonsure. But the fact that this was the case makes it more difficult to distinguish between academical and ecclesiastical robes, notably in the case of brasses and other monuments of university graduates and dignitaries who were also priests. Another source of difficulty is the variety of names by which the different parts of the academic costume are called in the university statutes and elsewhere, resulting sometimes in inextricable confusion.

The earliest information as to English academic dress is found in the second half of the 14th century. Certain early statutes show that "excess in apparel" had already to be rebuked in scholars (cf. the Constitution of Archbishop Stratford, 1342), while the statutes of certain colleges require of the scholars the tonsure and a "decent habit" suitable to a clerk (cf. Statutes of Peterhouse, 1344, and of Merton Coll., Oxford), *i.e.* a long gown (*toga* or *tunica talaris*), which it is stipulated in some cases must be closed in front. Some colleges had liveries, prescribed perhaps by the founder of the college and laid down by the statutes. The differences of colour and shape in the undergraduate gowns of most of the Cambridge colleges are supposed to be a survival of this. There was also an ordinance of Richard II. for King's Hall, Cambridge (1379), which fixed the dress of a scholar as the *roba talaris*, over which, if a bachelor, he should wear a tabard suited to his degree. The undergraduates seem in the early days to have worn a hood, the ordinary head-covering worn by all, but they gradually ceased to do so, until nobody below the rank of a bachelor might wear one.

It is proposed to give here (1) a list of the various parts of the academic dress, with a few remarks on each; (2) a short account of the early costume of the various degrees; (3) a sketch of any changes which have taken place since the Reformation.

The GOWN (*toga*, *roba*, or *tunica talaris*) was worn by all degrees, as befitting clerks. It is hard to determine whether there was at first any difference between the gown of the higher degrees, which some maintain was the *roba*, and that of the lower degrees, the *toga* or *tunica talaris*, but it seems improbable. It was frequently fur-lined, but the use of the more costly furs was forbidden to all below the degree of Master, except sons of noblemen, or those possessing a certain income, bachelors using budge (see in Anstey's *Munimenta Academica*, p. 301, the statute of 1432 *de admissione ad pelluram*). Students, and even doctors in theology (*Mun. Acad.* ii. 393), were also restricted to budge, and to sad-coloured habits. The robes of masters were to be flowing and reach to the ankles (see *Mun. Acad.* p. 212, an order of 1358 to the tailors not to stint the robes, which should be "*largae et talares,*" because clerks should be distinguished from the laity).

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[1] Sir G. G. Young in a pamphlet called *The Place of the Lord Mayor in proceeding through or within the City of London* (1852), quotes various royal visits to the city which seem to show that the Lord Mayor did not always wear his crimson velvet robe on these occasions. Thus in 1638 Charles I., on going to meet Marie de Médicis, was met by the Lord Mayor in scarlet, which was also worn at the entry of Charles II. in 1660. In 1702, when Queen Anne went to a thanksgiving service at St Paul's, the Lord Mayor wore crimson velvet, with the collar and jewel; but in 1705, at the thanksgiving after Blenheim, he met the queen on horseback, dressed in scarlet. In 1714, at the reception of George I., the Lord Mayor wore crimson velvet robes.

[2] The recorders had from an early date annual suits of robes like the mayor, aldermen, &c. See *Liber Albus*, p. 43: "Habet itaque Recordator pro feodo de Camera totiens et talem vesturam lineatam sive penulatum, quotiens et qualem Major et Aldermanni capiunt annuatim." The chamberlain, common serjeant, &c., had also gowns (see an order of 1523 in St J. Hope, ii. 146). For the sword-bearer's cap of maintenance see article CAP and St John Hope i. lxxvi–lxxix. For mayor's and sheriff's chains see ibid. pp. lxxix–lxxxiv.

[3] Practically the only detailed study of early English academic costume is a paper on "English Academic Costume (Medieval)," by Dr E. C. Clark, in *Archaeolog. Journal*, vol. l. pp. 74 seq., 137 seq. and 183 seq., which contains a mass of information, and upon which the present article is to a great extent based. Rashdall (*Universities of Europe in the Middle Ages*, vol. ii. pt. ii.) and Druitt (*Costume on Brasses*, ch. ii.) each devote a chapter to the subject; Rashdall treats of both the English and continental universities, not very thoroughly, Druitt of English academic dress only, but thoroughly. Clark gives many facts about foreign, as well as the English, costume.

The Cope, worn as part of academic dress over the gown, probably originated in the ordinary *cappa clericalis*, or everyday mantle of the clergy, which had been introduced into general use in England by synods of 1222, 1237 and 1268.[1] This kind of cope, closed in front, and originally black in colour, is generally known as the *cappa clausa*, and sometimes, for convenience' sake, had a slit in front to allow of the passage of the hands. It was worn by Regent Masters when lecturing (*Mun. Acad.* p. 421) and as a full dress by certain doctors. By the second half of the 14th century differences of colour occur; *e.g.* the Chancellor represented in a 14th-century miniature in the Oxford *Chancellor's Book* (reproduced by J. W. Wells, *The Oxford Degree Ceremony* (1906), facing p. 19) wears a scarlet cope closed in front, lined with miniver and with tippet and hood of miniver, and there is also a mention in an ancient statute of Cambridge of a red cope worn by Inceptors in Canon Law (Clark, p. 102). The Rev. N. F. Robinson (*loc. cit.* p. 195) quotes the will of R. Browne, archdeacon of Rochester (d. 1452), to prove that the habit of a doctor of civil law was violet; he also thinks that that of a doctor of theology was green, and of a doctor of canon law scarlet. By the 16th century all copes were scarlet. Clark (p. 138) gives as evidence "Stokys' picture" in the Cambridge Registrary. The scarlet *cappa clausa* has survived to the present day at Cambridge as the dress worn by the Vice-Chancellor and by Regius Professors of Divinity, Law and Medicine when presenting for degrees. It is now open down the front, but the fur edging only reaches half-way down, marking the place where the slit used to be. At Oxford the so-called "cope" which is the Convocation robe of certain doctors is not a real cope, but is probably derived from the medieval tabard, the out-of-door dress worn by the clergy and others, it having become customary by the beginning of the 16th century for Regent Masters to wear the tabard at lectures as more convenient than the cope (Rashdall, II. ii. 639, and *Mun. Acad.* p. 421, where the *pallium* is spoken of as an alternative to the *cappa clausa.* The *pallium* is most probably to be identified with the tabard).[2] The *capa manicata* mentioned in Anstey (*Mun. Acad.* p. 421, &c.) seems to have been a shorter gown with bell-shaped sleeves reaching to the elbow, and lined with fur, worn by masters and bachelors of arts (see Druitt, p. 124), and a shorter tabard is also occasionally found (Robinson's *Taberdum ad medias tibias*). These are illustrated in fig. 6 from a MS. of the 15th century at New College, Oxford.[3] The D.D.'s wear the *cappa clausa*, the other doctors tabards (see also pl. iii., xvi. in *Archaeologia*, where William of Wykeham and all the doctors wear long sweeping tabards, as ample as copes), the Warden a shorter tabard, reaching just below the knees, and the M.A.'s gowns or tabards with false sleeves.

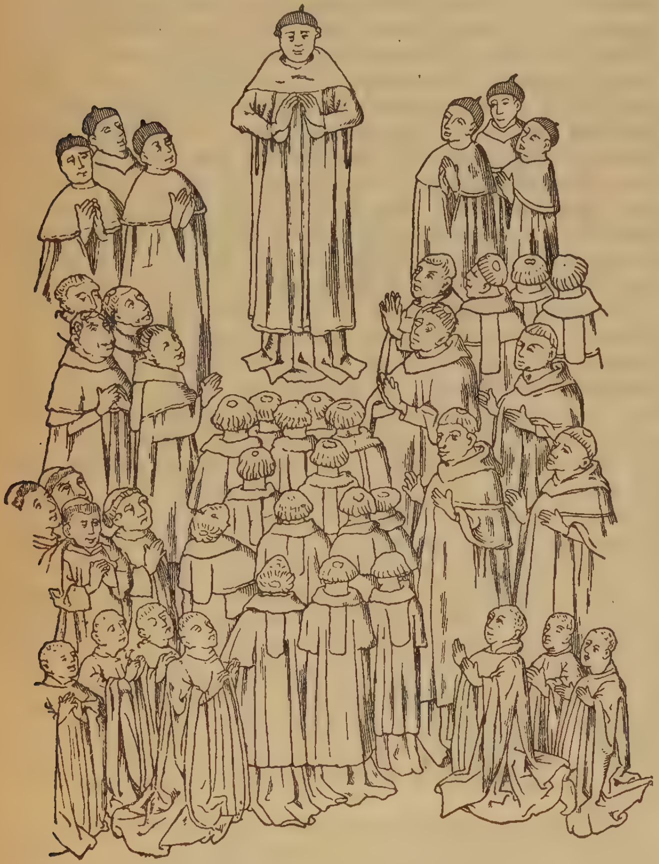

Fig. 6.—Members of New College, Oxford, from Chandler MS. (15th century).

The Hood was originally worn by all scholars, as by everybody, and had evidently no academic significance. Sometimes a cap was also worn, the hood being thrown back (Chaucer's "clerk of Oxenford" in the Ellesmere MS. illumination wears a red skull-cap, and a furred tippet and hood, with the hood falling rather back, though not on his shoulders). The liripipe[4] became somewhat elongated, as is seen in the hoods of the so-called M.A. group in the Chandler MS. An early mention of the undergraduate hood is the much-discussed Oxford Statute of 1489 (*Mun. Acad.* p. 360), which reads: "ut nullus de cetero scholaris non-graduatus (nobili sanguine insignitis &c. exceptis) capitio quovis utatur publice . . . nisi liripipium consutum habeat et non contextum, prout antiqua Universitatis laudabilis consuetudo exposcit . . ."[5] but the undergraduate

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[1] See Rev. T. A. Lacey in *Transactions of the St Paul's Ecclesiological Society*, vol. iv. (1900), p. 128, &c. Also Rev. N. F. Robinson in the same (1898), pp. 181–220.

[2] Clark (pp. 138–39) treats of the *pallium* and tabard as two separate garments, deciding that the *pallium* was a kind of tippet. Robinson considers the *pallium* to correspond to the tabard, his *taberdum talare*, which the Rev. T. A. Lacey (p. 128) also compares with the chimere of Anglican bishops. (See article Chimere, where the chimere is likewise traced to the tabard.) Moroni, *Dizionario dell' erudizione storica-ecclesiastica*, s.v. *zimarra*, says that professors of the university of Rome wear black *zimarre* while teaching. This recalls the *pallium* of Regent Masters (*Mun. Acad.* p. 421) and Inceptors in arts and medicine (*id.* p. 430).

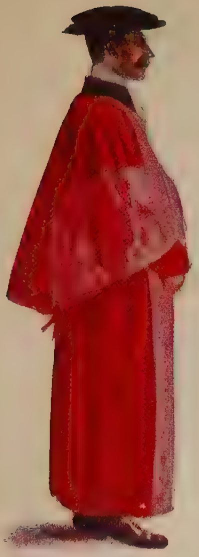
[3] The Chandler MS. The drawings from which the illustration is taken are reproduced in the *Transactions of the St Paul's Ecclesiological Society*, p. 208, with an explanatory article by the Rev. N. F. Robinson, and in *Archaeologia*, vol. liii. pl. i., with notes by T. F. Kirby. Robinson identifies the various groups of the Society of New College on his plate i. (xv. in *Archaeol.*) by the aid of a statute of the College settling the order of standing in choir and at processions, and thus claims to settle the question of the dress of the various kinds of Doctor and Bachelor, M.A.'s, &c., at the period.

[4] In the present article "liripipe" will be used of the tail of the hood, "tippet" of the shoulder-cape, sometimes forming part of the same garment as the hood, sometimes not, and "scarf" of the "tippet" or scarf, *e.g.* of D.D.'s, Anglican clergy.

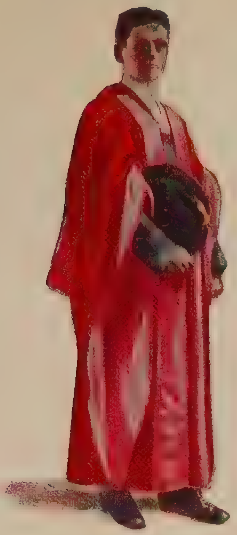
[5] "that no non-graduate scholar (with the usual exceptions of noblemen, &c.) shall wear any kind of hood in public, unless it have the liripipe sewn on, and not woven in one piece, as the ancient and venerable custom of the university demands." The meaning of this is not clear; Anstey (marginal note *ad loc.*) takes it to mean that the tail of the hood should be sewn to the hood; others that the tail of the hood should be sewn down to the gown; cf. Chaucer, *Prol. to Canon's, Yeoman's Tale*: "Till that I understood How that his cloke was sowed to his hood, For which, whan I hadde long avysed me, I demed him some Chanoun for to be," which shows that this method of sewing the hood, whatever it were, was used to define rank; others again hold that "*liripipium*" here means a tippet or shoulder-cape, and that for some reason the hood was to be sewn to the tippet and not made all in one piece with it. Rashdall reads "*consuetum*" instead of "*consutum*" (footnote ii. p. 641). The Constitution of Archbishop Bourchier (1463) forbids undergraduates to use liripipes or "tippets" round the neck in public (Clark, p. 85), so the sewing down of the liripipe at the back may

ROBES

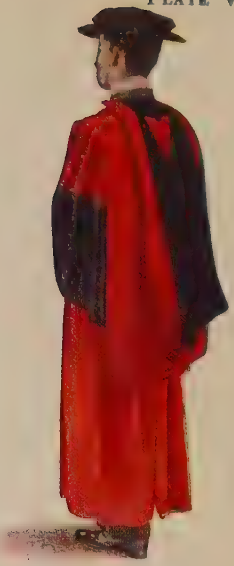
PLATE V.



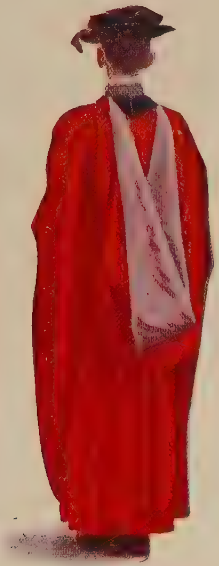
D.C.L., Oxford.



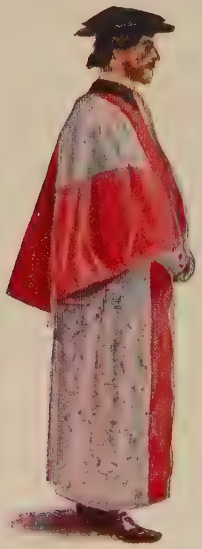
LL.D., Cambridge.



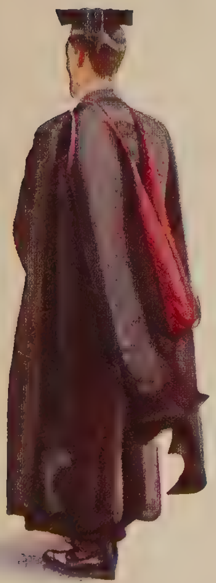
D.D., Oxford.



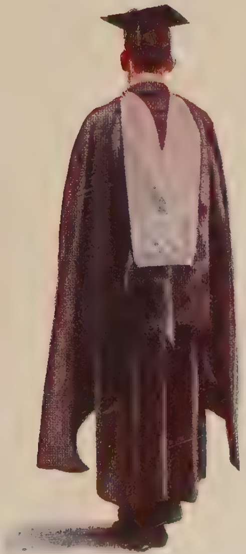
D.D., Cambridge.



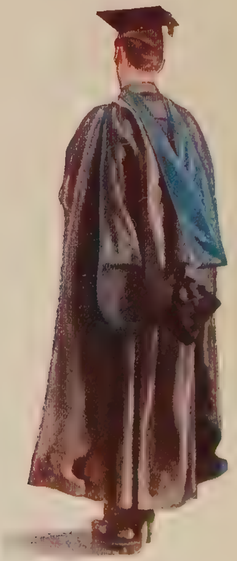
Doctor of Music, Oxford.



M.A., Oxford.



M.A., Cambridge.



M.A., Trinity College, Dublin.

Robes lent by Ede, Son & Ravenscroft, Chancery Lane, London

hood had gone out of use by the end of the 16th century.[1] Bachelors' hoods were to be lined throughout with fur (*Mun. Acad.* p. 361), which we learn from the statute *de admissione ad pelluram* (1432) to have been budge. Masters and noblemen might use miniver, or silk in summer (*Mun. Acad.* pp. 283, 301). There were evidently hoods of at least two kinds for masters, sometimes called respectively *caputium* and *epomis*, whether corresponding to the distinction between regents and non-regents we do not know. (See *Mun. Acad.* p. 638, will of Thomas Bray, M.A., and Robinson, *loc. cit.* In the Oxford *Corpus Statutorum* of 1768 the *epomis* is worn with the ordinary gown, the *caputium* with the scarlet habit.) At a later date, at Cambridge, a distinction was made between the hoods of non-regents, which were lined with silk, and those of regents, which were lined with miniver.[2] Later again the regents wore their hoods in such a way as to show the white lining, while the non-regents wore theirs "squared," so that the white did not show. Hence the name "White Hoods" and "Black Hoods" given to the upper and lower houses of the old Senate respectively. It is not settled when the modern colourings of hoods arose; they probably followed those of the gowns of the faculties, but about these we are equally uncertain. The Oxford Proctor still wears a miniver hood. The modern Cambridge hood has preserved the original shape more closely than the Oxford one, being a hood and tippet combined, the hood having square corners. The tippet, which appears as part of the early costume of certain doctors, was probably, like the judges' tippet, originally the shoulder-cape forming part of the same garment as the hood. Clark and others would derive it from the almuce (*q.v.*), but do not seem to show any definite grounds for so doing. Its place seems to have been taken by the scarf worn by D.D.'s, &c., probably developed from the hood with long liripipe as worn turban-wise on the head or as a scarf round the shoulders. It seems rather far-fetched to derive the scarf from the two pendants of the almuce.[3] (See article VESTMENTS and cp. the mayor's scarf mentioned above.)

There seem to have been at least three varieties of academic head-dress:[4] firstly, the doctor's skull-cap with "apex" as illustrated in the *Chandler MS.* drawings; secondly, the square cap of cloth as prescribed by Laud's statutes of 1636 for graduates and foundation scholars (similarly for Cambridge by Burleigh's letter to the vice-chancellor in 1588), with its counterpart of velvet worn by doctors; thirdly, a round cloth cap prescribed by the Laudian statutes and Burleigh's letter for undergraduates who were not foundation scholars, with the round cap of velvet for doctors which survives as part of their full dress to the present day. The square cap was adopted at the universities, according to Robinson, after 1520, in imitation of the university of Paris. For the development of the modern "college cap," see BIRETTA. In this connexion should be mentioned the term "tuft-hunting," *i.e.* attempting to thrust oneself into the society of one's social superiors, derived from the gold tufts or tassel worn by noblemen and fellow-commoners on their college caps.

As to the dresses of the different degrees, the drawings from the *Chandler MS.* give a good idea of the early costume. It is also well illustrated by brasses.[5] Doctors of theology seem to have worn a tippet but no hood. Masters of Arts seem to have worn a gown, over which was a garment with bell-shaped sleeves reaching to the elbow, a tippet and a hood (see Druitt, plate facing p. 136, and p. 135). The same dress was sometimes worn by B.A.'s (see brass of John Palmer, B.A., d. 1479, New College, Oxford, in Druitt, p. 141), and bachelors of law and divinity, the latter being generally already M.A.'s (Druitt, p. 139). Haines's theory is that after the middle of the 15th century the dress of the M.A.'s was changed, and they wore a sleeveless tabard reaching to midway between ankle and knee. This costume certainly occurs on brasses, chiefly of the 16th or late 15th centuries, but the change is hard to explain.[6]

Academic dress underwent much inquiry and some revision at the time of the Reformation, chiefly in the direction of sobriety and uniformity, "excess of apparel" being repressed as severely as ever, but not with much more effect.[7] Burleigh's letter to the Vice-Chancellor of Cambridge University (1585), and the statutes of Queen Elizabeth, strictly enforce the wearing of cap and gown by all, and hoods and habits by those entitled to wear them, and similar regulations were made for Oxford by Laud's statutes of 1633, further details being dealt with by a decree of 1770. Academic dress during the 17th century may be further studied in Bedel Buck's book (1665, see Appendix B. to Peacock, *Observations on the Statutes of the University of Cambridge*), and Loggan's plates of academic costume in *Oxonia Illustrata* (1675) and *Cantabrigia Illustrata* (1690, ed. J. W. Clark, 1905).

There have been few far-reaching changes since Loggan's day. Cambridge has of late years inquired into and revised her regulations as to dress, and in the *Ordinances* (latest ed. 1908, Statute A, cap. VII. p. 303) clear rules are laid down; the Oxford regulations (see *Statuta et Decreta Univ. Oxon.*

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have been to prevent this improper use as a scarf. But in this case, what is the force of "*et non contextum*"?

[1] An interesting survival, which only disappeared about the middle of the 19th century, was the little black hood placed round the neck of candidates going in for *viva voce* in all examinations subsequent to responsions at Oxford. This was a survival of the custom of conferring on *sophistae generales*, *i.e.* those who had passed the first stage of the exercises for the B.A. degree, a hood of plain black cloth. See A. Clark's *Introduction to the Registers of Oxford University*, vol. ii. pt. i. p. 22 (Oxford Hist. Soc., 1887).

[2] See *Caius' Statutes* (1557), also an account of the entertainments at Cambridge on the visit of Queen Elizabeth, 1564, given in Nichols, *Progresses*, vol. iii., "Theologiae Baccalaureos ac non-Regentes primum, sericis caputiis induti, tum Regentes Magistri suis pelliceis albescentibus decorati; tandem Juris Artiumque Baccalaureos suis agninis bracceis conspicui."

[3] See Rev. E. Wickham Legg in *Trans. of St Paul's Eccles. Soc.* vol. iii. Also Lacey and Robinson (*loc. cit.*).

[4] The subject is discussed in detail by Clark, "College Caps and Doctors' Hats," in *Archaeol. Journal*, vol. lxi., and N. F. Robinson, "Pileus Quadratus," in *Transact. of St Paul's Ecclesiological Socy.*, vol. v. pt. i. (1901). There is also much miscellaneous information in C. Wordsworth, *University Life in the 18th Century*, p. 499 seq.

[5] See for doctors' costume, J. G. and L. A. B. Waller's *Series of Monumental Brasses* (London, 1864), plate of "Four Ecclesiastics," from New College, Oxford, who are also illustrated in Druitt, pp. 131, 129, 119; and for M.A.'s and B.A.'s, Druitt, p. 135 seq. and plate facing p. 136. On the brass of John Lowthe, D.C.L., should be noticed the two curious long streamers or liripipes hanging from the back of his tabard or hood. It is hard to say what they can be; but the closest parallel is in the two streamers on the back of the old Oxford commoners' gown, which were probably survivals of sleeves. They are said to have given rise to the term "plucking," *i.e.* failing in examination, the story being that a man's creditors might assemble at the conferring of degrees, and by "plucking" at his gown prevent him from going up for his degree.

[6] It is just possible that this sleeved garment may be the *capa manicata* mentioned in *Mun. Acad.* p. 421, "nullus regens in artibus . . . in capa manicata lectiones legat ordinarias, sed in pallio vel capa clausa." Clark (pp. 188, 189, &c.) identifies the *cappa manicata* with the tabard, but if, as suggested above, the *pallium* is the tabard, the *cappa manicata* cannot be the same. Braun, *Liturgische Gewandung*, p. 308, shows that a sleeved cope, called *cappa manicata*, did develop from the *cappa clericalis* or everyday cope of the clergy, at the end of the 12th century, its use being forbidden by various synods. It is possible, then, that the *capa manicata* may have been worn by non-regents, the tabard (which Haines alleges to have been adopted generally by M.A.'s in the late 15th century), or *pallium*, by regents.

[7] The essential parts of Laud's statutes, Burleigh's letter, &c., with much other matter bearing on academic costume from the 16th century onwards, will be found in C. Wordsworth's *University Life in the 18th Century* (London and Cambridge, 1874, p. 485 seq.). To the passages quoted by him may be added the following from *Johannis Berebloci Commentarii*, an eye-witness's account of Queen Elizabeth's visit to Oxford in 1566 (published in *Elizabethan Oxford*, ed. C. Plummer, Oxford Hist. Soc., 1887); at one of the disputations Mr. Campion, M.A., was dressed as follows: "Toga illi tum Dalmatica talaris fuit, manicis remissis ac largitate sua diffluentibus. Huic pallium inductum est undique consutum, praeter quam qua dextro patebant aditus. Postremo erant humeri superius pellibus albis, candoreque lucentibus, redimiti. Atque hic tum habitus fuit omnium magistrorum, praeterquam quod nonnulli, loco palludamenti illius pellicei, serico utebantur, omni colore variegato." This points to the wide-sleeved gown, tabard and hood as the dress of masters, but the colour of the hood was evidently not fixed. For Doctor White, D.C.L., "ei vestis Dalmatica fuerat talaris, ex electiori et clarissima purpura; lato clavo coccineo superius induebatur, additum postremo humeris paludamentum est ejusdem coloris, cum serico subtegmine, similique tum vestiti habitu omnes Doctores sedebant." Here *vestis Dalmatica* would be the ordinary gown, *clavus latus* the scarlet gown, and *paludamentum* the hood, as before. For costume up to the middle of the 19th century see Wall-Gunning, *Ceremonies observed in the Senate House at Cambridge* (1828).

for 1909, Tit. xiv., *de vestitu et habitu*, pp. 327–328) have not been revised lately, and some of them are a dead letter.

Doctors of both universities have three sets of robes: firstly, the full-dress gown of scarlet cloth; secondly, the congregation habit and hood of scarlet (now at Cambridge a cope, at Oxford the so-called "cope"); thirdly, the black gown. The first is worn by all doctors except the doctor of music, and is accompanied by the round cap of velvet. The Oxford D.D. also wears a cassock, sash and scarf. The scarlet gown is of a different and older shape than the M.A. and B.A. gowns. As now worn, it is faced with silk of the same colour as the hood of the faculty. The second, or cope, has now gone almost out of use, but is still worn when presenting for degrees, &c. It is sometimes worn over the black gown. There are several types of black gown, but the tufted gown of Loggan's day has now gone out of use. The M.D. and Mus.D. black gowns at Cambridge are now made after the pattern of the LL.D. gown, with wing-like sleeve and flap collar, trimmed with black lace, but the D.D., D.Sc. and Litt.D. wear the M.A. gown, the former with the scarf, the two latter with lace on the sleeve, placed horizontally for D.Sc. and vertically for Litt.D. Some doctors of divinity wear the full-sleeved gown with scarf. The head-dress of a D.D. is the square cap, that of the lay doctors the velvet bonnet with gold cord. At Oxford, too, some doctors wear the M.A. gown, others the doctor's laced gown. The M.A. and B.A. gowns are two varieties of the civilian gown of the 15th and 16th century. The B.A. loose-sleeved gown is no longer worn with the sleeve tucked up round the elbow.

The Oxford sleeveless commoner's gown, though still by statute *talaris*, now reaches little below the waist, the full-sleeved scholar's gown to the knees. The tufted silk gown of the gentleman-commoner and the nobleman's gold-laced gown are not yet abolished by statute, but have fallen into disuse. Vice-Chancellors have no official costume, but wear the habit of their degree. The Chancellors of the older universities wear a black damask robe with gold lace, and a black velvet square cap with gold tassel or a doctor's velvet bonnet with gold cord; those of the newer universities have robes "created" by the robe-makers, who are nowadays to a large extent the arbiters of academic dress.

For the colours of the hoods of the various university degrees see UNIVERSITIES *ad fin.* (C. B. P.)

ROBESPIERRE, MAXIMILIEN FRANÇOIS MARIE ISIDORE DE (1758–1794), French revolutionist, was born at Arras on the 6th of May 1758. His family, according to tradition, was of Irish descent, having emigrated from Ireland at the time of the Reformation on account of religion, and his direct ancestors in the male line had been notaries at the little village of Carvin near Arras from the beginning of the 17th century. His grandfather, being more ambitious, established himself at Arras as an advocate; and his father followed the same profession, marrying Jacqueline Marguerite Carraut, daughter of a brewer in the same city, in 1757. Of this marriage four children were born, two sons and two daughters, of whom Maximilien was the eldest; but in 1767 Madame Derobespierre, as the name was then spelt, died, and the disconsolate widower at once left Arras and wandered about Europe until his death at Munich in 1769. The children were taken charge of by their maternal grandfather and aunts, and Maximilien was sent to the college of Arras, whence he was nominated in 1770 through the bishop of his native town to a bursarship at the college of Louis-le-Grand at Paris. Here he had for fellow-pupils Camille Desmoulins and Stanislas Fréron.

Completing his law studies with distinction, and having been admitted an advocate in 1781, Robespierre returned to his native city to seek for practice, and to struggle against poverty. His reputation had already preceded him, and the bishop of Arras, M. de Conzié, appointed him criminal judge in the diocese of Arras in March 1782. This appointment, which he soon resigned, to avoid pronouncing a sentence of death, did not prevent his practising at the bar, and he speedily became a successful advocate. He now turned to literature and society, and came to be esteemed as one of the best writers and most popular dandies of Arras. In December 1783 he was elected a member of the academy of Arras, the meetings of which he attended regularly; and, like all other young Frenchmen with literary proclivities, he began to compete for the prizes offered by various provincial academies. In 1784 he obtained a medal from the academy of Metz for his essay on the question whether the relatives of a condemned criminal should share his disgrace, the prize being divided between him and Pierre Louis Lacretelle, an advocate and journalist in Paris. An *éloge* on J. B. L. Gresset (1709–1777), the author of *Vert-Vert* and *Le Méchant*, written for the academy of Amiens in 1785, was not more successful; but Robespierre was compensated for these failures by his great popularity in the little literary and musical society at Arras known as the "Rosati," of which Carnot was also a member. There the sympathetic quality of Robespierre's voice, which afterwards did him such good service in the Jacobin Club, always caused his indifferent verses to be loudly applauded by his friends.

In 1788 he took part in the discussion as to the way in which the states-general should be elected, showing clearly and forcibly in his *Adresse à la nation artésienne* that, if the former mode of election by the members of the provincial estates were again adopted, the new states-general would not represent the people of France. Necker also perceived this, and therefore determined to make the old royal *bailliages* and *sénéchaussées* the units of election, which thus took place on the basis of almost universal suffrage. Under this plan the city of Arras was to return twenty-four members to the assembly of the *bailliage* of Artois, which was to elect the deputies. The corporation claimed the right to a preponderating influence in these city elections, and Robespierre headed the opposition, making himself very conspicuous and drawing up the *cahier*, or table of complaints and grievances, for the gild of the cobblers. Although the leading members of the corporation were elected, their chief opponent succeeded in getting elected with them. In the assembly of the *bailliage* rivalry ran still higher, but Robespierre had already made his mark in politics; by the *Avis aux habitants de Campagne* (Arras, 1789), which is almost certainly by him, he secured the support of the country electors, and, though but thirty years of age, poor and without influence, he was elected fifth deputy of the *tiers état* of Artois to the states-general.

When the states-general met at Versailles on 5th May 1789, the young deputy of Artois already possessed the one faculty which was to lead him to supremacy: he was a fanatic. As Mirabeau is reported to have said: "That young man believes what he says: he will go far." Without the courage and wide tolerance which make a statesman, without the greatest qualities of an orator, without the belief in himself which marks a great man, nervous, timid and suspicious, Robespierre yet believed in the doctrines of Rousseau with all his heart, and would have gone to death for them; and in the belief that they would eventually succeed and regenerate France and mankind, he was ready to work with unwearied patience. While the Constituent Assembly occupied itself in drawing up a constitution, Robespierre turned from the assembly of provincial lawyers and wealthy *bourgeois* to the people of Paris. However, he spoke frequently in the Constituent Assembly, and often with great success, and was eventually recognized as second only to Pétion de Villeneuve—if second to him—as a leader of the small body of the extreme left,—the thirty voices, as Mirabeau contemptuously called them. It is hardly necessary to examine minutely Robespierre's speeches and behaviour before 1791, when the death of Mirabeau left the way clear for the influence of his party; but what is noteworthy, as proving the religious cast of his mind and his belief in the necessity of a religion, is that he spoke several times in favour of the lower clergy and laboured to get their pensions increased. When he instinctively felt that his doctrines would have no success in the Assembly, he turned to the Society of the Friends of the Constitution, known later as the Jacobin Club, which had consisted originally of the Breton deputies only, but which, after the Assembly moved to Paris, began to admit among its members various leaders of the Parisian *bourgeoisie*. As time went on, many of the more intelligent artisans and small shopkeepers became members of the club, and among such men Robespierre found the hearers he sought. They did more than listen to him: they idolized him; the fanatical leader had found followers. As the wealthier *bourgeois* of Paris and deputies of a more moderate type seceded to the club of '89, the influence of the old leaders of the Jacobins (Barnave, Duport, Alexandre de Lameth) diminished; and when they themselves, alarmed at the progress of the Revolution, founded the club of the Feuillants in 1791, the followers of Robespierre dominated the Jacobin Club. The death of Mirabeau strengthened Robespierre's influence in the Assembly; but on the 15th of May 1791 he proved his lack of statesmanlike insight and his jealous suspicion of his colleagues by proposing and carrying the motion that no deputies who sat in the Constituent could sit in the succeeding Assembly. The flight of the king on the 20th of June and his arrest at Varennes made Robespierre declare himself at the Jacobin Club to be *ni monarchiste ni républicain*. After the "massacre" of the Champ de Mars (on the 17th of July 1791) he established himself, in order to be nearer to the Assembly and the Jacobins, in the house of Duplay, a cabinetmaker in the Rue St Honoré, and an ardent admirer of his, where he lived (with but two short intervals) till his death. At last came his day of triumph, when on the 30th of September, on the dissolution of the Constituent Assembly, the people of Paris crowned Pétion and himself as the two incorruptible patriots.

On the dissolution of the Assembly he returned for a short visit to Arras, where he met with a triumphant reception. In November he returned to Paris, and on the 18th of December made a speech which marks a new epoch in his life. Brissot de Warville, the *âme politique* of the Girondin party which had been formed in the Legislative Assembly, urged vehemently that war should be declared against Austria, and the queen was equally urgent, in the hope that a victorious army might restore the old absolutism of the Bourbons. Two men opposed the projects of the queen and the Girondins—Marat and Robespierre. Robespierre feared a development of militarism, which might be turned to the advantage of the reaction. This opposition from those whom they had expected to aid them irritated the Girondins greatly, and from that moment began the struggle which ended in the *coups d'état* of the 31st of May and the 2nd of June 1793. Robespierre persisted in his opposition to the war; the Girondins, especially Brissot, attacked him violently; and in April 1792, he resigned the post of public prosecutor at the tribunal of Paris, which he had held since February, and started a journal, *Le Défenseur de la Constitution*, in his own defence. It is noteworthy that during the summer months of 1792 in which the fate of the Bourbon dynasty was being sealed, neither the Girondins in the Legislative Assembly nor Robespierre took any active part in overthrowing it. Stronger men with practical instincts of statesmanship, like Danton and Billaud-Varenne, who dared to look facts in the face and take the responsibility of doing while others were talking, were the men who made the 10th of August and took the Tuileries. The Girondins, however, were quite ready to take advantage of the accomplished fact; and Robespierre, likewise, though shocked at the shedding of blood, was willing to take his seat on the Commune of Paris, which had overthrown Louis XVI., and might check the Girondins. The strong men of the Commune were glad to have Robespierre's assistance, not because they cared for him or believed in him, but because of the help got from his popularity, his reputation for virtue, which had won for him the surname of "The Incorruptible," and his influence over the Jacobin Club and its branches, which spread all over France. He it was who presented the petition of the Commune of Paris on 16th August to the Legislative Assembly, demanding the establishment of a revolutionary tribunal and the summoning of a Convention. The massacres of September in the prisons, which Robespierre in vain attempted to stop, showed that the Commune had more confidence in Billaud than in him. Yet, as a proof of his personal popularity, he was a few days later elected first deputy for Paris to the National Convention.

On the meeting of the Convention the Girondins immediately attacked Robespierre; they were jealous of his influence in Paris, and knew that his single-hearted fanaticism would never forgive their intrigues with the king at the end of July. As early as the 26th of September the Girondin M. D. A. Lasource accused him of aiming at the dictatorship; afterwards he was informed that Marat, Danton and himself were plotting to become triumvirs; and eventually on the 29th of October Louvet de Couvrai attacked him in a studied and declamatory harangue, abounding in ridiculous falsehoods and obviously concocted in Madame Roland's boudoir. But Robespierre had no difficulty in rebutting this attack (5th of November), while he denounced the federalist plans of the Girondins. All personal disputes, however, gave way by the month of December 1792 before the great question of the king's trial, and here Robespierre took up a position which is at least easily understood. These are his words spoken on the 3rd of December: "This is no trial; Louis is not a prisoner at the bar; you are not judges; you are—you cannot but be—statesmen, and the representatives of the nation. You have not to pass sentence for or against a single man, but you have to take a resolution on a question of the public safety, and to decide a question of national foresight. It is with regret that I pronounce the fatal truth: Louis ought to perish rather than a hundred thousand virtuous citizens; Louis must die, that the country may live." This great question settled by the king's execution, the struggle between Robespierre and the Girondins entered upon a more acute stage, and the want of statesmanship among the latter threw upon the side of the fanatical Robespierre Danton and all those strong practical men who cared little for personal questions, and whose only desire was the victory of France in her great struggle with Europe. Had it been at all possible to act with that group of men of genius whom history calls the Girondins, Danton, Lazare Carnot, Robert Lindet, and even Billaud-Varenne, would have sooner thrown in their lot with them than with Robespierre, whom they thoroughly understood; but the Girondins, spurred on by Madame Roland, refused to have anything to do with Danton. Government became impossible; the federalist idea, which would have broken France to pieces in the very face of the enemy, grew and flourished, and the men of action had to take a decided part. In the month of May 1793 Camille Desmoulins, acting under the inspiration of Robespierre and Danton, published his *Histoire des Brissotins* and *Brissot démasqué*; Maximin Isnard declared that Paris must be destroyed if it pronounced itself against the provincial deputies; Robespierre preached insurrection at the Jacobin Club; and on the 31st of May and the 2nd of June the Commune of Paris destroyed the Girondin party. For a moment it seemed as if France would avenge them; but patriotism was stronger than federalism. The defence of Lyons exasperated the men who were working for France, and the armies who were fighting for her, and on the 27th of July 1793, when the struggle was practically decided, the Convention elected Robespierre to the new Committee of Public Safety. He had not solicited, so it seems, nor even desired this election, yet it marks an important epoch, not only in the life of Robespierre, but in the history of the Revolution. Danton and the men of action had throughout the last two years of the crisis, as Mirabeau had in the first two years, seen that the one great need of France, if she was to see the end of her troubles without the interference of foreign armies, was the existence of a strong executive government. The means for establishing the much-needed strong executive were found in the Committee of Public Safety. The success of this Committee in suppressing the Norman insurrection had confirmed the majority of the Convention in the expediency of strengthening its powers, and the Committee of General

Security which sat beside it was also strengthened and given the entire management of the internal police of the country. It was not until Robespierre was elected to the Committee that he became one of the actual rulers of France. Indeed, the Committee was not finally constituted until the 13th of September, when the last two of the "great" twelve who held office until July 1794 were elected. Of these twelve at least seven—Lazare Carnot, Billaud-Varenne, Collot d'Herbois, Prieur Duvernois (of the Marne), Prieur (of the Côte d'Or), Jean Bon Saint-André and Robert Lindet—were essentially men of action, and were entirely free from the influence of Robespierre. Of the other four, Hérault de Séchelles was a professed adherent of Danton, Barère de Vieuzac was an eloquent Provençal, who was ready to be the spokesman to the Convention of any view which the majority of the Committee might adopt; and only Georges Couthon and Saint-Just, devoted to Robespierre, adroitly sustained his policy. It is necessary to dwell upon the fact that Robespierre was always in a minority in the great Committee in order to absolve him from the blame of being the inventor of the Terror, as well as to deprive him of the glory of the gallant stand made against Europe in arms.

After this examination of Robespierre's position it is not necessary to investigate closely every act of the great Committee during the year which was pre-eminently the year of the Terror; the biographer is rather called upon to examine his personal position with regard to the establishment of the Terror and the fall of the Hébertists and Dantonists, and then to dwell upon the last three months in which he stood almost alone trying to work up an effective counterbalance to the power of the majority of the great Committee. The Terror was the embodiment of the idea of Danton, that it was necessary to have resort to extreme measures to keep France united and strong at home in order to meet successfully her enemies upon the frontier. This idea was systematized by the Committee of Public Safety. With the actual organization of the Terror Robespierre had little or nothing to do; its two great engines, the revolutionary tribunal and the almost absolute power in the provinces of the representatives on mission, were in existence before he joined the Committee of Public Safety, and the laws of the maximum and of the suspects were by no means of his creation. The reason why he is almost universally regarded as its creator and the dominant spirit in the Committee is not hard to discover. Men like Lazare Carnot and Billaud-Varenne were not conspicuous speakers in the Convention, nor were they the idols of any section of the populace; but Robespierre had a fanatical following among the Jacobins and was one of the most popular orators in the Convention, on which his carefully prepared addresses often made a deep impression. His panegyrics on the system of revolutionary government and his praise of virtue led his hearers to believe that the system of the Terror, instead of being monstrous, was absolutely laudable; his pure life and admitted incorruptibility threw a lustre on the Committee of which he was a member; and his colleagues offered no opposition to his posing as their representative and reflecting some of his personal popularity upon them so long as he did not interfere with their work. Moreover, he alone never left Paris, whilst all the others, except Barère, were constantly engaged on missions to the armies, the navy and the provinces. It has been asserted that Robespierre, Couthon and Saint-Just took upon themselves the direction of "la haute politique," while the other members acted only in subordinate capacities; undoubtedly it would have suited Robespierre to have had this believed, but as a matter of fact he was in no way especially trusted in matters of supreme importance.

After this explanation it may be said at once that Robespierre was not the sole author of the overthrow of the Dantonists and the Hébertists, though he thoroughly agreed with the majority and had no desire to save them, the principles of both parties being obnoxious to him. The Hébertists were communists in the true meaning of the word. They held that each commune should be self-governing, and, while admitting the right of a central authority to levy men and money for the purposes of the state, they believed that in purely internal matters, as well as in determining the mode in which men and money were to be raised, the local government ought to be supreme. This position of the Hébertists was of course obnoxious to the Committee, who believed that success could only be won by their retention of absolute power; and in the winter of 1794–1795 it became obvious that the Hébertist party must perish, or its opposition to the Committee would grow too formidable owing to its paramount influence in the Commune of Paris. Robespierre shared his colleagues' fear of the Hébertist opinions, and he had a personal reason for disliking that party of atheists and *sansculottes*, since he believed in the necessity of religious faith, and detested their imitation of the grossness that belongs to the lowest class of the populace. In 1792 he had indignantly thrown from him the cap of liberty which an ardent admirer had placed upon his head; he had never pandered to the depraved tastes of the mob by using their language; and to the last day of his life he wore knee-breeches and silk stockings and wore his hair powdered. His position towards the Dantonist party was of a different character. After having seen established the strong executive he had laboured for, and having moved the resolutions which finally consolidated the power of the Committee of Public Safety in September 1793, Danton retired to his country house. But to his retreat came the news of the means the Committee used to maintain their supremacy. Danton did not believe that this continuous series of sacrifices under the guillotine was necessary, especially since the danger to the country had passed away with the victories of the revolutionary army; hence he inspired Camille Desmoulins to protest against the Terror in the *Vieux Cordelier*. Where is this system of terror to end? What is the good of a tyranny comparable only to that of the Roman emperors as described by Tacitus? Such were the questions which Camille Desmoulins asked under Danton's inspiration. This "moderantism," as it was called, was as objectionable to the members of the Committee as the doctrines of the Hébertists. Both parties must be crushed. Before the blows at the leaders of those two parties were struck, Robespierre retired for a month (from 13th February to 13th March 1794) from active business in the Convention and the Committee, apparently to consider his position; but he came to the conclusion that the cessation of the Reign of Terror would mean the loss of that supremacy by which he hoped to establish the ideal of Rousseau; for Danton, he knew, was essentially a practical statesman and laughed at his ideas and especially his politico-religious projects. He must have considered too that the result of his siding with Danton would probably have been fatal to himself. The result of his deliberations was that he abandoned Danton and co-operated in the attacks of the Committee on the two parties. On the 15th of March he reappeared in the Convention; on the 19th Hébert and his friends were arrested; and on the 24th they were guillotined. On the 30th of March Danton, Camille Desmoulins and their friends were arrested, and on the 5th of April they too were guillotined.

It was not until after the execution of Danton that Robespierre began to develop a policy distinct from that of his colleagues in the Committee, an opposition which ended in his downfall. He began by using his influence over the Jacobin Club to dominate the Commune of Paris through his devoted adherents, two of whom, Fleuriot-Lescot and C. F. de Payan, were elected respectively mayor and *procureur* of the Commune. He also attempted to usurp the influence of the other members of the Committee over the armies by getting his young adherent, Saint-Just, sent on a mission to the frontier. In Paris Robespierre determined to increase the pressure of the Terror: no one should accuse him of moderantism; through the increased efficiency of the revolutionary tribunal Paris should tremble before him as the chief member of the Committee; and the Convention should pass whatever measures he might dictate. To secure his aims, Couthon, his other ally in the Committee, proposed and carried on the 10th of June the outrageous law of 22nd Prairial, by which even the appearance of justice was taken from the tribunal, which, as no witnesses were allowed, became a simple court of condemnation. The result of this law was that between the 12th of June and the 28th of July, the day of Robespierre's death, no less than 1285 victims perished by the guillotine in Paris. It was the bloodiest and the least justifiable period of the Terror. But before this there had taken place in Robespierre's life an episode of supreme importance, as illustrating his character and his political aims: on the 7th of May he secured a decree from the Convention recognizing the existence of the Supreme Being. This worship of the Supreme Being was based upon the ideas of Rousseau in the *Social Contract,* and was opposed by Robespierre to Catholicism on the one hand and the Hébertist atheism on the other. In honour of the Supreme Being a great fête was held on the 8th of June; Robespierre, as president of the Convention, walked first and delivered his harangue, and as he looked around him he may well have believed that his position was secured and that he was at last within reach of a supreme power which should enable him to impose his belief on all France, and so ensure its happiness. The majority of the Committee found his popularity—or rather his ascendancy, for as that increased his personal popularity diminished—useful to them, since by increasing the stringency of the Terror he strengthened the position of the Committee, whilst attracting to himself, as occupying the most prominent position in it, any latent feeling of dissatisfaction at such stringency. Of the issue of a struggle between themselves and Robespierre they had little fear: they controlled the Committee of General Security through their alliance with its leaders, André Amar and Marc Guillaume Alexis Vadier; they were hopeful of obtaining a majority in the Convention; for they knew that the chief deputies on the left, or "the Mountain," were Dantonists, who burned to avenge Danton's death; while they felt sure also that the mass of the deputies of the centre, or "the Marsh," could be hounded on against Robespierre if they were to accuse him of aiming at the dictatorship and pour on him the obloquy of having increased the Terror when victory on the frontier rendered it less necessary; and they knew finally that his actual adherents, though devoted to him, were few in number. The devotion of these admirers had been further excited by the news that a half-witted girl, named Cécile Renault, had been found wandering near his house, with a knife in her possession, intending to play the part of Charlotte Corday. She was executed on the 17th of June, on the very day that Vadier raised a laugh at Robespierre's expense in the Convention by his report on the conspiracy of Catherine Théot (*q.v.*), a mad woman, who had asserted that Robespierre was a divinity.

Robespierre felt that he must strike his blow now or never. Yet he was not sufficiently audacious to strike at once, as Payan and Jean Baptiste Coffinhal, the ablest of his adherents, would have had him do, but retired from the Convention for some weeks, as he had done before the overthrow of the Hébertists and the Dantonists, to prepare his plan of action. This retirement seemed ominous to the majority of the Committee, and they too prepared for the struggle by communicating with the deputies of the Mountain, who were either friends of Danton or men of proved energy like Barras, Fréron and Tallien. These weeks, the last of his life, Robespierre passed very peacefully, according to his wont all through the Revolution. He continued to live with the Duplays, with whose daughter Éléonore he had fallen in love, and used to wander with her and his favourite dog, a great Danish hound, named Bruant, in the Champs Élysées during the long summer evenings. At last, on the 26th of July, Robespierre appeared, for the first time for more than four weeks, in the Convention and delivered a carefully studied harangue, which lasted for more than four hours, in which he declared that the Terror ought to be ended, that certain deputies who had acted unjustly and exceeded their powers ought to be punished, and that the Committees of Public Safety and General Security ought to be renewed. Great was the excitement in the Convention: all wondered who were the deputies destined to be punished; all were surprised that the Terror should be imputed as a fault to the very Committee of which Robespierre had been a member. The majority of the Committee of Public Safety determined to act promptly. The Convention, moved by Robespierre's eloquence, at first passed his motions; but he was replied to by Joseph Cambon the financier, Billaud-Varenne, Amar and Vadier, and the Convention rescinded their decrees and referred Robespierre's question to their committees. On the following day, the 27th of July, or in the revolutionary calendar the 9th Thermidor, Saint-Just began to speak on behalf of the motions of Robespierre, when violent interruptions showed the temper of the Convention. Jean Lambert, Tallien, Billaud-Varenne and Vadier again attacked Robespierre; cries of "Down with the tyrant!" were raised; and, when Robespierre hesitated in his speech in answer to these attacks, the words "C'est le sang de Danton qui t'étouffe" showed what was uppermost in the minds of the Mountain. Robespierre tried in vain to gain a hearing, the excitement increased and at five in the afternoon Robespierre, Couthon and Saint-Just, with two young deputies, Augustin Robespierre (younger brother of Maximilien) and Philippe François Joseph Lebas, the only men in all the Convention who supported them, were ordered to be arrested. Yet all hope for Robespierre was not gone; he was speedily rescued from his prison, with the other deputies, by the troops of the Commune and brought to the Hôtel de Ville. There he was surrounded by his faithful adherents, led by Payan and Coffinhal. But the day was past when the Commune could overawe the Convention; for now the men of action were hostile to the Commune, and its chief was not a master of *coups d'état.* On the news of the release of Robespierre, the Convention had again met, and declared the members of the Commune and the released deputies outlawed. The national guards under the command of Barras had little difficulty in making their way to the Hôtel de Ville; Robespierre was shot in the lower jaw by a young gendarme named Meda while signing an appeal to one of the sections of Paris to take up arms for him, though the wound was afterwards believed to have been inflicted by himself; and all the released deputies were again arrested. After a night of agony, Robespierre was the next day taken before the tribunal, where his identity as an outlaw was proved, and without further trial he was executed with Couthon and Saint-Just and nineteen others of his adherents on the Place de la Révolution on the 10th Thermidor (28th July) 1794.

The character of Robespierre, when looked upon simply in the light of his actions and his authenticated speeches, and apart from the innumerable legends which have grown up about it, is not a difficult one to understand. A well-educated and accomplished young lawyer, he might have acquired a good provincial practice and lived a happy provincial life had it not been for the Revolution. Like thousands of other young Frenchmen, he had read the works of Rousseau and taken them as gospel. Just at the very time in life when this illusion had not been destroyed by the realities of life, and without the experience which might have taught the futility of idle dreams and theories, he was elected to the states-general. At Paris he was not understood till he met with his audience of fellow-disciples of Rousseau at the Jacobin Club. His fanaticism won him supporters; his singularly sweet and sympathetic voice gained him hearers; and his upright life attracted the admiration of all. As matters approached nearer and nearer to the terrible crisis, he failed, except in the two instances of the question of war and of the king's trial, to show himself a statesman, for he had not the liberal views and practical instincts which made Mirabeau and Danton great men. His admission to the Committee of Public Safety gave him power, which he hoped to use for the establishment of his favourite theories, and for the same purpose he acquiesced in and even heightened the horrors of the Reign of Terror. It is here that the fatal mistake of allowing a theorist to have power appeared:

Billaud-Varenne systematized the Terror because he believed it necessary for the safety of the country; Robespierre intensified it in order to carry out his own ideas and theories. Robespierre's private life was always respectable: he was always emphatically a gentleman and man of culture, and even a little bit of a dandy, scrupulously honest, truthful and charitable. In his habits and manner of life he was simple and laborious; he was not a man gifted with flashes of genius, but one who had to think much before he could come to a decision, and he worked hard all his life.

On the family of Robespierre see A. J. Paris in the *Mémoires* (2nd series, vol. iii.) of the Academy of Arras; the *Œuvres de Maximilien Robespierre* (3 vols., 1840), published by Laponneraye with preface by Armand Carrel, contain some of his speeches and the memoirs of Charlotte Robespierre on her brothers. The standard work on Robespierre's career is Ernest Hamel, *Histoire de Robespierre d'après des papiers de famille, les sources originales et des documents entièrement inédits* (3 vols., 1865–67). After the appearance of the first volume, the publisher refused to proceed for fear of prosecution until compelled to do so by the author. Another edition with a different title appeared in 1878. See also Ch. d'Hericault, *La Révolution de Thermidor* (2nd ed., 1878); Karl Brunnemann, *Maximilian Robespierre* (Leipzig, 1880); F. A. Aulard, *Les Orateurs de l'Assemblée Constituante* (1882); M. de Lescure, "Le Roman de Robespierre," in *La Société française pendant la Terreur* (1882); E. Hamel, *La Maison de Robespierre* (1895); Hilaire Belloc, *Robespierre* (1901); and C. F. Warwick, *Robespierre and the French Revolution* (1909). Many of the books which have been written about Robespierre are most untrustworthy, and the picture of him given by Thomas Carlyle in his *French Revolution* is unjust.

ROBILANT, CARLO FELICE NICOLIS, Conte di (1826–1888), Italian statesman and diplomat, was a native of Turin. He entered the army, and lost his left hand at Novara, where he was aide-de-camp to Charles Albert, king of Piedmont. He fought in 1859, and reached the grade of general in the Austrian campaign of 1866, after which he served on the delimitation commission. He was chief of the Military Academy, and in 1867 was made prefect of Ravenna to suppress political disorder. He was defeated at Turin in the elections for the Chamber in 1870, and was sent in 1871 as minister plenipotentiary to Vienna, where he subsequently became ambassador. He was connected with the Prussian nobility by his mother, and he married an Austrian, a daughter of Prince Edmund Clary-Aldringen. In spite of the active share he had taken in driving Austria from Italy, he was a *persona grata* at Vienna, and his policy was steadily directed to an alliance between the two powers. This was accomplished by the secret terms of the Triple Alliance in 1882. He was recalled to Rome in 1885 to become minister for foreign affairs in the Depretis cabinet. Robilant's independent attitude as foreign minister secured greater consideration for Italy from her allies, but he did not adapt himself to the exigencies of domestic politics, and his excessive unpopularity contributed to the downfall of the ministry on the 7th of February 1887, consequent on an adverse vote on the Massawa question. Before leaving office, he completed the negotiations for the renewal of the Triple Alliance, and for its extension to cover Anglo-Italian co-operation in the Mediterranean. In the new Depretis-Crispi administration Robilant was not included. He was sent to London as ambassador in the next year, but died two months after his arrival, on the 17th of October 1888.

ROBIN HOOD, English legendary hero. The oldest mention of Robin Hood at present known occurs in the second edition—what is called the B text—of *Piers the Plowman*, the date of which is about 1377. In passus v. of that poem the figure of Sloth is represented as saying—

> "I can nouȝte perfitly my pater-noster, as the prest it syngeth:
> But I can rymes of Robyn Hood and Randolf Erle of Chestre."

He is next mentioned by Andrew of Wyntoun in his *Original Chronicle of Scotland*, written about 1420—

> "Lytel Jhon and Robyne Hude
> Waythmen ware commendyd gude;
> In Yngilwode and Barnysdale
> Thai oysyd all this time [*c.* 1283] thare trawale";

next by Walter Bower in his additions of Fordun's *Scotichronicon* about 1450—

> "Hoc in tempore [1266] de exheredatis et bannitis surrexit et caput erexit ille famosissimus sicarius Robertus Hode et Littill Johanne cum eorum complicibus, de quibus stolidum vulgus hianter in comoediis et tragoediis prurienter restum faciunt et super ceteras romancias, mimos, er bardanos cantitare delectantur."

Of his popularity in the latter half of the 15th and in the 16th centuries there are many signs. Just one passage must be quoted as of special importance because closely followed by R. Grafton, J. Stow and W. Camden. It is from John Mair's *Historia Majoris Britanniae tam Angliae quam Scotiae*, which appeared in 1521—

> "Circa haec tempora [Ricardi Primi], ut auguror, Robertus Hudus Anglus et Parvus Joannes latrones famatissimi in nemoribus latuerunt, solum opulentorum virorum bona deripientes. Nullum nisi eos invadentem vel resistentem pro suarum rerum tuitione occiderunt. Centum sagittarios ad pugnam aptissimos Robertus latrociniis aluit, quos 400 viri fortissimi invadere non audebant. *Rebus hujus Roberti gestis tota Britannia in cantibus utitur.* Faeminam nullam opprimi permisit nec pauperum bona surripuit, verum eos ex abbatum bonis sublatis opipare pavit. Viri rapinam improbo, sed latronum omnium humanissimus et princeps erat."

In the Elizabethan era and afterwards mentions abound; see the works of Shakespeare, Sidney, Ben Jonson, Drayton, Warner, A. Munday, Camden, Stow, Braithwaite, Fuller, &c.

Of the ballads themselves, *Robin Hood and the Monk* is possibly as old as the reign of Edward II. (see Thomas Wright's *Essays on England in the Middle Ages*, ii. 174); *Robin Hood and the Potter* and *Robyn and Gandelyn* are certainly not later than the 15th century. Most important of all is *A Lytell Geste of Robyn Hode*, which was first printed about 1510 (see A. W. Pollard's *Fifteenth Century Prose and Verse*, Westminster, 1903). This is evidently founded on older ballads; we read in *The Seconde Fytte*, ll. 176 and 177—

> "He wente hym forthe full mery syngynge,
> As men have told in tale."

In fact, it does for the Robin Hood cycle what a few years before Sir Thomas Malory had done for the Arthurian romances—what in the 6th century B.C. Peisistratus is said to have done for the Homeric poems.

These are the facts about him and his balladry. Of conjectures there is no end. He has been represented as the last of the Saxons—as a Saxon holding out against the Norman conquerors so late as the end of the 12th century (see Augustin Thierry's *Norman Conquest*, and compare Sir Walter Scott's *Ivanhoe*). J. M. Gutch maintains that he was a follower of Simon de Montfort. The Rev. Joseph Hunter associated him with the rebel earl of Lancaster of Edward II.'s time. This scholar in a brochure published in 1852 produced evidence from the exchequer accounts and the court rolls of the manor of Wakefield showing that a "Robyn Hod" and a "Robertus Hood" were living in this reign. The series of coincidences to which he points is undoubtedly striking, but had failed to convince most critics. Professor F. J. Child dismisses his inferences as "ludicrous."

For our part, we are not disinclined to believe that the Robin Hood story has some historical basis, however fanciful and romantic the superstructure. We parallel it with the Arthurian story, and hold that, just as there was probably a real Arthur, however different from the hero of the trouvères, so there was a real Hood, however now enlarged and disguised by the accretions of legend. That Charlemagne and Richard I. of England became the subjects of romances does not prevent our believing in their existence; nor need Hood's mythical life deprive him of his natural one. Sloth in Langland's poem couples him, as we have seen, with Randle, earl of Chester; and no one doubts this nobleman's existence because he had "rymes" made about him. We believe him to have been the third Randle (see Bishop Percy's Folio MS., ed. Hales and Furnivall, i. 260). And possibly enough Hood was contemporary with that earl, who "flourished" in the reigns of Richard I., John and Henry III. Wyntoun and Mair, as we have seen, assign him to that period. It is impossible to believe with Hunter that he lived so late as Edward II.'s reign. This would leave no time for the growth of his myth; and his myth was, as is evident from what we have already said and quoted, full-grown in the first half of the 14th century. Whatever may have been the immediate genesis of the myth—and it may well be sought in the heartless forest laws—its vitality was assured by the English love of archery and historical repetition. In the rolls of parliament of 1437 mention is made of Piers Venables, a robber who took to the woods "like as it had been Robin Hood and his meyné." There are indications that Robin was identified or confused with Robert Locksley, a manslayer of Bradfield in Hallamshire. The former is said to have been born in "Merry sweet *Locksley* town."

But whether he lived or not, and whenever he lived, it is certain that many mythical elements are contained in his story. Both his name and his exploits remind us of the woodland spirit Robin Goodfellow and his merry pranks. He is fond of disguising himself, and devoted to fun and practical jokes. These frolics suggest the wind. "The whole story," says Mr H. Bradley, "is ultimately derived from the great Aryan sun-myth. Robin Hood is Hod, the god of the wind, a form of Woden; Maid Marian is Morgen, the dawn-maiden; Friar Tuck is Toki, the spirit of frost and snow."

The name Robin (a French form from Rob, which is of course a short form for Robert) would serve both for "the shrewd and knavish sprite"—the German Knecht Ruprecht (see Grimm's *Teut. Myth.* p. 504, trans. Stallybrass)—and for the bandit (see "Roberdes Knaues" in the Prologue of *Piers the Plowman*, l. 44, and the note in Warton's *Hist. of Eng. Poet.* ii. 95, ed. 1840). *Hood* is a very usual dialectal form of *wood*; and in his play *Edward the First*, George Peele actually alludes to the bandit as "Robin of the Wood." Mr Gutch thus explains the origin of the name. It is still a common enough surname, of which the earlier shape is Odo (see "Houdart," &c., in Larchey's *Dict. des Noms*); notice, too, the name Hudson. But it also reminds one of the German familiar spirit Hudekin, or possibly of the German Witikind (see Wright's *Essays on the Middle Ages*, ii. 207). Mr Sidney Lee suggests that Robin was a forest elf so called because elves wore hoods (see *Dict. of National Biography*, sub. "Robin Hood"). How certain it is that the Robin Hood story attracted to it and appropriated other elements is illustrated by its subsequent history—its history after the 14th century. Thus later on we find it connected with the Morris dance; but the Morris dance was not known in England before the 16th century or late in the 15th. The Friar Tuck and Maid Marian elements have been thought to have been introduced for the purpose of these performances, which were held on May-day and were immensely popular (see Latimer's *Frutefull Sermons* (London, 1571), p. 75; also *Paston Letters*, ed. J. Gairdner, iii. 89). After 1615, the date of the pageant prepared for the mayoralty of Sir John Jolles, draper, by Anthony Munday and entitled *Metropolis Coronata*, a peer was imported into it, and the yeoman of the older version was metamorphosed into the earl of Huntingdon, for whom in the following century William Stukeley discovered a satisfactory pedigree! The earl of Huntingdon was probably a nickname for a hunter. At last, with the change of times, the myth ceased growing. Its rise and development and decay deserve a more thorough study than they have yet received.

What perhaps is its greatest interest as we first see it is its expression of the popular mind about the close of the middle ages. Robin Hood is at that time the people's ideal as Arthur is that of the upper classes. He is the ideal yeoman as Arthur is the ideal knight. He readjusts the distribution of property: he robs the rich and endows the poor. He is an earnest worshipper of the Virgin, but a bold and vigorous hater of monks and abbots. He is the great sportsman, the incomparable archer, the lover of the greenwood and of a free life, brave, adventurous, jocular, open-handed, a protector of women. Observe his instructions to Little John—

> "Loke ye do no housbonde harme
> That tylleth with his plough;
> No more ye shall no good yeman
> That walketh by grene wode shawe;
> Ne no knyght ne no squyer
> That wolde be a good felawe:
> These bysshoppes and thyse archebysshoppes
> Ye shall them bete and bynde;
> The hye sheryfe of Notynghame
> Hym holde in your mynde."

And we are told—

> "Robin loved our dere lady;
> For doute of dedely synne
> Wolde he never do company harme
> That ony woman was ynne."

See also Drayton's *Polyolbion*, Song xxvi. The story is localized in Barnsdale and Sherwood, *i.e.* between Doncaster and Nottingham. In Yorkshire, Nottinghamshire and Lincolnshire a host of place-names testify to the popularity of the Robin Hood legend—Robin Hood's Bay, Robin Hood's Cave, Robin Hood's Chase, Robin Hood's Cup (a well), Robin Hood's Chair, Robin Hood's Pricks, and many more.

The best collections of Robin Hood poems are those of Ritson (8vo, 1795) and Gutch (2nd ed., 1847), and of Professor Child in the 5th volume of his invaluable *English and Scotch Popular Ballads* (Boston, 1888). See also Professor F. B. Gummere's *Old English Ballads* (Boston, 1894). The versions in the Percy Folio (edited by Hales and Furnivall, 1867, vol. i.) are unhappily mutilated; but they should be consulted, for they are all more or less unique, and that on "Robin Hoode his death" is of singular interest. The literary and artistic value of many of the Robin Hood ballads cannot be pronounced considerable, but eight of them attain the high-water mark of their class. *Robin Hood and the Monk* and *Guy of Gisborne* are perhaps the best. There is, however, real vigour and force in this fragment on the hero's death. The earliest "Garland" was printed in 1670, and in 1678 appeared a prose version which was reprinted by W. J. Thoms in his *Early English Prose Romances* (vol. ii., 1858). Mr Lee's memoir in the *Dictionary of National Biography* is extremely erudite, and two valuable articles, contributed by Sir Edward Brabrook to the *Antiquary* for June and July 1906, might be consulted. See also Stukeley, *Paleographia Britannica*, No. i. 115; Thierry, *Conquête de l'Angleterre* (1830); and J. Hunter's *Great Hero of the Ancient Minstrelsy of England, Robin Hood* (1852). (J. W. H.; F. J. S.)

ROBIN HOOD'S BAY, a seaside resort in the Whitby parliamentary division of the North Riding of Yorkshire, England, 6½ m. S.E. of Whitby by a branch of the North-Eastern railway. The bay itself is a shallow indentation of the coast, and is fringed with high picturesque cliffs, breached in places by steep-sided narrow gullies. The old fishing village overhangs the cliffs, while the more modern watering-place is mostly built a little inland. A fine stretch of sandy shore is exposed at low tide.

ROBINIA, or LOCUST-TREE, a genus of about six species native of the United States and Mexico, belonging to the sub-order Papilionaceae of the great family Leguminosae. It was named by Linnaeus in honour of Jean Robin (1550–1629), herbalist to the king of France and his son and successor, Vespasien Robin (1579–1660) by whom the best-known species, *Robinia Pseudacacia*, was introduced into Europe, in the Jardin du Roi at Paris in 1636. This tree, the bastard acacia, or false acacia, and often called erroneously acacia, is now widely cultivated as an ornamental tree in this country and on the European continent. It grows from 30 to 60 ft. high, and bears long, graceful, compound leaves with 9 to 17 bright green oblong leaflets, and white fragrant flowers in loose pendulous racemes, recalling the laburnum in habit. There are many varieties in English gardens varying in the method of growth, the presence or absence of thorns (persistent spinose stipules) on the branches and the colour of the flower.

In the eastern United States, where it is native, it grows from 70 to 80 ft. high with a trunk 3 or 4 ft. in diameter. It is one of the most valuable timber trees of the American forest. The wood is heavy, very hard, strong, close-grained and durable, and is extensively used in shipbuilding, also for posts and other purposes where durability in contact with the ground is essential.

Like many plants of the same family, the leaves show sleep movement, folding together at night and in dull or wet weather; for this reason it is less injurious than many trees to plants growing in its shade, as the rain is able more quickly to reach the ground beneath.

ROBINS, BENJAMIN (1707–1751), English man of science and engineer, was born at Bath in 1707. His parents were Quakers in poor circumstances, and gave him very little education. Having come to London by the advice of Dr Henry Pemberton (1694–1771), who had recognized his talents, he for a time maintained himself by teaching mathematics, but soon devoted himself to engineering and the study of fortification. In particular he carried out an extensive series of experiments in gunnery, embodying his results in his famous treatise on *New Principles in Gunnery* (1742), which contains a description of his ballistic pendulum (see CHRONOGRAPH). Robins also made a number of important experiments on the resistance of the air to the motion of projectiles, and on the force of gunpowder, with computation of the velocities thereby communicated to projectiles. He compared the results of his theory with experimental determinations of the ranges of mortars and cannon, and gave practical maxims for the management of artillery. He also made observations on the flight of rockets, and wrote on the advantages of rifled barrels. His work on gunnery was translated into German by L. Euler, who added to it a critical commentary of his own. Of less interest nowadays are Robins's more purely mathematical writings, such as his *Discourse concerning the Nature and Certainty of Sir Isaac Newton's Methods of Fluxions and of Prime and Ultimate Ratios* (1735), "A Demonstration of the Eleventh Proposition of Sir Isaac Newton's Treatise of Quadratures" (*Phil. Trans.*, 1727), and similar works. Besides his scientific labours Robins took an active part in politics. He wrote pamphlets in support of the opposition to Sir Robert Walpole, and was secretary of a committee appointed by the House of Commons to inquire into the conduct of that minister. He also wrote a preface to the *Report on the Proceedings of the Board of General Officers on their Examination into the Conduct of Lieutenant-General Sir John Cope*, in which he gave an apology for the battle of Prestonpans. In 1749 he was appointed engineer-general to the East India Company, and went out to superintend the reconstruction of their forts; but his health soon failed, and he died at Fort St David on the 29th of July 1751.

His works were published in two volumes in 1761.

ROBINSON, EDWARD (1794–1863), American Biblical scholar, was born in Southington, Connecticut, on the 10th of April 1794, the son of William Robinson (1754–1825), minister of the Congregational Church of Southington. He graduated in 1816 at Hamilton College. In 1821 he came under the influence and teaching of Moses Stuart, the second edition of whose *Hebrew Grammar* he helped to prepare for the press in 1823, and through whom he was appointed in the same year instructor in Hebrew in Andover Seminary. With Stuart he translated in 1825 the first edition of Winer's *Grammar of New Testament Greek*; and alone he translated Wahl's *Clavis Philologica Novi Testamenti* (1825). In 1826–30 he studied in Germany, especially at Halle, under Gesenius, Tholuck and Rödiger, and at Berlin, under Neander. He was professor (extraordinary) of sacred literature and librarian at Andover in 1830–33, resigning because of dangerous epileptic attacks; and in 1831–35 he edited the *Biblical Repository*, which he founded and carried on very largely by his own contributions, assisted somewhat by his young German wife, Theresa Albertina Luise (1797–1869), the daughter of Professor Ludwig Heinrich von Jakob of Halle, a linguist of considerable ability, and a writer (in her early years under the pseudonym "Talvi") of essays and stories. In 1837 he accepted the professorship of Biblical literature in Union Theological Seminary, and left America for three years of study in Palestine and Germany, the fruit of which, his *Biblical Researches*, published in 1841, brought him the gold medal of the Royal Geographical Society in 1842. A second volume of *Researches* appeared in 1856. His plans to sum up his important topographical studies in a work on Biblical geography were cut short by cataract in 1861 and by his death in New York City on the 27th of January 1863. A great Biblical scholar and exegete, Robinson must be considered the pioneer and father of Biblical geography—his *Biblical Researches*, supplemented by the *Physical Geography of the Holy Land* (1865), were based on careful personal exploration and tempered by a thoroughly critical spirit, which was possibly at times too sceptical of local tradition. Of scarcely less value in their day were his *Greek Harmony of the Gospels* (1845 and often) and his *Greek and English Lexicon of the New Testament* (1836; revised 1847 and 1850). He established in 1843 and edited for some years the *Bibliotheca Sacra* (in which the *Biblical Repository* was merged in 1852), for which he wrote until 1855.

See Henry B. Smith and Roswell D. Hitchcock, *The Life, Writings and Character of Edward Robinson* (New York, 1863); a biography of Mrs Robinson was published, with a collection of her stories, in Leipzig, in 1874.

ROBINSON, HENRY CRABB (1777–1867), English journalist and diarist, the son of a tanner, was born at Bury St Edmunds on the 13th of March 1775. In 1796 he entered the office of a solicitor in London, but two years later, having inherited a sum of money sufficient to give him a small yearly income, he started in 1800 upon a tour on the Continent, travelling chiefly in Germany and Bohemia. In 1802 he became a student at the university of Jena, where he remained until his return to England in 1805. After vain endeavours to obtain a post in the diplomatic service, he was appointed foreign correspondent for *The Times* at Altona. His letters, "From the Banks of the Elbe," were published in this newspaper during 1807, and on his return he became its foreign editor. In 1808 at the outbreak of the Peninsular War he was sent out as special war correspondent—an innovation in English journalism—for *The Times* to Spain. There he witnessed Sir John Moore's retreat at Corunna. After his return to England he read for the bar at the Middle Temple, and from 1813 to 1828 he practised as a barrister, retiring as soon as he had acquired a modest competence. He is remembered chiefly as the friend of Lamb, Coleridge, Wordsworth and Southey. He was a great conversationalist, and his breakfast parties rivalled those of Samuel Rogers. He died in London on the 5th of February 1867.

His *Diary* of 35 volumes, his *Journals* of 30 volumes, and his *Letters and Reminiscences* in 36 volumes, contain vivid pictures drawn by an acute and sympathetic observer who had exceptional opportunities of studying contemporary celebrities. They are preserved at Dr Williams's Library in Gordon Square, London. Crabb Robinson seems to have intended to edit these for publication, but except for a meagre selection edited by Thomas Sadler and entitled *The Diary, Reminiscences and Correspondence of H. Crabb Robinson* (1869), they have never been reprinted. Crabb Robinson was one of the founders of the Athenaeum Club and of University College, London.

ROBINSON, JOHN (1650–1723), English diplomatist and prelate, a son of John Robinson (d. 1651), was born at Cleasby, near Darlington, on the 7th of November 1650. Educated at Brasenose College, Oxford, he became a fellow of Oriel College, and about 1680 chaplain to the British embassy to Stockholm, and remained in Sweden for nearly thirty years. During the absence of the minister, Philip Warwick, Robinson acted as resident and as envoy extraordinary, and he was thus in Sweden during a very interesting and important period, and was performing diplomatic duties at a time when the affairs of northern Europe were attracting an unusual amount of attention. Among his adventures not the least noteworthy was his journey to Narva with Charles XII. in 1700. In 1709 Robinson returned to England, and was appointed dean of Windsor and of Wolverhampton; in 1710 he was elected bishop of Bristol, and among other ecclesiastical positions he held that of dean of the Chapel Royal. In August 1711 he became lord privy seal, this being, says Lord Stanhope, "the last time that a bishop has been called upon to fill a political office." In 1712 the bishop represented England at the important congress of Utrecht, and at first plenipotentiary he signed the treaty of Utrecht in April 1713. Just after his return to England he was chosen bishop of London in succession to Henry Compton. He died at Hampstead on the 11th of April 1723, having been a great benefactor to Oriel College. Robinson wrote an *Account of Sweden:*

together with an Extract of the History of that Kingdom. By a person of note who resided many years there (London, 1695). This was translated into French (Amsterdam, 1712), and in 1738 was published with Viscount Molesworth's *Account of Denmark in 1692.* Some of his letters are among the Strafford papers in the British Museum.

A member of the same family was Sir Frederick Philipse Robinson (1763–1852), a Virginian soldier, who fought for England during the American War of Independence. On the conclusion of peace he went to England, and in 1813 and 1814 he commanded a brigade under Wellington in Spain. Afterwards he was governor of Tobago, and he became a general in 1841. He died at Brighton on the 1st of January 1852.

ROBINSON, JOHN (1575–1625), English Nonconformist divine, was born probably in Lincolnshire or Nottinghamshire about 1575. He seems to have studied at Cambridge, and to have been influenced by William Perkins. He took orders and held a curacy in Norwich, but was attracted by Puritan doctrines, and finally associated himself with a Congregation meeting at Gainsborough (where the "John Robinson Memorial Church" bears witness to his work). In 1606 the members divided into two societies, Robinson becoming minister of the one which made its headquarters at Scrooby, a neighbouring village. The increasing hostility of the authorities towards nonconformity soon forced him and his people to think of flight, and, not without difficulty, they succeeded in making their escape in detachments to Holland. Robinson settled in Amsterdam in 1608, but in the following year removed, with a large contingent, to Leiden, where he ministered to a community whose numbers gradually grew from one hundred to three hundred. In 1620 a considerable minority of these sailed for England in the "Speedwell," and ultimately crossed the Atlantic in the "Mayflower"; it was Robinson's intention to follow as soon as practicable, along with the rest of his flock, but he died before the plan could be carried out, on the 1st of March 1625.

In the early stages of the Arminian controversy he took the Calvinistic side, and even engaged in a public disputation with the famous Episcopius. He bore a high reputation even among his ecclesiastical opponents, and one of them (Robert Baillie) calls him "the most learned, polished and modest spirit that ever that sect enjoyed." He was large-minded and eminently reasonable in spirit, recognizing parish assemblies where "the pure word and discipline" prevailed as true churches of God. His sound judgment is seen in the way in which he adjusted the relations of elders and church—the most delicate practical problem of Congregationalism.

Amongst his publications may be mentioned *Justification of Separation from the Church* (1610), *Apologia Brownistarum* (1619), *A Defence of the Doctrine propounded by the Synod of Dort* (1624), and a volume of *Essays, or Observations Divine and Moral,* printed in 1625. His Works (with one exception, *A Manumission to a Manduction,* since published by the Massachusetts Historical Society, ser. iv., vol. i.), including a memoir, were reprinted by R. Ashton in three vols. in 1851. A summary of their contents is given in G. Punchard, *History of Congregationalism* (New York, 1867), iii. 300–344. See further CONGREGATIONALISM, and the literature there cited; also O. S. Davis, *John Robinson* (Hartford, Connecticut, 1897).

ROBINSON, SIR JOHN BEVERLEY, BART. (1791–1863), Canadian statesman and jurist, was the son of Christopher Robinson (1764–1798), one of the band known as United Empire Loyalists, who came to Canada at the conclusion of the American Revolution. He was born at Berthier, Quebec, on the 26th of July 1791, and studied under Dr John Strachan, by whom his religious and political ideas were much influenced. He served with distinction at the beginning of the war of 1812, and later in the war was appointed acting attorney-general of Upper Canada. In 1815 he visited England and read law at Lincoln's Inn.

From 1818 till 1829 he was the head of the Tory party in Upper Canada (the so-called "Family Compact"). In 1829 he became chief justice of Upper Canada, which position he held till shortly before his death on the 31st of January 1863. Not one of his decisions was ever reversed on appeal. In 1824 and again in 1839 he strongly advocated a federal union of British North America, and in 1839 opposed in *Canada and the Canada Bill* the legislative union of the two Canadas proposed by Lord Durham. In 1854 he was created a baronet of the United Kingdom and in 1855 a D.C.L. of Oxford University. His unbending Toryism rendered him a reactionary in politics, but his bitterest opponents admitted his sincerity and patriotism.

Several of his sons rose to eminence, John Beverley Robinson (1820–1896) becoming a member of the Dominion parliament and lieutenant-governor of Ontario (1880–1887). Christopher Robinson (1828–1905) was for many years the acknowledged leader of the Canadian Bar.

His *Life*, by his son, Major-General C. W. Robinson, C.B. (Toronto and London, 1904), gives a very favourable picture of the fine old colonial gentleman and loyalist. For a less favourable view see J. C. Dent, *Canadian Portrait Gallery*, vol. iv. (Toronto, 1881).

ROBINSON, JOHN THOMAS ROMNEY (1792–1882), Irish astronomer and physicist, was born in Dublin on the 23rd of April 1792. He studied at Trinity College, Dublin, and obtained a fellowship in 1814; for some years he was deputy professor of natural philosophy, until in 1821 he obtained the college living of Enniskillen. In 1823 he was appointed astronomer of the Armagh observatory, with which he (from 1824) combined the living of Carrickmacross, but he always resided at the observatory, engaged in researches connected with astronomy and physics, until his death on the 28th of February 1882.

Robinson published a number of papers in scientific journals, and the Armagh catalogue of stars (*Places of 5345 Stars observed from 1828 to 1854 at the Armagh Observatory,* Dublin, 1859), but he is best known as the inventor (1846) of the cup-anemometer for registering the velocity of the wind.

ROBINSON, SIR JOSEPH BENJAMIN (1845–), South African mine-owner, was born at Cradock, Cape Colony, in 1845. At the age of sixteen he started business as a general trader, wool-buyer and stock-breeder, but on the discovery of diamonds in South Africa in 1867 he hastened to the Vaal river district, where, by purchasing the stones from the natives and afterwards by buying diamond-bearing land, notably at Kimberley, he soon acquired a considerable fortune. He was mayor of Kimberley in 1880, and for four years was a representative of Griqualand West in the Cape parliament. On the discovery of gold in the Witwatersrand district in 1886, Robinson purchased the Langlaagte and Randfontein estates. His views as to the westerly trend of the main gold-bearing reef were entirely contrary to the bulk of South African opinion at the time, but events proved him to be correct, and the enormous appreciation in value of his various properties made him one of the richest men in South Africa. As a Rand capitalist he stood aloof from combinations with other gold-mining interests, and took no part in the Johannesburg reform movement, maintaining friendly relations with President Kruger. He claimed that it was as the result of his representations after the Jameson Raid that Kruger appointed the Industrial Commission of 1897, whose recommendations—had they been carried out—would have remedied some of the Uitlander grievances. In 1908 he was created a baronet.

ROBINSON, MARY ["Perdita"] (1758–1800), English actress and author, was born in Bristol on the 27th of November 1758, the daughter of a captain of a whaler named Darby. In 1774 she was married to Thomas Robinson, a clerk in London, where her remarkable beauty brought her many attentions; and when, after two years of fashionable life, her husband was arrested for debt, she shared his imprisonment. She had been a precocious child, encouraged to write verses, and while in King's Bench prison she completed the collection published in two volumes in 1775. On her release, thanks to Garrick, she secured an engagement at Drury Lane, making a successful first appearance as Juliet in 1776. On the 3rd of December 1779 she was Perdita in Garrick's version of *The Winter's Tale,* and her beauty so captivated George, prince of Wales (afterwards

George IV.), then in his eighteenth year, that he began a correspondence with her, signing himself "Florizel." She was for about two years his mistress, but he then deserted her, even dishonouring his bond for £20,000, payable when he came of age, and left her to obtain a pension of £500 in exchange for it from Charles James Fox. Owing to the hostility of public opinion, she feared to return to the stage, but she published some more volumes of her writings. There are numerous charming portraits of "Perdita"; two in the Wallace Collection, by Reynolds and by Gainsborough, reveal "her grave, refined beauty." Hoppner, Cosway and Romney also painted her.

See *Memoirs of Mary Robinson, "Perdita,"* with introduction and notes by J. F. Molloy (1894).

ROBINSON, THEODORE (1852–1896), American artist, was born at Irasburg, Vermont, in 1852. He was a pupil of J. L. Gérôme and Carolus-Duran in Paris, and worked with Claude Monet. He received the Webb Prize in 1890 for his "Winter Landscape," and the Shaw Fund in 1892 for his "In the Sun," a study of a peasant girl. He became a member (1881) of the Society of American Artists. He died in New York City on the 2nd of April 1896.

ROB ROY (1671–1734), the popular designation of a famous Highland outlaw whose prowess is the theme of one of Sir Walter Scott's novels, was by descent a Macgregor, being the younger son of Donald Macgregor of Glengyle, lieutenant-colonel in the army of James II., by his wife, a daughter of William Campbell of Gleneaves. He received the name Roy from his red hair, and latterly adopted Campbell as his surname on account of the acts proscribing the name of his clan. Though in stature not much above the middle height, he was so muscular and thickly set that few were his equals in feats of strength, while the unusual length of his arms gave him an extraordinary advantage in the use of the sword. His eyes were remarkably keen and piercing, and with his whole expression formed an appropriate complement to his powerful physical frame. He inherited a small property on the Braes of Balquhidder, and at first devoted himself to the rearing of cattle. Having formed a band of armed clansmen, he obtained, after the accession of William III., a commission from James II. to levy war on all who refused to acknowledge him as king, and in the autumn of 1691 made a descent on Stirlingshire to carry off the cattle of Lord Livingstone, when, being opposed by the villagers of Kippen, he also seized the cattle from all the byres of the village. Shortly afterwards he married Helen Mary, daughter of Macgregor of Comar. On the death of Gregor Macgregor, the chief of the clan, in 1693 he managed, though not the nearest heir, to get himself acknowledged chief, obtaining control of the lands stretching from the Braes of Balquhidder to the shores of Loch Lomond, and situated between the possessions of Argyll and those of Montrose. To assist in carrying on his trade as cattle-dealer he borrowed money from the 1st duke of Montrose, and, being unable to repay it, he was in 1712 evicted from his property and declared an outlaw. Taking refuge in the more inaccessible Highlands, Rob Roy from this time forward supported himself chiefly by depredations committed in the most daring manner on the duke and his tenants, all attempts to capture him being unsuccessful. During the rebellion of 1715, though nominally siding with the Pretender, he did not take an active part in the battle of Sheriffmuir except in plundering the dead on both sides. He was included in the Act of Attainder; but, having for some time enjoyed the friendship of the duke of Argyll, he obtained, on making his submission at Inveraray, a promise of protection. He now established his residence at Craigroyston, near Loch Lomond, whence for some time he levied blackmail as formerly upon Montrose, escaping by his wonderful address and activity every effort of the English garrison stationed at Inversnaid to bring him to justice. Ultimately, through the mediation of Argyll, he was reconciled to Montrose, and in 1722 he made submission to General Wade; he was carried off, and imprisoned in Newgate, and in 1727 was pardoned just as he was to be transported to Barbados. He then returned to Scotland. According to a notice in the *Caledonian Mercury* he died at Balquhidder on the 28th of December 1734. He was buried in Balquhidder churchyard.

The best lives are K. Macleay, *Historical Memoirs of Rob Roy* (1818; new ed., 1881); A. H. Millar, *Story of Rob Roy* (1883). See also Sir W. Scott's introduction to the novel *Rob Roy*. An early account, *The Highland Rogue*, &c. (1723), is ascribed to Defoe.

ROBSART, the maiden name of Lady Amy Dudley (1532–1560), wife of Lord Robert Dudley, afterwards earl of Leicester. She was the daughter of Sir John Robsart of Norfolk, and was married to Lord Robert on the 4th of June 1550. The marriage was apparently arranged by the family for business reasons, and there is no ground for supposing that it was a love match, or that she was beautiful. Her attraction lay in her estate, which was a provision for a younger son. During the early years of the marriage her husband was entangled in the rebellion of his family against Queen Mary, and was imprisoned in the Tower. She visited him there, and acted for his interests. After his release she saw little of him. When Elizabeth became queen in 1559 Lord Robert was soon known to be her favourite, and it was believed that she would marry him if he were free. His wife never came to court and was never in his company. Stories were set about to the effect that she was suffering from cancer and would soon die. Quadra, the Spanish ambassador, reported to the king of Spain that the queen had repeated this rumour to him. In 1560 she went by her husband's directions to Cumnor Place, a house near Oxford, rented by his agent Anthony Forster or Forrester, member of parliament for Abingdon. Here she was found lying dead on the floor of the hall on the 8th of September 1560 by her servants, whom she had allowed to go to Abingdon Fair. The circumstances of her death never have been, and now cannot be cleared up. A coroner's jury, which her husband did his best to pack and influence, attributed her end to accident. There is no evidence against Dudley, unless it be evidence that he was a most unscrupulous man, and that he was generally believed to have murdered several other persons who stood in his way.

See G. Adlard, *Amy Robsart and Leycester* (London, 1870), and W. Rye, *The Murder of Amy Robsart* (London, 1885).

ROBSON, STUART (1836–1903), American actor, whose real name was Robson Stuart, was born in Annapolis, Maryland, on the 4th of March 1836. An unintentionally humorous appearance in a serious part in 1852 showed him that his forte was comedy; and in partnership with W. H. Crane from 1877 to 1889 he was very successful as a comedian, *The Henrietta* being one of their best productions. He died on the 29th of April 1903. His wife, May Robson, also became well known as an actress.

ROBY, HENRY JOHN (1830–   ), English classical scholar and writer on Roman law, was born at Tamworth on the 12th of August 1830. He was educated at St John's College, Cambridge (senior classic, 1853; fellow, 1854). From 1866 to 1868 he was professor of jurisprudence at University College, London, and from 1872 to 1874 commissioner of endowed schools. From 1890 to 1895 he was member of parliament in the Liberal interest for the Eccles division of Lancashire. The book by which he is perhaps best known is his *Grammar of the Latin Language from Plautus to Suetonius*, a storehouse of illustrative quotations from Latin literature, but his most important works deal with Roman law—*Introduction to Justinian's Digest* (1884) and *Roman Private Law* (1902).

ROC, or more correctly Rukh, a fabulous bird of enormous size which carries off elephants to feed its young. The legend of the roc, familiar to every one from the *Arabian Nights*, was widely spread in the East; and in later times the home of the monster was sought in the direction of Madagascar, whence gigantic fronds of the *Raphia* palm very like a quill in form appear to have been brought under the name of roc's feathers (see Yule's *Marco Polo*, bk. iii. ch. 33, and *Academy*, 1884, No. 620). Such a feather was brought to the Great Khan, and we read also of a gigantic stump of a roc's quill being brought to Spain by a merchant from the China seas (Abu Ḥāmid of Spain, in Damīrī, *s.v.*). The roc is hardly different from the Arabian *ʿankā* (see PHOENIX); it is also identified with the Persian *sīmurgh*, the bird which figures in Firdausi's epic as the foster-father of the hero Zal, father of Rustam. When we go farther back into Persian antiquity we find an immortal bird, *amru*, or (in the *Minōi-khiradh*) *sīnamrū*, which shakes the ripe fruit from the mythical tree that bears the seed of all useful things. Sīnamrū and sīmurgh seem to be the same word. In Indian legend the *garuḍa* on which Vishnu rides is the king of birds (Benfey, *Pantschatantra*, iii. 98). In the Pahlavi translation of the Indian story as represented by the Syrian *Kalīlag and Damnag* (ed. Bickell, 1876), the sīmurgh takes the place of the garuḍa, while Ibn al-Moḳaffaʿ (*Calila et Dimna*, ed. De Sacy, p. 126) speaks instead of the ʿanḳā. The later Syriac, curiously enough, has *behmoth*,—apparently the behemoth of Job transformed into a bird.

For a collection of legends about the roc, see Lane's *Arabian Nights*, chap. xx. notes 22, 62, and Yule, *ut supra*. Also see Bochart, *Hieroz*, bk. vi. ch. xiv.; Damīrī, i. 414, ii. 177 seq.; Kazwīnī, i. 419 seq.; Ibn Baṭūṭa, iv. 305 seq.; Spiegel, *Eran. Altertumsk.* ii. 118.

ROCAMADOUR, a village of south-western France, in the department of Lot, 36 m. N.N.E. of Cahors by road. Pop. (1906) 296. Rocamadour, a famous place of pilgrimage, is most strikingly situated. Its buildings rise in stages up the side of a cliff on the right bank of the Alzou, which here runs between rocky walls 400 ft. in height. Flights of steps ascend from the lower town to the churches—a group of massive buildings half-way up the cliff. The chief of them is the church of Notre-Dame (1479), containing the wooden figure of the Madonna reputed to have been carved by St Amadour. The church opens on to a terrace called the Plateau of St Michel, where there is a broken sword said to be a fragment of "Durandal," once wielded by the hero Roland. The interior walls of the church of St Sauveur are covered with paintings and inscriptions recalling the pilgrimages of celebrated persons. The subterranean church of St Amadour (1166) extends beneath St Sauveur and contains relics of the saint. On the summit of the cliff stands the château built in the middle ages to defend the sanctuaries.

Rocamadour owes its origin to St Amadour or Amateur, who, according to tradition, chose the place as a hermitage for his devotions to the Virgin Mary. The saint is identified with Zacchaeus the publican and disciple of Jesus, who is said to have journeyed to Gaul to preach the gospel. The renown of Rocamadour as a place of pilgrimage dates from the early middle ages.

ROCAMBOLE, *Allium Scorodoprasum*, a hardy bulbous perennial occurring in a wild state in sandy pastures and waste places throughout Europe, but not common in the south; in Britain it is rare, and found in the north of England and the south of Scotland. Its cultivation does not appear to be of ancient date; it is not mentioned by Greek and Roman authors, and there are only a small number of original common names among ancient peoples (A. de Candolle, *Origin of Cultivated Plants*, p. 72). The plant is grown for its bulbs, which are smaller and milder than those of garlic, and consist of several cloves chiefly produced at the roots. The cloves are planted about the end of February or in March, and treated like garlic or shallot. When mature, the bulbs are taken up, dried and stored for use.

ROCH, ST (Lat. Rochus; Ital. Rocco; Span. Roque; Fr. Roch) (d. 1327), a confessor whose death is commemorated on the 16th of August; he is specially invoked against the plague. According to his *Acta*, he was born at Montpellier, France, about 1295. He early began to manifest strict asceticism and great devoutness, and on the death of his parents in his twentieth year he gave all his substance to the poor. Coming to Italy during an epidemic of plague, he was very diligent in tending the sick in the public hospitals at Aquapendente, Cesena and Rome, and effected many miraculous cures by prayer and simple contact. After similar ministries at Piacenza he himself fell ill. He was expelled from the town, and withdrew into the forest, where he would have perished had not a dog belonging to a nobleman named Gothardus supplied him with bread. On his return to Montpellier he was arrested as a spy and thrown into prison, where he died on the 16th of August 1327, having previously obtained from God this favour —that all plague-stricken persons invoking him should be healed. His cult spread through Spain, France, Germany, Belgium and Italy. A magnificent temple was raised to him at Venice, where his body is believed to lie, and numerous brotherhoods have been instituted in his honour. He is usually represented in the garb of a pilgrim, with a wound in his thigh, and with a dog near him carrying a loaf in its mouth.

See *Acta sanctorum*, August, iii. 380–415; Charles Cahier, *Les Caractéristiques des saints* (Paris, 1867), pp. 216-217. (H. DE.)

ROCHAMBEAU, JEAN BAPTISTE DONATIEN DE VIMEUR, COMTE DE (1725–1807), French soldier, was born at Vendôme (Loir-et-Cher) on the 1st of July 1725. He was originally destined for the church and was brought up at the Jesuit college at Blois, but after the death of his elder brother he entered a cavalry regiment, served in Bohemia and Bavaria and on the Rhine, and in 1747 had attained the rank of colonel He took part in the siege of Maestricht in 1748, became governor of Vendôme in 1749, and after distinguishing himself in 1756 in the Minorca expedition was promoted brigadier of infantry. In 1757 and 1758 he fought in Germany, notably at Crefeld, received several wounds in the battle of Clostercamp (1760), was appointed *maréchal de camp* in 1761 and inspector of cavalry and was frequently consulted by the ministers on technical points. In 1780 he was sent, with the rank of lieutenant-general, in command of 6000 French troops to help the American colonists under Washington against the English. He landed at Newport, Rhode Island, on the 10th of July, but was held here inactive for a year, owing to his reluctance to abandon the French fleet, which was blockaded by the British in Narragansett Bay. At last, in July 1781, Rochambeau's force was able to leave Rhode Island and, marching across Connecticut, joined Washington on the Hudson. Then followed the celebrated march of the combined forces to Yorktown, where on the 22nd of September they formed a junction with the troops of Lafayette; as the result Cornwallis was forced to surrender on the 19th of October. Throughout, Rochambeau had displayed an admirable spirit, placing himself entirely under Washington's command and handling his troops as part of the American army. In recognition of his services, Congress voted him and his troops the thanks of the nation and presented him with two cannon taken from the English. These guns, which Rochambeau took back to Vendôme, were requisitioned in 1792. On his return to France he was loaded with favours by Louis XVI. and was made governor of Picardy. During the Revolution he commanded the Army of the North in 1790, but resigned in 1792. He was arrested during the Terror, and narrowly escaped the guillotine. He was subsequently pensioned by Bonaparte, and died at Thoré (Loir-et-Cher) on the 10th of May 1807.

A statue of Rochambeau by Ferdinand Hamar, the gift of France to the United States, was unveiled in Lafayette Square, Washington, by President Roosevelt on the 24th of May 1902. The ceremony was made the occasion of a great demonstration of friendship between the two nations. France was represented by her ambassador, M. Cambon, Admiral Fournier and General Brugère, a detachment of sailors and marines from the warship "Gaulois" being present. Representatives of the Lafayette and Rochambeau families also attended. Of the many speeches perhaps the most striking was that of Senator Henry C. Lodge, who, curiously enough in the circumstances, prefaced his eloquent appreciation of the services rendered to the American cause by France by a brilliant sketch of the way in which the French had been driven out of North America by England and her colonists combined. General Brugère, in his speech, quoted Rochambeau's words, uttered in 1781: "*Entre vous,* *entre nous, à la vie, à la mort.*" A "Rochambeau fête" was held simultaneously in Paris.

The *Mémoires militaires, historiques et politiques, de Rochambeau* were published by Luce de Lancival in 1809. Of the first volume a part, translated into English by M. W. E. Wright, was published in 1838 under the title of *Memoirs of the Marshal Count de R. relative to the War of Independence in the United States.* Rochambeau's correspondence during the American campaign is published in H. Doniol, *Hist. de la participation de la France à l'établissement des États Unis d'Amérique*, vol. v. (Paris, 1892). See Duchesne, "Autour de Rochambeau" in the *Revue des facultés catholiques de l'ouest* (1898–1900); E. Gachot, "Rochambeau" in the *Nouvelle Revue* (1902); H. de Ganniers, "La Dernière Campagne du maréchal de Rochambeau" in the *Revue des questions historiques* (1901).

ROCHDALE, a municipal, county and parliamentary borough of Lancashire, England, on the river Roch, 10½ m. N.N.E. from Manchester and 196 m. N.W. by N. from London, on the Lancashire & Yorkshire railway. Pop. (1891) 76,161; (1901) 83,114. By means of the Rochdale canal and connexions it has water communications in every direction. The site rises sharply from the Roch, near its confluence with the Spodden, and from the high-lying public park of Rochdale fine views of the picturesque neighbourhood are obtained. Several interesting old houses remain in the vicinity of the town. The parish church of St Chad is built on the site of a church erected in the 12th century, but itself retains no portion earlier than the Perpendicular period. In the churchyard is buried John Collier (1708–1786), a local author, artist and caricaturist, who was among the first to recognize and utilize in writing the humour of the Lancashire dialect, and attained considerable fame under the pseudonym of Tim Bobbin. The town hall is an extensive and elaborate structure in the Decorated style, with a tower. Of educational charities the principal is the Archbishop Parker free grammar school, founded in 1565. There are also technical and art schools; and a large Roman Catholic orphanage. Among other public institutions are the public library, the infirmary, the literary and scientific society and the art society. Rochdale was the birthplace of the co-operative movement. The Equitable Pioneers Society (1844) numbers over 11,000 members, with a capital of over £350,000. A handsome co-operative store, belonging to the Rochdale Provident Co-operative Society, was opened in 1900. A statue of John Bright (1891) recalls the connexion of the statesman and his family with Rochdale. The staple manufactures are those of woollens and cottons. There are, besides, foundries, iron-works and machine-factories. Coal and stone are obtained extensively in the neighbourhood. Frequent cattle and horse fairs are held. Rochdale was incorporated in 1856, and includes several townships. The corporation consists of a mayor, 10 aldermen and 30 councillors. The county borough was created in 1888. The parliamentary borough, which has returned one member since 1832, falls between the Middleton and Heywood divisions of the county. Area of municipal borough, 6446 acres.

Rochdale (Recedham, Rachedam, Rachedal) takes its name from the river on which it stands. A Roman road passed the site, and a Saxon castle stood in Castleton, one of the component parts of the town. In Edward the Confessor's reign most of the land was held by Gamel the Thane, but after the Conquest the manor probably came into the hands of Roger de Poictou, from whom it passed to the Lacys and like their other lands became merged in the duchy of Lancaster. From 1462 to 1625 the crown seems to have leased it to the Byron family. In 1625 Charles I. conveyed the manor in trust for the earl of Holdernesse, and in 1638 it was sold to Sir John Byron, afterwards Baron Byron of Rochdale, whose descendants held it till 1823 when it was sold to the Deardens. Manor courts are still held periodically. Henry III. in 1240–41 granted by charter to Edmund de Lacy the right to hold a weekly market on Wednesday and an annual fair on the feast of SS Simon and Jude (28th October). Early in George III.'s reign the market day was changed to Monday. Two of the early industries, cutlery and hat-making, date from about the middle of the 16th century. The woollen industry is generally, but erroneously, said to have been introduced by Flemish immigrants in Edward III.'s reign; but, with the cognate trades of dyeing and fulling, its importance only dates from the early part of the 17th century. It was not till 1795 that a cotton mill was built here, and in the latter half of the 18th century the town was famed for its woollen, not its cotton manufactures.

See H. Fishwick, *History of the Parish of Rochdale* (1889).

ROCHE, SIR BOYLE, Bart. (1743–1807), Irish soldier and politician, famous for his "bulls," came of a branch of the family of the Viscounts Fermoy. He served in the American War, and sat in the Irish parliament from 1777 onwards, being created a baronet in 1782 for his loyalty to the government. He supported the Union, and one of his recorded "bulls"—many, however, being only fastened on him—was his declaration that he would have "the two sisters" (England and Ireland) "embrace like one brother." Sir Boyle Roche was a characteristically witty and genial Irishman, and was master of the ceremonies at Dublin Castle.

ROCHEFORT, HENRI, Marquis de Rochefort-Luçay (1830–), French politician, was born in Paris on the 30th of January 1830. His father was a Legitimist noble who as "Edmond Rochefort" was well known as a writer of vaudevilles; his mother's views were republican. After experience as a medical student, a clerk at the Hôtel de Ville, a playwright and a journalist, he joined the staff of the *Figaro* in 1863; but a series of his articles, afterwards published as *Les Français de la Décadence* (3 vols., 1866–68), brought the paper into collision with the authorities and caused the termination of his engagement. In collaboration with different dramatists he had meanwhile written a long series of successful vaudevilles, which began with the *Monsieur bien mis* at the Folies Dramatiques in 1856. On leaving the *Figaro* Rochefort determined to start a paper of his own, *La Lanterne.* The paper was seized on its eleventh appearance, and in August 1868 Rochefort was fined 10,000 francs, with a year's imprisonment. He then published his paper in Brussels, whence it was smuggled into France. Printed in French, English, Spanish, Italian and German, it went the round of Europe. After a second prosecution he fled to Belgium. A series of duels, of which the most famous was one fought with Paul de Cassagnac a propos of an article on Joan of Arc, kept Rochefort in the public eye. In 1869, after two unsuccessful candidatures, he was returned to the Chamber of Deputies by the first circonscription of Paris. He was arrested on the frontier, only to be almost immediately released, and forthwith took his seat. He renewed his onslaught on the empire, starting a new paper, the *Marseillaise*, as the organ of political meetings arranged by himself at La Villette. The staff was appointed on the votes of the members, and included Victor Noir and Pascal Grousset. The violent articles in this paper led to the duel which resulted in Victor Noir's death at the hands of Prince Pierre Bonaparte. The paper was seized, and Rochefort and Grousset were sent to prison for six months. The revolution of September was the signal for his release. He became a member of the government of National Defence, but this short association with the forces of law and order was soon broken on account of his openly expressed sympathy with the Communards. On the 11th of May 1871 he fled in disguise from Paris. A week earlier he had resigned with a handful of other deputies from the National Assembly rather than countenance the dismemberment of France. Arrested at Meaux by the Versailles government, he was detained for some time in prison with a nervous illness before he was condemned under military law to imprisonment for life. In spite of Victor Hugo's efforts on his behalf he was transported to New Caledonia. In 1874 he escaped on board an American vessel to San Francisco. He lived in London and Geneva until the general amnesty permitted his return to France in 1880. In Geneva he resumed the publication of *La Lanterne*, and in the Parisian papers articles constantly appeared from his pen. When at length in 1880 the general amnesty permitted his return to Paris he founded *L'Intransigeant* in the Radical and Socialist interest. For a short time in 1885–86 he sat in the Chamber of Deputies, but found a great opportunity next year for his talent for inflaming public opinion in the Boulangist agitation. He was condemned to detention in a fortress in August 1889 at the same time as General Boulanger, whom he had followed into exile. He continued his polemic from London, and after the suicide of General Boulanger he attacked M. Constans, minister of the interior in the Freycinet cabinet, with the utmost violence, in a series of articles which led to an interpellation in the chamber in circumstances of wild excitement and disorder. The Panama scandals furnished him with another occasion, and he created something of a sensation by a statement in the *Figaro* that he had met M. Clemenceau at the table of the financier Cornélius Herz. In 1895 he returned to Paris, two years before the Dreyfus affair supplied him with another *point d'appui*. He became a leader of the anti-Dreyfusards, and had a principal share in the organization of the press campaign. Subsequently he was editor of *La Patrie*.

Besides his plays and articles in the journals he published several separate works, among them being: *Les Petits Mystères de l'Hôtel des Ventes* (1862), a collection of his art criticisms; *Les Dépravés* (Geneva, 1882); *Les Naufrageurs* (1876); *L'Évadé* (1883), *Napoléon dernier* (3 vols., 1884); and *Les Aventures de ma vie* (5 vols., 1896).

ROCHEFORT, a small town of Belgium, situated on the Lomme, a tributary of the Lesse, in the S.E. of the province of Namur close to the Ardennes. Resident pop. (1904) 3068, which in July and August is doubled. It is of ancient origin, its position at the point where the route to St Hubert crossed that from Liége to Bouillon having made it at all times a place of some importance. The ruins of the old castle, which gave the place its name and a title to a long line of counts who had the right of coining their own money, still exist. This castle underwent many sieges and suffered much in the earlier wars, especially at the hands of Marshal de Chatillon in 1636. Rochefort is noted for its healthiness, and is a favourite place of residence. It also attracts every summer a large number of visitors and tourists, who visit it on account of the remarkable grottoes in its neighbourhood. One of these is situated in the town itself and is known by its name. This grotto contains six halls or chambers, the largest of which is called the Sabbat, and is remarkable for its great height. But the most famous are the grottoes of Han, situated three miles from Rochefort at Han sur Lesse. Here the river Lesse passes by a subterranean and undiscovered passage under the hill called Boëme or Boine. The endeavour to trace the course of the river led to the discovery of the grottoes, which consist of fifteen separate halls, connected by passages more or less short and emerging on the river in a dark and extensive cavern forming a sort of side creek or bay. Except in flood-time, when the exit has to be used, the entrance is near the point where the river disappears at what is called the gap or hole of Belvaux, and the exit is made by boat from the cavern last described, which leads out to the open river. A beautiful effect is afforded by the passage from the complete darkness of this cavern into the light. The finest stalactites are in the three halls called the Mysterieuses, the Vigneron and the Draperies. In the last-named is "the tomb," which looks as if chiselled out of white marble. The central hall—called the Salle d'Armes—is immense, and one of the river channels flows through it. Electric light has been introduced. Near Rochefort are the famous red marble quarries of St Remy, and the old Cistercian abbey of that name is now a Trappist seminary.

ROCHEFORT, a town of western France, capital of an arrondissement in the department of Charente-Inférieure, 20 m. S.S.E. of La Rochelle on the State railway from Nantes to Bordeaux. Pop. (1906) town, 31,433; commune, 36,694. It is situated on the right bank of the Charente, 9 m. from the Atlantic, and is built partly on the side of a rocky hill and partly on an old marshland. The town is laid out with great regularity, the streets being wide and straight and centring round the Place Colbert, in the middle of which is a monumental fountain of the 18th century. The public institutions of Rochefort comprise the sub-prefecture, tribunals of first instance and of commerce, a board of trade arbitration, a chamber of commerce, a lycée for boys, a college for girls and schools of drawing and architecture. The fortifications are slight. Below Rochefort the Charente is crossed by a *pont transbordeur*, the carrier of which is suspended at a height which admits of the tallest ships passing underneath at any time. There are both a naval and a commercial harbour. The former has the advantage of deep anchorage well protected by batteries at the mouth of the river, and the roadstead is perfectly safe. The windings of the channel, however, between Rochefort and the sea, and the bar at the entrance render navigation dangerous. Rochefort is capital of the fourth maritime arrondissement, which stretches from the bay of Bourgneuf to the coast of Spain. The naval harbour and arsenal, separated from the town by a line of fortifications with three gates, contain large covered building yards, repairing docks and extensive timber basins on both banks of the river. The arsenal has also a ropewalk dating from 1668, a school of navigation and pilotage, the offices of the maritime prefecture, the navy commissariat, a park of artillery and various boards of direction connected with the navy. Other government establishments at Rochefort are barracks for infantry, artillery and marines, and the naval hospital and school of medicine. In the grounds of this last institution is an artesian well, sunk in 1862–1866 to a depth of 2800 ft., and yielding water with a temperature of 100° F. The commercial harbour, higher up the river than the naval harbour, has two small basins, a third basin with an area of 15 acres and a depth at neap-tide of 25 ft., at spring-tide of 29½ ft., and a dry dock 110 yds. long. Besides shipbuilding, which forms the staple industry, flour- and saw-milling, sail-cloth, &c., are among the local manufactures. At the ports of Rochefort and Tonnay-Charente (4 m. higher up) there entered, in 1905, 265 vessels (166 British), with a tonnage of 192,537.

The lordship of Rochefort, held by powerful nobles as early as the 11th century, was united to the French Crown by Philip the Fair early in the 14th century; but it was alternately seized in the course of the Hundred Years' War by the English and the French, and in the Wars of Religion by the Catholics and Protestants. Colbert having in 1665 chosen Rochefort as the seat of a repairing port between Brest and the Gironde, the town rapidly increased in importance; by 1674 it had 20,000 inhabitants; and when the Dutch admiral Cornelius Tromp appeared at the mouth of the river with seventy-two vessels for the purpose of destroying the new arsenal, he found the approaches so well defended that he gave up his enterprise. It was at Rochefort that the naval school, afterwards transferred to Brest, was originally founded. The town continued to flourish in the later part of the 17th century. In 1690 and in 1703 the English made unsuccessful attempts to destroy it. Its fleet, under the command of Admiral la Gallissonnière, a native of the place, defeated Admiral Byng in 1755 and did good service in the wars of the republic. But the destruction of the French fleet by the English in 1809 in the roadstead of Île d'Aix, the preference accorded to the harbours of Brest and Toulon and the unhealthiness of its climate seriously interfered with the prosperity of the place. The convict establishment, founded at Rochefort in 1777, was suppressed in 1852.

ROCHESTER, JOHN WILMOT, 2ND EARL OF (1647–1680), English poet and wit, was the son of Henry Wilmot, 1st earl. The family was descended from Edward Wilmot of Witney, Oxfordshire, whose son Charles (*c.* 1570–*c.* 1644), having served with distinction in Ireland during the rebellion at the beginning of the 17th century, was president of Connaught from 1616 until his death. In 1621 he had been created an Irish peer as Viscount Wilmot of Athlone, and he was succeeded by his only surviving son, Henry (*c.* 1612–1658). Having fought against the Scots at Newburn and been imprisoned and expelled from the House of Commons for plotting in the interests of the king in 1641, Henry Wilmot served Charles I. well during the Civil War, being responsible for the defeats of Sir William Waller at Roundway Down in July 1643 and at Cropredy Bridge in June 1644. In 1643 he was created Baron Wilmot of Adderbury. Wilmot was on bad terms with some of the king's friends and advisers, including Prince Rupert, and in 1644 he is reported to have said that Charles was afraid of peace and to have advised his supercession by his son, the prince of Wales. Consequently he was deprived of his command, and after a short imprisonment was allowed to cross over to France. He was greatly trusted by Charles II., whose defeat at Worcester and subsequent wanderings he shared, and during this king's exile he was one of his principal advisers, being created by him earl of Rochester in 1652. In the interests of Charles he visited the emperor Ferdinand III., the duke of Lorraine, and the elector of Brandenburg, and in March 1655 he was in England, where he led a feeble attempt at a rising on Marston Moor, near York; on its failure he fled the country.

Born at Ditchley in Oxfordshire on the 10th of April 1647, John Wilmot, who succeeded his father as 2nd earl in 1658, was educated at Wadham College, Oxford, and in 1661, although he was only fourteen years of age, received the degree of M.A. On leaving Oxford he travelled in France and Italy with a tutor who encouraged his love of literature, and moreover advocated principles of temperance which, however, bore little fruit. He returned in 1664, and at once made his way to Charles II.'s court, where his youth, good looks and wit assured him of a welcome. In 1665 he joined the fleet serving against the Dutch as a volunteer, and in the following year distinguished himself by carrying a message in an open boat under fire. This reputation for courage was afterwards lost in private quarrels in which he seems to have shirked danger. He became gentleman of the bedchamber to Charles II., and was the confidant of his various exploits. According to Anthony Hamilton, banishment from court for lampooning the king or his mistresses was with Rochester an almost annual occurrence, but his disgrace was never of long duration. Charles seems to have found his company too congenial to be long dispensed with, and Pepys says that all serious men were disgusted by the complaisance with which he passed over Rochester's insolence (*Diary*, 17th Feb. 1669). In order to restore his rapidly vanishing fortune he became a suitor to Elizabeth Malet. In spite of the king's support of Rochester's suit, Miss Malet refused to marry the earl, who thereupon had her seized (1665) from her uncle's coach. Rochester was pursued, and Charles, who was very angry, sent him to the Tower. Miss Malet, however, married him in 1667.

Not content with making or unmaking the reputation of the maids of honour and the courtiers by his squibs and songs, Rochester aspired to be a patron of poetry and an arbiter of taste, but he was vain and capricious, tolerating no rivals in his capacity of patron. Dryden dedicated to him his *Marriage-à-la-Mode* (1672) in a preface full of effusive flattery, at the close of which, however, occurs a passage that may be taken to indicate that he already had misgivings. "Your lordship has but another step to make," he says, "and from the patron of wit, you may become its tyrant; and oppress our little reputations with more ease than you now protect them." Dryden had another patron in Lord Mulgrave (afterwards duke of Buckingham and Normanby), to whom he dedicated (1675) *Aurengzebe*. Mulgrave had engaged in a duel with Rochester, who had refused to fight at the last minute on the ground of ill-health. Mulgrave allowed this story to spread, and Rochester, who apparently thought him too dangerous an opponent, revenged himself on Dryden as Mulgrave's protégé by setting up as his rivals, first Elkanah Settle, and then John Crowne. By his influence Settle's *Emperor of Morocco* was played at Whitehall, and Crowne was employed, in direct infringement of Dryden's province as laureate, to write a masque for the court. Both these poets were discarded in turn for Nathaniel Lee and Thomas Otway. In 1679 Mulgrave began to circulate his *Essay on Satire* in which Rochester was singled out for severe criticism. Rochester chose to pretend that this was Dryden's work, not Mulgrave's, and by his orders a band of roughs set on the poet in Rose Alley, Covent Garden, and beat him. He obviously felt no shame for this infamous attack, for in his "Imitation of the First Satire of Juvenal" he says, "Who'd be a wit in Dryden's cudgelled skin?" His health was already undermined, and in the spring of 1680 he retired to High Lodge, Woodstock Park. He began to show signs of a more serious temper, and at his own request was visited (July 20th to July 24th) by Bishop Burnet, who attested the sincerity of his repentance. He died, however, two days after the bishop left him. When his son Charles, the 3rd earl, died on the 12th of November 1681, his titles became extinct.

As a poet Rochester was a follower of Abraham Cowley and of Boileau, to both of whom he was considerably indebted. His love lyrics are often happy; but his real vigour and ability is best shown in his critical poems and satires. The political satires are notable for their fierce exposure of Charles II.'s weakness, his ingratitude, and the slavery in which he was held by his mistresses. They show that Rochester had it in him to be a very different man from the criticizing courtier and the "very profane wit" who figures in contemporary memoirs.

BIBLIOGRAPHY.—*Poems on Several Occasions by the Right Honourable the Earl of Rochester* . . . (Antwerp, 1680) was really printed in London. Other issues, slightly varying in title and contents, appeared in 1685, 1691 and 1696. *Valentinian, A Tragedy*, adapted from Beaumont and Fletcher, was printed in 1685; a scurrilous attack on Charles II. in the shape of a play in heroic couplets, *Sodom*, was printed in 1684, and is supposed, in spite of Rochester's denial, to have been chiefly his work. No copy of this is known, but there are two MSS. extant. The completest edition of his works is *The Poetical Works of the Earl of Rochester* (1731–32). Expurgated collections are to be found in Johnson's, Anderson's and Chalmers's editions of the *British Poets*. His *Familiar Letters* were printed in 1686, 1697 and 1699. His Political Satires are available, with those of Sir John Denham and Andrew Marvell, in the *Bibliotheca Curiosa* (*Some Political Satires of the Seventeenth Century*, vol. i., Edinburgh, 1885). Contemporary accounts of Rochester are to be found in the memoir by Saint-Évremond prefixed to an edition of 1709, in Hamilton's *Mémoires du Comte de Gramont*, in the funeral sermon preached by Robert Parsons (1680), and in Bishop Burnet's *Some Passages in the Life and Death of John, Earl of Rochester* (1680), reprinted in Bishop Wordsworth's *Ecclesiastical Biography* (vol. vi.).

ROCHESTER, LAWRENCE HYDE, EARL OF (1641–1711), English statesman, second son of Edward Hyde, earl of Clarendon, was born in March 1641. After the restoration of Charles II. he sat as member of parliament, first for Newport in Cornwall and afterwards for the university of Oxford, from 1660 to 1679. In 1661 he was sent on a complimentary embassy to Louis XIV. of France, while he held the court post of master of the robes from 1662 to 1675. In 1665 he married Henrietta (d. 1687), daughter of Richard Boyle, earl of Burlington and Cork. When his father was impeached in 1667, Lawrence joined with his elder brother, Henry, in defending him in parliament, but the fall of Clarendon did not injuriously affect the fortunes of his sons. They were united with the royal family through the marriage of their sister, Anne, with the duke of York, afterwards James II., and were both able and zealous royalists. In 1676 Lawrence Hyde was sent as ambassador to Poland; he then travelled to Vienna, whence he proceeded to Nijmwegen to take part in the peace congress as one of the English representatives. Having returned to England, he entered the new parliament, which met early in 1679, as member for Wootton Bassett; in November 1679 he was appointed first lord of the treasury, and for a few years he was the principal adviser of Charles II. In April 1681 he was created Viscount Hyde of Kenilworth, and in November following earl of Rochester. He was compelled to join in arranging the treaty of 1681, by which Louis XIV. agreed to pay a subsidy to Charles, at the very moment when he was imploring William, prince of Orange, to save Europe from the ambitions of the French monarch. The conflict between his wishes and his interests may have tended to sour a temper never very equable; at all events the earl made himself so unpleasant to his colleagues that in August 1684 he was removed from the treasury to the more dignified, but less influential, post of president of the council, a process which his enemy Halifax described as being "kicked upstairs." Although appointed lord lieutenant of Ireland, Rochester did not take up this position; he was still president of the council when James II. became king in February 1685, and he was at once appointed to the important office of lord treasurer. But in spite of their family relationship and their long friendship, James and his treasurer did not agree. The king wished to surround himself with Roman Catholic advisers; the earl, on the other hand, looked with alarm on his master's leanings to that form of faith. In January 1687 he was removed from his office of treasurer, being solaced with a pension of £4000 a year and a gift of Irish lands.

After the revolution of 1688 Rochester appeared as a leader of the Tories, and he opposed the election of William and Mary as king and queen, raising his voice for the establishment of a regency on behalf of the exiled James. But he soon reconciled himself to the new order, perhaps because he could not retain his pension unless he took the oaths of allegiance. After this he was quickly in the royal favour and again a member of the privy council. He advised the queen in ecclesiastical matters, and returned to his former position as the leader of the High Church party. From December 1700 until February 1703 he was lord lieutenant of Ireland, although he did not spend much time in that country, and the concluding years of his public life were mainly passed in championing the interests of the Church. In 1710 he was again made lord president of the council. He died on the 2nd of May 1711, and was succeeded by his only son, Henry (1672–1758), who in 1724 inherited the earldom of Clarendon. When Henry died without issue on the 10th of December 1758 all his titles became extinct.

Lawrence Hyde had some learning and a share of his father's literary genius. The main employment of his old age was the preparation for the press of his father's *History of the Rebellion*, to which he wrote a preface. Like most of the men of his time, he drank deeply, and he was of an arrogant disposition and had a violent temper. In Dryden's satire of *Absalom and Achitophel* he is "Hushai," the friend of David in distress.

The correspondence of Rochester with his brother the earl of Clarendon, together with other letters written by him, was published with notes by S. W. Singer (1828). Other authorities are G. Burnet, *History of his Own Time*, edited by O. Airy (Oxford, 1897–1900); John Evelyn, *Diary*, edited by H. B. Wheatley (1879); and Macaulay, *History of England*.

ROCHESTER, a city, municipal and parliamentary borough of Kent, England, on the river Medway, 33 m. E.S.E. of London by the South-Eastern & Chatham railway, contiguous to Chatham and Strood. Pop. (1901) 30,590. Chatham lies east of the city on the same bank of the river, while Strood is opposite, on the left bank, being connected with Rochester by a railway bridge and by an iron swing bridge, the latter occupying the site of a bridge which spanned the Medway before the Conquest. The cathedral church of St Andrew was originally founded by Augustine in 604, for whom Æthelbert built the church. It was partially destroyed by the Danes, but was rebuilt, with a long choir and square east end, by Bishop Gundulph, the second Norman bishop (1077–1108). Gundulph at the same time (1089) established an order of Benedictine monks here. Bishop Ernulf (1115–24), who as prior of Canterbury and abbot of Peterborough had already distinguished himself as a builder, completed and also renovated the church, lengthening it by two bays eastward; the old chapter-house remains. The beautiful Norman west front was built about 1125–30, and in 1130 the new cathedral was consecrated. About 1201 a baker, William of Perth, while on a pilgrimage was murdered near Rochester by robbers. He was buried in the cathedral and was canonized, his shrine becoming a famous resort of pilgrims, who brought much wealth to the monastery. The edifice suffered from fire in 1137 and in 1171. During the whole of the 13th and a part of the 14th century a gradual rebuilding, or sometimes mere recasing, of the church was effected from east to west. The work included an extended choir by William de Hoo (1227), enlargement of the main transepts, the building of piers for a central tower, and treatment of the nave to the third bay. About 1352 a low central tower was built, to which a spire was added in the next century. Towards the end of the 15th century St Mary's chapel was added, the Norman clerestory was rebuilt, and a great west window inserted. Though a comparatively small building, being only 306 ft. in length and 65 ft. in breadth at the nave, the cathedral is of much architectural interest, and exhibits a variety of styles from Norman to Perpendicular. The rich and varied decoration of the Norman nave (especially the triforium) is very noteworthy, as is also the chapter-house doorway, a fine example of Decorated work. The Early English portion of the building is less successful. The ruins of Gundulph's Tower stand detached from and are earlier than the church; this tower was built by Bishop Gundulph probably as a defensive work for the eastern boundary of the city. The crypt beneath the choir is of special interest, showing early Norman work in the western part. The remainder is Early English, and there are traces of mural painting. The cathedral contains many interesting monuments, including a plain slab assigned to Gundulph, and several tombs of bishops of the 13th century, among them that of Bishop Walter de Merton, founder of Merton College, Oxford (d. 1277). The library attached to the modern chapter-house contains, among various valuable relics, the *Textus Roffensis*, being records of the cathedral compiled in the time of Bishop Ernulf. The old episcopal palace is partly converted into dwelling-houses. Portions of the wall of the priory dormitory and the refectory doorway may also still be seen. Among various restorations of the cathedral in the 19th century the earliest was that of Lewis Cottingham (1825–27), who erected a Decorated central tower unsuited to the general character of the building. Bishop Hamo de Hythe (1319–52) had erected a tower with short spire of timber and lead, and of this the general design is reproduced in the present tower and spire from designs of Mr C. H. Fowler, begun in 1904 under Dean Hole, who, however, did not survive to see its dedication on St Andrew's day at the close of the same year.

The parish church of St Nicholas was built in 1421, and restored after a fire in 1892. In Saxon times the cathedral was the parish church, but after the establishment of a monastery here, monks and parishioners quarrelled as to their rights, and a new parish church was built.

On the eminence overlooking the right bank of the river and commanding a wide view of the surrounding country are the extensive remains of the Norman castle, part of which was built by Bishop Gundulph at the order of William Rufus towards the close of the 11th century. The castle was besieged by King John, by Simon de Montfort in the reign of Henry III., and in the reign of Richard II. by a party of rebels during the insurrection of Wat Tyler. It was repaired by Edward IV., but soon afterwards fell into decay, although the massive keep is still in good preservation. This, one of the finest relics of its kind in England, is considered to be the work of William de Corbeil, archbishop of Canterbury, to whom the castle was granted in 1126. It is a quadrangular four-storeyed structure, flanked by turrets, with an extreme height of 120 ft. Remains of the 13th-century walls which once surrounded the city also exist. Gad's Hill, above Strood, to the north-west, is famous as the residence of Charles Dickens. At Borstal, south-west of Rochester, is a large convict prison. Among the principal public buildings of secular character in the city are the town hall (1687), the corn exchange with free library and a museum, the county court offices, and the Richard Watt's almshouses (1579). Besides these almshouses there are a number of other charities, among which the almshouse of St Catherine originated in 1316 as a leper's hospital. A picturesque Elizabethan mansion was acquired by the corporation for a museum as a memorial of Queen Victoria's Diamond Jubilee. The principal schools are the cathedral grammar-school or King's School, founded in 1544, and the Williamson mathematical school (1704), formerly for the sons of freemen, but now open to all. Rochester has an oyster fishery of some importance, and there is a considerable shipping trade, a quay and landing-place having been erected by the corporation. There is a large steam-engine manufactory. In Strood, which is a ward of the borough of Rochester, there are oil-mills, and brick and cement works. The dockyards and government works of Chatham employ many inhabitants of Rochester. The parliamentary borough returns one member. The city is governed by a mayor, six aldermen, and eighteen councillors. Area, 2933 acres.

History.—Its situation on the Roman way from the Kentish ports to London, as well as its strategical position on the bend of the river Medway, gave Rochester (Durobrivae, Hrofescester or Hrobicester, Roffa) an early importance. It was a walled Romano-British town (though of no great size), and the original bridge across the Medway probably dated from that period. The church of St Andrew was founded by King Æthelbert, who also made Rochester a bishop's see. Rochester was a royal borough in the time of William I., who raised a castle here, probably on Boley Hill. Richard I. granted the citizens quittance of *passagium* from crusaders in the town of Rochester. In 1227 Henry III. granted them the city at a fee farm rent of £25; he also granted them a gild merchant, the right to be impleaded only within the city walls, and other liberties. These charters were confirmed by subsequent sovereigns down to Henry VI., who in 1446 incorporated the city by the title of the bailiff and citizens, and granted them the power of admiralty and many privileges. Edward IV. by his charter of 1461 altered the style of incorporation to the mayor and citizens. Charters were granted in successive reigns down to Charles I., whose charter of 1629 remained the governing charter until 1835. A fair on the 18th, 19th and 20th of May was granted to the citizens by Henry VI., and another fair was formerly held in December by prescription. At the present time fairs are held on the 18th of May and the 26th, 27th and 28th of August. A "formarket" was granted in the second charter of Henry III.; the market days were formerly Tuesday and Friday. Corn and cattle markets are now held on Tuesday.

ROCHESTER, a city and the county seat of Olmsted county, Minnesota, U.S.A., on the Zumbro river, about 70 m. S.E. of St Paul. Pop. (1890) 5321; (1900) 6843; (1905, state census) 7233 (1905 foreign-born); (1910 census) 7844. It is served by the Chicago & North-Western and the Chicago Great Western railways. The city has a public library (1865), and is the seat of St John's School and the Academy of Our Lady of Lourdes (both Roman Catholic), of a state hospital for the insane (1878), originally planned (1877) as an inebriate asylum, liquor dealers being taxed for its erection, and of St Mary's Hospital (1889), a famous institution founded and maintained by the Sisters of St Francis. There is valuable water-power, and the city has grain elevators and various manufactures. Rochester was first settled in 1854, and was chartered as a city in 1858.

ROCHESTER, a city of Strafford county, New Hampshire, U.S.A., on the Cochecho and Salmon Falls rivers, about 30 m. E. by N. of Concord. Pop. (1890) 7396; (1900) 8466, of whom 1651 were foreign-born; (1910 U.S. census) 8868. Area, about 34 sq. m. Rochester is served by four lines of the Boston & Maine railroad. The rivers furnish excellent water-power for various manufactures. Rochester, named in honour of Lawrence Hyde, earl of Rochester, was incorporated as a town by a royal charter in 1722, but no settlement was made here until 1728. From parts of the original town Farmington and Milton were erected in 1798 and 1802 respectively, and in 1846 part of Rochester was annexed to Barrington. It was the birthplace of John Parker Hale. Rochester was chartered as a city in 1891.

See F. McDuffee, *History of the Town of Rochester, New Hampshire* (Rochester, 1892).

ROCHESTER, a city and the county-seat of Monroe county, New York, U.S.A., about 70 m. E.N.E. of Buffalo and about 230 m. W. of Albany, on the Genesee river, 7 m. above where it empties into Lake Ontario. Pop. (1880), 89,366; (1890), 133,896; (1900), 162,608, of whom 40,748 were foreign-born (including 15,685 Germans; 7746 English-Canadians; 5599 Irish; 3909 English; 1777 Russians; and 1278 Italians) and 601 were negroes; (1910, census) 218,149. Rochester is served by the Erie, the Pennsylvania (two divisions), the Lehigh Valley, the West Shore, the Buffalo, Rochester & Pittsburg (two divisions), and the New York Central & Hudson River (five divisions) railways. The Genesee river, which cuts through the centre of the city in a deep gorge whose banks vary in height from 50 to 200 ft., is navigable for lake craft only for 2½ m. from the mouth, to a point 4½ m. below the city; the Erie Canal runs through the heart of the city and is carried across the river on a stone viaduct of seven arches, 850 ft. long, and having a channel 45 ft. wide. Several lines of freight and passenger steamboats connect with Buffalo, Oswego and other lake ports, and there are daily passenger steamboats to Toronto, Canada, 70 m. distant across the lake. Electric railways connect with neighbouring cities and lake-side resorts on Lake Ontario (Ontario Beach) and Irondequoit Bay, an irregular arm of the lake 5 m. long 2 m. E. of the city limits. Rochester is on high plateaus on either side of the Genesee river at a general altitude of about 500 ft. above sea-level. It occupies an area of 20·3 sq. m. Within the city limits are the famous Falls of the Genesee,[1] three cataracts of 96, 26 and 83 ft. respectively, the banks above the first fall, which is in the heart of the city, rising to a height of fully 200 ft. above the river. From the city limits the river falls 263 ft. in its 7 m. course to the lake. Ten bridges, road and railway, connect the two sides of the river.

Rochester is an attractive city, with many fine avenues. East Avenue is perhaps the most beautiful street in the city, and Plymouth, West and Lake Avenues are other prominent residential streets. The park system of Rochester, planned by Frederick Law Olmsted, was 1264 acres in extent in 1908. The largest park is Eastman-Durand (512 acres), on the shore of Lake Ontario; Genesee Valley Park (443 acres) is on both sides of the river; Seneca Park (212 acres) includes a zoological garden; Highland Park (75 acres) and eleven other smaller parks. In Washington Park there is a soldiers' monument surmounted by a statue of Lincoln, and a statue (1898) by S. W. Edwards of Frederick Douglass, the negro orator and editor, who lived in Rochester in 1847–70, stands at the approach to the New York Central & Hudson River railway station. The principal cemeteries are the Mount Hope, the Holy Sepulchre, and Riverside. The Powers Building, a 7-storey stone and iron structure surmounted by a tower 204 ft. high, was one of the first office buildings in the United States to be equipped with elevator service. The Monroe County Court House (of New Hampshire granite) on West Main Street is in the Renaissance style, and contains a law library of about 25,000 volumes. The City Hall (of grey sandstone) has a tower 175 ft. high. Among the other prominent buildings are the Post Office, the Chamber of Commerce, the Lyceum Theatre, the Temple Theatre, the Masonic Building, the Buffalo, Rochester & Pittsburg office building, the Sibley building, the Duffy-McInnerney building, and the Young Men's Christian Association building. The following churches are architecturally noteworthy: the Central, the First and the Third Presbyterian, the Brick Presbyterian, St Patrick's Cathedral (Roman Catholic), the Cornhill and the Asbury (Methodist Episcopal), the First Baptist, St Paul's (Protestant Episcopal), and the First Unitarian. Rochester is the see of a Roman Catholic bishop. In Rochester are the Western New York Institution for Deaf Mutes, the Monroe County Penitentiary, a State Arsenal, a State Hospital for the Insane, the Protestant Episcopal Church Home, Rochester City Hospital (1864), and others, including the Rochester Municipal Hospital (1903) for contagious diseases and consumption.

Rochester is an important educational centre. Its best-known institution is the University of Rochester (Baptist, 1850; co-educational since 1900), having in 1908–9 28 instructors, 352 students (231 men and 121 women), and a library of 49,000 volumes. It occupies a tract of 24 acres on University Avenue in the eastern part of the city. With it is connected the Ward Museum, containing the valuable geological and zoological collections of Henry Augustus Ward (1834–1906), an American naturalist, professor of natural sciences here in 1860–75, who had in Rochester a laboratory for the manufacture of plaster-casts of fossils, and who prepared natural history cabinets for many museums. Much of the success of the university was due to Martin Brewer Anderson (1815–1890), president from 1853 to 1888, and David Jayne Hill (b. 1850), who was president from 1888 to 1896, and subsequently was assistant secretary of state in 1898–1903, and minister to Switzerland in 1903–5 and to the Netherlands from 1905 to 1907, when he became ambassador to Germany. Rochester Theological Seminary (1850) is also under the control of the Baptist Church, but has no organic connexion with the university of Rochester. Its library of 36,500 volumes includes the valuable collection (6500 vols.) of the German church historian, Johann August Wilhelm Neander. Other educational institutions include St Bernard's Theological Seminary (Roman Catholic; 1893); Wagner Memorial Lutheran College (German); Academy of the Sacred Heart (Roman Catholic), &c. One of Rochester's most noteworthy institutions is the Athenaeum and Mechanics' Institute (an outgrowth of the Rochester Athenaeum, established in 1829); it was founded in 1885 by Henry Lomb, of the Bausch & Lomb Optical Co., and has a large building, the gift of George Eastman (b. 1854), of the Eastman Kodak Co. It has an endowment of $650,000, and more than 60 instructors, and in 1907–8 more than 5000 students were enrolled. Since 1907 public school buildings have been used as club-houses for community civic clubs with libraries and gymnasiums; and in 1909 a League of Civic Clubs was organized. Besides the law library and the libraries of the educational institutions mentioned above, Rochester has the Reynolds (Public) Library, containing more than 65,000 volumes in 1910.

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[1] From the top of the upper falls (96 ft. high), in the centre of the city, Sam Patch (1807–1829) jumped and was killed in November 1829; he had formerly made the same leap, had jumped half the depth of Niagara, and was planning to go to London and jump from London Bridge—he was to go by sailing packet to Liverpool and jump from the yard-arm every fair day.

The Falls of the Genesee provide a valuable water-power, early utilized by the flour-milling industry, of which, owing largely to the nearness of the fertile wheat-fields of the Genesee Valley and the transportation facilities furnished by the Erie Canal and Lake Ontario, as well as to the water-power, Rochester was for many years the most important centre in the country. Flour-milling is no longer so important an industry here, but Rochester ranks high among the great manufacturing cities of the country, holding third rank in this as in population in New York state, and is remarkable for the great size and output of several of its manufacturing plants, which are the largest of their sort in the United States or the world. In 1905 the value of the city's factory products was $82,747,370, an increase of 38·7% since 1900. In value of product and in number of wage-earners employed the manufacture of men's clothing stood first; the value of the product was $14,948,703, or more than 18 % of the total value of all the city's manufactures; and 20% of the factory wage-earners in the city were employed in this industry. The second industry in 1905 was the making of boots and shoes, of which the value was $8,620,011, an increase of 24·3% since 1900. In the value of clothing and in the value of boots and shoes manufactured Rochester ranked seventh among the cities of the United States in 1905. In the manufacture of photographic apparatus and materials and optical goods Rochester easily holds first place in the world, and it has the largest establishment for the manufacture of cameras (the Eastman Kodak Co. at Kodak Park) and the largest manufactory of lenses, telescopes, opera and field glasses (Bausch & Lomb Optical Co.). The total value of the photographic apparatus in 1905 was $2,886,071, which represented 82·9% of the product value of photographic apparatus manufactured in the entire United States, and was 176·1% more than in 1900. Photographic materials amounted in value to $4,528,582, 47·4% of the total value of the product of the country. The value of the output of this industry was 2100% more in 1905 than in 1900. Another remarkable increase was shown in the value of electrical machinery and apparatus, which was only $15,000 in 1900, but in 1905 was $2,078,360. Flour and grist mill products in 1905 were valued at $3,222,257. In Rochester is an immense refinery of lubricating oil, and the oil product more than doubled in value between 1900 and 1905. Other important manufactures, with the value of their product in 1905, are as follows: foundry and machine-shop products, $2,874,142; furniture, $2,364,859; tobacco, cigars, snuff, &c., $2,234,531; malt liquors, $2,173,707; confectionery, $1,512,611; lumber and planing mill products, $1,495,229; carriages and wagons, $1,229,570; and stationery goods, $1,130,873. Rochester is also the nursery-gardening centre of the United States. The first nursery, that of Ellwanger & Barry, now one of the largest in the world, was established here in 1840. There are now more than a score of large nurseries, representing an investment of several millions of dollars, and annually shipping seeds, bulbs and plants having an approximate value of $2,000,000. Rochester is the port of entry for the Genesee customs-district, importing Canadian lumber and wheat and exporting dairy, garden, farm and orchard products. In 1909 its imports were valued at $1,809,746 and its exports at $1,360,367.

The government of Rochester is that of cities of the first class (the state census of 1905 showed that it had more than the 175,000 inhabitants necessary for a city of the first class under the New York state law). The city owns its water supply system, the supply being obtained largely from Hemlock Lake, 30 m. S. of the city limits. The value of the plant is approximately $8,000,000. Rochester is famous for the purity of its milk supply, which is regulated under a strict system of supervision and inspection.

The region about Rochester, when first visited by Europeans, was the home of the Seneca Indians. The Jesuits, Peter Joseph Marie Chaumonot (1611–1693) and Jacques Frémin (d. 1691), worked among the Indians in the neighbourhood. In 1687 the marquis de Denonville fought a battle with the Iroquois near the falls. In 1710 there was a French post on Irondequoit Bay. The district was included in the Phelps-Gorham Purchase in 1788. It was not until Ebenezer Allan (called " Indian Allan ") built a saw and grist mill at the falls in 1790 that a small settlement began to grow up. In 1802 a large tract of land, which included the site of the present city, passed into the hands of three Maryland proprietors, Charles Carroll, William Fitzhugh, and Nathaniel Rochester (1752–1831). Rochester, from whom the city took its name, was a native of Virginia, had been a manufacturer at Hagerstown, Maryland, and after settling in Rochester in 1818 was a member in 1822 of the New York Assembly. He established a settlement, largely of New Englanders, at the falls in 1810–12, but its growth was slow as it was not on the direct road between Albany and Buffalo, and the region was malarial. It was known at first as " The Falls " or " Falls Town." In 1817 it was incorporated as the village of Rochesterville, the name being shortened to its present form two years later. In 1820 it had only 1502 inhabitants. In 1821 Monroe county was erected with Rochester as the county-seat. The real growth of the place began with the completion of the Rochester and Lockport section of the Erie Canal in 1823, and in two years the population had about doubled. Rochester was first chartered as a city in 1834, with 12,000 inhabitants. Rochester's first newspaper, the *Gazette*, was established in 1816, the *Telegraph* following in 1818. The first daily newspaper was the *Daily Advertiser* (1826). Between 1828 and 1830 Rochester was the centre of the anti-Masonic political movement, and here Thurlow Weed published his *Anti-Masonic Enquirer*. Subsequently it was a centre of the abolitionist movement in New York state; Myron Holley (1779–1841) began here the publication of his *Freeman* in 1839, and in 1847 Frederick Douglass established the *North Star*. For many years before the Civil War it was a busy station of the " Underground Railroad," by which fugitive slaves were assisted in escaping to Canada. In 1846 Miss Susan B. Anthony settled in Rochester, and the city has been a gathering-place for advocates of women's rights. Here lived the Fox sisters, Margaret (1836–1893) and Katharine (b. 1839), whose spiritualistic demonstrations became notorious about 1850 as the " Rochester Rappings," and the city has been a gathering-place for American spiritualists also. The narrowness of the gorge through which the Genesee river runs has always rendered the city liable to disastrous floods. Several of these in its early history practically destroyed the manufacturing industries along the river, but the loss of property in the more recent ones has been relatively less; that of 1865 entailed a loss of more than $1,000,000, and in that of 1902 the damage exceeded $1,500,000.

See William F. Peck, *History of Rochester and Monroe County* (2 vols., Chicago, 1908).

ROCHET (Lat. *rochettum*, from the late Lat. *roccus*, connected with the O.H.Ger. *roch*, roc and the A.S. *rocc*; Fr. *rochet*, Ital. *rocchetto*, Sp. *roquete*, Ger. *Rochett*, *Chorkleid*), an ecclesiastical vestment. In the Roman Catholic Church the rochet is a tunic of white, and usually fine linen or muslin (battiste, mull) reaching about to the knee, and distinguished from the surplice by the fact that its arms are narrow and tight-fitting. The lower edge and the sleeves are usually garnished with lace, lined with violet or red silk in the case of prelates, or—more rarely—with embroidered borders.

The rochet is proper to, and distinctive of, prelates and bishops: but the right to wear it is sometimes granted by the pope to others, especially the canons of cathedral churches. It is not a *vestis sacra*, and cannot therefore be used as a substitute for the surplice, *e.g.* in the administering of the Sacraments (Decree of the Congregation of Rites of Jan. 10, 1852). None the less, since it is used at choir services and is ordered to be worn over the everyday dress at Mass (*Missa rom. Rit. celebr.* i. 2), it may be included among liturgical vestments in the widest sense.

The earliest notice of the use of the rochet is found in an inventory of the vestments of the Roman clergy, dating from the 9th century. In this it is called *camisia*, a name which it retained at Rome until the 14th century, and it seems to have been already at that time proper to particular members of the clergy. Other Roman names for the vestment were *succa*, *sucta*; it was not till the 14th century that the name *rochettum* appeared at Rome, but it was not long before it had superseded all the native designations. Outside Rome, too, the vestment is early met with, *e.g.* in the Frankish empire (9th century) as *alba clericalis*, in contradistinction to the liturgical alb, and in England (10th century) under the name of *oferslip* in the 46th canon of the ecclesiastical laws of Edgar. At the beginning of the 12th century the rochet is mentioned, under the name of *camisia*, by Gilbert of Limerick and by Honorius, and, somewhat later, by Gerloh of Reichersperg as *tunica talaris*. From the 13th century onward it is frequently mentioned. The name *rochettum* is first traceable in England; in Germany and northern France the rochet was also called *saroht* (*sarrotus*) or *sarcos* (*sarcotium*).

Outside Rome the rochet was, until well into the 14th century, a vestment common to all the clergy, and especially to those of the lower orders; and so it remained, in general, until the 16th century, and even, here and there, so late as the 19th. Moreover, in further contradistinction to the Roman use, it had—especially in the German dioceses—a liturgical character, being used instead of the surplice.

The rochet was originally a robe-like tunic, and was therefore girdled, like the liturgical alb. So late as 1260 the provincial synod of Cologne decreed that the *vestis camisialis* must be long enough entirely to cover the everyday dress. A good example of the *camisia* of the 12th century is the rochet of Thomas Becket, preserved at Dammartin in the Pas de Calais, the only surviving medieval example remarkable for the pleating which, as was the case with albs also, gave greater breadth and more elaborate folds. In the 15th century the rochet only reached half-way down the shin; in the 16th and 17th to the knee; in the 18th and 19th often only to the middle of the thigh. In the middle ages it was always plain. The rochet is unknown in the Eastern Churches. (J. Bra.)

Church of England.—In the English Church the rochet is a vestment peculiar to bishops, and is worn by them, with the chimere (*q.v.*) both "at all times of their ministration" in church and also on ceremonial occasions outside, *e.g.* in the House of Lords or at a royal levee. In general it has retained the medieval form more closely than the Roman rochet, in so far as it is of plain, very fine linen (lawn), and reaches almost to the feet. The main modifications have been in the sleeves. At the time of the Reformation these were still narrow, though already showing a tendency to expand. The portrait of Archbishop Warham at Lambeth, for instance, shows a rochet with fairly wide sleeves narrowing towards the wrists, where they are confined by fur cuffs. This fashion continued until, in the 17th century, the sleeves became much fuller; but it was not till the 18th century that they developed into the familiar exaggerated balloon shape, confined at the wrists by a ribbon, beyond which a ruffle projected. About the same period, too, arose the custom of making the rochet sleeveless and attaching the "lawn sleeves" to the chimere. This fashion survived throughout most of the 19th century, but there has since been a tendency to revert to the earlier less exaggerated form, and the sleeves have been reattached to the rochet. The ribbon by which the wrist is confined is black, except when convocation robes are worn, when it is scarlet. The rochet is worn without the chimere under the cope by those bishops who use this vestment. At his consecration the bishop-elect is, according to the rubric, presented to the consecrating bishops vested in a rochet only; after the "laying on of hands" he retires and puts on "the rest of the episcopal habit," *i.e.* the chimere. (W. A. P.)

ROCHFORD, EARL OF, an English title borne by the family of Nassau de Zulestein from 1695 to 1830. William Henry Nassau de Zulestein (1645–1709) was born at Zuylestein, near Utrecht, his father being Frederick Nassau de Zulestein (1608–1672), a natural son of Henry Frederick, prince of Orange, and his mother an English lady, Mary Killegrew. One of the most trusted companions of his kinsman, William of Orange, Zulestein was sent to England in 1687 and again in 1688 to report on the condition of affairs, and later in 1688 he sailed with the prince on his famous expedition. After the Revolution he was naturalized and served the king in the field, being created Viscount Tunbridge and earl of Rochford in 1695. He was succeeded by his son William (1681–1710), who was killed at the battle of Almenara, and then by another son Frederick (1682–1738). Frederick's son, William Henry, the 4th earl (1717–1781), was a diplomatist and a statesman. Having gained experience as envoy at Turin from 1749 to 1753, he was ambassador at Madrid from 1763 to 1766 and at Paris from 1766 to 1768. From 1768 to 1775 he was one of the secretaries of state. This earl left no children when he died on the 28th of September 1781, and his nephew, William Henry, the 5th earl (1754–1830), dying in September 1830 the earldom became extinct. The estates of the earls of Rochford were in Suffolk and Essex, their principal residence being St Osyth Priory in the latter county.

ROCHFORD, a town in the south-eastern parliamentary division of Essex, England, 39 m. E. by N. from London by the Southend branch of the Great Eastern railway. Pop. (1901) 1829. It lies on the small river Roach, near the head of a long estuary. The town has a Perpendicular church (St Andrew), a corn exchange and some agricultural trade. Rochford Hall, a picturesque gabled mansion of various dates, belonged once to the Boleyns, and it has been stated that Anne Boleyn, the unfortunate queen of Henry VIII., was born here, but this is in no way proved. Near Rochford the Lawless or Whispering Court, a remarkable survival of unknown origin, is held by a manorial tenure on the Wednesday following Michaelmas Day, beginning at midnight. No light is permitted, nor may voices be raised above a whisper. Nearly 3 m. N.W. from Rochford is Ashingdon. This is generally accepted as the scene of the fight of Assandun in 1016 between Canute and Edmund Ironside, in which the English were defeated through treachery in their ranks. Earthworks, of this or an earlier date, remain.

ROCK, DANIEL (1799–1871), English Roman Catholic priest and ecclesiologist, was born at Liverpool on the 31st of August 1799, and educated at St Edmund's College, Ware, Herts, and at the English College, Rome. He was ordained priest in 1824 and successively appointed chaplain to the 16th earl of Shrewsbury at Alton Towers, Staffordshire, and priest in charge of the Roman Catholic congregation at Buckland, near Faringdon in Berkshire. After the re-establishment of the Roman Catholic hierarchy in England, in which he had taken an active part, Rock was elected a canon of St George's Cathedral, Southwark. He was greatly interested in medieval art, and, having gone to live at South Kensington in 1864, in order to be near the museum, was of great assistance to the authorities there. He died on the 28th of November 1871.

Rock's principal works are: *Hierurgia, or the Holy Sacrifice of the Mass expounded* (London, 1833; revised edition by W. H. J. Weale, 1893), an exhaustive account of the Eucharistic rites in the Latin, Greek and Oriental Churches, and illustrated from early paintings, sculptures and inscriptions; *The Church of Our Fathers, as seen in St Osmund's Rite for the Cathedral of Salisbury, with Dissertations on the Belief and Ritual in England before the Coming of the Normans* (3 vols., 1849–54; new edition by G. W. Hart and W. H. Frere, London, 1903).

See the Memoir prefixed to Hart & Frere's edition of *The Church of Our Fathers* by the Rev. B. W. Kelly; a full list of his writings is given in J. Gillow's *Bibl. Dict. of the Engl. Catholics*, vol. v. p. 436.

ROCK (O.Fr. *roke*, Sp. *roca*, Ital. *rocca*; possibly from a Lat. form *rupica*, from *rupes*, rock), in geology a mass of the mineral matter of which the crust of the earth is composed (see PETROLOGY and GEOLOGY). In more general usage a "rock" is a large mass of this mineral matter, as distinguished from smaller pieces which are termed "stones."

From this word must be distinguished the verb "to rock," to swing an object to and fro, particularly of a cradle in which a child is rocked to sleep, the original meaning. The O.Eng. word is *roccian*, and is cognate with many words in Teutonic languages, *e.g.* Du. *rukkea*, Dan. *rykke*, Ger. *rücken*, to pull, tug, push.

ROCK-CRYSTAL, a colourless and transparent variety of quartz (*q.v.*), used as an ornamental stone. It usually occurs as crystals lining cavities in quartz-veins, which often run through granite, gneiss and crystalline schists. The limpidity of the crystal, its coldness to the touch and its common occurrence in rocks among Alpine glaciers, led to the ancient belief that it was a kind of congealed water, whence the name crystal, from Gr. κρύσταλλος (ice). In the Swiss Alps the "*Strahler*," or crystal-gatherer, searches the rocks at much personal risk, and is often led to a drusy cavity by tracing narrow veins, or strings, of quartz on the mountain-side. A remarkable druse, or *Krystalkeller*, discovered at Zinkenstock in the Bernese Oberland, in 1719, yielded about 20 tons of crystal, a single specimen weighing 8 cwt. The famous discovery of the Galenstock, in 1867, furnished magnificent crystals, but they were dark brown or smoky quartz. La Gardette, near Le Bourg d'Oisans, in the Alps of Dauphiné, is a notable locality for fine specimens of rock-crystal. The Alps and India probably furnished the ancients with their supplies.

Rock-crystal has been used for ornamental purposes since the Mycenean period. By the Romans under the Empire it was highly valued, and carved into vases and goblets, in some cases elaborately engraved. Lenses or globes were used for kindling the sacred vestal fire and for cauterizing the flesh, whilst ladies carried balls of crystal in order to cool their hands during the heat of summer. The artists of the Early Renaissance greatly favoured the use of rock-crystal, and executed beautiful carvings in this material. In modern times the use of rock-crystal has been largely superseded by that of glass, and it is notable that flint-glass is known in France as "*cristal*," probably from its resemblance to limpid quartz, or perhaps from the fact that powdered rock-crystal has been used as a source of silica in the manufacture of the finest glass. Rock-crystal is still cut as a faceted stone for personal decoration, but though not without brilliancy it lacks the "fire" of many gem-stones. It is often known locally by such names as Bristol diamond, Cornish diamond, Isle of Wight diamond, Briançon diamond, Marmaros diamond, Lake George diamond, &c. Rock-crystal is also carved into seals, paper-weights and other trivial objects, and into spheres for divination by crystal-gazing, Japanese balls being specially noteworthy. In Japan the crystal has been obtained for centuries from the granitic districts around Kimpū-san, in the province of Kai. Probably the most valuable application of rock-crystal is for spectacle lenses, which in consequence of their hardness are not readily abraded by use. They should be cut at right angles to the optic axis, or axis of the prism.

The "pebble" for lenses is found loose in the soil in many parts of the provinces of Goyaz, São Paulo and Minas Geraes in Brazil. Much of the material for spectacles comes also from Madagascar, where large crystals of clear quartz are found in the beds of certain streams, especially in the N.E. part of the island, having probably been derived from quartz-veins in the gneiss and pegmatite. In India rock-crystal has been worked at many localities, and the loot of the palace of Delhi yielded marvellous ornaments carved in this material. At the present day it is cut and polished at Vellum in the Tanjore district in Madras, and is known as Vellum stone. Among the numerous localities in the United States which yield rock-crystal mention may be made of those in Herkimer Co., New York State, whence the Lake George crystals are obtained; and it is notable that some of the Herkimer quartz encloses bituminous matter. Mokelumne Hill, Calaveras Co., California, has furnished some remarkable rock-crystal. In Europe the localities are very numerous, the most important being those in the Alps. Very fine crystals remarkable for pellucidity though not of large size occur in cavities in the statuary marble of Carrara; and remarkably hollowed crystals are known from Porretta near Bologna in Italy. The finest rock-crystal in Great Britain occurs at Tintagel and the Delabole slate quarry in N. Cornwall; and at Snowdon in N. Wales. (F. W. R.*)

ROCKEFELLER, JOHN DAVISON (1839–), American capitalist, was born in Richford, Tioga county, New York, on the 8th of July 1839. In 1853 his family removed to Ohio, living after 1857 in Cleveland, where Rockefeller had begun to work as a bookkeeper in 1855 and where in 1858 he went into the produce commission business. His firm, Clark & Rockefeller, in 1862 invested in an oil refinery, planned by Samuel Andrews, and in 1865 Rockefeller sold out his share to his partner Clark, bought for $72,500 a larger share in another refinery, and formed the partnership of Rockefeller & Andrews. At about the same time another refinery was started by Rockefeller's brother William (b. 1841), but in 1867 Rockefeller & Andrews absorbed this business, and Henry M. Flagler was added to the partnership. In 1870 the two Rockefellers, Flagler, Andrews and a refiner named Stephen V. Harkness formed the Standard Oil Company, with a capital of $1,000,000 (increased in 1872 to $2,500,000 and in 1874 to $3,500,000), of which John D. Rockefeller was president. This great corporation gradually established itself in practical control of the oil production in America, by means of business methods and financial operations which have been severely criticized, but which brought immense wealth to those concerned. Its capital was further increased in 1882, when separate companies were organized in each state; and in later years, as the first great American "trust," the Standard Oil Company was hotly attacked during the anti-trust movement (see INTER-STATE COMMERCE). Into the merits of this question it is impossible to enter here. Rockefeller himself retired from active business in 1895; he had for a time large iron interests (mines and ore-carrying vessels) on Lake Superior, which he sold to the United States Steel Corporation, and his personal wealth was probably greater than that of any other man in the country. In private life he was a devoted member of the Baptist church, and his benefactions were numerous. To "the University of Chicago founded by John D. Rockefeller" (in 1892) he had given, up to 1910, $24,809,666, while to the General Education Board he had given $43,000,000; he founded (1901) and supported the Rockefeller Institute for Medical Research in New York City; he gave large sums to Rush Medical College in Chicago, to Johns Hopkins Hospital in Baltimore, to Barnard College in New York City and to the Baptist Missionary Society; and in 1909 he gave $1,000,000 to endow a medical commission to investigate the nature of the hook-worm and to suppress the hook-worm disease.

See Ida M. Tarbell's *History of the Standard Oil Company* (New York, 1903), a severe attack on the Trust; also his own *Random Reminiscences* (1909).

ROCKET. (1) The name (Fr. *roquette*, Lat. *eruca*, a kind of cabbage) of two species of plants. The one, *Eruca sativa*, is a cruciferous annual with white flowers veined with purple; the leaves have a sharp flavour and are used in southern Europe for salads. The other is a hardy perennial herbaceous plant, of the genus *Hesperis*, of which *Hesperis matronalis* is the most familiar species (see HORTICULTURE).

(2) A cylinder of paper, pasteboard or metal, filled with an explosive mixture. This word, which appears in many forms in various languages, is from the It. *rocchetta*, diminutive of *rocca*, a distaff, the obsolete English "rock"; the application

is due to a resemblance in shape. Rockets are used in pyrotechny for purpose of display, scattering showers of stars, coloured balls, &c., on bursting (see Fireworks). They are also used in signalling, and especially as a part of life-saving apparatus for wrecks (see Lifeboat and Life-Saving Service).

Large and heavy rockets, of which the head formed a projectile, had too a considerable vogue in the early part of the 19th century for war purposes. They were invented by Sir William Congreve (*q.v.*) and employed by him both afloat in coast operations and in field operations. Brought to the notice of all armies by the fact that a rocket battery of the Royal Artillery served in the allied army in the Leipzig campaign, war rockets were introduced in many armies, being sometimes issued as an additional portion of the equipment of ordinary field batteries, sometimes reserved for special rocket batteries. The Congreve rocket was in use in the British army as late as 1860. There were four natures—3-pounder, 6-pounder, 12-pounder and 24-pounder. The case was of sheet-iron, on to which was screwed a cylindro-conoidal head forming the projectile. The head was made hollow and could be filled with a bursting charge if a shell effect was desired, a base fuze being provided. The iron case contained the rocket composition, and was closed at the rear end by a metal plate with five holes or vents, and on the centre a bush into which the stick was screwed. These rockets were fired from rocket tubes on tripods, the tubes being provided with a tangent sight. Against masses of troops within easy range, the war rocket was considered an efficient engine; it was used also to set fire to buildings, but was always deficient in accuracy. Eventually the Congreve rocket was superseded by the Hale, of which two patterns were in use, the 9-pounder and the 24-pounder, for field and fortress warfare respectively. These had no sticks, and were centred by the arrangement of the vent, the gases, as they emerged from the vent, impinging upon a screw-formed tail, to which they imparted the necessary rotation. These rockets were fired from a trough. The maximum effective range of the 9-pounder Hale rocket was about 1200 yards. The use of these engines was discontinued in the British service about 1885. On the continent of Europe they had disappeared more than twenty years before. Austria, the last power to use them, broke up her rocket batteries in 1867.

ROCKFORD, a city and the county seat of Winnebago county, Illinois, U.S.A., on the Rock river, in the northern part of the state, about 85 m. N.W. of Chicago. Pop. (1890) 23,584; (1900) 31,051, of whom 9337 were foreign-born (6690 Swedes); (1910 census) 45,401. Area, 8·91 sq. m. It is served by the Chicago, Burlington & Quincy, the Chicago & North-Western, the Chicago, Milwaukee & St Paul, the Chicago, Milwaukee & Gary ("Rockford Route") and the Illinois Central railways, and is connected by interurban electric railway with Chicago and Freeport, Illinois, and Janesville, Wisconsin. The city has a Memorial Hall, erected in honour of the soldiers and sailors of Winnebago county, and in charge of the Grand Army of the Republic; a soldiers' memorial fountain; a Carnegie library, containing 51,340 volumes in 1909; and the Velie Museum of natural history. Rockford College (non-sectarian), for the higher education of women, is ranked by the United States Commissioner of Education as one of fifteen women's colleges of the highest grade in the country; it was opened in 1849 as Rockford Seminary, and was named Rockford College in 1892. In 1908–9 it had 196 students. Rockford is the see of a Roman Catholic bishop. In and near the city there are two hospitals and three sanatoriums. Manufacturing is facilitated by good water-power, supplied by a dam across the Rock river about 800 ft. long, constructed in 1844. Among the manufactures are furniture, hosiery and knit goods, agricultural implements, foundry and machine-shop products, saddlery and harness, &c. The total value of all factory products in 1905 was $15,276,129 (38·6% more than in 1900). The municipality owns and operates its waterworks; the water supply is obtained from artesian wells. Rockford was first settled in 1834, and was chartered as a city in 1852. More than one-fourth of its area has been annexed to the city since 1889.

ROCKHAMPTON, a town of Livingstone county, Queensland, Australia, on the Fitzroy river 43 m. from its mouth, 335 m. in a direct line N.W. of Brisbane. It has a beautiful situation, and its climate, in spite of heat, is healthy. It is the port of a wide agricultural district, which also produces gold, copper and silver. Much of the trade is carried on through the ports of Alma and Broadmount, near the mouth of the river, both available for ocean steamers. Rockhampton has a large trade in frozen meat, and there are factories for extract and meat preserving. Rockhampton is the terminus of the Queensland Central railway and the seat of an Anglican and a Roman Catholic bishopric. Population of the municipality (1901), 15,461; within the 5 m. radius, 19,691; of the separate municipality of North Rockhampton, 2865.

ROCK HILL, a city of York county, South Carolina, U.S.A., 84 m. by rail N. of Columbia. Pop. (1890) 2744; (1900) 5485 (1706 negroes); (1910) 7216. Rock Hill is served by two lines of the Southern railway. It lies at an elevation of about 670 ft. above the sea. Among its buildings and institutions are the Federal Government Building, the City Hall, the Carnegie Library and the Winthrop Normal and Industrial College (chartered in 1891 and opened in 1894), a state institution for white girls. Cotton is the most important product of the surrounding country. The Catawba river, 5 m. distant, furnishes good water-power, and in a large power-plant electricity is generated for the city's manufactories. Among the manufactures are cotton goods, cotton-seed oil, yarn, wagons and carriages, foundry and machine-shop products; and there are cotton gins, marble and stone works. The growth of the city has been almost entirely since the Civil War. Rock Hill was incorporated as a village in 1870, and was chartered as a city in 1892.

ROCKINGHAM, CHARLES WATSON WENTWORTH, 2nd marquess of (1730–1782), twice prime minister of England, was the son of Thomas Watson Wentworth (*c.* 1690–1750), who was created earl of Melton in 1733 and marquess of Rockingham in 1746. The family of Watson was descended from Sir Lewis Watson (1584–1653), son and heir of Sir Edward Watson (d. 1616) of Rockingham Castle in Northamptonshire. For his services to the king during the Civil War Sir Lewis was created Baron Rockingham in 1645. His grandson Lewis, the 3rd baron (1655–1724), was created earl of Rockingham in 1714, and was succeeded by his grandson Lewis (*c.* 1709–1745), whose brother Thomas, the 3rd earl, died unmarried in February 1746, when the earldom became extinct. The barony of Rockingham, however, descended to a cousin, Thomas, father of the prime minister, a grandson of Edward, the 2nd baron (1630–1689), who had married Anne, daughter and heiress of Thomas Wentworth, 1st earl of Strafford. The vast estates of the Wentworths had passed to Edward's son, Thomas, who took the additional name of Wentworth, and then to his son, the 1st marquess of Rockingham.

Charles Watson Wentworth was born in 1730 on the 19th of March (according to some, the 13th of May), and was educated at Westminster school and St John's College, Cambridge. He showed his spirit as a boy by riding across from Wentworth to Carlisle in 1746 to join the duke of Cumberland in his pursuit of the Young Pretender. He was created earl of Malton in the peerage of Ireland in September 1750, and succeeded his father as 2nd marquess of Rockingham in December of the same year. In 1751 he became lord-lieutenant of the North and East Ridings of Yorkshire and a lord of the bedchamber, and in 1760 was made a knight of the Garter. After George III. had begun his policy of dividing the great Whig families, those Whig noblemen and gentlemen who did not choose to join the sections headed by the Grenvilles, the duke of Bedford, or any other great noblemen, selected as their chief the young marquess of Rockingham. In May 1762 the king's favourite, the earl of Bute, became first lord of the treasury, and the marquess of Rockingham was amongst those who in the following year were dismissed from their lord-lieutenancies. The opposition now grew so strong that Lord Bute resigned in April 1763, and the king, true to his policy, appointed George Grenville to be his successor. But Grenville's section of the Whig party was not strong enough to maintain him in power long, and in July 1765 Lord Rockingham formed his first administration with General Conway and the duke of Grafton as secretaries of state. The cabinet seemed stronger than it really was, for it was divided by intestine quarrels, and the earl of Chatham refused to have anything to do with it. Nevertheless, Rockingham recovered his lord-lieutenancies and won reputation as a good administrator. In May 1766 the duke of Grafton, a far abler man than Rockingham, though neither so conciliatory in his manners nor so generally popular, seceded from the government, and in August 1766 he succeeded his former chief as first lord of the treasury and prime minister. Then followed many years of fruitless opposition to the king's personal authority as exhibited through his ministers, but at last, on the 27th of March 1782, Lord Rockingham again became prime minister with Fox and Shelburne (afterwards marquess of Lansdowne) as secretaries of state. This time he enjoyed office for but a few weeks, for he died on the 1st of July 1782. He left no issue, and his property went to his nephew, the 2nd Earl Fitzwilliam, his titles becoming extinct. A few words from his epitaph by Burke deserve quotation as giving the reason of the predominance of such an ordinary man as Lord Rockingham over a party abounding in men of great abilities: "A man worthy to be held in esteem, because he did not live for himself. . . . He far exceeded all other statesmen in the art of drawing together, without the seduction of self-interest, the concurrence and co-operation of various dispositions and abilities of men, whom he assimilated to his character and associated in his labours."

See *Memoirs of the Marquis of Rockingham and his Contemporaries*, by George Thomas, earl of Albemarle (2 vols., 1852); Horace Walpole's *Memoirs* of the reign of George III., edited by G. F. R. Barker (1894); and the other letters, papers and diaries of the time.

ROCK ISLAND, a city and the county-seat of Rock Island county, Illinois, U.S.A., in the N.W. part of the state, on the E. bank of the Mississippi river, adjoining Moline, and opposite Davenport, Iowa (with which it is connected by two bridges), about 3 m. above the mouth of the Rock river, and at the foot of Rock Island rapids, which extend for nearly 16 m. Pop. (1890) 13,634; (1900) 19,493, of whom 4412 were foreign-born; (1910) 24,335. It is served by the Chicago, Burlington & Quincy, the Chicago, Milwaukee & St Paul, the Chicago, Rock Island & Pacific, and the Davenport, Rock Island & North-Western railways. Near the city, at the mouth of Rock river, the "Hennepin" (or Illinois & Mississippi) canal joins the Mississippi river. The city occupies a plain lying between the river and a series of bluffs. The island of Rock Island, a ridge of limestone rock about 3 m. long and 1½ m. wide, is connected with the mainland by bridges to Rock Island and Moline; on it there are a Federal arsenal, the most important in the country for the manufacture of small-arms, gun carriages and artillery equipment, a Federal armoury and a national cemetery; the island is connected with the Illinois shore at Moline by a dam, whence good water-power is derived. In the city are: a public library (1872), the Augustana College and Theological Seminary (controlled by the Evangelical Lutheran Augustana Synod of North America; co-educational), which was founded as Augustana Seminary in Chicago in 1860 chiefly for the education of Swedish Lutheran clergymen, was removed to Paxton, Illinois, in 1863 and to Rock Island in 1875, and received its present name in 1869; and the principal offices of the Modern Woodmen of the World, a fraternal society, founded in 1884 and having 219,729 members in 1909. The city has a large trade by water and rail; commercially it forms a unit with Davenport and Moline. Among the city's manufactures are lumber, agricultural implements, flour, glass, stoves, carriages, soap, &c. In 1905 the value of the factory product was $5,332,967. Some coal is mined in the county.

On the north bank of the Rock river, 3 m. from its mouth, there was a large summer village (sometimes called Saukenuk) of the Sauk Indians, built about 1730 and destroyed in 1831; and near the mouth of the Rock river is a bluff called "Black Hawk's watch-tower." A settlement on the island was made in 1816, when the fort was built; the first settlement on the mainland was made in 1826. In 1841 the town of Rock Island was formed by the consolidation of two small settlements named Stephenson and Farnhamsburg and was incorporated; it received a city charter in 1849. Upon the west end of the island the United States government in 1816 built Fort Armstrong, where on the 21st of September 1832, at the close of the Black Hawk War, a treaty of peace was signed by General Winfield Scott and Governor John Reynolds of Illinois and by the chiefs of the Sauk and Foxes, and where, six days before, General Scott and Governor Reynolds had made a treaty with the Winnebagoes. The fort was abandoned in 1836 and was burned in 1855; a monument now marks its site. The Rock Island armoury and arsenal, under an act of 1862, were built in 1863, when a number of captured Confederate soldiers were confined on the island.

ROCKLAND, a city and the county-seat of Knox county, Maine, U.S.A., on Rockland Harbor, Penobscot Bay, 86 m. by rail E.N.E. of Portland. Pop. (1900) 8150; (1910) 8174. It is the eastern terminus of a branch of the Maine Central railway, and is served by an interurban electric line and by steamboat lines to Portland, Boston, Bangor, Bar Harbor and other coast ports. The harbour is protected by a breakwater nearly 5000 ft. long. The principal buildings are the United States Government Building and the County Court House. Granite and limestone are quarried in the vicinity. The granite (biotite, biotite-muscovite and quartz-monzonite) is of fine quality, and has been used extensively in the United States for building and monumental purposes; and the burning of lime is by far the most important industry of the city. The shipbuilding industry is also important. The total value of the city's factory products in 1905 was $1,822,591 (46·5% more than in 1900). Lobsters and fish in considerable quantities are shipped from the city. Rockland was settled in 1769, but its growth began only with the establishment of the lime industry in 1795. It was a part of the township of Thomaston (pop. 2205 in 1910), from 1777 to 1848, when it was incorporated as a separate township under the name of East Thomaston. Two years later the present name was adopted, and in 1854 Rockland was chartered as a city.

ROCKLAND, a township of Plymouth county, Massachusetts, U.S.A., about 20 m. S. of Boston. Pop. (1890) 5213; (1900) 5327; (1910 U.S. census) 6928. Area, about 10 sq. m. It is served by the New York, New Haven & Hartford railway, and by interurban electric railway. Among its manufactures are boots and shoes and tacks. There is a public library (1878). Rockland was erected into a township in 1874, having been previously a part of Abington.

ROCKPORT, a township of Essex county, Massachusetts, U.S.A., on the N.E. end of Cape Ann, on the Atlantic Ocean, north-east of Gloucester, and about 35 m. north-east of Boston. Pop. (1890) 4087; (1900) 4592; (1910, U.S. census) 4211. Rockport is the southern terminus of the Gloucester branch of the Boston & Maine railway, and is served by an electric railway extending from Gloucester through Rockport and around the cape. Off Sandy Bay, a rendezvous of the Atlantic squadron of the U.S. navy, the Federal government began in 1884 a harbour of refuge, with an area of 1664 acres, to be protected from north and north-east winds by a breakwater, 117 ft. wide at a depth of 12 ft. below mean low water, rising 22 ft. above mean low water, and 9000 ft. long. In the township are the North Village or Pigeon Cove and the South Village or Rockport. Rockport is a summer resort, and there are many summer residences at Andrews Point and at the South

End and Headlands. There are large granite quarries along the coast, especially in Pigeon Cove, and there are two varieties of granite, called commercially "grey" and "green," both very hard, the former the more abundant. It has been used in building the great breakwater off Sandy Bay and various large bridges. Granite for paving-stones is quarried. Like many of the Maine quarries those of Rockport owe much of their development to their nearness to deep water transportation. Isinglass, glue, tools, parts for automobile engines, and copper paint are among the manufactures. Fishing was formerly of importance, but quarrying has displaced it. Sandy Bay, the fifth parish of Gloucester, first settled about 1697, and Pigeon Cove, part of the third parish, were set off from Gloucester and were incorporated as the township of Rockport in 1840. The Bennett & Mackay transatlantic commercial cable was landed in Rockport in May 1884.

ROCKVILLE, a city of Tolland county, Connecticut, U.S.A., in the N.E. part of the state, on the Hockanum river, about 15 m. N.E. of Hartford. Pop. (1890) 7772; (1900) 7287, of whom 2548 were foreign-born, many being Germans and Poles; (1910) 7977. It is served by the New York, New Haven & Hartford railway and by electric lines. It is in the township of Vernon (pop. in 1890, 8808; in 1910, 9087; area, 19 sq. m.), which was separated from Bolton township in 1808, and contains the villages of Vernon, Vernon Centre, Dobsonville and Talcottville. In the city are the George Maxwell Memorial Library and the Sykes Manual Training School. The river, by a series of falls, makes a descent of 280 ft. here, and furnishes power for large manufacturing establishments. The principal manufactures are woollen, silk and cotton goods, envelopes, and silk fish-lines. In 1841 fancy cassimeres, probably the first manufactured in the United States, were made here. At the Hockanum Mills (established 1809) worsted for men's clothing was first made (about 1870) in the United States. The first settlement here was made about 1726. Rockville was chartered as a city in 1889.

ROCKY MOUNTAIN GOAT, or WHITE GOAT (*Oreamnus montanus*), a North American hollow-horned ruminant of the family BOVIDAE, distinguished by its white colour. It is, in fact, the only ruminant, with the exception of the white Alaskan wild sheep, which is entirely white at all seasons of the year; and cannot, therefore, be mistaken for any other animal, and its description may consequently be brief. In the winter coat the hair is long and pendent, elongated into a short beard on the sides of the lower jaw behind the chin; and it is also longer than elsewhere on the neck and the chest; at the base of the long hair is a thick growth of short and woolly under-fur. In summer the coat becomes comparatively short. The muzzle is hairy, the ears are of moderate size, and the tail is short, and partially buried among the long hair of the rump. There are no glands on the face; but there is a large globular one at the base of each horn of the size of half a small orange. The black horns, which are ringed in their basal portion, are comparatively short and not unlike those of the Asiatic serows in general characters, being subcylindrical, and curving slightly backwards. They taper, however, much more rapidly than those of the serows, and diverge much more widely from the middle line. The lateral hoofs are well developed. Although commonly described as white, the hair has a more or less decided tinge of yellow, which appears to be more marked in the summer than in the winter coat. The cannon-bones are remarkably short and wide, and in this respect differ from those of all allied ruminants, except the Tibetan takin. The general shape of the animal is ungainly, owing to a huge hump on the withers, at which point the height is about 3 ft.

The head of a white goat obtained in 1900 from the mountains at the mouth of Copper river, opposite Kyak Island, has been described as a species apart. In addition to certain details in the conformation of the skull, the horns are much more slender than in the ordinary white goat, and instead of bending regularly backwards till near their tips, curve widely outwards from their bases. Their length is nearly equal to that of the longest pair of the ordinary form hitherto recorded, while the tip-to-tip interval is nearly double that of any other known specimen. This animal can scarcely be regarded as more than a local race, and should be styled *Oreamnus montanus kennedyi*.

The affinities of the white goat (which is really a member of a group intermediate between goats and antelopes) are probably with the Asiatic serows and takin, and hence perhaps with the musk-ox.

See a paper by Madison Grant, entitled "The Rocky Mountain Goat," published in the ninth annual report of the New York Zoological Society (1905). (R. L.*)

ROCOCO, or ROCAILLE, literally "rock-work," a style of architectural and mobiliary decoration popular throughout the greater part of Europe during the first half of the 18th century. In France it was especially characteristic of the regency and the reign of Louis XV. A debased style at the best, essentially fantastic and bizarre, it ended in extravagance and decadence. A meaningless mixture of imitation rock-work, shells, scrolls and foliage, the word came eventually to be applied to anything extravagant, flamboyant or tasteless in art or literature. The very exuberance of the rococo forms is, indeed, the negation of art, which is based upon restraint. There is something fundamentally Italian in the *bravura* upon which the style depends; yet Italy has produced some of the worst examples of what in that country is called the "Jesuit style," in allusion to the supposed lack of directness in Jesuit policy. Everything, indeed, in the rococo manner is involved and tortured, though before a superb example of Jacques Caffieri, such as the famous commode in the Wallace Collection, it is impossible not to admire the art with which genius can treat even the defects and weaknesses of a peculiarly mannered fashion. The best French work possesses a balance and symmetry which are usually entirely absent from its imitations. Spain and Italy produced many monstrous travesties—it is impossible to imagine anything more grotesque than the flamboyant convolutions of the monumental Roman style of the third quarter of the 18th century. In Germany, weak and lifeless imitations were as popular as might be imagined in a land which was content to take its art, especially its bad art, from France. England did not escape the infection, and Chippendale and his school produced examples of rocaille work and *coquillage* which were quite foreign to their own sentiment, and rarely rose above respectable mediocrity.

ROCROI, a town of northern France, capital of an arrondissement in the department of Ardennes, 22 m. N.N.W. of Charleville by rail, and within 2 m. of the Belgian frontier. Pop. (1906) town, 796; commune, 2116. As a fortified place it commands the Ardennes plateau between the valley of the Meuse and the head-waters of the Oise. The present fortifications, constructed by Vauban, form a pentagon and entirely close in the town, which has regularly built streets converging on a central square. Overlooking the latter is the church, a florid building of the 18th century. Rocroi is the seat of a sub-prefect and has a tribunal of first instance.

The place, originally called Croix-de-Rau or Rau Croix, was fortified in the 16th century and besieged by the imperialists in 1555. Invested by the Spaniards in 1643, it was relieved by Louis II., the duke of Enghien (afterwards the Great Condé), after a brilliant victory. Captured in 1658 by the same duke, then in the Spanish service, it was not restored to France till the treaty of the Pyrenees in 1659. In 1815 Rocroi was besieged for a month by the allies.

ROD, ÉDOUARD (1857–1910), French-Swiss novelist, was born at Nyon, in Switzerland, on the 31st of March 1857. He studied at Lausanne and Berlin, and in 1878 found his way to Paris. In 1881 he dedicated his novel, *Palmyre Veulard*, to Zola, of whom he was at this period of his career a faithful disciple. A series of novels of similar tendency followed. In 1884 he became editor of the *Revue contemporaine*, and in 1887 succeeded Marc Monnier as professor of comparative literature at Geneva, where he remained till 1893. *La Course à la mort* (1885) marks a turning-point in his career; in it he forsook the so-called naturalistic novel for the analysis of moral motives. He is at his best in presenting cases of conscience, the struggle between passion and duty, and the virtues of renunciation. *Le Sens de la vie* (1889), one of his most famous books, is in the nature of a complement to *La Course à la mort.* It was followed by *Les Trois cœurs* (1890), *La Sacrifiée* (1892), *La Vie privée de Michel Teissier* (1893), translated as *The Private Life of an Eminent Politician* (1893); *La Seconde Vie de Michel Teissier* (1894), *Le Silence* (1894), *Les Roches blanches* (1895), *Le Dernier Refuge* (1896), *Le Ménage du pasteur Naudié* (1898), a study of Protestant France; *L'Eau courante* (1902), *L'Inutile Effort* (1903), *Un Vainqueur* (1904), *L'Indocile* (1905), and *L'Incendie* (1906). M. Rod's books of literary criticism include *Les Idées morales du temps présent* (1897), an admirable *Essai sur Goethe* (1898), *Stendhal* (1892), and some columns of collected essays. He published *L'Affaire J. J. Rousseau* in 1906, and in the same year he drew from an episode in the life of the philosopher a play in three acts, *Le Réformateur*, which was produced at the Nouveau Théâtre. He died in January 1910.

ROD (O.E. *rodd*, probably related to Norw. *rudda*, stick, *rodda*, stake), a twig or shoot of a tree or bush, especially a straight slender stick or wand used as an instrument of punishment, as a symbol of office, or as an implement, usually composed of several joints, for angling or fishing. The term is thus applied to a metal bar, slender in proportion to its length, used as a tie, brace or connecting shaft between different parts of a machine. It is familiar in the titles, showing the colour of their wands of office, of the gentlemen ushers of the three principal British orders of knighthood, the ushers of the Garter and St Patrick being "Ushers of the Black Rod," and of the Thistle "Green Rod." The use of a rod as a measuring implement has given rise to the use of the word for a measure of length = $5\frac{1}{2}$ yds. or $16\frac{1}{2}$ ft.; this length is also named a pole or perch, the origin of the application being the same as in "rod"; as a measure of area, a rod = a square pole or perch, $30\frac{1}{4}$ square yds. = $272\frac{1}{4}$ square ft., 160 rods = 1 acre.

RODBERTUS, KARL JOHANN (1805–1875), German socialist, was born at Greifswald on the 12th of August 1805, his father being a professor at the university there. He studied law at Göttingen and Berlin, thereafter engaging in various legal occupations; and, after travelling for some time, he bought the estate of Jagetzow in Pomerania, whence his name of Rodbertus-Jagetzow. In 1836 he settled on this estate, and henceforward devoted his life chiefly to economic and other studies, taking also some interest in local and provincial affairs. After the revolution of March 1848 Rodbertus was elected member of the Prussian national assembly, in which body he belonged to the left centre; and for fourteen days he filled the post of minister of public worship and education. He sat for Berlin in the second chamber of 1849, and moved the adoption of the Frankfort imperial constitution, which was carried. When the system of dividing the Prussian electorate into three classes was adopted, Rodbertus recommended abstention from voting. His only subsequent appearance in public life was his candidature for the first North German diet, in which he was defeated. His correspondence with Lassalle was an interesting feature of his life. At one time Rodbertus had some intention of forming a "social party" with the help of the conservative socialist Rudolf Meyer and of W. Hasenclever, a prominent follower of Lassalle; but no progress was made in this. Rodbertus was neither disposed nor qualified to be an agitator, being a man of a quiet and critical temperament, who believed that society could not be improved by violent changes, but by a long and gradual course of development. He warned the working men of Germany against connecting themselves with any political party, enjoining them to be a "social party" pure and simple. He died on the 8th of December 1875.

The general position of Rodbertus was "social, monarchical and national." He held the purely economic part of the creed of the German social-democratic party, but he did not agree with their methods, and had no liking for the productive associations with state help of Lassalle. He regarded a socialistic republic as a possible thing, but he cordially accepted the monarchic institution in his own country and hoped that a German emperor might undertake the rôle of a social emperor. The basis of the economic teaching of Rodbertus is the principle laid down by Adam Smith and Ricardo, and insisted on by all the later socialists, that labour is the source and measure of value. In connexion with this he developed the position that rent, profit and wages are all parts of a national income produced by the united organic labour of the workers of the community. Consequently there can be no talk of the wages of labour being paid out of capital; wages is only that part of the national income which is received by the workmen, of a national income which they have themselves entirely produced. The wages fund theory is thus summarily disposed of. But the most important result of the theory is his position that the possession of land and capital enables the landholders and capitalists to compel the workmen to divide the product of their labour with those non-working classes, and in such a proportion that the workers only obtain as much as can support them in life. Thus the iron law of wages is established. Hence also Rodbertus deduces his theory of commercial crises and of pauperism.

A fundamental part of the teaching of Rodbertus is his theory of social development. He recognized three stages in the economic progress of mankind: (1) the ancient heathen period in which property in human beings was the rule; (2) the period of private property in land and capital; (3) the period, still remote, of property as dependent on service or desert. The goal of the human race is to be one society organized on a communistic basis; only in that way can the principle that every man be rewarded according to his work be realized. In this communistic or socialistic state of the future land and capital will be national property, and the entire national production will be under national control; and means will be taken so to estimate the labour of each citizen that he shall be rewarded according to its precise amount. An immense staff of state officials will be required for this function. Rodbertus believed that this stage of social development is yet far distant; he thought that five centuries will need to pass away before the ethical force of the people can be equal to it.

From temperament, culture and social position Rodbertus was averse to agitation as a means of hastening the new era; and, in the measures which he recommends for making the transition towards it, he showed a scrupulous regard for the existing interests of the capitalists and landholders. He proposed that those two classes should be left in full possession of their present share of the national income, but that the workers should reap the benefit of the increasing production. To secure them this increment of production, he proposed that the state should fix a "normal working day" for the various trades, a normal day's work, and a legal wage, the amount of which should be revised periodically, and raised according to the increase of production, the better workman receiving a better wage. By measures such as these, carried out by the state in order to correct the evils of competition, would Rodbertus seek to make the transition into the socialistic era.

The economic work of Rodbertus is an attempt made in a temperate and scientific spirit to elucidate the evil tendencies inherent in the competitive system, especially as exemplified in the operation of the iron law of wages. The remedy he proposes is a state management of production and distribution, which shall extend more and more, till we arrive at a complete and universal socialism,—and all based on the principle that as labour is the source of value so to the labourer should all wealth belong. It is therefore an attempt to place socialism on a scientific basis; and he is certainly entitled to be regarded as one of the founders of "scientific socialism."

The following are the most important works of Rodbertus: *Zur Erkenntniss unserer staatswirtschaftlichen Zustände* (1842); *Sociale Briefe an von Kirchmann* (1850); *Creditnot des Grundbesitzes* (2nd ed., 1876); "Der Normal-Arbeitstag," in *Tüb. Zeitschrift* (1878); *Letters* to A. Wagner, &c., *Tüb. Zeitschrift* (1878–79); *Letters* to Rudolf Meyer (1882). Rodbertus has received great attention in Germany, especially from Adolf Wagner (*Tüb. Zeitschrift*, 1878); see also Kosak's *Rodbertus sozialökonomische Ansichten* (Jena, 1882); an excellent monograph by G. Adler, *Rodbertus, der Begründer des wissenschaftlichen Sozialismus* (Leipzig, 1884); Dietzel, *Karl Rodbertus, Darstellung seines Lebens und seiner Lehre* (Jena, 1886); Jentsch, *Rodbertus* (Stuttgart, 1899); and E. C. K. Gonner, *Social Philosophy of Rodbertus* (London, 1899).

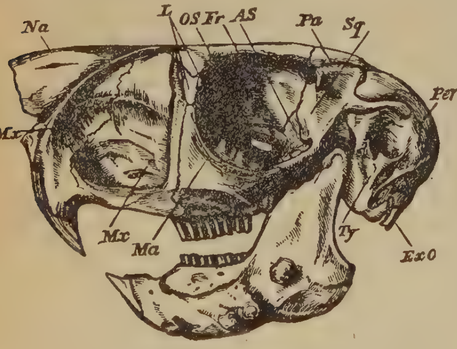
RODENTIA, or Glires, an order of placental mammals characterized by the peculiar form and structure of their front or incisor teeth, which are reduced to a single functional chisel-like pair in each jaw, specially adapted for gnawing, and growing throughout the entire life of their owners. Rodents may be characterized as terrestrial, or in some cases arboreal or aquatic, placental mammals of small or medium size, with a milk and a permanent series of teeth, plantigrade or partially plantigrade, and generally five-toed, clawed (rarely nailed or semihoofed) feet, clavicles or collar-bones (occasionally imperfect or rudimentary), no canine teeth, and a single pair of lower incisors, opposed by only one similar and functional pair in the upper jaw.

In all rodents the upper incisors resemble the lower ones in growing uninterruptedly from persistent pulps, and (except in the hare group, Duplicidentata) agree with them in number. The premolars and molars may be rooted or rootless, with tuberculated or laminated crowns, and are arranged in an unbroken series. The orbits are always open behind, never being surrounded by bone. The condyle of the lower jaw is antero-posteriorly elongated. The intestine (except in the dormice or Gliridae) has a large caecum. The testes are inguinal or abdominal. The uterus is two-horned, with the cornua opening separately into the vagina or uniting to form a *corpus uteri*. The placenta is discoidal and deciduate. And the smooth hemispheres of the brain do not extend backwards so as to cover any part of the cerebellum.

Rodents include by far the greater number of species, and have the widest distribution, of any of the orders of terrestrial mammals, being in fact cosmopolitan, although more abundant in some parts, as in South America, which may be considered their headquarters, than in others, as in Australasia and Madagascar, where they are represented only by members of the mouse-group, or Myoidea.

All rodents are vegetable-feeders, and this uniformity in their food and in the mode of obtaining it, namely by gnawing, has led to that general uniformity in structure observable throughout the group; a feature which renders their classification difficult. Indeed, despite the fact that they present much diversity of habit—some being arboreal, as the squirrels, many of which are provided with expansions of skin or parachutes on which they glide from tree to tree; some cursorial, as the hares; others jumpers, as the jerboas; others fossorial, as the mole-rats; and others aquatic, as the beavers and water-rats—no important structural modifications are correlated with such diversity of habit.

Anatomy.—The rodent skull is characterized by the great size of the premaxillae, which completely separate the nasals from the maxillae; by the presence of zygomatic arches; and by the wide unoccupied space existing between the incisors and the cheek-teeth; and (except in the Duplicidentata) by the antero-posteriorly elongated glenoid cavity for the articulation of the lower jaw. Post-orbital processes of the frontals exist in squirrels, marmots and hares; but in all other genera they are rudimentary or altogether absent; and the zygoma seldom sends upwards a corresponding process, so that the orbit is more or less completely continuous with the temporal fossa. The lachrymal foramen is always within the orbital margin; and in many species the infra-orbital foramen is very large (in some as large as the orbit) and transmits part of the masseter muscle. The zygomatic arch is variously developed, and the position of the jugal is a character for grouping the families. The nasals are, with few exceptions, large, and extend far forwards, the parietals are moderate, and there is generally a distinct interparietal. The palate is narrow from before backwards, this being especially the case in the hares, where it is reduced to a mere bridge between the premolars; in others, as in the rodent-moles (Bathyerginae), it is extremely narrow transversely, its width being less than that of one of the molar teeth. Tympanic bullae are always present and generally large; in some genera, as in the gerbils (Gerbillinae) and jerboas (Jaculidae), there are supplemental mastoid bullae which form great hemispherical bony swellings at the back of the skull (fig. 1, *Per*), in these genera and the hares the meatus auditorius being tubular and directed upwards and backwards. The lower jaw is characterized by its abruptly narrowed and rounded front part supporting the pair of large incisors, as well as by the small size of the coronoid process, and the great development of the lower hind, or angular, portion.



Flower, *Osteol. Mammal.*

FIG. 1.—Skull of Jumping-Hare (*Pedetes caffer*). *P Mx*, premaxilla; *Mx*, maxilla; *Ma*, malar; *Fr*, frontal; *L*, lachrymal; *Pa*, parietal; *Na*, nasal; *Sq*, squamosal; *Ty*, tympanic; *ExO*, exoccipital; *AS*, alisphenoid; *OS*, orbito-sphenoid; *Per*, mastoid bulla.

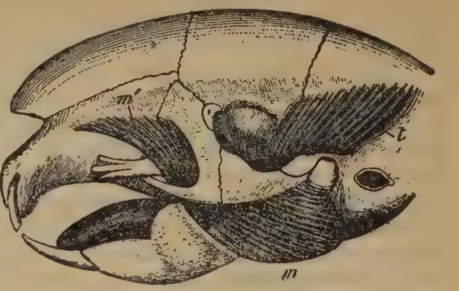


FIG. 2.—Skull of Porcupine (*Hystrix cristata*), with muscle attached. *t*, temporal muscle; *m*, masseter; *m'*, portion of masseter transmitted through the infra-orbital foramen, the superior maxillary nerve passing outwards between it and the maxilla.

The dental formula varies from *i.* $\frac{2}{1}$, *c.* $\frac{0}{0}$, *p.* $\frac{3}{2}$, *m.* $\frac{3}{3}$ (total 28) in the hares and rabbits to *i.* $\frac{1}{1}$, *c.* $\frac{0}{0}$, *p.* $\frac{0}{0}$, *m.* $\frac{2}{2}$ (total 12) in the Australian water-rats; but in the great majority of species it presents striking uniformity, and may be set down typically as *i.* $\frac{1}{1}$, *c.* $\frac{0}{0}$, *p.* $\frac{1}{1}$ or $\frac{0}{0}$, *m.* $\frac{3}{3}$. In the Duplicidentata only is there more than a single pair of incisors, and in these the additional pair is small and placed behind the middle pair. In this group the enamel extends partially to the back of the incisors, but in all the rest it is restricted to the front surface, so that, by the more rapid wearing-away of the softer structures behind, a chisel-shaped edge is maintained. Both upper and lower incisors are regularly curved, the upper ones slightly more so than the lower; and, their growth being continuous, should anything prevent the normal wear by which their length is regulated—as by the loss of one of them, or by displacement owing to a broken jaw or other cause—the unopposed incisor may gradually curve upon itself until a complete circle or more has been formed, the tooth sometimes passing through some part of the animal's head. The cheek-teeth may be either rooted or rootless, and either cusped or formed of parallel plates, this diversity of structure often occurring in the same family. When there are more than three cheek-teeth, those which precede the last three have succeeded milk-teeth, and are premolars. In some species, as in the agoutis (Dasyproctidae), the milk-teeth are long retained, while in the allied cavies (Caviidae) they are shed before birth.

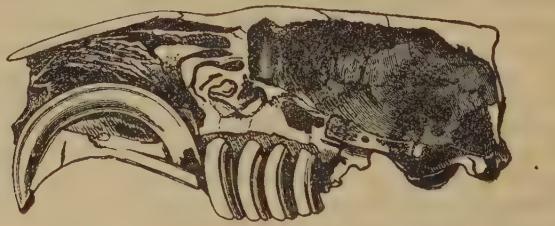


FIG. 3.—Vertical and Longitudinal Section through the Skull of the Beaver (*Castor fiber*), showing the brain-cavity, the greatly developed plates of bone in the nose-cavity, the mode of implantation of the ever-growing chisel-edged incisor, and the curved rootless cheek-teeth.

The tongue presents little variability in length, being short and compressed, with a blunt tip, which is never protruded beyond the incisors. In most species there are three circumvallate papillae at the base, and the apical portion is generally covered with small thread-like papillae, some of which in the porcupines become greatly enlarged, forming toothed spines. The stomach varies in form from the simple oval bag of the squirrels to the complex ruminant-like organ of the lemmings. In the water-rat and agoutis it is constricted between the oesophagus and pylorus; while in the dormouse the oesophagus immediately before entering the stomach is much dilated, forming a large egg-shaped bag with thickened glandular walls; and in certain other species, as in *Lophiomys* and the beaver, glandular masses are attached to and open into the cardiac or pyloric pouches. All rodents, with the sole exception of the dormice, have a caecum, often of great length and sacculated, as in hares, the water-rat and porcupines; and the long colon in some, as the hamster and water-rat, is spirally twisted upon itself near the commencement. The liver is divided in the typical manner in all, but the lobes are variously subdivided in different species (in *Capromys* they are divided into minute lobules); and the gall-bladder, though present in most, is absent in a few. In most species the penis (which is generally provided with a bone) may be more or less completely retracted within the fold of integument surrounding the vent, and lie curved backwards upon itself under cover of the integument, or it may be carried forward some distance in front of the anal orifice, from which, as in voles and marmots, in the breeding-season, it is separated by the prominent testicular mass. The testes in the pairing-season form projections in the groins, but (except in the Duplicidentata) do not completely leave the cavity of the abdomen. Prostate glands and, except in the Duplicidentata, vesiculae seminales are present in all. The uterus may be double, each division opening by a separate *os uteri* into a common vagina, as in *Leporidae*, *Sciuridae*, and *Hydrochoerus*, or two-horned, as in most species. The teats vary in number from a single abdominal pair in the guinea-pig to six thoracico-abdominal pairs in the rats; while in the *Octodontidae* and *Capromyidae* they are placed high up on the sides of the body.

There are generally nineteen dorso-lumbar vertebrae (thirteen thoracic and six lumbar); the form of which varies in different genera; in the cursorial and leaping species the lumbar transverse processes are generally very long, and in the hares there are large compressed inferior spines, or hypapophyses. The caudal vertebrae vary from a rudimentary condition in the guinea-pig to a great size in the jumping-hare and prehensile-tailed porcupines. The scapula is usually narrow, with a long acromion; the clavicles may be altogether absent or imperfect, as in porcupines, cavies and hares, but in most species are well developed. The humerus has no supra-condylar foramen, and the forearm bones are distinct; and in most species the fore foot has five digits with the phalanges normally developed, the first toe being but rarely rudimentary or absent. The pelvis has large ischia and pubes, with a long and usually bony symphysis. The femur varies considerably in form, but generally has a well-defined third trochanter. In the squirrels and porcupines the tibia and fibula are distinct, but in rats and hares they are united, often high up. The hind foot is more variable than the front one, the digits varying in number from five, as in squirrels and rats, to four, as in hares, or even three, as in the capybara, viscacha and agouti. In the *Jaculidae* the metatarsals are greatly elongated, and in some of the species, as jerboas, they are welded together.

The mouth is divided into two cavities communicating by a narrow orifice, the anterior one containing the incisors and the posterior the molars, the hairy skin of the face being continued inwards behind the incisors. This evidently prevents substances not intended for food getting into the mouth, as when the animal is engaged in gnawing through an obstacle. In hares and pacas the inside of the cheeks is hairy; and in some species, pouched rats and hamsters, there are large internal cheek-pouches lined with hair, which open near the angles of the mouth and extend backwards behind the ears. In the New World pouched rats (*Geomyidae*) the pouches open externally on the cheeks.

The peculiar odour evolved by many rodents is due to the secretions of special glands, which may open into the prepuce, as in *Mus*, *Microtus* and *Cricetus*, or into the rectum, as in *Arctomys* and *Thryonomys*, or into the passage common to both, as in the beaver, or into pouches opening near the vent, as in hares, agoutis and jerboas.

The skin is generally thin, and the panniculus carnosus muscle rarely much developed. The fur varies exceedingly in character,—in some, like the chinchillas and hares, being fine and soft, while in others it is more or less replaced by spines on the upper surface, as in spiny rats and porcupines; these spines in several genera, as *Xerus*, *Acomys*, *Platacanthomys*, *Echinothrix*, *Loncheres* and *Echinomys*, being flattened. In muscular structure the chief peculiarities are noticeable in the comparatively small size of the temporal muscles, and in the great double masseters (fig. 2), which are the principal agents in gnawing. The digastric muscles also are remarkable for their well-defined central tendon, and in many species their anterior bellies are united between the two halves of the lower jaw. The cleido-mastoid generally arises from the basi-occipital, and the pectoralis major is connected with the latissimus dorsi. In porcupines and hares the tendons of the flexor digitorum longus and flexor hallucis longus are connected in the foot, while in the rats and squirrels they are separate, and the flexor digitorum longus is generally inserted into the metatarsal of the first toe.

Classification.—Some diversity of view obtains among naturalists with regard to the classification of the order; the scheme here followed being the one adopted (with some modifications of nomenclature) by Professor Max Weber in his *Säugethiere*. The number of genera is so great that only the more important can be noticed. All authorities are agreed in dividing rodents into two great sections or sub-orders, the one, *Duplicidentata*, comprising only the hares, rabbits and picas, and the other, *Simplicidentata*, all the rest. In the latter there is only one pair of incisor teeth in the upper jaw, in which the enamel is confined to the front surface. The incisive foramina of the palate are moderate and distinct; the fibula does not articulate with the calcaneum; and the testes are abdominal, and descend periodically only into the inguinal canal.

Sewellels.—The first family is represented by certain peculiar North American rodents known as sewellels, constituting the genus *Haplodon* (or *Aplodon*) and the family Haplodontidae and section Haplodontoidea. In common with the next three sections these rodents have the angular process of the lower jaw (fig. 4) arising from the inferior surface of the socket of the incisor. The masseter muscle does not pass through the narrow infra-orbital canal. An alisphenoid canal may be present on the palatal aspect of the skull; but there is always a transverse canal. The malleus and incus of the inner ear are separate. The humerus often has a foramen (entepicondylar) on the inner side of its lower end; the tibia and fibula may be separate or united; but the scaphoid and lunar of the carpus are also united, while the centrale is free. The stomach is simple.

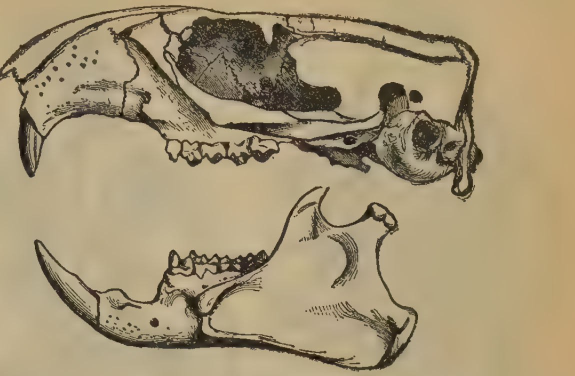


FIG. 4.—Skull of the American Marmot (*Arctomys monax*). The projection at the right-hand lower corner of the figure is the angular process of the lower jaw.

Sewellels are medium-sized terrestrial rodents, with no post-orbital process to the skull, which is depressed in form, and rootless cheek-teeth, among which the premolars number $\frac{2}{1}$, the first in the upper jaw being very small. The build is stout and heavy, the limbs and tail are short, the ears moderate, the eyes minute and the feet five-toed and plantigrade. *Haplodon* is represented by a small number of species in America west of the Rocky Mountains, of which *H. rufus* is the longest known. They are burrowing, and, in some cases at any rate, partially aquatic rodents.

Squirrel Group.—The Sciuroidea, which include the great group of squirrels, sousliks, marmots, &c., all comprised in the single family Sciuridae, differ from the sewellels in having large post-orbital processes to the skull (figs. 4, 5, 6); and, with one exception, have rooted cheek-teeth, the premolar-formula being $\frac{2\text{ or }1}{1}$. The infra-orbital foramen is also narrower, and the tympanic bulla is cellular. In both groups the tibia and fibula are separate.

The family is divided into three sub-families, the first of which is the Sciurinae. In this the crowns of the molars are more or less shortened, with their cusps either arranged in longitudinal lines, or forming four upper and three lower more or less distinct oblique ridges. The post-orbital processes of the frontal and jugal are widely sundered, and the former may even be small (*Xerus*). The expanded anterior root of the zygomatic process has its front border oblique. According to modern views the sub-family is broken up into a large number of genera.

The first of these is *Rhithrosciurus*, represented by one large species (*R. notatus*) from Borneo, characterized by its finely grooved incisors (see GROOVE-TOOTHED SQUIRREL). The second genus, *Heliosciurus*, includes arboreal African squirrels, typified by *H. stangeri*, allied in the characters of their skulls to the undermentioned *Xerus*, and with a very large pre-orbital foramen in the more typical forms. The third, *Funisciurus*, of which *F. pyrrhopus* is a well-known example, is also African and allied to *Xerus*, but has a still longer skull and soft fur. In *Xerus* itself, which is represented by the terrestrial African spiny squirrels, the ears are short, there are only two teats, and flat spines are mingled with the fur; while the skull, and more especially the frontals, is elongated, with a very short post-orbital process, and the crowns of the molars are taller than usual (see SPINY SQUIRREL). The well-known Indian palm-squirrel, *Funambulus palmarum*, typifies an Indo-Malay genus allied to *Xerus* in skull-characters but with molars more like those of *Sciurus*. In contrast to these small striped species are the giant squirrels of the same region, such as *Ratufa indica* and *R. bicolor*, which are very brightly coloured rodents, with *Sciurus*-like skulls (fig. 5) but extremely short-crowned molars, and only one pair of upper premolars. Next comes the typical *Sciurus*, including the great bulk of the entire group, and ranging over Europe, Asia, North Africa and America. The skull is short and broad, especially as regards the frontals, with large post-orbital processes (fig. 5), and very generally two upper premolars, making a total of five pairs of upper cheek-teeth, which have crowns of medium height. The teats are either four or six. Squirrels of this and the other arboreal groups have the bodily form slender and agile, the tail long and bushy, the ears well developed, pointed and often tufted; the feet adapted for

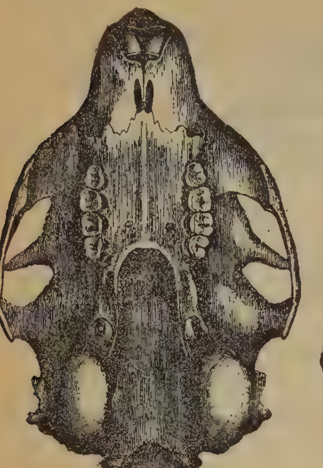


Fig. 5.—Under Side of Skull of the Malay Giant Squirrel (*Ratufa bicolor*).

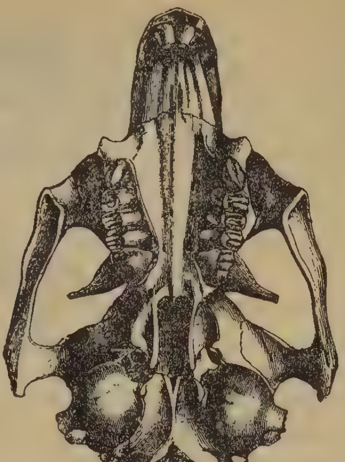


Fig. 6.—Under Side of Skull of Prairie-Marmot (*Cynomys ludovicianus*).

climbing, the anterior pair with four toes and a rudimentary thumb, and the posterior pair with five toes, all the toes having long, curved and short-pointed claws (see Squirrel). The names *Glyphotes* and *Sciurotamias* have been proposed respectively for one Bornean and some four Chinese squirrels. With *Tamias* (sometimes split into *Tamias* and *Eutamias*) we reach the North American striped ground-squirrels, or chipmunks, well characterized by the large internal cheek-pouches, with one outlying species in Northern Asia and Europe (see Ground-Squirrel). These lead on to the sousliks, *Spermophilus* (or *Citellus*), in which the incisors (as in the following genera) differ from those of all the squirrels in not being compressed. The genus which is common to the northern parts of both hemispheres is distinguished by the large cheek-pouches and by the absence or rudimentary condition of the claw of the first hind-toe, resembles *Tamias* in the slender form of the body, but displays great variation in the length of the tail, which may be a mere stump, or comparatively long. As in the following genera, there are two pairs of premolars, of which the first in this case is small and rounded, while the two series of cheek-teeth are nearly parallel (see Souslik). The prairie-dogs, or prairie-marmots, *Cynomys*, are a North American group, in which the five-toed forefeet have the claw of the first as large as that of the fifth toe. The skull is heavily built, with the post-orbital processes directed outwards. Dentition (fig. 6) remarkably heavy, the molar teeth differing from those of *Spermophilus* and *Arctomys* by having three instead of two transverse grooves on their crowns. First premolar nearly as large as the second. Molar series strongly convergent behind (see Prairie-Marmot). Finally, we have the marmots (*Arctomys*), which are larger and more heavily built rodents, with short ears, more or less short tails and rudimentary or no cheek-pouches. Fore-feet with the first toe rudimentary and bearing a flat nail. Skull (fig. 4) large and heavy, with the post-orbital process stouter and at right angles to the axis. Incisors broad and powerful. First upper premolar nearly as large as the second. Molar series nearly parallel, scarcely converging behind at all.

The genus is common to the northern half of both hemispheres, and its members, like those of the two preceding groups, burrow and hibernate (see Marmot).

The Nannosciurinae, or second sub-family of Sciuridae, are represented only by the pigmy squirrels (*Nannosciurus*), characterized by their very short-crowned molars (which approximate to those of dormice in structure) and small premolars, of which the first upper pair is often deciduous, while the upper molars have only three oblique ridges. The front root of the zygomatic arch is nearly vertical, and placed so far back that it is above the second molar, while the orbit—a unique feature among rodents—is almost completely surrounded by bone. The few representatives of this group are all very small rodents, confined to tropical Africa, the Philippines and the Malay islands.

The third and last sub-family, the Pteromyinae, is distinguished from the other two by the presence of a parachute-like fold of skin along the sides of the body, the supporting cartilage of which arises from the carpus or wrist. It includes *Sciuropterus*, represented by small species from the northern parts of both hemispheres; *Pteromys*, comprising large flying-squirrels, ranging from India and the Malay countries to Japan, characterized by the long cylindrical tail and large inter-femoral membrane; and *Eupetaurus*, represented by one very large dark grey, long-tailed and long-haired species from Astor and Gilgit, which differs from all other members of the family by its tall-crowned cheek-teeth (see Flying-Squirrel).

Beavers.—The second section, Castoroidea, of the present group includes only the family Castoridae, represented by the beavers, which are large aquatic rodents characterized by their massive skulls, devoid of post-orbital processes, with the angle of the lower jaw rounded, the molars rootless or semi-rooted, with re-entering enamel-folds, and one pair of premolars above and below. The tibia and fibula are united inferiorly, the tympanic bulla is hollow and the infra orbital foramen narrow. The single existing genus comprises the European beaver, *Castor fiber*, of Europe and Northern Asia, and the North American *C. canadensis.* The upper molars are subequal, each with one internal and two external enamel-folds; the stomach has a large glandular mass situated to the right of the oesophageal orifice; the anal and urino-genital orifices open within a common cloaca; the tail is broad, horizontally flattened and naked; and the hind-feet are webbed (see Beaver).

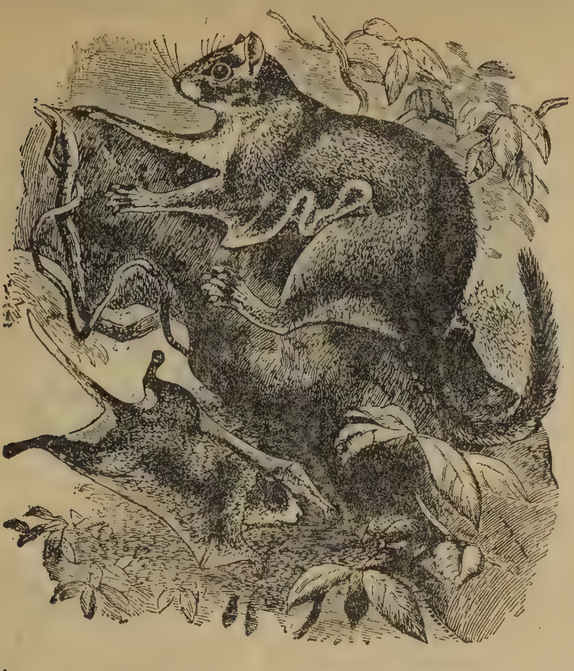
Pouched Rats.—The American pouched rats, or pocket-gophers, constitute the third section, Geomyoidea, with the single family Geomyidae. The dentition includes one pair of premolars above and below, and rooted or rootless molars with but few enamel-folds. In the skull the infra-orbital foramen is narrow, and post-orbital processes and an alisphenoid canal are absent. The tibia are fibula are united. The cheeks are provided with large pouches opening externally. Two sub-families are recognized. The first of these, or Geomyinae, is characterized as follows: Incisors broad; mastoid not appearing on the top of the skull; eyes small; ears rudimentary; limbs short, subequal. Habits fossorial. *Geomys bursarius*, the "red pocket-gopher" of North America, with deeply grooved incisors, inhabits the plains of the Mississippi, living in burrows like the mole. Several other species from the Southern States, Mexico and Central America are recognized. *Thomomys talpoides*, with plain incisors, extending from Canada to the United States west of the Rocky Mountains, typifies the second genus, which has also many species. The following are the characters of the second sub-family, Heteromyinae: Incisors narrow; mastoid appearing largely on the top of the skull; eyes and ears moderate or large; hind-limbs and tail elongated. Habits terrestrial. *Dipodomys*, which has the molars rootless, is typified by *D. phillipi*, the kangaroo-rat of the desert regions east of the Rocky Mountains, *Perodipus* and *Microdipodops* being allied genera. *Perognathus* and *Heteromys* have rooted molars; the latter genus is distinguished by the presence of flattened spines among the fur, and has species extending into South America. (See Pocket-Gopher, Pocket-Mouse and Kangaroo-Rat.)

Scaly-tailed Squirrels.—The next section, according to Prof. Max Weber's arrangement, is that of the Anomaluroidea, typified by the rodents commonly called African flying-squirrels (Anomaluridae), but better designated scale-tailed squirrels, or simply "scaly-tails," since one member of the family has no parachute. To this group Prof. H. Winge affiliates the African jumping-hares (Pedetidae), a view which is adopted by Prof. Weber, although Mr O. Thomas places these rodents in the neighbourhood of the porcupines. In the more extended sense, the Anomaluroidea are diagnosed as follows: In the skull the infra-orbital foramen (or canal) is large, the lachrymal foramen placed high up, and no transverse canal; while the malleus and incus of the internal ear are fused. In the carpus the scaphoid and lunar bones are united. There is a single pair of premolars in each jaw.

The Anomaluridae are characterized by having rooted cheek-teeth with shallow transverse enamel-folds, the two halves of the lower jaw movably articulated in front, very small post-orbital processes to the skull, and the presence of two rows of scales on the under surface of the base of the tail (figs. 7 and 8), which is cylindrical and thickly haired. The family is confined to the equatorial forest-tract of Africa, where it is most numerously represented on the west side. The majority of the species belong to the typical genus *Anomalurus* (fig. 7), which is provided with a parachute supported by a cartilaginous process arising from the olecranon of the ulna, and has well-developed ears and a moderately long tail. Several of the species are considerably larger than an ordinary squirrel. *Idiurus*, as represented by the West African *I. zenkeri* (figured in the article Flying-Squirrel), is a mouse-like form, with very small ears and an extremely long tail. The third genus, *Zenkerella* (*Aëthurus*), which is also West African, has no parachute (fig. 8).

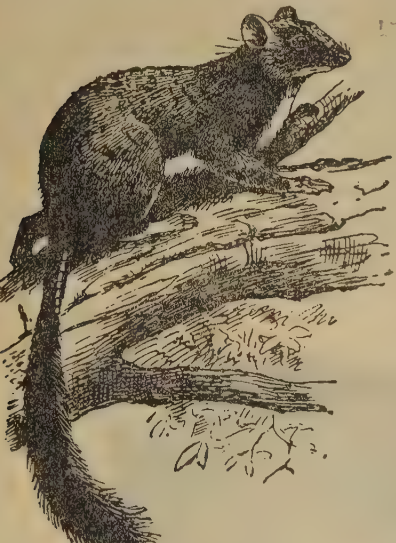
Jumping-Hares.—The grounds for referring the African jumping-hares (Pedetidae) to the Anomaluroidea rest largely on the evidence of certain Tertiary rodents from Europe, such as *Issiodoromys.* The family is represented by the South African *Pedetes caffer*, which is as large as a hare, and the smaller East African *P. surdaster.* In general habits and appearance these animals recall large jerboas, from which group they are, however, distinguished by the four pairs of rooted cheek-teeth, the premolars being as large as the molars, and the latter having one outer and one inner enamel-fold. The hind-limbs are elongated, with four toes, of which the metatarsals are separate; the tibia and fibula are welded in old age; the calcaneum and astragalus of the tarsus are elongated; and there is a perforation on the inner side of the lower end of the humerus (see Jumping-Hare).

Dormice.—The next three sections of the order, namely, the Myoxoidea, or dormice, Dipodoidea, or jerboas, and Myoidea, or the mouse group, have the following characteristics in common. The angular process of the lower jaw has the same relations as in the sewellels and the allied groups. The lachrymal foramen in the skull is low down and forms an elongated slit. In the carpus the scaphoid and lunar are welded, but the centrale remains distinct. The tibia and fibula are fused at their upper and lower ends. The malleus and incus of the inner ear are separate. Except in *Lophiomys*, the clavicles are complete. The infra-orbital foramen of the skull (fig. 9) is more or less broad; and there is generally a transverse canal. The stomach is generally complex.



From Alston.

Fig. 7.—Red Scaly-tailed Squirrel (*Anomalurus fulgens*).



From de Winton.

Fig. 8.—Zenker's Scaly-tailed Squirrel (*Zenkerella insignis*).

In the dormice, forming the section Myoxidea, with the single family Gliridae (or Myoxidae), a single pair of premolars may or may not be present; the molars are short-crowned and rooted, with transverse enamel-folds. The angle of the lower jaw is twisted and its coronoid process slender. Dormice are small arboreal rodents, with long hairy tails, large eyes and ears, and short fore-limbs, ranging over Europe, Asia and Africa. Of the four genera in the typical sub-family Glirinae, the first is *Glis*, represented by *Glis vulgaris* (or *G. glis*) of Europe, with a doubly vaned, bushy tail, simple stomach, and large molars with well-marked enamel-folds; the second, *Muscardinus*, with *M. avellanarius*, the common dormouse, distinguished by the cylindrical bushy tail, and thickened glandular walls of the cardiac extremity of the œsophagus; thirdly, *Eliomys*, containing several species, with tufted and doubly vaned tails, simple stomachs and smaller molar teeth, having concave crowns and faintly marked enamel-folds; and lastly, the African *Graphiurus*, represented by several species, with short cylindrical tails ending in a pencil of hairs, and very small molars almost without trace of enamel-folds. None of the members of the typical sub-family extend into India, where the group is represented by *Platacanthomys*, typifying the sub-family Platacanthomyinae, characterized by the absence of premolars; the other being the Chinese *Typhlomys*. These are small rodents with somewhat the appearance of the pigmy squirrels (*Nannosciurus*), which in some degree connect the family with the Muridae. (See DORMOUSE.)

Jerboa Group.—The Dipodoidea, or jerboa-group, which likewise includes only a single family, Jaculidae (or Dipodidae), is characterized by the presence of not more than one pair of premolars in the upper jaw, which, however, may be wanting; by the rooted cheek-teeth, which have transverse enamel-folds, and the absence of a transverse canal in the skull, and of a horny layer in the stomach. The family is divisible into two sub-families, of which the first, or Sminthinae, is represented only by the genus *Sminthus*, containing a few species which range from Denmark into Western Asia, Kashmir and China. They are small rat-like rodents, with one pair of upper premolars, which are mere pins, as is the last molar, and the two pairs of limbs of normal length, with the metatarsals separate; the infra-orbital opening in the skull being triangular and widest below, while the incisive foramina in the palate are elongated. The European *S. subtilis* has a black dorsal stripe bordered with yellow.

The Dipodinae, on the other hand, are leaping rodents, with the metatarsals elongated, a small upper premolar present or absent, and the crowns of the molars tall. Various degrees of specialization occur in the adaptation for leaping. The least specialized genus is *Zapus*, containing the jumping-mice of North America, with one outlying Siberian species, in which the five metatarsals are free, as are also the cervical vertebrae, the small upper premolar being retained. (See JUMPING-MOUSE.)

In the other genera, so far as known, the three central metatarsals of the hind foot are fused into a cannon-bone, of a type unique among mammals and comparable to that of birds. Some of the cervical vertebrae are also united in at least the better-known genera. The tail and ears are generally very long; while, in correlation with the size of the latter, the auditory bullae of the skull are also large. In the typical jerboas, *Jaculus* (or *Dipus*), ranging from North Africa to Persia, Russia and Central Asia, there are only three hind toes, the incisors are grooved, and the premolars are generally wanting. The other genera have five toes, of which only the middle three are functional, and smooth incisors. *Euchoreutes*, with one Yarkand species, has premolars, enormous ears and a long nose. *Alactaga*, ranging over Russia and Western and Central Asia, inclusive of Persia and Baluchistan, has smaller ears and a shorter nose; by some naturalists it is taken to include the North African *A. tetradactylus*, which is separated by others as *Scarturus*. The Turkestan *Platycercomys* (or *Pygeretmus*) has a lancet-shaped tail and no premolars; while *Cardiocranus* of the Nan-shan district of Central Asia has a similar type of tail, but short ears and a peculiarly triangular skull. (See JERBOA.)

Mole-Rats.—The mole-rats (Spalacidae) bring us to the mouse-like section, or Myoidea, in which there are no premolars and the molars may be occasionally reduced to $\frac{2}{2}$; these teeth being either rooted or rootless, with either cusps or enamel-folds, and the first generally larger than the second. In the skull the zygomatic arch is slender and the jugal bone small and not extending far forwards, being supported by the long zygomatic process of the maxilla, while the infra-orbital foramen is mostly large, and there are no post-orbital processes. Although sometimes short, the tail is generally long, sparsely haired and scaly. The cardiac portion of the complex stomach has a horny layer, and there is a caecum.

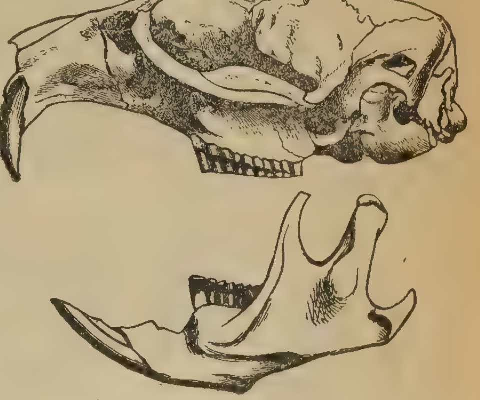
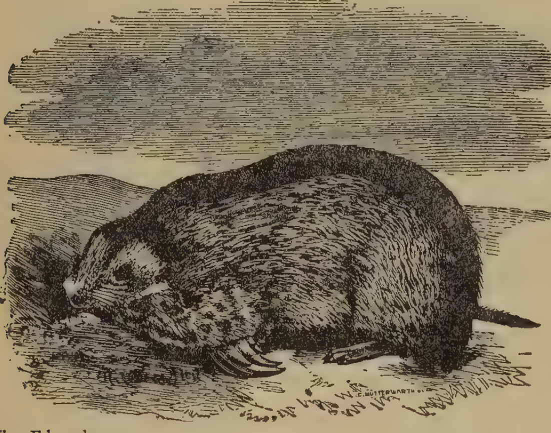


Fig. 9.—Skull of the Muskrat (*Fiber zibethicus*). Natural size.

The Spalacidae are burrowing types, allied apparently to the ancestral Jaculidae, and characterized by the second and third molars being equal in size, the presence of enamel-folds in all these teeth, and the superiority in size of the claws of the second, third and fourth front toes over the other two. All these "rodent-moles" are thoroughly adapted to a subterranean life, the eyes and ears being small and rudimentary, as is also the tail; while the bodily form is cylindrical, and the front claws are very large and powerful. The incisors are very large; and the palate of the skull is narrow. The typical representative of the group is the great mole-rat (*Spalax typhlus*) of Eastern Europe and North-East Africa, which, together with a few closely allied species, has the eyes completely buried in the skin, and the head much flattened.

In the bamboo-rats, *Rhizomys*, from the Indo-Malay countries, China and Tibet, as well as in the closely allied East African *Tachyoryctes*, the eyes are, however, functional, and the head is rounded. (See MOLE-RAT.)

According to the arrangement here followed, the burrowing zokors may be placed in this family, although they have teeth like those of the vole group in the Muridae. The first representative of this sub-group is the genus *Siphneus* (or *Myotalpa*), of which some five Central and North Asiatic species are known. They are characterized by the mole-like form and long, powerful, front claws (fig. 10). In the true zokors (*Ellobius*), on the other hand, the claws are short and the general form more vole-like. Of three named species, one extends from South Russia to Siberia, while two others are respectively from Kurdistan and Afghanistan. A third type, *Prometheomys*, from the Caucasus, is represented by a species of the size of a small water-rat, chestnut-brown in colour, with lighter feet, and the minute eyes covered with skin. The teeth are nearest to those of the true zokors (*Ellobius*). The single example was taken under flowering anemones.



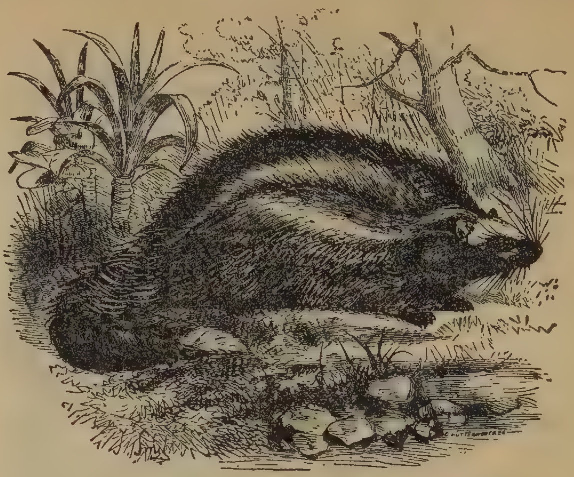
From Milne-Edwards.

FIG. 10.—The Tibetan Zokor (*Siphneus armandi*).

Malagasy Rats.—On account of certain structural peculiarities, the rats of Madagascar, which have a dentition like that of the cricetine Muridae, are separated as a distinct family, Nesomyidae. They are the only rodents in that island. Of these, *Hypogeomys* is a large, long-tailed, fawn-coloured rat, with large ears and feet; *Nesomys* is a red species, with long hair; *Brachytarsomys* is short-footed and long-tailed, with velvety fawn fur; *Hallomys* has elongated hind feet, as has also *Macrotarsomys*; *Gymnuromys* is naked-tailed; and the several species of *Eliurus* are dormouse-like.

Mouse Tribe.—The characteristics of the Muridae are those of the Myoidea generally, as given above under the heading of the Spalacidae. With the exception of Madagascar, the family, which may be divided into six sub-families, has a cosmopolitan distribution, and the genera are so numerous that only some of the most important can be even mentioned.

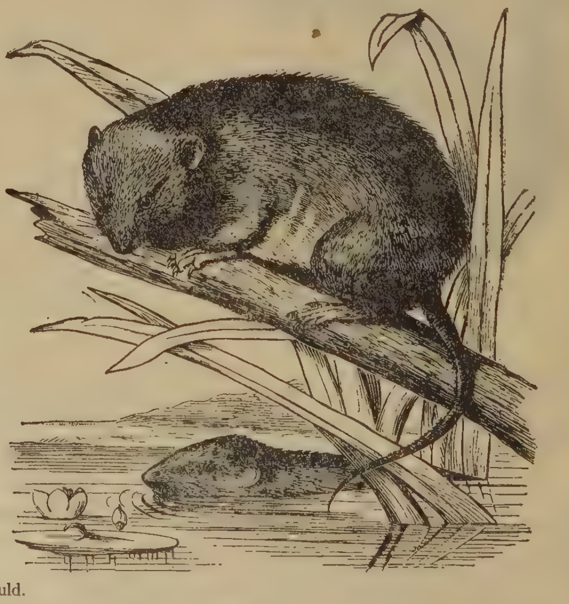
The first group is that of the hamsters, or cricetines (Cricetinae), in which the molars are rooted and tuberculated, with the cusps of the upper ones arranged in two longitudinal rows (fig. 13, B); in the upper teeth the outer cusps and in the lower the inner ones are the higher, and when worn the crown surfaces show oblique dentine-areas; in shape the third molar is like the second, but it is smaller. The infra-orbital foramen is generally narrow, and the tympanic bulla hollow. The humerus has a foramen at the lower end. The tail is short. The group is typified by the European hamster (*Cricetus vulgaris* or *C. cricetus*), to which a separate article is devoted (see HAMSTER); the genus includes a number of species ranged under several sub-genera, such as *Mesocricetus*, *Cricetulus*, and *Urocricetus*, widely spread in Western and Central Asia, the last-mentioned, which is from Tibet, being distinguished by its relatively long tail. The hamsters all possess cheek-pouches, which are, however, absent in many of the following genera. Africa claims only a single representative of the group, *Mystromys*, with one southern and one eastern species. Persia is the home of *Calomyscus* (with one species), a near relative of the American *Peromyscus*. In America, where the more typical kinds are known as white-footed, or deer, mice, the cricetines absolutely swarm, and include a host of genera, the majority of which are North American, although others are peculiar to Central and South America. Among these may be named *Onychomys*, *Peromyscus*, *Rhipidomys*, *Holochilus* (which is South American and includes the largest species), *Sigmodon* (typified by the North American rice-rat, *S. hispidus*), *Oryzomys*, *Rhithrodontomys* (with grooved incisors), *Ichthyomys* and *Anotomys* (fish-eating, aquatic forms, from the mountains of South America), *Acodon*, and the North American wood-rats, or *Neotoma*, in which the molars have a structure simulating that of the under-mentioned Microtinae. A distinct sub-family, Lophiomyinae, is represented by the Central African arboreal spiny rats, *Lophiomys*, of which there are two or three species. Although agreeing with the Cricetinae in the hollow tympanic bullae, they have the clavicles imperfect, the first front toe opposable to the rest, the temporal region of the skull roofed with bone, and the crowns of the molars with cusps arranged in rows but eventually covered by a layer of enamel.



From Milne-Edwards.

FIG. 11.—African Spiny Rat (*Lophiomys imhausi*).

The third sub-family is that of the Microtinae, or voles, which are distributed all over Europe, Northern Asia and North America, and are characterized by the tympanic bulla of the skull being filled with honey-combed bony tissue, the small size of the infra-orbital foramen, and the deep pterygoid fossa on the palatal aspect. The humerus lacks a foramen at the lower end; and the molar teeth, as explained and illustrated in the article VOLE (*q.v.*), consist of two longitudinal rows of triangular alternating vertical prisms, and may be either rootless or rooted. Voles, as typified by the water-rat and the tailed field-mouse, are stouter built and shorter-nosed rodents than the typical rats and mice, with smaller ears and eyes and shorter tails; all being good burrowers. In the circumpolar *Evotomys* (represented in England by the red-backed field-mouse) and the nearly allied North American *Phenacomys*, the molars develop roots in old age; but in *Microtus* (which includes the water-rat, and is circumpolar) they are rootless throughout life, the genus being one of the largest in the mammalian class (see VOLE). *Fiber*—the muskrats—is a North American aquatic type (see MUSKRAT), characterized by the compression of the tail. *Synaptomys* is also North American, and characterized by the grooved upper incisors and the presence of distinct enamel-loops on the outer side of the lower molars. The circumpolar lemmings of the genera *Lemmus* and *Dicrostonyx* are noticed in the article LEMMING. *Ellobius*, which many naturalists place in this group, has been mentioned among the Spalacidae.



After Gould.

FIG. 12.—The Australian Brown-footed Rat (*Mus fuscipes*).

The typical rats and mice, together with their nearest relatives, constitute the sub-family Murinae, which is represented by more than three hundred species, distributed over the whole of the Old World except Madagascar. The molars (fig. 13, A) are rooted and have a plate-like structure, with the cusps or tubercles forming three longitudinal rows in those of the upper jaw, but only two distinct ones in the lower. By this structure the Murinae are broadly distinguished both from the Cricetinae (fig. 13, B) and the Microtinae. In the skull the tympanic bulla is hollow, the pterygoid fossa shallow and the zygomatic arch slender, with a rudimentary jugal bone. The tail is long and scaly (fig. 12). The genus *Mus*, with about a couple of hundred species, includes the true mice and rats (see Mouse and Rat), and has the typical characters of the group, the incisors being narrow and smooth, the molars small, the eyes and ears large and the tip of the muzzle naked. In some cases there may be spines among the fur. None are much larger than the brown rat (*M. norvegicus*) or smaller than the harvest mouse; and they all have habits generally similar to those of one or other of the English species, although some live in trees like squirrels, or in the water; among the latter being the brown-footed rat (*M. fuscipes*) of western and southern Australia (fig. 12). The genus *Nesocia* is like *Mus*, but with the incisors and molars broader, and the transverse laminae of the latter more clearly defined. This genus contains a few clumsily built rats spread over Southern Asia from Palestine to Formosa, and from Kashmir to Ceylon (see Bandicoot-Rat). Among other important genera *Cricetomys* and *Eosaccomys* (both African) stand apart by the possession of cheek-pouches: *C. gambianus* being a very large species. The Javan *Pithechirus* has the thumb opposable, while the Papuan *Chiruromys* has the tip of the tail naked above and prehensile. The spiny mice, *Acomys* (or *Acanthomys*), of Western Asia, Cyprus and Africa, take their name from the fur being almost entirely replaced by flattened spines, and are further distinguished by the rudimentary coronoid process of the lower jaw. *Dasymys* is an allied African genus; while *Arvicanthis* includes the African striped mice. *Golunda*, from India and Africa, is like *Mus*, but with grooved upper incisors. *Vandeleuria*, ranging from India to Yunnan, has flat nails on the first and fifth toes of both feet, and a very long tail; while the Indo-Malay *Chiropodomys* has a flat nail on the first toe of both feet and a tufted tail. In the Philippines occur the peculiar genera *Batomys*, *Carpomys* and *Crateromys*, confined to the mountains of Luzon, the third remarkable for its huge size and long hair. *Mastacomys* is like *Mus*, but with the molars remarkably broadened, and with only four teats. The single species is from Tasmania, though it has been found fossil in New South Wales; it is somewhat similar in size and appearance to the English water-rat, but has longer and softer fur. *Uromys* differs from *Mus* in having the scales of the tail not overlapping, but set edge to edge, so as to form a sort of mosaic work. There are several species, spread over the northern part of the Australian region from the Aru Islands to Queensland. *Echinothrix* is a rat with an extremely elongated muzzle, all the bones of the face being much produced, and the incisors faintly grooved, the only species, *E. leucura*, being about the size of the common rat, with its fur thickly mixed with spines, a native of Celebes. Australia is the home of the group of jumping species, known as jerboa-rats, characterized by the elongation of the hind limbs, arranged under the genera *Notomys*, *Dipodillus*, *Ammomys* and *Conilurus*, distinguished from one another by the structure of the molars and the number of teats and foot-pads, the second being further characterized by its long ears.

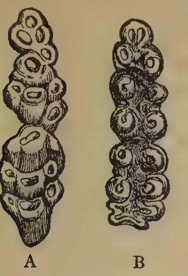


Fig. 13.—Upper Molars of *Mus* (A) and *Cricetus* (B).

The large-eared African *Otomys* and the allied *Oreomys* (*Oreinomys*), often made the type of a distinct sub-family, may be included in this section; as well as the small African tree-mice, *Dendromys*, allied to which is *Deomys*, peculiar in the circumstance that only the first molar has three rows of cusps, the other two having only a couple of such rows, as in cricetines. Other allied African genera are *Steatomys* and *Lophuromys*, which include several species of small mouse-like rodents, with the habits of dormice generally, though some burrow in cornfields. Here also may be noticed the huge Philippine long-haired rats of the genus *Phlaeomys*, characterized by their broad incisors, transversely laminated molars and large claws. They are often regarded as forming a sub-family by themselves. The gerbils, which are widely distributed over the more or less desert-like regions of the Old World exclusive of the Malay countries and Australia, form the sub-family Gerbillinae. They have long hind limbs, large eyes and ears; and in correlation with the latter an enlarged auditory bulla to the skull, which is hollow and divided into a tympanic and a mastoid portion. The tail is generally long and hairy. There are three pairs of rooted molars, whose crowns carry transverse plates, decreasing in number from three in the first to one in the last tooth. *Gerbillus* (or *Tatera*), with a large number of species, has a range coextensive with that of the sub-family; *Pachyuromys*, with two African species, has a short club-shaped tail and enormous auditory bullae; while the remaining members of the group, which are confined to North Africa, Eastern Europe and Asia, are arranged in the genera *Meriones*, *Psammomys* and *Rhombomys*, the latter represented only by *R. opimus* from Russia and Central Asia (see Gerbil).

The last representatives of the Muridae are confined to Australasia and the Philippines, and constitute the sub-family Hydromyinae, characterized by the very general presence of only two pairs of molars in each jaw. In the typical Australian and Papuan *Hydromys*, locally known as water-rats, the molars originally have transverse ridges, the enamel folds between which form cutting edges whose sharpness depends upon the degree to which the teeth have been worn, while the large hind feet are webbed. The typical *H. chrysogaster* is a large brown rat with an orange belly, which feeds on small fishes and insects. *Limnomys*, from New Guinea, is a type less specialized for swimming, the hind-feet being much less twisted than in *Hydromys*, and not so fully webbed. Still less specialized are *Chrotomys* and *Xeromys*, which include Philippine land-rats, while *Crunomys*, from the same area, retains the third molars, and thus connects the group with the Murinae.

Finally, the Philippine *Rhynchomys* is represented by a rat with two pairs of molars and a long shrew-like nose, the zygomatic arch of the skull being also placed unusually far backward.

Strand-Moles.—With the so-called strand-moles of South Africa, forming the section Bathyergoidea, and the family Bathyergidae, which were formerly placed with the Spalacidae, we come to the first of two sections in which the lower jaw has a totally different form to that obtaining in all the preceding groups. In the rodents now to be considered, the angular process of the lower jaw arises from the outer side of the sheath of the incisor. The malleus and incus of the internal ear are united, and there is no transverse canal in the skull. At least one pair of premolars is present in each jaw; and these teeth and the molars typically have one outer and one inner enamel fold. There is no foramen at the lower end of the humerus, and no horny layer in the stomach.

In the Bathyergoidea the scaphoid and lunar of the carpus are separate, the tibia and fibula united and the clavicles normal. The masseter muscle does not pass through the narrow infra-orbital canal, and the temporal muscle is large. All the Bathyergidae are African, and adapted to a burrowing life, having minute ears and eyes, a short tail and the thumb armed with a large claw. The largest species represents the genus *Bathyergus*, while several smaller kinds are included in *Georychus*. The former constructs its tunnels in the sandy flats near the shore at the Cape, but the latter generally frequent higher ground. In both genera there is only a single pair of premolars in each jaw, but in the smaller *Myoscalops* there are usually three pairs of these teeth. The most remarkable members of the family are the sand-rats of Somaliland and Shoa, forming the genera *Heterocephalus* and *Fornarina*, in which the premolars may be reduced to two pairs. They have large heads, projecting incisors, no ears, almost functionless eyes and moderately long tails; the skin, with the exception of a few hairs on the body and fringes on the feet, being naked. They spend their whole time buried in the hot desert sand, in which they construct burrows, throwing up at intervals small hillocks.

Porcupines.—In the second section, or Hystricoidea, including several families, the skull (fig. 14) is characterized by the heavy zygomatic arch, the middle portion of which is formed by the more or less straight and horizontal jugal, and the large infra-orbital canal, traversed by a portion of the masseter muscle. The tibia and fibula are separate, but the scaphoid and lunar are united, and the clavicles are generally incomplete. There is never more

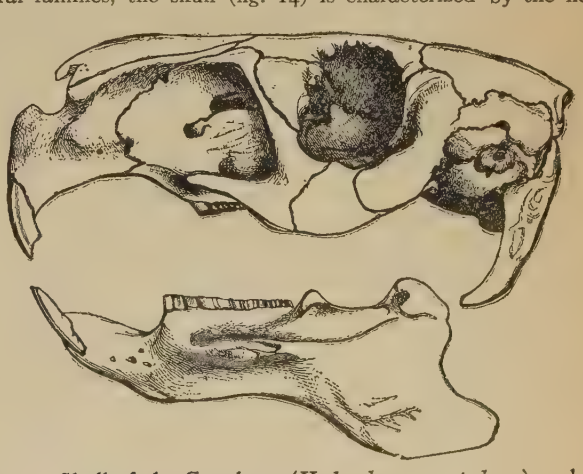


Fig. 14.—Skull of the Capybara (*Hydrochaerus capybara*), reduced.

than one pair of premolars, and the original ridges of all the cheek-teeth have become obscured and complicated by the development of secondary enamel-folds. The majority of these rodents, many of which are of large size, are terrestrial, but a few are burrowing, others arboreal and two or three aquatic.

The Old World porcupines, constituting the family Hystricidae, are terrestrial, stoutly built rodents, with limbs of subequal length in front and behind, and the skin covered with strong spines. The upper lip is cleft, the jugal lacks an inferior angle, the fore part of the skull is short and broad; the cheek-teeth are partially rooted, with external and internal enamel-folds, the soles of the feet are smooth, there are six pairs of teats, the clavicles are imperfect and the tail is not prehensile. In the typical genus *Hystrix*, which is represented in all the three great continents of the Old World, and extends as far east as Flores and Celebes, the skull is swollen and convex, the spines are cylindrical, and the tail is short and covered with spines and slender-stalked open quills. In *Atherura fasciculata* of the Malay Peninsula the spines are flattened, and the tails long and scaly, with a tuft of compressed bristles. A closely allied species, *A. africana*, inhabits Western Africa. The third genus is *Trichys* (see PORCUPINE).

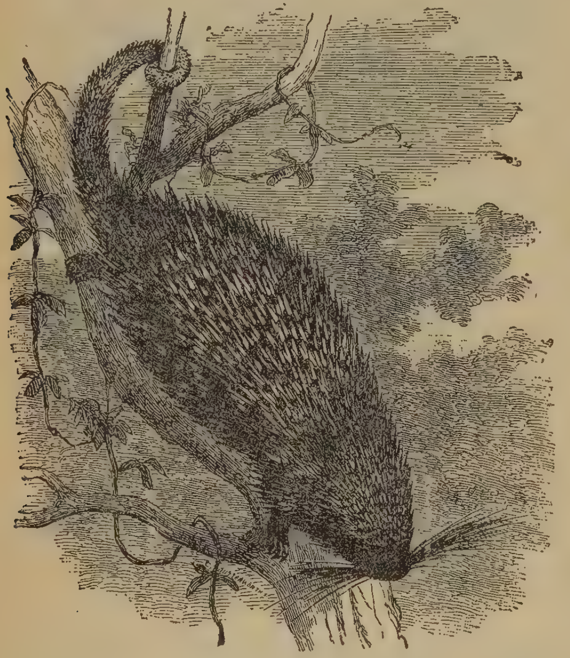


FIG. 15.—The Brazilian Tree-Porcupine (*Synetheres* (or *Cöendu*) *prehensilis*).

American Porcupines.—All the New World porcupines, representing the family Erethizontidae (or Cöendidae) are arboreal in their habits, and have the upper lip undivided, the cheek-teeth rooted, the clavicles complete, the soles of the feet tuberculated and three pairs of teats. *Erethizon dorsatus*, the urson, is distributed all over the forest regions of North America; *Synetheres* (or *Cöendu*) *prehensilis*, the prehensile-tailed porcupine of South America (fig. 15), represents a genus in which the whole upper surface of the body is protected by long white-tipped spines; *Chaetomys subspinosus* is clothed with strong wavy bristles. In the last two genera the feet have four toes, in place of the five of *Erethizon* (see PORCUPINE).

Cavy Group.—In the family Caviidae, typified by the cavies (or guinea-pigs), may be included a large number of South and Central American rodents, among which the agoutis and pacas are often ranked as a family (Dasyproctidae) by themselves. The Caviidae, in the present more comprehensive sense, include the giants of the rodent order. Many of them, like ungulates, are specialized for swift running, and have unusually long limbs, with ridges developed on the articular surfaces of the lower bones; the clavicles are more or less reduced; the thorax is more compressed than usual, with a narrower breast-bone; and there is a marked tendency to the reduction or loss of the lateral toes, more especially in the hind limb. Since these rodents walk more or less entirely on their toes, in such a manner that the edges of the claws or nails come in contact with the ground, these tend to assume somewhat of a hoof-like character; while the foot-pads are more or less horny. The tail is generally very short, and its basal vertebrae are often fused with the sacrum. In the skull the lachrymal bone is large, the par-occipital process is directed vertically downwards and the tympanic bulla is hollow. In the soft parts the caecum is very large, the penis is armed with a pair of barbed horny claspers and the scrotum is spiny.

Special interest attaches to the most aberrant member of the family, the Peruvian Dinomys, known for more ~~than~~ thirty years only by a single specimen taken in a house in Lima, and only lately rediscovered. It is a large rodent known to the Tupi Indians as the paca-rana, or false paca, in allusion to the resemblance of its coloration to that of the true paca, from which it differs by its well-developed tail, the absence of cheek-pouches, the full development of all five toes and the wider thorax. The Tupi name may be adopted as the popular title of the species. Dr E. Goeldi states that the paca-rana is a rodent of phlegmatic and gentle disposition, which may account, perhaps, for its rarity, if, indeed, it be really scarce in its native home, which is probably the eastern slopes and tablelands of the Bolivian and Peruvian foot-hills bordering on Brazil, inclusive of the headwaters of the Purus, Acre and Jurua rivers. In the true pacas, *Coelogenys* (or *Agouti*), the first front toe is small, and both the first and fifth digits of the hind-foot are much inferior in size to the other three. The most remarkable feature of the genus is, however, the extraordinary development of the zygomatic arches of the skull, which are enormously expanded vertically, forming great convex bony capsules on the sides of the face, enclosing on each side a large cavity lined with mucous membrane internally, and communicating by a small opening with the mouth. *C. paca* is a white-spotted rodent, about 2 ft. long, and lives generally in the forests or along the banks of rivers (see PACA). The Agoutis, *Dasyprocta*, include several species of slender-limbed rodents, with three hind-toes, inhabiting Central and South America, one (*D. cristata*) extending into the West Indian islands. The members of both *Coelogenys* and *Dasyprocta* are terrestrial in their habits, and have the fore- and hind-limbs subequal, hoof-like claws, short or obsolete tail and rudimentary clavicles. The masseteric ridge of the lower jaw is obsolete, the palate broad, the incisors long and the molars semi-rooted, with external and internal enamel-folds (see AGOUTI). The remaining and more typical members of the family, one of which is aquatic, are characterized by their short incisors, the strong masseteric ridges on the sides of the lower jaw, the long and curved par-occipitals and the palate contracted in front. Fore-feet with four digits, hind-feet with three; clavicles imperfect; molars divided by enamel-folds into transverse lobes; milk-teeth shed before birth. In the true cavies, or couies, *Cavia*, the fore- and hind-limbs are short and of subequal length, the ears are short and there is no tail. They include several species widely distributed throughout South America, extending even to the straits of Magellan, from one of which (*C. cutleri* of Peru) the guinea-pig is derived. The maras (*Dolichotis*) have the limbs and ears long and the tail very short. *D. patagonica* is a large species, nearly 3 ft. long, inhabiting the gravelly plains of Patagonia, while *D. salinicola* is a much smaller rodent from the salt-lagunas of Argentina. The palate is so much contracted in front that the premolars of opposite sides touch by their antero-internal edges. *Hydrochaerus*, in which all the feet are fully webbed, includes a single species, the capybara, or carpincho, the largest of living rodents. The skull (fig. 14) is distinguished not only by its great size, but by the enormous development of the par-occipital processes and the complex structure and large size of the last molars (see CAVY and CAPYBARA).

Chinchilla Group.—The family, Chinchillidae, typified by the well-known chinchilla, includes a small number of South American rodents with large ears and proportionately great auditory bullae in the skull, elongated hind-limbs, bushy tails, very soft fur and perfect clavicles. The jugal is without an inferior angle, and extends forwards to the lachrymal; the palate is contracted in front and deeply emarginate behind; the incisors are short, and the molars divided by continuous folds into transverse plates; and the two halves of the lower jaw are welded together in front. It includes three existing genera, represented by some five species. Of these the true chinchilla, *Chinchilla lanigera*, *C. brevicaudata*, *Lagidium peruanum* and *L. pallipes*, are restricted to the alpine zones of the Andes from the northern boundary of Peru to the southern parts of Chili; while *Lagostomus trichodactylus* (or *Viscaccia viscaccia*), the viscacha, is confined to the pampas from the Uruguay river to the Rio Negro. In *Chinchilla* the fore-feet have five and the hind four digits, the tail is long and bushy, and the auditory bullae are enormous, appearing on the top of the skull; *Lagidium* has four digits in both fore- and hind-feet, and *Lagostomus* three only in the hind-feet, while the auditory bullae are much smaller (see CHINCHILLA and VISCACHA).

Hutia Group.—The three remaining families of the Hystricoidea, of which one is African while the other two are chiefly South American, are very closely allied and often brigaded in a single family group. In the Capromyidae, which includes only the South American and West Indian hutias, the South American coypu and the African cane-rats, the tympanic bulla of the skull is hollow, the par-occipital process straight, the lachrymal small, and the cheek-teeth rooted, with deep enamel-folds; the first front toe being occasionally absent. Of the few living representatives of the group, the genus *Myocastor* (or *Myopotamus*) is represented only by the South American coypu, *M. coypu*, which is aquatic in its habits, and measures about 2 ft. in length, being the largest member of the group. It has a long tail, brown fur and red incisors, and lives in burrows near water, feeding on aquatic plants.

The hutia (*Capromys pilorides*) is nearly as large, arboreal in habits, and a native of Cuba, where it is the largest indigenous mammal. Other species occur in Cuba, Jamaica and the Bahamas, while a Venezuelan species, *Procapromys geayi*, represents a separate genus. In one kind the tail is prehensile. All these rodents are remarkable for the manner in which the liver is divided into minute lobules. *Plagiodontia aedium*, another member of the group, is peculiar to Hayti. The African cane-rats, *Thryonomys* (or *Aulacodus*), are large terrestrial rodents, ranging from the centre of the continent to the Cape, easily recognized by their deeply fluted incisors (see COYPU). The Octodontidae, which are exclusively South American, differ from the preceding family by the tympanic bulla being filled with cellular bony tissue, and by the par-occipital process curving beneath it, while the cheek-teeth are almost or completely rootless and composed of parallel plates. The first front toe may be absent. The more typical members of the family are rat-like burrowing rodents, living in communities. The typical genus is represented by the degu (*Octodon degus*) and several nearly related species; other genera being *Ctenomys*, *Octodontomys* (*Neoctodon*), *Aconaemys*, *Spalacopus* and *Abrocoma*; the latter taking its name from its unusually soft fur. Among these, the tuco-tucos (*Ctenomys*) are characterized by their burrowing habits, almost rudimentary ears, small eyes, short tails and the kidney-shaped grinding-surfaces of their cheek-teeth. They take their name of tuco-tuco from their cry, which resembles the blows of a hammer on an anvil, and may be heard all day as the little rodents move in their burrows, generally formed in sandy soil. In some districts the ground is undermined by these burrows, in which stores of food are accumulated. The species of *Octodon* have larger ears, longer, tufted tails and the sides of the cheek-teeth indented by plates of enamel; they are chiefly found in hedgerows and bushes, where they burrow. In *Abrocoma* the tail has no tuft, the ears are still larger and the lower cheek-teeth more complex than the upper ones. *Aconaemys* is an allied Chilean genus in which the enamel-folds meet across the molars. Several of these rodents live in the Andes, where the ground is covered for months with snow. The second group of the family is formed by the genera *Loncheres*, *Dactylomys*, *Echi[no]mys*, *Proechimys* and a few others, the members of which are rat-like rodents, with long scaly or furry tails, and frequently flattened spines mingled with the fur of the back. Most species are brown above and whitish beneath, but in some the lighter tints extend on to the sides, shoulders and head, communicating a coloration somewhat like that of a guinea-pig (see OCTODON). The North African gundis (*Ctenodactylus gundi* and *Ct. vali*) are the types of an African family, which also includes the genera *Massoutiera*, *Pectinator* and *Petromys*. In the gundi the two inner toes of the hind-foot are furnished with a horny comb and bristles for the purpose of cleaning the fur, and the tail is very short; but in *Pectinator* the tail is longer. *Petromys* has a still longer and more bushy tail, and no comb to the hind-feet. The gundi is a diurnal species, inhabiting rocky districts, and having habits very similar to those of a jerboa. Of these *Ctenodactylus* and *Pectinator* are characterized by the union of the incus and malleus of the internal ear, the free fibula and the almost rootless cheek-teeth. The premolar is very small, thus showing an approximation to the Myoidea, although in other respects *Petromys* appears to approximate to the Hystricidae.

Picas and Hares.—The remaining rodents, which include two families—the picas (Ochotonidae) and the hares and rabbits (Leporidae)—constitute a second sub-order, the Duplicidentata, differing from all the foregoing groups in possessing two pairs of incisors in the upper jaw (of which the second is small, and placed directly behind the large first pair), the enamel of which extends round to their posterior surfaces. At birth there are three pairs of incisors, but the outer one is soon lost. The incisive foramina are large and usually confluent; the bony palate is very narrow from before backwards; there is no alisphenoid canal; the fibula is welded to the tibia, and articulates with the calcaneum; and the testes are permanently external. All are terrestrial, and in many cases burrowing, in their habits, and some of them are of extreme fleetness. The Ochotonidae are represented at the present day only by the single genus *Ochotona* (*Lagomys*), which includes all the picas, or mouse-hares. They are small rodents with complete clavicles, fore- and hind-limbs of nearly equal length, no external tails and short ears. Skull depressed, frontals contracted and without post-orbital processes; *p.* $\frac{1}{1}$ or $\frac{2}{2}$; molars rootless, with transverse enamel-folds. In some cases the molar-formula is $\frac{2}{3}$. The genus includes about a score of species of guinea-pig-like animals, inhabiting chiefly the mountainous parts of Northern Asia (from 11,000 to 14,000 ft.), one species only being known from South-east Europe and several from the Rocky Mountains and Alaska.

From the picas the hares and rabbits (Leporidae) are distinguished by the imperfect clavicles, the more or less elongated hind-limbs, short recurved tail (absent in one case) and generally long ears. The skull is compressed, with large wing-shaped post-orbital processes (fig. 16); *p.* $\frac{3}{2}$. With the exception of Australasia, the family has a cosmopolitan distribution; and its numerous species resemble one another more or less closely in general external characters. In all the fore-limbs have five and the hind four digits; and the soles of the feet are densely clothed with hairs similar to those covering the legs; the inner surface of the cheeks being hairy. Although the family has such a wide distribution, the greater number of the species are restricted to Europe, northern and central Asia and North America; South America having very few. Till within the last few years the majority of naturalists followed the practice of including all the members of the family in the genus *Lepus*. It is true that Mr E. Blyth long ago proposed the name *Caprolagus* for the remarkable spiny rabbit of the western Himalayas, while the generic name *Oryctolagus* was suggested later for the rabbit, and *Sylvilagus* for the American "cotton-tails"; but none of these was accorded general acceptation. Of late years, however, zoologists have come to the conclusion that generic subdivisions of the Leporidae are advisable. In 1899 Dr Forsyth Major proposed a classification of the family in which a number of species were grouped with the spiny rabbit in the genus *Caprolagus*, whilst *Oryctolagus* was taken to include not only the common rabbit, but likewise the Cape hare. A more recent classification is that of Mr M. W. Lyon, in which by far the largest number of species of the family are retained in the original genus *Lepus*, which has also the widest geographical distribution of all the genera. It is typified by the blue hare (*Lepus timidus*), next to which comes the common hare (*L. europaeus*) and certain other allied forms. The jackass-hares of Mexico, &c., such as *L. californicus*, form a second sub-group; while these are in turn followed by the American hare (*L. americanus*) and its immediate relatives. The cotton-tails, or wood-rabbits, of North and South America are regarded as forming a genus, *Sylvilagus*, by themselves, which includes the Brazilian and Paraguay hares, and appears to be chiefly distinguished by a certain feature in the parietal region of the skull. Under the name of *Oryctolagus cuniculus*, the rabbit is considered to represent a genus by itself, specially characterized by the shortness of the ears and hind-feet. The swamp-rabbit (*L. palustris*) and water-hare (*L. aquaticus*) of the southern United States form the group *Limnotragus*, characterized by the harsher fur, the shorter ears, tail and hind-feet, and the complete fusion of the post-orbital process (which is so distinct in the typical hares) with the adjacent parts of the skull, so that neither notches nor perforations are developed in this region. The short-tailed rabbit of the western United States (*Brachylagus idahoensis*) is the sole member of a group allied in general characters to the typical *Lepus*, but distinguished by the unusually short tail. Another group is *Pronolagus*, typified by the Cape thick-tailed hare, the so-called *Lepus crassicaudatus*, which is externally similar to *Lepus* proper, but has the skull and teeth of the general type of the next group. The tailless rabbit of Mount Popocatepetl, Mexico, originally described as a distinct generic type, under the name of *Romerolagus nelsoni*, is broadly distinguished by the entire absence of the tail, and the short ears and hind-feet, its general form being like that of the Liu-Kiu rabbit, while, as in the latter, the post-orbital process of the skull is small, and represented only by the hinder half. Next come three remarkable rabbits from the Indo-Malay countries, all closely allied, although regarded as representing three generic groups, *Nesolagus*, *Caprolagus* and *Pentalagus*. In all three the skull is of the type of *Romerolagus*. The first is represented by the Sumatran rabbit, the so-called *N. netscheri*, which apparently differs from the spiny rabbit mainly by the pattern of the cheek-teeth. The spiny rabbit, separated from *Lepus* by Blyth in 1845 under the name of *Caprolagus hispidus*, is an inhabitant of Assam and the adjacent districts, and distinguished by its harsh, bristly fur and short ears and tail. In the Liu-Kiu rabbit (*Pentalagus furnessi*) the coat is equally harsh, but the ears and hind-feet are shorter, and there are only five (in place of the usual six) pairs of upper cheek-teeth. In the loss of the last upper molar, the Liu-Kiu rabbit approximates to the picas, as does the tailless rabbit in the abortion of its caudal appendage. Mr Lyon's scheme seems to be the best attempt to explain the affinities of the members of the group. Whether all his genera be adopted, or all the species be included in *Lepus*, must largely be a matter of individual opinion.

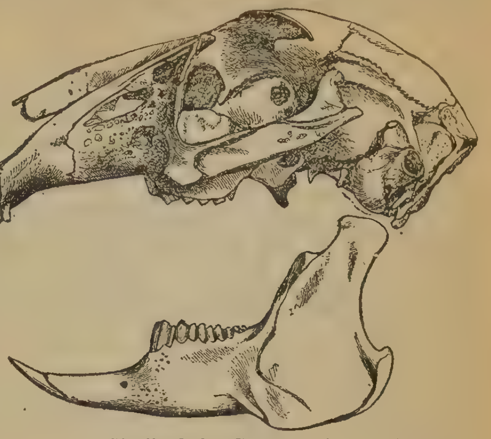


FIG. 16.—Skull of the Common Hare (*Lepus europaeus*).

If the latter course be followed, Mr Lyon's genera must be reduced to the rank of sub-genera, and his sub-generic divisions of *Lepus* and *Sylvilagus* ignored. (See HARE and RABBIT.)

EXTINCT RODENTS

Among extinct rodents, only a few of the more important types may be noticed. As to the origin of the order, we are still to a great extent in the dark; and even the relations of the Duplicidentata to the Simplicidentata are not yet fully understood. With regard to the latter point, it is, however, considered probable that both are branches of a common stock, which diverged from each other before all the typical rodent characters were acquired. As to the ancestral stock of the order, it has been suggested that this is represented by certain Lower Eocene European and North American mammals, at one time regarded as primitive Primates. In Europe these include *Plesiadapis* and *Protoadapis*, and in North America *Mixodectes*, *Microsyops* and *Cynodontomys*; the last three constituting the family Mixodectidae. Possibly the European forms, in which the dental formula has been given as $i.\,\frac{2}{1}$, $c.\,\frac{0}{0}$, $p\frac{2}{2}$, $m.\,\frac{3}{3}$, and there is a gap between the incisors and the cheek-teeth, are more nearly related to modern rodents than the American types, and may indeed belong to the same order. On the other hand, the American forms, which have one pair of large chisel-like incisors in the lower jaw, also possess a lower canine, and show no marked gap in front of the cheek-teeth, nor any indication of the characteristic rodent backwards movement of the lower jaw. On these grounds, while admitting that they are allied to the rodents, it has been pointed out that they can scarcely be included in the Rodentia, and the order Proglires has in consequence been proposed for their reception.

Whatever may be the true affinity of these problematical mammals, undoubted rodents are known from the Lower Eocene of both Europe and North America. In Europe these form the genus *Ischyromys* and the family Ischyromyidae, and have premolars $\frac{2}{1}$, and all the cheek-teeth low-crowned, with simple cusps or ridges. Possibly they are akin to the Sciuridae. In America, *Paramys*, with transversely ridged molars, is allied; and the European *Sciuromys* should perhaps find a place in the same neighbourhood. A more advanced phase is represented in the European Lower Oligocene by the Pseudosciuridae, with the genera *Pseudosciurus*, *Sciuroides*, *Trechomys*, *Theridomys*, &c., in which part of the masseter passes through the broad infra-orbital canal, and the premolars are $\frac{1}{1}$; the molars being low-crowned, many-rooted and either cusped or ridged. These rodents are thought to be allied to the Anomaluridae; and it is partly on their evidence that the family Pedetidae is placed next the latter. Here it may be mentioned that *Leithia*, from the Pleistocene of Malta, originally regarded as a giant dormouse, seems near akin to *Anomalurus*. In the highly specialized mastoid region of the skull, the North American Oligocene *Protoptychus* approaches to *Dipopodomys*, while the contemporary *Gymnoptychus* and *Entoptychus* likewise appear referable to the Geomyidae. The Upper Oligocene *Cricetodon* in Europe and *Eumys* in America are the earliest known forerunners of the cricetine Muridae; while at the same time primitive beavers appear in the form of *Steneofiber*, to be succeeded in the European Pleistocene by the gigantic *Trogontherium*.

The still larger North American Pleistocene *Castoroides*, known by one species of the size of a bear, and the allied West Indian *Amblyrhiza*, appear to be specialized beavers, although they have been referred to a family by themselves. Near akin is the North American Miocene family Mylagaulidae, typified by *Mylagaulus*, but including *Mesogaulus* and *Protogaulus*. Although showing some dental characters approximating to the porcupines, these rodents are regarded as allied to the Castoridae, although forming an isolated type. The prominent feature, writes Mr E. S. Riggs, is the unusual development of the premolar to the exclusion of the posterior teeth. Associated with this is the strength and sharpness of the lower jaw, the prominence and anterior position of the masseteric ridge, and the depth of the ramus from the alveolar line to the angle. These indicate unusual capacity for crushing or grinding; while the last premolar is a crushing implement, which has reached the highest degree of specialization known in Rodentia. It is suggested that these teeth may have been employed for cracking nuts or hard seeds, although also used for grinding. The remarkable North American *Ceratogaulus*, with a large bony nasal horn, belongs to the same family. To discuss the remaining Miocene and later fossil Simplicidentata would be doing little more than adding to the generic names referable to the various existing families. It may be mentioned, however, that the distribution of these later Tertiary types accords very closely with that of their existing relatives; the families of South American hystricoids being represented by a number of extinct genera in the formations of Argentina and Brazil. Special mention may be made of *Megamys*, from the caves of Brazil, which, while apparently allied to the living viscacha, attained dimensions approximating to those of a hippopotamus.

As regards the Duplicidentata, it appears that the families Ochotonidae and Leporidae had become differentiated as early as the Lower Miocene. *Titanomys* is the earliest form, from the Middle Miocene, succeeded by *Lagopsis*, and then by the modern *Ochotona*. In this line there is a tendency to lose the last upper molar, but in *Prolagus*, which ranges in the Pliocene from Sardinia and Corsica to Spain, and forms a side-branch, the corresponding lower tooth has likewise disappeared. In contradistinction to *Titanomys*, in which the cheek-teeth are rooted, is the North American Upper Oligocene *Palaeolagus*, where they are rootless. In general dental characters, especially the retention of three pairs of molars, this genus approximates to the Leporidae, although in the absence of post-orbital processes and the pattern of the molars it departs less widely from the modern Ochotonidae than does *Prolagus*.

AUTHORITIES.—The above article is partly based on that by G. E. Dobson in the 9th edition of this work. See also H. Winge, *Jord Fundene og Nulevende Gnadere* (Rodentia), *E. Museo Lundi* (1888); C. J. Forsyth-Major, "On some Miocene Squirrels, with Remarks on the Dentition and Classification of the Sciuridae," *Proc. Zool. Soc. London* (1893); "On Fossil and Recent Lagomorpha," *Trans. Linnean Soc. London*, vol. vii. (1899); T. S. Palmer, "A List of the Generic and Family Names of Rodents," *Proc. Zool. Soc. Washington*, vol. xi. (1897); O. Thomas, "On the Genera of Rodents," *Proc. Zool. Soc. London* (1896); T. Tuhlberg, *Über das System der Nagethiere* (Upsala, 1899); H. F. Osborn, "American Eocene Primates, and the Supposed Rodent Family Mixodectidae," *Bull. Amer. Mus. Nat. Hist.* vol. xvi. (1902); W. Lyon, "Classification of the Hares and their Allies," *Smithsonian Miscell. Collections*, vol. xlv. (1903). Also numerous papers by O. Thomas, in *Proc. Zool. Soc. London* and *Annals* and *Magazine of Nat. Hist.*, and by several American naturalists in transatlantic zoological serials. (R. L.*)

RODERICK, or RUADRI (d. 1198), king of Connaught and high king of Ireland, was the son of Turlough (Tordelbach) O'Connor, king of Connaught, who had obtained the over-kingship in 1151, but had lost it again in 1154 through the rise of Muirchertach O'Lochlainn in Ulster. Roderick succeeded to Connaught in 1156, and after ten years' fighting won back the title of high king. His ill-advised persecution of Dermot (Diarmait MacMurchada), king of Leinster, furnished the pretext for the Anglo-Norman invasion of Ireland. Roderick endeavoured to expel the invaders, but was driven behind the Shannon. He delayed his submission to Henry II. until 1175, when a treaty was concluded at Windsor. Roderick, under this agreement, held Connaught as the vassal of England, and exercised lordship over all the native kings and chiefs of Ireland; in return he undertook to pay an annual tribute. The treaty did not put an end to the wars of the Norman adventurers against Connaught and Roderick's dependants. He held out till 1191; but then, weary of strife, retired to the cloister. He died in 1198, the last of the high kings of Ireland.

See Giraldus Cambrensis, *Opera*, vol. v. (Rolls Series); G. Orpen's *Song of Dermot and the Earl* (1892); W. Stubbs's edition of *Benedictus Abbas* (Rolls Series); Miss K. Norgate's *England under the Angevin Kings*, vol. ii. (1887).

RODEZ, a town of southern France, capital of the department of Aveyron, 51 m. N.N.E. of Albi by rail. Pop. (1906) town, 11,076; commune, 15,502. Rodez is situated on the southern border of the Causse of Rodez, on an isolated plateau bordered on the E. and S. by the river Aveyron. The cathedral was built between 1277 and 1535. A great Flamboyant rose-window and a gallery in the same style are the chief features of the principal façade, which is flanked by two square towers and has no portal. Each transept has a fine Gothic doorway. On the north side of the building rises a tower (1510–1526) of imposing height (253 ft.). The three upper stages are richly decorated, and the whole is surmounted by a colossal statue of the Virgin. In the cathedral are a fine rood-loft, some good wood-carving and the tombs of several bishops. Other interesting buildings are the episcopal palace (17th and 19th centuries), flanked by a massive tower, relic of an older palace; the church of St Amans, of Romanesque architecture, restored in the 18th century; and, among other old houses, the hôtel d'Armagnac built in the Renaissance period on the site of the old palace of the counts. The ruins of a Roman amphitheatre still exist in Rodez, which is supplied with water by a Roman aqueduct. About 6 m. to the north of Rodez is the chasm of Tindoul de la Vayssière, leading to a subterranean river issuing in the springs of the picturesque village of Salles-la-Source.

The town is the seat of a bishop, a prefect and a court of assizes, and has tribunals of first instance and commerce, a chamber of commerce, a branch of the Bank of France, a lycée training college for both sexes and an ecclesiastical seminary. The industries include wool-spinning and the weaving of woollen goods.

Rodez, called *Segodunum* under the Gauls, and *Ruthena* under the Romans, was the capital of the *Rutheni*, a tribe allied to the Arverni, and was afterwards the principal town in the district of Rouergue. In the 4th century it adopted the Christian faith, and St Amans, its first bishop, was elected in 401. During the middle ages contests were rife between the bishops, who held the temporal power in the "cité," and the counts in the "bourg." The Albigenses were defeated near Rodez in 1210. The countship of Rodez, detached from that of Rouergue at the end of the 11th century, belonged first to the viscounts of Carlat, and from the beginning of the 14th century to the counts of Armagnac. From 1360 to 1368 the English held the town. After the confiscation of the estates of the Armagnacs in 1475 the countship passed to the dukes of Alençon and then to the D'Albrets. Henry IV. finally annexed it to the crown of France.

RODGERS, JOHN (1771–1838), American sailor, was born in Harford county, Maryland, on the 11th of July 1771. He entered the United States navy when it was organized in 1798. He was second in command to Commodore James Barron (1769–1851) in the expedition against the Barbary pirates, and succeeded him in the command in 1805. In this year he brought both Tunis and Tripoli to terms, and then returned to America. In 1811 he was in command as commodore of the U.S. frigate "President" (44) off Annapolis when he heard that an American seaman had been "pressed" by a British frigate off Sandy Hook. Commodore Rodgers was ordered to sea "to protect American commerce," but he may have had verbal instructions to retaliate for the impressment of real or supposed British subjects out of American vessels, which was causing much ill-feeling and was a main cause of the War of 1812. On the 16th of May 1811 he sighted and followed the British sloop "Little Belt" (22), and after some hailing and counter-hailing, of which very different versions are given on either side, a gun was fired, each side accusing the other of the aggression, and an action ensued in which the "Little Belt" was cut to pieces. The incident, which was represented as an accident by the Americans, and believed to be a deliberate aggression by the British navy, had a share in bringing on war. When hostilities broke out Rodgers commanded a squadron on the coast of America, and was wounded by the bursting of one of his guns while pursuing the British frigate "Belvedere." He was subsequently President of the Board of Navy Commissioners in 1815–1824 and in 1827–1837, and acting secretary of the navy in 1823 for two weeks. He died in Philadelphia on the 1st of August 1838.

His brother, George Washington Rodgers (1787–1832), a brother-in-law of Commodore Perry, served in the War of 1812 and in the war with Algiers (1815). Rear-Admiral John Rodgers (1812–1882), a son of Commodore John Rodgers, served in the Union navy and in 1877–1882 was superintendent of the Naval Observatory at Washington. G. W. Rodgers had two sons who were naval officers, Christopher Raymond Perry Rodgers (1819–1892) and George Washington Rodgers (1822–1863).

RODIN, AUGUSTE (1840–), French sculptor, was born in 1840, in Paris, and at an early age displayed a taste for his art. He began by attending Barye's classes, but did not yield too completely to his influence. From 1864 to 1870, under pressure of necessity, he was employed in the studio of Carrier-Belleuse, where he learnt to deal with the mechanical difficulties of a sculptor. Even so early as 1864 his individuality was manifested in his "Man with a Broken Nose." After the war, finding nothing to do in Paris, Rodin went to Brussels, where from 1871 to 1877 he worked, as the colleague of the Belgian artist Van Rasbourg, on the sculpture for the outside and the caryatides for the interior of the Bourse, besides exhibiting in 1875 a "Portrait of Garnier." In 1877 he contributed to the Salon "The Bronze Age," which was seen again, cast in bronze, at the Salon of 1880, when it took a third-class medal, was purchased by the State, and is now in the museum of the Luxembourg. Between 1882 and 1885 he sent to the Salons busts of "Jean-Paul Laurens" and "Carrier-Belleuse" (1882), "Victor Hugo" and "Dalou" (1884), and "Antonin Proust" (1885). From about this time he chiefly devoted himself to a great decorative composition six metres high, which was not finished for twenty years. This is the "Portal of Hell," the most elaborate perhaps of all Rodin's works, executed to order for the Musée des arts décoratifs. It is inspired mainly by Dante's *Inferno*, the poet himself being seated at the top, while at his feet, in under-cut relief, we see the writhing crowd of the damned, torn by the frenzy of passion and the anguish of despair. The lower part consists of two bas-reliefs, in their midst two masks of tormented faces. Round these run figures of women and centaurs. Above the door three men cling to each other in an attitude of despair. After beginning this titanic undertaking, and while continuing to work on it, Rodin executed for the town of Damvillers a statue of "Bastien-Lepage"; for Nancy a "Monument to Claude le Lorrain," representing the Chariot of the Sun drawn by horses; and for Calais "The Burgesses of Calais" surrendering the keys of the town and imploring mercy. In this, Rodin, throwing over all school tradition, represents the citizens not as grouped on a square or circular plinth, but walking in file. This work was exhibited at the Petit Gallery in 1889. At the time of the secession of the National Society of Fine Arts, or New Salon, in 1890, Rodin withdrew from the old Society of French Artists, and exhibited in the New Salon the bust of his friend "Puvis de Chavannes" (1892), "Contemplation" and a "Caryatid," both in marble, and the "Monument to Victor Hugo" (1897), intended for the gardens of the Luxembourg. In this the poet is represented nude, as a powerful old man extending his right arm with a sovereign gesture, the Muses standing behind him. In 1898 Rodin exhibited two very dissimilar works, "The Kiss," exhibited again in 1900, a marble group representing Paolo Malatesta and Francesca da Rimini, and the sketch in plaster for a "Statue of Balzac." This statue, a commission from the Society of Men of Letters, had long been expected, and was received with vehement dissensions. Some critics regarded this work, in which Balzac was represented in his voluminous dressing-gown, as the first-fruits of a new phase of sculpture; others, on the contrary, declared that it was incomprehensible, if not ridiculous. This was the view taken by the society who had ordered it, and who "refused to recognize Rodin's rough sketch as a statue of Balzac," and withdrew the commission, giving it to the sculptor Falguière. Falguière exhibited his model in 1899. In the same Salon, Rodin, to prove that the conduct of the society had made no change in his friendship with Falguière, exhibited a bust in bronze of his rival, as well as one of "Henri Rochefort." In 1900, the city of Paris, to do honour to Rodin, erected at its own expense a building close to one of the entrances to the Great Exhibition, in which almost all of the works of the artist were to be seen, more especially the great "Portal of Hell," still quite incomplete, the "Balzac," and a host of other works, many of them unfinished or mere rough sketches. Here, too, were to be seen some of Rodin's designs, studies and water-colour drawings. He has also executed a great many etchings and *sgraffiti* on porcelain for the manufactory at Sèvres. His best-known etching is the portrait of Victor Hugo. Many of Rodin's works are in private collections, and at the Luxembourg he is represented by a "Danaïd" (in marble), a "Saint John" (in bronze, 1880), "She who made the Helmet" (bronze statuette), the busts of "J. P. Laurens" and of "A Lady" and other works. In the Musée Galliera is a very fine bust of Victor Hugo. Rodin's "Hand of God" was exhibited in the New Gallery, London, in 1905. In 1904 Mr Ernest Beckett (Lord Grimthorpe) presented the British nation with the sculptor's "Le Penseur." In the same year Rodin became president of the International Society of Sculptors, Painters and Engravers, in succession to James McNeill Whistler.

See SCULPTURE (*Modern French*); also Geffroy, *La Vie artistique* (Paris, 1892, 1893, 1899, 1900); L. Maillard, *Rodin* (Paris, 1899); *La Plume, Rodin et son œuvre* (Paris, 1900); Alexandre, *Le Balzac de Rodin* (Paris, 1898); H. Boutet, *Dix dessins choisis de Auguste Rodin* (1904); R. Dircks, *Auguste Rodin* (1904); H. Duhem, *Auguste Rodin* (1903); C. Black, *Auguste Rodin: the Man, his Ideas and his Works* (1905).

RODNEY, GEORGE BRYDGES RODNEY, BARON (1718–1792), English admiral, second son of Henry Rodney of

Walton-on-Thames, was born in February 1718. His father had served in Spain under the earl of Peterborough, and on quitting the army served as captain in a marine corps which was disbanded in 1713. George was sent to Harrow, being appointed, on leaving, by warrant dated the 21st of June 1732, a volunteer on board the "Sunderland." While serving on the Mediterranean station he was made lieutenant in the "Dolphin," his promotion dating the 15th of February 1739. In 1742 he attained the rank of post-captain, having been appointed to the "Plymouth" on the 9th of November. After serving in home waters, he obtained command of the "Eagle" (60), and in this ship took part in Hawke's victory off Ushant (14th October 1747) over the French fleet. On that day Rodney gained his first laurels for gallantry, under a chief to whom he was in a measure indebted for subsequent success. On the 9th of May 1749 he was appointed governor and commander-in-chief of Newfoundland, with the rank of commodore, it being usual at that time to appoint a naval officer, chiefly on account of the fishery interests. He was elected M.P. for Saltash in 1751, and married his first wife, Jane Compton (1730–1757), sister of the 7th earl of Northampton, in 1753. During the Seven Years' War Rodney rendered important services. In 1757 he had a share in the expedition against Rochefort, commanding the "Dublin" (74). Next year, in the same ship, he served under Boscawen at the taking of Louisburg (Cape Breton). On the 19th of May 1759 he became a rear-admiral, and was shortly after given command of a small squadron intended to destroy a large number of flat-bottomed boats and stores which were being collected at Havre for an invasion of the English coasts. He bombarded the town for two days and nights, and inflicted great loss of war-material on the enemy. In July 1760, with another small squadron, he succeeded in taking many more of the enemy's flat-bottomed boats and in blockading the coast as far as Dieppe. Elected M.P. for Penryn in 1761, he was in October of that year appointed commander-in-chief of the Leeward Islands station, and within the first three months of 1762 had reduced the important island of Martinique, while both St Lucia and Grenada had surrendered to his squadron. During the siege of Fort Royal (now Fort de France) his seamen and marines rendered splendid service on shore. At the peace of 1763 Admiral Rodney returned home, having been during his absence made vice-admiral of the Blue and having received the thanks of both houses of parliament.

In 1764 Rodney was created a baronet, and the same year he married Henrietta, daughter of John Clies of Lisbon. From 1765 to 1770 he was governor of Greenwich Hospital, and on the dissolution of parliament in 1768 he successfully contested Northampton at a ruinous cost. When appointed commander-in-chief of the Jamaica station in 1771 he lost his Greenwich post, but a few months later received the office of rear-admiral of Great Britain. Till 1774 he held the Jamaica command, and during a period of quiet was active in improving the naval yards on his station. Sir George struck his flag with a feeling of disappointment at not obtaining the governorship of Jamaica, and was shortly after forced to settle in Paris. Election expenses and losses at play in fashionable circles had shattered his fortune, and he could not secure payment of the salary as rear-admiral of Great Britain. In February 1778, having just been promoted admiral of the White, he used every possible exertion to obtain a command, to free himself from his money difficulties. By May he had, through the splendid generosity of his Parisian friend Marshal Biron, effected the latter task, and accordingly he returned to London with his children. The debt was repaid out of the arrears due to him on his return. The story that he was offered a French command is fiction.

Sir George was appointed once more commander-in-chief of the Leeward Islands late in 1779. His orders were to relieve Gibraltar on his way to the West Indies. He captured a Spanish convoy off Cape Finisterre on the 8th of January 1780, and eight days later defeated the Spanish admiral Don Juan de Langara off Cape St Vincent, taking or destroying seven ships. On the 17th of April an action, which, owing to the carelessness of some of Rodney's captains, was indecisive, was fought off Martinique with the French admiral Guichen. Rodney, acting under orders, captured the valuable Dutch island of St Eustatius on the 3rd of February 1781. It had been a great *entrepôt* of neutral trade, and was full of booty, which Rodney confiscated. As large quantities belonged to English merchants, he was entangled in a series of costly lawsuits.

After a few months in England, recruiting his health and defending himself in Parliament, Sir George returned to his command in February 1782, and a running engagement with the French fleet on the 9th of April led up to his crowning victory off Dominica, when on the 12th of April with thirty-five sail of the line he defeated the comte de Grasse, who had thirty-three sail. The French inferiority in numbers was more than counterbalanced by the greater size and superior sailing qualities of their ships, yet five were taken and one sunk, after eleven hours' fighting. This important battle saved Jamaica and ruined French naval prestige, while it enabled Rodney to write: "Within two little years I have taken two Spanish, one French and one Dutch admirals." A long and wearisome controversy exists as to the originator of the manœuvre of "breaking the line" in this battle, but the merits of the victory have never seriously been affected by any difference of opinion on the question. A shift of wind broke the French line of battle, and advantage was taken of this by the English ships in two places.

Rodney arrived home in August to receive unbounded honour from his country. He had already been created Baron Rodney of Rodney Stoke, Somerset, by patent of the 19th of June 1782, and the House of Commons had voted him a pension of £2000 a year. From this time he led a quiet country life till his death, which occurred on the 24th of May 1792, in London. He was succeeded as 2nd baron by his son, George (1753–1802), from whom the present baron is descended.

Rodney was unquestionably a most able officer, but he was also vain, selfish and unscrupulous, both in seeking prize money, and in using his position to push the fortunes of his family. He made his son a post-captain at fifteen. He was accused by his second-in-command, Hood, of sacrificing the interest of the service to his own profit, and of showing want of energy in pursuit of the French on the 12th of April 1782. It must be remembered that he was then prematurely old and racked by disease.

See General Mundy, *Life and Correspondence of Admiral Lord Rodney* (2 vols., 1830); David Hannay, *Life of Rodney*; Rodney letters in 9th *Report* of Hist. MSS. Com., pt. iii.; "Memoirs," in *Naval Chronicle*, i. 353–93; and Charnock, *Biographia Navalis*, v. 204–28. Lord Rodney published in his lifetime (probably 1789) *Letters to His Majesty's Ministers, &c., relative to St Eustatius, &c.*, of which there is a copy in the British Museum. Most of these letters are printed in Mundy's *Life*, vol. ii., though with many variant readings.

RODOMONTADE, or Rhodomontade, a term for boastful, extravagant language or any inflated bragging speech. The word refers to the brave but boastful Saracen leader Rodomonte in Ariosto's *Orlando Furioso*. The name (in the form Rodamante) appears earlier in Boiardo's *Orlando Innamorato*. It is supposed to represent a compound of *rodare*, to roll, and *monte*, mountain.

RODOSTO (Turkish, *Tekir Dagh*), a town of European Turkey, in the vilayet of Adrianople, on the coast of the Sea of Marmora, 78 m. W. of Constantinople. Pop. (1905) about 35,000, of whom half are Greeks. The picturesque Bay of Rodosto is enclosed by the great promontory of Combos, a spur about 2000 ft. in height from the hilly plateau to the north. The church of Panagia Rheumatocratissa contains the graves, with long Latin inscriptions, of the Hungarians who were banished from their country in 1686 by the imperialist captors of Buda. Rodosto was long a great depot for the produce of the Adrianople district, but its trade suffered when Dédéagatch became the terminus of the railway up the Maritza, and the town is now dependent on its maritime trade, especially its exports to Constantinople. It is the administrative centre of a district (*sanjak*) producing and exporting barley, oats, spelt and canary seed, and largely planted with mulberry trees, on which silkworms are fed. White cocoons are exported to western Europe (394 cwt. in 1901), silkworms' eggs to Russia and Persia.

Rodosto is the ancient *Rhaedestus* or *Bisanthe*, said to have been founded by Samians. In Xenophon's *Anabasis* it is mentioned as in the kingdom of the Thracian prince Seuthes. Its restoration by Justinian in the 6th century A.D. is chronicled by Procopius. In 813 and again in 1206 it was sacked by the Bulgarians, but it continues to appear as a place of considerable note in later Byzantine history.

RODRIGUEZ (officially RODRIGUES), an island in the Indian Ocean in 19° 41′ S., 63° 23′ E.; the most important dependency of the British colony of Mauritius, from which it is distant 344 nautical miles. It is a station on the "all-British" cable route between South Africa and Australia, telegraphic communication with Mauritius being established in 1902. With a length of 13 m. E. and W., and a breadth of 3 to 6 m. N. and S., it has an area estimated at 42½ sq. m. On all sides it is surrounded by a fringing reef of coral, studded with islets. This reef, only 100 yds. wide at the eastern end of the island, extends westward 3 m., and both N. and S. forms a flat area partly dry at low water. Two passages through the reef are available for large vessels—these leading respectively to Port Mathurin on the N. coast and to Port South-East.

The island was at one period believed to consist of granite overlaid with limestone and other modern formations, and its supposed formation caused it to be regarded as a remnant of the hypothetical continent of Lemuria. The investigations made by an expedition sent by the British government in 1874 showed, however, that the island is a mass of volcanic rock, mainly a doleritic lava, rich in olivine. The land consists largely of a series of hills. The main ridge, which runs parallel to the longest diameter, rises abruptly on the east, more gradually on the west, where there is a wide plain of coralline limestone, studded with caves, some stalactitic. Of several peaks on the main ridge the highest is Mt. Limon, 1300 ft. above the sea. The ridge is deeply cut by ravines, the upper parts of which show successive belts of lava separated by thin beds of cinders, agglomerate and coloured clays. In places the cliffs rise 300 ft. and exhibit twelve distinct lava flows. The climate is like that of Mauritius, but Rodriguez is more subject than Mauritius to hurricanes during the north-west monsoon (November to April).

Flora and Fauna.—When discovered, and down into the 17th century, Rodriguez was clothed with fine timber trees; but goats, cattle and bush-fires have combined to destroy the great bulk of the old vegetation, and the indigenous plants have in many cases been ousted by intrusive foreigners. Parts are, however, still well wooded, and elsewhere there is excellent pasturage. The sweet potato, manioc, maize, millet, the sugar-cane, cotton, coffee and rice grow well. Tobacco is also cultivated. Wheat is seldom seen, mainly because of the parakeets and the Java sparrows. Beans (*Phaseolus lunatus*), lentils, gram (*Cicer arietinum*), dholl (*Cajanus indicus*) and ground-nuts are all grown to a certain extent in spite of ravages by rats. Mangoes, bananas, guavas, pineapples, custard-apples, and especially oranges, citrons and limes flourish. Of the timber trees the most common are *Elaeodendron orientale*, much used in carpentry and for pirouges, and *Latania Verschaffelti* (Leguat's plantane). At least two species of screw-pine (*Pandanus heterocarpus*, Balf. fil., and *P. tenuifolius*) occur freely throughout the island. The total number of known species, according to Professor I. B. Balfour, is 470, belonging to 85 families and 293 genera. The families represented by the greatest number of species are Gramineae, Leguminosae, Convolvulaceae, Malvaceae, Rubiaceae, Cyperaceae, Euphorbiaceae, Liliaceae, Compositae. *Mathurina penduliflora* (Turneraceae) is interesting, as its nearest congener is in Central America. Of 33 species of mosses 17 are peculiar. Variability of species and heterophylly are characteristic of the flora to quite an unusual degree.

At present the only indigenous mammal is a species of fruit-eating bat (*Pteropus rodericensis*), and the introduced species are familiar creatures as deer, pig, rabbit, rat, mouse, &c.; but down to a recent period the island was the home of a very large land-tortoise (*Testudo Vosmaeri* or *rodericensis*), and its limestone caves have yielded a large number of skeletons of the dodo-like solitaire (*Pezophaps solitarius*), which still built its mound-like nest in the island in the close of the 17th century, but is now extinct (see DODO). Deer, once plentiful, had become very scarce by the beginning of the 20th century, having been indiscriminately hunted by the inhabitants. Of indigenous birds 13 species have been registered. The guinea-fowl (introduced) has become exceedingly abundant, partly owing to a protective game-law; and a francolin (*F. ponticerianus*), popularly a "partridge," is also common. The marine fish-fauna does not differ from that of Mauritius, and the freshwater species, with the exception of *Mugil rodericensis* and *Myxus caecuticus*, are common to all the Mascarenes. Thirty-five species of crustaceans are known. The insects (probably very imperfectly registered) comprise 60 species of Coleoptera, 15 Hymenoptera, 21 Lepidoptera, 15 Orthoptera, and 20 Hemiptera. Forty-nine species of coral have been collected, showing a close affinity to those of Mauritius, Madagascar and the Seychelles.

History.—Rodriguez or Diego Ruy's Island was discovered by the Portuguese in 1645. In 1690 Duquesne prevailed on the Dutch Government to send a body of French Huguenots to the Island of Bourbon, at that time, he believed, abandoned by the French authorities. As the refugees, however, found the French in possession, they proceeded to Rodriguez, and there eight of their number were landed on the 30th of April 1691 with a promise that they should be visited by their compatriots within two years. The two years were spent without misadventure, but, instead of waiting for the arrival of their friends, the seven colonists (for one had meanwhile died) left the island on the 8th of May 1693 and made their way to Mauritius, where they were treated with great cruelty by the governor. The account of the enterprise by Francis Leguat—*Voyages et aventures* (London, 1708), or, as it is called in the English translation, *A New Voyage to the East Indies* (London, 1708)—is a garrulous and amusing narrative, and was for a long time almost the only source of information about Rodriguez. His description of the solitaire is unique.

From the Dutch the island passed to the French, who colonized it from Mauritius. Large estates were cultivated, and the islanders enjoyed considerable prosperity. In 1809–10 Rodriguez was seized by the British, in whose possession it has since remained. The abolition of slavery proved disastrous to the prosperity of the island, and in 1843 the population had sunk to about 250. Since that time there has been a gradual recovery in the economic condition and a steady increase in population. In 1881 the inhabitants numbered 1436; in 1904 the total had risen to 3681. In 1907 the total population was 4231. The inhabitants are mainly of African origin, being descendants of slaves introduced by the French and negro immigrants direct from Africa. There are a few families of European descent (besides the comparatively large staff maintained by the Eastern Telegraph Company) and a small colony of Indians and Chinese. The bulk of the people are French-speaking and Roman Catholics. There are two small settlements, Port Mathurin, the capital, and Gabriel, in the centre of the island. The chief industries are fisheries and cattle-rearing. Salt fish is the principal export, next in importance coming goats, pigs and horned cattle and tobacco. The value of the exports for the four years 1903–06 was £50,894; of the imports for the same period, £54,710. The island is administered by a magistrate appointed by the governor of Mauritius, and the laws are regulations issued by the governor in executive council. The revenue, some £1000 a year, is about half the expenditure incurred, the balance being furnished from the Mauritian treasury. The government maintains a hospital and schools, and pays the salary of a Roman Catholic priest.

Leguat's *Voyage*, edited by Capt. P. Oliver, forms vols. 82 and 83 of the Hakluyt Soc. publications (1891). See also C. Grant, *Hist. of Mauritius and the Neighbouring Islands* (1801); Higgin, in *Jour. R. G. Soc.* (1849); the *Reports* of the Transit of Venus Expedition, 1874–75, published as an extra volume of the *Philosophical Transactions* (clxviii., London, 1879) (Botany, by I. B. Balfour; Petrology, by N. S. Maskelyne, &c.); Behm, in *Petermann's Mittheilungen* (1880); and the annual reports on Mauritius.

ROE, EDWARD PAYSON (1838–1888), American novelist, was born in Moodna, Orange county, N.Y., on the 7th of March 1838. He studied at Williams College and at Auburn Theological Seminary; in 1862 became chaplain of the Second New York Cavalry, U.S.V., and in 1864 chaplain of Hampton Hospital, at Hampton, Virginia. In 1866–74 he was pastor of the Presbyterian Church at Highland Falls, N.Y. In 1874 he removed to Cornwall-on-the-Hudson, where he devoted himself to the writing of fiction and to horticulture. He died on the 19th of July 1888. During the Civil War he wrote weekly letters to the *New York Evangelist*, and subsequently lectured on the war and wrote for periodicals. Among his novels were *Barriers Burned Away* (1872), which first appeared as a serial in the *Evangelist* and made him widely known; *What Can she Do?* (1873), *Opening of a Chestnut Burr* (1874), *From Jest to Earnest* (1875), *Near to Nature's Heart* (1876), *A Knight of the Nineteenth Century* (1877), *A Face Illumined* (1878), *A Day of Fate* (1880), *Without a Home* (1881), *Nature's Serial Story* (1884), *A Young Girl's Wooing* (1884), *An Original Belle* (1885), *He Fell in Love with his Wife* (1886), *The Earth Trembled* (1887) and *Miss Lou* (left unfinished, 1888). He wrote also *Play and Profit in My Garden* (1873), *Success with Small Fruits* (1881) and *The Home Acre* (1887). His novels were very popular in their day, especially with middle-class readers in England and America, and were translated into several European languages. Their strong moral and religious purpose, and their being written by a clergyman, did much to break down a Puritan prejudice in America against works of fiction.

See *E. P. Roe: Reminiscences of his Life* (New York, 1899), by his sister, Mary A. Roe.

ROE (or Row), **SIR THOMAS** (*c.* 1581–1644), English diplomatist, son of Robert Rowe, and of Elinor, daughter of Robert Jermy of Worstead in Norfolk, was born at Low Leyton near Wanstead in Essex, and at the age of twelve (1593) matriculated at Magdalen College, Oxford. Shortly afterwards he joined one of the inns of court, and was made esquire of the body to Queen Elizabeth. He was knighted by James I. in 1605, and became intimate with Henry, prince of Wales, and also with his sister Elizabeth, afterwards queen of Bohemia, with whom he maintained a correspondence and whose cause he championed. In 1610 he was sent by Prince Henry on a mission to the West Indies, during which he visited Guiana and the river Amazon, but failed then, and in two subsequent expeditions, to discover the gold which was the object of his travels. In 1614 he was elected M.P. for Tamworth, and in 1621 for Cirencester. His permanent reputation was mainly secured by the success which attended his embassy in 1615–18 to the court at Agra of the Great Mogul, Jahāngīr, the principal object of the mission being to obtain protection for an English factory at Surat. Appointed ambassador to the Porte in 1621, which he even then describes as being "irrevocably sick," he distinguished himself by further successes. He obtained an extension of the privileges of the English merchants, concluded a treaty with Algiers in 1624, by which he secured the liberation of several hundred English captives, and gained the support, by an English subsidy, of the Transylvanian Prince Bethlen Gabor for the European Protestant alliance and the cause of the Palatinate. Through his friendship with the patriarch of the Greek Church, Cyril Lucaris, the famous Codex Alexandrinus was presented to James I., and Roe himself collected several valuable MSS. which he subsequently presented to the Bodleian library. In 1629 he was again successful in another mission undertaken to arrange a peace between Sweden and Poland. Subsequently Roe negotiated treaties with Danzig and Denmark, returning home in 1630, when a gold medal was struck in his honour. In January 1637 he was appointed chancellor of the Order of the Garter, with a pension of £1200 a year. Subsequently he took part in the peace conferences at Hamburg, Regensburg and Vienna, and used his influence to obtain the restoration of the Palatinate, the emperor declaring that he had "scarce ever met with an ambassador till now." In June 1640 he was made a privy councillor, and in October was returned to parliament as member for the university of Oxford, where his unrivalled knowledge of foreign affairs, commerce and finance, together with his learning and eloquence, gained for him in another sphere considerable reputation. He died on the 6th of November 1644. He had married Eleanor, daughter of Sir Thomas Carr of Stamford, Northamptonshire. Roe was a distinguished and most successful diplomatist, an accomplished scholar and a patron of learning, while his personal character was unblemished.

His *Journal* of the mission to the Mogul, several times printed, has been re-edited, with an introduction by W. Foster, for the Hakluyt Society (1899). This is a valuable contribution to the history of India in the early 17th century. Of his correspondence, *Negotiations in his Embassy to the Ottoman Porte, 1621–28*, vol. i. was published in 1740, but the work was not continued. Other correspondence, consisting of letters relating to his mission to Gustavus Adolphus, was edited by S. R. Gardiner for the Camden Society Miscellany (1875), vol. vii., and his correspondence with Lord Carew in 1615 and 1617 by Sir F. Maclean for the same society in 1860. Several of his MSS. are in the British Museum collections. Roe published a *True and Faithful Relation . . . concerning the Death of Sultan Osman . . . , 1622*; a translation from Sarpi, *Discourse upon the Resolution taken in the Valteline* (1628); and in 1613 Dr T. Wright published *Quatuor Colloquia*, consisting of theological disputations between himself and Roe; a poem by Roe is printed in *Notes and Queries*, iv. Ser. v. 9. The *Swedish Intelligencer* (1632–33), including an account of the career of Gustavus Adolphus and of the Diet of Ratisbon (Regensburg), is attributed to Roe in the catalogue of the British Museum. Several of his speeches, chiefly on currency and financial questions, were also published. Two other works in MS. are mentioned by Wood: *Compendious Relation of the Proceedings . . . of the Imperial Diet at Ratisbon* and *Journal of Several Proceedings of the Order of the Garter.*

ROEBLING, JOHN AUGUSTUS (1806–1869), American civil engineer, was born at Mühlhausen, Prussia, on the 6th of June 1806. Soon after his graduation from the polytechnic school at Berlin he removed to the United States, and in 1831 entered on the practice of his profession in western Pennsylvania. He established at Pittsburg a manufactory of wire-rope, and in May 1845 completed his first important structure, a suspended aqueduct across the Allegheny river. This was followed by the Monongahela suspension bridge at Pittsburg and several suspended aqueducts on the Delaware & Hudson Canal. Removing his wire manufactory to Trenton, New Jersey, he began, in 1851, the erection at Niagara Falls of a long span wire suspension bridge with double roadway, for railway and carriage use (see Bridge), which was completed in 1855. Owing to the novelty of its design, the most eminent engineers regarded this bridge as foredoomed to failure; but, with its complete success, demonstrated by long use, the number of suspension bridges rapidly multiplied, the use of wire-ropes instead of chain-cables becoming all but universal. The completion, in 1867, of the still more remarkable suspension bridge over the Ohio river at Cincinnati, with a clear span of 1057 ft., added to Roebling's reputation, and his design for the great bridge spanning the East river between New York and Brooklyn was accepted. While personally engaged in laying out the towers for the bridge, Roebling received an accidental injury, which resulted in his death, at Brooklyn, from tetanus, on the 22nd of July 1869. The bridge was completed under the direction of his son, Washington Augustus Roebling (b. 1837), who introduced several modifications in the original plans.

ROEBOURNE, a settlement of De Witt county, Western Australia, 8 m. from the N.W. coast, on the Harding river, 920 m. direct N. of Perth. It is the centre of one of the richest and most varied mineral districts in the colony; gold, silver, tin, lead, copper, diamonds and other precious stones are found. There are extensive pearl fisheries off its port at Cossack Bay.

ROEBUCK, JOHN (1718–1794), English inventor, was born in 1718 at Sheffield, where his father had a prosperous manufacturing business. After attending the grammar school at Sheffield and Dr Philip Doddridge's academy at Northampton, he studied medicine at Edinburgh, where he was imbued with a taste for chemistry by the lectures of William Cullen and Joseph Black, and he finally graduated M.D. at Leiden in 1742. He started practice at Birmingham, but devoted much of his time to chemistry, especially in its practical applications. Among the most important of his early achievements in this field was the introduction, in 1746, of leaden condensing chambers for use in the manufacture of sulphuric acid. Together with Samuel Garbett he erected a factory at Prestonpans, near Edinburgh, for the production of the acid in 1749, and for some years enjoyed a monopoly; but ultimately his methods became known, and, having omitted to take out patents for them at the proper time, he was unable to restrain others from making use of them. Engaging next in the manufacture of iron, he in 1760 established the ironworks which still exist at Carron, in Stirlingshire. There he introduced various improvements in the methods of production, including the conversion (patented in 1762) of cast iron into malleable iron "by the action of a hollow pit-coal fire" urged by a powerful artificial blast. His next enterprise was less successful. He leased a colliery at Bo'ness to supply coal to the Carron works, but in sinking for new seams encountered such quantities of water that the Newcomen engine which he used was unable to keep the pit clear. In this difficulty he heard of James Watt's engine and entered into communication with its inventor. This engine, then at an early stage of its development, also proved inadequate, but Roebuck became a strong believer in its future and in return for a two-thirds share in the invention assisted Watt in perfecting its details. His troubles at the colliery, however, aggravated by the failure of an attempt to manufacture alkali, brought him into pecuniary straits, and he parted with his share in Watt's engine to Matthew Boulton in return for the cancellation of a debt of £1200 which he owed the latter. Subsequently, though he had to give up his interest in the Bo'ness works, he continued to manage them and to reside at the neighbouring Kinneil House, where he occupied himself with farming on a considerable scale. He died on the 17th of July 1794.

ROEBUCK, JOHN ARTHUR (1801–1879), British politician, was born at Madras on the 28th of December 1801. After the death of his father, a civil servant, his mother's second marriage transferred him to Canada, where he was chiefly brought up. He came to England in 1824, was called to the bar (Q.C. 1843), became intimate with the leading radical and utilitarian reformers, was elected M.P. for Bath in 1832, and took up that general attitude of hostility to the government of the day, be it what it might, which he retained throughout his life. At all times conspicuous for his eloquence, honesty and recalcitrancy, he twice came with especial prominence before the public—in 1838, when, although at the time without a seat in parliament, he appeared at the bar of the Commons to protest, in the name of the Canadian Assembly, against the suspension of the Canadian constitution; and in 1855, when, having overthrown Lord Aberdeen's ministry by carrying a resolution for the appointment of a committee of inquiry into the mismanagement in the Crimean War, he presided over its proceedings. In his latter years his political opinions became greatly modified, but with one interruption he retained his seat for Sheffield, which he had won in 1849, until his death in London on the 30th of November 1879.

ROE-BUCK, the smallest of the British deer (a full-grown buck standing not more than 27 in. high at the shoulder), the typical representative of a genus (*Capreolus*) in which the antlers lack a brow-tine and belong to what is characterized as the forked type, while the tail is rudimentary (see DEER). The antlers are short, upright and deeply furrowed, the beam forking at about two-thirds of its length, and the upper prong again dividing, thus making three points. The coat in summer is foxy red above and white below; in winter this changes to a greyish fawn, with a white rump-patch. The roe-buck or roe-deer (*Capreolus caprea*, or *C. capreolus*) inhabits southern and temperate Europe as far east as the Caucasus, where, as in Syria, it is probably represented by another race or species. It frequents woods, preferring such as have a large growth of underwood and are in the neighbourhood of cultivated ground. The latter it visits in the evening in search of food; and where roe are numerous the damage done to growing crops is considerable. Pairing takes place in August, but the fawns are not born till the following May. According to one theory, the germ lies dormant until December, when it begins to develop; but it is now believed that this long gestation is due to slow rather than arrested development. Roe were formerly abundant in all the wooded parts of Great Britain, but were gradually exterminated, till a century and a half ago they were unknown south of Perthshire. Since then the increase of plantations has led to the partial restoration of the species in the south of Scotland and the north of England; and it was reintroduced into Dorset early in the 19th century. These deer take readily to the water, and they have been known to swim across lochs more than half a mile in breadth. The Siberian roe (*C. pygargus*), which is common in the Altai, is larger and paler than the type species, with shorter and more hairy ears, a larger white rump-patch, and small irregular snags on the inner border of the antlers. The Manchurian roe (*Capreolus manchuricus*) is about the size of the European species, with antlers of the type of those of the Siberian roe, but more slender, and the coat shorter. Although described in 1889 as a local variety of the Siberian species, the Manchurian roe really appears, both as regards stature, hairiness and the black and white markings on the muzzle, much more nearly related to the European animal. This is the more remarkable seeing that the habitats of the two are separated by such an enormous tract of country. (R. L.*)

ROEDERER, PIERRE LOUIS, COMTE (1754–1835), French politician and economist, was born at Metz on the 15th of February 1754, the son of a magistrate. At the age of twenty-five he became councillor at the parlement of Metz, and was commissioned in 1787 to draw up a list of remonstrances. His work advocating the suppression of internal customs houses (*Suppression des douanes intérieures*), published the same year, is an elaborate treatise on the laws of commerce and on the theory of customs imposts. In 1788 he published *Députation aux États généraux*, a pamphlet remarkable for its bold exposition of liberal principles, and partly on the strength of this he was elected deputy to the states-general by the Third Estate of the *bailliage* of Metz. In the Constituent Assembly he was a member of the committee of taxes (*comité des contributions*), prepared a scheme for a new system of taxation, drew up a law on patents, occupied himself with the laws relating to stamps and *assignats*, and was successful in opposing the introduction of an income tax. After the close of the Constituent Assembly he was elected, on the 11th of November 1791, *procureur général syndic* of the department of Paris. The directory of the department, of which the duc de la Rochefoucauld was president, was at this time in pronounced opposition to the advanced views that dominated the Legislative Assembly and the Jacobin Club, and Roederer was not altogether in touch with his colleagues. Thus he took no share in signing their protest against the law against the non-juring clergy, as a violation of religious liberty. But the directory did not long survive. With the growing anarchy of the capital many of its members resigned and fled, and their places could not be filled up. Roederer himself has left in his *Chronique des cinquante jours* (1832) an account of the pitiable part played by the directory of the department in the critical period between the 20th of June and the 10th of August 1792. Seeing the perilous drift of things, he had tried to get into touch with the king; and it was on his advice that Louis, on the fatal 10th, took refuge in the Assembly. His conduct arousing suspicion, he went into hiding, and did not emerge again until after the fall of Robespierre. In 1796 he was made a member of the Institute, was appointed to a professorship of political economy, and founded the *Journal d'économie publique, de morale et de législation*. Having escaped deportation at the time of the *coup d'état* of 18 Fructidor, he took part in the revolution of 18 Brumaire, and was appointed by Napoleon member of the council of state and senator. Under the Empire, Roederer, whose public influence was very considerable, was Joseph Bonaparte's minister of finance at Naples (1806), administrator of the grand duchy of Berg (1810), and imperial commissary in the south of France. During the Hundred Days he was created a peer of France. The Restoration government stripped him of his offices and dignities, but he recovered the title of peer of France in 1832. He died on the 17th of December 1835. His son, Baron Antoine Marie Roederer

(1782–1865), was also a politician of some note in his day.

Among P. L. Roederer's writings may be mentioned *Louis XII.* (1820); *François I.* (1825); *Comédies historiques* (1827–30); *L'Esprit de la révolution de 1789* (1831); *La Première et la deuxième année du consulat de Bonaparte* (1802); *Chronique des cinquante jours*, an account of the events of the 10th of August 1792; and *Mémoire pour servir à l'histoire de la société polie en France* (1835).

See his *Œuvres*, edited by his son (Paris, 1853 seq.); Sainte-Beuve, *Causeries du lundi*, vol. viii.; M. Mignet, *Notices historiques* (Paris, 1853).

ROEMER, FRIEDRICH ADOLPH (1809–1869), German geologist, was born at Hildesheim, in Prussia, on the 14th of April 1809. His father was a lawyer and councillor of the high court of justice. In 1845 he became professor of mineralogy and geology at Clausthal, and in 1862 director of the School of Mines. He first described the Cretaceous and Jurassic strata of Germany in elaborate works entitled *Die Versteinerungen des Norddeutschen Oolithen-gebirges* (1836–39), *Die Versteinerungen des Norddeutschen Kreidegebirges* (1840–1841) and *Die Versteinerungen des Harzgebirges* (1843). He died at Clausthal on the 25th of November 1869.

His brother, Carl Ferdinand von Roemer (1818–1891), who had been educated for the legal profession at Göttingen, also became interested in geology, and abandoning law in 1840, studied science at the university of Berlin, where he graduated Ph.D. in 1842. Two years later he published his first work, *Das Rheinische Übergangsgebirge* (1844), in which he dealt with the older rocks and fossils. In 1845 he paid a visit to America, and devoted a year and a half to a careful study of the geology of Texas and other Southern states. He published at Bonn in 1849 a general work entitled *Texas*, while the results of his investigations of the Cretaceous rocks and fossils were published three years later in a treatise, *Die Kreidebildungen von Texas und ihre organischen Einschlüsse* (1852), which included also a general account of the geology, and gained for him the title "Father of the geology of Texas." Subsequently he published at Breslau *Die Silurische Fauna des westlichen Tennessee* (1860). During the preparation of these works he was from 1847 to 1855 "privat-docent" at Bonn, and was then appointed professor of geology, palaeontology and mineralogy in the university of Breslau, a post which he held with signal success as a teacher until his death. As a palaeontologist he made important contributions to our knowledge especially of the invertebrata of the Devonian and older rocks. He assisted H. G. Bronn with the third edition of the *Lethaea geognostica* (1851–56), and subsequently he laboured on an enlarged and revised edition, of which he published one section, *Lethaea palaeozoica* (1876–1883). In 1862 he was called on to superintend the preparation of a geological map of Upper Silesia, and the results of his researches were embodied in his *Geologie von Oberschlesien* (3 vols., 1870). As a mineralogist he was likewise well known, more particularly by his practical teachings and by the collection he formed in the Museum at Breslau. He died at Breslau on the 14th of December 1891.

ROEMER, OLE (Latinized Olaus) (1644–1710), Danish astronomer, was born at Aarhuus in Jutland on the 25th of September 1644. He became in 1662 the pupil and amanuensis of Erasmus Bartholinus at Copenhagen, and assisted J. Picard in 1671 to determine the geographical position of Tycho Brahe's observatory (Uraniborg on the island of Hveen). In 1672 he accompanied Picard to Paris, where he remained nine years, occupied with observations at the new royal observatory and hydraulic works at Versailles and Marly. On the 22nd of November 1675 he read a paper before the Academy on the successive propagation of light as revealed by a certain inequality in the motion of the first of Jupiter's satellites. A scientific mission to England in 1679 made him acquainted with Newton, Halley and Flamsteed. In 1681, on the summons of Christian V., king of Denmark, he returned to Copenhagen as royal mathematician and professor of astronomy in the university; and from 1688 he discharged, besides, many important administrative functions, including those of mayor (1705), chief of police and privy councillor. He died at Copenhagen on the 23rd of September 1710.

Roemer will always be remembered as the discoverer of the finite velocity of light. He showed besides wonderful ingenuity in the improvement of astronomical apparatus. The first transit instrument worthy the name was in 1690 erected in his house. In the same year he set up in the university observatory an instrument with altitude and azimuth circles (for observing equal altitudes on both sides of the meridian) and an equatorial telescope. In 1704 he built, at his own cost, the so-called "Tusculan" observatory at Vridlösemagle, a few miles west of Copenhagen, and equipped it with a meridian circle (the transit instrument and vertical circle combined) and a transit moving in the prime vertical. Roemer thus effectively realized nearly all our modern instruments of precision, and accumulated with them a large mass of observations, all of which unfortunately perished in the great conflagration of the 21st of October 1728, except the three nights' work discussed by J. G. Galle (*O. Roemeri triduum observationum astronomicarum a. 1706 institutarum*, Berlin, 1845).

See E. Philipsen, *Nordisk Universitets Tidskrift*, v. ii (1860); P. Horrebow, *Basis Astronomiae* (Copenhagen, 1735); J. B. J. Delambre, *Hist. de l'astr. moderne*, ii. 632; J. F. Montucla, *Hist. des mathématiques*, ii. 487, 579; R. Grant, *Hist. of Phys. Astronomy*, p. 461; R. Wolf, *Gesch. der Astronomie*, pp. 452, 489, 576; J. F. Weidler, *Historia Astronomiae*, p. 538; W. Doberck, *Nature*, xvii. 105; C. Huygens, *Œuvres complètes*, t. viii. pp. 30–58; L. Ambronn, *Handbuch der astr. Instrumentenkunde*, ii. 552, 966; T. J. J. See, *Pop. Astronomy*, No. 105, May 1903.

ROERMOND, a town in the province of Limburg, Holland, on the right bank of the Maas at the confluence of the Roer, and a junction station 28 m. by rail N.N.E. of Maastricht. Pop. (1900) 12,348. The old fortifications have been dismantled and partly converted into fine promenades. At this point the Maas is crossed by a bridge erected in 1866–67, and the Roer by one dating from 1771, replacing an older structure, and connecting Roermond with the suburb of St Jacob. Roermond is the seat of a Roman Catholic episcopal see. The finest building in the town is the Romanesque minster church of the first quarter of the 13th century. In the middle of the nave is the tomb of Gerhard III., count of Gelderland, and his wife Margaret of Brabant. It was formerly the church of a Cistercian nunnery, and in modern times has been elaborately restored. The cathedral of St Christopher is also of note; on the top of the tower (246 ft.) is a copper statue of the saint, and the interior is adorned with paintings by Rubens, Jacob de Wit (1695–1754) and others. The Reformed church was once the chapel of the monastery of the Minorites. There is also a Redemptorist chapel. The old bishop's palace is now the courthouse, and the old Jesuits' monastery with its fine gardens a higher-burgher school. Woollen, cotton, silk and mixed stuffs, paper, flour and beer are manufactured at Roermond.

Close to Roermond on the west is the village of Horn, once the seat of a lordship of the same name, which is first mentioned in a document of 1166. The lordship of Horn was a fief of the counts of Loon, and after 1361 of the bishop of Liége; but in 1450 it was raised to a countship by the Emperor Frederick II. On the extinction of the house of Horn in 1540, the countship passed to the famous Philip of Montmorency, who, with the count of Egmont, was executed in Brussels in 1568 by order of the duke of Alva. In the beginning of the next century the countship was forcibly retained by the see of Liége, and was incorporated in the French department of the Lower Maas at the end of the 18th century. The ancient castle is in an excellent state of preservation and is sometimes used for the assembly of the states.

ROGATION DAYS (Lat. *rogatio*, from *rogare*, to beseech; the equivalent of Gr. λιτανεία, litany), in the Calendar of the Christian Church, the Monday, Tuesday and Wednesday before Ascension Day, so called because long associated with the chanting of litanies in procession (*rogationes*). The week in which they occur is sometimes called Rogation Week. In 51 the first Council of Orleans ordered that the three days preceding Ascension Day should be celebrated as rogation days with fasting and *rogationes*. All work was to be suspended that all might join in the processions. Leo III. (pope 795–816) introduced rogation days, but without the fasting, at Rome. St Augustine had earlier introduced the custom into the English Church, learning it on his way through Gaul. The Council of Clovesho in 747 confirmed Augustine's injunction, and ordered that the rogation days be kept up "according to the way of our fathers." The place-name "Gospel Oak," which occurs in London and elsewhere, is a relic of these rogation processions, the gospel of the day being read at the foot of the finest oak the parish boasted. After the Reformation the processions gradually ceased to be ecclesiastical in England, and are now practically secularized into the perambulation of the parish boundaries on or about Ascension Day.

See also Procession and Litany.

ROGER I. (1031–1101), ruler of Sicily, was the youngest son of Tancred of Hauteville. He arrived in Southern Italy soon after 1057. Malaterra, who compares Robert Guiscard (see Guiscard, Robert) and his brother to "Joseph and Benjamin of old," says of Roger: "He was a youth of the greatest beauty, of lofty stature, of graceful shape, most eloquent in speech and cool in counsel. He was far-seeing in arranging all his actions, pleasant and merry all with men; strong and brave, and furious in battle." He shared with Robert Guiscard the conquest of Calabria, and in a treaty of 1062 the brothers in dividing the conquest apparently made a kind of "condominium" by which either was to have half of every castle and town in Calabria.[1] Robert now resolved to employ Roger's genius in reducing Sicily, which contained, besides the Moslems, numerous Greek Christians subject to Arab princes who had become all but independent of the sultan of Tunis. In May 1061 the brothers crossed from Reggio and captured Messina. After Palermo had been taken in January 1072 Robert Guiscard, as suzerain, invested Roger as count of Sicily, but retained Palermo, half of Messina and the north-east portion (the Val Demone). Not till 1085, however, was Roger able to undertake a systematic crusade. In March 1086 Syracuse surrendered, and when in February 1091 Noto yielded the conquest was complete. Much of Robert's success had been due to Roger's support. Similarly the latter supported Duke Roger, his nephew, against Bohemund, Capua and his rebels, and the real leadership of the Hautevilles passed to the Sicilian count. In return for his aid against Bohemund and his rebels the duke surrendered to his uncle in 1085 his share in the castles of Calabria, and in 1091 the half of Palermo. Roger's rule in Sicily was more real than Robert Guiscard's in Italy. At the enfeoffments of 1072 and 1092 no great undivided fiefs were created, and the mixed Norman, French and Italian vassals owed their benefices to the count. No feudal revolt of importance therefore troubled Roger. Politically supreme, the count became master of the insular Church. While he gave full toleration to the Greek Churches, he created new Latin bishoprics at Syracuse and Girgenti and elsewhere, nominating the bishops personally, while he turned the archbishopric of Palermo into a Catholic see. The Papacy, favouring a prince who had recovered Sicily from Greeks and Moslems, granted to him and his heirs in 1098 the Apostolic Legateship in the island. Roger practised general toleration to Arabs and Greeks, allowing to each race the expansion of its own civilization. In the cities the Moslems, who had generally secured such terms of surrender, retained their mosques, their kadis, and freedom of trade; in the country, however, they became serfs. He drew from the Moslems the mass of his infantry, and St Anselm visiting him at the siege of Capua, 1098, found "the brown tents of the Arabs innumerable." Nevertheless the Latin element began to prevail with the Lombards and other Italians who flocked into the island in the wake of the conquest, and the conquest of Sicily was decisive in the steady decline from this time of Mahommedan power in the western Mediterranean. Roger, the "Great Count of Sicily," died on the 22nd of June 1101 in his seventieth year and was buried in S. Trinità of Mileto. His third wife, Adelaide, niece of Boniface, lord of Savona, gave him two sons, Simon and Roger, of whom the latter succeeded him.

See E. Caspar, *Roger II. und die Gründung der normannisch-sicilischen Monarchie* (Innsbruck, 1904). (E. Cu.)

ROGER II. (1093–1154), king of Sicily, son of the preceding, began personally to rule in 1112, and from the first aimed at uniting the whole of the Norman conquests in Italy. In June 1127, William, duke of Apulia, grandson of Robert Guiscard, died childless, having apparently made some vague promise of the succession to Roger. In any case Roger claimed at once, not only all the Hauteville possessions, but also the overlordship of Capua, for which Richard II. in 1098 had sworn homage to Duke Roger. The union of Sicily and Apulia, however, was resisted by Honorius II. and by the subjects of the duchy itself, averse from any strong ducal power, and the pope at Capua (Dec. 1127) preached a crusade against the claimant, setting against him Robert II. of Capua and Ranulf of Alife, or Avellino, brother-in-law of Roger, who proved himself the real leader of the revolt. The coalition, however, failed, and in August 1128 Honorius invested Roger at Benevento as duke of Apulia. The baronial resistance, which was backed by Naples, Bari, Salerno and other cities, whose aim was civic freedom, also gave way, and at Melfi (Sept. 1129) Roger was generally recognized as duke by Naples, Capua and the rest. He began at once to enforce order in the Hauteville possessions, where the ducal power had long been falling to pieces. For the binding together of all his states the royal name seemed essential, and the death of Honorius in February 1130, followed by a double election, seemed the decisive moment. While Innocent II. fled to France, Roger, with deep design, supported Anacletus II. The price was a crown, and on the 27th of September 1130 a bull of Anacletus made Roger king of Sicily. He was crowned in Palermo on the 25th of December 1130.

This plunged Roger into a ten years' war. Bernard of Clairvaux, Innocent's champion, built up against Anacletus and his "half heathen king" a coalition joined by Louis VI. of France, Henry I. of England and the emperor Lothar. Meanwhile the forces of revolt in South Italy drew to a head again. The rebels under Ranulf shamefully defeated the king at Nocera on the 24th of July 1132. Nevertheless, by July 1134 his terrific energy and the savagery of his Saracen troops forced Ranulf, Sergius, duke of Naples, and the rebels to submit, while Robert was expelled from Capua. Meanwhile Lothar's contemplated attack upon Roger had gained the backing of Pisa, Genoa and the Greek emperor, all of whom feared the growth of a powerful Norman kingdom. In February 1137 Lothar began to move south and was joined by Ranulf and the rebels; in June he besieged and took Bari. At San Severino, after a victorious campaign, he and the pope jointly invested Ranulf as duke of Apulia (Aug. 1137), and the emperor then retired to Germany. Roger, freed from the utmost danger, recovered ground, sacked Capua and forced Sergius to acknowledge him as overlord of Naples. At Rignano the indomitable Ranulf again utterly defeated the king, but in April 1139 Ranulf died, leaving none to oppose Roger, who subdued pitilessly the last of the rebels.

The death of Anacletus (25 Jan. 1138) determined Roger to seek the confirmation of his title from Innocent. The latter, invading the kingdom with a large army, was skilfully ambushed at Galuccio on the Garigliano (22 July 1139). This secured the king's object; on the 25th July the pope invested him as "Rex Siciliae ducatus Apuliae et principatus Capuae." The boundaries of the "regno" were finally fixed, by a truce with the pope in October 1144, at a line south of the Tronto and east of Terracina and Ceprano.

Roger, now become one of the greatest kings in Europe, made Sicily the leading maritime power in the Mediterranean. A powerful fleet was built up under several "admirals," or

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[1] See Chalandon, *La Domination normande*, vol. i. p. 200.

"emirs," of whom the greatest was George of Antioch, formerly in the service of the Moslem prince of El Mehdia. Mainly by him a series of conquests were made on the African coast (1135–53) which reached from Tripoli to Cape Bona. The second crusade (1147–48) gave Roger an opportunity to revive Robert Guiscard's designs on the Greek Empire. George was sent to Corinth at the end of 1147 and despatched an army inland which plundered Thebes. In June 1149 the admiral appeared before Constantinople and defied the Basileus by firing arrows against the palace windows. The attack on the empire had, however, no abiding results. The king died at Palermo on the 26th of February 1154, and was succeeded by his fourth son William.

Personally Roger was of tall and powerful body, with long fair hair and full beard. "He had," says Romnald of Salerno, "a lion face, and spoke with a harsh voice." With little or none of Robert Guiscard's personal valour, and living at intervals the life of an eastern Sultan, he yet showed to the full his uncle's audacity, diplomatic skill and determination. It is Roger II.'s distinction to have united all the Norman conquests into one kingdom and to have subjected them to a government scientific, personal and centralized. The principles of this are found in the Assizes of the kingdom of Sicily, promulgated at Ariano in 1140, which enforced an almost absolute royal power. At Palermo Roger drew round him distinguished men of various races, such as the famous Arab geographer Idrisi and the historian Nilus Doxopatrius. The king's active and curious mind welcomed the learned; he maintained a complete toleration for the several creeds, races and languages of his realm; he was served by men of nationality so dissimilar as the Englishman Thomas Brun, a kaid of the Curia, and, in the fleet, by the renegade Moslem Christodoulos, and the Antiochene George, whom he made in 1132 "amiratus amiratorum," in effect prime vizier. The Capella Palatina, at Palermo, the most wonderful of Roger's churches, with Norman doors, Saracenic arches, Byzantine dome, and roof adorned with Arabic scripts, is perhaps the most striking product of the brilliant and mixed civilization over which the grandson of the Norman Tancred ruled.

Contemporary authors are: Falco of Benevento, Alexander of Telese, Romuald of Salerno and Hugo Falcandus, all in the *Scrittori e cronisti napoletani*, ed. Del Re, vol. i. See also E. Caspar, *Roger II. und die Gründung der normannisch-sicilischen Monarchie* (Innsbruck, 1904). (E. Cu.)

ROGER (d. 1139), bishop of Salisbury, was originally priest of a small chapel near Caen. The future King Henry I., who happened to hear mass there one day, was impressed by the speed with which Roger read the service, and enrolled him in his own service. Roger, though uneducated, showed great talent for business, and Henry, on coming to the throne, almost immediately made him chancellor (1101). Soon after Roger received the bishopric of Salisbury. In the Investitures controversy he skilfully managed to keep the favour of both the king and Anselm. Roger devoted himself to administrative business, and remodelled it completely. He created the exchequer system, which was managed by him and his family for more than a century, and he used his position to heap up power and riches. He became the first man in England after the king, and was in office, if not in title, justiciar. He ruled England while Henry was in Normandy, and succeeded in obtaining the see of Canterbury for his nominee, William of Corbeil. Duke Robert seems to have been put into his custody after Tinchebrai. Though Roger had sworn allegiance to Matilda, he disliked the Angevin connexion, and went over to Stephen, carrying with him the royal treasure and administrative system (1135). Stephen placed great reliance on him, on his nephews, the bishops of Ely and Lincoln, and on his son Roger, who was treasurer. The king declared that if Roger demanded half of the kingdom he should have it, but chafed against the overwhelming influence of the official clique whom Roger represented. Roger himself had built at Devizes the most splendid castle in Christendom. He and his nephews seem to have secured a number of castles outside their own dioceses, and the old bishop behaved as if he were an equal of the king. At a council held in June 1139, Stephen found a pretext for demanding a surrender of their castles, and on their refusal they were arrested. After a short struggle all Roger's great castles were sequestrated. But Henry of Winchester demanded the restoration of the bishop. The king was considered to have committed an almost unpardonable crime in offering violence to members of the church, in defiance of the scriptural command, "Touch not mine anointed." Stephen took up a defiant attitude, and the question remained unsettled. This quarrel with the church, which immediately preceded the landing of the empress, had a serious effect on Stephen's fortunes. The moment that the fortune of war declared against him, the clergy acknowledged Matilda. Bishop Roger, however, did not live to see himself avenged. He died at Salisbury in December 1139. He was a great bureaucrat, and a builder whose taste was in advance of his age. But his contemporaries were probably justified in regarding him as the type of the bishop immersed in worldly affairs, ambitious, avaricious, unfettered by any high standard of personal morality.

Roger's nephew Alexander (d. 1148), who became bishop of Lincoln in 1123, was a typical secular ecclesiastic of the middle ages, wealthy, proud, ambitious and ostentatious. He founded monasteries, built castles at Newark, Sleaford and Banbury, and restored his cathedral at Lincoln after the fire of 1145. He followed the policy of Roger, whose imprisonment he shared, and died after a visit to Pope Eugenius III. at Auxerre, early in 1148.

See Sir J. Ramsay's *Foundations of England*, vol. ii., and J. H. Round's *Geoffrey de Mandeville.*

ROGER (d. 1181), archbishop of York, known as Roger of Pont l'Evêque, was a member of the household of Theobald, archbishop of Canterbury, where he quarrelled violently with another future archbishop, Thomas Becket. In 1148 he was appointed archdeacon of Canterbury, and soon afterwards chaplain to King Stephen, who sent him on an errand to Rome in 1152; then in October 1154 he was consecrated archbishop of York in Westminster Abbey. When Henry II. entered upon his great struggle with Becket over the immunity of clerks from secular jurisdiction, he managed to secure the support of Roger, and having been appointed papal legate in England, the archbishop visited Pope Alexander III. and the French king, Louis VII., in his master's interests. In June 1170 he crowned the king's son Henry, in spite of prohibitions from the pope and from Becket, and for this act he was suspended. One authority declares that Roger, who was then with Henry II. in Normandy, instigated the murder of the rival archbishop, but he swore he was innocent of this crime. He quarrelled with Richard, the new archbishop of Canterbury, about the respective rights of the two archiepiscopal sees, until 1176, when the king arranged a truce between them; and he was constantly endeavouring to assert his supremacy over the Scottish church. The archbishop died at York on the 21st of November 1181. He was always loyal to Henry II., to whom he was very useful during the great rising of 1174; but he has been accused of avarice, and he was certainly not lacking in ambition.

Another English prelate of this name was Roger, bishop of Worcester, a younger son of Robert, earl of Gloucester, and thus a grandson of the English king Henry I. In 1163 his cousin Henry II. appointed him bishop of Worcester, but almost alone of the English bishops he supported Thomas Becket and not the king during the quarrel between them in 1166. In 1167 he left England to share Becket's exile, but he soon returned to court, although he appears to have remained on friendly terms with the archbishop. He died at Tours in 1179.

ROGER OF HOVEDEN, or Howden (fl. 1174–1201), English chronicler, was, to judge from his name and the internal evidence of his work, a native of Howden in the East Riding of Yorkshire. But nothing is known of him before the year 1174. He was then in attendance upon Henry II., by whom he was sent from France on a secret mission to the lords of Galloway. In 1175 he again appears as a negotiator between the king and a number of English religious houses. The interest which Hoveden shows in ecclesiastical affairs and miracles may justify the supposition that he was a clerk in orders. This, however, did not prevent him from acting, in 1189, as a justice of the forests in the shires of Yorkshire, Cumberland and Northumberland. After the death of Henry II., it would seem that Hoveden retired from the public service, though not so completely as to prevent him from drawing on the royal archives for the history of contemporary events. About the year 1192 he began to compile his *Chronica*, a general history of England from 732 to his own time. Up to the year 1192 his narrative adds little to our knowledge. For the period 732–1148 he chiefly drew upon an extant, but unpublished chronicle, the *Historia Saxonum sive Anglorum post obitum Bedae* (British Museum MS. Reg. 13 A. 6), which was composed about 1150. From 1148 to 1170 he used the Melrose Chronicle (edited for the Bannatyne Club in 1835 by Joseph Stevenson) and a collection of letters bearing upon the Becket controversy. From 1170 to 1192 his authority is the chronicle ascribed to Benedictus Abbas (*q.v.*), the author of which must have been in the royal household at about the same time as Hoveden. Although this period was one in which Hoveden had many opportunities of making independent observations, he adds little to the text which he uses; except that he inserts some additional documents. Either his predecessor had exhausted the royal archives, or the supplementary searches of Hoveden were languidly pursued. From 1192, however, Hoveden is an independent and copious authority. Like "Benedictus," he is sedulously impersonal, and makes no pretence to literary style, quotes documents in full and adheres to the annalistic method. His chronology is tolerably exact, but there are mistakes enough to prove that he recorded events at a certain distance of time. Both on foreign affairs and on questions of domestic policy he is unusually well informed. His practical experience as an administrator and his official connexions stood him in good stead. He is particularly useful on points of constitutional history. His work breaks off abruptly in 1201, though he certainly intended to carry it further. Probably his death should be placed in that year.

See W. Stubbs's edition of the *Chronica* (Rolls Series) and the introductions to vols. i. and iv. This edition supersedes that of Sir H. Savile in his *Scriptores post Bedam* (1596). (H. W. C. D.)

ROGER OF WENDOVER (d. 1236), English chronicler, was probably a native of Wendover in Buckinghamshire. At some uncertain date he became a monk of St Albans; afterwards he was appointed prior of the cell of Belvoir, but he forfeited this dignity in the early years of Henry III., having been found guilty of wasting the endowments. His latter years were passed at St Albans, where he died on the 6th of May 1236. He is the first of the important chroniclers who worked in the scriptorium of this house. His great work, the *Flores Historiarum*, begins at the creation and extends to 1235. It is of original value from 1202. Some critics have supposed, but on inconclusive evidence, that Wendover copied, up to 1189, an earlier compilation, the work of John de Cella, the twenty-first abbot of St Albans (1195–1214). Wendover's work is known to us through one 13th-century manuscript in the Bodleian library (Douce MS. 207), a mutilated 14th-century copy in the British Museum (Cotton MS. Otho B. v.), and the edition prepared by Matthew Paris which forms the first part of that writer's *Chronica Majora* (ed. H. R. Luard, Rolls Series, 7 vols.). The best edition of Wendover is that of H. O. Coxe (4 vols., London, 1841–42); there is another (from 1154) in the Rolls Series by H. G. Hewlett (3 vols., 1886–89). Wendover is a copious but inaccurate writer, less prejudiced but also less graphic than Matthew Paris. Where he is the sole authority for an event, he is to be used with caution.

See Luard's prefaces to vols. i., ii., iii. and vii. of the *Chronica Majora*; and the *Monumenta Germaniae Historica. Scriptores*, Band xxviii. pp. 3–20. (H. W. C. D.)

ROGERS, HENRY (1806–1877), English Nonconformist divine, was born at St Albans on the 18th of October 1806, and was educated privately and by his father, a surgeon of considerable culture. Rogers was meant to follow his father's profession, but the reading of John Howe turned him to theology, and after qualifying at Highbury College he accepted a call to the Congregational Church at Poole in 1829. In 1832 he was appointed lecturer in logic at Highbury, in 1836 professor of English at University College, London, and in 1839 professor of English, mathematics and mental philosophy at Spring Hill College, Birmingham. In 1836 appeared his *Life and Character of John Howe*, and in 1837 *The Christian Correspondent*, a collection of some 400 religious letters "by eminent persons of both sexes." His contributions to the *Edinburgh Review* began in 1839 and were collected in volume form in 1850, 1855 and 1874. His most famous book, *The Eclipse of Faith, or a Visit to a Religious Sceptic*, was published anonymously in 1852 and went through six editions in three years. It drew a *Reply* from F. W. Newman, which Rogers answered in a *Defence* (1854). Two volumes of imaginary letters, *Selections from the Correspondence of R. E. H. Greyson* (an anagram for his own name), appeared in 1857 and show his style at its best. In 1858 he became principal and professor of theology at the Lancashire Independent College, where he edited the works of John Howe (6 vols., 1862–63) and wrote for the *British Quarterly*. He retired in 1871, and died at Machynlleth on the 21st of August 1877. Rogers was widely read, and as a Christian apologist carried on the traditions of the 18th century as illustrated by Butler.

See Memoir by Dr R. W. Dale, prefixed to the 8th edition of *The Supernatural Origin of the Bible Inferred from Itself* (the Congregational Lecture for 1873, delivered by Rogers).

ROGERS, HENRY DARWIN (1808–1866), American geologist, was born at Philadelphia on the 1st of August 1808. At the age of twenty-one he was chosen professor of chemistry and natural philosophy at Dickinson College, Pennsylvania. After holding this post for three years, he went to Europe and took up the study of geology. Subsequently he was engaged for twenty-two years in the State surveys of Pennsylvania and New Jersey, his Reports on which were published during the years 1836–41. In 1842 he and his brother WILLIAM BARTON ROGERS (1805–1882), who had been similarly occupied in Virginia (his Reports were published in 1838–41, and he wrote also on the connexion between thermal springs and anticlinal axes and faults), brought before the Association of American Geologists and Naturalists their conclusions on the physical structure of the Appalachian chain, and on the elevation of great mountain chains. The researches of H. D. Rogers were elaborated in his final *Report on Pennsylvania* (1858), in which he included a general account of the geology of the United States and of the coal-fields of North America and Great Britain. In this important work he dealt also with the structure of the great coal-fields, the method of formation of the strata, and the changes in the character of the coal from the bituminous type to anthracite. In 1857 he was appointed professor of natural history and geology at Glasgow. One of his later essays (1861) was on the parallel roads of Lochaber (Glen Roy), the origin of which he attributed to a vast inundation. He died at Glasgow on the 29th of May 1866.

ROGERS, JAMES EDWIN THOROLD (1823–1890), English economist, was born at West Meon, Hampshire, in 1823. He was educated at King's College, London, and Magdalen Hall, Oxford. After taking a first-class degree in 1846, he was ordained, and was for a few years a curate in Oxford. Subsequently, however, he resigned his orders. For some time the classics were the chief field of his activity. He devoted himself a good deal to classical and philosophical tuition in Oxford with success, and his publications included an edition of Aristotle's *Ethics* (in 1865). Simultaneously with these occupations he had been diligently studying economics, with the result that in 1859 he was appointed professor of statistics and economic science at King's College, London, a post which he filled till his death. From 1862 to 1867 he also held the position of Drummond professor of political economy at Oxford. During that period he published (in 1866) the first two volumes of his *History of Agriculture and Prices in England*, dealing with the period 1259–1400, a minute and masterly record of the subject, and the work upon which his reputation mainly rests. Two more volumes (1401–1582) were published in 1882, a fifth and sixth (1583–1702) in 1887, and he left behind him at his death copious materials for a seventh and eighth. In 1868 he published a *Manual of Political Economy*, and in 1869 an edition of Adam Smith's *Wealth of Nations*. In 1875 he collected and edited the *Protests of the Lords*. An intimate acquaintance with Cobden and John Bright led Rogers to take an active part in politics: he represented Southwark in parliament from 1880 to 1885, and Bermondsey from 1885–86, as an advanced Liberal. In 1888, on the death of Professor Bonamy Price, who had succeeded him at Oxford as professor of political economy, he was re-elected to the post, and held it till his death. Previously (in 1883) he had been appointed lecturer in political economy at Worcester College, Oxford. His latter years were mainly spent at Oxford, where he died on the 12th of October 1890. He was celebrated as a caustic wit and humorist. Of his miscellaneous economic and historical writings, which were numerous, the most noteworthy is his *Six Centuries of Work and Wages*, published in 1884. As an economist, Thorold Rogers did much to promote the historical study of his subject. He was, however, apt to be guided too frequently by political prejudice, and the value of his work suffered from his aggressively contentious spirit.

ROGERS, JOHN (1627–*c.* 1665), English preacher, second son of Nehemiah Rogers, a royalist and Anglican clergyman, was born at Messing in Essex, and became a servitor and student of medicine at King's College, Cambridge. When still a youth the violence of his religious despair led him to attempt suicide and ended in his joining the extreme sect of the Puritans. Deprived of his home in 1642, he walked to Cambridge, and found the college establishment broken up; he nearly starved, but obtained in 1643 a scholastic post in Lord Brudenel's house in Huntingdonshire, and subsequently at St Neot's free school. He became known as a preacher, received Presbyterian ordination in 1647, married a daughter of Sir Robert Payne of Midloe in Huntingdonshire, and obtained the living of Purleigh in Essex. Subsequently he came to London, joined the Independents, became lecturer at St Thomas Apostle's, and attracted attention by the violence of his political sermons. He was appointed preacher to Christ Church Cathedral in Dublin by the parliament in 1651, and while there served in the field, returning in 1652 to St Thomas Apostle's on account of religious dissensions. In 1653 his parishioners at Purleigh, where he had hitherto managed to retain the living, successfully proceeded against him for non-residence. In the quarrel between the army and the parliament Rogers had naturally sided with the former, and he was one of the first to join the Fifth Monarchy movement. He approved of the expulsion of the Long Parliament, and addressed two letters to Cromwell on the subject of the new government to be inaugurated, but the establishment of the Protectorate at once threw the Fifth Monarchy men into antagonism. Rogers addressed a warning letter to Cromwell, and boldly attacked him from the pulpit on the 9th of January 1654. Thereupon his house was searched and his papers seized, and Rogers then issued another denunciation against Cromwell, *Mene, Tekel, Perez: a Letter lamenting over Oliver Lord Cromwell*. On the 28th of March, on which day he had proclaimed a fast for the sins of the rulers, he preached a violent sermon against the protector, which occasioned his arrest in July. He confronted Cromwell with great courage when brought before him on the 5th of February 1655, and was imprisoned successively at Windsor and in the Isle of Wight, being released in January 1657. He returned to London, and, being suspected of a conspiracy, was again imprisoned by Cromwell in the Tower from the 3rd of February 1658 till the 16th of April. On the protector's death and the downfall of Richard Cromwell, the ideals of the Fifth Monarchy men seemed nearer realization, but Rogers was engaged in political controversy with Prynne and became a source of embarrassment to his own faction, which endeavoured to get rid of him by appointing him "to preach the gospel" in Ireland. On the outbreak of Sir George Booth's royalist insurrection, however, he became chaplain in Charles Fairfax's regiment, and served throughout the campaign. He obtained a lectureship at Shrewsbury in October and was in Dublin in January 1660, being imprisoned there by order of the army faction and released subsequently by the parliament. At the Restoration he withdrew to Holland, studied medicine at Leiden and Utrecht, and obtained from the latter university the degree of M.D. in 1662. He returned to England the same year and resided at Bermondsey, was admitted to the degree of M.D. at Oxford in 1664, and is supposed, in the absence of further record, to have died soon afterwards.

Besides the pamphlet already cited, Rogers wrote in 1653 *Ohel or Bethshemesh, a Tabernacle for the Sun*, in which he attacked the Presbyterians, and *Sagrir, or Doomesday drawing nigh*, from his new standpoint as a Fifth Monarchy man, and was the author of *Challah, the Heavenly Nymph* (1653); *Dod, or Chathan; the Beloved or the Bridegroom going forth for his Bride* . . . (1653); *Prison-born Morning Beams* (1654); *Jegar Sahadutha* . . . (1657); *Mr Prynne's Good Old Cause stated and stunted 10 Year ago* . . . (1609); Διαπολιτεία, *a Christian Concertation* (1659); *Mr Harrington's Parallel Unparalleled* (1659); *A Vindication of Sir H. Vane* (1659); *Disputatio Medica Inauguralis* (1662).

AUTHORITIES.—*Life and Opinions of a Fifth Monarchy Man*, by Ed. Rogers (1867), compiled from Rogers's own works; Wood, *Athenae Oxonienses and Fasti; Calendars of State Papers* (*Domestic*). See also "English Ancestry of Washington," *Harper's Magazine*, xxi. 887 (1891); "John Rogers of Purleigh," *The Nation*, vol. 53, p. 314 (1891).

ROGERS, JOHN (*c.* 1500–1555), English Protestant martyr, was born in the parish of Aston, near Birmingham, and was educated at Pembroke Hall, Cambridge, where he graduated B.A. in 1526. Six years later he was rector of Holy Trinity, Queenhithe, London, and in 1534 went to Antwerp as chaplain to the English merchants. Here he met William Tyndale, under whose influence he abandoned the Roman Catholic faith, and married an Antwerp lady. After Tyndale's death Rogers pushed on with his predecessor's English version of the Old Testament, which he used as far as 2 Chronicles, employing Coverdale's translation (1535) for the remainder and for the Apocrypha. Tyndale's New Testament had been published in 1526. The complete Bible was put out under the pseudonym of Thomas Matthew in 1537; it was printed in Antwerp, and Richard Grafton published the sheets and got leave to sell the edition (1500 copies) in England. Rogers had little to do with the translation, but he contributed some valuable prefaces and marginal notes. His work was largely used by those who prepared the Great Bible (1539–40), out of which in turn came the Bishop's Bible (1568) and the Authorized Version of 1611. After taking charge of a Protestant congregation in Wittenberg for some years, Rogers returned to England in 1548, where he published a translation of Melanchthon's *Considerations of the Augsburg Interim*. In 1550 he was presented to the crown livings of St Margaret Moyses and St Sepulchre in London, and in 1551 was made a prebendary of St Paul's, where the dean and chapter soon appointed him divinity lecturer. He courageously denounced the greed shown by certain courtiers with reference to the property of the suppressed monasteries, and defended himself before the privy council. He also declined to wear the prescribed vestments, donning instead a simple round cap. On the accession of Mary he preached at Paul's Cross commending the "true doctrine taught in King Edward's days," and warning his hearers against "pestilent Popery, idolatry and superstition." Ten days after (16th August 1553), he was summoned before the council and bidden to keep within his own house. His emoluments were taken away and his prebend was filled in October. In January 1554 Bonner, the new bishop of London, sent him to Newgate, where he lay with

John Hooper, Laurence Saunders, John Bradford and others for a year, their petitions, whether for less rigorous treatment or for opportunity of stating their case, being alike disregarded. In December 1554 parliament re-enacted the penal statutes against Lollards, and on January 22nd, 1555, two days after they took effect, Rogers with ten others came before the council at Gardiner's house in Southwark, and held his own in the examination that took place. On the 28th and 29th he came before the commission appointed by Cardinal Pole, and was sentenced to death by Gardiner for heretically denying the Christian character of the Church of Rome and the real presence in the sacrament. He awaited and met death (on the 4th of February 1555 at Smithfield) cheerfully, though denied even an interview with his wife. Noailles, the French ambassador, speaks of the support given to Rogers by the greatest part of the people: "even his children assisted at it, comforting him in such a manner that it seemed as if he had been led to a wedding." He was the first Protestant martyr of Mary's reign, and his friend Bradford wrote that "he broke the ice valiantly."

The following divines of the same name may be distinguished:—JOHN ROGERS (1572?–1603), Puritan vicar of Dedham, Essex, "one of the most awakening preachers of the age."—JOHN ROGERS (1610–1680), ejected vicar of Croglin, Cumberland, and the founder of Congregational churches in Teesdale and Weardale, where he evangelized the lead miners.—JOHN ROGERS (1679–1729), one of George II.'s chaplains, famous for his share in the Bangorian controversy (1719), his *Vindication of the Civil Establishment of Religion* (1728), and his *Persuasives to Conformity*, addressed to Dissenters (1736) and to Quakers (1747).—JOHN ROGERS (1740?–1814), leader of the Irish seceding divines, minister of Cahans, Co. Monaghan.—JOHN ROGERS (1778–1856), rector of Mawnan, Cornwall, and the owner of the Penrose and Helston estates; a good botanist and mineralogist, and a distinguished Hebrew and Syriac scholar.

ROGERS, JOHN (1829–1904), American sculptor, was born at Salem, Massachusetts, on the 30th of October 1829. In 1848 he became an apprentice in a machine shop at Manchester, New Hampshire, and remained there for about ten years. During the latter part of this time he had done some modelling in clay in his leisure hours, and, having decided to become a sculptor, he spent eight months in Rome and Paris in 1858–59. Becoming discouraged, he returned to America and obtained employment as a draughtsman in the office of the city surveyor of Chicago; but soon afterwards, owing to the favourable reception of his group of small figures, "The Checker Players," he resumed sculptural work, confining himself to these small figures, known as "Rogers Groups," which had an enormous popular success and were extensively reproduced. The Civil War in America gave him patriotic themes that increased his vogue and prosperity, and in 1863 he became a National Academician. His subjects were familiar scenes and incidents of home life known to the masses, and the reproductions of his groups were sold in the most remote districts as well as in the larger cities. He executed several life-sized statues, including "General John F. Reynolds" and a seated figure of Lincoln, both in Philadelphia; but it is by his statuettes that he is best remembered, and these were characterized by sentiment and human interest rather than any genuine artistic feeling. He died at New Haven, Connecticut, on the 27th of July 1904.

ROGERS, ROBERT (1727–1784?), American frontier soldier, was born of Irish parentage in 1727, probably at Methuen, Massachusetts, whence his father, James Rogers (often confused with James Rogers, an early settler of Londonderry, N.H.), removed in 1739 to Starktown (now Dunbarton), New Hampshire. During the Seven Years' War he raised and commanded a force of militia, known as Rogers' Rangers, which won a wide reputation for its courage and endurance in the campaigns about Lake George. He took part in Wolfe's expedition against Quebec, and on the 4th of October 1759 he destroyed an Abnaki Indian village on the St Francis river near its mouth and killed about 200 of its inhabitants. After the Montreal campaign of 1760, in which he served, he was sent by General Amherst to take possession of the north-western posts, occupied Detroit on the 29th of November, and later returned to the east. In 1763, during the Pontiac uprising, he accompanied the relief expedition under James Dalyell to Detroit and took part in the battle of Bloody Bridge on the 31st of July (see PONTIAC). Soon after this he went to England, and in 1765 published in London a *Concise Account of North America, containing a Description of the Several British Colonies . . . also an Account of the Several Nations and Tribes of Indians* (new edition, Albany, 1883). In 1766–68 he was commandant of Michilimackinac. He spent the next few years in England, and after 1772 was in the service of the dey of Algiers. At the beginning of the War of Independence he returned to America, and in spite of his protestations of patriotism was considered by Washington and others a Loyalist spy. He was arrested by agents of Congress, but was paroled. His re-arrest he considered a release from his parole. He then openly joined the British, and under a commission from General Howe organized a regiment of Loyalists which was known as the Queen's Rangers, and which after his return to England in 1776 was commanded by Capt. John G. Simcoe. In 1779 he was commissioned to raise a regiment to be called the King's Rangers, and he returned for a short time to America; but the command of the Rangers, which soon became a part of the garrison of St John's, Quebec, was taken by his brother James (d. 1792), who had formerly served under Robert. Rogers died in London probably in 1784.

In addition to the *Concise Account of North America*, he published his *Journals* (London, 1765), and is supposed to have written, at least in part, *Ponteach, or the Savages of America, a Tragedy* (London, 1766). See also his "Journal" in the *Diary of the Siege of Detroit in the War with Pontiac* (Albany, 1860; new edition, 1883), edited by F. B. Hough; and Francis Parkman, *Montcalm and Wolfe* (2 vols., Boston, 1884).

ROGERS, SAMUEL (1763–1855), English poet, was born at Newington Green, London, on the 30th of July 1763. His father, Thomas Rogers, was the son of a Stourbridge glass manufacturer, who was also a merchant in Cheapside. Thomas Rogers had a place in the London business, and married Mary, the only daughter of his father's partner, Daniel Radford, becoming himself a partner shortly afterwards. On his mother's side Samuel Rogers was connected with the two well-known Nonconformist divines Philip and Matthew Henry, and it was in Nonconformist circles at Stoke Newington that he was brought up. He was educated at private schools at Hackney and Stoke Newington. He wished to enter the Presbyterian ministry, but at his father's desire he joined the banking business in Cornhill. In long holidays, necessitated by delicate health, Rogers became a diligent student of English literature, particularly in Johnson, Gray and Goldsmith. Gray's poems, he said, he had by heart. He had already made some contributions to the *Gentleman's Magazine*, when in 1786 he published a volume containing some imitations of Goldsmith and an "Ode to Superstition" in the manner of Gray. In 1788 his elder brother Thomas died, and Samuel's business responsibilities were increased. In the next year he paid a visit to Scotland, where he met Adam Smith, Henry Mackenzie, the Piozzis and others. In 1791 he was in Paris, and enjoyed a hurried inspection of the art collection of Philippe Égalité at the Palais Royal, many of the treasures of which were later on to pass into his possession. With Gray as his model, Rogers took great pains in polishing his verses, and six years elapsed after the publication of his first volume before he printed his elaborate poem on *The Pleasures of Memory* (1792). This poem may be regarded as the last embodiment of the poetic diction of the 18th century. Here is carried to the extremest pitch the theory of elevating and refining familiar themes by abstract treatment and lofty imagery. In this art of "raising a subject," as the 18th-century phrase was, the *Pleasures of Memory* is much more perfect than Thomas Campbell's *Pleasures of Hope*, published a few years later in imitation. The acme of positive praise for the fashionable serious poetry of the time was given by Byron when he said, "There is not a vulgar line in the poem."

In 1793 his father's death gave Rogers the principal share in the banking house in Cornhill, and a considerable income.

He left Newington Green in the same year and established himself in chambers in the Temple. In his circle of friends at this time were "Conversation" Sharp and the artists Flaxman, Opie, Martin Shee and Fuseli. He also made the acquaintance of Charles James Fox, with whom he visited the galleries in Paris in 1802, and whose friendship introduced him to Holland House. In 1803 he moved to 22 St James's Place, where for fifty years he entertained all the celebrities of London. Flaxman and Stothard had a share in the decorations of the house, which Rogers had almost rebuilt, and now proceeded to fill with pictures and other works of art. His collections at his death realized £50,000. An invitation to one of Rogers's breakfasts was a formal entry into literary society, and his dinners were even more select. His social success was due less to his literary position than to his powers as a conversationalist, his educated taste in all matters of art, and no doubt to his sarcastic and bitter wit, for which he excused himself by saying that he had such a small voice that no one listened if he said pleasant things. Above all, he seems to have had a genius for benevolence. "He certainly had the kindest heart and unkindest tongue of any one I ever knew," said Fanny Kemble. He helped the poet Robert Bloomfield, he reconciled Moore with Jeffrey and with Byron, and he relieved Sheridan's difficulties in the last days of his life. Moore, who refused help from all his friends, and would only be under obligations to his publishers, found it possible to accept assistance from Rogers. He procured a pension for H. F. Cary, the translator of Dante, and obtained for Wordsworth his sinecure as distributor of stamps.

It is difficult to realize the length of time that Rogers played the part of literary dictator in England. He made his reputation by *The Pleasures of Memory* when Cowper's fame was still in the making. He became the friend of Wordsworth, Scott and Byron, and lived long enough to give an opinion as to the fitness of Alfred Tennyson for the post of poet laureate. Alexander Dyce, from the time of his first introduction to Rogers, was in the habit of writing down the anecdotes with which his conversation abounded. From the mass of material thus accumulated he made a selection which he arranged under various headings and published in 1856 as *Recollections of the Table-Talk of Samuel Rogers, to which is added Porsoniana.* Rogers himself kept a notebook, in which he entered impressions of the conversation of many of his distinguished friends—Charles James Fox, Edmund Burke, Henry Grattan, Richard Porson, John Horne Tooke, Talleyrand, Lord Erskine, Sir Walter Scott, Lord Grenville and the duke of Wellington. They were published by his nephew William Sharpe in 1859 as *Recollections by Samuel Rogers*; and *Reminiscences and Table-Talk of Samuel Rogers, Banker, Poet, and Patron of the Arts, 1763–1855* (1903), by G. H. Powell, is an amalgamation of these two authorities. Rogers held various honorary positions: he was one of the trustees of the National Gallery; and he served on a commission to inquire into the management of the British Museum, and on another for the rebuilding of the Houses of Parliament.

Meanwhile his literary production was slow. A poem of some autobiographical interest, *An Epistle to a Friend* (Richard Sharp), published in 1798, describes Rogers's ideal of a happy life. This was followed twelve years later by *The Voyage of Columbus* (1810), and by *Jacqueline* (1814), a narrative poem, written in the four-accent measure of the newer writers, and published in the same volume with Byron's *Lara.* His reflective poem on *Human Life* (1819), on which he had been engaged for twelve years, is written in his earlier manner.

In 1814 Rogers made a tour on the Continent with his sister Sarah. He travelled through Switzerland to Italy, keeping a full diary of events and impressions, and had made his way to Naples when the news of Napoleon's escape from Elba obliged him to hurry home. Seven years later he returned to Italy, paying a visit to Byron and Shelley at Pisa. Out of the earlier of these tours arose his last and longest work, *Italy.* The first part was published anonymously in 1822; the second, with his name attached, in 1828. The production was at first a failure, but Rogers was determined to make it a success. He enlarged and revised the poem, and commissioned illustrations from J. M. Turner, Thomas Stothard and Samuel Prout. These were engraved on steel in the sumptuous edition of 1830. The book then proved a great success, and Rogers followed it up with an equally sumptuous edition of his *Poems* (1838). In 1850, on Wordsworth's death, Rogers was asked to succeed him as poet laureate, but declined the honour on account of his great age. For the last five years of his life he was confined to his chair in consequence of a fall in the street. He died in London on the 18th of December 1855.

A full account of Rogers is given in two works by P. W. Clayden, *The Early Life of Samuel Rogers* (1887) and *Rogers and his Contemporaries* (2 vols., 1889). One of the best accounts of Rogers, containing many examples of his caustic wit, is by Abraham Hayward in the *Edinburgh Review* for July 1856. See also the Aldine edition (1857) of his *Poetical Works*, and the *Journals* of Byron and of Moore.

ROGERS, WILLIAM (1819–1896), English clergyman and educational reformer, was born in London on the 24th of November 1819, the son of a barrister. Educated at Eton and at Balliol College, Oxford, he entered Durham University in 1842, to study theology, and was ordained in 1843. In 1845 he was appointed to St Thomas Charterhouse, where he remained for eighteen years, throwing himself passionately into the work of education of his poor, degraded and often criminal parishioners. He began by establishing a school for ragamuffins in a blacksmith's abandoned shed, and with the generous help of friends he gradually extended its scope until the whole parish was a network of schools. In 1858 he was appointed a member of the Royal Commission to inquire into popular education, and he was returned a representative of the London School Board after the passing of Forster's Act in 1870. In 1863 the bishop of London gave him the living of St Botolph Bishopsgate. Rogers was also made a prebendary of St Paul's, and in 1857 he had been appointed Chaplain in Ordinary to the Queen. Having largely solved at St Thomas's the problem of elementary education, at Bishopsgate Rogers tackled the no less difficult one of middle-class schools. He believed in secular education, leaving doctrinal training to parents and clergy. To the cry against "godless education," Rogers impulsively replied, "Hang theology; let us begin"; and his nickname of "Hang-theology Rogers" stuck to him for the rest of his life. The Cowper Street Schools, costing £20,000, were the practical result of his energy. His next great work was the reconstruction of Edward Alleyn's charity at Dulwich. The new college was opened in 1870; new buildings were erected for the lower school, and the lion's share of the work fell upon Rogers. The culmination of his labours was the opening, on his seventy-fifth birthday, of the Bishopsgate Institute, including a hall, with accommodation for 500 people and a reference and lending library. On the same day a portrait and gift of plate was made him at the Mansion House, before a distinguished gathering. Lord Rosebery, then Prime Minister, observed in his speech that though bishoprics and deaneries had not been the rector's lot, there was not a poor Jew in Houndsditch or Petticoat Lane whose face would not brighten when he saw him coming. When he died, on the 19th of January 1896, this might have served as an appropriate epitaph.

ROGIER, CHARLES LATOUR (1800–1885), Belgian statesman, descended from a Belgian family settled in the department of the Nord in France, was born at St Quentin on 17th August 1800. His father, an officer in the French army, perished in the Russian campaign of 1812; and the family moved to Liége, where the eldest son, Firmin, held a professorship. Charles, after being called to the Bar, founded, in collaboration with his lifelong friends, Paul Devaux and Joseph Lebeau, the journal *Mathieu Laensberg* (afterwards *Le Politique*), which by its ardent patriotism and its attacks on the Dutch administration soon acquired a widespread influence. When the insurrection of 1830 broke out at Brussels, Rogier put himself at the head of 150 Liégeois, and inscribing on his banner the motto, "Vaincre ou mourir pour Bruxelles," he obtained arms from a local factory, and marched upon the capital. Here he took his place at once among the leaders of the revolutionary party. His influence saved the town-hall from pillage on 19th September. On the 24th a *commission administrative* was formed, of which Rogier became president. The energetic measures of this body and of its successor, the *gouvernement provisoire*, soon freed the greater part of the country from the Dutch troops. Rogier was sent in October to suppress an outbreak among the colliers of Hainaut, and then as delegate of the provisional government to Antwerp, where the citadel still held out for Holland. He succeeded in arranging an armistice, and then, in the exercise of the absolute power with which he was invested, reorganized the entire administration of the city. He sat for Liége in the National Congress, voted for the establishment of a hereditary monarchy, and induced the congress to adopt the principle of an elective second chamber. In the long-drawn debates on the bestowal of the crown he ranged himself on the side of Louis Philippe: he first supported the candidature of Otto of Bavaria, and on his rejection declared for the duc de Nemours. Finally, when Louis Philippe declined the crown on behalf of his son, Rogier voted with the majority for Leopold of Saxe-Coburg. In June 1831 he was appointed governor of the province of Antwerp, a post rendered exceptionally difficult by the continued presence of Dutch troops in the citadel. In October 1832 he was made minister of the interior in the Goblet-Devaux cabinet. In the following June he intervened in a quarrel in the chamber of deputies between Devaux and the Opposition leader, Alexandre Gendebien, claimed a prior right to give satisfaction, and fought a duel, in which he was severely wounded. During his term of office he carried, in the teeth of violent opposition, a law that established in Belgium the first railways on the continent of Europe, and thus laid the foundation of her industrial development. Owing to dissensions in the cabinet, he retired in 1834, together with Lebeau, and resumed the governorship of Antwerp. On Lebeau's return to power in 1840, Rogier became minister of public works and education. The proposals that he made in the latter capacity were defeated by the determined opposition of the Clerical party, and on the resignation of the ministry in 1841, Rogier gave his support to a compromise on the subject of education, which passed into law in 1842. He led the Liberal party in Opposition till 1847, when he formed a cabinet in which he held the ministry of the interior. He at once embarked on a programme of political and economic reform. He took effective steps to remedy the industrial distress caused by the decay of the Flemish linen trade. The limits of the franchise were extended; and as the result of the liberal policy of the government Belgium alone escaped the revolutionary wave that spread over the Continent in 1848. He passed a law in 1850 organizing secondary education under the control of the State, and giving the clergy only the right of religious instruction. The Clerical party, though unable to defeat this measure, succeeded in shaking the position of the cabinet; and it was finally undermined, after Prince Louis Napoleon's *coup d'état* of 1851, by the hostility of the French government, which found its political exiles welcomed by the liberal cabinet at Brussels. Rogier retired in October 1852, but was brought back into office by the liberal reaction of 1857. He again became president of the council and minister of the interior in a cabinet of which Frère-Orban was the most conspicuous member. The first important measure passed by the ministry was one for the fortification of Antwerp. In 1860 the fear of French designs on the independence of Belgium led to a movement of reconciliation with Holland, and inspired Rogier to write the only one of his numerous poems that is likely to survive, his national anthem, "La Nouvelle Brabançonne." Some of the ministers resigning in 1861, on the question of recognizing the kingdom of Italy, the cabinet was reconstructed, and Rogier exchanged the ministry of the interior for that of foreign affairs. In this capacity he achieved a diplomatic triumph in freeing the navigation of the Scheldt, and thus enabling Antwerp to become the second port on the mainland of Europe. Defeated at Dinant, he sat for Tournai from 1863 till his death. His younger and more energetic colleague, Frère-Orban, gradually overshadowed his chief, and in 1868 Rogier finally retired from power. He continued, however, to take part in public life, and was elected president of the extraordinary session of the chamber of representatives in 1878. From this time his age, his devoted patriotism and the unassuming simplicity of his life made him the idol of all classes. The fiftieth anniversary of the kingdom of Belgium in 1880, and two years later that of his entry into parliament, were the occasion of demonstrations in his honour. He died at Brussels on the 27th of May 1885, and his remains were accorded a public funeral.

See T. Juste, *Charles Rogier, 1800–1885, d'après des documents inédits* (Verviers, 1885).

ROGUE, a word which came into use about the middle of the 16th century as a slang or "cant" term for a vagrant vagabond, answering to the modern "tramp," and was adopted into English legal phraseology together with "vagabond" in the Statute of Elizabeth 1572, "rogue and vagabond" and "incorrigible rogue" remaining as legal terms for certain classes of persons amenable to the law under the Vagrancy Acts (see VAGRANCY). The act of Elizabeth defined "rogues, vagabonds and sturdy beggars" as including "idle persons going about and using subtle craft and unlawful games and all persons whole and mighty in body, but having neither land nor master, nor able to give an account how they get their living and all common labourers using loitering and refusing to work for the wages commonly given" (Sir G. Nicholls' *History of the English Poor Law*, ed. 1898 by H. G. Willink, vol, i. 159). The word has now the general meaning of a knave or rascal, though also used (by meiosis) as a term of playful or tender banter and in various special applications (*e.g.* a "rogue" elephant, one who has been driven out by the herd and lives a solitary life, becoming very savage and destructive. Gardeners also apply the word to a plant which does not come true from seed, showing some variation from the type).

The derivation of the word has been much disputed. It has usually been referred to Fr. *rogue*, meaning proud, arrogant, which is variously derived from the Icelandic *hroke*, rook, long-winded talker, or Breton *rok*, proud, haughty; cf. Irish and Gaelic *rucas*, pride. The *New English Dictionary*, however, rejects this derivation, and considers possible a connexion with another early "cant" word "roger," a begging vagabond pretending to be a poor university scholar.

ROHAN, the name of one of the most illustrious of the feudal families of France, derived from that of a small town in Morbihan, Brittany. The family appears to have sprung from the viscounts of Porhoët, and claims connexion with the ancient sovereigns of Brittany. Since the 12th century it held an important place in the history of Brittany, and strengthened its position by alliances with the greatest houses in France. It was divided into several branches, the eldest of which, that of the viscounts of Rohan, became extinct in 1527. Of the younger branches the most famous is that of Guéménée, from which sprang the branches of Montbazon, Soubise and Gié. The seigneurs of Frontenay, an offshoot of this last branch, inherited by marriage the property of the eldest branch of the house. Hercule de Rohan, duc de Montbazon (1568–1654) served Henry III. and Henry IV. against the League, and was made by Henry IV. governor of Paris and the Isle of France, and master of the hounds. His grandson, Louis de Rohan-Guéménée, the chevalier de Rohan, who was notorious for his dissolute life, conspired with the Dutch against Louis XIV. and was beheaded in Paris in 1674. In the 18th century the Soubise branch furnished several prelates, cardinals and bishops of Strassburg, among others the famous cardinal de Rohan, the hero of the affair of the diamond necklace. The seigneurs of Gié, a branch founded by Pierre de Rohan (1453–1513), a cadet of the branch of Guéménée and marshal of France, were conspicuous on the Protestant side during the wars of religion. René de Rohan, seigneur of Pontivy and Frontenay, commanded the Calvinist army in 1570, and defended Lusignan with great valour when it was besieged by the Catholics (1574–75). His son Henry, the first duke of Rohan, also distinguished himself in the Protestant army. His only child, Marguerite de Rohan, married in 1645 Henri Chabot, a cadet of a great family of Poitou. This marriage was opposed by her mother, Marguerite de Béthune, who put forward a rival heir called Tancred, whom she claimed to be her son by the duke of Rohan. This Tancred perished in the Fronde in 1649. The property and titles of Henry de Rohan thus passed to the Chabot family, which under the name of Rohan-Chabot produced some distinguished soldiers and a cardinal archbishop of Besançon. The male line of the Rohans is now represented by an offshoot of the Rohan-Guéménée branch.

ROHAN, HENRI, Duc de (1579–1638), French soldier, writer and leader of the Huguenots, was born at the château of Blain, in Brittany, in 1579. His father was René II., count of Rohan (1550–86), and head of one of the oldest and most distinguished families in France, which was connected with many of the reigning houses of Europe. He was educated by his mother, who was a woman of exceptional learning and force of character. Rohan was by birth the second son, but his elder brother René dying young he became the heir of the name. He appeared at court and in the army at the age of sixteen, and was a special favourite with Henry IV., after whom, failing the house of Condé, he might be said to be the natural chief of the French Protestants. Having served till the peace of Vervins, he travelled for a considerable time over Europe, including England and Scotland, in the first of which countries he received the not unique honour of being called by Elizabeth her knight, while in the second he was godfather at Charles I.'s christening. On his return to France he was made duke and peer at the age of twenty-four, and two years later (1603) married Marguerite de Béthune, the duc de Sully's daughter. He served in high command at the celebrated siege of Jülich in 1610, but soon afterwards he fell into active or passive opposition to the government over the religious disputes. For a time, however, he abstained from actual insurrection, and he endeavoured to keep on terms with Marie de' Medici; he even, despite his dislike of De Luynes, the favourite of Louis XIII., reappeared in the army and fought in Lorraine and Piedmont. It was not till the decree for the restitution of church property in the south threw the Bearnese and Gascons into open revolt that Rohan appeared as a rebel. His authority and military skill were very formidable to the royalists; his constancy and firmness greatly contributed to the happy issue of the war for the Huguenots, and brought about the treaty of Montpellier (1623). But Rohan did not escape the results of the incurable factiousness which showed itself more strongly perhaps among the French Huguenots than among any other of the numerous armed oppositions of the 17th century. He was accused of lukewarmness and treachery, though he did not hesitate to renew the war when the compact of Montpellier was broken. Again a hollow peace was patched up, but it lasted but a short time, and Rohan undertook a third war (1627–29), the first events of which are recounted in his celebrated *Memoirs*. This last war (famous for the defence of La Rochelle by Soubise, Rohan's younger brother) was one of considerable danger for Rohan. In spite of all efforts he had in the end to sign a peace, and after this he made his way quickly to Venice. Here he is said to have received from the Porte the offer of the sovereignty of Cyprus. It is more certain that his hosts of Venice wished to make him their general-in-chief, a design not executed owing to the peace of Cherasco (1631). At Venice he wrote his *Memoirs*; at Padua, *Le Parfait Capitaine*. But when France began to play a more conspicuous part in the Thirty Years' War Rohan was again called to serve his lawful sovereign, and entrusted with the war in the Valtelline. The campaign of 1633 was completely successful, but Rohan was still considered dangerous to France, and was soon again in retirement. At this time he wrote his *Traité du gouvernement des treize cantons.* Rohan fought another Valtelline campaign, but without the success of the first, for the motives of France were now held in suspicion. The unfortunate commander retired to Geneva and thence went to the army of Bernhard of Saxe-Weimar. He received a mortal wound at the battle of Rheinfelden on the 28th of February 1638, and died at the abbey of Königsfeld, canton Berne, on the 13th of April. His body was buried at Geneva, and his arms were solemnly handed over to the Venetian government. With his daughter Marguerite the honours of the family of Rohan-Gié passed to the house of Chabot.

Rohan's *Mémoires sur les choses qui se sont passées en France*, &c., rank amongst the best products of the singular talent for memoir writing which the French *noblesse* of the 16th and 17th centuries possessed. Alike in style, in clearness of matter and in shrewdness, they deserve very high praise. The first three books, dealing with the civil wars, appeared in 1644; the fourth, containing the narrative of the Valtelline campaigns, not till 1758. Some suspicions were thrown on the genuineness of the latter, but, it would seem, groundlessly. His famous book on the history and art of war, *Le Parfait Capitaine*, appeared in 1631 and subsequently in 1637 and 1693 (see also Quincy, *Art de la guerre*, Paris, 1741). It treats of the history and lessons of Caesar's campaigns and their application to modern warfare, and contains appendices dealing with phalangite and legionary methods of fighting and the art of war in general. He also wrote an account of his travels, the book on Switzerland mentioned above, *De l'intérêt des princes et états de la chrétienté*, etc. The *Memoirs* may be conveniently found in the collection of Michaud and Poujoulat, vol. 19.

See Fauvelet de Foix, *Histoire du Duc Henri de Rohan* (Paris, 1667); Schybergson, *Le Duc de Rohan et la charte du parti protestant en France* (Paris, 1880); Bühring, *Venedig, Gustaf Adolf, und Rohan* (Halle, 1885); Laugel, *Henri de Rohan, son rôle politique et militaire* (Paris, 1889); Veraguth, *Herzog Rohan und seine Mission in Graubünden* (Berne, 1894); and Shadwell, *Mountain Warfare*.

ROHAN, LOUIS RENÉ ÉDOUARD, Cardinal de (1734–1803), prince de Rohan-Guéménée, archbishop of Strassburg, a cadet of the great family of Rohan (which traced its origin to the kings of Brittany, and was granted the precedence and rank of a foreign princely family by Louis XIV.), was born at Paris on the 25th of September 1734. Members of the Rohan family had filled the office of archbishop of Strassburg from 1704—an office which made them princes of the empire and the compeers rather of the German prince-bishops than of the French ecclesiastics. For this high office Louis de Rohan was destined from his birth, and soon after taking orders, in 1760, he was nominated coadjutor to his uncle, Constantine de Rohan-Rochefort, who then held the archbishopric, and he was also consecrated bishop of Canopus. But he preferred the elegant life and the gaiety of Paris to his clerical duties, and had also an ambition to make a figure in politics. He joined the party opposed to the Austrian alliance, which had been cemented by the marriage of the archduchess Marie Antoinette to the dauphin. This party was headed by the duc d'Aiguillon, who in 1771 sent Prince Louis on a special embassy to Vienna to find out what was being done there with regard to the partition of Poland. Rohan arrived at Vienna in January 1772, and made a great noise with his lavish fêtes. But the empress Maria Theresa was implacably hostile to him; not only did he attempt to thwart her policy, but he spread scandals about her daughter Marie Antoinette, laughed at herself, and shocked her ideas of propriety by his dissipation and luxury. On the death of Louis XV. in 1774, Rohan was recalled from Vienna, and coldly received at Paris; but the influence of his family was too great for him to be neglected, and in 1777 he was made grand almoner, and in 1778 abbot of St Vaast. In 1778 he was made a cardinal on the nomination of Stanislaus Poniatowski, king of Poland, and in the following year succeeded his uncle as archbishop of Strassburg and became abbot of Noirmoutiers and Chaise-Dieu. His various preferments brought him in an income of two and a half millions of livres; yet the cardinal was restless and unhappy until he should be reinstated in favour at court and had appeased the animosity which Marie Antoinette felt against him. In pursuit of this object he fell into the hands of a gang of intriguers, the comtesse de Lamotte, the notorious Cagliostro and others, whose actions form part of the "affair of the diamond necklace." This story is disentangled elsewhere (see DIAMOND NECKLACE), and diverging views are still taken of it. Rohan certainly was led to believe that his attentions to the queen were welcomed, and that his arrangement by which she received the famous necklace was approved. He was the dupe of others, and at the trial in 1786 before the parlement his acquittal was received with universal enthusiasm, and regarded as a victory over the court and the unpopular queen. He was deprived, however, of his office as grand almoner and exiled to his abbey of Chaise-Dieu. He was soon allowed to return to Strassburg, and his popularity was shown by his election in 1789 to the states-general by the clergy of the bailliages of Haguenau and Weissenburg. He at first declined to sit, but the states-general, when it became the national assembly, insisted on validating his election. But as a prince of the church in January 1791 he refused to take the oath to the constitution, and went to Ettenheim, in the German part of his diocese. In exile his character improved, and he spent what wealth remained to him in providing for the poor clergy of his diocese who had been obliged to leave France; and in 1801 he resigned his nominal rank as archbishop of Strassburg. On the 17th of February 1803 he died at Ettenheim.

See the *Mémoires* of his secretary, the abbé Georgel, of the baroness d'Oberkirch, of Beugnot, and of Madame Campan; and works cited under DIAMOND NECKLACE.

ROHILKHAND, a tract in the United Provinces of India. The name is associated with the Rohilla tribe (*q.v.*), but in its historical significance it covers an area almost coincident with the modern division of Bareilly, for which it is a common alternative title. This division has an area of 10,720 sq. m., and comprises the districts of Bareilly, Bijnor, Budaun, Moradabad, Shahjahanpur and Pilibhit. Pop. (1901) 5,479,688. Political control over the state of Rampur is exercised by the commissioner for the division.

ROHILLA (a Pushtu word for "mountaineer"), a tribe of Afghan marauders, who, towards the beginning of the 18th century, conquered a district of Hindostan, giving it the name of Rohilkhand, which still survives as an alternative title of the Bareilly division of the United Provinces. The Rohillas are chiefly notable for their association with Warren Hastings, which formed one of the main counts in his impeachment. Having been driven into the mountains by the Mahrattas, they had appealed for aid to Shuja-ud-Dowlah, wazir of Oudh, and ally of the British. The wazir promised to assist them in return for a sum of money; but when the Mahrattas were driven off the Rohilla chiefs refused to pay. The wazir then decided to annex their country, and appealed to Hastings for assistance, which was given in return for a sum of forty lakhs of rupees. Hastings justified his action on the ground that the Rohillas were a danger to the British as uncovering the flank of Oudh; and while he would never involve the company in an unjust war, neither did he desire an unprofitable one. The Rohillas were defeated by Colonel Champion in April 1774, and the majority of them fled across the Ganges; but the charges of destroying a nation, brought against Hastings by Burke and Macaulay, were greatly exaggerated. The Rohillas were never a nation, but consisted of a small body of Mahommedans, who had imposed an alien rule upon a million Hindus; and one of their chiefs was left in possession of a tract which now forms the state of Rampur (*q.v.*).

See Charles Hamilton, *History of the Rohilla Afghans* (1787); and Sir J. Strachey, *Hastings and the Rohilla War* (Oxford, 1892).

ROHLFS, FRIEDRICH GERHARD (1831–1896), German explorer of the Sahara, son of a physician, was born at Vegesack, near Bremen, on the 14th of April 1831. After the ordinary course at the gymnasium of Osnabrück he entered the Bremen corps in 1848, and took part as a volunteer in the Schleswig-Holstein campaign, being made an officer after the battle of Idstedt (July 1850). He became a medical student at the universities of Heidelberg, Würzburg and then Göttingen; but his natural inclination was for travelling, and in 1855 he went to Algeria and enlisted in the Foreign Legion. He took part in the conquest of Kabylia, and was decorated for bravery as Chevalier of the Legion of Honour. Having made himself master of Arabic and gained a thorough knowledge of native customs, Rohlfs went to Morocco in 1861; presenting himself as a Mussulman, he gained the favour of the enlightened sherif of Wazzan, and was thus enabled to travel over the length and breadth of the country. He then entered the Sahara and traversed the entire extent of the Wad Draa, being the second European (the first being René Caillié) to visit Tafilet. On leaving Tafilet he was robbed by his guides and left for dead; but two marabouts charitably succoured him and he was able to reach Algeria. When scarcely recovered from his wounds he started once more for the Sahara (August 1862) by way of Algeria. Compelled by tribal disturbances to turn back, he went to Tangier and thence in March 1864 made a fresh start. Crossing the Atlas by an eastern route he again visited Tafilet, and thence made his way across the desert to the oasis of Tuat, which he was the first European to describe. Returning by Ghadames and Tripoli he spent three months in Germany, and then (March 1865) went back to Tripoli, intending to explore the highlands of the Ahaggar; being prevented, however, by a war among the Tuareg, he went from Ghadames to Murzuk, where he spent five months, and thence across the Sahara to Bornu, mapping *en route* the oasis of Kawar. Rohlfs passed through Mandara and its ancient capital Mora, and struck out for the coast of the Gulf of Guinea. He reached the Benue by way of the Bauchi highlands, and descended that river to its confluence with the Niger, which he ascended to Rabba. Thence he made his way on horseback to Lagos, reaching Liverpool on the 2nd of July 1867. In the following year he accompanied the British expedition against Theodore of Abyssinia, and on his return went once more to Tripoli, whence he traversed the Cyrenaica, reaching Egypt by way of the oasis of Siwa (1869). Returning home, he married and settled down in Weimar. He did not rest long, however, for in 1873–74 he took command of an expedition sent by the Khedive Ismail into the Libyan Desert, which made investigations of great value to science. In 1878 Rohlfs and Dr Stecker were commissioned by the German African Society to go to Wadai. They succeeded in reaching the oasis of Kufra, one of the chief centres of the Senussites, but being attacked by the Arabs, they were obliged to retreat, making their way to the coast at Benghazi, reached in October 1879. In 1880 Rohlfs accompanied Dr Stecker in an exploring expedition to Abyssinia; but after delivering a letter from the German emperor to the Negus, he returned to Europe. In 1885, when the rivalry between the British and Germans in East Africa was very keen, Prince Bismarck appointed Rohlfs consul at Zanzibar, which island Bismarck desired to secure for Germany. Rohlfs, untrained in diplomacy, was no match for Sir John Kirk, the British Agent, and he was soon recalled, and did not again visit Africa. He died at Rüngsdorf, near Bonn, on the 2nd of June 1896. Rohlfs visited many regions not before traversed by Europeans, and the value of his work was recognized in 1868 by the Royal Geographical Society, which bestowed on him the Patron's Medal.

Accounts of each of his expeditions, and other works on Africa were published by Rohlfs, including *Mein Erster Aufenthalt in Marokko* (Bremen, 1873; English edition, *Travels in Morocco*, London, 1874); *Reise durch Marokko* (Bremen, 1868); *Quer durch Afrika* (Leipzig, 1874–75); *Von Tripolis nach Alexandrien* (Bremen, 1871); *Expedition zur Erforschung der Libyschen Wüste* (Cassel, 1875–76); *Kufra: Reise von Tripolis nach der Oase Kufra* (Leipzig, 1881); *Land und Volk in Afrika* (Bremen, 1870); *Quid novi ex Africa?* (Cassel, 1886). See also a biographical notice by Dr W. Wolkenhauer in the *Deutsche geo. Blätter* for 1896.

ROHTAK, a town and district of British India, in the Delhi division of the Punjab. The town, which is of great antiquity, became the headquarters of a British district in 1824. 'Viewed from the sandhills to the south, Rohtak, with its white mosque in the centre, a fort standing out boldly to the east, is striking and picturesque. It has a station on the Southern Punjab railway, 44 m. N.W. of Delhi. Pop. (1901) 20,323. It is an important trade centre, with factories for ginning and pressing cotton, and a speciality in muslin turbans.

The district of Rohtak has an area of 1797 sq. m. It is situated in the midst of the level tableland between the Jumna and the Sutlej, forming one unbroken plain of hard clay copiously interspersed with light yellow sand, and covered in its wild state by a jungle of scrubby brushwood. The only natural reservoir for its drainage is the Najafgarh *jhil*, a marshy lake lying within the boundaries of Delhi. The Sahibi, a small stream from the Ajmere hills, traverses a corner of the district, and the northern portions are watered by the Rohtak and Butana branches of the Western Jumna canal; but the greater portion of the central plain, comprising about two-thirds of the district area, is entirely dependent upon the uncertain rainfall. The climate, though severe in point of heat, is generally healthy; the rainfall averages annually about 20 in.

The population in 1901 was 630,672, showing an increase of 6·8% in the decade. The principal crops are millets, wheat, barley, pulses, cotton and sugar-cane. The district is traversed by the line of the Southern Punjab railway from Delhi to Jind, and also touched by the Rewari-Ferozepore branch of the Rajputana railway. It is peculiarly exposed to drought, suffering in the famine of 1896–97, and yet more severely in 1899–1900, when the highest number of persons relieved was 33,632 in March 1900.

Rohtak was formerly included within the region known as Hariana. The district, with the other possessions of Sindhia west of the Jumna, passed to the British in 1803. Until 1832 Rohtak was under the administration of a political agent, resident at Delhi, but in that year it was brought under the general regulations and annexed to the North-Western Provinces. The outbreak of the Mutiny in 1857 led to its abandonment, when the mutineers attacked and plundered Rohtak, destroying every record of administration. It was not until after the fall of Delhi that the authority of the British government was permanently restored. Rohtak was then transferred to the Punjab.

ROJAS ZORRILLA, FRANCISCO DE (1607–*c.* 1660), Spanish dramatist, was born at Toledo; the only circumstance recorded of his life is that he became a knight of Santiago in 1644. The exact date of his death is unknown. His plays were published in 1640–45; the best of his dramatic compositions, *Del Rey abajo Ninguno*, is not included in the collection and was printed separately under the title of *Garcia del Castañar*. Of his other pieces, apart from their intrinsic merit, an international interest attaches to *No hay padre siendo rey*, which was borrowed by Rotrou for his *Venceslas*; to *Donde hay agravios no hay zelos* and the *Amo criado*, which were imitated by Scarron in his *Jodelet Souffletê* and *Maître Valet*; to *Entre Bobos anda el juego*, the source of Thomas Corneille's *Don Bertrand de Cigarral*, as well as of Scarron's *Don Japhet d'Armenie*; to *Obligados y ofendidos*, from which are derived *Les Gênéreux Ennemis* by Boisrobert, *Les Illustres Ennemis* by Thomas Corneille, and Scarron's *Écolier de Salamanque*; and to *La traición busca el castigo*, upon which are based Vanbrugh's *False Friend* and Le Sage's *Traître puni*. Rojas Zorrilla's power of conveying a tragic impression is manifest in *Garcia del Castañar*; his chief defect is his persistent preciosity of diction.

ROKITANSKY, CARL, Freiherr von (1804–1878), the founder of the Vienna school of pathological anatomy, was born on the 19th of February 1804 at Königgrätz in Bohemia. He studied medicine at Prague and at Vienna, graduating at the latter place in 1828. Soon afterwards he became assistant to Johann Wagner, the professor of pathological anatomy, and succeeded him in 1834 as prosector, being at the same time made extraordinary professor. It was not until ten years later (1844) that he reached the rank of full professor. To his duties as a teacher he added in 1847 the onerous office of medico-legal anatomist to the city, and from 1863 he filled an influential office in the ministry of education and public worship, wherein he had to advise on all routine matters of medical teaching, including patronage. A seat in the upper house of the Reichsrath rewarded his public labours in 1867, and on his retirement from all his offices in 1874 he was made a commander of the Order of Leopold. He joined the Imperial Academy of Sciences as a member in 1848, and became its president in 1869. He was president also of the medical society of the Austrian capital and an honorary member of many foreign societies. On his retirement at the age of seventy his colleagues celebrated the occasion by a function in the aula of the university, where his bust was unveiled. In his leave-taking speech he said that work had always been a pleasure to him and pleasures mostly a toil. His death in Vienna on the 23rd of July 1878 elicited many genuine expressions of affection and of esteem for his upright character. Two of his sons became professors at Vienna, one of astronomy and another of medicine, while a third gained distinction on the lyric stage.

With Rokitansky's name is associated the second great period of the medical school of Vienna, its first success having been identified with the liberal patronage of it by Maria Theresa and with the fame of Van Swieten, whom the empress had attracted thither from Leiden. The basis of its second reputation was morbid anatomy, together with the precision of clinical diagnosis dependent thereon, and associated with the labours of Rokitansky's lifelong friend, Joseph Skoda (1805–1881). The anatomical vogue had begun under Wagner while Rokitansky was still a student; but it reached its highest point while the latter was assistant in the dead-house and afterwards prosector and professor. The enthusiasm for the post-mortem study of disease brought one very serious consequence at the outset, in the enormous increase of the death-rate from puerperal fever in the lying-in wards of the general hospital. A comparison between the slight mortality in the wards that were afterwards reserved for the training of midwives and the excessive mortality in those set apart for the training of students proved that the cause was the conveyance of infection from the dead-house by the hands of the latter. The precautions introduced by I. P. Semmelweiss in 1847 proved adequate in removing that grave reproach from the study of morbid anatomy. Another and more lasting consequence of the assiduous pursuit of post-mortem study, counterbalancing somewhat the advantage of a more precise and localized diagnosis, was the loss of faith in the power of drugs to remedy the textural changes—the so-called "nihilism" of the Vienna school. The immediate outcome of Rokitansky's close application to the work of the dead-house was his *Handbuch der pathologischen Anatomie* (1842–46), in 3 vols., of which the first was published last. The value of the work lies in the second and third volumes, containing succinct descriptions of the visible changes and abnormalities in the several organs and parts of the body. Whenever Rokitansky touched the vital problems of general pathology, as he did in the postponed first volume, he revealed a metaphysical bent, which was strong in him behind all his undoubted powers of outward observation and accurate description. Being a few years too soon to profit by the microscopic movement which led to the cellular pathology, he endeavoured to reconcile the old humoral doctrine with his anatomical observations, and to read a new meaning into the doctrine of the various dyscrasias. In 1862 he entered into possession of a new pathological institute, in which he found means, for the first time, to display his extensive collection of specimens in a museum. Although he had no direct share in the newer developments of pathology, he was far from indifferent or reactionary towards them; indeed, the laboratories and chairs for microscopic and experimental pathology and for pathological chemistry were warmly encouraged and aided by him.

Next to his *Handbuch*, of which the Sydenham Society published an English translation in 4 vols. (1849–52), his most important writings were four memoirs in the *Denkschriften* of the Vienna Academy of Sciences (on the anatomy of goitre, cysts, diseases of arteries, and defects in the septa of the heart), the last as late as 1875. Other papers of less importance brought up the total of his writings to thirty-eight, including three addresses of a philosophical turn, on "Freedom of Inquiry" (1862), "The Independent Value of Knowledge" (1867) and "The Solidarity of Animal Life" (1869).

ROLAND [Roland de la Platière], **JEAN MARIE** (1734–1793), French statesman, was born at Thizy on the 18th of February 1734. He received a good education, and early formed the studious habits which remained with him through life. Proposing to seek his fortune abroad, he went on foot to Nantes, but was there prostrated by an illness so severe that all thoughts of emigration were perforce abandoned. For some years he was employed as a clerk; thereafter he joined a relative who was inspector of manufactures at Amiens, and he himself speedily rose to the position of inspector. To these two employments may be ascribed those qualities of assiduity and accuracy, and that familiarity with the commerce of the country, which distinguished his public career. In 1781 he married Manon Jeanne Phlipon (1754–1793), and the name of MADAME ROLAND is famous in history. She was the daughter of Gratien Phlipon, a Paris engraver, who was ambitious, speculative and nearly always poor. From her early years she showed great aptitude for study, an ardent and enthusiastic spirit, and unquestionable talent. She was to a considerable extent self-taught; and her love of reading made her acquainted first with Plutarch—a passion for which author she continued to cherish throughout her life—thereafter with Bossuet, Massillon, and authors of a like stamp, and finally with Montesquieu, Voltaire and Rousseau. These studies marked stages of her development, and as her mind matured she abandoned the idea of a convent which for a year or two she had entertained, and added to the enthusiasm for a republic which she had imbibed from her earlier studies not a little of the cynicism and the daring which the later authors inspired. She almost equalled her husband in knowledge, and infinitely excelled him in talent and in tact. Through and with him she exercised a singularly powerful influence over the destinies of France from the outbreak of the Revolution till her death.

For four years after their marriage Roland lived at Amiens, he being still an inspector of manufactures; but his knowledge of commercial affairs enabled him to contribute articles to the *Encyclopédie Nouvelle*, in which, as in all his literary work, he was assisted by his wife. On their removal to Lyons the influence of both became wider and more powerful. Their fervent political aspirations could not be concealed, and from the beginning of the Revolution they threw in their lot with the party of advance. The *Courrier de Lyon* contained articles the success of which reached even to the capital and attracted the attention of the Parisian press. They were from the pen of Madame Roland and were signed by her husband. A correspondence sprang up with Brissot and other friends of the Revolution at headquarters. In Lyons their views were publicly known; Roland was elected a member of the municipality, and when the depression of trade in the south demanded representation in Paris he was deputed by the council of Lyons to ask the Constituent Assembly that the municipal debt of Lyons, which had been contracted for the benefit of the state, should be regarded as national debt. Accompanied by his wife, he appeared in the capital in February 1791. He remained there until September, frequenting the Society of the Friends of the Constitution, and entertaining deputies of the most advanced opinions, especially those who later became the leading Girondists. Madame Roland took an active part in the political discussions in these reunions.

In September 1791, Roland's mission being executed, they returned to Lyons. Meanwhile the inspectorships of manufactures had been abolished; he was thus free; and they could no longer remain absent from the centre of affairs. In December they again reached Paris. Roland became a member of the Jacobin Club. They had made many and influential friends in advance, and Madame Roland's salon soon became the rendezvous of Brissot, Pétion, Robespierre and other leaders of the popular movement, above all of Buzot, whom she loved with platonic enthusiasm. In person Madame Roland was attractive though not beautiful; her ideas were clear and far-reaching, her manner calm, and her power of observation extremely acute. It was almost inevitable that she should find herself in the centre of political aspirations and presiding over a company of the most talented men of progress. The rupture had not yet been made evident between the Girondist party and that section still more extreme, that of the Mountain. For a time the whole left united in forcing the resignation of the ministers. When the crisis came the Girondists were ready, and on the 23rd of March 1792 Roland found himself appointed minister of the interior. As a minister of the crown Roland exhibited a bourgeois brusqueness of manner and a remarkable combination of political prejudice with administrative ability. While his wife's influence could not increase the latter, it was successfully exerted to foment and embitter the former. He was *ex officio* excluded from the Legislative Assembly, and his declarations of policy were thus in writing—that is, in the form in which she could most readily exert her power. A great occasion was invented. The decrees against the emigrants and the non-juring clergy still remained under the veto of the king. A letter was penned by Madame Roland and addressed by her husband to Louis. It remained unanswered. Thereupon, in full council and in the king's presence, Roland read his letter aloud. It contained many and terrible truths as to the royal refusal to sanction the decrees and as to the king's position in the state; but it was inconsistent with a minister's position, disrespectful if not insolent in tone. Roland's dismissal followed. Then he completed the plan: he read the letter to the Assembly; it was ordered to be printed, became the manifesto of disaffection, and was circulated everywhere. In the demand for the reinstatement of the dismissed ministers were found the means of humiliation, and the prelude to the dethronement, of the king.

After the insurrection of the 10th of August, Roland was recalled to power, one of his colleagues being Danton. But now he was dismayed by the progress of the Revolution. He was above all a provincial, and was soon in opposition to the party of the Mountain, which aimed at supremacy not only in Paris but in the government as well. His hostility to the insurrectional commune of Paris, which led him to propose transferring the government to Blois, and his attacks upon Robespierre and his friends rendered him very unpopular. His neglect to seal the iron chest discovered in the Tuileries, which contained the proofs of Louis XVI.'s relations with the enemies of France, led to the accusation that he had destroyed a part of these documents. Finally, in the trial of the king he demanded, with the Girondists, that the sentence should be pronounced by a vote of the whole people, and not simply by the Convention. He resigned office on the 23rd of January 1793, two days after the king's execution.

Although now extremely unpopular, the Rolands remained in Paris, suffering abuse and calumny, especially from Marat. Once Madame Roland appeared personally in the Assembly to repel the falsehoods of an accuser, and her ease and dignity evoked enthusiasm and compelled acquittal. But violence succeeded violence, and early on the morning of the 1st of June she was arrested and thrown into the prison of the Abbaye. Roland himself escaped secretly to shelter in Rouen. Released for an hour from the Abbaye, she was again arrested and thrown among the horrors of Sainte-Pélagie. Finally, she was transferred to the Conciergerie. In prison she won the affections of the guards, and was allowed the privilege of writing materials and the occasional visits of devoted friends. She there wrote her *Appel à l'impartiale postérité*, those memoirs which display a strange alternation between self-laudation and patriotism, between the trivial and the sublime. On the 8th of November 1793 she was conveyed to the guillotine. Before yielding her head to the block, she bowed before the clay statue of Liberty erected in the Place de la Révolution, uttering her famous apostrophe—"O Liberty! what crimes are committed in thy name!" When Roland heard of his wife's condemnation, he wandered some miles from his refuge in Rouen; maddened by despair and grief, he wrote a few words expressive of his horror at those massacres which could only be inspired by the enemies of France, protesting that "from the moment when I learned that they had murdered my wife I would no longer remain in a world stained with enemies." He affixed the paper to his breast, and unsheathing a sword-stick fell upon the weapon, which pierced his heart, on the 10th of November 1793.

Madame Roland's *Mémoires*, first printed in 1820, have been edited among others by P. Faugère (Paris, 1864), by C. A. Dauban (Paris, 1864), by J. Claretie (Paris, 1884), and by C. Perroud (Paris, 1905). Some of her *Lettres inédites* have been published by C. A. Dauban (Paris, 1867), and a critical edition of her *Lettres* by

C. Perroud (Paris, 1900–2). See also C. A. Dauban, *Étude sur Madame Roland et son temps* (Paris, 1864); V. Lamy, *Deux femmes célèbres, Madame Roland et Charlotte Corday* (Paris, 1884); C. Bader, *Madame Roland, d'après des lettres et des manuscrits inédits* (Paris, 1892); A. J. Lambert, *Le mariage de Madame Roland, trois années de correspondance amoureuse* (Paris, 1896); Austin Dobson, *Four Frenchwomen* (London, 1890); and articles by C. Perroud in the review *La Révolution française* (1896–99).

ROLAND, LEGEND OF. The legend of the French epic hero Roland (transferred to Italian romance as Orlando) is based on authentic history. Charlemagne invaded Spain in 778, and had captured Pampeluna, but failed before Saragossa, when the news of a Saxon revolt recalled him to the banks of the Rhine. On his retreat to France through the defiles of the Pyrenees, part of his army was cut off from the main body by the Basques, who had ambushed in a narrow defile, and now drove the rear-guard into a valley where it was surrounded and entirely destroyed. The Basques, after plundering the baggage, made good their escape, favoured by the darkness and by their knowledge of the ground. The incident is related in the *Annales* (Pertz i. 159) commonly ascribed to Einhard, and with more detail in Einhard's *Vita Karoli* (cap. ix.; Pertz ii. 448), where the names of the leaders are given. "In this battle were slain Eggihard, *praepositus* of the royal table; Anselm, count of the palace; and Hruodland, praefect of the Breton march. . . ." The scene of the disaster is fixed by tradition at Roncevaux, on the road from Pampeluna to Saint Jean Pied de Port. There is no foundation in this story for the fiction of the twelve peers, which may possibly arise from a still earlier tradition. In 636–37, according to the *Chronicles* of Fredegarius (ed. Krusch p. 159), twelve chiefs, whose names are given, were sent by Dagobert against the Basques. The expedition was successful, but in an engagement fought in the valley of Subola, or Robola, identified with Mauléon, which is not far from Roncevaux, the Duke Harembert, with other Frankish chiefs, was slain. Later fights in the same neighbourhood and under similar circumstances are related in 813 (*Vita Hludowici*; Pertz ii. 616), and especially in 824 (Einhard's *Annales*; Pertz i. 213). These incidents no doubt served to strengthen the tradition of the disaster to Charlemagne's rear-guard in 778, the importance of which was perhaps underrated by the Frankish historians and was certainly magnified in popular story. The author of the *Vita Hludowici*, writing sixty years after the battle of Roncevaux, thought it superfluous to give the names of the fallen chiefs, as being matter of common report.

Growth of the Legend.—The choice of Roland or Hruodland as the hero of the story probably points to the borders of French Brittany as the home of the legend. The exaggeration of a rear-guard action into a national defeat; the substitution of a vast army of Saracens, the enemies of the Frankish nation and the Christian faith, for the border tribe mentioned by Einhard;[1] and the vengeance inflicted by Charlemagne, where in fact the enemy escaped with complete impunity—all are in keeping with the general laws of romance. Charlemagne himself appears as the ancient epic monarch, not as the young man he really was in 778. The earliest version of the legend which we possess dates no earlier than the 11th century, but there is abundant evidence of the existence of a continuous tradition dating from the original event, although its methods of transmission remain a vexed question. Roncevaux lay on the route to Compostella, and the many pilgrims who must have passed the site from the middle of the 9th century onwards may have helped to spread the story. Whether the actual *cantilena Rollandi* chanted by Taillefer at the battle of Hastings (William of Malmesbury, *De gestis regum angl.* iii. 242, and Wace, *Brut.* ii. 11, 8035 seq.) was any part of the existing *Chanson de Roland* cannot be stated, but the choice of the legend on this occasion by the trouvère is proof of its popularity.

The oldest extant forms of the legend are: (*a*) chapters xix.–xxx. of the Latin chronicle, known as the *Pseudo-Turpin*, which purports to be the work of Turpin, archbishop of Reims, who died about 800, but probably dates from the 12th century; (*b*) *Carmen de proditione Guenonis*, a poem in Latin distichs; and (*c*) the *Chanson de Roland*, a French *chanson de geste* of about 4000 lines, the oldest recension of which is in the Bodleian Library, Oxford (MS. Digby 23). It is in assonanced tirades, of unequal length, many of them terminated with the refrain *Aoi*. This MS. was written by an Anglo-Norman scribe about the end of the 12th century, and is a corrupt copy of a text by a French trouvère of the middle of the 11th century. It concludes with the words: "Ci falt la geste, que Turoldus declinet." There was a Turold (d. 1098) who was abbot of Peterborough; another was tutor to William the Conqueror and died in 1035. Even if we could identify this personage, we cannot tell whether he was the poet, the minstrel or the scribe of the MS., but it seems likely that he was merely the scribe. The poem, which was first printed by Francisque Michel (Oxford, 1837), is the finest monument of the heroic age of French epic. In its fundamental features it evidently dates back to the reign of Charlemagne, who is not represented as the capricious despot of the later *chansons de geste*, but as governing in accordance with Frankish custom, accepting the counsel of his barons, and carrying out the curious procedure of Frankish law. *Roland* represents the monarchical idea, and was evidently, in its primitive form, written before the feudal revolts which weakened the power of Charlemagne's successors. Its unity of conception, the severity and conciseness of the language, the directness, vividness and sobriety of the narrative, place it far above the chansons of later trouvères, with their wordiness and their loose, episodic construction. With the exception of the small place allotted to Alde, women have practically no place in the story, and the romantic element is thus absent. Roland's master-passions are daring and an exaggerated conception of honour, the extravagance of which is the cause of the disaster. His address to Oliver before the battle is typical of the warlike spirit of the poem:—

> "Notre empereur qui ses Francs nous laissa,
> Tels vingt mille hommes a pour nous mis à part,
> Qu'il sait très bien que pas un n'est couard.
> Pour son seigneur grands maux on souffrira,
> Terribles froids, grands chauds endurera,
> Et de son sang, de sa chair on perdra!
> Brandis ta lance; et moi, ma Durendal,
> Ma bonne épée, que le Roi me donna.
> Et si je meurs, peut dire qui l'aura
> C'était l'épée d'un très noble vassal."
> (tr. Petit de Julleville xi. 1114 seq.)

The Story as related in the Chanson de Roland.—Charlemagne, after fighting for seven years in Spain, had conquered the whole country with the exception of Saragossa, the seat of the Saracen king Marsile. He was encamped before Cordova when he received envoys from the Saracen king, sent to procure the evacuation of Spain by the Franks through false offers of submission. Charlemagne held a council of his barons, Naimes of Bavaria, Roland, Oliver, Turpin, Ogier, Ganelon and the rest. Roland, the emperor's nephew, was eager for war; the peace party was headed by Ganelon of Mayence.[2] The Franks were weary of campaigning, and Ganelon's counsels won the day. At the suggestion of Roland, Ganelon, who was his stepfather, was entrusted with the embassy to Marsile—a sufficiently perilous errand, since two former envoys had been beheaded by the Saracens. Ganelon, inspired by hatred of Roland and Oliver, agreed with Marsile to betray Roland and his comrades for ten mule-loads of gold. He then returned to Charlemagne bearing Marsile's supposed assent to the Frankish terms. The retreat began. Roland, at Ganelon's instigation, was placed in command of the rear-guard. With him were the rest of the famous twelve peers,[3] his companions-in-arms, Oliver, Gérin, Gérier, Oton, Bérengier, Samson, Anséis, Girard de Roussillon, Engelier the Gascon, Ivon and Ivoire, and the flower of the Frankish army. They had nearly reached the summit of the pass when Oliver, who had mounted a high rock, saw the advancing army of the Saracens, 400,000 strong. In vain Oliver begged Roland to sound his horn and summon Charlemagne to his aid. A description of the battle, a series of single combats, follows. Oliver, with his sword Hauteclère, rivalled Roland with Durendal. After the first fight, a second division of the pagan army appears, then a third. Roland's army was reduced to sixty men before he consented to sound his horn. Presently all were slain but Roland and Oliver, Turpin and another. Finally, when the Saracens, warned of the return of Charlemagne, had retreated, Roland alone survived on the field of battle. With a last effort he blew his horn once more, and heard before he died the sound of Charlemagne's battlecry of "Montjoie." Charlemagne pursued the enemy, and destroyed their army. The raising of a second army by Baligant, the emir of Babylon, and its defeat by the emperor, who slays Baligant in single combat, is obviously an interpolation in the original narrative. The trouvère then relates the return of the Franks, the burial of the heroes of Roncevaux, and, at great length, the trial of Ganelon at Aix, his execution, and that of his thirty kinsmen, and the death of Alde, Roland's betrothed and Oliver's sister, when she heard the news of Roland's death. The trial of Ganelon is one of the most curious parts of the story, providing, as it does, a full account of the Frankish criminal procedure.

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[1] It is noteworthy, however, that an Arab historian, Ibn-al-Athīr, states that Charles's assailants were the Arabs of Saragossa, by whom he had been originally invited to interfere in Spain.

[2] Ganelon may perhaps be identified with Wenilo, archbishop of Sens, whose treason against Charles the Bald is related in the *Annales Bertiniani* (anno 859).

[3] The lists vary in different texts.

Relations between the Earlier Forms of the Legend.—The *Pseudo-Turpin* represents a different recension of the story, and is throughout clerical in tone. It was the trouvère of the *Chanson de Roland* who developed the characters into epic types; he invented the heroic friendship of Roland and Oliver, the motives of Ganelon's treachery, and many other details. The famous fight between Roland and the giant Ferragus appears in the *Pseudo-Turpin* (chapter xviii.), but not in the poem. The *Chanson de Roland* presupposes the existence of a whole cycle of epic poetry, probably in episodic form; it contains allusions to many events outside the narrative, some of which can be explained from other existing chansons, while others refer to narratives which are lost. In lines 590–603 of the poem Roland gives a list of the countries he has conquered for Charles, from Constantinople and Hungary on the east to Scotland on the west. Of most of these exploits no trace remains in extant poems, but his capture of Bordeaux, of Nobles, of Carcassonne, occur in various compilations. Roland was variously represented by the romancers as the son of Charlemagne's sister Gilles or Berte and the knight Milon d'Anglers. The romantic episode of the reconciliation of the pair with Charlemagne through Roland's childish prattle (*Berte et Milon*) is probably foreign to the original legend. In the Scandinavian versions Roland is the son of Charlemagne and his sister, a recital probably borrowed from mythology. His *enfances*, or youthful exploits, were, according to *Aspremont*, performed in Italy against the giant Eaumont, but in *Girais de Viane* his first taste of battle is under the walls of Vienne, where Oliver, at first his adversary, becomes his brother-in-arms.

Other Versions.—Most closely allied to the Oxford *Roland* are (*a*) a version in Italianized French preserved in a 13th or 14th century MS. in the library of St Mark, Venice (MS. Fr. iv.); (*b*) the *Ruolantes Liet* (ed. W. Grimm, Göttingen, 1838) of the Swabian priest Konrad (fl. 1130), who gave, however, a pious tone to the whole;[1] (*c*) the 8th branch of the *Karlamagnus-saga* (ed. C. Unger, Christiania, 1860), and the Danish version of that compilation.

In the 12th century the *Chanson de Roland* was modernized by replacing the assonance by rhyme, and by amplifications and additions. Several MSS. of this rhymed recension, sometimes known as *Roncevaux*, are preserved. In the prose compilations of *Galien* and in David Aubert's *Conquêtes de Charlemagne* (1458) the story kept its popularity for many centuries. In England the story was understood in the original French, and the English romances of Charlemagne (*q.v.*) are mostly derived from late and inferior sources. In Spain the legend underwent a curious transformation. Spanish patriotism created a Spanish ally of Marsile, Bernard del Carpio, to be the rival and victor of Roland. It was in Italy that the Roland legend had its greatest fortune: Charlemagne and Roland appear in the *Paradiso* (canto xviii.) of Dante; the statues of Roland and Oliver appear on the doorway of the cathedral of Verona; and the French *chansons de geste* regularly appeared in a corrupt Italianized French. The Roland legend passed through a succession of revisions, and, as the *Spagna*, forming the 8th book of the great compilation of Carolingian romance, the *Reali di Francia*, kept its popularity down to the Renaissance. The story of Roland (Orlando) in a greatly modified form is the subject of the poems of Luigi Pulci (*Morgante Maggiore*, 1481), of Matteo Boiardo (*Orlando innamorato*, 1486), of Ariosto (*Orlando furioso*, 1516), and of Francesco Berni (*Orlando*, 1541).

AUTHORITIES.—For a complete bibliography of the editions of the various MSS. of the *Chanson de Roland*, of the foreign versions, and of the enormous literature of the subject, see Léon Gautier, *Les Épopées françaises* (2nd ed., vol. iii., 1880), and the same author's *Bibliographie des chansons de geste* (1897). Among critical editions of the *Chanson* are those by Wendelin Foerster in the *Altfranz. Bibliotek*, vols. vi. and vii. (Heilbronn, 1883–86), and by E. Stengel, *Das altfranzösische Rolandslied* (Leipzig, 1900, &c.). The most popular edition is *La Chanson de Roland* (Tours, 1872, and numerous subsequent editions), by Léon Gautier, with text, translation, introduction, notes, variants and glossary. L. Petit de Julleville published in 1878 an edition with the old French text, and a modern French translation in assonanced verse. There are various other translations in French; in English prose by I. Butler (Boston, Mass., 1904); and a partial English verse translation by A. Way and F. Spencer (London, 1895). Consult further G. Paris, *Hist. poét. de Charlemagne* (reprint, 1905), and *De Pseudo Turpino* (Paris, 1865); P. Rajna, *Le Origini dell' epopea francese* (Florence, 1884) and *Le Fonti dell' Orlando Furioso* (2nd ed., Florence, 1900); F. Picco, *Rolando nella storia e nella poesia* (Turin, 1901); G. Paris, "Roncevaux," in *Légendes du moyen âge* (1903), on the topography of the battlefield.

ROLANDSECK, a village of Germany, in the Prussian Rhine province, delightfully situated on the left bank of the Rhine, 8 m. above Bonn, with a station on the railway Cologne-Coblenz. The place consists almost entirely of villas and is a favourite summer resort. Crowning the vine-clad hills behind it lie the ruins of the castle, a picturesque ivy-covered arch, whence a fine view is obtained of the Siebengebirge and the Rhine valley as far as Bonn. Immediately below Rolandseck in mid-river is the island of Nonnenwerth, on which is a nursing school under the conduct of Franciscan nuns, established in 1850. The convent which formerly stood here was founded in 1122 and secularized in 1802. Tradition assigns the foundation of the castle of Rolandseck to Charlemagne's paladin, Roland. It was certainly built at a very early date, as it was restored by Frederick, archbishop of Cologne, in 1120, and it was a fortress until the end of the 15th century.

ROLL, ALFRED PHILIPPE (1846–), French painter, was born in Paris on the 1st of March 1846. Pupil of Gérôme and Bonnat at the École des Beaux Arts, he made his *début* at the Salon in 1870 with "Environs of Baccarat" and "Evening," and attracted the widest attention in 1875 by his colossal painting of "The Flood at Toulouse" (now at the Havre Museum). All his early work is imbued with the spirit of romanticism under the influence of Géricault, whilst his colour tended to Bolognese heaviness with a strong leaning towards dark shadows in the flesh painting, in which he closely followed Courbet. In 1877 he showed at the Salon the "Fête of Silenus" (now at the Ghent Museum), a painting of such vivid colour and exuberant life that it recalls the work of Jordaens. About this time he began to devote himself to the realistic rendering of modern life, especially among the working classes, and together with romantic subjects he abandoned his earlier heavy colouring, and devoted himself to the study of free light. His "Miners' Strike" of 1880 (now at the Valenciennes Museum) placed him in the front rank of modern French painters, and from that date his career was one of continuous and brilliant success. He became "official painter" to the

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[1] A proof of the popularity of the legend in Germany is supplied by the so-called Roland statues, of which perhaps the most famous example is that of Bremen. Mention of a *statua Rolandi* is made in a *privilegium* granted by Henry V. to the town of Bremen in 1111. The *Rolands-säule* were probably symbolic of the judicial rights possessed by the towns where they are found, and it has been suggested that the word arises from false etymology with *Rothland-säule*, red-land-pillar, the symbol of the possession of the power of life and death.

French government, and was entrusted with numerous commissions for the decoration of public buildings and for commemorative pictures, like the "President Carnot at Versailles at the Centenary of the États Généraux" (now at Versailles Palace), and "The Tzar and President Faure laying the Foundation Stone of the Alexandre III. Bridge." For the Hôtel de Ville he executed "The Pleasures of Life" and "The Rosetime of Youth." Besides the pictures already mentioned, a vast number of his works are to be found in the public galleries of France. The museum of the Hôtel de Ville in Paris owns his "National Fête at Paris in 1880"; the Cognac Museum, "Labour, Works at Suresnes"; the Luxembourg, his "War" and "Manda Lametrie, farm-hand." At Avignon Museum is the "Don Juan and Haidee"; at Laval Museum, "Halt!"; at Fontainebleau Palace, "In Normandy"; at Pau Museum, "Roubey, cementer"; and at the Museum of Geneva, "Marianne Offrey, crieuse de vert." In portraiture he is known by his "Yves Guyot," "Coquelin cadet," "Jules Simon," &c., but his greatest success was the group of "Fritz Thaulow and his Wife." In 1905 he replaced Carolus-Duran as president of the Société Nationale des Beaux-Arts, of which he was one of the founders.

ROLL (O. Fr. *rolle*, *roulle*, mod. *rôle*, Lat. *rotulus*, dim. of *rota*, wheel), something rolled or wound up in a cylindrical form on an axis, or something which "rolls," that is, moves or is moved along a service by a turning motion. Primarily the word is used of a piece of writing material, such as parchment or paper, rolled up for the purpose of convenient storage, handling, &c. This is the meaning of the Med. Lat. *rotulus*, defined by Du Cange as "Scheda, charta in speciem rotulae seu rotae convoluta." It was thus the convenient name for any document kept in this form as an official record, and hence for any register, record, catalogue or official list. "The Rolls" was the name of the building where the records of the Chancery Court were kept, the keeper of which was the Master (*q.v.*) of the Rolls, now the title of the third member of the English Supreme Court of Judicature. Other familiar examples of the use of the word in this sense are the list of those admitted as qualified solicitors, whence the phrase "to strike off the rolls," of removal by the court of a solicitor for offences or delinquencies. There are numerous applications of the word to other objects packed in a cylindrical form, such as tobacco, cloth, &c., and particularly to a small loaf of bread rolled over before baking, the crust being thin and crisp and the crumb spongy.

In architecture a "roll" or "scroll" moulding is a moulding resembling a section of a roll or scroll of parchment with the end overlapping; a "roll and fillet" moulding is a section of a cylindrical moulding with a square fillet running along the centre of the face (see Label). For the sense of an object that rolls, the word "roller" is more general, but "roll" is frequent in technical usage for revolving cylinders, especially when working in fixed bearings. For the rolling of steel see Rolling Mill.

ROLLAND, JOHN (fl. 1560), Scottish poet, appears to have been a priest of the diocese of Glasgow, and to have been known in Dalkeith in 1555. He is the author of two poems, the *Court of Venus* and a translation of the *Seven Sages*. The former, which was printed by John Ros in 1575, may have been written before 1560. The latter was translated from a Scots prose version at the suggestion of an aunt ("ane proper wenche"), who had found his treatment of the courtly allegory involved and uninteresting.

The *Court of Venus* was edited by Walter Gregor for the S.T.S. in 1884. See W. A. Craigie's long list of corrections of that edition in the *Modern Language Quarterly* (March 1898). The *Seven Sages* was printed in 1578, and frequently during the earlier decades of the 17th century. It was reprinted by David Laing for the Bannatyne Club (1837). Sibbald, in his *Chronicle of Scottish Poetry* (iii. 287), hinted that Rolland may be the author of the *Thrie Priestis of Peblis*. There is not a scrap of evidence in support of this; and there are many strong reasons against the ascription.

ROLLE DE HAMPOLE, RICHARD (d. 1349), English hermit and author, was born near the end of the 13th century, at Thornton (now Thornton Dale), near Pickering, Yorkshire. His father, William Rolle, was perhaps a dependant of the Neville family. Richard was sent to Oxford at the expense of Thomas de Neville, afterwards archdeacon of Durham. At Oxford he gave himself to the study of religion rather than to the subtleties of scholastic philosophy, for which he professed a strong distaste. At the age of nineteen he returned to his father's house, and, making a rough attempt at a hermit's dress out of two kirtles of his sister's and a hood belonging to his father, he ran away to follow the religious vocation. At Dalton, near Rotherham, he was recognized by John de Dalton, who had been at Oxford with him. After satisfying himself of Rolle's sanity, Dalton's father provided him with food and shelter and a hermit's dress. Rolle then entered on the contemplative life, passing through the preliminary stages of purification and illumination, which lasted for nearly three years, and then entering the stage of sight, the full revelation of the divine vision. He is very exact in his dates, and attained, he says, the highest stage of his ecstasy four years and three months after the beginning of his conversion. Richard belonged to no order and acknowledged no rule. He left the Daltons, and wandered from place to place, resting when he found friends to provide for his wants. He seems to have desired to form a rule of hermits, but met with much opposition. The pious compilers of his "office" evidently thought it necessary to defend him against the charge of mere vagrancy. He nowhere says himself that his preaching made many converts, but his example was followed by many recluses in the north of England. After some years of wandering he gave up his more energetic propaganda, contenting himself with advising those who sought him out. He began also to write the songs and treatises by which he was to exert his widest influence. He settled in Richmondshire, twelve miles from the recluse Margaret Kirkby, whom he had cured of a violent seizure. To her some of his works are dedicated. Finally he removed to Hampole, near Doncaster, invited by an inmate of the Cistercian nunnery of St Mary. There he died on the 29th of September 1349. Many miracles were wrought at his shrine, and, in view of an expected canonization, an office was drawn up giving an account of his life and the legends connected with it.

Richard Rolle had a great influence on his own and the next generation. In his exaltation of the spiritual side of religion over its forms, his enthusiastic celebration of the love of Christ, and his assertion of the individualist principle, he represented the best side of the influences that led to the Lollard movement. He was himself a faithful son of the church, and the political activity of the Lollards was quite foreign to his teaching. The popularity of his devotional writings is attested by the numerous existing editions and by the many close imitations of them.

A very full list of his Latin and English works is given (pp. 36–43) in Dr Carl Horstmann's edition (1895–96) of his works in the Library of Early English Writers. Some of his works exist in both English and Latin, and it is often not easy to say which is the original version. The most considerable of them are *The Pricke of Conscience* and his *Commentary on the Psalter*.

The Pricke of Conscience is a long religious poem, in rhyming couplets, dealing with the beginning of man's life, the instability of the world, why death is to be dreaded, of doomsday, of the pains of hell, and the joys of heaven, the two latter subjects being treated with uncompromising realism. Rolle wrote in the northern dialect, but southern transcripts are also found, and the poem exists in a Latin version (*Stimulus conscientiae*). The sources of this work included the *De Contemptu Mundi sive de miseria humanae conditionis* of Pope Innocent III., and Rolle also showed a knowledge of Bartholomew Glanville, Thomas Aquinas and Honorius of Awtun. His English devotional commentary on the Psalms follows very closely his Latin *Expositio Psalterii*, which he based partly on Peter Lombard's *Catena*. It often agrees with the English metrical Psalter preserved in three MSS. in the British Museum (Cotton Vesp. D. vii., Egerton 614, and Harl. 1770). Dr R. F. Littledale in his edition (1873) of J. M. Neale's *Commentary on the Psalms* called it a "terse mystical paraphrase, which often comes very little short in beauty and depth of Dionysius the Carthusian himself."

There is no complete and accessible edition of his works. The best collection is by C. Horstmann, *Yorkshire Writers: Richard Rolle of Hampole; An English Father of the Church and his Followers*

(2 vols., 1895–96), in the "Library of Early English Writers." This includes many English prose treatises by Rolle, some beautiful examples of his lyric poems, and other treatises in prose and verse from northern MSS., some of which are attributed to Rolle, and others to his followers. Wynkyn de Worde printed in one volume, in 1506, *Rycharde Rolle Hermyte of Hampull in his contemplacyons of the drede and love of God . . . and the Remedy ayenst the troubles of temptacyons.* Neither of these are accepted by Dr Horstmann as Rolle's work. His Latin treatises, *De emendatione vitae* and *De incendio amoris*, the latter one of the most interesting of his works, because it is obviously largely autobiographical, were translated (1434–35) by Richard Misyn (ed. R. Harvey, Early English Text Soc., 1896). The *Pricke of Conscience* was edited (1863) by Richard Morris for the Philological Society. His *Commentary on the Psalms* was edited by the Rev. H. R. Bramley (Oxford, 1884). Ten prose treatises by Richard Rolle from the Thornton MS. (*c.* 1440, Lincoln Cathedral Library) were edited by Canon George Perry for the Early English Text Society in 1866. Partial editions of his Latin works are dated Paris (1510), Antwerp (1533), Cologne (1535–36), Paris (1618); and in vol. xxvi. of the "Bibliotheca Patrum Maxima" (Lyons, 1677). The office, which forms the chief authority for Rolle's life, was printed in the *York Breviary*, vol. ii. (Surtees Soc., 1882), and in Canon Perry's edition referred to above.

See also Percy Andreae, who collated eighteen MSS. in the British Museum in his *Handschriften des Pricke of Conscience* (Berlin, 1888); *Studien über Richard Rolle von Hampole unter besonderer Berücksichtigung seiner Psalmencommentare*, by H. Middendorff (Magdeburg, 1888), with a list of MSS., sources, &c.; J. Zupitza in *Englische Studien* (Heilbronn, vols. vii. and xii.); A. Hahn, *Quellenuntersuchungen zu Richard Rolle's Englischen Schriften* (Halle, 1900); and for his prosody, G. Saintsbury, *Hist. of English Prosody*, vol. i.

ROLLER, a very beautiful bird, so called from its way of occasionally rolling or turning over in its flight,[1] somewhat after the fashion of a tumbler-pigeon. It is the *Coracias garrulus* of ornithology, and is widely though not very numerously spread over Europe and Western Asia in summer, breeding so far to the northward as the middle of Sweden, but retiring to winter in Africa. It occurs almost every year in some part or other of the British Islands, from Cornwall to the Shetlands, while it has visited Ireland several times, and is even recorded from St Kilda. But it is only as a wanderer that it comes, since there is no evidence of its having ever attempted to breed in Great Britain; and indeed its conspicuous appearance—for it is nearly as big as a daw and very brightly coloured —would forbid its being ever allowed to escape a gun. Except the back, scapulars and tertials, which are bright reddish-brown, the plumage of both sexes is almost entirely blue—of various shades, from pale turquoise to dark ultramarine—tinted in parts with green. The bird seems to be purely insectivorous. The genus *Coracias*, for a long while placed by systematists among the crows, has really no affinity whatever to them, and is now properly considered to belong to the heterogeneous group of birds now associated as *Coraciiformes*, in which it forms the type of the family Coraciidae; and its alliance to the bee-eaters (Meropidae) and king-fishers (Alcedinidae) (*q.v.*) is very evident. Some eight other species of the genus have been recognized, one of which, *C. leucocephalus* or *C. abyssinicus*, is said to have occurred in Scotland. India has two species, *C. indicus* and *C. affinis*, of which thousands upon thousands used to be annually destroyed to supply the demand for gaudy feathers to bedizen ladies' dresses. One species, *C. temmincki*, seems to be peculiar to Celebes and the neighbouring islands, but otherwise the rest are natives of the Ethiopian or Indian regions. Allied to *Coracias* is the genus *Eurystomus* with some half-dozen species, of similar distribution, but one of them, *E. pacificus*, has a wider range, for it inhabits Australia and reaches Tasmania.

Madagascar has four or five very remarkable forms which have often been considered to belong to the family Coraciidae; and, according to A. Milne-Edwards, no doubt should exist on that point. Yet if any may be entertained it is in regard to one of them, *Leptosomus discolor*, which, on account of its zygodactylous feet, some authorities place among the Cuculidae, while others have considered it the type of a distinct family Leptosomatidae. The genera *Brachypteracias* and *Atelornis* present fewer structural differences from the rollers, and perhaps may be rightly placed with them; but the species of the latter have long tarsi, and are believed to be of terrestrial habit, which rollers generally certainly are not. These very curious and in some respects very interesting forms, which are peculiar to Madagascar, are admirably described and illustrated by a series of twenty plates in the great work of A. Grandidier and A. Milne-Edwards on that island (*Oiseaux*, pp. 223–250), while the whole family Coraciidae is the subject of a monograph by H. E. Dresser, as a companion volume to his monograph on the Meropidae. (A. N.)

ROLLER. For agricultural purposes the roller formerly consisted of a solid cylinder of timber or stone attached to a frame and shafts, but to facilitate turning two or more iron cylinders revolving on an axle are now generally used. The simplest form has a smooth surface. The diameter of the drum should be as great as possible—30 in. being a good size—because the larger this is the more easily it is pulled (within certain limits), while rollers of small diameter are heavier of draught and do their work less efficiently. The implement is used in spring and summer as an aid in pulverizing and cleaning the soil, by bruising clods and lumps of tangled roots and earth which the cultivator or other implement has brought to the surface; in smoothing the surface for the reception of small seeds or the better operation of the mower or reaper; in consolidating soil that is too loose in texture and pressing it down about the roots of young plants. In the case of young plants the roots are close to the surface, which must therefore be kept moist. This end is attained by the compression by the roller of the top-soil of which the capillarity, *i.e.* the power of drawing water from the sub-soil is thereby increased. On the other hand, when it is desired to conserve the soil-moisture, the roller may be followed by the harrow, which, by pulverizing the surface-soil, breaks the capillarity. Of the variations on the common smooth roller, the clod-crusher and the Cambridge roller are the most important. The clod-crusher combines weight with breaking power. The best-known form was patented about 1841 by Crosskill, and consists of a number of disks with serrated edges threaded loosely on an axle round which they revolve. The Cambridge roller carries on its axle a number of closely packed wheels, the rims of which narrow down to a wedge shape. The tubular roller, instead of drums, has tubes arranged longitudinally, producing a corrugated surface which is reproduced in the condition of the soil after it has been rolled.

ROLLER-SKATING, a pastime which, by the use of small wheels instead of a blade on the skate, has provided some of the pleasures of skating on ice without having ice as the surface (see SKATING). Wheeled skates were used on the roads of Holland as far back as the 18th century, but it was the invention of the four-wheeled skate, working on rubber springs, by J. L. Plimpton of New York, in 1863, that made the amusement popular. Still greater advance was made by the Raymond skate with ball and cone bearings. The wheels or rollers were first of turned boxwood, but the wearing of the edges was a fault which has been surmounted by making them of a hard composition or of steel. The floor of the rink on which the skating takes place is either of asphalt or of wood. The latter is that always used in newly made rinks. The best floors are of long narrow strips of maple. Figure-skating on roller-skates is in some respects easier to learn than on ice-skates, the four points of contact given by the wheels rendering easier the holding of an edge; but some figures, such as loops, are more difficult.

ROLLIN, CHARLES (1661–1741), French historian and educationist, was born at Paris on the 30th of January 1661. He was the son of a cutler, and at the age of twenty-two was made a master in the Collège du Plessis. In 1694 he was rector of the university of Paris, rendering great service among other things by reviving the study of Greek. He held that post for two years instead of one, and in 1699 was appointed principal of the Collège de Beauvais. Rollin held Jansenist principles, and even went so far as to defend the miracles supposed to be worked at the tomb of François de Paris, commonly known as Deacon Paris. Unfortunately his religious opinions deprived him of his appointments and disqualified him for the rectorship, to which in 1719 he had been re-elected. It is said that the same reason prevented his election to the French Academy, though he was a member of the Academy of Inscriptions. Shortly before his death (14th December 1741) he protested publicly against the acceptance of the bull *Unigenitus*.

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[1] Gesner in 1555 said that the bird was thus called, and for this reason, near Strassburg, but the name seems not to be generally used in Germany, where the bird is commonly called *Rake*, apparently from its harsh note. The French have kept the name *Rollier*. It is a curious fact that the roller, notwithstanding its occurrence in the Levant, cannot be identified with any species mentioned by Aristotle.

Rollin's literary work dates chiefly from the later years of his life, when he had been forbidden to teach. His once famous *Ancient History* (Paris, 1730–38), and the less generally read *Roman History*, which followed it, were avowed compilations, uncritical and somewhat inaccurate. But they instructed and interested generation after generation almost to the present day. A more original and really important work was his *Traité des études* (Paris, 1726–31). It contains a summary of what was even then a reformed and innovating system of education, including a more frequent and extensive use of the vulgar tongue, and discarded the medieval traditions that had lingered in France.

See Sainte-Beuve, *Causeries du lundi*, vol. vi.

ROLLINAT, MAURICE (1853–1903), French poet, was born at Châteauroux in 1853. His father represented Indre in the National Assembly of 1848, and was a friend of George Sand, whose influence is very marked in young Rollinat's first volume, *Dans les brandes* (1877). The volume, however, attracted little attention, and it was with his second publication, very different in manner, that he made his reputation. In *Les Névroses*, with the sub-title *Les Âmes*, *Les Luxures*, *Les Refuges*, *Les Spectres*, *Les Ténèbres*, he showed himself as a disciple of Charles Baudelaire. He constantly returns in these poems to the physical horrors of death, and is obsessed by unpleasant images. Less *outré* in sentiment are *L'Abîme* (1886), *La Nature*, and a book of children's verse, *Le Livre de la Nature* (1893). He was musician as well as poet, and set many of his songs to music. He lost his reason in consequence of his wife's death from hydrophobia, and died on the 26th of October 1903.

ROLLING-MILL, a term which includes several types of machines used for producing the sectional forms (fig. 1) in which wrought iron and steel are required for the use of boiler-makers, platers and bridge-builders, and for constructional work generally. The production of wrought iron has been a diminishing industry for many years, while that of steel increases. Though the plant employed for both is alike in essential principles of design, the growth in the use of steel has revolutionized the practice, chiefly on account of the more massive dimensions in which steel sections are rolled. Iron sections are relatively small, and many are produced by piling, *i.e.* by building up with small portions of malleable puddled metal. There is no limit in reason to the dimensions in which steel sections can be rolled, and they are never piled, however large, but always rolled from solid cast ingots.

When steel ingots are rolled into sectional forms the reduction in transverse dimensions is very great. The work begins at nearly a white heat, and continues until a low red is reached. Obviously the stresses to which the material is subjected are very severe. For this reason the process of reduction has to be effected very gradually, and especially so in those cases where reduction is being done in two directions at right angles with each other, as in channel sections (fig. 6) and joist or beam sections (figs. 7 and 8).

It might be thought, since steel is always cast previously to rolling, that it might be cast at once into the sectional forms required. But sound results could not be obtained in this way, because the gases occluded in the metal form blow-holes which are sources of weakness. The material itself, even in the solid portions, is not homogeneous. By removing the head of the ingot where the blow-holes chiefly congregate and rolling the remainder at a white or red heat, the metal is improved by consolidation, and by the work done upon it. To this practice there is no exception.

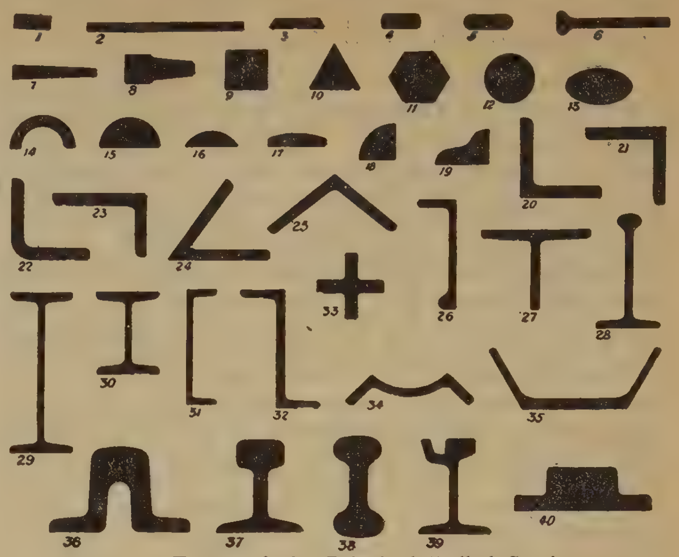


FIG. 1.—Forms of the Principal Rolled Sections.

1, 2, Flats. 3, Flat with bevelled edges. 4, 5, Flats with rounded edges. 6, Bulb bar. 7, Wedge bar. 8, Scree or grate bar. 9, Square. 10, Triangular. 11, Hexagonal. 12, Round. 13, Oval. 14, Hollow half-round. 15, Half-round. 16, Convex. 17, Square-edged convex. 18, Vee. 19, O.G. 20, Angle iron. 21, Square root, or square throat angle. 22, Round-backed angle. 23, Unequal-sided angle. 24, Acute angle. 25, Obtuse angle. 26, Bulb angle. 27, Tee. 28, Bulb tee. 29, 30, Beams or joists, or girders, or H-irons. 31, Channel. 32, Zed. 33, Cruciform section. 34, Pillar section. 35, Troughing. 36, 37, 38, Railway rail. 39, Tramway rail. 40, Heavy crane rail.

Rolling-mills are known as "two-high," or "three-high," according as two or three rolls are mounted one over the other (figs. 2 and 3). In the two-high type the two rolls revolve in opposite directions, so that an ingot, slab or bloom presented to the entering side is drawn in and between the rolls, which reduce its thickness. In the case of rolls which are two perfectly plain cylinders (plate-rolls) the shape produced is that of broad, long and flat plates or sheets. Several passages (passes) are required to effect the reduction required, because this must be gradual. To regulate the amount the top roll is set down bodily by means of screws pressing on its bearings which slide in the end supports (housings). In the case of plate-rolls, which are plain cylinders, this setting down must be equal at each end. The mass of the top roll is balanced, to avoid shock when a plate is entering. The rolls are made of cast iron, and are either *grain* rolls or *chilled* rolls. The first are formed from a tough strong grade of iron, the quality which is used for all the roughing down and general work. The second are made of a highly mottled iron, cast against a cold mould (chill) of cast iron, by which a steely surface is obtained. These are used for fine finishing, or for imparting a polished surface to a section already nearly reduced to size in grain rolls. In later heavier practice, rolls of cast steel and forged steel are becoming common. They are more costly than iron, but more durable and much lighter for equal strength. They are essential in armour plate rolls. The length of rolls should not exceed about four times their diameter, for otherwise they are liable to spring and produce plates thicker at the centre than towards the edges.

From this elementary design several types are derived. In the two-high mill it is clear that if the direction of the rotation of the rolls is always the same, then the plate being rolled must be taken back after each "pass" to the front of the rolls. Hence there is one "lost pass" for every reduction in thickness. This is the case in the "pull-over" mill, nearly obsolete. In the two-high reversing mill, introduced to avoid this "lost pass," as soon as a plate has gone through, the direction of rotation of the rolls is reversed, and the plate is rolled again on the backward journey, so avoiding the lost

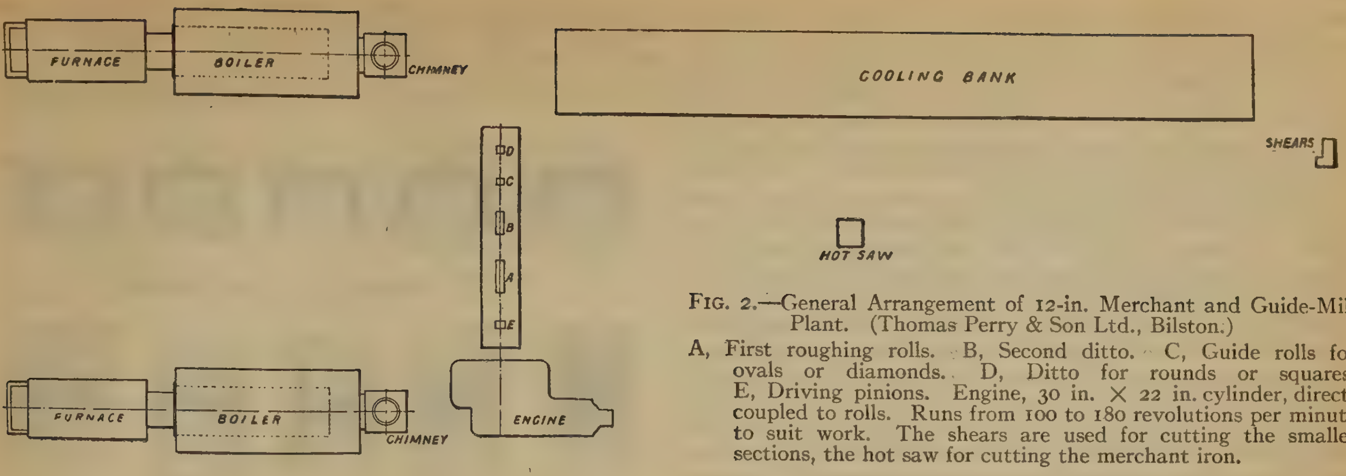


FIG. 2.—General Arrangement of 12-in. Merchant and Guide-Mill Plant. (Thomas Perry & Son Ltd., Bilston.)

A, First roughing rolls. B, Second ditto. C, Guide rolls for ovals or diamonds. D, Ditto for rounds or squares. E, Driving pinions. Engine, 30 in. × 22 in. cylinder, direct-coupled to rolls. Runs from 100 to 180 revolutions per minute to suit work. The shears are used for cutting the smaller sections, the hot saw for cutting the merchant iron.

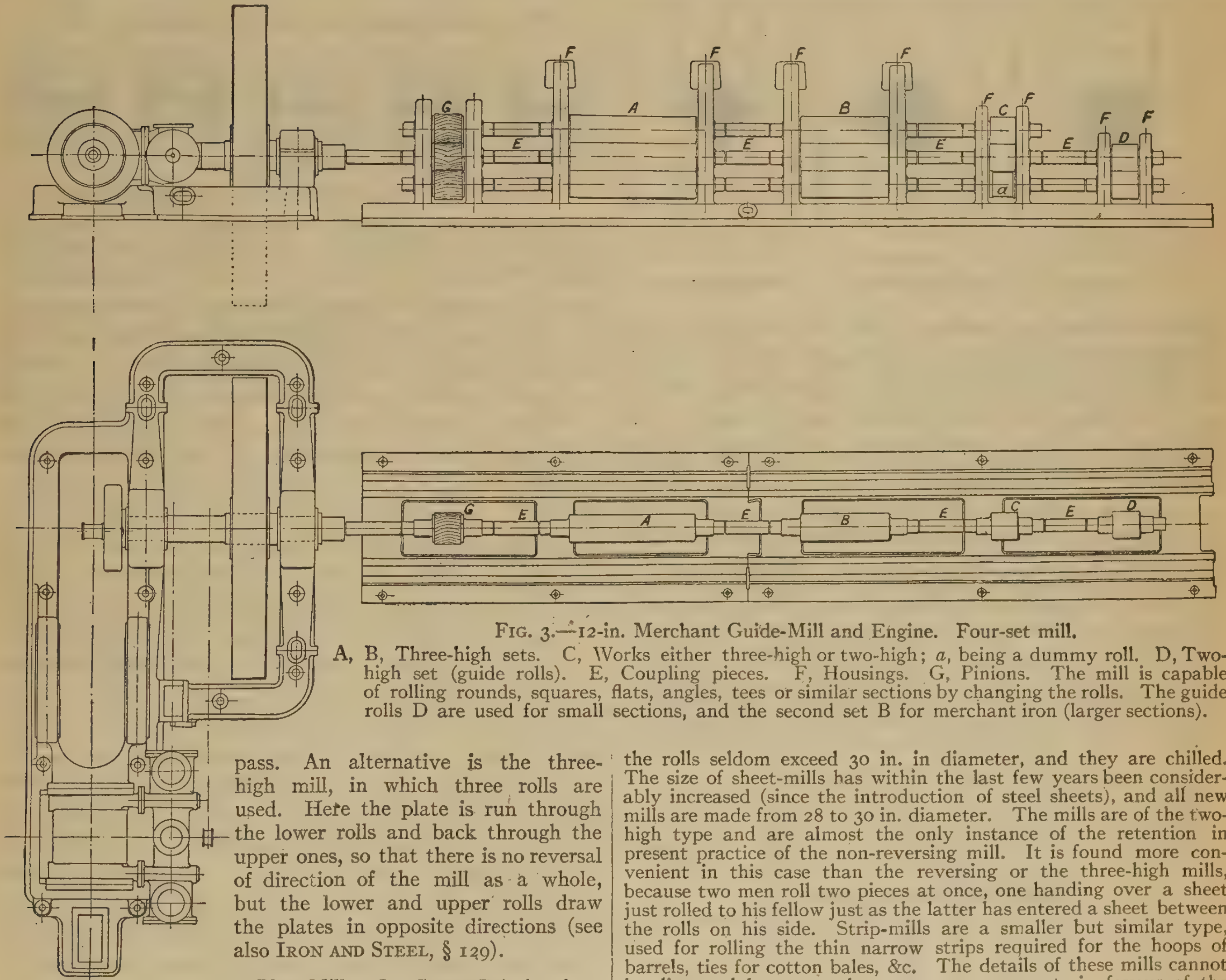


FIG. 3.—12-in. Merchant Guide-Mill and Engine. Four-set mill.

A, B, Three-high sets. C, Works either three-high or two-high; *a*, being a dummy roll. D, Two-high set (guide rolls). E, Coupling pieces. F, Housings. G, Pinions. The mill is capable of rolling rounds, squares, flats, angles, tees or similar sections by changing the rolls. The guide rolls D are used for small sections, and the second set B for merchant iron (larger sections).

pass. An alternative is the three-high mill, in which three rolls are used. Here the plate is run through the lower rolls and back through the upper ones, so that there is no reversal of direction of the mill as a whole, but the lower and upper rolls draw the plates in opposite directions (see also IRON AND STEEL, § 129).

Plate-Mills.—In Great Britain plate-mills are generally two-high reversing mills, in America three-high mills. Another difference is that in British practice two stands of rolls are used, in America one only. In the two-stand design there are two sets of rolls coupled endwise, one set being grain-rolls for roughing, and the other chilled rolls for finishing. Sets of live rollers conduct the plates to and from the separate rolls. The plate-mills proper are those which roll from $\frac{1}{4}$ in. to about 2 in. thick. Armour plate-mills are a special design for massive plates and sheet-mills are for thin plates or sheets having a less thickness than $\frac{1}{4}$ in. Armour plate-mills are of two-high reversing type usually, with forged steel rolls. They are of immense proportions, the rollers ranging from 10 to 14 ft. in length, by from 3 to 4 ft. in diameter. In sheet-mills, on the other hand, the rolls seldom exceed 30 in. in diameter, and they are chilled. The size of sheet-mills has within the last few years been considerably increased (since the introduction of steel sheets), and all new mills are made from 28 to 30 in. diameter. The mills are of the two-high type and are almost the only instance of the retention in present practice of the non-reversing mill. It is found more convenient in this case than the reversing or the three-high mills, because two men roll two pieces at once, one handing over a sheet just rolled to his fellow just as the latter has entered a sheet between the rolls on his side. Strip-mills are a smaller but similar type, used for rolling the thin narrow strips required for the hoops of barrels, ties for cotton bales, &c. The details of these mills cannot be discussed here, nor the numerous arguments in favour of the two systems. English practice retains the two-high reversing mill for all heavy work, the exceptions being those just noted. American practice retains the three-high mill.

Grooved Rolls.—In the mills designed for rolling various sectional forms the same distinction between two-high and three-high remains, but new problems arise. By "sectional forms" is meant all those which are not plates and sheets, such as bars of round and square section, angles, channels, rails and allied sections (fig. 1), for the production of which grooved rolls are required. The shapes and proportions of these grooves are such that reduction is effected very gradually. When metal is squeezed or hammered, one effect is to spread it laterally, since the metal cannot be appreciably squeezed in on itself. But the lateral extension is very much less than the longitudinal. The most marked effect of reduction in thickness is extension in length. But as there is some lateral extension, three courses are open: one is to gauge the exact amount of width required for extension; another is to turn a bar over at intervals in order to exercise pressure on the portions extended laterally and obliterate them (open passes); and a third is to allow the extensions to take the form of fin to be cut off subsequently (closed passes). The first is generally impracticable. The second can be illustrated by diagrams representing roll sections.

The work of reduction is generally divided between three sets of rolls. The first are the cogging-, or blooming-rolls, as they are termed in America, in which ingots are reduced to blooms with dimensions suitable for rolling the various sections. In these an ingot of say 14 in. square may be reduced to a bloom of 6 in. square. The grooves form rectangular sections (box passes). The top roll being raised, the ingot is passed through the largest groove; then the roll is lowered and it is passed through a second time. Then it is turned round through 90° and re-rolled. Afterwards the same processes are gone through till the last groove is reached. There is a great difference between, say, a plate and a rail, but the cogging-rolls have to be so designed as to produce blooms for varied forms. There are three principal forms: the box just noticed, the gothic and the diamond (fig. 4), all open passes. For plates, provision is made in "slabbing" rolls for roughing out, first in a box pass, and then in a broad flat groove, alternating with the square groove for correction of the edges. Gothic passes and diamond passes produce blooms which are subsequently used for various shapes having little resemblance to each other. These shapes are simple, and little difficulty arises in the work of drawing down. The rolls make 40 to 50 revolutions per minute; the difference in the area of the cross section (draught) between adjacent grooves is from 20 to 25 %.

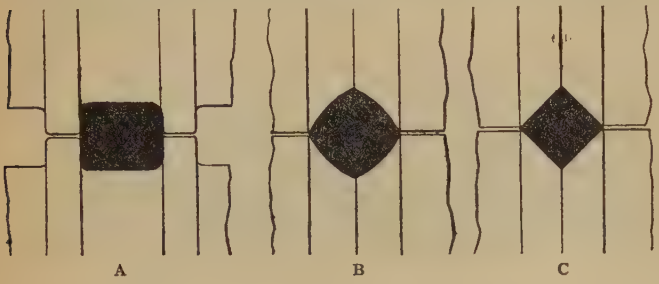


FIG. 4.

A, Box Pass. B, Gothic Pass. C, Diamond Pass.

The formative rolls for finished sections are of two classes: roughing and finishing. The roughing-rolls approximate much more closely to the finished sections than the cogging-rolls, but the aim is to make them do duty for a wide range of sections, in order to change them as seldom as possible. Thus the gothic pass (fig. 4) will serve alike for rolling square or round bars. Finishing rolls must be changed for every different section, except when slight differences in thicknesses only are made in the webbed portion of a rolled section. With the exception of rounds, sections are usually roughed and finished in closed passes—that is, the bar is wholly enclosed by the rolls. The groove in the lower roll is flanked by collars slightly deeper than the enclosed bar. These enter into grooves turned on the upper roll, and between them the bar is confined (fig. 5). It passes through a succession of these grooves, being diminished in area and extended at each pass. A certain amount of fin is squeezed out, and this is obliterated in the succeeding pass, and more formed, until in the finishing pass the amount of reduction is very slight, a surface finish being the principal result.

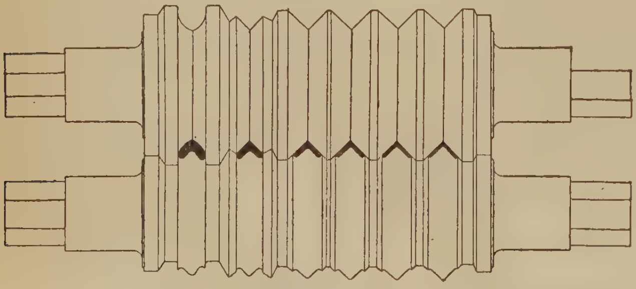


FIG. 5.—Pair of Rolls for producing Angle Sections. (Thomas Perry & Son Ltd., Bilston.)

Since but a slight amount of lateral extension occurs, it follows that the reduction wholly or mainly in the vertical plane is the most favourable condition. Rounds, squares and flats are wholly reduced in this way and offer no difficulty. The most unfavourable section is the joist or girder, the channels, tees and rails follow, and after these the various angles. In rolling a channel or a girder section (figs. 6, 7, 8), a square bloom is taken, and passed in succession through closed passes. The first produce shallow grooves in the opposite faces, gradually deepening until the insides of the flanges assume a definite slope. The angle of slope becomes gradually lessened, and the thicknesses of web and flanges, and also the radius in the corners, are reduced. At the same time the width over the flanges is being gradually increased. While this is going on, the fibres of the flanges are being strained, because the rolls run at a higher speed at their peripheries than next the body. The metal is being violently thrust and drawn in different ways, so that while economy has to be studied by reducing the number of passes as much as possible, undue stress must be avoided by making the reductions as easy as is practicable. These things cannot be put into a formula, but the roll-turners work by experience and empirical rules gathered by long practice. In order to avoid these deep groovings, and also severe lateral thrusts on the rolls, angle sections are always rolled with the slope of the flanges approximately equalized; so too are zeds (fig. 1, No. 32). The reduction is then effected with the minimum of stress to the metal. Variations are readily made in the thicknesses of rolled sections without changing the rolls, by simply varying the distance between their centres. This is effected by the adjustment of the top roll (fig. 5). Differences in thickness are made in $\frac{1}{16}$ths of an inch, up to a maximum of about $\frac{1}{2}$ in. Another detail of design in closed passes is so to shape the rolls as to make any pass obliterate the fin produced in the previous groove. Sometimes sections are turned over to effect this, but often the bodies of the rolls are turned of suitable diameters to produce the result. Guards are required to prevent the bars from becoming wrapped round the rolls ("collaring"). With the same object the upper roll is always made larger in diameter than the lower. Its speed is therefore slightly greater than that of the lower one. This stretches the plate or bar very slightly on the upper side, and so imparts a downward movement to it towards the floor, which is what is required. The difference in diameter varies with circumstances, ranging from $\frac{1}{4}$th to about 1 in.

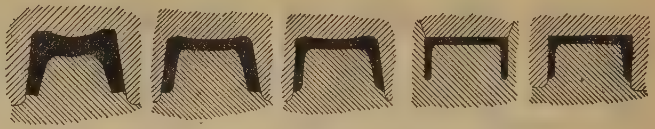


FIG. 6.—Reduction of Channel Section.

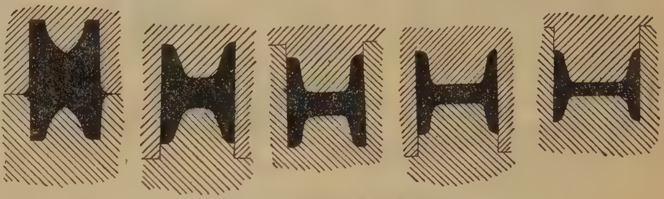


FIG. 7.—Reduction of Girder Section in Roughing Rolls.

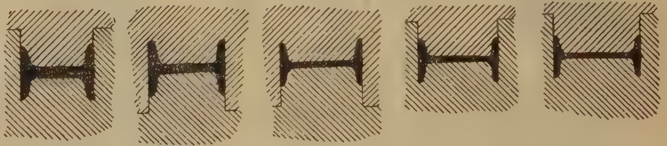


FIG. 8.—Reduction of Girder Section in Finishing Rolls.

Besides the standard types of mills noticed, the two-high and three-high, there are special mills. The merchant mill simply denotes either one of the above types used for the production of flat bars. The continuous mills are special designs for rolling small rods to be drawn into wire. In these there are several pairs of rolls placed in series, so that the billet is rolled from one stand to others in succession without re-heating. There are a number of different designs, one of which is the Belgian looping mill, so called because the rod is bent backward and forward in the form of the letter S in its passage through adjacent sets of rolls. In another design a flying shear is employed, which automatically cuts off billets from the bar while the latter is travelling at the rate of 6 or 8 ft. per second. (J. G. H.)

ROLLOCK, ROBERT (*c.* 1555–1599), the first principal of the university of Edinburgh, son of David Rollock of Powis, near Stirling, was born about 1555. He received his early education at the school of Stirling from Thomas Buchanan, a nephew of George Buchanan, and, after graduating at St Andrews, became a regent there in 1580. In 1583 he was appointed by the Edinburgh town council sole regent of the "town's college" ("Academia Jacobi Sexti," afterwards the university of Edinburgh), and three years later he received from the same source the title of "principal, or first master," and was engaged in lecturing on philosophy. When the staff of the young college was increased by the appointment of additional regents, he assumed with consent of the presbytery the office of professor of theology. From 1587 he also preached regularly in the East Kirk every Sunday at 7 a.m., and in 1596 he accepted one of the eight ministerial charges of the city. He took a prominent part in the somewhat troubled church politics of the day, and distinguished himself by gentleness and tact, as well as ability. He was appointed on several occasions to committees of presbytery and assembly on pressing ecclesiastical business. He was elected moderator of the General Assembly held at Dundee in May 1597. In 1598 he was translated to the parish church of the Upper Tolbooth, Edinburgh, and immediately thereafter to that of the Grey Friars (then known as the Magdalen Church). He died at Edinburgh on the 8th of February 1599.

Rollock wrote Commentaries on the Epistles to the Ephesians (1590) and Thessalonians (1598) and Hebrews (1605), the book of Daniel (1591), the Gospel of St John (1599) and some of the Psalms (1598); an analysis of the Epistle to the Romans (1594), and Galatians (1602); also *Questions and Answers on the Covenant of God* (1596), and a *Treatise on Effectual Calling* (1597). Soon after his death eleven *Sermons* (*Certaine Sermons upon Several Places of the Epistles of Paul*, 1599) were published from notes taken by his students. His *Select Works* were edited by W. Gunn for the Wodrow Society (1844–1849).

A Life by George Robertson and Henry Charteris was reprinted by the Bannatyne Club in 1826. See also the introduction to the *Select Works*, and Sir Alexander Grant's *History of the University of Edinburgh.*

ROMA, a town of Waldegrave county, Queensland, Australia, 318 m. by rail W.N.W. of Brisbane. It is the centre of a rich pastoral and wheat-growing district, in which oranges and vines are largely grown and much wine is produced. The town was incorporated in 1867. Flour-milling is its chief industry. Pop. (1901) of town, 2371; of the district, 7110.

ROMAN, capital of the department of Roman, Rumania, on the main line from Czernowitz in Bukovina to Galatz, and on the left bank of the river Moldova, 2¼ m. W. of its junction with the Sereth. Pop. (1900) 14,019, including 6099 Jews. The river is here spanned by a fine bridge of iron. Roman has been the seat of a bishop since 401. Its seminary dates from 1402. There are several ancient churches, including a cathedral, built in 1541. Roman has a transit trade in the products of northern Moldavia. A large annual fair is held in August.

ROMAN ARMY. In the long life of the ancient Roman army, the most effective and long-lived military institution known to history, we may distinguish four principal stages. (1) In the earliest age of Rome the army was a national or citizen levy such as we find in the beginnings of all states. (2) This grew into the Republican army of conquest, which gradually subdued Italy and the Mediterranean world. A citizen army of infantry, varying in size with the needs of each year, it eventually developed into a mercenary force with long service and professional organization. This became (3) the Imperial army of defence, which developed from a strictly citizen army into one which represented the provinces as well as Italy, and was a garrison rather than a field army. Lastly, (4) the assaults of the Barbarian horsemen compelled both the creation of a field force distinct from the frontier garrisons and the inclusion of a large mounted element, which soon counted for much more than the infantry. The Roman army had been one of foot soldiers; in its latest phase it was marked by that predominance of the horseman which characterized the earlier centuries of the middle ages.

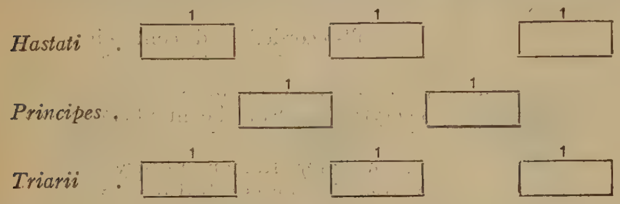
So far as we can follow this long development in its details, it was throughout continuous. So unbroken, indeed, is the growth that many of the military technical terms survived in use from epoch to epoch, unchanged in form though deeply modified in meaning, and ordinary readers often miss the diversity which underlies this unchanged-seeming system. The term *legio*, for example, occurs in all the four stages above outlined. But in each its significance varies. Throughout, it denoted citizen-soldiers: throughout, it denoted also a force which was chiefly, if not wholly, heavy infantry. But the setting of these two constant features varies from age to age. In the first period *legio* was the "levy," the whole host summoned to take the field. In the second period it was not the whole levy, but one of the principal units into which developing organization had divided that levy; the "legion" was now a body of some 5000 men—the number of "legions" varied with the circumstances, and the army included other troops besides citizens, though they were for the most part unimportant. In the third or Imperial age there were many legions (indeed, a fixed number) quartered in fixed fortresses; there were also other troops, numerous and important, if not yet so formidable as the legionaries. Finally, the legions became smaller units, and the other troops of the army, notably the cavalry, became the real fighting-line of Rome (see LEGION).

First Stage.—The history of the earliest Roman army is, as one might expect, both ill-recorded and contaminated with much legend and legal fiction. We read of a primitive force of 300 riders and 3000 foot soldiers, in which the horseman counted for almost everything. But the numbers are clearly artificial and invented, while the pre-eminence accorded to the cavalry has no sequel in later Roman history. We reach firmer ground with the organization ascribed to Servius Tullius. In this system the host included all citizens from 17 to 60 years of age, those under 47 for service in the field, those over 46 for garrison duty in Rome. The soldiers were grouped at first by their wealth—that is, their ability to provide their own horses, armour, &c.—into cavalry (18 "centuries"), heavy infantry, a remainder which it would be polite to call light infantry, and some artificers. The heavy infantry counted for most. Armed with long spears and divided into the three orders of *hastati*, *principes* and *triarii* (the origins and real senses of these names are lost), they formed a phalanx, and charged in a mass, while the cavalry protected the wings. The men were enrolled for a year—that is, for the summer campaign; in the autumn, like all primitive armies, they went home. It has been conjectured that about the time of the fall of the kings the normal Roman army comprised some 8500 infantry under 47 years of age, 5000 seniors, 1000 riders and 500 *fabri*, &c. The evidence for the calculation is unfortunately inadequate, but the result is not altogether improbable, and it may help the reader to realize what "may have been." It must be added that this Servian system is closely connected with the political organization (see ROME, *History*).

Second Stage.—From this Servian army a series of changes which we cannot trace in detail produced the Republican army of conquest. Our ancient authorities ascribe the chief reforms to the half-legendary Camillus (*q.v.*), who introduced the beginnings of pay and long service, improved the armour and weapons, abolished the phalanx and substituted for it an open order based on small subdivisions (maniples), each containing two centuries.

Whatever the truth about Camillus, some such reforms must at some time have been carried through, to convert the Servian system into the army which was engaged for nearly three centuries (from 350 B.C.) in conquering Italy and the world. This army broke in succession the stout native soldiers of Italy and the mountaineers of Spain and overthrew the trained Macedonian phalanx. Once only did it fail—against Hannibal (see PUNIC WARS). But not even Hannibal could oust it from entrenchments, and not even his victories could permanently break its *moral.* Much of its strength lay in the same qualities which made the Puritan soldiers of Cromwell terrible—the excellent character of the common soldiers, the rigid discipline, the high training. Credit, too, must be given to the genius of the Scipios and to the more commonplace capacities of many fairly able generals. But the organism itself deserves attention, and, as it chances, we know much about it, mainly from Polybius. Its elements were three:—

(A) The principal unit was the legion, generally a division of 4500 men—3000 heavy infantry, 1200 lighter-armed (*velites*), 300 horse—though sometimes including as many as 6000 men. The heavy infantry were the backbone of the legion. They were levied from the whole body of Roman citizens who had some private means and who had not already served 16 campaigns, and in effect formed a yeoman force. For battle they were divided into 1200 *hastati*, 1200 *principes* and 600 *triarii*: all had a large shield, metal helmet, leather cuirass, short Spanish thrusting and cutting sword, and in addition the *hastati* and *principes* each carried two short heavy throwing spears (*pila*), while the *triarii* had ordinary long spears (see ARMS AND ARMOUR). They were drawn up in three lines: (1) *hastati*, (2) *principes*, (3) *triarii*; the first two were divided into 10 maniples each (of 120 men, when the legion only counted 4500), the third into 10 maniples of half the strength. According to the ordinary interpretation of our ancient authorities, the maniples were arranged in a chess-board fashion (*quincunx*), the idea being that the front row of maniples could retire through the intervals in the second row without disordering it, and the second row could similarly advance. Recent military writers, however, doubt whether this arrangement can be considered workable, and it is possible that our authorities did not really mean what has been supposed. In any case the procedure in fighting seems to have been simple: the front line discharged a volley of *pila* and rushed in with the short sword—a sequence much like the volley and bayonet charge of the 18th century—and if this failed, the second line went in turn through the same process: the third line of *triarii*, armed with spear instead of *pilum*, was a reserve. The *velites*, armed with javelins, were either broken up among the heavy-armed centuries or used as skirmishers or as aids to the cavalry. The 300 cavalry, however, were (it seems) of little account—a natural result if, as we have reason to think, the horses were small and stirrups were not used. The officers of the legion consisted of: (*a*) Six tribunes, in part elected by the comitia, in part appointed by the consuls, and holding command in rotation. They were either veteran officers, sometimes even ex-magistrates, or young noblemen beginning their career. (*b*) Sixty centurions, each commanding one century, or, rather, a pair commanding each maniple. They were chosen by the tribunes from among the veteran soldiers serving at the time and were arranged in a complicated hierarchy, by means of which a centurion might move upwards till he became *primus pilus*, senior centurion of the first maniple of *triarii*, the chief officer in the legion. (*c*) There were also standard-bearers and other under-officers, for whom reference must be made to specialist publications.



(B) Besides the legions, composed of citizens, the Roman army included contingents from the Italian "allies" (*socii*), subjects of Rome. These contingents appear to have been large: in many armies we find as many *socii* as legionaries, but we are ignorant of details. The men were armed and drilled like the legionaries, but they served not in legions but in cohorts, smaller units of 400–500 men, and their conventional positions seem to have been on the wings of the legions. They were principally infantry, but included also a fairly large proportion of cavalry. Despite their numbers, they do not appear to have ranked with the heavy legionary infantry, and they were probably used more as detachments from the main army than as infantry of the line.

(C) Besides legionaries and *socii*, the Roman army included non-Italian troops of special kinds, Balearic slingers, Numidian horsemen, Rhodians, Celtiberians and others: at Trasimene, for example (217 B.C.), the Roman army included 600 Cretan archers. The numbers of these *auxilia* varied; probably they were not numerous till the latest days of the Republic.

Composition and Size of Armies in the Second Stage.—According to the general practice, each of the two consuls, if he took the field alone, commanded an army of two legions with appropriate *socii*. If the two consuls combined their forces, commanding the joint force in rotation (as often occurred), the total would be—according to our authorities—four legions, each of 4200 infantry, the same number of "allied" infantry (in all 33,600 infantry), 1200 legionary cavalry and about 3600 "allied" cavalry = 38,400 men. Such, for example, was the Roman army at Trebia (218 B.C.), where (says Polybius) there fought 16,000 legionaries and 20,000 allied infantry. The total number of men in the field could be increased; we even hear of 23 legions serving at one time in the Second Punic War. Just before this war, in 225 B.C., the total strength of Rome was reckoned at three-quarters of a million, of which about 65,000 were in the field and 55,000 were in a reserve at Rome; of the total, 325,000 were Roman citizens and 443,000 (apparently a rough estimate) were allies. The battle order in normal circumstances was simple. In the centre stood the legionary infantry: on each side of that was the allied infantry: on the wings the cavalry. But sometimes the legions were held in reserve and the brunt (and honour) of the fight was left to the allies. Sometimes, when the army was a double force, one commander's troops fought and the others lay in reserve. Frequently the attack was begun by one wing, as by Caesar at Pharsalus. At Ilipa in Spain Scipio put his Spanish auxiliaries in the centre, his Roman troops on the wings, and attacked with both wings. The chief command of the army fell (as stated above) to the consul, if present, or, if two consuls acted together, to them in turn. In default of consuls, a proconsul, praetor, or propraetor, in charge of a province, would command.

Development from the Second Stage to the Third.—Towards the end of the Republic many changes began to work themselves out in the Roman army. If Camillus began the system of pay and long service, it was effectually developed by long foreign wars in Spain and in the East. Moreover, the growth of Rome as a wealthy state tended to wreck the old theory that every citizen was a soldier, and favoured a division of labour between (*e.g.*) the merchant and the military, while the increasing complexity of war required a longer training and a more professional soldier. In consequence, the old restriction of legionary service to men with some sort of private property was abolished by Marius about 104 B.C. and the legionaries now became wholly proletariate and professionals. By a second change, also connected with the name of Marius, the legion was reorganized as a body of 6000 men in 60 centuries, divided into 10 cohorts instead of (as hitherto) into 30 maniples; the unit of tactical action thus became a body of 600 instead of 120. This was probably an adaptation within the legion of the system of cohorts already in use for the contingents of the *socii*. Soon after, the extension of the Roman franchise to all Italians converted allies and subjects into citizens, and the *socii* into legionaries. A fourth change abolished the legionary cavalry and greatly increased the *auxilia* (C above). And, finally, the appearance of great military leaders in place of civilian statesmen, and of pretenders to a throne in place of patriots, familiarized the world with the notion of large standing armies commanded by permanent chiefs, and at the same time destroyed discipline and military loyalty.

Third Stage.—The Imperial Army of Defence.—The evils of the Civil Wars (49–31 B.C.) furnished the first emperor, Augustus, with both the opportunity and the necessity for reforming the army. Disorganization had reigned for twenty years. It was needful to restore loyalty and system alike. Augustus did this, as he did all his work, by adapting the past: yet there is some truth in the view of his latest historian, von Domaszewski, that his army reforms were his greatest and most original work. The main lines of his work are simple. The Imperial army consisted henceforward of two classes or grades of troops, about equal in numbers if unequal in importance. The first grade were the legions, recruited from Roman citizens, whether resident in Italy or in the provinces. The second grade was formed by the *auxilia*, recruited from the subjects (not the citizens) of the Empire in the provinces, organized in cohorts and *alae* and corresponding somewhat to both the *socii* and the auxiliaries (B, C above) of the Republican army. There were also in Rome special "household" troops (see PRAETORIANS), and a large body of *vigiles* who were both fire brigade and police.

(A) The legion of the Empire was what Marius had left it—6000 heavy infantry divided into 10 cohorts: Augustus added only 120 horsemen to serve as despatch-riders and the like. The supreme command was no longer in the hands of the six tribunes. According to a practice which had sprung up in the latest Republic it was in the hands of a *legatus legionis*, deputy of the general (now of the emperor, commander-in-chief of the whole army) and a man usually of senatorial rank and position. The six tribunes assisted him, in theory: in practice they were now little more than young men of good birth learning their business or wasting their time. The real officers of the legion were the 60 centurions, men who (at least in the early Empire) generally served up from the ranks, and who knew their work. The senior centurion, *primus pilus*, was an especially important officer, and on retirement frequently became *praefectus castrorum*, "camp adjutant," or obtained other promotion. Below the centurions were under-officers, standard-bearers, *optiones*, clerks and the like. The men themselves were recruited from the body of Roman citizens (though we may believe that birth-certificates were not always demanded). During the 1st century Italy, and particularly north Italy, provided the bulk of the recruits. After A.D. 70, recruiting in Italy for the legions practically ceased and men were drawn from the Romanized towns of the provinces. After Hadrian, each province seems to have supplied most of the men for the legion (if any) stationed in it, and so many sons of soldiers born during service (*castrenses*) flocked to the army that a military caste almost grew up. The term of service was, in full, twenty years, at least in theory, but recruiting was voluntary and when men were short discharges were often withheld. On discharge the ex-legionary received a bounty or land: many *coloniae* (municipalities) were established in the provinces by certain emperors for the special purpose of taking discharged veterans—according to a custom of which the first instances occur in the latest Republican age. On the whole, the legionary was still the typical "Roman" soldier. If he was no longer Italian, he was generally of citizen birth and always of citizen rank, and his connexion with the Empire and the government was real. Each legion bore a title and a number (*e.g.* II. Augusta, III. Gallica). The custom of using such titles and numbers can be detected sporadically in the latest Republic, and many titles and numbers then borne by legions passed on into the Empire with the legions themselves. As Augustus gradually became master of the world, he found himself with three armies, his own and those of Lepidus and Antony; from the three he chose certain legions to form his new standing army, and he left these with the titles and numbers which they had previously borne, although that concession resulted in three legions numbered III. and two numbered IV., V., VI. and X. respectively. Similar titles and numbers were given to legions raised afterwards either to fill up gaps caused by disaster or to increase the army. Here, as elsewhere in the Roman and above all in the Augustan system, precedent defied logic.

(B) Besides the legions Augustus developed a new order of *auxilia*. Auxiliaries (as is said above) had served occasionally in the Republican armies since about 250 B.C., and in the latest Republic large bodies of them had been enlisted in the armies of contending generals. Thus Caesar in Gaul enrolled a division of native Gauls, free men but not citizens of Rome, which ranked from the first in all but legal status as a legion, the "Alaudae," and in due course was formally admitted to the legionary list (legio V.). But this use of non-citizens had been limited in extent and confined in normal circumstances to special troops such as slingers or bowmen. This casual practice Augustus reduced, or rather extended, to system, following in many details the scheme of the Republican *socii* and veiling the novelty under old titles. Henceforward, regiments of infantry (*cohortes*) or cavalry (*alae*), 500 or 1000 strong, were regularly raised (apparently, by voluntary recruiting) from the non-citizen populations of the provinces and formed a force almost equal in numbers (and perhaps ultimately much more than equal) to the legions. The men who served in these units were less well paid and served longer than the legionaries; on their discharge they received a bounty and the Roman franchise for themselves and wife and children. They were commanded by Roman *praefecti* or *tribuni*, and were no doubt required to understand Roman orders; they must have generally become Romanized and fit for the citizenship, but they were occasionally (at least in the 1st century A.D.) permitted to retain tribal weapons and methods of fighting and to serve under the command of tribal leaders, who were at once their chiefs and Roman officers. These auxiliaries provided both the whole of the archers, &c., and nearly the whole of the cavalry of the army; they also included many foot regiments. A peculiar arrangement (to which no exact parallel seems to occur in any other army) was that a cohort of 500 men might include 380 foot and 120 horse and a cohort of 1000 men or 760 foot and 240 horse (*cohors equitata*), and an *ala* might similarly include a proportion of foot (*ala peditata*). Each regiment bore a number and a title, the latter often derived from the officer who had raised the corps (*ala Indiana*, raised by one Julius Indus) or, still more often, from the tribe which supplied the first recruits (*cohors VII. Gallorum*, *cohors II. Hispanorum* and the like). To what extent recruiting remained territorial is uncertain: after the 1st century, probably, the territorial names meant in most cases very little. The total number of the auxiliary regiments probably varied from time to time and can at present hardly be guessed.

Composition of Armies and Distribution of Troops in the Third Stage.—If the system of legions and *auxilia* in the early Empire was novel, the use made of them was no less so. The latest Republic offers to the student the spectacle of large field armies, and though it also reveals a counter tendency to assign special legions to special provinces, that tendency is very feeble. Augustus ended the era of large field armies: he could, indeed, leave no such weapons for future pretenders to the throne. By keeping the Empire within set frontiers, he developed the counter tendency. That policy exactly suited the military position in his time. The early Roman Empire had not to face—as Britain or France or Germany might have to face to-day—the danger of a war with an equal enemy, needing the mobilization of all its national forces. From Augustus till A.D. 250 Rome had no conterminous foe from whom to fear invasion. Parthia, her one and dangerous equal, was far away in the East and little able to strike home. Elsewhere, her frontiers bordered more or less wild barbarians, who might often harass, but could not do serious harm. To meet this there was need, not of a strong army concentrated in one or two cantonments, but of many small garrisons scattered along each frontier, with a few stronger fortresses to act as military centres adjacent to these garrisons.

Accordingly, a system grew up under Augustus and his immediate successors whereby the whole army was distributed along the frontiers or in specially disorderly districts (such as N.W. Spain) in permanent garrisons. On the actual frontiers and on the chief roads leading to them were numerous cohorts and *alae* of auxiliaries, garrisoning each its own *castellum* of 3–7 acres in extent. Close behind the frontiers, or even on them, were the twenty-five legions, each (with a few exceptions of early date) holding its own fortress (*castra stativa* or *hiberna*) of 50–60 acres. Details varied at different times. Sometimes, where no Rhine or Danube helped, and where outside enemies were many, the frontier was further fortified by a continuous wall of wooden palisades (as in part of Germany, see Limes) or of earth or stone (as in Britain, see article Britain, Roman), or the boundary might be guarded by a road patrolled from forts planted along it (as in part of Roman Africa). The result was a long frontier guard covering Britain, and Europe from the German Ocean to the Black Sea, and the upper Euphrates valley, and the edge of the Sahara south of Tunis and Algeria and Morocco, while the wide Empire behind it was little troubled by the presence of soldiers.

The following table shows the disposition of the legions about A.D. 120 and for many decades subsequently. It would be impossible, even if space allowed, to add the auxiliaries, since the details of their distribution are too little known. But it may be in general assumed that the total number of auxiliaries in any province was little less, and probably rather greater, than the number of legionaries, and the sizes of the various provincial armies can thus be calculated roughly. Thus Britain was held probably by 35,000–40,000 men. Each provincial army was commanded either by the governor of the province or (in a few exceptional cases) by the senior *legatus* of the legions stationed there:—

Britain	II.	Augusta (*Isca Silurum*, now Caerleon).
,,	VI.	Victrix (*Eburacum*, York).
,,	XX.	Valeria Victrix (*Deva*, Chester).
Lower Germany (=lower Rhine)	I.	Minervia (*Bonna*, Bonn).
,, ,,	XXX.	Ulpia Victrix (*Vetera*, Xanten).
Upper Germany	XXII.	Primigenia (*Moguntiăcum*, Mainz).
,,	VIII.	Augusta (*Argentorate*, Strassburg).
Pannonia (Danube to Semlin)	X.	Gemina (*Vindobona*, Vienna).
,, ,,	XIV.	Gemina (*Carnuntum*, Petronell).
,, ,,	I.	Adiutrix (*Brigetio*, near Komorn).
,, ,,	II.	Adiutrix (*Aquincum*, near Budapest).
Upper Moesia (Middle Danube)	IV.	Flavia (*Singidūnum*, Belgrade).
,, ,,	VII.	Claudia (*Viminacium*, Kostolac).
Dacia (now Transylvania)	XIII.	Gemina (*Apulum*, Karlsburg).
Lower Moesia (Lower Danube)	I.	Italica (*Novae*, Sistov).
,, ,,	XI.	Claudia (*Durostorum*, Silistria).
,, ,,	V.	Macedonica (*Troesmis*, Iglitza).
Asia Minor (Cappadocia)	XV.	Apollinaris (*Satala*, Armenian frontier).
,, ,,	XII.	Fulminata (*Melitene*, on upper Euphrates).

Syria	XVI.	Flavia (*Samosata*, on upper Euphrates).	
"	IV	Scythica	near Antioch (?).
"	VI.	Ferrata	
"	III.	Gallica	
Judaea	X.	Fretensis (Jerusalem).	
Arabia	III.	Cyrenaica (*Bostra*).	
Egypt	II.	Trajana (near Alexandria—a disorderly city).	
Africa	III.	Augusta (*Lambaesis*).	
Spain	VII.	Gemina (*Legio*, Leon, in N.W. Spain).	

The total of legionaries may be put at about 180,000 men, the auxiliaries at about 200,000. If we exclude the "household" troops at Rome, the police fleets on the Mediterranean, and the local militia in some districts, we may put the regular army of the Empire at about 400,000 men. This army, as will be plain, was framed on much the same ideas as the British army of the 19th century. It was meant not to fight against a first-class foreign power, but to keep the peace and guard the frontiers of dominions threatened by scattered barbarian raids and risings. Field army there was none, nor any need. If special danger threatened or some special area was to be conquered—such as southern Britain (A.D. 43) or a little land across the upper Rhine (A.D. 74)—detachments (*vexillationes*) were sent by legions and sometimes also by auxiliaries in adjacent provinces, and a field force was formed sufficient for the moment and the work.

Change from the Third Period to the Fourth.—Two principal causes brought gradual change to the Augustan army. In the first place, the *pax Romana* brought such prosperity to many districts that they ceased to provide sufficient recruits. The Romans, like the British in India, had more and more to look to uncivilized regions and even beyond their borders. Hence comes, in the 2nd century and after, a new class of *numeri* or *cunei* or *vexillationes* who used (like the earlier auxiliaries) their national arms and tactics and imported into the army a more and more non-Roman element. This tendency became very marked in the 3rd century and bore serious fruit at its close. And, secondly, the old days of mere frontier defence were over. The barbarians began to beat on the walls of the Empire as early as A.D. 160: about A.D. 250 they here and there got through, and they came henceforward in ever-growing numbers. Moreover, they came on horseback, bringing new tactics for the Roman infantry to face, and they came in huge masses. We may doubt if any military system could have permanently stayed this astonishing torrent. But the Empire did what it could. It enlisted barbarians to fight barbarians, and added freely—too freely, perhaps, if there was any choice—to the non-Roman elements of the army. It increased its cavalry and began to form a distinct field force.

Fourth Period.—The results are seen in the reforms of Diocletian and Constantine the Great (A.D. 284–*circa* 320). New frontier guards, styled *limitanei* or *riparienses*, were established, and the old army was reorganized in field forces which accompanied or might accompany the emperors in war (*comitatenses*, *palatini*). The importance of the legions dwindled; the chief soldiers were the mercenaries, mostly Germans, enlisted from among the barbarians. New titles now appear, and it becomes plain even to the casual reader that in many points the new order is not the old. The details of the system are as complicated as all the administrative machinery of that age. Here it is enought to point out that the significance of such officers and titles as the *dux* and the *comes* (duke, count) lies ahead in the history of the middle ages, and not in the past, the history of the Roman army itself.

War Office, General Staff.—Under the Republic we do not find, and indeed should not expect to find, any central body which was especially entrusted with the development of the army system or military finance or military policy in wars. Even under the Empire, however, there was no such organization. The emperor, as commander-in-chief, and his more or less unofficial advisers doubtless decided questions of policy. But the army was so much a group of provincial armies that much was left to the chief officers in each province. Here, as elsewhere in the Empire, we trace a love if not for Home Rule, at least for Devolution. There was, however, a central finance office in Rome for the special purpose of meeting the bounties (or equivalent) due to discharged soldiers. This was established by Augustus in A.D. 6 with the title *aerarium militare*, and had, for receipts, the yield of two taxes, a 5% legacy duty and a 1% on sales (or perhaps only on auction-sales). The legacy duty did not touch legacies to near relations or legacies of small amount.

Bibliography.—Liebenam, "Exercitus," in Pauly-Wissowa, *Realencyclopädie*; Von Domaszewski, in Mommsen-Marquardt's *Handbuch der römischen Altertümer* (2nd ed., Leipzig, 1884), vol. v, pp. 319–612; H. Delbrück, *Geschichte der Kriegskunst*, vol. i., 2nd ed. (Berlin, 1907); E. Lammert, "Die Entwicklung der römischen Taktik," in *Neue Jahrbücher für das klassische Altertum*, ix. 100–28, 169–87; Cagnat's article "Legio" in Daremberg and Saglio, *Dictionnaire des antiquités grecques et romaines*; E. G. Hardy, *Studies in Roman History* (London, 1906–9); Th. Mommsen, "Das römische Militärwesen seit Diocletian," in *Hermes*, xxiv. 195–279.

(F. J. H.)

ROMAN ART. (1) *Introductory: History of Recent Research.*—The scientific study of ancient Roman art dates from a comparatively recent period. The great artists of the Renaissance, headed by Raphael and Michelangelo, showed no lack of appreciation for such models as the bas-reliefs of Trajan's Column; and it is sufficient to name Mantegna's "Triumph of Caesar" in order to recall the influence exerted by Roman historical sculpture upon their choice and treatment of monumental subjects; but their eyes were fixed on the Greek ideal, however imperfectly represented by monuments then accessible, and the supremacy of this standard became established beyond challenge. In the 18th century Winckelmann, the founder of the science of classical archaeology, directed the gaze of students and critics towards the glories of classical Greek art, which he divined behind the copies which filled the palaces and museums of modern Rome;[1] and the rediscovery of the extant remains of that art, which began early in the 19th century and still continues, has naturally absorbed the attention of the great majority of classical archaeologists. Nevertheless, towards the close of the 19th century, when the main lines of Greek artistic development had been firmly traced and interest was aroused in its later offshoots, critics were led to examine more closely the products of the Roman period. As early as 1874 Philippi had published a study of Roman triumphal reliefs;[2] but his intention was to show that they were derived from the paintings exhibited on the occasion of a triumph—a theory which can no longer be maintained—and not to determine their place in the history of art. In 1893, however, Alois Riegl published a series of essays on the history of ornament under the title of *Stilfragen*, in one of which he expressed the opinion that "there was in the antique art of the Roman Empire a development along the ascending line and not merely a decadence, as is universally believed." This thesis was taken up two years later by Franz Wickhoff in a preface contributed to the reproduction in facsimile of the illustrated MS. of Genesis in the imperial library at Vienna. Wickhoff contended that, whilst the art of the Augustan period was the culmination of that which had flourished under the Hellenistic monarchies, it was succeeded by an outburst of genuinely Roman artistic effort, which reached the height of its achievement in the reliefs and portrait-sculpture of the Flavian period, and gave birth in the 2nd century A.D. to the monuments of the "continuous" style of representation exemplified by the imperial columns. Wickhoff's work has become familiar to English readers through Mrs Strong's excellent translation, with copious illustrations, which appeared in 1900; in the following year Riegl published the first (which, by reason of his untimely death, remains the only) volume of his *Late Roman Industrial Art in Austria and Hungary*, in the opening chapters of which he endeavours to show that the later transformations of Roman art in the 2nd and succeeding centuries after Christ continue to mark a definite advance. On the other hand, the originality of Roman art under the Empire was called in quesion by Josef Strzygowski, whose first important work on the subject, *Orient oder Rom*, appeared in 1901. Strzygowski holds that even in the imperial period, Rome was receptive rather than creative; that what is termed "Roman imperial art" is in reality the latest phase of Hellenistic art, whose chief centres are to be sought in Asia Minor, Syria and Egypt; and that this late Hellenistic art was itself gradually transformed by the invading spirit of the East into that Byzantine art which is half Greek and half Oriental, but wholly un-Roman. The problem thus stated will presently be discussed; in the meantime it is to be noted that the principal monuments which fall within our province have been at length rendered accessible to students by a series of adequate reproductions. In sculpture, the reliefs of Trajan's Column have been published by Cichorius, and those of the column of Marcus Aurelius by Petersen and others; in metalwork, the treasure of Bosco Reale has been reproduced in the *Monuments Piot*, and that of Hildesheim has been published by the authorities of the Berlin Museum; a series of reproductions, including all the important examples of Roman painting, is issued by the firm of Bruckmann under the supervision of Paul Herrmann; and the ancient paintings preserved in the Vatican library, which include some of the most famous examples of the art, were published and described by Dr Nogara in 1907. The discussion of the date to be assigned to the Trophy of Trajan at Adam-Klissi in the Dobruja, initiated by Adolf Furtwängler, has led to a closer study of the remains of Roman provincial art; and the discovery of the foundations of the Ara Pacis Augustae at Rome, together with additional remains of its sculptured decoration, has given an impulse to the study of Roman historical monuments. In this field important contributions to knowledge have been made by members of the British school at Rome, which will be noticed below. Finally, the history of Roman sculpture has for the first time been systematically and comprehensively treated by Mrs Strong in a handbook whose copious and well-chosen illustrations add greatly to its value. Thus the necessary equipment has been furnished for students of the problem presented by Roman art.

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[1] The eleventh book of Winckelmann's *Geschichte der Kunst*, which deals with art under the Romans, contains notable proofs of the author's sureness of vision; for example, he divined the true date and affinities of the reliefs in the Villa Borghese, afterwards wrongly attributed to the time of Claudius (see below).

[2] "Über die römischen Triumphalreliefs und ihre Stellung in der Kunstgeschichte" (*Abhandlungen der sächs. Gesellsch. der Wissenschaften*, vi., 1874).

(2) *National Roman Art; Landmarks of its History.*—It is impossible to speak of a specifically Roman national art until we approach the latest period of Republican history. The germs of artistic endowment which existed in the Roman character were not developed until her political institutions were matured and her supremacy in the Mediterranean established. Up to that time such works of art as were produced in, or imported into, Rome were without exception Greek or Etruscan. Both in Etruria and in Latium Greek artists were commissioned to decorate the temples in which wood and terra-cotta took the place of the marble which Greece alone could afford to use. In 496 B.C., according to tradition, two Greek artists, Damophilos and Gorgasos, decorated the temple of Ceres, Liber and Libera with paintings and sculpture; when the temple was restored by Augustus their terra-cotta reliefs were carefully removed and framed.[1] But most of the early sculpture preserved in Rome doubtless belonged to the "Tuscan" school, whose works Pliny[2] quotes as evidence that there was an art of statuary native to Italy. It is true that Etruscan art was dependent for its motives and technique on Greek models; but in its portraiture—notably in the reclining figures which adorn Etruscan sarcophagi—we can trace the uncompromising realism and close attention to detail which are native to Italian soil; the fragments of temple-sculptures which have been preserved are of less value, since, if not the work of Greeks, they are entirely Greek in conception. Roman portraiture undoubtedly continues the Etruscan tradition. It was a common custom in Etruria to decorate the urn containing the ashes of the dead with a lid in the form of the human head (such urns are called *canopi*), and the same desire to record the features of the departed produced the waxen masks, or *imagines*, which were preserved in the houses of the Roman aristocracy. In architecture, too, Roman builders learnt much from their Etruscan neighbours, from whom they borrowed the characteristic form of their temples, and perhaps also the prominent use of the arch and vault. But the stream of Etruscan influence was met by a counter-current from the south, where the Greek colonies in Campania provided a natural channel by which Hellenic ideas reached the Latin race; and Roman architects soon abandoned the purely Etruscan type of temple for one which closely followed western Greek models. The conquests of the later Republic, however, brought them into more direct contact with the art of Greece proper. Beginning from 212 B.C., when Marcellus despoiled Syracuse of its principal statues, every victorious general adorned his triumph with masterpieces of Greek art, whether of sculpture or of painting, and, when Philhellenism became the ruling fashion at Rome, wealthy connoisseurs formed private collections drawn from the Greek provinces—Greek craftsmen, moreover, were employed in the decoration of the palaces of the Roman nobles and capitalists, which scarcely differed from those of the great Hellenistic cities. Except in portraiture, there was nothing characteristically Roman in the art which flourished in Rome in the time of Caesar and Cicero. But the remains of an altar, preserved partly at Munich and partly in the Louvre (Plate II. fig. 10), which is believed with good reason to have been set up by Cn. Domitius Ahenobarbus shortly before 30 B.C., furnish an early example of the historical, or, to speak more exactly, commemorative art, to whose development the Empire gave so powerful an impulse. On the one face of the altar we find a Greek subject—the marriage of Poseidon and Amphitrite,—on the other a Roman sacrifice, the *suovetaurilia*, with other scenes from the life of the army. Augustus enlisted art, as he did literature, in the service of the new order. The remarkable technical dexterity which characterizes all forms of art in this period—silver plate and stucco decoration, as well as sculpture in the round or in relief—is purely Greek; but the form is filled with a new content. For Augustus determined to enlist art as well as literature in the service of the new régime, and this purpose was served not only by public monuments, such as the Ara Pacis Augustae (Plate II. figs. 11–13), but by the masterpieces of the silversmith's and gem-engraver's art (Plate VII. figs. 32–37). In the art, as in the literature of the Augustan age, classicism was the dominant note, and the naturalism so congenial to the Italian temperament was repressed, though never extinguished. The result of this was that under the Julio-Claudian dynasty academic tradition filled the place of inspiration, and Roman art failed to discover its vocation. A change came under the Flavian emperors. The painters who decorated with fairy landscapes the walls of Roman palaces, untrammelled by the conventions of official art, introduced into Rome a summary method of working, which has much in common with that of the modern impressionist school; and the sculptors of the Flavian period laid to heart the lesson taught by their successful "illusionism" (to borrow Wickhoff's term). We shall see that this is true of all forms of sculpture—historical sculpture, portraiture and decorative ornament; and we are entitled to rank this Flavian art as the specific creation of imperial Rome, whatever may have been the precise nationality of the individual workers who adorned the new capital of the world. But this phase was of short duration; and the Roman spirit, which in harmony with that of Greece had produced such brilliant results, triumphed under Trajan and found its characteristic expression in the "epic in stone" with which his column is adorned. Wickhoff claims the "continuous"

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[1] *H.N.* xxxv. 154.

[2] *H.N.* xxxiv. 34; cf. 43; and see *Quint.* xii. 10, 1.

style in which the artist recounts the Dacian campaigns of Trajan as a creation of the Roman genius. We shall see that the term is not altogether a happy one; but there is good reason (as will be shown below) for the belief that the designer of the column, however profoundly influenced in his selection of motives and in his composition of individual scenes by Greek tradition, nevertheless worked out his main principles for himself. The realism of the Roman is shown in the minute rendering of details, which makes the reliefs a priceless source of information as to military antiquities. Historical art achieved no less a triumph in the great frieze from Trajan's Forum (Plate II. fig. 16), and in the panels of the arch at Benevento. Imposing as these works are, they suffer from the defects incidental to an art which endeavours to express too much. Overcharged with detail, and packed with meanings which reveal themselves only to patient study, they lack the spacious and reposeful character of Greek art; while, if we regard only their decorative function, we must admit that the excess of ornamental surface mars the effect of the buildings which they adorn. Along the path thus marked out, Roman art continued to progress; it is true that under the influence of Hadrian there was a brief renaissance of classicism which gave birth to the idealized type of Antinous, and to certain eclectic works which belong to Greek rather than to Roman art; but the historical reliefs which survive from the Antonine period, and more especially the sarcophagi, which reproduce scenes of Greek mythology with a close adherence to the letter but a fresh artistic spirit, show that the new leaven was at work. The main fact underlying the changes of the time was the loss of the true principles of plastic art, which even in Hellenistic times had become obscured by the introduction of pictorial methods into relief-sculpture. Colour, rather than form, now took the highest place in the gamut of artistic values. Painting, indeed, so far as our scanty knowledge goes, was not practised with conspicuous success; but the art of mosaic was carried to an extraordinary degree of technical perfection; and in strictly plastic art the choice of material was often determined by qualities of colour and transparency. For example, porphyry, basalt and alabaster of various hues were used by the sculptor in preference to white marble; and new conventions, such as the plastic rendering of the iris and pupil of the eye, were dictated by the ever-growing need for contrasts of light and shadow. This great revolution in taste has been traced, and doubtless with justice, to the permeation of the Graeco-Roman world of the 2nd century by oriental ideas. The East has always preferred colour to form, and richness of ornament to significance of subject; and in art, as in religion, the West was now content to borrow. Roman official art, however, continued to produce the historical monuments which the achievements of the time demanded; but the principles of figure-composition were less fully grasped. The reliefs of the Aurelian Column form a less intelligible series than those of the Column of Trajan; and the panels of the Arch of Septimius Severus, with their bird's-eye perspective, have not inaptly been compared to Flemish tapestries. The extravagance and pomp of the dynasty founded by Septimius Severus filled Rome with such works as the art of the time could produce; and the busts of Caracalla show that in portraiture Roman craftsmen retained their cunning. Even during the anarchy which followed masterpieces such as the portrait of Philip the Arabian were produced; and during the reign of Gallienus (A.D. 253–268), which saw the dismemberment of the Empire, there was a noteworthy outburst of artistic activity, whose products are seen in the naturalistic portraits of the emperor and the court.[1] But by the close of the 3rd century a further transformation had taken place, which coincided with the political revolution by which the absolute monarchy of Diocletian succeeded to the principate of Augustus. The portraits of Constantine and his house can no longer be termed naturalistic; they are monumental, both in scale and in conception, and, above all, their rigid "frontality" carries us back at a bound to the primitive art of the East. The classical standard set by the Greek genius had ceased to govern art, although the fund of types which Hellenism had created still furnished subjects to the artist, or was made the vehicle by which the new ideas derived from Christianity were expressed. The Roman spirit was still strong enough to maintain that interest in the human form and the representation of dramatic events which was lacking in the Oriental; but in the monuments of the Constantinian period, such as the narrow friezes of the Arch of Constantine, we can see nothing but the work of artists who had lost touch with true plastic principles, in spite of the ingenious arguments adduced by Riegl. If we are to seek for signs of progress, it must be rather in the domain of architecture, which had never ceased to make advances in dealing with the spatial and constructive problems presented by the great building works of the Empire; it was now called upon to face a fresh task in providing Christians with a fit place for public worship. In the solution of this problem the architects of the 4th century showed a wonderful fertility of resource; but to describe their achievements would be to pass the confines of Roman art in the proper sense of the word.

(3) *Individual Arts.* (*a*) *Architecture.*—This branch of the subject may be studied in the article ARCHITECTURE, and illustrations will be found in other articles (CAPITAL; COLUMN; ORDER; TRIUMPHAL ARCH; &c.). Architecture, regarded as a fine art, had been brought by the Greeks to the highest perfection of which it was capable under the limitations which they imposed upon themselves. The Greek temple appeals to the aesthetic sense by the simplicity and harmony of its proportions as well as by the rational correspondence between function and decoration in its several members. On these lines there was no room for progress. It is true that the Etruscans modified the type of the Greek temple and profoundly influenced Roman construction in this respect. The Etruscan temple was not approached on all sides by a low flight of steps, but raised on a high platform (*podium*) with a staircase in the front; it was broad in proportion to its depth, indeed, in many cases, square; and the temple itself (*cella*) was faced by a deep portico, which often occupied half the platform. Moreover, as the use of marble for building was unknown in early Italy, wood was employed in construction and terra-cotta in decoration, and this change of material led to a wider spacing of the columns than was possible in Greece. But these alterations in the system of proportions were disadvantageous to aesthetic effect; and the Romans—though they soon ceased (under the influence of the western Greeks) to build temples of purely "Tuscan" type—preserved certain of their features, such as the high platform and deep portico (see ARCHITECTURE, fig. 26). Nor can we regard as felicitous the design of certain Roman temples, such as that of Concord overlooking the Forum, and the supposed temple of Augustus (see ROME), which have a broad front (approached in the temple of Concord by a central portico) and narrow sides. The great temples of the Empire were (in general) inspired by Greek models, and need not therefore concern us; but we may notice Hadrian's peculiar design for the double temple of Venus and Rome, with twin *cellae* placed back to back. To the orders (see ORDER) of Greek architecture the Etruscans added the "Tuscan," a simplified Doric, of which an early example has been found at Pompeii, enclosed within the wall of the Casa del Fauno.[2] This column, which can scarcely be later than the 6th century B.C., has a smooth shaft with pronounced entasis, a heavy capital with a scotia between abacus and echinus, and a plain circular base. To the Romans we owe the "Composite" order, so called because it contains features distinctive of the Corinthian and Ionic orders (see ORDER, fig. 14). It is really a variety of the Corinthian, with Ionic volutes inserted in the capital; the earliest known example of its use is seen in the Arch of Titus. The Romans, moreover, made frequent use of the figured capital, which, as

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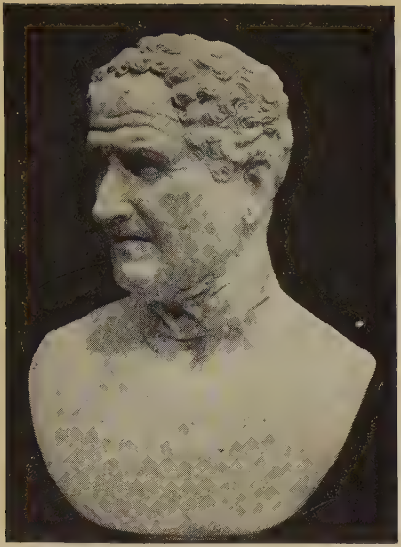
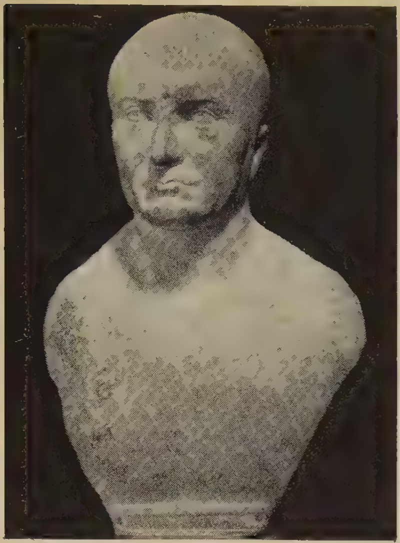
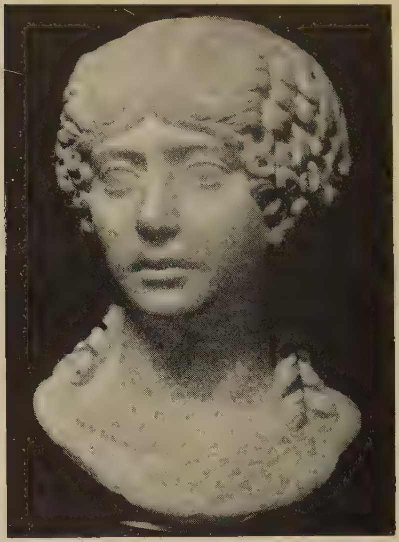
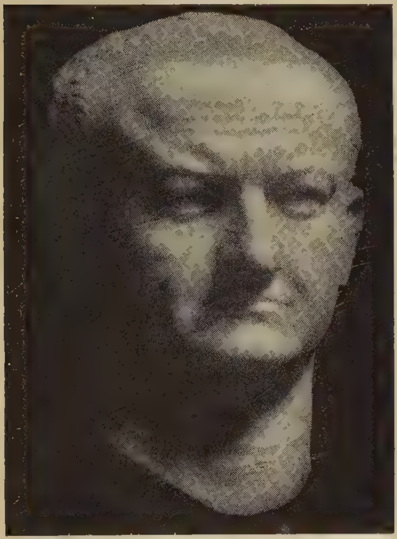
[1] It is very remarkable that the coin-portraits of the Gallic usurper Postumus (A.D. 258–68) are executed in precisely the same style; the coins were struck either at Trier or at Cologne.

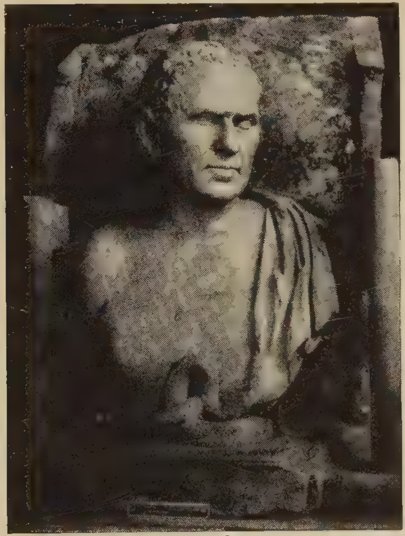
[2] *Römische Mitteilungen* (1902), pl. vii.

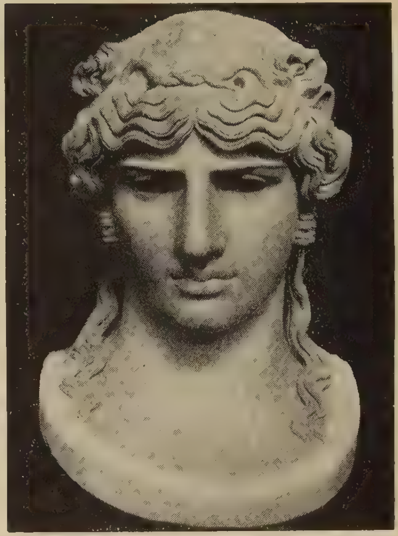

Photo, Alinari.
FIG. 1.—DOMITIUS AHENOBARBUS (SO CALLED).


Photo, Anderson.
FIG. 2.—SCIPIO AFRICANUS (SO CALLED).


Photo, Alinari.
FIG. 3.—UNKNOWN WOMAN.


Photo, Alinari.
FIG. 4.—VESPASIAN.


Photo, F. Bruckmann, Munich.
FIG. 5.—UNKNOWN PHYSICIAN.


Photo, Giraudon.
FIG. 6.—ANTINOÜS.

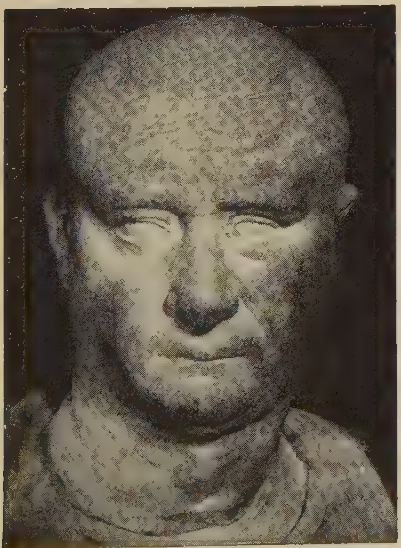
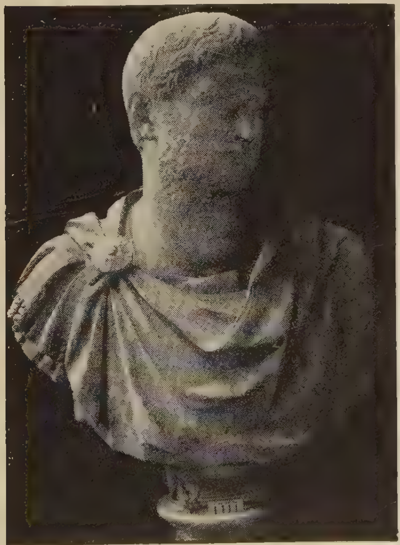
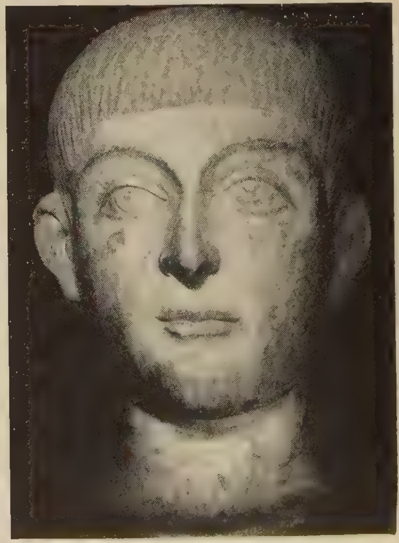
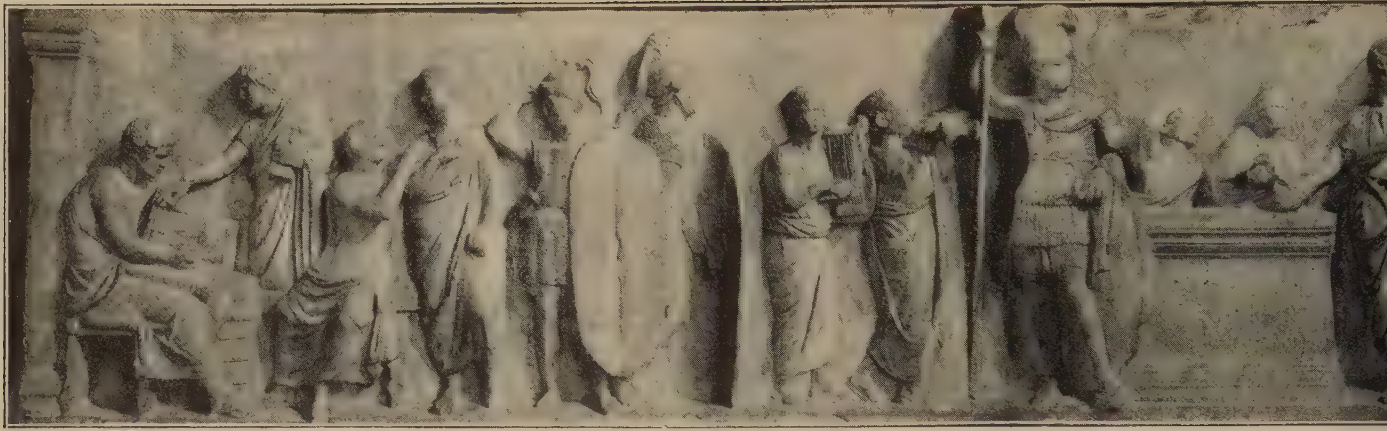


Photo F. Bruckmann, Munich.
FIG. 7.—UNKNOWN ROMAN.

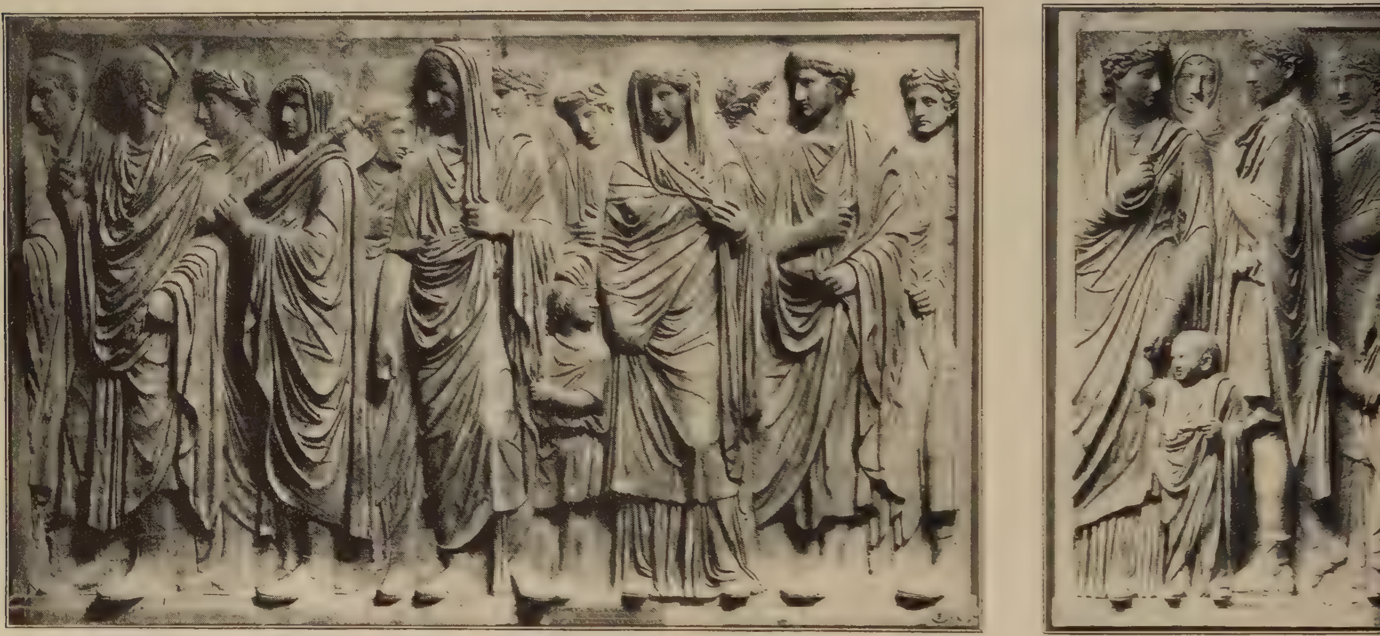

Photo, Giraudon.
FIG. 8.—GALLIENUS.


Photo, F. Bruckmann, Munich.
FIG. 9.—UNKNOWN MAN (4TH CENTURY).



Photo, Giraudon.

FIG. 10.—ALTAR OF



AUGUSTUS AND THE ROYAL FAMILY.

CLAUD

FIGS. 11–13.—PORTIONS OF THE DE

By permission of the Ita

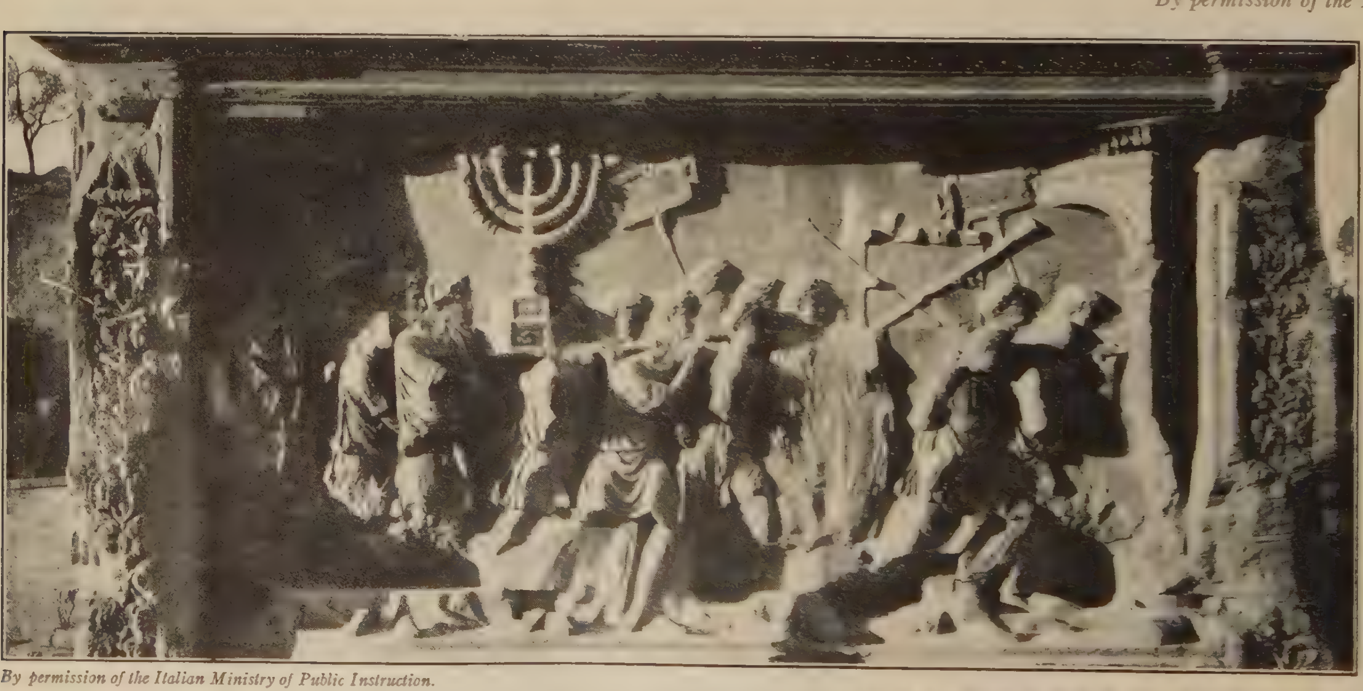


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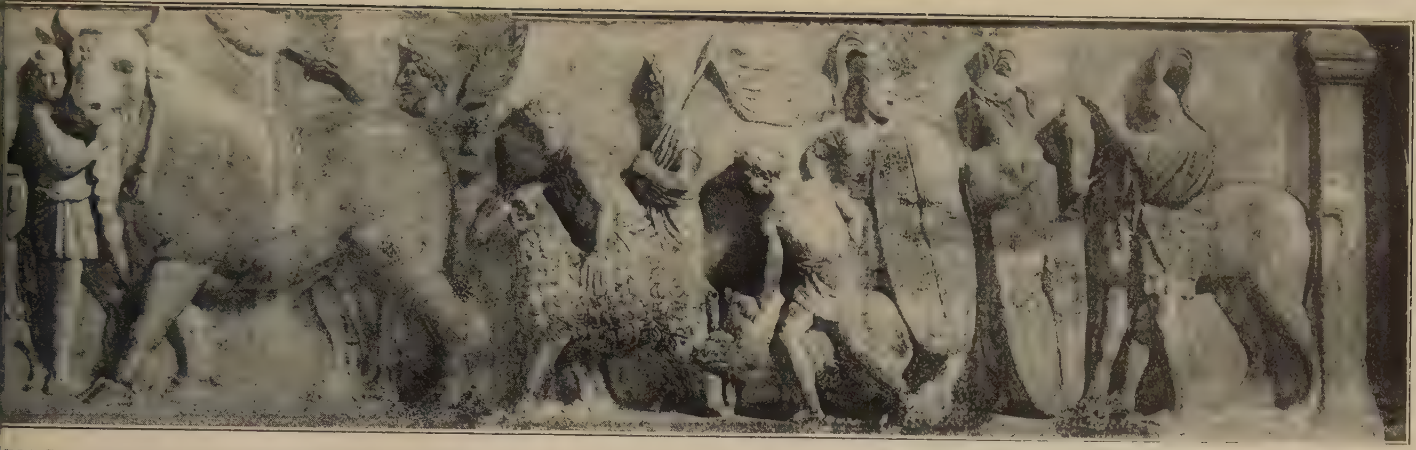
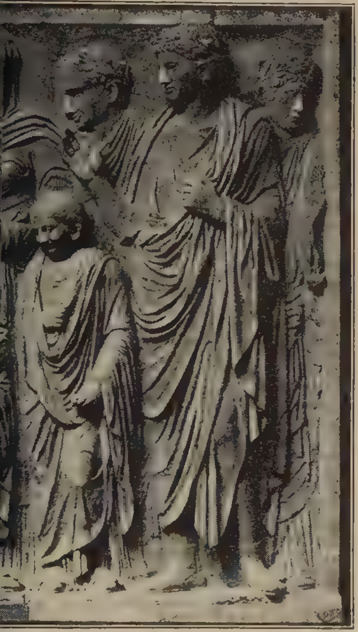
FIG. 14.—RELIEF FROM THE ARCH OF TITUS: TRIUMPH OF TITUS AND THE SPOILS OF JERUSALEM.



TIUS AHENOBARBUS.



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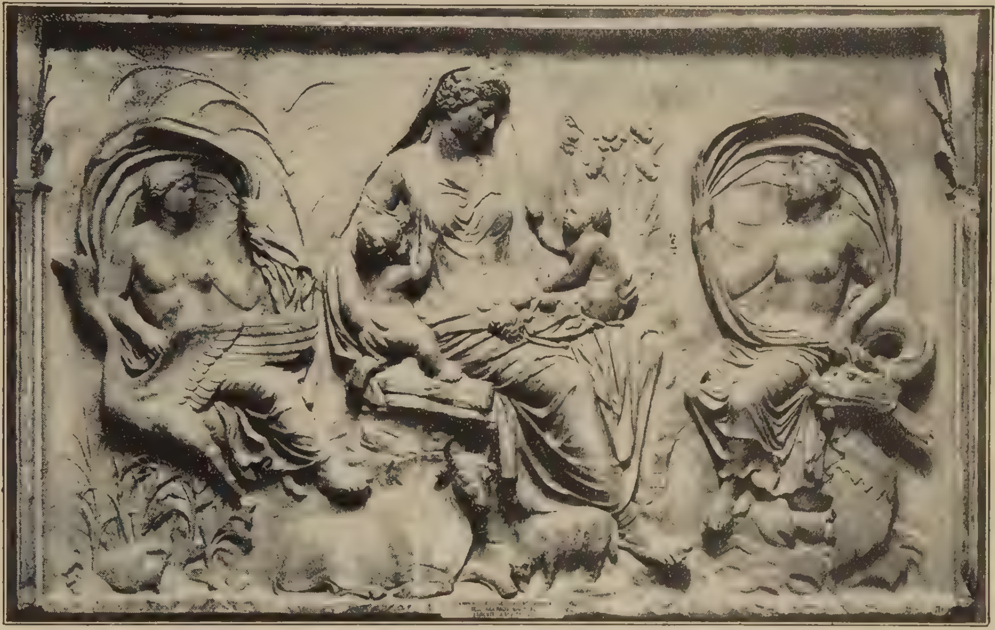

THE EARTH GODDESS AND THE SPIRITS OF AIR AND WATER.

ON OF THE ARA PACIS AUGUSTAE.
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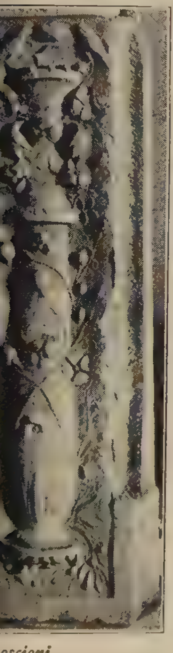

oscioni.
5.—PILASTER.

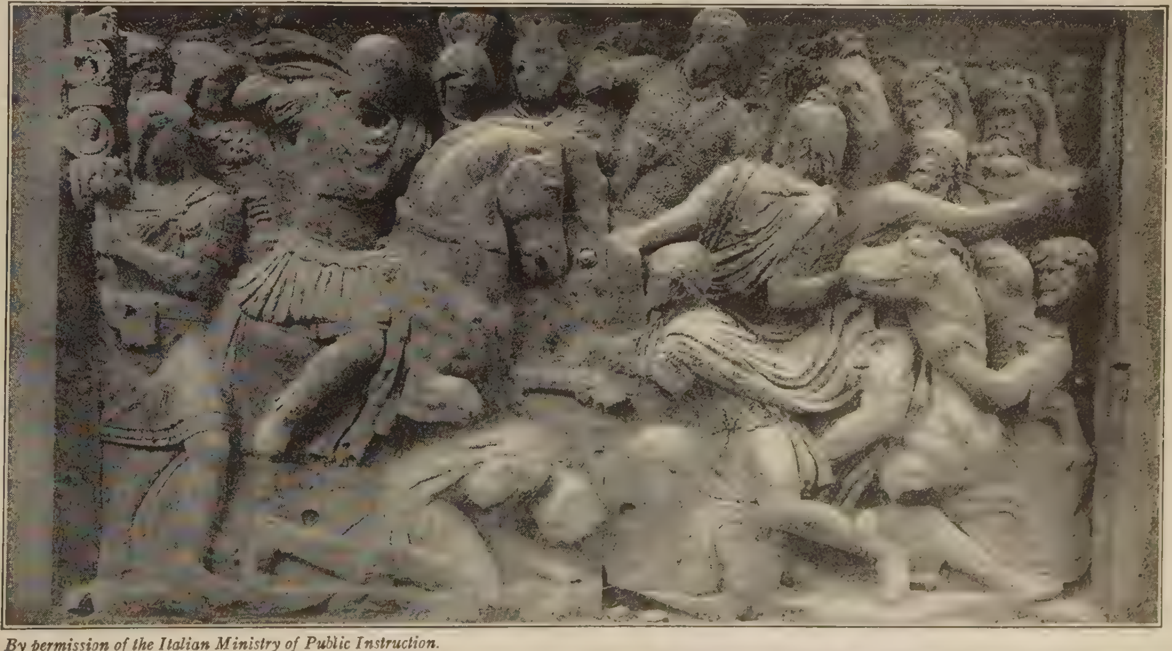

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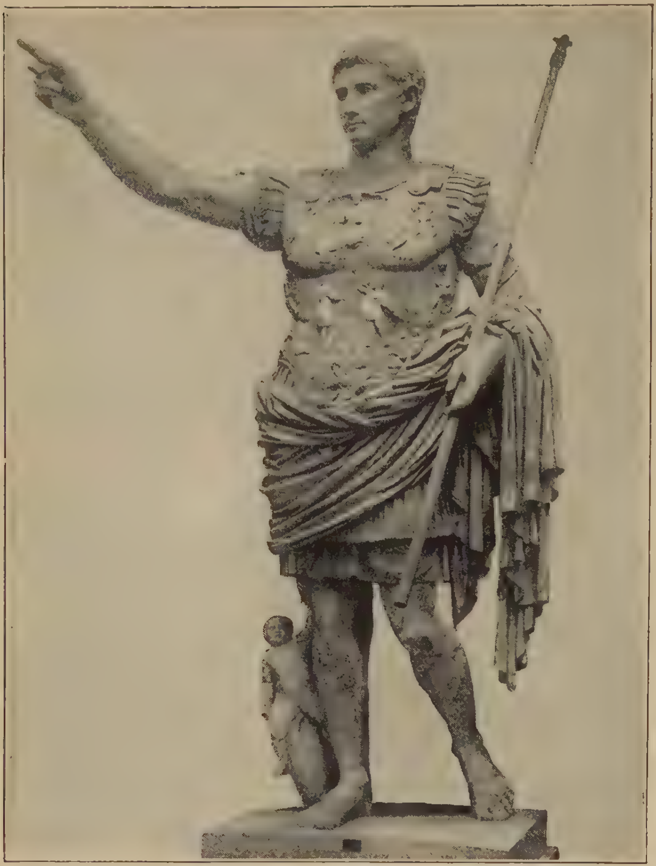
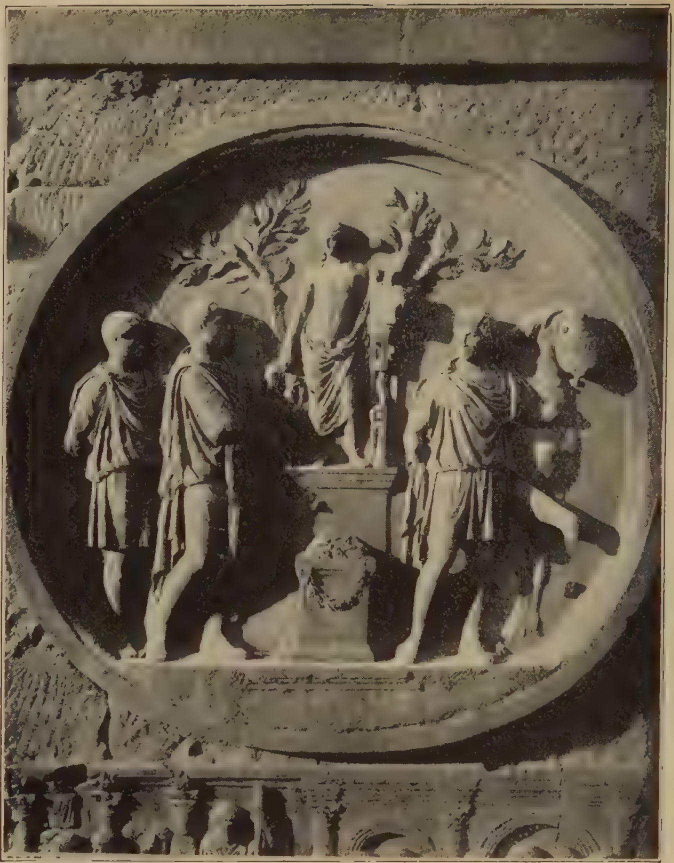
FIG. 16.—RELIEF FROM THE ARCH OF CONSTANTINE: ROMAN CAVALRY CHARGE.

ROMAN ART



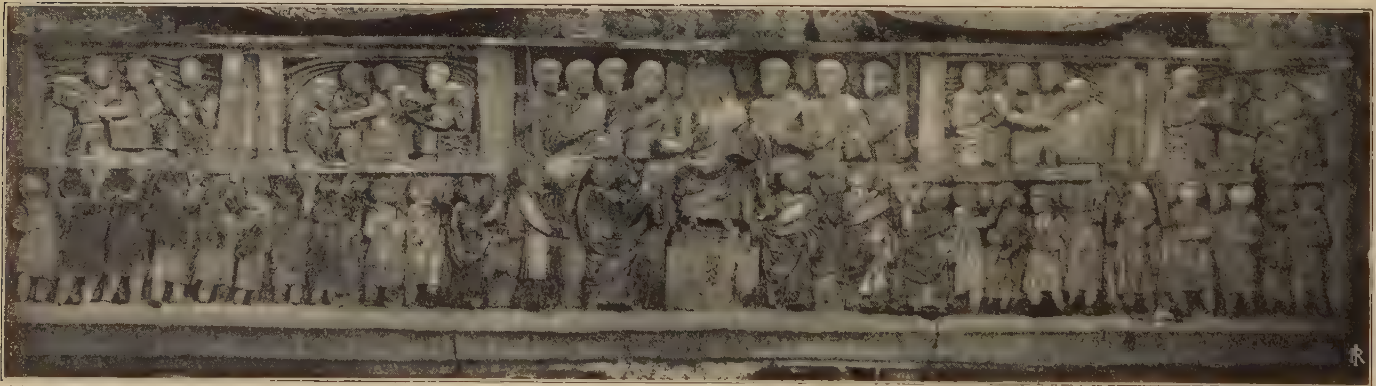
Photo, Anderson.

Fig. 17.—CAESAR AUGUSTUS.



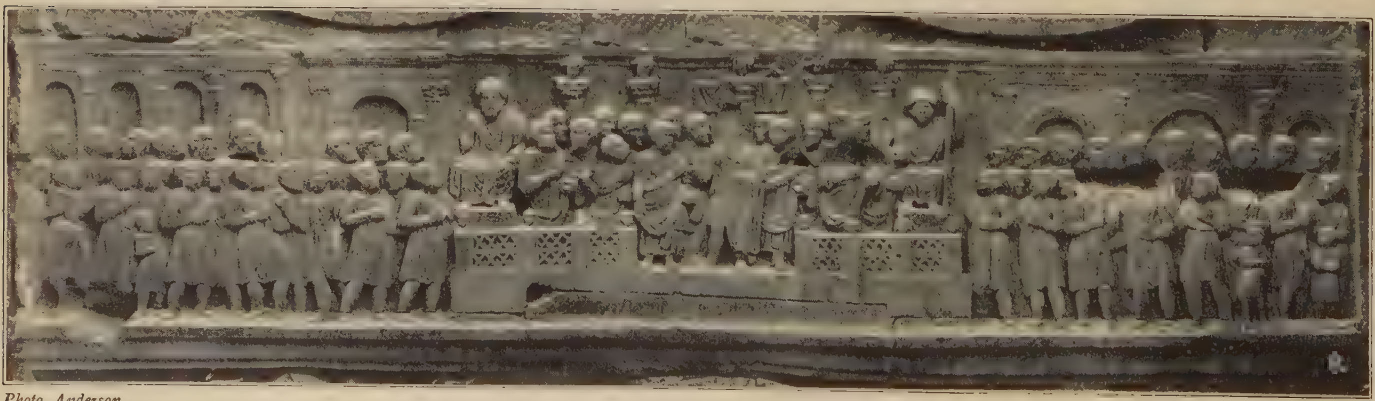
Photo, Anderson.

Fig. 18.—MEDALLION, ARCH OF CONSTANTINE.



Photo, Anderson.

CONSTANTINE DISTRIBUTING A DOLE



Photo, Anderson.

CONSTANTINE ON THE ROSTRUM.

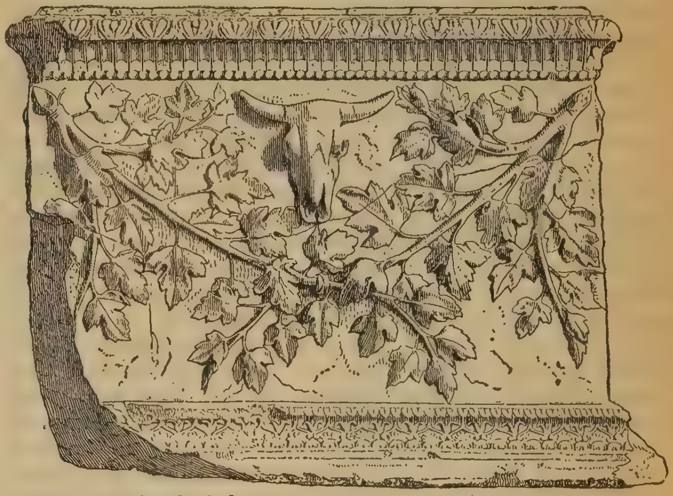
Fig. 19.—BAS-RELIEFS ON THE ARCH OF CONSTANTINE.

the remains of Pompeii show, was an invention of the later Hellenistic age. Reduced copies of statues are found in the decoration of such capitals in the baths of Caracalla; the capitals with Victories and trophies in S. Lorenzo Fuori also belonged to a building of pagan times.

But the specific achievement of the Roman architect was the artistic application of a new set of principles—those which are expressed in the arch, the vault and the dome. The rectilinear buildings of the Greeks, with their direct vertical supports, gave place to vaulted structures in which lateral thrust was called into play. The aesthetic effect of the curves thus brought into prominence was well understood by the Romans; and they were the inventors of the decorative combination of the Greek orders with the arcade. More than this, the erection of vaults and domes of wide span, rendered possible by the use of concrete, gave to the Roman architect the opportunity of dealing artistically with internal spaces. A simple yet grandiose example of this may be found in the Pantheon of Hadrian. Circular buildings were a common feature in Italian architecture;[1] the temple of Vesta, which doubtless represented the primitive hut or dwelling of the king, always had this form, and the theme was repeated with many variations, from the well-known circular temple in the Forum Boarium to the fantastic structure with broken outlines at Baalbek. But in the Pantheon the artist lays stress, not on the exterior, which possesses no special effect, but on the interior, whose proportions are carefully determined and give a most impressive result. The same may be said of the great halls of the Imperial Thermae, and as time went on more elaborate architectural schemes were devised to meet the requirements of the Christian Church.

(*b*) *Sculpture.*—It was pointed out above that in the late Republican period specifically Roman art was practically confined to portraiture. Of this we have many fine examples, such as the so-called Domitius Ahenobarbus of the Braccio Nuovo (Plate I. fig. 1); and there is a series of busts which possess a special interest in that some of them have been claimed as portraits of Scipio Africanus. The example in the Museo Capitolino (Plate I. fig. 2), with a modern inscription, though executed in the 2nd century A.D., is clearly copied from a famous Republican original. The baldness of the head has been thought to be derived from the technique of the waxen *imagines*, in which the hair was painted; the presence of a scar above the temple, which has given rise to various theories, merely betokens the unsparing realism of the Republican artist. In monumental sculpture our earliest datable example is the altar of Domitius Ahenobarbus, already referred to (Plate II. fig. 10). The ceremonial scene of the *suovetaurilia* fills the centre of the composition; to the left we see the dismissal of veterans for whom *diplomata* are being prepared; to the right the troops on active service, both horse and foot, are represented. The artist was clearly inspired by statuary and other types of earlier date, which are grouped in a somewhat loose composition. Augustan art is adequately represented by the Prima Porta statue of the emperor, discovered in 1863 in the Villa of Livia and now in the Braccio Nuovo (Plate III. fig. 17). The attitude of the figure is that of an imperator addressing his army; but there is a characteristic blending of the real with the ideal, for the emperor is not only bareheaded but barefoot, and beside him is a tiny cupid riding on a dolphin, which indicates the descent of the Julian house from Venus. We note, too, how the Roman artist—or the Greek artist interpreting the wishes of the Roman—is scarcely more concerned for the total effect of his work than for the significant details of the decoration. The chasings of the corselet display, as a central subject, the restoration by the Parthian in 20 B.C. of the standards taken from Crassus at Carrhae (53 B.C.). Not content with this, the artist has added a group of personifications indicating sunrise—Sol, Caelus, Aurora and the goddess of the morning dew—as well as Apollo, Diana, Mars and the earth goddess, and two figures symbolical of the western provinces, Gaul and Spain. It is also to be noted that the statue shows abundant traces of its original polychrome tints—brown, yellow, blue, red and pink. It must have been executed later—probably not much later—than 13 B.C., when Augustus returned from the West, and therefore belongs to the same period as the Ara Pacis Augustae, dedicated January 30, 9 B.C. This altar stood in a walled enclosure with two entrances, measuring 11½ by 10½ metres. The walls, with their plinth, were about 6 metres in height, and were decorated internally with a frieze of garlands and bucrania, and externally with two bands of relief, the lower consisting of conventional scrolls of acanthus varied with other floral motives, and teeming with bird and insect life, the upper showing processions (Plate II. fig. 11) passing from east to west. The most interesting of these is that on the south wall, which included Augustus himself, the *flamines* and the imperial family.[2] On the western face, towards which the processions are directed, we find a scene of sacrifice, with a landscape background, in which the ideal figures of senate and people appear. To the east front (apparently) belongs the beautiful group of the earth goddess (Tellus) and the spirits of air and water (Plate II. fig. 13). It is impossible to deny the incongruity of this composition with the realistic procession which adjoins it, and we can only suppose that the artist borrowed the group from some Hellenistic precursor and used it in that blend of the real and ideal which, as we saw, was the keynote of the new imperial art.

The lack of public monuments which can be assigned to the Julio-Claudian period is only in part supplied by those of private significance; the most important of these are the sepulchral *cippi* and other altars, decorated sometimes with figure-subjects, but largely with plant and animal forms rendered with the utmost naturalism. The altar with plane-leaves in the Museo delle Terme (fig. 38), though perhaps not later than Augustus, is typical of the spirit in which vegetable forms were treated under the first dynasty. We may take a female portrait discovered in a 1st-century house on the right bank of the Tiber (Plate I. fig. 3) as an example of the portraiture of this period, which shows great technical merit but a touch of conventionality.



Redrawn from a photo by Anderson.

FIG. 38.—Altar with Plane-leaves.

The sculpture of the Flavian period finds its best-known example in the reliefs of the Arch of Titus. This has but a single archway; the piers had no sculptured decoration, and the narrow frieze which surmounts the architrave is perfunctorily executed. But the long panels on either side of the passage, which represent the triumph of Titus and the spoils of Jerusalem, have been deemed (by Wickhoff) worthy of a place in the history of art beside the masterpieces of Velazquez—the "Hilanderas" and the "Surrender of Breda"; and though we cannot subscribe to his view that the artist calculated the effect of natural illumination upon the relief, it remains true that they are eminently pictorial compositions in respect of their depth of focus, yet without sacrifice of plastic effect (Plate II. fig. 14). So far as bas-relief is concerned, the problem of representing form in open space is here solved. Equally admirable in technique, though of less historical importance, are the circular medallions (*tondi*) which now adorn the Arch of Constantine, but originally belonged (as the present writer has shown)[1] to a monument of the Flavian period, perhaps the "temple of the Flavian house" erected by Domitian. The one shown (Plate III. fig. 18) is remarkable in that the head of the emperor has been replaced by a portrait, not of Constantine, but (in all probability) of Claudius Gothicus (A.D. 268–70), who was the first to divert these sculptures from their original destination.

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[1] See Altmann, *Die italischen Rundbauten* (1906).

[2] Some doubt has recently been cast on the identification of the emperor and his family.

Flavian portraits,[2] of which two are here figured,—a bust of Vespasian in the Museo delle Terme (Plate I. fig. 4) and a bust, now in the Lateran, found in the tomb of the Haterii, which, as is shown by the snake, represents a physician (Plate I. fig. 5),—must rank as the masterpieces of Roman art. Their extraordinarily lifelike character is due to the fact that the artist, without accumulating unnecessary detail, has contrived to catch the characteristic expression of his subject, and to render it with the utmost technical virtuosity. These portraits differ from the works of the Greek masters, who always subordinated the individual to the type, and therefore gave a less complete impression of reality than the Roman artists.

The same tendency has been noted in ornamental work which may be dated to the Flavian period. Wickhoff selected a pilaster from the monument of the Haterii (Plate II. fig. 15) upon which a column entwined with roses is carved. The flowers are not in fact represented with precise fidelity to nature, but the illusion of reality is no less great than in more accurately worked examples.

Roman sculpture soon passed the zenith of its achievement. We are not able to assign any historical monuments to the earlier years of Trajan's reign, but the portraits of the emperor betray a certain hardness of touch which makes them less interesting than those of the Flavian period. To the latter part of the reign belong a number of monuments which represent Trajanic art at its best. First and foremost come the reliefs, colossal in scale, which appear to have decorated the walls of Trajan's Forum. Four slabs were removed by Constantine's order and used to adorn the central passage and the shorter sides of the attic of his arch. The first of these (Plate II. fig. 16) shows the victorious charge of the Roman cavalry, with the emperor at its head, against their Dacian enemies. Other fragments of this frieze are extant in the Louvre,[3] and a much-restored relief, walled up in the garden of the Villa Medici, shows a Dacian on horseback swimming the Danube with Trajan's Bridge in the background. The composition of the battle-scene is very fine, and the heads of the Dacians are full of character; but, although details of armour, &c., are carefully and accurately reproduced, we see clear signs of technical decadence, both in the fact that the human eye is in many cases represented as though in full face on heads which are shown in profile, and also in the naïve attempt to render several files of troops in perspective by means of superposed rows of heads.[4] The reliefs of the spiral column in the Basilica Ulpia tell the same tale. The designer borrowed certain motives from Hellenistic art; *e.g.* we find the suicide of the Dacian king Decebalus represented in precisely the same way as that of a Gallic chief on the well-known sarcophagus in the Capitoline Museum representing a battle between Greeks and Gauls; again, the symmetry of the scene in which the fall of Sarmizegetusa (the Dacian capital) is depicted recalls that of Greek monuments—particularly the painting of the fall of Troy by Polygnotus, described by Pausanias at Delphi. But the loving care with which the arms and accoutrements of the Roman troops—both regular and irregular—are rendered[5] betrays the nationality of the artist; and his technical deficiencies, especially in the matter of perspective, point in the same direction. It seems probable, moreover, that the artistic conception of a column ornamented with a band of relief was new, and that the designer had to find his own solution for the problem. We find, in fact, that he tells his story in more than one way: (*a*) Considerable portions of the narrative, *e.g.* Trajan's march in the opening campaign, consist in a series of isolated and successive scenes; the divisions are usually marked by some conventional means, such as the insertion of a tree, or a change of direction in the action. (*b*) At other times the scenes unfold themselves against a continuous background, and merge almost insensibly into those which succeed them; to this form of narrative the term "continuous style," brought into use by Wickhoff, more properly applies. (*c*) The direct progress of the narrative is sometimes broken by passages which can only be called "panoramic"; the great composition showing the siege and fall of Sarmizegetusa falls under this head, and the "continuous" narration of Trajan's journey at the outset of the second war is followed by an extensive panorama illustrating the operations in Moesia in A.D. 105.

The reliefs (as already indicated) tell the story of both of Trajan's wars with the Dacians, a formal division between the two narratives being made by a figure of Victory setting up a trophy; and the design of the second series shows a decided advance in artistic and dramatic effect on that of the first. Clearly the artist learnt the laws of composition applicable to his problem in the course of his work.

Before leaving the Trajanic period a word must be said as to the arch erected at Benevento (see TRIUMPHAL ARCH, fig. 2), from which point a new road—the Via Trajana—ran to Brundisium. The inscription on this arch bears the date A.D. 114, but the prominence given to Hadrian has led to the supposition that the reliefs were executed after his accession. We have already noted that the use of relief as ornament is here carried to excess in the artist's desire to present a summary of Trajan's achievements at home and abroad.[6] The arrangement of the panels is calculated and significant. On the side which faces the town of Benevento the subjects have reference to Trajan's work in Rome. On the attic we see, to the left, a group of gods with the Capitoline triad—Jupiter, Juno and Minerva—in the foreground; to the right, Trajan welcomed at the entrance to the Capitol by the goddess Roma, the penates and the consuls. He is accompanied by Hadrian, who is designated by the gesture of Roma as the emperor's successor. The two lowest panels likewise form a single picture. To the right Trajan appears at the entrance of the Forum, where he is welcomed by the *praefectus urbi*; to the left, with the Curia as background, we see the representatives of senate, knights and people. The central panels symbolize the military and civil aspects of Trajan's government—veterans to left, merchants to right, are the recipients of imperial favour. On the other face of the arch we have a series of panels relating to Trajan's work in the provinces. On the attic the gods of the Danube provinces appear to the left, the submission of Mesopotamia on the right; the lowest panels represent negotiations with Germans (left) and Parthians (right); in the centre (as on the other face) we have a military scene (recruiting in the provinces) to left, balancing the foundation of colonies and growth of the *proles Romana* on the right. As the above description will show, this arch is, in respect of its significance, the most important monument of Roman historical art. Technically, the reliefs fall somewhat short of the best work of the Flavian period—the long panels of the archway, which represent a sacrifice offered by Trajan and his benefactions to the *municipia* of Italy, have not the *verve* of those from the Arch of Titus, but are at least as fine as the works executed for Trajan's Forum.

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[1] *Papers of the British School at Rome*, vol. iii. pp. 229 ff. Sieveking (*Röm. Mitth.* (1907) pp. 345 ff.) believes that four of the medallions only belong to the Flavian period and the rest to Hadrian's reign.

[2] On this subject see Mr Crowfoot's paper in *Journal of Hellenic Studies*, xx. (1900) pp. 31 ff. A list of examples is given by Mr Wace in *Papers of the British School at Rome*, vol. iii. pp. 290 ff.

[3] Mr Wace has recently identified the reliefs which show an emperor sacrificing before the temple of Jupiter Capitolinus as a part of the frieze (*Papers of the British School at Rome*, iv. pp. 229 ff.).

[4] These features make it clear that the reliefs in the Villa Borghese, formerly supposed to belong to an arch of Claudius, are Trajanic; see *Papers of the British School at Rome*, iii. pp. 215 ff. (Stuart Jones).

[5] Thus Cichorius, in his publication of the reliefs, has been able to identify several of the corps which took part in the war; *e.g.* the "cohorts of Roman citizens" are distinguished from the barbarian auxiliaries by the national emblems on their shields.

[6] The significance of these reliefs was first demonstrated by Domaszewski (*Jahreshefte des österreichischen archäologischen Institus*, ii. 1899, pp. 173 ff.); a full account will be found in Mrs Strong's *Roman Sculpture*, ch. 9.

With the accession of Hadrian—the "Greekling," as he was called by his contemporaries—a short-lived renaissance of classicism set in. The eclectic modifications of Greek statuary types which it called forth do not fall within our province; but it should be noticed that in portraiture the most important work of this period was the idealized type of Antinous, here represented by a famous example (Plate I. fig. 6) in the Louvre, which invests the favourite of Hadrian with a divinity expressed in the terms of Hellenic art as well as a pathos which belongs to his own time.[1] The historical monuments of this and the following reign are few in number, and lack the pregnancy of meaning and vigour of execution which distinguish those of the Trajanic period; mention may be made of three reliefs in the Palazzo dei Conservatori, one of which represents the apotheosis of an empress, and of the panels in the Palazzo Rondinini shown by the analogy of a medallion of Antoninus Pius to belong to his time. This is also the place to take note of the ideal figures symbolical of the subject peoples of the Empire. Under Trajan Roman sculptors had produced the fine statues of Dacian captives which now adorn the Arch of Constantine; to the Hadrianic period belong the idealized figures of provinces, classical in pose and motive, several of which are in the Palazzo de Conservatori.[2]

We pass on to the period of Marcus Aurelius and Commodus, in which Roman art underwent a further transformation. The earliest monument of the time which calls for our attention is the base of the column (now destroyed) erected in honour of Antoninus Pius. Two of its faces are here shown (Plate IV. figs. 21 and 22), and the contrast is remarkable between the classicistic representation of the apotheosis of Antoninus and Faustina, witnessed by the ideal figures of Rome and the Campus Martius (holding an obelisk), and the realistic treatment of the *decursio*, a ceremony performed by detachments of the praetorian guard on horse and foot. We note the endeavour of the Roman sculptor to express more than his medium will allow, and his inadequate grasp of the laws of proportion and perspective. Discarding the classical standard and its conventions, the artist disposes his figures like a child's toys, and, when confronted with the problem of the background, waves it aside and reduces the indication of the place of action to a few projecting ledges on which his puppets are supported. The reliefs of the Column of Marcus Aurelius suffer by comparison with those of Trajan's Column. The story which the designer had to tell was doubtless less definite in outline; we cannot trace, as in the former instance, the march of events towards a dramatic climax, and there is some reason to think that, although the two bands of relief, separated (as on Trajan's Column) by a figure of Victory, correspond generally with the "Germanic" and "Sarmatic" wars of Marcus down to A.D. 175, the narrative is not strictly chronological; thus the fall of rain ascribed by Christian tradition to the prayers of the "Thundering" Legion (Plate IV. fig. 24) is represented at a very early stage, whereas our historians place it towards the close of the war. The figures are smaller and at the same time more crowded than those upon Trajan's Column, and the landscape is less intelligently rendered. The type of the rain-god, which is without doubt the creation of the Roman sculptor, is boldly conceived but scarcely artistic. Still the reliefs show that the designers of the time were making vigorous efforts to think for themselves, and for this reason possess a higher value than the more conventional panels now distributed between the attic of the Arch of Constantine and the Palazzo dei Conservatori, which seem to have decorated a triumphal arch set up in or after A.D. 176.[3] The portraiture of the time also shows the invasion of new principles. Even before the reign of Marcus we find a tendency to emphasize the contrast between hair and flesh, the face often showing signs of high polish. In the latter half of the 2nd century the contrast is heightened by a new method of treating the hair, which is rendered as a mass of curls deeply undercut and honeycombed with drill-holes; a fine example is the Commodus of the Palazzo dei Conservatori. The aim of the sculptor is to obtain an ornamental effect by the violent contrast of light and dark—an adaptation for the purposes of plastic art of the *chiaroscuro* which more properly belongs to painting. This tendency may be seen at work in all branches of sculpture. The sarcophagi of the Antonine and later periods, with their crowded compositions and deep shadows, have the same pictorial effect; and in pure ornament the vivid illusionism of Flavian art disappears, and, though plant-forms are lavishly used—from the time of Trajan onwards we note a growing distaste for pure outlines, which are hidden beneath all-pervading acanthus foliage—the interest of the sculptor comes to lie more and more in intricacy of pattern, produced by the complementary effect of lights and shadows. An instance of this may be found in a pilaster now in the Lateran Museum (fig. 39), which Wickhoff justly contrasts with the rose-pillar from the monument of the Haterii. It is all-important to remember that (as Strzygowski has pointed out)[4] it is not true shadow which is contrasted with the high lights in later Roman ornament; if so, the plastic effect of the free members would be heightened, whereas the reverse is actually the case, for even the figures on sarcophagi, worked in the round though they be, do not stand out from the background—which indeed is practically abolished—but seem rather to form elements in a pattern. The reason is that pure darkness is set off against the high lights, and the whole surface being thus broken up, there remains no impression of depth.

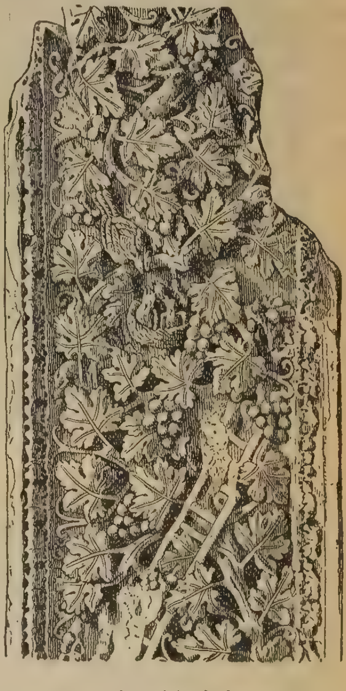
(Drawn from photo, Moscioni.)

FIG. 39.—Pilaster with Oak Leaf Ornament.

Under Septimius Severus and his successors, Roman art drifts steadily in its new direction. The reliefs of his arch at the entrance to the Forum represent the emperor's campaigns in the East in a compromise between bird's-eye perspective and the "continuous" style which cannot be called successful;

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[1] It is in the portraits of the Hadrianic period that we first meet with the plastic rendering (in marble) of the iris and pupil of the eye; on the significance of this convention see above.

[2] On these see Lucas's article in *Jahrb. des k. deutschen arch. Instituts* (1900), pp. 1 ff., and Mrs Strong, *Roman Sculpture*, pp. 243 ff.

[3] This series of panels is discussed in *Papers of the British School at Rome*, vol. iii. p. 251 ff.

[4] *Jahrbuch der preussischen Kunstsammlungen* (1904), p. 271.

a better example of the art of this period is to be seen in the relief (Plate IV. fig. 20) now in the Palazzo Sacchetti, recently published by Mr A. J. B. Wace,[1] which probably represents the presentation of Caracalla to the senate as the destined successor of his father. The squat figures of the senators, their grouping, which, though not lacking in naturalism and a certain effectiveness, is not in its main lines aesthetic, and the lavish use of deeply drilled ornament, are features which leave no doubt as to the period to which this work should be assigned. Rome, however, could still boast a school of portrait-sculptors, whose work was of no ordinary merit. The bronze statue of Septimius Severus, which passed into the Somzée collection, has been pronounced by Furtwängler to be of much earlier date, except for the head of the emperor, and we cannot therefore feel confidence in using it as a measure of the artistic achievements of Severus's reign; but the busts of Caracalla, which represent the tyrant in his later years, are masterly both in conception and in execution.

In the second quarter of the 3rd century A.D., when the Empire was torn by internal strife, threatened in its very existence by the inroads of barbarism, and hastening towards economic ruin, art could no longer flourish, and monuments of sculpture become scarce, if we except portraits and sarcophagi. The busts of this period are easily distinguished by the treatment of the hair and beard, which seem to have been closely clipped, and are indicated by a multitude of fine chisel strokes on a roughened surface. But, rough as these technical methods may seem, the artists of the time used them with wonderful effect, and the portraits of the emperor Philip (A. D. 244–49) in the Braccio Nuovo, and an unknown Roman in the Capitoline Museum (Plate I. fig. 7), are hardly to be surpassed in their delineation of craft and cruelty. Amongst the sarcophagi of the 3rd century we select, in preference to those adorned with scenes of Greek mythology, the fine example in the Museo delle Terme (formerly in the Ludovisi collection) decorated with a mêlée of Romans and Orientals (Plate IV. fig. 23); the principal figure—whose portrait is also to be seen in the Capitoline Museum—has been identified by Mr A. H. S. Yeames as C. Furius Sabinius Aquila Timesitheus, the minister and father-in-law of Gordian III. (d. A.D. 244). Even after the middle of the century, when the Empire was for a time dismembered, portrait-sculpture put forth fresh evidences of life and vigour. Gallienus, who was himself a dilettante and doubtless largely endowed with personal vanity, seems to have called into being a naturalistic school of sculptors, who harked back to the models of the later Antonine period, so that it is not always easy to distinguish the busts of his time from those of a much earlier date. The Louvre bust of the emperor (Plate I. fig. 8) will serve as a type of these works. But this singular renaissance was as short-lived as the eclectic revival of classicism under Hadrian. It is remarkable that the portrait of Gallienus is the last which can be identified by truly individual traits. The period of storm and stress which followed his death has left little or no monumental material for the historian of sculpture; and when the curtain again rises on the art of the new monarchy founded by Diocletian and perfected by Constantine, we seem to move in a new world. The East has triumphed over the West. Just as in Egyptian and, speaking generally, in all oriental art, before the revelation of true plastic principles, which we owe to the Greek genius, the law of "frontality" was universally operative, *i.e.* the pose of sculptured figures was rigidly symmetrical and without lateral curvature, so the portraits of Constantine and his successors are discerned at a glance by their stiff pose and fixed and stony stare. The fact is that the secret of organic structure has been lost; the bust (or statue) is no longer a true portrait, a block of marble made to pulsate with the life of the subject represented, but a monument. It was thus that the absolute monarchs of the Empire, before whom their subjects prostrated themselves in mute adoration, preferred to be portrayed; and we cannot help recalling Ammianus's description[2] of the entry of Constantius II. into Rome (A.D. 356). The emperor rode in a golden chariot, turning his head neither to the right nor to the left, but gazing impassively before him "tanquam figmentum hominis." The description fits such a portrait as that of an unknown personage of the 4th century in the Capitoline Museum (Plate I. fig. 9), which has found a panegyrist in Riegl. It remains to note that the narrow bands of relief on the Arch of Constantine, some of which probably date from the reign of Diocletian,[3] partake of the same monumental character as the single statues of the time. Where the nature of the subject permits, as in the case of the reliefs here represented (Plate III. fig. 19), the frontality of the central figure, and the strict symmetry of the grouping, which imparts an almost geometrical regularity to the main lines of the composition, are calculated for architectonic rather than for plastic effect. The breath of organic life has ceased to inspire the marble.

We have confined ourselves in the above section to tracing the course of development in what we may call official Roman sculpture, represented in the main, as is natural, by the monuments of the capital. The products of local schools cannot here be treated in detail. The difficult problems which they raise are best illustrated by the case of "Trajan's trophy" at Adam-Klissi in the Dobruja. Although the very name of the monument might seem to furnish sufficient evidence of its date, the late Professor Furtwängler stoutly maintained that Trajan did but restore a monument dating from 29 B.C.[4] He called attention to the uniformity in style of the grave-monuments of soldiers from north Italy, serving in the legions of the Rhine and Danube; these date from the early imperial period, and represent (according to Furtwängler) a traditional "legionary style." It may be admitted that they are eminently Italian in their hard realistic character; but the tradition was not extinct in the Trajanic period, so that the analogy between these monuments and its rudely carved figures is inconclusive, and the *ornament* of the trophy, which is far from being homogeneous, contains, as Studniczka[5] has observed, oriental elements which could not possibly be found in sculpture of the 1st century B.C. Local tradition may also be traced, *e.g.* in southern France, where the Hellenic influence which penetrated by way of Massilia was still strongly felt under the Julio-Claudian dynasty, as the sculptures of the tomb of the Julii at St Rémy and the triumphal arches of Orange and Carpentras suffice to prove. Gallo-Roman art, on the other hand, has a physiognomy of its own, whose outlines have been traced by M. Salomon Reinach (*Antiquités nationales; bronzes figurés de la Gaule romaine*, Introduction). In the Rhineland we find, at a later period, a singular school of realistic sculptors at work; the museum at Trier contains a number of their grave-monuments decorated with scenes of daily life.[6] Nor must we omit to mention the Palmyrene sculptors of the 3rd century A.D., whose portrait-statues give us the clue to the origin of the "frontal" style of the Constantinian period.[7]

(*c*) *Painting and Mosaic.*—The arts whose proper medium is colour enjoyed a popularity with the ancients and with the Romans, no less than with the Greeks, at least as great as that of sculpture; we need go no further for evidence of this than the statement of Pliny[8] that Julius Caesar paid eighty talents (£20,000) for the "Ajax and Medea" of Timomachus of Byzantium, which he placed in his newly built forum. But we are in a difficult position when we try

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[1] *Papers of the British School at Rome*, iv. pl. xxxiv., from which fig. 15 is taken.

[2] Amm. Marc. xvi. 10. 10.

[3] See Mr Wace's article in *Papers of the British School at Rome*, iv. pp. 270 ff.

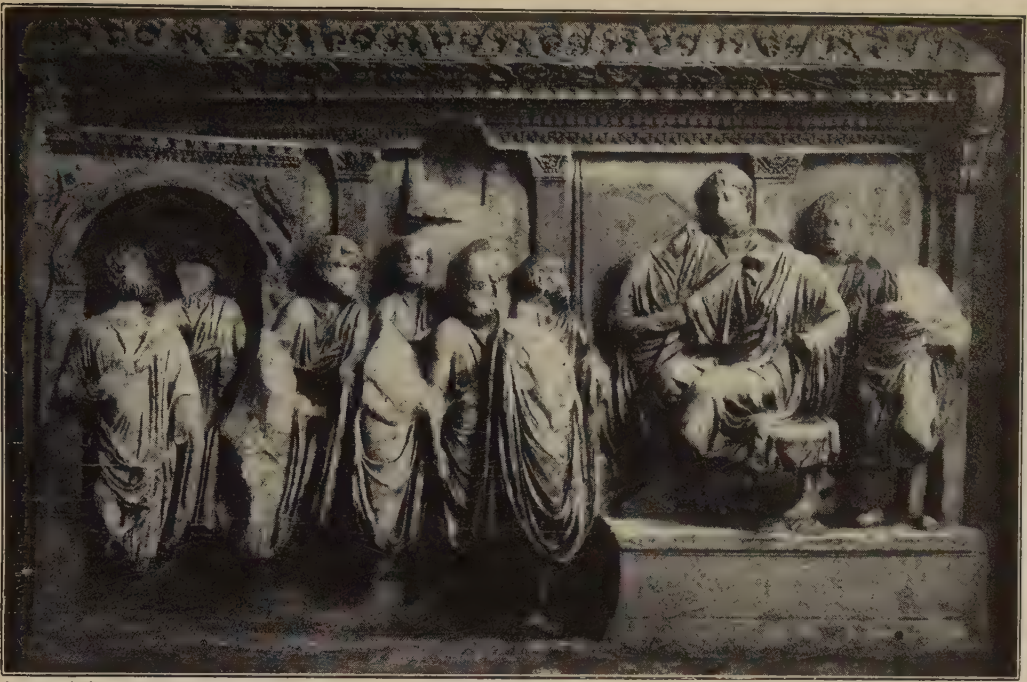
[4] His view is accepted by Mrs Strong (*Roman Sculpture*, p. 99).

[5] "Tropaeum Trajani" (*Abhandlungen der sächs. Gesellsch. der Wissenschaften*, xxii., pp. 88 ff.).

[6] Hettner, *Illustrierter Führer durch das National Museum zu Trier* (1903), pp. 2 ff.

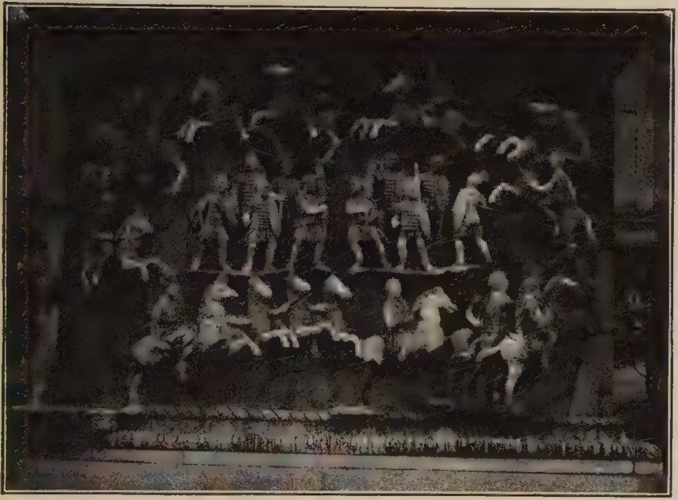
[7] Some fine examples are in the Jacobsen collection; see Arndt-Bruckmann, *Griechische und römische Portraits*, pls. 59, 60.

[8] *H.N.* xxxv. 136.



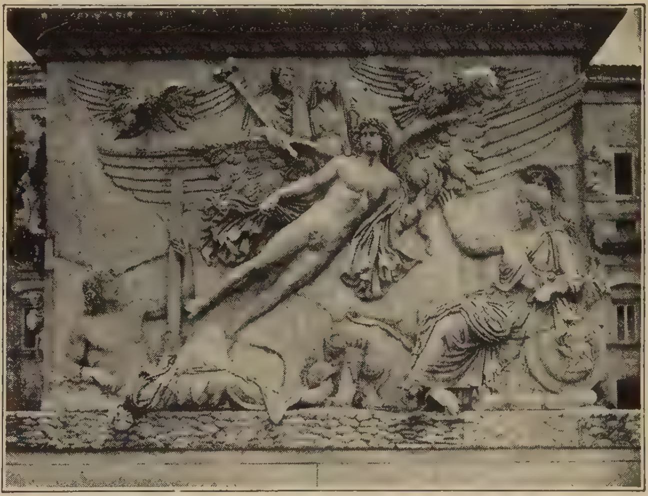
By permission of the British School of Rome.

FIG. 20.—PRESENTATION OF CARACALLA TO THE SENATE.



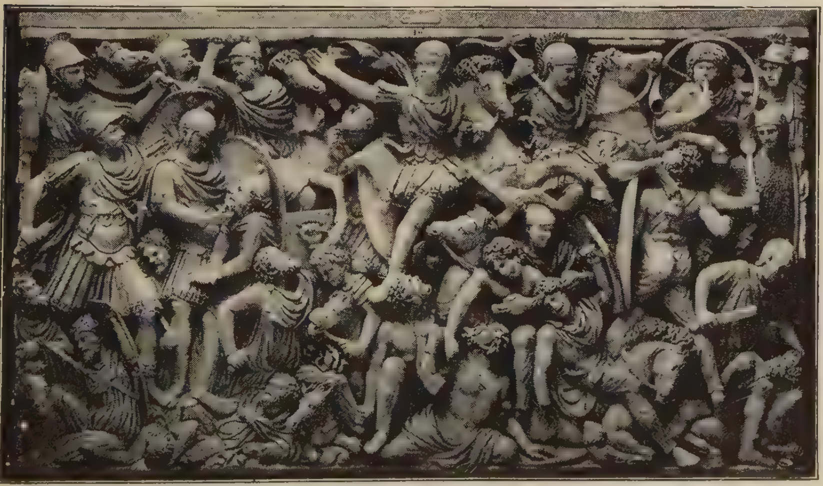
Photo, Moscioni.

FIG. 21.—BASE OF COLUMN OF ANTONINUS.



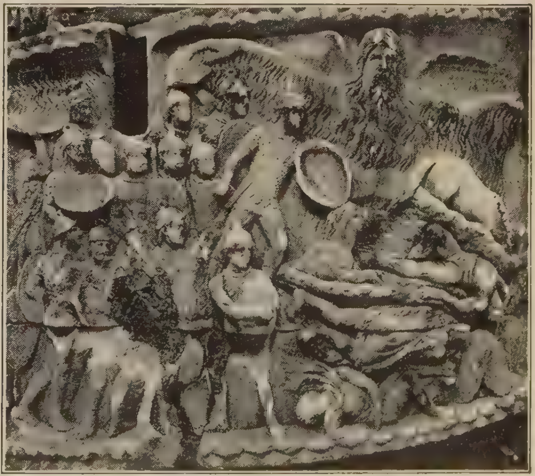
Photo, Moscioni.

FIG. 22.—BASE OF COLUMN OF ANTONINUS.



By permission of the Italian Ministry of Public Instruction.

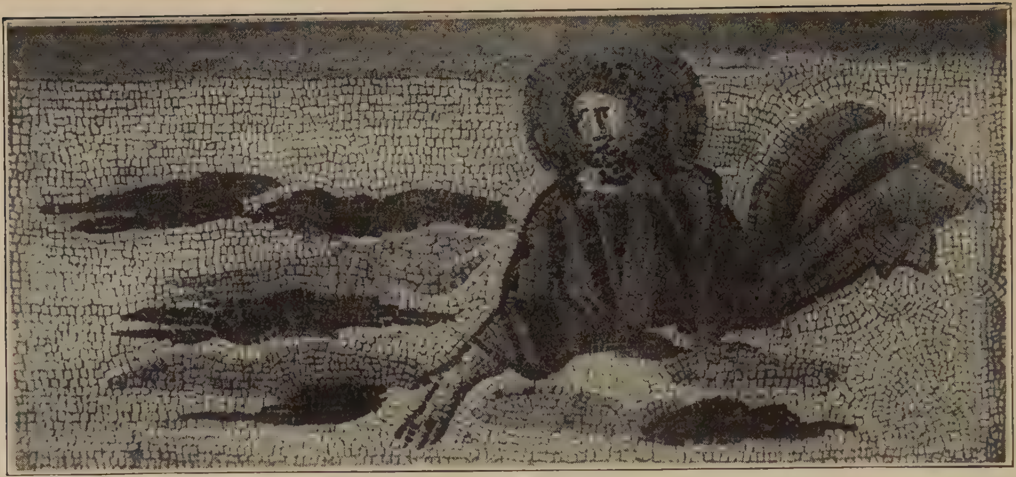
FIG. 23.—MÊLÉE OF ROMANS AND ORIENTALS, FROM A SARCOPHAGUS.



Photo, Anderson.

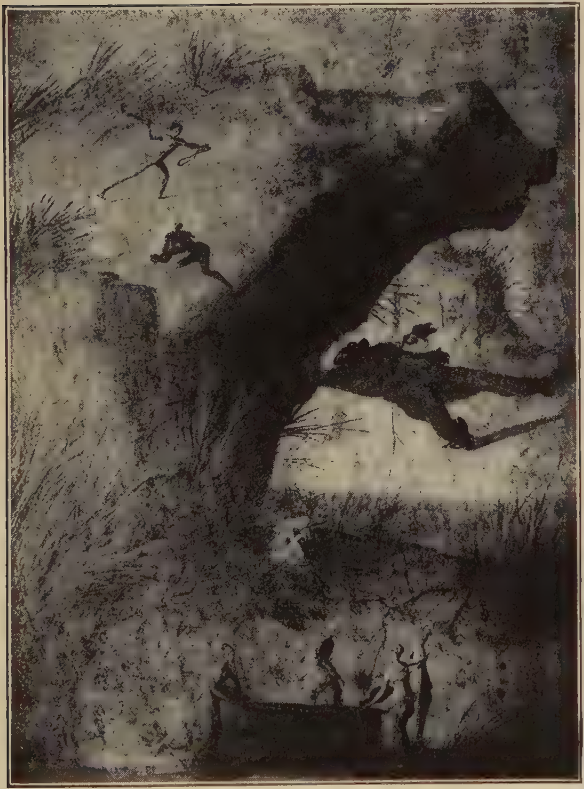
FIG. 24.—DETAIL OF THE COLUMN OF ANTONINUS.

ROMAN ART



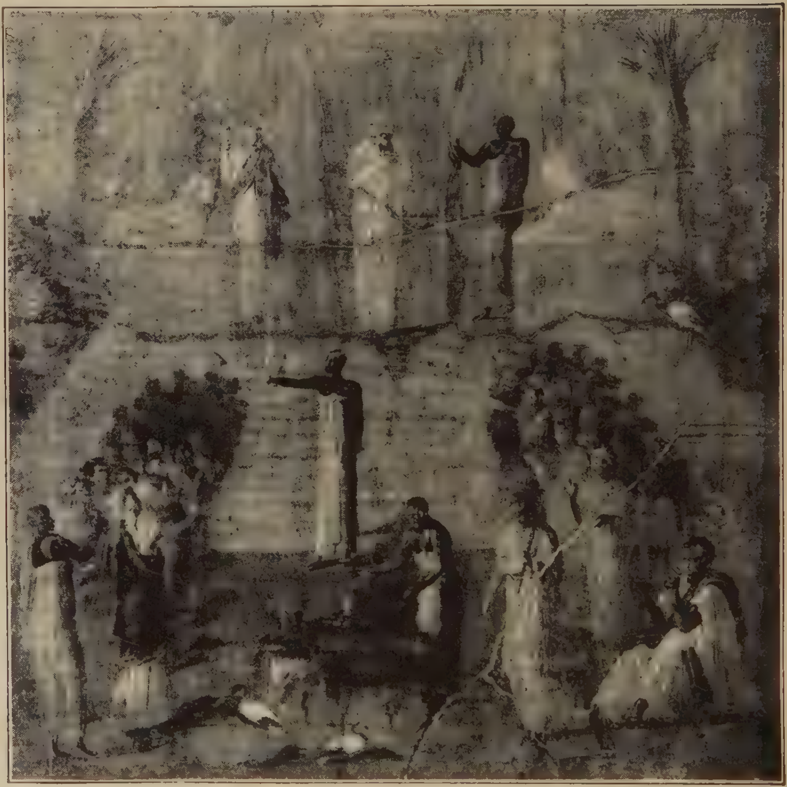
From Richter & Taylor's *Golden Age of Classic Christian Art*, by permission of the authors and Duckworth & Co.

FIG. 25.—MOSAIC, SHOWING CLOUD AND SKY EFFECTS.



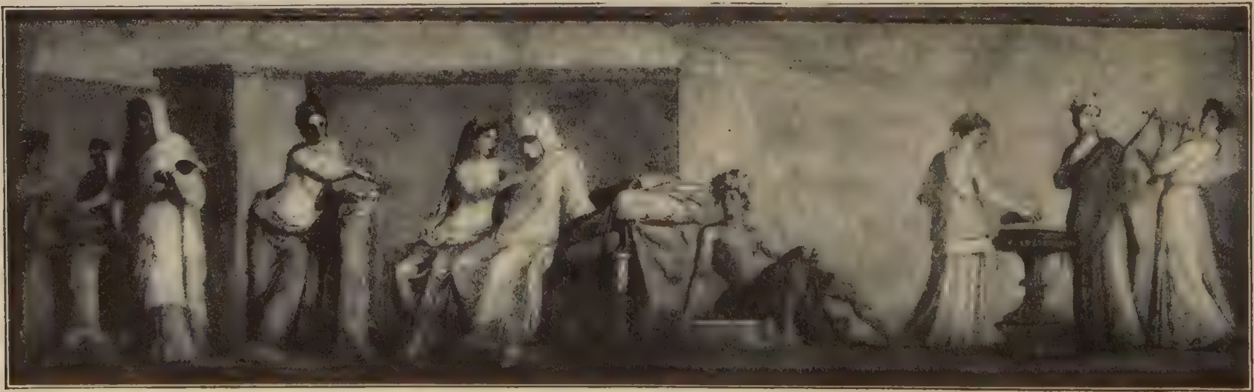
Photo, Sansaini.

FIG. 26.—FRESCO: ODYSSEUS AMONG THE SHADES.



Photo, Brogi.

FIG. 27.—FRESCO FROM POMPEII: EVENING BENEDICTION IN FRONT OF THE TEMPLE OF ISIS.



Photo, Anderson.

FIG. 28.—FRESCO: THE MARRIAGE OF ALDOBRANDINI

to estimate the artistic value of the masterpieces of ancient painting, since time has destroyed the originals, and it is but rarely that we can even recover the outlines of a famous composition from decorative reproductions. For the history of Greek painting we have in Pliny's *Natural History* a fairly full literary record; but this fails us when we come to Roman times, nor do original works, worthy to be ranked with the monuments of Roman historical sculpture, supply the want.

Painting in Italy was throughout its early history dependent on Greek models, and reflected the phases through which the art passed in Greece. Thus the frescoes which adorn the walls of Etruscan chamber-tombs show an unmistakable analogy with Attic vase-paintings. The neutral background, the use of conventional flesh-tones, and the predominant interest shown by the artists in line as opposed to colour, clearly point to the source of their inspiration; and the fine sarcophagus at Florence[1] depicting a combat between Greeks and Amazons, in which we first trace the use of naturalistic flesh-tints, though it bears an Etruscan inscription, can hardly have been the handiwork of native artists.

Roman tradition tells of early wall-paintings at Ardea and Lanuvium, which existed "before the foundation of Rome";[2] of these the Etruscan frescoes mentioned above may serve to give some impression. We also hear of Fabius Pictor, who earned his cognomen by decorating the temple of Salus on the Quirinal (302 B.C.); and a few more names are preserved by Pliny on account of the trivial anecdotes which attached to them. The chief works of specifically Roman painting in Republican times (other than the frescoes which adorned the walls of temples) were those exhibited by successful generals on the occasion of a triumph; thus we hear that in 263 B.C. M. Valerius Messalla was the first to display in the Curia Hostilia such a battle-piece, representing his victory over Hiero II. of Syracuse and the Carthaginians.[3] We may perhaps form some idea of these paintings from the fragment of a fresco discovered in a sepulchral vault on the Esquiline in 1889,[4] which appears to date from the 3rd century B.C. This painting represents scenes from a war between the Romans and an enemy who may almost certainly (from their equipment) be identified as Samnites; the names of the commanders are indicated, and amongst them is a Q. Fabius, probably Q. Fabius Maximus Rullianus, who played a part in the third Samnite War. The scenes are superposed in tiers; the background is neutral, the colour-scale simple, and there is but little attempt at perspective; but we note the files of superposed heads in the representation of an army, which are found at a later date in Trajanic sculpture.

We pass from this isolated example of early Roman painting to the decorative frescoes of Rome, Herculaneum and Pompeii, which introduce us to the new world conquered by Hellenistic artists. The scheme of colour is no longer conventional, but natural flesh-tints and local colour are employed; the "artist understands," as Wickhoff puts it, how to "concentrate the picture in space" instead of isolating the figures on a neutral background; he struggles (not always successfully) with the difficult problems of linear and aerial perspective, and contrives in many instances to give "atmosphere" to his scene; the modelling of his figures is often excellent; finally, he can, when need requires, produce an effective sketch by compendious methods. It must be premised that this style of wall-decoration was a new thing in the Augustan period. In the Hellenistic age the walls of palaces were veneered with slabs of many-coloured marble (*crustae*); and in humbler dwellings these were imitated in fresco. This "incrustation" style is found in a few houses at Pompeii, such as the Casa di Sallustio, built in the 2nd century B.C.; but before the fall of the Republic it had given place to what is known as the "architectural" style. In this the painter is no longer content to reproduce in stucco the marble decoration of more sumptuous rooms; by introducing columns and other architectural elements he endeavours to give the illusion of outer space, and this is heightened by the landscapes, peopled, it may be, with figures, which form the background. We shall take as an example of such decoration one of the "Odyssey landscapes" discovered on the Esquiline in 1849; these may be amongst the more recent works of this school, but can scarcely, from the character of their surroundings, be later than the reign of Claudius. Amongst the remains of a large private house was a room whose walls were decorated in their upper portion with painted pilasters treated in perspective, through which the spectator appears to look out on a continuous background of land and sea, which is diversified by scenes from the voyage of Odysseus. It is clearly to such works as these that Vitruvius refers in a well-known passage (vii. 5) where, in describing the wall-paintings of his time, he speaks of a class of "paintings on a large scale which represent images of the gods or unfold mythical tales in due order, as well as the battles of Troy or *the wanderings of Odysseus through landscapes* (*topia*)." And it is worthy of note that in a chamber discovered in the 18th century below the Flavian state-rooms on the Palatine (see ROME) the tale of Troy seems to have been represented in a very similar manner; drawings of the panel on which the landing of Helen is depicted have been preserved. Of the eight scenes from the Odyssey found on the Esquiline three represent the adventure in the country of the Laestrygones; the third forms a transition from this subject to the visit of Odysseus to Circe, which occupies the fourth and fifth panels;[5] the two last depict Odysseus among the shades. The second of these, which is here reproduced (Plate V. fig. 26), is only half as wide as the others, and was probably next to a door or window. It is, however, typical in style and treatment. The artist is mainly interested in the landscape, which is sketched with great freedom and breadth of treatment. He has clearly no scientific knowledge of perspective, and commits the natural error of placing the horizon too high. His figures are identified by Greek inscriptions, and we see that artistic considerations weigh more highly with him than close adherence to his poetical text; for the group of the Danaids in the foreground has no counterpart in the Homeric description. The conventional distinction of flesh-tints between the sexes is to be observed.

The use of landscape in decoration is expressly stated by Pliny (*H.N.* xxxv. 116) to have become fashionable in Rome in the time of Augustus. He attributes this to a painter named Studius, who decorated walls with "villas, harbours, landscape gardens, groves, woods, hills, fish-ponds, canals, rivers, shores," and so forth, diversified with figures of "persons on foot or in boats, approaching the villas by land on donkeys or in carriages, as well as fishers and fowlers, hunters and even vintagers." Vitruvius, too, in the passage above quoted, speaks of "harbours, capes, shores, springs, straits, temples, groves, mountains, cattle and herdsmen"; and existing paintings fully confirm the statements of ancient writers. In the Villa of Livia at Prima Porta the walls of a room are painted in imitation of a park; from the Villa of Fannius Synistor at Bosco Reale we have a variety of landscapes and perspectives; and in the house discovered in the grounds of the Villa Farnesina by the Tiber we find a room decorated with black panels, upon which landscapes exactly conforming to Pliny's description are sketched in with brush-strokes of white. While we have no reason to dispute the accuracy of Pliny's statement, or to refuse credit to the Roman artist for the development of landscape decoration, it is to be noted that the summary methods of impressionist technique which are here employed are probably traceable to Alexandrian influence. Petronius, who puts into the mouth of one of his characters a lament over the decline of art, attributes the decadence of painting to the "audacity of the Egyptians" and their discovery of "a short cut to high art" (*tam magnae artis compendiaria*). This has been thought to mean no more than the process of fresco-painting, which led to the substitution of mere wall-decoration for elaborate easel-paintings; but this was no new invention. It has been pointed out by Mrs Strong[1] that amongst the wall-paintings of Pompeii we can distinguish a group executed in bold dashes of colour—especially white—according to the principles of modern impressionism. The most striking example of this betrays its source of inspiration by its subject—the ceremony of the evening benediction in front of the temple of Isis (Plate V. fig. 27).

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[1] *Journal of Hell. Stud.* iv. (1883), pls. xxxvi.–xxxviii.

[2] Pliny, *H.N.* xxxv. 18.

[3] Ibid. xxxv. 22.

[4] *Bullettino Comunale* (1889), pls. xi. xii.

[5] The latter of these is so badly preserved that the subject cannot be precisely identified.

So far the paintings which we have considered can only be regarded as an extremely ingenious and, in the main, tasteful form of wall-decoration; they tell us little of that which we most wish to know—the style and treatment of substantive works of painting. The gap is in some measure filled by the central panels of Pompeian walls, which are usually adorned with subject-paintings, often mythological in subject, clearly marked off from the rest of the wall and intended to take the place of pictures. In the Architectural style these are usually framed in a species of pavilion or *aedicula*, painted in perspective;[2] but this motive gradually loses its importance. In the Third style ("ornate") distinguished by Mau the architectural design ceases to be intelligible as the counterfeit of real construction, and becomes a purely conventional scheme of decoration; and in the Fourth or Intricate style, which again reverts to true architectural forms, however fantastic and bewildering in their complexity, the figure-subjects are plainly conceived as pictures and framed with a simple band of colour. The subjects of these frescoes are for the most part taken from Greek mythology, and it has been argued that in the main we have to deal with reproductions of Hellenistic paintings rather than of contemporary works of art. It is not to be denied that the motives of famous compositions of earlier date may have found their way into the repertory of the Pompeian artists; it is not unnatural, for example, to conjecture that the figure of Medea here reproduced (Plate VI. fig. 30) may have been inspired by the celebrated painting of Timomachus above-mentioned. But there are reasons for thinking that the debt owed by the Pompeian artists to the Greek schools of the Hellenistic age is not so direct as was believed by Helbig, whose *Untersuchungen über die kampanische Wandmalerei* won a general acceptance for the theory. It seems clear that in the central subjects of walls decorated in the Architectural style we are intended to see, not a picture in the strict sense, but a view of the outside landscape, generally with a small shrine or cult-statue as the centre of the piece; and the importance of the figure-subject was therefore at first subordinate. These subjects are, it is true, taken from Greek mythology, but this only proves that that source of inspiration was as freely drawn upon in the art as in the literature of imperial Rome. In the later styles figure-subjects without landscape are extremely common, but it has been shown that, *e.g.* in the triclinium of the Casa dei Vettii, which is decorated with a cycle of mythological paintings, the lighting is carefully calculated with a view to illusionistic effect under the local conditions, so that the conception of an outlook into external space is not given up. We sometimes, as in one of the rooms in the "Farnesina" house, find framed pictures directly imitated, and here the models were clearly of a relatively early period; but this is exceptional. The Pompeian paintings, therefore, may fairly be used as evidence for the methods and aims of art in imperial Rome; and when allowance is made for their decorative character and hasty execution, we must admit that they give token of considerable technical skill—the modelling of figures is often excellent, the colour-scale rich, the "values" nicely calculated. The composition of subject-pictures is somewhat theatrical. Amongst the wall-paintings which have been preserved are some which from their classicistic style have been thought to represent Greek originals; the most famous is the "Aldobrandini Marriage" (Plate V. fig. 28), now in the Vatican library. As a matter of fact, the composition is formed by the juxtaposition of sculpturesque types, after a fashion familiar to Roman wall-painters. Mention may here be made of the combination of ornamental work in plaster with painting which is found at Pompeii, in the work of the Flavian period at Rome, and in tombs of the 2nd century A.D. In the Augustan period we find exquisitely modelled relief-work in plaster, used to ornament vaulted surfaces in the "Farnesina" house; it might seem natural to treat of these under the heading of Sculpture, but in point of fact they are translations from painting into stucco. At a later time both painter and modeller worked in conjunction, with admirable effect; the results are best seen in the tombs on the Latin Way.

Little can be said as to Roman portrait-painting. We know that in this branch of art the technique generally used was that called "encaustic." The colours were mixed with liquefied wax and fixed by heat; whether they were applied in a molten state or not has been disputed, but it seems more likely that the pigments were laid on cold, and a hot instrument used afterwards. Several examples of such wax-paintings have been found in Egypt, where it was the custom during the 2nd and 3rd centuries A.D. to substitute panel portraits for the plastic masks with which mummy-cases were adorned; but these cannot be described as works of high art, though they sometimes have realistic merit. A good example in the Berlin Museum (*Antike Denkmäler*, ii. pl. 13) is executed in tempera on primed canvas. The medium used in ancient as in medieval tempera painting appears from the statements of ancient writers to have been yolk of egg mixed with fig-sap or natural gums.

To the little we know of purely Roman painting something is added by that which we learn from the remains of the sister art of mosaic, which, being less easily destroyed, have survived in large numbers to the present day. It has been estimated by Gauckler that considerably more than 2000 mosaics with figure-subjects have been discovered; and the number is steadily increasing. For the origin of the art reference may be made to the article MOSAIC, where the reader will also find an explanation of the essential differences of principle between the arts of painting and mosaic. It is to the credit of the Roman artists that they were, generally speaking, alive to this distinction of method, and did not seek to produce the impression of painting executed with a liquid medium by the use of solid materials. Indeed, it seems not improbable that in this respect they had a truer conception of the function of mosaic decoration than their Greek forerunners. Amongst the mosaics of Roman date which employ a large number of exceedingly minute cubes in order to produce an illusion akin to that of painting, the most conspicuous examples are the pavement in the Lateran Museum signed by the Greek Heraclitus, which appears to reproduce the "unswept hall" of Sosos of Pergamum (see MOSAIC), and the Mosaic of the Doves from Hadrian's Villa, preserved in the Capitoline Museum, which may be supposed to have been inspired by the "drinking dove" of the same artist. The former of these contains about 120, the latter as many as 160 cubes to the square inch.

As shown in the article MOSAIC, a distinction must be drawn between *opus tessellatum*, consisting of cubes regularly disposed in geometrical patterns, and *opus vermiculatum*, in which a picture is produced by means of cubes irregularly placed. The two methods were commonly used in conjunction by the Romans, who recognized that a pavement should emphasize the form of the room to which it belonged by means of a geometrical border, while figure-subjects should be reserved for the central space. A good example is furnished by a mosaic pavement discovered on the Aventine in 1858, and preserved in the Museo delle Terme (Plate VI. fig. 29). Enclosed within a geometrical framework of guilloches and scroll-work, diversified with still-life subjects and scenic masks which break its monotony, we find a landscape evidently taken from the banks of the Nile, as the hippopotamus and crocodile, as well as the papyrus and lotus, clearly show. These Egyptian scenes are likewise found at Pompeii, and the celebrated pavement at Palestrina, with a bird's-eye view of the Nile and its surroundings, is the finest, as well as the latest, example of the class. The conclusion to be drawn is that the Roman mosaic-workers of the early Empire owed much to Alexandrian models. Their finer works, however, were restricted in size, and formed small pictures isolated in geometrical pavements. Such mosaic-pictures were called *emblemata*, and were often transported from the great centres of production to distant provinces, where pavements were prepared for their reception. The subjects of these *emblemata*, like those of the wall-paintings of Pompeii, were, for the most part, taken from Greek mythology, and it is not easy to determine what degree of originality is to be assigned to Roman artists. We note a certain interest in the great figures of literature and philosophy. A subject of which two somewhat different versions have been preserved, commonly known as "The Academy of Plato," shows us a group of Greek philosophers engaged in discussion. In provincial pavements it is not uncommon to find portraits of poets or philosophers used to fill ornamental schemes of decoration, as in the famous mosaic at Trier signed by Monnus. And it is possible to trace the growth of interest in Roman literature at the expense of that of Greece. Fig. 31 (Plate VI.) shows a mosaic discovered in the *tablinum* of a villa at Sousse (Susa) in Tunis (the ancient *Hadrumetum*). It represents the poet Virgil seated, with a scroll on his knee, upon which is written *Aen.* i. 8; beside him stand the muses of tragedy and history. In one of the side-wings (*alae*) of the *atrium* was a mosaic representing the parting of Aeneas from Dido, and this was no doubt balanced by another scene from the *Aeneid*. It has also been shown that the mythological scenes depicted by the mosaic-workers of the later imperial period are frequently inspired, not by Greek poetry or even Greek artistic tradition, but by the works of Ovid; and the popularity of the legend of Cupid and Psyche is doubtless to be traced to its literary treatment by Apuleius.

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[1] *The Elder Pliny's Chapters on the History of Art*, p. 238.

[2] The most striking example is that from the "House of Livia" on the Palatine.

The mosaic shown in fig. 31 is notable for the simplicity of its composition; and it may be laid down as a general rule that the later workers in this field preferred such subjects, consisting of few figures on a neutral background, which lend themselves to broad treatment, and are best suited to the genius of mosaic. The finer pavements discovered in the villas of the landed proprietors of the African provinces, Gaul, and even Britain, are distinguished by the excellent taste with which ornament and subject are adapted to the space at the disposal of the artist. Beside a well-chosen repertory of geometrical patterns, the mosaic-workers make use of vegetable motives taken from the vine, the olive, the acanthus or the ivy, as well as conventional figures, such as the seasons,[1] the winds, the months and allegorical figures of all kinds, forming elements in a scheme of decoration which, though often of great richness, is never lacking in symmetry and sobriety.

It is much to be regretted that the destruction, partial or complete, of the great thermae and palaces of the early Empire has deprived us of the means of passing judgment on the *opus musivum* proper (see MOSAIC), *i.e.* the decoration of vaults and wall-surfaces with mosaics in glass, enamel or precious materials. Effective as are the pavements constructed with tesserae of marble or coloured stone, they must have been eclipsed by the brilliant hues of the wall-mosaics. We can form but little idea of these from the decoration of fountains at Pompeii and elsewhere, and must depend chiefly on the compositions which adorn the walls and apses of early Christian basilicas. An attempt has, indeed, been made to prove that one of these—the church of S. Maria Maggiore—is nothing else than a private basilica once belonging to a Roman palace, and that its mosaics date from the period of Septimius Severus;[2] but it is impossible to accept this theory. The earliest monument of the class which we are now considering is the baptistery of S. Costanza at Rome, built by Constantine in the early years of the 4th century A.D. Unfortunately the mosaics of the cupola were destroyed in the 16th century, and we derive our knowledge of them from drawings made by Francesco d'Olanda. The tambour was decorated with a maritime landscape diversified with islands and filled with a crowd of *putti* fishing; and the cupola itself was divided into twelve compartments, containing figure-subjects, by acanthus motives and caryatids. The mosaics of the annular vault which surrounds the baptistery are extant, though much restored, and purely pagan in design, showing that the decorative schemes (Eros and Psyche, vine-patterns, medallions, &c.), commonly found in pavements were also used by the *musivarii*. The mosaic-panels of the nave of S. Maria Maggiore already mentioned are (in the absence of earlier examples) very instructive as to the artistic quality of Roman *opus musivum*. Richter and Taylor's publication of some of the unrestored portions, which unfortunately form but a small fraction of the whole, serve to show that the *musivarii* had an accurate conception of the true function of mosaic destined to be seen at a distance. Their effects are produced by a bold use of simple means; a few large cubes of irregular shape serve to give just the broad impression of a human face or figure which suits the monumental surroundings and subdued light. Very remarkable is the success with which the atmospheric backgrounds are treated. To seek delicate gradations of tint by elaborate means would be waste of labour for the mosaic-worker, but the artists of S. Maria Maggiore are able to produce sky and cloud effects (cf. Plate V. fig. 25) of great beauty, when seen from the floor of the church, with the aid of broad masses of colour. Their gamut of tones is of the richest; and it is to be remarked that *no gold* is used except in the restored parts. Doubtless gold was employed in decorative wall-mosaics before the Constantinian period; but the Roman *musivarius* knew the secret of making a true mosaic picture with natural tints alone.

(4) *Work in Precious Metals.*—In the article PLATE the history of this branch of art in ancient times is treated, and it is there shown that it continued to be a living art, capable of producing works of the highest merit, in Roman times. The sections of Pliny's *Natural History* (xxxiii. 154 sqq.) which treat of *caelatura* deal only with the works of Greek artists, and Pliny ends with the statement that, as silver-chasing was in his time a lost art, specimens of embossed plate were valued according to their antiquity; but the extant remains of Roman plate suffice to disprove his statement, and in a previous passage (xxxiii. 139) he names the principal *ateliers* where such works were produced. The famous treasure of Bosco Reale (see PLATE) comprises specimens of silver-work belonging to various dates, many of which bear the inscription "Maximae"; this doubtless gives the name of the owner of the objects, whose skeleton was found near the treasure. But some of them had passed through other hands; for example, four "salt-cellars," probably of pre-Roman date, are also inscribed with the name of "Pamphilus, the freedman of Caesar." Certain pieces, too, seem older and more worn than others; two ewers, decorated with Victories sacrificing to Athena, are probably of Alexandrian origin—the lotus-flower on their handles most probably points to their Egyptian provenance. On the other hand, the various decorative styles characteristic of Augustan art are well represented,—not merely the elaborate and conventional plant-systems of the Ara Pacis Augustae, teeming with animal life, which adorn two splendid canthari, but also the naturalistic treatment of vegetable forms, of which a cup decorated with sprays of olive furnishes a good example (Plate VII. fig. 32). But the most important pieces in the collection are those which show the silversmith at work on specifically Roman subjects. Amongst the cups with *emblemata* (for the meaning of the term see PLATE) were two which originally contained small portrait-busts of the master and mistress of the house to which the collection belonged. One of these became detached, and is now in the British Museum; the other is in the Louvre in its original setting. The lady's coiffure resembles that of the empresses of the later Julio-Claudian period; but this is not

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[1] At least fifty examples of these have been found.

[2] See Richter and Taylor, *The Golden Age of Classic Christian Art* (1904).

conclusive as to date, and the style of the male portrait (which recalls the realistic bronze busts found at Pompeii) points rather to an early Flavian date. Amongst the finest pieces of this collection is a large bowl with an *emblema* in high relief (Plate VII. fig. 35), which was at first taken to represent the city of Alexandria, on account of the *sistrum* which appears amongst the attributes of the figure. It seems, however, to be a personification of the province of Africa, which was conventionally represented with a headdress formed by an elephant's scalp with trunk and tusks. We have in this *emblema* the earliest example of the ideal types which the Roman artists of the Empire called into being to symbolize the subject-countries; the inexhaustible fertility of the African soil is indicated by the cornucopiae and the fruits carried in the bosom of the figure. But there is some trace of that overcharging of symbolism to which we drew attention in discussing the Prima Porta statue of Augustus; and, though the bowl was in a very fine state of preservation, there is little doubt that this was due to the care with which it had been kept—it was of course an ornament reserved for the table or sideboard—and that we should date it to the Augustan period. The same is clearly true of the most important pieces comprised in the treasure—the pair of cups reserved by Baron Edmond de Rothschild and forming part of his collection (Plate VII. figs. 33 and 34). In these we have examples of the *crustae*, or plaques decorated in repoussé, which were mounted on smooth silver cups. The manufacture of these—or at least the designing thereof—was a special branch of *caelatura*, and Pliny mentions an artist named Teucer who achieved distinction therein; we may possibly identify him with the gem-engraver whose signature is read on an amethyst at Florence. Upon one of these (Plate VII. fig. 34), we see a seated figure of Augustus, approached by a processional group on both sides. To the left are three divinities, the foremost of whom presents a statuette of Victory to the emperor; to the right is Mars in full panoply, in whose train follow the conquered provinces, symbolized by female figures, amongst whom we recognize Africa with her elephant headgear (see above). On the other face of the cup we see Augustus again seated, receiving the homage of a group of barbarians ushered into his presence by a Roman commander. The schemes which are here found for the first time, became typical in Roman historical art, and thence passed into the service of Christianity to portray the homage of the Magi. The second cup celebrates the glories of Tiberius, whose triumphal procession appears on the one face, and a finely conceived scene of sacrifice on the other. For the occasion various dates have been suggested (13–12 or 8–7 B.C.); but it seems most likely that the return of Tiberius from Dalmatia in A.D. 9 is here commemorated.

The fortunate preservation of the Bosco Reale treasure has enabled us to appraise Roman silverwork at its true value. It also affords some confirmation of the rapid decadence of the art, which Pliny laments. Amongst the cups are two decorated with still-life subjects and signed by an artist who writes a Roman name (Sabinus) in Greek characters, which clearly belong to the last years of Pompeii, and are coarser in execution than the earlier pieces. And the simple *emblemata* of the classical period, which stand out against the background of the bowl in which they are framed, give place to such a crowded group as we find on a gold patera[1] found at Rennes and preserved in the Cabinet des Médailles, where the artist has surrounded the central *emblema* with a frieze which detracts from its effect. This and still later specimens of Roman silversmiths' work are described in the article Plate.

(5) *Gem-Engraving and Minor Arts.*—The art of the gem-engraver, like that of the silversmith, was naturally held in high esteem by the wealthy Romans both of the Republic and Empire;[2] and the period of its highest excellence coincides almost precisely with that which gave birth to the masterpieces of Roman silver-chasing. By far the greater part of the ancient gems which exist in modern collections belong to the Roman period; and the great popularity of gem-engraving amongst the Romans is shown by the enormous number of imitative works cast in coloured glass paste, which reproduce the subjects represented in more precious materials. Not only were *intagli* thus produced to suit the popular demand, but fine cameos were at times cut (not cast) in coloured glass; the most notable example of these is a portrait of Tiberius in turquoise-coloured glass bearing the signature of Herophilus (see below).

In the style of Roman *intagli* we can trace each of the phases through which Roman plastic art has been shown to pass.[3] A black agate in the Hague Museum (Furtwängler, pl. xlvii. 13) supplies a characteristic portrait of the Ciceronian age; the splendid cornelian of the Tyszkiewicz collection (Furtwängler, pl. l. 19) with the signature ΠΟΠΠΙΛ · ΑΛΒΑΝ · which portrays Augustus in the guise of Poseidon in a chariot drawn by four hippocamps, is doubtless (as Furtwängler showed) to be referred to the victory of Actium; the classicism of the early Empire is exemplified by a sardonyx in Florence (Furtwängler, pl. lix. 11), which probably displays an empress of the Julio-Claudian line with the attributes of Hera; a sardonyx in the hermitage at St Petersburg (Furtwängler, pl. lviii. 1) is noteworthy because the subject is borrowed from painting and occurs on a Pompeian fresco discovered in 1897; the portraiture of the Flavian epoch is seen at its best in the aquamarine of the Cabinet des Médailles signed by Euhodos, which represents Julia, the daughter of Titus (Furtwängler, pl. xlviii. 8). Amongst later gems one of the finest is the "Hunt of Commodus" in the Cabinet des Médailles (Furtwängler, pl. l. 41), which is engraved in one of the stones most popular with the Roman artists—the "Nicolo," a sardonyx with a bluish-grey upper layer used as background and a dark brown under layer in which the design is cut.

But the masterpieces of Roman gem-cutting are to be found in the great cameos, the finest of which no doubt belonged to the treasures of the imperial house. These were engraved in various materials, including single coloured stones such as amethyst or chalcedony; but the stone most fitted by nature for this branch of art was the sardonyx in its two chief varieties—the Indian, distinguished by the warmth and lustre of its tones, and the Arabian, with a more subdued scale of colour. As examples of these we shall take the two master-works of the art—the "Grand camée de France" (Plate VII. fig. 37), and the "Gemma Augustea" (Plate VII. fig. 36), preserved in the imperial collection at Vienna. The latter is attributed by Furtwängler to Dioscorides, the artist who, as Pliny tells us, enjoyed the exclusive privilege of portraying the features of Augustus. We possess several gems inscribed with his name, as well as with those of his sons and pupils—Eutyches, Herophilus (see above) and Hyllos; and, though several of these are Renaissance forgeries, enough genuine material exists for an appreciation of his style. The Arabian sardonyx was amongst his favourite stones, and the Vienna cameo at least represents the work of his school. Blending the real with the ideal, the artist has represented in the upper zone Augustus and Rome enthroned. Behind them is a group of divine figures—the inhabited Earth, Time and Tellus, according to the most probable interpretation; to the left we see Tiberius descending from a chariot driven by Victory, before which stands a youth, probably Germanicus. We seem to have here, as in the Bosco Reale cup, a scene from the triumphal

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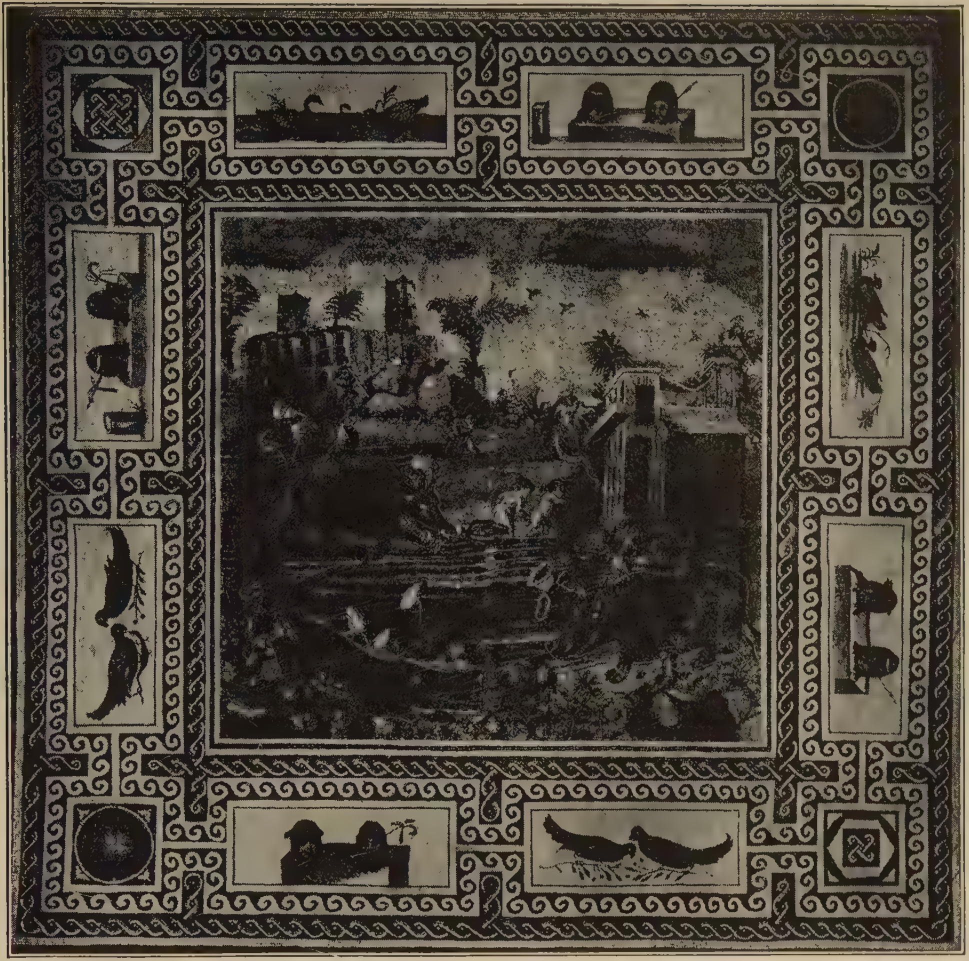
[1] Works of pure gold have but rarely survived to modern times; but traces of gilding remain upon many of the specimens of plate described above. In the law-books we have mention of cups adorned with golden *crustae*.

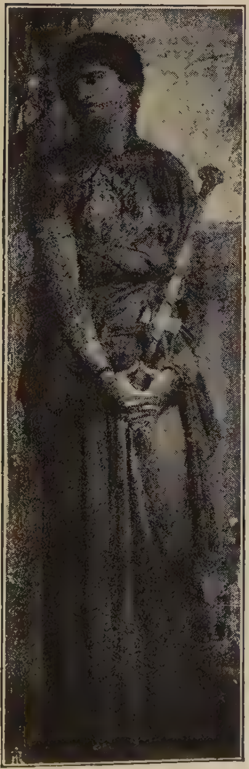
[2] We first hear of collections of gems in the last century of the Republic. Pompey dedicated that which had belonged to Mithridates the Great on the Capitol; Julius Caesar placed six collections in the temple of Venus Genitrix; and Marcellus dedicated another in the temple of Apollo on the Palatine.

[3] The references given in the text are to Furtwängler's great work, *Die antiken Gemmen*, in which all ancient gems of any considerable importance are reproduced.



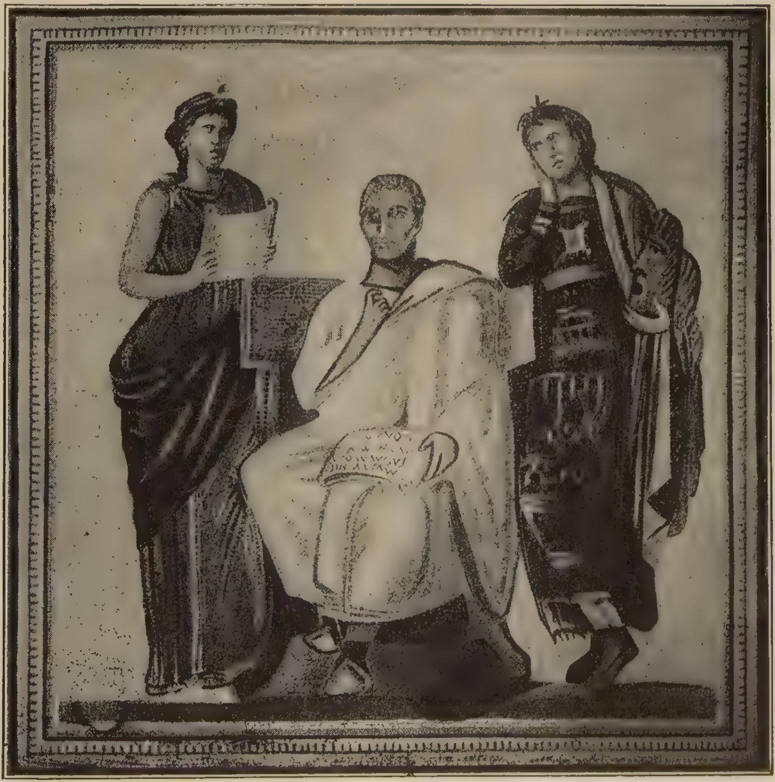
By permission of the Italian Ministry of Public Instruction.

FIG. 29.—MOSAIC PAVEMENT (MUSEO DELLE TERME).



Photo, Brogi.

FIG. 30.—MEDEA.

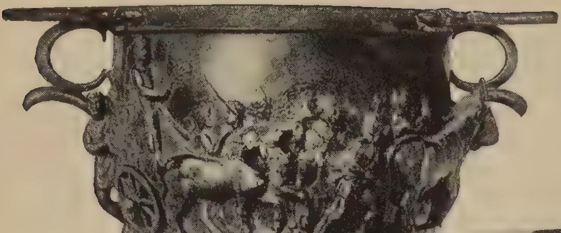


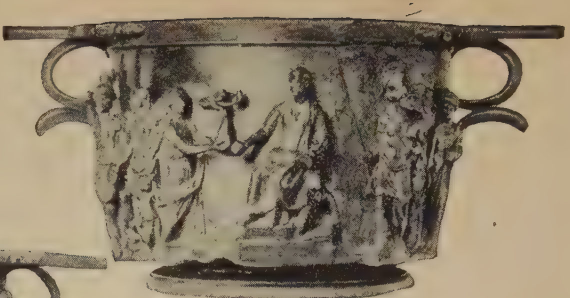
From Piot's *Monuments*, by permission of Ernest Leroux.

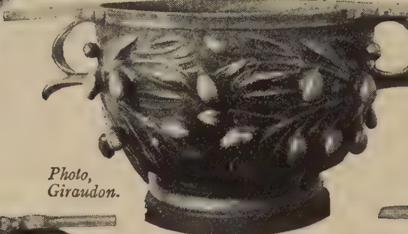
FIG. 31.—THE VIRGIL MOSAIC.

PLATE VII.

ROMAN ART







Photo, Giraudon.

FIG. 32.—CUP DECORATED WITH SPRAYS OF OLIVE.

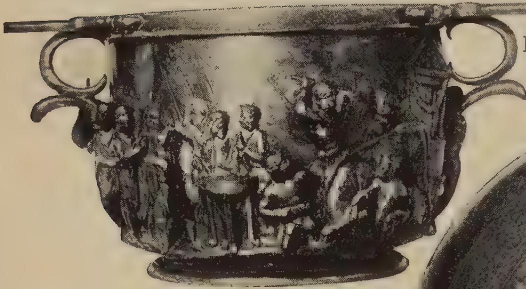


FIG. 33.—CUP IN THE BARON ROTHSCHILD COLLECTION.

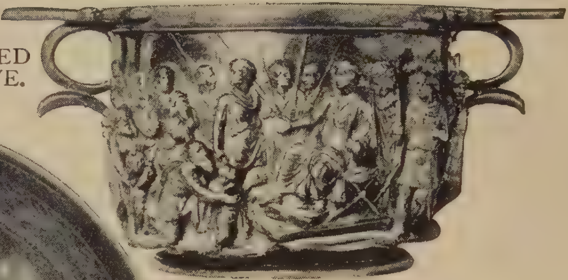
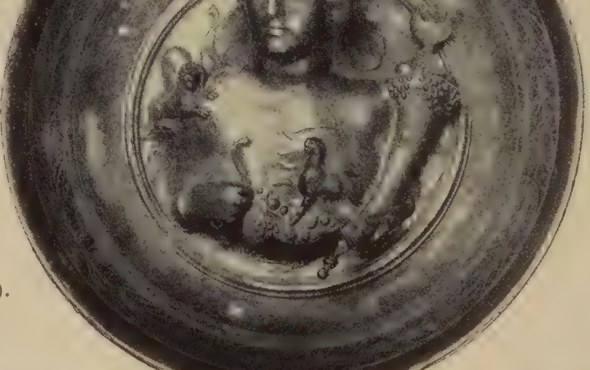


FIG. 34.—CUP IN THE BARON ROTHSCHILD COLLECTION.



Photo, Giraudon.

FIG. 35.—SILVER BOWL (LOUVRE).

EMBLEMA, IN HIGH RELIEF, PERSONIFICATION OF THE PROVINCE OF AFRICA.

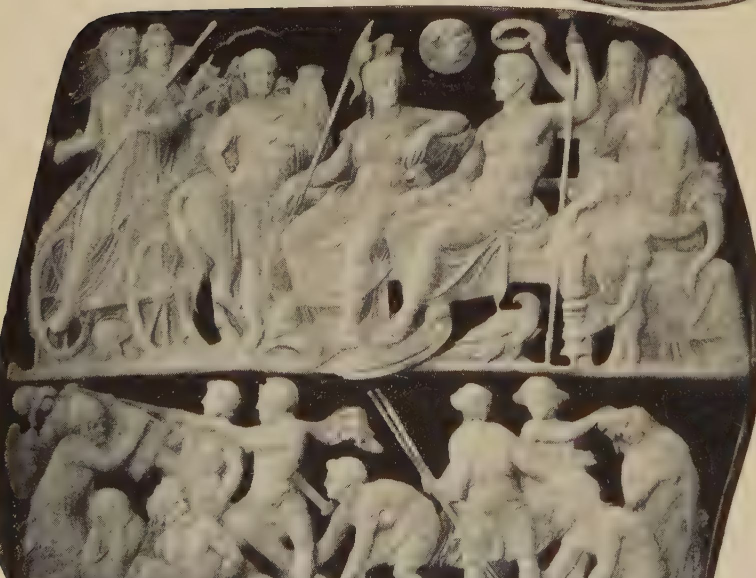


FIG. 36.—THE "GEMMA AUGUSTEA."

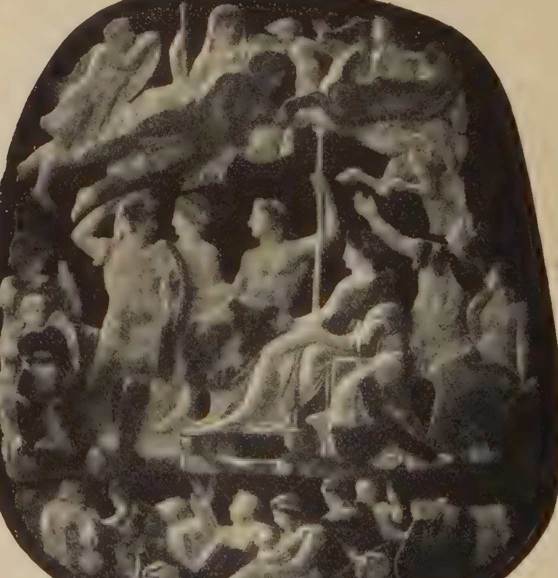


FIG. 37.—THE "GRAND CAMÉE DE FRANCE."

From Furtwängler, *Die Antiken Gemmen*, by permission of Gieseke and Devrient.

procession of A.D. 12, in the course of which, as Suetonius tells us, Tiberius stepped down from his car and did homage to his stepfather. In the lower zone we find loosely composed groups of captives and Roman soldiers, some of whom are setting up a trophy.

But the supreme triumph of imperial jewelry is attained in the Great Cameo of the Bibliothèque Nationale. This is an Indian sardonyx cut in five layers, the largest extant example of its class. There is a marked advance on the Vienna cameo in composition; the lower zone is reduced to the proportions of an exergue, whilst heaven and earth are kept clearly apart in the main subject, yet at the same time united in a single picture. In the centre are the living members of the Julio-Claudian house—Tiberius and Livia enthroned, together with Germanicus, his mother, and the rising generation—while above them hovers the deified Augustus, together with other deceased members of the family and an ideal figure in Phrygian garb bearing a globe, probably Iulus (Ascanius), or even Aeneas himself. The moment depicted is the departure of Germanicus for the East in A.D. 17, and amongst the figures of the central group we note the muse of history, bearing a scroll upon which to record the hero's deeds, and a personification of Armenia.

Engraved gems are not the only examples of Roman work in precious materials. Amongst the portraits of the first dynasty none is finer than a small head of Agrippina the younger (recently acquired by the British Museum) in *plasma* (root-of-emerald), a material much used by Roman gem-cutters. Vases, again, were carved in precious stones, such as the famous onyx vase at Brunswick (Furtwängler, *Die antiken Gemmen*, figs. 185–88), adorned with reliefs relating to the mysteries of Eleusis. A smaller, but finer, onyx vase in the Berlin Museum (Furtwängler, *op. cit.*, figs. 183, 184) represents the infancy of a prince of the Julian line—a rock surmounted by a small temple recalls the sculptures of the Ara Pacis, and the work seems to be of Augustan date.

It was mentioned above that coloured glass was used as a substitute for gems, and it is to the school which produced the cameos of the early Empire that we owe the exquisite vases in white and blue glass of which the Portland vase is the most famous example.[1] Pompeii furnishes a second in the amphora, decorated with vintage scenes, in the Naples Museum.

We must also class amongst the fine arts that of the die-sinker. Not only are the imperial portraits found on coins worthy of a place beside the works of the sculptor, but in the "medallions" of the 2nd century A.D. we find figure-subjects, often recalling those of contemporary reliefs, treated with the utmost delicacy and finish.

Of the purely industrial arts it is unnecessary to speak at length. The finds made in Gaul, Germany and Britain have enabled archaeologists to trace their history—particularly that of pottery—in some detail; but the chief importance of these discoveries lies in the fact that they prove the gradual diffusion of artistic talent throughout the provinces. In the last century of the republic a flourishing manufacture of red-glazed pottery was established with its chief centre at Arretium (Arezzo); the signatures of the vases enable us to distinguish a number of workshops owned by Romans who employed Greek or Oriental workmen. The repertory of decorative types used by these humble artists reflects the cross-currents of classicism and naturalism which were contending in the decadence of Hellenistic art; but, if we cannot set a high substantive value on their works, it is important to note that in the 1st century A.D. the Italian fabrics were gradually driven out of the market by those of Gaul, where the industry took root in the Cevennes and the valleys of the Rhone and the Allier; and before long north-eastern Gaul and the Rhineland became centres of production in the various minor arts,[2] which continued to flourish until the breakdown of the imperial system in the 3rd and 4th centuries A.D.

(6) *Summary: the Place of Roman Art in History.*—Just as the establishment of the Roman Empire gave a political unity to the ancient world, and the acceptance of Christianity by its rulers assured the triumph of a universal religion, so the growth of a Graeco-Roman nationality, due to the freedom of intercourse between the subjects of the emperors, led to a unity of culture which found expression in the art of the time. Yet no sooner was the fusion of the elements which contributed to the new culture complete than the process of disruption began, which issued in the final separation of the Eastern from the Western Empire. In the first, the oriental factors, which produced a gradual transformation in Graeco-Roman art, definitely triumphed; and the result is seen in Byzantine art. But in the West it was otherwise. The realism native to Italy remained alive in spite of the conventions imposed upon it; the human interest asserted itself against the decorative. The Christian art of the West, therefore, is the true heir of the Roman, and, through the Roman, of the classical tradition. The mosaics of S. Maria Maggiore, already referred to, show how strongly this tradition was at work in the 1st century of the Christian Empire; and monuments of the 5th century A.D., such as the consular diptychs of ivory and the carved doors of S. Sabina at Rome, tell the same tale. As we have seen, Roman art in its specific quality was an historical art; and it was for this reason eminently fitted for the service of an historical religion. The earliest Christian art whose remains are preserved is that of the catacombs; and this is not only devoid of technical merit, but is also dominated by a single idea, which governs the selection of subjects—that of deliverance from the grave and its terrors, whether this be conveyed by scriptural types or by representations of Paradise and its dwellers.[3] Not until the church's triumph was complete could she command the services of the highest art and unfold her sacred story on the walls of her basilicas; but, when the time came, the monumental art created by the demands of imperial pride was ready to minister *ad majorem gloriam Dei.*

BIBLIOGRAPHY.—F. Wickhoff's *Roman Art* (1900), translated by Mrs Strong from the author's *Wiener Genesis*, is well illustrated and indispensable to the student. A. Riegl's *Spätrömische Kunstindustrie in Österreich-Ungarn* (1901) also repays close study. The views of Strzygowski are expressed in a large number of monographs and essays; the most important are *Orient oder Rom* (1901), *Kleinasien, ein Neuland der Kunstgeschichte* (1903), "Mschatta" (*Jahrbuch der preussischen Kunstsammlungen*, 1904), *Der Dom zu Aachen und seine Entstellung* (1904), and articles in *Byzantinische Zeitschrift*, *Byzantinische Denkmäler*, and other periodicals. A summary of the debate raised by these writers will be found in the *Quarterly Review*, January 1906 (Stuart Jones). The controversy carried on by Furtwängler and Studniczka as to the date of the Trophy of Adam-Klissi is instructive. Furtwängler's articles appeared in the *Transactions of the Munich Academy for 1903–4*, Studniczka's ("Tropaeum Trajani") in *Abhandlungen der sächs. Gesellschaft der Wissenschaften*, xxii. (1904).

Of Roman sculpture Mrs Strong's handbook (*Roman Sculpture*, 1907), which has a great number of excellent illustrations, gives a general survey. Special branches are treated by E. Courbaud (*Le Bas-relief romain à réprésentations historiques*, 1899), W. Altmann (*Die römischen Grabaltäre der Kaiserzeit*, 1905), A. J. Wace ("The Evolution of Art in Roman Portraiture," *Transactions of the British and American Archaeological Society of Rome*, 1906). There has been much recent discussion of historical monuments in Rome in the *Papers of the British School at Rome*, the *Römische Mitteilungen* of the German Archaeological Institute, the *Jahreshefte* of the Austrian Archaeological Institute, and the *Neue Jahrbücher für Philologie*. Important publications of single monuments are: O. Benndorf (and others), *Das Tropaion von Adamklissi* (1895); E. Petersen, *Ara Pacis Augustae* (1903; further discoveries since this date are discussed by the author in *Jahreshefte des österreichischen arch. Instituts* (1906), 298 ff., and Sieveking in the same journal (1907), 175 ff.); C. Cichorius, *Die Reliefs der Trajanssäule* (1896–1900), criticized by E. Petersen, *Trajans dakische Kriege*

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[1] The tradition that this was found in the well-known sarcophagus of the early 3rd century now in the Capitoline Museum, formerly supposed to contain the ashes of Severus Alexander, is without foundation.

[2] For bronze-work see Willers in *Rheinisches Museum* (1907), pp. 133 ff.

[3] This principle is consistently applied by von Sybel, *Christliche Antike* (Marburg, 1907).

(1899–1903); E. Ferrero, *L'Arc d'Auguste à Suse* (1901); E. Petersen (and others), *Die Marcussäule* (1896).

For Roman portraits J. Bernoulli's *Römische Ikonographie* (4 vols., 1882–94) gives abundant material but little aesthetic criticism. Many of the finest portraits are included in Arndt-Bruckmann's series of *Griechische und römische Porträts*, and Brunn-Bruckmann's *Denkmäler griechisch-römischer Skulptur* contain reproductions of several Roman reliefs. The monuments collected by T. Schreiber under the title of *Hellenistische Reliefbilder* (1894) are largely of Roman date.

For Roman painting we have as yet no handbook; W. Helbig's *Untersuchungen über die campanische Wandmalerei* (1873) are still of great value, though the theory advanced is overstated. His *Campaniens Wandgemälde* (1868) gives a catalogue *raisonné* of Pompeian paintings, and has been supplemented by A. Sogliano, *Le pitture murali Campane* (1879). Those since discovered are described in the *Notizie degli Scavi*. A. Mau's *Geschichte der Wandmalerei* is also indispensable. Hermann-Bruckmann, *Denkmäler der Malerei des Alterthums* (1907–), will give reproductions, partly in colour, of all important specimens of ancient painting. *Le Nozze Aldobrandine*, &c., by B. Nogara (1907), contains both coloured and photographic reproductions of the paintings preserved in the Vatican library. For the Fayūm portraits see G. Ebers, *Antike Porträts* (Leipzig, 1893); F. Petrie, *Hawara*, ch. vii.; and C. Edgar, *Catalogue des antiquités du musée du Caire*, "Graeco-Egyptian Coffins," p. xi. ff. On the technique of ancient painting Otto Donner von Richter's introduction to Helbig's *Campaniens Wandgemälde* should be consulted. P. Girard's sketch of ancient painting (*La Peinture antique*, n.d.) is slight. For the bibliography of mosaics see that article (especially Gauckler in Daremberg and Saglio, *Dictionnaire des antiquités, s.v.* "Musivum Opus"); for work in gold and silver see the article Plate. For gem-engraving, A. Furtwängler's *Die antiken Gemmen* (3 vols., 1900) is the standard work. The history of Roman pottery is summarized by H. B. Walters, *History of Ancient Pottery*, vol. ii. 430 ff.; the most important works are J. Déchelette, *Les Vases ornés de la Gaule romaine* (1904), and H. Dragendorff's articles on "Terra sigillata" in the *Bonner Jahrbücher*.

Sections on Roman art will be found in general handbooks, such as Springer-Michaelis, *Handbuch der Kunstgeschichte* (6th ed., 1904); L. von Sybel, *Weltgeschichte der Kunst* (2nd ed., 1902); and C. Gurlitt, *Geschichte der Kunst*, vol. i. (1902). (H. S. J.)

ROMAN CATHOLIC CHURCH, the name generally given to that great branch of the Christian Church which acknowledges the pope, or bishop of Rome, as its head, and holds as an article of faith that communion with and submission to the authority of the see of Rome is essential to effective membership of the Catholic Church as founded by Christ. This belief is based upon the commission given by Christ to Peter as "prince of the apostles," "Feed my sheep" (John xxi. 15–17); the saying, "Thou art Peter, and upon this rock I will build my church; and the gates of hell shall not prevail against it. And I will give unto thee the keys of the kingdom of heaven: and whatsoever thou shalt bind on earth shall be bound in heaven; and whatsoever thou shalt loose on earth shall be loosed in heaven" (Matt. xvi. 18, 19). The authority thus conferred upon St Peter is held by Roman Catholics to be permanently vested in the bishop of Rome, as successor to Peter, first bishop of the imperial see. As such, the pope is regarded as "vicar of Christ, head of the bishops, and supreme governor of the whole Catholic Church, of whom the whole world is the territory or diocese." His peculiar powers as pope he exercises immediately on election. Thus he may grant indulgences, issue censures, give dispensations, canonize saints, institute bishops, create cardinals—in short, perform all the acts of his *jurisdiction*, even though he be no more than a layman; but by custom certain of his more solemn acts are postponed till after the ceremony of his coronation, from which his pontificate is officially dated. To exercise the *actus ordinis* of a priest or bishop, however, he must, if not already in orders, be specially ordained and consecrated. Hence his office is a dignity, not of order, but of jurisdiction (see Papacy and Pope).

The most distinctive characteristic of the Roman Catholic Church, at least as contrasted with the various Protestant communions, is its vigorous insistence on the principle of ecclesiastical authority. Of this authority the pope is regarded as the centre and source, so far as the interpretation of the Divine Will to the world is concerned in matters of faith and morals. His pronouncements are held to be infallible when he defines a doctrine concerning faith or morals *ex cathedra* to be held by the universal church (see Infallibility and Vatican Council).

The government of the Roman Catholic Church being centred at Rome, an elaborate organization has been developed there for the administration of its affairs. At the head of this is the college of cardinals, who are the princes and senators of the Church, the counsellors of the pope, and his vicars in the functions of the pontificate. By those of them who are members of the various Congregations and other offices of the Curia the greater part of the government of the Church is directed. (For accounts of the organization of the Roman Curia the reader is referred to the articles Cardinal and Curia Romana.) The characteristic note of the Roman Curia is its intense conservatism and its slowness to move, whether in approving or condemning new developments of opinion or action. This is explained by the nature of its organization and by the tradition on which it is based. For, just as the Roman Church as a whole preserves in the spiritual sphere the spirit and much of the organization of the Roman Empire, so the administration of the Curia carries on the tradition of Roman government, with its reverence for precedent and its practice of deciding questions, not on their supposed abstract merits, but in accordance with the rules of law as defined in the codes or by previous decisions. Thus the genius of Rome remains, as it always has been, administrative rather than speculative. The great dogmas of the Christian Church were shaped by the interplay of the subtle wits of the theologians of the Oriental Churches. The new dogmas promulgated by the Holy See from time to time have been the outcome of the slow growth of ages, built up from precedent to precedent, and only defined at last when the accumulated weight of evidence in their favour, or the necessity for precise definition to meet the contradictions of heretics, seemed to demand a decision. This temper and the process in which it finds expression are well illustrated in the case of the dogma of the Immaculate Conception (*q.v.*) and in the authorization given to the cult of the Sacred Heart (*q.v.*).

This conservative spirit and extreme reverence for authority pervades the whole Roman Catholic Church in exact proportion to the degree of effective control which the see of Rome has succeeded in obtaining over its branches in various countries. To pretend to an independent judgment in questions of faith or morals is for a Roman Catholic to commit treason against his Church; and even in the wide sphere of questions lying beyond the dogmas defined as *de fide* a too curious discussion is discouraged, if not condemned. As opposed to the critical and analytical tendencies of the modern world, then, the Roman Catholic Church assumes the function of the champion of moral and intellectual discipline, an attitude defined, in its extremest expression, by Pius IX.'s *Syllabus* of 1864 (see Syllabus), and the famous encyclical *Pascendi* of Pius X. in 1907. The development of this attitude, known—in so far as it depends on the full pretensions of the Papacy—as Ultramontanism, since the definition of the Roman Catholic Church by the council of Trent in 1564, will be found sketched in the historical section attached to this article. The earlier history, which is that of the Latin Church of the West, will be found in the articles Papacy, Church History and Reformation.

Under the supreme authority of the pope the Roman Catholic Church is governed and served by an elaborate hierarchy. This, so far as its *potestates ordinis* are concerned, is divided into seven orders: the three "major orders" of bishops and priests, deacons, and subdeacons (bishops and priests forming two degrees of the *ordo sacerdotium*), and the four "minor orders" of acolytes, exorcists, readers, and door-keepers. These various orders do not derive their *potestas ordinis* from the pope, but from God, in virtue of their direct ministerial succession from the apostles.[1] So far as jurisdiction is concerned, however, those members of the hierarchy known as prelates (*praelati*), who possess this power (*potestas jurisdictionis in foro externo*), whether bishops or priests, derive it from the pope.

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[1] Thus sacraments administered by validly ordained or consecrated priests and bishops are regarded as valid, even when those who administer them are heretics or schismatics.

These jurisdictions are of very varied character, and in most cases are not peculiar to the Roman Catholic Church. They include those of patriarchs, archbishops, metropolitans and bishops in the first rank of the hierarchy, with their subordinate officials, such as archdeacons, archpriests, deans and canons, &c., in the lower ranks. All of these will be found described under their proper headings (see also Ecclesiastical Jurisdiction). The basis of the organization of the Church is territorial, the world being mapped out into dioceses or, in countries where the Roman Church is not well developed—*e.g.* missions in non-Christian lands—into Apostolic Vicariates. The dioceses are grouped in various ways; some are immediately dependent upon the Holy See; some are grouped in ecclesiastical provinces or metropolitanates, which in their turn are sometimes grouped together to form a patriarchate.

According to the official *Gerarchia Cattolica*, published at Rome, there were in 1909 ten patriarchates, with fourteen patriarchal sees (including those of the Oriental rite, *i.e.* those Eastern communities which, though in communion with Rome, have been allowed to retain their peculiar ritual discipline). Of these the four greater patriarchates are those of Alexandria (with two patriarchs, Latin and Coptic); Antioch (with four, Latin, Graeco-Melchite, Maronite and Syriac); Constantinople (Latin) and Jerusalem (Latin). The lesser patriarchates are those of Babylon (Chaldaic), Cilicia (Armenian), the East Indies (Latin), Lisbon (Latin), Venice (Latin) and the West Indies (Latin). (See Patriarch.)

The archiepiscopal sees number 204. Of these 21 are immediately subject to the Holy See, while those of the Latin rite having ecclesiastical provinces number 164. There are 19 of the Oriental rite: 3 with ecclesiastical provinces, viz. Armenian, Graeco-Rumanian and Graeco-Ruthenian respectively; the rest are subject to the patriarchates, viz. 2 Armenian, 3 Graeco-Melchite, 3 Syriac, 2 Syro-Chaldaic, 6 Syro-Maronite.

Of episcopal sees of the Latin rite 6 are suburbican sees of the cardinal bishops, 85 are immediately subject to the Holy See, and 662 are suffragan sees in ecclesiastical provinces. Of those of the Oriental rite one (Graeco-Ruthenian) is immediately subject to the Holy See; 9 are suffragan sees in ecclesiastical provinces, viz. 3 Graeco-Rumanian and 6 Graeco-Ruthenian; the rest are subject to the patriarchates, viz. 15 Armenian, 2 Coptic, 9 Graeco-Melchite, 5 Syriac, 9 Syro-Chaldaic, 2 Syro-Melchite.

The whole number of these *residential* sees, including the patriarchates, is 1023. Besides these there are 610 *titular* sees, formerly called sees *in partibus infidelium*, the archbishops and bishops of which are not bound to residence. These titles are generally assigned to bishops appointed to Apostolic Delegations, Vicariates and Prefectures, or to the office of coadjutor, auxiliary or administrator of a diocese. (See Archbishop and Bishop.)

The dioceses are divided into parishes, variously grouped, the most usual organization being that of deaneries. In the parish the authority of the Church is brought into intimate touch with the daily life of the people. The main duties of the parish priest are to offer the sacrifice of the mass (*q.v.*), to hear confessions, to preach, to baptize and to administer extreme unction to the dying. It is true to say that in the "cure of souls" the confessional plays a larger part in the Church than the pulpit (see Confession and Absolution). For the official costume of the various orders of clergy see the article Vestments.

The clergy of the Roman Catholic Church are furthermore divided into regular and secular. The regular clergy are those attached to religious orders and to certain congregations (see Monasticism). Of these the former are outside the normal organization of the Church, being exempt from the ordinary jurisdiction of the diocesan bishops, while the more recently formed congregations are either wholly or largely subject to episcopal authority. By far the most powerful of the religious orders are the Jesuits (*q.v.*). The secular clergy, on the other hand, are bound by no vows beyond those proper to their orders. Both regular and secular clergy (those at least in major orders) are under the obligation of celibacy, which, by cutting them off from the most intimate common interests of the people, has proved a most powerful disciplinary force in the hands of the popes (see Celibacy). The more complete isolation of the regular clergy, however, together with their direct relation to the Holy See, has made them, not only the more effective instruments of papal authority, but more obnoxious to the peoples and governments of countries where they have gained any considerable power. Their privileged position, moreover, leads everywhere to a certain amount of friction between them and the secular clergy.

In doctrine the Roman Catholic Church is divided from the orthodox communions of the East mainly by the claims of the papacy, which the Orientals reject, and the question of the "Procession of the Holy Ghost" (see Church History). From the Protestant communities which were the outcome of the Reformation the divergence is more profound, though the central dogmas of the faith are common to Roman Catholics and orthodox Protestants. The difference lies essentially in the belief held as to the means by which the truths defined in these dogmas are to be made effective for the salvation of the world. It was defined in the canons of the council of Trent, as promulgated by Pope Pius IV. in 1564, in which the main theses of the Reformers as to the character of the Church, the sufficiency of Holy Scriptures, the nature of the sacraments, and the like were finally condemned (see Trent, Council of).

The Roman Catholic Church is by far the most widespread, numerous and powerful of all the Christian communions. It is the dominant Church in the majority of European states, in South and Central America and in Mexico; it is the largest single religious body in the United States of America, while in certain Protestant countries, *e.g.* Prussia and the United Kingdom, it has great religious and political influence. Any statistics of its membership, however, must necessarily be misleading. Those published are generally based on the principle of deducting the Protestant from the general population of "Catholic" countries and ascribing the rest to the Roman Church. This may be possible in Germany and other countries where there is a religious census; but it is, at best, a rough-and-ready method where, as in Italy or France, besides the class of "political" or "non-practising" Catholics, large numbers of the people are more or less actively hostile to Christianity itself. (For Roman Catholic missionary work see Missions.)

The Uniat or United Oriental Churches.—The overwhelming majority of the adherents of the Roman Catholic Church throughout the world belong to the Latin rite, *i.e.* follow the usages and traditions of the Western Church.[1] Ever since the schism of East and West, however, it has been an ambition of the papacy to submit the Oriental Churches to its jurisdiction, and successive popes have from time to time succeeded in detaching portions of those Churches and bringing them into the obedience of the Holy See. This has only been possible owing to the temper of the Oriental mind which, while clinging tenaciously to its rites, values dogma only in so far as it is expressed in rites. The popes, then, or at least the more politic of them, have been content to lay down as the condition of reunion no more than the acceptance of the distinctive dogmas of the Roman Catholic Church, especially the supremacy and infallibility of the pope; the *ritus* of the Uniat Oriental Churches—liturgies and liturgical languages, ecclesiastical law and discipline, marriage of priests, beards and costume, the monastic system of St Basil—they have been content for the most part to leave untouched. The attempts of Pius IX., who in 1862 established the *Congregatio de propaganda fide pro negotiis ritus orientalis*, to interfere in a Romanizing sense with the rites of the Armenians and Chaldaeans (by the bulls *Reversurus* of 1867 and *Cum Ecclesiastica* of 1869) led to a schism; and Leo XIII., who more than all his predecessors interested himself in the question of reunion, reverted to and developed the wiser principle of not aiming at any assimilation of rites, but only at "the full and perfect union of faith" (Encyclical *Praeclara gratulationis* of June 1894). This principle has even been carried to the extent of recognizing several bishops having jurisdiction over the adherents of various rites in the same see; thus there are three uniat patriarchs of Antioch (Graeco-Melchite, Maronite and Syrian).

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[1] The Latin word *ritus* covers not only the ordinary meaning of the modern English word "rite," *i.e.* "a formal procedure or act in a religious or other solemn function," or any "custom or practice of a formal kind," but the sense in which it is now obsolete in England—except in the religious connotation here used—of "the general or usual custom, habit or practice of a country, people, class of persons, &c." (*New English Dict.* s.v.). For the liturgies of the Latin and Oriental Churches see Liturgy.

Exact statistics of the membership of the Churches of the Oriental rite are almost impossible to obtain; the numbers of their adherents, moreover, are apt to vary suddenly with the shifting currents of political forces in the East, for political factors have always played a considerable part in these movements towards reunion or the reverse. In 1908 their numbers were estimated at approximately 5,500,000. The Churches of the Oriental rite fall under four main divisions: Greek, Armenian, Syrian, Coptic; and—with the exception of the Armenian—these are again subdivided according to nationality or to peculiarities of cult or language. The Churches may be further grouped according to the character of their constitution, *i.e.* (1) those having their own rite only in a restricted sense, since they have no hierarchy of their own but are subordinate to Latin bishops, *i.e.* the Greeks in Italy (*Italograeci*), the scattered Bulgarian Uniats, the Abyssinians, some of the Armenians and the "Christians of St Thomas"; (2) those having their own bishops and sometimes their own metropolitans, as in Austria-Hungary; (3) the Eastern patriarchates.

Geographically, the Uniat Churches may be grouped as follows:—

(A) EUROPE, where their association with the Roman Church is at once the oldest and the most intimate.

(1) The *Italograeci*. These are distributed in scattered groups throughout Italy, but are most compact in Apulia and Sicily, and number in all some 50,000. They are under the jurisdiction of the Latin diocesan bishops, but their priests are ordained by bishops of their own rite specially appointed by the pope.

(2) The Uniat Churches of Austria-Hungary. With the exception of the Armenian, these are all of the Greek rite, but are divided according to nationality and ritual language into the following groups: —(*a*) *Ruthenian Church.*—This, though still the most important numerically of all the Uniat Churches, is but a fragment of the Church which proclaimed its union with Rome at the synod of Brest in Lithuania in 1596, a union which, after long and bitter resistance, was completed by the submission of the dioceses of Lemberg and Luzk in 1700 and 1702. The Church was broken up by the successive partitions of Poland, and those parts of it which fell to Russia were, notably under Catherine II. and Nicholas I., forcibly absorbed into the Orthodox Church. The Church, however, still numbers some 3,000,000 adherents in Galicia, and 500,000 in Hungary. In Galicia it has an independent organization under the Greek-Catholic archbishop of Lemberg, with two suffragan sees: Przemysl, for West Galicia, and Stanislawov for East Galicia. In Hungary there are two bishoprics, Munkacz and Eperies, under the Latin primate of Hungary, the archbishop of Gran. The Serb bishopric of Kreutz in Croatia, under the Latin archbishop of Agram, may be also grouped with the Ruthenian Church, since the rite is identical. Its adherents number from 15,000 to 20,000. The liturgical language of the Uniat Slav Churches is Old Slavonic, and, so far as their rite is concerned, they differ from the Orthodox Slav Churches only in using the Glagolitic instead of the Cyrillic alphabet. (*b*) *Rumanian Church.*—This numbers about 1,000,000 adherents and has its own organization under the metropolitan of Fogarasch or Alba Julia, with three suffragan sees: Lugos, Gross-Wardein and Szamos-Uyjár. It has had its own ritual language since the 17th century. (*c*) *Armenian Church.*—This numbers in Austria-Hungary only some 4000 to 5000 members. It has an archbishopric at Lemberg, which has jurisdiction also over the Uniat Armenians at Venice.

(3) Uniat Churches in Russia and Turkey in Europe. (*a*) In Russia the Uniat Ruthenian Church (see above) ceased to exist with the incorporation of the little Polish diocese of Chlem in the Orthodox Russian Church under Alexander II. in 1875. The Holy See, however, has never withdrawn its claim to jurisdiction over it, nor have the Ruthenians ever been wholly reconciled to their absorption in the Russian Church. The *ukaz* of Nicholas II. (Easter, 1905), granting liberty of worship, produced a movement in the direction of Rome; but this appears to have been checked by the refusal of the government, even now, to recognize in Russia a Roman Catholic Church of the Greek rite. Converts to Rome have, therefore, to accept the Latin rite (see Prince Max of Saxony, *Vorlesungen über die orientalischen Kirchenfragen*, 1907). The scattered communities of the Uniat Armenian Church in Russia are subordinate to Latin vicars apostolic. The Uniat Armenian Church in the Caucasus, however, is under the jurisdiction of the patriarchate of Cilicia. (*b*) In European Turkey the Uniat Churches are represented by tiny groups, scattered about the Balkan Peninsula, attached to Latin "missions." The movement in favour of the union of the Bulgarian Church with Rome, which grew up in 1860, was the outcome of the national opposition to the Greeks, and with the establishment of the Bulgarian exarchate in 1872 it died away. There are not more than 10,000 to 15,000 Uniat Bulgarians, who have been ruled since 1883 by three vicars apostolic. The Uniat Armenians and Melchites in Constantinople belong to the Eastern patriarchates.

(B) ASIA AND AFRICA.—The Uniat Churches in Asia and Africa occupy a peculiar position in so far as Rome has recognized the traditional rights of the patriarchates (see, *e.g.*, Leo XIII.'s encyclical *Praeclara gratulationis* of June 1894), and they therefore enjoy almost complete autonomy; thus the patriarchs nominate their own suffragans and have the right to summon synods for specific purposes (see PATRIARCH).

There are six Uniat Patriarchates:—

(1) The *Patriarchatus Ciliciae Armenorum.* The Armenian patriarch, whose jurisdiction embraces the Catholic Armenians in the Balkan Peninsula, in Russian Armenia and in Asiatic Turkey, formerly resided in Lebanon, but has had his seat since 1867 at Constantinople. Under him are 19 dioceses, including a small one in Persia. The number of Catholic Armenians under his jurisdiction is, roughly, 100,000 (see ARMENIAN CHURCH).

(2) The three patriarchates of Antioch. (*a*) The Melchite (*Patriarchatus Antiochenus Graeco-Melchitarum*). The patriarch resides in the monastery of Ain-Traz in the Lebanon and has jurisdiction over all the Uniats of Greek nationality in the Turkish Empire, who number about 120,000. Under him are 3 archbishops and 9 bishops (see MELCHITES). (*b*) The Maronites (*Patriarchatus Antiochenus Syro-Maronitarum*), whose seat is in the Lebanon. The patriarch has jurisdiction over about 500,000 people (see MARONITES). (*c*) The Syrian (*Patriarchatus Antiochenus Syrorum*). The patriarch, who resides at Mardin near Diarbekr on the upper Tigris, is obeyed by from 15,000 to 20,000 people, who represent a secession from the Jacobite Church (see JACOBITE CHURCH). He has 3 archbishoprics and 5 bishoprics under his jurisdiction.

(3) The Chaldaeans (*Patriarchatus Chaldaeorum Babylonensis*). The patriarch has jurisdiction over the Uniat Nestorian Church, which numbers, roughly, about 50,000 adherents, and is divided, under the patriarch, into 11 dioceses (see NESTORIANS).

(4) The Coptic (*Patriarchatus Alexandrinus Coptorum*). This was founded on the 26th of November 1895 by Pope Leo XIII. The patriarch, who was given two suffragan bishops, has his seat at Cairo. The number of Uniat Copts is nominal.

(5) The Uniat Abyssinian Church. This has scaracely any adherents. Such as there are are under the authority of a vicar apostolic residing at Keren.

(6) The Christians of St Thomas (Malabar coast). For these Leo XIII. established in 1887 three special vicariates apostolic (*Vicariatus apostolici Syro-Malabarorum*); the vicars apostolic are Latins, but have the right to pontificate and to confirm according to the Syrian rite. The number of Christians of St Thomas in the obedience of Rome is said to be about 100,000.[1] (W. A. P.)

The Church in Europe since the Reformation.

The term "Romish Catholique" is as old as the days of Queen Elizabeth.[2] It is not happily chosen, for catholic means universal, and what is universal cannot be peculiar to Rome. But the term is inoffensive to Roman Catholics, since it advertises their claim that communion with the see of Rome is of the essence of Catholicity, and to Protestants, since it serves to emphasize the fact that the religion of modern Rome differs widely in many important respects from that of the undivided medieval Church. The change has brought both good and evil. Protestant controversialists have some show of reason on their side when they argue that Luther saved the Roman Church by forcing it to put an end to many intolerable abuses. On the other hand, under stress of his revolt the papacy could not but develop in a strongly anti-Protestant direction, laying exaggerated emphasis on every point he challenged. The more fiercely he denounced infallibility, the confessional, the sacramental system, the larger these things bulked in the eyes of Rome.

Not that this consequence showed itself at once. The Reformation was well established before it attracted any serious notice at Rome. The popes of the Renaissance were profoundly uninterested in theology; they were far more at home in an art gallery, or in fighting to recover their influence as temporal Italian princes, gravely shattered during the long residence of the papal court at Avignon in the 14th century. But these secular interests came to an end with the so-called sack of Rome in 1527, when Charles V. turned his arms against Clement VII., and made the pope a prisoner in his own capital. Thenceforward there was no more thought of territorial aggrandisement. The popes, as the phrase went, became Spanish chaplains, with a fixed territory guaranteed to them by Spanish arms; apart from the addition of Ferrara and one or two other petty principalities on the extinction of the reigning house, its boundaries remained unchanged till Napoleonic times. Under Clement's successor, Paul III., a new state of things began to dawn. Hitherto the way had been blocked by a horde of protonotaries, dataries and other officials—purveyors of indulgences, dispensations and such-like spiritual favours—to whom reform spelt ruin. Even the Reformation did not move them; if less money came in from Germany, that was all the more reason for leaving things unchanged in France and Spain. But among Paul's cardinals were three remarkable men, the Italians Contarini and Sadolet, and the Englishman Reginald Pole, afterwards archbishop of Canterbury under Mary. All three were disciples of Erasmus, the great apostle of a new, tolerant, scholarly religion very different from the grimy pedantry of the medieval doctors. It was better, he said, to be weak in Duns Scotus, but strong in St Paul—than to be crammed with all the learning of Durandus, and ignorant of the law of Christ. Men trained in this school were not likely to be tender towards vested interests in darkness, least of all when they stood in the way of a reconciliation with the Protestants: for the cardinals thought that the strength of the Reformation lay much less in the attractiveness of Luther's doctrines than in his vigorous denunciations of the vices of the clergy. Once root out abuses with a firm hand, and they believed that a few timely concessions on points of doctrine would tempt most Protestants back within the Roman pale. This belief was shared by Charles V. Together they persuaded the unwilling pope to call a general council. It met in December 1545, at the Tirolese city of Trent, with Pole as one of the three presidents (see TRENT, COUNCIL OF).

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[1] This account of the Uniat Churches is largely condensed from the excellent article "Unierte Orientalen," by F. Kattenbusch in Herzog-Hauck *Realencyklopädie* (3rd ed., Leipzig, 1908), where numerous authorities are given.

[2] It was officially adopted in the Relief Act of 1791 in place of the designation "Protesting Catholic Dissenters," to which the vicars apostolic objected.

The Council of Trent.

As a means of reconciliation the council was a signal failure. The Protestants refused to attend an assembly where even the most conciliatory prelate could hardly condescend to meet them on equal terms. Nor was Pole allowed to use the only possible means of overcoming their reluctance. He had wished to begin by reforming abuses before proceeding to sit in judgment on doctrinal errors. But this arrangement was cried down as a revolutionary departure from all established precedent; and he had much ado to secure the compromise that doctrines and practical reforms should be simultaneously discussed. But in the midst of its labours the council was prorogued (March 1547) in consequence of a quarrel between the pope and emperor. In 1551 it met again, only to be again prorogued in 1552. Ten years later it met again for a third and final session, lasting throughout 1562 and 1563. During those ten years great changes had taken place. Charles V. had followed Pole and his peace-loving colleagues to the grave; in his place stood his son, Philip II. of Spain, while the intellectual leadership of the council fell to Jaime Laynez, general of the newly founded Society of Jesus. There was no longer any question of reconciliation with the Protestants. North Germany, England, Scandinavia were irretrievably lost to Rome; wars of religion had broken out in France. Clearly the one hope was to enter into a desperate struggle for the possession of such countries as still hung in the balance; and that could best be done by striking at the heart of the Reformation. Protestantism centred—or was by Catholics supposed to centre—in a mysterious "right of private judgment"; the council accordingly retorted by hymning the praises of obedience, of submitting to authority and never thinking for oneself. To waverers it held up an absolutely sure and uniform Rule of Faith, contrasting impressively with the already multitudinous variations of the Protestant Churches. Moreover, thanks to Laynez, it accomplished this task without running the obvious danger of tying itself hand and foot to the past. When old-fashioned theologians talked about the canons and councils of antiquity, Laynez answered that the Church was not more infallible at one time than another; the Holy Ghost spoke through the decrees of Trent quite as plainly and directly as through the primitive Fathers. Thus the council's authority became at once peremptory and elastic. But the real gainer was the pope. Hitherto infallibility had been thought of as the supreme weapon of the Church's armoury, destined only for use at some extraordinary crisis; hence it was naturally conceived of as residing only in the extraordinary authority of a general council presided over by the pope. Since the outbreak of the Reformation, however, extraordinary crises, calling for immediate decision, might arise at any moment. It was no longer possible to wait for the assembling of a general council; stronger and stronger grew the tendency to ascribe infallibility to the pope alone, as being always on the spot.

The Counter-Reformation.

Doctrine and discipline once settled at Trent, the work of counter-reformation could begin. Rebels were won back by force wherever force could be applied. In Spain the Inquisition soon snuffed out the few Reformers. In Italy, though declared Protestants were few, there was widespread sympathy with some of Luther's ideas; a committee of cardinals at Rome was accordingly organized into an Inquisition, with branches at the chief Italian towns. For half a century trials were many at Venice and elsewhere, but actual executions were only common at Rome; the most illustrious victim was the philosopher Giordano Bruno, burnt in 1600. In the imperial dominions, however, there could be no recourse to the stake. The peace of Augsburg (1555) forbade the German princes to persecute, though it recognized their right to determine to what religion their subjects should belong, and to banish nonconformists. At first this compromise had worked in favour of the Reformation, but presently the Catholic princes began to turn it against their Protestant subjects. "Governments learned to oppress them wisely, depriving them of church and school, of pastor and schoolmaster; and by those nameless arts with which the rich used to coerce the poor in the good old days. Fervent preachers came amongst them, widely differing in morality, education, earnestness and eloquence from the parish clergy, whose deficiencies gave such succour to Luther. Most of those who, having no taste for controversy, were repelled by scandals were easily reconciled. Others, who were conscious of disagreement with the theology of the last thousand years, had now to meet disputants of a more serious type than the adversaries of Luther, and to meet them unsupported by experts of their own. Therefore it was by honest conviction, as well as by calculated but not illegal coercion, that the Reformation was driven back" (Acton, *Lectures on Modern History*, p. 123).

This system was not an unmixed success; for its extension to Bohemia early in the 17th century brought about the Thirty Years' War. But it obliged the authorities to pay anew attention to the training of the clergy. The "seminary system" came into being—that is, the custom of obliging candidates for ordination to spend several years in a theological college, whence lay influences were carefully excluded. But ecclesiastical learning of a wider type was also promoted. Gregory XIII. (1572–85) and Sixtus V. (1585–90) dreamed of making Rome once more the capital of European culture. Gregory reformed the Calendar, and founded the university that bears his name. Five years of power were enough for Sixtus to reform the central government of the Church and the administration of the Papal States, to set on foot the Vatican press and issue an official edition of the Vulgate. Their efforts bore fruit in many quarters. In Rome arose Cardinal Baronius, first of modern Church historians; Spain produced Suarez, most philosophical of divines. A generation later the French Oratory became the home of Malebranche and of Richard Simon, father of Biblical criticism. Mabillon and his Benedictines of Saint-Maur paved the way for the systematic investigation of historical records. The Flemish Jesuit Bolland brought the light of criticism to bear on the legends of the saints (see Bollandists). His French colleague, Petau, better known under his latinized surname of Petavius, opened still wider floodgates when he taught that theological dogmas, like everything else, have a history. Lastly, the Jansenist "hermitage" at Port Royal contributed the historian Tillemont, whose bigotry Edward Gibbon declares to be overbalanced by his erudition, veracity and scrupulous minuteness. Other such communities and "congregations"—semi-monastic bodies standing in closer touch with the world than did the medieval orders—undertook the diffusion of knowledge. Wherever they went the Jesuits opened grammar-schools, which had the double advantage of being excellent and cheap. An Italian sisterhood, the Ursulines, was founded for the higher instruction of girls; late in the 17th century a French priest started the Christian Brothers, pioneers of elementary education. Other communities again devoted themselves to parochial work. Such were the Oratorians of St Philip Neri, founded to evangelize the middle classes of Rome. Such, again, were the Lazarists of St Vincent de Paul, whose duty was to preach in neglected country districts. But the most interesting of all these new foundations was the Sisters of Charity, also founded by St Vincent de Paul. This admirable body represents a significant departure from medieval ideals. The old-fashioned nun had spent her time behind high walls in prayerful contemplation; the one object of the Sister of Charity was the service of her neighbour.

Not that medieval ideals were by any means dead; they never burned more brightly than in the Spain of St Teresa (1515–82). Her first idea had been to combat alike the heresies and the worldliness of her time by a return to the austerities of a more heroic age. With this object she founded her order of "Discalced" or barefooted Carmelites; it presently became the refuge of Louise de la Vallière and many another penitent of rank. But mere bodily rigours were not enough for Teresa; she felt the need of rising to a state of complete detachment from all earthly interests and ties. Her whole theology centres in the lines—

"The love of God flows just as much
As that of ebbing self subsides;
Our hearts, their scantiness is such,
Bear not the conflict of these rival tides."

The Jesuits.

How, then, subdue the rivalry? Teresa turned to the mystical writers, and learnt from them how to root out the last relics of self-love from the mind by a long discipline of mystical trance and "contemplation." These ideas, in a very modified form, were introduced into France by the great devotional writer, St Francis of Sales; in the latter half of the 17th century they were pushed to the extravagant length known as Quietism by Fénelon, and especially by Madame Guyon and Michel de Molinos. Meanwhile, the leading conception from which St Teresa started had developed along characteristically different lines in the mind of her compatriot and contemporary, Ignatius Loyola. He quite agreed that self-will was the enemy; but was there no quicker way of checkmating it than an interminable course of ecstasies and austerities? The thoughts of the converted soldier flew back to the military virtue of obedience. In the long-run no self-imposed hardships could prove quite as disagreeable as always being under the orders of some one else. Obedience accordingly became the typical virtue of Ignatius's society (see Jesuits). The individual Jesuit obeyed his superior, who obeyed the rector, who obeyed the provincial, who obeyed the general, who obeyed the pope, who took his orders straight from God Almighty. Such a theory was of untold practical value to the Church of Rome, more especially during the era of the Reformation. Laynez at the council of Trent has given one signal instance of its working, but its operations were by no means confined to the abstract field of dogma. If men were really to be made obedient, it could only be by stopping them from thinking for themselves about the everyday problems of conduct; and the best way to do this was to furnish them beforehand with a ready-made code of answers to such problems, warranted to meet all needs. Hence casuistry and the confessional loomed large on the Jesuit horizon. The casuist's duty was to apply the general precepts of the Church to particular cases. He explained, for instance, when a man was strictly bound to tell the truth; when he might avail himself of the mild licence of an equivocation; and when the Church placed at his service the greater indulgence of a mental reservation. The confessor brought the casuist's principles to bear on the conscience of his penitents, and thus saved them from the danger of acting on their own responsibility (see Casuistry).

Casuistry.

In its origin this system was a perfectly honest attempt to widen the sphere of obedience by making morality wholly objective and independent of the vagaries of the individual conscience. But what was begun in the interest of obedience was carried on in those of laxity. Experts proverbially differ, and the casuists were no exceptions to the rule. But when great authorities were at variance, it ill became an average priest or penitent to decide. Whatever a grave doctor said must have some solid reasons behind it—*aliqua niti probabilitate*—and humble lay-folk could act upon it without a twinge of conscience. Thus arose lax casuists of the type of Antonio Escobar (1589–1669), the central figure of Pascal's *Provincial Letters*. Their whole business was to hunt through the older authorities in search of "benign" decisions. Their temptation is easy to understand. Half Europe was full of waverers between Protestantism and Catholicism tolerably certain to decide for the Church that offered them the cheapest terms of salvation; and even in wholly Catholic countries many, especially of the upper class, might easily be scared away from the confessional by severity. Thereby their money and influence would be lost to the Church, and their souls robbed of the priceless benefit of priestly absolution. On the other hand, these "Escobarine morals" by no means passed unchallenged; ever since the foundation of the society the aims and methods of the Jesuits had called forth lively opposition in many parts of Catholic Europe, and not least in Loyola's native land of Spain. But the most effective protest against them was a movement which began when Michel de Bay, a professor at the Flemish university of Louvain, put forward certain theories on grace and free-will in the latter part of the 16th century. In 1640 a much more elaborate statement of the same ideas appeared in a posthumous treatise on the theology of St Augustine from the pen of Cornelius Jansen, also a Louvain professor (see Jansenism). Into the technical detail of the controversy there is no need to enter. It is enough to say that two rival doctrines of grace and free-will were struggling for mastery in the Roman Church. One theory emphasized the necessity of grace; having been put together by St Thomas Aquinas, it was known as Thomism, and was especially championed by the Dominicans. The other laid the chief stress on free-will; it was known as Molinism from its inventor, the Jesuit Louis de Molina, and was in great favour with the society. The two orders came into violent collision at Rome between 1588 and 1606. But the quarrel, known as the controversy *de auxiliis gratiae*, was brought to an end by Pope Paul V., who closed the debates and adjourned his decision *sine die*.

Jansenism.

At first sight this abstract question seemed endlessly remote from the practical policy of Escobar; really there is a close connexion between the two. The whole system of the Jesuits rested on a basis of free-will. Their quarry was the average man; and the best way of impressing the average man is to set before him duties that he feels himself fully capable of performing. Then he will really feel morally responsible if he leaves them undone, hence the necessity of free-will. On the other hand, as Jansen pointed out, free-will tends to make the average man's estimate of his own powers into the supreme criterion of all that is good and right. God must perforce be satisfied with whatever common sense thinks it fair and reasonable that He should expect. Jansen accordingly denounced free-will as dishonouring to God, and destructive of the higher interests of morality. But, if men threw over common sense, what was to be their guide in life? Jansen answered with his doctrine of Irresistible Grace. This was simply a cumbrous way of saying that God awakens in the righteous heart an intuitive faculty of discerning right from wrong. "This holy taste or relish," says a follower of Jansen, "distinguishes between good and evil without being at the trouble of a train of reasoning; just as the nature and tendency of a heavy body, let fall from a height, shows the way to the centre of the earth more exactly in a moment than the ablest mathematician could determine by his most accurate observations in a whole day." That being so, the Jansenist obeyed his Inner Light, and paid little heed to the earth-bound standards of unregenerate common sense. Nor was he much more respectful towards the official standards of the Church. Why should he consult a casuist rather than his Inner Light? Thus the Jesuits saw themselves menaced by a grave revolt. What would become of the confessional if penitents were allowed to act on what they fondly took to be a heaven-sent inspiration? In a twinkling they would be off to some spiritual Wonderland, where no confessor could bring them to book. On the other hand, only preach to them a strong doctrine of free-will, and all these dangers vanished. They would feel bound to disregard their sporadic intuitions, and act only for reasons that would be clearly set out in black and white. Their past performances could then be checked, and their future actions forecast by the priest; and there was small danger of their straying beyond the limits marked out by authority.

The Papacy and the New Monarchies.

Thus within the spiritual sphere free-will led up to Jesuit obedience. But in the secular world this paradox failed to obtain; there free-will was only too ready to come into conflict with the Church. The 15th and 16th centuries had seen the final break-up of the medieval system of reverence for authority and tradition. In art and learning, morals and government, the old walls came crashing down; in the general bankruptcy of authority men were forced to depend on themselves. And the contemporaries of Machiavelli soon learned to take the fullest advantage of this liberty to pursue their own best interests in the way that pleased them best. But if individuals might be guided by self-interest, why should that privilege be denied to associations of men? On the ruins of a medieval Christendom, hierarchically organized under the pope, grew up the "new monarchy," or modern state, owning no law but its own will. Yet the popes laid aside none of their medieval claims, or even their traditional weapons. In 1606 Paul V. laid Venice under an interdict, on the ground that the republic had infringed the immunities of the clergy; the doge replied by threatening with death any one who took any notice of the papal thunders. Thenceforward the thunders continued chiefly on paper. In 1625 Catholic Europe was scandalized by the *De Schismate* of the Jesuit Santarelli, in which he claimed for the pope an absolute right to interfere in the concerns of secular princes, whenever he chose to declare that the interests of religion were in any way concerned. He could dictate their policy at home and abroad, revise their statute-book, upset the decisions of their law-courts. If they refused to listen he could punish them in any manner he thought fit; in the last resort he could release their subjects from allegiance and head a crusade of Catholic powers against them. These pretensions roused a special burst of indignation in France. There, on the divisions of the wars of religion, had followed an irresistible reaction towards patriotism and national unity. France had suddenly grown to her full stature; like the contemporary England of John Milton, she was become a "noble and puissant nation, rousing herself like a strong man after sleep." Even the clergy were swept away by the current, and meant to be patriots like every one else. "Before my ordination," said the eminent theologian Edmond Richer, "I was a subject of the king of France: why should that ceremony make me a subject of the pope?" Subjection to the pope implied an Italianization of French religion; and most Frenchmen looked on the Italians as an inferior race. Why, then, should the right to decide ecclesiastical disputes be taken away from their own highly competent fellow-countrymen, and reserved for a set of incapable judges in a foreign land? Germany and Spain might let themselves be bitted and bridled if they chose, but for centuries France had prided herself that, thanks to her Gallican liberties, she stood on a different footing towards Rome.

Gallicanism.

The Liberties in question were certain ancient rights, whose origin was lost in the mists of time. One forbade papal bulls to be published in France without the consent of the crown. Another exempted French subjects from the jurisdiction of the Inquisition and other Roman tribunals—such as the Index of Prohibited Books. In the 17th century such immunities were all the more valuable since French statesmen found themselves in an awkward position. The great aim of Henry IV. and Richelieu was to exalt France at the expense of Vienna and Madrid. But Madrid and Vienna were the official champions of the papacy; hence to make war on them was indirectly to make war on the pope. This was enough to trouble the consciences of many excellent men; and it became necessary to devise a compromise that should set their minds at rest, by showing them that they could be at once good citizens and good Catholics. This compromise is known as Gallicanism. In the hands of Bossuet and other eminent divines it was developed along both theological and political lines. Theological Gallicanism refused to recognize papal decisions on questions of doctrine, until they had been ratified by the bishops of France. Political Gallicanism maintained that lawful sovereigns held their power directly of God, and not mediately through the pope. Hence no amount of misgovernment, or neglect of Catholic interests, could justify Rome in interfering with them. In other words, Bossuet only answered Santarelli by setting up the divine right of kings. However, this dogma by no means scandalized the subjects of Louis XIV., for the worship of the sovereign was one of their most cherished instincts. And Louis's ecclesiastical policy flattered their national pride. He introduced no theological novelties; all he did was to insist that, in matters of administration, he would be master in his own house. He supported pope and bishops so long as they took their marching orders from him. If they refused he was perfectly ready to make war on the one and send the others to the Bastille. It is eminently characteristic of his methods that, just at the same time as he was turning loose dragoons on his Protestant subjects after the revocation of the edict of Nantes (1685), he was employing other dragoons to invade the papal territory at Avignon, to punish Innocent XI. for having refused institution to some of his nominees to bishoprics.

The revocation of the edict of Nantes owes quite as much to the dream of political absolutism, inherited from Richelieu, as to religious bigotry. In the words of Saint-Simon, the Huguenots were "a sect that had become a state within the state, dependent on the king no more than it chose, and ready on the slightest pretext to embroil the whole country by an appeal to arms." So long as they were powerful, the crown had treated with them; but when once their power began to dwindle, it was certain that the crown would crush them. But during Louis's latter years, when the War of the Spanish Succession had brought a rain of disasters thickly upon him, bigotry got the upper hand. The broken old man became feverishly anxious to propitiate offended Heaven, and save himself another Blenheim or Malplaquet, by exterminating the enemies of the Church. And his Jesuit confessors had no doubt that the first and foremost of those enemies were the Jansenists. Not only did their doctrine of grace defy the favourite Jesuit principle of obedience to authority, but it bade fair to set aside the whole Catholic machinery of infallibility and sacraments. If God spoke directly to the individual conscience, what was the use of intermediaries? Led by his Jesuits, Louis wrung from the unwilling Clement XI. the Bull *Unigenitus* (1713), which was intended to deprive believers in individual inspiration of all possible foothold within the Roman Church. The bull caused a violent uproar. Fénelon, although personally an admirer, admits that public opinion credited it with "condemning St Augustine, St Paul, and even Jesus Christ"; and the few Jansenist bishops appealed and "re-appealed" against it. But the government was inexorable; in 1730 the *Unigenitus* became part and parcel of the law of the land. Still, to make a law is one thing; to get it administered is quite another. The *parlement* of Paris was a strongly Gallican body, and had many grievances to avenge on Louis XV. and his ministers. To annoy them, it put every possible difficulty in the way of an execution of the bull. Under the fostering care of the judges, a belief sprang up that to call oneself a "Jansenist," and oppose the *Unigenitus*, was to show oneself a lover of civil and religious liberty. This feeling was intensified by the conviction that every blow struck against the bull was a blow against the Jesuits, its authors. For the Society, as befitted the great exponent of authority and the keeper of the consciences of many kings, had always been on the side of political autocracy; and therefore it became increasingly unpopular, when once the tide of French intelligence began to set in the direction of revolutionary reform. Nor were the Jesuits in much better odour among other nations. Their perpetual meddling in politics, and even in speculation and finance, stank in the nostrils of every government in Europe; while their high-handedness and corporate greed in the matter of ecclesiastical privileges and patronage alienated the clergy. Their reform was more than once discussed; and death alone prevented Benedict XIV. (1740–58), the most remarkable of the 18th-century popes, from taking some very stringent measures. A year after Benedict's death the first blow fell. Pombal, the great reforming minister in Portugal, expelled them from that country on a charge of having conspired against the life of the king. Two years later the Paris *parlement* had its chance. La Valette, superior of the Jesuit missions in Martinique, had set up as a West-India merchant on a large scale. His enterprises were unsuccessful; in 1761 he became insolvent, and the Society refused to be responsible for his debts. The French courts made the consequent bankruptcy proceedings the excuse for a general inquiry into the Society's constitution, and ended by declaring its existence illegal in France, on the ground that its members were pledged to absolute obedience to a foreigner in Rome. Louis XV. now proposed that the French Jesuits should be placed under some special organization, less obnoxious to his *parlement*. The general only made the famous reply: "Sint ut sunt, aut non sint." Thereupon Louis let the judges have their way. In 1762 the Society was suppressed in France; in 1767 it was also declared illegal by Spain, Naples and other Italian powers. Pressure was now put on Clement XIII. to dissolve the Society altogether. He refused; but his successor, Clement XIV., was more pliable, and in 1773 the Jesuits ceased to be.

The Bull Unigenitus.

Suppression of the Jesuits.

In France the *philosophes* and the quarrels over the *Unigenitus* had effectually killed the spirit of religion; nor was the Christianity of other countries at a much higher ebb. Spain was utterly dumb; Italian fervour could only boast the foundation of two small orders of popular preachers—the Passionists (1737), and the Redemptorists, instituted in 1732 by St Alfonso Liguori (*q.v.*), who also won for himself a dubious reputation on the unsavoury field of casuistry. German Catholicism was still in a very raw, unsophisticated state. It is characteristic that, while Paris had its Bossuets and Bourdaloues, Vienna was listening to Abraham a Sancta Clara, the punning Capuchin whom Schiller, regardless of dates, introduces into the opening scene of his *Wallenstein*. However, from Germany was to come a serious attempt at reform. There the vision of a reunion with the Protestants had haunted many Catholic brains ever since Bossuet and Leibniz had corresponded on the subject. Faithful to the ancient tradition of Contarini and Pole at Trent, these good men persisted in supposing that the Reformation was nothing more than a protest against practical abuses: remove the abuses, and the rest would follow of itself. And, inasmuch as they held that most abuses were due to the slippery and procrastinating greed of Roman officials, the first step should be ruthlessly to curtail the power of Rome and extend that of local Churches. Such was the theme of a book, *De statu Ecclesiae, ad reuniendos dissidentes in religione Christianos compositus*, published by one Justinus Febronius in 1763. The author was Johann Nikolaus von Hontheim (*q.v.*), suffragan *in partibus* to the elector-archbishop of Treves. Hontheim's theories could not but prove attractive to the local Churches, more especially when they were governed by bishops who were also temporal great lords. The three ecclesiastical electors and the prince-archbishop of Salzburg met in congress at Ems in 1786, and embodied Hontheim's proposals, though in a very modified form, in a document known as the "punctuation of Ems" (see FEBRONIANISM). Meanwhile, their overlord, the emperor Joseph II. (1780–90), was dealing with the question of a much more radical spirit, and actually abolishing abuses wholesale. The reign of "Brother Sacristan," the nickname given to Joseph by Frederick the Great, was one continual suppression of superfluous abbeys, feast-days, pilgrimages. More dignified were his attempts to broaden the minds of the clergy. Instead of being brought up in diocesan seminaries, centres of provincial narrowness, candidates for ordination were to be collected into a few large colleges set up in university towns. Still, Joseph only touched the surface; his brother, the grand-duke Leopold of Tuscany, aspired to cut deeper, and provoke a religious revival on the lines of Jansenism. His plans, which made a great stir at the time, were outlined at a synod held at Pistoia in 1786 (see PISTOIA, SYNOD OF).

Febronianism.

The French Revolution.

Three years later, however, the world had more important things to think of than Leopold's ecclesiastical reforms. At first the French Revolution was by no means anti-Catholic—though the Constituent Assembly remembered too much of the quarrels about the *Unigenitus* not to be bitterly hostile to Rome—and its great aim was to turn the French Church into a purely national body. Hence it decreed the "civil constitution of the clergy." Bishops and rectors were made elective, with salaries paid by the state; and all priests were required to take an oath of fidelity to the government: those who refused the oath rendered themselves liable to banishment. Three years later the triumph of the Jacobins brought with it the "abolition of Christianity," and a spell of violent persecution, which gradually slackened under the Directory (1795–99). In 1799 Napoleon became First Consul, and at once set himself to deal with the ecclesiastical problem. There must clearly be a Church, and the small success of the Civil Constitution made clear that public opinion would not put up with a Church practically detached from Rome. On the other hand, Napoleon quite agreed with Louis XIV. in wishing to be master in his own house, and to turn the clergy into a supplementary police. Accordingly, in 1801 he negotiated with Pius VII. a Concordat, which remained in force till 1905 (see CONCORDAT). The state undertook to pay the bishops and parochial clergy; it was directly to appoint the one, and to have a veto on the appointment of the other. But for the religious orders no provision was made; and Napoleon refused to tolerate the presence of unsalaried clerics on whom the government had no hold. When his fall brought about the restoration of Louis XVIII. (1815), this restriction was relaxed, and the "congregations" returned in large numbers to France. But the Bourbon government had no intention of encouraging them

France and the Papacy.

too much; it clung as closely as Napoleon himself to the idea of a State Church, taking its orders from the government. In this way Gallicanism, which had once stood for all that was national and progressive, now came to mean subservience to a feeble autocracy already tottering to its fall. "A free Church in a free State" became the motto of the group of brilliant men, led by Lamennais, Montalembert and Lacordaire, who started up as soon as the July Revolution of 1830 replaced Charles X. by Louis Philippe. They felt that Catholicism was strong enough to stand alone, without artificial support. For the Revolution had not "abolished Christianity," even among the educated classes, quite so thoroughly as it imagined. Many were only kept back from going to church by the fear that their neighbours would think them superstitious or narrow-minded. But in 1802 Chateaubriand had published his epoch-making *Génie du Christianisme*, in which he declared that of all religions Christianity was "the most poetical, the most human, the most favourable to freedom, art and letters." If that were so, no one need be ashamed to profess it; and the younger generation of Frenchmen began to gravitate back to the Church. Meanwhile, Germany was being profoundly influenced by the great aesthetic revival known as the Romantic Movement, which began with the worship of medieval art and literature, and ended with the worship of medieval religion. And even Italy and Spain presently began to play their part in the Christian reaction. Rosmini in one country, and Balmes in the other, "brought piety to the learned, and learning to the pious."

These writers, however, only touched the few; and the great aim of Lamennais and his friends was to reach the mass of the people. Immediately after the accession of Louis Philippe they started their famous newspaper, *L'Avenir*, hoping thereby to reconcile the Church with democracy, and make the pope the leader of the party of progress. The enterprise was hazardous, since democracy had hitherto brought nothing but ill to Rome. In 1798 French troops had entered the papal states, proclaimed a republic in Rome, and kept Pius VI. a prisoner till his death (1799). In 1808 Napoleon arrested his successor, Pius VII., threw the papal states into his new Italian kingdom, and dragged Pius about from prison to prison till the eve of his own fall in 1814. When the congress of Vienna gave the pope back his dominions, the one thought of the broken old man was to restore, as far as possible, the ancient order of things. But the traditional methods of Roman administration were deplorably ineffective; on the accession of Gregory XVI. (1831–46), the powers presented a memorandum strongly urging reform. Some reforms of detail were introduced; but Gregory declared that to grant a constitution to the States of the Church would be incompatible with the principle of the papacy. Such a man was hardly likely to listen to the plans of Lamennais. In 1832 the *Avenir* was condemned, and the disgusted Lamennais left the Roman Church. Lacordaire and Montalembert, however, continued their democratic campaign, by no means without success; for the revolution of 1848, which drove Louis Philippe from the throne, was far less hostile to Catholicism than that of 1830. Under the short-lived Second Republic (1848–52) the position of the Church grew even stronger, for the introduction of universal suffrage brought to the polls great masses of new voters strongly clerical in sympathies. In 1850 was passed the *Loi Falloux*, which broke down the Napoleonic idea of a state-monopoly of teaching, and allowed the opening of voluntary schools. Of this concession the religious orders took full advantage.

Meanwhile in Rome things had gone from bad to worse. Gregory XVI.'s refusal to grant a constitution called forth a series of sporadic outbursts, inspired by Mazzini and the "Young Italian" party, between 1832 and 1838. These were put down by French and Austrian arms, with the result of focusing the hatred of Young Italy on the pope. One last attempt was made to save him. In 1843 the Piedmontese priest Gioberti brought out a remarkable book, in which he urged his countrymen to combine into an Italian confederation with the pope at its head. For a moment it seemed as though Gioberti's dream were about to translate itself into reality. In 1846 Gregory died, and was succeeded by Pius IX., one of the youngest of the cardinals, and well known for his popular sympathies. He at once granted an amnesty to political prisoners, of whom the Roman gaols were full; two years later (March 1848) he issued a constitution to the papal states, and seemed about to throw in his lot with the forces making for Italian independence. But the first step thereto was deliverance from the Austrian yoke; and Pius, the Italian prince, was grievously hampered by his position as head of the Church. How could a pope make war on Austria, the one power that had never faltered in its allegiance to the Church? Accordingly Pius soon drew back, and his popularity waned. In the autumn the revolutionary fever, which had swept through all Europe earlier in the year, spread to Rome. The pope's prime minister, Count Rossi, was murdered, and Pius himself, escaping to Gaeta, threw himself under Neapolitan protection. In Rome Mazzini proclaimed a republic. Once more France and Austria intervened; in 1850 Pius went back to Rome, and ruled there under the shadow of foreign bayonets. Meanwhile the Second Republic had come to an end in France; in 1852 the prince-president, Louis Napoleon, was elected emperor. At first he greatly needed the support of the clergy to secure him on his precarious throne. But, as he grew stronger, his desire for their good opinion paled before an overmastering propensity to meddle in the affairs of foreign nations. He allied himself with Victor Emmanuel, and marched into Italy in 1859, with the object of expelling the Austrians from the peninsula. This expedition led directly up to the unification of Italy. Two years later Victor Emmanuel was master of the whole country, except Venice and the "Patrimony of St Peter." This last—about one-third of the papal states—was all that was left to Pius; and even this was only held for him by French troops. When Napoleon withdrew his garrison in 1866, Garibaldi immediately raised a body of volunteers to march on Rome; and Napoleon was obliged to send back his troops. Three years later, the outbreak of the Franco-Prussian War (July 1870) led to their recall. In the following September, ten days after the final collapse of Louis Napoleon at Sédan, the troops of Victor Emmanuel entered Rome; and the temporal power of Pius came to an end.

End of the Temporal Power.

"Ultramontanism."

Pius might no longer rule over the papal states; but there was consolation in the thought that, within the realm of conscience, his power had increased by leaps and bounds. The whole history of the 19th century is one vast conspiracy to exalt the importance of the papacy. At its opening both the intellectual and administrative guidance of the Church was entirely in French and Italian hands; and the first instincts of those countries is to lean on an all-sufficing government. The French Revolution had supposed itself to be fighting for the "rights of man"; really it was trying to replace an autocratic kingship by an equally autocratic "general will" of the multitude. And it failed because no general will could make its voice rise above the conflict of particular inclinations. Thankfully did men bow before Napoleon, who undertook to relieve them of the responsibility of having to make up their minds. Nor did the emperor's fall by any means entail the fall of his ideas; Count Joseph de Maistre, the great orator of ultramontanism, did little more than transplant them on to the ecclesiastical domain. Bossuet and the old-fashioned divines had believed in an elaborate system of checks and balances—popes, councils, bishops, temporal sovereigns each limiting and controlling the other—just as Montesquieu and Alexander Hamilton had believed in a careful separation of the executive from the legislative power. Napoleon swept away the checks and balances, and made the will of a single man the one and only sanction of government. In like manner de Maistre proposed to sweep away the ecclesiastical checks and balances, and vest the whole of the Church's authority in the pope. That would bar out for ever all risk of a conflict of clerical wills. Fortune favoured his enterprise. The French bishops of the age of Bossuet had been a powerful estate of the realm, able in some degree to make their own terms with the king himself; their successors in the 19th century were a mere group of salaried public officials. Still more significant changes took place across the Rhine. An appreciable part of the Holy Roman Empire had been in the hands of clerical rulers. At their head stood the electors of Cologne, Mainz and Treves, temporal princes of no mean rank, usually chosen from the cadets of royal houses. But in 1803 electors and prince bishops came to an end. Their domains were secularized, and divided up among their lay neighbours, Prussia securing the lion's share. Thenceforward the German bishops became mere officials, as in France, and Rome had no cause to fear the opposition of another Febronius.

Still remoter was the danger of another Louis XIV. or Joseph II. The time had gone by when sovereigns could decide what particular shade of Catholicism their subjects should assume. Everywhere there was a growing belief that a man's religious tenets were his private affair, with which the state had nothing to do; and that a government only made itself ridiculous if it attempted to lay down which creeds were true and which were false. Hence the clergy were left to do as they pleased, so long as they respected the law of the land; and most of the modern collisions between Church and State have occurred on the debateable ground where their respective spheres overlap, over questions concerning education or the marriage-laws. Noticeable among these quarrels were the so-called *Kölnische Wirren* of 1837–40, when the archbishop of Cologne defied the Prussian government over the question of "mixed marriages," and paid for his rashness by a long imprisonment. Such conflicts did much to increase the power of the pope, by encouraging local Churches to turn to him as their protector. To ride rough-shod over individual bishops was nothing to Prussia; but to quarrel mortally with Rome was a serious matter for a sovereign reigning over millions of Catholic subjects. Even more successful were the papal incursions on to a more ethereal domain. Ever since the time of Kant and Goethe, the intellectual leadership of Europe had been slowly passing into the hands of the Germans, and Catholic theology shared the lot of other branches of learning. But the German divines were much more in touch with the world at large than were their brethren in Italy or France; and more than one interesting attempt was made to bring theology into line with modern schools of thought. Joseph von Görres read the medieval mystics in the light of the newer mysticism of Schelling. Hermes of Bonn defended Catholicism from the standpoint of Kant and Fichte. Continuing his work on a bolder scale, the Viennese priest Günther undertook to show that the articles of the Christian creed are only a rough-and-ready popular statement of the conclusions of philosophy. Of more enduring value have been the researches of the historical school, founded by John Adam Möhler (1796–1838), whose famous *Symbolik* (1832) was perhaps the heaviest literary blow ever dealt at the Reformation. On his early death his mantle fell on to the shoulders of Ignatius Döllinger (1799–1890). This school claimed that its methods, unlike those of Hermes and Günther, avoided all danger of speculative caprice. Catholicism was considered as an organic growth, developing from certain seminal principles in accordance with certain definite laws. The business of a sound theology was to discover and apply those laws, not to patch up fleeting compromises with the intellectual fashions of an age. On the other hand, the Historical School found but little favour at Rome. "Truth," as Malebranche quaintly says, "always has a few hairs on her chin"; and the conclusions of sound learning must needs be slow, fragmentary and tentative. But Italian taste was all for bold, highly-coloured, slashing statements, that any one could understand; what it wanted was a method that should be at once intellectually impressive, and free from the usual clouds that beset the scholar's path. It found what it asked for, when the Jesuits, whom Pius VII. had recalled to life (1814), revived the methods of Aquinas and the medieval Schoolmen. Under the fostering care of Pius IX., this "neo-Scholasticism" spread from Italy to the German Catholic universities, and especially the seminaries of France. The secret of its power was that it gave scope for an immense amount of intellectual subtlety, and at the same time saved men from all danger of independent thought. Although a metaphysic, it was not, and did not pretend to be, an unbiased search for truth. It admittedly started by taking the truth of Catholicism for granted; and its only object was to make intelligible to reason the dogmas that faith already accepted. Thus the whole neo-Scholastic movement played straight into the hands of authority. So comprehensive were its methods, so self-confident its bearing, that those who had once fallen under its spell would never need to doubt or hesitate again. They knew exactly what to think on every conceivable subject; and there was small danger of their suspecting that there might be things in heaven and earth undreamed of in its philosophy.

Catholic developments in Germany.

Rome and the "Historical School."

To the learned Rome might serve up authority with a garnish of neo-Scholastic metaphysics; for average mankind authority pure and simple was enough. Terrified out of their lives at the way in which science and criticism were taking one theological citadel after another, the more militant section of the clergy declared war on thought itself. Not only was faith made independent of reason, but it was considered all the purer, the less it owed to any kind of mental process. If it was a merit to believe without evidence, it was a shining virtue to believe in the teeth of evidence. *Credo, quia absurdum* was applied, notably by the popular writers of the French Second Empire, in a fashion grotesquely literal enough to scandalize Tertullian himself. "There had always existed in France, as elsewhere, those who loved traditional stories of a marvellous nature, and tended to multiply the number which were presented as facts rather than legends. The existence of this school has always been inseparable from the element of pious belief which enters so much into popular devotion. But in pre-Revolution days there had also been the critical school of the Maurists, which offered an alternative to minds averse from implicit reliance on tradition. This had passed away, and was not yet replaced. The *Acta sincera Martyrum* by Ruinart was replaced by the thoroughly uncritical and inexact *Actes des martyrs* of Guéranger. Church history was allowed to be represented by such men as the Abbé Darras; and many French Catholics were ready to accept without question what the Bollandist Père de Smedt has not hesitated to call the historical errors and lies of Charles Barthélémy. Incredible and unsupported stories in history, and extravagances in dogma were the order of the day. Those traditions or doctrines which were most uncongenial to the modern world were placed in strong relief; and the disparagement of the individual intellect was extended to the disparagement of scientific research itself" (Wilfrid Ward, *Life of W. G. Ward*, vol. ii. p. 119). The faithful were encouraged to drown all tendency to thought in an ever-increasing flood of sensuous emotionalism. In thirty years Pius IX. canonized more saints than all his predecessors together for a century and a half. In 1854 he gave a great impulse to the cultus of the Virgin by proclaiming her Immaculate Conception a dogma of the Church (see IMMACULATE CONCEPTION). In the following year he imposed on Catholicism at large a special "devotion" to the Heart of Mary Immaculate. Next year he added a similar devotion to the Sacred Heart of Jesus (see SACRED HEART).

Pius IX. and the New Dogmas.

That these things only widened the breach between the Church and the outside world was of no account to Pius. Ever since his return from Gaeta, he had made up his mind to a policy of no surrender; and the curtailment of his own dominions in 1860 only made him the keener to denounce the iniquities of other rulers. In 1864 appeared the encyclical *Quanta Cura*, together with a Syllabus of eighty of the most important "errors of our time" (see Syllabus). These two documents caused an excitement nowadays hard to understand.

The Syllabus of 1864.

Apart from some fulminations against such modern pests as "socialism, communism, secret societies, Bible societies, clerico-liberal societies," the Syllabus says nothing that the papacy had not been saying for hundreds of years. Its real object is to attack such professedly Catholic governments as have fallen in with modern ideas—as for instance, by allowing freedom of worship to their Protestant subjects, or by refusing to punish brawling in Catholic churches more severely than other breaches of the peace. In other words, Pius utterly rejected the whole principle of toleration, and declared that the Church would still impose itself by force, whenever it got the chance to do so. However, any hopes he may have had of finding another Philip II. were soon dashed to the ground. Eighteen months after the publication of the Syllabus broke out the Austro-Prussian War (June 1866), when the one faithful ally of Rome was trampled under the feet of the arch-Protestant Hohenzollerns. But the pope's spirit was not broken. If he could not lord it over one sphere, at least he could be master in another. In 1869 he summoned a general council at the Vatican, avowedly for the purpose of getting it to declare his personal infallibility.

Definition of the dogma of papal infallibility.

For although the old rivalry between pope and council had long ago been practically settled in favour of the pope, no council had yet formally acknowledged its defeat. Indeed, many prominent French and German divines still denied papal infallibility altogether; and Louis Napoleon had regularly fallen back on Richelieu's old device of stirring up the embers of Gallicanism, whenever the French clergy grew restive about his alliance with Victor Emmanuel. And even the more moderate believers in the pope's infallibility maintained that it was merely negative, a heaven-sent immunity against falling into error. But Pius and his immediate circle argued that this was not enough. The great need of the age was authority; and authority was most likely to strike the imagination of the faithful if it found a vivid concrete embodiment in the person of the pope. He must not simply be immune from error; truth must stream down on his head from heaven, and on his head alone. "We all know only one thing for certain," wrote the great Catholic pamphleteer, Louis Veuillot, "and that is that no one knows anything, except the man with whom God is for ever, the man who carries the thoughts of God." But this view was too extreme for the council; the most Pius could hope for was to be declared immune from error, instead of positively inspired. Even this negative infallibility was stoutly contested by the French and German bishops during the eight months that the council lasted (December 1869 to July 1870). But they were richer in talents than numbers: out of six hundred prelates they only commanded eighty votes. Most left Rome before the final session; only two—one from Naples, one from the United States—continued their protest up to the end. On the 18th of July the pope's decrees were declared "irreformable of themselves, irrespectively of the consent of the Church," always provided that they dealt with doctrines of faith and morals, and were delivered *ex cathedra*—that is, with the intention of binding the consciences of all Catholics. These limitations were the work of the moderate infallibilists, but the real hero of the day was Pius. Theologians might draw their fine-spun distinctions between realms where the pope was actually infallible and realms where he was not; but Pius knew well that loyal Catholic common sense would brush their technicalities aside and hold that on any conceivable question the pope was fifty times more likely to be right than any one else (see Vatican Council and Infallibility).

So absolute became the papal sovereignty over conscience that more than one government took alarm. While the council was still sitting the Bavarian minister, Prince Chlodwig zu Hohenlohe-Schillingsfürst, suggested to Bismarck that the Powers would do well to bring its deliberations to an end; and immediately after the publication of its decrees Austria notified the pope that so vast an extension of the Church's claims would necessitate a revision of the concordat. And when the excommunication of Döllinger and other anti-infallibilist divines (1871) led to the formation of an independent Old Catholic Church (see Old Catholics) Bavaria, Switzerland and other countries gave it a warm welcome.

Old Catholicism.

So also did Berlin. The new German empire, consolidated through wars with Catholic Germany and Catholic France, was of all countries least likely to tolerate Roman attempts to dictate to its subjects. Tension was increased by the fact that the Centre, or Catholic, party in the Reichstag was led by Windhorst, formerly prime minister to the dispossessed king of Hanover, and thus naturally became identified with the opposition of the smaller German states to the supremacy of Prussia. The quarrel began in 1871 when the Prussian government supported some teachers in state-aided Catholic schools whom the bishops wished to dismiss on account of their anti-infallibilist opinions. A year later, under the ministry of Falk, it developed into what the great scientist, Rudolf Virchow, called a *Kulturkampf*, or conflict of civilizations.

The Kulturkampf.

The famous May laws (1873) were a determined attempt to bring the literary education, appointment and discipline of the clergy under state control, and to regulate the use of such spiritual penalties as deprivation and excommunication. When the bishops refused to obey, Falk fell back on force. The Jesuits were banished from the German Empire, and most of the other orders from Prussia. The archbishops of Gnesen and Cologne and many minor dignitaries were imprisoned (1874); and the so-called "Bread-basket Law" was passed to coerce the parish clergy by suspending the salaries of the disobedient. The result of these severities was exactly the opposite of what Falk intended. He had meant only to lop off a few ultramontane extremists; he succeeded in sending Catholics of every shade and colour pell-mell into the arms of Rome. And the effect remained long after the cause had died away. On the death of Pius IX. (February 1878) his successor, Leo XIII., at once showed himself willing to come to terms. Negotiations were long and difficult; for Bismarck would not abolish the May laws outright, and Leo had much ado to hold in check the *zelanti* of the Vatican. But Falk retired in 1879; various mutual concessions were made which led to a gradual abrogation of the May laws. Yet—thanks to its organization, its press, and the elaborate network of alliances spun by Windhorst—the Ultramontane Centre still remains a powerful force in German politics.

This conciliatory policy towards Berlin was the first-fruits of a new régime; Leo XIII. was in every way a complete contrast to Pius IX.

Pope Leo XIII.

Pius had fed on inspirations; Leo was a man of calm, deliberate judgment, little likely to yield to the promptings of his *monsignori*. He was a polished scholar of the old-fashioned type; early in his reign he threw open the Vatican Archives to the students of the world. Having spent his youth in the papal diplomatic service—he was nuncio at Brussels from 1843–46—he had a certain knowledge of the workings of parliamentary institutions, while the years immediately before his accession had been spent as archbishop of Perugia, so that he was not closely identified with any of the Vatican parties. The results of a change of master were soon seen. Pius IX. had died at war with almost every country in Europe. He had quarrelled with Austria; Russia was persecuting its Catholic subjects; France was under the spell of Gambetta and his doctrine that clericalism was the enemy; Spain and Belgium followed France; even Switzerland was waging a *Kulturkampf* on a small scale. In a few years Leo had made peace with Austria, pacified Switzerland and Belgium, opened up negotiations with Russia; while his elevation of Newman to the cardinalate (1879) made a great impression in Great Britain. About 1886 hopes even ran high that he was on the eve of a reconciliation with King Humbert at the Quirinal. These hopes were vain. Leo was absolutely convinced that a territorial sovereignty was required to ensure the moral independence of the papacy; and he believed that the new Italian kingdom was a mushroom growth, that might fall in pieces at any moment. Hence he followed in the steps of Pius IX. and refused to recognize the existence of the *de facto* government in any way whatsoever; he would not accept the subsidies it offered him, or allow Catholics to take any part in political life. During the earlier years of his reign he undoubtedly had hopes of recovering his lost dominions with the help of Germany, and Bismarck was not the man to discourage such expectations. They were suddenly blasted when Germany, Italy and Austria entered into a Triple Alliance at the end of 1887. Thereafter Leo turned to France. Already in 1884 he had warned the French clergy against meddling in royalist intrigues; in 1892 he issued a much more stringent exhortation to French Catholics to rally to the Republic. An idea got abroad that he was looking to the time when the old dream of Lamennais and Gioberti might become a reality, and Italy would split up into a number of republics, amongst which the temporal power of the pope might find a place.

Certainly his public pronouncements took on an increasingly democratic tone. ***Christian Socialism.*** From the first he had shown great interest in social questions; and his encyclicals deal much less with theology than with citizenship, socialism, labour, the marriage-laws. Under his influence a Christian Socialist movement sprang up in France and Belgium, and soon spread to Italy, Germany and Austria. It had undoubtedly done much to awaken interest in social problems, and to call forth philanthropic zeal; but the movement soon travelled far beyond the limits that Leo would have set to it. In Germany, in particular, it has grown into a political party connected with the Social Democrats; nor have the democratic socialists been slow to exploit their Christian allies for their own ends. And in other countries the attempt to bring religion into politics has sometimes had the effect of lowering religion, rather than ennobling politics. In an age of universal suffrage public men cannot afford to appeal to pure reason, or even to pure sentiment. Christian socialism becomes a real force when it translates itself into anti-Semitism; and anti-Semitism is at its strongest when it is pursuing one particular Jewish captain in the French artillery. Much on the same lines stands the Italian Catholic attempt to show that the Freemasons are the real founders of Italian independence, and to take the field against them with the help of Léon Taxil and "Diana Vaughan." And, quite apart from their political colouring, such attempts to meet the devotional tastes of the masses as the miracles of Lourdes, or the modern French religious press, lie well within the range of criticism. Nor have they even had the dubious merit of success. Dying in 1903, Leo XIII. was spared from seeing the failure of his policy of reconciliation with the French Republic; for the "denunciation of the concordat" (December 1905) and consequent separation of Church and State took place under his successor, Pius X. ***Pius X.*** What results this measure may have on France it must be left to the future to decide. Nor is it yet possible to forecast the result of the only other sensational event that the reign of Pius X. has yet produced—his condemnation in 1907 of the complex movement known as Modernism. ***Modernism.*** This began as an attempt to break loose from the neo-Scholasticism so ardently patronized both by Pius IX. and Leo XIII., and to supplant the critical methods of the medieval doctors by those of modern scholarship; and its leaders have won special distinction in the fields of Biblical criticism and ecclesiastical history. But Modernism soon broadened into a thoroughgoing revolt against the modes of thought and methods characteristic of the latter-day Vatican; its motto is that Catholicism is the strength of popery, but popery the weakness of Catholicism. By "popery" must here be understood the belief that spiritual doctrines always lend themselves to a precise embodiment in black and white, and can thereafter be dealt with like so many clauses of an act of parliament. Modernists deny that the spirit of religion can be thus imprisoned in an unchangeable formula; they hold that it is always growing, and therefore in continual need of readjustment and restatement. On the other hand, they maintain that the present always has its roots in the past, and therefore they are opposed to any violent change; they consider, for instance, that northern Europe would have done better to listen to Erasmus than to Luther. But progress can leave little room to individual initiative, if it must always be orderly and systematic; and the Modernists accordingly show little sympathy with Protestantism. The core of their creed is a fervid belief in the infallibility of Catholic instinct, if only Catholic theology can be induced to leave it to develop in peace. Hitherto the theologians have shown small disposition to hold their hand; and several of the leading Modernists have been excommunicated (see especially the article LOISY, A. F.), while the whole movement was condemned in bitter and scathing language by Pius X.'s encyclical (*Pascendi gregis*) against the Modernists. But ideas are difficult to kill, and it is possible that the Modernist movement may yet prove to be the opening chapter of a mighty revolution within the Church of Rome.[1]

BIBLIOGRAPHY.—The literature on the Roman Catholic Church is, of course, vast. Many works will be found in the lists of authorities appended to the articles to which cross-reference is made above, notably PAPACY. Here it is only possible to give a few outstanding books of reference. The most compendious of all works of reference on the subject, though partly antiquated, is the *Encyclopédie théologique* of the Abbé Migne (1844–66), Ser. I. 50 vols., Ser. II. 52 vols., Ser. III. 66 vols. This is a series of dictionaries, and contains Fr. Périnnés's *Dictionnaire de bibliographie catholique*, 5 vols. (Paris, 1858–60). A useful systematized bibliography is also given in the Subject Index of the London Library (1909), pp. 945–51. Other encyclopaedias are Watzer and Welter's *Kirchenlexikon*, 13 B. (2nd ed., Hergenröther, &c., 1882–1903), Roman Catholic (there is a French translation of the 1st edition, ed. T. Goschler, 1870); Herzog-Hauck, *Realencyklopädie für Protestantische Theologie und Kirche* (3rd ed., Leipzig, 1896–1909), Protestant, but containing articles of universally recognized scientific authority on many aspects of the Roman Catholic Church; the *Catholic Encyclopaedia* (London and New York, 1907 ff.), invaluable as an authoritative account of Roman Catholicism in all its phases, by eminent Catholics of all nations. All these encyclopaedias are also bibliographies.

(St C.)

The Church in England.

The origin of the English Roman Catholics as a community separated from the National Church is generally held to date from the accession of Queen Elizabeth in 1558. In the following year was passed an Act of Supremacy, whereby all public officials, clerical and lay, were required to acknowledge the supremacy of the queen "as well in spiritual things or causes as temporal." This declaration all the existing bishops, with two exceptions, refused to make; some fled the country, some were imprisoned, others simply deprived and placed under surveillance.[2] To the parish clergy the declaration was not systematically tendered; of those deprived of their livings a large number were allowed to remain on as chaplains in private families. From laymen, unless they happened to hold some public office, no declaration was expected; and during the earlier years of Elizabeth's reign most of them continued to attend at their parish church. The line of division became much more acute when Pius V. deposed Elizabeth from her throne (1570); thenceforward her government looked on every Catholic as a potential rebel. Already it had passed a severe act against the Catholics in 1562; this was followed by other measures in 1571, 1580, 1584, 1585, 1593. During the forty-five years of Elizabeth's reign, however, only about 180 persons suffered death[3]—less than half the number of those whom the Catholic zeal of her sister, Queen Mary, had burnt in one-ninth of the time. Under James I. an attempt was made to distinguish between the loyal and disloyal Catholics, the latter comprising all those who maintained the pope's right to depose sovereigns from their throne. This led to a violent division among the Catholics themselves. Many forswore the deposing power; the majority, acting under imperative orders from Rome, refused to deny it. The government retorted by adding several new penal laws to the statute-book, though less than thirty Catholics were brought to the scaffold during James's reign. Under Charles I. the position of the Catholics was greatly improved, largely owing to the king's marriage with a French princess. Although not actually repealed, the penal laws were seldom put in force, and mass was openly celebrated in London and elsewhere. On the outbreak of the Civil War the Catholics naturally sided with the king, and a great many fell fighting for the royalist cause; towards the survivors Cromwell was unexpectedly merciful. Very few were put to death, though a number of estates were confiscated. Under Charles II. came a new period of prosperity; two Catholics, Lords Arlington and Clifford, were admitted to the inner circles of the government. Protestant suspicion was excited; in 1673 was passed the Test Act, obliging all office-holders to receive the sacrament in the Established Church, and to declare their disbelief in transubstantiation.[1] Five years later (1678) popular exasperation found a more savage outlet, and greedily swallowed the tales of Titus Oates about a mythical "popish plot." A number of victims were brought to the scaffold, and Catholics were declared incapable of sitting in either house of parliament. James II., however, was utterly indifferent to the feelings of his subjects. He packed the privy council, the army and the universities with Catholics, and tried to legalize the exercise of their religion by an utterly unconstitutional Declaration of Indulgence. Three years were enough to convince the nation that he was "endeavouring to subvert and extirpate the Protestant religion, and the laws and liberties of this kingdom"; and on his deposition in 1688 Roman Catholics, or persons married to Roman Catholics, were declared incapable of succeeding to the throne. A new oath of allegiance was imposed on all holders of civil or military office; they were required to swear that no foreign prelate had, or ought to have, any jurisdiction, whether civil or ecclesiastical, within the realm. Further, a number of statutes were passed with the object of putting every possible obstacle in the way of Catholics educating their children in their own creed, or of inheriting or buying land. That they remained so long "utterly disabled from bearing any public office or charge" was due to the participation of many of their number in the Jacobite revolts of 1715 and 1745. After Culloden, however, it was seen that all serious danger of a Stuart restoration was passed; and in 1778 Catholics who abjured the Pretender and denied the civil authority of the pope were relieved from their most pressing disabilities. A proposal to extend this measure to Scotland led to violent agitation in that country. Feeling soon spread to England, and culminated in the Gordon riots of 1780. Meanwhile, however, strenuous efforts were being made by the Roman Catholics to obtain relief by establishing a reasonable *modus vivendi* with the government. Within the Catholic body itself there was even at this time a more or less pronounced anti-Roman movement, a reflection of the Gallican and Febronian tendencies on the continent of Europe, and the "Catholic Committee," consisting for the most part of influential laymen, which had been formed to negotiate with the government, was prepared to go a long way in repudiating the extreme claims of the Holy See, some even demanding the creation of a national hierarchy in merely nominal dependence on Rome, and advocating the substitution of English for Latin in the services. This attitude led to a somewhat prolonged conflict between the Committee and the vicars apostolic, who for the most part represented the high ultramontane view. The outcome of the Committee's work was the great Protest, signed by 1500 bishops, priests and leading laymen, in which the loyalty of Catholics to the crown and constitution was strenuously affirmed and the ultramontane point of view repudiated in the startling declaration, "We acknowledge no infallibility in the pope." As the result of the negotiations preceding and following this action, the government in 1791 passed a bill relieving from all their more vexatious disabilities those Roman Catholics[2] who rejected the temporal authority of the pope; and during the first quarter of the 19th century a series of attempts was made to abolish Catholic disabilities altogether. To this, however, George III. and his successors were bitterly opposed; only in 1829 did George IV. give way, and allow the passage of the Catholic Relief Act. This virtually removed all restrictions on Catholics, except that it left them incapable of filling the offices of Regent, Lord Chancellor, or Lord Lieutenant of Ireland; and it expressly debarred their priests from sitting in the House of Commons.

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[1] For a criticism of the modern tendencies of the Roman Catholic Church from an outside point of view see ULTRAMONTANISM.

[2] From the Roman Catholic point of view the ancient English hierarchy came to an end with the death of Thomas Goldwell, some time bishop of St Asaph, at Rome on the 3rd of April 1585. Some six months previously Thomas Watson, formerly bishop of Lincoln, had died in prison in England.

[3] Not as heretics, by burning, but as traitors, by hanging, drawing and quartering. But, since to say or hear mass was constructive treason, the distinction was, in many cases, without a difference.

Ecclesiastical Administration.—During the reign of Elizabeth this was necessarily in a chaotic state. As the Marian clergy died out, their place was taken by priests trained at theological colleges established for this purpose at Douai, Rome, Valladolid and other places. These were the "seminary priests," objects of great suspicion to the government. About 1580 Jesuit missionaries began to come, and soon became involved in bitter quarrels with the secular missionaries already at work. Mutual jealousies were only increased when the seculars were grouped together under an arch-priest in 1599. Nor were matters much bettered when the papacy took advantage of the presence of a Catholic queen in England, and sent over in 1625 a vicar-apostolic[3]—that is, a prelate in episcopal orders, but without the full authority of a diocesan bishop. He was soon compelled to withdraw, and the direction of affairs fell to an intermittent series of papal envoys accredited to Henrietta Maria or Catherine of Braganza. On the accession of James II. a new vicar-apostolic—John Leyburne, bishop of Adrumetum *in partibus*—was at once appointed (1685); three years later England was divided into four districts—the London, Midland, Northern and Western—each under a vicar-apostolic. This arrangement lasted till 1840, when the number of vicariates was doubled by the addition of the Welsh, Eastern, Lancashire and Yorkshire districts. In 1850 came the "restoration of the hierarchy" by Pope Pius IX., when England was mapped out into an archbishopric of Westminster[4] and twelve suffragan sees, since increased to fifteen (sixteen including the Welsh see of Menevia). This "papal aggression" caused great excitement at the time, and an Ecclesiastical Titles Act was passed in 1851, though never put in force, forbidding Roman Catholic prelates to assume territorial designations.[5]

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[1] This declaration, which denounced the mass as "idolatrous and superstitious," was taken by all office-bearers, including bishops on taking their seats in the House of Lords, until the Relief Act of 1829. It was imposed by the Act of Settlement on the sovereign also, in order to make impossible any repetition of the policy of James II. This "Declaration of the Sovereign" formed the subject of heated debate on the accession of kings Edward VII. and George V., and in August 1910 parliament substituted for it a simple declaration of adhesion to the Protestant religion.

[2] They were described in the first draft of the bill as "Protesting Catholic Dissenters," but this was changed, in deference to the strenuous remonstrances of the vicars-apostolic, into "Roman Catholics."

[3] Richard Smith, bishop of Chalcedon *in partibus* (d. 1655).

[4] Cardinal Wiseman (*q.v.*) was the first archbishop of Westminster. It was on his advice that Pope Gregory XVI. increased the number of English vicariates-apostolic in 1839, and from 1840 onward, as vicar-apostolic first of the Midland and afterwards of the London district, he was mainly instrumental in bringing the English Roman Catholic Church into closer touch with "the spirit of Rome." The outward sign of this was the substitution of the Roman ritual for the English pre-Reformation use hitherto followed in the services, while English Roman Catholicism became increasingly ultramontane in temper, a tendency much strengthened under Cardinal Manning.

[5] The titles of the sees could not by law be the same as those of the Established Church. In several cases, however (*e.g.* Birmingham, Liverpool, Southwark, Newcastle), sees have since been created by

Population.—No trustworthy figures are forthcoming as to the numbers of the English Roman Catholics at the different stages of their history. At the accession of Elizabeth they undoubtedly formed a large proportion of the population. During her reign they greatly decreased, and the decrease continued during the 17th century. A return, made with some apparent care soon after the accession of William III., estimates their total number at barely 30,000. During the 18th century they began to increase; a return presented to the House of Lords in 1780 estimates their number at nearly 70,000. Joseph Berington, himself a distinguished Catholic priest, considers that this number was above the mark; he reports that his co-religionists were most numerous in Lancashire and London; next came Yorkshire, Northumberland and Staffordshire. In many of the southern counties there were scarcely any Catholics at all. Even in Berington's time, however, there was a certain tendency to increase; and the great number of conversions that followed the Relief Act of 1791 was a stock argument of opponents of the act of 1829. Of late years, notably since the Oxford Movement within the Established Church, the number of converts has been much increased; for some time past it has averaged about 8000 souls a year. But a far more potent factor in swelling the numbers of the Catholics has been the immigration of the Irish, which began early in the 19th century, but was enormously stimulated by the famine of 1846. In 1870 Mr Ravenstein reckoned the total number of Roman Catholics in England as slightly under a million, of whom about 750,000 were Irish, and 50,000 foreigners. By 1910 the general total is considered to have risen to about a million and a half. (St C.)

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English Law relating to Roman Catholics.—The history of the old penal laws against Roman Catholics in the United Kingdom has been sketched above and in the article Ireland, *History*.[1] The principal English acts directed against "popish recusants"[2] will be found in the list given in the acts repealing them (7 & 8 Vict. c. 102, 1844; 9 & 10 Vict. c. 59, 1846). The principal Scottish act was 1700, c. 3; the principal Irish act, 2 Anne c. 3. Numerous decisions illustrating the practical operation of the old law in Ireland are collected in G. E. Howard's *Cases on the Popery Laws* (1775). The Roman Catholic Emancipation Act 1829 (10 Geo. IV. c. 7), although it gave Roman Catholic citizens in the main complete civil and religious liberty, at the same time left them under certain disabilities, trifling in comparison with those under which they laboured before 1829. Nor did the act affect in any way the long series of old statutes directed against the assumption of authority by the Roman see in England. The earliest of these which is still law is the Statute of Provisors of 1351 (25 Edw. III. st. 4). The effect of the Roman Catholic Charities Act 1832 is to place Roman Catholic schools, places of worship and education, and charities, and the property held therewith, under the laws applying to Protestant nonconformists. The Toleration Act does not apply to Roman Catholics, but legislation of a similar kind, especially the Relief Act of 1791 (31 Geo. III. c. 32), exempts the priest from parochial offices, such as those of churchwarden and constable, and from serving in the militia or on a jury, and enables all Roman Catholics scrupling the oaths of office to exercise the office of churchwarden and some other offices by deputy. The priest is, unlike the nonconformist minister, regarded as being in holy orders. He cannot, therefore, sit in the House of Commons, but there is nothing to prevent a peer who is a priest from sitting and voting in the House of Lords. If a priest becomes a convert to the Church of England he need not be re-ordained. The remaining law affecting Roman Catholics may be classed under the following five heads:—

(1) *Office.*—There are certain offices still closed to Roman Catholics. By the Act of Settlement a papist or the husband or wife of a papist cannot be king or queen. The act of 1829 provides that nothing therein contained is to enable a Roman Catholic to hold the office of guardian and justice of the United Kingdom, or of regent of the United Kingdom; of lord chancellor, lord keeper, or lord commissioner of the great seal of Great Britain or Ireland or lord lieutenant of Ireland; of high commissioner to the General Assembly of the Church of Scotland, or of any office in the Church of England or Scotland, the ecclesiastical courts, cathedral foundations and certain colleges. The disability in the case of the lord chancellor of Ireland was removed by statute in 1867, with necessary limitations as to ecclesiastical patronage. The act of 1829 preserved the liability of Roman Catholics to take certain oaths of office, but these have been modified by later legislation (see 29 & 30 Vict. c. 19; 30 & 31 Vict. c. 75; 31 & 32 Vict. c. 72; 34 & 35 Vict. c. 48). Legislation has been in the direction of omitting words which might be supposed to give offence to Roman Catholics. The only offices which Roman Catholics are not legally capable of holding now are the lord chancellorship of England and the lord lieutenancy of Ireland (see, however, Lilly and Wallis, pp. 36–43).

(2) *Title.*—The act of 1829 forbids the assumption by any person, other than the person authorized by law, of the name, style or title of an archbishop, bishop or dean of the Church of England. The Ecclesiastical Titles Act 1851 went further, and forbade the assumption by an unauthorized person of a title from any place in the United Kingdom, whether or not such place were the seat of an archbishopric, bishopric or deanery. This act was, however, repealed in 1867, but the provisions of the act of 1829 are still in force.

(3) *Religious Orders.*—It was enacted by the act of 1829 that "every Jesuit and every member of any other religious order, community or society of the Church of Rome bound by monastic or religious vows" was, within six months after the commencement of the act, to deliver to the clerk of the peace of the county in which he should reside a notice or statement in the form given to the schedule to the act, and that every Jesuit or member of such religious order coming into the realm after the commencement of the act should be guilty of a misdemeanour and should be banished from the United Kingdom for life (with an exception in favour of natural-born subjects duly registered). A secretary of state, being a Protestant, was empowered to grant licences to Jesuits, &c., to come into the United Kingdom and remain there for a period not exceeding six months. An account of these licences was to be laid annually before parliament. The admission of any person as a regular ecclesiastic by any such Jesuit, &c., was made a misdemeanour, and the person so admitted was to be banished for life. Nothing in the act was to extend to religious orders of females. These provisions exist *in posse* only, and have, it is believed, never been put into force.

(4) *Superstitious Uses.*—Gifts to superstitious uses are void both at common law and by statute. It is not easy to determine what gifts are to be regarded as gifts to superstitious uses. Like contracts contrary to public policy, they depend to a great extent for their illegality upon the discretion of the court in the particular case. The act of 23 Hen. VIII. c. 10 makes void any assurance of lands to the use (to have obits perpetual) or the continual service of a priest for ever or for threescore or fourscore years. The act of 1 Edw. VI. c. 14 (specially directed to the suppression of chantries) vests in the crown all money paid by corporations and all lands appointed to the finding or maintenance of any priest, or any anniversary or obit or other like thing, or of any light or lamp in any church or chapel maintained within five years before 1547. The act may still be of value in the construction of old grants, and in affording examples of what the legislature regarded as superstitious uses. Gifts which the courts have held void on the analogy of those mentioned in the acts of Henry VIII. and Edward VI. are a devise for the good of the soul of the testator, a bequest to certain Roman Catholic priests that the testator may have the benefit of their prayers and masses, a bequest in trust to apply a fund to circulate a book teaching the supremacy of the pope in matters of faith, a bequest to maintain a taper for evermore before the image of Our Lady. The court may

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act of parliament bearing the same titles, so that there are now often two bishops bearing the same style. From the point of view of the State, that of the Roman Catholic bishop is, of course, only a title of courtesy, the Anglican bishop alone having the legal right to bear it.

[1] See also Stephen's *History of the Criminal Law*, vol. ii. p. 483; Anstey, *The Law affecting Roman Catholics* (1842); Lilly and Wallis, *Manual of the Law specially affecting Catholics* (1893).

[1] A recusant signified a person who refused duly to attend his parish church.

compel discovery of a secret trust for superstitious uses. Since 2 & 3 Will. IV. c. 115 gifts for the propagation of the Roman Catholic faith are not void as made to superstitious uses. It should be noticed that the doctrine of superstitious uses is not confined to the Roman Catholic religion, though the question has generally arisen in the case of gifts made by persons of that religion. The Roman Catholic Charities Act 1860 enables the court to separate a lawful charitable trust from any part of the estate subject to any trust or provision deemed to be superstitious. It also provides that in the absence of any written document the usage of twenty years is to be conclusive evidence of the application of charitable trusts.

(5) *Patronage.*—A Roman Catholic cannot present to a benefice, prebend, or other ecclesiastical living, or collate or nominate to any free school, hospital or donative (3 Jac. I. c. 5). Such patronage is by the act vested in the universities, Oxford taking the City of London and twenty-five counties in England and Wales, mostly south of the Trent, Cambridge the remaining twenty-seven. The principle is affirmed in subsequent acts (1 Will. and Mary, sess. 1, c. 26; 12 Anne, st. 2, c. 14; 11 Geo. II. c. 17). If the right of presentation to an ecclesiastical benefice belongs to any office under the crown, and that office is held by a Roman Catholic, the archbishop of Canterbury exercises the right for the time being (10 Geo. IV. c. 7, s. 17). No Roman Catholic may advise the crown as to the exercise of its ecclesiastical patronage (Ibid. s. 18). A Roman Catholic, if a member of a lay corporation, cannot vote in any ecclesiastical appointment (Ibid. s. 15). Grants and devises of advowsons, &c., by Roman Catholics are void, unless for valuable consideration to a Protestant purchaser (11 Geo. II. c. 17, s. 5). Where a *quare impedit* is pending before any court, the court may compel the patron to take an oath that there is no secret trust for the benefit of a Roman Catholic.

(J. W.)

The Church in the United States.

The history of Roman Catholicism in the New World begins with the Norse discoveries of Greenland and Vinland the Good. In the former the bishopric of Gardar was established in 1112, and extinguished only in 1492. To the latter (the coast of New England), the Northmen during the same period made "temporary visits for timber and peltries, or missionary voyages to evangelize for a season the natives." Beyond these facts, the Norse sagas and chronicles contribute little that is certain (cf. "The Norse Hierarchy in the United States," *Amer. Cath. Quart. Review*, April 1890). Although a bishop was appointed by the pope for the vaguely defined territory of Florida so early as 1528, the oldest Catholic community in what is now the United States dates from 1565, when the Spanish colony of St Augustine was founded. Hence the aboriginal tribes of the South were evangelized. In 1582 the missions of New Mexico were undertaken, and from 1601 Catholic missionaries were at work along the Pacific coast, especially in California. Early in the 17th century trading posts and mission centres were established on the coast of Maine, and during the same century French priests laboured zealously in northern New York, along the entire coast of the Mississippi from Wisconsin to Louisiana, and around the Great Lakes. Their principal concern was for the savages, over whom they acquired an extraordinary influence. Political jealousies, human avarice and treachery arrested the progress of most of their missions.

The English colony of Maryland, planned by the Catholic George Calvert (1st Lord Baltimore), and founded (1634) by his son the Catholic Cecilius Calvert (2nd Lord Baltimore), and Pennsylvania, founded (1681) by the tolerant Quaker William Penn, first permitted the legal existence of Catholicism in English-speaking communities of the New World. It is from these centres that it spread during the 18th century. In 1784 the Rev. John Carroll was appointed prefect-apostolic for the Catholics of the English colonies hitherto dependent on the vicar-apostolic of London. In 1790 Father Carroll was made bishop of the see of Baltimore, and given charge of all the Catholic interests in the United States. There were then about 24,500 Catholics in the land, of which number 15,800 were in Maryland, and 7000 in Pennsylvania, 200 in Virginia and 1500 in New York. In 1807 they had grown to 150,000 with 80 churches. In the following year Baltimore found itself the first metropolitan see of the United States, with New York, Philadelphia, Boston and Bardstown as suffragans.

The growth of the Catholic population by decades since 1820 was calculated by a competent historian, the late John Gilmary Shea, as follows:—

1820	244,500	1860	3,000,000
1830	361,000	1870	4,685,000
1840	1,000,000	1880	7,067,000
1850	1,726,470	1890	10,627,000

The number in 1906 was 12,079,142 (U.S. Census, *Special Report*, 1910). The main source of this growth has been immigration. Originally the Irish and the Germans furnished the greater quota. Later the French-Canadians, Italians, Poles and Bohemians added notably to the number; an appreciable percentage of Oriental Catholics is also found,—Greeks, Syrians, Armenians, &c. Natural increase, especially among the first Catholic immigrants, and a certain percentage of conversions from Protestantism, are contributory sources. Being under the protection of the constitution, and enjoying the advantages of the common law, Catholicism could not meet with any official opposition; such few outbursts of fanaticism as there have been were but temporary or local, and did not represent the true feelings of the country. As to the future of the Church in the United States, all Catholics feel, with their latest historian, that "the Catholic Church is in accord with Christ's revelation, with American liberty, and is the strongest power for the preservation of the Republic from the new social dangers that threaten the United States as well as the whole civilized world. She has not grown, she cannot grow so weak and old that she may not maintain what she has produced—Christian civilization."

Internally, Catholicism in the United States has been free from any noteworthy schisms or heresies that might impede its development—its doctrinal history offers nothing of importance. The discipline differs little from that of the other churches of Catholicism. The unity of doctrine, liturgy and moral ideals is preserved by an intimate union with the see of Rome. The general canonical legislation of the Church, the legislation by papal rescript and the Congregation of the Propaganda, the decisions of the Apostolic Delegation at Washington, and a certain amount of immemorial custom and practice, form the code that governs its domestic relations. Decennially each bishop of the United States is expected to pay a visit to Rome (*Ad Limina Apostolorum*), and to make a report of the spiritual condition of religion within his diocese. In addition a system of synods provides for local unity among bishops, priests and laity. Thus each province or body of bishops under a metropolitan holds provincial councils, while at greater intervals a plenary or national council is held. Of these last three have taken place—their decrees, when approved at Rome, are binding on all Catholics in the United States.

In education the Catholic Church endeavours to keep abreast with the best. There are, according to Hoffmann's *Directory* (Milwaukee, 1907), 4364 parochial schools, in which 1,096,842 children of both sexes receive instruction. The total number of children in Catholic institutions is given as 1,266,175. There are 198 colleges for boys and 678 academies for girls. This system of education is crowned by the Catholic University of America at Washington, established by Leo XIII. and the American hierarchy, and endowed with all the privileges of the old pontifical universities of Europe. In addition there are several other schools that rank as universities. The education of the clergy is provided for by 86 seminaries, in which there are 5697 students. The charitable institutions in the Church are very numerous. There are 255 orphan asylums, with 40,588 inmates. The other charitable institutions are 992 in number, and include every form of public and private charity; no diocese is without one or more such establishments. The actual government of the Church in the United States is represented by one cardinal, 14 archbishops, 89 bishops, 11,135 diocesan clergymen, under the sole and immediate direction of their bishops, 3958 members of religious orders subject to episcopal supervision—in all 15,093 clergymen. There are 8072 churches with resident priests, and 4076 mission churches—in all 12,148, to which must be added 3358 chapels. Several hundred weekly publications are printed in English and foreign tongues, to minister to the needs of the Catholic population. There exist also several literary and academical magazines and reviews of a high order of merit.

The principal religious events in the recent history of the Church were the holding of the Third Plenary Council of Baltimore (1884), the Catholic Congress (1889), the opening of the Catholic University (1889), the Columbian Educational Exhibit at Chicago (1893), the establishment of the Apostolic Delegation at Washington (1893).

The Catholic Church in the United States conducts no foreign missions, but takes care of its own percentage of Indians and Negroes. Of the Indian population of the United States about 48,194 are Catholics, and they are attended by 65 priests, who look after 96 churches or chapels; there are 50 schools conducted by members of 16 sisterhoods, in which 4430 children are educated. The Catholic negroes are about 138,573 in number. They have 47 churches conducted by 43 white clergymen; 114 schools, in which 6294 children are educated by 31 sisterhoods, who also conduct 11 charitable institutions. The expenses of these missions are borne by private charity, and by a general annual collection.

AUTHORITIES.—General History: John Gilmary Shea, *Life and Times of Archbishop Carroll* (New York, 1888); *The Catholic Church in Colonial Days* (New York, 1886); *The Hierarchy of the Catholic Church in the United States* (New York, 1886).—Bishop O'Gorman, *A History of the Catholic Church in the United States* (1895). This work contains a useful bibliography.—Clarke, *Lives of the Deceased Bishops* (1872). Statistics: *The Annual Directory of the Catholic Clergy*. Of these, two are published; one by D. & J. Sadlier, New York, the other (Hoffmanns') by M. Wiltzius & Co. of Milwaukee. The Catholic general statistics of the eleventh (1890) census may be found in *The Religious Forces of the United States*, by H. K. Carroll (New York, 1893). See also U.S. Census, *Special Report on Religious Bodies in 1906* (1910). Legislation: *Acta et Decreta Concilii Plenarii Baltimorensis*, iii. (Baltimore, 1886). This is illustrated and brought into relation with the general laws of the Church in Smith's *Elements of Ecclesiastical Law* (New York). In connexion with this may be read Humphrey's *Urbs et Orbis* (London, 1899), an account of the general government of Roman Catholicism.

(✠ J. G.)

ROMANCE, originally a composition written in "Romance" language: that is to say, in one of the phases on which the Latin tongue entered after or during the dark ages. For some centuries by far the larger number of these compositions were narrative fictions in prose or verse; and since the *special* "Romance" language of France—the earliest so-called—was the original vehicle of nearly all such fictions, the use of the term for them became more and more accepted in a limited sense. Yet for a long time there was no definite connotation of *fiction* attached to it, but only of narrative story: and the French version of William of Tyre's *History of the Crusades*, a very serious chronicle written towards the close of the 12th century, bears the name of *Roman d'Éracle* simply because the name of the emperor Heraclius occurs in the first line. But if the explanation of the name "Romance" is quite simple, certain and authentic, the same is by no means the case with its definition, or even with the origin of the thing to which that name came mostly to be applied. For some centuries an abstraction has been formed from the concrete examples. "Romance," "romanticism," "the romantic character," "the romantic spirits," have been used to express sometimes a quality regarded in itself, but much more frequently a difference from the supposed "classical" character and spirit. The following article will deal chiefly with the matter of Romance, excluding or merely referring to accounts of such individual romances as are noticed elsewhere. But it will not be possible to conclude without some reference to the vaguer and more contentious signification.

Romance in antiquity.

Speculations on the origin of the peculiar kind of story which we recognize rather than define under the name of romance have been numerous and sometimes confident; but a wary and well-informed criticism will be slow to accept most of them. It is certain that many of its characteristics are present in the *Odyssey*; and it is a most remarkable fact that these characteristics are singled out for reprehension—or at least for comparative disapproval—by the author of the *Treatise on the Sublime*. The absence of central plot, and the prolongation rather than evolution of the story; the intermixture of the supernatural; the presence and indeed prominence of love-affairs; the juxtaposition of tragic and almost farcical incident; the variety of adventure arranged rather in the fashion of a panorama than otherwise: all these things are in the *Odyssey*, and they are all, in varying degrees and measures, characteristic of romance. Nor are they absent from the few specimens of ancient prose fiction which we possess. If the *Satyricon* was ever more than a mass of fragments, it was certainly a romance, though one much mixed with satire, criticism and other things; and the various Greek survivals from Longus to Eustathius always and rightly receive the name. But two things were still wanting which were to be all-powerful in the romances proper—Chivalry and Religion. They could not yet be included, for chivalry did not exist; and such religion as did exist lent itself but ill to the purpose except by providing myths for ornament and perhaps pattern.

The "Saint's Life."

A possible origin of the new romance into which these elements entered (though it was some time before that of chivalry definitely emerged) has been seen by one of the least hazardous of the speculations above referred to in the hagiology or "Saint's Life," which arose at an early though uncertain period, developed itself pretty rapidly, and spreading over all Christendom (which by degrees meant all Europe and parts of Asia) provided centuries with their chief supply of what may be called interesting literature. If the author of *On the Sublime* was actually Longinus, the minister of Zenobia, there is no doubt that examples both sacred and profane of the kind of "fiction" ("imitation" or "representation") which he deprecated were mustering and multiplying close to, perhaps in, his own time. The Alexander legend of the pseudo-Callisthenes is supposed to have seen the light in Egypt as early as A.D. 200, and the first Greek version of that "Vision of Saint Paul," which is the ancestor of all the large family of legends of the life after death, is pretty certainly as old as the 4th century and may be as old as the 3rd. The development of the Alexandreid was to some extent checked or confined to narrow channels as long as something like traditional and continuous study of the classics was kept up. But hagiology was entirely free from criticism; its subjects were immensely numerous; and in the very nature of the case it allowed the tendencies and the folk-lore of three continents and of most of their countries to mingle with it. Especially the comparative sobriety of classical literature became affected with the Eastern appetite for marvel and unhesitating acceptation of it; and the extraordinary beauty of many of the central stories invited and necessitated embroidery, continuation, episode. Later, no doubt, the adult romance directly reacted on the original saint's life, as in the legends of St Mary Magdalene most of all, of St Eustace, and of many others. But there can be very little doubt that if the romance itself did not spring from the saint's life it was fostered thereby.

The gathering of matter.

Proceeding a little further in the cautious quest—not for the definite origins which are usually delusive, but for the tendencies which avail themselves of opportunities and the opportunities which lend themselves to tendencies—we may notice two things very important to the subject. The one is that as Graeco-Roman civilization began to spread North and East it met, to appearance which approaches certainty, matter which lent itself gladly to "romantic" treatment. That such matter was abundant in the literature and folk-lore of the East we know: that it was even more abundant in the literatures and folk-lore of the North, if we cannot strictly be said to *know*, we may be reasonably sure. On the other hand, as the various barbarian nations (using the word in the wide Greek sense), at least those of the North, became educated to literature, to "grammar," by classical examples, they found not a few passages in these examples which were either almost romances already or which lent themselves, with readiness that was almost insistence, to romantic treatment. Apollonius Rhodius had made almost a complete romance of the story of Jason and Medea. Virgil had imitated him by making almost a complete romance of the story of Aeneas and Dido: and Ovid, who for that very reason was to become the most popular author of the middle ages early and late, had gone some way towards romancing a great body of mythology. We do not know exactly who first applied to the legendary tale of Troy the methods which the pseudo-Callisthenes and "Julius Valerius" applied to the historical wars of Alexander, but there is every reason to believe that it was done fairly early. In short, during the late classical or semi-classical times and the whole of the dark ages, things were making for romance in almost every direction.

Uncertainty of its order.

It would and did follow from this that the thing evolved itself in so many different places and in so many different forms that only a person of extraordinary temerity would put his finger on any given work and say, "This is the first romance," even putting aside the extreme chronological uncertainty of most of the documents that could be selected for such a position. Except by the most meteoric flights of "higher" criticism we cannot attain to any opinion as to the age and first developed form of such a story as that of Weland and Beadohild (referred to in the *Complaint of Deor*), which has strong romantic possibilities and must be almost of the oldest. The much more complicated Volsung and Nibelung story, though we may explore to some extent the existence backwards of its Norse and German forms, baffles us beyond certain points in each case; yet this, with the exception of the religious element, is romance almost achieved. And the origin of the great type of the romance that *is* achieved—that has all elements present and brings them to absolute perfection—the Arthurian legend, despite the immense labours that have been spent upon it and the valuable additions to particular knowledge which have resulted from some of them, is, still more than its own Grail, a quest unachieved, probably a thing unachievable. The longest and the widest inquiries, provided only that they be conducted in any spirit save that which determines to attain certainty and therefore concludes that certainty has been attained, will probably acquiesce most resignedly in the dictum that romance "grew"—that its birthplace is as unknown as the grave of its greatest representative figure.

But when it has "grown" to a certain stage we can find it, and in a way localize it, and more definitely still analyse and comprehend its characteristics from their concrete expressions.

Classes of source.

Approaching these concrete expressions, then, without at first too hard and fast requirements in regard to the validation of the claims, we find in Europe about the 11th century (the time is designedly left loose) divers classes of what we should now call imaginative or fictitious literature, nearly all (the exceptions are Scandinavian and Old English) in verse. These are: (i) The saints' lives; (ii) the Norse sagas, roughly so-called; (iii) the French *chansons de geste*; (iv) the Old English and Old German stories of various kinds; (v) perhaps the beginning of the Arthurian cycle; (vi) various stories more or less based on classical legend or history from the tales of Alexander and of Troy down to things like *Apollonius of Tyre*, which have no classical authority of either kind, but strongly resemble the Greek romances, and which were, as in the case named, pretty certainly derived from members of the class; (vii) certain fragments of Eastern story making their way first, it may be, through Spain by pilgrimages, latterly by the crusades.

Now, without attempting to fence off too rigidly the classical from the romantic, it may be laid down that these various classes possess that romantic character, to which we are, by a process of netting and tracking, slowly making our way, in rather different degrees, and a short examination of the difference will forward us not a little in the hunt.

With i. (the saints' lives) we have least to do: because by the time that romance in the full sense comes largely and clearly into view, it has for the most part separated itself off—the legend of St Eustace has become the romance of Sir Isumbras, and so forth. But the influence which it may, as has been said, have originally given must have been continually re-exerted; the romantic-dynamic suggestion of such stories as those of St Mary of Egypt, of St Margaret and the Dragon, of St Dorothea, and of scores of others, is quite unmistakable. Still, in actual result, it works rather more on drama than on narrative romance, and produces the miracle plays.

In ii. (the sagas), while a large part of their matter and even not a little of their form are strongly romantic, differences of handling and still more of temper have made some demur to their inclusion under romance, while their final ousting in their own literatures by versions of the all-conquering French romance itself is an argument on the same side. But the Volsung story, for instance, is full of what may be called "undistilled" romance—the wine is there, but it has to be passed through the still—and even in the most domestic sagas proper this characteristic is largely present.

It is somewhat less so in iii. (the *chansons de geste*), at least in the apparently older ones, though here again the comparative absence of romantic characteristics has been rather exaggerated, in consequence of the habit of paying disproportionate and even exclusive attention to the *Chanson de Roland*. There is more, that is, of romance in *Aliscans* and others of the older class, while *Amis and Amiles*, which must be of this class in time, is almost a complete romance, blending war, love and religion—*salus*, *venus*, *virtus*—in full degree.

The other four classes, the miscellaneous stories from classical, Eastern and European sources, having less corporate or national character, lend themselves with greater ease to the conditions of romantic development; but even so in different degrees. The classical stories have to drop most of their original character and allow something very different to be superinduced before they become thoroughly romantic. The greatest success of all in this way is the story of *Troilus and Cressida*. For before its development through the successive hands of Benoît de Sainte-More, Boccaccio (for we may drop Guido of the Columns as a mere middleman between Benoît and Boccaccio) and Chaucer, it has next to no classical authority of any kind except the mere names. In the various Alexandreids the element of the marvellous—the Eastern element, that is to say—similarly overpowers the classical. As for the Eastern stories themselves, they are particularly difficult of certain unravelment. The large moral division—such as *Barlaam and Josaphat*, the *Seven Wise Masters* in its various forms, &c., comes short of the strictly romantic. We do not know how much of East and how much of West there is in such things as *Flore et Blanchefleur* or even in *Huon of Bordeaux* itself. Contrariwise we ought to know, more certainly than apparently is known yet, what is the date and history of such a thing as that story of Zumurrud and Ali Shahr, which may be found partly in Lane and fully in the complete translations of the *Arabian Nights*, though not in the commoner editions, and which is evidently either copied from, or capable of serving as model to, a Western *roman d'aventures* itself.

We come, however, much closer to the actual norm itself—closer, in fact, than in any other place save one—in the various stories, English, French, and to a less extent German,[1] which gradually received in a loose kind of way the technical French term just used, a term not to be translated without danger. Nearly all these stories were drawn, by the astonishing centripetal tendency which made France the home of all romance between the 11th and the 13th centuries, into French forms; and in most cases no older ones survive. But it is hardly possible to doubt that in such a case, for instance, as *Havelok*, an original story of English or Scandinavian origin got itself into existence before, and perhaps long before, the French version was retransferred to English, and so in other cases. If, once more, we take our existing English *Havelok* and its sister *King Horn*, we see that the latter is a *more* romanced form than the former. *Havelok* is more like a *chanson de geste*—the love interest in it is very slight; while in *King Horn* it is much stronger, and the increased strength is shown by the heroine being in some forms promoted into the title. If these two be studied side by side the process of transforming the mere story into the full romance is to no small extent seen in actual operation. But neither exhibits in any considerable degree the element of the marvellous, or the religious element, and the love interest itself is, even in *Horn*, simple and not very dramatically or passionately worked out. In the later *roman d'aventures*, of which the 13th century was so prolific (such as, to give one example out of many, *Amadas and Idoine*), these elements appear fully, and so they do in the great Auchinleck collection in English, which, though dating well within the 14th, evidently represents the meditation and adaptation of French examples for many years earlier.

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[1] Italian romance seems to have modelled itself early on French, and it is doubtful, rich as is the late crop of Spanish romances, whether we have any that deserve the name strictly and are really early.

The last of our divisions, however, exhibits the whole body of romantic elements as nothing else does. It is not our business in this place to deal with the Arthurian legend generally as regards origin, contents, &c., nor, in the present division of this actual article, to look at it except for a special purpose and in connexion with and contradistinction to the other groups just surveyed. Here, however, we at last find all the elements of romance, thoroughly mixed and thoroughly at home, with the result not merely that the actual story becomes immensely popular and widely spread; not only that it receives the greatest actual development of any romantic theme; but that, in a curious fashion, it attracts to itself great numbers of practically independent stories—in not a few cases probably quite independent at first—which seem afraid to present themselves without some tacking on (it may be of the loosest and most accidental description) to the great *polycentric* cycle, the stages of which gather round Merlin, the Round Table, the Grail and the Guinevere-Lancelot-Mordred catastrophe. All the elements, let it be repeated, are here present: war, love and religion; the characteristic extension of subject in desultory adventure-chronicles; the typical rather than individual character (though the strong individuality of some of the unknown or half-known contributors sometimes surmounts this); the admixture of the marvellous, not merely though mainly as part of the religious element; the presence of the chivalrous ideal. The strong dramatic interest of the central story is rather superadded to than definitely evolved from these elements; but they are still present, just as, though more powerfully than, in the weakest of miscellaneous *romans d'aventures*.

Types of story.

A further step in the logical and historical exploration of romance may be taken by regarding the character-and-story classes round which it instinctively groups itself, and which from the intense community of medieval literature—the habit of medieval writers not so much to plagiarize from one another as to take up each after each the materials and the instruments which were not the property of any—is here especially observable. Prominent above everything is the world-old motive of the quest; which, world-old as it is, here acquires a predominance that it has never held before or since. The object takes pretty various, though not quite infinitely various, forms, from the rights of the disinherited heir and the hand or the favour of the heroine, to individual things which may themselves vary from the Holy Grail to so many hairs of a sultan's beard. It may be a friendly knight who is lost in adventure, or a felon knight who has to be punished for his trespasses; a spell of some kind to be laid; a monster to be exterminated; an injured virgin or lady, or an infirm potentate, to be succoured or avenged; an evil custom to be put an end to; or simply some definite adventure or exploit to be achieved. But quest of some sort there must almost certainly be if (as in *Sir Launfal*, for instance) it is but the recovery of a love forfeited by misbehaviour or mishap. It is almost a *sine qua non*—the present writer, thinking over scores, nay hundreds, of romances, cannot at the moment remember one where it is wanting in some form or another.

Of incident.

It will be observed that this at once provides the amplest opportunity for the desultory concatenation or congregation of incident and episode which is of the very essence of romance. Often, nay generally, the conditions, localities and other circumstances of the quest are half known, or all but unknown, to the knight, and he is sometimes intentionally led astray, always liable to be incidentally called off by interim adventures. In many (perhaps most) cases the love interest is directly connected with the quest, though it may be in the way of hindrance as well as of furtherance or reward. The war interest always is so connected; and the religious interest commonly—almost universally in fact—is an inseparable accident. But everything leads up to, involves, eventuates in the fighting. The quest, if not always a directly warlike one, always involves war; and the endless battles have at all times, since they ceased to be the great attraction, continued to be the great obloquy of romance. It is possible no doubt that reports of tournaments and single combats with lance and sword, mace and battle-axe, may be as tedious to some people as reports of football matches certainly are to others. It is certain that the former were as satisfactory in former times to their own admirers as the latter are now. In fact the variety of incident is almost as remarkable as the sameness. And the same may be said, with even greater confidence, of the adventures between the fights in castle and church and monastery, in homestead or hermitage. The actual stories are not much more alike than those who have read large numbers of modern novels critically know to be the case with them. But the absence, save in rare cases, of the element of character, and the very small presence of that of conversation, show up the sameness that exists in the earlier case.

Of personages.

This same deficiency in individual character-drawing, and in the conversation which is one of its principal instruments, brings out in somewhat unfair relief some other cases of apparent sameness—the "common forms" of story and of character itself. The disinherited heir, the unfaithful or wronged wife, the wicked stepmother, the jealous or wrongly suspected lover, are just as universal in modern fiction as they are in medieval—for the simple reason that they are common if not universal in nature. But the skeleton is more obvious because it is less clothed with flesh and garments over the flesh; the texture of the canvas shows more because it is less worked upon. Some of these common forms, however, are more peculiar to medieval times; and some, though not many, allow excursions into abnormalities which, until recently, were tabooed to the modern novelist. Among the former the wickedness of the steward is remarkable, and of course not difficult to account for. The steward or seneschal of romance, with some honourable exceptions, is as wicked as the baronet of a novel, but here the explanation is not metaphysical. He was constantly left in charge in the absence of his lord and so was exposed to temptation. The extreme and almost Ephesian consolableness of the romance widow can be equally rationalized—and in fact is so in the stories themselves—by the danger of the fief being resumed or usurped in the absence of a male tenant who can maintain authority and discharge duties. While such themes as the usually ignorant incest of son with mother or the more deliberate passion of father for daughter come mostly from very popular early examples—the legend of St Gregory of the Rock or the story of Apollonius of Tyre.

Characters of romance proper.

The last point brings us naturally to another of considerable importance—the singular *purity* of the romances as a whole, if not entirely in atmosphere and situation, yet in language and in external treatment. It suited the purposes of the Protestant controversialists of the Renaissance, such as our own Ascham, to throw discredit upon work so intimately connected with Catholic ceremony and belief as the *Morte d'Arthur*; and it is certain that the knights of romance did not even take the benefit of that liberal doctrine of the *Cursor Mundi* which regards even illicit love as not mortal unless it be "with spouse or *sib*." But if in the romances such love is portrayed freely, and with a certain sympathy, it is never spoken of lightly and is always punished; nor are the pictures of it ever coarsely drawn. In a very wide reading of romance the present writer does not remember more than two or three passages of romance proper (that is to say before the later part of the 15th century) which could be called obscene by any fair judge. And the term would have to be somewhat strained in reference even to these. The contrast with the companion divisions of *fabliaux* and farces is quite extraordinary; and nearly as sharp as that between Greek tragedy on the one hand and Greek comedy or satiric play on the other. It is brought out for the merely English reader in Chaucer of course, but in him it might have been studied. In the immense *corpus* of known or unknown French and English writers (the Germans are not quite so particular) it comes out with no possibility of deliberation and with unmistakable force.

Development.

The history of the forms in which romance presents itself follows a sufficiently normal and probable course. The oldest are always—save in the single case of part of the Arthurian division, in which we probably possess none of the *actually* oldest, and in some of the division of Antiquity which had a long line of predecessors in the learned languages—the shortest. They become lengthened in a way continued and exemplified to the present moment by the tendency of writers to add sequels and episodes to their own stories, and made still more natural by the fact that these poems were in all or almost all cases *recited*. "Go on" is the most natural and not the least common as well as the most complimentary form of "Bravo!" and the reciter never seems to have said "no" to the compliment. In not a few cases—*Huon of Bordeaux*, *Ogier the Dane*, *Guy of Warwick*, are conspicuous examples—we possess the same story in various stages; and can see how poems, perhaps originally like *King Horn* of not more than a couple of thousand lines or even shorter in the 13th century, grew to thirty, forty, fifty thousand in the 15th. The transference of the story itself from verse to prose is also—save in some particular and still controverted instances—regularly traceable and part of a larger and natural literary movement. While, also naturally enough, the pieces become in time fuller of conversation (though not as yet often of conversation that advances the story or heightens its interest), of descriptive detail, &c. And in some groups (notably that of the remarkable *Amadis* division) a very great enlargement of the proportion and degradation of the character of the marvellous element appears—the wonders being no longer mystical, and magical only in the lower sense.

Characteristic examples.

And so we come to the particular characteristics of the kind or kinds in individual examples. Of these the English reader has a matchless though late instance in the *Morte d'Arthur* of Malory, a book which is at once a *corpus* and a pattern of romance in gross and in detail. The fact that it is not, as has been too often hastily or ignorantly asserted, a mere compilation, but the last of a singular series of rehandlings and redactions—conducted with extraordinary though for the most part indistinctly traceable instinct of genius—makes it to some extent transcend any single example of older date and more isolated composition. But it displays all the best as well as some of the less good characteristics of most if not all. Of the commonest kind—the almost pure *roman d'aventures* itself—the Gareth-Beaumains episode (for which we have no direct original, French or English, though *Lybius Disconus* and *Ipomedon* come near to it in different ways) will give a fair example; while its presentation of the later chapters of the Grail story, and the intertwisted plot and continuing catastrophe of the love of Lancelot and Guinevere, altogether transcend the usual scope of romance pure and simple, and introduce almost the highest possibilities of the romantic novel. The way in which Malory or his immediate authorities have extruded the tedious wars round the "Rock of the Saxons," have dropped the awkward episode of the false Guinevere, and have restrained the uninteresting exuberance of the continental wars and the preliminary struggles with the minor kings, keeps the reader from contact with the duller sides of romance only. Of the real variety which rewards a persistent reader of the class at large it would be impossible to present even a miniature hand-index here; but something may be done by sample, which will not be *mere* sample, but an integral part of the exposition. No arbitrary separation need be made between French and English; because of the intimate connexion between the two. As specially and symptomatically noteworthy the famous pair—perhaps the most famous of all—*Guy of Warwick* and *Bevis of Hampton*, should *not* be taken. For, with the exception of the separation of Guy and Felise in the first, and some things in the character of Josiane in the second, both are somewhat spiritless concoctions of stock matter. Far more striking than anything in either, though not consummately supported by their context, are the bold opening of *Blancandin et l'orgueilleuse d'amour*, where the hero begins by kissing a specially proud and prudish lady; and the fine scenes of fight with a supernatural foe at a grave to be found in *Amadas et Idoine*. Reputation and value coincide more nearly in the charming fairy story of *Parthenopex de Blois* and the Christian-Saracen love romance of *Flore* (Florice and other forms) *et Blanchefleur*. Few romances in either language, or in German, exhibit the pure adventure story better than Chrestien de Troyes's *Chevalier au Lyon*, especially in its English form of *Ywain and Gawain*; while the above-mentioned *Lybius Disconus* (*Le Beau Déconnu*) makes a good pair with this. For originality of form and phrase as well as of spirit, if not exactly of incident, *Gawain and the Green Knight* stands alone; but another Gawain story (in French this time), *Le Chevalieur aux deux épées*, though of much less force and fire, exceeds it in length without sameness of adventure. Only the poorest romances—those ridiculed by Chaucer in *Sir Thopas*—which form a small minority, lack striking individual touches, such as the picture of the tree covered with torches and carrying on its summit a heavenly child, which illuminates the huge expanse of *Durmart le Gallois*. The various forms of the *Seven Wise Masters* in different European languages show the attitude of the Western to the Eastern fiction interestingly. The beautiful romance of *Emaré* is about the best of several treatments of one of the exceptional subjects classed above—the unnatural love of father for daughter, while if we turn to German stories we find not merely in the German variants of Arthurian themes, but in others a double portion of the mystical element. French themes are constantly worked up afresh—as indeed they are all over Europe—but the Germans have the advantage of drawing upon not merely Scandinavian traditions like those which they wrought into the *Nibelungen Lied* and *Gudrun*, but others of their own. And both in these and in their dealings with French they sometimes show an amount of story-telling power which is rare in French and English. No handling of the Tristan and Iseult story can compare with Gottfried's; while the famous *Der arme Heinrich* of Hartmann von Aue (the original of Longfellow's *Golden Legend*) is one of the greatest triumphs and most charming examples of romance, displaying in almost the highest degree possible for a story of little complexity all the best characteristics of the thing.

What, then, are these characteristics? The account has now been brought to a point where a reasoned résumé of it will give as definite an answer as can be given.

Summary of opinion and fact.

Even yet we may with advantage interpose a consideration of the answer that *was* given to this question universally (with a few dissidents) from the Renaissance to nearly the end of the 18th century and not infrequently since; while it is not impossible that, in the well-attested revolutions of critical thought and taste, it may be given again. This is that romance on the whole, and with some flashes of better things at times, is a jumble of incoherent and mostly ill-told stories, combining sameness with extravagance, outraging probability and the laws of imitative form, childish as a rule in its appeal to adventure and to the supernatural, immoral in its ethics, barbarous in its aesthetics, destitute of any philosophy, representing at its very best (though the ages of its lowest appreciation were hardly able even to consider this) a necessary stage in the education of half-civilized peoples, and embodying some interesting legends, much curious folklore and a certain amount of distorted historical evidence. On the other hand, for the last hundred years and more, there have been some who have seen in romance almost the highest and certainly the most charming form of fictitious creation, the link between poetry and religion, the literary embodiment of men's dreams and desires, the appointed nepenthe of more sophisticated ages as it was the appointed pastime of the less sophisticated. Between these opposites there is of course room for many middle positions, but few of these will be occupied safely and inexpugnably by those who do not take heed of the following conclusions.

Romance, beyond all question, enmeshes and retains for us a vast amount of story-material to which we find little corresponding in ancient literature. It lays the foundation of modern prose fiction in such a fashion that the mere working out and building up of certain features leads to, and in fact involves, the whole structure of the modern novel (*q.v.*). It antiquates (by a sort of gradual "taking for granted") the classical assumption that love is an inferior motive, and that women, though they "may be good sometimes" are scarcely fit for the position of principal personages. It helps to institute and ensure a new unity—the unity of interest. It admits of the most extensive variety. It gives a scope to the imagination which exceeds that of any known older literary form. At its best it embodies the new or Christian morality, if not in a Pharisaic yet in a Christian fashion, and it establishes a concordat between religion and art in more ways than this. Incapable of exacter definition, inclining (a danger doubtless as well as an advantage) towards the vague, it is nevertheless comprehensible for all its vagueness, and, informal as it is, possesses its own form of beauty—and that a precious one. These characteristics were, if perceived at all by its enemies in the period above referred to, taken at their worst; they were perceived by its champions at the turn of the tide and perhaps exaggerated. From both attitudes emerged that distinction between the "classic" and the "romantic" which was referred to at the beginning of this article as requiring notice before we conclude. The crudest, but it must be remembered the most intentionally crude (for Goethe knew the limitations of his saying), is that "Classicism is health; Romanticism is disease." In a less question-begging proposition of single terms, classicism might be said to be method and romanticism energy. But in fact sharp distinctions of the kind do much more harm than good. It is true that the one tends to order, lucidity, proportion; the other to freedom, to fancy, to caprice. But the attempt to reimpose these qualities as absolutely distinguishing marks and labels on particular works is almost certain to lead to mistake and disaster, and there is more than mere irony in the person who defines romance as "Something which was written between an unknown period of the Dark Ages and the Renaissance, and which has been imitated since the later part of the 18th century." What that something really is is not well to be known except by reading more or less considerable sections of it—by exploring it like one of its own forbidden countries. But something of a sketch-map of that country has been attempted here.

To illustrate and reinforce the above, see in the first place articles on the different national literatures, especially French and Icelandic; as also the following:—

Classical or Pseudo-Classical Subjects.—APOLLONIUS OF TYRE; LONGUS; HELIODORUS; APULEIUS; TROY; THEBES; CAESAR, JULIUS; ALEXANDER THE GREAT; HERCULES; JASON; OEDIPUS; VIRGIL.

Arthurian Romance.—ARTHUR; GAWAIN; PERCEVAL; LANCELOT; MERLIN; TRISTAN; ROUND TABLE; GRAIL; and the articles on romance writers such as Malory, Wolfram von Eschenbach, Chrétien de Troyes, Gottfried of Strassburg, &c.

French Romance.—CHARLEMAGNE; GUILLAUME D'ORANGE; DOON DE MAYENCE; OGIER THE DANE; ROLAND; RENAUD DE MONTAUBAN (*Quatre fils Aymon*); HUON OF BORDEAUX; GIRART DE ROUSSILLON; AMIS ET AMILES; MACAIRE; PARTONOPEUS DE BLOIS; ROBERT THE DEVIL; FLORE AND BLANCHEFLEUR; GARIN LE LOHERAIN; RAOUL DE CAMBRAI; GUILLAUME DE PALERME; ADENÈS LE ROI; BENOÎT DE SAINTE-MORE, &c.

Anglo-Norman, Anglo-Danish, English Romance.—BEVIS OF HAMPTON; HORN; HAVELOK; GUY OF WARWICK; ROBIN HOOD; MAID MARIAN.

German.—NIBELUNGENLIED; ORTNIT; DIETRICH OF BERN; WOLFDIETRICH; HELDENBUCH; WALTHARIUS; GUDRUN; HILDEBRAND, LAY OF; RUODLIEB.

Northern.—SIGURD; WAYLAND; HAMLET; EDDA.

Spanish.—AMADIS DE GAULA.

Various.—REYNARD; ROMAN DE LA ROSE; GRISELDA and kindred stories; GENEVIÈVE OF BRABANT; GESTA ROMANORUM; BARLAAM AND JOSAPHAT; SEVEN WISE MASTERS; MAELDUNE, VOYAGE OF.

AUTHORITIES.—The first modern composition of importance on romance (putting aside the dealings of Italian critics in the 16th century with the question of romantic *v.* classical unity) is the very remarkable dialogue *De la Lecture des vieux romans* written by Chapelain in mid-17th century (ed. Feillet, Paris, 1870), which is a surprising and thoroughgoing defence of its subjects. But for long afterwards there was little save unintelligent and mostly quite ignorant depreciation. The sequence of really important serious works almost begins with Hurd's *Letters on Chivalry and Romance* (1762). In succession to this may be consulted on the *general* subject (which alone can be here regarded) the dissertations of Percy, Warton and Ritson; Sir Walter Scott, "Essay on Romance" in the supplement to the *Encyclopaedia Britannica* (1816–24); Dunlop, *History of Fiction* (1816, to be usefully supplemented and completed by its latest edition, 1888, with very large additions by H. Wilson); Wolff, *Allgemeine Geschichte des Romans* (Jena, 1841–50); Ward, *Catalogue of Romances in the British Museum* (vol. i. 1883, vol. ii. 1893) (the most valuable single contribution to the knowledge of the subject); G. Saintsbury, *The Flourishing of Romance and the Rise of Allegory* (Edinburgh, 1897), and its companion volumes in *Periods of European Literature* [W. P. Ker, *The Dark Ages* (1904); Snell, *The Fourteenth Century* (1899); Gregory Smith, *The Transition Period* (1900); Hannay, *The Later Renaissance* (1898)]; W. P. Ker, *Epic and Romance* (1897). (G. SA.)

ROMANCE LANGUAGES, the name generally adopted for the modern languages descended from the old Roman or Latin tongue, acted upon by inner decay or growth, by dialectic variety, and by outward influence, more or less marked, of all the foreign nations with which it came into contact.

During the middle ages the old Roman Empire or the Latin-speaking world was called Romania, its inhabitants Romani (adj. *Romanicus*), and its speech Romancium, Vulgar Romancio, Italian Romanzo, from *Romanice loqui*=to speak Romance; in Old French nominative *romanz*, objective *roman(t)*, Modern French *roman*, "a novel." originally a composition in the vulgar tongue. In English some moderns use Romanic (like Germanic, Teutonic) instead of Romance; some say Neo-Latin, which is frequently used by Romance-speaking scholars. By successive changes Latin, a synthetical language, rich in inflexions, was transformed into several cognate analytical tongues of few inflexions, most of the old forms being replaced by separate form-words. As the literary language of the ancient Roman civilization died out, seemingly extinguished by the barbarism of the middle ages, all the forms of the old classical language being confounded in the most hopeless chaos, suddenly new, vigorous and beautiful tongues sprang forth, ruled by the most regular laws, related to, yet different from, Latin. How was this wonderful change brought about? How can chaos produce regularity? The explanation of this mystery has been given by Diez, the great founder of Romance philology. The Romance languages did not spring from literary classical Latin, but from popular Latin, which, like every living speech, had its own laws, not subject to the changing literary fashions, but only to the slow process of phonetic change and dialectic variety. It is interesting to observe that much that is handed down to us in the oldest Latin literature (notably in the vocabulary) reappears in the most recent phase of Latin—the Romance languages. Thus, a verb *nivĕre*, "to snow," is known to Pacuvius, but does not again appear until the time of Venantius Fortunatus, and then with a change of conjugation —*nivēre*, while it has now a new term of life in French and Rhaeto-Romanic dialects. It is obvious that there was no break of continuity in the vulgar language, for if in the later imperial ages a verb had been formed from *nix*, *nivis*, it must have been *nivare*, or *niviare* (Fr. *neiger*). Here especially the words of Horace come true:—

> "Multa renascentur, quae jam cecidere, cadentque
> Quae nunc sunt in honore vocabula, si volet usus,
> Quem penes arbitrium est et jus et norma loquendi."

The present article, embracing all the Romance languages, aims at tracing on the one hand their common origin and their common development, on the other hand at pointing out the peculiarities of the individual languages and the possible explanations of the growth of these peculiarities. Their common development is mainly dealt with under LATIN LANGUAGE. The relation of the early vulgar Latin to the literary language, the spread of Latin following the spread of Roman rule, the prevalence of Latin over Oscan, Umbrian, Etruscan, and late Iberian and Gallic—all these matters concern rather the history of Latin than of the Romance languages. But we may say broadly that the language spoken throughout the Roman Empire at the time of Augustus was fairly uniform, and that naturally differentiations took place (varying according to regions) which were not, however, strongly marked, and which even tended to be obliterated in later times.

The main causes of these variations were twofold. (1) The process of Romanizing the various districts took place at epochs far remote one from the other, and between the earliest and the latest of these epochs Latin itself was modified.[1] (2) We have the reaction on Latin of the languages of the pre-Roman populations.

Applying this first point of view, we should find that the oldest form of Latin (oldest, that is, for our present purposes) was introduced into Sardinia (238 B.C.); next comes Spain (197 B.C.), Illyria (167 B.C.), South Gaul (120 B.C.), North Gaul (50 B.C.), Raetia (15 B.C.), Dacia (A.D. 107). And we can actually trace some of the results of these differences in date, chiefly perhaps in the vocabulary and morphology of the Romance languages. When, for example, we find the dative *illui* (Ital., Fr., Rum. *lui*) missing in the Iberian peninsula, we may infer that it was unknown to the Latin introduced there, and conversely that Latin still used the ancient *cova* (Sp. *cueva*, " cava ") and not the more recent *cava* (Ital. *cava*), also *demagis* or *gumia*, which we only know from Lucilius, Sp. *demas*, *gomia*.

We may be justified in assigning to these historic causes the beginnings of the divergence from the original uniformity. Neither active intercourse, nor the dislocations of tribes and populations brought about by the exigencies of military or colonizing enterprise, ever effected a complete fusion of these divergences. To this we must add, as a second element, ethnic considerations.

To begin with, we seem to find in Italy itself, among the Italic population in country districts, the survival of isolated forms which had been discarded by the literary language with its levelling tendencies, and in consequence also by what may be called " Average Latin " (*Durchschnittslatein*). In early Latin *d* becomes *r* before labials, *e.g.* *ar me advenias* occurs in Plautus; *arvorsus*, *arger* from **arfger* are the ancient forms. Only *arbiter* has survived as a word of the official language and because in general feeling the noun was consciously connected with the verb *baetere*, though it was soon discarded. *Arger*, under the influence of *aggerere*, *aggestus*, became *agger*, and *arvorsus* was displaced by *advorsus*. In Abruz. we have *arbendá*, " to repose," beside Sicil. *abbintari* which suppose **arventare* beside *adventari*; Abruz. *armuri*, " to put out the fire," represents Lat. **armoriri* instead of *admoriri*; *arbukká* is found beside Ital. *abboccare*.

All these forms are only attested in Italy, and they might by reason of their prefix be classed as Umbrian, since in Umbrian *ar* for *ad* is even commoner, cf. the place-name *Arestaffele* in Molise, which in Latin would be *ad Stabula*, save that the limitation to the cases that are in line with the Latin rule prove precisely that this is not a case of Umbrian influence, but of a preservation of ancient and popular forms. Beyond the limits of Italy *arger* has been preserved, *e.g.* Sp. *arcen*, and not only Ital. *argine*; further *armissarius*, " stallion," in the Lex Salica and in Rum. *armesariŭ*; perhaps Sp. *almuerzo*, " breakfast," for **armuerzo* beside Lat. *admorsus*.

In the second place we have, especially in Italy, clearly Umbro-Oscan forms. Contrary to Latin use, these two dialects, the most important in ancient Italy, have *f* between vowels from an early *bh*, *dh*, as against Latin *b*, *d*; and Umbrian, Paelignan, &c., *ē*, *ō*, from an early *ei*, *ou*, as against Latin *ī*, *ū*. Thus *crefrat* (in the glosses), as against Latin *cribrat*, is both by right of its vowel and consonant, an Umbrian form. And with this we must compare Ital. *bifolco* beside Lat. *bubulcus*; Ital. *taffiari*, " to feast," beside *tabulari*; *tafano*, " horsefly," beside Lat. *tabanus*; *bufalo*, beside Lat. *bubalus*. Further, Neap. *Ottufro*, " October," *morfende*, " eye-teeth," Lat. *mordente*, &c. There is a special interest in cases like the French *mandrin* beside Ital. *manfano*. What has come down to us is *manphur*, which is not Greek, its *ph* notwithstanding, but which owing to its *f* we must take to be Osco-Umbrian; while the corresponding Latin form would be **mandar*. The Latin supplies the French, the Osco-Umbrian the Italian form. As to the other instance, Varro points to *vella* beside *villa* as rustic, and to this we must add Ital. *stegola*, Sardin. *isteva*, Sp. and Port. *esteva* (**steva* for *stiva*), " plough tail "; Ital. *elce*, Sardin. *elige*, Fr. *yeuse*, " holly " (**ēlex* for *īlex*), or Ital. *pommice*, Fr. *ponce*, Sp. *pomez*, " pumice-stone " (**pomice* for *pumice*).

It must not be overlooked that the last word denotes an object found chiefly in Sicily and near Naples, that is, in the ancient seat of the Oscans. It will be clear that we are dealing chiefly with words connected with agriculture, and it is remarkable that those of our second category spread all over the empire, while those of the first were entirely, or almost entirely, limited to Italy.

As a parallel we may cite the vocabulary of North and South Gaul, which yields a number of Gallic elements, and one may safely infer that in the first few centuries after the Roman conquest these elements were more numerous than at a later stage, and there is in fact a definite justification for this inference. The so-called Endlichers glossary of the 5th century is a compilation, by a native of South Gaul, of Gallic words which were clearly at that time still current in the south of France.[2] And in this we have not only *dunum*, " *montem*," *cambiare*, " *pro re dare* " (Fr. *changer*); *caio*, " *breialo sive bigardio* " (Fr. *quai*); *nanto* " *valle*," Savoy. *nā*, " stream," but also *avallo*, " *poma*," which was lost in later times but is preserved in its derivative *amelanche*, " medlar."

Another Gallic word recorded by ancient tradition—*tegia*, " hut " —still exists to-day with this meaning in the Venetian and Raetic Alps, and moreover plays an important part in toponomy—Fr. *Arthies* from Gall. *are Tegias*, " at the huts," N. Ital. *Tezze*; but in the oldest Gallo-Romance it may have been in use as an appellative, and thence have passed into Basque—*e.g.* Basq. *tegi*, " hut." The permeation of the Latin vocabulary by Gallic elements dates from the time of the contact of Gauls and Roman forces. Many of these elements—*e.g.* *bracae*, *camisia*—were widely used at so early a stage as to have penetrated into Rumania (Rum. *îmbrăcá*, " put on," *cămeaşă*, " chemise "); others again have scarcely, if at all, passed beyond their ancient limits, even those that Roman literature has preserved for us. It is true that Martial says—

" Barbara de pictis veni bascauda Britannis
Sed me jam mavult dicere Roma sibi,"

but only in France has *bachoue* been preserved up to the present, while so far no traces of *bascauda* have been established for Italy.

Glancing over the Gallic contributions to the Gallo-Romance vocabulary, we see at once that they belong to a considerable extent to the sphere of agriculture, and that among the implements mentioned it is chiefly vehicles of all kinds which have Gallic names. The record of Roman times supplies us with *benna*, *carpentum*, *carrum*, *caruca*, *agredum*, *petorritum*, *rheda*, but *carrum* alone gained a firm footing; *caruca* in the form of *charrue*, " plough," survives in France, and *benna* (Fr. *banne*, Ital. *benna*) in its ancient home. Under this heading we may perhaps add *taratrum*, " gimlet," in Isidore, Fr. *tarière*, Engad. *tareder*, Sp. *taladro*, Port. *trado*; Fr. *jante*, " felloe of a wheel " (Bret. Kammed), Fr. *taranche*, Gall. *tarinca*. With *caruca* we may class *soc*, " plough-share," and O. Fr. *raie*, Mod. Fr. *rayon*, " furrow," Gallic **rica* (cf. Cymr. *rhych*).

A further group is formed by *cervoise*, " beer," from Gall. *cerevisia*, O. Fr. *braiz*, Mod. Fr. *brai*, " malt," *brasser*, " to brew," Gall. *brace*; *lie*, " yeast." Among the names of plants Gallic *betulla* has survived wherever the tree is common. Within narrower bounds we find Fr. *if*, " yew," Gall. **ivum* (cf. Ir. *eo*); probably also **cassanus*, " oak," Fr. *chêne*, Prov. *casser*; Fr. *verne*, " alder " (cf. Ir. *fern* and the Gall. place-name Vernodubrum, " alderwater "); *beloce*, " sloe," *bulluca*, and S. Fr. *aranhon*, " sloe " (Ir. *airne*). Pliny mentions *marga*, " marl," as being in use among the Gauls as manure for soil, from the diminutive **margila*, Fr. *marne*. An agricultural measure was called *arepennis*, Fr. *arpent*. Fields were separated by a hedge—Prov. *gorce* (cf. O. Fr. *gort*, " fence "); a hedged-round piece of land is called in French *lande*, Ir. *land*. Another method of demarcation was by means of hurdles, Fr. *claie*, Piedm. *cia* (cf. Ir. *cliath*); or of barricades, Fr. *combre* (whence the verbs *encombrer*, *décombrer*), which corresponds to a Gallic **comboros*. Inside the hurdles the sheep and cows were kept whose milk yielded *mègues*, " whey " (Ir. *medg*). The wood needed for the erection of fences was cut with the " wood-knife," Gall. *vidubium*, Fr. *vouge*. We may notice further the group *broga*, " enclosure," " preserve," Prov. *brogo* and the diminutive *brogilo*, Fr. *breuil*.

In north Italy we find *fruda*, " torrent " (cf. Cymr. *frwth*), which is a parallel to *na* mentioned above; also Comasc. *dren*, " blackberry," Ir. *drēn*, " thorn," and (over a large part of north Italy) *bar*, " bunch," " tuft," O. Ir. *barr*. To single out a few words, there is Prov. *ban*, " horn," Cymr. *ban*; Piedm. *vinverra*, from a word that has come down to us as Latin, but is really Gallic: *viverra*, Cymr. *gwywer*, Gaelic *feoragh*, " weasel," and in the Rhaeto-Rom. dialect in Switzerland *carmun*, from a Gallic *carmon*, which is cognate with O.H.G. *harmo*, Mod. H.G. *hermelin*, " ermine."

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[1] Cf. G. Gröber, *Archiv für lat. Lexicographie*, i. 35 ff.

[2] Cf. H. Zimmer Kuhn's *Zeitsch. für vergl. Sprachforschung*, 32, 230.

In this way we might amplify examples, and it should not escape notice that we have to deal chiefly with substantives, with few adjectives and hardly any verbs.[1]

In precisely the same way the Spanish vocabulary must have been seamed with traces of Iberian elements. But the process of elimination took place more rapidly and thoroughly in this case, so that the number of Iberian or Celtic-Iberian words that have resisted time and change is small. On a Latin inscription from Spain we find *paramus*, "plain," and *paramo* occurs to this day in this sense. As the Iberian does not know the sound *p*, the word cannot be Iberian, and must be Celtic.

In Isidore we find *baia*, "bay," which should be read *baía*, as Sp. and Port. *bahia* prove—doubtless an Iberian word, since Fr. *baie* and Ital. *baia* are forms quite recently borrowed from Spanish. This *baia* is perhaps somehow connected with the place-name Bayona. Again, the *lapides lausiae* of the Lex Metalli Vipascensis are Celtic rather than Iberian (cf. Sp. *losa*, Port. *lousa*, as well as Prov. *lausa*, Piedm. *losa*). Considering our ignorance of Iberian, and the pronounced colouring of Basque by Spanish words, it is not often easy to decide on which side the indebtedness lies when we meet with a word in Spanish and Basque whose etymology is still uncertain.

Much discussion centres round the question as to how far the pre-Romanic nations influenced the phonology of the Romans in the process of their assimilation. Opinions are strongly divergent. While G. I. Ascoli has repeatedly assumed influences of this kind on a large scale, the present writer is very sceptical.[2] It may be well to give the essential points.

Plautus uses *distennite* and *dispennite* instead of *distendite* and *dispendite*—forms he imported from his native Umbria. And like the Umbrians, the Oscans too pronounced *nn* instead of *nd*. Later we find this same change throughout the whole of south and central Italy, and even in Rome, whereas it is not observed in Tuscany, north Italy and other Romanic countries. We may therefore confidently assume that this is due to a reaction of the Oscan-Umbrian dialects. Similarly it is in accordance with Umbrian pronunciation to convert breathed plosives into voiced after nasals, *e.g.* *iuenga*=Lat. *juvenca*; and similarly we have *čingue* in central and south Italy beside Tusc. *cinque* (*quinque*). But even in this particular the change affects not only the regions of ancient Umbria, but also those of the Oscans and Messapians, though again it must be admitted that we do not know what the pronunciation of the ancient Messapians was. And finally, we find the Latin *d* represented in Umbrian between vowels by a sound which has a separate sign in the national alphabets and which in Latin is reproduced as *-rs*. And since the Paelignan alphabet too has a sign for a modified *d*, one may perhaps assume that in these districts *d* had a specialized sound as *th*, or *r*; and this view agrees with the fact that in the dialects of central and southern Italy *d* was pronounced sometimes like *r*, sometimes like *th*. And probably this sums up all we can say with certainty.

It has always been maintained that French *u* (pronounced as German *ü*), derived from *ū*, is due to the influence of Gallic. The *u* (with modern sound) is identified with the whole area of the French language except part of the Walloon, part of French Switzerland, and Piedmont, Genoa, Lombardy, the Grisons, Tirol and the northern part of the Emilia; but not Friuli, Venetia and Istria. On the other hand, the ancient *ū* became *i* in Cymric, to which *ü* must be regarded as an intermediary step, that may therefore have existed in Gallic. But in the first place we must observe that Greek writers always render the Gallic *ū* by *ov*, never by *v*; that the Romans too write *ū*, never *y*; and further, that over a large part of the area *ü* came in comparatively recently. Secondly, in Gallic inscriptions the combination CT is frequently replaced by XT, so that the Irish pronunciation *cht* (Ir. *nocht*, "night") is as old as Ancient Gallic. And since the preliminary stage of the Fr. *fait* from *factum*, *nuit* from *nocte*, is likewise *cht*, it is natural to suppose a relation between these facts, and all the more because the Iberian Peninsula on the one hand, and a large part of the western and central area of upper Italy on the other, show an identical process; but in Venetian, central and southern Italy *ct* became *tt*. Thirdly, nasalized vowels are in evidence chiefly in the ancient seats of the Celts—in northern and southern France, in Piedmont, Genoa, Lombardy and partly in Raetia, also in Portugal, but not as far as southern Emilia. At this point again evidence from the Gallic fails completely. Finally, an attempt has been made to trace back the general characteristics of the French and the Gallo-Romanic dialects of Italy to the peculiarities of the Gallic accent. It is assumed that there was a decided stress-accent, which brought about an over-emphasis of the stressed syllable at the expense of the unaccented ones, with the result of a marked weakening of the unaccented vowels, and particularly of those following the stressed syllable. Here again we can only say that Gallic itself affords no evidence for this assumption, and that, on the contrary, this peculiar accentuation may be due to other reasons, unknown to us. To turn to morphology, the method of enumerating—as we find it, for example, in Fr. *quatre-vingts*, &c.—would seem to be Gallic, since it is common to all the Celts.

But even if we admit certain regional variations, all these were overlaid by an "Average Latin" which presents a number of essential features uniformly over the whole area, and which differed from the literary language. These characteristics (in historical sequence) are as follows: (1) Loss of final *m* in polysyllabic words (which we find exemplified in the very oldest inscriptions); (2) loss of the *h-* sound, a loss which outside the towns was of great antiquity (cf. *anser*), and at the beginning of imperial times was fairly common; (3) loss of *n* before *s* coupled with the lengthening of the vowel, for which Varro is evidence in his alternations of *mensa* and *mesa*; (4) the assimilation of *rs* to *ss*—*e.g.* *sussum* from *sursum* (Ital. *suso*, O. Fr. *sus*, Mod. Fr. *dessus*). Toward the end of the Republic *v* is lost before *u*—*e.g.* *vius* instead of *vivus*, *rius* instead of *rivus* (Ital. Sp. *rio*), *anticus* instead of *antiquus* (Ital. *antico*). In the first century A.D. *b* became *v* between vowels, thus merging itself into the latter sound, so that in examining the Romance languages it is impossible to decide whether the original was *v* or *b*. And this change spreads in sentences to the initial *b* (as in the inscription *manduca vibe lude e beni at me*), which leads in some cases to some uncertainty in the use of *v* and *b*. And lastly, we have the case of *cl* and *tl*—*e.g.* *veclus* (Ital. *vecchio*, Fr. *vieil*, Sp. *viejo*, Port. *velho*, Rum. *viechĭu*) instead of *vetulus*; the reduction of *di* before vowels, of *j*, *g* before *e*, *i*, and of *z* to a single sound *j*, or rather *dj*, in consequence of which we have *diurnum* (Ital. *giorno*, Fr. *jour*); *juvenis* (Ital. *giovane*, Fr. *jeune*); *gener* (Ital. *genero*, Fr. *gendre*); *zelosus* (Ital. *geloso*, Fr. *jaloux*), all represented by the same initial.

To turn to vowels, we must first notice that, according to Varro, *ae* was pronounced *e* in the country, but that in the cities the diphthong was maintained at first, while the simple sound was only admitted during the course of the 1st century A.D. If this is an instance of an early spreading of a rustic pronunciation, we have in another case a victory for that of the bourgeoisie and aristocracy. *O* for *au* belongs to Umbrian, Volscian and vulgar Latin, which explains why Appius Claudius Pulcher changed his name to Clōdius when he deserted the patricians and went over to the plebeians. And there is other evidence of this change of sound. But in the inscriptions of the Empire *o* for *au* is very rare, save in proper names, and the Romance languages have partly preserved the *au* to this day with little or no change (cf. Rum. *auzí*, Prov. *auzir*, Port. *ouvir* from *audire*), or only changed it to *o* at a later stage (cf. Fr. *chose*, where *ch* could only have arisen before *a*, not *o*), so that one may assume that the "Average Latin" always preserved the *au*.

Then, without entering into detail, we must mention the prothesis of *i* before *st*, *sp*, *sc*, a phenomenon which arose, judging from the inscriptions, in the 2nd century A.D. We find it at the beginning of the sentence, and also within it after consonants, but not after vowels; *e.g.* *illa spata*, but *illas ispatas*; *istáre*, *istá*, but *tu istás*, &c.

Most important of all are the modifications that affect the accented vowels, which give a new look to the language as a whole. In Old Latin and even towards the end of the Republican age, vowels varied solely according to their quantity, *e.g.* *ā* was longer than *ă*, *ē* longer than *ĕ*, but the vowel sound was the same, or at any rate the difference in quality between long and short must have been quite insignificant, seeing that Cicero and Quintilian wished the word *divisio* to be avoided in speech from motives of decorum, because of the likeness in sound to *vissio*. Quantity was not influenced by the number of the consonants following: *actus* was pronounced with *ā*, factus with *ă*, &c. In the course of the 1st century approximately quality was differentiated in addition to quantity in all vowels except *a*—short vowels being pronounced with an open, long ones with a close, sound. The written language expresses this change by writing *ae* for *ĕ*, *i* for *ē*, *e* for *ĭ*, *u* for *ō*, *o* for *ŭ*. In addition there are statements of the grammarians, though they mention only the double pronunciation of *e* and *o*, not that of *i* and *u*. It was probably in the course of the 4th century that the further change took place, by which all vowels were lengthened before a single consonant, and shortened before two or more, *e.g.* *sĭtis* became *sītis*, while *tẹ̆ctum* became *tĕctum*. But the older qualitative variations were maintained so that even now *sītis* and *vītis*, or *tẹ̆ctum* and *lę̆ctum* did not contain the same vowel-sound, the former having a close, the latter an open, vowel. (Cf. Ital. *sete*, *vite*, Fr. *soif*, *vis*, Sp *sed*, *vid*; or Ital. *tẹtto* and *lętto*, Fr. *toit* and *lit*.) It is at the end of the 4th century that Augustine says: "Afrae aures de corruptione vocalium vel productione non judicant," and the uncertain practice of the poets in the matter of quantity points to the breaking down of the old conditions. This was not the end of the process of development; but the most important stages were already accomplished. In this, too, we are concerned with changes affecting the whole Romance region. The final step was taken when open *i* and close *e*, open *u* and close *o*, were reduced to one sound which may be called close *e* (or *o*). This step was not taken by the eastern regions, excepting as to *e*, and Sardinia remained completely unaffected (*v. infra*).

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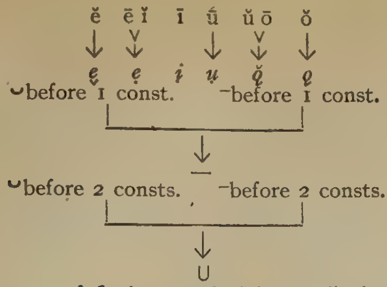
[1] Cf. R. Thurneysen, *Keltoromanisches* (Halle, 1885); W. Meyer-Lübke, *Einführung in die romanische Sprachwissenschaft*, p. 38 ff.

[2] G. I. Ascoli, *Una Lettera glottologica* (1880); *Archivio glottologico italiano*, x. 260; *Sprachwissenschaftliche Briefe* (1887; cf. H. Schuchardt, *Zeitschrift für rom. Phil.* iv. 140 and elsewhere); and Meyer-Lübke, *loc. cit.* 205 ff.

The vowel-system that developed in course of time is thus as follows:—



In the department of flexion we find less radical changes. The genitive was the first case to disappear. In general its functions were usurped by the preposition *de*. But for the possessive sense the dative was adopted, cf. HIC REQUIESCUNT MEMBRA AD DUOS FRATRES, in an inscription from Gaul. The accusative serves for the case after prepositions under all circumstances, and therefore even in places where the older language used the ablative, *e.g.* *magister cum suos discentes* in a Pompeian inscription. Nouns of the third declension with monosyllabic nominative, *e. g. lens*, *stirps*, *ars*, &c., form a dissyllabic nominative, *e.g. lentis*, *stirpis*, &c. The dividing line between masculine and neuter, at all times doubtful, is frequently broken down, especially in the singular, *e.g.* *cubitum* instead of *cubitus*, and there are converse cases. The absorption of the fourth declension by the second is almost complete. In the declension of the pronouns the genitives *ipsuius*, *illuius*, dat. *ipsui*, *illui*, fem. *illaeius*, *illaei*, are found in several inscriptions, but do not belong to the common language, since, as we have already said, they are not at home in the Iberian peninsula. On the other hand, all the Romance languages show that **eo* took the place of *ego*. The use of *ille* as personal pronoun, and also of *ipse*, and of both these forms as articles, dates from ancient times. We find a parallel to the weakening of these demonstratives in the amalgamation of the pronominal combinations to be found as early as Plautus with *ecce*, *eccum*, which results in new forms, *e.g. ecceille* (O. Fr. *cil*, Mod. Fr. *celui*) or *eccuille* (Ital. *quegli*, Sp. *aquel*); *ecceiste* (Fr. *ce-* (*t*)); *eccuiste* (Ital. *questo*, Sp. *aqueste*). In the verb-system, a characteristic change is the disappearance of the future and passive forms, the explanation of the phenomenon in both cases being psychological rather than formal. Popular language is not familiar with the future, and replaces it by the present—or, more strictly speaking, the vulgar person deals only with the present or the past. The case of the passive is similar. The transposition of active into passive is too complicated a process for the simple mind. The object of the action remains the object; when the subject of the action is not known, they resorted to the indefinite third person plural, *e.g.* *vendunt casam* is the popular mode of expressing *domus venditur*. And further, the perfect *amatus sum* was replaced by *amatus fui*, since *fui* was a perfect and could now take over the function of a present. For the moment, all other tenses and moods of the verb were preserved, only of the infinite forms, the gerundive, perfect infinitive and the two supines disappeared. Of the gerund nothing remained but the ablative. In compensation, however, we soon find a form *habeo cantatum* springing up beside *cantavi* in use as perfect, *e.g. litteras scriptas habeo* meant in the first instance, "I possess written letters," with nothing implied as to who wrote the letters; but later this usage is limited to cases where the owner is also the originator of the state of things expressed in the participle, and thus it attains to the force of a perfect.

There is little change in the formation of individual verb-forms. It is natural that the infinitives *esse*, *velle*, *posse*, being exceptional, should have been brought into line with all the rest. This was done by simply adding *-re* on to *esse* (Ital. *essere*, Fr. *être*), while the other two were constructed from the forms of the verb whose ending was accented, or from the perfect, *e.g. volebam*, *potebam*, *volui*, *potui*, gave rise to **volere*, **potere*, on the analogy of *docebam*, *docui*, *monebam*, *monui*, *nocebam*, *nocui*, &c.; with infinitives, *docere*, *monere*, *nocere*, &c. (cf. Ital. *volere*, *potere*, Fr. *vouloir*, *pouvoir*, Sp. and Port. *poder*, Rum. *vrea*, *putea*). In other infinitives there is much confusion, especially as between *-ēre*, and *-ĕre* verbs, noticed by the Latin grammarians themselves; we have evidence, too, that at an early stage the present forms in *-io*, *-iam* led to a confusion of the *-ire* and *-ĕre* conjugation, *e.g.* Plautus has *morire* (Ital. *morire*, Fr. *mourir*, Sp. *morir*, Rum. *murí*); Lucretius has *cupire*; Cato has *fodire*, &c. For the rest we may note as important that perfect-forms without *u-*, such as *-asti*, *-astis*, *-arunt*, infected the first person singular, *e.g.* *-ai* instead of *-avi*. A new type in *-idi* arose on the model of *vendidi*, and then affected other verbs in *-ndere*, *e.g*, *descendidi* (in Gellius), *prendidi* (in the grammarian Probus) and in general verbs of the third conjugation. But its spread was slow, so that it can scarcely be said to have been common to all the languages.

In the formation of words the popular language probably had far greater freedom than the written language. We find not only a marked preference for diminutives in *-ulus* and *-ellus*, but many other types are established, or new ones created. And as the chief ones we must mention the post-verbalia (nouns constructed out of verbs). Thus *pugnare*, being itself derived from *pugnum*, then produces *pugna* (on the pattern of *planta*, *plantare*), and these formations soon became extremely common, and not only in *a-* verbs, but also in *ĕre*-verbs, cf. in particular *dolus*, "grief" (not to be confused with the ancient *dolus*, "craft"), *C.I.L.* x. 4510 (Rum. *dor*, Ital. *duolo*, Fr. *deuil*, Sp. *duelo*). As examples of other types we have *-ura* beside *-or*, which we can trace back to *ardura*, a contamination of *ardor* and *arsura*, which extended to *fervura*; also to *strictura* beside *strictus*; *directura* beside *directus*, when the old participles had separated both in form and in meaning from the verbal-system and had become adjectives, whose *t* was felt to be part of the stem. Another feature of the verb is the gradual retreat of old simple formations in favour of derivatives from the participle, *e.g. cantare*, *adjutare*, *ausare*, &c., in place of *canere*, *adjuvare*, *audere*; then for denominatives *-icare* and the Gr. *-izare* (Ital. *-eggiare*, Fr. *-oyer*, Sp. *-ear*) which, coming in with Christianity, was soon added on to Latin stems, *e.g.* (in Fulgentius) *citherizantium aut tibizantium*.

Among points of syntax we may single out the replacing of infinitival sentences (following verbs of feeling, seeing, hearing, wishing) by clauses with *ut*, *quod* or *quia*, whence Ital. *che*, Fr. *que*. The latter particle spread most rapidly, and soon took precedence over the other conjunctions, not only in the cases just mentioned, but in introducing object-, subject-and final-clauses.

It is in the vocabulary that it is most difficult to define the relations of the common and the literary language. So much of the Latin vocabulary as appears over the whole Romance area comes of course from the everyday language which was used from the mouth of the Ebro to that of the Danube, but it is by no means all. It is more interesting to inquire whether anything can be reconstructed from Romance, and, if so, how much? The existence of a form *aiutare*, for example, mentioned above (Ital. *ajutare*, Fr. *aider*, Sp. *ayudar*, Rum, *aiutá*) and appearing in all the Romance languages, is indisputable. Between Fr. *grolle* ("crow"), Lyon. *grola*, Gascon. *agraulo*, Tirol. *grolo*, and (with change of gender) Apul. *raulu*, Rum. *graur*, the connexion, both in form and meaning, is so close that one is led to assume a common basis for all these words. This basis is **graulus*, *-a*, and it is safe to assume that such a word goes back to Latin, though remembering that it was not found in the western regions. Rum. *aflá*, Sic. *asciari*, Sp. *hallar*, Port. *achar*, Gris. *aflár*, Dalm. *afluár*, "to find," all point to *afflare*, and in this case, too, the change in meaning may be safely ascribed to Latin, only in this case Gaul is not included. Rum. *aripă*, Fr. *aube*, Prov. *aubo*, Sp. *alabe*, "paddle-board," in Rum. meaning also "wing," and in Sp. also "the wickerwork on both sides of a vehicle," in Port. "the wing of a parapet," point to a form **alapa*, which meant "wing" and which must have belonged to the vulgar language, even though no trace of it survives in Italy. Many other points could be enumerated, but problems are involved which have as yet hardly been taken up.[1]

In dealing with the division of this common language into a number of individual languages there are still further points of view to be considered. Before we can touch upon these, we must first take a general survey of these languages. There are altogether nine—Rumanian, Dalmatian, Sardinian, Italian, Raeto-Romanic, French, Provençal, Spanish and Portuguese. Of these nine languages, Dalmatian is now extinct, and even what we learn of it from the ancients is very meagre. On the one hand, Ragusa and the plains of Dalmatia never attained the degree of independence in literature which would have brought about a *floruit* in the language such as Provençal has to show. Neither, on the other hand, was its political independence stable enough, nor was it sufficiently remote to escape intercourse with the rest of the world, like the Raeto-Romanic dialects. The hordes of Slavs pressing forward from the inner regions of the *hinterland* soon put an end to the Romanic civilization, first in the country and then in the towns. And when the Venetians, who were, both in point of culture and of commerce and of politics, on a higher level, regained their power over the Dalmatians by occasional conquests, chiefly over the cities, the result was of course all in favour of the Venetian dialect. On the island of Veglia alone there were still living about the middle of the 19th century a few people who still spoke Old Dalmatian. The last of these is now dead. Our approximate notions of this language are gleaned from the speech of these natives of Veglia, from a few more ancient notes, place-names, proper names and from the Romance elements in the Servo-Croatian dialect of Ragusa.[2] We may begin by reducing these nine languages to seven groups—Dacian, Dalmatian, Sardinian, Italic, Raetic, Gallic and Iberian. The most striking peculiarity of the first three of these groups is the absence of Germanic words in the vocabulary. In other words, they were withdrawn from the influence of the general "Average-Latin" before the beginning of the more decided permeation of Latin by Germanic elements. There are other signs of their antiquity. In Central Sardinian *c* before *e*, *i*, and in Dalmatian *c* before *e* are always preserved as velars, and in south Sardinian and in Rumanian the palatalization is more recent, and secondary. The preservation of the tenues between vowels as breathed fortes is peculiar to Rumano-Dalmatian, but as north Sardinian used breathed lenes in their place, while the dialect of Nuoro, in Sardinia, preserved the fortes, we have every ground for assuming that central and south Sardinia also possessed either fortes or lenes in earlier times. Moreover, south Italy, Sicily and a large part of central Italy as far as the Apennines replace the old Latin tenues either with breathed fortes or breathed lenes, in marked contrast to the regions of the Po, to Gallic and the Iberian group. All these phenomena may perhaps be explained in conjunction with two historical events. By the abandonment of the province of Dacia (in A.D. 270), Rumanian lost its close touch with the languages of nearest affinity; and the division of the empire under Diocletian and Constantine necessarily entailed a linguistic division. At that epoch the linguistic conditions were roughly as follows:—

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[1] Cf. G. Gröber, *Archiv. f. lat. Lexicographie*, i. 204 ff.

[2] Cf. M. G. Bartoli, "Das Dalmatische" (1906), (*Schriften der Balkan-Kommission der K. Akademie der Wissenschaften*, linguistische Abteilung, Bd. iv. and v.).

The principal changes in the vowel-system, especially the development of qualitative beside quantitative variations, had been accomplished, but there was still a difference between *ĭ* and *ẹ*, *ŭ* and *ọ̄*. The old future had disappeared, and no tendency to produce a substitute had as yet appeared. The Latin pluperfect subjunctive still maintained its old usage, probably also the imperfect subjunctive and the future perfect. In declensions the type *membrum*, *-a*, had begun to spread; but *corpus*, *-ora*, was still in existence. Sardinia seems to have been, perhaps owing to its isolation, the first to have detached itself from this group. For it was not content with differentiating *ē* and *ī*, but it also retains *-s*, whereas the East-Rumanian and an Italian group suppressed *-s*, and in consequence also the difference between the nominative and the accusative singular. This and the levelling of neuters in *-us* and masculines in *-u* made it possible for the types *membra* and *corpora* to spread at the expense of the type *loci*,—a possibility of which South Italian and Rumanian made the fullest use.

On the given basis the various languages carried on their various developments, influenced partly by contiguity of other idioms, partly by causes unknown to us. Among neighbouring idioms, Greek had by right of its degree of civilization and its political power great influence in giving Rumanian and South Italian a similar direction, and that at a time when every trace of a geographical connexion between these two language-groups had long vanished. Thus, the replacing of the construction "I will come" by "I will that I come" took its rise in Greece and was passed on to Rumania and Apulia. The rise of the new future *voĭu cãntá*, "I will sing," in Rumanian is probably due to Greek influence. In Latin itself both *ille caballus* and *caballus ille* are found, the position depending on the accentual conditions of the sentence. Then the loss of *s* made room for the form *caball*[*u*] *ille* with a victory for the inverted order. In Rumania alone this was the actual process, under the influence of the surrounding speech—Illyrian or Bulgarian, or perhaps independently of them, in this latter case serving as prototype to these languages. Dalmatian and South Italian, on the other hand, were so closely connected with the languages that preserved *s* and therefore prefixed the article that in this particular they separated from Rumanian. This is not the place to show how the Rumanian vocabulary and the structure of words was permeated markedly by elements from Slav, less markedly by elements from Turkish, Mod. Greek and Hungarian, which gave the language an alien appearance in point of vocabulary.

In its consonants, and, as far as one can judge, in its morphology, Dalmatian has preserved the stamp of antiquity. But in its vowel-system there are marked changes, especially in the substitution of diphthongs for close vowels, *e.g.* changing *a* to *e*, *u* through the *ü* stage to *oi*, *ị* to *ei*, *ọ* to *au*, *e* to *ai*. Diphthongs such as they appear also in Istrian and Abruzzian, so that we must presuppose some sort of connexion.

It may be that Sardinian took another course of development because (A.D. 458) the island was rent from Rome and incorporated in the African empire of Genseric, king of the Vandals. Therefore the sympathies of Sardinia were alienated from Italy, and turned on the one hand towards Africa (and unfortunately we have no information as to the "latinity" of this region), on the other towards the Iberian peninsula. These conditions lasted for a while, but later we find Genoa and Pisa fighting at intervals for supremacy in Sardinia, their organization being in many points identical with that of the island. On the whole, this new combination has not materially affected the language, especially in Logodoro. The vowel system (of great antiquity), as well as the velar pronunciation of *c* before *e*, *i*, remained unchanged, neither did they get as far as to adopt the future-forms current on the mainland; on the contrary, the Sardinians arrived independently and later at their usage of *depo cantare* or *haia a cantar*. But the use of *ipse* as an article in Sardinia, Mallorca, and in the earliest times also in the Catalanian-Gascon area, clearly proves the linguistic connexion which for a time covered this area, and we may also see some connexion in the fact that the lenes became voiced between vowels. On the whole, and in spite of everything, Sardinian is the most archaic of the Romance languages. Owing to its retaining *s*, it ~~has~~ failed to extend the *membra-tempora* types of formation, indeed it has almost rejected them entirely. It has retained the imperfect subjunctive to this day, and as a corollary it has lost the pluperfect of that mood. And though every Romance language has a number of Latin words that are not common to the rest, yet in this language the number of these ἅπαξ λεγόμενα is greater than in others, and it is noteworthy that these have here survived such common expressions as *domo*, "house," *mannu*, "great," with other examples.

The East-Rumanian group (coupled with Sardinia) finds its counterpart in the great group based upon the Latinity of Gaul, the Iberian peninsula, and north Italy. This group contains a considerable number of fundamental peculiarities in phonology, morphology and vocabulary which prima facie lead us to assume a fairly long period of contact.

The chief of these peculiarities is the final change of the vowel-system, *i.e.* the loss of the distinction between *ē* and *ĭ*, between *ō* and *ŭ*; then the change of breathed plosives and fricatives between vowels into voiced plosives and fricatives respectively; the use of the pluperfect subjunctive instead of the lost imperfect subjunctive (Ital. *cantasse*, Fr. *que je chantasse*, Sp. *cantase*, Port. *cantasse*), the formation of a new future from the infinitive of the verb and the present, or (as the case may be) the imperfect or perfect of *habere*, *e.g.* Ital. *canterò*, *canterei*, Fr. *je chanterai*, *chanterais*, Sp. *cantaré*, *cantaria*. If it is safe to assume that this latter formation had its origin in places where we find it most firmly rooted, we are led to assign it to the north of France. For it is only there that both elements in the formation are inseparably connected from the beginning of our record. In the old Provençal the two constituent parts are still separable; in the oldest Spanish and Portuguese their position is not fixed (*i.e.* the auxiliary may follow or precede the verb). In north Italy we frequently find the form *avrò cantare* instead of *cantarò*, obviously because this formation is not properly acclimatized. But at any rate it is clear that the change of function from *cantare habeo* to *cantabo* belongs to the time when the three great groups were still in close contact, and the evidence of the Latin texts falls into line with this view, showing this construction well established from the second half of the 4th century.[1] In the vocabulary we must note, among other things, the introduction of Germanic words, *e.g.* *elmo*, Fr. *heaume*, Sp. *yelmo*, "helmet"; *harpa*, "harp," Ital. *arpa*, Fr. *harpe*, Sp. and Port. *arpa*; *medus*, "meed," which is found in Antimus and Isidore, but disappears later (cf. O. Fr. *mies*, "meed"); *waidanian*, Ital. *guadagnare*, Fr. *gagner*, Sp. *guadañar*, and many more.

The further steps in the process of differentiation were conditioned by the breaking up of the Roman empire by the great migrations. The establishment of the rule of the Franks in north Gaul, of the Visigoths in south Gaul and the Iberian peninsula, loosened old ties, created new nations and in consequence new and independent groups of languages.

The Iberian group was marked primarily by a striking simplicity in its flexions. The three-case system was given up at an early stage, even in prehistoric times, and has left no traces whatever. Owing to the preservation of *-s* the type *membra* was doomed to perish, and thus we find, from the beginning of our record and therefore presumably soon after the great cleavage took place, the prevalence in nouns of the following simple rule: sing. *-e*, *-o*, *-a*; plur. *-es*, *-os*, *-as*. The loss of the dative may have some connexion with the fact that the form *illui* for the 3rd personal pronoun had not yet established itself; and the desire for uniformity may have ousted the nominative of *o-* stems. There are analogies in the conjugation. The pluperfect indicative was preserved, and even (largely) with a Latin significance, but in the region of flexion much simplification took place, *e.g.* uniformity of accentuation in the three conjugations, marked reduction of the *s-* perfect and *u-* perfect forms and a great reduction in the number of *u-* participles.

The vocabulary is characterized by certain archaisms, and still more by the fact that a series of common ideas are rendered by new words limited in use to the Iberian peninsula. Thus we have *querer* (*quaerere*) instead of *velle*; *quedar* (*quietare*) instead of *manere*; *callar* (deriv. uncertain) for *tacere*; *hablar* (*fabulare*), "to speak"; *llegar* (*plicare*), "to arrive"; *dejar* (?) instead of *laxare*, &c. Further, we may mention the preference of *tenere* to *habere* even for the formation of perfect-forms, of which examples are to be found in Orosius, and of *magis* to *plus* for expressing comparisons, for which also we may find examples in Latin authors or the Iberian peninsula. The influence of the Goths or Suevi and Vandals on the vocabulary is inconsiderable, and when we trace it it is not easy to explain; *e.g.* Galician *laverca*, "lark," is clearly from a western Gothic **lawerka*, but it is difficult to see why the name for this bird should have been supplied by the Germanic. To sum up, one may say that the Latin of Iberia was a self-contained language, at first showing little modification by influences from Iberian, or later by those from Germanic; further, that its development was slow, and that it aimed at simplicity.

At the present day there are three great groups, running almost parallel from N.E. to S.W., *e.g.* Catalanian on the coast of the Mediterranean, akin to Provençal, Spanish in the centre, Galician-Portuguese on the Atlantic. From the historical point of view one part might be called Gothic-Romance, the other Suevo-Romance. But the national and linguistic history of the times and countries we are dealing with is still very obscure. The difference between the two idioms is chiefly one of phonetics, while in their morphology and vocabulary they do not greatly differ. Spanish may be described as a language which favours vowels at the expense of consonants, and which therefore shows, more than other Romance languages, a weakening even of initial consonants. It changes voiced stops first to fricatives, then to mere noises or "burrs" which finally disappear altogether, and *s* before a consonant or finally, becomes *h* (through a middle stage *š*) and is finally lost. The preferential treatment of vowels, however, entailed not a single change except that *ĕ* was changed to the diphthong *ie*, *o* to *ue*; all else were preserved, *e.g. diez* (*decem*), *tiempo* (*tempus*), *bueno* (*bonus*), *fuerte* (*fortis*); but *haver* (*habere*), *lid* (*lite*), *corona* (*corona*), *humo* (*fumus*). The weakness of the initial sound is shown in *enero* (*januaruis*), *hazer* (*facere*), *llamar* (*clamare* with a transitional **clyamar*), *llaga* (*plaga*), &c. The written language has no sign for voiced plosives between vowels, but *-atho* or *-ao* is spread over nearly the whole region.

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[1] See Thielmann, in *Archiv f. lat. Lexikogr.* ii. 48 seq.

In contrast to Spanish, Portuguese has a strong pronunciation of initial sounds, and so does not go beyond *janeiro*, *fazer*, and changes *cl* (with transitional form *cly*, *ky*), and also *pl* (via *ply*, *py*) to *ch*, *e.g. chamar*, *chaga*. On the other hand, it has a careless articulation of vowels and consonants, and consequently no diphthongs. The unaccented vowels are weakened, as finals almost to vanishing point. It shows further a fusion of nasals with the preceding vowel, so as to form a nasal vowel, and this new nasality takes the colour of the preceding vowel, *e.g. vina* becomes *vinho*, but *una* becomes *uma*, otherwise before a vowel the nasal finally disappears; *cheio* and *cheia*, from *plenus*, *plena*. Similarly *l* was lost between vowels, *e.g. ceo* (*caelum*); before consonants it became *ɫ*, or *u*, *e.g. outro* (*alteru*), *caɫdo* (*calidu*). Voiced plosives have a weak pronunciation between vowels, and these are sometimes made fricatives. In relation to the somewhat careless articulation we note a marked reaction on accented vowels by the final vowel (*e.g. novo* has a close vowel, *nova* an open one), and also by the following consonants: *ɫ* velarizes, *s* palatalizes preceding sounds, hence *estas* pronounced *istas*, "thou art," with reduced *i*, but *devedor* (*debitor*), "debtor," with reduced *e*. Lastly, the division between words is not sharp—the interaction of initial sounds and finals being very striking. *Devedor* has a plosive *d*, *a devedor* has a fricative; *istas* has a breathed *-s*, but *istas nos ceus*, "thou art in heaven," has a voiced *-s*; *seja*, "be," has a reduced *a*; *o nome* is pronounced *u nome*, but *seja o nome* is pronounced *sej o nome*, with an open *o* from *a*+*o*, &c.

The separation of Gaul took place likewise in the second half of the 5th century, when the Visigoths had settled down in the south, the Burgundians in the east, and the Franks in the north. The type of language that was evolved here is distinct from Spanish primarily and principally in the loss of final vowels except *a*, or, when the formation of the word was incompatible with this loss, in a weakening to *e*. On the other hand, the declension is strongly conservative. Nowhere are the old case-endings so clearly preserved as in this region, *e.g. reis*, "king," but *la rei fille* (*regi filia*), "the king's daughter"; *veit le rei*, "*videt regem*"; *dunet le rei*, "*donat* (*dat*) *regi*"; these are the modes of expression, and they last till far into the literary period. But at an early stage there was a breach between the Franks of the north and the Burgundians of the east on the one hand, and the Visigoths of the south on the other. For while the latter (the Visigoths) retained the old system of accented vowels, the former changed *ĕ* to a diphthong *ie*, *ŏ* became *uo*, *ue*, and moreover *ē* and *ĭ* became *ei*, *ō* and *ŭ* became *ou*; *a* was changed to *ä*, assuming that these vowels were long in accordance with the later Latin pronunciation, *e.g.*—

Lat.	debere	nepote	pede	mola	pratu
North Fr.	deveir	nevout	piet	muele	pret
South Fr.	dever	nebot	pe	mola	prat

The northern group, moreover, weakened the consonants still further. *D* and *g*, secondary consonants from *t* and *c*, disappear like the primary ones, and thus *pratellus* becomes *preau*, S. Fr. *pradel*; *advocatus* becomes *avoué*, S. Fr. *avogat*; a secondary *p* (from *b*) becomes *v*, as we see by the form which replaces *nepos* above. If we are right in ascribing this to the effort to stress the accented vowel at the expense of the other constituents of the word, we may take this to be connected with the weakening of *a* where final, and between two accented syllables, *e.g.* N. Fr. *aime* from *amat*, as against S. Fr. *ama*; or in one case *armëure* (Mod. Fr. *armure*), in the other *armadura*, from *armatura*.

Parallel to the preservation of *-s* on the one hand, and the close following of the old flexions on the other, we find the type *membra* preserved at first, though not spreading, whereas the *tempora*-type is abandoned. In the verb the variety in Latin perfect forms is still fairly well preserved, though there is a distinct extension of the *u*-perfect and the *dedi*-perfect. As we might expect, the vocabulary seems to be strongly coloured by Germanic elements of Frankish, Burgundian and Gothic origin.

The Raetic dialects, in their prehistoric phase, are less clear than others. Their contact, at an age nearing the Carolingian, with the French of the south-east in Valais seems to have caused a similar process of growth, especially as they change *e* and *o* into the diphthongs *ei* and *ou*, leaving at the same time the consonants more intact. At an early stage the inroads of the migrating nations cut off Raetia from the Po valley, and the pressure of the German tribes severed its union with the Romance-speaking nations of the west. Thus isolated it was free to follow its own course. This language also preserved at first the three cases and the type *membra*, the latter being developed later freely in use as a collective plural. But its further development was checked by the Lombards and Venetians.

But the most difficult problems are those that arise in Italy. Though one may say generally that the dialects of the region of the Po, and those of Liguria, belong to the types of north and western Romance, that is to say that the breathed plosives between vowels became voiced, yet they approach the typically Italian groups by their loss of *-s*. This means that when the whole Italian peninsula was separated from Gaul as well as from Iberia (after the close of the 5th century) and became again one homogeneous whole, the forms without *s* found their way into the north of Italy only slowly, so that *s* has remained in the west, *i.e.* in Piedmont, in monosyllabic words to this day, *e.g. as*, "thou hast," *ses*, "thou art"; the same rule prevailed in older times in the east, in Venice, and there the *s* was also preserved (in questions) in polysyllabic words, *e.g. venis-tu*, "comest thou?"; and the old form maintained itself in Milanese in the single form *sistu*, "art thou?" To the loss of *s* we trace the extinction of declensions, but as its action began to take effect later, the *membra*-type gained little footing, the *tempora*-type none at all. In the vocabulary the Lombard elements are numerous, extending, like the supremacy of the Lombards, over the whole peninsula. It may be that *s* was lost under the influence of central Italy acting on the north. If so, we may surmise that a similar influence has changed *cl*, *pl*, and *fl* to *chi*, *pi*, *fi* (*chiamare*, *pianta*, *fiamma*). For it is precisely this point that differentiates both the Raetic dialects and Provençal from the contiguous Italian dialects, and the change certainly took place only *after* the latter were completely detached. On the other hand the Italian vocabulary has been strongly influenced by the north, especially in Tuscany.

The rise and development of the Romance languages, in its large outline, appeals to the imagination as a vast historical phenomenon closely bound up with the fate of nations. One other element must not be overlooked on which we have touched more than once in the above sketch, for it bears so directly on the Romance vocabulary as to deserve the tribute of a general survey: this is the Germanic.

When mercenaries of Germanic origin pervaded the Roman armies, Germanic words found their way first into the language of the camp, and thence into the vulgar language generally. And at that stage perhaps many words may actually have been imported which were, partly at any rate, lost again later. Roman and Greek authors admit a considerable number of Germanic words, including terms belonging to warfare, *e.g. bandum*, "standard," used by Procopius, which still continues in the form of O. Fr. *ban*, Ital. *bandiera*, Sp. *bandera*, &c. *Brutis*, "bride," "daughter-in-law," which occurs frequently in inscriptions, may date from the period of camp life, but for the rest it is retained only in Fr. *bru*, and in Friuli and Dalmatia. On the other hand, *companio* is clearly a Latinization of Gothic *ga-hlaifa*, the meaning of which carries us back to the same sphere. Other old words express ideas of culture, or names of animals which the Romans learned to know in the German-speaking north, *e.g. ganta*, "wild goose" (in Pliny), O. Fr. *gante*, Prov. *ganta*; or *taxo*, "badger," Ital. *tassone*, Fr. *taisson*, Sp. *tejon*. But the impression made was not pronounced until the age of the Germanic invasions, and then we find a great variety in the various Romance countries. In Italy we have two invasions to consider—by the Goths, and by the Lombards. But the destruction of the rule of the Lombards by Charlemagne, and the introduction of Frankish elements consequent upon it, should not be considered under the same head, since these Franks may themselves have been a Romance-speaking tribe. Goths as well as Lombards have left a trail as noticeable in the language as elsewhere. Thus we find in several instances some uncertainty as between *b* and *p* as an initial sound in Italian words borrowed from Germanic, *e.g. banca* and *panca*, *balla* and *palla*, the forms with *b* being Gothic, those with *p* Lombardic. Or again *recare*, "to bring up," goes back to Gothic *rikan*, "heap up," "collect"; *ricco*, "rich," to Lomb. *rihhi*, &c. Whereas the vocabulary shows impartially an impress of both nationalities, the Lombards have left their stamp unmistakably on the proper names. Speaking generally, Italy as well as the other Romance countries follows the rule that medieval names of persons are either "Christian" (in the strict sense) and therefore of Hebrew or Graeco-Roman origin, or on the other hand Germanic. Roman names that are not also Christian seem to have survived only in south Italy in any great number, while on the contrary the Germanic are not represented at all in Dalmatia. One of the characteristics of Gothic is the change of ē to *i*, so that it has names ending in *-mir*. Of these we find no trace whatever in Italy, on the contrary we find *Gundimar*, *Ildimar*, &c. Then we have abbreviated forms in *izzo*, *e.g. Gaudizzo*, *Albizzo*, &c., which are distinctly Lombardic; but not Gothic ones in *-ila*. There is no parallel to all this in the Iberian peninsula. As we have already said, the Gothic contribution to the vocabulary is very slight. But on the other hand in the 11th century the great majority of proper names is Gothic, *e.g. Alfonsus* (*Hadufonsus*), *Gundomirus*, *Recimirus*, &c.; or *Recila*, *Fafila*, or *Elvira*, O. Port. *Gelvira*, Goth. **Gailavira*, and scores of others, all proving the great influence of Gothic.

And lastly, France possesses the largest number of Germanic elements in its vocabulary, Gothic in the south, Frankish in the north (though it is often impossible to ascertain to which class they belong). But beside these there are many Old High German words, and again Anglo-Saxon and northern ones, more particularly those connected with shipping and the sea. These Germanic elements cover nearly all branches of human activity. Thus *bât*, Fr. *bâtir*, "to build," from **bastyan*, "to bind together with bast," "to plait"; *hourder*, "to cover with boards," from *hurdi*, "hurdle"; maçon, "the mason," in Isidore *makjo* (Frankish rather than Gothic) refer to house-building; *guâcher* from *waskyan*, *broder* from **brusdan*, point to the occupations of women, and *danser* from *dinsan* and O. Fr. *treschier*, "to dance," from *treskan*, "to thresh," to their amusements. Women's work is probably denoted further in *rouir*, *rotjan*, and E. Frank. *naisier*, *natjan*, "to net"; the same remark applies to the dyeing of cloths (Fr. *touaille*, Engl. "towel," from *thwahila*), and ribbons (*bande* from *binda*) with *guède*, "woad," and other colouring matters, whence we have, *e.g.*, *brun*, *bleu*, *blond*, *blanc*.

But while the vocabulary has had its accessions drawn from various races, the proper names show the same rules as in Italian, *i.e.* Frankish gains the sole supremacy. We find, it must be admitted, some Gothic names in *-mir* in the south early in the middle ages, but they were not maintained as late as the Romance period, such was the influence of the victorious northern race.

Even after political and literary independence had enabled the individual Romance languages to grow as separate units on their own basis, they retained their interconnexion and were open to mutual influence. But this influence is only partial, *i.e.* it affects nothing but the vocabulary, and has a certain relation to various tendencies in the developments of civilization. And under this head the most important point is the really enormous influence which France (both south and north) has exercised on all the Romance countries, just as she has on the Germanic—an influence which has hitherto not been duly recognized. The first traces go back to the invasions of Charlemagne already mentioned. To instance only one, we have *schiavino*, "justice, alderman," which cannot be derived directly from the Germanic, as is shown by the *v*. The second important period is the age of chivalry and the literary tendencies centring round it. A word like *budriere*, "baldric," is derived from Fr. *baudrier*, not directly from Germanic *Balderich*; Ital. *banda* goes back to O. Fr. *bande*, and this again to *binda*; Ital. *giallo* is not from *galbinus* but from O. Fr. *jalne* (Mod. Fr. *jaune*), derived from that word, &c. But it seems that in one of the prehistoric periods the Tuscan vocabulary was strongly affected by that of the Gallo-Romanic. Whereas in the Iberian peninsula, in Sardinia, in south Italy, Rumania and Rhaetia *dies* survives, in O. Fr. *di* has been almost completely ousted by *jour*, but in Tuscan and the Italian literary language we find *giorno* and *di* side by side. Thus *trouver*, Prov. *trobar*, spreading from France into Italy, drove the old *afflare* more and more back towards the south. The most recent layer was introduced during the reign of the house of Anjou chiefly in south Italy and Sicily, and kept its hold to the present day in spite of the Sicilian Vespers, *e.g.* Sic. *vuccieri*, "butcher," from Fr. *boucher*.

The Iberian peninsula can likewise bear witness as to French influence, *e.g.* O. Sp. *fonta*, "shame," is not from Goth, **haunitha*, but from Fr. *honte*; O. Port. *saluar* not from Lat. *salutare*, but O. Fr. *saluer*. On the whole, Portuguese seems to possess more of these Gallicisms than Spanish, history supplying a simple explanation.

Italy too yielded its contributions, especially in the 15th and 16th centuries, many military terms (noble and ignoble), *e.g.* French *carogne* and *canaille*; *poignard*, "dagger," from Ital. *pugnale*, instead of O. Fr. *poigniel*; but also *panache*, "plume," from *pennacchio*, and many others that have become common property. But the influence of the Iberian peninsula on the contrary was not so strong as to be more than sporadic; the Sicilian and Neapolitan vocabularies alone are more closely akin to Spanish, and this is easily explained on the ground of their political and commercial relations.

As to the Romance languages beyond Europe we have but little to say. There is a distinction to be made between Creole and genuine Romance. Belonging to the latter we have the French of Canada, the Spanish of Central and South America, the Portuguese of the Brazils. Speaking generally we may say that the particular languages retained the form of the language in the 16th and 17th centuries, that is to say that of the time of the immigration, and that they developed along the lines already established. Thus in Mexican Spanish the loss of *d*, *g*, between vowels, of *s* before consonants and as a final, has been carried further than in the mother-country. There are no proved traces of any noticeable influence from the languages of the natives.

LITERATURE.—The real founder of scientific Romance philology and linguistics is Friedrich Diez, in his *Grammatik der romanischen Sprachen* (3 vols., Bonn, 1836–42), and *Etymologisches Wörterbuch der romanischen Sprachen* (2 vols., 1852). All questions concerning Romance philology and the historic grammar of the different Romance languages are treated in G. Gröber's *Grundriss der romanischen Philologie* (2nd ed., Strassburg, 1906), and in W. Meyer-Lübke's *Grammatik der romanischen Sprachen* (4 vols., Leipzig, 1890–1900); *Einführung in die romanische Sprachwissenschaft* (2nd ed., Heidelberg, 1909). The principal magazines devoted to the subject are *Zeitschrift für romanische Philologie* (ed. Gröber; since 1877); *Zeitschrift für neufranzösische Sprache und Literatur* (ed. Behrens; since 1879); *Romanische Forschungen* (ed. Vollmöller; since 1885); *Archiv für das Studium der neueren Sprachen* (since 1846); *Romania* (ed. G. Paris and P. Meyer; since 1812); *Archivio glottologico italiano* (ed. G. I. Ascoli; since 1873). The great development of Romanic philology after Diez is due principally to A. Tobler, G. Gröber, W. Förster and H. Suchier in Germany; A. Mussafia (d. 1905), H. Schuchardt in Austria; G. Paris (d. 1905), P. Meyer in France; G. I. Ascoli (d. 1907), and F. d'Ovidio in Italy.

(W. M.-L.)

ROMAN DE LA ROSE, a French poem dating from the 13th century. The first part was written about 1230 by Guillaume de Lorris (*q.v.*), whose work formed the starting-point, about forty years later, for the more extensive section written by Jean de Meun (*q.v.*). Guillaume de Lorris wrote an allegory, possibly of an adventure of his own, which is an artistic and beautiful presentment of the love philosophy of the troubadours. In a dream the Lover visits a park to which he is admitted by Idleness. In the park he finds Pleasure, Delight, Cupid and other personages, and at length the Rose. Welcome grants him permission to kiss the Rose, but he is driven away by Danger, Shame, Scandal, and especially by Jealousy, who entrenches the Rose and imprisons Welcome, leaving the Lover disconsolate. The story, thus left incomplete by its inventor, was finished in 19,000 lines by Jean de Meun, who allows the Lover to win the Rose, but only after a long siege and much discourse from Reason, the Friend, Nature and Genius. In the second part, however, the story is entirely subsidiary to the display of the author's encyclopaedic knowledge, to picturesque and poetic digressions, and to violent satire in the manner of the fabliaux against the abuse of power, against women, against popular superstition, and against the celibacy of the clergy. The length of the work and its heterogeneous character proved no bar to its enormous popularity in the middle ages, attested by the 200 MSS. of it which have survived.

The *Romaunt of the Rose* was translated into English by Chaucer (see the prologue to the *Legende of Good Women*), but the English version of that, extending to about one-third of the whole work, which has come down to us (see an edition by Dr Max Kaluza, Chaucer Society, 1891), is generally admitted to be by another hand. For a list of books on the vexed question of the authorship of the English translation see G. Körting, *Grundriss der engl. Lit.* (Münster, 1905, 4th ed. p. 184). A Flemish version by Hein van Aken appeared during Jean de Meun's lifetime, and at the beginning of the 14th century a free imitation, in the form of a series of sonnets, *Il Fiore*, was written in Italian by the Tuscan poet Durante. Three editions of the *Roman de la Rose* were printed at Lyons between 1473 and 1490; two by Antoine Verard (Paris, 1490 ? and 1496 ?), by Jean du Pré (Paris, 1493 ?), by Nicholas Desprez for Jean Petit (Paris), by Michel le Noir (Paris, 1509 and 1519). In 1503 Jean Molinet produced a prose version. Marot altered and modernized the text (1526), and his corrections were followed in subsequent editions. Modern editions are by Méon (4 vols., 1813), by Francisque Michel (2 vols., 1864), by Croissandeau (pseudonym for Pierre Marteau), with a translation into modern French (Orleans, 5 vols., 1878–80), and a critical edition by E. Langlois, author of *Origines et sources du Roman de la Rose* (Paris, 1890). There is a modern English version by F. S. Ellis (Temple Classics, 3 vols., 1900).

ROMAN EMPIRE, LATER. The reign of Constantine the Great forms the most deep-reaching division in the history of Europe. The external continuity is not broken, but the principles which guided society in the Greek and Roman world are replaced by a new order of ideas. The emperor-worship, which expressed a belief in the ideal of the earthly empire of Rome, gives way to Christianity; this is the outward sign that a mental transformation, which we can trace for 300 years before in visible processes of decay and growth, had reached a crisis.

Besides the adoption of Christianity, Constantine's reign is marked by an event only second in importance, the shifting of the centre of gravity of the Empire from the west to the east by making Byzantium a second capital, a second Rome. The foundation of Constantinople (*q.v.*) determined the subsequent history of the state; it established permanently the division between the eastern and western parts of the Empire—a principle already introduced—and soon exhibited, though not immediately, the preponderance of the eastern half. The eastern provinces were the richest and most resourceful, and only needed a Rome in their midst to proclaim this fact; and further, it was eastward that the Empire fronted, for here was the one great civilized state with which it was in constant antagonism. Byzantium was refounded on the model of Rome, had its own senate, and presently a *praefectus urbi*. But its character was different in two ways: it was Christian and it was Greek. From its foundation New Rome had a Christian stamp; it had no history as the capital of a pagan empire. There was, however, no intention of depressing Rome to a secondary rank in political importance; this was brought about by the force of circumstances.

The Christian Roman Empire, from the first to the last Constantine, endured for 1130 years, and during that long period, which witnessed the births of all the great modern nations of Europe, experienced many vicissitudes of decline and revival. In the 5th century it lost all its western provinces through the expansion of the Teutons; but in the 6th asserted something of its ancient power and won back some of its losses. In the 7th it was brought very low through the expansion of the Saracens and of the Slavs, but in consequence of internal reforms and prudent government in the 8th century was able before the end of the 9th to initiate a new brilliant period of power and conquest. From the middle of the 11th century a decline began; besides the perpetual dangers on the eastern and northern frontiers, the Empire was menaced by the political aggression of the Normans and the commercial aggression of Venice; then its capital was taken and its dominions dismembered by Franks and Venetians in 1204. It survived the blow for 250 years, as a shadow of its former self.

During this long life its chief political rôle was that of acting as a defender of Europe against the great powers of western Asia. While it had to resist a continuous succession of dangerous enemies on its northern frontier in Europe—German, Slavonic, Finnic and Tatar peoples—it always considered that its front was towards the east, and that its gravest task was to face the powers which successively inherited the dominion of Cyrus and Darius. From this point of view we might divide the external history of the Empire into four great periods, each marked by a struggle with a different Asiatic power: (1) with Persia, ending *c.* 630 with the triumph of Rome; (2) with the Saracens, who ceased to be formidable in the 11th century; (3) with the Seljuk Turks, in the 11th and 12th centuries; (4) with the Ottoman Turks, in which the Roman power went down.

Medieval historians, concentrating their interest on the rising states of western Europe, often fail to recognize the position held by the later Empire and its European prestige. Up to the middle of the 11th century it was in actual strength the first power in Europe, except in the lifetime of Charles the Great, and under the Comneni it was still a power of the first rank. But its political strength does not express the fulness of its importance. As the heir of antiquity it was confessedly superior in civilization, and it was supreme in commerce. Throughout the whole period (to 1204) Constantinople was the first city in the world. The influence which the Empire exerted upon its neighbours, especially the Slavonic peoples, is the second great rôle which it fulfilled for Europe—a rôle on which perhaps the most speaking commentary is the doctrine that the Russian Tsar is the heir of the Roman Caesar.

The Empire has been called by many names—Greek, Byzantine, Lower (Bas-empire), Eastern (or East-Roman). All these have a certain justification as descriptions, but the only strictly correct name is *Roman* (as recognized in the title of Gibbon's work). The continuity from Augustus to Constantine XI. is unbroken; the emperor was always the Roman emperor; his subjects were always Romans (Ῥωμαῖοι: hence *Romaic*—Modern Greek). "Greek Empire" expresses the fact that the state became predominantly Greek in character, owing to the loss, first of the Latin provinces, afterwards of Syria and Egypt; and from the middle of the 6th century Greek became the official language. "*Lower* Empire" (*Later* is preferable) marks the great actual distinction in character between the development before Constantine (Haut-empire) and after his adoption of Christianity. "Byzantine" sums up in a word the unique Graeco-Roman civilization which was centred in New Rome. *Eastern* is a term of convenience, but it has been used in two senses, not to be confused. It has been used, *loosely*, to designate the eastern half of the Empire during the 80 years or so (from 395) when there were two lines of emperors, ruling formally as colleagues but practically independent, at Rome and Constantinople; but though there were two emperors, as often before, there was only one Empire. It has also been used, justifiably, to distinguish the true Roman Empire from the new state founded by Charles the Great (800), which also claimed to be the Roman Empire; *Eastern* and *Western Empire* are from this date forward legitimate terms of distinction. But between the periods to which the legitimate and illegitimate uses of the term "Eastern Empire" apply lies a period of more than 300 years, in which there was only one Empire in any sense of the word.

A chronological table of the dynasties will assist the reader of the historical sketch which follows.

Succession of Emperors arranged in Dynasties.

1. Constantinian Dynasty.—A.D. 324–363.
   Emperors (founder of dynasty, Constantius I., 305–306):
      Constantine I. (306, sole emperor since), 324–337.
      In west—Constantine II., 337–340; Constans, 337–350.
      In east—Constantius II., 337– .
   Sole emperors: Constantius II., 350–361; Julian, 361–363.
   Inter-Dynasty.—Jovian, 363–364.
2. Valentinianean Dynasty.—A.D. 364–392.
   Emperors:
      In west—Valentinian I., 364–375; Gratian, 367–383; Valentinian II., 375–392.
      In east—Valens, 365–378 (Theodosius I., 379–392).
3. Theodosian Dynasty.—A.D. 392–457.
   Emperors: Theodosius I. (379), 392–395.
      In east—Arcadius, 395–408; Theodosius II., 408–450; Marcian, 450–457.
      In west—Honorius, 395–423; Constantius III., 422; Valentinian III., 425–455; (non-dynastic) Maximus, 455; Avitus, 455–456.
4. Leonine Dynasty.—A.D. 457–518.
   Emperors:
      In east—Leo I., 457–474; Leo II., 474; Zeno, 474–491; Anastasius I., 491–518.
      In west—non-dynastic, Majorian, 457–461; Severus, 461–465; (Leo I. sole emperor, 465–467); Anthemius, 467–472; Olybrius, 472; Glycerius, 473–474; Julius Nepos, 474–480; (usurper, Romulus Augustulus, 475–476).
5. Justinianean Dynasty.—A.D. 518–602.
   Emperors: Justin I., 518–527; Justinian I., 527–565; Justin II., 565–578; Tiberius II., 578–582; Maurice, 582–602.
   Inter-Dynasty.—Phocas, 602–610
6. Heraclian Dynasty.—A.D. 610–711.
   Emperors: Heraclius, 610–641; Constantine III., 641; Heracleonas, 641–642; Constans II., 642–668; Constantine IV. (Pogonatus) 668–685; Justinian II. (Rhinotmetus), 685–695; (non-dynastic) Leontius, 695–698 and Tiberius III. (Apsimar), 698–705; Justinian II. (restored), 705–711. II.
   Inter-Dynasty.—Philip Bardanes, 711–713; Anastasius II., 713–716; Theodosius III., 716–717.
7. Isaurian (Syrian) Dynasty.—A.D. 717–802.
   Emperors: Leo III., 717–740 (alias, 41); Constantine V. (Copronymus), 740–775; Leo IV. (Khazar), 775–780; Constantine VI., 780–797; Irene, 797–802.
   Inter-Dynasty.—Nicephorus I., 802–811; Stauracius (son of Nicephorus), 811; Michael I. (Rhangabē, father-in-law of Stauracius), 811–813; Leo V. (Armenian), 813–820.
8. Phrygian or Amorian Dynasty —A.D. 820–867.
   Emperors: Michael II. (Stammerer), 820–829; Theophilus, 829–842; Michael III. (Drunkard), 842–867.
9. Macedonian Dynasty.—A.D. 867–1057.
   Emperors: Basil I. (Macedonian), 867–886; Leo VI. (philosopher) and Alexander, 886–912; Constantine VII.

(Porphyrogennetos), 912–959; Romanus I. (Lecapenus), 920–944; Romanus II., 959–963; Basil II. (Bulgaroctonus) and Constantine VIII., 963–1025; (non-dynastic) Nicephorus II. (Phocas), 963–969, and John Zimisces, 969–976; Constantine VIII., alone, 1025–1028; Romanus III. (Argyros), 1028–1034; Michael IV. (Paphlagonian), 1034–1041; Michael V. (Calaphates), 1041–1042; Constantine IX. (Monomachus), 1042–1054; Theodora, 1054–1056; Michael VI. (Stratioticus), 1056–1057.

INTER-DYNASTY.—Isaac I. (Comnenus), 1057–1059; Constantine X. (Ducas), 1059–1067; Michael VII. (Parapinaces), Andronicus and Constantine XI., 1067; Romanus IV. (Diogenes), 1067–1071; Michael VII., alone, 1071–1078; Nicephorus III. (Botaneiates), 1078–1081.

10. COMNENIAN DYNASTY.—A.D. 1081–1204.

Emperors: Alexius I. (nephew of Isaac I.), 1081–1118; John II., 1118–1143; Manuel I., 1143–1180; Alexius II., 1180–1183; Andronicus I., 1183–1185; Isaac II. (Angelus), 1185–1195; Alexius III. (Angelus), 1195–1203; Isaac II. and Alexius IV., 1203–1204.

INTER-DYNASTY.—Alexius V. (Murtzuphlus), 1204.

Capture of Constantinople and dismemberment of the Empire by the Venetians and Franks, A.D. 1204–1205.

11. LASCARID DYNASTY.—A.D. 1206–1259.

Emperors: Theodore I. (Lascaris), 1206–1222; John III. (Vatatzes or Batatzes), 1222–1254; Theodore II. (Lascaris), 1254–1259.

12. PALAEOLOGIAN DYNASTY.—A.D. 1259–1453.

Emperors: Michael VIII. (Palaeologus), 1259–1282; Andronicus II. (Elder), 1282–1328; Andronicus III. (Younger), 1328–1341; John V., 1341–1391; (non-dynastic), John (Cantacuzenus), 1347–1355; Manuel II., 1391–1425; John VI., 1425–1448; Constantine XI., or XII. (Dragases), 1448–1453.

Historical Sketch.—Diocletian's artificial experiment of two Augusti and two Caesars had been proved a failure, leading to twenty years of disastrous civil wars; and when Constantine the Great (*q.v.*) destroyed his last rival and restored domestic peace, he ruled for the rest of his life with undivided sway. But he had three sons, and this led to a new partition of the Empire after his death, and to more domestic wars, Constans first annexing the share of Constantine II. (340) and becoming sole ruler of the west, to be in turn destroyed by Constantius II., who in 350 remained sole sovereign of the Empire. Having no children, he was succeeded by his cousin, Julian the Apostate (*q.v.*). This period was marked by wars against the Germans, who were pressing on the Rhine and Danish frontiers, and against Persia. Julian lost his life in the eastern struggle, which was then terminated by a disadvantageous peace. But the German danger grew graver, and the battle of Adrianople, in which the Visigoths, who had crossed the Danube in consequence of the coming of the Huns (see GOTHS and HUNS), won a great victory, and the emperor Valens perished (378), announced that the question between Roman and Teuton had entered on a new stage. Theodosius the Great saved the situation for the time by his Gothic pacification. The efforts of a series of exceptionally able and hard-working rulers preserved the Empire intact throughout the 4th century, but the dangers which they weathered were fatal to their weaker successors. On the death of Theodosius the decisive moment came for the expansion of the Germans, and they took the tide at the flood. There were three elements in the situation. Besides the Teutonic peoples beyond the frontier there were dependent people who had settled within the Empire (as Visigoths in Moesia, Vandals in Pannonia), and further there were the semi-Romanized Germans in the service of the Empire, some of whom had risen to leading positions (like Merobaudes and Stilicho). A Germanization of the Empire, or part of it, in some shape was inevitable, but, if the rulers of the 5th century had been men of the same stamp as the rulers of the 4th, the process might have assumed a different form. The sons of Theodosius were both incapable; and in their reigns the future of the state which was divided between them was decided. The dualism between the east (under Arcadius) and the west (under Honorious) developed under the rule of these brothers into antagonism verging on hostility. The German danger was averted in the east, but it led in a few years to the loss of many of the western provinces, and at the end of ninety years the immediate authority of the Roman Emperor did not extend west of the Adriatic. The reign of Honorius saw the abandonment of Britain, the establishment of the Visigothic kingdom in Aquitaine, the occupation of a great part of Spain by Vandals and Sueves (Suebi). Under Valentinian III. the Vandals founded their kingdom in North Africa, the Visigoths shared Spain with the Sueves, the Burgundian kingdom was founded in S.E. Gaul. The last Roman possession in Gaul passed to the Franks in 486 (see GOTHS; VANDALS; FRANKS). It is significant that the chief defender of the Empire against the Germans who were dismembering it were men of German race. Stilicho, who defended Italy against Alaric, Aëtius, whose great work was to protect the imperial possessions in Gaul, and Ricimer. It was also a German, Fravitta, who played a decisive part in suppressing a formidable Gothic movement which menaced the throne of Arcadius in 399–400. It was characteristic of this transformation of Europe that the Germans, who were imbued with a profound reverence for the Empire and its prestige, founded their kingdoms on Roman soil in the first instance as "federates" of the Emperor, on the basis of formal contracts, defining their relations to the native provincials; they seized their dominions not as conquerors, but as subjects. The double position of Alaric himself, as both king of the Visigoths and a *magister militum* of the Empire is significant of the situation.

The development of events was complicated by the sudden growth of the transient empire of the Huns (*q.v.*) in central Europe, forming a third great power, which, reaching from the Rhine to the Caucasus, from the Danube to the Baltic, might be compared in the extent of its nominal supremacy, but in nothing else, to the empires of Rome and Persia. The Huns, whose first appearance had precipitated the Germans on the Empire, now retarded for some years the process of German expansion, while they failed in their own attacks upon the Empire. On Attila's death (453) his realm collapsed, and his German vassals (Ostrogoths, &c.) founded important kingdoms on its ruins.

After the death of Valentinian III., the worst of his house, the Theodosian dynasty expired in the west, and the authority of the western emperors who succeeded him in rapid succession reached little beyond Italy. For most of this period of twenty years the general Ricimer, of German birth, held the scales of power in that peninsula, setting up and pulling down emperors. After his death the western throne was no longer tenable. First there was a usurpation; the general Orestes set up his child-son Romulus Augustulus against the legitimate Augustus, Julius Nepos, who was acknowledged by the eastern emperor; but this temporary government was overthrown (476) by a Germanic military revolution headed by Odoacer, who appropriated part of the soil to his German soldiers and founded an Italian kingdom under the nominal supremacy of the emperor at Constantinople, who, however unwilling, recognized his position (after the death of Julius Nepos).

The escape of the eastern provinces from the fate of the western illustrates the fact that the strength of the Empire lay in the east. These provinces were more populous and presented greater obstacles to the invaders, who followed the line of least resistance. But it was of immense importance that throughout this period the Empire was able to preserve a practically unbroken peace with its great eastern rival. The struggle with Persia, terminated in 364 by the peace of Jovian, was not renewed till the beginning of the 6th century. It was of greater importance that the rulers pursued a discreet and moderate policy, both in financial administration and in foreign affairs; and the result was that at the end of a hundred years the diminished Empire was strong and consolidated. Theodosius II. was a weak prince, but his government was ably conducted by Anthemius, by his sister Pulcheria and by the eunuch Chrysaphius. His reign was important for the Armenian question. Theodosius I. had committed the error of consenting to a division of this buffer state in the Roman and Persian spheres of influence, Persia having much the larger. The

Sassanid government tried to suppress the use of the Greek language. But the government of Theodosius II. officially supported the enterprise of translating the Bible into Armenian (Mesrob had just invented the Armenian alphabet), and this initiated the production of an abundant literature of translations from the Greek, which secured the perpetual connexion of Armenia with European culture, and not with Oriental. This reign is also distinguished by the building of the great landwalls of Constantinople, by the foundation of a university there and by the collection of the imperial laws in the Codex Theodosianus, which is a mine of material for the social condition of the Empire. It reveals to us the decline of municipal liberty, the decay of the middle classes in the West, the evils of the oppressive fiscal system and an appalling paralysis of Roman administration which had once been so efficient; it shows how the best-intentioned emperors were unable to control the governors and check their corruption; and discloses a disorganization which facilitated the dismemberment of the Empire by the barbarians.

In the reign of Zeno it seemed probable that an Ostrogothic kingdom would be established in the Balkan peninsula, but the danger was diverted to Italy (see GOTHS). The kingdom which Theodoric founded there was, in its constitutional aspect, a continuation of Odoacer's régime. He, like Odoacer and Alaric, held the double position of a German king and a Roman official. He was *magister militum* as well as *rex*. His powers were defined by capitulations which were arranged with the emperor Anastasius and loyally observed. The right of legislation was reserved to the emperor, and Theodoric never claimed it; but for all practical purposes he was independent.

In the 6th century the emperor Justinian, whose talents were equal to his ambitions, found himself, through the financial prudence of his predecessors, in a position to undertake the reconquest of some of the lost western provinces. The Vandal power had declined, and Africa was won back in one campaign by Belisarius in 533. The conquest of Italy was far more difficult. Begun by Belisarius in 535, it was not completed till 554, by Narses. A portion of southern Spain was also won from the Visigoths, so that the Romans again commanded the western straits. Justinian, possessed by large ideas and intoxicated with the majesty of Rome, aspired to be a great conqueror, a great lawgiver, a great pontiff, a great diplomatist, a great builder, and in each of these spheres his reign holds a conspicuous place in the annals of the Empire. His legal work alone, or the building of Santa Sophia was enough to ensure him immortal fame. But deep shadows balance the splendour. The reconquest of Africa was thoroughly justified and advantageous, but Italy was bought at a ruinous cost. In the first place, the Persian empire was at this time ruled by one of its greatest kings, Chosroes I. (*q.v.*), who was far from peacefully inclined. Justinian was engaged in a long Persian and a long Gothic war at the same time, and the state was unequal to the strain. In the second place, it was all-important for his western policy to secure the goodwill of the Italian provincials and the Roman bishop, and for this purpose he involved himself in an ecclesiastical policy (see below) which caused the final alienation of the Syrian and Egyptian provinces. The reconquest of the West was purchased by the disunion of the East. Thirdly, the enormous expenses of the Italian and Persian wars, augmented by architectural undertakings, caused a policy of financial oppression which hung as a cloud over all the brilliance of his reign, and led to the decline which ensued upon his death. Nor is it to be forgotten that he had at the same time to fulfil the task of protecting the Danube against the Germans, Slavs and Bulgarians who constantly threatened the Illyrian provinces. He spared no expense in building forts and walls. Justinian's name will always be associated with that of the gifted Theodora, an actress of doubtful fame in her early life, who shared his throne. Their mosaic portraits are preserved in the contemporary church of San Vitale at Ravenna. She possessed great political influence, and the fact that she was a heretic (monophysite), while Justinian was devoted to orthodoxy, did not mar their harmony, but only facilitated the policy of extending secret favour to the heretics who were publicly condemned; and enabled the left hand to act without the knowledge of the right. The events of the half-century after Justinian's death exhibited the weakness to which his grandiose policy had reduced the Empire. It was attacked on the west, on the north and on the east, and at all points was unequal to coping with its enemies. (1) Italy fell a victim to the Lombards (*q.v.*), and in a few years more than half of the peninsula had passed under their sway. (2) The Avars, a Hunnic people who had advanced from the Caspian, took possession of Pannonia and Dacia, and formed an empire, consisting of Slavonic and Bulgarian subjects, which endured for about sixty years. Their chief occupation was to invade the Illyrian peninsula and extort tribute and ransoms from the emperors. So far as the Avars themselves were concerned, these incursions had no permanent significance, but the Slavs who overran the provinces did more than devastate. These years saw the beginning of the Slavonic settlements which changed the ethnical character of the peninsula, and thus mark the commencement of a new period. Slavs occupied Moesia and a large part of Macedonia, even close to Thessalonica, which they besieged; they penetrated southward into Greece and made large settlements in the Peloponnesus (see GREECE, *History*, "Roman period," *ad fin.*). They occupied the north-western provinces, which became Croatia and Servia, as well as Dalmatia (except some of the coast towns). In the northern part of the peninsula the Slavonic element remained dominant, but in Greece it was assimilated to the Greek (after the 9th century) and has left little record of itself except in place names. (3) The Empire was simultaneously engaged in the perennial strife with Persia. A short interval of peace was secured when the emperor Maurice assisted Chosroes II. to dethrone a usurper, but after Maurice's death (602) the final and mortal struggle began (see PERSIA, *History*, section viii. "The Sassanian Empire"). Throughout the incompetent reign of Phocas the eastern provinces were overrun by the Persians, as the Illyrian were overrun by the Slavs. The unpopular rule of this cruel usurper was terminated in 610 by the intervention of the governor of Africa, whose son Heraclius sailed to Constantinople and, welcomed by an influential party, met with little resistance. Phocas, murderer of Maurice, was murdered by the people, and the victor was crowned emperor to find himself in presence of a desperate situation. Antioch, Damascus and many other great cities were captured by the Persians; and in 614 Jerusalem was destroyed and the Holy Cross, along with the patriarch, carried off to Ctesiphon. This event produced a profound sensation in Christendom. In 616 Egypt was conquered. The army had fallen into utter disorder under Phocas, and Heraclius so deeply despaired of saving Constantinople that he thought of transferring the imperial capital to Carthage. But the extreme gravity of the situation seems to have wrought a moral change among his subjects; the patriarch Sergius was the mouthpiece of a widespread patriotic feeling, and it was not least through his influence that Heraclius performed the task of creating a capable army. His efforts were rewarded in a series of brilliant campaigns (622–28), which, in the emphasis laid on the contrast between Christianity and fire-worship and on the object of recovering the Cross, had the character of crusades. Heraclius recovered his provinces and held Persia at his mercy (decisive battle at Nineveh, end of 627).

This war is remarkable for the attempt of the Persians to take Constantinople (626) in conjunction with the Avars and Slavs. Soon afterwards the Avar power began to decay, and the Slavs and Bulgarians shook off their yoke. It seemed as if the Roman government would now be able to regain the control in the Illyrian lands which it had almost entirely lost. It seems probable that Heraclius came to terms with the Slavs—Croatians and Servians—in the north-west; their position was regularized, as vassals of the Empire. But fate allowed no breathing-time to do more; the darkest hour had hardly passed when a new storm-cloud, from an unexpected quarter, overspread the heavens.

At this point we have to note that the Hellenic element in the state had definitely gained the upper hand before the end of the 6th century, so that henceforward the Empire might be described as Greek. Justinian's mother-tongue was Latin, and he was devoted to the Latin traditions of Rome, but even he found it necessary to publish his later laws in Greek, and from his reign Greek was the official language.

Many of the Latin official terms were already represented by Greek equivalents (*ὕπατος = consul*, *ἔπαρχος = praefectus*, &c.), but they were preserved in great numbers, transliterated and often corrupted (*e.g. κόμης, μάγιστρος, ἀσηκρήτης = a secretis, καγκελλάριος, πραιπόσιτος, κυέστωρ = quaestor, σάκρον παλάτιον, ὀφφίκιον, ὀψίκιον = obsequium*). Ῥήξ, *rex*, was always used of barbarian potentates, *βασιλεύς* being reserved as = the emperor (but also applied to the Persian king). In military drill many Latin words of command continued to be used.

It is to be noted that the year 630 marks the beginning of a period of literary (and artistic) sterility in the Greek world (see GREEK LITERATURE, section *Byzantine*).

With the rise of Islam (see CALIPHATE; MAHOMET) two universal religions, for the first time, stood face to face, each aspiring to win the universe. The struggle therefore which then began was not only a new phase of the "Eternal Question," the strife between Europe and Asia, but was one in which the religious element was fundamental. Fire-worship was only a national religion and did not present the danger of Islam. The creation of the political power of the Mahommedans was so sudden that it took the world by surprise. Bostra, the fortress of Roman Arabia, fell into their hands in 634, and before the death of Heraclius in 641 they had conquered Syria and all Egypt, except Alexandria, which opened its gates to them in 643. The religious alienation of the Syrian and Egyptian peoples from Constantinople, expressing as it did a national sentiment antagonistic to the Greeks, was an important political factor in the Mahommedan (as in the previous Persian) conquest. Thus the Mahommedans definitely cut the Empire short in the East, as the Germans had cut it short in the West; Egypt was never recovered, Syria only for short periods and partially, while the integrity of Asia Minor was constantly menaced and Cilicia occupied for many generations. By their conquest of Persia the Caliphs succeeded to the position of the Sassanids; this led to the conquest of Armenia (*c.* 654); while, in the West, Africa was occupied in 647 (though the conquest was not completed till the capture of Carthage and other strong places in 698). Thus within twenty years from the first attack the Empire was girt about by the new aggressive power from the precincts of the Caucasus to the western Mediterranean.

Fortunately Constans II., grandson of Heraclius, was a man of eminent ability and firmness. The state owed to him the preservation of Asia Minor, and the creation of a powerful fleet (see below) which protected the Aegean coasts and islands against the naval power which the Mahommedans created. He was responsible for completing a new, efficient military organization, which determined the lines of the administrative reforms of Leo III. (see below). In his last years he turned his eyes to Italy and Africa. He dreamed of restoring Old Rome as the centre of the Empire. But he did not succeed in recovering south Italy from the Lombards (Duchy of Beneventum), and having visited Rome he took up his residence in Syracuse, where he was assassinated, having lost two fleets which he sent against the Arabs of Africa. The strain lasted for another fifty years. Constantinople sustained two great sieges, which stand out as crises, for, if in either case the enemy had been successful, the Empire was doomed.

The first siege was in 673–77, under the caliph Moawiya; his fleet blockaded the capital for five years, but all its efforts were frustrated by the able precautions of Constantine IV.; "Greek fire" (see below) played an important part in the defence; and the armada was annihilated on the voyage back to Syria by storms and the Roman fleet. The second crisis was at the accession of Leo III., when the city was besieged by land and sea by Suleiman for a year (717–18), and Leo's brilliant defence, again aided by Greek fire, saved Europe. This crisis marks the highest point of Mahommedan aggression, which never again caused the Empire to tremble for its existence.

The Heraclian dynasty, which had fallen on evil times and rendered inestimable services to the Empire, came to an end in anarchy, which was terminated by the elevation of the Syrian (commonly called Isaurian) Leo III., whose reign opens a new period. His reforming hand was active in every sphere of government, but the ill-fame which he won by his iconoclastic policy obscured in the memory of posterity the capital importance of his work. His provincial organization was revolutionary, and his legislation departed from the Roman tradition (see below). From his reign to the middle of the 10th century the continuous warfare by land with the Caliphs consisted of marauding expeditions of each power into the other's territory, captures of fortresses, guerilla fighting, but no great conquests or decisive battles. The efficiency of the army was carefully maintained, but the neglect of the navy led to the losses of Crete (conquered by Moslem adventurers from Spain 826) and Sicily (conquered by the Saracens of Africa), Panormus taken 832, Syracuse 878 (see SICILY). The Africans also made temporary conquests, including Bari, in south Italy. This period saw the loss of the exarchate of Ravenna to the Lombards (750), the expansion of the Frankish power under Pippin and Charlemagne in Italy, and in close connexion therewith the loss of Old Rome.

The inconoclast emperors pursued a moderate foreign policy, consolidating the Empire within its contracted limits; but under the "Macedonian" dynasty, which was of Armenian descent, it again expanded and became the strongest power in Europe. The 9th century also witnessed a revival of learning and culture which had been in eclipse for 200 years. The reign of Basil I. was marked by an energetic policy in south Italy, where his forces co-operated with the western emperor Louis II. The Saracens were expelled from their strongholds, Bari recovered, Calabria saved, and the new province (Theme) of Longibardia formed. This secured the entrance to the Adriatic, and the increase of dominion here at the expense of the Lombards was a compensation for the loss of Sicily. Leo VI. did much for reorganizing the navy, but his reign was not fortunate; Saracen pirates plundered freely in the Aegean and, under the able renegade Leo of Tripolis, captured Thessalonica and carried off countless captives (904). But a great tide of success began fifty years later. Nicephorus Phocas won back Crete (961) as general of Romanus II., and then as emperor recovered Cilicia and North Syria (with Antioch) 968. Cyprus was also recovered. The tide flowed on under his equally able successor, John Zimisces (of Armenian race) and under Basil II.; these reigns mark the decisive victory of the Empire in the long struggle with the Saracens, whose empire had been broken up into separate states. The eastern frontier was strengthened by the active policy of Basil II. in Armenia, which was more fully incorporated in the Empire under Constantine IX.

The reign of Basil II. marks the culmination of the power of the Eastern Empire, for it also witnessed the triumphant conclusion of another conflict which had lasted almost as long. In the reign of Constantine IV. the Bulgarians (see BULGARIA) had founded a kingdom in Lower Moesia, reducing the Slavonic tribes who had occupied the country, but less than two centuries sufficed to assimilate the conquerors to the conquered, and to give Bulgaria the character of a Slavonic state. The reign of Constantine V. was marked by continuous war with this enemy, and Nicephorus I. lost his life in a Bulgarian campaign. This disaster was followed up by Prince Krum, who besieged Constantinople in 815. His death was followed by a long peace. Prince Boris was converted to Christianity (reign of Michael III.); a metropolitan see of Bulgaria was founded, dependent on the patriarch of Constantinople; and the civilization of the Bulgarians, and beginnings of their literature, were entirely under Byzantine influence. The conversion was contemporary with the work of the two missionaries Cyril and Methodius, who (while the field of their personal activity was in Great Moravia and

Pannonia) laid the south-eastern Slavs under a deep debt by inventing the Glagolitic (*q.v.*), *not* the so-called "Cyrillic" alphabet (based on Greek cursive) and translating parts of the Scriptures into Slavonic (the dialect of the Slavs of Macedonia). The most brilliant period of the old Bulgarian kingdom was the reign of Simeon (893–927), who extended the realm westward to the shores of the Adriatic and took the title "Tsar [*i.e.* Caesar] of Bulgaria and autocrator of the Romans." The aggression against the Empire which marked his ambitious reign ceased under his successor Peter, who married a daughter of Romanus I., and the Bulgarian Patriarchate founded by Simeon was recognized at Byzantium. But the Byzantine rulers only waited for a favourable time to reduce this formidable Slavonic state. At length Zimisces subjugated eastern Bulgaria and recovered the Danube frontier. But while Basil II. was engaged in contending with rivals, the heroic Samuel (of the Shishmanid family) restored the Bulgarian power and reduced the Servians. After a long and arduous war of fourteen years Basil (called the "Bulgar-slayer") subdued all Bulgaria western and eastern (1018). He treated the conquered people with moderation, leaving them their political institutions and their autocephalous church, and to the nobility their privileges. Some Bulgarian noble families and members of the royal house were incorporated in the Greek nobility; there was Shishmanid blood in the families of Comnenus and Ducas. Greek domination was now established in the peninsula for more than 150 years. The Slavs of Greece had in the middle of the 9th century been brought under the control of the government.

In the reign of Basil II. the Russian question also was settled. The Russian state (see RUSSIA) had been founded before the middle of the 9th century by Norsemen from Sweden, who were known in eastern Europe as Russians (Ῥῶς), with its centres at Novgorod and Kiev. They did for the eastern Slavs what the Bulgarians had done for the Slavs of Moesia. The Dnieper and Dniester gave them access to the Euxine, and the Empire was exposed to their maritime attacks (Constantinople was in extreme danger in 860 and 941), which recall the Gothic expeditions of the 3rd century. In 945 a commercial treaty was concluded, and the visit of the princess Olga to Byzantium (towards the end of the reign of the learned emperor Constantine VII., Porphyrogennetos) and her baptism seemed a pledge of peace. But Olga's conversion had no results. Sviatoslav occupied Bulgaria and threatened the Empire, but was decisively defeated by Zimisces (971), and this was virtually the end of the struggle. In 988 Prince Vladimir captured Cherson, but restored it to the emperor Basil, who gave him his sister Anna in marriage, and he accepted Christianity for himself and his people. After this conversion and alliance, Byzantium had little to fear from Kiev, which came under its influence. One hostile expedition (1043) indeed is recorded, but it was a failure. Much about the same time that the Russians had founded their state, the Magyars (see HUNGARY; the Greeks called them Turks) migrated westward and occupied the regions between the Dnieper and the Danube, while beyond them, pressing on their heels, were another new people, the Petchenegs (Patzinaks). The policy of Byzantium was to make use of the Magyars as a check on the Bulgarians, and so we find the Romans (under Leo VI.) and the Magyars co-operating against the tsar Simeon. But Simeon played the same game more effectively by using the Petchenegs against the Magyars, and the result was that the Magyars before the end of the 9th century were forced to move westward into their present country, and their place was taken by the Petchenegs. From their new seats the Magyars could invade the Empire and threatened the coast towns of Dalmatia. The conquest of Bulgaria made the Petchenegs immediate neighbours of the Empire, and during the 11th century the depredations of these irreclaimable savages, who filtered into the Balkan peninsula, constantly preoccupied the government. In 1064 they were driven from the Dniester regions into Little Walachia by the Kumans (or Polovtsi), a people of the same ethnical group as themselves. They were crushingly defeated by Alexius Comnenus in 1091, and exterminated by John Comnenus in 1123.

In the Macedonian period a grave domestic question troubled the government. This was the growth of the large estates of the rich nobles of Asia Minor, at the expense of small properties, to an excess which was politically and economically dangerous. The legislation against the evil began under Romanus I. and was directed to the defence of the poor against the rich, and to protecting the military organization which was based on holdings of land to which the obligation of military service was attached. There was also danger in the excessive influence of rich and powerful families, from which the great military officers were drawn, and which were extensively related by alliances among themselves. The danger was realized in the struggle which Basil II. had to sustain with the families of Sclerus and Phocas. Various kinds of legislation were attempted. Under Romanus I. alienation of property to the large landowners was forbidden. Nicephorus Phocas, whose sympathies were with the aristocracy to which he belonged, holding that there had been enough legislation in favour of the poor, sought to meet the difficulty of maintaining a supply of military lands in the future by forbidding further acquisitions of estates by the Church. Basil II. returned to the policy of Romanus, but, with much greater severity, resorting to confiscation of some of the immense private estates; and he endeavoured to keep down the aristocrats of Asia Minor by very heavy taxation. Through the recovery of the Balkan provinces he gained in Europe a certain political counterpoise to the influence of Asia Minor, which had been preponderant since the seventh century. Asia Minor meant the army, and opposition to its influence expressed itself in the 11th century in a fatal anti-military policy, which is largely responsible for the conquests of a new enemy, the Seljuk Turks, who now entered into the inheritance of the Caliphs (see CALIPHATE *ad fin.* and SELJUKS). Constantinople was haunted by the dread of a military usurpation. An attempt of the military hero George Maniaces (who had made a remarkable effort to recover Sicily) to wrest the crown from Constantine IX. had failed; and when Isaac Comnenus, who represented the military aristocrats of Asia Minor, ascended the throne, he found himself soon compelled to abdicate, in face of the opposition. The reign of Constantine X., of the rival family of Ducas, marked the culmination of this antagonism. The senate was filled with men of the lower classes, and the military budget was ruthlessly cut down. This policy reduced the army and stopped the supply of officers, since there was no longer hope of a profitable career. The emperor thought to meet dangers from external enemies by diplomacy. The successes of the Seljuks (after the fall of the great Armenian fortress of Ani in 1064) at length awoke the government from its dream of security. The general Romanus Diogenes was proclaimed emperor. He had to create an army and to train it; he did not spare himself, but it was too late. He was defeated and captured by Alp Arslan on the decisive field of Manzikert (1071). Released by the sultan, who honoured his bravery, he was deposed in favour of Michael Ducas, and falling into the hands of his enemies, was blinded. The east and centre of Asia Minor were thus lost; the Seljuk kingdom of Rūm was founded; Nicaea was captured by the Turks in 1080. The provinces which escaped the Seljuk occupation were thoroughly disorganized, a prey to foreign and native adventurers and usurpers (see SELJUKS).

Thus in the 'seventies of the 11th century the Empire seemed through incompetence and frivolity to have been brought to the verge of dissolution. The disorder was terminated by the accession of the extraordinarily able statesman Alexius Comnenus (1081), who effected a reconciliation with the rival family of Ducas, established a strong government and founded a dynasty. He had to deal with three great dangers—the Seljuks, the Petchenegs (see above), and in the west the Normans. The Normans had wrested from East Rome its possessions in South Italy (1041–71; see NORMANS)—succeeding where German emperors had failed—and throughout the Comnenian period the Empire was threatened by their projects of conquest beyond the Adriatic, projects which aimed at Constantinople itself.

Four great attempts against the Empire were made by the Normans; they were unsuccessful, but they heralded the Western conquest of 1204. (1) Expedition of Robert Guiscard, 1081–85, repelled by Alexius with help of Venice (2) Bohemond's expedition, 1105–7, foiled by the able strategy of Alexius; (3) the invasion of Greece by Roger of Sicily, 1147; Venice supported Manuel Comnenus, and the Normans were driven from Corfû, 1149; (4) the expedition of William II. of Sicily, 1185, who succeeded in capturing Thessalonica; the invaders were defeated at Demetritsa, but they gained the islands of Cephallenia and Zacynthus.

The two most important events in the reign of Alexius were the prices which he paid for help against his enemies. (1) He was obliged (1084) to grant to Venice (which had become independent of the Empire in the 9th century; see VENICE), in return for her naval aid against the Normans, commercial privileges which practically made the Empire commercially dependent on the Republic. (2) He sought auxiliary forces in western Europe to help him against the Seljuks; the answer of the pope and Latin Christendom was the First Crusade—a succour very different from that which he desired. Through his tact and discretion, the state was safely steered through the dangers with which the disorderly hosts of barbarous allies menaced it, and the immediate results were salutary; large parts of Asia Minor, including Nicaea, were restored to the Empire, which was thus greatly strengthened in the East while the Turks were weakened (see CRUSADES). But for this help Byzantium might not have recovered the transient strength and brilliance which it displayed under Manuel. In Asia Minor the crusaders kept the terms of their agreement to restore to the emperor what had belonged to him; but on capturing Antioch (1098) they permitted the Norman Bohemond to retain it, in flagrant violation of their oaths; for to Antioch if to any place the emperor had a right, as it had been his a few years before. This was in itself sufficient to cause a breach between Byzantium and the Latin kingdom of Jerusalem (founded 1099). But otherwise the new political situation created by the Crusade was dangerous, ultimately fatal, to the Empire. For its lands and seas became a highway from western Europe to the Latin colonies in Syria; the Byzantine government was forced to take precautions to protect itself against the crusading expeditions which travelled to the Holy Land; and these precautions were regarded by the western powers as a hindrance to the sacred objects of the crusades. The bitter religious antagonism between the Greek and Latin Christians increased the mutual distrust and the danger.

The history of the new relations between East and West dating from the First Crusade is closely connected with the history of the futile attempts at bringing about a reunion between the Greek and Latin Churches, which had severed communion in 1054 (see below). To heal the schism and bring the Greek Church under the domination of Rome was a principal object of papal policy from Gregory VII. forward. The popes alternated between two methods for attaining this, as circumstances dictated: namely, a peaceful agreement—the policy of union; or an armed occupation of the Empire by some western power (the Normans)—the policy of conquest. Their views varied according to the vicissitudes of their political situation and their struggles with the western emperors. The eastern emperors were also constantly preoccupied with the idea of reconciliation, constantly negotiating with a view to union; but they did not care about it for its own sake, but only for political advantages which it might bring, and their subjects were bitterly opposed to it. Manuel Comnenus during the first part of his reign was the close friend and ally of the western emperor Conrad III., but after Conrad's death, he formed the ambitious plan of realizing in Europe a sovereignty like that of Justinian, and hoped to compass it in conjunction with Rome, the enemy of the Hohenstaufen. His forward policy carried war into Italy; he seized Ancona. But his strength was unequal to such designs. His Latin sympathies, no less than his financial extravagance, made him highly unpopular at home; and the national lack of sympathy with his Western policy was exhibited—after the revolution which overthrew his son Alexius and raised his cousin Andronicus I. to the throne—by the awful massacre of the Latin residents at Constantinople in 1182, for which the expedition of William of Sicily (see above) and the massacre of the people of Thessalonica was the revenge. The short reign of the wicked and brilliant Andronicus was in all respects a reaction, prudent, economical and popular. His fall was due to the aristocracy against whom his policy was directed, and the reign of Isaac Angelus undid his efforts and completed the ruin of the state. Oppressive taxation caused a revolt of the Bulgarian and Walachian population in the European provinces; the work of Zimisces and Basil was undone, and a new Bulgarian kingdom was founded by John Asen—a decisive blow to the Greek predominance which the Macedonian emperors seemed to have established.

In the fatal year 1204 the perils with which the eastward expansion of western Christendom (the Crusades, and the commercial predominance and ambitions of Venice) had long menaced the Empire, culminated in its conquest and partition. It was due to a series of accidents that the cloud burst at this moment, but the conditions of such a catastrophe had long been present. Isaac Angelus was dethroned by his brother Alexius III., and his son escaped (1201) to the west, where arrangements were being made for a new crusade, which Venice undertook to transport to the Holy Land. The prince persuaded Philip of Swabia (who had married his sister) and Boniface of Montferrat to divert the expedition to Byzantium, in order to restore his father and himself to the throne, promising to furnish help to the Crusade and to reconcile the Greek Church with Rome; Venice agreed to the plan; but Pope Innocent III., the enemy of Philip, forbade it. Isaac and his son, Alexius IV., were restored without difficulty in 1203, and the crusading forces were prepared to proceed to Palestine, if Alexius had performed his promises. But the manner of this restoration, under Latin auspices, was intensely unpopular; he was not unwilling, but he was unable, to fulfil his pledges; and a few months later he was overthrown in favour of one who, if an upstart, was a patriot, Alexius V. Then the Crusaders, who were waiting encamped outside the city, resolved to carry out the design which the Normans had repeatedly attempted, and put an end to the Greek Empire. The leaders of the Fourth Crusade must be acquitted of having formed this plan deliberately before they started; it was not conceived before 1204. They first arranged how they would divide the Empire amongst themselves (March); then they captured the city, which had to endure the worst barbarities of war. In partitioning the Empire, which was now to become the spoil of the conquerors, the guiding mind was the Venetian leader, the blind doge, Henry Dandolo. He looked to the interests of Venice from the narrowest point of view, and in founding the new Latin Empire, which was to replace the Greek, it was his aim that it should be feeble, so as to present no obstacles to Venetian policy. The Latin Empire of Romania was a feudal state like the kingdom of Jerusalem; the emperor was suzerain of all the princes who established themselves on Greek territory; under his own immediate rule were Constantinople, southern Thrace, the Bithynian coast, and some islands in the Aegean. But he was hampered from the beginning by dependence on Venice, want of financial resources, and want of a fleet; the feudal princes, occupied with their separate interests, gave him little support in his conflict with Greeks and Bulgarians; at the end of ten years the worthless fabric began rapidly to decline, and the efforts of the popes, for whom it was the means of realizing Roman supremacy in the East, were unavailing to save it from the extinction to which it was doomed in its cradle.

The original Act of Partition (which gave ¼ of the Byzantine territory to the future emperor, ⅜ to Venice, the remaining ⅜ to the Crusaders) could hardly be carried out strictly, as the territory was still to be won. The most important vassal state was the kingdom of Thessalonica, including Thessaly, which was assigned to Boniface of Montferrat. But it was conquered by the Greeks of Epirus in 1222. The chief of the territories taken by Venice was Crete. For the Latin states in Greece and the Aegean see GREECE. The first Latin emperor, Baldwin of Flanders, was captured and put to death by the Bulgarians in 1205. He was succeeded by his brother Henry, an able statesman, after whose death (1216) the decline began.

Three Greek states emerged from the ruin of the Roman Empire. A member of the Comnenian house had founded an independent state at Trebizond, and this empire survived till 1461, when it was conquered by the Ottomans. A relation of the Angeli maintained in Europe an independent Greek state known as the Despotate of Epirus. But the true representative of the imperial line was Theodore Lascaris, who collected the Byzantine aristocracy at Nicaea and was elected emperor in 1206. He and his successors advanced surely and rapidly against the Latin Empire, both in Europe and Asia. It was a question whether Constantinople would fall to the Walacho-Bulgarians or to the Greeks. But an astute diplomat and general, the emperor Michael Palaeologus, captured it in 1261. His object was to recover all the lost territory from the Latins, but he was menaced by a great danger through Charles of Anjou, who had overthrown the rule of the Hohenstaufens in the two Sicilies, and determined to restore the Latin kingdom of Romania. To avert this peril, Michael negotiated with Pope Gregory X.; he was ready to make every concession, and a formal union of the Churches was actually brought about at the council of Lyons in 1274. The emperor had the utmost difficulty in carrying through this policy in face of clerical opposition; it aroused disgust and bitterness among his subjects; and it was undone by his successor. Meanwhile the pope had with difficulty bridled Charles of Anjou; but in Martin IV. he found a more pliable instrument, and in 1282 he made vast preparations for an expedition against the Greek Empire. It was saved by the Sicilian Vespers (see SICILY), to be the prey of other powers.

The end of the 13th century saw the rise of the Ottoman power in Asia and the Servian in Europe. The Empire was assisted by a band of Spanish mercenaries (the Catalan Grand Company; see GREECE, *History*, "Byzantine Period") against the advance of the Ottoman Turks in Asia Minor; they distinguished themselves by saving Philadelphia (1304). In 1326 Brusa (Prusa) became the Ottoman capital, while on the other side the Servians (crushing the Bulgarians in 1330) were gradually closing in on Byzantium. Under Stephen Dušan (1331–1355) Servia attained the height of her power. The enemies were strengthened by the domestic struggles within the Empire, first between Andronicus II. and his son, then between John VI. and the usurper Cantacuzenus. But before the fate of Byzantium was settled the two enemies on its flanks came face to face. In 1387 the Servian power was crushed on the field of Kossovo by the Ottomans (who had crossed the Hellespont in 1360 and taken Philippopolis in 1363). Sultan Bayezid I. won Philadelphia, the last Asiatic possession of the Empire, and conquered Trnovo, the Bulgarian capital, in 1393. Constantinople was now surrounded. The Ottoman power was momentarily eclipsed, and the career of conquest checked, by the Mongol invasion of Timur and the great defeat which it sustained in the battle of Angora (1402). Mahommed I. found it necessary to ally himself with the emperor Manuel. But the pause was brief. Murad II. took Adrianople, and tried (1422) to take Constantinople.

It was small compensation that during this time the Palaeologi had been successful against the Franks in Greece. The situation was desperate. The Turks were in possession of the Balkan peninsula, threatening Hungary; there was no chance of rescue, except from western Europe. John VI. and Manuel had both visited the West in search of help. The jeopardy of the Empire was the opportunity of Rome, and the union of the Churches became the pressing question. It was taken up earnestly by Pope Eugenius IV., and the result was the Decree of Union at the council of Florence in 1439. The emperor and the higher clergy were really in earnest, but the people and the monks did not accept it, and the last agony of Byzantium was marked by ecclesiastical quarrels. Eugenius IV. preached a crusade for the rescue of the Empire, and in 1443 an army of Hungarians and Poles, led by the Hungarian king, won a victory over Murad, which was more than avenged in the next year on the memorable field of Varna. The end came nine years later under Murad's successor, Mahommed II. An army of about 150,000 blockaded the city by land and sea, and Mahommed began the siege on the 7th of April. The emperor Constantine XI., Palaeologus, on whom the task of the forlorn defence devolved (and whose position was all the more difficult because he was alienated from his subjects, having embraced the Latin rite), can have had little more than 8000 men at his disposal; he received no help from the Western powers; but an experienced Genoese soldier of fortune, John Justiniani, arrived with two vessels and 400 cuirassiers and aided the emperor with his courage and advice. The resident foreigners, both Venetians and Genoese, loyally shared in the labours of the defence. The final storm of the land walls took place on the night of the 29th of May. All looked to Justiniani for salvation, and when he, severely wounded, retired from the wall to have his wound looked to, a panic ensued. The enemy seized the moment, and the Janissaries in a final charge rushed the stockade which had been constructed to replace a portion of the wall destroyed by the Turkish cannon. This decided the fate of the city. Constantine fell fighting heroically. Soon after sunrise (May 30) the Mahommedan army entered Constantinople (Stambul = 's τὴν πόλιν, "the city"), which was in their eyes the capital of Christendom.

The ultimate responsibility for this disaster is generally imputed to the political adventurers who dismembered the Empire in 1204. It may indeed be said that at that time the Byzantine state seemed already stricken with paralysis and verging to dissolution, and it was menaced by the re-arisen power of Bulgaria. But more than once before (in the 7th century and in the 11th) it had recovered its strength when it was weak and in dire peril; and, considering what the emperors of Nicaea and Michael VIII. accomplished, it seems probable that, if there had been no Fourth Crusade, it might have so revived and consolidated its forces in the course of the 13th century, as to be able to cope successfully with the first advances of the Ottomans. The true statement is that the Fourth Crusade was only an incident (not in itself decisive) in a world-movement which doomed the Eastern Empire to extinction—namely, the eastward movement of western Europe which began in the 11th century with the rise of the Normans and the First Crusade. Henceforward the Empire was a middle state, pressed between expanding forces on the east and on the west, and its ultimate disappearance was inevitable.

Church and State.—In making the state Christian, Constantine made the Church a state institution, and therefore under imperial control. Caesaro-papism was the logical consequence. The sacerdotium was united with the imperium in the person of the monarch as in the pagan state. The Church acquiesced, and yet did not acquiesce, in this theory. When a heretical emperor sought to impose his views, champions of ecclesiastical freedom never failed to come forward. At the very beginning Athanasius fought for the independence of the Church against the emperor Constantius. But the political principle which Constantine had taken for granted, and which was an indispensable condition of his adoption of Christianity, was fully recognized under Theodosius I., and, notwithstanding protests from time to time, was permanent. It is significant that Constantinople, which had become a second Rome politically, with its senate and capitol, became then a second Rome ecclesiastically, and that the elevation of the see of Constantinople to patriarchal rank next to the Roman see was due to Theodosius (381), who gave a permanent form to the dualism of the Empire. The patriarch became a state minister for religion. The character of the Church as a state institution is expressed above all in the synods. The general councils are not only summoned by the emperor, but are presided over by him or by his lay deputies. The order of the proceedings is modelled on that of the senate. The emperor or his representative not only keeps order but conducts the deliberations and intervenes in the theological debates. It has been erroneously thought that at the council of Chalcedon (451) the legate of Pope Leo presided; but the acts of that assembly teach us otherwise; the privilege which the Roman legates possessed was that of voting first (the right of the *princeps senatus*). The first general council at which a churchman presided was the seventh (at Nicaea, 787), at which the emperor (or empress) deputed, not a layman, but the patriarch Tarasius to preside. The resolutions of these ecclesiastical state-councils did not become the law of the Empire till they were confirmed by imperial edicts.

The emperors, in their capacity as heads of the Church, did not confine themselves to controlling it by controlling the councils. They soon began to issue edicts dealing with theology, by virtue of their own authority. It has been said that the council of Chalcedon closed an epoch of "parliamentary constitutionalism"; a general council was not summoned again for more than one hundred years, though the Empire during that period was seething with religious disunion and unrest. The usurper Basiliscus in his short reign set an example which his successors were not slow to follow. He issued an edict quashing the decision of Chalcedon. Zeno's *Henōtikon* (see below) a few years later was the second and more famous example of a method which Justinian largely used, and of which the *Ecthesis* of Heraclius, the *Type* of Constans II. and the iconoclastic edicts of Leo III. are well-known instances. It was a question of political expediency (determined by the circumstances, the intensity and nature of the opposition, &c.) whether an emperor supported his policy or not by an ecclesiastical council.

The emperor was always able to control the election of the patriarch, and through him he directed the Church. Sometimes emperor and patriarch collided; but in general the patriarchs were docile instruments, and when they were refractory they could be deposed. There were several means of resistance open to a patriarch, though he rarely availed himself of them. His participation in the ceremony of coronation was indispensable, and he could refuse to crown a new emperor except on certain conditions, and thus dictate a policy (instances in 812, Michael I.; 969, John Zimisces). There was the power of excommunication (Leo VI. was excommunicated on account of his fourth marriage). Another means of resistance for the Church was to invoke the support of the bishop of Rome, who embodied the principle of ecclesiastical independence and whose see admittedly enjoyed precedence and primacy over all the sees in Christendom. Up to the end of the 8th century he was a subject of the emperor, and some emperors exerted their ecclesiastical control over Rome by drastic measures (Justinian and Constans II.). But after the conquest of Italy by Charles the Great, the pope was outside the Byzantine domination; after the coronation of Charles in 800 he was associated with a rival empire; and when ecclesiastical controversies arose in the East, the party in opposition was always ready to appeal to him as the highest authority in Christendom. Under the iconoclastic emperors the image-worshippers looked to him as the guardian of orthodoxy.

As to the ecclesiastical controversies which form a leading feature of Byzantine history, their political significance alone concerns us. After the determination of the Arian controversy in 381 new questions (as to the union of the divine and human elements in the person of Christ: one or two natures?) arose, and it may seem surprising that such points of abstruse theology should have awakened universal interest and led to serious consequences. The secret was that they masked national feelings; hence their political importance and the attention which the government was forced to bestow on them. The reviving sense of nationality (anti-Greek) in Syria and in Egypt found expression in the 5th century in passionate monophysitism (the doctrine of one nature): theology was the only sphere in which such feelings could be uttered. The alienation and dissension which thus began had fatal consequences, smoothing the way for the Saracen conquests of those lands; the inhabitants were not unwilling to be severed politically from the Empire. This ultimate danger was at first hardly visible. What immediately troubled the emperors in the first half of the 5th century was the preponderant position which the see of Alexandria occupied, threatening the higher authority of Constantinople. The council of Chalcedon, called by Marcian, an able statesman, was as much for the purpose of ending the domination of Alexandria as of settling the theological question. The former object was effected, but the theological decision of the council was fatal; it only sealed and promoted the disunion. The recalcitrant spirit of Syria and Egypt forced Zeno, thirty years later, to issue his Henōtikon, affirming the decisions of previous councils but pointedly ignoring Chalcedon. This statesman-like document secured peace in the East for a generation. Rome refused to accept the Henōtikon, and when Justinian resolved to restore imperial supremacy in the Western kingdoms, conciliation with Rome became a matter of political importance. For the sake of this project, the unity of the East was sacrificed. The doctrine of Chalcedon was reasserted, the Henōtikon set aside; New Rome and Old Rome were again hand in hand. This meant the final alienation of Egypt and Syria. The national instinct which had been alive in the 5th century grew into strong national sentiment in the 6th. One of the chief anxieties of Justinian's long and busy reign was to repair the mischief. Deeply interested himself in matters of dogma, and prepared to assert to its fullest extent his authority as head of the Church, he has been called "the passionate theologian on the throne"; but in his chief ecclesiastical measures political considerations were predominant. His wife Theodora was a monophysite, and he permitted her to extend her protection to the heretics. He sought new formulae for the purpose of reconciliation, but nothing short of repudiation of the Chalcedon acts would have been enough. The last great efforts for union were made when the Saracens invaded and conquered the dissident provinces. A new formula of union was discovered (One Will and One Energy). This doctrine of monothelism would never have been heard of but for political exigencies. The Egyptians and Syrians would perhaps have accepted this compromise; but it was repudiated by the fanatical adherents of Chalcedon. Heraclius sought to impose the doctrine by an edict (Ecthesis, 638), but the storm, especially in Italy and Africa, was so great that ten years later an edict known as the Type was issued by Constans forbidding all disputation about the number of wills and energies. Constans was a strong ruler, and maintained the Type in spite of orthodox opposition throughout his reign. But the expediency of this policy passed when the Saracens were inexpugnably settled in their conquests, and in his successor's reign it was more worth while to effect a reconciliation with Rome and the West. This was the cause of the 6th Ecumenical Council which condemned monothelism (680–681).

In the Hellenic parts of the Empire devotion to orthodoxy served as a chrysalis for the national sentiment which was to burst its shell in the 10th century. For the Greeks Christianity had been in a certain way continuous with paganism. It might be said that the old deities and heroes who had protected their cities were still their guardians, under the new form of saints (sometimes imaginary) and archangels, and performed for them the same kind of miracles. Pagan idolatry was replaced by Christian image-worship, which by the Christians of many parts of Asia Minor, as well as by the Mahommedans, was regarded as simply polytheism. Thus in the great iconoclastic controversy, which distracted the Empire for nearly 120 years, was involved, as in the monophysitic, the antagonism between different racial elements and geographical sections. Leo III., whose services as a great deliverer and reformer were obscured in the memory of posterity by the ill-fame which he won as an iconoclast, was a native of Commagene. His first edict against the veneration of pictures evoked riots in the capital and a revolt in Greece. The opposition was everywhere voiced by the monks, and it is not to be overlooked that for many monks the painting of sacred pictures was their means of existence. Leo's son Constantine V. pursued the same policy with greater rigour, meeting the monastic resistance by systematic persecution, and in his reign a general council condemned image-worship

(753). Iconoclasm was supported by the army (*i.e.* Asia Minor), and a considerable portion of the episcopate, but it was not destined to triumph. When the Athenian Irene, wife of Leo IV., came to power after her husband's death, as regent for her son Constantine VI., she secured the restoration of the worship of icons. The Iconoclastic Council was reversed by the 7th Ecumenical Council of 787. The iconoclastic party, however, was not yet defeated, and (after the neutral reign of Nicephorus I.) came again to the helm in the reigns of the Armenian Leo V. and the first two Phrygian emperors, Michael II. and Theophilus. But the Empire was weary of the struggle, and on the death of Theophilus, who had been rigorous in enforcing his policy, icon-worship was finally restored by his widow Theodora (843), and the question was never reopened. This was a triumph for the Greek element in the Empire; the "Sunday of orthodoxy" on which iconoclasm was formally condemned is still a great day in the Greek Church.

The ablest champions who wielded their pens for the cause of icons, defending by theological arguments practices which really had their roots in polytheism, were in the early stage John of Damascus and in the later Theodore (abbot of the monastery of Studium at Constantinople). The writings of the iconoclasts were destroyed by the triumphant party, so that we know their case only from the works of their antagonists.

In this struggle the Greeks and Latins were of one mind; the image-worshippers had the support of the Roman see. When the pope resisted him, Leo III. confiscated the papal estates in Sicily and Calabria; and the diocese of Illyricum was withdrawn from the control of Rome and submitted to the patriarch of Constantinople. But when iconoclasm was defeated, there was no question of restoring Illyricum, nor could there be, for political reasons; since the iconoclastic schism had, with other causes, led to the detachment of the papacy from the Empire and its association with the Frankish power. By the foundation of the rival Roman Empire in 800 the pope had definitely become a subject of another state. No sooner had the iconoclastic struggle terminated than differences and disputes arose between the Greek and Latin Churches which finally led to an abiding schism, and helped to foster the national self-consciousness of the Greeks. A strife over the patriarchal chair between Ignatius (deposed by Michael III. and supported by Rome) and Photius the learned statesman who succeeded him, strained the relations with Rome; but a graver cause of discord was the papal attempt to win Bulgaria, whose sovereign Boris had been baptized under the auspices of Michael III. (*c.* 865), and was inclined to play Old Rome against New Rome. Photius stood out as the champion of the Greeks against the claim of the Roman see, and his patriarchate, though it did not lead to a final breach, marks the definite emancipation of the Greeks from the spiritual headship of Rome. This is the significance of his encyclic letter (867), which formulated a number of differences in rite and doctrine between the Greek and Latin Churches, differences so small that they need never have proved a barrier to union, if on one side there had been no question of papal supremacy, and if the Greek attitude had not been the expression of a tenacious nationality. There was a reconciliation about 900, but the Churches were really estranged, and the open and ultimate breach which came in 1054, when the influence of the Cluny movement was dominant at Rome (Leo IX. was pope and Michael Cerularius patriarch), sealed a disunion which had long existed. Subsequent plans of reunion were entertained by the emperors merely for political reasons, to obtain Western support against their foes, or to avert (through papal influence) the aggressive designs of Western princes. They were doomed to futility because they were not seriously meant, and the Greek population was entirely out of sympathy with these political machinations of their emperors. The Union of Lyons (1274) was soon repudiated, and the last attempt, the Union of Florence in 1439, was equally hollow (though it permanently secured the union of the Rumanians and of the Ruthenians). Part of the historical significance of the relations between the Greek and Latin Churches lies in the fact that they illustrate and promoted by way of challenge, the persistence of Greek national self-consciousness.

The emperors legislated against paganism and against heresy, not merely under ecclesiastical pressure, but because they thought religious uniformity politically desirable. Theodosius the Great, a Spaniard, with no sympathy for Hellenic culture, set himself the task of systematically eradicating pagan institutions and customs. Though his persecution accomplished much, paganism was far from being extinct either in the East or in the West in the 5th century. Not only did heathen cults survive in many remote districts, but the old gods had many worshippers among the higher classes at Rome, Constantinople, Antioch, Alexandria and Athens. The most distinguished Greek literati of that period were non-Christian. Justinian, who united theological enthusiasm with belief in the ideal of uniformity and, like Theodosius, was out of sympathy with Hellenism ("Hellen" now came to mean "pagan"), persecuted polytheism more earnestly and severely than his predecessors. His measures created a panic among the higher classes at Byzantium, of whom many, as he suspected, were addicted to the ancient religion. He instituted a regular inquisition, exacted oaths of orthodoxy from all officials and teachers, and closed the philosophical schools of Athens. Missionaries (and it is remarkable that he employed monophysite heretics) were sent to abolish the old heathen worship which survived in many parts of Asia Minor where Christianity had hardly penetrated. By the end of the 6th century formal paganism had practically disappeared.

In Asia Minor, especially in the east, there were many dissident communities which asserted independence of the Church of Constantinople and of all ecclesiastical traditions, founding their doctrines directly on the Bible. Most important of these heretics were the Paulicians (*q.v.*), a dualistic sect whom the Church regarded as Manichaeans.

The Autocracy and its Constitutional Forms.—With Diocletian the Principate of Augustus had become undisguisedly an absolute monarchy, and this constitution prevailed to the end. There is virtually no constitutional history in the proper sense of the term in the later Roman Empire, for there was neither evolution nor revolution. The monarchical system remained in all its essential points unchanged, and presents a remarkable example of an autocracy of immense duration which perfectly satisfied the ideas of its subjects. No attempt was made to alter it,—to introduce, for instance, a limited monarchy or a republican government; all revolts and conspiracies were aimed at the policies of particular autocrats, not at autocracy itself; generally they only represented sectional antagonisms and personal ambitions. The emperors inherited a deeply rooted instinct of legality as a tradition from Old Rome; and this respect for law which marked their acts, along with the generally good administration of justice, was a palladium of the monarchy. They were supreme in legislation, as well as in the administrative and judicial spheres; but they were on the whole moderate in wielding legislation as an instrument of policy.

There were, however, recognized constitutional principles which it would have been impossible for the emperor to override.

(1) The elective principle, inherited from the Republic, was never changed. A new emperor had to be elected by the senate and acclaimed by the people. The succession never became automatic. But even Augustus had indirectly introduced the dynastic principle. Theodosius the Great, by causing his two sons, Arcadius and Honorius, to be elected Augusti in their infancy, practically elevated the dynastic idea into a constitutional principle; henceforward it was regarded as in the regular course that the son born to a reigning sovereign should in his infancy be elected Augustus. Thus the election, though always an indispensable form, was only a reality when a dynasty came to an end.

(2) When the position of Christianity was assured by the failure of Julian's reaction, it was evident that profession of that religion would henceforward be a necessary qualification for election to the throne. This was formally and constitutionally recognized when the coronation of the emperor by the patriarch was introduced in 457, or perhaps in 450.

(3) The sovereignty of the emperor was personal and *not territorial*. In this respect it always retained the character which it had inherited as the offspring of a Roman magistracy. Hence no Roman territory could be granted by the emperor to another power. For instance, the Western emperor Conrad III. could promise to hand over Italy to Manuel Comnenus as the dowry of his wife, but it would have been constitutionally illegal for Manuel to have made such a promise to any foreign prince; an Eastern emperor had no right to dispose of the territory of the state. Tendencies towards a territorial conception begin indeed to appear (partly under Western influence) in the time of the Palaeologi, especially in the custom of bestowing appanages on imperial princes.

(4) While the senate of Rome generally lost its importance and at last became a mere municipal body, the new senate of Constantine preserved its position as an organ of the state till the fall of Constantinople. For the imperial elections it was constitutionally indispensable, and it was able sometimes to play a decisive part when the throne was vacant—its only opportunity for independent action. The abolition, under Diocletian's system, of the senatorial provinces deprived the senate of the chief administrative function which it exercised under the Principate; it had no legislative powers; and it lost most of its judicial functions. It was, however, still a judicial court; it tried, for instance, political crimes. In composition it differed from the senate of the Principate. The senators in the 4th century were chiefly functionaries in the public service, divided into the three ascending ranks of *clarissimi, spectabiles. illustres*. The majority of the members of the senatorial order lived in the provinces, forming a provincial aristocracy, and did not sit in the senate. Then the two lower ranks ceased to have a right to sit in the senate, which was confined to the *illustres* and men of higher rank (Patricians). The senatorial order must therefore be distinguished from the senate in a narrower sense; the latter finally consisted mainly of high ministers of state and the chief officials of the palace. It would be a grave mistake to underrate the importance of this body, through an irrelevant contrast with the senate of the Republic or even of the Principate. Its composition ensured to it great influence as a consultative assembly; and its political weight was increased by the fact that the inner council of imperial advisers was practically a committee of the senate. The importance of the senate is illustrated by the fact that in the 11th century Constantine X., in order to carry out a revolutionary, anti-military policy, found it necessary to alter the composition of the senate by introducing a number of new men from the lower classes.

(5) The memory of the power which had once belonged to the *populus Romanus* lingered in the part which the inhabitants of New Rome, and their representatives, played in acclaiming newly elected emperors, and in such ceremonies as coronations. In the 6th century the factions ("demes") of the circus, Blues and Greens, appear as political parties, distract the city by their quarrels, and break out in serious riots. On one occasion they shook the throne ("Nika" revolt, 532). The emperors finally quelled this element of disturbance by giving the factions a new organization, under "demarchs" and "democrats," and assigning them a definite quasi-political *locus standi* in the public ceremonies in the palace and the capital. The duty of providing *panem et circenses* was inherited from Old Rome; but the free distribution of bread cannot be traced beyond the 6th century (had the loss of the Egyptian granary to do with its cessation?), while the spectacles of the hippodrome lasted till the end. Outside the capital the people took little interest in politics, except when theology was concerned; and it may be said generally that it was mainly in the ecclesiastical sphere that public opinion among the masses, voiced by the clergy and monks, was an influence which made itself felt.

The court ceremonial of Constantinople, which forms such a market contrast to the ostentatiously simple establishments of Augustus and the Antonines, had in its origin a certain constitutional significance. It was introduced by Aurelian and Diocletian, not, we must suppose, from any personal love of display, but rather to dissociate the emperor from the army, at a time when the state had been shaken to its foundations by the predominance of the military element and the dependence of the emperor on the soldiers. It was the object of Diocletian to make him independent of all, with no more particular relation to the army than to any other element in the state; the royal court and the inaccessibility of the ruler were calculated to promote this object. The etiquette and ceremonies were greatly elaborated by Justinian, and were diligently maintained and developed. The public functions, which included processions through the streets to various sanctuaries of the city on the great feast-days of the Church, supplied entertainment of which the populace never wearied; and it did not escape the wit of the rulers that the splendid functions and solemn etiquette of the court were an effective means of impressing the imagination of foreigners, who constantly resorted to Constantinople from neighbouring kingdoms and dependencies, with the majesty and power of the Basileus.

The imperial *dignity* was collegial. There could be two or more emperors (*imperatores*, *βασιλεῖς*) at the same time; edicts were issued, public acts performed, in their joint names. Through the period of dualism, in the 4th and 5th centuries, when the administration of the Eastern provinces was generally separate from that of the Western, the imperial *authority* was also collegial. But after this period the system of divided authority came to an end and was never renewed. There was frequently more than one emperor, not only in the case of a father and his sons, or of two brothers, but also in the case of a minority, when a regent is elected emperor (Romanus I.; cf. Nicephorus II. and John Zimisces). But one colleague always exercised the sole authority, was the real monarch, the "great" or the "first" Basileus; the other or others were only sleeping partners. Under the Comneni a new nomenclature was introduced; a brother, *e.g.*, who before could have become the formal colleague of the ruler, received the title of *Sebastocrator* (Sebastos was the Greek equivalent of Augustus).

Legislation.—The history of the legislation of the Eastern Empire is distinguished by three epochs associated with the names of (1) Justinian, (2) Leo III., (3) Basil I. and Leo VI.

(1) The Justinianean legislation (see JUSTINIAN) is thoroughly Roman in spirit, and inspired by pious adhesion to the traditions of the past; but it admitted modifications of the older law in accordance with tendencies which had been long since making themselves felt: consideration is accorded to principles of humanity in the laws affecting persons, and to the principle of public interest in the laws relating to things. Justinian not only sanctioned changes which time had brought about, like the mitigation of the strict *patria potestas* and the greater independence of wives, but introduced a revolutionary change in the law of succession to property, abolishing inheritance by *agnatio* or relationship through males, and substituting inheritance by blood relationship whether through males or females.

(2) Justinian's reign was followed by a period in which juristic studies decayed. The seventh century, in which social order was profoundly disturbed, is a blank in legal history, and it would seem that the law of Justinian, though it had been rendered into Greek, almost ceased to be studied or understood. Practice at least was modified by principles in accord with the public opinion of Christian society and influenced by ecclesiastical canons. In a synod held at Constantinople in the reign of Justinian II. numerous rules were enacted, differing from the existing laws and based on ecclesiastical doctrine and Mosaic principles, and these were sanctioned as laws of the realm by the emperor. Thus Church influence and the decline of Roman tradition, in a state which had become predominantly Greek, determined the character of the ensuing legislative epoch under the auspices of Leo III., whose law book (A.D. 740), written in Greek, marks a new era and reflects the changed ideas of the community. Entitled a "Brief Selection of Laws" and generally known as the *Ecloga*, it may be described as a Christian law book. In regard to the *patria potestas* increased facilities are given for emancipation from paternal control when the son comes to years of discretion, and the parent is to a certain extent replaced by a *parental* control over minors. The law of guardianship is considerably modified. The laws of marriage are transformed under the influence of the Christian conception of matrimony; the institution of *concubinatus* is abolished. Impediments to marriage on account of consanguinity and of spiritual relationship are multiplied. While Justinian regarded marriage as a contract, and therefore, like any other contract, dissoluble at the pleasure of the parties, Leo III. accepted the Church view that it was an indissoluble bond. Ecclesiastical influence is written

large in the criminal law, of which a prominent feature is the substitution of mutilation of various kinds for the capital penalty. Death is retained for some crimes, such as murder and high treason; other offences were punished by amputation (of hand, nose, &c.). This system (justified by the passage in the New Testament, "If thine eye offend thee," &c.), though to modern notions barbaric, seemed a step in the direction of leniency; and it may be observed that the tendency to avoid capital punishment increased, and we are told that in the reign of John Comnenus it was never inflicted. (The same spirit, it may be noted, is apparent in the usual, though by no means invariable, practice of Byzantine emperors to render dethroned rivals or members of a deposed dynasty innocuous by depriving them of eyesight or forcing them to take monastic orders, instead of putting them to death.) The Church, which had its own system of penalties, exercised a great influence on the actual operation of criminal law, especially through the privilege of asylum (recognized by Justinian, but with many reserves and restrictions), which was granted to Christian churches and is admitted without exceptions in the *Ecloga*.

(3) The last period of legislative activity under Basil I. and Leo VI. represents a reaction, in a certain measure, against the *Ecloga* and a return to Justinian. The *Ecloga* had met practical needs, but the Isaurian and Phrygian emperors had done nothing to revive legal study. To do so was the aim of Basil, and the revival could only be based on Justinianean law books or their Greek representatives. These books were now treated somewhat as Justinian and his lawyers had treated their own predecessors. A handbook of extracts from the Institutes, Digest and Code was issued in 879 (ὁ πρόχειρος νόμος, "the law as it is"), to fulfil somewhat the same function as the Institutes. Then a collection of all the laws of the Empire was prepared by means of two commissions, and completed under Leo VI. It was entitled the *Basilika*. In many points (in civil, but not in criminal, law) the principles of the *Ecloga* are set aside in favour of the older jurisprudence. Thus the Justinianean ordinances on the subject of divorce were revived, and there remained henceforward a contradiction between the civil and the canon law.

After this there was no legislation on a grand scale; but there was a great revival of legal study under Constantine IX., who founded a new law-school, and there were many learned specialists who wrote important commentaries, such as John Xiphilin (11th century), Theodore Balsamon (12th century), Harmenopulos (14th century). The civil code of Moldavia (published 1816–17) is a codification of Byzantine law; and modern Greece, although in framing its code it took the Napoleonic for its model, professes theoretically to base its civil law on the edicts of the emperors as contained in the *Hexabiblos* of Harmenopulos.

Administration.—Three principles underlay the administrative reform of Diocletian: the separation of civil from military functions; the formation of small provincial units; and the scalar structure which deepened on the interposition of the vicar of a diocese and the praetorian prefect between the provincial governor and the emperor. This system lasted unchanged for three and a half centuries. The few unimportant alterations that were made were in harmony with its spirit, until the reign of Justinian, who introduced certain reforms that pointed in a new direction. We find him combining some of the small provinces into large units, undermining the scalar system by doing away with some of the dioceses and vicars, and placing in some cases military and civil authority in the same hands. The chief aim of Diocletian in his general reform had been to secure central control over the provincial governments; the object of Justinian in these particular reforms was to remedy corruption and oppression. These changes, some of which were soon cancelled, would hardly in themselves have led to a radical change; but they prepared the way for an administrative revolution, brought about by stress of external necessities. In the 7th century all the energies of the Empire, girt about by active enemies, were centred on war and defence; everything had to give way to military exigencies; and a new system was gradually introduced which led ultimately to the abolition of the old. The change began in Italy and Africa, at the end of the 6th century, where operations against the Lombards and the Berbers were impeded by the friction between the two co-ordinate military and civil authorities (masters of soldiers, and praetorian prefects). The military governors were made supreme with the title of *exarchs*, "viceroys"; the civil authority was subordinated to them in case of collision, otherwise remaining unaltered. The change is an index of the dangerous crisis through which these provinces were passing. In the East similar circumstances led to similar results. The Saracen danger hanging imminent over Asia Minor imposed a policy of the same kind. And so before the end of the 7th century we find the Empire divided into six great military provinces, three in Europe and three in Asia: (1) Exarchate of *Africa*, (2) Exarchate of *Italy*, (3) Strategia of *Thrace*, (4) County of *Opsikion* (=*obsequium*), including Bithynia, Honorias, Paphlagonia, parts of Hellespontus and Phrygia, (5) Strategia of the *Anatolikoi*, most of west and central Asia Minor, (6) Strategia of the *Armeniakoi*, eastern Asia Minor. In addition to these there was a naval circumscription, (7) the Strategia of the *Karabisiânoi* (from κάραβος, a vessel), including the southern coastland of Asia Minor, and the Aegean (see below under *Navy*).

The lands of the old prefecture of Illyricum were not included in the system, because this part of the Empire was then regarded as a lost position. On the contrary, here military powers were committed to the Prefect of Illyricum, whose actual sphere extended little beyond Thessalonica, which was surrounded by Slavonic tribes.

The Eastern changes, perhaps initiated by Heraclius, but probably due mainly to Constans II., did not interfere with the civil administration, except in so far as its heads were subordinated to the military commanders. But Leo III., who as a great administrative reformer ranks with Augustus and Diocletian, did away with the old system altogether. (1) Reversing Diocletian's principle, he combined military and civil powers in the same hands. The strategos or military commander became also a civil governor; his higher officers (turmarchs) were likewise civil functionaries. (2) The scalar principle disappeared, including both the vicars and the praetorian prefect of the East (some of whose functions were merged in those of the prefect of the city); no authority interposed between the strategoi and the emperor. (3) The new provinces, which were called *themes* (the name marks their military origin: *thĕma*=corps), resembled in size the provinces of Augustus, each including several of the Diocletian divisions. This third and last provincial reform has, like its predecessors, its own history. The list of themes in the 11th century is very different from that of the 8th. The changes were in one direction—the reduction of large provinces by cutting off parts to form smaller themes, a repetition of the process which reduced the provinces of Augustus. Hence the themes came to vary greatly in size and importance. Leo himself began the process by breaking up the Anatolic command into two themes (Anatolic and Thracesian). The principle of splitting up was carried out systematically by Leo VI. (who was also responsible for a new ecclesiastical division of the Empire).

The development will be exhibited by a list of the themes in the middle of the 10th century. A. Asia: {(1) Opsikion, (2) Optimaton, (3) Paphlagonia, (4) Bukellarian}=old Opsikion; {(5) Anatolic, (6) Thracesian, (7) Samos (naval), (8) Cappadocia, (9) Seleucia} =old Anatolic; {(10) Armeniac, (11) Colonea, (12) Sebastea, (13) Charsianon, (14) Chaldia, (15) Mesopotamia} =old Armeniac; (16) Cibyrrhaeot, (17) Aegean (=Dodekanesos). B. Europe: (1) Thrace, (2) Macedonia, (3) Strymon, (4) Thessalonica, (5) Hellas, (6) Peloponnesus, (7) Nicopolis, (8) Dyrrhachium, (9) Longibardia, (10) Cephallenia, (11) Cherson.

It is interesting to note that up to Leo VI. the district between Constantinople and the wall of Anastasius formed a separate theme or government, entitled the Wall (τὸ τειχίον) or the Ditch (ἡ τάφρος); Leo VI. united it with the theme of Thrace.

In the central administration, the general principles seem to have remained unchanged; the heads of the great administrative bureaux in Constantinople retain the *palatine* character which belonged to most of them from the beginning. But there were many changes in these offices, in their nomenclature and the delimitation of their functions. There are great differences between the administrative corps in the 5th, in the 10th and in the 15th centuries. We can hardly be wrong in conjecturing that, along with his provincial reform, Leo III. made a rearrangement of the central bureaux; the abolition of the Praetorian Prefecture of the East entailed, in itself, modifications. But minor changes were continually being made, and we may note the following tendencies: (1) Increase in the number of ministers directly responsible to the emperor, (*a*) subordinate offices in the bureaux being raised to the rank of independent ministries; (*b*) new offices being created and old ones becoming merely titular. (2) Changes in nomenclature; substitution of Greek for Latin titles. (3) Changes in the relative importance and rank of the high officials, both civil and military.

The Prefect of the City (ἔπαρχος) controlled the police organization and administration of justice in the capital; he was vice-president of the imperial court of justice, and, when the office of Prefect of the East was abolished, he inherited the functions of that dignitary as judge of appeals from the provinces. But the *praefectus vigilum*, commander of the city guards, who was subordinate to him, became an independent officer, entitled Drungary of the Watch, and in the 11th century superseded him as vice-president of the imperial court. We are told that in the last years of the Empire the Prefect of the City had no functions at all; but his office survives in the *Shehr-imaneti*, "city prefecture," of the Ottomans, in whose organization there are many traces of Byzantine influence.

Instead of the Quaestor of the Sacred Palace, whose duty was to draft the imperial laws and rescripts, we find in the 9th century a quaestor who possesses certain judicial and police functions and is far lower in the hierarchy of rank. It has been supposed that the later quaestor really inherited the duties of another officer, the *quaesitor*, who was instituted by Justinian. In the latest period the quaestor, if he still existed as a name, had no functions.

The Master of Offices, who supervised the bureaux in the palace and was master of court ceremonies, also performed many functions of a minister of foreign affairs, was head of the imperial post (*cursus*), and of the corps of *agentes in rebus* or Imperial Messengers. This ministry disappeared, probably in the 8th century, but the title was retained as a dignity at all events till the end of the 9th. The most important functions, pertaining to foreign affairs, were henceforward performed by the Logothete of the Post (λογοθέτης τοῦ δρόμου). In the 12th century this minister was virtually the chancellor of the Empire; his title was changed to that of Great Logothete by Andronicus II.

The two financial ministers, *comes sacrarum largitionum* and *comes rei privatae*, continued to the end under the titles λογοθέτης τοῦ γενικοῦ (General Logothete) and ὁ ἐπὶ τοῦ ἰδικοῦ (Anastasius added a third, the Count of the Sacred Patrimony, but he was afterwards suppressed). But in the 9th century we find both these ministers inferior in rank to the *Sacellarius*, or private pursekeeper of the emperor. Besides these there was a fourth important financial department, that of the military treasury, under a Logothete.

The employment of eunuchs as high ministers of state was a feature of the Byzantine Empire from the end of the 4th century. It is laid down as a principle (A.D. 900) that all offices are open to them, except the Prefecture of the City, the quaestorship, and the military posts which were held by "Domestics." There were then eight high posts which could only be held by eunuchs, of which the chief were the parakoimōmenos and the protovestiarios (master of the wardrobe).

An emperor who had not the brains or energy to direct the affairs of the state himself, necessarily committed the task of guiding the helm to some particular minister or court dignitary who had gained his confidence. Such a position of power was outside the constitution, and was not associated with any particular office; it might be held by an ecclesiastic or a eunuch; it had been held by the eunuchs Eutropius and Chrysaphius in the reigns of Arcadius and Theodosius II. respectively. In later times, such a first minister came to be denoted by a technical term, ὁ παραδυναστεύων. This was the position, for instance, of Stylianus, the father-in-law of Leo VI. Most of the emperors between Basil II. and Alexius Comnenus were under the influence of such ministers.

The orders of rank (which must be distinguished from titles of office) were considerably increased in later times. In the 4th and 7th centuries there were the three great classes of the *illustres*, *spectabiles* and *clarissimi*; and above the *illustres* a small, higher class of patricians. In the 9th century we find an entirely different system; the number of classes being largely augmented, and the nomenclature different. Instead of epithets like *illustres*, the names are titles which had designated offices; "patrician" alone survives. The highest rank is now (1) the magistroi; then come the patricians in two classes: (2) proconsular patricians, (3) respectable patricians; below these (4) protospatharioi; (5) dishypatoi (=*bis consules*); (6) spatharokandidatoi; (7) spatharioi; and other lower ranks. Particular ranks do not seem now to have been inalienably attached to particular offices. The strategos of the Anatolic Theme, *e.g.*, might be a patrician or only a protospathar. Whoever was promoted to one of these ranks received its insignia from the emperor's hand, and had to pay fixed fees to various officials, especially to the palace eunuchs

In the provinces ordinary justice was administered by judges (κριταί) who were distinct from the governors of the themes, and inherited their functions from the old provincial governors of Diocletian's system. In Constantinople higher and lower courts of justice sat regularly and frequently. The higher tribunals were those of the Prefect and the Quaestor, before whom different kinds of cases came. Appeals reached the emperor through the bureau of Petitions (τῶν δεησέων); he might deal with the case immediately; or might refer it to the imperial court of appeal, of which he was president; or else to the special court of the Twelve Divine Judges (θεῖοι δικασταί), which was instituted by Justinian.

While the administration of justice was one of the best features of the Eastern Empire, its fiscal system, likewise inherited from the early Empire, was one of its worst. If the government had been acquainted with the principles of public economy, which have not been studied till comparatively recent times, a larger revenue might have been raised without injuring the prosperity of the inhabitants. Taxes were injudiciously imposed and oppressively collected. The commerce of the Empire was one of its great sources of strength, but the government looked on the merchants as a class from which the utmost should be extorted. The chief source of revenue was the land. The main burdens which fell upon the landed proprietors throughout the whole period were the land tax proper and the *annona*. The land tax (*capitatio terrena*=the old *tributum* of the imperial, *stipendium* of the senatorial, provinces) was based, not on the yearly produce, but on the capital of the proprietor, the character and value of the land being taken into account. In later times this seems to have become the καπνικόν, or hearth tax. The *annona* was an additional impost for supporting the army and imperial officials; it was originally paid in produce. In later times, we meet it under the name of σιταρκία or συνωνή. The province was divided into fiscal districts, and the total revenue to be derived from each was entered in a book of assessment. The assessment was in early times revised every fifteen years (the "indiction" period), but subsequently such revisions seem to have been very irregular. The collection of the taxes was managed through the curial system, while it lasted (till 7th century?). The decurions, or municipal councillors, of the chief town in each district were responsible for collecting and delivering the whole amount, and had to make good the sums owed by defaulters. This system of collective responsibility pressed very heavily on the decurions, and helped to cause their decay in the Western provinces. After the abolition of the curial organization, the principle of collective responsibility remained in the form of the ἐπιβολή or additional charge; that is, if a property was left without an owner, the taxes for which it was liable became an extra charge on the other members of the district (οἱ ὁμόκηνσοι). The taxes were collected by *praktores*, who were under the General Logothete. The peasant proprietors were also liable to burdens of other kinds (corvées), of which the most important was the furnishing of horses, vehicles, postboys, &c., for the state post (see ANGARIA).

The history of landed property and agrarian conditions in the Eastern Empire still awaits a thorough examination. It may be noted that individual hereditary proprietorship was always the rule (on crown and monastic lands as well as in other cases), and that the commonly supposed extensive existence of communities possessing land in common is based on erroneous interpretation of documents. When imperial lands were granted to monasteries or as fiefs (πρόνοιαι) to individuals, the position and rights of the peasant proprietors on the estates were not changed, but in many cases the imposts were paid to the new master instead of to the fisc. In the 4th, 5th and 6th centuries the cultivators were attached to the soil (*coloni, ascripticii*; see SERFDOM), in the interests of the fiscus; it has been supposed, on insufficient grounds, that this serfdom was abolished for a time by Leo III., though it is probable that the condition of the peasants was largely changed by the invasions of the 7th century. In any case the system of compulsory attachment of peasants to their lands remained in force, and the class of adscripticii (ἐναπόγραφοι) existed till the latest times. The chief sources for agrarian conditions are, besides the imperial laws, monastic records, among which may be mentioned as specially valuable those of the Monastery of Lemboi near Smyrna.

Army and Navy.—The general principle of the military defence of the Empire in the 4th century consisted in large forces stationary on the frontiers, and reserve forces, stationed in the interior provinces, which could be moved to any point that was in danger. Thus the army was composed of (1) the *limitanei*, frontier-troops (under *duces*), and (2) reserve forces (under *magistri militum*) of two denominations, (*a*) *palatini* and (*b*) *comitatenses*. The limitanei were the more numerous; it has been estimated that if they numbered about 350,000, the comitatenses and palatini together amounted to less than 200,000. It is to be noted that for the old legion of 6000 men a smaller legion of 1000 had been substituted, and that the proportion of cavalry to infantry was small. In the 6th century the fundamental principles of the system were the same; but the cavalry had become a much more important branch of the service, and in the wars of Belisarius the *foederati*, barbarian mercenaries of various races, commanded by their own chiefs, played a great rôle. The peasants of Illyria and Thrace, the mountaineers of southern Asia Minor still supply an important part of the army, but the number of barbarians (Heruli, Vandals, Goths, Slavs, Arabs, &c.) is much larger. Solidity and a corresponding want of mobility characterized at this time both cavalry and infantry; their great merit was straight and rapid shooting: Belisarius ascribed his success in Italy to the excellence of the archery. It is remarkable with what small forces (not more than 25,000) the first conquest of Italy was achieved, though Belisarius was far from being a military genius and the discipline in his army was flagrantly defective.

Frontier Defence.— Justinian carried out on the frontiers and in the exposed provinces a carefully devised and expensive system of defensive works. Fortified towns along the *limes* were connected by intervening forts, and at some distance behind was a second line of more important fortresses more strongly garrisoned, which furnished both a second barrier and places of refuge for the inhabitants of the open country. There was an elaborate system of signals by which the garrisons of the front stations could announce not only the imminence of a hostile invasion, but the number and character of the enemy. In North Africa there are abundant remains of the forts of the 6th and 7th centuries, displaying the military architecture of the period and the general frontier system. The typical fortress had three defences: the wall flanked by square towers of three storeys; at a few yards' distance a second wall of stone; and outside a deep foss about 20 yds. wide, with vertical sides, filled with water, and along its edge a rampart of earth.

We have already seen how the disasters and losses of the 7th century led to a radical change in the military organization, and how the Empire was divided into themes. The preponderant influence which Asia Minor won and retained till the 11th century is reflected in the military establishment, which mainly depended on the Asiatic provinces. The *strategos* of a large theme commanded a corps of 10,000 and the scheme of the divisions and subordinate commands has a remarkable resemblance to the organization of some of the armies of modern Europe.

The recorded scheme was probably not uniform in all the themes, and varied at different periods. The *Thĕma* (corps) consisted of 2 *turmai* (brigades) under *turmarchai*; the turma of 5 *banda* (regiments), each under a *drungarios* (colonel); the bandon of 5 *pentarkhiai* (companies) under a *komētes* (captain). The pentarkhia, containing 200 men, had 5 subdivisions under *pentekontarkhai* (lieutenants); and there was a smaller unit of ten men under the *dekarkhes* (corporal). The total strength in the 9th century was 120,000; in Justinian's time it was reckoned at 150,000.

Distinct from the military forces (θέματα) of the provinces were the forces (τάγματα) stationed in or near the capital. The most important of these were the Scholae and the Excubitores. The Scholarian troops were in early times under the Master of Offices, but subsequently their chief officer, the Domestic of the Schools, became the highest military commander in the Empire next to the Strategos of the Anatolic Theme. In war, when the emperor did not assume the chief command himself, he might entrust it to any commander, and he often entrusted it to the Domestic. In the 11th century, after the conquest of Bulgaria, there were two Domestics, one for the east and one for the west, and under Alexius Comnenus the Domestic of the west received the title Great Domestic. Under the Palaeologi the Great Domestic was superior in rank to all other ministers.

Besides the Scholarians, and the Excubitores (who had been organized in the 5th century), there were the regiments of the Hikanatoi, the Arithmos and the Numeroi. The Numeroi were foot-soldiers. The Optimatoi, also infantry, properly belonged to the same category, though they were constituted as a theme. It is to be observed that the demes or corporations of Constantinople were partly organized as militia, and were available for purposes of defence.

The great difference between this Byzantine army and that of the earlier Empire is that its strength (like that of the feudal armies of the West) lay entirely in cavalry, which the successors of Heraclius and the Isaurian emperors developed to great perfection. The few contingents of foot were quite subsidiary. The army was free from the want of discipline which was so notable in the 6th century; it was maintained in Asia Minor, which was the great recruiting ground, by a system of military holdings of land (an extension of the old Roman system of assigning lands in the frontier districts to federate barbarians and to veterans). The conditions of the marauding expeditions and guerilla warfare, continuously carried on against and by the Saracens in the 8th, 9th and 10th centuries, were carefully studied by generals and tacticians, and we possess the theory of the Byzantine methods in a treatise composed by the emperor Nicephorus Phocas, and edited by one of his pupils. Every detail of an inroad into Saracen territory is regulated.

In the 8th and 9th centuries there was a system of signals by which an approaching Saracen incursion was announced to Constantinople from the Cilician frontier. The news was flashed across Asia Minor by eight beacon fires. The first beacon was at Lulon (which commanded the pass between Tyana and the Cilician gates), the last on Mt. Auxentius in Bithynia. When this fire appeared, a light was kindled in the pharos of the imperial palace at Constantinople. The system was discontinued in the reign of Michael III., probably after the capture of Lulon by the enemy in 860, and was not renewed, though Lulon was recovered in 877. It should be noted that this famous telegraphic system was only an application on a large scale of the frontier signalling referred to above.

The loss of a great part of Asia Minor to the Seljuks, and the disorganization of the provinces which they did not acquire, seriously weakened the army, and the emperors had recourse more and more to foreign mercenaries and barbarian auxiliaries. The employment of Scandinavians had begun in the 10th century, and in 988 was formed the Varangian guard, consisting chiefly of English adventurers. In the arsenal of Venice are two lions, which were transported from the Peiraeus, inscribed with obscure Runic characters, carved perhaps by Scandinavians in the army of Basil II. Under Michael IV. the famous Norwegian prince Harald Hardrada (described by a Greek writer as "Araltes, son of the king of Varangia") fought for the Empire in Sicily and in Bulgaria. But in the latter part of the 11th century foreign mercenaries greatly increased in numbers and importance.

The note of the Byzantine army was efficiency, and nowhere is the immeasurable superiority of the civilization of the Eastern Empire to the contemporary states of Europe more apparent. The theory of military science was always studied and taught; constant practice, interpreting and correcting theories, safeguarded it against pedantry; and a class of magnificent staff officers were trained, who in the 10th century were the terror of the enemy. The particular tactics of the various foes whom they had to face were critically studied. We have a series of military text-books, from the time of Anastasius I. to that of Basil II., in which we can learn their principles and methods. In this army there was plenty of courage, and distinct professional pride, but no love of fighting for fighting's sake, nor the spirit which in western Europe developed into chivalry. The Byzantines despised such ideas as characteristic of barbarians who had physical strength and no brains. The object of a good general, as Leo VI. shows in his important treatise on Tactics, was in their opinion not to win a great battle, but to attain success without the risks and losses of a great battle. The same author criticizes the military character of the Franks. Paying a tribute to their fearlessness, he points out their want of discipline, the haphazard nature of their array and order of battle, their eagerness to attack before the word was given, their want of faculty for strategy or tactical combinations, their incapacity for operations on difficult ground, the ease with which they could be deceived by simple artifices, their carelessness in pitching camps, and their lack of a proper intelligence department. These criticisms, borne out by all we know of feudal warfare, illustrate the contrast between a western host, with its three great "battles," rushing headlong at the foe, and the Byzantine army, with its large number of small units, co-operating in perfect harmony, under a commander who had been trained in military science, had a definite plan in his head, and could rely on all his subordinates for strict and intelligent obedience.

Under the early Empire, as Rome had no rival in the Mediterranean, it was natural that the navy and naval theory should be neglected. When Constantine the Great decided to besiege Byzantium by sea, both he and his opponent Licinius had to create fleets for the struggle. Even when the Vandals in Africa made transmarine conquests and became a naval power, the Romans did not seriously address themselves to building an efficient navy and securing their own thalassocracy; the Vandals harried their coasts; their expeditions against Africa failed. And even when the Vandal power was in its decline and Belisarius set forth on his successful expedition of conquest, his fears for the safety of his squadron in case he should be attacked at sea allow us to suspect that the fleet of the enemy was superior to the Roman. The conquest of Africa secured for Justinian the undisputed command of the Mediterranean, but he did nothing for the naval establishment. It was not till the Saracens, aspiring to conquer all the Mediterranean coastlands, became a naval power that the Roman Empire was forced, in a struggle for its being, to organize an efficient fleet. This, as we saw, was the work of Constans II., and we saw what it achieved. In this first period (*c.* 650-720) the naval forces, designated as the *Karabisianoi*, were placed under the command of an admiral, with title of *strategos*. They consisted of two geographical divisions, each under a drungarios: the province of the Cibyrrhaeots (probably named from the smaller Cibyra in Pamphylia) which included the southern coast districts of Asia Minor, and the Aegean province, which embraced the islands and part of the west coast of Asia Minor. The former was the more important; the marines of this province were the hardy descendants of the pirates, whose subjugation had taxed the resources of the Roman government in the last years of the Republic. It was a new principle to impose the burden of naval defence on the coast and island districts. Distinct from these fleets, and probably organized on a different principle, was the naval contingent stationed at Constantinople. Leo III. changed the naval administration, abolishing the supreme command, and making the Cibyrrhaeot and Aegean provinces separate independent themes under *strategoi*. The change was due to two motives. There was a danger lest a commander of the whole navy should become over powerful (indicated in the political rôle played by the navy before Leo's accession); but apart from this, the general reform of Leo, which united civil and military powers in the same hands, naturally placed the commanders of the two branches of the navy on a new footing, by making them provincial governors. In this and the following reigns, the tendency was to neglect the fleet; the interest of the government was concentrated on the army. For a time this policy was prosecuted with impunity, since the Omayyad dynasty was growing weak, and then under the Abbasids, who transferred the capital from Damascus to Bagdad, the sea-power of the caliphate declined. But the neglect of the fleet was avenged in the 9th century, when Crete and Sicily were wrested from the Empire, the loss of south Italy was imminent, and Moslem squadrons sailed in the Adriatic,—losses and dangers which led to a reorganization of the navy under Basil I. and Leo VI. After this reform we find the navy consisting of two main contingents: the imperial fleet (stationed at Constantinople), and the provincial fleets, three in number, of (*a*) Cibyrrhaeot theme, (*b*) Aegean theme, (*c*) theme of Samos. A small distinct contingent was supplied by the Mardaites who, natives of Mt. Lebanon, had been transplanted (partly to Pamphylia, partly to Epirus, the Ionian Islands, and Peloponnesus). The imperial fleet seems to have consisted of about 100 warships manned by 23,000 marines (the same men fought and rowed); the provincial fleets of 77 warships manned by 17,000. When the fleets acted together, the admiral in supreme command for the time was called the "drungarios of the naval forces." The warships (δρόμωνες, "dromonds") were mainly biremes, but there were also uniremes, built for speed, called "galleys" (γαλαῖαι). Pyrotechnic was an important department in the naval establishment; the manufacture of the terrible explosive known as *liquid* or *marine fire* (see GREEK FIRE) was carefully guarded as a state secret.

The navy, active and efficient in the 10th century, is described by a military and therefore unprejudiced officer of the 11th as the glory of Romania. But towards the end of the 11th century it declined, the main cause being the disorganization of the naval provinces of Asia Minor, which, as we saw, was a result of the Seljuk conquest of the interior. This decline had important indirect consequences; it led to the dependence of the Empire on the Venetian navy in the struggle with the Norman power, and for this help Venice exacted commercial privileges which injured Byzantine commerce and opened the door to the preponderant influences of the Venetians in eastern trade. In the period of the Palaeologi the imperial navy, though small, was active; and the importance which it possessed for the state is illustrated by the high rank at court which the admiral (who in the 11th century had received the title of Great Duke, μέγας δούξ) then occupied; the only minister who was superior to him was the Great Domestic.

Diplomacy.—In protecting the state against the barbarians who surrounded it, diplomacy was a weapon as important in the eyes of the Byzantine government as soldiers or fortifications. The peace on the frontiers was maintained not only by strong military defences, but by more or less skilful management of the frontier peoples. In the later Empire this kind of diplomacy, which we may define as the *science of managing the barbarians*, was practised as a fine art; its full development was due to Justinian. Its methods fall under three general heads. (1) One people was kept in check by means of another. The imperial government fomented rivalry and hatred among them. Thus Justinian kept the Gepidae in check by the Lombards, the Kuturgurs by the Utigurs, the Huns by the Avars. (2) Subsidies were given to the peoples on the frontiers, in return for which they undertook to defend the frontier adjacent to them, and to supply fighting men when called upon to do so. The chiefs received honours and decorations. Thus the Berber chiefs on the African border received a staff of silver, encrusted with gold, a silver diadem, white cloak, embroidered tunic, &c. More important potentates were invested with a costlier dress. In these investitures precedence was carefully observed. The chiefs thus received a definite position in the Empire, and the rich robes, with the ceremony, appealed to their vanity. In some cases they were admitted to posts in the official hierarchy,—being created Patricians, Masters of soldiers, &c. They were extremely fond of such honours, and considered themselves half-Romans. Another mode of winning influence was to marry barbarian princes to Roman wives, and rear their sons in the luxury of the palace. Dissatisfied pretenders, defeated candidates for kingship, were welcomed at Constantinople. Thus there were generally some princes, thoroughly under Byzantine influence, who at a favourable opportunity could be imposed on their compatriots. Throughout Justinian's reign there was a constant influx of foreign potentates to Constantinople, and he overwhelmed them with attentions, pompous ceremonies and valuable presents. (3) Both these methods were already familiar to the Roman government, although Justinian employed them far more extensively and systematically than any of his predecessors. The third method was new and characteristic. The close connexion of religion and politics at Constantinople prepares us to find that Christian propaganda should go hand-in-hand with conquest, and that the missionary should co-operate with the soldier. The missionary proved an excellent agent. The typical procedure is as follows. In the land which he undertakes to convert, the missionary endeavours to gain the confidence of the king and influential persons, and makes it a special object to enlist the sympathies of the women. If the king hesitates, it is suggested that he should visit New Rome. The attraction of this idea is irresistible, and when he comes to the capital, the pomp of his reception, the honours shown him by the emperor, and the splendour of the religious ceremonies overcome his last scruples. Thenceforward imperial influence is predominant in his dominion; priests become his advisers; a bishop is consecrated, dependent on the patriarch of Constantinople; and the barbarians are transformed by the penetration of Byzantine ideas. By the application of these various means, Justinian established Roman influence in Nubia, Ethiopia and South Arabia, in the Caucasian regions, and on the coast of the Euxine. The conversion of the Lazi (of Colchis) was specially notable, and that of the Sabiri, who were politically important because they commanded the eastern pass of the Caucasus known as the Caspian Gates. It will be observed that the great prestige of the Empire was one of the conditions of the success of this policy.

The policy had, of course, its dangers, and was severely criticized by one of Justinian's contemporaries, the historian Procopius. Concessions encouraged greater demands; the riches of the Empire were revealed. It was a system, of course, which could not be permanently successful without military power behind it, and of course it was not infallible; but in principle it was well-founded, and proved of immeasurable value. Less prejudiced writers than Procopius fully admit the far-sightedness and dexterity of the emperor in his diplomatic activity. A full account of it will be found in Diehl's *Justinien*.

In the 10th century we have again the means of observing how the government conducted its foreign policy on carefully thought out principles. The Empire was then exposed to constant danger from Bulgaria, to inroads of the Magyars, and to attacks of the Russians. The key to the diplomatic system, designed to meet these dangers, was the cultivation of friendly relations with the Petchenegs, who did not menace the provinces either by land or sea and could be incited to act against Russians, Bulgarians or Magyars. The system is explained in the treatise (known as *De administrando imperio*) composed by the emperor Constantine Porphyrogennetos (*c.* 950). The series of these northern states was completed by the kingdom of the Khazars (between the Caucasus and the Don), with which the Empire had been in relation since the time of Heraclius, who, to win its co-operation against Persia, promised his daughter in marriage to the king. Afterwards the Khazars gave two empresses to New Rome (the wives of Justinian II. and Constantine V.). Their almost civilized state steered skilfully between the contending influences of Islam and Christianity, and its kings adopted the curious means of avoiding suspicion of partiality for either creed by embracing the neutral religion of the Jews. Commercial and political relations with the Khazars were maintained through the important outpost of the Empire at Cherson in the Crimea, which had been allowed to retain its republican constitution under a president (*πρωτεύων*) and municipal board (*ἄρχοντες*), though this freedom was limited by the appointment of a *strategos* in 833, a moment at which the Khazars were seriously threatened by the Petchenegs. The danger to be feared from the Khazars was an attack upon Cherson, and it seems probable that this was a leading consideration with Leo III. when he wedded his son Constantine V. to a Khazar princess. In the 9th century it was an object of the government to maintain the Khazars (whose army consisted mainly of mercenaries) against the Petchenegs; and hence, if it should become necessary to hold the Khazars in check, the principle was to incite against them not the Petchenegs, but other less powerful neighbours, the Alans of the Caucasus, and the people of "Black Bulgaria" on the middle Volga (a state which survived till the Mongol conquest).

For this systematic diplomacy it was necessary to collect information about the peoples whom it concerned. The ambassadors sent to the homes of barbarous peoples reported everything of interest they could discover. We owe to Priscus a famous graphic account of the embassy which he accompanied to the court of Attila. We possess an account of an embassy sent to the Turks in Central Asia in the second half of the 6th century, derived from an official report. Peter the Patrician in Justinian's reign drew up careful reports of his embassies to the Persian court. When foreign envoys came to Constantinople, information was elicited from them as to the history and domestic politics of their own countries. It can be shown that some of the accounts of the history and customs of neighbouring peoples, stored in the treatise of Constantine Porphyrogennetos referred to above (furnishing numerous facts not to be found anywhere else), were derived from barbarian ambassadors who visited Constantinople, and taken down by the imperial secretaries. We may conjecture with some probability that the famous system of the *Relazioni*, which the Venetian government required from its ambassadors, goes back originally to Byzantine influence.

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(J. B. B.)

ROMANES, GEORGE JOHN (1848–1894), British biologist, was born at Kingston, Canada, on the 20th of May 1848, being the third son of the Rev. George Romanes, D.D., professor of Greek at the university of that town. He was educated in England, going in 1867 to Gonville and Caius College, Cambridge. He early formed an intimate friendship with Charles Darwin, whose theories he did much during his life to popularize and support. When studying under Sir J. Burdon Sanderson at University College, London, in 1874–76, he began a series of researches on the nervous and locomotor systems of the Medusae and Echinodermata, which provided him with material for his Croonian lecture in 1876. Subsequently he continued the inquiry, partly in conjunction with Professor J. Cossar Ewart, and the results were published in *Jelly-fish, Star-fish, and Sea-urchins* (1885). Meantime he had been also devoting his attention to broader problems of biology. In 1881 he published *Animal Intelligence*, and in 1883 *Mental Evolution in Animals*, in which he traced the parallel development of intelligence in the animal world and in man. He followed up this line of argument in 1888 with *Mental Evolution in Man*, in which he maintained the essential similarity of the reasoning processes in the higher animals and in man, the highest of all. In 1892 he brought out an *Examination of Weismannism*, in which he upheld the theory of the hereditability of acquired characters. In 1890 he left London and settled at Oxford, where he founded a lecture similar to the "Rede" of Cambridge, to be delivered annually on a scientific or literary topic. In 1893 he published the first part of *Darwin and after Darwin*, a work dealing with the development of the theory of organic evolution, and based on lectures, which he delivered as Fullerian professor of physiology at the Royal Institution in 1888–91; a second part appeared in 1895 after his death, which occurred at Oxford on the 23rd of May 1894.

Romanes was awarded the Burney prize at Cambridge in 1873 for an essay on "Christian Prayer and General Laws." Five years later, under the pseudonym "Physicus," he issued *A Candid Examination of Theism*, in which he showed himself out of accord with orthodox religious beliefs. In 1882 he published an article on the "Fallacy of Materialism," and in his Rede lecture of 1885 he appeared as a monist. Subsequently his views again changed in the direction of orthodoxy, as is shown by his *Thoughts on Religion*, written shortly before his death and published in 1895.

His *Life and Letters*, by his widow, appeared in 1896.

ROMANIN, SAMUELE (1808–1861), Venetian historian, was born of a poor Jewish family at Trieste. Being left an orphan at an early age, he provided for his younger brothers and sister by giving French and German lessons. In 1821 he settled in Venice, where he afterwards translated Hammer-Purgstall's *Geschichte des osmanischen Reiches* into Italian. He next published his own *Storia dei Popoli Europei* (Venice, 1843–44). He taught in a private school and was sworn interpreter in German to the courts of justice; on the expulsion of the Austrians in 1848 he was appointed professor of history by the provisional government, and he lectured on Venetian history at the Ateneo Veneto. In 1852 he began to publish his monumental *Storia documentata di Venezia*, but although he finished the work, carrying it down to the fall of the republic in 1798, he did not live to see the publication completed, as he died of apoplexy on the 9th of September 1861; among his papers were found all the documents which were to be added, and the index. The tenth and last volume was issued in 1861.

After Romanin's death his lectures on Venetian history were published in two volumes (Florence, 1875). Among his minor works we may mention: *Gli Inquisitori di Stato di Venezia* (Venice, 1858), *Bajamonte Tiepolo e le sue ultime vicende* (Venice, 1851), and *Venezia nel 1789* (Venice, 1860).

ROMAN LAW.[1] The term "Roman law" is indefinite and ambiguous, being used in more than one sense. First, in a wide sense, it comprehends the totality of the laws of the Roman state, which were observed by its subjects during about thirteen centuries, from Romulus to Justinian. In a second and stricter meaning it indicates the law as consolidated by Justinian or, in other words, the law contained in the *Corpus Juris Civilis*, which is the name that has been given since the 16th century to Justinian's legislative works as a whole, and distinguishes them from the *Corpus Juris Canonici*. In this acceptation it is equivalent to, and is often called, "civil law" as contrasted with canon law. In a third and loose sense Roman law embraces, in addition to the *Corpus Juris*, the interpretations of it after Justinian by medieval and modern courts, jurists and commentators adapting it to the customs and laws of their own countries and times. The German expression, for example, *modernes* (or *heutiges*) *römisches Recht*, indicates the Roman law as it was applied in Germany in modern times. Such medieval and modern interpretation, however, is also sometimes expressed, in English usage at least, by the term "civil law" as contrasted with native or common law; writers in this field being usually styled civilians rather than Romanists. It is to the Roman law in the first of the above-mentioned three significations that the present article is devoted.

Necessity for historic treatment.

To give a proper sketch of Roman law it must be treated historically. Nearly all systems of positive law are the product more or less of an historic development, but the Roman has this great advantage over other systems, that it was at all times a homogeneous body complete in itself. For the Romans were comparatively little indebted to other peoples for their jurisprudence, and, when they did borrow legal ideas and institutions from others, they generally transformed or modified these in adapting them to their own native system, so that they became substantially Roman. Moreover, the various stages of progress of the law from its genesis to its maturity and ultimate consolidation can be traced in unbroken continuity. Beginning in 753 B.C., the traditionally accepted date of the foundation of Rome, it continued its course till the death of Justinian in A.D. 565. Allowing for the first three centuries being without historic evidence, we have at least an authenticated evolution of about 1000 years. Of no other system of law, ancient or modern, can anything like the same thing be said.

As to the proper method of historic treatment there have been different opinions. Without going into these, it is enough to say that the subject may be treated from two sides, viz. on the one side in relation to the external sources of the law, including therein the political and social conditions and the various constitutional changes at different periods affecting the development of the law, as well as the modes in which the law manifested itself and the legal literature from which our knowledge of it is derived; on the other side it may be treated in relation to the several departments or institutions of the law in view of their development or changes through time or circumstance, such as marriage, slavery, property, and so forth. This corresponds to what Leibnitz described as *external* and *internal* history respectively, terms which are now rather out of vogue. Of course it is possible to treat the historic sources of the law, constitutional and literary, independently of the doctrines, and this is now often done; but unless both are discussed the field of Roman law is not covered. Both the external and the internal history, however, may be treated together or in a measure interwoven, and it is in this way that the subject is treated in the following pages. But constitutional events affecting the law are only noticed very summarily, details about these being given in separate articles.

Modern writers on the history of the Roman law have as a rule, for the purpose of systematic treatment, divided the subject into definite historic periods. Gibbon, in the 44th chapter of his *Decline and Fall of the Roman Empire*, seems to have been the first to suggest this mode of treatment, though the particular periods of division he selected (being based on an artificial symmetry of about three hundred years each) are not satisfactory.[2] In the present article, the division made by Muirhead in his article in the 9th edition of this Encyclopaedia into five historic epochs has been left unaltered. These are: (1) the regal period; (2) the *jus civile*, representing the period from the establishment of the Republic until the subjugation of central and southern Italy; (3) the *jus gentium* and *jus honorarium*, representing the latter half of the Republic; (4) the *jus naturale* and maturity of Roman jurisprudence, representing the period of the Empire until the beginning of the reign of Diocletian; (5) the period of codification, *i.e.* from Diocletian to Justinian. Not that there is any sharp or fundamental division between these or, indeed, between any historic epochs. The law is a unity: it has its roots in the past and grows with the nation itself, and, like it, decays; there is no break in its continuity. The division is made merely for convenient treatment of the subject.

Division into historic epochs.

It must be kept in view that our knowledge of Roman customs and laws earlier than the XII. Tables and even for some time after them cannot be based on strict historical evidence; it is almost entirely traditional and conjectural, and different writers will take different views according to the relative value they place upon this or that piece of presumptive evidence.

It is only the private law that is dealt with in the present article.

I. The Regal Period

i. *The People and the Law.*

The Beginnings of the State.—The early Romans were not different from other Indo-European communities in their essential characteristics. The tribe, the clan, the family, the individual: each of these appears in course of development prior to the XII. Tables. Putting aside much of the traditional accounts of Livy, Dionysius, and other ancient historians, regarding the foundation of Rome and its early political and social life, as mythical, modern critical historians are none the less agreed that in the earliest period of their existence as a settled community the Romans were subjected to the government of a king (*rex*), with a council of elders (*senatus*) and an assembly of burghers (*comitia curiata*).

It used to be a somewhat common opinion that the primitive Romans were a sort of amalgam of three different races—Latin, Sabine and Etruscan. This opinion is mainly based upon the tradition that the state was originally formed by a union of three tribes called Ramnes, Tities and Luceres; the Ramnes being of the Latin race, the Tities of the Sabine and the Luceres of the Etruscan. Attempts have even been made to find in the Roman laws and institutions traces of the influence of each of these races, and especially of the first two—*patria potestas* and *manus*, for example, being attributed to the Latin or dominant race; adoption and confarreation to the Sabine; forms and ceremonial (such as lictors, fasces, &c.) to the Etruscan.[3] But this attractive theory of a union of three races, apart from the suspicion of a symbolic trichotomy (*tres tribus*) due to later times, is based on no substantial evidence;[4] many of the institutions attributed to the Sabines and Etruscans were, as Mommsen and others have shown, common to all peoples of Greek-Italian stock, and could not be strange to the Latins. We must hold that the Romans were essentially a Latin race, though influenced by a considerable admixture with Sabine and, to a lesser degree, Etruscan races (see ROME).

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[1] This article represents a recast of the article contributed to the 9th edition of the *Encyclopaedia* by the late Professor Muirhead. A large part of that article has been retained by the present writer, and the plan of arrangement, though altered in some respects, has been adhered to in the main.

[2] See as to historic epochs Muirhead, *Hist. Introd. to the Law of Rome* (2nd ed. by Goudy, 1899), p. 421.

[3] See Muirhead, *Historical Introduction* (2nd ed., 1899), pp. 3–5, and authorities there cited.

[4] Some writers deny the existence of the tribes altogether, but this goes too far. See Bruns-Lenel in Holtzendorff's *Encyklopädie d. Rechtswissenschaft*, i. p. 86ⁿ.

Divisions of the people.

Patricians, Clients and Plebeians.—But whatever their ethnographic descent, it is pretty certain that the Roman civitas was in the earliest period an organization that was patriarchal in its essence, but in which there was to be distinguished, on the one hand, a dominant class enjoying all the rights of citizenship, and, on the other, a semi-servile or quasi-vassal class excluded from such rights. The former class were called *patricii* or *Quirites*;[1] the latter were called *clientes* and (later) *plebeii*.

Patricians.

Patricians.—There was part of the law of Rome that even in the Empire was known by the name of *jus Quiritium*, and this in the regal period was the only law. The patricians at first were the *Quirites*, and prior at least to the time of Servius Tullius they alone enjoyed rights under this law. From their number the council of elders was selected; they alone could take part in the curiate comitia; they alone could contract a lawful marriage and make a testament; in a word, all the peculiar institutions of early Rome were for their benefit alone.

The gentes.

But these rights and prerogatives they enjoyed as members of *gentes* or clans, the clans being aggregations of families bearing a common name and theoretically at least tracing their descent from a common ancestor. These clans, of which there were normally three hundred altogether according to a rather doubtful tradition, were organized constitutionally in curies. Of the curies, again, there were thirty in all, there being probably ten in each of the three tribes, organized primarily for military and secondarily for political and religious purposes. Though for the federation of the *curiae* and *gentes* Rome required a common ruler and common institutions, religious, military and political, yet it was long before such federation into a state displaced entirely the separate institutions of the several *gentes*. Every clan had its own cult peculiar to its own members. It had its common property and its common burial-place. It probably had some common council or assembly, for we read not only of special gentile customs, but of gentile statutes and decrees. Tradition records instances of wars waged by individual *gentes*, indicating that they had the right to require military service alike from their members and dependants. Widows and orphans of deceased clansmen were under the guardianship of the *gens* or of some particular member of it to whom the trust was specially confided. If a clansman left no descendants, his property passed to his fellow-gentiles. Finally, its members were always entitled to rely upon its assistance, to have maintenance when indigent, to be ransomed from captivity, and to be avenged when killed or injured.

Clients.

Along with the gentiles there were in Rome from the earliest period other persons known by the name of *clientes* (clients). Their origin is wholly unknown. Some of them may have been the original inhabitants of Rome and their descendants, but more probably they were mostly immigrants from other communities or citizens of conquered towns whom the Romans were unable or unwilling to treat as slaves. Some may have been slaves to whom liberty *de facto* had been given. Following a custom familiar both to Latins and Sabines, such persons were placed under the protection of the heads of patrician families. The relationship was hereditary on both sides, and known as that of patron and client. The client[2] became a dependent member of his patron's clan—not *gentilis* but *gentilicius*. His patron had to provide him with what was necessary for his sustenance and that of his family; and, as ownership or possession of lands increased in extent, it was probably not unusual for the patron or his *gens* to give him during pleasure a plot of land to cultivate for himself. The patron had, moreover, to assist him in his transactions with third parties, and obtain redress for him when injured. The client, on the other hand, had to maintain his patron's interests by every means in his power. But the advantage must have been chiefly on the side of the client, who, without becoming a citizen, obtained directly the protection of his patron and his clan, and indirectly that of the state. A large number of clients attached themselves to and received protection from the king as patron—"royal clients," as Cicero calls them.

Plebeians.

The plebeians (*plebs*, from πλῆθος, meaning crowd), as distinguished from the clients, must be regarded as a heterogeneous mass of non-gentile freemen. It used to be the prevailing opinion among modern writers, following the Roman historians, that the plebeians existed as a body since the very beginning of the city. They were thought to be mainly composed of immigrants and refugees who, while being allowed personal liberty, declined to submit themselves to a patron. But recently a theory of Mommsen, based on solid philological and other grounds, has obtained wide adhesion and tends to become the dominant one. Mommsen's view is that at first there were only two classes in the community, the patricians and clients, or, in other words, that the only plebeians were the clients who, as such, possessed only quasi-liberty (*Halbfreiheit*), and that it was not till after a century or two that the practice of voluntary clientage began to decay and the class of plebeian freemen arose. This was partly due to *gentes* dying out, so that the clients attached to them were left without patrons; partly to the numbers of foreigners at Rome (through transplantation of the inhabitants of conquered cities and otherwise) having become so large that they felt themselves sufficiently powerful to do without protection; and partly to other causes.[3]

However this be, it is generally admitted that, during the latter part of the present epoch at least, plebeians existed as a body composed of individuals of mixed races not united by any gentile organizations of their own nor attached to any Roman *gentes*. Tradition attributes to Numa the formation of gilds or societies of craftsmen, such as potters, carpenters, gold- and silver-smiths (*collegia opificum*) at Rome, eight or nine in number. This, though probably a myth as regards Numa, may be taken as slight evidence of the creation among the plebeians of associations for trade and other purposes, that to some extent compensated them for the want of gentile organization. These gilds seem to have had a common cult and a common council to arrange disputes and consolidate customs. Between the brethren (*sodales*) there was a bond of close alliance and interdependence, each owing duty to the other similar to what might be claimed from a guest or a kinsman.

The Regulatives of Public and Private Order.—It would be absurd to expect any definite *system of law* in those early times. What passed for it was a composite of *fas*, *jus* and *boni mores*, whose several limits and characteristics it is extremely difficult to define. This may to some extent be accounted for by the fact that much of what was originally within the domain of *fas*, once it had come to be enforced by secular tribunals, and thus had the sanction of human authority, was no longer distinguishable from *jus*; while it may be that others of its behests, once pontifical punishments for their contravention had gone into desuetude, sank to nothing higher than precepts of *boni mores*.

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[1] The derivation of the name is uncertain, and ancient writers differed about it. It probably comes either from *quiris*, a Sabine word for a spear, or from *curia*. The derivation from *Cures* is inadmissible. See Mommsen, *Röm. Staatsrecht* (1887, 1888), iii. 1, p. 5 n.

[2] The derivation of *cliens* from *cluere* indicates the relationship—one who is called on, who hearkens. The theory that clientage arose from the voluntary subjection of poorer citizens to the rich is an hypothesis supported by no satisfactory authority.

[3] Mommsen, *Staatsrecht*, iii. 1, pp. 66 seq. and pp. 127 seq. For a different view, Karlowa, *Röm. Rechtsgeschichte*, i. 62. Cf. Cuq, *Instit. jurid. des Romains* (2nd ed., 1904–8), i. 11–12.

Fas.

By *fas*[1] was understood the will of the gods, the laws given by heaven for men on earth, much of it regulative of ceremonial, but a by no means insignificant part embodying rules of conduct. It appears to have had a wider range than *jus*. It forbade that a war should be undertaken without the prescribed fetial ceremonial, and required that faith should be kept even with an enemy when a promise had been made to him under sanction of an oath. It enjoined hospitality to foreigners, because the stranger guest was presumed, equally with his entertainer, to be an object of solicitude to a higher power. It punished murder, for it was the taking of a god-given life; the sale of a wife by her husband, for she had become his partner in all things human and divine; the lifting of a hand against a parent, for it was subversive of the first bond of society and religion,—the reverence due by a child to those to whom he owed his existence; incestuous connexions, for they defiled the altar; the false oath and the broken vow, for they were an insult to the divinities invoked; the displacement of a boundary or a landmark, not so much because the act was provocative of feud, as because the march-stone itself, as the guarantee of peaceful neighbourhood, was under the guardianship of the gods. Some breaches of *fas* were expiable, usually by a peace-offering to the offended god; others were inexpiable. When an offence was inexpiable, the punishment was usually what is called *sacratio capitis*, excommunication and outlawry of the offender. The precepts of the *fas* therefore were not mere exhortations to a blameless life, but closely approached to laws, whose violation was visited with punishments none the less effective that they were religious rather than civil.

Jus.

The derivation of the word *jus* is disputed. The usual derivation is from the Sanskrit, *ju*, to "join, bind or unite," from which some deduce as its signification "that which binds," "the bond of society," others "that which is regular, orderly or fitting." Bréal identifies it with the *jos* or *jaus* of the Vedas, and the *jaes* or *jaos* of the Zend-Avesta—words whose exact meaning is controverted, but which he interprets as "divine will or power."[2] If Bréal's definition can be adopted we obtain a very significant interpretation of the words addressed by the presiding magistrate to the assembled comitia in asking them whether they assented to a law proposed by him,—*Velitis, jubeatis, Quirites*, &c., "Is it your pleasure, Quirites, and do you hold it as the divine will, that," and so on. As legislation by the comitia of the curies and centuries was regarded as a divine office, and their vote might be nullified by the fathers on the ground that there had been a defect in the *auspicia*, and the will of the gods consequently not clearly ascertained, this explanation of Bréal's seems not without support,—*vox populi vox dei*. If it be right, then the main difference between *fas* and *jus* was that the will of the gods, which both embodied, was in the one declared by inspired and in the other by merely human agency.

This *jus* might be the result either of traditional and inveterate custom (*jus moribus constitutum*) or of statute (*lex*).[3] As to the customs, it can well be believed that at the outset they were far from uniform; that not only the customs of the three original tribes but those also of the different *gentes* varied, and that they only gradually approximated, and in course of time consolidated into a general *jus Quiritium*. Of legislation there was, so far as is known, practically almost nothing.

Boni mores.

What went by the name of *boni mores* (as distinct from *jus moribus constitutum*) must also be regarded as one of the regulatives of public and private order. Part of what fell within their sphere might also be expressly regulated by *fas* or *jus*; but there was much that was only gradually brought within the domain of these last, and even down to the end of the Republic not a little that remained solely under the guardianship of the family tribunal or the censor's *regimen morum*. The functions of those who took charge of *boni mores* were twofold: sometimes they restrained by publicly condemning—though they could not prevent—the ruthless and unnecessary exercise of legal right, as, for example, that of the head of the house over his dependants, and sometimes they supplied deficiencies in the law by requiring observance of duties that could not be enforced by any legal process. Dutiful service, respect and obedience from inferiors to superiors, chastity, and fidelity to engagements, express or implied (*fides*), were among the *officia* that were thus inculcated, and whose neglect or contravention not only affected the reputation, but often entailed punishments and disabilities, social, political or religious. It was the duty of those in authority to enforce their observance by such *animadversio* as they thought proper—the *paterfamilias* in his family, the *gens* among its members, the king in relation to the citizens generally; and many a wrong was prevented not by fear of having to make reparation to the party injured but by the dread of the penalties that would follow conduct unbecoming an upright citizen.

Leges regiae.

That the bulk of the law during the regal period was customary is universally admitted, and that no laws were committed to writing prior to the XII. Tables is generally believed. Yet the jurist Pomponius, a contemporary of Hadrian, speaks of certain laws enacted by the comitia of the curies, which he calls *leges regiae* and which, he says, were collected by one Sextus Papirius, a prominent citizen in the reign of Tarquinius Superbus, under the name of *Jus Papirianum*.[4] We are also told by Paul that this work was commented on by a certain Granius Flaccus,[5] who was, it is supposed, of the time of Julius Caesar or Augustus. No remains of this *Jus Papirianum* are extant, but we have a considerable number of so-called *leges regiae* cited by Livy, Dionysius and others, which contain rules of the private law relating almost entirely to matters of *fas* and which appear to have been enacted under the kings. We are also told by Servius, the commentator on Virgil, that there was a work known to Virgil called *de Ritu Sacrorum*, in which *leges regiae* were collected.[6] The authenticity of these laws, however, is disputed, and the question is one of difficulty. Some modern writers of high authority (*e.g.* Mommsen hold that the *Jus Papirianum* is an apocryphal compilation made from pontifical records about the close of the Republic.[7] It has even been attributed (the suggestion was first made apparently by Gibbon) to Granius Flaccus himself. Nevertheless, the internal evidence from the character and language of the laws themselves (apart from the weight that must be given to the testimony of Pomponius, Servius and other ancient writers) is favourable to their great antiquity, and it is best to accept the view that the *leges regiae* are authentic remains of laws of the regal period. This does not, however, involve the belief that they were collected by Papirius, nor that they were enactments of the *comitia curiata*, as Pomponius says. They seem rather to have been regulations made by the king at his own hand.

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[1] Bréal derives *fas* from the Greek θέμις. It signifies the divinely inspired word. Bréal et Bailly, 101.

[2] *Nouv. rev. hist.* (1883), p. 605. But see J. Schmidt in Mommsen, *Staatsrecht*, iii. 310 n.

[3] For the distinction between *jus* and *lex*, see Mitteis, *Römisches Privatrecht* (1908), i. 30 seq. There is some controversy about the etymology of the word *lex*. See Bréal, *l.c.* p. 610; Schmidt in Mommsen, *S.R.* iii. 308 n. While *lex* is often used like *jus* to express law generally, it early acquired two distinct meanings, viz. (1) an obligation of any kind expressly incorporated in a private deed (*lex privata*), as in the phrases *lex mancipii*, *lex contractus*, &c.; (2) a comitial enactment, hence occasionally called *lex publica* (Gaius, i. 3 and ii. 104). But by the jurists of the Republic this latter meaning was extended so as to cover all laws resulting from the will of the people, including, for example, plebiscites and even senatorial or proconsular ordinances (*leges datae*).

[4] *Dig.* i. 2. 2, § 2 and § 36. In the latter passage Papirius is given the praenomen Publius.

[5] *Dig.* l. 16, 144.

[6] Serv., *in Aeneid*, 12, 836, cited in Bruns, *Fontes*, p. 3.

[7] It has been suggested that a work of the jurist Manilius mentioned by Pomponius (*Dig.* i. 2. 2, § 39) is its source (*Zeitschrift d. Sav. Stift.* xxiv. 420).

or perhaps old-established customs formulated by the higher pontiffs and ascribed to the kings.[1]

It is also stated by Dionysius that under Servius Tullius various laws, fifty in number, dealing with contracts and delicts, were enacted in the comitia of the curies.[2] But we have no corroboration of this, and recent writers are now generally agreed in regarding the statement as a legend.

ii. *Reforms of Servius Tullius.*

It is generally agreed that towards the end of the regal period, and connected with the king traditionally called Servius Tullius, a great reform of the constitution took place, which exercised much influence on the subsequent development of the law. No doubt there is a good deal of myth attached to the name of Servius, who seems to have been regarded by later Romans as a popular monarch, like Alfred by the English, but the main features of the traditional account of the constitutional reforms of this period may be taken as based on fair presumptive evidence. That all of them indeed were evolved from one brain is hardly credible, and that some of them were in observance *de facto* before being made constitutionally binding is very likely.

The design attributed to Servius was that of altering the old constitution in order to promote an advance towards equality between patricians and plebeians. He is credited with having desired, on the one hand, to ameliorate the position of the *plebs* and, on the other, to make them bear a proportionate share of the burdens of the state—in particular, to serve in the army and contribute to the war tax (*tributum*). He effected this by giving them qualified rights of citizenship, not indeed by admitting them into the gentile organizations, but by creating a new political assembly of a distinctly military character in which they as well as the gentiles could take part. The so-called Servian reforms may be roughly summarized under the following four heads, viz. (1) a division of the Roman territory within the city walls into four local wards called *tribus* (to which a number of tribes outside the city—*tribus rusticae*—were afterwards in course of time added); (2) the establishment of a register of the citizens (*census*) which was to contain, in addition to a record of the strength of their families, a statement of the value of their lands, with the slaves and cattle employed in their cultivation, and which was to be revised periodically; (3) a division of the people, as appearing in the census, into five classes for military purposes, determined by the value of their holdings in land and its appurtenances, with a subdivision of each class into so-called *centuriae*; (4) the creation of a new assembly with legislative power called *comitia centuriata*, in which the vote was to be taken by *centuriae*. While it may be an open question how far these reforms, and particularly the institution of the centuriate comitia, were actually due to Servius, or only a result of his arrangements, the whole conception of the new constitution is obviously of early date and indicative of considerable statesmanship.

The plebeians were thereby made constitutionally part of the *populus Romanus*; they became citizens (*Quirites*).[3] They got *commercium* and also *connubium* so far that their marriages *inter se* were recognized as legal marriages. Rights and duties were so far to be measured by each citizen's position as a holder of lands; the amount of land (including slaves and cattle appurtenant thereto)[4] held by him on quiritarian title was to determine the nature of the military service he was to render, the tribute he was to pay, and his right to take part in the new political assembly. It is indeed probable that a good while before Servius the conception of individual ownership of lands and things necessary for their cultivation had been reached, and that such ownership was recognized not only among the gentiles, but also *de facto* even more largely among the plebeians. The common lands of the *gentes* had become split up, to a considerable extent, among families and individuals. However this be, the creation of the *census* ensured, as far as possible, certainty of title, as it was declared that no transfers of property enrolled in it would be recognized unless made by public conveyance with observance of certain prescribed formalities.[5] The form of conveyance thus legally sanctioned was called originally *mancupium*, afterwards *mancipium*, and at a still later period *mancipatio*, while the lands and other things that were to pass by it came to be known as *res mancipii* (or *mancipi*). Hence arose a distinction of great importance in the law of property (which lasted till Justinian formally abolished it), between *res mancipi* and *res nec mancipi*; the former being transferable only by mancipation or surrender in court, the latter by simple delivery (see *infra*, p. 541).

iii. *Institutions of the Private Law.*

The patrician family.

Law of the Family.[6]—The word *familia* in Roman law had at once a more extensive and a more limited meaning than it has in its English form. Husband, wife and children did not necessarily constitute an independent family among the Romans, as with us, nor were they all necessarily of the same one. Those formed a family who were all subject to the power—originally *manus*,[7] later *potestas* or *jus*—of the same head (*paterfamilias*). The *paterfamilias* was himself a member of the family only in the sense in which a king is a member of the community over which he rules. He might have a whole host dependent on him, wife and sons and daughters, and daughters-in-law and grandchildren by his sons, and possibly remoter descendants related through males; so long as they remained subject to him they constituted but one family, that was split up only on his death or loss of citizenship. But if his wife had not passed *in manum* (a result apparently unknown among the patricians at this period), she did not become a member of his family: she remained a member of the family in which she was born, or, if its head were deceased or she had been emancipated, she constituted a family in her own person. Both sons and daughters on emancipation ceased to be of the family of the *paterfamilias* who had emancipated them. A daughter's children could never as such be members of the family of their maternal grandfather; for children born in lawful marriage followed the family of their father, while those who were illegitimate ranked from the moment of birth as *patresfamilias* and *matresfamilias*.

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[1] See Clark, *Hist. of Rom. Law* (1906), i. 16–19; Kipp, *Geschichte d. Quellen* (1903), pp. 24–25. The most comprehensive treatise on these royal laws, which also contains references to the earlier literature, is that of Voigt, *Über die Leges Regiae* (Leipzig, 1876). An exhaustive collection of them, including numerous references to royal institutions by Livy, Dionysius and others, is given in Bruns, *Fontes Juris*, 6th ed. i. 1 seq. Another collection is in Girard, *Textes*, 3rd ed. pp. 3 seq.

[2] Dion. iv. 10, 13.

[3] The view of some recent writers that the plebeians had at all times participated in the *jus Quiritium* and were admitted to the curiate comitia and even had gentile rights (see Lenel in Holtzendorff's *Encyklopädie d. Rechtswissenschaft*, 6th ed. i. 90 nn. 1, 2, and authorities there cited), must be decidedly negatived. Not only does it render the whole tradition about the Servian reforms untrustworthy, but the accounts of the struggles between patricians and plebs in the early Republic are left largely without meaning.

[4] Modern writers are not agreed as to whether movable *res mancipi* were included with lands in the valuation of property for fixing the classes.

[5] Or else by *cessio in jure*, though this may not have been before the XII. Tables, and it was in any case of very limited operation.

[6] On tribal family and matriarchate among the Romans in prehistoric times, consult Westermarck, *History of Human Marriage* (London, 1891); Post, *Grundriss der ethnologischen Jurisprudenz* (1894), i. 15–160. *Familia* and family are used in this section solely to designate the group of free persons subject by birth, marriage or adoption to the same *paterfamilias*. Strictly the word *familia* meant the household and all belonging to it. It had also the following principal meanings: (1) a *gens* or branch of a *gens* (group of families in the stricter sense); (2) the whole body of agnatic kinsmen (*familia communi jure*); (3) the family estate or *patrimonium*, as in the provisions of the XII. Tables about intestate succession, *e.g. adgnatus proximus familiam habeto*; (4) the family slaves collectively, as in the phrase *familia rustica*. See Mommsen, *Staatsr.* iii. 10 n. 16 n. 22; Rivier, *Précis du droit de famille romain* (Paris, 1891), § 1.

[7] This word *manus*, though in progress of time used technically to express the power (hand) of a husband over his wife *in familia*, was originally the generic term for all the rights exercised, not only over the things belonging but also over the persons subject to the head of the house—as seen, for example, in the words "manumission" and "emancipation." Cf. *Inst.* i. 5 pr. It should be observed that among uncivilized peoples there is always a very small vocabulary, and the same word often has to do duty in several senses—*e.g. familia, mancipium, nexum, caput.*

Marriage.

With the early Romans, as with the Hindus and the Greeks, marriage was a religious duty a man owed alike to his ancestors and to himself. Believing that the happiness of the dead in another world depended on their proper burial and on the periodical renewal by their descendants of prayers and feasts and offerings for the repose of their souls, it was incumbent upon him above all things to perpetuate his race and his family cult. The Romans were always strictly monogamous. In taking to himself a wife, he was about to detach her from her father's house and make her a partner of his family mysteries. With the patrician at least this was to be done only with divine approval, ascertained by *auspicia*. His choice was limited to a woman with whom he had *connubium* (ἐπιγαμία) or right of intermarriage. This was a matter of state arrangement; and in the regal period Roman citizens could have it outside their own bounds only with members of states with which they were in alliance, and with which they were connected by the bond of common religious observances. A patrician citizen, therefore, if his marriage was to be reckoned lawful (*justae nuptiae*), had to wed either a fellow-patrician or a woman who was a member of an allied community. In either case it was essential that she should be outside his sobrinal circle, *i.e.* more remote in kinship than the sixth degree. The ceremony was a religious one, conducted by the chief pontiff and the flamen of Jupiter, in presence of ten witnesses, representatives probably of the ten curies of the bridegroom's tribe, and was known as *farreum* or *confarreatio*. Its effect was to dissociate the wife entirely from her father's house, and to make her a member of her husband's; for confarreate marriage involved *in manum conventio*, the passage of the wife into her husband's "hand" or power, provided he was himself *paterfamilias*; if he was not, then, though nominally in his hand, she was really subject like him to his family head. Any property she had of her own—which was possible only if she had been independent before marriage—passed to him as a matter of course; if she had none, her *paterfamilias* usually provided her a dowry (*dos*), which shared the same fate. In fact, so far as her patrimonial interests were concerned, she was in much the same position as her children; and on her husband's death she had a share with them in his inheritance as if she had been one of his daughters. In other respects *manus* conferred more limited rights than *patria potestas*; for Romulus is said to have ordained that, if a man put away his wife except for adultery or one or two other grave offences, he forfeited his estate half to her and half to Ceres, while if he sold her he was to be given over to the infernal gods.[1]

Patria potestas.

Patria potestas was the name given to the power exercised by a father, or by his *paterfamilias* if he was himself *in potestate*, over the issue of such *justae nuptiae*. The Roman jurists boasted that it was a right enjoyed by none but Roman citizens; and it certainly was peculiar to them in this sense, that nowhere else, except perhaps among the Latin race from which they had sprung, did the paternal power attain such an intensity. The omnipotence of the *paterfamilias* and the condition of utter subjection to him of his children *in potestate* became greatly modified in the course of centuries; but originally the children, though in public life on an equality with the house-father, in private life, and so long as the *potestas* lasted, were subordinated to him to such an extent as, according to the letter of the law, to be in his hands little better than his slaves. They could have nothing of their own: all they earned was his; and, though it was quite common when they grew up for him to give them *peculia*, "cattle of their own," to manage for their own benefit, these were only *de facto* theirs, but *de jure* his. For offences committed by them outside the family circle, for which he was not prepared to make amends, he had to surrender them to the injured party, just like slaves or animals that had done mischief. If his right to them was disputed, he used the same action for its vindication that he employed for asserting his ownership of his field or his house: if they were stolen, he proceeded against the thief by an ordinary action of theft; if for any reason he had to transfer them to a third party, it was by the same form of conveyance that he used for the transfer of things inanimate. Nor was this all; for, according to the old formula recited in that sort of adoption known as adrogation, he had over them the power of life and death, *jus vitae necisque*.

Adrogation and adoption.

It might happen that a marriage was fruitless, or that a man saw all his sons go to the grave before him, and that the *paterfamilias* had thus to face the prospect of the extinction of his family and of his own descent to the tomb without posterity to make him blessed. To obviate so dire a misfortune, he resorted to the practice of adoption, so common in India and Greece. If it was a *paterfamilias* that he adopted, the process was called adrogation (*adrogatio*); if it was a *filiusfamilias* it was simply *adoptio*. The latter, unknown probably in the earlier regal period, was, as we first know it, a somewhat complicated conveyance of a son by his natural parent to his adopter, the purpose of course being expressed; its effect was simply to transfer the child from the one family to the other. But the former was much more serious, for it involved the extinction of one family that another might be perpetuated. It was therefore an affair of state. It had to be approved by the pontiffs, who probably had to satisfy themselves that there were relatives of the adrogatee to attend to the *manes* of the ancestors whose cult he was renouncing; and on their favourable report it had to be sanctioned by a vote of the curies, as it involved the deprivation of his *gens* of their possible right of succession to him and possible prejudice to creditors through *capitis deminutio*. If it was sanctioned, then the *adrogatus*, from being himself the head of a house, sank to the position of a *filiusfamilias* in the house of his adopting parent; if he had had wife or children subject to him, they passed with him into his new family, and so did everything that belonged to him and that was capable of transmission from one person to another. The adopting parent acquired *potestas* over the adopted child exactly as if he were the issue of his body; while the latter enjoyed in his new family the same rights exactly that he would have had if he had been born in it.

Domestic relations.

The *manus* and the *patria potestas* represent the masterful aspects of the patrician's domestic establishment. Its conjugal and parental ones, however, though not so prominent in the pages of the jurists, are not to be lost sight of. The patrician family in the early history of the law was governed as much by *fas* as by *jus*. The husband was priest in the family, but wife and children alike assisted in its prayers, and took part in the sacrifices to its lares and penates. As the Greek called his wife the house-mistress, δέσποινα, so did the Roman speak of his as *materfamilias*,[2] the house-mother. She was treated as her husband's equal. As for their children, the *potestas* was so tempered by the natural sense of parental duty on the one side and filial affection on the other that in daily life it was rarely felt as a grievance; while the risk of an arbitrary exercise of the domestic jurisdiction, whether in the heat of passion or under the impulse of justifiable resentment, was guarded against by the rule which required in grave cases the *paterfamilias* to consult in the first place the near kinsmen of his child, maternal as well as paternal. Even the incapacity of the children of the family to acquire property of their own cannot in those times have been regarded as any serious hardship; for, though the legal title to all their acquisitions was in the housefather during his life, yet in truth they were acquired for and belonged to the family as a whole, and he was little more than a trustee to hold and administer them for the common benefit.

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[1] See Plutarch, *Rom.* 22; Marquardt, *Röm. Altert.* v. 7. The question whether a husband could in early law sell his wife is one on which modern writers are not agreed. The better opinion is that he could not do so if the marriage was by confarreation. Apart from the *lex regia* above mentioned, it would have been inconsistent with her dignity as *materfamilias*. There is certainly no trace of its having been done. In marriages by coemption and *usus*, on the other hand, it is not improbable that it was allowed, though here also there is no evidence of it.

[2] *Materfamilias* is used in the texts in two distinct senses—(1) as a woman *sui juris*, *i.e.* not subject to any family head; and (2) as a wife *in manu mariti*.

The *patria potestas*, unless the *paterfamilias* voluntarily put an end to it, lasted as long as he lived and retained his status. The marriage of a son, unlike that of a daughter passing into the hand of a husband, did not release him from it, nor did his children become subject to him so long as he himself was *in potestate.* On the contrary, his wife passed on marriage into the power of her father-in-law, and their children as they were born fell under that of their paternal grandfather; and the latter was entitled to exercise over his daughters-in-law and grandchildren the same rights that he had over his sons and unmarried daughters. But there was this difference, that, when the *pater-familias* died, his sons and daughters who had remained *in potestate* and his grandchildren by a predeceased son instantly became their own masters (*sui juris*), whereas grandchildren by a surviving son simply passed from the *potestas* of their grandfather into that of their father.

Guardianship of tutors.

The acquisition of domestic independence by the death of the family head frequently involved the substitution of the guardianship of tutors (*tutela*) for the *potestas* that had come to an end. This was so invariably in the case of females *sui juris*, no matter what their age: they remained under guardianship until they had passed by marriage *in manum mariti.* It was only during pupillarity, however, that males required tutors, and their office came to an end when puberty was attained. It is improbable that during the regal period a testamentary appointment of tutors by a husband or parent to wife or children was known in practice. In the absence of it the office devolved upon the *gens* to which the deceased *paterfamilias* belonged.

Plebeian family.

Family Organization among the Plebeians.—If perfect identity of customs cannot be assumed to have existed amongst the patrician *gentes* in the regal period of Rome, far less can it be supposed to have existed amongst the heterogeneous population (Latins, Etruscans, Greeks, &c.) of which the *plebs* was constituted. Nevertheless, contiguity of residence and community of interests tend inevitably to unify customs and cause dissimilarities to disappear, and the plebeians must have not only gradually brought their own customs into unison *inter se*, but adapted them at the same time in many respects to those of the patricians. Even to those of non-Latin race *manus* over their wives and *potestas* over their children would become a desideratum. Though the plebeians seem to have been always excluded from confarreation, and their matrimonial unions must have been at first informal and irregular from the point of view of the *Quirites*, two civil modes of acquiring marital *manus* were available to them after they obtained citizenship, viz. *coemptio* and *usus.* Some writers hold that neither of these modes was legally recognized prior to the XII. Tables.[1] This may be so, but it is improbable. As the plebeians obtained by the Servian constitution full capacity for quiritarian ownership, it was at once open to them to adapt the modes sanctioned for acquiring property to the acquisition of marital *manus. Coemptio* was just a simple adaptation of mancipation above referred to (see also *infra*, p. 540). It was, as we may infer from what we know of it at a later time, a sale of the woman to the man *per aes et libram* for a nominal price. The price being fictitious, a piece of copper (*rauduscuIum*) was used to represent it, and this was handed over to the seller, who would ordinarily be the woman's *paterfamilias*, or, if she were *sui juris*, her gentile tutor. The nuncupatory words used in the ceremony have unfortunately not been preserved; necessarily, of course, they varied from those of an ordinary mancipation of property.[2] Though called by the jurists a mode of constituting marriage, *coemptio*, as we know it, was strictly a mode of creating *manus*; for, though usually contemporaneous with, it might, as Gaius informs us, follow the marriage at any distance of time, and was not dissolved by divorce, but required a separate act of remancipation. Students of comparative law have observed that in *coemptio* there are clear traces of earlier bride purchase, so common even nowadays among uncivilized tribes, where a real price in cattle or sheep, and not a mere nominal one, has to be paid for the bride. *Usus*, on the other hand, was a mode of acquiring marital *manus* by possession of the woman as wife for a certain period of time—long cohabitation.[3] Whether this was recognized by the law prior to the XII. Tables depends probably upon whether usucaption, as a mode of acquiring property, was settled by custom earlier than the Tables. Some writers, however, think it older than *coemptio*, and as a *de facto* relation prolonged cohabitation as man and wife must have existed from very early times. Comparative historians with good reason trace in *usus* the relics of primitive bride capture. Both coemption and *usus*, from the time they were first recognized by the *jus Quiritium*, undoubtedly created *patria potestas* and agnatic rights.

Property in land.—Patricians.

Law of Property.[4]—The history of the early Roman community, like many other primitive communities, is marked by the disintegration of the *gentes* and the growth of individual property. Yet the distribution of land amongst the early Romans is one of the puzzling problems of their history. The Servian constitution apparently classified the citizens and determined their privileges, duties and burdens according to the extent of their lands; and yet we know nothing for certain of the way in which these were acquired. All is conjectural. We have indeed a traditional account of a partition by Romulus of the little territory of his original settlement into three parts, one of which was devoted to the maintenance of the state and its institutions, civil and religious, the second (*ager publicus*) to the use of the citizens and profit of the state, and the third (*ager privatus*) subdivided among his followers. Varro and Pliny relate that to each *paterfamilias* among his followers he assigned a homestead (*heredium*) of two jugera, equal to about an acre and a quarter. These *heredia* were to be held by him and his heirs for ever (*quae heredem sequerentur*); Pliny adding that to none did the king give more. This can only be accepted as a partially correct account of what may have taken place at some early period during the kingly régime. There can be little doubt that a portion of the Roman territory, gradually augmented through new conquests, was early reserved by the state as *ager publicus*; that is sufficiently attested by the complaints made for centuries by the plebeians of its monopolization by the patricians. It is also probable that *heredia* (*i.e.* plots of land within the city) may have been granted to the heads of the gentile families, many of whom would be living in *pagi* on their respective gentile lands outside the city. Such *heredia* became family property, administered as such by the *paterfamilias*, but inalienable by him. In this respect the position would be very similar to what existed among the ancient Germans and exists to-day in India among the Hindus. Even late in the Republic, when the idea of individual ownership was paramount, it was still considered a disgrace for a man to alienate his *heredium*. But though the existence of monogamous families seems to imply private ownership to some extent, yet, as formerly indicated, a large part of the Roman territory at, and for a good while after, the foundation of the city must have been gentile lands held by the separate clans for the use of their members. The fact that the majority of the rural tribes bore the names of well-known patrician *gentes* favours the conclusion that even in the later regal period a good many of the clans still held lands in their collective capacity. It was at some uncertain time before Servius that there began to be a break-up of these gentile lands and their appropriation by individual members. Under the influence of this movement lands were acquired and held by families and individuals to a large extent. A patrician's holding must have been sometimes pretty large so as to enable him to make grants (so often alluded to by ancient writers) to his clients, but we have no means of estimating the normal size. The *heredia* were small; even during the Republic there is some evidence (*e.g.* the traditional story about Cincinnatus) that seven jugera were regarded as the normal extent of a patrician's holding for his own and his family's use. On the other hand, twenty jugera are commonly supposed to have been the qualification for enrolment in the first of the Servian classes. Of course it must be kept in view that a patrician did not necessarily hold all his lands by gratuitous assignation or concession either from the state or from his *gens*; purchase from the former was by no means uncommon, and it may have been on his purchased lands that his clients were usually placed. Those dependants were also probably employed in large numbers upon those parts of the *ager publicus* which were occupied by the patricians and were in historic times known as *possessiones*. These, of course, were not the property of their occupants; it was the lands acquired by assignation or purchase that were alone, apart from the *heredia*, regarded as theirs *ex jure Quiritium*.

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[1] See as to *coemptio*, Cuq, *Institutions juridiques*, 2nd ed., i. p. 62.

[2] One or two writers of the later Empire (*e.g.* Servius, in *Georg.* i. 31) describe *coemptio* as a mutual purchase, the man and woman taking alternately the position of *emptor* and using nuncupatory words as such; but this seems to be a misapprehension and not consistent with what Gaius says. See the arguments in favour of it in Muirhead, *Historical Introduction*, 2nd ed. pp. 414–415. Girard, *Manuel*, 4th ed. p. 150, gives a probable explanation of the mistake of these late authors.

[3] It would thus cure defects in a coemption just as usucaption did defects in mancipation.

[4] See Giraud, *Recherches sur le droit de propriété chez les Romains* (Aix, 1838); Macé, *Histoire de la propriété &c., chez les Romains* (Paris, 1851); Hildebrand, *De antiquissimae agri Romani distributionis fide* (Jena, 1862); Cuq, *Instit. jurid.*, 2nd ed., vol. i. pp. 72 seq.; Beaudouin, *La Limitation des fonds de terre* (1894), pp. 259 seq.

Property in land among plebeians.

The traditional accounts of the early distribution of lands among the plebeians are even, if possible, more vague than those regarding the patricians. They had apparently become holders *de facto* of land in large numbers before the Servian reforms. But they can have attained that position only by gradual stages. While their earliest grants of land, probably from the kings, can only have been during pleasure, latterly, as they increased in number and importance, they were allowed to have permanent possession. That those who had means also acquired lands by purchase from the state may be taken for granted. The distinction between *de facto* possession and ownership was at best a very vague one at this period, and, like the holders of provincial lands in later times, the plebeians might have the benefits of ownership without ownership. The result of the Servian constitution was to convert this *de facto* property or permanent possession into quiritarian ownership.[1]

Property in movables.

There are some writers who maintain that in the regal period, prior to the Servian reforms, though after the collective ownership of the *gentes* had begun to disintegrate, there was no private property in movables. This proposition can at most be accepted only in a qualified sense. If it be meant that movables generally were not then recognized as objects of quiritarian *dominium* which could be vindicated by any real action, it may be admitted. But otherwise the distinction between *meum* and *tuum* must have been well recognized, *de facto* at least. Men must have been in the habit of transferring things from one to another by simple delivery in respect of barter, sale or otherwise, and any violent or "theftuous" appropriation of things in a man's occupation would be punished by magisterial authority or by ordinary self-redress by the injured party. A sort of ownership in possession must at least have been recognized for movables generally.[2]

But apart from this, we must believe that certain kinds of movables, viz. those which have been described as appurtenant to land and necessary for its cultivation—which with land formed the real objects, as distinct from the personal subjects, of the *familia*—were treated from the time of Romulus downwards, as *in manu* of the *patresfamilias*. These were the *res mancipi* already referred to. Quiritarian ownership in them, as we have seen, was recognized both for patricians and plebs by the Servian constitution, periodical registration of them in the census and transference by the quasi-public act of mancipation being probably required. Earlier even than with lands, the conception of private ownership, it has been said, connected itself with them.[3]

A short explanation may now be given of the ceremony of mancipation and the nature of *res mancipi*.

Mancipation.

Mancipation is described by Gaius, with particular reference to the conveyance of movable *res mancipi*, as a pretended sale in presence of not less than five citizens as witnesses and a *libripens* holding a pair of copper scales. The transferee, with one hand on the thing being transferred, and using certain words of style, declared it his by purchase with a piece of copper (which he held in his other hand) and the scales (*hoc aere aeneaque libra*); and simultaneously he struck the scales with the *as*, which he then handed to the transferrer as figurative of the price. The principal variation when it was an immovable that was being transferred was that the mancipation did not require to be on the spot: the land was simply described by its known name in the valuation roll. Although in the time of Gaius only a fictitious sale—in fact the formal conveyance upon a relative contract—yet it was not always so. Its history is very simple. The use of the scales fixes its introduction at a time when coined money was not yet current, but raw copper nevertheless had become a standard of value and in a manner a medium of exchange. That, however, was not in the first days of Rome. Then, and for a long time, values were estimated in cattle or sheep, fines were imposed in them, and the deposits in the *legis actio sacramento* (*infra*, p. 549) took the same form. The use of copper as a substitute for them in private transactions was probably derived from Etruria. But, being only raw metal or foreign coins, it could be made available for loans or payments only when weighed in the scales: it passed by weight, not by tale. There is no reason for supposing that the weighing was a solemnity, that it had any significance beyond its obvious purpose of enabling parties to ascertain that a vendor or borrower was getting the amount of copper for which he had bargained.

It was this practice of everyday life in private transactions that Servius apparently adopted as the basis of his mancipatory conveyance, engrafting on it one or two new features intended to give it publicity and, as it were, state sanction, and thus render it more serviceable in the transfer of censuable property. Instead of the parties themselves using the scales, an impartial balance-holder, probably an official, was required to undertake the duty, and at least five citizens were required to attend as witnesses, who were to be the vouchers to the census officials of the regularity of the procedure. Whether they were intended as representatives of the five classes in which Servius had distributed the population, and thus virtually of the state, is disputed, though the fact that, when the parties appealed to them for their testimony, they were addressed not as *testes* but as *Quirites* lends some colour to this view.[4] Servius is also credited with the introduction of rectangular pieces of copper of different but carefully adjusted weights, stamped by his authority with various devices (*aes signatum*), which are usually supposed to have been intended to take the place of the raw metal (*aes rude*) formerly in use, and so facilitate the process of weighing; but there is more reason for thinking they were cast and stamped as standards to be put into one scale, while the raw metal whose weight was to be ascertained was put into the other.

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[1] On this question of land-holding among the early patricians and plebeians, consult Cuq, *Institutions juridiques des Romains*, 2nd ed., vol. i. pp. 73–76; Bourcart (French translation of Muirhead's *Historical Introduction*), p. 580, and authorities there cited.

[2] The position of the plebeians in this respect did not differ from that of the patricians.

[3] Mancipation seems to have been a very ancient mode of conveyance. The use of the balance in barter or sale was known to the ancient Egyptians at least as early as 2000 B.C., as may be seen on reliefs in the temple of Dehr-el-Bahri in Upper Egypt. The derivation of *mancipium* (*mancipatio*) from *manu capere*, to seize with the hand, is given by Gaius and is confirmed by the fact that at all times in its history the acquirer had to lay his hand on the thing being acquired, during the ceremony, if a movable. So where several things were being mancipated in a lot, this had to be done to each separately. With lands and other immovables it was different: they might be mancipated in absence, which goes some way to prove that mancipation must have been extended to them at a later period. The derivation of *mancipatio* given by Muirhead (*Historical Introduction*, 2nd ed., pp. 59 seq.) from *manum capere*, *i.e.* to acquire power (*manus*), is open to the objection that it places the abstract idea of power before the concrete symbol of it. Cf. Cuq, *Institutions juridiques*, 2nd ed., i. p. 80 n.

[4] See Gai. ii. § 104.

Instead, therefore, of being a fictitious sale, as Gaius describes it, and as it became after the introduction of coined money in the 4th century of the city, the mancipation, as regulated by Servius, was an actual completed sale in the strictest sense of the term. What were the precise words of style addressed by the transferee to the transferrer, or what exactly the form of the ceremonial, we know not. But, as attendance during all the time that some thousands of pounds, perhaps of copper, were being weighed would have been an intolerable burden upon the five citizens convoked to discharge a public duty, it may be surmised that it early became a common practice to have the price weighed beforehand, and then to reweigh, or pretend to reweigh, before the witnesses only a single little bit of metal (*raudusculum*), which the transferee then handed to the transferrer as "the first pound and the last," and thus representative of the whole.[1] And where no real price was intended, as in constituting a *dos* or in coemption, a *raudusculum* would also be employed. Whatever may have been its form, however, its effect was instant exchange of property against a price weighed in the scales. The resulting obligation on the vendor to maintain the title of the vendee, and the qualifications that might be superinduced on the conveyance by agreement of parties—the so-called *leges mancipii*—will be considered below in connexion with the provisions of the XII. Tables on the subject (*infra*, p. 542).

Res mancipi.

The things included in the class of *res mancipi* were lands and houses held on Quiritarian title, together with rights of way and aqueduct, slaves, and the following domestic beasts of draught or burden, viz. oxen, horses, mules and donkeys; all others were *res nec mancipi*. Many theories have been propounded to account for the distinction between these two classes of things, and to explain the principle of selection that admitted oxen and horses into the one, but relegated such animals as sheep and swine to the other. But there is really little difficulty. Under the arrangement of Servius, what was to determine the nature and extent of a citizen's political qualifications, military duties and financial burdens was apparently the value of his *heredium* (and other lands, if he had any), and what may be called its appurtenances—the slaves that worked for the household, the slaves and beasts of draught and burden that worked the farm, all of which lived and worked in common with the free members of the *familia*. But the cattle a man depastured on the public meadows were no more *res mancipi* than his sheep, a fact which, though ultimately in the later Empire lost sight of, was still understood in the time of Gaius.[2] To say that the things classed as *res mancipi* were selected for that distinction by Servius because they were what were essential to a family engaged in agricultural pursuits would be to fall short of the truth. They *constituted* the *familia* in the sense of the family estate proper; whereas the herds and flocks, and everything else belonging to the *paterfamilias*, fell under the denomination of *pecunia*. So the words are to be understood perhaps in the well-known phraseology of the mancipatory testament, *familia pecuniaque mea*.[3]

The public solemnity of *mancipatio* thus sanctioned as a mode of transferring a Quiritarian right of property, for which *manus* was probably as yet the only descriptive word in use, was not long in being adapted to and utilized for other transactions in which other kinds of *manus* were sought to be acquired. These new adaptations, if confined at first for the most part to plebeians, were also soon made use of by the patricians, perhaps before as well as after the XII. Tables, and became by custom part of the common law. Such were, for example, coemption (as explained above), emancipation and adoption of *filiifamilias*, and *mortis causa* alienation of a *familia* and *nexum*.

Succession amongst the patricians.

Law of Succession.—The legal order of succession during the regal period was extremely simple. It was this. on the death of a *paterfamilias* his patrimony devolved upon those of his descendants *in potestate* who by that event became *sui juris*, his widow (being *loco filiae*) taking an equal share with them, and no distinction being made between movables and immovables. Such persons were styled self-heirs (*sui heredes*). Failing widow and children, his patrimony went to his *gens*. The notion that between the descendants and the *gens* came an intermediate class under the name of agnates does not seem well founded as regards the regal period; the succession of agnates as such seems to have been first legally recognized by the XII. Tables, probably to meet the case of the plebeians, who, having no *gentes*, were without legal heirs in default of children.[4]

The later jurists more than once refer to the perfect equality of the sexes in the matter of succession in the ancient law.[5] But it was rather nominal than real. A daughter who had passed into the hand of a husband during her father's lifetime of course could have no share in the latter's inheritance, for she had ceased to be a member of his family. One who was *in potestate* at his death, and thereby became *sui juris*, did become his heir, unless he had prevented such a result by testamentary arrangements; but even then it was in the hands of the *gens* to prevent risk of prejudice to themselves. For she could not marry, and so carry her fortune into another family, without their consent as her guardians; neither could she without their consent alienate any of the more valuable items of it; nor, even with their consent, could she make a testament disposing of it in prospect of death. Her inheritance, therefore, was hers in name only; in reality it was in the hands of her guardians.

Of primogeniture or legal preference of one member of the family over the others there is not the faintest trace. And yet we are told of *heredia* remaining in a family for many generations—a state of matters that would have been impossible had every death of a *paterfamilias* necessarily involved a splitting up of the family estate. It is conceivable that this was sometimes prevented by arrangement amongst the heirs themselves; and the practice of every now and then drafting the younger members of families to colonies diminished the number of those who had a claim to participate. But the simplest plan of avoiding the difficulty was for the *paterfamilias* to regulate his succession by testament; and this was probably had recourse to, not so much for instituting a stranger heir when a man had no issue—according to patrician notions his duty then was to perpetuate his family by adopting a son—as for partitioning the succession when he had more children than one.

Testaments.

There were two sorts of testaments made use of by the patricians of the regal period—that made in the *comitia* of the curies (*test. calatis comitiis*) and that made in the presence of the army (probably represented for this purpose by a few comrades) on the eve of battle (*test. in procinctu factum*). The first at least—and the second was just a substitute for it on an emergency—was far from being an independent exercise of the testator's *voluntas*. For, though in course of time, and under the sanction of the *uti legassit ita jus esto* of the XII. Tables, the curies may have become merely the recipients of the oral declaration by the testator of his last will, in order that they might testify to it after his death, it is impossible not to see in the comitial testament what must originally have been a legislative act, whereby the testator's peers, for reasons which they and the presiding pontiffs thought sufficient, sanctioned in the particular case a departure from the ordinary rules of succession. The pontiffs were there to protect the interests of religion, and the curies to protect those of the testator's *gens*; and it is hardly conceivable that a testament could have been sanctioned by them which so far set at nought old traditions as to deprive a *filiusfamilias* of his birthright, at least in favour of a stranger.

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[1] The conjecture is suggested by the words of style in the *solutio per aes et libram*, Gai. iii. §§ 173, 174. There were some debts from which a man could be effectually discharged only by payment (latterly fictitious) by copper and scales in the presence of a *libripens* and the usual five witnesses. In the words addressed to the creditor by the debtor making payment these occurred—*hanc tibi libram primam postremamque expendo* ("I weigh out to you this the first and the last pound"). The idea is manifestly archaic, and the words, taken strictly, are quite inappropriate to the transaction in the form it had assumed long before the time of Gaius.

[2] Gai. ii. 15; Ulpian, *Frag.* xix. I.

[3] Gai. ii. 104. By the time of the XII. Tables the sharp distinction between these two terms is tending to disappear.

[4] It is quite true, however, that from the first the order of succession was agnatic; for it was those only of a man's children who were agnate that had any claim to his inheritance; and the *gens* was, theoretically at least, just a body of agnates. The supposed mention of agnates in a law attributed to Numa is a conjecture of P. E. Huschke's (in *Analecta litteraria*, Leipzig, 1826, p. 375). The law is preserved in narrative by Servius, *In Virg. Eclog.* iv. 43, which runs thus: "In Numae legibus cautum est, ut si quis imprudens occidisset hominem, pro capite occisi et natis ejus in cautione (Scalig., concione) offerret arietem." Huschke's substitution of *agnatis* for *et natis* is all but universally adopted; but, even were it necessary, it need mean nothing more than his children *in potestate* or his *gens*.

[5] The Voconian law of 169 B.C. avowedly introduced something new in prohibiting a man of fortune from instituting a woman, even his only daughter, as his testamentary heir; but even it did not touch the law of intestacy. See Girard, *Manuel*, 4th ed. p. 816.

Succession amongst the plebeians.

It may safely be assumed that by custom at all events the children of a plebeian usually took his estate on his death intestate. But, as he was not a member of a *gens*, there was no provision for the devolution of his succession on failure of children. The want of them he could not supply by adrogation, as he had for long, it is thought, no access to the assembly of the curies; and it is doubtful if adoption of a *filiusfamilias* was known before the XII. Tables. If therefore, as seems probable, the XII. Tables first introduced the succession of agnates, a plebeian unsurvived by children was necessarily heirless, that is to say, heirless in law. But custom seems to have looked without disfavour on the appropriation of his *heredium* by an outsider: a brother or other near kinsman would naturally have the earliest opportunity, and, if he maintained his possession of it in the character of heir for a reasonable period, fixed by the XII. Tables at a year, the law dealt with him as heir, and in course of time the pontiffs imposed upon him the duty of maintaining the family *sacra*. This was probably the origin, and a very innocent and laudable one, of the *usucapio pro herede*, which Gaius condemns as an infamous institution, and which undoubtedly lost some of its *raison d'être* once the right of succession of agnates had been introduced.

Mortis causa conveyance by mancipation.

There is no trace of testamentary succession among the *plebs* prior to the Servian constitution, nor is it in the least degree likely that there was any such. Primitive communities are slow to realize the conception of private testaments, and the plebeians could not at this period make a public one either *calatis comitiis* or *in procinctu*. But not long after their admission to citizenship there is reason to conjecture that mancipation was employed by them, not indeed to make a testament instituting an heir and taking effect only on the testator's death, but to make a conveyance of a whole patrimony *mortis causa*. The transaction took the form of an absolute acquisition, in exchange for a price (usually nominal), of the transferrer's *familia*,[1] by a friend, technically called *familiae emptor*, on trust to distribute, on the transferrer's death and according to his instructions, whatever the transferee was not authorized to retain for himself. The transferrer may also have had power to reserve in the mancipation a usufruct of the estate while he lived.[2] Like so many other of the transactions of the early law, it was legally unprotected so far as the third parties were concerned whom the transferrer meant to benefit; they could only trust to the *fides* of the transferee. This *mortis causa* alienation, whatever the date of its introduction, was the forerunner of the so-called testament *per aes et libram*, to be afterwards described (*infra*, p. 543).

Contract and its breach.

Contract and its Breach.—To speak of a law of obligations in connexion with the regal period, in the sense in which the words were understood in the later jurisprudence, would be a misapplication of language. It would be going too far to say, however, as is sometimes done, that before the time of Servius Rome had no conception of contract; for men must have bought and sold, or at least bartered, from earliest times—must have rented houses, hired labour, made loans, carried goods and been parties to a variety of other transactions inevitable amongst a people engaged to any extent in pastoral, agricultural or trading pursuits. It is true that a patrician family with a good establishment of clients and slaves had within itself ample machinery for supplying its ordinary wants, and was thus to a great extent independent of outside aid. But there were not many such families. There must therefore have been contracts and some customary rules to regulate them, though these were presumably very imperfect. In many cases, such as those alluded to, one of the parties at least must have trusted to the good faith of the other. What was his guarantee, and what remedy had he for breach of engagement?

His reliance in the first place was on the probity of the party with whom he was dealing—on the latter's reverence for Fides, and the dread he had of the disapprobation of his fellows should he prove false, and of the penalties, social, religious or pecuniary, that might consequently be imposed on him by his *gens* in the case of a patrician, by his gild in the case of a craftsman, or by the king in the case of any other plebeian.[3] If the party who had to rely on the other's good faith was not satisfied with his promise and the grasp of the right hand that was its seal,[4] he might require his solemn oath (*jusjurandum*); and it can hardly be doubted that, whatever may have been the case at a later period, in the time of the earlier kings he who forswore himself was amenable to pontifical discipline. If he preferred a more substantial guarantee, he took something in pledge or pawn from the other contractor; and, though he had no legal title to it, and so could not recover it by judicial process if he lost possession, yet so long as he retained it he had in his own hand a *de facto* means of enforcing performance. Upon performance he could be forced to return it or suffer a penalty—not by reason of obligation resulting from a contract of pledge, for the law as yet recognized none, but because, in retaining it after the purpose was served for which he had received it, he was committing theft and liable to its punishment. At this stage breach of contract, as such, does not seem to have founded any action for damages or reparation before the tribunals; but it is not improbable that, where actual loss had been sustained, the injured party was permitted to resort immediately to self-redress by seizure of the wrong-doer or his goods. Self-help was according to the spirit of the time—not self-defence merely in presence of imminent danger, but active measures for redress of wrongs already completed.

Contract "per aes et libram."

There was one contract, however, notorious in after years under the name of *nexum*, that must have received legal sanction soon after the Servian reforms, though probably, like mancipation of property itself, known in practice earlier. In the XII. Tables it is apparently referred to as an existing institution. In its normal character it was a loan of money, or rather of the raw copper that as yet was all that stood for money. How far in its original use it was accompanied by any formalities beyond the weighing of it in a pair of scales (which was rather substance than form) we know not; and what right it conferred on the creditor over his debtor who failed to repay can be only matter of speculation. Apparently the result of the Servian reforms was the regulating and ensuring the publicity of the contract and making the creditor's right of self-redress by apprehension (*manus injectio*) and imprisonment, &c., of his debtor conditional on the observance of the prescribed formalities of the *nexum*. The character and effects, however, of this the earliest independent contract of the *jus civile*, are much disputed and will be explained below on p. 545 seq.

Offences and their punishment.

Public and Private Offences and their Punishment.—For anything like a clear line of demarcation between crimes and civil injuries we look in vain in regal Rome. Offences against the state itself, such as trafficking with an enemy for its overthrow (*proditio*) or treasonable practices at home (*perduellio*) were matter of state prosecution and punishment from the first. But in the case of those that primarily affected an individual or his estate there was a halting between, and to some extent a confusion of, the three systems of private vengeance, sacral atonement and public or private penalty.[1] These may be said to have followed in sequence but overlapped each other. The same sequence is observable in the history of the laws of other nations, the later system gradually gaining ground upon the earlier and eventually superseding it.[2] The remarkable thing in Rome is that private vengeance should so long not only have left its traces but continued to be an active power. According to tradition it was an admitted right of the *gens* or kinsmen of a murdered man in the days of Numa; a law of his is said to have provided that, where a homicide was due to misadventure, the offering to them of a ram should stay their hands (*supra*, p. 533). And this seems to have been also prescribed in the XII. Tables (VIII., 24). To avenge the death of a kinsman was more than a right: it was a religious duty, for his *manes* had to be appeased; and so strongly was this idea entertained that, even long after the state had interfered and made murder a matter of public prosecution, a kinsman was so imperatively bound to set it in motion that if he failed he was not permitted to take anything of the inheritance of the deceased. The talion we read of in the XII. Tables is also redolent of the *vindicta privata*, although practically it had become no more than a means of enforcing reparation. And even the nexal creditor's imprisonment of his defaulting debtor (*infra*, p. 551), which was not abolished until the 5th century of the city, may not unfittingly, in view of the cruelties that too often attended it, be said to have savoured more of private vengeance than either punishment or procedure in reparation.

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[1] The *familia*, as the collective name for a man's lands and mancipable appurtenances, became itself capable of mancipation. The conveyance was universal. There would be, it is thought, nothing discreditable in a man's conveying his *heredium* in this form.

[2] For a different view cf. Maine, *Ancient Law*, ed. Pollock, pp. 214 seq.

[3] Such as debarment from gentile or gild privileges, exclusion from right of burial in the gentile or gild sepulchre, fines in the form of cattle and sheep, &c.

[4] Some of the old writers (*e.g.* Liv. i. 21, § 4, xxiii. 9, § 3; Plin. *H.N.* xi. 45; Serv. in *Aen.* iii. 687) say that the seat of Fides was in the right hand, and that to give it (*promittere dextram*—is this the origin of the word "promise"?) in making an engagement was emphatically a pledge of faith. See a variety of texts illustrating the significance of the practice, and testifying to the regard paid to Fides before foreign influences and example had begun to corrupt men's probity and trustworthiness, in Lasaulx, *Ueber d. Eid bei d. Römern* (Würzburg, 1844), p. 5 seq.; Danz, *Der sacrale Schutz im röm. Rechtsverkehr* (Jena, 1857), pp. 139, 140. Cf. Pernice, *Labeo*, vol. ii. (2nd ed., Halle), p. 459 seq.

Expiatio, *supplicium*, *sacratio capitis*, all suggest offences against the gods rather than against either an individual or the state. But it is difficult to draw the line between different classes of offences, and predicate of one that it was a sin, of another that it was a crime and of a third that it was but civil injury. They ran into each other in a way that is somewhat perplexing. Apparently the majority of those specially mentioned in the so-called *leges regiae* and other records of the regal period were regarded as violations of divine law, and the punishments appropriate to them determined upon that footing. Yet in many of them the prosecution was left to the state or to private individuals. It is not clear, indeed, that there was any machinery for public prosecution except in treason and murder—the former because it was essentially a state offence, the latter because it was comparatively early deemed expedient to repress the blood-feud, which was apt to lead to deplorable results when clansmen and neighbours appeared to defend the alleged assassin.

Take some of those offences whose sanction was *sacratio capitis*. Breach of duty resulting from the fiduciary relation between patron and client, maltreatment of a parent by his child, exposure or killing of a child by its father contrary to the Romulian rules, the ploughing up or removal of a boundary stone, the slaughter of a plough-ox—all these were capital offences; the offender, by the formula *sacer esto*, was devoted to the infernal gods. Festus says that, although the rules of divine law did not allow that he should be offered as a sacrifice to the deity he had especially offended (*nec fas est eum immolari*), yet he was so utterly beyond the pale of the law and its protection that any one might kill him with impunity. But, as the *sacratio* was usually coupled with forfeiture of the offender's estate or part of it to religious uses, it is probable that steps were taken to have the outlawry or excommunication judicially declared, though whether by the pontiffs, the king or the curies does not appear; such a declaration would, besides, relieve the private avenger of the incensed god of the chance of future question as to whether or not the citizen he had slain was *sacer* in the eye of the law.

That there must have been other wrongful acts that were regarded in early Rome as deserving of punishment or penalty of some sort, besides those visited with death, sacration or forfeiture of estate, total or partial, cannot be doubted; no community has ever been so happy as to know nothing of thefts, robberies and assaults. The XII. Tables contained numerous provisions in reference to them; but it is extremely probable that, down at least to the time of Servius Tullius, the manner of dealing with them rested on custom, and was in the main self-redress, restrained by the intervention of the king when it appeared to him that the injured party was going beyond the bounds of fair reprisal, and frequently bought off with a composition. When the offence was strictly within the family or the *gens*, it was for those who exercised jurisdiction over those bodies to judge of the wrong and prescribe and enforce the penalty.

Early course of justice.

Jurisdiction and Procedure.—Of the course of justice, whether in criminal or civil matters, during the regal period we know little that can be relied on. Ancient writers speak of the king as having been generally supreme in both. But this can be accepted only with considerable reservation. For the *paterfamilias*, aided by a council in cases of importance, was judge within the family—his jurisdiction sometimes excluding that of the state, at other times concurring with it, and not to be stayed even by an acquittal pronounced by it. He alone was competent in any charge against a member of the family for a crime or offence against the domestic order—adultery or unchastity of wife or daughter, undutiful behaviour of children or clients, or the like. Death, slavery, banishment, expulsion from the family, imprisonment, chains, stripes, withdrawal of *peculium*, were all at his command as punishments; and it may readily be assumed that in imposing them he was freer to take account of moral guilt than an outside tribunal. The indications of criminal jurisdiction on the part of the *gens* are slight; but its organization was such that it is difficult not to believe that it must occasionally have been called on to exercise such functions. And it must not be lost sight of that, as murder seems to have been the only crime in regard to which private revenge was absolutely excluded, the judicial office of the kings must have been considerably lightened, public opinion approving and not condemning self-redress so long as it was kept within the limits set by usage and custom.

The king as judge.

The boundary between civil and criminal jurisdiction, if it existed at all, was extremely shadowy. Theft and robbery, for example, if one may conclude from the position they held in the later jurisprudence, were regarded not as public but as private wrongs; and yet when a thief was caught in the act of theft by night he might be slain, and when by day might be scourged and thereafter sold as a slave. But in both cases it may also be assumed that a practice, afterwards formally sanctioned by the XII. Tables—that of the thief compounding for his life or freedom—was early admitted, and the right of self-redress thus made much more beneficial to the party wronged than when nothing was attained but vengeance on the wrongdoer. In assaults, non-manifest thefts, and other minor wrongs, self-interest would in like manner soon lead to the general adoption of the practice of compounding; what was originally a matter of option in time came to be regarded as a right; and with it there would be occasional difficulty in settling the amount of the composition, and consequent necessity of an appeal to a third party. Here seems to be the origin of the king's jurisdiction in matters of this sort. He was the natural person to whom to refer such a dispute; for he alone, as supreme magistrate, had the power to use coercion to prevent the party wronged insisting on his right of self-redress, in face of a tender by the wrongdoer of what had been declared to be sufficient reparation. But that self-redress was not stayed if the reparation found due was withheld; as the party wronged was still entitled at a much later period to wreak his vengeance upon the wrongdoer by apprehending and imprisoning him, it cannot reasonably be doubted that such also was the practice of the regal period.

How far the kings exercised jurisdiction in questions of quiritarian right, such as disputes about property or inheritance, is by no means obvious. Within the family, of course, such questions were impossible, though between clansmen they may have been settled by the *gens* or its chief. The words of style used in the sacramental real action (*infra*, p. 548) suggest that there must have been a time when the spear was the arbiter, and when the contending parties, backed possibly by their clansmen or friends, were actual combatants, and victory decided the right. Such a procedure could not long survive the institution of a state. In Rome there seems to have been very early substituted for it what from its general complexion one would infer was a submission of the question of right to the pontiffs as the repositories of legal lore. Their proper functions, however, being sacred, they had to bring what was a question of purely civil right within their jurisdiction, by engrafting on it a sacral element, viz. by requiring each of the parties to make oath to the verity of his contention; and the point that in form they decided was which of the two oaths was false and therefore to be made atonement for. In substance, however, it was a finding on the real question at issue; and the party in whose favour it was pronounced was free to make it effectual if necessary by self-redress in the ordinary way.

Servian reforms.

Of Servius, Dionysius says—using, as he often does, language more appropriate to the republican than to the regal period—that he drew a line of separation between public and private judicial processes, and that, while he retained the former in his own hands, he referred the latter to private judges, and regulated the procedure to be followed in causes brought before them.[3] Something of the sort was absolutely necessary. He was enormously increasing the number of the citizens,—that is to say, of those who were to enjoy in future the privileges of quiritarian right,—and multiplying the sources of future disputes that would have to be determined by the tribunals. The nature of the jurisdiction created by him, if any, to meet the new aspect of things is much controverted. He has been credited with the institution of the collegiate courts of the *Centumviri* and the *Decemviri* (*stlitibus judicandis*) as well as the private judge (*unus judex*), but the arguments in support of this view are not strong, and are, of course, based wholly on presumptions. However, it will be convenient to say a few words about each of these courts here.

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[1] See Rein, *Das Criminalrecht der Römer* (Leipzig, 1844), pp. 24 seq.; Clark, *Early Roman Law: Regal Period* (London, 1872), pp. 34 seq.; Mommsen, *Strafrecht*, pp. 6, 36, 900.

[2] Probably every offence at first was an act attributable to the whole family or clan, and it was upon them or by them and not upon the individual wrong-doer or by the injured party that vengeance was taken.

[3] Dion. Hal. iv. 25.

Centumviral court.

The centumviral court[1] is often referred to by Cicero, and the range of its jurisdiction in his time seems to have included every possible question of *manus* in the old sense of the word—status of individuals, property and its easements, and inheritance whether testate or intestate. By the time of Gaius the only matters apparently that were in practice brought before it were questions of inheritance by the *jus civile*, though theoretically it was still competent in all real actions, and the lance, the emblem of quiritarian right generally, was still its ensign. During the later Republic the *Centumviri* formed a quasi-corporate body of private judges selected originally from the tribes (afterwards from the ordinary list of *judices*) annually by the urban praetors.[2] Some writers identify the centumviral court with the Romulian senate of 100; others attribute its institution to Servius Tullius and hold that it was a plebeian court at first; others make it contemporaneous with the XII. Tables; others bring it down to the 6th century of the city; while the weight of recent authority is in favour of the view that it is not earlier than the beginning of the 7th century. The arguments in support of these several views cannot be gone into here. It is enough to say that we have no positive proof of its existence earlier than the 7th century, though presumptions are in favour of its having been somewhat earlier. In the exercise of their office the *Centumviri* acted more independently than private judices ventured to do, and even introduced some considerable reforms into the law.

Decemviral court.

There was a court at Rome during the Republic called the *Decemviri stlitibus judicandis.*[3] These decemvirs in historic times constituted a quasi-corporate body of judicial magistrates, whose duty it was to try certain kinds of actions, especially those relating to personal liberty. During the Principate, while ceasing to act as a separate court, they presided over the divisions into which the centumviral court had been under Augustus divided. Their origin is quite unknown. Pomponius indeed says that they were originally created soon after the institution of the peregrin praetorship in 242 B.C. for this very purpose of presiding over centumviral cases,[4] but this statement is generally discredited and, if true, their practice of so presiding must quickly have gone into disuse. Those writers who attempt to trace back the centumvirs to the regal period give, as a rule, a like antiquity to the *Decemviri stlitibus judicandis*. On the other hand, some authorities identify them with the *decemviri judices* mentioned by Livy[5] as having been declared by the *lex Valeria-Horatia* to be as sacrosanct as the tribunes of the *plebs*. But these latter judices seem to have been a purely plebeian court which early went into desuetude, and there is really no evidence of identity.

"Judices" and "arbitri."

So far back as historic evidence goes we find that actions were tried and judgments pronounced by *judices* and *arbitri*. There never was more than a single judge (*unus* or *unicus judex*) appointed to try a case, but there might be more than one arbiter, and frequently there were three. All kinds of actions, even a sacramental action *in rem*, could be brought before the *unus judex*, but especially appropriate to him were all personal claims of alleged indebtedness, whether arising out of a legal or illegal act, denied either *in toto* or only as to the amount. Matters of that sort involved as a rule no general principle of law but rather mere disputes as to facts, which could well be decided by a single individual. There is much more reason for crediting Servius with the institution of the single judge (the arbiters may have been a creation of the XII. Tables) than with either of the collegiate courts. If we believe that in the early regal period the king acting with the pontiffs kept all jurisdiction in his own hands, it is plain that this must have become a practical impossibility after the admission of the plebeians to citizenship. For the trial of disputed facts it would be necessary to delegate jurisdiction, and the earliest *judices* may have been the king's commissioners for such cases. If this be right, it was the beginning of a system that bore wondrous fruit in after years, and that, as will be shown in the sequel, helped the praetors to build up, through the *formulae*, the whole body of equity.

Civil procedure.

Under the kings it is not improbable that several of the *legis actiones*, more or less undeveloped, were already in use, but the nature of these actions will be more conveniently considered later on (*infra*, p. 566).

II. The Jus Civile

(From the establishment of the Republic until the subjugation of central and southern Italy.)

i. *Constitutional Events affecting the Law.*

Nature of "Jus Civile."

Jus Civile contrasted with Jus Quiritium.—The term *jus civile*, as used to designate this chapter, though almost synonymous with, may be taken as somewhat more comprehensive than, *jus Quiritium*. It is a term of later origin than the latter. *Jus Quiritium* was based entirely on old custom and legislation, finding, one might say, its culmination in the XII. Tables; whereas in the *jus civile*, as here understood, there appears the element of doctrinal interpretation of both statute and custom—the magistrates and jurists (particularly the pontiffs) adding much to the earlier law by introducing into it this element. We can say that the *jus civile* in this sense is *jus Quiritium* as developed by interpretation. It is as yet, however, little influenced, as was the more comprehensive *jus civile* of later periods, by the elements of *jus gentium* and equity. Still nowhere, we must note, are the terms *jus Quiritium* and *jus civile* placed in contrast by the jurists; they were each *jus proprium civium Romanorum*. In the classical law the term *jus Quiritium* seems to be used principally in formulae framed in accordance with old custom.

Historic evidence.

Though our information regarding the present period is less legendary than that of the kings, it is still far from being completely authentic, as no original documents belonging to it are extant. There is little dispute among critics that Rome was sacked and burned by the Gauls about 387 B.C. or a few years later, and it is probable that the original pontifical annals (*annales maximi*) upon which Livy and other Roman historians have presumably based their narratives of early history were destroyed at that time along with all other written records. What credence, then, we may give to the ancient historical narratives, for the period of the Republic antecedent to this event, depends largely upon how far the pontifices managed to have their lost records restored. In any case, however, there is sufficient presumptive evidence to warrant belief in such prominent events of the early Republic as the creation of two annually elected patrician consuls, with *potestas* similar to that of the kings, the creation of tribunes of the *plebs*, the enactment of the decemviral code, and periodic struggles between patricians and *plebs*, the one to keep and the other to gain political power. To know the exact dates of these events is relatively of little importance.

Legislation in Favour of the Plebs.—In their uphill battle for social and political equality the plebeians conquered stage by stage. The more important of their successes may here just be mentioned, with all reserve as to credibility, in the order of their traditional dates. By the *lex Valeria* (*de provocatione*) of 509 B.C. it was provided that no Roman citizen should be deprived of life, liberty or citizenship (*i.e.* suffer *poena capitis*), or be scourged, by any magistrate within the city, without an appeal (*provocatio*) to the *comitia centuriata*. This statute was often referred to by later Romans as a sort of Magna Carta; Livy calls it *unicum praesidium libertatis*. In 494 or 471 B.C. the tribunes of the *plebs* were created with right of intercession, and about the same time plebeian *aediles* and *judices decemviri* (the latter to act as judges or arbiters in litigations); the persons of all these officials being declared inviolable during their tenure of office. About 471 B.C. the *concilium plebis* became legislatively recognized, the tribunes were elected in it, and its resolutions (*plebiscita*) became directly binding on plebeians. The XII. Tables, twenty years later, were the fruit of the agitation of the plebeians for a revision and written embodiment of the law. In 449 plebiscita were—subject presumably to *auctoritas patrum*—declared by the *lex Valeria-Horatia* binding on the whole *populus*, while about the same time, or perhaps a little earlier, the patrician-plebeian *comitia* of the tribes was instituted.[1] By the *lex Canuleia* of 445 B.C. intermarriage between patricians and plebeians was sanctioned. Repeated protests by the plebeians against the monopolization of the public domain land by members of the higher order resulted in the definite admission of their right to participate in its occupation by one of the Licinian laws of 367 B.C. The long course of cruel oppression of insolvents (mainly plebeians) by their patrician creditors was put an end to by the Poetilian law about 326 B.C., depriving nexal contract of its privileges and generally prohibiting the use of chains and fetters on persons incarcerated for purely civil debt. By the Hortensian law of about 287 B.C. plebiscita were declared binding (presumably without *auctoritas patrum*) on the whole body of citizens. And from 421 B.C., when one of their number first reached the regular state magistracy as quaestor, down to 252 B.C., when one was elected *pontifex maximus*, the plebeians gradually vindicated their right as citizens to share in all the honours of the state. There is also evidence that plebeians were early in the Republic admitted to the senate and also to the *comitia curiata*.

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[1] Literature: Huschke, *Servius Tullius*, pp. 585 seq.; Keller-Wach, *Röm. Civil Process* (1883), § 6; Bethmann-Hollweg, *Geschichte d. C. P.* i. § 23; Wlassak, *Process-Gesetze*, i. 125 seq. and ii. 201 seq.; Girard, *Organisation judiciaire des Romains*, i. 23 n.; Martin, *Le tribunal des centumvirs* (Paris, 1904). In this last-named work a succinct account of the court and the various theories about it is given.

[2] On the question of their election, see Greenidge, *Legal Procedure in Cicero's Time*, pp. 41 and 264.

[3] Girard, *Organisation judiciaire*, i. 159; Pauly-Wissowa, *Encyklopädie, s.v.* "Decemviri."

[4] *Dig.* i. 2, § 29.

[5] Livy, ix. 46, 5; Karlowa, *Röm. R.G.* i. 116.

Legislative bodies.

The legislative bodies during the present period were thus three in number: the *comitia* of the centuries, the *concilium plebis* and the *comitia tributa*. As to the *comitia* of the curies, it seems to have hardly concerned itself with general legislation, but met merely to confer *imperium* on the higher magistrates and to sanction testaments and adrogations of the gentiles. The legislation of the centuries dealt for the most part (though the XII. Tables were enacted by it) with questions affecting public and constitutional rather than private interests. It could be convened only by a magistrate having military *imperium*, *i.e.* at first only the consuls, for the reason that it was theoretically a military assembly met for civil purposes (*exercitus civilis*). It is called in the XII. Tables *comitiatus maximus*. Its procedure was cumbrous and ill-adapted for legislation. As to the relation of the *concilium plebis* to the *comitia tributa* there is much controversy. The old opinion which identified them is now generally abandoned. According to Mommsen[2] they differed in the following points: (1) The *comitia* was an assembly of the whole people voting in tribes instead of centuries, while the *concilium* was an assembly of the *plebs* alone; (2) the *comitia* was always convoked and presided over by a patrician magistrate (often the praetor), while the *concilium* had to be convoked and presided over by a plebeian official (usually a tribune); (3) in the *comitia* auspices had to be taken beforehand, but not in the *concilium*; (4) an enactment of the *comitia* was a *lex* binding on all the *populus*, while an enactment of the *concilium* was a plebiscitum binding only on the *plebs*. It is, however, not possible to take Mommsen's view that plebiscita were not binding on the whole *populus* prior to the *lex Hortensia*, without disregarding distinct statements of Livy as to the *lex Valeria-Horatia* and the *lex Publilia*.[3] But whatever the relation of these two legislative assemblies to each other may have been originally, it is certain that the Hortensian law equalized them so far as their effects were concerned, and, looking to the small number of patricians compared with the *plebs*, it would probably be a matter of indifference in which assembly the vote was taken. The greater part of the legislation dealing with the private law in the later Republic consisted of plebiscita.

ii. *The XII. Tables.*

Causes of their Enactment.—The change from monarchy to republic brought of itself no benefit to the *plebs*, but rather the reverse. One of their chief complaints was against the administration of justice. They complained that they were kept in ignorance of the laws, and that in particular the consuls used their magisterial punitive powers (*coercitio*) unfairly and with undue severity when a plebeian was the object of them. The state of matters gradually became so intolerable that in the year 462 B.C., according to the ancient tradition, a proposal for a statute was made by C. Terentilius Arsa, one of the tribunes, by which a commission should be appointed to draw up a code of laws in writing. He carried a rogation in the *concilium plebis* to this effect. The senate at first strenuously resisted, but after a few years was induced to give way, and its assent to the proposal was obtained.

Compilation of the XII. Tables.

Tradition records that the first practical step towards its realization was the despatch of a mission to Athens, to study the laws of Solon and collect any materials that might be of service in preparing the projected code. On the return of the commissioners in 452 B.C. all the magistracies were suspended, and a body of ten patricians, called *decemviri legibus scribundis*, was appointed with consular powers, under the presidency of Appius Claudius, for the express purpose of putting the laws into shape. Before the end of the ensuing year (451) the bulk of the code was ready and was at once passed into law by the *comitia* of the centuries and published on ten tables (whether of brass or wood is doubtful), which were set up in the Forum. Next year, owing to additions being found necessary, the decemvirate was renewed, with, however, a change of membership (some plebeians being chosen), and in the course of a few months it had completed the supplemental matter. On the downfall of the decemvirate, these new laws, after being duly accepted by the *comitia*, were published on two other tables, thus bringing the number up to twelve. The code then received the official name of *Lex XII. Tabularum.*

Authenticity.

The foregoing account of the enactment of the Tables is an attempt to summarize what is stated by Livy and other Roman writers on the subject. Though inconsistent and sometimes even contradictory about details, these writers are on the main facts in concordance. Until a few years ago, the fact of the publication of such a code about the date above given had been accepted by modern historians, even the most iconoclastic, without question; unlike the *leges regiae*, the XII. Tables had always been regarded as authentic. But in his *History of Rome*, published in 1898, Professor Pais of Turin[4] emitted the view that the decemviral code was really a private compilation made about the year 304 B.C. by Cn. Flavius, the scribe of Appius Claudius the censor, and probably at the latter's instigation; or, in other words, that it was just the so-called *Jus Flavianum* which all writers had hitherto regarded as a work dealing with the styles of *legis actiones* and the calendar of court days. In Pais's view the annalists, in accordance with a habit of theirs, duplicated the same event by counterfeiting an earlier Appius Claudius, &c., in order to magnify the antiquity and authority of the laws collected by Flavius, while the whole account of the decemviral legislation was invented by them. More recently Professor Lambert of Lyons has attempted by similar arguments to prove that the XII. Tables were a private compilation of customs already in observance, and of sacerdotal and other rules already in circulation, made about 197 B.C. by the jurist Aelius Paetus, and were in fact identical with the *Tripertita* or *Jus Aelianum*, which had always heretofore been supposed to contain merely a recension of the Tables with an interpretation and commentary.[5] This is not the place to discuss these theories. Though of course incapable of positive disproof, the weight of presumptive evidence is against them; they have hitherto found little or no support from other Romanists, and they have, in our opinion, been sufficiently refuted on philological and other grounds by Girard[1] and others.[2]

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[1] There is diversity of opinion about this. Mommsen thinks the *comitia tributa* was earlier than the XII. Tables, and that the *lex Valeria-Horatia* applied to it. See next note.

[2] Mommsen, *Röm. Forschungen*, i. 177 seq.; *Röm. Staatsrecht*, iii. 322 seq.

[3] Livy, iii. 55, 3; viii. 12, 14.

[4] Pais, *Storia di Roma* (Turin), i. 566 seq.

[5] *Nouvelle Revue historique* (1902), xxvi. 149 seq.; *Revue générale du droit*, nos. 5 et 6; *Mélanges*, Appleton (1903), pp. 126 seq.

Sources.

There were provisions in the Tables that were almost literal renderings from the legislation of Solon; and others bore a remarkable correspondence to laws in observance in Greece, but they may have been only indirectly borrowed.[3] By far the greater proportion of them, however, were native and original,—not that they amounted to a general formularization of the hitherto floating customary law, for, notwithstanding Livy's eulogium of them as the "fountain of the whole law, both private and public," it seems clear that many branches of it were dealt with in the Tables only incidentally, or with reference to some point of detail. The institutions of the family, the fundamental rules of succession, the solemnities of such formal acts as mancipation, *nexum*, and testaments, the main features of the order of judicial procedure, and so forth,—of all of these a general knowledge was presumed, and the decemvirs thought it unnecessary to define them. What they had to do was to make the law equal for all, to remove every chance of arbitrary dealing by distinct specification of penalties and precise declaration of the circumstances under which rights should be held to have arisen or been lost, and to make such amendments as were necessary to meet the complaints of the plebeians and prevent their oppression in the name of justice. Probably very little of the customary law, therefore, was introduced into the Tables, that was already universally recognized, and not complained of as either unequal, defective or oppressive. Only one or two of the laws ascribed to the kings (assuming their greater antiquity) reappeared in them; yet the omission of the rest did not mean their repeal or imply denial of their validity, for a few of them continued still in force during the Empire, and are founded on by Justinian in his *Digest.* Neither apparently were any of the statutes of the Republic anterior to the Tables embodied in them, although for long afterwards many a man had to submit to prosecution under these laws and to suffer the penalties they imposed.

Remains.

The original Tables are said to have been destroyed when Rome was sacked and burned by the Gauls. But they were probably at once reproduced, and transcripts of them in more or less modernized language must have been abundant if, as Cicero says was still the case in his youth, the children were required to commit them to memory as an ordinary school task. This renders all the more extraordinary the fact that the remains of them are so fragmentary and their genuineness in many cases so debateable. They were embodied, as above mentioned, in the *Tripertita* of Sextus Aelius Paetus in the year 197 B.C., who probably republished them in somewhat modernized language and from whose work, it is thought, all later writers took their contents. They must have formed the basis of all the writings on the *jus civile* down to the time of Servius Sulpicius Rufus, who first took the praetor's edicts as a text; and they were the subjects of monographs even by authors later than Sulpicius, amongst them by M. Antistius Labeo in the early years of the Empire, and by Gaius, probably in the reign of Antoninus Pius. Yet a couple of score or so are all that can be collected of their provisions in what profess to be the *ipsissima verba* of the Tables, though in a form in most cases more modern than what we encounter in other remains of archaic Latin of the 4th century of the city. These are contained principally in the writings of Cicero, the *Noctes Atticae* of Aulus Gellius, and the treatise *De verborum significatione* of Festus; the two latter dealing with them rather as matters of antiquarian curiosity than as rules of positive law. There are also many allusions to particular provisions in the pages of Cicero, Varro, Gellius and the elder Pliny, as well as in those of Gaius, Paul, Ulpian and other ante-Justinian jurists; but these are not to be implicitly relied on, as we have evidence that they frequently represent the (sometimes divergent) glosses of the interpreters rather than the actual provisions of the statute. Reconstruction has therefore been a work of difficulty, and the results far from satisfactory, that of the latest editor, Voigt, departing very considerably from the versions generally current during the last half-century.[4]

General characteristics.

In form the laws contained in the Tables were of remarkable brevity, terseness and pregnancy, with something of a rythmical cadence that must have greatly facilitated their retention in the memory. Rarely, if ever, were the rules they embodied permissive; they were nearly all in the imperative mood, sometimes entering into minute detail but generally running on broad lines, surmounting instead of removing difficulties. Their application might cause hardship in individual instances, as when a man was held to the letter of what he had declared in a *nexum* or mancipation, even though he had done so under error or influenced by fraudulent misrepresentations; the decemvirs admitted no exceptions, preferring a hard-and-fast rule to any qualifications that might cause uncertainty. The system as a whole is one of *jus* as distinguished from *fas.* In the royal laws execration (*sacratio capitis, sacer esto*) was a common sanction; but in the Tables it occurs only once pure and simple, and that with reference to an offence that could be committed only by a patrician,—material loss caused by a patron to his client (*patronus, si clienti fraudem faxsit, sacer esto*). In all other cases the idea that a crime was an offence against public order, for which the community was entitled in self-protection to inflict punishment on the criminal, is prominent. Hanging and beheading, flogging to death, burning at the stake, throwing from the Tarpeian rock,—such are secular penalties that are met with in the Tables; but often, though not invariably, the hanging and so forth is at the same time declared a tribute to some deity to whom the goods of the criminal are forfeited (*consecratio bonorum*). The Tables also recognize the system of self-help.

The *manus injectio* of the third Table—the execution done by a creditor against his debtor—was probably in essence the same procedure as under the kings, but with the addition of some regulations intended to prevent its abuse. Against a thief taken in the act the same procedure seems to have been sanctioned; it was lawful to kill him on the spot if the theft was nocturnal, or even when it was committed during the day if he used arms in resisting his apprehension. According to Cicero there was a provision in these words: "si telum manu fugit magis quam jecit, arietem subicito"; this is perhaps just a re-enactment in illustrative language of the law attributed to Numa, that for homicide by misadventure—"if the weapon have sped from the hand rather than been aimed"—a ram was to be tendered as a peace-offering to the kinsmen of him who had been slain. The original purpose must have been to stay the blood revenge, but in the Tables it can only have been intended to stay the prosecution which it was incumbent on the kinsmen of a murdered man to institute. So with talionic penalties: "si membrum rupit ni cum eo pacit, talio esto"—such, according to Gellius, were the words of one of the laws of the Tables, and they undoubtedly recognize talion, "an eye for an eye, a tooth for a tooth"; while at the same time regulating it by enabling the injured man to bring an action and sanctioning a money recompense (*Wehrgeld*) in lieu of it.[5]

Interpretation of the Tables.

The structure of the provisions of the Tables was not such as to enable the plain citizen to apply them to concrete cases, or to know how to claim the benefit of them in the tribunals, without some sort of professional advice. Pomponius states that no sooner was the decemviral legislation published than the necessity was felt for its interpretation, and for the preparation by skilled hands of styles of actions by which its provisions might be made effectual. Both of these duties fell to the pontiffs as the only persons who, in the state of civilization of the period, were well qualified to give the assistance required; and Pomponius adds that the college annually appointed one of its members to be the adviser of private parties and of the *judices* in those matters. The *interpretatio*, commenced by the pontiffs and continued by the jurists during the Republic, which, Pomponius says, was regarded as part of the *jus civile*, was not confined to explanation of the words of the statute, but was in some cases their expansion, in others their limitation, and in many the deduction of new doctrines from the actual *jus scriptum*, and their development and exposition. An event that did much to diminish the influence of the pontiffs in connexion with it was the divulgement in the year 304 B.C., as already mentioned, by Cn. Flavius, of a formulary of actions and a calendar of lawful and unlawful days, which got the name of *Jus Flavianum*. The practice adopted in the beginning of the 6th century by Tiberius Coruncanius, the first plebeian chief pontiff, of giving advice in law in public had a still greater effect in popularizing it; and the *Tripertita* or *Jus Aelianum*, some fifty years later—a collection that included the Tables, the *interpretatio* and the current styles of actions—made it as much the heritage of the laity as of the pontifical college.

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[1] *Textes*, pp. 3–4; *Nouv. Rev. hist.* xxvi. 381 seq.

[2] Erman, *Z. d. Sav. Stift.* (1903), xxiii. 450; Lenel, *Z. d. Sav. Stift.* (1905), xxvi. 498.

[3] The decemvirs may have obtained them either from Magna Graecia or from Etruria, as the story of a mission to Athens is improbable.

[4] Dirksen's *Übersicht der bisherigen Versuche zur Kritik u. Herstellung d. Zwölf-Tafel-Fragmente* (Leipzig, 1824), supplies the basis of almost all the later work on the Tables anterior to that of Voigt. Schoell, in his *Legis XII. Tab. reliquiae* (Berlin, 1866), made a valuable contribution to the literature of the subject from a philological point of view. His version has been adopted substantially by Bruns in his *Fontes juris*, i. 16 seq. (6th ed. by Mommsen and Gradenwitz), and Girard in his *Textes* (3rd ed., Paris, 1903). See also Muirhead, *Historical Introduction* (2nd ed., 1899), and Wordsworth, *Fragments and Specimens of Early Latin* (Oxford, 1874), pp. 253 seq. The last-named writer in a subsequent part of his volume (pp. 502–38) has added notes, historical, philological and exegetical, which constitute a valuable commentary on the Tables as a whole. Voigt's two volumes, under the title of *Geschichte und System des Civil-und-Criminal-Rechtes wie Processes, der XII. Tafeln nebst deren Fragmenten* (Leipzig, 1883), contain an exposition of the whole of the earlier *jus civile*, whether embodied in the Tables or not. The history of them occupies the first hundred pages or thereby of the first volume; his reconstruction of fragments and allusions—a good deal fuller than any earlier one and supported by an imposing array of authorities, which, however, often rest on arbitrary assumptions—is in the same volume, pp. 693–737.

[5] There is little doubt that *talio* was actually enforced under the decemviral code, just as it was under the Jewish and Mahommedan codes, and as we see it among semi-civilized communities (*e.g.* the Abyssinians) at the present day. See Code of Khammurabi, 196 seq.; Leviticus xxiv. 20; Lane, *Modern Egyptians*, p. 94. Many references are given by Lenel in *Z. d. Sav. Stift.* xxiv. 509.

Subsequent legislation.

Subsequent Legislation.—Of legislation during the 4th and 5th centuries that affected the private law we have but scanty record. The best-known enactments are the Canuleian law of 445 B.C. above mentioned; the Genucian, Marcian and other laws about usury and the rate of interest; the Poetilian law of 326 B.C. abolishing imprisonment of nexal debtors by their creditors; the Silian law, probably not long afterwards, which introduced a new form of process for actions of debt; and the Aquilian law about 287 B.C., which amended the decemviral provisions for actions of damages for culpable injury to property, and continued to regulate the law on the subject even in the books of Justinian.

iii. *Development of the Substantive Institutions of the Law.*

The citizen and his "caput."

The Citizen and his "Caput."—The early law of Rome was essentially personal, not territorial. A man enjoyed the benefit of its institutions and of its protection, not because he happened to be within Roman territory, but because he was a citizen,—one of those by whom and for whom its law was established. The theory of the early Romans was that a man sojourning within the bounds of a foreign state was at the mercy of the latter and its citizens, that he himself might be dealt with as a slave, and all that belonged to him appropriated by the first comer; for he was outside the pale of the law. Without some sort of alliance with Rome a stranger had no right to claim protection against maltreatment of his person or attempt to deprive him of his property; and even then, unless he belonged to a state entitled by treaty to the international judicial remedy of *recuperatio*, it was by an appeal to the good offices of the supreme magistrate, or through the intervention of a citizen to whom he was allied by the (frequently hereditary) bond of *hospitium*, and not by means of any action of the *jus civile* set in motion by himself. A non-citizen—originally *hostis*, and afterwards usually called *peregrinus*[1]—in time came to be regarded as entitled to all the rights recognized by so-called *jus gentium* as belonging to a freeman, and to take part as freely as a Roman in any transaction of the *jus gentium*; but that was not until Rome, through contact with other nations and the growth of trade and commerce, had found it necessary to modify her jurisprudence by the adoption of many new institutions of a more liberal and less exclusive character than those of the *jus civile*.

A citizen's civil personality was technically his *caput*. The extent of it depended on his family status. It was only among citizens that the supremacy of the *paterfamilias* and the subjection of those *in manu*, *potestate* or *mancipio* were recognized—only among them therefore that the position of an individual in the family was of moment. While in public life a man's supremacy or subjection in the family was immaterial, in private life it was the *paterfamilias* alone who enjoyed full jural capacity. Those subject to him had a more limited personality; and, so far as capacity to take part in transactions of the *jus civile* was concerned, it was not inherent in them but derived from their *paterfamilias*: they were the agents of his will, representatives of his *persona* in every act whereby a right was acquired by them for the family to which they belonged.

"Capitis deminutio."

Whenever a citizen either ceased altogether to be a member of a Roman family or passed, either permanently or temporarily, into subjection to some *paterfamilias* outside his own family,[2] there was technically *capitis minutio* or *deminutio*. To harmonize with the gradually established conception of jural personality in non-citizens, and perhaps also from their partiality for tripartite divisions, the jurists about the end of the Republic divided *capitis deminutio* into three degrees, viz. *maxima*, *media* and *minima*—a division unknown to lawyers of an earlier period when *civitas* was theoretically identified with *libertas*. When a citizen forfeited his freedom, his *capitis deminutio* was said to be *maxima*; he lost all capacity, whether under the *jus civile* or the *jus gentium*. When, retaining freedom, he went into exile or joined a Latin colony, or otherwise became a peregrin, the loss (*deminutio*) of his capacity was only *media* or *minor*; it was his rights and privileges under the *jus civile* that alone were affected. When both freedom and citizenship remained, and there was produced merely the severance of connexion with a particular family (*familiae mutatio*), the loss was said to be *minima*. Illustrations of *c. d. minima* present themselves in the case of a *paterfamilias* becoming *filiusfamilias* by adrogation, or a *materfamilias* passing into the hand of a husband by confarreation or coemption; in both cases he or she who had been *sui juris* thereby became *alieni juris*. It was immaterial whether the change was from a higher family position to a lower, or from a lower to a higher,[3] or to the same position in the new family that had been held in the old—as when a *filiusfamilias* was transferred by his father into the *potestas* of an adopter, or when the *filiifamilias* of a person giving himself in adrogation passed with him into the *potestas* of the adrogator: in every case there was *capitis minutio*. It was not the change of family position that caused it, but the subjection to a new *potestas*. Thus the civil personality of Titius while a *filiusfamilias* in the *potestas* of Sempronius, *e.g.* the expectancy of succession, the agnatic relationships, the derivative capacity for being a party to a mancipation or a *sponsio* that resulted from the relationship, all came to an end through the subjection to a new *paterfamilias*, temporary or permanent. He might acquire another and independent capacity on becoming *sui juris* by emancipation, or another derivative capacity on passing into the *potestas* of Maevius by adoption; but while subject to a new *paterfamilias* his old personality *quoad civilia* was extinguished. This is what some of the jurists mean when they say that *capitis deminutio* was civil death.[4]

An important consequence of *minima capitis deminutio* was that it not only extinguished *patria potestas* where it existed, but severed the bond of agnation between the *capite minutus* and all those who had previously been related to him as agnates. There was no longer any right of succession between them on intestacy; their reciprocal prospective rights of tutory were defeated, and the *minutio* of either tutor or ward put an end to a subsisting guardianship, assuming always that it was a *tutela legitima* or agnatic *cura furiosi*. Very remarkable, yet quite logical, was the doctrine that the *minutio* extinguished the claims of creditors of the *minutus*; their debtor, the person with whom they had contracted, was civilly dead, and dead without an heir, and therefore there was no one against whom an action of the *jus civile* could be directed in order to enforce payment. But equity eventually provided a remedy, by giving the creditors a praetorian action in which the *minutio* was held as rescinded, and which the new *paterfamilias* was bound to defend on pain of having to give up all the estate he had acquired through the adrogation or *in manum conventio*. In other respects also the strict effects of this *capitis minutio* were attenuated or done away with by the jurists of the Empire, *e.g.* as regards personal servitudes.

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[1] Neither "alien" nor "foreigner" is an adequate rendering of *peregrinus*. For *peregrini* included not only citizens of other states, independent or dependent, but also ἀπόλιδες,—men who could not call themselves citizens (*cives*) at all, as, for example, the *dediticii* whom Rome had vanquished and whose civic organization she had destroyed, offenders sent into banishment, &c., and also, until Caracalla's general grant of the franchise, the greater portion of her provincial subjects.

[2] This is Mommsen's theory. See *Staatsrecht*, iii. 1. p. 8.

[3] Children who became *sui juris* by their parent's death, as they came under no new *potestas*, were not regarded as *capite minuti*.

[4] Owing to the ill-defined views among the Roman jurists themselves regarding the nature of *cap. dem.* various theories more or less divergent have been maintained about it by modern writers, of none of which can it be said that it has been generally accepted. Mommsen's theory, above adopted, seems to present fewest difficulties. See the subject discussed and authorities cited by Goudy in 2nd edition of Muirhead's *Historical Introduction*, pp. 422–27.

Law of family relations.

The Law of the Family Relations.—So far as appears no serious inroad was made by the XII. Tables on the law affecting husband and wife, unless in the recognition of the legality of so-called "free" marriages, *i.e.* entered into without any solemnity, and not involving that subjection of the wife to the husband (*manus*) which was a necessary consequence of the patrician confarreation and plebeian coemption. These latter were left untouched, while on the other hand acquisition of marital *manus* through *usus* was fully recognized. As formerly mentioned, it had become a practice with some of the plebeians to tie the marriage bond rather loosely in the first instance, possibly in consequence of objection by the women (as became quite general even among patricians at a later period) to renounce their independence and right to retain their own property and earnings, but more probably because taking a woman to be merely the mother of children (*matrimonium*) had been practically forced upon them before coemption had been introduced as a means of making her a lawful wife, and so they had become in a manner habituated to it. But the idea that, as a man might acquire the ownership of a thing to which his legal title was defective by prolonged possession of it, so he might acquire *manus* over the woman with whom he had thus informally united himself by prolonged cohabitation with her as his wife had probably matured and become customary law. The Tables accepted it; all that was needed was to define the conditions under which *manus* should be held to have been superinduced, and the wife converted from a doubtful *uxor* into a lawful *materfamilias*. Hence the provision that, if a woman, married neither by confarreation nor coemption, desired to retain her independence, she must each year absent herself for three consecutive nights from her husband's house (*trinoctialis usurpatio*)—twelve months' uninterrupted cohabitation being required to give him that power over her which would have been created instantly had the marriage been accompanied by either of the recognized solemnities.

Amongst the fragments of the Tables so industriously collected there is none that refers to a wife's marriage portion (*dos*); but it is hardly conceivable that it was as yet unknown. Justinian says that in ancient times it was regarded as a donation to the husband with his wife, rather than as a separate estate that was to be used by him while the marriage lasted but to revert to her or her representatives on its dissolution. And it is easy to see that, where there was *manus*, the wife becoming a member of her husband's family and everything of hers becoming his, such must originally have been its character.[1] But even then, when a man gave his daughter (*filiafamilias*)—who could have nothing of her own—in marriage, and promised her husband a portion with her, there must have been some process of law for compelling him to pay it; and Voigt's conjecture that an *actio dictae dotis* was employed for the purpose has something in its favour.[2] As regards divorce, Cicero alludes vaguely to a provision in the Tables about a man depriving his wife of the house-keys and turning her out of doors, with some such words as "take what is thine and get thee gone." This can only refer to free or non-*manus* marriages, but even for hand marriages, while repudiations by husbands (but not by wives) were competent, the statement of the historians is that they were few and far between until the 6th century of the city, and that, until the same date, any man who turned his wife away, however serious the ground, without the cognition of the family council, was liable to penalties at the hands of the censors.[3]

Of the two or three provisions of the Tables known to us that affected details of the *patria potestas*, which itself was assumed to be so well established by customary law as to need no statutory sanction or definition, one was in the words "si pater (familias) ter filium venum duuit, a patre filius liber esto." This came to be construed by the pontifical lawyers as meaning that so powerful was the bond of the *potestas* over a son that it could not be completely loosed until the father had three times gone through the process of fictitious sale by which emancipation was effected. But the conception of the law seems to indicate that its original purpose must have been rather to impose a penalty on the father and confer a benefit on a son *in potestate*, by declaring him *ipso jure* free from it on a certain event, than to place difficulties in the way of his emancipation. "If a house-father have thrice sold his son, the latter shall be free from his father." It reads as if the intention were to rescue the son from what, by its frequent repetition, was suggestive of a total absence of parental affection rather than reluctant obedience to overwhelming necessity. May not its object have been to restrain the practice, which did not wholly disappear even in the late Empire, of men selling their sons or giving them to their creditors in security of loans—such sales or pledges, at the time of the Tables, being effected only by an actual transfer of the child *per aes et libram* as a free bondman (*in mancipii causa*), accompanied by, in the case of a loan, a pact for reconveyance when the loan was repaid? Whatever its ratio, however, and whatever the earlier practice, it was upon this law that the interpreting pontiffs based the rules for adoptions and emancipations of *filiifamilias*. The usual procedure in adoptions was as follows: The natural father mancipated his son to a friend for a nominal price and the latter then manumitted him, the son thereupon reverting into his father's *potestas*. This was repeated a second time with the same result. After the third sale (*patria potestas* being extinguished) the purchaser remancipated to the parent. In the latter's hands the son was now *in causa mancipii*, and so in a position in which he could be permanently transferred to the adopter. This was effected by an *in jure cessio*, in which the adopter averred that the child was his *filiusfamilias*, and in which judgment was at once given in his favour on the natural parent's admission or tacit acquiescence. A similar method was followed in emancipation of a *filius*, except that of course there was no *cessio in jure*, but instead thereof the parent manumitted immediately after the reconveyance to him. Neither in adoption nor emancipation, however, was remancipation to the *paterfamilias* essential, though it was usual, and in the case of emancipation carried with it important rights of succession and tutory. For daughters and grandchildren the pontifical jurists by a casuistic interpretation of the said law held one mancipation to be in all cases enough to extinguish the *patria potestas*.

The nature of the relation between master and slave, like that of *manus* and *patria potestas*, seems also to have been too notorious to require exposition in the Tables. We find recorded only two references to it, one dealing with the case of a slave who had a conditional testamentary gift of freedom (*statu liber*), the other with noxal surrender (*noxae deditio*). The provision about noxal surrender was not limited to a slave; it was apparently to the effect that, if a member of a man's family (*familiaris*, *i.e.* a son or a daughter *in potestate* or a slave) committed a theft of, or did mischief to, property belonging to a third party, or a domestic animal belonging to one man did harm to another, the father of the delinquent child, or the owner of the slave or animal, should either surrender him or it to the person injured or make reparation in damages. In course of time the surrender came to be regarded as a means of avoiding the primary obligation of making reparation. But comparative jurisprudence recognizes in the enactment of the Tables a modified survival of the ancient right of an injured party to have the delinquent *corpus*—man, beast or thing—given up to him to wreak his revenge upon it privately, the modification consisting in the alternative of reparation offered to the owner. This noxal surrender, failing reparation, had gone out of use in the case of daughters *in potestate* before the time of Gaius, and in the case of sons before that of Justinian; but it was still sanctioned so far as slaves and domestic animals were concerned even in that emperor's legislation.

Gentile guardianship.

Guardianship and the Introduction of the Order of Agnates.—So long as Rome was patrician the *gens* apparently charged itself with the guardianship of a clansman's orphan pupil children and his widow and unmarried daughters above pupillarity after his decease (*tutela*), as well as with that of male members of his family who were *sui juris*, but above the age of pupillarity, when they chanced to be lunatic, imbecile, prodigal or helplessly infirm (*cura, curatio*). The *gens* in council, in all probability, appointed one of its members to act as tutor or curator as the case might be, itself prescribed his duties, and itself called him to account for any failure in his administration.

But, as this gentile tutory could not be extended to the plebeians, among whom some law of guardianship was as much required as among their fellow-citizens of the higher order, the decemvirs found it expedient to devise a new one of universal application. The Tables contained no express authority for testamentary nomination of tutors to the widow of the testator, or to his pupil children and grown-up unmarried daughters; but such appointment, if unknown previously, was soon held to be justified by a liberal interpretation of the very inclusive provision, "uti legassit suae rei, ita jus esto." In the absence of testamentary appointment the nearest male agnates of lawful age were to be tutors. This tutory of agnates was an invention of the decemvirs, just as was the agnates' right of succession on intestacy. The plebeians had no *gentes*, at least until a much later period; so, to make the law equal for all, it was necessary to introduce a new order of heirs and tutors. "Tutores . . . ex lege XII. Tabularum introducuntur . . . agnati" is the very notable language of Ulpian. And his words are very similar in speaking of their right of succession; for, while he says of testamentary inheritances no more than that they were *confirmed* by the XII. Tables, he explains that the *legitimae hereditates* of agnates and patrons were *derived* from them.[1] The phrases *legitima cognatio, legitima hereditas, legitimi heredes, tutela legitima, tutores legitimi* themselves proclaim the origin of agnation, agnatic inheritance and agnatic tutory; for, though the word *legitimus* might be applied to any institution based on statute, yet in the ordinary case it indicated one introduced by the XII. Tables, the law of laws.

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[1] See Cicero, *Top.* iv. 23.

[2] Voigt, *XII. Tafeln*, ii. p. 486. It has not, however, received any support from more recent writers.

[3] See Esmein, *Mélanges*, pp. 23 seq.

Guardianship of agnates.

A man's agnates, in the strict sense, were those of his collateral kinsmen who were subject to the same *patria potestas* as himself, or would have been had the common ancestor been still alive. A man's sons and daughters *in potestate*, therefore, whether the relationship was by birth or adoption, and his wife *in manu* (being *filiae loco*) were each other's agnates. But a wife not *in manu* was not their agnate; nor were children who had been emancipated or otherwise *capite minuti* the agnates of either their brothers and sisters or their mother *in manu*. A man was an agnate of his brother's children, assuming always that there had been no *capitis deminutio* on either side; but he was not an agnate of his sister's children, for they were not *ejusdem familiae*: they were agnates of their father's family, not of their mother's. In like manner, and again assuming the absence of *minutio capitis*, the children of brothers were each other's agnates, but not the children of a brother and a sister or of two sisters. Brothers and sisters were agnates of the second degree; a man and his brother's children were of the third, the children of two brothers (*patrueles*) of the fourth, and so on,—it being a condition, however, that the kinship should always result either from lawful marriage or from adoption in one or other of its forms.

When, therefore, a man died leaving pupil male descendants or unmarried female descendants who by his death became *sui juris*, they got their brothers of lawful age as their tutors; if he was survived by his wife, and she had been *in manu*, her sons, or it might be stepsons, acted for her in the same capacity; in either case they took office as the nearest qualified male agnates. If the widow had no sons or stepsons of full age, and the children consequently no qualified brothers, the tutory devolved on the agnates next in order,—*i.e.* the brothers german and consanguinean of the deceased husband and father; for they were agnates of the third degree. And so with agnates of the fourth and remoter degrees.[2] Failing agnates who could demonstrate their propinquity, the tutory passed to the *gens* when the ward happened to belong to one. This is nowhere expressly stated; but Cicero gives what he represents to be an enactment of the Tables, making the fellow-gentiles of a lunatic his guardians on failure of agnates; and analogy seems to justify the extension of the same rule to the case of sane pupil and female wards.[3]

The curatory of minors above pupillarity was of much later date than the Tables. The only curatories they sanctioned were those of lunatics (*furiosi*) and spendthrifts (*prodigi*). A lunatic was committed to the care of his agnates, and, failing them, of his fellow-gentiles; and a few words in Festus seem to suggest that arrangements had to be made by them for his safe custody.

Mancipation and the Law of Property.—In the early law, as we have seen, there was no technical word for ownership of things: it was an element of the house-father's *manus*. In time, although it is impossible to say when, the word *dominium* came into use, but, so far as can be discovered, it did not occur in the XII. Tables, and must have been of later introduction. In those days, when a man asserted ownership of a thing, he was content to say, "It is mine," or "It is mine according to the law of the Quirites." It is said by some jurists of eminence that under the law of the Tables what afterwards came to be called "dominium ex jure Quiritium" was competent only in the case of *res mancipi*—of a man's house and farm, and things appurtenant thereto, as slaves and animals with which he worked them. There is much to be said for this hypothesis, but it is so far contradicted by Ulpian and Paul, who tell us that *tigna juncta* (that is, building materials, vine stakes and the like, which undoubtedly were *res nec mancipi*) were exceptionally excluded from vindication. On the other hand, these texts may be explained as mere deductions by interpretation at a later time of the words "ne solvito" of the XII. Tables.[4] At any rate it is pretty certain that before the close of the present period *res nec mancipi* as well as *res mancipi* could be held in quiritarian ownership.

Ownership in "res mancipi" and "res nec mancipi."

The modes in which these two classes of things might be acquired in property were various. But there was this important difference: that, while a natural mode of acquisition sufficed in the case of *res nec mancipi*, some civil one was necessary for the derivative acquisition, at all events, of *res mancipi*. The most important were mancipation, surrender in court, usucapion and bequest as singular modes, and inheritance, *in manum conventio*, adrogation and purchase of a confiscated estate, as universal ones. All of these, with the exception of mancipation, applied equally to *res mancipi* and *res nec mancipi*. But there was, in addition, for *res nec mancipi*, what was the commonest of all the modes of transferring things of this class, simple tradition. If the transfer of these was by the owner, with the intention of passing the property, then the simple delivery of possession (*traditio*) was enough, unless indeed it was in virtue of a sale; in which latter case the ownership remained with the vendor, notwithstanding the change of possession, until the price was paid or security given for it.[5] Only mancipation, surrender in court and usucapion, however, need be noticed at present.

The origin of the distinction between mancipable and non-mancipable things, and of the form of conveyance by mancipation applicable to the first, has been explained (*supra*, p. 529).[6] Originally mancipation was not the imaginary sale that Gaius speaks of, but as real a sale as could well be conceived—the weighing in scales, held by an official, of the raw metal that was to be the consideration for the transfer of a *res mancipi*, and the handing of it by the transferee to the transferrer, with the declaration that thereby and therewith the thing in question became his in quiritary right. On the introduction of coined money weighing became unnecessary. The price was counted out before the ceremony, or sometimes left to be done afterwards; and though, in that spirit of conservatism that was so marked in the adhesion

Mancipation.

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[1] Ulp. *Frag.* xxvii. 5, "legitimae hereditatis jus . . . ex lege Duodecim Tabularum descendit." This derivation of agnatic inheritance from the XII. Tables was specially noticed by Danz in his *Gesch. d. röm. Rechts* (2nd ed., Leipzig, 1871–73), ii. 95, but is generally ignored.

[2] To determine the degree of propinquity between two persons it was necessary to count the generations upwards from the first to the common ancestor and downwards from him to the second. Consequently brothers were related in the second degree, uncle and nephew in the third, first cousins in the fourth, and so on.

[3] See Gai. i. 165.

[4] *Dig.* xlvii. 3, 1 pr. and xlvi. 3, 98, § 8. See Cuq, *Inst. Jurid.* 2nd ed. i. 91 n.; and on *tignum junctum* in general, Girard, *Manuel de droit romain*, 4th ed. p. 330.

[5] Our only authority for attributing this fundamental rule to the XII. Tables is Justinian's *Institutes*, ii. 1, § 41, where there is clear evidence of a Tribonianism. The rule undoubtedly must have been applied to *res mancipatae* in the Tables, and possibly its extension to tradition of *res nec mancipi* may have been due to interpretation. See Girard, *ut supra*, p. 288; cf. Cuq, *Institutions Jurid.* i. p. 87.

[6] Literature: Leist, *Mancipation und Eigenthumstradition* (Jena, 1865); Jhering, *Geist. d. röm. Rechts*, vol. ii. § 46; Bechmann, *Der Kauf nach gemeinem Recht* (Erlangen), i. pp. 47–302; Voigt, *XII. Tafeln*, vol. i. § 22, vol. ii. §§ 84–88; Kalowa, *Röm. Rechtsgesch.* ii. pp. 363–81.

to time-honoured forms after their *raison d'être* was gone, the scale-bearer and the scales were still retained as indispensable elements of the mancipation, yet the scales were simply touched by the purchaser with a *raudusculum* or a single coin, in order that he might be able to recite the old formula: "I say that this slave is mine in quiritary right, and that by purchase (for such and such a price) with these scales and this bit of copper." And that one coin, says Gaius, was then handed by the transferee to the transferrer as if it were in fact the price of the purchase (*quasi pretii loco*). Thus transformed, the mancipation was undoubtedly an imaginary sale; for the real price might have been paid weeks or months before, or might not be paid until weeks or months afterwards. The mancipation had become nothing more than a conveyance, and in this form it continued down to the end of the 3rd century of the Empire to be the appropriate mode of transfer of a *res mancipi*, or at least of conferring on the transferee of such a thing a complete legal title (*dominium ex jure quiritium*). After that, however, it seems gradually to have gone into disuse, being inapplicable to lands out of Italy that did not enjoy what was called *jus Italicum*; and long before the time of Justinian it had practically disappeared.

The effects of a mancipation, provided the price had been paid or security given for it, were that the property passed instantly to the purchaser, and that the transferrer was held to warrant the transferee against eviction from the moment the price was received. In the absence of either payment or sureties for it, the title still remained with the vendor, so that it was in his power, by means of a real action, to get back what had been mancipated, even though it had passed into the possession of the vendee. The vendor's liability to the vendee in the event of eviction is usually supposed to have arisen *ipso jure*—that is to say, without anything expressly said about it; the acceptance by the transferrer of the coin with which the scales had been struck was held to have imposed upon him an obligation to maintain the transferee in possession, under a penalty of double the amount of the price, recoverable by the latter by what is usually called an *actio auctoritatis*. But this *ipso jure* obligation did not arise when the mancipation was either really or fictitiously gratuitous (*nummo uno*),—really, in the case of donations, &c., fictitiously, when, on purpose to exclude the warranty, the recital of the transferee was that the price was a single sesterce.

The right of a vendee to sue an *actio auctoritatis* arose only when eviction resulted from a decree in a regular judicial process at the instance of a third party disputing his title, and was conditional on his having done all that was necessary on his part to bring his vendor (*auctor*) into the field to defend his own interests. And the duration of the *auctoritas* was limited by the Tables to two years in the case of lands and houses, to one year in the case of other things. As possession for those periods was sufficient to cure any defect in the vendee's title, it was but reasonable that with their expiry the vendor's liability on his warranty should be at an end.

By a provision of the Tables in the very inclusive terms, "cum nexum faciet mancipiumque, uti lingua nuncupassit, ita jus esto," the importance of mancipation was immensely increased; for any sort of qualification germane to the transaction might be superinduced upon it, and the range of its application thus greatly extended. Such qualifications were spoken of as *leges mancipii*,—self-imposed terms, conditions or qualifications of the conveyance and, as integral parts of the transaction *per aes et libram*, they partook of its binding character and were law between the parties. The matter of oral declaration might be the acreage of lands, their freedom from burdens or right to easements, reservation of a usufruct, undertaking to reconvey on a certain event, or what not, so long as it did not express a term or condition; the result was just so many obligations created *per aes et libram*, whose contravention or denial (Cicero tells us) was punished with a twofold penalty.[1] Ordinarily the words spoken in the hearing of the witnesses fixed the beginning and the end of the liability; it was enough that they were literally complied with, however much the other party might be injured by something inconsistent with their spirit, or which he had not taken the precaution to require should be made matter of declaration. But there was an exception (although not introduced until long after the Tables) in the case of that particular mancipatory agreement which was known by the name of *fiducia*, *i.e.* where the mancipation was to a creditor in security or to a friend for safe custody, and the engagement was to return the thing mancipated, in the one case when the debt secured by it was paid and in the other on demand. In such cases the transferee took the conveyance more in the transferrer's interest than his own; he became a sort of trustee, entitled to be treated with consideration, and neither mulcted in a twofold penalty when his inability to reconvey was due to no fault of his, nor forced to reconvey until relieved of charges incurred by him in reference to the property. Accordingly it became the practice to import into the mancipation a reference to *fides*—"fidi fiduciae causa meum esse aio," with explanation of the purpose, conditions, &c., of the *fiducia*, and this explanation as a rule not in the nuncupatory words, forming a relative *lex mancipii*, but in a separate agreement or *pactum fiduciae*. This pact then became enforceable not by ordinary *legis actio*, as part of the mancipation, but separately on grounds of good faith alone. It gave rise to an *actio fiduciae* which some writers think was just an application of the *legis actio per judicis postulationem*, but which more probably was originally an action *in factum* granted by the urban praetor by virtue of his *imperium*. In any case it was one of the earliest instances of an action *inter cives* based on principles of good faith. The fiduciary clause had the effect of freeing alike the right of the vendor and the obligation of the vendee from the hard-and-fast lines of the *jus strictum*, and subordinating them to the principles of *bona fides*.[2]

Surrender in court.

Of the civil modes of acquiring property on singular title applicable to both *res mancipi* and *res nec mancipi* surrender in court (*in jure cessio*) was just a *rei vindicātio* arrested in its initial stage. The parties, cedent and cessionary, having previously arranged the terms of transfer—sale, donation or otherwise—appeared before the magistrate; the cessionary, taking the position of plaintiff, declared the thing his in quiritary right; the cedent, as defendant, was asked what he had to say in answer; and, on his admission or silence, the magistrate at once pronounced a decree (*addictio*) which completed the transfer, but which might be subject to a fiduciary reservation or deduction of a servitude. It was probably more resorted to for the constitution of servitudes, both real and personal, and transfer of such rights as *patria potestas*, tutory-at-law of a woman, or an agnatic inheritance that had already opened, than for conveyance of property. For it was not only inconvenient, inasmuch as it required the parties to appear before the supreme magistrate in Rome, and could not be carried through by any one under power (as mancipation might), but it had also the serious disadvantage that it did not *ipso jure* imply any warranty of title by the cedent in the event of eviction or give rise to an action *de modo agri*. Nor did it, like mancipation and tradition, make payment of the price a condition precedent of the transfer of property. The reason was that in form the right of the cessionary flowed from the magisterial decree: "Since you say the thing is yours, and the cedent does not say it is his, I declare it yours," and not from any act or word of the cedent's, who was passive in the matter.

Usucapion.

Usucapion,[3] regulated by the XII. Tables, but not improbably recognized previously in a vague and uncertain way, converted uninterrupted possession (*usus*) into quiritary property by efflux of time. The provision in the Tables, as given by Cicero, was to this effect: "usus auctoritas fundi biennium est, ceterarum rerum omnium annuus est." The relation in which the words *usus* and *auctoritas* stand to each other has been a subject of much discussion: the prevailing opinion amongst modern civilians is that the two words should be taken disjunctively, the first alone referring to usucapion, and the second to the warranty of title incumbent on the vendor in a mancipation, and that both were limited to two years in the case of lands (and, by extensive interpretation, houses), and to one year in the case of anything else. In the later jurisprudence the possession required to be based on a sufficient title and the possessor to be in good faith. But the decemviral code, as is now generally admitted, contained no such requirements; any citizen occupying immovables or holding movables as his own, provided they were usucaptible and he had not taken them theftuously, acquired a quiritary right in two years or one, as the case might be, simply on the strength of his possession. Originally, therefore, it was simply the conversion of *de facto* possession, no matter how acquired so long as not by theft, into legal ownership when prolonged for the statutory period,—too often the maintenance of might at the cost of right. But in time it came to be regarded rather as a remedy for some defect of title, arising either from irregularity of conveyance or incapacity of the party from whom a transfer had been taken; and with the progress of jurisprudence it developed into the carefully regulated positive prescription which has to a greater or less extent found a place in every modern system.

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[1] Cic. *de Off.* iii. 16, § 65. Some writers, *e.g.* Girard, *Manuel de droit romain*, p. 550, n. 5, take the view that, apart from the *actio auctoritatis*, it was only where the extent of the land was misstated (*actio de modo agri*) that the penalty of a *duplum* was *ipso jure* incurred. But this puts a gloss on Cicero's language.

[2] There is much diversity of opinion about *fiducia*. See Oertmann, *Fiducia im röm. Privatrecht* (Berlin, 1890); Girard, *Manuel*, 4th ed. pp. 519–23; Sohm, *Institutionen* (Eng. trans., 2nd ed.), pp. 63–65.

[3] Literature: Stintzing, *Das Wesen von* bona fides *und* titulus *in d. röm. Usucapionslehre* (Heidelberg, 1852); Schirmer, *Die Grundidee d. Usucapion im röm. Recht* (Berlin, 1855); Pernice, *Labeo*, 2nd ed. ii. 328 seq.; Voigt, *XII. Tafeln*, ii. § 91, Karlowa, *Röm. R.G.* ii. 387 seq.; Esmein, "Sur l'histoire de l'usucapion," *Mélanges* (1886), pp. 171 seq.

Jura in re aliena.

The conception of the abstract notion of a real right in (or over) the property of another person (*jus in re aliena*) is not to be looked for at so early a period in the history of the law as that now under consideration. The rural servitudes of way and water were no doubt very early recognized, for they ranked as *res mancipi*, and the XII. Tables contained various regulations in reference to the former. Usufruct, too, was probably not unknown; but the urban praedial servitudes bear the impress of a somewhat later jurisprudence. Pignorate and hypothecary rights were certainly unknown as rights protected by action.[1] Between private parties the only thing legally recognized of the nature of a real security was the *fiducia* that is described above. Approaching more nearly to the modern idea of a mortgage was the security *praedibus praediisque* required by the state from those indebted to it in assurance of their obligations. Here there was the double guarantee of sureties (*praedes*) and mortgages of lands of theirs (*praedia subsignata*); but how they were dealt with when the debtor made default is by no means clear.

Forms of testament.

Changes in the Law of Succession.—The two forms of testament of the regal period, viz., that made in the *comitia* of the curies and that by soldiers on the eve of battle, still remained in use in the early Republic; though before the end of the Republic they were displaced by the general adoption of that executed with the copper and scales (*testamentum per aes et libram*). It seems to be the general opinion that it was to the first two alone that the words applied which stood in the forefront of the provisions of the XII. Tables about inheritance: "uti legassit suae rei, ita jus esto." Whether resort was to the *comitia* or to the army, the testator's own will in the matter was henceforth to be supreme. There was to be no more reference to the pontiffs as to the expediency of the testament in view of the interests of the family *sacra* and of creditors of the testator's; from legislators, sanctioning a departure from the ordinary rules of succession, the assembled Quirites became merely witnesses—recipients of the oral declaration of the testator's will in regard to his inheritance.[2]

Testament per aes et libram.

The testament with the copper and the scales is depicted by Gaius as a written instrument. But he presents it in what might be described as the third stage of its history. Its probable origin has been explained (*supra*, p. 534). It was originally not a testament but only a make-shift for one. A plebeian was not qualified in the regal period to make a testament in the *comitia*; so, instead, he transferred his estate to a friend on whom he could rely, with instructions how to distribute it on his death. The transferee was called *familiae emptor*, because the conveyance was in form a mancipation for a nominal price.

It is not at all unlikely that the same device may occasionally have been resorted to by a patrician who had neglected to make a regular testament, and was seized with mortal illness before he had an opportunity of appealing to the curies.[3] But such a disposition was not a testament, and may not have been so called. A testament was the nomination of a person as the testator's heir. It made the person instituted as fully the representative of the testator after his death as his heir-at-law would have been had he died intestate. The original *mortis causa* mancipation that opened the way for the testament *per aes et libram* conferred upon the *familiae emptor* no such character. Gaius says that he stood in place of an heir (*heredis loco*), inasmuch as he had such of an heir's rights and duties as the *familiae venditor* had it in his power to confer and impose; but the transaction was but a conveyance of estate, with a limitation of the right of the grantee. It has been argued that, as the law did not recognize conditional mancipation, the conveyance must have operated as a complete and immediate divestiture of the grantee. But this does not follow. For it was quite competent for a man, in transferring property by mancipation, to reserve to himself a life interest; and apparently it was equally competent for him to postpone delivery of possession, without infringing the rule that the mancipation itself could not be *ex certo tempore*. So far as one can see, therefore, there was nothing to prevent the grantor of the conveyance (or quasi-testator) bargaining that he was to retain the possession till his death; and, as the *familia* was an aggregate of estate (*universitas rerum*) which retained its identity notwithstanding any change in its component elements, he must in such case have been as free to operate on it while he survived, as if he had never conveyed it by mancipation.

Cicero incidentally remarks[4]—what indeed the nature of the transaction of itself very distinctly suggests—that the true testament with the copper and the scales had its statutory warrant, not in the *uti legassit suae rei* of the XII. Tables, but in the provision contained in the words: "cum nexum faciet mancipiumque, uti lingua nuncupassit, ita jus esto." Reflection on the import and comprehensiveness of these words led the pontifical interpreters to the conclusion that there was nothing in them to prevent the direct institution of an heir in the course of the *verba muncupata* engrafted on a mancipation. From the moment this view was adopted and put in practice the *familiae mancipatio* ceased to be a transfer of the testator's estate to the *familiae emptor*; the latter's purchase was now for form's sake only, though still an indispensable form, since it was it alone that, according to the letter of the statute, imparted efficacy to the *nuncupatio*. But it was the *nuncupatio*—the oral declaration addressed to the witnesses—that really contained the testamentary disposition, *i.e.* the institution of an heir, with such other provisions as the testator thought fit to embody in it. This was the second stage in the history of the testament *per aes et libram*. The third was marked by the introduction of tablets in which the testamentary provisions were set out in writing, and which the testator displayed to the witnesses, folded and tied up in the usual manner, declaring that they contained the record of his last will.

Gaius narrates the words spoken by the *familiae emptor* and addressed to the testator as follows: "Your estate and belongings (*familia pecuniaque tua*), be they mine by purchase with this bit of copper and these copper scales, subject to your instructions, but in my keeping, that so you may lawfully make your testament according to the statute (*quo tu jure testamentum facere possis secundum legem publicam*)." The meaning of the words "in my keeping (*endo custodelam meam*)" is not quite obvious; they are probably remnants of an older style, but may be due to a clerical error of the writer of the Verona MS. Certain it is that they no more imported a real custody than a real property in the *familiae emptor*; for the testator remained so entirely master of his estate that the very next day if he pleased he might mancipate it anew to a different purchaser, and nuncupate fresh testamentary writings. The nuncupation by the testator was in these terms: "As is written in these tablets so do I give, so do I legate, so do I declare my will; therefore, Quirites, grant me your testimony"; and, adds Gaius, "whatever the testator had set down in detail in his testamentary tablets he was regarded as declaring and confirming by this general statement." To the appeal of the testator the witnesses responded by giving their testimony in words which unfortunately are not preserved; and then the testament was sealed by testator, officials and witnesses, the seals being outside according to the early fashion.[5]

Although this testament with the copper and the scales was justified in the first instance by the provision of the XII. Tables as to the effect of nuncupative words annexed to a mancipation, yet in course of time it came to be subordinated to that other one which dealt directly with testamentary dispositions: *uti legassit suae rei, ita jus esto*. Upon the words *uti legassit* the widest possible meaning was put by the interpreters: not only was a testator held entitled on the strength of them to appoint tutors to wife and children, to enfranchise slaves and make bequests to legatees, but he might even disinherit a child in his *potestas* (*suus heres*) in favour of a stranger, so long as he did so in express terms. Institution of a stranger, without specific mention of the *suus heres*, however, was fatal, if the latter was a son; for without express disherison (*exheredatio*) his father could not deprive him of the interest he had in the family property as in a manner one of its joint owners. It can hardly be supposed that disherison was contemplated by the compilers of the Tables; it was foreign to the traditional conception of the family and the family estate. But it was a right whose concession could not be resisted when claimed as embraced in the *uti legassit*, although generally discountenanced, and as far as possible restrained by the strictness of the rules imposed on its exercise.

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[1] Hypothecary rights were unknown until near the end of the Republic. But Festus (*s.v.* "Nancitor"; see Bruns, *Fontes*, 6th ed., iii. 16) speaks of a provision in the Cassian league between Rome and the Latin states of the year 262 U.C.—"Si quid pignoris nasciscitur, sibi habeto"—which may suggest that the Romans at this period were not altogether unacquainted with pledge or pawn of movables as a transaction of some value *de facto* if not *de jure*.

[2] See Girard, *Manuel de droit romain*, 4th ed. p. 800. On the "uti legassit" law of the Tables see *ibid.* p. 782, and cf. Cuq, *Institutions Juridiques*, 2nd ed. pp. 124–125.

[3] The *comitia*, Gaius tells us (ii. § 102), met only twice a year to sanction testaments. In Mommsen's view, *Röm. Chronologie* (1859), pp. 241 seq., these days were the 24th of March and the 24th of May.

[4] Cic. *De Orat.* i. 57, § 245.

[5] On the above passage of Gaius, see Sohm, *Inst.* § 99.

Intestate succession.

In the absence of a testament, or on its failure from any cause, the succession opened to the heirs *ab intestato*. So notoriously were the *sui heredes* entitled to the first place—and that not so much in the character of heirs as of persons now entering upon the active exercise of rights hitherto existing, though in a manner dormant—that the compilers of the XII. Tables thought it superfluous expressly to declare it. "If a man die intestate, leaving no *suus heres*, his nearest agnate shall have his estate. If the agnate also fail, his gentiles shall have it." It has been pointed out, in dealing with the tutory of agnates, that the notion of agnation, as a bond distinct from that which connected the gentile members of a clan, was due to the decemvirs. They had to devise a law of intestate tutory and succession suitable alike to the patricians who had *gentes* and to the plebeians who had none. To put the latter in exactly the same position as the former was beyond their power; for the fact had to be faced that the plebeians had no gentile institutions, and to create them was impossible. The difficulty was overcome by accepting the principle of agnation upon which the patrician *gens* was constructed, and establishing an agnatic circle of kinsmen (perhaps at first limited to the sixth degree) to which the *gens* as a collective body should be postponed in the case of the patricians, and which should come in place of it in the case of the plebeians. It was not perfect equalization, but the nearest approach to it that the circumstances permitted. The difference was that, when the agnates of a plebeian intestate failed, his inheritance was vacant; whereas, on failure of those of a patrician, there was devolution to his *gens* in its collective capacity. Two "interpretations" put upon the statute had an important bearing in this connexion, viz. (1) that, if the nearest agnates in existence declined the succession, those next in degree were not allowed to take it; and (2) that no female agnate could take it more remote than a sister of the deceased intestate. The division among two or more agnates was always *per capita*, not *per stirpes*.

The order of intestate succession thus established by the XII. Tables, which prevailed until amended by the praetors probably in the 8th century of the city, was first to the *sui heredes* of the deceased, next to his nearest agnate or agnates, and finally, if the deceased was a patrician, to his *gens*.[1] His *sui heredes*, speaking broadly, were those of his descendants in his *potestas* when he died who by that event (or even after it, but before his intestacy became manifest) became *sui juris*, together with his wife *in manu* (who, as regarded his succession, was reckoned as a daughter); but they did not include children whom he had emancipated or daughters who had passed *in manum* of a husband. Emancipated children did not even come in as agnates on failure of *sui*; for emancipation severed the tie of agnation as well as that of *potestas*. For the same reason no kinsman who had been emancipated, and so cut off from the family tree, could claim as an agnate; for those only were agnates who were subject to the same *patria potestas*, or would have been had the common family head been still alive.

Position of heirs.

The opening of a succession (technically *delatio hereditatis*) in favour of *sui heredes*, whether in virtue of a testamentary institution or by operation of law on intestacy, at once invested them with the character, rights and responsibilities of heirs. No acceptance was necessary, nor, according to the rules of the *jus civile*, was any declinature competent. They had been all along in a manner joint owners with their parent of the family estate, which by his death had become, nominally at least, an inheritance; and, as he had not thought fit to terminate their interest in it by emancipating or disinheriting them, they were not now allowed to disown it. Hence they were spoken of as necessary heirs (*heredes sui et necessarii*). A slave, too whom his owner had instituted in his testament with gift of liberty was a necessary heir: he could not decline, and was invested with the character of heir the moment the testator died. Not so with stranger institutes or agnates taking on intestacy: they were free to take or reject the inheritance as they saw fit; consequently, an act of acceptance (*aditio*) was necessary on their part to make them heirs.

This was a formal declaration before witnesses, which got the name of *cretio*.[2] It was not unusual for a testator, in instituting an heir, to require that he should make a formal declaration of acceptance within a limited time, failing which his right should pass to a substitute, who in turn was required to enter within a certain time; and so on with any number of substitutes, the series ending with one of his slaves, who became heir without entry, and thus saved the testator from the disgrace of *post mortem* bankruptcy in the event of the inheritance proving insolvent. The *uti legassit* of the Tables, as interpreted by the pontiffs, conferred upon a testator very great latitude of testamentary disposition, even to the extent of disherison of *sui heredes*. This was a course, however, that was probably rarely resorted to unless when a child had been guilty of gross ingratitude, or when the parent had reason to believe his estate was insolvent and desired to protect his children from the responsibilities of inheritance. Usually his *sui*, if he had any, would be his institutes, and the purpose of the testament either to apportion the estate amongst them as he thought expedient, or to give him an opportunity of appointing tutors, bequeathing legacies, or enfranchising slaves. On intestacy the *sui* took equally but *per stirpes*; that is to say, grandchildren by a son who had predeceased or been emancipated, but who themselves had been retained in their grandfather's *potestas*, took amongst them the share to which their father would otherwise have been entitled, instead of taking equal shares with their surviving uncles. It was by no means unusual, when the whole inheritance descended to sons, for them to hold it in common for many years as quasi partners (*consortes*); but any one of them was entitled at any moment to claim a partition which was effected judicially, by an arbitral procedure introduced by the XII. Tables, termed *a judicium* (or *arbitrium*) *familiae erciscundae*. Where two or more strangers were instituted testamentarily, whether to equal or unequal shares, if one of them failed either by predecease or declinature his share accrued *ipso jure* to the others; for it was a rule that early became proverbial that a man could not die partly testate and partly intestate. There was the same accrual among agnates on intestacy; and both they and stranger testamentary institutes had the same action for division of the inheritance that was made use of by *sui heredes*.

Usucapio pro herede.

According to Gaius it was as a stimulus to heirs to enter as soon as possible to an inheritance that had opened to them, and thus make early provision alike for satisfying the claims of creditors of the deceased and attending to his family *sacra*, that the law came to recognize the somewhat remarkable institution of usucapion or prescriptive acquisition of the inheritance in the character of heir (*usucapio pro herede*). Such usucapion was impossible—there was no room for it—if the deceased had left *sui heredes*; for the inheritance vested in them the moment he died. But, if there were no *sui heredes*, then any person taking possession of the property that had belonged to the deceased, and holding it for twelve months without interruption, thereby acquired it as if he were heir: in fact, according to the views then held, he acquired the inheritance itself. Gaius characterizes it as a dishonest acquisition, inasmuch as the usucapient knew that what he had taken possession of was not his. But, as already explained, the usucapion of the XII. Tables did not require *bona fides* on the part of the uscapient; he might acquire ownership by prolonged possession of what he knew did not belong to him so long as he did not appropriate it theftuously, *i.e.* knowing that it belonged to another. But an inheritance unappropriated by an heir who had nothing more than a right to claim it belonged in strictness to no one; and there was no theft, therefore, when a person took possession of it with a view to usucapion in the character of heir. There can be little doubt that on the completion of his possession he was regarded as heir just as fully as if he had taken under a testament or as heir-at-law on intestacy—that is to say, that he was held responsible to creditors of the deceased and required to charge himself with the family *sacra*. Gaius does not say as much; but both the Coruncanian and the Mucian edict[3] imposed the latter burden upon him who had usucapted by possession the greater part of a deceased person's estate; and it is but reasonable to suppose that the burden of debts must in like manner have fallen on the usucapient or usucapients in proportion to the shares they had taken of the deceased's property.

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[1] This was for freeborn citizens; for freedmen, the patron (or his children *in potestate*) took the place of the nearest agnates.

[2] Gai. ii. 164–173.

[3] Cic. *de leg.* ii. 48, 49.

Law of obligations.

The Law of Obligations.—In his *Liber Aureorum* Gaius says obligations arise from either contract or delict, or miscellaneous causes (*variae causarum figurae*). But those arising from contract fill a place in the later jurisprudence vastly greater than those arising from delict. In the XII. Tables it was different. In them delicts were much more prominent than contracts—wrongs entitling the sufferer to demand the imposition of penalties upon the wrong-doer that in most cases covered both reparation and punishment. The disproportion in the formulated provisions in reference to the two sources of obligation, however, is not surprising. For, first of all, the purpose of the decemviral code was to remove uncertainties and leave as little as possible to the arbitrariness of the magistrates. In nothing was there more scope for this than in the imposition of penalties; and, as different offences required to be differently treated, the provisions in reference to them were necessarily multiplied. In the next place, the intercourse that evokes contract was as yet very limited. Agriculture was the occupation of the great majority; of trade and commerce there was little; coined money had hardly begun to be used as a circulating medium. Lastly, the safeguards of engagement then lay to a great extent in the sworn oath or the plighted faith, of which the law (*jus*) hardly yet took cognisance, but which found a protection quite as potent in the religious and moral sentiments that had so firm a hold on the people.

Contract in general.

It may be asked—If a man purchased sheep or store cattle, a plough, a toga, a jar of wine or oil, had he no action to compel delivery, the vendor no action for payment of the price? Did the hire of a horse or the loan of a bullock create no obligation? Was partnership unknown, and deposit, and pledge, and suretyship in any other form than that of *vadimonium*? One can have no hesitation in answering that, as transactions of daily life, they must all have been more or less familiar. It does not follow, however, that they were already regulated by law and protected by the ordinary tribunals. Modern historical jurists are pretty well agreed that not only the real contracts of loan (*mutuum* and *commodatum*), deposit, and pledge, but also the consensual ones of sale, location, partnership, and mandate, and the verbal one of suretyship, were as yet barely recognized by law. The law recognized conveyance but hardly contract. Sale was the offspring of barter—of instant exchange of one thing for another. With such instant exchange there was no room for obligation to deliver on either side. The substitution of coined money for the raw metal can hardly have effected any radical change: the ordinary practice of those early times must still have been ready-money transaction—an instant exchange of ware for price; and it can only have been when, for some reason or other, the arrangement was exceptionally for delivery or payment at a future date, say next market day, that obligation was held to have been created. Was that obligation enforceable by the civil tribunals? Some jurists hold that it was—that at no time were the *jus gentium* contracts outside the protection of judicial remedies, although by a simpler procedure than that resorted to for enforcement of the contracts of the *jus civile*. But two provisions in the XII. Tables seem to prove that it was not so enforceable when they were drawn up. The first is that already referred to as recorded by Justinian—that, where a thing was sold and delivered, the property, nevertheless, was not to pass until the price had been paid or sureties (*vades*) for it accepted by the vendor. Far from being a recognition of the obligatory nature of the transaction, this provision is really a recognition of the inability of the law to enforce payment of the price by the vendee; it is a declaration that, on the latter's failure to pay, the vendor, unprotected by any personal action, should be entitled to get back the thing sold as still his own, no matter in whose hands he found it. The second related to the case of a person who had bought a victim for sacrifice, but had failed to pay for it. A real action for its revindication by the seller after it had been consumed on the altar was out of the question; so he was authorized by the Tables, by the process of *pignoris capio*, at his own hand to appropriate in satisfaction a sufficient equivalent out of the belongings of the purchaser, against whom he had no personal action.

Requisites of binding contract.

It was a principle of the law of Rome through the whole of its history, though in course of time subject to an increasing number of exceptions, that mere agreement between two persons did not give him in whose favour it was conceived a right to demand its enforcement. To entitle a man to claim the intervention of the civil tribunals to compel implement of an engagement undertaken by another, it was necessary (subject to those exceptions) either that it should be clothed in some form prescribed or recognized by the law, or that it should be accompanied or followed by some relative act which rendered it something more than a mere interchange of consent. Under the jurisprudence of the XII. Tables the formalities required to elevate an agreement to the rank of contract and make it civilly obligatory sometimes combined ceremonial act and words of style, sometimes did not go beyond words of style, but in all cases took place before witnesses. *Dotis dictio*, the undertaking of a parent to provide a dowry with his daughter whom he was giving in marriage, and *vadimonium*, the guarantee of a surety for the due fulfilment of the undertaking either of a party to a contract or a party to a litigation (some think only the latter), probably required nothing more than words of style before persons who could if necessary bear witness to them; whereas an engagement incident to a mancipation, or an undertaking to repay borrowed money, required in addition a ceremony with the copper and the scales. This undertaking to repay arose from the contract of *nexum*, which was, it is thought, older than the Tables; both it and the verbal contract by *sponsio* or stipulation, which was younger, require here further consideration.

Causes of plebeian borrowing.

The Nexal Contract.[1]—The tumults and seditions so frequent in Rome during the first two centuries of the Republic are as frequently attributed by ancient writers to the abuses of the law of debt as to any other cause, social or political. The circumstances of the poorer plebeians were such as to make it almost impossible to avoid borrowing. Their scanty means were dependent on the regular cultivation of their little acres, and on each operation of the agricultural year being performed in proper rotation and at the proper season. But this was every now and again interfered with by wars which detained them from home at seed-time or harvest, practically rendering their farms unproductive, and leaving them and their families in straits for the commonest necessaries of life.

Nexal contract.

The practice of lending *per libram* was doubtless of great antiquity—indeed, the intervention of the scales was a necessity when money or what passed for it had to be weighed instead of counted; and not improbably old custom conceded to a lender who had thus made an advance in the presence of witnesses some very summary and stringent remedy against a borrower who failed in repayment. How, after the Servian reforms, it was subjected to much the same formalities as were required for mancipation has been shown already. With the introduction of a coinage the transaction, instead of being *per libram* simply, became one *per aes et libram*; the scales were touched with a single piece, representing the money which had already been or was about to be paid, a formula recited whereby the obligation of repayment was imposed on the borrower, and an appeal made to the witnesses for their testimony. Unfortunately this formula is nowhere preserved. Huschke assuming that the lender was the only speaker, formulates it thus—"quod ego tibi mille libras hoc aere aeneaque libra nexas dedi, eas tu mihi post annum jure nexi dare damnas esto"—"whereas with this coin and these copper scales I have given thee a thousand *asses*, be thou therefore bound *jure nexi* to repay them to me a year hence." The phrase *damnas esto*, like the rest of the formula, is unsupported by any conclusive authority;

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[1] The modern literature on the subject of *nexum* is very large and the views taken of it are discordant. The fundamental work is that of Huschke, *Über d. Recht des Nexum* (Leipzig, 1846). Danz (*Gesch. d. röm. Rechts*, ii. 2nd ed., 1873, § 146) gives a list of the more important writings about it and a *résumé* of the principal theories. To this list, which comes down to 1870, may be added Bekker, *Die Aktionen des röm. Privatrechts*, i. (Berlin, 1871), c. 1; Brinz, "Der Begriff *obligatio*," in Grünhut's *Zeitschr.* i. (1874), 11 seq.; and Voigt, *XII. Tafeln*, i. §§ 63–65; Girard, *Manuel*, 4th ed. pp. 476–482; Schlossmann, *Nexum* (1904); Mitteis, "Über das Nexum," *Ztsch. d. Sav. Stift.* xxii. 96 seq., and xxv 282–283; Mommsen, *Ztsch. d. Sav. Stift.* xxiii. 348 seq.; Lenel, *Z. d. S. S.* xxiii. 84 seq.; Bekker, *Z. d. S. S.* xxiii. 11–23 and 429–430; Kübler, *Z. d. S. S.* xxv. 254 seq.; Senn. *Nouv. Rev. hist.* (1905), pp. 49 seq.

but, as it is in harmony with the formula which is given by Gaius for dissolving an obligation of this kind, and with that most frequently employed in the Republic for imposing by a public act liability to pay a fixed and definite sum, it may not be wide of the mark.

What was the effect of this procedure? The question is one not easily answered. Brinz expressed the opinion that the creditor was entitled in virtue of the *nexum* to take his debtor into custody at any time when he considered such a course necessary for his own protection, even before the conventional term of repayment—that the debtor was in bonds, virtually a pledge, from the very first, and the tightness or looseness of them a matter in the discretion of his creditor.[1] Voigt holds that the *nexum* did not give the creditor any peculiar hold over his debtor, and that on the latter's failure to repay an ordinary action was necessary, to be followed by the usual proceedings in execution if judgment was in favour of the former. These views may be said to be the two extremes; and between them lie a good many others, more or less divergent. The difficulty of arriving at a conclusion is caused to some extent by the ambiguity of the words *nexus* and *nexum*. The transaction itself was called *nexum* and occasionally also *nexus*; the money advanced was *nexum aes* (hence *nexi*, *i.e. aeris*, *datio*); the bond was *nexus* (of the fourth declension); and the debtor on whom the bond was laid was also *nexus* (of the second). All this is simple enough. But we find the same word *nexus* employed by the historians as almost synonymous with *vinctus*—to denote the condition of a debtor put in fetters by his creditor. That might be the condition either of a nexal borrower or of an ordinary judgment-debtor. The former in such a case was doubly *nexus*; he was at once in the bonds of legal obligation and in those of physical constraint. In many passages in which Livy and others speak of the *nexi* it is extremely difficult, sometimes impossible, to be sure in which sense they use the word. It is therefore not surprising that there should be considerable diversity of opinion on the subject.[2]

Since Huschke, the great majority of writers—Voigt,[3] Lenel and Mitteis are distinguished exceptions—concur in opinion that the nexal contract entitled the creditor, after expiry of thirty days from the conventional date of repayment of the loan, to proceed against his debtor by *manus injectio* without any antecedent action or judgment, and failing settlement to detain him, and put him to servile labour, and subject him to servile treatment, until the loan was repaid. The parallel of such a course is to be met with amongst many ancient nations—Jews, Greeks, Scandinavians, Germans, &c.[4] And it was not altogether unreasonable. If a borrower had already exhausted all available means of raising money, had sold or mortgaged everything he possessed of any value, what other course was open to him in his necessity except to impledge himself? That the creditor should have been entitled to realize the right he had thus acquired without the judgment on it of a court of law is equally intelligible. It was just a case of regulated self-help. The nexal contract was a public act, carried out in the presence of the five citizen witnesses and *libripens*, who were witnesses alike of the acknowledgment of indebtedness and of the tacit engagement of the debtor. The only valid objection apparently that could be stated against the creditor's apprehension of his debtor in execution was that the indebtedness no longer existed—that the loan had been repaid. But a nexal debt could be legally discharged only by *nexi liberatio*, which also was a solemn procedure *per aes et libram* in the presence of five citizen witnesses. What need for a judicial inquiry in the presence of facts so notorious? A creditor would rarely be daring enough to proceed to *manus injectio* if his loan had been repaid; if he did, the testimony of the witnesses to the discharge would at once procure the release of his alleged debtor. It was probably to give opportunity for such proof, if there was room for it, that the XII. Tables required that a creditor who had apprehended a nexal debtor should bring him into court before carrying him off into detention.

Whether there was room for a *vindex* and for a magisterial addiction of the debtor after sixty days, with power to kill or sell into slavery after addiction, are disputed questions, but there seems no good reason for distinguishing a nexal from a *judicatus* debtor in these respects. Untenable is the notion at any rate that the *nexus* by the mere contract was placed *in loco servi*, or that by arrest he was in a worse position than one condemned for a judgment debt, of whom Quintilian states distinctly that he still retained his position in the census and in his tribe. Many a time when the exigencies of the state required it, were the *nexi* temporarily released in order to obey a call to arms—to fulfil the duty incumbent on them as citizens. The nexal debtor's position after arrest in regard to his family rights is obscure. If originally they shared his nexal condition, this did not long continue to be the law. If he was a house-father he seemingly still retained his *manus* over his wife and *potestas* over his children. Their earnings legally belonged to him, and did not fall to his creditor. It was the body of his debtor that the creditor was entitled to, and too often he wreaked his vengeance on it by way of punishment; there was as yet no machinery for attaching the debtor's goods in substantial reparation for the loss caused by his breach of contract.

Poetilian law.

The abuses to which this system of personal execution gave rise were great. Livy tells us that in the year 428 U.C. (326 B.C.) a more than ordinarily flagrant outrage committed by a creditor upon one of his young *nexi*, who had given himself up as responsible for a loan contracted by his deceased father, roused the populace to such a pitch of indignation as to necessitate instant remedial legislation. The result was the Poetilian law (*Lex Poetilia Papiria*). So far as can be gathered from the meagre accounts of it we possess, it contained at least these three provisions—(1) that fetters and neck, arm or foot blocks should in future be applied only to persons undergoing imprisonment for crime or delict; (2) that no one should ever again be the *nexus* of his creditor in respect of borrowed money; and (3) that all existing *nexi* should be released. The first was intended to prevent unnecessary restraint upon judgment-debtors formally given over to their creditors. The second did not necessarily abolish the contract of loan *per aes et libram*, but only what had hitherto been an *ipso jure* consequence of it—the creditor's right to incarcerate his debtor without either the judgment of a court or the warrant of a magistrate. For the future, execution was to be done against a borrower only as a judgment-debtor formally made over to his creditor by magisterial decree, and under the restrictions and limitations imposed by the Poetilian law itself. This very soon led to the disuse of nexal obligation; once it was deprived of its distinctive processual advantages it rapidly gave place to the simpler engagement by stipulation usually enforceable *per condictionem*. As for the release of the then existing *nexi*, Cicero, Livy and Dionysius say nothing of any condition annexed to the boon the statute conferred upon them; but Varro limits it to those *qui bonam copiam jurarunt*—those apparently who were able to declare on oath that they had done their best and could do no more to meet their creditors' claims.[5] Such a limitation can hardly be called unreasonable, even were we to assume—as probably we ought to do—that the release spoken of was only from the bonds of physical restraint, not from those of legal obligation.

Stipulation.

Introduction of the Stipulation.[6]—Few events in the history of the private law were followed by more far-reaching consequences than the introduction of the stipulation. It exercised an enormous influence on the law of contract; for by means of it there was created a unilateral obligation that in time became adaptable to almost every conceivable undertaking by one man in favour of another. By the use of certain words of style in the form of question and answer any lawful agreement could thereby be made not only morally but legally binding, so that much which previously had no other guarantee than a man's sense of honour now passed directly under the protection of the tribunals. Stipulations became the complement of engagements which without them rested simply on good faith, as when a vendor gave his stipulatory promise to his vendee to guarantee peaceable possession of the thing sold or its freedom from faults, and the vendee in turn gave his promise for payment of the price. The question and answer in the form prescribed by law made the engagement fast and sure. Hence the generic name of the contract; for Paul's derivation of it from *stipulum*, "firm" (which itself comes from *stipes*, a staff), is to be preferred to that of Varro and Festus from *stips* (money), or to a later and rather fanciful one from *stipula* (a straw). It was round the stipulation that the jurists grouped most of their disquisitions upon the general doctrines of the law of contract—capacity of parties, requisites of consent, consequences of fraud, error and intimidation, effects of conditions and specifications of time, and so forth. It may well be said, therefore, that its introduction marked an epoch in the history of the law.

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[1] Brinz, in Grünhut's *Zeitschr.* i. 22. He likens the position of the *nexus* to that of a thing—land, say—mortgaged to a creditor in security of a claim. Such security the Roman jurists constantly speak of as *res obligata*, and sometimes as *res nexa*. As Brinz observes, the thing was *obligata* from the first, and continued so as long as the debt it secured was unpaid, even though the creditor found it unnecessary to reduce it into possession or interfere with it in any way.

[2] As to the use of the terms *nexum* and *nexus* by the classical jurists, see Roby, *Roman Private Law* (1902), vol. ii. pp. 296 seq.

[3] He holds that the obligation created *nexo* did not impose any immediate liability on the borrower which the lender could enforce without judicial intervention, but that the latter required to proceed against the former in ordinary course, by what he calls an *actio pecuniae nuncupatae*. Mitteis, *ut supra*, supports, to a considerable extent, Voigt's views as to the necessity of further proceedings after the nexal contract, and rejects the notion of non-judicial *manus injectio*, but regards the *actio pecuniae nuncupatae* as nonexistent. Cf. Mitteis, *Röm. Privatrecht* (1908), pp. 137 seq. According to Lenel, *Z. d. Sav. Stift.* 84 seq., there never existed any nexal contract of loan, and the whole doctrine on the subject has therefore no solid foundation.

[4] See authorities in Brinz's paper in Grünhut's *Zeitschr.* i. 25. The Greek phrase was *ἐπὶ σώματι δανείζειν*. There is a curious style in Marculfus (*Form.* ii. 27), in which a borrower engages that, until he shall have repaid his loan, his creditor shall have right to his services so many days a week, and shall have power to inflict corporal punishment if there be dilatoriness in rendering them.

[5] The meaning of these words, however, is disputed. See Greenidge, *Infamia*, 206, and authorities there cited.

[6] Literature: Gneist, *Die formellen Verträge d. röm. Rechts* (Berlin, 1845), pp. 113 seq.; Heimbach, *Die Lehre vom Creditum* (Leipzig, 1849); Danz, *Der sacrale Schutz im röm. Rechtsverkehr* (Jena, 1857), pp. 102–142, 236 seq.; Schlesinger, *Zur Lehre von den Formalcontracten* (Leipzig, 1858), § 2; Voigt, *Jus. nat., &c., d. Röm.* vol. ii. § 33, vol. iv. Beilage xix.; Bekker, *Aktionen*, i. 382–401; Karsten, *Die Stipulation* (Rostock, 1878); Voigt, *Röm. Rechtsgeschichte*, § 7; Girard, *Manuel*, 483 seq.; Karlowa, *Röm. Rechtsgeschichte*, ii. 699 seq.

There is, however, no certainty either as to the time or as to the manner of its introduction. So far as appears, it was unknown at the time of the compilation of the XII. Tables, at least in private life; one of the first unmistakable allusions to it is in the Aquilian law of about 287 B.C. The mention of it in that enactment, however, is with regard to a phase of it which cannot have been reached for many years after it had come into use; and the probability is that it originated before the middle of the 5th century of the city, its first statutory recognition being in the Silian law introducing the *legis actio per condictionem* (*infra*, p. 550). In its earliest days it bore the name not of *stipulatio* but of *sponsio*, for the reason that the interrogatory of the party becoming creditor was invariably formulated with the word *spondes*—e.g. *centum dare spondes?*—while the answer was simply *spondeo*.

Its origin.

There has been much speculation as to the origin of the contract. Modern criticism has three theories: (1) that it was the verbal remnant of the *nexum*, after the business with the copper and the scales had gone into disuse; (2) that it was evolved out of the oath (*jusjurandum* or *sponsio*) at the great altar of Hercules and the appeal to Fides (*supra*, p. 534); (3) that it was imported from Latium, which it had reached from some of the Greek settlements farther south. The last view is the most probable, though there is much to be said also in favour of the second theory.[1] Verrius Flaccus, as quoted by Festus, connects it with the Greek σπένδειν and σπονδή; and Gaius incidentally observes that it was said to be of Greek origin. A libation (σπονδή) is frequently referred to by Homer and Herodotus as an accompaniment of treaties and other solemn covenants—a common offering by the parties to the gods which imparted sanctity to the transaction. Leist[2] is of opinion that the practice passed into Sicily and Lower Italy, but that gradually the libation and other religious features were dropped, although the word σπονδή was retained in the sense of an engagement that bound parties just as if the old ritual had been observed, and that it travelled northward into Latium and thence to Rome under the name of *sponsio*, being used in the first instance in public life for the conclusion of treaties, and afterwards in private life for the conclusion of contracts. The meaning of *spondes* as a question by a creditor to his debtor (although latterly, we may well believe, unknown to them) thus came to be: "Do you engage as solemnly as if the old ceremonial were gone through between us?" There are many examples of such simplification of terms, none more familiar than when a man says, "I give you my oath upon it," without either himself or the individual addressed thinking it necessary that the form should be gone through.

Its nature.

It is not a little remarkable that the use of the words *spondes* and *spondeo* in contracting were, down at least to the time of Gaius, confined in Rome to Roman citizens. The *sponsio* as a form of contract was essentially *juris civilis*. So at first were the later and less solemn forms of stipulation—*promittisne? promitto, fideipromittisne? fideipromitto.* Gaius speaks of these latter, along with such simple forms as *dabisne? dabo faciesne? faciam*, as *juris gentium*, *i.e.* binding even between Romans and peregrins. Such they became eventually, but peregrins probably could not make use of the stipulation until a good while after the *lex Silia*. Yet although *juris civilis*, both the *sponsio* and the later forms were from the first free from many of the impediments of the earlier *actus legitimi*. No witnesses were required to assist at them; and they were always susceptible of qualification by conditions and terms. It was long, however, before parties had much latitude in their choice of language; *spondeo* was so peculiarly solemn that no equivalent could be admitted; and even the later styles may be said to have remained stereotyped until well on in the Empire. And it was the use of the words of style that made the contract. It was formal, not material; that is to say, action lay upon the promise the words embodied, apart from any consideration whether or not value had been given for it. In time this serious disadvantage was abated by praetorian exceptions and otherwise, as will be noted below. Originally the stipulation was employed only in regard to engagements whose terms were in every respect definite and certain, and was enforced by the *legis actio per condictionem*, or sometimes possibly by *actio sacramento in personam*. But in time it came to be employed in engagements that were from the first indefinite. This seems to have been due to the intervention of the praetors, and to have received special impetus after the system of the *legis actiones* had begun to give place to that *per formulas*. The remedy in such a case was not spoken of as a *condiction* but as an *actio ex stipulatu*.

iv. *The Actions of the Law.*

The Legis Actiones generally.[3]—We owe to Gaius the only connected (though, owing to the state of the Verona MS., rather fragmentary) account we possess of the *legis actiones*, as the system of judicial procedure was called which prevailed in Rome down to the substitution of that *per formulas* by the Aebutian and Julian laws—the first either in the 6th or early in the 7th century of the city, and the second in the age of Augustus. He tells us that as *genera agendi* or generic forms of process they were five in number, each taking its name from its characteristic feature, viz. (1) *sacramento*, (2) *per judicis postulationem*, (3) *per condictionem*, (4) *per manus injectionem*, and (5) *per pignoris capionem*. The third was unknown in the decemviral period, and was introduced by the Silian law formerly mentioned. The other four were all more or less regulated by the XII. Tables, but must in some form have been anterior to them. It is utterly impossible, however, to say of any one of them, apart from the *condictes*, at what time it was introduced, or what was the statute (*lex*) by which it was sanctioned; it may well be that they were not of statutory introduction at all, but were called *legis actiones* simply because recognized and indirectly confirmed by the Tables. In character and purpose each of the five had its peculiarities. The first three were directly employed for determining a question of right or liability, which, if persistently disputed, inevitably resulted in a judicial inquiry. The fourth and fifth might possibly result in judicial intervention; but primarily they were proceedings in execution, in which the party moving in them worked out his own remedy. As regards their comparative antiquity, there is much to be said for the opinion of Jhering and Bekker that *manus injectio*, as essentially nothing more than regulated self-help, must have been the earliest of the five, and that the *legis actio sacramento* and the *judicis postulatio* must have been introduced in aid of it, and to prevent too hasty resort to it where there was room for doubt upon questions either of fact or law.

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[1] See the arguments in favour of this theory in Girard, *Manuel*, 4th ed. pp. 484 sqq.

[2] *Graeco-Italische Rechtsgeschichte* (Jena, 1884), pp. 465–70. Upon the *sponsionis vinculum* internationally, see Livy, ix. 9.

[3] The literature on the subject is very voluminous, great part of it in periodicals. Amongst the leading works are those of Keller, *Der röm. Civilprozess u. die Actionen* (6th ed. by Wach, Leipzig, 1883), §§ 12–21; Bethmann-Hollweg, *Der röm. Civilprocess* (3 vols., Bonn, 1864–1866), the first volume of which is devoted to the *legis actiones*; Buonamici, *Delle Legis Actiones nell' antico diritto romano* (Pisa, 1868); Bekker, *Die Aktionen d. röm. Privatrechts* (2 vols., Berlin, 1871–1873), particularly vol. i. pp. 18–74; Karlowa, *Der röm. Civilprozess zur Zeit d. Legisactionen* (Berlin, 1872); Padeletti, "Le Legis Actiones," in the *Archivio Giuridico* (1875), xvii, 321 sqq.; Schultze, *Privatrecht u. Prozess in ihrer Wechselbeziehung* (Freiburg, 1883), i. 439-532, in which some novel and not unimportant views are presented; Jobbé-Duval, *Études sur l'histoire de la procédure civile chez les Romains* (1896), vol. i.; Girard, *Organisation judiciaire*, i. 15–20, 56–104, 167–252.

In the three judicial *legis actiones* the first step was the *in jus vocatio* or procedure for bringing the respondent into court, minutely regulated by the provisions of the first of the XII. Tables. This was not done by any officers of the law; there was no writ of summons of any sort; the party moving in the contemplated litigation had himself to do what was needed. If the defendant did not appear, there could be no decree by default. Once before the magistrate (consul or praetor), the plaintiff stated his contention. If admitted or not disputed by the defendant, the magistrate at once pronounced his decree, leaving the plaintiff to work out his remedy as the law prescribed. But, if the case presented was met either with a denial or counterclaim, the magistrate remitted it for trial either to a collegiate tribunal or to one or more private citizens as judges or arbiters. The act of remit was technically *litis contestatio* or *ordinatio judicii*, the first so named because originally the parties called upon those present to be witnesses to the issue that was being sent for trial. This was the ordinary practice under both the system of the *legis actiones* and that of the *formulae*, and continued to exist until the time of Diocletian. In the first stage the proceedings were said to be *in jure*, and the duties of the magistrate in reference to them were part of his *jurisdictio*; in the second they were said to be *in judicio*, those presiding in it being styled *judices*. All that the judge or judges had to do was to pass judgment on the question remitted to them. They were "right-declarers" only, not "right-enforcers." If their judgment was for the plaintiff, and he failed to obtain an amicable settlement, he had himself to make it operative by subsequent proceedings by *manus injectio*, and that under the eye of the magistrate, not of the judge.

From an enumeration in Cicero of a variety of causes proper to the centumviral court the conclusion seems warranted that it was its peculiar province to decide questions of quiritary right in the strictest acceptation of the word. They were all apparently in his time real actions (*vindicationes*)—claims of property in land or of servitudes over it, of right as heir under a testament or in opposition to it, of rights of tutory and succession *ab intestato* as agnate or gentile, and so forth. It was a numerous court of Quirites, determining by its vote the question of quiritary right submitted to it. Many such questions in course of time, and possibly at first of express consent of parties, came to be referred to a single judge; but some, and notably claims of inheritance under or in opposition to a testament, were still frequently remitted to the centumviral court even in the classical period. Personal actions, however, do not appear ever to have fallen within its cognizance: they were usually sent to a single judge—a private citizen—selected by the parties, but appointed by the magistrate, and to whom the latter administered an oath of office. But, in a few cases in which an action involved not so much a disputed question of right as the exercise of skill and discretion in determining the nature and extent of a right that in the abstract was not denied, the remit was to a plurality of private judges or arbiters, usually three.

Sacramento.

The Legis Actio Sacramento.[1]—The characteristic feature of this *legis actio*, as described by Gaius, was that the parties, after a somewhat dramatic performance before the magistrate, each challenged the other to stake a certain sum, the amount of which was fixed by the Tables, and which was to abide the issue of the inquiry by the court or judge to whom the cause was eventually remitted. This stake Gaius refers to indifferently as *sacramentum*, *summa sacramenti*, and *poena sacramenti*. The formal question the court had to determine was—whose stake had been justified, whose not (*cujus sacramentum justum, cujus injustum*); the first was returned to the staker, the second forfeited originally to sacred and afterwards to public uses. But the decision on this formal question necessarily involved a judgment on the matter actually in dispute, and, if it was for the plaintiff, entitled him, failing an amicable arrangement, to take ulterior steps for making it effectual. The procedure was still employed in the time of Gaius in the few cases that continued to be referred to the centumviral court, but otherwise it had been long in disuse.

Gaius explains that it was resorted to both in real and personal actions. Unfortunately the MS. of his Institutes is defective in the passage in which he described its application to the latter. We possess the greater part of his account of the *actio in rem* as employed to raise and determine a question of ownership; but his illustration is of vindication of a slave, and not so interesting or instructive as the proceedings for vindication of land. These, however, can be reconstructed with tolerable certainty with the aid derived from other sources, especially from Cicero, Varro and Gellius.

The parties appeared before the magistrate, each carrying a rod (*festuca*) representing his spear (*quir* or *hasta*), the symbol, as Gaius says, of quiritarian ownership. The first word was spoken by the raiser of the action, and addressed to his opponent: "I say that the land in question [describing it sufficiently for identification] is mine in quiritary right (*meum esse ex jure quiritium*); wherefore I require you to go there and join issue with me in presence of the magistrate (*in jure manum conserere*)." Thereupon, according to the earliest practice, the magistrate and the parties, accompanied by their friends and backers, proceeded to the ground for the purpose: the court was transferred from the forum to the land itself. As distances increased, however, and the engagements of the consuls multiplied, this became inconvenient. Instead of it, the parties went to the spot without the magistrate, but on his command, and there joined issue in the presence of their seconds, who had been ordered to accompany them, and who probably made a report of the due observance of formalities on their return. Still later the procedure was further simplified by having a turf or sod brought from the place beforehand, and deposited a few yards from the magistrate's chair; and, when he ordered the parties to go to the ground and join issue, they merely brought forward the turf and set it before him, and proceeded to make their formal vindications upon it, as representing the whole land in dispute.

The ritual was as follows: The raiser of the action, addressing his adversary, again confirmed his ownership, but this time with the significant addition: "As I have asserted my right by word of mouth, look you, so do I now with my *vindicta*"; and therewith he touched the turf with his rod, which was called *vindicta* when employed for this purpose. The magistrate then asked the other party whether he meant to counter-vindicate. If he replied in the negative or made no response, there was instant decree (*addictio*) in favour of the first party, and the proceedings were at an end. If, however, he counter-vindicated, it was by repeating the same words and going through the same form as his adversary: "I say that the land is mine in quiritary right, and I too lay my *vindicta* upon it." The verbal and symbolical vindication and counter-vindication completed what was technically the *manus consertio*. The parties were now in this position: each had asserted his ownership, and had figuratively had recourse to arms in maintenance of his contention. But the matter was to be settled judicially, so the magistrate once more intervened and ordered both to withdraw from the land. The dialogue was then resumed, the vindicant demanding to know from his opponent upon what pretence (*causa*) he had counter-vindicated. In the illustration in Gaius he avoided the question and pleaded the general issue: "I have done as is my right in laying my *vindicta* on the land." But there can be little doubt that in certain circumstances the counter-vindicant would deem it expedient to disclose his title. This was very necessary where he attributed his right to a conveyance upon which two years' possession had not yet followed; in such a case he had to name his author (*auctorem laudare*) if he desired to preserve recourse against the latter on the warranty implied in the mancipation. That probably entailed a suspension of the proceedings to allow of the author's citation for his interest; and on their resumption, if he appeared and admitted his *auctoritas*, he was formally made a party to the action.

The proceedings had now reached the stage at which the sacrament came into play. The first challenge came from the vindicant,—"Since you have vindicated unrightfully, I challenge you with a sacrament of 500 *asses*," to which the counter-vindicant responded,—"And I you." This was technically the *sacramento provocatio*. The magistrate thereupon remitted the matter for trial to the centumviral court, or to a single judge, having declared what exactly was the question put in issue which the court or judge was to decide. The parties then called upon the bystanders to be witnesses of the magistrate's remit, this appeal to witnesses being, as is generally held, the *litis contestatio*.[2] At the same time, according to Gaius's account of the procedure, the magistrate required sureties from the parties for the eventual payment by him who was unsuccessful of the sacrament he had offered to stake, and which became a forfeit to the exchequer. (The original practice probably was for the stake to be deposited by both parties in the hands of the pontiffs before they were heard by the judge or judges; after judgment that of the gainer was restored to him, while that of the loser was retained for religious uses.) The magistrate also made arrangements for the interim possession of the land by one or other of the litigants (but preferably, it is thought, by the possessor), taking security from him that, if he was eventually unsuccessful, it should be returned to his opponent, along with all the fruits and profits drawn in the interval. At the trial, as both parties were vindicants, there must have been a certain burden of proof upon both sides. The vindicant, one may believe, must have been required to establish in the first instance that the thing he claimed had at some time been his; and then, but probably not till then, the counter-vindicant would have to prove a later title in his person sufficient to exclude that of his opponent. The judgment, as already observed, necessarily involved a finding on the main question; but in form it was a declaration as to the sacrament: that of the party who prevailed was declared to be just, and that of his unsuccessful opponent unjust.

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[1] To the literature in the last note may be added Asverus, *Die legis actio sacramenti* (Leipzig, 1837); Huschke (rev. Asverus), in Richter's *Krit. Jahrbuch*, vol. iii. (1839), pp. 665 sqq.; Stintzing, *Verhältniss d. l. a. sacramento zum Verfahren durch sponsio praejudicialis* (Heidelberg, 1853); Danz, *Der sacrale Schutz*, pp. 151–221; Danz, "Die l. a. Sacram. u. d. Lex Papiria," in the *Zeitschr. f. Rechtsgeschichte*, vol. vi. (1867), pp. 339 sqq.; Huschke, *Die Multa u. d. Sacramentum* (Leipzig, 1874); Lotmar, *Zur l. a. sacramento in rem* (Munich, 1876); Brinz (crit. Lotmar), "Zur Contravindication in d. l. a. sacr.," in the *Festgabe zu Spengel's Doctor-Jubiläum* (Munich, 1877), pp. 95–146; Münderloh, "Ueber Schein u. Wirklichkeit an d. l. a. sacramenti," in the *Z. f. Rechtsgesch.* vol. xiii. (1878), pp. 445 sqq.; E. Roth, in the *Z. d. Savigny Stiftung*, vol. iii. (1882), *Röm. Abtheil.* pp. 121 sqq.; Fioretti, *Leg. act. sacramento* (Naples, 1883); Jhering, "Reich u. Arm im altröm. Civilprozess," in his *Scherz u. Ernst in der Jurisprudenz* (Leipzig, 1885), pp. 175 sqq.; Schulin, *Lehrbuch*, pp. 525 sqq.; Pflüger, *Die legis actio sacramento* (Leipzig, 1898).

[2] But see Colassak, *Die Litis contestation* (1889), pp. 69 sqq., for a different view.

Looking at this ritual as a whole, the conviction is irresistible that it could not have been so devised by one brain. It reveals and combines three distinct stages in the history of procedure—appeal to arms and self-help, appeal to the gods and the spiritual power, appeal to the civil magistrate and his judicial office. As Gellius says, the real and substantial fight for might, that in olden days had been maintained at the point of the spear, had given place to a civil and festucarian combat in which words were the weapons, and which was to be settled by the interposition of the praetor. But this does not explain the *sacramentum*. Various theories have been proposed to account for it. According to Gaius, it was nothing more than the sum of money staked by each of the parties, which was forfeited originally to sacred and afterwards to public uses by him who was unsuccessful, as a penalty for his rashly running into litigation; and substantially the same explanation is given by Festus in one of his definitions of the word. But this is far from satisfactory, for it involves the apparent absurdity of declaring that a penalty imposed by law could be just in the case of the party who was in the right, and unjust in the case of him who was in the wrong. There is another definition in Festus—" a thing is said to be done *sacramento* when the sanction of an oath is interposed "—that lends support to the opinion that there was a time when parties to a question of right were required to take an oath to the verity of their respective assertions; that they were also required concurrently to deposit five bullocks or five sheep, according to the nature or value of the thing in dispute, to abide the issue of the inquiry;[1] that the question for determination was whose oath was just and whose unjust; and that he who was found to have sworn unjustly forfeited his cattle or sheep as a *piamentum*—a peace-offering to the outraged deity—while the other party reclaimed his from the repository in which they had been detained in the interval.[2] It was made an opportunity doubtless by the priests to get some profit for their temples.

The writers who adopt this view are far from being unanimous as to details. But there seems to be enough to render it more than probable that, at an intermediate stage between the *vera solida vis* of ancient times and the *vis civilis et festucaria* which Gellius and Gaius depict, there was a procedure by appeal to the gods through means of oaths of verity sworn by the parties, in the manner and with the consequences that have been indicated. That in time it should have dropped out of the ritual is quite in the order of things. Its tendency was to become a mere form, imposing no real restraint on reckless litigation. The restraint was rather in the dread of forfeiture of the sacramental cattle, sheep or money that would follow a verdict that an oath had been unjust. And it must have been felt besides that it was unfair to brand a man as a false-swearer, needing to expiate his offence by an offering to the gods, whose oath had been perfectly honest. That he should suffer a penalty for his imprudence in not having taken more care to ascertain his position, and for thus causing needless annoyance to others, was reasonable, but did not justify his being dealt with as one who had knowingly outraged the deity to whom he had appealed. So the oath—the original *sacramentum*—disappeared, the name passing by a natural enough process to the money which had been wont to be deposited before the oath was sworn, but which now ceased to be an offering in expiation by a false-swearer, and became a mere penalty (forfeited to the state) of rash litigation (*poena temere litigantis*). So when *praedes* later took the place of actual deposits, they became bound as state debtors for the *sacramentum*.

It may well be assumed that in most cases the finding of the court as to the justness or unjustness of the respective sacraments of the parties was the end of the case—that it was at once accepted and loyally given effect to. If in favour of the party to whom interim possession had been given by the magistrate there could be no difficulty; he retained the object in dispute with the fruits and profits he had drawn in the interval between *litis contestatio* and judgment. If, however, the finding was for the other party, and amicable arrangement was not come to, it is not clear what course was followed. Gaius says that in awarding interim possession (*vindicias dicere*) the praetor required the grantee to give security by sureties (*praedes*) to his adversary for restitution to the latter in the event of his success; while Festus preserves a law of the XII. Tables which, according to Mommsen's rendering, declared that, when it turned out that interim possession had been awarded to the wrong party, it was to be in such party's power to demand the appointment of three arbiters who should ascertain the value of the object of vindication and its fruits, and assess the damages due for non-restitution at double the amount. This provision seems to have been intended to afford the wrongful interim possessor, who was not in a position to make specific restitution to his successful opponent, a means of avoiding the apprehension and imprisonment which were the statutory consequences of failure to implement a judgment. It is probable that in time this duplicated money payment came to be regarded as the satisfaction to which the successful party in a vindication was entitled in every case in which, no matter for what reason, he was unable to obtain the thing itself and its fruits from their interim possessor; that consequently an *arbitrium liti aestimandae*, or reference to arbiters to assess their value, resulted in every such case; and that it was to assure its payment that the praetor required the party to whom the interim possession was awarded to give to his opponent the sureties (*praedes litis et vindiciarum*) to whom Gaius alludes.[3]

This procedure in the sacramental action for vindication of land was applicable to every kind of *manus* which a man could claim to have over persons or things, though necessarily with variations more or less important in the ritual. But the sacramental action was also quite common for claims *in personam*. As regards personal actions, the ordinarily received opinion, which rests, however, on slender foundations, is that from the first the parties met on equal terms; that, if it was a case of money debt, the creditor commenced the proceedings with the averment that the defendant owed him the sum in question,—" I say that you ought to pay me (*dare oportere*) 1000 *asses* "; that this was met with a denial; and that a sacramental challenge followed on either side. All are agreed that the remit was to a single *judex* after an interval of thirty days from the proceedings *in jure*; that where the claim was for a definite sum the plaintiff had to establish his case to the letter; and that his sacrament was necessarily declared unjust if he failed to prove his claim by a single penny. But there is considerable diversity of opinion as to whether by this form of process a claim of uncertain amount could be insisted on—as, for example, for damages for breach of a warranty of acreage of lands sold, or of their freedom from burdens. If it could, then probably the question raised and dealt with *sacramento* was the abstract one of liability—Was the warranty given, and has it failed?—the sum due in respect of the breach being left to be dealt with in a subsequent arbitral process (*arbitrium liti aestimandae*).

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[1] It was the *Lex Aternia Tarpeia* of the year 454 B.C. that commuted the five bullocks and five sheep into 500 and 50 ℔ of copper respectively (Cic. *De Rep.* ii. 35, § 60, where the words usually printed " de multae sacramento " should read " de multa et sacramento "). See Festus, *s.v.* " Peculatus " (in Bruns, *Fontes*). As to the relative value of oxen and sheep, it is interesting to note that, by the customs of the modern Ossetians, ten sheep are also held to be equivalent to one ox. See Kovalewsky, *Coutume contemporaine*, p. 11. For the pounds' weight of raw metal the XII. Tables substituted the same number of *asses*, declaring that 500 should be the *summa sacramenti* when the cause of action was worth 1000 *asses* or more, 50 when worth less or the question one of freedom or slavery (Gai. iv. 14).

[2] Varro, *De L. L.* v. 180, says that, even after the *summa sacramenti* had been converted into money, it was deposited *ad pontem*—some bridge, he does not say which, where there was a sacred " pound." (Curiously enough, the Irish spelling of " pound " is " pont "; Skeat's *Etym. Dict.*, *s.v.* " Pound.") A most ingenious and plausible explanation was suggested by Danz in 1867, in the *Zeitschr. f. Rechtsgesch.* vi. 359. Recalling the facts that there had been discovered in the Tiber Island *sacella* of Jupiter Jurarius and Dius Fidius, the two deities to whom solemn oaths were usually addressed, and that the island was spoken of as " inter duos pontes," because connected with both banks of the river by bridges bearing no particular names, he suggested that the island may have been the place to which disputants resorted to make their *sacramenta*, and that the cattle, sheep or money were deposited in a place for the purpose before the bridge was crossed. Much the same explanation was offered by Huschke two years later in his book *Das alte römische Jahr* (Breslau, 1869), p. 360, apparently without being aware of Danz's speculation. He adds, on the authority of the Iguvine Tables, that, while bullocks were offered to Jupiter, only sheep were offered to Dius Fidius. The island, he thinks, must have been selected as neutral ground to which all parties might have access, and which obviated intrusion into the temples of the two gods on the Capitol and Quirinal respectively. And it is to its use as the scene of the sacramental procedure that he attributes its name of " holy island," rather than to the fact of its having been the seat of the temple of Aesculapius. Huschke recurs to and enforces this view in his *Multa und Sacramentum* (1874), p. 410, where he does refer to Danz's paper.

[3] Another theory is that, while the interim possessor could not be proceeded against, the *praedes*, who were really bound in his place and not merely as accessories, were directly subject to execution as debtors of the state. On this and other theories, see Cuënot in *Nouv. Rev. hist.* pp. 345 sqq.; Girard, *Manuel*, pp. 328–29.

Per judicis postulationem.

The Legis Actio per Judicis Postulationem.[1]—The defects of the Verona MS. have deprived us of Gaius's account of this *legis actio*. There is little elsewhere that can with any certainty be said to bear upon it. The most important is a note in Valerius Probus—*T.PR.I.A.V.P.V.D.*, which is generally interpreted—*te, praetor, judicem arbitrumve postulo uti des.* This petition to the magistrate to appoint a judge, arbiter or arbiters (as the case might be) in all probability was part of the procedure in the action, and that from which it derived its distinctive name. Beyond this all is conjecture, alike as to the nature and form of the action and the cases to which it was applicable. Gaius says of the *legis actio sacramento* that it was general, and that it was the procedure that was to be resorted to where no other was prescribed by statute. There are, however, nowhere indications of an express instruction that proceedings in any particular case were to be *per judicis postulationem.*

While it is impossible with certainty to trace the history of this procedure to its first beginnings, yet the impression is general that it must have originated in the regal period. It is commonly held to have been applicable to the divisory actions, and some others triable by arbiters as directed by the XII. Tables. Some eminent writers hold that it was employed in certain actions in which equitable considerations were allowed to be taken into account by the judge (*e.g.* the *actio fiduciae*), and generally in so-called *jurgia* as contrasted with *lites*. But this theory has many difficulties to contend with. It has no support from any ancient writer, and it leads to the result that the courts by *legis actiones* had power to take into consideration questions of *bona fides*, which is not only in contradiction with what Gaius says (iv. 11), but inconsistent with their character.[2]

Per condictionem.

The Legis Actio per Condictionem.[3]—This, the youngest "action of the law," was introduced, Gaius says, by the Silian law as a means of recovering a liquid money debt (*certa pecunia*), and afterwards made available by the Calpurnian law for enforcing personal claims (as distinguished from real rights) for anything else definite and certain (*omnis res certa*), and in both its forms, therefore, essentially an action of debt. The date of both enactments is matter of controversy, although there is no question that the Silian was the earlier. Gaius says of it that its purpose was far from obvious, as there was no difficulty in recovering money either by a sacramental action or one *per judicis postulationem.* But it is probable, as above stated, that money due under a nexal contract was recoverable by neither of these processes, but by the much more summary one of *manus injectio*, a procedure which would be practically put an end to by the Poetilian law of 326 B.C. We are disposed to regard the *lex Silia* and the new procedure it authorized as a result of the change made by this last-mentioned statute. To have put off a creditor for money lent either with a sacramental action or one *per judicis postulationem*, would have been to deprive him of the advantages of *manus injectio* to a greater extent than was called for. At any rate, it seems to have been provided by the Silian law that, when a man disputed his liability for what was called *pecunia certa credita*, and forced his creditor to litigation, the plaintiff was entitled, if he pleased, to require from him an engagement to pay one-third more by way of penalty in the event of judgment being against him, while the *soi-disant* creditor had similarly to undertake to pay as penalty the same amount in case of judgment in favour of the alleged debtor. Those engagements (*sponsio et restipulatio tertiae partis*) were not allowed in every case in which a definite sum of money was claimed *per condictionem*, but only when it was technically *pecunia credita*. In Cicero's time *creditum* might arise either from loan, stipulation or literal contract (*expensilatio*); but the last dated probably at soonest from the beginning of the 6th century, and stipulation apparently was a result of the Silian law itself, so that the *pecunia credita* of this enactment can have referred only to borrowed money. The same phrase, according to Livy, was employed in the Poetilian law; it was thereby enacted, he says, that for *pecunia credita* the goods, not the body of the debtor, ought to be taken in execution. A connexion, therefore, between the Poetilian law and the disuse of the *nexum* on the one hand, and the Silian law and the introduction of the *legis actio per condictionem* on the other, can hardly be ignored, and raises a probability that the latter statute was a consequence of the former, and was passed immediately or soon after the year 326 B.C. In the action on the Calpurnian law, it is probable that there was no penalty of a third part on either side. A peculiarity of the *legis actio per condictionem* is that the plaintiff could when before the magistrate refer the case to the defendant's oath (*juramentum necessarium*). Taking the oath involved absolution, refusal involved condemnation.

Little is known of the procedure in this *legis actio*, for, in consequence of the loss of a leaf in the Verona MS., we are without part of Gaius's account of it. It got its distinctive name, he says, from the *condictio* or requisition made by the plaintiff on the defendant, whom he had brought into court in the usual way, to attend again on the expiry of thirty days to have a judge appointed. The procedure on the reappearance of the parties on the thirtieth day (provided a settlement had not been arrived at in the interval) varied according as the action was (1) for a definite sum of money falling under the category of *pecunia credita*, or (2) for any other definite sum of money or a definite thing or quantity of things. In the action for *pecunia credita* the *sponsio et restipulatio tertiae partis* were exchanged; and it is probable that, if either party refused on the praetor's command so to oblige himself towards the other, judgment was at once pronounced in favour of the latter without any remit to a *judex*. How the issue was adjusted when the sponsion and restipulation were duly given we are not informed, but, judging by analogy from the procedure in an action for breach of interdict under the formular system, and on the broader ground that there must have been machinery for a condemnation of the plaintiff on his restipulation in the event of his being found in the wrong, it may reasonably be concluded that there were in fact three concurrent issues sent to the same *judex*—the first on the main question, the second on the defendant's sponsion and the third on the plaintiff's restipulation. When a sum of money other than *pecunia credita* or a thing or quantity of things other than money was sued for, those subsidiary issues were unnecessary if the view above expressed be correct.

As Baron has demonstrated, it was not the usual practice to introduce any words explanatory of the ground of indebtedness when the action was either for money (other than *pecunia credita*) or for a thing or quantity of things. It might be loan, or bequest, or sale, or purchase, or delict, or unjustifiable enrichment, or any of a hundred *causae*; it would have to be stated of course before the judge; but in the initial stage before the praetor and in the issue all that was necessary was the averment that the defendant was owing such a sum of money or such a thing. It was for the judge to determine whether or not the averment was established and, in certain cases, that non-delivery was due to the fault of the defendant; the plaintiff, however, was bound to make his averment good to the letter of his claim. In the event of the plaintiff being successful in an action for *certa pecunia*, but delay was made by the defendant in satisfying the judgment, execution followed in ordinary form. How the matter was arranged in an action on the Calpurnian law for a *certa res* is not so obvious. What the plaintiff wanted was specific delivery or damages, and by some the opinion is entertained that he formulated his claim alternatively. Of this there is no evidence; and Gaius's statement that under the system of the *legis actiones* condemnation was always in the *ipsa res*, *i.e.* the specific thing sued for, leads to the assumption that a judgment for the plaintiff, on which specific implement failed, must have been followed by an *arbitrium liti aestimandae* for assessment of the damages in money, and that execution proceeded thereon as if the judgment had been for a sum of money in the first instance. The general opinion, however, is that the judge to whom the issue was remitted assessed the damages himself and as a matter of course—that the instruction to him was *quanti res erit, tantam pecuniam condemnato.*

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[1] To the literature on p. 548, note 1, add Baron, "Zur leg. act. per judicis arbitrive postulationem," in the *Festgabe für Aug. W. Heffter* (Berlin, 1873), pp. 29 sqq.; Huschke, *Multa*, &c., pp. 394 sqq.; Adolf Schmidt, "Ueber die l. a. per jud. post.," in the *Zeitschr. d. Sav. Stift.* (1881), vol. ii., *Röm. Abtheil.* pp. 145 sqq.; Voigt, *XII. Tafeln*, vol. i. § 61.

[2] See on this Mitteis, *Römisches Privatrecht* (1908), p. 31 and p. 44 n. 11.

[3] To the literature on p. 548, note 1, add Bekker, *Aktionen*, vol. i. cap. 4–7; Voigt, *Jus naturale, &c., d. Römer* (Leipzig, 1856–75), vol. iii. §§ 98, 99; Baron, *Die Condictionem* (Berlin, 1881), §§ 15, 16; Jobbé-Duval, *Procédure Civile* (1896), i. 61 sqq.

Per manus injectionem.

The Legis Actio per Manus Injectionem.[1]—This "action of the law" was ordinarily employed as a means of execution against the body of a judgment-debtor or one who had confessed liability in the first stage of a process. But, in certain cases, it is conjectured, it was thought proper that a creditor should have a more summary remedy than was afforded by a sacramental action or one *per judicis postulationem*, and he was allowed to apprehend his debtor without any antecedent judgment or confession; in which cases, if the debtor disputed liability, the question could be tried only in proceedings at his instance, or sometimes at that of a third party on his behalf, for a stay of execution. It will simplify matters, however, to confine our attention to it in the meantime as a means of execution against the body of a judgment-debtor.

Gaius's description of it is very general; for details we are indebted principally to the *Noctes Atticae* of Aulus Gellius, in an account which he gives (put into the mouth of Caecilius Africanus, a well-known jurist of about the same time as Gaius, and a contemporary of his own) of the provisions of the XII. Tables in reference to it. Africanus is made to say that according to his belief (*opinor*) the words of the statute were these: "For admitted money debts and in causes that have been regularly determined by judgment (*aeris confessi rebusque jure judicatis*) there shall be thirty days' grace. After that there may be *manus injectio.* The apprehending creditor shall then bring his debtor before the magistrate. If he still fail to satisfy the judgment, and no *vindex* come forward to relieve him, his creditor may carry him home and put him in chains. He may live at his own cost; if not, his creditor must give him daily a pound of spelt, or more if he please." Africanus continues *narrativê*: "There was still room for the parties to come to terms; but, if they did not, the debtor was kept in chains for sixty days. Towards the end of that time he was brought before the praetor in the *comitium* on three consecutive market-days, and the amount of the judgment-debt proclaimed on each occasion. After the third proclamation *capite poenas dabat*"—what these words mean will be considered in the sequel—"or else he was sent across the Tiber to be sold to a foreigner. And this capital penalty, sanctioned in the hope of deterring men from unfaithfulness to their engagements, was one to be dreaded because of its atrocity and of the new terrors with which the decemvirs thought proper to invest it. For, if it was to more creditors than one that the debtor had been adjudged, they might, if they pleased, cut up and divide his body. Here are the words of the statute—'*Tertiis nundinis partis secanto. Si plus minusve secuerunt, se fraude esto.*'"

Such is Gellius's account of the provisions of the XII. Tables in reference to this *legis actio*, and he is to a considerable extent corroborated by Quintilian, Tertullian and Dio Cassius. But it is to be borne in mind that he does not vouch for its accuracy; the Tables were already in his time matter of antiquity, and even the jurists knew little about them beyond what was still in observance. That he has reproduced them only partially seems almost beyond question; for in another chapter he himself quotes a couple of sentences that are to all appearance from the same context. We have to face, therefore, the extreme probability that the record is incomplete and the possibility besides that it is not literally accurate. There is room for error, consequently, in two directions; but the nature and effect of the procedure in its main features may be gathered from the texts as they stand with reasonable certainty.

It was competent only after thirty days from the date of judgment or confession.[2] It was apprehension of the debtor by the creditor himself,—in its first stage, at least, an act of pure self-help. The debtor had at once to be brought before the magistrate, in order that his creditor might solemnly go through the required formalities before he could carry him away and provisionally confine him in the domestic lock-up. It was this appearance before the magistrate that made it a *legis actio.* Such a course, however, was avoided either (1) by instant payment or other implement of the judgment or arrangement with the creditor, or (2) by the intervention of a *vindex* or champion. The position taken by the latter was not that either of a surety or of an attorney for the *judicatus* demanding a rehearing of the case: he appeared rather as a controverter in his own name of the right of the creditor to proceed further with his execution, on the ground that the judgment was invalid. This might necessitate an action between the *vindex* and the creditor, in which the former was plaintiff, but to which the debtor was not a party. If it failed, then the *vindex* was liable for double the amount of the original debt, as a penalty on him for having improperly interfered with the course of justice; his interference was treated as a delict, but on payment he had presumably relief against the original debtor who had been liberated through his intervention. Failing a *vindex* and failing payment, the creditor took his debtor home and incarcerated him, dealing with him for sixty days in the manner above described. On their expiry, without any arrangement, there was a magisterial decree (*addictio*) awarding the debtor to his creditor.

What right did this *addictio* confer upon the creditor? The debtor, says Gellius, "capite poenas dabat," which he interprets as meaning that his creditor might put him to death, the alternative being his sale as a slave beyond the Tiber. There is, however, a diversity of opinion among the modern writers as to the true meaning of these words. While some hold, and rightly it is thought, that the Gellian interpretation is correct, others object to it as extravagant. It is objected to by Muirhead on the ground, *inter alia*, of its incredible severity in the case of petty debtors. He holds that *capite poenas dabat* meant simply that the debtor "paid the penalty with his person," in contradistinction to "his means." *Caput* is thus merely used in opposition to *bona.* Even more numerous are the writers who object to Gellius's statement that the body of the *addictus* when killed might be cut in pieces where there were several creditors. They hold that the words *partis secanto* of the Tables referred not to the body but to the belongings of the debtor,—that when there were concurrent creditors they shared his *familia* amongst them.[3] But these views are, it is thought, somewhat fanciful refinements. *Poena capitis* always implies either death, slavery or deprivation of citizenship; there is nothing more astonishing in a creditor's right to kill his debtor than in a father's right to kill his child; and comparative law gives many instances, of a parallel kind, of the harshness of primitive law to defaulting debtors. The *partis secanto* was probably a relic of earlier times, and Gellius admits that he never heard or read of a dissection having taken place.

The cruelties and indignities to which creditors subjected both their judgment and nexal debtors led, as above noticed, to many a commotion in the first two centuries of the Republic. The latter were probably much more numerous than the *judicati*, and, being in great part the victims of innocent misfortune, it was the sufferings they endured at the hands of relentless creditors that so often roused the sympathies and indignation of the populace. But the judgment-debtors had suffered along with them; and some of the provisions of the Poetilian law of 326 B.C., already mentioned, were meant to protect the former against the needless and unjustifiable severity that had characterized their treatment by their creditors. The *manus injectio* itself was not abolished, nor the possible intervention of a *vindex*; neither were the *domum ductio* that followed, and the provisional imprisonment with the light chains, authorized by the Tables while it lasted; nor apparently was the formal *addictio* of the debtor to his creditor when the sixty days had expired without arrangement. But after addiction, if it was for nothing more than civil debt, there were to be no more dungeons and stripes, fetters and foot-blocks; the creditor was to treat his debtor and his industry as a source of profit that would in time diminish and possibly extinguish his indebtedness, rather than as an object upon which he might perpetrate any cruelty by way of punishment. Although the edict of P. Rutilius of 107 B.C. provided a creditor with machinery for attaching the estate of his debtor, he had still the alternative of incarceration. This might be avoided under the Julian law of *cessio bonorum* by the debtor's making a complete surrender of his goods to his creditor; but, failing such surrender, incarceration continued to be resorted to even under the legislation of Justinian. During the Empire, of course, it was not by *manus injectio* that the incarceration was affected; for it went out of use with the definitive establishment of the formular system of procedure.

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[1] To the literature on p. 548, note 1, may be added Huschke, *Nexum* (1846), pp. 79 seq.; Savigny, "Das altröm. Schuldrecht," in his *Verm. Schriften* (1850), ii. 396 seq.; Hoffmann, *Die Forcten u. Sanaten, nebst Anhang über d. altröm. Schuldrecht* (Vienna, 1866), pp. 54 seq.; Vainberg, *Le nexum et la contrainte par corps en droit Rom.* (Paris, 1874), pp. 36 seq.; Voigt, *XII. Tafeln*, vol. i. §§ 63–65; Jhering (as on p. 548), pp. 196 seq., 232 seq.; Cuq, *Institutions juridiques*, 2nd ed. i. 141 seq.; Schlossmann, *Altrömisches Schuldrecht* (1904); Kleineidam, *Personalexekution der XII. Tafeln* (1904).

[2] In his *Historical Introduction*, 2nd ed. pp. 192–193, Muirhead maintains that the "*aeris confessi*" of the Tables refers to nexal debtors, but this view has, it is thought, insurmountable objections to overcome.

[3] For a fuller explanation, see Muirhead, *Hist. Introduction*, 2nd ed. pp. 198 seq., and authorities there cited. See also Kleineidam, *Personalexekution*, pp. 235 seq. Lenel must be added to those writers who think that "*partis secanto*," &c., refers to the goods of the debtor (*Zeitschr. d. Sav. Stift.* xxvi. pp. 507–509).

It was as directed against judgment and nexal debtors that *manus injectio* was of most importance and chiefly made its mark in history. But there were other cases in which it was resorted to under special statutory authority, where a remedy seemed advisable more sharp and summary than that by ordinary action. In some of these it was spoken of as *manus injectio pro judicato* (*i.e.* as if upon a judgment), in others as simple *manus injectio* (*manus injectio pura*). In the first the arrestee was not allowed to dispute his alleged indebtedness in person; he could do so only through a *vindex*; and if no one intervened for him in that character he was carried off and dealt with by his arresting creditor as if a judgment had been obtained against him. In the second he was not required to find a *vindex*, but might himself dispute the verity of the charge made against him, under penalty, however, as is generally supposed (though it is disputed), of a duplication of his liability if he failed in his contention. By a *lex Vallia*, probably in the latter half of the 6th century of the city, this *manus injectio pura* was substituted for that *pro judicato* in all cases in which the ground of arrest was neither judgment nor so-called *depensum*, *i.e.* payment by a surety or other party on account of the true debtor, who failed to relieve the former within six months of such payment.[1]

Per pignoris capionem.

The Legis Actio per Pignoris Capionem.[2]—In the ritual of the *actio sacramenti* the *vis civilis et festucaria* was a reminiscence of the *vera solida vis* with which men settled their disputes about property in the earliest infancy of the commonwealth. *Manus injectio* was a survival from times when the wronged was held entitled to lay hands upon the wrongdoer, and himself subject him to punishment; custom and legislation intervened merely to regulate the conditions and mode of exercise of what essentially was still self-help. In *pignoris capio* self-help was likewise the dominant idea. It may be fairly enough described by the English legal term distress—the taking by one man of property belonging to another in satisfaction of or in security for a debt due by the latter which he had failed to pay. The seizure, however, did not proceed upon any judgment, nor did it require the warrant of a magistrate; it might be resorted to even in the absence of the debtor, and on a *dies nefastus*; but it required to be accompanied by certain words of style, spoken probably in the presence of witnesses. It was only in a few exceptional cases that it was competent, in some by force of custom, in others by statute, nearly all of which seem to be given by Gaius,[3] and all of them being of a military, religious or fiscal character. What was the procedure, and what its effects, are far from certain. Jhering, founding on some expressions of Cicero's, conjectures that, whether the debt was disputed or not, the distrainer could neither destroy nor sell nor definitely appropriate his *pignus* without magisterial authority,—that in every case he was bound to institute proceedings in justification of his caption, and to take in them the position of plaintiff. The idea is ingenious, and puts the *pignoris capio* in a new and interesting light. It makes it a summary means of raising a question of right for whose judicial arbitrament no other process of law was open,—with the additional advantage that it secured instant satisfaction to the raiser of it in the event of the question being determined in his favour. If against him, the inevitable result, in substance at least, must have been a judgment that he had no right to retain his pledge, with probably a finding that he was further liable to its owner in the value of it, as a punishment for his precipitancy.[4]

Procedure outside legis actiones.

Judicial or Quasi-Judicial Procedure outside the Legis Actiones.—Whatever may have been the extent of the field covered by the actions of the law, they did not altogether exclude other judicial or quasi-judicial agencies. The supreme magistrate was frequently called upon to intervene in matters brought under his cognizance by petition or complaint, in which his aid was sought not so much to protect a vested right of property or claim as to maintain public order, or to prevent the occurrence or continuance of a state of matters that might prove prejudicial to family or individual interests. The process was not an action, with its stages *in jure* and *in judicio*, but an inquiry (*cognitio*) conducted from first to last by the magistrate himself; and his finding, unless it was a dismissal of the complaint or petition, was embodied in an order (*decretum, interdictum*) which it was for him to enforce by such means as he thought fit,—*manu militari*, or by fine or imprisonment. Some jurists are disposed to give a very wide range to this magisterial intervention. One of its most important manifestations was in connexion with disputes about the occupancy of the public domain lands. These did not belong in property to the occupants, so that an action founded on ownership was out of the question. But, as the occupancy was not only recognized but sanctioned by the state, it was right, indeed necessary in the interest of public order, that it should be protected against disturbance. In the measures resorted to for its protection Niebuhr recognized the origin of the famous possessory interdict *uti possidetis*; and, although opinions differ as to whether protection of the better right or prevention of a breach of the peace was what primarily influenced the magistrate's intervention, there is, apart from some distinguished exceptions, a pretty general accord in accepting this view. Another illustration of this magisterial intervention is to be found in the interdiction of a spendthrift,—a decree depriving of his power of administration a man who was squandering his family estate and reducing his children to penury; a third presents itself in the removal of a tutor from office on the ground of negligence or maladministration, on complaint made to the magistrate by any third party in what was called *postulatio suspecti tutoris*; and a fourth in the putting of a creditor in possession of the goods of an insolvent debtor, which must have been common enough even before the general bankruptcy regulations of the Rutilian edict. These are to be taken merely as examples of this magisterial intervention, which manifested itself in very various directions; and it is easy to see how largely such procedure might be utilized for remedying the grievances of persons who, from defect of complete legal title, want of statutory authority, or otherwise, were not in a position to avail themselves of the "actions of the law."

In one of the Valerio-Horatian laws consequent on the second secession of the plebeians there was mention of ten judges (*judices decemviri*), whose persons were declared as inviolable as those of the tribunes of the people and the plebeian aediles. These were, it is generally supposed, a body of judges elected to officiate on remit from a tribune or aedile in questions arising between members of the plebeian body. We are without details as to the institution of this plebeian judicatory, the questions that fell under its cognizance, the forms of process employed, the law administered by it and the effect of its judgments. It is not much referred to by the historians; and its decadence has been attributed to the fact that the *Lex Hortensia* of 287 B.C. made the *nundinae* lawful court-days (*dies fasti*), and so made it possible for the country folk coming to the city to market to carry on their processes before the praetor. It has also been identified by some writers[5] with the *decemviri stlitibus judicandis*, whose jurisdiction has been already noticed (*supra*, p. 536).

As all in a manner exercising judicial or quasi-judicial functions must also be mentioned the pontiffs, the consuls, and afterwards the censors as *magistri morum*, the chiefs of the *gentes* within the gentile corporations, and heads of families within their households. While it may be the fact that with the enactment of the XII. Tables the jurisdiction of the pontiffs[6] was materially narrowed, it certainly did not disappear,—witness the famous case in which Cicero made before them the oration of which he was so proud, *Pro domo sua.* The action of the consuls and afterwards of the censors as guardians of public morals, and the social and political disqualifications and pecuniary penalties with which they visited persons who had been guilty of perjury or gross perfidy, did not a little to foster fidelity to engagements. Through the same agency the exercise of a variety of rights whose abuse could not be made matter of action—the husband's power over his wife, the father's over his children—was controlled and kept within bounds. It was not on light grounds, indeed, that the majesty of the *paterfamilias* within the household could be called in question; it was only when he forgot that in the exercise of serious discipline within his family he was bound to act judicially. For he also was a judge —*judex domesticus*, as he is often called, though in all cases of gravity he was required to invoke the advice of his kinsfolk in a family council. On him lay the duty of controlling his family; if he failed to do so he was himself in danger of censorial animadversion.[1]

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[1] On *manus injectio pro judicato* and *pura*, see Gaius, iv. 22–25.

[2] To the literature on p. 548, note 1, add Degenkolb, *Die Lex Hieronica* (Berlin, 1861), pp. 95 seq.; Jhering, *Geist d. röm. Rechts*, vol. i. § 11*c*; Voigt, *XII. Tafeln*, i. 502 seq.; Girard, *Manuel*, pp. 977 seq.; Wlassak, *Processgesetze*, i. 252 seq. For a comparative view, see Maine, *Early Institutions*, pp. 275 seq.; Jenks, *Law and Politics in the Middle Ages*, pp. 263 seq.

[3] For a case not mentioned by Gaius, see Girard, *Textes*, 3rd ed. p. 122; Bruns. *Fontes*, 6th ed. p. 18[illegible].

[4] Cf. Gaius, iv. § 32. This would be according to the spirit of the early system, which endeavoured to check reckless or unfounded litigation by penalities,—*e.g.* forfeiture of the *summa sacramenti* and duplication of the value of unrestored property and profits in the sacramental procedure; duplication of the value of the cause when judgment was against the defendant in an action upon an engagement embodied in a *lex mancipii* or *lex nexi*; duplication against a *vindex* who interfered ineffectually in *manus injectio* against a judgment-debtor; duplication against an heir who refused without judicial compulsitor to pay a legacy bequeathed *per damnationem*; the addition of one-third more by way of penalty where a debtor was found liable in an *actio certae creditae pecuniae* (Gai. iv. 171), &c.

[5] See Voigt, *Röm. Rechtsgeschichte*, i. Beilage i.; *contra*, Wlassak, *Processgesetze*, i. 144 seq.

[6] See Cauvet, *Le droit pontifical chez les anciens Romains* (Caen, 1869); Bouché-Leclerq, *Les pontifes de l'ancienne Rome* (Paris, 1871); Marquardt, *Röm. Staatsverwalt.* iii. 290 seq.

Reciperatio.

Between citizens and foreigners with whom Rome was in alliance by a treaty (temporary or permanent) conferring reciprocal rights of action, the proceedings took the form known as *reciperatio* or *recuperatio.*[2] The action was probably always raised in the *forum contractus.* According to the common opinion the magistrate ordinarily presiding there heard what parties had to say in plaint and defence, and then put into a simple formula the points of fact arising on them, authorizing the recuperators to whom the matter was remitted to find for plaintiff or defendant according to circumstances. The recuperators were generally three, sometimes five, sometimes perhaps still more numerous, but always in odd number; but whether the nationality of both parties required to be represented we are not told. Expedition being in most cases a matter of importance, recuperators were required to give judgment within ten days, and the number of witnesses was usually limited to ten. How execution proceeded upon it, if it were for the plaintiff, does not clearly appear; Voigt, founding on a few words in Festus, concludes it must have been by something like *pignoris capio.* This recuperatory procedure in time came to be resorted to in processes *de libertate* and even in some litigations where both parties were citizens. There are numerous instances of the latter in Cicero; and it is remarkable that in the praetorian actions *ex delicto* the remit was usually not to a *judex* but to recuperators. The explanation may be in the comparative summariness of the remedy.

III. The Jus Gentium and Jus Honorarium

(Latter half of the Republic.)

i. *Influences that operated on the Law.*

Influx of foreigners.

Growth of Commerce and Influx of Foreigners.—While it may be admitted that commerce was beginning to take root in Rome in the 5th century, yet it was not until the 6th that it really became of importance. The campaigns in which Rome was engaged until the end of the First Punic War absorbed all its energies. But after that time the influx of strangers, and their settlement in the city for purposes of trade, became very rapid—not only of Latins and other allies, but Greeks, Carthaginians and Asiatics. To them and the regulation of their affairs the *jus civile*—the law peculiar to Rome and its citizens—was applicable only if they were members of allied states to which *commercium* and *recuperatio* were guaranteed by treaty. But many were not in this favoured position; and even those who were soon found the range of Roman modes of acquiring property and contracting obligations too narrow for their requirements. Hence a *jus gentium* was gradually developed[3] which very early in its history drove treaty covenants for *recuperatio* out of use; its application may for a time have been limited to transactions between non-citizens or between citizens and non-citizens, but it was eventually accepted in the dealings of citizens *inter se* and became part and parcel of the *jus Romanorum.* Gaius and Justinian speak of it as "the common law of mankind," "the law in use among all nations"; but the language must not be taken too literally. The Roman *jus gentium* was not built up by the adoption of one doctrine or institution after another that was found to be generally current elsewhere. In the earliest stages of its recognition it was "an independent international private law, which, as such, regulated intercourse between peregrins or between peregrins and citizens on the basis of their common *libertas*";[4] during the Republic it was purely empirical and free from the influence of scientific theory, but its extensions in the early Empire were a creation of the jurists—a combination of comparative jurisprudence and rational speculation. To say that it was *de facto* in observance everywhere is inaccurate; on the contrary, it was Roman law, built up by Roman jurists, though called into existence through the necessities of intercourse with and among non-Romans.

It may be a little difficult for a modern jurist to say with perfect precision what were the doctrines and institutions of the *jus gentium* as distinguished from the *jus civile.* But the distinction was quite familiar to the Romans, as witness, for example, the statement of Marcian, in reference to the ἀπόλιδες, that they enjoyed all the rights competent to a man under the former, but none of those competent to him under the latter.

The peregrin praetor.

Institution of the Peregrin Praetorship.—The praetorship,[5] as already mentioned, was an outcome of the Licinian laws of the year 367 B.C. (see Praetor). Down to the end of the 5th century of the city the praetor so appointed superintended single-handed the administration of justice, alike between citizens and foreigners. But with the altered condition of things in the beginning of the 6th century, and the influx of strangers which has already been alluded to, the work seems to have been found too onerous for a single magistrate, and a second praetor was created. The date is generally assumed to have been about the year 242 B.C.; Pomponius says distinctly that the creation of the new office was rendered necessary by the increase of the peregrin population of Rome, and that the new magistrate got the name of *praetor peregrinus* because his principal duty was to dispense justice to this foreign element. After the submission of Sicily and Sardinia the number of the praetors was increased to four and after the conquest of Spain to six; Sulla raised the number to eight, and Caesar eventually to sixteen. But all the later creations were for special purposes; the ordinary administration of justice within the city was left with the representatives for the time of the two earliest, who came to be usually distinguished as *praetor qui inter cives jus dicit* (or *urbanus*) and *praetor qui inter cives et peregrinos jus dicit* (or *peregrinus*). It would be going too far to speak of the latter as the principal author of the *jus gentium*; for a large proportion of the actions for enforcing *jus gentium* rights were civil, not honorary—a fact which proves that the rights they were meant to protect and enforce had their origin in the *jus civile*, although moulded to meet new requirements by tacit consuetude and the agency of the jurists. But even in this view the peregrin praetor must have had a powerful influence in giving shape and consistency to the rising jursiprudence, by means of the formulae he adjusted for giving it practical effect.

Reforms of Aebutian law.

Simplification of Procedure and Introduction of New Remedies under the Aebutian Law.—The *lex Aebutia* is only twice mentioned by ancient writers (once by Aulus Gellius and once by Gaius), and we know neither its precise date nor its specific provisions. And yet, to judge by its effects, it must have been one of the most important pieces of legislation in the latter half of the Republic, for Gellius speaks of it as having given the death-blow to many of the institutions of the XII. Tables, and Gaius couples it with two Julian laws of the time of Augustus as the statutory instrument whereby the formular system of procedure was substituted for that *per legis actiones*. Its date was probably about the end of the 6th or beginning of the 7th century of the city. Girard, who has examined the question with great care, places it in the first third of the 7th century,[1] and, though his reasoning is not quite conclusive, it largely refutes the arguments of older writers, who in many cases put the date a century and more earlier. It is the opinion of Wlassak[2] that it was a piece of tentative legislation, and that as regards citizens it in no wise abolished the actions of the law but merely made the formulary procedure alternative to them, according as the praetor, on the representation of the parties, might determine in each case; formulae, in his view, being first made compulsory, subject to a few exceptions, by the Julian laws. This is a probable theory and is now adopted by many recent writers. The main purpose of the statute seems to have been to empower the urban praetors to adapt existing remedies to altered circumstances, and *inter alia* to fashion new actions on the *jus civile* for the use of the peregrins, to whom the *legis actiones* were rarely, if at all, available. But, whatever may have been its actual provisions, the result was the adoption of a procedure which gradually supplanted that by the actions of the law, which was much more pliant than the latter, and whose characteristic was this—that, instead of the issue being declared by word of mouth by the parties, and requiring as a rule to embody with perfect accuracy the statutory provision on which it was based, it was formulated in writing under the direction of the praetor, in the shape of an instruction to the judge to inquire into the merits of the dispute, with power to condemn or acquit according to his finding. A statute was necessary for accomplishing such an innovation, not only because the existing procedure was directly prescribed by statute, but also among other reasons because the *legis actiones* were favourites of the pontifical colleges (being often profitable to them), and any attempt by the magistrates to dispense with them would have been opposed by these powerful bodies. It is now the dominant opinion among modern writers, and it seems based on reasoning which cannot be gainsaid, that even prior to the *lex Aebutia* written formulae were employed in practice, particularly if not exclusively in the peregrin praetor's court, and that one of the objects of the statute was to legalize similar procedure in civil actions.[3] All such formulae granted by the peregrin praetor must of course have been *in factum conceptae*. Unless we hold this view it is difficult to see by what means the rights and obligations of peregrins in their transactions *inter se* or with citizens could have been enforced, as civil actions, save perhaps in exceptional cases where by treaty they enjoyed *jus commercii*, were not open to them. Written instructions to the recuperators or other judges for trying suits in which a peregrin was a party would be a practical necessity, for these judges would have to decide according to *jus gentium*, whose rules would probably be strange to them, and their instructions would therefore have to be precise and definite. Verbal instructions would have led to miscarriages of justice. From this point of view we can see how the peregrin praetor became the primary organ in developing *jus gentium*. But there is some reason for holding that the urban praetor had also, before the Aebutian law, occasionally exercised his imperium by granting actions *in factum*, and in this way perhaps enforced a number of contracts and other obligations in which elements of equity and good faith were present and which the *jus civile* left remediless. Actions of this kind among *cives* would be in the nature of *arbitria* accepted voluntarily by the parties. The latter view certainly explains several apparent anomalies in the later law, for which no other good explanation can be found, as, for instance, the fact that in deposit and commodate actions *in factum* as well as *in jus* might be brought. Also the *actio in factum* for enforcing a contract of *fiducia* can in this way be explained. It also serves to throw light upon the development of some of the *bonae fidei* contracts.[4]

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[1] On *Judex domesticus*, see Greenidge, *Legal Procedure in Cicero's Time*, pp. 376 seq.

[2] See Sell, *Die recuperatio der Römer* (Brunswick, 1837); Huschke (rev. Sell), in Richter's *Krit. Jahrbücher*, i. (1837), 868–911; Voigt, *Jus naturale*, &c., ii. §§ 28-32; Karlowa, *Röm. Civilprocess*, pp. 218-230; Girard, *Organisation judiciaire des romains* (1901), i. 97 seq.

[3] On the Roman *jus gentium*, see Voigt, *Das jus naturale, aequum et bonum, und jus gentium. d. Römer* (4 vols., Leipzig, 1856–1875). Nettleship, in the *Journal of Philology*, (1885), xiii. 169 seq.; Krüger, *Gesch. d. Quellen*, §§ 16, 17; Mommsen, *Staatsrecht*, iii. 604 n.

[4] Voigt, *Jus nat.* ii. 661. He distinguishes the *jus civile*, *jus gentium* and *jus naturale* as the systems which applied respectively to the citizen, the freeman and the man.

[5] See Labatut, *Histoire de la Prêture* (Paris, 1868); Mommsen, *Staatsrecht*, ii. 176 seq.; Karlowa, *Röm. Rechtsgeschichte*, i. 217 seq.; Girard, *Organisation judiciaire*, i. 160 seq., and on the peregrin praetorship in particular, pp. 206 seq.

Effects of provincial administration.

Provincial Conquests.—The growth of commerce and the enormous increase of wealth, which made great capitalists and enabled them through the agency of freedmen and slaves to carry on trade on a scale hitherto unknown, and which thus helped to foster the *jus gentium*, were no doubt due to a large extent to provincial conquests. But these operated also in other directions. The officials who proceeded to the conquered provinces as governors found themselves face to face with laws and institutions in many respects differing from those of Rome. Political considerations dictated how far these were to be respected, how far subverted. In some provinces, more especially the Eastern ~~ones~~, it was thought unnecessary to do more than supplement the existing system by the importation of doctrines of the *jus gentium* and the procedure of the praetor's edicts; while in others, in which it was deemed expedient to destroy as rapidly as possible all national feeling and every national rallying point, a Romanizing of all their institutions was resorted to, even to the extent of introducing some of the formal transactions which previously had been confined to citizens. But in either case there was a reflex action. The native institution had to be studied, its advantages and disadvantages balanced, the means considered of adapting it to the praetorian procedure, and the new ideas so presented as to make them harmonize as far as possible with the old. All this was a training of no small value for those who, on their return to Rome, were to exercise an influence on legislation and the administration of the law. They brought back with them not merely an experience they could not have obtained at home, but sometimes a familiarity with foreign institutions that they were very willing to acclimatize in Italy. Rome thus enriched its law from the provinces, deriving from them its emphyteutic tenure of land, its hypothec, its Rhodian law of general average and a variety of other features that were altogether novel. They were sanctioned by tacit recognition, by edicts of the praetors and in other ways; but, in whatever way received, they were indirectly fruits of provincial conquest.

Influence of literature and philosophy.

Spread of Literature and Philosophy.—The effect on Roman civilization of the addiction of educated men in the later Republic to literature and philosophy is a matter for consideration in connexion with Rome's general history. It is not proposed to consider here the question how far specific doctrines of Roman law bear the impress of the influence of the schools, especially that of the Stoics; it is a subject much too large to be disposed of in a few lines.[5] The matter is mentioned simply for the sake of noting that the spirit of critical inquiry aroused and fostered by literary and philosophical study, seriously and conscientiously undertaken, contributed greatly to promote a new departure in jurisprudence that became very marked in the time of Cicero—the desire to subordinate form to substance, the word spoken to the will it was meant to manifest, the abstract rule to the individual case to which it was proposed to apply it. This was the first effort of what then was called equity to temper and keep within the bounds the rigour of the *jus strictum*. The praetors, the judges and the jurisconsults all had their share in it. Although modern jurists are prone to speak of praetorian equity as if it were a thing apart, yet the same spirit was leavening the law in all directions and in the hands of all who had to deal with it, the difference being that the form and publicity of the edict gave to its applications by the praetors a more prominent and enduring record than was found in the decisions of private *judices* or the opinions of counselling jurisconsults.

Decline of religion and morals.

Decline of Religion and Morals.—It would be equally out of place to enlarge here on the causes and manifestations of that decline in religious sentiment and public and private virtue which was fraught with such disastrous results in the later days of the Republic. The private law was influenced by it to a considerable extent, alike in those branches which regulated the domestic relations and those which dealt with property and contract.

The ever-increasing disregard of the sanctity of the marriage tie is one of those features in the history of the period which strikes even the most unobservant. While from the first the law had denounced causeless separation and visited it with penalties, in principle it maintained the perfect freedom of repudiation on the part of the husband. With the simple and frugal habits of the first five centuries of Rome, and the surveillance of the *consilium domesticum*, the recognition of this principle produced no evil results; family misunderstandings were easily smoothed over, and divorces were of rare occurrence. But during the 6th and 7th centuries of the Republic a change to looser morals took place, and the family council lost much of its control. This was doubtless largely due to the decay of hand marriages, wives consequently remaining outside their husband's *familia* and often holding property of their own. With increasing luxury and licentiousness divorce became common.[1]

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[1] Girard, *Ztsch. d. Sav. Stift.* xiv. 11–54 and xxix. 113 seq.; *Manuel*, 4th ed. p. 993; cf. Mitteis, *Röm. Privatrecht* (1908), p. 52 n.; and Wlassak, *Z. d. Sav. Stift.* xxv. 81 seq. and xxviii. 1 seq.

[2] Wlassak, *Röm. Processgesetze* (1888), i. pp. 62–73, pp. 85 seq. and pp. 103–139.

[3] See Sohm, *Institutionen*, Ledlie's translation (2nd ed.), pp. 69, 80; Wlassak, *Processgesetze*, ii. 304 seq.; Cuq, *Institutions jurid.* (2nd ed.) i. 285–286.

[4] These points are well stated by Mitteis, *Röm. Privatrecht* (1908), pp. 39 seq.; see authorities cited by him in note 2, p. 39. *Contra*, Girard, *Z. d. Sav. Stift.* xxix. 154–158.

[5] It is one that was discussed with much greater fervour a century ago than it is now. Of the later literature may be mentioned—Van Vollenhoven, *De exigua vi quam philosophia Graeca habuit in efformanda jurisprudentia Romana* (Amsterdam, 1834); Ratjen, *Hat die Stoische Phil. bedeutenden Einfluss gehabt, &c.?* (Kiel, 1839); Voigt, *Jus. nat., &c.*, vol. i. §§ 49–51; Laferrière, *De l'influence du Stoïcisme sur la doctrine des jurisconsultes Romains* (Paris, 1860); Hildenbrand, *Gesch. u. System d. Rechts- und Staats-Philosophie* (Leipzig, 1860), vol. i. §§ 141, 142. The earlier literature is given in Hildenbrand, p. 593.

This looseness of the marriage bond, as was naturally to be expected, had its effect on the other family relations. The right of children to take their father's inheritance began to be lightly esteemed. The law—or rather the interpretation put upon the *uti legassit* of the XII. Tables—had empowered him testamentarily to disinherit them, or in instituting them to limit their right to a mere fraction of the inheritance; but it was assumed that this power would be exercised with discretion and only when justified by circumstances. But in the later days of the Republic, amid the slackened ties of domestic life, paternal as well as conjugal duty seems to have often been lost sight of, and children were disinherited or cut off with a nominal share of the inheritance in order that a stranger might be enriched. This led to the recognition by the centumviral court, without apparently any legislative enactment or praetor's edict to warrant it, of what was called the *querela inofficiosi testamenti*—challenge of a testament by a child whose natural claims had been capriciously and causelessly disregarded. While the practice may for a time have been hesitating and uncertain, yet early in the empire, through means of this *querela*, the rule came to be established that every child was entitled, notwithstanding the terms of his father's testament, to at least a fourth (*portio legitima, quarta legitima*)[2] of what would have come to him had his parent died intestate, unless it appeared that the latter had had adequate grounds for excluding him or limiting him to a smaller share. A parent might in like manner challenge an undutiful testament made by his child to his prejudice; and ultimately in certain cases so might brothers and sisters *inter se*.

The decline of morals had an equally marked effect on the transactions of daily life, calling for precautions and remedies that had not been found requisite in the hey-day of the πίστις τῶν Ῥωμαίων. Men no longer relied on each other's good faith unless backed by stipulations, securities (*cautiones*) and guarantees. The Rutilian bankruptcy arrangements and the *actio Pauliana* for setting aside alienations in fraud of creditors indicate a laxity in mercantile dealings that was perhaps an inevitable consequence of the growth of trade and commerce. But, that such remedies as, for example, the *exceptio rei venditae et traditae* or the *exceptio non numeratae pecuniae* should have been found necessary—the one an answer to a vendor (with the price in his pocket) who attempted to dispossess his vendee because some of the formalities of conveyance had been neglected, the other an answer to an action on a bond for repayment of money that by some accident had never been advanced—proves that the law had now to encounter fraud in all directions, and that *Graeca fides* had to a great extent displaced the old Roman probity.

ii. *Factors of the Law.*

Legislation.

Legislation.—It cannot be said that during the period of nearly two centuries and a half embraced within the present epoch the private law owed much to legislation. The vast majority of the enactments of the time referred to by the historians dealt with constitutional questions, municipal and colonial government, agrarian arrangements, fiscal policy, sumptuary prohibitions, criminal and police regulations, and other matters that affected the public law rather than the private. Those of the latter class mentioned by Gaius and Ulpian in their institutional works barely exceed a score in number; and of these not above half a dozen can be said to have exercised a permanent influence on the principles (as distinguished from the details) of the law. Most of them were enactments of the *concilium plebis* or of the *comitia* of the tribes, to which ordinary legislation had passed as more readily convened and more easily worked than the *comitia* of the centuries.

Magistrates' edicts.

Edicts of the Magistrates.[3]—The practice of propounding edicts was very ancient, and had been followed by kings and consuls long before the institution of the praetorship. It was one of the most obvious ways of exercising the *imperium* with which the supreme magistrate was invested—to lay an injunction upon a citizen and enforce his obedience, or to confer upon him some advantage and maintain him in its enjoyment. It was one of the ways in which public order was protected where there had been no invasion of what the law regarded as a right, and where, consequently, there was no remedy by action. That the earlier edicts of the praetors were of this character—issued, that is to say, with reference to particular cases, and what afterwards came to be called *edicta repentina* or *prout res incidit posita*—there is little reason to doubt. In time a new class of edicts appeared which got the name of *edicta perpetua* (or *perpetuae jurisdictionis causa proposita*)—announcements by the praetor, published on his album (as the white boards displayed for the purpose in the forum were called), of the remedy he would be prepared to grant on the application of any one alleging that the state of facts contemplated had arisen. The next year's praetor was free to adopt the edicts of his predecessor or not; but it was usual for him to do so if they had been found beneficial in practice, he adding to them new provisions suggested by demands made upon past praetors for *edicta repentina*, but which they had not generalized, or even proposing for acceptance some remedy entirely of his own devising. As each new praetor entered upon office he announced his jurisdictional programme—his *lex annua*, as it was called from this particular point of view, by far the greater part of it *tralaticium, i.e.* transmitted from his predecessors, and only a few paragraphs, diminishing in number as time progressed, representing his own contribution. And so it went on in the first years of the Empire, until the praetorian function was eclipsed by the imperial; and at last, after having, by instruction of Hadrian, been subjected to revision, and consolidated along with the Aedilian Edicts, by Salvius Julianus, it was, as will be noticed below, sanctioned as binding on the whole Empire. The term "Edict" is applied both to the single edicts and also to the whole body of them together.

There is some reason for supposing that the edict attained considerable proportions in the time of Cicero; for he mentions that, whereas in his youth the XII. Tables had been taught to the boys in school, in his later years these were neglected, and young men directed instead to the praetor's edicts for their first lessons in law. Of a few of them the date and authorship are known with tolerable precision; but of the history of the majority, including some of the most important, such as those introducing *restitutio in integrum* on the ground of lesion through error, absence, minority and the like, and those revolutionizing the law of succession, we are to a great extent in the dark. It was one of the great advantages the edicts had over legislative enactments that they might be dropped, resumed or amended by a new praetor according to his judgment of public requirements. For the edict was *viva vox juris civilis*—intended to aid, supplement and correct it in accordance with the ever-changing estimate of public necessities; and this would have been impossible had its provisions from the first been as stereotyped as they became by the consolidation in the time of Hadrian.

The edict seems to have contained two parts—the first what may be called the edicts proper, and the second styles of actions, &c., whether derived from the *jus civile* or from the *jus praetorium*. The styles or formulae for civil actions were published without any corresponding edict; for praetorian actions styles were published appropriate to their corresponding edicts. There were also independent formulae for interdicts, processual stipulations, &c. The contents of the edicts proper were in detail very various, but all devoted to an exposition of the ways in which the praetor meant to exercise his jurisdiction during his year of office. They were not didactic or dogmatic formulations of law, but rather announcements of what remedy he would grant in such and such circumstances, or direct orders to do or prohibitions against doing certain things. A party claiming an action or whatever else it might be under any of them did so not of right, as he would have done had his claim had a statutory or customary foundation, but of grace—on the strength of the praetor's promise to grant him what he claimed and make the grant effectual. That was why originally such an action had to be raised and concluded within the particular praetor's year of office—a rule which in time, by abuse, was converted into the somewhat different one that a purely praetorian action (*i.e.* not originally of the *jus civile*) had to be raised within a year of the occurrence to which it referred.

As already observed, the praetor's edicts proceeded upon lines of equity; that is to say, they were directed against the strictness and formalism of the jurisprudence of the XII. Tables. Such may be said to have been the general tendency of the edicts as a whole.

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[1] Voigt, *Die Lex Maenia de dote* (Weimar, 1866), attributes to a *lex Maenia* of 168 B.C. the creation of the *judicium de moribus* which superseded the family council as a divorce court by providing a penal action on divorce. The existence, however, of a statute for this purpose has not been proved, and is discredited by most recent writers. See Czylharz, *Das römische Dotalrecht* (Giessen, 1870).

[2] From this the legitim of children recognized by most continental countries nowadays is derived.

[3] See Lenel, *Beiträge zur Kunde des praetorischen Edicts* (Stuttgart, 1878), and the introductory chapters in his *Edictum Perpetuum* (Leipzig, 2nd ed., 1907); Karlowa, *Röm. Rechtsgesch.* vol. i. § 60; Voigt, *Röm. Rechtsgesch.* §§ 19, 20

But it was the tendency of the whole jurisprudence of the time, and by no means peculiar to the praetorian creation. Nowhere in the texts are the praetors spoken of as the mouthpieces of equity as distinguished from law. Such a distinction recurs frequently in Cicero; he identifies *aequitas* with the spirit of a law or agreement, and *jus* with its letter, but it is in order to sing the praises not of the praetors but of the pleaders who maintained the former as against the latter, and of the judges who were persuaded by their arguments. Much of what was contained in the edict might quite as well have been embodied in statute, and we know that in time statute came to its aid; witness a very remarkable provision of it—"I will give *bonorum possessio* as may be enjoined by statute, whether comitial enactment or senatusconsult."

Of the edicts of the peregrin praetor and their relation to that of his urban colleague little is known. That they differed in some respects there can be no doubt, for in the *lex Rubria* (49 B.C.) for settling the government of Cisalpine Gaul the magistrates are directed, with reference to a certain action, to formulate it in the way prescribed in the edict of the peregrin praetor. The latter, therefore, must to some extent have been in advance of that of the urban praetor, probably in this respect, that, being prepared primarily for the regulation of questions affecting non-citizens, it more thoroughly than the other avoided formalities that were competent only to citizens, and thus to a greater extent simplified procedure. The edicts of the provincial governors must have varied according to circumstances, being in all cases composites of provisions, more or less numerous, borrowed from the edicts of the praetors and additions suggested by the peculiar wants of the different provinces for which they were framed (*provinciale genus edicendi*). As for those of the curule aediles, who amongst other duties were charged with the supervision of markets, their range was very limited; their most important provisions having reference to open sales of slaves, horses and cattle, and containing regulations about the duties of vendors exposing them, and their responsibility for latent faults and vices. They also had cognisance of certain delicts committed in the streets and markets. As the aediles had no *imperium* their restricted *jus edicendi* may have been conferred on them by custom or statute.

Consuetudinary law.

Consuetude, Professional Jurisprudence and Res Judicatae.—Great as may be the difficulty experienced by philosophical jurists in defining the ground of the authority of consuetudinary law, there is no room to dispute the importance of its contributions to every system of jurisprudence ancient and modern. The men who first drew, accepted and endorsed a bill of exchange did as much for the law as any lawgiver has ever accomplished. They may or may not have acted on the advice of jurists; but, whether or not, they began a practice which grew into custom, and as such was recognized by the tribunals as a law-creating one—one conferring rights and imposing obligations. There is much of this—far more probably than is commonly imagined—in the history of every system of law.

In Rome the process was sometimes wonderfully expeditious; witness what Justinian narrates of the introduction and recognition of testamentary trusts and of codicils to last wills, both in the time of Augustus. It can hardly be doubted that the literal contract *per expensilationem* originated in the same way, probably in the end of the 5th or the beginning of the 6th century of the city. The keeping of domestic account-books may have been enjoined and enforced by the censors; but it was custom, and neither statute nor praetor's edict, that made an entry in them to another person's debit creative of a claim against the latter for *certa pecunia credita*, that might be made effectual by an action under the Silian law. It must have been in exactly the same way that *mutuum*, formless loan of money, came to be regarded as the third variety of *certa credita pecunia*, and to be held recoverable under the same action. True, this could not have been attained without the co-operation of the *judices*. But then each case was as a rule tried by a single private citizen, whose office ended with his judgment, and who was untrammelled by the authority of any *series rerum judicatarum*.[1] He had simply to decide whether in his view expensilation or formless loan created such an obligation as was covered by the words *pecuniam dari oportere*. There may for a time have been a divergent practice, contradictory findings, as Cicero says there were in his day upon the question whether *aequitas* or *jus strictum* was to be applied to the determination of certain matters; but the eventual unanimity of judicial opinion in one direction was but the expression of the general sentiment of the citizens, of whom the *judices* were the representatives.

These are but examples of the way in which consuetudinary law was constructed. It required the combined action of the laity and the *judices*, both at times acting under professional advice; in some cases even that of the praetors was necessary. It would have been impossible, for instance, to have introduced the consensual contracts into the Roman system and determined what were the obligations they imposed on either side, without magisterial co-operation in framing the formulae that were to be submitted to the judges. Taking the action on sale as an illustration, the formula substantially was this: "It being averred that the defendant sold such or such a thing to the plaintiff, whatever, judge, it shall appear that the defendant ought in good faith to give to or do for the plaintiff in respect thereof, in the money equivalent thereof condemn the defendant; otherwise, acquit him." It is very manifest that the free hand here given to the judge must immensely have facilitated the reception of customary doctrine into the law. The judge was to a great extent the spokesman of the forum; his judgment was formed in accordance with current public opinion, which he had ample opportunity of gauging; it was the reflection of that general sentiment of right, which, phrase it how we may, is the real basis of all customary law. And so in an action for establishing a right of property in a *res nec mancipi*. The formula was very simple: "If it appear that such or such a thing belongs to the plaintiff in quiritary right, then, judge, whatever be its value for the plaintiff, in that condemn the defendant; should it appear otherwise, acquit him." The primary duty of a judge on such a remit was to determine whether the title on which the plaintiff founded his pretensions gave him a right that came up to property; and it can hardly be disputed that it was by the decisions of a series of judges, in a series of such actions, that the long list of natural modes of acquiring property given by Justinian under technical names was gradually brought into view. Those decisions, whether upon the obligations of a vendor, direct or indirect, or upon the sufficiency of a title founded on by a party averring a right of property by natural acquisition, doubtless were in many cases arrived at under professional advice, and were in all cases embodied in judgments. But that does not in the least deprive the doctrine deduced from them of its character of customary law. It was not until the Empire that the opinions of the jurists submitted to a judge (*responsa prudentium*) were invested with binding authority. During the Republic, if a judge deferred to them, it was simply because he regarded them as in consonance with well-qualified public opinion; and what a series of consistent judgments *of this sort* built up was in the strictest sense a law based on consuetude.

Professional jurisprudence.

As regards the professional jurists in particular it has already been observed that, according to the testimony of the Roman historians, the law was a monopoly of the patricians down at least to the middle of the 5th century of the city. Livy goes so far as to speak of it as *in penetralibus pontificum repositum*, —among the secrets of the pontifical college. It was so doubtless during the regal period. But after the publication of the XII. Tables this could be the case only in a qualified sense, the pontiffs becoming the official interpreters of that which in the letter was patent to the world. The *Jus Flavianum*, with its formulary of actions, about the year 304 B.C., the practice of giving advice in law in public adopted by Tib. Coruncanius in the beginning of the 6th century, and the Tripertita (also called *Jus Aelianum*), embodying the current *interpretatio*, some fifty years later, put an end not only to pontifical but to patrician monopoly.[2] From this time onwards there was a series of jurists (*jurisconsulti, jurisperiti, jurisprudentes* or *prudentes*, as they were styled), gradually increasing in number and eminence, of whom a list is given by Pomponius, and many of whom are signalized by Cicero, particularly in his *Orator* and *Brutus*. They occupied themselves in giving advice to clients (see PATRON AND CLIENT), teaching, pleading at the bar, framing styles of contracts, testaments, and various other deeds of a legal character, or writing commentaries or shorter treatises on different branches of the law.[3]

iii. *Substantive Changes in the Law during the Period.*

Publician edict.

The Publician Edict.—There were necessarily many changes during the period in the law of property and of minor real rights, several of them of no mean importance. But the greatest of all was that effected by the Publician Edict,[4] indirectly recognizing the validity (1) of what Theophilus calls bonitary ownership as an actual though inferior ownership of *res mancipi*, and (2) of what got the name of *bonae fidei possessio* as a fictitious ownership of either *res mancipi* or *res nec mancipi*, valid against all the world except the true *dominus*. The accounts we possess of this edict are somewhat inconsistent and even contradictory; the explanation may be that it went through a process of amendment and expansion at the hands of successive praetors, and that eventually it may have had more than one section, without our always being able to say to which of them the criticism of a particular commentator is directed. But there is no doubt of its general tendency—of the defects it was meant to correct and of the way in which the correction was accomplished.

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[1] It was not until the Empire that a "series rerum perpetuo similiter judicatarum," a uniform series of precedents, was held to be law. During the Republic a judge was much freer, and not only entitled but bound to decide according to his own notion of what was right, taking the risk of consequences if his judgment was knowingly contrary to law.

[2] There is some doubt whether the *Jus Aelianum* mentioned by Pomponius (*Dig.* i. 2, 2, 7) was not an independent collection of actions by Sextus Aelius different from his *Tripertita* mentioned (*Dig.* i. 2, 2, 38). See Bremer, *Jurispr. Ante-Hadriana* (1896), i. p. 15.

[3] Sanio, *Zur Geschichte der röm. Rechtswissenschaft* (Königsberg, 1858); Grellet-Dumazeau, *Études sur le barreau romain* (2nd ed., Paris, 1858); Karlawo, *Röm. Rechtsgesch.* i. § 61; Roby, *Introd. to Digest*, chaps. vii. and viii.; Jörs, *Röm. Rechtswissenschaft* (1888), vol. i.; Bremer, *Jurispr. Antehadriana*, vol. i.

[4] See Ribéreau, *Théorie de l'* in bonis habere *ou de la propriété prétorienne* (Paris, 1867); Huschke, *Das Recht der Publicianischen Klage* (Stuttgart, 1874); Schulin (rev. Huschke), in the *Krit. Vierteljahrschrift*, xviii. (1876), 526 seq.; Lenel, *Beiträge zur Kunde d. praetorischen Edicts: I. Das Public. Ed.* (Stuttgart, 1878); Appleton, *Histoire de la propriété prétorienne* (Paris, 1889);

Dominium bonitarium.

One of the defects was this: if a man had taken a transfer of a *res mancipi* from its rightful owner, but simply by tradition instead of by mancipation or cession in court, he did not acquire *dominium ex jure Quiritium*, and the transferrer remained undivested. The result was that the latter was in law entitled to raise a *rei vindicatio* and oust the transferee whose money he might have in his pocket, while if a third party had obtained possession of the thing, but in such a way as not to be amenable to an interdict, the transferee could have no effectual vindication against him, as he was not in a position to prove *dominium ex jure Quiritium*. The first difficulty was overcome by the *exceptio rei venditae et traditae*, also a praetorian remedy, and probably older than the Publician; to the transferrer's vindication on the strength of his unextinguished quiritary right the transferee pleaded sale and delivery as an effectual praetorian defence. But, when a third party was in possession, and the transferee by simple delivery had to take the initiative, the position was more complicated. Such third party might be in perfect good faith; he might even have acquired from the original transferrer and fortified his acquisition with a formal conveyance. But that was no sufficient reason in equity why he should be allowed to defeat the prior right of the original transferee, who, if he had possessed for the requisite period of usucapion before the third party came upon the scene would have cured the defect of the informal delivery and acquired an unassailable quiritary right. So the praetor announced in his edict that, if a man came to him and represented that he had bought a *res mancipi* from its owner, and had had it delivered to him, but had lost possession within the period of usucapion, he (the praetor) would allow him a vindication embodying a fiction of completed usucapion (*infra*), with which he might proceed either against the transferrer or any third party withholding the thing in question.

The publication of such an edict and the formula of the action based upon it (which, though of praetorian origin, was in many respects dealt with as just a variety of the *rei vindicatio*) had almost the same effect as if the legislature had directly enacted that in future delivery of a *res mancipi* in pursuance of a sale or other good cause would confer a right of ownership in it even before usucapion had been completed. Till completed, however, the transferee was not quiritary owner: the thing in question was only *in bonis*, "of his belongings," and the legal title, though an empty one—*nudum jus Quiritium*—remained in the transferrer; it was only with the completion of the usucapion that it became the transferee's *pleno jure*. The inevitable result of the recognition of this tenure *in bonis* was that mancipation came to be regarded in many cases as an unnecessary formality; and the marvel is that it continued to hold its ground at all. The explanation may be that it afforded a substratum for and gave force of law to the *verba nuncupata* that accompanied the *negotium per aes et libram*; and, although many of these might quite well be thrown into the form of stipulations, yet there were others that it may have been thought safer to leave to take effect under the provisions of the earlier law.

Bonae fidei possessio.

The second case that was met by the Publician Edict—whether as originally published or by an amendment of it cannot be determined—was that of the *bona fide* transferee of a thing by purchase or other sufficient title who, having lost possession of it before usucapion, found to his cost that the transferrer had not been its owner, that no ownership therefore had been transmitted to him (the transferee), and that consequently he was not in a position to raise a vindication with its averment of *dominium ex jure Quiritium*.[1] As against the true owner, whose property had been disposed of by a stranger behind his back, there would be no equity in such an action, and the owner was given an effectual *exceptio justi dominii*; but as against all the world except the true owner (and perhaps a person who also was *in causa usucapiendi*), his "better right" was recognized by the praetor, who accorded to him a vindication proceeding on a fiction of completed usucapion, for usucapion would cure the defect of *his* title, just as it did that of the bonitarian owner. In this way the praetors introduced that *bonae fidei possessio* which was worked out with much skill by the jurists of the early Empire, and which assumed very large proportions in the Justinianian law when the term of prescription had been greatly extended, and the difficulty of proving property (as distinguished from *bona fide* possession) consequently very much increased. The Publician action was also in time made applicable in modified form to servitudes and other real rights as much as to property.

Changes in law of contract.

Development of the Law of Contract.[2]—It is impossible within the limits of an article such as this to indicate a tithe of the amendments that were effected on the law of obligations during the period whose distinguishing features were the rise of a *jus gentium* and the construction of the praetor's edict. In every branch of it there was an advance not by steps but by strides—in that of obligations arising from contract, of those arising from delict, and of those arising from facts and circumstances, such as unjustifiable enrichment at another person's cost.[3] The law of suretyship, in its three forms of *sponsio*, *fidepromissio*, and *fidejussio*, received considerable attention, and formed the subject of a series of legislative enactments for limiting a surety's liability; while that of agency, which was sparingly admitted in Rome, had a valuable contribution from the praetorian edict in the recognition of a man's liability, more or less qualified, for the contractual debts of his *filiifamilias* and slaves, as also, and without qualification, for the debts properly contracted of persons, whether domestically subject to him or not, who were managing a business on his account, or whom he had placed in charge of a ship belonging to him. The development of the law in the matter of obligations generally was greatly facilitated by the praetorian simplification of procedure and the introduction of new forms of actions—the instruction to a judge, "Whatever in respect thereof the defendant ought to give to or do for the plaintiff, in that condemn him," preceded by a statement of the cause of action, giving wide scope for the recognition of new sources of liability.

Stipulation.

The origin of the verbal contract of stipulation and its actionability under the Silian and Calpurnian laws have already been explained. It was theoretically a formal contract, *i.e.* creative of obligation on the strength of the formal question and answer interchanged by the parties, even though no substantial ground of debt might underlie it; but in time it became the practice to introduce words—the single word *recte* was enough—excluding liability in case of malpractice (*clausula doli*); and finally even that became unnecessary when the praetors had introduced the general *exceptio doli*, pleadable as an equitable defence to any personal action. And it was essentially productive only of unilateral obligation, *i.e.* the respondent in the interrogatory alone incurred liability; if mutual obligations were intended it was necessary that each should promise for his own part, with the result that two contracts were executed which were perfectly independent. Originally the only words that could be employed were *spondes?* on the one side, *spondeo* on the other; and in this form the contract was *juris civilis* and competent only to citizens (and non-citizens enjoying *commercium*?). In time the words *promittis? promitto*, came to be used alternatively. They were, eventually at least, competent to peregrins as well as to citizens, although that may not have been until the stipulation had become of daily use amongst the former in the still simpler phraseology *dabis? dabo*, *facies? faciam*. Originally competent only for the creation of an obligation to pay a definite sum of money, and afterwards one for delivery of a specific thing other than money, the contract came in time, by the simplification of the words of interrogatory and response and especially by the substitution of the conditions of the formular system for the *legis actiones* of the Silian and Calpurnian laws, and the introduction of the *actio ex stipulatu* to meet cases of indefinite promise—to be adaptable to any sort of unilateral engagement, whether initiated by it or only confirmed. It was of immense service too outside the ordinary range of contract in what were called necessary (in contradistinction to voluntary) stipulations, of which a variety of illustrations are given *infra*, p. 569. In all directions advantage was taken of it to bind a man by formal contract either to do or to refrain from doing what in many cases he might already be bound *ipso jure* to do or to abstain from doing, and that because of the simplicity of the remedy—an action on

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Lenel, *Palingenesia*, ii. pp. 511 seq.; Girard, *Manuel*, 4th ed. pp. 348 seq.; Lenel *Edict. Perpet.* 2nd ed. 164, and references in n. 10 there.

[1] This case is the only one alluded to by Justinian (*Inst.* iv. 6, 4). He had abolished the distinction between quiritarian and bonitarian property, which had, he says, become in practice a mockery (Cod. vii. 25), and so it was unnecessary for him to mention the other. Lenel, in the second edition of his *Edictum Perpetuum*, i. p. 164, gives strong reasons for holding that there was from the beginning only one edict and one formula which was applied alike to bonitary ownership and *bona fide* possession. Cf. Appleton, *l.c.* i. p. 49. For the different theories, see Girard, *Textes*, 3rd ed. pp. 137–38. What was the nature of the so-called *actio Publiciana recissoria* in which completed usucapion was feigned not to have taken place, seems doubtful. *Inst.* iv. 6, §§ 3, 5. See Cuq. *Inst. Jurid.* vol. ii. 2nd ed. p. 722 n.; Lenel, *Edict. Perpet.* pp. 117–19.

[2] See Bekker, *Aktionen*, i. c. 5–8, and App. D, E, F and vol. ii. c. 15, 16; Voigt, *Jus naturale*, &c., vol. iii. §§ 106–24, and vol. iv. App. xix., xxi.

[3] Such obligations—usually imposing the duty of restitution of unjustifiable gains—filled a considerable space in the practice and doctrine of the period, and early gave rise to a variety of brocards, *e.g.* "Nemo cum alterius damno lucrari debet," "Nemo damnum sentire debet per lucrum alterius," &c.

his stipulation—that would lie against him in the event of his failure.

Literal contract.

A second form of contract that came into use to a considerable extent in the latter half of the Republic is what is commonly called the literal contract, or, as Gaius phrases it with greater accuracy, the *nomen transscripticium*.[1] Notwithstanding the prolific literature of which it has been the subject, it must be admitted that in many points our knowledge of it is incomplete and uncertain. The prevalent opinion, formed before the discovery of the Verona MS. had made known Gaius's description of it, and almost universally adhered to ever since, is that such contracts were created by entries in the account-books which the censors insisted that all citizens of any means should keep with scrupulous regularity. They are often alluded to by the lay writers; but the text principally relied on is what remains of Cicero's speech for the player Roscius. From the tenor of the argument in that case, and incidental remarks elsewhere, the conclusion has been formed that a citizen who made an entry in his *codex*—whether of the nature of a cash-book or a ledger is much disputed—to the debit of another, thereby made the latter his debtor for a sum recoverable by an *actio certae creditae pecuniae*. Gaius in his description of the contract does not mention the *codices*; but his account is not inconsistent with the notion that the entries (*nomina*) of which he speaks were made in them. He says that those entries were of two sorts, *nomina arcaria* and *nomina transscripticia*. The former were entries of cash advances; and of them he observes that they did not create obligation, but only served as evidence of one already created by payment to and receipt of the money by the borrower. These entries were posted periodically (usually each month) from a day-book (*adversaria*), and there were distinct pages in the codex for what was thus paid out of the *arca* (*expensum*) and what was paid in. Of the *nomina transscripticia* Gaius says that there were two varieties, the entry transcribed from thing to person and that transcribed from one person to another, and that both of them were not probative merely but creative of obligation. The first was effected by a creditor (A) entering to the credit of his debtor (B) the liquidated amount of what the latter was already owing as the price of something purchased, the rent of a house leased, the value of work done, or the like, and then on the opposite page of the codex debiting him with same sum as *expensum*. The second was effected by A transcribing B's debt in a similar way to the debit of a third party (C), hitherto a debtor of B's, and who consented to the transaction—A at the same time crediting B with the sum thus booked against C, and B in his books both crediting C with it (*acceptilatio*) and marking it as paid to A (*expensilatio*). These *nomina transscripticia* were purely fictitious entries so far as any passing of money was concerned, though they had to be made by the direction (*jussus*) of the person made chargeable as debtor. Corresponding entries in the debtor's own codex, though usual, do not seem to have been necessary.

All this at first sight seems just a series of book-keeping operations. But it was much more than that for the Roman citizens who first had recourse to it. There was a time, as formerly stated, when sale, and lease and the like, so long as they stood on their own merits, created no obligation enforceable at law, however much it might be binding as a duty to Fides or (as moderns would say) in the forum of conscience; to found an action at law it required to be clothed in some form approved by the *jus civile*. The *nexum* may possibly have been one of those forms, the vendee or tenant being fictitiously dealt with as borrower of the price or rent due under his purchase or lease; the stipulation was another, the obligation to pay the price or rent being made legally binding by its embodiment in formal question and answer. But stipulation was competent only between persons who were face to face, whereas expensilation was competent also as between persons at a distance from each other. This of itself gave expensilation—which, originally at least, was as much a *negotium juris civilis* as the *sponsio*—one advantage over stipulation. But it had also a further advantage, which was not affected by the subsequent recognition of the real and consensual contracts as productive of legal obligation on their own merits: it enabled subsequent transcription of debts from one person to another to be effected. This last must have been of infinite convenience in commerce, not only by enabling traders to dispense with a reserve of coin, but by obviating the risks attending the transit of money over long distances. It was this that led, as Theophilus says was the case, to the conversion even of stipulatory obligations into book-debts; it was not that thereby the creditor obtained a tighter hold over his debtor, but that an obligation was obtained from him which in a sense was negotiable and therefore more valuable. But in other respects it was much more restricted than stipulation. Thus it only applied to money debts; it did not admit of conditions (though it did admit of a term); and it was never available to peregrins, though the Sabinians proposed that transcription *a re in personam* should be binding on them.

Consensual contracts.

The evolution of the four purely consensual contracts—sale, location, partnership and mandate—supplies matter for one of the most interesting chapters in the whole history of the law. But, as it is impossible in such an article as this to attempt to mark the successive stages in the progress of all of them, we shall confine ourselves to sale. The others did not and could not follow identically the same course: location ran most nearly parallel with sale; but partnership and mandate, from their nature, not only started at a different point from the other two, but reached the same goal with them—that of becoming productive of obligation simply on the strength of consent interchanged by the parties—by paths that were sometimes far apart. Nevertheless, a sketch of the history of the origin of the contract of sale may be sufficient to indicate generally some of the milestones that were successively passed by all four.[2]

Contracts of sale.

Going back as far as history carries us, we meet with it under the names of *emptio* and *venditio*, but meaning no more than barter; for *emere* originally signified simply "to take" or "acquire" (*accipere*). Sheep and cattle (*pecus*, hence *pecunia*) may for a time have been a very usual article of exchange on one side, and then came raw metal weighed in the scales. But it was still exchange, instant delivery of goods on one side against simultaneous delivery of so many pounds weight of copper on the other. With the reforms of Servius Tullius, as we have seen, came the distinction between *res mancipi* and *res nec mancipi*, and with it a regulated mancipation of the former. It was still barter; but along with it arose an obligation on the part of the transferrer of the *res mancipi* to warrant the transferee against eviction—a warranty that was implied in the mancipation. Whether this rule obtained from the first or was the growth of custom it is impossible to say; but it is probable that it was the XII. Tables which fixed that the measure of the transferrer's liability to the transferee in the event of eviction should be double the amount of the price. Equally impossible is it to say when the practice arose of embodying declarations, assurances and so forth in the mancipation (*leges mancipii*), which were held binding on the strength of the *negotium juris civilis* in which they were clothed. They received statutory sanction in the Tables, in the words already referred to more than once—"cum nexum faciet mancipiumque, uti lingua nuncupassit, ita jus esto," which means in effect "whatever shall by word of mouth be declared by the parties in the course of a transaction *per aes et libram* in definition of its terms shall be law as between them."

The substitution, by or soon after the decemvirs, of coined money, that was to be counted, for rough metal that had been weighed, converted the object of transfer on one side into price (*pretium*), as distinguished from article of purchase (*merx*) on the other; and sale thus became distinct from barter. In contemplation of the separation of the mancipation and the price-paying, and the transition of the former into a merely imaginary sale, the decemvirs enacted that, mancipation notwithstanding, the property of what was sold should not pass to the purchaser until the price had been paid or security by sureties (*vades*) given for it to the vendor; and it was probably by the interpretation of the pontiffs that to this was added the rule—that until the price was paid no liability for eviction should attach to the transferrer (or *auctor*). The reason perhaps of the provision on this point in the XII. Tables was that a vendor who had mancipated or delivered a thing sold by him before receiving the price had no action to enforce payment of the latter; and in such circumstances it was thought but right to give him the opportunity of getting back the thing itself by a real action. It might be, however, that the price had been paid, and yet the vendor refused to mancipate. It was long, apparently, before the purchaser could in such a case compel him to do so. After the introduction of the *legis actio per condictionem* he (the purchaser) had undoubtedly the power to recover the money on the ground of the vendor's unjustifiable enrichment—that the latter had got it for a consideration which had failed (*causa data, causa non secuta*); and it is possible that before that he had a similar remedy *per judicis postulationem* or by an action *in factum*.

Down to this point, therefore, say the beginning of the 6th century, there were several obligations consequent on sale of a *res mancipi*; but not one of them arose directly out of the sale itself, or could be enforced simply on the ground that it had taken place. The vendor was bound to support the purchaser in any action by a third party disputing his right, and to repay him the price twofold in the event of that third party's success; and he was bound, moreover, to make good to him any loss he had sustained through a deficiency of acreage he had guaranteed, non-existence of servitudes he had declared the lands enjoyed, existence of others from which he had stated they were free,[1] incapability of a slave for labour for which he was vouched fit, and so on. But breaches of these obligations were probably all regarded as of a delictual character; the obligations were binding, not in virtue of the sale *per se*, but of the transaction *per aes et libram* superinduced upon it; and, if the vendor had at any time to return the price on failure to mancipate what he had sold, it was not because he had committed a breach of contract, but because he had unjustly enriched himself at the purchaser's expense.

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[1] Literature: Savigny, "Über den Literalcontract der Römer" (originally 1816, with additions in 1849), in his *Verm. Schriften*, i. 205 seq.; Keller, in Sell's *Jahrb. f. hist. u. dogm. Bearbeit. des röm. Rechts*, i. (1841), 93 seq.; Gneist, *Die formellen Verträge d. röm. Rechts* (Berlin, 1845), 321 seq.; Danz. *Gesch. d. röm. Rechts*, ii. 42 seq. (where there is a résumé of the principal of the older theories); Buonamici, in the *Archivio Giuridico*, xvi. (1876), 3 seq.; Gide, *Études sur la novation* (Paris, 1879), 185, seq.; Voigt, "Über die Bankiers," &c., in *Abhandl. d. K. S. Gesellschaft d. Wissenschaften* (1887), x. 515 seq., and adverse review of this work by Niemeyer in *Z. d. Sav. Stift.* (1890), xi. 312 seq.; Karlowa, *Röm. R. G.* ii. 746–57; Mitteis, *Z. d. Sav. Stift.* xix. 230 seq.

[2] The literature on the history of the contract of sale is profuse, but mostly scattered in periodicals and much of it fragmentary. It may be enough to refer to Bechmann, *Der Kauf nach Gemeinem Recht* (3 vols., 1876, 1884 and 1905); Karlowa, *Röm. R. G.* ii. pp. 611–32; Girard, *Nouv. Rev. historique* (1883), pp. 539 seq., and in his *Manuel*, 4th ed. pp. 533 seq.

In sales of *res nec mancipi*, just as in those of *res mancipi*, a vendor who had been incautious enough to deliver his wares before he had been paid, or had got stipulatory security for the price, or had converted it into a book-debt, might recover them by a real action if payment was unduly delayed; while the purchaser who had paid in advance but failed to get delivery might also get back his money from the vendor on the plea of unwarrantable enrichment. But, as mancipation was, as is generally supposed, incompetent for carrying the property, some other machinery had to be resorted to than that of the copper and the scales for imposing upon the vendor an obligation of warranty against eviction, defects and so forth. What it was is a question much controverted among modern writers. It may be that, until trade began to assume considerable proportions, and when a transaction was between citizens, a purchaser was content to rely partly on the honesty of his vendor, partly on the latter's knowledge that he ran the risk of an action for theft if what he sold belonged to another,[2] and partly on the maxim common in all ages and climes, *caveat emptor*. When it was one between a citizen and a peregrin, a different set of rules of course came into operation; for between them disputes were settled by actions *in factum* before recuperators, whose decisions were arrived at very much on considerations of natural equity. On the whole, while admitting it to be quite maintainable that the urban praetors, under the influence of *jus gentium*, granted *arbitria* for enforcing obligations of parties in sales *inter cives* even a good while prior to the *lex Aebutia*, the balance of evidence, we think, is in favour of the view that it was the popularization of the stipulation that facilitated the development of sale into a *bonae fidei* contract.

Confirmatory stipulations.

We read of a *satisdatio secundum mancipium*, a *stipulatio habere licere* and a *stipulatio duplae*. The nature of the first is obscure; it seems to have been connected with mancipatory sales, and probably to have been the guarantee of a *sponsor* for the liabilities imposed upon the vendor by the transaction *per aes et libram* and the *verba nuncupata* that were covered by it.[3] The stipulation *habere licere* occurs in Varro, in a collection of styles of sales of sheep, cattle, &c., some of which he says were abridgments of those of M. Manilius, who was consul in the year 149 B.C. It was the guarantee of the vendor of a *res nec mancipi*, or even occasionally of a *res mancipi* sold without mancipation, that the purchaser should be maintained in possession of what he had bought; it entitled him to reparation on eviction, measured not by any fixed standard but according to the loss he had sustained. It cannot have been introduced, therefore, until after the *Lex Aebutia* and the formulation by the praetor of the *actio ex stipulatu*. The *stipulatio duplae* was one binding the vendor for double the price in case of eviction, and was entered into not only where no mancipation of a *res mancipi* took place or one which might be challengeable for invalidity, but also where valuable *res nec mancipi* were sold.

The idea of the *stipulatio duplae* may have been borrowed from the *duplum* incurred by a vendor on the eviction of a purchaser acquiring a thing by mancipation; for one of its earliest manifestations was in the edict of the curule aediles, who insisted on it from persons selling slaves, probably because the dealers were for the most part foreigners, and therefore unable to complete their sales *per aes et libram*. Judging from Varro, it was a form of stipulation against eviction that in his time was used only in sales of slaves, although he adds that by agreement of parties it might be limited to a *simplum*.

There were also stipulations against vices in the object sold. We learn from Varro—what is also indicated in various passages of Plautus—that the vendor at the same time and in the body of the same *stipulatio duplae* guaranteed that the sheep or cattle he was selling were healthy and of a healthy stock and free from faults, and that the latter had not done any mischief for which their owner could be held liable in a noxal action; and similarly that a slave sold was healthy and not chargeable for any theft or other offence for which the purchaser might have to answer. If any of these guarantees turned out fallacious, the purchaser had an *actio ex stipulatu* against the vendor: "Whereas the plaintiff got from the defendant a stipulation that certain sheep he bought from him were healthy, &c. [repeating the words of guarantee], and that he, the plaintiff, should be free to hold them (*habere licere*), whatever it shall appear that the defendant ought in respect thereof to give to or do for the plaintiff, in the value thereof, judge, condemn him; otherwise, acquit him." It is an observation of Bekker's[4] that the *actio empti* in its original shape was just a simplification of the *actio ex stipulatu* on a vendor's guarantees; the stipulations to which we have been alluding had become such unfailing accompaniments of a sale as to be matters of legal presumption, the result being that the words "whereas this plaintiff *bought* from the defendant the sheep about which the action has arisen" were substituted in the *demonstratio* (as the introductory clause of the formula was called) for the detailed recital of what had been stipulated. Bekker justifies this by reference to the language of Varro, who seems to include under the words *emptio, venditio* not merely the agreement to buy and sell but also the stipulations that usually went with it.

Origin of *actio empti*.

The introduction of an *actio empti* in this shape, however, was far from the recognition of sale as a purely consensual contract. If the price was not paid at once, the purchaser gave his stipulatory promise for it, or got some one on whom the vendor placed more reliance to do so for him, or else the vendor made a book-debt of it; and, if it had to be sued for, it was in all these cases by a *condictio certae pecuniae* and not by an action on the sale. If the price was paid but the thing purchased not delivered, the only remedy open to the purchaser was to get back his money by the same condiction, unless, indeed, the guarantee *habere licere* was held to cover delivery, in which case the purchaser might obtain damages in an *actio ex stipulatu* under the name of *actio empti*. But this *actio empti*, whether raised on the ground of non-delivery, eviction or breach of some other warranty, was really an action on the verbal contracts that had accompanied the sale—a *strictum jus* action in which the judge could not travel beyond the letter of the engagements of the purchaser. In the latter years of the Republic, and probably a little before the time of Q. Mucius Scaevola, it was a *bonae fidei* action. How had the change come about? A single case of hardship may have been sufficient to induce it, such as the defeat of a claim for damages for eviction on the ground that the stipulatory guarantee had been accidentally overlooked. Ulpian says: "As the *stipulatio duplae* is a thing of universal observance, action on the ground of eviction will lie *ex empto* if perchance the vendor of a slave have failed to give his stipulatory guarantee, for everything that is of general custom and practice ought to be in view of the judge in a *bonae fidei judicium*."[5]

Very little was required to convert the *stricti juris actio empti*, really nothing more than an *actio ex stipulatu*, into a *bonae fidei* one—simply the addition by the praetor of the words "on considerations of good faith" (*ex fide bona*) to the "whatever the defendant ought to give to or do for the plaintiff." The effect, however, was immeasurable—not that it did away with the practice of stipulatory guarantees, for Varro wrote after the time of Q. Mucius (who speaks of the action on sale as a *bonae fidei* one), and references to them are abundant in the pages of the classical jurists; but it rendered them in law unnecessary. It made sale a purely consensual contract in which, in virtue of the simple agreement to buy and sell, all the obligations on either side that usually attended it were held embodied without express formulation or (still less) stipulatory or literal engagement. And, in instructing the judges to decide in every case between buyer and seller suing *ex empto* or *ex vendito* on principles of good faith, it really empowered them to go far beyond "general custom and practice," and to take cognisance of everything that in fairness and equity and common sense ought to influence their judgment, so as to enable them freely to do justice between the parties in any and every question that might directly or indirectly arise out of their relation as seller and buyer.[6]

Real contracts.

The history of the four nominate real contracts—*mutuum* (*i.e.* loan of money or other things returnable generically), commodate (*i.e.* loan of things that had to be returned specifically), deposit and pledge—is even more obscure than that of the consensual ones.[7] Down to the time of the Poetilian law loan of money, corn, &c., was usually contracted *per aes et libram*; and it is probable that on the subsequent disuse of the *nexum* the obligation on a borrower to repay the money or corn advanced to him was made actionable, under the Silian and Calpurnian laws respectively, by a stipulation contemporaneous with the loan. With the rise of *jus gentium* loan became actionable on its own merits—that is to say, the advance and receipt of money as a loan of itself laid the borrower under a *stricti juris* obligation to repay it, even though no stipulatory engagement had intervened; the *res*—in this case the giving and receiving *mutui causa*—completed the contract. The obligation that arose from it was purely unilateral, and enforceable, where the loan was of money, by the same action—*certae pecuniae creditae*—as stipulation and literal contract; and so strictly was it construed that interest on the loan was not claimable along with it, the *res* given and received being the full measure of the obligation of repayment. The other three—commodate, deposit and pledge—became independent real contracts much later than *mutuum*, possibly not all at the same time, and none of them apparently until very late in the Republic. All of them, of course, had been long known as transactions of daily life; the difficulty is to say when they first became actionable in the urban praetor's court (for in transactions with peregrins actions *in factum* would doubtless be granted), and under what guise.

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[1] Cicero says (*De Off.* iii. 16, § 65) that, though by the XII. Tables it was enough if a vendor *per aes et libram* made good his positive assurances (*uti lingua nuncupassit, ita jus esto*), the jurists held him responsible for reticence about burdens or defects he ought to have revealed, and liable for a *poena dupli* exactly as if he had guaranteed their non-existence.

[2] "In rebus mobilibus . . . qui alienam rem vendidit et tradidit furtum committit" (Gai. ii. 50).

[3] See Lenel, *Edict. Perpet.* 2nd ed. p. 521.

[4] Bekker, *Aktionen* (1871), i. 156 seq. and 314 seq.

[5] Ulp., "Lib. I. ad ed. aedil.," in *Dig.* xxi. 1, fr. 31, § 20.

[6] The above view is supported in the main by Girard, *Manuel*, 524 seq. For other views see Pernice, *Labeo*, i. 456 seq.; Cuq, *Inst. Jurid.* 2nd ed. vol. i. pp. 226 sqq.

[7] Demelius, in the *Zeitschr. f. Rechtsgesch.* (1863), ii. 217 seq.; Bekker, *Aktionen*, i. 306 seq.; Ubbelohde, *Zur Gesch. d. benannten Realcontracte* (Marburg, 1870); Huschke, *Lehre vom Darlehn* (Leipzig, 1882); Girard, *Manuel*, 4th ed. pp. 505 sqq.

It is impossible within the space at our command to criticize the various theories entertained of their vicissitudes, for they necessarily vary to some extent in regard to each. We must content ourselves, therefore, with the simple statement that eventually, and within the period with which we are now dealing, they came to be recognized as independent real contracts, the *res* by which they were completed being the delivery of a thing by one person to another for a particular purpose, on the understanding that it was to be returned when that purpose was served. And it is to be noted that, while *mutuum* transferred the property of the money lent, the borrower being bound to return not the identical coins but only an equal amount, in pledge it was only the possession that passes, while in commodate and deposit the lender or depositor retained both property and (legal) possession, the borrower or depositary having nothing more than the natural detention. In all but *mutuum*, therefore, there was trust; the holder was bound, to an extent varying according to circumstances, to care for what he held as if it were his own, and entitled to be reimbursed for outlay on its maintenance—bound to return it, yet excused if his failure to do so was due to a cause for which in fairness he could not be held responsible. Consequently the actions on these three contracts, differing from that on *mutuum*, were all *bonae fidei*, the judge being vested with full discretion to determine what was fair and equitable in each individual case.

Praetorian bonorum possessio.

Praetorian Amendments on the Law of Succession.—The most important change in the law of succession during the latter half of the Republic was due to the praetors. They introduced, under the technical name of *bonorum possessio*,[1] what was really beneficial enjoyment of the estate of a deceased person without the legal title of inheritance. There is much to lead to the conclusion that the series of provisions in regard to it which we find in the Julian consolidation of the Edict were the work of a succession of praetors, some of them probably not under the Republic but under the Empire; but it will be convenient to give here a general view of the subject as a whole, disregarding the consideration that some of its features may not have been given to it within the period now under notice.

Testamentary.

Justinian, speaking of the origin of *bonorum possessio*, observes that in promising it to a petitioner the praetors were not always actuated by the same motives; in some cases their object was to facilitate the application of the rules of the *jus civile*, in some to amend their application according to what they believed to be the spirit of the XII. Tables, in others, again, to set them aside as inequitable.[2] It is not unreasonable to assume that it was with the purpose of aiding the *jus civile* that the first step was taken in what gradually became a momentous reform; and it is probable that this first step was the announcement by some praetor that, where there was dispute as to an inheritance, and a testament was presented to him bearing not fewer seals than were required by law, he would give possession of the goods of the defunct to the heir named in it.[3] In this as it stands there is nothing but a regulation of possession of the *bona* of the inheritance pending the question of legal right. Just as between two parties contending about the ownership of a specific thing in a *rei vindicatio* the praetor first settled the question of interim possession, so did he promise to do here when a question was about to be tried about the right to an inheritance (*si de hereditate ambigitur*). It was a provisional arrangement merely, and very necessary in view of the state of the law which permitted a third party, apart from any pretence of title, to step in and complete a *usucapio pro herede* by a year's possession of the effects of the inheritance. Even at the time when the Edict was closed it was not necessarily more than a provisional grant; for, if heirs-at-law of the deceased appeared and proved that, although the testament bore on the outside the requisite number of seals, yet in fact some solemnity of execution, such as the *familiae venditio* or *testamenti nuncupatio*, had been omitted, the grantee had to yield them up the possession that had been given him pending inquiry. It was only by a rescript of Antoninus Pius that it was declared that a plea by the heir-at-law of invalidity of a testament on the ground of defect of formalities of execution might be defeated by an *exceptio doli*, on the principle that it was contrary to good faith to set aside the wishes of a testator on a technical objection that was purely formal. Thus was the *bonorum possessio secundum tabulas*, *i.e.* in accordance with a testament, from being originally one in aid of the *jus civile*, in course of time converted into one in contradiction of it. That the motives and purposes of the series of praetors who built up the law of *bonorum possessio* must have varied in progress of years is obvious; and, once the machinery had been invented, nothing was easier than to apply it to new ideas. The praetor could not make a man heir—that he always disclaimed; but he could give a man, whether heir or not, the substantial advantages of inheritance, and protect him in their enjoyment by praetorian remedies. He gave him possession of the goods of the deceased, with summary remedies for ingathering them, which, once in his hands, would become his in quiritarian right on the expiry of the period of usucaption; and subsequently, by interpolation into the formula of a fiction of heirship, he gave him effectual personal actions against debtors of the deceased, rendering him liable in the same way to the deceased's creditors.

Contra-tabular.

Another variety of the *bonorum possessio* was that *contra tabulas*—in opposition to the terms of a testament. If a testator had neither instituted nor expressly disinherited a son who was one of his *sui heredes*, then his testament was a nullity, and the child passed over had no need of a praetorian remedy. Where *sui heredes* other than sons were passed over the *jus civile* upheld the will but allowed them to participate with the instituted heirs by a sort of accrual. But the Edict went further; for, if the institute was a stranger, *i.e.* was not a person in the *potestas* of the testator with the child passed over, then, on the petition of the latter, the praetor gave him and any other *sui* concurring with him possession of the whole estate of the deceased as on intestacy, the institute being left with nothing more than the empty name of heir. Another application of the *bonorum possessio contra tabulas* was to the case of emancipated children of the testator. By the *jus civile* he was not required to institute or disinherit them; for by their emancipation they had ceased to be *sui heredes*, and had lost that interest in the family estate which was the reason why they had to be mentioned in the testament of their *paterfamilias*. The praetors—although probably not until the empire, and when the doctrines of the *jus naturale* were being more freely recognized—put them on the same footing as unemancipated children, requiring that they also should be either instituted or disinherited, and giving them *bonorum possessio* if they were not. It was *contra tabulas* in the sense that it displaced the instituted heirs either wholly or partially—wholly when the institutes were not children of the deceased, partially when they were. In the latter case, at least when *sui* were affected by it, the grant of *bonorum possessio* was under the equitable condition that the grantees should collate or bring into partition all their own acquisitions since their emancipation.

Ab intestato.

The third variety of *bonorum possessio* was that granted *ab intestato*. The rules of the *jus civile* in reference to succession on intestacy were, as we have seen, extremely strict and artificial. They admitted neither emancipated children nor agnates who had undergone *capitis deminutio*; they admitted no female agnate more remote than a sister; if the nearest agnate or agnates declined, the right did not pass to those of the next degree; mere cognates, kinsmen of the deceased who were not agnates, *e.g.* grandchildren or others related to him through females and agnates *capite minuti*, were not admitted at all; while a wife had no share unless she had been *in manu* of the deceased and therefore *filiae loco*. All these rules the praetors amended, and so far paved the way for the revolution in the law of intestate succession which was accomplished by Justinian.

They established four orders or classes of heirs. (1) Displacing the *sui heredes* of the *jus civile*, they gave the first place to descendants (*liberi*), including in the term all those whom the deceased would have been bound either by the *jus civile* or the Edict to institute or disinherit had he made a will, *i.e.* his wife *in manu*, sons and daughters of his body whether *in potestate* at his death or emancipated, the representatives of sons who had predeceased him, and adopted children in his *potestas* when he died. (2) On failure of *liberi* the right to petition for *bonorum possessio* opened to the nearest collateral agnates of the intestate, under their old name of *legitimi heredes*. (3) Under the *jus civile*, on failure of agnates (and of the *gens* where there was one), the succession was vacant and fell to the fisc, unless perchance it was usucapted by a stranger possessing *pro herede*. The frequency of such vacancies was much diminished by the recognition by the praetors of the right of cognates to claim *bonorum possessio* in the third place. Who they had primarily in view under the name of "cognates" it is impossible to say. The epithet is most frequently applied by modern writers to kinsmen related through females; but in its widest sense it included all kinsmen without exception, and in a more limited sense all kinsmen not entitled to claim as agnates. There were included amongst them therefore—although it is very probable that the list was not made up at once, but from time to time by the action of a series of praetors—not merely kinsmen related through females (who were not agnates), but also agnates of a remoter degree who were excluded as such because the nearest agnates in existence had declined, persons who had been agnates but by reason of *capitis minutio* had lost that character, female agnates more distantly related than sisters, and children of the intestate who at the time of his death were in an adoptive family. All these took according to proximity, but not beyond the sixth degree and the children of a second cousin in the seventh. (4) Finally, the claim passed to the survivor of husband and wife, assuming always that their marriage had not involved *manus*. This list constituted the praetorian order of succession on intestacy among freeborn citizens. The praetorian order of succession to freedmen and *emancipati* was necessarily different, the patron or quasi-patron taking the place of agnates; but it is too detailed and complex to be gone into here.

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[1] For a *résumé* of the principal theories (down to 1870) about the origin of *bonorum possessio*, see Danz, *Geschichte d. röm. Rechts*, vol. ii. § 176. Of the later literature it is enough to mention Leist, in the first 4 vols. of his continuation of Glück's *Pandecten-Commentar* (Erlangen, 1870–1879); Sohm, in his *Inst. d. r. R.* (Eng. trans., 2nd ed.), pp. 580 seq.; A. Schmidt, in *Z. d. Sav. Stift.* xvii. 324 seq.

[2] *Inst.* iii. 9 pr. and § 1.

[3] Cic., *In Verr.* II. i. 45, § 117. He says (writing in 70 B.C.) that an edict to that effect was already *tralaticium*, *i.e.* had been adopted year after year by a series of praetors. Gaius (ii. 119) speaks of seven at least as the requisite number of seals; *i.e.* probably those of the *libripens* and the five citizen witnesses, and that of the *antestatus*, whose functions are not well understood, but whose official designation appended to his seal recurs so regularly in inscriptions as to leave no doubt that his was originally the seventh.

Praetorian order of intestate succession.

All these *bonorum possessiones* had to be formally petitioned for. In that *ab intestato* descendants were allowed a year for doing so, while other persons were limited to 100 days, the period for those entitled in the second place beginning when that of those entitled in the first had expired, and so on. The grant was always made at the risk of the petitioner; nothing was assured him by it; it might turn out real and substantial (*cum re*) or merely nominal (*sine re*), according as the grantee could or could not maintain it against the heir of the *jus civile*. For the latter was entitled to stand on his statutory or testamentary right, without applying to *bonorum possessio*, although in fact he often did so for the sake of the summary procedure it supplied him for ingathering the effects of the deceased.

Law of procedure.

The Law of Procedure.—The use of the formular system of procedure as alternative to that by the "actions of the law" commenced long before the end of the period now under consideration; and we have had occasion more than once to observe how greatly it facilitated the development of the institutions of property and contractual obligation. But as the change was only completed in the early Empire it will be more convenient to defer explanation of the nature of the new procedure in the meantime.

IV. The Jus Naturale and Maturity of Roman Jurisprudence

(The Empire until the time of Diocletian.)

1. *Characteristics and Formative Agencies of the Law during the Period.*

Characteristics generally and Recognition of a Jus Naturale in particular.—The first three centuries of the Empire witnessed the perfection of Roman jurisprudence and the commencement of its decline. During that time the history of the law presents no such great landmarks as the enactment of the XII. Tables, the commencement of a praetor's edict, the recognition of simple consent as creative of a contractual bond, or the introduction of a new system of judicial procedure; the establishment of a class of patented jurists speaking as in a sense the mouthpieces of the prince, and the admission of all the free subjects of the Empire to the privileges of citizenship, are about the only isolated events to which one can point as productive of great and lasting results. There were, indeed, some radical changes in particular institutions, such as the caduciary legislation of Augustus, intended to raise the tone of domestic morality and increase fruitful marriages, and the legislation of the same emperor and his immediate successor for regulation of the status of enfranchised slaves; but these, although of vast importance in themselves, and the first of them influencing the current of the law for centuries, yet left upon it no permanent impression. It was by much less imposing efforts that it attained the perfection to which it reached under the sovereigns of the Severan house—a steady advance on the lines already marked out in the latter years of the Republic. The sphere of the *jus Quiritium* became more and more circumscribed, and one after another of the formalities of the strict *jus civile* was abandoned. The *manus* of the husband practically disappeared; the *patria potestas* of the father lost much of its significance by the recognition, notwithstanding it, of the possibility of a separate and independent estate in the child (*peculium castrense*); slaves might be enfranchised to a certain extent by informal manumission; *res mancipi* constantly passed by simple tradition, the right of the transferee being secured by the Publician action; servitudes and other real rights informally constituted were maintained as effectual *tuitione praetoris*; an heir's acceptance of a succession could be accomplished by any indication of his intention, without observance of the formal *cretio* of the earlier law; and many of the incidental bargains incident to consensual contract, but varying their natural import, that used to be embodied in words of stipulation, came to be enforceable on the strength of formless contemporaneous agreements.

Idea of a jus naturale.

The preference accorded by the magistrates and jurists and judges to the *jus gentium* over the *jus civile* is insufficient to account for these and many other changes in the same direction, as well as for the ever-increasing tendency evinced to subordinate word and deed to the *voluntas* from which they arose. They are rather to be attributed to the striving on the part of many after a higher ideal, to which has been given the name of *jus naturale*.[1] It is sometimes said that the notion of a *jus naturale* as distinct from the *jus gentium* was peculiar to Ulpian, and that it found no acceptance with the Roman jurists generally. But this is inaccurate. Justinian, indeed, has excerpted in the *Digest* and put in the forefront of his *Institutes* a passage from an elementary work of Ulpian's, in which he speaks of a *jus naturale* that is common to man and the lower animals, and which is substantially instinct. This is a law of nature of which it is quite true that we find no other jurist taking account, and it may be attributed to a habit, specially noticeable in Ulpian's writings, of making tripartite classifications. But though the classical jurists are undoubtedly indistinct in their conceptions about the matter, many of them refer again and again to *jus naturale* in the sense of law based on natural reason; and Gaius is the only one (Justinian following him) who definitely, though not consistently, makes it synonymous with *jus gentium*. There can be no question that the latter was much more largely imbued with precepts of natural law than was the *jus civile*, but it seems incorrect to say that natural law and *jus gentium* were identical; it is enough to cite but one illustration, pointed out again and again in the texts: while the one admitted the legality of slavery, the other denied it. While the *jus civile* studied the interests only of citizens, and the *jus gentium* those of freemen irrespective of nationality, the law of nature had theoretically a wider range and took all mankind within its purview. The doctrine of the *jus gentium* agreed in this respect with that of the *jus civile*—that a slave was nothing but a chattel; yet we find the latter, when tinctured with the *jus naturale*, recognizing many rights as competent to a slave, and even conceding that he might be debtor or creditor in a contract, although his obligation or claim could be given effect to only indirectly, since he could neither sue nor be sued.[2]

Characteristics of jus naturale.

Voigt thus summarizes the characteristics of this speculative Roman *jus naturale*:—(1) its potential universal applicability to all men, (2) among all peoples, (3) at all times, and (4) its correspondence with the innate conviction of right (*innere Rechtsüberzeugung*).[3] Its propositions, as gathered from the pages of the jurists of the period, he formulates thus:—(1) recognition of the claims of blood (*sanguinis vel cognationis ratio*); (2) duty of faithfulness to engagements—*is*

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[1] See Voigt, *Das Jus naturale . . . der Römer*, particularly vol. i. §§ 52–64, 89–96; Maine, *Ancient Law*, chap. iii.

[2] Ulp. in *Dig.* xliv. 7 fr. 14.

[3] Voigt, *l.c.* p. 304.

natura debet . . . cujus fidem secuti sumus; (3) apportionment of advantage and disadvantage, gain and loss, according to the standard of equity; (4) supremacy of the *voluntatis ratio* over the words or form in which the will is manifested.[1] It was regard for the first that, probably pretty early in the principate, led the praetors to place emancipated children on a footing of equality with unemancipated in the matter of succession, and to admit to succession collateral kindred through females as well as those related through males; and that, in the reigns of Hadrian and Marcus Aurelius respectively, induced the senate to give a mother a preferred right of succession to her children, and *vice versa*. It was respect for the second that led to the recognition of the validity of what was called a natural obligation,—one that, because of some defect of form or something peculiar in the position of the parties, was ignored by the *jus civile* and incapable of being made the ground of an action for its enforcement, yet might be given effect to indirectly by other equitable remedies. Regard for the third was nothing new in the jurisprudence of the period; the Republic had already admitted it as a principle that a man was not to be unjustifiably enriched at another's cost; the jurists of the empire, however, gave it a wider application than before, and used it as a key to the solution of many a difficult question in the domain of the law of contract. As for the fourth, it was one that had to be applied with delicacy; for the *voluntas* could not in equity be preferred to its manifestation to the prejudice of other parties who in good faith had acted upon the latter. We have many evidences of the skilful way in which the matter was handled, speculative opinion being held in check by considerations of individual interest and general utility.

A remark of Voigt's on the subject is well worthy of being kept in view, that the risk which arose from the setting up of the precepts of a speculative *jus naturale*, as derogating from the rules of the *jus civile*, was greatly diminished through the position held by the jurists of the early Empire. Their *jus respondendi* made them in a sense legislative organs of the state, so that, in introducing principles of the *jus naturale*, or of *aequum et bonum*, they at the same moment defined them and gave them the force of law. They were, he says, "philosophers in the sphere of law, searchers after the ultimate truth; but, while they—usually in reference to a concrete case—sought out the truth and applied what they had found, they combined with the freedom from constraint of speculation, the life-freshness of practice, and the power of assuring the operativeness of their abstract propositions."[2]

Position and character of jurists.

Influence of Constitutional Changes.—The changes in the constitution aided not a little the current of the law. Men of foreign descent reached the throne and recruited the senate, sometimes proud indeed of the history and traditions of Rome, yet in most cases free from prejudice in favour of institutions that had nothing to recommend them but their antiquity. Military life, for obvious reasons, had not the same attractions as during the Republic; there was no longer a tribunate to which men of ambition might aspire; the *comitia* soon ceased to afford an outlet for public eloquence; so that men of education and position had all the more inducement to devote themselves to the conscientious study and regular practice of the law. This was greatly encouraged by the action of Augustus in creating a class of, so to say, patented jurists privileged to give answers *ex auctoritate principis* to questions submitted to them by the magistrates and judges. It was still more so perhaps by Hadrian's reorganization of the imperial privy council, wherein a large proportion of the seats were assigned to jurists of distinction. Several of the emperors had lawyers amongst their most intimate and trusted friends. Again and again the office of praetorian prefect, the highest next the throne, was filled by them; Papinian, Ulpian and Paul all held it in their time. Jurisprudence, therefore, was not merely an honourable and lucrative profession under the new arrangements, but a passport to places of eminence in the state; and till the death of Alexander the ranks of the jurists never failed to be recruited by men of position and ability.

Extension of citizenship to whole Empire.

Extension of Citizenship to the Empire generally.—It was in the year A.D. 212 that Caracalla published his Constitution conferring citizenship on all the free inhabitants of the Empire. Far-reaching as were its consequences, the primary purpose was purely fiscal. The *lex Vicesimaria*, passed under Augustus, had imposed a tax of 5% on testamentary inheritances and bequests, except where the whole succession was worth less than a certain sum or the heir or legatee was a *heres domesticus* of the deceased. It was continued by his successors and was very profitable, thanks to the propensity of the well-to-do classes for single blessedness, followed by testamentary distribution of their fortunes amongst their friends. But it affected only the successions of Roman citizens, so that the great mass of the provincials escaped it. Caracalla, being needy, not only increased it temporarily to 10%, but widened the area of its operation by elevating all his free subjects to the rank of citizens. The words of Ulpian regarding the constitution are very inclusive,—"in orbe Romano qui sunt . . . cives Romani effecti sunt";[3] but there is considerable diversity of opinion as to their meaning, caused partly by the fact that peregrins are still mentioned by some of Caracalla's successors, and there can be little doubt that among others it did not apply to Junian Latins or *peregrini dediticii*. Limit the constitution, however, as we may, there can be no question of its immense importance. By conferring citizenship on the provincial peregrins it subjected them in their legal relations to the law of Rome, and qualified them for taking part in many transactions both *inter vivos* and *mortis causa* which previously had been incompetent for them. It did away with the necessity for regarding *jus gentium* as something distinct from *jus civile*. The principles and doctrines of *jus gentium*, it is true, survived and were expanded and elaborated as freely and successfully as ever; but they were so dealt with as part and parcel of the civil law of Rome, which had ceased to be Italian and become imperial.

Enactments under Augustus

Legislation of Comitia and Senate.—Augustus, clinging as much as possible to the form of republican institutions, thought it expedient not to break with the old practice of submitting legislative proposals to the vote of the *comitia* of the tribes. Some of the *leges* of his reign were far from insignificant. Besides various measures for the amendment of the criminal law, &c., there were three sets of enactments of considerable importance which owed their authorship to him: the first to improve domestic morality and encourage fruitful marriage, the second to abate the evils that had arisen from the too lavish admission of liberated slaves to the privileges of citizenship, and the third to regulate procedure in public prosecutions and private litigations.

about marriage;

The first set included the *lex Julia de adulteriis et de fundo dotali* of 18 B.C. and the *lex Julia et Papia Poppaea* of A.D. 9—the latter a voluminous matrimonial code, in which an earlier *lex de maritandis ordinibus* (18 B.C.) seems to have been incorporated, and which for two or three centuries exercised such an influence as to be regarded as one of the sources of Roman law almost as much as the XII. Tables or Julian's consolidated Edict. It was often spoken of as the *lex Caducaria*, one of its most remarkable provisions being that unmarried persons (within certain ages and under certain qualifications) should forfeit entirely anything to which they were entitled under a testament, and that married but childless persons should similarly forfeit one-half, the lapsed provisions (*caduca*) going to the other persons named in the will who were qualified in terms of the statute, and failing them to the fisc. However well intended, the language of Juvenal and others raises doubts whether the law did not really do more harm than good. By the Christian emperors many of its provisions were repealed as inconsistent with the New Testament views of celibacy, &c., while others fell into disuse; and in the Justinian books hardly a trace is left of its distinctive features.

about manumission.

The second set included the Fufia-Caninian law of the year 2 B.C., the Aelia-Sentian law of the year A.D. 4, and the Junia-Norban law of the year A.D. 19—the last it is thought passed in the reign of Tiberius, but probably planned by Augustus.[4] The Aelia-Sentian law regulated the matter of manumission, with the result that a slave might on that event, and according to circumstances minutely described, become either (1) a citizen, or (2) a freedman with the possibility of attaining citizenship by a process indicated in the statute, or (3) a freedman who, because of his having undergone certain punishments for grave offences, was forbidden to reside within a hundred miles of Rome and denied the hope of ever becoming a citizen (*libertus dediticius*). The Junian law was passed in order to define more precisely the status in the meantime of those freedmen who had a potentiality of citizenship. It did so by assimilating them, to a large extent, to the colonial Latins, denying to them the rights of a citizen proper so far as concerned family and succession, but conceding to them all the patrimonial rights of a citizen and the fullest power of dealing with their belongings so long as not *mortis causa* and to the prejudice of their patrons. This was the Junian Latinity so prominent in the pages of Gaius, but of which our limits exclude any detailed description.

Judiciary laws.

The third set of enactments referred to included the two *leges Juliae judiciariae*, of which we know but little. They were probably enacted in the year 17 B.C. One *lex Julia* seems to have dealt with *judicia publica* and another with procedure in private litigations. Gaius, however, seems to refer to two *leges Juliae judiciorum privatorum*, and it is the opinion of Wlassak, who had studied the subject profoundly, that the second of these was enacted for municipalities outside Rome and was in similar terms to the first. It was these two last-mentioned judiciary statutes that, as Gaius tells us, completed the work of the Aebutian law in substituting the formular system for that of *legis actiones*. The one regulating procedure in private suits at Rome must have been a somewhat comprehensive statute, as a passage in the *Vatican Fragments* refers to a provision of its 27th section; and our ignorance of its contents therefore, beyond one or two trifling details, is the more to be regretted. The opinion of Wlassak, already referred to, is that the judiciary laws made procedure by formulae compulsory, while the Aebutian law had left it optional. In all cases remitted to a *unus judex* or other private judges a formula was to be henceforth compulsory; a *legis actio* could no longer be tried before private judges but only exceptionally by the centumviral court.[1]

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[1] Voigt, *l.c.* pp. 321–323.

[2] Voigt, *l.c.* p. 341.

[3] Ulp. in *Dig.* i. 5 fr. 17. As to the effects of this *constitutio Antonina*, see Mitteis, *Reichsrecht und Volksr.*, c. vi.

[4] There is a long-standing controversy as to the date of this *lex Junia*, some writers placing it earlier than the *lex Aelia-Sentia*. See Girard, *Manuel*, 4th ed., p. 124, and authorities cited in Muirhead, *Hist. Introduction*, 286 n. 7 and 317 n. 6.

Legislation of Senate.

From the time of Tiberius onwards it was the senate that did the work of legislation, for the simple reason that the *comitia* were no longer fit for it. And very active it seems to have been. This may have been due to some extent to the fact that so many professional jurists, aware from their practice of the points in which the law required amendment, possessed seats in the imperial council, where the drafts of the senatusconsults were prepared. It was the senatusconsults that were the principal statutory factors of what was called by both emperors and jurists the *jus novum*—law that departed often very widely from the principles of the old *jus civile*, that was much more in accordance with those of the Edict, and that to a great extent might have been introduced through its means had not the authority of the praetors been overshadowed by that of the prince. In the end of the 2nd and the beginning of the 3rd century the supremacy of the latter in the senate became rather too pronounced, men quoting the *oratio* in which he had submitted to it a project of law instead of the resolution which gave it legislative effect. No doubt such project must have been carefully considered beforehand in the imperial council, and rarely stood in need of further discussion; but the ignoring of the formal act that followed it tended unduly to emphasize the share borne in it by the sovereign, and made it all the easier for the emperors after Severus Alexander to dispense altogether with the time-honoured practice.

Julian's Edictum.

The Consolidated Edictum Perpetuum.—The edicts of the praetors, which had attained very considerable proportions before the fall of the Republic, certainly received some additions in the early Empire. But those magistrates did not long enjoy the same independence as of old; there was a greater *imperium* than theirs in the state, before which they hesitated to lay hands on the law with the boldness of their predecessors. They continued as before to publish annually at entry on office the edicts that had been handed down to them through generations; but their own additions were soon almost limited to mere amendments rendered necessary by the provisions of some senatusconsult that affected the *jus honorarium*. They ceased to be that *viva vox juris civilis* which they had been in the time of Cicero; the emperor, if any one, was now entitled to the epithet; the annual edict had lost its *raison d'être*. Hadrian apparently was of opinion that the time had come for writing its "explicit," and giving it another and more enduring and authoritative shape, binding on all future magistrates. He accordingly, it is said, commissioned Salvius Julianus to revise it—or Julian, when urban praetor, may have done so at his own hand with the emperor's approval—and the senate gave it binding force. It did not, however, become statute law; the distinction between *jus civile* and *jus praetorium* still continued.

The revised Edict unfortunately, like the XII. Tables, is no longer extant. It is only a very slight account we have of the revision—a line or two in Eutropius and Aurelius Victor, and a few lines in two of Justinian's prefaces to the Digest. We may assume from what is said there that both abridgment and rearrangement of the edicts of the urban praetor took place, but the question remains how far Julian consolidated with them those of the peregrin praetor and other officials who had contributed to the *jus honorarium*. Those of the curule aediles, we are told, were included; Justinian says that they formed the last part of Julian's work; they formed, in fact, a sort of addendum to it. There is reason to believe that so much of the edicts of the provincial governors as differed from those of the praetors were also incorporated in it, and that the edicts of the peregrin praetors, in so far as they contained available matter not embodied in those of their urban colleagues or the provincial governors, were dealt with in the same way.[2] The consolidation got the name of *Edictum Perpetuum* in a sense somewhat different from that formerly imputed to *edicta perpetua* as distinguished from *edicta repentina*; it became perpetual in the English sense of the word. Sanctioned by senatusconsult and by the emperor, it became a closed chapter so far as the praetors were concerned; for, though it continued for a time to hold its place on their album with its formularies of actions, they had no longer any power to alter or even perhaps make additions to it. Having ceased to be a mere efflux of their *imperium* and become a type prescribed by statute, its interpretation and amendment were no longer in their hands but in the hands of the emperor.

The Julian Edict was not divided into parts or books like Justinian's Digest but only into titles, which were perhaps numbered and certainly were rubricated. Since the publication of Lenel's great work, noted below, modern Romanists are agreed that the formularies of actions it contained were distributed in their appropriate places throughout the work and not collected together in one place as used to be supposed. Thus a formula based on the civil law (*e.g.* the *rei vindicatio*) appeared by itself (*i.e.* without any edict) as a separate head or subdivision of the title appropriate to it; while formulae based on the praetor's *imperium* (*e.g.* that of the praetorian action *de dolo*) were placed under their respective edicts. The general arrangement of the subject-matter is not difficult to discover, as we have documentary evidence to a certain extent in writings which have come down to us. These are principally (1) the Digest of Justinian, in the prefaces to which we are told expressly that it followed the order of the Edict except in certain places specially noticed; (2) the Code of Justinian; (3) the extracts from divers commentaries on the Edict by the classical jurists principally preserved in the Digest. As the inscriptions of these extracts contain the name of the author, the work and the particular book from which they are taken, they have proved of great help towards understanding the arrangement—especially the commentaries of Ulpian and Paul on the urban edict and the commentary of Gaius on the provincial edict. Lenel has shown that Julian's plan of arrangement was neither logical nor symmetrical, but adhered in great measure to the old order (tralatitious) of the urban praetors. The following fourfold division of the subject-matter is, according to Lenel (partially following Rudorff), clearly ascertainable: first, a series of titles dealing with the preliminary steps in all actions such as jurisdiction, summons, intervention of procurators and the like; second, titles dealing mainly with matters of ordinary procedure or rather with actions granted principally in accordance with statute (*judicia legitima*) as *petitio hereditatis, rei vindicatio*, &c.; third, titles dealing with actions resting principally on the magistrate's *imperium* (*judicia imperio continentia*); fourth, execution of judgments, including bankruptcy, &c. These four parts were followed by a kind of appendix containing in three titles the separate styles of interdicts, exceptions and praetorian stipulations. Finally, the edicts of the curule aediles, with their formulae also consolidated, were added at the end of the work. From the fragments of the jurists preserved by Justinian (principally from the three above-mentioned commentaries, but also to an important extent from Julian himself in his *Digesta*) repeated attempts have been made in modern times to reproduce the Edict in its entirety. Most of these are mere transcripts with attempted reconstructions of passages in Justinian's Digest and of little value. The only really scientific and worthy critical efforts are those of Rudorff in 1869 and, above all, of Lenel in 1883.[3]

Responses of Patented Counsel (*juris consulti*).

The Responses of Patented Counsel.—The right of responding under imperial authority (*jus respondendi ex auctoritate principis*), first granted by Augustus and continued by his successors down to about the time of Severus Alexander, did not imply any curtailment of the right of unlicensed jurists to give advice to any one who chose to consult them. What it did was to give an authoritative character to a response, so that the judge who had asked for it and to whom it was presented—for the judges were but private citizens, most of them unlearned in the law—was practically bound to adopt it as if it had emanated from the emperor himself. It may be that Augustus was actuated by a political motive—that he was desirous by this concession to attach lawyers of eminence to the new régime, and prevent the recurrence of the evils experienced during the Republic from the too great influence of patrons. But, whatever may have prompted his action in the matter, its beneficial consequences for the law can hardly be overrated. For the powers with which they were invested enabled the patented counsel to influence current doctrine not speculatively merely but positively (*jura condere*), and so to leaven their interpretations of the *jus civile* and *jus honorarium* with the principles of natural law as to give a new complexion to the system.

Instead of giving his opinion like the unlicensed jurist by word of mouth, either at the request of the judge or at the instance of one of the parties, the patented counsel, who did not require to give his reasons, reduced it to writing and sent it to the court under seal. Augustus does not seem to have contemplated the possibility of conflicting responses being tendered from two or more jurists equally privileged. It was an awkward predicament for a judge to be placed in. Hadrian solved the difficulty by declaring that in such a case the judge should be entitled to use his own discretion.[1] That on receiving a response with which he was dissatisfied he could go on calling for others until he got one to his mind, and then pronounce judgment in accordance with it on the ground that there was difference of opinion, is extremely unlikely. The more probable explanation of Hadrian's rescript is, that the number of patented responding counsel was very limited; that a judge, if he desired their assistance, was required by this rescript to consult them all (*quorum omnium si*, &c.); that, if they were unanimous, but only then, their opinion had force of statute (*legis vicem optinet*); and that when they differed the judge must decide for himself.

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[1] Wlassak, *Processgesetze*, i. 191 sqq., and ii. 221 sqq.

[2] It may be, however, that the edicts of the peregrin praetors and provincial governors were independently codified. See Girard, *Manuel élémentaire*, 4th ed. 53–4. An attempt recently made by von Velsen, *Z. d. Sav. St.* xxi. (1900), 73 sqq., to identify the *edictum provinciale* with that of the peregrin praetor from the time of Augustus is far from convincing and has received no support from other writers. See Kipp. *Gesch. d. Quellen*, p. 123 n.

[3] Rudorff, *De jurisdictione edictum: edicti perpetui quae reliqua sunt* (Leipzig, 1869), and rev. by Brinz in the *Krit. Vierteljahrschrift* (1870), xi. 471 sqq.; Lenel, *Das Edictum Perpetuum: ein Versuch zu dessen Wiederherstellung* (Leipzig, 1883), 2nd ed., 1907 (French ed. translation by Peltier, 2 vols., 1901–3). The last gained the "Savigny Foundation Prize" offered by the Munich Academy in 1882 for the best restitution of the formulae of Julian's Edict, but goes far beyond the limited subject prescribed; see Brinz's report upon it to the Academy in the *Zeitschr. d. Sav. Stift.* (1883), vol. iv. *Röm. Abtheil*, 164 sqq. See Karlowa, *Röm. Rechtsgesch.* i. 628–41; Krüger, *Gesch. d. Quellen*, 84 sqq.

Edicts of Emperors.

Constitutions of the Emperors.[2]—Gaius and Ulpian concur in holding that every imperial constitution, whether in the shape of rescript, decree or edict, had the force of statute. It may be that by the time of Ulpian that was the prevailing opinion; but modern criticism is disposed to regard the dictum of Gaius, written in the time of Antoninus Pius, as coloured by his Asiatic notions, and not quite accurate so far at least as the edicts were concerned. Apart from executive laws (*leges datae*), the early imperial edicts were theoretically rather part of the *jus honorarium*. As supreme magistrate the emperor had the same *jus edicendi* that consuls and praetors had had before him, and used it as they did to indicate some course of action he meant to adopt and follow or some relief he proposed to grant. His edicts were as a rule drawn up in writing in the imperial council and publicly notified in all parts of the Empire. His range, of course in respect of his *imperium*, was much greater than that of the praetors had been; for his authority endured for life, and extended over the whole Empire and every department of government. But in principle, it is thought, his successor on the throne was no more bound to adopt any of his edicts than a praetor was to adopt those of his predecessors. That it was not unusual for an edict to be renewed, and that it occasionally happened that the renewal was not by the immediate successor of its original author, are manifest from various passages in the texts. Sometimes, when its utility had stood the test of years, it was transmuted into a senatusconsult; this fact proves of itself that an edict *per se* had not the effect of statute. But their adoption by a succession of two or three sovereigns, whose reigns were of average duration, may have been held sufficient to give them the character of consuetudinary law; and, by a not unnatural process, unreflecting public opinion may have come to impute force of statute to the edict itself rather than to the *longa consuetudo* that followed on it, thus paving the way for the assertion by the sovereigns of the later Empire of an absolute right of legislation, and for the recognition of the *lex edictalis* as the only form of statute.

Rescripts and Decrees.

The imperial rescripts and decrees (*rescripta, decreta*) apparently acquired force of law (*legis vicem obtinent*) pretty early in the Empire, and their operation was not theoretically limited to the lifetime of the prince from whom they had proceeded. But they were not directly acts of legislation. In both the emperor theoretically did no more than authoritatively interpret existing law, although the boundary between interpretation and new law, sometimes difficult to define, was not always closely adhered to. Thus the *decretum Marci*, penalizing procedure by self-help, and the *epistula Hadriani*, introducing the *beneficium divisionis* among co-sureties, are notable instances of authoritative interpretation. The rescript was strictly a written answer by the emperor to a petition, either by an official or a private party, for an instruction as to how the law was to be applied in any particular case to the facts set forth: when the answer was in a separate writing it was usually spoken of as an *epistula*; when noted at the foot of the application its technical name was *subscriptio*. But sometimes also general orders of the emperors addressed to some official and intended for a province or particular community were classed under the head of rescripts. The decree was the emperor's ruling, orally announced, in a case submitted to him judicially; it might be when it had been brought before him in the first instance *extra ordinem*, or when it had been removed by *supplicatio* from an inferior court in its earliest stage, or when it came before him by appeal. Such decrees were duly recorded and kept *apud acta*. It was theoretically as a judge that the emperor pronounced his decree, though in practice he sometimes went beyond the case in hand, evolving new doctrines. Proceeding as it did from the fountain of authoritative interpretation, the decree had a value far beyond that of the sentence of an inferior court (which was law only as between the parties), and formed a precedent which governed all future cases involving the same question. Those rescripts and decrees constituted one of the most important sources of the law during the first three centuries of the Empire, and were elaborated with the assistance of the most eminent jurists of the day, the rescripts being the special charge of the *magister libellorum*. From the time of the Gordians to that of the abdication of Diocletian they were almost the only channel of the *jus scriptum* that remained.

Mandata.

A fourth class of imperial constitutions were the so-called *mandata*. These, however, were mainly of the nature of instructions by the emperors to individual imperial officials, similar to edicts, and dealt with public law for the most part.

The Jurists.

Professional Jurisprudence.—The present period of legal history is by modern writers sometimes called "the classical age of jurisprudence," though that term is more usually and correctly restricted to the years between Hadrian and the close of Severus Alexander's reign. It has been called "classical," on the analogy of the Augustan age of literature, from the celebrity of the jurists who flourished during it and the scientific pre-eminence of their works. For accounts of the great jurists, see articles GAIUS, &c., and also H. J. Roby's *Introduction to the Study of Justinian's Digest*[3] and Professor Karlowa's *Rechtsgeschichte.*[4] For an account of the extant remains of their writings, such as the Institutes of Gaius, the Rules of Ulpian, the Sentences of Paul and a variety of other works, reference may be made to Muirhead's *Historical Introduction to the Private Law of Rome*, where a brief account of the jurists is also given.[5]

ii. *Substantive Changes in the Law.*

Military Testaments.

Concession of Peculiar Privileges to Soldiers.—While the period with which we are dealing saw the substantial disappearance of the distinction between citizen and peregrin, it witnessed the expansion of another—that between soldiers and civilians (*milites, pagani*). The most remarkable effluxes of the *jus militare* (as it is sometimes called) were the military testament and the *castrense peculium*. The first was practically exempted from all the rules of the *jus civile* and the praetors' edict alike as to the form and substance of last wills. It might be in writing, by word of mouth, by the unspoken signs perhaps of a dying man; all that was required was the *voluntas* so manifested as not to be mistaken. More extraordinary still—it was sustained even though its provisions ran counter to the most cherished rules of the common law. Contrary to the maxim that no man could dispense with the institution of an heir or die partly testate and partly intestate, a soldier might dispose of part of his estate by testament with or without nomination of an heir, and leave the rest to descend to his heirs *ab intestato*. Contrary also to the maxim *semel heres semper heres*, he might give his estate to A for life or for a term of years, or until the occurrence of some event, with remainder to B. Contrary to the general rule, a Latin or peregrin, or an unmarried or married but childless person, might take an inheritance or a bequest from a soldier as freely as could a citizen with children. His testament, in so far as it disposed only of *bona castrensia*, was not affected by *capitis deminutio minima*. It was not invalidated by praeterition of *sui heredes*, nor could they challenge it because they had less under it than their "legitim"; nor could the instituted heir claim a Falcidian fourth, even though nine-tenths of the succession had been assigned to legatees. Finally, a later testament did not nullify an earlier one, if it appeared to be the intention of the soldier testator that they should be read together.

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[1] Gaius, i. 7; Justinian, *Inst.* i. 2, § 8. The passages from Pomponius in *Dig.* i. 2, 2, §§ 48, 49 are of doubtful meaning, and different interpretations of them have been given. Cf. Sohm. *Institutionen* (translation by Ledlie, 2nd ed.), p. 97; Girard, *Manuel*, p. 70; Kipp, *Geschichte d. Quellen*, p. 99.

[2] Gai. i. 5; Ulp., in *Dig.*, i. 4, fr. 1, § 1; Mommsen, *Röm. Staatsrecht*, ii. 843 seq.; Wlassak, *Krit. Studien zur Theorie der Rechtsquellen im Zeitalter d. klass. Juristen* (Gratz, 1884); A. Pernice (crit. Wlassak), in *Zeitschr. d. Sav. Stift.* (1885), vi. *Röm. Abtheil.* 293 seq.: Karlowa, *Röm. Rechtsgesch.* i. § 85; Kipp, *Quellen*, 59 seq.

[3] Cambridge, 1884, chaps. ix.–xv.

[4] Leipzig, 1885, i. §§ 87–92. See also Krüger, *Geschichte d. Quellen*, §§ 18–27, and, for the period from Augustus to Hadrian, Bremer, *Jurisprudentia Antehadriana*, ii.

[5] Edited by Goudy, 1889, §§ 61–65. See also Krüger, *Geschichte d. Quellen*, §§ 18–27; Lenel, *Palingenesia Juris Civilis* (2 vols., Leipzig, 1888–89), a work which contains all the texts of the ante-Justinian jurists, as contained in the Digest and other sources, arranged systematically, with valuable critical and explanatory notes, but excluding the Institutes of Gaius, Paul's Sentences and Ulpian's Rules.

All this is remarkable, manifesting a spirit very different from that which animated the common law of testaments. True, it was a principle with the jurists of the classical period that the *voluntatis ratio* was to be given effect to in the interpretation of testamentary writings; but that was on the condition that the requirements of law as to form and substance had been scrupulously observed. But in the military testament positive rules were made to yield to the *voluntas* in all respects: the will was almost absolutely unfettered. Roman law in this matter gave place to natural law. One would have expected the influence of so great a change to have manifested itself by degrees in the ordinary law of testaments; yet it is barely visible. In a few points the legislation of Constantine, Theodosius II. and Justinian relaxed the strictness of the old rules; but there was never any approach to the recognition of the complete supremacy of the *voluntas*. In the *Corpus Juris* the contrast between the *testamentum paganum* and the *testamentum militare* was almost as marked as in the days of Trajan. The latter was still a privileged deed, whose use was confined to a soldier actually on service, and if he received an honourable discharge, for twelve months after his retirement.

Peculium Castrense.

The *peculium castrense* had a wider influence; for it was the first of a series of amendments that vastly diminished the importance of the *patria potestas* on its patrimonial side. It had its origin in a constitution of Augustus granting to *filiifamilias* on service the right to dispose by testament of what they had acquired in the active exercise of their profession (*quod in castris adquisierant*).[1] But it soon went much further. Confined at first to *filiifamilias* on actual service, the privilege was extended by Hadrian to those who had obtained honourable discharge. The same emperor allowed them not merely to test on their *peculium castrense*, but to manumit *inter vivos* slaves that formed part of it; and by a little step further the classical jurists recognized their right to dispose of it onerously or gratuitously *inter vivos*. In the 3rd century the range of it was extended so as to include not only the soldier's pay and prize, but all that had come to him, directly or indirectly, in connexion with his profession—his outfit, gifts made to him during his service, legacies from comrades and so on. All this was in a high degree subversive of the doctrines of the common law. It may almost be called revolutionary; for it involved in the first place the recognition of the right of a person *alieni juris* to make a testament as if he were *sui juris*, and in the second place the recognition of a separate estate in a *filiusfamilias* which he might deal with independently of his *paterfamilias*, which could not be touched by the latter's creditors, and which he was not even bound to collate (or bring into hotch-pot) on claiming a share of his father's succession. The radical right of the parent, however, was rather suspended than extinguished; for, if the soldier son died intestate, the right of the *paterfamilias* revived: he took his son's belongings, not as his heir appropriating an inheritance, but as his *paterfamilias* reclaiming a *peculium*.[2]

Family Relations.

The Family.—The legislative efforts of Augustus to encourage marriage, to which persons of position showed a remarkable distaste, have already been mentioned. The relation of husband and wife still in law required no more for its creation than deliberate interchange of nuptial consent, although in certain cases some act indicative of change of life, such as the bride's home-coming to her husband's house, was regarded as the criterion of completed marriage.[3] But it was rarely accompanied with *manus*. So repugnant was such subjection to patrician ladies that they declined to submit to confarreate nuptials; and so great consequently became the difficulty of finding persons qualified by confarreate birth to fill the higher priesthoods that early in the Empire it had to be decreed that confarreation should in future be productive of *manus* only *quoad sacra*, and should not make the wife a member of her husband's family. *Manus* by a year's uninterrupted cohabitation was long out of date in the time of Gaius; and, although that by coemption was still in use in his time, it was almost unknown by the end of the period. Husband and wife therefore had their separate estates, the common establishment being maintained by the husband, with the assistance of the revenue of the wife's dowry (*dos*)—an institution which received much attention at the hands of the jurists, and was to some extent regulated by statute. Divorce (either of common consent or by *repudium* by either spouse) was unfortunately very common; it was lawful even without any assignable cause; when blame attached to either spouse, he or she suffered deprivation to some extent of the nuptial provisions, but there were no other penal consequences.

Not only in the case of a *filiusfamilias* who had adopted a military career, but in all directions, there was manifested a strong tendency to place restrictions on the exercise of the *patria potestas*. This was due in a great degree to the hold that the principles of natural law were gaining within the Roman system, perhaps due to the fact that the emperors, having succeeded to the censorial *regimen morum*, allowed these principles freely to influence their edicts and rescripts. Exposure of an infant was still apparently allowed; but a parent was no longer permitted, even in the character of household judge, to put his son to death or cruelly ill-treat him; in fact his prerogative was limited to moderate chastisement, the law requiring, in the case of a grave offence that merited severer punishment, that he should bring his child before the competent magistrate. His right of sale, in like manner, was permitted only when he was in great poverty and unable to maintain them, while their impignoration by him was prohibited under pain of banishment.

Except in the solitary case of a son who was a soldier, a *paterfamilias* was still recognized as in law the owner of all the earnings and other acquisitions of his children *in potestate*; but the old rule still remained that for their civil debts he was not liable beyond the amount of the fund he had advanced them to deal with as *de facto* their own (*peculium profecticium*), except when he had derived advantage from their contract or had expressly or by implication authorized them to enter into it as his agents. To the party with whom he had contracted a *filiusfamilias* was himself liable as fully as if he had been a *paterfamilias*, with one exception, namely, when his debt was for borrowed money; in that case, with some very reasonable qualifications, it was declared by the well-known Macedonian senatusconsult (of the time of Vespasian) that the lender should not be entitled to recover payment, even after his borrower had become *sui juris* by his father's death. Between a father and his emancipated son there was, and always had been, perfect freedom of contract; but so was there now between a father and his soldier son in any matter relating to the *peculium castrense*, even though the son was *in potestate*. What is still more remarkable is that the new sentiment which was operating on the *jus civile* admitted the possibility of natural obligation between *paterfamilias* and *filiusfamilias* even in reference to the *peculium profecticium*, which, though incapable of direct enforcement by action, was yet to some extent recognized and given effect to indirectly.

In the matter of guardianship, while the tutory of pupils was carefully maintained and the law in regard to it materially amended during the period under review (particularly by a senatusconsult generally referred to as the *Oratio divi Severi*, prohibiting alienation of the ward's property without judicial authority), that of women above the age of pupillarity gradually disappeared.[4] The guardianship or curatory (*cura*) of minors above pupillarity owed its establishment as a general doctrine to Marcus Aurelius. The Plaetorian law[5] of the middle of the 6th century of the city had indeed imposed penalties on those taking undue advantage of the inexperience of minors, *i.e.* persons *sui juris* under the age of twenty-five; and from that time the praetors were in the habit of granting *restitutio in integrum* in cases of lesion and appointing curators to act with such persons for the protection of their interests in particular affairs. But it was Marcus Aurelius that first made curatory a general permanent office, to endure in the ordinary case until the ward attained majority. The powers, duties and responsibilities of such curators became a matter for careful and elaborate definition and regulation by the jurists, whose exposition indeed of the law of guardianship generally, whether by tutors or curators, has found wide acceptance in modern systems of jurisprudence.

Law of Succession.

The Law of Succession and particularly Testamentary Trusts.—There were far more positive changes in the law of succession than in either that of property or that of obligation. The rise and progress of the military testament has already been explained. The testament of the common law was still ostensibly that *per aes et libram*; but the practice of granting *bonorum possessio secundum tabulas* to the persons named as heirs in any testamentary instrument that bore outside the requisite number of seals led, from the time of Antoninus Pius, to the frequent neglect of the time-honoured formalities of the *familiae mancipatio* and *nuncupatio testamenti*. It was his rescript, formerly mentioned, declaring that an heir-at-law should no longer be entitled to dispute the last wishes of a testator on the technical ground of non-compliance with the purely formal requirements of the law, that practically established what Justinian calls the praetorian testament.

One of the commonest provisions in the testaments of the period was the *fideicommissum*,—a request by the testator to his heir to enter on the inheritance and thereafter denude wholly or partially in favour of a third party. It was introduced in the time of Augustus by (it is said by Theophilus) a testator who had married a peregrin wife, and desired thus indirectly to give to his peregrin children the succession which, as not being citizens, they could neither take *ab intestato* nor as his direct testamentary heirs.[6] He probably soon found imitators, and their number must have rapidly multiplied once the emperor, shocked at the perfidy of a trustee who had failed to comply with the request of his testator, indicated his approval of the new institution by remitting the matter to the consuls of the day, with instructions to do in the circumstances what they thought just. So quickly did it establish itself in public favour, and so numerous did the questions become as to the construction and fulfilment of testamentary trusts, that under Claudius it was found necessary to institute a court specially charged with their adjudication—that of the *praetor fideicommissarius*.

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[1] *Inst.* ii. 12 pr.

[2] This was altered by Justinian's 118th Novel, under which a *paterfamilias* taking any part of a deceased son's estate did so as his heir; see *infra*, p. 573.

[3] Some writers take the view that such act was always essential. See Girard, *Manuel*, 4th ed. p. 151.

[4] *Dig.* xxvii. 9 fr. 1, § 2.

[5] Also sometimes called *lex Laetoria*. See, *e.g.* reference to a recently discovered papyrus in *Z. d. Sav. Stift.* xxii. 170.

[6] *Fideicommissa*, as informal requests to heirs or legatees to hand over what they received to third parties, were known earlier than Augustus, but had no legal force.

The employment of a trust as a means of benefiting those who were under disqualifications as heirs or legatees, as, for example, persons who had no *testamenti factio*, women incapacitated by the Voconian law, unmarried and married but childless persons incapacitated by the Julian and Papia-Poppaean law, and so on, was in time prohibited by statute; but that did not affect its general popularity. For, whether what was contemplated was a transfer of the universal *hereditas* or an aliquot part of it to the beneficiary (*fideicommissum hereditatis*), or only of some particular thing (*fideicommissum rei singularis*), a testamentary trust had various advantages over either a direct institution or a direct bequest (*legatum*). Still the imposition upon the heir of a trust in favour of a beneficiary, whether it required him to denude of the whole or only a part of the inheritance, did not in theory deprive him of his character of heir or relieve him of the responsibilities of the position; and at common law therefore he was entitled to decline the succession, often to the great prejudice of the beneficiary. In order to avoid such a mischance, and at the same time to regulate their relations *inter se* and towards debtors and creditors of the testator, it became the practice for the parties to enter into stipulatory arrangements about the matter; but these were to some extent rendered superfluous by two senatusconsults, the Trebellian in the time of Nero and the Pegasian in that of Vespasian, which not only secured the beneficiary against the trustee's (*i.e.* the heir's) repudiation of the inheritance, but also protected the latter from all risk of loss where he was trustee and nothing more, and enabled the former to treat directly with debtors and creditors of the testator and himself ingather the corporeal items of the inheritance.

It was one of the advantages of a trust-bequest, whether universal or singular, that it might be conferred in a codicil, even though unconfirmed by any relative testament. The codicil (*codicilli*), also an invention of the time of Augustus, was a deed of a very simple nature. Though in the later Empire it required to be formally attested by at least five witnesses, it was at first quite informal. It was inappropriate either for disherison of *sui* or institution of an heir; but if confirmed by testament, either prior or posterior to its date, it might contain direct bequests, manumissions, nominations of tutors, and the like, and whether confirmed or unconfirmed might, as stated, be utilized as a vehicle for trust-gifts. Latterly it was held operative, even in the absence of a testament, the trusts contained in it being regarded as burdens on the heir-at-law.

The most important changes in the law of intestate succession during the period were those accomplished by the Tertullian and Orphitian senatusconsults, fruits of that respect for the precepts of natural law which in so many directions was modifying the doctrines of the *jus civile*. The first was passed in the reign of Hadrian, the second in the year 178, under Marcus Aurelius. Down to the time of the Tertullian senatusconsult a mother and her child by a marriage that was unaccompanied with *manus* stood related to each other only as cognates, being in law members of different families; consequently their chance of succession to each other was remote, being postponed to that of their respective agnates. The purpose of the senatusconsult was to prefer a mother to all agnates of her deceased child except father and brother and sister; father and brother excluded her; but with a sister of the deceased, and in the absence of father or brother, she shared equally. While there can be little doubt that it was considerations of natural law that dictated this amendment, yet its authors were too timid to justify it on the abstract principle of common humanity, and so they confined its application to women who had the *jus liberorum*, *i.e.* to women of free birth who were mothers of three children and freedwomen who were mothers of four, thus making it ostensibly a reward of fertility. The Orphitian senatusconsult was the counterpart of the Tertullian. It gave children, whether legitimate or illegitimate, a right of succession to their mother in preference to all her agnates; and subsequent constitutions extended the principle, admitting lawful children to the inheritance not only of their maternal grandparents but also to that of their paternal grandmother.

iii. *Judicial Procedure.*

Formular System.

The Formular System.[1]—The ordinary procedure during the greater part of the first three centuries of the Empire was still two-staged; it commenced before the praetor (*in jure*) and was concluded before a judge or judges (*in judicio*). But the *legis actiones* had with a few exceptions given place to praetorian formulae. Under the sacramental system parties, and particularly the plaintiff, had themselves to formulate in statutory or traditional words of style the matter in controversy between them; and as they formulated, so did it go for trial to centumviral court or *judex*, with the not infrequent result that it was then all too late discovered that the real point in the case had been missed. Under the formular system parties were free to represent their plaint and defence to the praetor in any words they pleased, the plaintiff asking for a formula and usually indicating the style on the *album* that he thought would suit his purpose, and the defendant demanding when necessary an exception, *i.e.* a plea in defence, either praetorian or statutory, that, without traversing the facts or law of the plaintiff's case, avoided his demand on grounds of equity or public policy or the like. It was for the praetor to consider and determine whether the action or exception should or should not be granted, and, if granted, whether it should be according to the style exhibited on the *album* or according to a modification of it. The result he embodied in a written and signed appointment of a judge, whom he instructed what he had to try, and empowered to pronounce a finding either condemning or acquitting the defendant. This writing was the formula.

Although it was not until the early Empire that this system of civil procedure attained its full development, yet it had begun between one and two centuries before the fall of the Republic. Gaius ascribes its introduction and definitive establishment to the *lex Aebutia* and two judiciary laws of the time of Augustus, formerly mentioned (*supra*, pp. 98, 124). The Aebutian law, of which unfortunately we know very little, is generally supposed to have empowered the praetors (1) to devise a simpler form of procedure for causes already cognizable *per legis actionem*, (2) to devise forms of action to meet cases not cognizable under the older system, and (3) themselves to formulate the issue and reduce it to writing. It was by no means so radical a change as is sometimes supposed. There were formulae employed by the peregrin praetor before it and also perhaps something analogous thereto by the urban praetor. There were also formulae of a kind employed both in the procedure *per judicis postulationem* and in that *per condictionem*. The difference between the latter and the *formulae* of the Aebutian system was that they were in part mere echoes of the statutory words of style uttered by the plaintiff, and that they were not written but spoken in the hearing of witnesses.

Its application to Personal Actions.

A large proportion of the personal actions of the formular system were evolved out of the *legis actio per condictionem*. The sequence of operations may have been something like this. Taking the simplest form of it, the action for *certa pecunia* under the Silian law, the first step was to drop the formal *condictio* from which it derived its character of *legis actio*, thus avoiding a delay of thirty days; the plaintiff stated his demand in informal words, and, if the defendant denied indebtedness, the praetor straightway formulated a written appointment of and instruction to a judge, embodying in it the issue in terms substantially the same as those he would have employed under the earlier procedure:—"Titius be judge. Should it appear that N. N. ought to pay (*dare oportere*) 50,000 sesterces to A. A., in that sum condemn N. N. to A. A.;[2] should it so not appear, acquit him." This was no longer the *legis actio per condictionem*, because what had made it *legis actio* was gone, but the *condictio certae pecuniae* of the formular system. The *condictio triticaria* of the same system ran on the same lines: "Titius be judge. Should it appear that N. N. ought to give A. A. the slave Stichus, then, whatever be the value of the slave, in that condemn N. N. to A. A.," and so on. In each of these examples the formula included only two of the four principal clauses that might find place in it[3]—an "intention" and a "condemnation." The matter of claim in both cases was certain,—so much money in one, a slave in the other; but, while in the first the condemnation also was certain, in the second it was uncertain. What if the claim also was uncertain,—say a share of the profits of a joint adventure assured by stipulation? It was perhaps competent for the plaintiff to specify a definite sum, and claim that as due to him; but it was very hazardous, for unless he was able to prove the debt to the last sesterce he lost his case. To obviate the risk of such failure the praetors devised the *actio ex stipulatu*, whose formula commenced with a "demonstration" or indication of the cause of action, and whose "intention" referred to it and was conceived indefinitely: "Titius be judge. Whereas A. A. stipulated with N. N. for a share of the profits of a joint adventure, whatever in respect thereof N. N. ought to give to or do for (*dare facere oportet*) A. A., in the money amount thereof condemn N. N.," and so on.[1] Once this point was attained further progress was comparatively easy, the way being open for the construction of formulae upon illiquid claims arising from transactions in which the practice of stipulation gradually dropped out of use, till at last the *bonae fidei judicia* were reached, marked by the presence in the "intention" of the words *ex fide bona*—"whatever in respect thereof N. N. ought in good faith to give to or do for A. A."

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[1] See Keller (as on p. 547, n.), §§ 23–43; Bethmann-Hollweg (as in same note), vol. ii. §§ 81–87; Bekker (as in same note), vol. i. chaps. 4–7, vol. ii. chaps. 15, 19, 20; Baron, *Gesch. d. röm. Rechts* (Berlin, 1884), vol. i. §§ 202–215.

[2] In the typical Roman styles of actions the plaintiff was usually called Aulus Agerius and the defendant Numerius Negidius.

[3] Gaius enumerates them as *demonstratio*, *intentio*, *adjudicatio* and *condemnatio*, and describes their several functions in iv. §§ 39–43. The *intentio* and *condemnatio* were much the most important, the others being employed only in certain kinds of actions. Besides these a *formula* might be preceded by a *praescriptio* (Gai. iv. §§ 130–137), and have incorporated in it fictions (§§ 32–38), exceptions (§§ 115–125), and replications, duplications, &c. (§§ 126–129).

Its application to real actions.

In the case of real actions the transition from the *legis actiones* to the formulae followed a different course. The Aebutian law, while sanctioning the competency of formulae, did not interfere with the procedure *per sacramentum* when reference was to be to the centumviral court on a question of quiritarian right. In the time of Cicero that court was apparently still in full activity (*supra*), but by that of Gaius, owing, it is supposed, to the Julian laws having made formulae in most cases compulsory, it was rarely resorted to except for trial of questions of inheritance. In his time questions of property were raised either *per sponsionem* or *per formulam petitoriam*. The procedure by sponsion may be regarded as a sort of bridge between the sacramental process and the petitory *vindicatio*. In it the question of real right was determined only indirectly. The plaintiff required the defendant to give him his stipulatory promise to pay a nominal sum of twenty-five sesterces in the event of the thing in dispute being found to belong to the former; and at the same time the defendant gave sureties for its transfer to the plaintiff, with all fruits and profits, in the same event. The formula that was adjusted and remitted to a judge raised *ex facie* only the simple question whether the twenty-five sesterces were due or not: the action was in form a personal, not a real one, and was therefore appropriately remitted to a single *judex* instead of to the centumviral tribunal. But judgment on it could be reached only through means of a finding (*sententia*) on the question of real right; if it was for the plaintiff, he did not claim the amount of the sponsion, but the thing which had been found to be his; and, if the defendant delayed to deliver it, with its fruits and profits, the plaintiff had recourse against the latter's sureties. The petitory formula was undoubtedly of later introduction and much more straightforward. Like the *condictio certae pecuniae*, it contained only "intention" and "condemnation." It ran thus: "Titius be judge. Should it appear that the slave Stichus, about whom this action has been raised, belongs to A. A. in quiritary right, then, unless the slave be restored, whatever be his value, in that you will condemn N. N. to A. A.; should it not so appear, you will acquit him."

Formulae in jus and in factum conceptae.

The formulae given above, whether applicable to real or personal actions, are so many illustrations of the class known as *formulae juris civilis* or *in jus conceptae*. The characteristic of such a formula was that it contained in the "intention" such phrases as the following—*ejus esse ex jure Quiritium, praestare oportere*,[2] *dare oportere, dare facere oportere*, or *damnum decidere oportere*.[3] Such words were employed where the right to be vindicated or the obligation to be enforced had its sanction directly in the *jus civile* whether in the shape of statute, consuetude or interpretation. Where, on the other hand, the right or obligation had its sanction solely from the praetor's edict, special formulae had to be framed. The actions employed in such cases were *actiones juris honorarii*, and these either *actiones utiles* or *actiones in factum*. The first were adaptations of actions of the *jus civile* to cases that did not properly fall within them; the second were actions entirely of praetorian devising, for the protection of rights or redress of wrongs unknown to the *jus civile*.[4]

Actiones utiles.

Utilis actio may be translated as analogous or adapted action, *i.e.* analogous to a direct action. Where a direct action was inapplicable to particular cases or persons, according to the terms of a *lex*, edict, &c., the praetor frequently adapted the statute, &c., to such cases and persons by granting an *actio utilis*. He did so where he thought them to be within the spirit though not the letter of the law. He effected his object commonly by a modification of the regular formula either objectively, as by adding, or omitting, or altering words, or subjectively by transposing names of parties. But sometimes also the adaptation was made by the introduction of a legal fiction into the regular formula, and in this case the action was called *utilis fictitia* or simply *fictitia*. The *actiones utiles* might, therefore, be of two kinds, ordinary and fictitious. Those of common occurrence early became stereotyped in the Edict and even got special names.

Ordinary.

As illustrations of an ordinary *actio utilis*, in which the formula was objectively modified, reference may be made to the numerous actions for wrongful damage to property under the *lex Aquilia*. Thus this statute in its first chapter used the term *occidere*, which means killing by a physical act of violence (*corpore corpori*), but to meet cases of killing without violence (*e.g.* by poison) the praetors simply substituted the words *mortis causam praestare* for *occidere* in the formula. As illustrations of an ordinary *actio utilis* with subjective transposition of names, we may mention the *actio Rutiliana* applicable to a purchaser of the bankrupt estate of a living debtor, the action by an assignee of a debt against the debtor, and the action of a procurator suing for his principal. In these the names of the bankrupt, cedent and principal respectively appeared in the *intentio*, while the plaintiff's name was inserted in the *condemnatio*.

Actiones fictitiae.

Resort to a fiction is sometimes said to be a confession of weakness, and adversely criticized accordingly. But every amendment on the law is an admission of defect in what is being amended; and it was in sympathy with the spirit of Roman jurisprudence, when it found an action too narrow in its definition, to include some new case that ought to fall within it, rather by feigning that the new case was the same as the old, to bring it within the scope of the existing and familiar action, than to cause disturbance by either altering the definition of the latter or introducing an entirely new remedy. A *bonorum possessor* held a position unknown to the *jus civile*; he was not an heir, and therefore not entitled offhand to employ the actions competent to an heir, either for recovering the property of the defunct or proceeding against his debtors. The praetor could have had no difficulty in devising new actions to meet his case; but he preferred the simpler expedient of adapting to it an heir's actions, by introducing into the formula a fiction of civil heirship; so he did with the *bonorum emptor* or purchaser of a deceased bankrupt's estate at the sale of it in mass by his creditors. A peregrin could not sue or be sued for the penalties imposed for theft or culpable damage to property, for the XII. Tables and the Aquilian law applied only to citizens; but he could both sue and be sued under cover of a fiction of citizenship. A man who had acquired a *res mancipi* on a good title, but without taking a conveyance by mancipation or surrender in court, if he was dispossessed before he had completed his usucapion, could not sue a *rei vindicatio* for its recovery, for he was not in a position to affirm that he was quiritarian owner; neither, for the same reason, could a man who in good faith and on a sufficient title had acquired a thing from one who was not in a position to alienate it. But in both cases the praetor granted him what was in effect a *rei vindicatio* proceeding on a fiction of completed usucapion—the Publician action referred to on p. 556. These are examples of *actiones fictitiae*—actions of the *jus civile* adapted by this very simple expedient to cases to which otherwise they would have been inapplicable, and forming one of the most important varieties of the *actiones utiles*.

Quite different was the course of procedure in the *actiones in factum*, whose number and varieties were practically unlimited, although for the most part granted in pursuance of the praetor's promise in the edict that under such and such circumstances he would make a remit to a *judex* (*judicium dabo*),[5] and formulated in accordance with the relative skeleton styles also published on the *album*. A great number of them came to be known by special names, as, for example, the *actio de dolo, actio negotiorum gestorum, actio hypothecaria, actio de pecunia constituta, actio vi bonorum raptorum, actio de superficie*, &c.—the generic name *actio in factum* being usually confined to the innominate ones. Their formulae, unlike those *in jus conceptae*, submitted no question of legal right for the consideration of the judge, but only a question of fact, proof of which was to be followed by a condemnation. That of the *actio de dolo*, for example, ran thus: "Titius be judge. Should it appear that, through the fraud of N. N., A. A. was induced to convey and cede possession to him of his farm (describing it), then, unless on your order N. N. restores it, you will condemn him in damages to A. A.; if it shall not so appear, you will acquit him." Actions *in factum* might be *utiles* as well as direct; *e.g. actio quasi-Serviana* or *hypothecaria* was *utilis*, being based on analogy to the *actio Serviana*.

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[1] This *actio ex stipulatu* used to be regarded as nothing more than a variety of the *condictio incerti*. It is doubtful, however, whether in the *condictiones incerti* (*e.g.* the *condictio furtiva*) there was any *demonstratio*. See Girard, *Manuel*, p. 614 n. 2 and 3 and authorities there cited.

[2] Employed in the divisory actions, *i.e.* for dividing common property, partitioning an inheritance, or settling boundaries; the demand was that the judge should adjudicate (or assign) to each of the parties such a share as he though just. See Lenel, *Edict. Perpet.* 2nd ed. pp. 202, 205.

[3] Employed in certain actions upon delict, where the old penalties of death, slavery or talion had in practice, or by the praetor's authority, been transmuted into money payments, and the defendant consequently called upon to pay penal damages. According to Lenel, *Ed. Perp.* 2nd ed. p. 287, the form *dare facere praestare oportere* was probably used in actions *pro socio*.

[4] These latter have an analogy to the English "action on the case." In a few instances there was both civil and praetorian remedy for the same wrong; for Gaius observes (iv. 47) that in commodate and deposit failure of the borrower or depositary to return the thing lent to or deposited with him gave rise to actions that might be formulated either *in jus* or *in factum*. In the same section he gives the styles of *actiones depositi in jus* and *in factum conceptae*; their comparison is instructive. The formula *in factum* must almost certainly have been the earlier and shows, it is thought, that deposit and commodate were enforced (perhaps first by the peregrin praetor) by means of edicts before being admitted into the *jus civile*.

[5] Examples: "Si quis negotia alterius ... gesserit, judicium eo nomine dabo" (*Dig.* iii. 5, 3, pr.); "Quae dolo malo facta esse dicentur, si de his rebus alia actio non erit et justa causa esse videbitur, judicium dabo" (*Dig.* iv. 3, 1, § 1); "Nautae caupones stabularii quod cujusque salvum fore receperint, nisi restituent, in eos judicium dabo" (*Dig.* iv. 9, 1, pr.); "Quod quis commodasse dicetur, de eo judicium dabo" (*Dig.* xiii. 6. 1, pr.).

Our limits do not admit of any explanation of the purpose, form, or effect of the prescriptions, exceptions, replications, &c., that were engrafted on a *formula* when required; or of the ways in which the "condemnation" was occasionally "taxed" by the praetor, so as to prevent the award of extravagant damages; or of the consequences of defects in the formula; or of the procedure *in jure* before it was adjusted, or *in judicio* afterwards; or of appeal for review of the judgment by a higher tribunal; or of execution (which was against the estate of the judgment-debtor, and took the form of incarceration only when his goods could not be attached). Our main object has been to show how elastic was this procedure, and how the praetorian *formulae*, in conjunction with the relative announcements in the edict, supplied the vehicle for the introduction into the law of an immense amount of new doctrine. The system was fully developed before Julian's consolidation of the Edict; and the statutory recognition which the latter then obtained, though it stopped the praetor's power of amending the law, did nothing to impair the efficiency of the existing procedure.

Procedure extra ordinem.

Procedure extra Ordinem.[1]—The two-staged procedure, first *in jure* and then *in judicio*, constituted the *ordo judiciorum privatorum*. Early in the Empire, however, it became the practice in certain cases to abstain from adjusting a *formula* and making a remit to a *judex*, and to leave the cause in the hands of the magistrate from beginning to end. In these cases, speaking generally, the magistrate acted as an administrative official. Such cases did not necessarily come before the ordinary judicial praetors; on the contrary, they were committed as a rule to special officials (*e.g.* consuls) who were appointed to decide them by the emperors. This kind of procedure was adopted sometimes because the claim that was being made rested rather on moral than on legal right, and sometimes in order to avoid unnecessary disclosure of family misunderstandings. Thus, the earliest questions that were raised about testamentary trusts were sent for consideration and disposal to the consuls, apparently because, in the existing state of jurisprudence, it was thought incompetent for a beneficiary to maintain in reference to the heir (who had only been *requested* to comply with the testator's wishes) that he was bound in law to pay him (*dare oportere*) his bequest. Had the difficulty arisen at an earlier period, and in the heyday of the constructive energy of the praetors, they would probably have solved it with an *actio in factum*. As it was, it fell to the emperors to deal with it, and they adopted the method of *extraordinaria cognitio*, the jurisdiction which they in the first instance conferred on the consuls being before long confided to a magistrate specially designated for it,—the *praetor fidei commissarius*. Questions between tutors and their pupil wards in like manner began to be dealt with *extra ordinem*, the cognition being entrusted by Marcus Aurelius to a *praetor tutelaris*; while fiscal questions in which a private party was interested went to a *praetor fisci*, whose creation was due to Nerva. Claims for aliment between parent and child or patron and freedman rested on natural duty rather than on legal right; they could not therefore well be made the subject-matter of a *judicium*, and consequently went for disposal to the consuls or the city prefect, and in the provinces to the governor. Questions of status, especially of freedom or slavery, at least from the time of Marcus Aurelius, were also disposed of *extra ordinem*; and so were claims by physicians, advocates and public teachers for their *honoraria*, and by officials for their salaries, the Romans refusing to admit that these could be recovered by an ordinary action of location. In all those extraordinary cognitions the procedure began with a complaint addressed to the magistrate, instead of an *in jus vocatio* of the party complained against; it was for the magistrate to require the attendance of the latter (*evocatio*) if he thought the complaint relevant. The decision was a *judicatum* or *decretum* according to circumstances.

Direct magisterial intervention.

Jural Remedies flowing directly from the Magistrate's Imperium.[2]—Great as were the results for the law of the multiplication and simplification of *judicia* through the formular system, it may be questioned whether it did not benefit quite as much from the direct intervention of the praetors and other magistrates in certain cases in virtue of the *imperium* with which they were invested. This manifested itself principally in the form of (1) interdicts; (2) praetorian stipulations; (3) *missio in possessionem*; and (4) *in integrum restitutio*. All these had been in common use during the Republic.

Interdicts.

1. The interdicts[3] have already been referred to as in use under the régime of the *jus civile*; but their number and scope were vastly increased under that of the *jus praetorium*. The characteristic of the developed procedure by interdict was this—that in it the praetor reversed the ordinary course of things, and, instead of waiting for an inquiry into the facts alleged by a complainer, provisionally assumed them to be true and pronounced an order upon the respondent, which he was bound either to obey or show to be unjustified. The order pronounced might be either restitutory, exhibitory (in both cases usually spoken of in the texts as a *decretum*), or prohibitory:—restitutory, when, for example, the respondent was ordained to restore something he was alleged to have taken possession of by violent means, to remove impediments he had placed in the channel of a river, and the like; exhibitory, when he was ordained to produce something he was unwarrantably detaining, *e.g.* the body of a freeman he was holding as his slave, or a will in which the complainer alleged that he had an interest; prohibitory, as, for example, that he should not disturb the *status quo* of possession as between the complainer and himself, that he should not interfere with a highway, a watercourse, the access to a sepulchre, and so forth. If the respondent obeyed the order pronounced in a restitutory or exhibitory decree, there was an end of the matter. But frequently, and perhaps more often than not, the interdict was only the commencement of a litigation, facilitated by sponsions and restipulations, in which the questions had to be tried (1) whether the interdict or injunction was justified, (2) whether there had been breach of it, and, (3) if so, what damages were due in consequence. The procedure therefore was often anything but summary.

In the possessory interdicts *uti possidetis* and *utrubi* in particular it was extremely involved, due to some extent to the fact that they were double interdicts (*interdicta duplicia*), *i.e.* addressed indifferently to both parties. Gaius says, but, as most modern writers think, erroneously, that they had been devised as ancillary to a litigation about ownership, and for the purpose of deciding which of the parties, as possessor, was to have the advantage of standing on the defensive in the *rei vindicatio*.[4] That they were so used in his time, as in that of Justinian, cannot be doubted. But it is amazing that they should have been, for they were much more cumbrous than the *vindicatio* to which they led up. Take the interdict *uti possidetis*, which applied to immovables, as *utrubi* did to movables. Both parties being present, the praetor addressed them to this effect: "I forbid that one of you two who does not possess the house in question to use force in order to prevent the other who is in possession, provided he is so neither by clandestine or violent exclusion of the first, nor in virtue of a grant from him during pleasure, from continuing to possess as at present." It is manifest that this decided nothing; it was no more than a prohibition of disturbance of the *status quo*; it left the question entirely open which of the parties it was that was in possession, and which that was forbidden to interfere. The manner of its explication was somewhat singular. Each of the parties was bound at once to commit what in the case of one of them must have been a breach of the interdict, by a pretence of violence offered to the other (*vis ex conventu*);[5] each of them was thus in a position to say to the other: "We have both used force; but it was you alone that did it in defiance of the interdict, for it is I that am in possession." The interim enjoyment of the house was then awarded to the highest bidder, who gave his stipulatory promise to pay rent to his adversary in the event of the latter being successful in the long-run; penal sponsions and restipulations were exchanged upon the question which of them had committed a breach of the interdict; and on these, four in number, *formulae* were adjusted and sent to a *judex* for trial. If the procedure could not thus be explicated, because either of the parties declined to take part in the *vis ex conventu*, or the bidding, or the sponsions and restipulations, he was assumed to be in the wrong, and, by what was called a secondary interdict, required to yield up his possession or detention and to abstain from disturbing the other "in all time coming." Whatever we may think of the action system of the Romans in the period of the classical jurisprudence, one cannot help wondering at a procedure so cumbrous and complex as that of their possessory interdicts.

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[1] See Keller-Wach, *Civilprocess*, § 81; Bethmann-Hollweg, *Röm. Civilprocess*, vol. ii. § 122; Bekker, *Aktionen*, vol. ii. chap. 23; Baron, *Gesch. d. röm. Rechts*, vol. i. § 220.

[2] Keller-Wach, *Röm. Civilprocess*, §§ 74–80; Bethmann-Hollweg, *Röm. Civilprocess*, vol. ii. §§ 98, 119–121; Bekker, *Akt.* vol. ii. chaps. 16–18; Baron, vol. i. §§ 216–219. Procedure in these cases is also sometimes included under the term *cognitio extraordinaria*.

[3] In addition to the authorities in last note, see K. A. Schmidt, *Das Interdiktenverfahren d. Röm. in geschichtl. Entwickelung* (Leipzig, 1853); Machélard, *Théorie des interdits en droit romain* (Paris, 1864); Karlowa, *Röm. R. G.* ii. pp. 313 seq.; Ubbelohde, *Die Interdicte d. röm Rechts*, 1889–96 (in Gluck's *Pandecten Serie d. Bücher*, 43 and 44); Jobbé-Duval, *La Procédure civile chez les Romains* (1896), i. pp. 207 seq.

[4] If that had been their original purpose, they must have been unknown as long as a *rei vindicatio* proceeded *per sacramentum*; for in the sacramental real action both parties vindicated, and both consequently were at once plaintiffs and defendants.

[5] So Gaius calls it; it was probably the same thing as the *vis moribus facta* referred to by Cicero, *Pro Caec.* 1, § 2, 8, § 22.

Praetorian stipulations.

2. A praetorian stipulation[1] was a stipulatory engagement imposed upon a man by a magistrate or judge, in order to secure a third party from the chance of loss or prejudice through some act or omission either of him from whom the engagement was exacted or of some other person for whom he was responsible. Although called praetorian, because the cases in which such stipulations were exigible were set forth in the Edict, there can be no question that they originated in the *jus civile*; in fact, they were just a means of assuring to a man in advance the benefit of an action of the *jus civile* whereby he might obtain reparation for any injury suffered by him through the occurrence of the act or omission contemplated as possible. They were enforced nearly always by granting or refusing an action or by *missio in possessionem*. Ulpian classifies them (rather illogically) as cautionary (*cautionales*), judicial and common. The first were purely precautionary, and quite independent of any action already in dependence between the party moving the magistrate to exact the stipulation and him on whom it was desired to impose it. There were many varieties of them, connected with all branches of the law—for example, the *cautio damni infecti*, security against damage to a man's property in consequence, say, of the ruinous condition of his neighbour's house, the *cautio usufructuaria* that property usufructed should revert unimpaired to the owner on the expiry of the usufructuary's life interest, the aedilian stipulation against faults in a thing sold, and so forth. In all these cases the stipulation or *cautio* was a guarantee against future loss or injury, usually corroborated by sureties, and made effectual by an action on the stipulation in the event of loss or injury resulting. Judicial stipulations, according to Ulpian's classification, were those imposed by a judge in the course of and with reference to an action in dependence before him, as, for example, the *cautio judicatum solvi* (that the defendant would satisfy the judgment), the *cautio de dolo* (that a thing claimed in the action would not be fraudulently impaired in the meantime) and many others. Common were such as might either be imposed by a magistrate apart from any depending action or by a judge in the course of one, such as that taken from a tutor or curator for the faithful administration of his office, or from a procurator that his principal would ratify what he did.

Missio in possessionem.

3. *Missio in possessionem* was the putting of a person in possession provisionally in the first instance, either of the whole estate of another (*missio in bona*) or of some particular thing belonging to him (*missio in rem*). The former was by far the more important. It was resorted to as a means of execution not only against a judgment-debtor but also against a man who fraudulently kept out of the way and thus avoided summons in an action, or who, having been duly summoned, would not do what was expected on the part of a defendant; against the estate of a person deceased to which no heir would enter, thus leaving creditors without a debtor from whom they could enforce payment of their claims; and also against the estate that had belonged to a person who had undergone *capitis deminutio*, if the family head to whom he had subjected himself refused to be responsible for his debts. *Missio in rem* was granted where, for example, a man refused to give *cautio damni infecti*; the applicant was then put in possession of the ruinous property for his own protection.

In integrum restitutio.

4. *In integrum restitutio*,[2] reinstatement of an individual, on grounds of equity, in the position he had occupied before some occurrence which had resulted to his prejudice and for which no other legal remedy existed was one of the most remarkable manifestations of the exercise of magisterial *imperium*. It was not that the individual in question, either directly by action or indirectly by exception, obtained a judgment that either rendered what had happened comparatively harmless or gave him compensation in damages for the loss he had sustained from it, but that the magistrate—and it could only be the praetor, the urban or praetorian prefect, a provincial governor or the emperor himself—at his own hand pronounced a decree that as far as possible restored the *status quo ante*. It was not enough, however, to entitle a man to this extraordinary relief, that he was able to show that he had been taken advantage of to his hurt, and that no other adequate means of redress was open to him; he required in addition to be able to found on some subjective ground of restitution, such as minority, or, if he was of full age, intimidation which could not be resisted, mistake of fact, fraud, absence or the like. It required also to be applied for within a limited period—originally an *annus utilis*, but under Justinian a *quadriennium*—counting from the time the party was in a position to make the application. What should be held to amount to a sufficient ground of restitution, either objective or subjective, was at first left very much to the discretion of the magistrate; but even here practice and jurisprudence in time fixed the lines within which he ought to confine himself, and made the principles of *in integrum restitutio* as well settled almost as those of the *actio quod metus causa* or the *actio de dolo*.

V. The Period of Codification

(Diocletian to Justinian.)

i. *Historical Events that Influenced the Law.*

Emperors sole legislators.

Supremacy of the Emperors as Sole Legislators.—From the time of Diocletian onwards the making of the law was exclusively in the hands of the emperors. The senate still existed, but shorn of all its old functions alike of government and legislation.[3] The responses of patented jurists were a thing of the past. It was to the imperial consistory alone that men looked for interpretation of old law or promulgation of new.

In the reign of Diocletian rescripts were still abundant; but the constitutions in the Theodosian and Justinianian Codes from the time of Constantine downwards are mostly of a wider scope, and of the class known as general or edictal laws (*leges generales edictales*). It would be wrong, however, to infer that rescripts had ceased; for Justinian's Code contains various regulations as to their form, and the matter is dealt with again in one of his Novels. The reason why so few are preserved is that they were no longer authoritative except for the parties to whom they were addressed. This was expressly declared by the emperors Arcadius and Honorius in 398 in reference to those they issued in answer to applications for advice from officials; and it is not unreasonable to assume that a limitation of the same sort had been put at an earlier date on the authority of those addressed to private parties. Puchta is of opinion that the enactment of Honorius and Arcadius applied equally to *decreta*, for the reason that during this period matters of litigation did not come under the cognisance of the emperors except on appeal, and that under the new arrangements of Constantine the judgment of affirmance or reversal was embodied in a rescript addressed to the magistrate from whom the appeal had been taken. The rule of Arcadius and Honorius was renewed in 425 by Theodosius and Valentinian, who qualified it, however, to this extent—that, if it contained any distinct indication that the doctrine it laid down was meant to be of general application, then it was to be received as an edict or *lex generalis*. To this Justinian adhered in so far as rescripts in the old sense of the word were concerned; but he declared that his judgments (*decreta*) should be received everywhere as laws of general application, and so should any interpretation given by him of a *lex generalis*, even though elicited by the petition of a private party. The imperial edicts, adjusted in the consistory, were usually addressed to the people, the senate or some official, civil, military or ecclesiastical, according to the nature of their subject-matter.

Christianity—its influence.

Influence of Christianity.[4]—A disposition has sometimes been manifested to credit nascent Christianity with the humaner spirit which began to operate on some of the institutions of the law in the first century of the Empire, but which in a previous section we have ascribed to the infiltration into the *jus civile* of doctrines of the *jus naturale*, the product of the philosophy of the Stoa. The teaching of Seneca did quite as much—nay, far more—to influence it then than the lessons that were taught in the little assemblies of the early converts. It would be a bold thing to say that, had Christianity never gained its predominance, that spirit of natural right would not have continued to animate the course of legislation, and to evoke, as years progressed, most of those amendments in the law of the family and the law of succession that were amongst the most valuable contributions of the imperial constitutions to the private law. It may well be that that spirit was intensified and rendered more active with the growth of Christian belief; but not until the latter had been publicly sanctioned by Constantine, and more especially after Theodosius declared it to be the religion of the state, do we meet with incontestable records of its influence. We find them in enactments in favour of the church and its property, and of its privileges as a legatee; in those conferring or imposing on the bishops a supervision of charities and charitable institutions, and a power of interfering in matters of guardianship; in the legitimation *per subsequens matrimonium* of children born of concubines; in the introduction of a mode of manumitting slaves *in facie ecclesiae*;

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[1] Schirmer, *Ueber die prätorischen Judicial-Stipulationen* (Greifswald, 1853); Keller-Wach, *Civilprocess*, § 77; Bekker, *Aktionen*, ii. chap. 16.

[2] Savigny, *System d. röm. Rechts.* vol. vii. §§ 315–343; Karlowa, *Röm. R. G.* ii. pp. 1064–1104; Keller-Wach, *op. cit.* § 79; Bekker, *Aktionen*, ii. chap. 18.

[3] There was a senate both at Constantinople and at Rome during the later Empire. In his History, Zosimus, iii. 11, says: [Ἰουλιανὸς] ἔδωκε μὲν τῇ πόλει [Κωνσταντινουπόλει] γερουσίαν ἔχειν ὥσπερ τῇ Ῥώμῃ. Both senates were addressed by the emperors on matters of legislation. See *Cod.* Theod. vi. 2.

[4] See Troplong, *De l'influence du christianisme sur le droit civil des Romains* (Paris, 1843, and subsequently); Merivale, *The Conversion of the Roman Empire* (Boyle Lectures for 1864) (London, 1864), particularly lect. iv.; Allard, *Le Christianisme et l'empire romain* (2nd ed., Paris, 1897).

in the recognition of the efficacy of certain acts done in presence of two or three of the clergy and thereafter recorded in the church registers; in the disabilities as to marriage and succession with which heretics and apostates were visited, and in a variety of minor matters. Of greater importance were three features for which it was directly responsible—the repeal of the caduciary provisions of the Papia-Poppaean law, the penalties imposed upon divorce, and the institution of the *episcopalis audientia.*

The purpose of the caduciary law was to discourage celibacy and encourage fruitful marriages; but legislation in such a spirit could not possibly be maintained when celibacy had come to be inculcated as a virtue, and as the peculiar characteristic of a holy life. The penalties alike of *orbitas* and *coelibatus* were abolished by Constantine in the year 320. The legislation about divorce, from the first of Constantine's enactments on the subject down to those of Justinian, forms a miserable chapter in the history of the law. Not one of the emperors who busied himself with the matter, undoing the ill-advised work of his predecessors and substituting legislation of his own quite as complicated and futile, thought of interfering with the old principle that divorce ought to be as free as marriage and independent of the sanction or decree of a judicial tribunal. Justinian was the first who, by one of his Novels, imposed a condition on parties to a divorce of common accord (*communi consensu*), namely, that they should both enter a convent, otherwise it should be null; but, so distasteful was this to popular feeling, and so little conducive to improvement of the tone of morals within the conventual precincts, that it was repealed by his successor. The legislation of Justinian's predecessors and the bulk of his own were levelled at one-sided repudiations, imposing penalties, personal and patrimonial (1) upon the author of a repudiation on some ground the law did not recognize as sufficient—and the lawful grounds varied almost from reign to reign—and (2) upon the party whose misconduct gave rise to a repudiation that was justifiable. The bishop's court (*episcopale judicium, episcopalis audientia*) had its origin in the practice of the primitive Christians, in accordance with the apostolic precept, of submitting their differences to one or two of their brethren in the faith, usually a presbyter or bishop, who acted as arbiter. On the state recognition of Christianity the practice obtained legislative sanction, Constantine giving the bishop's court concurrent jurisdiction with the ordinary civil courts where both parties preferred the former, and by a later enactment (whose authenticity, however, is open to some doubt) going so far as to empower one of the parties to a suit to remove it to the ecclesiastical tribunal against the will of the other. He also declared that the judgments were to be enforced by the civil courts.[1] For various reasons, advantage was taken of this power of resorting to the bishop to an extent which seriously interfered with the proper discharge of his spiritual functions, so that in 398 Arcadius in the Eastern Empire judged it expedient to revert to Constantine's original rule, and, at least as regarded laymen, to limit the right of resort to the episcopal judicatory to cases in which both parties consented. The same thing was done by Valentinian in the Western Empire in 452. It is impossible to say with any approach to exactitude what effect this intervention of the clergy as judges in ordinary civil causes—for they had no proper criminal jurisdiction—had on the development of the law. But it can hardly have been without some influence in still further promoting the tendency to subordinate act and word to will and intention, to deal leniently with technicalities, and to temper the rules of the *jus civile* with equity and considerations of natural right.

New methods of procedure.

Abandonment of the Formular System of Procedure.[2]—The formular system, with its remit from the praetor to a sworn *judex* who was to try the cause, was of infinite advantage to the law; for the judgment was as a rule that of a free and independent citizen, untrammelled by officialism, fresh from some centre of business, chosen by, and in full sympathy with, the parties between whom he had to decide. Such a system was incompatible with the autocratic government of Diocletian and Constantine; and it is with no surprise that we find the former of these sovereigns instructing the provincial governors that in future, unless when prevented by pressure of business (or, according to a later constitution of Julian's, when the matter was of trifling importance), they were not to remit them but were themselves to hear the causes brought before them from first to last, as had previously been the practice in the *extraordinariae cognitiones.* The remit in the excepted cases was not, as formerly, to a private citizen, but to what was called a *judex pedaneus*, who acted as an inferior substitute of the magistrate and was probably a matriculated member of the local bar; and for a time his delegated authority was embodied in a *formula* after the old fashion. But even this exceptional use of it did not long survive, for an enactment by the two sons of Constantine, conceived in terms the most comprehensive, declared fixed styles to be but traps for the unwary, and forbade their use in any legal act whatever, whether contentious or voluntary. The result was, not only the formal disappearance of the distinction between the proceedings *in jure* and *in judicio* (*judicium* receiving a more extensive meaning) but the practical (though not formal) disappearance also of the distinctions between actions *in jus* and *in factum*, and between *actiones directae* and *actiones utiles*, the conversion of the interdict into an *actio ex interdicto*, admission of the power of amendment of the pleadings, condemnation in the specific thing claimed, if in existence, instead of its pecuniary equivalent, and execution accordingly by the aid of officers of the law.

Under the new system a process was full from first to last of intervention by officials. The *in jus vocatio* of the XII. Tables—the procedure by which a plaintiff himself brought his adversary into court—became a thing of the past. So also did the *vadimonium.* In the earlier part of the period the proceedings commenced with the *litis denuntiatio* introduced in the time of Marcus Aurelius and remodelled by Constantine; but under Justinian (though probably begun before his reign) the initial step was what was called the *libellus conventionis.* This was a short and precise written statement addressed by the plaintiff to the court, explaining (but without detail) the nature of the action he proposed to raise and the claim he was making, which was accompanied by a formal undertaking to proceed with the cause and follow it out to judgment, under penalty of having to pay double costs to the defendant. If the judge was satisfied of the relevancy of the libel, he pronounced an interlocutor (*interlocutio*) ordaining its service on the respondent; this was done by an officer of the court, who cited him to appear on a day named, usually at a distance of one or two months. The defendant, through the officer, had to put in an answer (*libellus contradictionis*), at the same time giving security for the proper maintenance of the defence and eventual satisfaction of the judgment. If defendant did not appear after three summonses the case was heard and decree given in his absence. On the day appointed the parties or their procurators were first heard on any dilatory pleas, such as defect of jurisdiction; if none were offered, or those stated repelled, they then proceeded to expound their respective grounds of action and defence, each finally making oath of his good faith in the matter (*juramentum calumniae*), and their counsel doing the same.

From this point, which marked the *litis contestatio* or joinder of issue, the procedure was much the same as that *in judicio* under the formular system. Evidence was taken and judgment given. But in all cases in which the demand was that a particular thing should be given or restored, and the plaintiff desired to have the thing itself rather than damages, execution might be specific and effected through officers of the law (*manu militari*). Where, on the other hand, the condemnation was pecuniary, the usual course, where performance was not made, was for the judge, through his officers, to take possession of such things belonging to the defendant as were thought sufficient to satisfy the judgment (*pignus in causa judicati captum*), and they were eventually sold judicially if the defendant still refused to pay; the *missio in bona* of the classical period was not resorted to except in the case of insolvency.

Valentinian's law of citations.

The Valentinian Law of Citations.[3]—This famous enactment, the production of Theodosius (II.), tutor of the youthful Valentinian III., was issued from Ravenna in the year 426, and was addressed to the Roman senate. It ran thus:—

"We accord our approval of all the writings of Papinian, Paul, Gaius, Ulpian and Modestine, conceding to Gaius the same authority that is enjoyed by Paul, Ulpian and the rest, and sanctioning the citation of all his works. We ratify also the jurisprudence (*scientia*) of those earlier writers whose treatises and statements of the law the aforesaid five have imported into their own works,—Scaevola, for example, and Sabinus, and Julian, and Marcellus,—and of all others whom they have been in the habit of quoting as authorities (*omniumque quos illi celebrarunt*), provided always, as their antiquity makes them uncertain, that the texts of those earlier jurists are verified by collation of manuscripts.[4] If divergent *dicta* be adduced, that party shall prevail who has the greatest number of authorities on his side; if the number on each side be the same, that one shall prevail which has the support of Papinian; but, whilst he, most excellent of them all, is to be preferred to any other single authority, he must yield to any two. [Paul's and Ulpian's notes on his writings, however, as already enacted, are to be disregarded.] Where opinions are equal, and none entitled to preference, we leave it to the discretion of the judge which he shall adopt."

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[1] The truth of this as well as the previous rule depends on the authenticity of a Sirmondian constitution. See Cuq, *Inst. Jurid.* ii. p. 868 n.

[2] Wieding, *Der Justinianeische Libellprocess* (Vienna, 1865); Bethmann-Hollweg (*Gesch. d. C. P.*), vol. iii. (1866); Muther (rev. Wieding), in the *Krit. Vierteljahrschrift.* vol. ix. (1867), pp. 161 seq., 329 seq.; Wieding, in same journal, vol. xii. (1870), pp. 228 seq.; Bekker, *Aktionen*, vol. ii. chaps. 23, 24; Cuq, *Inst. Jurid.* 2nd ed. ii. pp. 875 seq.

[3] *Theod. Cod.* i. 4, 3; Puchta, in the *Rhein, Museum f. Jurisprud.* vol. v. (1832), pp. 141 seq., and *Verm. Schriften* (Leipzig, 1851), pp. 284 seq.; Karlowa, *Röm. Rechtsgesch.* vol. i. pp. 933 seq.; Sohm, *Inst.* § 21, nn. 1 and 2, and authorities there cited.

[4] There is, however, a good deal of doubt as to what is meant by the words *collatione codicum* in this Edict. See Sohm as in preceding note, and authorities cited by him.

This constitution has always been regarded as a signal proof of the lamentable condition into which jurisprudence had sunk in the beginning of the 5th century. Constantine, a hundred years earlier, had condemned the notes of Ulpian and Paul upon Papinian. There were no longer any living jurists to lay down the law (*jura condere*); and, if it was to be gathered from the writings of those who were dead, it was perhaps as well that the use of them should be regulated. The Valentinian law proceeded so far in the same direction. It made a selection of the jurisconsults of the past whose works alone were to be allowed to be cited,—Papinian, Paul, Ulpian and Modestine, the four latest patented counsel of any distinction; Gaius, of authority previously only in the schools, but whose writings were now approved universally, notwithstanding that he had never possessed the *jus respondendi*; and all the earlier jurists whose dicta these five had accepted. But it went yet a step further, for it declared all of them, with the sole exception of Papinian, to be of the same authority, and degraded the function of the judge in most cases—so far at least as a question of law was concerned—to the purely arithmetical task of counting up the names which the industry of the advocates on either side had succeeded in adducing in support of these respective contentions. It is probable that, from the days of Hadrian down to Severus Alexander, when the emperor in his council had to frame a rescript or a decree, its tenor would be decided by the vote of the majority; but that was after argument and counter-argument, which must in many cases have modified first impressions. Taking the votes of dead men, who had not heard each other's reasons for their opinions, was a very different process. It may have been necessary; but it can have been so only because a living jurisprudence had no existence,—because the constructive talent of the earlier Empire had entirely disappeared.

ii. *Ante-Justinian Collections of Statutes and Jurisprudence.*

Collections of statutes. Codification.

Of cardinal importance for this period were the collections of imperial constitutions made prior to Justinian. There were three of these, viz. the Gregorian, the Hermogenian and the Theodosian Codes;[1] the first two being the work of private hands, though they afterwards received statutory sanction from Theodosius II., the third being due to that emperor himself.

Gregorian Code.

Codex Gregorianus.—This was a collection of imperial constitutions from Hadrian to Diocletian, made by a certain Gregorius about the end of the 3rd century (*a.* 295?), who, in Mommsen's opinion[2] was at that time a professor at the law school of Beirut. Only fragments of it have come down to us, obtained chiefly from Alaric's Breviary, the *Lex Romana Burgundionum*, the *Consultatio*, the *Collatio* and the Vatican Fragments mentioned below; but it was a work of considerable size, divided into books and titles.

Hermogenian Code.

Codex Hermogenianus.[3]—This, like the Gregorian, was compiled in the Eastern Empire, apparently at the end of the 3rd century, but at any rate not later than the year 324. As, however, it contains a constitution of the year 365 there must have been subsequent additions to it. Only fragmentary remains of it are extant, obtained from the same sources as the Gregorian. Its author was a certain Hermogenianus (perhaps the jurist of that name cited in the Digest), and the work seems to have been intended as a sort of supplement to the Gregorian Code. It was a smaller work than the latter, being divided only into titles, and, unlike it, contains no pre-Diocletian constitutions. It has, however, a great number of contemporary ones, issued by Diocletian especially during the years 293 and 294. It was from this work and that of Gregorius that Justinian obtained the constitutions contained in his Code for the period prior to Constantine, and from the language he uses about the two Codes it would seem that they had been regarded in the courts before his time as the only authoritative record of constitutions during the period covered by them.

Theodosian Code.

Codex Theodosianus.—In the year 429 the emperor Theodosius nominated a commission of nine persons to collect the constitutions issued by the emperors from Constantine to his own reign. From the terms of the edict appointing them he seems to have intended to initiate the preparation of a body of law which, if his scheme had been carried into execution, would have rendered that of Justinian unnecessary. In a constitution about ten years later he explains the motives that had actuated him: that he saw with concern the poverty-stricken state of jurisprudence and how few men there were who, notwithstanding the prizes that awaited them, were able to make themselves familiar with the whole range of law; and that he attributed it very much to the multitude of books and the large mass of statutes through which the law was dispersed, and which it was next to impossible for any ordinary mortal to master. His scheme was eventually to compile one single code from materials derived alike from the writings of the jurists, the Gregorian and Hermogenian collections of rescripts, and the constitutions from the time of Constantine downwards. His language leaves little doubt that it was his intention to have this general code carefully prepared, so as to make it a complete exponent of the existing law, which should take the place of everything, statutory or jurisprudential, of an earlier date. The collection of constitutions which he directed his commissioners meantime to prepare, and which was to contain even those that were merely of historical interest (provided only it was made clear how later enactments had affected them), was to be the first step in the execution of his project. For some reason or other nothing followed upon this enactment, and in 435 a new commission of sixteen persons was nominated to collect the constitutions, but nothing was said in their instructions about anything ulterior. They were directed, however, to deal with their material in a systematic way, as by arranging the constitutions chronologically under definite titles, separating, where necessary, any constitutions dealing with more than one matter into parts, so as to bring each matter under its proper title, and with power otherwise to make such omissions, additions and alterations as seemed good to them for the same object. The work was completed in less than three years and published at Constantinople early in the year 438, with the declaration that it should take effect from the 1st of January following, and a copy was sent to Valentinian, who notified it to the senate at Rome and ordained that it should come into force in the West from the 12th of January 439. The arrangement is in sixteen books, subdivided into titles with rubrics in which the constitutions are as a rule (though not consistently) placed in chronological order. They cover the whole field of law, private and public, civil and criminal, fiscal and administrative, military and ecclesiastical. The private law is contained in the first five books. This code was usually called in later documents "Theodosianus," without *codex* adjected. All constitutions since Constantine not contained in it were abrogated. The manuscripts in which it has come down to us are very defective, but many lacunae have been filled up from other sources, especially from Alaric's Breviary. Unfortunately the lacunae are principally in the books relating to the private law.[4]

Post-Theodosian Novels.

Novellae Post-Theodosianae.—The imperial constitutions subsequent to the publication of the *Theodosianus* got the name of Novels (*novellae leges*). There were three collections of these, all made in the Western Empire, and they are generally known as post-Theodosian Novels. The first collection containing edicts of Theodosius himself, sent by him to Valentinian III. in 447, was published by the latter emperor in the following year. The second collection contained in addition to edicts of Theodosius some edicts of Marcian and other emperors of the East, and also some of Valentinian, Majorian and other emperors of the West. The third collection was published in abridged form in Alaric's Breviary. These collections are not extant, but from Alaric's Breviary, with additions from manuscript sources, modern editions of the Novels have been prepared.[5] There was also a collection of constitutions, issued between the years 331 and 425, nearly all relating to church matters, first published by T. Sirmondus in 1631, and now known as the Sirmondian Constitutions.[6]

Jurisprudential collections.

Besides the collections of statutes just mentioned there were a number of juristic works of this period, containing both statute law (*leges*) and common law (*jus*) in combination, made by private individuals. Of these the following, which have come down to us in a more or less imperfect condition, are the most important:—

Collatio.

The *Collatio Legum Mosaicarum et Romanarum*[7]—or, as its title bears, *Lex Dei quam praecipit Dominus ad Moysen*—is a parallel of divine and human law, especially in the matter of delicts and punishments, the former drawn from the Pentateuch, and the latter from the works of Gaius, Papinian, Paul, Ulpian, and

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[1] Mommsen suggests (*Z. d. Sav. Stift.*, 1889, x. pp. 345 seq.) that the name *codex* (meaning a volume) was given to them because, instead of being written on papyrus rolls, they were originally written in the form of *tabulae publicae* and bound together as a parchment volume. Private collections of Constitutions had been made even earlier than Gregorian (*e.g.* by Papirius Justus).

[2] *Z. d. Sav. Stift.* xxii. pp. 139 seq.

[3] Mommsen, *Z. d. Sav. Stift.* (1889), x. pp. 347 seq.; Kipp, *Gesch. d. Quellen*, pp. 78–79. The fragments of both this and the Gregorian Code, edited by Krüger, are given in the *Collectio Juris Antej.* by K. M. and S., vol. iii. pp. 236–245.

[4] There have been several editions of the Theodosian Code. That of J. Gothofredus, published after his death in 1652 (ed. with additions by Ritter in 7 vols., Leipzig, 1736–41), is a work of monumental learning and still indispensable on account of its commentary. But the latest and best edition is that of Mommsen, being the last work from the pen of that great master. It has been published at Berlin in 1905 under the title, *Theodosiani libri xvi. cum constitutionibus Sirmondianis et leges novellae ad Theodosianum pertinentes ediderunt Th. Mommsen et Paulus M. Meyer: I. Theodosiani libri xvi. cum constitutionibus Sirmondianis edidit, adsumpto apparatu P. Krugeri, Th. Mommsen* (1905).

[5] These Novels, so far as preserved, have been published as a second part of Mommsen's edition of the Theodosian Code. *II. Leges ad Theodosianum pertinentes edidit adjutore Th. Mommseno Paulus M. Meyer* (1905).

[6] These are contained in the Mommsen-Meyer edition of the *Theodosianus*.

[7] *Collectio Juris Antejustiniani*, by Krüger and Mommsen, iii. pp. 107 seq.; Girard, *Textes*, pp. 543 seq.; Krüger, *Quellen*, pp. 302 seq.

Modestine, rescripts from the Gregorian and Hermogenian Codes, and one later general enactment. Its date is probably soon after the year 390, but its authorship is unknown.[1]

Vatican fragments.

Fragmenta Vaticana.[2]—These fragments, discovered by Cardinal Angelo Mai in a palimpsest in the Vatican in 1821, seem to have formed part of a book of practice, compiled in the Western Empire and of considerable dimensions. The extant fragments of the Titles into which it was divided deal with sale, usufruct, dowries, donations, tutories and processional agency, and have been extracted from the writings of Papinian, Paul the Ulpian, an unknown work on interdicts, and the imperial constitutions prior to Theodosius, the latest of which is of the year 372. Its antiquity is therefore probably about the same as that of the *Collatio*.[3]

Consultatio.

The Consultatio.[4]—The so-called *Veteris cujusdam Jurisconsulti Consultatio* was first published in 1577 by Cujas, from whom it got its name. It is a collection of answers by an advocate, supported by citations of texts (*consultationes*) upon questions of law submitted for his opinion by a solicitor, and is of value for the extracts it contains from Paul's Sentences and the three above-mentioned codes. It is thought to have been written in Gaul in the end of the 5th or beginning of the 6th century.

Syro-Roman Law-Book.

Syro-Roman Law-Book.[5]—This was a sort of manual of Roman law drawn up in the East, apparently in the Greek language, at an uncertain date, but some time between Theodosius and Justinian. Translations of it into Syriac, Arabic and Armenian have come down to us, and it would seem that the work in these translations was greatly made use of in legal practice in the East (especially in the ecclesiastical Courts) for several centuries, having in some places more authority attached to it than had the Digest and Code of Justinian. As a repertory of Roman law it is of little value, as it misunderstands or varies from that law in many respects, but it is of importance as showing how firmly Hellenic law and customs maintained themselves in the East during the decay of the Empire.[6]

Light has also been thrown upon the ante-Justinian law by the numerous papyri documents, mostly in Greek, that have been in recent years recovered in Egypt (especially by Grenfell and Hunt) and elsewhere.[7] Mitteis, Gradenwitz and others have done much to elucidate these, by numerous publications. But to give anything like a consecutive account of them would occupy much space and cannot be attempted here.[8]

Romano-Barbarian Codes.

Romano-Barbarian Codes (*Leges Romanae*).[9]—Besides the collections of statutes and juristic law mentioned in this section, there were several official collections made prior to Justinian in Western Europe, after it had fallen under the dominion of Gothic and other kings. There are three of these which require special notice—each of them compiled from documentary sources of ante-Justinian law. Though of considerable use in explicating difficulties and filling up lacunae in the earlier law sources, they must be used with caution for that purpose, as they contain not a few corruptions of the original texts. They are:—

Edict of Theoderic.

1. *Edictum Theoderici.*[10]—This was compiled at the instance of Theodoric, king of the Ostrogoths, not long after the year 500 (not later than 515). Theoderic after he had conquered Italy desired to be representative of the emperor and always acknowledged his suzerainty. He did not aim at being an independent legislator, and his Edict is therefore of limited scope and in no proper sense a code. Its materials were mainly drawn, without however indication given, from the writings of Paul, the Gregorian, Hermogenian and Theodosian Codes, and the post-Theodosian Novels. Divided into 155 chapters, with no systematic arrangement, it touches upon all branches of the law, public and private, but especially criminal law and procedure. Though it contains a certain infusion of Gothic law and was professedly intended to apply to all Theoderic's subjects, both Goths and Romans, it seems nevertheless generally admitted that this idea cannot have been fully realized, and that in some matters with which it deals, *e.g.* the law of the family, Gothic customs must still have continued to prevail for Gothic subjects.

West Gothic Code.

2 The *Lex Romana Wisigothorum* or *Breviarium Alarici* or *Alaricianum*[11] (both of these titles are modern) was a much more ambitious and important collection than the one last mentioned. It was compiled by a commission of lawyers appointed by Alaric II., king of the Western Goths, with approval of the bishops and nobles, and published at Aire in Gascony in the year 506. The compilers selected their material partly from the *leges* (imperial constitutions after Diocletian) and partly from the *vetus jus* (juristic law), taking what they considered appropriate, without materially altering the text of their authorities except in the way of excision of passages that were obsolete or superseded. For the *leges* they utilized some 400 of the 3400 enactments (according to Haenel's estimate) of the Theodosian Code and about 30 of the Post-Theodosian Novels; for the *jus* they made use of Paul's Sentences, Gaius's Institutes (in a corrupt and greatly abridged form in two books dating probably from, and adapted to the law of, the 5th century), the first book of Papinian's Responses (a single *responsum*), and the Gregorian and Hermogenian Collections (which were treated as *jus*). All of these, except Gaius (for the reason mentioned), were accompanied by *interpretationes* (*i.e.* for the most part explanatory adaptations of the passages to the existing practice) which were largely borrowed from books in current use for purposes of instruction, and which resemble the interpretation of the XII. Tables in that they are often not so much explanatory of the text as qualificative or corrective. The Breviary exercised great influence in western Europe; and there is no question that, until the rise of the Bologna school in the end of the 11th century, it was from it more than from the books of Justinian that western Europe, other than Italy, acquired its scanty knowledge of Roman law.

The Burgundian Code.

3. The *Lex Romana Burgundionum*[12]—to which erroneously, about the 9th century, owing to a mistake of a MS. transcriber, the name *Papianus* (a contraction of *Papinianus*) was given. It is a collection which King Gundobad, when publishing his code of native law (*Lex Gundobada*) for his native subjects, had promised should be prepared for the use of his Roman subjects. It was published probably before his death in 516. It deals with private law, criminal law and procedure, distributed through forty-seven titles, and is arranged much in the same order as the *Gundobada*, from which it has a few extracts. Its statutory Roman sources are the same as those of the Breviary; its juristic sources are Paul's Sentences and a work of Gaius of which we cannot say with certainty that it is his Institutes. It also contains some *interpretationes* of the same character as those in the Breviary, but whether taken directly from the latter or not is disputed. After the conquest of the Burgundian kingdom by the Franks this code ceased to have any direct authority, but was used in the courts as a sort of supplement to the Breviary, being often bound in the same volume with the latter.

iii. *Justinian's Legislation.*

Justinian's codification.

Justinian's Collections and his own Legislation.—The history of Justinian outside his legislative achievements, and his collections in detail, are dealt with in the article JUSTINIAN I. Ambitious to carry out a reform more complete even than that which Theodosius had planned but failed to execute, he took the first step towards it little more than six months after the death of his uncle Justin, in the appointment of a commission to prepare a collection of statute law (*leges*), among which he included the rescripts of the Gregorian and Hermogenian Codes, which were commonly at this period described as *jus*. It was published in April 529; and in rapid succession there followed his Fifty Decisions

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[1] For opinions as to its author, see Girard, *l.c.* p. 543. He must have been an ecclesiastic.

[2] *Collectio Jur. Antej.* iii. pp. 1 seq. (ed. Mommsen); Karlowa, *Röm. R.G.* i. pp. 969 seq.; Krüger, *Quellen*, pp. 298–302.

[3] Mommsen, however (*Collectio*, iii. p. 11), thinks it was compiled about the time of Constantine.

[4] *Collect. Jur. Antej.* iii. pp. 203–20; Girard, *Textes*, pp. 590 seq. See Krüger, *Quellen*, pp. 305–7.

[5] Ed. by Bruns and Sachau under the name *Syrisch-Römisches Rechtsbuch aus dem fünften Jahrhundert* (Leipzig, 1880). See Esmein, *Mélanges*, pp. 403 seq.; Ferrini, *Z. d. Sav. Stift.* (1902), xxiii. pp. 101 seq.; Krüger, *Quellen*, pp. 320 seq.

[6] The first volume of a complete collection of the versions of the Syrian Law-Book, with a translation into German by Sachau, was published at Berlin in 1907.

[7] *E.g.* the *Amherst Papyri*, by Grenfell and Hunt. See *Archiv für Papyrusforschung* (since 1900).

[8] For an account of the papyri found at Sinai, containing parts of a commentary on Ulpian, *ad Sabinum*, supposed to have been written after A.D. 438, see Muirhead, *Hist. Introd.* p. 374, and Girard, *Textes*, p. 578. For other papyri, see Girard, *op. cit.* pp. 838–44.

[9] See Krüger, *Gesch. d. Quellen*, § 41; Brunner, *Deutsche Rechtsgesch.* (1887), i. §§ 49, 50.

[10] Ed. Bluhme in Pertz's *Monumenta Germaniae*, *Leges*, v. pp. 145 seq. (Hanover, 1875); see Savigny, *Gesch. d. r. R.* ii. pp. 172 seq.; Gaudenzi in *Z. d. Sav. Stift.* (*Germ. Abtheil.*), 1886, vii. pp. 29 seq.

[11] Ed. Haenel (Leipzig, 1849); Conrat (Cohn), *Brev. Alaricianum* (1903). This work of Cohn is a systematic arrangement of the Breviary, with the Latin text as given by Haenel, and a translation into German of the *interpretatio* (or, where there is none, of the text itself), and some explanatory notes. See Karlowa, *Röm. R.G.* i. pp. 976 seq.; Krüger, *Quellen*, § 40.

[12] Ed. Bluhme in Pertz's *Monumenta German. Hist. Leges*, iii. pp. 505 seq. (Hanover, 1863); *de Salis Monum. Germ. Leg.* sec. I. and ii. p. 1 (Hanover, 1892). See Karlowa, *Röm. R.G.* i. pp. 983–985.

(529–531), his Institutes[1] (November 21, 533), his Digest of excerpts from the writings of the jurists (December 16, 533),[2] and the revised edition of his Code, in which he incorporated his own legislation down to date (November 16, 534).[3] From that time down to his death in 565 there followed a series of Novels (*novellae constitutiones*), mostly in Greek, which were never officially collected, and of which probably some have been lost.[4]

His own enactments.

Taking his enactments in the Code and his Novels together, we have of Justinian's own legislation not far short of 600 constitutions. Diocletian's contributions to the Code are more than twice as numerous; but most of them professed to be nothing more than short declaratory statements of pre-existing law, whereas Justinian's, apart from his Fifty Decisions, were mostly reformatory enactments, many of those in the Novels as long as an average act of parliament, and often dealing with diverse matters under the same rubric. They cover the whole field of law, public and private, civil and criminal, secular and ecclesiastical. It cannot be said that they afford pleasant reading: they are so disfigured by redundancy of language, involved periods and nauseous self-glorification. But it cannot be denied that many of those which deal with the private law embody reforms of great moment and of most salutary tendency. The emperor sometimes loved to pose as the champion of the simplicity and even-handedness of the early law, at others to denounce it for its subtleties; sometimes he allowed himself to be influenced by his own extreme asceticism, and now and again we detect traces of subservience to the imperious will of his consort; but in the main his legislation was dictated by what he was pleased to call *humanitas* so far as the law of persons was concerned, and by *naturalis ratio* and public utility so far as concerned that of things. The result was the eradication of almost every trace of the old *jus Quiritium*, and the substitution for it, under the name of *jus Romanum*, of that cosmopolitan body of law which has contributed so largely to almost every modern system.

Law of family relations.

Changes in the Law of the Family.—With the Christian emperors, from Constantine downwards, almost the last traces disappeared of the old conception of the *familia* as an aggregate of persons and estate subject absolutely to the power and dominion of its head. *Manus*, the power in a husband over his wife and her belongings, was a thing of the past; both stood now on a footing of equality before the law; perhaps it might be more accurate to say, at least with reference to the Justinianian legislation, that the wife was the more privileged of the two in respect both of the protection and the indulgence the law accorded her. With *manus* the old confarreation and coemption had ceased, marriage needing nothing more than simple interchange of consent, except as between persons of rank (*illustres*) or when the intention was to legitimate previous issue; in the latter case a written marriage settlement (*instrumentum dotale*) was required, and in the former both such a settlement and a marriage in church before the bishop and at least three clerical witnesses, who granted and signed a certificate of the completed union. The legislation of the Christian emperors on the subject of divorce, largely contributed to by Justinian in his Novels, has already been referred to. In regard to the *dos*, many new provisions were introduced, principally for curtailing the husband's power of dealing with it while the marriage lasted, enlarging the right of the wife and her heirs in respect of it, and simplifying the means of recovering it from the husband or his heirs when the marriage was dissolved. Between the time of Constantine and that of Theodosius and Valentinian a new form of matrimonial settlement became established. It became apparently a legally sanctioned practice for a man to make (apart from ordinary marriage presents) a settlement on his intended wife either by actual transfer or by promise of a provision which was to remain his property (though without the power of alienation) during the marriage, but to pass to her on his predecease or on divorce by his fault. This got the name of *donatio ante nuptias*, or sometimes, as being a sort of counterpart for the *dos*, *antipherna*. There was some important legislation about it by the two last-mentioned emperors; Leo and Justin followed suit; and Justinian, in his Code and Novels, published five or six enactments for its regulation. The general result was that, wherever a *dos* was given or promised on the part of the wife, there a *donatio* of equal amount was to be constituted on the part of the husband; that, if one was increased during the marriage, a corresponding increase was to be made to the other; that it might be constituted or increased after the marriage without infringing the rule prohibiting donations between husband and wife, which caused Justinian to change its name to *donatio propter nuptias*; that the wife might demand its transfer to her (to the same extent as she could that of the *dos*) on her husband's insolvency, but under obligation to apply its income to the maintenance of the family; and that on the dissolution of the marriage by her husband's death or by a divorce for which he was in fault, she had an hypothec and other ample remedies for reducing it into possession.[5]

The change in the complexion of the relations between husband and wife under the Christian emperors, however, was insignificant when compared with that which had overtaken the relation between parent and child. Justinian in his Institutes reproduces the boast of Gaius that nowhere else had a father such power over his children as was exercised by a Roman *paterfamilias*. True it is that the *patria potestas* in name still held a prominent place in the Justinianian collections; but it had been shorn of most of the prerogatives that had characterized it in earlier periods. To expose a newborn child was forbidden under penalties. To take the life of a grown-up one—unless it was a daughter slain with her paramour in the act of adultery—was murder; for the domestic tribunal, with the judicial power of life and death in the *paterfamilias* as its head, had long disappeared.

Further, a parent could no longer sell his child save only when the child was an infant and he in such extreme poverty as to be unable to support it. Even the right to make a noxal surrender of his son to a party who had suffered from the latter's delict had silently become obsolete; so greatly had altered sentiment, in sympathy with legislation, curtailed the power of the *paterfamilias* over those in his *potestas*. This *noxae deditio* was formally abolished by Justinian. All that remained of the *patria potestas*, in short, in the Justinianian law was little more than would be sanctioned in most modern systems as natural emanations of the paternal relationship. Thus he had right of moderate chastisement for offences (for the infliction of graver punishments he had to apply to the magistrate), of testamentary nomination of guardians, of pupillary substitution (enlarged by Justinian), and of withholding consent from the marriage of a child, but subject in this last case to magisterial intervention if used unreasonably.

How the right of the *paterfamilias* over the earnings and acquisitions of his children was modified by the recognition of the *peculium castrense* has been shown in a previous page. But the modification was carried to such an extent by the Christian emperors as finally to negative the father's ownership altogether, except as regarded acquisitions that were the outcome of funds advanced by him to his child for his separate use (*peculium profecticium*). Of some of the child's acquisitions (*bona adventicia*) his father had, down to the time of Justinian, the life interest and right of administration; but by his legislation even these might be excluded at the pleasure of the parties from whom the acquisitions had been derived or by maladministration of the father.

By the classical law the father's radical right in his son's *peculium castrense* revived on the latter's death; for if he died intestate the former appropriated it not as his son's heir, but as an owner whose powers as such had been merely temporarily suspended. But by one of the chapters in the famous 118th Novel on the law of intestate succession even this prerogative of the *paterfamilias* was abolished, and all a child's belongings except his *peculium profecticium* were recognized as his own in death as well as in life, so that if any of them should pass to his parent on his intestacy it should only be by title of inheritance and in the absence of descendants.

In every other branch of the law of the family the same reforming spirit was manifested. Adoption of *filiifamilias* was no longer followed in all cases by a change of family for the adoptee, but only when either the adopter was in fact one of his ancestors in whose

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[1] The best edition is that of Krüger, which is prefixed to the stereotype edition of the *Corpus Juris* by Mommsen, Krüger and Schoell, vol. i., and also published separately.

[2] The best edition is that of Mommsen, *Digesta Justiniani* (2 vols., Berlin, 1866–70), and also vol. i. of the stereotype edition of the *Corpus Juris* mentioned in preceding note. A new and handy edition, however, based on that of Mommsen, by Bonfante and several other Italian professors, is now in course of publication. Books I.–XXVIII. were published up to 1908 (Milan). A collotype facsimile of the Florentine MS. of the Digest is also in course of publication in Italy. Fascicoli I.–VI. have already (1908) appeared (Rome, 1902–7).

[3] The best edition is that of Krüger, forming vol. ii. of the *Corpus Juris* last mentioned.

[4] The best edition is that of Schoell, completed by Kroll in 1895, and forming vol. iii. of the *Corpus Juris* last mentioned. It contains the Greek texts, Latin Vulgate and a Latin translation more correct than the Vulgate.

[5] See Esmein, *Mélanges*, pp. 58–70; Mitteis, *Reichsrecht und Volksrecht in d. Ostl. Provinz.*, deals with its history, pp. 256–312. Though beneficial on the whole, the regulations of Justinian on this matter seem rather too great an interference with the freedom of marriage settlements.

potestas he had never been, such as a paternal or maternal grandfather, when there was a natural *potestas* to underlie and justify the civil one—or when an ancestor gave in adoption a grandchild who was in his *potestas* but would not become *sui juris* by his death. The mode of strict adoption also was simplified, the old procedure by sales and manumissions, which degraded the child too much to the level of a slave, was abolished. The modes of legitimation of children born of a concubine, especially that by subsequent marriage of the parents, first introduced by Constantine, were regulated, and the extent of the rights of the legitimated issue carefully defined. Emancipation was simplified in a similar way to that of strict adoption. Tutory at law was opened to the pupil's nearest kinsman, whether on the father's side or the mother's; and the mother herself, or the child's grandmother, might be allowed, under certain conditions, to act as its guardian. Slavery was often converted into the milder condition of colonate; but, even where this did not happen, the rights of owners were not allowed to be abused; for slaves were permitted to claim the protection of the magistrate, and cruelty by a master might result in his being deprived of his human property. Kinship that had arisen between two persons when one or both were slaves (*servilis cognatio*) was recognized as creative not only of disabilities but of rights. The modes of manumission were multiplied, and the restriction of the legislation of the early empire abolished; and a freedman invariably became a citizen, Junian Latinity and dediticiancy being no longer recognized.

Law of property.

Amendments on the Law of Property and Obligation.—In the law of property the principal changes of the Christian Empire were the simplification of the forms of conveyance, the extension of the colonate, the introduction and regulation of emphyteusis and the remodelling of the law of prescription. Simplification of the forms of conveyance was necessary only in the case of *res mancipi*, for *res nec mancipi* had always passed by delivery. From the Theodosian Code it is apparent that movable *res mancipi* usually passed in the same way from very early in the period, and that for the mancipation of lands and houses—for *in jure cessio* had disappeared with the formular system—a *solemnis traditio*, *i.e.* a written instrument and delivery following thereon, and both before witnesses, had been gradually substituted. Of this there is no trace in the Justinianian Code. For Justinian abolished all remains of the distinction between *res mancipi* and *res nec mancipi*, between full ownership, bonitarian ownership and *nudum jus Quiritium*, placing movables and immovables on a footing of perfect equality so far as their direct conveyance was concerned. But, as regarded the possession required of an acquirer to cure any defect in the conveyance, he made a marked difference between immovables and movables. For, amalgamating the old positive usucaption of the *jus civile* with the negative "prolonged possession" (*longi temporis possessio*) that had been first introduced for immovables in the provinces (probably by the provincial edict), and afterwards by rescripts of Caracalla for movables,[1] he declared that possession on a sufficient title and in good faith should in future make the possessor legal owner of the thing possessed by him, provided that the possession of himself and his author had endured uninterruptedly for three years in the case of a movable, and in the case of an immovable for ten years if the party against whom he possessed was resident in the same province, or for twenty if he resided in another one.

Emphyteusis.

The same causes that led to the colonate induced the introduction of emphyteusis,[2]—an institution which had already existed in some of the Eastern provinces when independent, and which came to be utilized first by the emperors, then by the church, and afterwards by municipalities and private landowners, for bringing into cultivation the large tracts of provincial land belonging to them which were unproductive and unprofitable through want of supervision on the spot. Its nature and conditions (which bore a certain similarity to the earlier *jus in agro vectigali* of the Western Empire, with which it was ultimately fused, and to hereditary leases sometimes granted in the early Empire) were carefully defined by Zeno and amended by Justinian. The *emphyteuta*, as the grantee of the right was ultimately called, did not become owner; the granter still remained *dominus*, all that the grantee enjoyed being a *jus in re aliena*, but so extensive as hardly to be distinguishable from ownership. It conferred upon him and his heirs a perpetual right in the lands included in the grant, in consideration of a fixed annual payment to the lord (*canon*) and due observance of conventional and statutory conditions; but he was not entitled to abandon it, nor able to free himself of the obligations he had undertaken, without the lord's consent. The latter was entitled to hold the grant forfeited if the *canon* fell into arrear for three years (in church lands for two), or if the land-tax was in arrear for the same period, or if the *emphyteuta* allowed the lands to deteriorate, or if he attempted to alienate them (*alienare meliorationes* as the text says) without observance of statutory requirements. These were that he should intimate an intended alienation and the name of the intended alienee to the lord, so that the latter, before giving his assent, might satisfy himself that he would not be a loser by the transaction; and, if the alienation was to be by sale, he had to state the price fixed, so as to give the lord the opportunity of exercising his statutory right of pre-emption at the same figure. If those requirements were complied with, and the lord (himself declining to purchase) stated no reasonable objection to the proposed alienee, he was not entitled to resist the alienation, provided a payment (*laudemium*) was made to him of 2% of the sale price or of the value of the lands in consideration of his enforced consent.

Obligations.

The changes in the law of obligation were more superficial than those in the law of property, and consisted principally in the simplification of formalities and in some cases in their entire abolition. To describe them, however, would carry us into details which would here be out of place.

Testamentary succession.

Changes in the Law of Succession.—The changes made in the law of succession by Justinian's Christian predecessors, especially Theodosius II. and Anastasius, were far from insignificant; but his own were in some directions positively revolutionary. The testament *per aes et libram* of the *jus civile* probably never obtained any firm footing in the East; for it was only by Caracalla's constitution conferring citizenship on all his free subjects that provincials generally acquired *testamenti factio*; and by that time a testament bearing externally the requisite number of seals had been recognized as sufficient for a grant of *bonorum possessio* unchallengeable by the heirs-at-law, even though they were able to prove that neither *familiae mancipatio* nor *testamenti nuncupatio* had intervened. Hence the universal adoption of what Justinian calls the praetorian testament, which, however, underwent considerable reform at the hands of the emperors, notably Theodosius II. and Valentinian III., in the requirement (in the ordinary case) of signature by the testator and subscription by the witnesses, thereby becoming what Justinian calls the tripartite testament. There was much hesitating legislation on the subject before the law was finally established as it stands in the Justinianian books; and even at the last we find it encumbered with many exceptions and reservations in favour of testaments that were merely deeds of division by a parent among his children, testaments made in time of plague, testaments made before a magistrate and recorded in books of court, testaments entrusted to the safe keeping of the emperor, and so forth. Codicils had become deeds of such importance as, in the absence of a testament, to be dealt with as imposing a trust on the heir-at-law; it was therefore thought expedient to deny effect to them unless attested by at least five witnesses. And a most important step in advance was taken by Justinian in the recognition of the validity of an oral *mortis causa* trust; for he declared that, if it should be represented to a competent judge that a person on his death-bed had by word of mouth directed his heir to give something to the complainant, the heir should be required either on his oath to deny the averment or to give or pay what was claimed.[3]

The 118th Novel.

In the matter of intestacy there had been long a halting between two opinions—a desire still further to amend the law in the direction taken by the praetors and by the legislature in the Tertullian and Orphitian senatusconsults, and yet a hesitancy about breaking altogether from the time-hallowed principle of agnation. Justinian in his Code went far beyond his predecessors, making a mother's right of succession independent altogether of the *jus liberorum*; extending that of a daughter or sister to her descendants, without any deduction in favour of agnates thus excluded; admitting emancipated collaterals and their descendants as freely as if there had been no *capitis deminutio minima*; applying to agnates the same *successio graduum* that the praetors had allowed to cognates, and so forth. But it was by his Novels, especially the 118th and 127th, that he revolutionized the system, by eradicating agnation altogether (except as regards adopted children) and settling the canons of descent—which were the same for real and personal estate—solely on the basis of blood kinship, whether through males or females, and whether crossed or not by a *capitis deminutio*. First came descendants of the intestate, male and female alike, taking *per capita* if all were of the same degree, *per stirpes* if of different degrees. Failing descendants, the succession passed to the nearest ascendants, and, concurrently with them, to brothers and sisters of full blood (*germani*) and (by Nov. 127) the children of any that had predeceased. Where there were ascendants alone, one-half of the succession went to the paternal line and one-half to the maternal; where there were ascendants and brothers and sisters, or only brothers and sisters, the division was made equally *per capita*; when children of a deceased brother or sister participated it was *per stirpes*. In the third class came brothers and sisters of half blood and their children, and grandchildren of brothers and sisters german; the division here was on the same principle as in the second class. The fourth class included all other collaterals according to propinquity, apparently to the remotest degree, and without distinction between full and half blood;

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[1] *Dig.* xliv. 3, 9.

[2] See Elia Lattes, *Studi storici sopra il Contratto d'Enfiteusi nelle sue relazioni col Colonato* (Turin, 1868), chaps. 1 and 3; and François, *De l'Emphytéose* (Paris, 1883); Beaudouin in *Nouv. rev. hist.* (1898), pp. 545 seq.; Karlowa, *Röm. R. G.* ii. pp. 1268 seq. The name comes from the obligation imposed upon the grantees to make plantations (ἐμφυτεύειν).

[3] *Inst.* ii. 23, § 12.

but among those the nearest in degree excluded the more remote, and when all were of the same degree they took *per capita*.

The 115th Novel.

A reform effected by Justinian by his 115th Novel ought not to pass unnoticed; for it rendered superfluous all the old rules about disherison and praeterition of a testator's children, practically abolished *bonorum possessio contra tabulas* as regards freeborn persons and established the principle that a child had, as a general rule, an inherent and indefeasible right to be one of his father's heirs in a certain share at all events of his succession, and that a parent had the same right in the succession of his child if the latter had died without issue. The enactment enumerated certain grounds upon which alone it should be lawful for a parent to disinherit his child or a child his parent, declaring that in every case of disherison the reason of it should be stated in the testament, but giving leave to the person disinherited to dispute and disprove the facts when the testament was opened. If a child who had not been disinherited—and one improperly disinherited was eventually in the same position—was not instituted to some share, however small, of his parent's *hereditas*, he was entitled to have the testament declared null in so far as the institutions in it were concerned, thus opening the succession to himself and the other heirs-at-law, but without affecting accessory provisions, such as bequests, nominations of tutors, &c.; and if the share to which he was instituted was less than his legitim (*legitima* or *debita portio*) he was entitled to an action in supplement. The legitim, which under the practice of the centumviral court had been one-fourth of the share to which the child would have been entitled *ab intestato*, had been raised by Justinian (by Novel 18) to one-third at least, and one-half where there were five or more entitled to participate. He did not allow challenge of the will to be excluded, as in the earlier *querela inofficiosi testamenti*, because the testator had made advances to his child during his life or left him a legacy which quantitatively equalled the legitim; his idea was that a child was entitled to recognition by his parent *as one of his heirs*, and that to deny him that position without statutory grounds was to put upon him an indignity which the law would not permit.

Other changes.

Amongst the other beneficial changes effected by Justinian may be mentioned the assimilation so far as possible of *hereditas* and *bonorum possessio*, so that the latter might be taken like the former without formal petition for a grant of it; the equiparation of legacies and singular trust-gifts, and the application of some of their rules to *mortis causa* donations; the extension of the principle of "transmission" to every heir without exception, so that, if he died within the time allowed him for considering whether or not he would accept (*tempus deliberandi*), his power of acceptance or declinature passed to *his* heirs, to be exercised by them within what remained of the period; the introduction of entry under inventory (*cum beneficio inventarii*), which limited the heir's responsibilities and rendered unnecessary the nine or twelve months of deliberation; and the application of the principle of collation to descendants generally, so that they were bound to throw into the mass of the succession before its partition every advance they had received from their parent in anticipation of their shares.

iv. *The Justinianian Law-Books.*

Justinianian law-books.

Their Use in the Courts and in the Schools.—Although the Institutes were primarily intended to serve as a text-book in the schools, it was expressly declared that it and the Digest and the Code should be regarded as just so many parts of one great piece of legislation and all of equal authority; and that, although Digest and Code were but collections of common law and legislation that had proceeded originally from many different hands, yet they were to be treated with the same respect as if they had been the work of Justinian himself. But, while everything within them was to be held as law, nothing outside them was to be looked at, not even the volumes from which they had been collected; and so far did this go that, after the publication in 534 of the revised Code, neither the first edition of it nor the Fifty Decisions were allowed to be referred to. If a case arose for which no precedent was to be found, the emperor was to be resorted to for his decision, as being outside his collections the only fountain of the law. To preserve the purity of the texts Justinian forbade the use of conventional abbreviations (*sigla*) in making transcripts, visiting an offender with the penalties of falsification (*crimen falsi*). Literal translations into Greek were authorized, and indeed were necessary for many of his subjects; so were indexes and παράτιτλα, *i.e.* summaries of parallel passages, texts or individual titles. Commentaries and general summaries were forbidden under heavy penalties, as an interference with the imperial prerogative of interpretation.[1] But these prohibitions do not seem to have been enforced, as we have accounts and remains not only of translations but of commentaries, notes, abridgments, excerpts and general summaries even in Justinian's lifetime. These, it is true, were mostly by professors (*antecessores*), and their productions may have been intended primarily for educational purposes; but they soon passed into the hands of the practitioners and were used without scruple in the courts. A Greek *Paraphrase of the Institutes*, usually attributed to Theophilus, a professor in Constantinople and one of Justinian's commissioners, has been supposed to have been used by him in his prelections. It embodies much more historical matter than is to be found in the Institutes; but it contains a good many inaccuracies and its value has been very differently rated by different critics. Its latest editor, Ferrini, who puts a high estimate on it, is of opinion that the original of it was a reproduction in Greek of Gaius, drawn up at Beirut, which was remodelled after the plan of Justinian's Institutes, and had the new matter of this latter work subsequently incorporated in order to adapt it to the altered conditions; but he denies that there is any sufficient authority for ascribing it to Theophilus. If he be right in assuming that it was really based on a redaction of Gaius, its historical explanations will be received with all the more confidence.[2]

Their fate in the East.

Fate of the Justinianian Books in the East.—The literary work indicated in the preceding section was continued throughout the 6th century. But the next three were comparatively barren, the only thing worth noting being the Ἐκλογὴ τῶν νόμων ἐν συντόμῳ γενομένη of Leo the Isaurian in 740, professedly an abstract of the whole Justinianian law amended and rearranged; but it was repealed by Basil the Macedonian on account of its imperfections and its audacious departure from the law it pretended to summarize. The last-named emperor, followed by his son Leo the Philosopher, set themselves in the end of the 9th and beginning of the 10th centuries to the production of an authoritative Greek version of the whole of the Justinianian collections and legislation, omitting what had since become obsolete, excising redundancies, and introducing such of the post-Justinianian legislation as they thought merited preservation. The result was the *Basilica* (Τὰ Βασιλικά, *sc.* νόμιμα), which was completed and published in the reign of Leo, though begun in the reign of Basil, who also published a sort of institutional work, entitled Πρόχειρον, which was revised and republished by Leo under the name of Ἐπαναγωγὴ τοῦ νόμου. The *Basilica*[3] consists of sixty books, subdivided into titles, following generally the plan of the Justinianian Code, but with the whole law on any particular subject arranged consecutively, whether from Institutes, Digest, Code or Novels (see article BASILICA). Leo's son, Constantinus Porphyrogenitus, made an addition to it in the shape of an official commentary collected from the writings of the 6th-century jurists, the so-called Παραγραφαὶ τῶν παλαιῶν, which is now spoken of as the *scholia* to the *Basilica*, and has done good exegetical service for modern civilians. Later annotations by jurists of the 10th to the 12th century are also called *scholia* but are of less value. The *Basilica* retained its statutory authority until the fall of the Byzantine Empire in 1453. But long before that it had fallen into neglect in practice; and though nearly the whole of it and a great part of its *scholia* have come to us, yet not a single complete copy of it exists. Its place was taken by epitomes and compendia, the last being the Ἑξάβιβλος of Constantinus Harmenopoulos about 1345, "a miserable epitome of the epitomes of epitomes," as Bruns calls it, which survived the vicissitudes of the centuries, and finally received statutory authority in the modern kingdom of Greece in the year 1835, in place of the *Basilica*, which had been sanctioned thirteen years before, in 1822.[4]

Their fate in the West.

Their Fate in the West.—Before the rise of the Bologna school it was to a much greater extent from the Romano-Barbarian codes than from the books of Justinian that central and western Europe, apart from Italy, derived their acquaintance with Roman law. Theoderic's Edict can have had little influence after Justinian's recovery of Italy, and the Romano-Burgundian law was no doubt gradually displaced by Alaric's Breviary after Burgundy had fallen into the hands of the Franks; but the Breviary itself found its way in all directions in France and Germany, penetrating even into England, mainly through the agency of the church. There must, however, have been other repertories of Roman law in circulation (and among others probably either Gaius's Commentaries or Ulpian's Rules), as witness a testament made in Paris in the end of the 7th century, mentioned by Savigny as preserved by Mabillon, in which the testator uses the old formula of the *jus civile*,—"*ita do, ita lego, ita testor, ita vos Quirites testimonium mihi perhibetote*," words that are not to be found either in the Visigothic or the Justinianian collections. We know that in his pragmatic sanction of the year 554, Justinian anew accorded his imperial sanction to the *jura* and *leges*, *i.e.* the Digest and Code, which he says he had long before transmitted to Italy, at the same time declaring that his Novels were to be of the same authority there as in the East. Two years after this came Julian's Latin epitome of the Novels (a private work by a Constantinopolitan professor), not improbably prepared by command of the emperor himself. That Justinian's works soon came to some extent into use in Italy is beyond question; for there is preserved in Marini's collection the testament of one Mannanes, executed at Ravenna in the reign of Justinian's immediate successor Justin II., in which the requirements of both Code and Novels are scrupulously observed. Of other monuments of the same period that prove their currency in Italy several are referred to by Savigny in the second volume of his *History of the Roman Law in the Middle Ages*, among which may be mentioned the Turin gloss of the Institutes, which Fitting ascribes to about the year 545,[1] and two little pieces known as the *Dictatum de consiliariis* and the *Collectio de tutoribus*.[2] The invasion of the Lombards, the disturbance they caused in Italy for two centuries, and the barrier they formed between it and the rest of Europe militated against the spread of the Justinianian law northwards; but it was taught (from the 6th to the 11th century) without much interruption at law schools in Rome, and also at Ravenna, the seat of the exarchs, to which (but this is doubtful) the school (*studium*) of Rome, revived by Justinian, is said to have been transferred in the 11th century. By the Lombards, as their savagery toned down, the Roman law was so far recognized that they allowed it to be applied to the Romans living within their territory, and it is said even to have been taught in Pavia, which they had established as their capital. Their overthrow by Charlemagne opened an outlet for it beyond Italy; and there is evidence that in the 9th century Justinian's works, or some of them, were already circulating in the hands of the clergy in various parts of Europe. Yet there are few remains of any literature of this period indicating much acquaintance with them. The only writings worth mentioning are the so-called *Summa Perusina*, an abridgment of the first eight books of the Code, ascribed to the 7th century; the Lombardic *Quaestiones ac Monita* containing observations on the Germanic and Roman laws with texts drawn from the Institutes, the Digest, the Code and Julian's Epitome, and supposed to have been written early in the 11th century; the so-called *Brachylogus*,[3] in large part a sort of abbreviated revision of Justinian's Institutes, but with references also to his other books, which Fitting and others hold to have been written in France (perhaps Orleans), possibly by a pupil of Irnerius, about the very beginning of the 12th century; and the *Petri Exceptiones legum Romanorum*, a similar systematic exposition of the law in four books, probably written in the 11th century earlier than Irnerius's *Summa*. Both the *Brachylogus* and the *Petrus* were mainly compiled from pure Justinianian sources.

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[1] Const. *Deo Auctore*, § 12; *Tanta*, § 21.

[2] Editions by Reitz, 1751, and Ferrini, 1884–97.

[3] Ed. Heimbach, 6 vols. with Latin translation (and in 1846 a supplement by Zachariae a Lingenthal), Leipzig, 1833–70. A new supplement forming vol. 7, by Ferrini and Mercati, was published in 1897.

[4] For the history of Byzantine law subsequent to Justinian, see Zachariae, *Geschichte des Griechisch.-Röm. Rechts* (3rd ed., 1892), and *Historia juris Graeco-Romani* (1839); Mortreuil, *Histoire du droit byzantin* (3 vols., 1843–46).

The glossarists.

Apart from these remains a word may here be said about the work of the glossarists.[4] It was at the very end of the 11th century that at the law school of Bologna, then under the guidance of the celebrated Irnerius, the study of Roman law began somewhat suddenly to attract students from all parts of Europe. Partly through ignorance and partly through the action of the clergy, the parts of the Justinianian legislation that had hitherto been in ordinary use were the Institutes, the Code and the Novels. The first, from its elementary character, had naturally commended itself; the Code and the Novels, with their abundant legislation on matters ecclesiastical, were in many respects charters of the church's privileges, and were prized accordingly; but the Digest, as being the work of pagan jurists, had been looked on askance and practically little used. The Code and the Novels, however, with their modicum of wheat concealed in a great quantity of chaff, offered little attraction to laymen of intelligence; and, when under the guidance of Irnerius their attention was first concentrated on the Digest, it must have come to them as a sort of revelation. Dogmatic and exegetic teaching of the *Corpus Juris* in all its parts was actively begun, and a new school arose called the glossarists (*glossatores*), of whom Irnerius has always been rightly regarded as the founder. This great man, who is said to have been trained both in logic and rhetoric and to have afterwards studied and taught law at Rome before coming to Bologna, was more than a glossator. He was also the first of the medievalists to treat the law in a scientific way. In his *Summa Codicis* (a work attributed to him by Fitting on evidence which seems almost conclusive) he produced for his contemporaries and successors an independently planned and so far systematic manual of the subject-matter of the Code, omitting the last three books.[5] The subject was treated in full relation to the other parts of the *Corpus Juris*, but follows in general the titles of the Code. The glossators got their name from the *glossae, i.e.* marginal and interlinear annotations (both grammatical and doctrinal) with which they furnished the texts of the *Corpus Juris* which were in their hands. They also wrote *summae, casus, brocarda*, &c., for use both in the courts and the schools, and occasionally special treatises. They confined their work entirely to the *Corpus Juris*, being almost wholly ignorant of the history of the law. Beginning with Irnerius, the school lasted for about a century and a half, and ended with Franciscus Accursius, who died in 1260 after having made a systematic but summarized collection of the glosses of his predecessors, which was afterwards known as the *Glossa Ordinaria* or "The Great Gloss." Among the more famous representatives of the school (other than Irnerius) were, in the 12th century, Bulgarus, Martinus, Jacobus and Hugo, known as the *quattuor doctores*, and Accursius himself. To these may be added Placentinus and Vacarius of the 12th and Azo and Odofredus of the 13th century. The Digest, as used by the glossarists, was divided into three parts, known as *Digestum Vetus* (books 1–24, tit. 2), *Infortiatum* (books 24, **tit.** 3–38), and *Digestum Novum* (books 39 to the end). The manuscripts of these, as used by the glossarists, are called the Vulgate (*lectio Vulgate*), to distinguish them from the Florentine Manuscript (*lectio Pisana*), on which, indeed (or on the same original source as it), they were probably all primarily based, but from which, as far at least as book 33, they varied in numerous readings. The historical explanation of the cause of this just-mentioned threefold division is given by Mommsen in the preface to his larger edition of the Digest, to which it will be sufficient to refer.[6] The whole *Corpus Juris* was by the glossarists distributed into five volumes, viz. the three just named; a fourth, containing the first nine books of the Code; and the fifth, called *volumen parvum legum*, containing the Institutes; 134 of the Novels in Latin (known as the *Authenticum*[7]); and the last three books of the Code.

The success of the Accursian gloss was rather detrimental to scientific development of the law. It became a sort of code in itself which both in the schools and the courts tended to supersede the texts of Justinian. The intelligent study of the Sources was neglected while lawyers devoted themselves to subtle distinctions and useless divisions of subject-matter. It led to the application during the 14th and 15th centuries of the methods of scholasticism to the Roman law. The authors of this scholastic jurisprudence, which prevailed during the greater part of these centuries, have been called post-glossators and *scribentes* or commentators. Their most noted representative was Bartolus (1314–1357), after whom they were often called Bartolists. This school, however (mainly Italian), did much towards developing a definite system of common law in Italy based on the Roman, and thereby facilitated the reception of Roman law in Germany and other countries.[8]

In the 16th century a new start or, so to say, second renaissance was given to the Roman law. The study of classical antiquities, so active on the side of literature, extended to jurisprudence also. The juridical writings which had been handed down from the Romans ceased to be regarded purely as positive law, binding according to the letter, but as a part of ancient tradition whose spirit as well as form must be examined by the light of the past. Among the pioneers in this new method, to whom the name of Humanists has been given, must be specially mentioned Alciatus (1492–1540), Cujacius (1522–1590) and Donellus (1527–1591). Medievalism has passed away, and with these jurists began what has been called the modern Roman law, to describe which, however, is entirely beyond the province of this article. (H. Go.)

ROMANOS, called ὁ μελῳδός, Greek hymn-writer, "the Pindar of rhythmic poetry," was born at Emesa (Homs) in Syria. From the scanty notices of his life we learn that he resided in Constantinople during the reign of the emperor Anastasius.[9] Having officiated as a deacon in the church of the Resurrection at Berytus, he removed to Constantinople, where he was attached to the churches of Blachernae and Cyrus. According to the legend, when he was asleep in the last-named church, the Virgin appeared to him and commanded him to eat a scroll. On awaking (it was Christmas Day), he immediately mounted the pulpit, and gave forth his famous hymn on the Nativity. Romanos is said to have composed more than 1000 similar hymns or *contakia* (Gr. κοντάκιον, "scroll") celebrating the festivals of the ecclesiastical year, the lives of the saints and other sacred subjects—on the death of a monk (extremely impressive); the last judgment; the treachery of Judas; the martyrdom of St Stephen; Simeon

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[1] Fitting, *Über die sogenannte Turiner Institutionen-glosse* (Halle, 1870); cf. Conrat, *Gesch. d. Quellen u. Litt. d. röm. R. im früheren Mittelalter*, vol. i. pp. 180 seq., Leipzig, 1891.

[2] Conrat *ut sup.* pp. 137–140.

[3] *Brachylogus totius juris civilis* is a fuller title given to it. It has also been called *Corpus legum*. It first got the name *Brachylogus* in the 16th century.

[4] Savigny, *Geschichte d. r. R.* vols. 3–5.

[5] See *Summa Codicis* of Irnerius by Fitting (Berlin, 1894). Two other works attributed to Irnerius, called respectively *Quaestiones de Subtilitatibus Juris* and a treatise *De Aequitate*, have been edited by the same author. See also Fitting, *Z. d. Sav. Stift.* xvi. pp. 1 seq.

[6] *Digesta Justiniani Augusti*, recognovit Th. Mommsen (Berlin, 1870).

[7] Or *liber authenticorum*. So called because it contained a more complete collection and correcter translation of the Greek Novels than the Epitome of Julian. It was the one used in the law courts in the middle ages.

[8] See Sohm, *Institutionen*, § 27, and authorities there cited.

[9] On the question whether Anastasius I. (491–518) or II. (713–716) is meant, see Krumbacher, who is in favour of the earlier date.

Stylites; paschal and pentecostal hymns. The MS. of the hymns, written by his own hand, was said to have been preserved in the church of Cyrus, in which he was buried and celebrated as a saint on the 1st of October. Prof. C. Krumbacher, who has edited the works of Romanos from the best (the Patmos) MSS., regards him as the greatest poet of the Byzantine age, and perhaps the greatest ecclesiastical poet of any age.

Editions: J. B. Pitra, *Analecta Sacra*, i. (1876), containing 29 poems, and *Sanctus Romanus Veterum Melodorum Princeps* (1888), with three additional hymns from the monastery of St John in Patmos. See also Pitra's *Hymnographie de l'Église grecque* (1867); C. Krumbacher, *Geschichte der byzantinischen Litteratur* (1897); and HYMNS.

ROMANOV, the name of the Russian imperial dynasty, regnant in the male line from 1613 to 1730, and thenceforward in the female line. The Romanovs descended from Andrei, surnamed Kobyla, who is said to have come to Moscow from Prussia about 1341 to enter the service of the grand-duke Semen (d. 1353). His son Feodor, surnamed Koschka, was the ancestor of the families of Suchovo-Kobylin, Kalytschev and Scheremetjev, as well as of the Romanovs. Feodor's grandson, Sakhariya Ivanovich, was a boyar of Vasilii V., grand-duke of Moscow at intervals between 1425 and 1462, and the family took its name from his grandson Roman, whose daughter Anastasia Romanovna married the tsar Ivan the Terrible. Her brother Nikita Romanovich married the princess Eudoxia Alexandrovna, a descendant of Andrei Jaroslavovich, grand-duke of Susdal-Vladimir (d. 1264), and in this way the Romanovs were linked up with the ancient royal house of Rurik. The Romanovs suffered heavily in the disorders following on the death of Ivan. Some were executed and others exiled. Nikita's son Feodor (the archimandrite Philaret) was banished, but was recalled by the false Demetrius. In 1610 he was imprisoned by the king of Poland, but his piety and virtues led to the election of his son, Mikhail Feodorovich Romanov, to the throne of the tsars in 1613. Philaret became patriarch of Moscow in 1619, and supported his son's government until his death in 1634. Mikhail was seventeen when he began his reign, and died in 1645. He was succeeded by his son Alexis, whose three sons, Feodor III., Ivan II. and Peter I. (the Great), inherited the throne. After the two years' reign of Peter's widow, Ekaterina Aleksievna Skavronska (Catherine I.), his grandson, Peter Aleksievich (Peter II.), succeeded. He died in 1730, and the succession devolved on the family of Ivan II., on his daughter Anna (1730–40) and his great-grandson Ivan III., and in 1741 on Elizabeth, daughter of Peter the Great. Peter's elder daughter, Anna, had married Charles Frederick of Holstein-Gottorp, and with the accession of her son, Peter III., in 1762 begins the present reigning dynasty of Holstein-Gottorp or Oldenburg-Romanov.

See R. Nisbet Bain, *The First Romanovs* (1905); P. V. Dolgorukov, *Notice sur les principales familles de la Russie* (2nd ed., Berlin, 1858).

ROMAN RELIGION. In tracing the history of the religion of the Roman people we are not, as in the case of Greece, dealing with separate, though interacting, developments in a number of independent communities, but with a single community which won its way to the headship first of Latium, then of Italy and finally of a European empire. But this very fact of its ever-extending influence, coupled with an absence of dogmatism in belief, which made it at all times ready and even anxious to adopt foreign customs and ideas, gave its religion a constantly shifting and broadening character, so that it is difficult to determine the original essentials. By the time when Latin literature begins, the genuine Roman religion had already been overlaid by foreign cults and modes of thought, by the classical period it was—except in formal observance—practically buried and to a large extent fossilized. But the comparative study of religions has suggested the lines of reconstitution and the careful analysis of survivals embedded in literature and the evidence of monumental remains, and in particular of the old calendars, has enabled modern scholars to make good progress in the task of separating the elements due to different periods and influences.

The Roman people were of Aryan stock, a section of a host of invaders from the north, who overran and settled in the Italian peninsula. They preserved traces of their original nationality not merely in the general cast of their religious thought, but in certain common features such as the worship of the hearth (Vesta) and of the sky-divinity (Jupiter) (see GREEK RELIGION). But the development of their religion was arrested at an earlier stage than that of the Greeks: with them—at any rate in the genuine Roman period—Animism never passed into Anthropomorphism; they stopped at the conception of the "spirit" without reaching that of the "god." Their belief might be described as a polydemonism rather than a polytheism, or more correctly, to avoid altogether the intrusion of foreign notions, as a "multinuminism."

Fetishism.

In the cult and ritual of Rome there are enshrined many survivals from a very early form of religious thought prior to the development of the characteristic Roman attitude of mind. Fetishism—the belief in the magic or divine power of inanimate objects—is seen in the cult of stones, such as the *silex* of Jupiter (Iuppiter), which plays a prominent part in the ceremonial of treaty-making, and the *lapis* used in the ritual of the *aquaelicium*, a process, probably magic in origin, designed to produce rain after a long drought. The boundary-stones between properties (*termini*) were also the objects of cult at the annual festival of the Terminalia, and the "god Terminus," the symbolic boundary-stone, shares with Jupiter the great temple on the Capitol. Tree-worship (*q.v.*) again is a constantly recurring feature, seen, for instance, in the permanently sacred character of the *ficus Ruminalis* and the *caprificus* of the Campus Martius, and above all in the oak of *Iuppiter Feretrius*, on which the *spolia opima* were hung after a victory. Nor did Roman fetishism stop short at natural objects. The household was always the centre of religious cult, and certain objects in the house—the door, the hearth, the store-cupboard (*penus*)—seem always to have had a sacred significance, and so became the objects and later the sites of the domestic worship. Of the cult of animals there is just sufficient trace to show that it must formerly have had its place in religious rite; the animals, once the objects of worship, appear in later times as the attributes of divinities, for instance, the sacred wolf and woodpecker of Mars.

Animism.

But Fetishism must very early have developed into Animism, the feeling of the sacredness of the object into the sense of an indwelling spirit. In the animistic attitude we have indeed the true background of the genuine Roman religion; but its characteristic and peculiar development is a kind of "higher Animism," which can associate the "spirit" not merely with visible and tangible objects, but with states and actions in the life of the individual and the community. No doubt the later *indigitamenta* ("bidding-prayers") which give us detailed lists of the spirits which preside over the various actions of the infant, or the stages in the marriage ceremony, or the agricultural operations of the farmer, are due in a large measure to deliberate pontifical elaboration, but they are a true indication of the Roman attitude of mind, which reveals itself continually in the analysis of the cults of the household or the festivals of the agricultural year.

The "powers" (*numina*, not *dei*), which thus become the objects of worship, are spirits specialized in function and limited in sphere. They are not conceived of in any anthropomorphic form, their sex even may often be indeterminate ("sive mas, sive femina" is the constantly recurring formula of prayer), but the sphere of action of each is clearly marked and an appeal to a spirit outside his own special sphere would never even be thought of. Locality thus becomes an important point in the conception of the *numen*: the household spirits must be worshipped at the door, the hearth, the store-cupboard, and the external spirits of the fields and countryside have their sacred hill-tops or groves. But the *numen* has no form of sensuous representation, nor does he need a house to dwell in: statue and temple are alien to the spirit of Roman religion. Nor are the *numina*, not being anthropomorphic, capable of relation to one another: hence there is no Roman mythology. Yet, all-powerful in their individual spheres of action, they can influence the fortunes of men and can enter into relations with them. The primary attitude of man to the *numina* seems clearly to be one of fear, which survives prominently in the "impish" character of certain of the spirits of the countryside, such as Faunus and Inuus, and is always seen in the underlying conception of *religio*, a sense of awe in the presence of a superhuman power. But the practical mind of the Roman gives this relation a legal turn: the *ius sacrum*, which regulates the dealings of men with the divine powers, is an inseparable part of *ius publicum*, the body of civil law, and the various acts of worship, prayer and thanksgiving are conceived of under the legal aspect of a contract. The base-notion is that the spirits, if they are given their due, will make a return to man: the object of the recurring annual festivals is to propitiate them and forestall any hostile intention by putting them, as it were, in debt to man—more rarely to express gratitude for benefits received.

Ritual.

In such a religion exactness of ritual must play a large part—so large, indeed, that many modern critics have been misled into regarding the Roman religion as a mere network of formalities without any background of genuine religious feeling. This formalism shows itself in many ways. It is necessary in the first place to make quite certain that the right deity is being addressed: hence it is well to invoke all the spirits who might be concerned, and even to add a general formula to cover omissions: here we have the ritual significance of the *indigitamenta*. Place, again, as we have seen, was an essential element even in the conception of the *numen*, and is therefore all-important in ritual. So, too, is the character of the offering: male victims must be sacrificed to male deities; female victims to goddesses: white animals are the due of the *di superi*, the gods of the upper world, black animals of the gods below. Special deities, moreover, will demand special victims, while the more rustic *numina*, such as Pales (*q.v.*), should be given milk and millet cakes rather than a blood-offering. All-important, too, is the order of ceremonial and the formula of prayer: a mistake or omission or an unpropitious interruption may vitiate the whole ritual, and though such misfortunes may occasionally be expiated by the additional offering of a *piaculum*, in more serious cases the whole ceremony must be recommenced *ab initio*. Herein lies the importance of the priesthood: the priest is not, as in other religions, the mediator between god and man, but on the one hand for the purpose of state-worship the chosen representative of the whole people, on the other the repository of tradition and ritual lore.

Household worship.

This conception of the nature of the *numina* and man's relation to them is the root notion of the old Roman religion, and the fully-formed state cult of the *di indigetes* even at the earliest historical period, must have been the result of long and gradual development, of which we can to a certain extent trace the stages. The original settlement on the Palatine, like its neighbour on the Quirinal, was an agricultural community, whose unit both from the legal and religious point of view was not the individual but the household. The household is thus at once the logical starting-point of religious cult, and throughout Roman history the centre of its most real and vital activity. The head of the house (*paterfamilias*) is the natural priest and has control of the domestic worship: he is assisted by his sons as acolytes (*camilli*) and deputes certain portions of the ritual to his wife and daughters and even to his bailiff (*vilicus*) and his bailiff's wife. The worship centres round certain *numina*, the spirits indwelling in the sacred places of the original round hut in which the family lived. Janus, the god of the door, comes undoubtedly first, though unfortunately we know but little of his worship in the household, except that it was the concern of the men. To the women is committed the worship of the "blazing hearth," Vesta, the natural centre of the family life, and it is noticeable that even to Ovid (*Fast.* vi. 291–92) the conception of Vesta was still material and not anthropomorphic. The Penates (*q.v.*) were the *numina* of the store-cupboard, at first vague and animistic, but later on, as the definite *deus*-notion was developed, identified with certain of the other divinities of household or state religion.

Lar and Genius.

To these *numina* of the sacred places must be added two other important conceptions, that of the *Lar familiaris* and the *Genius*. The *Lar familiaris* has been regarded[1] as the embodiment of all the family dead and his cult as a consummation of ancestor-worship, but a more probable explanation regards him as one of the Lares (*q.v.; numina* of the fields worshipped at the *compita*, the places where properties marched) who had special charge of the house or possibly of the household servants (*familia*); for it is significant that his worship was committed to the charge of the *vilica*. The *Genius* is originally the "spirit of developed manhood," the *numen* which is attached to every man and represents the sum total of his powers and faculties as the *Juno* does of the woman: each individual worships his own *Genius* on his birthday, but the household-cult is concerned with the *Genius* of the *paterfamilias*. The established worship of the household then represents the various members of the family and the central points of the domestic activity; but we find also in the ordinary religious life of the family a more direct connexion with morality and a greater religious sense than in any other part of the Roman cult. The family meal is sanctified by the offering of a portion of the food to the household *numina*: the chief events in the individual life, birth, infancy, puberty, marriage, are all marked by religious ceremonial, in some cases of a distinctively primitive character. The dead, too, though it is doubtful whether in early times they were actually worshipped, at any rate have a religious commemoration as in some sense still members of the family.

Agricultural worship.

The next stage in the logical development of the state religion should naturally be found in the worship of the *gens*, the aggregate of households belonging to one clan, but our information about the gentile worship is so scanty and uncertain[2] that we cannot make practical use of it. It is more profitable to turn from the life of the household to the outdoor occupations of the fields, where the early Roman settler met with his neighbours to celebrate the various stages of the agricultural year in religious ceremonies which afterwards became the festivals of the state calendar. Here we have a series of celebrations representing the occupations of the successive seasons, addressed sometimes to *numina* who developed later on into the great gods of the state, such as Jupiter, Mars or Ceres, sometimes to vaguer divinities who remained always indefinite and rustic in character, such as Pales and Consus. Sometimes again, as in the case of the Lupercalia (*q.v.*), the attribution is so indefinite that it is hard to discover who was the special deity concerned; in other cases, such as those of the Robigalia and the Meditrinalia, the festival seems at first to have been addressed generally to any interested *numina* and only later to have developed an eponymous deity of its own. Roughly we may distinguish three main divisions of the calendar year, the festivals of Spring, of the Harvest and of Winter, preserving on the whole their peculiar characteristics. (1) In the Spring (it must be remembered that the old Roman calendar began the year with March) we have ceremonials of anticipation and prayer for the crops to come: prominent among them are the *Fordicidia*, with its symbolic slaughter of pregnant cows, addressed to Tellus, the *Cerealia*, a prayer-service to Ceres for the corn-crop, and the most important of the rustic celebrations of lustration and propitiation, the *Parilia*, the festival of Pales. To these must be added the *Ambarvalia* (*q.v.*), the lustration of the fields, a movable feast (and therefore not found in the calendars) addressed at first to Mars in his original agricultural character (see MARS). (2) Of the Harvest festivals the most significant are the twin celebrations on August 21st and 25th to the divinity-pair Consus and Ops, who are both concerned with the storing of the year's produce, and two mysterious vintage festivals, the *Vinalia Rustica* and the *Meditrinalia*, connected originally with Jupiter. (3) The Winter festivals are less homogeneous in character, but we may distinguish among them certain undoubtedly agricultural celebrations, the *Saturnalia* (at first connected with the sowing of the next year's crop, but afterwards overlaid with Greek ceremonial), and a curious repetition of the harvest festivals to Consus and Ops.

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[1] *e.g.* by De Marchi.

[2] See, however, De Marchi, *Il Culto Privato di Roma Antica*, vol. ii.

State religion.

In passing to the religion of the state we are clearly entering on a later period and a more developed form of society. The loose aggregation of agricultural households gives place to the organized community with new needs and new ideals, and at the same time in religious thought the old vague notion of the *numen* is almost universally superseded by the more definite conception of the *deus*—not even now quite anthropomorphic, but with a much more clearly realized personality. We find then two prominent notes of the state influence, firstly, the adaptation of the old ideas of the household and agricultural cults to the broader needs of the community, especially to the new necessities of internal justice between citizens and war against external enemies, and secondly the organization of more or less casual worship into something like a consistent system. Adaptation proceeds at first naturally enough on the lines of analogy. As Janus is in the household the *numen* of the door, so in the state he is the god associated with the great gate near the corner of the forum: the Penates have their analogy in the *Di Penates populi Romani Quiritium* by whom the magistrates take their oath on entering office, the *Lar familiaris* in the *Lares Praestites* of the community, and the *Genius* in the new notion of the *Genius populi Romani* or *Genius urbis Romae*. But the closest and most curious analogy is seen in the case of Vesta. The Vesta of the state is in fact the king's hearth, standing in close proximity to the *Regia*, the king's palace; the Vestal Virgins, who have charge of the sacred fire, are the "king's daughters," and as such even in republican times were in the *manus* of the *pontifex maximus*, who was the successor of the king on the legal side of his religious duties, as the *rex sacrorum* was on the sacrificial side. But adaptation meant also reflection and the widening of old conceptions under the influence of thought and even of abstract ideas. Thus, the simple reflection that the door is used for the double purpose of entrance and exit leads to the notion of the Janus of the state as *bifrons* ("two-faced"): the thought of the door as the first part of the house to which one comes, produces the more abstract idea of Janus as the "god of beginning," in which character he has special charge of the first beginnings of human life (*Consevius*), the first hour of the day, the Calends of the month and the first month of the year in the later calendar: for the same reason his name takes the first place in the *indigitamenta*. But development proceeds also on broader and more important lines. Jupiter in the rustic-cult was a sky-god concerned mainly with the wine festivals and associated with the sacred oak on the Capitol. Now he develops a twofold character: as the receiver of the *spolia opima* he becomes associated with war, especially in the double character of the stayer of rout (*Stator*) and the giver of victory (*Victor*), in which last capacity he later gives birth to an offshoot in the abstract conception of the goddess Victoria. As the sky-god again he is appealed to as the witness of oaths in the special capacity of the *Dius Fidius*, producing once more an abstract offshoot in the goddess Fides. In these two conceptions, justice and war, lie the germs of the later idea of Jupiter as the embodiment of the life of the Roman people both in their internal organization and in their external relations. In much the same manner Mars takes on in addition to his agricultural character the functions of war-god, which in time completely superseded the earlier idea. Finally, we must notice, as the sign of the synoecismus of the two settlements, the inclusion of the Colline deity, Quirinus, apparently the Mars of the originally rival community. In these three deities, Jupiter, Mars, Quirinus, we have the great triad of the earliest stage of the state religion.

Organization showed itself in the fixing of the annual calendar and the development of the character and functions of the priesthood, and as we should expect, in a new conception of the legal relation of the gods to the state. In the earlier stage—whose notions of course still persist alongside of the state religion—each household has its own relations to its *numina*: now the state approaches the gods through its duly appointed representatives, the magistrates and priests. Their presence is typical of that of the whole people, and the private citizen is required to do no more on festival days than a ceremonial abstinence from work. It is obvious that the state religion has a less direct connexion with morality and the religious sense than the worship of the household, but it has its ethical value in a sense of discipline and a consecration of the spirit of patriotism.

External influences.

The later stages represent not the spontaneous development of the genuine Roman religion, but its alteration and supersession by new cults and ideas introduced from foreign sources. Authorities are generally agreed in recognizing three periods:—(1) from the end of the Regal epoch to the second Punic War, when Rome was influenced by other peoples in Italy, with whom she was brought into contact by commerce or war; (2) from the second Punic War to the end of the Republic, when contact with Greek and oriental sources and the growth of literature revolutionized religious notions and led to a philosophic scepticism; (3) the Imperial epoch, opening with a revival of old religious notions and later marked by the official worship of the deified emperors and the wide influence of oriental cults.

Etruria.

Latium.

Magna Graecia.

(1) By the end of the regal period Rome had ceased to be a mere agricultural community and had developed into a city-state. There had consequently grown up within the state a large artisan class, excluded from the old patrician *gentes* and therefore from the state cult: at the same time the beginnings of commerce had opened relations with neighbouring peoples. The consequence was the introduction of certain new deities, the *di novensides*, from external sources, and the birth of new conceptions of the gods and their worship. We may distinguish three main influences, to a certain extent historically successive. (*a*) Tradition always assigned to the last three kings of Rome a connexion with the mysterious people of Etruria, and their influence at this period though not very definite was certainly extensive. To them, possibly through the mediation of Falerii, a Latin town on the Etruscan border, was due the introduction of Minerva, who, as the goddess of handicraft and protectress of the artisan gilds, was established in a temple on the Aventine. Soon, however, she found her way on to the Capitol, and there a new Etruscan triad, Jupiter, Juno and Minerva, possibly going back from Etruria to Greece, was enshrined in a magnificent new temple built by Etruscan workmen and decorated in the Etruscan manner. In this temple the deities were represented by images, and on its dedication day, September 13th, at the novel festival of the *epulum Jovis*, the images were adorned and set out as partakers of the feast, a proceeding wholly foreign to the native Roman religion (see further ETRURIA, § *Religion*). (*b*) Secondly, in war and peace Rome formed relations with her neighbours of Latium, and, as a sign of the Latin league which resulted, the cult of Diana was brought from Aricia and established on the Aventine in the "commune Latinorum Dianae templum" (Varro, *Ling. Lat.* v. 43): about the same time was built the temple of Jupiter Latiaris on the Alban mount, its resemblance in style to the new Capitoline temple pointing to Rome's hegemony. So great was Rome's sense of kinship to the Latins that in two cases Latin cults were introduced inside the *pomoerium*: the worship of Hercules, which came from Tibur in connexion with commerce, was established at the *ara maxima* in the *forum boarium*, and the Tusculan cult of Castor as the patron of cavalry found a home close to the *forum Romanum*: it is a strange irony that both these deities should in reality have been in their origin Greek. Other Italian cults introduced at this period were those of Juno Sospes and Juno Regina, Venus and Fortuna Primigenia, a goddess of childbirth who came from Praeneste. (*c*) Later on in the same period contact with the cities of Magna Graecia brought about the wide-reaching introduction of the Sibylline books. Whatever may be their origin—and they came from Cumae—they were placed in the Capitoline temple under the care of a special commission of two (*duoviri sacris faciundis*, later *decemviri* and *quindecimviri*), and their "oracles," which were referred to in times of great national stress, recommended the introduction of foreign cults. In 493 B.C., at a time of serious famine, they ordered the building of a temple to the Greek triad Demeter, Dionysus and Persephone, who were identified with the old Roman divinities Ceres, Liber and Libera: Apollo must have come with or before the books themselves, though his temple was not built till 433 B.C.: Mercury followed, the representative of Ἑρμῆς Ἐμπολαῖος, Asclepius was brought from Epidaurus to the Tiber island in 293 B.C., and Dis and Proserpina, with their strange chthonic associations and night ritual, probably from Tarentum in 249 B.C. With new deities came new modes of worship: the *graecus ritus*, in which, contrary to Roman usage, the worshipper's head was unveiled, and the *lectisternium* (*q.v.*), an elaborate form of the "banquet of the gods." In this period, then, we find first a legitimate extension of cults corresponding to the needs of the growing community, and secondly a religious restlessness and a consequent tendency to more dramatic forms of worship.

Greek deities.

Oriental deities.

(2) The two chief notes of the next period are superstition and scepticism: both the populace and the educated classes lose faith in the old religion, but they supply its place in different ways. The disasters of the early part of the second Punic War revealed an unparalleled religious nervousness: portents and prodigies were announced from all quarters, it was felt that the divine anger was on the state, yet there was no belief in the efficacy of the old methods for restoring the *pax deum.* Accordingly recourse is had, under the direction of the Sibylline books, to new forms of appeal for the divine help, the general vowing of the *ver sacrum* and the elaborate Greek *lectisternium* after Trasimene in 217 B.C., and the human sacrifice in the forum after Cannae in the following year. The same spirit continues to show itself in the almost reckless introduction of Greek deities even within the walls of the *pomoerium* and their ready identification with gods of the old religion, whose cult they in reality superseded. Thus we hear of temples dedicated to Juventas=Hebe (191 B.C.), Diana=Artemis (179 B.C.), Mars=Ares (138 B.C.), and find even such unexpected identifications as that of the Bona Dea (*q.v.*)—a cult title of the ancient Fauna, the female counterpart of the countryside *numen Faunus*—with a Greek goddess of women, Damia. At the same time the new acquaintance with Greek art introduces the making of cult statues, in which the identified Greek type is usually adopted without change, with such curious results as the representation of the *Penates* under the form of the Dioscuri. But more significant still was the order of the Sibylline books in 206 B.C. for the introduction of the worship of the *Magna Mater* (see GREAT MOTHER OF THE GODS) from Pessinus and her ultimate installation on the Palatine in 191 B.C.: the door was thus opened to the wilder and more orgiastic cults of Greece and the Orient, which at once laid hold on the popular mind. In the train of the *Magna Mater* came the secret cult of Bacchus, which grew to such proportions in private worship that it had to be suppressed by decree of the Senate in 186 B.C., and later on were established the cults of Ma of Phrygia, introduced by Sulla and identified with Bellona, the Egyptian Isis, and, after Pompey's war with the pirates, even the Persian Mithras (*q.v.*). In all these more emotional rituals, the populace sought expression for the religious emotions which were not satisfied by the cold worship of the older deities.

Scepticism.

Meanwhile a corresponding change was taking place in the attitude of the educated classes owing to the spread of Greek literature. The knowledge of Greek mythology, to which they were thus introduced, set poets and antiquarians at work in a field wholly foreign to the Roman religious spirit, the task of creating a Roman anthropomorphic mythology. This they accomplished partly by the popular process of adoption and identification, partly by imitative creation. In this way grew up the "religion of the poets," whose falseness and shallowness was patent even to contemporary thinkers. But more important was the influence of philosophy, which led soon enough to a general scepticism among the upper classes. Its first note is struck by Ennius in his translation of the Sicilian rationalist Euhemerus, who explained the genesis of the gods as apotheosized mortals. In the last century of the Republic the two later Greek schools of Epicureanism and Stoicism laid hold on Roman society. The influence of Epicureanism was wholly destructive to religion, but not perhaps very widespread: Stoicism became the creed of the educated classes and produced several attempts, notably those of Scaevola and Varro, at a reconciliation of philosophy and popular religion, in which it was maintained that the latter was in itself untrue, but a presentation of a higher truth suited to the capacity of the popular mind. Such a theory was bound to be fatal, as it makes religion at once a mere instrument of statecraft.

The result on the old religion was twofold. On the one hand, worship passed into formalism and formalism into disuse. Some of the old cults passed away altogether, others survived in name and form, but were so wholly devoid of inner meaning that even the learning of a Varro could not tell their intention or the character of the deity with whom they were concerned. The old priesthood, and in particular the *flaminia*, came to be regarded as tiresome restrictions on political life and were neglected: from 87 to 11 B.C. the office of *flamen Dialis* was vacant. On the other hand, as the result in part of the theory of Stoicism, religion passed into the hands of the politicians: cults were encouraged or suppressed from political motives, the membership of the colleges of pontifices and augurs, now conferred by popular vote, was sought for its social and political advantages, and augury was debased till it became the meanest tool of the politician. In the general wreck of the old religion, little survived but the household cult, protected by its own genuineness and vitality.

Imperial religion.

(3) The revival of Augustus, which marks the opening of the last stage, was perhaps the most remarkable phenomenon in the whole story. It was no doubt very largely political, a part of his plan for the general renaissance of Roman life, which was to centre no longer round the abstract notion of the state, but round the persons of an imperial house. But it was genuinely religious, in that he saw that no revival could be effective which did not appeal to the deeper sentiments of the populace. It was thus his business to revitalize the old forms with a new and more vigorous content. His new palace on the Palatine he intended to be primarily the seat of the Julian family and the cults associated with it, and secondarily the centre of the new popular religion. With this object he consecrated there his new temple of Apollo (28 B.C.), associated for long with the Julian house, and adopted by Augustus as his special patron at Actium, and transferred to its keeping the Sibylline books, thus marking the new headquarters of the Graeco-Roman religion. Similar in purpose was his institution of the *ludi saeculares* in 17 B.C., in which a day celebration was added to the old *παννυχὶς*, and Apollo and Diana deliberately set up as a counterpart to the Capitoline Jupiter and Juno: Horace's hymn written for the festival is a good epitome of Augustus's religious intentions. In the same spirit he established a new shrine of Vesta Augusta within the palace, a private cult at first, but destined to be a serious rival of the ancient worship in the forum. A still more marked action was the building of a great temple at the end of his own new forum to Mars Ultor,—Mars, the ancestor of the Julian *gens*, as of the Roman people itself, and now to be worshipped as the avenger of Caesar's murderers. Nor did he hesitate to avail himself of the popular outburst, which immediately after the murder had consecrated the site of Caesar's cremation with a *bustum*, to erect on the spot a permanent temple to his adopted father, under the definitely religious title of *divus Julius.* No doubt he also did much generally to revive the ancient cults: he rebuilt, as he tells us himself, eighty-two temples which had fallen into disrepair, he re-established the old priesthoods, filling once more the office of *flamen Dialis* and reviving such bodies as the Sodales Titii (see TITUS TATIUS) and the Arval Brothers (*q.v.*); but the new revival attached itself primarily to these four cults, and their tendency was unmistakable. Originally, no doubt, Augustus designed to attract religious feeling generally to the reigning house, but it was inevitable that the more personal note should be given to it. The deification of Julius Caesar was one important step: another was the natural prominence in the palace of the cult of the *Genius* of the emperor himself. As the palace cults became national, the worship of the Genius was bound to spread, and ultimately Augustus sanctioned its celebration at the *compita* together with the worship of the old Lares. But here he and the wiser of his successors drew the line, and though under oriental influence divine honours were paid to the living emperor outside Italy, they were never permitted officially in Rome. In the succeeding centuries Augustus's intentions were realized with a fullness which he would hardly have wished, and the cult of the imperial house practically superseded the state religion as the official form of worship.

With this last period the story of Roman religion really draws to a close. For, though the form of the old cults was long preserved and even Antoninus Pius was honoured in an inscription for his care of the ancient rites of religion, the vital spirit was almost gone. In the popular mind the hosts of exciting oriental cults, which in the 3rd and 4th centuries of the Empire filled Rome with the rites of mysticism and initiation, held undisputed sway; and with the more educated a revived philosophy, less accurate perhaps in thought, but more satisfying to the religious conscience, gave men a clearer monotheistic conception, and a notion of individual relations with the divine in prayer and even of consecration. It was with these elements—fiercely antagonistic because so closely allied in character—that the battle of Christianity was really fought, and though, after its official adoption, the old religion lingered on as "paganism" and died hard at the end, it was really doomed from the moment when the Augustan revival had taken its irrecoverable bias in the direction of the emperor-worship.

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(*b*) Special.—For the Imperial Period, G. Boissier, *La Religion romaine d'Auguste aux Antonins: La fin du Paganisme*; Henzen, *Acta Fratrum Arvalium*; for the private and gentile cults, A. de Marchi, *Il culto privato di Roma Antica.*

(C. BA.)

ROMANS, a town of south-eastern France, in the department of Drôme, 12½ m. N.E. of Valence on the railway to Grenoble. Pop. (1906) town, 13,304; commune, 17,622. Romans stands on an eminence on the right bank of the Isère, a fine stone bridge uniting it with Bourg-de-Peage (pop. 4668) on the other side of the river. Both towns owe their prosperity to their situation in the most fertile part of the valley of the Isère. The present parish church belonged to an abbey founded in 837 by St Bernard, bishop of Vienne. The principal portal is a fine specimen of 12th-century Romanesque, and the lower part of the nave is of the same period; the choir and the transept are striking examples of the style of the 13th century.

Romans has a tribunal of commerce and a communal college. Its industries include tanning, leather-dressing and shoe-making, silk-spinning, hat-making, absinthe-distilling and oil-refining. There is trade in walnuts, walnut-oil, silk, cattle, &c.

ROMANS, EPISTLE TO THE. In this book of the New Testament, the apostle Paul begins, after a brief pregnant introduction (i. 1–7), by explaining that he had hitherto been prevented from carrying out his cherished project of visiting the church of Rome, whose faith was world-wide (i. 8 f.). Meanwhile, he outlines the gospel which he preached as an exhibition of God's righteousness, *ἐκ πίστεως εἰς πίστιν*. This forms the leading theme of the epistle.

Both Gentile (i. 18–32) and Jew (ii. 1, iii. 20)[1] alike have missed this righteousness up till now, but the revelation of God in Jesus Christ (iii. 21–31) had brought the divine boon within reach of all. The condition of its reception was not nationality but faith. Hence, as Paul stops for a moment to argue (iv. 1–25), the Jew cannot claim any preference; Abraham himself, before circumcision and the law came into force, was a man of faith, and consequently all believers (not all legal Jews, iv. 16) are true descendants of Abraham.[2] Returning to the blissful results of this δικαιοσύνη revealed in Jesus Christ (v. 1–11), Paul proceeds to contrast these with the sombre effects produced in humanity by the fall of Adam. Life had now triumphed over death, grace over sin (v. 12 f.). But the supersession of the law, which was bound up with the régime of sin and death, does not mean the relaxation of the moral bond. On the contrary (vi. 1 f.), the reception of God's grace and spirit implies the death of the believing man to sin. The struggle of the soul[3] between the thwarting power of sin and the ethical demands of the law (vii. 1 f.) cannot be ended happily save by the interposition of Jesus Christ, whose Spirit guarantees a sound life in this world and life eternal in the world to come (viii. 12 f.).

The splendid and unfettered[4] prospects of faith, which thus break on the apostle's vision, only serve to deepen his distress in one direction.[5] As a theologian and as a patriot, he is confronted with the problem of Israel's collective repudiation of a boon to which their own history, as he read it, clearly pointed. Reverting to the thought of ii. 17 f. and iv. 1, Paul now essays, in ix.–xi., to show how this unbelief of Israel is to be reconciled with the justice and the promises of God. He begins by showing, as in Gal. iv. 7 f. (cf. Rom. ii. 28–29), that mere physical descent could not entitle a Jew to the promises. Besides (ix. 14–29), no Jew has the right to challenge God's sovereign freedom. If God determines to extend the promise of faith to the Gentiles, who shall accuse Him of injustice? The rejection of the Jews is their own fault, due to their obstinacy and legalism (ix. 30–x. 21). Finally, Paul tries to see this fact of Israel's unbelief in the light of a wide religious philosophy of history; it (xi. 1–10) cannot be anything but a temporary and partial (xi. 11–24)[6] phase; the future will clear up the present; the final result will be the inclusion of all Israel in the heritage of the messianic kingdom of Christ. The prospect of this consummation stirs him to an outburst of adoration, with which the whole section ends (xi. 33–36).[7]

Applying the thought of God's mercy to the obligations of believing men (xii. 1–2), Paul proceeds now to sketch the ethical duties of Christians in the church (xii. 3–21), in society, and in the state (xiii. 1–7); love is the supreme law (xiii. 8–10), and the nearness of the end the supreme motive to morality (xiii. 11–14). These considerations are still before Paul's mind as he descends from general counsels to a special problem of practical ethics, raised by the varying attitude of Christians at Rome towards food offered to idols (xiv. 1 f.). After laying down the principle of individual responsibility, he appeals for charity and mutual consideration (xiv. 13–xv. 6), and for Christian forbearance.[8] Finally, he exhorts all, Gentile and Jewish Christians alike (xv. 8–13), to unite in thanksgiving for God's mercy to them in Christ.

In a brief epilogue, the apostle justifies himself for having thus addressed the Roman Christians. He alleges (xv. 14 f.) his apostolic vocation and informs them of his future movements. With an appeal for their prayers and a brief benediction, the epistle then closes (xv. 30–33). It ends as it began (i. 8 f.) with the apostle's hope and plan of visiting Rome on a subsequent missionary tour.[9]

Critical problems.

Rom. xvi. contains a separate note (1–23), together with a doxology (25–27). The former came from Paul's pen, but it did not belong originally to this epistle.[10] In all likelihood it is a letter of commendation for Phoebe[11] which includes vers. 1–23 (so *e.g.* Weizsäcker, McGiffert and Jülicher), though most break it off at ver. 20 (so Eichhorn, Ewald, Schulz, Renan, Weiss, Lipsius, von Soden, &c.), while others do not begin it until ver. 3 (so *e.g.* Ewald, Schürer, Reuss and Mangold: *Der Römerbrief*, pp. 136 f.). Vers. 21–23 might indeed follow xv. 33, but it is not Paul's way to add salutations after a final Amen, and the passage connects as well with xvi. 20, though it may have lain originally (Jülicher) between 16 and 17. The main reasons[12] for conjecturing that this section was addressed separately, not to Rome but to a city like Ephesus, lie in its contents. Paul was as yet a stranger to Rome, and it is extremely difficult to suppose that he already knew so many individuals there. The earlier tone of Romans shows that he was writing as a comparative stranger to strangers. Any touches of familiarity with the local circumstances (as in xiv.–xv.) are no more than might have percolated to him through hearing and report; they do not imply the presence of friends upon the spot who kept him supplied with information. On the other hand, the circle of people addressed in xvi. 1–23, with its wealth of individual colour and personal detail, presupposes a sphere where Paul had worked for long. He can appeal to these Christians. He can speak sharply with authority to them. Now, as he wrote from Corinth, the only other city which answers to this description is Ephesus, the centre of Paul's long Asiatic mission. With that city and district several of the names in xvi. 1–23 are more or less directly connected, *e.g.* Epaenetus (5), Aquila and Priscilla (3), who were at Ephesus immediately before Romans was written (Acts xviii. 18, 26; cf. 1 Cor. xvi. 19), and apparently were there (cf. 2 Tim. iv. 19) not long afterwards. These are the first people mentioned in the note, nor is there any likelihood that they or the rest of Paul's friends[1] had made a sudden migration to the capital. Doubtless, there was fairly constant communication between Rome and the provinces, and in the course of time these friends may have gradually followed the apostle thither. Hence it is not remarkable that almost all the names mentioned in this note have been found by archaeologists (cf. Lightfoot's *Philippians*, pp. 171 f.) within the Roman *Corpus Inscriptionum.* Most of them, anyhow, are fairly common throughout the Roman world (cf. Lietzmann, p. 73), whilst half are to be found in the Greek *Corpus Inscriptionum* for Asia Minor (*e.g.* Epaenetus, Hermes, Hermas).[2] Furthermore, the sharp warning against errorists and heretics (xvi. 17–20) suits Rome at this period much less aptly than Ephesus (cf. 1 Cor. xvi. 8–9; Acts xx. 29 f.; Rev. ii. 2 f.), where trouble of this kind was in the air. Controversy against false teachers is conspicuously absent from Romans. Nor is it possible to regard (with Zahn) such counsels as merely prophylactic; they are too definite and pointed. They imply the existence of a community with which Paul was personally acquainted, and to which he felt himself bound and free to address keen, authoritative reproaches.

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[1] On iii. cf. G. W. Matthias's *Exegetischer Versuch* (Cassel, 1857).

[2] "Paul here unconsciously changes the conception of law. By introducing the example of Abraham he shows that the book of the law contains the doctrine of justification by faith, and through the latter, therefore, is not made of none effect. This proof rests, objectively regarded, on a fallacy; for the law, of which the validity is threatened by the doctrine of justification, is that part of the book of the law which demands the observance of all commands, not that which relates anything about Abraham. But this error of thought would be easily concealed from a mind with the rabbinical training of Paul's" (Schmiedel, in *Hibbert Journal*, 1902, pp. 548–549).

[3] Cf. Engel's exhaustive monograph, *Der Kampf um Römer vii.* (1902), and, for the ideas of i.–viii., Du Bose's *The Gospel according to St Paul* (1907), and Titius, *Der Paulinismus* (1900), pp. 159 ff.

[4] The word *all*, as Matthew Arnold observes (*St Paul and Protestantism*, ch. i.), is "in some sense the governing word of the Epistle to the Romans."

[5] As arranged in the canonical edition, ix.–xi. are closely interwoven with i.–viii., and xi. 32–36 concludes not simply ix.–xi. but i.–xi. (cf. Bühl in *Studien und Kritiken*, 1887, 295–320). Certainly what Paul has in mind throughout the epistle is not a Judaizing tendency among the Jewish Christians at Rome, but the general and perplexing question of Judaism in relation to the new faith. Cf. Hoennicke's *Das Judenchristentum* (1908), pp. 160 f.

[6] In this passage Paul has generally been held to have erred botanically in his allegory. For a defence of his accuracy, see W. M. Ramsay's *Pauline and other Studies* (1907), 219 f.

[7] On the method of dialectic in this section, see Bishop Gore's paper in *Studia Biblica* (vol. iii.). The literature up to 1907 is summarized in H. J. Holtzmann's *Neutest. Theologie*, ii. pp. 171 f., one of the most significant essays being that of Beyschlag on *Die paulin. Theodicee* (1868). Wernle (*Beginnings of Christianity*, i. pp. 315 f.) sums up his discussion by pointing out that "the Jesus of history is simply non-existent for St Paul when he treats apologetic problems of this nature. No mention whatever is made of him in the three chapters of Romans which treat of Israel's fate. The literal text of the Septuagint seems to be the only decisive authority, and that is so sacred and almighty, that, whenever it comes into collision with the human conscience, the latter is silenced when the voice of revelation speaks."

[8] The weaker minority probably were a Jewish-Christian circle (cf. Riggenbach in *Studien und Kritiken*, 1893, pp. 649–678). For the religious aspect of vegetarianism in these and other circles, see von Dobschütz's *Christian Life in the Primitive Church* (1904), pp. 125 f., 396 f.

[9] "It was a sufficient reason for writing to the Romans that Paul was expecting to visit them, but was obliged once more to postpone an event to which he had long looked forward. There was nothing in the circumstances of the church that required his intervention, and, as he was therefore free to choose his subject, he wrote out of the fullness of his heart that grand defence of the gospel which, though shaped by the conditions of the times, is animated by the timeless Spirit, and has proved to be a possession for ever" (Drummond, p. 246).

[10] For the literature, cf. the present writer's *Historical New Testament* (1901), pp. 209–213. The hypothesis has won very wide acceptance, but several editors and critics (including Harnack, Zahn and Clemen) remain unconvinced. Cf. also Wabnitz in *Revue de théologie et des quest. religieuses* (1900), 461–469.

[11] On her functions, see Zscharnack's *der Dienst der Frau in den ersten Jahrhunderten der christlichen Kirche* (1902), pp. 45 f.

[12] Cf. Lucht (*Über die beiden letzten Kapitel des Römerbriefes*, 1871, pp. 126 f.), with Weizsäcker's brilliant pages in his *Apostolic Age*, i. pp. 379 f.).

The textual phenomena of the doxology (xvi. 25–27), which occurs in some MSS. after xiv. 23, are sufficiently strange; they suggest that the epistle must have passed through a certain process of editing, during the 2nd century, previous to its final incorporation in the canon of the epistles.[3] It may further be conjectured that the epistle does not lie before the modern reader in the precise shape in which it left Paul and his amanuensis at Corinth. Opinions, indeed, vary on the doxology. Either it is authentic but irrelevant, added by Paul as a postscript, or it is unauthentic,[4] due to some copyist who added it as a suitable finale at the close. In the Pauline canon Romans originally occupied the last place. It would therefore be natural that a note like that of xvi. 1–23 should be put in here, especially if this canon was drawn up at Rome, whither Phoebe probably travelled eventually. The doxology would then be shifted from after xiv. 23 or inserted for the first time for ecclesiastical purposes. The material conditions of such a process are lucidly stated by Dr C. R. Gregory in his *Canon and Text of the New Testament* (1907), pp. 319 f.

The problems presented by the structure of these chapters[5] cannot be solved adequately by the mere hypothesis, worked out variously by critics like Paulus, Griesbach (*Curarum in historiam textus Graeci epistolarum Pauli spec.* i. pp. 45 f.), Eichhorn and Flatt, that they are a series of postscripts or afterthoughts, much less by the conjecture that, in whole or in part, they are unauthentic (Baur, Volkmar, &c.). The only tenable line of argument, in the present state of criticism, is to regard their phenomena as due to compilation, at the time when the canon (perhaps of Paul's epistles) was first formed. If the hypothesis already outlined is set aside, it is open to the critic to regard large portions of the canonical Romans as having originally occupied a separate setting,[6] or to ascribe the textual variations to the exigencies of church reading after the formation of the canon (which might explain the absence of ἐν Ῥώμῃ in i. 7, 15, and the duplicate position of the doxology).[7]

The uncertainty as to the literary structure of the epistle naturally renders it hazardous to infer the character of the Christians who are addressed, but it may be said that the results of the long debate on this point are converging upon the belief that the predominant class in the local church or churches were Gentile Christians, while proselytes must have swelled the ranks to no inconsiderable degree. Since Weizsäcker wrote, the older view of Baur (cf. his *Paul*, Eng. tr. i. pp. 321 f.) has steadily lost ground. Zahn is now its main supporter, and his contentions are not convincing. Even were ix.–xi. taken as the kernel of the epistle, its obvious motive is to be found in the need of explaining to Gentile Christians the reasons for Israel's apparent rejection, and passages like i. 5 f., 13, xi. 13, xv. 15 f., are, if not decisive, at any rate superior to any references which can be urged fairly on the opposite side. To a church of this kind, in the capital of the Empire, Paul writes out his gospel more fully than in any other of his extant epistles. It is the essence of the gospel that he treats, and that is the revelation of God's righteousness to man by faith in Jesus Christ. Neither sacraments nor organization come within his purview. Even eschatology lies quite in the background. Paul writes of the heart of the gospel with all his heart, and while a certain controversial[1] element inevitably enters into his exposition—since he is writing with his eye on the Roman Church—any such considerations are quite subordinate to his dominating aim.

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[1] Erbes (*Zeitschrift für Kirchengeschichte*, 1901, 224–231) makes xvi. 1–16*a* a note forwarded by Paul to Rome during his last voyage thither, in order to advise some of the local Christians of his arrival (Acts xxviii. 15), but this theory is no improvement upon that of Semler, who regarded xvi. 3–16 as designed for Paul's friends outside Rome, to introduce the bearers of the larger epistle. The point of such hypotheses is to explain how the note came to be attached to Romans, but this can be shown otherwise (cf. Deissmann's *Licht vom Osten*, 1908, pp. 164, 201). Eichhorn (*Einleit. in das N.T.* iii. 243 f.) regarded xvi. 1–20 as addressed to Corinth, while Schenkel viewed it as designed for all the churches which Phoebe was to visit.

[2] In the Ephesian *Acta Johannis* (*c.* A.D. 160) the house of Andronicus (Rom. xvi. 7?) is one centre of Christian activity. E. H. Gifford (pp. 27–30) evades the difficulty by taking xvi. 3–20 as part of a second letter written by Paul after, not before, his release from imprisonment.

[3] The most recent and radical analyses are those of Spitta (*Urchristentum*, iii. 1902) and Völter (*Paulus u. seine Briefe*, 1905). The former detects a short letter written (xii.–xv. 7, xvi. 1–20) after Acts xxviii. 30, during a tour of the Gentile churches (A.D. 63–64), and another (i.–xi. 10, xv. 14–33) written to believing Jews in order to justify the Gentile mission and afterwards edited for Gentile readers with the addition of xi. 11 f., xv. 8–13, &c, Völter (pp. 135 f.) distinguishes an original letter (in i. 1, 5*b*–7, 8–17, v. 1–12, 15–19, 21, vi. 1–13, 16–23, xii.–xv. 6, xv. 14–16, 23*b*–33, xvi. 21–24) from editorial additions, and also from still later accretions in ii. 14–15, iii. 23–26, vii. 25*b*, xi. 11 f., xv. 7–13, 17–23*a*, xvi. 17 f., 25 f. Spitta's views are properly set aside by Feine and Bahnsen (*Protest. Monatshefte*, 1902, 331 f.) amongst others.

[4] It suggests a stereotyped form (cf. Mangold, *Der Römerbrief*, 44–81, and Holtzmann, *Ephes. Col. Brief*, 307–310). "In spite of the vindication of the style word by word, the impression it bears upon the mind is hardly Pauline. It seems artificial rather than inspired" (Denney, p. 582). Proofs of its Pauline authorship are led fully by Zahn (*Einleitung in das N.T.* § 21 f.) and Jacquier (*Histoire des livres du N.T.*, 1903, pp. 271 f.); cf. also Bacon in *Journal of Biblical Literature* (1899), pp. 184 f. The entire data of xv.–xvi. are discussed fully by Lightfoot and Hort, in the former's *Biblical Essays* (pp. 287 f.) and in the latter's admirable volume (*Romans and Ephesians*), as well as in Sanday and Headlam's edition (pp. lxxxv. f.).

[5] Ryder (*Journal of Biblical Literature*, 1898, pp. 184 f.) suggests that xv.–xvi. 24 form a letter or part of a letter written not by Paul but by his amanuensis, Tertius, to his friends at Rome, *c.* A.D. 64, previous to the Neronic persecution.

[6] So J. Weiss (in *Theologische Studien*, 1897, pp. 182 f.), as well as those who, like Renan (*S. Paul*, lxiii–lxxv), find different editions in the canonical epistle, one meant for Thessalonica (i.–xiv. 33, xvi. 25–27), one for Ephesus (i.–xiv., xvi. 1–20) and one for Rome (i.–xi., xv.), or who, like Lightfoot (*Biblical Essays*), see a double recension, the original draft having been meant for Rome (i.–xvi. 23), the later being, like Ephesians, a circular epistle.

[7] The epistle was so systematic in treatment and wide in scope that it lent itself readily to this "catholicizing" manipulation; thus the fact that xv.–xvi. are very rarely quoted in primitive tradition may be due to their fullness of local detail, which would have less interest for the later church. But the question of course arises, May not the epistle, in whole or in part, have originally been more of a treatise in epistolary form than at first sight appears? For various suggestions as to the problem of i. 7 see Harnack in *Zeitschrift für die neutest. Wissenschaft* (1902), 83–86; R. Steinmetz (*ibid.*, 1908, 177 f.); and Schmiedel in *Hibbert Journal* (1903), pp. 537 f.

The epistle dates itself. Paul is on his way to Jerusalem with the moneys collected from the Macedonian and Achaian churches (xv. 19–32), and, after his visit to the Jewish capital, he proposes to visit the church of Rome *en route* for a mission in Spain. The situation corresponds to that outlined in Acts xx. 2–3. Paul probably despatched the epistle from Corinth. This conclusion would be put almost beyond doubt were Rom. xvi. regarded as an integral part of the original epistle, since in that case Timothy and Sosipater (xvi. 21) would be with Paul as in Acts xx. 4, like Gaius (xvi. 23) and Erastus, both of whom were Corinthians (1 Cor. i. 14; 2 Tim. iv. 20). Phoebe of Cenchreae, the seaport of Corinth, would also be the bearer of the epistle (xvi. 1). But even apart from the evidence of ch. xvi., the tone of the epistle (especially of xv. 19 f.) indicates that Paul regards his work in the eastern provinces as done, and now turns to the West. It is just possible, of course, that the epistle was written from some other town, perhaps in Illyricum (so H. E. G. Paulus), but the facilities of communication point to Corinth.[2]

LITERATURE.—The ablest recent editions of the Greek text have been those of B. Weiss (in Meyer's commentary, 9th ed. 1899, thorough and all-round), R. A. Lipsius (*Hand-Commentar*, 2nd ed. 1892), H. Oltramare (Paris, 1881–82), Sanday and Headlam (*Internat. Crit. Comm.* 5th ed. 1905, strong in philology and external criticism), and Denney (*Expositor's Greek Testament*, 1901, a masterpiece of theological exposition), to which the Roman Catholic commentaries of A. Schäfer (Münster, 1891) and Cornely (Paris, 1896) may be added. The patristic and medieval literature is summarized by Sanday and Headlam (*op. cit.* pp. xcviii. f.), and a conspectus of the vast later work may be found in W. P. Dickson's translation of Meyer (Edinburgh, 1873–74). The editions of Tholuck (1842), Moses Stuart (3rd ed. 1876), Godet (1879–80, Eng. trans. 1888), E. H. Gifford (*Speaker's Commentary*, 1881) and Philippi (4th ed. Frankfort, 1896) are of special theological value, Godet's for its delicate exegesis and Gifford's for its adequacy of treatment; so, from its own point of view, is F. Delitzsch's *Brief an die Römer aus dem griech. Urtext in das Hebräische übersetzt, und aus Talmud und Midrasch erläutert* (1870); with which may be classed the earlier works of Reiche (*Versuch einer ausführl. Erklärung*, &c, 1833–34) and C. F. A. Fritzsche (1836–43). Since Dean Alford (1852), the freshest English editors have been Dr David Brown (Glasgow, 1860), Moule (*Cambridge Bible*, 1879), C. J. Vaughan (7th ed. 1890), B. Jowett (3rd ed. 1894), J. Agar Beet (9th ed. 1901) and Garvie (*Century Bible*, 1901). Jülicher's notes in *Die Schriften des N T.* (1907), though written from a different standpoint, resemble Denney's in their conciseness and penetration. Lietzmann's edition, again, is slight and philological (*Handbuch zum Neuen Testament*, 1907). Lightfoot's posthumous fragment (*Notes on Epistles of St Paul*, 1895, pp. 237–305) unfortunately breaks off at vii. 25. In addition to the special monographs already noted in the course of this article, the essays of H. E. G. Paulus (*De originibus Pauli epist. ad Rom.*, Jena, 1801), Lorenz (*Der Römerbrief*, 1884), Grafe (*Über Veranlassung und Zweck des R.*, 1881), G. B. Stevens (*The Pauline Theology*, 1894), Feine (*Der Römerbrief*, 1903) and A. Robertson (Hastings' *Dict. of Bible*, iv. 295–306) may be specially mentioned out of a large crowd, together with G. Semeria's monograph, *Il pensiero di S. Paolo nella lettera ai Romani* (Rome, 1903). Holsten's position is stated in a series of articles in the *Jahrbuch für protest. Theologie* (1879), pp. 95 f., 314 f., 680 f., Pfleiderer's in *Das Urchristentum* (2nd ed. i. 149 f., Eng. tr. *Primitive Christianity*, i. pp. 211 f.) and Hilgenfeld's in his own *Zeitschrift für die wissensch. Theologie* (1892), pp. 296–347. The recent literary and historical discussions are chronicled in C. Clemen's *Paulus*, i. 85 f., ii. 238 f., with which the English reader may compare R. J. Knowling's *The Testimony of St Paul to Christ* (1905), pp. 60 f., 311 f., 465 f. On Marcion's text of the epistle cf. Zahn's *Geschichte des N.T Kanons*, ii. pp. 515–521; on the early reception of the epistle in the church, Gregory's *Canon and Text of the N.T.* (1907), pp. 192 f., and Leipoldt's *Geschichte des neut. Kanons* (1907), i. pp. 77 f., 188 f., 192 f., 209 f. (J. MT.)

ROMANSHORN, an important commercial town in the Swiss canton of Thurgau. It is situated on the west shore of the lake of Constance, and by rail is 51½ m. N.E. of Zürich, 12½ m. S.E. of Constance, and 10 m. N.W. of Rorschach. In 1900 its population was 4577, mostly German-speaking, while there were 3093 Protestants to 1478 Romanists. Originally a small fishing village, it belonged to the abbot of St Gall from 1432 to 1798, when it became part of the canton of Thurgau. In 1856 the railway from Romanshorn to Zürich was opened, and this vastly increased the commercial importance of Romanshorn. Nowadays it is the centre of a great transit trade, as it communicates, by means of the lake, with the principal towns on its shores. The corn trade and that in timber are among the most important, while there are many industrial establishments. It is essentially a modern commercial centre.

ROMANUS, the name of four East Roman emperors.

ROMANUS I. (Lecapenus), who shared the imperial throne with Constantine VII. (*q.v.*) and exercised all the real power from 919 to 944, was admiral of the Byzantine fleet on the Danube when, hearing of the defeat of the army at Achelous (917), he resolved to sail for Constantinople. After the marriage of his daughter Helena to Constantine he was first proclaimed "basileopater" in 919 and soon after crowned colleague of his son-in-law. His reign, which was uneventful, except for an attempt to check the accumulation of landed property, was terminated by his own sons, Stephen and Constantine, who in 944 carried him off to the island of Prote and compelled him to become a monk. He died in 948.

ROMANUS II. succeeded his father Constantine VII. in 959 at the age of twenty-one, and died—poisoned, it was believed, by his wife, Theophano—in 963. He was a pleasure-loving sovereign, but showed judgment in the selection of his ministers. The great event of his reign was the conquest of Crete by Nicephorus Phocas.

ROMANUS III. (Argyrus), emperor 1028–1034, was an undistinguished Byzantine patrician, who was compelled by the dying emperor Constantine IX. to marry his daughter Zoe and to become his successor. He showed great eagerness to make his mark as a ruler, but was mostly unfortunate in his enterprises. He spent large sums upon new buildings and in endowing the monks, and in his endeavour to relieve the pressure of taxation disorganized the finances of the state. In 1030 he resolved to retaliate upon the incursions of the Moslems on the eastern frontier by leading a large army in person against Aleppo, but by allowing himself to be surprised on the march sustained a serious defeat at Azaz near Antioch. Though this disaster was retrieved by the successful defence of Edessa by George Maniakes and by the defeat of a Saracen fleet in the Adriatic, Romanus never recovered his popularity. His early death was supposed to have been due to poison administered by his wife.

See J. B. Bury in the *English Historical Review* (1889), pp. 53–57; G. Schlumberger, *L'Épopée byzantine* (Paris, 1905), iii. pp. 56–158.

ROMANUS IV. (Diogenes), emperor 1068–1071, was a member of a distinguished Cappadocian family, and had risen to distinction in the army, when he was convicted of treason against the sons of Constantine X. While waiting execution he was summoned into the presence of the empress regent, Eudocia Macrembolitissa, whom he so fascinated that she granted him a free pardon and shortly afterwards married him. After his coronation he carried on three successful campaigns against the Saracens and Seljuk Turks, whom he drove beyond the Euphrates; in a fourth he was disastrously defeated by Alp Arslan on the banks of the Araxes and taken prisoner. After releasing himself by the promise of a large ransom and the conclusion of a peace, he turned his arms against the pretender Michael VII., but was compelled after a defeat to resign the empire and retire to the island of Prote, where he soon died in great misery. It was during this reign that, by the surrender of Bari (1071), the Byzantine empire lost its last hold upon Italy.

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[1] Not, however, in the sections bearing on the Law. "It has been customary to explain this feature of the epistle by the fact of its having been written to a church with which Paul had no personal relations, and this may count for something. But there is a deeper and a worthier reason for the contrast in tone between this epistle and those written to the Galatian and Corinthian churches. The whole situation is changed. Then Paul was fighting for existence with his back to the wall; now he writes as one conscious that the cause of Gentile Christianity is safe" (A. B. Bruce, *St Paul's Conception of Christianity*, 1894, p. 96).

[2] This is carefully worked out by Paley in his *Horae Paulinae* (ed. Birks, 1825), pp. 8 f.

See J. G. C. Anderson in the *Journal of Hellenic Studies* (1897), pp. 36–39. On all the above see also J. B. Bury's edition of Gibbon's *Decline and Fall.* (M. O. B. C.)

ROME (*Roma*), the capital of the modern kingdom of Italy, in the province of Rome, on the river Tiber, 17 miles N.E. from its mouth on the Mediterranean. As formerly the centre of the ancient Roman republic and of the Roman empire, and the headquarters of the Christian Church, Rome is unique among historical cities, and its antiquarian interest far surpasses that of any other locality in the world. In the following account the general subject of Rome is treated broadly under two aspects, themselves subdivided. These are:—(1) the topography and growth of the city of Rome, the evolution of which is traced from the earliest times to the present, and (2) Roman history, *i.e.* the political and social history of the Roman republic, empire and medieval commune.

The nine or ten hills and ridges on which the city stands are formed of masses of tufa or conglomerated sand and ashes thrown out by neighbouring volcanoes now extinct, but active down to a very recent period. One group of these volcanoes is that around Lago Bracciano, while another, still nearer to Rome, composes the Alban Hills. That some at least of these craters have been in a state of activity at no very distant period has been shown by the discovery at many places of broken pottery and bronze implements below the strata of tufa or other volcanic deposits. Traces of human life have even been found below that great flood of lava which, issuing from the Alban Hills, flowed towards the site of Rome, only stopping about 3 miles short, by the tomb of Cecilia Metella.

The superficial strata on which Rome is built are of three main kinds: (1) the plains and valleys on the left bank of the Tiber are covered, as it were, by a sea of alluvial deposits, in the midst of which (2) the hills of volcanic origin rise like so many islands; and (3) on the right bank of the Tiber, around the Janiculan and Vatican Hills, are extensive remains of an ancient sea-beach, conspicuous in parts by its fine golden sand and its deposits of greyish white potter's clay. From its yellow sand the Janiculan has been sometimes known as the Golden Hill, a name which survives in the church on its summit called S. Pietro in Montorio (Monte d'Oro). In addition to these three chief deposits, at a few places, especially in the Aventine and Pincian Hills, under-strata of travertine crop out—a hard limestone rock, once in solution in running water, and deposited gradually as the water lost its carbonic-acid solvent, a process still rapidly going on at Terni, Tivoli and other places in the neighbourhood. The conditions under which the tufa hills were formed have been very various, as is clearly seen by an examination of the rock at different places. The volcanic ashes and sand of which the tufa is composed appear in parts to lie just as they were showered down from the crater; in that case it shows but little sign of stratification, and consists wholly of igneous products. In parts time and pressure have bound together these scoriae into a soft and friable rock; in other places they still lie in loose sandy beds and can be dug out with the spade. Other masses of tufa again show signs either of having been deposited in water, or else washed away from their first resting-place and redeposited with visible stratifications; this is shown by the water-worn pebbles and chips of limestone rock, which form a conglomerate bound together by the volcanic ashes into a sort of natural cement. A third variety is that which exists on the Palatine Hill. Here the shower of red-hot ashes has evidently fallen on a thickly growing forest, and the burning wood, partly smothered by the ashes, has been converted into charcoal, large masses of which are embedded in the tufa rock. In some places charred branches of trees, their form well preserved, can be easily distinguished. The so-called "wall of Romulus" is built of this conglomerate of tufa and charred wood; a very perfect section of the branch of a tree is visible on one of the blocks by the Scalae Caci.

So great have been the physical changes in the site of Rome since the first dawn of the historic period that it is difficult now to realize what its aspect once was. The Forum Romanum, the Velabrum, the great Campus Martius (now the most crowded part of modern Rome), and other valleys were once almost impassable marshes or pools of water (Ov. *Fasti*, vi. 401; Dionys. ii. 50). The draining of these valleys was effected by means of the great cloacae, which were among the earliest important architectural works of Rome (Varro, *Ling. Lat.* iv. 149). Again, the various hills and ridges were once more numerous and very much more abrupt than they are now. At an early period, when each hill was crowned by a separate village fort, the great object of the inhabitants was to increase the steepness of its cliffs and render access difficult. At a later time, when Rome was united under one government, the very physical peculiarities which had originally made its hills so populous, through their natural adaptability for defence, became extremely inconvenient in a united city, where architectural symmetry and splendour were above all things aimed at. Hence the most gigantic engineering works were undertaken: tops of hills were levelled, whole ridges cut away, and gentle slopes formed in the place of abrupt cliffs. The levelling of the Velia and the excavation of the site for Trajan's forum are instances of this. The same works were continued in the middle ages, as when in the 14th century an access was made to the Capitoline Arx[1] from the side of the Campus Martius; up to that time a steep cliff had prevented all approach except from the side of the Forum.

Finally, after Rome had become the capital of united Italy, in the last quarter of the 19th century, an extensive government plan (*piano regulatore*) was gradually carried out, with the object of reducing hills and valley to a uniform level and constructing wide boulevards on the chessboard method of a modern American city. The constant fires which have at times devastated Rome have been a powerful agent in obliterating the natural contour of the ground; and the accumulated rubbish from this and other causes has in some places overlaid the ground to a depth of 40 ft., notably in the valleys.

THE ANCIENT CITY

Building materials.

The chief building materials used in ancient Rome may be enumerated as follows: (1) *Tufa*, the "*ruber et niger tophus*" of Vitruvius (ii. 7), varying in colour from warm brown to yellow or greyish green (called *capellaccio*). The Aventine, Palatine and Capitoline Hills contained quarries of the tufa, much worked at an early period (see Liv. xxvi. 27, xxxix. 44, and Varro, *L.L.* iv. 151). It is a very bad "weather-stone," but stands well if protected with stucco (Plin. *H.N.* xxxvi. 166). (2) *Lapis Albanus*, from Alba Longa, of volcanic origin, a conglomerate of ashes, gravel and fragments of stone; its quarries are still worked at Albano and Marino. This is now called *peperino*, from the black scoriae, like peppercorns, with which the brown conglomerate mass is studded. (3) *Lapis Gabinus*, from Gabii, very similar to the last, but harder and a better weather-stone; it contains large lumps of broken lava, products of an earlier eruption, and small pieces of limestone. According to Tacitus (*Ann.* xv. 43), it is fire-proof, and this is also the case with the Alban stone. Lapis Gabinus is now called *sperone*. (4) *Silex* (mod. *selce*), a lava from the now extinct volcanoes in the Alban Hills, used for paving roads; when broken into small pieces and mixed with lime and pozzolana it formed an immensely durable concrete. It is dark grey, very hard and breaks with a slightly conchoidal fracture (Plin. *H.N.* xxxvi. 135; Vitr. ii. 7), but does not resemble what is now called *silex* or flint. (5) *Lapis Tiburtinus* (travertine), the chief quarries of which are at Tibur (Tivoli) and other places along the river Anio; a hard pure carbonate of lime, of a creamy white colour, deposited from running or dripping water in a highly stratified form, with frequent cavities and fissures lined with crystals. As Vitruvius (ii. 5) says, it is a good weather-stone, but is soon calcined by fire. If laid horizontally it is very strong, but if set on end its crystalline structure is a great source of weakness, and it splits from end to end. Neglect on the part of Roman builders of this important precaution in many cases caused a complete failure in the structure. This was notably the case in the rostra. (6) *Pulvis Puteolanus* (pozzolana), so called from extensive beds of it at Puteoli—a volcanic product, which looks like red sandy earth, and lies in enormous beds under and round the city of Rome. When mixed with lime it forms a very strong hydraulic cement, of equal use in concrete, mortar or undercoats of stucco. It is to this material that the concrete walls of Rome owe their enormous strength and durability, in many cases far exceeding those of the most massive stone masonry. Vitruvius devotes a chapter (bk. ii. ch. 6) to this very important material.

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[1] By the great flight of marble steps up to S. Maria in Ara Coeli.

Bricks were either sun-dried (*lateres crudi*) or kiln-baked (*lateres cocti, testae*). The remarks of Vitruvius (ii. 3) seem to refer wholly to sun-dried bricks, of which no examples now exist in Rome. It is important to recognize the fact that among the existing ancient buildings of Rome there is no such thing as a brick wall or a brick arch in the true sense of the word; bricks were merely used as a facing to concrete walls and arches and have no constructional importance.[1] Concrete (*opus caementicium*, Vitr. ii. 4, 6, 8), the most important of all the materials used, is made of rough pieces of stone, or of fragments of marble, brick, &c., averaging from about the size of a man's fist and embedded in cement made of lime and pozzolana—forming one solid mass of enormous strength and coherence. Stucco, cement and mortar (*tectorium, opus albarium* and other names) are of many kinds; the ancient Romans especially excelled in their manufacture. The cement used for lining the channels of aqueducts (*opus signinum*) was made of lime mixed with pounded brick or potsherds and pozzolana; the same mixture was used for floors under the "nucleus" or finer cement on which the mosaic or marble paving-slabs were bedded, and was called *caementum ex testis tunsis*. For walls, three or four coats of stucco were used, often as much as 5 in. thick altogether; the lower coats were of lime and pozzolana, the finishing coats of powdered white marble (*opus albarium*) suitable to receive painting. Even marble buildings were usually coated with a thin layer of this fine white stucco, nearly as hard and durable as the marble itself—a practice also employed in the finest buildings of the Greeks—probably because it formed a more absorbent ground for coloured decoration; stone columns coated in this way were called "*columnae dealbatae*" (Cic. *In Verr.* ii. 1, 52 seq.). For the kinds of sand used in mortar and stucco, Vitruvius (ii. 4) mentions sea, pit and river sand, saying that pit sand is to be preferred.

Decorative materials.

Marble appears to have come into use about the beginning of the 1st century B.C. Its introduction was at first viewed with great jealousy, as savouring of Greek luxury. The orator Crassus was the first to use it in his house on the Palatine, built about 92 B.C.; and, though he had only six small columns of Hymettian marble, he was for this luxury nicknamed the "Palatine Venus" by the stern republican M. Brutus (Plin. *H.N.* xxxvi. 7). The temporary wooden theatre of the aedile M. Aemilius Scaurus, built in 58 B.C., appears to have been the first building in which marble was more largely used; its 360 columns and the lower order of its scena were of Greek marble (see Plin. *H.N.* xxxvi. 5, 50). In a very few years, under the rule of Augustus, marble became very common.[2]

Of white statuary marble four principal varieties were used. (1) *Marmor Lunense*, from Luna, near the modern Carrara (Strabo, v. p. 222), is of many qualities, from the purest creamy white and the finest grain to the coarser sorts disfigured with bluish grey streaks. (Ex., the eleven Corinthian columns in the Borsa.) (2) *Marmor Hymettium*, from Mount Hymettus, near Athens, is coarser in grain than the best Luna marble and is usually marked with grey or blue striations (Strabo ix. p. 399). (Ex., the forty-two columns in the nave of S. Maria Maggiore and the columns in S. Pietro in Vincoli.) (3) *Marmor Pentelicum*, from Mount Pentelicus, also near Athens, is very fine in grain and of a pure white; it was more used for architectural purposes than for statues, though some sculptors preferred it above all others, especially Pheidias and Praxiteles. (Ex., the bust of the young Augustus in the Vatican.) (4) *Marmor Parium*, from the Isle of Paros, is very beautiful, though coarse in texture, having a very crystalline structure. (Ex., the nineteen columns of the round temple in the Forum Boarium.)

Coloured marbles.

Nine chief varieties of coloured marbles were used in Rome. (1) *Marmor Numidicum* (mod. *giallo antico*; Plin. *H.N.* v. 22), from Numidia and Libya, hence also called *Libycum*, is of a rich yellow, deepening to orange and even pink. Enormous quantities of it were used, especially for columns, wall-linings and pavements. (Ex., seven columns on the arch of Constantine, taken from the arch of Trajan; the eighth column is in the Lateran basilica.) (2) *Marmor Carystium* (mod. *cipollino*), from Carystus in Euboea (Strabo x. p. 446), has alternate wavy strata of white and pale green—the "undosa Carystos" of Statius (*Silv.* i. 5, 34). From its well-defined layers like an onion (*cipolla*) is derived its modern name. (Ex., columns of temple of Antoninus and Faustina.) (3) *Marmor Phrygium* or *Synnadicum* (mod. *pavonazzetto*), from Synnada in Phrygia (Strabo xii. p. 577; Juv. xiv. 307; Tibull. iii. 3, 13), is a slightly translucent marble, with rich purple markings, violet verging on red. It was fabled to be stained with the blood of Atys (Stat. *Silv.* i. 5, 37). (Ex., twelve fluted columns in S. Lorenzo fuori le Mura, and four columns in the apse of S. Paolo fuori, saved from the ancient nave of the basilica, burnt in 1823.) (4) *Marmor Iasium* (probably the modern *porta santa*), from Iasus, is mottled with large patches of dull red, olive green and white. The "holy doors" of the four great basilicas are framed with it, hence its modern name. (Ex., the slabs in front of the hemicycle of the Rostra and four columns in S. Agnese fuori le Mura). (5) *Marmor Chium* (probably the modern *Africano*), from Chios, is similar in the variety of its markings to the *portasanta*, but more brilliant in tint. (Ex., a great part of the paving of the Basilica Julia and two large columns in the centre of the façade of St Peter's.) (6) *Marmor Taenarium* (mod. *rosso antico*), from Taenarum in Laconia (Strabo viii. p. 367; Pliny, *H.N.* xxxvi. 158), is a very close-grained marble, of a rich deep red, like blood. As a rule it does not occur in large pieces, but was much used for small cornices and other mouldings in interiors of buildings. Its quarries in Greece are still worked. (The largest pieces known are the fourteen steps to the high altar of S. Prassede and two columns nearly 12 ft. high in the Rospigliosi Casino dell' Aurora.) (7) The name *Marmor Taenarium* is also applied by the ancients to a black marble (*nero antico*) now no longer quarried. It is mentioned by Tibullus (iii. 3, 14) in conjunction with Phrygian and Carystian marbles; see also Prop. iii. 2, 9, and Plin. *H.N.* xxxvi. 135. (Ex., two columns in the choir of S. Giovanni in Laterano.) (8) *Lapis Atracius* (*verde antico*), found at Atrax in Thessaly, was one of the favourite materials for decorative architecture; it is not strictly a marble (*i.e.* a calcareous stone) but a variety of "precious serpentine," with patches of white and brown on a brilliant green ground. It seldom occurs in large masses. (The finest known specimens are the twenty-four columns beside the niches in the nave of the Lateran basilica.) (9) The hard oriental alabaster, the "onyx" or "alabastrites" of Pliny (*H.N.* xxxvi. 59, xxxvii. 109); its chief quarries were on the Nile near Thebes,[3] in Arabia and near Damascus. In Pliny's age it was a great rarity; but in later times it was introduced in large quantities, and fragments of a great many columns have been found on the Palatine, in the baths of Caracalla and elsewhere. It is semi-transparent and beautifully marked with concentric nodules and wavy strata. An immense number of other less common marbles have been found, including many varieties of breccia, whose ancient names are unknown.[4]

Granites and basalts.

From the latter part of the 1st century B.C. hard stones—granites and basalts—were introduced in great quantities. The basalts—"basanites" of Pliny (xxxvi. 58)—are very refractory, and can only be worked by the help of emery or diamond dust. The former was obtained largely at Naxos; diamond-dust drills are mentioned by Pliny (*H.N.* xxxvii. 200). The basalts are black, green and brown, and are usually free from spots or markings; examples of all three exist, but are comparatively rare. The red variety called "porphyry" was used in enormous quantities. It is the "porphyrites" of Pliny (*H.N.*

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[1] In less solid constructions than those which have survived until modern times bricks were doubtless used by themselves.

[2] The oft-quoted boast of Augustus (Suet. *Aug.* 29) that he "found Rome of brick and left it of marble" has probably much truth in it, if for "brick" we read "peperino and tufa." In the time of Augustus burnt brick was very little used, the usual wall-facings being *opus quadratum* of tufa or peperino, and *opus reticulatum* of tufa only.

[3] These Nile quarries were worked during the 19th century, and many blocks were imported into Rome for the rebuilding of S. Paolo fuori le Mura.

[4] On the subject of Roman marbles, see Corsi, *Delle pietre antiche* (ed. 3, 1845), and Pullen, *Handbook of Roman Marbles* (London, 1894); also Brindley in *Transactions of the Royal Institute of British Architects* (1887). A collection of 1000 specimens, originally formed by Corsi, is preserved in the museum at Oxford.

xxxvi. 57), and was brought from Egypt. It has a rich red ground, covered with small specks of white felspar; hence it was also called "leptopsephos." A large number of columns of it exist, and it was much used for pavements of *opus Alexandrinum*. A rich green porphyry or basalt was also largely used, but not in such great masses as the red porphyry. It has a brilliant green ground covered with rectangular light green crystals of felspar. This is the *lapis Lacedaemonius* (wrongly called by the modern Romans "serpentino"), so named from its quarries in Mount Taÿgetus in Lacedaemonia (Paus. iii. 21, 4; Plin. *H.N.* xxxvi. 55; Juv. xi. 175). It appears to have been mostly used for pavements and panels of wall linings. The granites used in Rome came mostly from near Philae on the Nile (Plin. *H.N.* xxxvi. 63). The red sort was called *lapis pyrrhopoecilus* and the grey *lapis psaronius*. The columns in the Basilica Ulpia are a fine example of the latter; both sorts are used for the columns of the Pantheon and those of the temple of Saturn in the Forum. Gigantic ships were specially made to carry the obelisks and other great monoliths (Plin. *H.N.* xxxvi. 2, 67).

Architectural styles. The style of architecture employed in ancient Rome (see ARCHITECTURE, section *Roman*, and ROMAN ART) may be said to have passed through three stages—the Etruscan, the Greek and the Roman. During the first few centuries of the existence of the city, both the methods of construction and the designs employed appear to have been purely Etruscan. The earliest temples were either simple cellae without columns, or else, in the case of the grander temples, such as that of Capitoline Jupiter, the columns were very widely spaced (araeostyle), and consequently had entablatures of wooden beams. The architectural decorations were more generally in gilt bronze or painted terra-cotta than in stone, and the paintings or statues which decorated the buildings were usually the work of Etruscan artists.[1] The Greek influence is more obvious; it is found in the period following the Second Punic or Hannibalic War, and almost all the temples of the earlier imperial age are Greek, with certain modifications, not only in general design but in details and ornaments. Greek architects were largely employed, such as Apollodorus of Damascus, who designed Trajan's forum and other buildings; on the other hand, a Roman, Cossutius, was employed on the building of the Olympieum at Athens, in the 2nd century B.C. Roman architects such as Vitruvius and C. Mucius in the 1st century B.C., Severus and Celer under Nero, and Rabirius under Domitian, were Greek by education, and probably studied at Athens (see Vitr. vii. *Praef.*; Hirt, *Gesch. d. Baukunst*, ii. p. 257).[2] The Romans, however, though far below the Greeks in artistic originality, were very able engineers, and this led to the development of a new and more purely Roman style, in which the restrictions imposed by the use of the stone lintel were put aside and large spaces were covered with vaults and domes cast in semi-fluid concrete, a method which had the enormous advantage of giving the arched form without the constant thrust at the springing which makes true arches or vaults of wide span so difficult to deal with. The enormous vaults of the great thermae, the basilica of Constantine, and the like, cover their spaces with one solid mass like a metal lid, giving the form but not the principle of the arch, and thus allowing the vault to be set on walls which would at once have been thrust apart had they been subjected to the immense leverage which a true arched vault constantly exerts on its imposts.[3] This is a very important point, and one which is usually overlooked, mainly owing to the Roman practice of facing their concrete with bricks, which (from an examination of the surface only) appear to be a principal item in the construction. The walls of the Pantheon, for example, are covered with tiers of brick arches, and many theories have been invented as to their use in distributing the weight of the walls. But a recognition of the fact that these walls are of concrete about 20 ft. thick, while the brick facing averages scarcely 6 in. in thickness, clearly shows that these "relieving arches" have no more constructional use as far as concerns the pressure than if they were painted on the surface of the walls. The same applies to the superficial use of brick in all arches and vaults. Although, however, the setting of the concrete rendered the brick facing superfluous, it played its part in sustaining the fluid mass on its centring during the process of solidification.

Opus quadratum. At first tufa only was used in *opus quadratum*, as we see in the so-called wall of Romulus. Next the harder peperino began to be worked: it is used, though sparingly, in the "Servian" wall, and during the later Republic appears to have been largely employed for exterior walls or points where there was heavy pressure, while other parts were built of tufa. Thirdly, travertine appears to have been introduced about the 2nd century B.C. but was used at first for merely ornamental purposes, very much as marble was under the Empire; after about the middle of the 1st century A.D. travertine began to be largely used for the solid mass of walls, as in the temple of Vespasian and the Colosseum. The tufa or peperino blocks were roughly 2 (Roman) ft. thick in regular courses (the "isodomum" of Vitruvius) by 2 ft. across the end, and under the Republic often exactly 4 ft. long, so that two blocks set endways ranged with one set lengthways. They were arranged in alternate courses of headers and stretchers, so as to make a good bond; this is the "emplecton" of Vitruvius (ii. 8). The so-called Tabularium of the Capitol is a good example of this. The harder and more valuable travertine was not cut in this regular way, but pieces of all sizes were used, just as they happened to come from the quarry, in order to avoid waste: blocks as much as 15 by 8 ft. were used, and the courses varied in thickness—the "pseudisodomum" of Vitruvius. When tufa or peperino was mixed with the travertine, it was cut so as to range with the irregular courses of the latter.

It is interesting to note the manner in which the Roman builders mixed their different materials according to the weight they had to carry. While tufa was frequently used for the main walls, peperino (*e.g.* in the "Servian" wall on the Aventine) or travertine (*e.g.* in the forum of Augustus and the temple of Fortuna Virilis, so called) was inserted at points of special pressure, such as piers or arches (see fig.). The Colosseum is a particularly elaborate example of this mixed construction with three degrees of pressure supported by three different materials.

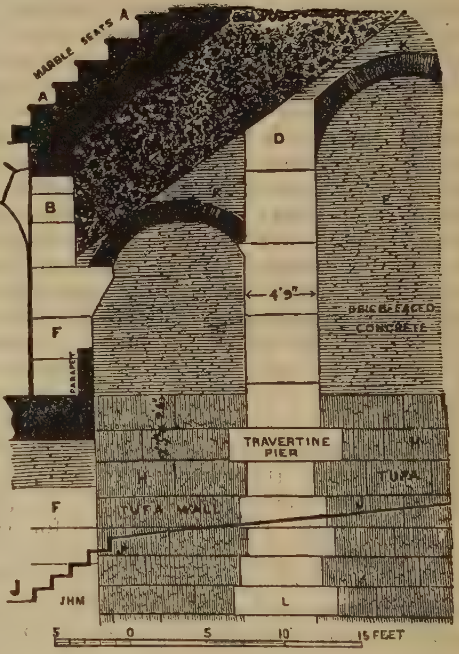

FIG. 1.—Example of Construction in which many materials are used; upper part of one of the inner radiating walls under the cunei of the Colosseum. A, A. Marble seats on brick and concrete core, supported on vault made of pumice-stone concrete (C). B. Travertine arch at end of raking vault (C). D. One of the travertine piers built in flush with the tufa wall to give it extra strength. E, E. Wall of tufa concrete faced with triangular bricks, carrying the vaults of pumice concrete which support the marble seats. F. Travertine pier at end of radiating wall. G. Brick-faced arch of concrete to carry floor of passage. H, H. Tufa wall, *opus quadratum*. J, J, J. Line of steps in next bay. K, K. Surface arches of brick, too shallow to be of any constructional use, and not meant for ornament, as the whole was stuccoed; they only face the wall (which is about 4 ft. thick) to the average depth of 4 in.

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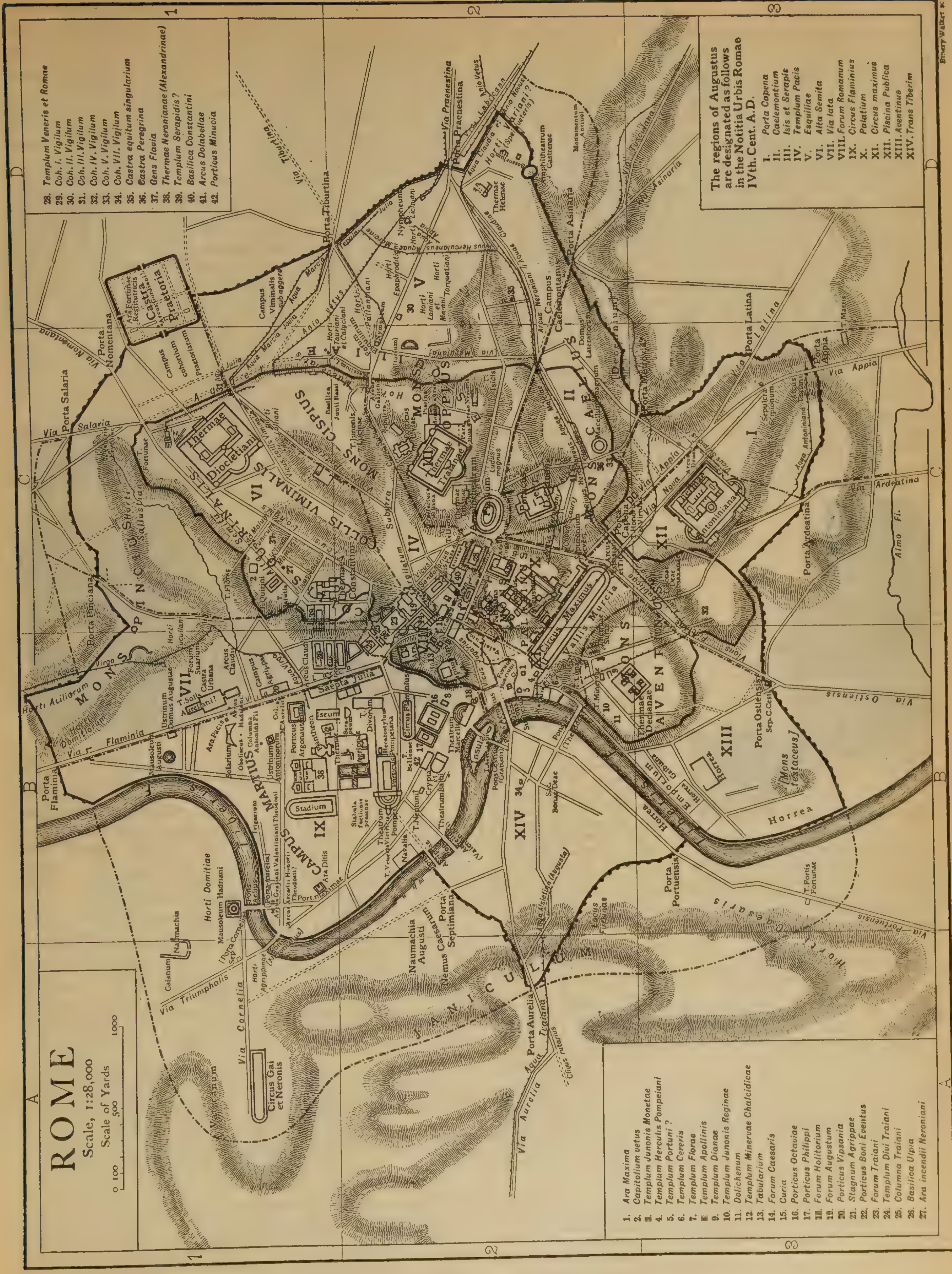
[1] Pliny (*H.N.* xxxv. 154), quoting Varro, says that the decorations in painting and sculpture of the temple of Ceres near the Circus Maximus were the work of the first Greek artists employed in Rome, and that before that (*c.* 493 B.C.) "all things in temples were Etruscan." Vitruvius (iii. 3) says, "Ornantque signis fictilibus aut aereis inauratis eorum fastigia Tuscanico more, uti est ad Circum Maximum Cereris, et Herculis Pompeiani, item Capitolii" (cf. iv. 7, vi. 3).

[2] The frequent use of engaged columns is a peculiarity of Roman architecture, but it is not without precedent in Greek buildings of the best period, *e.g.* in the temple of Zeus at Agrigentum. Surface enrichments over the mouldings were used far more largely by the Romans than by the Greeks.

[3] In the beautiful drawings of Choisy (*L'Art de bâtir chez les Romains*, Paris, 1873) the structural importance of the brick used in vaults and arches is very much exaggerated.



ROME
Scale, 1:28,000
Scale of Yards
0 100 500 1000
1. Ara Maxima
2. Capitolium vetus
3. Templum Junonis Monetae
4. Templum Herculis Pompeiani
5. Templum Portuni ?
6. Templum Cereris
7. Templum Florae
8. Templum Apollinis
9. Templum Dianae
10. Templum Junonis Reginae
11. Dolichenum
12. Templum Minervae Chalcidicae
13. Tabularium
14. Forum Caesaris
15. Curia
16. Porticus Octaviae
17. Porticus Philippi
18. Forum Holitorium
19. Forum Augustum
20. Porticus Vipsania
21. Stagnum Agrippae
22. Porticus Boni Eventus
23. Forum Traiani
24. Templum Divi Traiani
25. Columna Traiani
26. Basilica Ulpia
27. Ara incendii Neroniani
28. Templum Veneris et Romae
29. Coh. I. Vigilum
30. Coh. II. Vigilum
31. Coh. III. Vigilum
32. Coh. IV. Vigilum
33. Coh. V. Vigilum
34. Coh. VII. Vigilum
35. Castra equitum singularium
36. Castra Peregrina
37. Gens Flavia
38. Thermae Neronianae (Alexandrinae)
39. Templum Serapidis?
40. Basilica Constantini
41. Arcus Dolabellae
42. Porticus Minucia
The regions of Augustus are designated as follows in the Notitia Urbis Romae IVth. Cent. A.D.
I. Porta Capena
II. Caelemontium
III. Isis et Serapis
IV. Templum Pacis
V. Esquiliae
VI. Alta Semita
VII. Via lata
VIII. Forum Romanum
IX. Circus Flaminius
X. Palatium
XI. Circus maximus
XII. Piscina Publica
XIII. Aventinus
XIV. Trans Tiberim
Campus Martius
Mons Pincius
Collis Quirinalis
Collis Viminalis
Mons Cispius
Mons Oppius
Mons Caelius
Aventinus
Ianiculum
Vaticanum
Tiberis
Circus Maximus
Amphitheatrum Flavium
Thermae Diocletiani
Thermae Traiani
Thermae Antoninianae
Castra Praetoria
Mausoleum Augusti
Mausoleum Hadriani
Pantheon
Stadium
Theatrum Marcelli
Theatrum Pompei
Saepta Julia
Circus Gai et Neronis
Naumachia Augusti
Mons Testaceus
Emporium
Horrea
Porta Flaminia
Porta Pinciana
Porta Salaria
Porta Nomentana
Porta Tiburtina
Porta Praenestina
Porta Asinaria
Porta Metrovia
Porta Latina
Porta Appia
Porta Ardeatina
Porta Ostiensis
Porta Portuensis
Porta Aurelia
Porta Septimiana
Via Flaminia
Via Salaria
Via Nomentana
Via Tiburtina
Via Praenestina
Via Labicana
Via Tusculana
Via Latina
Via Appia
Via Ardeatina
Via Ostiensis
Via Portuensis
Via Aurelia
Via Cornelia
Via Triumphalis
Almo Fl.
A B C D
1 2 3
Emery Walker sc.
Based on Plan in Kiepert's Formae Orbis Antiqui, by permission of Dietrich Reimer, Berlin.

FIG. 7.—PLAN OF ANCIENT ROME.

The use of mortar with *opus quadratum* is a sign of a comparatively early date. It occurs, *e.g.* in the "Servian" wall on the Aventine and in the Tabularium. **Mortar.** Under the Empire massive blocks, whether of tufa, travertine or marble, are set without any mortar. It must, however, be observed that in these early instances the "mortar" is but a thin stratum of lime, little thicker than stout paper, used not as a cement to bind the blocks together, but simply to give the joints a smoothly fitting surface. **Clamps.** The actual binding together was done by clamps and dowels, as well as by the mass and weight of the great blocks used. Except in the earliest masonry, each block was very carefully fastened, not only to the next blocks on the same course, which was done with double dove-tailed dowels of wood, but also to those above and below with stout iron clamps, run with lead (Vitr. ii. 8).[1] In more ornamental marble work bronze clamps were often used. Concrete is rarely found in connexion with *opus quadratum*; part of the "Servian" wall on the Aventine received a backing of concrete at a relatively late period. Up to the 1st century B.C. it was faced with *opus incertum*—small irregularly shaped blocks of tufa, 3 to 6 in. across, with pointed ends driven into the concrete while it was soft, and worked smooth on the face only (see fig. 2). **Opus reticulatum.** From the beginning of the 1st century B.C. *opus reticulatum*,[2] formed of rectangular tufa prisms laid in a regular pattern like a net (whence the name), is found. It is very neat in appearance, and is often fitted with great care, though it was generally covered with stucco. The so-called "house of Livia" on the Palatine is a good example of the earlier sort, when the quoins were made of small rectangular blocks of tufa. Under the Empire brick quoins came into use (as may be seen, *e.g.* in the so-called palace of Caligula). Though in Rome *opus reticulatum* was almost always made of tufa, in the neighbourhood of the city it was sometimes of peperino or even lava, where these materials were found on the spot.

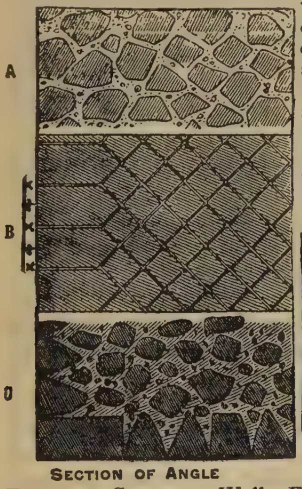


FIG. 2.—Concrete Wall faced with (A) Opus Incertum and (B) Opus Reticulatum. C shows the section, similar in both.

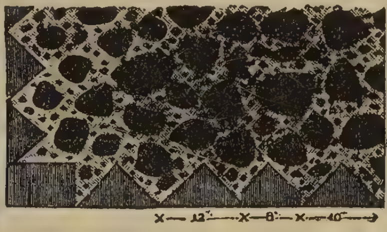


FIG. 3.—Section of Concrete Wall, showing the use of bricks merely as a facing.

Brick facing. Of concrete walls faced with burnt bricks no dated example earlier than the middle of the 1st century B.C. is known. The facing consisted at first of triangular fragments of tiles (*tegulae*), broken for the purpose and more or less irregular in shape and size, but from the latter part of the 1st century A.D. onwards triangular bricks were specially manufactured for wall-facings. This shape was adopted in order to present a large surface on the face with little expenditure of brick, and also to improve the bond with the concrete behind (see fig. 4). Even party walls of small rooms are not built solid, but have a concrete core faced with brick triangles about 3 in. long. In order to support the facing until the concrete was set, the Roman builders used a wooden framing covered with planks on the inside. Sometimes the planks were nailed outside the wooden uprights, as was done with unfaced concrete walls, and then a series of grooves appear in the face of the brickwork. Walls faced with *opus reticulatum* must have been supported temporarily in the same way.

The character of the brick facing is a great help towards determining the date of Roman buildings. In early work the bricks are thick and the joints thin, while in later times the reverse is the case, so that brickwork of the time of Severus and later has more bricks to the foot than that of the Flavian period.

The length of the bricks as it appears on the face is no guide to the date, since one or more of the sharp points of the brick triangles were frequently broken off before they were used. Moreover, varieties both in quality of workmanship and size of the bricks often occur in work of the same date. In the remains of Nero's Golden House great varieties appear, and some of the walls in the inferior rooms are faced with very irregular and careless brickwork.[3] Special care and neatness were employed in the rare cases when the wall was not to be covered with stucco, which in the absence of marble was usually spread over both inside and outside walls. All these circumstances make great caution necessary in judging of dates; fortunately after the 1st century A.D., and in some cases even earlier, stamps impressed on bricks, and especially on the large tiles used for arches, give clearer indications. The reason of the almost universal use of smooth facings either of *opus reticulatum* or of brick over concrete walls is a very puzzling question; for concrete itself forms an excellent ground for the stucco coating or backing to the marble slabs, while the stucco adheres with difficulty to a smooth facing, and is very liable to fall away. The modern practice of raking out the joints to form a key was not employed by the Romans, but before the mortar was hard they studded the face of the wall with marble plugs and iron or bronze nails driven into the joints, so as to give a hold for the stucco—a great waste both of labour and material.[4] The quality of the mortar varies according to its date: during the 1st and 2nd centuries it is of remarkable hardness—made of lime with a mixture of coarse pozzolana of a bright red colour; in the 3rd century it began to be inferior in quality; and the pozzolana used under the later Empire is brown instead of red.

Concrete was at first always made of lumps of tufa; then travertine, lava, broken bricks and even marble were used, in fact all the chips and fragments of the mason's yard. **Concrete walls and vaults.** Under the Empire the concrete used was made with travertine or lava for foundations, with tufa or broken bricks for walls, and with tufa or pumice-stone (for the sake of lightness) for vaults. Massive walls were cast in a mould; upright timbers, about 6 by 7 in. thick and 10 to 14 ft. long, were set in rows on each face of the future wall; planks 9 to 10 in. wide were nailed to them, so as to form a case, into which the semi-fluid mass of stones, lime and pozzolana was poured. When this was set the timbers were removed and refixed on the top of the concrete wall; then fresh concrete was poured in; and this process was repeated till the wall was raised to the required height. Usually such cast-work was only used for foundations and cella walls, the upper parts being faced with brick; but in some cases the whole wall to the top was cast in this way and the brick facing omitted. In strength and durability no masonry, however hard the stone or large the blocks, could ever equal these walls of concrete when made with hard lava or travertine, for each wall was one perfectly coherent mass, and could only be destroyed by a laborious process like that of quarrying hard stone from its native bed. Owing to this method of building the progress of the work from day to day can often be traced by a change in the look of the concrete. About 3 ft. appears to have been the average amount of wall raised in a day.

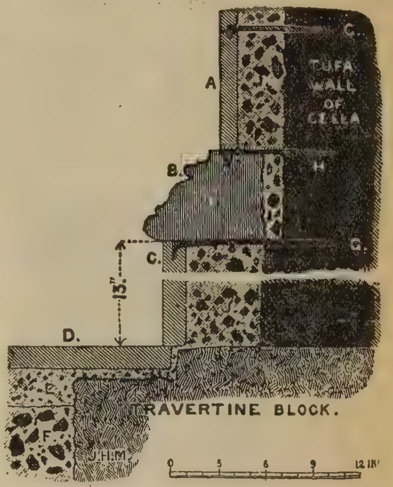


FIG. 4.—Example of Marble Lining, from the Cella of the Temple of Concord. A. Slabs of Phrygian marble. B. Plinth moulding of Numidian "giallo." C. Slab of cipollino (Carystian marble). D. Paving of porta santa. E and F. "nucleus" and "rudus" of concrete bedding. G, G. Iron clamps run with lead to fix marble lining. H. Bronze clamp. J. Cement backing.

Marble linings were fixed very firmly to the walls with long clamps of metal, hooked at the end so as to hold in a hole made in the marble slab. **Marble linings, &c.** Fig. 4 gives an example, of the time of Augustus, fixed against a stone wall. The blocks were usually marked in the quarry with a number, and often with the names of the reigning emperor and the overseer of the quarry. These quarry-marks are often of great value as indications of the date of a building or statue.[5] Metropolitan building acts, not unlike those of modern London, were enacted by several of the emperors. These fixed the materials to be used, thickness of walls, minimum width of streets, maximum height allowed for houses, &c. After the great fire in Nero's reign, A.D. 64, an act was passed requiring the lower storeys of houses to be built with fire-proof materials, such as peperino or burnt brick.

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[1] The expansion of the iron through rust, which caused the stone to split, has frequently been a great source of injury to Roman walls, as well as the practice, common in the middle ages, of breaking into the stones in order to extract the metal.

[2] These two kinds of stone facings are mentioned thus by Vitruvius (ii. 8), "*reticulatum*, quo nunc [reign of Augustus] omnes utuntur, et antiquum, quod *incertum* dicitur."

[3] Some of the bricks are as much as 2½ in. thick, while 1½ in. is the usual maximum for Roman bricks.

[4] The Roman method of applying stucco to walls with a wooden "float" exactly as is done now, is shown in a painting from Pompeii (see *Ann. Inst.*, 1881, pl. H.).

[5] See Bruzza, in *Ann. Inst.* (1870), pp. 106–204; Hirschfeld, *Die kaiserlichen Verwaltungsbeamten* (1905), pp. 162 ff.

Ancient works of art.

Enormous accumulations of statues and pictures enriched Rome during its period of greatest splendour. In the first place, the numerous statues of the republican and even of the regal period were religiously preserved at a time when, from their archaic character, they must have been regarded rather as objects of sacred or archaeological interest than as works of art (Plin. *H.N.* xxxiv. 15 ff., xxxv. 19 ff.). Secondly came the large Graeco-Roman class, mostly copies of earlier Greek works, executed in Rome by Greek artists. To this class belongs most of the finest existing sculpture preserved in the Vatican and other museums. Thirdly, countless statues and pictures were stolen from almost every important city in Greece, Magna Graecia, Sicily and western Asia Minor. These robberies began early, and were carried on for many centuries. The importations included works of art by all the chief artists from the 5th century downwards. Long lists are given by Pliny (*H.N.* xxxiii.–xxxvi.), and pedestals exist with the names of Praxiteles, Timarchus, Polyclitus, Bryaxis and others. These accumulated works of sculpture were of all materials—gold and ivory (Suet. *Tit.* 2), of which seventy-four are mentioned in the catalogue of the Breviarium, many hundreds or even thousands of silver[1] (Plin. *H.N.* xxxiii. 151 f.), while those of gilt bronze and marble must have existed in almost untold numbers (Paus. viii. 46). Nor were the accumulated stores of Greek paintings much inferior in number; not only were easel pictures by Zeuxis, Apelles, Timanthes and other Greek artists taken, but even mural paintings were carefully cut off their walls and brought to Rome secured in wooden frames (Plin. *H.N.* xxxv. 173, and compare *ibid.* 154).

Roads.

The roads were made of polygonal blocks of lava (*silex*), neatly fitted together and laid on a carefully prepared bed, similar to that used for mosaic paving (see MOSAIC and ROADS). Roads thus made were called *viae stratae.* A good specimen of Roman road-making, in which the blocks were fitted together with the utmost accuracy, is to be seen in a portion of the Clivus Capitolinus in front of the temple of Saturn (see fig. 5, which also shows the massive travertine curb which bordered the road; sometimes the curb was of lava). In 1901 the late and badly laid pavement of the Sacra Via on the ascent of the Velia was removed, and the earlier paving laid bare at a lower level. The original pavement of the Nova Via was exposed in 1904. Other well-preserved *viae stratae* are those leading up to the Palatine from the Summa Sacra Via and that which follows the curved line of shops in Trajan's forum.

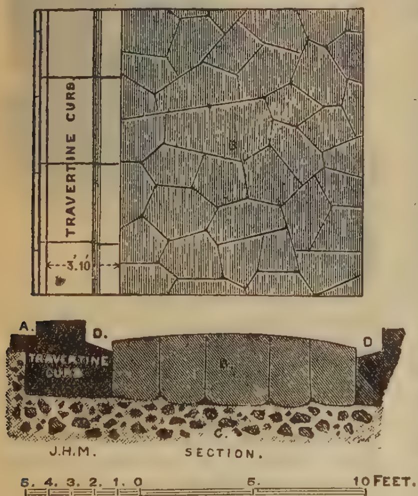

FIG. 5.—Example of Early Basalt Road by the Temple of Saturn on the Clivus Capitolinus. A. Travertine paving B. Polygonal basalt blocks. C. Concrete bedding. D. Rain-water gutter. The curb shown is taken from another part of the road.

The following is a list of the chief roads which radiated from Rome:—(1) Via Appia issued from the Servian Porta Capena and the Aurelian P. Appia; from it diverged (2) Via Latina, which issued from the Aurelian P. Latina; (3) Via Labicana and (4) Via Tiburtina issued from the Servian P. Esquilina; from (3) diverged (5) Via Praenestina at the double arch of the Claudian aqueduct, now P. Maggiore, while (4) passed through the Aurelian P. Tiburtina; (6) Via Nomentana and (7) Via Salaria issued from the Servian P. Collina and passed respectively through the Aurelian P. Nomentana and P. Salaria; (8) Via Flaminia issued from the Servian P. Fontinalis, and was called Via Lata for the first half-mile or more, then passed through the Aurelian P. Flaminia; (9) Via Aurelia, from the Transtiberine P. Aurelia; (10) Via Portuensis, from the Transtiberine P. Portuensis; (11) Via Ostiensis, from the Servian P. Trigemina and the Aurelian P. Ostiensis; (12) Via Ardeatina, from the Servian P. Naevia and the Aurelian P. Ardeatina.

Remains of Prehistoric Rome.

It is evident from recent discoveries that the site of Rome was inhabited at a very early period.[2] Flint implements and remains of the Bronze Age have been found on the Aventine and elsewhere; and from the Early Iron Age onwards we have a continuous archaeological record, owing to the discovery of ancient burial-places. In 1902 a very early necropolis was brought to light at the S.E. corner of the temple of Antoninus and Faustina, some 17 ft. below the level of the Forum. The graves contain either the ashes of cremated bodies placed in a large vessel (*dolio*), or skeletons buried either in a simple trench (*fossa*), a tufa sarcophagus or a tree-trunk. The cremation graves are the earlier, and none are later than the 6th century, while the oldest may be of the 9th; the pottery and other objects placed in the graves belong to the Early Iron Age. It is clear that this cemetery is earlier than the union of the Palatine and Quirinal settlements in one city (see below, p. 759). Other early cemeteries have been discovered on the Quirinal and Esquiline, which were in use from the beginning of the Iron Age down to the beginning of the historic period. The large necropolis on the Esquiline is cut in two by the "Servian" wall, which is evidently of later date. The later tombs contain objects of Etruscan, Phoenician and Greek manufacture.

The Palatine city.

There is no doubt that the earliest settlement bearing the name of Rome was on the Palatine hill,[3] which was both easy of defence and possessed the means of communication with its neighbours in the proximity of the Tiber. The name *Roma* is said to mean "river," but this is uncertain. The Palatine is roughly square in outline, and the Roman antiquarians sometimes applied the name Roma Quadrata to the earliest settlement; but the term seems more properly to have applied to a sanctuary connected with the foundation of the city. The ideal boundary of the city was formed by the Pomerium (see Varro, *L.L.* v. 143; Liv. i. 44; Dionys. i. 88), whose original course is traced by Tacitus (*Ann.* xii. 24). It passed along the foot of the hill (*per ima montis Palatini*), the angle-points being given by the Ara Maxima in the Forum Boarium, the Ara Consi in the Circus Maximus, the Curiae Veteres (near the arch of Constantine) and the Sacellum Larum (at the N. angle). But this was of course not a defensible site, and the extent of the fortified city can only be determined by the traces of its early walls. These enable us to fix its line along the whole valley of the Velabrum, on the west of the hill, and along the valley of the Circus Maximus as far as the so-called Paedagogium, about half-way on the south side.

Ancient fortifications.

Considerable remains of this fortification exist near the west angle of the hill. These show that the natural strength given by the cliff was increased by artificial means. The wall was set neither at the top nor at the foot of the hill, but more than half-way up, a level terrace or shelf all round being cut in the rock on which the base of the wall stood. Above that the hill was cut away into a cliff, not quite perpendicular but slightly "battering" inwards, to give greater stability to the wall, which was built up against it, like a retaining wall, reaching to the top of the cliff, and probably a few feet higher. The stones used in this wall are soft tufa, a warm brown in colour, and full of masses of charred wood. The cutting to form the steep cliff probably supplied part of the material for the wall; and ancient quarries, afterwards used as reservoirs for water, exist in the mass of rock on which the so-called temple of Jupiter Victor stands. It has been asserted that these tufa blocks are not cut but split with wedges; this, however, is not the case. Tufa does not split into rectangular masses, but would be shattered to pieces by a wedge; moreover, distinct tool-marks can be seen on all the blocks whose surface is well preserved and in the quarries themselves. Chisels from one-fourth to three-fourths of an inch in width were used, and also a sharp-pointed pick or hammer. The wall is about 10 ft. thick at the bottom, and increases in thickness above as the scarped cliff against which it is built recedes. It is built of blocks laid in alternate courses of headers and stretchers, varying in thickness from 22 to 24 in., in length from 3 to 5 ft. and in width from 19 to 22 in. These blocks are carefully worked on their beds, but the face is left rough, and the vertical joints are in some cases open, spaces of nearly 2 in. being left between block and block; in other cases the vertical joints are worked true and close like the beds. No mortar was used. At two points on the side of the Velabrum winding passages are excavated in the tufa cliff, the entrance to which was once closed by the ancient wall. One of these in early times (before water in abundance was brought to the Palatine on aqueducts) was used as a reservoir to collect surface water, probably for use in case of siege; circular shafts for buckets are cut downwards through the rock from the top of the hill. A similar rock-cut cistern with vertical shafts, of very early date, exists at Alba Longa. Opposite the church of S. Teodoro a series of buttresses belonging to the early wall exists, partly concealed by a long line of buildings of the later years of the Republic and the early Empire, to make room for which the greater part of the then useless wall was pulled down, and only fragments left here and there, where they could be worked into the walls of the later houses.

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[1] Eighty silver statues of Augustus, some equestrian and some in quadrigae, are mentioned in the *Mon. Anc.* 4, 51.

[2] On the prehistoric remains of Rome and Latium, see Pinza in *Monumenti antichi pubblicati per cura della reale Accademia dei Lincei*, vol. xv., 1905; also Comm. Boni's reports on the necropolis adjoining the Forum in the *Notizie degli scavi*, and Modestor, *Introduction à l'histoire romaine* (Paris, 1907).

[3] The "primacy of the Palatine" has been disputed by Carter (*Amer. Jour. Arch.*, 1908, p. 181), who thinks that the first *city* was that of the Four Regions (see below) formed by the Etruscan kings.

The age of the walls here described cannot be determined with certainty, but their resemblance to the remains of the "Servian" wall, especially in the system of "headers and stretchers" and the dimensions of the blocks, makes it certain that they do not differ greatly in date from that work. The chief technical difference lies in the open vertical joints found in some cases; but too much stress should not be laid on this feature. There are, however, at the western angle of the hill some remains of an earlier fortification, constructed with blocks of grey-green tufa, smaller in size than those of the main wall. A few courses have been preserved, owing to the fact that at the angle of the hill this wall was encased first of all by that described above and afterwards by concrete substructures of imperial date. The technique is primitive, as the blocks are of irregular size and are not laid in courses of "headers and stretchers"; the nearest parallel is supplied by the foundations of the temple of Jupiter Capitolinus. These remains are shown by Delbrück, *Der Apollotempel auf dem Marsfelde*, pl. iii., cf. p. 13 f.

Gates of Roma Quadrata.

Pliny (*H.N.* iii. 66) tells us that the city of Romulus had three gates (cf. Serv. *Ad. Aen.* i. 222); and three approaches to the Palatine city can be traced. One is the so-called Scalae Caci, a long sloping ascent cut through the rock (see fig. 17) from the side of the Circus Maximus; some remains of the early wall still exist along the sides of this steep ascent or staircase. The upper part of this has remains of a basalt pavement, added in later times, probably covering the more ancient rock-cut steps. The name of the gate which led at this point into the Palatine city is unknown. The only two gates whose name and position can be (with any degree of probability) identified are the Porta Romanula and the Porta Mugonia. The former of these is called Porta Romana by Festus (ed. Müller, p. 262), who states that it was at the foot of the Clivus Victoriae (see fig. 17) and was so called by the Sabines of the Capitol because it was their natural entrance to Roma Quadrata (see also Varro, *L.L.* v. 164 (who only mentions the two gates named above), vi. 24). It would thus have been at the foot of the hill in the Velabrum (see below, p. 600); but Varro says that it was approached by steps from the Nova Via,[1] which would place it at the N. angle of the Palatine. The stairs connecting the Nova Via with the Clivus Victoriae still exist. Doubtful traces of the Porta Mugonia (see Sol. i. 24) have been discovered where a basalt paved road leads up into the Palatine from the Summa Sacra Via and the Summa Nova Via, which join near the arch of Titus; exposure to weather has now destroyed the soft tufa blocks of which this gate was built. This is probably the "vetus porta Palatii" of Livy (i. 12), through which the Romans fled when defeated by the Sabines.

Growth of early Rome.

The Palatine settlement was the nucleus around which, by a series of expansions, the historical city of Rome grew up. The first step was the amalgamation of Roma Quadrata with the villages on the neighbouring spurs of the Esquiline and Caelian. This gave birth to the community of the Seven Hills, whose existence is proved by the survival of the festival known as the Septimontium, celebrated on the 11th of December (Fest. 340; Macrob. i. 16, 6). The seven hills were not those familiar in later nomenclature, but the following:—(1) Palatium and (2) Cermalus, the two summits of the Palatine; (3) Velia, the saddle between the Palatine and Esquiline; (4) Oppius and (5) Cispius, the two westernmost spurs of the Esquiline, together with (6) Fagutal, the extreme crest of the Oppius; (7) Sucusa (confused by later writers with Subura), the eastern spur of the Caelian. Varro (*L.L.* v. 48) mentions the *murus terreus Carinarum*, which may have belonged to the defences of this community, since the N.W. slope of the Oppius bore the name Carinae; but there is no proof that the Septimontium was a walled city.

The next stage in the development of Rome was marked by the division of the city into four regions, ascribed by tradition to Servius Tullius,[2] who was said to have formed the four city tribes, corresponding with the regions: (1) Suburana, including the Caelian and the valley between that hill and the Esquiline; (2) Esquilina, the Oppius and Cispius; (3) Collina, the Quirinal and Viminal; (4) Palatina, including the Palatine and Velia. The third region was an addition to the City of the Seven Hills; the new city was, in fact, formed by the union of the old Latin settlement with a Sabine community on the Quirinal. The Capitol was the citadel, but was not included in the city (hence the phrase *urbs et* Capitolium).

Line of Servian wall.

Tradition likewise assigned to Servius Tullius[3] the construction of the great wall which embraced not merely the four regions but a considerably extended area, including the Aventine. Excavations have done much to determine the line of the Servian wall, especially the great works undertaken in laying out a new quarter of the city on the Quirinal, Esquiline and Viminal, which have laid bare and then mostly destroyed long lines of wall, especially along the *agger*. Beginning from the Tiber, which the Servian wall touched at a point near the present Ponte Rotto, and separating the Forum Holitorium (outside) from the Forum Boarium (inside), it ran in a straight line to the Capitoline hill, the two crests of which, the Capitolium and the Arx, with the intermediate valley the Asylum, were surrounded by an earlier fortification, set (Dionys. ix. 68) ἐπὶ λόφοις . . . καὶ πέτραις ἀποτόμοις. In this space there were two gates, the Porta Flumentana, next the river (see Cic. *Ad Att.* vii. 3; Liv. xxxv. 19, 21); and the Porta Carmentalis close to the Capitolium.[4] From the Capitoline hill the wall passed to the Quirinal along a spur of elevated ground, afterwards completely cut away by Trajan. Close to the Capitol was the Porta Fontinalis, whence issued the Via Lata. Remains of the wall and foundations of the gate exist in Via di Marforio. After passing Trajan's forum, we find remains of the walls on the slope of the Quirinal. A piece of the wall has been exposed in the new Via Nazionale, and also an archway under the Palazzo Antonelli, which may represent the Porta Sanqualis (see Festus, ed. Müller, p. 343). The Porta Salutaris (Festus, pp. 326-327) was also on the Quirinal, probably on the slope between the Trevi fountain and the royal palace. Its position is indicated by the existence of some tombs which give the line of the road. On the north-west of the Quirinal was the Porta Quirinalis (Festus, p. 254), probably near the "Quattro Fontane." In the Barberini palace gardens, and especially in those of the Villa Barberini (Horti Sallustiani), extensive remains of the wall have been recently exposed and destroyed,—which was also the fate of that fine piece of wall that passed under the new office of finance, with the Porta Collina, which was not on the line of the present road, but about 50 yds. to the south (see Dionys. ix. 68; Strabo iv. p. 234). Thus far in its course from the Capitol the wall skirted the slopes of hills, which were once much more abrupt than they are now; but from the Porta Collina to the Porta Esquilina it crossed a large tract of level ground; and here its place was taken by the great *agger* described below. About the middle of it the Porta Viminalis was found in 1872; it stood, as Strabo (iv. p. 234) says, ὑπὸ μέσῳ τῷ χώματι, and from it led a road which passed through the Porta Chiusa (ancient name unknown) in Aurelian's wall. Foundations of the Porta Esquilina were found in 1875 close behind the arch of Gallienus. The further course of the wall across the valley of the Colosseum is the least known part of the circuit. Hence the wall skirts the slopes of the Caelian (where, as is probable, it was pierced by the Porta Caelemontana and Porta Querquetulana) to the valley along which the Via Appia passed through the Porta Capena, near the church of S. Gregorio. Its line along the Aventine is fairly distinct, and near S. Balbina and in the Vigna Torlonia are two of the best-preserved pieces (see below). There were three gates on the Aventine,—the Porta Naevia on the southern height, P. Raudusculana in the central depression, and P. Lavernalis on the northern summit. Under the Aventine it appears to have touched the river near the existing foundations supposed to be those of the Pons Sublicius. The Porta Trigemina was close by the bank. Hence to our starting-point the river formed the defence of the city, with its massive quay wall.

Its construction.

The wall is built of blocks of tufa, usually the softer kinds, but varying according to its position, as in most cases the stone used was that quarried on the spot. In restorations a good deal of peperino is used. The blocks average from 23 to 24 in. in thickness—roughly 2 Roman feet—and are laid in alternate courses of headers and stretchers. The method of construction varied according to the nature of the ground traversed by the fortification. Where the wall followed the face of the cliffs, as for instance on the Capitol and Quirinal, it was raised on an artificial shelf after the fashion employed on the Palatine (*vide supra*). In other places, where the slope was gentler, the wall was formed of rubble with revetments of opus quadratum, *e.g.* on the Aventine; finally, where the ground was flat, as on the plateau of the Esquiline, a ditch was dug and an embankment formed by the upcast; this *agger*, as it was called, was then faced with retaining walls of opus quadratum. The length of the agger on the Esquiline is put by Dionysius (ix. 68) at 7 stadia, which agrees, roughly speaking, with the discoveries made in 1876–1879, when the railway station was built and the new quarters laid out. The total length was about 4225 ft., the thickness of wall and agger about 50 ft., while the ditch was 100 Roman ft. in width and 30 in depth. There is, however, a difference in technique between the inner and outer retaining walls of the agger. The inner wall is built of greenish tufa in blocks of irregular size, while in the outer brown tufa is employed and the blocks are of standard size, two headers ranging with each stretcher. Between the railway station and the Dogana a fine lofty piece of the front wall remains, with traces of the Porta Viminalis and of the lower back wall. Unfortunately the whole of the bank or agger proper has been removed, and the rough back of the great retaining wall exposed. Both tufa and peperino are used, the latter in restored parts; the blocks vary in length, but average in depth the usual 2 Roman ft. The railway cutting, which has destroyed a great part of the agger, showed clearly the section of the whole work: the strata of different kinds of soil which appeared on the sides of the foss appeared again in the agger, but reversed as they naturally would be in the process of digging out and heaping up. Dionysius (ix. 68) states the length of the agger to have been 7 stadia—that is, about 1400 yds.—which agrees (roughly speaking) with the actual discoveries. Originally one road ran along the bottom of the foss and another along its edge; the latter existed in imperial times. But the whole foss appears to have been filled up, probably in the time of Augustus, and afterwards built upon; houses of mixed brick and opus reticulatum still exist against the outside of the great wall, which was itself used as the back wall of these houses, so that we now see painted stucco of the time of Hadrian covering parts of the wall of the kings. Another row of houses seems to have faced the road mentioned above as running along the upper edge of the foss, thus forming a long street. As early as the time of Augustus a very large part of the wall of the kings had been pulled down and built over, so that even then its circuit was difficult to trace (Dionys. iv. 13). A very curious series of masons' marks exists on stones of the agger wall (as well as on those of some other early buildings). They are deeply incised, usually on the ends of the blocks, and average from 10 to 14 in. in length: some are single letters or monograms; others are numbers, *e.g.* ↓, the numeral 50. Fig. 6 shows the chief forms from the Palatine and Esquiline.[1]

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[1] "Novalia," MSS. "Navalia" has been conjectured.

[2] Varro, *L.L.* v. 46–54.

[3] Livy i. 44; Dion. Hal. iv. 13. The wall is, however, said to have been planned and partly executed by Tarquinius Priscus (Liv. i. 36, 38; Dion. Hal. iii. 37); and the fortification of the Aventine is ascribed to Ancus Martius (Dion. Hal. iii. 43).

[4] See Sol. i. 13; Liv. ii. 49, xxiv. 47, xxv. 7. xxvii. 37; Ascon. *Ad. Cic. in Toga*, p. 81.

Masons' marks.

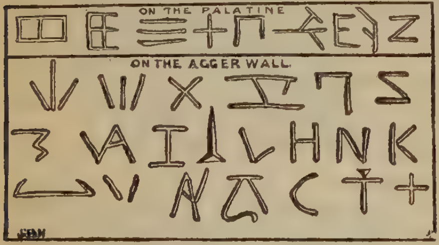

Fig. 6.—Masons' Marks on Early Walls.

There are also extensive remains of the "Servian" wall on the Aventine, in the Via di Porta S. Paolo. Here the wall has a backing of concrete and the upper portion is built with blocks of peperino, set in mortar and bevelled at the edges. These are unmistakable signs that the wall has undergone restoration. This portion is pierced by an arch about 9½ ft. high, which probably served as an embrasure for a military engine. Finally, where the wall skirts the bank of the Tiber it is built in two sections—a foundation about 2 metres in height and 3 in width, which forms a landing-stage, and an upper wall, 6 metres high, which retains the bank. It is built of peperino, and is probably later than the rest of the fortification.

The age of this wall is uncertain, but it has been rendered exceedingly probable that it belongs to the 4th century B.C. The evidence for this is derived from the comparison of other fortifications in central Italy, from the measurements of the blocks employed, which presuppose the later Roman foot of 296 millimetres, and from the character of the alphabet from which the masons' marks are taken.[2] Livy (vi. 32) speaks of a contract entered into by the censors of 378 B.C. for the construction of a wall of opus quadratum, and this probably refers to the older portions of the existing wall, which was built owing to the fear of a second Gallic invasion.[3]

The Servian city did not include what is now the most crowded part of Rome, and which under the Empire was the most architecturally magnificent, namely, the Campus Martius, which was probably to a great extent a marsh. It was once called Ager Tarquiniorum, but after the expulsion of the Tarquins was named Campus Martius from an altar to Mars, dating from prehistoric times (Liv. ii. 5).

Cloacae.

Of that wonderful system of massive arched sewers[4] by which, as Dionysius (iii. 68) says, every street of Rome was drained into the Tiber, considerable remains exist, especially of the Cloaca Maxima, which runs from the valley of the Subura, under the Forum along the Velabrum, and so into the Tiber by the round temple in the Forum Boarium; it is still in use, and well preserved at most places. Its mouth, an archway in the great quay wall nearly 11 ft. wide by 12 high, consists of three rings of peperino "voussoirs," most neatly fitted. The rest of the vault and walls is built of mixed tufa and peperino.[5] Pliny (*H.N.* xxxvi. 104) gives an interesting account of what is probably this great sewer, big enough (he says) for a loaded hay-cart to pass along. The mouths of two other similar but smaller cloacae are still visible in the great quay wall near the Cloaca Maxima, and a whole network of sewers exists under a great part of the Servian city. Some of these are not built with arched vaults, but have triangular tops formed of courses of stone on level beds, each projecting over the one below—a primitive method of construction, employed in the Tullianum. The great quay wall of tufa and peperino which lined the Tiber at the mouth of the Cloaca Maxima is also of early date. In later times this massive wall was extended, as the city grew, all along the bank of the Campus Martius, and, having lost its importance as a line of defence, had frequent flights of stairs built against it, descending to the river. Some of these are shown in one of the fragments of the marble plan (see Jordan, *F.U.R. Frag.* 169). In 1879 a travertine block was dredged up inscribed **P. BARRONIVS . BARBA . AED . CVR . GRADOS . REFECIT**, dating from the 1st century B.C. This records the repair of one of these river stairs.[6]

Great quay wall.

Tullianum and Carcer.

The Tullianum is the earliest of the existing buildings of Rome. Imprisonment as a punishment was unknown to Roman law, and hence the Carcer, where criminals were detained pending trial, was of small dimensions. Its remains are preserved beneath the church of S Giuseppe dei Falegnami, and below them is the Tullianum, a dungeon where executions took place. It is partly cut in the tufa rock of the Capitoline hill and partly built of 2-ft. blocks of tufa, set with thin beds of pure lime mortar, in courses projecting one over the other. Its name is derived, not from Servius Tullius, as Varro (v. 151) asserts, but from an early Latin word, *tullus*, a spring of water; its original use was probably that of a cistern or well. It was closed by a conical vault, arched in shape, but not constructionally an arch—very like the so-called "treasury of Atreus" at Mycenae, and many early Etruscan tombs. When the upper room with its arched vault, also of tufa, was built the upper part of the cone seems to have been removed, and a flat stone floor (a flat arch in construction) substituted.[7] That its use as a cistern was abandoned is shown by the cloaca which leads from it, through the rock, to a branch of the Cloaca Maxima. This horrible place was used as a dungeon, prisoners being lowered through a hole in the stone floor—the only access. The present stairs are modern. The two chambers are vividly described by Sallust (*Cat.* 55). The entrance to the upper prison was on the left of the stairs leading up from the Forum to the Clivus Argentarius, the road to the Porta Fontinalis (see fig. 7, General Plan of Ancient Rome). Lentulus and the Catiline conspirators, as well as Jugurtha, Vercingetorix and other prisoners of importance, were killed or starved to death in this fearful dungeon, which is called τὸ βάραθρον by Plutarch (*Marius*, xii.). According to a doubtful tradition of the Catholic Church, St Peter was imprisoned in the Tullianum. The name Mamertine prison is of medieval origin. The front wall of the prison was restored in the reign of Tiberius A.D. 22, and bears this inscription on a projecting string-course—**C . VIBIVS . C . F . RVFINVS . M . COCCEIV[S . M . F . NERVA]COS . EX . S . C.**[8] The floor of the upper prison is about 16 ft. above the level of the Forum. The Capitol was approached from the Carcer by a flight of steps—Scalae Gemoniae—on which the bodies of criminals were exposed;[1] Pliny (*H.N.* viii. 145) calls it the "stairs of sighs" (*gradus gemitorii*).

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[1] See Bruzza, *Ann. Inst.* (1876), 72; Jordan, *Topographie*, i. 250; Richter, *Über antike Steinmetzzeichen* (1885).

[2] See Richter in the work quoted above, and *Beiträge zur römischen Topographie* (Berlin, 1903); also Delbrück, *Der Apollotempel auf dem Marsfelde in Rom*, pp. 14 ff.

[3] For earlier studies of the Servian wall consult Nibby and Gell, *Le Mura di Roma* (1820); Piale, *Porte del Recinto di Servio* (1833); Becker, *De Romae Muris* (Leipzig, 1842); Lanciani, *Ann. Inst.* (1871), p. 40, *Mon. Inst.* ix. pl. xxvii.; Borsari, "Le mura e porte di Servio," *Bull. Comm. Arch.* (1888), pp. 12 ff.

[4] See Liv. i. 38, 56; Dionys. iv. 44.

[5] In the upper part of its course the Cloaca Maxima was restored in some places, under the Empire, with a vault of brick-faced concrete; at the entrance to the Forum a large bend was made when the Basilica Aemilia was extended westwards in 34 B.C.

[6] A great quay wall with arched cloaca, similar in style to those in Rome, exists at the mouth of the river Marta near Tarquinii, and similar constructions are found in other Etruscan cities.

[7] Livy (i. 33) mentions the "carcer . . . media urbe imminens foro," and also speaks (xxxiv. 44) of an "inferiorem carcerem," and at xxix. 22 of a criminal being put in the Tullianum.

[8] Consules suffecti for A.D. 22.

Forum Romanum and Adjacent Buildings.

The Forum Romanum or Magnum, as it was called in late times to distinguish it from the imperial fora, occupies a valley which extends from the foot of the Capitoline hill to the north-west part of the Palatine. Till the construction of the great cloacae it was, at least in wet seasons, marshy ground, in which were several pools of water. In early times it was bounded on two sides by rows of shops and houses, dating from the time of the first Tarquin (Liv. i. 35). The shops on the south-west side facing the Sacra Via, where the Basilica Julia afterwards was built, were occupied by the Tabernae Veteres.[2] The shops on the northern side, being occupied by silversmiths, were called Tabernae Argentariae, and in later times, when rebuilt after a fire, were called Tabernae Novae (see Liv. xxvi. 27, xl. 51).[3] An altar to Saturn (Dionys. i. 34, vi. 1), traditionally set up by the companions of Hercules, and an altar to Vulcan, both at the end towards the Capitol, with the temple of Vesta and the Regia at the opposite end, were among the earliest monuments grouped around the Forum. The Lacus Curtius vanished, as Varro says (*L.L.* v. 148–49), probably with other stagnant pools, when the cloacae were constructed (Liv. i. 38, 56).[4] Another pool, the Lacus Servilius, near the Basilica Julia, was preserved in some form or other till the imperial period. Under Sulla it was used as a place to expose the heads of many senators murdered in his proscriptions (Cic. *Rosc. Am.* 32, 89; Seneca, *De Prov.* 3, 7). The Volcanal was an open area, so called from the early altar to Vulcan, and was (like the Comitium) a place of public meeting, at least during the regal period.[5] It was raised above the Comitium, and was a space levelled on the lower slope of the Capitoline hill behind the arch of Severus; the foundations of the altar were discovered in 1898. It was probably much encroached upon when the temple of Concord was enlarged in the reign of Augustus. Fig. 8 gives a carefully measured plan of the Forum, showing the most recent discoveries.

Unlike the fora of the emperors, each of which was surrounded by a lofty wall and built at one time from one design, the architectural form of the Forum Romanum was a slow growth. The marshy battlefield of the early inhabitants of the Capitol and Palatine became, when the ground was drained by the great cloacae, under a united rule the most convenient site for political meetings, for commercial transactions, and for the pageants of rich men's funerals, *ludi scenici*, and gladiatorial games.[6] For these purposes a central space, though but a small one, was kept clear of buildings; but it was gradually occupied in a somewhat inconvenient manner by an ever-accumulating crowd of statues and other honorary monuments. On three sides the limits of this open space are marked by paved roads, faced by the stately buildings which gradually took the place of the simple wooden tabernae and porticus of early times. The Comitium[7] was a level space in front of the Curia; the construction of both is ascribed to Tullus Hostilius. For the position of the Comitium and the Curia[8] see plan of Forum (fig. 8). Varro (*L.L.* v. 155-56) gives the following account of the buildings which were grouped along the northern angle of the Forum:—

"Comitium ab eo quod coibant eo comitiis curiatis et litium causa. Curiae duorum generum, nam et ubi curarent sacerdotes res divinas, ut Curiae Veteres, et ubi senatus humanas, ut Curia Hostilia, quod primum aedificavit Hostilius rex. Ante hanc Rostra, quojus loci id vocabulum, quod ex hostibus capta fixa sunt rostra. Sub dextra hujus a Comitio locus substructus, ubi nationum subsisterent legati qui ad senatum essent missi. Is Graecostasis appellatus a parte ut multa. Senaculum supra Graecostasim, ubi Aedis Concordiae et Basilica Opimia. Senaculum vocatum, ubi senatus, aut ubi seniores consisterent."

Curia.

The curia or senate-house passed through many vicissitudes.[9] At first called Curia Hostilia, from its founder Tullus Hostilius (Liv. i. 30), it lasted till 52 B.C., when it was burnt at the funeral of Clodius, and was then rebuilt by Faustus Sulla, and from his *gens* called Curia Cornelia (Dio Cass. xl. 50). It was again rebuilt by Julius Caesar, and dedicated by Augustus (29 B.C.) under the name of the Curia Julia, as recorded in the inscription of Ancyra (*q.v.*)—CVRIAM . ET . CONTINENS . EI . CHALCIDICVM . . . FECI. Little is known about the adjoining buildings called the Athenaeum and Chalcidicum; Dion Cassius (li. 22) mentions the group. In the reign of Domitian the Curia Julia was restored (Prosp. Aquit. p. 571), and it was finally rebuilt by Diocletian. The existing church of S. Adriano is the Curia of Diocletian, though of course much altered, and with its floor raised about 20 ft. above the old level. The level of the entrance was raised in the middle ages, and again in 1654. Sixteenth-century drawings and engravings show the lower level. The ancient bronze doors now at the end of the nave of the Lateran basilica originally belonged to this building, and were removed thence by Alexander VII. The brick cornice and marble consoles, covered with enriched mouldings in stucco, and the sham marble facing, also of stucco, if compared with similar details in the baths of Diocletian, leave no doubt as to this being a work of his time, and not, as was at one time assumed, the work of Pope Honorius I. (A.D. 625–38) who consecrated it as the church of S. Adriano.

Comitium.

From the Curia a flight of steps led down to the Comitium (Liv. i. 36), a space consecrated as a *templum* according to the rules of augury (Cic. *De Or.* iii. 3) and used for the meetings of the *Comitia Curiata*, and for certain religious ceremonies performed, after the fall of the monarchy, by the *rex sacrificulus*. It contained ancient monuments, relics, such as the *ficus ruminalis*, and the supposed tomb of Romulus, whose site was marked in later times by a "black stone" (*lapis niger*). Facing the Curia stood the platform from which speakers addressed the people, adorned in 338 B.C. with the beaks of the ships captured from the Latins at the naval victory of Antium and hence called the rostra. Caesar determined to remove the rostra from the Comitium to the Forum, and this plan was carried out after his murder. From the original rostra Cicero delivered his *Second* and *Third Catiline Orations*, and they were the scene of some of the most important political struggles of Rome, such as the enunciation of their laws by the Gracchi. Beside the Comitium another monument was erected, also adorned with beaks of ships, to commemorate the same victory at Antium. This was the Columna Maeniana, so called in honour of Maenius (Plin. *H.N.* xxxiv. 20, vii. 212). The Columna Duilia was a similar monument, erected in honour of the victory of C. Duilius over the Punic fleet in 260 B.C.; a fragment of it with inscription (restored in imperial times) is preserved in the Capitoline Museum.[10] Columns such as these were called *columnae rostratae*.

Original rostra.

In 1899–1900 the site of the Comitium—which was considerably reduced in extent by the building of the later Curia—was excavated by Commendatore Boni, in some parts as far as the virgin soil.[11] Remains of walls and pavements of various periods (some very early) were discovered; some of the walls, there is no doubt, supported the platform of the early rostra, which appears to have been at first rectangular and at a later time curved. Opposite to the Curia is a square paved with black marble slabs, which it is natural to identify with the *lapis niger* of tradition. Beneath this pavement was found a group of early monuments, which were at some time destroyed and afterwards covered over. We are told on the authority of Varro that Romulus was buried in front of (or behind) the rostra, and that two lions were sculptured as guardians of his tomb; and we find in fact a foundation (D, fig. 9) from which project two moulded bases of tufa (A, B) on which the lions may well have stood, on either side of a block (C) which might serve as an altar. Beside this tomb (if such it be) stood the trunk of a tufa column (E) and a rectangular *stele* (F) which bears on all its faces an inscription written alternately upwards and downwards, so that only the ends of the lines can be read. That it is the earliest specimen of the Latin language is undoubted; and it certainly mentions the *rex*. But after the expulsion of the kings the *rex*

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[1] See Tac. *Hist.* iii. 74, 85; Suet. *Vit.* 17.

[2] See Livy (xliv. 16), who mentions a house of P. Africanus, "pone veteres ad Vortumni signum," which was bought by T. Sempronius to clear the site for the Basilica Sempronia in 169 B.C. This basilica was afterwards absorbed in the Basilica Julia.

[3] Hence these two sides of the Forum are frequently referred to in classical writings as "sub veteribus" and "sub novis."

[4] In later times it was an enclosed space containing an altar; it is described by Ovid (*Fast.* vi. 403); according to one tradition it marked the spot where Curtius's self-immolation filled up the chasm which had opened in the Forum (see Dionys. ii. 41). (See below.)

[5] See Dionys. ii. 50, vi. 67; Plin. *H.N.* xvi. 236; Plut. *Quaes. Rom.* 47.

[6] The first gladiatorial show in Rome was given in 264 B.C. in the Forum Boarium by D. Junius Brutus at his father's funeral (Liv. *Epit.* xvi.), the first in the Forum Romanum in 216 B.C. (Liv. xxiii. 30). See also Liv. xxxi. 50, xli. 28; and Suet. *Caes.* 39; *Aug.* 43; and *Tib.* 7.

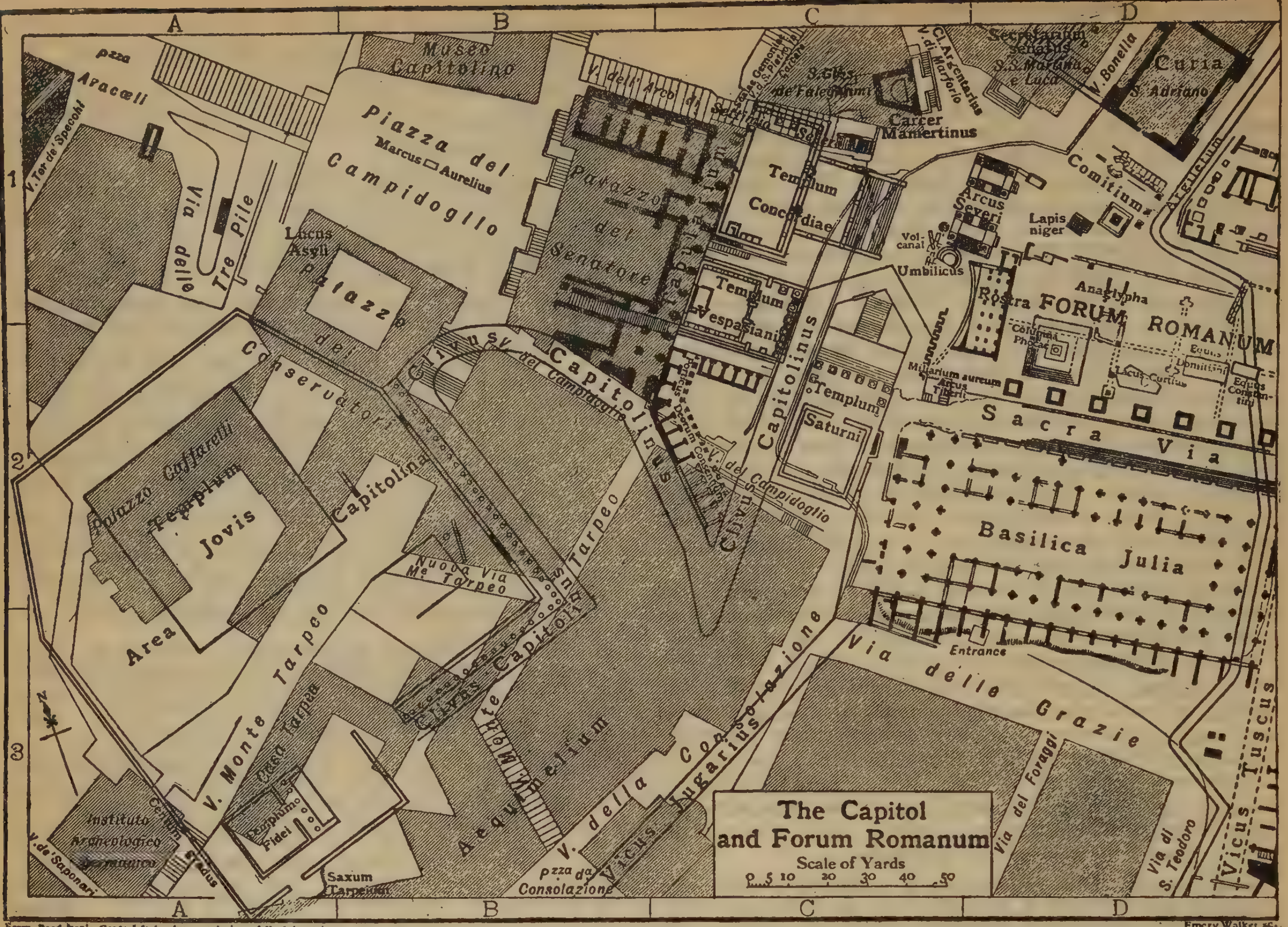
[7] On the Comitium see Detlefsen, *Ann. Inst.* (1860), pp. 128 ff., and the works mentioned below, note 11.

[8] Livy (xlv. 24) indicates their relative positions by the phrase "comitium vestibulum Curiae."

[9] On the Curia and its vicissitudes see Lanciani, *L'Aula e gli Uffici del Senato Romano* (1883).

[10] The column itself is a copy made by Michelangelo; it is at the foot of the stairs of the Palazzo dei Conservatori.

[11] The discoveries of Comm. Boni have given rise to much discussion. Of the numerous articles, &c., which have appeared it will suffice to name Petersen, *Comitium, Rostra, Grab des Romulus* (1904), and Pinza, *Il Comizio romano nell' etá repubblicana* (1905); see Huelsen, *The Roman Forum*, pp. 110 ff.


A
B
C
D
1
2
3
pzza Aracœli
V. Tor de' Specchi
Via delle Tre Pile
Museo Capitolino
Piazza del Campidoglio
Marcus Aurelius
Lucus Asyli
Palazzo dei Conservatori
Palazzo del Senatore
V. dell' Arco di Settimio Severo
S. Gius. de Falegnami
Scalae Gemoniae
V. di S. Pietro in Carcere
Cl. Argentarius
V. di Marforio
Carcer Mamertinus
Secretarium Senatus
S.S. Martina e Luca
V. Bonella
Curia
S. Adriano
Argiletum
Comitium
Templum Concordiae
Arcus Severi
Lapis niger
Vol-canal
Umbilicus
Templum Vespasiani
Rostra
Anaglypha
FORUM ROMANUM
Columna Phocae
Equus Domitiani
Lacus Curtius
Equus Constantini
Miliarium aureum
Arcus Tiberii
Templum Saturni
Porticus Deorum Consentium
V. del Campidoglio
Clivus Capitolinus
Capitolinus
Sacra Via
Basilica Julia
Entrance
Via delle Grazie
Via del Foraggi
Via di S. Teodoro
Vicus Tuscus
Palazzo Caffarelli
Templum Jovis
Area Capitolina
Clivus Capitolinus
V. del Campidoglio
V. Monte Tarpeo
Nuova Via Me. Tarpeo
Casa Tarpea
Templum Fidei
Saxum Tarpeium
Aequimelium
V. della Consolazione
Vicus Jugarius
pzza da Consolazione
Instituto Archeologico Germanico
Centum Gradus
V. de' Saponari
N
The Capitol and Forum Romanum
Scale of Yards
0 5 10 20 30 40 50

From Baedeker's Central Italy, by permission of Karl Baedeker.

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FIG. 8.—The Roman Forum

acrificulus performed his functions in the Comitium, and the inscription may refer to him. This may be the stele to which Dionysius of Halicarnassus refers as marking the tomb of Hostus Hostilius (father of Tullus Hostilius) whose site (according to those who believed in the translation of Romulus to heaven) was marked by the *lapis niger*.

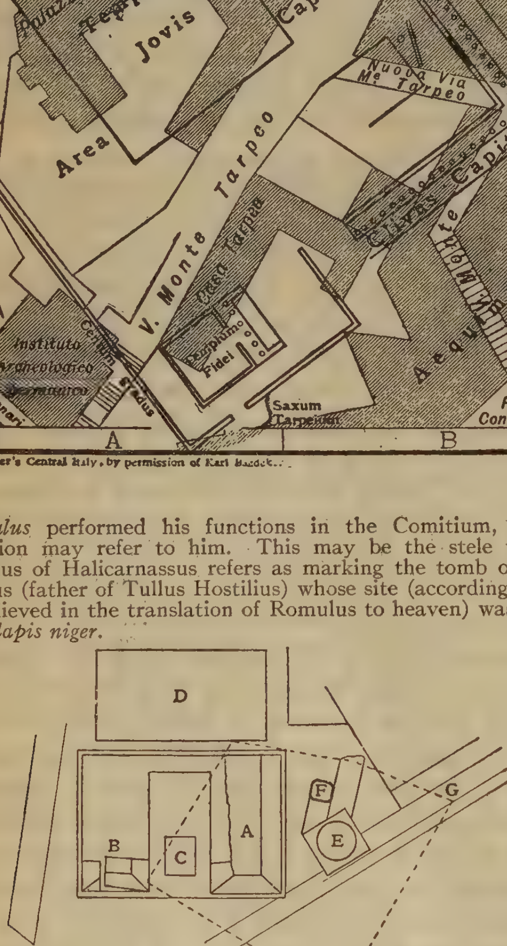

FIG. 9.—Early Monuments in the Comitium.

A, B. Moulded tufa bases.
C. Base of altar (?).
D. Rectangular foundation.
E. Truncated column.
F. Stele with inscription.
G. Steps leading to platform of rostra.

The dotted line shows the position of the *lapis niger*.

Senaculum.

The Senaculum appears to have been a place of preliminary meeting for the senate before entering the Curia (Liv. xli. 27; Val. Max. ii. 2, 6); it adjoined the temple of Concord, and when this was rebuilt on an enlarged scale in the reign of Augustus it appears probable that its large projecting portico became the Senaculum.

Basilicae in Forum.

A great part of the north-east side of the Forum was occupied by two basilicae, which were more than once rebuilt under different names. The first of these appears to have been adjacent to the Curia, on its west side; it was called the Basilica Porcia, and was founded by the elder Cato in 185 B.C. (see Liv. xxxix. 44, and Plut. *Cato Major*, 19); it was burnt with the Curia at Clodius's funeral. On the north side of the Forum another basilica, called Aemilia et Fulvia (Varro vi. 4), was built in 179 B.C. by the censors M. Fulvius and M. Aemilius Lepidus;[1] it stood, according to Livy (xl. 51), "post argentarias novas," the line of silversmiths' shops along the north-east side of the Forum. In 50 B.C. it was rebuilt by L. Aemilius Paulus with Caesar's money (Plut. *Caes.* 29; Appian, *Bell. Civ.* ii. 26), and was more than once restored within the few subsequent years by members of the same family. Its later name was the Basilica Pauli, and it was remarkable for its magnificent columns of Phrygian marble (Plin. *H.N.* xxxvi. 102) or pavonazzetto. Part of the western end was still standing in the 16th century, and was drawn by Giuliano da Sangallo (Huelsen, *The Roman Forum*, fig. 61). Recent excavations have shown that it was approached from the Forum by a flight of steps leading to a two-storeyed colonnade. Behind this was a row of tabernae in the middle of which was the entrance to the main hall, consisting in a nave and three aisles (two on the north side).

Temple of Janus.

Near the middle of the north-east side of the Forum stood also the small bronze temple of Janus,[2] the doors of which were shut on those rare occasions when Rome was at peace.[3] A first brass of Nero shows it as a small cella, with richly ornamented frieze and cornice. Another aedicula near that of Janus was the shrine of Venus Cloacina (or the Purifier), on the line of the cloaca which runs under the Basilica Aemilia;

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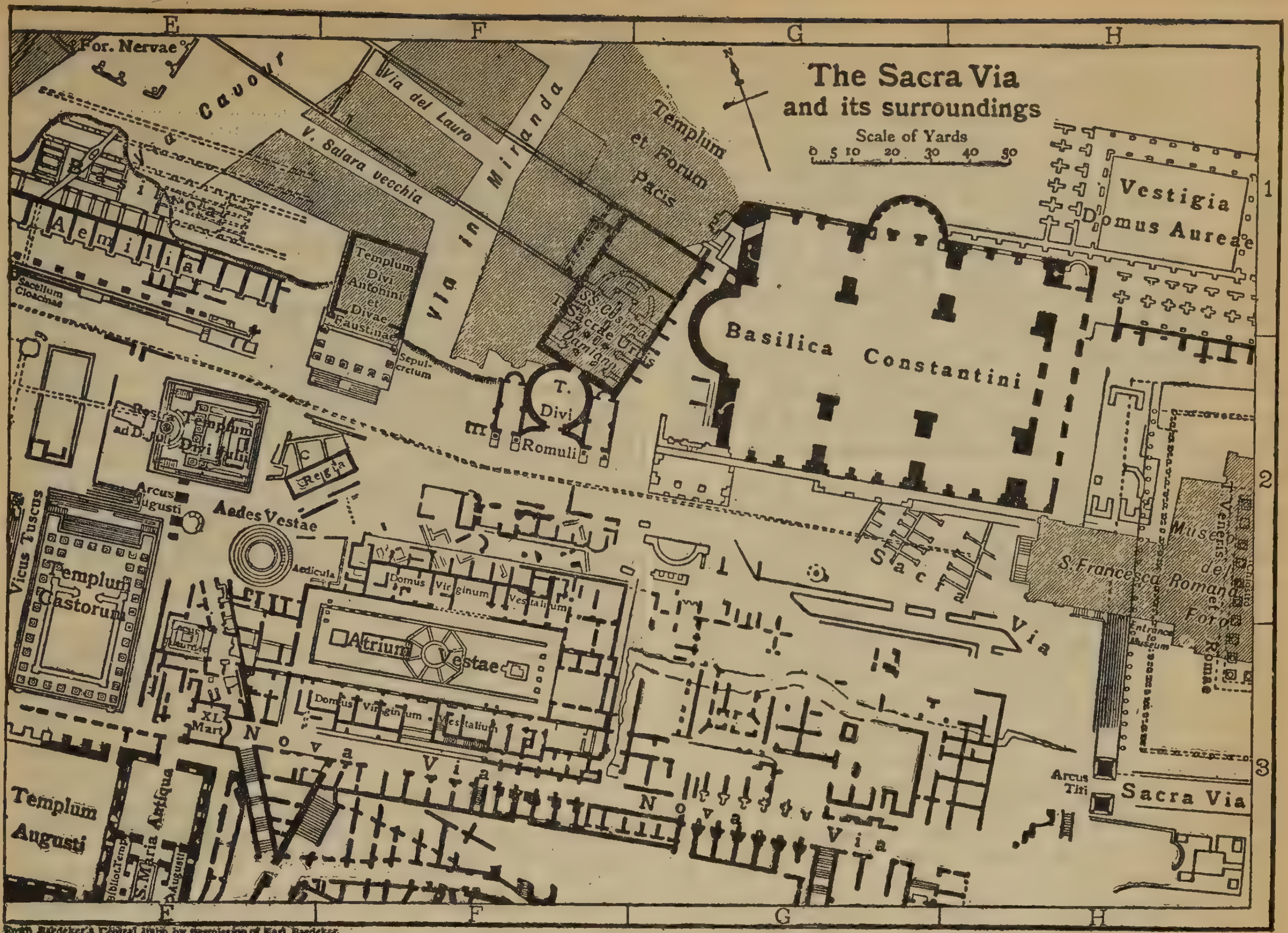
[1] The Forum Piscatorium or fish-market appears to have been at the back of this basilica (see Liv. xl. 51).

[2] The original temple was one of the prehistoric buildings attributed to Romulus and Tatius (Serv. *Ad Aen.* i. 291), or by Livy (i. 19) to Numa.

[3] See *Mon. Anc.* 2, 42; Procop. *Bell. Goth.* i. 25; Liv. i. 19; Suet. *Aug.* 22.


E
F
G
H
The Sacra Via
and its surroundings
Scale of Yards
0 5 10 20 30 40 50
N
1
2
3
For. Nervae
Cavour
Via del Lauro
V. Salara vecchia
Via in Miranda
Templum et Forum Pacis
Vestigia Domus Aureae
Basilica Constantini
Basilica Aemilia
Sacellum Cloacinae
Templum Divi Antonini et Divae Faustinae
Sepulcretum
SS. Cosma e Damiano
T. Divi Romuli
Templum Divi Julii
Ara Divi Julii
Regia
Arcus Augusti
Aedes Vestae
Aedicula
Domus Virginum Vestalium
Atrium Vestae
Vicus Tuscus
Templum Castorum
XL Mart.
Nova Via
Templum Augusti
S. Maria Antiqua
Bibliotheca Templi Augusti
Sacra Via
Museo
S. Francesca Romana
Venere e Roma
Entrance to Museum
Arcus Titi
Sacra Via

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and the Sacra Via.

its foundations and plinth were brought to light in 1899 (Liv. iii. 48; Plin. *H.N.* xv. 119).

Existing rostra. Fig. 8 shows plan of the rostra as they existed under the Empire. We see an oblong platform about 78 ft. long and 11 ft. high above the level of the Forum; its ground floor, paved with herring-bone bricks, is 2 ft. 6 in. below the Forum paving. Its end and side walls are of tufa blocks, 2 ft. thick and 2 ft. wide, each carefully clamped to the next with wooden dovetail dowels. Its floor was supported by a series of travertine piers, carrying travertine lintels, on which the floor slabs rested. Outside it was completely lined with Greek marble and had a richly moulded plinth and cornice; the front wall was restored in 1904, and the fragments of the cornice replaced. A groove cut in the top of the cornice shows the place where marble cancelli were fixed; one of the cornice blocks is partly without this groove, showing that the screen did not extend along the whole front of the rostra. This agrees with a relief on the arch of Constantine, representing the emperor making an oration from the rostra, with other buildings at this end of the Forum shown behind. In this relief the screen is shown with a break in the middle, so that the orator, standing in the centre, was visible from head to foot. Two tiers of large holes to hold the bronze rostra are drilled right through the tufa wall, and even through the travertine pilasters where one happens to come in the way; these holes show that there were nineteen rostra in the lower tier, and twenty above set over the intermediate spaces of the lower row. The back wall of the rostra is of concrete faced with brick. The inside space, under the main floor of the rostra, is coated thickly with stucco—the brick wall being studded in the usual way with iron nails to form a key for the plaster.

Curved platform. Immediately behind the rostra is a curved platform approached by steps from the side facing the Capitol. It has been much disputed whether this platform is earlier or later than the rostra; but the evidence of the construction at the point of juncture seems to show that the hemicycle is the earlier. When the arch of Severus was built, part of the platform of the rostra was cut away and a court of irregular shape was thus formed, from which the rostra was approached by steps. The front wall of the hemicycle was now exposed in its eastern half; this was faced with slabs of porta santa marble, pilasters of africano, and a moulded plinth of white marble, whose blocks bear the Greek characters Τ, Δ, Ε, Ζ, Η, Θ, Κ; the omissions make it clear that the blocks were removed from some other building. A number of holes in the marble, some of which contain fragments of metal pins, show that bronze ornaments were at one time attached to the facing. The hemicycle has been identified (without sufficient reason) with the Graecostasis, a platform near the rostra reserved for foreign embassies (Varro, *L.L.* v. 155; Cic. *Q.F.* ii. 1), which continued to exist throughout the imperial period and was restored by Antoninus Pius (*Vita* 9, 2). It is, however, far more likely that it represents the original form of the rostra as removed to the Forum according to Caesar's design.[1] When the oblong platform was built (perhaps by Trajan) it was approached from the back by the hemicycle. The bronze rostra on the imperial structure were believed to be the original beaks from Antium, moved from the old rostra (Florus, i. 11). On its marble platform stood many statues,[2] *e.g.* of Sulla, Pompey, two of Julius Caesar, and others (Dio Cass. xlii. 18 and xliv. 4); these are represented on a bas-relief from the arch of Constantine. It is further commonly believed that the marble *plutei* which now stand in the centre of the Forum once decorated the rostra. Owing probably to the weight of the many statues proving too much for the travertine piers, which are not set on their natural beds but endways, and therefore are very weak, the structure seems to have given way at more than one time, and the floor has been supported by piers and arches of brick-faced concrete, inserted either in place of or at the sides of the shattered piers. These later additions, apparently of the 3rd and 4th centuries, are omitted in fig. 8 for the sake of clearness. In or about A.D. 470 the façade of the rostra was prolonged northwards by an addition in very poor brickwork, apparently to celebrate a naval victory over the Vandals.

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[1] See Mau in *Röm. Mitt.* 1906, pp. 230 ff.

[2] The original rostra had specially honorary statues to those Roman ambassadors who had been killed while on foreign service (Liv. iv. 17); these were probably removed during Cicero's lifetime (Cic. *Phil.* ix. 2, 4; see also Dio Cass. xliii. 49, and Plin. *H.N.* xxxiv. 23, 24). Ghastly ornaments fixed to these rostra in the year 43 B.C., shortly after they were built, were the head and hands of the murdered Cicero (Appian, *Bell. Civ.* iv. 20; Dio Cass. xlvii. 8; Juv. x. 120), as on the original rostra had been fixed many heads of the chief victims of the proscriptions of Marius and Sulla (see Appian, *Bell. Civ.* i. 71, 94; Florus iii. 21). The denarius of the *gens* Lollia with the legend **PALIKANVS** represents the rostra of the late republican period.

Umbilicus and Milliarium.

At the northern end of the curved platform there is a cylindrical structure of concrete faced with brick and lined with thin marble slabs; it is in three stages, each diminishing in size, and appears to be an addition of about the time of Severus. This is usually identified with the Umbilicus Romae, or central point of the city, mentioned in the *Notitia* and the Einsiedeln MS. (Jordan, *Topographie der Stadt Rom*, ii. 655). Near the rostra, below the temple of Saturn, stood the Milliarium Aureum, a marble column sheathed in gilt bronze and inscribed with the names and distances of the chief towns on the roads which radiated from the thirty-seven gates of Rome (Plin. *H.N.* iii. 66). It was set up by Augustus in 20 B.C., and its position "sub aede Saturni" is indicated by Tacitus (*Hist.* i. 27; see schol. on Suet. *Otho.* 6, and Plut. *Galba*, 24). The Miliarium is mentioned in the *Notitia* (Reg. viii.) as being near the Vicus Jugarius. Its precise position cannot be determined. Fragments of a marble cylinder and cornice with floriated reliefs, now lying in front of the temple of Saturn, probably belonged to this monument; they were found in 1835 near the supposed site.

Temple of Saturn.

The position of the temple of Saturn is indicated in *Mon. Anc.* (see below, n. 6) and shown on the marble plan, and is also identified by various passages in ancient writers. Varro (*L.L.* v. 42) speaks of it as being *in faucibus Capitolii*; Servius (*Ad Aen.* ii. 115) says that it is in front of the Clivus Capitolinus, and near the temple of Concord (see Plate VIII.). It was built against a steep slope or outlying part of the Capitoline hill[1] (cf. Dionys. i. 34) on the site of a prehistoric altar to Saturn, after whom the Capitoline hill was originally called Mons Saturnius. The public treasury was part of this temple (Serv. *Ad Aen.* ii. 116, and Macrob. *Sat.* i. 8). The original temple is said by Varro (ap. Macrob. i. 8) to have been begun by the last Tarquin, and dedicated by T. Larcius, the first dictator, 498 B.C.; but Dionysius (vi. 1) and Livy (ii. 21) attribute it to the consuls A. Sempronius and M. Minucius in 497 B.C. It was rebuilt on a larger scale by L. Munatius Plancus in 42 B.C. (Suet. *Aug.* 29). The only part remaining of this date is the very lofty podium of massive travertine blocks, and part of the lower course of Athenian marble, with which the whole was faced. In the 16th century a piece of the marble frieze was found, inscribed L . PLANCVS . L . F . COS . IMPER . ITER . DE . MANIB . (*C.I.L.* vi. 1316). The erection of the six granite columns in the front and two at the sides, with their clumsily patched entablature, bearing the inscription SENATVS . POPVLVSQVE . ROMANVS . INCENDIO . CONSVMTVM . RESTITVIT, belongs to the last rebuilding in the time of Diocletian. Some of these fine columns are evidently earlier than this rebuilding, but were refixed with rude caps and bases. One of the columns is set wrong way up, and the whole work is of the most careless sort. Part of the inscription, once inlaid with bronze, recording this latest rebuilding, still exists on the entablature. On the Forum side the temple is flanked by the Vicus Jugarius, while the steep Clivus Capitolinus winds round the front of the great flight of steps leading up to the cella, and then turns along the north-west side of the temple.[2] The Vicus Jugarius (see fig. 8), part of the basalt paving of which is now exposed, was so called (see Festus, ed. Müller, p. 104) from an altar to Juno Juga, the guardian of marriage. Starting from the Forum, it passed between the temple of Saturn and the Basilica Julia, then close under the cliff of the Capitolium (see Liv. xxxv. 21) and on to the Porta Carmentalis. It was spanned at its commencement by a brick-faced arch lined with marble, the lower part of which exists, and is not earlier than the 3rd or 4th century.[3] At this end of the Forum the arch of Tiberius was built beside the Sacra Via. It was erected in A.D. 17, to commemorate the recovery of the standards lost by Varus.[4] The concrete foundation has recently been exposed.

Vicus Jugarius.

Basilica Julia.

The Basilica Julia[5] occupies a great part of the south-west side of the Forum, along the line of the Sacra Via; its ends are bounded by the Vicus Jugarius and the Vicus Tuscus. It was begun by Julius Caesar, who dedicated it when still unfinished, on the 26th of September 46 B.C., completed by Augustus, and again rebuilt by him after a fire, as is recorded in *Mon. Anc.* 4, 13,[6] in an important passage which gives its complete early history. It consisted of a central hall with aisles, galleries and clerestory, surrounded on three sides by a colonnade in two storeys approached by steps; on the S.W. a row of rooms or tabernae took the place of the colonnade. The central nave was paved with richly coloured oriental marbles, namely pavonazzetto, cipollino, giallo and africano. The covered aisles are paved with large slabs of white marble.[7] Many *tabulae lusoriae*, or gambling boards, are scratched on this marble paving (cf. Cic. *Phil.* ii. 23).[8] Low marble cancelli, with moulded plinth, closed the otherwise open arches of the basilica; many fragments exist, and one piece of the subplinth is still *in situ*. This basilica held four law-courts, which in important cases held joint sessions. Trajan and other emperors held law-courts there (Dio Cass. lxxxviii. 10). An inscription found near it (*C.I.L.* vi. 1658) records its restoration by Septimius Severus in A.D. 199, after a fire; it was again burnt in 283 and restored by Diocletian. These fires had destroyed nearly all the fine marble arches of Augustus; and Diocletian rebuilt it mostly with brick or travertine piers, portions of which remain.[9] A final restoration is recorded in inscriptions discovered at various times from the 16th century onwards, as being carried out by Gabinius Vettius Probianus, praefect of the city in 377; one of these is on a pedestal which now stands in the Vicus Jugarius. Suetonius (*Cal.* 37) mentions that it was one of Caligula's amusements to throw money to the people below from the roof of this basilica, which formed a link in the bridge by which this maniac connected the Palatine with the Capitolium.

Vicus Tuscus.

The Vicus Tuscus passes from the Sacra Via between the Basilica Julia and the temple of Castor to the Velabrum and Circus Maximus; its basalt paving has been exposed at many points along its whole line. A very early statue of Vortumnus stood in this street, a little to the south-west of the Basilica Julia, where part of its pedestal was found in 1549 inscribed VORTVMNVS TEMPORIBVS DIOCLETIANI . ET . MAXIMIANI . . . (*C.I.L.* vi. 804;[10] see also Pseudo-Ascon, *Ad Cic. Verr.* ii. 1, 59). The Vicus Tuscus was also called Thurarius, from shops of perfume-sellers (see Schol. ad Hor. *Sat.* ii. 3, 228, and *Ep.* ii. 1, 269). It is the street along which processions passed, mentioned by Cicero (*Verr.* ii. 1, 59) as extending *a signo Vertumni in Circum Maximum.*

Temple of Castor.

The temple of Castor[11]—or, more properly, of "the Castores," *i.e.* Castor and Pollux—on the south-east side of the Vicus Tuscus was founded to commemorate the apparition in the Forum of the Dioscuri, announcing the victory of Aulus Postumius at Lake Regillus, 496 B.C., and was dedicated in 484 B.C. by the son of A. Postumius (Liv. ii. 20, 42; Dionys. vi. 13; Ov. *Fast.* i. 706). In 119 B.C. it was restored by the consul L. Caecilius Metellus Dalmaticus (Ascon. *In. Cic. Pro Scaur.* 46), and finally rebuilt in the reign of Augustus by Tiberius and Drusus, A.D. 6 (Suet. *Tib.* 20; Ov. *Fast.* i. 705; Dio Cass. lv. 8, 27); the three existing Corinthian columns and piece of entablature, all very delicate and graceful in detail, and of the finest workmanship, in Pentelic marble, belong to a still later restoration under Trajan or Hadrian. One point shows Roman timidity in the use of a lintel: the frieze is jointed so as to form a flat arch, quite needlessly, with the object of relieving the weight on the architrave. Its plan, hexastyle, with only eleven columns on the sides, is shown in fig. 8. It had a lofty podium, faced with marble and decorated with a heavy cornice and pilasters, one under each column. The podium is an interesting example of the enormous solidity of Roman buildings of the best period. Solid tufa walls, 8 ft. thick, are built under the whole of the cella and the front row of columns, while the columns of the sides rest on spurs of similar walling, projecting at right angles from that under the cella; the part immediately under the columns is of travertine, and the spurs are united and strengthened laterally by massive flat arches, also of travertine. Between the foundations of the columns were chambers used as offices, &c. With the exception of a small chamber under the steps, entered from the Vicus Tuscus, the entire podium is filled up by a solid mass of concrete, made of broken tufa, pozzolana and lime, the whole forming a lofty platform, about 22 ft. high, solid as a rock, on which the columns and upper structure are erected. The podium contains a few remains[1] of the earliest temple, built of blocks of grey-green tufa. Two fragments of mosaic, with simple lozenge pattern in white marble and basalt, still exist in the cella of this temple. The level of the mosaic, which probably belongs to the rebuilding of Tiberius, lies considerably below that of the later floor, which seems to date from Hadrian's reign. It has all the characteristics of early mosaic—very small tesserae fitted with great accuracy, like the early mosaic in the Regia. The temple of Castor was often used as a meeting-place for the senate, and its lofty podium formed a tribunal for orations.[2] The Fons or Lacus Juturnae (see Ov. *Fast.* i. 705, and Dionys. vi. 13), at which the Dioscuri were fabled to have watered their horses, was beside their temple; the precinct was discovered in 1900–1. The Lacus itself, a basin 16¾ ft. square and 6½ ft. deep, is immediately opposite the three standing columns of the temple; in the centre is a base of *opus reticulatum*, which supported statues of the Dioscuri; an altar with reliefs, together with other sculptures, has been found close by, and a few yards off is a small chapel or *aedicula*, intended for a statue of Juturna, and in front of it a well-curb (*puteal*) of white marble, set up by the aedile M. Barbatius Pollio in the reign of Augustus.

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[1] Below the temple of Saturn the Clivus Capitolinus is carried on an arched substructure of somewhat irregular *opus reticulatum*. This has been described (but without much probability) as the *rostra* of Caesar.

[2] A portion of these streets with part of the temple of Saturn and the Basilica Julia is shown on fragments of the marble plan (see Plate VIII.).

[3] One side of this gate was built against one of the marble piers of the Basilica Julia, a perfect print of which still exists in the concrete of the gate, though the marble pier itself has disappeared. The other side of the gate abutted against the marble-lined podium of the temple of Saturn.

[4] See Tac. *Ann.* ii. 41, who says it was *propter aedem Saturni.*

[5] See Suet. *Aug.* 29; Gerhard, *Bas. Giulia*, &c. (1823); and Visconti, *Escavazione della Bas. Giulia* (1872).

[6] "Forvm . Ivlivm . et . basilicam . qvae . fvit . inter . aedem . Castoris . et . aedem . Satvrni . coepta . profligataqve . opera . a . patre. meo. perfeci. et. eandem. basilicam. consvmptam. incendio . ampliato . eivs . solo . svb . titvlo . nominis . filiorvm . inchoavi . et . si . vivvs . non . perfecissem . perfici . ab . haeredibvs . [meis . ivssi]." The *filii* here referred to are Augustus's grandsons, Gaius and Lucius, adopted by him in 17 B.C. (see Dio Cass. lvi. 27).

[7] Three medieval lime-kilns were found by Canina within this basilica, which accounts for the scantiness of the existing remains.

[8] A few have inscriptions, *e.g.* "Vinces . gaudes: perdes . plangis."

[9] The whole building has unhappily been much falsified by needless restoration.

[10] A drawing of this pedestal, which is now lost, with MS. note by Ligorio, exists in *Cod. Vat.* 3439, fol. 46.

[11] The temple of Castor is shown on two fragments of the marble plan, and its position is also indicated by the passage in the *Mon. Anc.* quoted above (note 6).

Arch of Augustus.

Close to the temple of Castor, at the angle of the Forum, stood the arch of Augustus, set up in 20 B.C. to commemorate the recovery of the standards taken from Crassus by the Parthians. Its foundations were discovered in 1888; it had three bays, and rested on the pavement of a street which before the time of Augustus formed the E. boundary of the Forum.

Temple of Divus Julius.

On the other side of the Sacra Via stand the remains of the temple of Divus Julius, erected by Augustus. Though little beyond its concrete core is left, its plan can be fairly well made out from the voids in the concrete, which show the position of the tufa foundations under the walls and columns (as in the temple of Castor). The temple itself, a hexastyle prostyle building, with close intercolumniation (Vitr. iii. 2), stood on a lofty podium with a curved recess in the front between two flights of stairs (see Plate VIII.). The wall which now fills up the recess is a late addition. In 1898 the base of a large altar was discovered in the niche, doubtless that mentioned by Appian (*Bell. Civ.* ii. 148). The podium, which projects in front of the temple itself, was adorned with beaks from the ships taken at Actium (Dio Cass. li. 19), and hence it was called the Rostra Julia, to distinguish it from the other rostra described above. Both were used for the funeral orations in honour of Augustus (Suet. *Aug.* 100; see also Dio Cass. liv. 35). Besides the concrete core and the curved tufa wall of the recess, little now exists except a small bit of the mosaic of the cella floor and some fragments of the cornice and pediment, of fine Greek marble. This temple is represented on coins of Augustus and Hadrian.

Temple of Vesta.

The temple of Vesta, founded according to tradition by Numa,[3] stands at the southern angle of the Forum on the ancient line of the Sacra Via (Ov. *Trist.* iii. 1, 28). No shrine in Rome was equal in sanctity to this little circular building, which contained the sacred fire and the relics on which the welfare and even the existence of Rome depended. The original building was destroyed in 390 B.C. by the Gauls; it was burnt again in 241 B.C., again in the great fire of Nero's reign, and then in the reign of Commodus; after this it was rebuilt by Severus, to whose age belong the fragments of columns, cornice and other architectural features now lying around the ruined podium. With the aid of coins[4] and a relief preserved in the Uffizi at Florence[5] it is possible to make a sufficiently accurate restoration of the temple.[6] It consisted of a circular cella, surrounded by eighteen columns, with screens between them; the circular podium, about 10 ft. high, still exists, mainly of concrete with some foundations of tufa blocks, which may belong to the original structure. Recent excavations have disclosed a pit (*favissa*) in the middle of the podium, where the ashes of the sacred fire were temporarily stored. In the time of Pliny (*H.N.* xxxiv. 7) the tholus or dome over the cella—symbolizing the canopy of heaven (Ov. *Fast.* vi. 276)—was covered with Syracusan bronze. Its position near the temple of Castor is mentioned by Martial (i. 71–73).[7]

Regia.

The Regia, or office of the *pontifex maximus*, was on the Sacra Via, close by the temple of Vesta. It also was traditionally founded by Numa, and used as his dwelling-house; it was destroyed in 390 B.C. by the Gauls, and was again burnt in 210 B.C. (Liv. xxvi. 27), when the temple of Vesta narrowly escaped. Ovid (*Trist.* iii. 1, 28) describes this end of the Forum thus:—

> "Haec est a sacris quae via nomen habet,
> Hic locus est Vestae, qui Pallada servat et ignem,
> Hic fuit antiqui Regia parva Numae."

It was again damaged by fire in 148 B.C. and 36 B.C., after which it was rebuilt in marble by Cn. Domitius Calvinus, and its outer walls inscribed with the lists of consuls and triumphs (*fasti consulares et triumphales*) of which many fragments have been recovered. Recent excavations have brought to light the tufa foundations of the republican building, including a round substructure, which may have supported the *sacrarium Martis*, in which were preserved the *ancilia* or sacred shields and spears (Gell. iv. 6), and an underground cistern, which has been brought into connexion with the shrine of Ops Consiva (Varro, *L.L.* vi. 21). The official residence of the *pontifex maximus* was not the Regia, but the *domus publica*; when Augustus succeeded to the office, he conveyed a part of his residence on the Palatine to the state in order to satisfy the claims of tradition, and presented the *domus publica* to the vestals.

The excavations of 1883–84 laid bare remains of this very interesting building, and showed that it was a large house extending close up to the Atrium Vestae; its orientation corresponded with that of the Regia. The existing remains are of several dates—first, walls of soft tufa, part possibly of the earliest building; second, walls of hard tufa, of rather later date; and lastly, concrete walls faced with brick, decorated with painted stucco, and columns of travertine, also stuccoed and painted,[8] with a large quantity of fine mosaic of that early sort which has very small tesserae put together with great accuracy. These valuable remains were preserved in spite of the erection of later buildings over them, because the levels of the later floors were higher than those of the Regia, and thus covered and protected the mosaics and lower parts of the walls and columns.

Atrium Vestae.

The Atrium Vestae, or house of the vestals, like the temple, was many times burnt and rebuilt; the existing building, which was excavated in 1883–84 and more completely in 1901, seems to have been built after the great fire of A.D. 64, and to have been restored or enlarged several times—by the Flavian emperors, who added the colonnade; Hadrian, who built the tablinum and other rooms at the end; the Antonines, and Septimius Severus, who restored the whole after the fire of A.D. 192.[9] It consists of a large atrium or quadrangle with columns of cipollino. At one end is the tablinum, with three small rooms on each side of it—probably for the six vestals. A bathroom, bakehouse, servants' offices, and some rooms lined with rich marbles extend along the south-west side. This extensive building is set against the side of the Palatine, which is cut away to admit the lower storey. Thus the level of the first upper floor is nearly the same as that of the Nova Via, on which it faces, about 23 ft. above the ground floor. The upper floor is in part well preserved; it contains a large suite of bath and other rooms, which were probably the sleeping apartments of the vestals. All the better rooms and the baths are lined with polished marbles, many of great beauty and rarity; the floors are mostly mosaic of tessellated work. The paving of the tablinum was a beautiful specimen of inlay in porphyry and marble. In many places alterations and clumsy patchings of the 4th and 5th centuries are apparent. A number of statues of the chief vestal, or *virgo vestalis maxima*, with inscribed pedestals, were found in the atrium, mostly of the 3rd century, though a few are earlier; these are of especial interest as illustrating the sacerdotal dress of the vestals.[10] Nothing but the Nova Via separates the Atrium Vestae from the imperial palace (see Plin. *Ep.* vii. 19; Aul. Gell. i. 12), which extends over the site of the Lucus Vestae—"qui a Palatii radice in Novam Viam devexus est" (Cic. *De Div.* i. 45). A curious octagonal structure in the middle of the atrium looks very much like a border for flower-beds; and it is possible that this miniature garden was made by the vestals when the Lucus Vestae ceased to exist. By the main entrance from the Forum stood a small aedicula—a large pedestal, at the angles of which were columns supporting an entablature.[11] It no doubt contained a statue of Vesta, there being none within the temple. It is of the time of Hadrian. Gratian confiscated the house and endowments of the vestals in A.D. 382, but the atrium continued to be partly inhabited for many centuries later by imperial or papal officials.[12] In September 1884 a road was discovered leading up past the tablinum end of the atrium from the Sacra Via to the Nova Via. In about the 4th century this road appears to have been blocked up at the Nova Via end by a building which adjoined the Atrium Vestae.

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[1] On these see Delbrück, *Das Capitolium von Signia* (1903), p. 22; *Der Apollotempel auf dem Marsfelde* (1903), p. 14; van Buren in *Class. Rev.* xx. pp. 77 ff.

[2] The front of the podium was decorated with ships' beaks. One of the mad acts of Caligula was to make the temple of Castor into the vestibule of his palace by breaking a door through the back of the cella (Suet. *Cal.* 22).

[3] Another legend attributes its founding to Romulus.

[4] On the coins see Dressel, *Zeitschr. für Numismatik* (1899), 20 ff.

[5] Lanciani, *L'Atrio di Vesta* (1884), pl. xix.

[6] See Huelsen, *The Roman Forum*, p. 190, fig. 108.

[7] See Jordan, *Vesta und die Laren* (Berlin, 1865); and Auer in the *Denkschriften der Wiener Akademie* (1888), ii. 209 ff.

[8] The columns were crimson, the travertine rain-water gutter bright blue, and the inner walls had simple designs in panels of leaf ornament and wreaths.

[9] A full account of the Atrium Vestae and its successive restorations is given in Miss E. B. Van Deman's *Atrium Vestae* (1909).

[10] The most important of these have been removed to the Museo delle Terme.

[11] The front is inscribed SENATVS . POPVLVSQVE . ROMANVS . PECVNIA . PVBLICA . FACIENDAM . CVRAVIT.

[12] In the excavations of December 1883 a pot was found in the north corner containing 830 silver pennies of English kings of the 9th and 10th centuries—Alfred the Great, Edward I., Aethelstan, Eadmund I., and others. A list of these is given by De Rossi in Lanciani's work, *L'Atrio di Vesta* (Rome, 1884). None are later

Arch of Fabius.

At the north-east corner of the Forum stood the arch of Q. Fabius Maximus, consul in 121 B.C., called Allobrogicus from his victory over the Allobroges (Schol. on Cic., *In Verr., Actio* i. 7); Liv. *Ep.* lvi.; Plin. *H.N.* vii. 166). It marked the extreme limit of the Forum in this direction (Cic. *Pro Planc*, 7, 17), as the rostra did at the other end. Remains of this arch were dug up and mostly destroyed in 1546, near the temple of Faustina; on one of the fragments then discovered was inscribed **Q.FABIVS.Q. F. MAXSVMVS.AED.CVR.REST.** (Dessau, *Inscr. Lat. Sel.* 43a). About twenty-five other fragments were found in 1882.[1]

Temple of Faustina.

The temple of Faustina the elder stands at the east angle of the Forum, facing the later line of the Sacra Via. It is prostyle hexastyle, and has monolithic columns of cipollino and a rich entablature of Greek marble, with graceful reliefs of griffins and candelabra on the frieze.[2] The walls are of massive peperino, once lined with marble. On the front is inscribed **DIVO. ANTONINO. ET. DIVAE. FAVSTINAE. EX. S. C.** This temple, built by Antoninus Pius in memory of his wife, who died in 141, was after his death dedicated also to him, and the first line was then added (*Vita Ant. Pii*, 6). In the Middle Ages it was consecrated as the church of S. Lorenzo in Miranda, and a great part of its cella has been destroyed. The front is now excavated to the original level. This temple is shown on the reverse of several coins of Antoninus Pius; some have the legend **DEDICATIO. AEDIS.**

Temple of Concord.

The space between the north-west end of the Forum and the Tabularium is occupied by a range of important buildings (see Plate VIII.). The chief of these is the temple of Concord (see Festus, ed. Müller, p. 347) shown on a fragment of the marble plan, founded by Camillus in 366 B.C. (Plut. *Cam.* 42), and restored by Opimius after the death of C. Gracchus (121 B.C.). It was afterwards rebuilt by Tiberius out of the spoils gained in Germany; it was rededicated by Tiberius in A.D. 10 in his own name and that of his brother Drusus (who had died in B.C. 9) [Suet. *Tib.* 20; Dio. Cass. lv. 25]. It is shown with unusual minuteness on the reverse of a first brass of Tiberius. The existing remains[3] are of the rebuilding by Tiberius, and show that it was unusual in plan, having a large cella much wider than its depth, and a very large projecting portico. Its construction is an interesting example of the Roman use of many different materials. The lower part of the walls was of massive tufa blocks, the upper part of the cella of travertine; and the inner low wall, which supported ranges of internal columns, was of mixed concrete, tufa and travertine. The whole was lined with marble, white outside, and rich oriental marbles inside (see fig. 4), which were also used for the pavement. The door-sill is made of enormous blocks of porta santa marble, in which a bronze caduceus (emblem of Mercury) was inlaid. Between the internal columns of the cella stood rows of statues; and the temple also contained a large collection of pictures, engraved gems, gold and silver plate, and other works of art, mostly the work of ancient Greek artists (see Plin. *H.N.* xxxiv. 19, xxxv. 36, 40, xxxvi. 67, xxxvii. 2). On the apex of the pediment was a group of three figures embracing; the tympanum was filled with sculpture; and statues were set in the open porch. Though now only the podium and the lower part of the cella wall exist, with foundations of the great flight of steps, many rich fragments both of the Corinthian entablature and of the internal caps and bases are preserved in the Tabularium; and some of the marble lining is still *in situ*. The Einsiedeln MS. gives part of the inscription of the front—**S.P.Q.R. AEDEM. CONCORDIAE. VETVSTATE. COLLAPSAM. IN. MELIOREM. FACIEM. OPERE. ET. CVLTV. SPLENDIDIORE. RESTITVERVNT** (*C.I.L.* vi. 89).[4]

Temple of Vespasian.

The temple of Vespasian stands close by that of Concord, abutting on the Tabularium in a similar way, and blocking up a doorway at the foot of a long flight of steps (see fig. 1). It consists of a nearly square cella with prostyle hexastyle portico of the Corinthian order; three of the columns are still standing, with their rich entablature, the frieze of which is sculptured with sacred instruments. The walls are of enormous blocks of travertine with strong iron clamps; the whole was lined with white Pentelic marble outside, and inside with coloured oriental marbles. There was an internal range of columns, as in the temple of Concord. This temple was begun by Titus in A.D. 80, in honour of his father Vespasian, and finished by Domitian, who dedicated it to Vespasian and Titus. The inscription on the entablature, given in the Einsiedeln MS., records a restoration by Severus and Caracalla—**DIVO. VESPASIANO. AVGVSTO. S.P.Q.R. IMPP. CAESS. SEVERVS. ET. ANTONINVS. PII. FELIC. AVGG. RESTITVERVNT**; part of the last word only now exists.

In the narrow space between the temples of Concord and Vespasian (only about 7 ft. in width) a small brick and concrete edifice stands against the Tabularium. In it was found an inscribed base dedicated to Faustina the younger by one of the *viatores* (messengers) of the quaestors, who probably had their office here.

Porticus Deorum Consentium.

The next building is the Porticus Deorum Consentium, a colonnade in two wings which join at the obtuse angle, with a row of small rooms or shrines partly cut into the tufa rock of the hill behind. This conjunction of twelve deities was of Etruscan origin; they were six of each sex and were called Senatus Deorum (Varro, *L.L.* viii. 70, and *De Re Rust*, i. 1).[5] The columns are of cipollino with Corinthian caps; on the frieze is an inscription recording a restoration by Vettius Agorius Praetextatus, praefect of the city in A.D. 367. Under the marble platform is a row of seven small rooms, the brick facing of which is perhaps of the Flavian period.

Arch of Severus.

The arch of Severus stands by the rostra, across the road on the north-east side of the Forum; the remains of the ancient travertine curb show that originally the road went along a rather different line, and was probably altered to make room for this great arch, which was accessible only by steps, and was not used for ordinary traffic. It was built in A.D. 203, after victories in Parthia, and was originally set up in honour of Severus and his two sons M. Aurelius Antoninus (Caracalla) and Geta. Caracalla, after murdering Geta, erased his name from all monuments to his honour in Rome. Representations of the arch on coins of Severus show that its attic was surmounted by a chariot of bronze drawn by six horses, in which stood Severus crowned by Victory; at the sides were statues of Caracalla and Geta, with an equestrian statue at each angle. The arch, except the base, which is of marble-lined travertine, is built of massive blocks of Pentelic marble, and has large crowded reliefs of victories in the East, showing much decadence from the best period of Roman art.

Central space of Forum.

The central space of the Forum is paved with slabs of travertine, much patched at various dates; it appears to have been marked out into compartments with incised lines (see Plate VIII.), the use of which is not known. There are also square holes which probably held masts on which awnings could be spread. Numerous clamp-holes all over the paving show where statues and other ornaments once stood. The recorded number of these is very great, and they must once have thickly crowded a great part of the central area. Two short marble walls or plutei covered with reliefs, discovered in 1872, stand on the north side. The rough travertine plinth on which they have been set is evidently of late date. Each of these marble screens has (on the inside) reliefs of a fat bull, boar and ram, decked out with sacrificial wreaths and vittae—the suovetaurilia. On the outside are scenes in the life of Trajan: in both cases the emperor is speaking from the rostra. On one we also see him seated on a *suggestus* instituting a charity for destitute children in A.D. 101—a scene similar to one shown in one of his first brasses with the legend **ALIM[ENTA] ITALIAE**;[6] at the other end the emperor stands on the rostra, on which the two tiers of beaks are shown; he is addressing a crowd of citizens. In the background is shown the long line of arches of the Basilica Julia, with (on the left) what is probably the temple of Castor and the arch of Augustus. On the right are the statue of Marsyas and the sacred fig-tree.[7] On the other slab a crowd of officials are bringing tablets and piling them in a heap to be burnt. This records the remission by Trajan of some arrears of debt due to the imperial treasury (Auson. *Grat. Act.* 32). The background here represents again the Basilica Julia, with (on the right) the Ionic temple of Saturn and the Corinthian temple of Vespasian. Between them is an arch, which may be that of Tiberius.[8] On the left the

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than 946, and a bronze fibula inlaid with silver with the name of Pope Marinus II. (942–46) makes it seem probable that this hoard was concealed during his pontificate.

[1] *Not. degli Scavi* (1882), p. 225.

[2] This finely sculptured frieze is almost an exact copy of that on the temple of Apollo at Miletus.

[3] The size of the earlier and smaller temple is indicated by the rough blocks on the face of the wall of the Tabularium, close against which the temple stands. When the Tabularium was built it was not thought worth while to dress to a smooth face that part of its wall which was concealed by the then existing temple of Concord.

[4] Little is known of the Basilica Opimia, which probably adjoined the earlier temple of Concord, and the existing building appears also to have occupied the site of the Senaculum (see Festus, ed. Müller, p. 347). For various exciting scenes which took place in the temple of Concord and on its steps, see Cic. *Phil.* vii. 8; Sallust, *Bell. Cat.* 49. Another temple of Concord, built in 216 B.C., stood on the Capitoline Arx (Liv. xxii. 33, xxiii. 21); and a bronze aedicula of Concord in the Area Vulcani, which must have been close by the great temple. This was dedicated by Cn. Flavius, 305 B.C. (see Liv. ix. 46); according to Pliny (*H.N.* xxxiii. 19) it stood "in

Graecostasi, quae tunc supra Comitium erat." Both these were probably only small shrines.

[5] Twelve gilt statues are mentioned by Varro.

[6] Cohen, vol. ii. 303–5.

[7] This is not the *ficus ruminalis* in the Comitium, but another mentioned by Pliny (*H.N.* xv. 20) in the middle of the Forum.

[8] As it seems to be on a higher level, it may indicate the Tabularium.

fig-tree and the statue of Marsyas are repeated. Other explanations of these reliefs have been given, but the above appears the most probable. Towards the other end of the Forum are remains of a large concrete pedestal. It may possibly have supported an equestrian statue of Constantine, which was still standing in the 8th century. A smaller foundation, laid bare by Comm. Boni's excavations in 1905, is thought by him to have supported the equestrian statue of Q. Marcius Tremulus, the conqueror of the Hernici, set up before the temple of Castor in B.C. 305 (Liv. ix. 43).

The seven cubical brick and concrete structures, once faced with marble, which line the Sacra Via are not earlier than the time of Diocletian. They are probably the pedestals of honorary columns such as those shown in the relief on Constantine's arch, mentioned above. The column erected in honour of the tyrant Phocas by Smaragdus in the eleventh year of his exarchate (608) is still standing. It is a fine marble Corinthian column, stolen from some earlier building; it stands on rude steps of marble and tufa. The name of Phocas is erased from the inscription; but the date shows that this monument was to his honour. In the 4th century, or perhaps even later, a long brick and concrete building faced with marble was built along the whole south-east end of the Forum, probably a row of shops. They were destroyed by Comm. Rosa's order. Two columns—one of pavonazzetto, the other of grey granite—were set up on two of the brick bases in 1899.

In 1902 a network of passages (*cuniculi*) was discovered about 3 ft. beneath the pavement of the Forum. These have tufa walls and concrete vaults; they are about 8 ft. high and 5 ft. broad. At the intersections of the passages are square chambers, in the centre of which are travertine blocks with sockets for windlasses. The construction of the passages seems to date from the time of Julius Caesar, and it is thought that they were used for scenic purposes when games were given in the Forum.

In 1903 a large concrete foundation was found, partly blocking the E. end of one of the *cuniculi*. There can be no doubt that this once supported the colossal equestrian statue of Domitian described by Statius (Silv. i. 1, 21 ff.) which was destroyed after his murder. Embedded in the concrete was a cist of massive travertine blocks which was found to contain five archaic vases similar to those from the early necropolis (above, *as init.*). One held a nugget of quartz containing pure gold. It is uncertain whether these were buried here for ritual purposes or were the contents of an early tomb found in digging the foundations. Near this monument there were found in 1904 remains of an enclosure of irregular shape which once contained an altar. This must have been the altar which in imperial times represented the Lacus Curtius (Ov. *Fast.* vi. 403). Beside this were found some remains of a structure of imperial date which Comm. Boni identified with the Tribunal at which justice was administered by the emperors.[1]

Palatine Hill or Palatium.

In addition to the early walls described above, only a few remains now exist earlier in date than the later years of the republic; these are mostly grouped near the Scalae Caci (see fig. 10, in Plan), and consist of small cellae and other structures of unknown use.[2] They are partly built of the soft tufa used in the "wall of Romulus," and partly of hard granulated tufa so called. Various names, such as the "hut of Faustulus" and the "Auguratorium," have been given to these very ancient remains, but with little reason. On thing is certain, that the buildings were respected and preserved even under the empire, and were probably regarded as sacred relics of the earliest times.

Temple of Jupiter Victor.

Statue of Cybele.

Remains of more than one temple of the republican period exist near this west angle of the Palatine. The larger of these (see Plan) has been called conjecturally the temple of Jupiter Victor (Liv. x. 29; Ov. *Fast.* iv. 621).[3] It stands on a levelled platform of tufa rock, the lower part of which is excavated into quarry chambers, used in later times as water reservoirs. Two ancient well-shafts lined with tufa communicate with these subterranean hollows. Extensive foundations of hard tufa exist in the valley afterwards covered by the Flavian palace (see Plan, "Foundations of the Domus Augustana"). The masonry is in parts of republican date, and was used to support the Flavian palace. Not far from the top of the Scalae Caci are the massive remains of a large cella, nothing of which now exists except the concrete core faced with *opus incertum* in alternate layers of tufa and peperino. It was probably once lined with marble. By it a noble colossal seated figure of a goddess was found, in Greek marble, well modelled, a work of the 1st century A.D. The head and arms are missing, but the figure is probably rightly called a statue of Cybele; and inscriptions dedicated to Magna Mater have been found close to the temple. Augustus in the *Monumentum Ancyranum* (4, 8) records AEDEM. MATRIS. MAGNAE. IN. PALATIO. FECI; and there can be little doubt that this is the temple in question. Some interesting early architectural fragments are lying near this temple; they consist of drums and capitals of Corinthian columns, and part of the cornice of the pediment, cut in peperino, and thickly coated with hard white stucco to imitate marble. Between this and the temple of Jupiter Victor are extensive remains of a large porticus, with tufa walls and travertine piers, also republican in date. The use and name of this building are unknown.

Domus Tiberiana.

House of Livia.

Remains of extensive lines of buildings in early *opus reticulatum* exist on the upper slopes of the Palatine, all along the Velabrum side, and on the south-west side as far as the so-called Paedagogium. These buildings are constructed on the ruins of the wall of Romulus, a great part of which has been cut away to make room for them; their base is at the foot of the ancient wall, on the shelf cut midway in the side of the hill; their top reached originally above the upper level of the summit. They are of various dates, and cannot be identified with any known buildings. Part is apparently of the time of the emperor Tiberius, and no doubt belongs to the Domus Tiberiana mentioned by Suetonius (*Tib.* 5; Tac. *Hist.* i. 27, iii. 71); this palace covered a great part of the west corner of the hill. Of about the same date is a very interesting and well-preserved private house built wholly of *opus reticulatum*, which formed part of the imperial property, and was respected when the later palaces were built. The discovery of lead-pipes bearing the inscription IVLIAE. AVG (*C.I.L.* xv. 7264) has led to the conjecture that the house was that bequeathed to Livia by her first husband, Tib. Claudius Nero. At the north-west end is a small atrium, out of which open three rooms commonly called the *tablinum* and *alae*, as well as a *triclinium*, all decorated with good paintings of mythological and domestic scenes, probably the work of Greek artists, as inscriptions in Greek occur, *e.g.* ΕΡΜΗϹ, under the figure of Hermes, in a picture representing his deliverance of Io from Argus.[4] This suite of rooms was a later addition to the house. The south-east portion was three storeys high, and is divided into a great number of very small rooms, mostly bedrooms. The house is built in a sort of hole against the side of an elevation, so that the upper floor behind is level with an ancient paved road. The dampness caused by this is counteracted and kept off the paintings by a lining of flange-tiles over the external walls, under the stucco, thus forming an air-cavity all over the surface. From the back of the house, at the upper level, a long subterranean passage leads towards the Flavian palace, and then, turning at right angles and passing by the foundations of the so-called temple of Jupiter Victor, issues in the ancient tufa building mentioned above. Another crypto-porticus starts near this house and communicates with the long semi-subterranean passage by which the palaces of Caligula and Domitian are connected. It is ornamented with very beautiful stucco reliefs of cupids, beasts and foliage, once painted and gilt. Some hold that the house was that of Germanicus, into which the soldiers who killed Caligula in the long crypto-porticus escaped, as described by Josephus (*Ant. Jud.* xix. 1; see also Suet. *Cal.* 58).

Palace of Augustus and Area Apollinis.

From the Summa Sacra Via a road led to the Area Palatina in the centre of the hill. Here was the sanctuary called *Roma quadrata*, containing the *mundus*, a pit in which the instruments used in the founding of the city were deposited. To the east was the Area Apollinis, the entrance of which led through lofty propylaea into a very extensive peristyle or porticus, with columns of Numidian giallo; the temple was of white Luna marble. In the centre of this enclosure stood the great octostyle peripteral temple of Apollo Palatinus. The splendour of its architecture and the countless works of art in gold, silver, ivory, bronze and marble, mostly the production of the best Greek artists, which adorned this magnificent group of buildings, must have made it the chief glory of this splendid city. This temple was begun by Augustus in 36 B.C.,[1] after his Sicilian victory over Sextus Pompeius, and dedicated on the 9th of October 28 B.C.[2] A glowing account of the splendours of these buildings is given by Propertius (ii. 2, iii. 31). Inside the cella were statues of Apollo between Latona and Diana by Scopas, Cephisodotus and Timotheus respectively (Plin. *H.N.* xxxvi. 24, 25, 32); beneath the base of the group were preserved the Sibylline books. The pediment had sculpture by Bupalus and Archermus of Chios (Plin. *H.N.* xxxvi. 13), and on the apex was Apollo in a quadriga of gilt bronze. The double door was covered with ivory reliefs of the death of the Niobids and the defeat of the Gauls at Delphi. The Ancyran inscription records that Augustus melted down eighty silver statues of himself and with the money "offered golden gifts" to this temple, dedicating them both in his own name and in the names of the original donors of the statues.[3] The Sibylline books were preserved under the statue of Apollo (Suet. *Aug.* 31); and within the cella were vases, tripods and statues of gold and silver, with a collection of engraved gems dedicated by Marcellus (see Plin. *H.N.* xxxvii. 11, xxxiv. 14). In the porticus was a large library, with separate departments for Latin and Greek literature,[4] and a large hall where the senate occasionally met (Tac. *Ann.* ii. 37). Round the porticus, between the Numidian marble columns, were statues of the fifty Danaids, and opposite them their fifty bridegrooms on horseback (see Schol. on Pers. ii. 56). In the centre, before the steps of the temple, stood an altar surrounded by four oxen, the work of Myron (Prop. iii. 31, 5). In the centre of the Palatine stood the palace of Augustus, built in the years following 36 B.C., and renewed after a fire in A.D. 3. It contained a small temple of Vesta (*C.I.L.* i.^{2} p. 317), dedicated on the 28th of April 12 B.C., when Augustus was elected *pontifex maximus.* Augustus's building was completely transformed by later emperors, but the name *domus Augustana* was retained in official use. The Area Apollinis and its group of buildings suffered in the fire of Nero, and were restored by Domitian. The whole was finally destroyed in the great fire of 363 (Ammian. xxiii. 3, 3), but the Sibylline books were saved.

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[1] Authorities on the Forum; For the earlier literature of the subject it will suffice to refer to Jordan, *Topographie der Stadt Rom*, i. 2, 195–429, and, in English, to Nichols, *The Roman Forum* (1877). By far the best account based on the recent discoveries of Comm. Boni is Huelsen, *The Roman Forum* (Eng. trans. from the 2nd German edition, by J. B. Carter, 1906), in which full references are given. The official reports of excavations by Comm. Boni appear at intervals in the *Notizie degli Scavi*, and are largely concerned with the ancient necropolis. Huelsen publishes reports in the *Römische Mitteilungen* which are of great value.

[2] Our knowledge of these remains has been considerably increased by excavations in this region begun in 1907, which form the subject of a series of reports in the *Notizie degli Scavi*; their significance is discussed by Pinza in the *Annali della Società degli ingegneri ed architetti Italiani* for that year, cf. Ashby in *Classical Quarterly* (1908), p. 145 ff. It is almost too much to hope that the difficult problems raised by these discoveries will ever be solved; meanwhile it may be noted (i) that abundant traces of a primitive settlement (pottery, foundations of huts, &c.) have come to light near the W. angle of the hill; (ii) that walls of various epochs have been found which may have belonged to a system of fortification, though this cannot be demonstrated; (iii) that *beneath* a piece of walling built with regularly laid tufa blocks was found an inhumation-grave containing pottery of the 4th century B.C.

[3] It has recently been argued by Pinza that this is the temple of Apollo built by Augustus.

[4] See *Mon. Inst.* xi. pls. xxii., xxiii.; Mau, *Geschichte der Wandmalerei*, pl. ix.; Renier, *Les Peintures du Palatin* (Paris, 1870).

Domus Tiberiana.

To the north-west of the Area Palatina stood the Domus Tiberiana, a palace built by Tiberius on substructures of concrete which crown the north-west slope of the hill and form a platform now occupied by the Farnese gardens, overlooking the Clivus Victoriae. Caligula is said to have added to this palace on the side towards the Forum, making the temple of Castor into a vestibule, and to have connected it with the Capitol by a bridge whose piers were found by the temple of Augustus and the Basilica Julia; but this was destroyed after his death. At a later time the palace was extended so as to include the northern angle of the Palatine, which had once been covered with private houses. Among these were the dwellings of Q. Lutatius Catulus, Q. Hortensius, Scaurus, Crassus (Plin. *H.N.* xxxvi. 3, 24), whose house was afterwards bought by Cicero.[5] Many other wealthy Romans had houses on this part of the Palatine. The part now existing is little more than the gigantic substructure built to raise the principal rooms to the level of the top of the hill. The lowest parts of these face the Nova Via, opposite the Atrium Vestae, and many storeys of small vaulted rooms built in mixed brick and *opus reticulatum* rise one above the other to the higher levels.[6] The palace extends over the Clivus Victoriae, supported on lofty arches so as to leave the road unblocked; many travertine or marble stairs lead to the upper rooms, some starting from the Nova Via, others from the Clivus Victoriae. A large proportion of these substructures consist of dark rooms, some with no means of lighting, others with scanty borrowed light. Many small rooms and stairs scarcely 2 ft. wide can only have been used by slaves. The ground floors on the Nova Via and the Clivus Victoriae appear to have been shops, judging from their wide openings, with travertine sills, grooved for the wooden fronts with narrow doors, which Roman shops seem always to have had—very like those now used in the East. The upper and principal rooms were once richly decorated with marble linings, columns and mosaics; but little of these now remains. The upper part of the palace, that above the Clivus Victoriae, is faced wholly with brickwork, no *opus reticulatum* being used as in the lower portions by the Nova Via. This marks a difference of date, and this is confirmed by the occurrence of brick stamps of the 2nd century A.D.

Flavian Palace.

The next great addition to the buildings of the Palatine was the magnificent suite of state apartments built by Domitian, over a deep natural valley running across the hill (see Plan). The valley was filled up and the level of the new palace raised to a considerable height above the natural soil. Remains of a house, decorated with painting and rich marbles, exist under Domitian's peristyle, partly destroyed by the foundations of cast concrete which cut right through it. The floor of this house shows the original level, far below that of the Flavian palace. This building is connected with the palace of Caligula by a branch subterranean passage leading into the earlier crypto-porticus. It consists of a block of state-rooms, in the centre of which is a large open peristyle, with columns of oriental marble, at one end of which is the grand triclinium with magnificent paving of opus sectile in red and green basalt and coloured marbles, a piece of which is well preserved; next to the triclinium, on to which it opens with large windows, is a nymphaeum or room with marble-lined fountain and recesses for plants and statues. On the opposite side of the peristyle is a large throne-room, the walls of which were adorned with rows of pavonazzetto and giallo columns and large marble niches, in which were colossal statues of porphyry and basalt; at one side of this is the basilica, with central nave and apse and narrow aisles, over which were galleries. The apse, in which was the emperor's throne, is screened off by open marble cancelli, a part of which still exists. It is of great interest as showing the origin of the Christian basilica (see BASILICA).[7] On the other side of the throne-room is the lararium, with altar and pedestal for a statue; next to this is the grand staircase, which led to the upper rooms, now destroyed. The whole building, both floor and walls, was covered with the richest oriental marbles. Outside were colonnades or porticus,— on one side of cipollino, on the other of travertine, the latter stuccoed and painted. The magnificence of the whole, crowded with fine Greek sculpture and covered with polished marbles of the most brilliant colours, is difficult now to realize; a glowing description is given by Statius (*Silv.* iv. 11, 18; see also Plut. *Poplic.* 15, and Mart. viii. 36). Doors were arranged in the throne-room and basilica so that the emperor could slip out unobserved and reach by a staircase (*g* on Plan) the crypto-porticus which communicates with Caligula's palace. The vault of this passage was covered with mosaic of mixed marble and glass, a few fragments of which still remain; its walls were lined with rich marbles; it was lighted by a series of windows in the springing of the vault. This, as well as the Flavian palace, appears to have suffered more than once from fire, and in many places important restorations of the time of Severus, and some as late as the 4th century, are evident. In 1720–28 extensive excavations were made here for the Farnese duke of Parma, and an immense quantity of statues and marble architectural fragments were discovered, many of which are now at Naples and elsewhere. Among them were sixteen beautiful fluted columns of pavonazzetto and giallo, fragments of the basalt statues, and an immense door-sill of Pentelic marble, now used for the high altar of the Pantheon; these all came from the throne-room. The excavations were carried on by Bianchini, who published a book on the subject.[8]

Domus Gelotiana.

In the middle of the slopes of the Palatine, towards the Circus Maximus, are considerable remains of buildings set against the early wall and covering one of its projecting spurs, consisting in a series of rooms with a long Corinthian colonnade. The rooms were partly marble-lined and partly decorated with painted stucco, on which are incised a number of interesting inscriptions and rude drawings. Here, in 1856, was found the celebrated caricature of the Crucified Christ, now in the Museo Kircheriano.[9] The inscription **CORINTHVS . EXIT . DE . PEDAGOGIO** suggests that this building was at one time used as a school, perhaps for the imperial slaves.[10] A number of soldiers' names also occur, *e.g.* **HILARVS . MI . V . D . N .** (*Hilarus miles vestitor domini nostri?*); some are in mixed Latin and Greek characters. After one pair of names is inscribed **PEREG**, showing that they belonged to the corps called *frumentarii* stationed in the Castra Peregrinorum on the Caelian. Most of these inscriptions appear to be as early as the 1st century A.D.[11] These interesting graffiti have in great part perished during the last few years. Some inscriptions found in the larger rooms seem to indicate that the imperial wardrobe found a place in them.

To the south of the Flavian state-rooms, on the side of the hill overlooking the Circus, was a building with a central peristyle ("Palace of Domitian" on Plan), which was excavated in 1775 and

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[1] TEMPLVM . APOLLINIS . IN . SOLO . MAGNAM . PARTEM . EMPTO . FECI (*Mon. Anc.* 4, 1).

[2] See Dio Cass. xlix. 15, liii. 1, and *C.I.L.* i.^{2} p. 331.

[3] See also Suet. *Aug.* 52, whose account is rather different.

[4] Schol. to Juv. i. 128, and Suet. *Aug.* 29.

[5] Cic. *Pro Domo*, 43; Val. Max. vi. 3, 1; and see Becker, *Handb.* i. p. 423.

[6] At this point the Palatine is cut away into four stages like gigantic steps; the lowest is the floor of the Atrium Vestae, the second the Nova Via, the third the Clivus Victoriae, and the top of the hill forms the fourth.

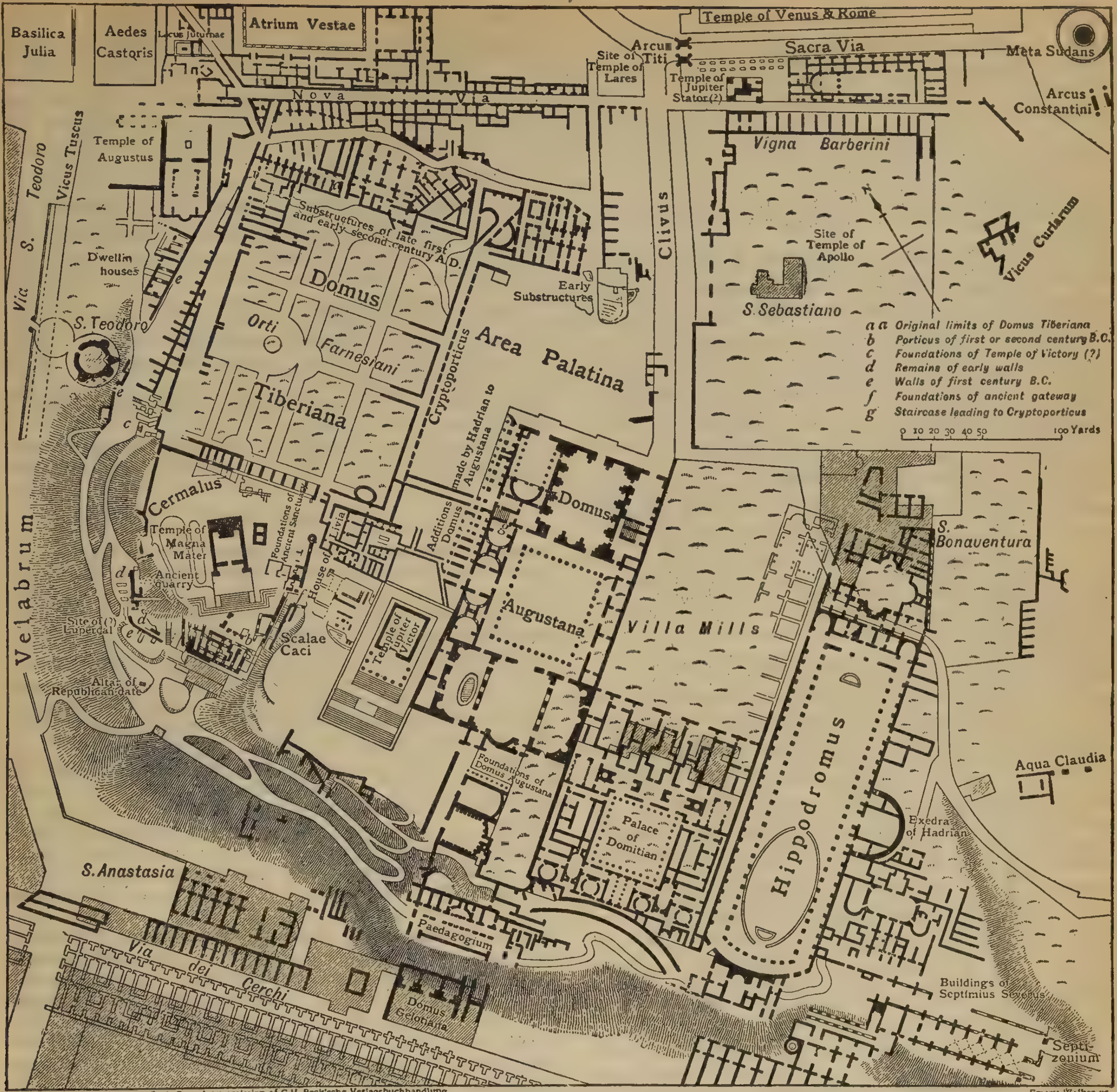
[7] The brick stamps on the tiles laid under the marble paving of the basilica have **CN. DOMITI. AMANDI. VALEAT. QVI. FECIT.**,—the last three words a common augury of good luck stamped on bricks or amphorae.

[8] *Pal. dei Cesari* (Verona, 1738); see Guattani, *Not. di Antich.* (1798).

[9] See Kraus, *Das Spottcrucifix vom Palatin* (Freiburg, 1872), and Becker, *Das Spottcrucifix*, &c. (Breslau, 1866).

[10] The *paedagogium* was, however, on the Caelian. Huelsen suggests that it is here used as a slang term for a prison.

[11] See Henzen, in the *Bull. Inst.*, 1863, p. 72, and 1867, p. 113.


Basilica Julia
Aedes Castoris
Lacus Juturnae
Atrium Vestae
Temple of Venus & Rome
Arcus Titi
Site of Temple of Lares
Sacra Via
Temple of Jupiter Stator (?)
Meta Sudans
Arcus Constantini
Nova Via
Temple of Augustus
Vicus Tuscus
Via S. Teodoro
Vigna Barberini
Clivus
Substructures of late first and early second century A.D.
Dwelling houses
Domus
Orti Farnesiani
Tiberiana
Early Substructures
Site of Temple of Apollo
Vicus Curiarum
S. Sebastiano
S. Teodoro
Cryptoporticus
Area Palatina
a a Original limits of Domus Tiberiana
b Porticus of first or second century B.C.
c Foundations of Temple of Victory (?)
d Remains of early walls
e Walls of first century B.C.
f Foundations of ancient gateway
g Staircase leading to Cryptoporticus
0 10 20 30 40 50 100 Yards
Cermalus
Additions made by Hadrian to Domus Augustana
Domus
Temple of Magna Mater
Foundations of Ancient Sanctuary
House of Livia
S. Bonaventura
Ancient quarry
Augustana
Villa Mills
Velabrum
Site of (?) Lupercal
Scalae Caci
Temple of Jupiter Victor
Altar of Republican date
Hippodromus
Aqua Claudia
Foundations of Domus Augustana
Exedra of Hadrian
Palace of Domitian
S. Anastasia
Paedagogium
Via dei Cerchi
Domus Gelotiana
Buildings of Septimius Severus
Septizonium
a
b
c
d
e
f
g

From Richter's Topographie der Stadt Rom, by permission of C.H. Beck'sche Verlagsbuchhandlung

Emery Walker sc.

FIG. 10.—Plan of the Palatine.

again partly laid bare in 1869 and the following years. This has often, but wrongly, been called the palace of Augustus; we should rather see in it the dwelling-rooms of the Flavian palace. Adjoining it is the so-called stadium of the Palatine ("Hippodromus" on Plan), begun by Domitian, enlarged by Hadrian, and much altered or restored by Severus. The greater part of the outer walls and the large exedra or apse at the side, with upper floor for the emperor's seat, are of the time of Hadrian, as is shown by the brick stamps, and the character of the brick facing, which much resembles that of the Flavian time (bricks 1½ in. and joints ½ in. thick).[1] The stadium is surrounded with a colonnade of engaged shafts, forming a sort of aisle with gallery over it. Except those at the curved end, which are of Hadrian's time, these piers are of the time of Severus, as are also all the flat piers along the outer wall,—one opposite each of those in the inner line. Severus restored the galleries after the great fire of A.D. 191. This building was the *hippodromus Palatii*; the word here means, not a racecourse, but a garden (Plin. *Epp.* 5, 6, 19).

Hadrian's palace.

In addition to the stadium, Hadrian built a number of very handsome rooms, forming a palace on the south-east side and at the south-west end of the stadium. These rooms were partly destroyed and partly hidden by the later palace of Severus, the foundations of which in many places cut through and render useless the highly decorated rooms of Hadrian. The finest of these which is now visible is a room with a large window opening into the stadium near the south angle; it has intersecting barrel vaults, with deep coffers, richly ornamented in stucco. The oval structure shown in the plan (fig. 10), with other still later additions, belongs to the 6th century; in its walls, of *opus mixtum*, are found brick stamps of the reign of Theodoric, *c.* 500.

Palace of Severus.

The palace of Septimius Severus was very extensive and of enormous height; it extends not only all over the south angle of the Palatine but also a long way into the valley of the Circus Maximus and towards the Coelian. This part (like Caligula's palace) is carried on very lofty arched substructures, so as to form a level, uniform with the top of the hill, on which the grand apartments stood. The whole height from the base of the Palatine to several storeys above its summit must have been enormous. Little now remains of the highest storeys, except part of a grand staircase which led to them. Extensive baths, originally decorated with marble linings and mosaics in glass and marble, cover a great part of the top of the hill. These and other parts of the Palatine were supplied with water by an aqueduct built by Nero in continuation of the Claudian aqueduct, some arches of which still exist on the slope of the Palatine ("Aqua Claudia" on Plan) (see Spart. *Sept. Sev.* 24). One of the main roads up to the Palatine passes under the arched substructures of Severus, and near this, at the foot of the hill, at the south angle, Septimius Severus built an outlying part of his palace, a building of great splendour called the Septizodium,[1] or House of the Seven Planets. Part of the Septizodium existed as late as the reign of Sixtus V. (1585–90), who destroyed it in order to use its marble decorations and columns in the new basilica of St Peter; drawings of it are given by Du Pérac, *Vestigj di Roma* (1575), pl. 13, and in other works of that century.[2]

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[1] In parts of the outer wall brick stamps of the Flavian period appear, *e.g.* FLAVI . AVG . L . CLONI—"[A brick] of Flavius Clonus, freedman of Augustus" (*C.I.L.* xv. 1149).

Velia and Cermalus.

The name Palatium seems to have originally denoted the southern height of the Palatine hill, while the summit overlooking the Velabrum was called Cermalus, and the saddle connecting the Palatine and the Esquiline on which the temple of Venus and Rome and the arch of Titus now stand bore the name Velia.[3] It is evident that this was once higher than it is now; a great part of it was cut away when the level platform for the temple of Venus and Rome was formed. The foundations of part of Nero's palace along the road between this temple and the Esquiline are exposed for about 20 to 30 ft. in height, showing a corresponding lowering of the level here, and the bare tufa rock, cut to a flat surface, is visible on the site of Hadrian's great temple; that the Velia was once much loftier is also indicated by the story of the removal of Valerius Publicola's dwelling.[4]

Arch of Titus.

The arch of Titus, erected in memory of that emperor's subjugation of the Jews, but not completed until after his death, stands at the point where the Sacra Via crosses the Velia; it is possible that it once stood farther to the east and was removed to its present position when the temple of Venus and Rome was built. The well-known reliefs of the archway depict the Jewish triumph and the spoils of the Temple. In the middle ages the arch was converted into a fortress by the Frangipani; their additions were removed and the arch restored in its present shape in 1821.

Sacra Via.

Temple of Jupiter Stator.

Temple of Victory.

On the Velia and the adjoining Summa Sacra Via were the temples of the Lares and Penates which Augustus rebuilt.[5] The "Aedes Larum" is probably distinct from the "Sacellum Larum" mentioned by Tacitus (*Ann.* xii. 24) as one of the points in the line of the original pomerium. The temple of Jupiter Stator, traditionally vowed by Romulus during his repulse by the Sabines (Liv. i. 12), stood near the Porta Mugonia, and therefore near the road leading up to the Palatine Sacra Via.[6] To the south-east of the arch of Titus (see Plan) are the remains of a concrete podium which may have belonged to this temple in its latest form; and Comm. Boni discovered (in 1907) some early tufa walling close to the above-named arch in which he recognized the foundations of the early temple. Augustus rebuilt the temple of Victory, which gave its name to the Clivus Victoriae; this temple stood on the site of a prehistoric altar (Dionys. i. 32), and was more than once rebuilt,—*e.g.* by L. Postumius, 294 B.C. (Liv. x. 33). In 193 B.C. an aedicula to Victory was built near it by M. Porcius Cato (Liv. xxxv. 9). Remains of the temple and a dedicatory inscription were found in 1728[7] not far from the church of S. Teodoro; the temple was of Parian marble, with Corinthian columns of Numidian giallo antico. The Sacra Via started at the Sacellum Streniae, an unknown point on the Esquiline, probably in the valley of the Colosseum (Varro, *L.L.* v. 47), in the quarter called Cerolia. Thence it probably (in later times) passed round part of the Colosseum to the slope leading up to the arch of Titus on the Velia; this piece of its course is lined on one side by remains of private houses, and farther back, against the cliff of the Palatine, are the substructures of the Area Apollinis. From the arch of Titus or Summa Sacra Via the original line of the road has been altered, probably when the temple of Venus and Rome was built by Hadrian. Its later course passed at a sharp angle from the arch of Titus to the front of Constantine's basilica, and on past the temple of Faustina. It is uncertain whether the continuation of this road to the arch of Severus was in later times called the Sacra Via or whether it rejoined its old line along the Basilica Julia by the cross-road in front of the Aedes Julii. Its original line past the temple of Vesta was completely built over in the 3rd and 4th centuries, and clumsily fitted pavements of marble and travertine occupy the place of the old basalt blocks.[8] The course of the Nova Via[9] (see Plan) along the north-east slope of the Palatine[10] was exposed in 1882–84. According to Varro (*L.L.* vi. 59) it was a very old road. It led up from the Velabrum, probably winding along the slope of the Palatine, round the north angle above the church of S. Maria Antiqua. The rest of its course, gently ascending towards the arch of Titus, is now exposed, as are also the stairs which connected it with the Clivus Victoriae at the northern angle of the Palatine; a continuation of these stairs led down to the Forum.[11]

Velabrum.

The extent of the once marshy Velabrum (Gr. ϝέλος) is not known, though part of its site is indicated by the church of S. Giorgio in Velabro; Varro (*L.L.* vi. 24) says, "extra urbem antiquam fuit, non longe a porta Romanula." It was a district full of shops (Plaut. *Capt.* 489; Hor. *Sat.* ii. 3, 30). The Vicus Tuscus on its course from the Forum to the Circus skirted the Velabrum (Dionys. v. 26), from which the goldsmiths' arch was an entrance into the Forum Boarium.

From the S.W. end of the Velabrum the Clivus Victoriae rose in a gradual ascent along the slope of the Palatine and ultimately wound round the northern angle.

Capitoline Hill[12]

Temple of Jupiter Capitolinus.

The Capitoline hill, once called Mons Saturnius (Varro, *L.L.* v. 42), consists of two peaks, the Capitolium and the Arx,[13] with an intermediate valley (Asylum). The older name of the Capitolium was Mons Tarpeius (Varro, *L.L.* v. 41). Livy (i. 10) mentions the founding of a shrine to Jupiter Feretrius on the Capitolium by Romulus;[14] this summit was afterwards occupied by the great triple temple dedicated to Jupiter, Juno and Minerva, a triad of deities worshipped under the names of Tinia, Thalna and Menerva in every Etruscan city. This great temple was (Liv. i. 38, 53) founded by Tarquin I., built by his son Tarquin II., and dedicated by M. Horatius Pulvillus, consul suffectus in 509 B.C.[15] It was built in the Etruscan style, of peperino stuccoed and painted (Vitr. iii. 3), with wooden architraves, wide intercolumniations and painted terra-cotta statues.[16] It was rebuilt many times; the original temple lasted till it was burnt in 83 B.C.; it was then refounded in marble by Sulla, with Corinthian columns stolen from the temple of Olympian Zeus in Athens (Plin. xxxvi. 4, 5), and was completed and dedicated by Q. Lutatius Catulus, whose name appeared on the front. Augustus, although he restored it at great expense (*Mon. Anc.* 4, 9), did not introduce his name by the side of that of Catulus. It was again burnt by the Vitellian rioters in A.D. 70, and rebuilt by Vespasian in 71.[17] Lastly, it was burnt in the three days' fire of Titus's reign[18] and rebuilt with columns of Pentelic marble by Domitian; the gilding alone of this last rebuilding is said to have cost 2½ millions sterling (Plut. *Publ.* 15). Extensive substructures of tufa have been exposed on the eastern peak; in 1875 a fragment of a fluted column was found, of such great size that it could only have belonged to the temple of Jupiter; and a few other architectural fragments have been discovered at different times. The western limit of the temple was determined in 1865, its eastern limit in 1875, and the S.E. angle in 1896.

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[1] The form Septizonium is also found.

[2] See Huelsen, *Das Septizonium des Septimius Severus* (Berlin, 1886); Maass, *Die Tagesgötter in Rom und den Provinzen* (Berlin, 1902).

[3] "Huic (Palatio) Germalum et Velias conjunxerunt . . . 'Germalum' a germanis Romulo et Remo, quod ad ficum Ruminalem ibi inventi" (Varro, *L.L.* v. 54).

[4] Liv. ii. 7; Cic. *Rep.* ii. 31; see also Ascon. *Ad Cic. in Pis.* 52.

[5] AEDEM.LARVM.IN.SVMMA.SACRA.VIA.AEDEM.DEVM.PENATIVM.IN.VELIA . . . FECI (*Mon. Anc.*).

[6] Dionys. ii. 50; see also Plut. *Cic.* 16; Ov. *Fast.* vi. 793, and *Trist.* iii. i, 131. Near this temple, and also near the Porta Mugonia, was the house of Tarquinius Priscus (Liv. i. 41; Solin. i. 24). Owing to the strength of its position this temple was more than once selected during troubled times as a safe meeting-place for the Senate; it was here, as being a "locus munitissimus," that Cicero delivered his *First Catiline Oration* (see Cic. *In Cat.* i. 1).

[7] See Bianchini. *Pal. dei Cesari* (1738), p. 236, pl. viii.

[8] See Jordan, *Topographie der Stadt Rom.* i. 2. 274–91.

[9] See Solinus (i. 24) and Varro (ap. Gell. xvi. 17), who mention its two ends, *summa* and *infima* (cf. Liv. v. 32).

[10] See *Not. d. Scavi* (1882), p. 234. Original level laid bare, 1904.

[11] See marble plan on Plate VII. and cf. Ov. *Fast.* vi. 395.

[12] See Rodocanachi, *Le Capitole romain* (1903; Eng. trans., 1906).

[13] The first-named was the southern, the second the northern summit.

[14] This is the earliest temple mentioned in Roman history. It was rebuilt by Augustus (*Mon. Anc.* 4, 5).

[15] See Plut. *Publ.* 14; *C.I.L.* i. p. 487; Liv. ii. 8. Dionys. v. 35 wrongly gives 507 B.C.

[16] Plin. xxxv. 157; see Tac. *Hist.* iii. 72; Val. Max. v. 10.

[17] Suet. *Vit.* 15, and *Vesp.* 8; cf. Tac. *Hist.* iv. 53, and Dio Cass. lxvi. 10.

[18] Suet. *Dom.* 5; Dio Cass. lxvi. 24.

It appears that the figures given by Dionysius (iv. 61) for the area are slightly too large. The true measurements were 188 × 204 Roman ft.[1] The temple is represented on many coins, both republican and imperial; these show that the central cella was that of Jupiter, that of Minerva on his right and of Juno on his left. The door was covered with gold reliefs, which were stolen by Stilicho (*c.* 400; Zosim. v. 38), and the gilt bronze tiles (cf. Plin. xxxiii. 57) on the roof were partly stripped off by Geiseric in 455 (Procop. *Bell. Vand.* i. 5), and the rest by Pope Honorius I. in 630 (Marliani, *Topogr.* ii. 1).[2] Till 1348, when the steps up to Ara Coeli were built, there was no access to the Capitol from the back; hence the three ascents to it mentioned by Livy (iii. 7, v. 26–28) and Tacitus (*Hist.* iii. 71–72) were all from the inside of the Servian circuit. Even on this inner side it was defended by a wall, the gates in which are called "Capitolii fores" by Tacitus. Part of the outer wall at the top of the tufa rock, which is cut into a smooth cliff, is visible from the modern Vicolo della Rupe Tarpeia; this cliff is traditionally called the Tarpeian rock, but that must have been on the other side towards the Forum, from whence it was visible, as is clearly stated by Dionysius (vii. 35, viii. 78).[3] Another piece of the ancient wall has been exposed, about half-way up the slope from the Forum to the Arx. It is built of soft yellow tufa blocks, five courses of which still remain in the existing fragment. The large temple of Juno Moneta ("the Adviser") on the Arx, built by Camillus in 384 B.C., was used as the mint; hence *moneta* = "money" (Liv. vi. 20).

A large number of other temples and smaller shrines stood on the Capitoline hill, a word used broadly to include both the Capitolium and the Arx.[4] Among these were the temple of Honos and Virtus, built by Marius, and the temple of Fides, founded by Numa, and rebuilt during the First Punic war. Both these were large enough to hold meetings of the senate. The temples of Mars Ultor (*Mon. Anc.* 4, 5) and Jupiter Tonans (Suet. *Aug.* 29; *Mon. Anc.* 4, 3) were built by Augustus. Other shrines existed to Venus Victrix Ops, Jupiter Custos, and Concord—the last under the Arx (Liv. xxii. 33)—and many others, as well as a triumphal arch in honour of Nero, and a crowd of statues and other works of art (see Plin. *H.N.* xxxiii. 9, xxxiv. 38, 39, 40, 43, 44, 79, xxxv. 69, 100, 108, 157), so that the whole hill must have been a mass of architectural and artistic magnificence.

Tabularium.

The so-called Tabularium[5] occupies the central part of the side towards the Forum; it is set on the tufa rock, which is cut away to receive its lower storey. It derives its name from an inscription which remained *in situ* until the 15th century (*C.I.L.* vi. 1314); whilst all public departments had their *tabularia*, this was a central Record Office, where copies of laws, treaties, &c., were preserved. It was built by Catulus, who was also the dedicator of the great temple of Jupiter (Tac. *Hist.* iii. 72; Dio Cass. xliii. 14), consul in 78 B.C. Its outer walls are of sperone, its inner ones of tufa; the Doric arcade has capitals, imposts and entablature of travertine. Above the arcade was a gallery or porticus, faced with a Corinthian colonnade, of which a few architectural members have been found. The columns appear to have belonged to the 1st century A.D. A road paved with basalt passes through the building along this arcade, entered at one end from the Clivus Capitolinus, and at the other probably from the Gradus Monetae, a flight of steps leading from the temple of Concord and the Forum up to the temple of Juno Moneta on the Arx. The entrance from the Clivus Capitolinus is by a wide flat arch of peperino beautifully jointed; the other end wall has been mostly destroyed. The back of this building overlooked the Asylum or depression between the two peaks. From this higher level a long steep staircase of sixty-seven steps descends towards the Forum; the doorway at the foot of these stairs has a flat arch, with a circular relieving arch over it; it was blocked up by the temple of Vespasian. Great damage was done to this building by the additions of Boniface VIII. and Nicholas V., as well as by its being used as a salt store, by which the walls were much corroded.[6]

The Imperial Fora.

Forum Julium.

The Forum Julium (see fig. 11, Plan), with its central temple of Venus Genetrix, was begun, about 54 B.C., by Julius (who dedicated it in an unfinished state in 46 B.C.) and completed by Augustus.[7] Being built on a crowded site it was somewhat cramped, and the ground cost nearly a hundred million sesterces.[8] Part of its circuit wall, with remains of five arches, exists in the Via delle Marmorelle; and behind is a row of small vaulted rooms, probably shops or offices. The arches are slightly cambered with travertine springers and keys; the rest, with the circular relieving arch over, is of tufa; it was once lined with slabs of marble, the holes for which exist. Foundations of the circuit wall exist under the houses towards S. Adriano, but the whole plan has not been made out. In the centre of the Forum stood the temple of Venus Genetrix, whose remains were seen and described by Palladio (*Arch.* iv. 31). This temple was vowed by Caesar at the battle of Pharsalus.[9]

Forum of Augustus.

The forum of Augustus (see fig. 11) adjoined that of Julius on its north-east side; it contained the temple of Mars Ultor, built to commemorate the vengeance taken on Caesar's murderers at Philippi, 42 B.C. (Ov. *Fast.* v. 575 seq.).[10] It was surrounded with a massive wall of peperino, over 100 ft. high, with travertine string-courses and cornice; a large piece of this wall still exists, and is one of the most imposing relics of ancient Rome. Against it are remains of the temple of Mars, three columns of which, with their entablature and marble ceiling of the peristyle, are still standing; it is Corinthian in style, very richly decorated, and built of fine Luna marble. The cella is of peperino, lined with marble; and the lower part of the lofty circuit wall seems also to have been lined with marble on the inside of the forum. The large archway by the temple (Arco dei Pantani) is of travertine. Palladio (*Arch.* iv.) and other writers of the 16th century give plans of the temple and circuit wall, showing much more than now exists. The temple, which was octastyle, with nine columns and a pilaster on the sides, occupied the centre, and on each side the circuit wall formed two large semicircular apses, decorated with tiers of niches for statues.[11]

Forum Pacis.

The Forum Pacis, built by Vespasian, was farther to the south-east; the only existing piece, a massive and lofty wall of mixed tufa and peperino, with a travertine archway, is opposite the end of the basilica of Constantine. The arch opened into the so-called Templum Sacrae Urbis, a rectangular building entered by a portico on its west side, whose north wall was decorated with a marble plan of the city of Rome (see below, p. 608). The original plan was probably burnt with the whole group of buildings in this forum in 191, in the reign of Commodus (Dio Cass. lxxii. 24); but a new plan was made, and the building restored in concrete and brick by Severus. The north end wall, with the clamps for fixing the marble plan, still exists, as does also the other (restored) end wall with its arched windows towards the forum; one hundred and sixty-seven fragments of this plan were found *c.* 1563 at the foot of the wall to which they were fixed, and are now preserved in the Capitoline Museum; drawings of seventy-four pieces now lost are preserved in the Vatican[12] (*Cod. Vat.* 3439). The whole of these fragments were published by Jordan, *Forma Urbis Romae* (Berlin, 1874). Other fragments have since been brought to light, and the whole series was rearranged in the Palazzo dei Conservatori in 1903. The circular building at the end facing on the Sacra Via is an addition built by Maxentius in honour of his deified son Romulus; like the other buildings of Maxentius, it was rededicated and inscribed with the name of his conqueror

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[1] See *Bull. Comm. Arch.* iii. (1875), p. 165; *Mon. Inst.* v. pl. xxxvi., x. pl. xxx*a*; Jordan, *Topographie der Stadt Rom,* i. 2, 69; *Notizie degli Scavi,* 1896, p. 161, 1897, p. 30; Richter, "Der kapitolinische Jupitertempel und der italische Fuss," in *Hermes* (1887), p. 17.

[2] The pediment is shown on a relief now lost, but extant in the 16th century and reproduced in drawings of that date. It has been recently proved to have decorated the Forum of Trajan (Wace in *Papers of the B.S.R.* iv. p. 240, pl. xx.). The front of the temple is shown on one of the reliefs of Marcus Aurelius now in the Palazzo dei Conservatori (*Papers of the B.S.R.* iii. pl. xxvi.).

[3] See Rodocanachi, *The Roman Capitol,* p. 50. A graceful account of the legend of Tarpeia is given by Propertius, *Eleg.* iv. 4.

[4] A structure of great sanctity, dating from prehistoric Etruscan times, was the Auguraculum, an elevated platform upon the Arx, from which the signs in the heavens were observed by the augurs (see Festus, ed. Müller, p. 18).

[5] On the Tabularium see Delbrück, *Hellenistische Bauten in Latium,* i. (1907), pp. 23–46.

[6] The Porta Pandana ("ever-open gate") gave access from the Area Capitolina, upon which the temple of Jupiter stood, to the Tarpeian rock.

[7] See *Mon. Anc.* (quoted above); Plin. *Hist. Nat.* xxxv. 156, xxxvi. 103.

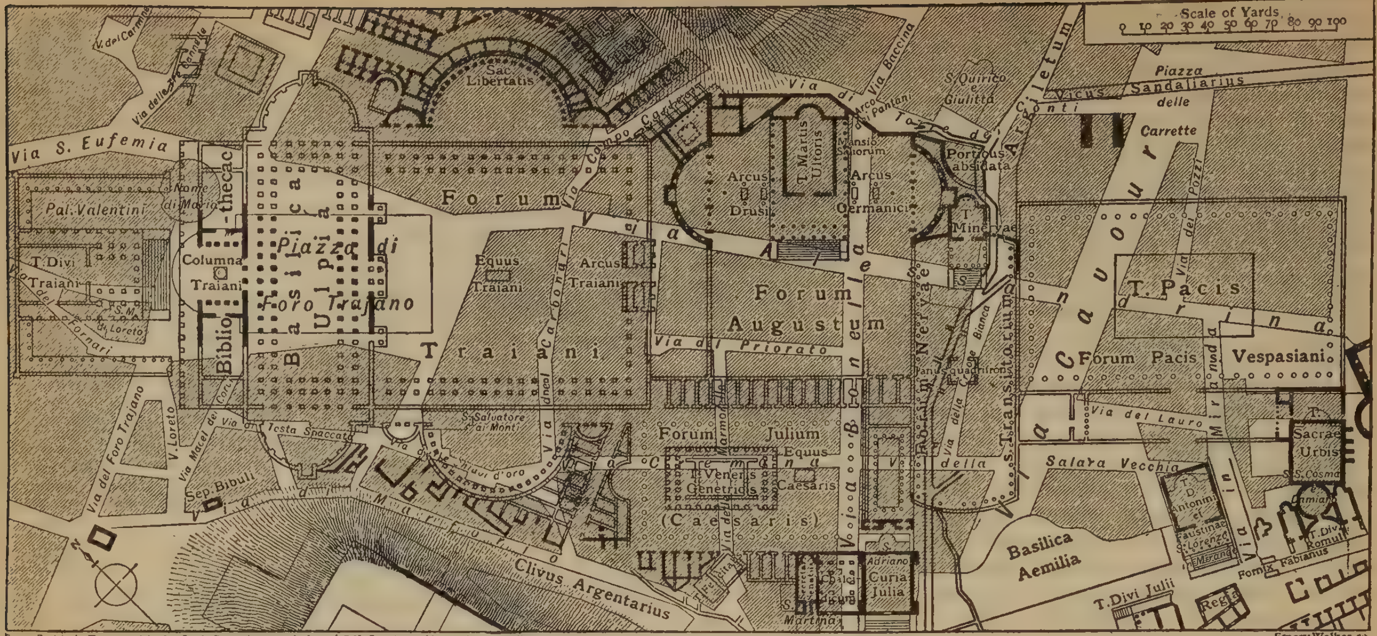
[8] Cic. *Ep. ad Att.* iv. 16; Suet. *Caes.* 26; Plin. *H.N.* xxxvi. 103.

[9] See Dio Cass. xliii. 22; Appian, *Bell. Civ.* ii. 102; Vitr. iii. 3; Plut. *Caes.* 60.

[10] The Ancyran inscription records—**IN.PRIVATO.SOLO.[EMP]TO. MARTIS.ULTORIS.TEMPLVM.FORVMQVE.AVGVSTVM.EX. [MANI]BIIS.FECI.** See Suet. *Aug.* 29, 56; Dio Cass. lvi. 27; Plin. *H.N.* xxxvi. 102, xxxv. 94, xxxiv. 48, vii. 183, where many fine Greek works of art are mentioned as being in the forum of Augustus.

[11] Those of Roman leaders and generals, from Aeneas and Romulus to Augustus. See Borsari, *Foro d'Augusto,* &c. (1884).

[12] An interesting description of this discovery is given by Vacca, writing in 1594 (see Schreiber in *Berichte der sächs. Gesellsch. der Wissenschaften,* 1881). The scale is roughly 1 to 250.


Scale of Yards
0 10 20 30 40 50 60 70 80 90 100
Via S. Eufemia
V. del Carmine
Via delle Tre Cannelle
Sac. Libertatis
Pal. Valentini
Nome di Maria
T. Divi Traiani
S. M. di Loreto
Via dei Fornari
Columna Traiani
Biblio-thecae
Basilica Ulpia
Piazza di Foro Trajano
Forum Traiani
Equus Traiani
Arcus Traiani
Via Campo Carleo
Via Carbonari
Via Alessandrina
Via del Foro Trajano
V. Loreto
Via Macel dei Corvi
Via di Testa Spaccata
Sep. Bibuli
S. Salvatore ai Monti
Via de' Chiavi d'oro
Via di Marforio
Clivus Argentarius
Via di Torre de' Conti
Via Baccina
Arco de' Pantani
S. Quirico e Giulitta
Mansio Saliorum
T. Martis Ultoris
Arcus Drusi
Arcus Germanici
Porticus absidata
T. Minervae
Forum Augustum
Via del Priorato
Via Bonella
Forum Nervae
Forum Transitorium
Janus quadrifrons
Via della Croce Bianca
Via di Marmorelle
Forum Julium
Templum Veneris Genetricis
Equus Caesaris
(Caesaris)
Chalcidicum
Curia Julia
S. Adriano
S. Martina
Argiletum
Vicus Sandaliarius
Piazza delle Carrette
Via dei Pozzi
Via Cavour
T. Pacis
Forum Pacis
Vespasiani
Via del Lauro
Via della Salara Vecchia
Via in Miranda
T. Sacrae Urbis
SS. Cosma e Damiano
T. Divi Romuli
T. D. Antonini et Faustinae
S. Lorenzo in Miranda
Basilica Aemilia
Fornix Fabianus
T. Divi Julii
Regia

From Richter's Topographie der Stadt Rom, by permission of C. H. Beck'sche Verlagsbuchhandlung. Emery Walker sc.

FIG. 11.—Imperial Fora.

Constantine.[1] The original building of Vespasian was probably an archive and record office; it was certainly not a temple. The fine bronze doors at the entrance to the temple of Romulus are much earlier than the building itself, as are also the porphyry columns and very rich entablature which ornament this doorway. Pope Felix IV. (526–30) made the double building into the church of SS. Cosmo e Damiano, using the circular domed temple of Romulus as a porch.[2] The chief building of Vespasian's forum was the Templum Pacis,[3] dedicated in 75, one of the most magnificent in Rome, which contained a very large collection of works of art.

Forum of Nerva.

The forum of Nerva (see fig. 11) occupied the narrow strip left between the fora of Augustus and Vespasian; being little more than a richly decorated street, it was called the Forum Transitorium or Forum Palladium, from the temple to Minerva which it contained. It was begun by Domitian, and dedicated by Nerva in 97 (see Suet. *Dom.* 5; Mart. i. 2, 8). Like the other imperial fora, it was surrounded by a peperino wall, not only lined with marble but also decorated with rows of Corinthian columns supporting a rich entablature with sculptured frieze. Two columns and part of this wall still exist; on the frieze are reliefs of weaving, fulling and various arts which were under the protection of Minerva. A great part of the temple existed till the time of Paul V., who in 1606 destroyed it to use the remains for the building of the Acqua Paola.[4] In the reign of Severus Alexander a series of colossal bronze statues, some equestrian, were set round this forum; they represented all the previous emperors who had been deified, and by each was a bronze column inscribed with his *res gestae* (*Hist. Aug.*; *Sev. Alex.* 28).

Forum of Trajan.

The forum of Trajan with its adjacent buildings was the last and, at least in size, the most magnificent of all; it was in progress from 113 to 117, at least. A great spur of hill, which connected the Capitoline with the Quirinal, was cut away to make a level site for this enormous group of buildings. It consisted (see fig. 11) of a large dipteral peristyle, with curved projections, lined with shops on the side. That against the slope of the Quirinal, three storeys high, still partly exists. The main entrance was through a triumphal arch (Dio Cass. lxviii. 29). Aurei of Trajan show this arch and other parts of his forum.[5] The opposite side was occupied by the Basilica Ulpia (Jordan, *F.U.R.* iii. 25, 26), part of which, with the column of Trajan, is now visible; none of the columns, which are of grey granite, are *in situ*, and the whole restoration is misleading. Part of the rich paving in oriental marble is genuine. This basilica contained two large libraries (Dio Cass. lxviii. 16; Aul. Gell. xi. 17).

Trajan's column.

The Columna Cochlis (so called from its spiral stairs) is, including capital and base, 97 ft. 9 in. high,[6] *i.e.* 100 Roman ft.; its pedestal has reliefs of trophies of Dacian arms, and winged Victories. On the shaft are reliefs arranged spirally in twenty-three tiers scenes of Trajan's victories, containing about 2500 figures. Trajan's ashes were buried in a gold urn under this column (Dio Cass. lxviii. 16); and on the summit was a colossal gilt bronze statue of the emperor, now replaced by a poor figure of St Peter, set there by Sixtus V.[7] Beyond the column stood the temple of Trajan completed by Hadrian; its foundations exist under the buildings at the north-east side of the modern piazza, and many of its granite columns have been found. This temple is shown on coins of Hadrian.[8] The architect of this magnificent group of buildings was Apollodorus of Damascus (Dio Cass. lxix. 4), who also designed many buildings in Rome during Hadrian's reign.[9] In addition to the five imperial fora, and the Forum Magnum, Holitorium and Boarium, mentioned above, there were also smaller markets for pigs (Forum Suarium), bread (Forum Pistorium) and fish (Forum Piscarium), all of which, with some others, popularly but wrongly called fora, are given in the regionary catalogues.

Temple of Trajan.

Other Temples, &c.

Other temples.

Besides the temples mentioned in previous sections remains of many others still exist in Rome. The circular temple by the Tiber in the Forum Boarium (Plan, No. 5), formerly thought to be that of Vesta, is possibly that of Portunus, the god of the harbour (Varro, *L.L.* vi. 19). Its design is similar to that of the temple of Vesta in the forum (fig. 8), and, except the entablature and upper part of the cella, which are gone, it is well preserved. It may date from the 2nd century B.C. The neighbouring Ionic temple, popularly called of Fortuna Virilis, is of special interest from its early date, probably the end of the 3rd century B.C. The complete absence of marble and the very sparing use of travertine, combined with the simple purity of its design, indicate an early date.[1] It has a prostyle tetrastyle portico of travertine, and a short cella of tufa with engaged columns; the bases of these and of the angle columns are of travertine. The frieze has reliefs of ox skulls and garlands. The whole was originally stuccoed and painted so that the different stones used would not show. Fig. 12 gives the plan, showing the hard travertine used at the points of greatest pressure, while the main walls with the half columns are of the weaker and softer tufa. The dedication of this temple is doubtful; but it is probably either that of Fortuna or of Mater Matuta, both of which were destroyed by fire in 213 B.C. and restored in the following year. The church of S. Maria in Cosmedin contains some remains of a temple (Plan, No. 4) which has been identified with that of Hercules built by Pompey *ad Circum Maximum* (Vitr. iii. 2, 5; Plin. *H.N.* xxxiv. 57). The temple stands close to the carceres of the Circus Maximus, in the Forum Boarium. The columns built up in the church did not, however, belong to a temple, but to a porticus. Within the walls of S. Niccoló in Carcere in the Forum Holitorium (Plan, No. 18) are preserved remains of three small hexastyle peripteral temples, two Ionic and one Tuscan, set close side by side.[2] A fragment of the marble plan includes part of this group. The Tuscan temple is built of travertine, the others of tufa and peperino, with travertine at the points of greatest pressure. They are probably those of Janus *ad Theatrum Marcelli*, dedicated by C. Duilius in the First Punic War (Tac. *Ann.* ii. 49); of Spes, built by A. Atilius Calatinus, of about the same date (Tac. *Ann.* ii. 49); and of Juno Sospita, dedicated by C. Cornelius Cethegus in 197 B.C. (Liv. xxxiv. 53). Near the Forum Holitorium are extensive remains of the large group of buildings included in the Porticus Octaviae (Plan, No. 16), two of which, dedicated to Juno Regina and Jupiter Stator, with part of the enclosing porticus and the adjoining temple of Hercules Musarum, are shown on a fragment of the marble plan. The Porticus Octaviae, a large rectangular space enclosed by a double line of columns, was built in honour of Octavia by her brother Augustus on the site of the Porticus Metelli, founded in 146 B.C. This must not be confounded with the neighbouring Porticus Octavia founded by Cn. Octavius, the conqueror of Perseus (Liv. xlv. 6, 42), in 168 B.C., and rebuilt under the same name by Augustus, as is recorded in the Ancyran inscription. The whole group was one of the most magnificent in Rome, and contained a large number of works of art by Pheidias and other Greek sculptors. The existing portico, which was the main entrance into the porticus, is a restoration of the time of Severus in 203. The church of S. Angelo in Pescheria and the houses behind it conceal extensive remains of the porticus and its temples (see *Ann. Inst.*, 1861, p. 241, 1868, p. 108; and Contigliozzi, *I. Portici di Ottavia*, 1861).[3]

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[1] For accounts of this group of buildings, see De Rossi, *Bull. Arch. Crist.* (1867), pp. 66 ff.; and Lanciani, *Bull. Comm. Arch. Rom.* (1882), pp. 29 ff.

[2] "Hic (Felix) fecit basilicam SS. Cosmae et Damiani . . . in Via Sacra, juxta Templum Urbis Romae" (*Lib. Pont.*, *Vita S. Felicis IV.*). By the last words the basilica of Constantine is meant.

[3] Statues by Pheidias and Lysippus existed in the Forum Pacis as late as the 6th century (Procop. *Bell. Goth.* iv. 21).

[4] Drawings of it are given by Du Pérac and Palladio (*Arch.* iv. 8).

[5] See Aul. Gell. xiii. 25, 2; and Amm. Marc. xvi. 10, 15.

[6] Its pedestal is inscribed, "Senatus Populusque Romanus Imp. Caesari Divi Nervae F. Nervae Trajano Aug. Germ. Dacico Pontif. Maximo Trib. Pot. XVII. [*i.e.* A.D. 113] Imp. VI. Cos. VI. P. P. ad declarandum quantae altitudinis mons et locus tantis operibus sit egestus." This would seem to indicate the height of the hill removed to form the site, and is so explained by Dion Cass. (lxviii. 16). It is impossible that the saddle connecting the Quirinal with the Capitoline hill can have been 100 ft. in height (Brocchi, *Suolo di Roma*, p. 133), but it may be that the cliff of the Quirinal was cut back to a slope reaching to a point about 72 ft. high; thus the statement of the inscription is much exaggerated. Comm. Boni has found the remains of a road beneath the pavement of the Forum, near the column, and believes that the inscription refers to the *height* of the buildings. Comparetti refers *mons* to the mass of marble quarried to build the Forum; Sogliano to the mass of ruins and rubbish carted away; Mau to the Servian *agger* between the Capitol and Quirinal (see *Rom. Mitth.*, 1907, 187 ff.).

[7] For the reliefs, see Cichorius, *Die Reliefs der Trajanssäule* (1896–1900); Petersen, *Trajans dakische Kriege* (1899–1903); Stuart Jones, *Papers of the B. R. S.*, vol. v. From their lofty position they are now difficult to see, but originally must have been very fairly visible from the galleries on the colonnades which once surrounded the column.

[8] See Aul. Gell. xi. 17, 1; *Hist. Aug. Hadr.* 19; and compare Pausanias (v. 12, 6; x. 5, 11), who mentions the gilt bronze roofs of Trajan's forum.

[9] See Richter and Grifi, *Ristauro del Foro Trajano* (1839).

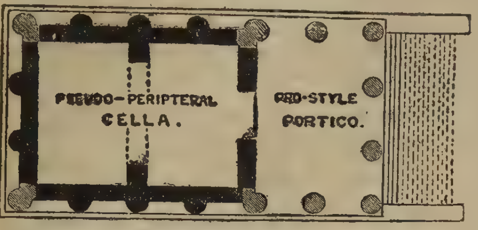

FIG. 12.—So-called Temple of Fortuna Virilis. The black shows tufa; the shading travertine.

Porticus Octaviae.

Temple of Neptune.

Remains of a large peripteral Corinthian temple are built into the side of the Borsa (formerly the Custom House). Eleven marble columns and their rich entablature are still *in situ*, with the corresponding part of the cella wall of peperino, in 1878 a piece of the end wall of the cella was discovered, and, under the houses near, part of a large peribolus wall, also of peperino, forming an enclosure with columns all round the temple nearly 330 ft. square (see *Bull. Comm. Arch. Rom.* vi. pl. iv., 1878). This temple has commonly been identified with that of Neptune (Dio Cass. lxvi. 24), built by Agrippa, and surrounded by the Porticus Argonautarum (Dio Cass. liii. 27; Mart. iii. 20, 11); but it clearly dates, at least in its present form, from the 2nd century A.D., and is not improbably the temple of Hadrian, mentioned in the *Notitia* as being near this spot.

Temple of Venus and Rome.

The temple of Venus and Rome on the Velia (see fig. 8) was the largest in Rome; it was pseudo-dipteral, with ten Corinthian columns of Greek marble at the ends, and probably twenty at the sides; it had an outer colonnade round the peribolus of about 180 columns of polished granite. Of these only a few fragments now exist; for several centuries the whole area of this building was used as a quarry, while the residue of the marble was burnt into lime on the spot in kilns built of broken fragments of the porphyry columns. A considerable part of the two cellae with their apses, set back to back, still exists; in each apse was a colossal seated figure of the deity, and along the side walls of the cellae were rows of porphyry columns and statues in niches. The vault is deeply coffered with stucco enrichments once painted and gilt. The roof was covered with tiles of gilt bronze, which were taken by Pope Honorius I. (625–38) to cover the basilica of St Peter's. These were stolen by the Saracens during their sack of the Leonine city in 846. The emperor Hadrian himself designed this magnificent temple, which was partially completed in 135; the design was criticized severely by the architect Apollodorus (Dio Cass. lxix. 4; *Vita Hadr.* 19). The temple was probably finished by Antoninus Pius; it was partly burned in the reign of Maxentius, who began its restoration, which was carried on by Constantine. The existing remains of the two cellae are mainly of Hadrian's time, but contain patches of the later restorations. Between the south angle of this temple and the arch of Constantine stand the remains of a fountain, usually known as the Meta Sudans. This was a tall conical structure in a large circular basin, all lined with marble. From its brick facing it appears to be a work of the Flavian period.

Buildings on the Caelian, Esquiline and Quirinal.

That part of the Caelian hill which is near the Colosseum is covered with very extensive remains—a great peribolus of brick-faced concrete, apparently of Flavian date, and part of a massive travertine arcade in two storeys, similar to that of the Colosseum; most of the latter has been removed for the sake of the stone, but a portion still exists under the monastery and campanile of SS. Giovanni e Paolo. There can be no reasonable doubt that these substructures carried the temple of Claudius, built by Vespasian (Suet. *Vesp.* 9).

The so-called temple of Minerva Medica ("Nympheum" on Plan) on the eastern slope of the Esquiline (so named from a statue found in it), a curiously planned building, with central decagonal domed hall, probably belonged to the palace of Gallienus (263–68). Somewhat similar ruins beside the neighbouring basilica of S. Croce formed part of the Sessorium, a palace on the Esquiline. The remains on the Quirinal, in the Colonna gardens, of massive marble entablatures richly sculptured were formerly thought to belong to Aurelian's great temple of the Sun, but it now appears certain that they belong to the very extensive thermae of Constantine, part of the site of which is now occupied by the Quirinal palace and neighbouring buildings.[4]

Private houses.

The excavations of recent years have brought to light, and in many cases destroyed, a large number of domestic buildings; these discoveries are recorded in the *Notizie degli Scavi* and the *Bull. Comm. Arch. Rom.* The extensive cutting away of the Tiber bank for the new embankment exposed some very ornate houses near the Villa Farnesina, richly decorated with marble, fine wall-paintings, and stucco reliefs, equal in beauty to any works of the kind that have ever been found. These are now exhibited in the Museo delle Terme, but the houses themselves have been destroyed. The laying out of the new Quirinal and Esquiline quarters has also exposed many fine buildings. Some remains on the Esquiline have been supposed (without much probability) to belong to the villa of Maecenas. A very remarkable vaulted room, decorated with paintings of plants and landscapes, has been shown to be a greenhouse;[5] at one end is an apse with a series of step-like stages for flowers. This one room has been preserved, though the rest of the villa has been destroyed; it is on the road leading from S. Maria Maggiore to the Lateran. The walls are a very fine specimen of tufa *opus reticulatum*, unmixed with brick, evidently of the early imperial period. Among the numerous buildings discovered in the Horti Sallustiani near the Quirinal was a very fine house of the 1st century A.D., in concrete faced with brick and *opus reticulatum*. It had a central circular domed hall, with many rooms and staircases round it, rising four storeys high. This house was set in the valley against a cliff of the Quirinal, so that the third floor is level with the upper part of the hill. It is nearly on the line of the Servian wall, which stood here at a higher level on the edge of the cliff. This park was laid out by the historian Sallust, and remained in the possession of his family until the reign of Tiberius, when it became imperial property; it was used as a residence by Nero (Tac. *Ann.* xiii. 47) and other emperors till the 4th century.[6] In 1884, near the Porta S. Lorenzo, a long line of houses was discovered during the making of a new road. Some of these were of *opus reticulatum* of the 1st century B.C.; others had the finest kind of brick-facing, probably of the time of Nero; all had been richly decorated with marble linings and mosaics. The line of the street was parallel to that of the later Aurelian wall, which at this part was built against the back of this row of houses. At the same time, behind the line of houses were uncovered fine peperino and tufa piers of the aqueduct rebuilt by Augustus, one arch of which forms the Porta S. Lorenzo. These interesting remains have all been completely destroyed. A fine house of the end of the 1st century A.D., with richly decorated walls, was exposed in June 1884 against the slope of the Quirinal, near the Palazzo Colonna; it was immediately destroyed to make room for new buildings.

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[1] Fiechter (*Röm. Mitth.*, 1906, pp. 220 ff.) has endeavoured to show that the temple in its present form dates from the 1st century B.C.

[2] For drawings of them, see the list given by Huelsen in Jordan, *Topographie*, i. 3, 511, note 11.

[3] The remains of the Porticus Octaviae have been more completely exposed by the demolition of the Ghetto.

[4] See Palladio (*Terme dei Romani*, London, 1732), who gives the plan of this enormous building, now wholly hidden or destroyed.

[5] *Bull. Inst.* (1875), 89–96; see also *Bull. Comm. Arch.* (1874), 137 ff., pls. xi.–xviii.

[6] During excavations made here in 1876, lead pipes were found inscribed with the name of the estate, the imperial owner (Severus Alexander), and the plumber who made them—ORTORVM SALLVSTIANOR . IMP . SEVER . ALEXANDRI . AVG . NAEVIVS . MANES . FECIT . (*C.I.L.* xv. 7249).

Praetorian camp.

The praetorian camp was first made permanent and surrounded with a strong wall by the emperor Tiberius (Suet. *Tib.* 37). Owing to the camp being included in the line of the Aurelian wall, a great part of it still exists; it is a very interesting specimen of early imperial brick-facing. The wall is only 12 to 14 ft. high, and has thinly scattered battlements, at intervals of 20 ft. The north-east gate (*Porta Principalis Dextra*) is well preserved; it had a tower on each side, now greatly reduced in height, in which are small windows with arched heads moulded in one slab of terra-cotta. The brick-facing is very neat and regular,—the bricks being about 1½ in. thick, with ½-in. joints. On the inside of the wall are rows of small rooms for the guards. Part of the Porta Praetoria also remains. This camp was dismantled by Constantine, who removed its inner walls; the outer ones were left because they formed part of the Aurelian circuit. The present wall is nearly three times the height of the original camp wall. The upper part was added when Aurelian included it in his general circuit wall round Rome. The superior neatness and beauty of Tiberius's brick-facing make it easy to distinguish where his work ends and that of the later emperors begins. Owing to the addition of the later wall it requires some care to trace the rows of battlements which belong to the camp.

Pantheon.

The Pantheon is the most perfect among existing classical buildings in Rome. The inscription on the frieze of the portico (M . AGRIPPA . L . F . COS . TERTIVM . FECIT) refers to a building erected by Agrippa in 27 B.C., consecrated to the divinities of the Julian house (Mars, Venus, etc.) under the name Pantheum ("all-holy"); cf. Dio Cass. liii. 27; Plin. *H.N.* xxxvi. 43. It was sometimes used as the meeting-place of the Fratres Arvales before they began to meet in the temple of Concord (*C.I.L.* v. 2041). Pliny mentions the sculpture by the Athenian Diogenes which adorned it, and its capitals and dome covering of Syracusan bronze (xxxiv. 7). It was long supposed that the present rotunda was the Pantheon of Agrippa; but this was destroyed in the great fire of A.D. 80 (Oros. 7, 12; Hieron. Abr. 2127); and recent investigations have shown that the rotunda is a work of Hadrian's reign, bricks of that period having been found in all parts of the building. Excavations have made it probable that the site of the rotunda was previously occupied by an open piazza, whose pavement of coloured marbles has been discovered beneath the flooring, and that Agrippa's Pantheon covered the present piazza and faced southward. The present portico has been reconstructed; it is probable that Agrippa's portico had ten columns in the front. The ceiling of the portico too was of bronze, supported by hollow bronze girders,[1] which remained till Urban VIII. melted them to make cannon for S. Angelo; the bronze weighed 450,000 ℔. The bronze tiles of the dome were stolen long before by Constans II., in 663, but on their way to Constantinople they were seized by the Saracens. The portico has eight columns on the front and three on the sides, all granite monoliths except the restored ones on the east side,—sixteen in all. The capitals are Corinthian, of white marble; the tympanum (ἀετός) of the pediment was filled with bronze reliefs of the battle of the gods and the giants.[2] The walls of the circular part, nearly 20 ft. thick, are of solid tufa concrete, thinly faced with brick. The enormous dome, 142 ft. 6 in. in span, is cast in concrete made of pumice-stone, pozzolana and lime; being one solid mass, it covers the building like a shell, free from any lateral thrust at the haunches. On the face of the concrete is a system of superimposed relieving arches in brick. These no longer possess any constructive value, but were designed to preserve the stability of the dome whilst the concrete became firmly set. Round the central opening or hypaethrum still remains a ring of enriched mouldings in gilt bronze, the only bit left of the bronze which once covered the whole dome. The lower storey of the circular part and the walls of the projecting portico were covered with slabs of Greek marble; a great part of the latter still remains, enriched with Corinthian pilasters and bands of sculptured ornament. The two upper storeys of the drum were covered outside with hard stucco of pounded marble. Inside the whole was lined with a great variety of rich oriental marbles. This magnificent interior, divided into two orders by an entablature supported on columns and pilasters, has been much injured by alteration.[3] About 608 the Pantheon was given by Phocas to Boniface IV., who consecrated it as the church of S. Maria ad Martyres.

Thermae of Agrippa.

In 1881–82 the destruction of a row of houses behind the Pantheon exposed remains of a grand hall with richly sculptured entablature on Corinthian columns, part of the great thermae of Agrippa, which extend beyond the Via della Ciambella. A great part of the thermae appears from the brick stamps to belong to an extensive reconstruction in the reign of Hadrian[4] (see BATHS).

Close by the Pantheon is the church of S. Maria sopra Minerva, which stands (as its name records) on or near the site of a temple to Minerva Chalcidica (Plan, No. 12), probably founded by Pompey the Great, *c.* 60 B.C. (Plin. *H.N.* vii. 97), and restored by Domitian. Adjoining this were temples to Isis and Serapis, a cult which became very popular in Rome in the time of Hadrian; large quantities of sculpture, Egypto-Roman in style, have been found on this site at many different times.[5]

Firemen's barracks.

Several of the barracks (*excubitoria*) of the various cohorts of the *vigiles* or firemen have been discovered in various parts of Rome. That of the first cohort (Plan, No. 29) is buried under the Palazzo Savorelli; that of the second (Plan, No. 30) was on the Esquiline, near the so-called temple of Minerva Medica; that of the third (Plan, No. 31) was near the baths of Diocletian. The most perfect is that of the seventh cohort (Plan, No. 34), near S. Crisogono in Trastevere, a handsome house of the 2nd century, decorated with mosaic floors, wall-paintings, &c.[6]

The excavations made in exposing the ancient church of S. Clemente brought to light interesting remains of different periods; drawings are given by Mullooly, *St Clement and his Basilica* (1869), and De Rossi, *Bull. Arch. Crist.* (1863), 28.

Golden House of Nero.

Some remains exist of the Golden House of Nero, which, including its parks, lakes, &c., covered an incredibly large space of ground, extending from the Palatine, over the Velia and the site of the temple of Venus and Rome, to the Esquiline, filling the great valley between the Caelian and the Esquiline where the Colosseum stands, and reaching far over the Esquiline to the great reservoir now called the "Sette Sale." No other extravagances or cruelties of Nero appear to have offended the Roman people so much as the erection of this enormous palace, which must have blocked up many important roads and occupied the site of a whole populous quarter. It was partly to make restitution for this enormous theft of land that Vespasian and Titus destroyed the Golden House and built the Colosseum and Thermae of Titus on part of its site. Adjoining the baths of Titus were those built on a much larger scale by Trajan. Under the substructions of these extensive remains of the Golden House still exist;[7] and at one point, at a lower level still, pavements and foundations remain of one of the numerous houses destroyed by Nero to clear the site. The great bronze colossus of Nero, 120 ft. high (Suet. *Nero*, 31), which stood in one of the porticus of the Golden House, was moved by Vespasian, with head and attributes altered to those of Apollo (Helios), on to the Velia; and it was moved again by Hadrian, when the temple of Rome was built, on to the base which still exists near the Colosseum. Several coins show this colossus by the side of the Colosseum.

Saepta Julia.

Under the Palazzo Doria, the church of S. Maria in Via Lata, and other neighbouring buildings extensive remains exist of a great porticus, with long rows of travertine piers; this building is designated on fragments of the marble plan with the words SAEPT . . . LIA. This must be the Saepta Julia, begun by Julius Caesar, and completed by Agrippa in 27 B.C., as the voting place for the Comitia Centuriata, divided into compartments, one for each century. The building contained rostra, and was also used for gladiatorial shows. Under the later empire it became a bazaar and resort of slave-dealers.

That curiously planned building on the Esquiline, in the new Piazza Vit. Emmanuele, where the so-called trophies of Marius once were placed (see Du Pérac, *Vestigj*, pl. 27), is one of the numerous castella or reservoirs from which the water of the various aqueducts was distributed in the quarters they were meant to supply, and may perhaps be identified with the Nymphaeum Alexandri built by Severus Alexander at the termination of his Alexandrine aqueduct, opened in 225 (see *Hist. Aug. Sev. Alex.* 25). But the marble trophies now set at the top of the Capitoline steps bear a quarry mark which shows them to be of the time of Domitian: it consists of the following inscription, now not visible, as it is cut on the under part—IMP. DOM. AVG. GERM. PER. CHREZ. LIB. ✱ C≶.[1]

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[1] A drawing of this interesting bronze work, by G. A. Dosio, is preserved in the Uffizi at Florence (No. 1021).

[2] On the architrave is cut an inscription recording the restoration of the Pantheon by Severus in 202.

[3] The bronze door is not in its present form antique, having been recast by order of Pius IV.

[4] The plan of the whole group, including the Pantheon, is given by Palladio (*op. cit.*). The recent discoveries are given by Lanciani, *Not. d. Scavi* (1882), p. 357, with a valuable plan. See also Geymüller, *Documents inédits sur les Thermes d'Agrippa* (Lausanne, 1883); Beltrami and Armanini, *Il Panteon* (1898); Durm, *Baukunst der Römer*, ed. 2, pp. 550 ff.; Rivoira, *Rivista di Roma* (1910), p. 412.

[5] See Lanciani in *Bull. Comm. Arch. Rom.* (1883), and Marucchi, *ibid.* (1896); Fea, *Miscell.* ccliv. 112. Part of the Serapeum is shown on fragments of the marble plan, which have been pieced together by Huelsen (Jordan, *Topographie der Stadt Rom.* i. 3, pl. x.).

[6] See Visconti, *La stazione della Coorte VII. de' Vigili* (1867).

[7] See De Romanis, *Le antiche camere esquiline* (1822). It should be noted that the paintings said to have belonged to the baths of Titus really decorated the Golden House, over which the baths of Titus and Trajan were built.

Places of Amusement.

Circuses. The Circus Maximus (see CIRCUS) occupied the Vallis Murcia[2] between the Palatine and the Aventine. Its first rows of seats, which were of wood, are said to have been made under the Tarquins (Liv. i. 26, 35; Dionys. iii. 68). Permanent carceres were set up in 329 B.C. and restored in 174 B.C. (Liv. viii. 20, xli. 27). In the reign of Julius Caesar it was rebuilt with (for the first time) lower seats of stone (Plin. *H.N.* xxxvi. 102), the upper being still of wood (Suet. *Caes.* 39); Dionysius (iii. 68) describes it as it was after this rebuilding. It was further ornamented with marble by Augustus, Claudius and other emperors. The wooden part was burnt in the great fire of Nero, and again under Domitian; it was considerably enlarged by Trajan, and lastly it was restored by Constantine. In its later state it had a marble façade with three external tiers of arches with engaged columns, and (inside) sloping tiers of marble seats, supported on concrete raking vaults (Plin. *Paneg.* 51). A great part of these vaults existed in the 16th century, and is shown by Du Pérac. It is said by Pliny (*H.N.* xxxvi. 102)—if the text be not corrupt—to have held 250,000 spectators, while the Regionary Catalogues give the number of seats as 485,000; but Huelsen has shown (*Bull. Comm. Arch.*, 1894, 421 ff.) that the figures are much exaggerated and must, moreover, be interpreted, not of the number of spectators, but of the length of the tiers expressed in feet. The end with the carceres was near the church of S. Maria in Cosmedin.[3] Some of its substructures, with remains of very early tufa structures on the Palatine side, still exist below the church of S. Anastasia (see Plan of Palatine). The obelisk now in the Piazza del Popolo was set on the spina by Augustus, and that now in the Lateran piazza by Constantius II. The Circus Flaminius in the Campus Martius was built in 221 B.C. by the C. Flaminius Nepos who was killed at the Trasimene Lake in 217 B.C.; remains of the structure existed until the 16th century, when they were destroyed to build the Palazzo Mattei. In the middle ages its long open space was used as a rope-walk, hence the name of the church called S. Caterina dei Funari, which occupies part of its site.[4] The circus of Caligula and Nero was at the foot of the Vatican Hill (Plin. *H.N.* xxxvi. 74). The modern sacristy of St Peter's stands over part of its site. The obelisk on its spina remained standing *in situ* till it was moved by Fontana[5] for Sixtus V. to its present site in the centre of the piazza. The great stadium, foundations of which exist under most of the houses of the Piazza Navona (Agonalis), and especially below S. Agnese, is that built by Domitian and restored by Severus Alexander. That it was a stadium and not a circus is shown by the fact that its starting end is at right angles to the sides and not set diagonally, as was always the case with the carceres of a circus; nor is there any trace of foundations of a spina. The best preserved circus is that built by Maxentius in honour of his deified son Romulus, by the Via Appia, 2 m. outside the walls of Rome. It was attributed to Caracalla till 1825, when an inscription recording its true dedication was found.[6]

The first permanent naumachia was that constructed by Augustus between the foot of the Janiculan hill and the Tiber. The naumachia of Domitian was pulled down and the materials used to restore the Circus Maximus (Suet. *Dom.* 5); it was perhaps restored by Trajan, for the remains of a naumachia built of *opus reticulatum* mixed with brick have been discovered near the mausoleum of Hadrian.

Theatres. The first stone theatre in Rome was that built by Pompey in 55–52 B.C. (see THEATRE: *Roman*); it contained a temple to Venus Victrix, and in front of it was a great porticus, called Hecatostylum from its hundred columns. This is shown on the marble plan.[7] Considerable remains of the foundations exist between the Piazza dei Satiri, which occupies the site of the scena, and the Via de' Giubbonari and Via del Paradiso. Adjoining this was the *porticus Pompeiana*, which contained the curia of Pompey, where Caesar was murdered, after which it was walled up. The colossal statue, popularly supposed to be that of Pompey, at the feet of which Caesar died,[8] now in the Palazzo Spada, was found in 1553 near the theatre. This theatre was restored by Augustus (*Mon. Anc.* 4, 9); in the reign of Tiberius it was burnt, and its rebuilding was completed by Caligula. The scena was again burnt in A.D. 80, and restored by Titus. According to Pliny (*H.N.* xxxvi. 115), it held 40,000 spectators; the Regionary Catalogues give the number 17,580. Huelsen estimates its capacity at 9000–10,000 spectators. In 1864 the colossal gilt bronze statue of Hercules, now in the Vatican, was found near the site of the theatre of Pompey, carefully concealed underground. The theatre of Marcellus is much more perfect; complete foundations of the cunei exist under the Palazzo Savelli, and part of the external arcade is well preserved. This is built of travertine in two orders, Tuscan and Ionic, with delicate details, very superior to those of the Colosseum, the arcade of which is very similar to this in general design. This theatre was begun by J. Caesar, and finished by Augustus in 13 B.C., who dedicated it in the name of his nephew Marcellus.[9] It was restored by Vespasian (Suet. *Vesp.* 19). Foundations also of the theatre dedicated by Cornelius Balbus in 13 B.C. (Suet. *Aug.* 29; Dio Cass. liv. 25) exist under the Monte dei Cenci; and in the Via dei Calderari there is a small portion of the external arcade of a porticus (Plan, No. 42); the lower storey has travertine arches with engaged columns, and the upper has brick-faced pilasters. This has been supposed to be the *Crypta Balbi* mentioned in the Regionary Catalogues, but is more probably the *Porticus Minucia*, built in 110 B.C. An interesting account of the temporary theatre of M. Aemilius Scaurus, erected in 58 B.C., is given by Pliny (*H.N.* xxxvi. 5, 113). The same writer mentions an almost incredible building, which consisted of two wooden theatres made to revolve on pivots, so that the two together made an amphitheatre; this was erected by C. Curio in 50 B.C. (*H.N.* xxxvi. 116).

Amphitheatres. The first stone amphitheatre in Rome was that built by Statilius Taurus in the reign of Augustus. (For the Colosseum and the Amphitheatrum Castrense, see AMPHITHEATRE; for the Baths, see that article.)

Arches, Columns, Tombs and Bridges.

Arches. The earliest triumphal arches were the two erected by L. Stertinius (196 B.C.) in the Forum Boarium and in the Circus Maximus, out of spoils gained in Spain.[10] In the later years of the empire there were nearly forty in Rome. The arch of Titus and Vespasian on the Summa Sacra Via was erected by Domitian to commemorate the conquest of Judaea by Titus in his father's reign. Reliefs inside the arch represent the triumphal procession—Titus in a chariot, and on the other side soldiers bearing the golden candlestick, trumpets and table of prothesis, taken from the Jewish temple. The central part only of this monument is original; the sides were restored in 1823.[11] Another arch in honour of Titus had previously been built (A.D. 80) in the Circus Maximus; its inscription is given in the Einsiedeln MS. (*C.I.L.* vi. 944). A plain travertine arch near the supposed palace of Commodus on the Caelian is inscribed with the names of the Consul Publius Cornelius Dolabella (A.D. 10) and of the *flamen martialis*, C. Junius Silanus. It may have originally been used to carry the Aqua Marcia; in later times the Aqua Claudia passed over it. The so-called arch of Drusus by the Porta Appia also carries the specus of an aqueduct—that built by Caracalla to supply his great thermae. Its composite capitals show, however, that it is later than the time of Drusus, and it was very possibly the work of Trajan. Adjoining the church of S. Giorgio in Velabro a rich though coarsely decorated marble gateway with flat lintel still exists—built, as its inscription records, in honour of Severus and his sons by the argentarii (bankers and silversmiths) and other merchants of the Forum Boarium in 204. It formed an entrance from the Forum Boarium into the Velabrum. The figure of Geta in the reliefs and his name have been erased by Caracalla; the sculpture is poor both in design and execution (see *Bull. Inst.*, 1867, p. 217, and 1871, p. 233). Close by is a quadruple arch, set at the intersection of two roads, such as was called by the

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[1] See Bruzza, in *Ann. Inst.* (1870), and Lenormant, *Trophées de Marius*, Blois (1842). This once magnificent building, with the marble trophies in their place, is shown with much minuteness on a bronze medallion of Severus Alexander (see Froehner, *Médaillons de l'empire*, Paris, 1878, p. 169).

[2] So called from a prehistoric altar to the Dea Murcia (Venus); Varro, *L.L.* v. 154.

[3] Part of it is shown on a fragment of the marble plan (see Jordan, *F.U.R.*); it is represented on a bronze medallion of Gordian III., with an obelisk on the spina and three metae at each end; in front are groups of wrestlers and boxers (see Grueber, *Rom. Med.* pl. xli., London, 1874).

[4] The remains extant in the 16th century were described by Ligorio, *Libro delle Antichitá* (1553), p. 17.

[5] See his *Trasportazione dell' Obelisco Vat.* (1590).

[6] Nibby, *Circo di Caracalla* (1825); Canina, *Edifizj di Roma*, iv. pls. 194–96.

[7] Plut. *Pomp.* 52; Dion Cass. xxxix. 38; Tac. *Ann.* xiv. 20.

[8] See Fea, *Rom. Ant.* lxviii. 57, for an account of its discovery.

[9] Suet. *Aug.* 29. See *Mon. Anc.* 4, 22: "Theatrvm . ad . aedem. Apollinis . in . solo . magna . ex . parte . a . [privatis .] empto . feci . qvod . svb . nomine . M . Marcelli . generi . [me]i . esset." The temple of Apollo here named was one of the most ancient and highly venerated in Rome; it was dedicated to the Delphic Apollo in 431 B.C. by Cn. Julius (Liv. iv. 25); meetings of the Senate were held in it; and it contained many fine works of art—an ancient cedar-wood statue of Apollo (Plin. *H.N.* xiii. 11) and the celebrated statues of the slaughter of the Niobids by Praxiteles or Scopas (Plin. *H.N.* xxxvi. 28), of which many ancient copies exist.

[10] Liv. xxxiii. 27.

[11] This arch is the earliest known example of the so-called Composite order, a modification of Corinthian in which the capitals combine Ionic volutes with Corinthian acanthus leaves; in other respects it follows the Corinthian order.

Romans an arch of Janus Quadrifrons. Though partly built of earlier fragments, it is late in style, and may be the Arcus Constantini mentioned in the XIth region. The finest existing arch is that by the Colosseum erected by Constantine. It owes, however, little of its beauty to that artistically degraded period. Not only most of its reliefs but its whole design and many of its architectural features were stolen from an earlier arch erected by Trajan as an entrance to his forum (see above). The arch of Claudius, built in 43 to commemorate his supposed victories in Britain, stood across the Via Lata (modern Corso) in the Piazza Sciarra. Its exact position is shown in *Bull. Comm. Arch. Rom.*, 1878, pl. iv. Its remains were removed in the middle of the 16th century,[1] and nothing now is left but half its inscription, preserved in the garden of the Barberini palace. It is shown on both aurei and denarii of Claudius, with an attic inscribed **DE BRITANNIS,** and surmounted by a quadriga and trophies. A little to the N. of the Piazza Colonna was an arch popularly called the Arco di Portogallo, destroyed in 1665, whose reliefs are now in the Palazzo dei Conservatori. They appear to date from the reign of Hadrian, but may have been used at a later time to decorate this arch. An arch also stood opposite S. Maria in Via Lata until 1498, which was probably erected by Diocletian in A.D. 303. The central part of the once triple arch of Gallienus still exists on the Esquiline; it took the place of the ancient Porta Esquilina of the Servian wall. It is built of travertine, is simple in design, with coarse details, and has an inscription on its attic. The two side arches and pediment over the centre existed in the 16th century, and are shown in the Mantuan oil-painting of Rome,[2] and in several antiquarian works of the 16th century. The inscription (*C.I.L.* vi. 1106) records that it was erected in honour of Gallienus and his wife Salonina by Aurelius Victor.[3]

Columns.

The column of Antoninus Pius was a monolith of red granite, erected after his death by his adopted sons M. Aurelius and L. Verus. One fragment of it is preserved in the Vatican with an interesting quarry incription, recording that it was cut in the ninth year of Trajan's reign, under the supervision of Dioscurus and the architect Aristides. The rest of its fragments were used by Pius VI. to repair the obelisk of Monte Citorio, set up by Augustus in the Campus Martius as the gnomon of a sundial (Plin. *H.N.* xxxvi. 72). The marble pedestal of the Antonine column is now in the Vatican; it has reliefs representing the apotheosis of Faustina and Antoninus Pius, and the *decursio equitum* which formed part of the funeral ceremony. This and the column of M. Aurelius were both surmounted by colossal portrait statues of gilt bronze. The column of M. Aurelius is very similar in size and design to that of Trajan. Its spiral reliefs represent victories in Germany from 171–175, arranged in twenty tiers. Like the column of Trajan, it is exactly 100 Roman ft. high, without the pedestal. The pedestal was originally much higher than at present, but is now partly buried; it is shown by Gamucci, Du Pérac and other 16th-century writers. This column stood in front of a temple to M. Aurelius, and within a great peribolus, forming a forum similar to that of Trajan, though much smaller; the remains of this temple, amongst other buildings, probably form the elevation now called Monte Citorio.[4]

For the catacombs, see CATACOMBS; for obelisks, see OBELISK and EGYPT.

Tombs.

The prehistoric cemeteries of Rome are described above (*Prehistoric Rome*). Few tombs exist of the Roman period earlier than the 1st century B.C.,—probably owing to the great extension of the city beyond the Servian limits, which thus obliterated the earlier burial-places. The tomb of the Cornelii Scipiones is the most important of early date which still exists. It is excavated in the tufa rock at the side of the Via Appia, outside the Porta Capena. Interments of the Scipio family went on here for about 400 years, additional chambers and passages being excavated from time to time. The peperino sarcophagus of Lucius Cornelius Scipio Barbatus (Liv. x. 12, 13), consul in 298 B.C., is now in the Vatican; its inscription, in rude Saturnian verse, is one of the most important existing specimens of early Latin epigraphy. Many other inscribed slabs were found in the 17th century, covering the *loculi* in which lay the bodies of later members of the family. Those now existing in the tomb are modern copies.[5] This burial-place of the Scipios is unlike those of other families, owing to the gens Cornelia keeping up the early custom of interment without burning; thus stone sarcophagi or loculi (rock-cut recesses) were required instead of mere pigeonholes to hold the cinerary urns. The tomb of M. Bibulus, a few yards outside the Porta Fontinalis, and remains of two recently discovered during the destruction of the Aurelian towers at the Porta Salara, date from about the middle of the 1st century B.C., as does also the curious tomb of the baker Eurysaces outside the Porta Maggiore. In 1863 an interesting tomb of the Sempronia gens[6] was discovered on the Quirinal, below the royal palace, near the site of the Porta Salutaris. It is of travertine, with a rich entablature and frieze sculptured with the Greek honeysuckle ornament (see *Bull. Comm. Arch.*, 1876, 126, pl. xii.). This also is of the last years of the republic.

Mausolea.

The mausoleum of Augustus, built 28 B.C., stood in the north part of the Campus Martius, between the Tiber and the Via Flaminia. It is a massive cylindrical structure of concrete, faced with *opus reticulatum*; according to Strabo, this was faced with "white stone," *i.e.* travertine; inside was a series of radiating chambers, in plan like a wheel. On the top was a great mound of earth, planted with trees and flowers (Tac. *Ann.* iii. 9). In the middle ages it was converted into a fortess by the Colonna, which was destroyed in 1167. In the 16th century the central portion was occupied by a garden.[7] Only the bare core exists now, with its fine *opus reticulatum*, best seen in the court of the Palazzo Valdambrini. The inside is concealed by modern seats, being now used as a concert-hall (Anfiteatro Chorea). The sepulchral inscription in honour of Augustus, engraved on two bronze columns at the entrance, is preserved to us by its copy at Ancyra (*q.v.*). It records an almost incredible amount of building: in addition to the long list of building mentioned by name Augustus says, **DVO. ET. OCTAGINTA. TEMPLA. DEVM. IN. VRBE. CONSVL. SEXTVM. REFECI.** The first burial in the mausoleum of Augustus was that of M. Claudius Marcellus (died 23 B.C.), and it continued to be the imperial tomb till the death of Nerva, A.D. 98, after whose interment there was no more room.

The mausoleum of Hadrian, built by that emperor as a substitute for that built by Augustus, and dedicated in A.D. 138 by his successor, was a large circular building on a square podium; its walls, of enormous thickness, were of tufa faced with Parian marble and surrounded by a colonnade with rows of statues,—a work of the greatest magnificence. The splendour of the whole is described by Procopius (*Bell. Goth.* i. 22), who mentions its siege by the Goths, when the defenders hurled statues on to the heads of the enemy. In the 7th century the church of S. Angelus inter Nubes was built on its summit, and all through the middle ages it served as a papal fortress. The interior chambers are still well preserved, but its outside has been so often wrecked and refaced that little of the original masonry is visible.[8]

Sepulchral pyramids.

Several of the grander sepulchral monuments of Rome were built in the form of pyramids. One of these still exists, included in the Aurelian wall, by the Porta Ostiensis. It is a pyramid of concrete, 118 feet high, faced with blocks of white marble, and contains a small chamber decorated with painted stucco. An inscription in large letters on the marble facing records that it was built as a tomb for C. Cestius, a praetor, tribune of the people, and septemvir of the epulones (officials who supervised banquets in honour of the gods). It was erected, according to Cestius's will, by his executors, in the space of 330 days. It dates from the time of Augustus[9] (see Falconieri, in Nardini, *Roma Antica*, iv. p. 1, ed. 1818–20). Another similar pyramid, popularly known as the tomb of Romulus, stood between the mausoleum of Hadrian and the basilica of St Peter. It was destroyed at the close of the 15th century, during the rebuilding of the long bridge which connects the former building with the Vatican.

Bridges.

The earliest bridge was a wooden drawbridge called the Pons Sublicius from the piles (*sublicae*) on which it was built. The river being an important part of the defence of Rome from the Aventine to the Porta Flumentana (see plan of Servian wall, fig. 8), no permanent bridges were made till the Romans were strong enough not to fear attacks from without. The Pons Sublicius had a sacred character, and was always restored in wood, even in the imperial period.[10] Its exact site is doubtful, but it must be placed some distance below the Ponte Rotto. The first stone bridge was begun in 179 B.C. and completed in 142 B.C., when the conquest of Etruria and the defeat of Hannibal had put an end to fears of invasion; it was called the Pons Aemilius, after the pontifex maximus[11] M. Aemilius Lepidus, its founder. It was also called Pons

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[1] See Vacca, *ap.* Fea, *Misc*, p. 67.

[2] Reproduced by De Rossi in his *Piante di Roma Anteriori al Sec. XVI.* (1879).

[3] See Bellori, *Veteres Arcus* (1690), showing some now destroyed: and Rossini, *Archi Trionfali* (1832).

[4] On the Antonine column see Petersen in Amelung's *Katalog der vaticanischen Sculpturen*, i. p. 883; on that of M. Aurelius see *Die Marcussäule*, by Petersen, v. Domaszewski and Calderini (Munich, 1896).

[5] The inscriptions are given in *C.I.L.* i. 29–39—vi. 1284–94. On the earlier ones see Woelfflin, *Münchener Sitzungsberichte* (1892), 188 ff.

[6] This is shown by an inscription (*C.I.L.* vi. 26152) found on the site in the 17th century.

[7] See Du Pérac's *Vestigj*, pl. 36, which shows the garden on the top.

[8] On the mausoleum of Hadrian, see Borgatti, *Castel S. Angelo* (1890).

[9] Near the tomb of Cestius is that extraordinary mound of potsherds called Monte Testaccio. These are mostly fragments of large amphorae, not piled up at random, but carefully stacked, with apertures at intervals for ventilation. It has been shown by Dressel (*Ann. dell' Inst.*, 1878, 118 ff.; *C.I.L.* xv. p. 492) that damaged or imperfect vessels were thus disposed of.

[10] See Varro, *L.L.* v. 83; Ov. *Fast.* v. 622; Tac. *Hist.* i. 86; *Vita Antonini Pii*, 8.

[11] The bridges were specially under the care of the pontifex maximus, at least till the later years of the republic (Varro, *L.L.* v. 83)

Lapideus, to distinguish it from the wooden Sublician bridge. The modern Ponte Rotto represents this bridge; but the existing arches are mainly medieval. An ancient basalt-paved road still exists, leading to the bridge from the Forum Boarium. The Pons Fabricius united the city and the island (Insula Tiberina).[1] The bridge derived its name from L. Fabricius, a curator viarum in 62 B.C; its inscription, twice repeated, is L . FABRICIVS . C . F . CVR . VIAR . FACIVNDVM . COERAVIT. Like the other existing bridges, it is built of great blocks of peperino and tufa, with a massive facing of travertine on both sides. Corbels to support centering were built in near the springing of the arches, so that they could be repaired or even rebuilt without a scaffolding erected in the river-bed. The well-preserved Pons Cestius, probably named after L. Cestius, praefectus urbi in 46 B.C., unites the island and the Janiculan side; on the marble parapet is a long inscription recording its restoration in 370 by Gratian, Valentinian, and Valens.[2] The next bridge, Ponte Sisto, is probably on the site of an ancient bridge called in the *Notitia* Pons Aurelius. Marliano gives an inscription (now lost) which recorded its restoration in the time of Hadrian. About 100 yards above this bridge have been found the remains of sunken piers, which are proved by an inscription (*C.I.L.* vi. 31545) to have belonged to the Pons Agrippae, not otherwise known. The Pons Aelius was built in 134 by Hadrian, to connect his mausoleum with the Campus Martius; it is still well preserved, and is now called the Ponte S. Angelo (see Dante, *Inferno*, xviii. 28–33). It had eight arches, of which the three in the centre were higher than the rest, so that the road sloped on both sides. The material is peperino, with travertine facings. Its inscription, now lost, is given in the Einsiedeln MS.—IMP . CAESAR . DIVI . TRAIANI . PARTHICI . FILIVS . DIVI . NERVAE . NEPOS . TRAIANVS . HADRIANVS . AVG . PONT . MAX . TRIB . POT . XVIIII . COS . III . P . P . FECIT. The Pons Aelius is shown on coins of Hadrian. A little below it are the foundations of another bridge, probably the Pons Neronianus of the *Mirabilia*, called also Vaticanus, built probably by Nero as a way to his Vatican circus and the Horti Agrippinae. At the foot of the Aventine, near the Marmorata, are the remains of piers which seem to have belonged to the Pons Probi, mentioned in the *Notitia*. It is uncertain whether this bridge is to be identified with the Pons Theodosii, which was built in A.D. 381–387 (Symm. *Ep.* 4, 70, 2; 5, 76, 3), and is mentioned in the *Mirabilia*.[3]

Regiones of Augustus.

Augustan regiones.

In spite of the extensive growth of the city under the republic no addition was made to the four regiones of Servius till the reign of Augustus, who divided the city and its suburbs into fourteen regiones. The lists in the *Notitia* and *Curiosum* are the chief aids in determining the limits of each, which in many cases cannot be done with any exactness (see Preller, *Die Regionen der Stadt Rom* (1846) and Urlich's *Codex Topographicus* (Würzburg, 1871)). Each regio was divided into vici or parishes, each of which formed a religious body, with its aedicula larum, and had magistri victorum. The smallest regio (No. II.) contained seven vici, the largest (No. XIV.) seventy-eight.

The list is as follows:—

I. *Porta Capena*, a narrow strip traversed by the Appian Way; it extended beyond the walls of Aurelian to the brook Almo.
II. *Caelemontium*, the Caelian Hill.
III. *Isis et Serapis*, included the valley of the Colosseum and the adjoining part of the Esquiline.
IV. *Templum Pacis*, included the Velia, part of the Cispius, most of the Subura, the fora of Nerva and Vespasian, the Sacra Via, and also buildings along the north-east side of the Forum Magnum.
V. *Esquiliae*, north part of the Esquiline and the Viminal.
VI. *Alta Semita*, the Quirinal as far as the praetorian camp.
VII. *Via Lata*, the valley bounded on the west by the Via Lata, and by the neighbouring hills on the east.
VIII. *Forum Romanum*, also included the imperial fora and the Capitoline hill.
IX. *Circus Flaminius*, between the Tiber, the Capitol, and the Via Flaminia.
X. *Palatium*, the Palatine hill.
XI. *Circus Maximus*, the valley between the Palatine and the Aventine, with the Velabrum and Forum Boarium.
XII. *Piscina Publica*, the eastern part of the Aventine, and the districts south of and beyond the Via Appia, including the site of Caracalla's thermae.
XIII. *Aventinus*, the hill, and the bank of the Tiber below it.
XIV. *Trans Tiberim*, the whole district across the river and the Tiber Island.[4]

Aurelian wall.

The walls of Aurelian (see fig. 7), more than 12 m. in circuit, enclosed almost the whole of the regiones of Augustus, the greater part of which were then thickly inhabited. This enormous work was begun in 271, to defend Rome against sudden attacks of the Germans and other northern races when the great armies of Rome were fighting in distant countries.[5] After the death of Aurelian the walls were completed by Probus in 280, and about a century later they were restored and strengthened by the addition of gate-towers under Arcadius and Honorius (A.D. 403), in place of the earlier gateways of Aurelian; this is recorded by existing inscriptions on three of the gates.[6] At many periods these walls suffered much more from the attacks of the Goths (Procop. *Bell. Goth.* iii. 22, 24), and were restored successively by Theodoric (about 500), by Belisarius (about 560), and by various popes during the 8th and 9th centuries, and in fact all through the middle ages. A great part of the Aurelian wall still exists in a more or less perfect state; but it has wholly vanished where it skirted the river, and a great part of its trans-Tiberine course is gone. The best-preserved pieces are between Porta Pinciana and Porta Salaria (in which breaches have lately been made for streets), and between the Lateran and the Amphitheatrum Castrense. The wall, of concrete, has the usual brick-facing and is about 12 ft. thick, with a guard's passage formed in its thickness. Fig. 13 shows its plan: on the inside the passage has tall open arches, which look like those of an aqueduct, and at regular intervals of about 45 ft. massive square towers are built, projecting on the outside of the wall, in three storeys, the top storey rising above the top of the wall. The height of the wall varies according to the contour of the ground; in parts it was about 60 ft. high outside and 40 inside. Necessaria, supported on two travertine corbels, projected from the top of the wall on the outside beside most of the towers. The Einsiedeln MS. gives a description of the complete circuit, counting fourteen gates, as follows:—

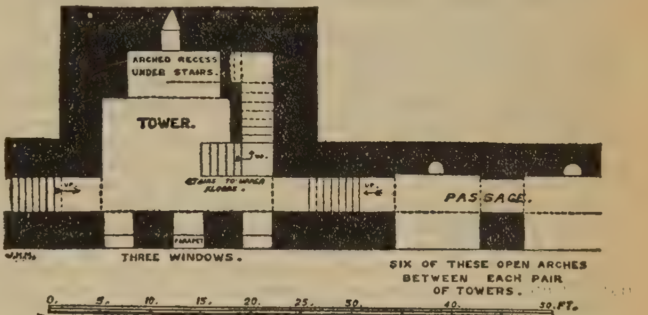
ARCHED RECESS UNDER STAIRS.
TOWER.
STAIRS TO UPPER FLOORS.
UP.
UP.
PASSAGE.
PARAPET
J.H.M.
THREE WINDOWS.
SIX OF THESE OPEN ARCHES BETWEEN EACH PAIR OF TOWERS.
0. 5. 10. 15. 20. 25. 30. 40. 50. FT.

FIG. 13.—Aurelian's Wall; plan showing one of the towers and the passage in thickness of wall.

Porta S. Petri (at the Pons Aelius, destroyed); P. Flaminia (replaced by P. del Popolo); P. Pinciana (in use); P. Salaria (now P. Salara); P. Nomentana (replaced by P. Pia); P. Tiburtina (now P. S. Lorenzo); P. Praenestina (now P. Maggiore); P. Asinaria (replaced by P. San Giovanni); P. Metrovia or Metroni (closed); P. Latina (closed); P. Appia (now P. S. Sebastiano); P. Ostiensis (now P. S. Paolo). On the Janiculan side, P. Portuensis (destroyed); P. Aurelia (now Porta San Pancrazio). Besides these there was a gate, now closed (Porta Chiusa), to the south of the Castra Praetoria; and in all probability a gate on the right bank of the Tiber, replaced by the modern Porta Settimiana.

These existing gates are mostly of the time of Honorius; each is flanked by a projecting tower, and some are double, with a second pair of towers inside. Several have grooves for a portcullis (*cataracta*) in the outer arch. The handsomest gate is the P. Appia, with two massive outer towers, three stages high, the upper semicircular in plan. Many of the gates of Honorius have Christian symbols or inscriptions. The general design of all these gates is much the same—a central archway, with a row of windows over it and two flanking towers, some square, others semicircular in plan. In many of the gates older materials are used, blocks of tufa, travertine, or marble. The doors themselves swung on pivots, the bottom ones let into a hole in the threshold, the upper into projecting corbels.

At many points along the line of the Aurelian wall older buildings form part of the circuit—near the Porta Asinaria a large piece of the Domus Lateranorum, a house of the 3rd century which gave its name to the Lateran basilica, and a little farther on, by S. Croce in Gerusalemme, the Amphitheatrum Castrense; the latter, of about the end of the 1st century A.D., has two tiers of arches and engaged columns of moulded brick on the outside. Between the P. Praenestina and the P. Tiburtina comes a large castellum of the Aqua Tepula. The Praetorian Camp forms a great projection near the P. Nomentana. Lastly, the angle near the Porta Flaminia, at the foot of the Pincian Hill, is formed by remains of a lofty and enormously massive building, faced with fine *opus reticulatum* of the 1st century B.C. Owing to the sinking of the foundation this is very much out of the perpendicular, and was known as the "murus tortus" at a very early time.[1] What this once important building was is uncertain. Two archways which form gates in the Aurelian wall are of much earlier date. The Porta Maggiore consists of a grand double arch of the aqueducts Anio Novus and Claudia built in travertine. The Porta S. Lorenzo enclosed a single travertine arch, built by Augustus where the aqueduct carrying the Aqua Marcia, Tepula, and Julia crossed the Via Tiburtina. The inner gateway, built of massive travertine blocks by Honorius, was pulled down by Pius IX., in 1868.[2]

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[1] Livy (ii. 5) gives the fable of the formation of this island from the Tarquins' corn, cut from the Campus Martius and thrown into the river.

[2] The two stone bridges connecting the island with the right and left banks took the place of earlier wooden structures.

[3] See Mayerhöfer, *Die Brücken im alten Rom*, 1883.

[4] The text of the Regionary Catalogues is printed by Richter, *Topographie der Stadt Rom*,[2] pp. 371 ff.

[5] *Vita Aurel.* 21, 39; Zosimus, i. 37, 49; Eutrop. ix. 15.

[6] The inscriptions run thus: S. P. Q. R. IMPP . CAESS . D. D. INVICTISSIMIS . PRINCIPIBVS . ARCADIO . ET . HONORIO . VICTORIBVS . AC . TRIVMPHATORIBVS . SEMPER . AVGG . OB . INSTAVRATOS . VRBIS . AETERNAE . MVROS . PORTAS . AC . TVRRES . EGESTIS . IMMENSIS . RVDERIBVS—the rest refers to honorary statues erected to commemorate this work.

Bibliography of Ancient Roman Topography.—Amongst ancient writers special mention is due to Varro (*De Lingua Latina*), Dionysius of Halicarnassus (*Antiquitates Romanae*), Ovid (*Fasti*), Vitruvius (*De Architectura*), Pliny the Elder (*Naturalis Historia*), Frontinus (*De Aquis*) and the remains of ancient commentaries on Virgil, Horace, &c. The inscriptions found in the city of Rome are contained in vol. VI. of the *Corpus Inscriptionum Latinarum*. Many of them are of the highest importance for Roman topography, *e.g.* the *Basis Capitolina*, preserved in the Palazzo dei Conservatori, a pedestal which once supported a statue of Hadrian, dedicated in A.D. 136 by the vicomagistri of five regions; on the sides are inscribed the names of the vici and their officials. Vol. XV. of the *C.I.L.* contains the inscriptions stamped on tiles and water-pipes, which are likewise of great importance. The *Monumentum Ancyranum* (*Res gestae divi Augusti*, ed.^{2} Mommsen, 1883) reproduces the bronze tablets set up by Augustus on his mausoleum at Rome, and contains a list of the buildings which he erected or restored. The marble plan of Rome (*Forma urbis Romae*, ed. Jordan, 1874; the more recently discovered fragments have only been published in periodicals) dates from the reign of Septimius Severus, who restored the building to which it belonged after the fire of 191 B.C. The plan which it replaced was executed by order of Vespasian. The scale was generally 1 : 250; it was oriented with S.E. at the top, N.W. at the bottom. Buildings are of course frequently represented on coins and works of art, and these may often be identified with existing remains.

In the reign of Constantine the Great there was compiled a catalogue of the principal buildings of Rome, arranged according to the fourteen regions of Augustus. This has been preserved in two recensions, one made in A.D. 334 and known as the *Notitia*, the second in or about A.D. 357, and known as the *Curiosum urbis Romae*. These are called the Regionary Catalogues, and contain, besides lists of buildings, statistics as to the number of vici, domus, insulae, &c., in each region, which are of great value. (See Preller, *Regionen der Stadt Rom*, Jena, 1846.)

In the middle ages, guide-books were written for the use of pilgrims visiting Rome. Besides giving the routes for the principal churches and cemeteries, they mention ancient buildings and give current legends regarding them. The earliest is the *Itinerary of Einsiedeln*, a MS. of the 8th century preserved in the monastery of Einsiedeln in Switzerland (see C. Huelsen, *L'Itinerario di Einsiedeln*, 1908). In the 12th century was compiled the *Mirabilia urbis Romae*, which became the foundation of later guide-books. The last recension is contained in a MS. of the early 15th century. These and other medieval documents are printed in Urlichs' *Codex Topographicus urbis Romae* (1871). The *Ordo Benedicti Canonici* (see Jordan, *Topographie*, II. 1, 646, and Lanciani, *Monumenti Antichi*, I. 437), which gives the route of papal processions, belongs also to the 12th century, and was perhaps written by the author of the *Mirabilia*. The *Liber Pontificalis* (ed. Duchesne, Paris, 1886; ed. Mommsen, in *Monumenta Germaniae historica*, vol. i.), which gives the biographies of the early popes and was continued throughout the middle ages, is of value as illustrating the transition from pagan to Christian Rome.

Several early views and plans of Rome exist, beginning with the painting by Cimabue in the upper church of S. Francesco at Assisi (1275). A collection of these was published by De Rossi, *Piante icnografiche e prospettiche di Roma anteriori al secolo XVI.* (1879). Many others have since come to light. (See Huelsen in *Bull. Comm. Arch.*, 1892, p. 38).

In Italian and other libraries are preserved large numbers of plans and drawings from ancient remains by the architects of the 15th and later centuries, *e.g.* Bramantino, Fra Giocondo, the members of the families of Sangallo and Peruzzi, Pirro, Ligorio, Palladio, &c. These are of immense value, since the monuments which they drew have to a large extent been destroyed. Unfortunately they are not always trustworthy, especially those of Ligorio. The drawings at Florence have been indexed by Ferri; amongst recent publications may be noted those of the *Codex Escorialensis* by Egger (Vienna, 1905), and of a sketch-book, probably by A. Coner, in the Soane Museum by Dr Ashby, in *Papers of the British School at Rome*, vol. ii. (1903). Amongst the printed works of the early Italian architects may be named Palladio, *Architettura* (Venice, 1542), and *Terme dei Romani* (London, 1732), Serlio, *Architettura* (Venice, 1545), and Labacco, *Architettura ed Antichità*, (Rome 1557). Engravings of ancient remains in Rome have been published in great numbers since the 16th century; the most important of the earlier collections are the *Speculum Romanae Magnificentiae*, a series extending over many years in the 16th century, and Du Pérac's *Vestigj di Roma* (1575). To the 18th century belong the etchings of Piranesi, published in several volumes, and still reproduced from the copper-plates by the Calcografia.

The literature of Roman topography would in itself form a large library; the best bibliographical guide is Mau's *Katalog der Bibliothek des k. deutschen archäologischen Instituts in Rom* (1900). The earliest modern work which can be called scientific is Flavio Biondo's *Roma instaurata*, written under Eugenius IV. (1431–1447), first dated edition, 1479. Biondo's work was based on the study of ancient literary authorities; he was followed in his method and results by the scholars of the 15th and early 16th centuries, *e.g.* Pozzo, Leo Battista Alberti and Andrea Fulvio. In the 16th century the study of ancient remains took its place beside that of ancient literature. Marliani, who had followed Biondo in the first edition of his *Antiquae urbis Romae topographia* (1538), issued a second edition in 1544, which contained plans and illustrations. For more than a century his book formed the foundation upon which such writers as Fauno, G. Fabricius, Mauro, Panvinius, &c., raised their works. Unfortunately the Regionary Catalogues were largely interpolated during this period, and published in this form by Panvinius. In 1666 Famiano Nardini's *Roma antica* appeared, based upon the interpolated version of the Regionary Catalogues; this was productive of disastrous errors, many of which remained uncorrected until our own time. Nardini was followed in the 18th century by such writers as Ficoroni and Venuti; the most important works of this period were those produced by excavators such as Bianchini (*Il palazzo dei Cesari*, 1738), or independent students of the monuments such as Raphael Fabretti (*De Columna Trajana*, 1683; *De Aquis et Aquaeductibus*, 1680). In the 18th century Winckelmann revived interest in ancient, including Roman, art (especially by his *Geschichte der Kunst des Alterthums*, 1764), and his follower, Carlo Fea, inaugurated the era of systematic and scientific excavation, especially in the Forum. In 1829 there was founded the international *Instituto di Corrispondenza Archeologica* (which in 1874 became the *Kaiserlich deutsches archäologisches Institut*); in 1830–42 was issued the *Beschreibung der Stadt Rom*, by Bunsen and others, in which the grosser errors which had passed current since Nardini's time were corrected. To the same period belong the magnificently illustrated works of Luigi Canina (*Indicazione di Roma antica*, 1830; *Esposizione topografica*, 1842; *Architettura antica*, 1834–44; *Foro Romano*, 1845; *Edifizj di Roma antica*, 1848–56), the value of which is impaired by their inaccuracy and the imaginative character of the restorations.

The books on Roman topography written in the early 19th century, such as those of Antonio Nibby, still pursued the uncritical methods of Nardini; from 1830 onwards, however, we find a series of writers whose work shows the influence of the new criticism. Such were Becker (*Topographie der Stadt Rom*, 1843), Sir Wm. Gell (*Rome and its Vicinity*, 1834; rev. ed. E. H. Bunbury, 1846), Braun (*Ruinen und Museen Roms*, 1854), Reber (*Die Ruinen Roms*, 1862) and T. H. Dyer (*The City of Rome*, 1864).

Since 1861, when excavations were begun on the Palatine at the instance of Napoleon III., under the direction of P. Rosa, the discovery of ancient remains has made constant progress, and the results have been incorporated in a number of works, of which only the most important can be named here. These are: Jordan, *Topographie der Stadt Rom im Alterthum*, of which three vols. (I1, I2, and II.) appeared in 1871–85, and a third (I3) was written after Jordan's death by C. Huelsen and published in 1907; Gilbert, *Geschichte und Topographie der Stadt Rom im Alterthum* (3 vols., 1883–90); the works of Lanciani, especially *Ruins and Excavations of Ancient Rome* (1897) and *Storia degli Scavi* (in progress); O. Richter, *Topographie der Stadt Rom* (ed. 2, 1901); Middleton, *The Remains of Ancient Rome* (2 vols., 1892). A short handbook may be found in S. B. Platner's *Topography and Monuments of Ancient Rome* (Boston, 1904). For the study of recent discoveries (besides the special works referred to in the course of this article) the following periodicals are the most important:—*Notizie degli Scavi*, published by the Accademia dei Lincei since 1876; *Bullettino della Commissione Archeologica comunale di Roma* (from 1872); *Mittheilungen des k. deutschen archäologischen Instituts*

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[1] Cf. Procop. *Bell. Goth.* i. 23.

[2] On the walls of Aurelian, see (in addition to the general works mentioned in the bibliography) Nibby and Gell, *Le Mura di Roma* (1820); Quarenghi, *Le Mura di Roma* (1880); and especially Homo, *Essai sur le règne de l'empereur Aurélien* (Paris, 1904), IV.^{e} partie, ch. ii., "L'Enceinte de Rome."

(from 1886); *Papers of the British School at Rome* (from 1903). Brief reports of discoveries are published by Dr T. Ashby in the *Classical Review*.

All previous archaeological maps of Rome have been superseded by Lanciani's *Formae urbis Romae*, in 46 sheets (Milan, 1893–1902). The best recent maps are those in Kiepert's *Formae orbis antiqui*, sheets 21 and 22. Kiepert and Huelsen's *Formae urbis Romae antiquae* date from 1896; they are accompanied by a *Nomenclator topographicus*. Homo, *Lexique de topographie romaine* (1900), is also useful. (J. H. M.; H. S. J.)

CHRISTIAN ROME

From the 4th to the 12th Century

The era of church building in Rome may be said to begin with the reign of Constantine and the peace of the church. Before then Christian worship was conducted with various degrees of secrecy either in private houses or in the catacombs (*q.v.*), according as the reigning emperor viewed the sect with tolerance or dislike. The type of church which in the beginning of the 4th century was adopted with certain modifications from the pagan basilica, though varying much in size, had little or no variety in its general form and arrangement. One fixed model was strictly adhered to for many centuries, and, in spite of numberless alterations and additions, can be traced in nearly all the ancient churches of Rome. It is fully described and illustrated in the article BASILICA.

Construction.

The walls of these early churches were mostly built of concrete, faced with brick, left structurally quite plain, and decorated only with painted stucco or glass mosaics—especially (internally) in the apse and on the face of its arch, and (externally) on the east or entrance wall, the top of which was often built in an overhanging curve to keep off the rain. The windows were plain, with semicircular arches, and were filled with pierced marble screens, or in some cases with slabs of translucent alabaster; the latter was the case at S. Lorenzo fuori le Mura, and examples of the former still exist in the very early church formed in the rooms of some thermae on the Esquiline (possibly those of Trajan), below the 6th-century church of S. Martino ai Monti. Almost the only bit of external architectural ornament was the eaves cornice, frequently (as at the last-named church) formed of marble cornices stolen from earlier classical buildings. Internally the nave columns, with their capitals and bases, were usually taken from some classical building, and some churches are perfect museums of fine sculptured caps and rich marble shafts of every material and design.[1] At first the nave had no arches, the columns supporting a horizontal entablature, as in old St Peter's, S. Clemente, and S. Maria Maggiore, but afterwards, in order to widen the intercolumniation, simple round arches of narrow span were introduced, thus requiring fewer columns. The roof was of the simple tie-beam and kingpost construction, left open, but decorated with painting or metal plates. The floor was paved either with coarse mosaic of large tesserae (as at S. Pudentiana) or with slabs of marble stripped from ancient buildings. A later development of this plan added a small apse containing an altar at the end of each aisle, as in S. Maria in Cosmedin and S. Pietro in Vincoli.[2]

Circular churches.

The type of church above described was used as a model for by far the majority of early churches not only in Rome, but also in England, France, Germany, and other Western countries. Another form was, however, occasionally used in Rome, which appears to have been derived from the round temple of pagan times. This is a circular building, usually domed and surrounded with one or more rings of pillared aisles. To this class belong the combined church and mausoleum of Costanza (see fig. 14) and that of SS. Marcellinus and Petrus, both built by Constantine, the former to hold the tomb of his daughters Constantia (or Constantina) and Helena, the latter that of his mother Helena. The latter is on the Via Labicana, about 2 m. outside Rome; it is a circular domed building, now known as the Torre Pignattara, from the *pignatte* or amphorae built into the concrete dome to lighten it. The mausoleum of S. Costanza, close by S. Agnese fuori, is also domed, with circular aisle, or rather ambulatory, the vault of the latter decorated with mosaic of classical style (see MOSAIC, vol. xviii. p. 885). The red porphyry sarcophagi, sculptured richly with reliefs, from these mausolea are now in the Vatican. On a much larger scale is the church of S. Stefano Rotondo on the Coelian, built by Pope Simplicius (468–482), with a double ring of pillared aisles, the outer one of which was pulled down and a new enclosure wall built by Nicholas V. Other round churches are S. Teodoro (by the Vicus Tuscus), restored in the 8th century, and S. Bernardo, which is one of the domed halls of Diocletian's thermae, consecrated as a church in 1598.

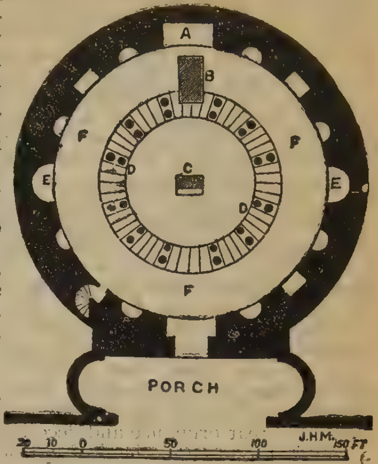

FIG. 14.—Church and Mausoleum of Costanza. A, Recess for altar. B, Porphyry slab in floor where the tomb stood. C, Modern altar. D, D, Slabs of white marble, part of ancient paving. E, E, Recesses with mosaics. F, F, Ambulatory with mosaic vault.

Space will not allow any individual description of the very numerous and important churches in Rome which are built on the basilican plan. The principal examples are these:—S. Pudentiana, traditionally the oldest in Rome, restored in 398; S. Clemente, restored under Siricius (384–399), now forming the crypt of an upper church built in the 12th century; S. Sabina, 5th century; S. Vitale, 5th century, founded by Innocent I. (401–417); S. Martino ai Monti, *c.* 500; S. Balbina, 6th century; church of Ara Coeli, founded by Gregory the Great (590–604) as S. Maria in Capitolio; S. Giorgio in Velabro, rebuilt by Leo II. (682–683); S. Cesareo, 8th century; S. Maria in Via Lata, restored by Sergius I. (687–701); S. Crisogono, rebuilt in 731 by Gregory III.; S. Maria in Cosmedin; S. Pietro in Vincoli, and S. Giovanni ad Portam Latinam, rebuilt *c.* 772 by Adrian I.; S. Maria in Dominica, rebuilt by Paschal I. (817–824), who also rebuilt S. Cecilia in Trastevere and S. Prassede; S. Marco, rebuilt by Gregory IV. in 833; S. Maria Nuova, rebuilt by Nicholas I. (858–867), now called S. Francesca Romana; the church of the SS. Quattro Coronati, rebuilt by Paschal II. about 1113; and S. Maria in Trastevere, rebuilt by Innocent II. in 1130.[3]

Though the apses and classical columns of the naves in these churches were built at the dates indicated, yet in many cases it is difficult to trace the existence of the ancient walls; the alterations and additions of many centuries have frequently almost wholly concealed the original structure. Except at S. Clemente, the early choir, placed as shown in fig. 26, has invariably been destroyed; the side walls have often been broken through by the addition of rows of chapels; and the whole church, both within and without, has been overlaid with the most incongruous architectural features in stucco or stone. The open roof is usually concealed either by a wooden panelled ceiling or by a stucco vault. The throne[4] and marble benches in the apse have usually given place to more modern wooden fittings, to suit the later position of the choir, which has always been transferred from the nave to the apse. In many cases the mosaics of the apse and the columns of the nave are the only visible remains of the once simple and stately original church.[5]

From 1200 to 1450; and the Papal Palaces

Era of the Cosmati.

The 10th and 11th centuries in Rome were extraordinarily barren in the production of all branches of the fine arts, even that of architecture; and it was not till the end of the 12th that any important revival began. The 13th century was, however, one of great artistic activity, when an immense number of beautiful works, especially in marble enriched with mosaic, were produced in Rome. This revival, though on different lines, was very similar to the rather later one which took place at Pisa (see PISANO), and, like that, was in great part due to the great artistic talents of one family,—the Cosmati,[6] which, for four or five generations, produced skilful architects, sculptors and mosaicists.

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[1] S. Lorenzo and S. Agnese fuori, S. Maria in Trastevere, Ara Coeli, and numberless other churches are very rich in this respect.

[2] See Heinrich Holtzinger, *Die altchristliche Architectur* (Stuttgart, 1889–99); Dehio and von Bezold, *Die kirchliche Baukunst des Abendlandes* (Stuttgart, 1884–99).

[3] This list does not include the great basilicas of Rome, for which see BASILICA. On the churches of Rome see Armellini, *Le chiese di Roma* (2nd ed. 1891); Tuker and Malleson, *Handbook to Christian and Ecclesiastical Rome* (1900); Marucchi, *Basiliques et églises de Rome* (1902); Frothingham, *Monuments of Christian Rome* (1910).

[4] Some of these marble thrones which still exist are very interesting relics of Hellenic art, much resembling the existing seats in the theatre of Dionysius at Athens. Examples of these thrones exist at S. Pietro in Vincoli, S. Stefano Rotondo, and in the Lateran cloister.

[5] The interior of S. Maria in Cosmedin has in recent years been restored according to primitive tradition.

[6] On the Cosmati see Boito, *Architettura del Medio Evo* (Milan, 1880, pp. 117–182); Clausse, *Les Marbriers romains et le mobilier presbytéral* (Paris, 1897); Crowe and Cavalcaselle, *History of Painting in Italy* (ed. Douglas, 1903), ch. iii.

The first member of the family of whom we have knowledge was Lorenzo, who, with his son Jacopo, made the ambones of S. Maria in Ara Coeli and an altar-canopy (ciborium) in SS. Apostoli. Jacopo decorated the door of S. Saba in 1205 and, together with his son Cosma (who gave his name to the family), that of S. Tommaso in Formis; the father and son worked together at Civita Castellana in 1210. Cosma made a ciborium for SS. Giovanni e Paolo in 1235, and worked with his sons Luca and Jacopo at Anagni and Subiaco during the first half of the 13th century. So far the inscriptions enable us to trace the relationships of the Cosmati with certainty; it is not so clear whether the Cosma above mentioned is to be identified with the master who decorated the chapel of the Sancta Sanctorum belonging to the old Lateran palace which was rebuilt by Nicholas III. (1277–1280). This Cosma was, however, almost certainly the father of Giovanni, the last of the family, who made the tombs of Cardinal Durand (died 1299) in S. Maria sopra Minerva, Cardinal Rodriguez in S. Maria Maggiore, and Stefano de' Surdi in S. Balbina. Another artist who seems to have belonged to this family, Deodato, made the ciboria of S. Maria in Cosmedin and (probably) of S. John Lateran; he is probably identical with the *Deodatus filius Cosmati* who, together with another Jacopo, executed a pavement at S. Jacopo alla Lungara. A large number of other works of this school, but unsigned, exist in Rome. These are mainly altars and baldacchini, choir-screens, paschal candlesticks, ambones, tombs, and the like, all enriched with sculpture and glass mosaic of great brilliance and decorative effect.

Besides the more mechanical sort of work, such as mosaic patterns and architectural decoration, they also produced mosaic pictures and sculpture of very high merit, especially the recumbent effigies, with angels standing at the head and foot, in the tombs of Ara Coeli, S. Maria Maggiore, and elsewhere. One of their finest works is in S. Cesareo; this is a marble altar richly decorated with mosaic in sculptured panels, and (below) two angels drawing back a curtain (all in marble) so as to expose the open grating of the confessio.

Besides the Cosmati, other artists, such as Paulus Romanus and his sons in the 12th century, and Petrus Vassallectus in the 13th, contributed to the revival of art. The beautiful cloisters of S. Paolo fuori le Mura, begun by "Magister Petrus," and those of S. John Lateran, the work of Vassallectus, are the finest architectural works of this school. In the latter part of the 13th century we find the sculptor Arnolfo del Cambio at work in Rome. His altar-canopy at S. Paolo fuori le Mura (1285) seems to have been imitated by the Cosmati in their latest works; his tomb of Cardinal de Braye (d. 1282) at Orvieto also shows his intimate connexion with that school. Another artist of the same period, Petrus Oderisius, worked in England; the shrine of the Confessor at Westminster (1269) was made by him.

The earlier works of the Cosmati are Romanesque in style, but in the 13th century Gothic elements were introduced, especially in the elaborate altar-canopies, with their geometrical tracery. In detail, however, they differ widely from the purer Gothic of northern countries. The richness of effect which the English or French architect obtained by elaborate and carefully worked mouldings was produced in Italy by the beauty of polished marbles and jewel-like mosaics,—the details being mostly rather coarse and often carelessly executed.

Campanili.

Chiefly to the 13th century belong the large number of beautiful campanili, which are the most conspicuous relics of the medieval period in Rome. The finest of these are attached to the churches of S. Francesca Romana, SS. Giovanni e Paolo, and S. Maria Maggiore. Others belong to the basilicas of S. Lorenzo fuori and S. Croce in Gerusalemme, and to S. Giorgio in Velabro, S. Maria in Cosmedin, S. Alessio, S. Giovanni ad Portam Latinam, S. Cecilia, S. Crisogono, and S. Pudentiana. They occupy various positions with regard to the church, being all later additions; that of SS. Giovanni e Paolo stands at some distance from it. In design they are very similar, consisting of many stages, divided by brick and marble cornices; in the upper storeys are from two to four windows on each side, with round arches supported on slender marble columns. They are decorated with brilliantly coloured *ciotole* or disks of earthenware, enamelled and painted in green or turquoise blue, among the earliest existing specimens of the so-called majolica (see CERAMICS). Sometimes disks or crosses made of red or green porphyry are inlaid in the walls. In most cases on one face of the top storey is a projecting canopied niche, which once contained a statue or mosaic picture. The walls are built of fine neat brickwork. The largest and once the handsomest of all, that of S. Maria Maggiore, has string-courses of enamelled and coloured terra-cotta.[1] The slender columns of the windows have often proved insufficient to support the weight, and so many of the arches are built up.[2]

Domestic architecture.

Though but little used for churches, the Gothic style, in its modified Italian form, was almost universally employed for domestic architecture in Rome during the 13th and 14th centuries. Tufa[3] or brick was used for the main walls, the lowest storey being often supported on an arcade of pointed arches and marble columns. The windows were usually formed of large marble slabs with trefoil-shaped heads or cusped arches. As a rule the upper storeys projected slightly over the lower wall, and were supported on small ornamental machicolations. The top storey frequently had an open loggia, with rows of pointed arches. When vaulting was used it also was of the pointed form, usually in simple quadripartite bays, with slightly moulded groin-ribs. The finest existing specimen of this style is the palace built about 1300 by Boniface VIII. (Benedetto Gaetani), enclosing the tomb of Cecilia Metella on the Via Appia, with a graceful little chapel within the precincts of the castle. This building is well worthy of study; the remaining part is well preserved. Many houses of this period, though generally much injured by alterations, still exist in Rome. They are mostly in out-of-the-way alleys, and, not being mentioned in any books, are seldom examined. The Ghetto (now destroyed) and the quarter near the Ponte Rotto contained many of these interesting buildings, as well as some of the most crowded parts of the Trastevere district, but most have disappeared owing to the wholesale destruction of old streets. Among those which may possibly escape for a while is the 13th-century house where Giulio Romano lived, near the Palazzo di Venezia, and the Albergo del Orso, at the end of the Via di Tordinona, of the same period, which was an inn in the 16th century and is one still; this has remains of a fine upper loggia, with rich cornices in moulded terra-cotta; the lowest storey has pointed vaulting resting on many pillars. Another graceful but less stately house exists, though sadly mutilated, opposite the entrance to the atrium of S. Cecilia in Trastevere.[4] Few now remain of the once numerous lofty towers built by the turbulent Roman barons for purposes of defence. The finest, the Torre delle Milizie on the Viminal, was built in the 13th century by the sons of Petrus Alexius; of about the same date is the Torre dei Conti, near the forum of Augustus, built by Marchione of Arezzo; both these were once much higher than they are now; they are very simple and noble in design, with massive walls faced with neat brickwork.

Lateran Palace.

Till the 14th century the Lateran was the usual residence of the pope; this was once a very extensive building, covering four times its present area. The original house is said to have belonged to the senator Plautius Lateranus in the reign of Nero; but the existing part on the line of the Aurelian wall is of the 3rd century. This house, which had become the property of the emperors, was given by Constantine as a residence for S. Sylvester; it was very much enlarged at many periods during the next ten centuries; in 1308 a great part was burnt, and in 1586 the ancient palace was completely destroyed by Sixtus V., and the present palace built by Domenico Fontana. The Cappella Sancta Sanctorum (see list of Cosmati works) is the only relic of the older palace.[5]

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[1] This campanile was restored and enriched in 1376.

[2] See De Montault, *Les Cloches de Rome* (Arras, 1874).

[3] For many centuries wall-facing of small tufa stones was used, *e.g.* in the medieval part of the Capitol; this was called "opera saracinesca" from its supposed adoption from the Saracens; it is largely employed in the walls and towers of the Leonine city, built by Leo IV. (847–855) to defend the Vatican basilica and palace against the inroads of the Moslem invaders. The greater part of this wall is now destroyed and built over, but a long piece with massive circular towers well preserved exists in the gardens of the Vatican.

[4] The house of Crescentius, popularly called the "house of Rienzi," near the Ponte Rotto, is perhaps the sole relic of the domestic architecture of an earlier period—the 12th century. Its architectural decorations are an extraordinary mixture of marble fragments of the most miscellaneous sort, all taken from classical buildings; it has an inscription over the doorway, from which we learn that it was the property of "Crescentius, son of Nicolaus."

[5] See Rohault de Fleury, *Le Latran au moyen âge* (Paris, 1877).

The present palace has never been used as a papal residence; in the 18th century it was an orphan asylum, and is now a museum of classical sculpture and early Christian remains.

The Vatican.

The Vatican palace originated in a residence built by Symmachus (498–514) adjoining the basilica of S. Peter. This was rebuilt by Innocent III. (*c.* 1200) and enlarged by Nicholas III. (1277–80). It did not, however, become the fixed residence of the popes till after the return from Avignon in 1377. In 1415 John XXIII. connected the Vatican and the castle of S. Angelo by a covered passage carried on arches. But little of the existing palace is older than the 15th century; Nicholas V. in 1447 began its reconstruction on a magnificent scale, and this was carried on by Sixtus IV. (Sistine chapel), Alexander VI. (Torre Borgia), Julius II. and Leo X. (Bramante's cortile and Raphael's Loggie and Stanze), and Paul III. (Sala Regia and Cappella Paolina by Antonio da Sangallo). Sixtus V. and his successors built the lofty part of the palace on the east of Bramante's cortile. The Scala Regia was built by Bernini for Urban VIII. and Alexander VII., the Museo Pio-Clementino under Clement XIV. and Pius VI., the Braccio Nuovo under Pius VII., and lastly the grand stairs up to the cortile were added by Pius IX.[1]

The Quirinal.

The Quirinal palace, now occupied by the king of Italy, is devoid of architectural merit. It stands on the highest part of the hill, near the site of the baths of Constantine. This palace was begun in 1574, under Gregory XIII., by Flaminio Ponzio, and was completed by Fontana and Maderna under subsequent popes.

Ecclesiastical Gothic.

The only important church in Rome which is wholly Gothic in style is S. Maria sopra Minerva, the chief church of the Dominican order. This was not the work of a Roman architect, but was designed by two Dominican friars from Florence—Fra Ristori and Fra Sisto—about 1289, who were also the architects of their own church of S. Maria Novella. It much resembles the contemporary churches of the same order in Florence, having wide-spanned pointed arches on clustered piers and simple quadripartite vaulting. Its details resemble the early French in character.[2] It contains a large number of fine tombs; among them that of Durandus, bishop of Mende (the author of the celebrated *Rationale divinorum officiorum*), by Giovanni Cosma, *c.* 1300, and the tomb of Fra Angelico, the great Dominican painter, who died in Rome, 1455. The most elaborate specimen of ecclesiastical Gothic in Rome is that part of S. Maria in Ara Coeli which was rebuilt about 1300, probably by one of the Cosmati, namely, the south aisle and transept. During the 14th century (chiefly owing to the absence of the popes at Avignon) the arts were neglected at Rome, and a period of decadence set in. The sculptured effigy and reredos of Cardinal d'Alençon (d. 1403) in S. Maria in Trastevere, executed by a certain Paulus Romanus, is a fair example of the works produced during this period; the effigy is a very clumsy and feeble copy of the fine recumbent figures of the Cosmati.

Florentine Period, c. 1450–1550.

The long period of almost complete artistic inactivity in Rome was broken in the 15th century by the introduction of a number of foreign artists, chiefly Florentines, who during this and the succeeding century enriched Rome with an immense number of magnificent works of art. The dawn of this brilliant epoch may be said to have begun with the arrival of Fra Angelico (see FIESOLE) in 1447, invited by Nicholas V. to paint the walls of his small private chapel in the Vatican dedicated to S. Lorenzo.

Florentine and Lombard sculptors.

In the latter half of the 15th century a large number of sculptured tombs (as well as tabernacles, altar frontals, reredoses and the like) were made for Roman churches by sculptors from Tuscany and north Italy. The earliest of these tombs is that of Eugenius IV. (d. 1447) in S. Salvatore in Lauro, by Isaia da Pisa. It presents the typical form of a life-sized recumbent effigy resting on a richly ornamented sarcophagus over which is a canopy decorated with reliefs and statuettes. The type was brought to perfection by the Florentine Mino da Fiesole (see MINO DI GIOVANNI), who worked in Rome under Pius II. and succeeding popes, being assisted in some cases by another artist of almost equal skill, Giovanni Dalmata. A Lombard sculptor, Andrea Bregno, came to Rome under Paul II. and worked there until the closing years of the century; his tomb is in S. Maria Sopra Minerva. The works of these artists and their followers are to be found in a great number of churches, notably S. Maria del Popolo.[3]

The architecture no less than the sculpture of the latter part of the 15th century was mainly the work of Florentines, especially of Baccio Pontelli, who is said by Vasari to have built S. Maria del Popolo, S. Agostino,[4] and S. Cosimato in Trastevere. He also was the architect of S. Pietro in Montorio, erected in 1500 for Ferdinand and Isabella of Spain. Other buildings were carried out by another Florentine, Giuliano da Majano. The Palazzo di Venezia, begun for Cardinal Barbo, afterwards Paul II., about 1455, a very massive and stately building of medieval character, was built by Giuliano da Sangallo and Francesco di Borgo San Sepolcro.

Bramante.

During the latter part of the 15th and the first few years of the succeeding century Rome was enriched with a number of buildings by Bramante (*q.v.*), one of the greatest architects the world has ever seen. He combined the delicacy of detail and the graceful lightness of the Gothic style with the measured stateliness and rhythmical proportions of classic architecture. Though he invariably used the round arch and took his mouldings from antique sources, his beautiful cloisters and loggie are Gothic in their general conception. Moreover, he never committed the prevalent blunder of the 16th century, which was a fruitless attempt to obtain magnificence by mere size in a building, without multiplying its parts. His principal works in Rome are the Palazzo della Cancelleria, built for Cardinal Riario (1495–1505), with its stately church of S. Lorenzo in Damaso; the so-called Palazzo di Bramante in the Governo Vecchio, built in 1500; and the Palazzo Giraud, near St Peter's, once the residence of Cardinal Wolsey, built in 1503. He also built the cortile of S. Damaso in the Vatican, the toy-like tempietto in the cloister of S. Pietro in Montorio (1502), and the cloisters of S. Maria della Pace (1504).[5] In 1503 Bramante was appointed architect to St Peter's, and made complete designs for it, with a plan in the form of a Greek cross. The piers and arches of the central dome were the only parts completed at the time of his death in 1514, and subsequent architects did not carry out his design.[6]

Peruzzi.

Baldassare Peruzzi (*q.v.*) of Siena was one of the most talented architects of the first part of the 16th century; the Villa Farnesina and the Palazzo Massimi alle Colonne are from his designs. His later works bear traces of that decadence in taste which so soon began, owing mainly to the rapidly growing love for the dull magnificence of the pseudo-classic style. This falling off in architectural taste was due to Michelangelo (*q.v.*) more than to any other one man. His cortile of the Farnese palace, though a work of much stately beauty, was one of the first stages towards that lifeless scholasticism and blind following of antique forms which were the destruction of architecture as a real living art, and in the succeeding century produced so much that is almost brutal in its coarseness and neglect of all true canons of proportion and scale. During the earlier stage, however, of this decadence, and throughout the 16th century, a large number of fine palaces and churches were built in and near Rome by various able artists, such as the Villa Madama by Raphael, part of the Palazzo Farnese by Antonio da Sangallo the younger, S. Giovanni de' Fiorentini by J. Sansovino, and many others.[7] (J. H. M.; H. S. J.)

LATER DEVELOPMENT

The transformation of Roman architecture after the 16th century was marked by the abandonment of classical models. The works of Michelangelo were too grand to be accused of exceeding the extreme limits of good taste, but his scholars and imitators exaggerated his manner, and the *barocco* style,

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[1] See Letarouilly, *Le Vatican et le basilique de St Pierre à Rome* (Paris, 1882).

[2] The absence of a triforium is one of the chief reasons why the large Gothic churches of Italy are so inferior in effect to the cathedrals of France and England.

[3] On Mino da Fiesole, see Gnoli in *Archivio Storico dell' Arte* (1890–91); on Giovanni Dalmata, Fabriczy in *Jahrb. der preuss-Kunstammlungen* (1901); on Andrea Bregno, Steinmann in the same periodical, vol. xx.; many of the monuments are drawn in Tosi, *Raccolta di monumenti sacri e sepolcrati scolpiti a Roma* (1853).

[4] These two churches were the first in Rome built with domes after the classical period.

[5] The upper storey of the latter is varied by having horizontal lintels instead of arches on the columns.

[6] See Geymüller, *Projets primitifs pour le basilique de St Pierre à Rome* (Paris, 1875–85).

[7] A valuable account of Raphael's architectural works is given by Geymüller, *Raffaello come Architetto* (Milan, 1882). Drawings of many of the finest palaces of Rome are given in the fine work by Letarouilly, *Édifices de Rome moderne* (Brussels, 1856–66).

Architecture.

which had its cradle in Rome, was soon adopted throughout Italy. Vignola (1507–1573) had done his best to bind the art of building to strictly classic rules, but in spite of his efforts the degeneration made progress during his own lifetime and under Carlo Maderna (1556–1639), and proceeded still more rapidly under Bernini (1598–1680). The characteristics of the *barocco* are the reckless abuse of curves and extravagantly broken lines, of contorted columns, twisted tympanums and highly exaggerated ornaments; yet we must confess that many monuments of this period of art exhibit such exuberant life, such contrasts of relief and shadow, and such a wonderful combination of variety and solidity as cannot fail to please the many, even now, by the magnificence of their general effect. In Rome, the numerous works of Bernini, Borromini, Maderna, Rainaldi, Salvi, Fuga, Longhi and others bear witness to the gifted activity of Italian architects during that period; if genius necessarily creates, those men showed more of it than their predecessors who adhered to the classic and revered the teachings of Vitruvius. Degeneration is tolerated and sometimes even pleases, under the name of transformation, but there is nothing to be said for the real decay which marks the 18th century. It was not universal at first, for it is by nature a slow process; such men as A. Galilei, Specchi, Peparelli, Marchionni, Morelli, Camporese and Piranesi left works not altogether without value; but the outrageous abuse of ornament increased with every year, and was made more and more evident by the clumsy heaviness of the pillars and pilasters that supported the whole. The refined purity of the Renaissance disappeared as completely as the delicate grace and exquisite ornamentation of the Cosmatesque period. Many works of the greatest beauty were destroyed outright, and many more were disfigured and often wholly hidden by horrible stucco constructions and decorations; or, on a larger scale, by the application of hideous stone façades to churches of which the simple good taste had delighted generations of mankind. The deformation of the noble old Lateran basilica is a conspicuous instance of such deeds; another is Santa Maria Maggiore, and the false fronts plastered upon San Marcello and Santa Maria in Via Lata, both in the Corso, give a very clear idea of what was generally done. The interiors of old churches suffered quite as much, and even the frescoes of early masters were not spared; those by Pinturicchio in the third chapel (south) of S. Maria del Popolo were covered with wretched stucco ornaments, only removed in 1850, and numberless works of art by Giotto and other early painters were wilfully destroyed.

The decline of architecture continued in the 19th century, notwithstanding the laudable efforts of Valadier and a few other painstaking imitators, who produced the so-called "academic neo-classic" reaction; among them may be noted the names of Canina, Poletti, Sarti and Azzurri. The futility of their works invited the feeble eclecticism which soon afterwards became so general that the architecture of the period is wholly without individuality, good or bad. The chief architectural work of the 19th century was the rebuilding of the great basilica of S. Paolo fuori le Mura, burnt in 1823, in a style of cold splendour which is anything but devotional in its general effect. The pillars are huge monoliths of grey granite from the Alps; the confessio and transepts are lined with rosso and verde antico from quarries then recently rediscovered in Greece, and with Egyptian alabaster and lapis lazuli and malachite adorn the bases of the columns round the high altar in lavish profusion. Thirty years were required for the rebuilding of the frigidly magnificent edifice, which was reconsecrated in 1854. The east façade displays a quantity of gaudy mosaics, and the projected quadriportico is wanting. The belfry is nothing but a steeple, and has an unfortunate resemblance to a lighthouse. In extenuation of the result it must be admitted that the original building had been totally destroyed by fire, but no such excuse can be found for the barbarous assault on Christian art which was perpetrated by Francesco Vespignani in the extension of the Lateran basilica. This work was begun under Pius IX. and finished under Leo XIII.; it involved the destruction of the ancient tribune and its ambulatory, the only parts of the church which had so far escaped complete disfigurement, and the priceless mosaics (1290), among the most beautiful in Rome, were taken down and replaced in the new apse in a sadly mutilated and restored form. (For the interesting discoveries made in excavating for the new foundations, see *Ann. Ist.* 1877, p. 332.)

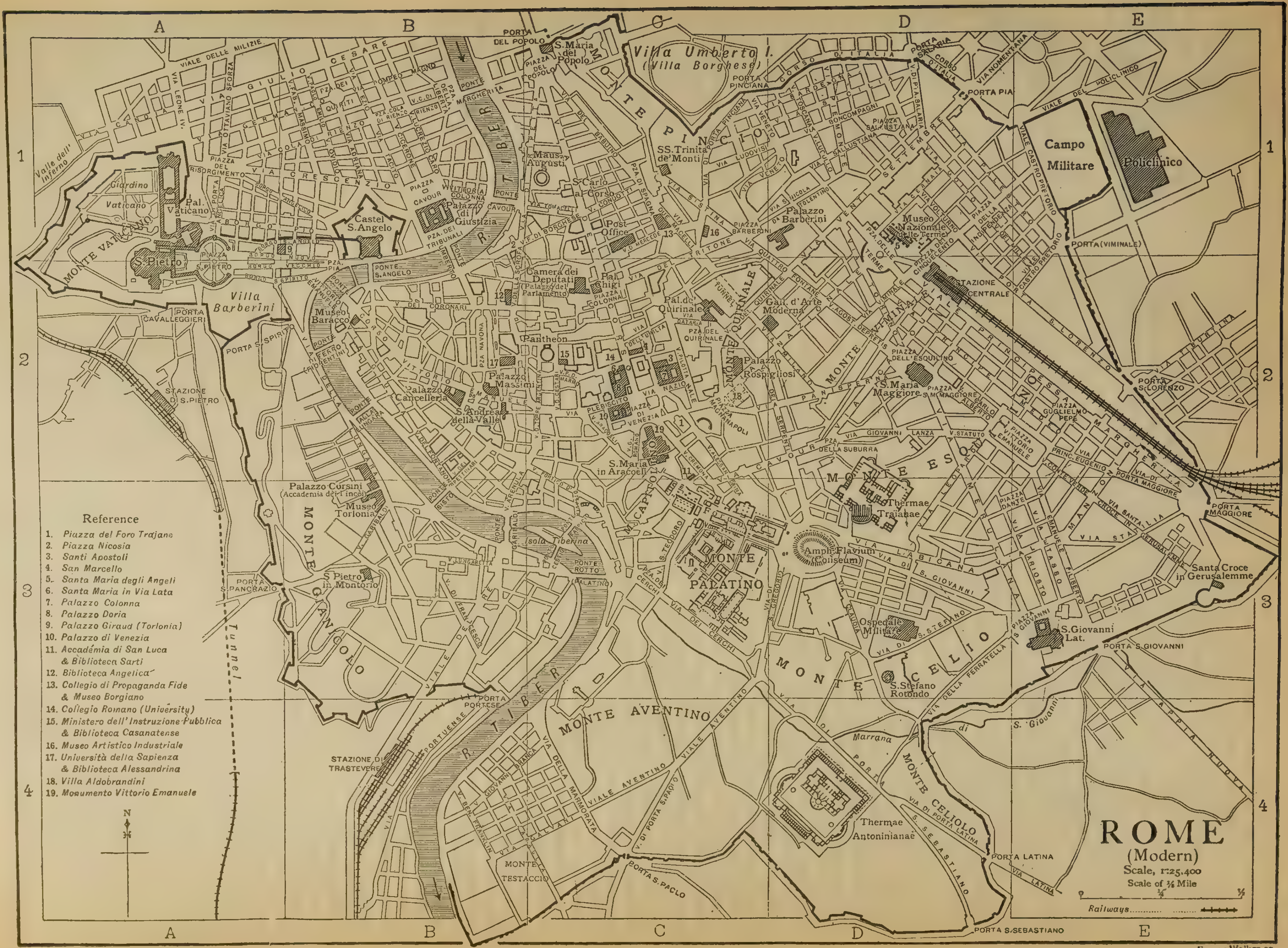
Galleries and collections.

The Vatican contains the largest collection in the world of Greco-Roman and Roman sculpture, with a few specimens of true Hellenic art. It is also very rich in Greek vases and in objects from Etruscan tombs; this latter division is called the Museo Gregoriano. There is also an Egyptian museum which contains a few important curiosities. In the great library are preserved a number of early glass chalices and other rare objects from the catacombs, as well as many fine specimens of later Christian art—church plate and jewels. The picture gallery, though not as large as some of the private collections in Rome, contains few inferior pictures. The Lateran palace, still, like the Vatican, in the possession of the pope, contains a fine collection of classical sculpture, but is most remarkable as a museum of Christian antiquities. The two capitoline museums are very rich in classical sculpture, bronzes, coins, pottery and the contents of early Etruscan and Latin tombs. A large hall has been added, and is filled with sculptures found in Rome since 1870, of which the arrangement was completed on the occasion of King Edward VII.'s visit. The picture gallery contains a few masterpieces and a large number of inferior works. The new Museo delle Terme has been formed in the great cloister of S. Maria degli Angeli, to hold the numerous fine examples of classical painting and sculpture found along the Tiber during the excavations for the new embankment, and in other places in Rome. The university of Rome possesses fine collections of minerals, fossils and other geological specimens, and examples of ancient marbles used in the buildings of Rome. A Museo Artistico Industriale has been formed in a monastery in the Capo le Case, to contain medieval works of art. It is, however, a matter for regret that the few medieval works which Rome possesses should be scattered in three small collections, namely, the one last mentioned, the Capitol and the Castle of S. Angelo, where an attempt is being made to form a real medieval museum; many objects, too, are dispersed throughout the city, and will doubtless disappear unless they are better protected. The Museo Kircheriano contains an unrivalled collection of prehistoric objects of stone, bronze, iron and pottery, found in Italy and the Italian islands, and more particularly a number of ancient Latian urns, *capanne* and the like. The collection of *aes grave* is the finest yet made; and the museum also contains a large quantity of interesting classical antiquities of various kinds. Another branch is the Ethnological Museum. Unfortunately all these museums are badly adapted for purposes of study, being neither well arranged nor well catalogued. The Museo Baracco, presented to the city in 1905 by the senator of that name, contains some ancient sculptures of great value. The Museum of Etruscan and Faliscan antiquities in the Villa Giulia, near Porta del Popolo, is of considerable importance, as is also the Borgia Museum in the Propaganda palace, the latter for its ancient geographical curiosities. The museum of plaster casts in the Testaccio quarter contains reproductions of the principal ancient sculptures possessed by foreign museums.

Private collections.

Among the private collections of pictures the Borghese is unrivalled. The next in importance is that in the Doria palace, which, however, like most Italian collections, contains a large proportion of very inferior works. The Corsini picture gallery, bought by the government, is chiefly rich in the works of the Bolognese and other third-rate painters, but also possesses a fine collection of engravings and etchings. There are a few fine paintings in the Barberini palace, but the Sciarra gallery no longer exists. There are some good pictures by Raphael and Guido Reni in the Academy of St Luke; the Galleria d'Arte Moderna is a collection of modern paintings acquired by the government.

The largest private collection of sculpture is that of the Villa Albani, which, among a large mass of inferior Roman sculpture, contains a few gems of Greek art. The original Albani collection was stolen and brought to Paris by Napoleon I., and was there dispersed; one relief, the celebrated Antinous, is the only piece of sculpture from the original collection which was sent back from Paris. This is in the collection of Prince Torlonia, which contains several very fine works, but unfortunately the greater number are much injured and falsified by restorations. The casino in the Borghese gardens possesses a great quantity of sculpture, mostly third-rate Roman works, the most important of which, however, are executed in precious marbles. The small collection which formerly existed in the Villa Ludovici has been bought by the government and removed to the Museo delle Terme; it contained a few works of Greek sculpture of great value, the most important being the Pergamean group representing the suicide of a Gaulish chief, a Medusa's head in relief and a male terminal figure. The


ROME
(Modern)
Scale, 1:25,400
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Railways
Reference
1. Piazza del Foro Trajano
2. Piazza Nicosia
3. Santi Apostoli
4. San Marcello
5. Santa Maria degli Angeli
6. Santa Maria in Via Lata
7. Palazzo Colonna
8. Palazzo Doria
9. Palazzo Giraud (Torlonia)
10. Palazzo di Venezia
11. Accadèmia di San Luca & Biblioteca Sarti
12. Biblioteca Angelica
13. Collegio di Propaganda Fide & Museo Borgiano
14. Collegio Romano (University)
15. Ministero dell' Instruzione Pubblica & Biblioteca Casanatense
16. Museo Artistico Industriale
17. Università della Sapienza & Biblioteca Alessandrina
18. Villa Aldobrandini
19. Monumento Vittorio Emanuele
N
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4
Villa Umberto I. (Villa Borghese)
Porta del Popolo
S. Maria del Popolo
Monte Pincio
SS. Trinità de' Monti
Porta Pinciana
Porta Salaria
Porta Pia
Campo Militare
Policlinico
Porta (Viminale)
Museo Nazionale (delle Terme)
Palazzo Barberini
Stazione Centrale
Porta S. Lorenzo
Porta Maggiore
Santa Croce in Gerusalemme
S. Giovanni Lat.
Porta S. Giovanni
Via Appia Nuova
Porta Latina
Porta S. Sebastiano
Monte Celiolo
Thermae Antoninianae
S. Stefano Rotondo
Monte Celio
Ospedale Militare
Ampi. Flavium (Coliseum)
Thermae Traianae
Monte Esquilino
S. Maria Maggiore
Monte Viminale
Quirinale
Pal. del Quirinale
Gall. d'Arte Moderna
Palazzo Rospigliosi
Monte Palatino
Monte Capitolino
S. Maria in Aracoeli
Monte Aventino
Tevere
Isola Tiberina
Ponte Rotto
Monte Testaccio
Porta S. Paolo
Porta Portese
Stazione di Trastevere
Monte Gianicolo
S. Pietro in Montorio
Porta S. Pancrazio
Tunnel
Palazzo Corsini (Accademia dei Lincei)
Museo Torlonia
Museo Baracco
Palazzo Cancelleria
S. Andrea della Valle
Palazzo Massimi
Pantheon
Camera dei Deputati (Palazzo del Parlamento)
Pal. Chigi
Post Office
Maus. Augusti
S. Carlo al Corso
Palazzo di Giustizia
Castel S. Angelo
Ponte S. Angelo
Villa Barberini
Porta Cavalleggieri
Porta S. Spirito
Stazione di S. Pietro
S. Pietro
Pal. Vaticano
Giardino Vaticano
Monte Vaticano
Valle dell' Inferno
Via Leone IV.
Viale delle Milizie
Piazza del Risorgimento
Via Crescenzio
Via Cola di Rienzo
Piazza Cavour
Via Nazionale
Via Cavour
Via Quattro Fontane
Via Tritone
Via Sistina
Piazza di Spagna
Piazza Colonna
Piazza Venezia
Via del Corso
Via Labicana
Via di S. Giovanni
Via Merulana
Piazza Vittorio Emanuele
Via di Porta Maggiore
Viale Aventino
Via della Marmorata
Viale di Porta S. Paolo
Via Portuense
Via dei Cerchi
Via S. Gregorio
Via Claudia
Via della Ferratella
Via di Porta Latina
Via di S. Sebastiano
Marrana
Viale Castro Pretorio
Via Nomentana
Corso d'Italia
Via Veneto
Via Ludovisi
Viale Principessa Margherita
Via S. Lorenzo
Via Giovanni Lanza
Via della Suburra
Via dei Serpenti
Via Panisperna
Via Agostino Depretis
Via Viminale
Via Emanuele Filiberto
Via Ariosto
Via Tasso
Via Santa Croce in Gerusalemme
Corso Vittorio Emanuele
Via Giulia
Via della Lungara
Via di S. Francesco
Viale di Trastevere
Via Garibaldi
Via Ostiense

Emery Walker sc.

Giustiniani collection, which was considerable, is now dispersed, but many private residences, such as the Colonna palace, still contain collections of sculpture and painting of a secondary order.

Libraries. The principal libraries in Rome are, for old and modern works, the Biblioteca Vittorio Emanuele and the library of the German Archaeological Institute; for manuscripts and early books, the Angelica, the Casanatense, the Alessandrina and the Chigi libraries; but none of them can be compared with that of the Vatican, which now contains also the former library of the Barberini. Mention must also be made of the Corsiniana, now belonging to the Accademia dei Lincei. The Biblioteca Sarti, beside the Academy of S. Luke, contains works on art.

THE MODERN CITY

Great changes in the municipal and social conditions of Rome followed the occupation of the city by the Italians (20th September 1870), and the rapid increase of population due to immigration from other parts of Italy. It is a mistake, however, to attribute all the works undertaken and executed since 1870 to the initiative of the new government. The first plan for modernizing and improving Rome was that of Pope Julius II., who aimed at the enlargement of the lower city on both sides of the Tiber. The modern Via Giulia shows in part what he meant to do. Following him, Sixtus V. did his best to develop the upper part of the city by laying out the Via Sistina, from the Trinità dei Monti to S. Maria Maggiore and Porta S. Giovanni. Almost in our own time a plan for the improvement of the city was made, under the direction of Mgr. de Merode, during the reign of Pius IX.; and although but a small portion of the projected changes were carried out under the pope, the general scheme was in most respects satisfactory, and proved a good foundation for further extensive developments. He was able to complete the construction of the beautiful ascent to S. Pietro in Montorio, as well as that which leads up to the Quirinal Palace; and the Via Nazionale, which was to have been called Via De Merode, was also begun. His plan did not include, however, the destruction of villas such as the Ludovisi, nor the wholesale removal of trees, which is so greatly to be deplored. These acts of barbarism were the consequences of the reckless speculations in land and buildings that accompanied and followed the active and excellent work done by the municipality, and might have been checked by vigorous and timely action of the government. As it was, a number of the most important Roman families were ruined. At the outset, and as soon as political circumstances admitted the consideration of such matters, the municipality set to work; and though a comprehensible love of the picturesque has caused many persons to regret the result, altogether or in part, it is not to be denied that the improvements carried out have been of the highest advantage to the city, and that the work is in many instances of creditable solidity.

Two principal problems presented themselves. The more important was the confinement of the Tiber in such a manner as to render impossible the serious floods which had from time to time inundated the city, often causing great damage to property and rendering the lower streets more or less impassable. There were floods which almost reached the level of the first storey near San Carlo in the Corso, and it was common to see the great Piazza Navona and the neighbourhood of the Pantheon full of water for days together during the winter. The interruption of traffic can be imagined, and the damage to property was serious. The other urgent matter was one of which the government of Pius IX. had been partially aware, namely, the necessity for opening better thoroughfares between different parts of the city. In the middle ages the population of Rome had dwindled to twenty or thirty thousand inhabitants, who lived huddled together about the strongholds of the barons, and the modern city had slowly grown again upon the exiguous foundation of a medieval town. The need for changing this condition of things, which had been felt under Pius IX., became overwhelmingly apparent as the population rapidly increased. That which under a continuance of the old government might have been done by degrees during a long period, had to be accomplished in the shortest possible time, with means which, though considerable, were far from adequate, and in the face of opposition by many holders of real estate, the most important of whom were conservatively attached to the papal government, and resisted change for no other reason. In what was now done it is necessary to distinguish clearly between the work undertaken and carried out by the municipality, under considerable pressure of circumstances, and that which was done in the way of private speculation. The first was on the whole good, and has proved enduring; the second was in many cases bad, and resulted in great loss. As soon as the opening of such streets as the Via Nazionale and the Via Cavour, the widening and straightening of the Via dell' Angelo Custode, now the Via del Tritone Nuovo, and similar improvements, such as the construction of new bridges over the Tiber, had demonstrated that the value of property could be doubled and quadrupled in a short time, and as soon as the increase of population had caused a general rise in rents, owners of property awoke to the situation of affairs, and became as anxious as they had at first been disinclined to improve their estates by wholesale building.

The most important and expensive work executed by the government with the assistance of the municipality was the construction of the embankments along the Tiber. Though damaged by the great flood of December 1900, their truly Roman solidity saved the city from the disastrous consequences of a wide inundation. It is impossible not to admire them, and not to feel respect for a people able to carry out such a plan in such a manner and in so short a time, in the face of such great difficulties. But so far as the life of the city was concerned, the cutting of new streets and the widening of old ones produced a more apparent immediate result. The opening of such a thoroughfare as the Via Nazionale could not but prove to be of the greatest value. It begins at the Piazza delle Terme, in which the principal railway station is situated, and connects the upper part of the city by a broad straight road, and then, by easy gradients, with the Forum of Trajan, the Piazza dei Santi Apostoli and the Piazza di Venezia, whence, as the Corso Vittorio Emanuele, it runs through the heart of the old city, being designed to reach St Peter's by a new bridge of the same name, near the bridge of S. Angelo. It is true that, in order to accomplish this, the Villa Aldobrandini had to be partially destroyed, but this is almost the only point which lovers of beauty can regret, and in compensation it opened to full view the famous palace of the Massimo family, the imposing church of S. Andrea della Valle, and the noble pile of the Cancelleria, one of the best pieces of architecture in Rome. Another great artery is the Via Cavour, which was intended to connect the railway station with the south-western part of Rome, descending to the Forum, and thence turning northwards to reach the Piazza di Venezia on the east side of the monument to Victor Emanuel II. These are only examples of what was done, for it would be impossible to give a just idea of the transformation of the city. Rome is now divided clearly into two parts, the old and the new, of which the old is incomparably the more artistic and the more beautiful, as it will always remain the more interesting. Among the works carried out by the government and municipality the fine tunnel under the Quirinal Hill (completed in 1902) deserves mention; it forms a connecting channel for the traffic between the streets at the north end of the old city, the Corso, Babuino, &c., and the upper part of Rome, including the Via Nazionale and the Esquiline. Another difficult undertaking, successfully completed in April 1908, was the construction of the enormous causeway and bridge which now unite the Pincio with the Villa Borghese, or, as it is now called, the Villa Umberto Primo, to the immense advantage of the public. In the same year the building for the new law courts was finished; it stands near S. Angelo, and presents, on the whole, an imposing appearance, though overloaded with clumsy stone ornamentation.

It is unnecessary to mention a number of public buildings and government offices which have little architectural merit, but we cannot overlook such a magnificent group of buildings devoted to scientific purposes as the Policlinico, on the Macas, which is admittedly one of the finest hospitals in Europe, and the military hospital on the Coelian. The rebuilding of the Palazzo del Parlamento is only second to the enormous monument of Victor Emanuel II. The majority of the buildings erected by individuals and corporations since 1870 present no original or characteristic features, and the best of them are copies or imitations of well-known models. The Cassa del Risparmio, in the Corso, reproduces a Florentine palace; the Palazzo Negroni, near the Piazza Nicotia, is modelled on the Cancelleria and the Palazzo Giraud; many of the large residences in the new quarters beyond the Tiber are fairly good copies of palaces in the Florentine style, though the magnificent carved stone of earlier centuries is disadvantageously replaced by stucco, a material which lasts tolerably well in the mild climate of Rome. Opposite the beautiful and severe Palazzo di Venezia, what might have been a faultless reproduction of it is marred by tasteless ornament. Finally, so far as the construction of new streets is concerned, which lovers of the picturesque so greatly deplore, it must be admitted that they have been rendered necessary by the great increase of traffic and population, and it should be remembered that after the 16th century the wisest of the popes did their best to open up the city by widening and straightening the thoroughfares.

Municipal Administration.—After the taking of Rome, those persons who remained loyal to Pius IX. took no part whatever in public affairs, and the municipal administration was entirely in the hands of the monarchists. The expression "nè eletti nè elettori," meaning that Catholics are to be neither voters nor candidates, which came to be regarded as a sort of rule of the party, was invented at that time by an epigrammatic journalist, and it seems at first to have been applied also to municipal matters, whereas it was later understood to refer only to parliamentary elections. Leo XIII. encouraged the formation of a Catholic party in the municipal administration, and the municipal government drifted largely into the hands of Catholics, though circumstances make it necessary that the Syndic (Mayor) should always be a royalist. Between 1870 and the end of the century the socialist party had no great influence in Rome, which can never be a city of manufacturing interests. For purposes of municipal government the division of the city into districts has been modified, but the old division into fourteen *rioni* is adhered to in principle, the new quarters of Castro Pretorio and the Esquiline having been included in the first Rione, which still bears the name of "Monti." The municipality consists of a mayor and eighty communal councillors, of whom a large proportion were for many years members of the aristocracy. Later, however, the three democratic parties, known as the monarchist, socialist and republican, united to form a popular coalition, and succeeded in completely excluding the conservative, aristocratic and Catholic elements.

Population.—The population in 1870 was 226,022, as against 462,743 in 1901 (communal population). It therefore more than doubled in thirty years. The increase, however, did not take place at a regular rate, owing to the changes in the rates of immigration and emigration. The largest increase was in 1870, reaching 22,186; the next most important in 1884, 1885, 1886, 1887, in which years it constantly remained near 20,000. The least increase in later years was 4417 in 1891. The garrison of Rome is about 10,000 men. Careful inquiry has placed it beyond doubt that there are in Rome about the same number of ecclesiastics of all orders, including about 1500 students in the theological seminaries. The average birth-rate is lower in Rome than in the majority of great cities. The number of births increased after 1870 very nearly in proportion with the increase of population.

Climate and Hygiene.—The climate of Rome is mild and sunny, but the variation in temperature between day and night is very great. December and February appear to be the coldest months, the thermometer then averaging 47° F.; the greatest heat, which averages 75°, is felt in July and August. The surrounding Campagna is still not all habitable during the summer, though the dangerous malaria has been checked by the planting of numerous eucalyptus trees. A remarkable instance of the effect produced upon the marshy soil by these plantations may be studied at the Trappist monastery of the Tre Fontane, situated on the Via Ardeatina, about 4 m. from Rome. Whereas in former times it was almost always fatal to spend the whole summer there, the monks have so far dried the soil by means of the eucalyptus that they reside in the monastery throughout the year. The municipality has everywhere made strenuous efforts to reduce the mortality due to malaria; in 1890, 14% of all the deaths in Rome and the Campagna were attributed to this cause; in 1905 the proportion had dropped to 3%. Very large sums have been expended in a scientific system of drainage and sub-drainage on both sides of the Tiber, and the use of wire gauze mosquito nets for the doors and windows of the humblest habitations in the Campagna has contributed much to the present satisfactory result. The hygienic conditions of Rome itself have greatly improved, largely through the ceaseless efforts of Commendatore Baccelli, a distinguished man of science, who repeatedly held office in the Italian Ministry. The publication of exceedingly accurate graphic tables in February 1900 shows the following facts. Ninety per 1000 deaths occurred in 1871 from typhoid (the so-called "Roman fever"), and the average has now fallen to a low constant. Deaths from small-pox, formerly of alarming frequency, can be said not to occur at all, and their numbers diminished suddenly after the introduction of compulsory vaccination.

Charities and Education.—A great number of small charitable institutions for children and old people have been founded, which are organized on the most modern principles, and in many of these charitable persons of the upper classes give their individual assistance to the poor. There are also private hospitals for diseases of the eye, in which poor patients are lodged and treated without payment. There are two hospitals entirely maintained by private resources, where infants are treated whose mothers fear to send them to a public hospital, or in cases refused by the latter as not being serious enough for admission. Of course, the numbers of the poor greatly increased with the growth of population, especially after the failure of building speculations between 1888 and 1890, though great efforts were made by the municipality to send all persons then thrown out of employment back to their homes. One of the difficulties under which Rome labours is that while it attracts the population of the country, as other capitals do, it possesses no great mechanical industries in which the newcomers can be employed. Efforts to create small industries in the populous quarters of the poor met with little success. Before 1870 a society was formed, which has since greatly developed as an intelligent private enterprise, to provide the poor with sanitary tenements; but its success is much hampered by the absence of employment, which again is partly due to the heavy taxation of small industries. A number of trade schools are also maintained by private funds, such as the Instituto degli Artigianelli, managed by the Fratelli della Dottrina Cristiana, and the Ricovero pei Fanciulli Abbandonati (home for friendless children), which is under lay management and has flourishing workshops. The character of official charities has certainly improved in principle, so far as their educational and moral scope are concerned; for whereas in former times the limited number of the poor made individual and almost paternal relief possible, that form of charity had a pauperizing influence. If anything, the present tendency is to go too far in the opposite direction, and to require too many formalities before any relief is granted; and while the union of the principal charities under a central management on advanced theories improved the methods of administration, it destroyed numerous small sources of immediate relief on which the poor had a traditional right to count, and was in that way productive of hardship. At the same time, however, mutual benefit societies (*società di mutuo soccorso*) have been organized in great numbers by the different crafts and professions, and are chiefly distinguishable by the political parties to which they belong. It is characteristic of the modern Roman people that the most widely different elements subsist without showing any signs of amalgamating, yet without attacking each other. Some of these societies have an exclusively clerical character, others are merely conservative, some consist of monarchists, and some of avowed republicans.

Popular education is principally in the hands of the municipality, but besides the public schools there are numerous religious institutions attended by the children of the lower classes; they follow the curriculum prescribed by the government, and are under the constant supervision of municipal inspectors, both as regards their teaching and their hygiene. The pope also expends large sums in the maintenance of the people's schools, managed entirely by laymen, and also under government inspection. For education of the higher grade, besides the regular lyceums and gymnasiums, there are many private schools similarly designated from which pupils can present themselves for the regular government examinations, the privilege of conferring certificates and degrees having been allowed only to very few private institutions.

Society.—After 1870 both the aristocracy and the middle classes were divided into hostile factions, each of which maintained a press of its own and rallied round representative individuals. So far as the middle classes were concerned, the common interest of commercial operations soon concentrated political differences. The aristocracy, however, kept rigidly aloof from all speculations for a time, and maintained its traditional attitude of contemptuous superiority, to which the middle class answered with its profound hatred. This state of things lasted about ten years, until the time of the great building speculations, in which a number of noble families were tempted, and in which they soon found themselves hopelessly involved, and brought into close contact with the middle class. The two classes thus became necessary to each other, and the result was a notable and salutary diminution of prejudice, soon leading to alliances by marriage, which would formerly have seemed impossible, but which the redistribution of wealth rendered mutually advantageous. The appearance at social gatherings of an official element, almost exclusively taken from the middle class, also tended to reduce inequalities of caste. Yet it must be admitted that the parties composing Roman society were drawn together mechanically, rather than fused into anything really homogeneous. It is worth mentioning that the Jewish element, which is very strong in business, in journalism, and in the administrations, had made no attempt to enter Roman society. Rome and Genoa are practically the only Italian cities in which Israelites are rigidly excluded from social intimacy, and are only met on official occasions. (M. Cr.)

Ancient History

I. *The Beginnings of Rome and the Monarchy.*

The Sabines in Rome.

Both the city and the state of Rome are represented in tradition as having been gradually formed by the fusion of separate communities. The original settlement of Romulus is said to have been limited to the Palatine Mount. With this were united before the end of his reign the Capitoline and the Quirinal; Tullus Hostilius added the Caelian, Ancus Martius the Aventine; and finally Servius Tullius included the Esquiline and Viminal, and enclosed the whole seven hills with a stone wall. The growth of the state closely followed that of the city. To the original Romans on the Palatine were added successively the Sabine followers of King Tatius, Albans transplanted by Tullus, Latins by Ancus, and lastly the Etruscan comrades of Caeles Vibenna. This tradition is supported by other and more positive evidence. The race of the Luperci on February 15 was in fact a purification of the boundaries of the "ancient Palatine town,"[1] the "square Rome" of Ennius;[2] and the course taken is that described by Tacitus as the "pomoerium" of the city founded by Romulus.[3] On the Esquiline, Varro mentions an "ancient city" and an "earthen rampart,"[4] and the festival of the Septimontium is evidence of a union between this settlement and that on the Palatine.[5] The fusion of these "Mounts" with a settlement on the Quirinal "Hill" is also attested by trustworthy evidence;[6] and in particular the line taken by the procession of the Argei represents the enlarged boundaries of these united communities.[7] Lastly, the Servian agger still remains as a witness to the final enclosure of the various settlements within a single ring-wall. The united community thus formed was largely of Latin descent. Indications of this are not wanting even in the traditions themselves: King Faunus, who rules the Aborigines on the Palatine, is Latin; "Latini" is the name ascribed to the united Aborigines and Trojans; the immediate progenitors of Rome are the Latin Lavinium and the Latin Alba. Much evidence in the language, the religion, the institutions and the civilization of early Rome points to the same conclusion. The speech of the Romans is from the first Latin,[8] though showing many traces of contact with the neighbouring dialects of the Sabines and Volscians and also of Etruscans; the oldest gods of Rome—Saturn, Jupiter, Juno, Diana—are all Latin; "rex," "praetor," "dictator," "curia," are Latin titles and institutions.[9] The primitive settlements, with their earthen ramparts and wooden palisades planted upon them out of reach both of human foes and of the malaria of the swampy low grounds, are only typical of the mode of settlement which the conditions of life dictated throughout the Latian plain.[10] But tradition insists on the admixture of at least two non-Latin elements, a Sabine and an Etruscan. The question as regards the latter will be more fully discussed hereafter; it is enough to say here that while the evidence of nomenclature (Schulze, *Geschichte der Lat. Eigennamen*, Leipzig, 1904, p. 579, with the modifications suggested in the *Classical Review*, December 1907) shows that many Etruscan *gentes* were settled within the bounds of the early city, there is no satisfactory evidence that there was any large Etruscan strain in the Roman blood.[11] With the Sabines it is otherwise. That union of the Palatine and Quirinal settlements which constituted so decisive a stage in the growth of Rome is represented as having been in reality a union of the original Latins with a band of Sabine invaders who had seized and held not only the Quirinal Hill, but the northern and nearest peak of the Capitoline Mount. The tradition was evidently deeply rooted. The name of the god *Quirinus*, from which that of the Quirinal Hill itself presumably sprang, was popularly connected with the Sabine town of Cures.[12] The ancient worships connected with it were said to be Sabine.[13] One of the three old tribes, the Tities, was believed to represent the Sabine element;[14] the second and the fourth kings are both of Sabine descent. By the great majority of modern writers the substance of the tradition, the fusion of a body of Sabine invaders with the original Latins, is accepted as historical; and even Mommsen allowed its possibility, though he threw back the time of its occurrence to an earlier period than that of the union of the two settlements.[15] We cannot here enter into the question at length, but some fairly certain points may be mentioned. The probability of Sabine raids and a Sabine settlement, possibly on the Quirinal Hill, in very early times may be admitted. The incursions of the highland Apennine tribes into the lowlands fill a large place in early Italian history. The Latins were said to have originally descended from the mountain glens near Reate.[16] The invasions of Campania and of Magna Graecia by Sabine (more correctly Safine) tribes are matter of history (see Samnites), and the Sabines themselves are represented as a restless highland people, ever seeking new homes in richer lands.[17] In very early days they appear on the borders of Latium, in close proximity to Rome, and Sabine forays are familiar and frequent occurrences in the old legends. But beyond these general considerations recent inquiry enables us to advance to some few definite conclusions. (1) It may now be regarded as established beyond question that the patrician class at Rome sprang from a race other than that of the plebeians,

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[1] Varro, *L.L.* vi. 34.

[2] Fest. 258; Varro ap. Solinus i. 17.

[3] Tac. *Ann.* xii. 24. For a full discussion of the exact limits of the Palatine city see Smith, *Dict. Geog.*, *s.v.* "Roma"; Jordan, *Topog. d. Stadt Rom*, i. cap. 2; Gilbert, *Topog. u. Gesch. d. Stadt Rom*, i. caps. 1, 2; and "Topography" below.

[4] *L.L.* v. 48; cf. ibid. 50.

[5] Festus 348; Jordan i. 199; Gilbert i. 161. The seven "montes" are the Palatine with the Velia and Germalus, the Subura, and the three points of the Esquiline (Fagutal, Oppius and Cispius).

[6] See Mommsen, *R.G.* (7th ed.), i. 51.

[7] Varro, *L.L.* v. 45, vii. 44; Jordan ii. 237.

[8] See Latin Language.

[9] The title "rex" occurs on inscriptions at Lanuvium, Tusculum, Bovillae; Henzen, *Bullettino dell'Inst.* (1868), p. 159; Orelli, 2279; *Corp. I. Lat.* vi. 2125. For "dictator" and "praetor," see Livy i. 23, viii. 3; cf. Marquardt, *Röm. Staatsverwaltung*, i. 475: for "curia," Serv. on *Aen.* i. 17; Marquardt i. 467.

[10] B. Modestov, *Introduction à l'histoire romaine* (translated from the Russian by M. Delines), Paris, 1907, supersedes other authorities such as Helbig, *Die Italiker in d. Poebene*; Pohlmann, *Anfänge Roms*, 40; Abeken, *Mittel-Italien*, 61 seq.

[11] The existence of a Tuscan quarter (*Tuscus vicus*) in early Rome may point to nothing more than the presence in Rome of Etruscan artisans and craftsmen. But see Etruria, § *Language*.

[12] Varro, *L.L.* v. 51.

[13] Ibid. v. 74; Schwegler i. 248 seq.

[14] Ibid. v. 55; Livy i. 13.

[15] Mommsen, *R.G.* i. 43. Schwegler (*R.G.* i. 478) accepted the tradition of a Sabine settlement on the Quirinal, and considered that in the united state the Sabine element predominated. Volquardsen (*Rhein. Mus.* xxiii. 559) believed in a complete Sabine conquest; and so did Zöller (*Latium u. Rom*, Leipzig, 1878), who, however, placed it after the expulsion of the Tarquins.

[16] Cato ap. Dionys. ii. 48, 49.

[17] Ibid. ii. 48, 49. For the institution of the "ver sacrum" see Schwegler, *Röm. Gesch.* i. 240; Nissen, *Templum* iv.

This was long ago recognized by Schwegler (see his *Römische Geschichte*, passim) on the sufficient ground of the great religious cleavage between the two orders. Such jealousy of mutual contact in religious matters as is apparent all through the history of the city very rarely, if ever, springs from any other source than a real difference of race. This point was developed by Professor W. Ridgeway in his *Who were the Romans?* (London, 1908), where he points out (*a*) that the deities tended by the three greater or patrician flamens, namely, Dialis, Martialis, Quirinalis, were all closely connected with the Sabines; (*b*) further, that the patrician form of marriage, the highly religious ceremony called *Confarreatio*, differed entirely from the other forms, *Usus* and *Coemptio*, which there is reason to attribute to a plebeian origin; (*c*) that the arms, especially the round shield, carried by the first class in the originally military constitution of Servius Tullius (see below), are characteristic of the warriors of Central Europe in the Early Iron and Bronze Age, whereas those of the remaining classes can be shown to have been in general use during the immediately preceding period in the Mediterranean lands.

For other archaeological evidence separating the patricians from the plebeians, and connecting the patricians closely with the Sabines the reader must be referred to Ridgeway's essay. It is, however, well to make special mention here of the tradition, which is given by Livy (ii. 16. 4), and is undated but not the less probable for being a non-annalistic tradition, preserved in the *gens* itself, of the prompt welcome given to the Sabine Appius Claudius, the founder of the haughtiest of all the Roman noble families, by the patricians of Rome and his immediate admission to all their political privileges. Ridgeway points out that this implies, at that early time, a substantial identity of race.

On the linguistic side of the question it is well to mention for clearness' sake that this Safine or patrician class marked its ascendancy all over Central and Southern Italy, from the 6th century B.C. onwards, by its preference for forming ethnic names with the suffix *-no-* which it frequently imposed also upon the communities whom it brought under its influence. *Sabini* (earlier *Safini*), *Romani*, *Latini*, *Sidicini*, *Aricini*, *Marrucini*, and the like are all names formed in this way (see further SABINI).

2. It may also now be regarded as certain that what we may call the Lower or Earlier Stratum (or Strata) of population in Rome, themselves spoke a language which was as truly Indo-European as the language of their Safine conquerors. In the article VOLSCI will be found evidence for the conclusion that the language of what has been there entitled the Co-Folk was not less certainly Indo-European, and in some respects probably a less modified form of Indo-European, than that of the Safines. A number of the names formed with the *-co-* suffix and with the *-ati-* suffix (which is frequent in the same districts) contain unmistakably Indo-European words such as *Graviscae*, *Marica*, *dea Marica*, *Volsci*, *Casinates*, *Soracte*, *Interamnites*, *Auxumates*. The fusion of this earlier population with the patricians is far easier to imagine when it is recognized that the two parties spoke kindred though by no means identical languages. It is the essentially Indo-European character of the early inhabitants of the Latin plain which has led many scholars to doubt that there was any racial distinction at all between patricians and plebeians, but the increase of knowledge of the dialects spoken in the different regions of Italy has now enabled us to judge this question with very much fuller evidence.

3. There arises, however, the important question or questions as to the origin, or at least the ethnic connexions of this earlier stratum. The task of the historic inquirer will not be completely performed until at least some further progress has been made in connecting this earlier population of the western coast of Italy, on the one hand, with one or more of the early races (see SICULI, VENETI, LIGURIA, PELASGIANS) whom tradition declares to have once inhabited the soil of Latium; and on the other, with the people or peoples whom archaeological research reveals to us as having left behind them different strata of remains, all earlier than the Iron or Roman Age, both in Latium and in other parts of Italy. Professor Ridgeway has taken a short way with these problems which may prove to be the true one; he classes together as Ligurian all pre-Safine inhabitants of Italy save such elements as, like the Etruscans, can be shown to have invaded it over sea (see ETRURIA, § *Language*). This is one of the most promising fields of investigation now open to scholars, but in view of the confused and mutilated shape in which the traditions current in ancient times have come down to us, it demands an exceedingly careful scrutiny of the archaeological and the linguistic evidence, and exceedingly cautious judgment in combining them. The point of outstanding importance is to determine whether the earlier Indo-European population is to be regarded as having been in Italy from the beginning of human habitation. Archaeologists generally like W. Helbig (*Die Italiker der Poebene*) and more recently B. Modestov (*Introduction à l'histoire romaine*, Paris, 1907) have been inclined to regard the Ligurians as the most primitive population of Italy, but to distinguish them sharply from the people who built the Lake Settlement and Pile Dwellings, which appear (with important variations of type):—(1) in the western half of the valley of the Po; (2) in the eastern half of the same; (3) in Picenum; (4) in Latium; and (5) as far south as Tarentum. One of the most important points in the identification is the question of the method of burial employed at different epochs by the different communities. (See the works already cited, with that of O. Montelius, *La Civilisation primitive en Italie*.)

The people.

The *populus Romanus* was, we are told, divided into three tribes, Ramnes, Tities and Luceres,[1] and into thirty curiae. The three names, as Schulze has shown (*Lat. Eigennamen*, p. 580), are neither more nor less than the names of three Etruscan *gentes* (whether or not derived from Safine or Latin originals), and the tradition is a striking result of the Etruscan domination in the 6th century B.C.,[2] which we shall shortly consider.

Of far greater importance is the division into *curiae*. In Cicero's time there were still curies, curial festivals and curiate assemblies, and modern authors are unquestionably right in regarding the curia as the keystone of the primitive political system. It was a primitive association held together by participation in common *sacra*, and possessing common festivals, common priests and a common chapel, hall and hearth. As separate associations the curiae were probably older than the Roman state, but,[3] however this may be, it is certain that of this state when formed they constituted the only effective political subdivisions. The members of the thirty curiae form the *populus Romanus*, and the earliest known condition of Roman citizenship is the *communio sacrorum*, partnership in the curial *sacra*. Below the curia there was no further political division, for there is no reason to believe that the curia was ever formally subdivided into a fixed number of *gentes* and families.[4]

The king.

At their head was the *rex*, the ruler of the united people. The Roman "king" is not simply either the hereditary and patriarchal chief of a clan, the priestly head of a community bound together by common *sacra*, but the elected magistrate of a state, but a mixture of all three.[5] In later times, when no "patrician magistrates" were forthcoming to hold the elections for their successors, a procedure was adopted which was believed to represent the manner in which the early kings had been appointed.[1] In this procedure the ancient privileges of the old *gentes* and their elders, the importance of maintaining unbroken the continuity of the *sacra*, on the transmission and observance of which the welfare of the community depended, and thirdly the rights of the freemen, are all recognized. On the death of a king, the *auspicia*, and with them the supreme authority, revert to the council of elders, the *patres*, as representing the *gentes*. By the *patres* an *interrex* is appointed, who in turn nominates a second; by him, or even by a third or fourth *interrex*, a new king is selected in consultation with the *patres*. The king-designate is then proposed to the freemen assembled by their curiae for their acceptance, and finally their formal acceptance is ratified by the *patres*, as a security that the *sacra* of which they are the guardians have been respected.[2] Thus the king is in the first instance selected by the representatives of the old *gentes*, and they ratify his appointment. In form he is nominated directly by a predecessor from whose hands he receives the *auspicia*. But it is necessary also that the choice of the *patres* and the nomination of the *interrex* should be confirmed by a solemn vote of the community.

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[1] The tradition connecting the Ramnes with Romulus and the Tities with Tatius is as old as Ennius (Varro, *L.L.* v. 55). The best authorities on the question, earlier than Schulze's epoch-making treatise, are Schwegler i. 505, and Volquardsen, *Rhein. Mus.* xxxiii. 538.

[2] They are traditionally connected only with the senate of 300 *patres*, with the primitive legion of 3000, with the vestal virgins, and with the augurs (Varro, *L.L.* v. 81, 89, 91; Livy x. 6; Festus 344; Mommsen i. 41, 74, 75; Genz, *Patricisch. Rom*, 90).

[3] It is possible that the curiae were originally connected with separate localities; cf. such names as Foriensis, Veliensis (Fest. 174; Gilbert i. 213).

[4] Niebuhr's supposition of ten *gentes* in each curia has nothing in its favour but the confused statement of Dionysius as to the purely military δεκάδες (Dionys. ii. 7; cf. Müller, *Philologus*, xxxiv. 96).

[5] Rubino, Genz and Lange insisted on the hereditary patriarchal character of the kingship, Ihne on its priestly side, Schwegler on its elective. Mommsen came nearest to the view taken in the text, but

It is useless to attempt a precise definition of the prerogatives of the king when once installed in office. Tradition ascribes to him a position and powers closely resembling those of the heroic kings of Greece. He rules for life, and he is the sole ruler, unfettered by written statutes. He is the supreme judge, settling all disputes and punishing wrongdoers even with death. All other officials are appointed by him. He imposes taxes, distributes lands and erects buildings. Senate and assembly meet only when he convenes them, and meet for little else than to receive communications from him. In war he is absolute leader,[3] and finally he is also the religious head of the community. It is his business to consult the gods on its behalf, to offer the solemn sacrifices and to announce the days of the public festivals. Hard by his house was the common hearth of the state, where the vestal virgins cherished the sacred fire.

The senate.

By the side of the king stood the senate, or council of elders. In the descriptions left us of the primitive senate, as in those of the *rex*, we can discover traces of a transition from an earlier state of things when Rome was only an assemblage of clans or village communities, allied indeed, but each still ruled by its own chiefs and headmen, to one in which these groups have been fused into a single state under a common ruler. On the one hand the senate appears as a representative council of chiefs, with inalienable prerogatives of its own, and claiming to be the ultimate depositary of the supreme authority and of the *sacra* connected with it. The senators are the *patres*; they are taken from the leading *gentes*; they hold their seats for life; to them the *auspicia* revert on the death of a king; they appoint the *interrex* from their own body, are consulted in the choice of the new king,[4] and their sanction is necessary to ratify the vote of the assembled freemen. On the other hand, they are no longer supreme. They cannot appoint a king but with the consent of the community, and their relation to the king when appointed is one of subordination. Vacancies in their ranks are filled up by him, and they can but give him advice and counsel when he chooses to consult them.

The assembly.

The popular assembly of united Rome in its earliest days was that in which the freemen met and voted by their curiae (*comitia curiata*[5]). The place of assembly was in the Comitium at the north-east end of the Forum,[6] at the summons and under the presidency of the king or, failing him, of the *interrex*. By the *rex* or the *interrex* the question was put, and the voting took place *curiatim*, the curiae being called up in turn. The vote of each curia was decided by the majority of individual votes, and a majority of the votes of the curiae determined the final result. But the occasions on which the assembly could exercise its power must have been few. Their right to elect magistrates was apparently limited to the acceptance or rejection of the king proposed by the *interrex*. Of the passing of laws, in the later sense of the term, there is no trace in the kingly period. Dionysius's statement[7] that they voted on questions of war and peace is improbable in itself and unsupported by tradition. They are indeed represented, in one instance, as deciding a capital case, but it is by the express permission of the king and not of right.[8] Assemblies of the people were also, and probably more frequently, convened for other purposes. Not only did they meet to hear from the king the announcement of the high days and holidays for each month, and to witness such solemn religious rites as the inauguration of a priest, but their presence (and sometimes their vote) was further required to authorize and attest certain acts, which in a later age assumed a more private character. The disposal of property by will[9] and the solemn renunciation of family or gentile *sacra*[10] could only take place in the presence of the assembled freemen, while for adoption[11] (*adrogatio*) not only their presence but their formal consent was necessary.

Rome under the kings.

A history of this early Roman state is out of the question. The names, dates and achievements of the first four kings are all too unsubstantial to form the basis of a sober narrative;[12] a few points only can be considered as fairly well established. If we except the long eventless reign ascribed to King Numa, tradition represents the first kings as incessantly at war with their immediate neighbours. The details of these wars are no doubt mythical; but the implied condition of continual struggle, and the narrow range within which the struggle is confined, may be accepted as true. The picture drawn is that of a small community, with a few square miles of territory, at deadly feud with its nearest neighbours, within a radius of some 12 m. round Rome. Nor, in spite of the repeated victories with which tradition credits Romulus, Ancus and Tullus, does there seem to have been any real extension of Roman territory except towards the sea. Fidenae remains Etruscan; the Sabines continue masters up to the Anio; Praeneste, Gabii and Tusculum are still untouched; and on this side it is doubtful if Roman territory, in spite of the possible destruction of Alba, extended to a greater distance than the sixth milestone from Rome.[13] But along the course

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failed to bring out the nature of the compromise on which the kingship rests.

[1] Cic. *De Legg.* iii. 3; Livy iv. 7.

[2] "Patres auctores facti," Livy i. 22; "patres fuere auctores," ibid. i. 32. In 336 B.C. (Livy viii. 12) the Publilian law directed that this sanction should be given beforehand, "ante initum suffragium," and thus reduced it to a meaningless form (Livy i. 11). It is wrongly identified by Schwegler with the "lex curiata de imperio," which in Cicero's day followed and did not precede election. According to Cicero (*De Rep.* ii. 13, 21), the proceedings included, in addition to the "creation" by the *comitia curiata* and the sanction of the *patres*, the introduction by the king himself of a *lex curiata* conferring the *imperium* and *auspicia*; but this theory, though generally accepted, is probably an inference from the practice of a later time, when the *creatio* had been transferred to the *comitia centuriata*.

[3] For the references, see Schwegler i. 646 seq.

[4] If the analogy of the *rex sacrorum* is to be trusted, the "king" could only be chosen from the ranks of the *patricii*. Cic. *Pro Domo*, 14; Gaius i. 122.

[5] Cic. *De Rep.* ii. 13; Dionys. ii. 14, &c.

[6] Varro, *L.L.* v. 155. For the position of the Comitium, see Smith, *Dict. Geog.*, *s.v.* "Roma," and Jordan, *Topog. d. Stadt Rom.* (Petersen).

[7] Dionys. *l.c.*

[8] Livy i. 26; Dionys. iii. 22.

[9] Gaius ii. 101.

[10] Gell. xv. 27.

[11] Gell. v. 19, "Comitia praebentur, quae curiata appellantur." Cf. Cic. *Pro Domo*, 13, 14; and see ROMAN LAW.

[12] By far the most complete criticism of the traditional accounts of the first four kings will be found in Schwegler's *Röm. Geschichte*, vol. i.; compare also Ihne's *Early Rome* and Sir G. C. Lewis's *Credibility of Early Roman History*. More recently, E. Pais (*Storia d'Italia*) has subjected the early legends to learned and often suggestive criticism, but without attaining very solid results.

[13] The *fossa Cluilia*, 5 m. from Rome (Livy ii. 39), is regarded by Schwegler (i. 585) and by Mommsen (i. 45) as marking the Roman frontier towards Latium. Cf. Ovid. *Fast.* ii. 681; Strabo 230, "μεταξὺ γοῦν τοῦ πέμπτου καὶ τοῦ ἕκτου λίθου . . . τόπος Φῆστοι . . . ὅριον τῆς τότε Ῥωμαίων γῆς."

of the Tiber below the city there was a decided advance. The fortification of the Janiculum, the building of the *pons sublicius*, the foundation of Ostia and the acquisition of the salt-works near the sea may all be safely ascribed to this early period. Closely connected, too, with the control of the Tiber from Rome to the sea was the subjugation of the petty Latin communities lying south of the river; and the tradition of the conquest and destruction of Politorium, Tellenae and Ficana is confirmed by the absence in historical times of any Latin communities in this district.

The Tarquins.

With the reign of the fifth king Tarquinius Priscus a marked change takes place. The traditional accounts of the last three kings not only wear a more historical air than those of the first four, but they describe something like a transformation of the Roman city and state. Under the rule of these latter kings the separate settlements are for the first time enclosed with a rampart of colossal size and extent.[1] The low grounds are drained, and a forum and circus elaborately laid out; on the Capitoline Mount a temple is erected, the massive foundations of which were an object of wonder even to Pliny.[2] To the same period are assigned the redivision of the city area into four new districts and the introduction of a new military system. The kings increase in power and surround themselves with new splendour. Abroad, too, Rome suddenly appears as a powerful state ruling far and wide over southern Etruria and Latium. These startling changes are, moreover, ascribed to kings of alien descent, who one and all ascend the throne in the teeth of established constitutional forms. Finally, with the expulsion of the last of them—the younger Tarquin—comes a sudden shrinkage of power. At the commencement of the Republic Rome is once more a comparatively small state, with hostile and independent neighbours at her very doors. It is impossible to doubt the conviction that the true explanation of this phenomenon is to be found in the supposition that Rome during this period passed under the rule of powerful Etruscan lords.[3] In the 7th and 6th centuries B.C., and probably earlier still, the Etruscans appear as ruling widely outside the limits of Etruria proper. They were supreme in the valley of the Po until their power there was broken by the irruption of Celtic tribes from beyond the Alps, and while still masters of the plains of Lombardy they established themselves in the rich lowlands of Campania, where they held their ground until the capture of Capua by the Samnite highlanders in 423 B.C. It is on the face of it improbable that a power which had extended its sway from the Alps to the Tiber, and from the Liris to Surrentum, should have left untouched the intervening stretch of country between the Tiber and the Liris. And there is abundant evidence of Etruscan rule in Latium.[4] According to Dionysius there was a time when the Latins were known to the Greeks as Tyrrhenians, and Rome as a Tyrrhenian city.[5] When Aeneas landed in Italy the Latins were at feud with Turnus (Turrhenos? Dionys. i. 64) of Ardea, whose close ally was the ruthless Mezentius, prince of Caere, to whom the Latins had been forced to pay a tribute of wine.[6] Cato declared the Volsci to have been once subject to Etruscan rule,[7] and Etruscan remains found at Velitrae,[8] as well as the second name of the Volscian Anxur, Tarracina (the city of Tarchon), confirm his statement. Nearer still to Rome is Tusculum, with its significant name, at Praeneste we have a great number of Etruscan inscriptions and bronzes, and at Alba we hear of a prince Ταρχέτιος,[9] lawless and cruel like Mezentius, who consults the "oracle of Tethys in Tyrrhenia." Thus we find the Etruscan power encircling Rome on all sides, and in Rome itself a tradition of the rule of princes of Etruscan origin. The Tarquinii come from south Etruria; their name can hardly be anything else than the Latin equivalent of the Etruscan Tarchon, and is therefore possibly a title (= "lord" or "prince") rather than a proper name.[10] Even Servius Tullius was identified by Tuscan chroniclers with an Etruscan "Mastarna."[11] Again, what we are told of Etruscan conquests does not represent them as moving, like the Sabellian tribes, in large bodies and settling down *en masse* in the conquered districts. We hear rather of military raids led by ambitious chiefs who carve out principalities for themselves with their own good swords, and with their followers rule oppressively over alien and subject peoples.[12] And so at Rome the story of the Tarquins implies not a wave of Etruscan immigration so much as a rule of Etruscan princes over conquered Latins.

The achievements ascribed to the Tarquins are not less characteristic. Their despotic rule and splendour contrast with the primitive simplicity of the native kings. Only Etruscan builders, under the direction of wealthy and powerful Etruscan lords, could have built the great cloaca, the Servian wall, or the Capitoline temple,—monuments which challenged comparison with those of the emperors themselves. Nor do the traces of Greek influence upon Rome during this period[13] conflict with the theory of an Etruscan supremacy; on the contrary, it is at least possible that it was thanks to the extended rule and wide connexions of her Etruscan rulers that Rome was first brought into direct contact with the Greeks, who had long traded with the Etruscan ports and influenced Etruscan culture.[14]

The Servian reforms.

The Etruscan princes are represented, not only as having raised Rome for the time to a commanding position in Latium and lavished upon the city itself the resources of Etruscan civilization, but also as the authors of important internal changes. They are represented as favouring new men at the expense of the old patrician families, and as reorganizing the Roman army on a new footing, a policy natural enough in military princes of alien birth, and rendered possible by the additions which conquest had made to the original community. From among the leading families of the conquered Latin states a hundred new members were admitted to the senate, and these *gentes* thenceforth ranked as patrician, and became known as *gentes minores*.[15] The changes in the army begun, it is said, by the elder Tarquin and completed by Servius Tullius were more important. The basis of the primitive military system had been three tribes, each of which furnished 1000 men to the legion and 100 to the cavalry.[16] Tarquinius Priscus, we are told, contemplated the creation of three fresh tribes and three additional centuries of horsemen with new names,[17] though in face of the opposition offered by the old families he contented himself with simply doubling the strength without altering the names of the old divisions.[18] But the change attributed to Servius Tullius went far beyond this. His famous distribution of all freeholders (*assidui*) into tribes, classes and centuries,[19] though subsequently adopted with modifications as the basis of the political system, was at first exclusively military in its nature and objects.[1] It amounted, in fact, to the formation of a new and enlarged army on a new footing. In this force, excepting in the case of the centuries of the horsemen, no regard was paid either to the old clan divisions or to the semi-religious, semi-political curiae. In its ranks were included all freeholders within the Roman territory, whether members or not of any of the old divisions, and the organization of this new army of *assidui* was not less independent of the old system with its clannish and religious traditions and forms. The unit was the *centuria* or company of 100 men; the *centuriae* were grouped in "classes" and drawn up in the order of the phalanx.[2] The centuries in front were composed of the wealthier citizens, whose means enabled them to bear the cost of the complete equipments necessary for those who were to bear the brunt of the onset. These centuries formed the first class. Behind them stood the centuries of the second and third classes, less completely armed, but making up together with those of the first class the heavy-armed infantry.[3] In the rear were the centuries of the fourth and fifth classes, recruited from the poorer freeholders, and serving only as light-armed troops. The entire available body of freeholders was divided into two equal portions, a reserve corps of *seniores* and a corps of *juniores* for active service. Each of these corps consisted of 85 centuries or 8500 men, *i.e.* of two legions of about 4200 men each, the normal strength of a consular legion under the early Republic.[4] It is noticeable also that the heavy-armed centuries of the three first classes in each of these legions represented a total of 3000 men, a number which agrees exactly with the number of heavy-armed troops in the legion as described by Polybius. Attached to the legions, but not included in them, were the companies of sappers and trumpeters. Lastly, to the six centuries of horsemen, which still retained the old tribal names, twelve more were added as a distinct body, and recruited from the wealthiest class of citizens.[5] The four "tribes" also instituted by Servius were probably intended to serve as the bases for the levy of freeholders for the new army.[6] As their names show, they corresponded with the natural local divisions of the city territory.[7]

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[1] Livy i. 36.

[2] Ibid. i. 38, 55; Plin. *N.H.* xxxvi. 15.

[3] This was the view of O. Müller, and more recently of Deecke, Gardthausen and Zöller.

[4] W. Schulze, *Gesch. d. Lat. Eigennamen*, passim (esp. pp. 579 ff.); Zöller, *Latium u. Rom*, 166, 189; Gardthausen, *Mastarna* (Leipzig, 1882).

[5] Dionys. i. 29.

[6] Livy i. 2; Dionys. i. 64, 65; Plut. *Q.R.* 18.

[7] Cato ap. Serv. *Aen.* xi. 567.

[8] Helbig, *Ann. d. Inst.* (1865).

[9] Plut. *Rom.* 2. παρανομώτατος καὶ ὠμότατος; cf. Rutulian Tarquitius, Virg. *Aen.* x. 550.

[10] Müller-Deecke, i. 69, 70; Zöller, *Latium u. Rom*, 168; cf. Strabo, p. 219; Serv. on *Aen.* x. 179, 198. The existence of an independent "gens Tarquinia" of Roman extraction (Schwegler, i. 678) is unproven and unlikely. See now Schulze, *Lat. Eigennamen*, pp. 95 and 402 n. 6.

[11] See speech of Claudius, *Tab. Lugd.* App. to Nipperdey's edition of the *Annals* of Tacitus, "Tusce Mastarna ei nomen erat." For the painting in the François tomb at Vulci, see Gardthausen, *Mastarna*, 29 seq.; *Annali dell. Instit.* (Rome, 1859).

[12] Cf. the traditions of Mezentius, of Caeles Vibenna, Porsena, &c.

[13] Schwegler, *R.G.* i. 679 seq.

[14] *Ibid.* i. 791, 792. He accepts as genuine, and as representing the extent of Roman rule and connexions under the Tarquins, the first treaty between Rome and Carthage mentioned by Polybius (iii. 22); see, for a discussion of the question, Vollmer, *Rhein. Mus.* xxxii. 614 seq.; Mommsen, *Röm. Chronologie*, 20; Dyer, *Journ. of Philol.* ix. 238.

[15] Livy i. 35; Dionys. iii. 67; Cic. *De Rep.* ii. 20.

[16] Varro, *L.L.* v. 89.

[17] Livy i. 36; Dionys. iii. 71.

[18] The six centuries of horsemen were thenceforward known as "primi secundique Ramnes" (Fest. 344; cf. Schwegler, i. 685 seq.). It is possible that the reforms of Tarquinius Priscus were limited to the cavalry.

[19] Cic. *De Rep.* ii. 22; Livy i. 42; Dionys. iv. 16.

Fall of the monarchy.

The last of these Etruscan lords to rule in Rome was Tarquin the Proud. He is described as a splendid and despotic monarch. His sway extended over Latium as far south as Circeii. Aristodemus, tyrant of Cumae, was his ally, and kinsmen of his own were princes at Collatia, at Gabii, and at Tusculum. The Volscian highlanders were chastised, and Signia with its massive walls was built to hold them in check. In Rome itself the Capitoline temple and the great cloaca bore witness to his power. But his rule pressed heavily upon the Romans, and at the last, on the news of the foul wrong done by his son Sextus to a noble Roman matron, Lucretia, the indignant people rose in revolt. Tarquin, who was away besieging Ardea, was deposed; sentence of exile was passed upon him and upon all his race; and the people swore that never again should a king rule in Rome. Freed from the tyrant, they chose for themselves two yearly magistrates who should exercise the supreme authority, and thus the Republic of Rome was founded. Three times the banished Tarquin strove desperately to recover the throne he had lost. First of all the men of Veii and Tarquinii marched to his aid, but were defeated in a pitched battle on the Roman frontier. A year later Lars Porsena, prince of Clusium, at the head of all the powers of Etruria, appeared before the gates of Rome, and closely besieged the city, until, moved by the valour of his foe, he granted honourable terms of peace and withdrew.[8] Once again, by Lake Regillus, the Romans fought victoriously for their liberty against Tarquin's son-in-law Mamilius, prince of Tusculum, and chief of the Latin name. Mamilius was slain; Tarquin in despair found a refuge at Cumae, and there soon afterwards died.

So, in brief, ran the story of the flight of the kings, as it was told by the chroniclers whose story Livy reports, though with explicit and repeated notes of reserve. Its details are most of them fabulous; it is crowded with inconsistencies and improbabilities; there are no trustworthy dates; the names even of the chief actors are probably fictitious, and the hand of the improver, Greek or Roman, is traceable throughout.[9] But there is no room for doubting the main facts of the emancipation of Rome from the rule of alien princes and the final abolition of the kingly office. (H. F. P.; R. S. C.)

II. *The Republic.*

245–189 A.U.C.

Period A: 509–265 B.C.[10]—(*a*) *The Struggle between the Orders.*—It is characteristic of Rome that the change from monarchy to republic[11] should have been made with the least possible disturbance of existing forms. The title of king was retained, though only as that of a priestly officer (*rex sacrorum*) to whom some of the religious functions of the former kings were transferred. The two annually elected consuls, or *praetores*,[12] were regarded as joint heirs of the full kingly authority, and as holding the *imperium*, and the correlative right of taking the auspices, by direct transmission from the founder of the city. They were, it is true, elected or designated by a new assembly, by the army of landholders voting by their classes and centuries (*comitia centuriata*), and to this body was given also the right of passing laws; nevertheless it was still by a vote of the thirty curiae (*lex curiata*) that the supreme authority was formally conferred on the magistrates chosen by the centuries of landholders, and both the choice of magistrates and the passing of laws still required the sanction of the patrician senators (*patrum auctoritas*).[13] Nor, lastly, were the legal prerogatives of the senate altered, although it is probable that before long plebeians were admitted to seats, if not to votes, and though its importance was gradually increased by the substitution of an annual magistracy for the lifelong rule of a single king. But the abolition of the monarchy brought with it a change of the utmost importance in the actual working of the constitution. Though the distinction between patricians and plebeians was at least as old as the state itself, it is not until the establishment of the Republic that it plays any part in the history of Rome. No sooner, however, was the overshadowing authority of the king removed than a struggle commenced between the two orders which lasted for more than two centuries. It was in no sense a struggle between a conquering and a conquered class, or between an exclusive citizen body and an unenfranchised mass outside its pale. Patricians and plebeians were equally citizens of Rome, sprung of the same race and speaking the same tongue (but see above).[1] The former were the members of those ancient *gentes* which had possibly been once the "chiefly" families in the small communities which preceded the united state, and which claimed by hereditary right a privileged position in the community. Only patricians could sit in the council of *patres*, and hence probably the name given to their order.[2] To their representatives the supreme authority reverted on the death of the king; the due transmission of the *auspicia* and the public worship of the state gods were their special care; and to them alone were known the traditional usages and forms which regulated the life of the people from day to day. To the *plebs* (the multitude, πλῆθος) belonged all who were not members of some patrician *gens*, whether independent freemen or attached as "clients"[3] to one of the great houses. The plebeian was a citizen, with civil rights and a vote in the assembly of the curies, but he was excluded by ancient custom from all share in the higher honours of the state, and intermarriage with a patrician was not recognized as a properly legal union[4] (see PATRICIANS).

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[1] This is recognized by Mommsen, Genz and Soltau, as against Niebuhr, Schwegler and Ihne. Even in the later *comitia centuriata* the traces of the originally military character of the organization are unmistakable.

[2] The century ceased to represent companies of one hundred when the whole organization ceased to be military and became exclusively political.

[3] The property qualification for service in the first class is given at 100,000 asses (Livy), for the second at 70,000, third 50,000, fourth 25,000, fifth 11,000. It was probably originally a certain number of cows, afterwards translated into terms of money; cf. W. Ridgeway, *The Origin of Coinage and Metallic Currency* (Cambridge, 1892), p. 391. The same scholar, in his *Who were the Romans?* p. 17, has pointed out the ethnical meaning of the varieties of armature in the early army.

[4] Polyb. vi. 20; Mommsen, *Röm. Trib.* 132 seq.

[5] Livy i. 43. Dionys. (iv. 18) and Cic. (*De Rep.* ii. 22) ascribe the whole eighteen to Servius. But the six older centuries remained distinct, as the "sex suffragia" of the *comitia centuriata*; Cic. *De Rep.* ii. 22.

[6] Dionys. iv. 14, *εἰς τὰς καταγραφὰς τῶν στρατιωτῶν.*

[7] Livy i. 43. The four were Palatina, Suburana, Exquilina, Collina.

[8] Livy ii. 9–14. Pliny (*N.H.* 34, 14) and Tacitus (*Ann.* iii. 72) imply the existence of a tradition, possibly that of "Tuscan annalists," according to which Porsena actually made himself master of Rome. The whole story is fully criticized by Schwegler (ii. 181 seq.) and Zöller (*Latium u. Rom*, p. 180).

[9] See the exhaustive criticism in Schwegler (ii. pp. 66–203).

[10] The traditional account of early republican history, given in annalistic form by Livy, has been subjected to severe criticism in recent times, notably by Pais in his *Storia di Roma*, vols. i. and ii. It is true that the dearth of contemporary documents, especially for the period before the sack of Rome by the Gauls (390 B.C.), must have led to the filling of gaps by episodes drawn mainly from popular traditions, and it is therefore impossible to guarantee the accuracy of the narrative in details. Nevertheless, the general truth of the story of Rome's early wars and constitutional growth cannot be seriously impugned.

[11] Schwegler (ii. 92) suggests that the dictatorship formed an intermediate step between the monarchy and the consulate; cf. Ihne, *Röm. Forsch.* 42.

[12] That the consuls were originally styled *praetores* is stated by Varro, *ap. Non.* p. 23, and Liv. iii. 55; cf. Cic. *Legg.* viii. 3, 8. When additional praetors were created, the two originally appointed were called *praetores maximi* and hence *στρατηγοὶ ὕπατοι* or simply *ὕπατοι* in Greek.

[13] The view of the *patrum auctoritas* here adopted is that taken by T. Mommsen (*Forsch.* i.).

The revolution which expelled the Tarquins gave the patricians, who had mainly assisted in bringing it about, an overwhelming ascendancy in the state. The *plebs* had indeed gained something. Not only is it probable that the strictness of the old tie of clientship had somewhat relaxed, and that the number of the *clientes* was smaller and their dependence on patrician patrons less complete, but the ranks of the *plebs* had, under the later kings, been swelled by the admission of conquered Latins, and the freeholders among these had with others been enrolled in the Servian tribes, classes and centuries. The establishment of the Republic invested this military levy of landholders with political rights as an assembly, for by their votes the consuls were chosen and laws passed, and it was the plebeian landholders who formed the main strength of the *plebs* in the struggle that followed. But these gains were greater in appearance than in reality. The plebeian landholders commanded only a minority of votes in the *comitia centuriata*. In their choice of magistrates they were limited to the patrician candidates nominated by patrician presiding magistrates, and their choice required confirmation not only by the older and smaller assembly of the curiae, in which the patricians and their clients predominated, but also by the patrician *patres*. They could only vote on laws proposed by patrician consuls, and here again the subsequent sanction of the *patres* was necessary. The whole procedure of the *comitia* was in short absolutely in the hands of their patrician presidents, and liable to every sort of interruption and suspension from patrician pontiffs and augurs (for details see further COMITIA and SENATE).

But these political disabilities did not constitute the main grievance of the *plebs* in the early years of the Republic. What they fought for was protection for their lives and liberties, and the object of attack was the despotic authority of the patrician magistrates. The consuls wielded the full *imperium* of the kings, and against this "consular authority" the plebeian, though a citizen, had no protection and no appeal, nor were matters improved when for the two consuls was substituted in some emergency a single, all-powerful, irresponsible dictator.

Lex Valeria de provocatione.

The history of this struggle between the orders opens with a concession made to the *plebs* by one of the consuls themselves, a concession possibly due to a desire to secure the allegiance of the plebeian landholders, who formed the backbone of the army. In the first year of the Republic, according to the received chronology, P. Valerius Publicola or Poplicola carried in the *comitia centuriata* his famous law of appeal.[5] It enacted that no magistrate, saving only a dictator, should execute a capital sentence upon any Roman citizen unless the sentence had been confirmed on appeal by the assembly of the centuries. But, though the "right of appeal" granted by this law was justly regarded in later times as the greatest safeguard of a Roman's liberties, it was by no means at first so effective a protection as it afterwards became. For not only was the operation of the law limited to the bounds of the city, so that the consul in the field or on the march was left as absolute as before, but no security was provided for its observance even within the city by consuls resolved to disregard it.[6]

The first secession and the tribunate.

It was by their own efforts that the plebeians first obtained any real protection against magisterial despotism. The traditional accounts of the first secession are confused and contradictory,[7] but its causes and results are tolerably clear. The seceders were the plebeian legionaries recently returned from a victorious campaign. Indignant at the delay of the promised reforms, they ignored the order given them to march afresh against Volsci and Aequi, and instead entrenched themselves on a hill across the Anio, some 3 m. from Rome, and known afterwards as the Mons Sacer. The frightened patricians came to terms, and a solemn agreement (*lex sacrata*)[8] was concluded between the orders, by which it was provided that henceforth the plebeians should have annual magistrates of their own called tribunes (*tribuni plebis*), members of their own order, who should be authorized to protect them against the consuls,[9] and a curse was invoked upon the man who should injure or impede the tribune in the performance of his duties.[10] The number of tribunes was possibly at first two, then five; before 449 B.C. it had been raised to ten.

The tribunate is an institution which has no parallel in history. The tribune was not, and, strictly speaking, never became, a magistrate of the Roman people. His one proper prerogative was that of granting protection to the oppressed plebeian against a patrician officer. This prerogative (*jus auxilii*) was secured to him, not by the ordinary constitution, but by a special compact between the orders, and was protected by the ancient oath (*vetus jusjurandum*),[11] which invoked a curse upon the violator of a tribune. This exceptional and anomalous right the tribunes could only exercise in person, within the limits of the "pomoerium," and against individual acts of magisterial oppression.[12] It was only gradually that it expanded into a wide power of interference with the whole machinery of government, and was supplemented by the legislative powers which rendered the tribunate of the last century B.C. so formidable (see TRIBUNE).

Lex Publilia.

But from the first the tribunes were for the *plebs* not only protectors but leaders, under whom they organized themselves in opposition to the patricians. The tribunes convened assemblies of the *plebs* (*concilia plebis*), and carried resolutions on questions of interest to the order. This incipient plebeian organization was materially advanced by the Publilian **283.** law of 471 B.C.,[1] which appears to have formally recognized as lawful the plebeian *concilia*, and established also the tribune's right *cum plebe agere*, *i.e.* to propose and carry resolutions in them. These assemblies were *tributa*, or, in other words, the voting in them took place not by curies or centuries but by tribes. In them, lastly, after the Publilian law, if not before, the tribunes were annually elected.[2] By this law the foundations were laid both of the powerful *concilia plebis* of later days and also of the legislative and judicial prerogatives of the tribunes. The patricians maintained indeed that resolutions (*plebiscita*) carried by tribunes in the *concilia plebis* were not binding on their order, but the moral weight of such resolutions, whether they affirmed a general principle or pronounced sentence of condemnation on some single patrician, was no doubt considerable.

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[1] This is the view taken by the present writer, as against Schwegler and others. For Ridgeway's theory, see above.

[2] Cf. *aedilis*, *aedilicius*, &c.; Cic. *De Rep.* ii. 12; Livy i. 8; for a full discussion of other views, see Soltau 179 seq.; Christensen, *Hermes*, ix. 196.

[3] For the clientela, see Mommsen (*Forsch.* i. 355 sqq.; *Staatsr.* iii. 54 sqq.); Schwegler (i. 638 sqq.); Pauly-Wissowa, *Realencyklopädie*, iv. 23 sqq. (von Premerstein).

[4] The offspring of such a union ranked as plebeians.

[5] Livy ii. 8, *lex Valeria de provocatione*; Cic. *De Rep.* ii. 31; cf. Livy iii. 20.

[6] Greenidge, *Legal Procedure of Cicero's Time*, pp. 344 sqq.

[7] Schwegler ii. 226 seq.

[8] Ibid. ii. 251 n.; Livy i. 33.

[9] Cic. *De Rep.* ii. 34, "contra consulare imperium creati."

[10] Livy iii. 55.

[11] Festus 318.

[12] Gell. xiii. 12, "ut injuria quae coram fieret arceretur."

The next stage in the struggle is marked by the attempt to substitute a public written law for unwritten usage.

292. The proposal of C. Terentilius Arsa (462 B.C.) to appoint a plebeian commission to draw up laws restricting the powers of the consuls[3] was resolutely opposed by the patricians, but after ten years of bitter party strife a compromise was effected. A commission of ten patricians was appointed, who **The Decemvirate.** should frame and publish a code of law binding equally on both the orders. These decemviri were to be the sole and supreme magistrates for the year, and the law of appeal was suspended in their favour.[4] The code which they promulgated, the famous XII. Tables, owed little of its importance to any novelties or improvements contained in its provisions. For the most part it seems merely to have reaffirmed existing usages and laws (see ROMAN LAW). But it imposed, as it was intended to do, a check on the arbitrary administration of justice by the magistrates. With the publication of the code the proper work of the decemvirs was finished; nevertheless, for the next year a fresh decemvirate was elected, and it is conceivable that the intention was permanently to substitute government by an irresponsible patrician "council of ten" for the old constitution.[5] However this may have been, the tyranny of the decemvirs themselves was fatal to the continuance of their power. We are told of a second secession of the *plebs*, this time to the Janiculum, and of negotiations with the senate, the result of which was the enforced abdication of the decemvirs. The *plebs* joyfully chose for themselves tribunes, and in the *comitia centuriata* two consuls were created. But this restoration of the old régime was accompanied by legislation which **Valerio-Horatian laws.** made it an important crisis in the history of the struggle between the orders. With the fall of the decemvirate this struggle enters upon a new phase. The tribunes appear as at once more powerful and more strictly constitutional magistrates; the plebeian *concilia* take their place by the side of the older assemblies; and finally this improved machinery is used not simply in self-defence against patrician oppression but to obtain complete political equality. This change was no doubt due in part to circumstances outside legislation, above all to the expansion of the Roman state, which swelled the numbers and added to the social importance of the *plebs* as compared with the dwindling forces of the close corporation of patrician *gentes*. Still the legislation of 449 clearly involved more than a restoration of the old form of government. The Valerio-Horatian laws, besides reaffirming the right of appeal and the inviolability of the tribunes, improved the position of the plebeian assemblies by enacting that *plebiscita* passed in them, and, as seems probable, approved by the *patres*, should be binding on patricians as well as plebeians.[6] By this law the tribunes obtained a recognized initiative in legislation. Henceforth the desired reforms were introduced and carried by tribunes in what were now styled *comitia tributa*, and, if sanctioned by the *patres*, became laws of the state. From this period, too, must be dated the legalization at any rate of the tribune's right to impeach any citizen before the assembly of the tribes.[7] Henceforward there is no question of the tribune's right to propose to the *plebs* to impose a fine, or of the validity of the sentence when passed. The efficiency of these new weapons of attack was amply proved by the subsequent course of the struggle. Only a few years after the Valerio-Horatian legislation came the *lex Canuleia*, itself a *plebiscitum* (445 B.C.), by which mixed marriages between patricians **Lex Canuleia.** and plebeians were declared lawful, and the social exclusiveness of the patriciate broken down. In the **309.** same year with this measure, and like it in the interests primarily of the wealthier plebeians, a vigorous attack commenced on the patrician monopoly of the consulate, and round this **Leges Liciniae Sextiae.** stronghold of patrician ascendancy the conflict raged until the passing of the Licinian laws in 367. The **387.** original proposal of the tribune Gaius Canuleius, in 445, that the people should be allowed to elect a plebeian consul was evaded by a compromise. The senate resolved that for the next year, in the stead of consuls, six military tribunes with consular powers should be elected,[8] and that the new office should be open to patricians and plebeians alike. The consulship was thus for the time saved from pollution, as the patricians phrased it, but the growing strength of the *plebs* is shown by the fact that in fifty years out of the seventy-eight between 444 and 366 they succeeded in obtaining the election of consular tribunes rather than of consuls. **310-88.** Despite, however, these discouragements, the patricians fought on. Each year they strove to secure the creation of consuls rather than consular tribunes, and failing this strained every nerve to secure for their own order at least a majority among the latter. Even the institution of the censorship (435), though **319.** rendered desirable by the increasing importance and complexity of the census, was, it is probable, due in part to their desire to discount beforehand the threatened loss of the consulship by diminishing its powers.[9] Other causes, too, helped to protract the struggle. Between the wealthier plebeians, who were ambitious of high office, and the poorer, whose minds were set rather on allotments of land, there was a division of interest of which the patricians were not slow to take advantage, and to this must be added the pressure of war. The death struggle with Veii and the sack of Rome by the Gauls absorbed for the time all the energies of the community. In 377, however, **377.** two of the tribunes, C. Licinius Stolo (see LICINIUS STOLO, GAIUS) and L. Sextius, came forward with proposals which united all sections of the *plebs* in their support. Their proposals were as follows:[10] (1) that consuls and not consular tribunes be elected; (2) that one consul at least should be a plebeian; (3) that the priestly college, which had the charge of the Sibylline books, should consist of ten members instead of two, and that of these half should be plebeians; (4) that no single citizen should hold in occupation more than 500 acres of the common lands, or pasture upon them more than 100 head of cattle and 500 sheep; (5) that all landowners should employ a certain amount of free as well as slave labour on their estates; (6) that interest already paid on debts should be deducted from the principal, and the remainder paid off in three years. The three last proposals were obviously intended to meet the demands of the poorer plebeians, and to secure their support for the first half of the scheme. Ten years of bitter conflict followed, but at last, in 367 B.C., the Licinian rogations 387. became law, and one of their authors, L. Sextius, was created the first plebeian consul. For the moment it was some consolation to the patricians that they not only succeeded in detaching from the consulship the administration of civil law, which was entrusted to a separate officer, *praetor urbanus*, to be elected by the *comitia* of the centuries, with an understanding apparently that he should be a patrician, but also obtained the institution of two additional aediles (*aediles curules*), who were in like manner to be members of their own order.[1] With the opening of the consulship, however, the issue of the long contest was virtually decided, and the next eighty years witnessed a rapid succession of plebeian victories. Now that a plebeian consul might preside at the elections, the main difficulty **Opening of the magistracies.** in the way of the nomination and election of plebeian candidates was removed. The proposed patrician monopoly of the new curule aedileship was almost 398. 404. instantly abandoned. In 356 the first plebeian was made dictator; in 350 the censorship, and in 417. 337 the praetorship were filled for the first time by 454. plebeians; and lastly, in 300, by the *lex Ogulnia*, even the sacred colleges of the pontiffs and augurs, the old strongholds of patrician supremacy, were thrown open to the *plebs*.[2] The patricians lost also the control they had exercised so long over the action of the people in assembly. The *patrum auctoritas*, the sanction given or refused by the patrician senators to laws and to elections, had hitherto been a powerful 415. weapon in their hands. But in 339 a law of Q. Publilius **Publilian laws.** Philo, a plebeian dictator, enacted that this sanction should be given beforehand to laws enacted in the *comitia centuriata*,[3] and a *lex Maenia* of uncertain date extended the rule to elections in the same assembly. Livy ascribes to the same Publilius a law emancipating the *concilium plebis* **Lex Hortensia,** 467. from the control of the *patres*; but this seems in reality to have been effected by the famous *lex Hortensia*, carried by another plebeian dictator.[4] Henceforward the *patrum auctoritas* sank into a meaningless form, though as such it still survived in the time of Livy. From 287 onwards it is certain that measures passed by the *plebs*, voting by their tribes, had the full force of laws without any further conditions whatsoever. The legislative independence of the plebeian assembly was secured, and with this crowning victory ended the long struggle between the orders.

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[1] Livy ii. 56, 60; Dionys. ix. 41; Schwegler ii. 541; Soltau 493.

[2] For theories as to the original mode of appointing tribunes see Mommsen, *Forsch.* i. 185, *Staatsr.* ii. 274 sqq.

[3] Livy iii. 9.

[4] Ibid. iii. 32.

[5] On the disputed question of the date of the XII. Tables see Pais, *Storia di Roma*, vol. i. chap. iv., and Greenidge, *Eng. Hist. Review* (1905), pp. 1 sqq.

[6] Livy iii. 55, "quum veluti in controverso jure esset, tenerenturne patres plebiscitis legem comitiis centuriatis tulere, ut quod tributim plebs jussisset populum teneret, qua lege tribuniciis rogationibus telum acerrimum datum est." What were the precise conditions under which a *plebiscitum* became law can only be conjectured. The control of the *patres* over legislation certainly remained effective until 287 B.C. (See below.)

[7] After the decemvirate, the tribunes no longer pronounce capital sentences. They propose fines, which are confirmed by the *comitia tributa*.

[8] Livy iv. 6; cf. Mommsen, *Staatsrecht*, ii. 181.

[9] Mommsen, *Staatsrecht*, ii. 331.

[10] Livy vi. 35, 42; Appian, *B.C.* i. 8.

(*b*) *Conquest of Italy.*—Twelve years after the passing of the *lex Hortensia*, King Pyrrhus, beaten at Beneventum, withdrew from Italy, and Rome was left mistress of the peninsula. The steps by which this supremacy had been won have now to be traced.[5]

The expulsion of the Tarquins from Rome, followed as it seems to have been by the emancipation from Etruscan supremacy of all the country between the Tiber and the Liris, entirely altered the aspect of affairs. North of the Tiber the powerful Etruscan city of Veii, after a vain attempt to restore the Tarquins, relapsed into an attitude of sullen hostility towards Rome, 347. which, down to the outbreak of the final struggle in 407, found vent in constant and harassing border forays. The Sabines recommenced their raids across the Anio; from their hills to the south-east the Aequi pressed forward as far as the eastern spurs of the Alban range, and ravaged the low country between that range and the Sabine mountains; the Volsci overran the coast-lands as far as Antium, established themselves at Velitrae and even wasted the fields within a few miles of Rome. But the good fortune of Rome did not leave her to face these foes single-handed, and it is a significant **League with the Latins and Hernicans.** fact that the history of the Roman advance begins, not with a brilliant victory, but with a timely alliance. According to Livy, it was in 493, only a few years after the defeat of the prince of Tusculum at Lake Regillus, 261. that a treaty was concluded between Rome and the Latin communities of the Campagna.[6] The alliance was in every respect natural. The Latins were the near neighbours and kinsmen of the Romans, and both Romans and Latins were just freed from Etruscan rule to find themselves as lowlanders and dwellers in towns face to face with a common foe in the ruder hill tribes on their borders. The exact terms of the treaty cannot, any more than the precise circumstances under which it was concluded, be stated with certainty (see LATIUM), but two points seem clear. There was at first a genuine equality in the relations between the allies; Romans and Latins, though combining for defence and offence, did so without sacrificing their separate freedom of action, even in the matter of waging wars independently of each other.[7] But, secondly, Rome enjoyed from the first one inestimable advantage. The Latins lay between her and the most active of her foes, the Aequi and Volsci, and served to protect her territories at the expense of their own. Behind this barrier Rome grew strong, and the close of the Aequian and Volscian wars left the Latins her dependents rather than her allies. Beyond the limits of the Campagna Rome found a second ally, hardly less useful than the Latins, in the tribe of the Hernici ("the men of the rocks"), in the valley of the Trerus, who had equal reason with the Romans and Latins to dread the Volsci and Aequi, while their position midway between the two latter peoples made them valuable auxiliaries to the lowlanders of the Campagna.

The treaty with the Hernici is said to have been concluded in 486,[8] and the confederacy of the three peoples—Romans, Latins and Hernicans—lasted down to the 268. great Latin war in 340. Confused and untrustworthy 414. as are the chronicles of the early wars of Rome, it is clear that, notwithstanding the acquisition of these allies, Rome made but little way against her foes during the first fifty years of the existence of the Republic. In 474, it is true, an end was put for a time to the harassing border feud 280. with Veii by a forty years' peace, an advantage due not so much to Roman valour as to the increasing dangers from other quarters which were threatening the Etruscan states.[9] But this partial success stands alone, and down to 449 the raids of Sabines, Aequi and Volsci continue without 305. intermission, and are occasionally carried up to the very walls of Rome.

Very different is the impression left by the annals of the next sixty years (449–390). During this period there is an 305-64. unmistakable development of Roman power on all sides. In southern Etruria the capture of Veii (396) **Capture of Veii.** virtually gave Rome the mastery as far as the Ciminian forest. Sutrium and Nepete, "the gates of Etruria," became her allies and guarded her interests against 358. any attack from the Etruscan communities to the north, while along the Tiber valley her suzerainty was acknowledged as far as Capena and Falerii. On the Anio frontier we hear of no disturbances from 449 until some ten years after the sack of Rome by the Gauls. In 446 the Aequi appear for the last time before the gates of Rome. After 418 308. they disappear from Mount Algidus, and in the same 336. year the communications of Rome and Latium with the Hernici in the Trerus valley were secured by the capture and colonization of Labicum. Successive invasions, too, broke the strength of the Volsci, and in 393 a Latin colony was founded as far south as Circeii. In part, no doubt, 361. these Roman successes were due to the improved condition of affairs in Rome itself, consequent upon the great reforms carried 304–312. between 450 and 442; but it is equally certain that now, as often afterwards, fortune befriended Rome by weakening, or by diverting the attention of, her opponents. In particular, her rapid advance in southern Etruria was ***Decline of Etruscan power.*** facilitated by the heavy blows inflicted upon the Etruscans during the 5th century B.C. by Celts, Greeks and Samnites. By the close of this century the Celts had expelled them from the rich plains of what was afterwards known as Cisalpine Gaul, and were even threatening to advance across the Apennines into Etruria proper. The Sicilian Greeks, headed by the tyrants of Syracuse, wrested from them their mastery of the seas, and finally, on the capture of Capua by the 331. Samnites in 423, they lost their possessions in the fertile Campanian plain. These conquests of the Samnites were part of a great southward movement of the highland Sabellian peoples, the immediate effects of which upon the fortunes of Rome were not confined to the weakening of the Etruscan power. It is probable that the cessation of the Sabine raids across the Anio was partly due to the new outlets which were opened southwards for the restless and populous hill tribes which had so long disturbed the peace of the Latin lowlands. We may conjecture, also, that the growing feebleness exhibited by Volsci and Aequi was in some measure caused by the pressure upon their rear of the Sabellian clans which at this time established themselves near the Fucine lake and along the course of the Liris.

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[1] Livy vi. 42.

[2] Ibid. vii. 17, 22; viii. 15; x. 6.

[3] Ibid. viii. 12, "ut . . . ante initum suffragium patres auctores fierent," cf. Livy. i. 17. For the *lex Maenia*, see Cic. *Brut.* 14, 55; Soltau 112.

[4] Plin. *N.H.* xvi. 10; Gell. xv. 27; Gaius i. 3, "plebiscita lege Hortensia non minus valere quam leges."

[5] For details of these wars see articles on the various cities, districts and tribes. For ethnographic and philological evidence see ITALY, *Ancient Peoples*.

[6] Livy ii. 33; Cic. *Pro Balbo*, 23.

[7] Livy viii. 2.

[8] Ibid. ii. 41.

[9] From the Celts in the north especially.

But in 390, only six years after the great victory over her ancient rival Veii, the Roman advance was for a moment ***Sack of Rome by the Gauls.*** checked by a disaster which threatened to alter the course of history in Italy, and which left a lasting impress on the Roman mind. In 391 a Celtic horde 363. left their newly won lands on the Adriatic, and, crossing the Apennines into Etruria, laid siege to the Etruscan city of Clusium (Chiusi). Thence, provoked, it is said, by the conduct of the Roman ambassadors, who, forgetting their sacred character, had fought in the ranks of Clusium and slain a Celtic chief, the barbarians marched upon Rome. On July the 364. 18th of 390 B.C., only a few miles from Rome, was fought the disastrous battle of the Allia. The defeat of the Romans was complete, and Rome lay at the mercy of her foe. But in characteristic fashion the Celts halted three days to enjoy the fruits of victory, and time was thus given to put the Capitol at least in a state of defence. The arrival of the barbarians was followed by the sack of the city, but the Capitol remained impregnable. For seven months they besieged it, and then in as sudden a fashion as they had come they disappeared. The Roman chroniclers explain their retreat in their own way, by the fortunate appearance of M. Furius Camillus with the troops which he had collected, at the very moment when famine had forced the garrison on the Capitol to accept terms. More probably the news that their lands across the Apennines were threatened by the Veneti, coupled with the unaccustomed tedium of a long siege and the difficulty of obtaining supplies, inclined the Celts to accept readily a heavy ransom as the price of their withdrawal. But, whatever the reason, it is certain that they retreated, and, though during the next fifty years marauding bands appeared at intervals in the neighbourhood of Rome, and even once penetrated as far south as Campania (361–60), the Celts never obtained any 393–94. footing in Italy outside the plains in the north which they had made their own.

Nor, in spite of the defeat on the Allia and the sack of the city, was Rome weakened except for the moment by the Celtic ***Annexation of southern Etruria.*** attack. The storm passed away as rapidly as it had come on. The city was hastily rebuilt, and Rome dismayed the enemies who hastened to take advantage of her misfortunes by her undiminished vigour. Her conquests in southern Etruria were successfully defended against repeated attacks from the Etruscans to the north. The 367. creation in 387 of four new tribes (Stellatina, Sabatina, Tromentina, Arnensis) marked the final annexation of the territory of Veii and of the lands lying along the Tiber valley. A few years later Latin colonies were established at Sutrium and Nepete for the more effectual defence of the frontier, and finally, in 353, the subjugation of South Etruria was completed by the submission of Caere (*q.v.*) and its 401. partial incorporation with the Roman state as a "municipium sine suffragio"—the first, it is said, of its kind.[1]

Next to the settlement of southern Etruria, the most important of the successes gained by Rome between 390 and 343 B.C. were those won against her old foes the Aequi and Volsci, and her old allies the Latins and Hernicans. ***Successes against Aequi and Volsci.*** The Aequi indeed, already weakened by their long feud with Rome, and hard pressed by the Sabellian tribes in their rear, were easily dealt with, and after 364–411. the campaign of 389 we have no further mention of 365. an Aequian war until the last Aequian rising in 304. The Volsci, who in 389 had advanced to Lanuvium, 450. were met and utterly defeated by Camillus, the conqueror of Veii, and this victory was followed up by the gradual subjugation to Rome of all the lowland country lying between the hills and the sea as far south as Tarracina. Latin colonies were established at Satricum (385), at Setia (379), and 369, 375. at Antium and Tarracina some time before 348. In 406, 396. 358 two fresh Roman tribes (Pomptina and Publilia) were formed in the same district.[2]

Rome had now nothing more to fear from the foes who a century ago had threatened her very existence. The lowland country, of which she was the natural centre, from ***Re-organization of the Latin league.*** the Ciminian forest to Tarracina, was quiet, and within its limits Rome was by far the strongest power. But she had now to reckon with the old and faithful allies to whose loyal aid her present position was largely due. The Latini and Hernici had suffered severely in the Aequian and Volscian wars; it is probable that not a few of the smaller communities included in the league had either been destroyed or been absorbed by larger states, and the independence of all alike was threatened by the growing power of Rome. The sack of Rome by the Celts gave them an opportunity of reasserting their independence, and we are consequently told that this disaster was immediately followed by the temporary dissolution of the confederacy, and this again a few years later by a series of actual conflicts between Rome and her former allies. Between 383 and 358 we hear 371–96. of wars with Tibur, Praeneste, Tusculum, Lanuvium, Circeii and the Hernici. But in all Rome was successful. In 382 Tusculum was fully incorporated with the Roman 372. state by the bestowal of the full franchise;[3] in 358, 396. according to both Livy and Polybius, the old alliance was formally renewed with Latini and Hernici. We cannot, however, be wrong in assuming that the position of the allies under the new league was far inferior to that accorded them by the treaty of Spurius Cassius.[4] Henceforth they were the subjects rather than the equals of Rome, a position which it is evident that they accepted much against their will, and from which they were yet to make one last effort to escape.

We have now reached the close of the first stage in Rome's advance towards supremacy in Italy. By 343 B.C. she was already mistress both of the low country stretching 411. from the Ciminian forest to Tarracina and Circeii and of the bordering highlands. Her own territory had largely increased. Across the Tiber the lands of Veii, Capena and Caere were nearly all Roman, while in Latium she had carried her frontiers to Tusculum on the Alban range and to the southernmost limits of the Pomptine district. And this territory was protected by a circle of dependent allies and colonies reaching northward to Sutrium and Nepete, and southward to Sora on the upper Liris, and to Circeii on the coast. Already, too, she was beginning to be recognized as a power outside the limits of the Latin lowlands. The fame of the capture of Rome by the Celts had reached Athens, and her subsequent victories over marauding Celtic bands had given her prestige in South ***400.*** Italy as a bulwark against northern barbarians. In 354 she had formed her first connexions beyond the ***406.*** Liris by a treaty with the Samnites, and in 348 followed a far more important treaty with the great maritime state of Carthage.[1]

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[1] For the status of Caere and the "Caerite franchise," see Marquardt, *Staatsverw.* i. 28 seq.; Madvig, *R. Verf.* i. 39; Beloch, *Ital. Bund*, 120; Mommsen, *Staatsr.* iii. 583 sqq.

[2] Livy vii. 15.

[3] Ibid. vi. 26.

[4] Mommsen, *R.G.* i. 347 n; Beloch, *Ital. Bund*, cap. ix.

Advance beyond the Liris, and the Samnite Wars.

Rome had won her supremacy from the Ciminian forest to the Liris as the champion of the comparatively civilized communities of the lowlands against the rude highland tribes which threatened to overrun them, and so, when her legions first crossed the Liris, it was in answer to an appeal from a lowland city against invaders from the hills. While she was engaged in clearing Latium of Volsci and Aequi, the Sabellian tribes of the central Apennines had rapidly spread over the southern half of the peninsula. Foremost among these tribes were the Samnites, a portion of whom had captured the Etruscan city of Capua in ***331, 334.*** 423, the Greek Cumae in 420, and had since then ruled as masters over the fertile Campanian territory. But in their new homes the conquerors soon lost all sense of relationship and sympathy with their highland brethren. They dwelt in cities, amassed wealth, and inherited the civilization of the Greeks and Etruscans whom they had dispossessed;[2] above all, they had before long to defend themselves in their turn against the attacks of their ruder kinsmen from the hills, and it was for aid against these that the Samnites of Campania appealed to the rising state which had already made herself known as the bulwark of the lowlands north of the Liris, and which with her Latin and Hernican allies had scarcely less interest than the Campanian cities themselves in checking the raids of the highland Samnite tribes.

First Samnite War.

The Campanian appeal was listened to. Rome with her confederates entered into alliance with Capua and the neighbouring Campanian towns, and war was formally declared (343) against the Samnites.[3] While to the ***411.*** Latins and Hernicans was entrusted apparently the defence of Latium and the Hernican valley against the northerly members of the Samnite confederacy, the Romans themselves undertook the task of driving the invaders out of Campania. After two campaigns the war was ended in ***413.*** 341 by a treaty, and the Samnites withdrew from the lowlands, leaving Rome the recognized suzerain of the Campanian cities which had sought her aid.[4]

The Latin War.

There is no doubt that the check thus given by Rome to the advance of the hitherto invincible Sabellian highlanders not only made her the natural head and champion of the low countries, south as well as north of the Liris, but also considerably added to her prestige. Carthage sent her congratulations, and the Etruscan city of Falerii voluntarily enrolled herself among the allies of Rome. Of even greater service, however, was the fact that for fifteen years the Samnites remained quiet, for this inactivity, whatever its cause, enabled Rome triumphantly to surmount a danger which threatened for the moment to wreck her whole position. This danger was nothing less than a desperate effort on the part of nearly all her allies and dependants south of the Tiber to throw off the yoke of her supremacy. The way was led by her ancient confederates the Latini, whose smouldering discontent broke into open flame directly the fear of a Samnite attack was removed. From the Latin Campagna and the Sabine hills the revolt spread westward and southward to Antium and Tarracina, and even to the towns of the Campanian plain, where the mass of the inhabitants at once repudiated the alliance formed with Rome by the ruling class. The struggle was sharp but short. In two pitched battles[5] the strength of the insurrection was broken, and two more campaigns sufficed for the complete reduction of such of the insurgent communities as still held out. The revolt crushed, Rome set herself deliberately to the task of re-establishing on a new and firmer basis her supremacy over the lowlands, and in doing so laid the foundations of that marvellous organization which was destined to spread rapidly over Italy, and to withstand the attacks even of Hannibal. The old historic Latin league ceased to exist, though its memory was still preserved by the yearly Latin festival on the Alban Mount. Most if not all of the common land of the league became Roman territory;[6] five at least of the old Latin cities were compelled to accept the Roman franchise[7] and enter the pale of the Roman state. The rest, with the Latin colonies, were ranked as Latin allies of Rome, but on terms which secured their complete dependence upon the sovereign city. The policy of isolation, which became so cardinal a principle of Roman rule, was now first systematically applied. No rights of *conubium* or *commercium* were any longer to exist between these communities. Their federal councils were prohibited, and all federal action independent of Rome forbidden.[8]

Settlement of Latium; and of Campania.

In Campania and the coast-lands connecting Campania with Rome, a policy of annexation was considered safer than that of alliance. Of the two frontier posts of the Volsci, Antium and Velitrae, the former was constituted a Roman colony, its long galleys burnt and their prows set up in the Forum at Rome, while the walls of Velitrae were razed to the ground, its leading men banished beyond the Tiber, and their lands given to Roman settlers. Farther south on the route to Campania, Fundi and Formiae were, after the precedent set in the case of Caere, declared Roman and granted the civil rights of Roman citizenship, while lastly in Campania itself the same status was given to Capua, Cumae, and the smaller communities dependent upon them.[9] During the ten years from 338 to 328 the work of ***416-26.*** settlement was steadily continued. Tarracina, like Antium, was made a Roman colony. Privernum, the last Volscian town to offer resistance to Rome, was subdued ***424.*** in 330, part of its territory allotted to Roman citizens, and the state itself forced to accept the Roman franchise. Lastly, to strengthen the lines of defence against the Sabellian tribes, two colonies with the rights of Latin allies were established at Cales (334) and at Fregellae (328). The ***420, 426.*** settlement of the lowlands was accomplished. As a single powerful and compact state with an outer circle of closely dependent allies, Rome now stood in sharp contrast with the disunited and degenerate cities of northern Etruria, the loosely organized tribes of the Apennines, and the decaying and disorderly Greek towns of the south.

Second Samnite War, 327-04=427-50.

The strength of this system was now to be tried by a struggle with the one Italian people who were still ready and able to contest with Rome the supremacy of the peninsula. The passive attitude of the Samnites between 342 and 327 was no doubt largely due to the dangers which had suddenly threatened them in South Italy. But ***412-27.*** the death of Alexander of Epirus, in 332,[10] removed ***422.*** their only formidable opponent there, and left them free to turn their attention to the necessity of checking the steady advance of Rome. In 327, the year after the ***427.*** ominous foundation of a Roman colony at Fregellae, a pretext for renewing the struggle was offered them. The

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[1] Livy vii. 27. For the whole question of the early treaties with Carthage, see Polybius iii. 22; Mommsen, vol. ii. Appendix (p. 523); Strachan-Davidson, *Polybius*, pp. 50 ff.; Pais, *Storia di Roma*, i. 2, 305, n. 1; also article CARTHAGE.

[2] For the Samnites in Campania, see Mommsen, *Hist. of Rome*, i. 453; Schwegler-Clason, *R.G.* v. 98 seq.; Beloch, *Campanien* (Berlin, 1879).

[3] Livy vii. 32.

[4] For the difficulties in the traditional accounts of this war, see Mommsen, *Hist. of Rome*, i. 459 n.; Schwegler-Clason, *R.G.* v. 14 seq.

[5] At the foot of Mount Vesuvius, Livy viii. 9; at Trifanum, ibid. viii. 11.

[6] Livy viii. 11.

[7] Livy viii. 14; Lanuvium, Aricia, Nomentum, Pedum, Tusculum.

[8] Ibid. *loc. cit.*, "ceteris Latinis populis conubia commerciaque et concilia inter se ademerunt."

[9] For the controversy as to the precise status of Capua and the "equites Campani" (Livy viii. 14), see Beloch, *Ital. Bund*, 122 seq.; *idem*, *Campanien*, 317; Mommsen, *Staatsr.* iii. 574.

[10] Livy viii. 3, 17, 24.

Cumaean colony of Palaepolis[1] had incurred the wrath of Rome by its raids into her territory in Campania. The Samnites sent a force to defend it, and Rome replied by a declaration of war. The two opponents were not at first sight unequally matched, and had the Sabellian tribes held firmly together the issue of the struggle might have been different. As it was, however, the Lucanians to the south actually joined Rome from the first, while the northern clans, Marsi, Vestini, Paeligni, Frentani, after a feeble and lukewarm resistance, subsided into *450.* a neutrality which was exchanged in 304 for a formal alliance with Rome. An even greater advantage to Rome from the outset was the enmity existing between the Samnites and the Apulians, the latter of whom from the first joined Rome and thus gave her a position in the rear of her enemy and in a country eminently well fitted for maintaining a large military force. These weaknesses on the Samnite side were amply illustrated by the events of the war.

The first seven or eight years were marked by one serious disaster to the Roman arms, the defeat at the Caudine Forks *433, 436.* (321), but, when in 318 the Samnites asked for and obtained a two years' truce, Rome had succeeded not only in inflicting several severe blows upon her enemies but in isolating them from outside help. The Lucanians to the south were her allies. To the east, in the rear of Samnium, Apulia acknowledged the suzerainty of Rome, and *434.* Luceria, captured in 320, had been established as a base of Roman operations. Finally to the north the Romans had easily overcome the feeble resistance of the Vestini and Frentani, and secured through their territories a safe passage for their legions to Apulia. On the renewal of hostilities in *438.* 316, the Samnites, bent on escaping from the net which was being slowly drawn round them, made a series of desperate efforts to break through the lines of defence which protected Latium and Campania. Sora and Fregellae on the upper Liris were captured by a sudden attack; the Ausones in the low country near the mouth of the same river were encouraged to revolt by the appearance of the Samnite army; and in Campania another army, attracted by rumours of disturbance, all but defeated the Roman consuls under the very walls of Capua. But these efforts were unavailing. Sora and Fregellae were recovered as quickly as they had been lost, and the frontier there was strengthened by the establishment of a colony at Interamna. The Ausones were punished by the confiscation of their territory, and Roman supremacy further secured by the two colonies of Suessa and Pontia (312). The construction of the famous Via Appia,[2] the work of the censor Appius Claudius Caecus, opened a safe and direct route to Campania, while the capture of Nola deprived the Samnites of their last important stronghold in the Campanian lowlands. The failure of these attempts broke the courage even of the Samnites. Their hopes were indeed raised for a moment by the news that Etruria had risen against Rome (310), but their daring scheme of effecting a union with the Etruscans was frustrated *449.* by the energy of the Roman generals. Five years later (305) the Romans revenged a Samnite raid into Campania by an invasion of Samnium itself. Arpinum on the frontier was taken, and at last, after a twenty-two *450.* years' struggle, the Second Samnite War was closed by a renewal of the ancient treaty with Rome (304).[3]

The six years of peace which followed (304–298) were employed by Rome in still further strengthening her position. *450–56.* Already, two years before the peace, a rash revolt of the Hernici[4] had given Rome a pretext for finally annexing the territory of her ancient allies. The tribal confederacy was broken up, and all the Hernican communities, with the exception of three which had not joined the revolt, were incorporated with the Roman state as municipia, with the civil rights of the Roman franchise. Between the Hernican valley and the frontiers of the nearest Sabellian tribes lay what remained of the once formidable people of the Aequi. In their case, too, a revolt (304) was followed by the *450.* annexation of their territory, which was marked in this *453.* case by the formation there (301) of two Roman tribes (Aniensis and Teretina).[5] Not content with thus carrying the borders of their own territory up to the very frontiers of the Sabellian country, Rome succeeded (304) in finally detaching from the Sabellian confederacy all the tribes lying[6] between the north-east frontier of Latium and the Adriatic Sea. Henceforward the Marsi, Paeligni, Vestini, Marrucini and Frentani were enrolled among the allies of Rome, and not only swelled her forces in the field but interposed a useful barrier between her enemies to the north in Etruria and Umbria and those to the south in Samnium, while they connected her directly with the friendly Apulians. Lastly, as a security for the fidelity at least of the nearest of these allies, colonies were planted in the Marsian territories at Alba Fucentia (303) and at Carsioli (298). A significant indication *451, 456.* of the widening range of Rome's influence in Italy, and of the new responsibilities rapidly pressing upon her, is the fact that when in 302 the Spartan Cleonymus *452.* landed in the territory of the Sallentini, far away in the south-east, he was met and repulsed by a Roman force.[7]

Third Samnite War, 298–90=456–64.

Six years after the conclusion of the treaty which ended the Second Samnite War, news arrived that the Samnites were harassing the Lucanians. Rome at once interfered to protect her allies. Samnium was invaded in force, the country ravaged and one stronghold after another captured. Unable any longer to hold their own in a position where they were hedged round by enemies, the Samnite leaders turned as a last hope to the communities of northern Etruria, to the free tribes of Umbria and to the once dreaded Celts. With a splendid daring they formed the scheme of uniting all these peoples with themselves in a last desperate effort to break the power of Rome.

Romans in N. Etruria.

For some forty years after the final annexation of southern Etruria (351 B.C.) matters had remained unchanged in that quarter. Sutrium and Nepete still guarded the Roman frontier; the natural boundary of the Ciminian forest was still intact; and up the valley of *403.* the Tiber Rome had not advanced beyond Falerii, a few miles short of the most southerly Umbrian town Ocriculum. But in 311, on the expiry, apparently of the long *443.* truce with Rome, concluded in 351, the northern Etruscans, alarmed no doubt by the rapid advances which Rome was making farther south, rose in arms and attacked Sutrium. The attack, however, recoiled disastrously upon the heads of the assailants. A Roman force promptly relieved Sutrium, and its leader, Q. Fabius Rullianus, without awaiting orders from home, boldly plunged into the wilds of the Ciminian forest, and crossing them safely swept with fire and sword over the rich lands to the north. Then turning southward he met and utterly defeated the forces which the Etruscans had hastily raised in the hopes of intercepting him at the Vadimonian Lake.[8] This decisive victory ended the war. The Etruscan cities, disunited among themselves, and enervated by long years of peace, abandoned the struggle for the time, paid a heavy indemnity and concluded a truce with Rome (309–8). In the *445–46.* same year the promptitude of Fabius easily averted a threatened attack by the Umbrians, but Rome proceeded nevertheless to fortify herself in her invariable fashion against future dangers on this side, by an alliance with Ocriculum, which was followed ten years later (299) by a colony at Nequinum,[9] and an alliance with the Picentes, whose position in the rear of Umbria rendered them as valuable to Rome as the Apulians had proved farther south.

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[1] Livy viii. 22.

[2] Ibid. ix. 29; see APPIA, VIA.

[3] Ibid. ix. 45.

[4] Ibid. ix. 43.

[5] Livy x. 9.

[6] Ibid. ix. 45.

[7] Ibid. x. 2.

[8] Ibid. ix. 39. Ihne (*Römische Geschichte*, i.² 394 seq.) throws some doubts on the traditional accounts of this war and of that in 296.

[9] It received the name of Narnia (Livy x. 10).

Battle of Sentinum, 295 = 459.

Fourteen years had passed since the battle on the Vadimonian Lake, when the Samnites appeared on the borders of Etruria and called on the peoples of northern Italy to rise against the common enemy. Their appeal, backed by the presence of their troops, was successful. The Etruscans found courage to face the Roman legions once more; a few of the Umbrians joined them; but the most valuable allies to the Samnites were the Celts, who had for some time threatened a raid across the Apennines, and who now marched eagerly into Umbria and joined the coalition. The news that the Celts were in motion produced a startling effect at Rome, and every nerve was strained to meet this new danger. While two armies were left in southern Etruria as reserves, the two consuls, Q. Fabius Maximus Rullianus and P. Decius Mus the younger, both tried soldiers, marched northwards up the valley of the Tiber and into Umbria at the head of four Roman legions and a still larger force of Italian allies. At Sentinum, on the further side of the Apennines, they encountered the united forces of the Celts and Samnites, the Etruscans and Umbrians having, it is said, been withdrawn for the defence of their own homes. The battle that followed was desperate, and the Romans lost one of their consuls, Decius, and more than 8000 men.[1] But the Roman victory was decisive. The Celts were annihilated, and the fear of a second Celtic attack on Rome removed. All danger from the coalition was over. The Etruscan communities gladly purchased peace by the payment of indemnities. The rising in Umbria, never formidable, died away, and the Samnites were left single-handed to bear the whole weight of the wrath of Rome. During four years more, however, they desperately defended their highland homes, and twice at least, in 293 and 292, they *461, 462.* managed to place in the field a force sufficient to *464.* meet the Roman legions on equal terms. At last, in 290, the consul M'. Curius Dentatus finally exhausted their power of resistance. Peace was concluded, and it is significant of the respect inspired at Rome by their indomitable courage that they were allowed to become the allies of Rome, on equal terms and without any sacrifice of independence.[2]

Between the close of the Third Samnite War and the landing *473.* of Pyrrhus in 281 B.C. we find Rome engaged, as her wont was, in quietly extending and consolidating her power. In southern Italy she strengthened her hold on Apulia by planting on the borders of Apulia and Lucania the strong colony of Venusia.[3] In central Italy the annexation of the Sabine country (290) carried her frontiers *464.* eastward to the borders of her Picentine allies on the Adriatic.[4] Farther east, in the territory of the Picentes themselves, she established colonies on the Adriatic coast at Hadria and Castrum (285–83).[5] *469–71.* North of the Picentes lay the territories of the Celtic Senones stretching inland to the north-east borders of Etruria, and these too now fell into her hands. Ten years after their defeat at Sentinum (285–84) a Celtic force descended into Etruria, besieged Arretium and defeated the relieving force despatched by Rome. In 283 the consul L. Cornelius Dolabella was sent to avenge the insult. He completely routed the Senones. Their lands were annexed by Rome, and a colony established at Sena on the coast. This success, followed as it was by the decisive defeat of the neighbouring tribe of the Boii, who had invaded Etruria and penetrated as far south as the Vadimonian Lake, awed the Celts into quiet, and for more than forty years there was comparative tranquillity in northern Italy.[6]

In the south, however, the claims of Rome to supremacy were now to be disputed by a new and formidable foe. *War with Pyrrhus, 281–75 = 473–79.* At the close of the Third Samnite War the Greek cities on the southern coast of Italy found themselves once more harassed by the Sabellian tribes on their borders, whose energies, no longer absorbed by the long struggles in central Italy, now found an attractive opening southward. Naturally enough the Greeks, like the Capuans sixty years before, appealed for aid to Rome (283–82), and like *471–72.* the Capuans they offered in return to recognize the suzerainty of the great Latin Republic. In reply a Roman force under C. Fabricius Luscinus marched into south Italy, easily routed the marauding bands of Lucanians, Bruttians and Samnites, and established Roman garrisons in Locri, Croton, Rhegium and Thurii. At Tarentum, the most powerful and flourishing of the Greek seaports, this sudden and rapid advance of Rome excited the greatest anxiety. Tarentum was already allied by treaty (301) with Rome, and she had now *453.* to decide whether this treaty should be exchanged for one which would place her, like the other Greek communities, under the protectorate of Rome, or whether she should find some ally able and willing to assist in making a last stand for independence. The former course, in Tarentum, as before at Capua, was the one favoured by the aristocratic party; the latter was eagerly supported by the mass of the people and their leaders. While matters were still in suspense, the appearance, contrary to the treaty, of a Roman squadron off the harbour decided the controversy. The Tarentines, indignant at the insult, attacked the hostile fleet, killed the admiral and sunk most of the ships. Still Rome, relying probably on her partisans in the city, tried negotiation, and an alliance appeared likely after all, when suddenly the help for which the Tarentine democrats had been looking appeared, and war with Rome *473–74.* was resolved upon (281–80).[7]

King Pyrrhus,[8] whose timely appearance seemed for the moment to have saved the independence of Tarentum, was the most brilliant of the military adventurers whom the disturbed times following the death of Alexander the Great had brought into prominence. High-spirited, generous and ambitious, he had formed the scheme of rivalling Alexander's achievements in the East, by winning for himself an empire in the West. He aspired not only to unite under his rule the Greek communities of Italy and Sicily, but to overthrow the great Phoenician state of Carthage—the natural enemy of Greeks in the West, as Persia had been in the East. Of Rome it is clear that he knew little or nothing; the task of ridding the Greek seaports of their barbarian foes he no doubt regarded as an easy one; and the splendid force he brought with him was intended rather for the conquest of the West than for the preliminary work of chastising a few Italian tribes, or securing the submission of the unwarlike Italian Greeks. He defeated the Roman consul, M. Valerius Laevinus, on the banks of the Liris (280), and gained the support of the Greek cities *474.* as well as that of numerous bands of Samnites, Lucanians and Bruttians. But, to the disappointment of his new allies, Pyrrhus showed no anxiety to follow up his advantage. His heart was set on Sicily and Africa, and his immediate object was to come to terms with Rome. But though he advanced as near Rome as Anagnia (279), nothing could *475.* shake the resolution of the senate, and in the next year (278) he again routed the legions at Asculum (Ascoli), but only to find that the indomitable resolution of the enemy was strengthened by defeat. He now crossed into Sicily, where, though at first successful, he was unable to achieve any lasting result. Soured and disappointed, Pyrrhus returned to Italy *478.* (276) to find the Roman legions steadily moving southwards, and his Italian allies disgusted by his desertion of their cause. In 275 the decisive battle of the war *479.* was fought at Beneventum. The consul, M'. Curius Dentatus, the conqueror of Samnium, gained a complete victory, and Pyrrhus, unable any longer to face his opponents in the field, and disappointed of all assistance from his allies, retreated to disgust to Tarentum and thence crossed into Greece.[1]

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[1] Livy x. 27.

[2] Livy, *Epit.* xi., "pacem petentibus Samnitibus foedus quarto renovatum est."

[3] Dion. Hal. *Exc.* xvi. xvii. 5; Vell. Pat. i. 14.

[4] Livy, *Epit.* xi.; Vell. Pat. i. 14.

[5] Livy, *Epit.* x.

[6] Ibid. xii.; *Polyb.* ii. 20.

[7] Livy, *Epit.* xii.; Plut. *Pyrrh.* 13.

[8] For his career and for the story of his wars with Rome, see the article PYRRHUS.

482. A few years later (272) Tarentum was surrendered to Rome by its Epirot garrison; it was granted a treaty of alliance, but its walls were razed and its fleet handed 484. over to Rome. In 270 Rhegium also entered the 485. ranks of Roman allies, and finally in 269 a single campaign crushed the last efforts at resistance in Samnium. Rome was now at leisure to consolidate the position she had won. Between 273 and 263 three new colonies 481, 491. were founded in Samnium and Lucania—Paestum 481, 486, 491. in 273, Beneventum in 268, Aesernia in 263. In 486. central Italy the area of Roman territory was increased by the full enfranchisement (268) of the Sabines,[2] and of their neighbours to the east, the people of Picenum. 486. To guard the Adriatic coast colonies were established 490. at Ariminum (268), at Firmum and at Castrum Novum (264), while to the already numerous maritime colonies was added that of Cosa in Etruria.[3]

Rome was now the undisputed mistress of Italy. The limits of her supremacy to the north were represented roughly by a *Rome the mistress of Italy.* line drawn across the peninsula from the mouth of the Arno on the west to that of the Aesis on the east.[4] Beyond this line lay the Ligurians and the Celts; all south of it was now united as "Italy" under the rule of Rome.

But the rule of Rome over Italy, like her wider rule over the Mediterranean coasts, was not an absolute dominion over conquered subjects. It was in form at least a confederacy under Roman protection and guidance; and the Italians, like the provincials, were not the subjects, but the "allies and friends" of the Roman people.[5] In the treatment of these allies Rome consistently followed the maxim, *divide et impera*. In every possible way she strove to isolate them from each other, while binding them closely to herself. The old federal groups were in most cases broken up, and each of the members united with Rome by a special treaty of alliance. In Etruria, Latium, Campania and Magna Graecia the city state was taken as the unit; in central Italy where urban life was non-existent, the unit was the tribe. The northern Sabellian peoples, for instance—the Marsi, Paeligni, Vestini, Marrucini, Frentani—were now constituted as separate communities in alliance with Rome. In many cases, too, no freedom of trade or intermarriage was allowed between the allies themselves, a policy afterwards systematically pursued in the provinces. Nor were all these numerous allied communities placed on the same footing as regarded their relations with Rome herself. To begin with, a sharp distinction was drawn between the "Latini" and the general mass of Italian allies. The *The Latins.* "Latins" of this period had little more than the name in common with the old thirty Latin peoples of the days of Spurius Cassius. With a few exceptions, such as Tibur and Praeneste, the latter had either disappeared or had been incorporated with the Roman state, and the Latins of 268 B.C. were almost exclusively the "Latin colonies," that is to say, communities founded by Rome, composed of men of Roman blood, and whose only claim to the title "Latin" lay in the fact that Rome granted to them some portion of the rights and privileges formerly enjoyed by the old Latin cities under the Cassian treaty.[6] Though nominally allies, they were in fact offshoots of Rome herself, bound to her by community of race, language and interest, and planted as Roman garrisons among alien and conquered peoples. The Roman citizen who joined a Latin colony lost his citizenship—to have allowed him to retain it would no doubt have been regarded as enlarging too rapidly the limits of the citizen body; but he received in exchange the status of a favoured ally. The member of a Latin colony had the right of *commercium* and down to 268[7] 486. of *conubium* also with Roman citizens. Provided they left sons and property to represent them at home, they were free to migrate to Rome and acquire the Roman franchise. In war-time they not only shared in the booty, but claimed a portion of any land confiscated by Rome and declared "public." These privileges, coupled with their close natural affinities with Rome, successfully secured the fidelity of the Latin colonies, which became not only the most efficient props of Roman supremacy, but powerful agents in the work of Romanizing Italy. Below the privileged Latins stood the Italian *The Italian allies.* allies; and here again we know generally that there were considerable differences of status, determined in each case by the terms of their respective treaties with Rome. We are told that the Greek cities of Neapolis and Heraclea were among the most favoured;[8] the Bruttii, on the other hand, seem, even before the Hannibalic War, to have been less generously treated. But beyond this we have no detailed information.

Rome, however, did not rely only on this policy of isolation. Her allies were attached as closely to herself as they were clearly separated from each other, and from the first she took every security for the maintenance of her own paramount authority. Within its own borders, each ally was left to manage its own affairs as an independent state.[9] The badges which marked subjection to Rome in the provinces—the resident magistrate and the tribute—were unknown in Italy. But in all points affecting the relations of one ally with another, in all questions of the general interests of Italy and of foreign policy, the decision rested solely with Rome. The place of a federal constitution, of a federal council, of federal officers, was filled by the Roman senate, assembly and magistrates. The maintenance of peace and order in Italy, the defence of the coasts and frontiers, the making of war or peace with foreign powers, were matters the settlement of which Rome kept entirely in her own hands. Each allied state, in time of war, was called upon for a certain contingent of men, but, though its contingent usually formed a distinct corps under officers of its own, its numerical strength was fixed by Rome, it was brigaded with the Roman legions, and was under the orders of the Roman consul.[10]

This paramount authority of Rome throughout the peninsula was confirmed and justified by the fact that Rome herself was now infinitely more powerful than any one of her *The Roman state.* numerous allies. Her territory, as distinct from that of the allied states, covered something like one-third of the peninsula south of the Aesis. Along the west coast it stretched from Caere to the southern borders of Campania. Inland, it included the former territories of the Aequi and Hernici, the Sabine country, and even extended eastward into Picenum, while beyond these limits were outlying districts, such as the lands of the Senonian Celts, with the Roman colony of Sena, and others elsewhere in Italy, which had been confiscated by Rome and given over to Roman settlers. Since the first important annexation of territory after the capture of Veii (396), twelve new tribes had been formed,[11] and the 358. number of male citizens registered at the census had risen from 152,000 to 290,000.[12] Within this enlarged Roman

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[1] Livy, *Epit.* xiv.; Plut. *Pyrrh.* 26.

[2] Vell. Pat. i. 14, "suffragii ferendi jus Sabinis datum."

[3] Ibid.; Livy, *Epit.* xv.

[4] Mommsen, *Hist. of Rome*, ii. 60, note 1; Nissen, *Ital. Landeskunde*, i. p. 71.

[5] Beloch, *Ital. Bund*, 203; Mommsen, *Hist. of Rome*, ii. 60, note 2.

[6] For the *coloniae Latinae* founded before the First Punic War, see Beloch, 136 seq.

[7] The year of the foundation of Ariminum, the first Latin colony with the restricted rights; Cic. *Pro Caec.* 35, 202; Mommsen, *Hist. of Rome*, ii. 52 n.; *Staatsr.* iii. 624; Marquardt, *Staatsverw.* i. 54; Beloch, 155–58, takes a different view.

[8] Beloch, *Camp.* 39; Cic. *Pro Balbo*, 8, 21, 22, 50.

[9] For the relation of the *socii Italici* to Rome, see Mommsen, *Hist. of Rome*, ii. 53 ff.; Beloch, *Ital. Bund*, cap. x.

[10] Beloch, 203. The importance of this duty of the allies is expressed in the phrase, "socii nominisve Latini quibus ex formula togatorum milites in terra Italia imperare solent."

[11] Four in South Etruria (387), two in the Pomptine territory (358), two in Latium (332), two in the territory of the southern Volsci and the Ager Falernus (313), two in the Aequian and Hernican territory (299). The total of thirty-five was completed in 241 by formation of the Velina and Quirina, probably in the Sabine and Picentine districts, enfranchised in 268. See Beloch, 32.

[12] Livy, *Epit.* xvi.; Eutrop. ii. 18; Mommsen, *Hist. of Rome*, ii. 55 n.; Beloch, cap. iv. pp. 77 seq.

Colonies and municipia.

state were now included numerous communities with local institutions and government. At their head stood the Roman colonies (*coloniae civium Romanorum*), founded to guard especially the coasts of Latium and Campania.[1] Next to these eldest children of Rome came those communities which had been invested with the full Roman franchise, such, for instance, as the old Latin towns of Aricia, Lanuvium, Tusculum, Nomentum and Pedum. Lowest in the scale were those which had not been considered ripe for the full franchise, but had, like Caere, received instead the *civitas sine suffragio*, the civil without the political rights.[2] Their members, though Roman citizens, were not enrolled in the tribes, and in time of war served not in the ranks of the Roman legions but in separate contingents. In addition to these organized town communities, there were also the groups of Roman settlers on the public lands, and the dwellers in the village communities of the enfranchised highland districts in central Italy.

The administrative needs of this enlarged Rome were obviously such as could not be adequately satisfied by the system which had done well enough for a small city state with a few square miles of territory. The old centralization of all government in Rome itself had become an impossibility, and the Roman statesmen did their best to meet the altered requirements of the time. The urban communities within the Roman pale, colonies and *municipia*, were allowed a large measure of local self-government. In all we find local assemblies, senates and magistrates, to whose hands the ordinary routine of local administration was confided, and, in spite of differences in detail, *e.g.* in the titles and numbers of the magistrates, the same type of constitution prevailed throughout.[3] But these local authorities were carefully subordinated to the higher powers in Rome. The local constitution could be modified or revoked by the Roman senate and assembly, and the local magistrates, no less than the ordinary members of the community, were subject to the paramount authority of the Roman consuls, praetors and censors. In particular, care was taken to keep the administration of justice well under central control. The Roman citizen in a colony or *municipium* enjoyed, of course, the right of appeal to the Roman people in a capital case. We may also assume that from the first some limit was placed to the jurisdiction of the local magistrate, and that cases falling outside it came before the central authorities. But an additional safeguard for the equitable and uniform administration of Roman law, in communities to many of which the Roman code was new and unfamiliar, was provided by the institution of prefects (*praefecti juri dicundo*),[4] who were sent out annually, as representatives of the Roman praetor, to administer justice in the colonies and *municipia*. To prefects was, moreover, assigned the charge of those districts within the Roman pale where no urban communities, and consequently no organized local government, existed. In these two institutions, that of municipal government and that of prefectures, we have already two of the cardinal points of the later imperial system of government.

Prefects.

The military system.

Lastly, the changes which the altered position and increased responsibilities of Rome had effected in her military system[5] tended to weaken the intimate connexion between the Roman army in the field and the Roman people at home, and thus prepared the way for that complete breach between the two which in the end proved fatal to the Republic. It is true that service in the legion was still the first duty and the highest privilege of the fully qualified citizen. But this service was gradually altering in character. Though new legions were still raised each year for the summer campaigns, this was by no means always accompanied, as formerly, by the disbandment of those already on foot, and this increase in the length of time during which the citizen was kept with the standards had, as early as the siege of Veii, necessitated a further deviation from the old theory of military service—the introduction of pay.[6] Moreover, while in the early days of the Republic the same divisions served for the soldier in the legion and the citizen in the assembly, in the new manipular system,[7] with its three lines, no regard was paid to civic distinctions, but only to length of service and military efficiency, while at the same time the more open order of fighting which it involved demanded of each soldier greater skill, and therefore a more thorough training in arms than the old phalanx. One other change resulted from the new military necessities of the time, which was as fruitful of results as the incipient separation between the citizen and the soldier. Under the early Republic, the chief command of the legions rested with the consuls of the year. But, as Rome's military operations increased in area and in distance from Rome, a larger staff became necessary, and the inconvenience of summoning home a consul in the field from an unfinished campaign became intolerable. The remedy found, that of prolonging for a further period the imperium of the consul, was first applied in 327 B.C. in the case of Q. Publilius Philo,[8] and between 327 and 264 instances of this *prorogatio imperii* became increasingly common. This proconsular authority, originally an occasional and subordinate one, was destined to become first of all the strongest force in the Republic, and ultimately the chief prop of the power of the Caesars.

The Proconsulate.

427–90.

489–608.

Period B: Rome and the Mediterranean States, 265–146 B.C.—(*a*) *Conquest of the West.*—Though marked out by her geographical position as the natural centre of the Mediterranean, Italy had hitherto played no active part in Mediterranean politics, but, now that she was for the first time united, it was felt throughout the Mediterranean world that a new power had arisen, and Rome, as the head and representative of Italy, found herself irresistibly drawn into the vortex of Mediterranean affairs. Egypt sought her alliance, and Greek scholars began to interest themselves keenly in the history, constitution, and character of the Latin Republic which had so suddenly become famous. But Rome looked naturally westward rather than eastward. The western coasts of the peninsula were the most fertile and populous and wealthy; and it was in this direction that the natural openings for Italian commerce were to be found. It was, however, precisely on this side that Rome had serious ground for anxiety. Carthage was now at the height of her power. Her outposts were threateningly near to Italy in Sardinia and in Sicily, while her fleets swept the seas and jealously guarded for the benefit of Carthage alone the hidden treasures of the West. In the east of Sicily, Syracuse still upheld the cause of Greek independence against the hereditary foe of the Greek race; but Syracuse stood alone, and her resources were comparatively small. What Rome had to fear was the establishment, and that at no distant date, of an absolute Carthaginian domination over the Western seas—a domination which would not only be fatal to Italian commerce, but would be a standing menace to the safety of the Italian coasts.

First Punic War, 265–41–489–513.

It was above all things essential for Rome that the Carthaginians should advance no farther eastward. But already in 272 Tarentum had almost fallen into their grasp, and seven years later Rome was threatened with the establishment of Carthaginian rule at Messana, within sight of the Italian coast. The intervention of both powers in a quarrel between the Mamertines, a body of Campanian mercenaries who had occupied Messana, and Hiero II.

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[1] Ostia, Antium, Tarracina, Minturnae, Sinuessa, and, on the Adriatic, Sena and Castrum Novum.

[2] To both these classes the term *municipia* was applied.

[3] For details, see Beloch, *Ital. Bund*, caps. v., vi., vii. The enfranchised communities in most cases retained the old titles for their magistrates, and hence the variety in their designations.

[4] For the *praefecti*, see Mommsen, *Hist. of Rome*, ii. 49, 67, and *Staatsr.* ii. 608; Beloch, 130–33.

[5] Mommsen, *Hist. of Rome*, ii. 72 seq.; Livy viii. 8; Polyb. vi. 17–42.

[6] Livy iv. 59.

[7] This system was probably introduced in order to meet the charge of the Celtic swordsmen, but it was perfected during the Samnite wars. See Marquardt, *Staatsverw.* iii. 350 seq.; Daremberg-Saglio, *Dictionnaire des antiquités, s.v.* "Legio" (Cagnat).

[8] Livy viii. 23, "ut pro consule rem gereret quoad debellatum esset."

of Syracuse, led to the outbreak of war between Rome and 490. Carthage in 264 B.C. The military history of the struggle which followed is treated in the article PUNIC WARS; it will suffice to note here that the war lasted until 241 B.C., when the Carthaginians were compelled to cede Sicily and the Lipari islands to Rome, and to pay an indemnity of 3200 talents (about £800,000).

The struggle was one in which both Rome and Carthage were serving an apprenticeship in a warfare the conditions of which were unfamiliar to both. The Roman legions were foes very unlike any against which the Carthaginian leaders had ever led their motley array of mercenaries, while Rome was called upon for the first time to fight a war across the sea, and to fight with ships against the greatest naval power of the age. The novelty of these conditions accounts for much of the vacillating and uncertain action observable on both sides. It is possible that Hamilcar had already made up his mind that Rome must be attacked and crushed in Italy, but his government attempted nothing more than raids upon the coast. There are indications also that some in the Roman senate saw no end to the struggle but in the destruction of Carthage; yet an invasion of Africa was only once seriously attempted, and then only a half-hearted support was given to the expedition. But these peculiarities in the war served to bring out in the clearest relief the strength and the weakness of the two contending states. The chief dangers for Carthage lay obviously in the jealousy exhibited at home of her officers abroad, in the difficulty of controlling her mercenary troops, and in the ever-present possibility of disaffection among her subjects in Libya—dangers which even the genius of Hannibal failed finally to surmount. Rome, on the other hand, was strong in the public spirit of her citizens, the fidelity of her allies, the valour and discipline of her legions. What she needed was a system which should make a better use of her splendid materials than one under which her plans were shaped from day to day by a divided senate, and executed by officers who were changed every year, and by soldiers most of whom returned home at the close of each summer's campaign.

The interval between the First and Second Punic Wars was employed by both Rome and Carthage in strengthening their respective positions. The eastern end of Sicily was still left under the rule of Hiero as the ally of Rome, but the larger western portion of the island became directly subject to Rome, and a temporary arrangement seems to have been made for its government, either by one of the two praetors, or possibly by a quaestor.[1] Sardinia and Corsica had not been surrendered to 513, 515. Rome by the treaty of 241, but three years later (239), on the invitation of the Carthaginian mercenaries stationed in the islands, a Roman force occupied them; Carthage protested, but, on the Romans threatening war, she gave way, and Sardinia and Corsica were formally ceded to Rome, though it was some seven or eight years before all resistance 527. on the part of the natives themselves was crushed. In 227, however, the senate considered matters ripe for the establishment of a separate administration in her oversea possessions. In that year two additional praetors were elected; to one was assigned the charge of western Sicily, to the other that of Sardinia and Corsica,[2] and thus the first stones of the Roman provincial system were laid. Of at least equal importance for the security of the peninsula was the subjugation of the Celtic tribes in the valley of the Po. These, headed by the Boii and Insubres and assisted by levies from 529. the Celts to the westward, had in 225 alarmed the whole of Italy by invading Etruria and penetrating to Clusium, only three days' journey from Rome. Here, however, their courage seems to have failed them. They retreated northward along the Etruscan coast, until at Telamon their way was barred by the Roman legions, returning from Sardinia to the defence of Rome, while a second consular army hung upon their rear. Thus hemmed in, the Celts fought desperately, but were completely defeated and the flower of their tribesmen slain. The Romans followed up their success by invading the Celtic territory. The Boii were easily reduced to submission. The Insubres, north of the Po, resisted more obstinately, but by 222 the war was over, and all the tribes in the rich 532. Po valley acknowledged the supremacy of Rome. The conquered Celts were not enrolled among the Italian allies of Rome, but were treated as subjects beyond the frontier. Three colonies were founded to hold them in check—Placentia (218) and Cremona in the territory of the Insubres, Mutina (183) in that of the Boii; and the great northern road (Via Flaminia) was completed as far as the Celtic border at Ariminum.

On the Adriatic coast the immediate interests of Rome were limited to rendering the sea safe for Italian trade. It was with this object that, in 229, the first Roman expedition 525. crossed the Adriatic, and inflicted severe chastisement on the Illyrian pirates of the opposite coast.[3] This expedition was the means of establishing for the first time direct political relations between Rome and the states of Greece proper, to many of which the suppression of piracy in the Adriatic was of as much importance as to Rome herself. Alliances were concluded with Corcyra, Epidamnus, and Apollonia; and embassies explaining the reasons which had brought Roman troops into Greece were sent to the Aetolians, the Achaeans, and even to Athens and Corinth. Everywhere they were well received, and the admission of the Romans to the Isthmian games[4] (228) formally acknowledged them as the 526. natural allies of the free Greek states against both barbarian tribes and foreign despots. Meanwhile Carthage had acquired a possession which promised to compensate her for the loss of Sicily, Sardinia and Corsica. The genius of her greatest citizen and soldier, Hamilcar Barca, had appreciated the enormous value of the Spanish peninsula, and conceived the scheme of founding there a Carthaginian dominion which should not only add to the wealth of Carthage, but supply her with a base of operations for a war of revenge with Rome. The conquest of southern and eastern Spain, begun 518–26. by Hamilcar (236–28) and carried on by his kinsman 526–33. Hasdrubal (228–21), was completed by his son Hannibal, who, with all his father's genius, inherited also his father's hatred of Rome, and by 219 the authority 535. of Carthage had been extended as far as the Ebro (see SPAIN, *History*). Rome had not watched this rapid advance without anxiety, but, probably owing to her troubles with the Celts, she had contented herself with stipulating 528. (226) that Carthage should not carry her arms beyond the Ebro, so as to threaten Rome's ancient ally, the Greek Massilia (mod. Marseilles), and with securing the independence of the two nominally Greek communities, Emporiae and Saguntum,[5] on the east coast.

But these precautions were of no avail against the resolute determination of Hannibal, with whom the conquest of Spain was only preliminary to an attack upon Italy, and who could not afford to leave behind him in Spain a state allied to Rome. In 219, therefore, disregarding the protests of a Roman embassy, he attacked and took Saguntum, an act which, as he had foreseen, rendered a rupture with Rome inevitable, while it set his own hands free for a further advance.

For the details of the war which followed, the reader may be referred to the articles PUNIC WARS, HANNIBAL, and SCIPIO. From the outbreak of hostilities until the crowning *Second Punic War, 218–1=536–53.* victory of Cannae in 216 Hannibal's career of success was unchecked; and the annihilation of the Roman army in that battle was followed by the defection of almost the whole of southern Italy, with the exception of the Latin colonies and the Greek coast towns. In 215, moreover, Philip V. of Macedon formed an alliance 538. with Hannibal and threatened to invade Italy; in 539. 214 Syracuse revolted, and in 212 the Greek cities 540. in S. Italy went over to Hannibal. But the indomitable spirit of the Romans asserted itself in the face of these crushing *542, 543.* misfortunes. In 212 Syracuse was recovered; in 211 Capua fell after a long siege which Hannibal failed to raise, even by his famous march up to the gates of Rome, and in the same year a coalition was formed in Greece against Philip V. of Macedon, which effectually paralysed his offensive action. Hannibal was now confined to Lucania and Bruttium; and his brother Hasdrubal, marching from Spain to join him, *547.* was defeated and slain on the river Metaurus (207). The war in Italy was now virtually ended, for, though during four years more Hannibal stood at bay in a corner of Bruttium, he was powerless to prevent the restoration of Roman authority throughout the peninsula. Sicily was once more *548.* secure; and finally in 206, the year after the victory *543-48.* on the Metaurus, the successes of the young P. Scipio in Spain (211–6) were crowned by the complete expulsion of the Carthaginians from the peninsula. On his return from Spain Scipio eagerly urged an immediate invasion *549.* of Africa. The senate hesitated; but Scipio gained the day. He was elected consul for 205, and given the province of Sicily, with permission to cross into Africa if he thought fit. Voluntary contributions of men, money, and supplies poured in to the support of the popular hero; and by the end of 205 Scipio had collected in Sicily a sufficient *550.* force for his purpose. In 204 he crossed to Africa, *551.* where he was welcomed by the Numidian prince Massinissa, whose friendship he had made in Spain. In 203 he twice defeated the Carthaginian forces, and a large party at Carthage were anxious to accept his offer of negotiations. But the advocates of resistance triumphed.

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[1] Marquardt, *Staatsverw.* i. 243; Mommsen, *Hist. of Rome*, ii. 209; Appian, *Sic.* 2.

[2] Livy, *Epit.* xx.

[3] Polyb. ii. 8 seq.

[4] Ibid. ii. 12.

[5] Livy xxi. 2. 5; Polyb. iii. 15, 31.

Hannibal was recalled from Italy, and returned to fight his last battle against Rome at Zama, where Scipio, who had *552.* been continued in command as proconsul for 202 by a special vote of the people, won a complete victory. The war was over. The Roman assembly voted that the Carthaginian request for peace should be granted, and entrusted the settlement of the terms to Scipio and a commission of ten senators. Carthage was allowed to retain her territory in Africa; but she undertook to wage no wars outside Africa, and none inside without the consent of Rome. She surrendered all her ships but ten triremes, her elephants, and all prisoners of war, and agreed to pay an indemnity of 10,000 talents in fifty years. The Numidian Massinissa (*q.v.*) was rewarded by an increase of territory, and was enrolled among the "allies and friends" of the Roman people.

The West under Roman rule.

Sicily and Spain.

The battle of Zama decided the fate of the West. The power of Carthage was broken and her supremacy passed to Rome. Henceforth Rome had no rival to fear westward of Italy, and it rested with herself to settle within what limits her supremacy should be confined and what form it should take. For the next fifty years, however, Rome was too deeply involved in the affairs of the East to think of *631.* extending her rule far beyond the limits of the rich inheritance which had fallen to her by the defeat of Carthage; but within this area considerable advance was made in the organization and consolidation of her rule. In Sicily and Spain, the immediate establishment of a Roman government was imperatively necessary, if these possessions were not either to fall a prey to internal anarchy, or be recovered for Carthage by some second Hamilcar. Accordingly, we find that in Sicily the former dominions of Hiero were at once united with the western half of the island as a single province,[1] and that in Spain, *553.* after nine years of a provisional government (206–197), *548-57.* two provinces were in 197[2] definitely established, and each, like Sicily, assigned to one of the praetors for the year, two additional praetors being elected for the purpose. But here the resemblance between the two cases ends. *553.* From 201 down to the outbreak of the Slave *618.* War in 136 there was unbroken peace in Sicily, and its part in the history is limited to its important functions in supplying Rome with corn and in provisioning and clothing the Roman legions.[3] It became every year a more integral part of Italy; and a large proportion even of the land itself passed gradually into the hands of enterprising Roman speculators. The governors of the two Spains had very different work to do from that which fell to the lot of the Sicilian praetors. The condition of Spain required that year after year the praetors should be armed with the consular authority, and backed by a standing force of four legions, while more than once the presence of the consuls themselves was found necessary. Still, in spite of all difficulties, the work of pacification proceeded. To M. Porcius Cato, the censor, and *559.* to Tiberius Sempronius Gracchus (praetor and pro- *574–75.* praetor, 180–79), father of the two tribunes, is mainly due the credit of quieting the Celtiberian tribes of central Spain, and the government of Gracchus was followed by thirty years of comparative tranquillity. The insurrection *605.* headed by Viriathus in 149 was largely caused by exactions of the Roman magistrates themselves, while its obstinate continuance down to the capture of Numantia, *621.* in 133, was almost as much the result of the incapacity of the Roman commanders.[4] But the re-settlement of the country by Scipio Africanus the younger in that year left all Spain, with the exception of the highland Astures and Cantabri in the north-west, finally and tranquilly subject to Rome. Roman traders and speculators flocked to the seaport towns and spread inland. The mines became centres of Roman industry; the Roman legionaries quartered in Spain year after year married Spanish wives, and when their service was over gladly settled down in Spain in preference to returning to Italy. The first Roman communities established outside Italy were both planted in Spain, and both owed their existence to the Roman legions.[5]

Africa—Third Punic War, 153–46=605–8.

In Africa there was no question at first of the introduction of Roman government by the formation of a province (see Africa, Roman). Carthage, bound hand and foot by the treaty of 201, was placed under the jealous watch of the loyal prince of Numidia, who himself willingly acknowledged the suzerainty of Rome. But it was impossible for this arrangement to be permanent. Every symptom of reviving prosperity at Carthage was regarded at Rome with feverish anxiety, and neither the *559, 571.* expulsion of Hannibal in 195 nor his death in 183 did much to check the growing conviction that Rome would never be secure while her rival existed. It was therefore with grim satisfaction that many in the Roman senate watched the increasing irritation of the Carthaginians under the harassing raids and encroachments of their favoured neighbour Massinissa, and waited for the moment when Carthage should, by some breach of the conditions imposed upon her, supply Rome with a pretext for interference. At last in 151 *603.* came the news that Carthage, in defiance of treaty obligations, was actually at war with Massinissa. The anti-Carthaginan party in the senate, headed by M. Porcius Cato, eagerly seized the opportunity, and war was declared, and nothing short of the destruction of their city itself was demanded from the despairing Carthaginians. The demand was refused, and in 149 the siege of Carthage begun. During the next two *607.* years little progress was made, but in 147 P. Cornelius Scipio Aemilianus, grandson by adoption of the conqueror of Hannibal, was, at the age of thirty-seven, and though only a candidate for the aedileship, elected consul, and given the 608. command in Africa. In the next year (146) Carthage was taken and razed to the ground. Its territory became the Roman province of Africa, while Numidia, now ruled by the three sons of Massinissa, remained as an allied state under Roman suzerainty, and served to protect the new province against the raids of the desert tribes (see CARTHAGE).

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[1] Livy xxvi. 40. The union was apparently effected in 210.

[2] Ibid. xxxii. 27; cf. Marquardt, *Staatsverw.* i. 252, and Hübner in *Hermes*, i. 105 seq.

[3] Livy xxvii. 5, "pace ac bello fidissimum annonae subsidium"; cf. xxxii. 27.

[4] Some fresh light has been thrown upon the later campaigns in Spain by the recently discovered fragment of an epitome of Livy (Oxyrhynchus Papyri, iv. 668; Kornemann, *Die neue Liviusepitome aus Oxyrhynchos* (1904).

[5] Italica (206), Appian, *Iber.* 38; Carteia (171), Livy xliii. 3.

In Italy itself the Hannibalic war had been followed by important changes. In the north the Celtic tribes paid for their *Italy.* sympathy with Hannibal by the final loss of all separate political existence. Cispadane Gaul, studded with colonies and flooded with Roman settlers, was rapidly Romanized. Beyond the Padus (Po) in Polybius's time Roman civilization was already widely spread. In the extreme north-east the Latin colony of Aquileia, the last of its kind, was 573. founded in 181, to control the Alpine tribes, while in the north-west the Ligurians were held in check by 574. the colony of Luna (180), and by the extensive settlements of Roman citizens and Latins made on Ligurian 581. territory in 173.[1] In southern Italy the depression of the Greek cities on the coast, begun by the raids of the Sabellian tribes, was completed by the repeated blows inflicted upon them during the Hannibalic struggle. Some of them lost territory;[2] all suffered from a decline of population and loss of trade; and their place was taken by such new Roman settlements as Brundusium (Brindisi) and Puteoli (Pozzuoli).[3] In the interior the southern Sabellian tribes suffered scarcely less severely. The Bruttii were struck off the list of Roman allies, and nearly all their territory was confiscated.[4] To the Apulians and Lucanians no such hard measure was meted out; but their strength had been broken by the war, and their numbers dwindled; large tracts of land in their territories were seized by Rome, and allotted to Roman settlers, or occupied by Roman speculators. That Etruria also suffered from declining energy, a dwindling population, and the spread of large estates is clear from the state of 621. things existing there in 133. It was indeed in central Italy, the home of the Latins and their nearest kinsmen, and in the new Latin and Roman settlements throughout the peninsula that progress and activity were henceforth concentrated.

553–608. 554–621. (*b*) *Rome in the East, 200–133.*—Ever since the repulse of Pyrrhus from Italy, Rome had been slowly drifting into closer contact with the Eastern states. With one of the three great powers which had divided between them the empire of Alexander, with Egypt, she had formed an alliance in 273, and the alliance had been cemented by the growth of commercial intercourse between the two countries.[5] In 526. 228 her chastisement of the Illyrian pirates had led 540. naturally enough to the establishment of friendly relations with some of the states of Greece proper. In 214 the alliance between Philip V. and Hannibal, and the former's threatened attack on Italy, forced her into war with Macedon, at the head of a coalition of the Greek states against him, which effectually frustrated his designs against herself; at the first 549. opportunity, however (205), she ended the war by a peace which left the position unchanged. The results of the war were not only to draw closer the ties which bound Rome to the Greek states, but to inspire the senate with a genuine dread of Philip's restless ambition, and with a bitter resentment against him for his union with Hannibal. The events of the next four years served to deepen both these feelings. In 205 Philip entered into a compact with 549. Antiochus III. of Syria for the partition between them of the dominions of Egypt,[6] now left by the death of Ptolemy Philopator to the rule of a boy-king. Antiochus was to take Coele-Syria and Phoenicia, while Philip claimed for his share the districts subject to Egypt on the coasts of the Aegean and the Greek islands. Philip no doubt hoped to be able to secure these unlawful acquisitions before the close of the Second Punic War should set Rome free to interfere with his plans. But the obstinate resistance offered by Attalus of Pergamum and the Rhodians upset his calculations. In 201 Rome made 553. peace with Carthage, and the senate had leisure to listen to the urgent appeal for assistance which reached her from her Eastern allies. With Antiochus indeed the senate was not yet prepared to quarrel; but with Philip the senate had no thoughts of a peaceful settlement. Their animosity against him has been deepened by the assistance he had recently rendered to Carthage. Always an unsafe and turbulent neighbour, he would, if allowed to become supreme in the Aegean, prove as dangerous to her interests in the East as Carthage had been in the West. To cripple or at least to stay the growth of Philip's power was in the eyes of the senate a necessity; but it was only by representing a Macedonian invasion of Italy as imminent that they persuaded the assembly, which was longing 554. for peace, to pass a declaration of war[7] (200).

The war began in the summer of 200 B.C., and, though the landing of the Roman legions in Epirus was not followed, as had been hoped, by any general rising against Philip, *Second Macedonian War, 200–197—554–57.* yet the latter had soon to discover that, if they were not enthusiastic for Rome, they were still less inclined actively to assist himself. Neither by force nor by diplomacy could he make any progress south of Boeotia. The fleets of Pergamum and Rhodes, now the zealous allies of Rome, protected Attica and watched the eastern coasts. The Achaeans and Nabis of Sparta were obstinately neutral, while nearer home in the north the Epirots and Aetolians threatened Thessaly and Macedonia. His own resources both in men and in money had been severely strained by his constant wars,[8] and the only ally who could have given him effective assistance, Antiochus, was fully occupied with the conquest of Coele-Syria. It is no wonder then that, in spite of his dashing generalship and high courage, he made but a brief stand. T. Quinctius Flamininus (consul 556. 198), in his first year of command, defeated him on the Aous, drove him back to the pass of Tempe, and in the next year utterly routed him at Cynoscephalae. Almost at the same moment the Achaeans, who had now joined Rome, took Corinth, and the Rhodians defeated his troops in Caria.[9] Further resistance was impossible; Philip submitted, and early the next year a Roman commission reached Greece with instructions to arrange terms of peace. These were such as effectually secured Rome's main object in the war, the removal of all danger to herself and her allies from Macedonian aggression.[10] Philip was left in possession of his kingdom, but was degraded to the rank of a second-rate power, deprived of all possessions in Greece, Thrace and Asia Minor, and forbidden, as Carthage had been in 201, to wage war without the consent of 553. Rome, whose ally and friend he now became.

The second point in the settlement now effected by Rome was the liberation of the Greeks. The "freedom of Greece" was proclaimed at the Isthmian games amid a scene of *The liberation of Greece.* 560. wild enthusiasm,[11] which reached its height when two years later (194) Flamininus withdrew his troops even from the "three fetters of Greece"—Chalcis, Demetrias and Corinth.[12] There is no reason to doubt that, in acting thus, not only Flamininus himself, but the senate and people at home were influenced, partly at any rate, by feelings of genuine sympathy with the Greeks and reverence for their past. It is equally clear that no other course was open to them. For Rome to have annexed Greece, as she had annexed Sicily and Spain, would have been a flagrant violation of the pledges she had repeatedly given both before and during the war; the attempt would have excited the fiercest opposition, and would probably have thrown the Asiatic as well as the European Greeks into the arms of Antiochus. But a friendly and independent Greece would be at once a check on Macedon, a barrier against aggression from the East, and a promising field for Roman commerce. Nor while liberating the Greeks did Rome abstain from such arrangements as seemed necessary to secure the predominance of her own influence. In the Peloponnese, for instance, the Achaeans were rewarded by considerable accessions of territory; and it is possible that the Greek states, as allies of Rome, were expected to refrain from war upon each other without her consent.[1]

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[1] Livy xlii. 4.

[2] *E.g.* Tarentum, Livy xliv. 16. A Roman colony was established at Croton in 194, and a Latin colony (Copia) at Thurii in 193 (Livy xxxiv. 45, 53).

[3] Brundusium was established in 246 (Liv. *Epit.* xix.) or 245 (Vell. i. 14). Puteoli was fortified during the Second Punic War and became a Roman colony in 194 (Livy xxxiv. 45).

[4] Appian, *Hann.* 61; Aul. Gell. x. 3; cf. Beloch, *Ital. Bund.*

[5] Egypt had supplied corn to Italy during the Second Punic War (Polyb. ix. 44).

[6] Polyb. iii. 2, xv. 20; Livy xxxi. 14.

[7] Ibid. xxxi. 6, 7.

[8] Ibid. xxxiii. 3.

[9] Ibid. 18.

[10] Polyb. xviii. 44–47; Livy xxxiii. 30–34.

[11] Ibid. xxxiii. 32, 33.

[12] Ibid. xxxiv. 48–52.

War with Antiochus, 192–89=562–65.

Antiochus III. of Syria, Philip's accomplice in the proposed partition of the dominions of their common rival, Egypt, returned from the conquest of Coele-Syria (198) to learn first of all that Philip was hard pressed by the Romans, and shortly afterwards that he had been decisively beaten at Cynoscephalae. It was already too late to assist his former ally, but Antiochus resolved at any rate to lose no time in securing for himself the possessions of the Ptolemies in Asia Minor and in eastern Thrace, which Philip had claimed, and which Rome now pronounced free and independent. 557–58. In 197–96 he overran Asia Minor and crossed into Thrace.[2] But Antiochus was pleasure-loving, 562. irresolute, and no general, and it was not until 192 that the urgent entreaties of the Aetolians, and the withdrawal of the Roman troops from Greece, nerved him to the decisive step of crossing the Aegean; even then the force he took with him was so small as to show that he completely failed to appreciate the nature of the task before him.[3] At Rome the prospect of a conflict with Antiochus excited great anxiety, and it was not until every resource of diplomacy had been exhausted that war was declared,[4] and the real weakness which lay behind the once magnificent pretensions of the "king of kings" was revealed.

Had Antiochus acted with energy when in 192 he landed in 562. Greece, he might have won the day before the Roman legions appeared. As it was, in spite of the warnings of Hannibal,[5] who was now in his camp, and of the Aetolians, he frittered away valuable time between his pleasures at Chalcis 563. and useless attacks on petty Thessalian towns. In 191 Glabrio landed at the head of an imposing force; and a single battle at Thermopylae broke the courage of Antiochus, who hastily recrossed the sea to Ephesus, leaving his Aetolian allies to their fate. But Rome could not pause here. The safety of her faithful allies, the Pergamenes and Rhodians, and of the Greek cities in Asia Minor, as well as the necessity of chastising Antiochus, demanded an invasion of Asia. A Roman fleet had already (191) crossed the Aegean, and in concert with the fleets of 564. Pergamum and Rhodes worsted the navy of Antiochus. In 190 the new consul L. Scipio, accompanied by his famous brother, the conqueror of Africa, led the Roman legion for the first time into Asia. At Magnesia ad Sipylum, in Lydia, he met and defeated the motley and ill-disciplined hosts of the great king.[6] For the first time the West, under Roman leadership, successfully encountered the forces of the East, and the struggle began which lasted far on into the days of the emperors. **Settlement of western Asia.** The terms of the peace which followed the victory at Magnesia tell their own story clearly enough. There is no question, any more than in Greece, of annexation; the main object in view is that of securing the predominance of Roman interests and influence throughout the peninsula of Asia Minor, and removing to a safe distance the only eastern power which could be considered dangerous.[7] The line of the Halys and the Taurus range, the natural boundary of the peninsula eastward, was established as the boundary between Antiochus and the kingdoms, cities and peoples now enrolled as the allies and friends of Rome. This line Antiochus was forbidden to cross; nor was he to send ships of war farther west than Cape Sarpedon in Cilicia. Immediately to the west of this frontier lay Bithynia, Paphlagonia and the immigrant Celtic Galatae, and these frontier states, now the allies of Rome, served as a second line of defence against attacks from the east. The area lying between these "buffer states" and the Aegean was organized by Rome in such a way as should at once reward the fidelity of her allies and secure both her own paramount authority and safety from foreign attack. Pergamum and Rhodes were so strengthened—the former by the gift of the Chersonese, Lycaonia, Phrygia, Mysia and Lydia, the latter by that of Lycia and Caria—as not only amply to reward their loyalty, but to constitute them effective props of Roman interests and effective barriers alike against Thracian and Celtic raids in the north and Syrian aggression in the south. Lastly, the Greek cities on the coast, except those already tributary to Pergamum, were declared free, and established as independent allies of Rome.

In a space of little over eleven years (200–189) 554–65. Rome had broken the power of Alexander's successors and established throughout the eastern Mediterranean a Roman protectorate.

Third Macedonian War, 171–68=583–86.

It was in the western half of this protectorate that the first steps in the direction of annexation were taken. The enthusiasm provoked by the liberation of the Greeks had died away, and its place had been taken by feelings of dissatisfied ambition or sullen resentment. Internecine feuds and economic distress had brought many parts of Greece to the verge of anarchy, and, above all, the very foundations of the settlement effected in 197 557. were threatened by the reviving power and aspirations of Macedon. Loyally as Philip had aided Rome in the war with Antiochus, the peace of Magnesia brought him nothing but fresh humiliation. He was forced to abandon all hopes of recovering Thessaly, and he had the mortification to see the hated king of Pergamum installed almost on his borders as master of the Thracian Chersonese. Resistance at the time was unavailing, but from 189 until his death (179) he 565–75. laboured patiently and quietly to increase the internal resources of his own kingdom,[8] and to foment, by dexterous intrigue, feelings of hostility to Rome among his Greek and barbarian neighbours. His successor, Perseus, his son by a left-handed alliance, continued his father's work. He made friends among the Illyrian and Thracian princes, connected himself by marriage with Antiochus IV. of Syria and with Prusias of Bithynia, and, among the Greek peoples, strove, not without success, to revive the memories of the past glories of Greece under the Macedonian leadership of the great Alexander.[9] The senate could no longer hesitate. They were well aware of the restlessness and discontent in Greece; and after hearing from Eumenes of Pergamum, and from their own officers, all details of Perseus's intrigues and preparations, they declared war.[10] The struggle, in spite of Perseus's courage and the incapacity at the outset of the Roman commanders, was short and decisive. The sympathy of the Greeks with Perseus, which had been encouraged by the hitherto passive attitude assumed by Rome, instantly evaporated on the news that the Roman legions were on their way to Greece. No assistance came from Prusias or Antiochus, and Perseus's only allies were the Thracian king Cotys and the Illyrian Genthius. The victory gained by L. Aemilius Paulus at Pydna (168) ended the war.[11] Perseus 586. became the prisoner of Rome, and as such died in Italy a few years later.[12] Rome had begun the war with the fixed resolution no longer of crippling but of destroying the Macedonian state. Perseus's repeated proposals for peace during the war had been rejected; and his defeat was followed by the final extinction of the kingdom of Philip and Alexander.[1] Macedonia, though it ceased to exist as a single state, was not, however, definitely constituted a Roman province.[2] On the contrary, the mistake was made of introducing some of the main principles of the provincial system—taxation, disarmament and the isolation of the separate communities—without the addition of the element most essential for the maintenance of order—that of a resident Roman governor. The four petty republics now created were each autonomous, and each separated from the rest by the prohibition of *commercium* and *conubium*, but no central controlling authority was substituted for that of the Macedonian king. **605–8.** The inevitable result was confusion and disorder, resulting finally (149–48) in the attempt of a pretender, Andriscus, who claimed to be a son of Perseus, to resuscitate the ancient monarchy.[3] **Macedonia a Roman province.** On his defeat in 148 the senate declared Macedonia a Roman province, and placed a Roman magistrate at its head.[4]

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[1] For the conflicting views of moderns on the action of Rome, see Mommsen, *Hist. of Rome*, ii. 442; Holm, *Hist. of Greece*, iv. 349; and on the other side Ihne, *Hist. of Rome*, iii. 76 ff., and C. Peter, *Studien zur röm. Gesch.* (Halle, 1863), pp. 158 seq.

[2] Livy xxxiii. 38; Polyb. xviii. 50.

[3] Livy xxxv. 43. [4] Ibid. xxxv. 20, xxxvi. 1. [5] Ibid. xxxvi. 7.

[6] Livy (xxxvii. 40) describes the composition of Antiochus's army.

[7] Livy xxxvii. 55, xxxviii. 38; Polyb. xxi. 17.

[8] Livy xxxix. 24 seq. [9] Ibid. xlii. 5. [10] Ibid. xlii. 19, 36.

[11] Ibid. xliv. 36–41; Plut. *Aemil.* 15 seq.

[12] Diod. xxxi. 9; Livy xlv. 42; Polyb. xxvii. 16.

Affairs in Greece, 565–87. From 189 to the defeat of Perseus in 168 no formal change of importance in the status of the Greek states had been made by Rome. The senate, though forced year after year to listen to the mutual recriminations and complaints of rival communities and factions, contented itself as a rule with intervening just enough to remind the Greeks that their freedom was limited by its own paramount authority, and to prevent any single state or confederacy from raising itself too far above the level of general weakness which it was the interest of Rome to maintain. After the victory at Pydna, however, the sympathy shown for Perseus, exaggerated as it seems to have been by the interested representations of the romanizing factions in the various states, was made the pretext for a more emphatic assertion of Roman ascendancy. All those suspected of Macedonian leanings were removed to Italy, as hostages for the loyalty of their several communities,[5] and the real motive for the step was made clear by the exceptionally severe treatment of the Achaeans, whose loyalty was not really doubtful, but whose growing power in the Peloponnese and independence of language had awakened alarm at Rome. A thousand of their leading men, among them the historian Polybius, were carried off to Italy (see POLYBIUS). In Aetolia the Romans connived at the massacre by their so-called friends of five hundred of the opposite party. Acarnania was weakened by the loss of Leucas, while Athens was rewarded for her unambitious loyalty by the gift of Delos and Samos.

But this somewhat violent experiment only answered for a time. **Settlement of Greece, 146=608.** In 148 the Achaeans rashly persisted, in spite of warnings, in attempting to compel Sparta by force of arms to submit to the league. When threatened by Rome with the loss of all that they had gained since Cynoscephalae, they madly rushed into war.[6] They were easily defeated, and a "commission of ten," under the presidency of L. Mummius, was appointed by the senate thoroughly to resettle the affairs of Greece.[7] Corinth, by orders of the senate, was burnt to the ground and its territory confiscated. Thebes and Chalcis were destroyed, and the walls of all towns which had shared in the last desperate outbreak were razed to the ground. All the existing confederacies were dissolved; no *commercium* was allowed between one community and another. Everywhere an aristocratic type of constitution, according to the invariable Roman practice, was established, and the payment of a tribute imposed. **587.** Into Greece, as into Macedonia in 167, the now familiar features of the provincial system were introduced—disarmament, isolation and taxation. The Greeks were still nominally free, and no separate province with a governor of its own[8] was established, but the needed central control was provided by assigning to the neighbouring governor of Macedonia a general supervision over the affairs of Greece. From the Adriatic to the Aegean, and as far north as the river Drilo and Mount Scardus, the whole peninsula was now under direct Roman rule.[9]

The Roman protectorate in Asia, 189–46=565–608. Beyond the Aegean the Roman protectorate worked no better than in Macedonia and Greece, and the quarrels and disorders which flourished under its shadow were aggravated by its longer duration and by the still more selfish view taken by Rome of her responsibilities.[10] At one period indeed, after the battle of Pydna, it seemed as if the more vigorous, if harsh, system then initiated in Macedon and Greece was to be adopted farther east also. The levelling policy pursued towards Macedon and the Achaeans was applied with less justice to Rome's two faithful and favoured allies, Rhodes and Pergamum. The former had rendered themselves obnoxious to Rome by their independent tone and still more by their power and commercial prosperity. On a charge of complicity with Perseus they were threatened with war, and though this danger was averted[11] they were forced to exchange their equal alliance with Rome for one which placed them in close dependence upon her, and to resign the lucrative possessions in Lycia and Caria given them in 189. **565.** Finally, their commercial prosperity was ruined by the establishment of a free port at Delos,[12] and by the short-sighted acquiescence of Rome in the raids of the Cretan pirates. With Eumenes of Pergamum no other fault could be found than that he was strong and successful; but this was enough. His brother Attalus was invited, but in vain, to become his rival. His turbulent neighbours, the Galatae, were encouraged to harass him by raids. Pamphylia was declared independent, and favours were heaped upon Prusias of Bithynia. These and other annoyances and humiliations had the desired effect. Eumenes and his two successors—his brother and son, Attalus II. and Attalus III.—contrived indeed by studious humility and dexterous flattery to retain their thrones, but Pergamum (*q.v.*) ceased to be a powerful state, and its weakness, added to that of Rhodes, increased the prevalent disorder in Asia Minor. During the same period we have other indications of a temporary activity on the part of Rome. The frontier of the protectorate was pushed forward to the confines of Armenia by alliances with the kings of Pontus and Cappadocia beyond the Halys. **590.** In Syria, on the death of Antiochus Epiphanes (164), Rome intervened to place a minor, Antiochus Eupator, on the throne, under Roman guardianship.[13] **586. 591.** In 168 Egypt formally acknowledged the suzerainty of Rome,[14] and in 163 the senate, in the exercise of this new authority, restored Ptolemy Philometor to his throne, but at the same time weakened his position by handing over Cyrene and Cyprus to his brother Euegertes.[15]

595–621. But this display of energy was shortlived. From the death of Eumenes in 159 down to 133 Rome, secure in the absence of any formidable power in the East, and busy with affairs in Macedonia, Africa and Spain, relapsed into an inactivity the disastrous results of which revealed themselves in the next period, in the rise of Mithradates of Pontus, the spread of Cretan and Cilician piracy, and the advance of Parthia.

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[1] Livy xlv. 9.

[2] Ibid. xlv. 17, 29; Plut. *Aemil.* 28; Mommsen, *Hist. of Rome*, ii. 508; Ihne, *Hist. of Rome*, iii. 258; Marquardt, *Staatsverw.* i. 316.

[3] Polyb. xxxvii. 2; Livy, *Epit.* l.

[4] For the boundaries of the province, see Ptolemy iii. 13; Marquardt, *loc. cit.* 318 f.

[5] Livy xlv. 31.

[6] Ibid. *Epit.* li., lii.

[7] Ibid. *Epit.* lii.; Polyb. xl. 9 seq.; Pausanias vii. 16; Mommsen, *Hist. of Rome*, iii. 270.

[8] Mommsen, *loc. cit.* note; Marquardt, *Staatsverw.* i. 321 seq.; Niese, *Geschichte der griechischen und makedonischen Staaten*, iii. 358.

[9] North of the Drilo the former kingdom of Perseus's ally Genthius had been treated as Macedon was in 167 (Livy xlv. 26); cf. Zippel, *Röm. Herrschaft in Illyrien* (Leipzig, 1877). Epirus, which had been desolated after Pydna (Livy xlv. 34), went with Greece; Marquardt i. 319.

[10] Mommsen, *Hist. of Rome*, ii. 510 ff., iii. 274 ff.

[11] Livy xiv. 20; Polyb. xxx. 5.

[12] Polyb. xxxi. 7. The Rhodian harbour dues suffered severely.

[13] Rome had already intervened between Syria and Egypt: Livy xlv. 12; Polyb. xxix. 11, xxxi. 12.

[14] Livy xlv. 13, "Regni maximum praesidium in fide populi Romani."

[15] Ibid. *Epit.* xlvi., xlvii.

Both the western and eastern Mediterranean now acknowledged the suzerainty of Rome, but her relations with the two were from the first different. The West fell to her as the prize of victory over Carthage, and, the Carthaginian power broken, there was no hindrance to the immediate establishment in Sicily, Sardinia, Spain, and finally in Africa, of direct Roman rule. To the majority, moreover, of her western subjects she brought a civilization as well as a government of a higher type than any before known to them. And so in the West she not only formed provinces but created a new and wider Roman world. To the East, on the contrary, she came as the liberator of the Greeks; and it was only slowly that in this part of the Empire her provincial system made way. In the East, moreover, the older civilization she found there obstinately held its ground. Her proconsuls governed and her legions protected the Greek communities, but to the last the East remained in language, manners and thought Greek and not Roman.

608–705.

Period C: The Period of the Revolution (146–49 b.c.).—In the course of little more than a century, Rome had become the supreme power in the civilized world. By all men, says Polybius, it was taken for granted that nothing remained but to obey the commands of the Romans.[1] For the future the interest of Roman history centres in her attempts to perform the two Herculean tasks which this unique position laid upon her,—the efficient government of the subject peoples, and their defence against the barbarian races which swarmed around them on all sides. They were tasks under which the old republican constitution broke down, and which finally overtaxed the strength even of the marvellous organization framed and elaborated by Augustus and his successors.

Constitutional changes, 265–146–489–608.

Although in its outward form the old constitution had undergone little change during the age of war and conquest from 265 to 146,[2] the causes, both internal and external, which brought about its fall had been silently at work throughout. Its form was in strictness that of a moderate democracy. The patriciate had ceased to exist as a privileged caste,[3] and there was no longer any order of nobility recognized by the constitution. The senate and the offices of state were in law open to all,[4] and the will of the people in assembly had been in the most explicit and unqualified manner declared to be supreme alike in the election of magistrates, in the passing of laws, and in all matters touching the *caput* of a Roman citizen. But in practice the constitution had become an oligarchy. The senate, not the assembly, ruled Rome, and both the senate and the magistracies were in the hands of a class which, in defiance of the law, arrogated to itself the title and the privileges of a nobility.[5] The ascendancy of the senate is too obvious and familiar a fact to need much illustration here. It was but rarely that the assembly was called upon to decide questions of policy, and then the proposal was usually made by the magistrate in obedience to the express directions of the senate.[6] In the enormous majority of cases the matter was settled by a *senatus consultum*, without any reference to the people at all. The assembly decides for war or peace,[7] but the conduct of the war and the conditions of peace are matters left to the senate (*q.v.*). Now and then the assembly confers a command upon the man of its choice, or prolongs the *imperium* of a magistrate,[8] but, as a rule, these and all questions connected with foreign affairs are settled within the walls of the senate-house.[9] It is the senate which year after year assigns the commands and fixes the number and disposition of the military forces,[10] directs the organization of a new province,[11] conducts negotiations, and forms alliances. Within Italy, though its control of affairs was less exclusive, we find that, besides supervising the ordinary current business of administration, the senate decides questions connected with the Italian allies, sends out colonies, allots lands, and directs the suppression of disorders. Lastly, both in Italy and abroad it managed the finances.[12] Inseparably connected with this monopoly of affairs to the exclusion of the assembly was the control which in practice, if not in theory, the senate exercised over the magistrates. The latter had become what Cicero wrongly declares they were always meant to be, merely the subordinate ministers of the supreme council,[13] which assigned them their departments, provided them with the necessary equipment, claimed to direct their conduct, prolonged their commands, and rewarded them with triumphs. It was now at once the duty and the interest of a magistrate to be *in auctoritate senatus*, "subject to the authority of the senate," and even the once formidable *tribuni plebis* are found during this period actively and loyally supporting the senate, and acting as its spokesmen in the assembly.[14]

Ascendancy of the senate.

Its causes.

The causes of this ascendancy of the senate are to be found firstly in the fact that the senate was the only body capable of conducting affairs in an age of incessant war. The voters in the assembly, a numerous, widely scattered body, could not readily be called together, and when assembled were very imperfectly qualified to decide momentous questions of military strategy and foreign policy. The senate, on the contrary, could be summoned in a moment,[15] and included in its ranks all the skilled statesmen and soldiers of the commonwealth. The subordination of the magistrates was equally the result of circumstances, for, as the numbers of the magistrates, and also the area of government, increased, some central controlling power became absolutely necessary to prevent collisions between rival authorities, and to secure a proper division of labour, as well as to enforce the necessary concert and co-operation.[16] No such power could be found anywhere in the republican system but in the senate, standing as it necessarily did in the closest relations with the magistrate, and composed as it was increasingly of men who were or had been in office.

The nobiles.

608.

Once more, behind both senate and magistrates, lay the whole power and influence of the new nobility.[17] These *nobiles* were essentially distinct from the older and more legitimate patrician aristocracy. Every patrician was of course noble, but the majority of the "noble families" in 146 were not patrician but plebeian.[18] The title had been gradually appropriated, since the opening of the magistracies, by those families whose members had held curule office, and had thereby acquired the *ius imaginum*. It was thus in theory within the reach of any citizen who could win election even to the curule aedileship, and, moreover, it carried with it no legal privileges whatsoever. Gradually, however, the ennobled plebeian families drew together, and combined with the older patrician *gentes* to form a distinct order. Office brought wealth and prestige, and both wealth and prestige were liberally employed in securing for this select circle a monopoly of political power, and excluding new men.[1] Already by the close of the period it was rare for any one but a noble to find his way into high office or into the senate. The senate and magistrates are the mouthpieces of this order, and identified with it in policy and interest. Lastly, it must be allowed that both the senate and the nobility had to some extent justified their power by the use they made of it. It was their tenacity of purpose and devoted patriotism which had carried Rome through the dark days of the Hannibalic War. The heroes of the struggle with Carthage belonged to the leading families; the disasters at the Trasimene Lake and at Cannae were associated with the blunders of popular favourites.

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[1] Polyb. iii. 4.

[2] The most important change was the assimilation of the division by classes and centuries with that by tribes, a change possibly due to the censorship of Gaius Flaminius in 220 (Mommsen, *Staatsr.* iii. 270). On this point see Comitia. *534.*

[3] A few offices of a more or less priestly character were still filled only by patricians, *e.g. rex sacrorum, flamen Dialis.* A plebeian first became *curio maximus* in 209 (Livy xxvii. 8). *545.*

[4] The *lectio senatus* was in the hands of the censors, but whether before Sulla's time their choice was subject to legal restrictions is doubtful (see Senate).

[5] Mommsen, *Hist. of Rome*, iii. 7; Lange, *Röm. Alterth.* ii. 1 ff.

[6] "Ex auctoritate senatus." The *lex Flaminia agraria* of 232 was an exception (Cic. *De senect.* 4; Polyb. ii. 21). In 167 b.c. a praetor brought the question of war with Rhodes directly before the assembly, but this was condemned as unprecedented (*novo maloque exemplo*, Liv. xlv. 21).

[7] Livy xxxi. 5, xxxiii. 25, xxxvii. 55.

[8] Ibid. xxx. 27, &c.

[9] Polyb. (vi. 15) expressly includes the prorogation of a command among the prerogatives of the senate.

[10] Livy xxvi. 1, "consules de republica, de administratione belli, de provinciis exercitibusque patres consuluerunt."

[11] Ibid. xlv. 18.

[12] Ihne, *Hist. of Rome*, iv. 43; Polyb. vi. 13.

[13] *Pro Sestio* 65, "quasi ministros gravissimi consilii."

[14] Livy xxvii. 5, xxviii. 45.

[15] Ibid. xxii. 7. In 191 the senators were forbidden to leave Rome for more than a day, nor were more than five to be absent at once (Livy xxxvi. 3).

[16] Ibid. xxvii. 35.

[17] Mommsen, *Hist. of Rome*, iii. 7 ff.

[18] *E.g.* Livii, Sempronii, Caecilii, Licinii, &c.

Weakness of the senatorial government.

From the first, however, there was an inherent weakness in this senatorial government. It had no sound constitutional basis, and with the removal of its accidental supports it fell to the ground. Legally the senate had no positive authority. It could merely advise the magistrate when asked to do so, and its decrees were strictly only suggestions to the magistrate, which he was at liberty to accept or reject as he chose.[2] It had, it is true, become customary for the magistrate not only to ask the senate's advice on all important points, but to follow it when given. But it was obvious that if this custom were weakened, and the magistrates chose to act independently, the senate was powerless. It might indeed anathematize[3] the refractory official, or hamper him if it could by setting in motion against him a colleague or the tribunes, but it could do no more, and these measures failed just where the senate's control was most needed and most difficult to maintain—in its relations with the generals and governors of provinces abroad. The virtual independence ***608.*** of the proconsul was before 146 already exciting the jealousy of the senate and endangering its supremacy.[4] Nor again had the senate any legal hold over the assembly. Except in certain specified cases, it rested with the magistrate to decide whether any question should be settled by a decree of the senate or a vote of the assembly.[5] If he decided to make a proposal to the assembly, he was not bound except by custom to obtain the previous approval of the senate,[6] and the constitution set no limits to the power of the assembly to decide any question whatsoever that was laid before it.

587. From 167, at least, onwards, there were increasing indications that both the acquiescence of the people in senatorial government and the loyalty of the magistrates to the senate were failing. The absorbing excitement of the great wars had died away; the economic and social disturbance and distress which they produced were creating a growing feeling of discontent; and at the same time the senate provoked inquiries into its title to govern by its failure any longer to govern well. In the East there was confusion; in the West a single native chieftain defied the power which had crushed Carthage. At home the senate was becoming more and more simply an organ of the nobility, and the nobility were becoming every year more exclusive, more selfish, and less capable and unanimous.[7]

But if the senate was not to govern, the difficulty arose of finding an efficient substitute, and it was this difficulty that mainly determined the issue of the struggles which convulsed Rome from 133 to 49. ***621-705.*** As the event showed, neither the assembly nor the numerous and disorganized magistracy was equal to the work; the magistrates were gradually pushed aside in favour of a more centralized authority, and the former became only the means by which this new authority was first encouraged in opposition to the senate and finally established in a position of impregnable strength. The assembly which made Pompey and Caesar found out too late that it could not unmake them.

Effects of conquest on Roman society: the new wealth.

It is possible that these constitutional and administrative difficulties would not have proved so rapidly fatal to the Republic had not its very foundations been sapped by the changes which followed more or less directly on the conquests of the 3rd and 2nd centuries B.C. For the opening of the world to Rome, and of Rome to the world, produced a radical change in the structure of Roman society. The subjugation of the Mediterranean countries, by placing at the disposal of Rome the vast natural resources of the West and the accumulated treasures of the East, caused a rapid rise in the standard of wealth and a marked change in its distribution. The Roman state was enabled to dispense with the direct taxation of its citizens,[8] since it derived all the revenue which it needed from the subject countries. But the wealth drawn from the provinces by the state was trifling in amount compared with that which flowed into the pockets of individual citizens. Not only was the booty taken in war largely appropriated by the Roman commanders and their men, but a host of money-makers settled upon the conquered provinces and exploited them for their profit. The nobles engaged in the task of administration, the contractors (*publicani*) who farmed the revenues, and the "men of business" (*negotiatores*) who, as money-lenders, merchants or speculators, penetrated to every corner of the Empire, reaped a rich harvest at the expense of the provincials. Farming in Italy on the old lines became increasingly laborious and unprofitable owing to the importation of foreign corn and foreign slaves,[9] and capitalists sought easier methods of acquiring wealth. If this had meant that capital was expended in developing the natural resources of the provinces, the result would have been to increase the prosperity of the countries subject to Rome; but it was not so. The Roman *negotiatores*, who were often merely the agents of the great families of Rome, drained the accumulated wealth of the provinces by lending money to the subject communities at exorbitant rates of interest. Cicero, for example, found when governor of Cilicia that M. Junius Brutus had lent a large sum to the people of Salamis in Cyprus at 48% compound interest; and we cannot suppose that this was an exceptional case. Such practices as these, together with the wasteful and oppressive system of tax-farming, and the deliberate extortions carried on by senatorial governors, reduced the flourishing cities of the Greek East, within the space of two generations, to utter economic exhaustion.

Accentuation of class distinctions.

But the reaction of the same process on Rome herself had far more important consequences. The whole structure of Roman society was altered, and the equality and homogeneity which had once been its chief characteristics were destroyed. The Roman nobles had not merely ceased, as in old days, to till their own farms; they had found a means of enriching themselves beyond the dreams of avarice, and when they returned from the government of a province it was to build sumptuous villas, filled with the spoils of Greece and Asia, to surround themselves with troops of slaves and dependents, and to live rather as princes than as citizens of a republic. The *publicani* and *negotiatores* formed a second order in the state, which rivalled the first in wealth and coveted a share in its political supremacy; while the third estate, the *plebs urbana*, was constantly increasing in numbers and at the same time sinking into the condition of an idle proletariat. The accentuation of class distinctions is indeed inevitable in a capitalist society, such as that of Rome was now becoming. But the process was fraught with grave political danger owing to the peculiarities of the Roman constitution, which rested in theory on the ultimate sovereignty of the people, who were in practice represented by the city mob. To win the support of the *plebs* became a necessity for ambitious politicians, and the means employed for this end poisoned the political life of Rome. The wealth derived from the provinces was freely spent in bribery,[1] and the populace of Rome was encouraged to claim as the price of its support a share in the spoils of empire.

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[1] Livy xxii. 34, "plebeios nobiles . . . contemnere plebem, ex quo contemni a patribus desierint, coepisse"; cf. Sall, *Jug.* 41, "paucorum arbitrio belli domique agitabatur; penes eosdem aerarium, provinciae, magistratus." Mommsen, *Hist. of Rome*, iii. 15 n. The number of new families ennobled dwindles rapidly after 200 B.C.; Willems, *Le Sénat de la république romaine*, i. 366 seq. (Paris, 1878).

[2] The senators' whole duty is "sententiam dicere." The senator was asked "quid censes?" the assembly "quid velitis jubeatis?" Cf. also the saving clause, "Si eis videretur" (*sc.* consulibus, &c) in Scta., *e.g.* Cic. *Phil.* v. 19, 53.

[3] By declaring his action to be "contra rempublicam." The force of this anathema varied with circumstances. It had no legal value.

[4] Livy xxxviii. 42, of Cn. Manlius Vulso in Asia, 189 B.C.; cf. also the position of the two Scipios.

[5] Hence the same things, *e.g.* founding of colonies, are done in one year by a Sctum., in another by a *lex*; cf. Cic. *De rep.* ii. 32, 56; *Phil.* i 2, 6, of Antony as consul, "mutata omnia, nihil per senatum, omnia per populum."

[6] There was no legal necessity, before Sulla's time, for getting the *senatus auctoritas* for a proposal to the assembly.

[7] See generally Mommsen, *Hist. of Rome*, i. bk. iii. cap. 6; Lange, *Röm. Alterth.* vol. ii.; Ihne, bk. v. cap. i. The first law against bribery at elections was passed in 181 B.C. (Livy xl. 19), and against magisterial extortion in the provinces in 149 (*Lex Calpurnia de pecuniis repetundis*). The senators had special seats allotted to them in the theatre in 194 B.C.; Livy xxxiv. 44, 54.

[8] The *tributum* was no longer levied after 167 B.C. (Cic. *Off.* ii. 22; Plin. *H.N.* xxxiii. 56).

[9] See, however, p. 637, note 1 and reff.

The new learning and manners.

It was not only the structure and composition of Roman society that underwent a transformation. The victory of Rome in her struggle for supremacy in the Mediterranean basin had been largely due to the powerful conservative forces by which her institutions were preserved from decay. Respect for the *mos majorum*, or ancestral custom, imposed an effective check on the desire for innovation. Though personal religion, in the deeper sense, was foreign to the Roman temperament, there was a genuine belief in the gods whose favour had made Rome great in the past and would uphold her in the future so long as she trod in the old paths of loyalty and devotion. Above all, the healthy moral traditions of early Rome were maintained by the discipline of the family, resting on the supreme authority of the father—the *patria potestas*—and the powerful influence of the mother, to whom the early training of the child was entrusted.[2] Finally, the institution of the censorship, backed as it was by the mighty force of public opinion, provided a deterrent which prevented any flagrant deviation from the accepted standard of morals. All this was changed by the influence of Greek civilization, with which Rome was first brought face to face in the 3rd century B.C., owing to her relations with Magna Graecia. At first the results of contact with the older and more brilliant culture of Hellas were on the whole good. In the 2nd century B.C., when constant intercourse was established with the communities of Greece proper and of Asia Minor, "philhellenism" became a passion, which was strongest in the best minds of the day and resulted in a quickened intellectual activity, wider sympathies and a more humane life. But at the same time the "new learning" was a disturbing and unsettling force. The Roman citizen was confronted with new doctrines in politics and religion, and initiated into the speculations of critical philosophy.[3] Under the influence of this powerful solvent the fabric of tradition embodied in the *mos majorum* fell to pieces; a revolt set in against Roman discipline and Roman traditions of self-effacement, and the craving for individual distinction asserted itself with irresistible vehemence. As it had been in the days of the "Sophistic" movement at Athens, so it was now with Rome; a higher education, which, owing to its expense, was necessarily confined to the wealthier classes, interposed between the upper and lower ranks of society a barrier even more effectual than that set up by differences of material condition, and by releasing the individual from the trammels of traditional morality, gave his ambition free course. The effect on private morals may be gauged by the vehemence with which the reactionary opposition, headed by M. Porcius Cato (consul, 195 B.C.; censor, 184 B.C.), inveighed against the new fashions, and by the list of measures passed to check the growth of luxury and licence, and to exclude the foreign teachers of the new learning.[4] It was all in vain. The art of rhetoric, which was studied through the medium of Greek treatises and Greek models, furnished the Roman noble with weapons of attack and defence of which he was not slow to avail himself in the forum and the senate-house. In the science of money-making, which had been elaborated under the Hellenistic monarchies, the Roman capitalists proved apt pupils of their Greek teachers. Among the lower classes, contact with foreign slaves and freedmen, with foreign worships and foreign vices, produced a love of novelty which no legislation could check. Even amongst women there were symptoms of revolt against the old order, which showed itself in a growing freedom of manners and impatience of control,[5] the marriage tie was relaxed,[6] and the respect for mother and wife, which had been so powerful a factor in the maintenance of the Roman standard of morals, was grievously diminished. Thus Rome was at length brought face to face with a moral and economic crisis which a modern historian has described in the words: "Italy was living through the fever of moral disintegration and incoherence which assails all civilized societies that are rich in the manifold resources of culture and enjoyment, but tolerate few or no restraints on the feverish struggle of contending appetites." In this struggle the Roman Republic perished, and personal government took its place. The world had outgrown the city-state and its political machinery, and as the notions of federalism (on any large scale) and representative government had not yet come into being, no solution of the problem was possible save that of absolutism. But a far stronger resistance would have been opposed to political revolution by the republican system had not public morals been sapped by the influences above described. Political corruption was reduced to a science[7] for the benefit of individuals who were often faced with the alternatives of ruin or revolution;[8] there was no longer any body of sound public opinion to which, in the last resort, appeal could be made; and, long before the final catastrophe took place, Roman society itself had become, in structure and temper, thoroughly unrepublican.

559,570.

The Gracchi, 133-21 = 621-33.

The first systematic attack upon the senatorial government is connected with the names of Tiberius and Gaius Gracchus (*q.v.*) and its immediate occasion was an attempt to deal with no less a danger than the threatened disappearance of the class to which of all others Rome owed most in the past.[9] The small landholders throughout the greater part of Italy were sinking deeper into ruin under the pressure of accumulated difficulties. The Hannibalic war had laid waste their fields and thinned their numbers, nor when peace returned to Italy did it bring with it any revival of prosperity. The heavy burden of military service still pressed ruinously upon them,[10] and in addition they were called upon to compete with the foreign corn imported from beyond the sea, and with the foreign slave-labour purchased by the capital of wealthier men.[1] Farming became unprofitable, and the hard laborious life with its scanty returns was thrown into still darker relief when compared with the stirring life of the camps with its opportunities of booty, or with the cheap provisions, frequent largesses and gay spectacles to be had in the large towns. The small holders went off to follow the eagles or swell the proletariat of the cities, and their holdings were left to run waste or merged in the vineyards, oliveyards and above all in the great cattlefarms of the rich, and their own place was taken by slaves. The evil was worst in Etruria and in southern Italy; but everywhere it was serious enough to demand the earnest attention of Roman statesmen. Of its existence the government had received plenty of warning in the declining numbers of able-bodied males returned at the census,[2] in the increasing difficulties of recruiting for the legions,[3] in servile outbreaks in Etruria and Apulia,[4] and **554-94.** between 200 and 160 a good deal was attempted by way of remedy. In addition to the foundation of twenty colonies,[5] there were frequent allotments of land to veteran soldiers, especially in Apulia and Samnium.[6] In **574.** 180, 40,000 Ligurians were removed from their homes **594.** and settled on vacant lands once the property of a Samnite tribe,[7] and in 160 the Pomptine marshes were drained for the purpose of cultivation.[8] But these efforts were only partially successful. The colonies planted in Cisalpine Gaul and in Picenum flourished, but of the others the majority slowly dwindled away, and two required re-colonizing only eight years after their foundation.[9] The veterans who received land were unfitted to make good farmers; and large numbers, on the first opportunity, gladly returned **594** as volunteers to a soldier's life. Moreover, after 160 even these efforts ceased, and with the single exception **597. 621.** of the colony of Auximum in Picenum (157) nothing was done to check the spread of the evil, until in 133 Tiberius Gracchus, on his election to the tribunate, set his hand to the work.

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[1] From 181 B.C. onwards a succession of laws *de ambitu* were passed to prevent bribery, but without effect.

[2] Cf. Tacitus's account of Cornelia, the mother of the Gracchi, and Aurelia, the mother of Julius Caesar, in the dialogue *De oratoribus*, c. 28.

[3] It is to be noted that these subjects were, generally speaking, taught by freedmen or slaves.

[4] In 161 B.C. a decree of the senate was passed against "philosophi et rhetores Latini, uti Romae ne essent" (Gell. xv. 11). In 155 B.C. the philosopher Carneades was expelled from Rome (Plut. *Cato*. 22).

[5] The elder Cato complained of this as early as 195 B.C. (Liv. xxxiv. 2).

[6] Divorce was unknown at Rome until 231 B.C. (Dionys. ii. 25). In the last century of the Republic it was of daily occurrence.

[7] In the Ciceronian period the lower classes of Rome, with whom the voting power in the *comitia* rested, were openly organized for purposes of bribery by means of *collegia* and *sodalicia*, nominally religious bodies.

[8] Caesar had accumulated debts amounting to £800,000 by the time of his praetorship. Catiline and his fellow-bankrupts, amongst whom were several women, including a certain Sempronia who, as we are told by Sallust, "danced and played better than an honest woman need do," hoped to bring about a cancelling of debts (*novae tabulae*).

[9] For authorities, see under GRACCHUS.

[10] To Spain alone more than 150,000 men were sent between 196 and 169 (Ihne iii. 319); compare the reluctance of the people to declare war against Macedon in 200 B.C., and also the case of Spurius Ligustinus in 171 (Livy, xlii. 34).

Tiberius Gracchus.

The remedy proposed by Gracchus[10] amounted in effect to the resumption by the state of as much of the "common land" as was not held in occupation by authorized persons and conformably to the provisions of the Licinian law,[11] and the distribution in allotments of the land thus rescued for the community from the monopoly of a few. It was a scheme which could quote in its favour ancient precedent as well as urgent necessity. Of the causes which led to its ultimate failure something will be said later on; for the present we must turn to the constitutional conflict which it provoked. The senate from the first identified itself with the interests of the wealthy occupiers, and Tiberius found himself forced into a struggle with that body, which had been no part of his original plan. He fell back on the legislative sovereignty of the assembly; he resuscitated the half-forgotten powers of interference vested in the tribunate in order to paralyse the action of the senatorial magistrates, and finally lost his life in an attempt to make good one of the weak points in the tribune's position by securing his own re-election for a second year. But the conflict did not end with his death. It was renewed on a wider scale, and with a more deliberate aim by his brother Gaius, who on his election to the tribunate (123) **Gaius Gracchus. 631.** at once came forward as the avowed enemy of the senate.[12] The latter suddenly found its control of the administration threatened at a variety of points. On the invitation of the popular tribune the assembly proceeded to restrict the senate's freedom of action in assigning the provinces.[13] It regulated the taxation of the province of Asia[14] and altered the conditions of military service.[15] In home affairs it inflicted two serious blows on the senate's authority by declaring the summary punishment of Roman citizens by the consuls on the strength of a *senatus consultum* to be a violation of the law of appeal,[16] and by taking out of the senate's hands the control of the newly established court for the trial of cases of magisterial misgovernment in the provinces.[17] Tiberius had committed the mistake of relying too exclusively on the support of one section only of the community; his brother endeavoured to enlist on the popular side every available ally. The Latins and Italians had opposed an agrarian scheme which took from them land which they had come to regard as rightfully theirs, and gave them no share in the benefit of the allotments.[18] Gaius not only removed this latter grievance,[19] but ardently supported and himself brought forward the first proposals made in Rome for their enfranchisement.[20] The indifference of the city populace, to whom the prospect of small holdings in a remote district of Italy was not a tempting one, was overcome by the establishment of regular monthly doles of corn at a low price.[21] Finally, the men of business—the publicans, merchants and money-lenders—were conciliated by the privilege granted to them of collecting the tithes of the new province of Asia, and placed in direct rivalry with the senate by the substitution of men of their own class as judges in the "quaestio de repetundis," in place of senators.[22] The organizer of this concerted attack upon the position of the senate fell, like his brother, in a riot.

Failure of the attempt at agrarian reform.

The agrarian reforms of the two Gracchi had little permanent effect.[23] Even in the lifetime of Gaius the clause in his brother's law rendering the new holdings inalienable was repealed, and the process of absorption recommenced. In 118 a stop was put to further allotment of occupied lands, and finally, in 111, the whole position of the agrarian question was altered by a law which converted all land still held in occupation into private **636. 643.** land.[24] The old controversy as to the proper use of the lands of the community was closed by this act of alienation. The controversy in future turns, not on the right of the poor citizens to the state lands, but on the expediency of purchasing other lands for distribution at the cost of the treasury.[1]

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[1] Mommsen, *Hist. of Rome*, iii. 75 seq. Ihne, *Hist. of Rome*, iv. 364, argues that Mommsen has exaggerated the depressing effects of foreign competition: cf. Salvioli, *Le Capitalisme dans le monde antique*, chaps. v.–vii.

[2] Beloch, *Ital. Bund.* 80 seq.

[3] Livy xliii. 14; *Epit.* xlviii., lv. During the period the minimum qualification for service in the legion was reduced from 11,000 to 4000 asses.

[4] Livy xxxii. 26, xxxiii. 36, xxxix. 29, 41.

[5] Sixteen Roman and four Latin colonies. See Marquardt, *Staatsverw*, i.

[6] *E.g.* Livy xxxi. 4, 49, xxxii. 1.

[7] Livy xl. 38.

[8] Livy, *Epit.* xlvi.

[9] Sipontum and Buxentum in 186; Livy xxxix. 23.

[10] Plut. *T. G.* 9–14; Appian, *B.C.* i. 9–13; Livy, *Epit.* lviii. Compare also Mommsen, *Hist. of Rome*, iii. 320 seq.; Lange, *Röm. Alterth.* iii. 8 seq.; Nitzsch, *Gracchen*, 294; Greenidge, *Hist. of Rome*, i. (1904), pp. 110 seq.

[11] For the details, see the article AGRARIAN LAWS.

[12] On the legislation of C. Gracchus, see Warde Fowler in *Eng. Hist. Review* (1905), pp. 209 seq., 417 seq.

[13] *Lex Sempronia de provinciis consularibus*; Cic. *Pro domo*, 9, 24; *De Prov. Cons.* 2, 3; Sallust, *Jug.* 27.

[14] *Lex de provincia Asia*; Cic. *Verr.* 3, 6, 12; Fronto, *Ad Ver.* ii. 125.

[15] Plut. *C.G.* 5; Diod. xxxiv. 25.

[16] Plut. *C.G.* 4; Cic. *Pro domo*, 31, 82; *Pro Rab. Perd.* 4, 12.

[17] *Quaestio de repetundis*, est. 149 B.C. See Plut. *C.G.* 5; Livy, *Epit.* lx.; Tac. *Ann.* xii. 60; App. *B.C.* i. 22. For the *lex Acilia*, see *C.I.L.* i. 189; Wordsworth, *Fragm.* 424; Bruns, *Fontes juris Romani*, ed. 6, pp. 56 seq.

[18] They had succeeded in 129 in suspending the operations of the agrarian commission. App. *B.C.* i. 18; Livy, *Epit.* lix.; Cic. *De Rep.* iii. 29, 41.

[19] Lange, *R.A.* iii. 32; *Lex Agr.* line 21.

[20] The *rogatio Fulvia*, 125 B.C.; Val. Max. ix. 5, 1; App. *B.C.* i. 21.

[21] Plut. *C.G.* 5; App. i. 21; Livy, *Epit.* lx.; Festus, 290.

[22] Hence Gaius ranked as the founder of the equestrian order. Plin. *N.H.* xxxiii. 34, "judicum appellatione separare eum ordinem . . . instituere Gracchi"; Varro ap. Non. 454, "bicipitem civitatem fecit."

[23] Traces of the work of the commission survive in the Miliarium Popilianum, *C.I.L.* i. 551, in a few Gracchan "termini," *ib.* 552, 553, 554, 555, in the "limites Gracchani," *Liber Colon.*, ed. Lachmann, pp. 209, 210, 211, 229, &c. Compare also the rise in the numbers of the census of 125 B.C.; Livy, *Epit.* lx.

[24] See App. i. 27. The *lex agraria*, still extant in a fragmentary condition in the museum at Naples, is that of 111. See Mommsen, *C.I.L.* i. 200; Wordsworth, 441 seq.; Bruns, *Fontes juris Rom.* ed. 6, pp. 74 seq., and cf. the article AGRARIAN LAWS.

But, though the agrarian reform failed, the political conflict it had provoked continued, and the lines on which it was waged were in the main those laid down by Gaius Gracchus. The sovereignty of the assembly continued to be the watchword of the popular party, and a free use of the tribunician powers of interference and of legislation remained the most effective means of accomplishing their aims.

Marius, 118–100=636–54.

Ten years after the death of Gaius the *populares* once more summoned up courage to challenge the supremacy of the senate; but it was on a question of foreign administration that the conflict was renewed. The course of affairs in the client state of Numidia since Micipsa's *636.* death in 118 had been such as to discredit a stronger government than that of the senate.[2] In defiance of Roman authority, and relying on the influence of his own well-spent gold, Jugurtha had murdered both his legitimate rivals, Hiempsal and Adherbal, and made himself master of Numidia. The *642.* declaration of war wrung from the senate (112) by popular indignation had been followed by the corrup- *643.* tion of a consul[3] (111) and the crushing defeat of the proconsul Albinus.[4] On the news of this crowning disgrace the storm burst, and on the proposal of the tribunes a commission of inquiry was appointed into the conduct of the war.[5] But the popular leaders did not stop here. Q. Caecilius *645.* Metellus, who as consul (109) had succeeded to the command in Numidia, was an able soldier but a rigid aristocrat; and they now resolved to improve their success by entrusting the command instead to a genuine son of the people. Their choice fell on Gaius Marius (see MARIUS), an experienced officer and administrator, but a man of humble birth, wholly illiterate, and one who, though no politician, was by temperament and training a hater of the polished and effeminate nobles who filled the senate.[6] He was triumphantly elected, and, in spite of a decree of the senate continuing Metellus as proconsul, he was entrusted by a vote of the assembly with the charge of the war against Jugurtha (*q.v.*).[7]

Jugurtha was vanquished; and Marius, who had been a second time elected consul in his absence, arrived at Rome in *650.* January 104, bringing the captive prince with him in chains.[8] But further triumphs awaited the popular hero. The Cimbri and Teutones were at the gates of Italy; they had four times defeated the senatorial generals, and Marius was called upon to save Rome from a second invasion of the barbarians.[9] After two years of suspense the victory at Aquae *652.* Sextiae (102), followed by that on the Raudine plain *653.* (101), put an end to the danger by the annihilation of the invading hordes; and Marius, now consul for the fifth time, returned to Rome in triumph. There the popular party welcomed him as a leader with all the prestige of a successful general. Once more, however, they were destined to a brief success followed by disastrous defeat. Marius became for the sixth time consul;[10] of the two popular leaders Glaucia became praetor and Saturninus tribune. But Marius and his allies were not statesmen of the stamp of the Gracchi; and the laws proposed by Saturninus had evidently no serious aim in view other than that of harassing the senate. His corn law merely reduced the price *631.* fixed in 123 for the monthly dole of corn, and the main point of his agrarian law lay in the clause appended to it requiring all senators to swear to observe its provisions.[11] The laws were carried, but the triumph of the popular leaders was short-lived. Their recklessness and violence had alienated all classes in Rome; and their period of office was drawing to a close. At the elections fresh rioting took place, and Marius as consul was called upon by the senate to protect the state against his own partisans. Saturninus and Glaucia surrendered, but while the senate was discussing their fate they were surrounded and murdered by their opponents.

Saturninus and the Appuleian laws.

The popular party had been worsted once more in their struggle with the senate, but none the less their alliance with Marius, and the position in which their votes placed him, marked an epoch in the history of the revolution. The transference of the political leadership to a consul who was nothing if not a soldier was at once a confession of the insufficiency of the purely civil authority of the tribunate and a dangerous encouragement of military interference in political controversies. The consequences were already foreshadowed by the special provisions made by Saturninus for Marius's veterans, and in the active part taken by them in the passing of his laws. Indirectly, too, Marius, though no politician, played an important part in this new departure. His military reforms[12] at once democratized the army and attached it more closely to its leader for the time being. He swept away the last traces of civil distinctions of rank or wealth within the legion, admitted to its ranks all classes, and substituted voluntary enlistment under a popular general for the old-fashioned compulsory levy. The efficiency of the legion was increased at the cost of a complete severance of the ties which bound it to the civil community and to the civil authorities.

Military reforms of Marius.

Discontent of the Italian allies.

The next important crisis was due partly to the rivalry which had been growing more bitter each year between the senate and the commercial class, and partly to the long-impending question of the enfranchisement of the Italian allies. The *publicani*, *negotiatores* and others, who constituted what was now becoming known as the equestrian order (see EQUITES), had made unscrupulous use of their control of the courts and especially of the *quaestio de repetundis* against their natural rivals, the official class in the provinces. The threat of prosecution before a hostile jury was held over the head of every governor, legate and quaestor who ventured to interfere with their operations in the provinces. The average official preferred to connive at their exactions; the bolder ones paid with fines and even exile for their courage. In 92 the necessity for a reform was *662.* proved beyond a doubt by the scandalous condemnation of P. Rutilius Rufus,[13] ostensibly on a charge of extortion, in reality as the reward of his efforts to check the extortions of the Roman equites in Asia. The difficulties of the Italian question were more serious. That the Italian allies were discontented was notorious. After nearly two centuries of close alliance, of common dangers and victories, they now eagerly coveted as a boon that complete amalgamation with Rome which they had at first resented as a dishonour. But, unfortunately, Rome had grown more exclusive in proportion as the value set upon Roman citizenship increased. During the last forty years feelings of hope and disappointment had rapidly succeeded each other; Marcus Fulvius Flaccus, Gaius Gracchus, Saturninus, had all held out promises of relief—and nothing had yet been done. On each occasion they had crowded to Rome, full of eager expectation, only to be harshly ejected from the city by the consul's orders.[14] The justice of their claims could hardly be denied, the danger of continuing to ignore them was obvious—yet the difficulties in the way of granting them were formidable in the extreme, and from a higher than a merely selfish point of view there was much to be said against the revolution involved in so sudden and enormous an enlargement of the citizen body.

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[1] Cic. *Agr.* ii. 25, 65.

[2] Sallust, *Jug.* 5 seq.; Livy, *Epit.* lxii., lxiv.

[3] L. Calpurnius Bestia, tribune 121; Sall. *Jug.* 28.

[4] Ibid. 38, 39.

[5] Ibid. 40.

[6] Sallust, *Jug.* 63; Plut. *Marius*, 2, 3. For the question as to the position of his parents, see Madvig, *Verf.* i. 170; Diod. xxxiv. 38.

[7] Sallust, *Jug.* 73.

[8] Ibid. 114. For the chronology of the Jugurthine war, see Mommsen, *Hist. of Rome*, iii. 398; Pelham, *Journ. of Phil.* vii. 91; Meinel, *Zur Chronologie des jugurthinischen Kriegs* (1883).

[9] Livy, *Epit.* lxvii.; Plut. *Mar.* 12; Mommsen, *Hist. of Rome*, iii. 414 seq.

[10] Livy, *Epit.* lxix.; Appian, *B.C.* i. 28 seq.

[11] For the *leges Appuleiae*, see SATURNINUS, L. APPULEIUS, and authorities there quoted.

[12] Sallust, *Jug.* 86, "ipse interea milites scribere, non more majorum neque ex classibus, sed uti cujusque cupido erat, capite censos plerosque." For details, cf. Mommsen, *Hist. of Rome*, iii. 456 seq.; Madvig, *Verf.* ii. 468, 493; Marquardt, *Staatsv.* iii. 430 seq.

[13] Livy, *Epit.* lxx.; Vell. ii. 13.

[14] *Lex Junia*, Cic. *De Off.* iii. 11, 47; *lex Licinia Mucia*, Cic. *Pro Corn.* fr. 10; Ascon. p. 60.

Marcus Livius Drusus, 91=663.

Marcus Livius Drusus (*q.v.*), who as tribune gallantly took up the task of reform, is claimed by Cicero[1] as a member of that party of the centre to which he belonged himself. Noble, wealthy and popular, he seems to have hoped to be able by the weight of his position and character to rescue the burning questions of the day from the grasp of extreme partisans and to settle them peacefully and equitably. But he, like Cicero after him, had to find to his cost that there was no room in the fierce strife of Roman politics for moderate counsels. His proposal to reform the law courts excited the equestrian order and their friends in the senate to fury. The agrarian and corn laws which he coupled with it[2] alienated many more in the senate, and roused the old anti-popular party feeling; finally, his known negotiations with the Italians were eagerly misrepresented to the jealous and excited people as evidence of complicity with a widespread conspiracy against Rome. His laws were carried, but the senate pronounced them null and void.[3] Drusus was denounced in the senate house as a traitor, and on his way home was struck down by the hand of an unknown assassin. His assassination was the signal for an outbreak which had been secretly prepared for some time before. Throughout the highlands of central and southern Italy the flower of the Italian peoples rose as one man.[4] Etruria and Umbria held aloof; the isolated Latin colonies stood firm; but the Sabellian clans, north and south, the Latinized Marsi and Paeligni, as well as the Oscan-speaking Samnites and Lucanians, rushed to arms. No time was lost in proclaiming their plans for the future. A new Italian state was to be formed. The Paelignian town of Corfinium was selected as its capital and re-christened with the proud name of Italica. All Italians were to be citizens of this new metropolis, and here were to be the place of assembly and the senate house. A senate of 500 members and a magistracy resembling that of Rome completed a constitution which adhered closely to the very political traditions which its authors had most reason to abjure.

The Social War, 90–89=664–65.

Lex Julia and lex Plautia Papiria.

Now, as always in the face of serious danger, the action of Rome was prompt and resolute. Both consuls took the field;[5] with each were five legates, among them the veteran Marius and his destined rival L. Cornelius Sulla, and even freedmen were pressed into service with the legions. But the first year's campaign opened disastrously. In central Italy the northern Sabellians, and in the south the Samnites, defeated the forces opposed to them. And though before the end of the year Marius and Sulla in the north, and the consul Caesar himself in Campania, succeeded in inflicting severe blows on the enemy, and on the Marsi especially, it is not surprising that, with an empty treasury, with the insurgents' strength still unbroken, and with rumours of disaffection in the loyal districts, opinion in Rome should have turned in the direction of the more liberal policy which had been so often scornfully rejected and in favour of some compromise which should check the spread of the revolt, and possibly sow discord among their enemies. 664. Towards the close of the year 90 the consul L. Julius Caesar (killed by Fimbria in 87) carried the *lex Julia*,[6] by which the Roman franchise was offered to all communities which had not as yet revolted; early in the next year 665. (89) the Julian law was supplemented by the *lex Plautia Papiria*, introduced by two of the tribunes, M. Plautius Silvanus and C. Papirius Carbo Arvina, which enacted that any citizen of an allied community then domiciled in Italy might obtain the franchise by giving in his name to a praetor in Rome within sixty days. A third law (*lex Calpurnia*), apparently passed at the same time, empowered Roman magistrates in the field to bestow the franchise there and then upon all who were willing to receive it. This sudden opening of the closed gates of Roman citizenship was completely successful, and its effects were at once visible in the diminished vigour of the insurgents. By the end of 89 the Samnites and Lucanians were left alone in their obstinate hostility 665. to Rome, and neither, thanks to Sulla's brilliant campaign in Samnium, had for the moment any strength left for active aggression.

The termination of the Social War brought with it no peace in Rome. The old quarrels were renewed with increased bitterness, and the newly enfranchised Italians themselves complained as bitterly of the restriction[7] which robbed them of their due share of political influence by allowing them to vote only in a specified number of tribes. The senate itself was distracted by violent personal rivalries—and all these feuds, animosities and grievances were aggravated by the widespread economic distress and ruin which affected all classes.[8] Lastly, war with Mithradates VI. had been declared; it was notorious that the privilege of commanding the force to be sent against him would be keenly contested, and that the contest would lie between the veteran Marius and L. Cornelius Sulla.[9]

P. Sulpicius Rufus, 88=666.

It was in an atmosphere thus charged with the elements of disturbance that P. Sulpicius Rufus as tribune[10] brought forward his laws. He proposed—(1) that the command of the Mithradatic war should be given to Marius, (2) that the new citizens should be distributed through all the tribes, (3) that the freedmen should no longer be confined to the four city tribes, (4) that any senator owing more than 2000 denarii should lose his seat, (5) that those exiled on suspicion of complicity with the Italian revolt should be recalled. These proposals inevitably provoked a storm, and both sides were ominously ready for violent measures. The consuls, in order to prevent legislation, proclaimed a public holiday. Sulpicius replied by arming his followers and driving the consuls from the forum. The proclamation was withdrawn and the laws carried, but Sulpicius's triumph was short-lived. From Nola in Campania, where lay the legions commanded by him in the Social War, Sulla advanced on Rome, and for the first time a Roman consul entered the city at the head of the legions of the Republic. Resistance was hopeless. Marius and Sulpicius fled,[11] and Sulla, summoning the assembly of the centuries, proposed the measures he considered necessary for the public security, the most important being a provision that the sanction of the senate should be necessary before any proposal was introduced to the assembly.[12] Then, after waiting in Rome long enough to hold the 667. consular elections, he left for Asia early in 87.

Marius and Cinna.

Sulla had conquered, but his victory cost the Republic dear. He had first taught political partisans to look for final success, not to a majority of votes in the forum or campus, but to the swords of the soldiery. The lesson was well learnt. Shortly after his departure L. Cornelius Cinna as consul revived the proposals of Sulpicius;[13] his colleague, Gnaeus Octavius, at the head of an armed force fell upon the new citizens who had collected in crowds to vote, and the forum was heaped high with the bodies of the slain.[1] Cinna fled, but fled, like Sulla, to the legions. When the senate declared him deposed from his consulship, he replied by invoking the aid of the soldiers in Campania in behalf of the violated rights of the people and the injured dignity of the consulship, and, like Sulla, found them ready to follow where he led. The neighbouring Italian communities, who had lost many citizens in the recent massacre, sent their new champion men and money;[2] while from Africa, whither he had escaped after Sulla's entry into Rome, came Marius with 1000 Numidian horsemen. The senate had prepared for a desperate defence, but fortune was adverse, and after a brief resistance they gave way. Cinna was acknowledged as consul, the sentence of outlawry passed on Marius was revoked and Cinna and Marius entered Rome with their troops. Marius's thirst for revenge was gratified by a frightful massacre, and he lived long enough to be nominated consul for the seventh time. But he held his 668. consulship only a few weeks. Early in 86 he died, and 669, 670. for the next three years Cinna ruled Rome. Constitutional government was virtually suspended. For 85 and 84 Cinna nominated himself and a trusted colleague as consuls.[3] The state was, as Cicero[4] says, without lawful authority.[5] One important matter was carried through—the registration in all the tribes of the newly enfranchised Italians,[6] but beyond this little was done. The attention of Cinna and his friends was in truth engrossed by the ever-present dread of Sulla's return from Asia. The consul of 86, L. Valerius Flaccus (who 668. had been consul with Marius in 100 B.C.), sent out to supersede him, was murdered by his own soldiers at Nicomedia.[7] 669. In 85 Sulla, though disowned by his government, concluded a peace with Mithradates.[8] In 84, after settling affairs in Asia and crushing Flaccus's successor, C. Flavius ***The return of Sulla, 83=671.*** Fimbria, he crossed into Greece, and in the spring of 83 landed at Brundusium with 40,000 soldiers and a large following of *émigré* nobles. Cinna was dead,[9] murdered like Flaccus by his mutinous soldiers; his most trusted colleague, Cn. Papirius Carbo, was commanding as proconsul in Cisalpine Gaul; and the resistance offered to Sulla's advance was slight. At Capua, Sulla routed the forces of one consul, Gaius Norbanus; at Teanum the troops of the other went over in a body to the side of the outlawed proconsul. After a winter spent in Campania he pressed forward to Rome, 672. defeated the younger Marius (consul, 82) near Praeneste, and entered the city without further opposition. In north Italy the success of his lieutenants, Q. Caecilius Metellus Pius (son of Metellus Numidicus), Cn. Pompeius and Marcus Crassus, had been fully as decisive. Cisalpine Gaul, Umbria and Etruria had all been won for Sulla, and the two principal leaders on the other side, Carbo and Norbanus, had each fled, one to Rhodes, the other to Africa. Only one foe remained to be conquered. The Samnites and Lucanians whom Cinna had conciliated, and who saw in Sulla their bitterest foe, were for the last time in arms, and had already joined forces with the remains of the Marian army close to Rome. The decisive battle was fought under the walls of the city, and ended in the complete defeat of the Marians and Italians (battle of the Colline Gate).[10]

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[1] Cic. *De orat.* i. 7, 24 f., and De *domo*, 19, 50; Appian, *B.C.* i. 35; Diod. Sic. xxxvii. 10; Ihne, bk. vii. cap. xiii.

[2] For the provisions of the *leges Liviae*, see App. *B.C.* i. 35; Livy, *Epit.* lxxi. They included, according to Pliny, *N.H.* xxxiii. 3, a proposal for the debasement of the coinage.

[3] Cic. *Pro domo*, 16, 41.

[4] For the Social War, see, besides Mommsen, Ihne and Lange, Kiene, *Der römische Bundesgenossenkrieg* (Leipzig, 1845).

[5] App. *B.C.* i. 39–49; Livy, *Epit.* lxxii.–lxxvi.

[6] For the *lex Julia*, see Cicero, *Pro Balbo*, 8, 21; Gell. iv. 4; App. *B.C.* i. 49. For the *lex Plautia Papiria*, see Cic. *Pro Archia*, 4, 7, and Schol. Bob. p. 353.

[7] Vell. ii. 20; App. *B.C.* i. 49, 53. It is impossible to reconcile in detail the statements of these authors.

[8] App. *B.C.* i. 54, and *Mithr.* 22; Oros. v. 18; Livy, *Epit.* lxxiv.

[9] It had been already declared a consular province for 87, and early in 88 seems to have been assigned to Sulla by decree of the senate.

[10] See SULPICIUS RUFUS, P.

[11] Marius finally escaped to Africa (see MARIUS); Sulpicius was taken and killed; App. i. 60.

[12] App. *B.C.* i. 59, μηδὲν ἔτι ἀπροβούλευτον ἐς τὸν δῆμον ἐσφέρεσθαι For the other laws mentioned by Appian, see Mommsen, *Hist. of Rome*, iii. 541 f.

[13] Livy, *Epit.* lxxix.; Vell. ii. 20.

For a period of nearly ten years Rome and Italy had been distracted by civil war. Sulla was now called upon to heal the divisions which rent the state asunder, to set in working ***Sulla's dictatorship, 81=673.*** again the machinery of civil government and above all so to modify it as to meet the altered conditions, and to fortify it against the dangers which visibly threatened it in the future. The real charge against Sulla[11] is not that he failed to accomplish all this, for to do so was beyond the powers even of a man so able, resolute and self-confident as Sulla, armed though he was with absolute authority and backed by overwhelming military strength and the prestige of unbroken success. He stands convicted rather of deliberately aggravating some and culpably ignoring others of the evils he should have tried to cure, and of contenting himself with a party triumph when he should have aimed at the regeneration and confirmation of the whole state. His victory was instantly followed, not by any measures of conciliation, but by a series of massacres, proscriptions and confiscations, of which almost the least serious consequence was the immediate loss of life which they entailed.[12] From this time ***Effects of the Sullan proscriptions.*** forward the fear of proscription and confiscation recurred as a possible consequence of every political crisis, and it was with difficulty that Caesar himself dissipated the belief that his victory would be followed by a Sullan reign of terror. The legacy of hatred and discontent which Sulla left behind him was a constant source of disquiet and danger. In the children of the proscribed, whom he excluded from holding office, and the dispossessed owners of the confiscated lands, every agitator found ready and willing allies.[13] The moneyed men of the equestrian order were more than ever hostile to the senatorial government, which they now identified with the man who cherished towards them a peculiar hatred,[14] and whose creatures had hunted them down like dogs. The attachment which the new Italian citizens might in time have learnt to feel for the old republican constitution was nipped in the bud by the massacres at Praeneste and Norba, by the harsh treatment of the ancient towns of Etruria, and by the ruthless desolation of Samnium and Lucania.[15] Quite as fatal were the results to the economic prosperity of the peninsula. Sulla's confiscations, following on the civil and social wars, opened the doors wide for a long train of evils. The veterans whom he planted on the lands he had seized[16] did nothing for agriculture, and swelled the growing numbers of the turbulent and discontented.[17] The "Sullan men" became as great an object of fear and dislike as the "Sullan reign."[18] The *latifundia* increased with startling rapidity—whole territories passing into the hands of greedy partisans.[19] Wide tracts of land, confiscated but never allotted, ran to waste.[20] In all but a few districts of Italy the free population finally and completely disappeared from the open country; and life and property were rendered insecure by the brigandage which now developed unchecked, and in which the herdsmen slaves played a prominent part. The outbreaks of Spartacus in 681. 73, and of Catiline ten years later, were significant commentaries on this part of Sulla's work.[21] His con- ***Constitutional legislation of Sulla.*** stitutional legislation, while it included many useful administrative reforms, is marked by as violent a spirit of partisanship, and as apparently wilful a blindness to the future. The re-establishment on a legal basis of the ascendancy which custom had so long accorded to the senate was his main object. With this purpose he had already, *666.* when consul in 88, made the *senatus auctoritas* legally necessary for proposals to the assembly. He now as dictator[1] followed this up by crippling the power of the magistracy, which had been the most effective weapon in the hands of the senate's opponents. The legislative freedom of the tribunes was already hampered by the necessity of obtaining the senate's sanction; in addition, Sulla restricted their wide powers of interference (*intercessio*) to their original purpose of protecting individual plebeians,[2] and discredited the office by prohibiting a tribune from holding any subsequent office in the state.[3] The control of the courts (*quaestiones perpetuae*) was taken from the equestrian order and restored to the senate.[4] To prevent the people from suddenly installing and keeping in high office a second Marius, he re-enacted the old law against re-election,[5] and made legally binding the custom which required a man to mount up gradually to the consulship through the lower offices.[6] His increase of the number of praetors from six to eight,[7] and of quaestors to twenty,[8] though required by administrative necessities, tended, by enlarging the numbers and further dividing the authority of the magistrates, to render them still more dependent upon the central direction of the senate. Lastly, he replaced the pontifical and augural colleges in the hands of the senatorial nobles, by enacting that vacancies *650.* in them should, as before the *lex Domitia* (104), be filled up by co-optation.[9] It cannot be said that Sulla was successful in fortifying the republican system against the dangers which menaced it from without. He accepted as an accomplished fact the enfranchisement of the Italians,[10] but he made no provision to guard against the consequent reduction of the *comitia* to an absurdity,[11] and with them of the civic government which rested upon them, or to organize an effective administrative system for the Italian communities.[12] Of all men, too, Sulla had the best reason to appreciate the dangers to be feared from the growing independence of governors and generals in the provinces, and from the transformation of the old civic militia into a group of professional armies, devoted only to a successful leader, and with the weakest possible sense of allegiance to the state. He had himself, as proconsul of Asia, contemptuously and successfully defied the home government, and he, more than any other Roman general, had taught his soldiers to look only to their leader, and to think only of booty.[13] Yet, beyond a few inadequate regulations, there is no evidence that Sulla dealt with these burning questions, the settlement of which was among the greatest of the achievements of Augustus.[14] One administrative reform of real importance must, lastly, be set down to his credit. The judicial procedure first established in 149 for the trial of cases of magisterial extortion in the provinces, and applied between 149 *605-673.* and 81 to cases of treason and bribery, Sulla extended so as to bring under it the chief criminal offences, and thus laid the foundations of the Roman criminal law.[15]

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[1] Cic. *Pro Sestio*, 36, 77; *Catil.* iii. 10, 24.

[2] Tibur and Praeneste especially.

[3] The consuls of 86, 85, 84 were all nominated without election. Livy, *Epit.* lxxx. lxxxiii.; App. i. 75.

[4] *Brut.* 227.

[5] The nobles had fled to Sulla in large numbers; Vell. ii. 23.

[6] This work was accomplished apparently by the censors of 86; but cf. Lange iii. 133; Mommsen, *Hist. of Rome*, iv. 70; Livy, *Epit.* lxxxiv.

[7] Livy, *Epit.* lxxxii; Appian, *Mithr.* 52; Plut. *Sulla*, 23.

[8] Livy, *Epit.* lxxxiii.; Vell. ii. 23; Plut. *Sulla*, 24.

[9] In 84; App. *B.C.* i. 78; Livy, *Epit.* lxxxiii.

[10] Livy, *Epit.* lxxxviii., "cum Samnitibus ante portam Collinam debellavit"; Plut. *Sulla*, 29, and *Crassus*, 6. According to App. i. 93, and Livy, *loc cit.*, 8000 captives were massacred. Florus, iii. 21, gives 4000. Praeneste surrendered, was razed to the ground, and its population put to the sword.

[11] Compare especially Mommsen's brilliant chapter, which is, however, too favourable (bk. iv. cap. x.), and also Lange (iii. 146 seq.). Further references will be found in the article SULLA (*q.v.*).

[12] App. i. 95 seq.; Dio Cassius, fr. 109; Plut. *Sulla*, 31. The number of the proscribed is given as 4700 (Val. Max.), including, according to Appian, 2600 members of the equestrian order.

[13] *E.g.* Catiline, in 63. Sall. *Cat.* 21, 37. For the *liberi proscriptorum*, see Vell. ii. 28.

[14] Cic. *Pro. Cluent.* 55, 151.

[15] Cic. *Phil.* v. 16, 43, "tot municipiorum maximae calamitates." Cic. *Pro Domo*, 30, 79; Cic. *Ad Att.* i. 19; Florus iii. 21; Strabo, 223, 254.

[16] Livy, *Epit.* lxxxix.; App. *B.C.* i. 100; Cicero, *Catil.* ii. 79. 20.

[17] Sall. *Cat.* 28.

[18] Cic. *Agr.* ii. 269.

[19] Cic. *Agr.* ii. 26, 69 seq.; 28, 78; iii. 2, 8—the territories of Praeneste and of the Hirpini.

[20] Ibid. iii. 4, 14.

[21] See especially Cicero's oration *Pro Tullio*. For the *pastores* of Apulia, Sall. *Cat.* 28.

Overthrow of the Sullan constitution.

The Sullan system stood for nine years, and was then overthrown—as it had been established—by a successful soldier. It was the fortune of Cn. Pompeius, a favourite officer of Sulla, first of all to violate in his own person the fundamental principles of the constitution re-established by his old chief, and then to overturn it. In Spain the Marian governor Q. Sertorius (see SERTORIUS) had defeated one after another of the pro- *70=684.* consuls sent out by the senate, and was already in 77 *677.* master of all Hither Spain. To meet the crisis, Pompey, who was not yet thirty, and had never held even the quaestorship, was sent out to Spain with proconsular authority.[16] Still Sertorius held out, until in 73 he was *681.* foully murdered by his own officers. The native tribes who had loyally stood by him submitted, and Pompey *683.* early in 71 returned with his troops to Italy, where, during his absence in Spain, an event had occurred which had shown Roman society with startling plainness how near it stood to revolution. In 73 Spartacus,[17] a Thracian slave, *681.* escaped with seventy others from a gladiators' training school at Capua. In an incredibly short time he found himself at the head of 70,000 runaway slaves, outlaws, brigands and impoverished peasants, and for two years terrorized Italy, routed the legions sent against him, and even threatened Rome. He was at length defeated and slain by the praetor, M. Licinius Crassus, in Apulia. In Rome itself the various classes and parties hostile to the Sullan system had, *676.* ever since Sulla's death in 78, been incessantly agitating for the repeal of his most obnoxious laws, and needed only

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[1] For Sulla's dictatorship as in itself a novelty, see App. i. 98; Plut. *Sulla*, 33; Cic. *Ad Att.* 9, 15; Cic. *De Legg.* i. 15, 42.

[2] Cic. *De Legg.* iii. 9, 22, "injuriae faciendae potestatem ademit, auxilii ferendi reliquit." Cf. Cic. *Verr.* i. 60, 155; Livy, *Epit.* lxxxix.

[3] Cic. *Pro Cornel.* fr. 78; Ascon. *In Corn.* pp. 59, 70; Appian i. 100.

[4] Vell. ii. 32; Tac. *Ann.* xi. 22; Cic. *Verr. Act.* i. 13, 37.

[5] App. *B.C.* i. 100; cf. Livy vii. 42 (342 B.C.), "ne quis eundem magistratum intra decem annos caperet."

[6] The custom had gradually established itself. Cf. Livy xxxii. 7. The "certus ordo magistratuum" legalized by Sulla was—quaestorship, praetorship, consulate; App. i. 100.

[7] Pompon. *De orig. juris* (*Dig.* i. 2, 2, 32); Vell. ii. 89. Compare also Cicero, *In Pison.* 15, 35 with Cic. *Pro Milone*, 15, 39. The increase was connected with his extension of the system of *quaestiones perpetuae*, which threw more work on the praetors as the magistrates in charge of the courts.

[8] Tac. *Ann.* xi. 22. The quaestorship henceforward carried with it the right to be called up to the senate. By increasing the number of quaestors, Sulla provided for the supply of ordinary vacancies in the senate and restricted the censors' freedom of choice in filling them up. Fragments of the *lex Cornelia de XX quaestoribus* survive. See *C.I.L.* i. 108; Bruns, *Fontes juris Romani* (ed. 6), p. 91.

[9] Dio xxxvii. 37; Ps. Ascon. 102 (Orelli). He also increased their numbers; Livy, *Epit.* lxxxix.

[10] He did propose to deprive several communities which had joined Cinna of the franchise, but the deprivation was not carried into effect; Cic. *Pro domo*, 30, 79.

[11] The inadequacy of the *comitia* as a representative body was increased by the unequal distribution of the new citizens amongst the thirty-five tribes, each of which formed a single voting unit. Some tribes represented only a thinly populated district in the Campagna with one or two outlying communities, others included large and populous territories. See Mommsen, *Staatsr.* iii. 187; *Hermes*, xxii. 101 sqq.

[12] Sulla does not appear to have passed any general municipal law; the necessary resettlement of the local constitutions after the Social War was seemingly carried out by commissioners. The fragment of a municipal charter found at Tarentum (*Ephem. epigr.* ix. 1, Dessau, *Inscr. Lat. sel.* 6086) is probably a specimen of such *leges datae*.

[13] Sall. *Cat.* 11. "L. Sulla exercitum, quo sibi fidum faceret, contra morem majorum luxuriose nimisque liberaliter habuerat."

[14] There was a *lex Cornelia de provinciis ordinandis*, but only two of its provisions are known; (1) that a magistrate sent out with the *imperium* should retain it till he re-entered the city (Cic. *Ad Fam.* i. 9, 25), a provision which increased rather than diminished his freedom of action; (2) that an outgoing governor should leave his province within thirty days after his successor's arrival (Cic. *Ad Fam.* iii. 6. 3). A *lex Cornelia de majestate* contained, it is true, a definition of treason evidently framed in the light of recent experience. The magistrate was forbidden "exire de provincia, educere exercitum, bellum sua sponte gerere, in regnum injussu populi ac senatus accedere," Cic. *Pis.* 21, 50. Sulla also added one to the long list of laws dealing with extortion in the provinces. But the danger lay, not in the want of laws, but in the want of security for their observance by an absolutely autocratic proconsul. The present writer cannot agree with those who would include among Sulla's laws one retaining consuls and praetors in Rome for their year of office and then sending them out to a province. This was becoming the common practice before 81. After 81 it is invariable for praetors, as needed for the judicial work, and invariable but for two exceptions in the case of consuls; but nowhere is there a hint that there had been any legislation on the subject, and there are indications that it was convenience and not law which maintained the arrangement. Mommsen, *Hist. of Rome*, iv. 118 sqq.; Marquardt, *Staatsverw.* i. 518; cf. also Cic. *Att.* 8, 15; "consules, quibus more majorum concessum est vel omnes adire provincias."

[15] For this, the most lasting of Sulla's reforms, see Mommsen, *Hist. of Rome*, iv. 127 sqq.; Rein, *Criminal-Recht*; Zumpt, *Criminal-Prozess d. Römer*; Greenidge, *Legal Procedure of Cicero's Time*, p. 415 sqq.

[16] Plut. *Pomp.* 17; Livy, *Epit.* xci. For Pompey's earlier life, see POMPEY.

[17] For the Slave War, see SPARTACUS.

Pompey as consul.
684.

a leader in order successfully to attack a government discredited by failure at home and abroad. With the return of Pompey from Spain their opportunity came. Pompey, who understood politics as little as Marius, was anxious to obtain a triumph, the consulship for the next year (70), and as the natural consequence of this an important command in the East. The opposition wanted his name and support, and a bargain was soon struck. Pompey and with him Marcus Licinius Crassus, the real conqueror of Spartacus, were elected consuls, almost in the presence of their troops, which lay encamped outside the gates in readiness to assist at the triumph and ovation granted to their respective leaders. Pompey lost no time in performing his part of the agreement. The tribunes regained their prerogatives.[1] The "perpetual courts" (*quaestiones perpetuae*) were taken out of the hands of the senatorial judices, who had outdone the equestrian order in scandalous corruption,[2] and finally the censors, the first since 86 B.C., purged the senate of the more worthless and disreputable of Sulla's partisans.[3] The victory was complete; but for the future its chief significance lay in the clearness with which it showed that the final decision in matters political lay with neither of the two great parties in Rome, but with the holder of the military authority. The tribunes ceased to be political leaders and became lieutenants of the military commanders, and the change was fatal to the dignity of politics in the city. Men became conscious of the unreality of the old constitutional controversies, indifferent to the questions which agitated the forum and the curia, and contemptuously ready to alter or disregard the constitution itself when it stood in the way of interests nearer to their hearts.

Gabinian and Manilian laws.
684-87.
687, 688.

When his consulship ended, Pompey impatiently awaited at the hands of the politicians he had befriended the further gift of a foreign command. He declined an ordinary province, and from the end of 70 to 67 he remained at Rome in a somewhat affectedly dignified seclusion.[4] But in 67 and 66 the laws of Gabinius and Manilius gave him all and more than all that he expected (see POMPEY). By the former he obtained the sole command for three years against the Mediterranean pirates.[5] He was to have supreme authority over all Roman magistrates in the provinces throughout the Mediterranean and over the coasts for 50 miles inland. Fifteen legati, all of praetorian rank, were assigned to him, with two hundred ships, and as many troops as he thought desirable. The Manilian law transferred from Lucullus and Glabrio to Pompey the conduct of the Mithradatic War in Asia, and with it the entire control of Roman policy and interests in the East.[6] The unrepublican character of the position thus granted to Pompey, and the dangers of the precedent established, were clearly enough pointed out by such moderate men as Q. Lutatius Catulus, the "father of the senate," and by the orator Hortensius—but in vain. Both laws were supported, not only by the tribunes and the populace, but by the whole influence of the *publicani* and *negotiatores*, whose interests in the East were at stake.

687, 692.
Caesar.
684.
689.
689.
691.

Pompey left Rome in 67. In a marvellously short space of time he freed the Mediterranean from the Cilician pirates and established Roman authority in Cilicia itself. He then crushed Mithradates, added Syria to the list of Roman provinces, and led the Roman legions to the Euphrates and the Caspian, leaving no power capable of disputing with Rome the sovereignty of western Asia.[7] He did not return to Italy till towards the end of 62. The interval was marked in Rome by the rise to political importance of Caesar and Cicero, and by Catiline's attempt at revolution. As the nephew of Marius and the son-in-law of Cinna, Caesar possessed a strong hereditary claim to the leadership of the popular and Marian party.[8] He had already taken part in the agitation for the restoration of the tribunate; he had supported the Manilian law; and, when Pompey's withdrawal left the field clear for other competitors, he stepped at once into the front rank on the popular side.[9] He took upon himself, as their nearest representative, the task of clearing the memory and avenging the wrongs of the great popular leaders, Marius, Cinna and Saturninus. He publicly reminded the people of Marius's services, and set up again upon the Capitol the trophies of the Cimbric War. He endeavoured to bring to justice, not only the ringleaders in Sulla's bloody work of proscription, but even the murderers of Saturninus, and vehemently pleaded the cause of the children of the proscribed. While thus carrying on in genuine Roman fashion the feud of his family, he attracted the sympathies of the Italians by his efforts to procure the Roman franchise for the Latin communities beyond the Po, and won the affections of the populace in Rome and its immediate neighbourhood by the splendour of the games which he gave as curule aedile (65), and by his lavish expenditure upon the improvement of the Appian Way. But these measures were with him only means to the further end of creating for himself a position such as that which Pompey had already won; and this ulterior aim he pursued with an audacious indifference to constitutional forms and usages. His coalition with Crassus, soon after Pompey's departure, secured him an ally whose colossal wealth and wide financial connexions were of inestimable value, and whose vanity and inferiority of intellect rendered him a willing tool. The story of his attempted *coup d'état* in January 65 is probably false,[10] but it is evident that by the beginning of 63 he was bent on reaping the reward of his exertions by obtaining from the people an extraordinary command abroad, which should secure his position before Pompey's return; and the agrarian law proposed early that year by the tribune P. Servilius Rullus had for its object the creation, in favour of Caesar and Crassus, of a commission with powers so wide as to place its members almost on a level with Pompey himself.[11] It was at this moment when all seemed going well, that Caesar's hopes were dashed to the ground by Catiline's desperate outbreak, which not only discredited every one connected with the popular party, but directed the suspicions of the well-to-do classes against Caesar himself, as a possible accomplice in Catiline's revolutionary schemes.[12]

Cicero.

The same wave of indignation and suspicion which for the moment checked Caesar's rise carried Marcus Tullius Cicero to the height of his fortunes. Cicero, as a politician, has been equally misjudged by friends and foes. That he was deficient in courage, that he was vain, and that he attempted the impossible, may be admitted at once. But he was neither a brilliant and unscrupulous adventurer nor an aimless trimmer, nor yet a devoted champion merely of senatorial ascendancy.[1] He was a representative man, with a numerous following, and a policy which was naturally suggested to him by the circumstances of his birth, connexions and profession, and which, impracticable as it proved to be, was yet consistent, intelligible and high-minded. Born at Arpinum, he cherished like all Arpinates the memory of his great fellow-townsman Marius, the friend of the Italians, the saviour of Italy and the irreconcilable foe of Sulla and the nobles. A "municipal" himself, his chosen friends and his warmest supporters were found among the well-to-do classes in the Italian towns.[2] Unpopular with the Roman aristocracy, who despised him as a *peregrinus*,[3] and with the Roman populace, he was the trusted leader of the Italian middle class, "the true Roman people," as he proudly styles them. It was they who carried his election for the consulship[4] (63), who in 58 insisted on his recall from exile,[5] and it was his influence with them which made Caesar so anxious to win him over in 49. He represented their antipathy alike to socialistic schemes and to aristocratic exclusiveness, and their old-fashioned simplicity of life in contrast with the cosmopolitan luxury of the capital.[6] By birth, too, he belonged to the equestrian order, the foremost representatives of which were indeed still the *publicani* and *negotiatores*, but which since the enfranchisement of Italy included also the substantial burgesses of the Italian towns and the smaller "squires" of the country districts. With them, too, Cicero was at one in their dread of democratic excesses and their social and political jealousy of the *nobiles*.[7] Lastly, as a lawyer and a scholar, he was passionately attached to the ancient constitution. His political ideal was the natural outcome of these circumstances. He advocated the maintenance of the old constitution, but not as it was understood by the extreme politicians of the right and left. The senate was to be the supreme directing council,[8] but the senate of Cicero's dreams was not an oligarchic assemblage of nobles, but a body freely open to all citizens, and representing the worth of the community.[9] The magistrates, while deferring to the senate's authority, were to be at once vigorous and public-spirited; and the assembly itself which elected the magistrates and passed the laws was to consist, not of the "mob of the forum," but of the true Roman people throughout Italy.[10] For the realization of this ideal he looked, above all things, to the establishment of cordial relations between the senate and nobles in Rome and the great middle class of Italy represented by the equestrian order, between the capital and the country towns and districts. This was the *concordia ordinum*, the *consensus Italiae*, for which he laboured.[11]

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[1] The exact provisions of Pompey's law are nowhere given; Livy, *Epit.* xcvii., "tribuniciam potestatem restituerunt." Cf. Vell. ii. 30. A *lex Aurelia*, in 75, had already repealed the law disqualifying a tribune for further office; Cic. *Corn.* fr. 78.

[2] This was the work of L. Aurelius Cotta, praetor in this year. The judices were to be taken in equal proportions from senators, equites and *tribuni aerarii*. For the latter and for the law generally, see Lange, *R. Alt.* iii. 193; Greenidge, *Legal Procedure of Cicero's Time*, pp. 443 sqq.; and article AERARIUM. Compare also Cicero's language, *In Verr.*, *Act.* i. 1. The prosecution of Verres shortly preceded the *lex Aurelia*.

[3] Livy, *Epit.* xcviii. Sixty-four senators were expelled. Cf. Plut. *Pomp.* 22.

[4] Vell. ii. 31; Plut. *Pomp.* 23.

[5] Plut. *Pomp.* 25; Dio xxxvi. 6; Livy, *Epit.* c.

[6] Cic. *Pro Lege Manilia*; Dio xxxvi. 25; Plut. *Pomp.* 30.

[7] See POMPEY and MITHRADATES.

[8] For his early life, see CAESAR.

[9] Prof. Beesly has vainly endeavoured to show that Catiline and not Caesar was the popular leader from 67 to 63. That this is the inference intentionally conveyed by Sallust, in order to screen Caesar, is true, but the inference is a false one.

[10] The story is so told by Suetonius, *Jul.* 8. In Sallust, *Cat.* 18, it appears as an intrigue originating with Catiline, and Caesar's name is omitted.

[11] Cic. *Agr.* ii. 6, 15, "nihil aliud actum nisi ut decem reges constituerentur."

[12] That Caesar and Crassus had supported Catiline for the consulship in 65 is certain, and they were suspected naturally enough of favouring his designs in 63, but their complicity is in the highest degree improbable.

691, 696.
705.

The conspiracy of Catiline, 63=691.

Cicero's election to the consulship for 63 over the heads of Caesar's nominees, Antonius and Catiline, was mainly the work of the Italian middle class, already rendered uneasy both by the rumours which were rife of revolutionary schemes and of Caesar's boundless ambition, and by the numerous disquieting signs of disturbance noticeable in Italy. The new consul vigorously set himself to discharge the trust placed in him. He defeated the insidious proposals of Rullus for Caesar's aggrandizement and assisted in quashing the prosecution of Gaius Rabirius (*q.v.*). But with the consular elections in the autumn of 63 a fresh danger arose from a different quarter. The "conspiracy of Catiline" (see CATILINE) was not the work of the popular party, and still less was it an unselfish attempt at reform; Catiline himself was a patrician, who had held high office, and possessed considerable ability and courage; but he was bankrupt in character and in purse, and two successive defeats in the consular elections had rendered him desperate. To retrieve his broken fortunes by violence was a course which was only too readily suggested by the history of the last forty years, and materials for a conflagration abounded on all sides. The danger to be feared from his intrigues lay in the state of Italy, which made a revolt against society and the established government only too likely if once a leader presented himself, and it was such a revolt that Catiline endeavoured to organize. Bankrupt nobles like himself, Sullan veterans and the starving peasants whom they had dispossessed of their holdings, outlaws of every description, the slave population of Rome, and the wilder herdsmen-slaves of the Apulian pastures, were all enlisted under his banner, and attempts were even made to excite disaffection among the newly conquered people of southern Gaul and the warlike tribes who still cherished the memory of Sertorius in Spain. In Etruria, the seat and centre of agrarian distress and discontent, a rising actually took place headed by a Sullan centurion, but the spread of the revolt was checked by Cicero's vigorous measures. Catiline fled from Rome, and died fighting with desperate courage at the head of his motley force of old soldiers, peasants and slaves. His accomplices in Rome were arrested, and, after an unavailing protest from Caesar, the senate authorized the consuls summarily to put them to death.

Return of Pompey from Asia.

Coalition of Pompey, Caesar and Crassus, 60=694.

695.

Caesar's command in Gaul.

The Catilinarian outbreak had been a blow to Caesar, whose schemes it interrupted, but to Cicero it brought not only popularity and honour, but, as he believed, the realization of his political ideal. But Pompey was now on his way home,[12] and again as in 70 the political future seemed to depend on the attitude which the successful general would assume; Pompey himself looked simply to the attainment by the help of one political party or another of his immediate aims, which at present were the ratification of his arrangements in Asia and a grant of land for his troops. It was the impracticable jealousy of his personal rivals in the senate, aided by the versatility of Caesar, who presented himself not as his rival but as his ally, which drove Pompey once more, in spite of Cicero's efforts, into the camp of what was still nominally the popular party. In 60, on Caesar's return from his propraetorship in Spain, the coalition was formed which is known by the somewhat misleading title of the First Triumvirate.[13] Pompey was ostensibly the head of this new alliance, and in return for the satisfaction of his own demands he undertook to support Caesar's candidature for the consulship. The wealth and influence of Crassus were enlisted in the same cause, and the *publicani* were secured by a promise of release from their bargain for collecting the taxes of Asia. Cicero was under no illusions as to the significance of this coalition. It scattered to the winds his dreams of a stable and conservative republic. The year 59 saw the republic powerless in the hands of three citizens. Caesar as consul procured the ratification of Pompey's acts in Asia, granted to the *publicani* the relief refused by the senate, and carried an agrarian law of the new type, which provided for the purchase of lands for allotment at the cost of the treasury and for the assignment of the rich *ager Campanus*.[14] But Caesar aimed at more than the carrying of laws in the teeth of the senate or any party victory in the forum. An important military command was essential to him. An obedient tribune, P. Vatinius, was found, and by the *lex Vatinia* he was given for five years the command of Cisalpine Gaul and Illyricum, to which was added by a decree of the senate Transalpine Gaul also.[1] This command not only opened to him a great military career, but enabled him, as the master of the valley of the Po, to keep an effective watch on the course of affairs in Italy.

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[1] Mommsen is throughout unfair to Cicero, as also are Drumann and Professor Beesly. The best estimates of Cicero's political position are those given by Mr Strachan-Davidson in his *Cicero* (1894), and by Professor Tyrrell in his Introductions to his edition of Cicero's *Letters*.

[2] Cic. *Ad Att.* i. 19, 4, "noster exercitus . . . locupletium."

[3] Cic. *Pro Sulla*, 7, 22; Sall. *Cat.* 31, "inquilinus urbis Romae."

[4] See the *De petitione consulatus*, passim.

[5] *De Domo*, 28, 75; *Pro Plancio*, 41, 97.

[6] Cic. *Pro Quinctio*, 8, 31; *Pro Cluentio*, 46, 153.

[7] Cic. *In Verr.* ii. 73; *De Pet. Cons.* i. He shared with them their dislike of Sulla, as the foe of their order; *Pro Cluentio*, 55, 151.

[8] *De Legg.* iii. 12.

[9] *Pro Sestio*, 65, 136; *De Legg.* iii. 4.

[10] *Pro Sestio*, 45.

[11] *Ad Att.* i. 18.

[12] For the history of the next eighteen years, the most important ancient authority is Cicero in his letters and speeches.

[13] Misleading, because the coalition was unofficial. The "triumvirs" of 43 were actual magistrates, "IIIviri reipublicae constituendae causa."

[14] For the *lex Julia Agraria* and the *lex Campana*, see Dio Cass. xxxviii. 1; App. *B C.* ii. 10; Suet. *Jul.* 20; Cic. *Ad Att.* ii. 16, 18.

Banishment and recall of Cicero, 58-57=696-97.

Early the next year the attack upon himself which Cicero had foreseen was made. P. Clodius (*q.v.*) as tribune brought forward a law enacting that any one who had put a Roman citizen to death without trial by the people should be interdicted from fire and water. Cicero, finding himself deserted even by Pompey, left Rome in a panic, and by a second Clodian law he was declared to be outlawed.[2] With Caesar away in his province, and Cicero banished, Clodius was for the time master in Rome. But, absolute as he was in the streets, and recklessly as he parodied the policy of the Gracchi by violent attacks on the senate, his tribunate merely illustrated the anarchy which now inevitably followed the withdrawal of a strong controlling hand. A reaction speedily followed. Pompey, bewildered and alarmed by Clodius's violence, at last bestirred himself. Cicero's recall was decreed by the senate, and early in August 57 in the *comitia centuriata*, to which his Italian supporters flocked in crowds, a law was passed revoking the sentence of outlawry passed upon him.

Renewal of the coalition, 65=698.

Death of Crassus, 53=701.

Pompey sole consul, 52=702.

Proposed recall of Caesar.

Caesar crosses the Rubicon, 49=705.

Intoxicated by the acclamations which greeted him, and encouraged by Pompey's support, and by the salutary effects of Clodius's excesses, Cicero's hopes rose high.[3] With indefatigable energy he strove to reconstruct a solid constitutional party, but only to fail once more. Pompey was irritated by the hostility of a powerful section in the senate, who thwarted his desires for a fresh command and even encouraged Clodius in insulting the conqueror of the East. Caesar became alarmed at the reports which reached him that the repeal of his agrarian law was threatened, and that the feeling against the coalition was growing in strength; above all, he was anxious for a renewal of his five years' command. He acted at once, and in the celebrated *698.* conference at Luca (56) the alliance of the three self-constituted rulers of Rome was renewed. Cicero succumbed to the inevitable and withdrew in despair from public life. *699.* Pompey and Crassus became consuls for 55. Caesar's command was renewed for another five years, and to each of his two allies important provinces were assigned for a similar period—Pompey receiving the two Spains and Africa, and Crassus Syria.[4] The coalition now divided between them the control of the empire. For the future the question was, how long the coalition itself would last. Its duration proved to be short. In 53 Crassus was defeated and slain by the Parthians at Carrhae, and in Rome the course of events slowly forced Pompey into an attitude of *700.* hostility to Caesar. The year 54 brought with it a renewal of the riotous anarchy which had disgraced Rome in 58–57. Conscious of its own helplessness, the senate, with the eager assent of all respectable citizens, dissuaded Pompey from leaving Italy; and he accordingly left his provinces to be governed by his legates. But the anarchy and confusion only grew worse, and even strict constitutionalists like Cicero talked of the necessity of investing Pompey with some extraordinary powers for the preservation of order.[5] At last in 52 he was elected sole consul, and not only so, but his provincial command was prolonged for five years more, and fresh troops were assigned him.[6] The rôle of "saviour of society" thus thrust upon Pompey was one which flattered his vanity, but it entailed consequences which it is probable he did not foresee, for it brought him into close alliance with the senate, and in the senate there was a powerful party who were resolved to force him into heading the attack they could not successfully make without him upon Caesar. It was known that the latter, whose command *705.* expired in March 49, but who in the ordinary course of things would not have been replaced by his successor *706.* until January 48, was anxious to be allowed to stand for his second consulship in the autumn of 49 without coming in person to Rome.[7] His opponents in the senate were equally bent on bringing his command to an end at the legal time, and so obliging him to disband his troops and stand for the consulship as a private person, or, if he kept his command, on preventing his standing for the consulship. *703-4. 705.* Through 51 and 50 the discussions in the senate and the negotiations with Caesar continued, but with no result. On 1st January 49 Caesar made a last offer of compromise. The senate replied by requiring him on pain of outlawry to disband his legions. Two tribunes who supported him were ejected from the senate-house, and the magistrates with Pompey were authorized to take measures to protect the republic. Caesar hesitated no longer; he crossed the Rubicon and invaded Italy. The rapidity of his advance astounded and bewildered his foes. Pompey, followed by the consuls, by the majority of the senate and a long train of nobles, abandoned Italy as untenable, and crossed into Greece.[8] At the end of March Caesar entered Rome as the master of Italy. Four years later, after the final victory of *709.* Munda (45), he became the undisputed master of the Roman world.[9]

Dictatorship of Caesar, 48-44=706-10.

The task which Caesar had to perform was no easy one. It came upon him suddenly; for there is no sufficient reason to believe that Caesar had long premeditated revolution, or that he had previously aspired to anything more than such a position as that which Pompey had already won, a position unrepublican indeed, but accepted by republicans as inevitable.[10] War was forced upon him as the alternative to political suicide, but success in war brought the responsibilities of nearly absolute power, and Caesar's genius must be held to have shown itself in the masterly fashion in which he grasped the situation, rather than in the supposed sagacity with which he is said to have foreseen and prepared for it. In so far as he failed, his failure was mainly due to the fact that his tenure of power was too short for the work which he was required to perform. From the very first moment when Pompey's ignominious retreat left him master of Italy, he made it clear that he was neither a second Sulla nor even the reckless anarchist which many believed him to be.[11] The Roman and Italian public were first startled by the masterly rapidity and energy of his movements, and then agreeably surprised by his lenity and moderation. No proscriptions or confiscations followed his victories, and all his acts evinced an unmistakable desire to effect a sober and reasonable settlement of the pressing questions of the hour; of this, and of his almost superhuman energy, the long list of measures he carried out or planned is sufficient proof. The "children of the proscribed" were at length restored to their rights,[1] and with them many of the refugees[2] who had found shelter in Caesar's camp during the two or three years immediately preceding the war; but the extreme men among his supporters soon realized that their hopes of *novae tabulae* and grants of land were illusory. In allotting lands to his veterans, Caesar carefully avoided any disturbance of existing owners and occupiers,[3] and the mode in which he dealt with the economic crisis produced by the war seems to have satisfied all reasonable men.[4] It had been a common charge against Caesar in former days that he paid excessive court to the populace of Rome, and now that he was master he still dazzled and delighted them by the splendour of the spectacles he provided, and by the liberality of his largesses. But he was no indiscriminate flatterer of the mob. The popular clubs and gilds which had helped to organize the anarchy of the last few years were dissolved.[5] A strict inquiry was made into the distribution of the monthly doles of corn, and the number of recipients was reduced by one-half;[6] finally, the position of the courts of justice was raised by the abolition of the popular element among the judices.[7] Nor did Caesar shrink from the attempt, in which so many had failed before him, to mitigate the twin evils which were ruining the prosperity of Italy—the concentration of a pauper population in the towns, and the denudation and desolation of the country districts. His strong hand carried out the scheme so often proposed by the popular leaders since the days of Gaius Gracchus, the colonization of Carthage and Corinth. Allotments of land on a large scale were made in Italy; decaying towns were reinforced by fresh drafts of settlers; on the large estates and cattle farms the owners were required to find employment for a certain amount of free labour; and a slight and temporary stimulus was given to Italian industry by the reimposition of harbour dues upon foreign goods.[8]

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[1] Suet. *Jul.* 22; Dio Cass. xxxviii. 8; App. *B.C.* ii. 13; Plut. *Caes.* 14.

[2] Both laws were carried in the *concilium plebis*. The first merely reaffirmed the right of appeal, as the law of Gaius Gracchus had done. The second declared Cicero to be already by his own act in leaving Rome "interdicted from fire and water"—a procedure for which precedents could be quoted. Clodius kept within the letter of the law.

[3] Cicero's speech *Pro Sestio* gives expression to these feelings; it contains a passionate appeal to all good citizens to rally round the old constitution. The acquittal of Sestius confirmed his hopes. See *Ad Q. Fr.* ii. 4.

[4] Livy, *Epit.* cv.; Dio Cass. xxxix. 33. For Cicero's views, see *Ep. ad Fam.* i. 9; *Ad Att.* iv. 5.

[5] A dictatorship was talked of in Rome; Plut. *Pomp.* 54; Cic. *Ad Q. Fr.* iii. 8. Cicero himself anticipated Augustus in his picture of a *princeps civitatis* sketched in a lost book of the *De republica*, written about this time, which was based upon his hopes of what Pompey might prove to be; *Ad Att.* viii. 11; August. *De civ. Dei*, v. 13.

[6] Plut. *Pomp.* 54; App. *B.C.* ii. 24.

[7] For the rights of the question involved in the controversy between Caesar and the senate, see Mommsen, *Rechtsfrage zw. Caesar und d. Senat*; Guiraud, *Le Différend entre César et le Sénat* (Paris, 1878), and the article CAESAR.

[8] Cicero severely censures Pompey for abandoning Italy, but strategically the move was justified by the fact that Pompey's strength lay in the East, where his name was a power, and in his control of the sea. Politically, however, it was a blunder, as it enabled Caesar to pose as the defender of Italy.

[9] For the Civil Wars, see CAESAR; CICERO; and POMPEY.

[10] On this, as on many other points connected with Caesar, divergence has here been ventured on from the views expressed by Mommsen in his brilliant chapter on Caesar (*Hist. of Rome*, bk. v. cap. xi.). Too much stress must not be laid on the gossip retailed by Suetonius as to Caesar's early intentions.

[11] Cicero vividly expresses the revulsion of feeling produced by Caesar's energy, humanity and moderation on his first appearance in Italy. Compare *Ad Att.* vii. 11; with *Ad Att.* viii. 13.

The reform of the calendar, which is described elsewhere,[9] completes a record of administrative reform which entitles Caesar to the praise of having governed well, whatever may be thought of the validity of his title to govern at all. But how did Caesar deal with what was after all the greatest problem which he was called upon to solve, the establishment of a satisfactory government for the Empire? One point indeed was already settled. Some centralization of the executive authority was indispensable, and this part of his work Caesar thoroughly performed. From the moment when he seized the moneys in the treasury on his first entry into Rome[10] down to the day of his death, he recognized no other authority but his throughout the Empire. He alone directed the policy of Rome in foreign affairs; the legions were led, and the provinces governed, not by independent magistrates, but by his "legates";[11] and the title *Imperator* which he adopted was intended to express the absolute and unlimited nature of the *imperium* he claimed, as distinct from the limited spheres of authority possessed by republican magistrates.[12] In so centralizing the executive authority over the Empire at large, Caesar was but developing the policy implied in the Gabinian and Manilian laws, and the precedent he established was closely followed by his successors. It was otherwise with the more difficult question of the form under which this new executive authority should be exercised and the relation it should hold to the republican constitution. We must be content to remain in ignorance of the precise shape which Caesar intended ultimately to give to the new system. The theory that he contemplated a revival of the old Roman kingship[13] is supported by little more than the popular gossip of the day, and the form under which he actually wielded his authority can hardly have been regarded by so sagacious a statesman as more than a provisional arrangement. This form was that of the dictatorship; and in favour of the choice it might have been urged that the dictatorship was the office naturally marked out by republican tradition as the one best suited to carry the state safely through a serious crisis, that the powers it conveyed were wide, that it was as dictator that Sulla had reorganized the state, and that a dictatorship had been spoken of as the readiest means of legalizing Pompey's protectorate of the Republic in 53–52. *701-2.* The choice nevertheless was a bad one. It was associated with those very Sullan traditions from which Caesar was most anxious to sever himself; it implied necessarily the suspension for the time of all constitutional government; and, lastly, the dictatorship as held by Caesar could not even plead that it conformed to the old rules and traditions of the office. The "perpetual dictatorship" granted him after his crowning victory at Munda (45) was a contradiction in terms *709.* and a repudiation of constitutional government which excited the bitterest animosity.[14]

A second question, hardly less important, was that of the position to be assigned to the old constitution. So far as Caesar himself was concerned, the answer was for the time sufficiently clear. The old constitution was not formally abrogated. The senate met and deliberated; the assembly passed laws and elected magistrates; there were still consuls, praetors, aediles, quaestors and tribunes; and Caesar himself, like his successors, professed to hold his authority by the will of the people. But senate, assembly and magistrates were all alike subordinated to the paramount authority of the dictator; and this subordination was, in appearance at least, more direct and complete under the rule of Caesar than under that of Augustus. Caesar was by nature as impatient as Augustus was tolerant of established forms; and, dazzled by the splendour of his career of victory and by his ubiquitous energy and versatility, the Roman public, high and low, prostrated themselves before him and heaped honours upon him with a reckless profusion which made the existence of any authority by the side of his own an absurdity.[15] Hence under Caesar the old constitution was repeatedly disregarded, or suspended in a way which contrasted unfavourably with the more respectful attitude assumed by Augustus. For months together Rome was left without any regular magistrates, and was governed like a subject town by Caesar's prefects.[16] At another time a tribune was seen exercising authority outside the city bounds and invested with the *imperium* of a praetor.[17] At the elections, candidates appeared before the people backed by a written recommendation from the dictator, which was equivalent to a command.[18] Finally, the senate itself was transformed out of all likeness to its former self by the raising of its numbers to 900, and by the admission of old soldiers, sons of freedmen and even "semi-barbarous Gauls."[1] But, though Caesar's high-handed conduct in this respect was not imitated by his immediate successors, yet the main lines of their policy were laid down by him. These were—(1) the municipalization of the old republican constitution, and (2) its subordination to the paramount authority of the master of the legions and the provinces. In the first case he only carried further a change already in progress. Of late years the senate had been rapidly losing its hold over the Empire at large. Even the ordinary proconsuls were virtually independent potentates, ruling their provinces as they chose, and disposing absolutely of legions which recognized no authority but theirs. The 673. consuls and praetors of each year had since 81 been stationed in Rome, and immersed in purely municipal business; and, lastly, since the enfranchisement of Italy, the *comitia*, though still recognized as the ultimate source of all authority, had become little more than assemblies of the city populace, and their claim to represent the true Roman people was indignantly questioned, even by republicans like Cicero. The concentration in Caesar's hands of all authority outside Rome completely and finally severed all real connexion between the old institutions of the Republic of Rome and the government of the Roman Empire. But the institutions of the Republic not merely became, what they had originally been, the local institutions of the city of Rome; they were also subordinated even within these narrow limits to the paramount authority of the man who held in his hands the army and the provinces. Autocratic abroad, at home he was the chief magistrate of the commonwealth; and this position was marked, in his case as in that of those who followed him, by a combination in his person of various powers, and by a general right of precedence which left no limits to his authority but such as he chose to impose upon himself. During the greater 706. part of his reign he was consul as well as dictator. In 48, after his victory at Pharsalia, he was given the *tribunicia potestas* for life,[2] and after his second success at Thapsus the *praefectura morum* for three years.[3] As chief magistrate he convenes and presides in the senate, nominates candidates, conducts elections, carries laws in the assembly and administers justice in court.[4] Finally, as a reminder that the chief magistrate of Rome was also the autocratic ruler of the Empire, he wore even in Rome the laurel wreath and triumphal dress, and carried the sceptre of the victorious imperator.[5]

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[1] Dio xli. 18.

[2] App. ii. 48; Dio xli. 36.

[3] Plut. *Caes.* 51; Suet. 38, "adsignavit agros, sed non continuos, ne quis possessorum expelleretur." Cf. App. ii. 94.

[4] For the *lex Julia de pecuniis mutuis*, see Suet. *Jul.* 42; Caesar, *B.C.* iii. 1; Dio xli. 37; App. ii. 48. The *faeneratores* were satisfied; Cic. *Ad Fam.* viii. 17. But the law displeased anarchists like M. Caelius Rufus and P. Cornelius Dolabella.

[5] Suet. *Jul.* 42.

[6] Ibid. 41; Dio xliii. 21.

[7] Suet. *Jul.* 41; Dio xliii. 25.

[8] Suet. *Jul.* 42, 43.

[9] See Calendar; Mommsen, *Hist. of Rome*, v. 438, and Fischer, *Röm. Zeittafeln*, 292 seq.

[10] Plut. *Caes.* 35.

[11] Dio xliii. 47.

[12] Dio xliii. 44. For this use of the title Imperator, see Mommsen, *Hist of Rome*. v. 332, and note.

[13] See Mommsen, *Hist. of Rome*, v. 333, and Ranke, *Weltgeschichte*, ii. 319 seq. According to Appian ii. 110, and Plutarch, *Caes.* 64, the title *rex* was only to be used abroad in the East, as likely to strengthen Caesar's position against the Parthians.

[14] Cicero, *Phil.* i. 2, 4, praises Antony, "quum dictatoris nomen . . . propter perpetuae dictaturae recentem memoriam funditus ex republica sustulisset."

[15] For the long list of these, see Appian ii. 106; Dio xliii. 43–45; Plut. *Caes.* 57; Suet. *Jul.* 76. Cf. also Mommsen, *Hist. of Rome*, v. 329 ff.; Watson, *Cicero's Letters*, App. x.; Zumpt, *Studia Romana*, 199 seq. (Berlin, 1859).

[16] Zumpt, *Stud. Rom.* 241; Suet. *Jul.* 76.

[17] Cic. *Ad Att.* x. 8*a*.

[18] Suet. *Jul.* 41, "Caesar dictator . . . commendo vobis illum et illum, ut vestro suffragio suam dignitatem teneant."

Nor are we without some clue as to the policy which Caesar had sketched out for himself in the administration of the Empire, the government of which he had centralized in his own hands. The much-needed work of rectifying the frontiers[6] he was forced, by his premature death, to leave to other hands, but within the frontiers he anticipated Augustus in lightening the financial burdens of the provincials,[7] and in establishing a stricter control over the provincial governors,[8] while he went beyond him in his desire to consolidate the Empire by extending the Roman franchise[9] and admitting provincials to a share in the government.[10] He completed the Romanization of Italy by his enfranchisement of the Transpadane Gauls,[11] and by establishing throughout the peninsula a uniform system of municipal government, which under his successors was gradually extended to the provinces.[12]

Attempted restoration of the republic, 44–43 = 710–11.

On the eve of his departure for the East, to avenge the death of Crassus and humble the power of Parthia, Caesar fell a victim to the wounded pride of the republican nobles; and between the day of his death (March 15, 44) and that on which Octavian defeated Antony at Actium (September 2, 31) lies a dreary period of anarchy and bloodshed.[13] 710.

723. For a moment, in spite of the menacing attitude of Caesar's self-constituted representative Marcus Antonius (Mark Antony), it seemed to one man at least as if the restoration of republican government was possible. With indefatigable energy Cicero strove to enlist the senate, the people, and above all the provincial governors in support of the old constitution. But, though his eloquence now and again carried all before it in senate-house and forum, it was powerless to alter the course of events. By the beginning of 43 civil war had re- 711. commenced; in the autumn Antony was already threatening an invasion of Italy at the head of seventeen legions. Towards the end of October Antony and his ally M. Aemilius Lepidus coalesced with the young Octavian, who had been recently elected consul at the age of twenty, in spite of senatorial opposition; and the coalition was legalized by the creation of the extraordinary commission for the "reorganization of the commonwealth" known as the "Second Triumvirate."[14] It was appointed for a period of five years, and was continued in 37 for five years more.[15] The rule of the triumvirs was inaugur- 717. ated in the Sullan fashion by a proscription, foremost among the victims of which was Cicero himself.[16] In the next year the defeat of M. Junius Brutus and C. Cassius Longinus at Philippi, by the combined forces of Octavian and Antony, destroyed the last hopes of the republican party.[17] In 714. 40 a threatened rupture between the two victors was avoided by the treaty concluded at Brundusium. Antony married Octavian's sister Octavia, and took command of the eastern half of the empire; Octavian appropriated Italy and the West; while Lepidus was forced to content himself with Africa.[18] For the next twelve years, while Antony was indulging in dreams of founding for himself and Cleopatra an empire in the East, and shocking Roman feeling by his wild excesses and his affectation of oriental magnificence,[19] Octavian was patiently consolidating his power. Lepidus his fellow-triumvir was in 36 ejected from Africa and banished to Circeii, while 718. Sextus Pompeius, who had since his defeat at Munda maintained a semi-piratical ascendancy in the western Mediterranean, was decisively defeated in the same year, and his death in 35 left Octavian sole master of the West. The 719. inevitable trial of strength between himself and Antony was not long delayed. In 32 Antony openly challenged 722. the hostility of Octavian by divorcing Octavia in favour of the beautiful and daring Egyptian princess, with whom, as the heiress of the Ptolemies, he aspired to share the empire of the Eastern world. By a decree of the senate Antony was declared deposed from his command, and war was declared against Queen Cleopatra.[20] On the 2nd of September 31 723. was fought the battle of Actium.[21] Octavian's victory was complete. Antony and Cleopatra committed 724. suicide (30), and the Eastern provinces submitted in 725. 29. Octavian returned to Rome to celebrate his triumph and mark the end of the long-continued anarchy

The second triumvirate, 43–28 = 711–26.

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[1] Suet. *Jul.* 41, 76; Dio xliii. 47.

[2] Dio xlii. 20.

[3] Dio xliii. 14; Suet. *Jul.* 76. The statement is rejected by Mommsen; see CAESAR.

[4] Suet. *Jul.* 43, "jus laboriosissime ac severissime dixit."

[5] App. ii. 106; Dio xliii. 43.

[6] Plut. *Caes.* 58, "συνάψαι τὸν κύκλον τῆς ἡγεμονίας"; Suet. *Jul.* 44; Dio xliii. 51.

[7] Plut. *Caes.* 48; App. v. 4.

[8] He limited the term of command to two years in consular and one year in praetorian provinces; Cicero, *Phil.* i. 8, 19; Dio xliii. 25.

[9] Suet. *Jul.* 42; Cic. *Ad. Att.* xiv. 12.

[10] Suet. *Jul.* 76.

[11] Dio xli. 36; Tac. *Ann.* xi. 24.

[12] *Lex Julia municipalis*; see CAESAR.

[13] For this period see Merivale, *Romans under the Empire*, vol. iii.; Lange, *Röm. Alterth.* iii. 506 seq.; Gardthausen, *Augustus*, bk. i.

[14] The triumvirate was formally constituted in Rome (Nov. 27th) by a *plebiscitum*; App. iv. 7; Dio xlvi, 56, xlvii. 2; Livy, *Epit.* cxx., "ut IIIviri reipublicae constituendae per quinquennium essent."

[15] Dio xlviii. 54; App. v. 95. For the date, cf. Mommsen, *Staatsr.* ii. 718.

[16] Livy, *Epit.* cxx.; App. iv. 7; and article CICERO.

[17] Dio xlvii. 35–49; App. iv. 87–138.

[18] Vell. ii. 76; Dio xlviii, 28; App. v. 65.

[19] For Antony's policy and schemes in the East, see Ranke, *Weltgeschichte*, ii. 381–85; Mommsen, *Provinces of the Roman Empire*, ii. p. 24 sqq.; Lange, *Röm. Alterth.* iii. 573 sqq.

[20] Suet. *Aug.* 17; Dio l. 1–8; Plutarch, *Anton.* 53.

[21] Dio li. 1; Zonaras x. 30.

711.

by closing the temple of Janus;[1] at the end of the next year he formally laid down the extraordinary powers which he had held since 43, and a regular government was established.

III. *The Empire.*

The Augustan system, 28–27=726–27.

PERIOD I.: THE PRINCIPATE, 27 B.C.–A.D. 284—(a) *The Constitution of the Principate.*—The conqueror of Antonius at Actium, the great-nephew and heir of the dictator Caesar, was now summoned, by the general consent of a world wearied out with twenty years of war and anarchy,[2] to the task of establishing a government which should as far as possible respect the forms and traditions of the Republic, without sacrificing that centralization of authority which experience had shown to be necessary for the integrity and stability of the Empire. It was a task for which Octavian was admirably fitted. To great administrative capacity and a quiet tenacity of purpose he united deliberate caution and unfailing tact; while his bourgeois birth[3] and genuinely Italian sympathies enabled him to win the confidence of the Roman community to an extent impossible for Caesar, with his dazzling pre-eminence of patrician descent, his daring disregard of forms and his cosmopolitan tastes.

The new system which was formally inaugurated by Octavian in 28–27 B.C.[4] assumed the shape of a restoration of the republic under the leadership of a *princeps*.[5] Octavian voluntarily resigned the extraordinary powers which he had held since 43, and, to quote his own words, "handed over the republic to the control of the senate and people of Rome."[6] The old constitutional machinery was once more set in motion; the senate, assembly and magistrates resumed their functions;[7] and Octavian himself was hailed as the "restorer of the commonwealth and the champion of freedom."[8] It was not so easy to determine what relation he himself, the actual master of the Roman world, should occupy towards this revived republic. His abdication, in any real sense of the word, would have simply thrown everything back into confusion. The interests of peace and order required that he should retain at least the substantial part of his authority;[9] and this object was in fact accomplished, and the rule of the emperors founded, in a manner which has no parallel in history. Any revival of the kingly title was out of the question, and Octavian himself expressly refused the dictatorship.[10] Nor was any new office created or any new official title invented for his benefit. But by senate and people he was invested according to the old constitutional forms with certain powers, as many citizens had been before him, and so took his place by the side of the lawfully appointed magistrates of the republic; —only, to mark his pre-eminent dignity, as the first of them all, the senate decreed that he should take as an additional cognomen that of "Augustus,"[11] while in common parlance he was henceforth styled *princeps*, a simple title of courtesy, familiar to republican usage, and conveying no other idea than that of a recognized primacy and precedence over his fellow-citizens.[12] The ideal sketched by Cicero in his *De Republica*, of a constitutional president of a free republic, was apparently realized; but it was only in appearance. For in fact the special prerogatives conferred upon Octavian gave him back in substance the autocratic authority he had resigned, and as between the restored republic and its new *princeps* the balance of power was overwhelmingly on the side of the latter.

711, 721. The settlement of 27=727. 727.

Octavian had held the *imperium* since 43; in 33, it is true, the powers of the triumvirate had legally expired, but he had continued to wield his authority, as he himself puts it,[13] "by universal consent." In 27 he received a formal grant of the *imperium* from the senate and people for the term of ten years, and his *provincia* was defined as including all the provinces in which military authority was required and legions were stationed.[14] He was declared commander-in-chief of the Roman army, and granted the exclusive right of levying troops, of making war and peace, and of concluding treaties.[15] As consul, moreover, he not only continued to be the chief magistrate of the state at home, but took precedence, in virtue of his *majus imperium*, over the governors of the "unarmed provinces," which were still nominally under the control of the senate. Thus the so-called "restoration of the republic" was in essence the recognition by law of the personal supremacy of Octavian, or Augustus, as he must henceforth be called.

The re-settlement of 23=731. 723.

In 23 an important change was made in the formal basis of Augustus's authority. In that year he laid down the consulship which he had held each year since 31, and could therefore only exert his *imperium pro consule*, like the ordinary governor of a province. He lost his authority as chief magistrate in Rome and his precedence over the governors of senatorial provinces. To remedy these defects a series of extraordinary offices were pressed upon his acceptance; but he refused them all,[16] and caused a number of enactments to be passed which determined the character of the principate for the next three centuries.[17] Firstly, he was exempted from the disability attaching to the tenure of the *imperium* by one who was not an actual magistrate, and permitted to retain and exercise it in Rome. Secondly, his *imperium* was declared to be equal with that of the consuls, and therefore superior to that of all other holders of that power. Thirdly, he was granted equal rights with the consuls of convening the senate and introducing business, of nominating candidates at elections,[18] and of issuing edicts.[19] Lastly, he was placed on a level with the consuls in outward rank. Twelve lictors were assigned to him and an official seat between those of the consuls themselves (Dio liv. 10).

Tribunicia potestas.

Thus the proconsular authority[20] was for the first time admitted within the walls of Rome; but Augustus was too cautious a statesman to proclaim openly the fact that the power which he wielded in the city was the same as that exercised in camps and provinces by a Roman military commander. Hence he sought for a title which should disguise the nature of his authority, and found it in the

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[1] He celebrated his triumph on the 13th, 14th and 15th of August; Dio li. 21; Livy, *Epit.* cxxxiii. For the closing of the temple of Janus, see Livy i. 19; Vell. ii. 38; Suet. *Aug.* 22.

[2] Tac. *Ann.* i. 2, "cunctos dulcedine otii pellexit."

[3] Suet. *Aug.* i. His grandfather was a citizen of Velitrae; "municipalibus magisteriis contentus."

[4] Mommsen, *Staatsrecht*, ii. 745 ff.; *Mon. Ancyranum* (ed. Mommsen, Berlin, 1883), vi. 13–23, pp. 144–53; Herzog, *Gesch. u. System d. röm. Verfassung*, ii. p. 126 sqq.

[5] Tac. *Ann.* iii. 28, "sexto demum consulatu . . . quae IIIviratu jusserat abolevit, deditque jura quis pace et principe uteremur"; *Ibid.* i. 9, "non regno neque dictatura sed principis nomine constitutam rempublicam."

[6] *Mon. Anc.* vi. 13.

[7] Vell. ii. 89, "prisca et antiqua reipublicae forma revocata."

[8] Ovid, *Fasti*, i. 589. On a coin of Asia Minor Augustus is styled "libertatis P. R. vindex." The 13th of January, 27 B.C., was marked in the calendar as the day on which the republic was restored (*C.I.L.* i. p. 384).

[9] Dio Cassius describes Augustus as seriously contemplating abdication (lii. 1; liii. 1–11); cf. Suet. *Aug.* 28.

[10] Suet. *Aug.* 52; *Mon. Anc.* i. 31.

[11] *Mon. Anc.* vi. 16, 21–23.

[12] The explanation of *princeps* as an abbreviated form of *princeps senatus* is quite untenable. For its real significance, see Mommsen, *Staatsrecht*, ii. 774; Pelham, *Journ. of Phil.* vol. viii. It is not an official title.

[13] *Mon. Anc.* 6, 14, "per consensum universorum."

[14] Dio liii. 12; Suet. *Aug.* 47.

[15] Dio, *l.c.*

[16] He was offered the dictatorship, a life-consulship, a "cura legum et morum." It is stated by Suetonius (*Aug.* 53) and Dio (liv. 10) that he accepted the last named; but this is disproved by his own language in the *Mon. Anc.* (i. 31); cf. Pelham, *Journ. of Philol.* xvii. 47.

[17] Dio liii. 32. Part of the law by which the rights essential to the principate were conferred upon Vespasian is extant; see Rushforth, *Latin Historical Inscriptions*, No. 70 (the *Lex de imperio Vespasiani*).

[18] Tac. *Ann.* i. 81.

[19] *Lex de imperio*, ll. 17–21.

[20] The term *proconsulare imperium*, which we find used, *e.g.*, by Tacitus, was not employed in republican times, and Augustus himself speaks of his *consulare imperium* (*Mon. Anc.* 2, 5, 8).

"tribunician power," which had been conferred upon him for life 718. in 36, and was well suited, from its urban and democratic traditions, to serve in Rome as "a term to express his supreme position."[1] 731. From 23 onwards the *tribunicia potestas* appears after his name in official inscriptions, together with the number indicating the period during which it had been held (also reckoned from 23); 731. it was in virtue of this power that Augustus introduced the social reforms which the times demanded;[2] and, though far inferior to the *imperium* in actual importance, it ranked with or even above it as a distinctive prerogative of the emperor or his chosen colleague.[3]

The *imperium* and the *tribunicia potestas* were the two pillars upon which the authority of Augustus rested, and the other offices and privileges conferred upon him were 731. of secondary importance. After 23 he never held the 749, 752. consulship save in 5 and 2 B.C., when he became the colleague of his grandsons on their introduction to public life. He permitted the triumvir Lepidus to retain the chief pontificate until his death, when Augustus naturally became *pontifex* 742. *maximus* (12 B.C.).[4] He proceeded with the like caution in reorganizing the chief departments of the public service in Rome and Italy. The *cura annonae*, *i.e.* the supervision of the corn supply of Rome, was entrusted to him in 732. 22 B.C.,[5] and this important branch of administration thus came under his personal control; but the other boards (*curae*), created during his reign to take charge of the roads, the water-supply, the regulation of the Tiber and the public buildings, were composed of senators of high rank, and regarded in theory as deriving their authority from the senate.[6]

Such was the ingenious compromise by which room was found for the master of the legions within the narrow limits of the old Roman constitution. Augustus could say with truth that he had accepted no office which was "contrary to the usage of our ancestors," and that it was only in dignity that he took precedence of his colleagues. Nevertheless, as every thinking man must have realized, the compromise was unreal, and its significance was ambiguous. It was an arrangement avowedly of an exceptional and temporary character, yet no one could suppose that it would in effect be otherwise than permanent. The powers voted to Augustus were (like those conferred upon 687. Pompey in 67 B.C.) voted only to him, and (save the 727. *tribunicia potestas*) voted only for a limited time; in 27 he received the *imperium* for ten years, and it was afterwards renewed for successive periods of five, five, ten and ten years.[7] In this way the powers of the principate were made coextensive in time with the life of Augustus, but there was absolutely no provision for hereditary or any other form of succession, and various expedients were devised in order to indicate the destined successor of the *princeps* and to bridge the gap created by his death. Ultimately Augustus associated his stepson Tiberius with himself as co-regent. The *imperium* and the *tribunicia potestas* were conferred upon him, and he was thus marked out as the person upon whom the remaining powers of the principate would naturally be bestowed after the death of his stepfather. But succeeding emperors did not always indicate their successors so clearly, and, in direct contrast to the maxim that "the king never dies," it has been well said that the Roman principate died with the death of the *princeps*.[8]

Changes in the constitution of the principate.

In theory, at least, the Roman world was governed according to the "maxims of Augustus" (Suet. *Ner.* 10), down to the time of Diocletian. Even in the 3rd century there is still in name at least, a republic, of which the emperor is in strictness only the chief magistrate, deriving his authority from the senate and people, and with prerogatives limited and defined by law. The case is quite different when we turn from theory to practice. The division of authority between the republic and its chief magistrate became increasingly unequal. Over the provinces the *princeps* from the first ruled autocratically; and this autocracy reacted upon his position in Rome, so that it became every year more difficult for a ruler so absolute abroad to maintain even the fiction of republican government at home. The republican institutions, with the partial exception of the senate, lose all semblance of authority outside Rome, and even as the municipal institutions of the chief city of the empire they retain but little actual power. The real government even of Rome passes gradually into the hands of imperial prefects and commissioners, and the old magistracies become merely decorations which the emperor bestows at his pleasure. At the same time the rule of the *princeps* assumes an increasingly personal character, and the whole work of government is silently concentrated in his hands and in those of his own subordinates. Closely connected with this change is the different aspect presented by the history of the empire in Rome and Italy on the one hand and in the provinces on the other. Rome and Italy share in the decline of the republic. Political independence and activity die out; their old pre-eminence and exclusive privileges gradually disappear; and at the same time the weight of the overwhelming power of the *princeps*, and the abuses of their power by individual *principes*, press most heavily upon them. On the other hand, in the provinces and on the frontiers, where the imperial system was most needed, and where from the first it had full play, it is seen at its best as developing or protecting an orderly civilization and maintaining the peace of the world.

Decay of republican institutions. 705, 726.

The decay of the republican institutions had commenced before the revolutionary crisis of 49. It was accelerated by the virtual suspension of regular government between 49 and 28; and not even the diplomatic deference towards ancient forms which Augustus displayed availed to conceal the unreality of his work of restoration. The *comitia* received back from him "their ancient rights" (Suet. *Aug.* 40), and during his lifetime they continued to pass laws and to elect magistrates.

The comitia.

But after the end of the reign of Tiberius we have only two instances of legislation by the assembly in the ordinary way,[9] and the law-making of the empire is performed either by decrees of the senate or by imperial edicts and constitutions. Their prerogative of electing magistrates was, even under Augustus, robbed of most of its importance by the control which the *princeps* exercised over their choice by means of his rights of nomination and commendation, which effectually secured the election of his own nominees.[10] By Tiberius this restricted prerogative was still further curtailed. The candidates for all magistracies except the consulship were thenceforward nominated and voted for in the senate-house and by the senators,[11] and only the formal return of the result (*renuntiatio*) took place in the assembly (Dio lviii. 20). And, though the election of consuls was never thus transferred to the senate, the process of voting seems to have been silently abandoned. In the time of the younger Pliny we hear only of the nomination of the candidates and of their formal *renuntiatio* in the Campus Martius.[12] The *princeps* himself as long as the Principate lasted, continued to receive the *tribunicia potestas* by a vote of the assembly, and was thus held to derive his authority from the people.[13]

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[1] Tac. *Ann.* iii. 56; "summi fastigii vocabulum."

[2] *Mon. Anc. Graec.* 3, 19.

[3] Tac. *Ann.* i. 3 (of Tiberius), "collega imperii, consors tribuniciae potestatis"; cf. Mommsen, *Staatsr.* ii. 1160.

[4] Suet. *Aug.* 31.

[5] *Mon. Anc.* 1, 32; Dio liv. 1.

[6] See Hirschfeld, *Verwaltungsgesch.* i. 173.

[7] Dio liii. 13, 16.

[8] Mommsen, *Staatsr.* ii. 1143.

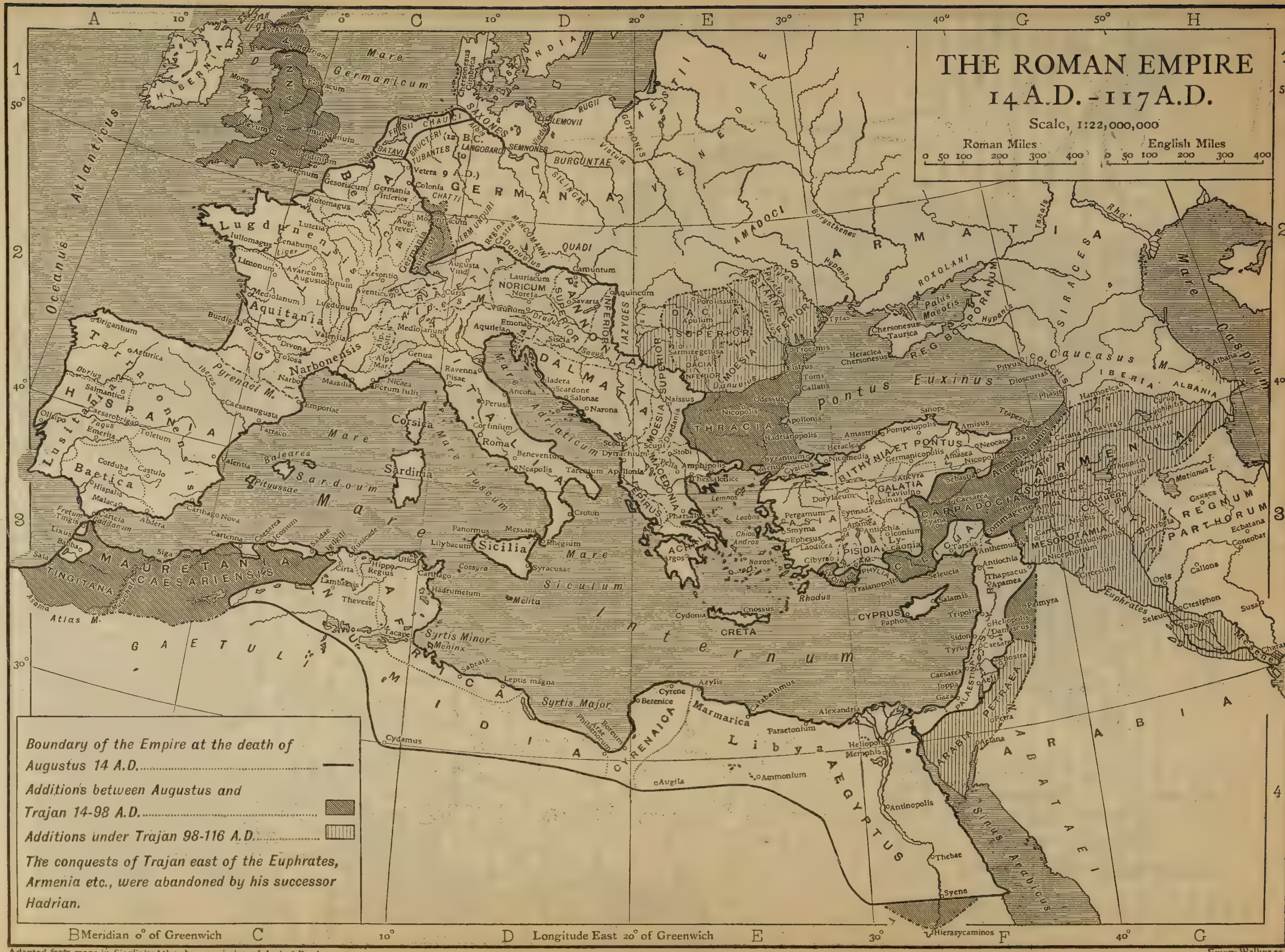
[9] The *plebiscita* of Claudius, Tac. *Ann.* xi. 13, 14, and the *lex agraria* of Nerva; *Digest*, xlvii. 21, 3; Dio lxviii. 2; Plin. *Epp.* vii. 31.

[10] On these rights, the latter of which was not exercised in the case of the consulship until the close of Nero's reign, see Mommsen, *Staatsr.* ii. 916–28; Tac. *Ann.* i. 14, 15, 81; Suet. *Aug.* 56; Dio lviii. 20.

[11] Tac. *Ann.* i. 15, "comitia e campo ad patres translata sunt"; compare *Ann.* xiv. 28. The magistracy directly referred to is the praetorship, but that the change affected the lower magistracies also is certain; see, *e.g.*, Pliny's *Letters*, *passim*, especially iii. 20, vi. 19.

[12] Plin. *Paneg.* 92.

[13] Gaius i. 5, "cum ipse imperator per legem imperium accipiat."


A
C
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B Meridian 0° of Greenwich
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Scale, 1:22,000,000
Roman Miles
0 50 100 200 300 400
English Miles
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BRITANNIA
Mona
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GERMANIA
SAXONES
LANGOBARDI
SEMNONES
BURGUNTAE
GOTHONES
AESTII
VENEDAE
SARMATIA
AMADOCI
ROXOLANI
SIRACESA
Mare Caspium
Lugdunensis
Aquitania
Belgica
Narbonensis
Tarraconensis
HISPANIA
Lusitania
Baetica
Pyrenaei M.
Corsica
Sardinia
Sicilia
ITALIA
Roma
Mare Adriaticum
Mare Tyrrhenum
Mare Sardoum
Mare Siculum
Mare Internum
NORICUM
PANNONIA
DALMATIA
DACIA
MOESIA
THRACIA
MACEDONIA
ACHAIA
Pontus Euxinus
BITHYNIA ET PONTUS
GALATIA
CAPPADOCIA
ARMENIA
MESOPOTAMIA
REGNUM PARTHORUM
Caucasus
IBERIA
ALBANIA
ASIA
CYPRUS
CRETA
Rhodus
SYRIA
PALAESTINA
ARABIA PETRAEA
ARABIA
NABATAEI
Sinus Arabicus
AEGYPTUS
Alexandria
Libya
Marmarica
CYRENAICA
AFRICA
NUMIDIA
MAURETANIA CAESARIENSIS
TINGITANA
GAETULI
Atlas M.
Syrtis Major
Syrtis Minor
Euphrates
Ctesiphon

THE ROMAN EMPIRE
14 A.D. - 117 A.D.

Scale, 1:22,000,000

Boundary of the Empire at the death of Augustus 14 A.D. .... —

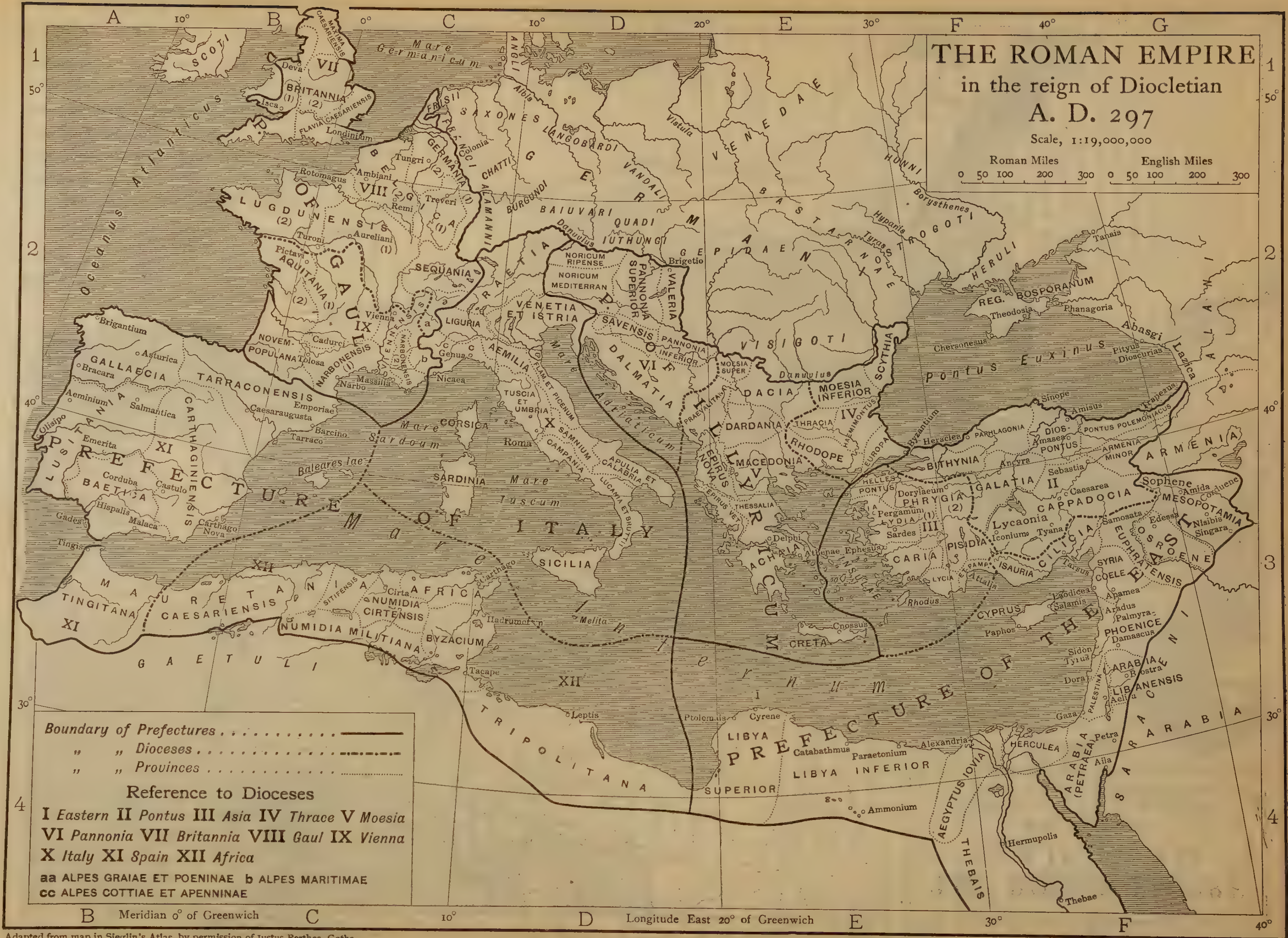
Additions between Augustus and Trajan 14-98 A.D. .... ▨

Additions under Trajan 98-116 A.D. .... ▥

The conquests of Trajan east of the Euphrates, Armenia etc., were abandoned by his successor Hadrian.

Adapted from maps in Sieglin's Atlas, by permission of Justus Perthes

Emery Walker sc.


THE ROMAN EMPIRE
in the reign of Diocletian
A. D. 297
Scale, 1:19,000,000
Roman Miles
0 50 100 200 300
English Miles
0 50 100 200 300
Boundary of Prefectures
" " Dioceses
" " Provinces
Reference to Dioceses
I Eastern II Pontus III Asia IV Thrace V Moesia
VI Pannonia VII Britannia VIII Gaul IX Vienna
X Italy XI Spain XII Africa
aa ALPES GRAIAE ET POENINAE b ALPES MARITIMAE
cc ALPES COTTIAE ET APENNINAE
Meridian 0° of Greenwich
Longitude East 20° of Greenwich
PREFECTURE OF GAUL
PREFECTURE OF ITALY
PREFECTURE OF ILLYRICUM
PREFECTURE OF THE EAST
Oceanus Atlanticus
Mare Germanicum
Mare Internum
Pontus Euxinus
Mare Adriaticum
Mare Tuscum
Mare Sardoum
BRITANNIA
GERMANI
SARMATAE
GAETULI
SARACENI
ARABIA
ALANI
VENEDAE
GOTI
SCOTI
SAXONES
FRANCI
ALAMANNI
VISIGOTI
HUNNI
HERULI
LUGDUNENSIS
AQUITANIA
NARBONENSIS
BELGICA
GERMANIA
SEQUANIA
TARRACONENSIS
CARTHAGINIENSIS
GALLAECIA
LUSITANIA
BAETICA
MAURETANIA
TINGITANA
CAESARIENSIS
NUMIDIA
AFRICA
BYZACIUM
TRIPOLITANA
SICILIA
SARDINIA
CORSICA
RAETIA
NORICUM
PANNONIA
VALERIA
DALMATIA
DACIA
MOESIA
THRACIA
MACEDONIA
ACHAIA
CRETA
SCYTHIA
BITHYNIA
GALATIA
CAPPADOCIA
ARMENIA
MESOPOTAMIA
SYRIA
PHOENICE
PALESTINA
CYPRUS
AEGYPTUS
THEBAIS
LIBYA
Roma
Byzantium
Alexandria
Carthago

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Emery Walker, Sc.

The magistracies. **Consulship.** **Praetorship.** **Aedileship.** **Tribunate.** **Quaestorship.**

This almost complete effacement of the *comitia* was largely due to the fact that they had ceased to represent anything but the populace of Rome, and the comparatively greater vitality shown by the old magistracies is mainly attributable to the value they continued to possess in the eyes of the Roman upper class. But, though they were eagerly sought (Plin. *Epp.* ii. 9, vi. 6), and conferred on their holders considerable social distinction, the magistrates ceased, except in name, to be the popularly chosen executive officers of the Roman state. In the administration of the empire at large they had no share, if we except the subordinate duties still assigned to the quaestor in a province. In Rome, to which their sphere of work was limited, they were overshadowed by the dominant authority of the *princeps*, while their range of duties was increasingly circumscribed by the gradual transference of administrative authority, even within the city, to the emperor and his subordinate officials. And their dependence on the *princeps* was confirmed by the control he exercised over their appointment. For all candidates the approval, if not the commendation, of the *princeps* became the indispensable condition of success, and the *princeps* on his side treated these ancient offices as pieces of preferment with which to reward his adherents or gratify the ambition of Roman nobles. The dignity of the office, too, was impaired by the practice, begun by Caesar and continued by Augustus and his successors, of granting the insignia to men who had not held the actual magistracy itself.[1] The consulship was still the highest post open to the private citizen, and consular rank a necessary qualification for high office in the provinces;[2] but the actual consuls have scarcely any other duties than those of presiding in the senate and occasionally executing its decrees, while their term of office dwindles from a year to six and finally to two months.[3] In the age of Tacitus and the younger Pliny, the contrast is striking between the high estimate set on the dignity of the office and the frankness with which its limited powers and its dependence on the emperor are acknowledged.[4] The praetors continued to exercise their old jurisdiction with little formal change down at least to the latter half of the second century, but only as subordinate to the higher judicial authority of the emperor.[5] The aediles retained only such petty police duties as did not pass to one or another of the imperial prefects and commissioners. The tribunate fared still worse, for, by the side of the *tribunicia potestas* wielded by the *princeps*, it sank into insignificance.[6] The quaestorship suffered less change than any other of the old offices. It kept its place as the first step on the ladder of promotion, and there was still a quaestor attached to each governor of a senatorial province, to the consuls in Rome, and to the *princeps* himself.[7]

The Senate.

The senate alone among republican institutions retained some importance and influence, and it thus came to be regarded as sharing the government of the Empire with the *princeps* himself. It nominally controlled the administration of Italy and of the "public provinces," whose governors it appointed. It is to the senate, in theory, that the supreme power reverts in the absence of a *princeps*. It is by decree of the senate that the new *princeps* immediately receives his powers and privileges,[8] though he is still supposed to derive them ultimately from the people. After the cessation of all legislation by the *comitia*, the only law-making authority, other than that of the *princeps* by his edicts, was that of the senate by its decrees.[9] Its judicial authority was co-ordinate with that of the emperor, and at the close of the 1st century we find the senators claiming, as the emperor's "peers," to be exempt from his jurisdiction.[10] But in spite of the outward dignity of its position, and of the deference with which it was frequently treated, the senate became gradually almost as powerless in reality as the *comitia* and the magistracies. The senators continued indeed to be taken as a rule from the ranks of the wealthy, and a high property qualification was established by Augustus as a condition of membership; but this merely enabled the emperors to secure their own ascendancy by subsidizing those whose property fell short of the required standard, and who thus became simply the paid creatures of their imperial patrons.[11] Admission to the senate was possible only by favour of the emperor, both as controlling the elections to the magistracies, which still gave entrance to the curia, and as invested with the power of directly creating senators by *adlectio*, a power which from the time of Vespasian onwards was freely used.[12] As the result, the composition of the senate rapidly altered. Under Augustus and Tiberius it still contained many representatives of the old republican families, whose prestige and ancestral traditions were some guarantee for their independence. But this element soon disappeared. The ranks of the old nobility were thinned by natural decay and by the jealous fears of the last three Claudian emperors. Vespasian[13] flooded the senate with new men from the municipal towns of Italy and the Latinized provinces of the West. Trajan and Hadrian, both provincials themselves, carried on the same policy, and by the close of the 2nd century even the Greek provinces of the East had their representatives in the senate. Some, no doubt, of these provincials, who constituted the great majority of the senate in the 3rd century, were men of wealth and mark, but many more were of low birth, on some rested the stain of a servile descent, and all owed alike their present position and their chances of further promotion to the emperor.[14] The procedure of the senate was as completely at the mercy of the *princeps* as its composition. He was himself a senator and the first of senators;[15] he possessed the magisterial prerogatives of convening the senate, of laying business before it, and of carrying *senatus consulta*;[16] above all, his tribunician power enabled him to interfere at any stage, and to modify or reverse its decisions. The share of the senate in the government was in fact determined by the amount of administrative activity which each *princeps* saw fit to allow it to exercise, and this share became steadily smaller. The jurisdiction assigned it by Augustus and Tiberius was in the 3rd century limited to the hearing of such cases as the emperor thought fit to send for trial, and these became steadily fewer in number. Its control of the state treasury, as distinct from the imperial *fiscus*, was in fact little more than nominal, and became increasingly unimportant as the great bulk of the revenue passed into the hands of the emperor. Even in Rome and Italy its control of the administration was gradually transferred to the prefect of the city, and after the reign of Hadrian to imperial officers (*juridici*) charged with the civil administration.[1] The part still played by its decrees in the modification of Roman law has been dealt with elsewhere (see SENATE), but it is clear that these decrees did little else than register the expressed wishes of the emperor and his personal advisers.

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[1] On the permission to use the *ornamenta consularia, praetoria*, &c., see Mommsen, *Staatsr.* i. 455 sqq.; Suet. *Jul.* 76; Claud. v. 24; Tac. *Ann.* xii. 21, xv. 72; Dio Cass. lx. 8. Cf. also Friedländer, i. 691.

[2] For a consular senatorial province and for the more important of the imperial legateships.

[3] Mommsen, *Staatsr.* ii. 82 sqq. Six months was the usual term down to the death of Nero; we have then four or two months; in the 3rd century two is the rule. The consuls who entered on office on the 1st of January were styled *consules ordinarii*, and gave their name to the year, whilst the others were distinguished as *consules suffecti* or *minores*; Dio Cass. xlviii. 35.

[4] Plin. *Paneg.* 92; Tac. *Hist.* i. 1, *Agric.* 44.

[5] Mommsen, *Staatsr.* ii. 225.

[6] Plin. *Epp.* i. 23, "inanem umbram et sine honore nomen." There are a few instances of the exercise by the tribunes of their power of interference within the senate; Tac. *Ann.* i. 77, vi. 47, xvi. 26; Plin. *Epp.* ix. 13.

[7] Mommsen, *Staatsrecht*, ii. 567–69. Pliny was himself "quaestor Caesaris," *Epp.* vii. 16.

[8] Mommsen, *Staatsrecht*, ii. 842; Tac. *Ann.* xii. 69, *Hist.* i. 47. In the 3rd century the honours, titles and powers were conferred *en bloc* by a single decree; *Vit. Sev. Alex.* 1.

[9] Gaius i. 4; Ulpian, *Dig.* i. 3, 9.

[10] Under Domitian; Dio Cass. lxvii. 2. Even Septimius Severus caused a decree to be passed "ne liceret imperatori inconsulto senatu occidere senatorem"; *Vita Severi*, 7.

[11] Suet. *Nero*, 10, *Vesp.* 17.

[12] Mommsen, *Staatsrecht*, ii. 939 sqq. The power was derived from the censorial authority. Domitian was censor for life; Suet. *Dom.* 8. After Nerva it was exercised as falling within the general authority vested in the *princeps*; Dio liii. 17.

[13] Suet. *Vesp.* 90; Tac. *Ann.* iii. 55.

[14] See on this point Friedländer, *Sittengeschichte Roms*, i. 237 sqq.

[15] *Mon. Ancyr. Gr.* iv. 3, πρῶτον ἀξιώματος τόπον.

[16] *Lex de imp. Vesp.*, *C.I.L.* vi. 930: "Senatum habere, relationem facere, remittere; Scta. per relationem discessionemque facere."

Centralization of authority: the imperial service.

The process by which all authority became centralized in the hands of the *princeps* and in practice exercised by an organized bureaucracy[2] was of necessity gradual; but it had its beginnings under Augustus, who formed the equestrian order (admission to which was henceforth granted only by him) into an imperial service, partly civil and partly military, whose members, being immediately dependent on the emperor, could be employed on tasks which it would have been impossible to assign to senators (see EQUITES). From this order were drawn the armies of "procurators"—the term was derived from the practice of the great business houses of Rome—who administered the imperial revenues and properties in all parts of the empire. Merit was rewarded by independent governorships such as those of Raetia and Noricum, or the command of the naval squadrons at Misenum and Ravenna; and the prizes of the knight's career were the prefectures of the praetorian guard, the corn-supply and the city police, and the governorship of Egypt. The household offices and imperial secretaryships were held by freedmen, almost always of Greek origin, whose influence became all-powerful under such emperors as Claudius.[3] The financial secretary (*a rationibus*) and those who dealt with the emperor's correspondence (*ab epistulis*) and with petitions (*a libellis*) were the most important of these.

Outward splendour.

This increase of power was accompanied by a corresponding elevation of the *princeps* himself above the level of all other citizens. The comparatively modest household and simple life of Augustus were replaced by a more than regal splendour, and under Nero we find all the outward accessories of monarchy present, the palace, the palace guards, the crowds of courtiers, and a court ceremonial. In direct opposition to the republican theory of the principate, members of the family of the *princeps* share the dignities of his position. The males bear the cognomen of Caesar, and are invested, as youths, with high office; their names and even those of the females are included in the yearly prayers for the safety of the *princeps*;[4] their birthdays are kept as festivals; the praetorian guards take the oath to them as well as to the *princeps* himself. The logical conclusion was reached in the practice of Caesar-worship,[5] which was in origin the natural expression of a widespread sentiment of homage, which varied in form in different parts of the empire and in different classes of society, but was turned to account by the statecraft of Augustus to develop something like an imperial patriotism. The official worship of the deified Caesar, starting from that of the "divine Julius," gave a certain sanctity and continuity to the regular succession of the emperors, but it was of less importance politically than the worship of "Rome and Augustus," first instituted in Asia Minor in 29 B.C., and gradually diffused throughout the provinces, as a symbol of imperial unity. It must be observed that living emperors were not officially worshipped by Roman citizens; yet we find that even in Italy an unauthorized worship of Augustus sprang up during his lifetime in the country towns.[6]

The frontiers.

On the accession of Augustus, there could be little doubt as to the nature of the work that was necessary, if peace and prosperity were to be secured for the Roman world. He was called upon to justify his position by rectifying the frontiers and strengthening their defences, by reforming the system of provincial government, and by reorganizing the finance; and his success in dealing with these three difficult problems is sufficiently proved by the prosperous condition of the empire for a century and a half after his death. To secure peace it was necessary to establish on all sides of the empire really defensible frontiers; and this became possible now that for the first time the direction of the foreign policy of the state and of its military forces was concentrated in the hands of a single magistrate. To the south and west the generals of the republic, and Caesar himself, had extended the authority of Rome to the natural boundaries formed by the African deserts and the Atlantic Ocean, and in these two directions Augustus's task was in the main confined to the organization of a settled Roman government within these limits. In Africa the client state of Egypt was ruled by Augustus as the successor of the Ptolemies, and administered by his deputies (*praefecti*), and the kingdom of Numidia (25 B.C.) was incorporated with the old province of Africa. In Spain the hill-tribes of the north-west were finally subdued and a third province, Lusitania, established.[7] In Gaul Augustus (27 B.C.) established in addition to the "old province" the three new ones of Aquitania, Lugdunensis and Belgica,[8] which included the territories conquered by Julius Caesar.

The North.

Towards the north the republic had left the civilized countries bordering on the Mediterranean with only a very imperfect defence against the threatening mass of barbarian tribes beyond them. The result[9] of Augustus's policy was to establish a protecting line of provinces running from the Euxine to the North Sea, and covering the peaceful districts to the south,—Moesia (A.D. 6), Pannonia (A.D. 9), Noricum (15 B.C.), Raetia (15 B.C.) and Gallia Belgica. Roman rule was thus carried up to the natural frontier lines of the Rhine and the Danube. It was originally intended to make the Elbe the frontier of the empire; but after the defeat of P. Quintilius Varus (A.D. 9) the forward policy was abandoned. Tiberius recalled Germanicus as soon as Varus had been avenged; and after the peace with Maroboduus, the chief of the Marcomanni on the upper Danube, in the next year (A.D. 17), the defensive policy recommended by Augustus was adopted along the whole of the northern frontier. The line of the great rivers was held by an imposing mass of troops. Along the Rhine lay the armies of Upper and Lower Germany, consisting of four legions each; eight more guarded the Danube and the frontiers of Pannonia and Moesia. At frequent intervals along the frontier were the military colonies, the permanent camps and the smaller intervening *castella*. Flotillas of galleys cruised up and down the rivers, and Roman roads opened communication both along the frontiers and with the seat of government in Italy.

The East.

In the East, Rome was confronted with a well-organized and powerful state whose claims to empire were second only to her own. The victory of Carrhae (53 B.C.) had encouraged among the Parthians the idea of an invasion of Syria and Asia Minor, while it had awakened in Rome a genuine fear of the formidable power which had so suddenly arisen in the East. Caesar was at the moment of his death preparing to avenge the death of Crassus by an invasion of Parthia, and Antony's schemes of founding an Eastern empire which should rival that of Alexander included the conquest of the kingdom beyond the Euphrates. Augustus, however, adhered to the policy which he recommended to his successors of "keeping the empire within its bounds"; and the Parthians, weakened by internal feuds and dynastic quarrels, were in no mood for vigorous action. Roman pride was satisfied by the restoration of the standards taken at Carrhae. Four legions guarded the line of the Euphrates, and, beyond the frontiers of Pontus and

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[1] *Vit. Hadr.* 22; "Juridici" were appointed by Marcus Aurelius, *Vit. Ant.* 11; Marquardt i. 224.

[2] On the growth of the imperial bureaucracy see Hirschfeld, *Die kaiserlichen Verwaltungsbeamten bis auf Diocletian* (1905).

[3] For the position of the imperial freedmen under Claudius, see Friedländer i. 88 sqq.; Tac. *Ann.* xii. 60, xiv. 39, *Hist.* ii. 57, 95.

[4] *Acta Fr. Arval.* (ed. Henzen), 33, 98, 99.

[5] For Caesar-worship, see Mommsen, *Staatsr.* ii. 755 sqq.; Wissowa, *Religion und Kultus der Römer*, p. 283 sqq., and Kornemann in *Beiträge zur alten Geschichte*, i.

[6] See Rushforth, *Roman Historical Inscriptions*, Nos. 38 sqq. and notes.

[7] Marquardt i. 257; Mommsen, *Provinces*, i. 64.

[8] Marquardt i. 264; Mommsen, *Provinces*, i. 84 seq.

[9] See especially Mommsen, *Provinces*, i. caps. 4 and 6.

Cappadocia, Armenia was established as a "friendly and independent ally."[1]

Administrative reforms in the provinces.

Next in importance to the rectification and defence of the frontiers was the reformation of the administration, and the restoration of prosperity to the distracted and exhausted provinces. The most serious defect of the republican system had been the absence of any effective control over the Roman officials outside Italy. This was now supplied by the general proconsular authority vested in the emperor. The provinces were for the first time treated as departments of a single state, while their governors, from being independent and virtually irresponsible rulers, became the subordinate officials of a higher authority.[2] Over the *legati* of the imperial provinces the control of the emperor was as complete as that of the republican proconsul over his staff in his own province. They were appointed by him, held office at his good pleasure, and were directly responsible to him for their conduct. The proconsuls of the senatorial provinces were in law magistrates equally with the *princeps*, though inferior to him in rank; it was to the senate that they were as of old responsible; they were still selected by lot from among the senators of consular and praetorian rank. But the distinction did not seriously interfere with the paramount authority of the emperor. The provinces left nominally to the senate were the more peaceful and settled districts in the heart of the empire, where only the routine work of civil administration was needed, and where the local municipal governments were as yet comparatively vigorous. The senatorial proconsuls themselves were indirectly nominated by the emperor through his control of the praetorship and consulship. They wielded no military and only a strictly subordinate financial authority, and, though Augustus and Tiberius, at any rate, encouraged the fiction of the responsibility of the senatorial governors to the senate, it was in reality to the emperor that they looked for direction and advice, and to him that they were held accountable. Moreover, in the case of all governors this accountability became under the empire a reality. Prosecutions for extortion (*de pecuniis repetundis*), which were now transferred to the hearing of the senate, are tolerably frequent during the first century of the empire; but a more effective check on maladministration lay in the appeal to Caesar from the decisions of any governor, which was open to every provincial, and in the right of petition. Finally, the authority both of the legate and the proconsul was weakened by the presence of the imperial procurator, to whom was entrusted the administration of the fiscal revenues; while both legate and proconsul were deprived of that right of requisitioning supplies which, in spite of a long series of restrictive laws, had been the most powerful instrument of oppression in the hands of republican governors.

Financial reforms.

The financial reforms of Augustus[3] are marked by the same desire to establish an equitable, orderly and economical system, and by the same centralization of authority in the emperor's hands. The institution of an imperial census, or valuation of all land throughout the empire, and the assessment upon this basis of a uniform land tax, in place of the heterogeneous and irregular payments made under the republic, were the work of Augustus, though the system was developed and perfected by the emperors of the 2nd century and by Diocletian. The land tax itself was directly collected, either by imperial officials or by local authorities responsible to them, and the old wasteful plan of selling the privilege of collection to *publicani* was henceforward applied only to such indirect taxes as the customs duties. The rate of the land tax was fixed by the emperor, and with him rested the power of remission even in senatorial provinces.[4] The effect of these reforms is clearly visible in the improved financial condition of the empire. Under the republic the treasury had been nearly always in difficulties, and the provinces exhausted and impoverished. Under the emperors, at least throughout the 1st century, in spite of a largely increased expenditure on the army, on public works, on shows and largesses, and on the machinery of government itself, the better emperors, such as Tiberius and Vespasian, were able to accumulate large sums, while the provinces show but few signs of distress. Moreover, while the republic had almost entirely neglected to develop the internal resources of the provinces, Augustus set the example of a liberal expenditure on public works, in the construction of harbours, roads and bridges, the reclamation of waste lands, and the erection of public buildings.[5] The crippling restrictions which the republic had placed on freedom of intercourse and trade, even between the separate districts of a single province, disappeared under the empire. In the eyes of the republican statesmen the provinces were merely the estates of the Roman people, but from the reign of Augustus dates the gradual disappearance of the old pre-eminence of Rome and Italy. It was from the provinces that the legions were increasingly recruited; provincials rose to high rank as soldiers, statesmen and men of letters;[6] and the methods of administration, formerly distinctive of the provinces, were adopted even in Rome and Italy. From Augustus himself, jealous as he was of the traditions and privileges of the ruling Roman people, date the rule of an imperial prefect[7] in the city of Rome, the division of Italy into *regiones* in the provincial fashion, and the permanent quartering there of armed troops.[8]

Liberal policy towards the provinces.

Italy and the provinces under the empire.

The Julio-Claudian line.

Augustus founded a dynasty which occupied the throne for more than half a century after his death. The first and by far the ablest of its members was Tiberius (A.D. 14–37). He was undoubtedly a capable and vigorous ruler, who enforced justice in the government of the provinces, maintained the integrity of the frontiers and husbanded the finances of the empire, but he became intensely unpopular in Roman society, and was painted as a cruel and odious tyrant. His successor, Gaius (A.D. 37–41), generally known as Caligula, was the slave of his wild caprices and uncontrolled passions, which issued in manifest insanity. He was followed by his uncle, Claudius (A.D. 41–54), whose personal uncouthness made him an object of derision to his contemporaries, but who was by no means devoid of statesmanlike faculties. His reign left an abiding mark on the history of the empire, for he carried forward its development on the lines intended by Augustus. Client-states were absorbed, southern Britain was conquered, the Romanization of the West received a powerful impulse, public works were executed in Rome and Italy, and the organization of the imperial bureaucracy made rapid strides. Nero (A.D. 54–68), the last of the Julio-Claudian line, has been handed down to posterity as the incarnation of monstrous vice and fantastic luxury. But his wild excesses scarcely affected the prosperity of the empire at large; the provinces were well governed, and the war with Parthia led to a compromise in the matter of Armenia which secured peace for half a century.[9]

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[1] Mommsen, *Provinces*, cap. 9. Armenia, however, long continued to be a debatable ground between Rome and Parthia—passing alternately under the influence of one or the other.

[2] For the provincial reforms of Augustus, see Marquardt, *Staatsverw.*, i. 544 sqq.

[3] Marquardt, ii. 204 sqq.; Hirschfeld, *Verwaltungsbeamten*, 55 sqq.

[4] Tac. *Ann.* ii. 47.

[5] Suet. *Aug.* 18, 47.

[6] Jung, *Die romanischen Landschaften* (Innsbruck, 1881); Budinsky, *Die Ausbreitung d. lateinischen Sprache* (Berlin, 1881).

[7] The *praefectus urbi*, unlike the other imperial prefects, was always a senator. He commanded the three *cohortes urbanae*, which preserved order in the city, and possessed a power of jurisdiction which tended to increase in importance. The office, which was only temporary under Augustus, became a permanent one under his successor.

[8] Besides the *cohortes urbanae* mentioned above, the nine regiments of the imperial guard (*cohortes praetorianae*) were quartered in Rome. The guards were not at first concentrated but billeted in Rome and the neighbouring towns; the praetorian barracks on the Esquiline were built under Tiberius (Tac. *Ann.* iv. 2). Augustus also formed the quasi-military police force of the *vigiles* (in seven cohorts), which performed the duties of a fire brigade and night watch. Police duties in those parts of Italy which were subject to brigandage were performed by *stationes militum* (Suet. *Aug.* 32).

[9] For an estimate of the Julio-Claudian Caesars, based on the results of recent research, see Pelham in *Quarterly Review* (April

The fall of Nero and the extinction of the "progeny of the Caesars" was followed by a war of succession which revealed the military basis of the Principate and the weakness of the tie connecting the emperor with Rome. Galba, Otho, Vitellius and Vespasian represented in turn the legions of Spain, the household troops, the army of the Rhine, and a coalition of the armies of the Danube and the Euphrates; and all except Otho were already *de facto* emperors when they entered Rome. The final survivor in the struggle, Vespasian (A.D. 69–79), was a man of comparatively humble origin, and as the Principate ceased to possess the prestige of high descent it became imperatively necessary to remove, as far as possible, the anomalies of the office and to give it a legitimate and permanent form.

The Flavian and Antonine emperors.

Thus we find an elaborate and formal system of titles substituted for the personal names of the Julio-Claudian emperors, an increasing tendency to insist on the inherent prerogatives of the Principate (such as the censorial power), and an attempt to invest Caesarism with an hereditary character, either by natural descent or by adoption, while the worship of the *Divi*, or deified Caesars, was made the symbol of its continuity and legitimacy. The dynasty of Vespasian and his sons (Titus, A.D. 79–81, Domitian, A.D. 81–96) became extinct on the murder of the last named, whose high-handed treatment of the senate earned him the name of a tyrant; his successor, Nerva (A.D. 96–98), opened the series of "adoptive" emperors (Trajan, A.D. 98–117, Hadrian, 117–38, Antoninus Pius, 138–61, Marcus Aurelius, 161–80) under whose rule the empire enjoyed a period of internal tranquillity and good government. Its boundaries were extended by the subjugation of northern Britain (by Agricola, A.D. 78–84; see BRITAIN, § *Roman*), by the annexation of the districts included in the angle of the Rhine and Danube under the Flavian emperors, and by the conquest of Dacia (the modern Transylvania) under Trajan (completed in A.D. 106). Trajan also annexed Arabia Petraea and in his closing years invaded Parthia and formed provinces of Armenia, Mesopotamia and Assyria; but these conquests were surrendered by his successor, Hadrian, who set himself to the task of consolidating the empire and perfecting its defences. To him is due the system of permanent *limites* or frontier fortifications, such as the wall which protected northern Britain and the palisade which replaced the chain of forts established by the Flavian emperors from the Rhine to the Danube.[1] The construction of these defences showed that the limit of expansion had been reached, and under M. Aurelius the tide began to turn. A great part of his reign was occupied with wars against the Marcomanni, Quadi, Sarmatians, &c., whose irruptions seriously threatened the security of Italy. Henceforth Rome never ceased to be on the defensive.

Condition of the provinces.

Within the frontiers the levelling and unifying process commenced by Augustus had steadily proceeded. A tolerably uniform provincial system covered the whole area of the empire. The client states had one by one been reconstituted as provinces, and even the government of Italy had been in many respects assimilated to the provincial type.

Spread of the municipal system.

The municipal system had spread widely; the period from Vespasian to Aurelius witnessed the elevation to municipal rank of an immense number of communities, not only in the old provinces of the West, in Africa, Spain and Gaul, but in the newer provinces of the North, and along the line of the northern frontier; and everywhere under the influence of the central imperial authority there was an increasing uniformity in the form of the local constitutions, framed and granted as they all were by imperial edict.[2]

Extension of the Roman franchise.

Throughout the empire again the extension of the Roman franchise was preparing the way for the final act by which Caracalla assimilated the legal status of all free-born inhabitants of the empire,[3] and in the west and north this was preceded and accompanied by the complete Romanizing of the people in language and civilization. Yet, in spite of the internal tranquillity and the good government which have made the age of the Antonines famous, we can detect signs of weakness. It was in this period that the centralization of authority in the hands of the *princeps* was completed; the "dual control" established by Augustus, which had been unreal enough in the 1st century, was now, though not formally abolished, systematically ignored in practice. The senate ceased to be an instrument of government, and became an imperial peerage, largely composed of men not qualified by election to the quaestorship but directly ennobled by the emperor.[4] The restricted sphere of administration left by Augustus to the old magistracies was still further narrowed; their jurisdiction, for example, tended to pass into the hands of the Greek officers appointed by Caesar—the prefect of the city and the prefect of the guards. The complete organization of Caesar's own administrative service, and its recognition as a state bureaucracy, was chiefly the work of Hadrian, who took the secretaryships out of the hands of freedmen and entrusted them to procurators of equestrian rank.[5] All these changes, inevitable, and in some degree beneficial, as they were, brought with them the attendant evils of excessive centralization. Though these were hardly felt while the central authority was wielded by vigorous rulers, yet even under Trajan, Hadrian and the Antonines we notice a failure of strength in the empire as a whole, and a corresponding increase of pressure on the imperial government itself. The reforms of Augustus had given free play to powers still fresh and vigorous. The ceaseless labours of Hadrian were directed mainly to the careful husbanding of such strength as still remained, or to attempts at reviving it by the sheer force of imperial authority. Among the symptoms of incipient decline were the growing depopulation, especially of the central districts of the empire, the constant financial difficulties, the deterioration in character of the local governments in the provincial communities,[6] and the increasing reluctance exhibited by all classes to undertake the now onerous burden of municipal office.

It is to such facts as these that we must look in passing a final judgment on the imperial government, which is admittedly seen in its best and most perfect form in the Antonine period. In our review of the conditions which brought about the fall of the Roman Republic, we saw that the collapse of the city-state made Caesarism inevitable, since the extension of federal and representative institutions to a world-empire lay beyond the horizon of ancient thought. The benefits which Caesarism conferred upon mankind are plain. In the first place, the Roman world, which had hitherto not been governed in the true sense of the word, but exploited in the interests of a dominant clique, now received an orderly and efficient government, under which the frightful ravages of misrule and civil strife were repaired. The financial resources of the empire were husbanded by skilled and, above all, *trained* administrators, to whom the imperial service offered a *carrière ouverte aux talents*; many of these were Greeks, or half-Greek Orientals, whose business capacity formed an invaluable asset hitherto

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1905). It is now generally admitted that Tacitus's picture is overdrawn.

[1] On the *limes imperii*, see Pelham, "A Problem of Roman Frontier Policy" (*Transactions of the Royal Historical Society*, 1906), and Kornemann, "Die neueste Limesforschung" (*Klio*, 1907, pp. 73 ff.). The *limes* connecting the Rhine with the Danube has been systematically excavated in recent years; for the results see *Der obergermanisch-rätische Limes* (Heidelberg, 1894–), and *Der römische Limes in Österreich* (Vienna, 1900–).

[2] Marquardt, i. 132 ff.; cf. especially the *leges Salpensanae et Malacitanae*; Bruns, *Fontes Juris Romani* (ed. 6, p. 142).

[3] Dio lxxvii. 9 (A.D. 212).

[4] For the use of *adlectio* see Mommsen, *Staatsr.* ii. 877.

[5] *Vit. Hadr.* 21. Besides Hirschfeld's *Verwaltungsbeamten* reference may be made to Liebenam, *Die Laufbahn der Procuratoren* (Jena, 1886), and Schurz, *De mutationibus in imperio Romano ordinando ab imperatore Hadriano factis* (Bonn, 1883).

[6] This led to the appointment of the *curatores* and *correctores* in the 2nd century. The younger Pliny was one of these imperial commissioners, and his correspondence with Trajan throws much light on the condition of the provinces.

neglected. Augustus caused an official survey of the empire to be made, and a scientific census of its resources was gradually carried out and from time to time revised; thus the balance of revenue and expenditure could be accurately estimated and adjusted, and financial stability was established. The system of tax-farming was gradually abolished and direct collection substituted; commerce was freed from vexatious restrictions, and large customs-districts were formed, on whose borders duties were levied for revenue only. The government took even more direct measures for the encouragement of industry and especially of agriculture. The most remarkable of these were the "alimentary" institutions, originally due to Nerva and developed by succeeding emperors. Capital was advanced at moderate rates of interest to Italian landowners on the security of their estates, and the profits of this system of land-banks were devoted to the maintenance and education of poor children. The foundation of colonies for time-expired soldiers, who received grants of land on their discharge, contributed something to the formation of a well-to-do agricultural class; and although the system was not successful in lower Italy, where economic decline could not be arrested, there can be no doubt that central and northern Italy, where the vine and olive were largely cultivated, and manufacturing industries sprang up, enjoyed a considerable measure of prosperity. The extension of the Roman municipal system to the provinces, and the watchful care exercised by the imperial government over the communities, together with the profuse liberality of the emperors, which was imitated by the wealthier citizens of the towns, led to the creation of a flourishing municipal life still evidenced by the remains which in districts such as Asia Minor or Tunis stand in significant contrast with the desolation brought about by centuries of barbaric rule. Mommsen[1] has, indeed, expressed the opinion that "if an angel of the Lord were to strike the balance whether the domain ruled by Severus Antoninus were governed with the greater intelligence and the greater humanity at that time or in the present day, whether civilization and national prosperity generally had since that time advanced or retrograded, it is very doubtful whether the decision would prove in favour of the present."

But there is another side to the picture. The empire brought into being a new society and a new nationality, due to the fusion of Roman ideas with Hellenic culture, beside which other elements, saving only, as we shall see, those contributed by the Oriental religions, were insignificant. This new nationality grew in definition through the gradual disappearance of distinctions of language and manners, the assimilating influence of commercial and social intercourse, and the extinction of national jealousies and aspirations. But the cosmopolitan society thus formed was compacted of so many disparate elements that a common patriotism was hard to foster, and doubly hard when the autocratic system of government prevented men from aspiring to that true political distinction which is attainable only in a self-governing community. It is true that there was much good work to be done, and that much good work was done, in the service of the emperors; true, also, that the *carrière ouverte aux talents* was in large measure realized. Distinctions of race were slowly but steadily effaced by the grant of citizen rights to provincials and by the manumission of slaves; and the career open to the Romanized provincial or the liberated slave might culminate in the highest distinctions which the emperor could bestow. In the hierarchy of social orders—senate, *equites* and *plebs*—ascent was easy and regular from the lower grade to the higher; and the more enlightened of the emperors—especially Hadrian—made a genuine endeavour to give a due share in the work of government to the various subject races. But nothing could compensate for the lack of self-determination, and although during the first century and a half of imperial rule a flourishing local patriotism in some degree filled the place of the wider sentiment, this gradually sank into decay and became a pretext under cover of which the lower classes in the several communities took toll of their wealthier fellow-citizens in the shape of public works, largesses, amusements, &c., until the resources at the disposal of the rich ran dry, the communities themselves in many cases became insolvent, and the inexorable claims of the central government were satisfied only by the surrender of financial control to an imperial commissioner. Then the organs of civic life became atrophied, political interest died out, and the whole burden of administration, as well as that of defence, fell upon the shoulders of the bureaucracy, which proved unequal to the task.

In a world thus governed the individual was thrown more and more upon his own resources—the pursuit of wealth[2] and pleasure, or the satisfaction of intellectual interests. Under the rule of the Caesars much was done for education. Julius Caesar bestowed Roman citizenship on "teachers of the liberal arts"; Vespasian endowed professorships of Greek and Latin oratory at Rome;[3] and later emperors, especially Antoninus Pius, extended the same benefits to the provinces. Local enterprise and munificence were also devoted to the cause of education; we learn from the correspondence of the younger Pliny that public schools were founded in the towns of northern Italy. But though there was a wide diffusion of knowledge under the empire, there was no true intellectual progress. Augustus, it is true, gathered about him the most brilliant writers of his time, and the debut of the new monarchy coincided with the Golden Age of Roman literature; but this was of brief duration, and the beginning of the Christian era saw the triumph of classicism and the first steps in the decline which awaits all literary movements which look to the past rather than the future. Political oratory could not exist under an absolute ruler; public life furnished no inspiring theme to poet or historian; and literature became didactic or imitative, while rhetoric degenerated into declamation. It is true that for some time both literature and philosophy maintained an alliance with the old republican aristocracy and voiced the undercurrent of opposition to the empire; but both had ceased to be irreconcilable before the time of Hadrian. Under his rule classicism gave way to the archaism of which Fronto and Apuleius furnish the most notable examples, and which preferred Cato and Ennius to Cicero and Virgil. But this return to the past was not followed by any renewed creative energy. It was a confession of weakness and little more; and the widely diffused culture of the Antonine period, though outwardly brilliant, had no progressive energy and presented but a feeble resistance to the dissolving forces of barbarism.

To strike the balance of loss and gain in the field of morals is an exceedingly difficult task. The denunciations of the satirists, especially of Juvenal, might lead us to believe that an appalling state of depravity existed in the society of the early empire; but satirists notoriously paint in glaring colours for literary effect, and whatever may be said of the morality of Rome—which was probably no better and no worse than that of any cosmopolitan capital—there were sound and healthy elements in plenty amongst the population of Italy and the provinces. Doubtless the craving for amusement—especially for the shows of the amphitheatre and the chariot-races of the circus—infected the idle masses of the populace in Rome and the larger towns, and was fostered by the policy of despotism, which always aims at securing cheap popularity with the proletariat; but the tendency of the time, not only in the higher ranks, but also amongst humbler folk, was towards a broader humanity and a more serious view of life and its problems. Greek philosophy, especially the Stoic system, in order to appeal to the practical Roman intelligence, found itself obliged to elaborate a rule of conduct, and in many households the philosopher, generally a Greek, played the part of a director of consciences. The influence of these doctrines is shown in the humane provisions of the civil law as elaborated in the Antonine period, which did much to mitigate the lot of the slave and to smooth the process by which freedom might be attained.[1] Above all, a religious movement which drew its motive power not from Greek philosophy, but from Oriental mysticism, carried the human race far from its old moorings, and culminated in the triumph of Christianity. All the Eastern cults—whether of Cybele, of Isis, of the Syrian Baalim or of the Persian Mithras—had this in common, that they promised to their adherents redemption from the curse of the flesh and a glorious immortality after death; and this fact gave them an irresistible attraction for the disillusioned and overburdened subjects of the emperors. The religion of Mithras, whose doctrines were specially suited to the military temperament, made its way wherever the armies of the empire were stationed, and seemed likely at one moment to become universal; but it was forced to yield to Christianity, which refused to tolerate any rival, faced the empire with a claim to absolute dominion in the spiritual sphere, and at length made that claim good (see Roman Religion; Mithras; Great Mother of the Gods).

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[1] *Provinces*, i. p. 5.

[2] Immense fortunes were accumulated under the early empire, especially by imperial freedmen, such as Pallas, who is said to have possessed the equivalent of £3,000,000 sterling; and there were instances of extravagant luxury, which was encouraged by Nero. But we are told that there was a return to simpler habits of life under the Flavian dynasty.

[3] Quintilian occupied the chair of Latin rhetoric, and received the *ornamenta consularia.*

The empire from 180–284.

Marcus Aurelius died in 180, and the reign of his worthless son, Commodus (A.D. 180–93), was followed by a century of war and disorder, during which nothing but the stern rule of soldier emperors saved the empire from dissolution. The first and ablest of these was Septimius Severus (193–211), whose claims were disputed by Clodius Albinus in the West, and by Pescennius Niger in the East; in these struggles rival Roman forces, for the first time since the accession of Vespasian, exhausted each other in civil war.[2] Severus emphasized strongly the military character of the Principate; he abstained from seeking confirmation for his authority from the senate, and deprived that body of most of the share in the government which it still retained; he assumed the title of proconsul in Rome itself, made the prefect of the guard the vicegerent of his authority, and heaped privileges upon the army, which, although they secured its entire devotion to his family, impaired its efficiency as a fighting force and thus weakened Rome in face of the barbarian invader.[3] He succeeded in founding a short-lived dynasty, which ended with the attempt of the virtuous but weak Alexander (222–35) to restore the independence of the senate. This led to a military reaction, and the elevation of the brutal Maximinus, a Thracian peasant, to the throne. The disintegration of the empire was the natural result; for the various provincial armies put forward their commanders as claimants to the purple. A hundred ties bound them closely to the districts in which they were stationed; their permanent camps had grown into towns, they had families and farms; the unarmed provincials looked to them as their natural protectors, and were attached to them by bonds of intermarriage and by long intercourse. Now that they found themselves left to repel by their own efforts the invaders from without, they reasonably enough claimed the right to ignore the central authority which was powerless to aid them, and to choose for themselves *imperatores* whom they knew and trusted. These "tyrants," as they were called when unsuccessful, sprang up in ever-increasing numbers, and weakened Rome's power of resistance to the new enemies who were threatening her frontiers—the Alamanni and Franks, who broke through the German *limes* in 236; the Goths, who crossed the Danube in 247, raided the Balkan provinces, and defeated and slew the emperor, Decius, in 251, and the restored Persian kingdom of the Sassanidae (see Persia), whose rulers laid claim to all the Asiatic possessions of Rome and in 260 captured Antioch and made the emperor, Valerian, a prisoner. During the reign of Gallienus, the son of Valerian (260–68), the evil reached its height. The central authority was paralysed; the Romanized districts beyond the Rhine were irrevocably lost; the Persians were threatening to overrun the Eastern provinces; the Goths had formed a fleet of 500 sail which harried Asia Minor and even Greece itself, where Athens, Corinth, Sparta and Argos were sacked; and the legions on the frontiers were left to repel the enemies of Rome as best they could. A provincial empire was established by M. Cassianius Latinius Postumus in Gaul and maintained by his successors, M. Piavonius Victorinus and C. Pius Esuvius Tetricus.[4] Their authority was acknowledged, not only in Gaul and by the troops on the Rhine, but by the legions of Britain and Spain; and under Postumus at any rate (259–69) the existence of the Gallic Empire was justified by the repulse of the barbarians and by the restoration of peace and security to the provinces of Gaul. On the Danube, in Greece and in Asia Minor none of the "pretenders" enjoyed more than a passing success. In the Far East, the Syrian Odaenathus, prince of Palmyra[5] (*q.v.*), though officially only the governor of the East (*dux Orientis*) under Gallienus, drove the Persians out of Asia Minor and Syria, recovered Mesopotamia, and ruled Syria, Arabia, Armenia, Cappadocia and Cilicia with all the independence of a sovereign. Odaenathus was murdered in 266. His young son Vaballathus (Wahab-allath) succeeded him in his titles, but the real power was vested in his widow Zenobia, under whom not only the greater part of Asia Minor but even the province of Egypt was forcibly added to the dominions governed by the Palmyrene prince, who ceased to acknowledge the supremacy of Rome.

Reign of Gallienus, 260–268.

Odaenathus and Zenobia at Palmyra.

Restoration of unity by Aurelian, 273.

Gallienus was murdered at Milan in 268, and after the brief reign of Claudius II. (A.D. 268–70), who checked the advance of the Goths, Aurelian (270–75) restored unity to the distracted empire. Palmyra was destroyed and Zenobia led a prisoner to Rome (in 273) and in the next year the Gallic empire came to an end by the surrender of Tetricus. Aurelian, it is true, abandoned the province of Dacia, but the defences of the Danube were strengthened, and in 276 Probus repulsed the Franks and Alamanni, who had been pressing on the Rhine frontier for some forty years. Finally, Carus (282) recovered Armenia and Mesopotamia from the Persians and restored the frontier fixed by Septimius Severus.

State of the empire at the close of the 3rd century.

Although any serious loss of territory had been avoided, the storms of the 3rd century had told with fatal effect upon the general condition of the empire. The "Roman peace" had vanished; not only the frontier territories, but the central districts of Greece, Asia Minor, and even Italy itself, had suffered from the ravages of war, and the fortification of Rome by Aurelian was a significant testimony to the altered condition of affairs. War, plague and famine had thinned the population and crippled the resources of the provinces. On all sides land was running waste, cities and towns were decaying, and commerce was paralysed. Only with the greatest difficulty were sufficient funds squeezed from the exhausted taxpayers to meet the increasing cost of the defence of the frontiers. The old established culture and civilization of the Mediterranean world rapidly declined, and the mixture of barbaric rudeness with Oriental pomp and luxury which marked the court, even of the better emperors, such as Aurelian, was typical of the general deterioration, which was accelerated by the growing practice of settling barbarians on lands within the empire, and of admitting them freely to service in the Roman army.

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[1] The massacre of the slaves of Pedanius Secundus, who had been murdered by some person unknown (Tac. *Ann.* xiv. 42), was, it is true, decreed by the senate; but it was a highly unpopular act, and is chiefly significant as showing that the senatorial aristocracy was out of harmony with the spirit of the time.

[2] Gibbon (ed. Bury), i. chap. v.; Schiller, *Gesch. d. Kaiserzeit*, i. (2) 660.

[3] The common soldier was now permitted to marry, and ceased to live in camp (Herodian iii. 8. 5).

[4] Gibbon, i. chap. x.; Mommsen, *Provinces*, i. 164; Schiller, i. (2) 827.

[5] Gibbon, i. chap. x.; Mommsen, *Provinces*, ii. 103; cf. Palmyra.

PERIOD II.: THE DOMINATE, A.D. 284–476.—(*a*) *From the Accession of Diocletian to the Death of Theodosius* (A.D. 284–395).

The reforms of Diocletian and Constantine.

Augusti and Caesares.

The work of fortifying the empire alike against internal sedition and foreign invasion, begun by Aurelian and Probus, was completed by Diocletian and Constantine the Great, whose system of government, novel as it appears at first sight, was in reality the natural and inevitable outcome of the history of the previous century.[1] Its object was twofold, to give increased stability to the imperial authority itself, and to organize an efficient administrative machinery throughout the empire. In the second year of his reign Diocletian associated Maximian with himself as colleague, and six years later (293) the hands of the two "Augusti" were further strengthened by the proclamation of Constantius and Galerius as "Caesares." Precedents for such an arrangement were to be found in the earlier history of the Principate[2]; and it divided the burdens and responsibilities of government, without sacrificing the unity of the empire; for, although to each of the Augusti and Caesars a separate sphere was assigned, the Caesars were subordinate to the higher authority of the Augusti, and over all his three colleagues Diocletian claimed to exercise a paramount control. It also reduced the risk of a disputed succession by establishing in the two Caesars the natural successors to the Augusti, and it satisfied the jealous pride of the rival armies by giving them *imperatores* of their own. The distribution of power between Diocletian and his colleagues followed those lines of division which the feuds of the previous century had marked out. The armies of the Rhine, the Danube and of Syria fell to the lot respectively of Constantius, Galerius and Diocletian, the central districts of Italy and Africa to Maximian.[3]

Altered character of the imperial authority.

Levelling policy of Diocletian.

Degradation of Italy and Rome.

The new administrative system.

In the new system the imperial authority was finally emancipated from all constitutional limitation and control and the last traces of its republican origin disappeared. The emperors from Diocletian onwards were autocrats in theory as well as in practice. This avowed despotism Diocletian, following in the steps of Aurelian, hedged round with all the pomp and majesty of Oriental monarchy. The final adoption of the title *dominus*, the diadem on the head, the robes of silk and gold, the replacement of the republican salutation of a fellow-citizen by the adoring prostration even of the highest in rank before their lord and master, were all significant marks of the new regime.[4] In the hands of this absolute ruler was placed the entire control of an elaborate administrative machinery. Most of the old local and national distinctions, privileges and liberties which had once flourished within the empire had already disappeared under the levelling influence of imperial rule, and the process was now completed. Roman citizenship had, since the edict of Caracalla, ceased to be the privilege of a minority. Diocletian finally reduced Italy and Rome to the level of the provinces: the provincial land-tax and provincial government were introduced into Italy,[5] while Rome ceased to be even in name the seat of imperial authority.[6] Throughout the whole area of the empire a uniform system of administration was established, the control of which was centred in the imperial palace.[7] Between the civil and military departments the separation was complete. At the head of the former were the praetorian prefects,[8] next below them the *vicarii*, who had charge of the *dioceses*; below these again the governors of the separate provinces (*praesides*, *correctores*, *consulares*),[9] under each of whom was a host of minor officials. Parallel with this civil hierarchy was the series of military officers, from the *magistri militum*, the *duces*, and *comites* downwards.[10] In both there is the utmost possible subordination and division of authority. The subdivision of provinces, begun by the emperors of the 2nd century, was systematically carried out by Diocletian, and each official, civil or military, was placed directly under the orders of a superior; thus a continuous chain of authority connected the emperor with the meanest official in his service. Finally, the various grades in these two imperial services were carefully marked by the appropriation to each of distinctive titles, the highest being that of *illustris*, which was confined to the prefects and to the military *magistri* and *comites*, and to the chief ministers.[11]

Effects of these reforms.

There can be little doubt that on the whole these reforms prolonged the existence of the empire, by creating a machinery which enabled the stronger emperors to utilize effectively all its available resources, and which even to some extent made good the deficiencies of weaker rulers. But in many points they failed to attain their object. Diocletian's division of the imperial authority among colleagues, subject to the general control of the senior Augustus, was effectually discredited by the twenty years of almost constant conflict which followed his own abdication (305–23). Constantine's partition of the empire among his three sons was not more successful in ensuring tranquillity, and in the final division of the East and West between Valens and Valentinian (364) the essential principle of Diocletian's scheme, the maintenance of a single central authority, was abandoned. The "tyrants," the curse of the 3rd century, were far from unknown in the 4th. The system, moreover, while it failed altogether to remove some of the existing evils, aggravated others. The already overburdened financial resources of the empire were strained still further by the increased expenditure necessitated by the substitution of four imperial courts for one, and by the multiplication in every direction of paid officials. The gigantic bureaucracy of the 4th century proved, in spite of its undoubted services, an intolerable weight upon the energies of the empire.

Constantine the Great.

Diocletian and Maximian formally abdicated their high office in 305. Nineteen years later Constantine I., the Great, the sole survivor of six rival emperors, united the whole empire under his own rule. His reign of fourteen years was marked by two events of first-rate importance,—the recognition of Christianity as the religion of the empire, and the building of the new capital at Byzantium.

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[1] See Gibbon (ed. Bury), ii. chap. xvii. 158 ff.; Marquardt, *Staatsverw.* i. pp. 81, 336, 337, ii. 217 seq.; Madvig, *Verf. d. Röm. Reichs*, i. 585; Böcking, *Notitia dignitatum* (Bonn, 1853); Hodgkin, *Italy and her Invaders* (ed. 2), bk. i. chap. xii.; Preuss, *Diocletian* (Leipzig, 1869); Seeck, *Untergang der antiken Welt*, vols. i., ii. (1897–1902).

[2] Mommsen, *Staatsrecht*, ii. 1168 seq. Verus was associated with Marcus Aurelius as Augustus; Severus gave the title to his two sons. The bestowal of the title "Caesar" on the destined successor dates from Hadrian. Mommsen, *op. cit.* 1139.

[3] The division was as follows:—(1) Diocletian—Thrace, Egypt, Syria, Asia Minor; (2) Maximian—Italy and Africa; (3) Galerius—Illyricum and the Danube; (4) Constantius—Britain, Gaul, Spain. See Gibbon, i. 354; Aurelius Victor, c. 39.

[4] Aurel. Victor, 39; Eutrop. ix. 26.

[5] Marquardt, *Staatsverw.* i. 233 ff. Italy, together with Sicily, Sardinia and Corsica, was divided into 17 provinciae. Each had its own governor; the governors were subject to the two *vicarii* (*vic. urbis, vic. Italiae*), and they in turn to the prefect of Italy, whose prefecture, however, included as well Africa and Western Illyricum.

[6] The seats of government for Diocletian and his three colleagues were Mediolanum, Augusta Trevirorum, Sirmium, Nicomedia.

[7] For these last, see Gibbon, ii. chap. xvii. p. 188; cf. also *Notitia Dignitatum* and Böcking's notes.

[8] At first the number of these varied and there was no fixed division of provinces between them; but by the close of the 4th century there were four prefectures, viz. Oriens, Illyricum, Italia, Gallia, to which must be added the prefectures of Rome and Constantinople. See Mommsen in *Hermes*, xxxvi. 204 ff.

[9] There were 12 dioceses and 101 provinces; cf., in addition to the authorities mentioned above, Bethmann-Hollweg, *Civil-Prozess*, iii.; Kuhn, *Die städtische und bürgerliche Verfassung des römischen Reichs* (1877).

[10] The army was completely remodelled, and the old frontier garrisons (now called *Limitanei*) were supplemented by a field force attached to the persons of the Augusti and Caesares, and hence called *Comitatenses*. The change was accompanied by the subdivision of the old legions into units of about 2000 men. For these reforms see Seeck, *Untergang der antiken Welt*, bk. iii. chap. v.; Mommsen in *Hermes*, xxiv. 225 ff.

[11] The grades were as follows: *illustres*, *spectabiles*, *clarissimi*, *perfectissimi*, *egregii*. For the other insignia, see Madvig, ii. 590, and the *Notitia Dignitatum*.

Recognition of Christianity.

The alliance which Constantine inaugurated between the Christian church and the imperial government, while it enlisted on the side of the state one of the most powerful of the new forces with which it had to reckon, imposed a check, which was in time to become a powerful one, on the imperial authority.

Constantinople.

The establishment of the new "City of Constantine" as a second Rome paved the way for the final separation of East and West by providing the former for the first time with a suitable seat of government on the Bosphorus. The death of Constantine in 337 was followed, as the abdication of Diocletian had been, by the outbreak of quarrels among rival Caesars. Of the three sons of Constantine who in 337 divided the empire between them, Constantine the eldest fell in civil war against his brother Constans; Constans himself was, ten years afterwards, defeated and slain by Magnentius; and the latter in his turn was in 353 vanquished by Constantine's only surviving son Constantius.

Constantius II., 351–63.

Thus for the second time the whole empire was united under the rule of a member of the house of Constantine. But in 355 Constantius granted the title of Caesar to his cousin Julian and placed him in charge of Gaul, where the momentary elevation of a tyrant, Silvanus, and still more the inroads of Franks and Alamanni, had excited alarm. But Julian's successes during the next five years were such as to arouse the jealous fears of Constantius. In order to weaken his suspected rival the legions under Julian in Gaul were suddenly ordered to march eastward against the Persians (360).

Julian, 361–63.

They refused; and when the order was repeated, replied by proclaiming Julian himself emperor and Augustus. Julian, with probably sincere reluctance, accepted the position, but the death of Constantius in 361 saved the empire from the threatened civil war. Julian's attempted restoration of pagan and in especial of Hellenic worships had no more permanent effect than the war which he courageously waged against the multitudinous abuses which had grown up in the luxurious court of Constantius.[1] But his vigorous administration in Gaul undoubtedly checked the barbarian advance across the Rhine, and postponed the loss of the Western provinces; on the contrary, his campaign in Persia, brilliantly successful at first, ended in his own death (363), and his successor, Jovian, immediately surrendered the territories beyond the Tigris won by Diocletian seventy years before.

Jovian, 363–64.

Jovian died on the 17th of February 364; and on the 26th of February Valentinian was acknowledged as emperor of the army at Nicaea.

Valentinian I., 364–75.

In obedience to the wish of the soldiers that he should associate a colleague with himself, he conferred the title of Augustus upon his brother Valens, and the division of the empire was at last effected,—Valentinian became emperor of the West, Valens of the East.

Division of the empire, 364.

Valentinian maintained the integrity of the empire until his death (in 375), which deprived the weaker Valens of a trusted counsellor and ally, and was followed by a serious crisis on the Danube.

Valens, 364–78.

Revolt of the Goths.

In 376 the Goths, hard pressed by their new foes from the eastward, the Huns, sought and obtained the protection of the Roman Empire. They were transported across the Danube and settled in Moesia, but, indignant at the treatment they received, they rose in arms against their protectors. In 378 at Adrianople Valens was defeated and killed, and the victorious Goths advanced eastward to the very walls of Constantinople. Once more, however, the danger passed away.

Theodosius I., 378–95.

The skill and tact of Theodosius, who had been proclaimed emperor of the East by Gratian,[2] conciliated the Goths; they were granted an allowance, and in large numbers entered the service of the Roman emperor. The remaining years of Theodosius's reign (382–95) were mainly engrossed by the duty of upholding the increasingly feeble authority of his western colleague against the attacks of pretenders. Maximus, the murderer of Gratian (383), was at first recognized by Theodosius as Caesar, and left in undisturbed command of Gaul, Spain and Britain; but, when in 386 he proceeded to oust Valentinian II. from Italy and Africa, Theodosius marched westward, crushed him, and installed Valentinian as emperor of the West. In the very next year, however, the murder of Valentinian (392) by Arbogast, a Frank, was followed by the appearance of a fresh tyrant in the person of Eugenius, a domestic officer and nominee of Arbogast himself.

Division of the empire between Arcadius and Honorius.

Once more Theodosius marched westward, and near Aquileia decisively defeated his opponents. But his victory was quickly followed by his own illness and death (395), and the fortunes of East and West passed into the care of his two sons Arcadius and Honorius.

(b) *From the Death of Theodosius to the Extinction of the Western Empire (395–476).*—Through more than a century from the accession of Diocletian the Roman Empire had succeeded in holding at bay the swarming hordes of barbarians.

Fall of the Western Empire.

But, though no province had yet been lost, as Dacia had been lost in the century before, and though the frontier lines of the Rhine and the Danube were still guarded by Roman forts and troops, there were signs in plenty that a catastrophe was at hand.

From all the writers who deal with the 4th century we have one long series of laments over the depression and misery of the provinces.[3]

Distress of the provinces in the 4th century.

To meet the increased expenditure necessary to maintain the legions, to pay the hosts of officials, and to keep up the luxurious splendour of the imperial courts, not only were the taxes raised in amount, but the most oppressive and inquisitorial methods were adopted in order to secure for the imperial treasury every penny that could be wrung from the wretched taxpayer. The results are seen in such pictures as that which the panegyrist Eumenius[4] draws of the state of Gaul (306–12) under Constantine, in the accounts of the same province under Julian fifty years later, in those given by Zosimus early in the 5th century, and in the stringent regulations of the Theodosian code, dealing with the assessment and collection of the taxes. Among the graver symptoms of economic ruin were the decrease of population, which seriously diminished not only the number of taxpayers, but the supply of soldiers for the legions;[5] the spread of infanticide; the increase of waste lands whose owners and cultivators had fled to escape the tax collector; the declining prosperity of the towns; and the constantly recurring riots and insurrections, both among starving peasants, as in Gaul,[6] and in populous cities like Antioch.[7] The distress was aggravated by the civil wars, by the rapacity of tyrants, such as Maxentius and Maximus, but above all by the raids of the barbarians, who seized every opportunity afforded by the dissensions or incapacity of the emperors to cross the frontiers and harry the lands of the provincials. Constantine (306–12), Julian (356–60) and Valentinian I. (364–75) had each to give a temporary breathing-space to Gaul by repelling the Franks and Alamanni. Britain was harassed by Picts and Scots from the north (367–70), while the Saxon pirates swept the northern seas and the coasts both of Britain and Gaul. On the Danube the Quadi, Sarmatae, and above all the Goths, poured at intervals into the provinces of Pannonia and Moesia, and penetrated to Macedon and Thrace. In the East, in addition to the constant border feud with Persia, we hear of ravages by the Isaurian mountaineers, and by a new enemy, the Saracens.[8]

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[1] In especial against the overweening influence of the eunuchs, an influence at once greater and more pernicious than even that of the imperial freedmen in the days of Claudius.

[2] The son of Valentinian and ruler of the West.

[3] F. Dill, *Roman Society in the Last Century of the Western Empire* (2nd ed., 1899).

[4] Eumenius, *Paneg. Vet.* vii.

[5] Gibbon ii. 179.

[6] For the Bagaudae, see Jung, *Die romanischen Landschaften*, p. 264, where the authorities are given.

[7] In 387; Hodgkin i. 483.

[8] Amm. Marc. xiv. 4.

Barbarians within the empire.

Even more ominous of coming danger was the extent to which the European half of the empire was becoming barbarized. The policy which had been inaugurated by Augustus himself of settling barbarians within the frontiers had been taken up on a larger scale and in a more systematic way by the Illyrian emperors of the 3rd century, and was continued by their successors in the 4th. In Gaul, in the provinces south of the Danube, even in Macedon and Italy, large barbarian settlements had been made—Theodosius in particular distinguishing himself by his liberality in this respect. Nor did the barbarians admitted during the 4th century merely swell the class of half-servile *coloni*. On the contrary, they not only constituted to an increasing extent the strength of the imperial forces, but won their way in ever-growing numbers to posts of dignity and importance in the imperial service. Under Constantine the palace was crowded with Franks.[1] Julian led Gothic troops against Persia, and the army with which Theodosius defeated the tyrant Maximus (388) contained large numbers of Huns and Alans, as well as of Goths. The names of Arbogast, Stilicho and Rufinus are sufficient proof of the place held by barbarians near the emperor's person and in the control of the provinces and legions of Rome; and the relations of Arbogast to his nominee for the purple, Eugenius, were an anticipation of those which existed between Ricimer and the emperors of the latter half of the 5th century.

Barbaric invasions.

Alaric and the Visigoths.

It was by barbarians already settled within the empire that the first of the series of attacks which finally separated the western provinces from the empire and set up a barbaric ruler in Italy were made, and it was in men of barbarian birth that Rome found her ablest and most successful defenders. The Visigoths whom Alaric led into Italy had been settled south of the Danube as the allies of the empire since the accession of Theodosius. But, like the Germans of the days of Caesar, they wanted land for their own, and Alaric himself aspired to raise himself to the heights which had been reached before him by the Vandal Stilicho at Ravenna and the Goth Rufinus at Constantinople. The jealousy which existed between the rulers of the western and eastern empires furthered his plans. In the name of Arcadius, the emperor of the east, or at least with the connivance of Arcadius's minister Rufinus, he occupied the province of Illyricum, and from thence ravaged Greece, which, according to the existing division of provinces, belonged to the western empire. Thence in 396 he retreated before Stilicho to Illyricum, with the command of which he was now formally invested by Arcadius; he thus gained a base of operations against Italy.[2] In 400 he led his people, with their wives and families, their wagons and treasure, to seek lands for themselves south of the Alps. But in this first invasion he penetrated no farther than the plains of Lombardy, and after the desperate battle of Pollentia (402 or 403) he slowly withdrew from Italy, his retreat being hastened by the promises of gold freely made to him by the imperial government. Not until the autumn of 408 did Alaric again cross the Alps. Stilicho was dead; the barbarian troops in Honorius's service had been provoked into joining Alaric by the anti-Teutonic policy of Honorius and his ministers, and Alaric marched unopposed to Rome. The payment of a heavy ransom, however, saved the city. Negotiations followed between Alaric and the court of Ravenna. Alaric's demands were moderate, but Honorius would grant neither lands for his people nor the honourable post in the imperial service which he asked for himself. Once more Alaric sat down before Rome, and the citizens were forced to agree to his terms. Attalus, a Greek, the prefect of the city, was declared Augustus, and Alaric accepted the post of commander-in-chief. But after a few months Alaric formally deposed Attalus, on account of his incapacity, and renewed his offers to Honorius. Again they were declined, and Alaric marched to the siege and sack of Rome (410).[3] His death followed hard on his capture of Rome. Two years later (412) his successor Ataulf led the Visigoths to find in Gaul the lands which Alaric had sought in Italy. It is characteristic of the anarchical condition of the west that Ataulf and his Goths should have fought for Honorius in Gaul against the tyrants,[4] and in Spain against the Vandals, Suebi and Alani; and it was with the consent of Honorius that in 419 Wallia, who had followed Ataulf as king of the Visigoths, finally settled with his people in south-western Gaul and founded the Visigothic monarchy.[5]

The Visigoths in Gaul.

Vandals, Suebi and Alani in Spain.

It was about the same period that the accomplished fact of the division of Spain between the three barbarian tribes of Vandals, Suebi and Alani was in a similar manner recognized by the paramount authority of the emperor of the west.[6] These peoples had crossed the Rhine at the time when Alaric was making his first attempt on Italy. A portion of the host led by Radagaisus[7] actually invaded Italy, but was cut to pieces by Stilicho near Florence (405); the rest pressed on through Gaul, crossed the Pyrenees, and entered the as yet untouched province of Spain.

Death of Honorius, 423.

Honorius died in 423. With the single exception of Britain,[8] no province had yet formally broken loose from the empire. But over a great part of the west the authority of the emperors was now little more than nominal; throughout the major part of Gaul and in Spain the barbarians had settled, and barbarian states were growing up which recognized the supremacy of the emperor, but were in all essentials independent of his control.

Valentinian III., 423–55.

Vandal conquest of Africa.

The long reign of Valentinian III. (423–55) is marked by two events of first-rate importance—the conquest of Africa by the Vandals[9] and the invasion of Gaul and Italy by Attila. The Vandal settlement in Africa was closely akin in its origin and results to those of the Visigoths and of the Vandals themselves in Gaul and Spain. Here, as there, the occasion was given by the jealous quarrels of powerful imperial ministers. The feud between Boniface, count of Africa, and Aëtius, the "master-general" or "count of Italy," opened the way to Africa for the Vandal king Gaiseric (Genseric), as that between Stilicho and Rufinus had before set Alaric in motion westward, and as the quarrel between the tyrant Constantine and the ministers of Honorius had paved the way for the Vandals, Suebes and Alans into Spain. In this case, too, land-hunger was the impelling motive with the barbarian invader, and in Africa, as in Gaul and Spain, the invaders' acquisitions were confirmed by the imperial authority which they still professed to recognize. In 429 Gaiseric, king of the Vandals, crossed with his warriors, their families and goods, to the province of Africa, hitherto almost untouched by the ravages of war. Thanks to the quarrels of Boniface and Aëtius, their task was an easy one. The province was quickly overrun. In 435[10] a formal treaty secured them in the possession of a large portion of the rich lands which were the granary of Rome, in exchange for a payment probably of corn and oil. Carthage was taken in 439, and by 440 the Vandal kingdom was firmly established.

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[1] Amm. Marc. xv. 5.

[2] Hodgkin *op. cit.* i. 661.

[3] For the treatment of Rome by Alaric, see Hodgkin i. 798; Gibbon iii. 321 sqq.; Ranke iv. 246. Allowance must be made for the exaggerations of the ecclesiastical writers.

[4] For these tyrants, see Freeman in the *Eng. Hist. Rev.* i. 53–86.

[5] The capital of the new state was Tolosa (Toulouse).

[6] Jung, *Die Romanischen Landschaften*, 73 seq.

[7] For the connexion between his movement and those of Alaric and of the Vandals, see Hodgkin i. 711; Gibbon iii. 262 seq.

[8] The Roman troops were withdrawn from Britain by Constantine in 407; Mommsen, *Chron. min.* i. 465.

[9] Hodgkin vol. ii. bk. iii. chap. ii.; Gibbon ii. 400 sqq.; Jung, 183. The leading ancient authority is Procopius. See Ranke iv. (2) 285; Papencordt, *Gesch. d. Vandal. Herrschaft in Africa.*

[10] Prosper 659; Ranke iv. (1) 282.

Attila and the Huns.

Battle of Châlons.

Eleven years later (451) Attila invaded Gaul, but this Hunnish movement was in a variety of ways different from those of the Visigoths and Vandals. Nearly a century had passed since the Huns first appeared in Europe, and drove the Goths to seek shelter within the Roman lines. Attila was now the ruler of a great empire in central and northern Europe and, in addition to his own Huns, the German tribes along the Rhine and Danube and far away to the north owned him as king. He confronted the Roman power as an equal; and, unlike the Gothic and Vandal chieftains, he treated with the emperors of east and west as an independent sovereign. His advance on Gaul and Italy threatened, not the establishment of one more barbaric chieftain on Roman soil, but the subjugation of the civilized and Christian West to the rule of a heathen and semi-barbarous conqueror. But the Visigoths in Gaul, Christian and already half Romanized, rallied to the aid of the empire against a common foe. Attila, defeated at Châlons[1] by Aëtius, withdrew into Pannonia (451). In the next year he overran Lombardy, but penetrated no farther south, and in 453 he died. With the murder of Valentinian III. (455) the western branch of the house of Theodosius came to an end, and the next twenty years witnessed the accession and deposition of nine emperors.

Sack of Rome by the Vandals.

Ricimer supreme in Italy,

Orestes, the Pannonian.

Romulus Augustulus.

Under the three-months' rule of Maximus, the Vandals under Gaiseric invaded Italy and sacked Rome. From 456–72 the actual ruler of Italy was Ricimer, the Suebe. Of the four emperors whom he placed on the throne, Majorian (457–61) alone played any imperial part outside Italy.[2] Ricimer died in 472, and two years later a Pannonian, Orestes, attempted to fill his place. He deposed Julius Nepos and proclaimed as Augustus his own son Romulus. But the barbarian mercenaries in Italy determined to secure for themselves a position there such as that which their kinsfolk had won in Gaul and Spain and Africa. Their demand for a third of the lands of Italy was refused by Orestes,[3] and they instantly rose in revolt. On the defeat and death of Orestes they proclaimed their leader, Odoacer the Rugian,[4] king of Italy. Romulus Augustulus laid down his imperial dignity, and the court at Constantinople was informed that there was no longer an emperor of the West.[5]

King Odoacer.

The installation of a barbarian king in Italy was the natural climax of the changes which had been taking place in the West throughout the 5th century. In Spain, Gaul and Africa barbarian chieftains were already established as kings. In Italy, for the last twenty years, the real power had been wielded by a barbarian officer. Odoacer, when he decided to dispense with the nominal authority of an emperor of the West, placed Italy on the same level of independence with the neighbouring provinces. But the old ties with Rome were not severed. The new king of Italy formally recognized the supremacy of the one Roman emperor at Constantinople, and was invested in return with the rank of "patrician," which had been held before him by Aëtius and Ricimer. In Italy too, as in Spain and Gaul, the laws, the administrative system and the language remained Roman.[6] But the emancipation of Italy and the Western provinces from direct imperial control, which is signalized by Odoacer's accession, has rightly been regarded as marking the opening of a new epoch. It made possible in the West the development of a Romano-German civilization; it facilitated the growth of new and distinct states and nationalities; it gave a new impulse to the influence of the Christian church, and laid the foundations of the power of the bishops of Rome.

Chronological Table of the Roman Emperors

B.C.	
27.	Augustus.
A.D.	
14.	Tiberius.
37.	Gaius.
41.	Claudius.
54.	Nero.
68, 69.	Galba. Otho. Vitellius.
69.	Vespasian.
79.	Titus.
81.	Domitian.
96.	Nerva.
98.	Trajan.
117.	Hadrian.
138.	Antoninus Pius.
161.	Marcus Aurelius.
180.	Commodus.
193.	Pertinax. Didius Julianus. Septimius Severus.
211.	Caracalla.
217.	Macrinus.
218.	Elagabalus.
222.	Alexander Severus.
235.	Maximinus.
238.	The two Gordiani. Pupienus and Balbinus. Gordian III.
A.D.	
244.	Philip.
249.	Decius.
251.	Gallus.
253.	Aemilianus.
260.	Valerian. Gallienus.
268.	Claudius.
270.	Quintillus. Aurelian.
275.	Tacitus.
276.	Probus.
282.	Carus.
283.	Carinus and Numerian.
284.	Diocletian (Maximian associated with him, 286).
305.	Constantius and Galerius.
311.	Licinius. Constantine I.
324.	Constantine I.
337.	Constantine II. Constantius II. Constans.
350.	Constantius II., sole emperor.
361.	Julian.
363.	Jovian.

Division of the Empire.

A.D.	*West.*	A.D.	*East.*
364.	Valentinian I.	364.	Valens.
375.	Gratian and Valentinian II.	379.	Theodosius I.
383.	Valentinian II.		
392.	Theodosius I.		
395.	Honorius.	395.	Arcadius.
423.	Valentinian III.	408.	Theodosius II.
455.	Maximus.	450.	Marcian.
455.	Avitus.		
457.	Majorian.	457.	Leo I.
461.	Severus.		
467.	Anthemius.		
472.	Olybrius.		
473.	Glycerius.		
474.	Julius Nepos.	474.	Leo II.
475.	Romulus Augustulus.		

(H. F. P.; H. S. J.)

Authorities.—I. Republican Period: *Ancient Sources.*—The writing of history, like other branches of literature, was a late growth amongst the Romans, and it is very difficult to determine how far authentic records were preserved of the earlier republican period. It seems that the calendars issued yearly by the pontifices and posted on the walls of the Regia were inscribed with brief notices of important events ("digna memoratu . . . domi militiaeque terra marique gesta per singulos dies," Serv. *Ad Aen.* i. 373); these tabulae were preserved and edited in 80 books by P. Mucius Scaevola (*pontifex maximus*, 130–?114 B.C.) under the name of *Annales Maximi*. The *Commentarii* preserved in the archives of the various priestly colleges and official boards (*e.g.* consuls and censors), which appear to have consisted mainly of instructions as to official procedure, doubtless furnished historical material in the shape of precedents and decisions. It is hard to say how much of this documentary evidence survived the burning of Rome by the Gauls; the fact that the earliest solar eclipse mentioned in the *Annales Maximi* was that of the 5th of June, 351 B.C., casts doubt on the completeness of the earlier records.

Many modern scholars have supposed that these meagre official records were supplemented by—(*a*) popular poetry, more or less legendary in content; (*b*) family chronicles, the substance of which was worked up into the funeral orations (*laudationes funebres*) pronounced at the grave of distinguished Romans. The existence of the former class of documents is, however, quite unsupported by evidence; as to family tradition, we cannot say more than that it has probably left a deposit in the accounts of republican history handed down to us, and caused the exploits of the members of illustrious houses to be exaggerated in importance.

Setting aside the works of Greek historians who incidentally touched on Roman affairs, such as Hieronymus of Cardia, who wrote of the wars of Pyrrhus as a contemporary, and Timaeus of Tauromenium (*c.* 345–250 B.C.), who treated of the history of Sicily and the West down to 272 B.C., the earliest writers on Roman history were Q. Fabius Pictor [1] and L. Cincius Alimentus, who lived during the Second Punic War and wrote in Greek. We are told by Dionysius that they treated the earlier history summarily, but wrote more fully of their own times. They were followed in their use of the Greek language by C. Acilius (introduced a Greek embassy to the senate, 155 B.C.) and A. Postumius Albinus (consul, 151 B.C.). In the meantime, however, M. Porcius Cato the Elder (234–149 B.C.), the leader of the national party at Rome and a vigorous opponent of Greek influence, had treated of Roman antiquities in his *Origines*. This work was not purely annalistic, but treated of the ethnography and customs of the Italian peoples, &c. Cato founded no school of antiquarian research, but his use of the Latin language as the medium of historical writing was followed by the annalists of the Gracchan period, L. Cassius Hemina, L. Calpurnius Piso (consul, 133 B.C.), C. Sempronius Tuditanus (consul, 129 B.C.), Cn. Gellius, Vennonius, C. Fannius (consul, 122 B.C.), and L. Caelius Antipater.[2] By these writers some attempt was made to apply canons of criticism to the traditional accounts of early Roman history, but they did little more than rationalize the more obviously mythical narratives; they also followed Greek literary models and introduced speeches, &c., for artistic effect. Where they wrote as contemporaries, however, *e.g.* Fannius in his account of the Gracchan movement, their works were of the highest value. About the beginning of this period Polybius (*q.v.*) had published his history, which originally embraced the period of the Punic wars, and was afterwards continued to 146 B.C. His influence was not fully exerted upon Roman historians until the close of the 2nd and early part of the 1st century B.C., when a school of writers arose who treated history with a practical purpose, endeavouring to trace the motives of action and to point a moral for the edification of their readers. To this school belonged Sempronius Asellio, Claudius Quadrigarius, Valerius Antias and C. Licinius Macer (d. 66 B.C.). Their writings were diffuse, rhetorical and inaccurate; Livy complains of the gross exaggerations of Valerius (whom he followed blindly in his earlier books), and Macer seems to have drawn much of his material from sources of very doubtful authenticity. Contemporary history was written by Cornelius Sisenna (119–67 B.C.), and the work of Polybius was continued to 86 B.C. by the Stoic Posidonius (*c.* 135–45 B.C.), a man of encyclopaedic knowledge. From the Gracchan period onwards the memoirs, speeches and correspondence of distinguished statesmen were often published; of these no specimens are extant until we come to the Ciceronian period, when the Speeches and Letters of Cicero (*q.v.*) and the Commentaries of Julius Caesar (*q.v.*)—the latter continued to the close of the Civil War by other hands—furnish invaluable evidence for the history of their times. We possess examples of historical pamphlets with a strong party colouring in Sallust's tracts on the Jugurthine War and the conspiracy of Catiline. During the same period Roman antiquities, genealogy, chronology, &c., were exhaustively treated by M. Terentius Varro (116–27 B.C.) (*q.v.*) in his *Antiquitates* (in 41 books) and other works. Cicero's friend, M. Pomponius Atticus, also compiled a chronological table which was widely used, and Cornelius Nepos (*q.v.*) wrote a series of historical biographies which have come down to us.

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[1] For the battle of Châlons, see Gibbon iv. 464; Hodgkin ii. 124 *n.* 6, 143, where the topography is discussed.

[2] Majorian was the last Roman emperor who appeared in person in Spain and Gaul.

[3] Hodgkin ii. 520.

[4] The nationality of Odoacer is a disputed point. Hodgkin ii. 516; Ranke iv. (1) 372.

[5] Gibbon iv. 50 seq. The authority for the embassy to Zeno is Malchus (Müller, *Fragm. Hist. Gr.* iv. 119).

[6] Gibbon iv. 54 seq.; Jung 66 seq.; Bryce, *Holy Roman Empire*, 24–33. See also ROMAN LAW.

In the Augustan age the materials accumulated by previous generations were worked up by compilers whose works are in some cases preserved. The work of Livy (*q.v.*) covered the history of Rome from its foundation to 9 B.C. in 142 books; of these only 35 are preserved in their entirety, while the contents of the rest are known in outline from an epitome (*periochae*) and from the compendia of Florus and later authors. Diodorus Siculus (*q.v.*) of Agyrium in Sicily followed the earlier annalists in the sections of his *Universal History* (down to Caesar) which dealt with Roman affairs; Dionysius of Halicarnassus (*q.v.*), in his *Roman Archaeology* (published in 7 B.C.), treated early Roman history in a more ambitious and rhetorical style, with greater fulness than Livy, whose work he seems to have used. Universal histories were also written in the Augustan age by Nicolaus of Damascus, a *protégé* of Herod the Great, and Trogus Pompeius, whose work is known to us from the epitome of Justin (2nd century A.D.). Juba, the learned king of Mauretania installed by Augustus, wrote a History of Rome as well as antiquarian works. Strabo (*q.v.*), whose *Geography* is extant, was the author of a continuation of Polybius's history (to 27 B.C.). The learning of the time was enshrined in the encyclopaedia of Verrius Flaccus, of which we possess part of Festus's abridgment (2nd century A.D.), together with an Epitome of Festus by Paulus Diaconus (*temp.* Charlemagne). An official list of the consuls and other chief magistrates of the republic was inscribed on the walls of the Regia (rebuilt 36 B.C.), followed somewhat later by a similar list of *triumphatores*; the former of these is known as the *Fasti Capitolini*, (*C.I.L.I.*^{2}, 1 sqq.), since the fragments which have been recovered are preserved in the Palace of the Conservatori on the Capitol. The Forum of Augustus (see ROME, section *Archaeology*) was decorated with statues of famous Romans, on the bases of which were inscribed short accounts of their exploits; some of these *elogia* are preserved (cf. Dessau, *Inscr. Lat. sel.* 50 sqq.).

Amongst writers of the imperial period who dealt with republican history the most important are Velleius Paterculus, whose compendium of Roman history was published in A.D. 30; Plutarch (*c.* A.D. 45–125), in whose biographies much contemporary material was worked up; Appian, who wrote under the Antonines and described the wars of the republic under geographical headings (partly preserved) and the civil wars in five books, and Dio Cassius (*v. infra*), of whose history only that portion which deals with events from 69 B.C. onwards is extant. The date of Granius Licinianus, whose fragments throw light on the earlier civil wars, is not certain.

The evidence of inscriptions (*q.v.*) and coins (*q.v.*) begins to be of value during the 150 years of the republic. A series of laws and *Senatus consulta* (beginning with the *Senatus consultum de Bacchanalibus*, 189 B.C.) throws light on constitutional questions, while the coins struck from about 150 B.C. onwards bear types illustrative of the traditions preserved by the families to which the masters of the mint (*III viri monetales*) belonged.

MODERN AUTHORITIES.—The principles of historical criticism may be said to have been formulated by Giambattista Vico (*q.v.*), whose *principi di scienza nuova* were published in 1725. The credibility of the traditional account of Roman republican history was called in question by Louis de Beaufort (*Dissertation sur l'incertitude des cinq premiers siècles de l'histoire romaine*, 1738); but the modern critical movement dates from Niebuhr, two volumes of whose *Römische Geschichte* appeared in 1811–12 (the third was published after his death in 1832, his lectures in 1846). The early history of Rome was fully treated by Niebuhr's follower, F. C. A. Schwegler, whose *Römische Geschichte* in 3 vols. (1853–58) was continued to 327 B.C. by O. Clason (vols. 4 and 5, 1873–76). A reaction against the negative criticism of Niebuhr was headed by J. Rubino, who showed in his *Untersuchungen über römische Verfassung und Geschichte* (1839) that the growth of the Roman constitution might be traced with some approach to certainty by the analysis of institutions. It was left for Theodor Mommsen (*Römische Geschichte*, 1st ed., 1854–56; Eng. trans. new ed. in 5 vols., 1894; *Römische Forschungen*, 1864–79; *Römisches Staatsrecht*, 1st ed., 1872–75 [in the *Handbuch der römischen Alterthümer*, begun by Becker in 1843 and continued under the supervision of J. Marquardt]; *Römisches Strafrecht*, 1899, and many other works) to reduce Roman constitutional history to a science. Mommsen substituted for the detailed criticism of the traditional narrative a picture of the growth of Italian civilization based on linguistic, literary and monumental evidence. W. Ihne (*Römische Geschichte*, 8 vols., 1868–90) dealt more fully with the course of events as related by ancient historians. L. Lange's *Römische Alterthümer* (1856–71), 3 vols., treated constitutional history in a narrative form. In more recent times Eduard Meyer has treated of early Italian history in his *Geschichte des Alterthums*, vols. ii.–v. (1893–1902); and Ettore Pais, in his *Storia di Roma*, vols. i.–ii. (1898–99), has subjected the narratives of Roman history down to the Samnite wars to a searching and in many cases exaggerated criticism. De Sanctis, in his *Storia dei Romani* (2 vols., 1907) (down to the establishment of the Roman hegemony in Italy), combines radical criticism of tradition with a constructive use of archaeological and other evidence. Heitland's *Roman Republic* (3 vols., 1909) is a fresh and independent work. The last century of the republic has been the subject of many works (see reff. in text and biographical articles). W. Drumann (*Geschichte Roms*, 1834–44; new ed. by Groebe in progress) gave an exhaustive biographical account of the contemporaries of Caesar and Cicero; A. H. J. Greenidge's *History of Rome from 133 B.C. to A.D. 70* (vol. i. 1904) was unfortunately cut short by the author's early death in 1906; G. Ferrero's *Grandezza e Decadenza di Roma* (in progress, Eng. trans. of vols. i., ii., 1907; iii.–v., 1909) is ambitious but unsound.

II. IMPERIAL PERIOD: *Ancient Sources*.—The memoirs of Augustus as well as those of his contemporaries (Messalla, Agrippa, Maecenas, &c.) and successors (Tiberius, Agrippina the younger, &c.) have perished, but we possess the *Res gestae divi Augusti* inscribed on the walls of his temple at Ancyra (ed. Mommsen, 1883). Few historical works were produced under the earlier Julio-Claudian emperors; Cremutius Cordus lost his life under Tiberius for the freedom with which his opinion of the triumvirs was expressed. Aufidius Bassus wrote the history of the civil wars and early empire, perhaps to A.D. 49, and this was continued by Pliny the Elder (*q.v.*) in 31 books, probably to the accession of Vespasian.[3] These works, together with those of Fabius Rusticus, a friend of Seneca, and Cluvius Rufus, a courtier under Nero, were amongst the authorities used by Tacitus (*q.v.*), whose *Annals* (properly called *ab excessu divi Augusti*) and *Histories*, when complete, carried the story of the empire down to A.D. 96.[4] Tacitus wrote under Trajan, upon whom the younger Pliny pronounced his *Panegyric*; Pliny's correspondence with Trajan about the affairs of Bithynia, which he administered in A.D. 111–13, is of great historical value. Suetonius (*q.v.*), who was for some time secretary of state to Hadrian, wrote biographies of the emperors from Julius Caesar to Domitian, which contain much interesting gossip. Arrian, a Bithynian Greek promoted by Hadrian to important posts, wrote on Rome's policy and wars in the East. Appian (*v. supra*) dealt with the wars waged under the early empire in the closing books of his work, which have not been preserved. Dio Cassius, a Bithynian who attained to the dignity of a second consulship as the colleague of Severus Alexander, wrote a history of Rome to the death of Elagabalus in 80 books. We possess only epitomes and excerpts of the portion dealing with events from A.D. 46 onwards, except for parts of the 78th and 79th books, in which Dio's narrative of contemporary events is especially valuable. Herodian, a Syrian employed in the imperial service, wrote a history of the emperors from Commodus to Gordian III., which as the work of a contemporary is not without value, although the author had no historical insight. L. Marius Maximus compiled biographies of the emperors from Nerva to Elagabalus which, like those of Suetonius, contained much worthless gossip. His work was amongst the sources used in the compilation of the *Historia Augusta* (see further AUGUSTAN HISTORY), upon which we are obliged to rely for the history of the 3rd century A.D. This work consists in a series of lives of the emperors (including most of the pretenders to that title) from Hadrian to Carinus, professedly written by six authors, Spartianus, Vulcacius Gallicanus, Capitolinus, Lampridius, Trebellius Pollio, and Vopiscus, under Diocletian and Constantine. Modern criticism has shown that (at least in its present form) it is a compilation made towards the close of the 4th century; it is not even certain that any of the above-named writers really existed, and the documents inserted in the text are palpable forgeries. The earlier biographies, however, contain much authentic information, which seems to have been derived from a good contemporary source. The fragments of Dexippus, an Athenian who successfully defended his native town against the Goths, throw much light on the barbaric invasions of the 3rd century. Under Diocletian and his successors (A.D. 289–321) were delivered twelve *Panegyrics* by Eumenius and other court rhetoricians which possess slight historical value. The history of the final struggle between church and empire is told from the Christian point of view by the author of the *De mortibus persecutorum*—perhaps Lactantius, the tutor of Crispus. Eusebius's *Ecclesiastical History* and *Life of Constantine* give an *ex parte* version of the events which they relate; the first of two tracts published under the name of the Anonymus Valesianus furnishes a brief contemporary narrative of the period 305–37, without Christian prepossessions; while the lost work of Praxagoras treated the history of Constantine from the pagan standpoint. The most important historian of the 4th century was Ammianus Marcellinus, a native of Antioch and an officer in the imperial guard, who continued the work of Tacitus (in Latin) to the death of Valens. We possess the last eighteen books of his history which cover the years A.D. 353–78. Two compendia of imperial history pass under the name of Aurelius Victor, the *Caesares*, or lives of the emperors from Augustus to Julian, and the *Epitome de Caesaribus* (not by the same author,) which goes down to Theodosius I. Similar works are the *Breviarum* of Eutropius (secretary of state under Valens) and the still more brief epitome of Festus. The writings of the Emperor Julian and of the rhetoricians Libanius, Themistius and Eunapius—the last-named continued the history of Dexippus to A.D. 404—are of great value for the latter part of the 4th century A.D. They wrote as pagans, while the Christian version of events is given by the three orthodox historians Socrates, Sozomen and Theodoret, and the Arian Philostorgius, all of whom wrote in the 5th century. An imperial official, Zosimus, writing in the latter half of that century, gave a sketch of imperial history to A.D. 410; the latter part is valuable, being based on contemporary writings, *e.g.* those of the Egyptian Olympiodorus, of whose work some fragments are preserved. The bishops Synesius and Palladius, who lived under Arcadius and Theodosius II., furnish valuable information as to their own times; while the fragments of Priscus tell us much of Attila and the Hunnish invasions. Mention must also be made of the poets and letter-writers of the 4th and 5th centuries—Ausonius, Claudian, Symmachus, Paulinus of Nola, Sidonius Apollinaris, Prudentius, Merobaudes and others—from whose writings much historical information is derived. Cassiodorus, the minister of Theodoric, wrote a history of the Goths, transmitted to us in the *Historia Gothorum* of Jordanes (*c.* A.D. 550), which gives an account of the earlier barbaric invasions.

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[1] For these writers see further under ANNALISTS and LIVY.

[2] Caelius's work dealt only with the Second Punic War.

[3] The *Jewish Antiquities* and *Jewish War* of Josephus (*q.v.*), composed under the Flavian dynasty, are of great value for the events of the writer's time.

[4] The *Histories* (A.D. 69–96) were written before the *Annals*.

Several chronological works were compiled in the 4th and 5th centuries. It will suffice to name the Chronology of Eusebius (to A.D. 324), translated by Jerome and carried down to A.D. 378; the Chronicle of Prosper Tiro, based on Jerome and continued to A.D. 455; the *Chronography of A.D. 354*, an illustrated calendar containing miscellaneous information; and the works based on the so-called *Chronica Constantinopolitana* (not preserved), such as the *Fasti* of Hydatius (containing valuable notices of the period A.D. 379–468). Some minor chronological works such as the *Chronicon Ravennae* are published in Mommsen's *Chronica Minora*. The *Chronicon Paschale*, primarily a table giving the cyle of Easter celebrations, was compiled in the 7th century A.D.

The Codes of Law, especially the *Codex Theodosianus* (A.D. 438) and the Code of Justinian, as well as the Army List of the early 5th century, known as the *Notitia Dignitatum*, possess great historical value. For the inscriptions of the empire, which are of incalculable importance as showing the working of the imperial system in its details, see INSCRIPTIONS; the coins (*q.v.*) also throw much light on the dark places of history in the lack of other authorities. Egyptian papyri are not only instructive as to legal, economic and administrative history, but also (by the formulae employed in their dating) contribute to our general knowledge of events. The *Zeitschrift für Papyrusforschung*, edited by U. Wilcken, gives an account of progress in this branch of study.

MODERN AUTHORITIES.—Tillemont's *Histoire des empereurs* (6 vols., 1690–1738), supplemented by his *Mémoires pour servir à l'histoire ecclésiastique*, a laborious and erudite compilation, furnished Gibbon with material for his *Decline and Fall of the Roman Empire* (1776–1788), which has never been superseded as a history of the entire imperial period, and has been rendered adequate for the purposes of the modern reader by Professor J. B. Bury's edition (1897–1900). The history of the empire has yet to be written in the light of recent discoveries. Mommsen's fifth volume (Eng. tr., as *Provinces of the Roman Empire*, 1886) is not a narrative, but an account of Roman culture in the various provinces. C. Merivale's *History of the Romans under the Empire* (8 vols., 1850–62, to Marcus Aurelius) is literary rather than scientific. H. Schiller's *Geschichte der römischen Kaiserzeit* (1883–88) is a useful handbook. For the later period we have Bury's *History of the Later Roman Empire* (1889), beginning from A.D. 395, and T. Hodgkin's *Italy and her Invaders* (8 vols., 1880–99), which tells the story of the barbaric invasions at great length. The imperial constitution is described by Mommsen in the second volume of his *Staatsrecht* (*v. supra*); divergent views will be found in Herzog's *Geschichte und System der römischen Staatsverfassung* (1884–91); the working of the imperial bureaucracy is treated by O. Hirschfeld, *Die römischen Verwaltungsbeamten* (1905). The *Prosopographia Imperii Romani*, compiled by Dessau and Klebs (1897–98), is a mine of information, as is the new edition of Pauly's *Realencyklopädie der classischen Alterthumswissenschaft* (in progress). Von Domaszewski's *Geschichte der römischen Kaiser* (2 vols., 1909) is popularly written and gives no references to authorities. See further the articles on individual emperors and provinces.

A general history of Rome to the barbarian invasions, popular in character and richly illustrated, was written in French by Victor Duruy (Eng. tr. in 6 vols., 1883–86). The 2nd, 3rd and 4th vols. of Leopold von Ranke's *Weltgeschichte* deal with Roman history. An outline of Roman history is given by B. Niese in the 3rd vol. of Müller's *Handbuch der klassischen Alterthumswissenschaft* (3rd ed., 1906). A. H. J. Greenidge's *Roman Public Life* (1901) is an excellent guide to Roman institutions. The principal authorities on Roman chronology are: Ideler, *Handbuch der mathematischen und technischen Chronologie* (1825–26); Fynes-Clinton, *Fasti Romani* (1845) (a continuation of the same author's *Fasti Hellenici*, 1830–41, which goes down to A.D. 14); Fischer, *Römische Zeittafeln* (1846); Mommsen, *Römische Chronologie* (2nd ed., 1859); Matzat, *Römische Chronologie* (1883–84) and *Römische Zeittafeln* (1889); Holzapfel, *Römische Chronologie* (1885); Soltau, *Römische Chronologie* (1889); Unger, "Römische Zeitrechnung" in the 1st vol. of Müller's *Handbuch der klassischen Alterthumswissenschaft* (2nd ed., 1892). Goyau's *Chronologie de l'empire romain* (Paris, 1891) is a useful handbook.

(H. S. J.)

IV. *The Roman Republic in the Middle Ages*

The history of the Roman commune as distinguished from the papacy during the middle ages has yet to be written, and only by the discovery of new documents can the difficulties of the task be completely overcome. Although very different in its origin, the Roman Republic gradually assumed the same form as the other Italian communes, and with almost identical institutions. But, owing to the special local conditions amid which it arose, it maintained a distinct physiognomy and character. The deserted Campagna surrounding the city checked any notable increase of trade or industry, and prevented the establishment of the gilds on the solid footing that elsewhere made them the basis and support of the commune. There was also the continual and oppressive influence of the empire, and, above all, the presence of the papacy, which often appeared to absorb the political vitality of the city. At such moments the commune seemed annihilated, but it speedily revived and reasserted itself. Consequently there are many apparent gaps in its history, and we have often extreme difficulty in discovering the invisible links connecting the visible fragments.

Even the aristocracy of Rome had a special stamp. In the other republics, with the exception of Venice, it was feudal, of German origin, and in perpetual conflict with the popular and commercial elements which sought its destruction. The history of municipal freedom in Italy lay in this struggle. But the infiltration of Teutonic and feudal elements broke up the ancient aristocracy of Rome, gave it a special character and left it at the mercy of the people. Then the popes, by the bestowal of lucrative offices, rich benefices and vast estates, and, above all, by raising many nobles to the purple, introduced new blood into the Roman aristocracy, and endued it with increasing strength and vitality. Always divided, always turbulent, this irrepressible body was a continual source of discord and civil war, of permanent confusion and turmoil. Amidst all these difficulties the commune struggled on, but never succeeded in preserving a regular course or administration for long. What with continual warfare, attacks on the Capitol and consequent slaughter, pillage and incendiarism, it is no wonder that so few original documents are left to illustrate the history of the Roman Republic. Nor have chroniclers and historians done much to supply this want, since, in treating of Roman affairs, their attention is mainly devoted to the pope and the emperor. Nevertheless, we will attempt to connect in due order all the facts gleaned from former writers and published records.

The Goths.

The removal of the seat of the empire to Constantinople effected a radical change in the political situation of Rome; nor was this change neutralized by the formation of the weak Western empire soon to be shattered by the Germanic invasions. But we still find Roman laws and institutions; and no sign is yet manifest of the rise of a medieval municipality. The earliest germ of this new type of municipality is seen during the barbarian invasions. Of these we need only enumerate the four most important—those of the Goths, Byzantines (who, however, were not mere barbarians but civilized and corrupt), Lombards and Franks. The Gothic rule merely superimposed upon the Roman social order a Teutonic stratum, that never penetrated beneath its surface. The Goths always remained a conquering army; according to the German custom, they took possession of one-third of the vanquished territory, but, while forbidding the Romans to bear arms, left their local administration intact. The senate, the curiae, the principal magistrates, both provincial and municipal, the prefect of the city, and the Roman judges enforcing the enactments of the Roman law, were all preserved. Already, under the empire, the civil power had been separated from the military, and this separation was maintained. Hence there was no visible change in the constitution of the state. Only, now there were conquered and conquerors. All real and effective power was on the side of brute force, and the Goths alone bore arms. In every province they had their *comites*, or heads of the army, who had judicial power over their countrymen, especially in criminal cases. Here, then, was a combination of civil and military jurisdiction altogether contrary to Roman ideas. Nor can it be denied that the *comites*, as chiefs of the armed force, necessarily exerted a direct or indirect influence on the civil and administrative power of the provinces, and especially upon the collection of the imposts. The civil arm, being virtually subordinate to the military, suffered unavoidable change. Notwithstanding the praise lavished on Theodoric, the kingdom founded by him in Italy had no solid basis. It was composed of two nations differing in race and traditions and even in religion, since the Goths were Arians and the Romans Catholics. The latter were sunk in degeneracy and corruption; their institutions were old and decrepit. It was necessary to infuse new life into the worn-out body. This was difficult, perhaps impossible; and at any rate Theodoric never attempted the task. Little wonder then if the Gothic kingdom succumbed to the Byzantine armies from Constantinople.

The Byzantine rule.

The wars of Belisarius and Narses against the Goths lasted twenty years (535–55 A.D.), caused terrible slaughter and devastation in Italy, and finally subjected her to Constantinople. In place of a Gothic king she was now ruled by a Greek patrician, afterwards entitled the exarch, who had his seat of government at Ravenna as lieutenant of the empire. In the chief provincial cities the ruling counts were replaced by dukes, subordinate to the exarch; and the smaller towns were governed by military tribunes. Instead of dukes, we sometimes find *magistri militum*, apparently of higher rank. The *praefectus praetorio* of Italy, likewise a dependent of the exarch, was at the head of the civil administration. The pragmatic sanction (554), promulgating the Justinian code, again separated the civil from the military power, which was no longer allowed to intervene in the settlement of private disputes, and, by conferring on the bishops the superintendence of and authority over the provincial and municipal government, soon led to the increase of the power of the church, which had already considerable influence.

The new organization outwardly resembled that of the Goths: one army had been replaced by another, the counts by dukes; there was an exarch instead of a king; the civil and military jurisdictions were more exactly defined. But the army was not, like that of the Goths, a conquering nation in arms; it was a Graeco-Roman army, and did not hold a third of the territory which was now probably added to the possessions of the state (*fisc*). The soldiery took its pay from Constantinople, whence all instructions and appointments of superior officers likewise proceeded. In Rome we find a *magister militum* at the head of the troops. The Roman senate still existed, but was reduced to a shadow. Theodoric had left it intact until he suspected it of hostile designs and dealings with the Byzantines, but then began to persecute it, as was proved by the wretched fate of Boetius and Symmachus. Nevertheless the senate survived, added the functions of a *curia* or municipal council to those of a governmental assembly, and took part in the election of the pope—already one of the chief affairs of Rome. So many senators, however, were slaughtered during the Byzantine War that it was commonly believed to be extinct. The pragmatic sanction, conferring on senate and pope the superintendence of weights and measures in Italy, might seem a convincing proof to the contrary, although, in the general chaos, now that Rome was a mere provincial city, constantly exposed to attack, we may imagine to what the senate was reduced.

The Lombards.

All Roman institutions were altered and decayed; but their original features were still to be traced, and no heterogeneous element had been introduced into them. The first dawn of a completely new epoch can only be dated from the invasion of the Lombards (568–72). Their conquest of a large portion of Italy was accompanied by the harshest oppression. They abolished all ancient laws and institutions, and not only seized a third of the land, but reduced the inhabitants almost to slavery. But, in the unsubdued parts of the country—namely, in Ravenna, Rome and the maritime cities—a very different state of things prevailed. The necessity for self-defence and the distance of the empire, now too worn out to render any assistance, compelled the inhabitants to depend solely on their own strength. Thus, certain maritime cities, such as Naples, Amalfi, Pisa and Venice, soon attained to a greater or less degree of liberty and independence.

This is the moment in which ancient society seems to disappear completely and a new one begins to rise. Ancient customs disappear, Christian processions take the place of the ancient games, ancient temples are transformed into churches and dedicated to new saints. If Roman tradition in Italy can ever be said to have been completely broken, this could only be during the Longobard domination. It is certain, however, that soon the elements of ancient culture began to revive once more.

The popes.

Gregory I.

A special state of things now arose in Rome. We behold the rapid growth of the papal power and the continual increase of its moral and political influence. This had already begun under Leo I., and been further promoted by the pragmatic sanction. Not only the superintendence but often the nomination of public functionaries and judges was now in the hands of the popes. And the accession to St Peter's chair of a man of real genius in the person of Gregory I., surnamed the Great, marked the beginning of a new era. By force of individual character, as well as by historic necessity, this pope became the most potent personage in Rome. Power fell naturally into his hands; he was the true representative of the city, the born defender of church and state. His ecclesiastical authority, already great throughout Italy, was specially great in the Roman diocese and in southern Italy. The continual offerings of the faithful had previously endowed the church with enormous possessions in the province of Rome, in Sicily, Sardinia and other parts. The administration of all this property soon assumed the shape of a small government council in Rome. In the middle ages the owner of the land was also master of the men who cultivated it, and exercised political authority as well; these administrators therefore protected and succoured the oppressed, settled disputes, nominated judges and controlled the ecclesiastical authorities. The use made by the pope of his revenues greatly contributed to the increase of his moral and political authority. When the city was besieged by the Lombards, and the emperor left his army unpaid, Gregory supplied the required funds and thus made resistance possible. And, when the defence could be no longer maintained, he alone, by the weight of his personal influence and the payment of large sums, induced the Lombards to raise the siege. He negotiated in person with Agilulph, and was recognized by him as the true representative of the city. Thus Rome, after being five times taken and sacked by the barbarians, was, on this occasion, saved by its bishop. The exarch, although unable to give any help, protested against the assumption of so much authority by the pope; but Gregory was no usurper; his attitude was the natural result of events. "For twenty-seven years"—so wrote this pontiff to the imperial government of Constantinople—"we lived in terror of the Longobards, nor can I say what sums we had to pay them. There is an imperial treasurer with the army at Ravenna; but here it is I who am treasurer. Likewise I have to provide for the clergy, the poor and the people, and even to succour the distress of other churches."

The Roman commune.

It was at this moment that the new Roman commune began to take shape and acquire increasing vigour owing to its distance from the seat of the empire and its resistance to the Lombard besiegers. Its special character was now to be traced in the preponderance of the military over the civil power. A Roman element had penetrated into the army, which was already possessed of considerable political importance. The prefect of Rome loses authority and seems almost a nullity compared with the *magister militum*. Hardly anything is heard of the senate. "Quia enim Senatus deest, populus interiit," exclaims Gregory in a moment of despair. The popes now make common cause with the people against the Lombards on the one hand and the emperor on the other. But they avoid an absolute rupture with the empire, lest they should have to face the Lombard power without any prospect of help. Later, when the growing strength of the commune becomes menacing, they remain faithful to the empire in order not to be at the mercy of the people. It was a permanent feature of their policy never to allow the complete independence of the city until they should be its sole and absolute masters. But that time was still in the future. Meanwhile pope and people joined in the defence of their common interests.

This alliance was cemented by the religious disputes of the East and the West. First came the Monothelite controversy regarding the twofold nature of Christ. Later a long and violent struggle ensued, in which the people of Rome and of other Italian cities sided so vigorously with the popes that John VI. (701–5) had to interpose in order to release the exarch from captivity and prevent a definitive rupture with the empire. Then (710–11) Ravenna revolted against the emperor, organized its armed population under twelve flags, and almost all the cities of the exarchate joined in a resistance that was the first step towards the independence of the Italian communes. A still fiercer religious quarrel then broke out concerning images. Pope Gregory II. (715–31) opposed the celebrated edict of the iconoclastic emperor Leo the Isaurian. Venice and the Pentapolis took up arms in favour of the pope, and elected dukes of their own without applying to the emperor. Again public disorder rose to such a pitch that the pope was obliged to check it lest it should go too far.

The duchy of Rome.

In the midst of these warlike tumults a new constitution, almost a new state, was being set up in Rome. During the conflict with Philippicus, the Monothelite and heretical emperor who ascended the throne in 711, the *Liber Pontificalis* makes the first mention of the duchy of Rome (*ducatus Romanae urbis*), and we find the people struggling to elect a duke of their own. In the early days of the Byzantine rule the territory appertaining to the city was no greater than under the Roman Empire. But, partly through the weakness of the government of Constantinople, and above all through the decomposition of the Italian provinces under the Lombards, who destroyed all unity of government in the peninsula, this dukedom was widely extended, and its limits were always changing in accordance with the course of events. It was watered by the Tiber, and stretched into Tuscia to the right, starting from the mouth of the Marta, by Tolfa and Bleda, and reaching as far as Orte. Viterbo was a frontier city of the Lombards. On the left the duchy extended into Latium as far as the Garigliano. It spread very little to the north-east and was badly defended on that side, inasmuch as the duchy of Spoleto reached to within fourteen miles of the Salara gate. On the other side, towards Umbria, the river Nera was its boundary line.

The first constitution of the commune.

The constitution of the city now begins to show the results of the conditions amid which it took shape. The separation of the civil from the military power has entirely disappeared. This is proved by the fact that, after the year 600, there is no further mention of the prefect. His office still survived, but with a gradual change of functions, until, in the 8th century, he once more appears as president of a criminal tribunal. The constitution of the duchy and of the new republic formed during the wars with the Lombards and the exarch was substantially of an aristocratico-military nature. At its head was the duke, first appointed by the emperor, then by the pope and the people, and, as his strength and influence grew with those of the commune, he gradually became the most respected and powerful personage in Rome. The duke inhabited the palace of the Caesars on the Palatine Hill, and had both the civil and the military power in his hands; he was at the head of the army, which, being composed of the best citizens and highest nobility of Rome, was a truly national force. This army was styled the *felicissimus* or *florens exercitus Romanus* or also the *militia Romana*. Its members never lost their citizen stamp; on the contrary they formed the true body of the citizens. We find mention of other *duces* in Rome, but these were probably other leaders or superior officers of the army. Counts and tribunes are found in the subject cities bound to furnish aid to the capital. In fact during the pontificate of Sergius II. (844), when the duchy was threatened by a Saracenic invasion, they were requested to send troops to defend the coast, and as many soldiers as possible to the city.

The different classes of society in Rome.

At that time the inhabitants of Rome were divided into four principal classes—clergy, nobles, soldiers and simple citizens. The nobles were divided into two categories, first the genuine *optimates*, *i.e.* members of old and wealthy families with large estates, and filling high, and often hereditary, offices in the state, the church and the army. These were styled *proceres* and *primates*. The second category comprised landed proprietors, of moderate means but exalted position, mentioned as *nobiles* by Gregory I., and constituting in fact a numerous petty nobility and the bulk of the army. Next followed the citizens, *i.e.* the commercial class, merchants and craftsmen, who, having as yet no fixed organization and but little influence, were simply designated as *honesti cives*. These, however, were quite distinct from the plebeians, *plebs*, *vulgus populi*, *viri humiles*, who in their turn ranked above bondsmen and slaves. The *honesti cives* did not

Scholae militum.

usually form part of the army, and were only enrolled in it in seasons of emergency. Nevertheless the army was not only national, but became increasingly democratic, so that in the 10th century it included every class of inhabitants except churchmen and slaves. At that period we sometimes find the whole people designated as the *exercitus*, those actually under arms being distinguished as the *militia exercitus Romani*. This again was divided into bands or "numbers," *i.e.* regiments, and also, in a manner peculiar to Rome, into *scholae militum*. These *scholae* were associations derived from antiquity, gaining strength and becoming more general in the middle ages as the central power of the state declined. There were *scholae* of notaries, of church singers, and of nearly every leading employment; there were *scholae* of foreigners of diverse nationalities, of Franks, Lombards, Greeks, Saxons, &c. Even the trades and crafts began to form *scholae*. These were at first very feeble institutions, and only later gained importance and became gilds. As early as the 8th century there were *scholae militum* in the army, which was thus doubly divided. But we have no precise definition of their functions. They were *de facto* corporations with separate property, churches and magistrates of their own. The latter were always *optimates*, and guarded the interests of the army. But the real chiefs of the bands or *numeri* were the *duces* or tribunes, and under the Franks the latter became *comites*. These chiefs were styled *magnifici consules, optimates de militia*, often too *judices de militia*, since, as was the custom of the middle ages, they wielded political and judicial as well as military authority. The title of consul was now generally given to superior officers, whether civil or military. The importance of the *scholae militum* began to decline in the 10th century; towards the middle of the 12th they disappeared altogether, and, according to Felix Papencordt, were last mentioned in 1145. It is probable that the *scholae militum* signified local divisions of the army, corresponding with the city wards, which were twelve in number during the 10th and 11th centuries, then increased to thirteen, and occasionally to fourteen. It is certain that from the beginning the army was distributed under twelve flags; after the *scholae* had disappeared, we find it classified in districts, which were subdivided into companies. The division of cities into quarters, *sestieri* or *rioni*, corresponding with that of the army, and also with that of the municipal government, was the common practice of Florence, Siena and almost all the Italian communes. But, while usually losing importance as the gilds acquired power, in Rome the insignificance of the gilds added to the strength of the *regioni* or *rioni*, which not only became part of the army but finally grasped the reins of government. This was a special characteristic of the political constitution of the Roman commune.

The senate in the middle ages.

We now come to a question of weightier import for all desiring to form a clear idea of the Roman government at that period. What had become of the senate? It had undoubtedly lost its original character now that the empire was extinct. But, after much learned discussion, historical authorities are still divided upon the subject. Certain Italian writers of the 18th century—Vendettini, for example—asserted with scanty critical insight that the Roman senate did not disappear in the middle ages. The same opinion backed by much learned research was maintained by the great German historian Savigny. And Leo, while denying the persistence of the curia in Lombard Italy, adhered to Savigny's views as regarded Rome. Papencordt did the same, but held the Roman senate to be no more than a curia. This judgment was vigorously contested, first by Hegel and Giesebrecht, then by Gregorovius. These writers believe that after the middle of the 6th century the senate had a merely nominal existence. According to Gregorovius its last appearance was in the year 579. After that date it is mentioned in no documents, and the chroniclers are either equally silent or merely allude to its decay and extinction. In the 8th century, however, the terms *senator, senatores, senatus* again reappear. We find letters addressed to Pippin, beginning thus: *Omnis senatus atque universi populi generalitas*. When Leo III. returned from Germany he was met by *tam proceres clericorum cum omnibus clericis, quamque optimates et senatus, cunctaque militia* (see Anastasius, in Muratori, vol. iii. 198*c*). But it has been noted that the senate was never found to act as a political assembly; on occasions when it might have been mentioned in that capacity we hear nothing of it, and only meet with it in ceremonials and purely formal functions. Hence the conclusion that the term *senator* was used in the sense of noble, *senatus* of nobility, and no longer referred to an institution but only to a class of the citizens. Even when we find that the emperor Otto III. (who sought to revive all the ancient institutions of Rome) addressed an edict to the "consuls and senate of Rome," and read that the laws of St Stephen were issued *senatus decreto*, the learned Giesebrecht merely remarks that no important changes in the Roman constitution are to be attributed to the consuls and senate introduced by Otto III. Thus for the next glimpse of the senate we must pass to the 12th century, when it was not only reformed, as some writers believe, but entirely reconstituted.

The consuls.

But in this case a serious difficulty remains to be disposed of. Gregorovius firmly asserts that the nobles acquired great power between the 7th and 10th centuries, not only filling the highest military, judicial and ecclesiastical offices, "but also directing the municipal government, presumably with the prefect at their head." He further adds: "Notwithstanding the disappearance of the senate, it is difficult to suppose that the city was without governing magistrates, or without a council." Thus, after the 7th century, the *optimates* at the head of the army were also at the head of the citizens, and "formed a communal council in the same manner in which it was afterwards formed by the *banderesi*."[1] Now, if the nobles were called *senatores* and the nobility *senatus*, and if this body of nobles met in council to administer the affairs of the republic, there is no matter for dispute, inasmuch as all are agreed that the original senate must have had a different character from the senate of the middle ages. And, since the absence of all mention of a prefect after the 7th century is not accepted as a proof of his non-existence, and we find him reappear under another form in the 8th century, so the silence as to the senate after the year 579, the fresh mention of it in the 8th century, and its reappearance in the 12th as a firmly reconstituted body reasonably lead to the inference that, during that time, the ancient senate had been gradually transformed into the new council. Its meetings must have been held very irregularly, and probably only in emergencies when important affairs had to be discussed, previously to bringing them before the parliament or general assembly of the people. Historians are better agreed as to the significance of the term *consul*. At first this was simply a title of honour bestowed on superior magistrates, and retained that meaning from the 7th to the 11th century, but then became—as in other Italian cities—a special title of the chief officers of the state.

During this period the Roman constitution was very simple. The duke, commanding the army, and the prefect, presiding over the criminal court, were the chiefs of the republic; the armed nobility constituted the forces, filled all of superior offices, and occasionally met in a council called the senate, although it had, as we have said, no resemblance to the senate of older times. In moments of emergency a general parliament of the people was convoked. This constitution differed little from that of the other Italian communes, where, in the same way, we find all the leading citizens under arms, a parliament, a council, and one or more chiefs at the head of the government.

But Rome had an element that was lacking elsewhere. We have already noted that, in the provinces, the administrators of church lands were important personages, and exercised during the middle ages, when there was no exact division of power, both judicial and political functions. It was very natural that the heads of this vast administration resident in Rome should have a still higher standing, and in fact, from the

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[1] Gregorovius, *Geschichte*, vol. ii. pp. 427–28 and note (2nd ed.).

Judices de clero.

6th century, their power increased to such an extent that in the times of the Franks they already formed a species of papal cabinet with a share and sometimes a predominance in the affairs of the republic. There were seven principal administrators, but two of them held the chief power—the *primicerius notariorum* and the *secundicerius*, *i.e.* the first and under secretaries of state. When, on the constitution of the new empire, these ministers were declared to be palatine or imperial as well as papal officials, the *primicerius* and the *secundicerius* were also in waiting on the emperor, who sat in council with them when in Rome. Next came the *arcarius*, or treasurer; the *sacellarius*, or cashier; the *protoscriniarius*, who was at the head of the papal chancery; the *primus defensor*, who was the advocate of the church and administered its possessions. Seventh and last came the *nomenclator*, or *adminiculator*, who pleaded the cause of widows, orphans and paupers. There were also some other officials, such as the *vestiarius*, the *vicedominus* or steward, the *cubicularius* or major-domo, but these were of inferior importance. They were ecclesiastics, but not bound to be in priest's orders. The first seven were those specially known as *proceres clericorum* and oftener still as *judices de clero*, since they speedily assumed judicial functions and ranked among the chief judges of Rome. But as ecclesiastics they did not give decisions in criminal cases. Thus Rome had two tribunals, that of the *judices de clero*, or *ordinarii*, presided over by the pope, and that of the *judices de militia*, leaders of the army, dukes and tribunes, also bearing the generic title of consuls. First appointed by the exarch and then frequently by the pope, these decided both civil and criminal cases. In the latter they were sole judges under the presidency of the prefect.

The popes and the papal power.

The pope was thus at the head of a large administrative body with judicial and civil powers that were continually on the increase, and, in addition to his moral authority over Christendom, was possessed of enormous revenues. So in course of time he considered himself the real representative of the Roman Republic. Gregory II. (715–31) accepted in the name of the republic the submission of other cities, and protested against the conquest by the Lombards of those already belonging to Rome. He seemed indeed to regard the territory of the duchy as the patrimony of the church. The duke was always at the head of the army, and, officially, was always held to be an imperial magistrate. But the empire was now powerless in Italy. Meanwhile the advance of the Lombards was becoming more and more threatening; they seized Ravenna in 751, thus putting an end to the exarchate, and next marched towards Rome, which had only its own forces and the aid of neighbouring cities to rely upon. To avoid being crushed by the brute force of a foreign nation unfit to rule, and only capable of oppression and pillage, it was necessary to make an energetic stand.

The popes appeal to the Franks for aid.

Accordingly, the reigning pope, Stephen II. (752–57), appealed to Pippin, king of the Franks, and concluded with that monarch an alliance destined to inaugurate a new epoch of the world's history. The pope consecrated Pippin king of the Franks, and named him *patricius Romanorum*. This title, as introduced by Constantine, had no longer the ancient meaning, but now became a sign of lofty social rank. When, however, it was afterwards conferred on barbarian chieftains such as Odoacer and Theodoric, and then on the representative of the Byzantine empire in Italy, it acquired the meaning of a definite dignity or office. In fact, the title was now given to Pippin as defender of the church, for the pope styled him at the same time *patricius Romanorum* and *defensor* or *protector ecclesiae*. And the king pledged himself not only to defend the church but also to wrest the exarchate and the Pentapolis from the Lombards and give them to Rome, or rather to the pope, which came to the same thing. This was considered as a restitution made to the head of the church, who was also the representative of the republic and the empire. And, to preserve the character of a restitution, the famous "donation of Constantine" was invented during this period (752–77). Pippin brought his army to the rescue (754–55) and fulfilled his promise. The pope accepted the donation in the name of St Peter, and as the visible head of the church. Thus in 755 central Italy broke its connexion with the empire and became independent; thus was inaugurated the temporal power of the papacy, the cause of so much subsequent warfare and revolution in Rome.

Donation of Pippin.

Its first consequences were speedily seen. In 767 the death of Paul I. was followed by a fierce revolt of the nobles under Duke Toto (Theodoro) of Nepi, who by violent means raised his brother Constantine to the chair of St Peter, although Constantine was a layman and had first to be ordained. For more than a year the new pontiff was a pliable tool in the hands of Toto and of the nobles. But the genuine papal faction, headed by a few *judices de clero*, asked the aid of the Lombards and made a formidable resistance. Their adversaries were defeated, tortured and put to death. Toto was treacherously slain during a fight. The pope was blinded and left half dead on the highway. Fresh and no less violent riots ensued, owing to the public dread lest the new pope, Stephen III. (768–72), elected by favour of the Lombards, should give them the city in return. But Stephen went over to the Franks, whom he had previously deserted, and his successor, Adrian I. (772–95), likewise adhered to their cause, called the city to arms to resist King Desiderius and his Lombard hordes, and besought the assistance of Charlemagne. This monarch accordingly made a descent into Italy in 773, and not only gained an easy victory over Desiderius, but destroyed the Lombard kingdom and seized the iron crown. Entering Rome for the first time in 774, he confirmed and augmented the donation of Pippin by the addition of the dukedom of Spoleto. He returned several times to Italy and Rome, making new conquests and fresh concessions to Adrian I., until the death of the latter in 795.

Charlemagne in Italy.

The papacy, the republic and the Franks.

The position of Rome and of the pope is now substantially changed. Duke, prefect, militia and the people exist as heretofore, but are all subordinate to the head of the church, who, by the donations of Pippin and Charlemagne, has been converted into a powerful temporal sovereign. Henceforth all connexion with Byzantium is broken off, but Rome is still the mainspring of the empire, the Roman duchy its sole surviving fragment in Italy, and the pope stands before the world as representative of both. And, although it is difficult to determine how this came about, the pope is now regarded and regards himself as master of Rome. In the year 772 he entrusts the *vestiarius* with judicial powers over the laity, ecclesiastics, freemen and slaves *nostrae Romanae reipublicae*. He writes to Charlemagne that he has issued orders for the burning of the Greek ships employed in the slave trade, "in our city of Civita Vecchia" (Centumcellae), and he always speaks of Rome and the Romans as "our city," "our republic," "our people." The donations of Pippin and Charlemagne are restitutions made to St Peter, the holy church and the republic at the same time. It is true that Charlemagne held the supreme power, had an immensely increased authority and actively fulfilled his duties as *patricius*. But his power was only occasionally exercised in Rome; it was the result of services rendered to the church, and of the church's continual need of his help; it was, as it were, the power of a mighty and indispensable ally. The pope, however, was most tenacious of his own authority in Rome, made vigorous protest whenever rebels fled to Charlemagne or appealed to that monarch's arbitration, and contested the supremacy of the imperial officials in Rome. Yet the pope was no absolute sovereign, nor, in the modern sense of the term, did any then exist. He asserted supremacy over many lands which continually rebelled against him, and which, for want of an army of his own, he was unable to reduce to obedience without others' help. Neither did the republic acknowledge him as its head. It profited by the growing power of the pope, could not exist without him, respected his moral authority, but considered that he usurped undue power in Rome. This was specially the feeling of the nobles, who had hitherto held the chief authority in the republic, and, being still the leaders of the army, were by no means willing to relinquish it. The Roman nobles were very different from other aristocratic bodies elsewhere. They were not as they pretended, descendants of the Camilli and the Scipios, but neither were they a feudal aristocracy, inasmuch as the Teutonic element had as yet made small way among them. They were a mixture of different elements, national and foreign, formed by the special conditions of Rome. Their power was chiefly derived from the high offices and large grants of money and land conferred on them by the popes; but, as no dynasty existed, they could not be dynastic. Every pope aggrandized his own kindred and friends, and these were the natural and often open adversaries of the next pontiff and his favourites. Thus the Roman nobility was powerful, divided, restless and turbulent; it was continually plotting against the pope, threatening not only his power, but even his life; it continually appealed to the people for assistance, stirred the militia to revolt and rendered government an impossibility. Hence, notwithstanding his immense moral authority, the pope was the effective head neither of the aristocracy, the army nor of the as yet unorganized lower classes. The lord of vast but often insubordinate territories, the recognized master of a capital city torn by internecine feud and plots against himself, he needed the support of an effective force for his own preservation and the maintenance of the authority proffered him from all quarters. Hence the necessity of creating an empire of the West, after having snapped every link with that of the East. Thus the history of Rome is still, as in the past, a history of continual strife between pope, emperor and republic; and the city, while imbibing strength from all three, keeps them in perpetual tumult and confusion.

Leo III. (796–816) further strengthened the ties between Charlemagne and the church by sending the former a letter with the keys of the shrine of St Peter and the banner of Rome. Charlemagne had already joined to his office of patrician the function of high justice. The new symbols now sent constituted him *miles* of Rome and general of the church. The pope urged him to despatch an envoy to receive the oath of fealty, thus placing himself, the representative of the republic, in the subordinate position of one of the bishops who had received the immunities of counts. And all these arrangements took place without the slightest reference to the senate, the army or the people. Much resentment was felt, especially by the nobles, and a revolution ensued headed by the *primicerius* Paschalis and the *secundicerius* Campulus, and backed by all who wished to liberate the city from the papal rule. During a solemn procession the pope was attacked and barbarously maltreated by his assailants, who tried to tear out his eyes and tongue (799). He was thrown into prison, escaped and overtook Charlemagne at Paderborn, and returned guarded by ten of the monarch's envoys, who condemned to death the leaders of the revolt, reserving, however, to their sovereign the right of final judgment. Charlemagne arrived in December 800, and as high justice assembled a tribunal of the clergy, nobles, citizens and Franks; he pronounced Leo to be innocent, and confirmed the capital sentence passed on the rebels. But through the intercession of the pope, who dreaded the wrath of the nobles, this was presently commuted into perpetual exile. And finally on Christmas day, in St Peter's, before an assemblage of Roman and Frankish lords, the clergy and the people, the pontiff placed the imperial crown on Charlemagne's head and all proclaimed him emperor.

Charlemagne crowned emperor.

Thus the new emperor was elected by the Romans and consecrated by the pope. But he was their real master and supreme judge. The pope existed only by his will, since he alone supplied the means for the maintenance of the temporal power, and already pretended to the right of controlling the papal elections. Yet Charlemagne was not sovereign of Rome; he possessed scarcely any regalia there, and was not in command of the army; he mainly represented a principle, but this principle was the law which is the basis of the state. The pope still nominated the Roman judges, but the emperor or his *missi* presided over them, together with those of the pope, and his decision was appealed to in last resort. During the Carolingian times no mention is found of the prefect, and it would seem that his office was filled by the imperial *missus*, or legate, the *judices de clero* and *judices de militia*. The power of the pope was now entangled with that of the republic on the one hand and that of the empire on the other. The consequent confusion of sacred and secular functions naturally led to infinite complications and disputes.

Decline of the empire.

Renewed power of the aristocracy.

The death of Charlemagne in 814 was the signal for a fresh conspiracy of the nobles against the pope, who, discovering their design, instantly put the ringleaders to death, and was severely blamed by Louis for this violation of the imperial prerogative. While the matter was under discussion the nobles broke out in fiercer tumults, both in Rome and the Campagna. At last, in 824, the emperor Lothair came to re-establish order in Rome, and proclaimed a new and noteworthy constitution, to which Pope Eugenius II. (824–27) gave his oath of adherence. By this the partnership of pope and emperor in the temporal rule of Rome and the states of the church was again confirmed. The more direct power appertained to the pope; the supreme authority, presidence of the tribunals, and final judgment on appeal to the emperor. The new constitution also established the right of contending parties to select either the Roman or the Teutonic code for the settlement of their disputes. During the Carolingian period it is not surprising that the commune should have been, as it were, absorbed by the church and the empire. In fact, it is scarcely mentioned in history throughout that time. And when, no longer sustained by the genius of its founder, the Frankish empire began to show signs of dissolution, the popes, finding their power thereby strengthened, began to assume many of the imperial attributes. Soon, however, as a natural consequence of the loss of the main support of the papacy, the nobles regained vigour and were once more masters of the city. Teutonic and feudal elements had now largely penetrated into their organization. The system of granting lands, and even churches and convents, as benefices according to feudal forms, became more and more general. It was vain for the popes to offer opposition, and they ended by yielding to the current. The fall of the Frankish empire left all Italy a prey to anarchy, and torn by the faction fights of Berengar of Friuli and Guido of Spoleto, the rival claimants to the crowns of Italy and the empire. The Saracens were advancing from the south, the Huns from the north; the popes had lost all power; and in the midst of this frightful chaos a way was opened for the rise of the republics. Anarchy was at its climax in Rome, but the laity began to overpower the clergy to such an extent that the *judices de militia* prevailed over the *judices de clero*. For a long time no imperial *missi* or legates had been seen, and the papacy was incredibly lowered. The election of the popes had positively fallen into the hands of certain beautiful women notorious for their evil life and depravity. The aristocracy alone gained strength; now freed from the domination of the emperor, it continually wrested fresh privileges from the impotent pontiffs, and became organized as the ruling force of the republic. Gregorovius, notwithstanding his denial of the continuation of the senate after the 6th century, is obliged to acknowledge that it appeared to have returned to life in the power of this new baronage. And, although this body was now permeated with the feudal principle, it did not discard its ancient traditions. The nobles claimed to be the main source of the empire; they wished to regain the dignity and office of *patricius*, and to make it, if possible, hereditary in some of their families. Nothing is known of their system of organization, but it seems that they elected a chief bearing the title of *consul*, *senator*, *princeps Romanorum*, who was officially recognized by the pope, as a *patricius* presided over the tribunals, and was the head of the commune.

Theophylact was one of the first to assume this dignity. His wife Theodora, known as the *senatrix*, was one of the women then dominating Rome by force of their charms and licentiousness. She was supposed to be the concubine of Pope John X. (914–28), whose election was due to her influence. Her daughter Marozia, in all things her worthy rival, was married to Alberic, a foreign mercenary of uncertain birth who rose to a position of great influence, and, although an alien, played a leading part in the affairs of the city. He helped to increase the power of Theophylact, who seemingly shared the rule of the city with the pope. In the bloody war that had to be waged against the Saracens of southern Italy, and at the defeat of the latter on the Garigliano (916), Theophylact and Alberic were the Roman leaders, and distinguished themselves by their valour. They disappeared from the scene after this victory, but Marozia retained her power, and bore a son, Alberic, who was destined to greater deeds. The pope found himself caught in this woman's toils, and struggled to escape, but Marozia, gaining fresh influence by her marriage with Hugo, margrave of Tuscany, imprisoned the pontiff himself in the castle of St Angelo (928). This fortress was the property of Marozia and the basis of her strength. The unfortunate John died within its walls. Raised to the chair by Theodora, he was deposed and killed by her daughter. The authority of the latter reached its culminating point in 931, when she succeeded in placing her son John XI. on the papal throne. On the death of her second husband she espoused Hugh of Provence, the same who in 928 had seized the iron crown at Pavia, and now aspired to the empire. Dissolute, ambitious and despotic, he came to Rome in 932, and, leaving his army outside the walls, entered the castle of St Angelo with his knights, instantly began to play the tyrant, and gave a blow to Alberic his stepson, who detested him as a foreign intruder. This blow proved the cause of a memorable revolution; for Alberic rushed from the castle and harangued the people, crying that the time was come to shake off the tyrannous yoke of a woman and of barbarians who were once the slaves of Rome. Then, putting himself at the head of the populace, he closed the city gates to prevent Hugh's troops from coming to the rescue, and attacked the castle. The king fled; Marozia was imprisoned, Alberic proclaimed lord of the Romans, and the pope confined to the Lateran in the custody of his own brother. Rome was again an independent state, a republic of nobles. Rid of the temporal dominion of emperor and pope, and having expelled the foreigners with great energy and courage, it chose Alberic for its chief with the title of *princeps atque omnium Romanorum senator*. The tendency of the Roman Republic to elect a supreme authority, first manifested in the case of Theophylact, was repeated in those of Alberic, Brancaleone, Crescenzio, Cola di Rienzo and others. One of the many causes of this tendency may be traced to the conception of the new empire of which Rome was the original and enduring fountainhead. As Rome had once transferred the empire from Byzantium to the Franks, so Rome was surely entitled to reclaim it. The imperial authority was represented by the office of patrician, now virtually assumed by Alberic. That he gave the name of Octavian to his son is an additional proof of this fact. In the Eternal City the medieval political idea has always the aspect of a resurrection or transformation of classic antiquity. This is another characteristic of the history of the Roman commune.

The revolt of the Romans. Alberic at the head of the commune.

Alberic's strength was due to his connexion with the nobility, to his father's valiant service against the Saracens at the battle of Garigliano, and to the militia under his command, on which everything depended amid the internal and external dangers now threatening the new state. As yet no genuine municipal constitution was possible in Rome, where neither the people nor the wealthy burghers engaged in industry and commerce had any fixed organization. All was in the hands of the nobles, and Alberic, as their chief, frequently convened them in council, although obliged to use pressure to keep them united and avoid falling a prey to their disputes. Hence the whole power was concentrated in his grasp; he was at the head of the tribunals as well as of the army. The *judices de clero* and *judices de militia* still existed, but no longer met in the Lateran or the Vatican, under the presidency of emperor and pope or their *missi*. Alberic himself was their president; and, a still more significant fact, their sittings were often held in his private dwelling. There is no longer any mention of prefect or *patricius*. The papal coinage was inscribed with Alberic's name instead of the emperor's. His chief attention was given to the militia, which was still arranged in *scholae*, and it is highly probable that he was the author of the new division of the city into twelve *regions*, with a corresponding classification of the army in as many regiments under twelve flags and twelve *banderesi*, one for every region. The organization of the *scholae* could not have been very dissimilar, but doubtless Alberic had some important motive for altering the old method of classification. By means of the armed regions he included the people in the forces. It is certain that after his time we find the army much changed and far more democratic. It was only natural that so excellent a statesman should seek the aid of the popular element as a defence against the arrogance of the nobles, and it was requisite to reinforce the army in order to be prepared for the attacks threatened from abroad. This change effected, Alberic felt prepared for the worst, and began to rule with energy, moderation and justice. His contemporaries award him high praise, and he seems to have been exempt from the vices of his mother and grandmother.

In 933 Hugh made his first attack upon the city, and was repulsed. A second attempt in 936 proved still more unfortunate, for his army was decimated by a pestilence. Thoroughly disheartened, he not only made peace, but gave his daughter in marriage to Alberic, thus satisfying the latter's desire to ally himself with a royal house. But this union led to no conciliation with Hugh. For Alberic, finding his power increased, marched at the head of his troops to consolidate his rule in the Campagna and the Sabine land. On the death of his brother, Pope John XI., in 936, he controlled the election of several successive popes, quelled a conspiracy formed against him by the clergy and certain nobles instigated by Hugh, and brilliantly repulsed, in 941, another attack by that potentate. At last, however, this inveterate foe withdrew from Rome, being summoned to the north by the victories of his rival Berengarius. But Alberic, after procuring the election of various popes who were docile instruments of his will, experienced a check when Agapetus II. (946–55), a man of firmness and resource, was raised to the papal throne. The fortunes of Berengarius were now in the ascendant. In 950 he had seized the iron crown, and ruled in the Pentapolis and the exarchate. This being singularly painful to the pope, he proceeded to make alliance with all those enemies of Berengarius preferring a distant emperor to a neighbouring and effective sovereign, with the Roman nobles who were discontented with Alberic, and with all who foresaw danger, even to Rome, from the extended power of Berengarius. And Agapetus recurred to the old papal policy, by making appeal to Otto I., whose rule in Germany was distinguished by a prestige almost comparable with that of Charlemagne.

Otto immediately responded to the appeal and descended into Italy; but his envoys were indignantly repulsed by Alberic, and, being prudent as well as firm, he decided to wait a more opportune moment for the accomplishment of his designs. Meanwhile Alberic died in 954, and the curtain fell on the first great drama of the Roman Republic. He had reigned for twenty-two years with justice, energy and prudence; he had repelled foreign invaders, maintained order and authority. He seems, however, to have realized that the aspect of affairs was about to change, that the work he had accomplished would be exposed to new dangers. These dangers, in fact, had already begun with the accession of an enterprising pope to the Holy

See. The name of Octavian given by Alberic to his son leads to the inference that he meant to make his power hereditary. But, suddenly, he began to educate this son for the priesthood, and, assembling the nobles in St Peter's shortly before his death, he made them swear to elect Octavian as pope on the decease of Agapetus II. They kept their word, for in this way they freed themselves from a ruler. Possibly Alberic trusted that both offices might be united, and that his son would be head of the state as well as the church. But the nobles knew this to be a delusion, especially in the case of a nature such as Octavian's. The lad was sixteen years old when his father died, received princely honours until the death of Agapetus, and was then elected pope with the name of John XII. He had inherited the ungoverned passions of his grandmother Marozia and great-grandmother Theodora, but without their intelligence and cunning. His palace was the scene of the most scandalous licence, while his public acts were those of a baby tyrant. He conferred a bishopric on a child of ten, consecrated a deacon in a stable, invoked Venus and Jupiter in his games, and drank to the devil's health. He desired to be both pope and prince, but utterly failed to be either. Before long, realizing the impossibility of holding in check Berengarius, who still ruled over the exarchate, he sought in 960 the aid of Otto I., and promised him the imperial crown. Thus the new ruler was summoned by the son of the man by whom he had been repulsed. Otto vowed to defend the church, to restore her territories, to refrain from usurping the power of the pope or the republic, and was crowned on the 2nd of February 962 with unheard-of pomp and display.

Otto I. crowned emperor.

Accordingly, after being extinct for thirty-seven years, the empire was revived under different but no less difficult conditions. The politico-religious unity founded by Charlemagne had been dissolved, partly on account of the heterogeneous elements of which it was composed, and partly because other nations were in course of formation. Now too the feudal system was converting the officers of the empire into independent princes, and the new spirit of communal liberty was giving freedom to the cities. Otto once more united the empire and the church, Italy and Germany, in order to combat these new foes. But the difficulties of the enterprise at once came to light. John XII., finding a master in the protector he had invoked, now joined the discontented nobles who were conspiring with Berengarius against the emperor. But the latter hastened to Rome in November 963, assembled the clergy, nobles and heads of the people, and made them take an oath never again to elect a pope without his consent and that of his son. He also convoked a synod presided over by himself in St Peter's, which judged, condemned and deposed Pope John and elected Leo VIII. (863–65), a Roman noble, in his stead. All this was done at the direct bidding of the emperor, who thus deprived the Romans of their most valued privilege, the right of choosing their own pope. But the people had now risen to considerable importance, and, for the first time, we find it officially represented in the synod by the plebeian Pietro, surnamed Imperiola, together with the leaders of the militia, which had also become a popular institution since Alberic's reign. It was no longer easy to keep the lower orders in subjection, and by their junction with the malcontent nobles they formed a very respectable force. On the 3rd of January 964 they sounded the battle-peal and attacked the Vatican, where the emperor was lodged. The German knights repulsed them with much slaughter, and this bloodshed proved the beginning of an endless feud. Otto departed in February, and John XII., as the chosen pope of the Romans, returned with an army of followers and compelled the defenceless Leo VIII. to seek safety in flight. Soon afterwards Leo was deposed and excommunicated by a new synod, and many of his adherents were cruelly murdered. But on the 14th of May 964 John suddenly expired; the Romans, amid violent struggles and tumults, resumed their rights, elected Benedict V., and procured his consecration in spite of the emperor's veto. Otto now appeared at the head of an army, committed fresh slaughter, besieged the city, reduced it by famine, and, after holding a council which deposed Benedict and sent him a prisoner to Hamburg, restored Leo VIII. to the papal throne.

Rising importance of the people.

Another revolution.

But, although the emperor thus disposed of the papacy at his will, his arbitrary exercise of power roused a long and obstinate resistance, which had no slight effect upon the history of the commune. Leo VIII. died in 965, and the imperial party elected John XIII. (965–72). Upon this the nobles of the national party joined the people and there was a general revolt. The nobles were led by Pietro, prefect of Rome. As we have noted, this office seemed to be extinct during the Carolingian rule, but we again meet with it in 955, after an interval of a century and a half. The leaders of the people were twelve *decarconi*, a term of unknown derivation, but probably indicating chiefs of the twelve regions (*dodecarchi*, *dodecarconi*, *decarconi*). The new pope was seized and confined, first in the castle of St Angelo, then in a fortress in the Campagna. But the emperor quickly marched an army against Rome, and this sufficed to produce a reaction which recalled the pope (November 966), sent the prefect into exile, and put several of the rebellious nobles to death. And shortly after the emperor sacked the city. Many Romans were exiled, some tortured, others, including the twelve *decarconi*, killed. John XIII. died in 972 and Otto in 973.

Judices dativi.

All these events clearly prove how great a change had now taken place in the conditions of Rome. The people (*plebs*) had made its appearance upon the stage; the army had become democratic; the twelve regions were regularly organized under leaders. Opposed to them stood the nobles, headed by the prefect, also a noble, precisely as in Florence the nobles and the podestà were later opposed to the gilds and the people. So far, it is true, nobles and people had made common cause in Rome; but this harmony was soon to be interrupted. The feudal spirit had made its way among the Roman aristocrats, had split them into two parties and diminished their strength. It was now destined to spread, and, as it was always vigorously detested and opposed by the people elsewhere in Italy, so the same consequence was inevitable in Rome. Another notable change, and a subject of unending controversy, had also occurred in the administration of justice. So far there were the *judices de clero*, also known as ordinary or palatine judges, and the *judices de militia*, also styled *consules* or *duces*. These judges generally formed a court of seven, three being *de clero*, four *de militia*, or vice versa, under the presidency of the papal or imperial *missi*. In criminal cases the *judices de militia* had the prefect or the imperial *missus* for their president. But there was a third order of judges called *pedanei*, *a consulibus creati*. It seems clear that the *duces*, being *distributi per judicatus*, found themselves isolated in the provinces, and to obtain assistance nominated these *pedanei*, who were legal experts. In Rome, with its courts of law, they were less needed, but possibly in those sections of the city where cases of minor importance were submitted to a single magistrate reference was made to the *pedanei*. But many changes were made under the Franks, and when the edict of Lothair (824) granted free choice of either the Roman or Germanic law, and the *duces* were replaced by *comites* and *gastaldiones*, chiefly of German origin, the use of legal experts became increasingly necessary. And the custom of employing them was the more easily diffused by being already common among the Franks, whose *scabini* were legal experts acting as judges, though not qualified to pass sentence. Thus the *pedanei* multiplied, came to resemble the *scabini*, and were designated *judices dativi* (*a magistratu dati*) or simply *dativi*. These were to be found in the exarchate in 838, but not in Rome until 961, when the *judices de militia* had ceased to exist. The great progress of the German legal procedure may then have contributed to the formation of the new office.

Meanwhile Pope John XIII. had been succeeded by Benedict VI. (973–74) and Otto I. by his son Otto II., a youth of eighteen married to the Byzantine princess Theophano. Thereupon the Romans, who had supported the election of another pope, and were in no awe of the new emperor, rose to arms under the command of Crescenzio, a rich and powerful noble. They not only seized Benedict VI. by force, but strangled him in the castle of St Angelo. The national and imperial parties then elected several popes who were either exiled or persecuted, and one of them was said to be murdered. In 985 John XV. was elected (985–96). During this turmoil, the national party, composed of nobles and people, led by Giovanni Crescenzio, son of the other Crescenzio mentioned above, had taken complete possession of the government. This Crescenzio assumed the title of patrician, and sought to imitate Alberic, although far his inferior in capacity. Fortunately for him, the reigning pope was a detested tyrant, and the emperor a child entirely guided by his mother. But the new emperor Otto III. was backed by a powerful party, and on coming to Rome in 996 was able, although only aged fifteen, to quell the rebellion, oust Crescenzio from public life, and elect as successor to John XV. his own cousin, Pope Gregory V. (996–99). But this first German pope surrounded himself with compatriots, and by raising them to lofty posts even in the tribunals excited a revolt that drove him from the throne (29th September 999). Crescenzio, being master of the castle of St Angelo, resumed the title of patrician or consul of the Romans, expelled the German judges, reconstituted the government, prepared his troops for defence, and created a new pope. But the following year Otto III. came to Rome, and his party opened the gates to him. Although deserted by nearly all his adherents, Crescenzio held the castle valiantly against its besiegers. At last, on the 29th of April 998, he was forced to make terms, and the imperialists, violating their pledges, first put him to torture and then hurled him from the battlements. Gregory V. dying shortly after these events, Sylvester II., another native of southern France, who had been tutor to the emperor Otto III., was raised to the papacy (999–1003).

Giovanni Crescenzio.

Otto III.

Thus Otto III. was enabled to establish his mastery of Rome. But, as the son of a Greek mother, trained amid Greek influences, his fantastic and contradictory nature seemed only to grasp the void. He wished to reconstitute a Romano-Byzantine empire with Rome for his capital. His discourse always turned on the ancient republic, on consuls and senate, on the might and grandeur of the Roman people; and his edicts were addressed to the senate and the people. The senate is now constantly mentioned, and its heads bear the title of consuls. The emperor also gave renewed honour to the title of patrician, surrounded himself with officials bearing Greek and Roman designations, and raised the prestige of the prefect, who, having now almost the functions of an imperial vicar, bore the eagle and the sword as his insignia. Nevertheless Otto III. was thoroughly German, and during his reign all Germanic institutions made progress in Rome. This was particularly the case with feudalism, and Sylvester II. was the first pope to treat it with favour. Many families of real feudal barons now arose. The Crescenzii held sway in the Sabine hills, and Praeneste and Tusculum were great centres of feudalism in the 11th century. The system of feudal benefices was recognized by the church, which made grants of lands, cities and provinces in the feudal manner. The bishops, like feudal barons, became actual counts. And, in consequence of these changes, when the emperor, as head of the feudal system, seeks to impose his will upon the church (which has also become feudal) and control the papal elections, he is met by the great question of the investitures, a question destined to disturb the whole world. Meanwhile the Roman barons were growing more and more powerful, and were neither submissive nor faithful to the emperor. On the contrary, they resented his attitude as a master of Rome, and, when he subjected Tivoli to the Holy See, attacked both him and the pope with so much vigour as to put both to flight (16th February 1001). Thereupon Rome again became a republic, headed by Gregory of Tusculum, a man of a powerful family claiming descent from Alberic.

The second Giovanni Crescenzio.

By the emperor's death in January 1002 the race of the Ottos became extinct, the papacy began to decline, as at the end of the Carolingian period, and the nobles, divided into an imperial and a national party, were again predominant. They reserved to themselves the office of patrician, and, electing popes from their own ranks, obtained enlarged privileges and power. At the time when Ardoin, marquis of Ivrea, profiting by the extinction of the Ottos and the anarchy of Germany, was stirring Italy in the vain hope of constituting a national kingdom, the Roman Republic was being consolidated under another Giovanni Crescenzio, of the national faction. He was now elected patrician; one of his kinsmen was invested with the office of prefect, and the new pope John XVIII. (1003–9) was one of his creatures. Although the power of Henry of Bavaria was then gaining ascendancy in Germany, and giving strength to the imperialist nobles, Crescenzio still remained supreme ruler of the city and the Campagna. Surrounded by his judges, the senators and his kinsman the prefect, he continued to dispense justice in his own palace until his death in 1012, after ten years' rule. And, Pope Sergius IV. having died the same year, the counts of Tusculum compassed the election of Benedict VIII. (1012–24), one of their own kin. This pope expelled the Crescenzii, changed the prefect and reserved the title of patrician for Henry II., whom he consecrated emperor on the 14th February 1014. A second Alberic, bearing the title of "eminentissimus consul et dux," was now at the head of the republic and dispensed *placita* in the palace of his great ancestor, from whom the counts of Tusculum were also descended.

Henry II.

The new emperor endeavoured to re-establish order in Rome, and strengthen his own authority together with that of the pope. But the nobles had in all things the upper hand. They were regularly organized under leaders, held meetings, asserted their right to nominate both pope and emperor, and in fact often succeeded in so doing. Even Henry II. himself was obliged to secure their votes before his coronation. The terms senate and senator now recur still more frequently in history. Nevertheless, Benedict VIII. succeeded in placing his own brother, Romano, at the head of the republic with the title of "consul, dux and senator," thus making him leader of the nobles, who met at his bidding, and chief of the militia and the tribunals. The prefect still retained his authority, and the emperor was by right supreme judge. But, a violent revolt breaking out, the emperor only stayed to suppress it and then went to Germany in disgust. The pope, aided by his brother, conducted the government with energy; he awed the party of Crescenzio, and waged war against the Saracens in the south. But he died in 1024, and in the same year Henry II. was succeeded by Conrad II. There was now beheld a repetition of the same strange event that had followed the death of Alberic, and with no less fatal consequences. Benedict's brother Romano, head of the republic, and still retaining office, was, although a layman, elected pope. He took the name of John XIX. (1024–33), and in 1027 conferred the imperial crown on Conrad the Salic, who, abolishing the Lothairian edict of 824, decreed that throughout Rome and its territory justice should be henceforth administered solely by the Justinian code. Thus, notwithstanding the spread of feudalism and Germanic procedure, the Roman law triumphed through the irresistible force of the national character, which was already manifested in many other ways.

Meanwhile John XIX. was succeeded by his nephew, Benedict IX. (1033–45), a lad of twelve, who placed his own brother at the head of the republic. Thus church and state assumed the aspect of hereditary possessions in the powerful house of the counts of Tusculum. But the vices and excesses of Benedict were so monstrous that the papacy sank to the lowest depth of corruption; there followed a series of tumults and reactionary attempts, and so many conflicting elections that in 1045 three popes were struggling for the tiara in the midst of scandal and anarchy. The streets and neighbourhood of Rome swarmed with thieves and assassins; pilgrims were plundered; citizens trembled for their lives; and a hundred petty barons threatened the rival popes, who were obliged to defend themselves by force. This state of things lasted until Henry III. came to re-establish order. He appointed a synod to depose the three popes, and then, with the consent of the wearied and anarchy-stricken Romans, assuming the right of election, proposed a German, Clement II., who was consecrated at Christmas 1046. Henry III. was then crowned, and also took the title of patrician. Thus the emperor was lord over church and state. This, however, stirred both people and pope against him, and led to the terrible contest of the investitures, although for the moment the Romans, being exhausted by past calamities, seemed not only resigned but contented.

Hildebrand and the question of investiture.

In fact, the idea of reform and independence was already germinating in the church and was soon to become tenacious and irresistible. Hildebrand was the prompter and hero of this idea. He sought to abolish the simony and concubinage of the priesthood, to give the papal elections into the hands of the higher ecclesiastics, and to emancipate the church from all dependence on the empire. Henry III. procured the election of four German popes in succession, and Hildebrand was always at hand to inspire their actions and dominate them by his strength of intellect and still greater strength of will. But the fourth German pope, Victor II., died in 1057, and Henry III. had been succeeded in 1056 by the young Henry IV. under the regency of a weak woman, the empress Agnes. Hildebrand seized this favourable moment for trying his strength and procured the election of Stephen IX. (1057–58), a candidate he had long had in view. Stephen, however, died in 1058; the nobles instantly rose in rebellion; and Gregory of Tusculum, who had assumed the patriciate, caused an incapable cousin to be named pope (Benedict X.). Upon this Hildebrand postponed his design of maintaining the papacy by the help of Italian potentates and had recourse to the empress. In a synod held at Siena with her consent Benedict was deposed and Nicholas II. (1059–61) elected in his stead. This pope entered Rome escorted by the troops of Godfrey of Tuscany, and, when also assured of help from Naples, assembled a council of one hundred and thirteen bishops (1059), who condemned the deposed pontiff and renewed the prohibition of simony and concubinage among the priesthood. Finally Nicholas instituted the college of cardinals, entrusting it with the election of the pope, who was in future to be chosen from its ranks. The assent of the clergy and people was left purely formal. The decree also contained the proviso—"saving the honour and reverence due to the emperor"; but this too was an empty expression.

The new decree was a master-stroke of Hildebrand's genius, for by means of it he placed the papal election in the hands of a genuine ecclesiastical senate and gave a monarchical form to the church. Backed by the Normans who were in Rome, and whose commander, Richard of Capua, did not scruple to strike off the heads of many recalcitrant nobles, Hildebrand and the pope could now pursue their work of reform. Nevertheless the nobles again revolted on the death of Nicholas II. in 1061, and declared their purpose of restoring to Henry IV. the patriciate and right of election; but Hildebrand, by speedily convoking the cardinals, procured the election of Alexander II. (1061–73). This pope, although friendly to the empire, did not await the imperial sanction, but, protected by the Romans, at once entered the Lateran and put some other riotous nobles to death. The German bishops, however, elected Honorius II., who had the support of the barons. Thus the city was split into two camps and a deadly civil war ensued, terminating, despite the vigorous resistance of the nobility, in the defeat of Honorius II. But the nobles persevered in the contest and were the real masters of Rome. By conferring the patriciate on the emperor, as their feudal chief, they hoped to organize themselves under the prefect, who now, with greatly increased authority, presided over both the civil and criminal courts in the absence of the pope's representative. In a general assembly the Romans elected their prefect, whose investiture was granted by the emperor, while the pope elected another. Thus disorder was brought to a climax.

Gregory VII.

Alexander died on the 21st April 1073, and thereupon Hildebrand was at last raised to the chair as pope Gregory VII. (1073–85). He reconfirmed his predecessors' decrees, dismissed all simoniacal and non-celibate priests, and then in a second council (1075) forbade the clergy to receive investiture at the hands of laymen. No bishop nor abbot was again to accept ring or crozier from king or emperor. Now, as ecclesiastical dignities included the possession of extensive benefices, privileges and feudal rights, this decree gave rise to tremendous dispute and to fierce contest between the empire and the church. The nobles took a very decided part in the struggle. With Cenci, their former prefect, at their head, they rose in revolt, assailed the pope on Christmas day 1075, and threw him into prison. But their fear of the popular wrath compelled his speedy release; and he then decreed the excommunication and deposition of the emperor who had declared him deposed. That monarch afterwards made submission to Gregory at Canossa (1077), but, again turning against him, was again excommunicated. And in 1081 he returned to Italy bringing the antipope Clement III., and besieged Rome for forty days. Assembling the nobles in his camp, he there arranged a new government of the city with prefect and senate, palatine judges and other magistrates, exactly similar to the existing government within the walls. He then took his departure, returned several times in vain, but at last forced his way into the city (March 1084) and compelled Gregory VII. to seek refuge in the castle of St Angelo. The emperor was then master of Rome, established the government he had previously arranged and, calling a parliament of nobles and bishops, procured the deposition of Gregory and the consecration of Clement III., by whom he was crowned in 1084. He then attacked and seized the Capitol, and assaulted the castle in order to capture the pope. But Robert Guiscard brought his army to the rescue. Emperor and antipope fled; the city was taken, the pope liberated and Rome reduced to ruin by fire and pillage. Upon this Gregory VII., broken with grief, went away with the Normans, and died at Salerno on the 25th May 1085. He had separated the church from the people and the empire by a struggle that, as Gregorovius says, disturbed the deep sleep of the middle ages.

Paschal II. and the nobles.

Pope Paschal II. (1099–1118) found himself entirely at the mercy of the tyrannous nobles who were alike masters of Rome, of its government, and its spiritual lord. As they were divided among themselves, all the pope could do was to side with one party in order to overcome the other. With the help of his own nephew Gualfredo, the prefect Pietro Pierleone, and the Frangipani, he was able to keep down the Corsi, and hold the Colonna in check. Being compelled to repair to Benevento in 1108, he left Gualfredo to command the militia, Tolomeo of Tusculum to guard the Campagna, and the consuls Pierleone and Leone Frangipani, together with the prefect, in charge of the government. The consulship was no longer a mere title of honour. The consuls seem to have been elected, as at Ravenna, in imitation of those of the Lombard cities, and were at the head of the nobles and senate. The expressions "praefectus et consules," "de senatoribus et consulibus," are now of frequent occurrence. We have no precise knowledge of the political organization of the city at this moment; but it was an aristocratic government, similar to that originally formed in Florence, as Villani tells us, with a senate and consuls. The nobles were so completely the masters that the pope, in spite of having trusted them with the government, could only return to Rome with the aid of the Normans. Being now absorbed in the great investiture question, he had recourse to a daring plan. He proposed to Henry V. that the bishops should resign all property derived from the crown and depend solely on tithes and donations, while the empire should resign the right of investiture. Henry seemed disposed to accept the suggestion, but, suddenly changing his mind, took the pope prisoner and forced him to yield the right of investiture and to give him the crown (1111). But the following year the party of reform annulled in council this concession, which the pope declared to have been extorted by force. By the death of Countess Matilda in 1115 and the bequest of her vast possessions to the Holy See, the pope's dominions were greatly enlarged, but his authority as a ruler was nowise increased. Deeds of violence still continued in Rome; and then followed the death of the prefect Pietro. The nobles of the imperial party, joined with the people, wished to elect Pietro's son, also nephew to Tolomeo of Tusculum, who then held the position of a potent imperial margrave, had territories stretching from the Sabine mountains to the sea, was the dictator of Tusculum, master of Latium and consul of the Romans. The pope opposed this election to the best of his strength; but the nobles carried the day, and their new prefect received investiture from the emperor. Upon this the pope again quitted Rome, and on his return, two years later, was compelled to shut himself up in the castle of St Angelo, where he died in 1118.

New power of the people.

The popes were now the sport of the nobles whom they had aggrandized by continual concessions for the sake of peace. And peace seemed at hand when Innocent II. (1130–43), after triumphing over two antipopes, came to terms with Roger I., recognized him as king of Sicily, and gained his friendship and protection. But now still graver tumults took place. In consequence of the division of the nobles neither party could overcome its foes without the aid of the people, which thus became increasingly powerful. Throughout upper and central Italy the cities were being organized as free and independent communes on a democratic basis. Their example soon followed in the ancient duchy of Rome and almost in the immediate neighbourhood of the city. Even Tivoli was converted into a republic. This excited the deepest jealousy in the Romans, and they became furious when this little city, profiting by its strong position in the Teverone valley, not only sought to annex Roman territory, but dared to offer successful resistance to the descendants of the conquerors of the world. In 1141 Tivoli openly rebelled against the mother city, and the pope sent the Romans to subdue it. They were not only repulsed, but ignominiously pursued to their own gates. Afterwards, returning to the assault in greater numbers, they conquered the hostile town. Its defenders surrendered to the pope, and he immediately concluded a treaty of peace without consulting either the people or the republic. The soldiery, still flushed with victory, were furious at this slight. They demanded not only submission of Tivoli to the Roman people, but also permission to demolish its walls and dwellings and expel its population. Innocent II. refused consent to these excesses, and a memorable revolution ensued by which the temporal power of the papacy was entirely overthrown.

Popular revolution. Reconstruction of senate and republic.

In 1143 the rebellious people rushed to the Capitol, proclaimed the republic, reconstituted the senate, to the almost entire exclusion of the nobles, declared the abolition of the temporal power, issued coin inscribed to the senate, the people and St Peter, and began to reckon time from the day of the restoration of liberty. Arnold of Brescia was not, as has been incorrectly stated, the author of this revolution, for he had not yet arrived in Rome. It was the outcome of an historic necessity —above all, of the renewed vigour of the people and its detestation of the feudal aristocracy. This body, besides being divided into an imperial and a national party, had almost excluded from the government the powerful baronage of the Campagna and the provinces. Also, as we have before noted, the Roman aristocracy was by no means an exclusive caste. Between the great aristocrats and the people there stood a middle or new nobility, which made common cause with the people, whose chief strength now lay in the army. This, divided into twelve and then into thirteen or fourteen regions, assembled under its banners all arm-bearing citizens. Thus the *exercitus* was also the real *populus Romanus*, now bent on the destruction of the temporal power. This purpose, originating in the struggle of the investitures, was the logical and inevitable result of the proposals of Paschal II., which, despite their rejection, found a loud echo in Italy. Lucius II. (1144–45) tried to withstand the revolution by seeking Norman aid and throwing himself into the arms of the feudal party, but this only precipitated the course of events. The people, after having excluded nearly all aristocrats from the senate, now placed at its head the noble Giordano dei Pierleoni, who had joined the revolutionary party. They named him patrician, but without prejudice to the authority of the empire, still held by them in respect, and also conferred on him the judicial powers appertaining to the aristocratic and imperial office of prefect. The pope was requested to resign the temporal power, the regalia and every other possession, and content himself with the tithes and offerings of the faithful according to the scheme of Paschal II. He indignantly refused, marched at the head of the nobles against the Capitol, but was violently repulsed, and received a blow on the head from a stone, which is supposed to have occasioned his speedy death on the 15th February 1145. Eugenius III. was then elected (1145–53), but soon had to fly to Viterbo in quest of armed assistance, in consequence of the senate's resolve to prevent his consecration by force until he recognized the new state of things in the Eternal City.

Arnold of Brescia.

It was at this moment that Arnold of Brescia arrived in Rome. His ideas, already well known in Italy, had inspired and promoted the Roman revolution, and he now came to determine its method and direction. Born at Brescia in the beginning of the 12th century, Arnold had studied in France under the celebrated Abelard, who had instructed him in theology and philosophy, inspired him with a great love for antiquity, and stimulated his natural independence of mind. On returning to his native land he assumed the monkish habit, and proved the force and fervour of his character by taking part in all struggles for liberty. And, together with political reform, he preached his favourite doctrine of the necessary renunciation by the clergy of all temporal wealth. Expounded with singular eloquence, these doctrines had a stirring effect on men's minds, spread throughout the cities of northern Italy, and were echoed on all sides. It seems undoubted that they penetrated to Rome and helped to promote the revolution, so that Arnold was already present in spirit before he arrived there in person. It is known that at the Lateran council of 1139 Innocent II. had declared these doctrines to be inimical to the church and enjoined silence on their author. And, as at that time the party hostile to liberty was triumphant in Brescia, Arnold left his native place, crossed the Alps and returned to France, where other struggles awaited him. He professed no anti-Catholic dogmas,—only maintaining that when the pope and the prelacy deviated from the gospel rule of poverty they should not be obeyed, but fearlessly opposed. In France, finding his master, Abelard, exposed to the persecutions of St Bernard, he assumed his defence with so much ardour that St Bernard directed the thunders of his eloquence against the disciple as well as the master, saying of the former, "He neither eats nor drinks, suffers hunger, and, being leagued with the devil, only thirsts for the blood of souls." In 1142 we find Arnold a wanderer in Switzerland, and then, suddenly reappearing in Italy, he arrived in Rome.

Three different elements entered into his nature and inspired his eloquence—an exalted and mystic temperament, a great and candid admiration for classic antiquity added to an equal admiration for republican freedom independent of the church and the empire, and a profound conviction, derived from the Vaudois and Paterine doctrines, that the church could only be purified by the renunciation of temporal wealth. Finding Rome already revolutionized in accordance with his own ideas, he immediately began to preach there. His mystic exhortations against the riches of the church had an inflammatory effect, while his classical reminiscences aroused the enthusiasm of the Romans, and his suggestion that they should imitate the republican institutions of upper Italy met the necessities of the time that had created the revolution. He urged the reconstitution of the ancient senate and senatorial order, which indeed was already partially accomplished, and of the ancient equestrian order, and the reconstruction and fortification of the Capitol. His proposed senate was a body somewhat resembling the communal councils of upper Italy, his equestrian order a mounted force composed of the lesser nobility, since at Rome, as elsewhere, the lower classes had neither time nor means to form part of it. All his suggestions were accepted; the citizens laboured strenuously on the fortification of the Capitol. The pope soon beheld the revolution spread beyond the walls, and several cities of the state proclaimed their independence. The barons of the Campagna profited by the opportunity to act as independent sovereigns. Thus the whole domain of the church was threatened with dissolution. The pope marched towards Rome with his newly gathered army, but hoped to come to terms. The Romans in fact recognized his authority, and he in his turn recognized the republic. The office of patrician was abolished, and seems to have been replaced by that of gonfalonier, and the prefect, answering to the podestà of the other republics, was revived. The senators received investiture from the pope, who returned to Rome at Christmas 1145.

There public now seems to have been fully constituted. The senate was drawn from the lower classes and the petty nobility, and this was the special characteristic of the new revolution. In 1144 there were fifty-six senators, probably four to each of the fourteen regions, but the number often varied. By the few existing documents of the period we notice that the senators were divided into *senatores consiliarii* and ordinary senators. The former constituted a smaller council, which, like the *credenza* or lesser council found in other cities, consulted with the head or heads of the republic on the more urgent and secret affairs of the state. And, conjointly with the rest of the senators, it formed the greater council. Thus classic traditions were identified with new republican usages, and the commonwealth of Rome resembled those in other parts of Italy. But, of course, every republic had special local customs of its own. So the Roman senate had judicial as well as political attributes, and there was a *curia senatus* composed of senators and legal experts.

As was easily to be foreseen, the agreement with the pope was of short duration. The revolution could not be checked; the Romans desired independence, and their spiritual lord fled to France, whence, in 1147, he proclaimed a new crusade, while the Romans were employed in demolishing Tivoli, banishing its inhabitants, and waging war on other cities. Giordano Pierleone was gonfalonier and head of the republic, and Arnold, supported by the popular favour and the enthusiasm of the lower clergy, was preaching with even greater fervour than before. But the pope now re-entered Italy, proclaimed Arnold a schismatic, and then advancing to Tusculum assembled an army in order to attack Rome. In this emergency the Romans applied to Conrad III., the first emperor of the house of Hohenstaufen; and their urgent letters are clearly expressive of Arnold's theories and his medley on ancient and modern, sacred and profane, ideas. "Rome," so they said, "is the fountain of the empire confided to you by the Almighty, and we seek to restore to Rome the power possessed by her under Constantine and Justinian. For this end we conquered and destroyed the strongholds of the barons who, together with the pope and the Normans, sought to resist us. These are now attacking us on all sides. Haste to Rome, the capital of the world, thus to establish thy imperial sway over the Italian and German lands."

After long hesitation the king of the Romans at last replied to these appeals, stating that he would come "to re-establish order, reward the faithful, and punish the rebellious." These words promised ill. In fact Conrad had already arranged terms with the pope; but his life came to an end on the 15th of February 1152.

Frederick I.

He was succeeded by Frederick I. surnamed Barbarossa, who took no notice of the numerous letters urging him to come and receive the empire from the Roman people, which alone had the right of conferring it. In accordance with his design of subduing all the independent cities, he made an agreement with the pope, in which he vowed to give no truce to the Romans, but subject them to their spiritual lord, whose temporal power should be restored. The pope, on his side, promised to crown him emperor. Thereupon the people again rose to arms, and Arnold broke off all negotiations with Eugenius III. The senate was reorganized, formed of one hundred members, and, according to the old Roman precedent, had two consuls, one for internal and the other for external affairs. Frederick was a daring statesman, a valiant soldier in command of a powerful army, and was no friend of half measures. Accordingly the nobles ventured on reaction. Finally, to increase the gravity of the situation, an English pope, Adrian IV., was elected (1154–59), who was also a man of strong and resolute temper. In fact, even before being able to take possession of the Lateran, he requested the Romans to banish Arnold, who, with greater eloquence than ever, was directing his thunders against the papacy. These utterances increased the wrath of Adrian, who, encouraged by the knowledge that Frederick and his host were already in Italy, at last launched an interdict against Rome. It was the first time that a pope had ventured to curse the Eternal City. The interdict put a summary stop to the religious life of the inhabitants. Men's minds were seized with a sudden terror, and a fierce tumult broke out. Thereupon the senators, whose opposition to the pope was less courageous than that of the fallen magnates, prostrated themselves at his feet and implored pardon. But Adrian demanded the expulsion of Arnold before consenting to raise the interdict. Arnold was therefore obliged to leave Rome. After having for nine years preached successfully in favour of liberty, after having been the moving spirit of the new revolution, the new constitution, he was now abandoned by all, and forced to wander from castle to castle, in the hope of reaching some independent city capable of shielding him from the fierce enmity of the pope. Meanwhile Frederick I. had achieved his first victories in Lombardy, and, leaving ruined cities and bloodshed in his track, was rapidly advancing towards central Italy. The pope sent three cardinals to him, with a request for the capture and consignment of Arnold, who had taken refuge in the castle of the Visconti of Campagnatico. Frederick without delay caused one of the Visconti to be seized and kept prisoner until Arnold was given up, and then consigned the latter to the papal legates. The pope in his turn gave the reformer into the hands of the prefect, Pietro di Vico, who immediately hanged his prisoner, burnt his body at the stake and cast his ashes into the Tiber. The execution took place in June 1155. The exact date and place of it are unknown; we only know that Arnold met his fate with great serenity and firmness.

Arnold's execution.

But the Romans who had so basely deserted their champion would not give up their republic. Their envoys went to meet Frederick near Sutri, and made an address in the usual fantastic style on the privileges of the Roman people and its sole right to confer the imperial crown. But Frederick indignantly cut short their harangue, and they had to depart full of rage. He then continued his march, and, entering Rome on the 18th of June 1155, was forthwith crowned in St Peter's by the pope. Thereupon the Romans rushed to arms, and made a furious attack on the Leonine city and the imperial camp. A desperate battle went on throughout the day; and the knights proved that the equestrian order instituted at Arnold's suggestion was no empty sham. About a thousand Romans perished by the sword or by drowning, but their fellow-citizens made such determined preparations to continue the struggle that Frederick, on the 19th of June, hastily retreated, or rather fled, and was escorted as far as Tivoli by the pope and the cardinals. After all, the temporal power of the papacy was not restored, and the republic still survived in the form bestowed on it by Arnold of Brescia. Its existence was in truth favourable rather than injurious to Frederick, whose aim was to rule over Rome and treat the bishops as his vassals. He had not yet discerned that his best policy would have been to use the republic as a lever against the pope. The latter, with keener acumen, while remaining faithful to the feudal party in Rome, made alliance with the communes of Lombardy and encouraged them in their resistance to the emperor. Adrian IV. died in 1159, and the national party elected Alexander III. (1159–81), who energetically opposed the pretensions of Frederick, but, having to struggle with three antipopes successively raised against him by the imperial party, was repeatedly driven into exile. During these schisms the senate quietly carried on the government, administered justice, and made war on some neighbouring cities and barons. An army comprising many nobles of the national party marched against Tusculum, but found it defended by several valiant officers and a strong band of German soldiery, who, on the 29th of May 1167, inflicted on the Romans so severe a defeat that it is styled by Gregorovius the Cannae of the middle ages. Shortly afterwards the emperor arrived in Rome with his antipope Paschal III., and Alexander had to fly before him to Benevento. Then, at last, Frederick came to terms with the republic, recognized the senate, which accepted investiture at his hands, re-established the prefecture as an imperial office, and bestowed it on Giovanni, son of Pietro di Vico. He then hastily departed, without having advanced outside the Leonine city.

The republic still remains.

Agreement between the republic and the pope.

Meanwhile Pope Alexander continued the crafty policy of Adrian and with better success, for the Lombard cities had now formed a league and inflicted a signal defeat on the emperor at Legnano on the 29th of May 1176. One of the results of this battle was the conclusion of an agreement between the pope and the emperor, the latter resigning his pretensions on Rome and yielding all that he had denied to Adrian. And by the treaty of Venice (1st of August 1177) the antipope was forsaken, Alexander III. recognized and hailed as the legitimate pontiff, and the prefect of Rome again nominated by the pope, to whom the emperor restored the temporal power, acknowledging him the independent sovereign of Rome and of the ecclesiastical state, from Acquapendente to Ceprano. Frederick's troops accompanied the pope to Rome, where the republic was forced to make submission to him. But, proudly conscious as it still was of its strength, its surrender wore the aspect of a voluntary concession, and its terms began with these words: "Totius populi Romani consilio et deliberatione statutum est," &c. The senators, elected yearly in September, had to swear fealty to the pope, and a certain proportion of nobles was included in their number. On his return to Rome, Alexander received a solemn welcome from all, but he had neither extinguished nor really subdued the republic. On the contrary, men's minds were more and more inflamed by the example of freedom displayed in the north of Italy. He died on the 30th of August 1181. The fact that between 1181 and 1187 there were three popes always living in exile proves that the republic was by no means crushed. During the same period another blow was inflicted on the papacy by the marriage of Henry VI., son and successor to Frederick I., with Constance, sole heiress of the Norman line in Naples. For thus the kingdom was joined to the empire, and the popes were more than ever in the latter's power. On the 20th of December 1187 Clement III. (1187–91), being raised to the pontificate, made a solemn agreement with the government of the Capitol before coming to Rome. And this peace or *concordia* had the air of a treaty between potentates of equal importance. Rome confronted the pope from the same standpoint from which the Lombard cities had confronted the emperor after Legnano. This treaty, the basis of the new constitution, was confirmed on the last day of May 1188 (Anno XLIV. of the senate). It begins with these words: "Concordia inter Dominum Papam Clementem III. et senatores populumque Romanum super regalibus et aliis dignitatibus urbis." The pope was recognized as supreme lord, and invested the senators with their dignity. He resumed the privilege of coinage, but allowed one-third of the issue to be made by the senate. Almost all the old pontifical rights and prerogatives were restored to him. The pope might employ the Roman militia for the defence of his patrimony, but was to furnish its pay. The rights of the church over Tivoli and Tusculum were confirmed; but the republic reserved to itself the right of making war on those cities, and declared its resolve to dismantle and destroy the walls and castle of Tusculum. In this undertaking the pope was to co-operate with the Romans, even should the unhappy city make surrender to him alone.

Rome independent of the empire.

The nobles re-enter the senate.

Popular revolution and counter-revolution of the aristocracy.

From all this it is clear that the church had been made independent of the empire, and that the republic, despite its numerous concessions, was by no means subject to the church. The pope, in fact, had obtained liberty of election, and Frederick I., by resigning the investiture of the prefect, had virtually renounced his claim to imperial power in Rome. The republic had no patrician nor any other imperial magistrate, and preserved its independence even as regarded the pope, who merely granted investiture to magistrates freely chosen by the people, and had no legislative nor administrative power in the city. His temporal dominion was limited to his great possessions, to his regalia, to a supreme authority that was very indefinite, and to a feudal authority over the barons of the Campagna and many cities of a state that seemed ever on the point of dissolution. The senate continued to frame laws, to govern, and to administer justice. The army carried on the wars of the republic, as we see by the tragic fate of Tusculum, which was razed to the ground on the 19th of April 1191. Thus the powerful counts of Tusculum disappeared; they sought refuge in the Campagna, and according to all probability the no less potent family of the Colonna sprang from their line. In consequence of these events, the nobles realized that the papacy sought to reduce them to vassalage. And, seeing that the republic remained firmly established and able to help them, they began to adhere to it and succeeded in obtaining admission to the new senate. In fact, whereas since 1143 plebeians and petty nobles had prevailed in its ranks, nobles of ancient descent are now found outnumbering the knights and burghers. But in 1191 this state of things caused a sudden popular outbreak which abolished the aristocratic senate and gave the headship of the republic to a single senator, *summus senator*, named Benedetto "Carissimus" or "Carus Homo" or "Carosomo," of unknown, but undoubtedly plebeian, origin. During the two years he remained in office this personage stripped the pope of his revenues, despatched *justitiarii* even to the provinces, and with the aid of the parliament and other popular assemblies promulgated laws and statutes. But he was overthrown by a counter-revolution, and Giovanni Capoccio of the party of the nobles became senator for two years, and had been succeeded by one of the Pierleoni when, in 1197, a fresh revolution re-established a senate of fifty-six members, chiefly consisting of feudal barons in high favour with Henry VI., who had revived the imperial faction in Rome. But this emperor's life ended the same year as the pope's, in 1198, and the new pontiff, Innocent III. (1198–1216), began to make war on the nobles, who were again masters of the republic. Their leader was the prefect Pietro di Vico. Owing to the revolution of 1143, most of the prefectorial attributes were now vested in the senate; nevertheless, Pietro still retained a tribunal of police both within and without the

The office of prefect becomes hereditary.

city. But his main strength was derived from the vast possessions of the Vico family, in which the office of prefect now became hereditary. Very soon, however, these prefects of Vico were chiefly regarded as the great feudal lords of Tuscia, and the independent municipal office lost its true character. Then the popes made a point of according great pomp and dignity to this nominal prefect, in order to overshadow the senator, who still represented the independence of the republic and had assumed many of the attributes wrested from the prefect.

Innocent III. elects the senate.

But Innocent III., dissatisfied with this state of things, contrived by bribing the people to arrogate to himself the right of electing the senator, who had now to swear fealty and submission to the pope; and also that of nominating the provincial *justitiarii*, formerly chosen by the government of the Capitol. This was a deadly blow to the republic, for the principal rights of the people—*i.e.* the election of pope and emperor, prefect and senate—were now lost. The general discontent provoked fresh revolutions, and Innocent III. employed all his political dexterity to ward off their effects. But shortly afterwards the people made a loud outcry for a senate of fifty-six members; and the pope, again making a virtue of necessity, caused that number to be chosen by twelve *mediani* specially named by him for the purpose. Even this did not calm the popular discontent, which was also stirred by other disputes. The consequence was that when, six months later, the pope again elected a single senator the Romans rose to arms, and in 1204 formed a government of *Buoni Uomini* in opposition to that created by the pope. But an amicable arrangement being concluded, the pope once more nominated fifty-six senators; and when, soon after, he again reduced them to one, the people were too weary to resist (1205). Thus the Capitol was subdued, and Innocent III. spent his last years in tranquillity.

The republic regains independence.

On the 22nd of November 1220 Honorius III. (1216–27) conferred the imperial crown on Frederick II., who confirmed to the church the possession of her former states, of those bequeathed to her by Countess Matilda, and even of the March of Ancona. But it was soon seen that he sought to dominate all Italy, and was therefore a foe to be dreaded. The successor of Honorius, Pope Gregory IX. (1227–41), was speedily insulted and put to flight by the Ghibelline nobles, whose courage had revived, and the republic began to subdue the Latian cities on its own account. Peace was several times made and unmade by pope and people; but no enduring harmony was possible between them, since the former wished to subject the entire state to the church, and the latter to escape from the rule of the church and hold sway over "the universal land from Ceprano to Radicofani" formerly belonging to the duchy. Accordingly, the Roman people now appointed judges, imposed taxes, issued coin, and made the clergy amenable to secular tribunals. In 1234 the senator Luca Savelli published an edict declaring Tuscia and Campania territories of the republic, and sent judges thither to exact an oath of obedience. He also despatched the militia to the coast, where it occupied several cities and erected fortresses; and columns were raised everywhere inscribed with the initials S. P. Q. R. The pope, unable to prevent but equally unable to tolerate these acts, fled from Rome, hurling his anathema against Savelli, "et omnes illos consiliarios urbis quorum consilio," &c. The Romans sacked the Lateran and the houses of many cardinals, and marched on Viterbo, but were driven back by the papal troops. When Savelli left office and Angelo Malabranca was elected in his stead, the people made peace and submission in 1235, and were obliged to give up their pretensions of subjecting the clergy to ordinary tribunals and the urban territory to the republic. Thus matters were virtually settled on the footing established by Innocent III., thanks to the aid given to the pope by Frederick II., who had been one of the promoters of the rebellion.

The republic submits to the people.

Formation of the greater and lesser councils.

It may appear strange that, at this period of their history, the Romans, after showing such tenacious adherence to the republic and senate, should have accepted the rule of a single senator without rushing to arms, and passed and repassed from one form of government to another with such surprising indifference. But on closer examination it is plain that these changes were greater in appearance than reality. We have already seen, in treating of Carosomo, how the single senator convoked the people in parliament to pass sanction on the laws. But, whenever there is only one senator, we also continually meet with the expression "consilium vel consilia urbis." It is evident that when, instead of laws to be approved in parliament by a simple placet or rejected by a non-placet, matters requiring consideration had to be discussed, the senator convoked a much smaller council, consisting only of the leaders of the people. These leaders were the heads of the twelve or thirteen regions of the guilds, now becoming organized and soon to be also thirteen in number, and of the militia. As in the other Italian republics, all these associations had been formed in Rome.

The senator therefore held consultation with the leading men of the city; and, although, especially at first, these meetings were rather loosely organized, it is clear that they took the form of two councils—one numerous (*consiglio maggiore*), the other limited (*consiglio minore* or *speciale*), co-operating with and forming part of the first. Such was the prevailing custom throughout Italy at the time when Roman institutions most nearly resembled those of the other republics. We already know that, from the date of Arnold's reforms, the senate, with its junta of counsellors, had been divided into two parts, forming when united a species of greater council. Therefore the transition from a senate divided into two parts to the greater and lesser councils must have been very easy and natural. And, seeing that later, when the nomination of a single senator had become a constant practice, the meetings of the two councils are frequently mentioned without the slightest remark or hint as to their origin, it is clear that they had been gradually formed and long established. Not long after the revolution of 1143 the grandees sought to re-enter the senate; and the popes themselves, partly from dread of the people and partly to aggrandize their own kindred, contributed to build up the power of a new and no less turbulent nobility. This class, arising between the 12th and 13th centuries, was composed of families newly created by the popes, together with remnants of the old aristocracy, such as the Frangipani, Colonna, &c. These nobles, regaining possession of the senate, so completely eliminated the popular element that, when the popes again opposed them, and, obtaining from the parliament the right of electing the senators, adopted the expedient of appointing one only, the senator was always chosen from the ranks of the nobles. And then the people, unable and unwilling to renounce republican forms, replaced their suppressed senate by a greater and a lesser council. This was an easy task—a natural consequence of the fact that the people now began to constitute the real strength of the republic. Later, with an increasing detestation for their nobility, the Romans decreed that the single senator should be of foreign birth, and, as we shall see, chose Brancaleone in the middle of the 13th century.

The Roman statutes.

Thus, after a long series of frequent changes and revolutions, the Roman republic became a commonwealth, with an increasing resemblance to those of the other Italian cities. The people were organized and armed, the gilds almost established, the two councils gradually constituted, and the aristocracy, while retaining special local characteristics, assumed its definitive shape. It is not surprising to find that Rome, like other Italian cities, now possessed statutes of its own. There has been much controversy on this point. Certain writers had alluded to a statute of 1246. As no one, however. could discover any statute of that date, others decided that it had never existed. A statute of 1363 was recently published by Professor Camillo Re, who asserted it to be the first and most ancient that Rome had possessed. But the still more recent researches of Messrs La Mantia and Levi prove that Professor Re's assertions were somewhat too bold. There is certain evidence of a *statutum senatus* existing between 1212 and 1227, of a *statutum vel capitulare senatoris vel senatus* of 1235, followed in 1241 by a *statutum urbis*. This brings us very near to the statute of 1246 mentioned by Vitale and others. So it is well ascertained that, in the first half of the 13th century, Rome possessed statutes at large composed of older limited statutes. The consuls of the trade gilds were from 1267 regular members of the councils; and the merchants' gild held general meetings in 1255. Its statutes were confirmed in 1296 by the senator Pandolfo Savelli, and the compilation of these, published in 1880 by Signor Gatti, refers to 1317.

Frederick II. and the pope.

Meanwhile the struggle between Frederick II. and the pope was once more renewed. The former sought to dominate Italy, separate the state from the church, and repress the republics. The latter, although really hostile to the Roman free government, joined it against the emperor, who on his side favoured the republic of Rome and the nobles most adverse to the pope. Thus the new nobility, composed, as we have seen, of two different elements, was again split into a Guelph party headed by the Orsini and a Ghibelline party under the Colonna. And in 1238 it was deemed advisable to elect two senators instead of one, in the hope of conciliating both factions by simultaneously raising them to power. Afterwards one only was elected, alternately an Orsini and a Colonna, then again two, and so on. But all these changes failed in their aims, since the struggle between emperor and pope exasperated party feeling in Rome. Frederick was king of southern Italy and emperor; had he been able to enforce the whole of his authority he would have been absolute master of all Italy, a state of things which the popes could not in any way tolerate. Hence the obstinate and uninterrupted struggle which proved injurious both to the papacy and the empire. The political genius of Frederick might have wrought great harm to the city had not his mind teemed with contradictory ideas. Although desirous to emancipate the state from the church, he was opposed to the communal democracy, which was then the chief strength of the secular state in Italy. While combating the church and persecuting her defenders, he yet sent heretics to the stake; although excommunicated, he undertook a crusade; he feasted at his table philosophers, sceptic and atheist poets, bishops and Mussulmans; he proclaimed anti-Christian the possession of wealth by the church, yet made lavish gifts to altar and monastery. Thus, although he had a strong party in Rome, it seemed to dissolve at his approach, inasmuch as all feared that he might abolish the statutes and liberties of the commune. In fact, when he advanced towards Rome on the death of Gregory IX. in 1241 he was energetically repulsed by the people, and later even by Viterbo, a city that had always been faithful to him. But after he had withdrawn, his adherents gained strength and put to flight his opponent, Innocent IV. (1243–54), the newly elected pope, who then from his asylum at Lyons hurled an excommunication against him. Frederick's death in December 1250 determined the fall of the Ghibelline party and the close of the imperial epoch in Italy. The pope instantly returned to Rome with the set purpose of destroying the power of the Hohenstaufens. This was no longer difficult when, by the decease of Conrad IV. (1254), the child Conradin became the last legitimate representative of that line, and negotiations were already on foot for placing the Angevins on the Neapolitan throne.

The republic meanwhile preserved its independence against the pope, who, among other concessions, had entirely given up to it the right of coinage. Nevertheless, being much harassed by the factiousness of the nobility, it was obliged in 1252 to decide on the election of an alien senator armed with ample powers, precisely as other communes gave the government into the hands of a podestà. Accordingly a Bolognese noble, Brancaleone degli Andalò, count of Casalecchio, and a Ghibelline of much energy and talent, was invited to Rome. But before accepting office he insisted on making definite terms. He desired to hold the government for three years; and this, although contrary to the statutes, was granted. Further, to ensure his personal safety, he demanded that many scions of the noblest Roman houses should be sent as hostages to Bologna; and to this also the republic consented. Then, in August 1252, he came with his judges and notaries, made oath to observe justice and the laws, and began to govern. He was head of the republic in peace and in war, supreme judge and captain in chief. He nominated the podestàs of subject territories, despatched ambassadors, issued coin, concluded treaties and received oaths of obedience. The pope, who was then at Perugia, was greatly afflicted by the arrival of this new master, but, despairing of aid from any quarter, was forced to make a virtue of necessity. Thus Brancaleone was able to seize the reins of power with a firm grasp. The parliament still met in the square of the Capitol, and the greater and lesser councils in the church of Ara Coeli. There were besides frequent assemblies of the college of Capitoline judges or *assectamentum*. Unfortunately, no records having been preserved of the proceedings of the Roman councils and parliament, little can be said of the manner in which affairs were conducted. Certainly Brancaleone's government was not very parliamentary. He convoked the councils as seldom as was possible, although he frequently assembled the people in parliament. The chief complaint made against him was of undue severity in the administration of justice. He rendered the clergy amenable to secular tribunals, subdued the neighbouring cities of Tivoli, Palestrina, &c., and commanded in person the attacking force. But his greatest energy was directed to the repression of the more turbulent nobles who were opposed to him; and he soon made them feel the weight of his hand by hanging some, banishing others, and persecuting several more. But he too recognized the expediency of winning the popular favour. He was the first senator to add to his title that of captain of the people ("Almae Urbis Senator Ill: et Romani Populi Capitaneus"). He befriended the people by promoting the organization of gilds after the manner of those of his native Bologna. There were already a few in Rome, such as the merchants' gild and that of the agriculturists, *Bobacteriorum* or *Bovattari*, who must have resembled the so-called *mercanti di campagna* or graziers of the present day, since no peasant gild existed in Italian republics. The merchants' gild, definitely established in 1255 under Brancaleone's rule, had four consuls and twelve councillors, held meetings and made laws. The other gilds, thirteen in all, were organized much on the same plan. The admission of their heads into the councils of the republic in 1267 shows how efficaciously their interests had been promoted by Brancaleone.

Brancaleone degli Andalò, the first foreign senator.

The death of Innocent IV. and the election of Alexander IV. (1254–61), who was milder and less shrewd than his predecessor, were favourable events for Brancaleone; but he failed to check the growing discontent of the clergy and the more powerful nobles, who had received deadly injuries at his hands. And when, on the expiration of his three years' term of office, his re-election was proposed, his enemies rose against him, accused him before the *sindacato*, threw him into prison, and vehemently protested against the continuance of "foreign tyranny." His life was only spared on account of the hostages sent to Bologna. The next senator chosen was a Brescian Guelph, Emanuele de Madio, a tool of the nobles, who were now masters of the situation. But soon afterwards, in 1257, the gilds rose in revolt, drove the nobles from power, put the pope to flight, and recalled Brancaleone for another three years' term. He ruled more sternly than before, hung several nobles, and made alliance with Manfred, the representative of the Swabian party in Italy. This rendered him increasingly odious to the pope and procured his excommunication. But, disregarding the thunders of the church, he marched against Anagni, the pope's birthplace, and Alexander was quickly obliged to humiliate himself before the senator of Rome. Brancaleone next set to work to destroy the fortified towers of the nobility, and in razing them to the ground ruined many of the adjacent dwellings. Accordingly, a considerable number of nobles became homeless exiles. In 1258, while engaged on the siege of Corneto, Brancaleone was attacked by a violent fever, and, being carried back to Rome, died on the Capitoline Hill. Thus ended the career of a truly remarkable statesman. He was succeeded by his uncle, Castellano degli Andalò, who, lacking the political genius of his nephew, only retained office until the following spring (1259), in the midst of fierce and perpetual disturbances. Then the people, being bribed by the pope, joined with the nobles and drove him away. His life too was saved by having followed his nephew's shrewd plan of sending hostages to Bologna. Two senators of Roman birth were next elected; and on the death of Alexander IV. a French pope was chosen, Urban IV. (1261–64), thus giving fresh predominance in the church to the anti-Swabian policy. But the internal disturbances of the city soon drove Urban to flight.

Charles of Anjou senator.

Don Henry of Castile senator.

At this period the fall of the empire had induced many Italian republics to seek strength by placing their governments in the hands of some prince willing to swear respect to their laws and to undertake their defence against neighbouring states and the pope. In Rome the Guelphs and Ghibellines proposed various candidates for this office, and after many fierce quarrels ended by electing a committee of *boni homines*, charged with the revision of the statutes, reorganization of the city, and choice of a senator. This committee sat for more than a year without nominating any one, so, the Guelph party being now predominant, and all being wearied of this provisional state of things, the majority agreed on the election as senator of Charles of Anjou, who, at the pope's summons, was already preparing for the conquest of Naples. The Romans thought that he would defend Rome against the pope, and the pope would defend Rome against him; and by thus taking advantage of either's jealousy the citizens hoped to keep their republic intact. In fact, although Urban IV. had incited Charles to attack Naples, he was by no means willing to see him established as master in Rome. He accordingly declared that, if Charles really wished to obtain the Neapolitan crown, he must only accept the offered dignity pending the conquest of that kingdom. And he must likewise promise to recognize the supremacy of the pope over the senate. Charles soothed him with the amplest verbal promises, but in fact accepted the senatorship for life. In 1265, when Urban was succeeded by Clement IV. (1265–68), who as a Provençal was a subject of Charles, the latter entered Rome and was immediately made senator. Seven days later (28th of June) he received the investiture of the Neapolitan kingdom, and in the following January its crown. On the 26th of February 1266 the battle of Benevento was fought, and, the valiant Manfred being killed, the triumph of the Guelph Angevins in Italy was assured. Then, at the urgent command of the pope, Charles was forced to resign the senatorship in the May of the same year. Two Romans were elected in his stead, but soon fell out with the pope, because the Guelph nobles again tried to exercise tyranny. The people, however, profited by these disturbances to rise on its own account, and formed a democratic government of twenty-six *boni homines* with Angelo Capocci, a Ghibelline, as its captain. By this government Don Henry, son of Ferdinand III. of Castile, was elected senator; and he came to Rome for the purpose of promoting a Ghibelline and Swabian policy in favour of Conradin, who was preparing for conflict. The rule of the new senator was very energetic, for he kept down the clergy, subdued the Campagna, persecuted the Guelph nobles, made alliance with the Tuscan Ghibellines, forcibly drove back the troops of King Charles, who was advancing towards Rome, and gave a splendid reception to Conradin. But the battle of Tagliacozzo (23rd of August 1268), followed by the murder of Conradin, proved fatal to the Ghibelline party. Charles was re-elected senator immediately after the battle, and the pope confirmed his powers for a term of ten years, after having already named him imperial vicar in Tuscany. On the 16th of September Charles for the second time took possession of the Capitol, and ruled Rome firmly by means of vice-governors or vicars.

The senate in the hands of the popes.

The Swabian line was now extinct, and in Charles's hands the Neapolitan kingdom had become a fief of the church. The empire had fallen so low as to be no longer formidable. Now therefore was the moment for treating with it in order to restrain Charles, and also for making use of the French king to keep the empire in check. And this was the policy of Nicholas III. (1277–80), who hastened to extract advantageous promises from Rudolph of Habsburg, the new candidate for the imperial crown. In 1278, the ten years' term having expired, he deprived Charles of the senatorship and appointed Rudolph vicar of Tuscany. After declaring that he left to the people the right of electing the senator, he promulgated a new constitution (18th of July 1278) which, while confirming the rights of the church over the city, prohibited the election of any foreign emperor, prince, marquis, count or baron as senator of Rome. Thus the Colonna, Savelli, Orsini, Annibaldi and other Roman nobles again rose to power, and the republic was again endangered and plunged in disorder. The Romans then gave the reconstitution of the city into the pope's hands by yielding to him the right of nominating senators, declaring, however, that this was a personal concession to himself, and not to the popes in general. So Nicholas proceeded to name senators, alternating a Colonna with an Orsini, or simultaneously choosing one of each faction. The same power over the senate was granted with the same restriction to Martin IV. (1281–85), and he at once re-elected Charles of Anjou. Thus, greatly to the disgust of the Romans, the Capitol was again invaded by French vicars, notaries, judges and soldiery. But the terrible blow dealt at Charles's power by the Sicilian Vespers (31st of March 1282) resounded even in Rome. The Orsini, backed by the people, rose to arms, massacred the French garrison, and quickly re-established a popular government. Giovanni Cencio, a kinsman of the Orsini, was elected captain and defender of the people, and ruled the city with the co-operation of the senator and a council of priors of the gilds. This government was of brief duration, for, although the pope had professed his willingness to tolerate the experiment, he quickly arranged fresh terms, and, forsaking Charles of Anjou, again nominated two Roman senators. Pope and king both died in 1285, and Nicholas IV. (1288–92), also holding sway over the senate, favoured the Colonna in order to curb the growing mastery of the Orsini. But thus there were two powerful houses instead of one. In fact, Giovanni Colonna, when elected senator, ruled from the Capitol as an independent sovereign, conducted in person the campaign against Viterbo, and subjected that city to the republic on the 3rd of May 1291.

Boniface VIII.

When one of the Gaetani, Boniface VIII. (1294–1303), was raised to the papal chair, the extent of the Colonnas' power became evident to all. Boniface opposed them in order to aggrandize his own kin, and they showed equal virulence in return. The Cardinals Colonna refused to acknowledge him as the legitimate pope, and he excommunicated them and proclaimed a crusade against their house. Even after he had subdued them and destroyed Palestrina, their principal fief, the drama did not yet come to an end. Boniface had a very lofty conception of the church, and desired to establish her supremacy over the state. The king of France (Philip the Fair) believed, on the contrary, that the Angevin successes entitled him to fill the place in Italy vacated by the Swabians, and to play the master there. This led to a tremendous contest in which all the French sided with their king. And shortly afterwards a plot was hatched against the pope by the agents of France and the Colonna. These determined enemies of the pope met with much favour in Rome, on account of the general irritation against the Gaetani and the enormous power conferred on them by Boniface.

Suffice it to say that they were now lords of the whole of lower Latium, from Capo Circeo to Ninfa, from Ceprano to Subiaco. Thus Sciarra Colonna and a Frenchman named Nogaret were able to fall on the pope at Anagni, insult him, and take him prisoner. The people rising to his rescue, the conspirators were put to flight. But when Boniface returned to Rome with the escort and protection of the Orsini, who had made themselves masters of the city, he found that he was virtually a captive in their hands. He felt this so keenly that he died of rage and exhaustion on the 11th of October 1303. The brief pontificate of his successor Benedict XI. was followed by that of Clement V. (1305–14), a Frenchman, who, instead of coming to Rome, summoned the cardinals to France. This was the beginning of the church's so called exile in Avignon, which, although depriving Rome of a scource of wealth and influence, left the republic to pursue its own course. It employed this freedom in trying to hold its own against the nobles, whose power was much lessened by the absence of the pope, and endeavoured to gain fresh strength by organizing the thirteen regions, which, as we have shown, were associations of a much firmer nature in Rome than the gilds. Accordingly, in 1305, a captain of the people was elected with thirteen elders and a senator, Paganino della Torre, who governed for one year. The pope was opposed to these changes at first, but in 1310 he issued a brief granting Rome full permission to select its own form of government. Thus, the first pope in Avignon restored the rights of the Romans. But the latter, even with church and empire so far removed, still considered Rome the Eternal City, the source of all law, and the only natural seat of the spiritual and temporal government of the world. To their republic, they thought, appertained a new and lofty destiny, nor could it ever be content to descend to the level of other Italian municipalities.

The republic again takes a democratic form.

Henry VII.

On the 6th of January 1309 Henry VII. was crowned king of the Romans at Aix-la-Chapelle; and so greatly were men's minds changed in Italy that, throughout the land, he was hailed as a deliverer. He wished to restore the grandeur of the empire, and the Italians, above all Dante Alighieri, beheld in him the champion of the state against the church, who, after becoming the foe of communal liberty, had forsaken Italy and withdrawn to France. The Roman people shared these ideas, and awaited Henry with equal impatience, but the nobles rose in opposition. The Orsini, leaders of the Guelphs, and allied with Robert of Naples, took possession of the castle of St Angelo and the Trastevere. Hence, when Henry reached Rome in May 1312, after seizing the iron crown at Milan, he was obliged to act on the offensive. He took the Capitol by assault, but, failing in his attack on the castle of St Angelo, was pursued by its Neapolitan garrison. Forsaken by many discouraged adherents, he was forced to recognize the expediency of departure. First, however, he desired to be crowned at the Lateran, St Peter's being held by his foes. The cardinals refused his request, but were compelled to yield by the threats of the people, who, reasserting their ancient rights, insisted that the coronation should take place without delay. And the ceremony was performed on the 29th of June 1312. The emperor then resolved to depart in spite of the popular protest against his leaving the natural seat of the empire, and on the 20th of August started for Tuscany, where worse fortune awaited him.

Jacopo Arlotti, captain of the people.

Their differences settled, the nobles expelled the captain of the people left by Henry, and elected as senators Sciarra Colonna and Francesco Orsini. But this was the signal for a popular revolt. The Capitol was attacked, the senators put to flight, and Jacopo Arlotti elected captain with a council of twenty-six worthies (*buoni homini*). The new leader instantly summoned the chief nobles before his tribunal, had them chained and cast into prison, and demolished many of their houses and strongholds. But, having thus humiliated their pride, Arlotti dared not put them to death, and, releasing them from confinement, banished them to their estates, where they plunged into hostile preparations. Meanwhile the victorious people convoked a parliament and decreed that, the aristocracy being now overthrown, the *tribunitia potestas* alone should invite the emperor to make his triumphal entry into the Capitol, and receive his authority from the people of Rome. This conception of the Roman power will now be seen to become more and more definite until finding its last expression in Cola di Rienzi. Pope Clement, resigning himself to necessity, acknowledged the new government under the energetic rule of Arlotti. The latter now joined the Ghibellines of the Campagna against the Orsini and the Neapolitans, subdued Velletri, and gave it a podestà. But then the Gaetani, who were Guelphs, united with the Orsini and the Neapolitans, and, giving battle to the Ghibellines in the Campagna, routed them in such wise as to put an end to the popular government. The nobles forced their way into the city, attacked the Capitol, made Arlotti their prisoner, and re-elected the senators Sciarra Colonna and Francesco Orsini. Close upon these reverses came the death of Henry VII. (24th of August 1313) at Buonconvento near Siena, which put an end to the Ghibelline party in Italy. Thereupon King Robert of Naples, being named senator by the pope, immediately appointed a vicar in Rome. Clement likewise profited by the vacancy of the imperial throne to name the king imperial vicar in Tuscany. And he died on the 20th of April 1314, well content to have witnessed the triumphs of the Guelphs in Italy.

Sciarra Colonna, captain of the people.

Louis the Bavarian.

Affairs took a fresh turn under Pope John XXII. (1316–34). Rome was still ruled by the vicars of King Robert; but, owing to the continued absence of the popes, matters grew daily worse. Trade and industry declined, revenue diminished, the impoverished nobles were exceedingly turbulent, deeds of murder and violence occurred on all sides; even by day the streets of the city were unsafe. Hence there was universal discontent. Meanwhile Louis the Bavarian, who in 1314 had been crowned king of the Romans, having overcome his German enemies at Mühldorf in 1322, turned against the pope, one of his fiercest opponents. Louis was surrounded by Minorite friars, supporters of the poverty of the church, and consequently enemies to the temporal power. They were men of the stamp of William of Occam, Marsilio of Padua, Giovanni Janduno, and other philosophers favourable to the rights of the empire and the people. Accordingly the Italian Ghibellines hailed Louis as they had previously hailed Henry. Even the Roman people were roused to action, and, driving out the representatives and partisans of King Robert, in the spring of 1327, seized on the castle of St Angelo, and again established a democratic government. "Nearly all Italy was stirred to new deeds," says G. Villani, "and the Romans rose to arms and organized the people" (bk. x. c. 20). Regardless of the reproofs of the pope, they elected a haughty Ghibelline, Sciarra Colonna, captain of the people and general of the militia, with a council of fifty-two *popolani*, four to each region. Then, ranged under the standards of the militia, the Romans gave chase to the foes of the republic, and Sciarra, returning victorious, ascended to the Capitol and invited Louis the Bavarian to Rome. The summons was obeyed; on the 7th of January 1328 the king was already encamped in the Neronian Fields with five thousand horse and a considerable number of foot soldiers, and, with better fortune than Henry VII., was able to enter the Vatican at once.

Encircled by a crowd of heretics, reformers and Minorite brethren, he convoked a parliament on the Capitol, asking that the imperial crown might be conferred upon him by the people, from whom alone he wished to receive it. And the people proclaimed him their captain, senator and emperor. On the 17th of January his coronation took place in St Peter's. But, as he had neither money nor practical sense, his method of taxation and the excesses committed by himself and his over-excited philosophers speedily aroused the popular discontent. His ecclesiastical vicar, Marsilio of Padua, and

Giovanni Janduno placarded the walls with insulting manifestoes against the pope, whom the Minorites stigmatized as a heretic and wished to depose. In April Louis twice assembled the parliament in St Peter's Square, and, after obtaining its sanction to several anti-papal edicts, declared John XXII. degraded and deposed as a heretic. This was a very strange and novel spectacle, the more so that, as was speedily proved, the Romans were stirred by no anti-Catholic spirit, no yearning for religious reform. Jacopo Colonna, a canon of the Lateran, was able to make his way into Rome with four masked companions, to publicly read, at the top of his voice and before a great multitude, the excommunication launched against the emperor by the deposed pope, to traverse the entire city, and to withdraw unmolested to Palestrina. Meanwhile the emperor contented himself with decreeing that henceforth the popes must reside in Rome,—that if, when invited, they should fail to come they would be thereby held deposed from the throne. As a logical consequence, proceedings were immediately begun for the election of the new pope, Nicholas V., who on the 12th of May was proclaimed by the popular voice in St Peter's Square, and received the imperial sanction. But this ephemeral drama came to an end when the emperor departed with his antipope on the 4th of August. This caused the immediate downfall of the democratic government. Bertoldo Orsini, who had returned to Rome with his Guelphs, and Stefano Colonna were elected senators, and confirmed in the office by Cardinal Giovanni Orsini in the name of the pope. A new parliament cancelled the emperor's edicts, and had them burnt by the public executioner. Later, Nicholas, the antipope, went with a rope about his neck to make submission to John XXII., and Louis promised to disavow and retract all that he had done against the church, provided the sentence of excommunication were withdrawn. This, however, was refused. Never had the empire fallen so low. Meanwhile King Robert was again supreme in Rome, and, being re-elected senator, appointed vicars there as before. Anarchy reigned. The city was torn by factions, and the provinces rebelled against the French representatives of the pope, who, in their ignorance of Italian affairs, were at a loss how to act.

Reconstitution of the republic.

And after the election of Benedict XII. (1334–42) confusion reached so great a pitch that, on the expiration of Robert's senatorial term, the Romans named thirteen heads of regions to carry on the government with two senators, while the king still sent vicars as before. The people, for the sake of peace, once more granted the supremacy of the senate to the pope, and he nominated two knights of Gubbio, Giacomo di Cante dei Gabrielli and Bosone Novello dei Gabrielli, who were succeeded by two other senators the following year. But in 1339 the Romans attacked the Capitol, named two senators of their own choice, re-established a democratic government, and sent ambassadors to Florence to ask for the ordinances of justice (*ordinamenti della giustizia*), by which that city had broken the power of the nobles, and also that a few skilled citizens should lend their help in the reconstitution of Rome. Accordingly some Florentines came with the *ordinamenti*, some portions of which may be recognized in the Roman statutes, and, after first rearranging the taxes, elected thirteen priors of the gilds, a gonfalonier of justice, and a captain of the people after the Florentine manner. But there was a dissimilarity in the conditions of the two cities. The gilds having little influence in Rome, the projected reform failed, and the pope, who was opposed to it, re-elected the senators. Thereupon public discontent swelled, and especially when, by the foundation of the papal palace of Avignon, it was evident that Benedict XII. had no intention of restoring the Holy See to Italy. This pope was succeeded in 1342 by Clement VI. (1342–52), and King Robert in 1343 by his niece Joanna; and the latter event, while plunging the kingdom in anarchy, likewise aggravated the condition of Rome. For not only were the Neapolitan sovereigns still very powerful there, but the principal Roman nobles held large fiefs across the Neapolitan borders,

Cola di Rienzi.

Shortly before this another revolution in Rome had re-established the government of the thirteen elders and the two senators. The people, being anxious to show their intention of respecting the papal authority, had despatched to Avignon as ambassador of the republic, in 1343, a man destined to make much noise in the world. This was Cola di Rienzi, son of a Roman innkeeper, a notary, and an impassioned student of the Bible, the fathers, Livy, Seneca, Cicero, and Valerius Maximus. Thoroughly imbued with a half pagan, half Christian spirit, he believed that he had a divinely inspired mission to revive the ancient glories of Rome. Of handsome presence, full of fantastic eloquence, and stirred to enthusiasm by contemplation of the ruined monuments of Rome, he harangued the people with a stilted oratory that enchanted their ears. He hated the nobles, because one of his brothers had been killed by them; he loved the republic, and in its name addressed a stately Latin speech to the astonished pope, and, offering him the supreme power, besought his instant return to Rome. He also begged him to allow the city to celebrate a jubilee every fifty years, and then, as a personal request, asked to be nominated notary to the urban chamber. The pope consented to everything, and Rienzi communicated this good news to Rome in an emphatically worded epistle. After Easter, in 1344, he returned to Rome, and found to his grief that the city was a prey to the nobles. He immediately began to admonish the latter, and then, draped in a toga adorned with symbols, exhibited and explained allegorical designs to the people, and announced the speedy restoration of the past grandeur of Rome. Finally he and a few burghers and merchants, whom he had secretly inflamed by his discourses, made a solemn vow to overthrow the nobility and consolidate the republic. The moment was favourable, owing to the anarchy of Naples, the absence of the pope, the weakness of the empire and the disputes of the barons, although the latter were still very potent and constituted, as it were, a separate government opposed to that of the people. Rienzi, having gained the pope's ecclesiastical vicar to his side, passed in prayer the night of the 19th of May 1347, placing his enterprise under the protection of the Holy Spirit, and the following day marched to the Capitol, surrounded by his adherents, convoked a parliament of the people, and obtained its sanction for the following proposals:—that all pending lawsuits should be at once decided; that justice should be equally administered to all; that every region should equip one hundred foot soldiers and twenty-five horse; that the dues and taxes should be rearranged; that the forts, bridges and gates of the city should be held by the rector of the people instead of by the nobility; and that granaries should be opened for the public use. On the same day, amid general homage and applause, Rienzi was proclaimed head of the republic, with the title of tribune and liberator of the Holy Roman Republic, "by authority of the most merciful Lord Jesus Christ." The nobles withdrew scoffing but alarmed. Rienzi engaged a body-guard of one hundred men, and assumed the command of thirteen hundred infantry and three hundred and ninety light horse; he abolished the senators, retained the Thirteen and the general and special councils, and set the administration on a new footing. These measures and the prompt submission of the other cities of the state brought an instant increase of revenue to Rome.

This revolution, as will be noted, was of an entirely novel stamp. For its leader despatched envoys to all the cities of Italy, exhorting them to shake off the yoke of their tyrants, and send representatives to the parliament convoked for the 1st of August, inasmuch as the liberation of Rome also implied the "liberation of the sacred land of Italy." In Rienzi's judgment the Roman revolution must be, not municipal, but national, and even in some points universal. And this idea was welcomed with general enthusiasm throughout the peninsula. Solemn festivals and processions were held in Rome; and, when the tribune went in state to St Peter's, the canons met him on the steps chanting the *Veni, Creator Spiritus*. Even the pope, willingly or unwillingly, accorded his approval to

Rienzi's deeds. The provincial cities did homage to Rome and her tribune, and almost all the rest of Italy gave him its enthusiastic adherence. The ancient sovereign people seemed on the point of resuscitation. And others besides the multitude were fascinated and carried off their feet. Great men like Petrarch were transported with joy. The poet lauded Cola di Rienzi as a sublime and supernatural being, the greatest of ancient and modern men. But it was soon evident that all this enthusiasm was mainly factitious. On the 26th of July a new parliament was called, and this decreed that all the rights and privileges granted to the empire and church must now be vested in the Roman people, from whom they had first emanated. But on the convocation of the national parliament few representatives obeyed the summons and the scheme was a failure. All had gone well so long as principles only were proclaimed, but when words had to be followed by deeds the municipal feeling awoke and distrust began to prevail. Nevertheless, on the 1st of August Rienzi assumed the spurs of knighthood and passed a decree declaring that Rome would now resume her old jurisdiction over the world, invoking the Holy Spirit upon Italy, granting the Roman citizenship to all her cities, and proclaiming them free in virtue of the freedom of Rome. This was a strange jumble of the ancient Roman idea combined with the medieval. It was a dream of Rienzi's brain, but it was also the dream of Dante and Petrarch. The conception of the empire and the history of Italy, particularly that of ancient and medieval Rome, were inevitably preparing the way for the national idea. This Rienzi foresaw, and this constitutes the true grandeur of his character, which in other respects was not exempt from pettiness and infirmity. He pursued his course, therefore, undismayed, and had indeed gone too far to draw back. On the 15th of August he caused himself to be crowned tribune with great pomp, and confirmed the rights of Roman citizenship to all natives of Italy. But practical matters had also to be taken into account, and it was here that his weakness and lack of judgment were shown. The nobles remained steadily hostile, and refused to yield to the charm of his words. Hence conflict was unavoidable; and at first Rienzi succeeded in vanquishing the Gaetani by means of Giovanni Colonna. He next endeavoured to suppress the Guelph and Ghibelline factions, and to restore Italy to "holy union" by raising her from her present abasement.

The pope, however, was weary of toleration, and, coming to terms with the nobles, incited them to war. They accordingly moved from Palestrina, and on the 30th of November were encamped before Rome. Rienzi now put forth his energy. He had already called the militia to arms, and a genuine battle took place in which eighty nobles, chiefly of the Colonna clan, were left dead. This was a real catastrophe to them, and the aristocracy never again achieved the rule of the republic. But Rienzi's head was turned by this sudden success. In great need of money, he began to play the tyrant by levying taxes and exacting instant obedience. The papal legate saw his opportunity and seized it, by threatening to bring a charge of heresy against the tribune. Rienzi was dismayed. He declared himself friendly to the pope and willing to respect his authority; and he even sought to conciliate the nobles. At this moment certain Neapolitan and Hungarian captains, after levying soldiers with the tribune's consent, joined the nobles and broke out in revolt. On their proving victorious in a preliminary encounter with some of Rienzi's guards, the tribune suddenly lost heart, resigned the power he had held for seven months, and took refuge with a few trusty adherents in the castle of St Angelo on the 15th December 1347. Thence he presently fled to Naples, vainly hoping to find aid, and afterwards disappeared for some time from the scene.

Meanwhile the Romans remained tranquil, intent on making money by the jubilee; but no sooner was this over than disorders broke out and the tyranny of the baronage recommenced. To remedy this state of things, application was made to the pope. He consulted with a committee of cardinals, who sought the advice of Petrarch, and the poet suggested a popular government, to the complete exclusion of the nobles, since these, he said, were strangers who ruined the city. The people had already elected the Thirteen, and now, encouraged by these counsels, on the 26th of December 1351 chose Giovanni Perrone as head of the republic. But the new leader was unable to withstand the hostilities of the nobles; and in September 1353 Francesco Baroncelli was elected tribune. He was a follower of Rienzi, had been his ambassador to Florence and did little beyond imitating his mode of government and smoothing the way for his return.

Rienzi had spent two years in the Abruzzi, leading a life of mystic contemplation on Monte Maiella. Then, in 1350, he had gone to Prague and endeavoured to convert to his ideas the yet uncrowned emperor Charles IV. When apparently on the point of success, he was sent under arrest to the new pope, Innocent VI. (1352–62), a man of great shrewdness and practical sense. On Rienzi's arrival at Avignon it became evident that his popularity was still very great, and that it would be no easy task to dispose of him. The Romans were imploring his return; Petrarch lauded him as a modern Gracchus or Scipio; and the pope finally released him from confinement. Innocent had decided to send to Italy, in order to settle affairs and bring the state into subjection to the church, that valiant captain and skilled politician, Cardinal Albornoz. And, having no fear that the latter's hand would be forced, he further decided that Rienzi should be sent to give him the support of his own popularity in Rome. In fact, directly the pair arrived Baroncelli was overthrown, the supremacy of the senate granted to the pope and the government confided to Albornoz, who, without concerning himself with Rienzi, nominated Guido Patrizi as senator. He then marched at the head of his troops against Giovanni, prefect of Vico, and forced him to render submission at Montefiascone on the 5th of June 1354. With the same promptitude and skill he reduced Umbria and the Tuscan and Sabine districts, consented to leave the privileges of the cities intact in return for their recognition of the papal authority and planted fortresses in suitable positions. In the meantime Rienzi's popularity was increasing in Rome; without either money or arms, the ex-tribune succeeded by his eloquence in winning over the two Provençal leaders, brothers of the famous free captain Fra Monreale; and, seduced by his promises and hopes, they supplied him with funds. Then, profiting by his prestige, the apparent favour of the pope, and the sums received, he was able to collect a band of five hundred soldiers of mixed nationalities and returned towards Rome. On Monte Mario he was met by the *cavallerotti*. On the 1st of August 1354 he entered the Castello gate, took possession of the government, named Monreale's two brothers his captains, and sent them to lay siege to Palestrina, which was still the headquarters of the Colonna. But then money ran short, and he again lost his head. Inviting Fra Monreale to a banquet, he put him to death for the sake of his wealth, and kept the two brothers in confinement. This act excited general indignation. And when, after his ill-gotten gains were spent, he again recurred to violence to fill his purse, the public discontent was vented in a sudden revolt on the 8th of October. The people stormed the Capitol with cries of "Death to the traitor." Rienzi presented himself at a window waving the flag of Rome. But the charm was finally broken. Missiles were hurled at him; the palace was fired. He hid himself in the courtyard, shaved his beard and, disguised as a shepherd with a cloth over his head, slipped into the crowd and joined in their cries against himself. Being recognized, however, by the golden bracelets he had forgotten to remove, he was instantly stabbed. For two days his corpse was left exposed to the insults of the mob, and was then burned. Such was the wretched end of the man who, at one moment, seemed destined to fill the world with his name as the regenerator of Rome and of Italy.

In all the Italian cities the overthrow of the aristocracy had led to military impotence and pressing danger of tyranny. The same thing had happened in Rome when the nobility, weakened by the absence of church and empire, received its death-blow

The popes seek to constitute a temporal kingdom.

Foreign senators.

The banderesi.

from Rienzi. But, whereas elsewhere tyrants were gradually arising in the citizen class, Rome was always in danger of oppression by the pope. Nor was any aid available from the empire, which had never recovered from its abasement under Louis the Bavarian. In fact, when Charles of Luxemburg came to Rome to be crowned, he was obliged to promise the pope that he would not enter the city. On Easter day 1355 he received the crown, and departed after counselling the Romans to obey the pope. And the pontiffs had greater need than ever of an established kingdom. Their position in France was much endangered by that country's disorder. New states were being formed on all sides; the medieval unity was shattered; and the shrunken spiritual authority of the church increased her need of material strength. As Italian affairs stood, it would be easy for the popes to found a kingdom, but their presence was required in Rome before it could be firmly established. The blood-stained sword of Albornoz had prepared the way before them. In 1355–56 he vanquished the lords or tyrants of Rimini, Fano, Fossombrone, Pesaro, Urbino and other cities. And all these places had been so rudely oppressed that the cardinal was often hailed as a liberator after subduing their masters by fire and sword. But everywhere he had been obliged to leave existing governments and rulers *in statu quo* after exacting their oaths of fealty. Thus the state was still dissevered, and it was impossible to bind it together with the pope at Avignon and Rome a republic. Bologna was still independent, Ordelaffi still lord of Forlì; Cesena and other cities were still rebellious; and the Campagna was still in the hands of the barons. Some places were ruled by rectors nominated by the pope; at Montefiascone there was an ecclesiastical rector, with a bench of judges, and a captain commanding a mixed band of adventurers. Rome had submitted to the haughty cardinal, but hated him mortally, and, on his departure for Avignon in 1357 to assist the threatened pontiff, immediately conceded to the latter the supremacy of the senate. And the pope, instead of two senators, hastened to name a single one of foreign birth. This was a shrewd device of Albornoz and another blow to the nobles, with whom he was still at war. Thus was inaugurated, by the nomination of Raimondo de' Tolomei in 1358, a series of foreign senators, fulfilling the functions of a podestà, and changed every six months, together with their staff of judges, notaries and knights. The people approved of this reform as being inimical to the nobles and favourable to the preservation of liberty. Hitherto the senators had been assisted, or rather kept in check, by the thirteen representatives of the regions. These were now replaced by seven reformers, in imitation of the priors of Florence, the better to follow that city's example. The reformers were soon the veritable chiefs of the republic. They first appeared in 1360, were either *popolani* or *cavallerotti*, and were elected by ballot every three months. When Albornoz returned to Italy, although desirous to keep Rome in the same subjection as the other cities, he had first to vanquish Ordelaffi and reduce Bologna. The latter enterprise was the more difficult task, and provoked a lengthy war with Matteo Visconti of Milan. Thus Rome, being left to herself, continued to be governed by her reformers; and the nobles, already shut out from power, were also excluded from the militia, which had been reorganized, like that of Florence, on the democratic system. Three thousand men, mostly archers, were enrolled under the command of two *banderesi*, "in the likeness," says M. Villani, "of our gonfaloniers of the companies," with four *antepositi* constituting a supreme council of war. And the whole body was styled the "Felix Societas Balestrariorum et Pavesatorum." It was instituted to support the reformers and re-establish order in the city and Campagna, to keep down the nobles and defend the republic. It fulfilled these duties with much, and sometimes excessive, severity. *Banderesi* and *antepositi* had seats in the special council beside those of the reformers, as, in Florence, the gonfaloniers of the companies were seated beside the priors. Later these officials constituted the so-called *signoria dei banderesi*. In 1362, the Romans having subjected Velletri, which was defended by the nobles, the latter made a riot in Rome. Thereupon the *banderesi* drove them all from the city, killed some of their kindred, and did not even spare the *cavallerotti*. The fight became so furious that from gate to gate all Rome was in arms, and even mercenaries were hired. But in the end renewed submission was made to the pope.

On the death of Innocent VI. in 1362, an agreement was concluded with his successor, Urban V. (1362–70), also a Frenchman, who was obliged to give his sanction to the government of the reformers and *banderesi*. And then, Albornoz being recalled in disgrace to Avignon, and afterwards sent as legate to Naples, these Roman magistrates were able, with or without the co-operation of the foreign senator, to rule in their own way. They did justice on the nobles by hanging a few more; and they defended the city from the threatening attacks of the mercenaries, who had now become Italy's worst foes. It was at this period that the Roman statutes were revised and rearranged in the compilation erroneously attributed by some writers to Albornoz, which has come down to us supplemented by alterations of a later date.

Urban V. begins to destroy the republic.

But now the popes, being no longer in safety at Avignon, really decided to return to Italy. Even Urban V. had to pay ransom to escape from the threatened attacks of the free companies. The Romans implored his return, and he was further urged to it by the Italian *literati*, with Petrarch at their head. In April 1367 he finally quitted Avignon, and, entering Rome on the 16th of October, was given the lordship of the city. Cardinal Albornoz had fallen mortally ill at Viterbo; but, though unable to accompany the pope to Rome, had, before dying, suggested his course of action. Certainly Urban showed much acumen in profiting by the first burst of popular enthusiasm to effect quick and dexterous changes in the constitution of the republic. After naming a senator, he abolished the posts of reformers and *banderesi*, substituting three conservators, or rather a species of municipal council, alone charged with judicial and administrative powers, which has lasted to the present day. The thirteen leaders of the regions and the consuls of the gilds still sat in the councils, which were left unsuppressed. But all real power was in the hands of the pope, who, in Rome, as in his other cities, nominated the principal magistrates. Thus, by transforming political into civil institutions and concentrating the supreme authority in his own grasp, Urban V. dealt a mortal blow to the liberties of Rome. Yet he felt no sense of security among a people who, after the first rejoicings over the return of the Holy See, were always on the brink of revolt. Besides, he felt himself a stranger in Italy, and was so regarded. Accordingly, in April 1370 he decided to return to France; on the 20th of that month he wrote from Viterbo that no change was to be made in the government; and he died in Avignon on the 19th of December.

Re-establishment of the republic and the banderesi.

The Romans retained the conservators, conferring on them the political power of the reformers; they re-established the *banderesi* with the Florentine title of *executores justitiae* and the four *antepositi* with that of *consiliarii*. Thus the "Felix Societas Balestrariorum et Pavesatorum Urbis" was restored, and the two councils met as before. The new French pope, Gregory XI. (1370–78), had to be content with obtaining supremacy over the senate and the possession of the castle of St Angelo. It was a difficult moment for him. The Florentines had come to an open rupture with his legates, and had adopted the expedient of inviting all the cities of the Roman state to redeem their lost freedom. Accordingly, in 1375 many of them rose against the legates, who were mostly French and regarded with dislike as foreigners. Florentine despatches, full of classical allusions and chiefly composed by the famous scholar Secretary Coluccio Salutati, were rapidly sent in all directions. Those addressed to the Romans were specially fervid, and emphatically appealed to their patriotism and memories of the past. But the Romans received them with doubt and mistrust, for they saw that the revolution threatened to dismember the state, by promoting the independence of every separate city. Besides, while maintaining their republic, they also desired the pope's presence in Rome. Nevertheless, they went with the current to the extent of reforming their constitution. In February 1376 they nominated Giovanni Cenci captain of the people, and gave him uncontrolled power over the towns of the patrimony and the Sabine land. The conservators, with their new political authority, the *executores*, the *antepositi* and the two councils were all preserved, and a new magistracy was created, the "Tres Gubernatores Pacis et Libertatis Reipublicae Romanae." This answered to the Eight (afterwards Ten) of War in Florence, likewise frequently called the Eight of Liberty and Peace. It was this Council of Eight that was now directing the war against the pope and braving his sentence of excommunication; and their fiery zeal had won them the title of the Holy Eight from the Florentines.

Realizing that further absence would cost him his state, Gregory XI. quitted Avignon on the 13th of September 1376, and, reaching Corneto in December, despatched to Rome three legates, who, on the 21st of the month, concluded an agreement with the parliament. The people gave up the gates, the fortresses and the Trastevere, and promised that if the pope returned to Rome he should have the same powers which had been granted to Urban V. But, on his side, he must pledge himself to maintain the *executores* and their council, and allow the Romans the right of reforming the *banderesi*, who would then swear fealty to him. The terms of this peace and the pope's epistles clearly prove that the two councils still exercised their functions, that the *banderesi* were still the virtual heads of the government, and that their suppression was not contemplated. In fact, when the pope made his entry on the 17th of January 1377, accompanied by two thousand armed men, he perceived that there was much public agitation, that the Romans did not intend to fulfil their agreement, and that the government of the *banderesi* went on as before. Accordingly, after naming Gomez Albornoz, a nephew of the deceased cardinal, to the office of senator, he retired to Anagni, and remained there until November 1377. The Romans presently waited on him with conciliating offers, and begged him to negotiate a peace for them with the prefect of Vico. In fact, the treaty was concluded at Anagni in October, and on the 10th of November confirmed in Rome by the general council. The meeting was held in the great hall of the Capitol, *ubi consilia generalia urbis fieri solent*, in the presence of all the members of the republican government. But the pope was enraged by the survival of this government, and, being worn out by the persistent hostility of the Florentines, which reduced his power to a low ebb, had determined to make peace, when surprised by death on the 27th of March 1378.

The next pope, Urban VI. (1378–89), a Neapolitan, was the spirit of discord incarnate. His election was not altogether regular: the French party among the cardinals was against him; and the people were ripe for insurrection. But, regardless of all this, Urban threatened the cardinals in his first consistory, saying that church reform must begin with them; and he used the same tone with the people, reproving them for failing to suppress the *banderesi*. In consequence of this the cardinals of the French party, assembling at Fondi, elected the antipope Clement VII. (1378–94) and started a long and painful schism in the church. Clement resided in Avignon, while Urban in Rome was engaged in opposing Queen Joanna I. of Naples and favouring Charles of Durazzo, who, on conquering the Neapolitan kingdom, was made gonfalonier of the church and senator of Rome, where he left a vicar as his deputy. Shortly afterwards the pope went to Naples, and made fierce war on the king. Then, after many adventures, during which he tortured and put to death several cardinals whom he suspected of hostile intentions, he returned to Rome, where the utmost disorder prevailed. The conservators and the *banderesi* were still at the head of the government, and, the pope speedily falling out with them, a riot ensued, after which he excommunicated the *banderesi*. These at last made submission to him, and Urban VI. became master of Rome before his death in 1389. He was succeeded by Boniface IX. (1389–1404), another Neapolitan, but a man of greater shrewdness and capacity. His first act was to crown Ladislaus king of Naples, and secure the friendship and protection of this ambitious and powerful prince. In all the principal cities of the state he chose the reigning lords for his vicars. But he allowed Fermo, Ascoli and Bologna the privilege of assuming their own vicariate for twenty-five years. And, as these different potentates and governments had only to pay him an annual tribute, all parties were satisfied, and the pope was able to bestow at least an appearance of order and unity on his state. But fresh tumults soon arose, partly because the conservators and *banderesi* sought to govern on their own account, and especially because the pope seems for a time to have omitted naming the senator. Boniface was a prudent man; he saw that events were turning in his favour, now that throughout Italy liberty was tottering to its fall, and bided his time. He was satisfied for the moment by obtaining a recognition of the immunities of the clergy, rendering them solely amenable to ecclesiastical tribunals, and thus distinguishing the powers of the church from those of the state in Rome. The republic also pledged itself neither to molest the prelates nor to levy fresh contributions on them towards repairing the walls, to aid in recovering the estates of the church in Tuscia, and to try to conciliate the baronage. This concordat, concluded with the conservators and *banderesi* on the 11th of September 1391, was also confirmed on the 5th of March 1392 by the heads of the regions, together with a fresh treaty binding both parties to furnish a certain number of armed men to combat the prefect of Vico and the adherents of the antipope at Viterbo. With the exception of this city, Orchi and Civita Vecchia, all other conquered territory was to belong to the republic. But the Romans soon discovered that they were playing into the hands of the pope, who kept everything for himself, without even paying the troops. Upon this a riot broke out; Boniface fled to Perugia in October 1392, and resolved to exact better terms when next recalled to Rome. Meanwhile the Romans subdued the prefect, captured Viterbo, and, being already repentant, handed it over to the pope and implored his return. He then proposed his own terms, which were approved, not only by the conservators, *banderesi* and four councillors, but also by the special council and by the unanimous vote of a general assembly, composed of the above-mentioned authorities, heads of regions, other officials and a hundred citizens (8th August 1393). These terms prescribed that the pope was to elect the senator, and that, on his failing so to do, the conservators would carry on the government after swearing fealty to him. The senatorial function was to be neither controlled nor hampered by the *banderesi*. The immunities of the clergy were to be preserved, and all church property was to be respected by the magistrates. The expenses of the pope's journey were to be paid, and he was to be escorted to Rome in state. Boniface tried to complete his work by abolishing the *banderesi*, the last bulwarks of freedom; but the people, although weakened and weary, made efforts to preserve them and, although their fall was inevitable, the struggle went on for some time.

Urban VI. undertakes the destruction of the republic.

Boniface IX. continues the destruction of the republic.

During the spring of 1394 the *banderesi* provoked an insurrection in which the pope's life was endangered; it was only saved by the arrival of King Ladislaus, who came from Naples with a large force in the early autumn. But for the Neapolitan soldiery Boniface could not have withstood the long series of revolts that continually exposed him to fresh perils and the anxiety caused by the persistent schism of the church. The death of Clement VII. in 1394 was followed by the election of

Fall of the banderesi and of the republic.

another antipope, Benedict XIII. But a new jubilee was in prospect for the year 1400, and this was always an efficacious means of bending the will of the Romans. Depending upon this and the assistance of Ladislaus, Boniface not only demanded full powers to nominate senators (none having been recently elected), but insisted on the suppression of the *banderesi*. Both requests were granted; but, directly Angelo Alaleoni was made senator, a conspiracy was hatched for the re-establishment of the *banderesi*. However, the pope felt sure of his strength; the plot was discovered and the conspirators were beheaded on the stairs of the Capitol. This proved the end of the *banderesi* and of the liberties of Rome. The government was again directed by an alien senator together with three conservators; but the latter were gradually deprived of their political attributes, and became mere civil officers. The militia, regions, gilds and other associations now rapidly lost all political importance, and before long were little more than empty names. Thus in 1398 the Romans submitted to the complete sway of the pope, and in July of the same year the senator chosen by him was Malatesta dei Malatesti of Rimini, one of a line of tyrants, a valiant soldier, who was also temporal vicar and captain-general of the church. Boniface continued to appoint foreign senators during the rest of his life; he fortified the castle of St Angelo, the Vatican and the Capitol; he stationed galleys at the mouth of the Tiber, and proved himself in all things a thoroughly temporal prince. He aggrandized all his kindred, especially his brother, and, with the aid of his senator, his armed force and the protection of Ladislaus, succeeded in keeping down all the surviving nobles. In 1400, however, these made an attempt to upset the government. Niccolò Colonna forced his way into the city with cries of "Popolo, popolo! death to Boniface!" But the Romans had grown deaf to the voice of liberty; they refused to rise, and the senator, a Venetian named Zaccaria Trevisan, behaved with much energy. Colonna and his men had to beat a swift retreat to Palestrina. A charge of high treason was immediately instituted against him, and thirty-one rebels were beheaded. The pope then proclaimed a crusade against all the Colonna, and sent a body of two thousand men and some of the Neapolitan soldiery to attack them. Several of their estates were seized and devastated, but Palestrina continued to hold out, and on the 7th of January 1401 the Colonna finally made submission to the pope. Nevertheless, they obtained advantageous terms, for Boniface left them their lands, appointed them vicars of other territories, and made similar agreements with the Gaetani and Orsini. In this way he became absolute master of Rome. One chronicler remarks that "Romanis tanquam rigidus imperator dominabatur," and the same tone is taken by others. But he did not succeed in putting an end to the schism of the church, which was still going on when he died in the Vatican on the 1st of October 1404.

Innocent VII. (1404–6) was the next pope. He too was a Neapolitan, and on his election the people again rose in revolt and refused to acknowledge him unless he consented to resign the temporal power. But Ladislaus of Naples hastened to his help, and an agreement was made which, under the cover of apparent concessions, really riveted the people's chains. Rome was recognized as the seat of the temporal and spiritual sovereignty of the pope, and the pope continued to appoint the senator. The people were to elect seven governors of the city, who were to swear fealty to the pope and carry on the government in conjunction with three other governors chosen by the pontiff or Ladislaus. The stipulations of Boniface IX. concerning ecclesiastical immunities were again confirmed. The barons were forbidden to place more than five lances each at the service of the people, and—which was the real gist of the covenant—the people were henceforth forbidden to make laws or statutes without the permission of the pope. The captain of the people, deprived of his political and judicial functions and reduced to a simple judge, was also to be chosen by the pope. But this treaty, drawn up on the 27th of October 1404, was not signed at the time, and many difficulties and disturbances arose when its terms were to be put into effect. The Romans nominated the seven governors, but, without waiting until the pope had chosen three more, placed the state in their hands, and styled them "governors of the liberty of the Roman Republic." They were, in fact, *banderesi* or *reformatori* under a new name. But the attempt proved inefficacious, for, at the pope's first threat of departure, the Romans made their submission, and the treaty of October was subscribed on the 15th of May 1405. Nevertheless, as it only bears the signatures of the "seven governors of the liberty of the Roman Republic," the pope would seem to have made some concessions. His position was by no means assured. Ladislaus was known to aspire to absolute dominion in Italy, and, although willing to aid in suppressing the republic, tried to prepare the way for his own designs, and frequently held out a helping hand to the vanquished. On the 6th of August fourteen influential citizens of Rome boldly presented themselves at the Vatican, and in a threatening manner called the pope to account for giving his whole attention to worldly things, instead of endeavouring to put a stop to the schisms of the church. But, on leaving his presence, they were attacked by Luigi Migliorati, the pope's nephew, and notorious for his violence, who killed eleven of their number, including several heads of the regions and two of the governors. An insurrection ensued, and the pope and his nephew fled to Viterbo. The Colonna tried to profit by these events, and applied to Ladislaus, who, hoping that the moment had come to make himself master of Rome, sent the count of Troia thither with a troop of three thousand horse. But the people, enraged by this treachery, and determined not to fall under the yoke of Naples, awoke for an instant to the memory of their past glories, and bravely repulsed the Colonna and the Neapolitans. And, on the speedy arrival of the Orsini with some of the papal troops, the people voluntarily restored the papal government, and, assembling the parliament, besought the pope to return on his own terms. Accordingly, after first naming Francesco Panciatichi of Pistoia to the senatorship, the pope came back on the 13th of March 1406, bringing his whole curia with him, and also the murderer Migliorati, who, triumphing in impunity, became more arrogant than before. Here indeed was a proof that the Romans were no longer worthy of liberty! And now, by means of the Orsini, Innocent had only to reduce the Colonna and other nobles raised to power by Ladislaus; nor was this very difficult, seeing that the king, in his usual fashion, abandoned them to their fate, and, making terms with the pope, was named gonfalonier of the church and again protected her cause.

Ladislaus master of Rome.

Innocent, dying in 1406, was succeeded by Gregory XII., a Venetian, who, as we shall presently see, resigned the chair in 1415. On his accession, finding his state firmly established, he seemed to be seriously bent on putting an end to the Great Schism, and for that purpose arranged a meeting with the antipope Benedict XIII. at the congress of Savona in 1408. But Gregory and Benedict only used the congress as a pretext for making war upon each other, and were urged on by Ladislaus, who hoped by weakening both to gain possession of Rome, where, although opposed by the Orsini, he had the support of the Colonna. Gregory, who had then fled from Rome, made a momentary attempt to win the popular favour by restoring the government of the *banderesi*; but Ladislaus marched into Rome in June 1408 and established a senator of his own. Meanwhile the two popes were continuing their shameful struggle, and the council of Pisa (March 1409), in attempting to check it, only succeeded in raising up a third pontiff, first in the person of Alexander V. (1409–10), and then in the turbulent Baldassare Cossa, who assumed the name of John XXIII. The latter began by sending a large contingent to assist Louis of Anjou against Ladislaus. But the enterprise failed, and, seeing himself deserted by all, Pope John next embraced the cause of his foe by naming him gonfalonier of the church. Thereupon Ladislaus concluded a sham peace, and then, seizing Rome, put it to the sack and established his own government there. Thus John, like the other two popes, became a wanderer in Italy. In August 1414 Ladislaus died, and was succeeded by the scandalous Queen Joanna II. The Roman people promptly expelled the Neapolitans, and Cardinal Isolani, John's legate, succeeding in rousing a reaction in favour of the church, constituted a government of thirteen "conservators" on the 19th of October.

End of the schism, and election of Martin V.

Rome in a state of anarchy.

In November 1414 the council of Constance assembled, and at last ended the schism by deposing all the popes and incarcerating John XXIII., the most turbulent of the three. On the 11th of November 1417 Oddo Colonna was unanimously elected to the papal chair; he was consecrated in the cathedral on the 27th as Pope Martin V., and, being acknowledged by all, hastened without delay to take possession of his see. Meanwhile disorder was at its height in Rome. The cardinal legate Isolani governed as he best could, while the castle of St Angelo remained in the hands of the Neapolitans, who still had a party in the city. In this divided state of affairs, Braccio, a daring captain of adventurers, nicknamed Fortebraccio, was inspired with the idea of making himself master of Rome. Overcoming the feeble resistance opposed to him, he succeeded in this on the 16th of June 1416, and assumed the title of "Defensor Urbis." But Joanna of Naples despatched Sforza, an equally valiant captain, against him, and, without offering battle, Fortebraccio withdrew on the 26th of August, after having been absolute master of the Eternal City for seventy days. Sforza marched in on the 27th and took possession of the city in the name of Joanna. Martin V. instantly proved himself a good statesman. He confirmed the legate Isolani as his vicar and Giovanni Savelli as senator. Leaving Constance on the 16th of May 1418, he reached Milan on the 12th of October, and slowly proceeded on his journey. While in Florence he despatched his brother and nephew to Naples to make alliance with Joanna, and caused her to be crowned on the 28th of October 1419 by his legate Morosini. Upon this she promised to give up Rome to the pope. Her general, Sforza, then entered the service of Martin V., and compelled Fortebraccio, who was lingering in a threatening attitude at Perugia, to make peace with the pope. The latter entrusted Fortebraccio with the conduct of the campaign against Bologna, and that city was reduced to submission on the 15th of July 1420. The Romans had already yielded to Martin's brother the legate, and now earnestly besought the arrival of their pope. Accordingly, he left Florence on the 19th of September 1420, and entered the Vatican on the 28th. Rome was in ruins; nobility and burghers were equally disorganized, the people unable to bear arms and careless of their rights, while the battered walls of the Capitol recorded the fall of two republics.

The popes of the Renaissance.

Martin V. had now to fulfil a far more difficult task than that of taking possession of Rome. Throughout Italy municipal freedom was overthrown, and the Roman Republic had ceased to exist. The Middle Ages were ended; the Renaissance was beginning. The universal unity both of church and of empire was dissolved; the empire was now Germanic, and derived its principal strength from direct dominion over a few provinces. Independent and national states were already formed or forming on all sides. The papacy itself had ceased to claim universal supremacy over the world's governments, and the possession of a temporal state had become essential to its existence. In fact, Martin V. was the first of the series of popes who were real sovereigns, and more occupied with politics than religion. Involved in all the foreign intrigues, falsehoods and treacheries of Italian diplomacy in the 15th century, their internal policy was imbued with all the arts practised by the tyrants of the Renaissance, and nepotism became necessarily the basis of their strength. It was natural that men suddenly elected sovereigns of a new country where they had no ties, and of which they had often no knowledge, should seek to strengthen their position by aggrandizing so-called nephews who were not unfrequently their sons.

The temporal kingdom of the popes raised on the ruins of the republic.

Martin V. reduced the remains of the free Roman government to a mere civil municipality. Following the method of the other despots of Italy, the old republican institutions were allowed to retain their names and forms, their administrative and some of their judicial attributes, while all their political functions were transferred to the new government. Order was re-established, and justice rigidly observed. Many rebellious places were subdued by the sword, and many leaders of armed bands were hanged. The pope, however, was forced to lean on his kinsmen the Colonna and again raise them to power by grants of vast fiefs both in his own state and the Neapolitan territory. And, after first supporting Joanna II., who had assisted his entry into Rome, he next sided with her adversary, Louis of Anjou, and then with Alphonso of Aragon, the conqueror of both and the constant friend of the pope, who at last felt safe on his throne. Rome now enjoyed order, peace and security, but had lost all hope of liberty. And when Martin died (20th February 1431) these words were inscribed on his tomb, "Temporum suorum felicitas."

A revolution expels the pope.

Eugenius IV. resumes possession.

Eugenius IV. (1431–47) leant on the Orsini, and was fiercely opposed by the Colonna, who excited the people against him. Accordingly on the 29th of May 1434 the Romans rose in revolt to the old cry of "Popolo e popolo," and again constituted the rule of the seven governors of liberty. The pope fled by boat down the Tiber, and, being pursued with stones and shots, narrowly escaped with his life. On reaching Florence, he turned his energies to the recovery of the state. It was necessary to quell the people; but, first of all, the Colonna and the clan of the prefects of Vico, with their renewed princely power, had to be overthrown. The Orsini were still his friends. Eugenius entrusted the campaign to Patriarch (afterwards Cardinal) Vitelleschi, a worthy successor of Albornoz, and of greater ferocity if less talent. This leader marched his army towards Rome, and, instantly attacking Giovanni, prefect of Vico, captured and beheaded him. The family was now extinguished; and its possessions reverting to the church, the greater part of them were sold or given to Count Everso d'Anguillara, of the house of Orsini. The prefecture, now little more than an honorary title, was bestowed at will by the popes. Eugenius gave it to Francesco, founder of the powerful line of the Gravina-Orsini. Thus one noble family was raised to greatness while another perished by the sword. Vitelleschi had already begun to persecute the Colonna and the Savelli, and committed terrible slaughter among them. Many castles were demolished, many towns destroyed; and their inhabitants, driven to wander famine-stricken over the Campagna, had to sell themselves as slaves for the sake of bread. Finally the arrogant patriarch marched into Rome, as into a conquered city, at the head of his men, and the Romans crouched at his feet. The pope now began to distrust him, and sent Scarampo, another prelate of the same stamp, to take his place. This new commander soon arrived, and, perceiving that Vitelleschi proposed to resist, had him surrounded by his soldiers, who were obliged to use force to compel his surrender. Vitelleschi was carried bleeding to the castle of St Angelo, where he soon afterwards died. The pope at last returned to Rome in 1443, and remained there quietly till his death in 1447.

Conspiracy of Stefano Porcari.

His successor Nicholas V. (1447–55) was a scholar solely devoted to the patronage of *literati* and artists. During his reign there was a fresh attempt to restore the republic, but it was rather prompted by literary and classical enthusiasm than by any genuine patriotic ardour. Political passions and interests had ceased to exist. The conspiracy was headed by Stefano Porcari, a man of the people, who claimed to be descended from Cato. He had once been captain of the people in Florence, and was made podestà of Bologna by Eugenius IV. He was a caricature of Cola di Rienzi, and extravagantly proud of his

Latin speeches in honour of ancient republican liberty. The admiration of antiquity was then at its height, and Porcari found many enthusiastic hearers. Directly after the death of Eugenius IV. he made a first and unsuccessful attempt to proclaim the republic. Nevertheless Nicholas V., with the same indulgence for scholars that had prompted him to pardon Valla for denying the temporal power of the papacy and laughing to scorn the pretended donation of Constantine, freely pardoned Porcari and named him podestà of Anagni. He filled this office with credit, but on his return to Rome again began to play the agitator, and was banished to Bologna with a pension from the pope. Nicholas V. had conferred all the state offices upon priests and abbots, and had erected numerous fortresses. Hence there were many malcontents in Rome, in communication with Porcari at Bologna, and ready to join in his plot. Arms were collected, and on the day fixed he presented himself to his fellow-conspirators adorned with rich robes and a gold chain, and harangued them in Latin on the duty of freeing their country from the yoke of the priests. His design was to set fire to the Vatican on the 6th of January 1453, the feast of the Epiphany; he and his followers were to seize the pope, the cardinals and the castle of St Angelo. But Nicholas received timely warning; the conspirators' house was surrounded; and Porcari himself was seized while trying to escape, confined in the castle of St Angelo, and put to death with nine of his companions on the 9th of January. Others shortly suffered the same fate.

Men of learning persecuted on suspicion of republican tendencies.

Under Calixtus III. and Pius II. affairs went on quietly enough, but Paul II. (1464–71) had a somewhat troubled reign. Yet he was a skilled politician. He re-ordered the finances and the courts of justice, punished crime with severity, was an energetic foe to the Malatesta of Rimini, put an end to the oppression exercised in Rome by the wealthy and arrogant house of Anguillara, and kept the people in good humour with continual festivities. But—and this was a grave defect at that period—he extended no favour to learning, and, by driving many scholars from the curia to make room for his own kinsmen, brought a storm about his ears. At that time the house of Pomponio Leto was the rendezvous of learned men and the seat of the Roman Academy. Leto was an enthusiast of antiquity; and, as the members of the Academy all assumed old Latin names, they were suspected of a design to re-establish paganism and the republican government. It is certain that they all inveighed against the pope; and, as the latter was no man of half measures, during the carnival of 1468 he suddenly imprisoned twenty Academicians, and even subjected a few of them to torture. Pomponio Leto, although absent in Venice, was also arrested and tried; but he exculpated himself, craved forgiveness, and was set at liberty. His friends were also released, for the charge of conspiracy proved to be unfounded. Certain members of the Academy, and notably Platina in his *Lives of the Popes*, afterwards revenged themselves by stigmatizing Paul II. as the persecutor of philosophy and letters. But he was no more a persecutor than a patron of learning; he was a politician, the author of some useful reforms, and solely intent on the consolidation of his absolute power. Among his reforms may be classed the revision of the Roman statutes in 1469, for the purpose of destroying the substance while preserving the form of the old Roman legislation, and entirely stripping it of all political significance. In fact the pope's will was now absolute, and even in criminal cases he could trample unhindered on the common law.

There was still a senator of Rome, whose nomination was entirely in the hands of the pope, still three conservators, the heads of the *rioni*, and an elected council of twenty-six citizens. Now and then also a shadowy semblance of a popular assembly was held to cast dust in the eyes of the public, but even this was not for long. All these officials, together with the judges of the Capitol, retained various attributes of different kinds. They administered justice and gave sentence. There were numerous tribunals all with undefined modes of procedure, so that it was very difficult for the citizens to ascertain in which court justice should be sought. But in last resort there was always the supreme decision of the pope. Thus matters remained to the time of the French Revolution.

For the completion of this system a final blow had to be dealt to the aristocracy, whose power had been increased by nepotism; and it was dealt by bloodshed under the three following popes—Sixtus IV. (1471–84), Innocent VIII. (1484–92) and Alexander VI. (1492–1503)—each of whom was worse than his predecessor. The first, by means of his nephews, continued the slaughter of the Colonna, sending an army against them, devastating their estates at Marino, and beheading the protonotary Lorenzo Colonna. Innocent VIII. was confronted by the power of the Orsini, who so greatly endangered his life by their disturbances in the city that he was only saved by an alliance with Naples. Neither peace nor order could be lastingly established until these arrogant barons were overthrown. This task was accomplished by the worst of the three pontiffs, Alexander VI. All know how the massacre of the Orsini was compassed, almost simultaneously, by the pope in Rome and his equally iniquitous son, Caesar Borgia, at Sinigaglia (1502). This pair dealt the last blow to the Roman aristocracy and the tyrants of Romagna, and thus the temporal dominion of the papacy was finally assured. The republic was now at an end; it had shrivelled to a civil municipality. Its institutions, deprived of all practical value, lingered on like ghosts of the past, subject from century to century to unimportant changes. The history of Rome is henceforth absorbed in that of the papacy.

Post-medieval Rome.

Nevertheless the republic twice attempted to rise from its grave, and on the second occasion gave proofs of heroism worthy of its most glorious past. It was first resuscitated in February 1798, by the influence of the French Revolution, and the French constitution of the year III. was rapidly imitated. Rome had again two councils—the tribunate and the senate, with five consuls constituting the executive power. But in the following year, owing to the military reverses of the French, the government of the popes was restored until 1809, when Napoleon I. annexed to his empire the States of the Church. Rome was then governed by a *consulta straordinaria*—a special commission—with the municipal and provincial institutions of France. In 1814 the papal government was again reinstated, and the old institutions, somewhat modified on the French system, were recalled to life. Pius IX. (1846–77) tried to introduce political reforms, and to improve and simplify the old machinery of state; but the advancing tide of the Italian revolution of 1848 drove him from Rome; the republic was once more proclaimed, and had a brief but glorious existence. Its programme was dictated by Giuseppe Mazzini, who with Saffi and Armellini formed the triumvirate at the head of the government. United Italy was to be a republic with Rome for her capital. The rhetorical idea of Cola di Rienzi became heroic in 1849. The constituent assembly (9th February 1849) proclaimed the fall of the temporal power of the popes, and the establishment of a republic which was to be not only of Rome but of all Italy. France, although then herself a republic, assumed the unenviable task of re-establishing the temporal power by force of arms. But the gallant defence of Rome by Garibaldi covered the republic with glory. The enemy was repulsed, and the army of the Neapolitan king, sent to restore the pope, was also driven off. Then, however, France despatched a fresh and more powerful force; Rome was vigorously besieged, and at last compelled to surrender. On the 2nd of July 1849 the heroic general departed from the city with some thousands of his followers. Almost at the same time the constituent assembly proclaimed in the Capitol the constitution of the Roman Republic. Immediately afterwards the French restored the government of Pius IX., whose reign down to 1870 was that of an absolute sovereign. Then the Italian government entered Rome (20th September 1870), proclaimed the national constitution (9th October 1870), and the Eternal City became the capital of Italy. Thus the scheme of national unity, the natural outcome of the history of Rome and of Italy, impossible of accomplishment under the rule of the popes, was finally achieved by the monarchy of Savoy, which, as the representative and personification of Italian interests, abolished the temporal power of the papacy and made Rome the seat of government of the united country (see ITALY).

AUTHORITIES.—The history of the commune of Rome in the middle ages has to be collected from the scattered materials in special treatises, or from the general histories of the papacy. The greater part of the facts are to be found in the *Liber Pontificalis*, edited by the Abbé Duchesne (2 vols., Paris, 1886–92), and in the excellent histories of Rome by Felix Papencordt and Gregorovius (see below). Vitale, *Storia diplomatica de' Senatori di Roma* (2 vols., Rome, 1791); Galletti, *Del primicerio della Santa Seda Apostolica e di altri ufficiali maggiori del sagro palazzo Lateranense* (Rome, 1776); Vendettini, *Del Senato Romano* (Rome, 1782); Baronius, *Annales Ecclesiastici*, continued by Raynaldus (42 vols. fol., 1738–56), and the recent continuations of Theiner relating to the years 1572–85; J. Ficker, *Forschungen zur Reichs- und Rechtsgeschichte Italiens* (4 vols., Innsbruck, 1868–74); Savigny, *Geschichte des römischen Rechts im Mittelalter* (frequently reprinted and translated into all the principal languages); Leo, *Entwickelung der Verfassung der lombardischen Städte* (Hamburg, 1824); M. A. von Bethmann-Hollweg, *Ursprung der lombardischen Städtefreiheit* (Anhang: *Schicksale der römischen Stadtverfassung im Exarchat und in Rom*) (Bonn, 1846); Hegel, *Geschichte der Städteverfassung von Italien* (Leipzig, 1847); Giesebrecht, "Ueber die städtischen Verhältnisse im X. Jahrhundert," at end of vol. i. of *Geschichte der deutschen Kaiserzeit* (Brunswick, 1863); "Studi e documenti di Storia e Diritto," in *Annuario di Conferenze storico-giuridiche* (Rome, 1880 seq.); *Archivio della Reale Società Romana di Storia Patria* (the other publications of the same society, as, *e.g.* the *Regesto di Farfa*, may also be consulted with advantage); F. Papencordt, *Geschichte der Stadt Rom* (Paderborn, 1857); Id. *Cola di Rienzo* (Hamburg, 1841); Gregorovius, *Geschichte der Stadt Rom* (8 vols., Stuttgart, finished in 1872; 3rd ed., Stuttgart, 1875–81); A. von Reumont, *Geschichte der Stadt Rom* (3 vols., Berlin, 1867–68).

Among more recent works see especially M. Creighton, *History of the Papacy* (London, 1897); L. Pastor, *Geschichte der Päpste seit dem Ausgang des Mittelalters* (Freiburg i/B., 1886, &c.), a learned work, but written in an extremely clerical spirit; more impartial, although written by a Jesuit, is P. H. Grisar's *Storia di Roma e dei Papi nel Medio Evo* (Italian edition, Rome, 1899, &c., not yet completed). For the history of the republic in 1849 accounts will be found in all the histories of the Italian Risorgimento (see under ITALY). A very important and complete work on the events of Rome in 1848–49 is G. Trevelyan's *Garibaldi's Defence of the Roman Republic* (London, 1907), which contains a full bibliography. (P. V.)

ROME, a province of modern Italy, co-extensive with the *compartimento* of Lazio, but really covering a considerably larger area than the ancient Latium, even including Latium adjectum. On the S.E. and E. alone it does not extend so far, the boundary being that between the former papal states and the kingdom of Naples, running from a point S.E. of Terracina along the eastern edge of the Volscian mountains to Ceprano, and thence along the Liris valley. It then runs N.E. through the mountains to Carsoli, being conterminous with the Abruzzi; it then includes part of the ancient Sabine country, reaching the Tiber near the railway station of Fara Sabina, 25 m. N. of Rome. It follows the river for some distance, where it is conterminous with Umbria, and then runs S.W. to the coast, where it is conterminous with the province of Grosseto (Tuscany), thus including a considerable portion of the ancient Etruria. The resident population in 1901 was estimated at 1,196,909 (including Rome itself, 520,196), and the floating population, Italian and foreign, 54,383. In 1907 the total number was calculated at 1,278,000. In 1871 the aggregate population was only 836,704. Emigration rose from 2222 in 1896 to 18,507 in 1906, there being a great rise in 1905, as over all Italy. The economic crisis in the United States in 1907, led, however, to a set-back, many emigrants being obliged to return to Italy for lack of work. Alum is extracted from the mines principally near Tolfa. At Filettino above Subiaco asphaltic rock is obtained, and salt from a rocksalt mine near Corneto Tarquinia. Chemical fertilizers are manufactured by several firms. The main industries of the district are, however, agricultural (see LATIUM).

ROME, a city and the county-seat of Floyd county, in the N.W. part of Georgia, U.S.A., at the junction of the Etowah and Oostanaula rivers, which here form the Coosa. Pop. (1900) 7291, of whom 2830 were negroes; (1910) 12,099. It is served by the Central of Georgia, the Western & Atlantic (leased by the Nashville, Chattanooga & St Louis), the Southern and the Rome & Northern railways, and the Coosa river is navigable from this point to the falls of the river in Alabama. The city is the seat of Shorter College (for women), which was established in 1873 as the Cherokee Female College, and received its present name in 1877, when it was rebuilt and endowed by Colonel Alfred Shorter; and of the Berry Industrial School (1902), for mountain boys. Rome is situated in a rich agricultural region producing cotton, cereals, vegetables and fruits, for which it is a trading centre, and is a shipping point for bauxite, mined in the vicinity. Other mineral products of this region are iron, limestone, cement rock, fire-brick clay, coal, slate and marble. Rome's principal manufactures are cotton, cotton-seed oil, lumber, foundry and machine-shop products, bricks and agricultural implements. Its site was originally within the territory of the Cherokee, and on the other side of the Oostanaula river there is said to have been at one time an Indian village, which, like several other Creek villages, was called Chiaha (or Chehaw). Here, in October 1793, in his Etowah campaign, John Sevier, with militia from Tennessee, crushed a party of marauding Indians; the battle is commemorated by a monument in Myrtle Hill cemetery. Floyd county was erected in 1833. The first settlement of Rome was made in 1834, and immediately afterwards it became the county-seat. Rome was first chartered as a city in 1847. In 1863 there were brilliant cavalry manœuvres in its vicinity, which resulted in the capture (May 3) of Colonel Abel D. Streight (Federal) with 1800 men by General Nathan B. Forrest (Confederate), with a force one-third the size of that of his opponent. On the 19th of May 1864 the city was captured by a detachment of the Federal Army of General William T. Sherman, then conducting his Atlanta campaign. In 1848–75 Rome was the home of Charles Henry Smith (1826–1903), a popular humorist, who wrote under the name "Bill Arp." In 1906 East Rome (pop. 671 in 1900) and North Rome (pop. 960 in 1900), which was formerly called Forestville, were annexed to the city.

ROME, a city of Oneida county, New York, U.S.A., on the Mohawk river and Wood Creek, and the Erie and the Black river canals, 14 m. W.N.W. of Utica. Pop. (1890) 14,991; (1900) 15,343, of whom 2527 were foreign-born; (1910, census) 20,497. Rome is served by the New York Central & Hudson River, the Rome, Watertown & Ogdensburg (controlled by the New York Central), the New York, Ontario & Western, and the Utica & Mohawk Valley (electric) railways. It is about 450 ft. above sea-level. The city is the seat of the Academy of the Holy Names (opened in 1865 as St Peter's Academy), of the State Custodial Asylum for unteachable idiots, of the Central New York Institution for Deaf Mutes (1875), and of the Oneida County Home. The Jervis Public Library (1895), founded by John Bloomfield Jervis (1795–1885), a famous railway engineer, had in 1909 about 15,000 volumes. The surrounding country is devoted largely to farming, especially vegetable gardening, and to dairying. Among the manufactures are brass and copper work, wire for electrical uses, foundry and machine-shop products, locomotives, knit goods, tin cans and canned goods (especially vegetables). In 1905 the value of the factory products was $8,631,427 (55·6% more than in 1900).

The portage at this place between the Mohawk river and Wood Creek, which are about 1 m. apart, gave the site its Indian name, De-o-wain-sta, "place where canoes are carried from one stream to another," and its earliest English name, "The Great (or Oneida) Carrying-Place," and gave it strategic value as a key between the Mohawk Valley and Lake Ontario. About 1725 there were built, to protect the carrying-place here, Fort Bull, on Wood Creek, which was surprised and taken by French and Indians in March 1756, and Fort Williams, on the Mohawk, which, like Fort Craven, also on the Mohawk, was destroyed by Colonel Daniel Webb after the reduction of Oswego by the French in August 1756. General John Stanwix built Fort Stanwix here at an expense of £60,000, and the first permanent settlement dates from about this time. In October-November 1768, Sir William Johnson and representatives of Virginia and Pennsylvania met 3200 Indians of the Six Nations here and made a treaty with them, under which, for £10,460 in money and provisions, they surrendered to the crown their claims to what is now Kentucky and West Virginia and the western part of Pennsylvania. Of this cession the part which lay in Pennsylvania was secured by purchase from the Indians for the proprietors Richard and Thomas Penn (see PITTSBURG). The fort was dismantled immediately afterward. After 1776, when it was partly repaired by Colonel Elias Dayton, it was called by the continentals Fort Schuyler, in honour of General Philip Schuyler, and so is sometimes confused with (old) Fort Schuyler at Utica. The third regiment of the New York line under Colonel Peter Gansevoort occupied the fort in April 1777 and completed the repairs begun in 1776; on the 3rd of August in the same year (one month before the official announcement by Congress of the design of the flag) the first flag of the United States, made according to the enactment of the 14th of June and used in battle, was raised here: it was made from various pieces of cloth. On the 2nd of August an advance party of Colonel Barry St Leger's forces coming from the west arrived before the fort, and the main body (altogether about 650 whites, including loyalists—the Royal Greens—under Sir John Johnson, and more than 800 Indians, some led by Joseph Brant) arrived soon afterwards. The fort then contained about 750 men under Colonel Gansevoort, with Lieut.-Colonel Marinus Willett as second in command. The danger to the fort roused General Nicholas Herkimer to gather a force of between 700 and 1000 men (including some Oneida Indians), who during their advance on the 6th of August were ambuscaded in a ravine near Oriskany (*q.v.*), about 8 m. E. of the fort; after heavy losses to both sides, about 250 men from the fort under Willett attacked the camp of the Indians who were supporting St Leger, thus relieved Herkimer through the falling back of the British and Indians to save their supplies, captured five ensigns of the Royal Greens, and seized large quantities of stores from the enemy's camp. The siege now lost force, the Indians straggled away after the loss of their camp supplies, and on the 23rd of August, St Leger, hearing exaggerated reports of the immediate approach of large reinforcements under General Benedict Arnold, withdrew, abandoning his camp and stores. The successful resistance here to St Leger contributed greatly to the American success at Saratoga. Fort Stanwix was the headquarters of Colonel Gozen Van Schaick (1736–1789) in 1779 when he destroyed the Onondaga villages. At the fort, on the 22nd of October 1784, a treaty was made by Oliver Wolcott, Richard Butler and Arthur Lee, commissioners for the United States, with the chiefs of the Six Nations. In 1796 a canal was built across the old portage between Wood Creek and the Mohawk river. In 1796 the township of Rome was formed, receiving its name, says Schoolcraft, "from the heroic defence of the republic made here." The village of Rome, in the centre of the township, was incorporated in 1819; and Rome was chartered as a city in 1870.

See Pomroy Jones, *Annals and Recollections of Oneida County* (Rome, 1851); W. M. Willett, *A Narrative of the Military Actions of Col. Marinus Willett* (New York, 1831); and *Orderly Book of Sir John Johnson during the Oriskany Campaign* (Albany, 1882), with notes by W. L. Stone and J. W. de Peyster.

ROMÉ DE L'ISLE, JEAN BAPTISTE LOUIS (1736–1790), French mineralogist, was born on the 26th of August 1736 at Gray, in Haute-Saône. As secretary of a company of artillery he visited the East Indies, and was taken prisoner by the English in 1761 and held in captivity for three years. Subsequently he became distinguished for his researches on mineralogy and crystallography. He was the author of *Essai de Cristallographie* (1772), the second edition of which, regarded as his principal work, was published as *Cristallographie* (3 vols. and atlas, 1783). He died at Paris on the 7th of March 1790.

ROMESH CHANDRA MITRA, SIR (1840–1899), Indian judge, was born in 1840. When the East India Company's charter was renewed in 1853, the old supreme courts and sadr courts in the presidency towns were changed into high courts, and Roma Prasad Roy, son of the great reformer Raja Ram Mohan Roy, was the first Indian who was appointed a judge of the new high court of Calcutta. He did not live, however, to take his seat on the bench, and was succeeded by Sambhu Nath Pandit, and then by Dwarka Nath Mitra, perhaps the most talented judge that India produced in the 19th century. Dwarka Nath's great ability and thorough insight into cases were universally recognized in India; his decisions were valued and often quoted; and his name was often mentioned as an illustration of the judicial capacity of the natives of India. Anukul Chandra Mukerji also sat on the bench for a time; and on his death in 1871, Romesh Chandra Mitra was appointed judge in his place. He maintained the high reputation of his predecessors, and for a period of nearly twenty years, down to 1890, he performed his judicial duties with credit and distinction. When the post of chief justice was temporarily vacant in 1882, the marquis of Ripon, then viceroy of India, appointed Romesh Chandra to officiate in that post—the highest judicial position in the Indian empire. Lord Dufferin, who succeeded Lord Ripon as viceroy of India, appointed Romesh Chandra a member of the Public Service Commission, and in this capacity he did valuable work. Failing health compelled him to retire from the high court in 1890, and he was then knighted and appointed a member of the viceroy's legislative council. Till he died in 1899, he continued to take interest in all social, educational and political reforms in India.

ROMFORD, a market town in the Romford parliamentary division of Essex, England; on the small river Rom, which flows into the Thames; 12½ m. E.N.E. from London by the Great Eastern railway. Pop. of urban district (1901) 13,656. The ancient church of St Edward the Confessor was replaced in 1850 by a structure in Decorated style. There is a large brewery in the town, and extensive market gardens in the neighbourhood. A grant of a market was obtained in 1247, and this is still of importance as regards both cattle and corn. Romford was included in the liberty of Havering-atte-Bower, which until 1892 had a jurisdiction of its own distinct from that of the county, with a high steward, magistrates, clerk of the peace, coroner and quarter sessions. The name of Bower was derived from a queen's residence attached to the ancient royal hunting-lodge in the vicinity.

The fact that Romford (*Rumford*, *Rompford*) lies on the high road between Colchester and London has determined its history. Bronze implements have been found here, but no notice of Romford occurs till the 12th century. It was included in the liberty of Havering, and the chief business of the liberty was conducted there. But the corporation which is mentioned in medieval records is not that of the town of Romford, but of the liberty of Havering. Romford has only had a separate constitution since a local board of health was formed in 1894, under the act of 1875, after the abolition of the liberty in 1892. In the middle ages Romford was rather a meeting-place for merchants than an industrial centre. Brewing, however, is mentioned in 1331, and one tanner at least carried on business in Hare Street in 1467.

ROMILLY, JOHN ROMILLY, 1ST BARON (1802–1874), English judge, was the second son of Sir Samuel Romilly, and was born on the 10th of January 1802. He was educated at Trinity College, Cambridge, and was called to the bar at Gray's Inn in 1827. He first entered parliament in 1832 as member for Bridport, and in 1843 he became a queen's counsel. He was elected M.P. for Devonport in 1847, and was appointed solicitor-general in 1848 in Lord John Russell's administration and attorney-general in 1850. In 1851 he was appointed master of the rolls, and continued to sit for Devonport till the general election in 1852, when he was defeated. He was the last master of the rolls to sit in parliament. Romilly was raised to the peerage as Baron Romilly of Barry in 1866, and retired from the mastership of the rolls in 1873. He did much to remove the restrictions which had long hampered research among the public records and state papers. Lord Romilly died in London on the 23rd of December 1874.

ROMILLY, SIR SAMUEL (1757–1818), English legal reformer, was the second son of Peter Romilly, a watchmaker and jeweller in London, whose father had emigrated from Montpellier after the revocation of the edict of Nantes, and who had married Margaret Garnault, a Huguenot refugee like himself, but of a far wealthier family. Samuel Romilly was born in Frith Street, Soho, on the 1st of March 1757. He served for a time in his father's shop; but his education was not neglected, and he became a good classical scholar and particularly conversant with French literature. A legacy of £2000 from one of his mother's relations led to his being articled to a solicitor and clerk in chancery with the idea of qualifying himself to purchase the office of one of the six clerks in chancery. In 1778, however, he determined to go to the bar, and entered himself at Gray's Inn. He went to Geneva in 1781, where he made the acquaintance of the chief democratic leaders, including Étienne Dumont. Called to the bar in 1783, he went the midland circuit, but was chiefly occupied with chancery practice. On the publication of Madan's *Thoughts on Executive Justice*, advocating the increase of capital punishments, he at once wrote and published in 1786 *Observations* on Madan's book. Of more general interest is his intimacy with the great Mirabeau, to whom he was introduced in 1784. Mirabeau saw him daily for a long time and introduced him to Lord Lansdowne, who highly appreciated him, and, when Mirabeau became a political leader, it was to Romilly that he applied for an account of the procedure used in the English House of Commons. He visited Paris in 1789, and studied the course of the Revolution there; and in 1790 he published his *Thoughts on the Probable Influence of the Late Revolution in France upon Great Britain*, a work of great power. His practice at the chancery bar continued largely to increase, and in 1800 he was made a K.C. In 1798 he married Anne, daughter of Francis Garbett of Knill Court, Herefordshire; and in 1805 he was appointed chancellor of the county palatine of Durham. His great abilities were thoroughly recognized by the Whig party, to which he attached himself; and in 1806, on the accession of the ministry of "All the Talents" to office, he was offered the post of solicitor-general, although he had never sat in the House of Commons. He accepted the office, and was knighted and brought into parliament for Queenborough. He went out of office with the government, but remained in the House of Commons, sitting successively for Horsham, Wareham and Arundel. It was now that Sir Samuel Romilly commenced the greatest labour of his life, his attempt to reform the criminal law of England, then at once cruel and illogical. By statute law innumerable offences were punished by death, but, as such wholesale executions would be impossible, the larger number of those convicted and sentenced to death at every assizes were respited, after having heard the sentence of death solemnly passed upon them. This led to many acts of injustice, as the lives of the convicts depended on the caprice of the judges, while at the same time it made the whole system of punishments and of the criminal law ridiculous. Romilly saw this, and in 1808 he managed to repeal the Elizabethan statute, which made it a capital offence to steal from the person. This success, however, raised opposition, and in the following year three bills repealing equally sanguinary statutes were thrown out by the House of Lords under the influence of Lord Ellenborough. Year after year the same influence prevailed, and Romilly saw his bills rejected; but his patient efforts and his eloquence ensured victory eventually for his cause by opening the eyes of Englishmen to the barbarity of their criminal law. The only success he had was in securing the repeal, in 1812, of a statute of Elizabeth making it a capital offence for a soldier or a mariner to beg without a pass from a magistrate or his commanding officer. Sir Samuel Romilly's efforts made his name famous not only in England but all over Europe, and in 1818 he had the honour of being returned at the head of the poll for the city of Westminster. He did not long survive his triumph. On the 29th of October 1818 Lady Romilly died in the Isle of Wight. Her husband's grief was intense, and he committed suicide in a fit of temporary insanity on the 2nd of November. No man of his time was more loved than Sir Samuel Romilly; his singularly sweet nature, his upright manliness, his eloquence and his great efforts on behalf of humanity secured him permanent fame.

See the *Memoirs of the Life of Sir Samuel Romilly written by himself, with a selection from his Correspondence, edited by his Sons* (3 vols., 1840); *The Speeches of Sir Samuel Romilly in the House of Commons* (2 vols., 1820); "Life and Work of Sir Samuel Romilly," by Sir W. J. Collins, in *Trans. of the Huguenot Society* (1908).

ROMILLY-SUR-SEINE, a town of north-central France, in the department of Aube, a mile from the left bank of the Seine and 24 m. N.W. of Troyes, on the Paris-Belfort line. Pop. (1906) 9777.

Romilly is an important industrial town, with extensive manufactures of cotton and woollen hosiery, and of the special machinery and appliances required for the industry. The Eastern Railway Company has large workshops here.

ROMINTEN, a village of Germany, in the province of East Prussia, 12 m. N.E. from Goldap, situated in the Rominter Heide, a fine tract of heath and forest country, 90 sq. m. in extent, well stocked with game and affording excellent sport. Here is a favourite hunting-box of the German emperor, with a church adjacent, both in the Norwegian style. Pop. 1200.

See K. E. Schmidt, *Die Rominter Heide* (Danzig, 1898).

ROMNEY, GEORGE (1734–1802), English historical and portrait painter, was born at Dalton-in-Furness, Lancashire, on the 26th of December 1734. His father was a builder and cabinet-maker of the place, and the son, having manifested a turn for mechanics, was instructed in the latter craft, showing considerable dexterity with his fingers, executing carvings of figures in wood, and constructing a violin, which he spent much time in playing. He was also busy with his pencil; and some of his sketches of the neighbouring rustics having attracted attention, his father was at length induced to apprentice the boy, at the age of nineteen, to an itinerant painter of portraits and domestic subjects named Steele, an artist who had studied in Paris under Vanloo; but the erratic habits of his instructor prevented Romney from making great progress in his art. In 1756 he impulsively married a young woman who had nursed him through a fever, and started as a portrait painter on his own account, travelling through the northern counties, executing likenesses at a couple of guineas, and producing a series of some twenty figure compositions, which were exhibited in Kendal, and afterwards disposed of by means of a lottery.

Having, at the age of twenty-seven, saved about £100, he left a portion of the sum with his wife and family, and started to seek his fortune in London, never returning, except for brief visits, till he came, a broken-down and aged man, to die. Credit must, however, be given him for recognizing to some extent his family responsibilities. He did not allow his wife and children to fall into poverty, and he gave help to his brothers, who seem to have resembled him in a kind of shiftlessness of temperament. In London he rapidly rose into popular favour. His "Death of General Wolfe" was judged worthy of the second prize at the Society of Arts, but a word from Reynolds in praise of Mortimer's "Edward the Confessor" led to the premium being awarded to that painter, while Romney had to content himself with a donation of £50, an incident which led to the subsequent coldness between him and the president which prevented him from exhibiting at the Academy or presenting himself for its honours.

In 1764 he paid a brief visit to Paris, where he was befriended by Joseph Vernet; and his portrait of Sir Joseph Yates, painted on his return, bears distinct traces of his study of the works of Rubens then in the Luxembourg Gallery. In 1766 he became a member of the Incorporated Society of Artists, and three years later he seems to have studied in their schools.

Soon he was in the full tide of prosperity. He removed to Great Newport Street, near the residence of Sir Joshua, whose fame in portraiture he began to rival in such works as "Sir George and Lady Warren" and "Mrs Yates as the Tragic Muse"; and his professional income rose to £1200 a year. But this marked increase in his popularity had the effect of enlarging his ambitions, and he became anxious to attempt subjects which required more experience than he possessed. Realizing as he did the need for more thorough knowledge, he was seized with a longing to study in Italy; and in the beginning of 1773 he started for Rome in company with Ozias Humphrey, the miniature painter. On his arrival he separated himself from his fellow-traveller and his countrymen, and devoted himself to solitary study, raising a scaffold to examine the paintings in the Vatican, and giving much time to work from the undraped model, of which his painting of a "Wood Nymph" was a fine and graceful result. At Parma he concentrated himself upon the productions of Correggio, which fascinated him and greatly influenced his practice.

In 1775 Romney returned to London, establishing himself in Cavendish Square, and resuming his extensive and lucrative employment as a portrait painter, which in 1785, according to the estimate of his pupil Robinson, yielded him an income of over £3600. The admiration of the town was divided between him and Reynolds. "There are two factions in art," said Lord Thurlow, "and I am of the Romney faction"—and the remark, and the rivalry which it implied, caused much annoyance to Sir Joshua, who was accustomed to refer contemptuously to the younger painter as "the man in Cavendish Square." After his return from Italy Romney formed two friendships which powerfully influenced his life. He became acquainted with Hayley, his future biographer, then in the zenith of his little-merited popularity as a poet. His influence on the painter seems to have been far from salutary. Weak himself, he flattered the weaknesses of Romney, encouraged his excessive and morbid sensibility, disturbed him with amateurish fancies and suggestions, and tempted him to expend on slight rapid sketches, and ill-considered, seldom-completed paintings of ideal and poetical subjects, talents which would have found fitter exercise in the steady pursuit of portraiture. About 1783 Romney was introduced to Emma Hart, afterwards celebrated as Lady Hamilton, and she became the model from whom he worked incessantly. Her bewitching face smiles from numerous canvases; he painted her as a Magdalene and as a Joan of Arc, as a Circe, a Bacchante, a Cassandra; and he has himself confessed that she was the inspirer of what was most beautiful in his art. But her fascinations seem to have been too much for the more than middle-aged painter, and they had their own share in aggravating that nervous restlessness and instability, inherent in his nature, which finally ruined both health and mind.

In 1786 Alderman Boydell started his great scheme of the Shakespeare Gallery, apparently at the suggestion of Romney. The painter at least entered heartily into the plan, and contributed his scene from the *Tempest*, and his "Infant Shakespeare attended by the Passions," the latter characterized by the Redgraves as one of the best of his subject pictures. Gradually he began to withdraw from portrait painting, to limit the hours devoted to sitters, and to turn his thoughts to mighty schemes of the ideal subjects which he would execute. Already, in 1792, he had painted "Milton and his Daughters," which was followed by "Newton making Experiments with the Prism." He was to paint the Seven Ages, Visions of Adam with the Angel, "six other subjects from Milton—three where Satan is the hero, and three from Adam and Eve,—perhaps six of each." Having planned and erected a large studio in Hamsptead, he removed thither in 1797, with the fine collection of casts from the antique which his friend Flaxman had gathered for him in Italy. But his health was now irremediably shattered, and the man was near his end. In the summer of 1799, suffering from great weakness of body and the profoundest depression of mind, he returned to the north, to Kendal, where his deserted but faithful and long-suffering wife received and tended him. He died on the 15th of November 1802.

The art of Romney, especially his figure subjects, suffered greatly from the waywardness and instability of the painter's disposition, from his want of fixed purpose and sustained energy. He lacked the steadfast perseverance needful to the accomplishment of a great picture. Afflicted as he was throughout his life by an unreasonable timidity and by a self-consciousness which led him at one moment into assertive affectations and at another into exaggerated humility, he avoided the society of his brother artists and lost many opportunities of receiving that frank professional criticism which might have stimulated him to more serious effort. In unwholesome surroundings he steadily deteriorated. His imagination flashed and flickered fitfully upon him, like April sunshine. His fancy would be captivated by a subject, which was presently embodied in a sketch, but the toil of elaborating it into the finished completeness of a painting too frequently overtaxed his powers; he became embarrassed by technical difficulties which, through defective early training, he was unable to surmount, and the half-covered canvas would be turned to the wall. Even in the pictures he finished he was unable to keep to any consistent level of achievement. He produced some fine things, very personal in style and very skilful in handling; but much that he did seems too tentative and too plainly deficient in shrewdness of insight to deserve serious consideration. His colour, too, was often unpleasant, hot and monotonous, and his composition was apt to be stilted and artificial. It is in the best of his portraits that we feel the painter's real ability. These, especially his female portraits, are full of grace, charm, distinction, and sweetness. When we examine his heads of Cowper and Wilkes, his delicate and dignified full-length of William Beckford, his "Parson's Daughter" in the National Gallery, and his group of the Duchess of Gordon and her Son, we cannot deny his claim to rank as one of the notable portrait painters of 18th-century England.

See the *Memoirs* by William Hayley (1809) and by the artist's son, the Rev. John Romney (1830); Cunningham's *Lives of the Painters*; *George Romney and his Art*, by Hilda Gamlin (1894). In the fully illustrated *George Romney*, by Lord Ronald Sutherland Gower (1904), pictures, mainly studies, are reproduced not elsewhere to be found. But the great work upon the artist is *Romney*, by Humphry Ward and W. Roberts (1904), a monograph of real importance, containing 70 illustrations, a biographical and critical essay, and a *catalogue raisonné* of the painter's works. Arthur B. Chamberlain's *Romney* (1910) has 73 plates.

ROMNEY, HENRY SIDNEY, Earl of (1641–1704), fourth son of Robert, 2nd earl of Leicester, was born in Paris in 1641. He and his nephew, Robert Spencer, afterwards 2nd earl of Sunderland, his senior by a few months, were sent to travel on the continent of Europe in charge of a Calvinist divine, Dr Thomas Pierce. Sidney's handsome face helped his advancement at court, but the favour in which he was held by the duchess of York, to whom he was master of the robes, led to his dismissal in 1666. His disgrace, however, was short-lived. He was promoted captain in 1667, and colonel in 1678. In 1672 he was sent on a mission of congratulation to Louis XIV., and in 1677 became master of the robes to Charles II. He entered parliament as member for Bramber in 1679, and became a close political ally of his nephew Sunderland, with whose wife he carried on an intrigue which caused considerable scandal. Sunderland made this intimacy a means to further his political ends, while Sidney's social reputation and his apparent frivolity partly concealed his real capacity for intrigue. Sidney was sent by Sunderland and others in 1679 on a special mission to urge William of Orange to visit England, a task that he was able to discharge while acting as the official envoy of Charles II. at the Hague. He was recalled in 1682, but was again sent on a special mission to Holland in the year of the accession of James II. He returned to England in the spring of 1688, and set to work, at William's desire, to obtain promises of support for the prince of Orange in the event of his landing. He was presently allowed to leave England on giving his word not to visit the

Hague, but he broke his promise on getting clear of England, and conveyed to William a duplicate of the invitation addressed to him by the English nobility, together with intelligence of affairs of state obtained through the countess of Sunderland. He landed with William at Torbay, and received substantial rewards for his undoubted services. Sworn of the privy council in 1689, Sidney was made gentleman of the bedchamber and colonel of the king's regiment of footguards, and received the titles of Baron Milton and Viscount Sidney of Sheppey. In 1690 he received considerable grants of land from the confiscated estates of the Irish supporters of James II., much of which he lost, however, on the parliamentary investigation in 1699 into the distribution of the Irish lands. William made him secretary of state in 1690, pending the discovery of a better person. He was soon asked to resign, but was compensated by his appointment, in 1692, as lord-lieutenant of Ireland. His inability to cope with the difficulties of this position led to his recall in the next year, when he became master-general of the ordnance. He was created earl of Romney in May 1694, and he retained William's confidence to the last, but on Anne's accession he was dismissed from his various offices. He never married, and his titles became extinct on his death on the 8th of April 1704.

In 1801 the title of earl of Romney was revived in the family of Marsham. Sir Robert Marsham, Bart. (1685–1724), of Cuxton in Kent, was a member of parliament from 1708 to 1716, when he was created Baron of Romney. His grandson Charles, the 3rd Baron (1774–1811), was created earl of Romney in 1801, and from him the present earl is descended.

ROMNEY (New Romney), a municipal borough and one of the Cinque Ports in the Ashford parliamentary division of Kent, England, 75 m. S.E. by E. of London by the South-Eastern & Chatham railway. Pop. (1901) 1328. It lies in the open, flat and low tract of Romney Marsh, part of a level extending from Winchelsea in the south-west to Hythe in the north-east, which was within historic times in great part covered by an estuarine inlet of the sea. The river Rother, which now has its mouth at Rye Harbour, formerly entered the sea here, but had its course wholly changed during a great storm in 1287, and the gradual accretion of land led to the decay, not only of Romney, but of Winchelsea and Rye as seaports. Romney Marsh itself, which extends north of New Romney, is protected by a seawall of great thickness, and its guardianship and drainage is in the hands of a special ancient corporation. The level affords pasturage for vast flocks of sheep. New Romney, which is now over a mile from the sea, has large sheep fairs, but little other trade. Of the five churches mentioned here in the Domesday Survey only one remains, but this, dedicated to St Nicholas, is a rich Norman building with later additions. Its Norman west tower is among the finest in England, and it has a beautiful Decorated east window with reticulated tracery. New Romney, the name of which distinguishes it from the decayed village of Old Romney, 2 m. W., is governed by a mayor, 4 aldermen and twelve councillors. Area, 1351 acres. Littlestone-on-Sea, on the coast E. of New Romney, is in some favour as a seaside resort and has excellent golf-links.

Its fine harbour was the cause of the early importance of Romney (Romenal, Romenhall). The annual assembly of the Cinque Ports, called the Brodhull, was held here owing to its central position. At the time of Domesday the archbishop of Canterbury and the bishop of Bayeux were joint lords. Romney also owed maritime service to the king, which consisted of supplying five ships to serve for fifteen days in the year. A confirmation of liberties was granted by John in 1205. The town, which was a borough by prescription, was governed "from time immemorial" by twelve jurats; a bailiff was appointed by the archbishop, but the rights of the overlord seem to have been small, and in 1521 the inhabitants denied the bailiff the right of presiding with the jurats over their court. Elizabeth changed the style of incorporation to the mayor, jurats and commonalty, and another charter was granted by James II. in 1686, which remained the governing charter until 1835. The Cinque Ports were first summoned to parliament in 1265; the first returns for Romney are for 1266; it returned two members until it was disfranchised in 1832.

ROMORANTIN, a town of central France, capital of an arrondissement in the department of Loir-et-Cher, 31 m. S.E. of Blois by rail. Pop. (1906) town, 6836; commune, 8374. The town is situated on the Sauldre at its confluence with the Morantin, whence its name (*Rivus Morantini*). A church dating mainly from the 12th century, a gateway of the 16th century and some old houses are the chief objects of interest. The remains of a château rebuilt by Francis I. in the Renaissance style are used as the sub-prefecture. Tribunals of first instance and of commerce, and a communal college are among the public institutions. The manufacture of flannel and cloth especially for army clothing is carried on, together with trade in wine, live stock, agricultural produce and the asparagus of the vicinity.

In 1560 Romorantin gave its name to an edict which prevented the introduction of the Inquisition into France. The industrial importance of the town dates from the later middle ages.

ROMSDAL, the valley of the river Rauma, in Norway. The Rauma is a torrent descending from Lake Lesjekogen to the Romsdal Fjord on the west coast (62° 30′ N.). The nearest port is Molde, from which steamers run to Veblungsnaes (30 m.) at the foot of the valley. A good road traverses the valley, which is one of the finest in southern Norway, flanked by steep mountains terminating in abrupt peaks—Vengetinder (5960 ft.), Romsdalshorn (5105), Troldtinder ("witch-peaks," 6010) and others. Several waterfalls are seen, such as the Mongefos, the Vaermofos, falling nearly 1000 ft., and the Slettafos. Lake Lesjekogen also drains from the opposite end by the Laagen or Lougen river to the Glommen, and so to the Skagerrack, and the road follows its valley, the Gudbrandsdal. The Romsdal gives its name to an *amt* (county) extending from the promontory of Stadt in the south to Ram Fjord in the north, including the Stor, Molde, Halse and their branch fjords, the ports of Aalesund, Molde and Christiansund, and reaching inland to the Dovrefjeld.

ROMSEY, a market town and municipal borough in the New Forest parliamentary division of Hampshire, England, 7 m. N.W. of Southampton by the London & South-Western railway. Pop. (1901) 4365. It is pleasantly situated in the rich valley of the Test. The abbey church of SS. Mary and Elfleda is one of the finest examples in England of a great Norman church little altered by later builders. Its history is not clear, but a house was founded here by Edward the elder (*c.* 910), and became a Benedictine nunnery. The church, which is the only important relic of the foundation, is cruciform, with a low central tower. Building evidently began in the first half of the 12th century, and continued through it, as the western part of the nave shows the transition to the Early English style, which appears very finely in the west front. Decorated windows occur in the east end, beyond which a chapel in this style formerly extended. Perpendicular insertions are insignificant. The nave and choir have aisles, triforium and clerestory. The transepts have eastern apsidal chapels, as have the choir aisles, though the walls of these last are square without. Foundations of the apse of a large pre-Norman church have been discovered below the present building. In Romsey there are tanyards, ironworks and works of the Berthon Boat Company. The borough is under a mayor, 4 aldermen and 12 councillors. Area, 533 acres.

Romsey (*Romesyg*, *Romeseie*) probably owed its origin, as it did its early importance, to the abbey. At the time of the Domesday Survey it was owned by the abbey, which continued to be the overlord until the dissolution. There is no evidence to show that Romsey was a borough before the charter of incorporation granted by James I. in 1608. This was confirmed by William III. in 1692, and the corporation was reformed in 1835. Romsey has never been represented in parliament. The right to hold a fair was granted to the abbey by Henry III.

in 1271, and fairs were held on Easter Monday, on August 26 and November 8. The market now held on Thursday, formerly on Saturday, dates from 1272. Every alternate Thursday is a great market. In medieval times Romsey had a considerable share of the woollen trade of Hampshire, but by the end of the 17th century this manufacture began to decline, and the introduction of machinery and the adoption of steam led to its subsequent transference to the northern coal centres. The clothing trade was replaced by the manufacture of paper, an industry which still exists.

ROMULUS, the legendary eponymous founder and first king (753–716?) of Rome, represented as the son of Mars by the Vestal Rhea Silvia or Ilia, daughter of Numitor, who had been dispossessed of the throne of Alba by his younger brother Amulius. Romulus and Remus, the twin sons of Silvia, were placed in a trough and cast into the Tiber by their granduncle. The trough grounded in the marshes where Rome afterwards stood, under the wild fig tree (*ficus ruminalis*), which was still holy in later days. The babes were suckled by a she-wolf and fed by a woodpecker, and then fostered by Acca Larentia, wife of the shepherd Faustulus. They became leaders of a warlike band of shepherds on the Palatine, and in course of time were recognized by their grandfather, whom they restored to his throne, slaying the usurper Amulius. They now proposed to found a city on the site where they had been nurtured; but a quarrel for precedence broke out and Remus was slain. Romulus strengthened his band by offering an "asylum" to outcasts and fugitives, found wives for them by capture and waged war with their kinsmen. His most formidable foe was Titus Tatius (*q.v.*), king of the Sabines, but after an obstinate struggle he and Romulus united their forces and reigned side by side till Tatius was slain at Lavinium in the course of a blood-feud with Laurentum. Romulus then reigned alone till he suddenly disappeared in a storm. He was thereafter worshipped as a god under the name of Quirinus, which, however, is really a Sabine form of Mars. The story of Romulus, best preserved in the first book of Livy (see also Dion. Halic. i. 75–ii. 56; Plutarch, *Romulus*; Cicero, *de Republica*, ii. 2–10), belongs throughout to legend. This was felt in later times by the Romans themselves, who gave a rationalistic explanation of the miraculous incidents. Thus, Mars was converted into a stranger disguised as the god of war, and the she-wolf into a woman of ill-fame (*lupa*); Romulus was not taken up into heaven, but put to death and carried away piecemeal by the patricians under their cloaks.

The whole story, probably first given by the annalists Fabius Pictor and Cincius Alimentus, contains religious and aetiological elements. The foundation of the city by twins may be explained by the worship of the Lares, who are generally represented as a pair of brothers, especially as the mother of Romulus and Remus was connected with the worship of the hearth of the state. The introduction of the wolf may be of Greek or eastern origin; it may have a totemistic significance; or may be due to the *ficus ruminalis*, the fig tree near the Lupercal on the Palatine, where the twins were first exposed. This tree was sacred to a goddess Rumina (*ruma*, "breast," whence the suckling incident), and the resemblance between Romulus and *ruminalis* led to the fig tree and the founder of the city being subsequently connected by the Roman antiquarians. The wolf would then be suggested by the proximity of the Lupercal, the grotto of Faunus Lupercus, with whom the shepherd Faustulus is identical. According to Professor Ducati of Bologna, in a paper on an old Etruscan stele, on which a she-wolf is represented suckling a child, the wolf legend is an importation from Etruria, the original home of which was Crete. Miletus, son of Apollo and a daughter of Minos, having been exposed by his mother, was suckled by she-wolves, being afterwards found and brought up by shepherds. To escape the designs of Minos, Miletus fled to Asia Minor, and founded the city called after him, where the Etruscans first became acquainted with the legend. The opening of the "asylum" is a Greek addition (as the name itself suggests). Down to imperial times, the Romans seem to have been ignorant of the Greek custom of taking sanctuary; further, the idea was entirely opposed to the exclusive spirit of the ancient Italians. The story was probably invented to give an explanation of the sacred spot named "Inter duos lucos" between the arx and the Capitol. Another Greek touch is the deification of an eponymous hero. The rape of the Sabine women is clearly aetiological, invented to account for the custom of marriage by capture. Consus, at whose festival the rape took place, was a god of the earth and crops, the giver of fruitfulness in plants and animals. It is generally agreed that the capture of the Capitol by Titus Tatius may contain an historical element, pointing to an early conquest of Rome by the Sabines, of which there are some indications. Subsequently, to efface the recollection of an event so distasteful to Roman vanity and national pride, Sabine names and customs were accounted for by a supposed union of Romans and Sabines during the regal period, the result of a friendly league concluded between Romulus and Tatius. According to E. Pais, Romulus is merely the eponym of Roma; his life is nothing but the course of the sun, and the institutions ascribed to him are the result of long historical development.

Romulus, like his double Tullus Hostilius, is regarded as the founder of the military and political (see ROME), as Numa and his counterpart Ancus Marcius of the religious institutions of Rome.

For a critical examination of the story, see Schwegler, *Römische Geschichte*, bks. viii.–x.; Sir George Cornewall Lewis, *Credibility of early Roman History*, chap. 11; W. Ihne, *History of Rome*, i.; Sir J. Seeley, Introduction to his edition of Livy, bk. i.; E. Pais, *Storia di Roma* (1898), i. pt. 1, and *Ancient Legends of Roman History* (Eng. trans., 1906); also O. Gilbert, *Geschichte und Topographie der Stadt Rom im Altertum* (1883–1885).

RONCESVALLES (Fr. *Roncevaux*), a village of northern Spain, in the province of Navarre; situated on the small river Urrobi, at an altitude of 3220 ft. among the Pyrenees, and within 5 m. from the French frontier. Pop. (1900) 152. Roncesvalles is famous in history and legend for the defeat of Charlemagne and the death of Roland (*q.v.*) in 778. The small collegiate church contains several curious relics associated with Roland, and is a favourite place of pilgrimage. The battle is said to have been fought in the picturesque valley known as Val Carlos, which is now occupied by a hamlet bearing the same name, and in the adjoining defile of Ibaneta. Both of these are traversed by the main road leading north from Roncesvalles to St Jean Pied de Port, in France.

RONCONI, GIORGIO (1810–1890), Italian baritone vocalist, was born in 1810. He learnt singing from his father Domenico, who had been a celebrated tenor in his time, and made his début in 1831 at Pavia. After singing in Italy for some years with ever-growing success, he appeared for the first time in England, in 1842, as Henry Ashton in *Lucia di Lammermoor*. His success was immediate, and he continued to be one of the most popular artists on the lyric stage until his retirement in 1866. His voice was neither extensive in compass nor fine in quality, but the genius of his acting and the strength of his personality fully atoned for his vocal defects. He was equally at home in comedy and tragedy, and the two parts by which he is best remembered, Rigoletto and Figaro, show conclusively the range of his talent. In his later years Ronconi founded a school of singing at Granada, and he also accepted the post of professor of singing at the Madrid Conservatoire. He died in 1890.

RONDA, a town of southern Spain, in the province of Malaga; on the river Guadiaro and on the Algeciras-Bobadilla railway. Pop. (1900) 20,995. Ronda is built on a high rock nearly surrounded by the Guadiaro, which flows through an abrupt chasm 530 ft. deep and 300 ft. wide, by which the old town is separated from the new. Of the three bridges, one is said to have been built by the Romans, another by the Moors; the most modern (1761) spans the stream in a single arch at a height of about 255 ft. On the edge of the chasm is the alameda or public promenade, commanding a wide and beautiful prospect of the fertile valley or vega and the sierras beyond. The old part of the town has a Moorish aspect, with narrow, steep and crooked lanes, and still retains some Moorish towers and other medieval buildings. The Ronda bull-ring is one of the finest in Spain, and can accommodate 10,000 spectators. Ronda has a considerable trade in leather, saddlery, horses, soap, flour, chocolate, wine and hats.

Some remains of an aqueduct and theatre, about 7 m. N. of Ronda, are supposed to represent the *Acinipo* or *Arunda* of ancient geographers. Ronda was taken from the Moors in 1485. It gives its name to the Sierra or Serrania de Ronda, one of the main sections of the coast mountains which rise between the great plain of Andalusia and the Mediterranean.

RONDEAU (Ital. *Rondo*), a structural form in poetry and (in the form of "rondo") in music. In poetry the rondeau is a short metrical structure which in its perfect form consists of thirteen eight- or ten-syllabled verses divided into three strophes of unequal length, and knit together by two rhymes and a refrain. In Clement Marot's time the laws of the rondeau were laid down, and, according to Voiture, in the 17th century, the following was the type of the approved form of the rondeau:—

" Ma foy, c'est fait de moy, car Isabeau
M'a conjuré de luy faire un Rondeau:
Cela me met en une peine extrême.
Quoy treize vers, huit en *eau*, cinq en *ème*.
Je luy ferois aussi-tôt un bateau !

En voilà cinq pourtant en un monceau:
Faisons en huict, en invoquant Brodeau,
En puis mettons, par quelque stratagème,
Ma foy, c'est fait !

Si je pouvois encore de mon cerveau
Tirer cinq vers, l'ouvrage seroit beau;
Mais cependant, je suis dedans l'onzième,
Et si je croy que je fais le douzième
En voilà treize ajustez au niveau.
Ma foy, c'est fait !"

All forms of the rondeau, however, are alike in this, that the distinguishing metrical emphasis is achieved by a peculiar use of the refrain. Though we have a set of rondeaux in the *Rolliad* (written by Dr. Lawrence the friend of Burke, according to Edmund Gosse, who has given us an admirable essay upon exotic forms of verse), it was not till recent years that the form had any real vogue in England. Considerable attention, however, has lately been given in England to the form. Some English rondeaux are as bright and graceful as Voiture's own. Swinburne, who in his *Century of Roundels* was perhaps the first to make the refrain rhyme with the second verse of the first strophe, has brought the form into high poetry. In German, rondeaux have been composed with perfect correctness by Weckherlin, and with certain divergences from the French type by Götz and Fischart; the German name for the form is *rundum* or *ringel-gedicht*.

Although the origin of the refrain in all poetry was no doubt the improvisatore's need of a rest, a time in which to focus his forces and recover breath for future flights, the refrain has a distinct metrical value of its own; it knits the structure together, and so intensifies the emotional energy, as we see in the Border ballads, in the *Oriana* of Lord Tennyson, and in the *Sister Helen* of Rossetti. The suggestion of extreme artificiality—of "difficulty overcome"—which is one great fault of the rondeau as a vehicle for deep emotion, does not therefore spring from the use of the refrain, but from the too frequent recurrence of the rhymes in the strophes—for which there is no metrical necessity as in the case of the Petrarchan sonnet. The rondeau is, however, an inimitable instrument of gaiety and grace in the hands of a skilful poet.

RONDEL, a form of verse closely allied to the rondeau (*q.v.*) but distinguished from it by containing fourteen instead of thirteen lines, and by demanding a slightly different arrangement of rhymes. Moreover, the initial couplet is repeated in the middle and again at the close. The arrangement of rhymes is as follows: a, b b, a; a b, a b; a, b, b, a, a, b. This form, which was invented in the 14th century, was largely used in later medieval French poetry, but particularly by Charles d'Orléans (1391–1465), the very best of whose graceful creations are all rondels. One of the most famous of this prince's rondels may be given here as a type of their correct construction:—

" Le temps a laissié son manteau
De vent, de froidure et de pluye,
Et s'est vestu de brouderie
De souleil luisant, cler et beau.
Il n'y a beste ne oyseau
Qu'en son jargon ne chante ou crie:
Le temps a laissié son manteau
De vent, de froidure et de pluye.
Rivière, fontaine et ruisseau
Portent, en livrée jolie,
Gouttes d'argent d'or faverie;
Chascun s'abille de nouveau;
Le temps a laissié son manteau
De vent, de froidure et de pluye."

The rondel, in French, may begin with either a masculine or a feminine rhyme, but its solitary other rhyme must be of the opposite kind. The rondel was introduced into English in the 15th century, but the early specimens of it are very clumsy. It was revised in the 19th century, but it appears to suit the French better than any other language. Correct examples are found in the poems of Robert Bridges, Dobson, Gosse and Henley. The following, by Austin Dobson, gives an exact impression of what an English rondel should be in all technical respects:—

" Love comes back to his vacant dwelling,—
The old, old Love that we knew of yore !
We see him stand by the open door,
With his great eyes sad, and his bosom swelling.
He makes as though in our arms repelling
He fain would lie as he lay before;—
Love comes back to his vacant dwelling,—
The old, old Love that we knew of yore !
Ah ! who shall help us from over-spelling
That sweet, forgotten, forbidden lore ?
E'en as we doubt, in our hearts once more,
With a rush of tears to our eyelids welling,
Love comes back to his vacant dwelling,
The old, old Love that we knew of yore !"

Théodore de Banville remarks that the art of the rondel consists in the gay and natural reintroduction of the refrain, which should always seem inevitable, while slightly changing the point of view of the reader. If this is not successfully achieved, "on ne fera que de la marqueterie et du placage, c'est-à-dire, en fait de poésie,—rien!" In Germany, the rondel was introduced, in the 18th century, under the name of *ringel-gedicht*, by Johann Nikolaus Götz (1731–1781), and was occasionally used, in the course of the 19th century, by German poets.

RONDO, a musical form originally derived from the rondel in verse; as may be seen, long before the development of instrumental forms, in some of the *chansons* of Orlando di Lasso. The *rondeau en couplets* of Couperin and his contemporaries shows both in name and form the same connexion with verse. It consists of the alternation between a single neatly rounded phrase and several slightly contrasted episodes (the *couplets*) without any important change of key. Bach enriched it with his wealth of epigram, but did not expand its range.

The later sense of the term covers an important series of the sonata forms (*q.v.*), chiefly found in finales; but rondo-form sometimes occurs in slow movements (*e.g.* Mozart, *Haffner Serenade*, String Quintet in E flat; Beethoven, Fourth Symphony; Quartet, *Op.* 74, &c.). The single-phrase *ritornello* and short *couplets* of the old form are in the sonata style replaced by a broadly designed melody and well-contrasted episodes in different keys.

If the form of a Bach or Couperin rondo may be represented by *A B A C A D A*, &c., the various forms of the later rondo may be represented somewhat as follows: placing on a horizontal line those parts that are in the main key, and representing other keys by differences of level:—

(i) *Sectional rondos; i.e.* with little or no development or transition between episode and main theme; very characteristic of Haydn, who, however, often gives it more organization than appears on the surface—$\underline{\mathrm{A}\ \overset{\mathrm{B}}{\quad}\ \mathrm{A}\ \underset{\mathrm{C}}{\quad}\ \mathrm{A}\ \textit{coda}}$; very rarely with no change of key except between tonic major and minor, as in Haydn's famous *Gipsy Rondo*. Frequently the episodes are increased in number or made to recur. Beethoven most clearly shows the influence of Haydn in his frequent use of modifications of this type of rondo in his earlier works, *e.g.* finales of Sonatas, *Op.* 10, No. 3, *Op.* 14, Nos. 1 and 2. He also applied it very successfully to his early slow movements, as in the Sonatas, *Op.* 2, No. 2, and *Op.* 13 (*Pathétique*). The sectional rondo was modernized on a gigantic scale by Brahms in the finale of his G minor Pianoforte Quartet, *Op.* 25; and Schumann's favourite art-forms are various compounds between it and the cognate idea of the dance-tune with one or more "trios," as in the Novellettes, the Arabeske, and the Romance in B major.

(ii) *Rondos influenced by the form of a first movement* (for which see SONATA FORMS). The normal scheme for this, which is Mozart's favourite rondo-form, is $\underline{\mathrm{A}\ \overset{\mathrm{B}}{\quad}\ \mathrm{A}\ \underset{\mathrm{C}}{\quad}\ \mathrm{A}\ \mathrm{B}\ \mathrm{A}\ \textit{coda}}$, and it is easy to see how it may be applied to sectional rondos, as in the finale of Beethoven's Sonata, *Op.* 13. But it normally implies longer and weightier themes and a higher degree of organization. If the second episode (*C*) is transformed into an elaborate development of previous material in various keys, the resemblance to first-movement form is increased; the only external difference being the recurrence of *A* in full after the first episode *B* (which is treated exactly like the "second subject" of a first movement). As, however, many first movements that do not repeat their exposition (corresponding to $A+B$ in the above rondo-scheme) make a feint of so doing before beginning the development, it is obvious that the blending of rondo and first-movement form may become very complete. In fact, the true criterion of a rondo is, as with all real art-forms, a matter of style rather than of external shape. The well rounded-off, self-repeating, tune-like character of the main theme, and a sense of pleasure and importance in the mere fact of its return (without absolute necessity for dramatic effect) are the distinctive evidences of rondo form and style. This rule is well proved by the case most frequently cited as an exception, the rondo of Beethoven's Sonata in D, *Op.* 10, No. 3; for nothing can be more significant than the way in which its fragmentary opening figure is built up into a self-contained musical epigram and ended with a full close, as contrasted with the way in which the most tuneful of first-movement beginnings (*e.g.* Beethoven's Quartet in F major, *Op.* 59, No. 1, Trio in B flat, *Op.* 97; Brahms's String Quintet in F major, *Op.* 88) expand gradually into their further course.

The following are some of the more important of many modifications and applications of this form:—

(*a*) Omission of return of main theme before recapitulation of episode—$\mathrm{A}\ \overset{\mathrm{B}}{\quad}\ \mathrm{A}$ *development in various keys*, B A *coda*—as in Beethoven's G major Concerto, where, however, much happens between the recapitulation of *B* and the following return of *A*, and the *coda* is nearly as long as all that has gone before.

(*b*) $\mathrm{A}\ \overset{\mathrm{B}}{\quad}\ \mathrm{A}$ B (A) like a first movement without a development. Here *A* will be very large and the transition to *B* important, while *B* will consist of a considerable number of themes. See the finales of Mozart's E flat String Quartet and C major Quintet, most of his greater slow movements, and many of Beethoven's.

In concertos the only modifying influence the balance between solo and orchestra shows in rondo-form is in the tendency to give the orchestra a large number of subsidiary themes at the outset, which perhaps do not reappear until the *coda*, where, with the aid of the solo, they can round off the design very effectively. Mozart's use of this device is not confined to concertos. (D. F. T.)

RONSARD, PIERRE DE (1524–1585), French poet and "prince of poets" (as his own generation in France called him), was born at the Château de la Poissonnière, near the village of Couture in the province of Vendômois (department of Loir-et-Cher), on the 11th of September 1524. His family are said to have come from the Slav provinces to the south of the Danube (provinces with which the crusades had given France much intercourse) in the first half of the 14th century. Baudouin de Ronsard or Rossart was the founder of the French branch of the house, and made his mark in the early stages of the Hundred Years' War. The poet's father was named Loys, and his mother was Jeanne de Chaudrier, of a family not only noble in itself but well connected. Pierre was the youngest son. Loys de Ronsard was *maître d'hôtel du roi* to Francis I., whose captivity after Pavia had just been softened by treaty, and he had to quit his home shortly after Pierre's birth. The future Prince of Poets was educated at home for some years and sent to the Collège de Navarre at Paris when he was nine years old. It is said that the rough life of a medieval school did not suit him. He had, however, no long experience of it, being quickly appointed page, first to the king's eldest son François, and then to his brother the duke of Orleans. When Madeleine of France was married to James V. of Scotland, Ronsard was attached to the king's service, and he spent three years in Great Britain. The latter part of this time seems to have been passed in England, though he had, strictly speaking, no business there. On returning to France in 1540 he was again taken into the service of the duke of Orleans. In this service he had other opportunities of travel, being sent to Flanders and again to Scotland. After a time a more important employment fell to his lot, and he was attached as secretary to the suite of Lazare de Baïf, the father of his future colleague in the Pléiade and his companion on this occasion, Antoine de Baïf, at the diet of Spires. Afterwards he was attached in the same way to the suite of the cardinal du Bellay-Langey, and his mythical quarrel with Rabelais dates mythically from this period. His apparently promising diplomatic career was, however, cut short by an attack of deafness which no physician could cure, and he determined to devote himself to study. The institution which he chose for the purpose among the numerous schools and colleges of Paris was the Collège Coqueret, the principal of which was Daurat—afterwards the "dark star" (as he has been called from his silence in French) of the Pléiade, and already an acquaintance of Ronsard's from his having held the office of tutor in the Baïf household. Antoine de Baïf, Daurat's pupil, accompanied Ronsard; Belleau shortly followed; Joachim du Bellay, the second of the seven, joined not much later. Muretus (Jean Antoine de Muret), a great scholar and by means of his Latin plays a great influence in the creation of French tragedy, was also a student here.

Ronsard's period of study occupied seven years, and the first manifesto of the new literary movement, which was to apply to the vernacular the principles of criticism and scholarship learnt from the classics, came not from him but from Du Bellay. The *Défense et illustration de la langue française* of the latter appeared in 1549, and the Pléiade (or *Brigade*, as it was first called) may be said to have been then launched. It consisted, as its name implies, of seven writers whose names are sometimes differently enumerated, though the orthodox canon is beyond doubt composed of Ronsard, Du Bellay, Baïf, Belleau, Pontus de Tyard (a man of rank and position who had exemplified the principles of the friends earlier), Jodelle the dramatist, and Daurat. Ronsard's own work came a little later, and a rather idle story is told of a trick of Du Bellay's which at last determined him to publish. Some single and minor pieces, an epithalamium on Antoine de Bourbon and Jeanne de Navarre (1550), a "Hymne de la France" (1549), an "Ode à la Paix," preceded the publication in 1550 of the four first books ("first" is characteristic and noteworthy) of the *Odes* of Pierre de Ronsard. This was followed in 1552 by the publication of his *Amours de Cassandre* with the fifth book of *Odes*. These books excited a violent literary quarrel. Marot was dead, but he left a numerous school, some of whom saw in the stricter literary critique of the Pléiade, in its outspoken contempt of merely vernacular and medieval forms, in its strenuous advice to French poetry to "follow the ancients," and so forth, an insult to the author of the *Adolescence Clémentine* and his followers. The French court, and indeed all French society, was just then much interested in literary questions, and a curious story is told of the rivalry that ensued. Mellin de Saint-Gelais, it is said, the chief of the "École Marotique" and a poet of no small merit, took up Ronsard's book and read part of it in a more or less designedly burlesque fashion before the king. It may be observed that if he did so it was a distinctly rash and uncourtier-like act, inasmuch as, from Ronsard's father's position in the royal household, the poet was personally known and liked both by Henry and by his family. At any rate, Marguerite de Valois, the king's sister, afterwards duchess of Savoy, is said to have snatched the book from Saint-Gelais and insisted on reading it herself, with the result of general applause. Henceforward, if not before, his acceptance as a poet was not doubtful, and indeed the tradition of his having to fight his way against cabals is almost entirely unsupported. His popularity in his own time was overwhelming and immediate, and his prosperity was unbroken. He published his *Hymns*, dedicated to Marguerite de Savoie, in 1555; the conclusion of the *Amours*, addressed to another heroine, in 1556; and then a collection of *Œuvres complètes*, said to be due to the invitation of Mary Stuart, queen of Francis II., in 1560; with *Elégies, mascarades et bergeries* in 1565. To this same year belongs his most important and interesting *Abrégé de l'art poëtique français*.

The rapid change of sovereigns did Ronsard no harm. Charles IX., who succeeded his brother after a very short time, was even better inclined to him than Henry and Francis. He gave him rooms in the palace; he bestowed upon him divers abbacies and priories; and he called him and regarded him constantly as his master in poetry. Neither was Charles IX. a bad poet. This royal patronage, however, had its disagreeable side. It excited violent dislike to Ronsard on the part of the Huguenots, who wrote constant pasquinades against him, strove (by a ridiculous exaggeration of the Dionysiac festival at Arcueil, in which the friends had indulged to celebrate the success of the first French tragedy, Jodelle's *Cléopatre*) to represent him as a libertine and an atheist, and (which seems to have annoyed him more than anything else) set up his follower Du Bartas as his rival. According to some words of his own, which are quite credible considering the ways of the time, they were not contented with this variety of argument, but attempted to have him assassinated. During this period Ronsard's work was considerable but mostly occasional, and the one work of magnitude upon which Charles put him, the *Franciade* (1572), has never been ranked, even by his most devoted admirers, as a chief title to fame. The metre (the decasyllable) which the king chose could not but contrast unfavourably with the magnificent alexandrines which Du Bartas and Agrippa d'Aubigné were shortly to produce; the general plan is feebly classical, and the very language has little or nothing of that racy mixture of scholarliness and love of natural beauty which distinguishes the best work of the Pléiade. The poem could never have had an abiding success, but at its appearance it had the singular bad luck almost to coincide with the massacre of St Bartholomew, which had occurred about a fortnight before its publication. One party in the state were certain to look coldly on the work of a minion of the court at such a juncture, the other had something else to think of. The death of Charles made, indeed, little difference in the court favour which Ronsard enjoyed, but, combined with his increasing infirmities, it seems to have determined him to quit court life. During his last days he lived chiefly at a house which he possessed in Vendôme, the capital of his native province, at his abbey at Croix-Val in the same neighbourhood, or else at Paris, where he was usually the guest of Jean Galland, well known as a scholar, at the Collège de Boncourt. It seems also that he had a town house of his own in the Faubourg Saint-Marcel. At any rate his preferments made him in perfectly easy circumstances, and he seems neither to have derived nor wished for any profit from his books. A half-jocular suggestion that his publisher should give him money to buy "du bois pour se chauffer" in return for his last revision of his *Œuvres complètes* is the only trace of any desire of the kind. On the other hand, he received not merely gifts and endowments from his own sovereign but presents from many others, including Elizabeth of England. Mary, queen of Scots, who had known him earlier, addressed him from her prison; and Tasso consulted him on the *Gerusalemme*. His last years were, however, saddened not merely by the death of many of his most intimate friends, but by constant and increasing ill-health. This did not interfere with his literary work in point of quality, for he was rarely idle, and some of his latest work is among his best. But he indulged (what few poets have wisely indulged) the temptation of constantly altering his work, and many of his later alterations are by no means for the better. Towards the end of 1585 his condition of health grew worse and worse, and he seems to have moved restlessly from one of his houses to another for some months. When the end came, which, though in great pain, he met in a resolute and religious manner, he was at his priory of Saint-Cosme at Tours, and he was buried in the church of that name on Friday, December 27.

The character and fortunes of Ronsard's works are among the most remarkable in literary history, and supply in themselves a kind of illustration of the progress of French literature during the last three centuries. It was long his fortune to be almost always extravagantly admired or violently attacked. At first, as has been said, the enmity, not altogether unprovoked, of the friends and followers of Marot fell to his lot, then the still fiercer antagonism of the Huguenot faction, who, happening to possess a poet of great merit in Du Bartas, were able to attack Ronsard in his tenderest point. But fate had by no means done its worst with him in his lifetime. After his death the classical reaction set in under the auspices of Malherbe, who seems to have been animated with a sort of personal hatred of Ronsard, though it is not clear that they ever met. After Malherbe the rising glory of Corneille and his contemporaries obscured the tentative and unequal work of the Pléiade, which was, moreover, directly attacked by Boileau himself, the dictator of French criticism in the last half of the 17th century. Then Ronsard was, except by a few men of taste, like La Bruyère and Fénelon, forgotten when he was not sneered at. In this condition he remained during the whole 18th century and the first quarter of the 19th. The Romantic revival, seeing in him a victim of its special *bête noire* Boileau, and attracted by his splendid diction, rich metrical faculty, and combination of classical and medieval peculiarities, adopted his name as a kind of battle-cry, and for the moment exaggerated his merits somewhat. The critical work, however, first of Sainte-Beuve in his *Tableau de la littérature française au 16ème siècle*, and since of others, has established Ronsard pretty securely in his right place, a place which may be defined in a few sentences.

For the general position of the Pléiade, see French Literature. Ronsard, its acknowledged chief and its most voluminous poet, was probably also its best, though a few isolated pieces of Belleau excel him in airy lightness of touch. Several sonnets of Du Bellay exhibit what may be called the intense and voluptuous melancholy of the Renaissance more perfectly than anything of his, and the finest passages of the *Tragiques* and the *Divine Sepmaine* surpass his work in command of the alexandrine and in power of turning it to the purposes of satirical invective and descriptive narration. But that work is, as has been said, very extensive (we possess at a rough guess not much short of a hundred thousand lines of his), and it is extraordinarily varied in form. He did not introduce the sonnet into France, but he practised it very soon after its introduction and with admirable skill—the famous "Quand vous serez bien vieille" being one of the acknowledged gems of French literature. His odes, which are very numerous, are also very interesting and in their best shape very perfect compositions. He began by imitating the strophic arrangement of the ancients, but very soon had the wisdom to desert this for a kind of adjustment of the Horatian ode to rhyme, instead of exact quantitative metre. In this latter kind he devised some exquisitely melodious rhythms of which, till our own day, the secret died with the 17th century. His more sustained work sometimes displays a bad selection of measure; and his occasional poetry—epistles, eclogues, elegies, &c.—is injured by its vast volume. But the preface to the *Franciade* is a very fine piece of verse, far superior (it is in alexandrines) to the poem itself. Generally speaking, Ronsard is best in his amatory verse (the long series of sonnets and odes to Cassandre, Marie, Genèvre, Hélène—Hélène de Surgères, a later and mainly "literary" love—&c.), and in his descriptions of the country (the famous "Mignonne allons voir si la rose," the "Fontaine Bellerie," the "Forêt de Gastine," and so forth), which have an extraordinary grace and freshness. No one used with more art than he the graceful diminutives which his school set in fashion. He knew well too how to manage the gorgeous adjectives (" marbrine," " cinabrine," " ivoirine " and the like) which were another fancy of the Pléiade, and in his hands they rarely become stiff or cumbrous. In short, Ronsard shows eminently the two great attractions of French 16th-century poetry as compared with that of the two following ages—magnificence of language and imagery and graceful variety of metre.

Bibliography.—The chief separately published works of Ronsard are noted above. He produced, however, during his life a vast number of separate publications, some of them mere pamphlets or broadsheets, which from time to time he collected, often striking out others at the same time, in the successive editions of his works. Of these he himself published seven—the first in 1560, the last in 1584. Between his death and the year 1630 ten more complete editions were published, the most famous of which is the folio of 1609. A copy of this presented by Sainte-Beuve to Victor Hugo, and later in the possession of M. Maxime du Camp, has a place of its own in French literary history. The work of C. Binet in 1586, *Discours de la vie de Pierre de Ronsard,* is very important for early information, and the author seems to have revised some of Ronsard's work under the poet's own direction. From 1630 Ronsard was not again reprinted for more than two centuries. Just before the close of the second, however, Sainte-Beuve printed a selection of his poems to accompany the above-mentioned *Tableau* (1828). There are also selections by M. Noel (in the *Collection Didot*) and Becq de Fouquières. In 1857 M. Prosper Blanchemain, who had previously published a volume of *Œuvres inédites de Ronsard,* undertook a complete edition for the *Bibliothèque Elzévirienne.* The eighth and last volume of this appeared ten years later. It is practically complete; a few pieces of a somewhat free character which are ascribed with some certainty to the poet are, however, excluded. A later and better edition still is that of Marty-Laveaux (1887–1893), and another that of B. Pifteau (1891). As for criticism, Sainte-Beuve followed up his early work by articles in the *Causeries du lundi,* and the chief later critics have dealt with him in their collected works. Of books may be mentioned those of E. Gandar (Metz, 1854), which considers him chiefly in his relation to the ancients, *Ronsard, imitateur d'Homère et de Pindare*; the marquis de Rochambeau, *La Famille de Ronsard* (1868); G. Scheffler, *Ronsard et sa réforme littéraire* (1874); G. Bizos, *Ronsard* (1891); the Abbé Froger, *Les Premières poésies de Ronsard* (1892); L. Mellerio, *Lexique de Ronsard* (1895); P. Perdrizet, *Ronsard et la réforme* (1902), with a still more recent series of articles in different publications by M. Paul Lemonnier. In English Mr A. Tilley's *Literature of the French Renaissance* (1904) may be consulted, and on Ronsard's critical standpoint Saintsbury's *History of Criticism,* vol. ii. (G. Sa.)

RONSDORF, a town of Germany, in the Prussian Rhine province, situated on the Morsbach, a small affluent of the Rhine, 18 m. E. of Düsseldorf and 5 m. S. of Elberfeld-Barmen by rail. Pop. (1905) 14,005. It is the seat of iron, steel and copper industries, besides carrying on extensive manufactures of ribbons, trimmings and silk goods generally. It has also breweries, distilleries and electrical works.

Founded in 1737 by the followers of Elias Eller, a religious enthusiast, Ronsdorf received civic rights in 1745. The Ronsdorf sect, the members of which called themselves Zionites, is now extinct.

RÖNTGEN, DAVID, sometimes called David de Lunéville (1743–1807), German cabinet-maker, eldest son of Abraham Röntgen, was born at Herrenhag. In 1753 his father migrated to the Moravian settlement at Neuwied, near Coblenz, where he established a furniture factory. He learned his trade in his father's workshop, and succeeded to the paternal business in 1772, when he entered into some kind of partnership with the clock-maker Kintzing. At that time the name of the firm appears already to have been well known, at all events in France; but it is a curious circumstance that although he is always reckoned as one of the little band of foreign cabinet-makers and workers in marquetry who, like Oeben and Riesener, achieved distinction in France during the superb *floraison* of the Louis Seize style, he never ceased to live at Neuwied, where apparently the whole of his furniture was made, and merely had a shop, or show-room, in Paris. We have, as it happens, a record of his first appearance there. The engraver Wille enters in his journal of August 30, 1774, that " M. Röntgen, célèbre ébéniste, établi à Nieuwied, près de Coblenz, m'est venu voir, en m'apportant une lettre de recommandation de M. Zick, peintre à Coblenz. . . . Comme M. Röntgen connaissait personne à Paris, je lui fus utile en lui enseignant quelques sculpteurs et dessinateurs dont il avait besoin." Röntgen was first and foremost an astute man of business and it is not improbable that the moving cause of this opening up of relations with Paris was the accession to the throne of Marie Antoinette, whose Teutonic sympathies were only too well known. Before very long she appointed him her *ébéniste-méchanicien.* He appears, indeed, to have acquired considerable favour with the queen, for on several occasions she took advantage of his journeys through Europe to charge him with the delivery of presents and of dolls dressed in the Paris fashions of the moment—they were intended to serve as patterns for the dressmakers—to her mother and her sisters. He appears at once to have opened a shop in Paris, but despite, and perhaps because of, the favour in which he was held at court, all was not plain sailing. The powerful trade corporation of the *maîtres-ébênistes* disputed his right to sell in Paris furniture of foreign manufacture, and in 1780 he found that the most satisfactory way out of the difficulty was to get himself admitted a member of the corporation to which all his great rivals belonged. By this time he had attracted a good deal of attention by the introduction of a new style of marquetry, in which light and shade, instead of being represented as hitherto by burning, smoking or engraving the materials, were indicated by small pieces of wood so arranged as to create the impression of *pietra dura.* We have seen that Röntgen had been appointed *ébêniste-méchanicien* to Marie Antoinette, and the appointment is explained by his fondness for and proficiency in constructing furniture in which mechanical devices played a great part. The English cabinet-makers of the later eighteenth century often made what was called, with obvious allusion to its character, " harlequin furniture," especially little dressing-tables and washstands which converted into something else or held their essentials in concealment until a spring was touched. David was a past master in this kind of work, and unquestionably much of the otherwise inexplicable reputation he enjoyed among contemporaries who were head and shoulders above him is explained by his mechanical genius. The extent of his fame in this direction is sufficiently indicated by the fact that Goethe mentions him in *Wilhelm Meister.* He compares the box inhabited by the fairy during her travels with her mortal lover to one of Röntgen's desks, in which " at a pull a multitude of springs and latches are set in motion." For a desk of this kind Louis XVI. paid him 80,000 livres. Outwardly it was in the form of a commode, its marquetry panels symbolizing the liberal arts. A personification of sculpture was in the act of engraving the name of Marie Antoinette upon a column to which Minerva was hanging her portrait. Above a riot of architectural orders was a musical clock (the work of the partner Kintzing), surmounted by a cupola representing Parnassus. The interior of this monumental effort, 11 ft. high, was a marvel of mechanical precision; it disappeared during the First Empire. Röntgen did not confine his activities to Paris, or even to France. It has been said that he travelled about Europe accompanied by furniture vans, and undoubtedly his aptitude as a commercial traveller was remarkable. He had shops in Berlin and St Petersburg, and himself apparently twice went to Russia. On one of these visits he sold to the Empress Catherine furniture to the value of 20,000 roubles, to which she added a personal present of 5000 roubles and a gold snuff-box—in recognition, it would seem, of his readiness and ingenuity in surmounting a secretaire with a clock indicating the date of the Russian naval victory over the Turks at Cheshme, news of which had arrived on the previous evening. This suite of furniture is believed still to be in the Palace of the Hermitage, the hiding-place of so much remarkable and forgotten art. To the protection of the queen of France and the empress of Russia David added that of the king of Prussia, Frederick William II., who in 1792 made him a *Commerzienrath* and commercial agent for the Lower Rhine district. The French Revolution and the Napoleonic Wars which so speedily followed, eclipsed Röntgen's star as they eclipsed those of so many other great cabinet-makers of the period. In 1793 the Revolutionary government, regarding him as an *émigré,* seized the contents of his show-rooms and his personal belongings, and after that date he appears neither to have done business in Paris nor to have visited it. Five years later the invasion of Neuwied led to the closing of his workshops; prosperity never returned, and he died half ruined at Wiesbaden on the 12th of February 1807.

Röntgen was not a great cabinet-maker. His forms were often clumsy, ungraceful and commonplace; his furniture lacked the artistry of the French and the English cabinet-makers of the great period which came to an end about 1790. His bronzes were poor in design and coarse in execution—his work, in short, is tainted by commercialism. As a *marqueteur*, however, he holds a position of high distinction. His marquetry is bolder and more vigorous than that of Riesener, who in other respects soared far above him. As an adroit deviser of mechanism he fully earned a reputation which former generations rated more highly than the modern critic, with his facilities for comparison, is prepared to accept. On the mechanical side he produced, with the help of Kintzing, many long-cased and other clocks with ingenious indicating and registering apparatus. Röntgen delighted in architectural forms, and his marquetry more often than not represents those scenes from classical mythology which were the dear delight of the 18th century. He is well represented at South Kensington.

RÖNTGEN, WILHELM KONRAD (1845–), German physicist, was born at Lennep on the 27th of March 1845. He received his early education in Holland, and then went to study at Zürich, where he took his doctor's degree in 1869. He then became assistant to Kundt at Würzburg and afterwards at Strassburg, becoming *privat-docent* at the latter university in 1874. Next year he was appointed professor of mathematics and physics at the Agricultural Academy of Hohenheim, and in 1876 he returned to Strassburg as extraordinary professor. In 1879 he was chosen ordinary professor of physics and director of the Physical Institute at Giessen, whence in 1885 he removed in the same capacity to Würzburg. It was at the latter place that he made the discovery for which his name is chiefly known, the Röntgen rays. In 1895, while experimenting with a highly exhausted vacuum tube on the conduction of electricity through gases, he noticed that a paper screen covered with barium platinocyanide, which happened to be lying near, became fluorescent under the action of some radiation emitted from the tube, which at the time was enclosed in a box of black cardboard. Further investigation showed that this radiation had the power of passing through various substances which are opaque to ordinary light, and also of affecting a photographic plate. Its behaviour being curious in several respects, particularly in regard to reflection and refraction, doubt arose in his mind whether it was to be looked upon as light or not, and he was led to put forward the hypothesis that it was due to longitudinal vibrations in the ether, not to transverse ones like ordinary light; but in view of the uncertainty existing as to its nature, he called it X-rays. For this discovery he received the Rumford medal of the Royal Society in 1896, jointly with Philip Lenard, who had already shown, as also had Hertz, that a portion of the cathode rays could pass through a thin film of a metal such as aluminium. Röntgen also conducted researches in various other branches of physics, including elasticity, capillarity, the conduction of heat in crystals, the absorption of heat-rays by different gases, piezo-electricity, the electromagnetic rotation of polarized light, &c.

RÖNTGEN RAYS, W. K. Röntgen discovered in 1895 (*Wied. Ann.* 64, p. 1) that when the electric discharge passes through a tube exhausted so that the glass of the tube is brightly phosphorescent, phosphorescent substances such as potassium platinocyanide became luminous when brought near to the tube. He found that if a thick piece of metal, a coin for example, were placed between the tube and a plate covered with the phosphorescent substance a sharp shadow of the metal was cast upon the plate; pieces of wood or thin plates of aluminium cast, however, only partial shadows, thus showing that the agent which produced the phosphorescence could traverse with considerable freedom bodies opaque to ordinary light. He found that as a general rule the greater the density of the substance the greater its opacity to this agent. Thus while this effect could pass through the flesh it was stopped by the bones, so that if the hand were held between the discharge tube and a phosphorescent screen the outline of the bones was distinctly visible as a shadow cast upon the screen, or if a purse containing coins were placed between the tube and the screen the purse itself cast but little shadow while the coins cast a very dark one. Röntgen showed that the cause of the phosphorescence, now called Röntgen rays, is propagated in straight lines starting from places where the cathode rays strike against a solid obstacle, and the direction of propagation is not bent when the rays pass from one medium to another, *i.e.* there is no refraction of the rays. These rays, unlike cathode rays or *Canalstrahlen*, are not deflected by magnetic force; Röntgen could not detect any deflection with the strongest magnets at his disposal, and later experiments made with stronger magnetic fields have failed to reveal any effect of the magnet on the rays. The rays affect a photographic plate as well as a phosphorescent screen, and shadow photographs can be readily taken. The time of exposure required depends upon the intensity of the rays, and this depends upon the state of the tube, and the electric current going through it, as well as upon the substances traversed by the rays on their journey to the photographic plate. In some cases an exposure of a few seconds is sufficient, in others hours may be required. The rays coming from different discharge tubes have very different powers of penetration. If the pressure in the tube is fairly high, so that the potential difference between its electrodes is small, and the velocity of the cathode rays in consequence small, the Röntgen rays coming from the tube will be very easily absorbed; such rays are called "soft rays." If the exhaustion of the tube is carried further, so that there is a considerable increase in the potential differences between the cathode and the anode in the tube and therefore in the velocity of the cathode rays, the Röntgen rays have much greater penetrating power and are called "hard rays." With a highly exhausted tube and a powerful induction coil it is possible to get appreciable effects from rays which have passed through sheets of brass or iron several millimetres thick. The penetrating power of the rays thus varies with the pressure in the tube; as this pressure gradually diminishes when the discharge is kept running through the tube, the type of Röntgen ray coming from the tube is continually changing. The lowering of pressure due to the current through the tube finally leads to such a high degree of exhaustion that the discharge has great difficulty in passing, and the emission of the rays becomes very irregular. Heating the walls of the tube causes some gas to come off the sides, and by thus increasing the pressure creates a temporary improvement. A thin-walled platinum tube is sometimes fused on to the discharge tube to remedy this defect; red-hot platinum allows hydrogen to pass through it, so that if the platinum tube is heated, hydrogen from the flame will pass into the discharge tube and increase the pressure. In this way hydrogen may be introduced into the tube when the pressure gets too low. When liquid air is available the pressure in the tube may be kept constant by fusing on to the discharge tube a tube containing charcoal; this dips into a vessel containing liquid air, and the charcoal is saturated with air at the pressure which it is desired to maintain in the tube. Not only do bulbs emit different types of rays at different times, but the same bulb emits at the same time rays of different kinds. The property by which it is most convenient to identify a ray is the absorption it suffers when it passes through a given thickness of aluminium or tin-foil. Experiments made by McClelland and Sir J. J. Thomson on the absorption of the rays produced by sheets of tin-foil showed that the absorption by the first sheets of tin-foil traversed by the rays was much greater than that by the same number of sheets when the rays had already passed through several sheets of the foil. The effect is just what would occur if some of the rays were much more readily absorbed by the tin-foil than others, for the first few layers would stop all the easily absorbable rays while the ones left would be those that were but little absorbed by tin-foil.

The fact that the rays when they pass through a gas ionize it and make it a conductor of electricity furnishes the best means of measuring their intensity, as the measurement of the amount of conductivity they produce in a gas is both more accurate and more convenient than measurements of photographic or phosphorescent effects. Röntgen rays when they pass through matter produce—as Perrin (*Comptes rendus*, 124, p. 455), Sagnac (*Jour. de Phys.*, 1899, (3), 8, and J. Townsend (*Proc. Camb. Phil. Soc.*, 1899, 10, p. 217, have shown—secondary Röntgen rays as well as cathodic rays. A very complete investigation of this subject has been made by Barkla and Sadler (Barkla, *Phil. Mag.*, June 1906, pp. 812–828; Barkla and Sadler, *Phil. Mag.*, October 1908, pp. 550–584; Sadler, *Phil. Mag.*, July 1909, p. 107; Sadler, *Phil. Mag.*, March 1910, p. 337). They have shown that the secondary Röntgen rays are of two kinds: one kind is of the same type as the primary incident ray and may be regarded as scattered primary rays, the other kind depends only on the matter struck by the rays—their quality is independent of that of the incident ray. When the atomic weight of the element exposed to the primary rays was less than that of calcium, Barkla and Sadler could only detect the first type of ray, *i.e.* the secondary radiation consisted entirely of scattered primary radiation; elements with atomic weights greater than that of calcium gave out, in addition to the scattered primary radiation, Röntgen rays characteristic of the element and independent of the quality of the primary rays. The higher the atomic weight of the metal the more penetrating are the characteristic rays it gives out. This is shown in the table, which gives for the different elements the reciprocal of the distance, measured in centimetres, through which the rays from the element can pass through aluminium before their energy sinks to 1/2·7 of the value it had when entering the aluminium; this quantity is denoted in the table by λ.

Element.	Atomic weight.	λ.
Chromium	52	367
Iron	55·9	239
Cobalt	59·0	193·2
Nickel	58·7? (61·3)	159·5
Copper	63·6	128·9
Zinc	65·4	106·3
Arsenic	75·0	60·7
Selenium	79·2	51·0
Strontium	87·6	35·2
Molybdenum	96·0	12·7
Rhodium	103·0	8·44
Silver	107·9	6·75
Tin	119·0	4·33

The radiation from chromium cannot pass through more than a few centimetres of air without being absorbed, while that from tin is as penetrating as that given out by a fairly efficient Röntgen tube. Barkla and Sadler found that the radiation characteristic of the metal is not excited unless the primary radiation is more penetrating than the characteristic radiation. Thus the characteristic radiation from silver can excite the characteristic radiation from iron, but the characteristic radiation from iron cannot excite that from silver. We may compare this result with Stokes's rule for phosphorescence, that the phosphorescent light is of longer wave-length than the light which excites it.

The discovery that each element gives out a characteristic radiation (or, as still more recent work indicates, a line spectrum of characteristic radiation) is one of the utmost importance. It gives us, for example, the means of getting homogeneous Röntgen radiation of a perfectly definite type: it is also of fundamental importance in connexion with any theory of the Röntgen rays. We have seen that there is no evidence of refraction of the Röntgen rays; it would be interesting to try if this were the case when the rays passing through the refracting substance are those characteristic of the substance.

Secondary Cathodic Rays.—The incidence of Röntgen rays on matter causes the matter to emit cathodic rays. The velocity of these rays is independent of the intensity of the primary Röntgen rays, but depends upon the "hardness" of the rays; it seems also to be independent of the nature of the matter exposed to the primary rays. The velocity of the cathodic rays increases as the hardness of the primary Röntgen rays increases. Innes (*Proc. Roy. Soc.* 79, p. 442) measured the velocity of the cathodic radiation excited by the rays from Röntgen tubes, and found velocities varying from $6{\cdot}2\times10^9$cm./sec. to $8{\cdot}3\times10^9$ cm./sec. according to the hardness of the rays given out by the tube. The cathodic rays given out under the action of the homogeneous secondary Röntgen radiation characteristic of the different elements have been studied by Sadler (*Phil. Mag.*, March 1910) and Beatty (*Phil. Mag.*, August 1910). The following table giving the properties of the cathode rays excited by the radiation from various elements is taken from Beatty's paper; t_1 is the thickness of air at atmospheric pressure and temperature required to absorb one-half of the energy of the cathode particles, t_2 is the corresponding quantity for hydrogen.

Radiator.	t_1	t_2
Iron	·00804	·0410
Copper	·0135	·0733
Zinc	·0164	·0909
Arsenic	·0255	
Tin	·1672	1·37

The properties of the cathode rays excited by the radiation from tin correspond very closely with those produced in a discharge tube when the potential difference between the anode and cathode is about 30,000 volts. When Röntgen rays pass through a thin plate the cathodic radiation on the side the rays emerge is more intense than on the side they enter. Kaye (*Phil. Trans.* 209, p. 123) has shown that when cathode rays fall upon a metal two kinds of Röntgen rays are excited, one being the characteristic radiation of the metal and the other a kind independent of the nature of the metal and dependent only upon the velocity of the cathode rays. The faster the cathode rays the harder the Röntgen rays they produce. It would be interesting to see if there is any connexion between the velocity of the cathode rays required to excite Röntgen rays as hard as those given out say by tin and the velocity of the cathode rays which the radiation from tin produces when it falls upon any metal. Sadler has shown that metals can give off cathodic radiation even when the incident Röntgen rays are too soft to excite the characteristic Röntgen radiation of the metal, but that there is a large increase in the cathodic radiation as soon as the characteristic Röntgen radiation is excited. It is possible that the shock produced by the emission of these cathode particles starts the vibrations which give rise to the characteristic rays; the cathode particles emitted when the incident rays are too soft to excite the characteristic radiation coming from a different source from those tapped by the hard rays.

Absorption of Röntgen Rays.—The wide variations in the penetrating power of Röntgen rays from different sources is shown by the above table of the penetrating power of the characteristic rays of the different elements. Many experiments have been made on the penetration of the same rays for different substances. It is a rule to which there is no well-established exception that the greater the density of the substance the greater is its power of absorbing the rays. The connexion, however, between the absorption and the density of the substance is not in general a simple one, though there is evidence that for exceedingly hard rays the absorption is proportional to the density.

The power of any material to absorb rays is usually measured by a coefficient λ, the definition of which is that a plate 1/λ centimetres thick reduces the energy of the rays when they pass through it normally to $1/e$ of their original value, where e is the base of the Napierian logarithms and equal to 2·7128. It has been shown that however the physical state of a substance may alter,—if, for example, it changes from the liquid to the gaseous,—λ/D, where D is the density of the substance, remains constant. It has also been shown that if we have a mass M made up of masses $M_1, M_2, M_3, \ldots$ of substances having coefficients of absorption $\lambda_1, \lambda_2, \lambda_3, \ldots$ and densities $D_1, D_2, D_3, \ldots$ then if λ/D for the mixture is given by the equation

$$M\lambda/D = M_1\lambda_1/D_1 + M_2\lambda_2/D_2 + M_3\lambda_3/D_3 + \ldots$$

this equation is true whether the substances are chemically combined or chemically mixed. From this equation, when we know λ/D for a binary compound and for one of its constituents, we can find the value of λ/D for the other constituent. By the use of this principle we can find the value of λ/D for the elements which cannot be obtained in a free state. Benoist (*Jour. de Phys.* (7), 28, p. 289) has shown that if the values of λ/D are plotted against the atomic weight we get a smooth curve; if we draw this curve it is evident that we have the means of determining the atomic weight of an element by measuring its transparency to Röntgen rays when in combination with elements whose transparency is known. Benoist has applied this method to determine the atomic weight of indium.

The value of λ/D for any one substance depends upon the type of ray used, and the ratio of the values of λ/D for two substances may vary very greatly with the type of ray; this is especially the case when one of the substances is hydrogen. Thus Crowther (*Proc. Roy. Soc.*, March 1909) has shown that the ratio of λ for air to λ for hydrogen varied from 100 for rays given out by a Röntgen tube at a comparatively high pressure when the rays were very soft to 5·56 when the pressure in the bulb was very low and the rays very hard. Beatty (*Phil. Mag.*, August 1910) found that this ratio was as large as 175 for the characteristic rays given out by iron, copper, zinc and arsenic, but fell to 25·0 for the rays from tin.

Polarization of Röntgen Rays.—A great deal of attention has been paid to a phenomenon called the polarization of the

Röntgen rays. The nature of this effect may be illustrated by fig. 1. Suppose that AB is a stream of cathode rays striking against a solid obstacle B and giving rise to Röntgen rays, let these rays impinge on a small body P, P under these conditions will emit secondary rays in all directions. Barkla (*Phil. Trans.*, 1905, A, 204, p. 467; *Proc. Roy. Soc.* 77, p. 247) found that the intensity of the secondary rays, tested by the ionization they produced in air, was less intense in the plane ABP than in a plane through PB at right angles to this plane, the distances from P being the same in the two cases; the difference in the intensities amounting to about 15%. Haga (*Ann. d. Phys.* 28, p. 439), who tried a similar experiment but used a photographic method to measure the intensity of the secondary rays, could not detect any difference of intensity in the two planes, but experiments by Bassler (*Ann. der Phys.* 28, p. 808) and Vegard (*Proc. Roy. Soc.* 83, p. 379) have confirmed Barkla's original observations.

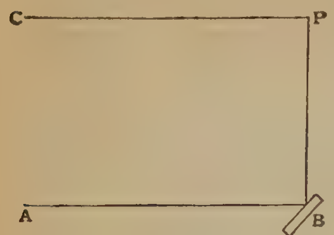


Fig. 1.

The "polarization" is much more marked if instead of exciting the secondary radiation in P by the Röntgen rays from a discharge tube we do so by means of secondary rays. If, for example, in the case illustrated by fig. 1 we allow a beam of Röntgen rays to fall upon B instead of the cathode rays, the difference between the intensities in the plane ABP and in the plane at right angles to it are very much increased. It is only the scattered secondary radiation which shows this "polarization"; the characteristic secondary radiation emitted by the body at P is quite unpolarized. The existence of this effect has a very important bearing on the nature of Röntgen rays. Whether Röntgen rays are or are not a form of light, *i.e.* are some form of electromagnetic disturbance propagated through the aether, is a question on which opinion is not unanimous. They resemble light in their rectilinear propagation; they affect a photographic plate and, Brandes and Dorn have shown, they produce an effect, though a small one, on the retina, giving rise to a very faint illumination of the whole field of view. They resemble light in not being deflected by either electric or magnetic forces, while the characteristic secondary radiation may be compared with the phosphorescence produced by ultra-violet light, and the cathodic secondary rays with the photo-electric effect. The absence of refraction is not an argument against the rays being a kind of light, for all theories of refraction make this property depend upon the relation between the natural time of vibration T of the refracting substance and the period t of the light vibrations, the refraction vanishing when t/T is very small. Thus there would be no refraction for light of a very small period, and this would also be true if instead of regular periodic undulations we had a pulse of electromagnetic disturbance, provided the time taken by the light to travel over the thickness of the pulse is small compared with the periods of vibration of the molecules of the refracting substance. Experiments on the diffraction of Röntgen rays are very difficult, for, in addition to the difficulties caused by the smallness of the wave-length or the thinness of the pulse, the secondary radiation produced when the rays strike against a photographic plate or pass through air might give rise to what might easily be mistaken for diffraction effects. Röntgen has never succeeded in observing effects which prove the existence of diffraction. Fomm (*Wied. Ann.* 59, p. 50) observed in the photograph of a narrow slit light and dark bands which looked like diffraction bands; but observation with slits of different sizes showed that they were not of this nature, and Haga and Wind (*Wied. Ann.* 68, p. 884) have explained them as contrast effects. These observers, however, noticed with a very narrow wedge-shaped slit a broadening of the image of the narrow part which they are satisfied could not be explained by the causes. Walter and Pohl (*Ann. der Phys.* 29, p. 331) could not observe any diffraction effects, though their arrangement would have enabled them to do so if the wave-length had not been smaller than $1\cdot5\times10^{-9}$ cm. Sir George Stokes (*Proc. Manchester Lit. and Phil. Soc.*, 1898) put forward the view that the disturbances which constitute the rays are not regular periodic undulations but very thin pulses. Thomson (*Phil. Mag.* 45, p. 172) has shown that when charged particles are suddenly stopped, pulses of very intense electric and magnetic disturbances are started. As the cathode rays consist of negatively electrified particles, the impact of these on a solid would give rise to these intense pulses. The electromagnetic theory therefore shows that effects resembling light, inasmuch as they are electromagnetic disturbances propagated through the aether, must be produced when the cathode rays strike against an obstacle. Since under these circumstances Röntgen rays are produced, it seems natural, unless direct evidence to the contrary is obtained, to connect the Röntgen rays with these pulses. This view explains very simply the "polarization" of the rays; for, suppose the cathode particle moving from A to B were stopped at its first impact with the plate B (fig. 1), the electric force transmitted along BP would be in the plane ABP at right angles to BP. When this electric force reached the body at P it would accelerate any electrified particles in that body, the acceleration being parallel to AB. Each of these accelerated particles would start electric waves. The theory of such waves shows that their intensity vanishes along a line through the particle parallel to the direction of acceleration, while it is a maximum at right angles to this line; thus the intensity of the rays along a horizontal line through P would vanish, while it would be a maximum in the plane at right angles to this line. In this case there would be complete polarization. In reality the cathode particle is not stopped at its first encounter, but makes many collisions, changing its direction between each; and these collisions will send out electric disturbances which when they fall on P are able to excite waves which send some energy along PC. The polarization will therefore be only partial and will be of the kind found by Barkla.

The velocity with which the waves travel has not yet been definitely settled. Marx (*Ann. der Phys.* 20, p. 677) by an ingenious but elaborate method came to the conclusion that they travelled with the velocity of light; his interpretation of his experiments has, however, been criticized by Franck and Pohl (*Verh. d. D. Physik Ges.* 10, p. 489).

Another view of the nature of Röntgen rays has been advocated by Bragg (*Phil. Mag.* 14, p. 429); he regards them as neutral electric doublets consisting of a negative and a positive charge of electricity which are usually held together by the attraction between them, but which may be knocked asunder when the rays strike against matter and turned into cathodic rays. On this view when the rays pass through a gas only a few of the molecules of the gas are struck by the rays and so we can easily understand why so few of the molecules are ionized. On the ordinary view of an electric wave all the molecules would be affected by the wave when it passed through a gas, and to explain the small fraction ionized we must either suppose that systems sensitive to the Röntgen rays are at any time present only in a very small fraction of the molecule or else that the front of an electric or light wave is not continuous but that the energy is concentrated in patches which only occupy a fraction of the wave front.

Apparatus for producing Röntgen Rays.—The tube now used most frequently for producing Röntgen rays is of the kind introduced by Porter and known as a focus tube (fig. 2). The cathode is a portion of a hollow sphere, and the cathode rays come to a point on or near a metal plate A, called the anti-cathode, connected with the anode; this plate is the source of the rays. This ought to be made of a very unfusible metal such as platinum or, still better, tantalum, and kept cool by a water-cooling arrangement. The anti-cathode is generally set at an angle of 45° to the rays; it is probable that the action of the tube would be improved by putting the anti-cathode at right angles to the cathode rays. The walls of the tube get strongly electrified. This electrification affects the working of the tube, and the production of rays can often be improved by having an earth-connected piece of tin-foil on the outside of the bulb, and moving it about until the best position is attained. To produce the discharge an induction coil is generally employed with a mercury interrupter. Excellent results have been obtained by using an electrostatic induction machine to produce the current, the emission of rays is more uniform than when an induction coil is used. The rays are emitted pretty uniformly in all directions until the plane of the anti-cathode is approached; in the neighbourhood of this plane there is a rapid falling off in the intensity of the rays. After long use the glass of the bulb often becomes distinctly purple. This is believed to be due to the presence of manganese compounds in the glass.

(J. J. T.)

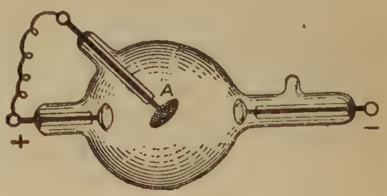
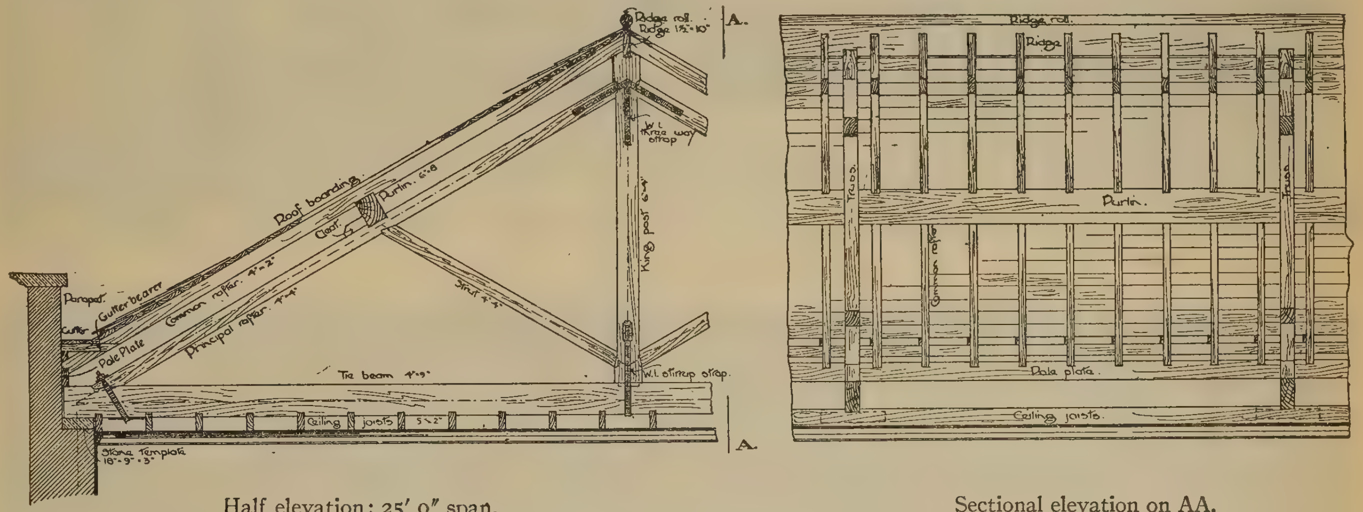


Fig. 2.

ROOD (O.E. *rôd*, a stick, another form of "rod," O.E. *rodd*, possibly cognate with Lat. *rudis*, a staff), properly a rod or pole, and so used as the name of a surface measure of land. The rood varies locally but is generally taken as = 40 square rods, poles or perches; 4 roods = 1 acre. The term was, however, particularly applied, in O.E., to a gallows or cross, especially to the Holy Cross on which Christ was crucified, the sense in which the word survives. A crucifix, often accompanied by figures of St John and the Virgin Mary, was usually placed in churches above the screen, hence known as "rood screen" (see SCREEN), which divides the chancel or the choir from the nave. The rood was carried either on a transverse beam, the "rood beam," or by a gallery, the "rood loft." Such a gallery was also used as a place from which to read portions of the service (see JUBÉ). It was reached by the "rood stair," a small winding stair or "vice." In English churches these stairs generally run up in a small turret in the wall at the west end of the chancel; often this also leads out on to the roof. On the continent of Europe they often lead out of the interior of the church and are enclosed with tracery, as at Rouen or Strassburg. "Rood stairs" remain in many English churches where the rood loft has been destroyed. A fine example of a rood loft is at Charlton-on-Otmoor, Oxfordshire. The screen might be separate from the rood beam or rood loft. The general construction of wooden screens is close panelling beneath, on which stands screen-work composed of slender turned balusters or regular wooden mullions, supporting tracery more or less rich with cornices, crestings, &c., and often painted in brilliant colours and gilded. The central tower of a church over the intersection of the nave and chancel with the transepts is sometimes called the "rood tower"; an example is that at Notre Dame at Paris. In England rood lofts do not appear to have been introduced before the 14th century, and were not common till the 15th. The "roods" themselves were not disturbed in Henry VIII.'s reign, but were generally removed under Edward VI. and Elizabeth.

The legality of rood screens or rood lofts in the Church of England depends on the law of the Church with regard to images, *i.e.* "whether they do or do not, or will or will not, encourage or lead to idolatrous or superstitious worship in the place where they are, or are to be put" (Lindley, L. J. in *R.* v. *Bishop of London*, 1889, 24 Q.B.D. 213, 237; see also *St John Timberhill, Norwich*, case, 1889 Prob. 71, and article IMAGE).

ROOFS. A roof is a construction placed as a covering over the upper portion of a building to exclude the weather and preserve the contents dry and uninjured. Roofs are designed to throw off rain and snow, and their slope or "pitch," as it is generally termed, is governed to a great extent by the climate, as well as by the material used and manner of laying. The pitch may vary from an almost horizontal surface (as largely adopted in dry countries and also in temperate climates for roofs of metal or asphalt) to the steeply pitched roofs required for the ordinary flat tiles which to be weatherproof must be laid at an angle of from 45° to 80° with the horizon. Besides serving the useful purpose of protection against inclement weather the roof, both externally and internally, may be designed to form an architectural feature in keeping with the character of he building.



Half elevation; 25′ 0″ span.

Sectional elevation on AA.

FIGS. 1 and 2.—King-post Roof Truss.

Forms of roof.

The simplest form is the "flat roof" consisting of horizontal wood joists laid from wall to wall as in floor construction. The roof must not be quite flat, for a slight fall is necessary in its upper surface to allow water to drain away into gutters placed at convenient points. The joists are covered with a waterproof material such as asphalt, lead, zinc or copper, the three last materials being usually laid upon boarding, which stiffens the structure and forms a good surface to fix the weatherproof covering upon. Such roofs are not suitable for cold climates, for accumulations of snow might overburden the structure and would also cause the wet to penetrate through any small crevices and under flashings. With flat roofs the pressure exerted upon the supports is directly vertical.

"Lean-to," "shed," or "pent" roofs are practically developments of the flat roof, one end of the joists (which are now called "rafters") being tipped up to form a decided slope, which enables slates, tiles, corrugated iron and other materials to be employed which cannot be used upon a "flat" roof.

Simple roofs in general use with a double slope are the "coupled rafter roofs," the rafters meeting at the highest point upon a horizontal ridge-piece which stiffens the framework and gives a level ridge-line. In some old roofs the rafters are connected without any intervening ridge-plate, with the result that after a time the ridge instead of remaining level takes on a wavy outline, due to the fact that some of the timbers have settled slightly owing to decay or other causes, whilst others have remained firm in their places. The lower ends of the rafters should pitch on a wood plate bedded on the top of the wall; this, as described under CARPENTRY, assists in spreading the weight over a large area of the wall, and provides good fixing for the timbers. The simple "couple roof" consists merely of two sets of rafters pitched from plates on the walls on either side of the building and sloping upwards to rest against a common ridge-piece. There are no ties between the feet of the rafters, which therefore exert a considerable thrust against the supporting walls. On account of this and of the lack of rigidity of the framing this form of roof should only be used to cover small spans of 10 to 12 ft. Generally the ends of the rafters are connected by ceiling joists which form a level ceiling and at the same time prevent any outward thrust on the supports. When used for spans between 12 ft. and 18 ft. a binder supported by an iron or wood "king" tie every 5 or 6 ft. should be run along across the centres of the ceiling joists and the latter spiked to it. Such roofs with the wood tie across the feet of the rafters are termed "couple close roofs." When the ties are fixed about half-way up the rafters it is called a "collar roof," and may be used for spans up to 16 ft. These are the type of roof commonly used in ordinary dwelling-houses where the framing, usually of rough northern pine or spruce, is generally hidden from view by the ceilings. The spans usually are not great, and extra support is obtained at various points from partitions and cross walls. Where the span is large, that is, above 20 ft. without intermediate support, it is necessary to employ roofs with "principals" and "purlins," sometimes called "double rafter roofs." Principals are strong trusses of timber rigidly framed together and placed at intervals of about 10 ft. to support the weight of the roof covering. Purlins—stout timbers running longitudinally—are fixed on the principal rafters with intervals of about 8 ft., and on these the common rafters are fastened. Principals, or "roof trusses" as they are more often called, are framed together in various ways, and the members may be entirely of wood or reinforced by ties of iron rods or bars; the latter are called "composite trusses."

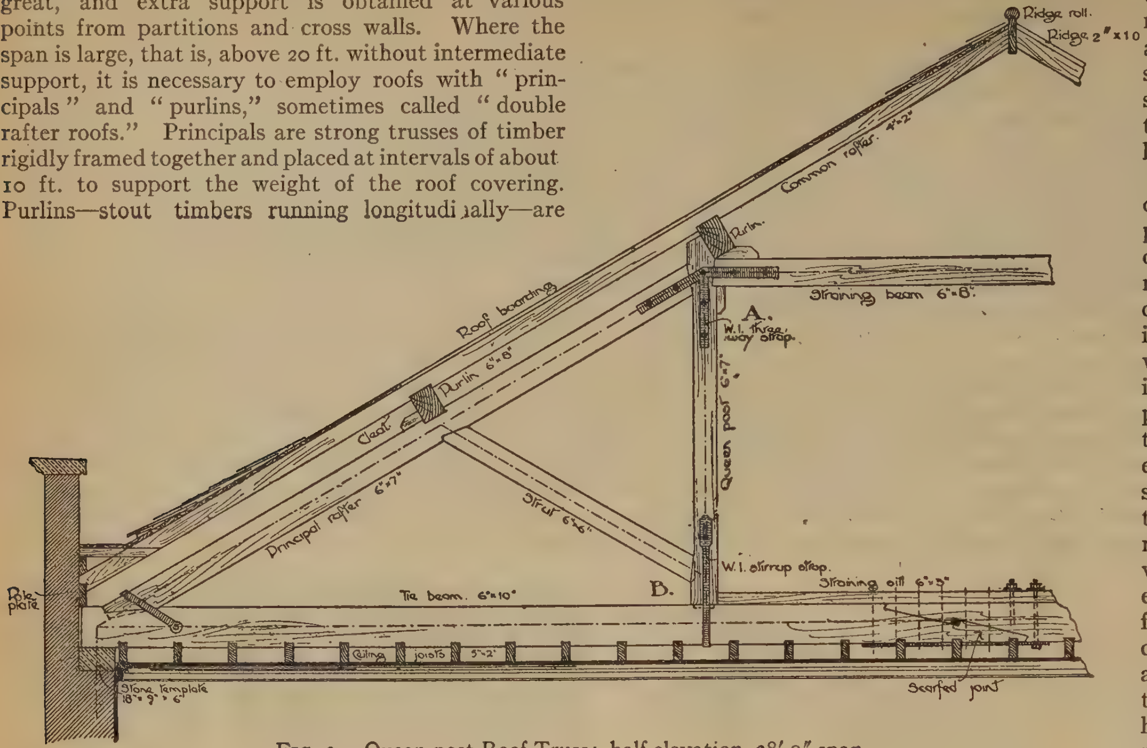

Ridge roll.
Ridge 2"x10
Common rafters 4"x2"
Purlin
Straining beam 6"x8"
A.
W.I. three way strap
Queen post 6"x7"
Roof boarding
Cleat
Purlin 6"x8"
Principal rafter 6"x7"
Strut 6"x6"
W.I. stirrup strap
Straining sill 6"x5"
B.
Tie beam 6"x10"
Pole plate
Ceiling joists 5"x2"
Stone template 18"x9"x6"
Scarfed joint

FIG. 3.—Queen-post Roof Truss; half elevation, 38′ 0″ span.

The "king-post truss" may be used for spans up to 30 ft. and is constructed as shown in figs. 1 and 2. It has a central post sustaining the "tie-beam" in the centre with struts projecting from its base to support the principal rafters at their centres at a point where the weight of the purlins renders strutting necessary. The members are connected by wrought-iron straps and bolts; the strap connects the king-post and tie-beam and is often fitted with a gib-and-cotter arrangement (really a pair of iron folding wedges) which allows the whole truss to be tightened up should any settlement or shrinkage occur. "Queen-post trusses" have, in place of the king-post dividing the tie-beam into two, two queen-posts supporting it at two points (fig. 3). The joints between the members are made in a similar manner to those of the king-post principal with wrought-iron straps. The purlins are two in number on each slope, one supported at the top of each "queen," the other half-way between that point and the wall-plate and resting upon the principal rafter at a point where strutted from the base of the queen-post. A stout straining beam connects the heads of the queens. In fig. 4, *a* and *b* are details at the foot of the queen-post, and *c* at the head. Trusses of this type are suitable for spans up to 45 ft. In roofs of a larger span than this and up to 60 ft. the tie-beam requires to be upheld at more than two points, and additional posts called "princesses" are introduced for this purpose. This also entails extra struts and purlins.

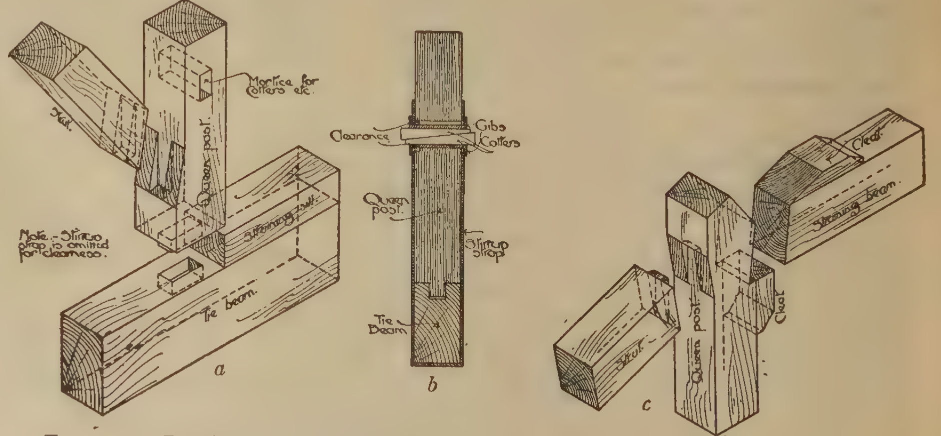
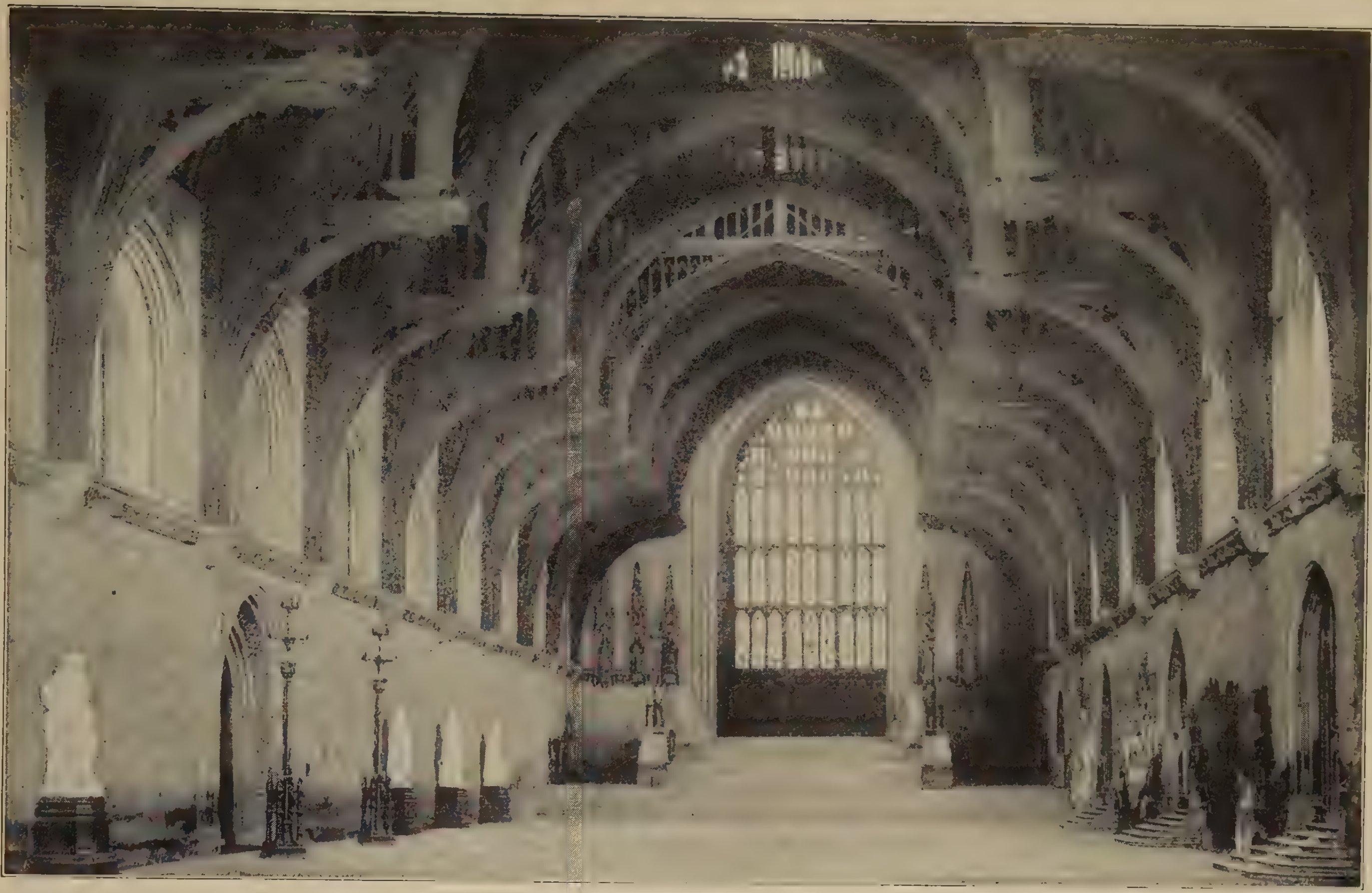

Mortise for cotters etc.
Strut
Queen post
Straining sill
Note—Stirrup strap is omitted for clearness.
Tie beam
a
Clearance
Gibs
Cotters
Queen post
Stirrup strap
Tie Beam
b
Cleat
Straining beam
Strut
Queen post
Cleat
c

FIG. 4.—*a*. Detail of queen-post truss at *b*.
b. Vertical section through queen-post.
c. Detail of queen-post truss at head; purlin and wrought-iron straps are omitted for the sake of clearness.

In such large spans the straining beam often becomes of such a length as to require support and this is effected by continuing the principal rafters up to the ridge and introducing a short king-post to sustain the beam in the middle of its length.

Open timber roofs.

Open timber roofs of various types but principally of "hammer-beam" construction were used in the middle ages where stone vaulting was not employed. Many of these old roofs still exist in good preservation and exhibit the great skill of the medieval carpenters who designed and erected them. Such forms are still used, chiefly for ecclesiastical buildings and the roofs over large halls. In the best periods of Gothic architecture the pitch of these roofs was made very steep, sometimes as much as 60° with the horizon. In the hammer-beam type of roof the tie-beam at the foot of the rafters is omitted, a collar being thrown across connecting the principal rafters at a point about half-way in their length, the lower portion of the principal consisting of a number of struts and braces rigidly connected in such a manner as to throw as little thrust as possible upon the walls serving as abutments. There are two kinds of hammer beams, the arched and the bracketed; the chief examples are Westminster Hall and Middle Temple Hall (Plate I. figs. 24 and 25). The "hammer beam" projects from the top of the wall and is bracketed from a corbel projecting from the wall some distance below. This form of roof has a style and dignity of its own, and gives greater height in the upper part of the building as well as being more ornamental and lighter in effect than tie-beam trusses, which have a rather heavy effect.



Photo, G. W. Wilson & Co.

Fig. 24.—WESTMINSTER HALL.

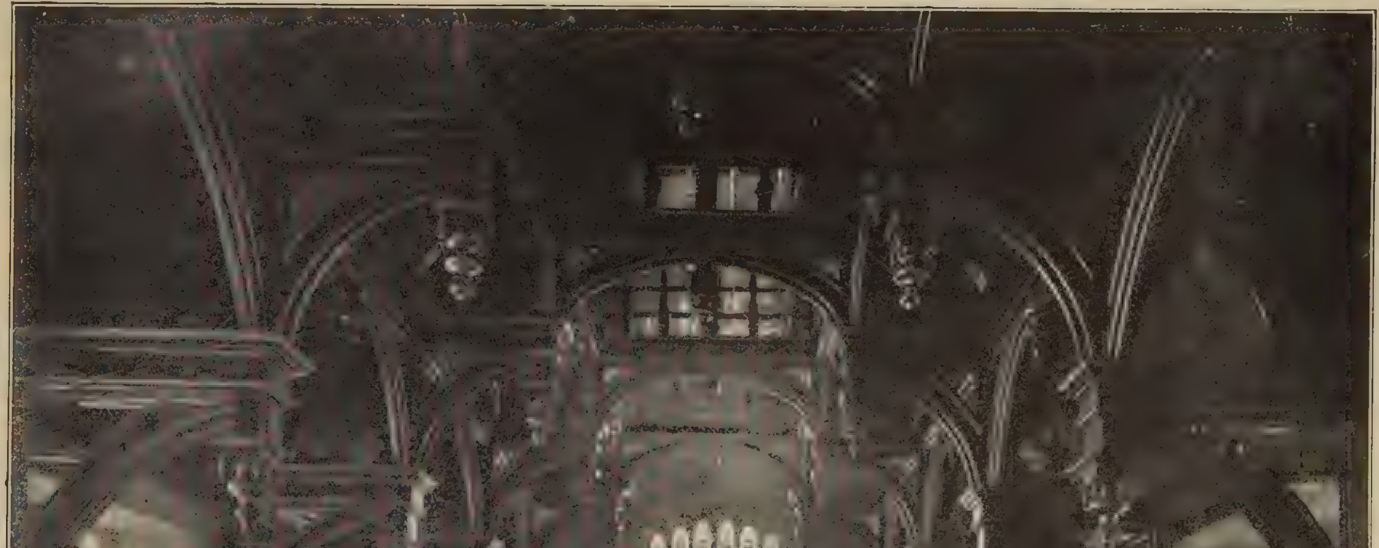
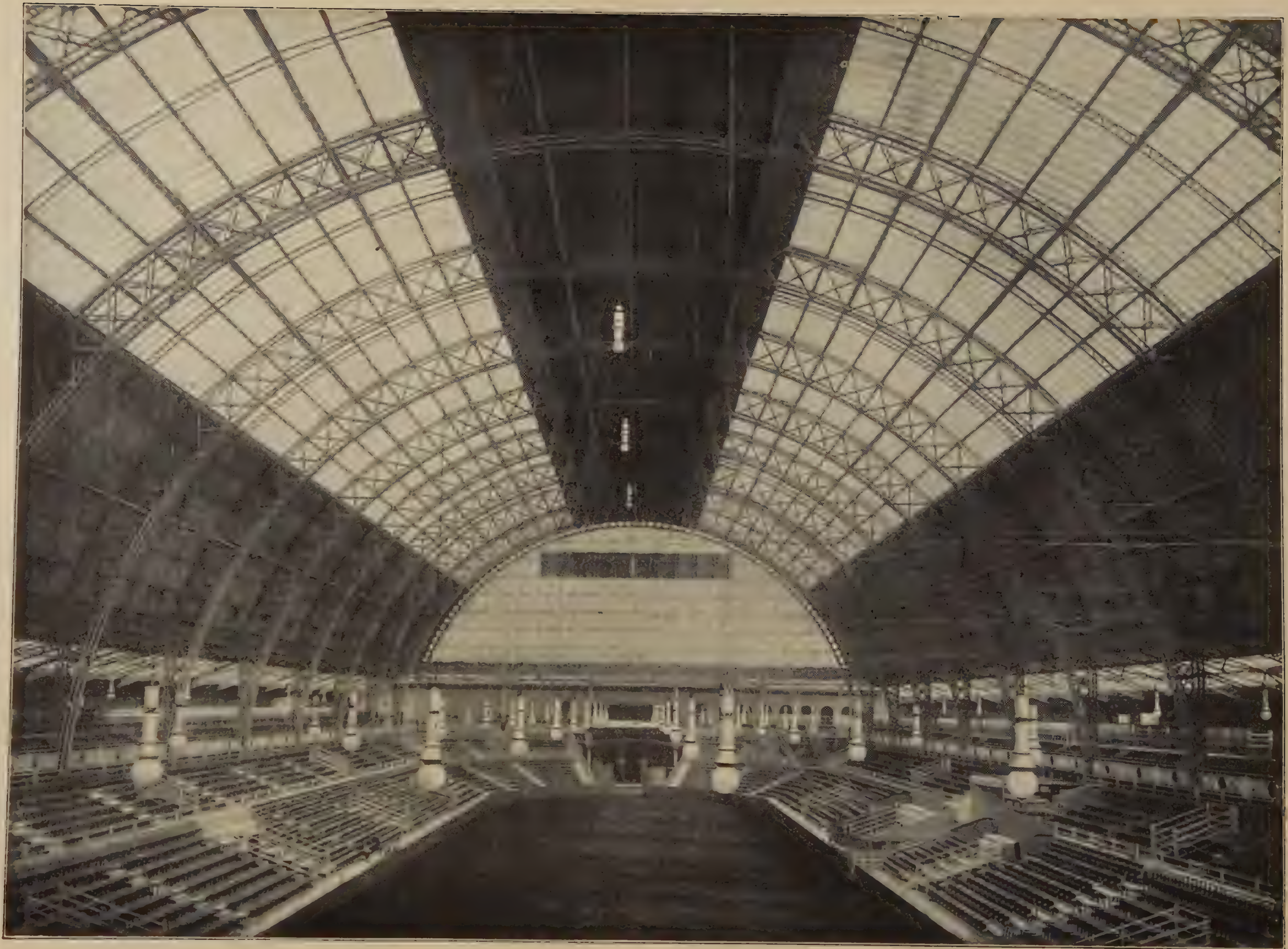


Fig. 25.—HALL OF THE MIDDLE TEMPLE.



ROOF OF OLYMPIA, LONDON.

Mansard roof.

The Mansard roof (fig. 5) is a useful form of construction which obtains its name from François Mansard, a distinguished French architect who lived in the 17th century. This kind of roof has been largely used, especially in France and other European countries, as well as in America in the old colonial days. It adapts itself well to some styles of architecture, but should be very carefully applied, since it is apt to appear ungainly in some situations. By the use of a Mansard roof extra rooms can be obtained at a small expense without adding an additional storey to the building proper. The outward thrust upon the supporting walls is not so great as with an ordinary pitched roof, the load coming practically vertically upon them. There is no recognized rule for the proportion or pitch of a roof of this description, which should be designed to suit the particular building it is intended to cover. Fig. 5, A, B, C, D and E show various forms. A similar type of curb roof is often used having a flat lead- or zinc-covered top in place of the pitched slate- or tile-covered top of the ordinary Mansard roof.

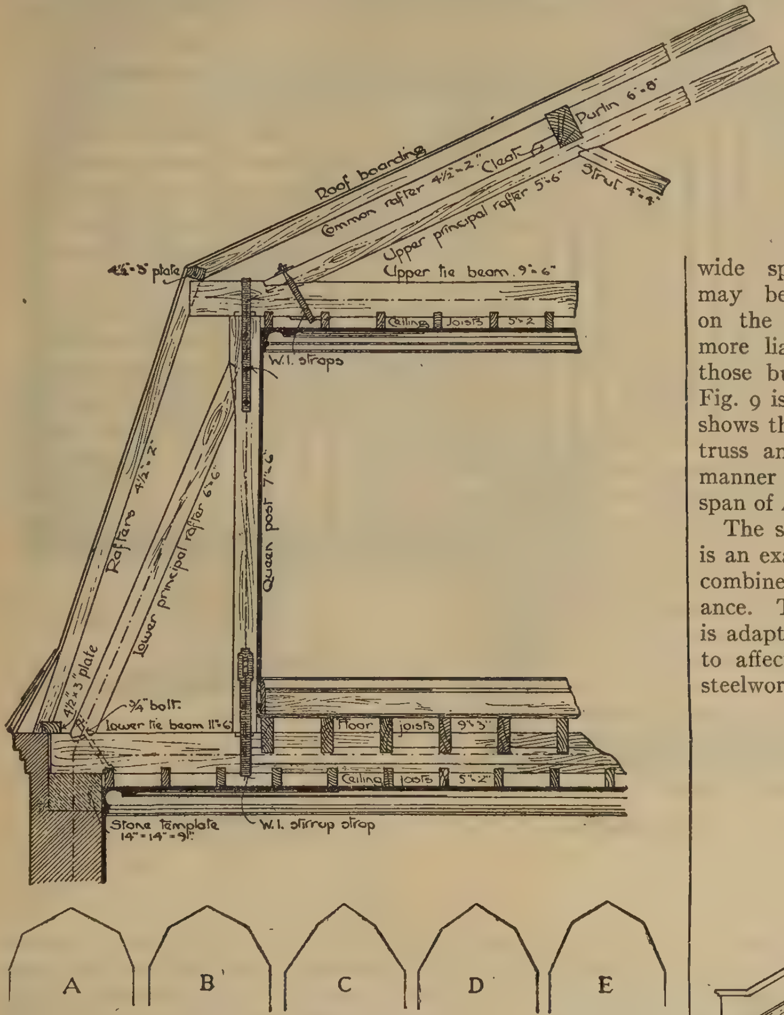


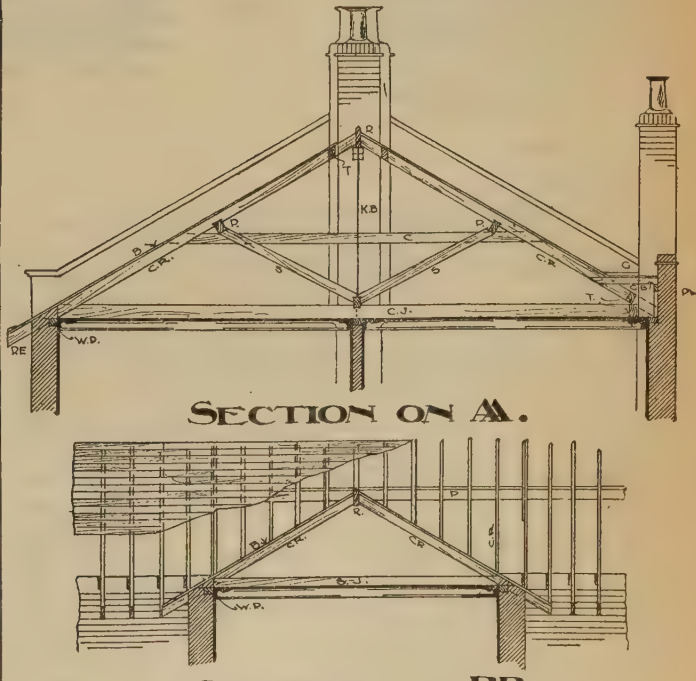
FIG. 5.—Mansard Roof Truss: detail of outline as A; other outlines at B, C, D and E.

Composite roof trusses of wood and iron are frequently used for all classes of buildings, and have proved very satisfactory. They are built upon the same principles as wooden types of roof trusses. The struts—that is, those members subjected to compressional stress—are of wood, and iron bars or rods are used for the ties, which have to withstand tensile forces. When any shrinkage occurs to loosen the joints of the framing, as usually happens in large trusses, the tie-rods are tightened up by the bolts attached to them. Figs. 6, 7 and 8 are the sections and plan of a simple method of constructing the roof for an ordinary domestic building with plaster ceilings to the top rooms. It is a simple construction of the couple close order with the addition of a collar and struts and king-rod to every fourth rafter. Trimming is necessary for openings and where portions of the structure, such as chimney stacks, cut into the roof. The trimming rafters are made an inch thicker than the others. The dragon tie is framed in connexion with the wall-plate at the hipped corners to take the thrust of the hip rafters.

Iron roofs.

Steel and iron trusses in many cases follow the wood models already described. The struts and principal rafters are usually of **T** section, the tensional members being rods or flat bars. Flat plates and bolts or rivets are used to form the connexions between the members, and a means is provided in the tie-rod for tightening up the truss should any of the members "give" slightly under their load. Large trusses for very wide spans are specially designed for their work and may be of many different types of design. Big roofs on the tie-rod principle are now being discarded as being more liable to failure, through deterioration or defect, than those built on the girder principle in one form or another. Fig. 9 is a queen-rod roof principal for a span of 50 ft., and shows the sizes of the different members, a line diagram of the truss and large details of the joints. Fig. 10 in a similar manner shows the roof at Cardiff railway station, which has a span of 43 ft.

The steel roof covering the great hall at Olympia, London, is an example of a carefully designed and well-built roof which combines with strength an extremely light and elegant appearance. This is due to the fact that every member of the roof is adapted to meet the particular stresses found by calculation to affect it. By careful study of conditions the sections of steelwork used for the various members have been reduced to the smallest size compatible with safety. In this way any unnecessary surplus of material is avoided, and so is the heavy, overwhelming effect noticeable in many roofs of large span. There is an entire absence of long wide plates and webs; the various members are composed wholly of flat bars and angle irons riveted together, and plates are introduced only where required to cover joints. Some notes on its size and construction



FIGS. 6 and 7.—Roof for Domestic Building.

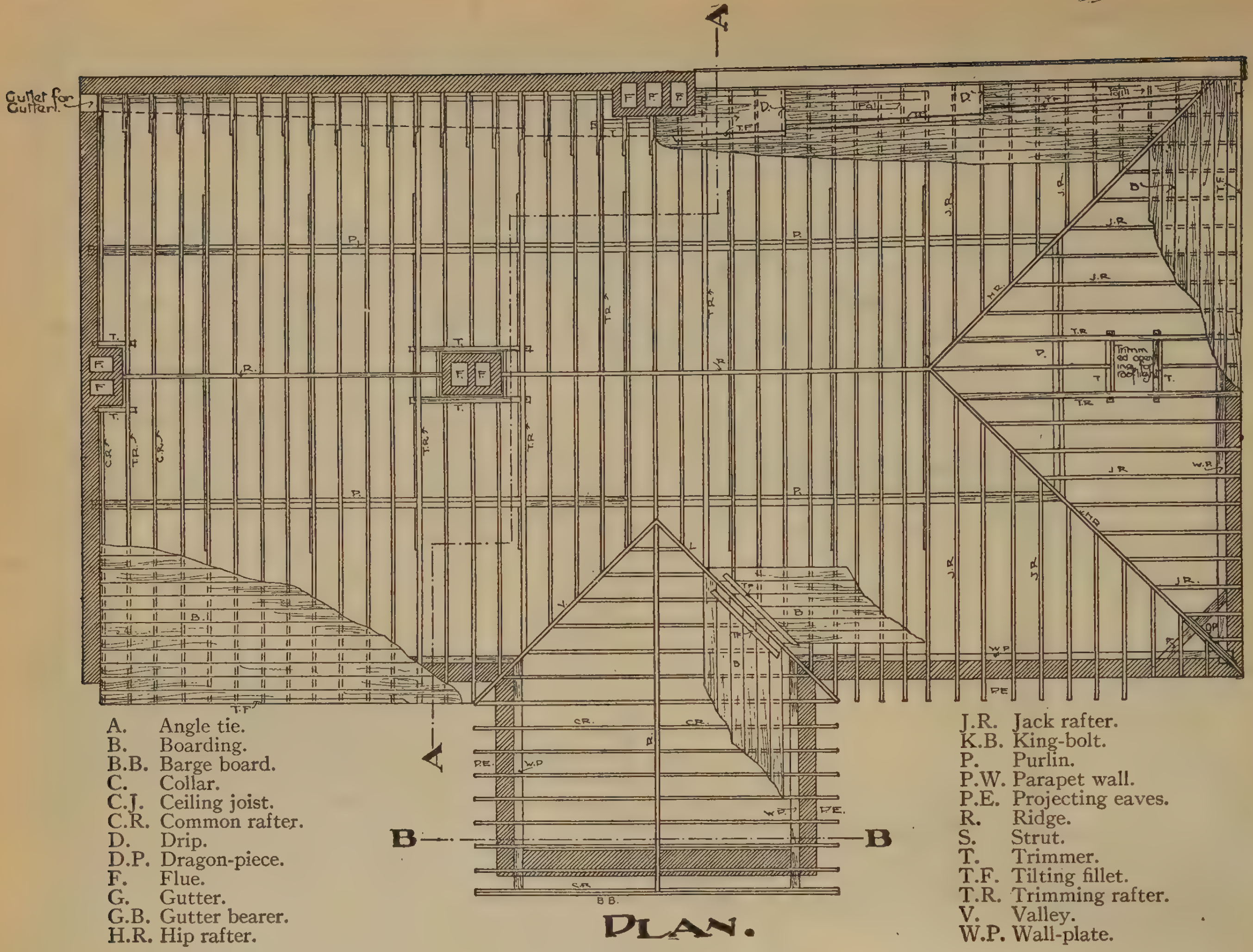


FIG. 8.

will be interesting. The dimensions of the great hall are 440 ft. long by 250 ft. wide, the height to the crown of the roof being about 100 ft. The main ribs of the roof have a clear span of 170 ft. and are placed 34 ft. apart. They are of box-girder form and measure 7 ft. deep and 2 ft. wide. The gallery around the hall is 40 ft. wide on three sides and 26 ft. wide on the remaining side. It is covered by a lean-to roof which abuts against the curved ribs on the north and south sides, and is attached to horizontal members of the screens on the east and west sides. The bricks walls of the building are not called upon to resist any portion of the thrust from the roof, as the side frames through which the gallery floor passes form a self-contained system of steelwork in which the thrust is ultimately conveyed to the ground. The screens which close the semicircular ends of the roof are of vertical ridge and furrow construction, as can be clearly seen in the illustrations, this form offering great resistance to wind pressure while at the same time requiring a minimum amount of material. Of the two illustrations, fig. 11 is a detailed cross-section showing fully the method of construction of the foot of the main rib and column, and the arrangement of the side frames above referred to is shown in fig. 12, which is a complete cross-section view, and will convey to the reader some idea of the vast size of the building and its general proportions.

The following five roofs are examples of large span: Crystal Palace (104 ft.); Olympia, London (170 ft.); St Enoch station, Glasgow (198 ft.); Central station, Manchester (210 ft.); St Pancras station, London (240 ft.).

Domical roofs.

Domes may be framed up with wood rafters cut to shape. For small spans this construction is satisfactory, but when the dome is of considerable size it is often framed in steel as being stronger and more rigid than wood, and therefore not exerting so great a thrust upon the supporting walls. The outer dome of St Paul's cathedral in London is of lead-covered wood, framed upon and supported by a conical structure of brickwork which is raised above the inner dome of brick. Concrete is a very suitable material for use in the construction of domes, and may be employed simply or with iron or steel reinforcement in the shape of wires, bars or perforated plates. One of the best modern examples of concrete vaulting and domical roofing without metal reinforcement occurs in the Roman Catholic cathedral at Westminster, a remarkable building designed by Mr J. F. Bentley. A few details of the roofs will be interesting. The circle developed by the pendentives of the nave domes is 60 ft. in diameter. The thickness of the domes at the springing is 3 ft. gradually reduced to 13 in. at the crown; the curve of equilibrium is therefore well within the material. The domes were turned on closely boarded centring in a series of superimposed rings of concrete averaging 4 ft. in width. The concrete is not reinforced in any way. The independent external covering of the domes is formed of 3 in. artificial stone slabs cast to the curve. They rest on radiating ribs 5 in. deep of similar material fixed on the concrete and rebated to receive the slabs; thus an air space of 2 in. is left between the inner shell and the outer covering, the object being to render the temperature of the interior more uniform. At the springing and at the

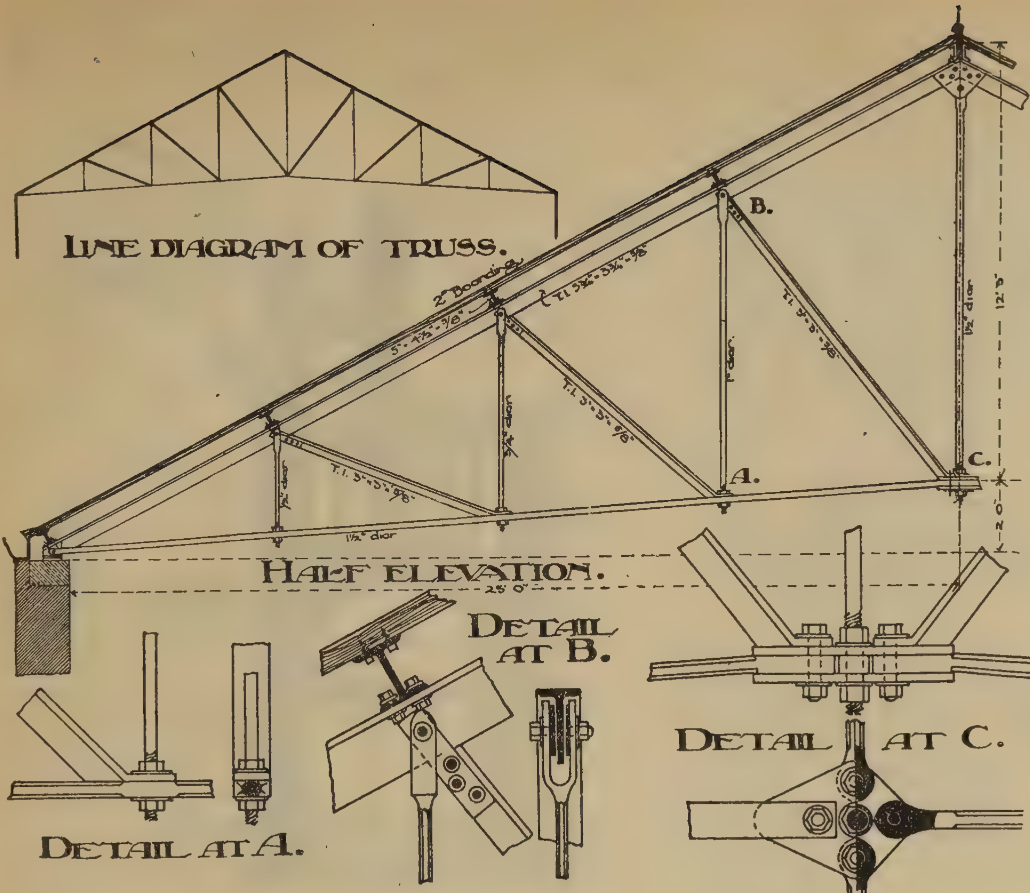


FIG. 9.—Queen-rod Roof Truss.

crown the spaces between the ribs are left open for ventilation. The sanctuary dome differs in several respects from those of the nave. Unlike the latter, which seem to rest on the flat roofing of the church, the dome of the sanctuary emerges gradually out of the substructure, the supporting walls on the north and south being kept down so as to give greater elegance to the eastern turrets. The apsidal termination of the choir in the east is covered in with a concrete vault surmounted by a timber roof, in striking contrast to the domes covering the other portions of the structure. Fig. 13 is a section through the nave showing how the domes are buttressed, fig. 14 is a section through the sanctuary dome, and figs. 15 and 16 a section and part plan of the vaulting of the choir with its wood span roof above the concrete vault.

Covering Materials for Roofs.—There are a large number of different roof-covering materials in common use, of which short descriptions, giving the principal characteristics, may be useful. The nature of the material employed as the outer covering affects the details of roof construction very considerably. A light covering such as felt or corrugated iron can be safely laid upon a much lighter timber framing than is necessary for a heavy covering of tiles or slates.

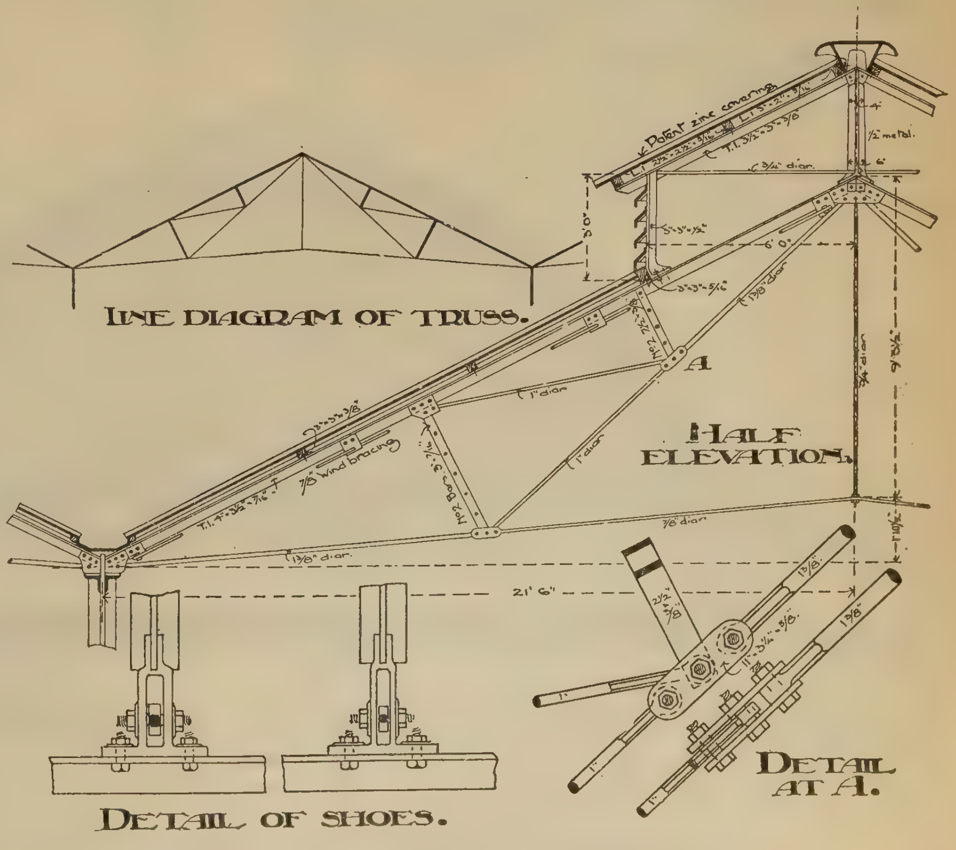


FIG. 10.—Roof at Cardiff Station.

Felt.

Roofing felt is an inexpensive fabric of animal or vegetable fibre treated with asphalt to make it capable of resisting the weather. It is largely used as a roofing material for temporary buildings. When exposed to the weather it should be treated with an application of a compound of tar and slaked lime well boiled and applied hot, the surface being sprinkled with sand before it becomes hard. Felt is also used on permanent buildings as a good non-conductor of heat under slating and other roof-covering materials. In this case it is not tarred and sanded. It is supplied in rolls containing from 25 to 35 yds. 30 in. wide. The sheets should be laid with a lap of 2 in. at the joints and secured to the boarding beneath by large-headed clout-nails driven in about 2 in. apart.

Corrugated iron.

Corrugated iron is supplied either black or galvanized. It is especially suited for the roofs of outbuildings and buildings of a more or less temporary character. Being to a large extent self-supporting, it requires a specially designed roof framework of light construction. If, as is usually the case, the sheets are laid with the corrugations running with the slope of the roof, they can be fixed directly on purlins spaced 5 ft. to 10 ft. apart according to the stiffness and length of the sheets. In

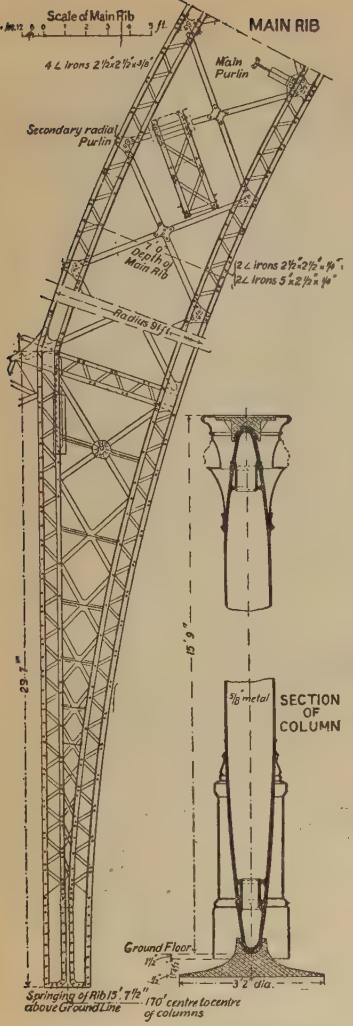

Scale of Main Rib
Ins. 12 6 0 1 2 3 4 5 ft.
MAIN RIB
4 ∠ Irons 2½"×2½"×3/8"
Main Purlin
Secondary radial Purlin
7' 0" Depth of Main Rib
2 ∠ irons 2½"×2½"×¼"
2 ∠ irons 5"×2½"×¼"
Radius 91 ft.
29' 7"
15' 9"
5/8" metal
SECTION OF COLUMN
Ground Floor
1½"
4½"
½"
3' 2" dia.
Springing of Rib 15' 7½" above Ground Line
170' centre to centre of columns

FIG. 11.—Detail of Main Rib and Column, Olympia.

pure air zinc coating of the galvanized sheets is durable for many years, but in large cities and manufacturing towns its life is short unless protected by painting. In such districts it has often been found that plain ungalvanized sheets well coated with paint will last longer than those galvanized, for the latter are attacked by corrosive influences through minute flaws in the zinc coating developed in the process of corrugation or resulting from some defect in the coating. The stock sizes of corrugated sheets vary from 5 ft. to 10 ft. long, and from 2 ft. to 2 ft. 9 in. wide with corrugations measuring 3 in. to 5 in. from centre to centre. For roofing purposes the sheets are supplied in several thicknesses ranging from No. 16 to No. 22 Standard Wire Gauge. No. 16 is for exceptionally strong work, No. 18 and No. 20 are used for good-class work, and No. 22 for the roofs of temporary buildings. The sheets when laid should lap about 3 in. at their sides and from 3 in. to 6 in. at the ends. Riveting is the best method of connecting the sheets, although galvanized bolts, which are not so satisfactory, are frequently employed. The joints should be made along the raised corrugations to lessen the risk of leakage. Holes can be punched during the erection of the roof; their positions should first be determined by placing the sheets in position and marking the necessary point of fixing. Sheets are usually attached to timber framework with galvanized screws, or nails with domed washers placed under their heads. Fixing to a steel framework is effected by means of galvanized hooked bolts clipping the purlins passed through the sheet and held tight by nuts on the outside. Sheets corrugated in the Italian pattern have raised half-rounds every 15 in. or so, the portions between being flat. Such sheets have a very neat appearance and give a better effect in some positions than the ordinary corrugations

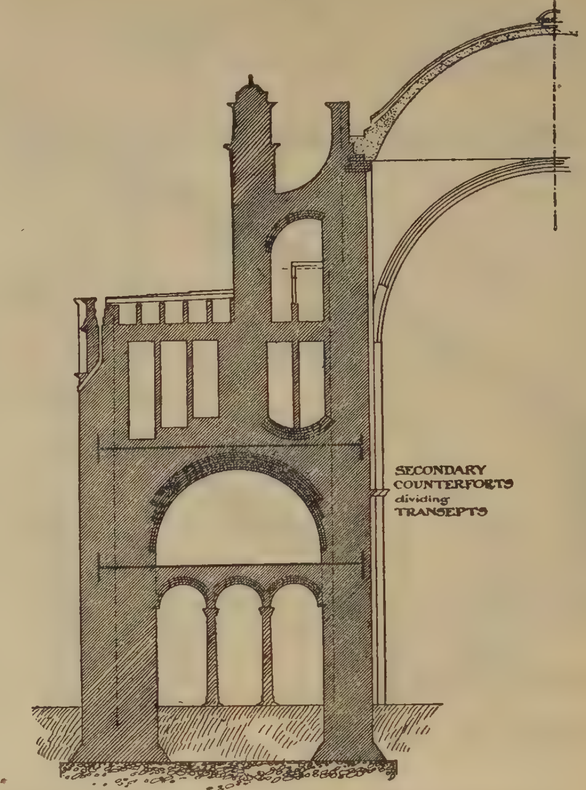

SECONDARY COUNTERFORTS dividing TRANSEPTS

FIG. 13.—Westminster Cathedral: section through nave.

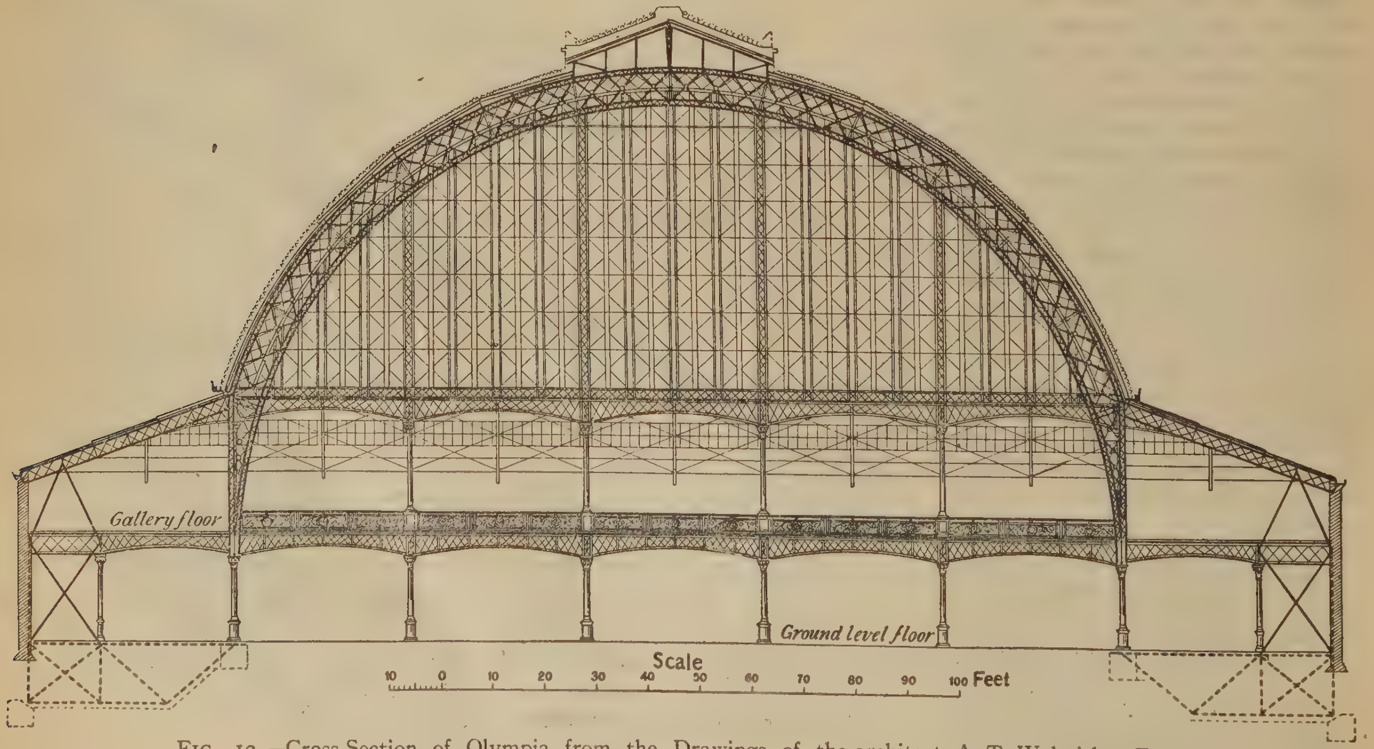

Gallery floor
Ground level floor
Scale
10 0 10 20 30 40 50 60 70 80 90 100 Feet

FIG. 12.—Cross-Section of Olympia from the Drawings of the architect, A. T. Walmisley, Esq.

Zinc.

Zinc in sheets is a material largely used as a roof covering, and if care be taken to ensure metal of good quality, it proves itself light, strong and durable, as well as inexpensive. Zinc is stronger weight for weight than lead, slate, tile and glass, but weaker than copper, wrought-iron and steel, although with the exception of the two last mentioned it is not so durable when exposed to the weather. It is not liable to easy breakage as are slate, tile and glass. It is usually supplied in flat sheets, although it can also be had in the corrugated form similar to corrugated sheet-iron. When exposed, a thin coating of oxide is formed on the surface which protects the metal beneath from any further change, and obviates the necessity of painting. In laying the sheets, the use of solder and nails should be avoided entirely except for fixing clips and tacks which do not interfere with the free expansion and contraction of the sheets. The reason for this is that zinc expands freely, and sheets laid with soldered seams or fixed with nails are liable to buckle and probably break away owing to movements set up by changes of temperature. The usual sizes of zinc sheets are 7 ft. or 8 ft. long by 3 ft. wide. The thickness and weights of zinc are shown in the following table, which compares the Vieille Montagne Gauge with the Old Belgian Gauge and the British Imperial Standard Wire Gauge.

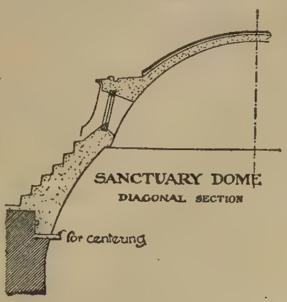
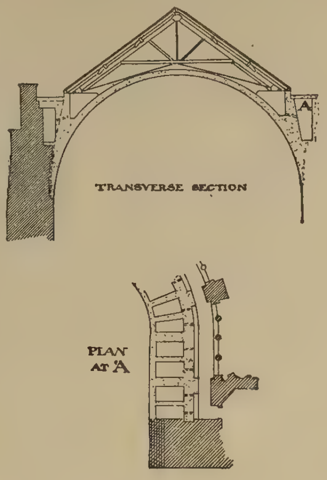


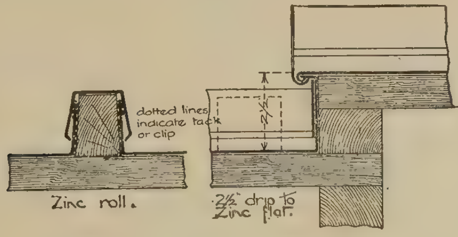
FIG. 14.—Westminster Cathedral: diagonal section through sanctuary dome.



FIGS. 15 and 16.—Westminster Cathedral: choir-vaulting.

V.M.G.	O.B.G. approximately.	S.W.G. approximately.	Weight per sq. ft.
10	9	25	11½ oz.
11	10	24	13½ ,,
12	11	23	15 ,,
13	12	22	17 ,,
14	13	21	18¾ ,,
15	14	20	21¾ ,,
16	15	19	24¾ ,,

The best method of laying a zinc flat roof is with the aid of wood "rolls" of about 2 in.×2 in. in section, splayed at sides and spaced 2 ft. 8 in. apart and fixed to the roof boarding with zinc nails. Iron nails should not be used as this metal affects the zinc. The sheets of zinc are laid between the rolls with their sides bent up 1½ in. or 2 in. against them, and held firmly in position by clips of zinc attached to the rolls. A cap of the same metal is then slipped over each roll and fastened down by tacks about 3 in. long soldered inside it so as to hook under the same clips that hold the sheet down. Drips of about 2½ in. are made in the slope at intervals of 6 ft. or 7 ft.—that is, the length of a sheet—and special care must be taken at these points to keep the work waterproof. The lower sheet is bent up the face of the drip and under the projecting portion of the upper sheet, which is finished with a roll edge to turn off the water. The end of the roll has a specially folded cap which also finishes with a curved or beaded water check, and this in conjunction with the saddle piece of the roll beneath forms a weather-proof joint (figs. 17 and 18). The fall between the drips is usually made about 1½ in., but where necessary it may be less, the least permissible fall being about 1 in 80. Felt laid beneath zinc has the effect of lengthening the life of the roof and should always be used, as the edges of the boarding upon which it is laid are, when the latter warps, apt to cut the sheets. It also forms a cushion protecting the zinc if there is traffic across the roof.

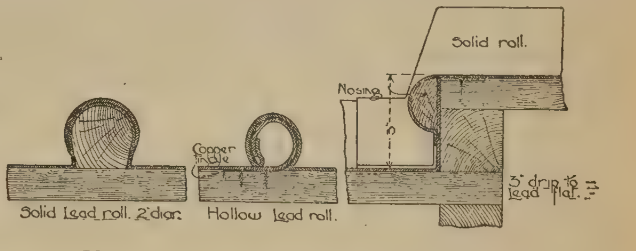


17 18

FIGS. 17 and 18.—Details of Zinc Flats.

Lead.

Sheet-lead forms a much heavier roof covering than zinc, but it lasts a great deal longer and more easily withstands the attacks of impure air. Lead must be laid on a close boarding, for its great ductility prevents it from spanning even the smallest spaces without bending and giving way. This characteristic of the metal, however, conduces largely to its usefulness, and enables it to be dressed and bossed into awkward corners without the necessity of jointing. The coefficient of expansion for lead is nearly as great as that for zinc and much higher than in the case of iron, and this fact requires precautions similar to those affecting zinc to be taken when laying the roofing. The manner of laying is with rolls and drips as in the case of zinc, the details of the work differing somewhat to suit the character of the material (see figs. 19, 20 and 21). Allowances must be made for expansion and contraction, and the use of nails and solder avoided as far as possible. Contact with iron sets up corrosion in lead, and when nails are necessary they should be of copper; screws should be of brass. Lead is supplied in rolls of 25 to 35 ft. long and 6 ft. to 7 ft. 6 in. wide. That in general use varies from one-fourteenth to one-seventh of an inch in thickness. The weights most suitable for employment in roofing work are 7 or 8 ℔ per square foot for flats and gutters, 6 ℔ for ridges and hips, and 5 ℔ for flashings.



19 20 21

FIGS. 19, 20 and 21.—Details of Lead Flats.

Copper.

As a roof covering copper is lighter, stronger and more durable than either zinc or lead. It expands and contracts much less than these metals, and although not so strong as wrought-iron and steel it is much more durable. From a structural point of view these qualities enable it to be classed as the best available metal for roof covering, although its heat-conducting properties require it to be well insulated by layers of felt and other non-conducting material placed beneath the metal. On exposure to the air copper develops a feature of great beauty in the coating of green carbonate which forms upon its surface protecting it from further decomposition. Perhaps the chief disadvantage in the use of copper lies in its first cost, but against this must be set the almost imperishable nature of the metal and the fact that by reason of its light weight less substantial framework is required for its support. Copper roofing should be laid in a similar manner to zinc, with wood rolls at intervals of about 2 ft. 4 in. It is, however, often laid with welted seams. The general stock sizes of sheets are from 4 ft. to 5 ft. 3 in. long and 2 ft. to 3 ft. 6 in. wide. The thickness almost invariably used is known as 24 S.W.G. and weighs 16 oz. per square foot. Thinner metal would suffice, but owing to the increased cost of rolling very little would be gained by adopting the thinner gauges.

American tin roofs.

In the United States of America "tin" roofs are quite commonly used. Sheets of wrought-iron coated either with tin or zinc are used of a size usually 14 in. by 20 in., though they may be had double this size. Preparation for laying is made by fixing an insulating foundation of somewhat stout paper or felt; this must be dry, else it is apt to spoil the impermeable covering laid upon it by causing it to rust. Junctions between the sheets are made by welted seams in which the four edges of the sheets are turned over so as to lock together, thus forming one large sheet of tin covering the roof. In high-class work of a permanent nature the seams in addition are soldered, rosin only being used as a flux. Each sheet also is secured to the roof with two or three tin cleats. The life of such roofs may be practically doubled by the application of a good coat of paint, which, however, adds considerably to the cost.

Slate.

Slate is a strong and very impermeable material, and these qualities and the fact that it is easily split into thin plates suitable for laying, as well as its low cost, cause it to be by far the most generally used of all materials for roof covering. Some of the best known varieties of slates, classed according to their colour, are as follows:—

Blue . .	North Wales (Penrhyn, Festiniog, Dinorwic, &c.), France, Norway, Germany.
Blue-grey .	Cornwall (Delabole).
Grey . .	North Wales (Penrhyn, Dinorwic).

Purple . .	North Wales (Bangor, Penrhyn, Dinorwic), Newfoundland, Germany.
Green . .	South Wales (Precelly), Cumberland, Westmorland, Lancashire, Ireland, Newfoundland, Norway, United States and Germany.

Slates are cut to many different sizes varying in length from 10 in. to 36 in. and in width from 5 in. to 24 in. There are perhaps thirty or more recognized sizes, each distinguished by a different name. In common practice those generally used are "large ladies," 16 in. by 8 in.; "countesses," 20 in. by 10 in.; and "duchesses," 24 in. by 12 in. Generally speaking, the rule governing the use of the different sorts is that the steeper the pitch the smaller the slate, and vice versa. Buildings in very exposed positions naturally require steeply pitched roofs.

Some of the technical terms used by the slater are as follows:—

Bed, the under surface of a slab when laid.

Back, the upper surface of the slate.

Gauge, the distance between the lines of nailing. This depends on the length of the slate and equals half the length of the slate after the lap plus an inch for the nail-hole has been deducted. This is for slates nailed near the top edge; for those fixed near the middle the gauge would be half an inch more, as no allowance for nail-holes is required.

Margin, the width of the exposed portion of each course which equals the width apart of the nailing.

Head and tail, the top and bottom edges of the slate.

Lap, the lap of the tail of one course of slates over the head of the second course below it. The lap is made from 2½ in. to 4 in. (usually 3 in.), and for this distance there are three thicknesses of slate, namely, the tail of the top course, the middle of the next and the head of the third course.

Slates may be fixed by nailing at the head (see fig. 22) or at about the middle. The latter method is the stronger, as the levering effect of the wind cannot attain so great a strength. There is a small economy effected by centre nailing, as the margin is slightly larger and fewer slates are required to cover a given space; longer nails, however, are required, for as slates are laid at an angle with the pitch of the roof their centres cannot be made to approach so near to the slating battens or boarding as the head, which lies close on the surface to which it is fixed. Another point worth noticing is that the nail-holes in the centre nailed slating are only covered by 3 in. of the tail (the amount of the "lap") of the course of slates above, and rain is very liable to be forced under by the wind and cause the wood battens or other woodwork to rot. Head-nailed slates, on the other hand, have their holes covered by two layers of slate, and are removed from exposure by the length of the gauge plus the lap, which in the case of "countess" slating equals 11 in.

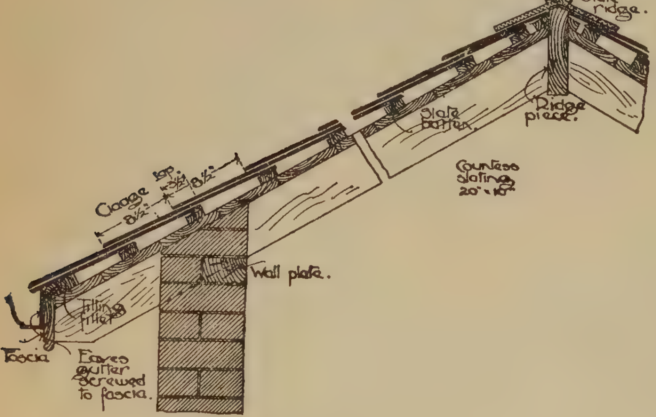


FIG. 22.—Detail of a Slated Roof.

"Open slating" is an economical method of laying slates that is often adopted for the roofs of sheds and temporary buildings. The slates in the same course are not laid edge to edge as in close slating, but at a distance of two or more inches apart. This forms a roof covering light in weight and inexpensive, which, although not strictly weather-proof, is sufficiently so for the buildings upon which it is used.

Slates are laid upon open battens fixed upon the rafters or upon close boarding or upon battens fixed upon boarding. The battens are ¾ in. or 1 in. thick and 1½ in. to 3 in. wide, and are spaced to suit the gauge of the slates. When close boarding is used it is often covered with inodorous asphalted felt. While taking these precautions to make the roof sound and tight it should be borne in mind that slate is liable to decay if not ventilated, and to effect this the battens are sometimes fixed vertically, ridge ventilators introduced and air inlets arranged at the eaves. The bed of slates laid without provision for the admission of ~~air~~ will be found on removal after some time to have rotted so as to scale off and easily crumble into powder.

The nails used in slating are a very important item, and the durability of the work depends to a large extent upon them. They should have large flat heads. The most satisfactory are those made of a composition of copper and zinc, but others of copper, zinc, galvanized iron and plain iron are used. Those of copper are most durable, but are soft and expensive. Zinc nails are soft and not very durable; they will last about twenty years. Iron nails even if galvanized are objectionable in permanent work, though they may be used for temporary roofs. When the plain-iron nails are employed they should be heated and plunged in boiled linseed oil. The pitch of a roof intended for slating should not incline less than 25° with the horizontal, while 30° is a safer angle to adopt.

Tiles.

Tiles for roofing purposes are made from clay and burned in a manner similar to bricks. The clay from which they are made is, however, of a specially tenacious nature and prepared with great care so as to obtain a result as strong and as nearly non-porous as possible. Tiles are obtainable in many different colours, and some of these have a very beautiful effect when fixed and improve with age. They comprise a large number of tints from yellowish red, red and brown to dark blue. As with bricks the quality depends to a large extent upon the burning; underburnt tiles are weak and porous, liable to early decay, while overburning, though improving the tiles as regards durability, will cause them to warp and will spoil colour. The usual shape is the "plain tile," but they are made in various other shapes with a view both to easier fixing and lighter weight, and to ornamental effect. There are also several patented forms on the market for which the makers claim special advantages. The ordinary tiles are slightly curved in shape to enable them to lie close one upon the other. Some of them have small "nibs" moulded on at the head by which they may be hung upon the battens and nailing avoided (see fig. 23). Nail-holes are provided, and upon steep slopes it is advisable to make use of them. Others are made without the nibs, and are fixed either by nailing to the battens or boarding or hung by means of oaken pegs wedged in the holes to the battens, the pegs in the latter case acting in the same way as the above-mentioned nibs. Plain tiles are of rectangular form, the standard dimensions are 10½ in. long by 6½ in. wide. They are usually ½ in. thick and weigh about 2½ lb each.

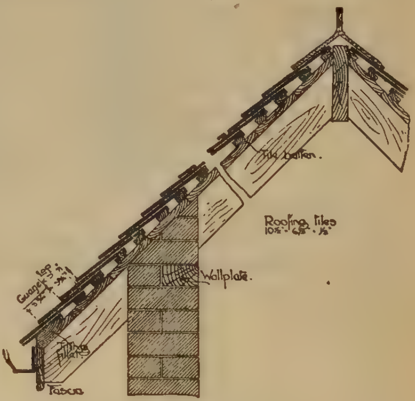


FIG. 23.—Detail of a Tiled Roof.

There are many forms of ornamental tiles, which are plain tiles having their tails cut to various shapes instead of moulded square. A number of patented forms of tiles also are on the market, some of which possess considerable merit. Pantiles are suitable for temporary and inferior buildings such as sheds and outhouses. They are laid on a different principle from plain tiles, merely overlapping each other at the edges, and this necessitates bedding in mortar and pointing inside and sometimes outside with mortar or cement. This pointing plays an important part in keeping the interior of the building free from the penetration of wind and water. Pantiles are generally made to measure 13½ in. long by 9½ in. wide, and weigh from 5 lb to 5½ lb each. Moulded on at the head of each tile is a small projecting nib which serves for the purpose of hanging the tile to the lath or batten. They are laid with a lap of 3½ in., 2½ in. or 1½ in., giving a gauge (and margin) of 10 in., 11 in. and 12 in., respectively. The side lap is generally 1½ in., leaving a width of 8 in. exposed face. There are many other forms based upon the shape of the pantile, some of which are patented and claim to have advantages which the original form does not possess. Among such are "corrugated tiles," of the ordinary shape or with angular flutes, and also the Italian pattern "double roll tiles," "Foster's lock-wing tiles." Poole's bonding roll tiles are a development of the Italian pattern tile.

Glass as a roof covering and the different methods of fixing it are dealt with in the article GLAZING.

Miscellaneous materials.

There are many other materials used for roof covering besides those already described, many of them of considerable value. Some have in the past enjoyed considerable vogue, but have practically died out of use owing to the development and cheapening of other forms of roofing. Among these may be included thatch and wood shingles, the use of which in these days is practically reduced to special cases. Other little used roofing materials are those of recent invention, some of which perhaps have a great future before them. Plates of asbestos used as slates or tiles make a light, strong and fireproof covering. Large terra-cotta tiles or slabs are much used in the United States of America. A good form of flat roof is that in which concrete is used as a foundation for a waterproof layer of asphalt, laid to slight falls to allow the water to run off easily. This is the usual method adopted when a roof garden is required. Shingles or thatch look extremely well on a roof, but their use is debarred in a great many districts owing to the danger of fire. Galvanized iron tiles, zinc tiles and copper tiles may be employed on small areas with good effect. "Willesden paper," often used as an insulating layer beneath slates and tiles, is also at times used as a roof covering. It is cardboard chemically treated to render it tough, waterproof and fire-resisting.

Weight.

The weights of some of the various materials used in the construction and covering of roofs are given in the following table. The weights which are approximate are for a square foot of roofing. The roof trusses are taken to be spaced 10 ft. apart and include the necessary purlins.

King-post wood truss 20 ft. to 30 ft. span	2 to 2½ ℔
Queen-post " 30 ft. to 50 ft.	3 to 3½ "
Wood rafters	2¼ "
Ceiling joists and ceiling	11 "
¾-in. boarding for roof covering	2½ "
1-in. " "	3½ "
1¼-in. " "	4¼ "
2½-in. × 1 in. slate battens for 8½-in. gauge	1½ "
Felt	½ "
Thatch	6½ "
Slates (ordinary laid with 3-in. lap)	9 "
Tiles, plain flat	18 "
Pantiles	11 "
Zinc 12 to 16 gauge laid complete including rolls	1¼ to 1¾ "
Copper 25 to 19 gauge laid complete including rolls	1¼ to 2½ "
Lead weighing 6 ℔ per square foot laid complete including rolls	6½ "
Corrugated iron 20 S.W. gauge	2 "

Wind pressure is usually calculated at 22 to 25 ℔ on a roof with pitch of 30°, and 27 to 30 ℔ on a roof of 45° pitch.

From these particulars it is easy to calculate the weight of a square (100 superficial ft.) of roofing material, this being the usual standard of measurement for many roofing materials.

Regulations.

The London Building Act of 1894 and its amendments set forth with regard to roofs erected in the London district that every structure on a roof is to be covered with slate, tile, metal or other incombustible material, except wooden cornices and barge boards to dormers not exceeding 12 in. in depth, and doors and windows and their frames. Every dwelling-house or factory above 30 ft. in height and having a parapet must have means of access to the roof. The pitch of the roofs of warehouse buildings must not exceed 47°, and those of other buildings must not exceed 75°, but towers, turrets and spires are excepted. In domestic buildings not more than two storeys are to be formed in the roof, and if the floor is more than 60 ft. above the street level fireproof materials must be used throughout and a sufficient means of escape provided. The building by-laws of the municipality of Johannesburg contain several clauses affecting the designing of roofs and their method of construction. In the designing of buildings roof-slopes must be within a line drawn and produced from the ground level at the opposite side of the street to the top of the eaves, gutter or parapet. No roof in the municipal fire limit may be constructed of thatch, reed or other inflammable material. Without the fire area they may be so constructed if the building stands at least 20 ft. from the boundary of its site. Roofs having a pitch of less than 22½° must be constructed to bear safely a load of at least 28 ℔ per square foot of surface. Roofs of steeper pitch must be able to support a live load of 21 ℔ per square foot. The framing of Mansard or other roofs of more than 60° pitch on a building exceeding 45 ft. high must be constructed of approved fireproof material at least 2 in. thick. No roofs except those of towers, turrets or spires shall exceed 70° pitch for a Mansard or 60° for an ordinary roof. Every fireproof roof, in addition to a door or scuttle for access from below, must have a skylight or skylights with metallic framing, having an area equal to at least one-sixtieth the area of the roof. Skylights placed over rooms or areas to which the public have access must be protected by wire netting below or be glazed with wire-wove glass.

The Building and Health Laws and Regulations and Amendments of 1905 affecting the city of New York are based, so far as the construction of roofs goes, upon the same lines as those of London, the principal exceptions being that they give very full working details, under part 24, as to the strengths of materials required to be used and the wind pressure to be provided against. In part 17 they provide that where a building exceeds three storeys or 40 ft. in height and the roof has a pitch of over 60°, it shall be constructed of iron rafters and be lathed with iron or steel on the inside and plastered or be filled in with fireproof material not less than 3 in. thick and covered with metal, slate or tile. The provision as to access to roof and fire escapes therefrom adopted by the London County Council in 1907 under the London Building Act Amendment Act 1905 were in operation in New York in 1899.

LITERATURE.—The principal reference books on this subject are the following:—Thomas Tredgold, *Elementary Principles of Carpentry*; J. Newland, *Carpenter and Joiner's Assistant*; G. L. Sutcliffe, *The Modern Carpenter, Joiner and Cabinet Maker*; J. Griffiths, *Trusses in Wood and Iron*; F. Bond, *Gothic Architecture*; J. Gwilt, *Encyclopaedia of Architecture*; F. E. Kidder, *Trussed Roofs and Roof Trusses*; J. Brandon, *Analysis of Gothic Architecture*; A. Pugin, *Ornamental Gables*; M. Emy, *L'Art de la charpenterie*; Viollet le Duc, *Dictionnaire*; J. K. Colling, *Details of Gothic Architecture.* (J. Bt.)

ROOK (O.E. *Hrōc*, Icel. *Hrôkr*,[1] Swed. *Råka*, Du. *Roek*, Gael. *Rocas*), the *Corvus frugilegus* of ornithology, and throughout a great part of Europe the commonest and best-known of the crow-tribe, belonging to the Passerine family Corvidae. Besides its pre-eminently gregarious habits, which did not escape the notice of Virgil (*Georg.* i. 382)[2] and are so unlike those of nearly every other member of the Corvidae, the rook is at once distinguished from the rest by commonly losing at an early age the feathers from its face, leaving a bare, scabrous and greyish-white skin that is sufficiently visible at some distance. In the comparatively rare cases in which these feathers persist, the rook may be readily known from the black form of crow (*q.v.*) by the rich purple gloss of its black plumage, especially on the head and neck, the feathers of which are soft and not pointed. In a general way the appearance and manners of the rook are well known, and particularly its habit of forming communities in the breeding-season, which it possesses in a measure beyond that of any other land bird of the northern hemisphere. Yet each of these communities, or rookeries, seems to have some custom intrinsically its own. In a general way the least-known parts of the rook's mode of life are facts relating to its migration and geographical distribution. Though the great majority of rooks in Britain are sedentary or only change their abode to a very limited extent, it is now certain that a very considerable number arrive in or towards autumn, not necessarily to abide, but merely to pass onward, like most other kinds of birds, to winter farther southwards; and, at the same season or even a little earlier, it cannot be doubted that a large proportion of the young of the year migrate in the same direction. As a species the rook on the European continent only resides during the whole year throughout the middle tract of its ordinary range. Farther to the northward, as in Sweden and northern Russia, it is a regular summer-immigrant, while farther to the southward, as in southern France, Spain and most parts of Italy, it is, on the contrary, a regular winter-immigrant. The same is found to be the case in Asia, where it extends eastward as far as the upper Irtish and the Ob. It breeds throughout Turkestan, in the cold weather visiting Afghanistan, Cashmere and the Punjab, and Sir Oliver St John found a rookery of considerable size at Casbin in Persia. In Palestine and in lower Egypt it is only a winter-visitant, and H. B. Tristram noticed that it congregates in great numbers about the mosque of Omar in Jerusalem. The same writer (*Proc. Zool. Soc.*, 1864, p. 444; *Ibis*, 1866, pp. 68, 69) considered the Palestine rook entitled to specific distinction as *Corvus Agricola*. The rook of China has also been described as a distinct species, *C. pastinator* (*Proc. Zool. Soc.*, 1845, p. 1) from having the feathers of its face only partially deciduous.

ROOKE, SIR GEORGE (1650–1709), English naval commander, was born near Canterbury in 1650. Entering the navy as a volunteer, he served in the Dutch Wars and became post-captain in 1673. After the Revolution of 1688, he commanded the squadron which raised the siege of Londonderry in 1689. He became rear-admiral in 1690, and fought at the battle of Beachy Head. In May of 1692 he served under Russell at the battle of Barfleur, and he greatly distinguished himself in a night attack on the French fleet at La Hogue, when he succeeded in burning six of their ships. Shortly afterwards he received the honour of knighthood and a reward of £1000. In 1693 he commanded the Smyrna convoy, which was scattered and partly taken by the French admiral Tourville near Lagos Bay. Till the peace of Nymwegen (1697), he continued to serve in the Channel and Mediterranean. In 1702 he commanded the expedition against Cadiz, and on the passage home destroyed the Plate fleet in Vigo. With Sir Cloudesley Shovel he took part in the capture of Gibraltar on the 21st of July 1704. On the 13th of August of the same year he attacked the French fleet off Malaga, the battle being drawn. On account of the dissatisfaction expressed indirectly at the result of the contest, he retired from the service in February 1705. He died on the 24th of January 1709.

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[1] The bird, however, does not inhabit Iceland, and the language to which the name belongs would perhaps be more correctly termed Old Teutonic. From this word is said to come the French *Freux*. There are many local German names of the same origin, such as *Rooke*, *Rouch*, *Ruch* and others, but the bird is generally known in Germany as the *Saat-Krähe*, *i.e.* seed-(=corn-)crow.

[2] This is the more noteworthy as the district in which he was born and educated is almost the only part of Italy in which the rook breeds. Shelley also very truly speaks of the "legioned rooks" to which he stood listening "mid the mountains Euganean."

Rooke's Journal for 1700–2 has been printed by the Navy Record Society.

ROOM, originally a word meaning space or accommodation; the ordinary meaning of an apartment in a building, one of the interior divisions of a house, dates from the 15th century. The word is common to Teutonic languages, cf. Du. *ruim*, Ger. *Raum*, Swed. and Dan. *rum*, with the original meaning of space. Skeat connects the word with the root seen in Lat. *rus*, open country.

ROON, ALBRECHT THEODOR EMIL, Count von (1803–1879), Prussian general field-marshal, was born at Pleushagen, near Colberg, in Pomerania, on the 30th of April 1803. His family was of Flemish origin, and was settled in Pomerania. His father, an officer of the Prussian army, died in poverty during the French occupation, and young von Roon was brought up, in a country ravaged in the War of Liberation and in straitened circumstances, by his maternal grandmother. He entered the corps of cadets at Kulm in 1816, whence in 1818 he proceeded to the military school at Berlin, and in January 1821 received a commission in the 14th (3rd Pomeranian) regiment quartered at Stargard in Pomerania. In 1824 he went through the three years' higher course of study at the war school in Berlin, where he also applied himself with the greatest energy to improving his general education. In 1826 he was transferred to the 15th regiment at Minden, but in the same year was appointed an instructor in the military cadet school at Berlin, where he devoted himself especially to the subject of military geography. He published in 1832 the well-known *Principles of Physical, National and Political Geography*, in three volumes (*Grundzüge der Erd-, Völker- und Staaten-Kunde*), which gained him a great reputation, and of which over 40,000 copies were sold in a few years. This work was followed in 1834 by *Elements of Geography* (*Anfangsgründe der Erdkunde*), in 1837 by *Military Geography of Europe* (*Militärische Länderbeschreibung von Europa*), and in 1839 by *The Iberian Peninsula* (*Die Iberische Halbinsel*).

Meantime, in 1832, he rejoined his regiment, and was afterwards attached to the headquarters of General von Müffling's corps of observation at Crefeld, when he first became alive to the very inefficient state of the Prussian army. In 1833 he was appointed to the Topographical Bureau at Berlin, in 1835 he entered the General Staff, and in the following year was promoted captain and became instructor and examiner in the military academy at Berlin. In 1842, after an illness of two years brought on by overwork, he was promoted to be major and attached to the staff of the VII. corps, in which post he was again impressed with the inefficiency of the organization of the army, and occupied himself with schemes for its reform. Two years later, as tutor to Prince Frederick Charles, he attended him at Bonn university and in his European travels. In 1848 he was appointed chief of the staff of the VIII. Army Corps at Coblenz. During the disturbances of that year he served under the Crown Prince William (afterwards German emperor) in the suppression of the insurrection at Baden, and distinguished himself by his energy and bravery, receiving the 3rd class of the order of the Red Eagle in recognition of his services. While attached to the Crown Prince's staff at that time he broached to him the subject of his schemes of army reform. In 1850 came the revelation of defective organization and efficiency which led to the humiliating treaty of Olmütz. In the same year Roon was made a lieutenant-colonel, and in 1851 full colonel. He now enjoyed the confidence of Prince William, and began active work as reorganizer of the army.

Promoted to be major-general in 1856 and lieutenant-general in 1859, Roon had held since 1850 several commands and had been employed on important missions. Prince William became regent in 1857, and in 1859 he appointed Roon a member of a commission to report on the reorganization of the army. Supported by Manteuffel and Moltke, Roon was able to get his plans seriously considered and generally adopted. His aim was to create an armed nation, to extend Scharnhorst's system and to adapt it to Prussia's altered circumstances. To attain this he proposed a universal three years' service, and a reserve (*Landwehr*) for the defence of the country when the army was actively engaged. During the Italian War he was charged with the mobilization of a division. At the end of 1859, though the junior lieutenant-general in the army, he succeeded von Bonin as war minister, and two years later the ministry of marine was also entrusted to him. His proposals of army reorganization met with the bitterest opposition, and it was not until after long fighting against a hostile majority in the chambers that, with Bismarck's aid, he carried the day. Even the Danish campaign of 1864 did not wholly convince the country of the necessity of his measures, and it required the war with Austria of 1866 to convert obstinate opposition into enthusiastic support. After that von Roon, from being the best-hated man in Prussia, became the most popular, and his reforms were ultimately copied throughout continental Europe. He was promoted general of infantry at the outbreak of this war, was present at the brilliant and decisive victory of Königgrätz, and received the Black Eagle at Nikolsburg on the road to Vienna. His system, adopted after 1866 by the whole North German Confederation, produced its inevitable result in the victorious war with France 1870–71, throughout which von Roon was in attendance on the German emperor. The fiftieth anniversary of his entrance into the army was celebrated at Versailles on the 19th of January 1871, when the emperor expressed his gratitude for the great services he had rendered. He was created a count, and in December 1871, having resigned the ministries of war and marine, he succeeded Bismarck as president of the Prussian ministry Ill-health compelled him to resign in the following year. He was promoted to be field-marshal on the 1st of January 1873. He died at Berlin on the 23rd of February 1879.

After his death his son published the valuable *Denkwürdigkeiten aus dem Leben des Generalfeldmarschalls Kriegsministers Grafen Roon* (2 vols., Breslau, 1892), and *Kriegsminister von Roon als Redner politisch und militärisch erläutert* (Breslau, 1895). His correspondence with his friend Professor Cl. Perthes, 1864–67, was also published at Breslau in 1895.

ROORKEE, or Rurki, a town of British India, in the Saharanpur district of the United Provinces, on the Oudh & Rohilkhand railway, 22 m. E. of Saharanpur. Pop. (1901) 17,197. It is the headquarters of the workshops of the Ganges canal, and also of the Bengal Sappers and Miners. Two heavy batteries of artillery are usually stationed in the cantonment. The Thomason Civil Engineering College, founded in 1848, was transferred from the Public Works to the Education Department in 1895 and reorganized. It was instituted in order to train natives in engineering, and students originally received stipends. After 1875 the emoluments were limited, and became in the nature of scholarships, but the education of all students remained practically free till 1896, when fees began to be charged. The college works in co-operation with the workshops and foundry of the canal, and also trains in surveying, photography and other subjects, having chemical, physical, electrical and mechanical laboratories and workshops.

ROOSEVELT, THEODORE (1858–), twenty-sixth president of the United States, was born in New York City on the 27th of October 1858. The Roosevelt family[1] has been prominent in the life of New York for many generations, and is of Dutch origin. Mr Roosevelt's mother, Martha Bullock, came from a family of Scotch-Irish and Huguenot origin equally prominent in Georgia. Each family may lay just claims to a history of more than ordinary social and political distinction. Although born in New York, Mr Roosevelt spent much of his boyhood at Oyster Bay, the country home of his father, on Long Island Sound, where he began with a distinct purpose, unusual among boys of his age, to build up a naturally frail physique by rowing and swimming in the waters of Long Island Sound, and by riding over the hills and tramping through the woods of Long Island. That his early outdoor life furnished a definite training for his after career is indicated by the fact that when he was about fourteen years of age he went with his father on a tour up the Nile as far as Luxor, and on this journey he made a collection of Egyptian birds found in the Nile valley, which is now in the Smithsonian Museum in Washington, D.C. Mr Roosevelt was educated at Harvard University, where he graduated in the class of 1880;[2] his record for scholarship was creditable, and his interest in sports and athletics was especially manifest in his skill as a boxer. On leaving college he made a short visit to Europe, was elected to the London Alpine Club for climbing the Jungfrau and the Matterhorn, and returning to New York studied law for a brief period in the Law School of Columbia University and in the office of his uncle Robert B. Roosevelt. Determining to enter active politics, he gave up his legal studies without qualifying for the bar, and in 1881 was elected to the New York legislature as a regular Republican, although in opposition to the "boss" of the assembly district for which he was a candidate. He was elected again in 1882 and in 1883, and at the age of twenty-four was his party's candidate for Speaker of the Assembly. In 1884 he was a delegate of the Republican party to the convention in Chicago which nominated James G. Blaine for president. In the convention he opposed the nomination of Mr Blaine, and in a speech which attracted considerable attention for its vigour and courage advocated the nomination of Senator George F. Edmunds. After Mr Blaine's nomination, however, he supported him in the campaign as the chosen candidate of the party, in spite of the fact that an important wing of the Republican party "bolted" the nomination and espoused the candidacy of Grover Cleveland, who was elected president. In 1884, partly because his political life seemed at least for the immediate present to be at an end, partly on account of the freedom and activity of out-of-door life, he bought two cattle ranches near Medora on the Little Missouri river in North Dakota, where he lived for two years, becoming intimately associated with the life and spirit of the western portion of the United States.

In 1886 he was the Republican candidate for mayor of New York City, but was defeated by Abram F. Hewitt, the Tammany candidate, and received a smaller vote than Henry George, the candidate of the United Labor party. Mr Roosevelt, however, received a larger proportion of the total vote cast than any mayoralty candidate of the Republican party had previously received in New York City. In April 1889, on the accession to the presidency of Benjamin Harrison, Mr Roosevelt, then closely identified with the work of Civil Service reform, was appointed a member of the United States Civil Service Commission. In this office, until then one of minor importance, he served for six years. He made it not only nationally prominent, but instrumental in shaping the course of legislative and executive action by introducing into the work of the Commission an entirely new spirit and new methods. The annual reports, of which he was the chief author, became controversial pamphlets; he published bold replies to criticisms upon the work of the Commission; he explained its purposes to newspaper correspondents; when Congress refused to appropriate the amount which he believed essential for the work, he made the necessary economies by abandoning examinations of candidates for the Civil Service in those districts whose representatives in Congress had voted to reduce the appropriation, thus very shrewdly bringing their adverse vote into disfavour among their own constituents; and during the six years of his commissionership more than twenty thousand positions for government *employés* were taken out of the realm of merely political appointment and added to the classified service to be obtained and retained for merit only. In 1895 he resigned from the Civil Service Commission and became President of the Board of Police Commissioners for the City of New York. After a strenuous two years in this office, he was appointed by President McKinley in 1897 assistant-secretary of the navy. He was certain that war with Spain was inevitable, and he did much to prepare the navy for hostilities, framing an important personnel bill, collecting ammunition, getting large appropriations for powder and ammunition used in improving the marksmanship of the navy by gunnery practice, buying transports and securing the distribution of ships and supplies (especially in the Pacific) in such a way that, when hostilities were declared, American naval victories would be assured. He urged upon the administration the bold policy of protesting against the sailing of Cervera's fleet, on the ground that it would be regarded as a warlike measure not against the Cuban revolutionaries, who had no navy, but against the United States; and he advised that, if Cervera sailed, an American squadron be sent to meet him and to prevent his approach to America. At the outbreak of the war with Spain he resigned from the Navy Department and raised the first volunteer regiment of cavalry, popularly known as the "Rough Riders," because many of its members were Western cowboys and ranchmen expert in the handling of the rough and often unbroken horses of the Western frontier. The regiment also included college athletes, city clubmen and members of the New York police force, every man possessing some special qualification for the work in view. Mr Roosevelt declined the colonelcy of the regiment, preferring to take the post of lieutenant-colonel under his intimate friend Dr Leonard Wood, who, while a surgeon in the United States army, had served in action with gallantry and skill against the Indians. On the promotion of Colonel Wood to the command of the brigade, Mr Roosevelt became colonel of the regiment, which took an especially prominent part in the storming of San Juan Hill. In this battle Colonel Roosevelt became the ranking officer and, abandoning his horse, led the charge up the hill on foot under severe fire at the head of his troops. This charge, in which many of the "Rough Riders" were killed or wounded, drove the Spaniards from the trenches and opened the way to the surrender of Santiago. At the conclusion of the war, while the troops were still in camp in the South, Mr Roosevelt joined in a "round robin" of protest against the mismanagement in the War Department, which had resulted in widespread suffering among the troops from wretched food and bad sanitary arrangements. This "round robin" created a sensation which aroused public opinion and was instrumental in bringing about some desirable reforms in the War Department.

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[1] Claas Martenszen van Roosevelt (or Rosenvelt) settled in New Amsterdam in 1649; his son Claas (or Nicholas) in 1700–1 was a New York alderman of the Leislerian party; in the next three generations, Johannes, Cornelius and Jacobus (James) were merchants and (in 1748–67, 1785–1801 and 1797–99 and 1809, respectively) aldermen of New York; in the third generation the family became allied with the Schuylers. Isaac Roosevelt was a member of the Provincial Congress in 1775–77 and of the state Senate in 1777–86 and in 1788–92; in the state Assembly were James Roosevelt (1796–97), Cornelius C. Roosevelt (1803), James I. Roosevelt, jun. (1835–40), and Clinton Roosevelt (1837–40). James I. Roosevelt, jun. (1795–1875), was a Democratic member of the national House of Representatives in 1841–43, and a justice of the state Supreme Court in 1851–59. Nicholas J. Roosevelt (1767–1854), with John Stevens, Robert R. Livingstone and Robert Fulton, was prominent in the development of steam navigation. His brother, Cornelius van Schaik Roosevelt (1794–1871), was a founder of the Chemical National Bank of New York, and the grandfather of the president. The president's uncle, Robert Barnwell Roosevelt (1829–1906), was a New York lawyer, New York state fish commissioner in 1866–68, a member of the Committee of Seventy which exposed the corruption of Tammany in New York City, a Democratic member of the national House of Representatives in 1871–73, U.S. minister to the Netherlands in 1888, and author of works on American game birds and fish. R. B. Roosevelt's brother, the president's father, Theodore Roosevelt (1831–1878), was a glass importer, prominent in city charities, an organizer of the Union League Club, and the founder of the Orthopaedic Hospital. A cousin, James Henry Roosevelt (1800–1863), was founder of the Roosevelt Hospital in New York City. The president's mother, Martha Bullock, was of an old Georgia family of Scotch-Irish and Huguenot extraction; her grandfather was Archibald Bullock (1730–1777), first president (1776–77) of Georgia; and her brother, James Dunwoody Bullock, often compared by Theodore Roosevelt to Colonel Newcome, was in the Confederate navy, and equipped in England vessels (including the "Alabama") as Confederate cruisers.

[2] In the same year he married Alice Hathaway Lee of Boston, who died in 1884 leaving one daughter. Later (in 1886) he married Edith Kermit Carow of New York City, and by this marriage had four sons and one daughter.

When his regiment was mustered out of service in September 1898, Mr Roosevelt was nominated by the Republican party for the governorship of New York State and was elected in November by a substantial plurality. He was governor for two years. He reformed the administration of the state canals, making the Canal Commission non-partisan; he introduced the merit system into many of the subordinate offices of the state; and he vigorously urged the passage of and signed the Ford Franchise Act (1899), taxing corporation franchises. In various contests, in which he was almost uniformly victorious, he showed himself to be independent of "boss" control. In 1900, although he wished to serve another term as governor in order to complete and establish certain policies within the state, he was nominated for the vice-presidency of the United States on the ticket with President McKinley by the Republican National Convention in Philadelphia in spite of his protest. It was very commonly believed at the time that this nomination for the vice-presidency was participated in and heartily approved of by the machine politicians or "bosses" of the State of New York in their belief that it would result in his elimination from active political life. The office of vice-president of the United States had so far in the history of the country been almost purely a perfunctory one, and has rarely, if ever, led to political promotion. The vice-president is *ex officio* president of the Senate, but has little voice or part in shaping either legislation or the affairs of the party. Mr Roosevelt never, however, presided over the deliberations of the Senate, because before the session following his inauguration convened he had ceased to be vice-president.

Upon the assassination of McKinley, on the 14th of September 1901, he succeeded to the presidency. No previous president had entered the office at so early an age as forty-three. It was his frankly expressed wish to be nominated and elected president in 1904, and he was nominated unanimously by the Republican National Convention at Chicago, and was elected in November of that year by the largest popular majority ever given to any candidate in any presidential election. He received 7,623,486 popular votes and 336 electoral votes to 5,077,971 popular votes and 140 electoral votes cast for Judge Alton B. Parker, the nominee of the Democratic party. Immediately after his election he publicly declared that he would not accept the nomination for the presidency in 1908, and he adhered to that pledge in spite of great popular pressure brought to bear upon him to accept the nomination of the party for another term. The nomination and election of President Taft, who had been a member of Mr Roosevelt's cabinet, was very largely due to the latter's great influence in the party. On March 23rd, two weeks after he ceased to be president, Mr Roosevelt sailed for Africa, to carry out a long-cherished plan of conducting an expedition for the purpose of making a scientific collection of the fauna and flora of the tropical regions of that continent. Expert naturalists accompanied the party, which did not emerge from the wilderness until the middle of the following March, bringing with it a collection which scientists pronounce of unusual value for students of natural history. Most of the specimens were sent to the National Museum of the Smithsonian Institution at Washington. The experiences of his African journey were recorded by Mr Roosevelt in a volume entitled *African Game Trails: The Wanderings of an American Hunter Naturalist.* The spring and early summer of 1910 were spent by Mr Roosevelt in travelling through Egypt, the continent of Europe, and England, in acceptance of invitations which he had received to make various public speeches in these countries. Honorary academic degrees were conferred upon him by the universities of Cairo, Christiania, Berlin, Cambridge and Oxford, and he was given both popular and official ovations of almost royal distinction—ovations which were repeated by his own countrymen on his return to America.

It may be said without exaggeration that no American public man in the history of the country has achieved such extraordinary popularity during his lifetime as Mr Roosevelt had attained at fifty years of age, both at home and abroad. Great popularity necessarily brings with it bitter enmity and genuine criticism. To understand clearly his career as a public man, and to appreciate the forces at work which caused both the popularity and the enmity, two facts must be kept distinctly in mind: first, that at twenty-two years of age he deliberately decided to make politics his life-work at a time when in the United States the word "politics" had a sinister sound in the ears of almost all of the so-called cultivated classes; and secondly, that in making this deliberate choice he recognized that the government of the United States is primarily a party government. He therefore allied himself with the Republican party, to which by tradition, by family association, and by political principles he was naturally drawn.

In the history of the United States the politician has been too often the man who, in connexion with some other trade or profession, has taken up politics as a tool to carve out some personal ambition or manufacture a financial profit. Mr Roosevelt from the beginning apparently believed with the lexicographers that politics is the science and practice of government. He has himself told the story of an early experience that illustrates his point of view. When in 1881 he decided to join the Republican Association of his assembly district in New York City, members of his family were shocked. "You will find at the meetings," they said, "nobody but grooms, liquor dealers and low politicians." "Well," said Mr Roosevelt in reply, "if that is so, they belong to the governing class, and you do not. I mean if I can to be one of the governing class." He forthwith became an active member of the political organization of his district. He also early determined to work with his party as being the only way in which a legislator can work. A free lance, an independent, a journalist, or a preacher, without definite political affiliations, may create public opinion, but a legislator or an administrator must belong to a party. Mr Roosevelt was severely criticized by many "independent Republicans" for having supported the presidential candidacy of James G. Blaine in 1884, when he had vigorously opposed his nomination in the convention on moral grounds. The reply to this criticism is that Mr Blaine was the choice of the majority of the party, and that while Mr Roosevelt felt free to fight within the party vigorously for reform, he did not feel that the nomination justified a schism like that which occurred in the Democratic party over the free silver issue in 1896—a schism which remained afterwards a hopeless weakness in that party. His position in the Blaine campaign, his attitude in tariff discussions and legislation, his relations with United States senators, congressional representatives, and other party leaders, his methods in making official appointments, were entirely consistent with his constantly reiterated conviction that in politics permanent good is achieved not by guerilla warfare, but by working through and within the party. He was so often accused by political purists for associating politically with men of discredited reputation that his own picturesque statement of his conversion to a belief that in legislative or administrative politics one must work with all sorts and conditions of men is illuminating. This statement is related by his intimate friend Jacob A. Riis,[1] to whom Mr Roosevelt made it in commenting upon his first political success in the New York legislature.

> "I suppose that my head was swelled. It would not be strange if it was. I stood out for my own opinion alone. I took the best 'mugwump' stand—my own conscience, my own judgment were to decide in all things. I would listen to no argument, no advice. I took the isolated peak on every issue, and my associates left me. When I looked around, before the session was well under way, I found myself alone. I was absolutely deserted. The people didn't understand. The men from Erie, from Suffolk, from anywhere, would not work with me. 'He won't listen to anybody,' they said, and I would not. My isolated peak had become a valley; every bit of influence I had was gone. The things I wanted to do I was powerless to accomplish. I looked the ground over, and made up my mind that there were several other excellent people there, with honest opinions of the right, even though they differed from me. I turned in to help them, and they turned to and gave me a hand. And so we were able to get things done. We did not agree in all things, but we did in some, and those we pulled at together. That was my first lesson in real politics. It is just this: if you are cast on a desert island with only a screw-driver, a hatchet and a chisel to make a boat with, why, go make the best one you can. It would be better if you had a saw, but you haven't. So with men. Here is my friend in Congress who is a good man, a strong man, but cannot be made to believe in some things in which I trust. It is too bad that he doesn't look at it as I do, but he *does not*, and we have to work together as we can. There is a point, of course, where a man must take the isolated peak and break with all his associates for clear principle: but until that time comes he must work, if he would be of use, with men as they are. As long as the good in them overbalances the evil, let him work with them for the best that can be obtained."

In his successive offices Mr Roosevelt not merely exerted a strong influence upon the immediate community, whose official representative he was at the time being, but by reason both of his forceful personality and of the often unconventional, although always effective, methods of work which he employed he achieved a national prominence out of ordinary proportion to the importance of his official position. His record in the Assembly was such that his party nominated him for the mayoralty of the city of New York when he was absent on his ranch in Dakota. Although defeated in the mayoralty election, his work on behalf of the merit system, as opposed to the spoils system of politics, was such that he was made a Civil Service commissioner—probably the last office a politician would wish to hold who desired further promotion, for the conflict which a Civil Service commissioner must have with members of Congress and other party leaders on questions of patronage is usually, or, at any rate, has been in the past history of American politics, inevitably detrimental to further official advancement. He was taken from the Federal service in Washington to New York City by a reform mayor and put in charge of the police, because he had shown both physical and moral courage in fighting corruption of all sorts; and the New York police force at that time was thoroughly tainted with corruption, not in its rank and file, but among its superior officers, who used the power in their hands to extort money bribes chiefly from saloon-keepers, liquor-dealers, gamblers and prostitutes. As police commissioner Mr Roosevelt brought to his side every honest man on the force. By personal detective work, that is, by visiting police stations at unexpected times and by making the rounds at night of disorderly places which were suspected of violating the law, he not only displayed personal courage in positions of some danger, but aroused public opinion. The very sensation created by the novelty of his methods set standards and started reforms which have greatly improved the *morale* of the entire force. The hopelessly vicious policemen hated him, but no man ever had a stronger personal hold upon the great body of the honest officers—a hold which existed long after he left the police department, and was frequently expressed by members of the force as he passed through the city streets. When he became assistant-secretary of the navy, his work was not so publicly conspicuous, but in this office he gained an experience which was of great value in his administration of naval affairs during his presidency. It is doubtful if, without the experience of this secretaryship, he could have successfully originated and carried out the plan of sending the United States navy around the world in 1907. He went to the Spanish War as a volunteer against the urgent wishes of his political advisers, and in spite of the protests of some of his best and most intimate friends. The conditions in Cuba had long convinced him that war with Spain was inevitable, and that, for humane reasons alone, it was both right and necessary to drive the Spanish power out from the Carribean Sea. Having urged this view upon the country, when war was declared he felt that it would be inconsistent for him not to share personally in the perils of a conflict which he believed to be a just one, and which he had done as much as he could to bring about. His record in the war for efficiency and personal gallantry no doubt contributed largely to his nomination and election as governor of the state of New York; but he attained the governorship not on this ground alone. There are many instances in American politics of nominations made solely on a war record which have led to hopeless defeat in election. His work in the governorship brought him still more into prominence as a national leader. His uncompromising antagonism to political blackmail and bribery, and his determination to pursue the right, as he saw the right, only in a common-sense fashion, made bitter enemies on the one hand among the corrupt politicians, and, on the other hand, among theoretical reformers, and discussions raged in the newspapers about his executive acts, his speeches, and his official messages much as they raged during his seven years in the White House. If he had never reached the presidency he would probably have been a figure long remembered in American political life. But it was his course in the presidency that gave him his international reputation, and it is as President Roosevelt that future historians of American political life must chiefly discuss him.

Mr Roosevelt entered the presidency definitely committed to two principles which profoundly affected his course as chief executive of the United States. He had a well wrought-out belief in centralized authority in government and a passionate hatred of political and commercial corruption. He believed the United States to be a unified republic, a sovereign nation, and not a federation of independent states united only for mutual benefit and protection. He not only hated corruption *per se*, but he clearly saw that as efficiency has a greater power for good, so corruption has a greater power for evil in a strongly centralized government. He understood that political materialism, selfishness and corruption in federal administration afford the strongest possible argument for those who advocate strengthening the independent power of the separate states at the expense of nationalism. At the very outset of his administration he therefore set himself to work, not only to improve the personnel of the government service, but by exhortations in his messages and public speeches to arouse a sense of civic responsibility both among office-holders and among all the citizens. His official messages to Congress, probably more frequent, certainly much longer than those of any of his predecessors, were quite as often treatises on the moral principles of government as they were recommendations of specific legislative or administrative policies. The effect of his exhortations, as well as of his personal character and public acts, upon the standards and spirit of official life in the United States, was a pronounced one in attracting to the federal service a group of men who took up their work of public office with the same spirit of enthusiasm and self-sacrifice that actuates the military volunteer in time of war. No American president has done so much to discredit and destroy the old Jacksonian theory of party government that "to the victors belong the spoils," and to create confidence in the practical success as well as the moral desirability of a system of appointments to office which rests upon efficiency and merit only. Mr Roosevelt not only attacked dishonesty in public affairs but in private business as well, asserting that "malefactors of great wealth" endeavour to control legislation so as to increase the profits of monopolies or "trusts," and that to prevent such control it is necessary to extend the powers of the federal government. In carrying out this policy of government regulation and supervision of corporations he became involved in a great struggle with the powerful financial interests whose profits were threatened, and with those legislators who sincerely believed that government should solely concern itself with protecting life and property, and should leave questions of individual and social relations in trade and finance to be settled by the operation of so-called natural economic laws. In the struggle, although he was bitterly accused of violating the written constitution, of arresting and destroying business prosperity and of attempting a radical departure from the accepted social system of the country, he was remarkably successful. By his speeches and messages, and by his frank use of one of the greatest of modern social engines—the newspaper press—he created a public opinion which heartily supported him. Under his effective influence laws were framed which were not merely in themselves measures of stringent regulation of business and the accumulation of wealth, but which established precedents, that as time goes on will inevitably make the doctrine of federal control permanent and of wider application. The struggle against some of the most powerful financial and political influences of the time not unnaturally gave rise to the idea that his work as president was destructive—perhaps the necessarily destructive work of the reformer—but not essentially constructive. Even those friendly to him sometimes felt it necessary to defend his political course by saying that he was compelled to raze the old buildings and prepare the ground on which his successors might build new and better structures. A brief consideration of some of the constructive achievements of his administration will show that the "destructive" theory of his political activities is not sustained by the facts.

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[1] In a volume entitled *Roosevelt the Citizen*, which, while it is frankly written as the enthusiastic tribute of a personal admirer, may be relied upon for accuracy in its statement of historical or biographical facts.

Civil Service Reform.—Some reference has already been made to the fact that in every office which Mr Roosevelt held he constantly dwelt upon the truism, often forgotten or ignored, that no government can accomplish any permanent good unless its administrative and legislative officers are chosen and maintained for merit only. As assemblyman, as police commissioner, as naval secretary and as president, he advocated this fundamental doctrine. When Federal Civil Service commissioner he did more than any other single public man in the United States has had either the ability or the opportunity to do, to promote the doctrine of service for merit only out of the realm of theory into the realm of governmental practice. While he was criticized by the friends of Civil Service Reform for not going far enough during his presidency to protect the encroachments of those who desire to have the offices distributed as political rewards or for partisan ends, such specific acts as his transference to the classified service of all fourth-class postmasters east of the Mississippi and north of the Ohio rivers, his insistence upon a thorough investigation of the scandals in the Post Office department, and his order forbidding federal *employés* to use their offices for political purposes in the campaign of 1908 are typical of his vigorous support of the merit system.

Conservation of National Resources.—If Mr Roosevelt did not invent this term he literally created as well as led the movement which made Conservation in 1910 the foremost political and social question in the United States. The old theory was that the general prosperity of the country depends upon the development of its natural resources—a development which can best be achieved by private capital, acting under the natural incentive of financial profits. Upon this theory public land was either given away or sold for a trifle by the nation to individual holders. While it is true that the building of railways, the opening of mines, the growth of the lumber industry and the settlement of frontier lands by hardy pioneers was rapidly promoted by this policy, it also resulted naturally in the accumulation of great wealth in the hands of a comparatively few men who were controlling lumber, coal, oil and railway transportation in a way that was believed to be a menace to the public welfare. Nor was the concentration of wealth the only danger of this policy; it led to the destruction of forests, the exhaustion of farming soils and the wasteful mining of coal and minerals, since the desire for quick profits, even when they entail risk to permanency of capital, is always a powerful human motive. Mr Roosevelt not only framed legislation to regulate this concentration of wealth and to preserve forests, water power, mines and arable soil, but organized departments in his administration for carrying his legislation into effect (see IRRIGATION: *United States*). His official acts and the influence of his speeches and messages led to the adoption by both citizens and government of a new theory regarding natural resources. It is that the government acting for the people, who are the real owners of all public property, shall permanently retain the fee in public lands, leaving their products to be developed by private capital under leases which are limited in their duration and which give the government complete power to regulate the industrial operations of the lessees.

Government Regulation of Corporations.—The growth of the corporation as an industrial machine had in recent years been very rapid in the United States. The industrial and financial corporations had grown so powerful as to venture to contend for the first place with the authority of the government itself. As Mr Roosevelt often pointed out, no nation will live long in which the authority of government—especially in a democracy—is supplanted by the private interest of a real money power. Early in his political career, Mr Roosevelt foresaw this conflict, and as president he aroused public opinion so that the people understood it, and threw his effective influence into the framing of legislation under which the Federal government is now successfully combating the illegal acts of the powerful trusts. He established the Federal Department of Commerce and Labor, the secretary of which has a seat in the cabinet, and in which there exists a bureau of corporations possessing the specific function of inspecting and supervising interstate corporations—an entirely new feature in American government. He strengthened the interstate commission for the regulation of railroads, inaugurated successful suits against monopolies—notably the Standard Oil Company and the so-called Sugar Trust,—and achieved distinct practical results in favour of a system of "industrial democracy" where all men shall have equal rights under the law and where there shall be no privileged interests exempt from the operation of the law. Both his friends and his enemies agree that he did more than any other public man to effect these changed relations of government and industry. There is, however, a violent disagreement regarding the desirability and the results of his course. His critics assert that he simply interrupted the orderly course of business, inspired panic and dangerously arrested prosperity. Mr Roosevelt and his supporters were convinced that his policy was necessary to save the country from the social and political dangers of plutocracy, and that in establishing a definite system of government regulation not only were popular rights preserved and justice promoted but industrialism and finance were placed upon a basis of regularity and honesty that paved the way for an era of general prosperity in the United States, unhampered by feverish speculation and shrewd scheming, such as the country had so far in its history been unable to enjoy.

The Army and Navy.—Mr Roosevelt was a pronounced advocate of international peace but also an advocate of law and order. He believed that international controversies would ultimately be settled by judicial procedure, and in the Russo-Japanese War and the establishment of the Hague Court he took an active part in promoting the judicial settlement of disputes between nations. For his efforts leading to the settlement of the Russo-Japanese War he received the Nobel Peace Prize, and in May 1910 he delivered an address on "International Peace" before the Nobel committee in Christiania. But, with this advocacy of international peace, he also advocated the maintenance by the United States of an efficient and thoroughly equipped army and navy. To some of his critics these two positions seem inconsistent. Mr Roosevelt argued not only that they were consistent but that the one logically followed the other. In his Nobel address he said: "In any community of any size the authority of the courts rests upon actual potential force; on the existence of a police or on the knowledge that the able-bodied men of the country are both ready and willing to see that the decrees of judicial and legislative bodies are put into effect;" and he expressed the opinion that until a recognized international supreme court was firmly established, every nation must be prepared to defend itself, and when it was established all the nations must be prepared to maintain its decrees against any recalcitrant nation. On this ground during his presidential administration Mr Roosevelt was deeply concerned in many measures for improving the administrative side of the War Department and educating, training and strengthening the army. Although he himself served in the army during the Spanish War his special interest was in the navy, springing probably from his relationship with the navy during his brief term as assistant secretary. The successful and dramatic voyage of the American fleet around the world, undertaken in spite of predictions of disaster made by naval experts in Europe and the United States, was conceived and inspired by him, and this single feat would alone justify the statement that no American public man had done so much since the Civil War as he to strengthen the physical power and the moral character of the United States navy.

The Panama Canal.—The greatest single material achievement of Mr Roosevelt's presidency was the taking over by the United States of the project to build a Panama Canal. The project itself is nearly four centuries old; for a century Great Britain and the United States had been sometimes in friendly, sometimes in acrimonious dispute as to how this was to be accomplished; the French undertook the work and failed. Mr Roosevelt recognized the new republic of Panama, and obtained from it for the United States, in return for a commercial and military protection advantageous to Panama, the right to build a canal and control it in perpetuity. His critics said that his course in this matter was unconstitutional, although the question of constitutionality has never been raised before any national or international tribunal. The fact remains that the construction of the Panama Canal was undertaken to the practical satisfaction to the civilized world. But for Mr Roosevelt's vigorous official action and his characteristic ability to inspire associates with enthusiasm the canal would still be a subject of diplomatic discussion instead of a physical actuality.

Colonial Policy.—Strictly speaking, the United States has no colonial policy, for the Philippine Islands and Porto Rico can scarcely be called colonies. It has, however, a policy of territorial expansion. Although this policy was entered upon at the conclusion of the Spanish War under the presidency of Mr McKinley it has been very largely shaped by Mr Roosevelt. He determined that Cuba should not be taken over by the United States, as all Europe expected it would be, and an influential section of his own party hoped it would be, but should be given every opportunity to govern itself as an independent republic; by assuming supervision of the finances of San Domingo, he put an end to controversies in that unstable republic, which threatened to disturb the peace of Europe; and he personally inspired the body of administrative officials in the Philippines, in Porto Rico and (during American occupancy) in Cuba, who for efficiency and unselfish devotion to duty compare favourably with any similar body in the world. In numerous speeches and addresses he expressed his belief in a strong colonial government, but a government administered for the benefit of the people under its control and not for the profit of the people at home. In this respect, for the seven years of his administration at Washington, he developed a policy of statesmanship quite new in the history of the United States.

No account of Mr Roosevelt's career is complete without a reference to his literary work, which has been somewhat overshadowed by his reputation as a man of public affairs. He was all his life an omnivorous reader of the best books in very varied fields of literature, and he developed to an unusual degree the faculty of digesting and remembering what he has read. His history of the War of 1812 between the United States and Great Britain, written when he was twenty-four years old, is still the standard history of that conflict, and his *Winning of the West* is probably the best work which has been written on American frontier life of the 19th century, a life that developed certain fundamental and distinctive American social and political traits. His *African Game Trails*, the record of his scientific hunting expedition in Africa in 1909–10, is much more than a narrative of adventures on a wild continent. It is a study of social and ethnological conditions, and contains many passages of literary charm, describing bird life, animal life and natural scenery. An appendix that gives some account of the "Pigskin Library" which he carried with him for daily reading in the heart of Africa is a surprising exposition of the wide range of his reading. As a public speaker his style was incisive, forceful and often eloquent, although he made no effort to practise oratory as an art. The volume of his African and European addresses, published in the autumn of 1910, not only presents an epitome of his political philosophy, but discloses the wide range of his interest in life and the methods by which he had striven to bring public opinion to his point of view.

Personally of great physical and mental vigour, his work was done at high pressure and he had the faculty of inspiring his colleagues or his subordinates with his own enthusiasm for doing things. The volume of his letters and his writings in books, articles for the press and speeches and official messages, is enormous, and yet this work was done in the midst of the executive labours of a long political career. Besides being famous as a hunter of big game, he was a skilful horseman and a good tennis player. Regular physical exercise in the open air contributed much to his abounding vitality. A man of decisive action when his mind was made up on any given question, his very decisiveness sometimes gave the impression that his judgments were hasty. On the contrary, few men were more deliberate in considering all sides of an important problem. His long experience, his wide reading and his thorough knowledge of all sorts and conditions of men, enabled him to act quickly at a time of crisis, but his important speeches, or a course of political action that might be far-reaching in its effect, were not cast into their final form without careful consultation with the best advisers he could obtain. The first form of his written speeches was always painstakingly edited and revised, and not infrequently entirely rewritten. He expressed his own judgment of his success as a public man by saying that it was not due to any special gifts or genius, but to the fact that by patience and laborious persistence he had developed ordinary qualities to a more than ordinary degree. (L. F. A.)

The following is a list of his principal works:—*The Naval Operations of the War between Great Britain and the United States—1812–1815* (1882), written to correct the history of James; *Thomas Hart Benton* (1887) and *Gouverneur Morris* (1888), both in the American Statesmen Series; *New York City* (1891; revised 1895) in the Historic Towns Series; *Hero Tales, from American History* (1895) with H. C. Lodge; *Winning of the West* (4 vols., 1889–96); a part of the sixth volume of the *History of the Royal Navy of England* (1898) by W. L. Clowes; *The Rough Riders* (1899); *Oliver Cromwell* (1901); the following works on hunting and natural history, *Hunting Trips of a Ranchman* (1886), *Ranch Life and Hunting Trail* (1888), *The Wilderness Hunter* (1893), *Big Game Hunting in the Rockies and on the Plains* (1899; a republication of *Hunting Trips of a Ranchman* and *The Wilderness Hunter*), *The Deer Family* (1902), with other authors, and *African Game Trails* (1910); and the essays, *American Ideals* (2 vols., 1897) and *The Strenuous Life* (1900); and *State Papers and Addresses* (1905) and *African and European Addresses* (1910). Several of his works have been translated into French and German. Uniform editions were published in 1900 and 1903. Early in 1909 he became a "contributing editor" of the *Outlook*.

The biographical sketches by Jacob A. Riis (New York, 1904), F. E. Leupp (ibid., 1904), G. W. Douglas (ibid., 1907), James Morgan (ibid., 1907), and Murat Halstead (Akron, 1902), are personal or political eulogies. John Burroughs's *Camping and Tramping with Roosevelt* (Boston, 1907) is an appreciation of Roosevelt as a naturalist. J. W. Bennett, *Roosevelt and the Republic* (New York, 1908), is bitterly hostile. There is a sketch by F. V. Greene in Roosevelt's *American Ideals*.

ROOT, ELIHU (1845–), American lawyer and political leader, was born at Clinton, New York, on the 15th of February 1845, the son of Oren Root (d. 1885), professor of mathematics at Hamilton College from 1849–81. He graduated at Hamilton College in 1864, taught at the Rome (N.Y.) Academy in 1865, and graduated at the University Law School, New York City, in 1867. As a corporation lawyer he soon attained high rank and was counsel in many famous cases. Politically, he became identified with the reform element of the Republican party. He was United States attorney for the Southern District of New York (1883–85), and a delegate to the State Constitutional Convention of 1894, acting as chairman of its judiciary committee. From August 1899 until February 1904 he was secretary of war in the cabinets of Presidents McKinley and Roosevelt, and in this position reorganized the army and created a general staff, and in general administered his department with great ability during a period marked by the Boxer uprising in China, whither troops were sent under General A. R. Chaffee, the insurrection of the Filipinos, the withdrawal of the United States troops from Cuba, and the establishment of a government for the Philippines under a Philippine Commission, for which he drew up the "instructions," in reality comprising a constitution, a judicial code and a system of laws. In 1903 he was a member of the Alaskan Boundary Tribunal. In July 1905 he re-entered President Roosevelt's cabinet as secretary of state. In the summer of 1906, during a visit to the Pan-American Conference at Rio de Janeiro, he was elected its honorary president, and during a tour through the Latin-American republics, brought about a better understanding between the United States and these republics. In general he did much to further the cause of international peace, and he concluded treaties of arbitration with Japan, Great Britain, France, Italy, Spain, Portugal, Austria-Hungary, Switzerland, Norway, Sweden, Denmark, Holland and other countries. Upon his resignation from the cabinet he was elected, in January 1909, as United States senator from New York. In 1910 he was chief counsel for the United States before the Hague tribunal for the arbitration of the long-standing dispute concerning fisheries between his country and Great Britain (see NEWFOUNDLAND). He received the degree of LL.D. from

Hamilton, 1896; Yale, 1900; Columbia, 1904; New York University, 1904; Williams, 1905; Princeton, 1906; University of Buenos Aires, 1906; University of San Marcos, of Lima, 1906; and Harvard, 1907.

ROOT (late O.E. *rōt*, adopted from Scand., cf. Norw. and Swed. *rot*, Dan. *rod*; the true O.E. word was *wyrt*, plant, represented in Ger. *Wurz* or *Wurzel*; the ultimate root is the same in both words, and is seen in Lat. *radix*), the underground part of a plant. This is the popular meaning of the word. In its botanical use the term is more restricted (see below). The various other meanings have all developed from this, its primary, significance. Of these the principal are: the source or origin of a condition, state, quality, &c.; the base or embedded part of a structure of the body, such as a nail, tooth, the hair, &c.; in mathematics, a number, quantity or dimension which produces a given expression when multiplied by itself a requisite number of times; and in philology an ultimate element of language, incapable of further analysis. A particular extension of the primary meaning is that which applies the word generally to a class of plants, such as the turnip or carrot, whose root is fleshy, and edible either by man or domestic animals.

The embryo of a typical plant, for instance a pea plant (fig. 1), has an ascending axis which will grow into the shoot, and a descending axis or radicle which will grow into the root. When the seed germinates, the radicle is the first to appear; it grows downwards, and its primary function is to act as a holdfast for the plant; its most important function, however, is the absorption of water and dissolved nutrient substances from the soil, and it also frequently serves for storage of food-stuffs. The root is distinguished from underground shoots by not bearing leaves and by having its apex (growing point) protected by a cap (root-cap), which can be clearly seen by making a median vertical section through the root-tip; the cap protects it in its passage through the soil. The root also generally bears root-hairs, slender unicellular outgrowths of the outer layer, borne in the region a little behind the root-tip. It is by means of the root-hairs especially that the root is brought into close relation with the soil particles and absorbs the nutrient materials in solution in the water which surrounds these particles. The older root-hairs are continually dying off, so that they are borne only on a small part of the area behind the apex. Branches of the root, which repeat the form and structure of the main root, are developed in regular succession from above downwards (acropetal), and owing to the fact that they originate in a definite position in the interior of the root (endogenous) they develop in longitudinal rows and have to break through the overlying tissue of the parent root (fig. 2). True forking of the root (dichotomy) occurs in the Lycopodiaceae (the shoots of which also branch dichotomously), but is unknown in the higher plants.

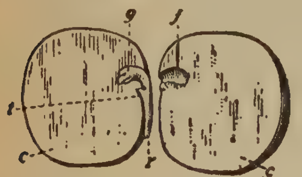
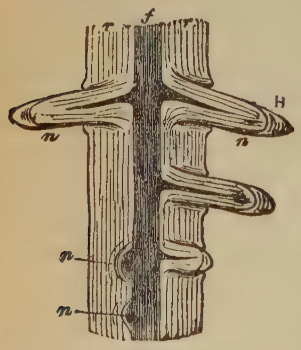


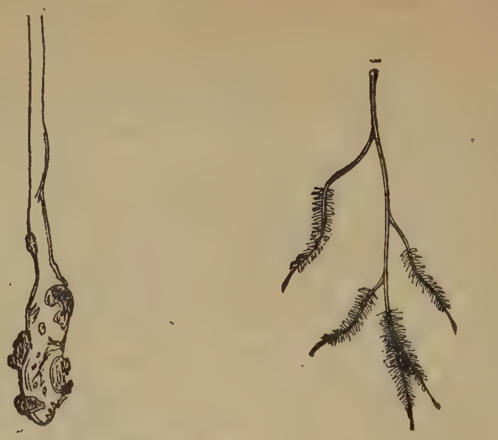
FIG. 1.—The Dicotyledonous Embryo of the Pea laid open. *c*, *c*, the two fleshy cotyledons, or seed-lobes, which remain under ground when the plant sprouts; *r*, the radicular extremity of the axis which develops into the root; *t*, the axis bearing the young stalk and leaves *g*, which lie in a depression of the cotyledons *f*.



From Vines's *Student's Botany*, by permission.

FIG. 2.—Lateral Roots *n* arising endogenously from the pericycle of the Tap-Root of *Vicia Faba* (longitudinal section. *f*, axial cylinder (stele); *r*, cortex of main root; *h*, root-cap of lateral root.

Roots which originate elsewhere than as acropetal outgrowths of a main root are known as *adventitious*, and may arise on any part of a plant. They are especially numerous on underground stems, such as the under side of rhizomes, and also develop from stem nodes under favourable conditions, such as moisture and absence of light; a young shoot or a cutting placed in moist soil quickly forms adventitious roots. They may also arise from leaves under similar conditions, as, for instance, from begonia leaves when planted in soil.



From Green's *Vegetable Physiology*, by permission.

FIG. 3 *a* and *b*.

Root-hair in contact with particles of soil (highly magnified).

Ultimate root-branches, showing position of root-hairs.

The forms of roots depend on their shape and mode of branching. When the central axis goes deep into the ground in a tapering manner, without dividing, a *tap-root* is produced. This kind of root is sometimes shortened, and becomes swollen by storage of food-stuffs, forming the *conical* root of carrot, or the *fusiform* or spindle-shaped root of radish, or the *napiform* root of turnip. In ordinary forest trees the first root protruded continues to elongate and forms a long primary root-axis, whence secondary axes come off. In primary plants, especially Monocotyledons, the primary axis soon dies and the secondary axes take its place. When the descending axis is very short, and at once divides into thin, nearly equal fibrils, the root is called *fibrous*, as in many grasses (fig. 4); when the fibrils are thick and succulent, the root is *fasciculated*, as in *Ranunculus Ficaria*, *Asphodelus luteus*, and *Oenanthe crocata*; when some of the fibrils are developed in the form of tubercules, the root is *tubercular*, as in dahlia (fig. 5); when the fibrils enlarge in certain parts only, the root is *nodulose*, as in *Spiraea Filipendula*, or *moniliform*, as in *Pelargonium triste*, or *annulated*, as in *Ipecacuanha*. Some of these so-called roots are formed of a stem and root combined, as in *Orchis* (fig. 6), where the tuber consists of a fleshy swollen

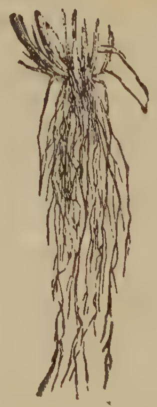
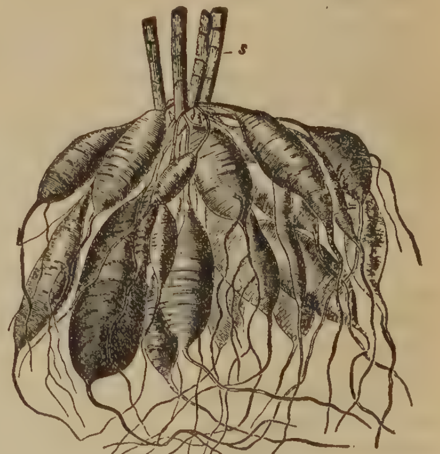


FIG. 4.—Fibrous Root of a Grass. Numerous fibrils coming off from one point.



From Strasburger's *Lehrbuch der Botanik*, by permission of Gustav Fischer.

FIG. 5.—Root-Tubers of *Dahlia variabilis*. *s*, the lower portions of the cut stems.

root bearing at the apex a stem bud. As in the case of the stem, growth in length occurs only for a short distance behind the apex, but in long-lived roots increase in diameter occurs continually in a similar manner to growth in thickness in the stem.

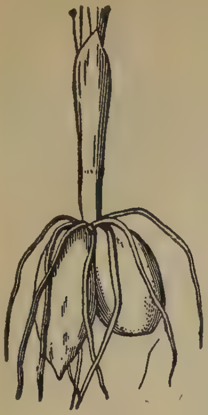


FIG. 6.—Base of plant of *Orchis*, showing tubercules or tuberous roots.

Roots are usually underground and colourless, but in some cases where they arise from the stem they pass for some distance through the air before reaching the soil. Such roots are called *aerial*. They are well seen in the screw-pine (*Pandanus*), the Banyan (*Ficus indica*, fig. 7), and many other species of *Ficus*, where they assist in supporting the stem and branches. In the mangrove they often form the entire support of the stem, which has decayed at its lower part. In tree-ferns they form a dense coating around, and completely concealing, the stem; such is also the case in some Dracaenas and palms. In *Epiphytes*, or plants growing in the air, attached to the trunks of trees, such as orchids of warm climates, the aerial roots produced do not reach the soil; they continue always aerial and greenish, and they possess stomata. Delicate hairs are often seen on these epiphytal roots, as well as a peculiar spongy investment formed by the cells of the epidermis which have lost their succulent contents and are now filled with air. This layer is called the *velamen*, and serves to condense the moisture contained in the air, on which the plant is dependent for its water-supply. The aerial roots of the ivy are not the nutritive roots of the plant, but are only intended for mechanical support. The climbing roots of many orchids, aroids and epiphytic ferns branch and form places of lodgment for humus into which absorbent branches of the climbing roots penetrate. Some leafless epiphytic orchids, such as species of *Angraecum*, depend entirely upon their aerial roots for nourishment; the roots, which are green, perform the functions both of leaves and roots. A respiratory or aerating function is performed by roots of certain mangroves growing in swampy soil or water and sending vertical roots up into the air which are provided with aerating passages by which the root system below can communicate with true outside air.

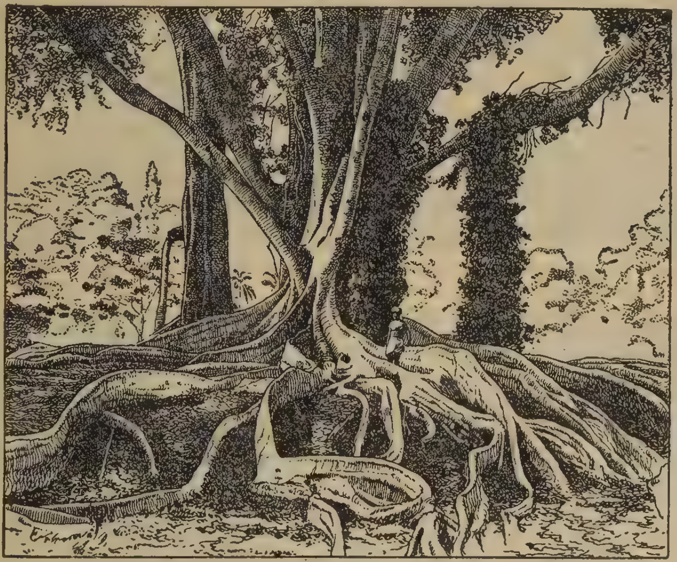


FIG. 7.—*Ficus indica*, the Banyan tree, sending out numerous aerial roots, which reach the soil, and prop the branches.

Parasitic plants, as the mistletoe (*Viscum*), broom-rape (*Orobanche*) and *Rafflesia*, send root-like processes into the substance of the plants whence they derive nourishment. In the dodder (*Cuscuta*), the tissue around the root swells into a kind of sucker (haustorium), which is applied flat upon the other plant, and ultimately becomes concave, so as to attach the plant by a vacuum. From the bottom of the sucker the root protrudes, and penetrates the tissue of the host plant. Leaf-buds are sometimes formed on roots, as in plum, cherry and other fruit trees; the common elm affords an excellent example, the young shoots which grow up in the neighbourhood of a tree arising from the roots beneath the soil. In some plants no roots are formed at all; thus in the orchid *Corallorhiza*, known as coral-root, a stem-structure, the shortly branched underground rhizome, performs all the functions of a true root which is absent. In aquatic plants the root acts merely as a holdfast or is altogether absent as in *Salvinia*, *Utricularia* and others.

ROPE AND ROPE-MAKING. All varieties of cordage having a circumference of an inch or more are known by the general name of "rope." Twisted cordages of smaller dimensions are called cords, twines and lines, and when the sectional area is still smaller, the article is known as thread or doubled yarn. All these varieties of cordage are composed of a number of separate yarns, each of which is made from some kind of textile fibre by preparing and spinning machinery. The number of separate yarns which ultimately form the rope or cord depends upon the fineness of the yarn, and also upon the circumference of the finished article. From thread and fine twine upwards the whole art of manufacture is that of twisting together fibres and yarns; but the comparative heaviness and coarseness of the materials operated on in rope-making render necessary the adoption of heavy machinery and modified processes which clearly define this manufacture as a distinct calling. The modern trade of rope-making is again divided into two distinct branches dealing with vegetable fibres and metallic wire.

Many different vegetable fibres are used for rope-making, but for the combined qualities of strength, flexibility and durability, none can compete with the common hemp, which is consequently the staple of the rope-maker. Cotton ropes are, however, much more flexible, and in addition are strong and durable; they are, therefore, much preferred for power transmission in textile and other works. Manila hemp is a fibre of remarkable tenacity, of unapproached value for heavy cordage, but too stiff for small cords and twines. After these in utility come Sisal hemp of Central America (*Agava Sisalana*), Phormium hemp of New Zealand (*Phormium tenax*) and Sunn hemp of the East Indies (*Crotalaria juncea*)—all fibres of great strength, and largely used by rope-makers. Jute (*q.v.*) of India (*Corchorus capsularis* and *C. olitorus*) is now largely used by rope-makers on account of its cheapness. When used alone it is deficient in strength and durability, but when used in conjunction with proper proportions of hemp it makes a very satisfactory and useful rope. Among fibres more rarely seen in rope-works are Jubbulpore hemp (*Crotalaria tenuifolia*), boxstring hemp (*Sanseviera zeylanica*), and other hemps of the East Indies, plantain fibre (*Musa paradisica*), and agave fibre (*Agave americana*) of America. Coir and many other fibres are used, but principally in the localities of their production.

A rope is composed of a certain number of "strands," the strand itself being made up of a number of single threads or yarns. Three strands laid or twisted together form a "hawser-laid" rope, and three such hawsers similarly laid make a "cable-laid" rope or "cable." A "shroud-laid" rope usually consists of four strands laid around a central strand or core. The prepared fibre is twisted or spun to the right hand to form yarn; the required number of yarns receive a left-hand twist to make a strand; three strands twisted to the right make a hawser; and three hawsers twisted to the left form a cable. Thus the twist in each operation is in a different direction from that of the preceding one, and this alternation of direction serves, to some extent, to preserve the parallelism of the fibres.

The primary object of twisting fibres together in a rope is that by mutual friction they may be held together when a strain is applied to the whole. Hard twisting has the further advantage of compacting the fibres and preventing, to some extent, the penetration of moisture when the ropes are exposed to water; but the yield of rope from a given length of yarn diminishes in proportion to the increase of twist. The proper degree of twist given to ropes is generally such that the rope is from three-fourths to two-thirds the length of yarn composing it.

Rope-walk Spinning.—The sequence of operations in this method of working is as follows: (1) hackling the fibre; (2) spinning the yarn; (3) tarring the yarn when necessary; (4) forming the strands; (5) laying the strands into ropes.

Hackling differs but slightly from the hand-hackling process used in the preparation of flax. The hackle board consists of a wooden block studded with strong, tapered and sharp-pointed steel prongs. A series of such hackle boards is used in the progressive hackling operation, the prongs diminishing in size and being more closely set together. For the commoner kinds of ropes, however, hackling through the coarsest board is found to be sufficient, while in most other cases two hacklings are adopted.

The hackler takes up a handful or "streak"[1] of hemp from the bundle, wraps one end firmly round his hand, and with his fingers distributes a little oil over the hemp. The oil softens the material, keeps the hackle pins in good condition, and facilitates generally the splitting up of the fibre as the streak is drawn through the pins. In the first place, only the ends of the streak are hackled; they are dashed into the pins and drawn through them in order to separate the fibres and to lay them parallel; but as the operation proceeds a gradually increasing length of the streak is thrown on and drawn through the pins. The process is indeed very similar to the combing out of a head of human hair. When half the length of the streak is thoroughly combed, the other half is treated in precisely the same manner. The hackled streak is then weighed, doubled up to prevent any entanglement, and laid aside for the process of spinning. During the hackling process a large quantity of comparatively short fibres are retained in the pins; the longest of these are separated, and the remainder used for tow yarns. The above description refers entirely to hand hackling; machine hackling of hemp is very similar to flax hackling.

The spinning is done in what is termed the "rope-walk," and from the nature of hand-spinning, and the length of the rope required, it is necessary that this walk should be from 300 to 400 yds. in length. It is sometimes completely covered in with walls and roof; at other times only a roof is built; while in exceptional cases the whole of the walk, with the exception of a small hut at each end, is without shelter of any kind. The operation of spinning is very important, as the weight of the yarn and the appearance of the finished product depend upon it. A description of spinning and laying as performed by the aid of the hand-wheel will perhaps be the best means of giving an idea of this useful branch of manufacture.

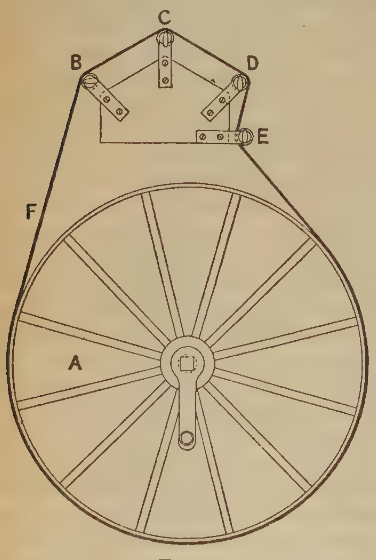


FIG. 1.

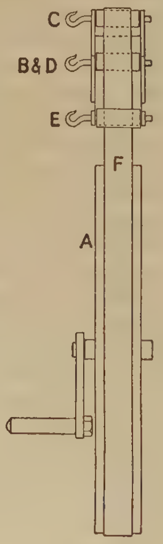


FIG. 2.

The front and end elevations of one variety of spinning-wheel are shown in figs. 1 and 2. The apparatus is fixed to some convenient part of the building, or to special supports. The wheel A, which is turned by hand, and always in the same direction, communicates motion to the rotating hooks or "whirls" B, C, D and E by means of a listing band or strap F. The arrangement of the listing shows clearly that the hook E will revolve in the opposite direction to hooks B, C, and D. The spinner takes two streaks of the hackled hemp, wraps them round his waist with the ends at his back, and keeps the fibre in position by adjusting his apron partly round it. From the middle of the streak—that is, midway between the two ends—he takes hold of a quantity of fibre and hangs it on to one of the hooks B, C or D; the assistant at the wheel begins to turn, and thus a certain amount of twist is imparted to the material between the spinner and the hook. The spinner now walks backwards down the walk, drawing out the fibre with his left hand and adjusting it with his right. A piece of flannel or woollen cloth held in his right hand aids in the formation of the thread and protects his fingers from the rough fibre. In some cases two threads are spun simultaneously; when this is done, two of the hooks, say B and C, are used at the same time. Since the revolutions of the hook divided by the length of yarn spun give the amount of twist per inch or foot, it follows that the ratio of the walking pace of the spinner to the revolutions of the wheel A should be constant, otherwise the yarn will not be uniform. The spinner calls to the assistant when there is any irregularity in speed, or when, from any cause, he is obliged to stop walking.

At convenient intervals in the length of the walk, and projecting from posts, are short horizontal bars; the top of each bar is provided with wires or pegs to form a number of vertical partitions something like a very coarse comb. As the spinner proceeds down the walk, he throws the spun yarn into one of these partitions, thus relieving himself of the weight and keeping the yarn off the ground. When a sufficient length of yarn has been spun, he breaks off the fibres and fastens the yarn to a convenient peg or hook until he has spun a sufficient number (usually three) to form a small rope or cord. The person at the wheel hangs these three yarns one on each of the three hooks B, C and D, while the spinner attaches the other ends to a revolving hook termed a "looper." All is now ready for "laying" the yarns. For small cords, this may be done, with or without a "top." This top is a conical-shaped piece of hard wood provided with three equidistant grooves which merge towards each other at the thin end, and into which the yarns are laid. The thick end of the top is nearest the wheel, so that the yarns may be kept separate on that side. As the hooks twist the three threads, the spinner goes up the walk with the top; the twist in the yarns causes the looping hook to revolve in the opposite direction to the other hooks, and thus it twists the three threads in the opposite direction to the original twist.

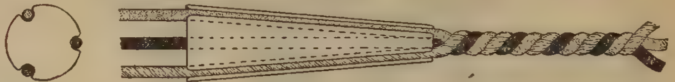


FIG. 3.

Fig. 3 shows one form of top, the three yarns being shown in distinctive marks so that the path of each may be more easily followed by the reader; a plan of the thick end of the top appears to the left of the figure. If four yarns of strands are required, the top would contain four grooves, as well as a hole through the centre to admit of a core when such a thing is required. As soon as the spinner, who carries the top, arrives at the wheel, the assistant takes the yarns off hooks B, C and D (figs. 1 and 2), and puts them all on hook E. The other ends of the strands are removed from the looper and attached to a block of wood called a "drag." The wheel is then rotated as before, which puts more twist into the cord. While this operation, which is termed hardening, proceeds, a shrinkage in the length of the cord takes place, and the drag is consequently drawn up the walk. The drag, however, holds the cord taut, and serves to retain the twist which is imparted by the hook E.

If the strands require tarring before they are laid, they are separately taken off the hooks, after they have been spun, and tied at both ends to pegs to keep them taut until a sufficient number has collected to be conveniently handled at the tarring tank. The tar is heated to about 220° F., and the strands are then passed through it at a speed not greater than 15 ft. per minute. Before emerging from the tank, the strands pass between squeezing rollers which remove all superfluous tar. In a short time the strands are dry, while in the space of a few days the tar is hard enough to allow the strands to be formed into ropes.

Such is, in general, the hand process of forming ropes when they are composed of only three or four single yarns. It very often happens, however, that a number of single yarns are required to form each strand of the rope. The single yarns may be spun by hand, as described above, or by machinery. In the former case a group of yarns is usually termed a "haul," while the machine-spun yarns are formed into what is known as a "warp" or "chain." In any case, the group of yarns is stretched down the rope-walk, at each end of which is a "jack" twister. A few of the yarns taken from the group—the number depending upon the size of the yarn and also upon the required diameter of the strand—are then placed on a hook of the jack twister and twisted together. When three such strands are made they are laid into a rope in a similar manner to that explained above. A simple form of hand jack twister is illustrated in figs. 4 and 5. The wheel A gears with pinions B on the shafts of the hooks or whirls, and this imparts the necessary motion to the latter. At the other end of the walk is a similar machine which moves upon rails as the twist is put into the strands. When the hooks are empty, pinions B and wheel A (fig. 4) are out of gear, but those hooks carrying yarn are drawn out, as shown at C, until the pinion B gears with wheel A, when the hooks are rotated. The

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[1] See note in the article on JUTE for variations of spelling.

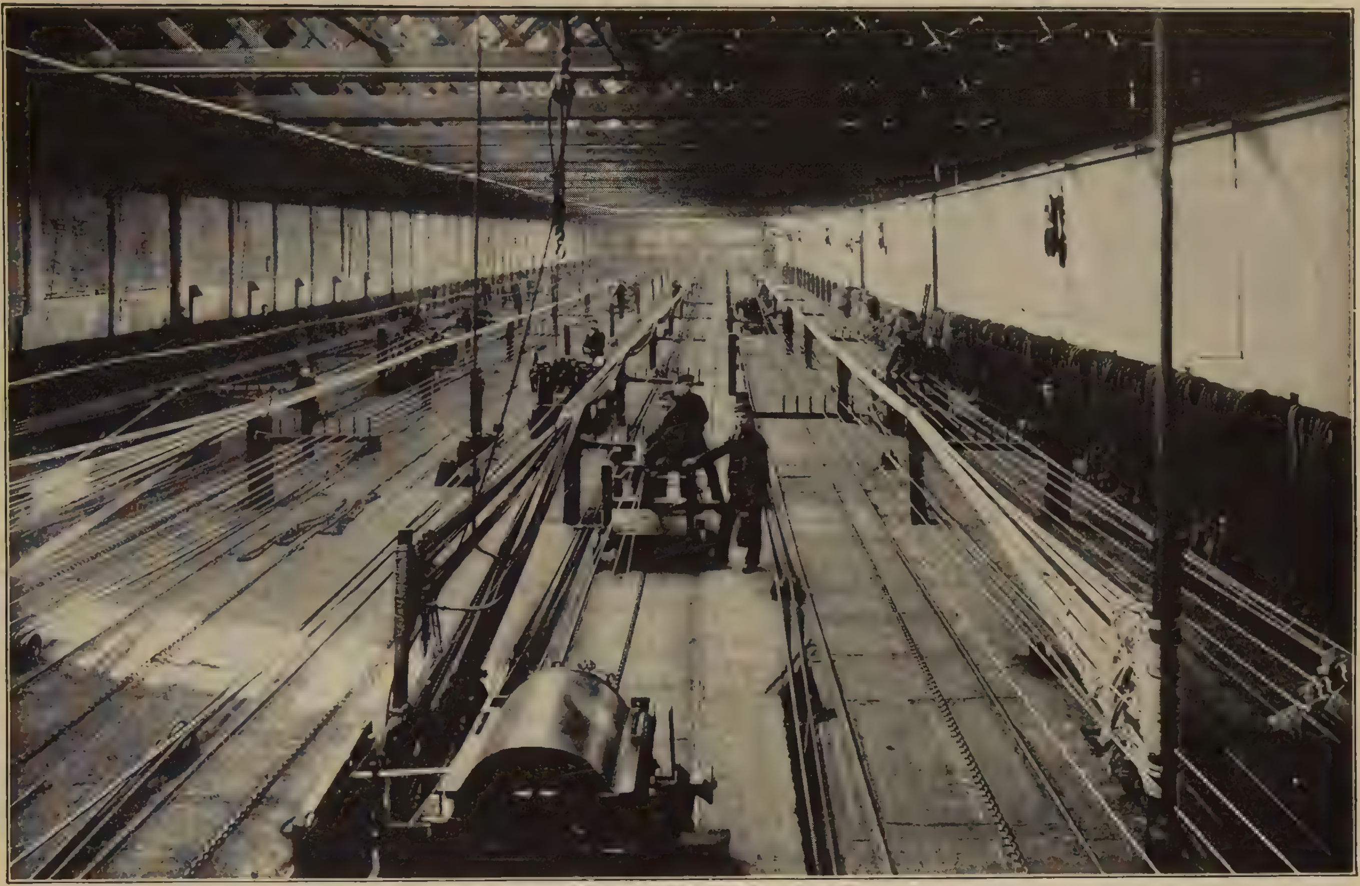


FIG. 9.—ROPE-MAKING, POTTINGER MILL.

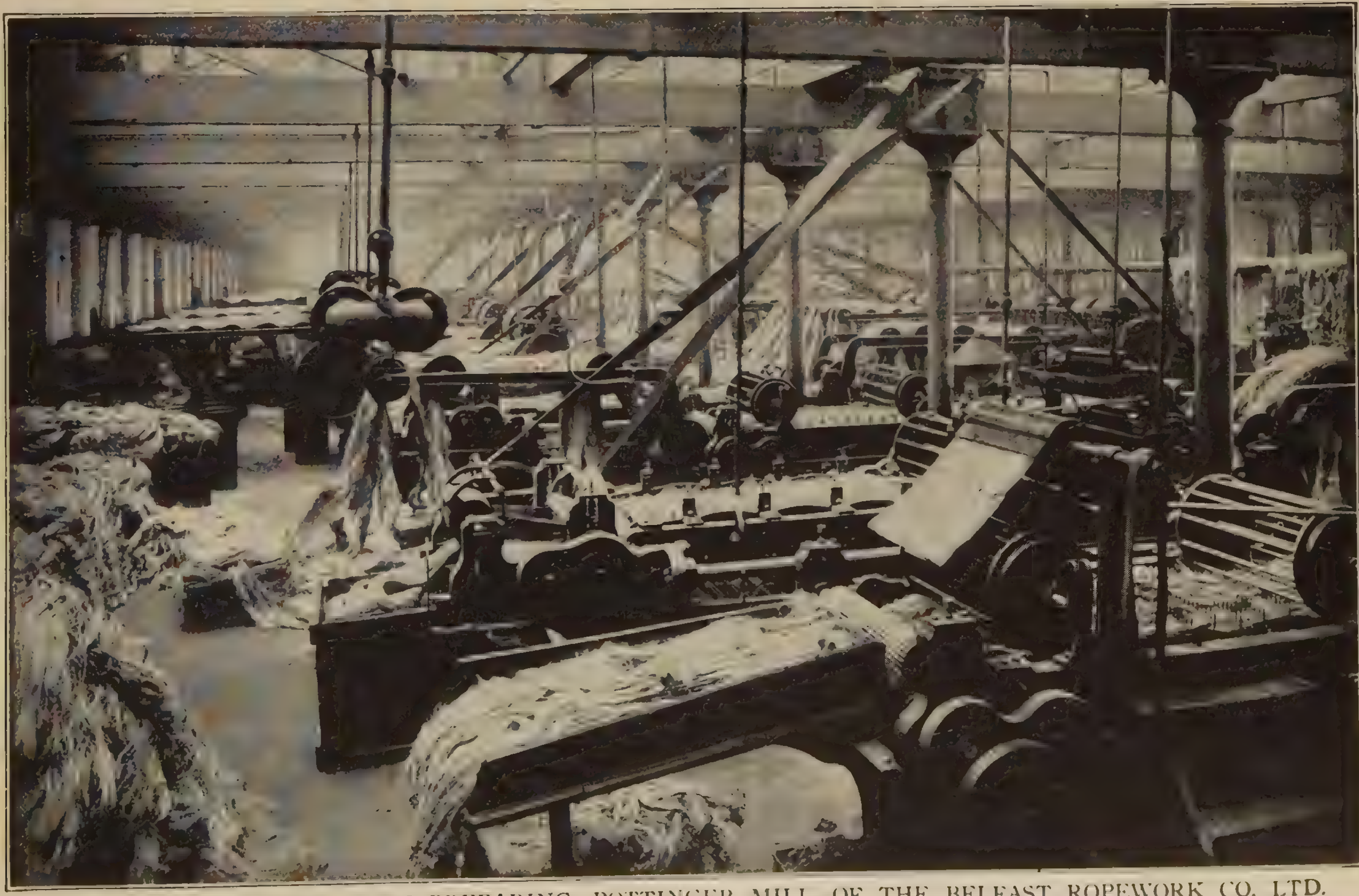


FIG. 10.—MANILA ROPE YARN PREPARING, POTTINGER MILL, OF THE BELFAST ROPEWORK CO. LTD.

PLATE II.

ROPE AND ROPE-MAKING

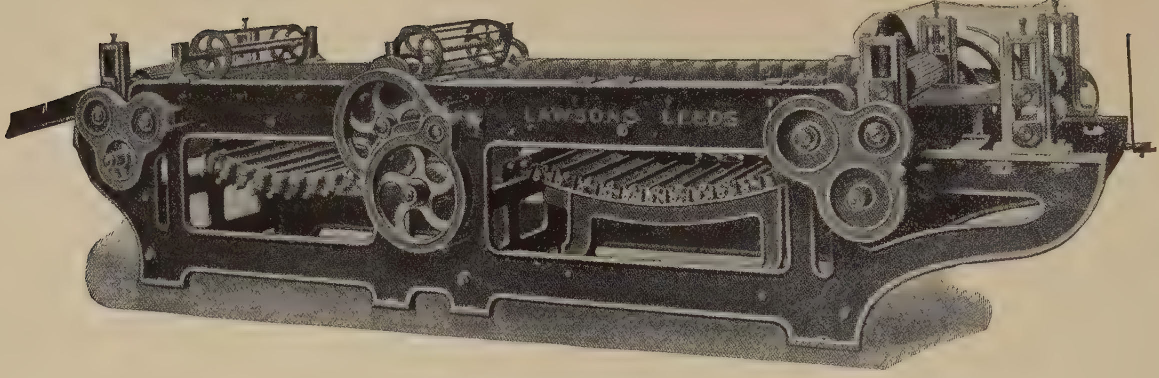

LAWSONS LEEDS

FIG. 11.—GOOD'S HACKLING AND SPREADING MACHINE.

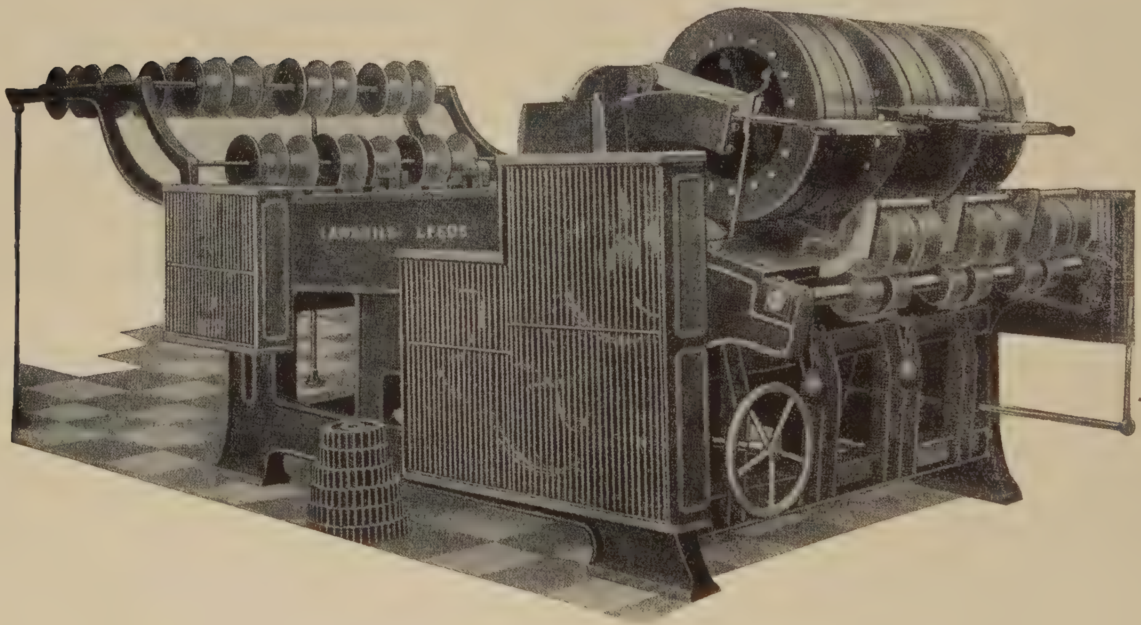

LAWSONS LEEDS

FIG. 12.—HEAVY SPIRAL OR SCREW-GILL DRAWING FRAME; ONE HEAD, SIX GILLS.

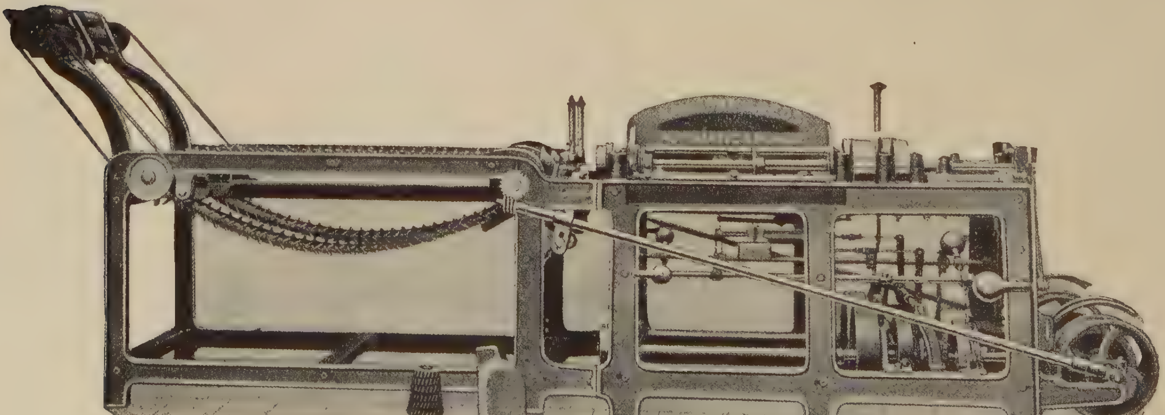
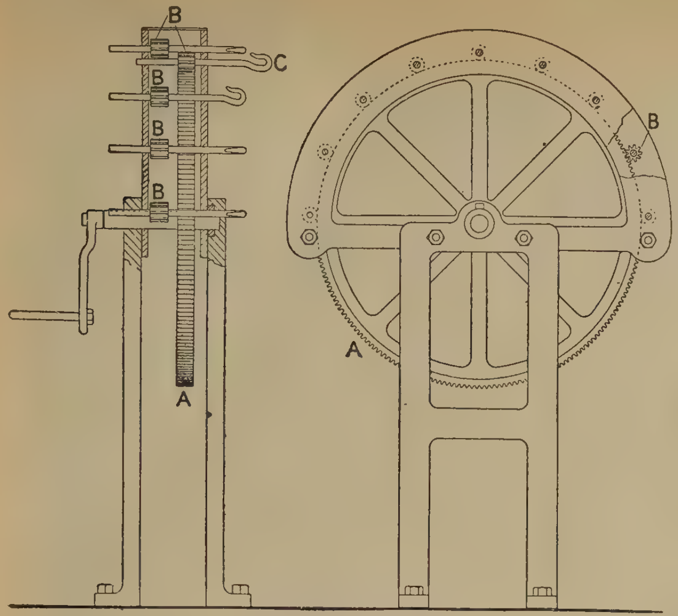


FIG. 13.—SPINNER OR JENNY.

sequence of operations is very similar to that described for the simple hand-wheel.



FIGS. 4 and 5.

Machine or Factory Rope-Making.—The most modern methods of rope-making are far superior to the foregoing, which, as stated, have been introduced to show the principle. One of the greatest drawbacks in the formation of a strand from a haul or chain, even for a small number of yarns, is the irregularity of the tension of the yarns at different parts of the strand. If a large number of yarns be required for each strand, it would be almost impossible to make a satisfactory rope by the above system. If, however, the strand be made from bobbins, each yarn bears its proper share of the tension, and an almost perfect rope is obtained.

Two mechanical methods are in use for the spinning of long vegetable fibres—the ordinary and the special. When flax or jute yarns are required, they are almost invariably spun on the ordinary spinning frames, and the yarn rewound from the spinning bobbins on warping bobbins, or else rewound in the shape of rolls or cheeses. Hemp yarns, especially the finer kinds, are sometimes treated in the same manner, but Manila hemp, New Zealand hemp (*Phormium*), and similar fibres, are invariably spun on bobbins by special machinery. The strands for light ropes may then be made on the twisting frames, and the rope finished on what is called a "house machine." When a large rope is desired, a slightly different method is usually employed. The bobbins from the automatic spinner, or the rolls from the winding frame, are placed upon pegs in a frame which answers the same purpose as a bank or creel used in conjunction with a warping machine. If the rope is to be say 3½ in. in circumference, there may be, with fine yarns, 300 or more individual threads in its composition. Suppose that 300 threads are to be used, then 300 bobbins would be placed on the pegs of the bobbin bank or creel, and divided into three sets of 100 threads each for a three-strand rope. The threads are passed separately through a register plate, which is simply a plate containing a sufficient number of holes for the maximum quantity required, and arranged in a series of concentric circles. There are three sets of concentric rings used in the plate for a three-strand rope, and four sets for one of four strands. As the threads emerge from the register plate they are grouped together and passed through a tapered tube, the sectional area of the smaller end of the tube being equal to the sectional area of the strand. This operation is done for each group of 100 threads, and finally the three or four groups are attached to separate rotating hooks of the forming machine or "traveller." As the latter moves down the walk on rails, it draws the threads from the bobbins in the bank, and through the register plate and tubes, while the hooks put in the twist. A perfectly circular strand, without slack threads, is thus formed; and, at the same time, a uniform strand is obtained, since the ratio of the speed of the traveller to the number of turns per inch of the hooks is constant. The process is continued until the desired length of strand is made—about 150 fathoms (300 yds.) of each of the three strands are required for 100 to 120 fathoms of rope—then a little more twist is introduced. Afterwards, all three strands are placed on one hook of the traveller, and the ends from the shaping tubes are cut off and put on the hooks of the fixed machine, called the "fore-turn." The carriage containing the "top" is now brought close to the traveller, and the strands are placed in the grooves of the top as explained under hand-laying. Similar means to those used in hand-spinning are adopted for keeping the rope off the ground. The two machines are now started, the three hooks of the fore-turn machine revolving in one direction and the single hook of the traveller revolving in the opposite direction. Simultaneously the carriage with the laying top moves forward towards the head of the walk.

Fig. 9, Plate I., shows many stages in the process of rope-making. The most prominent part shows the carriage with the top in position approaching the fore-turn machine at the head of the walk. The person on the right of the carriage is holding a top in his left hand, while the top in the carriage is laying a rope of four strands. At other parts of the figure appear three or four travellers, some twisting the strands, others moving up the walk as the laying proceeds, while on the extreme right one machine is laying two ropes, of three strands each, at the same time.

We have already stated that the yarns for the above machine may be prepared by two systems. When the hemp fibre is spun on the ordinary frame, the method of preparation for such a frame is somewhat similar to that employed for flax, but since the fibre is harsher than flax, it invariably requires softening. The softening machines crush the streaks as in the case of jute, but the fluted rollers are arranged to form part of a circle. The coarser fibres receive a somewhat different treatment; the first process in the preparation of Manila hemp and similar fibres used for rope yarn is illustrated in fig. 10, Plate I. The streaks are clearly shown as being led between fluted rollers on to the pins of the hackling and spreading machine; the lanterns or skeleton rollers, seen on the extreme right, press the fibres into the pins. A little oil is made to drop on to the fibre in order to soften it and to facilitate the operation. The oiling apparatus is usually of a simple character, and consists of a revolving roller partly immersed in an oil bath. The roller is driven as shown in the figure, and the oil which it draws up is scraped off its surface by a knife-edge, and led, by means of a sheet, upon the fibre between the fluted rollers and the gill-pins. A view of a similar machine is shown in fig. 11, Plate II., from which it will be seen that there are two sheets of revolving gill-pins. The sheet nearest the feed-cloth revolves slightly quicker than the surface speed of the fluted feed rollers, while the second sheet moves at a much higher rate. The difference in the speeds of the gill-pins results in the fibre being combed out and straightened, while the delivery rollers, the surface speed of which is slightly greater than that of the second sheet of gill-pins, help further to complete the process, and finally deliver the fibre in the form of a broad ribbon, termed a sliver.

In general, three such machines are used for the process; the pins in the gill-sheets are graded, those in the second machine being finer and more closely set than those in the first machine, while a still finer and closer arrangement obtains in the third machine. The slivers from the third hackling and spreading machine are now placed at the back of the first drawing frame, one type of which appears in fig. 12, Plate II. Each sliver is passed separately over a guide pulley, led upon the pins, drawn out and joined by others, and finally delivered as a sliver ready for the second drawing frame. A similar process is carried on in this machine, from which the sliver emerges ready for the spinning frame. It will thus be seen that a system of doubling, as well as of drawing, obtains in these processes as in flax-preparing; such a system is adopted in order to obtain uniformity of sliver and the correct weight.

The slivers are taken from the drawing frame to the automatic spinner—a beautiful piece of mechanism. Fig. 13, Plate II., illustrates the machine as it leaves the makers. Two sliver cans from the second drawing frame are placed behind the machine, and the slivers passed between the rollers. They are then deflected and made to enter a trumpet-mouthed conductor which guides them on to the pins of the chain-sheet. As the two slivers emerge from these pins, each enters a separate self-feeding and adjusting apparatus, the function of which is, as its name implies, to regulate the delivery of the sliver to the nippers. The delivery is increased or decreased according as the sliver is thin or thick. Consequently, a very even yarn results; indeed, it is claimed that for uniformity of yarn this system of spinning has no equal. The bobbins, which are placed in a horizontal position, have a lateral movement, so that the finished yarn may be wound on evenly. This machine is made for ordinary rope yarn, and for binder twine for self-reaping machines. When all three spreading machines are used in conjunction with the spiral drawing frames, the automatic feeding arrangement is sometimes considered unnecessary, because of the uniformity of the slivers when delivered from the finishing drawing frame.

Figs. 14 and 15, Plate III., show two sheds filled with preparing machinery for the manufacture of binder twine. A complete system of Manila machinery, as recommended by Messrs Lawsons, Leeds, would consist of the following:—

1 No. 1 spreading and hackling machine.
1 ,, 2 ,, ,, ,, ,,
1 ,, 3 ,, ,, ,, ,,
1 spiral 1st drawing frame, 1 head, 88 in. reach, 4 slivers per head.
1 ,, 2nd ,, 2 heads, 88 in. ,, 6 ,, ,,
20 improved automatic spinners or jennies of 2 spindles each.

The length of sliver from a given length of fibre is proportional to the drafts and inversely proportional to the doublings. Thus, if

$d_1, d_2, d_3, d_4, d_5, d_6,$ = the drafts,
$s_1, s_2, s_3, s_4, s_5, s_6,$ = the number of slivers,
l = the feet per ℔ on the feed-table of No. 1 spreading machine,
L = the feet per ℔ delivered at the automatic spinner, then:—

$$l \times \underbrace{\frac{d_1}{s_1} \times \frac{d_2}{s_2} \times \frac{d_3}{s_3}}_{\substack{\text{No. 1.} \quad \text{No. 2.} \quad \text{No. 3.} \\ \text{Spreading} \\ \text{machines.}}} \times \underbrace{\frac{d_4}{s_4} \times \frac{d_5}{s_5}}_{\substack{\text{No. 1.} \quad \text{No. 2.} \\ \text{Drawing} \\ \text{frames.}}} \times \underset{\substack{\text{Auto-} \\ \text{matic} \\ \text{spinner.}}}{\frac{d_6}{s_6}} = \text{L.}$$

A numerical example, showing the drafts, slivers, &c., used for the production of No. 22^s rope yarn of 330 ft. per ℔ appears below:—

$$l \times \underbrace{\frac{15{\cdot}5}{1} \times \frac{15{\cdot}5}{12} \times \frac{15{\cdot}5}{12}}_{\substack{\text{Spreading} \\ \text{machines.}}} \times \underbrace{\frac{7{\cdot}42}{4} \times \frac{9{\cdot}7}{4}}_{\substack{\text{Drawing} \\ \text{frames.}}} \times \underset{\substack{\text{Automatic} \\ \text{spinner.}}}{\frac{5\frac{3}{16}}{1}} = 330 \text{ ft.}$$

Whence $l = {\cdot}536$ ft., say ·54 ft. per ℔; that is to say, 1 ℔ of Manila fibre, approximately 6 in. in length, spread on the feed-table of No. 1 spreading and hackling machine, and subjected to the above drafts and doublings, would produce yarn No. 22^s of 330 ft. per ℔ from the automatic spinner.

The bobbins from these automatic spinners may be used in the bank at the rope-walk as already indicated, or they may be taken to what is termed a "house machine." These machines are of two distinct kinds—vertical and horizontal. They perform the same work as the machines in the rope-walk, but take up much less space.

Figs. 16 and 17, Plate IV., illustrate two types of horizontal machines, each of which is capable of completing a rope in one operation. The process is pretty clear in fig. 17, which shows that eighteen threads are treated at once. On the right, and driven by spur gearing, are three revolving carriages or creels, each containing six bobbins. Each group revolves as the yarns are drawn off the bobbins, and thus the threads are formed into three strands. As the strands emerge from the guides, they converge towards three other guides, are laid together, and finally the finished rope is wound on to the reel.

In principle the vertical machine is the same as the horizontal machine, and the rope is, consequently, made in one operation. Any number of bobbins, from 24 to 128, may be twisted at the same time; the machine in fig. 18, Plate IV., is for making a rope of three strands, each with 12 threads, or 36 threads in all. These machines are also made to make ropes of four strands. The strands are formed by the rotation of the carriages, from the top of which each strand passes. The three strands then converge to, and pass through, the top of the machine, where they are laid into a rope. The latter passes over a series of guide pulleys, and is ultimately wound on the large drum shown in front of the machine. Such a machine for making a 128-thread, four-strand rope, occupies only about 125 sq. ft.—8 ft. 9 in. × 14 ft. 4 in.

In addition to the heavy rope there are many varieties of cord and twine made by means of the preparing, spinning and doubling machines. The fishing industry takes many different types for lines and nets, while the variety of cord and twine for other industrial and for household purposes is almost unlimited. All yarn from long vegetable fibre is more or less rough as it leaves the spinning frame, even after two or more threads have been twisted together. It is therefore necessary, for many uses, to impart a polish to the cord or twine. Special machines are used for this purpose. A certain number of bobbins, depending upon the capacity of the machine, are placed in a bank, and the ends are collected and passed under a roller which is immersed in hot starch. The yarns become saturated with this starch, but, as they emerge from the starch-box, the superfluous starch is removed by passing the yarns between two rollers. The yarns now pass over a series of drying cylinders and polishing rollers, and are finally rewound by the same machine on bobbins. These machines are termed bobbin-to-bobbin polishing machines. In some cases the hot drying cylinders are replaced by a system of hot air drying. The finished yarns are now made up by machinery into hanks, balls or cheeses, according to which happens to be the best state for future use and for transport.

Driving Ropes.—It has already been stated that cotton driving ropes are extensively applied in the transmission of motive power. Although the mechanical efficiency of transmission by ropes is less than that obtained by wheel gearing, rope driving has several compensating advantages:—

1. It is practically noiseless.
2. It occupies less space than belt driving, and the slip is not so great.
3. The turning movement is better; machines therefore run more steadily and production is increased.
4. Shafts may be run at higher speeds.
5. Greater range of drives; anything from 10 ft. to over 80 ft., and much greater distances when carrier pulleys are used.
6. The drive is usually obtained by a number of ropes; if one should break, the rope may be removed and the machinery run, in most cases, until stopping-time.

The number of ropes to be used depends upon the power to be transmitted and upon the surface speed of the driving pulley. The speed of the rope may vary from 2000 ft. to 6000 ft. or over per minute. In some few exceptional cases 60 ropes have been used on one pulley; the number usually varies between 15 and 40. (See also POWER TRANSMISSION, § *Mechanical.*) Fig. 6 shows the application of these ropes, which pass direct from the main driving pulley to the different flats of the mill. Fig. 7 shows the construction of the Lambeth four-strand cotton rope. There are two distinct systems of arranging the ropes on the driver and the driven pulleys. In the United Kingdom each rope is independent of all the others, and, as it is unlikely for more than one rope to break at a time, the stoppages are reduced to a minimum. In America, where hemp ropes are largely employed,

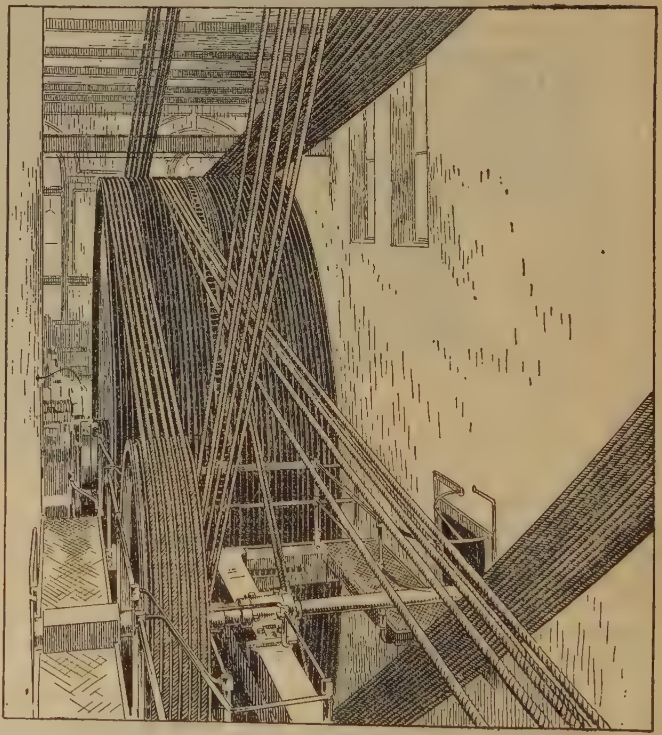


FIG. 6.—Rope Race of a Lancashire Cotton-Spinning Mill, with 38 Lambeth Cotton Driving Ropes, $1\frac{3}{4}$ in. diameter; engine, 1700 H.P.

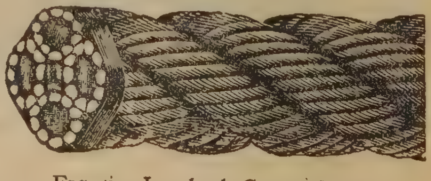


FIG. 7.—Lambeth Cotton Rope.

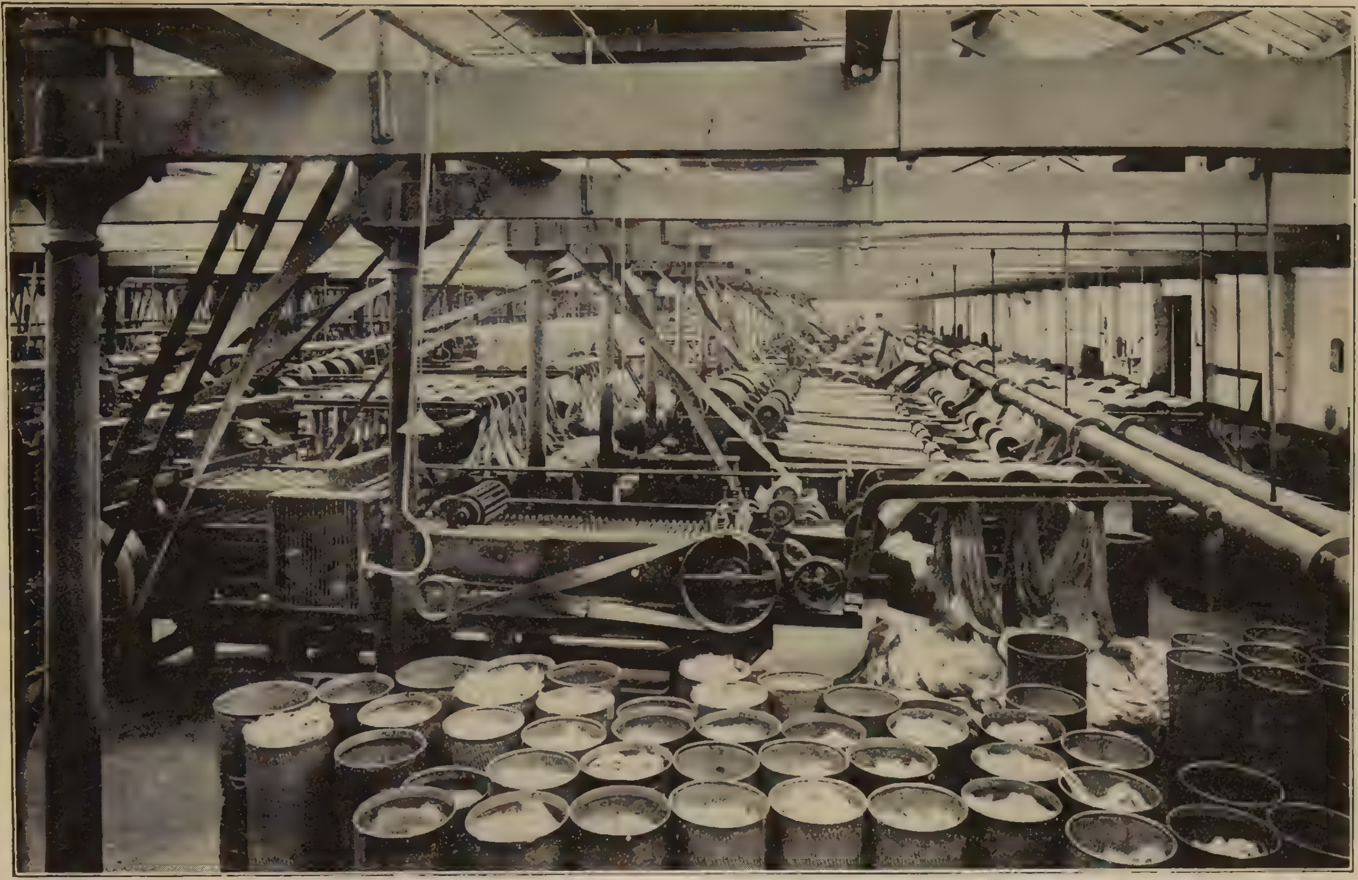


Fig. 14.—BINDER TWINE PREPARING, CONNSWATER MILL, OF THE BELFAST ROPEWORK CO. LTD.

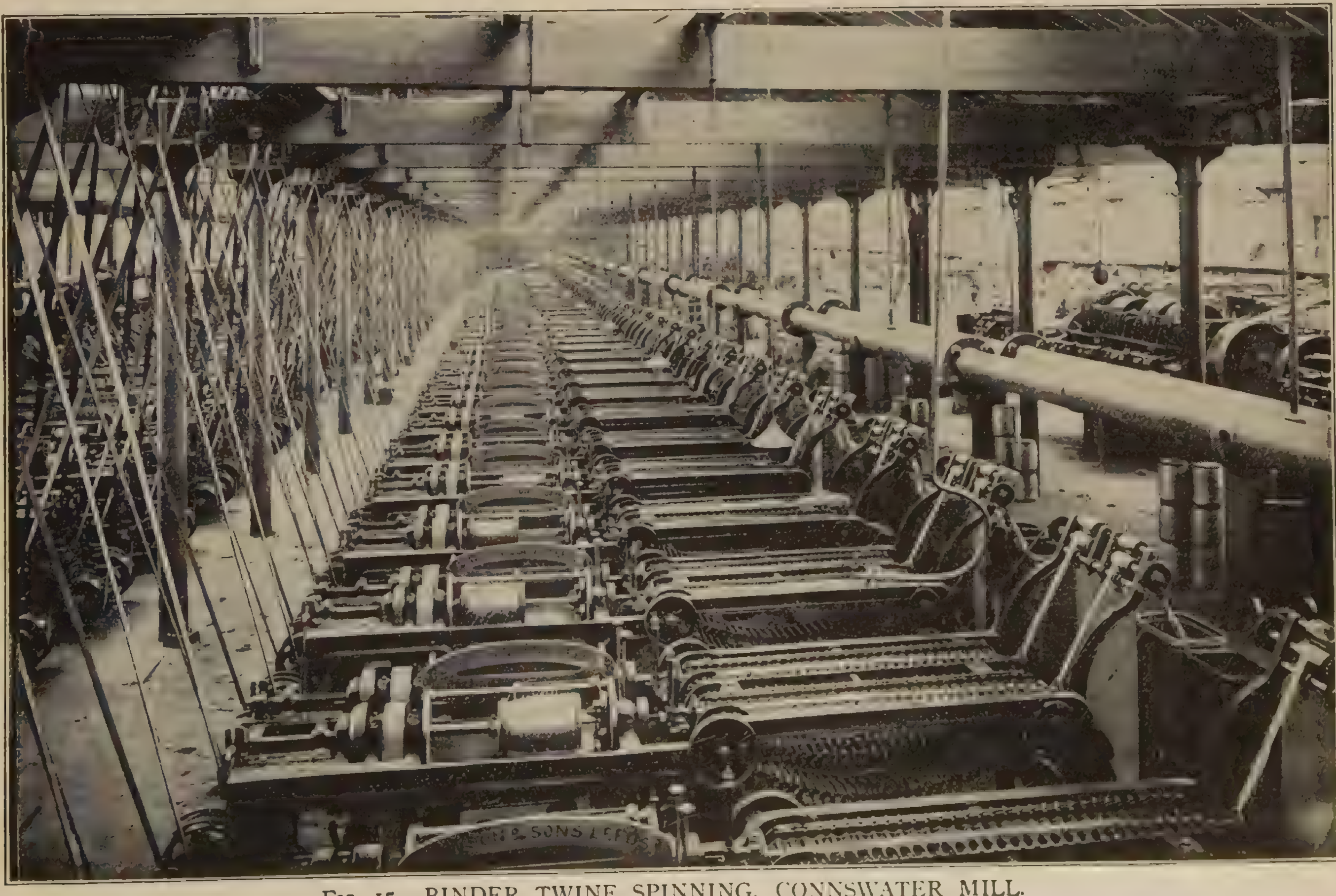


Fig. 15.—BINDER TWINE SPINNING, CONNSWATER MILL.

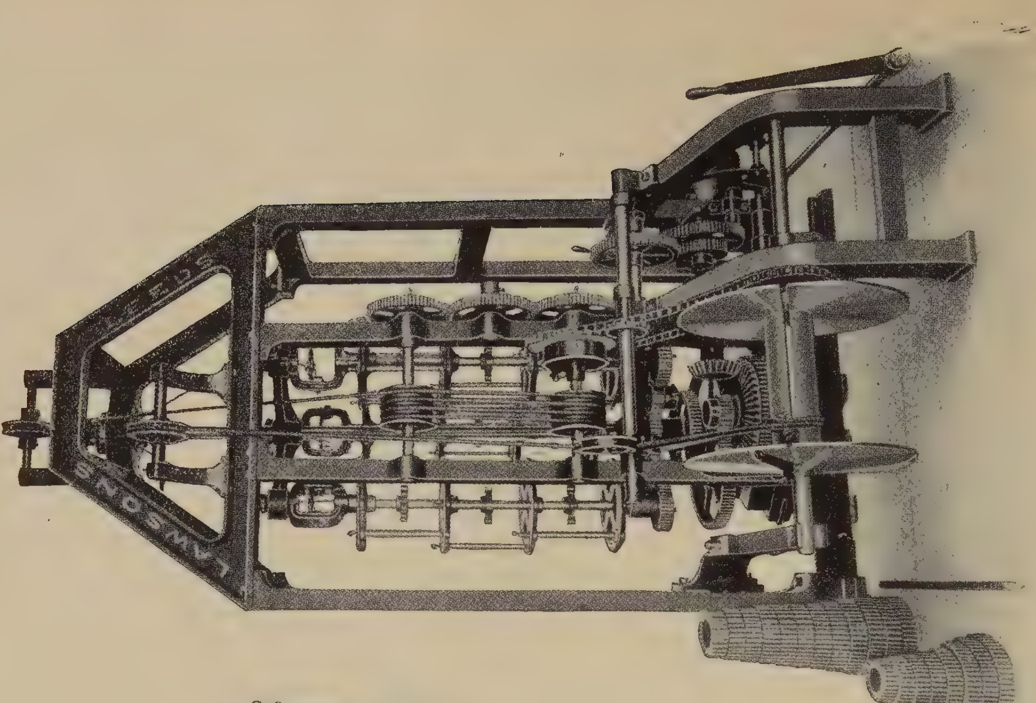

LAWSONS LEEDS

FIG. 18.—HASKELL-DAWES VERTICAL ROPE MACHINE.

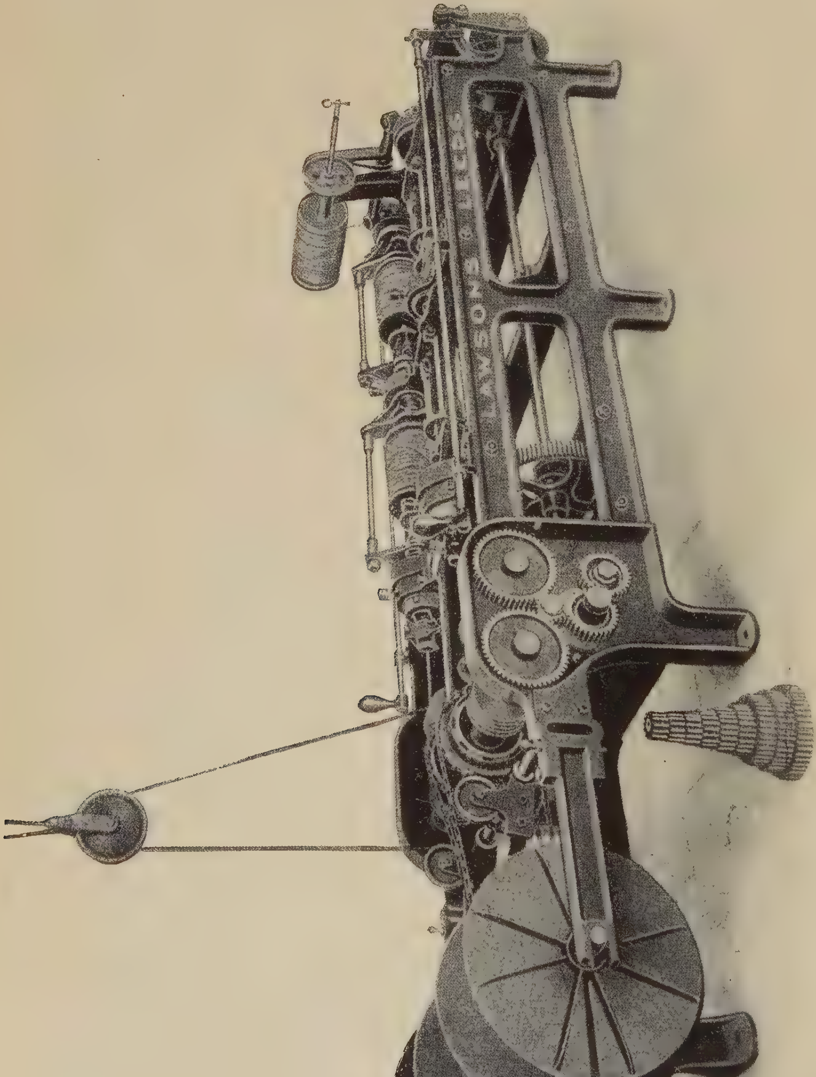

LAWSONS LEEDS

FIG. 16.—HASKELL-DAWES HORIZONTAL ROPE MACHINE.

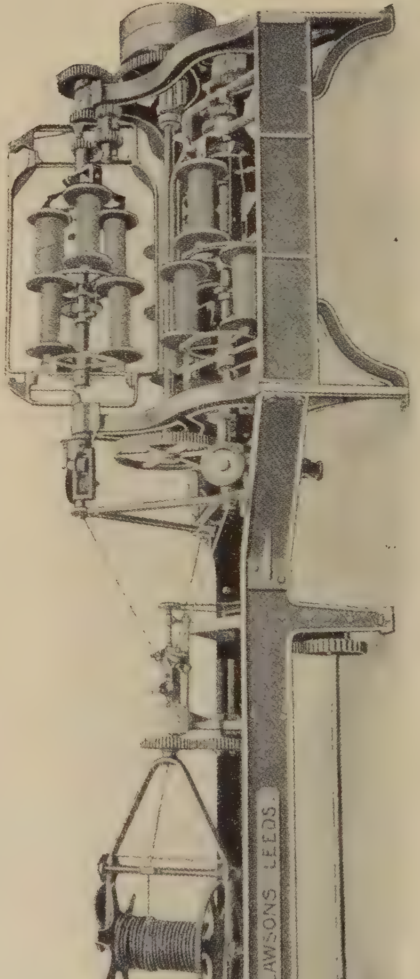

LAWSONS LEEDS

FIG. 17.—EIGHTEEN-THREAD ROPE-MAKING MACHINE.

the continuous system is mostly used; here the rope is wound round and round over driver and driven, and, except in rare cases, is joined only at one place. Although the system has the great advantage of the minimum number of joinings, it requires tension pulleys to keep the ropes taut. It is also clear that when the rope breaks at any point the machinery must stand until the repair is completed.

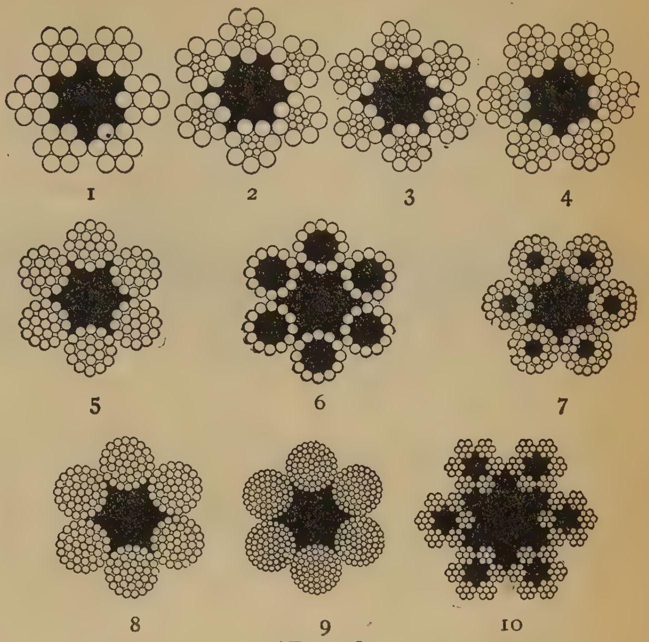
Wire Ropes.—Although the manufacture of ropes is of ancient origin, the practice of making ropes from wire on a large scale is of comparatively recent date. Since 1874, however, great developments have taken place in the manufacture of ropes from different kinds of wire, and the uses to which they can be put have enormously increased. This is owing almost entirely to the introduction of flexible wire ropes which were invented about this time by Messrs Bullivant & Co. Ltd., of 72 Mark Lane, London, E.C. Prior to that date the uses at which wire ropes were put were limited to winding ropes for collieries and hauling, and to cases in which flexibility was not a great desideratum. The introduction of flexibility, however, made possible the use of wire rope for ships' hawsers and rigging, for cranes, derricks and other purposes for which hempen ropes were formerly employed—indeed it has almost entirely superseded hemp for marine uses. The reason is that it is much stronger for the same size than rope made from any other material, whilst for the same strength its size and weight are only about one-third that of hempen rope. Consequently, the required power may be obtained with a wire rope of comparatively small bulk.

Wire rope is specially suited for aerial ropeways which provide a means of conveying ore, metals, merchandise, &c., over ground where it would be difficult to arrange transport by ordinary means. Messrs Bullivant & Co. Ltd., to whom we are indebted for the table of strengths and other particulars, as well as for the sectional illustration of wire ropes, construct seven different systems of aerial ropeways:—

1. The endless running rope, with carriers hanging therefrom and moving with it through frictional contact.
2. An endless rope, with the carriers hanging therefrom and moving with it, being rigidly fixed in position on the rope.
3. The fixed rope, in which the carriers are drawn along and hang from a fixed rope which acts also as a rail, returning on a parallel rope.
4. The single fixed rope, in which one carrier, hanging from a fixed rope, is drawn to and fro by means of an endless hauling rope.
5. The use of two fixed ropes with an endless hauling rope, in which one carrier travels in one direction, while the other travels on a parallel rope in the opposite direction. This is a serviceable type of ropeway, capable of being used over extremely long spans, and of carrying loads up to 5 tons.
6. The use of one fixed rope placed on an incline, on which the carriers (uncontrolled by hauling ropes) with their suspended loads are allowed to run down at a high speed. This is generally called a "shoot."
7. Bullivant's system of aerial ropeway for raising, lowering, and transporting heavy loads, by means of which a load can be hoisted, traversed in either direction and deposited at one operation.

The flexibility of a wire rope depends upon the number of wires of which it is formed; consequently the use to which a rope is to be put will partly determine the number of wires used in its construction. In some cases nearly 400 individual wires are employed in making one rope. Fig. 8 shows in section ten different types of construction, the particulars of which appear below:—

1. Laid rope made of 6 strands of 7 wires each. This is the class of rope most frequently used for hauling ropes where the size of the barrel and sheave will permit; it is also the make of rope in general use for standing rigging, and is such as is required by Lloyd's regulations.
2. Hauling rope made of 6 strands, each strand being of 7 wires covering 7 smaller ones.
3. Hauling rope made of 6 strands, each of 8 wires covering 7 smaller ones.
4. Hauling rope made of 6 strands, each of 10 wires covering 7 smaller ones.
5. Formed rope made of 6 strands of 19 wires each. In larger sizes this make of rope is used for standing rigging on vessels. In smaller sizes it is sometimes used for running rigging, and it is the usual make of rope for trawl warps.
6. Flexible steel wire rope, made of 6 strands each of 12 wires, with hemp heart and hemp centre in each strand. This is the usual make of flexible steel wire rope, $4\frac{1}{2}$ in. in circumference and smaller; used for hawsers, running lifts, hoists, &c.
7. Extra flexible steel wire rope made of 6 strands each of 24 wires.
8. Special extra flexible steel wire rope made of 6 strands each of 37 wires.
9. Special extra flexible steel wire rope made of 6 strands each of 61 wires. This is the make of rope usually adopted for large ropes—say over 10 in. in circumference—which are largely used for slipway and salvage purposes.
10. Cable-laid rope. This is an obsolete form of rope, which is composed of six complete ropes twisted together.



[FIG. 8.]

The following table supplies particulars about wire ropes which are used for general hauling purposes:—

Circumference.	Diameter.	Breaking Strain in Tons.				Approximate Weight per Fathom.
		"Crucible" Steel.	Best Selected Improved "Crucible" Steel.	Best Selected "Mild Plough" Steel.	Best Selected "Extra Plough" Steel.	
$1\frac{1}{4}$ in.	$\frac{13}{32}$ in.	$4\frac{1}{2}$	$4\frac{3}{4}$	$5\frac{1}{4}$	$5\frac{3}{4}$	$1\frac{3}{4}$ lb
$1\frac{1}{2}$,,	$\frac{1}{2}$,,	6	$6\frac{1}{2}$	$7\frac{1}{4}$	$7\frac{3}{4}$	$2\frac{1}{2}$,,
$1\frac{3}{4}$,,	$\frac{9}{16}$,,	$8\frac{1}{4}$	$8\frac{3}{4}$	$9\frac{1}{2}$	$10\frac{1}{2}$	$3\frac{1}{4}$,,
2 ,,	$\frac{5}{8}$,,	11	$11\frac{3}{4}$	$12\frac{3}{4}$	$14\frac{1}{4}$	4 ,,
$2\frac{1}{4}$,,	$\frac{11}{16}$,,	$14\frac{1}{4}$	15	$16\frac{1}{2}$	18	$5\frac{1}{4}$,,
$2\frac{1}{2}$,,	$\frac{13}{16}$,,	$17\frac{1}{2}$	$18\frac{1}{4}$	20	$22\frac{1}{2}$	$6\frac{1}{4}$,,
$2\frac{3}{4}$,,	$\frac{7}{8}$,,	$21\frac{1}{4}$	$22\frac{1}{2}$	$24\frac{3}{4}$	$27\frac{1}{4}$	$7\frac{1}{2}$,,
3 ,,	$\frac{15}{16}$,,	$24\frac{3}{4}$	$26\frac{1}{2}$	29	$31\frac{3}{4}$	9 ,,
$3\frac{1}{4}$,	1 ,,	$29\frac{3}{4}$	$31\frac{3}{4}$	35	38	$10\frac{1}{2}$,,
$3\frac{1}{2}$,,	$1\frac{1}{16}$,,	$34\frac{1}{2}$	$36\frac{3}{4}$	$40\frac{1}{4}$	$44\frac{1}{4}$	13 ,,
$3\frac{3}{4}$,,	$1\frac{3}{16}$,,	$39\frac{1}{2}$	42	46	$50\frac{3}{4}$	$14\frac{1}{2}$,,
4 ,,	$1\frac{1}{4}$,,	$45\frac{1}{2}$	$48\frac{1}{2}$	53	58	$16\frac{1}{2}$,,
$4\frac{1}{4}$,,	$1\frac{3}{8}$,,	$52\frac{1}{2}$	56	$61\frac{1}{2}$	67	$17\frac{3}{4}$,,
$4\frac{1}{2}$,,	$1\frac{7}{16}$,,	$57\frac{1}{2}$	61	67	73	20 ,,
$4\frac{3}{4}$,,	$1\frac{1}{2}$,,	65	69	76	83	22 ,,
5 ,,	$1\frac{3}{5}$,,	72	76	83	92	25 ,,

The diameter of drums and sheaves should be about thirty times the circumference of the rope.

For shaft winding at high speed one-tenth of the breaking strain of a rope is sometimes taken as a fair working load. For inclines, the proportion of load to breaking strain varies according to gradient conditions, and friction should be allowed for.

The first requisite in the manufacture of wire ropes is the selection and blending of the different iron ores. The different processes through which the metal passes, and the hammering and drawing into rods, require great experience, and give to it the peculiar properties that are essential for the finished article. The same remarks apply to the annealing and hardening processes, during which the rods are drawn through dies to the required gauge. The wire is now subjected to special processes of galvanizing in order to make it proof against atmospheric and other influences. Afterwards it is wound on bobbins of suitable size, a definite number of which are mounted on the forks or frames of the stranding machine. These forks are swung or pivoted between disks, which are keyed on a hollow main shaft, through which the wires or other material intended for the core pass. This core is of such a size that the aggregate number of wires that are mounted in the machine exactly cover it in a spiral direction.

All the wires, including the centre core, are passed through their individual hollow spindles, then led to the nose or head of the machine, and finally passed through a stationary compression block to draw-off wheels. The speed of these wheels is regulated in proportion to the speed of the machine by means of suitable gearing. During the revolutions of the machine each bobbin and fork is kept in a vertical position, and floats thus, by means of an eccentric ring behind the back disk. This ring is connected to the spindles of the bobbin forks by means of small cranks, thus preventing any torsional movement that would otherwise be imparted to the individual wires.

Each bobbin is controlled by a brake which acts as a tensioning device so that equal strain can be applied to each, allowing the wires to unwind uniformly. The finished strands are wound in turn upon large bobbins, and mounted in the flyers or disks of the rope closing machine. These machines are similar in design to the stranding machine, but are naturally much heavier in construction, and therefore revolve at a proportionate speed. The speed of the machines varies according to the weight of material, the size of the strands and the construction of the finished rope. The modern machine, or the type most generally used, makes about fifty revolutions per minute, whilst three times this speed is often obtained when spinning the strands.

The rapid strides made by electricity have furnished another large branch of what may be termed wire rope manufacture. The ropes used for electrical purposes are almost invariably termed cables, and there are many different kinds and sizes of them. The wire must necessarily possess good conducting power, and be comparatively cheap. Up to the present copper has proved to be the chief material possessing these two important properties in combination; hence it is the metal *par excellence* for electrical conduction. Aluminium and alloys have been tried with varying degrees of success.

The conductor itself consists of a strand of soft copper wires, around which the dielectric or non-conducting material is placed. The methods of forming the strands do not differ essentially from those described above. The dielectric is usually paper, spun jute fibre, vulcanized india-rubber or vulcanized bitumen. If the first two dielectrics are used, a lead sheath is necessary to enclose the insulated strand and so exclude moisture; if the cable is likely to get damaged, it is further enclosed by steel tapes or steel wires, and finally covered with yarn or braid. Vulcanized bitumen is not only a dielectric, but is also absolutely impervious to moisture. Hence in many instances where paper or fibre is employed as the principal dielectric, a sheath of vulcanized bitumen is used instead of lead to exclude moisture. Cables are also made with a single central stand of copper wires in addition to one or more concentric layers of copper wires, the layers being separated by some dielectric material; or there may be two or more strands, separately insulated, and more or less elaborately clothed with the above-mentioned substances. (T. Wo.)

ROPES, JOHN CODMAN (1836–1899), American military historian and lawyer, was born at St Petersburg on the 28th of April 1836, the son of a leading merchant of Boston who was engaged in business in Russia. At the age of fourteen, his family having meantime returned to Massachusetts, he developed an affection of the spine which eventually became a permanent deformity. His courage and energy, however, did not allow him to yield to his affliction. He entered Harvard in 1853, and graduated in 1857. His interests as a young man were chiefly religious, legal and historical, and these remained with him throughout life, his career as a lawyer being conspicuous and successful. But it was the outbreak of the Civil War in 1861 which fixed his attention principally on military history. He ceaselessly assisted with business and personal help and friendship the officers and men of the 20th Massachusetts regiment, in which his brother, Henry Ropes, served up to his death at Gettysburg, and after the war he devoted himself to the collection and elucidation of all obtainable evidence as to its incidents and events. In this work his clear and unprejudiced legal mind enabled him to sift the truth from the innumerable public and private controversies, and the ill-informed allotment of praise and blame by the popular historians and biographers. The focus of his work was the Military Historical Society of Massachusetts, which he founded in 1876. The work of this society was the collection and discussion of evidence relating to the great conflict. Although practically every member of this society except himself had fought through the war, and many, such as Hancock and W. F. Smith, were general officers of great distinction, it was from first to last maintained and guided by Ropes, who presented to it his military library and his collection of prints and medals. He died at Boston on the 28th of October 1899. His principal work is an unfinished *Story of the Civil War*, to which he devoted most of his later years; this covers the years 1861–62. *The Army under Pope* is a detailed narration of the Virginia campaign of August–September 1862, which played a great part in reversing contemporary judgment on the events of those operations, notably as regards the unjustly-condemned General Fitz John Porter. Outside America, Ropes is known chiefly as the author of *The Campaign of Waterloo*, which is one of the standard works on the subject.

The greater part of his studies of the Civil War appears in the Military Historical Society's publications. Papers on the Waterloo campaign appeared in the *Atlantic Monthly* of June 1881, and in *Scribner's Magazine* of March and April 1888. Amongst his miscellaneous works is a paper on "The Likenesses of Julius Caesar" in *Scribner's Magazine* (February 1887).

See *Memoir of John Codman Ropes* (Boston, privately printed, 1901).

ROPE-WALKING, the art of walking, dancing and performing tricks of equilibrium on a rope or wire stretched between two supports. It has been popular with most Asiatic and European peoples from the beginning of history. Before the middle of the 19th century a rope was invariably used, and was stretched as tightly as possible, on which account the art was called *Tight-rope Walking*. About the year 1875 the *slack wire*, stretched loosely from support to support, was introduced, and is now more commonly used. The performer is often aided in keeping his balance by a Chinese umbrella or a long pole.

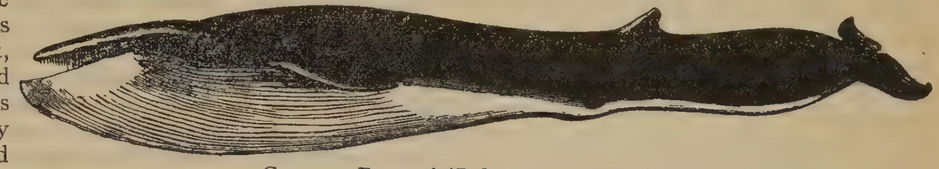
ROPS, FÉLICIEN (1833–1898), Belgian painter, designer and engraver, was born at Namur, in Belgium, on the 7th of July 1833; he spent his childhood in that town, and afterwards in Brussels, where he composed in 1856, for his friends at the university, the *Almanach Crocodilien*, his first piece of work. He also brought out two *Salons Illustrés*, and collaborated on the *Crocodile*, a magazine produced by the students. The humour shown in his contributions attracted the attention of publishers, who offered him work. He designed, among other things, frontispieces for Poulet-Malassis, and afterwards for Gay and Doucé. In 1859 he began to contribute to a satirical journal in Brussels called *Uylenspiegel*, a sort of *Charivari*. The issue, limited unfortunately to two years, included his finest lithographs. About 1862 he went to Paris and worked at Jacquemart's. He subsequently returned to Brussels, where he founded the short-lived International Society of Etchers. In 1865 he brought out his famous "Buveuse d'Absinthe," which placed him in the foremost rank of Belgian engravers; and in 1871 the "Dame au Pantin." After 1874 Rops resided in Paris. His talent, which commanded attention by its novel methods of expression, and had been stimulated by travels in Hungary, Holland and Norway, whence he brought back characteristic sketches, now took a soaring flight. To say nothing of the six hundred original engravings enumerated in Ramiro's *Catalogue of Rops' Engraved Work* (Paris, Conquet, 1887), and one hundred and eighty from lithographs (Ramiro's *Catalogue of Rops' Lithographs*, Paris, Conquet, 1891), besides a large number of oil-paintings in the manner of Courbet, and of pencil or pen-and-ink drawings, he executed several very remarkable water-colour pictures, among which are "Le Scandale," 1876; "Une Attrapade," 1877 (now in the Brussels Museum); a "Tentation de St Antoine," 1878; and "Pornocrates," 1878. Most of these have been engraved and printed in colours by Bertrand. From 1880 to 1890 he devoted himself principally to illustrating books: *Les Rimes de joie*, by Théo Hannon; *Le Vice suprême* and *Curieuse*, by J. Péladan; and *Les Diaboliques*, by Barbey d'Aurévilly; *L'Amante du Christ*, by R. Darzens; and *Zadig*, by Voltaire; and the poems of Stéphane Mallarmé have frontispieces due to his fertile and powerful imagination. Before this he had illustrated the *Légendes Flamandes*, by Ch. Decoster; *Jeune France*, by Th. Gautier;

and brought out a volume of *Cent Croquis pour rêjouir les Honnêtes Gens.* His last piece of work, an advertisement of an exhibition, was done in November 1896. Rops died on the 23rd of August 1898, at Essonnes, Seine-et-Oise, on the estate he had purchased, where he lived in complete retirement with his family. Scorning display, Rops almost always opposed any exhibition of his works. However, he consented to join the Art Society of the "XX.," formed at Brussels in 1884, as their revolutionary views were in harmony with the independence of his spirit. After his death, in 1899, the Libre Esthétique, which in 1894 had succeeded the "XX.," arranged a retrospective exhibition, which included about fifty paintings and drawings by Rops. Rops was a Chevalier of the Legion of Honour. He excelled in these three methods of artistic expression; but his engraved work is the most important, both as to mastery of technique and originality of ideas, though in all his talent was exceedingly versatile. Hardly any artist of the 19th century equalled him in the use of the dry-point and soft varnish. By his assured handling and admirable draughtsmanship, as well as the variety of his sometimes wildly fantastic conceptions, he made his place among the great artists of his time. "Giving his figures a character of grace which never lapses into limpness," says his biographer, E. Ramiro, "he has analysed and perpetuated the human form in all the elegance and development impressed on it by modern civilization."

In 1896 *La Plume* (Paris) devoted a special number to this artist, fully illustrated, by which the public were made aware how many of his works are unsuitable for display in the drawing-room or boudoir. E. Deman, the publisher at Brussels, brought out a volume in 1897 with the title, *Félicien Rops et son œuvre*—papers by various writers. We may also mention a study of *Félicien Rops*, by Eugène Demolder (Paris, Princebourde, 1894), and another by the same writer in *Trois Contemporains* (E Deman, 1901); *Les Ropsiaques*, by Pierre Gaume, brought out in London, 1898; and the admirable notice by T. K. Huysmans in his volume called *Certains*. (O. M.*)

ROQUELAURE, a title derived from a small commune in France (dep. of Gers), and borne by a French family of Armagnac, one member of which was Antoine, baron de Roquelaure (1544–1625), who was in the service of Henry IV. before he became king, and after his accession was made master of the wardrobe, lieutenant-general in Auvergne (1576) and Guienne (1610), and marshal of France in 1614. His son, Gaston Jean Baptiste de Roquelaure (1617–1683), a celebrated wit, was created duke and peer of France in 1652, and was appointed governor of Guienne in 1679. Gaston's son, Antoine Gaston Jean Baptiste de Roquelaure (1656–1738), carried on the family reputation for wit, and, in spite of his military incapacity, received the marshal's bâton in 1724.

RORQUAL, a whale of a long and elongated shape, with a small back-fin and a number of longitudinal pleatings or folds on the throat (see CETACEA). The name rorqual refers to these folds, while the alternative title of finner, or fin-whale, marks an important difference between these whales (for there are several species) and right-whales. The furrows on the throat are numerous and close-set, the flipper is comparatively small, and the dorsal fin distinct. The head is relatively small, flat and pointed in front, the whalebone short and coarse, the body long and slender, and the tail much compressed before it expands into the "flukes." Rorquals are the most abundant and widely distributed of all whales, being found in all seas, except the extreme Arctic and Antarctic regions. There are four distinct species of this genus in British seas. Firstly, Sibbald's rorqual, or blue whale (*Balaenoptera sibbaldi*), the largest of all animals, attaining a length of 80 or even sometimes 85 ft. Its colour is dark bluish grey, with small whitish spots on the breast; the whalebone is black; the flippers are larger proportionally than in other rorquals, measuring one-seventh of the total length of the body; and the dorsal fin is small and placed far back. This whale has usually 64 vertebrae, of which 16 bear ribs. Like the others, this species seems to pass the winter in the open seas, and approaches the coast of Norway at the end of April or beginning of May. At this time its sole food is a small crustacean (*Euphausia inermis*), which swarms in the fjords. Secondly, we have the common rorqual (*B. musculus*, or *B. physalus*) with a length of from 65 ft. to 70 ft., and of a greyish slate-colour above and white underneath, and the whalebone slate-colour, variegated with yellow or brown. It has usually 62 vertebrae, of which 15 bear ribs. This is the commonest of all the large whales on the British coasts; scarcely a winter passing without the body of one being washed ashore, usually after stormy weather, and frequently on the south coast, as this species has a more southern range than the last, and enters the Mediterranean. It feeds largely on fish, and is frequently seen feasting among shoals of herrings. Thirdly comes Rudolphi's rorqual (*B. borealis*), a smaller species, scarcely attaining a length of 50 ft. It is bluish black above, with oblong light-coloured spots, whilst the under-parts are more or less white; the whole of the tail and both sides of the flippers are black; the whalebone is black, and the bristly ends fine, curling and white; the flippers are very small, measuring one-eleventh of the total length of the body. There are 56 vertebrae, with 14 pairs of ribs. This species, according to Dr. C. Collett, feeds chiefly on minute crustaceans, mainly *Calanus finmarchicus* and *Euphausia inermis*, and not on fish. Down to the last quarter of the 19th century it was considered the rarest of the whales of European seas, and was only known from a few individuals stranded on the coasts of northern Europe at long intervals. The most southern point at which it has been met with is Biarritz. Since the establishment of the whaling station near the North Cape it has been shown to be a regular summer visitor. Lastly, the lesser rorqual, *B. rostrata*, the sharp-nosed finner of American whalers, is the smallest species found in the northern seas, rarely exceeding 30 ft. in length. Its colour is greyish black above, whilst the under-side is white, including the whole of the lower side of the tail; the inner side of the flippers is also white, and there is a broad white band across the outer side, which is a very characteristic mark of the species; the whalebone is yellowish white. The dorsal fin in this and the preceding species is comparatively high, and placed far forwards on the body. This whale has usually 48 vertebrae, of which 11 bear ribs. It is common in summer in the fjords of Norway, and is often seen around the British Isles. It has been taken, though rarely, in the Mediterranean, and ranges as far north as Davis Strait.



Common Rorqual (*Balaenoptera musculus*).

Rorquals are met with in almost all seas, and nearly all the individuals carefully examined, whether from the North Pacific, the Australian seas or the Indian Ocean, come very near in structure to one or the other of the Atlantic forms described above, so much so that some zoologists believe that there are but four species, with an almost cosmopolitan range. Other naturalists, on the contrary, have described and named almost every individual specimen captured as belonging to a different species. See WHALE and HUMP-BACK WHALE. (R. L.*)

RORSCHACH, a busy commercial town in the Swiss canton of St Gall, situated on the south-west shore of the Lake of Constance, and by rail 62 m. N.E. of Zürich, 10 m. S.E. of Romanshorn and 57 m. N. of Coire. In 1900 its population was 9140, mostly German-speaking, while there were 5935 Romanists to 3139 Protestants. From 1408 to 1798 it belonged to the abbot of St Gall, and then to the canton Säntis (named canton of St Gall in 1803) of the Helvetic Republic. It has always been a great commercial centre, though now superseded by Romanshorn as regards the corn trade. It has many industrial establishments, of which the chief is one for the manufacture of lace and muslin. Above the town is the old convent of Mariaberg, originally built in the 15th century as a refuge for the monks of St Gall against the turbulent citizens of that town, but now a seminary for teachers. From Rorschach a cogwheel railway runs south-east in 4¼ m. up to Heiden, a village in the canton of Appenzell well known for its goats' whey cure. (W. A. B. C.)

ROS, or De Ros, the name of a noble English family. Robert de Ros (d. 1227), a son of Everard de Ros (d. 1191) of Helmsley, or Hamlake, in Yorkshire, possessed lands in Yorkshire, including Ros, or Ross, in Holderness, and also in Normandy. He served King John in several ways, both in England and abroad, and obtained lands in Northumberland, where he built a castle at Wark, or Werke. About 1215, however, he deserted the king and became one of the leaders of the baronial party, being one of the twenty-five executors of Magna Carta and fighting against John when he repudiated this engagement. He submitted to Henry III. and became a monk before he died in 1227. His wife was Isabella, daughter of William the Lion, king of Scotland, by whom he had two sons, William and Robert. Robert de Ros the younger (d. 1274), was an itinerant justice under Henry III., but later he was one of the barons who fought against this king. He passed much of his time, however, in Scotland, where he held a barony and where he was one of the guardians of Margaret, the English bride of King Alexander III. His son Robert was summoned to parliament as Lord Ros de Werke in 1295; just afterwards he revolted against Edward I. and his lands were forfeited. William de Ros (d. 1258), the elder son of the executor of Magna Carta, had a son Robert (d. 1285), who was summoned to parliament as a baron by Simon de Montfort in 1264; he was also summoned to parliament by Edward I. His son William, 2nd baron Ros of Helmsley, or Hamlake (d. 1317), obtained Belvoir Castle in Leicestershire through his mother Isabel, daughter of William d'Albini. He was one of the minor claimants for the crown of Scotland in 1292, and soon afterwards he obtained the lands in Northumberland which had been taken from his traitorous cousin Robert de Ros. His second son, John de Ros (d. 1338), was a courtier under Edward II. Later he joined Edward's queen, Isabella, was summoned to parliament by Edward III., and distinguished himself on the sea. Another John de Ros (d. 1332), bishop of Carlisle from 1325 to 1332, was doubtless a member of this family.

The second baron's descendants retained the barony of Ros until the death of Edmund de Ros, the 11th baron, in October 1508. Edmund's nephew Sir George Manners (d. 1513), of Belvoir and Helmsley, then claimed it, and was called Lord Ros, or Roos. His son, Thomas Manners, the 13th baron (d. 1543), was created earl of Rutland in 1525, but the barony was separated from the earldom when Thomas's grandson Edward died in 1587, leaving an only child, Elizabeth (d. 1591), who, as heir general of the family, became Baroness Ros, or Roos. Elizabeth married into the Cecil family, and when her only child, William Cecil, died in 1618, the barony reverted to the Manners family, Francis Manners, 6th earl of Rutland (1578–1632), becoming the 18th baron. On his death the barony again passed to a female, his daughter Katherine, through whom it came to the family of Villiers. Then in 1806, after a long abeyance, Charlotte (1769–1831), daughter of the Hon. Robert Boyle, and a descendant of the Manners family, was declared Baroness Ros, or Roos. She married Lord Henry Fitzgerald, and their son, Henry William Fitzgerald-de-Ros (1793–1839), became the 22nd baron on his mother's death. In 1907, on her father's death, Mary Frances, wife of the Hon. Anthony Dawson, became Baroness Ros, or rather, De Ros, which is the present form of the title. For a long time after they had ceased to hold the barony the earls and dukes of Rutland continued to style themselves Lords Roos.

ROS, SIR RICHARD (b. 1429), English poet, son of Sir Thomas Ros, lord of Hamlake (Helmsley) in Yorkshire and of Belvoir in Leicestershire, was born on the 8th of March 1429. In Harl. MS. 372 the poem of "La Belle Dame sanz Mercy," first printed in W. Thynne's *Chaucer* (1532), has the ascription "Translatid out of Frenche by Sir Richard Ros." "La Belle Dame sanz Mercy" is a long and rather dull poem from the French of Alain Chartier, and dates from about the middle of the 15th century. It is written in the Midland dialect, and is surprisingly modern in diction. The opening lines—

"Half in a dreme, not fully wel awaked,
The golden sleep me wrapped under his wing,"

have often been quoted, but the dialogue between the very long-suffering lover and the cruel lady does not maintain this high level.

See W. W. Skeat, *Chaucerian and Other Pieces* (1897); and Dr. H. Gröhler, *Ueber Richard Ros' mittelenglische Uebersetzung . . .* (Breslau, 1886).

ROSA, CARL AUGUST NICHOLAS (1843–1889), English musical impresario, was born at Hamburg, his family name (which he subsequently changed) being Rose. He started as a solo violinist, studying at Leipzig and Paris, and also had considerable success as a conductor both in England and America; and it was at New York in 1867 that he met and married the famous operatic soprano Madame Parepa (1836–1874), at whose death he afterwards endowed a Parepa-Rosa scholarship at the Royal Academy of Music in London. In 1875 he started the Carl Rosa Opera Company, for producing the best operas in English versions, and both during his own life and after his death this company had much to do with popularizing good music in England, encouraging native composers and training a number of excellent singers. Carl Rosa married a second time in 1881, and died in Paris on the 30th of April 1889.

ROSA, MONTE, the name of a great glacier-clad mountain mass (the name comes from the Aostan patois word *roëse*, meaning a glacier) which rises S.E. of Zermatt, and on the frontier between Switzerland (canton of the Valais) and Italy. Ten summits in this huge mass are distinguished by name, of which four (the Nordend, 15,132 ft., the Zumsteinspitze, 15,004 ft., the Signalkuppe or Punta Gnifetti, 14,965 ft., and the Parrotspitze, 14,643 ft.) rise on the frontier. The five lower summits are on the Italian slope, but the highest of all, the Dufourspitze, 15,217 ft. (so named by the Swiss government in honour of General Dufour, the head of the great survey which first accurately fixed the position of these points), rises W. of the frontier ridge, on a buttress, and is thus entirely in Switzerland, of which it is the culminating peak (and not, as often stated, the Dom, 14,942 ft., in the Mischabel group). The loftiest point of the Dufourspitze was first attained in 1855 by a large English party, which included Messrs G. and C. Smyth, C. Hudson, Birkbeck and Stevenson. The Zumsteinspitze was first climbed in 1820, the Signalkuppe (on top of which there is now a club hut) in 1842, the Nordend in 1861 and the Parrotspitze in 1863. The ascent of all the points named is not difficult from the Swiss side, but excessively dangerous on the east or Italian side. (W. A. B. C.)

ROSA, SALVATOR (1615–1673), Italian painter of the Neapolitan school, was born in Arenella, in the outskirts of Naples, in 1615: the precise day is given as the 20th of June, and also as the 21st of July. His father, Vito Antonio de Rosa, a land surveyor, was bent upon making the youth a lawyer, or else a priest, and sent him to study in the convent of the Somaschi fathers. Here Salvator began showing a turn for art: he went in secret to his maternal uncle Paolo Greco to learn the practice of painting, but soon found that Greco had little pictorial lore to impart, so he transferred himself to his own brother-in-law Francesco Fracanzaro, a pupil of Ribera, and afterwards had some practice under Ribera himself. Above all he went to nature, frequenting the Neapolitan coast, and keeping his eyes open and his hand busy. At the age of seventeen he lost his father; the widow was left unprovided for, with at least five children, and Salvator found himself immersed in a sea of troubles and perplexities, with nothing for the while to stem them except a buoyant and adventurous temperament. He obtained some instruction under the battle-painter Aniello Falcone, but chiefly painted in solitude, haunting romantic and desolate spots, beaches, mountains, caverns, verdure-clad recesses. Hence he became in process of time the initiator of romantic landscape, with a special turn for scenes of strange or picturesque aspect—often turbulent and rugged, at times grand, and with suggestions of the sublime. He picked up scanty doles when he could get them, and his early landscapes sold for a few pence to petty dealers. The first person to discover that Rosa's work was not as trumpery as it was cheap was the painter Lanfranco, who bought some of the paintings, and advised the youth to go to Rome. Hither in 1635, at the age of twenty, Rosa betook himself; he studied with enthusiasm, but, catching fever, he returned to Naples and Falcone, and for a while painted nothing but battlepieces, and these without exciting any attention. This class of work was succeeded by the landscape art peculiarly characteristic of him—wild scenes wildly peopled with shepherds, seamen or especially soldiers. He then revisited Rome, and was housed by Cardinal Brancaccio; this prelate being made bishop of Viterbo, Rosa painted for the Chiesa della Morte a large and noticeable picture of the "Incredulity of Thomas"—the first work of sacred art which we find recorded from his hand. At Viterbo he made acquaintance with a mediocre poet named Abati, and was hence incited to try his own faculty in verse. He then returned to Naples. Here the monopolizing triumvirate—Ribera, Caracciolo and Corenzio—were still powerful. Rosa was as yet too obscure to suffer from their machinations; but, having painted a picture of "Tityus Torn by the Vulture," which went to Rome and there produced a great sensation, he found it politic to follow in the footsteps of his fame, and once more, in 1638, resought the papal city.

Rosa was a man of facile and versatile genius, and had by this time several strings to his bow. It is said that, still keeping painting steadily in view as his real objective, he resolved to secure attention first as a musician, poet, improvisatore and actor—his mother-wit and broad Neapolitan dialect (which appears to have stuck to him through life) standing him powerfully in stead. In the carnival he masqued as Formica and Capitan Coviello, and bustled about Rome distributing satirical prescriptions for diseases of the body and more particularly of the mind. As Formica he inveighed against the farcical comedies acted in the Trastevere under the direction of the celebrated Bernini. Some of the actors, in one of their performances, retaliated by insulting Rosa, but the public was with him, and he now enjoyed every form of success—social prestige, abundant commissions and any amount of money, which he was wont to throw about broadcast to the populace. In 1646 he returned to Naples, and is said to have taken an active part in the insurrection of Masaniello; certain it is that he sympathized with and admired the fisherman autocrat, for a passage in one of his satires proves this. His actual share in the insurrection is, however, dubious; it appears only in recent narratives, and the same is the case with the well-known story that at one time he herded with a band of brigands in the Abruzzi—an incident which cannot be conveniently dove-tailed into any of the known dates of his career. As regards the popular revolt against Spanish tyranny, it is alleged that Rosa, along with other painters—Coppola, Porpora, Domenico Gargiuolo, Dal Po, Masturzo, the two Vaccari and Cadogna—all under the captaincy of Aniello Falcone, formed the *Compagnia della Morte*, whose mission it was to hunt up Spaniards in the streets and despatch them, not sparing even those who had sought some place of religious asylum. He painted a portrait of Masaniello—probably from reminiscence rather than from life: indeed, it is said that he painted him several times over in less than life size. On the approach of Don John of Austria the blood-stained *Compagnia* dispersed, Rosa escaping or at any rate returning to Rome. Here he painted some important subjects, showing the uncommon bent of his mind as it passed from landscape into history—"Democritus amid Tombs," the "Death of Socrates," "Regulus in the Spiked Cask" (these two are now in England), "Justice Quitting the Earth," and the "Wheel of Fortune." This last work, the tendency of which was bitingly satirical, raised a storm of ire and remonstrance. Rosa, endeavouring at conciliation, published a description of its meaning (probably softened down not a little from the real facts); none the less an order for his imprisonment was issued, but ultimately withheld at the instance of some powerful friends. It was about this time that Rosa wrote his satire named *Babylon*, under which name Rome was of course indicated.

Cardinal Giancarlo de' Medici now invited the painter to leave Rome—which had indeed become too hot to hold him—for Florence. Salvator gladly assented, and remained in the Tuscan capital for the better part of nine years, introducing there the new style of landscape; he had no pupils, but various imitators. Lorenzo Lippi the painter poet, and other *beaux esprits* shared with Rosa the hospitalities of the cardinal, and they formed an academy named *I Percossi* (the Stricken), indulging in a deal of ingenious jollity—Rosa being alike applauded as painter, poet and musician. His chief intimate at this time was Lippi, whom he encouraged to proceed with the poem *Il Malmantile Racquistato*. He was well acquainted also with Ugo and Giulio Maffei, and housed with them more than once in Volterra, where he wrote other four satires—*Music*, *Poetry*, *Painting* and *War*. About the same time he painted his own portrait, now in the Uffizi Gallery of Florence. Finally he reverted once more to Rome, and hardly left that city again. Much enmity still brooded there against him, taking the form more especially of an allegation that the satires which he zealously read and diffused in MS. were not his own production, but filched from some one else. Rosa indignantly repelled this charge, which remains indeed quite unsubstantiated, although it is true that the satires deal so extensively and with such ready manipulation in classical names, allusions and anecdotes, that one is rather at a loss to fix upon the period of his busy career at which Rosa could possibly have imbued his mind with such a multitude of semi-erudite details. It may perhaps be legitimate to suppose that his literary friends in Florence and Volterra had coached him up to a large extent—the satires, as compositions, remaining none the less strictly and fully his own. To confute his detractors he now wrote the last of the series, entitled *Envy*. Among the pictures of his closing years were the admired "Battlepiece" now in the Louvre, painted in the short space of forty days, full of long-drawn carnage, with ships burning in the offing; "Pythagoras and the Fishermen;" the "Oath of Catiline" (Pitti Gallery); and the very celebrated "Saul and the Witch of Endor" (Louvre), which is almost his latest work. He undertook a series of satirical portraits, to be closed by one of himself; but while occupied with this project he was assailed by dropsy, which, after lasting fully half a year, brought his life to a close on the 15th of March 1673. In his last moments he married a Florentine named Lucrezia, who kept his house and had borne him two sons, one of them surviving him, and he died in a contrite frame of mind. He lies buried in the Chiesa degli Angeli, where a portrait of him has been set up. Salvator Rosa, after the hard struggles of his early youth, had always been a successful man, and he left a handsome fortune.

Rosa was indisputably a great leader in that modern tendency of fine art towards the romantic and picturesque which, developing in various directions and by diversified processes, has at last almost totally differentiated modern from olden art. He saw appearances with a new eye, and presented new images of them on his canvases, and deserves therefore all the credit due to a vigorous innovator, even if we contest the absolute value of his product. He himself courted reputation for his historical works, laying comparatively little stress on his landscapes; in portraits he was forcible. In chiaroscuro he is simple and effective; his design has energy and a certain grandeur, without any high type of form or any superior measure of correctness. His colour is too constantly of a sandy or yellowish-grey tone. Personally he was a man of high spirit, and he sold his pictures at large prices, more (it is said) to assert the honour of his art than from love of money; rather than sell them cheap he destroyed them. In his later Florentine period he etched several of his works, subjects of mythology, soldiering, &c. He was choleric, but kind and generous. Though a man of gaiety and pleasure, and a jovial boon companion, he does not appear to have been vicious in any serious degree. He was talkative, very sharp-tongued and an unblushing encomiast of his own performances. Among his pictures not already mentioned we may name, in the National

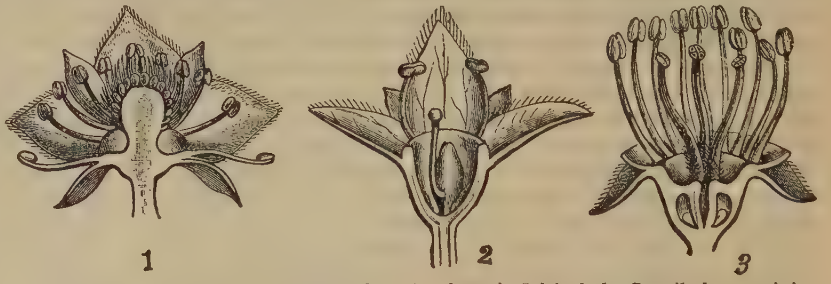
Gallery, London, "Mercury and the Dishonest Woodman," and three others; in Raynham Hall, "Belisarius"; in the Grosvenor Gallery, "Diogenes"; in the Pitti Gallery, a grand portrait of a man in armour, and the "Temptation of St Anthony," which contains his own portrait. This last subject appears also in St Petersburg, and in the Berlin Gallery.

The satires of Salvator Rosa deserve more attention than they have generally received. There are, however, two recent books taking account of them—by Cesareo, 1892, and Cartelli, 1899. The satires, though considerably spread abroad during his lifetime, were not published until 1719. They are all in terza rima, written without much literary correctness, but remarkably spirited, pointed and even brilliant. They are slashingly denunciatory, and from this point of view too monotonous in treatment. Rosa here appears as a very severe castigator of all ranks and conditions of men, not sparing the highest, and as a champion of the poor and down-trodden, and of moral virtue and Catholic faith. It seems odd that a man who took so free a part in the pleasures and diversions of life should be so ruthless to the ministers of these. The satire on *Music* exposes the insolence and profligacy of musicians, and the shame of courts and churches in encouraging them. *Poetry* dwells on the pedantry, imitativeness, adulation, affectation and indecency of poets—also their poverty, and the neglect with which they were treated; and there is a very vigorous sortie against oppressive governors and aristocrats. Tasso's glory is upheld; Dante is spoken of as obsolete, and Ariosto as corrupting. *Painting* inveighs against the pictorial treatment of squalid subjects, such as beggars (though Rosa must surely himself have been partly responsible for this misdirection of the art), against the ignorance and lewdness of painters, and their tricks of trade, and the gross indecorum of painting sprawling half-naked saints of both sexes. *War* (which contains the eulogy of Masaniello) derides the folly of hireling soldiers, who fight and perish while kings stay at home; the vile morals of kings and lords, heresy and unbelief also come in for a flagellation. In *Babylon* Rosa represents himself as a fisherman, Tirreno, constantly unlucky in his net-hauls on the Euphrates; he converses with a native of the country, Ergasto. Babylon (Rome) is very severely treated, and Naples much the same. *Envy* (the last of the satires, and generally accounted the best, although without strong apparent reason) represents Rosa dreaming that, as he is about to inscribe in all modesty his name upon the threshold of the temple of glory, the goddess or fiend of Envy obstructs him, and a long interchange of reciprocal objurgations ensues. Here occurs the highly charged portrait of the chief Roman detractor of Salvator (we are not aware that he has ever been identified by name); and the painter protests that he would never condescend to do any of the lascivious work in painting so shamefully in vogue.

As authorities for the life of Salvator Rosa, Passeri, *Vite de' Pittori*, may be consulted, and Salvini, *Satire e Vita di Salvator Rosa*; also Baldinucci and Dominici. The *Life* by Lady Morgan is a romantic treatment, mingling tradition or mere fiction with fact. The novel, *A Company of Death*, by Albert Cotton, 1904, gives an interesting picture of Salvator Rosa at Naples. (W. M. R.)

ROSACEAE, in botany, a large cosmopolitan family of seed-bearing plants belonging to the subclass Polypetalae of Dicotyledons and containing about 90 genera with 2000 species. The plants vary widely in manner of growth. Many are herbaceous, growing erect, as *Geum*, or with slender creeping stem, as in species of *Potentilla*, sometimes sending out long runners, as in strawberry; others are shrubby, as raspberry, often associated with a scrambling habit, as in the brambles and roses, while apple, cherry, pear, plum and other British fruit trees represent the arborescent habit. Vegetative propagation takes place by means of runners, which root at the apex and form a new plant, as in strawberry; by suckers springing from the base of the shoot and rising to form new leafy shoots after running for some distance beneath the soil, as in raspberry; or by shoots produced from the roots, as in cherry or plum. The scrambling of the brambles and roses is effected by means of prickles on the branches and leaf-stalks.

The leaves, which are arranged alternately, are simple, as in apple, cherry, &c., but more often compound, with leaflets palmately arranged, as in strawberry and species of *Potentilla*, or pinnately arranged, as in the brambles, roses, mountain ash, &c. A difference in this respect often occurs in one and the same genus, as in *Pyrus*, where apple (*P. Malus*), and pear (*P. communis*) have simple leaves, whereas mountain ash or rowan (*P. aucuparia*) has pinnately compound leaves. In warm climates the leaves are often leathery and evergreen. The leaves are stipulate, the stipules being sometimes small and shortlived, as in *Pyrus* and *Prunus* (cherry, plum, &c.), or more important structures adnate to the base of the leaf-stalk, as in roses, brambles, &c. The flowers, which are regular, generally bisexual, and often showy, are sometimes borne singly, as in some species of rose, or of the cloudberry (*Rubus chamaemorus*), or few or more together in a corymbose manner, as in some roses, hawthorn and others. The inflorescence in agrimony is a raceme, in *Poterium* a dense-flowered spike, in *Spiraea* a number of cymes arranged in a corymb. The parts of the flowers are arranged on a 5-merous plan, with generally considerable increase in the number of stamens and carpels. The shape of the thalamus or floral receptacle, and the relative position and number of the stamens and carpels and the character of the fruit, vary widely and form distinguishing features of the different suborders, six of which may be recognized.



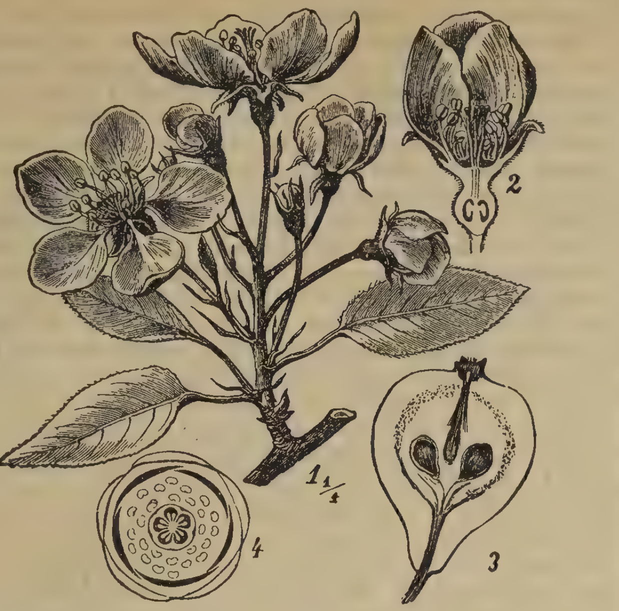
After Focke in *Natürl. Pflanzenfamilien*, from Strasburger's *Lehrbuch der Botanik*, by permission of Gustav Fischer.

FIG. 1.—Three flowers cut through longitudinally to show different forms of receptacles in the *Rosaceae*: 1, *Comarum palustre*; 2, *Alchemilla alpina*; 3, *Pyrus Malus*.

Suborder I. Spiraeoideae is characterized by a flat or slightly concave receptacle on which the carpels, frequently five in number, form a central whorl; each ovary contains several ovules, and the fruit is a follicle. There are five sepals, five petals and the stamens vary from ten to indefinite. The plants are generally shrubs with simple or compound leaves and racemes or panicles of numerous small white, rose or purple flowers. This suborder, which is nearly allied to the order Saxifragaceae, contains 17 genera, chiefly north temperate in distribution. The largest is *Spiraea*, numerous species of which are cultivated in gardens; *S. salicifolia* occurs in Britain apparently wild in plantations, but is not indigenous. The native British meadow-sweet (*S. Ulmaria*) and dropwort (*S. Filipendula*) have been placed in a separate genus, *Ulmaria*, and included in the Rosoideae on account of their one-seeded fruit. *Quillaja saponaria* is the Chilean soap tree; the bark contains saponin.

Suborder II. Pomoideae is characterized by a deep cup-shaped receptacle with the inner wall of which the five or fewer carpels are united (fig. 1, 3); the carpels are also united with each other, and each contains generally two ovules. The fruit is made up of the large fleshy receptacle surrounding the ripe ovaries, the endocarp of which is leathery or stony and contains one seed. The plants are shrubs or trees with simple or pinnately compound leaves and white or rose-coloured often showy flowers, with five sepals and petals and indefinite stamens. The 14 genera are distributed through the north temperate zone, extending southwards in the New World to the Andes of Peru and Chile. The largest genus, *Pyrus*, with about 50 species, includes apple (*P. Malus*), pear (*P. communis*) (fig. 2), wild service (*P. torminalis*), rowan or mountain-ash (*P. aucuparia*), and white beam (*P. Aria*). *Mespilus* (medlar) and *Cotoneaster* are also included. (See separate articles for most of the above.)

Suborder III. Rosoideae is characterized by the receptacle being convex and swollen (fig. 1, 1), as in strawberry, or cup-shaped, as in rose (fig. 4), and bearing numerous carpels, each of which contains one or two ovules, while the fruit is one-seeded and indehiscent. The 39 genera are grouped in tribes according to the form of the receptacle and of the fruit. The Potentilleae bear the carpels on a large, rounded or convex outgrowth of the receptacle. In the large genus *Rubus* (fig. 3) the ripe ovaries form drupels upon the dry receptacle; the genus is almost cosmopolitan, but the majority of species occur in the forest region of the north temperate zone and in the mountains of tropical America. *R. fruticosus* is blackberry, *R. Idaeus*, raspberry, and *R. Chamaemorus*, cloudberry. In the flower of *Potentilla*, *Fragaria* (strawberry) and a few allied genera an *epicalyx* is formed by stipular structures arising at the base of the sepals. The fruits consist of numerous dry achenes borne in *Fragaria* on the much-enlarged succulent torus, which in the other genera is dry. In *Geum* (avens) and *Dryas* (an arctic and alpine genus) the style is persistent in the fruit, forming a feathery appendage (*Dryas*) or a barbed awn (avens), either of which is of service in distributing the fruit. The Potentilleae are chiefly north temperate, arctic and alpine plants.



After Wossidlo, from Strasburger's *Lehrbuch der Botanik*, by permission of Gustav Fischer.

FIG. 2.—*Pyrus communis* (pear). 1, flowering branch; 2, a flower cut through longitudinally; 3, longitudinal section of fruit; 4, floral diagram.

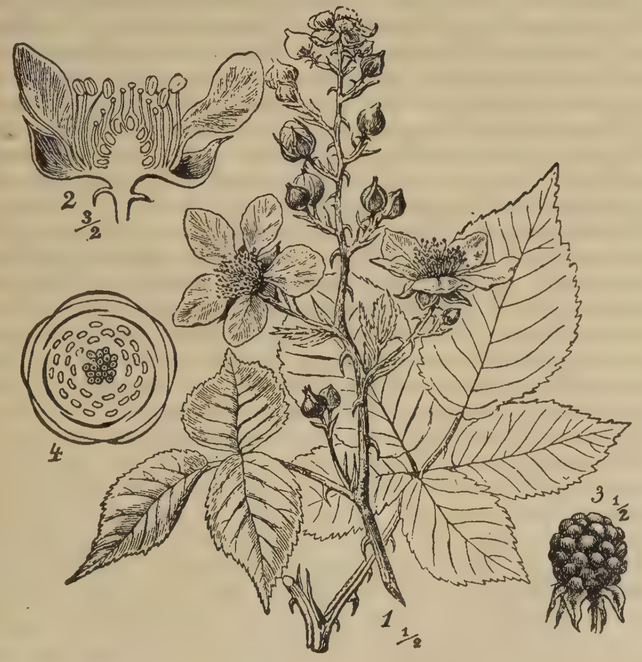


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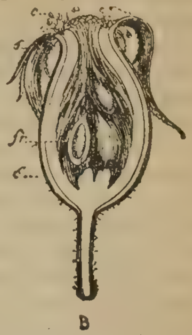
FIG. 3.—*Rubus fruticosus* (blackberry). flowering branch; 2, longitudinal section of a flower; 3, fruit; 4, floral diagram.

The Roseae comprise the large genus *Rosa*, characterized by a more or less urn-shaped torus (fig. 4) enclosing the numerous carpels which form dry one-seeded fruits enveloped in the bright-coloured fleshy torus. The numerous stamens surround the mouth of the torus. The plants are shrubs bearing prickles on the stems and leaves; many species have a scrambling habit resembling the brambles. The species of *Rosa*, like those of *Rubus*, are extremely variable, and a great number of subspecies, varieties and forms have been described. The Sanguisorbeae are a reduced form of Rosoideae. The dry one-seeded fruit is enclosed in the urn-shaped torus, which, however, is dry and inconspicuous, and the number of carpels is much reduced, sometimes to one (figs. 2, 5, 6). Petals are often wanting, as in *Alchemilla* (lady's mantle) and *Poterium*, and the flowers are often unisexual and frequently wind-pollinated, as in salad burnet (*Poterium Sanguisorba*), where the small flowers are crowded in heads, the upper pistillate, with protruding feathery stigmas, and the lower staminate (or bisexual), with exserted stamens. *Agrimonia* (agrimony) has a long spike of small honeyless flowers with yellow petals; in the fruit the torus becomes hard and crowned by hooked bristles which ensure the distribution of the enclosed achenes.



After Duchartre, from Strasburger's *Lehrbuch der Botanik*, by permission of Gustav Fischer.

FIG. 4.—Fruit of Rose, consisting of the fleshy hollowed axis, *s'*, the persistent sepals *s*, and the carpels *fr*. The stamens *e* have withered.

Suborder IV. Neuradoideae contains only two genera of desert-inhabiting herbs with yellow flowers; and the five to ten carpels are united together and with the base of the cup-shaped torus, which enlarges to form a dry covering round the one-seeded fruits.

Suborder V. Prunoideae (fig. 7) is characterized by a free solitary carpel with a terminal style and two pendulous ovules, and the fruit a one-seeded drupe. The torus forms a cup from the edge of which spring the five sepals, five alternating petals and the ten to indefinite stamens. The plants are deciduous or evergreen trees or shrubs with simple leaves, often with small caducous stipules, and racemes or umbels of generally showy, white or pink flowers. There are five genera, the chief of which is *Prunus*, to which belong the plum (*Prunus communis*), with several well-marked subspecies—*P. spinosa* (sloe or blackthorn), *P. insititia* (bullace), *P. domestica* (wild plum), the almond (*P. Amygdalus*), with the nearly allied peach (*P. persica*), cherry (*P. Cerasus*), birdcherry (*P. Padus*) and cherry laurel (*P. Laurocerasus*). The tribe is distributed through the north temperate zone, passing into the tropics.

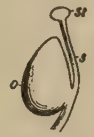


FIG. 5.—Carpel of Lady's Mantle (*Alchemilla*) with lateral style *s*; *o*, ovary; *st*, stigma, enlarged.

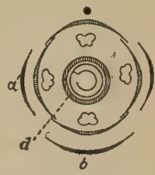
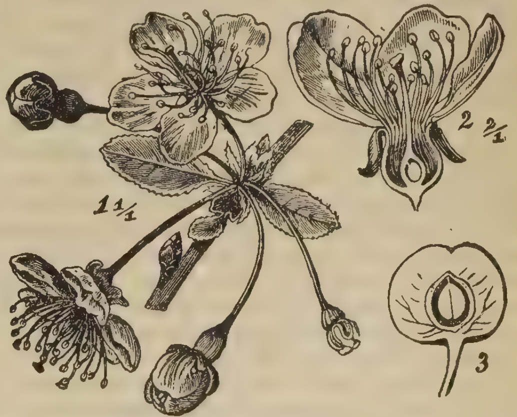


FIG. 6.—Floral Diagram of *Sanguisorba*. *b*, bract; α', β', bracteoles; *d*, disk.



After Wossidlo from Strasburger's *Lehrbuch der Botanik*, by permission of Gustav Fischer.

FIG. 7.—*Prunus Cerasus*. 1, flowering branch; 2, a flower cut through longitudinally; 3, fruit in longitudinal section.

Suborder VI. Chrysobalanoideae resembles the last in having a single free carpel and the fruit a drupe, but differs in having the style basal, not terminal, and the ovules ascending, not pendulous; the flowers are also frequently zygomorphic. The 12 genera are tropical evergreen trees or shrubs, the great majority being South American. The zygomorphic flowers indicate an affinity with the closely allied order Leguminosae.

ROSAMOND, known as "The Fair" (d. *c.* 1176), mistress of Henry II., king of England, is believed to have been the daughter of Walter de Clifford of the family of Fitz-Ponce. The evidence for the paternity is, however, only an entry of a statement made by the jurors of the manor of Corfham in a Hundred Roll of the second year of the reign of Edward I. (1274), great grandson of Henry II. Rosamond is said to have been Henry's mistress secretly for several years, but was openly acknowledged by him only when he imprisoned his wife Eleanor of Acquitaine as a punishment for her encouragement of her sons in the rebellion of 1173–74. She died in or about 1176, and was buried in the nunnery church of Godstow before the high altar. The body was removed by order of St Hugh, bishop of Lincoln, in 1191, and was, seemingly, reinterred in the chapter house. The story that she was poisoned by Queen Eleanor first appears in the French Chronicle of London in the 14th century. The romantic details of the labyrinth at Woodstock, and the clue which guided King Henry II. to her bower, were the inventions of story-writers of later times. There is no evidence for the belief that she was the mother of Henry's natural son William Longsword, earl of Salisbury.

ROSARIO, a city and river port of Argentina, in the province of Santa Fé, on the W. bank of the Paraná, 186 m. by rail N.W. of Buenos Aires. Pop. (1904, estimate) 120,000. It is accessible to ocean-going steamers of medium draught. The city stands on the eastern margin of the great pampean plain, 65 to 75 ft. above the wide river-bed washed out by the Paraná. It extends back a considerable distance from the river, and there are country residences and gardens of the better class along the line of the Central Argentine railway and northward toward San Lorenzo. The city is laid out with chessboard regularity, and the streets are paved (in great part with cobblestones), lighted with gas and electricity, traversed by tramway lines, and provided with sewers and water mains. The Boulevard El Santafecino is an attractive residence street with double driveways separated by a strip of garden and bordered by fine shade trees. The chief edifices of an official character are the custom house, post office, municipal hall and law courts. There is a large charity hospital, and the English and German colonies maintain a well-equipped infirmary. The largest sugar refinery in Argentina is here, and there are flour-mills, breweries and some smaller manufactures. The city is chiefly commercial, being the shipping port for a large part of northern Argentina, among its exports being wheat, flour, baled hay, linseed, Indian corn, sugar, rum, cattle, hides, meats, wool, quebracho extract, &c. The railway connexions are good, including the Buenos Aires and Rosario and the Central Argentine lines to the national capital, the Buenos Aires and Rosario line northward to Tucuman, where it connects with the government line to Salta, Jujuy and the Bolivian frontier, the Central Argentine line westward to Cordoba, with connexions at Villa Maria for Mendoza and the Chilean frontier, and two narrow-gauge lines, one running to Santa Fé and the other to Cordoba. The port of Rosario has hitherto consisted of a deep river anchorage and wooden wharves on the lower bank for the accommodation of steamers. Since 1902 work has been in progress under a contract with a French company for the construction of 12,697 ft. of quays, 23 m. of railway tracks along the quays to connect with the several railways entering the city, drawbridges, roadways, sheds, depots, elevator, offices, electric plant, fixed and movable cranes, and other appliances, &c., for the handling of produce and merchandise. The trade of the port was officially valued at 21,276,672 Arg. gold dollars imports, and 68,503,231 gold dollars exports in 1905.

Rosario was founded in 1730 by Francisco Godoy, but it grew so slowly that it was still a small village up to the middle of the 19th century. In 1854 General Justo José de Urquiza, then at the head of the Argentine Confederation, made it the port of the ten inland provinces then at war with Buenos Aires, and in 1857 imposed differential duties on the cargoes of vessels first breaking bulk at the southern port. This gave Rosario a start, and its trade and population have grown since then with great rapidity.

ROSARY (Lat. *rosarium*), a popular devotion of the Roman Catholic Church, consisting of 15 Paternosters and Glorias and 150 Aves, recited on beads. It is divided into three parts, each containing five decades, a decade comprising 1 Pater, 10 Aves and a Gloria, in addition to a subject for meditation selected from the "mysteries" of the life of Christ and of the Blessed Virgin. The Christian practice of repeating prayers is traceable to early times: Sozomen mentions (*H.E.* v. 29) the hermit Paul of the 4th century who threw away a pebble as he recited each of his 300 daily prayers; and a canon of the English synod of Cealcythe in 816 (Mansi xiv. 360) directed *septem beltidum Paternoster* to be said for a deceased bishop. In many orders the lay brothers daily said a large number of Paternosters instead of reading the breviary; it was natural that the Paternoster should be the prayer most often repeated. The Ave Maria is first mentioned as a form of prayer in the second half of the 11th century, but it was not until the 16th century that it became general in its present form. It is not known precisely when the mechanical device of the rosary was first used. William of Malmesbury (*De gest. pont. Angl.* iv. 4) says that Godiva, who founded a religious house at Coventry in 1040, left a string of jewels, on which she had told her prayers, that it might be hung on the statue of the Blessed Virgin. Thomas of Chantimpré, who wrote about the middle of the 13th century, first mentions the word "rosary" (*De apibus*, ii. 13), using it apparently in a mystical sense as Mary's rose-garden. There is no contemporary confirmation of the story that the rosary was given to St Dominic through revelation of the Blessed Virgin and was employed during the crusade against the Albigenses, although the story was later accepted by Leo X., Pius V., Gregory XIII., Sixtus V., Alexander VII., Innocent XI. and Clement XI. According to Benedict XIV. (*De Fest.* 160), the belief rests on the tradition of the Dominican order. Whatever may have been the origin of the rosary, the Dominicans did much to propagate the devotion. The practice of meditating on the mysteries doubtless began with a Dominican, Alanus de Rupe (born 1428), and another Dominican, Jacob Sprenger (d. 1495), grand-inquisitor in Germany, founded the first confraternity of the rosary at Cologne in 1475. This society spread rapidly, and was specially privileged by Sixtus IV., Innocent VIII. and Leo. X. After the battle of Lepanto (1st Sunday in October 1571), which was won while the members of the confraternity at Rome were making supplication for Christian success, Pius V. ordered an annual commemoration of "St Mary of Victory," and Gregory XIII., by bull of the 1st of April 1583, set aside the 1st Sunday in October as the feast of the Rosary of the Blessed Virgin Mary, to be observed in such churches as maintained an altar in honour of the rosary. Clement XI., by bull of the 3rd of October 1716, directed the observance of the feast by all Christendom. The devotion has been particularly fostered by the Jesuits, St Ignatius Loyola having expressly ordered its use. It has been repeatedly indulgenced by various popes. Leo XIII. issued eight encyclicals on the devotion; he urged its recitation throughout October, and directed (1883) the insertion of the title *regina sacratissimi rosarii* in the Litany. There are several varieties of the rosary more or less in use by Roman Catholics: the Passionists, or rosary of the five wounds, approved by Leo XII. in 1823; the Crown of Our Lord, attributed to Michael of Florence, a Camaldolese monk (*c.* 1516), and consisting of 33 Paters, 5 Aves and a Credo; St Bridget's, 7 Paters and 63 Aves, in honour of the joys and sorrows of the Blessed Virgin and the 63 years of her life. The Living Rosary, in which 15 persons unite to say the rosary every month, was approved by Gregory XVI. (1832) and placed in charge of the Dominican order by Pius IX. (1877).

Similar expedients to assist the memory in repetitions of prayers occur among Buddhists and Mahommedans: in the former case the prayers are said on a string of some hundred beads, called the *tibet-pren-ba* or the *ten-wa*; in the latter case, the so-called *tasbih* has 33, 66 or 99 beads, and is used for the repetition of the 99 names which express the attributes of God.

See the critical dissertation in the *Acta sanctorum, Aug.* 1, 422 sqq.; Quetif and Echard, *Script. Ord. Praed.* i. 411 sqq.; Benedict XIV olim Prospero de Lambertini, *De festis B.V.M.* i. 170 sqq.; H. Holzapfel, O.F.M., *St Dominikus u. der Rosenkranz* (Munich, 1903); Pradel, *Rosenkranz-Büchel* (Trier, 1885); D. Dahm, *Die Bruderschaft vom hl. Rosenkranz* (Trier, 1902). For the indulgences attached to the devotion consult Beringer, S.J., *Die Ablässe*, 11th ed. 292 ff., 354 ff. (Paderborn, 1895). For the corresponding devotion among Buddhists, consult Waddell, *The Buddhism of Tibet, or Lamaism* (London, 1895), and an article by Monier Williams in the *Athenaeum*, 9th of Feb. 1878; for that of the Mahommedans, see L Petit, *Les Confrères musulmanes* (Paris, 1899), and E. Arnold, *Pearls of the Faith, or Islam's Rosary* (London, 1882). There is an excellent article, "Rosenkranz," by Zöckler in Herzog-Hauck, *Realencyklopädie*, 3rd ed. vol. 17, pp. 144–50. (C. H. Ha.)

ROSAS, JUAN MANUEL (1793–1877), tyrant of Buenos Aires, was born on the 30th of March 1793, in the city of that name. His father, Leon Ortiz de Rosas, was an owner of cattle runs (*estancias*) and a trader in hides, who took an active part in defeating the English attack on the city in 1807. Juan Rosas received so little education that he had to learn to read and write when he was already a married man and a successful cattle breeder. From a very early age he was left in charge of one of his father's establishments. When he was eighteen he married Maria de la Encarnacion Escurra. His mother having suspected him of appropriating money, he left his parents, and for some time subsisted by working as a *vaquero* or cowboy, and then as overseer on the estates of other owners; but he accumulated money, and by the help of a loan from a friend he became possessed of a cattle run of his own, Los Cerrillos. The anarchical state of the country since its independence of Spain had favoured the Indians, who had taken the offensive and raided up to within forty miles of Buenos Aires. Rosas obtained leave to arm his cowboys. Under his management Los Cerrillos became a refuge for adventurers, whom he paid and fed well, but from whom he exacted implicit obedience. His followers became a fighting force of acknowledged efficiency, and Rosas took practically the position of an independent ruler whose help was sought by contending political parties. By attending to his own interest only, and by astute intrigue, or savage fighting when necessary, he grew in power from 1820 onwards, and from 1835 to 1852 ruled as dictator (see ARGENTINA). It is probable that he would have continued to govern in Buenos Aires till his death if his ambition had not led him into wars with all his neighbours. He wished to extend the authority of the Republic over all the territory which had belonged to the Spanish viceroyalty of Buenos. This led him directly into wars with Uruguay, Paraguay and Chile, and into "warlike operations" with England and France, with whom he had other causes of quarrel arising out of the complaints of traders and bondholders. His government was overthrown in 1852 by a coalition of his neighbours and the defection of several of his generals, and even members of his own family who lived in fear of his suspicions and violence. He took refuge in England, and lived at Swaythling, near Southampton, till his death on the 14th of March 1877. A portrait taken in 1834 and reproduced by Sir Woodbine Parish in his *Buenos Ayres and Provinces of the Rio de la Plata* (London, 1852) represents Rosas as a fine-looking man of the handsome Spanish type.

See O. Martens, *Ein Caligula unseres Jahrhunderts* (Berlin, 1896), which contains a full bibliography.

ROSCELLINUS (RUCELINUS, or ROUSSELIN) (*c.* 1050–*c.* 1122), often called the founder of Nominalism (see SCHOLASTICISM), was born at Compiègne (Compendium). Little is known of his life, and our knowledge of his doctrines is mainly derived from Anselm, Abelard and John of Salisbury. He studied at Soissons and Reims, was afterwards attached to the cathedral of Chartres, and became canon of Compiègne. It seems most probable that Roscellinus was not strictly the first to promulgate nominalistic doctrines; but in his exposition they received more definite expression, and, being applied to the dogma of the Trinity, attracted universal attention. Roscellinus maintained that it is merely a habit of speech which prevents our speaking of the three persons as three substances or three Gods. If it were otherwise, and the three persons were really one substance or thing (*una res*), we should be forced to admit that the Father and the Holy Spirit became incarnate along with the Son. Roscellinus seems to have put forward this doctrine in perfect good faith, and to have claimed for it at first the authority of Lanfranc and Anselm. In 1092, however, a council convoked by the archbishop of Reims condemned his interpretation, and Roscellinus, who was in danger of being stoned to death by the orthodox populace, recanted his error. He fled to England, but having made himself unpopular by an attack on the doctrines of Anselm, he left the country and repaired to Rome, where he was well received and became reconciled to the Church. He then returned to France, taught at Tours and Loc-menach (Loches) in Brittany (where he had Abelard as a pupil), and finally became canon of Besançon. He is heard of as late as 1121, when he came forward to oppose Abelard's views on the Trinity.

Of the writings of Roscellinus, nothing is preserved except a letter to Abelard, mainly concerned with the doctrine of the Trinity (ed. J. A. Schmeller, Munich, 1850). See F. Picaret, *Rosselin, philosophe et théologien* (1896), and authorities quoted under SCHOLASTICISM.

ROSCHER, WILHELM GEORG FRIEDRICH (1817–1894), German economist, was born at Hanover on the 21st of October 1817. He studied at Göttingen and Berlin, and obtained a professorship at Göttingen in 1844 and subsequently at Leipzig in 1848. Omitting preparatory indications and undeveloped germs of doctrine, the origin of the "historical" school of political economy may be traced to Roscher. Its fundamental principles are dated, though with some hesitation, and with an unfortunate contrast of the historical with the philosophical method, in his *Grundriss zu Vorlesungen über die Staatswirthschaft nach geschichtlicher Methode* (1843). This short study was afterwards expanded into his great *System der Volkswirthschaft*, published in five volumes between 1854 and 1894, and arranged as follows: vol. i., *Die Grundlagen der Nationalökonomie*, 1854 (trans. by J. J. Lalor, *Principles of Political Economy*, Chicago, 1878); vol. ii., *Die Nationalökonomie des Ackerbaues und der verwandten Urproduktionszweige*, 1859; vol. iii., *Die Nationalökonomie des Handels und Gewerbfleisses*, 1881; vol. iv., *System der Finanzwissenschaft*, 1886; vol. v., *System der Armenpflege und Armenpolitik*, 1894. His *Geschichte der Nationalökonomie in Deutschland* (1874) is a monumental work. He also published in 1842 an excellent commentary on the life and works of Thucydides. He died at Leipzig on the 4th of June 1894.

See T. Roscher, *Zur Geschichte der Familie Roscher in Niedersachsen* (Hanover, 1892); Brasch, *Wilhelm Roscher und die sozialwissenschaftlichen Strömungen der Gegenwart* (Leipzig, 1895).

ROSCIUS GALLUS, QUINTUS (*c.* 126–62 B.C.), Roman actor, was born, a slave, at Solonium, near Lanuvium. Endowed with a handsome face and manly figure, he studied the delivery and gestures of the most distinguished advocates in the Forum, especially Q. Hortensius, and won universal praise for his grace and elegance on the stage. He especially excelled in comedy. Cicero took lessons from him. The two often engaged in friendly rivalry to try whether the orator or the actor could express a thought or emotion with the greater effect, and Roscius wrote a treatise in which he compared acting and oratory. Q. Lutatius Catulus composed a quatrain in his honour, and the dictator Sulla presented him with a gold ring, the badge of the equestrian order, a remarkable distinction for an actor in Rome, where the profession was held in contempt. Like his contemporary Aesopus, Roscius amassed a large fortune, and he appears to have retired from the stage some time before his death. In 76 B.C. he was sued by C. Fannius Chaerea for 50,000 sesterces (about £400), and was defended by Cicero in a famous speech.

See H. H. Pflüger, *Cicero's Rede pro Q. Roscio Comoedo* (1904).

ROSCOE, SIR HENRY ENFIELD (1833–   ), English chemist, was born in London on the 7th of January 1833. After studying at Liverpool High School and University College, London, he went to Heidelberg to work under R. W. Bunsen, of whom he became a lifelong friend. In 1857 he was appointed to the chair of chemistry at Owens College, Manchester, where he remained for thirty years, and from 1885 to 1895 he was M.P. for the south division of Manchester. He served on several royal commissions appointed to consider educational questions, in which he was keenly interested, and from 1896 to 1902 was vice-chancellor of London University. He was knighted in 1884. His scientific work includes a memorable series of researches carried out with Bunsen between 1855 and 1862, in which they laid the foundations of comparative photochemistry. In 1867 he began an elaborate investigation of vanadium and its compounds, and devised a process for preparing it pure in the metallic state, at the same time showing that the substance which had previously passed for the metal was contaminated with oxygen and nitrogen. He was also the author of researches on niobium, tungsten, uranium, perchloric acid, the solubility of ammonia, &c. His publications include, besides several elementary books on chemistry which have had a wide circulation and been translated into many foreign languages, *Lectures on Spectrum Analysis* (1869); a *Treatise on Chemistry* (the first edition of which appeared in 1877–1892); *A New View of Dalton's Atomic Theory*, with Dr A. Harden (1896); and an *Autobiography* (1906). The *Treatise on Chemistry*, written in collaboration with Carl Schorlemmer (1834–1892), who was appointed his private assistant at Manchester in 1859, official assistant in the laboratory in 1861, and professor of organic chemistry in 1874, is a standard work.

ROSCOE, WILLIAM (1753–1831), English historian and miscellaneous writer, was born on the 8th of March 1753 at Liverpool, where his father, who was a market gardener, kept a publichouse known as the Bowling Green at Mount Pleasant. Roscoe was eager in the acquisition of knowledge, and at twelve he left school, having learned all that his schoolmaster could teach. He now assisted his father in the work of the garden, and gave his leisure hours to reading and study. "This mode of life," he says, "gave health and vigour to my body, and amusement and instruction to my mind; and to this day I well remember the delicious sleep which succeeded my labours, from which I was again called at an early hour. If I were now asked whom I consider to be the happiest of the human race, I should answer, those who cultivate the earth by their own hands." At fifteen it was necessary to decide upon a path in life. A month's trial of bookselling sufficed to disgust him, and in 1769 he was articled to a solicitor. Although a diligent student of law, he did not bid farewell to the Muses, but continued to read the classics, and made that acquaintance with the language and literature of Italy which became the instrument of his distinction in after life. He wrote many verses: his *Mount Pleasant* was composed when he was sixteen, and this and other verses, though now forgotten, won the esteem of good critics. In 1774 he commenced business as an attorney, and as soon as his professional gains warranted he married (1781) Jane, second daughter of William Griffies, a Liverpool tradesman, and had seven sons and three daughters. He had the courage to denounce the African slave trade in his native town, where not a little of the wealth came from this source. He wrote the *Wrongs of Africa* (1787–1788), and entered into a controversy with an ex-Roman Catholic priest, who undertook to prove the "licitness of the slave trade" from the Bible. Roscoe was also a political pamphleteer, and like many other Liberals of the day hailed the promise of liberty in the French Revolution.

Meanwhile he had steadily pursued his Italian studies, and had made extensive collections relating to the great ruler of Florence. The result was his *Life of Lorenzo de' Medici*, which appeared in 1796, and at once placed him in the front rank of contemporary historians. The work has often been reprinted, and translations in French, German and other languages show that its popularity was not confined to its author's native land. Perhaps the most gratifying testimony was that of Fabroni, who had intended to translate his own Latin life of Lorenzo, but abandoned the design and induced Gaetano Mecherini to undertake an Italian version of Roscoe. In 1796 Roscoe gave up practice as an attorney, and had some thought of going to the bar, but relinquished the idea after keeping a single term. Between 1793 and 1800 he paid much attention to agriculture, and helped to reclaim Chat Moss, near Manchester. He also succeeded in restoring to good order the affairs of a banking house in which his friend William Clark, then resident in Italy, was a partner. This task led to his introduction to the business, which eventually proved disastrous. His translation of Tansillo's *Nurse* appeared in 1798, and went through several editions. It is dedicated in a sonnet to his wife, who had practised the precepts of the Italian poet.

The Life and Pontificate of Leo the Tenth appeared in 1805, and was a natural sequel to that by which he had made his reputation. The work, whilst it maintained its author's fame, did not, on the whole, meet with so favourable a reception as the *Life of Lorenzo*. It has been frequently reprinted, and the insertion of the Italian translation in the *Index* did not prevent its circulation even in the papal states. Roscoe was elected member of parliament for Liverpool in 1806, but the House of Commons was not a congenial place, and at the dissolution in the following year he declined to be again a candidate. The commercial troubles of 1816 brought into difficulties the banking house with which he was connected, and forced the sale of his collection of books and pictures. It was on this occasion that he wrote the fine "Sonnet on Parting with his Books." Dr S. H. Spiker, the king of Prussia's librarian, gives an interesting account of a visit to Roscoe at this period of trouble. Roscoe said he still desired to write a biography of Erasmus but "wanted both leisure and youth." This project was not executed (Spiker's *Travels through England*, &c., 1816). After a five years' struggle to discharge the liabilities of the bank, the action of a small number of creditors forced the partners into bankruptcy in 1820. For a time Roscoe was in danger of arrest, but ultimately he received honourable discharge. On the dispersal of his library, the volumes most useful to him were secured by friends and placed in the Liverpool Athenaeum. The sum of £2500 was also invested for his benefit. The independent and sensitive nature of Roscoe made both these operations difficult. Having now resigned commercial pursuits entirely, he found a pleasant task in the arrangement of the great library at Holkham, the property of his friend Coke. In 1822 he issued an appendix of illustrations to his *Lorenzo* and also a *Memoir of Richard Robert Jones of Aberdaron*, a remarkable self-taught linguist. The year 1824 was memorable for the death of his wife and the publication of his edition of the works of Pope, which involved him in a controversy with Bowles. His versatility was shown by the appearance of a folio monograph on the *Monandrian Plants*, which was published in 1828. It appeared first in numbers, and the last part came out after his recovery from a paralytic attack. He died on the 30th of June 1831.

Roscoe's character was a fine one. Under circumstances uncongenial and discouraging he steadfastly maintained the ideal of the intellectual life. Sensitive and conscientious, he sacrificed his possessions to a punctilious sense of duty. He had the courage of unpopular opinions, and, whilst promoting every good object in his native town, did not hesitate to speak out where plain dealing, as in the matter of slavery, was required. He was a sincere friend and exemplary in his domestic relations. Posterity is not likely to endorse the verdict of Horace Walpole, who thought Roscoe "by far the best of our historians," but in spite of newer lights and of some changes of fashion in the world of letters, his books on Lorenzo de' Medici and Leo X. remain important contributions to historical literature.

In addition to the writings already named, Roscoe wrote tracts on penal jurisprudence, and contributed to the *Transactions* of the Royal Society of Literature and of the Linnean Society. The first collected edition of his *Poetical Works* was published in 1857, and is sadly incomplete, omitting, with other verses known to be from his pen, the *Butterfly's Ball*, a fantasy, which has charmed thousands of children since it appeared in 1807. Other verses are in *Poems for Youth, by a Family Circle* (1820).

The *Life* by his son Henry Roscoe (2 vols., London, 1833) contains full details of Roscoe's career, and there are references to him in the *Autobiographical Sketches* of De Quincey, and in Washington Irving's *Sketch Book*. (W. E. A. A.)

ROSCOFF, a maritime town and watering-place of north-western France, in the department of Finistère, on the English Channel, 17½ m. N.N.W. of Morlaix by rail. Pop. (1906) town, 1984; commune, 5054. Roscoff, separated from the Ile de Batz by a narrow channel, has a tidal port used by fishing and coasting vessels. Many of the inhabitants are engaged in the cultivation of early vegetables, to the growth of which the mild climate and fertile soil is eminently favourable. The church of Roscoff (16th century) has a fine Renaissance tower and contains interesting alabaster bas-reliefs. The ruined chapel of St Ninian commemorates the landing at Roscoff in 1548 of Mary Stuart, previous to her betrothal with the dauphin, son of Henry II. In 1746 Charles Edward, the young Pretender, landed at the port after his defeat at Culloden.

ROSCOMMON, WENTWORTH DILLON, 4TH EARL OF (*c.* 1630–1685), English poet, was born in Ireland about 1630. He was a nephew of Thomas Wentworth, earl of Strafford, and was educated partly under a tutor at his uncle's seat in Yorkshire, partly at Caen in Normandy and partly at Rome. After the Restoration he returned to England, and was well received at court. In 1649 he had succeeded to the earldom of Roscommon, which had been created in 1622 for his great-grandfather, James Dillon; and he was now put in possession by act of parliament of all the lands possessed by his family before the Civil War. As captain of the Gentleman Pensioners he found abundant opportunity to indulge the love of gambling, which appears to have been his only vice. Disputes with the Lord Privy Seal about his Irish estates necessitated his presence in Ireland, where he gave proof of some business capacity. On his return to London he was made master of the horse to the duchess of York. He was twice married, in 1662 to Lady Frances Boyle, widow of Colonel Francis Courtenay, and in 1674 to Isabella Boynton.

His reputation as a didactic writer and critic rests on his blank verse translation of the *Ars Poetica* (1680) and his *Essay on Translated Verse* (1684). The essay contained the first definite enunciation of the principles of "poetic diction," which were to be fully developed in the reign of Queen Anne. Roscommon, who was fastidious in his notions of "dignified writing," was himself a very correct writer, and quite free from the indecencies of his contemporaries. Alexander Pope, who seems to have learnt something from his carefully balanced phrases and the regular cadence of his verse, says that "In all Charles's days, Roscommon only boasts unspotted bays." He saw clearly that a low code of morals was necessarily followed by a corresponding degradation in literature, and he insists that sincerity and sympathy with the subject in hand are essential qualities in the poet. This elevated conception of his art is in itself no small merit. He has, moreover, the distinction of having been the first critic to avow his admiration for *Paradise Lost*. Roscommon formed a small literary society which he hoped to develop into an academy with authority to formulate rules on language and style, but its influence only extended to a limited circle, and the scheme fell through after its promoter's death. He was buried in Westminster Abbey on the 21st of January 1685.

The title passed to his uncle, Carey Dillon (1627–1689). In 1746, on the death of James, the 8th earl, it passed to Robert Dillon (d. 1770), a descendant of the first earl. His family became extinct in 1816, and in 1828 Michael James Robert Dillon, another descendant of the 1st earl, established his title to the earldom before the House of Lords. When he died in May 1850 it became extinct.

Roscommon's poems were collected in 1701, and are included in Anderson's and other collections of the British poets. He also translated into French from the English of Dr W. Sherlock, *Traitté touchant l'obéissance passive* (1686).

ROSCOMMON, a county of Ireland in the province of Connaught, bounded N.E. by Leitrim, N.W. by Sligo, W. by Mayo, W. and S. by Galway, E. by Longford and E. and S. by Westmeath and King's County. The area is 629,633 acres, or about 985 sq. m. The greater part of the county belongs to the great limestone plain of central Ireland, and is either flat or very slightly undulating. In the north-east, on the Leitrim border, the Braulieve Mountains, consisting of rugged and precipitous ridges with flattened summits, attain an elevation in Cashel Mountain of 1377 ft.; and in the north-west the Curlew Mountains, of similar formation, between Roscommon and Sligo, rise abruptly to a height over 800 ft. In the east the Slievebawn range, formed of sandstone, have a similar elevation. The Shannon with its expansions forms nearly the whole eastern boundary of the county, and on the west the Suck from Mayo forms for over 50 m. the boundary with Galway till it unites with the Shannon at Shannon Bridge. The other tributaries of the Shannon within the county are the Arigna, the Feorish and the Boyle. The lakes formed by expansions of the Shannon on the borders of Co. Roscommon are Loughs Allen, Boderg, Boffin, Forbes and Ree. Of the numerous other lakes within the county the most important are Lough Key in the north, very picturesquely situated with finely wooded banks, and Lough Gara (mostly in Co. Sligo) in the north-west.

In this long county one may travel fifty miles across the Carboniferous Limestone plain, with the grey rock cropping out here and there, and long grass-covered esker-ridges forming the only obstacle to the roads. Lough Ree is a typical lake of the plain. Two inliers of Silurian rocks have been thrust up, forming hills between Lough Ree and Lough Boffin. At Boyle, however, higher Old Red Sandstone country is encountered, and farther north the Millstone Grit and Coal-Measure series cap the mountains almost horizontally at Arigna near Lough Allen. The nodules of clay-ironstone here were formerly smelted, and the seams of bituminous coal, mostly on Millstone Grit horizons, are worked successfully on a high level of the mountains.

The subsoil is principally limestone, but there is some light, sandy soil in the south. In the level parts the land when drained and properly cultivated is very fertile, especially in the district known as the plains of Boyle, which includes some of the richest grazing land in Ireland. Along the banks of the Suck and Shannon there is, however, a large extent of bog and marsh. The proportion of tillage to pasture is roughly as one to three. Oats and potatoes are the principal crops, but the acreage devoted to them decreases; the numbers of cattle, sheep, pigs, goats and poultry, on the other hand, are proportionately large and increasing. Communications are afforded by the Midland Great Western railway, the Sligo line of that system crossing the northern part of the county by Boyle, the Athlone and Mayo line passing from S.E. to N.W. by the towns of Roscommon and Castlerea, and the Athlone and Galway line crossing the southern part.

The population was 116,552 in 1891, and 101,791 in 1901; 97% are Roman Catholics, and nearly the whole population is rural. The chief towns are Boyle, Roscommon, Elphin and Castlerea; and a small portion of Carrick-on-Shannon, including the railway station, is in this county, the major portion being in Co. Leitrim. The county is divided into ten baronies. Ecclesiastically it belongs to the Protestant dioceses of Elphin and Ardagh (united with Kilmore and Tuam), and to the Roman Catholic dioceses of Tuam, Clonfert, Achonry, Elphin and Ardagh. Assizes are held at Roscommon and quarter sessions at Boyle, Strokestown and Roscommon. The county returns two members to parliament. To the Irish parliament before the Union of 1800 two members were returned for the county, and two each for the boroughs of Boyle, Roscommon and Tulsk.

The district was granted by Henry III. to Richard de Burgo, but remained almost wholly in the possession of the native septs. Until the time of Elizabeth Connaught was included in the two districts of Roscommon and Clare, but in 1570 it was further subdivided by Sir Henry Sydney, and was assigned its present limits. All the old proprietors were dispossessed at the Cromwellian settlement, except the O'Conor family headed by the O'Conor Don. The most interesting antiquarian remains within the county are the ruins of Crogan, the ancient palace of the kings of Connaught. The principal ancient castles are the old stronghold of the M'Dermotts on Castle Island, Lough Key, the dismantled castle of the M'Donoughs at Ballinafad, and the extensive fortress at Roscommon rebuilt by John d'Ufford, justiciary of Ireland in 1268. There are fragments of a round tower at Oran. The abbey of Boyle is in remarkably good preservation, and exhibits fine specimens of the Norman arch. The other monastic remains within the county, with the exception of the abbey of Roscommon, are of comparatively small importance. The Irish bard Carolan, who died in 1738, is buried by the ruined church of Kilronan, in the extreme north of the county. The bishopric of Elphin was united with Kilmore and Ardagh in 1833, and the former cathedral and episcopal buildings are largely modernized.

ROSCOMMON, a market town and the county town of Co. Roscommon, Ireland, situated on rising ground in a bare plain in the centre of the county, on the Mayo line of the Midland Great Western railway, 18¾ m. N.W. by N. from Athlone. Pop. (1901) 1891. It contains the county buildings, and has Protestant and Roman Catholic churches, the latter of which is a fine building completed in 1903. An extensive trade is carried on in agricultural produce and live stock. A castle, dating from 1268, when it was founded by John d'Ufford, justiciary of Ireland, stands, an imposing mass of ruins, but far gone in decay, overlooking the plain. It fell to besiegers in 1566, 1642 and 1652, and was partially burned after the battle of Aughrim in 1691. There are also remains of a Dominican priory of the middle of the 13th century, founded by Felim O'Conor, king of Connaught, and exhibiting fine, though mutilated, details of the style of that period. The name of the town, signifying St Coman's wood, is derived from the saint who founded the monastery of Canons Regular here in the 6th century. The town received charters from Edward I. and James I. Two m. N.E. are small remains of the abbey of Deerane.

ROSCREA, a market town near the north-western border of Co. Tipperary, Ireland, pleasantly situated on undulating ground connecting the Devil's Bit and the Slieve Bloom mountains. Pop. (1901) 2325. It is 77 m. W.S.W. from Dublin on the Ballybrophy and Limerick branch of the Great Southern & Western railway. A branch line runs northward to Birr or Parsonstown. Flour-milling and tanning are industries, and monthly cattle fairs are held. There is a branch here of the Trappist Monastery of Mount Melleray in Co. Waterford. The antiquarian remains are of interest. These include portions of an Augustinian abbey, founded by St Cronan, early in the 7th century, which are incorporated into the church. Out of this abbey a diocese grew, to be united with that of Killaloe in the 12th century. Here also was produced the *Book of Dimma*, consisting of the gospels and accompanied by a brazen shrine, ornamented with silver and tracery, and preserved in the library of Trinity College, Dublin. A cross and a shrine of St Cronan are in the churchyard. There are also a round tower, 80 ft. in height, but lacking the upper storeys, and a Franciscan friary (1490); while a circular tower, and a square keep (occupied as barracks), mark strongholds, the one built by King John and the other by the Ormondes, and testify to the former importance of the town, which was doubtless accentuated by its physical position in a passway between the neighbouring mountain ranges. Leap Castle, about 4 m. N., is another fortified mansion, which is still inhabited.

ROSE, the name of a distinguished family of German chemists. VALENTINE ROSE the elder was born on the 16th of August 1736 at Neu-Ruppin, and died on the 28th of April 1771 at Berlin, where he was an apothecary and for a short time before his death assessor of the Ober Collegium Medicum. He was the discoverer of "Rose's fusible metal" (see FUSIBLE METAL). His son, VALENTINE ROSE the younger, born on the 31st of October 1762 at Berlin, was also an apothecary in that city and assessor of the Ober Collegium Medicum from 1797. It was he who in 1800 proved that sulphuric ether contains no sulphur. He died in Berlin on the 10th of August 1807, leaving four sons, one of whom, Heinrich, was a distinguished chemist, and another, Gustav, a crystallographer and mineralogist. HEINRICH ROSE, born at Berlin on the 6th of August 1795, began to learn pharmacy in Danzig, where, during the siege of 1807, he nearly lost his life from typhus. Like his brother he served in the campaign of 1815. During the summer of the following year he studied at Berlin under M. H. Klaproth, a devoted friend of the family, and in the autumn entered a pharmacy at Mitau. In 1819 he went to Stockholm, where he spent a year and a half with J. J. Berzelius, and in 1821 he graduated at Kiel. Returning to Berlin he became a *Privatdozent* in the university in 1822, extraordinary professor of chemistry in 1823 and ordinary professor in 1835, and there he died on the 27th of January 1864. He devoted himself especially to inorganic chemistry and the development of analytical methods, and the results of his work are summed up in the successive issues of his classical work, *Ausführliches Handbuch der analytischen Chemie*, of which he published the first edition at Berlin in 1829, and the sixth, practically a new work in French, at Paris in 1861. He was the discoverer of antimony pentachloride, and mention may also be made of his researches on the influence of the mass-action of water in many reactions, carried out before the investigations of Guldberg and Waage in 1867. GUSTAV ROSE, born at Berlin on the 18th of March 1798, began his career as a mining engineer, but soon turned his attention to theoretical studies. A pupil of Berzelius like his brother, he graduated in 1820 at Berlin University where he became successively *Privatdozent* (1823), extraordinary professor of mineralogy (1826) and ordinary professor (1839). In 1856 he succeeded to the directorship of the Royal Mineralogical Museum at Berlin, and he helped to found the German Geological Society, of which he was president from 1863 until the end of his life. He made many journeys in different parts of Europe for the sake of mineralogical study, and in 1829 with A. von Humboldt and C. G. Ehrenberg (1795–1876), professor of medicine at Berlin, took part in an expedition to the Ural and Altai mountains and the Caspian Sea, which yielded information of primary importance concerning the mineralogy of the Russian Empire. His work covered every branch of mineralogy, including crystallography and the artificial formation of minerals. The science of petrography, according to Gerhard vom Rath, originated with him. He was the first in his own country to use the reflecting goniometer for the measurement of the angles of crystals, and to teach the method of studying rocks by means of microscopic sections. He also devoted special attention to meteorites and to the problem presented by the different structure of the stony matter in them and in the crust of the earth, and just before his death, which took place at Berlin on the 15th of July 1873, he was engaged in investigating the formation of the diamond. In addition to many scientific memoirs he published *Elemente der Krystallographie* (1830); *Mineralogischgeognostische Reise nach dem Ural, dem Altai und dem Kaspische Meere* (1837) vol. i.; (1842) vol. ii.; *Das Krystallo-chemische Mineralsystem* (1852); and *Beschreibung und Eintheilung der Meteoriten* (1863).

ROSE, GEORGE (1744–1818), British politician, was born on the 17th of June 1744, and was educated at Westminster school, afterwards entering the navy, a service which he left in 1762 after he had taken part in some fighting in the West Indies. He then obtained a position in the Civil Service, becoming joint keeper of the records in 1772 and secretary to the board of taxes in 1777. In 1782 he gave up the latter appointment to become one of the secretaries to the treasury under Lord Shelburne, though he did not enter parliament. He left office with his colleagues in April 1783, but in the following December he returned to his former position at the treasury in Pitt's ministry, being henceforward one of this minister's most steadfast supporters. He entered parliament as member for Launceston early in 1784, and his fidelity and friendship were rewarded by Pitt, who gave him a lucrative post in the court of exchequer; in 1788 he became clerk of the parliaments. In 1801 Rose left office with Pitt, but returned with him to power in 1804, when he was made vice-president of the committee on trade and joint paymaster-general. He resigned these offices a few days after Pitt's death in 1806, but he served as vice-president of the committee on trade and treasurer of the navy under the duke of Portland and Spencer Perceval from 1807 to 1812. He was again treasurer of the navy under Lord Liverpool, and he was still member of parliament for Christchurch, a seat which he had held since 1790, when he died at Cuffnells, in Hampshire, on the 13th of January 1818. Rose was an able and conscientious public servant, although he and his two sons drew a large amount of money from sinecures, a fact referred to by William Cobbett in his "A New Year's Gift to old George Rose." He wrote several books on economic subjects, and his *Diaries and Correspondence*, edited by the Rev. L. V. Harcourt, was published in 1860.

His elder son, Sir George Henry Rose (1771–1855), was in parliament from 1794 to 1813, and again from 1818 to 1844, and in the meantime he was British minister at Munich and at Berlin; in 1818 he succeeded his father as clerk of the parliaments. He was the father of Baron Strathnairn (*q.v.*). The second son was the poet William Stewart Rose (*q.v.*).

ROSE, HUGH JAMES (1795–1838), English divine, was born at Little Horsted in Sussex on the 9th of June 1795, and was educated at Uckfield school and at Trinity College, Cambridge, where he graduated B.A. in 1817, but missed a fellowship. Taking orders, he was appointed to Buxted, Sussex, in 1819, and to the vicarage of Horsham in 1821. He had already attained some repute as a critic, which was enhanced when, after travelling in Germany, he delivered as select preacher at Cambridge, four addresses against rationalism, published in 1825 as *The State of the Protestant Religion in Germany*. The book was severely criticized in Germany, and in England by E. B. Pusey. In 1827 Rose was collated to the prebend of Middleton; in 1830 he accepted the rectory of Hadleigh, Suffolk, and in 1833 that of Fairsted, Essex, and in 1835 the perpetual curacy of St Thomas's, Southwark. In 1833–1834 he was professor of divinity at Durham, a post which ill-health forced him to resign. In 1836 he became editor of the *Encyclopaedia Metropolitana*, and he projected the *New General Biographical Dictionary*, a scheme carried through by his brother Henry John Rose (1800–1873). He was appointed principal of King's College, London, in October 1836, but he was attacked by influenza, and after two years of ill-health he died at Florence on the 22nd of December 1838. Rose was a high-churchman, who to propagate his views in 1832 founded the *British Magazine* and so came into touch with the leaders of the Oxford movement. Out of a conference at his rectory in Hadleigh came the Association of Friends of the Church, formed by R. H. Froude and Wm. Palmer.

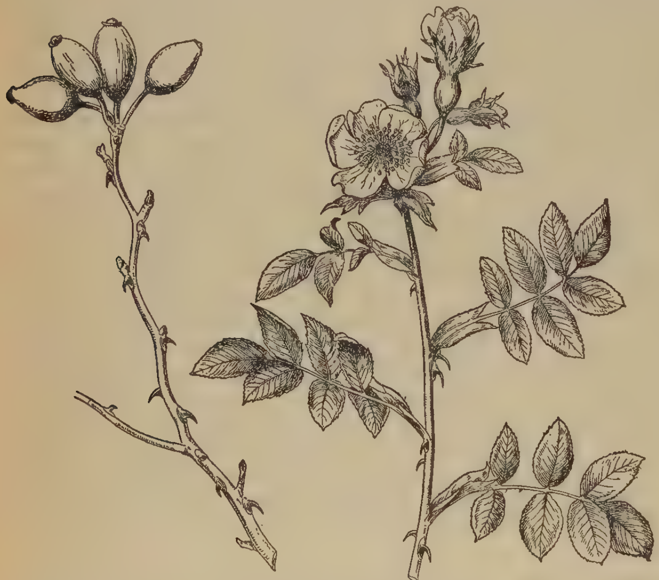
See J. W. Burgon, *Lives of Twelve Good Men* (1891).

ROSE, WILLIAM STEWART (1775–1843), English poet and translator, second son of George Rose (*q.v.*), was born in 1775. He was educated at Eton College, and in 1796 was returned to parliament for the borough of Christchurch. In 1800 he accepted the Chiltern Hundreds on his appointment as reading clerk of the House of Lords and clerk of the private committees. His first work, *A Naval History of the Late War*, was undertaken at his father's wish, but he only completed one volume. He produced a free version of the *Amadis de Gaul* from the French text of Herberay des Essarts in 1803, followed by a translation of the *Partenopex de Blois* (1807) after Le Grand d'Aussy. With *Partenopex* he printed his ballad of "The Red King," and in 1810 appeared *The Crusade of King Louis* and *King Edward the Martyr*. In 1814 he made a prolonged journey through Italy and eastern Europe, spending the year 1817 at Venice, where he married a Venetian lady. *The Court and Parliament of Bees*, a translation of the *Animali Parlanti* of Casti, and *Letters from the North of Italy, addressed to Henry Hallam, Esq.*, appeared in 1819. In the same year the publisher Murray offered him £2000 for a translation of Ariosto (T. Moore, *Diary*, 14th of April 1819). He had already written an abridged version of Berni's *rifacimento* of the *Orlando Inamorato* of Boiardo, and had begun his *Orlando Furioso translated into English Verse* which appeared in two parts in 1823 and 1831. This, which has become the standard English version, is a close rendering in the *ottava rima* of the original. Rose retired from his official position in 1824. He suffered from paralysis in his later years, and at Abbotsford, where he was an honoured guest, rooms were specially fitted up on the ground floor for his use. His last works were *An Epistle to the Right Honourable John Hookham Frere* (1834), in verse, and a volume of *Rhymes* (1837) (see *Quarterly Review*, July 1836 and April 1837). He died on the 30th of April 1843.

ROSE (*Rosa*). The rose has for all ages been the favourite flower, and as such it has a place in general literature that no other plant can rival. In most cases the rose of the poets and the rose of the botanist are one and the same in kind, but popular usage has attached the name rose to a variety of plants whose kinship to the true plant no botanist would for a moment admit. In this place we shall employ the word in its strict botanical significance, and in commenting on it treat it solely from the botanical point of view. The rose gives its name to the order Rosaceae, of which it may be considered the type. The genus consists of species varying in number, according to the diverse opinions of botanists of opposite schools, from thirty to one hundred and eighty, or even two hundred and fifty, exclusive of the many hundreds of mere garden varieties. While the lowest estimate is doubtless too low, the highest is enormously too large, but in any case the wide discrepancies above alluded to illustrate very forcibly the extreme variability of the plants, their adaptability to various conditions, and consequently their wide dispersion over the globe, the facility with which they are cultivated, and the readiness with which new varieties are continually being produced in gardens by the art of the hybridizer or the careful selection of the raiser. The species are natives of all parts of the northern hemisphere, but are scantily represented in the tropics unless at considerable elevations.

They are erect or climbing shrubs, never herbs or trees, generally more or less copiously provided with straight or hooked prickles of various shapes and with glandular hairs, as in the sweet-brier or in the moss-rose of gardens. The prickles serve the purpose of enabling the shrub to sustain itself amid other vegetation. The viscid hairs which are specially frequent on the flower stalks or in the neighbourhood of the flower serve to arrest the progress of undesirable visitants, while the perfume emitted by the glands in question may co-operate with the fragrance and colour of the flower to attract those insects whose presence is desirable. The leaves are invariably alternate, provided with stipules, and unequally pinnate, the leaflets varying in number from one (as in *R. simplicifolia* or *berberi folia*) to 11 and even 15, the odd leaflet always being at the apex, the others in pairs. The flowers are solitary or in loose cymes (cluster-roses) produced on the ends of the shoots. The flower-stalk expands into a vase- or urn-shaped dilatation, called the receptacle or receptacular tube, which ultimately becomes fleshy and encloses in its cavity the numerous carpels or fruits. From the edge of the urn or "hip" proceed five sepals, often more or less compound like the leaves and overlapping in the bud. Within the sepals are five petals, generally broad or roundish in outline, with a very short stalk or none at all, and of very various shades of white, yellow or red. The very numerous stamens originate slightly above the sepals and petals; each has a slender filament and a small two-celled anther. The inner portion of the receptacular tube whence the stamens spring is thick and fleshy, and is occasionally spoken of as the "disk"; but, as in this case it does not represent any separate organ, it is better to avoid the use of the term. The carpels are very numerous, ultimately hard in texture, covered with hairs, and each provided with a long style and button-like stigma. The carpels are concealed within the receptacular tube and only the stigmas as a rule protrude from its mouth. Each carpel contains one ovule. The so-called fruit is merely the receptacular tube, which, as previously mentioned, becomes fleshy and brightly coloured as an attraction to birds, which devour the hips and thus secure the dispersion of the seed. The dry one-seeded fruits (achenes) are densely packed inside the hip, and are covered with stiff hairs which cling to the bird's beak. The stamens are in whorls, and, according to Payer, they originate in pairs one on each side of the base of each petal so that there are ten in each row; a second row of ten alternates with the first, a third with the second, and so on. By repeated radial and tangential branching a vast number of stamens are ultimately produced, and when these stamens assume a petaloid aspect we have as a consequence the double flowers which are so much admired. The carpels are much less subject to this petaloid change, and, as it generally happens in the most double of roses that some few at least of the anthers are formed with pollen, the production of seed and the possibility of cross-breeding become intelligible. Under natural circumstances rose flowers do not secrete honey, the attraction for insects being provided by the colour and perfume and the abundance of pollen for food. The stigmas and anthers come to maturity at the same time, and thus, while cross-fertilization by insect agency is doubtless most common, self-fertilization is not prevented.

The large number of species, subspecies, varieties and forms described as British may be included under about a dozen species. Among them may be mentioned *R. spinosissima*, the Scotch rose, much less variable than the others; *R. rubiginosa* (or *R. eglanteria*), the sweet-brier, represented by several varieties; *R. canina*, the dog rose (see fig.), including numerous subspecies and varieties; the large-fruited apple rose, *R. pomifera*; and *R. arvensis*, the parent of the Ayrshire roses. Cultivated roses are frequently "budded" or worked upon the stems of the brier or *R. canina*, or upon young seedling plants of the same species; and upon stems of an Italian rose called the Manetti, raised in the Milan Botanic Gardens about 1837. Other species, notably *R. polyantha*, also are used for stocks.


Dog Rose (*Rosa canina*) in flower and fruit.

Roses have been grown for so many centuries and have been crossed and recrossed so often that it is difficult to refer the cultivated forms to their wild prototypes. The older roses doubtless originated from *R. gallica*, a native of central and southern Europe. *R. centifolia* (the cabbage rose), a native of the Caucasus, contributed its share. A cross between the two species named may have been the source whence originated the Bourbon roses. The yellow-flowered Austrian and Persian brier originated from *R. lutea*, a native of Austria and the East. The monthly or China roses sprang from the Chinese *R. indica*, and these, crossed with others of the *R. centifolia* or *gallica* type, are the source of the "hybrid perpetuals" so commonly grown nowadays, because, in addition to their other attractions, their blooming season is relatively prolonged, and, moreover, is repeated in the autumn. Tea roses and noisettes, it is to be presumed, also acknowledge *R. indica* as one of their progenitors. A magnificent race called "hybrid teas" have been evolved of late years, by crossing the tea roses and hybrid perpetuals. They are much more vigorous in constitution than the true tea roses, while quite as beautiful in blossom and more perpetual in bloom than the hybrid perpetuals. Recently, by crossing the Japanese *R. Wichuraiana* with hybrid perpetuals, a beautiful and vigorous race of climbers has been produced. The Banksian rose is a Chinese climbing species, with small white or fawn-coloured flowers of great beauty, but rarely seen; the Macartney rose (*R. bracteata*) is also of Chinese origin. Its nearly evergreen deep green leaves and large white flowers are very striking. The Japanese *R. rugosa* is also a remarkable species, notable for its bold rugose foliage, its large white or pink flowers, and its conspicuous globular fruit. *R. damascena* is cultivated in some parts of the Balkans for the purpose of making attar of roses. In Germany the same variety of rose is used, while at Grasse a strain of the Provence rose is cultivated for the same purpose. In India *R. damascena* is grown largely near Ghazipur for the purpose of procuring attar of roses and rose water.

Rose water is chiefly produced in Europe from the Provence or cabbage rose, *R. centifolia*, grown for the purpose at Mitcham and much more abundantly in the south of France. Conserve of roses and infusion of roses, two medicinal preparations retained for their agreeable qualities rather than for any special virtue, are prepared from the petals of *R. gallica*, one variety of which was formerly grown for the purpose near the town of Provins. Conserve of dog rose is made from the ripe hips of the dog rose, *R. canina*. Its only use is in the manufacture of pills.

The rose is so universal a favourite that some portion of the garden must necessarily be devoted to it, if the situation be at all favourable. Many choice roses will not, however, thrive in the vicinity of large towns, since they require a pure air, and do not endure a smoky atmosphere. The best soil for them is a deep rich strong loam free from stagnant moisture. Very light sandy or gravelly soils, or soils which are clayey and badly drained, are not suitable, and both must be greatly improved if rose-growing on them is attempted. Light soils would be improved by a dressing of strong loam in conjunction with cow-dung or nightsoil; the latter, provided it is properly prepared and not too fresh, is indeed the very best manure for roses in all but soils which are naturally very rich. Heavy soils are improved by adding burned earth or gritty refuse, with stable manure and leaf-mould, peat moss litter, &c.; and damp soils must necessarily be drained by trenching. Tea roses may, however, be grown to perfection in a gravel soil, provided it be well manured, cow manure being best. Roses generally require a constant annual supply of manure, and, if this is given as a mulching in autumn, it serves to protect their roots through the winter. They also require liberal supplies of water during the growing season, unless the surface is mulched or top-dressed from time to time with well-rotted manure. Aphides and caterpillars of all kinds may be checked by syringing with dilute tobacco water or some of the many insecticides now provided to facilitate this rather troublesome task.

Some growers prefer roses grown on their own roots, some on the Manetti and others on the brier stock. There is this to be said in favour of their own roots that, if the tops are killed down by accident or by severe weather, the roots will usually throw up new shoots true to their kind, which cannot be looked for if they are worked; though it is sometimes recommended to plant deep in order that the rose itself may learn to do without its foster parent the stock. Too often, however, in the case of persons unfamiliar with roses, the choice rose dies, and the stock usurps its place. This is especially true of the Manetti stock, as its foliage is more like that of many cultivated forms than the brier, and therefore more easily overlooked. Where standards or half-standards are required, the brier stock from the hedges is always used. It forms the most reliable stock for dwarfs of all kinds, and especially for tea roses, most of which fail on the Manetti stock.

An open situation, not shaded but sheltered from strong winds, is what the rose prefers. October and November are the best months for planting roses, but if the weather be wet or frosty and the soil sticky, the plants should be placed in a sheltered place and protected by green boughs or matting until suitable conditions prevail. The planting should never be deep, the uppermost layer of roots being about 2 or 3 in. below the general level of the surface, and the soil should always be kept stirred with the hoe during the summer months. In regard to pruning, roses vary considerably, some requiring close cutting and others only thinning out; some again, such as strong growing climbers, may be safely pruned in autumn, and others are better left till spring. Instructions on this point as to the several groups of varieties will be found in most rose catalogues, and may be followed, provided the variety is true to name. It may be laid down as a general rule that the more strongly growing varieties should be less severely cut back than the weakly varieties; and, again, the more tender the variety, the later in the spring should the pruning be done, April being the best month for pruning teas and noisettes. It should be remembered also that no amount of correct pruning will improve a rose bush that has been badly planted or placed in a quite unsuitable position.

Where dwarf beds of roses are required, a good plan is to peg down to within about 6 in. from the ground the strong one-year-old shoots from the root. In due time blooming shoots break out from nearly every eye, and masses of flowers are secured, while strong young shoots are thrown up from the centre, the plant being on its own roots. Before winter sets in, the old shoots which have thus flowered and exhausted themselves are cut away, and three or four or more of the strongest and best ripened young shoots are reserved for pegging down the following season, which should be done about February. In the meantime, after the pruning has been effected, plenty of good manure should have been dug in lightly about the roots. Thus treated, the plants never fail to produce plenty of strong wood for pegging down each succeeding season.

The most troublesome fungoid pest of the rose is undoubtedly the mildew (*Sphaerotheca pannosa*). The young shoots, leaves and flower-buds frequently become covered with a delicate white mycelium, which by means of the suckers it sends into the underlying cells robs its host of considerable amounts of food, and causes the leaves to curl and fall early. The spores are produced in great abundance and carried by animals and the wind to other plants, and so the disease is rapidly spread. Later the mycelium increases and forms a thick velvety coating on the young shoots, and in this the winter state of the fungus is produced. Spraying with potassium sulphide (1 oz. to 2 to 3 gallons of water) is the best means of checking the spread of the disease. The rose rust (*Phragmidium subcorticatum*) appears on both cultivated and wild roses in the spring, bursting through the bark in the form of copious masses of orange powder consisting of the spores of the fungus. These spores infect the leaves, and produce on them in the summer small dots of an orange colour and, later, groups of spores that are able to live through the winter. The last, the teleutospores, are of a dark colour, and it is by these that the disease is started in the spring. It is therefore important that all the affected leaves should be destroyed in the autumn, and the bushes should be sprayed with Bordeaux mixture or ammoniacal copper carbonate in the spring to prevent the infection of the leaves by spores brought from a distance. Many other fungi attack the rose, but perhaps the only other one that merits mention here is *Actinonema Rosae*. This attacks the leaves, forming large dark blotches upon them and frequently causing them to fall prematurely.

A very large number of insect pests are found upon the rose, but the best known and most formidable on account of their great powers of reproduction are the aphides. More than one species is found upon the rose, though *Aphis Rosae* is the commonest. Their attack should be checked by the use of a spray made by boiling 4 oz. quassia chips for an hour or so in a gallon of soft water, straining off the solution and dissolving therein 4 oz. of soft soap while it is still warm, afterwards adding 1 or 2 gallons of soft water according to the age of the rose leaves that are to be sprayed. Any delay in dealing with the pest gives the opportunity for its increase, even a day being sufficient materially to augment their numbers. The larvae of some of the *Tortrix* moths fold the leaves almost as soon as they are developed from the bud, and do considerable damage in this way and by devouring the leaves, while several "looper" caterpillars are also found feeding on the foliage. Many species of saw-fly larvae are also known to attack the rose, feeding either upon the leaves or devouring the young shoot. These larvae should be carefully searched for and destroyed whenever found. One of the leaf-cutting bees, *Megachile*, cuts pieces out of the leaves with which to line its nest, materially reducing their effective surface. The bees may be caught in a butterfly net or traced to their nests, which should be destroyed.

For further information see the late Dean Hole's *Book about Roses* (1894); *Book of the Rose*, by Rev. A. Foster Mellias (1905); *Beautiful Roses for Garden and Greenhouse*, by J. Weathers (1903); and *Roses, their History, Development and Cultivation*, by the Rev. J. H. Pemberton (1908).

ROSEBERY, ARCHIBALD PHILIP PRIMROSE, 5TH EARL OF (1847–), British statesman, born in London on the 7th of May 1847, was the grandson and successor to the title of Archibald John Primrose, 4th earl of Rosebery (1783–1868), a representative peer of Scotland, who was in 1828 created a peer of the United Kingdom as Baron Rosebery, and was an active supporter of the Reform Bill. The Scottish earldom was first conferred in 1703 upon the 4th earl's great-grandfather, Archibald Primrose of Dalmeny (1664–1723), a staunch Whig and a commissioner for the Union. The 5th earl's mother was Catherine Lucy Wilhelmina, only daughter of Philip Henry, 4th Earl Stanhope; she was thus a sister of Earl Stanhope, the historian, and a niece of Lady Hester Stanhope, who was the niece of William Pitt. A celebrated beauty, a maid of honour and bridesmaid of Queen Victoria, she married, on the 20th of December 1843, Archibald, Lord Dalmeny (1809–1851), member for the Stirling Burghs, who became a lord of the admiralty under Melbourne. After his death she became the wife of Harry George Vane, 4th duke of Cleveland, and died in 1901.

The young Lord Dalmeny was educated at Brighton and at Eton, where he had as slightly junior contemporaries Mr A. J. Balfour and Lord Randolph Churchill. He was described by the most brilliant Eton tutor of his day, William Johnson Cory (author of *Ionica*), as a "portentously wise youth, not, however, deficient in fun." He added that Dalmeny "desired the palm without the dust." In 1866 he matriculated at Christ Church, Oxford, but went down in 1868, by the request of the dean, rather than abandon the possession of a small racing stud. In the same year he succeeded to the earldom and to the family estates. In February 1871 he seconded the Address in the House of Lords; a more original effort followed in November 1871, when he delivered a remarkable essay on the Union of Scotland and England at the Edinburgh Philosophical Institution. Three years later he was elected president of the Social Science Congress at Glasgow, where, on the 30th of September, he gave a striking address upon the discovery of means for raising the condition of the working class as the "true leverage of empire." In the meantime he travelled in the south of Europe and in North America. On his return he acquired an English country house called The Durdans, Epsom, which he largely rebuilt and adorned with some of the finest turf portraits of George Stubbs. Following the example, as he declared, of Oliver Cromwell (for whom he showed an admiration in other respects—culminating in 1900 in the erection of a statue outside Westminster Hall, which was not appreciated either by the Irish Nationalist party or by others among his political associates), he took a pride in owning racehorses, and afterwards won the Derby three times, in 1894, 1895 and 1905. He was the first man to enjoy the distinction of winning the Derby while prime minister; but though this was popular enough among many classes, it did not please the Liberal Nonconformists so much, who considered a racehorse a mere gambling-machine. On the 20th of March 1878 Lord Rosebery married Hannah, only child of Baron Meyer Amschel de Rothschild, of Mentmore, Bucks. The newly married couple took a lease of Lansdowne House, which for several years was a salon for the Liberal party and a centre of hospitality for a much wider circle.

Though impeded in his political career by his exclusion from the House of Commons, Lord Rosebery's reputation as a social reformer and orator was steadily growing. In 1878 he was elected Lord Rector of Aberdeen and in 1880 of Edinburgh University, where he gave an eloquent address upon Patriotism. In 1880 he entertained Mr Gladstone at Dalmeny, and during the "Mid Lothian campaign" he had much to do with the stage-management of the demonstrations. As was shown later, he imported into his view of politics a warm sentiment and an imaginative outlook; and he was an enthusiastic student of Lord Beaconsfield's political novels, more particularly of *Sybil*, after the heroine in which he named one of his daughters. In August 1881 he became under-secretary at the Home Office, his immediate chief being Sir William Harcourt. His work was practically confined to the direction of the Scottish department of the Office. A clamour was nevertheless raised in regard to the incompatibility of the under-secretaryship with a position in the House of Lords, and Lord Rosebery resigned the post in June 1883. He and his wife utilized the interval to make a trip round the world, being most warmly received in Australia, and returning by way of India. At the close of 1884 he resumed office as first commissioner of works with a seat in the cabinet, and his adherence carried with it a distinct accession of strength to the Liberal ministry, which was much discredited by the tragedy attached to the fate of Gordon. The attitude of the government on the Afghan question and generally in regard to Russia was held by many to have been perceptibly stiffened owing to Lord Rosebery's influence.

In June 1885 the Liberal administration broke up, but Lord Salisbury's ministry, which succeeded, was beaten early in February 1886, and when Mr Gladstone adopted Home Rule, Lord Rosebery threw in his lot with the old leader, and was made secretary of state for foreign affairs during the brief Liberal ministry which followed. He rather distinguished himself in the Lucia Bay negotiations then being carried on with Germany. If Busch is to be believed, Prince Bismarck's view was that Lord Rosebery had "quite mesmerized" Count Herbert Bismarck; and the latter, from his father's standpoint, conceded too much to Lord Rosebery, who proved himself to be, in Bismarck's language, "very sharp." His views on foreign policy differed materially from those of Granville and Gladstone. His mind was dwelling constantly upon the political legacy of the two Pitts; he was a reader of Sir John Seeley; he had himself visited the colonies; had predicted that a war would not, as was commonly said, disintegrate the empire, but rather the reverse; had magnified the importance of taking colonial opinion; and had always been a convinced advocate of some form of Imperial Federation. He was already taunted with being an Imperialist, but his independent attitude won public approval. Cambridge gave him the degree of LL.D. in 1888; in January 1889 he was elected a member of the first county council of London, and on the 12th of February he was elected chairman of that body by 104 votes to 17. The tact, assiduity and dignity with which he guided the deliberations of the council made him exceedingly popular with its members. In the spring of 1890 he presided over the Co-operative Congress, but with a view to the impending political campaign he found it necessary to resign the chairmanship of the county council in June. In November of this year, however, Lady Rosebery died, and he withdrew for a period from public business. In 1891 he made some brief continental visits, one to Madrid, and in October he saw through the press his little monograph upon *William Pitt*, in the Twelve English Statesmen Series, of which it may be said that it competes in interest with Viscount Morley's *Walpole*. In January 1892, upon a new election, he again for a few months became chairman of the county council. It was already recognized that in him the country possessed not only a public man of exceptionally attractive personality, but one whose literary tastes were combined with a gift for expression which was at once original and fluent. In October the Garter was conferred upon him by Queen Victoria.

Meanwhile, in August, upon the return of Gladstone to power, he was induced with some difficulty (for he was suffering at the time from insomnia) to resume his position as foreign minister. His acceptance was construed as a security against the suspicion of weakness abroad which the Liberal party had incurred by their foreign policy during the 'eighties. He strongly opposed the evacuation of Egypt; he insisted upon the exclusive control by Great Britain of the Upper Nile Valley, and also upon the retention of Uganda. In 1893 the question of Siam came near to causing serious trouble with France, but by the exercise of a combination of firmness and forbearance on Lord Rosebery's part the crisis was averted, and the lines were laid down for preserving Siam, if possible, as a buffer state between the English and French frontiers in Indo-China. In the spring of 1895 he was clear-sighted enough to refuse to join the anti-Japanese League of Russia, France and Germany at the end of the China-Japan War.

Lord Rosebery's personal popularity had been increased at home by his successful intervention in the coal strike of December 1893, and when in March 1894 the resignation of Gladstone was announced, his selection by Queen Victoria for the premiership was welcomed by the public at large and by the majority of his own party. On all hands he was then considered *dignus imperio*—it was only as the new administration went to pieces that people began to add *nisi imperasset*. The conditions he had to face were by no means hopeful. The Liberal majority of 44 was already dwindling away, and the malcontents, who considered that Sir William Harcourt should have been the prime minister, or who were perpetually intriguing against a leader who did not satisfy their idea of Radicalism, made Lord Rosebery's personal position no easy one. A systematic policy of detraction was pursued by the small section of the Radical party who objected to a peer premier as such, and a great deal of adverse criticism was also aroused by a speech in which the prime minister, taunted for not again bringing forward a Home Rule measure, insisted upon the truism that the conversion of England, the "predominant partner," was a necessary condition of success. The support of the Irish Nationalists was by no means secure. Lord Rosebery's foreign policy, moreover, was too Tory for his Radical followers; he insisted upon "continuity of policy in foreign affairs," which meant carrying on the Conservative policy and not upsetting it. The premier was thought to have shown a restlessness and a rawness at the touch of censure which did not increase his reputation for reserve power or strength, but this was undoubtedly due in large measure to the recrudescence of the insomnia from which he had suffered in 1891. The government effected little. In Mr Asquith's phrase, it was "ploughing the sands." The Parish Councils Act was only passed by compromising with the Opposition. Local Veto and Disestablishment of the Welsh Church were put in the forefront of the party programme, but the government was already to all appearances riding for a fall, when on the 24th of June 1895 it was beaten upon an adverse vote in the Commons in regard to a question of the supply and reserve of small arms ammunition.

The general election which followed after Lord Salisbury had formed his new ministry was remarkable for the undisciplined state of the Liberal party. At the Eighty Club and the Albert Hall Lord Rosebery advised them to concentrate upon the reform of the House of Lords, that assembly being, as he said, a foremost obstacle to the passing of legislation on the lines of the Newcastle programme; but he was unable to suggest in what direction it should be reformed. Sir William Harcourt and Mr John Morley, on the other hand, concentrated respectively upon Local Option and Home Rule. The Liberals were quarrelling among themselves, and the result was an overwhelming defeat. In Opposition Lord Rosebery was now at a serious disadvantage as head of a parliamentary party; for in any case he could not rally them as a loyally followed leader in the House of Commons might have done. But his followers were not all loyal, and his rivals in leadership were themselves in the House of Commons. Added to this there was still in the background the veteran statesman to whom Liberalism owed an unequalled obligation. When the "Armenian atrocities" became a burning question in the country in 1896, and Mr Gladstone himself emerged from his retirement to advocate intervention, Lord Rosebery's difficulties had taken their final form. He declined to support this demand at the risk of a European war, and on the 8th of October 1896 he announced to the Liberal whip, Mr Thomas Ellis, his resignation of the Liberal leadership. On the following day he made a farewell speech at the Empire Theatre, Edinburgh, to over four thousand people, and for some time he held aloof from party politics, "ploughing his furrow alone," as he afterwards phrased it.

In 1898, on the death of Mr Gladstone, he paid a noble and eloquent tribute in the House of Lords to the life and public services of his old leader. He was a pall-bearer at his funeral on the 28th of May, as he had previously been at the burials of Tennyson and Millais. His influence in the country was still a strong one on personal grounds, and he came forward now and again to give expression independently to popular feeling. In the autumn of 1898 he gave valuable support to the attitude taken up by Lord Salisbury upon the Fashoda question. He was indeed bound by consistency to withstand what his own government, by the words of Sir Edward Grey, had declared would be an unfriendly act on the part of France. Again, after Mr Kruger's ultimatum in October 1899, Lord Rosebery spoke upon the necessity of the nation closing its ranks and supporting the government in the prosecution of war in South Africa. After Nicholson's Nek he reiterated the resolution of the country "to see this thing through." Nevertheless, in a letter to Captain

Lambton, an unsuccessful Liberal candidate for Newcastle, in September 1900, he condemned the general conduct of affairs by Lord Salisbury's government, while in several speeches in the House of Lords he strongly urged the necessity of army reform. Since his abandonment of the leadership in 1896, the lack of coherence in the Liberal party had become more and more manifest. The war had brought to the front a pro-Boer section, who seemed gradually to be compromising the whole party, and had apparently succeeded in winning the support of Sir Henry Campbell-Bannerman, the leader in the House of Commons. Lord Rosebery maintained for the most part a sphinx-like seclusion, but in July 1901 he at last came forward strongly as the champion of the Liberal Imperialist section.

In deference to the wishes of supporters such as Mr Asquith, Sir Henry Fowler and Sir Edward Grey he determined to "put his views into the common stock" at a representative meeting of Liberals held at Chesterfield in December 1901. There he advised the Liberal party that "its slate must be cleaned," and, as he subsequently explained, this cleansing must involve the elimination of Home Rule for Ireland. His appeal for "spade work" resulted in the formation of the Liberal League, inside the Liberal Opposition; and what Lord Rosebery himself described as his "definite separation" from Sir Henry Campbell-Bannerman's "tabernacle" took place. This announcement, however, was no sooner made than it was explained away by the supporters of both, and early in 1902 Lord Rosebery spoke at the National Liberal Club in a way which indicated that an understanding might still be arrived at. But though Mr Asquith and Sir Edward Grey adhered to the Liberal League, Sir Henry Campbell-Bannerman retained the loyalty of the majority of the Liberal party, and Lord Spencer threw his weight on the same side; and in a speech at the Liberal League dinner on the 31st of July Lord Rosebery had to admit that their principles had not yet prevailed, and that, until they did, a reconciliation between the two wings of the party would be impossible. In January 1903 he addressed a Liberal meeting at Plymouth, and appeared to be attempting to concentrate Opposition criticism upon the points in the government policy which did not involve the Imperialist difference; and in discussing War Office reform he advocated the appointment of Lord Kitchener as secretary of state for war.

When Mr Chamberlain started his new fiscal programme, combining Tariff Reform with Colonial Preference, Lord Rosebery at first seemed inclined to treat it as non-political, and on the 19th of May 1903 he declared in an address to the Burnley Chamber of Commerce that he was not one of those who regarded Free Trade as part of the Sermon on the Mount. This utterance led to an idea that he was inclined to consider favourably the proposal for a preferential tariff, his earlier enthusiasm for Imperial Federation making his support an interesting political possibility. But this idea was quickly dispelled; on the 22nd he expressed his surprise that anybody should have thought he intended to approve of Mr Chamberlain's plan; he was not prepared to dismiss in advance a proposal for the consolidation of the empire made by the responsible government, but he believed that the objections to a policy of preference were insurmountable. The fact, no doubt, was that Mr Asquith, Lord Rosebery's chief lieutenant in the Liberal League, made himself from the outset a determined champion of free trade in opposition to Mr Chamberlain; and Lord Rosebery quickly came into line with the rest of the Liberal party on this question. On the 12th of June, addressing the Liberal League, he admitted that as a lifelong Imperialist it was with pain and grief that he could not support Mr Chamberlain's scheme, but the empire had been built upon free trade, and he only saw danger to the empire in these new proposals. Speaking at Sheffield on the 13th of October he criticized the scheme in more detail, and, as an Imperialist, warned the country against it, emphasizing his own ideal of the future of the empire—"a strong mother with strong children, each working out his own political and fiscal salvation." His attitude on the new issue undoubtedly affected public opinion, and helped to draw him closer to the great body of the Liberal party, who saw that their identification with the cause of free trade was doing much to remove the public distrust associated with their support of Home Rule. On the 7th of November at Leicester Lord Rosebery insisted that what the country wanted was not fiscal reform but commercial reform, and he appealed to the free-trade section of the Unionist party to join the Liberals in a united defence,—an appeal incidentally for Liberal unity which was warmly seconded ten days later by Sir Henry Campbell-Bannerman. On the 26th of November Lord Rosebery's speech on the same lines at a meeting in South London resulted in a powerful demonstration in favour of his resuming the Liberal leadership, but he made no public response. On the 10th of June 1904 he addressed a meeting of the Liberal League at the Queen's Hall, London, and sketched a programme of "sane and practical Imperialism"; but he irritated the Home Rulers by again repudiating a parliament in Dublin, and he perplexed the public generally by his adverse criticism on the popular Anglo-French Agreement, which he was the only English statesman to oppose, on the ground of its handing over Morocco to France.

At Glasgow on the 5th of December he again outlined a Liberal programme, this and other speeches all leading to the assumption that his return to active co-operation with the Liberal party in the general election—which could not be long delayed—was fairly certain. Early in 1905 this impression gained such strength and such polite references were made to one another in public by Lord Rosebery and Sir Henry Campbell-Bannerman, that his assumption of office in a Liberal ministry, possibly presided over by Earl Spencer, was confidently anticipated. But these forecasts were ultimately upset, not only by Lord Spencer's illness and his removal from the list of possible Liberal prime ministers, but by Sir Henry Campbell-Bannerman's pronouncement at Stirling in November on the subject of Irish Home Rule. Lord Rosebery had just gone down to Cornwall to make a series of speeches in support of the Liberal programme, now fairly well mapped out as regards those items which represented the strong public opposition to what had been done by the Unionist government. It was believed that an understanding had been come to between his Liberal League henchmen (Mr Asquith, Sir E. Grey and Mr Haldane) and Sir Henry Campbell-Bannerman, and that Lord Rosebery's co-operation was to be secured by the adoption of some formula which would temporarily take Home Rule out of the official programme as a question of practical politics. But to the general surprise and Lord Rosebery's own very evident mortification Sir Henry went a long way in his Stirling speech to nail the Home Rule colour to the mast; he did not indeed propose to introduce a Home Rule Bill, but he declared his determination to proceed in Irish legislation on lines which would lead up to the same result. Lord Rosebery abruptly broke off his campaign, declaring at Bodmin (26th of November) that he would never "fight under that banner." From the moment the apparent recrudescence of the Liberal split over this question seemed to have misled Mr Balfour, who resigned office on the 4th of December, into thinking that difficulties would arise over the formation of a Liberal cabinet; but, whether or not the rumour was correct that a blunder had been made at Stirling and that explanations had ensued which satisfied Mr Asquith and Sir Edward Grey, this anticipation proved unjustified. Lord Rosebery himself, it is true, held aloof; his protest had been publicly made and he adhered to it in the absence of any public withdrawal by Sir Henry Campbell-Bannerman; but he encouraged his Liberal League supporters to be loyal to the new prime minister, and Mr Asquith, Sir E. Grey and Mr Haldane were included in the Liberal cabinet. The overwhelming Liberal and Labour victory at the general election of 1906 began a new era in the fortunes of the party, and Lord Rosebery's individuality once more sank back from any position of prominence in regard to its new programme. He remained outside party politics, emerging only in 1909, first to attack Mr Lloyd George's budget in the country as a "revolution," and then—to the general surprise—to condemn the House of Lords in debate for rejecting it; and in 1910 (see PARLIAMENT) he appeared once more to be coming to the front, by the resolutions he carried in regard to the remodelling of the Upper Chamber, when the death of King Edward VII. caused a temporary postponement of the constitutional crisis. In September 1910 he acted as head of the special mission sent to the Austrian court by George V. to announce his accession to the throne,—a selection peculiarly appropriate, and cordially welcomed as such, because of his well-known Austrian sympathies. Indeed, in the East European crisis of 1909 Lord Rosebery had taken a somewhat isolated part in vindicating the attitude of Austria and her right to annex Bosnia-Herzegovina, in opposition to the criticisms generally passed in the English press.

After his retirement from active politics Lord Rosebery continually displayed his great qualities as a public speaker by eloquent and witty addresses on miscellaneous subjects. No public man of his time was more fitted to act as unofficial national orator; none more happy in the touches with which he could adorn a social or literary topic and charm a non-political audience; and on occasion he wrote as well as he spoke. His *Pitt* has already been mentioned; his *Appreciations and Addresses* and his *Peel* (containing a remarkable comment on the position of an English prime minister) were published in 1899; his *Napoleon: the Last Phase*—an ingenious, if paradoxical, attempt to justify Napoleon's conduct in exile at St Helena—in 1900; his *Cromwell* in the same year. In 1906 he published an appreciation of his old friend Lord Randolph Churchill, inspired by the publication of Mr Winston Churchill's Life of his father. In its detached yet intimate way, this is a model of the art by which a good judge of men, possessed at the same time of a just historical sense, may, from the point of view of a contemporary on the opposite side in politics, correct the perspective of an official biography written under the limitations of filial obligation, and give tone and value to the picture of an interesting personality.

Lord Rosebery's family consisted of two sons and two daughters. His eldest son, Lord Dalmeny (b. Jan. 1882), who in 1909 married a daughter of Lord Henry Grosvenor, 3rd son of the 1st duke of Westminster, entered parliament in 1906 as Liberal member for Mid Lothian, but retired in 1910; he was well known as a cricketer, captaining the Surrey eleven in 1905 and 1906. The younger son, the Hon. Neil Primrose (b. Dec. 1882), took more actively than his brother to a political career, and in January 1910 was returned as a Liberal for the Wisbech division of Cambridgeshire. The elder daughter, Lady Sybil, in 1903 married Captain Charles Grant; the younger, Lady Margaret, in 1899 married the 1st earl of Crewe. (H. CH.)

ROSECRANS, WILLIAM STARKE (1819–1898), American soldier, was born in Kingston, Ohio, on the 6th of September 1819, and graduated in 1842 from the U.S. Military Academy, being appointed to the engineers. After serving (1843–47) as assistant professor at West Point, and in fort construction, he resigned (April 1854) from the army and went into business in Cincinnati. On the outbreak of the Civil War Rosecrans volunteered for service under McClellan and helped raise the Ohio "Home Guards," with which he served in the West Virginian operations of 1861 in the rank of brigadier-general. He was second in command to McClellan during this campaign, and succeeded to the command when that officer was called to Washington. In the latter part of 1861 Rosecrans conducted further operations in the same region with great skill and success, and early in 1862 he was transferred to the West as a major-general of volunteers. He took part in the operations against Corinth, and when General John Pope was ordered to Virginia, Rosecrans took over command of the Army of the Mississippi with which he fought the successful battles of Iuka and Corinth. Soon afterwards he was ordered to replace D. C. Buell in command of the forces, renamed the Army of the Cumberland about the same time. In December he advanced against General Braxton Bragg, and on the 31st of December to the 3rd of January was fought the bloody and indecisive battle of Stone River (Murfreesboro), after which Bragg withdrew his army to the southward. In 1863 Rosecrans, refusing to advance until the isolation of Vicksburg (farther west) was assured, did not take the offensive until late in June. The operations thus begun were most skilfully conducted, and Bragg was forced back to Chattanooga (*q.v.*), whence he had to retire on being once more outmanœuvred. But Rosecrans sustained a great defeat at the battle of Chickamauga (*q.v.*), and was soon besieged in Chattanooga. He was then relieved from his command. Later he did good service in Missouri, and in March 1865 he was made brevet major-general U.S.A. He resigned in 1867, and in the following year became minister to Mexico. Subsequently he was engaged in many railway and industrial enterprises in that country, as also in California. He was a representative in Congress from California, 1881–85, and register of the treasury, 1885–93. Under an act of Congress he was on the 2nd of March 1889 restored to the rank of brigadier-general, and retired. He died near Redondo, Cal., on the 11th of March 1898. On the 17th of May 1902 his body was reinterred with military honours in the National Cemetery at Arlington, in the presence of President Roosevelt, members of the cabinet and many of his campaigning comrades.

ROSEGGER, PETER (1843–), Austrian poet and novelist, known down to 1894 under the pseudonym *Petri Kettenfeier*, was born at Alpl near Krieglach in Upper Styria, on the 31st of July 1843, the son of a peasant. Until his seventeenth year he was employed as a farm hand and received no regular school education, though he learnt reading and writing from a retired schoolmaster who lived near. Unfit, owing to physical weakness, for the hard labour of agriculture, he was apprenticed to a journeyman tailor, and on his wanderings employed his leisure hours in educating himself. He soon composed poems and wrote stories. Some of these productions he sent in 1864 to Dr Svoboda, the editor of the Graz *Tagespost*, who, recognizing Rosegger's extraordinary talent, interested himself in the young author, and with the assistance of friends enabled him to study (from 1865–69) at the Handelsakademie of Graz. In 1869, encouraged by Robert Hamerling, Rosegger published his first work, a volume of poems in Styrian dialect, *Zither und Hackbrett*, which immediately established his reputation. As a result, the provincial diet of Styria accorded him a substantial *stipendium* (scholarship) for three years, which enabled him to supplement his studies by foreign travel. He now devoted himself entirely to authorship, and in 1876 founded the monthly periodical *Der Heimgarten*. On the occasion of the centenary of its reorganization the University of Heidelberg conferred upon him, in 1903, the honorary degree of doctor of philosophy.

Rosegger is one of the most fertile authors of recent times. His fresh natural style, sound judgment and his fascinating descriptions of Alpine scenery and the life of its inhabitants have made him one of the most popular authors of Austria and Germany. These characteristics are displayed to great advantage in *Die Schriften des Waldschulmeisters* (1875), *Aus meinem Handwerkerleben* (1880), *Alpengeschichten* (1896), *Als ich noch jung war* (1895), and in the love-story *Mann und Weib* (1879), while his simple religious mind is shown in *Mein Himmelreich* (1901), *Erdsegen* (1900) and *Das ewige Licht* (1897), and his attachment to friends in *Gute Kameraden* (1893) and *Persönliche Erinnerungen an Robert Hamerling* (1891). Among his other works may be mentioned a volume of poems, *Gedichte* (1891), a popular play, *Am Tage des Gerichts* (1892), two books for boys, *Waldferien* (1887) and *Waldjugend* (1900), and the stories *Das Sünderglöckl* (1904), *Wildlinge* (1906) and *I.N.R.I. Frohe Botschaft eines armen Sünders* (1905), which has also been translated into English. He has also written several works which are autobiographical in character, such as *Waldheimat* (1873) and *Mein Weltleben* (1898).

Rosegger's *Ausgewählte Schriften* appeared in thirty volumes (1881–94); a popular edition (1895–1900); his *Schriften in steirischer Mundart* (3 vols., 1894–96). See also A. V. Svoboda, *P. K. Rosegger* (1886); A. Stern, *Studien zur Literatur der Gegenwart* (1895); and H. Möbius, *P. Rosegger* (1903).

ROSELLINI, IPPOLITO (1800–1843), Italian Egyptologist, was born at Pisa. He studied under Mezzofanti at Bologna, and in 1824 became professor of oriental languages at Pisa University. He is best known as the associate of J. F. Champollion (*q.v.*), whose studies he shared and whom he accompanied in his Egyptian explorations (1828). On the death of Champollion the publication of the results of their expedition fell to Rosellini (*Monumenti dell' Egitto e della Nubia*, Florence, 1832–40, 10 vols. fol.).

ROSEMARY, botanically *Rosmarinus*, a Labiate plant, the only representative of the genus and a native of the Mediterranean region. It is a low shrub with linear leaves, dark green above, white beneath, and with margins rolled back on to the under face. The flowers are in small axillary clusters. Each has a two-lipped calyx, from which projects a bluish two-lipped corolla enclosing two stamens, the other two, which are generally present in the family, being deficient. The fruit consists of four smooth nutlets. Botanically the genus is near to *Salvia*, but it differs in the shorter connective to the anther. Rosemary was highly esteemed by the ancients for its aromatic fragrance and medicinal uses. In modern times it is valued mainly as a perfume, for which purpose the oil is obtained by distillation. It doubtless has slight stimulant properties, such as are common to all volatile oils, which may account for the general belief in the efficacy of the plant in promoting the growth of the hair. Rosemary plays no unimportant part in literature and folk-lore, being esteemed as an emblem of remembrance. "There's rosemary, that's for remembrance," says Ophelia. Its use in connexion with funeral ceremonies is not extinct in country places to this day, and it was formerly much valued at wedding festivities. The name "ros marinus" or "ros maris," literally "sea-dew," was probably given in allusion to its native habitat in the neighbourhood of the sea.

ROSENHEIM, a town and watering-place of Germany, in the kingdom of Bavaria, situated at the confluence of the Mangfall and the Inn, 40 m. by rail S.E. of Munich. Pop. (1905) 15,403. It is an interesting town, with many medieval houses. Among its seven churches the Roman Catholic parish church, with a curious cupola and containing numerous old tombs and effigies, and that of the Holy Ghost (15th century), are remarkable. There are a monastery, two convents, several schools and a hospital. Rosenheim is frequented for its saline and sulphur baths, and there are important saltworks, the brine being conveyed from Reichenhall in pipes; it has also machine factories, metalworks and breweries. Cordage is manufactured, and there is a trade in cattle and grain. Although founded in the 12th century Rosenheim did not become a town until 1864.

See Ditterich, *Rosenheim in Oberbayern* (Munich, 1870), and Eid, *Aus Altrosenheim* (Rosenheim, 1906).

ROSENKRANZ, JOHANN KARL FRIEDRICH (1805–1879), German philosopher, was born at Magdeburg on the 23rd of April 1805. He read philosophy at Berlin, Halle and Heidelberg, devoting himself mainly to the doctrines of Hegel and Schleiermacher. After holding the chair of philosophy at Halle for two years, he became, in 1833, professor at the university of Königsberg, where he remained till his death on the 14th of July 1879. In his last years he was quite blind. Throughout his long professorial career, and in all his numerous publications he remained, in spite of occasional deviations on particular points, loyal to the Hegelian tradition as a whole. In the great division of the Hegelian school, he, in company with Michelet and others, formed the "centre," midway between Erdmann and Gabler on the one hand, and the "extreme left" represented by Strauss, Feuerbach and Bruno Bauer.

Of his numerous writings, the following may be mentioned:—1. Philosophical: *Kritik der Schleiermacherschen Glaubenslehre* (1836); *Psychologie oder Wissenschaft vom subjektiven Geist* (1837; 3rd ed., 1863); *Kritische Erläuterungen des Hegelschen Systems* (1840); *Vorlesungen über Schelling* (1842); *System der Wissenschaft* (1850); *Meine Reform der Hegelschen Philosophie* (1852); *Wissenschaft der logischen Idee* (1858–59), with a supplement (*Epilegomena*, 1862); *Hegels Naturphilosophie und die Bearbeitung derselben durch Vera* (1868); *Erläuterungen zu Hegels Encyklopädie der philosophischen Wissenschaften* (1871). Two other of his works on Hegel are important, the *Leben Hegels* (1844) and the *Hegel als deutscher Nationalphilosoph* (1870). Between 1838 and 1840 in conjunction with F. W. Schubert, he published an edition of the works of Kant, to which he appended a history of the Kantian doctrine. 2. Literary and General: *Geschichte der deutschen Poesie im Mittelalter* (1830); *Handbuch einer allgemeinen Geschichte der Poesie* (1832–33); *Die Pädogogik als System* (1848); *Aesthetik des Hässlichen* (1853); *Die Poesie und ihre Geschichte* (1885); *Studien* (1839–47) and *Neue Studien* (1875–78). He published also an autobiography entitled *Von Magdeburg nach Königsberg* (1873), which deals with his life up to the time of his settlement at Königsberg.

See Quäbicker, *Karl Rosenkranz* (1899), and J. Hutchison Stirling, *The Secret of Hegel*, part 6.

ROSENTHAL, TOBY EDWARD (1848–), American artist, was born at New Haven, Connecticut, on the 15th of March 1848. Removing to San Francisco with his parents in 1855, he there studied painting under Fortunato Arriola. In 1865 he went to Munich, where he was a pupil of the Royal Academy under Strachuber, Raupp and Piloty. Among his more important works are: "Morning Prayers" (Leipzig Museum), "Elaine," "Trial of Constance de Beverley," "Dancing Lesson During the Empire" and "Departure from the Family."

ROSES, WARS OF THE, a name given to a series of civil wars in England during the reigns of Henry VI., Edward IV. and Richard III. Their importance in the general history of England is dealt with elsewhere, and their significance in the history of the art and practice of war is small. They were marked by a ferocity and brutality which are practically unknown in the history of English wars before and since. The honest yeoman of Edward III.'s time had evolved into a professional soldier of fortune, and had been demoralized by the prolonged and dismal Hundred Years' War, at the close of which many thousands of ruffians, whose occupation had gone, had been let loose in England. At the same time the power of feudalism had become concentrated in the hands of a few great lords, who were wealthy enough and powerful enough to become king-makers. The disbanded mercenaries enlisted indifferently on either side, corrupting the ordinary feudal tenantry with the evil habits of the French wars, and pillaged the countryside, with accompaniments of murder and violence, wherever they went. It is true that the sympathies of the people at large were to some extent enlisted: London and, generally, the trading towns being Yorkist, the country people Lancastrian—a division of factions which roughly corresponded to that of the early part of the Great Rebellion, two centuries later, and similarly in a measure indicative of the opposition of hereditary loyalty and desire for sound and effective government. But there was this difference, that in the 15th century the feeling of loyalty was to a great extent focused upon the great lords. Each lord could depend on his own tenantry, and he could, further, pay large bands of retainers. Hence, much as the citizen desired a settlement, the issue was in the hands of the magnates; and as accessions to and defections from one party and the other constantly shifted the balance of power, the war dragged on, becoming more and more brutal with every campaign.

It is from the Wars of the Roses that there originated the deep-rooted dislike of the professional soldier which was for nearly four centuries a conspicuous feature of the English social and governmental system, and it is therefore in their results rather than their incidents that they have affected the evolution of war. They withdrew the English army system from European battlefields precisely at the moment of transition when the regimental and technical organization of armies was becoming a science and seeking models, and the all-powerful English longbow at the moment when the early, scarcely effective firearms were, so to speak, struggling for recognition as army weapons. On the other hand, they destroyed the British military organization. The national army, aloof from the main streams of military progress, remained for 150 years an aggregation of county levies armed with bills and bows. In so far as the king was permitted or able to raise armies, they were small mercenary forces formed, on a basis of unemployed professionals, from pressed men and criminals, and they were disbanded as soon as the brief occasion for their services had passed.

The first campaign, or rather episode, of these wars[1] began with an armed demand of the Yorkist lords for the dismissal of the Lancastrian element in the king's council, Henry VI. himself being incapable of governing. The Lancastrians, and the king with them, marched out of London to meet them, and the two small armies (3000 Yorkists, 2000 Lancastrians) met at St Albans (May 22, 1455). The encounter ended with the dispersion of the weaker force, and the king fell into the hands of the Yorkists. Four years passed before the next important battle, Blore Heath, was fought (Sept. 23, 1459). In this the earl of Salisbury trapped a Lancastrian army in unfavourable ground near Market Drayton, and destroyed it; but new political combinations rendered the Yorkist victory useless and sent the leaders of the party into exile. They made a fresh attempt in 1460, and, thanks partly to treason in the Lancastrian camp, partly to the generalship of Warwick, won an important success and for the second time seized the king at Northampton (July 10, 1460). Shortly afterwards, after a period of negotiation and threats, there was a fresh conflict. Richard duke of York went north to fight the hostile army which gathered at York and consisted of Lancashire and Midland Royalists, while his son Edward, earl of March, went into the west. The father was ambushed and killed at Wakefield (Dec. 30, 1460), and the Lancastrians, inspired as always by Queen Margaret of Anjou, moved south on London, defeated Warwick at St Albans (Feb. 17, 1461), and regained possession of the king's person. But the young earl of March, now duke of York, having raised an army in the west, defeated the earl of Pembroke (Feb. 2, 1461) at Mortimer's Cross (5 m. W. of Leominster). This was the first battle of the war which was characterized by the massacre of the common folk and beheading of the captive gentlemen—invariable accompaniments of Edward's victories, and conspicuously absent in Warwick's. Edward then pressed on, joined Warwick, and entered London, the army of Margaret retreating before them. The excesses of the northern Lancastrians in their advance produced bitter fruit on the retreat, for men flocked to Edward's standard. Marching north in pursuit, the Yorkists brought their enemy to bay at Towton (*q.v.*), 3 m. S. of Tadcaster, and utterly destroyed them (March 29, 1461). For three years after Towton the war consisted merely of desultory local struggles of small bodies of Lancastrians against the inevitable. The duke of York had become King Edward IV., and had established himself firmly. But in 1464, in the far north of England, the Red Rose was again in the field. Edward acted with his usual decision. His lieutenant Montagu (Warwick's brother) defeated and slew Sir Ralph Percy at Hedgley Moor, near Wooler (April 25, 1464), and immediately afterwards destroyed another Lancastrian army, with which were both Henry VI. and Queen Margaret, at Hexham (May 8, 1464). The massacres and executions which followed effectively crushed the revolt. For some years thereafter Edward reigned peacefully, but Warwick the king-maker and all the Neville following having turned against him (1470), he was driven into exile. But at a favourable moment he sailed from Flushing with 1500 retainers and Burgundian mercenaries, and eluding the Lancastrian fleet and the coast defence troops, landed at Ravenspur (Spurn Head) in Yorkshire in March 1471. His force was hardly more than a bodyguard; the gates of the towns were shut against him, and the country people fled. But by his personal charm, diplomacy, fair promises and an oath of allegiance to King Henry VI., sworn solemnly at York, he disarmed hostility and, eluding Montagu's army, reached his own estates in the Wakefield district, where many of his old retainers joined him. As he advanced south, a few Yorkist nobles with their following rallied to him, but it was far more the disunion of the Warwick and the real Lancastrian parties than his own strength which enabled him to meet Warwick's forces in a pitched battle. At Barnet, on Easter Eve, April 14, 1471, the decisive engagement was fought. But in the midst of the battle reinforcements coming up under the earl of Oxford to join Warwick came into conflict with their own party, the badge of the Vere star being mistaken for Edward's *Rose-en-soleil.* From that point all the mutually distrustful elements of Warwick's army fell apart, and Warwick himself, with his brother Montagu, was slain. For the last time the unhappy Henry VI. fell into the hands of his enemies. He was relegated to the Tower, and Edward, disbanding his army, reoccupied the throne. But Margaret of Anjou, his untiring opponent, who had been in France while her cause and Warwick's was being lost, had landed in the west shortly after Barnet, and Edward had to take the field at once. Assembling a fresh army at Windsor, whence he could march to interpose between Margaret and her north Welsh allies, or directly bar her road to London, he marched into the west on the 24th of April. On the 29th he was at Cirencester, Margaret, engaged chiefly in recruiting an army, near Bath. Edward hurried on, but Margaret eluded him and marched for Gloucester. At that place the governor refused the Lancastrians admittance, and seeking to cross the Severn out of reach of the Yorkists, they pushed on by forced marches to Tewkesbury. But Edward too knew how to march, and caught them up. The battle of Tewkesbury (May 4, 1471) ended with the destruction of Margaret's force, the captivity of Margaret, the death of her son Edward (who, it is sometimes said, was stabbed by Edward IV. himself after the battle) and the execution of sixteen of the principal Lancastrians.

This was Edward's last battle. The rest of his eventful reign was similar in many ways to that of his contemporary Louis XI., being devoted to the consolidation of his power, by fair means and foul, at the expense of the great feudatories. But the Wars of the Roses were not yet at an end. For fourteen years, except for local outbreaks, the land had peace, and then Richard III.'s crown, struck from his head on Bosworth Field (Aug. 22, 1485), was presented to Henry earl of Richmond, who, as Henry VII., established the kingship on a secure foundation. A last feeble attempt to renew the war, made by an army gathered to uphold the pretender Lambert Simnel, was crushed by Henry VII. at Stoke Field (4 m. S.W. of Newark) on the 16th of June 1487.

ROSETTA (Coptic *Rashit*, Arabic *Rashīd*), a town situated at the western or "Rosetta" mouth of the Nile on the west bank. It was called Bolbitine by the Greeks, but according to Herodotus the Bolbitine mouth was artificial, and it was evidently of little importance compared with the Canopic, Sebennytic and Pelusiac mouths. When the other branches and the Alexandria canal silted up, Rosetta prospered like its sister port of Damietta on the eastern branch; the main trade of the overland route to India passed through it until Mehemet Ali cut a new canal joining Alexandria to the Nile. Rosetta is now much decayed. Its population in 1907 was 16,810, almost entirely Mussulman. A railway joins it to Alexandria. The celebrated Rosetta Stone which supplied Champollion with the key for the decipherment of the ancient monuments of Egypt was found near Fort St Julien, 4 m. N. of the town, in 1799, by Boussard, a French officer. It is a basalt stele inscribed in hieroglyphic, demotic and Greek with a decree of the priests assembled at Memphis in favour of Ptolemy V. Epiphanes. It was ceded to the English at the capitulation of Alexandria (1801) and is now in the British Museum. See EGYPT: II. *Ancient Egypt*, section D. "Writing." (F. Ll. G.)

ROSEWOOD, the name given to several distinct kinds of ornamental timber. That, however, so called in the United Kingdom is Brazilian rosewood, the *palissandre* of the French, the finest qualities of which, coming from the provinces of Rio de Janeiro and Bahia, are believed to be the produce principally of *Dalbergia nigra*, a leguminous tree of large dimensions, called *cabiuna* and *jacaranda* by the Brazilians. The same name, jacaranda, is applied to several species of *Machaerium*, also trees belonging to the natural order Leguminosae; and there can be no doubt that a certain proportion of the rosewood of commerce is drawn from these sources. Rosewood comes to the United Kingdom from Rio de Janeiro, Bahia, Jamaica and Honduras. The heartwood attains large dimensions, but as it begins to decay before the tree arrives at maturity it is always faulty and hollow in the centre. On this account squared logs or planks of rosewood are never seen, the wood being imported in half-round flitches 10 to 20 ft. in length and from 5 to 12 in. in their thickest part. Owing to its irregular form, the wood is sold by weight, and its value varies within wide limits according to the richness of colour. Rosewood has a deep ruddy brown colour, richly streaked and grained with black resinous layers. It takes a fine polish, but, on account of its resinous nature, it is somewhat difficult to work. The wood is very much in demand both by cabinet-makers and pianoforte-makers, by whom it is used both solid and in veneer.

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[1] The name, as is well known, comes from the "white rose of York" and the "red rose of Lancaster"; but these badges, though more or less recognized as party distinctions, by no means superseded the private devices of the various great lords, such as the "falcon and fetterlock" of Richard duke of York, the "rose in sun" of Edward IV., the "crowned swan" of Margaret, the Vere star, and even the revived "white hart" of Richard II.

The wood of *Dalbergia latifolia*, a native of the East Indies, used for ornamental furniture and carvings under the name of black wood, is frequently termed East Indian Rosewood. The *Bois de Rose* of the French, the Portuguese *Pao de Rosa*, and the German *Rosenholz* is a Brazilian wood, the produce of *Physocalymma floribundum*, called in the United Kingdom tulip wood, and very highly esteemed on account of its beautiful rose colour and grain.

ROSICRUCIANISM. What is known as the Society of Rosicrucians (*Rosenkreuzer*) was really a number of isolated individuals who early in the 17th century held certain views in common (which apparently was their only bond of union); for of a society holding meetings, and having officers, there is no trace. So far as the numerous works are concerned it is evident that the writers who posed as Rosicrucians were moral and religious reformers, and utilized the technicalities of chemistry (alchemy), and the sciences generally, as media through which to make known their opinions, there being a flavour of mysticism or occultism promotive of inquiry and suggestive of hidden meanings discernible or discoverable only by adepts.

The publication of the *Allgemeine und General-Reformation der ganzen weiten Welt* (Cassel, 1614), and the *Fama Fraternitatis* (Cassel, 1615) by the theologian Johann Valentin Andrea (1586–1654), caused immense excitement throughout Europe, and they not only led to many re-issues, but were followed by numerous pamphlets, favourable and otherwise, whose authors generally knew little, if anything, of the real aims of the original author, and doubtless in not a few cases amused themselves at the expense of the public. It is probable that the first work was circulated in MS. about 1610, for it is said that a reply was written in 1612 (according to Herder), but if so, there was no mention of the cult before that decade. The authors generally favoured Lutheranism as opposed to Roman Catholicism. Others, like John Heydon, admitted they were not Rosicrucians, but under attractive and suggestive titles to their works sought to make Hermeticism and other curious studies more useful and popular, and succeeded, for a time at least.

The curious legend, in which the fabulous origin of the so-called society was enshrined (that a certain Christian Rosenkreuz had discovered the secret wisdom of the East on a pilgrimage in the 15th century), was so improbable, though ingenious, that the genesis of the Rosicrucians was generally overlooked or ignored, but the worthy objects of the fratres were soon discovered and supported by several able men; the result being a mass of literature on the subject, which absorbs some 80 pages of Gardner's *Catalogue Raisonné of Works on the Occult Sciences* (London, 1903).

The influence that Rosicrucianism had in the modernizing of ancient Freemasonry early in the 18th century must have been slight, if any, though it is likely that as the century advanced, and additional ceremonies were grafted on to the first three degrees, Rosicrucian tenets were occasionally introduced into the later rituals. So far, however, as the real foundation ceremonies of Craft Masonry are concerned, whether before or after the premier Grand Lodge was formed, it is most unlikely that such a society as the Freemasons would adopt anything of a really distinctive character from any other organization.

In *The Muses' Threnodie* by H. Adamson (Perth, 1638) are the lines—

> "For what we do presage is riot in grosse,
> For we are brethren of the Rosie Crosse;
> We have the Mason Word and second sight,
> Things for to come we can fortell aright."

Dr Begemann considers that possibly during the decade from 1720 to 1730 a kind of Rosicrucian or Hermetic influence took place in the lodges of London, some additions to the ritual of that period not having been derived from operative masonry; but in the previous century no such influence is traceable. Several modern societies have been formed from time to time (some of which are still flourishing in Great Britain) for the study of Rosicrucianism and allied subjects, but in no sense are they directly derived from the "Brethren of the Rosy Cross" of the 17th century, though keen followers thereof. By far the most important of these is the "Societas Rosicruciana in Anglia," with headquarters in London. The Supreme Magus, Dr William Wynn Westcott, has written its History (1900), with other important works on the subject, and the published *Transactions* of the Society are most valuable.

The Rosicrucians, their Rites and Mysteries, by Hargrave Jennings (three editions, 1870–87); *The Real History of the Rosicrucians, founded on their own Manifestoes and on Facts and Documents collected from the Writings of Initiated Brethren*, by A. E. Waite (1887); and *The Arcane Schools*, by John Yarker (1909), may be consulted with advantage, though not authorized publications of the Society. (W. J. H.*)

ROSIN (a later variant of "resin," *q.v.*) or Colophony (*Colophonia resina*, resin from Colophon in Lydia), the resinous constituent of the oleo-resin exuded by various species of pine, known in commerce as crude turpentine. The separation of the oleo-resin into the essential oil-spirit of turpentine and common rosin is effected by distillation in large copper stills. The essential oil is carried off at a heat of between 212° and 316° F., leaving fluid rosin, which is run off through a tap at the bottom of the still, and purified by passing through a straining wadding. Rosin varies in colour, according to the age of the tree whence the turpentine is drawn and the amount of heat applied in distillation, from an opaque almost pitchy black substance through grades of brown and yellow to an almost perfectly transparent colourless glassy mass. The commercial grades are numerous, ranging by letters from A, the darkest, to N, extra pale,—superior to which are W, "window glass," and WW, "water white" varieties, the latter having about three times the value of the common qualities. Rosin is a brittle and friable resin, with a faint piny odour; the melting-point varies with different specimens, some being semi-fluid at the temperature of boiling water, while others do not melt till 220° or 250° F. It is soluble in alcohol, ether, benzene and chloroform. Rosin consists mainly of abietic acid, and combines with caustic alkalis to form salts (rosinates or pinates) that are known as "rosin soaps." In addition to its extensive use in soap-making, rosin is largely employed in making inferior varnishes, sealing-wax and various cements. It is also used for preparing shoemaker's wax, as a flux for soldering metals, for pitching lager beer casks, for rosining the bows of musical instruments and numerous minor purposes. In pharmacy it forms an ingredient in several plasters and ointments. On a large scale it is treated by destructive distillation for the production of rosin spirit, pinoline and rosin oil. The last enters into the composition of some of the solid lubricating greases, and is also used as an adulterant of other oils.

The chief region of rosin production is the South Atlantic and Eastern Gulf states of the United States. American rosin is obtained from the turpentine of the swamp pine, *Pinus australis*, and of the loblolly pine, *P. Taeda*. The main source of supply in Europe is the "landes" of the departments of Gironde and Landes in France, where the cluster pine, *P. Pinaster*, is extensively cultivated. In the north of Europe rosin is obtained from the Scotch fir, *P. sylvestris*, and throughout European countries local supplies are obtained from other species of pine.

ROSKILDE, or ROESKILDE, a town of Denmark in the *amt* (county) of Kjöbenhavn (Copenhagen), 20 m. by rail W. of Copenhagen, on the great lagoon-like inlet named Roskilde Fjord. Pop. (1901) 8368. It has a small port, and is an important railway junction, from which lines diverge W., S.W. and S. through the island of Zealand. Its interest, however, is historical. It was the capital of the kingdom until 1443, and the residence of the bishops of Zealand until the Reformation. The cathedral, a beautiful church, was consecrated in 1084, but of this early building only foundation walls remain; the present structure of brick was begun in 1215, and enlarged and restored at various later dates. It stands in relation to Danish history somewhat as Westminster Abbey does to English, containing the tombs of most of the Danish kings from Harold I. (987). The most noteworthy architectural details are the Chapel of the Trinity (15th century) and that of Christian IV. (Renaissance, 1617), carved choir-stalls, and an altar-piece of the 16th century. Other old buildings are a church of Our Lady, dating as it stands from 1242, a diocesan library (partly of the 15th century), royal palace (1733) and institute for daughters of noblemen (1670).

ROSMEAD, HERCULES GEORGE ROBERT ROBINSON, 1ST BARON (1824–1897), British colonial administrator, was born on the 19th of December 1824. He was of Irish descent on both sides; his father was Admiral Hercules Robinson, his mother a Miss Wood of Rosmead, County Westmeath, from which he afterwards took his title. Passing from Sandhurst into the 87th Foot, he attained the rank of captain; but in 1846, through the influence of Lord Naas, he obtained a post in the Board of Public Works in Ireland, and subsequently became chief commissioner of fairs and markets. His energy in these positions, notably during the famine of 1848, and the clearness and vigour of his reports, secured for him at the age of thirty the office of president of the island of Montserrat. Subsequently he was governor of St Christopher, from 1855 to 1859, when he was knighted in recognition of his services in introducing coolie labour into the island; of Hong-Kong; of Ceylon (K.C.M.G. in 1869); and in 1872 of New South Wales. It fell to his lot to annex the Fiji Islands to the British Empire, and his services were rewarded in 1875 by promotion to G.C.M.G. In 1879 he was transferred to New Zealand, and in 1880 he succeeded Sir Bartle Frere as high commissioner of South Africa. He arrived in South Africa shortly before the disaster of Majuba, and was one of the commissioners for negotiating a peace which was personally distasteful to him. It left him with the task of conciliating on the one hand a Dutch party elated with victory, and on the other hand a British party almost ready to despair of the British connexion. He was called home in 1883 to advise the government on the terms of the new convention concluded with the Transvaal Boers in February 1884. On his return to South Africa he found that a critical situation had arisen in Bechuanaland, where Boer commandoes had seized large tracts of territory and proclaimed the "republics" of Stella and Goshen. They refused to retire within the limits of the Transvaal as defined by the new convention, and Robinson, alive to the necessity of preserving this country—the main road to the north—for Great Britain, determined on vigorous action. John Mackenzie and later Cecil Rhodes were sent to secure the peaceful submission of the Boers, but without immediate result, partly owing to the attitude of the Cape ministry. Robinson's declaration that the advice of his ministers to patch up a settlement with the filibustering Boers was equivalent to a condonation of crime, led to the expedition of Sir Charles Warren and the annexation of Bechuanaland early in 1885. The difficulties of Robinson's position were illustrated by the dispute which arose between him and Warren, who declared that the high commissioner's duties to the home government were at times in conflict with the action which, as governor of Cape Colony, he was bound to take on the advice of his ministers in the interests of the colony. Sir Hercules Robinson succeeded in winning the confidence of President Kruger by his fair-mindedness, while he seconded Rhodes's efforts to unite the British and Dutch parties in Cape Colony. His mind, however, was that of the administrator as distinguished from the statesman, and he was content to settle difficulties as they arose. In 1886 he investigated the charges brought against Sir John Pope-Hennessy, governor of Mauritius, and decreed his suspension pending the decision of the home authorities, who eventually reinstated Pope-Hennessy. In 1887 Robinson was induced by Rhodes to give his consent to the conclusion of a treaty with Lobengula which secured British rights in Matabele and Mashona lands. In May 1889 Robinson retired. In his farewell speech he declared that there was no permanent place in South Africa for direct Imperial rule. This was interpreted to mean that South Africa must ultimately become independent—an idea repugnant to him. He explained in a letter to *The Times* in 1895 that he had referred to the "direct rule of Downing Street over the crown colonies, as contrasted with responsible colonial government." He was made a baronet in 1891. Early in 1895, when he had entered his 71st year and was not in robust health, he yielded to the entreaties of Lord Rosebery's cabinet, and went out again to South Africa, in succession to Sir H. Loch. His second term of office was not fortunate. The Jameson Raid produced a permanent estrangement between him and Cecil Rhodes, and he was out of sympathy with the new colonial secretary, Mr Chamberlain, who had criticized his appointment, and now desired Robinson to take this opportunity of settling the whole question of the position of the Uitlanders in the Transvaal. Robinson answered that the moment was inopportune, and that he must be left to choose his own time. Alarmed at the imminent danger of war, he confined his efforts to inducing the Johannesburgers to lay down their arms on condition that the raiders' lives were spared, not knowing that these terms had already been granted to Jameson. He came home to confer with the government, and was raised to the peerage as Baron Rosmead. He returned to South Africa later in the year, but was compelled by ill-health, in April 1897, to quit his post, and died in London on the 28th of October 1897, being succeeded in the title by his son.

ROSMINI-SERBATI, ANTONIO (1797–1855), Italian philosopher, was born at Rovereto in Italian Tirol on the 25th of March 1797. He belonged to a noble and wealthy family, but at an early age decided to enter the priesthood. After studying at Pavia and Padua, he took orders in 1821. In 1828 he founded a new religious order, the Institute of the Brethren of Charity, known in Italy generally as the Rosminians. The members might be priests or laymen, who devoted themselves to preaching, the education of youth, and works of charity—material, moral and intellectual. They have branches in Italy, England, Ireland, France and America. In London they are attached to the church of St Etheldreda, Ely Place, Holborn, where the English translation of Rosmini's works is edited. His works, *The Five Wounds of the Holy Church* and *The Constitution of Social Justice*, aroused great opposition, especially among the Jesuits, and in 1849 they were placed upon the Index. Rosmini at once declared his submission and retired to Stresa on Lago Maggiore, where he died on the 1st of July 1855. Before his death he had the satisfaction of learning that the works in question were dismissed, that is, proclaimed free from censure by the Congregation of the Index. Twenty years later, the word "dismissed" (*dimittantur*) became the subject of controversy, some maintaining that it amounted to a direct approval, others that it was purely negative and did not imply that the books were free from error. The controversy continued till 1887, when Leo XIII. finally condemned forty of his propositions and forbade their being taught.

In 1848 Rosmini took part in the struggle which had for its object emancipation from Austria, but he was not an initiator of the movement which ended in the freedom and unity of Italy. In fact, while eager for the deliverance of Italy from Austria, his aim was to bring about a confederation of the states of the country, which was to be under the control of the pope.

The most comprehensive view of Rosmini's philosophical standpoint is to be found in his *Sistema filosofico*, in which he set forth the conception of a complete encyclopaedia of the human knowable, synthetically conjoined, according to the order of ideas, in a perfectly harmonious whole. Contemplating the position of recent philosophy from Locke to Hegel, and having his eye directed to the ancient and fundamental problem of the origin, truth and certainty of our ideas, he wrote: "If philosophy is to be restored to love and respect, I think it will be necessary, in part, to return to the teachings of the ancients, and in part to give those teachings the benefit of modern methods" (*Theodicy*, n. 148). He examined and analysed the fact of human knowledge, and obtained the following results: (1) that the notion or idea of being or existence in general enters into, and is presupposed by, all our acquired cognitions, so that, without it, they would be impossible; (2) that this idea is essentially objective, inasmuch as what is seen in it is as distinct from and opposed to the mind that sees it as the light is from the eye that looks at it; (3) that it is essentially true, because "being" and "truth" are convertible terms, and because in the vision of it the mind cannot err, since error could only be committed by a judgment, and here there is no judgment, but a pure intuition affirming nothing and denying nothing; (4) that by the application of this essentially objective and true idea the human being intellectually perceives, first, the animal body individually conjoined with him, and then, on occasion of the sensations produced in him *not by himself*, the causes of those sensations, that is, from the action felt he perceives and affirms an agent, a being, and therefore a true thing, that acts on him, and he thus gets at the external world,—these are the true primitive judgments, containing (*a*) the subsistence of the particular being (subject), and (*b*) its essence or species as determined by the quality of the action felt from it (predicate); (5) that reflection, by separating the essence or species from the subsistence, obtains the full specific idea (universalization), and then from this, by leaving aside some of its elements, the abstract specific idea (abstraction); (6) that the mind, having reached this stage of development, can proceed to further and further abstracts, including the first principles of reasoning, the principles of the several sciences, complex ideas, groups of ideas, and so on without end; (7) finally, that the same most universal idea of being, this generator and formal element of all acquired cognitions, cannot itself be acquired, but must be innate in us, implanted by God in our nature. Being, as naturally shining to our mind, must therefore be what men call the light of reason. Hence the name Rosmini gives it of ideal being; and this he laid down as the fundamental principle of all philosophy and the supreme criterion of truth and certainty. This he believed to be the teaching of St Augustine, as well as of St Thomas, of whom he was an ardent admirer and defender.

Of his numerous works, of which a collected edition in 17 volumes was issued at Milan (1842–44), supplemented by *Opere postume* in 5 vols. (Turin, 1859–74), the most important are the *New Essay on the Origin of Ideas* (Eng. trans., 1883); *The Principles of Moral Science* (1831); *The Restoration of Philosophy in Italy* (1836); *The Philosophy of Right* (1841–45). The following have also been translated into English: *A Catholic Catechism*, by W. S. Agar (1849); *The Five Wounds of the Holy Church* (abridged trans. with introd. by H. P. Liddon, 1883); *Maxims of Christian Perfection*, by W. A. Johnson (1889); *Psychology* (Anonymous) (1884–88); *Sketch of Modern Philosophy*, by Lockhart (1882); *The Ruling Principle of Method Applied to Education*, by Mrs W. Grey (Boston, Mass., 1887); *Select Letters*, by D. Gazzola. Rosmini's *Sistema filosofico* has been translated into English by Thos. Davidson (*Rosmini's Philosophical System*, 1882, with a biographical sketch and complete bibliography); see also *Lives* by G. S. Macwalter (1883) and G. B. Pagani (1907); C. Werner, *Die Italienische Philosophie des 19. Jahrhunderts* (1884); F. X. Kraus, "Antonio Rosmini: sein Leben, seine Schriften," in *Deutsche Rundschau*, liv. lv. (1888); "Church Reformation in Italy" in the *Edinburgh Review*, cxiv. (July 1861); and numerous recent Italian works, for which Baldwin's *Dictionary of Philosophy* or Pagliani's *Catalogo Generale* (Milan, 1905) should be consulted.

ROSNY, JOSEPH HENRY, a pseudonym covering the collaboration of the French novelists, Joseph Henri Honoré Boëx, born at Brussels in 1856, and his brother Séraphin Justin François Boëx, born at Brussels in 1859. The novels of J. H. Rosny are full of scientific knowledge, of astronomy, anthropology, zoology and, above all, sociology. The stories are approached from the point of view of society rather than of the individual, but the characters, strongly individualized and intensely real, are only incidentally typical. The elder Rosny was the sole author of the earlier novels, and began novel-writing as an avowed disciple of Zola. *Nell Horn, membre de l'armée du salut* (1885) is a picture of London life and social reform; *Le Bilatéral* (1886) and *Marc Fane* (1888) describe the revolutionary and anarchist parties of Paris; *L'Immolation* (1887) is a brutal story of peasant life; *Le Termite* (1890) is a picture of literary life in Paris; and *Vamireh* (1891), with *Erymah* (1895), and *Les Profondeurs de Kyamo* (short stories, 1896) and others deal with prehistoric man. MM. Rosny were among the writers who in 1887 entered a formal protest in the *Figaro* against Zola's *La Terre*, and they were designated by Edmond de Goncourt as original members of his academy. Among their later novels the more famous are: *Daniel Valgraive* (1891), a study in the possibilities of personal sacrifice; *L'Impérieuse Bonté* (1894), an indictment of Parisian charity; *L'Indomptée* (1895), the history of a girl medical student in Paris; *Le Serment* (1896, dramatized 1897); *Les Ames perdues* (1899), another anarchist novel; *La Charpente* (1900); *Thérèse Degaudy* (1902); *Le Crime du docteur* (1903); *Le Docteur Harambur* (1904); *Le Millionaire* (1905); and *Sous le fardeau* (1906).

ROSS, ALEXANDER (1699–1784), Scottish poet, was born on the 13th of April 1699 at Kincardine-O'Neil, Aberdeenshire. He was educated at Marischal College, Aberdeen, and became tutor to the children of Sir William Forbes of Craigievar. He became in 1732 schoolmaster of Lochlee, Angus, where the rest of his life was spent. He had long been in the habit of writing verse for his own amusement, when in 1768 he published, at the suggestion of James Beattie, *The Fortunate Shepherdess . . . to which is* (*sic*) *added a few songs.* This is a pastoral narrative poem, written in obvious imitation of Allan Ramsay's *Gentle Shepherd*. Its affectations are chiefly on the surface. The background of shepherd life as known to Ross, and the rather sordid motives of the characters, despite their high-sounding names of Helenore, Rosalind, &c., are depicted with uncompromising truth. He died at Lochlee, and was buried on the 26th of May 1784.

See *Helenore, or the Fortunate Shepherdess*, edited by John Longmuir (1866); also H. Walker, *Three Centuries of Scottish Literature* (1893), ii. 28–34. The bulk of Ross's writings remain in MS.

ROSS, GEORGE WILLIAM (1841–), Canadian politician, was born near Nairn, Middlesex county, Ontario, on the 18th of September 1841, the son of James Ross and Ellen M'Kinnon, natives of Ross-shire, Scotland. From 1872–1883 he was a Liberal member of the Federal House; from 1883–99 minister of education in the legislature of the province of Ontario; and from 1899–1905 premier and treasurer of that province. In 1905 his government was defeated, and in 1907 he retired to the Canadian Senate. He was for many years an advocate of total abstinence, and a well-known speaker on imperial questions.

ROSS, SIR HEW DALRYMPLE (1779–1868), British soldier, entered the Royal Military Academy, Woolwich, in 1793, and passed out into the Royal Artillery two years later. With the Royal Horse Artillery he saw active service during the Irish rebellion of 1798, and after eleven years' service was promoted captain and appointed to command "A" troop R.H.A. (afterwards famous as the "Chestnut Troop"). In 1809 the troop landed at Lisbon and at once set out to join Wellington's army, reaching the front two days after Talavera. Ross's guns were attached to the Light Division, and, with Craufurd, took part in the actions on the Coa and the battle of Busaco. When Masséna began his famous retreat from the lines of Torres Vedras, Ross's troop was amongst the foremost in the pursuit; at Redinha and Pombal, at Sabugal and Fuentes d'Onor, the "Chestnuts" earned great distinction, and in December 1811 their commander received a brevet-majority for his services. He was present at Ciudad Rodrigo and Badajoz, at the Salamanca forts and the battle of Salamanca, still attached to the Light Division. In the campaign of Vittoria, Ross's guns were continually with the most advanced troops, and after Vittoria they captured the only piece of artillery that remained to the defeated French. A further brevet-promotion and a good service reward came to Ross for his part in the campaign. At Vera in the Pyrenees Ross's troop was one of the three which played a decisive part in the action, and Vera remains a classical example of the action of horse artillery. "A" troop was engaged at St Pierre and Orthez, and at the conclusion of peace returned to England. It was engaged at Waterloo, and though half its guns were disabled the remainder took part in the pursuit of the French. Ross received, besides the Peninsular and Waterloo medals, the K.C.B., the Portuguese order of the Tower and Sword and the Russian St Anne. He had commanded the troop for nineteen years when he at last received a regimental lieutenant-colonelcy. As officer commanding Royal Artillery in the Northern District, with delegated command over all the forces of the four northern counties, Sir Hew Ross had for nearly sixteen years to deal with continually threatened civil disorder, and bore himself as well as on the field of battle. From 1840 to 1858, when he retired, he practically directed, in one post or another, all the artillery services of the British army, and when in 1854 the test of war came, the artillery took the field in a far better condition than the rest of Lord Raglan's army. Much of the present efficiency of the "Royal Regiment" is directly traceable to the influence of Sir Hew Ross, to whom it owes the institution of the School of Gunnery at Shoeburyness and the establishment of the Royal Artillery Institution at Woolwich. Major-general in 1841 and lieut.-general in 1851, he became general in 1854, and died, a field-marshal and G.C.B., in 1868.

See Memoir of the R.A. Institution, 1871; and Duncan, *History of the Royal Regiment of Artillery.*

ROSS, SIR JAMES CLARK (1800–1862), British rear-admiral and Polar explorer, was born in London on the 15th of April 1800. He entered the navy in 1812 under his uncle, Captain (afterwards Sir) John Ross, whom he accompanied on his first Arctic voyage in search of a North-West passage (1818). Between 1819 and 1827 he returned four times to the same seas in the Arctic expeditions under Parry, and in 1829–33 again served on the same mission under his uncle, and while thus employed determined (1831) the position of the North Magnetic Pole. In 1834 he was promoted captain, and from 1835–38 was employed on the magnetic survey of Great Britain. In 1839–43 he commanded the Antarctic expedition of the "Erebus" and "Terror" (see Polar Regions), and for this service he received a knighthood (1844) and was nominated to the French order of the Legion of Honour. He published a narrative of this expedition under the title of *A Voyage of Discovery and Research to Southern and Antarctic Regions* (1847), and was the author also of various reports on zoological and other matters relating to his earlier voyages. He was elected to the Royal Society in 1848, and in that year made his last expedition, as captain of the "Enterprise," in the first Franklin search expedition. He died at Aylesbury on the 3rd of April 1862.

ROSS, JOHN, or Kooeskoowe (1790–1866), chief of the Cherokee Indian Nation, was of Scotch-Indian descent, and was born among the Cherokees in Georgia in 1790. In 1819–1827 he was president of the Cherokee national committee, in July 1827 he presided over the Cherokee constituent assembly, and under the constitution which it drafted he was principal chief from 1828 until his death. In 1830–31 he applied to the Supreme Court of the United States for an injunction restraining the state of Georgia from executing its laws within the Cherokee territory, but the court dismissed his suit on the ground that it had no jurisdiction. There was a small party among the Cherokees under the leadership of John Ridge, a subchief, who were early disposed to treat with the United States for the removal of their nation west of the Mississippi, and in February 1835, while negotiations with Ridge were progressing at Washington, Ross proposed to cede the Cherokee lands to the United States for $20,000,000. The United States Senate resolved that $5,000,000 was sufficient. The treaty negotiated by the Ridge party and the proposal to treat on the basis of a $5,000,000-payment were both rejected in a full council of the Cherokees held in October 1835. The council authorized Ross to renew negotiations, but before leaving for Washington he was arrested by the Georgia authorities on the ground that he was a white man residing in the Indian country contrary to law. Ross was soon released, but in December of this year a few hundred Cherokees met the United States Indian commissioner at New Echota and concluded with him a treaty of removal. When Ross learned this he called a council to meet in February 1836, and at this meeting the treaty was declared null and void and a protest against the proceedings at New Echota was signed by more than 12,000 Cherokees. Notwithstanding Ross's opposition, the Senate in the following May ratified the treaty by a vote exceeding by one the necessary two-thirds majority, and in December 1838, Ross, with the last party of Cherokees, left for the West (see Georgia). During the Civil War, Ross first urged upon the Cherokee Nation a policy of friendly inactivity; in May 1861, proclaimed a strict neutrality; in October 1861, signed a treaty with the Confederate States; in the summer of 1862 was forced (by Union sympathizers in the Nation) to proclaim neutrality again; soon afterwards went over to the Union lines; and was in Washington treating with the Federal government in February 1863 when the treaty with the Confederate States was abrogated by the Cherokees. He died at Washington on the 1st of August 1866.

See C. C. Royce, "The Cherokee Nation of Indians" in the *Fifth Annual Report of the Bureau of Ethnology* (Washington, 1887), and T. V. Parker, *The Cherokee Indians* (New York, 1907).

ROSS, SIR JOHN (1777–1856), British rear-admiral and Arctic explorer, son of the Rev. Andrew Ross, minister of Inch, Wigtonshire, entered the Royal Navy in 1786, serving in the Mediterranean till 1789, and afterwards in the Channel. In 1808 he acted as captain of the Swedish Fleet, and in 1812 was promoted commander. Six years later he was given the command of an Arctic expedition fitted out by the Admiralty, the first of a new series of attempts to solve the question of a North-West passage. This expedition failed to discover much that was new, and somewhat prejudiced the Arctic reputation of its leader, who attained the rank of captain on his return. But in 1829, through the munificence of Mr (afterwards Sir) Felix Booth, he was able to undertake a second Arctic expedition, which, during an absence of four years, achieved important geographical and scientific results. On his return Captain Ross was the recipient of gold medals from the English and French geographical societies, and of various foreign orders, including a knighthood of the Pole Star of Sweden, and in the following year (1834) received a knighthood and a C.B. at home. In 1850 he undertook a third voyage to the Arctic regions, this time in search of Sir John Franklin, and in the following year he attained flag-rank. His publications include—*Voyage of Discovery for the Purpose of Exploring Baffin's Bay* (1819); *Narrative of a Second Voyage in Search of a North-West Passage, including the Discovery of the North Magnetic Pole* (1835); *Memoirs and Correspondence of Lord De Saumerez* (1838).

ROSS, ROBERT (1766–1814), British major-general, entered the 25th Foot at the age of nineteen, and in 1795 became captain in the 7th Regiment, obtaining a half-pay majority a few months later. As a major of the 20th he served in Holland under the duke of York in 1799. At the action of Krabbendam the regiment greatly distinguished itself, though largely composed of raw militia recruits. Ross was here severely wounded. In 1801 the 20th went to Egypt and took part in the final operations which led to Menou's surrender. In 1803, though lieutenant-colonel only by brevet, Ross succeeded to the command, and at once initiated a severe system of training, in barracks and in the field, in his regiment. The result of this was apparent when under Sir John Stuart's command the regiment proceeded to Naples. The 20th played a decisive part in the brilliant action of Maida, and distinguished itself not less in the subsequent storm of the castle of Scylla. In 1808–9 Ross and the 20th formed part of Anstruther's brigade of Sir John Moore's army in Spain, and though the statement that the 20th, owing to its good discipline, suffered less loss than any other regiment in the retreat on Corunna is incorrect, the regiment was among the best disciplined in the army. Later in 1809 it was sent to Walcheren, where fever soon laid low two-thirds of the men. Ross and his regiment were then sent to Ireland to recover, and here the colonel repeated the course of drill and manœuvre which had so markedly improved the 20th in Malta. He received a gold medal for Corunna and a sword of honour for Maida (which action had already won him a gold medal). At the end of 1812 the 20th was again engaged in the Peninsula, and Major-General Ross early in the following year received a brigade command in Cole's division. Scarcely engaged at Vittoria, Ross's brigade played a distinguished part in the operations around Pamplona, and the 20th covered itself with glory at Roncesvalles and Sorauren. At Orthez Ross was severely wounded at the head of the brigade, which was assaulting the village of St Boës. He was among those who received the thanks of parliament for this battle, and he received the gold medal for Vittoria and the Peninsula gold medal. At the end of the war Ross was sent in command of a brigade to harry the coast of North America, and with 4500 men and three light guns landed in Maryland. At Bladensburg the Americans stood to fight in a strong position, but Ross's men routed them (Aug. 24, 1814). The same evening Washington was entered, and, the public buildings having been destroyed, the expedition re-embarked. This short and brilliant campaign excited the admiration of soldiers, critics and public alike, but the commander did not live to receive his reward. A few days later an expedition against Baltimore was undertaken; skirmishing soon began, and one of the first to fall was Ross. A public monument was erected to his memory in St Paul's Cathedral, and others at his residence at Rosstrevor and at Halifax, N.S. His family was granted the name Ross of Bladensburg by royal letters-patent.

See *Gentleman's Magazine*, 1814, ii. 483; Cole, *Peninsular Generals*; Smythe, *History of the 20th Regiment.*

ROSS, a market town in the Ross parliamentary division of Herefordshire, England; 133 m. W. by N. from London and 12 S.E. from Hereford by the Great Western railway. Pop. of urban district (1901) 3303. It occupies a fine position on and about a rocky eminence on the left bank of the river Wye. There are manufactures of machinery and agricultural implements, and trade in the products of the district, such as cider and malt, and several fairs are held annually. The church of St Mary the Virgin stands high, and is surmounted by a lofty spire; it shows good Decorated and Perpendicular work. A beautiful terrace called the Prospect adjoins the churchyard and overlooks the river. The market house, dated 1670, is a picturesque building supported on columns, the upper portion serving as a town hall. There are in the town many memorials of John Kyrle, the Man of Ross, who died here in 1724, and is eulogized by Pope in his third *Moral Epistle* (1732). The Prospect was acquired and laid out by Kyrle, who also planted the fine elm avenues near the church; his house stands opposite the market house, where he disbursed his charities; he erected the church spire, and is buried in the chancel, where his grave remained without a monument until Pope called attention to the omission. Nearly opposite the town is Wilton Castle, which defended the ford in the disturbed reign of Stephen, and suffered in the Civil Wars, being held for the Parliament and burned by the Royalists. The inhabited portion is modern. Four miles below Ross the important ford of Goodrich probably carried traffic in British and Roman times, and a magnificent castle, on a precipice rising sheer above the right bank of the river, commands it. The keep is doubtfully assigned to a date previous to the Conquest; the important position on the Welsh March led to several subsequent additions, especially in the 14th century, and the castle was only dismantled by order of the Parliamentarians after it had strongly resisted their arms on behalf of Charles I. in 1646, being the last to fall of the royal strongholds in this county.

Ross (*Ros, Rosse*) was granted to the see of Hereford by Edmund Ironside, but became crown property by an exchange effected in 1559. It derived importance from its situation on the road to South Wales. In 1305, only, it was represented in parliament by two members; but it was never incorporated, and was governed by appointees of the manor court, until the Ross Improvement Act of 1865 established elected commissioners of the borough. Fairs on the days of the Ascension, Corpus Christi, St Margaret and St Andrew were conferred by Henry III., and were in existence in 1888. A market every Thursday was granted by Stephen and confirmed by Henry III.; Friday is now market day.

ROSS AND CROMARTY, a northern county of Scotland. The mainland portion is bounded N. by Sutherland and Dornoch Firth, E. by the North Sea and Moray Firth, S. by Beauly Firth and Inverness-shire and W. by the strait of the Minch. The island portion, consisting of as much of the island of Lewis as lies north of a line drawn from Loch Resort to Loch Seaforth, is bounded on the W., N. and E. by the Atlantic, and S. by Harris, the southern part of Lewis. Many islands, all but eleven uninhabited, are scattered principally off the west coasts of Lewis and the mainland. The area of the mainland is 1,572,294 acres and of the islands 404,413 acres, giving a total for the county of 1,976,707 acres or 3088·6 sq. m. The inhabited islands belonging to the mainland are all situated off the west coast. They are Gillean (lighthouse) in the parish of Lochalsh, Croulin in Applecross, Horisdale, Dry and Ewe in Gairloch parish, and Martin and Tanera More, of the group of the Summer Isles in the parish of Lochbroom. On the North Sea front the chief indentations are Beauly Firth and Inner Moray Firth, marking off the Black Isle from Inverness-shire; Cromarty Firth, bounding the districts of Easter Ross and the Black Isle; Moray Firth, separating Easter Ross from Nairnshire; and Dornoch Firth, dividing north-east Ross from Sutherlandshire. On the Atlantic face—which is a coastline of more than 300 m.—the principal sea lochs and bays, from S. to N., are Loch Duich, Loch Alsh, Loch Carron, Loch Kishorn, Loch Torridon, Loch Shieldaig, Upper Loch Torridon, Gairloch, Loch Ewe, Gruinard Bay, Little Loch Broom and Enard Bay. The chief capes are Tarbat Ness on the east coast, and Coygach, Greenstone, Reidh, Red and Hamha Points on the west. Almost all the southern boundary with Inverness-shire is guarded by a rampart of peaks, among them being An Riabhachan (3696), Sgurr na Lapaich (3773), Carn Eige (3877), Mam Soul (3862), Ben Attow (3383), Scour Ouran (3505), famous for its view from the summit, Ben Mohr (3570) and the Saddle (3317). To the north of Glen Torridon occur the masses of the Liatach, with peaks of 3456 and 3358 ft., and Ben Eay with four peaks above 3000 ft. each. On the north-eastern shore of Loch Maree rises Ben Slioch (3217), while the Fannich group contains at least six peaks of more than 3000 ft. The immense isolated bulk of Ben Wyvis (3429), and its subordinate peaks An Socach (3295) and An Cabar (3106), is the most noteworthy feature in the north-east, and the Challich Hills in the north-west with peaks of 3483 and 3474 ft. are equally conspicuous, though less solitary. Only a small fraction of western and southern Ross is under 1000 ft. in height. Easter Ross and the peninsula of the Black Isle are comparatively level. The longest stream is the Orrin, which rises in An Sithean and pursues a course mainly E. by N. to its confluence with the Conon after a run of about 26 m., during a small part of which it forms the boundary with Inverness-shire. At Aultgowrie the stream rushes through a narrow gorge where the drop is considerable enough to make the falls of Orrin. From its source in the mountains in Strathvaich the Blackwater flows S.E. for 19 m. till it joins the Conon, forming soon after it leaves Loch Garve the small but picturesque falls of Rogie. Within a short distance of its exit from Loch Luichart the Conon pours over a series of graceful cascades and rapids and then pursues a winding course of 12 m., mainly E. to the head of Cromarty Firth. The falls of Glomach, in the south-west, are the deepest in the United Kingdom. The stream giving rise to them drains a series of small lochs on the northern flanks of Ben Attow and, in an almost unbroken sheet about 40 ft. broad, effects a sheer leap of 370 ft., and soon afterwards ends its course in the Elchaig. The falls are usually visited from Invershiel, 7 m. to the south-west. Twelve miles south by east of Ullapool, on the estate of Braemore, are the falls of Measach, formed by the Droma, a head-stream of the Broom. The cascades, three in number, are close to the gorge of Corriehalloch. The Oykell, throughout its course, forms the boundary with Sutherlandshire, to which it properly belongs. The largest and most beautiful of the many freshwater lakes is Loch Maree (*q.v.*), but a few of the others are interesting. In the far north-west, 243 ft. above the sea, lies Loch Skinaskink, a lake of such irregularity of outline that it has a shore-line of 17 m. It contains several islands covered with rich woods affording a shelter to deer, and drains into Enard Bay by the Polly. Lochan Fada (the "long loch"), 1005 ft. above the sea, is 3¾ m. in length, has a greatest breadth of ⅔ m., covers an area of 1½ sq. m., and is 248 ft. deep, with a mean depth of 102 ft. Once drained by the Muic, it has been tapped a little farther west by the Fhasaigh, which has lowered the level of the lake sufficiently to behead the Muic. Other lakes are, north of Loch Maree, Loch Fionn (the "white" or "clear" lake), 8 m. long by 1 m. wide, famous for its heronries; towards the centre of the shire, Loch Luichart (5 m. long by from ⅓ m. to nearly 1 m. wide), fringed with birches and having the shape of a crescent; the mountain-girt Loch Fannich (7 m. long by 1 m. wide); and the wild narrow lochs Monar (4 m. long) and Mullardoch (5 m. long), on the Inverness-shire boundary. Of the straths or valleys the more important run from the centre eastwards, such as Strathconon (12 m.), Strathbran (10 m.), Strathgarve (8 m.), Strathpeffer (6 m.) and Strathcarron (14 m.). Excepting Glen Orrin (13 m.), in the east central district, the longer glens lie in the south and towards the west. In the extreme south Glen Shiel (9 m.) runs between fine mountains to its mouth on Loch Duich. General Wade's road passes down the glen. Farther north are Glen Elchaig (9 m.), Glen Carron (12 m.), in the latter of which the track of the Dingwall & Skye railway is laid, and Glen Torridon (6 m.).

Geology.—The central portion of this county is occupied by the younger highland schists or Dalradian series. These consist of quartzites, mica-schists, garnetiferous mica-schists and gneisses, all with a gentle inclination towards the S.E. On the eastern side of the county the Dalradian schists are covered unconformably by the Old Red Sandstone; the boundary runs southward from Edderton on Dornoch Firth, by Strathpeffer, to the neighbourhood of Beauly. These rocks comprise red flags and sandstones, grey bituminous flags and shales. An anticlinal fold with a S.W.-N.E. axis brings up the basal beds of the series about the mouth of Cromarty Firth and exposes once more the schists in the Sutors guarding the entrance to the firth. The western boundary of the younger schist is formed by the great pre-Cambrian dislocation line which traverses the county in a fairly direct course from Elphin on the north by Ullapool to Glencarron. Most of the area west of the line of disturbance is covered by Torridonian Sandstone, mainly dark reddish sandstones, grits and shales, resting unconformably on the ancient Lewisian gneiss with horizontal or slightly inclined bedding. The unconformity is well exposed on the shores of Gairloch, Loch Maree and Loch Torridon. These rocks, which attain a considerable thickness and are divisible into three sub-groups, build up the mountain districts about Applecross, Coigach and elsewhere. Within the Torridonian tract the older, Lewisian gneiss occupies large areas north of Coigach, on the east of Enard Bay, between Gruinard Bay and Loch Maree; between the last named and Gairloch, on both sides of middle Loch Torridon and at many other spots smaller patches are to be found. The Lewisian gneiss is everywhere penetrated by basic dikes, generally with a N.W.-S.E. direction; some of these are of great breadth. The Torridonian rocks are succeeded unconformably by a series of Cambrian strata which is confined to a variable but, on the whole, narrow belt lying west of the line of main thrusting. This belt of Cambrian rocks has itself suffered an enormous amount of subordinate thrusting. It is composed of the following subdivisions in ascending order: false-bedded quartzite, "Pipe Rock" quartzite, fucoid beds and *Olenellus* band, serpulite grit, Durness dolomite and marble, Durness dolomite and limestone: but these are not always visible at any one spot. So great has been the disturbance in the region of thrusting that in some places, as in the neighbourhood of Loch Kishorn and elsewhere, the rocks have been completely overturned and the ancient gneiss has been piled upon the Torridonian. On the shore of Moray Firth at Rathie a small patch of Kimeridge shale occurs; and beneath the cliffs of Shandwick there is a little Lower Oolite with a thin seam of coal. Glacial striae are found upon the mountains up to heights of 3000 ft., and much boulder clay is found in the valleys and spread over large areas in the eastern districts. Raised beaches occur at 100, 50 and 25 ft. above the present sea-level; they are well seen in Loch Carron. Lewis, on Long Island, is made almost entirely of ancient "Lewisian gneiss," but a little Torridonian occurs about Stornoway.

Climate and Agriculture.—On the west coast the rainfall is excessive, averaging for the year 50·42 in. at Loch Broom and 62 in. at Strome Ferry (autumn and winter being the wettest seasons), but on the east coast the annual is only mean 27 in. The temperature for the year is 46·5° F., for January 38° F. and for July 57° F. The most fertile tracts lie on the eastern coast, especially in Easter Ross and the Black Isle, where the soil varies from a light sandy gravel to a rich deep loam. Among grain crops oats is that most generally cultivated, but barley and wheat are also raised. Turnips and potatoes are the chief green crops. On the higher grounds there is a large extent of good pasturage which carries heavy flocks of sheep, blackfaced being the principal breed. Most of the horses, principally half-breds between the old garrons (hardy, serviceable, small animals) and Clydesdales, are maintained for the purposes of agriculture. The herds of cattle, mainly native Highland or crosses, are large, many of them supplying the London market. Pigs are reared, though in smaller numbers than formerly, most generally by the crofters. Owing partly to the overcrowding of the island of Lewis and partly to the unkindly nature of the bulk of the surface—which offers no opportunity for other than patchwork tillage—the number of small holdings is enormous, Sutherlandshire alone amongst Scottish counties showing an even larger proportion of holdings under 5 acres; while the average size of all the holdings throughout the shire does not exceed 20 acres. About 800,000 acres are devoted to deer forests, a greater area than in any other county in Scotland, among the largest being Achnashellach (50,000 acres), Fannich (20,000), Kinlochluichart (20,600), Braemore (40,000), Inchbae (21,000) and Dundonnell (23,000). At one time the area under wood must have been remarkable, if we accept the common derivation of the word "Ross" as from the Irish *ros*, "a wood," and there is still a considerable extent of native woodland, principally fir, oak, ash and alder. The fauna is noteworthy. Red and roe deer abound, and foxes and alpine hares are common, while badgers and wild cats are occasionally trapped. Winged game are plentiful, and amongst birds of prey the golden eagle and osprey occur. Waterfowl of all kinds frequent the sea lochs; many rivers and lakes are rich in salmon and trout, and the pearl mussel is found in the bed of the Conon.

Other Industries.—Apart from agriculture, the fisheries are the only considerable industry, the county containing two fishery districts—Stornoway and Cromarty—and portions of two others—Loch Broom (the remainder belonging to Sutherlandshire) and Loch Carron (which includes part of Inverness-shire) Herring, cod and ling form the principal catch, while salmon are taken in large quantities in the bays and at the mouth of rivers. Distilleries are found near Dingwall, Tain and some other places, and there are manufactures, on a very limited scale, of woollens, chemical manures and aërated waters, besides some sandstone quarrying and flour mills. At Muir of Ord, in the parish of Urray, are held great horse, cattle and sheep markets.

The Highland railway entering the county to the north of Beauly runs northwards to Dingwall, and then strikes off to the north-east by Invergordon and Tain, where it bends to the west by north, leaving the shire at Culrain, having largely followed the coast throughout. At Muir of Ord it sends off the Black Isle branch and at Dingwall a branch to Strathpeffer, as well as a line to Strome Ferry and Kyle of Lochalsh on the south-western shore. Coaches connect various districts with stations on the Dingwall & Skye railway.

Population and Administration.—The population of the county in 1891 was 78,727, and in 1901 that of the mainland was 47,501, and of the islands 28,949, an aggregate of 76,450 or 25 to the sq. m. Thus Ross and Cromarty, though the third largest in size, is the least populated county in Scotland, excepting Sutherland, Inverness and Argyll. In 1901 there were 12,171 persons who spoke Gaelic only (of whom 9928 belonged to the islands) and 39,392 speaking Gaelic and English (of whom 15,990 were insular). The chief towns and villages are Stornoway (pop. 2854), Dingwall (2485), Fortrose (1322), Tain (2067), Cromarty (1242), Invergordon (1085). Ullapool is a small fishing port near the mouth of Loch Broom. For administrative purposes the county is divided into six districts, namely, Black Isle (pop. 6271), Easter Ross (12,192), Lewis (28,760), Mid Ross (12,953), South-Western Ross (4103) and Western Ross (5394). The county returns one member to parliament, and Cromarty, Dingwall and Tain belong to the Wick group of parliamentary burghs, and Fortrose to the Inverness group. Excepting Cromarty, these are royal burghs, and Dingwall is the county town. Ross and Cromarty forms a sheriffdom with Sutherlandshire, and there are resident sheriffs-substitute at Dingwall and Stornoway, the former also sitting at Tain and Cromarty. The shire is under school-board control, and there are academies at Tain, Dingwall and Fortrose, while several schools earn grants for higher education. The county council gives the "residue" grant to the committee on secondary education, which subsidizes science and art classes in various schools and higher grade science schools at Dingwall, Tain and Stornoway.

History.—It may be doubted whether the Romans ever effected even a temporary settlement in the area of the modern county. At that period, and for long afterwards, the land was occupied by Gaelic Picts, who, in the 6th and 7th centuries, were converted to Christianity by followers of St Columba. Throughout the next three centuries the natives were continually harassed by Norse pirates, of whose presence tokens have survived in several place-names (Dingwall, Tain, &c.). At this time the country formed part of the great province of Moray, which then extended as far north as Dornoch Firth and the Oykell, and practically comprised the whole of Ross and Cromarty, excepting a comparatively narrow strip on the Atlantic seaboard. When the rule of the Celtic *maormors* or earls ceased in the 12th century, consequent on the plantation of the district with settlers from other parts (including a body of Flemings), by order of David I., who was anxious to break the power of the Celts, the bounds of Moravia were contracted and the earldom of Ross arose. At first Ross proper only included the territory adjoining Moray and Dornoch Firths. The first earl was Malcolm MacHeth, who received the title from Malcolm IV. After his rebellion in 1179 chronic insurrection ensued, which was quelled by Alexander II., who bestowed the earldom on Farquhar Macintaggart (Farquhar, son of the priest), then abbot of Applecross, and in that capacity lord of the western district. William, 4th earl, was present with his clan at the battle of Bannockburn (1314), and almost a century later (1412) the castle of Dingwall, the chief seat on the mainland of Donald, lord of the Isles, was captured after the disastrous fight at Harlaw in Aberdeenshire, which Donald had provoked when his claim to the earldom was rejected. The earldom reverted to the crown in 1424, but James I. soon afterwards restored it to the heiress of the line, the mother of Alexander MacDonald, 3rd lord of the Isles, who thus became 11th earl. In consequence, however, of the treason of John Macdonald, 4th and last lord of the Isles and 12th earl of Ross, the earldom was again vested in the crown (1476). Five years later James III. bestowed it on his second son, James Stewart, whom he also created duke of Ross in 1488. By the 16th century the whole area of the county was occupied by different clans. The Rosses held what is now Easter Ross; the Munroes the small tract around Ben Wyvis, including Dingwall; the Macleods Lewis, and, in the mainland, the district between Loch Maree and Loch Torridon; the MacDonalds of Glengarry, Coygach, and the district between Strome Ferry and Kyle of Lochalsh, and the Mackenzies the remainder. The county of Ross was constituted in 1661, and Cromarty in 1685 and 1698, both being consolidated into the present county in 1889 (see CROMARTY, county). Apart from occasional conflicts between rival clans, the only battles in the shire were those of Invercarron, at the head of Dornoch Firth, when Montrose was crushed by Colonel Strachan on the 27th of April 1650, and Glenshiel, when the Jacobites, under the earl of Seaforth, aided by Spaniards, were defeated, at the pass of Strachel, near Bridge of Shiel, by General Wightman on the 11th of June 1719.

Antiquities.—The principal relics of antiquity—mainly stone circles, cairns and forts—are found in the eastern district. A vitrified fort crowns the hill of Knockfarrel in the parish of Fodderty, and there is a circular dun near the village of Lochcarron. Some fine examples of sculptured stones occur, especially those which, according to tradition, mark the burial-place of the three sons of a Danish king who were shipwrecked off the coast of Nigg. The largest and handsomest of these three crosses—the *clach-a-charridh*, or Stone of Lamentation—stands at Shandwick. It is about 9 ft. high and contains representations of the martyrdom of St Andrew and figures of an elephant and dog. It fell during a storm in 1847 and was broken in three pieces. On the top of the cross in Nigg churchyard are two figures with outstretched arms in the act of supplication; the dove descends between them; and below are two dogs. The cross was knocked down by the fall of the belfry in 1725, but has been riveted together. The third stone formerly stood at Cadboll of Hilltown, but was removed for security to the grounds of Invergordon Castle. Among old castles are those of Lochslin, in the parish of Fearn, said to date from the 13th century, which, though ruinous, possesses two square towers in good preservation; Balone, in the parish of Tarbat, once a stronghold of the earls of Ross; the remains of Dingwell Castle, their original seat; and Eilean Donain in Loch Alsh, which was blown up by English warships during the abortive Jacobite rising in 1719.

See R. Bain, *History of the Ancient Province of Ross* (Dingwall, 1899); J. H. Dixon, *Gairloch* (Edinburgh, 1888); F. N. Reid, *The Earls of Ross* (Edinburgh, 1894); W. C. Mackenzie, *History of the Outer Hebrides* (Paisley, 1904).

ROSSANO, a city of Calabria, Italy, in the province of Cosenza, 24 m. N.N.E. from that town direct, with a station 4 m. distant on the line from Metaponto to Reggio. Pop. (1901) 13,354. It is picturesquely situated on a precipitous spur of the mountain mass of Sila overlooking the Gulf of Taranto, the highest part of the town being 975 ft. above sea-level. Rossano is the seat of an archbishop, and in the cathedral is preserved the *Codex Rossanensis*, an uncial MS. of the Gospels of Matthew and Mark in silver characters on purple vellum, with twelve miniatures, of great interest in the history of Byzantine art, belonging to the 6th century A.D. It was brought to Grottaferrata (*q.v.*) for the exhibition of Byzantine art held there in 1905. Marble and alabaster quarries are worked in the neighbourhood.

Mentioned in the Itineraries, Rossano (*Roscianum*) appears under the Latin empire as one of the important fortresses of Calabria. Totila took it in 548. The people showed great attachment to the Byzantine empire. In the 14th century Rossano was made a principality for the great family of De Baux. Passing to the Sforza, and thus to Sigismund of Poland, it was united in 1558 to the crown of Naples by Philip II. of Spain in virtue of a doubtful will by Bona of Poland in favour of Giovanni Lorenzo Pappacoda. Under Isabella of Aragon and Bona of Poland the town had been a centre of literary culture; but under the Spaniards it declined. The crown sold the lordship in 1612 to the Aldobrandini, and from them it passed to the Borghesi and the Caraffa. Rossano is best known as the birthplace of St Nilus the younger, whose life is the most valuable source of information extant in regard to the state of matters in southern Italy in the 10th century. Pope John VII. (705–7) was also a native of the town.

See F. Lenormant, *La Grande-Grèce* (1881), vol. i. 339 sqq.

ROSSBACH, a village of Prussian Saxony in the district of Merseburg, 8 m. S.W. of that place and N.W. of Weissenfels, famous as the scene of Frederick the Great's victory over the allied French and the army of the Empire on the 5th of November 1757. For the events preceding the battle see SEVEN YEARS' WAR. The Prussian camp on the morning of the 5th lay between Rossbach (left) and Bedra (right), facing the Allies, who, commanded by the French general, Charles de Rohan, prince de Soubise (1715–1787), and Joseph Frederick William, duke of Saxe-Hildburghausen (1702–1787), General Feldzeugmeister of the Empire, had manœuvred in the preceding days without giving Frederick an opportunity to bring them to action, and now lay to the westward, with their right near Branderoda and their left at Mücheln (see sketch). The advanced posts of the Prussians were in the villages immediately west of their camp, those of the Allies on the Schortau hill and the Galgenberg.

The Allies possessed a numerical superiority of two to one in the battle itself, irrespective of detachments,[1] and their advanced post overlooked all parts of Frederick's camp. They had had the best of it in the manœuvres of the previous days, and the duke of Hildburghausen determined to take the offensive. He had some difficulty, however, in inducing Soubise to risk a battle, and the Allies did not begin to move off their camping-ground until after eleven on the 5th, Soubise's intention being probably to engage as late in the day as possible, with the idea of gaining what advantages he could in a partial action. The plan was to march the Allied army by Zeuchfeld, round Frederick's left (which was covered by no serious natural obstacle), and to deploy in battle array, facing north, between Reichardtswerben (right) and Pettstädt (left). The duke's proposed battle and the more limited aim of Soubise were equally likely to be attained by taking this position, which threatened to cut off Frederick from the towns on the Saale. This position, equally, could only be gained by marching round the Prussian flank, *i.e.* by a flank march before the enemy. The obvious risk of interference on the exposed flank was provided against by a considerable flank guard, and in fact it was not in the execution of their original design but in hastily modifying it to suit unfounded assumptions that the Allies met with disaster.

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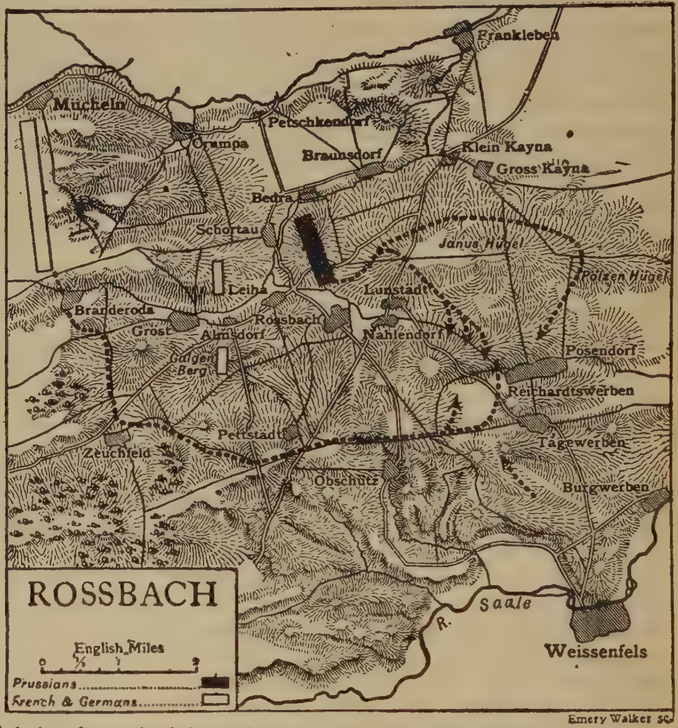
[1] V. der Goltz (*Rossbach bis Jena*, 1906 edition) gives 41,000 Allies and 21,600 Prussians as the combatant strengths. Berndt's statistical work, *Zahl im Kriege*, gives the respective forces engaged as Allies 43,000, Prussians 21,000. Other accounts give the Allies' total strength as 64,000 and the Prussians' as 24,000.

Frederick spent the morning watching them from a house-top in Rossbach. The initial stages of their movement convinced him that the Allies were retreating southward towards their magazines, and about noon he went to dinner, leaving Captain von Gaudi on the watch. This officer formed a different impression of the Allies' intentions, for the columns which from time to time became visible in the undulations of the ground were seen to turn eastwards from Zeuchfeld. Gaudi's excited report at first served only to confirm Frederick in his error. But when the king saw for himself that hostile cavalry and infantry were already near Pettstädt, he realized the enemy's intentions. The battle for which he had manœuvred in vain was offered to him, and he took it without hesitation. Leaving a handful of light troops to oppose the French advanced post (or flank guard) on the Schortau hill, the Prussian army broke camp and moved—half an hour after the king gave the order—to attack the enemy. The latter were marching in the normal order in two main columns, the first line on the left, the second line on the right; farther to the right was a column consisting of the reserve of foot, and between the first and second lines was the reserve artillery on the road. The right-wing cavalry was of course at the head, the left-wing cavalry at the tail of the two main columns. At first the regulation distances were preserved, but when wheeling eastward at Zeuchfeld there was much confusion, part of the reserve infantry getting in between the two main columns and hampering the movements of the reserve artillery, and the rest, on the outer flank of the wheel, being unable to keep up with the over-rapid movement of the wheeling pivot. A weak flank guard was thrown out towards Rossbach. When it was seen that the Prussians were moving, as far as could be judged, eastward, it was presumed that they were about to retreat in order to avoid being taken in flank and rear; and the Allied generals thereupon hurried the march, sending on the leading (right-wing) cavalry towards Reichardtswerben, and calling up part of the left-wing cavalry from the tail of the column, and even the flank-guard cavalry, to take part in the general chase. That Frederick's move meant an attack upon them before they could form up, Soubise and the duke failed to realize. They had taken more than three hours to break camp, and found it difficult to suppose that Frederick's army could move off in one-sixth that time. It was obvious, moreover, that the Prussians were not deploying for battle on the plain in front of Rossbach and Nahlendorf.

Frederick had no intention either of forming up parallel to the enemy or of retreating. As his army could move as a unit twice as fast as the enemy's, he intended to make a détour, screened by the Janus Hügel and the Pölzen Hügel, and to fall upon them suddenly from the east. If at the moment of contact the Allies had already formed their line of battle facing north, the attack would strike their right flank; if they were still on the move in column eastwards or north-eastwards, the heads of their columns would be crushed before the rest could deploy in the new direction—deployment in those days being a lengthy affair. To this end General von Seydlitz, with every available squadron, hurried eastward from Rossbach, behind the Janus Hügel, to the Pölzen Hügel; Colonel von Moller, with eighteen heavy guns, came into action on the Janus Hügel at 3.15 against the advancing columns of the Allied cavalry; and the infantry followed as fast as possible. When they came under the fire of Moller's guns, the Allied squadrons, which were now north of Reichardtswerben and well ahead of their own infantry, suffered somewhat heavily; but it was usual to employ heavy guns to protect a retreat, and they contented themselves with bringing some field-guns into action. They were, however, amazed when Seydlitz's thirty-eight squadrons suddenly rode down upon the head and right flank of their columns from the Pölzen Hügel *avec une incroyable vitesse.* Gallantly as the leading German regiments deployed to meet him, the result was scarcely in doubt for a moment. Seydlitz threw in his last squadron, and then himself fought like a trooper, receiving a severe wound. The mêlée drifted rapidly southward, past the Allied infantry, and Seydlitz finally rallied his horsemen in a hollow near Tagewerben, ready for fresh service. This first episode was over in half an hour, and by that time the Prussian infantry, in échelon from the left, was descending the Janus Hügel to meet the already confused and disheartened infantry of the Allies. The latter, as their cavalry had done, managed to deploy some regiments on the head of the column, and the French in particular formed one or two columns of attack—then peculiar to the French army—and rushed forward with the bayonet. But Moller's guns, which had advanced with the infantry, tore gaps in the close masses, and, when it arrived within effective musketry range, the attack died out before the rapid and methodical volleys of the Prussian line. Meanwhile the Allies were trying in vain to form a line of battle. The two main columns had got too close together in the advance from Pettstädt, part of the reserve which had become entangled between the main columns was extricating itself by degrees and endeavouring to catch up with the rest of the reserve column away to the right, and the reserve artillery was useless in the middle of the infantry. The Prussian infantry was still in échelon from the left, and the leftmost battalions that had repulsed the French columns were quickly within musket-shot of this helpless mass. A few volleys directed against the head and left flank of the column sufficed to create disorder, and then from the Tagewerben hollow Seydlitz's rallied squadrons charged, wholly unexpectedly, upon its right flank. The Allied infantry thereupon broke and fled. Soubise and the duke, who was wounded, succeeded in keeping one or two regiments together, but the rest scattered over the country-side. The battle had lasted less than an hour and a half, and the last episode of the infantry fight no more than fifteen minutes. Seven Prussian battalions only were engaged, and these expended five to fifteen rounds per man. Seydlitz and Prince Henry of Prussia, the cavalry and the infantry leaders engaged, were both wounded, but the total loss of the king's army was under 550 officers and men as compared with 7700[1] on the part of the Allies. (C. F. A.)



Emery Walker Sc.

ROSSE, EARL OF, a title borne by the Irish family of Parsons. James Parsons, a native of Leicestershire, who flourished in the 16th century, was the father of Sir William Parsons (*c.* 1570–1650), one of the lords justices of Ireland. Having crossed to Ireland in early life, William Parsons became surveyor-general in 1602 and obtained land in various parts of the country. In 1620 he was made a baronet; in 1643 he was deprived of his office as lord justice, and he died early in 1650. His great-grandson, Sir Richard Parsons, bart. (*c.* 1657–1703), was created Baron Oxmantown and Viscount Rosse in 1681, and Richard's son and successor, Richard (d. 1741), was made earl of Rosse in 1718. The titles became extinct when Richard, the 2nd earl, died in August 1764.

Sir William Parsons had two brothers, Sir Lawrence and Sir Fenton Parsons. Sir Lawrence, second baron of the Irish exchequer, left a son, William (d. 1653), who defended Birr Castle, King's County, for over a year against the Irish during the rebellion of 1641, and whose son, Sir Lawrence Parsons (d. 1698), was made a baronet in 1677. This Sir Lawrence was a strong Protestant, and was found guilty of high treason, being attainted and sentenced to death during the brief period of James II.'s ascendancy in Ireland. He was not executed, however, and afterwards he took some part in the struggle against the supporters of James II. His descendant, Lawrence Harman Parsons (1749–1807), was created Baron Oxmantown in 1792, Viscount Oxmantown in 1795, and earl of Rosse in 1806. He died on the 20th of April 1807, and was succeeded by his nephew Lawrence.

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[1] Figures again vary in different authorities. The above figure is that given by Berndt, *Zahl im Kriege*.

Lawrence Parsons, 2nd earl of Rosse (1758–1841), the eldest son of Sir William Parsons, bart. (d. 1791), of Birr Castle, was born on the 21st of May 1758. Educated at Trinity College, Dublin, he entered the Irish parliament as member for the university in 1782, and soon came to the front in debate. A friend and follower of Henry Flood, he has been described as "one of the very, very few honest men in the Irish House of Commons." He favoured some measure of relief to Roman Catholics and also parliamentary reform, a speech which he delivered on this question in 1793 being described by W. E. H. Lecky as "exceedingly valuable to students of Irish history"; but he disliked and opposed the union of the parliaments of Great Britain and Ireland. After this event, however, he represented King's County in the united parliament until 1807, and he was a representative peer for Ireland from 1809 to 1841. He died at Brighton on the 24th of February 1841. Rosse wrote *Observations on the Bequest of Henry Flood to Trinity College, Dublin, with a Defence of the Ancient History of Ireland* (Dublin, 1795). His eldest son was the astronomer William Parsons, 3rd earl of Rosse (see below).

ROSSE, WILLIAM PARSONS, 3RD EARL OF (1800–1867), Irish astronomer and telescope constructor, was born at York on the 17th of June 1800, a son of the 2nd earl (see above). Until his father's death he was known as Lord Oxmantown. Entered at Trinity College, Dublin, in 1818, he proceeded to Magdalen College, Oxford, in 1821, and in the same year he was returned as M.P. for King's County, a seat which he resigned in 1834. He was Irish representative peer from 1845, president of the British Association in 1843, president of the Royal Society from 1849 to 1854, and chancellor of the university of Dublin from 1862. From 1827 he devoted himself to the improvement of reflecting telescopes; in 1839 he mounted a telescope of 3 ft. aperture at his seat, Birr Castle, Parsonstown; and in February 1845 his celebrated 6-foot reflector was finished. Owing to the famine and the disturbed state of the country, which demanded his attention as a large landowner and lieutenant of King's County (from 1831), the instrument remained unused for nearly three years, but since 1848 it has been in constant use, chiefly for observations of nebulae, for which it was particularly suited on account of its immense optical power, nominally 6000. Lord Rosse died at Monkstown on the 31st of October 1867. He had four sons. The eldest, Lawrence Parsons, 4th earl of Rosse, and Baron Oxmantown, born on the 17th of November 1840, succeeded to the title on his father's death, and made many investigations on the heavenly bodies, particularly on the radiation of the moon and related physical questions; the youngest, the Hon. Charles Algernon Parsons, born on the 13th of June 1854, is famous for his commercial development of the steam turbine.

The first constructor of reflecting telescopes on a large scale, William Herschel, never published anything about his methods of casting and polishing specula, and he does not appear to have been very successful beyond specula of 18 in. diameter, his 4-foot speculum ("the 40-foot telescope") having been little used by him (see discussion between Sir J. Herschel and Robinson in *The Athenaeum*, Nos. 831–36, 1843). Lord Rosse had therefore no help towards his brilliant results. His speculum metal is composed of four atoms of copper (126·4 parts) and one of tin (58·9 parts), a brilliant alloy, which resists tarnish better than any other compound tried. Chiefly owing to the brittleness of this material, Lord Rosse's first larger specula were composed of a number of thin plates of speculum metal (sixteen for a 3-foot mirror) soldered on the back of a strong but light framework made of a peculiar kind of brass (2·75 of copper to 1 of zinc), which has the same expansion as his speculum metal. In Brewster's *Edinburgh Journal of Science* for 1828 he described his machine for polishing the speculum, which in all essential points remained unaltered afterwards. It imitates the motions made in polishing a speculum by hand by giving both a rectilinear and a lateral motion to the polisher, while the speculum revolves slowly; by shifting two eccentric pins the course of the polisher can be varied at will from a straight line to an ellipse of very small eccentricity, and a true parabolic figure can thus be obtained. The speculum lies face upwards in a shallow bath of water (to preserve a uniform temperature), and the polisher fits loosely in a ring, so that the rotation of the speculum makes it revolve also, but more slowly. Both the grinding and polishing tools are grooved, to obtain a uniform distribution of the emery used in the grinding process and of the rouge employed in polishing, as also to provide for the lateral expansion of the pitch with which the polisher is coated. In September 1839 a 3-foot speculum was finished and mounted on an altazimuth stand similar to Herschel's; but, though the definition of the images was good (except that the diffraction at the joints of the speculum caused minute rays in the case of a very bright star), and its peculiar skeleton form allowed the speculum to follow atmospheric changes of temperature very quickly, Lord Rosse decided to cast a solid 3-foot speculum. Hitherto it had been felt as a great difficulty in casting specula that the solidification did not begin at one surface and proceed gradually to the other, the common sand mould allowing the edges to cool first, so that the central parts were subject to great straining when their time of cooling came, and in large castings this generally caused cracking. By forming the bottom of the mould of hoop iron placed on edge and closely packed, and the sides of sand, while the top was left open, Lord Rosse overcame this difficulty, and the hoop iron had the further advantage of allowing the gas developed during the cooling to escape, thus preventing the speculum from being full of pores and cavities. This invention secured the success of the casting of a solid 3-foot speculum in 1840, and encouraged Lord Rosse to make a speculum of 6 ft. diameter in 1842. In the beginning of 1845 this great reflector was mounted and ready for work. The instrument has a focal length of 54 ft. and the tube is about 7 ft. in diameter; owing to these large dimensions it cannot be pointed to every part of the heavens, but can only be moved a short distance from the meridian and very little to the north of the zenith; these restrictions have, however, hardly been felt, as there is almost at any moment a sufficient number of objects within its reach.

From 1848 to 1878 it was but with few interruptions employed for observations of nebulae (see NEBULA); and many previously unknown features in these objects were revealed by it, especially the similarity of "annular" and "planetary" nebulae, and the remarkable "spiral" configuration prevailing in many of the brighter nebulae. A special study was made of the nebula of Orion, and the resulting large drawing gives an extremely good representation of this complicated object. (See TELESCOPE.)

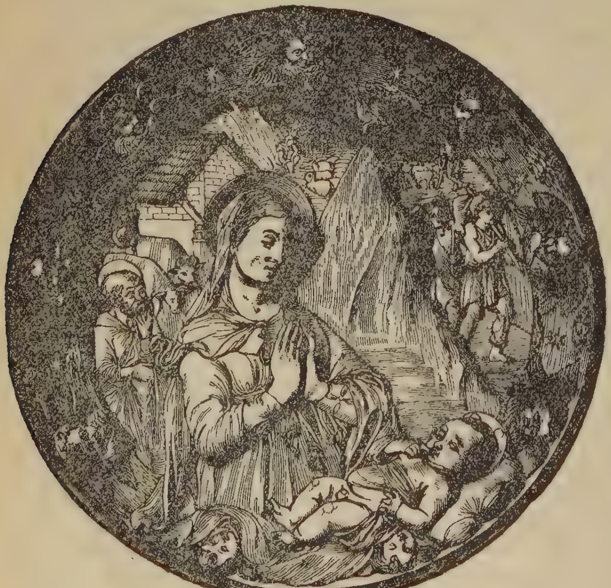
Lord Rosse gave a detailed account of the experiments which step by step had led to the construction of the 3-foot speculum in the *Philosophical Transactions* for 1840. In the same publication for 1844 and 1850 he communicated short descriptions and drawings of some of the more interesting nebulae, and in the volume for 1861 he published a paper "On the Construction of Specula of 6-ft. Aperture, and a Selection from the Observations of Nebulae made with them," with numerous engravings. The accounts of the observations given in these papers, however, were fragmentary; but in 1879–80 a complete account of them was published by the present earl ("Observations of Nebulae and Clusters of Stars made with the 6-foot and 3-foot Reflectors at Birr Castle from 1848 to 1878") in the *Scient. Trans. R. Dublin Soc.* vol. ii. The drawing of the nebula of Orion was published in the *Phil. Trans.* for 1868.

See obituary notice in the *Proc. Roy. Soc.* (1868), 16, 36, and in the *Monthly Notices of Roy. Astr. Soc.* vol. 29, p. 123.

ROSSELLI, COSIMO (1439–*c.* 1507), Florentine painter, was born in 1439. At the age of fourteen he became a pupil of Neri di Bicci, and in 1460 he worked as assistant to his cousin Bernardo di Stefano Rosselli. The first work of Cosimo mentioned by Vasari exists in S. Ambrogio, in Florence, over the third altar on the left. It is an "Assumption of the Virgin," a youthful and feeble work. In the same church, on the wall of one of the chapels, is a fresco by Cosimo which Vasari praises highly, especially for a portrait of the young scholar Pico of Mirandola. The scene, a procession bearing a miracle-working chalice, is painted with much vigour and less mannerism than most of this artist's work. A picture painted by Rosselli for the church of the Annunziata, with figures of SS. Barbara, Matthew and the Baptist, is in the Academy of Florence. Rosselli also spent some time in Lucca, where he painted several altar-pieces for various churches. A picture attributed to him, taken from the church of S. Girolamo at Fiesole, is now in the National Gallery of London. It is a large retable, with, in the centre, St Jerome in the wilderness kneeling before a crucifix, and at the sides standing figures of St Damasus and St Eusebius, St Paolo and St Eustachia; below is a predella with small subjects. Though dry and hard in treatment, the figures are designed with much dignity. The Berlin Gallery possesses three pictures by Rosselli: "The Virgin in Glory," "The Entombment of Christ," and "The Massacre of the Innocents." In 1480 Rosselli, together with the chief painters of Florence, was invited by Sixtus IV. to Rome to assist in the painting of the frescoes in the Sistine Chapel. Three of these were executed by him—"The Destruction of Pharaoh's Army in the Red Sea," "Christ Preaching by the Lake of Tiberias," and "The Last Supper." The last of these is well preserved, but is a mediocre work. Vasari's story about the pope admiring Rosselli's paintings more than those of his abler brother painters has probably little foundation. Rosselli's Sistine frescoes were partly painted by his assistant Piero di Cosimo, who was so called after Cosimo Rosselli. His chief pupil was Fra Bartolommeo. According to Vasari, Rosselli died in 1484, but this is a mistake, as his will exists dated 25th of November 1506 (see Gaye, *Car. ined.* ii. 457 *n.*).

For an account of Rosselli's Sistine frescoes, see Platner and Bunsen, *Beschreibung der Stadt Rom*, ii. pt. i.; and Rumohr, *Italien. Forschungen*, ii. 265.

ROSSELLINO, ANTONIO (1427–*c.* 1479), Florentine sculptor, was the son of Matteo di Domenico Gamberelli, and had four brothers, who all practised some branch of the fine arts. Almost nothing is known about the life of Antonio, but many of his works exist, and are full of religious sentiment, and executed with the utmost delicacy of touch and technical skill. The style of Antonio and his brother Bernardo is a development of that of Donatello and Ghiberti; it possesses all the refinement and sweetness of the earlier masters, but is not equal to them in vigour or originality. Antonio's chief work, still in perfect preservation, is the lovely tomb of a young cardinal prince of Portugal, who died in 1459. It occupies one side of a small chapel, also built by Rossellino, on the north of the nave of San Miniato al Monte.[1] The recumbent effigy of the cardinal rests on a handsome sarcophagus, and over it, under the arch which frames the whole, is a beautiful relief of the Madonna between two flying angels. The tomb was begun in 1461 and finished in 1466; Antonio received four hundred and twenty-five gold florins for it. A reproduction of this tomb with slight alterations, and of course a different effigy, was made by Antonio for the wife of Antonio Piccolomini, duke of Amalfi, in the church of S. Maria del Monte at Naples, where it still exists. For the same church he also executed some delicate reliefs, which perhaps err in being too pictorial in style, especially in the treatment of the backgrounds. A fine medallion relief by him in marble, originally modelled in terra-cotta, is preserved in the Bargello at Florence (see fig.).



Marble Relief by Antonio Rossellino.

BERNARDO ROSSELLINO (1409–1464), Florentine sculptor, was no less able than his younger brother Antonio. His finest piece of sculpture is the tomb, in the Florentine Santa Croce, of Leonardo Bruni of Arezzo, the historian of Florence, executed in 1443 some years after Bruni's death; the recumbent effigy is of great merit. The inner cathedral pulpit at Prato, circular in form on a tall slender stem, was partly the work of Mino da Fiesole and partly by Bernardo Rossellino. The latter executed the minute reliefs of St Stephen and the Assumption of the Virgin. For his part in the work he received sixty-six gold florins. The South Kensington Museum possesses a relief by Bernardo, signed and dated (1456). It is a fine portrait of the physician Giovanni da S. Miniato. Bernardo's works as an architect were numerous and important, and he was also a skilful military engineer. He restored the church of S. Francis at Assisi, and designed several fine buildings at Civita Vecchia, Orvieto and elsewhere. He also built fortresses and city walls at Spoleto, Orvieto and Civita Castellana. He was largely employed by Nicholas V. and Pius II. for restorations in nearly all the great basilicas of Rome, but little trace of his work remains, owing to the sweeping alterations made during the 17th and 18th centuries. Between the years 1461 and 1464 (when he died while engaged on the Lazzari monument at Pistoia) he occupied the important post of *capo-maestro* to the Florentine duomo. A number of buildings at Pienza, executed for Pius II., are attributed to him; the Vatican registers mention the architect of these as M° Bernardo di Fiorenza, but this indication is too slight to make it certain that the elder Rossellino is referred to (see Vasari, ed. Milanesi, iii. 93 seq.).

See Wilhelm Bode, *Die Italienische Plastik* (Berlin, 1902).

ROSSETTI, CHRISTINA GEORGINA (1830–1894), English poet, was the youngest of the four children of Gabriele Rossetti (see the article on her brother DANTE GABRIEL ROSSETTI). She was born at 38 Charlotte Street, Portland Place, London, on the 5th of December 1830. She enjoyed the advantages and disadvantages of the strange society of Italian exiles and English eccentrics which her father gathered about him, and she shared the studies of her gifted elder brother and sister. As early as 1847 her grandfather, Gaetano Polidori, printed privately a volume of her *Verses*, in which the richness of her vision was already faintly prefigured. In 1850 she contributed to *The Germ* seven pieces, including some of the finest of her lyrics. In her girlhood she had a grave, religious beauty of feature, and sat as a model not only to her brother Gabriel, but to Holman Hunt, to Madox Brown and to Millais. In 1853–54 Christina Rossetti for nearly a year helped her mother to keep a day-school at Frome-Selwood, in Somerset. Early in 1854 the Rossettis returned to London, and the father died. In poverty, in ill-health, in extreme quietness, she was now performing her life-work. She was twice sought in marriage, but each time, from religious scruples (she was a strong high-church Anglican), she refused her suitor; on the former of these occasions she sorrowed greatly, and her suffering is reflected in much of her early song. In 1861 she saw foreign countries for the first time, paying a six weeks' visit to Normandy and Paris. In 1862 she published what was practically her earliest book, *Goblin Market*, and took her place at once among the poets of her age. In this volume, indeed, is still to be found a majority of her finest writings. *The Prince's Progress* followed in 1866. In 1867 she, with her family, moved to 56 Euston Square, which became their home for many years. Christina's prose work *Commonplace* appeared in 1870. In April 1871 her whole life was changed by a terrible affliction, known as "Graves's disease"; for two years her life was in constant danger. She had already composed her book of children's poems, entitled *Sing-Song*, which appeared in 1872. After a long convalescence, she published in 1874 two works of minor importance, *Annus Domini* and *Speaking Likenesses*. The former is the earliest of a series of theological works in prose, of which the second was *Seek and Find* in 1879. In 1881 she published a third collection of poems, *A Pageant*, in which there was evidence of slackening lyrical power. She now gave herself almost entirely to religious disquisition. The most interesting and personal of her prose publications (but it contained verse also) was *Time Flies* (1885)—a sort of symbolic diary or collection of brief homilies. In 1890 the S.P.C.K. published a volume of her religious verse. She collected her poetical writings in 1891. In 1892 she was led to publish a very bulky commentary on the Apocalypse, entitled *The Face of the Deep*. After this she wrote little. Her last years were spent in retirement at 30 Torrington Square, Bloomsbury, which was her home from 1876 to her death. In 1892 her health broke down finally, and she had to endure terrible suffering. From this she was released on the 29th of December 1894. Her *New Poems* were published posthumously in 1896. In spite of her manifest limitations of sympathy and experience, Christina Rossetti takes rank among the foremost poets of her time. In the purity and solidity of her finest lyrics, the glow and music in which she robes her moods of melancholy reverie, her extraordinary mixture of austerity with sweetness and of sanctity of tone with sensuousness of colour, Christina Rossetti, in her best pieces, may challenge comparison with the most admirable of our poets. The union of fixed religious faith with a hold upon physical beauty and the richer parts of nature has been pointed to as the most original feature of her poetry. Hers was a cloistered spirit, timid, nun-like, bowed down by suffering and humility; her character was so retiring as to be almost invisible. All that we really need to know about her, save that she was a great saint, was that she was a great poet. (E. G.)

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[1] Illustrated by Gonnelli, *Mon. Sepol. della Toscana* (Florence, 1819), pl. xxiii.

See the *Poetical Works* of C. G. R., with Memoir by W. M. Rossetti (1903). Also Edmund Gosse's *Critical Kit-Kats* (1896); an article by Ford Madox Hueffer in the *Fortnightly Review* (March 1904); and another in *The Christian Society* (Oct. 1904). The *Family Letters of Christina Rossetti* were edited by W. M. Rossetti in 1908.

ROSSETTI, DANTE GABRIEL (1828–1882), English poet and painter, whose full baptismal name was Gabriel Charles Dante, was born on the 12th of May 1828, at 38 Charlotte Street, Portland Place, London. He was the first of the two sons and the second of the four children of Gabriele Rossetti (1783–1854), an Italian poet and liberal, who, about 1824, after many vicissitudes connected with the part he played in the Naples reform movement against Ferdinand I., came to England, where he married in 1826 Frances Mary Polidori (d. 1886), sister of Byron's physician, Dr John Polidori, and daughter of a Tuscan, Gaetano Polidori, who had in early youth been Alfieri's secretary and who had married an English lady. In 1831 he became professor of Italian in King's College, London, and afterwards achieved a recognized position as a subtle and original, if eccentric, commentator on Dante. In 1852 he published a volume of Italian religious poems. His family, besides Dante Gabriel, consisted of Maria Francesca (1827–1876), who eventually entered an Anglican sisterhood—she is known to Dante scholars by her valuable *Shadow of Dante*; William Michael (b. 1829), a well-known man of letters who from 1845 to 1894 was in the Inland Revenue Office—he married a daughter of Ford Madox Brown; and Christina (*q.v.*), the poet. The literary spirit was strongly entrenched here; and the talent which was always distinguished in William Michael rose to the height of rare genius in Dante Gabriel and Christina.

Dante Rossetti's education was begun at a private school in Foley Street, Portland Place, where he remained, however, only nine months, from the autumn of 1835 to the summer of 1836. He next went (in the autumn of 1836) to King's College School, where he remained till the summer of 1843, having reached the fourth class. From early childhood he had displayed a marked propensity for drawing and painting. It had therefore from the first been tacitly assumed that his future career would be an artistic one, and he left school early. In Latin, however, he was already fairly proficient for his age; French he knew well; Italian he had spoken from childhood, and he had some German lessons about 1844–45. But, although he learned enough German to be able to translate the *Arme Heinrich* of Hartmann von Aue, and some portions of the *Nibelungenlied*, he afterwards forgot the language almost entirely. His Greek too, such as it had been, he lost. On leaving school he went (1843) to Cary's Art Academy (previously called Sass's), near Bedford Square, and thence obtained admission to the Royal Academy Antique School towards 1846. Of the artistic education of foreign travel Rossetti had very little. But in early life he made a short tour in Belgium, where he was indubitably much impressed and influenced by the works of Van Eyck at Ghent and Memling at Bruges.

[It may be convenient to interpolate here a continuous account of Rossetti's career as a pictorial artist. Being much impressed by some of the early works of Ford Madox Brown exhibited at the Academy (1841), Westminster Hall (1844–45) and the British Institution (1845), he sought from that master of technique technical instruction of a more direct and stringent kind than he had previously submitted to. Brown, ever generous in that way, undertook without a fee the training of Rossetti as a painter, and set him to work upon such rudimentary studies as pickle-pots and other "still-life." The pupil's course of such work was, as might be expected, short; the master's example and that of Millais, together with the uncompromising energy of Holman Hunt, with both of whom Rossetti became intimate about this time, helping and encouraging him. Most of all, perhaps, so far as his temporary impressions were concerned, a picture of Brown's which was shown at the "Free Exhibition," Hyde Park Corner, in the spring of 1848 profoundly affected Rossetti. This was, of course, months before the formation of the Pre-Raphaelite Brotherhood in the autumn of the last-named year, when five painter-students, a sculptor (Thomas Woolner) and a layman (W. M. Rossetti) agreed upon certain principles they desired should obtain in art. None of the five owed the initiative of his views to any of the others or to Brown, whose impulse was purely technical and connected with Rossetti only; neither Millais, Holman Hunt, J. Collinson nor F. G. Stephens needed the help of Madox Brown. The point of Pre-Raphaelite crystallization which had so great though brief an influence upon Rossetti's life and art was found at a chance meeting of Rossetti, Millais and Holman Hunt in Millais's house in Gower Street, where certain prints from early Italian frescoes were studied. The enthusiasm of Rossetti led him to propose the formation of a "Brotherhood" with more or less definite views and much loftier aims than artists generally venture to announce. This took effect; the views of the remaining three men were already known, and in a few days they joined the new society and took their shares in the obloquy which attended the doings of Millais, Hunt and Collinson. Brown, though invited, declined to become a P-R.B. Rossetti's first effort was by means of "The Girlhood of Mary, Virgin," which in March 1849 was exhibited at Hyde Park Corner. It was a picture which attested the prodigious value of his studies since the previous October, and the native genius of the painter and the sincere passion with which he had accepted the obligations of Pre-Raphaelitism, as they were then, but not for long, understood. Nothing of his producing was more independent than the inception of "The Girlhood of Mary, Virgin"; indeed the design for it was made some half a year before the meeting in Gower Street, though the execution of this work owed not a little to the influence, if not the actual help, of Millais and Hunt. Its mysticism was Rossetti's own, its technique owed something to Brown. On the whole, there can be no doubt that in this work was the first pronouncement of a new view of art, a fresh technique and power rapidly developing itself. Of course, the style of this noteworthy and epoch-marking picture was jejune, its handling was timid, while its coloration and tonality were dry, not to say thin. Such was Rossetti's advent in art under the Pre-Raphaelite banner. The picture's reception was not encouraging, nor did the next work from his hands induce him to emerge from that proud exclusiveness in which all such minds as his are content to abide. The diverse moods of the other Brothers chose otherwise, but of Rossetti's immediate circle it has been truly said: "It appears that of seven young men and Brethren five have attained eminent positions, four of them being pre-eminent, although for years after the society was formed no single member, whatever his position might be, escaped insult, obloquy and wicked and malicious misrepresentation. The more conspicuous the Brother [*e.g.* Millais], the more outrageously was he attacked." No estimate of Rossetti's genius, his triumph and his life as a whole can be justly based without ample allowance being made for the circumstances which attended his advent as a painter. "Ecce Ancilla Domini!" the smaller picture which is now in the National Gallery of British Art at Millbank, was the one perfect outcome of the original motive of the Pre-Raphaelite Brotherhood by its representative and typical member. It is replete with the mystical mood which then ruled the painter's mind; that mood chose what may be called virginal white and its harmonies as its aptest coloration, and the intense light of morning sufficed for its tonality. It was exhibited at the Portland Gallery in 1850. After these pictures were finished, the outside world saw no more of Rossetti as a painter until it had prepared itself to see modern art from a higher plane than before.

In December 1850 there appeared the first number of *The Germ*, a magazine (which lasted for only four numbers) in which Rossetti had a leading place as the poet in verse and prose. The influence of Robert Browning upon Rossetti was more potent in *The Germ* than in that splendid romance in water-colours called "The Laboratory," where a court lady of the *ancien régime* visits an old poison-monger to obtain from him a fatal potion for her rival in love. This wonderful gem of colour, glowing in lurid and wicked passion and voluptuous suggestion, marked the opening of the artist's second period and signalized his departure from that phase of Pre-Raphaelitism of which "Ecce Ancilla Domini!" was the crowning achievement, and, so far as he was concerned, the artistic *ne plus ultra*. Millais and the other Brothers remained faithful during several years yet to come. Later in 1850, Rossetti produced the original, which is in ink, of the famous "Hesterna Rosa," a gambling scene of men and their mistresses in a tent by lamplight, while pallid dawn gathers force between the trees without. Then came from his hands "Borgia," which, like "The Laboratory," is in water-colours, and, like "Hesterna Rosa," is a sardonic tragedy. "How they met Themselves" came next, and, in illustrating a legend similar to that of the Döppelgänger, affirmed the force, the originality and the tragic passion of Rossetti's genius. Two lovers are walking in a twilight wood, where they are confronted suddenly by their apparitions, portending death. The year 1852 produced "Giotto painting Dante's Portrait," and saw a new development of the painter's mind and mood, dashed with a humour not often to be seen in him. In its somewhat dry coloration it differed from the ardent jewel-like glow and deeper gloom of "Borgia" and its successor and the sumptuous visions of womanhood in later pictures. "Found," Rossetti's sole contribution of the sort which Mr Holman Hunt affected, was begun somewhere about this period; but this piece of pictorial moralizing (the analogue of the poet's own "Jenny"), vigorous and intensely pathetic as it is, was never really finished by its author, being, indeed, far remote from Rossetti's inner self, which was rather over-scornful of didactic art, and thoroughly indisposed towards attempts to ameliorate anybody's condition by means of pictures. Nor did the stringency of naturalistic painting suit his mood or his experience. Nevertheless, what is his in the existing picture remains a masterpiece of poetry with exquisitely finished parts.

Passing a few fine but comparatively unimportant drawings, such as "Lancelot and Guinevere at the Tomb of Arthur," "Lancelot looking at the Dead Lady of Shalott," "Mariana of the South," "Sir Galahad," "The Blue Closet," and various works owing subjects to the Arthurian cycle of romances, we may note that the artist illustrated by five cuts *Poems by Alfred Tennyson*, on which Millais and Mr Holman Hunt were also engaged, and which was published by Moxon in 1857. As in "Ecce Ancilla Domini!" we had virginal white and morning light employed to strengthen the mystical significance of the design, so in "Borgia" Venetian voluptuousness and sensuous splendours obtained, and in "The Blue Closet" is a very potent and suggestive exercise intended to symbolize the association of colour with music. The last is one of the subtlest of the artist's "inventions," and it shows how he had developed upon "Borgia" an artistic sympathy which is but too likely to be "caviare to the general." "The Wedding of St George" is not so fine; nor was "Lancelot's Dream of the Sangreal," Rossetti's part in the luckless decorations of the Oxford Union[1] (1857–58); nor are "Guinevere and Sir Lancelot," "Galahad in the Chapel" and other Arthurian examples quite worthy of his art. "Bocca Baciata," the super-sensuous portrait of a woman, a work of wonderful fire, and the pictures on the pulpit at Llandaff Cathedral, marked the expiration of the second epoch in Rossetti's art and the beginning of a new, the third, last and most powerful of all the phases of his career. The picture "Dr Johnson at the Mitre," when the "pretty fools" consulted the lexicographer anent Methodism, is a good example of his humour.

In 1861 Rossetti produced several fine designs for stained glass, and in the revival of stained-glass painting as an art he had a larger share than has frequently been ascribed to him. The practice of designing upon a large scale, and employment of masses of splendid though deep-toned colours, had probably something to do with the prodigious development of his powers and the enlargement of his views as regards painting which took effect at this period (1862–63). At this time a striking and highly imaginative triptych, representing three events in the careers of Paolo and Francesca, was produced; it is a great improvement upon an earlier design. There is unprecedented energy in the group of the lovers embracing in the garden-house just as they have paused in reading the fatal romance. The composition of this group, with the circular window behind their figures, is as fine as it was comparatively novel in Rossetti's practice. Its lurid coloration was so thoroughly in harmony with the pathos of the subject that in this respect the work excelled all the painter had previously produced. The same elements, energy, a sympathetic and poetic scheme of colour, and composition of a fine order, combined with far greater force and originality in "The Bride," or "The Beloved," that magnificent illustration of The Song of Solomon. The last named is a life-size group of powerfully coloured and diversely beautiful damsels accompanying their mistress with music and with song on her way to the bridegroom. This picture, as regards its brilliance, finish, the charms of four lovely faces and the splendour of its lighting, occupies a great place in the highest grade of modern art of all the world. It is likewise, so far as the qualities named are concerned, the crowning piece of Rossetti's art, and stands for him much as the "Sacred and Profane Love" of Titian represents that master. Very fine, indeed, but hardly so passionate and virile, is the "Beata Beatrix," now in the National Gallery of British Art with "Ecce Ancilla Domini!" which he produced thirteen years earlier. These works belong to a category of fine and quite original examples, all replete with similar technical qualities, poetry and pathos. The group comprises paintings by which Rossetti is best known, such as "Proserpina in Hades," which is, on the whole, perhaps the most original, if not indeed the most poetical and powerful, of all his output; "Sibylla Palmifera," "Venus Verticordia," "Lilith" (the better of the two versions is now referred to), "Washing Hands," "Monna Vanna," "Il Ramoscello," "Aurea Catena," "La Pia," "Rosa Triplex," "Veronica Veronese," "La Ghirlandata," "Pandora," "The Blessed Damozel," and, last and largest, but not, perhaps, the greatest of his paintings (a distinction for which "The Bride" and "Proserpina" must contend), the famous "Dante's Dream," now in the Walker Art Gallery at Liverpool. Besides these, Rossetti produced a large number of fine things. Nearly the whole of them were exhibited by the Royal Academy and at the Burlington Fine Art Club in 1883, after their author's death. (F. G. S.)]

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[1] In 1857, Rossetti, when in Oxford with William Morris, conceived the design of filling the bays above the gallery in the then new Union debating room (now the library) with paintings from the *Morte d'Arthur*, and he enlisted the co-operation of several of his artistic circle, including Burne-Jones and William Morris, in the work, which was begun in August. Morris's picture was "Sir Palomides watching Tristram and Iseult," Burne-Jones's "Nimue luring Merlin." Unfortunately the walls were too new and not properly prepared for painting; the colour soon began to fade and wear off, and in the course of twenty years or so the pictures became almost indistinguishable.

Meanwhile, the literary side of Rossetti had developed *pari passu* with his achievements as a painter. The goal before the young Rossetti's eyes was to reach through art the forgotten world of old romance—that world of wonder and mystery and spiritual beauty which the old masters knew and could have painted had not lack of science, combined with slavery to monkish traditions of asceticism, crippled their strength. In that great rebellion against the renascence of classicism which (after working much good and much harm) resulted in 18th-century materialism—in that great movement of man's soul which may be appropriately named "the Renascence of the Spirit of Wonder in Poetry and Art"—he had become the acknowledged protagonist before ever the Pre-Raphaelite brotherhood was founded, and so he remained down to his last breath. It was by inevitable instinct that Rossetti turned to that mysterious side of nature and man's life which to other painters of his time had been a mere fancy-land, to be visited, if at all, on the wings of sport. For if there is any permanent vitality in the Renascence of Wonder in modern Europe, if it is really the inevitable expression of the soul of man in a certain stage of civilization (when the sanctions which have made and moulded society are found to be not absolute and eternal, but relative, mundane, ephemeral and subject to the higher sanctions of unseen powers that work behind "the shows of things"), then perhaps one of the first questions to ask in regard to any imaginative painter of the 19th century is, In what relation did he stand to the newly awakened spirit of romance? Had he a genuine and independent sympathy with that temper of wonder and mystery which all over Europe had preceded and now followed the temper of imitation, prosaic acceptance, pseudo-classicism and domestic materialism? or was his apparent sympathy with the temper of wonder, reverence and awe the result of artistic environment dictated to him by other and more powerful and original souls around him?

We do not say that the mere fact of a painter's or a poet's showing but an imperfect sympathy with the Renascence of Wonder is sufficient to place him below a poet in whom that sympathy is more nearly complete, but we do say that, other things being equal or anything like equal, a painter or poet of this time is to be judged very much by his sympathy with that great movement, which we call the Renascence of Wonder because the word "romanticism" never did express it even before it had been vulgarized by French poets, dramatists, doctrinaires and literary harlequins. To struggle against the prim traditions of the 18th century, the unities of Aristotle, the delineation of types instead of characters, as Chateaubriand, Madame de Staël, Balzac and Hugo struggled, was well. But in studying Rossetti's works we reach the very key of those "high palaces of romance" which the English mind had never, even in the 18th century, wholly forgotten, but whose mystic gates no Frenchman ever yet unlocked. Not all the romantic feeling to be found in all the French romanticists (with their theory that not earnestness but the grotesque is the life-blood of romance) could equal the romantic spirit expressed in a single picture or drawing of Rossetti's, such, for instance, as Beata Beatrix or Pandora. For, while the French romanticists—inspired by the theories (drawn from English exemplars) of Novalis, Tieck and Herder—cleverly simulated the old romantic feeling, the "beautifully devotional feeling" which Holman Hunt speaks of, Rossetti was steeped in it: he was so full of the old frank childlike wonder and awe which preceded the great renascence of materialism that he might have lived and worked amidst the old masters. Hence, in point of design, so original is he that to match such ideas as are expressed in "Lilith," "Hesterna Rosa," "Michael Scott's Wooing," the "Sea Spell," &c., we have to turn to the sister art of poetry, where only we can find an equally powerful artistic representation of the idea at the core of the old romanticism—the idea of the evil forces of nature assailing man through his sense of beauty. We must turn, we say, not to art—not even to the old masters themselves—but to the most perfect efflorescence of the poetry of wonder and mystery—to such ballads as the "Demon Lover," to Coleridge's "Christabel" and "Kubla Khan," to Keats's "La Belle Dame sans Merci," for parallels to Rossetti's most characteristic designs. Now, although the idea at the heart of the highest romantic poetry (allied perhaps to that apprehension of the warring of man's soul with the appetites of the flesh which is the basis of the Christian idea) may not belong exclusively to what we call the romantic temper (the Greeks, and also most Asiatic peoples, were more or less familiar with it, as we see in the *Salámán and Absal* of Jami), yet it became peculiarly a romantic note, as is seen from the fact that in the old masters it resulted in that asceticism which is its logical expression and which was once an inseparable incident of all romantic art. But in order to express this stupendous idea as fully as the poets have expressed it, how is it possible to adopt the asceticism of the old masters? This is the question that Rossetti asked himself, and answered by his own progress in art. In all of his pictures, the poorest and the best, is displayed that power which Blake calls vision—the power which, as he finely says, is "surrounded by the daughters of inspiration," the power, that is, of seeing imaginary objects and dramatic actions—physically seeing them as well as mentally—and flashing them upon the imaginations (even upon the corporeal senses) of others.

Mr W. M. Rossetti (in the Preface to the *Collected Works*, 1886) has given an interesting account of his brother's literary nurturing. Shakespeare, Walter Scott, Byron, the Bible were the earliest influences: then Shelley, Mrs Browning, the older English and Scottish ballads, and Dante. Afterwards he preferred Keats to Shelley. By 1847 he was "deep in Robert Browning." Malory's *Morte d'Arthur*, about 1856, engrossed him; Victor Hugo and De Musset, among French poets, were his delight. In his last years he had an enthusiasm for Chatterton. From childhood's days he had loved to compose, but *The Germ* (1850) contained Rossetti's first published prose or verse. In it appeared "The Blessed Damozel," the prose poem "Hand and Soul," six sonnets and four lyrics.

"The Blessed Damozel" was written so early as 1847 or 1848. "Sister Helen" was produced in its original form in 1850 or 1851. His translations from the early Italian poets also began as far back as 1845 or 1846, and may have been mainly completed by 1849. He published a volume of *The Early Italian Poets* (*Dante and his Circle*) in 1861. In 1856 he contributed to the *Oxford and Cambridge Magazine*, in which among other things the "Burden of Nineveh" appeared. Materials for a volume of original poetry accumulated slowly, and these having been somewhat widely read in manuscript had a very great influence upon contemporary poetic literature long before their appearance in print. He had intended to publish a volume in 1862, but the death of his wife (see below) caused its postponement till 1870. In poetry no less than in art what makes Rossetti so important a figure is the position he took up with regard to the modern revival of the "romantic" spirit. The Renascence of Wonder culminates in Rossetti's poetry as it culminates in his painting. The poet who should go beyond Rossetti would pass out of the realm of poetry into pure mysticism, as certain of his sonnets show. Fine as are the sonnets (of which the sonnet sequence, the "House of Life," in the 1881 volume, may be specially mentioned), it is in his romantic ballads that Rossetti (notwithstanding a certain ruggedness of movement) shows his greatest strength. "Sister Helen," "The Blessed Damozel," "Staff and Scrip," "Eden Bower," "Troy Town," "Rose Mary," as representing the modern revival of the true romantic spirit, take a place quite apart from the other poetry of the time.

Rossetti's poetry, and his prose too, is marked by an extraordinary fastidiousness of expression and beauty of diction; the form and colour of his style are alike marvellous in clearness and loveliness of language. But the dominant characteristic, after all, is the underlying idea, the romantic motive. By the revival of the romantic spirit in English poetry we mean something much more than the revival, at the close of the 18th century, of natural language, the change discussed by Wordsworth in his famous Preface, and by Coleridge in his comments thereon—that change of diction and of poetic methods which is commonly supposed to have arisen with Cowper, or, if not with Cowper, with Burns. The truth is that Wordsworth and Coleridge were too near the great changes in question, and they themselves took too active a part in those changes, to hold the historical view of what the changes really were. Important as was the change in poetic methods which they so admirably practised and discussed, important as was the revival of natural language, which then set in, it was not nearly so important as that other revival which had begun earlier and of which it was the outcome—the revival of the romantic spirit, the Renascence of Wonder, even beneath the weight of 18th-century diction, the first movement of which is certainly English, and neither German nor French in its origin, and can be traced through Chatterton, Macpherson and the Percy Ballads.

As a mere question of methods, a reaction against the poetic diction of Pope and his followers was inevitable. But, in discussing the romantic temper in relation to the overthrow of the bastard classicism and didactic materialism of the 18th century, we must go deeper than mere artistic methods in poetry. When closely examined, it is in method only that the poetry of Cowper is different from the ratiocinative and unromantic poetry of Dryden and Pope and their followers. Pope treated prose subjects in the ratiocinative—that is to say, the prose—temper, but in a highly artificial diction which people agreed to call poetic. Cowper treated prose subjects too—treated them in the same prose temper, but used natural language; a noble thing to do, no doubt. But this was only a part (and by no means the chief part) of the great work achieved by English poetry at the close of last century. That period, to be sure, rendered obsolete the poetic diction of Pope; but it introduced something more precious still—entire freedom from the hard rhetorical materialism imported from France; it gave a new seeing to English eyes, which were opened once more to the mystery and the wonder of the universe and the romance of man's destiny; it revived, in short, the romantic spirit, but the romantic spirit enriched by all the clarity and sanity that the renascence of classicism was able to lend. Of the great movement which substituted for the didactic materialism of the 18th century the new romanticism of the 19th, the leaders were Coleridge and Scott, admirably followed by Byron, Shelley and Keats. Not that Wordsworth was a stranger to the romantic temper. The magnificent image of Time and Death under the yew tree is worthy of any romantic poet that ever lived, yet it cannot be said that he escaped save at moments from the comfortable 18th-century didactics, or that he was a spiritual writer in the sense that Coleridge, Blake and Shelley were spiritual writers.

Of the true romantic feeling, the ever-present apprehension of the spiritual world and of that struggle of the soul with earthly conditions which we have before spoken of, Rossetti's poetry is as full as his pictures—so full, indeed, that it was misunderstood by certain critics, who found in the most spiritualistic of poets and painters the founder of a "fleshly school." Although it cannot be said that "The Blessed Damozel" or "Sister Helen" or "Rose Mary" reaches to the height of the masterpieces of Coleridge, the purely romantic temper was with Rossetti a more permanent and even a more natural temper than with any other 19th-century poet, even including the author of "Christabel" himself. As to the other 19th-century poets, though the Ettrick Shepherd in "The Queen's Wake" shows plenty of the true feeling, Hogg's verbosity is too great to allow of really successful work in the field of romantic ballad, where concentrated energy is one of the first requisites. And even Dobell's "Keith of Ravelston" has hardly been fused in the fine atmosphere of fairyland. Byron's "footlight bogies" and Shelley's metaphysical abstractions had of course but very little to do with the inner core of romance, and we have only to consider Keats, to whose "La Belle Dame sans Merci" and "Eve of St Mark" Rossetti always acknowledged himself to be deeply indebted. In the famous close of the seventh stanza of the "Ode to a Nightingale"—

> "Charmed magic casements opening on the foam
> Of perilous seas in faery lands forlorn"—

there is of course the true thrill of the poetry of wonder, and it is expressed with a music, a startling magic, above the highest reaches of Rossetti's poetry. But, without the evidence of Keats's two late poems, "La Belle Dame sans Merci" and the "Eve of St Mark," who could have said that Keats showed more than a passing apprehension of that which is the basis of the romantic temper—the supernatural? In contrasting Keats with Rossetti, it must always be remembered that Keats's power over the poetry of wonder came to him at one flash, and that it was not (as we have said elsewhere) "till late in his brief life that his bark was running full sail for the enchanted isle where the old ballad writers once sang and where now sate the wizard Coleridge alone." Though outside Coleridge's work there had been nothing in the poetry of wonder comparable with Keats's "La Belle Dame sans Merci," the latter had previously in "Lamia" entirely failed in rendering the romantic idea of beauty as a maleficent power. The reader, owing to the atmosphere surrounding the dramatic action being entirely classic, does not believe for a moment in the serpent woman. The classic accessories suggested by Burton's brief narrative hampered Keats where to Rossetti (as we see in "Pandora," "Cassandra" and "Troy Town") they would simply have given birth to romantic ideas. It is perhaps with Coleridge alone that Rossetti can be compared as a worker in the Renascence of Wonder. Although his apparent lack of rhythmic spontaneity places him below the great master as a singer (for in these miracles of Coleridge's genius poetry ceases to appear as a fine art at all —it is the inspired song of the changeling child "singing, dancing to itself"), in permanence of the romantic feeling, in vitality of belief in the power of the unseen, Rossetti stands alone. Even the finest portions of his historical ballad "The King's Tragedy" are those which deal with the supernatural.

The events of Rossetti's life may be briefly summarized. In the spring of 1860 he married Elizabeth Eleanor Siddall, a milliner's assistant, who, being very beautiful, was constantly painted and drawn by him. From 1856 onwards he had been very intimate with William Morris and Edward Burne-Jones, who had the greatest affection and artistic admiration for him. Mrs Rossetti, whose health was delicate, had one still-born child in 1861, and she died from an overdose of laudanum in February 1862. Rossetti then moved from Blackfriars to 16 Cheyne Walk, Chelsea, where for a short time George Meredith, A. C. Swinburne and W. M. Rossetti lived with him. Mrs Rossetti's own water-colour designs show an extraordinary genius for invention and a rare instinct for colour. Rossetti felt her death so acutely that in the first paroxysm of his grief he insisted upon his poems (then in manuscript) being buried in her coffin. But in 1869 the manuscripts were disinterred, and published in 1870. From this time to his death he continued to write poems and produce pictures—in the latter relying more and more upon his manipulative skill but exercising less and less his exhaustless faculty of invention.

In 1871 an unsigned article in the *Contemporary Review* (by Robert Buchanan) on the "Fleshly School of Poetry" made a fierce attack on Rossetti's poems from what was intended to be a moral point of view, to which he answered by one on the "Stealthy School of Criticism." The attack was deeply felt by him, and increased his tendency—previously tempered by natural high spirits—towards gloomy brooding. About 1868 the curse of the artistic and poetic temperament, insomnia, attacked him. One of the most distressing effects of this malady is a nervous shrinking from personal contact with any save a few intimate and constantly seen friends. This peculiar kind of nervousness may be aggravated by the use of narcotics, and in his case was aggravated to a very painful degree; at one time he saw scarcely any one save his own family and immediate family connexions and the present writer. He was frequently away with William Morris at Kelmscot, in Oxfordshire. During the time that his second volume of original poetry, *Ballads and Sonnets*, was passing through the press (in 1881) his health began to give way, and he left London for Cumberland. A stay of a few weeks in the Vale of St John, however, did nothing to improve his health, and he returned much shattered. He then went to Birchington-on-Sea, but received no benefit from the change, though affectionately tended by friends like Hall Caine and others already mentioned; and, gradually sinking from a complication of disorders, he died on Sunday the 9th of April 1882.

In all matters of taste Rossetti's influence has been immense. The purely decorative arts (see ARTS AND CRAFTS) he may be said to have rejuvenated directly or indirectly. And he left the deepest impression upon the poetic methods of his time.

One of the most wonderful of Rossetti's endowments, however, was neither of a literary nor an artistic kind: it was that of a rare and most winning personality which attracted towards itself, as if by an unconscious magnetism, the love of all his friends, the love, indeed, of all who knew him. (T. W.-D.)

AUTHORITIES.—See various books by W. M. Rossetti—*Dante Gabriel Rossetti as Designer and Writer* (1889); *Ruskin, Rossetti, Pre-Raphaelitism* (1899); and *Some Reminiscences* (1906); Memoir by W. M. Rossetti prefixed to the *Collected Works*, published in 1886. Lady Burne-Jones's *Memorials of Edward Burne-Jones* (1904) is full of interesting sidelights. See also F. G. Stephens, *D. G. Rossetti*; "Portfolio" monograph (1894); H. C. Marillier, *D. G. Rossetti* (1899 and 1901); W. Sharp, *Dante Gabriel Rossetti: A Record and a Study* (1882); T. Hall Caine, *Recollections of Dante Gabriel Rossetti* (1882); W. Allingham, *Letters of Dante Gabriel Rossetti to William Allingham, 1854–70* (1897). An article by Vernon Lushington in the *Oxford and Cambridge Magazine* (1856) is an early contemporary view worth noting.

ROSSI, LUIGI DE, a 17th-century Italian musical composer, said to have been born at Naples towards the close of the 16th century. Of his life practically nothing is known. An opera of his, *Il Palazzo Incantato*, was given at Rome in 1642; in 1646 he was invited by Cardinal Mazarin to Paris, where he gave his opera *Le Mariage d'Orphée et d'Euridice* (1647), the first Italian opera performed in Paris. A collection of cantatas published in 1646 describes him as musician to Cardinal Antonio Berberini, and G. A. Perti in 1688 speaks of him along with Carissimi and Cesti as "the three greatest lights of our profession." Rossi is noteworthy principally for his chamber-cantatas, which are among the finest that the 17th century produced. A large quantity are in MS. in the British Museum and in Christ Church library, Oxford. *La Gelosia*, printed by F.A. Gevaert in *Les Gloires d'Italie*, is an admirable specimen.

ROSSI, PELLEGRINO LUIGI EDOARDO, COUNT (1787–1848), Italian economist and statesman, was born at Carrara on the 13th of July 1787. He was educated at Pavia and Bologna, and in 1812 became professor of law at the latter university. In 1815 he gave his support to Joachim Murat, and after his fall escaped to France, whence he proceeded to Geneva. There he began a course of jurisprudence applied to Roman law, the success of which gained him the unusual honour of naturalization as a citizen of Geneva. In 1820 he was elected as a deputy to the cantonal council, and was a member of the extraordinary diet of 1832. He was entrusted with the task of drawing up a revised constitution, which was known as the *Pacte Rossi*. This was rejected by a majority of the diet, a result which deeply affected Rossi, and induced him to look with favour on the suggestions of Guizot and the duc de Broglie that he should settle in France. He was appointed in 1833 to the chair of political economy in the Collège de France, vacated by the death of J. B. Say. He was naturalized as a French citizen in 1834, and in the same year became professor of constitutional law in the faculty of law at Paris. In 1836 he was elected a member of the *Académie des sciences politiques et morales*, was raised to the peerage in 1839 and in 1843 became doyen of the faculty of law. In 1845 he was sent to Rome by Guizot to discuss the question of the Jesuits, being finally appointed ambassador of France at Rome. The revolution of 1848 severed his connexion with France, and he remained at Rome and became minister of the interior under Pius IX. He was unpopular, however, owing to his conservative views, and was assassinated on the 15th of November, as he was alighting at the steps of the House of Assembly.

As a statesman, Rossi was a man of signal ability and intrepid character, but it is as an economist that his name will be best remembered. His *Cours d'économie politique* (1838–54) gave in classic form an exposition of the doctrines of Say, Malthus and Ricardo. His other works were *Traité de droit pénal* (1829); *Cours de droit constitutionnel* (1866–67), and *Mélanges d'économie politique, d'histoire et de philosophie* (2 vols., 1857). His widow left a sum of 100,000 francs to the Institut de France, to found in his memory scholarships in political economy or law. Carrara erected a statue to his memory in 1876, and in 1887 the *Société d'économie politique* celebrated his centenary with a notice of his life and works.

See also le Comte Fleury d'Ideville, *Le Comte Pellegrino Rossi, sa vie, ses œuvres, sa mort* (1887).

ROSSINI, GIOACHINO ANTONIO (1792–1868), Italian musical composer, was born at Pesaro on the 29th of February 1792. His father was town trumpeter and inspector of slaughter-houses, his mother a baker's daughter. The elder Rossini's sympathies for the French became a source of trouble when, after the occupation of the papal state by the French in 1796, the Austrians restored the old régime. He was sent to prison, and his wife took Gioachino to Bologna, earning her living as a *prima donna buffa* at various theatres of the Romagna, where she was ultimately rejoined by her husband. Gioachino remained at Bologna in the care of a pork butcher, while his father played the horn in the bands of the theatres at which his mother sang. The boy had three years' instruction in the harpsichord from Prinetti of Novara, but Prinetti played the scale with two fingers only, combined his profession of a musician with the business of selling liquor, and fell asleep while he stood, so that he was a fit subject for ridicule with his critical pupil. Gioachino was taken from him and apprenticed to a smith. In Angelo Tesei he found a congenial master, and learned to read at sight, to play accompaniments on the pianoforte, and to sing well enough to take solo parts in the church when he was ten years of age. At thirteen he appeared at the theatre of the Commune in Paër's *Camilla*— his only appearance as a public singer (1805). He was also able to play the horn. In 1807 he was admitted to the counterpoint class of Padre P. S. Mattei, and soon after to that of Cavedagni for the 'cello at the Conservatorio of Bologna. He learned to play the 'cello with ease, but the pedantic severity of Mattei's views on counterpoint only served to accentuate the tendency of his genius towards a freer school of composition, and his insight into orchestral resources is to be ascribed rather to knowledge gained by scoring the quartets and symphonies of Haydn and Mozart, than to any prescribed rules for the composition of music. At Bologna he was known as "il Tedeschino" on account of his devotion to Mozart. Through the friendly interposition of the Marquis Cavalli, his first opera, *La Cambiale di Matrimonio*, was produced at Venice when he was a youth of eighteen. But two years before this he had already received the prize at the Conservatorio of Bologna for his cantata *Il pianto d' armonia per la morte d'Orfeo.* Between 1810 and 1813, at Bologna, Rome, Venice and Milan, Rossini produced operas of which the successes were varying. All memory of them is eclipsed in that of *Tancredi.* The libretto was an arrangement of Voltaire's tragedy by J. A. Rossi. Traces of Paër and Paisiello were undeniably present in fragments of the music. But all critical feeling on the part of the public was drowned in the effect of sweetness and clarity produced by such melodies as "Mi rivedrai, ti rivèdrò" and "Di tanti palpiti," the former of which became so popular that the Italians would sing it in crowds at the law courts until called upon by the judge to desist. Rossini continued to write operas for Venice and Milan during the next few years, but their reception was tame and in some cases unsatisfactory after the success of *Tancredi.* In 1815 he retired to his home at Bologna, where Barbaja, the impresario of the Naples theatre, who had once been a waiter in a coffee-house and now combined the business of theatrical management with that of farming the public gaming-tables, concluded an agreement with him by which he was to take the musical direction of the Teatro San Carlo and the Teatro Del Fondo at Naples, composing for each of them one opera a year. His payment was to be 200 ducats (about £35 or $175) per month; he was also to receive a share in the gaming-tables amounting to about 1000 ducats (£175 or $875) per annum. The presence of Zingarelli and Paisiello in Naples was an incentive to intrigue against the success of the youthful composer, but all hostility was made futile by the enthusiasm which greeted the court performance of his *Elisabetta regina d' Inghilterra,* in which Isabella Colbran, who subsequently became the composer's wife, took a leading part. The libretto of this opera by Schmidt was in many of its incidents an anticipation of those presented to the world a few years later in Scott's *Kenilworth.* The opera was the first in which Rossini wrote the ornaments of the airs instead of leaving them to the fancy of the singers, and also the first in which the *recitativo secco* was replaced by a recitative accompanied by a quartet of strings. In *Almaviva,* produced in the beginning of the next year in Rome, the libretto, a version of Beaumarchais' *Barbier de Seville* by Sterbini, was the same as that already used by Paisiello in his *Barbiere,* an opera which had enjoyed European popularity for more than a quarter of a century. The indignation of Paisiello's admirers expressed itself strongly on the production of the new setting, but in the thirteen days devoted to the composition of his *Almaviva,* Rossini had created such a masterpiece of musical comedy that the fame of Paisiello's opera was transferred to his, to which the title of *Il Barbiere di Siviglia* passed as an inalienable heritage. Between 1815 and 1823 Rossini produced twenty operas. Of these *Otello* formed the climax to his reform of serious opera, and offers a suggestive contrast with the treatment of the same subject at a similar point of artistic development by the composer Verdi. In Rossini's time the tragic close was so distasteful to the public of Rome that it was necessary to invent a happy conclusion to *Otello;* and there are still places in Italy in which the Shakespearian end of the story can never be performed without interruption from the audience, who warn Desdemona of Otello's deadly approach. Conditions of stage mechanism in 1817 are illustrated by Rossini's acceptance of the subject of Cinderella for a libretto only on the condition that the supernatural element should be omitted. The opera *Cenerentola* is to be ranked with the *Barbiere.* The absence of a similar precaution in the construction of his *Mosè in Egitto* led to disaster in the scene depicting the passage of the Israelites through the Red Sea, when the defects in stage contrivance always raised a laugh, so that the composer was at length compelled to introduce the chorus "Dal tuo stellato Soglio" to divert attention from the dividing waves. In 1821, three years after the production of this work, Rossini married Isabella Colbran. In 1822 he directed his *Cenerentola* in Vienna, where *Zelmira* was also performed. After this he returned to Bologna; but an invitation from Prince Metternich to come to Verona and "assist in the general re-establishment of harmony" was too tempting to be refused, and he arrived at the Congress in time for its opening on the 20th of October 1822. Here he made friends with Chateaubriand and Madame de Lieven. In 1823, at the suggestion of the manager of the King's Theatre, London, he came to England, being much fêted on his way through Paris. In England he was given a generous welcome, which included an introduction to King George IV. and the receipt of £7000 after a residence of five months. In 1824 he became musical director of the Théâtre Italien in Paris at a salary of £800 per annum, and when the agreement came to an end he was rewarded with the offices of chief composer to the king and inspector-general of singing in France, to which was attached the same income. The production of his *Guillaume Tell* in 1829 brought his career as a writer of opera to a close. The libretto was by Étienne Jouy and Hippolyte Bis, but their version was revised by Armand Marrast. The music is remarkable for its freedom from the conventions discovered and utilized by Rossini in his earlier works, and marks a transitional stage in the history of opera. In 1829 he returned to Bologna. His mother had died in 1827, and he was anxious to be with his father. Arrangements for his subsequent return to Paris on a new agreement were upset by the abdication of Charles X. and the July Revolution of 1830. Rossini, who had been considering the subject of *Faust* for a new opera, returned, however, to Paris in the November of that year. Six movements of his *Stabat Mater* were written in 1832 and the rest in 1839, the year of his father's death, and the success of the work bears comparison with his achievements in opera; but his comparative silence during the period from 1832 to 1868 makes his biography appear almost like the narrative of two lives—the life of swift triumph, and the long life of seclusion, of which the biographers give us pictures in stories of the composer's cynical wit, his speculations in fish culture, his mask of humility and indifference. His first wife died in 1845, and political disturbances in the Romagna compelled him to leave Bologna in 1847, the year of his second marriage with Olympe Pelissier, who had sat to Vernet for his picture of "Judith and Holofernes." After living for a time in Florence he settled in Paris in 1855, where his house was a centre of artistic society. He died at his country house at Passy on the 13th of November 1868. He was a foreign associate of the Institute, grand officer of the Legion of Honour, and the recipient of innumerable orders. In his compositions Rossini plagiarized even more freely from himself than from other musicians, and few of his operas are without such admixtures frankly introduced in the form of arias or overtures. A characteristic mannerism in his musical writing earned for him the nickname of "Monsieur Crescendo." His music is associated with the names of the greatest singers in lyrical drama, such as Tamburini, Mario, Rubini, Delle Sedie, Albani, Grisi, Patti and Nilsson.

ROSSLAND, an important city in the Kootenay district of British Columbia, incorporated in 1897. Pop. (1907) 4033. It is situated in a valley 7 m. W. of Trail on the Columbia river and 8 m. N. of the international boundary. It has direct railroad communication with Trail and the Arrow lakes as well as with Northport and Spokane in the state of Washington. Rossland owes its importance to the immense deposits of iron and copper pyrites carrying gold, which occur in the vicinity. The best-known mines are the Le Roy, Centre Star and War Eagle. The city derives its electric light and power service from Bonnington Falls on the Kootenay river.

ROSSLAU, a town of Germany, in the duchy of Anhalt, on the right bank of the Elbe, here crossed by two railway bridges, 3 m. by rail N. of Dessau and 35 m. S.E. of Magdeburg. Pop. (1905) 11,027. It has a ducal residence, an old castle, a handsome parish church, and manufactures of machinery, paper, sealing-wax, wire goods, sugar, bricks and chemicals. Rosslau became a town in 1603.

ROSSLYN, EARLS OF. The first earl of Rosslyn was Alexander Wedderburn (see below), who was succeeded by his nephew, James St Clair Erskine (1762–1837), a son of

Wedderburn's sister Janet by her marriage with Sir Henry Erskine (d. 1765), a Scottish baronet and soldier. Entering the army in 1776, James Erskine served in Portugal, in Denmark and in the Netherlands, and became a general in 1814. From 1782 until 1805, when he became a peer, he was a member of parliament; a Tory politician and an associate of the duke of Wellington, he was lord privy seal in 1829–30 and lord president of the council in 1834–35. He inherited the estates of the family of St Clair and took this name in 1789, and he died on the 18th of January 1837. His son, James Alexander (1802–1866), became 3rd earl, and in 1890 the latter's grandson, James Francis Harry (b. 1869), became 5th earl.

ROSSLYN, ALEXANDER WEDDERBURN, 1ST EARL OF (1733–1805), Lord Chancellor of Great Britain, was the eldest son of Peter Wedderburn (a lord of session as Lord Chesterhall), and was born in East Lothian on the 13th of February 1733. He acquired the rudiments of his education at Dalkeith, and in his fourteenth year matriculated at the university of Edinburgh. It was from the first his desire to practise at the English bar, though in deference to his father's wishes he qualified as an advocate at Edinburgh, in 1754, but entered himself at the Inner Temple on the 8th of May 1753, so that he might keep the Easter and Trinity terms in that year. His father was called to the bench in 1755, and for the next three years Wedderburn stuck to his practice in Edinburgh, during which period he employed his oratorical powers in the General Assembly of the Church of Scotland, and passed his evenings in the social and argumentative clubs which abound in Edinburgh. In 1755 the precursor of the later *Edinburgh Review* was started, now chiefly remembered because in its pages Adam Smith criticized the dictionary of Dr Johnson, and because the contents of its two numbers were edited by Wedderburn. The dean of faculty at this time, Lockhart, afterwards Lord Covington, a lawyer notorious for his harsh demeanour, in the autumn of 1757 assailed Wedderburn with more than ordinary insolence. His victim retorted with extraordinary powers of invective, and on being rebuked by the bench declined to retract or apologize, but placed his gown upon the table, and with a low bow left the court for ever. He was called to the English bar at the Inner Temple in 1757. To shake off his native accent and to acquire the graces of oratorical action, he engaged the services of Thomas Sheridan and Charles Macklin. To secure business and to conduct his cases with adequate knowledge, he studied the forms of English law, he solicited William Strahan, the printer, "to get him employed in city causes," and he entered into social intercourse (as is noted in Alexander Carlyle's autobiography) with busy London solicitors. His local connexions and the incidents of his previous career introduced him to the notice of his countrymen Lords Bute and Mansfield. When Lord Bute was prime minister this legal satellite used, says Dr Johnson, to go on errands for him, and it is to Wedderburn's credit that he first suggested to the premier the propriety of granting Johnson a pension. Through the favour of Lord Bute, he was returned to parliament for the Ayr burghs in 1761. In 1763 he became king's counsel and bencher of Lincoln's Inn, and for a short time went the northern circuits, but was more successful in obtaining business in the Court of Chancery. He obtained a considerable addition to his resources (Carlyle puts the amount at £10,000) on his marriage in 1767 to Betty Anne, sole child and heiress of John Dawson of Marly in Yorkshire. When George Grenville, whose principles leaned to Toryism, quarrelled with the court, Wedderburn affected to regard him as his leader in politics. At the dissolution in the spring of 1768 he was returned by Sir Lawrence Dundas for Richmond as a Tory, but in the questions that arose over John Wilkes (*q.v.*) he took the popular side of "Wilkes and liberty," and resigned his seat in May 1769. In the opinion of the people he was now regarded as the embodiment of all legal virtue; his health was toasted at the dinners of the Whigs amid rounds of applause, and, in recompense for the loss of his seat in parliament, he was returned by Lord Clive for his pocket-borough of Bishop's Castle, in Shropshire, in January 1770. During the next session he acted vigorously in opposition, but his conduct was always viewed with distrust by his new associates, and his attacks on the ministry of Lord North grew less and less animated in proportion to its apparent fixity of tenure. In January 1771 he was offered and accepted the post of solicitor-general. The high road to the woolsack was now open, but his defection from his former path has stamped his character with general infamy. Junius wrote of him, "As for Mr Wedderburn, there is something about him which even treachery cannot trust," and Colonel Barré attacked him in the House of Commons. The new law officer defended his conduct with the assertion that his alliance in politics had been with Mr George Grenville, and that the connexion had been severed on his death. All through the American War he consistently declaimed against the colonies, and he was bitter in his attack on Benjamin Franklin (*q.v.*) before the Privy Council. In June 1778 Wedderburn was promoted to the post of attorney-general, and in the same year he refused the dignity of chief baron of the exchequer because the offer was not accompanied by the promise of a peerage. At the dissolution in 1774 he had been returned for Okehampton in Devonshire, and for Castle Rising in Norfolk, and selected the former constituency; on his promotion as leading law officer of the crown he returned to Bishop's Castle. The coveted peerage was not long delayed. In June 1780 he was created chief justice of the Court of Common Pleas, with the title of Baron Loughborough.

During the existence of the coalition ministry of North and Fox, the great seal was in commission (April to December 1783), and Lord Loughborough held the leading place among the commissioners. For some time after that ministry's fall he was considered the leader of the Whig party in the House of Lords, and, had the illness of the king brought about the return of the Whigs to power, the great seal would have been placed in his hands. The king's restoration to health secured Pitt's continuance in office, and disappointed the expectations of the Whigs. In 1792, during the period of the French Revolution, Lord Loughborough seceded from Fox, and on the 28th of January 1793 he received the great seal in the Tory cabinet of Pitt. The resignation of Pitt on the question of Catholic emancipation (1801) put an end to Wedderburn's tenure of the Lord Chancellorship, for, much to his surprise, no place was found for him in Addington's cabinet. His first wife died in 1781 without leaving issue, and he married in the following year Charlotte, youngest daughter of William, Viscount Courtenay; but her only son died in childhood. Lord Loughborough accordingly obtained in 1795 a re-grant of his barony with remainder to his nephew, Sir James St Clair Erskine. His fall in 1801 was softened by the grant of an earldom (he was created earl of Rosslyn 21st April 1801, with remainder to his nephew), and by a pension of £4000 per annum. After this date he rarely appeared in public, but he was a constant figure at all the royal festivities. He attended one of those gatherings at Frogmore, on the 31st of December 1804. On the following day he was seized with an attack of gout in the stomach, and on the 2nd of January 1805 he died at his seat, Baylis, near Salt Hill, Windsor. His remains were buried in St Paul's Cathedral on the 11th of January.

At the bar Wedderburn was the most elegant speaker of his time, and, although his knowledge of the principles and precedents of law was deficient, his skill in marshalling facts and his clearness of diction were marvellous; on the bench his judgments were remarkable for their perspicuity, particularly in the appeal cases to the House of Lords. For cool and sustained declamation he stood unrivalled in parliament, and his readiness in debate was universally acknowledged. In social life, in the company of the wits and writers of his day, his faculties seemed to desert him. He was not only dull, but the cause of dulness in others, and even Alexander Carlyle confesses that in conversation his illustrious countryman was "stiff and pompous." In Wedderburn's character ambition banished all rectitude of principle, but the love of money for money's sake was not among his faults.

See Brougham's *Statesmen of the Reign of George III.*; Foss's *Judges*; Campbell's *Lives of Lord Chancellors.* (W. P. C.)

ROSSTREVOR, a watering-place of county Down, Ireland, on Carlingford Lough. See WARRENPOINT.

ROSSWEIN, a town of Germany, in the kingdom of Saxony, situated on the Freiberger Mulde, 46 m. S.E. from Leipzig by the railway via Döbeln to Dresden. Pop. (1905) 9297. It is famous for its technical schools, among which are one for builders, another for furniture-makers, and a third for ironmongers. The industries are considerable, and include woollen and cloth manufactures, dyeing, spinning, and the making of agricultural machinery, cigars, chemicals, bricks and iron goods. Rosswein is an old town, cloth-making being a flourishing industry here in the 14th century.

See C. V. Böhmert, *Die Stadt Rosswein, 1883–94* (Dresden, 1895).

ROSTAND, EDMOND (1869–), French dramatist, was born on the 1st of April 1869, the son of Joseph Eugène Herbert Rostand (b. 1843), a prominent journalist and economist of Marseilles. His first play, a burlesque, *Les romanesques*, was produced on the 21st of May 1894 at the Théâtre Français. He took the motive of his second piece, *La Princesse lointaine* (Théâtre de la Renaissance, 5th April 1895), from the story of the troubadour Rudel and the Lady of Tripoli. The part of Mélissande was created by Sarah Bernhardt, who also was the original Photine of *La Samaritaine* (Théâtre de la Renaissance, 14th April 1897), a Biblical drama in three scenes taken from the gospel story of the woman of Samaria. The production of his "heroic comedy" of *Cyrano de Bergerac* (28th December 1897, Théâtre de la Porte Saint-Martin), with Coquelin in the title-rôle, was a triumph. No such enthusiasm for a drama in verse had been known since the days of Hugo's *Hernani*. The play was quickly translated into English, German, Russian and other European languages. For his hero he had drawn on French 17th-century history; in *L'Aiglon* he chose a subject from Napoleonic legend, suggested probably by Henri Welschinger's *Roi de Rome, 1811–32* (1897), which contained much new information about the unhappy life of the duke of Reichstadt, son of Napoleon I. and Marie Louise, under the surveillance of Metternich at the palace of Schönbrunn. *L'Aiglon*, in six acts and in verse, was produced (15th March 1900) by Sarah Bernhardt at her own theatre, she herself undertaking the part of the duke of Reichstadt. In 1902 Rostand was elected to the French Academy. His *Chantecler*, produced in February 1910, was awaited with an interest (enhanced by considerable delay in the production) hardly equalled by the enthusiasm of its reception. Lucien Guitry was in the title-rôle and Mme. Simone played the part of the pheasant, the play being a fantasy of bird and animal life, and the characters denizens of the farmyard and the woods. Rostand's wife, *née* Rosemonde Étienette Gérard, published in 1890 *Les Pipeaux*, a volume of verse crowned by the Academy.

See a notice by Henry James in vol. 84, pp. 477 seq. of the *Cornhill Magazine*.

ROSTOCK, a town of Germany, in the grand duchy of Mecklenburg-Schwerin, one of the most important commercial cities on the Baltic. It is situated on the left bank of the estuary of the Warnow, 8 m. from the port of Warnemünde on the Baltic. 177 m. N.W. of Berlin by rail, 80 m. N.E. of Lübeck, and 106 m. S. of Copenhagen. Pop. (1905) 60,790. It consists of three parts—the old town to the east, and the middle and new towns to the west—of which the first retains some of the antique features of a Hanse town, while the last two are for the most part regularly and handsomely built. There are also several suburbs. The town has four gates, one of them dating from the 14th century, and some fine squares, among them the Blücher Platz, with a statue of Blücher, who was born here, and the Neue Markt. Rostock was a fortress of some strength, but the old fortifications have been razed, and their site is occupied by promenades. Rostock has five old churches: St Mary's, dating from 1398 to 1472, one of the most imposing Gothic buildings in Mecklenburg, with two Romanesque towers and containing a magnificent bronze font and a curious clock; St Nicholas's, begun about 1250 and restored in 1450, and again in 1890–94; St Peter's, with a lofty tower over 400 ft. high, built in 1400, which serves as a landmark to ships at sea; St James's, completed in 1588, and the church of the Holy Rood, begun in 1270. St Mary's church contains a monument marking the original tomb of Hugo Grotius, who died in Rostock in 1645, though his remains were afterwards removed to Delft. Among other interesting buildings are the curious 14th-century Gothic town hall, the façade of which is concealed by a Renaissance addition; the palace of the grand duke of Mecklenburg-Schwerin, built in 1702; the law courts, built in 1878–79; the university buildings, erected in 1867–70; and an assembly hall of the estates of Mecklenburg (Ständehaus), a handsome Gothic building erected in 1889–93.

The university of Rostock was founded in 1418 by Dukes Johann III. and Albrecht V. of Mecklenburg. From 1437 till 1443 it had its seat at Greifswald in consequence of commotions at Rostock; and in 1760 it was again removed, on this occasion to Bützow. The professors appointed by the city, however, still taught at Rostock, so that there were practically two universities in the duchy until 1789, when they were reunited at the original seat. Rostock is the seat of the supreme court for both the duchies of Mecklenburg, and is well equipped with schools, hospitals, and other institutions.

Although the population, commerce and wealth of Rostock have declined since Hanse days, it has a considerable trade, being the chief commercial town of Mecklenburg and owning a considerable fleet. Vessels drawing 16 ft. of water are able to get up to the wharves. By far the most important export is grain, which goes almost entirely to British ports; but wool, flax and cattle are also shipped. The chief imports are coal from Great Britain, herrings from Sweden, petroleum from America, timber, wine and colonial goods. Rostock has an important fair at Whitsuntide, lasting for fourteen days, and also a frequented wool and cattle market. The industries of the town are varied. One of the chief is shipbuilding. Machinery, chemicals, sugar, malt, paper, musical instruments, cotton, straw hats, tobacco, carpets, soap, playing cards, chocolate and dye-stuffs are among the manufactures. The town also contains distilleries, saw-mills, oil-mills, tanneries, breweries and electrical works.

Local historians assert that a village existed on the site of Rostock as early as A.D. 329, but no certain proofs have been traced of any earlier community than that founded here in the 12th century, which is said to have received municipal rights in 1218. The earliest signs of commercial prosperity date from about 1260. For a time Rostock was under the dominion of the kings of Denmark. Soon after returning under the protection of Mecklenburg in the 14th century it joined the Hanseatic League; and was one of the original members of the powerful Wendish Hansa, in which it exercised an influence second only to that of Lübeck. The most prosperous epoch of its commercial history began in the latter half of the 15th century, precisely at the period when its political power began to wane. Rostock, however, never entirely lost the independence which it enjoyed as a Hanse town; and in 1788, as the result of long contentions with the rulers of Mecklenburg, it secured for itself a peculiar and liberal municipal constitution, administered by three burgomasters and three chambers. In 1880 this constitution was somewhat modified, and the city became less like a state within a state. It has belonged to Mecklenburg-Schwerin since 1695; in 1712 it was taken by the Swedes, in 1715 by the Danes and in 1716 by the Russians. The badge of Rostock is the figure 7; and a local rhyme explains that there are 7 doors to St Mary's church, 7 streets from the market-place, 7 gates on the landward side and 7 wharves on the seaward side of the town, 7 turrets on the town-hall, which has 7 bells, and 7 linden trees in the park.

See Reinhold, *Chronik der Stadt Rostock* (Rostock, 1836); Krabbe, *Die Universität Rostock im 15 und 16 Jahrhundert* (2 vols., Rostock, 1854), Koppmann, *Geschichte der Stadt Rostock* (Rostock, 1887); Volckmann, *Führer durch Rostock* (3rd ed., 1896); the *Geschichtsquellen der Stadt Rostock* (Rostock, 1885); and the *Beiträge zur Geschichte der Stadt Rostock* (Rostock, 1890).

ROSTOPTSCHIN, COUNT FEODOR VASSILIEVICH (1763–1826), Russian general, was born on the 23rd of March 1763, in the government of Orel. He had great influence with the Tsar Paul, who made him in 1796 adjutant-general, grand-marshal of the court, then minister of the interior. In 1799 he received the title of count. He was disgraced in 1801 for his opposition to the French alliance, but was restored to favour in 1810, and was shortly afterwards appointed military governor of Moscow. He was therefore charged with its defence against Napoleon, and took every means to rouse the population of the town and district against the invader. He has been generally charged with instigating the burning of Moscow the day after the French had made their entry; it is certain that the prisons were opened by his order, and that he took no means to stop the outbreak. He defended himself against the charge of incendiarism in a pamphlet printed in Paris in 1823, *La Vérité sur l'incendie de Moscou*, but he subsequently made grave admissions. Shortly after the congress of Vienna, to which he had accompanied the Tsar Alexander, he was disgraced. He only returned to Russia in 1825, and died at Moscow on the 12th of February of the next year.

His *Mémoires écrits en dix minutes* were posthumously published at St Petersburg in 1853, his *Œuvres inédites* in Paris in 1894. A partial account of his life was written by his grandson A. de Ségur (Paris, 1872). See also Varnhagen von Ense, *Denkwürdigkeiten*, vol. ix.; G. Tzenoff, *Wer hat Moskau im Jahre 1812 in Brand gesteckt* (Berlin, 1900).

ROSTOV-ON-THE-DON, a seaport of Russia, in the territory of the Don Cossacks, well situated on the high right bank of the Don, 13 m. from its mouth in the Sea of Azov. In 1731 a small fort was erected on an island in the Don, near its mouth. Thirty years later the fortifications were transferred to the site now occupied by Rostov, 5 m. above the head of the first branch of the delta of the Don. The Don, which has here a breadth of 230 to 250 yds., with a hardly perceptible current, offers an excellent roadstead. The navigation, however, is considerably impeded by the shallowness of the river. Dredging operations have but partially remedied this. Moreover, the river is frost-bound for more than one hundred days in the year. The population has grown rapidly: while in 1881 it was 70,700, in 1897 it numbered 119,889, and in 1905 126,375, exclusive of the suburbs; if these, which comprise Nakhichevan (32,582 in 1905) be included, the population is well over 160,000, a figure which is still further swollen in the summer by the influx of about 60,000 men, who find work in connexion with the shipment of grain for export. The permanent population includes 15,000 Jews, 5000 Armenians, with Tatars, Poles, Germans and others. In Nakhichevan there are 20,500 Armenians. Owing to its situation on the navigable river Don and at the junction of three railways, radiating to north-western Russia, Caucasia and the Volga respectively, Rostov has become the chief seaport of south-eastern Russia, being second in importance on the Black Sea to Odessa only. It is the chief centre for the supply of agricultural machinery to the steppe governments of south-eastern Russia. On an average, £3,000,000 to £4,000,000 worth of wheat, about £1,000,000 worth of rye, and over £1,500,000 worth of barley are exported annually, besides oats, flax, linseed, rape seed, oilcake, bran, flour, vegetable oils, raw wool and caviare. The imports average between four and five millions sterling annually, and consist largely of agricultural machinery. There are a shipbuilding yard, flour-mills, tobacco factories, iron works, machinery works, distilleries, soap works, timber mills, bell foundries, paper mills and rope works. Rostov is the chief centre of steam flour-mills for south-eastern Russia and Caucasia. Two fairs, one of which has considerable importance for the whole of south-eastern Russia, are held here yearly. Rostov has excellent fisheries. The town has a cathedral, a fine town hall (1897–99), navigation schools, technical schools, and a good municipal library.

ROSTOV VELIKIY, a town of Russia, in the government of Yaroslavl, 35 m. by rail S.W. of the town of Yaroslavl, near Lake Rostov or Nero. Pop. (1897) 14,342. It has numerous cotton and linen mills. The great fair for which it was formerly famous has lost its importance, but the town remains the centre of a variety of domestic trades—tailoring, the manufacture of leather, and the making of boots and small enamelled ikons (sacred images); it is also famous for its kitchen gardening and the export of pickled and dried vegetables and medical herbs. Fishing is carried on. The restoration of the buildings (royal palace, archiepiscopal palace, and five churches) of the kreml or citadel was begun in 1901. The other public buildings include six 17th-century churches, a museum and a cathedral, consecrated in 1231 and having its interior walls covered with paintings.

Rostov was founded by Slavs in or before 862, and played so prominent a rôle in the history of that part of Russia that it used to be known as Rostov the Great. From the beginning of the 11th century to the 13th it was the chief town of a territory which included large parts of the present governments of Yaroslavl, Vladimir and Novgorod. After the Mongol invasion of 1239–42 it rapidly declined, and in 1474 it was purchased by Ivan III. and annexed to Moscow. It was repeatedly plundered by Tatars, Lithuanians and Poles in the 15th, 16th and 17th centuries.

ROSTRA[1] ("beaks"), in Roman antiquities, the orators' platform, which originally stood between the comitium and the forum proper, opposite the curia. It is not known when it was erected, but in 338 B.C. it was decorated by Gaius Maenius with the prows of ships captured from the people of Antium (Livy viii. 14). From that time it was called *Rostra*, having previously been known as *templum* (literally "consecrated place"), since it had been consecrated by the augurs (Cicero, *In Vatinium*, x. 24). Some, however, deny the identity of the *templum* and *rostra*. On the platform or hard by were exhibited the statues of famous Romans (Camillus, Caesar), and state documents and memorials (the laws of the Twelve Tables, the treaty with the Latins, the *columna rostrata* of Duilius). Caesar had it pulled down, intending that it should be rebuilt on the west side of the forum, but it was left for Augustus (or Mark Antony) to carry out his plan. The term Rostra Vetera, often used by classical authors in connexion with funeral orations, makes it doubtful whether the old platform was entirely demolished, unless the name was simply transferred to the new rostra of Augustus. This consisted of a rectangular platform, 78 ft. long, 33 ft. broad and 11 ft. above the level of the forum pavement. It was reached by steps from the back; in front there was a marble balustrade with an opening in the centre where the speaker stood, possibly also intended for a staircase leading down into the forum. In the existing remains the holes in which the beaks of the ships were fastened, arranged in pairs, are visible. Behind these remains, close to the Clivus Capitolinus, a row of light low-arched cells has been found, which, owing to a certain resemblance to the earlier rostra as shown on the well-known coin of Lollius Palicanus, has been identified by Boni with the rostra removed by Julius Caesar, the other remains being attributed to the time of Domitian (for objections to this theory, see Hülsen and Richter). In the time of Hadrian the side balustrades were decorated with marble slabs, on which were represented in relief the burning of the lists of the citizens who were in arrears to the fisc and the distribution of necessaries to the poorer citizens. Thédenat explains the first as Domitian reassuring a deputation of citizens by burning the denunciatory reports of the *delatores*, and the second (the scene of which he places at the Rostra Julia) as the promulgation of the law forbidding the mutilation of children. The erection of the arch of Severus necessitated considerable alterations, the most important of which was a triangular courtyard cut out of the north half of the rostra, to allow direct access to it from the side that faced the arch, its breadth being thereby reduced by a third. A later extension of the façade northwards is explained by a long inscription, recording that about the year 470, Ulpius Junius Valentinus, a city prefect, restored the structure (hence called Rostra Vandalica) after a naval victory over the Vandals. A relief on the arch of Constantine represents the emperor speaking from the rostra.

The Rostra Julia was a platform with a semicircular niche in the centre, in front of the Aedes divi Julii, built by Augustus on the spot where the body of Caesar was cremated. The niche was probably used to support the bier while a funeral *laudatio* was being delivered. The front on either side was decorated with the beaks of ships captured at the battle of Actium.

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[1] The Lat. singular *rostrum*, a beak, the beak of a ship, is used in English of a platform, stand or pulpit from which a speaker addresses his audience. It is also used in its original meaning of a beak-like prolongation or process in zoology or botany.

For results of the excavations see C. Hülsen, *Das Forum Romanum* (Eng. tr. by J. B. Carter, Rome, 1906); see also O. Richter, "Topographie der Stadt Rom" (1901), pp. 81, 93, 356 (iii. Abt. 3, pt. 2 of I. von Müller's *Handbuch der klassischen Altertumswissenschaft*); H. Thédenat, *Le Forum Romain* (3rd ed. 1904); J. H. Middleton, *Remains of Ancient Rome* (1892); O. Richter, *Rekonstruktion und Geschichte der römischen Rednerbühne* (Berlin, 1884); F. M. Nichols, *The Roman Forum* (1877); also article ROME: *Archaeology*.

ROTA, COURT OF, one of the departments of the medieval papal organization, existing alongside the Dataria, the Poenitentiaria, the two Signaturas (*S. Gratiae* and *S. Justitiae*), and other bureaus. The Rota was the supreme court of Christendom. It consisted of twelve members, three from Rome, two from Spain, one each from Bologna, Ferrara, Venice, Milan, Germany, France, and (alternately) Tuscany or Perugia. It declined in importance when the Signitura Justitiae was set above it as the court of appeal for Italy, and more so as the geographical jurisdiction of the pope was gradually lessened. After the Council of Trent the old arrangements were replaced by the Congregations, permanent committees of cardinals which deal with definite branches of business. The Rota, however, was restored to its functions as supreme court of appeal by Pope Pius X. in 1908 (see CURIA ROMANA).

ROTH, JUSTUS LUDWIG ADOLF (1818–1892), German geologist and mineralogist, was born at Hamburg on the 15th of September 1818. In 1867 he was appointed professor of mineralogy at the university of Berlin. He may be regarded as one of the founders of petrographical science. In his published papers he dealt with metamorphism and crystalline schists, discussed the origin of serpentine, and wrote on Vesuvian rocks and on Ponza Island. His separate works included *Der Vesuv und die Umgebung von Neapel* (1857); *Beiträge zur Petrographie der plutonischen Gesteine* (1869–84); *Allgemeine und chemische Geologie* (3 vols., 1879–93); and *Über die Erdbeben* (1882). He died at Berlin on the 1st of April 1892.

ROTHE, RICHARD (1799–1867), Lutheran theologian, was born at Posen on the 28th of January 1799. He studied theology in the universities of Heidelberg and Berlin (1817–20) under Karl Daub (1765–1836), Schleiermacher and Neander, the philosophers and historians Georg Hegel, Friedrich Creuzer (1771–1858) and F. C. Schlosser (1776–1861) exercising a considerable influence in shaping his thought. From 1820 to 1822 he was in the clerical seminary at Wittenberg. In the autumn of 1823 he was appointed chaplain to the Prussian embassy in Rome, of which Baron Bunsen was the head. This post he exchanged in 1828 for a professorship in the Wittenberg theological seminary, of which in 1832 he became also second director and *ephorus*, and hence in 1837 he removed to Heidelberg as professor and director of a new clerical seminary; in 1849 he accepted an invitation to Bonn as professor and university preacher, but in 1854 he returned to Heidelberg as professor of theology, and afterwards became member of the Oberkirchenrath, a position he held until his death on the 20th of August 1867. As a youth Rothe had a bent towards a supernatural mysticism; his chosen authors were those of the romantic school, and Novalis remained throughout his life a special favourite. In Berlin and Wittenberg he came under the influence of Pietism as represented by such men as Rudolf Stier (1800–1862) and Friedrich Tholuck, though Tholuck pronounced him a "very modern Christian." He afterwards confessed that, though he had been a sincere, he was never a happy, Pietist. In Rome, under the broadening influence of classical and ecclesiastical art, he learned to look at Christianity in its human and universalistic aspects, and began to develop his great idea, the inseparable relation of religion and morals. He began then, and particularly after the revolution of July 1830, likewise to give a more definite form to his peculiar view of the relations of church and state. He thus became out of harmony with the pietistic thought and life of Wittenberg. His removal to Heidelberg and the publication of his first important work, *Die Anfänge der christlichen Kirche und ihrer Verfassung* (1837), coincide with the attainment of the principal theological positions with which his name is associated. During the middle period of his career (1837–61) he led the life of a scholastic recluse. During the last six years of his life he came forward as the advocate of a free theology and of the Protestantenverein.

Rothe was one of the most profound and influential of modern German theologians. Like Schleiermacher he combined with the keenest logical faculty an intensely religious spirit, while his philosophical tendencies were in sympathy rather with Hegel than with Schleiermacher, and theosophic mysticism was more congenial to him than the abstractions of Spinoza, to whom Schleiermacher owed so much. He classed himself among the theosophists, and claimed to be a convinced and happy supernaturalist in a scientific age. His system, though it may seem to contain doubtful or even fantastic elements, is in its general outlines a noble massive whole, constructed by a profound, comprehensive, fearless and logical mind. A peculiarity of his thought was the realistic nature of his spiritualism: his abstractions are all real existences; his spiritual entities are real and corporeal; his truth is actual being. Hence Rothe, unlike Schleiermacher, lays great stress, for instance, on the personality of God, on the reality of the worlds of good and evil spirits, and on the visible second coming of Christ. Hence his religious feeling and theological speculation demanded their realization in a kingdom of God coextensive with man's nature, terrestrial history and human society; and thus his theological system became a *Theologische Ethik*, as he entitled one of his books (3 vols., 1845–1848). It is on this work that Rothe's permanent reputation as a theologian and ethical writer will rest. The first edition remained twelve years out of print before the second (5 vols., 1867–71) appeared. It was the author's purpose to rewrite the whole, but he died when he had completed the first two volumes. The remainder was reprinted from the first edition by Professor Heinrich Holtzmann, with the addition of some notes and emendations left by the author.

The *Theologische Ethik* begins with a general sketch of the author's system of speculative theology in its two divisions, theology proper and cosmology, cosmology falling into the two subdivisions of *Physik* (the world of nature) and *Ethik* (the world of spirit). It is the last subdivision with which the body of the work is occupied. After an analysis of the religious consciousness, which yields the doctrine of an absolute personal and spiritual God, Rothe proceeds to deduce from his idea of God the process and history of creative development, which is eternally proceeding and bringing forth, as its unending purpose, worlds of spirits, partially self-creative and sharing the absolute personality of the Creator. Rothe regards the natural man as the consummation of the development of physical nature, and obtains spirit as the personal attainment, with divine help, of those beings in whom the further creative process of moral development is carried on. His theory leaves the natural man, without hesitation, to be developed by the natural processes of animal evolution. The attainment of the higher stage of development is the moral and religious vocation of man; this higher stage is self-determination, the performance of every human function as a voluntary and intelligent agent, or as a person, having as its cosmical effect the subjection of all material to spiritual existences. This personal process of spiritualization is the continuation of the eternal divine work of creation. Thus the moral life and the religious life coincide, and when normal are identical; both have the same aim and are occupied with the same task, the accomplishment of the spiritualization of the world. "Piety, that it may become truth and reality, demands morality as its fulfilment, as the only concrete element in which the idea of fellowship with God is realized; morality, that it may find its perfect unfolding, requires the aid of piety, in the light of which alone it can comprehend its own idea in all its breadth and depth." The process of human development Rothe regards as necessarily taking an abnormal form and passing through the phase of sin. This abnormal condition necessitates a fresh creative act, that of salvation, which was, however, from the first, part of the divine plan. As a preparation for this salvation supernatural revelation was required for the purifying and revivification of the religious consciousness, and the Saviour Himself had to appear in human history as a fresh miraculous creation, born of a woman but not begotten by a man. In consequence of His supernatural birth the Saviour, or the second Adam, was free from original sin. By His own moral and religious development He made possible a relation of perfect fellowship between God and man, which was the new and highest stage of the divine creation of mankind. This stage of development inaugurated by the Saviour is attained by means of His kingdom or the community of salvation, which is both moral and religious, and in the first instance and temporarily only religious—that is, a church. As men reach the full development of their nature, and appropriate the perfection of the Saviour, the separation between the religious and the moral life will vanish, and the Christian state, as the highest sphere of human life representing all human functions, will displace the church. "In proportion as the Saviour Christianizes the state by means of the church must the progressive completion of the structure of the church prove the cause of its abolition." The decline of the church is therefore not to be deplored, but recognized as the consequence of the independence and completeness of the Christian life. It is the third section of his work—the *Pflichtenlehre*—which is generally most highly valued, and where his full strength as an ethical thinker is displayed, without any mixture of theosophic speculation.

Since Rothe's death several volumes of his sermons and of his lectures (on dogmatics, the history of homiletics) and a collection of brief essays and religious meditations under the title of *Stille Stunden* (Wittenberg, 1872) have been published.

See F. Nippold, *Richard Rothe, ein christliches Lebensbild* (2 vols., Wittenberg, 1873–74); D. Schenkel, "Zur Erinnerung an Dr R. Rothe," in the *Allgemeine kirchliche Zeitschrift* (1867–68); H. Holtzmann, "Richard Rothe," in the *Jahrbuch des Protestantenvereins* (1869); K. H. W. Schwarz, *Zur Geschichte der neuesten Theologie* (4th ed., Leipzig, 1869, pp. 417–44); Otto Pfleiderer, *Religionsphilosophie auf geschichtlicher Grundlage* (2nd ed., Berlin, 1884, vol. i. pp. 611–15); cf. *The Development of Theology in Germany since Kant* (1890); W. Hönig, *Richard Rothe, sein Charakter, Leben und Denken* (1898); Adolf Hausrath, *Richard Rothe und seine Freunde* (1902).

ROTHELIN, JACQUELINE DE ROHAN, Marquise de (*c.* 1520–1587), daughter of Charles de Rohan and Jeanne de Saint-Séverin. Her husband, François of Orleans-Longueville, marquis de Rothelin, died in 1548, and in watching her son's interests in Neuchâtel she was brought into contact with the reformers in Switzerland. She then embraced Protestantism and turned her château at Blandy, in Brie, into a refuge for Huguenots. In 1567 she underwent a term of imprisonment at the Louvre for harbouring Protestants.

ROTHENBURG-OB-DER-TAUBER, a town of Germany, in the kingdom of Bavaria, 49 m. by rail S.W. of Nuremberg. Pop. (1905) 8436. It is beautifully situated on an eminence 200 ft. above the Tauber. It is flanked by medieval walls, towers and gates, and its antique appearance has been carefully preserved. Perhaps the most interesting building is the town hall, one part of which dates from 1240 and the other from 1572. The latter is a beautiful Renaissance structure, with a magnificent façade and a delicate spire, and contains a grand hall, the Kaisersaal, in which every Whit Monday a play, *Der Meistertrunk*, which commemorates the capture of the town by Tilly in 1631, is performed. Other buildings are the Gothic church of St James, with curiously carved altars and beautiful stained-glass windows, and containing in the Toppler chapel the tomb of the burgomaster, Heinrich Toppler; the 15th-century church of St Wolfgang; the Franciscan church; and five other churches. The town has many picturesque houses, and possesses a library with some interesting archives. It has manufactures of toys and agricultural machinery, electrical works and breweries.

Rothenburg-ob-der-Tauber, mentioned in the chronicles in 804 as *Rotinbure*, was probably a residence of the dukes of Franconia. It first appears as a town in 942 and until 1108 was the seat of the counts of Rothenburg-Komburg; when this line became extinct it passed to the family of Hohenstaufen, one member of which took the title of duke of Rothenburg. In 1172 it became a free imperial city and it attained the zenith of its prosperity under the famous burgomaster Heinrich Toppler (1350–1408). It took part in the movements in South Germany during the 15th and 16th centuries. In 1631 Rothenburg was stormed by Tilly, and the cup of wine presented by the burgomaster, which, according to tradition, saved the town from destruction, is annually commemorated in the play mentioned above.

See Bensen, *Beschreibung und Geschichte der Stadt Rothenburg* (Erlangen, 1856); Merz, *Rothenburg in alter und neuer Zeit* (2nd ed., Ansbach, 1881); Schultheiss, *Rothenburg, ein Städtebild* (Zürich, 1892); and *Das Festspiel zu Rothenburg-ob-der-Tauber* (Munich, 1892); and W. Klein, *Führer durch die Stadt Rothenburg* (Rothenburg, 1888).

ROTHERHAM, THOMAS (1423–1500), archbishop of York, also called Thomas Scot, was born at Rotherham on the 24th of August 1423; he was educated in his native town and seems to have been connected with both the universities of Oxford and Cambridge. Having entered the church he became rector of Ripple, Worcestershire, and later of St Vedast, Foster Lane, London, and it was probably when he was chaplain to John de Vere, earl of Oxford, that he made the acquaintance of Elizabeth Woodville, afterwards the queen of Edward IV. In 1467 Rotherham became keeper of the privy seal to this king; in 1468 he was appointed bishop of Worcester, in 1472 bishop of Lincoln and in 1475 chancellor of England. Several times he went to France on public business; in 1475 at the treaty of Picquigny he received a pension from Louis XI. of France, and in 1480 he was chosen archbishop of York. When Edward IV. died in April 1483 the archbishop remained true to his widow Elizabeth, and consequently lost the chancellorship and was put into prison by Richard III. He was soon set at liberty, and he died in 1500 at Cawood, near York. At Oxford Rotherham built part of Lincoln College and increased its endowment; at Cambridge, where he was chancellor and master of Pembroke Hall, he helped to build the University Library. He founded a college at Rotherham, which was suppressed under Edward VI., and he was responsible for the building of part of the church of All Saints there.

ROTHERHAM, a market-town and municipal borough in the Rotherham parliamentary division of the West Riding of Yorkshire, England, 5 m. N.E. of Sheffield, on the Midland, North-Eastern and Great Central railways. Pop. (1891) 42,061; (1901) 54,349. It lies in the valley of the Don, where that river is joined by the Rother, and has communication by water with the Humber. The Don is crossed by a bridge on which is a small ancient building, formerly a chapel. The parish church of All Saints, occupying the site of a building dating from Anglo-Saxon times, was erected in the reign of Edward IV., and is among the best specimens of Perpendicular in the north of England. The town possesses iron, steel and brass works, railway wagon works, potteries, glass-works, breweries, saw-mills and rope-yards. At the township of Masborough, opposite Rotherham across the Don, works were established in 1746 by Samuel Walker, a successful ironmaster. The municipal borough, incorporated in 1871, is under a mayor, 6 aldermen and 18 councillors. Area, 6012 acres.

The town was of some importance in Anglo-Saxon times, and at Templeborough, on the S.E. side of Rotherham, there was a Roman fort, but its traces are effaced. In the time of Edward the Confessor, Rotherham possessed a market and a church. During the Civil War it sided with the Parliament. It was taken by the Royalists in 1643, but after the victory of Marston Moor was yielded to a detachment of the Parliamentary forces.

ROTHES, EARLS OF. The first earl of Rothes was George Leslie, son of Norman Leslie of Rothes in Moray, and of Ballinbreich in Fife. In 1445 he was created Baron Leslie of Leven, and about 1458 earl of Rothes in the peerage of Scotland. His grandson George, the 4th earl (d. 1558), whose father, William, the 3rd earl, was killed at Flodden, was accused, but acquitted in 1546, of complicity in the murder of Cardinal Beaton, in which his brother and his two sons were undoubtedly implicated; he was one of the Scottish commissioners who witnessed the marriage of Mary queen of Scots with Francis, the dauphin of France. His son Andrew, 5th earl of Rothes (d. 1611), took an active part with the lords of the congregation, first against the queen-mother, Mary of Guise, when regent of Scotland, and afterwards against Mary queen of Scots in opposing her marriage with Darnley, and in devising the murder of Rizzio. He was, however, one of the peers who acquitted Bothwell of Darnley's murder; and going over to the side of the queen, he fought for her at Langside. He continued to occupy a position of some prominence in Scottish affairs until his death in 1611. His great-grandson, John, 7th earl of Rothes (1630–1681), held a command in the Royalist army at the battle of Worcester in 1651, and accompanied Charles II. to England at the Restoration, when he became lord president of the council in Scotland. He was lord treasurer of Scotland from 1663 till 1667, when he was made lord chancellor of Scotland for life. His estates having been sequestrated by the parliament in 1651, he received a re-grant in 1663 of the earldom of Rothes, together with the title of Lord Leslie and Ballinbreich, with remainders to his heirs male and female, providing that in every case where a female should succeed to the peerage the name of Leslie should be assumed by her husband. In 1680 the earl was advanced to the dignity of duke of Rothes and marquess of Ballinbreich, but these titles became extinct at his death without a son in the following year. The earldom of Rothes and the other older titles now passed, under the special remainder mentioned above, to his daughter Margaret, whose husband, Charles Hamilton, 5th earl of Haddington, accordingly took the name of Leslie, at the same time making an arrangement by which his own peerage should pass to a younger son in order to keep the two earldoms separate. Margaret's son John, who on her death became 9th earl of Rothes, was vice-admiral of Scotland from 1715 to 1722, and fought with distinction against the Jacobite rebels in 1715; and her grandson, the 10th earl, who sold the estates of Ballinbreich to the Dundas family, was commander-in-chief in Ireland in 1754, and became a general in 1765. The office of sheriff of Fife, which had been an hereditary right of the earls of Rothes since 1540, was sold by the 10th earl under the Heritable Act of 1747. On several subsequent occasions the earldom again passed through the female line, and in 1893 Mary Elizabeth, countess of Rothes in her own right, was succeeded by her grandson, Norman Evelyn Leslie (b. 1877), as 19th earl of Rothes.

See Sir R. Douglas, *The Peerage of Scotland*, edited by Sir J. B. Paul; and G. E. C., *Complete Peerage*.

ROTHESAY, a royal, municipal and police burgh, and the chief town of the county and island of Bute, Scotland. Pop. (1901) 9378. It is situated on a beautiful bay, 40 m. S.W. of Glasgow, with which there is regular communication by railway steamers from Wemyss Bay, Gourock, Greenock (Prince's Pier) and Craigendoran, as well as by many other steamers from Glasgow and the Clyde ports. It is a popular watering-place, and as the bay is sheltered by low wooded hills and affords excellent anchorage, it is well patronized by yachts. Loch Striven, on the opposite shore of Argyllshire, is known as the "Rothesay weather-glass," its appearance furnishing a certain clue to meteorological conditions. The town is under the jurisdiction of a provost and council. Rothesay has ceased to be a manufacturing centre, fishing being now its chief industry. Owing to its mild and equable climate it is a resort of invalids. There is a tramway to Port Bannatyne, pleasantly situated on the east horn of Kames Bay, and Craigmore, about 1 m. west of Rothesay, is a fashionable suburb. Ardbeg Point, Loch Fad, Loch Ascog and Barone Hill (530 ft.) are all within a mile and a half of the town, and there are numerous excursions by road to other points of interest. The Kyles of Bute are within a short sail of Rothesay. In the centre of the town are the ruins of a castle erected in 1098 either by Magnus Barefoot, king of Norway, or by the Scots as a defence against the Norwegians, with whom during the 13th century, and earlier, there was constant strife. The village which grew up round the castle was made a royal burgh by Robert III., who, in 1398, created his eldest son David duke of Rothesay, a title which became the highest Scottish title of the heir-apparent to the crown of the United Kingdom. During the Commonwealth the castle was garrisoned by Cromwell's troops. It was burned by the followers of Argyll in 1685, and remained neglected till the rubbish was cleared away by the second marquess of Bute in 1816. It was repaired by the third marquess.

ROTHSCHILD, the name of a Jewish family which has acquired an unexampled position from the magnitude of its financial transactions. The original name was Bauer, the founder of the house being Mayer Anselm (1743–1812), the son of Anselm Moses Bauer, a small Jewish merchant of Frankfort-on-the-Main. His father wished him to become a rabbi, but he set up as a money-lender at the sign of the "Red Shield" (*Rothschild*) in the Frankfort Judengasse. He had already acquired some standing as a banker when his numismatic tastes obtained for him the friendship of William, ninth landgrave and afterwards elector of Hesse-Cassel, who in 1801 made him his agent. In the following year Rothschild negotiated his first great government loan, ten million thalers for the Danish government. When the landgrave was compelled to flee from his capital on the entry of the French, he placed his silver and other bulky treasures in the hands of Rothschild, who, not without considerable risk, took charge of them and buried them, it is said, in a corner of his garden, whence he dug them up as opportunity arose for disposing of them. This he did to such advantage as to be able afterwards to return their value to the elector at 5% interest. He died at Frankfort on the 19th of September 1812, leaving ten children, five sons and five daughters. Branches of the business were established at Vienna, London, Paris and Naples, each being in charge of one of the sons, the chief of the firm always residing at Frankfort. By a system of co-operation and joint counsels, aided by the skilful employment of subordinate agents, they obtained unexampled opportunities of acquiring an accurate knowledge of the condition of the financial market, and practically embraced the whole of Europe within their financial network. The unity of the interests of the several members of the firm has been preserved by the system of intermarriages which has been the general practice of the descendants of the five brothers. Each of the brothers received in 1815 from Austria the privilege of hereditary landowners, and in 1822 they were created barons by the same country. The charge of the Frankfort house devolved on the eldest, Anselm Mayer (1773–1855), born on the 12th of June 1773, who was chosen a member of the royal Prussian privy council of commerce, and, in 1820, Bavarian consul and court banker. The Vienna branch was undertaken by Solomon (1774–1826), born on the 9th of December 1774, who entered into intimate relations with Prince Metternich, which contributed in no small degree to bring about the connexion of the firm with the allied powers. The third brother, Nathan Mayer (1777–1836), born on the 16th of September 1777, has, however, generally been regarded as the financial genius of the family, and the chief originator of the transactions which have created for the house its unexampled position in the financial world. He went to Manchester about 1800 to act as a purchaser for his father of manufactured goods; but at the end of five years he removed to London. The boldness and skill of his financial transactions, which caused him at first to be regarded as unsafe by the leading banking firms and financial merchants, later awakened their admiration and envy. By the employment of carrier-pigeons and of fast-sailing boats of his own for the transmission of news he was able to utilize to the best advantage his special sources of information, while no one was a greater adept in the art of promoting the rise and fall of the stocks. The colossal influence of the house dates from an operation of his in 1810. In that year Wellington made some drafts which the English government could not meet; these were purchased by Rothschild at a liberal discount, and renewed to the government, which finally redeemed at par. From this time the allied powers negotiated loans to carry on the war against Napoleon chiefly through the house of Rothschild. Rothschild never lost faith in the ultimate overthrow of Napoleon, his all being virtually staked on the issue of the contest. He is said to have been present at the battle of Waterloo. Being able to transmit to London private information of the allied success several hours before it reached the public, he effected an immense profit by the purchase of stock, which had been depressed on the news of Blucher's defeat two days previously. Rothschild was the first to popularize foreign loans in Britain by fixing the rate in sterling money and making the dividends payable in London and not in foreign capitals. Latterly he became the financial agent of nearly every civilized government, although persistently declining contracts for Spain or the American States. He did not confine himself to operations on a large scale, but on the contrary made it a principle to despise or neglect no feasible opportunity of transacting business, while at the same time his operations gradually extended to every quarter of the globe. He died on the 28th of July 1836, and was succeeded in the management of the London house by his son Lionel (1808–1879), born on the 22nd of November 1808, whose name is associated with the removal of the civil disabilities of the Jews. He was elected a member for the City of London in 1847, and again in 1849 and 1852, but it was not till 1858 that the joint operation of an act of parliament and a resolution of the House of Commons, allowing the omission from the oath of the words to which as a Jew he conscientiously objected, rendered it possible for him to take his seat. He continued to represent the City of London till 1874. His eldest son, Nathan (b. 1840), was created a peer as Baron Rothschild in 1885. Jacob (1792–1868), the youngest of the original brothers, was entrusted with the mission of starting the business in Paris after the restoration of the Bourbons, for whom he negotiated large loans. At the Revolution of 1848 he was a heavy loser, and had also to be protected for a time by a special guard. It was by his capital that the earliest railways were constructed in France; the profits he obtained from the speculation were very large. He died on the 15th of November 1868. The Naples branch was superintended by another of the brothers, Karl (1780–1855). It was always the least important of the five, and after the annexation of Naples to Italy in 1860 it was discontinued.

See *Das Haus Rothschild* (1858); Picciotto, *Sketches of Anglo-Jewish History* (1875); Francis, *Chronicles and Characters of the Stock Exchange* (1853); Treskow, *Biographische Notizen über Nathan Meyer Rothschild nebst seinem Testament* (1837); Roqueplan, *Le Baron James de Rothschild* (1868).

ROTHWELL, an urban district in the Normanton parliamentary division of the West Riding of Yorkshire, England, 4 m. S.E. of Leeds. Pop. (1901) 11,702. The church of the Holy Trinity, though largely restored, retains some good Decorated details. Rothwell soon after the Conquest was granted as a dependency of the castle of Pontefract to the Lacys, who erected here a baronial residence of which there are slight remains. Coal and stone are obtained in the neighbourhood, and the town possesses match-works and rope and twine factories in which the majority of the large industrial population is employed.

ROTIFERA (or Rotatoria), a small, in many respects well-defined and somewhat isolated, class of the animal kingdom. Now familiarly known as "wheel animalcules," from the wheel-like motion produced by the rings of cilia which generally occur in the head region, the so-called rotatory organs, they were first discovered by A. Leeuwenhoek, to whom we also owe the discovery of Bacteria and ciliate Infusoria. Leeuwenhoek described *Rotifer vulgaris* in 1702, and he subsequently described *Melicerta ringens* and other species. A great variety of forms were described by other observers, but they were not separated as a class from the unicellular organisms (*Protozoa*) with which they usually occur, until the appearance of C. G. Ehrenberg's monograph, which contained a mass of detail regarding their structure. At the present day few groups of the animal kingdom are so well known to the microscopist, few groups present more interesting affinities to the morphologist, and few multicellular animals such a low physiological condition.

A rotifer may be regarded as typically a hemisphere or half an oblate spheroid or paraboloid with a mouth somewhere on the flat end ("disk" or "corona"), which bears a usually double ciliated ring, the outer zone the "cingulum," and inner the "trochus": this ring serves both for progression and for bringing up food. The body-wall, cuticulized outside, is formed by a single layer of ill-defined cells, and surrounds the simple body cavity (archicoele), traversed by simple or branched muscular fibres ("mesenchyme") (fig. 1, *m,m*). The mouth opens through a narrow pharynx (*p*) into a chamber which is (as in Crustacea) at once crop and gizzard, the mastax (*ma*), whose thickenings are imbedded in the posteroventral wall. A slender ciliated gullet (*e*) leads into a large stomach (*st*) whose wall consists of large richly ciliated cells with usually a pair of simple secretory sacs opening into it: it may open through an intestine or rectum into the cloaca. A pair of coiled nephridial tubes (*n*) formed of a file of perforated "drain-pipe" cells, with ciliated tag-like "flame" cells (*f*), open into a contractile bladder (*bl*), which passes by a slender duct into the cloaca. Into this also opens the genital duct from the single or paired gonad (*ov*). The simple nerve-ganglion or brain (*g*) lies on the anterodorsal side of the pharynx, and by its position determines the orientation of the animal, the cloacal opening lying on the same side, and the course of the gut being "neural." The sense organs are a pair of pigmented eyes (*oc*), and two pairs of antennae, one anterior proximal and near the wreath, the other distal and usually more or less lateral. The sexes are always separate, the males being of very rare occurrence in most cases. In the female the gonad is complex as in flatworms, composed of a germary for the formation of the eggs, and a vitellary, much more conspicuous and alone figured (*ov*), consisting of a definite number of large nucleated cells for the nourishment of the eggs. The apical end of the rotifer usually narrows suddenly beyond the curve of the gut and the cloacal aperture to form the foot of pseudopodium which ends in an organ of attachment, a pair of movable toes, each with the opening of a cement-gland (*gl*) at its tip. Thus for orientation we place the rotifer like the cuttle-fish, head downwards: the ciliated disk is basal or oral, proximal to the rest of the animal, the foot is apical, and the brain and cloacal aperture are anterodorsal. It is in this position that free-swimming forms glide over the substratum of organic debris in which they find their food.

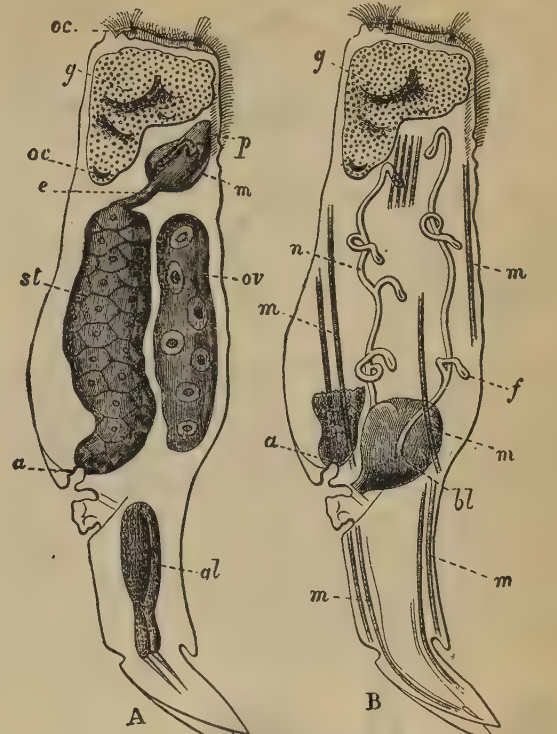
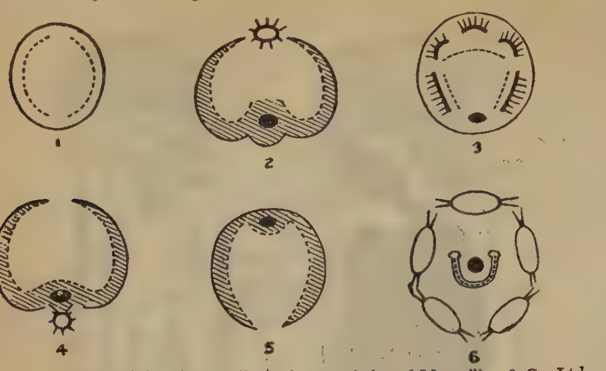


Fig. 1.—*Notommata naias.* A and B represent the same animal, some of the organs being shown in one figure and some in the other. *oc*, eye-spots; *g*, nerve ganglion; *p*, pharynx; *ma*, mastax; *e*, oesophagus; *st*, stomach; *a*, anus, opening into the cloaca; *gl*, cement-glands in the foot; *n*, nephridia; *f*, flame-cells; *bl*, bladder; *m*, *m*, muscles; *ov*, ovary (vitellarium alone seen).

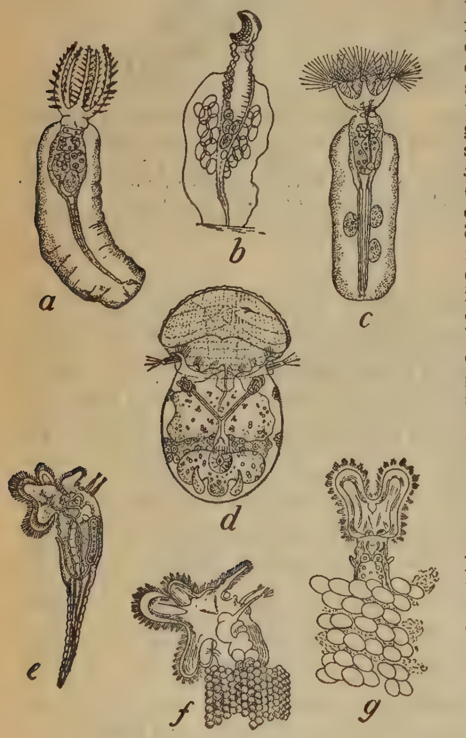
The cuticle may be locally or generally hardened, in the latter case being termed a lorica. Often the head is retractile, and a constriction of flexible cuticle distal to it is termed a neck: in Philodinaceae there are a series of thin flexible rings which permit both distal and proximal ends to be telescoped into the middle; and in *Taphrocampa*, regular constrictions of the whole bodywall give an appearance of metemeric segmentation to the body. In Philodinacea accessory toes are found, unfurnished with cement-glands and distinguished as spurs.

Corona or Disk.—This typically consists of two concentric zones, the trochus and cingulum, often separated by a groove or gutter which may be finely ciliated; but in several genera of no close affinity, where it is very oblique to the longitudinal axis of the body, it is represented by a general ciliation of the surface (*Taphrocampa, Rattulus, Copeus, Adineta*). We may suppose that primitively the mouth was seated in the centre of a funnel-shaped disk, surrounded by a double wreath. The nearest approach to this is found in *Microcodon* (fig. 2, 1) and its allies, the trochus being oval with two median gaps, the cingulum, more delicate, and complete. In Flosculariaceae the trochus is a horseshoe-shaped ridge deep down in the funnel-shaped disk. The cingulum appears to be represented by the margin, usually produced into long petal-like lobes, fringed with long stiffish setae, which in *Stephanoceros* are vibratile at intervals, seemingly at will. In *Floscularia* they serve to convert the lobed funnel into an efficient casting net or clasp net: in one species (*F. pelagica*) there is an outer girdle of fine cilia for swimming. In *Apsilus* and *Atrochus* (fig. 3, *b*, *d*) the cingulum is a mere contractile hood. In most rotifers, on the contrary, the trochus is stronger than the cingulum, often lobed, and with some of its cilia aggregated into vibratile styles homologous with the comb-plates of *Ctenophora* (*q.v.*) and the membranelles of ciliate Infusoria (*q.v.*). The trochus forms the powerful currents for locomotion, and for the supply of food material, while the cingulum produces a local current round the upper rim of the corona to bring the food particles direct to the mouth, which is displaced through a postero-ventral gap in the trochus to lie behind the disk, just as occurs in the more specialized Ciliata. The current formed by the trochus is a gigantic vortex-ring, the down stroke of the cilia being directly outwards, but the wave beats running round the organ in uniform succession in one direction. Thus the rotifer is, as it were, constantly drawn forward into the centre of this vortex ring. There is a dorsal interruption to the disk, involving both trochus and cingulum and groove: in this case the two halves of the disk may be developed in lobes, flower-shaped in *Melicerta ringens*, but often rounded and projecting like kettledrums. These give a strong impression of two crown wheels revolving in the same sense. This appearance puzzled the older observers, who were led thereby to give the name "wheel-bearers" to the group, until the true character of ciliary motion was recognized; for a wheel cannot be in organic continuity with the support on which it rotates. In *Conochilus* (fig. 2, 5), a Melicertan, the mouth is displaced towards the antero-dorsal side and the gap is postero-ventral.



From *Camb. Nat. Hist.* vol. ii. "Worms," &c., by permission of Macmillan & Co. Ltd.

FIG. 2.—Diagrammatic Views of Disks of Rotifers: cingulum continuous; trochus dotted; groove shaded; mouth black. 1, Simple disk of *Microcodon*; 2, bdelloid disk of *Rotifer* and of most Melicertids showing dorsal gap; 3, disk of *Hydatina*, with lobed ridges in the groove, bearing vibratile styles (membranelles); 4, disk of *Melicerta ringens* and *M. conifera*; the star represents the ciliated cup connected by ciliated depressions with the groove; 5, disk of *Conochilus*, like the Bdelloid, but with mouth antero-dorsal, the gap postero-ventral; 6, disk of *Stephanoceros*—cingulum broken up into setiferous lobes, groove a naked funnel, trochus a horseshoe-shaped ridge, mouth central.

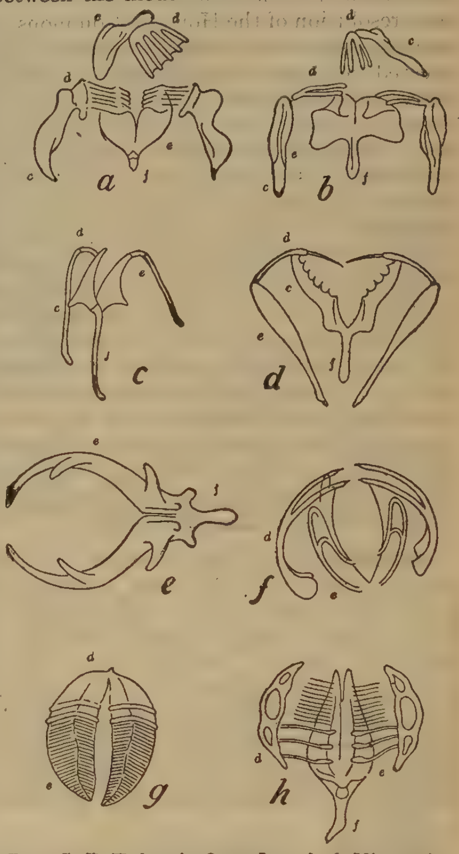


From H. S. Jennings in *American Naturalist*, vol. xxxv., by permission of Ginn & Co.

FIG. 3.—*a*, *Stephanoceros eichornii* in gelatinous tube; *b*, *Acyclus inquietus* in gelatinous tube, with eggs; *c*, *Floscularia coronetta* in gelatinous tube, with eggs; *d*, *Apsilus bucinedax*, showing lateral (distal) antennae funnel of mouth hanging into enormous crop, stomach at apical end with gastric glands, anus on postero-ventral surface, large coiled kidneys at proximal end, uniting into median duct; *e*, *Melicerta ringens* in tube; *f*, same, proximal end enlarged, showing a pellet in the cup proximal to the paired lateral antennae; *g*, *Melicerta janus*, tube formed of faecal pellets.

In *Melicerta ringens* and *M. conifera* (fig. 2, 4; fig. 3, *e*, *f*) there is a glandular ciliated pit between the mouth and the chin into which the overflow water passes by a pair of gutters, and in which fine particles are aggregated into pellets, which the animal deposits, as formed, on the edge of its tube and so builds it up. *M. janus* builds up a tube by pellets of its own faeces (fig. 3, *g*). In most *Ploima* the dorsal gap is not well marked, and the trochus is broken up into a number of lobes, often furnished with vibratile styles, in front and at the sides, but ventrally passing into the uniformly ciliated oral funnel.

Other ciliated organs to be noticed are the proboscis cup of Bdelloidaceae, and the toes of *Pedalion*. Besides these Synchaetadae and Notommatidae (fig. 7) possess a pair of aurioles, great eversible ciliated pouches a little above the disk, utilized in swimming. The mouth begins as a funnel, continued into a narrow pharynx, which in Flosculariaceae is prolonged into a slender tube hanging freely down into the crop: this is followed by the crop-gizzard, also ciliated except behind, where it is hardened into a set of articulated sclerites (trophi) to form the gizzard or mastax. Thus the crop-gizzard has the same combination of structures as we find in the stomach of higher *Crustacea*, with which we may call it homoplastic. The trophi are (1) a median incus or anvil (fig. 4), Y-shaped, with the foot (fulcrum) distal and the arms (rami) apical, often independently jointed; (2) with the outer ends of the rami articulate two lateral pieces (mallei), and again composed of a distal longitudinal piece (manubrium) and an apical transverse piece (the uncus), the whole recalling, as the name implies, a single-clawed hammer. For the varieties and modifications of the trophi we simply refer to Hudson's figure above. The relative size of the crop to the trophi varies greatly; it is small where the trophi are well developed and complex, as well as in Bdelloidea; but in Flosculariaceae it is large, and so it is in Asplanchnaceae. Eversible trophi of the forcipate or virgate type, which can be used for nibbling, are common in *Ploima*, notably Rattulidae, and are used for attachment to the host in the parasitic Seisonaceae, &c. In Asplanchnaceae also,



From C. T. Hudson in *Quar. Journal of Microscopical Science*, vol. xxiv., by permission of J. & A. Churchill.

FIG. 4.—Types of Trophi. *a*, malleate, with enlarged view of malleus above—the Y-shaped incus consists of a short median fulcrum bearing two large rami, each of which is in contact with a stout malleus consisting of a toothed uncus carried on a long manubrium; *b*, sub-malleate, with enlarged view of malleus—the manubria are twice as long as the 3- to 5-toothed unci; *c*, virgate—mallei rod-like, manubria and fulcrum very long, unci 1- or 2-toothed; *d*, forcipate—rami large and used as a forceps, mallei rod-like, unci pointed or evanescent; *e*, incudate—stout fulcrum, rami forming a forceps, mallei evanescent; *f*, uncinate—unci large, 2-toothed, manubria evanescent, incus slender; *g*, ramate—rami subquadrantic, fulcrum rudimentary, manubria evanescent; *h*, malleo-ramate—mallei fastened by their unci to the rami, manubria looped, rami large and fulcrum slender.

where the whole crop is strengthened by a framework of bars, the incudate mastax lies in a little postero-ventral pouch which can be everted through the crop and mouth. The stomach is generally large; its wall consists of a layer of very large ciliated cells, which often contain fat globules and yellowish-green or brown particles, and outside these a connective tissue membrane; muscular fibrillae have also been described. Very constantly a pair of simple sack-like glands open into the stomach, and probably represent the hepato-pancreatic glands of other Invertebrates.

Following upon the stomach there is a longer or shorter intestine, which ends in the cloaca. The intestine is lined by ciliated cells. In forms living in a tube the intestine turns round and runs forward, the cloaca being placed so as to debouch over the margin of the tube. The cloaca is often very large; the nephridia and oviducts may open into it, and the eggs lodge there on their way outwards; they are thrown out, as are the faecal masses, by an eversion of the cloaca. *Asplanchna*, *Notommata seiboldii*, and certain species of *Ascomorpha* are devoid of intestine or anus, excrementitious matters being ejected through the mouth. The body cavity (archicoele) contains a fluid in which very minute corpuscles have been detected. There is no trace of a true vascular system. The nephridia (fig. 1, B, *n*) present a very interesting stage of development. They consist of a pair of tubules with an intracellular lumen running up the sides of the body, at times merely sinuous, at others considerably convoluted. From these are given off at irregular intervals short lateral branches, each of which terminates in a flame-cell (*f*) precisely similar in structure to the flame-cells found in Planarians, Trematodes and Cestodes; here as there the question whether they are open to the body cavity or not must probably be answered in the negative. At the base these tubes open either into a permanent bladder (fig. 1, *bl*) which communicates with the cloaca, or directly into the cloaca. They have the same functions as the contractile vacuole of freshwater *Protozoa* (*q.v.*).

Nervous System.—There is a large ganglion lying in close contact with the pharynx, proximal to the crop and on its antero-dorsal side; in Bdelloidaceae at least it is united by short connectives with a smaller postero-ventral ganglion to form a nerve collar. From this simple nerve fibres are given off to the body-wall, especially to the ciliated cells of the corona, to the foot, and also to the muscles and sense organs.

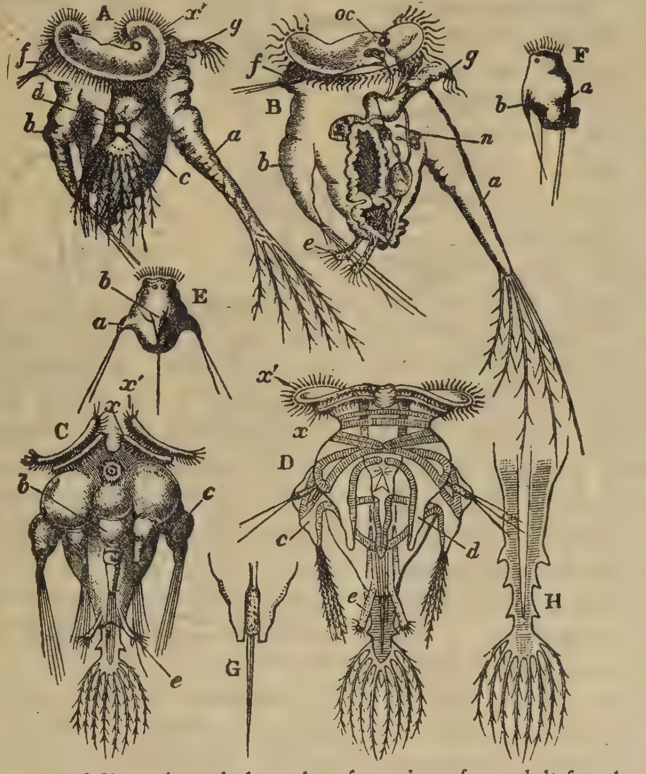


FIG. 5.—*Pedalion mira.* A, lateral surface view of an adult female: *a*, median ventral appendage; *b*, median dorsal appendage; *c*, distal ventro-lateral appendage; *d*, dorso-lateral appendage; *f*, dorsal antenna; *g*, "chin"; *x'*, cephalotroch. B, lateral view, showing viscera: *oc*, eye-spots; *n*, nephridia; *e*, ciliated toes; other letters as above. C, ventral view: *x'*, trochus; *x*, cingulum; other letters as above. D, ventral view, showing the musculature (cf. text). E, dorsal view of a male: *a*, lateral appendages; *b*, dorsal appendage. F, lateral view of a male. G, enlarged view of the antenna *f*. H, enlarged view of the median ventral appendage. (All after Hudson.)

The sense organs are eyes, antennae, sensory styles and a statocyst in a few species. The eyes are refractive globules set in a cup of red pigment traversed by a nerve fibre, and lie on the proximal side of the body, directly on the postero-dorsal surface of the brain, or at a little distance from it, on the neck, often within the circle on the corona, and usually well within the transparent body. There may be one, a pair, or rarely more, the outer ones being more or less rudimentary. The antennae are short tubular extensions of the body wall, sometimes retractile with a depressed tip from which protrudes a tuft of fine stiff bristles. They are possibly organs of external taste (smell) as well as of touch. Typically there are two pairs—a proximal, more or less approximated on the postero-dorsal surface, and a distal pair, more widely separate. But the proximal pair are often fused into a single median antenna (supplied, however, by two nerves), and in one case at least the distal pair may be similarly fused. Additional paired antennae may occur within the coronal surface, which is the seat of the sensory styles, of less complex structure, which occur in many genera. The statocyst (retro-cerebral organ of *P. Marius de Beauchamp*) is a sac filled with highly refractive granules soluble in dilute acids, and opening by a slender duct (or a pair) to the surface: its function is doubtless that of an organ of equilibrium, and it resembles in its opening to the surface the primitive internal ear of even Vertebrates, for the duct to the surface persists through life in the sharks.

Locomotor Organs.—Most free rotifers swim by the corona, aided by the ciliated auricles when present. In Bdelloidaceae this may alternate with a leech-like gait; the corona being withdrawn, the cupped end of the proboscis serves as a sucker for attachment alternately with the adherent foot, so that the animal loops its way along. In two families motile articulated rods occur; in Triarthridae they probably simply expand the dimensions of the body in adaptation to life at the surface; or as a protection against being swallowed by their smaller foes. In *Polyurthra* and *Pteroessa* they are numerous, pinnated (feathered), and are doubtless used for active swimming by jerks; they can be moved up or down by special muscles attached to their bases, which project into the body.

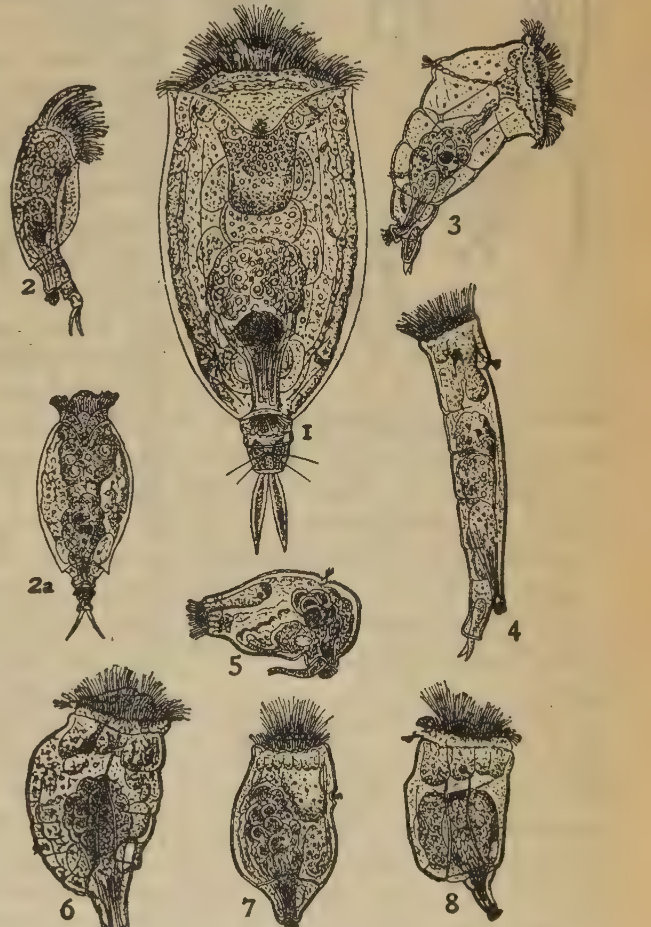


FIG. 6.—Male Rotifers. 1, *Euchlanis deflexa*; 2, lateral; 2*a*, dorsal views of *Colurus bicuspidatus*; 3, *Notops brachionus*; 4, *Diglena permollis*; 5, *Gastropus minor*; 6, *Anuraea serrata*; 7, *Ascomorpha parasita*; 8, *Notholca heptodon*. (Drawn from specimens by F. R. Dixon Nuttall.)

In *Pedalion* (fig. 5), a remarkable form discovered by Dr C. J. Hudson in 1871 and found in numbers several times since, these appendages have acquired a new and quite special development. They are six in number, median, ventral and dorsal, and two unequal lateral pairs. The largest is placed ventrally at some distance distal to the mouth. Its free extremity is a plumose fan-like expansion (fig. 5, A*a* and H). It is, in common with others, a hollow process into which run two pairs of broad, coarsely transversely striated muscles. Each pair has a single insertion on the inner wall—the one pair near the free extremity of the limb, the other near its attachment; the bands run up, one of each pair on each side, and run right round the body forming an incomplete muscular girdle, the ends approximating in the median line. Above this point springs the large median dorsal limb, which terminates in groups of long setae. It presents a single pair of muscles attached along its inner wall which run up and form a muscular girdle round the body in its posterior third. On either side is attached a dorso-lateral and ventro-lateral appendage, each with a fan-like plumose termination consisting of compound hairs or setae, found elsewhere only among arthropods (*q.v.*); each of these is moved by muscles running upwards towards the neck and arising immediately under the trochal disk, the inferior ventro-lateral pair also presenting muscles which form a girdle in the hind region of the body. It bears a group of long setose hairs the bases of which are connected with the nerve fibre. There are also two pairs of distal antennae. *Pedalion* presents a pair of ciliated toes in the posterior region of the body (fig. 5, B, C, and D, *e*), which it can apparently use as a means of attachment; Dr Hudson states that he has seen it anchored by these and swimming round and round in a circle.

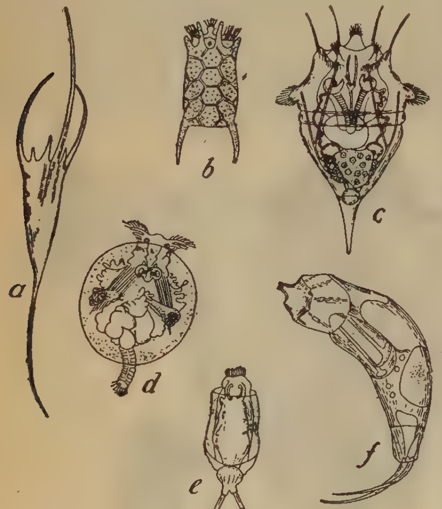


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FIG. 7.—Loricate Rotifers. *a*, *Notholca longispina*, lorica only; *b*, *Anuraea aculeata*, like the former, a floating pelagic type (plankton proper); *c*, *Synchaeta stylata*; corona with accessory antennae and sensory styles; auricles for swimming—an actively swimming pelagic type (nekton); *d*, *Pterodina patina*, with bdelloid corona and retractile foot with terminal ciliated cup; *e*, *Distyla gissensis* partly extended; *f*, *Rattulus tigris*.

Reproduction Organs.—Rotifera are unisexual, with the sexes dimorphic. The ovary is, as in many Platyhelminthes, duplex; one part, the germary, being an organ for the production by cell multiplication of the germ-cells or eggs proper, the other, the vitellarium, much more conspicuous and usually consisting of a definite number of large cells, producing yolk material for the growth of the egg. The whole ovary is unilateral and unpaired in most rotifers; symmetrical in Asplanchnaceae, Philodinaceae and Seisonaceae. In Asplanchnaceae the germary is median, continuous at the distal end with the middle of the transverse horseshoe-shaped vitellary. In Bdelloidaceae and Seisonaceae the whole organ is paired, the germary proximal, the vitellary next the cloaca. As a rule, the wall of the ovary is continued into a uterine tube opening into the cloaca; but in Philodinaceae this is absent, and the young are free in the body cavity and escape by perforating the cloacal walls. The male organs are usually a testis, a large seminal bladder and a protrusible penis. The males are unlike the females in most species; only in *Eosphora digitata, Rhinops vitrea, Proales werneckii*, and the Seisonaceae a complete digestive system is present. Frequently the foot is ciliated at the tip, as in the young of tubicolous forms.

The males of rotifers are of relatively rare occurrence, except in the genus *Asplanchna*, where they were first recognized as such by Brightwell in 1841; though those of *Hydatina* had long since been seen and described as a distinct genus. Despite their rare occurrence, the males of over one hundred and twenty species have now been recognized, and we may well believe that all species will be found to present males. This statement may seem to need qualification; for the male of no Bdelloid has been seen, and there is but a doubtful record of "winter-eggs" in this group. But possibly, as in Seisonaceae, the males resemble the females, and have escaped recognition. It may, however, well be that the capacity for wintering in the dry state has physiologically replaced the need for resistent fertilized eggs. Insemination takes place either by the introduction of the penis into the cloaca of the female, or by the puncture of the body-wall of the female by the penis, and the injection of the sperm into the body cavity, whence the single spermatozoa must make their way to the eggs. The females habitually produce eggs without impregnation, which again habitually develop into females, more rarely into males. These unfertilized eggs develop directly, often in the uterus. In other cases the eggs are liberated earlier and adhere to the foot, or are hatched within the tube (fig. 3, *b*, *c*). The impregnated eggs undergo a very partial development in the mother, and these pass into a state of rest, for which they are furnished with a dense shell. They always give rise to parthenogenetic females (see REPRODUCTION). The thin-walled eggs are often termed "summer-eggs," the fertilized ones "winter" or "ephippial" eggs (by parity with the phyllopod Entomostraca, *q.v.*). But the appearance of males seems to be as much associated with those of summer drought as of winter cold. No adequate knowledge of the conditions under which males arise has been established. The phenomenon of seasonal dimorphism is of especial moment for the plankton dwellers. Not only is the appearance of males regular, but the forms of the females at different times of the year may be so distinct as to have led them to be classed as distinct species.

Development.—The egg is holoblastic, but the segmentation is very unequal, recalling that of marine annelids and of molluscs. Gastrulation takes place by epiboly, and the stomodaeum (oral invagination—mastax pharynx) takes place in two stages of the region of the closed blastopore. Unlike the molluscs and annelids, however, the cloacal invagination lies outside this region, and the foot is formed by an elongation of the end of the body between the two apertures. The nerve ganglion is formed by an ingrowth of epiblast, and so are the pedal glands. The body cavity is the primitive blastocoele.

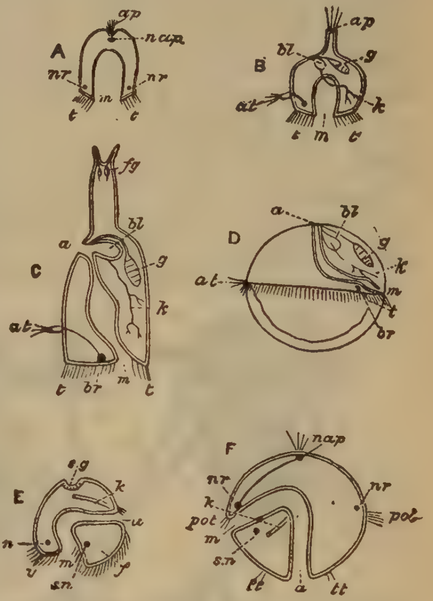

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FIG. 8.—Diagram of morphological relations of Rotifera. A, pilidium larva of nemertine; B, *Asplanchnapus* schematized; C, a ploimal rotifer; D, trochosphaera female (schematized from Semper); E, veliger larva of mollusc; F, trochophore larva of annelid. *a*, anus; *ap*, apical organ, corresponding to foot of rotifers; *at*, median antenna, united by a nerve to *br*, brain (letter omitted in B); *bl*, bladder, receiving ramified kidney in B, C, D; *f*, foot, and *f.g*, its cement-gland; *g*, ovary; *k*, kidney; *m*, mouth; *n*, supra-oesophageal ganglion; *nr*, nerve ring in section.

Relationships and Morphology.—Passing over the earlier authors who regarded this group as allied to Infusoria, a view first contested by Dujardin, T. H. Huxley viewed them as equivalent to and on a level with the larvae of Echinoderms, and of such other trochophore larvae as resembled these, a view generally adopted. But it became more and more apparent that the larvae of this category developed mouth, gut and anus by the closure in the middle of such a slit-like blastopore opening into a sack-like stomach as is seen in the larvae of Turbellaria and Nemertina. The extra-blastoporic opening of the cloaca leads us to a very different view, which finds negative support in the failure of previous morphologists to adapt the details of development and of the structure of the disk to their identification of "trochus" and "cingulum" with the preoral and postoral wreaths of the trochophore larva. We homologize the rotifer with the Turbellarian larva (fig. 8, A), and with the preoral or upper part of the trochopore (fig. 8, E, F). Its adhesive foot is paralleled by a cup-shaped ciliated depression, possibly nervous, found in all the larvae cited, except some Echinoderms, and which in Asterids and Crinoids actually serves as an organ of attachment. This view obviates the deed for assuming the complicated flexures of the wreath which has to be done on other assumptions (see ROTIFERA, *Encycl. Brit.* ed. 9). Thus *Trochosphaera* (fig. 8, D) (which has a male of the same type as *Melicerta*, &c.) is an extremely modified type, and its resemblance to the trochophore larva of *Lepadorhynchus* or *Polygordius* is only superficial. We may note that it was long since shown that the apical organ (at first assumed to be the brain) of these larvae was innervated from an anterior thickening of the circular nerve ring, corresponding with the brain of Rotifers; the nerve cells immediately below the pit are the ordinary bipolar ganglion cells below invertebrate sense-organs. Moreover, the body cavity of the Rotifers is a primitive archicoele; the persistent or accrescent cleft between epiblast and hypoblast, traversed by mesenchymal muscular bands. Thus we regard Rotifers as an independent stem branching off at the outset of the rise from the Platode type to higher Invertebrata. The Polyzoa (*q v*), which in many ways recall Rotifers, appear to be equally independent.

The following classification of Rotifers is our modification of that of Hudson and Gosse, further altered through considerations put forward by C. Wesenberg-Lund, which, however, we do not consider wholly convincing. He notably regards an oblique disk with uniform ciliation as primitive, a view which we cannot adopt.

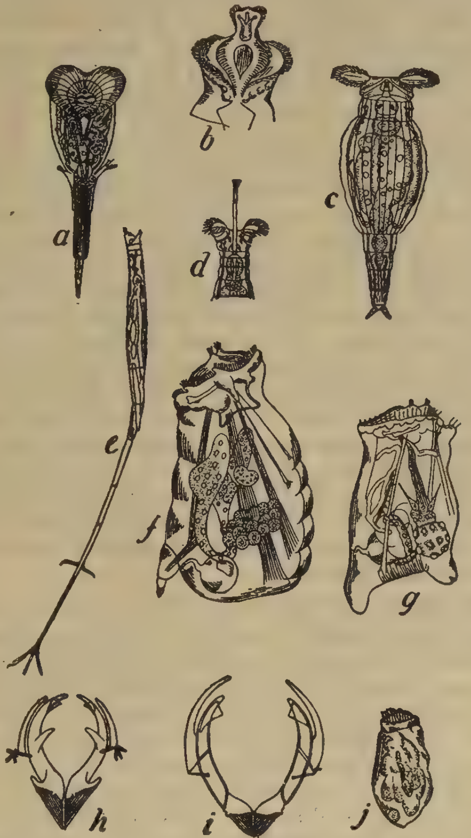

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FIG. 9.—*a*, *Microcodon clavus*, showing corona, lateral antennae and jointed foot; *b*, *Rhinops vitrea*, corona from below, showing proboscidiform extension containing eyes; *c*, *Philodina megalotrocha*; *d*, head of *Rotifer macroceros*, postero-ventral view, showing lobes of corona, and antero-dorsal median antenna, telescopic with setae; *e*, *Rotifer* (*Actinurus*) *neptunius*, showing head with retracted corona, and protruded dorsal proboscis bearing median antenna, and telescopic foot with toes and spurs; *f*. *Asplanchnopus myrmeleo*, showing horseshoe-shaped germarium (left), blind saccate stomach (right), apical bladder, foot, &c.; *g*, *Asplanchna ebbesbornii*—the coiled tube at left is a kidney; *h*, *i*, incudate jaws of *Asplanchna brightwellii* and *girodii* chiefly formed of rami, with the rudimentary mallei parallel and external to them; *j*, *Ascomorpha hyalina*.

Classification:—

(A.) Disk usually with well-marked strong trochus, ciliated groove and more delicate cingulua interrupted by an antero-dorsal median gap, usually more or less bilobed.

(i.) Trophi incudate:

1. Asplanchnaceae; trochus circular; foot absent or minute; trophi incudate; stomach blind; males frequent, not very dissimilar to females. *Asplanchna* Gosse (fig. 9, *g*–*i*); *Asplanchnopus* Deguerne (fig. 9, *f*); *Ascomorpha* Perty (fig. 9, *j*).

(ii.) Trophi malleoramal:

2. Melicertaceae; females tubicolous, usually attached, or forming spherical floating social aggregates; males free swimming. *Melicerta* Schranck (fig. 3, *e*, *f*); *Oecistes* Ehrenberg; *Lacinularia* Schweigger; *Conochilus* Ehrenberg, with gap postero-ventral and mouth antero-dorsal (fig. 2, 5).

3. Trochosphaeraceae; female footless; subspherical, the corona bulging into a hemisphere which may equal the hemispherical body; anus apical; male as in Melicertaceae, *Trochosphaere* Semper (fig. 8, D).

4. Ploimoidaceae; subconical; corona bilobed; retractile foot absent or ciliated; motile appendages present in two families.

   (*a*) Pterodinidea; foot a ciliated cup; cuticle forming flat lorica. *Pterodina* Ehr. (fig. 7, *d*).

   (*b*) Triarthridae; body with a pair of long cervical spines pointing distally and serving for leaping movements or to extend the body and make it too big for small enemies to swallow; *Pedetes* Gosse (no median spines); *Triarthra* Ehr., one postero-ventral spine; *Tetramastix* Zacharias, two unequal median spines.

   (*c*) Pedalionidae, foot represented by two styles, sometimes ciliated; body provided with six hollow-jointed muscular fins for swimming and leaping. *Pedalion* Hudson (fig. 5).

(iii.) Trophi ramate:

5. Bdelloidaceae; foot with two toes and accessory spurs or a simple perforated disk; body telescopic at either end, with an antero-dorsal proboscis ending in a ciliate cup and bearing the proximal antenna; corona usually bilobed, very wheel-like. Males if present probably like the females. Germary and ovary paired; oviduct absent; young viviparous. *Rotifer* Schrank (fig. 9, *d*, *e*); *Philodina* Ehr. (fig. 9, *c*); *Callidina* Ehr. (eyeless); *Adineta* Hudson is eyeless with the corona uniformly ciliated, and proboscis adnate, hooked.

(iv.) Trophi uncinate:

Flosculariaceae; disk a contractile cup, often lobed, the cingulum of long vibratile cilia, of very long motionless bristles or absent, rarely with an outer zone of fine cilia. Trochus a pair of ridges or horseshoe open in front. Oral funnel produced into a fine tube hanging freely into a pharyngeal cup, containing the uncinate trophi. Body-wall usually traversed by a network of canals serving by their contraction to expand the disk. Males and larvae with a ciliated pedal cup and a simple ciliated disk.

   (*a*) Floscularidae; tubicolous, with a lobed disk, bearing stiff or vibratile setae. *Floscularia* Oken (fig. 3, *b*); *Stephanoceros* Ehr. (fig. 3, *a*).

   (*b*) Acyclidae. Disk entire or tentaculate, not setiferous; *Acyclus* Leidz (fig. 3, *c*). Foot represented by a button-like disk, carried far from the posterior surface; *Apsilus* Metchnikoff (fig. 3, *d*); *Atrochus* Wierzezski (fig. 3, *c*).

(B) Ploimaeae; disk variable, often circular, sometimes with a lobed trochus bearing membranelles (vibratile styles); trophi complete, malleate, submalleate, virgate, or forcipate; anus subapical; foot usually short, and usually bearing two toes which may be much elongated.

Illoricata, cuticle soft; ciliated exsertile auricles above the disk sometimes present. *Albertia* Dujardin; *Drilophagus* Vejdovsky; *Microcodon* Ehr. (fig. 9, *a*); *Rhinops* Hudson (fig. 9, *b*); *Synchaeta* Ehr. (fig. 7, *c*); *Hydatina* Ehr. has no eye; *Notommata* Ehr. (restricted by Gosse); *Copens* Gosse; *Notops* Hudson (fig. 6, 3); *Proales* Gosse; *Gastroschiza*; *Diglena* Ehr. (fig. 6, 4).

Loricata, cuticle hardened armour-like, often sculptured; *Polyarthra* Ehr.; *Pedetes* Gosse; *Euchlanis* Ehr. (fig. 6, 1); *Anuraea* Ehr. (fig. 7, *b*); *Notholca* Gosse (fig. 7, *a*); *Distylis* Eckstein (fig. 7, *e*); *Rattulus* Ehr. (fig. 7, *f*); *Colurus* Ehr. (fig. 6, 2); *Taphrocampa* Gosse.

(C.) Seisonaceae. Body elongated with a narrow neck above the disk; foot ending in a terminal perforated disk. Trophi virgate exsertile; germary paired; genito-urinary cloaca opening above the neck in the male, subapically in the female. Gut blind (*Paraseison*), or opening into cloaca (*Seison*). Males resembling females, common. All known species are parasitic on the Crustacean *Nebalia*; *Seison* Claus; *Paraseison* Plate.

Habitat and Habits.—The Rotifera are all aquatic, the majority dwelling in fresh water with Protozoa and Protophyta, as well as Entomostracous Crustacea. This association with Protophyta accounts for their study by many distinguished botanists, such as W. C. Williamson and F. Cohn. Some are moss-dwellers, inhabiting the surface film of water that bathes these plants: such especially are the Bdelloids, with their exceptional capacity for resisting desiccation. Others—the majority—live among weeds, the tubicolous ones mostly upon them. A few are sapropelic, haunting the looser debris that forms the uppermost layer of the bottom ooze of quiet waters: we may cite the aberrant Floscularian *Atrochus*. Widely different are the habits of the plankton forms, which float or swim near the surface, and are often provided with long cuticular extensions for this purpose (fig. 7, *a*, *b*). Asplanchnaceae, plankton, dwellers in small pools, are, however, ovoid, and *Trochosphaera* is spherical and must owe its floating powers to the low density of the liquid in its enormously dilated body-cavity. *Lacinularia racemovata* and *Conochilus* form free floating aggregates, the eggs, as laid, hatching and the young settling among the approximated gelatinous tubes of the parents. Some species only frequent the clearest waters; but the lovely transparent *Hydatina senta* (fig. 2, 3) likes water contaminated by the visits of cattle or the drainings of manure. *Drilophagus* and *Albertia* are parasitic on the surface or within the gut of Naid Oligochaete worms: Seisonaceae are ectoparasitic on the Crustacean *Nebalia*, *Proales werneckii* forms galls within the Conferva *Vaucheria*, and *P. parasita* infests the central jelly of the Phytoflagellate *Volvox*; *P. petromyzon* is a frequent commensal in the gill cavity of some Cladoceran Crustacean *Eurycereus lamellatus*.

The geographical distribution is cosmopolitan, as is the case with Protozoa and Protophyta of similar habits. A curious fact is that when a new and striking form is found first in one place it is shortly after collected from widely separated areas. In the case of one genus, *Gastroschiza*, this led to the creation of no less than six generic names.

History and Bibliography.—As rotifers are common in ponds, the first workers with the microscope observed them repeatedly, the first record being that of John Harris in 1696, who found a Bdelloid in a gallipot that had been standing in his window. Leeuwenhoek found and described some tubicolous species; and during the 18th century a fair number of species were observed, figured and described with names. During this time the illusion of a wheel or wheels produced by the ciliary action of the disk had puzzled all observers. C. E. Ehrenberg included the Rotifers in his *Infusionsthiere*, and described and figured with fair precision many of the genera and species. Dujardin gave a less detailed but more accurate account under the name of *Zoophytes Systolides*. The next full work was a valuable compilation by W. C. Williamson (best known as a botanist) in Pritchard's *Infusoria*, in 1861. Much work was done with the gradual introduction of improved methods during the last forty years of the century. The discovery and recognition of the males was made, however, at the close of the fifties. P. H. Gosse collected and described many species, and elucidated the structure of the mastax in 1856. Zoologists of the standing of Huxley, Claus and Leydig added to our knowledge of the anatomy and to the theory of their relations. But the monumental monograph of C. T. Hudson and Gosse containing a new classification, an illustrated description of all the then known species and much information on habits and structure, provided students with an easy access to the domain and stimulated many to work hard at the group. Of these new-comers we may cite C. F. Rousselet, who has found many new species and many unknown males of known species, elucidated habits and faithfully kept record of the publications on the class in the *Journal* of the Royal Microscopical Society. He has moreover elaborated a method for preserving Rotifera for microscopic observation, so that the types of each observer are now as readily available for comparison as the plant-specimens of the botanist's herbarium. C. Zelinka has given us the most detailed anatomical accounts we possess for several Bdelloidaceae, and was the first to utilize modern methods of microscopic technique on a complete scale.

C. G. Ehrenberg, *Die Infusionsthiere als vollkommenere Organismen* (1838); F. Dujardin, *Histoire naturelle des zoophytes* (1841); T. H. Huxley, "Lacinularia socialis," *Trans. Micr. Soc.* i. (1853); P. H. Gosse, "Manducatory Organs in Class Rotifera," *Phil. Trans.* (1856); W. C. Williamson, "The Rotifera" in A. Pritchard's *History of the Infusoria* (1861); C. T. Hudson and P. H. Gosse, *The Rotifera* (1886), and supplement (1889); Marcus Hartog, "Rotifera," in *Cambridge Natural History*, vol. ii., reprinted 1901; H. S. Jennings, *Synopses of North American Invertebrates*, xvii., "The Rotifera," *Amer. Nat.* xxxv. (1901); C. F. Rousselet, numerous papers in *Journ. Micr. Soc.* and *Journ.* Quekett Club; C. Wesenberg-Lund, "Danmarks Rotifera," in *Vid. Meddel. Nat. For. Kjöbenhavn* (1899); C. Zelinka, "Studien über Rotiferen," in *Zeit. Wiss. Zool.* xliv. (1886), xlvii. (1888), liii. (1891). (M. Ha.)

ROTORUA, a town of Rotorua county, North Island, New Zealand. It lies in the midst of a remarkable volcanic district generally known as the Hot Spring district, or fancifully as the Wonderland, which covers an area of 660 sq. m. and extends 160 m. from N.E. to S.W. from White Island, an active volcanic cone in the Bay of Plenty to the mountains of Tongariro, Ngaruhoe and Ruapehu in the interior of the island, S.W. of lake Taupo. Rotorua attracts many visitors on account of the beauty and scientific interest of the locality and the bathing in its various medicinal springs. It is a scattered township lying on the south-western shore of lake Rotorua, amid hills reaching 2600 ft. in the immediate neighbourhood, and much of the volcanic soil supports a rich growth of forest or "bush."

The springs are principally alkaline, alkaline and siliceous, acidic, or acidic and hepatic (sulphurous). The township includes the Maori village of Ohinemutu, an interesting collection of native dwellings, whose inmates constantly use the numerous rudely excavated baths which are fed by springs varying in temperature from 60° F. to the boiling-point, and are in some cases used for cooking. In the vicinity, on the lake-shore, is the government sanatorium. Two miles south of Rotorua is another native village, Whakarewarewa, where there are geysers as well as hot springs. Four miles from Rotorua, near the centre of the lake, the island of Mokoia rises to 1518 ft. It is partly under grass and partly wooded, and is inhabited by Maoris, by whom it is regarded as holy ground. A short channel connects lake Rotorua with lake Rotoiti to the N.E. At the eastern end steep cliffs rise from the water, and luxuriant vegetation covers the hills. Both this lake and the smaller ones to the east, Rotoehu and Rotoma, have deeply indented shores, and are set in exquisite scenery. The group is known collectively as the Cold Lakes. The waters of Rotoma are of a particularly vivid blue. To the south of Rotoiti is Tikitere, a sombre valley abounding in mud volcanoes, springs and other active volcanic phenomena. Mount Tarawera (16 m. S.E. of Rotorua) is noted for the eruption of June 1886, which changed the outline of several lakes, destroyed the famous Pink and White terraces on the adjoining lake Tarawera, and converted a region of great beauty into a desolate wilderness. A fissure was formed extending nearly 9 m. along the axis of the disturbance, and the mission station of Wairoa (8 m. from Rotorua) on the western shore of the lake was overwhelmed. A line of craters is seen to the south-west. The large lakes Okataina, Kahahi and Rerewhakaitu lie respectively N., W. and S.E. of lake Tarawera.

ROTROU, JEAN DE (1609–1650), French tragic poet, was born on the 19th or 20th of August 1609, at Dreux in Normandy. Rotrou studied at Dreux and at Paris, and, though three years younger than Corneille, began play-writing before him. In 1632 he became playwright to the actors of the Hôtel de Bourgogne. With few exceptions, the only events recorded of his life are the successive appearances of his plays and his enrolment in 1635 in the band of five poets who had the duty of turning Richelieu's dramatic ideas into shape. Rotrou's own first piece, *L'Hypocondriaque* (pr. 1631), dedicated to the Comte de Soissons, seigneur of Dreux, appeared when he was only eighteen. In the same year he published a collection of *Œuvres poétiques*, including elegies, epistles and religious verse. His second piece, *La Bague de l'oubli* (pr. 1635), an adaptation in part from the *Sortija del Olvido* of Lope de Vega, was much more characteristic. It is the first of several plays in which Rotrou endeavoured to naturalize in France the romantic comedy which had flourished in Spain and England instead of the classical tragedy of Seneca and the classical comedy of Terence. Corneille had leanings in the same direction. Rotrou's brilliant but hasty and unequal work showed throughout marks of a stronger adhesion to the Spanish model. In 1634, when he printed *Cleagénor et Doristée* (acted 1630), he said he was already the author of thirty pieces; but this applies no doubt to adaptations. *Diane* (acted 1630; pr. 1633), *Les Occasions perdues* (acted 1631; pr. 1635), which won for him the favour of Richelieu, and *L'Heureuse Constance* (acted 1631; pr. 1635), which was praised by Anne of Austria, succeeded each other rapidly, and were all in the Spanish manner. In 1631 Rotrou imitated Plautus in *Les Menechmes* (pr. 1636), and in 1634 Seneca in his *Hercule mourant* (pr. 1636). Comedies and tragi-comedies followed. Documents exist showing the sale of four pieces to Antoine de Sommarille for 750 *livres tournois* in 1636, and in the next year he sold ten to the same bookseller. He spent much time at Le Mans with his patron, M. de Belin, who was one of the opponents of Corneille in the quarrel of the Cid. It has been generally assumed, partly because of a forged letter long accepted as Corneille's, that Rotrou was his generous defender in this matter. He appears to have been no more than neutral, but is credited with an attempt at reconciliation between the parties in a pamphlet printed in 1637, *L'Incognu et véritable amy de messieurs de Scudéry et Corneille.* M. de Belin died in 1637, and in 1639 Rotrou bought the post of *lieutenant particulier au bailliage* at Dreux. In the next year he married Marguerite Camus, and settled down as a model magistrate and *père de famille*. Among his pieces written before his marriage were a translation of the *Amphitryon* of Plautus, under the title of *Les Deux Sosies* (1636), *Antigone* (1638), and *Laure Persecutée* (acted 1637; pr. 1639), in the opposite style to these classical pieces. In 1646 Rotrou produced the first of his four masterpieces, *Le Véritable Saint Genest* (acted 1646; pr. 1648), a story of Christian martyrdom containing some amusing by-play, one noble speech and a good deal of dignified action. Rotrou uses with considerable success the device of a play within a play. The actor Genest becomes a real convert while playing the part of a Christian martyr. Incidentally (Act i. Sc. v.) Rotrou pays a noble tribute to the genius of Corneille. *Don Bertrand de Cabrère* (1647) is a tragi-comedy of merit; *Venceslas* (1647; pr. 1648) is considered in France his masterpiece, and has had several modern revivals; *Cosroès* (1649) has an Oriental setting, and is claimed as the only absolutely original piece of Rotrou. These masterpieces follow foreign models, and Rotrou's genius is shown in the skill with which he simplifies the plot and strengthens the situations. *Saint Genest* followed Lope de Vega's *Lo fingido verdadero*; *Venceslas* followed the *No ay ser padre siendo rey* of Francisco de Rojas. In this play Ladislas and his brother both love the princess Cassandra; Ladislas makes his way into her house and in the darkness kills a man whom he thinks to be the duke of Courland, but who is really his brother Alexandre, the favoured lover. In the early morning he meets the king and is confronted by the duke of Courland. The outline of this incident is in the Spanish play, but there the spectators are aware of the ghastly mistake at the time of the murder. Rotrou shows his dramatic skill by concealing the real facts from the audience until they are revealed to the horror-struck Ladislas himself.

In 1650 the plague broke out at Dreux. Rotrou remained at his post, although urgently desired to save himself by going to Paris; caught the disease, and died in a few hours. He was buried at Dreux on the 28th of June 1650. Rotrou's great fertility (he left thirty-five collected plays besides others lost, strayed or uncollected), and perhaps the uncertainty of dramatic plan shown by his hesitation almost to the last between the classical and the romantic style have injured his work. He has no thoroughly good play, hardly one thoroughly good act. But his situations are often pathetic and noble, and as a tragic poet properly so called he is at his best almost the equal of Corneille and of Racine. His single lines and single phrases have a brilliancy and force not to be found in French drama between Corneille and Hugo.

A complete edition of Rotrou was edited in five volumes by Viollet le Duc in 1822. In 1882 M. de Ronchaud published a handsome edition of six plays—*Saint Genest*, *Venceslas*, *Don Bertrand de Cabrère*, *Antigone*, *Hercule Mourant* and *Cosroes*. *Venceslas* and *Saint Genest* are also to be found in the *Chefs-d'œuvre Tragiques* of the Collection Didot.

Rotrou's brother, Pierre Rotrou de Saudreville, left a memoir of him which is unfortunately lost, but this is cited by the Abbé Brillon (1671–1736) as his authority in a *Notice biographique sur Jean Rotrou*, first printed in 1885 at Chartres under the editorship of L. Merlet. Other good earlier authorities are Nicéron, *Mémoires pour servir à l'histoire des hommes illustres* (1731), vol. xvi. pp. 89–97; and the duke de la Vallière, *Bibl. du théâtre françois depuis son origine* (Dresden, 1768), vol. ii. pp. 155–273. Modern works are by J. Jarry, *Essai sur les œuvres dramatiques de Jean Rotrou* (Paris and Lille, 1868); Léonce Person, *Hist. du Venceslas de Rotrou, suivie de notes critiques et biographiques* (1882), in which many legends about Rotrou are discredited; *Hist. du véritable Saint Genest de Rotrou* (1882), *Les Papiers de Pierre Rotrou de Saudreville* (1883); Henri Chardon, *La Vie de Rotrou mieux connue* (1884); and Georg Steffens, *Jean de Rotrou als Nachahmer Lope de Vega's* (Berlin, 1891).

ROTTA, CHROTTA, HROTTA (Fr. *Cithare*, rotta; Ger, *Cythara*, Rotta), a medieval stringed instrument derived from the Greek cithara. The rotta possessed, in common with all other forerunners of the violin, the chief structural features of the cithara, *i.e.* the box sound-chest composed of back and belly either flat or delicately arched connected by ribs. The rotta represents the first step in the evolution of the cithara, when arms and cross-bar were replaced by a frame joined to the body, the strings being usually restricted to eight or less. Examples of these early rottas abound in miniatures from the 8th to the 12th century or even the 14th, such as Cotton MS. Vespasian A. I. (Brit. Mus.), 700 A.D., and the MS. copy in the Durham Cathedral Library of the Cassiodorus Commentary on the Psalms[1] *manu Bedae*. The most interesting is a real specimen of wood found in an Alamannic tomb of the 4th to the 7th century at Oberflacht[2] in the Black Forest, and now preserved in the Völker Museum, Berlin.

The next step was the addition of a finger-board and the consequent reduction of the strings to three or four, since each string was now capable of producing several notes. In the Carolingian Bible presented to Charles the Bald[3] by Count Vivian of Tours there is a fine example of the rotta at this stage, in which the artist has reproduced the position of the fingers of the left hand stopping the strings, and of the right hand plucking them. The same instrument occurs in a companion Bible, known as the Bible of St Paul because it was preserved in the monastery of that name "without the walls" at Rome. Although these MSS. were executed in the 9th century, they do not represent contemporary scenes, but were inspired by Romano-Christian models, if not actually copied from older MSS. This is the only representation yet found of the finger-board thus applied to the rotta. In the final transition preceding the transformation into the guitar, the rotta appears as a guitar-shaped instrument without neck or head and having a hole large enough to allow the hand to pass through left in the body on each side of the strings. At first this instrument, which developed into the crwth, was twanged with the fingers, but in the 11th century it was played with a bow, the bridge having been slightly raised on feet.

The first (and perhaps also the second) of these transitions was accomplished in the Christian East, where, however, the upper frame of the earliest rotta seems to have been at once discarded in favour of a long neck with frets, for which the tanbur undoubtedly supplied the idea. This evolution is to be traced in the miniatures of a single MS., which supplies examples of all the transitions. The miniatures illustrate the Psalms in the Utrecht Psalter; they were beyond doubt originally designed to accompany a Greek or Syriac version.[4] The Utrecht Psalter, executed in the diocese of Reims under Anglo-Saxon influence during the 9th century, is no servile copy, but it owes much of its inspiration and local colour to an unknown Greek or Syrian prototype.

As soon as the neck was added to the guitar-shaped body, the instrument ceased to be a rotta and became a guitar (*q.v.*), or a guitar-fiddle (*q.v.*) if played with the bow. Of the rotta, there were two distinct types, the one derived from the cithara, the rotta proper, and the other derived from the lyre, which survived to the 18th century as the Welsh crwth. Although the various forms of the name came to be applied somewhat indiscriminately in different countries and epochs to both types, yet the structural features of both remained true to their respective archetypes.

The words rotta in England and cythara in Germany seem to have clung more especially to the first of these types, while the forms crwth, crowd, crouth were reserved for the bowed instruments, the earliest of which appeared in the 11th century.[5]

The crwth or crowd, so popular in England during the 14th century, does not seem to have won equal favour in Germany, where at that time the nidel or guitar-fiddle had been popularized by the minnesingers. The crwth derived from the lyre underwent no further development. (K. S.)

ROTTENBURG, a town and episcopal see of Germany, in the kingdom of Württemberg, situated on the left bank of the Neckar, which is here crossed by two bridges connecting the town with the suburb of Ehingen, 7 m. by rail S.W. of Tübingen. Pop. (1905) 7554. It is the seat of a Roman Catholic bishop, and possesses the fine Gothic cathedral of St Martin; several other churches; an old castle now used as a prison; and a building, formerly a Jesuit monastery and now the residence of the bishop. The chief industries are the manufacture of machinery, screws, watches and beer, tanning and the cultivation of fruit and hops. Rottenburg passed into the possession of Austria in 1281 and into that of Württemberg in 1805. Near the town are the remains of the Roman station of Sumalocenna or Salmulocenae.

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[1] Both miniatures are reproduced by J. O. Westwood in *Facsimiles* (London, 1868).

[2] Reproduced in *Jahreshefte d. Würtemb. Altertums Ver.* vol. iii. (Stuttgart, 1846), pl. viii. figs. 10 and 11.

[3] See *Facsimile*, by Comte Auguste de Bastard (Paris, 1883).

[4] The whole case of this much-discussed Psalter, with *résumés* of the principal writings on the subject of facsimiles of the miniatures bearing on the evolution of the cithara, will be found in Kathleen Schlesinger's *Instruments of the Orchestra*, pp. 343–82 and pl. iii., vi. and vii. (London, 1909).

[5] See Kathleen Schlesinger, *op. cit.*, pp. 334, 338–39 n. and 441–50.

ROTTERDAM, a city of Holland in the province of South Holland, on both banks of the New Maas, at the confluence of the canalized Rotte, and a junction station 14½ m. by rail S.S.E. of the Hague. Steam tramways connect it with Schiedam, and with Numansdorp on the south of the island of Beierland, and there is a regular service of steamers by river and canal to Antwerp by way of the South Holland and Zeeland Islands and in every direction. The population of the city was about 20,000 in 1632; 53,212 in 1796; 105,858 in 1860; and 379,017 in 1905. Its shipping facilities have raised Rotterdam to the position of the first commercial city of Holland. By means of the New Waterway (1869–90) to the Hook of Holland it is accessible for the largest ships. The principal quay is the Boompjes ("little trees"), forming the riverfront on the north side. Although originally situated exclusively on the north or right bank of the Maas, in 1869 Rotterdam was extended to the southern shore by the acquisition of the commune of Feienoord; while in 1886 Delftshaven on the west, and in 1895 Charlois on the south-west and Kralingen on the east, were also incorporated. The river is spanned by a road bridge (1878) and a railway bridge (1877) passing from the Boompjes to the North Island, whence they are continued to the farther shore by swing-bridges through which the largest ships can pass to the upper river. These bridges prove useful in breaking up the ice which forms above them in winter. On the south side of the river are numerous large docks and wharves, while the city proper on the north side consists of a labyrinth of basins and canals with tree-bordered quays.

In the centre of the town is the Beursplein, or Exchange Square, with the large general post office (1875), the "Amicitia" club, and the exchange itself (1723). Behind the exchange is the great market-place, built on vaulting over a canal, and containing a bronze statue of Erasmus, who was born in Rotterdam in 1467. The statue is the work of Hendrik de Keyser, and was erected in 1622 (the inscription being added in 1677) to replace an older one. Beyond the market-place is the High Street, which runs along the top of the Maas Dyke. On the west of the city a pretty road planted with trees and grass plots leads from the Zoological Gardens (1857), on the north to the small park overlooking the river. In the park is a statue of the popular poet Hendrik Tollens (d. 1856), a native of the city. Among the churches of Rotterdam are an English church, originally built by the 1st duke of Marlborough, whose arms may be seen with the royal arms over the entrance. The Groote Kerk, or Laurens Kerk (end of the 15th century), contains a fine brass screen (1715), a celebrated organ with nearly 5000 pipes, and the monuments of Admirals Witte de Witte (d. 1658), Kortenaer (d. 1665), and van Brakel (d. 1690), and other Dutch naval heroes. The lofty tower commands an extensive view. In the New Market adjoining is a fountain adorned with sculptures erected in 1874 to commemorate the jubilee of the restoration of Dutch independence (1813). The museums of the city comprise an ethnographical museum, the maritime museum established by the Yacht Club in 1874, and the Boyman's Museum (1867) containing pictures, drawings and engravings, as well as the town library. Of the original collection of pictures bequeathed by F. J. O. Boyman in 1847, more than half was destroyed by fire in 1864; but the collection has been enlarged since and is representative of both ancient and modern artists. Close to the museum is a statue of the statesman Gysbert Karel van Hogendorp (1762–1834), a native of the city. Among the remaining buildings must be mentioned the town hall (17th century; restored 1823), the court-house, the concert-hall of the "Harmonic" club, the record office (1900), the *leeskabuiet*, or subscription library and reading-rooms, and the ten-storeyed *Witte Huis* (1897), which is used for offices and is one of the highest private buildings on the Continent.

The industries comprise the manufacture of tobacco, cigars, margarine, rope, leather, &c., and there are breweries, distilleries and sugar refineries. The gas, electricity (1894) and waterworks (1870) are under municipal control. Shipbuilding yards extend above and below the city, one of the earliest being that of the Netherlands Steamboat Company (1825). It is, however, as a commercial rather than as a manufacturing city that Rotterdam is distinguished, its progress in this respect having been very striking. Between 1850 and 1902 the area of canals and docks in use on both sides of the river increased from 96 to over 300 acres, about £2,000,000 having been spent on the building of docks in the last quarter of the 17th century. Besides its maritime trade Rotterdam has an extensive river traffic, not only with Holland, but also with Belgium and Germany. Its overseas trade is principally with the Dutch colonies, New York, La Plata and the east and west coasts of Africa. The great harbour works on the south side of the river required to accommodate this growing trade were planned by the engineer Stieltjes (d. 1878), who has a monument on the North Island. Besides being easily accessible from the river and connected with the railways, the docks are provided with every facility for coaling and loading or discharging cargoes. The larger passenger steamers of the Rotterdamsche Lloyd to Netherlands India and of the Holland-American Steamship Company (the two principal passenger and cargo steamship companies at Rotterdam) have their berths on the south side of the river. In the centre of the river there is accommodation for over thirty vessels at the mooring buoys. The increase in the importance of Rotterdam as a port, apart from the development of the trade of the Netherlands generally, is shown by the fact that whereas in 1846 only 31% of the total trade of the country passed through the port, in 1883 the proportion was 50%; in the same year 43·75% of the total number of vessels engaged in Dutch trade used the port of Rotterdam, whereas in 1850 the proportion was only 35·77%. The average number of all vessels using the port annually during the decade 1897–1906 was 7228 of 11,163,624 tons, but a steady increase was recorded during this period, from 6212 ships of 8,434,032 tons in 1897 to 8570 ships of 14,572,246 tons in 1906.

Rotterdam probably owes its existence to two castles, which existed in feudal times. In 1299 John I., count of Holland, granted to the people of Rotterdam the same rights as were enjoyed by the burghers of Beverwijk, which were identical with those of Haarlem (K. Hegel, *Städte und Gilden*, 1891, Bd. ii.). This privilege marks the origin of the town. In 1489 it was surprised by Francis van Brederode, and in 1572 it was plundered by the Spaniards, who were in possession for four months. It continued to increase in size, various extensions of its boundaries being made, and its trading importance is to a large extent the result of its commercial intercourse with England.

ROTTWEIL, a town of Germany, in the kingdom of Württemberg, lying on a hill on the left bank of the Neckar, 46 m. S.W. of Tübingen by rail. Pop. (1905) 9008. It is partly surrounded by walls, and contains two fine churches, the Gothic Heilige-Kreuz-kirche, built in the 14th century and restored in 1840, and the Capellen-kirche with a Gothic spire 230 ft. high. It has a medieval town hall, several schools and a museum of antiquities. Especially noteworthy is the collection of sculptures and pictures of old German art in the chapel of St Lawrence, where there is also a Roman mosaic, found in the vicinity, portraying Orpheus in the centre and, at the sides, Roman chariot-races and gladiators. The industries of the place embrace the manufacture of powder, locomotives, machinery, cotton, leather and beer. There is also a considerable trade in live stock, agricultural produce and wine.

Rottweil-Altstadt, which lies about ½ m. to the south, was a Roman colony. It has an old church and a Cistercian nunnery founded in 1221 and dissolved in 1838. Near the town is Wilhelmshall, with saline springs. In the 13th century Rottweil became a free imperial city and was subsequently the seat of an imperial court of law, the jurisdiction of which extended over Swabia, the Rhineland and Alsace. The functions of this tribunal came to an end in 1784. In 1803 Rottweil passed into the possession of Württemberg.

See Ruckgaber, *Geschichte der Stadt Rottweil* (3 vols., Rottweil, 1835); and Greiner, *Das ältere Recht der Reichsstadt Rottweil* (Stuttgart, 1900).

ROTUMAH (Rotuma, Rotuam or Grenville), an island of the South Pacific Ocean, in 12° 30′ S., 177° E., about 300 m. N. by W. of Fiji, of which British colony it is a dependency. Its area is 14 sq. m., and its extreme elevation 800 ft. It is surrounded by coral reefs, and is richly wooded. Several islets lie round it. The population is about 2200, the natives being Polynesian, though their language has been classified as Melanesian. They are Wesleyans or Roman Catholics. The chief product is copra. A European commissioner resides. Local laws, subject to approval by the legislative council of Fiji, are promulgated by a regulation board, composed of the commissioner, native chiefs of the seven districts into which the island is divided, and two native magistrates. Rotumah was discovered by Captain Edwards of the "Pandora" in 1791, and was annexed by Great Britain in 1881.

ROUAULT, JOACHIM (d. 1478), French soldier, was a member of an old family of Poitou. He attached himself to the dauphin (afterwards Louis XI.) and became his premier squire. He followed Louis in his expedition against the Swiss in 1444, distinguished himself in the war against England in 1448, and received the posts of governor of Blaye and Fronsac and constable of Bordeaux. After taking an important part in the battle of Castillon (1453), which resulted in the defeat and death of John Talbot, 1st earl of Shrewsbury, he fought against John V., count of Armagnac, in 1455, and in the following year made a fruitless expedition into Scotland. He took part in the campaign in Catalonia, and became marshal of France in 1461, and governor of Paris in 1471. In 1471 and 1472 he defended Amiens and Beauvais against the Burgundians. Towards the end of his life he was disgraced by Louis XI., and sentenced to banishment and the confiscation of his property.

(M. P.*)

ROUBAIX, a manufacturing town of northern France, in the department of Nord, 6 m. N.E. of Lille on the railway to Ghent. Pop. (1906) 119,955. Roubaix is situated about a mile from the Belgian frontier on the Roubaix Canal, which connects the lower Deule with the Scheldt by way of the Marcq and the Espierre. Tramways connect the town with Lille and with the neighbouring communes of Tourcoing (pop. 62,694), Croix (pop. 16,292) and Wattrelos (pop. 14,618), with which it unites to form one great industrial centre. The chief business of Roubaix is the woollen manufacture, but cotton, silk and other materials are also produced. The chief of these are fancy and figured stuffs for garments, velvet and upholstering fabrics. Wool-combing and wool-dressing works, spinning-mills, weaving establishments, dye-houses and printing-works occupy some 50,000 work-people, and four hundred firms act as commission agents for the sale of raw material and the other requisites for the industry. Power is supplied chiefly by steam, less than 5000 out of 28,000 looms being hand-looms. There are breweries, rubber-works, metal foundries and machinery-works in the town. Tomato and grape growing under glass for the winter market is extensively prosecuted. To maintain the high standard of artistic taste which has made the industry of Roubaix a success, schools have been multiplied. By the co-operation of the town and the state the national school of industrial arts was founded in 1883. This is a small university of art, commerce and industry, the twenty-two courses of which include all the branches of knowledge useful in any of those pursuits. Among the public institutions are the tribunal of commerce and the chamber of commerce, the exchange, a board of trade-arbitration and the establishment (*bureau de conditionnement*) for determining the nature and weight of silk, wool and cotton.

The prosperity of Roubaix had its origin in the first factory franchise granted in 1469 by Charles the Bold, duke of Burgundy, to Peter, lord of Roubaix, a descendant of the royal house of Brittany. In the 18th century Roubaix suffered from the jealousy of Lille of which it was a dependency, and it was not till the 19th century that its industries acquired real importance. The population, which in 1804 was only 8700, had risen in 1861 to 40,000, in 1866 to 65,000, and in 1876 to 83,000.

ROUBILIAC (more correctly ROUBILLAC), **LOUIS FRANÇOIS** (1695–1762), French sculptor, was born at Lyons and became a pupil of Balthasar of Dresden and of N. Coustou. It is generally stated that he settled in London about 1720, but as he took the second grand prize for sculpture in 1730, while still a pupil of Coustou, it is unlikely that he visited England at an earlier date. The date 1744, as given by Dussieux, is incorrect. He was at once patronized by Walpole and soon became the most popular sculptor in England, superseding the success of the Fleming Rysbraeck and even of Scheemakers. He died on the 11th of January 1762, and was buried in the church of St Martin-in-the-Fields. Roubiliac was largely employed for portrait statues and busts, and especially for sepulchral monuments. His chief works in Westminster Abbey are the monuments of Handel, Admiral Warren, Marshal Wade, Mrs Nightingale and the duke of Argyll, the last of these being the first work which established Roubiliac's fame as a sculptor. The statues of George I., Sir Isaac Newton, and the duke of Somerset at Cambridge, and of George II. erected in Golden Square, London, were also his work. Trinity College, Cambridge, possesses a series of busts of distinguished members of the college by him. Roubiliac possessed skill in portraiture and was technically a master, but lived at a time when his art had sunk to a low ebb. His figures are frequently uneasy, devoid of dignity and sculpturesque breadth, and his draperies treated in a manner more suited to painting than sculpture. There are, however, noteworthy exceptions, his bust of Pope, for example, reaching a high standard. More often, however, his striving after dramatic effect detracts from repose of attitude.

His most celebrated work, the Nightingale monument, in Westminster Abbey, a marvel of technical skill, is saved from being ludicrous by its ghastly and even impressive hideousness. On this the dying wife is represented as sinking in the arms of her husband, who in vain strives to ward off a dart which Death is aiming at her. The lower part of the monument, on which the two portrait figures stand, is shaped like a tomb, out of the opening door of which Death, as a half-veiled skeleton, is bursting forth. The celebrated bust of Shakespeare, known as the Davenant bust, in the possession of the Garrick Club, London, must be attributed to Roubiliac. The statue of Shakespeare, a commission from David Garrick, and bequeathed by the actor to the English nation, is in the British Museum, and shows the talent of the sculptor in a flattering light. It is noteworthy that none of his work is recorded in France, the land of his birth and education.

See Le Roy de Sainte-Croix, *Vie et ouvrages de L. F. Roubillac, sculpteur lyonnais (1695–1762)* (Paris, 1882). (An extremely rare work, of which a copy is in the National Art Library, Victoria and Albert Museum, South Kensington, London.) Allan Cunningham, *The Lives of the Most Eminent British Painters, Sculptors, and Architects*, vol. 3, pp. 31–67 (London, 1830)—the fount of information of later biographies. Dutton Cook, *Art in England* ("A Sculptor's Life in the Past Century") (London, 1869); Austin Dobson, *The Magazine of Art*, "Little Roubiliac," vol. 17, pp. 202 and 231 (London, 1894). See also J. T. Smith, *Nollekens and his Times* (London, 1829 *passim*). Henry B. Wheatley has also devoted research to the work and life of Roubiliac. (M. H. S.)

ROUCHER, JEAN ANTOINE (1745–1794), French poet, the son of a tailor of Montpellier, was born on the 22nd of February 1745. By an epithalamium on Louis XVI. and Marie Antoinette he gained the favour of Turgot, and obtained a salt-tax collectorship. His poem was entitled *Les Mois*; it appeared in 1779, was praised in MS., damned in print and restored to a just appreciation by the students of literature of the 19th century. It has the drawbacks of merely didactic-descriptive poetry on the great scale, but occasionally displays much grace and spirit. The malicious wit of Rivarol's *mot* on the ill-success of the poem, "C'est le plus beau naufrage du siècle," is not intelligible unless it is said that one of the most elaborate passages describes a shipwreck. Roucher was a disciple of Voltaire, and therefore a friend of the Revolution, but he remained moderate in his opinions. He frequently presided over an anti-Jacobin club, and denounced the tyranny of the popular demagogues in supplements published with the *Journal de Paris* in 1792. He was arrested on the 4th of October 1793, and, accused of being the leader of a conspiracy among the prisoners at Saint Lazare, was sent to the guillotine on the same tumbril with his friend André Chénier on the 25th of July 1794. Roucher translated in 1790 Adam Smith's *Wealth of Nations*. His letters from prison were edited by his son-in-law under the title of *Consolations de ma captivité* (1797), and his death was made the subject of a tragedy in 1834 by his brother Claude Roucher-Deratte, a voluminous writer.

See A. Guillois, *Pendant la terreur, la poète Roucher, 1745–1794* (1890), founded on the poet's papers by one of his descendants.

ROUÉ, a dissipated debauchee. The word is French, and its original meaning was "broken on the wheel." Breaking on the wheel was a form of execution reserved in France, and some other countries, for crimes of peculiar atrocity. A *roué*, therefore, came by a natural process to be understood to mean a man morally worse than a *pendard* or gallows-bird, who only deserved hanging for common crimes. He was also a leader in wickedness, since the chief of a gang of brigands (for instance) would be broken on the wheel, while his obscure followers were merely hanged. Philip, duke of Orleans, who was regent of France from 1715 to 1723, gave the term the sense of impious and callous debauchee, which it has borne since his time, by habitually applying it to the very bad male company who amused his privacy and his leisure. The *locus classicus* for the origin of this use of the epithet is in the *Memoirs* of Saint-Simon (vol. xii. pp. 441–46, ed. Chéruel and Regnier, Paris, 1873–86).

ROUELLE, GUILLAUME FRANÇOIS (1703–1770), French chemist, was born in 1703 at Mathieu, near Caen. He started as an apothecary, but in 1742 he was appointed experimental demonstrator of chemistry at the Jardin du Roi in Paris, where he was especially influential and popular as a teacher, numbering Lavoisier and J. L. Proust among his pupils. Many stories are told of the vivacity and enthusiasm with which he lectured, of the absent-mindedness which sometimes led him, forgetting that his pupils could not hear what he was saying, to continue his explanations while he was out of the classroom looking for some piece of apparatus, and of the vigorous tirades, generally culminating in the epithet "plagiaire," in which he used to indulge against men with whom he disagreed (Höfer, *Hist. de la chimie*, ii. 378). His most important achievement was to define "salts"—a term formerly used in the most loose and indeterminate way—as the compounds formed by the union of acids and bases, and further to distinguish between neutral, basic and acid salts. Other subjects on which he published papers were the inflammation of turpentine and other essential oils by nitric acid, and the methods of embalmment practised by the Egyptians. He died at Passy on the 3rd of August 1770. He is known as Rouelle the elder, to distinguish him from his younger brother and assistant, HILAIRE MARIN (1718–1779), who, on his resignation in 1768, succeeded him as demonstrator at the Jardin du Roi.

ROUEN, a city of France, capital of the department of Seine-Inférieure and the ancient capital of the province of Normandy, on the Seine, 87 m. N.W. of Paris by rail. Pop. (1906) 111,402. The old city lies on the north bank of the river in an amphitheatre formed by the hills which border the Seine valley. It is surrounded by boulevards. Outside the ellipse formed by these lie the suburbs of Martainville, St Hilaire, Beauvoisine, Bouvreuil and Cauchoise; 2½ m. to the east is the industrial town of Darnétal (pop. 6770), and in the level plain on the opposite bank of the Seine is the extensive manufacturing suburb of St Sever with the industrial towns of Sotteville (pop. 18,096) and Petit Quevilly (pop. 14,852) in its immediate neighbourhood. Finally in the centre of the river, north-east of St Sever, is the Ile Lacroix, which also forms part of Rouen. Communication across the Seine is maintained by ferry and by three bridges, including a *pont transbordeur*, or moving platform, slung between two lofty columns and propelled by electricity. Rouen possesses four railway stations. The central point of the old town is the Place de l'Hôtel de Ville, occupied by the church of St Ouen, the hôtel de ville and an equestrian statue of Napoleon I., and traversed by the Rue de la République which leads from it past the cathedral to the Place de la République and the Quai de Paris. Parallel to this street to the west are the Rue Beauvoisine with its southern continuations, the Rue des Carmes and the Rue Grand-Pont, and the wide and handsome Rue Jeanne d'Arc terminating on the Quai de la Bourse. These thoroughfares, which are all within the boulevards, are crossed at right angles by the Rue de la Grosse-Horloge and by the Rue Thiers, running from the Place Cauchoise on the west to the Place de l'Hôtel de Ville, and passing on the left the Jardin Solferino and the museum.

The cathedral was built on the site of a previous cathedral which was destroyed by fire in 1200, and its construction lasted from the beginning of the 13th century, to which period belong the lateral doors of the west portal, to the beginning of the 16th century, when the Tour de Beurre was completed. The spire surmounting the central tower, which is the highest in France (485 ft.), is modern. The western façade, with its profusion of niches, pinnacles and statues, belongs, as a whole, to the Flamboyant style. But the northern tower, the Tour St Romain, is in the main of the 12th century, its upper stage (with its steep, pointed roof) having been added later. The southern tower, the Tour de Beurre, so named because funds for its building were given in return for the permission to eat butter in Lent, is of a type essentially Norman, and consists of a square tower pierced by high mullioned windows and surmounted by a low, octagonal structure, with a balustrade and pinnacles. The juxtaposition of these two towers, so different in character, is the most striking feature of the main façade, which is notable besides for its width. The portals of the transept are each flanked by two towers and decorated with sculpture and statuary. That to the north, the Portail des Libraires, looks upon the Cour des Libraires, once the resort of the booksellers of Rouen. That to the south is known as the Portail de la Calende. The plan of the church comprises a nave with aisles and lateral chapels, a transept and a choir with ambulatory. The most remarkable part of the interior is the Lady Chapel (1302–20) behind the choir with the tombs (1518–25) of Cardinal Georges d'Amboise and his nephew, the statuary of which, including the kneeling statues of the two cardinals, is of the finest Renaissance workmanship. The chapel also contains the tomb (1536–44) of Louis de Brézé, seneschal of Normandy. Behind the cathedral is the archiepiscopal palace, a building of the 14th and 15th centuries.

St Ouen, formerly the church of an abbey dating to the Roman period and reorganized by Archbishop St Ouen in the 7th century, exceeds the cathedral in length as well as in purity of style. In spite of the juxtaposition of the second and third, the Radiant and Flamboyant types of Gothic architecture, the building, as a whole, presents a unity which even the modern façade has failed to mar. It was founded in 1318 in place of a Romanesque church which previously occupied the site and of which the only relic is the chapel in the south transept. The choir alone was constructed in the 14th century. The nave of the church belongs to the 15th century, by the end of which the central tower with its octagonal lantern and four flanking turrets had been erected. The building of the western facade, which is flanked by two towers, was not undertaken till 1846.

The walls of the church are pierced by windows filled with stained glass of the 14th, 15th and 16th centuries and cover more space than is usual even in French Gothic churches. The Portail des Marmousets, the entrance to the south transept, has a projecting porch, behind and above which rises a magnificent rose window. The north façade has no entrance. In the interior, now despoiled of many artistic treasures, there is an organ-case dating from 1630 and a railing of the 18th century surrounding the choir.

The church of St Maclou, behind the cathedral, begun in 1437 and finished early in the 16th century, is a rich example of the Flamboyant style, the characteristics of which are specially displayed in the decoration of the façade and the tracery of the portal with its five arched openings. It is celebrated for carving attributed to Jean Goujon which appears on the western doors and in other parts of the church, and has a handsome organ-loft reached by a graceful open staircase, and stained glass of the 15th and 16th centuries. The spire above the central tower is modern and was finished in 1869. Close by the church is the old parish cemetery called the Aître de St Maclou; it is surrounded by wooden galleries of the Renaissance period, supported on stone pillars on which are sculptures representing a dance of death.

The church of St Vincent, near the Seine, is a building of the 16th century and contains the finest stained-glass windows in Rouen; those at the end of the north aisle, by Engrand and Jean le Prince, artists of Beauvais, are the most noted. The stained glass in the churches of St Patrice (16th century) and St Godard (late 15th century) is inferior only to that of St Vincent. Among the less important ecclesiastical buildings of Rouen are the churches of St Gervais, St Romain, St Laurent, St Vivien, and the tower of St André, a relic of an old church of the 15th and 16th centuries.

The most important secular building in Rouen is the Palais de Justice, once the seat of the exchequer and, later, of the parlement of Normandy. It is in the late Gothic style and consists of a main building flanked by two wings. The left wing, known as the Salle des Procureurs, was erected in 1493 and is remarkable for its lofty barrel-roof of timber. South of the Palais de Justice is the Porte de la Grosse Horloge, an arcade spanning the street and surmounted by a large clock of the 15th century with two dials. The Tour de la Grosse Horloge, which rises beside the arcade, was built in 1389. The tower known as the Tour de Jeanne d'Arc was the scene of her trial, and is all that remains of the castle built by Philip Augustus early in the 13th century. The Porte Guillaume-Lion, opening on to the Quai de Paris, is a handsome gateway built in 1749.

There are numerous old houses in Rouen in the Gothic and Renaissance styles. The Hôtel de Bourgtheroulde, the most famous of them, is a stone mansion of the 15th century added to in the reign of Francis I., the façades of which are decorated with bas-reliefs representing scenes from the meeting of the Field of the Cloth of Gold and allegories from the Triumphs of Petrarch. Among more modern buildings are the hôtel de ville of the 18th century, adjoining the north side of the church of St Ouen, the Bourse dating from the same period, and the Musée-Bibliothèque constructed in 1880 and containing rich collections of pictures and ceramics and a library with upwards of 133,000 volumes and many valuable MSS. An important museum of antiquities and a museum of natural history are contained in the old convent of the Visitation. A statue of the composer F. A. Boïeldieu overlooks the Quai de la Bourse, and one of Pierre Corneille stands at the western extremity of the Ile Lacroix; both were natives of the town. At Bonsecours, on a hill on the Seine 2 m. above Rouen, are the modern church, which is a resort of pilgrims, and the monument to Joan of Arc consisting of three small Renaissance buildings with a statue of the heroine in the principal one.

Rouen is the seat of an archbishop, a prefect, a court of appeal and a court of assizes, and headquarters of the III. army corps. Its public institutions also include a tribunal of first instance, tribunals of commerce and of maritime commerce, a council of trade-arbitration, a chamber of commerce and a branch of the Bank of France. Among its educational establishments are preparatory schools of medicine and pharmacy, and of higher instruction in science and literature, lycées and training-colleges for both sexes, ecclesiastical seminaries, and schools of commerce and industry, of architecture, music and fine arts. All the more important nations have consulates in the city. Rouen is an important centre for trade in wines, spirits, grain and cattle. Grain, wine, coal, timber and petroleum are leading imports. Besides its manufactures it exports plaster, sugar and sand. The principal industries of Rouen and its district are the spinning and weaving of cotton, notably the manufacture of *rouenneries* (cotton fabric woven with dyed yarn), the printing and dyeing of the manufactured material and the spinning of flax, hemp and jute; ship-building and the making of braces, shirts, bodices, boots, shoes and hats is also carried on, and there are distilleries, petroleum-refineries and manufactories of chemicals, soap, machinery, carding-combs and brushes. The port of Rouen comprises the marine docks below the Boïeldieu bridge, and the river dock, the timber dock and the petroleum dock above it. There is also a repairing dock. The Seine is tidal beyond Rouen. The port is accessible for ships drawing $19\frac{1}{2}$ to $22\frac{1}{2}$ ft. of water, and its quays have a superficial area of about 123 acres. It is served by the lines of the Orleans, the Western and the Northern railway companies, and these, in addition to the waterways connected with the Seine, make Rouen a convenient centre for the distribution of merchandise.

Ratuma or *Ratumacos*, the Celtic name of Rouen, was modified by the Romans into *Rotomagus*, and by the writers of medieval Latin into *Rodomum*, of which the present name is a corruption. Under Caesar and the early emperors the town was the capital of the Veliocasses, a people of secondary rank, and it did not attain to any eminence till it was made the centre of Lugdunensis Secunda at the close of the 3rd century, and a little later the seat of an archbishop. Rouen owed much to its first bishops —from St Mello, the apostle of the region, who flourished about 260, to St Remigius, who died in 772. The bishops built many churches and their tombs became in turn the origin of new sanctuaries. Under Louis le Débonnaire and his successors, the Normans several times sacked the city, but after the treaty of St Clair-sur-Epte in 912, Rouen became the capital of Normandy and attained still greater prosperity. It was the principal residence of the dukes and was the scene in 949 of a victory gained by Duke Richard I. over Otto the Great, emperor of Germany, Louis d'Outremer, king of France, and Arnold, count of Flanders. In 1087 William the Conqueror, mortally wounded at Mantes, died at Rouen. The succeeding Norman kings of England tended to neglect Rouen in favour of Caen and afterwards of Poitiers, Le Mans and Angers; but its monasteries, local trade and manufactures, and the communal organization which the citizens exacted from their sovereigns during the course of the 12th century maintained an importance which is indicated by the building of several fine churches, notably that of St Ouen. In 1203 Rouen was the scene of the murder of Arthur of Brittany at the hands of King John of England. Ostensibly to avenge the crime, Philip Augustus invaded Normandy and entered the capital unopposed. The union of the province with the crown of France in no way hindered the prosperity of the city, for Philip confirmed its communal privileges and built a new castle. A convention between the merchants of Rouen and those of Paris relating to the navigation of the Seine was followed by treaties with London, with the Hanseatic towns and with Flanders and Champagne. In 1302 the seat of the exchequer or sovereign court, afterwards the parlement, of Normandy was definitely fixed at Rouen, which had previously shared its sessions with other towns. In 1356 Charles the Bad, king of Navarre, a favourite in the city, was arrested within its walls, an event which displeased the inhabitants, who after the disaster at Poitiers supported the cause of Étienne Marcel. The revolt of the Harelle in 1382, caused by the exactions both of the uncles of Charles VI. and of the monks of St Ouen, was followed by heavy punishment. In spite of this a stubborn resistance was offered to Henry V. of England who, after a long siege, occupied the town in 1419. The prosperity of Rouen continued under the English domination, and during this period the greater part of the church of St Ouen was constructed. In 1431 Joan of Arc was tried and burnt in the city. From that year the French began a series of attempts to recapture the town, but they were unsuccessful till 1449 when Somerset, the English commander, was obliged to surrender the principal fortified places in Normandy. During the close of the 15th century and the first half of the 16th, Rouen was the metropolis of art and taste in France and was one of the first places to reflect the influence of the Renaissance. During the wars of religion the arts declined. In 1562 the town was sacked by the Protestants. This did not prevent the League from gaining so firm a footing there that Henry IV. besieged it unsuccessfully and only obtained entrance after his abjuration. The revocation of the edict of Nantes in 1685 lost Rouen many of its richest and most industrious citizens in the Calvinistic emigration. The town suffered less from the excesses of the French Revolution than from the depredations of bandits who, under the Directory, infested the neighbourhood of the city and were not suppressed till the Consulate. During the Franco-German War the city was occupied by the invaders from December 1870 till July 1871, and had to submit to heavy requisitions.

See A. Chéruel, *Histoire de Rouen pendant l'époque communale* (Rouen, 1843); *Histoire de Rouen sous la domination anglaise au quinzième siècle* (Rouen, 1840); N. Périaux, *Histoire sommaire et chronologique de la ville de Rouen* (Rouen, 1874); C. Enlart, *Rouen* (Paris, 1904).

ROUERGUE (*Ruthenensis pagus*), one of the old provinces of France, was originally inhabited by the *Rutheni*. It was bounded on the N. by Auvergne, on the S. and S.W. by Languedoc, on the E. by Gévaudan and the Cévennes and on the W. by Quercy. It included (1) the county of Rodez, (2) Haute and Basse Marche; and it was divided between the dioceses of Rodez and Vabres (province d'Alby after this province had been separated from that of Bourges in 1678). Administratively it formed first a *sénéchaussée*, dependent on Languedoc (capital Villefranche, in the Basse Marche), and later it was attached to the military governments of Guienne and Gascony. It was then part of the departments of Aveyron and of Tarn-et-Garonne. The county of Rodez, after having been in the possession of the houses of Toulouse and Carlat, fell in the 14th century into that of Armagnac. Jean II. of Armagnac having served Charles V. faithfully during his wars with England, received from him, in 1374, what were called the four "*châtellenies*" with the "Commun de la paix," a tax which had been established there to organize resistance against foreigners. Jean V. of Armagnac was deprived of the county for crime and treason against Louis XI., in 1469, but afterwards it was given back to Charles of Armagnac, who died without legitimate issue in 1496. Its possession was then disputed between King Francis I. and the duke of Alençon, who at last compromised (1519); the king ceded the county to his sister Marguerite d'Angoulême, who took it as dowry first to the duke of Alençon, and then to her second husband Henri d'Albret, king of Navarre. The county afterwards passed to Jeanne d'Albret, then to Henri IV., and was joined to the crown lands in 1590.

ROUGE ("red," from Lat. *rubeus*), a French name applied to various colouring substances of a brilliant carmine tint, especially when used as cosmetics. The best of these preparations are such as have for their basis carthamine, obtained from the safflower (*Carthamus tinctorius*). The Chinese prepare a rouge, said to be from safflower, which, spread on the cards on which it is sold, has a brilliant metallic green lustre, but when moistened and applied to the skin assumes a delicate carmine tint. Jeweller's rouge for polishing plate is a fine red iron oxide prepared by calcination from ferrous sulphate (green vitriol).

ROUGET DE LISLE, CLAUDE JOSEPH (1760–1836), French author, was born on the 10th of May 1760, at Lons-le-Saunier (Jura). He entered the army as an engineer, and attained the rank of captain. He was one of those authors whom a single work has made famous. The song which has immortalized him, the *Marseillaise*, was composed at Strassburg, where Rouget de Lisle was quartered in April 1792. He wrote both words and music in a fit of patriotic excitement after a public dinner. The piece was at first called *Chant de guerre de l'armée du Rhin*, and only received its name of *Marseillaise* from its adoption by the Provençal volunteers whom Barbaroux introduced into Paris, and who were prominent in the storming of the Tuileries. The author was a moderate republican, and was cashiered and thrown into prison; but the counter-revolution set him at liberty. He died at Choisy-le-Roi (Seine et Oise) on the 26th of June 1836. The stirring melody of the *Marseillaise* and its ingenious adaptation to the words serve to disguise the alternate poverty and bombast of the words themselves. Rouget de Lisle wrote a few other songs of the same kind, and in 1825 he published *Chants français*, in which he set to music fifty songs by various authors. His *Essais en vers et en prose* (1797) contains the *Marseillaise*, a prose tale of the sentimental kind called *Adelaïde et Monville*, and some occasional poems.

ROUGH CAST (the French equivalent is *crépis*), in architecture, the exterior coating originally given to the walls of common dwellings and outbuildings, but now frequently employed for decorative effect on country houses, especially those built in half timber. It is a composition of small gravel and sand, mixed with strong lime mortar, and is thrown on the walls already covered with two ordinary coats of plaster. Variety can be obtained on the surface of the wall by small pebbles of different colours, and in the Tudor period fragments of glass were sometimes embedded. The central tower of St Alban's cathedral, built with Roman tiles from Verulam, was covered with rough cast believed to be coeval with the building. The rough cast was removed about 1870.

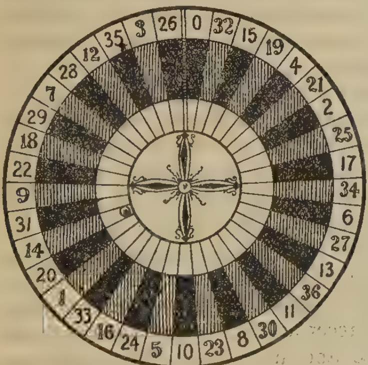
ROUHER, EUGÈNE (1814–1884), French statesman, was born at Riom (Puy de Dôme) on the 30th of November 1814. He practised law in his native place after taking his degree in Paris in 1835, and in 1846 sought election by his fellow-citizens to the Chamber of Deputies as an official candidate of the Guizot ministry. It was only after the revolution of 1848, however, that he became deputy for the department of Puy de Dôme. Re-elected to the Legislative Chamber in 1849 he succeeded Odilon Barrot as minister of justice, with the additional office of keeper of the seals, which he retained with short intervals until January 1852. From the tribune of the Chamber he described the revolution of February as a "catastrophe," and he supported reactionary legislation, notably the bill (May 31, 1850) for the limitation of the suffrage. After the *coup d'état* of December 2, 1851, he was entrusted with the redaction of the new constitution, and on his resignation of office in January became vice-president of the Council of State. After the formal establishment of the Empire, Napoleon III. rewarded him by a grant of £40,000 and the estate of Cirey. In 1855 he became minister of agriculture, commerce and public works, and in 1856 senator. He secured for France an excellent system of railways without making them a state monopoly, and he conducted the complicated negotiations for the treaty of commerce with England which was concluded in January 1860, and subsequently arranged similar treaties with Belgium and Italy. In 1863 he became minister president of the Council of State, and on the death of A. A. M. Billault minister of state and chief spokesman of the emperor before the Corps Législatif. Although the government had a great majority in the Chamber, the opposition counted the redoubtable names of Thiers, Berryer and Jules Favre, and government measures were only passed by frequent resort to the closure. Rouher had to defend Napoleon's foreign adventures as well as the free-trade treaties and the extravagances of Baron Haussmann for which he was directly responsible. After an attempted defence of the foreign policy which had aided the aggrandizement of Prussia at the expense of Austria, Thiers told him in the Chamber that there were "no more blunders left for him to make." He opposed the abortive Liberal concessions of January 1867, announced in a personal letter from Napoleon III. to himself, and resigned with the rest of the cabinet, only to resume office after a short interval as minister of finance. When concessions became inevitable Rouher, the "vice-empereur," resigned to make way after six months' interval for Emile Ollivier. He still fought for reaction in his new office of president of the Senate. After the fall of the Empire he fled to England, but returned to France a year later to work for the fortunes of the prince imperial. After serious disturbances he was elected member for Ajaccio on the 11th of February 1872, his election being characterized by the prefect of Corsica as a regular conspiracy in favour of the Empire. In the Chamber, where he subsequently represented Riom, he formed the group of the Appel au Peuple. His first speech in the House was the occasion (May 21, 1872) of violent attacks by Audiffret-Pasquier and Gambetta. The death of the prince imperial in 1879 put an end to the serious chances of the Bonapartists, although Rouher sought to secure the recognition of Prince Napoleon, son of the ex-king Jerome, as heir to the imperial honours. Rouher lost his reason after a stroke of paralysis in 1883, and died on the 3rd of February 1884.

For an estimate of Rouher, see marquis de Castellane, *Les Hommes d'état français du xix*

ROULERS (Flemish *Roeselaere*), a town of Belgium, in the province of West Flanders, 13 m. N.W. of Courtrai. Pop. (1904) 24,548. It is one of the oldest communes in Belgium, and was famous for its weavers in the 11th and 12th centuries. Its prosperity depends on the cultivation of flax and the manufacture of linen. The church of St Michael is remarkable for its lofty tower. Baldwin VIII., count of Flanders, died here in 1120, and in 1794 the French under Pichegru defeated the Austrians under Clerfayt.

ROULETTE, in mathematics, the locus of a point carried on a curve which rolls on another (fixed) curve. The name appears to have been used by Pascal to denote the cycloid (*q.v.*), which is the simplest roulette, being traced by a point on the circumference of a circle rolling on a straight line. The trochoids and epicycloids (*q.v.*) are also simple roulettes, the latter being traced by points on a circle which rolls on another circle.

See W. H. Besant, *Roulettes and Glissettes*.



ROULETTE, a gambling game, of French origin. It is one of the two games played in the gambling-rooms at Monte Carlo, and the description here given, and the maximum and minimum stakes mentioned, are to be understood as applying to the game as it is there conducted. It is solely a game of chance, though so-called "systems" are innumerable, and some of them for a short period often appear to give the player an advantage. There is no possible system, however, which will assure success in the long-run, and it is herein that the ingenuity of the game consists. Every systematic method of play must depend upon increased stakes to retrieve past losses; and though a player with an unlimited capital might be practically certain to achieve his end in the course of time, the circumstance that there is always a maximum renders the bank invincible. The roulette table, covered with a green cloth, is made up of precisely corresponding halves with a circular space let into the middle holding the wheel, on either side of which the cloth is divided into spaces marked *passe*, *pair*, *manque*, *impair*, and the black and red diamonds. The wheel is divided into thirty-seven compartments, coloured alternately black and red, numbered from one to thirty-six, the thirty-seventh being zero. *Pair* indicates even numbers, *impair* odd numbers, *manque* includes the numbers from 1 to 18; *passe*, from 19 to 36. The methods of staking are innumerable. The minimum stake is five francs, which must be placed on the table in the form of a five-franc piece, and not in smaller change. *Rouge*, *noir*, *pair*, *impair*, *manque* and *passe* are even chances; *i.e.* a stake put upon any of them is paid in corresponding coin should the player win, the exception being when the little ball which is spun round the wheel falls into zero, in which case the even money chances are put "in prison"—that is to say, laid aside until another spin, when if the bank wins they are lost, if the player wins he is allowed to retrieve his money. The maximum in the case of these chances is 6000 francs. Any one who desires to play *en plein* puts his stake on one of the thirty-seven numbers. If the ball falls into the corresponding number on the wheel, the stake is paid thirty-five times; and as there are thirty-seven numbers on the board, with the advantage already described of imprisoning the even-money chances when zero comes up, it will be seen that there is a steady percentage in favour of the tables and consequently against the player. This percentage is of course greatly increased when, as is often the case, a second zero, called *double-zéro*, is used. In some gambling-houses there is even a third one, called Eagle Bird. The maximum stake allowed *en plein* is 180 francs. The next most daring selection is *à cheval*, when the stake is placed on the line separating any two numbers, and if either of them wins the player is paid seventeen times, the highest stake permissible being 360 francs. *Transversale pleine* covers any three numbers in a line, the coin or note being placed on the line dividing any one of the numbers from the neighbouring even-money chance, as, for instance, between 4 and *passe*, or 6 and *manque*. A *transversale simple* covers six numbers, as, for example, where the line between 4 and 7 joins *passe*, or between 6 and 9 joins *manque*; and if any one of these numbers wins, five times the value of the stake is paid, the maximum here being 1200 francs. *En carré* includes four numbers, the coin being placed, for instance, on the cross between 1, 2, 4, 5, or 28, 29, 31, 32; eight times the value of the stake is paid, and the maximum is 760 francs. The dozens and the columns are also indicated on the board, the first dozen of course including 1 to 12. In each of the columns are twelve numbers in different order. A stake placed on either a dozen or a column is paid twice its value, the maximum here being 3000 francs. A stake constantly played is called the *quatre premiers*, which includes zero, 1, 2 and 3, the stake being placed on the line where zero and 1 join *passe*, or where zero and 3 join *manque*. If any one of these four numbers, including zero, wins, the stake is paid eight times; and four times eight being thirty-two, there is a greater advantage to the table than when it loses *en plein* or on certain other chances. Zero can also be played in combination with any one or two of its neighbours; if with one of them the stake is paid seventeen times, if with two of them eleven times. A croupier sits on either side of the wheel; there is also one at each end of the table, their business being to assist the players in staking and recovering their winnings. Behind each of the former pair an official on a high chair supervises the table. The croupier whose duty it is to spin the wheel waits for a time till stakes have been made, and then, exclaiming, "Messieurs, faites votre jeu!" sets the cylinder in motion, throwing the ball in the direction contrary to that in which the wheel revolves. When it is seen that the ball will soon fall at rest in one of the compartments of the cylinder the croupier gives the notice, "Rien ne va plus," after which no stakes can be placed. When the ball finally rests in the compartment, the croupier announces the number and the even-money chances that win, as for instance *rouge*, *impair* and *manque*. He and his fellows then gather in with a rake all the money that has been lost, after which the winnings are paid and the game proceeds. At the beginning of play each table is supplied with a certain large sum. When the bank loses this and is forced to send for another supply it is said to be "broken."

ROUND (O. Fr. *rond*, Lat. *rotundus*, the Fr. is the source also of Du. *rond*; Ger., Swed., Dan. and Nor. *rund*), circular, spherical, globular. As a substantive, the word has several specific applications; thus it is used of the rung of a ladder, of a rounded cross-bar connecting the legs of a chair, of the circuit of the watch under an officer which patrols the sentries in a fortress, fortified town, camp or other military station, and hence of the beat or customary course of a policeman, a postman, or a tradesman, and of the full course at such a game as golf. Similarly there were old dances called "rounds," in which the dancers stood in a circle or ring. They were popular in the 16th and 17th centuries. Later the name was also applied to country dances where the dancers stood in two lines. For the "round" in music see CANON. A complaint or remonstrance signed by a number of persons is commonly known as a "round robin"; properly such a document should have the signatures arranged in a circle, the idea being that thus the order in which the complainants signed should be unknown. In the 16th century "round robin" was a name of mockery given to the Eucharist.

ROUNDERS, an English ball game, probably dating from the 18th century, but not attaining to any popularity before 1800. It was the immediate ancestor of Baseball (*q.v.*). Up to the year 1889 no special code of rules existed, but the game was played on the green, the field being marked out in a regular pentagon by five bases about 15 or 20 yds. apart, called respectively *home-base* (at which the striker stood), *1st base*, *2nd base*, *3rd base*, and *4th base*. The feeder, or bowler, stood in the middle of the pentagon and tossed the ball, which was softer than a cricket ball, to the striker, who with a round club, often a cricket stump, endeavoured to hit it as far out of the reach of the fielders as possible, a run being scored when the striker made the circuit of the bases without being put out. Almost any number of players could form a side, and the batsman would be retired when a batted ball was caught on the fly or first bounce, or when he was struck by having the ball thrown at him while running between bases. Rounders in its primitive form was more of a romp than a regular game, but it experienced a revival in Scotland and the north of England about the year 1889, when two governing bodies were formed, the National Rounders Association of Liverpool and Vicinity and the Scottish Rounders Association. These, with the later Gloucester Rounders Association, drew up the rules now recognized.

A hard ball similar to that used in baseball was adopted, and the rule by which a runner could be put out by hitting him with a thrown ball abandoned. The bat must not exceed 3½ in. in diameter nor 35 in. in length. The game is similar to baseball, but there are several important differences, the most radical being that the ball may be hit in any direction, as at cricket. The original pentagon has been discarded in favour of an elongated diamond, the home-base being at one end and 1st, 2nd and 3rd bases at the other points, while the 4th base is situated on the line of 3rd base towards home and 17 yds. from the former, the sides of the diamond being 22 yds. in length. The bowler stands in a space marked off in the centre of the diamond and tosses the ball to the batsman, who must hit at every "good" ball, *i.e.* one that is straight over the home-base and between head and knee. Two bad balls score one for the batsman. If the latter hits the ball he must run to 1st base and then 2nd, and so on round to home again, resting at any base; but he may be put out if the batted ball be caught on the fly or first bounce or the backstop (wicket-keeper in cricket) catch a ball struck at but not hit, or the batsman be touched with a ball while running between bases. Ten players constitute a side and three innings a piece are played, every player batting once in each innings. Each base made counts one. The *backstop* is placed directly behind the batsman, and behind the backstop are placed *1st cover* (right), *longstop* (middle), and *4th cover* (left). The *1st*, *2nd* and *3rd* basemen are stationed at the bases, while behind them in the field are placed the *2nd cover* (right), *centre cover* and *3rd cover* (left). The bases are designated by light wooden posts. An umpire presides over the game. A variation of rounders is *Fieldball*, invented in 1888, a combination of rounders and cricket, a wicket being placed in front of the backstop, and the four bases arranged in a circle 25 yds. distant from each other. The bat and ball are similar to those used in baseball. Another variation is called *Baseball Rounders*, which was invented in 1889 and is practically the same as baseball.

ROUNDHEAD, a term applied to the adherents of the parliamentary party in England during the great Civil War. Some of the Puritans, but by no means all, wore the hair closely cropped round the head, and there was thus an obvious contrast between them and the men of fashion with their long ringlets. "Roundhead" appears to have been first used as a term of derision towards the end of 1641 when the debates in parliament on the Bishops Exclusion Bill were causing riots at Westminster. One authority says of the crowd which gathered there: "They had the hair of their heads very few of them longer than their ears, whereupon it came to pass that those who usually with their cries attended at Westminster were by a nickname called Roundheads." John Rushworth (*Historical Collections*) is more precise. According to him the word was first used on the 27th of December 1641 by a disbanded officer named David Hide, who during a riot is reported to have drawn his sword and said he would "cut the throat of those round-headed dogs that bawled against bishops." Clarendon (*History of the Rebellion*, iv. 121) remarks on the matter: "and from those contestations the two terms of 'Roundhead' and 'Cavalier' grew to be received in discourse, . . . they who were looked upon as servants to the king being then called 'Cavaliers,' and the other of the rabble contemned and despised under the name of 'Roundheads.'" Baxter ascribes the origin of the term to a remark made by Queen Henrietta Maria at the trial of Strafford; referring to Pym, she asked who the roundheaded man was. The name remained in use until after the revolution of 1688.

Roundhead was also used during the Civil War as the name of a weapon. This is described as having "an head about a quarter of a yard long, a staffe of two yards long put into their head, twelve iron pikes round about, and one in the end to stop with."

ROUNDSMAN SYSTEM (sometimes termed the billet, or ticket, or item system), in the English poor law, a plan by which the parish paid the occupiers of property to employ the applicants for relief at a rate of wages fixed by the parish. It depended not on the services, but on the wants of the applicants, the employer being repaid out of the poor rate all that he advanced in wages beyond a certain sum. According to this plan the parish in general made some agreement with a farmer to sell to him the labour of one or more paupers at a certain price, paying to the pauper out of the parish funds the difference between that price and the allowance which the scale, according to the price of bread and the number of his family, awarded to him. It received the local name of billet or ticket system from the ticket signed by the overseer which the pauper in general carried to the farmer as a warrant for his being employed, and afterwards took back to the overseer, signed by the farmer, as a proof that he had fulfilled the conditions of relief. In other cases the parish contracted with a person to have some work performed for him by the paupers at a given price, the parish paying the paupers. In many places the roundsman system was carried out by means of an auction, all the unemployed men being put up to sale periodically, sometimes monthly or weekly, at prices varying according to the time of year, the old and infirm selling for less than the able-bodied. The roundsman system disappeared on the reform of the poor law in 1834.

ROUND TABLE, THE, in the Arthurian Romance (*q.v.*), the table round which, in order to avoid quarrels as to precedence, King Arthur's knights are seated, and so applied collectively to the knights themselves as the title of a mythical order of chivalry. The origin of the Round Table is obscure. Geoffrey of Monmouth makes no mention of it, and the earliest record is that of Wace, much expanded by his translator, Layamon, who gives a picturesque detailed description of the fight for precedence which took place at Arthur's board on a certain Yuletide day, and the slaughter which ensued. For this slaughter Arthur took summary vengeance, slaying all the kinsfolk of the man who started the fight, and cutting off the noses of his women-folk. For the future avoidance of any such scenes a cunning workman of Cornwall offered to make a table which should seat 1600 knights and more, and at which all should be equal. Arthur accepted this offer, and the result was the Round Table, peace and harmony. Wace does not mention the number of knights.

These versions of the pseudo-chronicles practically ascribe the foundation to Arthur; the romances, however, differ. In these either Merlin made the table for Uther Pendragon, or it had belonged to Leodegrance, king of Cornwall and father of Guenevere, and was given to Arthur on his marriage with that princess. When the founding of the Round Table is ascribed to Merlin it is generally in close connexion with the Grail legend, forming the last of a series of three, founded in honour of the Trinity—the first being the table of the Last Supper, the second that of the Grail, established by Joseph of Arimathea. The number of knights whom the table will seat varies; it might seat twelve or fifty or a hundred and fifty; nowhere, save in Layamon, do we find a practically unlimited power of accommodation. It is also to be noted that whereas, in the pseudo-chronicles, it is the common table of Arthur's court, designed in the interests of peace and unity, in the romances it is a sign of superiority, only the best and most valiant knights being adjudged worthy of a seat at the Round Table. In fact, it has become the equivalent of an order of knighthood, the members of which form a brotherhood bound by oath to succour each other at need and to refrain from fighting among themselves. The membership is not restricted to the knights of Arthur's immediate court and household, knights who are, in all essentials outsiders, appearing but as passing guests at Arthur's board, such as, *e.g.*, Perceval and Tristan, may be elected knights of the Round Table. In two romances, the prose *Tristan* and the *Parzival*, the place of the Round Table proper is taken, on a journey, by a silken cloth laid on the ground, round which the knights are seated. In the versions more closely connected with the Grail story the name of the chosen knight appears on his seat, and there is one vacant place, the *Siege perilous*, eventually to be filled by the Grail winner.

It is obvious that the tradition has passed through several stages, and has varied in the process. The original source is not easy to determine. Dr Lewis Mott has pointed out that "Round Tables" exist in many parts of Great Britain, the name being often associated with circular trenches, or rings of stones, which were demonstrably employed in connexion with the agricultural festivals held at Pentecost, Midsummer and Michaelmas. However this may be, and it seems probable that Dr Mott is right in his identification, the pseudo-chroniclers and romance writers certainly had in their minds a genuine table, although, probably, one of magical properties. Thus Layamon's table can seat an indefinite number, and yet it can be carried by Arthur when he rides abroad. On closely examining Layamon's version it seems probable that he had in his mind not merely a circular, but a turning table; he gives it as ground for the quarrel that all the knights wished to sit within; at the table the Cornish workman will make none shall be left without, but they shall sit "without and within, man against man." It is difficult to explain this phrasing in any other hypothesis than that Layamon pictured to himself Arthur's hall as open on one side, and that, on a great feast-day, owing to the number of guests, the table extended beyond the covering afforded by the roof. As the feast took place "on mid-winter's day" the annoyance of those who were without would be intelligible. To obviate this the cunning workman devised a circular table, turning on a pivot, with seats affixed, at which the guests sat the one half in turn within, the other without, the hall "man against man." This would make the Round Table analogous to the turning castles which we frequently meet with in romances; and while explaining the peculiarities of Layamon's text, would make it additionally probable that he was dealing with an earlier tradition of folk-lore character, a tradition which was probably also familiar to Wace, whose version, though much more condensed than Layamon's, is yet in substantial harmony with this latter. This, too, is certain; the fight for precedence at Arthur's board may be paralleled by accounts of precisely similar quarrels in early Irish literature, *e.g.* the famous tale of *Fled Bricrend* or *Bricriu's Feast* of the Ultonian cycle.

Recent grail researches have made it most probable that that mysterious talisman was originally the vessel of the ritual feast held in honour of a deity of vegetation,—Adonis, or another; if the Round Table also, as Dr Mott suggests, derives from a similar source, we have a link between these two notable features of Arthurian tradition, and an additional piece of evidence in support of the view that behind the Arthur of romance there lie not only memories of an historic British chieftain, but distinct traces of a mythological and beneficent hero. Incidentally also it would seem that those versions which connect the table more closely with Arthur are the more correct.

See Wace, *Le Roman de Brut*, ed. Leroux de Lincy (1836–38), vol. ii. 74–76); Layamon, *Brut*, ed. Madden, vol. ii. p. 532; A. C. L. Brown, *The Round Table before Wace* (Boston, 1900); Lewis F. Mott, *The Round Table* (Boston, 1905). (J. L. W.)

ROUND TOWERS. A peculiar class of round tower exists throughout Ireland; about one hundred and twenty examples once existed; most of these are ruined, but eighteen or twenty are almost perfect. These towers were built either near or adjoining a church; they are of various dates, from perhaps the 8th to the 13th century; though varying in size and detail, they have many characteristics common to all. They are built with walls slightly battering inwards, so that the tower tapers towards the top. The lower part is formed of solid masonry, the one doorway being raised from 6 to 20 ft. above the ground, and so only accessible by means of a ladder. The towers within are divided into several storeys by two or more floors, usually of wood, but in some cases, as at Keneith, of stone slightly arched. The access from floor to floor was by ladders. The windows, which are always high up, are single lights, mostly arched or with a flat stone lintel. In some of the oldest towers they have triangular tops, formed by two stones leaning together. One peculiarity of the door and window openings in the Irish round towers is that the jambs are frequently set sloping, so that the opening grows narrower towards the top, as in the temples of ancient Egypt. The later examples of these towers, dating from the 12th and 13th centuries, are often decorated with chevron, billet and other Norman enrichments round the jambs and arches. The roof is of stone, usually conical in shape, and some of the later towers are crowned by a circle of battlements. The height of the round towers varies from about 60 to 132 ft.; that at Kilcullen was the highest. The masonry differs according to its date,—the oldest examples being built of almost uncut rubble work, and the later ones of neatly jointed ashlar.

Much has been written as to the use of these towers, and the most conflicting theories as to their origin have been propounded. It is fairly certain, however, that they were constructed by Christian builders, both from the fact that they always are or once were near a church, and also because crosses and other Christian emblems frequently occur among the sculptured decorations of their doors and windows. Their original purpose was probably for places of refuge, for which the solid base and the door high above the ground seem specially adapted. They may also have been watch-towers, and in later times often contained bells. Their circular form was probably for the sake of strength, angles which could be attacked by a battering ram being thus avoided, and also because no quoins or dressed stones were needed, except for the openings—an important point at a time when tools for working stone were scarce and imperfect. Both these reasons may also account for the Norman round towers which are so common at the west end of churches in Norfolk, Suffolk and Essex, though these have little resemblance to those of Ireland except in the use of a circular plan. One example exactly like those of Ireland exists in the Isle of Man, within the precincts of Peel Castle adjacent to the cathedral of St German; it was probably the work of Irish builders. There are also three in Scotland, viz. at Egilshay in Orkney, and at Abernethy and Brechin.

Round towers wider and lower in proportion than those of Ireland appear to have been built by many prehistoric races in different parts of Europe. The towers of this class in Scotland are called "brochs"; they average about 50 ft. high and 30 ft. in internal diameter. Their walls, which are usually about 15 ft. thick at the bottom, are built hollow, of rubble masonry, with series of passages one over the other running all round the tower. As in the Irish towers, the entrance is placed at some distance from the ground; and the whole structure is designed as a stronghold. The brochs appear to have been the work of a pre-Christian Celtic race. Many objects in bronze and iron and fragments of hand-made pottery have been found in and near these towers, all bearing witness of a very early date. (See Anderson, *Scotland in Pagan Times*, 1883, and *Scotland in Early Christian Times*, 1881.) The *nuraghi* of Sardinia are described in the article on that island. During the 6th century church towers at and near Ravenna were usually built round in plan, and not unlike those of Ireland in their proportions. The finest existing example is that which stands by the church of S. Apollinare in Classe, the old port of the city of Ravenna (see BASILICA, fig. 8). It is of brick, divided into nine storeys, with single-light windows below, three-light windows in the upper storeys, and two-lights in the intermediate ones. The most magnificent example of a round tower is the well-known leaning tower of Pisa, begun in the year 1174. It is richly decorated with tiers of open marble arcades, supported on free columns. The circular plan was much used by Moslem races for their minarets. The finest of these is the 13th-century minar of Kutb at Old Delhi, built of limestone with bands of marble. It is richly fluted on plan, and when complete was at least 250 ft. high.

The best account of the Irish round towers is that given by Petrie in his *Ecclesiastical Architecture of Ireland* (Dublin, 1845). See also Keane, *Towers and Temples of Ancient Ireland* (Dublin, 1850); Brash, *Ecclesiastical Architecture of Ireland* (Dublin, 1875); and Stokes, *Early Architecture in Ireland* (Dublin, 1878). (J. H. M.)

ROUS, FRANCIS (1579–1659), English Puritan, was born at Dittisham in Devon in 1579, and educated at Oxford (Broadgates Hall, afterwards Pembroke College) and at Leiden, graduating at the former in January 1596–97, and at the latter thirteen months afterwards. For some years he lived in seclusion in Cornwall and occupied himself with theological studies, producing among other books *The Arte of Happines* (1619) and *Testis Veritatis*, a reply to Richard Montagu's *Appello Caesarem*. He entered parliament in 1625 as member for Truro, and continued to represent that or some neighbouring west country constituency in such parliaments as were summoned till his death. He obtained many offices under the Commonwealth, among them that of provost of Eton College. At first a Presbyterian, he afterwards joined the Independents. In 1657 he was made a lord of parliament. He died at Acton in January 1658–59. The subjective cast of his piety is reflected in his *Mystical Marriage . . . betweene a Soule and her Saviour* (1635), but he is best known by his metrical version of the Psalms (1643), which was approved by the Westminster Assembly and (in a revised form) is still used in the Scottish Presbyterian churches.

ROUS, HENRY JOHN (1795–1877), British admiral and sportsman, was born on the 23rd of January 1795, the second son of the 1st earl of Stradbroke. He was educated at Westminster School, and entered the British navy in 1808, serving as a midshipman in the expedition to Flushing. He was afterwards appointed to the "Bacchante," and received a medal for bravery in various actions and expeditions. In 1823 he was made captain, and served in the Indian and New Holland stations from 1823 to 1829. In 1834 he was appointed to the command of the "Pique," a 36-gun frigate, which ran ashore on the coast of Labrador and was much damaged. Rous, however, brought her across the Atlantic with a sprung foremast and without keel, forefoot or rudder, and though the ship was making 23 ins. of water an hour. Rous, always fond of sport, retired from the navy, and became in 1838 a steward of the Jockey Club, a position which he held almost uninterruptedly to his death. In 1855 he was appointed public handicapper. He managed the duke of Bedford's stables at Newmarket for many years, and wrote a work on *The Laws and Practice of Horse Racing* that procured for him the title of "the Blackstone of the Turf." In 1841 he was returned M.P. for Westminster, and in 1846 Sir Robert Peel made him a lord of the admiralty. He died on the 19th of June 1877.

For the naval career of Admiral Rous see O'Byrne, *Naval Biographical Dictionary* (London, 1849). A vivid sketch of him as a turf authority will be found in Day's *Turf Celebrities* (London, 1891).

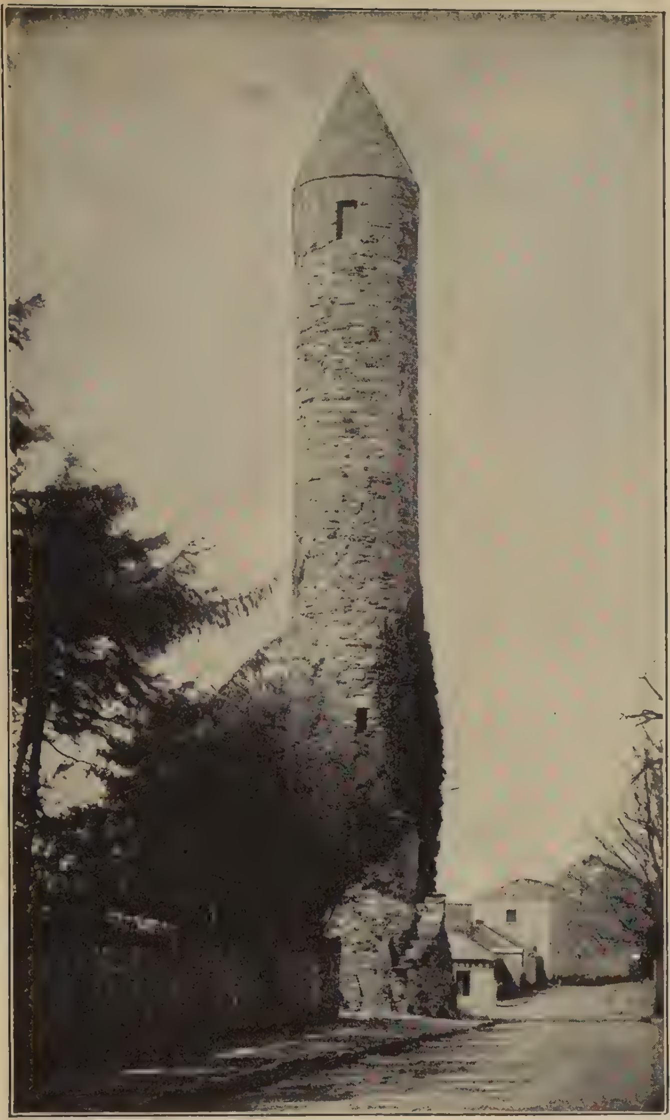
ROUSSEAU, JACQUES (1630–1693), French painter, a member of a Huguenot family, was born at Paris in 1630. He was remarkable as a painter of decorative landscapes and classic ruins, somewhat in the style of Canaletto, but without his delicacy of touch; he appears also to have been influenced by Nicolas Poussin. While young Rousseau went to Rome, where he spent some years in painting the ancient ruins, together with the surrounding landscapes. He thus formed his style, which was artificial and conventionally decorative. His colouring for the most part is unpleasing, partly owing to his violent treatment of skies with crude blues and orange, and his chiaroscuro usually is much exaggerated. On his return to Paris he soon became distinguished as a painter, and was employed by Louis XIV. to decorate the walls of his palaces at St Germain and Marly. He was soon admitted a member of the French Academy of the Fine Arts, but on the revocation of the edict of Nantes he was obliged to take refuge in Holland, and his name was struck off the Academy roll. From Holland he was invited to England by the duke of Montague, who employed him, together with other French painters, to paint the walls of his palace, Montague House (on the site of which is now the British Museum). Rousseau was also employed to paint architectural subjects and landscapes in the palace of Hampton Court, where many of his decorative panels still exist. He spent the latter part of his life in London, where he died in 1693.

Besides being a painter in oil and fresco Rousseau was an etcher of some ability; many etchings by his hand from the works of the Caracci and from his own designs still exist; they are vigorous, though coarse in execution.

ROUSSEAU, JEAN BAPTISTE (1671–1741), French poet, was born at Paris on the 6th of April 1671; he died at Brussels on the 17th of March 1741. The son of a shoemaker, he was well educated and early gained favour with Boileau, who encouraged him to write. He began with the theatre, for which he had no aptitude. A one-act comedy, *Le Café*, failed in 1694, and he was not much happier with a more ambitious play, *Le Flatteur* (1696), or with the opera of *Vénus et Adonis* (1697). He tried in 1700 another comedy, *Le Capricieux*, which had the same fate. He then went with Tallard as an attaché to London, and, in days when literature still led to high position, seemed likely to achieve success. His misfortunes began with a club squabble at the Café Laurent, which was much frequented by literary men, and where Rousseau indulged in lampoons on his companions. A shower of libellous and sometimes obscene verses was written by or attributed to him, and at last he was turned out of the café. At the same time his poems, as yet only singly printed or in manuscript, acquired him a great reputation, due to the dearth of genuine lyrical poetry between Racine and Chénier. He had in 1701 been made a member of the Académie des inscriptions; he had been offered, though he had not accepted, profitable places in the revenue department; he had become a favourite of the libertine but influential coterie of the Temple; and in 1710 he presented himself as a candidate for the Académie française. Then began the second chapter of an extraordinary history of the animosities of authors. A copy of verses, more offensive than ever, was handed round, and gossip maintained that Rousseau was its author. Legal proceedings of various kinds followed, and Rousseau ascribed the lampoon to Joseph Saurin. In 1712 Rousseau was prosecuted for defamation of character, and, on his non-appearance in court, was condemned *par contumace* to perpetual exile. He spent the rest of his life in foreign countries except for a clandestine visit to Paris in 1738, refusing to accept the permission to return which was offered him in 1716 because it was not accompanied by complete rehabilitation.

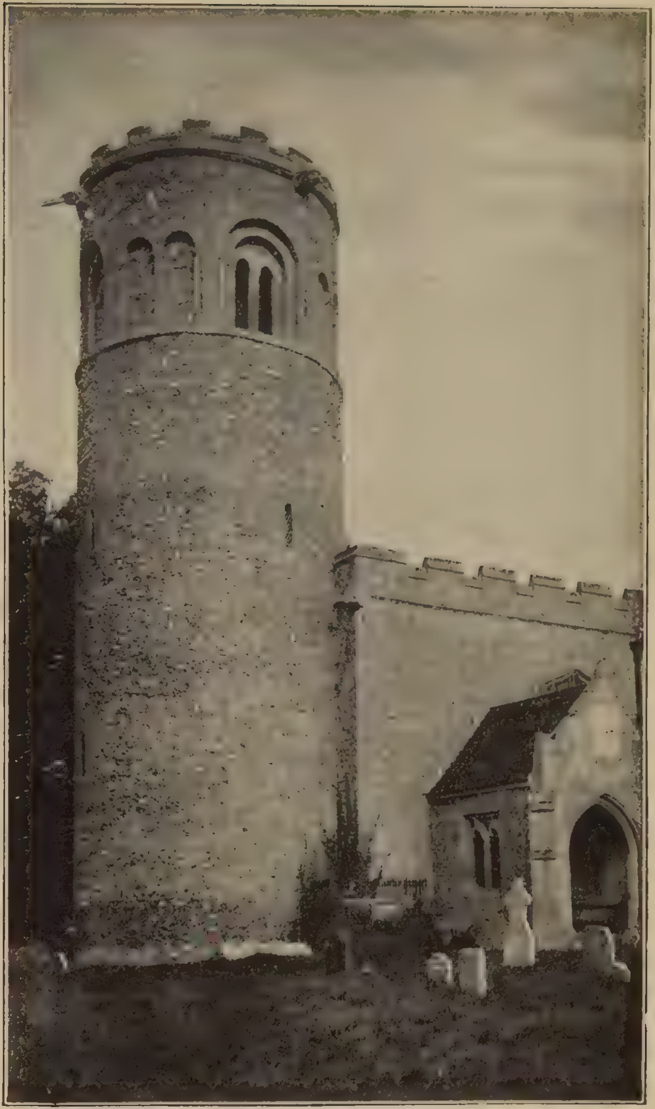
Prince Eugène and then other persons of distinction took him under their protection during his exile, and he printed at Soleure the first edition of his poetical works. Voltaire and he met at Brussels

ROUND TOWERS



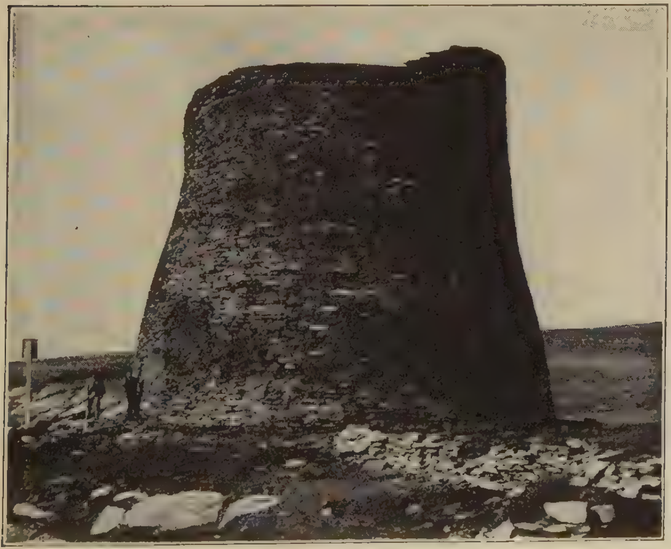
Photo, Valentine.

IRISH ROUND TOWER: CLONDALKIN, CO. DUBLIN.



Photo, Mansell & Co.

EAST ANGLIAN ROUND CHURCH-TOWER: LITTLE SAXHAM.



Photo, Valentine

BROCH: MOUSA, SHETLAND.

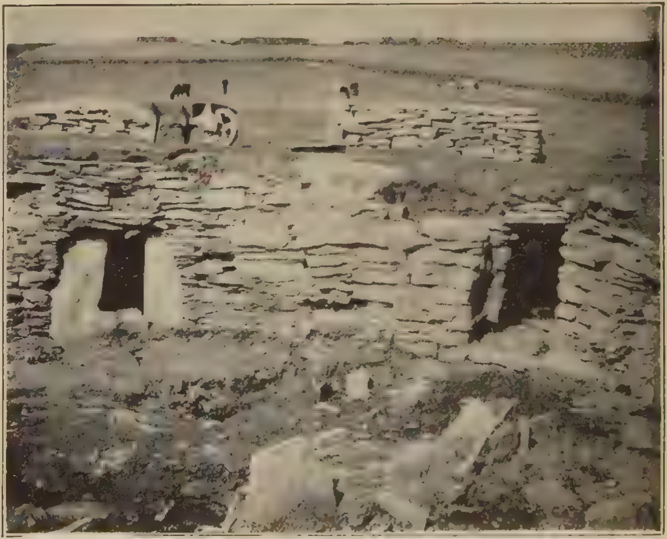


Photo by the late Sir Francis Barry, by permission of *The Country Home.*

BROCH: KEISS ROAD, CAITHNESS (INTERIOR, LOWER PART, EXCAVATED).

in 1722. Voltaire's *Le Pour et le contre* is said to have shocked Rousseau, who expressed his sentiments freely. At any rate the latter had thenceforward no fiercer enemy than Voltaire. His death elicited from Lefranc de Pompignan an ode of real excellence and perhaps better than anything of Rousseau's own work. That work is divided, roughly speaking, into two contrasted divisions. One consists of formal and partly sacred odes and cantatas of the stiffest character, of which perhaps the *Ode à la fortune* is the most famous; the other of brief epigrams, sometimes licentious and always, or almost always, ill-natured. As an epigrammatist Rousseau is only inferior to his friend Alexis Piron. In the former he stands almost alone. The frigidity of conventional diction and the disuse of all really lyrical rhythm which characterize his period do not prevent his odes and cantatas from showing at times true poetical faculty, though cramped, and inadequate to explain his extraordinary vogue. Few writers were so frequently reprinted during the 18th century, but even in his own century La Harpe had arrived at a truer estimate of his real value when he said of his poetry: "Le fond n'est qu'un lieu commun chargé de déclamations et même d'idées fausses."

Besides the Soleure edition mentioned above Rousseau published another issue of his work in London in 1723. The chief edition since is that of J. A. Amar (5 vols., 1820), preceded by a notice of his life. M. A. de Latour published (1869) a useful though not complete edition, with notes and a biographical introduction.

ROUSSEAU, JEAN JACQUES (1712–1778), French philosopher, was born at Geneva on the 28th June 1712. His family had established themselves in that city at the time of the religious wars, but they were of pure French origin. Rousseau's father Isaac was a watchmaker; his mother, Suzanne Bernard, was the daughter of a minister; she died in childbirth, and Rousseau, who was the second son, was brought up in a haphazard fashion, his father being dissipated, violent-tempered and foolish. But he early taught his son to read, and seems to have laid the foundation of the flighty sentimentalism in morals and politics which Rousseau afterwards illustrated with his genius. When the boy was ten years old his father got entangled in a dispute with a fellow-citizen, and being condemned to a short term of imprisonment abandoned Geneva and took refuge at Lyons. The father and son henceforth rarely met. Rousseau was taken charge of by his mother's relations and was committed to the tutorship of M. Lambercier, pastor at Boissy. In 1724 he was removed from this school and taken into the house of his uncle Bernard, by whom he was shortly afterwards apprenticed to a notary. His master, however, found or thought him incapable and sent him back. After a short time (April 25, 1725) he was apprenticed afresh, this time to an engraver. He did not dislike the work, but was or thought himself cruelly treated. In 1728 he ran away, the truancy being by his own account unintentional in the first instance, and due to the fact of the city gates being shut earlier than usual. Then began an extraordinary series of wanderings and adventures, for much of which there is no authority but his own *Confessions*. He first fell in with some proselytizers of the Roman faith at Confignon in Savoy, and by them he was sent to Madame de Warens at Annecy, a young and pretty widow who was herself a convert. Her influence, however, which was to be so great, was not immediately exercised, and he was passed on to Turin, where there was an institution specially devoted to the reception of neophytes. His experiences here were unsatisfactory, but he abjured duly and was rewarded by being presented with twenty francs and sent about his business. He wandered about in Turin for some time, and at last established himself as footman to a Madame de Vercellis. Here occurred the famous incident of the theft of a ribbon, of which he accused a girl fellow-servant. But, though he kept his place by this piece of cowardice, Madame de Vercellis died not long afterwards and he was turned off. He found another place with the Comte de Gouvon, but lost this also through coxcombry. Then he resolved to return to Madame de Warens at Annecy. The chronology of all these events, as narrated by himself, is somewhat obscure, but they seem to have occupied about three years.

Even then Rousseau did not settle at once in the anomalous but to him charming position of domestic lover to this lady, who, nominally a converted Protestant, was in reality, as many women of her time were, a kind of deist, with a theory of noble sentiment and a practice of libertinism tempered by good nature. It used to be held that in her conjugal relations she was more sinned against than sinning. But modern investigations seem to show that M. de Vuarrens (which is said to be the correct spelling of the name) was an unfortunate husband, and was deserted and robbed by his wife. However, she welcomed Rousseau kindly, thought it necessary to complete his education, and he was sent to the seminarists of St Lazare to be improved in classics, and also to a music master. In one of his incomprehensible freaks he set off for Lyons, and, after abandoning his companion in an epileptic fit, returned to Annecy to find Madame de Warens gone. Then for some months he relapsed into the life of vagabondage, varied by improbable adventures, which (according to his own statement) he so often pursued. Hardly knowing anything of music, he attempted to give lessons and a concert at Lausanne; and he actually taught at Neuchâtel. Then he became, or says he became, secretary to a Greek archimandrite who was travelling in Switzerland to collect subscriptions for the rebuilding of the Holy Sepulchre; then he went to Paris, and, with recommendations from the French ambassador at Soleure, saw something of good society; then he returned on foot through Lyons to Savoy, hearing that Madame de Warens was at Chambéry. This was in 1732, and Rousseau, who for a time had unimportant employments in the service of the Sardinian crown, was shortly installed by Madame de Warens, whom he still called Maman, as *amant en titre* in her singular household, wherein she diverted herself with him, with music and with chemistry. In 1736 Madame de Warens, partly for Rousseau's health, took a country house, Les Charmettes, a short distance from Chambéry. Here in summer, and in the town during winter, Rousseau led a delightful life, which he has delightfully described. In a desultory way he did a good deal of reading, but in 1738 his health again became bad, and he was recommended to go to Montpellier. By his own account this journey to Montpellier was in reality a *voyage à Cythère* in company with a certain Madame de Larnage. This being so, he could hardly complain when on returning he found that his official position in Madame de Warens's household had been taken by a person named Vintzenried. He was, however, less likely than most men to endure the position of second in command, and in 1740 he became tutor at Lyons to the children of M. de Mably, not the well-known writer of that name, but his and Condillac's elder brother. But Rousseau did not like teaching and was a bad teacher, and after a visit to Les Charmettes, finding that his place there was finally occupied, he once more went to Paris in 1741. He was not without recommendations. But a new system of musical notation which he thought he had discovered was unfavourably received by the Académie des sciences, where it was read in August 1742, and he was unable to obtain pupils. Madame Dupin, however, to whose house he had obtained the entry, procured him the honourable if not very lucrative post of secretary to M. de Montaigu, ambassador at Venice. With him he stayed for about eighteen months, and has as usual infinite complaints to make of his employer and some strange stories to tell. At length he threw up his situation and returned to Paris (1745).

Up to this time—that is to say, till his thirty-third year—Rousseau's life, though continuously described by himself, was of the kind called subterranean, and the account of it must be taken with considerable allowances. From this time, however, he is more or less in view; and, though at least two events of his life—his quarrel with Diderot and his death—are subjects of dispute, its general history can be checked and followed with reasonable confidence. On his return to Paris he renewed his relations with the Dupin family and with the literary group of Diderot, to which he had already been introduced by M. de Mably's letters. He had an opera, *Les Muses galantes*, privately represented; he copied music for money, and received from Madame Dupin and her son-in-law M. de Francueil a small but regular salary as secretary. He lived at the Hotel St Quentin for a time, and once more arranged for himself an equivocal domestic establishment. His mistress, whom towards the close of his life he married after a fashion, was Thérèse le Vasseur, a servant at the inn, whom he first met in 1743. She had little beauty, no education or understanding, and few charms that his friends could discover, besides which she had a detestable mother, who was the bane of Rousseau's life. But he made himself happy with her, and (according to Rousseau's account, the accuracy of which has been questioned) five children were born to them, who were all consigned to the foundling hospital. This disregard of responsibility was partly punished by the use his critics made of it when he became celebrated as a writer on education and a preacher of the domestic affections.[1] Diderot, with whom from 1741 onwards he became more and more familiar, admitted him as a contributor to the *Encyclopédie.* He formed new musical projects, and he was introduced by degrees to many people of rank and influence, among them Madame d'Épinay (*q.v.*), to whom in 1747 he was introduced by her lover M. de Francueil. It was not, however, till 1749 that Rousseau made his mark as a writer. The academy of Dijon offered a prize for an essay on the effect of the progress of civilization on morals. Rousseau took up the subject, developed his famous paradox of the superiority of the savage state, won the prize, and, publishing his essay (*Discours sur les arts et sciences*) next year, became famous. The anecdotage as to the origin of this famous essay is voluminous. It is agreed that the idea was suggested when Rousseau went to pay a visit to Diderot, who was in prison at Vincennes for his *Lettre sur les aveugles.* Rousseau says he thought of the paradox on his way down; Morellet and others say that he thought of treating the subject in the ordinary fashion and was laughed at by Diderot, who showed him the advantages of the less obvious treatment. Diderot himself, who in such matters is almost absolutely trustworthy, does not claim the suggestion, but uses words which imply that it was at least partly his. It is very like him. The essay, however, took the artificial and crotchety society of the day by storm. Francueil gave Rousseau a valuable post as cashier in the receiver-general's office. But he resigned it either from conscientiousness, or crotchet, or nervousness at responsibility, or indolence, or more probably from a mixture of all four. He went back to his music-copying, but the salons of the day were determined to have his society, and for a time they had it. In 1752 he brought out at Fontainebleau an operetta, the *Devin du village,* which was successful. He received a hundred louis for it, and he was ordered to come to court next day. This meant the certainty of a pension. But Rousseau's shyness or his perversity (as before, probably both) made him disobey the command. His comedy *Narcisse,* written long before, was also acted, but unsuccessfully. In the same year, however, a letter *Sur la musique française* again had a great vogue.[2] Finally, for this was an important year with him, the Dijon academy, which had founded his fame, announced the subject of "The Origin of Inequality," on which he wrote a discourse which was unsuccessful, but at least equal to the former in merit. During a visit to Geneva in 1754 Rousseau saw his old friend and love Madame de Warens (now reduced in circumstances and having lost all her charms), while after abjuring his abjuration of Protestantism he was enabled to take up his freedom as citizen of Geneva, to which his birth entitled him and of which he was proud. Shortly afterwards, returning to Paris, he accepted a cottage near Montmorency (the celebrated Hermitage) which Madame d'Épinay had fitted up for him, and established himself there in April 1756. He spent little more than a year there, but it was an important year. Here he wrote *La Nouvelle Héloïse*; here he indulged in the passion which that novel partly represents, his love for Madame d'Houdetot, sister-in-law of Madame d'Épinay, a lady young and amiable, but plain, who had a husband and a lover (St Lambert), and whom Rousseau's devotion seems to have partly pleased and partly annoyed. Here too arose the obscure triangular quarrel between Diderot, Rousseau and Frederick Melchior Grimm, which ended Rousseau's sojourn at the Hermitage. The supposition least favourable to Rousseau is that it was due to one of his numerous fits of half-insane petulance and indignation at the obligations which he was nevertheless always ready to incur. That most favourable to him is that he was expected to lend himself in a more or less complaisant manner to assist and cover Madame d'Épinay's adulterous affection for Grimm. At any rate, Rousseau quitted the Hermitage in the winter of 1757–58, and established himself at Montlouis in the neighbourhood.

Hitherto Rousseau's behaviour had frequently made him enemies, but his writings had for the most part made him friends. The quarrel with Madame d'Épinay, with Diderot, and through them with the philosophe party reversed this. In 1758 appeared his *Lettre à d'Alembert contre les spectacles,* written in the winter of the previous year at Montlouis. This was at once an attack on Voltaire, who was giving theatrical representations at Les Délices, on D'Alembert, who had condemned the prejudice against the stage in the *Encyclopédie,* and on one of the favourite amusements of the society of the day. Voltaire's strong point was not forgiveness, and, though Rousseau no doubt exaggerated the efforts of his "enemies," he was certainly henceforward as obnoxious to the philosophe coterie as to the orthodox party. He still, however, had no lack of patrons—he never had—though his perversity made him quarrel with all in turn. The amiable duke and duchess of Luxembourg, who were his neighbours at Montlouis, made his acquaintance, or rather forced theirs upon him, and he was industrious in his literary work—indeed, most of his best books were produced during his stay in the neighbourhood of

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[1] Apart from the fact that there were probably no children at all, the whole bearing of the belief of Rousseau that they were sent by him to the *Enfants trouvés* has been falsified by hostile writers. He was a penniless man of letters, with theories as to state maintenance of children; and Thérèse was a consenting party. Rousseau, however, never saw any of the alleged children; and Mrs Macdonald has shown good cause for believing that their existence was a myth, an imposition on Rousseau's credulity, invented by Thérèse and her mother to make the tie more binding. (H. Ch.)

[2] Rousseau's influence on French music was greater than might have been expected from his very imperfect education; in truth, he was a musician by natural instinct only, but his feeling for art was very strong, and, though capricious, based upon true perceptions of the good and beautiful. The system of notation (by figures) concerning which he read a paper before the Académie des Sciences, August 22, 1742, was ingenious, but practically worse than useless, and failed to attract attention, though the paper was published in 1743 under the title of *Dissertation sur la musique moderne.* In the famous "guerre des buffons," he took the part of the "buffonists," so named in consequence of their attachment to the Italian "opera buffa," as opposed to the true French opera; and, in his *Lettre sur la musique française,* published in 1753, he indulged in a violent tirade against French music, which he declared to be so contemptible as to lead to the conclusion "that the French neither have, nor ever will have, any music of their own, or at least that, if they ever do have any, it will be so much the worse for them." This silly libel so enraged the performers at the Opera that they hanged and burned its author in effigy. Rousseau revenged himself by printing his clever satire entitled *Lettre d'un symphoniste de l'Académie Royale de Musique à ses camarades de l'orchestre.* His *Lettre à M. Burney* is of a very different type, and does full justice to the genius of Gluck. His articles on music in the *Encyclopédie* deal very superficially with the subject; and his *Dictionnaire de musique* (Geneva, 1767), though admirably written, is not trustworthy, either as a record of facts or as a collection of critical essays. In all these works the imperfection of his musical education is painfully apparent, and his compositions betray an equal lack of knowledge, though his refined taste is as clearly displayed there as is his literary power in the *Letters* and *Dictionary.* His first opera, *Les Muses galantes,* privately prepared at the house of La Popelinière, attracted very little attention; but *Le Devin du village,* given at Fontainebleau in 1752, and at the Académie in 1753, achieved a great and well-deserved success. Though very unequal, and exceedingly simple both in style and construction, it contains some charming melodies, and is written throughout in the most refined taste. His *Pygmalion* (1775) is a melodrama without singing. Some posthumous fragments of another opera, *Daphnis et Chloé,* were printed in 1780; and in 1781 appeared *Les Consolations des misères de ma vie,* a collection of about one hundred songs and other fugitive pieces of very unequal merit. The popular air known as "Rousseau's Dream" is not contained in this collection, and cannot be traced back farther than J. B. Cramer's celebrated "Variations." M. Castil-Blaze has accused Rousseau of extensive plagiarisms (or worse) in *Le Devin du village* and *Pygmalion,* but apparently without sufficient cause. (W. S. R.)

Montmorency. A letter to Voltaire on his poem about the Lisbon earthquake embittered the dislike between the two, being surreptitiously published. *La Nouvelle Héloïse* appeared in the same year (1760), and it was immensely popular. In 1762 appeared the *Contrat social* at Amsterdam, and *Émile*, which was published both in the Low Countries and at Paris. For the latter the author received 6000 livres, for the *Contrat* 1000.

Julie, ou La Nouvelle Héloïse, is a novel written in letters describing the loves of a man of low position and a girl of rank, her subsequent marriage to a respectable freethinker of her own station, the mental agonies of her lover, and the partial appeasing of the distresses of the lovers by the influence of noble sentiment and the good offices of a philanthropic Englishman. It is too long, the sentiment is overstrained, and severe moralists have accused it of a certain complaisance in dealing with amatory errors; but it is full of pathos and knowledge of the human heart. The *Contrat social*, as its title implies, endeavours to base all government on the consent, direct or implied, of the governed, and indulges in much ingenious argument to get rid of the practical inconveniences of such a suggestion. *Émile*, the second title of which is *De l'Éducation*, is much more of a treatise than of a novel, though a certain amount of narrative interest is kept up throughout.

Rousseau's reputation was now higher than ever, but the term of the comparative prosperity which he had enjoyed for nearly ten years was at hand. The *Contrat social* was obviously anti-monarchic; the *Nouvelle Héloïse* was said to be immoral; the sentimental deism of the "Profession du vicaire Savoyard" in *Émile* irritated equally the philosophe party and the church. On June 11, 1762, *Émile* was condemned by the parlement of Paris, and two days previously Madame de Luxembourg and the prince de Conti gave the author information that he would be arrested if he did not fly. They also furnished him with means of flight, and he made for Yverdun in the territory of Bern, whence he transferred himself to Motiers in Neuchâtel, which then belonged to Prussia. Frederick II. was not indisposed to protect the persecuted when it cost him nothing and might bring him fame, and in Marshal Keith, the governor of Neuchâtel, Rousseau found a true and firm friend. He was, however, unable to be quiet or to practise any of those more or less pious frauds which were customary at the time with the unorthodox. The archbishop of Paris had published a pastoral against him, and Rousseau did not let the year pass without a *Lettre à M. de Beaumont*. The council of Geneva had joined in the condemnation of *Émile*, and Rousseau first solemnly renounced his citizenship, and then, in the *Lettres de la montagne* (1763), attacked the council and the Genevan constitution unsparingly. All this excited public opinion against him, and gradually he grew unpopular in his own neighbourhood. This unpopularity is said on uncertain authority to have culminated in a nocturnal attack on his house. At any rate he thought he was menaced if he was not, and migrated to the Île St Pierre in the Lake of Bienne, where he once more for a short, and the last, time enjoyed that idyllic existence which he loved. But the Bernese government ordered him to quit its territory. He was for some time uncertain where to go, and thought of Corsica (to join Paoli) and Berlin. But finally David Hume offered him, late in 1765, an asylum in England, and he accepted. He passed through Paris, where his presence was tolerated for a time, and landed in England on January 13, 1766. Thérèse travelled separately, and was entrusted to the charge of James Boswell, who had already made Rousseau's acquaintance. Here he had once more a chance of settling peaceably. Severe English moralists like Johnson thought but ill of him, but the public generally was not unwilling to testify against French intolerance, and regarded his sentimentalism with favour. He was lionized in London to his heart's content and discontent, for it may truly be said of Rousseau that he was equally indignant at neglect and intolerant of attention. When, after not a few displays of his strange humour, he professed himself tired of the capital, Hume procured him a country abode in the house of Mr Davenport at Wootton in Derbyshire. Here, though the place was bleak and lonely, he might have been happy enough, and he actually employed himself in writing the greater part of his *Confessions*. But his habit of self-tormenting and tormenting others never left him. His own caprices interposed some delay in the conferring of a pension which George III. was induced to grant him, and he took this as a crime of Hume's. The publication of a spiteful letter (really by Horace Walpole, one of whose worst deeds it was) in the name of the king of Prussia made Rousseau believe that plots of the most terrible kind were on foot against him. Finally he quarrelled with Hume because the latter would not acknowledge all his own friends and Rousseau's supposed enemies of the philosophe circle to be rascals. He remained, however, at Wootton during the year and through the winter. In May 1767 he fled to France, addressing letters to the lord chancellor and to General Conway, which can only be described as the letters of a lunatic. He was received in France by the marquis de Mirabeau (father of the great Mirabeau), of whom he soon had enough, then by the prince de Conti at Trye. From this place he again fled and wandered about for some time in a wretched fashion, still writing the *Confessions*, constantly receiving generous help, and always quarrelling with, or at least suspecting, the helpers. In the summer of 1770 he returned to Paris, resumed music-copying, and was on the whole happier than he had been since he had to leave Montlouis. He had by this time married Thérèse le Vasseur, or had at least gone through some form of marriage with her.

Many of the best-known stories of Rousseau's life date from this last time, when he was tolerably accessible to visitors, though clearly half-insane. He finished his *Confessions*, wrote his *Dialogues* (the interest of which is not quite equal to the promise of their curious sub-title, *Rousseau juge de Jean Jacques*), and began his *Rêveries du promeneur solitaire*, intended as a sequel and complement to the *Confessions*, and one of the best of all his books. It should be said that besides these, which complete the list of his principal works, he has left a very large number of minor works and a considerable correspondence. During this time he lived in the Rue Platière, which is now named after him. But his suspicions of secret enemies grew stronger rather than weaker, and at the beginning of 1778 he was glad to accept the offer of M. de Girardin, a rich financier, and occupy a cottage at Ermenonville. The country was beautiful; but his old terrors revived, and his woes were complicated by the alleged inclination of Thérèse for one of M. de Girardin's stable-boys. On July 2nd he died in a manner which has been much discussed, suspicions of suicide being circulated at the time by Grimm and others.[1]

There is little doubt that for the last ten or fifteen years of his life, if not from the time of his quarrel with Diderot and Madame d'Épinay, Rousseau was not wholly sane—the combined influence of late and unexpected literary fame and of constant solitude and discomfort acting upon his excitable temperament so as to overthrow the balance, never very stable, of his fine and acute but unrobust intellect. He was by no means the only man of letters of his time who had to submit to something like persecution. Fréron on the orthodox side had his share of it, as well as Voltaire, Helvétius, Diderot and Montesquieu on that of the innovators. But Rousseau had not, like Montesquieu, a position which guaranteed him from serious danger; he was not wealthy like Helvétius; he had not the wonderful suppleness and trickiness which even without his wealth would probably have defended Voltaire himself; and he lacked entirely the "bottom" of Fréron and Diderot. When he was molested he could only shriek at his enemies and suspect his friends. His moral character was undoubtedly weak in other ways than this, but it is fair to remember that but for his astounding *Confessions* the more disgusting parts of it would not have been known, and that these *Confessions* were written, if not under hallucination, at any rate in circumstances entitling the self-condemned criminal to the benefit of considerable doubt. If Rousseau had held his tongue, he might have stood lower as a man of letters; he would pretty certainly have stood higher as a man. He was, moreover, really sinned against, if still more sinning. The conduct of Grimm to him was certainly bad; and, though Walpole was not his personal friend, a worse action than his famous letter, considering the well-known idiosyncrasy of the subject, would be difficult to find. It was his own fault that he saddled himself with the Le Vasseurs, but their conduct was probably, if not certainly, ungrateful in the extreme. Only excuses can be made for him; but the excuses for a man born, as Hume after the quarrel said of him, "without a skin" are numerous and strong.

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[1] The local inquiry into the death, on the following day, resulted in a certificate that he died of apoplexy; but the story that he shot himself persisted. In December 1897 Rousseau's coffin in the Panthéon was opened, and M. Berthelot, who examined the skull, found no trace of injury by a bullet; and on the whole there is no reason to doubt the verdict of the original inquiry at Ermenonville. (H. CH.)

His peculiar reputation increased after his death. During his life his personal peculiarities and the fact that his opinions were nearly as obnoxious to the one party as to the other worked against him, but it was not so after his death. The men of the Revolution regarded him with something like idolatry, and his literary merits conciliated many who were far from idolizing him as a revolutionist. His style was taken up by Bernardin de Saint Pierre and by Chateaubriand. It was employed for purposes quite different from those to which he had himself applied it, and the reaction triumphed by the very arms which had been most powerful in the hands of the Revolution. Byron's fervid panegyric enlisted on his side all who admired Byron—that is to say, the majority of the younger men and women of Europe between 1820 and 1850—and thus different sides of his tradition were continued for a full century after the publication of his chief books. His religious unorthodoxy was condoned because he never scoffed; his political heresies, after their first effect was over, seemed harmless from the very want of logic and practical spirit in them, while part at least of his literary secret was the common property of almost every one who attempted literature.

In religion Rousseau was undoubtedly what he has been called above—a sentimental deist; but no one who reads him with the smallest attention can fail to see that sentimentalism was the essence, deism the accident of his creed. In his time orthodoxy at once generous and intelligent hardly existed in France. There were ignorant persons who were sincerely orthodox; there were intelligent persons who pretended to be so. But between the time of Massillon and D'Aguesseau and the time of Lamennais and Joseph de Maistre the class of men of whom in England Berkeley, Butler and Johnson were representatives did not exist in France. Little inclined by nature to any but the emotional side of religion, and utterly undisciplined in any other by education, course of life, or the general tendency of public opinion, Rousseau naturally took refuge in the nebulous kind of natural religion which was at once fashionable and convenient. If his practice fell far short even of his own arbitrary standard of morality, as much may be said of persons far more dogmatically orthodox.

In politics, on the other hand, Rousseau was a sincere and, as far as in him lay, a convinced republican. He had no great tincture of learning, he was by no means a profound logician, and he was impulsive and emotional in the extreme—characteristics which in political matters predispose the subject to the preference of equality above all political requisites. He saw that under the French monarchy the actual result was the greatest misery of the greatest number, and he did not look much further. The *Contrat social* is for the political student one of the most curious and interesting books existing. Historically it is null; logically it is full of gaping flaws, practically its manipulations of the *volonté de tous* and the *volonté générale* are clearly insufficient to obviate anarchy. But its mixture of real eloquence and apparent cogency is exactly such as always carries a multitude with it, if only for a time. Moreover, in some minor branches of politics and economics Rousseau was a real reformer. Visionary as his educational schemes (chiefly promulgated in *Émile*) are in parts, they are admirable in others, and his protest against mothers refusing to nurse their children hit a blot in French life which is not removed yet, and has always been a source of weakness to the nation.

But it is as a literary man pure and simple—that is to say, as an exponent rather than as an originator of ideas—that Rousseau is most noteworthy, and that he has exercised most influence. The first thing noticeable about him is that he defies all customary and mechanical classification. He is not a dramatist—his work as such is insignificant—nor a novelist, for, though his two chief works except the *Confessions* are called novels, *Émile* is one only in name, and *La Nouvelle Héloïse* is as a story diffuse, prosy and awkward to a degree. He was without command of poetic form, and he could only be called a philosopher in an age when the term was used with such meaningless laxity as was customary in the 18th century. If he must be classed, he was before all things a describer—a describer of the passions of the human heart and of the beauties of nature. In the first part of his vocation the novelists of his own youth, such as Marivaux, Richardson and Prévost, may be said to have shown him the way, though he improved greatly upon them; in the second he was almost a creator. In combining the two and expressing the effect of nature on the feelings and of the feelings on the aspect of nature he was absolutely without a forerunner or a model. And, as literature since his time has been chiefly differentiated from literature before it by the colour and tone resulting from this combination, Rousseau may be said to hold, as an influence, a place almost unrivalled in literary history. The defects of all sentimental writing are noticeable in him, but they are palliated by his wonderful feeling, and by the passionate sincerity even of his insincere passages. Some cavils have been made against his French, but none of much weight or importance. And in such passages as the famous "Voilà de la pervenche" of the *Confessions*, as the description of the isle of St Pierre in the *Rêveries*, as some of the letters in the *Nouvelle Héloïse* and others, he had achieved absolute perfection in doing what he intended to do. The reader, as it has been said, may think he might have done something else with advantage, but he can hardly think that he could have done this thing better. (G. Sa.)

Bibliography.—The dates of most of Rousseau's works published during his lifetime have been given above. The *Confessions* and *Rêveries*, which, read in private, had given much umbrage to persons concerned, and which the author did not intend to be published until the end of the century, appeared in Geneva in 1782. In the same year and the following appeared a complete edition in forty-seven small volumes. There have been many since, the most important of them being that of Musset-Pathay (Paris, 1823). Some unpublished works, chiefly letters, were added by Bosscha (Paris, 1858) and Streckeisen Moulton (Paris, 1861). See also the latter's *Rousseau et ses amis* (1865). Works on Rousseau are innumerable. The chief biographies are: in French that of Saint Marc Girardin (1874), in English the *Life* by Viscount Morley. But the materials for his biography are so controversial and so personal—his own *Confessions* and the memoirs of associates whose accuracy and honesty are disputed—that the correct historical view can hardly be said yet to be standardized. Mrs Frederika Macdonald, in her *Jean Jacques Rousseau* (1906), makes out a good case for regarding Mme. d'Épinay's *Memoirs* as coloured, if not actually dictated, by the malevolent attitude of Grimm and Diderot; and her study of the documents undoubtedly qualifies a good many of the assumptions that have been made on the strength of evidence which is at least tainted by contemporary prejudice, and leaves the way open for an interpretation of the facts which would reconcile Rousseau's character as a writer with his actions as a man. Unfortunately for the consistency of historical writing, the view taken of Rousseau's biography affects those of Grimm, Diderot, Mme. d'Épinay and others, and while Mrs Macdonald's researches have done much to suggest a rehabilitation of Rousseau's veracity they have not definitely been accepted to an extent which would justify the rewriting of these other lives in her sense. See also E. Ritter, *Famille et jeunesse de Rousseau* (1896); A. Houssaye, *Les Charmettes* (2nd ed., 1864); J. Grand-Carteret, *Rousseau jugé par les Français d'aujourd'hui* (1890); L. Ducros, *J. J. Rousseau de Genève à l'Hermitage, 1712–57* (1908). (H. Ch.)

ROUSSEAU, PIERRE ÉTIENNE THÉODORE (1812–1867), French painter of the Barbizon school, was born in Paris on the 15th of April 1812, of a bourgeois family which included one or two artists. At first he received a business training, but soon displayed aptitude for painting. Although his father regretted the decision at first, he became reconciled to his son leaving business, and throughout the artist's career (for he survived his son) was a sympathizer with him in all his conflicts with the Salon authorities. Théodore Rousseau shared the difficulties of the romantic painters of 1830 in securing for their pictures a place in the annual Paris exhibition. The whole influence of the classically trained artists was against them, and not until 1848 was Rousseau adequately presented to the public. He had exhibited one or two unimportant works in the Salon of 1831 and 1834, but in 1836 his great work "La Déscente des vaches" was rejected by the vote of the classic painters; and from then until after the revolution of 1848 he was persistently refused. He was not without champions in the press, and under the title of "le grand refusé" he became known through the writings of Thoré, the critic who afterwards resided in England and wrote under the name of Bürger. During these years of artistic exile Rousseau produced some of his finest pictures: "The Chestnut Avenue," "The Marsh in the Landes" (now in the Louvre), "Hoar-Frost" (now in America); and in 1851, after the reorganization of the Salon in 1848, he exhibited his masterpiece, "The Edge of the Forest" (also in the Louvre), a picture similar in treatment to, but slightly varied in subject from, the composition called "A Glade in the Forest of Fontainebleau," in the Wallace collection at Hertford House.

Up to this period Rousseau had lived only occasionally at Barbizon, but in 1848 he took up his residence in the forest village, and spent most of his remaining days in the vicinity. He was now at the height of his artistic power, and was able to obtain fair sums for his pictures (but only about one-tenth of their value thirty years after his death), and his circle of admirers increased. He was still ignored by the authorities, for while Diaz was made Chevalier of the Legion of Honour in 1851, Rousseau was left undecorated at this time, but was nominated shortly afterwards. At the Exposition Universelle of 1855, where all Rousseau's rejected pictures of the previous twenty years were gathered together, his works were acknowledged to form one of the finest of the many splendid groups there exhibited. But during his lifetime Rousseau never really conquered French taste, and after an unsuccessful sale of his works by auction in 1861, he contemplated leaving Paris for Amsterdam or London, or even New York. Misfortune then overtook him: his wife, who had been a source of constant anxiety for years, became almost hopelessly insane; his aged father looked constantly to him for pecuniary assistance; his patrons were few. Moreoever, while he was temporarily absent with his invalid wife, a youth living in his home (a friend of his family) committed suicide in his Barbizon cottage; when he visited the Alps in 1863, making sketches of Mont Blanc, he fell dangerously ill with inflammation of the lungs; and when he returned to Barbizon he suffered from insomnia and became gradually weakened. He was elected president of the fine art jury for the 1867 Exposition. His disappointment at being passed over in the distribution of the higher awards told seriously on his health, and in August he was seized with paralysis. He slightly recovered, but was again attacked several times during the autumn. Finally, in November, he began to sink, and he died, in the presence of his lifelong friend, J. F. Millet, on the 22nd of December 1867.

Rousseau's other friend and neighbour, Jules Dupré, himself an eminent landscape painter of Barbizon, relates the difficulty Rousseau experienced in knowing when his picture was finished, and how he, Dupré, would sometimes take away from the studio some canvas on which Rousseau was labouring too long. Millet, the peasant painter, for whom Rousseau had the highest regard, was much with him during the last years of his life, and at his death Millet took charge of the insane wife. Rousseau was a good friend to Diaz, teaching him how to paint trees, for up to a certain point in his career Diaz considered he could only paint figures.

Rousseau's pictures are always grave in character, with an air of exquisite melancholy which is powerfully attractive to the lover of landscapes. They are well finished when they profess to be completed pictures, but Rousseau spent so long a time in working up his subjects that his absolutely completed works are comparatively few. He left many canvases with parts of the picture realized in detail and with the remainder somewhat vague; and also a good number of sketches and water-colour drawings. His pen work in monochrome on paper is rare; it is particularly searching in quality. There are a number of fine pictures by him in the Louvre, and the Wallace collection contains one of his most important Barbizon pictures. There is also an example in the Ionides collection at the Victoria and Albert Museum.

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(D. C. T.)

ROUSSEAU DE LA ROTTIÈRE, JEAN SIMÉON (b. 1747), French decorative painter, was the youngest son of Jules Antoine Rousseau, "sculpteur du Roi." The territorial addition to his patronymic has never been explained, but it is known to have been in use when he was little more than a boy. He studied at the Académie Royale, where we find him in September 1768 winning the medal given to the best painter of the quarter. He appears with his brother Jules Hugues to have been employed from an early date by his father for the decorative work executed by the family at Versailles. There has been some controversy among the authorities as to the respective shares of father and son in these works, but many of the attributions are fairly determined by dates, Jules Antoine Rousseau having been at work at Versailles for years before the birth of his famous son. The "Bains du Roi," the "Salon de la Méridienne," part of the bedchamber of Madame Adelaïde, and the "Garde-robe of Louis XVI." were among the achievements which there can be little doubt were shared in by Rousseau de la Rottière. His most individual and most famous undertaking was, however, the decoration of the lovely "Boudoir de Madame de Sévilly," now at the Victoria and Albert Museum. This little room, 14 ft. long, 10½ ft. wide and 16 ft. high, was removed from the house in the Rue de Saint Louis, in the Marais. The Seigneur de Sévilly, who was hereditary "Trésorier-général de l'Extraordinaire des guerres" under Louis XVI., married his cousin Anne Marie Louise de Pange, a favourite maid-of-honour of Marie Antoinette, and the story runs that his wife and the queen, desiring to give him a surprise, had the room decorated during his absence from Paris. It was purchased for the museum for 60,000 francs in 1869. The wall paintings of this sumptuous room came from the hand of Rousseau de la Rottière; the overdoor and part of the ceiling were executed by Lagrenée le jeune; the architect was Ledoux; the grey marble figures of aged men on either side of the fireplace were sculptured by Clodion; the mounts of the chimney-piece are apparently from the chisel of Gouthière. The date of the room is assigned to 1781–82, and Jean Siméon's authorship of much of its decoration is rendered certain by his own still existing sketch. The decoration is Pompeian in feeling, and in the main its taste is admirable; the execution is of the highest excellence. The tall narrow panels are painted in medallions with amorini; festoons and bouquets of flowers fill every available space; the shutters are painted with doves and shepherdesses. Lagrenée's pictures in the upper lunettes represent the elements; upon the ceiling is Jupiter enthroned within a deep blue border. The perfection of detail, the unity of the whole composition, the dexterity with which so small a chamber, lofty out of proportion to its length and width, has been picked out with recessed arches, the tenderness of its scheme of colour, combine to produce an exquisite effect. It is a melancholy reflection that M. de Sévilly, whom his wife and Marie Antoinette combined to surprise with this *chef-d'œuvre*, was guillotined, and that his wife, whose sitting-room it was, was condemned to die with him and with Madame Élisabeth de France, whom they had befriended, but was saved, against her will, by the princess, who made a false declaration as to her condition. She had two subsequent husbands, and lost them both in little more than two years. She herself lived less than five years after her delivery by the fall of Robespierre. There is no information as to Rousseau's later life. The last known mention of him is in 1792.

ROUSSILLON, one of the old provinces of France. It now forms the greater part of the department of Pyrénées Orientales (*q.v.*). It was bounded S. by the Pyrenees, W. by the county of Foix, N. by Languedoc and E. by the Mediterranean. The province derived its name from a small place near Perpignan, the capital, called Ruscino (Rosceliona, Castel Rossello), where the Gallic chieftains met to consider Hannibal's request for a conference. The district formed part of the Roman province of Gallia Narbonensis from 121 B.C. to A.D. 462, when it was ceded with the rest of Septimania to Theodoric II., king of the Visigoths. His successor, Amalaric, on his defeat by Clovis in 531 retired to Spain, leaving a governor in Septimania. In 719 the Saracens crossed the Pyrenees, and Septimania was held by them until their defeat by Pippin in 756. On the invasion of Spain by Charlemagne in 778 he found the borderlands wasted by the Saracenic wars, and the inhabitants hiding among the mountains. He accordingly made grants of land to Visigothic refugees from Spain, and founded several monasteries, round which the people gathered for protection. In 792 the Saracens again invaded France, but were repulsed by Louis, king of Aquitaine, whose rule extended over all Catalonia as far as Barcelona. The different portions of his kingdom in time grew into allodial fiefs, and in 893 Suniaire II. became the first hereditary count of Roussillon. But his rule only extended over the eastern part of what became the later province. The western part, or Cerdagne, was ruled in 900 by Miron as first count, and one of his grandsons, Bernard, was the first hereditary count of the middle portion, or Bésalu. In 1111 Raymond-Bérenger III., count of Barcelona, inherited the fief of Bésalu, to which was added in 1117 that of Cerdagne; and in 1172 his grandson, Alfonso II., king of Aragon, united Roussillon to his other states on the death of the last count, Gerard II. The counts of Roussillon, Cerdagne and Bésalu were not sufficiently powerful to indulge in any wars of ambition. Their energies had been devoted to furthering the welfare of their people. Under the Aragonese monarchs the progress of the united province still continued, and Collioure, the port of Perpignan, became a centre of Mediterranean trade. But the country was destined to pay the penalty of its position on the frontiers of France and Spain in the long struggle for ascendancy between these two powers. By the treaty of Corbeil (1258) Louis IX. surrendered the sovereignty of Roussillon and the ancient countship of Barcelona to Aragon, and from that time until the 17th century the province ceased to belong to France. James I. of Aragon had wrested the Balearic Isles from the Moors and left them with Roussillon to his son James (1276), with the title of king of Majorca. The consequent disputes of this monarch with his brother Pedro III. of Aragon were not lost sight of by Philip III. of France in his quarrel with the latter about the crown of the Two Sicilies. Philip espoused James's cause and led his army into Spain, but retreating died at Perpignan in 1285. James then became reconciled to his brother, and in 1311 was succeeded by his son Sancho, who founded the cathedral of Perpignan shortly before his death in 1324. His successor James II. refused to do homage to Philip VI. of France for the seigniory of Montpellier, and applied to Pedro IV. of Aragon for aid. Pedro not only refused it, but on various pretexts declared war against him, and seized Majorca and Roussillon in 1344. The province was now again united to Aragon, and enjoyed peace until 1462. In this year the disputes between John II. and his son about the crown of Navarre gave Louis XI. of France an excuse to support John against his subjects, who had risen in revolt. Louis turned traitor, and the province having been pawned to him for 300,000 crowns, was occupied by the French troops until 1493, when Charles VIII. restored it to Ferdinand and Isabella. During the war between France and Spain (1496–98) the people suffered equally from the Spanish garrisons and the French invaders. But dislike of the Spaniards was soon effaced in the pride of sharing in the glory of Charles V., and in 1542, when Perpignan was besieged by the dauphin, the Roussillonnais remained true to their allegiance. Afterwards the decay of Spain was France's opportunity, and on the revolt of the Catalans against the Castilians in 1641, Louis XIII. espoused the cause of the former, and the treaty of the Pyrenees in 1659 secured Roussillon to the French crown.

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ROUTH, EDWARD JOHN (1831–1907), English mathematician, was born at Quebec on the 20th of January 1831. At the age of eleven he came to England, and after studying under A. de Morgan at University College, London, entered Peterhouse, Cambridge, in 1851. In the mathematical tripos three years later he was senior wrangler, beating J. Clerk Maxwell, who, however, tied with him for the Smith's prize. Elected a fellow of his college, he devoted himself to teaching, and quickly proved himself one of the most successful mathematical "coaches" ever known at Cambridge. In thirty years, of some 700 pupils who passed through his hands 500 became wranglers; and for twenty-two successive years, from 1861 to 1882, the senior wrangler was trained by him. He made considerable contributions to scientific literature, and among his publications were: *An Analytical View of Newton's Principia*, with Lord Brougham (1855); an *Essay on the Stability of a given State of Motion*, which won the Adams' prize in 1877; and treatises on the *Dynamics of Rigid Bodies*, on *Analytical Statics*, and on the *Dynamics of a Particle*. He died at Cambridge on the 7th of June 1907.

ROUTH, MARTIN JOSEPH (1755–1854), English classical scholar, was born at South Elmham, Suffolk, on the 18th of September 1755. He was educated at Queen's College, Oxford, and subsequently elected to a fellowship at Magdalen, of which society he became president in 1791. He died at Oxford on the 22nd of December 1854, and retained his physical and intellectual powers to the last. He was the author of editions of the *Euthydemus* and *Gorgias* of Plato (1784), to which Dindorf declared himself indebted for his first ideas of Greek criticism, and of Bishop Burnet's *History of his Own Time* (2nd ed., 1833) and *History of the Reign of King James the Second* (1852). Routh was also an authority on patristic literature, his *Reliquiae Sacrae* (2nd ed., 1846–48), a collection of the fragments of the Fathers of the 2nd and 3rd centuries, and *Scriptorum ecclesiasticorum opuscula praecipua quaedam* (2nd ed., 1840) being valuable contributions to ecclesiastical knowledge.

See *Gentleman's Magazine*, 1855; J. W. Burgon, *Lives of Twelve Good Men* (1888).

ROUTLEDGE, GEORGE (1812–1888), English publisher, was born at Brampton in Cumberland on the 23rd of September 1812. He gained his earliest experience of business with a bookseller at Carlisle. Proceeding to London in 1833, he started in business for himself as a bookseller in 1836, and as a publisher in 1843, making his first serious success by reprinting the Biblical commentaries of an American writer, Albert Barnes. His fame as a publisher, however, rests chiefly upon the enormous number of cheap books which he issued. A series of shilling volumes called the "Railway Library" was an immense success, including as it did Mrs Harriet Beecher Stowe's *Uncle Tom's Cabin*, and he also published in popular form some of the writings of Washington Irving, Fenimore Cooper, Bulwer Lytton and Benjamin Disraeli. He also brought out a number of shilling books in "Routledge's Universal Library." Routledge died in London on the 13th of December 1888. After being styled Routledge, Warne & Routledge, his firm changed its name to that of George Routledge & Sons. A branch of the business was established in New York in 1854.

ROUVIER, MAURICE (1842–), French statesman, was born at Aix on the 17th of April 1842, and spent the early years of his manhood in business at Marseilles. He supported Gambetta's candidature there in 1867, and in 1870 he founded an anti-imperial journal, *L'Égalité*. Becoming secretary general of the prefecture of Bouches-du-Rhône in 1870–71, he refused the office of prefect. In July 1871 he was returned to the National Assembly for Marseilles at a by-election, and voted steadily with the Republican party. He became a recognized authority on finance, and repeatedly served on the Budget Commission as reporter or president. At the general elections of 1881 after the fall of the Ferry cabinet he was returned to the chamber on a programme which included the separation of Church and State, a policy of decentralization, and the imposition of an income-tax. He then joined Gambetta's cabinet as minister of commerce and the colonies, and in the 1883–85 cabinet of Jules Ferry he held the same office. He became premier and minister of finance on the 31st of May 1887, with the support of the moderate republican groups, the Radicals holding aloof in support of General Boulanger, who began a violent agitation against the government. Then came the scandal of the decorations in which President Grévy's son-in-law Daniel Wilson figured, and the Rouvier cabinet fell in the attempt to screen the president. Rouvier's opposition in his capacity of president of the Budget Commission was one of the causes of the defeat of the Floquet cabinet in February 1889. In the new Tirard ministry formed to combat the Boulangist agitation he was minister of finance. This portfolio he retained consecutively in the Freycinet, the Loubet and the Ribot cabinets, 1890–93. His relations with Cornélius Herz and the baron de Reinach compelled his retirement, however, from the Ribot cabinet at the time of the Panama scandals in December 1892. Again, in 1902, he became minister of finance, after nearly ten years in exclusion from office, in the Radical cabinet of M. Combes; and on the fall of the Combes ministry in January 1905 he was invited by the president to form a new ministry. In this cabinet he at first held the ministry of finance. In his initial declaration to the chamber the new premier had declared his intention of continuing the policy of the late cabinet, pledging the new ministry to a policy of conciliation, to the consideration of old age pensions, an income-tax, separation of Church and State. Public attention, however, was chiefly concentrated on foreign policy. During the Combes ministry M. Delcassé had come to a secret understanding with Spain on the Moroccan question, and had established an understanding with England. His policy had aroused German jealousy, which became evident in the asperity with which the question of Morocco was handled in Berlin. At a cabinet meeting on June 5th it is said that M. Rouvier reproached the Foreign Minister with imprudence in the matter of Morocco, and after a heated discussion M. Delcassé gave in his resignation. M. Rouvier himself took the portfolio of foreign affairs at this anxious juncture. He, after critical negotiations, secured on July 8th an agreement with Germany accepting the international conference proposed by the sultan of Morocco on the assurance that Germany would recognize the special nature of the interest of France in maintaining order on the frontier of her Algerian empire. Lengthy discussions resulted in a new convention in September, which contained the programme of the proposed conference, and in December M. Rouvier was able to make a statement of the whole proceedings in the chamber, which received the assent of all parties. M. Rouvier's government did not long survive the presidential election of 1906. The disturbances arising in connexion with the Separation Law were skilfully handled by M. Clemenceau to discredit the ministry, which gave place to a cabinet under the direction of M. Sarrien.

ROVERETO, the most important industrial town in the southern or Italian-speaking portion of the Austrian province of Tirol, though its population (which in 1900 was 10,180, Italian-speaking and Romanist) is less than that of Trent. It is also the principal town of the administrative district of Rovereto. Built on the left bank of the Adige, in the widest portion of the Val Lagarina (the name given to the Adige valley from Acquaviva, above Rovereto, to the Italian frontier), it is divided into two parts by the Leno torrent. It is on the Brenner railway, by which it is 15 m. S.W. of Trent and 41½ m. N. of Verona. Save in the newer quarter of the town, the streets are narrow and crooked, several being named after the most distinguished native of the place, Antonio Rosmini-Serbati (*q.v.*). The finest church is that of Santa Maria del Carmine, the old 14th-century church now serving as a sacristy to that built from 1678 to 1750. The church of San Marco dates from the 15th century. The town is dominated by the castle (now used as barracks), which was reconstructed in 1492 by the Venetians, after it had been burnt in 1487 by the count of Tirol. The staple silk industry (which dates from the 16th century) has declined, the number both of *filande* (establishments wherein the cocoons are unwound) and of *filatoje* (those wherein the silk is spun) having diminished.

In 1132 the emperor Lothair found the passage of the gorge above the site of the town barred by a castle, which he took and gave to one of his Teutonic followers, the ancestor of the Castelbarco family. Towards the middle of the 13th century that family obtained by marriage the lands of the Lizzana family (whose castle rises S. of the town), and in 1300 practically founded the town and surrounded it with walls. In 1416 it was taken by the Venetians, who in 1487 successfully resisted, at Calliano, an attempt to take it made by the count of Tirol and the bishop of Trent. In 1509, at the outset of the war of the League of Cambray, the town gave itself voluntarily to the emperor Maximilian, to whom it was ceded formally by Venice in 1517, and next year incorporated with Tirol. South of Rovereto is the village of Marco, near which are certain natural remains (either those of a landslip that occurred in 883, or of a glacier moraine) believed to have been described by Dante (*Inf.* xii. 4–9), who is said to have spent part of the year 1304, during his exile from Florence, in the castle of Lizzana, between Marco and Rovereto. (W. A. B. C.)

ROVIGNO, a seaport of Austria, in Istria, 75 m. S. of Trieste by rail. Pop. (1900) 10,205, mostly Italian. It is situated on the west coast of Istria, and possesses an interesting cathedral, built on the summit of the promontory Monte di Sant' Eufemia. Its campanile, built after the model of the famous campanile in Venice, is crowned with a bronze statue of St Eufemia, the patron saint of the town, whose remains are preserved in the church. It contains a station of the Berlin Aquarium, with a fine collection of the fauna of the Adriatic Sea. In the neighbourhood are vineyards, which produce the best wine in Istria, and olive gardens, while its hazel-nuts are reputed the finest in the world. Rovigno is the principal centre of the Austrian tunny and sardine fishery. The industries, in addition to shipbuilding and the preservation of fish, include the manufacture of tobacco, cement, macaroni and similar preparations, and flour. There is an active export trade. Its inhabitants are renowned seamen. Rovigno is the ancient *Arupenum* or *Rubinum*, and according to tradition it was originally built on an island, Cissa by name, which disappeared during the earthquakes about 737. Rovigno passed definitively into the hands of the Venetians in 1330, and it remained true to the republic till the treaty of Campo Formio (1797).

ROVIGO, a town of Venetia, Italy, capital of the province of Rovigo. It stands on the low ground between the lower Adige and the lower Po, 50 m. by rail S.W. of Venice and 27 m. S.S.W. of Padua, and on the Adigetto Canal, 17 ft. above sea-level. Pop. (1901) 6038 (town); 10,735 (commune). It is a station on the line between Bologna and Padua, with branches to Legnago and Chioggia. The architecture of the town bears the stamp both of Venetian and of Ferrarese influence. The cathedral church of Santo Stefano (1696) is of less interest than La Madonna del Soccorso, an octagon with a fine campanile, begun in 1594 by Francesco Zamberlano of Bassano, a pupil of Palladio. The town hall contains a library including some rare early editions, belonging to the Accademia de' Concordi, founded in 1580, and a fair picture gallery enriched with the spoils of the monasteries. The Palazzo Roncali is a fine Renaissance building by Sanmicheli (1555). Two towers of its medieval castle remain. Wool, silk, linen and leather are among the local manufactures.

Rovigo (Neo-Latin *Rhodigium*) appears to be mentioned as Rodigo in 838. It was selected as his residence by the bishop of Adria on the destruction of his city by the Huns. From the 11th to the 14th century the Este family was usually in authority; but the Venetians took the place by siege in 1482 and retained possession of it by the peace of 1484, and though the Este more than once recovered it, the Venetians, returning in 1514, retained possession till the French Revolution. In 1806 the city was made a duchy in favour of General Savary. The Austrians in 1815 created it a royal city. (T. As.)

ROVUMA, a river in East Africa, forming during the greater part of its course the boundary between German and Portuguese territory. The lower Rovuma is formed by the junction in 11° 25′ S., 38° 31′ E. of two branches of nearly equal importance, the longer of which, the Lujenda, comes from the south-west, the other, which still bears the name Rovuma, from the west. Its source lies on an undulating plateau, 3000 ft. high, immediately to the east of Lake Nyasa, in 10° 45′ S., 35° 40′ E., the head-stream flowing first due west before turning south and east. In its eastward course the Rovuma flows near the base of the escarpment of an arid sandstone plateau to the north, from which direction the streams, which have cut themselves deep channels in the plateau edge, have almost all short courses. On the opposite bank the Rovuma receives, besides the Lujenda, the Msinje and Luchulingo, flowing in broad valleys running from south to north. The Lujenda rises in close proximity to Lake Chilwa, in the small Lake Chiuta (1700 ft.), the swamps to the south of this being separated from Chilwa only by a narrow wooded ridge. The stream which issues from Chiuta passes by a swampy valley into the narrow Lake Amaramba, from which the Lujenda finally issues as a stream 80 yds. wide. Lower down it varies greatly in width, containing in many parts long wooded islands which rise above the flood level, and are often inhabited. The river is fordable in many places in the dry season. At its mouth it is about a mile wide. The lower Rovuma, which is often half a mile wide but generally shallow, flows through a swampy valley flanked by plateau escarpments containing several small backwaters of the river. The mouth, which lies in 10° 28′ S., 40° 30′ E., is entirely in German territory, the boundary near the coast being formed by the parallel of 10° 40′. The length of the Rovuma is about 500 m.

ROW, JOHN (*c.* 1525–1580), Scottish reformer, was born near Stirling and educated in that town and at St Andrews, where he began to practise as an advocate in the consistorial court. In 1550 he was sent to Rome in the interests of John Hamilton, archbishop of St Andrews, and attracted the notice of the highest authorities, who, when his failing health drove him back to Scotland in 1558, nominated him papal nuncio to inquire into the spread of heresy in that country. That inquiry ultimately led him to change his faith. Much influenced by Knox's preaching, he joined the reformers and in April 1560 was admitted minister of Kennoway in Fife, and in July of the same year minister of the Old or Middle Church at Perth. He was one of the commission of six who drew up the "Confession of Faith" and the "First Book of Discipline," and during the struggle with Queen Mary was often employed on important engagements. He was moderator of the Church Assembly at Edinburgh in July 1567 and at Perth in the following December, and again in Edinburgh 1576 and Stirling 1578. Meanwhile he helped to compile the "Second Book of Discipline," and became more than ever opposed to the Episcopal system of church government. He was a considerable scholar and is said to have been the first to teach Hebrew in Scotland. He died at Perth on the 16th of October 1580.

His son JOHN ROW (1568–1646), minister of Carnock, wrote a *Historie of the Kirk of Scotland 1558 to 1637*, which was continued to 1639 by his son, the third John Row (*c.* 1598–*c.* 1672), rector of the Perth grammar school and then (appointed by Cromwell) principal of King's College, Aberdeen, who, with his father and grandfather was a famous Hebraist, but left the Church of Scotland to become an Independent minister. This *Historie* was published by the Wodrow Society and by the Maitland Club in 1842.

ROWE, NICHOLAS (1674–1718), English dramatist and miscellaneous writer, son of John Rowe (d. 1692), barrister and serjeant-at-law, was baptized at Little Barford in Bedfordshire on the 30th of June 1674. Nicholas Rowe was educated at Westminster School under Dr Busby. He became in 1688 a King's Scholar, and entered the Middle Temple in 1691. On his father's death he became the master of an independent fortune. His first play, *The Ambitious Stepmother*, the scene of which is laid in Persepolis, was produced in 1700, and was followed in 1702 by *Tamerlane*. In this play the conqueror represented William III., and Louis XIV. is denounced as Bajazet. It was for many years regularly acted on the anniversary of William's landing at Torbay. *The Fair Penitent* (1703), an adaptation of Massinger and Field's *Fatal Dowry*, was pronounced by Dr Johnson to be one of the most pleasing tragedies in the language. In it occurs the famous character of Lothario, whose name passed into current use as the equivalent of a rake. Calista is said to have suggested to Samuel Richardson the character of Clarissa Harlowe, as Lothario suggested Lovelace. In 1704 Rowe tried his hand at comedy, producing *The Biter* at Lincoln's Inn Fields. The play is said to have amused no one except the author, and Rowe returned to tragedy in *Ulysses* (1706). *The Royal Convert* (1707) dealt with the persecutions endured by Aribert, son of Hengist and the Christian maiden Ethelinda. *The Tragedy of Jane Shore*, which was played at Drury Lane with Mrs Oldfield in the title-rôle in 1714, ran for nineteen nights, and kept the stage longer than any of his other works. *The Tragedy of Lady Jane Grey* followed in 1715. Rowe's friendship with Pope, who speaks affectionately of his vivacity and gaiety of disposition, led to attacks inspired by the publisher Edmund Curll, the best known of these being *The New Rehearsal, or Bays the Younger, containing an Examen of Seven of Rowe's Plays*, by Charles Gildon. Rowe acted as under-secretary (1709–11) to the duke of Queensberry when he was principal secretary of state for Scotland. On the accession of George I. he was made a surveyor of customs, and in 1715 he succeeded Nahum Tate as poet laureate. He was also appointed clerk of the council to the prince of Wales, and in 1718 was nominated by Lord Chancellor Parker as clerk of the presentations in Chancery. He died on the 6th of December 1718, and was buried in Westminster Abbey. He was twice married, and his widow received a pension from George I. in 1719 in recognition of her husband's translation of Lucan. This verse translation, or rather paraphrase of the *Pharsalia*, was called by Samuel Johnson "one of the greatest productions in English poetry," and was widely read, running through eight editions between 1718 and 1807.

Rowe was the first modern editor of Shakespeare. It is unfortunate that he based his text (6 vols., 1709) on the corrupt Fourth Folio, a course in which he was followed by later editors. We owe to him the preservation of a number of Shakespearian traditions, collected for him at Stratford by Thomas Betterton. These materials he used with considerable judgment in the memoir prefixed to the *Works*. Moreover, his practical knowledge of the stage suggested technical improvements. He divided the play into acts and scenes on a reasonable method, noted the entrances and exits of the players, and prefixed a list of the *dramatis personae* to each play. Rowe wrote occasional verses addressed to Godolphin and Halifax, adapted some of the odes of Horace to fit contemporary events, and translated the *Caractères* of La Bruyère and the *Callipaedia* of C. Quillet. He also wrote a memoir of Boileau prefixed to a translation of the *Lutrin*.

Rowe's *Works* were printed in 1727, and in 1736, 1747, 1756, 1766 and 1792; his occasional poems are included in Anderson's and other collections of the British poets.

ROWEL (from O. Fr. *rouel* or *roel*, dim. of *roue*, Lat. *rota*, wheel), the name of the small revolving wheel or disk with radiating points forming the termination of a rider's spur. The earliest rowels probably did not revolve but were fixed. They appear on monuments of the 13th century, as in the great seal of Henry III. of England, but the older "prick" spurs remained the standard form till the 14th century (see Spur). In veterinary science, the word is used of a small disk of leather or other material used as a seton.

ROWING (O. Eng. *rōwan*, to row, cf. Lat. *remus*, Gr. *ἐρετμός*, oar), the act of driving forward or propelling a boat (*q.v.*) along the surface of the water by means of oars.

History.—The earliest historical records describe battles and voyages in which the ships were propelled by oars. There must, of course, have been from time to time friendly trials of speed between these ancient craft, such as that described by Virgil in the fifth book of the *Aeneid*, but there is no record in classical or even in medieval times of rowing having been indulged in solely as a recreation, or as a means of promoting athletic contest. The absence of any element of competition is sufficient to account for the fact that the boats, the oars, and the method of rowing of the 17th century differed but little from those of the earliest times.

The history of Great Britain abounds in instances of the use of the oar. The ancient Britons propelled themselves in coracles of wickerwork covered with skins, by means of paddles rather than oars, but the Saxons were expert oarsmen, as also were the Danish and Norwegian invaders. It is recorded by William of Malmesbury that Edgar the Peaceable was rowed in state on the river Dee by eight tributary kings, himself acting as coxswain.

During the 11th and 12th centuries, when roads were often impassable, considerable use was made of the various rivers of England for the transmission of both passengers and merchandise; and, until the introduction of coaches, the nobility and gentry who had mansions and watergates on the banks of the Thames relied almost entirely upon their boats and elaborately fitted barges as a means of conveyance from place to place.

This use of boats and barges as a means of conveyance for merchandise and passengers provided a means of livelihood for a class of professional oarsmen known as bargemen or watermen. They were professionals, not in the sense of professional athletes, but because they made their living by rowing and navigating passenger and other craft along and across the Thames. Watermen as a class are mentioned in history as early as the 13th century. The distress occasioned to them by the long frosts is referred to in the chronicles of that period. They are mentioned as having been employed to row the barons and their retinues to Runnymede for the signing of the Magna Carta by King John, and about the same time several of the city companies established barges for the purposes of processions and other pageants upon the Thames. It is stated by Fabian that in 1454 "Sir John Norman, then lord mayor of London, built a noble barge at his own expense and was rowed by watermen with silver oars, attended by such of the city companies as possessed barges, in a splendid manner." The lord mayor's procession by water to Westminster was annual until 1856, the state barge of the lord mayor being a magnificent species of shallop rowed by watermen, while those of the city companies were propelled by a double bank of oars in the fore half, the after part consisting of a cabin which somewhat resembled that of a gondola. In 1514 and in 1555 acts of parliament were passed for the regulation of watermen and their boats and fares upon the Thames (7 Henry VIII. cap. vii. and 2 and 3 Ph. & Mar. cap. xvi.), and from the terms of these statutes there can be no doubt that there were in the 15th century a considerable body of men who lived by the "trade of Rowing" as it is there called. During the 16th and 17th centuries there were no doubt competitions from time to time between these watermen, but the first actual mention of boat-racing is the record of the establishment in 1715 of Doggett's Coat and Badge. Mr Thomas Doggett, who may fairly be described as the founder of modern boat-racing, was a celebrated comedian. He established a fund to provide an annual prize of a waterman's coat with a large silver badge on the arm. The race was founded in honour of the house of Hanover and to commemorate the anniversary of "King George I.'s happy accession to the throne of Great Britain." The contest was to take place at the beginning of August and on the Thames between six young watermen who were not to have exceeded the time of their apprenticeship by more than twelve months. Although the first race took place in 1715 the names of the winners have only been preserved since 1791. Doggett's Coat and Badge is still an annual event, the conditions as to boats to be used and other details having been slightly modified. It is entirely controlled and managed by the Fishmongers' Company.

The first English regatta (Ital. *regata*)—an entertainment introduced, as the *Annual Register* records, from Venice—of which we have evidence, took place on the Thames off Ranelagh Gardens in 1775. Great public interest seems to have been taken in the spectacular aspect of this pageant, the barges of the lord mayor and the city companies being present, but there is no record of the competing wager boats or of the names of the watermen who took part in the races.

About the years 1800 to 1810 there are instances of matches between watermen for stakes presented by gentlemen who no doubt made wagers upon the result, and from these professional wager matches it was but a short step to sporting matches between the gentlemen themselves. When once the "gentleman amateur," as he was called, appeared, his evolution, from the sportsman who occasionally rowed a match against a friend, or against time, for a wager, to the amateur oarsman of the present day, was not slow. The amateur rowing which began about the year 1800 on the Thames at Westminster has flourished as a branch of athletic sport, and has spread to every quarter of the globe.

Rowing in the United Kingdom.—The earliest rowing clubs in England were small groups of oarsmen who combined to purchase a six-oared or eight-oared boat for the purpose of racing. The club was called by the same name as the ship it possessed, and at the commencement of the 19th century the principal clubs in existence upon the Thames were the "Star," the "Arrow," the "Shark" and the "Siren." The two latter have long since disappeared, but the "Star" and the "Arrow" combined about the year 1818 and founded the Leander Club, an institution which after varying fortunes has for many years been recognized as the premier rowing club of the world.

The earliest contemporary record of boat-racing is the Water Ledger of Westminster School, which commences in the year 1813 with a list of the crew of the six-oared boat "Fly." In 1811 Eton had a ten-oared boat and three boats with eight oars, but there is no existing record of a race until 1817. In 1818 Eton challenged Westminster School to row from Westminster to Kew Bridge against the tide; but the race was stopped by the authorities, and it was not until 1829 that the first contest between the two schools took place. Between 1829 and 1847 there were eight matches between Eton and Westminster. The race was revived for a few years in the sixties, and in the year 1868 the state of the lower tideway was such that the Westminster boys moved their boathouse first to Wandsworth and then to Putney. This arrangement was found to be inconvenient, and shortly afterwards Westminster rowing came to an end. Eton rowing, on the other hand, has continued to prosper, and for many years it has been the greatest "nursery" of first-class oarsmen. Since 1861 the Eton College Boat Club has never failed to enter a crew at Henley Regatta.

At Oxford the records of periodical races between college boats begin as early as 1815, and those of Cambridge a few years later. The first contest between eight-oared crews representing the two universities took place at Henley-on-Thames in June 1829. The second contest was not until 1836, and was rowed from Westminster to Putney. In 1837 and 1838 the universities were unable to make a match, and in each of those years a race was rowed between Cambridge and the Leander Club, which had thus early become the premier club of the tideway. It was not always easy in the early days of boat-racing for the university boat clubs to agree as to the conditions and time of the match, but on several occasions when the universities had been unable to meet on the tideway they fought their battle whilst competing for the Grand Challenge Cup at Henley Regatta. Since 1856 the Oxford and Cambridge boat race has been an annual event. It is rowed about a week or ten days before Easter from Putney to Mortlake over what is known as the championship course, a distance of 4¼ m. The race is rowed with the flood-tide, and occupies as a rule a time varying between 19 and 22 min. The time occupied by a crew in covering this course depends a great deal more upon the conditions of wind and tide than upon the excellence, or the reverse, of the crew. The crew of each university is selected by a president, usually one of the senior members of the last crew, who is elected at the first meeting in the summer term and holds office for a year. Thus the university race comes at the end of his term of office, and he has every opportunity during the summer and autumn of studying the material which will be at his disposal for the formation of a crew in the ensuing spring. The aquatic arrangements at the two universities are very much alike. The university year begins in October. During the winter term the freshmen are instructed in the elements of rowing, while the senior men are engaged in practising for the University (inter-collegiate) Fours, a race which takes place early in November. During the latter portion of the term the president of the University Boat Club is engaged in selecting and coaching the trial eights, two picked crews comprising the bulk of the material available for the formation of the university crew. The trial eight races are rowed in the beginning of December, that of Cambridge on the Ouse at Ely, and that of Oxford on the Thames at Moulsford, neither the Cam nor the Isis being wide enough for two crews to race abreast. During the whole of the Easter term the university crews are engaged in practice and training for the University Boat Race. The attention of the remainder of the rowing men at the universities is devoted to training for the bumping races known at Oxford and Cambridge respectively as the Torpids and Lent Races. Each college is represented in these races, and no oarsman who has rowed in the first boat of his college during the previous summer is qualified to compete. The boats start at fixed distances apart, and each boat endeavours to bump the boat in front of it, and to avoid being bumped by the boat behind. When a bump is effected, the two boats involved draw to the side, and the next night the successful boat starts in front of its victim. Each spring the boats start in the order in which they finished the previous year. The races last for six nights at Oxford and four at Cambridge. In the summer term the important bumping races between the best crews of each college take place. They are known as "The Eights" at Oxford and "The May Races" at Cambridge. To attain the position of "Head of the River" in these races is the summit of a college boat club's ambition.

The great arena of rowing contests is Henley Royal Regatta. It was founded in 1839 at a public meeting held in the town hall at Henley-on-Thames, at which it was decided to raise a subscription and purchase two challenge cups, the Grand Challenge Cup to be rowed for annually in eight-oared boats open to all amateur crews, and the Town Challenge Cup for four-oared crews residing within 5 m. of Henley. The first regatta was held on the 14th of June 1839, and was a most successful affair, the Grand Challenge Cup being won by the Trinity Boat Club, Cambridge. In 1840 another district race was added, and in 1841 the Stewards Challenge Cup for four oars was added to the programme, open to competition upon the same conditions as the Grand Challenge Cup. There have now for many years been eight events at the regatta, four of which are open to all amateurs, viz. the Grand Challenge Cup for eight oars, the Stewards Challenge Cup for fours, the Silver Goblets for pair oars founded in 1845, and the Diamond Sculls for single scullers founded in 1844. The races for which the entry is restricted are the Ladies Challenge Plate for eight oars (founded 1845) and the Visitors Challenge Cup for four oars (founded 1847), which are open to crews from schools and colleges in the United Kingdom; also the Thames Challenge Cup for eight oars (founded 1868) and Wyfold Challenge Cup for four oars (founded 1855). The rule as to entry for the Thames Cup is that no one who has won the Grand Challenge or Stewards Cup may compete, nor may any one enter for this race and for the Grand or Stewards Cups in the same year. The rule for the Wyfold Cup is the same, except that a competitor may also enter for the Grand Challenge Cup.

The original regatta course was from the upper end of the Temple Island to Henley Bridge, but a change was made in 1886 so as to avoid the corner at the finish. The races now start at the lower end of the island and finish at the upper end of the grounds of Phyllis Court. The course is 1 m. 550 yds. in length and about 110 ft. in width. The races are rowed against the stream, and the time usually occupied by the winning crew of the Grand Challenge Cup is within a few seconds of 7 min. In 1843 took place the famous "seven-oar" victory of Oxford. At the eleventh hour one of the Oxford crew was incapacitated by illness. Their opponents, the Cambridge Subscription Rooms Club, refused to allow them to introduce a substitute, and the Oxford men gained undying fame by winning the Grand Challenge Cup with seven oars. Ten years later (1853) there was a magnificent race between Oxford and Cambridge in the Grand Challenge Cup, the former winning by 18 in. only. In 1862 there was a dead heat in the final heat of the Diamond Sculls between Mr E. D. Brickwood and Mr W. B. Woodgate. In 1878 occurred the memorable contest between Mr T. C. Edwards-Moss and Mr G. W. Lee (U.S.A.) in a heat for the Diamond Sculls which was won on the post by the former. In 1891 the Leander Club, after a dead heat with the Thames R.C., began a series of victories in the Grand Challenge Cup, winning the cup on seven occasions in the next ten years. In 1892 the Diamond Sculls left England for the first time, having been won by Mr J. J. K. Ooms of Holland. In 1895 a crew representing Cornell University, U.S.A., entered for the Grand Challenge Cup and were drawn in their heat against the Leander Club. Owing to a misunderstanding between the starter and the Leander crew, the latter failed to start, and the Cornell crew rowed on to the finish without offering to return to the start, a proceeding which caused no little comment at the time. On the following day they were defeated by Trinity Hall, Cambridge, the ultimate winners. In 1897 the Grand Challenge Cup was won by 2 ft. by New College, Oxford, in the record time of 6 min. 51 secs., after a desperate race with Leander. The feature of the next ten years was the persistency with which colonial and foreign crews endeavoured to carry off the principal prizes of the regatta, and the invasion culminated in 1906 by the capture of the Grand Challenge Cup by a crew from the Club Nautique de Gand, Belgium. On this occasion the Leander Club was not represented, but in 1907 the Belgians repeated their victory after defeating a strong Leander crew in one of the heats. In 1903 Mr Herbert Steward, the chairman of the regatta committee, published a detailed record of the regatta from its commencement, which gives a complete history of the meeting and an account of every race.

Henley regatta is rowed "in accordance with" the rules of the Amateur Rowing Association, a body which has control of all other amateur rowing in England. The Henley Stewards and the Amateur Rowing Association (or A.R.A.) are in complete harmony. Their rules are identically the same, but the Stewards being the older body are not subject to the A.R.A., and in the improbable event of a difference occurring they would be entitled to act independently. The A.R.A. was formed in 1882 for the purpose of drawing up a definition of an "amateur," and for the purpose of having a body who could if necessary select a national representative crew to meet any foreign or colonial invaders. It has long since dropped the latter portion of its original programme, and the A.R.A. as at present constituted is an association to which all the principal amateur boat clubs are affiliated. Its objects are to maintain the standard of amateur oarsmanship and to promote the interests of boat racing. It is governed by a committee which occupies in the British rowing world a position not unlike that of the stewards of the Jockey Club in racing matters. The constitution and objects of the A.R.A. are clearly defined in the rules, and their definition of an amateur is so much stricter than that of some other countries that it is advisable to set it out *in extenso*. It is as follows:—

No person shall be considered an amateur oarsman, sculler or coxswain—

(1) Who has ever rowed or steered in any race for a stake, money or entrance fee;

(2) Who has ever knowingly rowed or steered with or against a professional for any prize;

(3) Who has ever taught, pursued or assisted in the practice of athletic exercises of any kind for profit;

(4) Who has ever been employed in or about boats or in manual labour for money or wages;

(5) Who is or has been by trade or employment for wages a mechanic, artisan or labourer, or engaged in any menial duty;

(6) Who is disqualified as an amateur in any other branch of sport.

The rules of the A.R.A. also comprise the "Laws of Boat Racing," which govern the race from start to finish; and the "Rules for Regattas," which deal with a large number of matters such as the definition of the different classes of oarsmen, seniors, juniors and maidens, the making of entries, the powers of regatta committees, &c.

A large number of regattas are held under these rules in all parts of the country during the summer months. There are also several matches and other competitions rowed under special rules, the most important of these being the Wingfield Sculls (founded 1830), or amateur championship of the Thames, rowed in the month of July over the championship course from Putney to Mortlake (4¼ m.).

If the number of entries at Henley Regatta, the extension of the sphere of influence of the A.R.A. and the public interest in the Oxford and Cambridge Boat Race, may be taken as tests, rowing has more than held its own among the various competing forms of recreation in the world of British amateur athletic sport.

Rowing in the United States.—The earliest record of a boat race in the United States is that of a contest in light barges in the year 1811 between the "Knicker-bocker" of New York and the "Invincible" of Long Island, in which the former was successful. The evolution from racing in heavy pleasure boats to racing in specially constructed craft proceeded with great rapidity, and by the year 1834 a large number of small clubs in New York had combined, under the title of the Castle Garden Boat Club Association. In 1837 the first regatta took place at Poughkeepsie, the race being between "six-oars" for a prize of $200. In those days there was no real distinction in America between amateur and professional, and in spite of rules and definitions the distinction between one who is qualified as an amateur and one who is not has remained in America much less certain and precise than in the United Kingdom.

Yale and Harvard Universities became centres of aquatic energy very early in the history of American rowing. The first racing boat at Yale, a six-oar, was bought in 1844, and in the following spring Harvard purchased an eight, and in 1852 a race was rowed between a Harvard crew and three Yale crews at Lake Winnepesaukee, which resulted in a victory for the former. In 1859 Harvard again defeated Yale in a six-oared race, but on the following day at Worcester City Regatta the same crews entered for a prize and Yale defeated Harvard. In 1864 at a college regatta Yale defeated Harvard, but in 1866 Harvard with a very fine crew showed their superiority over all the other colleges. In 1869 Harvard sent a challenge to Oxford and Cambridge to row a four-oared match on the Thames from Putney to Mortlake. It was accepted by the former and the race was rowed on the 27th of August. The race aroused great public interest, and the banks of the river were crowded from end to end of the course. The crews were: *Oxford*, F. Willan (bow), A. C. Yarborough, J. C. Tinné and S. Darbishire (stroke); *Harvard*, J. S. Fay (bow), E. G. Lyman, W. H. Simmons and A. P. Loring (stroke). Harvard led at first, but Oxford eventually rowed them down and won by three lengths.

The trip of the Harvard four to England aroused the rowing enthusiasm of other American universities such as Princeton, Cornell, Columbia and Pennsylvania, and during the next ten years considerable improvement was shown in American rowing. In 1875 no fewer than thirteen university or college crews competed in a race, in which Cornell finished first, Columbia second and Harvard third, the ships used being six-oars without coxswains. In 1876 the eight-oared match over a four-mile course between Harvard and Yale was instituted, and in 1878 a four from Columbia University went to Henley and won the Visitors Challenge Cup. In 1879 and 1880 there were a very large number of inter-collegiate matches and regattas, in several of which Columbia maintained the reputation which they had gained at Henley. In 1881 a Cornell four started at Henley for the Stewards Cup, but were easily beaten. During the next few years there was considerable difference of opinion between universities as to the correct style of stroke, and in 1882 a Yale crew, coached by Mr Davis, did some fine performances, rowing a very fast short stroke in a very long boat. They were, however, eventually beaten by Harvard after an exciting race, in which it is only fair to them to record that the erratic steering of their coxswain contributed in no small degree to their defeat. The next year, 1883, Yale tried an even faster and shorter stroke, but were easily beaten by Harvard, who rowed with great length and steadiness. This year saw the end of the very fast short stroke, and although the "strokes" of the various crews since that day have differed in minor degrees, they settled down to a longer steadier method of rowing which is spoken of in England as the "American style." It differs from that adopted by English oarsmen in that there is an absence of swing and body work, and in that the oarsmen appear to rely almost entirely upon their long slides and hard leg work. In the early "nineties" Cornell was almost always successful at home, and in 1895 they entered for the Grand Challenge Cup at Henley. Owing to a misunderstanding at the start the Leander crew were left at the post in the first heat, but on the next day Cornell suffered defeat at the hands of Trinity Hall. In 1896 Yale entered at Henley under the tuition of Cook, but were somewhat easily beaten by Leander. The result of these two expeditions to Henley was an attempt to introduce the English style of rowing in America. The experiment was not altogether successful. Mr R. C. Lehmann, who had met with considerable success in England as a coach both at Oxford and Cambridge, went to Harvard for two seasons. The attempt to instruct the American oarsmen in the English methods of swing and body work, instead of the American stroke, resulted in their falling short of perfection in either style, and they were beaten by Yale upon each occasion. Mr Lehmann's visit, if it failed to give pace to the crews he coached, resulted, however, in improving the whole spirit of American college rowing. Mutual confidence and friendly rivalry took the place of the atmosphere of suspicion and almost of enmity which had at times existed between Harvard and Yale. In 1895 an Inter-collegiate Rowing Association was formed by

Cornell, Columbia and Pennsylvania to organise contests at Poughkeepsie open to all colleges. In 1899 and 1900 Pennsylvania won, in 1902, 1904 and 1908 Syracuse, and in most other years Cornell. The two annual inter-collegiate regattas are the Harvard-Yale at New London, and that at Poughkeepsie, open to all but not participated in by Harvard and Yale. By way of exception, Harvard rowed at Poughkeepsie in 1896, and in 1897 and 1898 Cornell rowed in two regattas. In 1901 Pennsylvania was just beaten by Leander Club in the race for the Grand Challenge Cup at Henley.

The history of amateur rowing in the United States, other than that of the colleges and universities, is a narrative of continual struggles on the part of the authorities to distinguish between the amateur and the non-amateur. The National Association of Amateur Oarsmen was established in 1872. Many regattas have been held since that date under their rules, but the standard of amateurism which satisfied the N.A.A.O. has never been strict enough to comply with the requirements of the English A.R.A. or the Henley Stewards. In 1883 a Hillsdale four from U.S.A. tendered an entry at Henley, but it was refused by the Stewards, on the ground that the men were not amateurs according to the English definition. In subsequent years several American scullers entered for the Diamond Sculls, and in 1897 they were won by E. H. Ten-Eyck of Wachusett Boat Club, Worcester, U.S.A. In 1898 Ten-Eyck's entry was refused by the Henley Stewards. No little resentment has been caused in America by the reluctance of the English authorities to accept American entries, but their justification lies in the essential difference, not only in letter but in spirit, between the laws and customs of the two countries with regard to the amateur status and amateur sport. In 1904 a crew of the Vesper B.C. of Philadelphia were duly vouched by the N.A.A.O. and their entry accepted by the Henley Stewards. They competed and were beaten, and it afterwards became known that not only had several of the men made money out of the trip, but that two or three of the oarsmen were not qualified to row at Henley. It also appeared that certain members of the N.A.A.O. had, to say the least of it, been extremely careless in giving assurances as to the status of the Vesper crew, and all relations between the N.A.A.O. and the Henley Stewards were abruptly terminated, the Stewards determining that they would not accept foreign entries except from a country where there was a governing body which had control of amateur rowing and which had an agreement with the Stewards by which they definitely pledged themselves not to send competitors to Henley unless they came within the English definition. In 1906 Harvard challenged Cambridge. The race, which attracted an immense concourse of spectators, was rowed from Putney to Mortlake in September. Cambridge led from the start and won by three lengths.

Rowing in other Countries.—During the latter years of the 19th century and during the early years of the present century, rowing increased very greatly in popularity as a branch of athletic sport in every quarter of the globe. It would be impossible here to describe the history or organization of boat clubs and regattas in Australia, in Canada, and in the various countries of Europe. Canadian rowing has always been of a high class. In 1904 L. Scholes, a Canadian sculler, won the Diamond Sculls at Henley, and on several occasions Canadian eights and fours have competed for the Grand Challenge and Stewards Challenge Cups at Henley. In Australia they have a regatta which is called the "Australian Henley," and an inter-university contest for a cup presented by Oxford and Cambridge oarsmen. In Europe international championships have been instituted in the hope of bringing together oarsmen and scullers from all countries. The Belgian oarsmen have by their Henley successes achieved the greatest distinction among continental oarsmen. In Holland the principal rowing clubs have their headquarters at Amsterdam, and several Dutch crews have been seen at Henley. In France there are innumerable rowing clubs which are now governed by the Fédération française, a body which has a strict code of rules, but which has not adopted quite so strict an amateur definition as that of the English A.R.A. In Germany, also, rowing is very extensively practised under the auspices of the Deutsche Ruderverband; the chief contests between English and German crews of recent years were at the Cork Regatta of 1902 when Leander Club defeated the Berlin Club in the eight-oared race, and at the Henley Regatta of 1907, when a four of the Ludwigshafener Club were defeated in a heat of the Stewards Cup by a Leander crew.

Methods and Style.—The English style is the only one in which the oarsman swings his body to the full extent fore and aft, at the same time making use of his sliding seat. Most of the foreign crews who have competed in England have sacrificed a portion of their swing in order to enable them, as they believe, to make better use of their leg work. There can be no doubt that the English style is in a sense more exhausting to the oarsman, that is to say it enables him to bring more muscle into play and to make full use of his weight and strength, but in spite of recent defeats it is still believed by English oarsmen to be the most effective. The crews of 1906 and 1907 which were defeated by the Belgians were the best that England could at the time produce, but they undoubtedly rowed in a style which fell a long way short of ideal English rowing.

The secret of good rowing is the simultaneous application of leg and body work from end to end of the stroke. The instant the blades are covered the whole weight must be lifted from the stretcher and applied to the oar-handle, and must remain so applied until the hands come in to the chest. In order to ensure that the pressure so applied to the blade shall be as long and as hard as possible, the body must be swung forward to its full extent, and during the stroke the shoulders must always be swinging back faster than the seat, while at the same time the legs are driving hard at the stretcher. The slide and swing should be finished simultaneously. There are many subsidiary rules of style as to the movements of the hands and arms, but they are all of secondary importance and are devised so as to enable the average man to execute the working portion of the stroke effectively and often, without undue exertion to himself. The movements of a crew must be as nearly as possible simultaneous in every particular. There have been many instances of crews which although inferior in style and strength to their opponents have been victorious owing to being "better together."

See the volumes on *Rowing* in the Badminton and Isthmian Libraries; W. E. Sherwood, *Oxford Rowing*; W. B. Woodgate, *Oars and Sculls*; E. D. Brickwood, *Boat Racing*; H. T. Steward, *Henley Royal Regatta.* (C. M. P.)

ROWLAND, HENRY AUGUSTUS (1848–1901), American physicist, was born at Honesdale, Pennsylvania, on the 27th of November 1848. From an early age he exhibited marked scientific tastes and spent all his spare time in electrical and chemical experiments. At the Rensselaer Polytechnic Institute at Troy, N.Y. he graduated in 1870, and he then obtained an engagement on the Western New York railway. But the work there was not to his liking, and after a short time he gave it up for an instructorship in natural science at the university of Wooster, Ohio, which in turn he resigned in order to return to Troy as assistant professor of physics. Finally, in 1876, he became the first occupant of the chair of physics at the Johns Hopkins University, Baltimore, a position which he retained until his premature death on the 16th of April 1901. Rowland was one of the most brilliant men of science that America has produced, and it is curious that at first his merits were not perceived in his own country. In America he was unable even to secure the publication of certain of his scientific papers; but Clerk Maxwell at once saw their excellence, and had them printed in the *Philosophical Magazine.* When the managers of the Johns Hopkins University asked advice in Europe as to whom they should make their professor of physics, he was pointed out in all quarters as the best man for the post. In the interval between his election and the assumption of his duties at Baltimore, he studied physics under Helmholtz at

Berlin, and carried out a well-known research on the effect of an electrically charged body in motion, showing it to give rise to a magnetic field. As soon as he was settled at Baltimore, two important pieces of work engaged his attention. One was a redetermination of the ohm. For this he obtained a value which was substantially different from that ascertained by the committee of the British Association appointed for the purpose, but ultimately he had the satisfaction of seeing his own result accepted as the more correct of the two. The other was a new determination of the mechanical equivalent of heat. In this he used Joule's paddle-wheel method, though with many improvements, the whole apparatus being on a larger scale and the experiments being conducted over a wider range of temperature. He obtained a result distinctly higher than Joule's final figure; and in addition he made many valuable observations on thermometrical questions and on the variation of the specific heat of water, which J. P. Joule had assumed to be the same at all temperatures. In 1882, before the Physical Society of London, he gave a description of the diffraction gratings with which his name is specially associated, and which have been of enormous advantage to astronomical spectroscopy. These gratings consist of pieces of metal or glass ruled by means of a diamond point with a very large number of parallel lines, on the extreme accuracy of which their efficiency depends. For their production, therefore, dividing engines of extraordinary trueness and delicacy must be employed, and in the construction of such machines Rowland's engineering skill brought him conspicuous success. The results of his labours may be found in the elaborate *Photographic Map of the Normal Solar Spectrum* (1888) and the *Table of Solar Wave-Lengths* (1898). In the later years of his life he was engaged in developing a system of multiplex telegraphy.

ROWLANDS, RICHARD (fl. 1560–1620), Anglo-Dutch antiquary, whose real name was Verstegen, was the son of a cooper whose father, Theodore Roland Verstegen, a Dutch emigrant, came to England about 1500. Under the name of Rowlands, Richard went to Christ Church, Oxford, in 1565, where he studied early English history and the Anglo-Saxon language. Leaving the university without a degree, he published in 1576 a work of antiquarian research, translated from the German, entitled *The Post of the World*, describing the great cities of Europe; and soon afterwards he moved to Antwerp, where he resumed the name of Verstegen, and set up in business as a printer and engraver. In 1587 he went to Paris, and in 1595 to Spain, where he studied in the college at Seville, afterwards returning to Antwerp, where he lived so far as is known until his death, the date of which, though certainly later than 1620, is unknown. Rowlands was a zealous Roman Catholic, and in 1587 he published at Antwerp *Theatrum Crudelitatum haereticorum*, in which he criticized the treatment of the Roman Catholics in England under Elizabeth so freely that when a French translation of the book appeared in the following year he was thrown into prison at the instance of the English ambassador in Paris. Many of his writings were published in the name of Verstegen. His works included *A Dialogue on Dying Well* (1603), a translation from the Italian; *Restitution of Decayed Intelligence in Antiquities concerning the English Nation*, dedicated to James I. (1605); *Neder Dvytsche Epigrammen* (1617); *Sundry Successive Regal Governments in England* (1620); *Spiegel der Nederlandsche Elenden* (1621). The verses on the defeat of the Irish rebels under Tyrone, entitled *England's Joy*, by R. R. (1601), is doubtfully attributed to him. Richard Verstegan, author of *Nederlantische Antiquiteyten* (Brussels, 1646), is probably another person, possibly Rowlands's son.

See Anthony à Wood, *Athenae Oxonienses*, edited by P. Bliss (4 vols., London, 1813–20); J. W. Burgon, *Life and Times of Sir T. Gresham* (2 vols., London, 1839); W. C. Hazlitt, *Collections and Notes* (London, 1882 and 1887).

ROWLANDS, SAMUEL (*c.* 1573–1630), English author of pamphlets in prose and verse, which reflect the follies and humours of the lower middle-class life of his time, seems to have had no contemporary literary reputation; but his work throws considerable light on the social London of his day. Among his works, which include some poems on sacred subjects, are: *The Betraying of Christ* (1598); *The Letting of Humours Blood in the Head-vaine* (epigrams and satires) and *A Mery Meetinge, or 'tis Mery when Knaves mete* (1600)—the two latter being publicly burnt by order, but republished later under other names—(*Humors Ordinarie* and *The Knave of Clubbes*); *Greenes Ghost haunting Conie-Catchers* (1602), which he pretended to have edited from Greene's papers, but which is largely borrowed from his printed works; *Tis Merrie when Gossips meete* (1602), a dialogue between a Widow, a Wife, a Maid and a Vintner; *Looke to it; for Ile stabbe ye* (1604), in which Death describes the tyrants, careless divines and other evil-doers whom he will destroy; *Hells broke loose* (1605), an account of John of Leyden, and in the same year a *Theatre of Divine Recreation* (not extant), poems founded on the Old Testament; *A Terrible Battell betwene . . . Time and Death* (1606); *Democritus, or Doctor Merry-man his Medicines against Melancholy humors*, reprinted, with alterations, as *Doctor Merrie-man*, and *Diogenes Lanthorne* (1607), in which "Athens" is London; *The Famous History of Guy, Earl of Warwick* (1607), a long romance in Rowlands's favourite six-lined stanza, and one of his hastiest, least successful efforts; *Humors Looking Glasse* (1608); and *Martin Mark-all, Beadle of Bridewell* (1610), a history of roguery containing much information about notable highwaymen and the completest vocabulary of thieves' slang up to that time. Of his later works may be mentioned *Sir Thomas Overbury; or the Poysoned Knights Complaint*, and *The Melancholie Knight* (1615), which suggests a hearing of Beaumont and Fletcher's *Knight of the Burning Pestle*. The last of his humorous studies, *Good Newes and Bad Newes*, appeared in 1622, and in 1628 he published a pious volume of prose and verse, entitled *Heavens Glory, Seeke it: Earts vanitie, Flye it: Hells Horror, Fere it.* After this nothing is known of him. Mr Gosse, in his introduction to Rowlands's complete works, edited (1872–80) for the Hunterian Club in Glasgow by Mr S. J. H. Herrtage, sums him up as a "kind of small non-political Defoe, a pamphleteer in verse whose talents were never put into exercise except when their possessor was pressed for means, and a poet of considerable talent without one spark or glimmer of genius."

Mr Gosse's notice is reprinted in his *Seventeenth Century Studies* (1883). A recently discovered poem by Rowlands, *The Bride* (1617), was reprinted at Boston, U.S.A., in 1905 by Mr A. C. Potter.

ROWLANDSON, THOMAS (1756–1827), English caricaturist, was born in Old Jewry, London, in July 1756, the son of a tradesman or city merchant. On leaving school he became a student in the Royal Academy. At the age of sixteen he resided and studied for a time in Paris, and he afterwards made frequent tours on the Continent, enriching his portfolios with numerous jottings of life and character. In 1775 he exhibited at the Royal Academy a drawing of "Delilah visiting Samson in Prison," and in the following years he was represented by various portraits and landscapes. Possessed of much facility of execution and a ready command of the figure, he was spoken of as a promising student; and had he continued his early application he would have made his mark as a painter. But by the death of his aunt, a French lady, he fell heir to a sum of £7000, plunged into the dissipations of the town and was known to sit at the gaming-table for thirty-six hours at a stretch. In time poverty overtook him; and the friendship and example of Gillray and Bunbury seem to have suggested caricature as a means of filling an empty purse. His drawing of Vauxhall, shown in the Royal Academy exhibition of 1784, had been engraved by Pollard, and the print was a success. Rowlandson was largely employed by Rudolph Ackermann, the art publisher, who in 1809–11 issued in his *Poetical Magazine* "The Schoolmaster's Tour"—a series of plates with illustrative verses by Dr William Coombe. They were the most popular of the artist's works. Again engraved by Rowlandson himself in 1812, and issued under the title of the "Tour of Dr Syntax in Search of the Picturesque," they had attained a fifth edition by 1813, and were followed in 1820 by "Dr Syntax in Search of Consolation," and in 1821 by the "Third Tour of Dr Syntax in Search of a Wife." The same Collaboration of designer, author and publisher appeared in the English "Dance of Death," issued in 1814–16, one of the most admirable of Rowlandson's series, and in the "Dance of Life," 1822. Rowlandson also illustrated Smollett, Goldsmith and Sterne, and his designs will be found in *The Spirit of the Public Journals* (1825), *The English Spy* (1825), and *The Humourist* (1831). He died in London, after a prolonged illness, on the 22nd of April 1827.

Rowlandson's designs were usually executed in outline with the reed-pen, and delicately washed with colour. They were then etched by the artist on the copper, and afterwards aqua-tinted—usually by a professional engraver, the impressions being finally coloured by hand. As a designer he was characterized by the utmost facility and ease of draughtsmanship, and the quality of his art suffered from this haste and over-production. He was a true if not a very refined humorist, dealing less frequently than his fierce contemporary Gillray with politics, but commonly touching, in a rather gentle spirit, the various aspects and incidents of social life. His most artistic work is to be found among the more careful drawings of his earlier period; but even among the exaggerated caricature of his later time we find hints that this master of the humorous might have attained to the beautiful had he so willed.

See J. Grego, *Rowlandson the Caricaturist, a Selection from his Works, &c.* (2 vols., 1880).

ROWLEY, WILLIAM (*c.* 1585–*c.* 1642), English actor and dramatist, collaborator with several of the dramatists of the Elizabethan period, especially with Thomas Middleton. He is not to be identified with "Master Rowley, once a rare scholar of learned Pembroke Hall in Cambridge," whom Francis Meres described in his *Palladis Tamia* as one of the "best for comedy." The only Rowley at Pembroke Hall at the period was Ralph Rowley, afterwards rector of Chelmsford. William Rowley is described as the chief comedian in the Prince of Wales's company, and it was doubtless during the two years' union (1614–16) of these players with the Lady Elizabeth's company that he was brought into contact with Middleton. Rowley joined the King's Servants in 1623, and retired from the stage about four years later. The fact of his marriage is recorded in 1637, and he is supposed to have died about 1642. Four plays attributed to his sole authorship are extant: *A new Wonder, A Woman never Vext* (printed, 1632); *A Match at Midnight* (1633); *A Tragedie called Alls Lost by Lust* (1633); and a *Shoomaker a Gentleman with the Life and Death of the Cripple that stole the Weathercock at Paules* (1638). They are distinguished by effectiveness of situation and ingenuity of plot, so that we may conjecture why he was in such request as an associate in play-making, and he had further an experimental knowledge of the coarse comedy likely to please the pit. It is recorded by Langbaine that he "was beloved of those great men Shakespeare, Fletcher and Jonson." The plays he wrote with Middleton are dealt with under that heading. With George Wilkins and John Day he wrote *The Travailes of the Three English Brothers* (1607); with Thomas Heywood he produced the romantic comedy of *Fortune by Land and Sea* (printed, 1655); he was associated with Thomas Dekker and John Ford in *The Witch of Edmonton*[1] (printed, 1658); *A Cure for a Cuckold* (printed, 1661) and *The Thracian Wonder* (printed, 1661) are assigned to the joint authorship of Webster and Rowley; while Shakespeare's name was unjustifiably coupled with his on the title-page of *The Birth of Merlin: or, The Childe hath found his Father* (1662). Rowley also wrote an elegy on Hugh Attwell, the actor, and a satirical pamphlet describing contemporary London, entitled *A Search for Money* (1609).

The dramatist Samuel Rowley, described without apparent reason by J. P. Collier as William Rowley's brother, was employed by Henslowe as a reader of plays. He wrote some scriptural plays now lost, with William Borne (or Bird, or Boyle)[2] and Edward Juby. His only extant pieces are: *When you see me, You know me. Or the famous Chronicle Historie of King Henry the eight, with the birth and vertuous life of Edward Prince of Wales* (1605), of interest because of its possible connexion with the Shakespearian play of *Henry VIII.*, and *The Noble Souldier. Or, A Contract Broken, justly reveng'd* (1634), which was entered, however, in the Stationers' Register as the work of Thomas Dekker, to whom the major share is probably assignable.

ROWLEY REGIS, an urban district in the Kingswinford parliamentary division of Staffordshire, England, on the Stourbridge branch of the Great Western railway, 7 m. W. of Birmingham, Pop. (1901) 34,670. It lies in a hilly district rich in coal and iron, while a hard basaltic intrusion known as Rowley rag is largely quarried. The town is a modern growth out of a village surrounding the church of St Giles, which dates from the 13th century, though rebuilt in 1840. Iron manufactures are extensive; there are also brick and tile works and breweries.

ROWLOCK (pronounced *rullock* or *rollock*), a device on the gunwale of a boat in or on which an oar rests, forming a fulcrum for the oar in rowing. The word is a corruption due to "row" of the earlier "oar-lock," O.E. *ārlōc*, a lock or enclosed place for an oar. The simplest form of rowlock is a notch, square or rounded, on the gunwale, in which the oar rests; other kinds are formed by two pins or pegs, "thole pins" (thole being ultimately the same word as Norw. *toll*, a young fir-tree), and by a swivel with two horns of metals, pivoted in the gunwale or on an outrigger (see Oar).

ROWTON, MONTAGUE WILLIAM LOWRY-CORRY, Baron (1838–1903), second son of the Right Hon. Henry Corry by his wife Harriet, daughter of the 6th earl of Shaftesbury, was born in London on the 8th of October 1838, educated at Harrow and at Trinity College, Cambridge, and called to the bar in 1863. His father, a son of the 2nd earl of Belmore, represented County Tyrone in parliament continuously for forty-seven years (1826–73), and was a member of Lord Derby's cabinet (1866–68) as vice-president of the council and afterwards as first lord of the Admiralty. Montague Corry was thus brought up in close touch with Conservative party politics; but it is said to have been his winning personality and social accomplishments rather than his political connexions that recommended him to the favourable notice of Disraeli, who in 1866 made Corry his private secretary. From this time till the statesman's death in 1881 Corry maintained his connexion with Disraeli, the relations between the two men being more intimate and confidential than usually subsist between a private secretary and his political chief. When Disraeli resigned office in 1868 Corry declined various offers of public employment in order to be free to continue his services, now given gratuitously, to the Conservative leader; and when the latter returned to power in 1874, Corry resumed his position as official private secretary to the prime minister. He accompanied Disraeli (then earl of Beaconsfield) to the congress of Berlin in 1878, where he acted as one of the secretaries of the special embassy of Great Britain. On the defeat of the Conservatives in 1880, Corry was raised to the peerage with the title of Baron Rowton, of Rowton Castle, Shropshire. He had rendered service of an exceptional order to his chief, and after Beaconsfield's removal to the House of Lords his private secretary became invaluable in keeping him in touch with the rank and file of his party. Lord Rowton was in Algiers when Beaconsfield was stricken with his last illness in the spring of 1881; but returning post-haste across Europe, he was present at the death-bed of his old chief. Beaconsfield (*q.v.*) bequeathed to Rowton all his correspondence and other papers.

Lord Rowton will long be remembered as the originator of the scheme known as the Rowton Houses. Consulted by Sir

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[1] It is usual to minimize Rowley's share in this play. Mr Seccombe (*Dict. Nat. Biog.*, *s.v.* Rowley) says: "Dekker appears to have had the chief share, but Rowley supplied some acceptable buffoonery." J. O. Halliwell-Phillipps (*Dict. of Old English Plays*), however, defined it as a tragi-comedy by William Rowley, adding that he had help from the other two.

[2] William Borne or Bird engaged to play with the Admiral's Men for three years from 1597. In 1600 he borrowed 30s. from Henslowe to pay for a new play, *Jugurth*, by W. Boyle (probably another name for himself). He helped S. Rowley in *Joshua* (1601), and in additions (1602) to Marlowe's *Dr Faustus*. His connexion with the theatre ceased about 1621.

Edward Guinness (afterwards Lord Iveagh) with regard to the latter's projected gift of £200,000 for endowment of a trust for the improvement of the dwellings of the working classes, Rowton made himself personally familiar with the conditions of the poorest inhabitants of London; and he determined to establish "a poor man's hotel," which should offer better accommodation than the common lodging-houses, at similar prices. In the face of much discouragement and difficulty, the first Rowton House was opened at Vauxhall in December 1892, the cost (£30,000) being defrayed by Lord Rowton, though he was by no means a man of great wealth. In 1894 a company, Rowton Houses (Limited), was incorporated to extend the scheme, a main characteristic of which was that the houses should not be charitable institutions but should be on a paying commercial basis. The scheme proved a gratifying success, and was imitated not only in many of the chief towns of Great Britain, but also in different countries of Europe and in America (see HOUSING). Lord Rowton also devoted himself to the business of the Guinness Trust, of which he was a trustee, and was interested in many philanthropic schemes. Lord Rowton was unmarried, and the title consequently became extinct at his death, which occurred in London on the 9th of November 1903.

ROXANA, or ROXANE, daughter of the Bactrian king Oxyartes, and wife of Alexander the Great. After the latter's death she gave birth at Babylon to a son (Alexander IV.), who was accepted by the generals as joint-king with Arrhidaeus. Having crossed over to Macedonia, and thrown in her lot with Olympias, mother of Alexander the Great, she was imprisoned by Cassander in the fortress of Amphipolis and put to death (310 or 309 B.C.). The marriage of Alexander and Roxana was the subject of a famous painting by Aëtion.

See Plutarch, *Alexander*, 47, 77; Arrian, *Anab.* iv. 18, vii. 27; Diod. Sic. xviii. 3, 38, xix. 11, 52, 105; Strabo xi. p. 517, xvii. p. 794.

ROXBURGHE, EARLS AND DUKES OF. ROBERT KER, 1st earl of Roxburghe (*c.* 1570–1650), was the eldest son of William Ker of Cessford (d. 1606) and the grandson of Sir Walter Ker (d. *c.* 1584), who fought against Mary queen of Scots both at Carberry Hill and at Langside. He was descended from Sir Andrew Ker of Cessford (d. 1526) who fought at Flodden and was killed near Melrose in January 1526 by the Scotts of Buccleuch. The deed was avenged when the Kers under Sir Walter killed Sir Walter Scott of Buccleuch in Edinburgh in 1552. Robert Ker was also descended, on the maternal side, from Andrew Ker of Ferniehurst (*c.* 1471–1545), a celebrated border chieftain. Another famous member of the family was Andrew's grandson, Sir Thomas Ker of Ferniehurst (d. 1586), who, Camden says, was "of an immovable fidelity to the queen of Scots and the king her son." He was the father of Robert Carr, earl of Somerset, the favourite of James I.

After a turbulent life on the border Robert Ker became a Scottish privy councillor in 1599 and was made Lord Roxburghe about the same time; he accompanied King James to London in 1603, and was created earl of Roxburghe in 1616. He was lord privy seal for Scotland from 1637 to 1649, and in the Scottish parliament he showed his sympathy with Charles I.; but he took no part in the Civil War, although he signed the "engagement" for the king's release in 1648. He died at Floors, his residence near Kelso, on the 18th of January 1650. His son Harry, Lord Ker, had died in January 1643; consequently his titles and estates passed by special arrangement to his grandson, WILLIAM DRUMMOND (d. 1675), the youngest son of his daughter Jean and her husband John Drummond, 2nd earl of Perth. William took the name of Ker, became 2nd earl of Roxburghe, and married his cousin Lord Ker's daughter Jean.

The second earl's son was ROBERT, 3rd earl (*c.* 1658–1682), whose son was JOHN, 1st duke of Roxburghe (*c.* 1680–1741). John became 5th earl on the death of his brother Robert, the 4th earl, in 1696, and is described by George Lockhart of Carnwath as "perhaps the best accomplished young man of quality in Europe." In 1704 he was made a secretary of state of Scotland, and he helped to bring about the union with England, being created duke of Roxburghe in 1707 for his services in this connexion. This was the last creation in the Scottish peerage. The duke was a representative peer for Scotland in four parliaments; George I. made him a privy councillor and keeper of the privy seal of Scotland, and he was loyal to the king during the Jacobite rising in 1715. He was again a secretary of state from 1716 to 1725, but he opposed the malt-tax, and in 1725 Sir Robert Walpole procured his dismissal from office. He died on the 24th of February 1741. His only son, ROBERT (*c.* 1709–1755), who had been created Earl Ker of Wakefield in 1722, became 2nd duke, and was succeeded by his son JOHN, 3rd duke of Roxburghe (1740–1804), the famous bibliophile. John was betrothed to Christiana, daughter of the duke of Mecklenburg-Strelitz; but when the princess's sister Charlotte was affianced to George III., reasons of state led to the rupture of the engagement, and he died unmarried on the 19th of March 1804. The duke's library, including a unique collection of books from Caxton's press, and three rare volumes of broadside ballads, was sold in 1812, when the Roxburghe Club was founded to commemorate the sale of Valdarfer's edition of Boccaccio. Roxburghe's cousin William, 7th Lord Bellenden (*c.* 1728–1805), who succeeded to the Scottish titles and estates, died childless in October 1805, and for seven years the titles were dormant. Then in 1812 Sir JAMES INNES, bart. (1736–1823), a descendant of the 1st earl, established his claim to them, and taking the name of Innes-Ker, became 5th duke of Roxburghe. Among the unsuccessful claimants to the Roxburghe dukedom was John Bellenden Ker (*c.* 1765–1842), famous as a wit and botanist and the author of *Archaeology of Popular Phrases and Nursery Rhymes* (1837), whose son was the legal reformer, Charles Henry Bellenden Ker (*c.* 1785–1871).

The 5th duke's great-grandson, HENRY JOHN INNES-KER (b. 1876), became 8th duke in 1892. The duke of Roxburghe sits in the House of Lords as Earl Innes, a peerage of the United Kingdom, which was conferred in 1837 upon James Henry, the 6th duke (1816–1879).

ROXBURGHSHIRE, a Border county of Scotland, bounded W. by Berwickshire, E. and S.E. by Northumberland, S. by Cumberland, S.W. by Dumfriesshire and N.W. by the shires of Selkirk and Mid Lothian. It has an area of 426,060 acres, or 665·7 sq. m. The only low-lying ground in the shire is found in the N. and in the valleys of the larger rivers, and the whole S. is markedly hilly. Though the Cheviots, forming for a considerable distance the natural boundary with England, mostly belong to Northumberland, Catcleuch Shin (1742 ft.) and Peel Fell (1964) are Scottish peaks. The chief heights of the mountainous mass constituting the watershed between Teviotdale and Liddesdale are Cauldcleuch Head (1996), Greatmoor (1964), Pennygant (1805), Din Fell (1735), Windburgh (1622) and Arnton Fell (1464). In the W. is Crib Law (1369), and in the N., near Melrose, occur the triple Eildons (highest peak, 1385). The county is abundantly watered. The Tweed flows through the N. of the shire for 26 out of its total run of 97 m., though for about 2 m. (near Abbotsford) it is the boundary stream with Selkirkshire, and for 10 m. lower down with Berwickshire (parishes of Earlston and Merton). On the right its affluents are the Bowden and the Teviot, and on the left the Allan and the Eden. The Teviot is the principal river lying entirely in Roxburghshire. From its source near Causeway Grain Head on the Dumfriesshire border, it follows mainly a N.E. direction for 37 m. to its confluence with the Tweed at Kelso. Its chief tributaries are, on the right, Allan Water, the Slitrig, Dean Burn, the Rule, the Jed, the Oxnam and the Kale, and, on the left, Borthwick Water and the Ale, both rising in Selkirkshire. The Liddel is the leading stream in the S. Rising near Peel Fell in the Cheviots it flows S.W. to the Esk after a course of 27 m., receiving on the right Hermitage Water, on the left Kershope Burn. The Kershope and Liddel, during part of their run, serve as boundaries with Cumberland. Excepting the Liddel, which drains to the Esk, much the greater portion of the surface is drained, by the Tweed, to the North Sea. The lakes are few and small, the largest being Yetholm or Primside Loch and Horselaw, both in the parish of Linton among outlying hills of the Cheviots. Teviotdale, Liddesdale, Tweedside and Jedvale are the principal valleys.

Geology.—This county contains a considerable range of sedimentary rocks from the Ordovician to the Carboniferous systems, and with these are associated large tracts of volcanic rocks. The Ordovician and Silurian rocks occupy the N.W. and W. part of the county; they have been thrown into numerous sharp folds. It is on the crests of the anticlines that the strata of the former system appear flanked on either side by those of the latter. The oldest rocks are the mudstones and radiolarian cherts with contemporaneous and intrusive igneous rocks of Arenig age; these are followed by shales and greywackes of Llandeilo age and similar rocks of Caradoc age. Then comes the Silurian with the Birkhill shales and massive grits and greywackes of the Gala or Queensberry group with the Hawick rocks; these are all of Llandovery age and they occupy the greater part of the Silurian area. Wenlock and Ludlow rocks are found S. of Hawick rocks from Wisp Hill N.E. by Stobs Castle; other inlying masses occur in the Old Red Sandstone and Carboniferous areas, the largest of these being that which appears in a belt some 14 m. in length from near Riccarton in the direction of Hobkirk. Two divisions of the Old Red Sandstone occur; the lower, which consists of subordinate sandstones and conglomerates in sheets of contemporaneous lavas with some tuffs, is confined to the Cheviots; the strata are unconformable upon the upturned Silurian beds. The upper division, which in its turn is unconformable upon the lower, occupies about one-third of the county. It consists of coarse conglomerates at the base followed by sandstones and marls. It is well developed in the N., where volcanic rocks come in; the Trow Crags of Makerstown which cross the Tweed are due to these lavas. It extends from Newtown and Kelso to Kirkton with extensions in the valleys S.W. Carboniferous rocks are represented by the Calciferous sandstone series; in the S.W. in Liddesdale and on the uplands of Carter Fell, Larriston Fell, &c., they are sandstones with shales, some calcareous beds and coal and volcanic beds. In the N.E. corner of the county the outer part of the Berwickshire Carboniferous basin just comes within the boundary. An interesting series of volcanic "necks" belonging to this period is exemplified in Dunain Law, Black Law, Maiden Paps, Ruberslaw and other hills. Glacial deposits are represented by boulder clay and beds and ridges of sand and gravel.

Climate and Industries.—The average annual rainfall is about 37 in., higher in the hilly regions and somewhat lower towards the N. and E. The mean temperature for the year is 48° F., for January 38° F. and for July 60° F. The soil is chiefly loam in the level tracts along the banks of the larger streams, where it is also very fertile. In other districts a mixture of clay and gravel is mostly found, but there is besides a considerable extent of mossy land. Of the area under grain about two-thirds are occupied by oats, the remainder being principally devoted to barley. Among green crops turnips and swedes are most generally cultivated, potatoes covering a comparatively small acreage. In different parts of Tweedside and Jedvale several kinds of fruit are successfully grown. Both in the pastoral and arable localities agriculture is in an advanced condition. The hill country is everywhere covered with a thick green pasturage admirably suited for sheep, which occupy the walks in increasingly large quantities. The herds of cattle are also heavy, horses are kept mostly for farming operations, and pigs are raised in moderate numbers. Fairly large holdings predominate, farms of between 100 and 300 acres being general, and only in Berwickshire is the proportion of farms of more than 1000 acres exceeded. Many districts on the Tweed and Teviot are beautifully wooded, but having regard to the great area once occupied by forest, the acreage under wood is now relatively small.

The county is the principal seat of the tweed and hosiery manufactures in Scotland. Engineering, ironfounding, dyeing and tanning are also carried on at Hawick and Jedburgh, and agricultural implements and machinery, chemical manures and especially fishing tackle are made at Kelso. The salmon fisheries on the Tweed are of considerable value.

The Waverley route of the North British railway runs through the county from near Melrose in the N. to Kershopefoot in the S. At St Boswells branches are sent off to Duns and Reston, and to Jedburgh and Kelso via Roxburgh. The North-Eastern railway, an English company, has a line from Berwick to Kelso, via Coldstream and Carham.

Population and Administration.—The population in 1901 was 48,804, or 73 persons to the sq. m. In 1901 there were 132 persons who spoke Gaelic and English, but none Gaelic only. The principal towns are Hawick (pop. 17,303), Kelso (4008), Jedburgh (3136), Melrose (2195). The county returns a member to parliament, and Hawick belongs to the Border group of parliamentary burghs. Jedburgh, the county town, is a royal burgh, and Hawick, Kelso and Melrose are police burghs. The shires of Roxburgh, Berwick and Selkirk form a sheriffdom, and a resident sheriff-substitute sits at Jedburgh and Hawick. The county is under school-board jurisdiction, and there are secondary schools at Hawick and Kelso, while the board schools at Jedburgh and Melrose have secondary departments. Most of the "residue" grant is expended in assisting teachers to attend science and art classes at Edinburgh University and Hawick, and in subsidizing science and art and technical classes at Hawick, Kelso and elsewhere.

History and Antiquities.—Among the more important remains of the original inhabitants are the so-called "Druidical" stones and circles at Plenderleath between the Kale and Oxnam; on Hownam Steeple, a few miles to the N.W. (where they are locally known as the Shearers and the Bandster); and at Midshiels on the Teviot. The stones on Ninestane Rig, near Hermitage Castle, and on Whisgill are supposed to commemorate the Britons of Strathclyde who, under Aidan, were defeated with great slaughter by Ethelfrith, king of Bernicia, at the battle of Degsanstane or Dawstane in 603. There are hill forts in Liddesdale on the Allan, in the parish of Oxnam, and on the most easterly of the three Eildons. This last is said to be the largest example of its kind in Scotland. The fortress was defended by palisades around the three circular terraces which form the hill-top. Within the enclosure there was a town of huts, judging from certain marks that indicate the site of such dwellings, and the relics of early British pottery that have been found, while the fact that springs exist renders the theory of a settlement all the more probable. One of the most important and most mysterious of British remains is the Catrail, or Picts' Work Dyke. In its original condition it is supposed to have consisted of a line of double mounds or ramparts, averaging about 30 ft. in width, with an intervening ditch 6 ft. broad, the slope from the centre of the mound to the middle of the bottom of the trench being 10 ft. Owing to weather and other causes, however, it is now far from perfect and in places has disappeared for miles. Beginning at Torwoodlee, N.W. of Galashiels, it ran S.W. to Yarrow church, whence it turned first S. and then S.E., following a meandering course to Peel Fell in the Cheviots, a distance of 48 miles. Though it must have been difficult to defend so long a line, the bulk of opinion is in favour of its being a defence work. Roman remains are also of exceptional interest. Watling Street crossed the Border N. of Brownhart Law (1664 ft.) in the Cheviots, then took a mainly N.W. direction across the Kale, Oxnam, Jed and Teviot to Newstead, near Melrose, where it is conjectured to have crossed the Tweed and run up Lauderdale into Haddingtonshire. The chief stations were *Ad Fines* on the Cheviots, *Gadanica* (Bonjedward) near Jedfoot and Eildon Hill (? *Trimontium*). Another so-called Roman road is the Wheel Causeway or Causey, a supposed continuation of the Maiden Way which ran from Overburgh in Lancashire to Bewcastle in Cumberland, and so to the Border. It entered Roxburghshire N. of Deadwater and went (roughly) N. as far as Wolflee, whence its direction becomes a matter of surmise. Of Roman camps the principal appear to have been situated at Cappuck, to the S.E. of Jedburgh, and near Newstead, at the base of the Eildons, the alleged site of *Trimontium*. After the retreat of the Romans the country was occupied by the Britons of Strathclyde in the W. and the Bernicians in the E. It was then annexed to Northumbria for over four centuries until it was ceded, along with Lothian, to Scotland in 1018. David I. constituted it a shire, its ancient county town of Roxburgh (see Kelso) forming one of the Court of Four Burghs. The castle of Roxburgh, after changing hands more than once, was captured from the English in 1460 and dismantled. Other towns were repeatedly burned down, and the abbeys of Dryburgh, Jedburgh, Kelso and Melrose ultimately ruined in the expedition of the earl of Hertford (the Protector Somerset) in 1544–45. The Border freebooters—of whom the Armstrongs and Elliots were the chief—conducted many a bloody fray on their own account. On the union of the crowns the county gradually settled into what was comparatively a state of repose, disturbed to some extent during the Covenanting troubles and, to a much slighter degree. by the Jacobite rebellions.

Bibliography.—Sir George Douglas, *Roxburgh, Selkirk and Peebles* (Edinburgh, 1899); W. S. Crockett, *The Scott Country* (Edinburgh, 1902); Alexander Jeffrey, *The History and Antiquities of Roxburghshire* (4 vols., Edinburgh, 1857–64).

ROXBURY, formerly a city of Norfolk county, Massachusetts, U.S.A., situated between Boston and Dorchester, but since 1868 a part of Boston. It is primarily a residential district. Among its institutions are the Roxbury Latin School, established in 1645,[1] the Fellowes Athenaeum (a part of the Roxbury branch of the Boston Public Library), with about 26,000 volumes in 1909, and the New England Hospital for Women and Children (1863), the New England Baptist Hospital (1893), the Woman's Charity Club Hospital (1890), the Roxbury Homoeopathic Dispensary (1886), the Roxbury Home for Children and Aged Women (1856), a Home for Aged Couples (1884) and the Massachusetts Home for Intemperate Women (1879). On Mount Bellevue, in West Roxbury (set apart from Roxbury in 1851 and annexed to Boston in 1873), there is an observatory (erected in 1869 by the city of Boston as a standpipe for the high service water supply). Among the manufactures of the district are cotton and woollen goods, cordage, carpets, shoes and foundry products. The town of Roxbury (at first usually spelled Rocksbury) was founded in 1630 by some of the Puritan immigrants who came with Governor John Winthrop; the settlers were led by William Pynchon, who in 1636 led a party from here and founded Springfield, Mass. At the home of Rev Thomas Welde (d. 1662), the first minister, Anne Hutchinson (*q.v.*) was held in custody during the winter of 1637–38. Associated as teacher with Welde and his successors, Samuel Danforth and Nehemiah Walter, was John Eliot, the apostle to the Indians, who removed to Roxbury in 1632 and died here in 1690. Roxbury was the home also of Thomas Dudley, of his son Joseph and of his grandson Paul; of Robert Calef (d. 1719), the leader of the opposition to the witchcraft craze; of General Joseph Warren, and of William Eustis (1753–1825), who was U.S. secretary of war (1809–12), minister to the Netherlands (1814–18), and governor of Massachusetts (1823–25); and from 1837 to 1845 Theodore Parker was the pastor of the Unitarian Church of West Roxbury. Of special interest in the old Roxbury burial-ground is the "Ministers' Tomb," containing the remains of John Eliot, and the tomb of the Dudleys. West Roxbury was the scene of the Brook Farm experiment (see Brook Farm). Roxbury was chartered as a city in 1846.

See F. S. Drake, *The Town of Roxbury, its Memorable Persons and Places* (Boston, 1878 and 1905).

ROY, WILLIAM (1726–1790), a famous British surveyor, military draughtsman, antiquary, &c. In 1746, when an assistant in the office of Colonel Watson, deputy quartermaster-general in North Britain, he began the survey of the mainland of Scotland, the results of which were embodied in what is known as the "duke of Cumberland's map." In 1755 he obtained his commission in the 4th King's Own Foot, and in 1759 gained his lieutenancy and went to serve in Germany in the Seven Years' War. In 1765 he appears as deputy quartermaster-general to the forces, surveyor-general of coasts and engineer-director of military surveys in Great Britain; in 1767 he became F.R.S., in 1781 major-general, in 1783 director of Royal Engineers. Besides his campaigns and observations in Germany, his visits to Ireland (1766) and to Gibraltar (1768) were important. In 1783–84 he conducted observations for determining the relative positions of the French and English royal observatories. His measurement of a base-line for that purpose on Hounslow Heath in 1784, the germ of all subsequent surveys of the United Kingdom, gained him in 1785 the Copley medal of the Royal Society. Roy's measurements (not fully utilized till 1787, when the Paris and Greenwich observatories were properly connected) form the basis of the topographical survey of Middlesex, Surrey, Kent and Sussex. He was finishing an account of this work for the *Phil. Trans.* when he died on the 1st of July 1790.

Roy's principal book-publication is the *Military Antiquities of the Romans in Britain* (1793). See also notices of him and contributions from him in the records of the War Office and the Royal Engineers, in the *Transactions* of the Royal Society of London, vols. lxvii., lxxv., lxxvii., lxxx., lxxxv., and in the *Gentleman's Magazine*, vols. lv., lx. He is whimsically denounced by Jonathan Oldbuck of Monkbarns in Scott's *Antiquary*.

ROYAL FERN, in botany, the common name for the fern *Osmunda regalis*, a native of Britain, where it grows in bogs, marshy woods, &c. It is a handsome plant with bi-pinnate fronds 2 to 6 ft. long and 1 ft. or more broad; the tops of the fronds are fertile, the fertile pinnae being cylindrical and densely covered with the spore-cases, giving the appearance of a dense panicle of flowers, whence the plant is known as the flowering fern. There are various cultivated forms—*cristata* has the ends of the fronds and the pinnae finely crested, and *corymbifera* has curiously forked and crested fronds. Several other species, such as *O. cinnamomea*, *O. Claytoniana*, are known as handsome greenhouse ferns (see also Ferns).

ROYAL SOCIETY, THE, the oldest scientific society in Great Britain, and one of the oldest in Europe. The Royal Society (more fully, The Royal Society of London for Improving Natural Knowledge) is usually considered to have been founded in the year 1660, but a nucleus had in fact been in existence for some years before that date. As early as the year 1645 weekly meetings were held in London of "divers worthy persons, inquisitive into natural philosophy and other parts of human learning, and particularly of what hath been called the *New Philosophy* or *Experimental Philosophy*," and there can be little doubt that this gathering of philosophers is identical with the "Invisible College" of which Boyle speaks in sundry letters written in 1646 and 1647. These weekly meetings, according to Wallis, were first suggested by Theodore Haak, "a German of the Palatinate then resident in London," and they were held sometimes in Dr Goddard's lodgings in Wood Street, sometimes at the Bull-Head Tavern in Cheapside.

Some of these "Philosophers," resident in Oxford about 1648, formed an association there under the title of the Philosophical Society of Oxford, and used to meet, most usually in the rooms of Dr Wilkins, warden of Wadham College. A close intercommunication was maintained between the Oxford and London Philosophers; but ultimately the activity of the society was concentrated in the London meetings, which were held principally at Gresham College.

On November 28, 1660, the first journal book of the society was opened with a "memorandum," from which the following is an extract: "Memorandum that Novemb. 28. 1660, These persons following, according to the usuall custom of most of them, mett together at Gresham Colledge to heare Mr Wren's lecture, viz. The Lord Brouncker, Mr Boyle, Mr Bruce, Sir Robert Moray, Sir Paul Neile, Dr Wilkins, Dr Goddard, Dr Petty, Mr Ball, Mr Rooke, Mr Wren, Mr Hill. And after the lecture was ended, they did, according to the usuall manner, withdrawe for mutuall converse. Where amongst other matters that were discoursed of, something was offered about a designe of founding a Colledge for the promoting of Physico-Mathematicall Experimentall Learning." It was agreed at this meeting that the company should continue to assemble on Wednesdays at three o'clock; an admission fee of ten shillings with a subscription of one shilling a week was instituted; Dr Wilkins was appointed chairman; and a list of forty-one persons judged likely and fit to join the design was drawn up. On the following Wednesday Sir Robert Moray brought word that the king (Charles II.) approved the design of the meetings; a form of obligation was framed, and was signed by all the persons enumerated in the memorandum of the 28th of November and by seventy-three others. On the 12th of December another meeting was held at which fifty-five was fixed as the number of the society,—persons of the degree of baron, Fellows of the College of Physicians, and public professors of mathematics, physics and natural philosophy of both universities being supernumeraries.

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[1] This school was founded, primarily through the influence of the Rev. John Eliot, by inhabitants of Roxbury. In 1672 Thomas Bell, one of the original founders, bequeathed to the school all his Roxbury lands. In 1789 the school was incorporated.

Gresham College was now appointed to be the regular meeting-place of the society. Sir Robert Moray (or Murray) was chosen president (March 6, 1661), and continued from time to time to occupy the chair until the incorporation of the society, when Lord Brouncker was appointed the first president under the charter. In October 1661 the king offered to be entered one of the society, and next year the society was incorporated under its present title. The name "Royal Society" appears to have been first applied to the Philosophers by John Evelyn, in the dedication of his translation of a book by Gabriel Naudé, published in 1661. Evelyn received in that year the thanks of the "philosophic assembly" for the honourable mention he had made of them by the name of "The Royal Society."

The charter of incorporation passed the Great Seal on the 15th of July 1662, to be modified, however, by a second charter in the following year, repeating the incorporating clauses of the first charter, but conferring further privileges on the society. The second charter passed the Great Seal on the 22nd of April 1663, and was followed in 1669 by a third, confirming the powers granted by the second charter, with some modifications of detail, and granting certain lands in Chelsea to the society. The council of the Royal Society met for the first time on the 13th of May 1663, when resolutions were passed that debate concerning those to be admitted should be secret, and that Fellows should pay 1s. a week to defray expenses.

At this early stage of its history the "correspondence" which was actively maintained with continental philosophers formed an important part of the society's labours, and selections from this correspondence furnished the beginnings of the *Philosophical Transactions* (a publication now of world-wide celebrity). At first the publication of the *Transactions* was entirely "the act of the respective secretaries." The first number, consisting of 16 quarto pages, appeared on Monday, March 6, 1664–65, under the title of *Philosophical Transactions: giving some Accompt of the present undertakings, studies and labours of the Ingenious in many considerable parts of the world*, with a dedication to the Royal Society signed by Henry Oldenburg, the first secretary of the society. It was ordered (1st of March 1664–65) "that the tract be licensed by the Council of the Society, being first reviewed by some of the members of the same." In 1750, 496 numbers, or 46 volumes, had been published. After this date the work was issued under the superintendence of a committee, and the division into numbers disappeared. The society also from its earliest years published, or directed the publication of, separate treatises and books on matters of philosophy; most notable among these being the *Philosophiae naturalis principia mathematica Autore Is. Newton. Imprimatur: S. Pepys, Reg. Soc. Praeses. Julii 5, 1686, 4to Londini 1687*.

In 1887 the *Philosophical Transactions* was divided into two series, labelled A and B respectively, the former containing papers of a mathematical or physical character, and the latter papers of a biological character. More than 225 quarto volumes have been published. In 1832 appeared the first volume of *Abstracts of papers printed in the Philosophical Transactions from the year 1800*. This publication developed in the course of a few years into the *Proceedings of the Royal Society*, which has been continued up to the present time. It is published now in two series, corresponding to the two series of the *Philosophical Transactions*, and is issued in 8vo form at the rate of about three volumes a year.

It is, however, certain that one of the most important functions of the society from the beginning was the performance of experiments before the members. In the royal warrant of 1663 ordering the mace which the king presented to the society, it is described as "The Royal Society for the improving of Natural Knowledge by experiments"; and during its earlier years the time of the meetings was principally occupied by the performance and discussion of experiments. The society early exercised the power granted by charter to appoint two "curators of experiments," the first holder of that office being Robert Hooke, who was afterwards elected a secretary of the society.

Another matter to which the society gave attention was the formation of a museum, the nucleus being "the collection of rarities formerly belonging to Mr Hubbard," which, by a resolution of council passed on the 21st of February 1666, was purchased for the sum of £100. This museum, at one time the most famous in London, was presented to the trustees of the British Museum in 1781, upon the removal of the society to Somerset House. A certain number, however, of instruments and models of historical interest have remained in the possession of the society, and some of them, more peculiarly associated with its earlier years, are still preserved at Burlington House. The remainder have been deposited in the Victoria and Albert Museum, South Kensington.

After the Great Fire of London in September 1666 the apartments of the Royal Society in Gresham College were required for the use of the city authorities, and the society were therefore invited by Henry Howard of Norfolk to meet in Arundel House. At the same time he presented them with the library purchased by his grandfather, Thomas earl of Arundel, and thus the foundation was laid of the important collection of scientific works, now exceeding 60,000 volumes, which the society possesses. Of the Arundel MSS. the bulk was sold to the trustees of the British Museum in 1830 for the sum of £3559, the proceeds being devoted to the purchase of scientific books. These MSS. are still kept in the British Museum as a separate collection. The society, however, still possesses a valuable collection of scientific correspondence, official records, and other manuscripts, including the original manuscript, with Newton's autograph corrections, from which the first edition of the *Principia* was printed, and many other original documents of great interest.

Under date December 21, 1671, the journal-book records that "the lord bishop of Sarum proposed for candidate Mr Isaac Newton, professor of the mathematicks at Cambridge." Newton was elected a Fellow January 11, 1671–72, and in 1703 he was appointed president, a post which he held till his death in 1727. During his presidency the society moved to Crane Court, their first meeting in the new quarters being held November 8, 1710. In the same year they were appointed visitors and directors of the Royal Observatory at Greenwich, a function which they continued to perform until the accession of William IV., when by the new warrant then issued the president and six of the Fellows of the Royal Astronomical Society were added to the list of visitors.

In 1780, under the presidency of Sir Joseph Banks, the Royal Society removed from Crane Court to the apartments assigned to them by the government in the new Somerset House, where they remained until they removed to Burlington House in 1857. The policy of Sir Joseph Banks was to render the Fellowship more difficult of attainment than it had been; and the measures which he took for this purpose, combined with other circumstances, led to the rise of a faction headed by Dr Horsley. Throughout the years 1783 and 1784 feeling ran exceedingly high, but in the end the president was supported by the majority of the society. An account of the controversy will be found in a tract entitled *An Authentic Narrative of the Dissensions and Debates in the Royal Society*. An important step in pursuance of the same policy was taken in the year 1847, when the number of candidates recommended for election by the council was limited to fifteen, and the election was made annual. This limitation has remained in force up to the present time. Concurrent with the gradual restriction of the Fellowship was the successive establishment of other scientific bodies. The founding of the Linnean Society in 1788 under the auspices of several Fellows of the Royal Society was the first instance of the establishment of a distinct scientific association under royal charter; and this has been followed by the formation of the large number of societies now active in the promotion of special branches of science.

From the time of its royal founder onwards the Royal Society has constantly been appealed to by the government for advice in connexion with scientific undertakings of national importance. The following are some of the principal matters of this character upon which the society has been consulted by, or which it has successfully urged upon the attention of, the government: the improvement and equipment of the Royal Observatory, Greenwich, in 1710, when it was placed in the sole charge of the society; the change of the calendar in 1752; ventilation of prisons; protection of buildings and ships from lightning; measurement of a degree of latitude; determination of the length of a pendulum vibrating seconds; comparison of the British and French standards of length; the Geodetic Survey in 1784, and the General Trigonometrical Survey begun in 1791; expeditions to observe the transits of Venus in 1761, 1769 (commanded by Captain Cook), 1877 and 1882; the Antarctic expeditions of 1772 (under Captain Cook, whose voyage extended to the circumnavigation of the globe), of 1839 (under Ross), and 1900; observations for determining the density of the earth; Arctic expeditions of 1817 (in search of the North-West Passage), of 1819 (under Parry), of 1827 (Parry and Ross), of 1845 (Franklin), of 1874 (under Nares); numerous expeditions for observing eclipses of the sun; 1822, use of coal-tar in vessels of war; best manner of measuring tonnage of ships; 1823, corrosion of copper sheathing by sea-water; Babbage's calculating machine; lightning-conductors for vessels of war; 1825, supervision of gas-works; 1832, tidal observations; 1835, instruments and tables for testing the strength of spirits; magnetic observatories in the colonies; 1862, the great Melbourne telegraph; 1865, pendulum observations in India; 1866, reorganization of the meteorological department; 1868, deep-sea research; 1872, "Challenger" expedition; 1879, prevention of accidents in mines; 1881, pendulum observations; cruise of the "Triton" in Faroe Channel; 1883, borings in delta of Nile; 1884, Bureau des Poids et Mesures; international conference on a prime meridian; 1888, inquiry into lighthouse illuminants; 1890, the investigation of colour-blindness; 1895, examination of the structure of a coral reef by boring; 1896, inquiry into cylinders for compressed gases; the establishment of an International Geodetic Bureau; 1897, determination of the relations between the metric and imperial units of weights and measures; and, more recently, an inquiry into the volcanic eruptions in the West Indies; international seismological investigation; international exploration of the upper atmosphere; measurement of an arc of the meridian across Africa. In recent years also the society, acting at the request of the government, has taken the leading part in investigations, in the course of which important discoveries have been made, in relation to various tropical diseases, beginning with the tsetse-fly disease of cattle in Africa, followed by investigations into malaria, Mediterranean fever and sleeping sickness. The society has standing committees which advise the Indian government on matters connected with scientific inquiry in India and on the observatories of India. The society has taken a leading part in the promotion of the *International Catalogue of Scientific Literature from 1900*, and of the International Association of Academies, which is composed of all the principal scientific academies of the world, meeting regularly to promote international action in questions of scientific interest.

In addition to the occasional services enumerated above, the Royal Society has exercised, and still exercises, a variety of important public functions of a more permanent nature. It still provides seven of the board of visitors of the Royal Observatory at Greenwich. From 1877 until the reconstitution of the Meteorological Office in 1906 the society nominated the meteorological council, which had the control of that office. The society has the custody of standard copies of the imperial standard yard and pound. The president and council have the control of the National Physical Laboratory, an institution established in 1899 in pursuance of the recommendations of a treasury committee appointed by H.M. government in response to representations from the Royal Society. The society had previously for many years had control of the Kew Observatory, now incorporated with the National Physical Laboratory, and still remains trustee of the Gassiot Fund, a fund established for the maintenance of the observatory. The society elects four of the nine members of the managing committee of the Lawes Agricultural Trust, and is officially represented on the governing bodies of a number of important scientific and educational institutions and of the principal public schools.

One of the most important duties which the Royal Society performs on behalf of the government is the administration of the annual grant of £4000 for the promotion of scientific research. This grant originated in a proposal by Lord John Russell in 1849 that at the close of the year the president and council should point out to the first lord of the treasury a limited number of persons to whom the grant of a reward or of a sum to defray the cost of experiments might be of essential service. This grant of £1000 afterwards became annual, and was continued until 1876. In that year an additional sum of £4000 for similar purposes was granted, and the two funds of £1000 and £4000 were administered concurrently until 1881, in which year the two were combined in a single annual grant of £4000 under new regulations. Since 1896 parliament has also voted annually a grant of £1000 to be administered by the Royal Society in aid of scientific publications, not only those issued by itself, but also scientific matter published through other channels. One of the most useful of the society's publications is the great catalogue of scientific papers—an index now in twelve quarto volumes, under authors' names, of all the memoirs of importance in the chief English and foreign scientific serials from the year 1800 to the year 1883. The work was prepared under the direction of the Royal Society. A continuation carrying the catalogue up to the end of the 19th century, and a subject index to the whole catalogue, have also been compiled.

A statement of the trust funds administered by the Royal Society will be found in the *Year Book* published annually, and the origin and history of these funds will be found in the *Record of the Royal Society* (2nd ed. 1901). The income of the society is derived from the annual contributions and composition fees of the Fellows, from rents and from interest on various investments. The balance-sheet and an account of the estates and property are published in the *Year Book*. Five medals (the Copley, two Royal, the Davy and the Hughes) are awarded by the society every year; the Rumford and the Darwin medals biennially, the Sylvester triennially and the Buchanan quinquennially. The first of these originated in a bequest by Sir Godfrey Copley (1709), and is awarded "to the living author of such philosophical research, either published or communicated to the society, as may appear to the council to be deserving of that honour"; the author may be an Englishman or a foreigner. The Rumford medal originated in a gift from Count Rumford in 1796 of £1000 3% consols, for the most important discoveries in heat or light made during the preceding two years. The Royal medals were instituted by George IV., and are awarded annually for the two most important contributions to science published in the British dominions not more than ten years nor less than one year from the date of the award. The Davy medal was founded by the will of Mr John Davy, F.R.S., the brother of Sir Humphry Davy, and is given annually for the most important discovery in chemistry made in Europe or Anglo-America. An enumeration of the awards of each of the medals and the conditions of the awards are published in the *Year Book*. The society also has the award of three research studentships, one founded in 1890 in memory of J. P. Joule, and the others created out of a bequest to the society by Sir William Mackinnon in 1897.

Under the existing statutes of the Royal Society every candidate for election into the society must be recommended by a certificate in writing signed by six or more Fellows, of whom three at least must sign from personal knowledge. From the candidates so recommended the council annually select fifteen by ballot, and the names so selected are submitted to the society for election by ballot. Princes of the blood, however, and not more than two persons selected by the council on special grounds once in two years, may be elected by a more summary procedure. Foreign members, not exceeding fifty, may be selected by the council from among men of the greatest scientific eminence abroad, and proposed to the society for election. Every Fellow of the society is liable to an admission fee of £10 and an annual payment of £4; but, by aid of a fund established in 1878 for the purpose, the admission fees and £1 of the annual contribution of all the Fellows elected since that date have been remitted. The composition for annual payments is £60.

The anniversary meeting for the election of the council and officers is held on St Andrew's Day. The council for the ensuing year, out of which are chosen the president, treasurer, principal secretaries, and foreign secretary, must consist of eleven members of the existing council and ten Fellows who are not members of the existing council. These are nominated by the president and council previously to the anniversary meeting. The session of the society is from November to June; the ordinary meetings are held on Thursdays during the session, at 4.30 p.m. The selection for publication from the papers read before the society is made by the "Committee of Papers," which consists of the members of the council for the time being aided by committees appointed for the purpose. The papers so selected are published either in the *Philosophical Transactions* (4to) or the *Proceedings of the Royal Society* (8vo), and one copy of each of these publications is presented gratis to every Fellow of the society and to the chief scientific societies throughout the world.

The making and repealing of laws is vested in the council, and in every case the question must be put to the vote on two several days of their meeting.

The text of the charters of the Royal Society is given in the *Record*, and in the same work will be found lists of the presidents, treasurers, secretaries and assistant-secretaries from the foundation to the year 1900. The same work gives a chronological list of all the Fellows, with dates of election, and an alphabetical index. Other histories are Thomson's *History of the Royal Society* (1812); Weld's *History of the Royal Society*; Bishop Sprat's (1667), which consists largely of a defence of the society against the attacks of a priori philosophers; and Dr Birch's (1756), which treats mainly of the society's scientific work. (R. W. F. H.)

ROYALTY (O. Fr. *realte, reialte, royaulté*, from Med. Lat. *regalitas*, the substantive of *regalis*, of or belonging to a king, *rex*), kingly state or personality, hence a royal person, or number of persons of royal birth collectively, a member of a royal family. More particularly "royalty" is used of the rights and attributes of a sovereign, and especially of dues paid to the crown, which belong to the sovereign *jure coronae*, such as dues from gold and silver mines, waifs, estrays, &c. The term is usually applied to the payment made by a publisher to an author on every copy of his book sold; to the payment made to a patentee on each article manufactured under his patent by a licensee (see Patents), and to the payment made to the owner of minerals for the right of working, paid on the ton or other weight raised.

ROYAN, a town of W. France, in the department of Charente Inférieure, on the right bank of the Gironde, at its mouth 63 m. below and N.N.W. of Bordeaux. Pop. (1906) 7142. Royan is one of the most frequented bathing resorts on the Atlantic seaboard. The coast is divided into a number of small bays or "conches," forming so many distinct beaches: to the E. of the town is the "Grande Conche" with the municipal casino; to the S. the "Conche de Foncillon," separated from the first-named by a quay which forms a fine terraced esplanade; beyond the fort of Royan follow in succession the conches "du Chay" and "de Robinson," and the most fashionable of all, that of Pontaillac. The port carries on sardine-fishing and an active coasting trade, but the harbour at high tide is accessible only to vessels drawing from 8 to 10 ft., and at low water is dry. Eugène Pelletan, the author, has a statue in the town, of which he was a benefactor. The lighthouse of Cordouan, 200 ft. in height, rebuilt on the site of an older tower by the architect Louis de Foix in 1584–1610 and added to about the end of the 18th century, stands on a rock 7½ m. W.S.W. of Royan.

Royan after passing through many hands came to the family of la Trémoille, in whose favour it was made first a marquisate and then a duchy. During the first half of the 15th century it was held by the English. During the wars of religion it was a centre of Calvinism and had to sustain in 1622 an eight days' siege by the troops of Louis XIII. As late as the end of the 18th century it was but a "bourg" of about one thousand inhabitants, noticeable only for its priory, where Brantôme wrote a portion of his *Chronicles*. The prosperity of the place dates from the Restoration, when steamboat communication was established with Bordeaux.

ROYAT, a watering-place of central France, in the department of Puy-de-Dôme, situated at a height of 1475 ft. on the Tiretaine, 1½ m. S.W. of Clermont-Ferrand. Pop. (1906) 1451. The thermal springs, situated in the part of Royat known as St Mart, are strongly impregnated with carbonic acid and chloride of sodium and are used in cases of rheumatism, gout, bronchitis, asthma, anaemia, &c. They were known in Roman times, and ruins of ancient baths are still to be seen. The village of Royat proper, a little higher up the valley, has a church of the 11th and 12th centuries fortified with battlements.

ROYER-COLLARD, PIERRE PAUL (1763–1845), French statesman and philosopher, was born on the 21st of June 1763 at Sompuis, near Vitry le Français (Marne), the son of Antoine Royer, a small proprietor. His mother, Angélique Perpétue Collard, was a woman of unusual strength of character and of austere piety. Pierre Paul Royer was sent at twelve to the college of Chaumont of which his uncle, Father Paul Collard, was director. He subsequently followed his uncle to Saint-Omer, where he studied mathematics. At the outbreak of the Revolution, which moved him to passionate sympathy, he was practising at the Parisian bar. He was returned by his section, the Island of Saint Louis, to the Commune, of which he was secretary from 1790 to 1792. After the revolution of the 10th of August in that year he was replaced by J. L. Tallien. His sympathies were now with the Gironde, and after the insurrection of the 12th Prairial (31st of May 1793) he was in danger of his life. He returned to Sompuis, and was saved from arrest possibly by the protection of Danton and in some degree by the impression made by his mother's courageous piety on the local commissary of the Convention. In 1797 he was returned by his department (Marne) to the Council of the Five Hundred, where he allied himself especially with Camille Jordan. He made one great speech in the council in defence of the principles of religious liberty, but the *coup d'état* of Fructidor (4th of September 1797) drove him again into private life. It was at this period that he developed his legitimist opinions and entered into communication with the comte de Provence (Louis XVIII.). He was the ruling spirit in the small committee formed in Paris to help forward a Restoration independent of the comte d'Artois and his party; but with the establishment of the Consulate he saw the prospects of the monarchy were temporarily hopeless, and the members of the committee resigned. From that time until the Restoration Royer-Collard devoted himself exclusively to the study of philosophy. He derived his opposition to the philosophy of Condillac chiefly from the study of Descartes and his followers, and from his early veneration for the fathers of Port-Royal. He was occupied with the erection of a system which should provide a moral and political education consonant with his view of the needs of France. From 1811 to 1814 he lectured at the Sorbonne. From this time dates his long association with Guizot. Royer-Collard himself was supervisor of the press under the first restoration. From 1815 onwards he sat as deputy for Marne in the chamber. As president of the commission of public instruction from 1815 to 1820 he checked the pretensions of the clerical party, the immediate cause of his retirement being an attempt to infringe the rights of the university of Paris by giving university diplomas, independent of university examinations, to the teaching fraternity of the Christian Brothers. Royer-Collard's acceptance of the Legitimist principle did not prevent a faithful adhesion to the social revolution effected in 1789, and he protested in 1815, in 1820, and again under the monarchy of July against laws of exception.

He was the moving spirit of the "Doctrinaires," as they were called, who met at the house of the comte de Ste Aulaire and in the salon of Madame de Staël's daughter, the duchesse de Broglie. The leaders of the party, beside Royer-Collard, were Guizot, P. F. H. de Serre, Camille Jordan and Charles de Rémusat. In 1820 he was excluded from the council of state by a decree signed by his former ally Serre. In 1827 he was elected for seven constituencies, but remained faithful to his native department. Next year he became president of the chamber, and fought against the reactionary policy which precipitated the Revolution of July. It was Royer-Collard who in March 1830 presented the address of the 221. From that time he took no active part in politics, although he retained his seat in the chamber until 1839. He died at his estate of Châteauvieux, near Vitry, on the 2nd of September 1845. He had been a member of the Academy since 1827. Royer-Collard married in 1799 Mlle. de Forges de Châteauvieux. The two daughters who survived to womanhood received an education of the utmost austerity.

Royer-Collard left no considerable writings, but fragments of his philosophical work are included in Jouffroy's translation of the works of Thomas Reid. The standard life of Royer-Collard is by his friend Prosper de Barante, *Vie politique de M. Royer Collard, ses discours et ses écrits* (2 vols., 1861). There are also biographies by M. A. Philippe (1857), by L. Vingtain (1858), by E. Spuller (1895), in *Grands écrivains français*. Cf. E. Faguet, *Politique et morale du xix^{e} siècle* (1891); H. Taine, *Les Philosophes français du xix^{e} siècle* (1857); L. Séché, *Les Derniers Jansénistes* (1891); and Lady Blennerhasset, "The Doctrinaires" in the *Cambridge Modern History* (vol. x. chap. ii., 1907). For further references see H. P. Thieme, *Guide bibliographique* (Paris, 1907).

ROYLE, JOHN FORBES (1799–1858), British botanist and teacher of materia medica, was born in Cawnpore in 1799. Entering the service of the East India Company as assistant surgeon, he devoted himself to studying botany and geology, and made large collections among the Himalaya Mountains. He also investigated the medical properties of the plants of

Hindustan and the history of their uses among the native races. The results of these investigations appeared in an essay *On the Antiquity of Hindoo Medicine* (1837). For nearly ten years he held the post of superintendent of the East India Company's botanic garden in the Himalayas at Saharanpur. In 1837 he was appointed to the professorship of materia medica in King's College, London, which he held till 1856. From 1838 onwards he conducted a special department of correspondence, relating to vegetable products, at the East India House, and at the time of his death he had just completed there an extensive and valuable museum of technical products from the East Indies. In 1851 he superintended the Indian department of the Great Exhibition. He died at Acton near London on the 2nd of January 1858.

The work on which his reputation chiefly rests is the *Illustrations of the Botany and other branches of Natural History of the Himalaya Mountains, and of the Flora of Cashmere*, in 2 vols. 4to, begun in 1839. In addition he wrote *An Essay on the Productive Resources of India* (1840), *On the Culture and Commerce of Cotton in India and Elsewhere* (1851) and *The Fibrous Plants of India fitted for Cordage* (1855), together with papers in scientific journals.

ROYSTON, a market town in the Hitchin parliamentary division of Hertfordshire, England, close to the border of Cambridgeshire, 48 m. N. of London by the Cambridge branch of the Great Northern railway. Pop. of urban district (1901) 3517. The church of St John the Baptist is mainly Early English. There are a market house, and institute with library and museum. Beneath a street in the town is a curious example of a hermit's cave, excavated in the chalk, and containing rude carvings of the crucifixion and other sacred subjects. It was discovered in 1742. The town lies on the Roman Ermine Street, at the point where it strikes from the hills across the plain, and its straight course is deflected slightly W. Roman relics have been found, and several barrows and earth-mounds occur on the neighbouring hills. A monastery of Augustinian canons was founded here towards the close of the 12th century, but there are no remains.

ROYTON, an urban district of Lancashire, England, within the parliamentary borough of Oldham, 2 m. N. of Oldham on the Lancashire & Yorkshire railway. Though of early origin, it is, as a town, of wholly modern growth. The cotton manufacture is its chief industry. Pop. (1901) 14,881.

ROZAS, JUAN MARTINEZ DE (1759–1813), the earliest leader in the Chilean struggle for independence, was born at Mendoza in 1759. In early life he was a professor of law, and of theology and philosophy at Santiago. He held the post of acting governor of Concepción at one time, and was also colonel in a militia regiment. In 1808 he became secretary to the last Spanish governor, Francisco Antonio Carrasco, and used his position to prepare the nationalist movement that began in 1809. After resigning his position as secretary, Rozas was mainly responsible for the resignation of the Spanish governor, and the formation of a national Junta on the 18th of September 1810, of which he was the real leader. Under his influence many reforms were initiated, freedom of trade was established, an army was organized and a national congress was called together in July 1811. But at the end of that year divisions began to arise between Rozas' followers from Concepción and the men of Santiago; and a feud broke out between Rozas and José Miguel Carrera (*q.v.*) who had secured control of Santiago. In 1812 Carrera succeeded in securing the banishment of his rival, who retired to Mendoza, where he died on the 3rd of March 1813.

See P. B. Figueroa, *Diccionario biográfico de Chile, 1550–1887* (Santiago, 1888), and J. B. Suarez, *Rasgos biográficos de hombres notables de Chile* (Valparaiso, 1886); both giving biographical sketches of prominent characters in Chilean history.

RUABON (*Rhiwabon*), a town of Denbighshire, N. Wales, in the E. parliamentary division, near the Shropshire border, 5 m. S.W. of Wrexham, on the Great Western railway. Pop. (1901) 3248. It is situated on a small tributary of the Dee. The old Gothic church is thought by some to have been founded by Mabon, a brother of Llewelyn (13th c.), and has monuments to the Wynn family, by Nollekens and Rhysbrac, and to Dr D. Powel (d. 1598), translator into English of Caradoc's (of Llancarfan) *History of Wales*. In the neighbourhood are collieries, engineering works, an iron foundry and chemical works, besides an extensive industry in glazed and other bricks. Near Ruabon is Caerdden (*Caerddin*), an ancient camp (village) surrounded by circular intrenchments, and Wynnstay, with an avenue of fine trees. Anciently the residence of Madoc ab Gruffyd Maelor (founder of Valle Crucis Abbey), it was called Wattstay, from Watt's Dyke, an old rampart on the estate. It was named Wynnstay on its coming into possession of the Wynns (17th c.). Offa's Dyke, near here, is 10 ft. high, and broad enough for two carriages abreast. Not far is Chirk Castle (supposed to have been built in 1013), besieged by Cromwell's artillery: near it, in the Ceiriog valley, the defeat of Henry II. by Owen Gwynedd took place in 1165.

RUBBER, INDIARUBBER or CAOUTCHOUC (a word probably derived from *Cahucha* or *Caucho* the names in Ecuador and Peru respectively for rubber or the tree producing it), the chief constituent of the coagulated milky juice or latex furnished by a number of different trees, shrubs and vines. The latex of the best rubber plants furnishes from 20 to 50% of rubber. The latex is not to be confused with the sap of trees, on the circulation of which their nutrition depends. Though frequently occurring, it is not a universal feature of plant life, and does not appear to be necessary or even directly connected with the nutritive system of plants. Its exact function is not fully understood. Latex, though chiefly secreted in vessels or small sacs which reside in the cortical tissue between the outer bark and the wood is also found in the leaves and sometimes in the roots or bulbs. The trees and plants whose latices furnish caoutchouc in considerable quantity chiefly belong to the natural orders Euphorbiaceae, Urticaceae, Apocynaceae, Asclepiadaceae. The latex is usually obtained from the bark or stem by making an incision reaching almost to the wood when the milky fluid flows more or less readily from the laticiferous vessels. It is, like milk, an emulsion, and when examined with the microscope is seen to consist of numerous globules suspended in a watery fluid. On standing, some latices separate, more or less readily, into an upper layer resembling cream and consisting of the globules, and a lower watery layer. This separation can be rapidly effected with some latices by the use of a centrifugal machine, but this method has not yet been applied to any extent commercially. The globules which furnish the cream gradually pass on standing into solid caoutchouc, a process which is facilitated by rapid stirring, or by the addition of an acid or other chemical agent. If the latex is warmed or an acid, an alkali or astringent plant juice is added to it, "coagulation" usually takes place more or less readily, the caoutchouc separating in solid flakes or curds. The efficacy of heat or of an acid, an alkali or other agent in promoting coagulation depends on the character of the latex, and varies with that obtained from different plants. The watery fluid in which the globules are suspended holds certain proteids, carbohydrates and a small proportion of salts in solution. The latex exhibits a neutral, acid or alkaline reaction depending upon the plant from which it has been obtained.

When exposed to air the latex gradually undergoes putrefactive changes accompanied by coagulation of the caoutchouc. The addition of a small quantity of ammonia or of formalin to some latices usually has the effect of preserving them for a considerable time. The nature of the coagulation is not yet completely understood. It has been compared with that of milk and of blood, which depend essentially on the coagulation or separation in curds of a proteid or albuminous substance, such as takes place when white of egg is warmed. There is, however, reason to believe that the coagulation of latex into rubber is not mainly of this character. The globules in the latex are liquid, and the phenomenon of coagulation would seem to consist in the passage of this liquid into solid caoutchouc through the kind of change known as polymerization or condensation, in which a liquid passes into solid without alteration of composition or by condensation with the elimination of the elements of water. The effect of chemical agents in producing coagulation are in consonance with what is known of other instances of polymeric or condensation changes, whilst the fact that the collection of globules separated by creaming after thorough washing, and therefore removal of all proteid, is susceptible of solidification into caoutchouc by a merely mechanical act such as churning, strongly supports the view that the character of the change is distinct from that of any alteration which may occur in the proteid constituents of the latex.

The existence of caoutchouc or rubber was first observed soon after the discovery of America. It was noticed that certain Indian tribes of South America played with a ball composed of a resilient and elastic substance, which afterwards was found to possess the power of removing lead pencil marks from paper and came into commerce as "Indian Rubber." It was not until the middle of the 18th century that the trees which yielded caoutchouc were identified, chiefly by French observers. La Condamine ascertained the nature of the tree, now known as *Hevea brasiliensis*, from which the Para rubber of S. America was obtained, whilst a little later Fresnau and Aublet described the Euphorbiaceous trees which furnished the rubber of Guiana.

The methods adopted by the natives in S. America and in Mexico for incising the trees and obtaining the rubber are exceedingly primitive, but survive with little modification at the present day.

Statistics of Rubber Production.—Until recently rubber was obtained almost exclusively from the tropical forests of S. and Central America, E. and W. Africa and Asia, being the produce of naturally occurring trees and vines. The increase in the demand, for which the employment of rubber tires is largely responsible, has given an increased stimulus to the production of "wild" rubber, with the result that trees and vines have been recklessly cut and destroyed, and in some instances vast regions, as in the S. Sudan, have been nearly entirely denuded of rubber vines. This has led to restrictive measures, the vines being tapped under definite regulations as to the manner and time of tapping, and also to requirements as to replanting vines to take the place of those which have been injured or destroyed, certain areas being periodically closed. Such measures, which are now in operation in the French Sudan, the Congo and in German W. and E. Africa, can, however, only be enforced by special administrative machinery and at considerable expense, and this legislative action can only be regarded as temporary and preliminary to the establishment of plantations of rubber trees, which are not only easier to control, but the trees are less liable to injury from careless tapping. In Africa it seems probable that the production of rubber from vines is likely to be entirely superseded in process of time, and replaced by the plantations of trees which are already being established in those districts in which careful experiment has determined the kind of rubber tree best adapted to the locality. The forests of tropical America have suffered similarly, trees having been injured or destroyed and in some cases cut down in order to secure the immediate increase of supply which was called for by a considerable rise in value. The result has been that in the forests of Brazil and Mexico the conservation of rubber trees has received greater attention, whilst new and extensive areas are planted in S. and Central America. The wild rubber of S. and Central America is still the principal source of the rubber supply of the world, and is likely to continue to be so for many years to come. Although the cost of transport from the remote forest regions of some districts is a serious consideration, this is not likely to be operative in reducing production until there has been a considerable and permanent fall in price, by which time new areas in those countries in which planting is now taking place will probably have come into bearing.

The enormous increase in the commercial demand for rubber and the probability of the continuance of this increase in view of the great variety of purposes to which the material can be applied, has led to great activity in rubber planting in other parts of the world, especially in Ceylon and the Malay Peninsula and Archipelago, where the Para rubber trees (*Hevea brasiliensis*) has been successfully introduced, and numerous plantations, many of which have not been in existence for more than ten or fifteen years, are now contributing to the world's supply. This rubber is known as "Plantation" rubber in contradistinction to the "wild" rubber.

"Plantation" Para rubber from Ceylon and the Malay States has brought prices equal to and often exceeding those of fine Para rubber from Brazil. This is largely due to the improved methods of preparing the rubber practised by the planters of Ceylon and Malaya, which lead to the exclusion of the impurities usually found in "wild" rubber. Para rubber from Brazil generally contains about 15% of water, whilst "plantation" Para is usually nearly dry and contains 1% of water or less. It would appear, however, that the finest "wild" Para rubber as a rule possesses greater tensile strength than the "plantation" rubber. This has been ascribed by some to the presence in "wild" rubber of certain impurities derived either from the latex or introduced during the preparation of the rubber which are thought to enhance the physical properties of the caoutchouc. It is more probable, however, that the superiority of the "wild" Para is principally due to the greater age of the forest trees from which the rubber is obtained, many of which are from thirty to fifty years old. It is well known that the *Hevea* tree usually furnishes very inferior rubber if tapped before it is six or seven years old, and there is evidence to show that the quality of the rubber improves with the age of the tree. The oldest of the plantation trees of Ceylon and Malaya are not much more than twelve years old, whilst it is to be feared that immature trees are often tapped and their latex mixed with that of older trees before coagulation, thus forming inferior rubber. It is therefore to be expected that as time goes on the quality of "plantation" rubber will improve, and there would seem to be no reason why it should not eventually be fully equal to that of the "wild" rubber.

In 1909 the total production of rubber is stated to have been about 70,000 tons, of which more than one-half came from tropical America, about one-third from Africa, whilst the remainder was chiefly of Asiatic origin, including "plantation" rubber from Ceylon and Malaya, which amounted to about 3000 tons.

Chiefly owing to the supplies of "wild" rubber which are still available, comparatively little has been done until recently in establishing plantations either in Africa or in tropical America, but in Asia, including Ceylon, India and Malaya, in which there are relatively few important naturally-occurring rubber plants, there has been for some years great activity in forming plantations of rubber trees introduced mainly from tropical America, and there are now many millions sterling of British capital invested in companies established to form rubber plantations chiefly in Ceylon and Malaya. Each year should therefore show an increase in the production of plantation rubber. No trustworthy estimate of the rate of the increase of production can, however, be formed, as several uncertain economic factors have to be taken into account. Among these are the precise extent of demand, the limit of the inevitable fall in price with largely increased production, the cost of labour as increasing amounts are required, and the effect of changed conditions on the output of "wild" rubber and the competition of the new plantations which are being established in tropical America.

There can be little doubt that with a fall in price further uses for rubber would arise, leading to an increased demand, and among them may be mentioned its utilization as a road material. Difficulties in the supply of labour in the East may hinder the further development of the rubber-planting industry, especially at a period when a reduction in the cost of production may be the chief problem. In 1909 the average cost of producing "plantation" rubber in Ceylon and Malaya

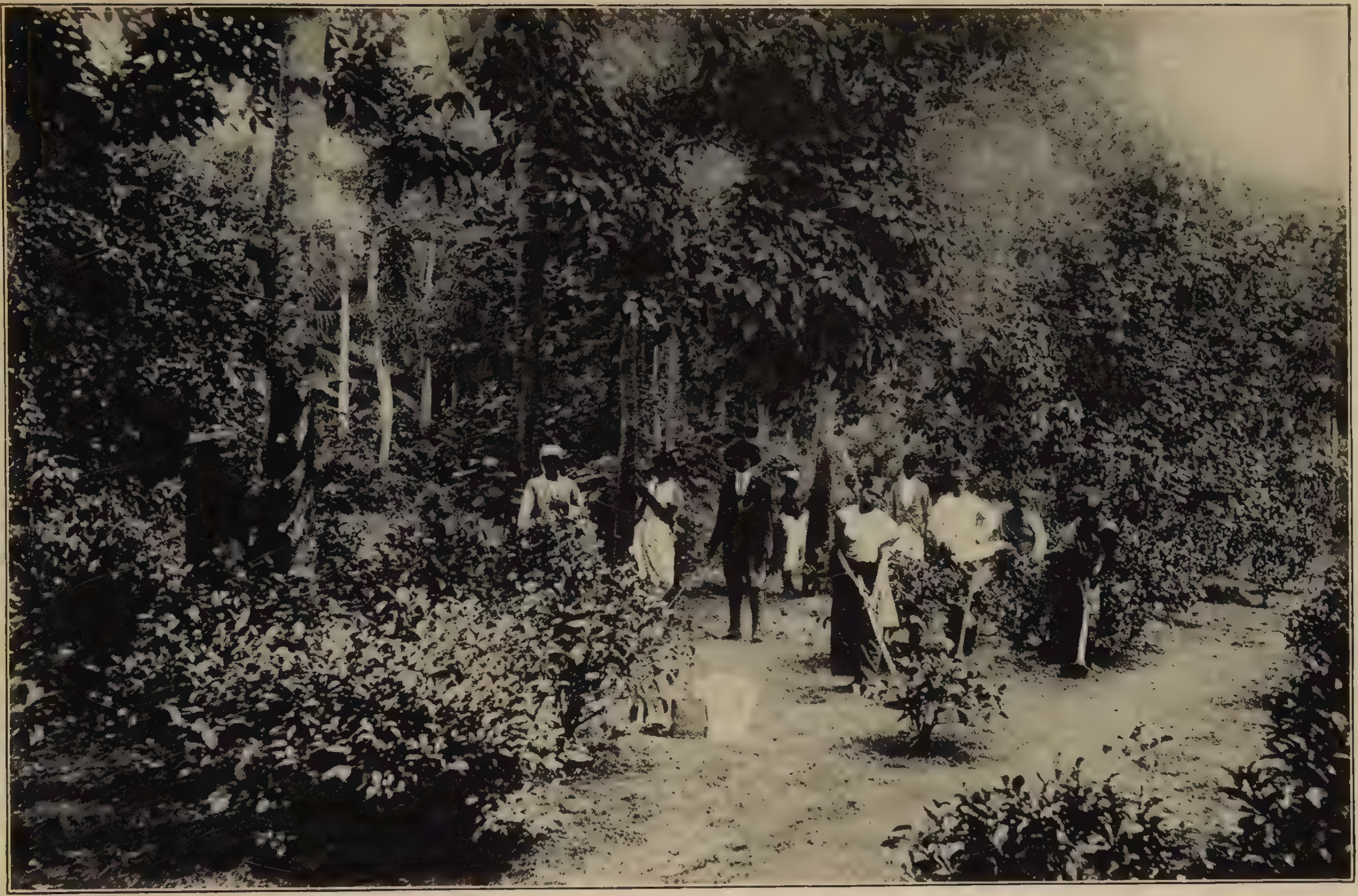


FIG. 11.—PARA RUBBER PLANTATION, CEYLON.

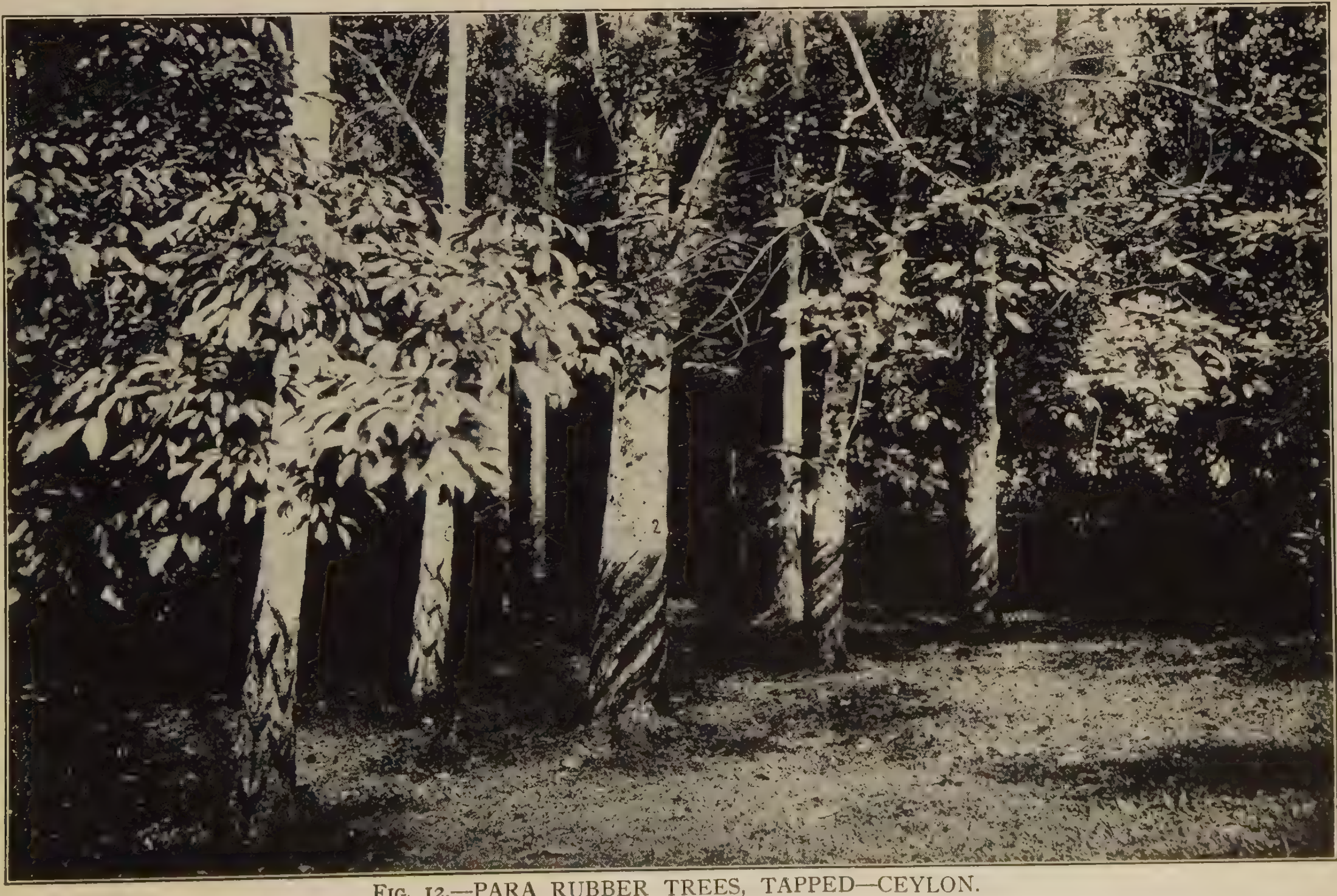


FIG. 12.—PARA RUBBER TREES, TAPPED—CEYLON.
(Spiral and V Systems.)

From Photographs in the Collections of the Imperial Institute.

RUBBER

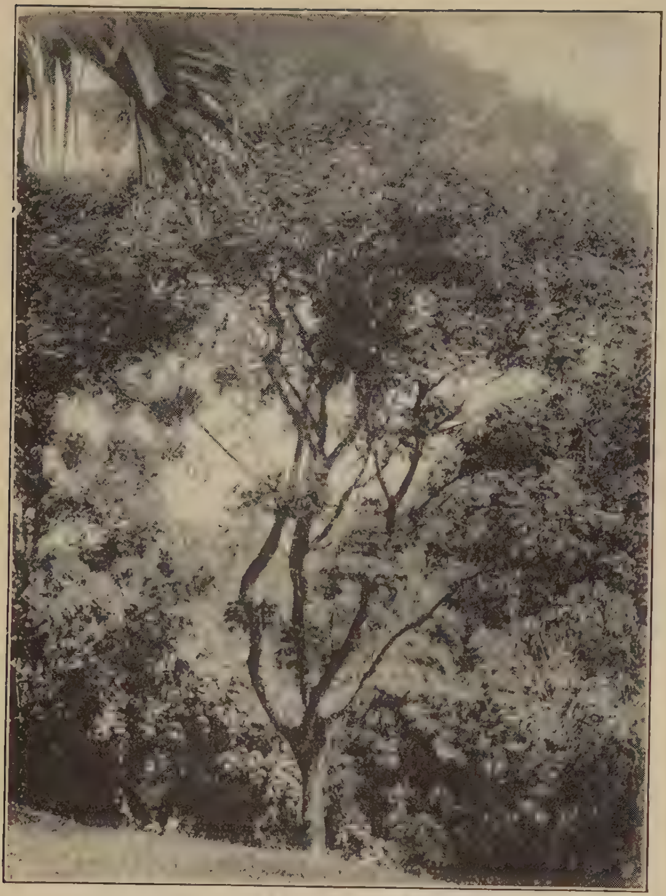


FIG. 13.—CEARA RUBBER TREE.

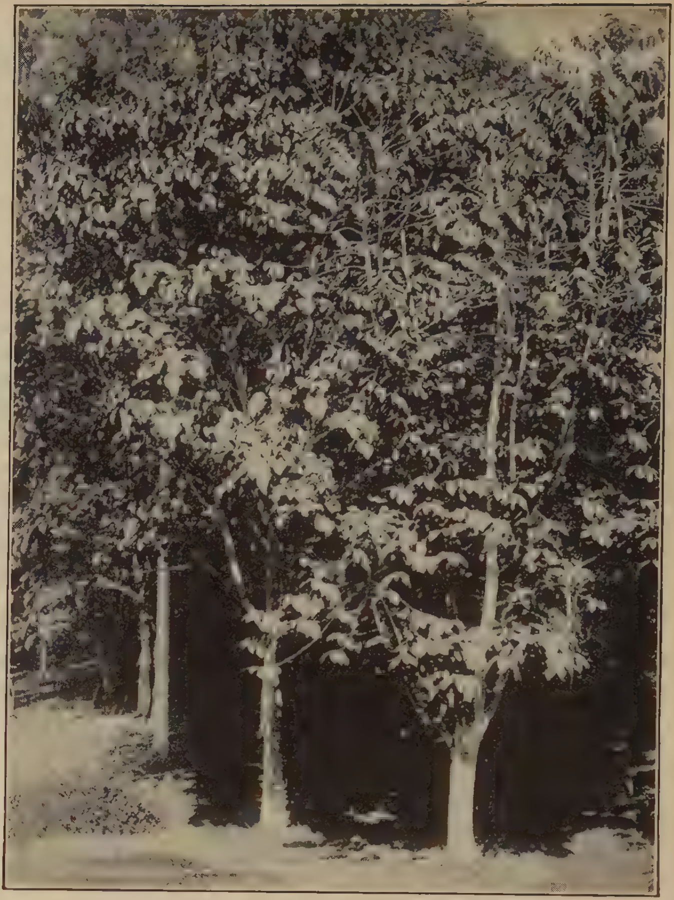


FIG. 14.—CASTILLOA RUBBER TREES.

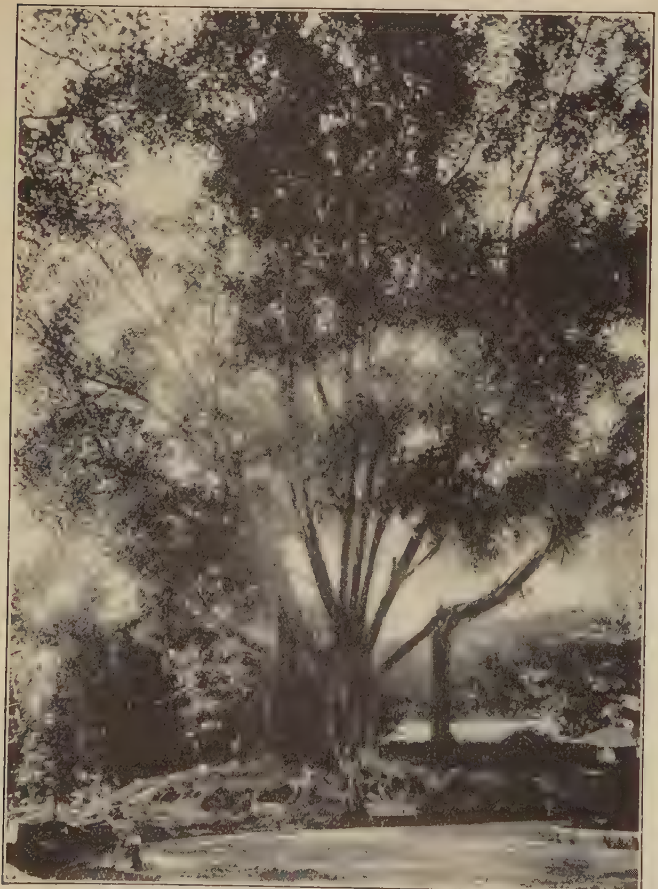


FIG. 15.—*FICUS ELASTICA.*

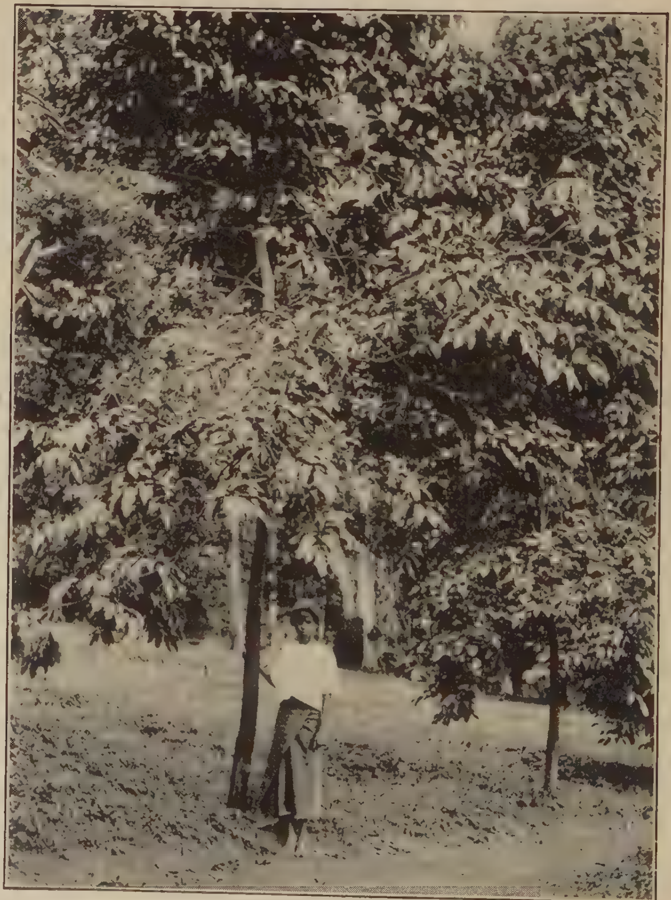


FIG. 16.—*FUNTUMIA ELASTICA.*

From Photographs in the Collections of the Imperial Institute.

may be stated approximately to have been from 10d. to 1s. per lb. The cost of collecting "wild" rubber is less easy to state with any approach to accuracy, since the cost varies in different districts of S. and Central America, but the average cost is stated not to be less than 1s. per lb. In Africa the cost of collection is much less, but the rubber is generally of inferior quality.

The market price of commercial rubber is determined by the current price of "fine Para" from S. America. This is subject to considerable fluctuation, and varied in 1900 to 1908 from 2s. 10d. to 5s. 9d. a lb. As much as 6s. 9d. per lb was given for specially prepared "plantation Para." Towards the latter part of 1904 the price of fine Para reached a high level and then considerably declined, reaching in 1907–8 a lower figure than had been recorded since 1900. At the beginning of 1908 the price gradually rose again to the neighbourhood of 4s. a lb. During 1909, without any serious decline in production, the price rapidly rose, owing to extraordinary causes, to about 10s. a lb, and in the early part of 1910 rose to over 12s. a lb, and subsequently fell to about half this price. Having regard to the present cost of producing "plantation" rubber, and to the probability that, apart from a possible increase in the price of labour, this cost is susceptible of further reduction, it may be concluded that rubber production will continue to be profitable even should a considerable fall in market value take place.

The Principal Rubber Trees, their Cultivation, and the Preparation of Rubber.—Most commercial rubber is derived from natural supplies, from the wild rubber trees of S. and Central America, India and Africa. Each year, however, the output of "plantation" rubber will show a considerable increase, and it is to be expected that ultimately this will form the chief source of supply, unless unforeseen circumstances should arise to interfere with the development of the plantation industry, which has been vigorously started chiefly with European capital in the tropical possessions of Great Britain, France and Germany. The best rubber is now obtained from large trees, of which the following are the more important:—

1. "Para" rubber, which takes the first position in the market, is derived from species of *Hevea*, principally *Hevea brasiliensis*, of which there are enormous forests in the valleys of the Amazon and its tributaries, and also in Peru, Bolivia, Venezuela and Guiana. In Brazil alone it is stated that the rubber area amounts to at least one million sq. m. The tree has been recently planted with great success especially in Ceylon and Malaya (Plate figs. 11 and 12).

2. "Ceara" or Maniçoba rubber is derived from species of *Manihot*, chiefly *Manihot Glaziovii*, a native of S. America especially abundant in Brazil, and successfully introduced into other countries (Plate fig. 13). The latex of this tree flows less freely than that of *Hevea brasiliensis*, and the collection of large quantities of the latex is attended with considerable difficulty. The latex is therefore usually allowed to coagulate on the tree, as it slowly exudes from the incision. On this account it is often exported in strings or "scrap" and not usually in biscuits or balls. Partly for this reason and partly because pieces of wood and dirt are apt to be included with the scrap, the market value of Ceara rubber is usually less than that of Para. The plantations of *Manihot* established in E. Africa, Ceylon and S. India have, however, begun to furnish a better quality of Ceara rubber, which is often prepared in biscuit form. Other species of *Manihot* are also under trial, and some give promise of good results, especially *M. dichotoma* and *M. heptaphylla*.

3. The "Ule" rubber of Central America and British Honduras originates from *Castilloa elastica*. In S. America its natural occurrence appears to be limited to west of the Andes, but the tree is abundant in Mexico, Guatemala and Nicaragua. The rubber comes into commerce in thick strips or sheets or as "scrap." The rubber is usually dark in colour and is often contaminated with proteid impurities derived from the latex. Ule rubber is generally inferior in strength to Para and commands a lower price. The *Castilloa* tree has been experimentally planted in Ceylon, the West Indies and other countries (Plate fig. 14).

Other trees occurring in S. America which furnish rubber of secondary commercial importance are *Hancornia speciosa*, yielding the Mangabeira rubber of Brazil, and species of *Sapium* furnishing the Colombian rubber and much of the rubber of Guiana (derived from *Sapium Jenmani*), which is scarcely inferior to the rubber of Para.

4. "Rambong" or Assam rubber is the produce of *Ficus elastica*, commonly known as the indiarubber tree and cultivated in Europe as an ornamental plant. This tree, indigenous to Asia, attains large dimensions in India, Celon and the Malay Archipelago (Plate fig. 15). It furnishes most of the rubber of India, Sumatra and Java. Although intrinsically of excellent quality, Rambong rubber, owing to the careless method of collection practised by the natives which leads to the inclusion of much impurity, usually fetches a lower price than Para. The tree has been introduced into W. Africa and Egypt, but has not proved very successful in Africa as a rubber producer.

5. "Lagos" rubber is the produce of the African rubber tree *Funtumia elastica*, which is indigenous to Africa from Uganda to W. Africa (Plate fig. 16). It is known as the silk rubber tree, probably on account of the silky hairs which are attached to the seeds. The latex, which is usually coagulated by standing or by heating, is obtained from incisions in the bark of the tree. The rubber is of good quality, though, owing to the method of preparation adopted, the product is often impure and discoloured, and consequently usually brings a lower price than the best rubbers of commerce.

6. Besides the trees described above, a number of climbing plants or vines belonging to the Apocyanaceae secrete a latex which furnishes rubber of good quality. These vines are less satisfactory than trees as rubber producers, owing to the readiness with which they are injured and destroyed by careless tapping, and to the difficulty of regulating these methods in the case of vines distributed over enormous areas of forest. Of these vines the most important are the species of *Landolphia* which occur throughout tropical Africa, including the Sudan, Congo, Mozambique and Madagascar, the principal of which are *Landolphia owariensis* and *L. Heudelotii*, common throughout W. Africa, and *L. Kirkii* and *L. Dawei* in E. Africa. The rubber is obtained by incising the stems of the vines and coagulating the latex by exposure, by admixture with acid vegetable juices or by heating. *Landolphia* rubber is usually roughly prepared and in consequence commands a low price. The vines of species of *Clitandra* and *Carpodinus* in W. Africa also furnish good rubber, as do the *Forsteronia gracilis* of British Guiana and *Forsteronia floribunda* of Jamaica. Vines resembling Landolphias are widely distributed in Asia. Among these are species of *Willughbeia* and *Leuconotis*, from which much of the rubber exported from Borneo is derived; *Parameria glandulifera*, common in Siam and Borneo, and *Urceola esculenta* and *Cryptostegia grandiflora*, both common in Burma.

Among other sources from which rubber is commercially obtained may be mentioned the Guayule plant (*Parthenium argentatum*) of Mexico, and the "Ecanda" plant of Portuguese W. Africa, from the tuberous roots of which rubber is extracted by the natives. The "Ecanda" plant has been named *Raphionacme utilis*. The root rubber prepared by the natives of the Congo and the S. Sudan is extracted partly from the roots of *Landolphia* or from the rhizomes of *Landolphia Thollonii* or *Carpodinus lanceolatus*. It is obtained by breaking up the roots or rhizomes in hot water and separating the rubber, and machines have now been devised for this purpose.

Little is at present known of the large rubber tree of Tonkin (*Bleckrodea tonkinensis*), the latex of which is stated to furnish excellent rubber.

Sources of Commercial Rubber

1. Para rubber is so named from the Para province of Brazil, from the principal town of which, also known as Para, most of the rubber is shipped. This rubber is obtained chiefly from *Hevea brasiliensis*, Müll. Arg., a large euphorbiaceous tree upwards of 60 ft. in height, and having trifoliate leaves, the leaflets being lanceolate and tapering at both ends (fig. 1). The trunk reaches about 8 ft. in circumference. The flowers are usually pale green. The fruit is a capsule containing three seeds rather larger than cobnuts, having a brown smooth surface figured with black patches. The seeds readily lose their vitality, and on this account need special care in transport. They should be loosely packed in dry soil or charcoal. These seeds have been examined at the Imperial Institute, and the kernels have been found to contain nearly half their weight (48 %) of an oil resembling linseed oil and applicable for the same purposes. The residue or "cake" left after expression of the oil is apparently nutritious and may prove to be of value for feeding animals. There is present in the seeds an enzyme which rapidly decomposes the oil if the seeds are crushed and kept, setting free a fatty acid and glycerin. As the seeds are very abundant, they will probably be utilized commercially as soon as the demand for planting has subsided.

In Brazil the trees are found in different districts, but flourish best on rich alluvial clay slopes by the side of rivers, where there is a certain amount of drainage, and the temperature reaches from 89° F. to 94° F. at noon and is never cooler than 73° F. at night, while rain falls during about six months and the soil and atmosphere are moist throughout the year. The genus *Hevea* was formerly called *Siphonia*, and the tree named Pao de Xerringa by the Portuguese, from the use by the Omaqua Indians of squirts or syringes made from a piece of pipe inserted in a hollow flask-shaped ball of rubber. The trees are not generally tapped until they are ten to fifteen years old, as young trees yield inferior rubber. If carefully conducted, tapping does not injure the tree. The latex is collected in the so-called dry season between June and February. The trees are tapped in the early morning when the latex is most readily obtained.

To obtain the latex, deep incisions are made near the base of the tree extending up the trunk. Small shallow cups are placed below the incisions to receive the milk, each cup being attached by sticking a piece of soft clay to the tree and pressing the cup against it. The latex, of which each tree yields only about 6 oz. in three days, has a strong ammoniacal odour, which rapidly disappears, and in consequence of the loss of ammonia the latex will not keep for longer than a day unchanged; hence when it has to be carried to a distance from the place of collection, 3% of ammonia solution is added. The latex usually furnished about 30% of rubber.

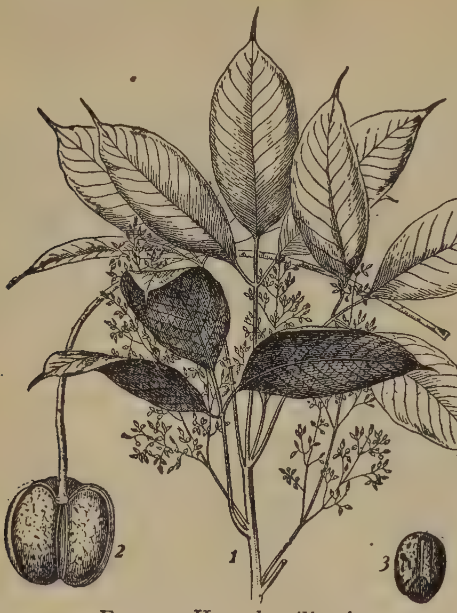


FIG. 1.—*Hevea brasiliensis.*

To obtain the rubber, the latex is usually treated in the following manner. A piece of wood about 3 ft. long, with a flattened end forming a kind of paddle, is dipped in the milk, or this is poured over it as evenly as possible. The milk is then carefully dried by turning the mould round and round in the smoke produced by burning wood mixed with certain oily palm nuts; those of *Attalea excelsa* are considered best, the smoke being confined within certain limits by the narrowness of the neck of the pot in which the nuts are heated. The creosote and other products from the smoke no doubt act antiseptically and prevent to a large extent the subsequent putrefaction of the proteids retained by the coagulated rubber. Each layer of rubber is allowed to become firm before forming another; a practised hand can make 5 or 6 ℔ in an hour. In some districts a stout stick is substituted for the paddle, on which the rubber as it coagulates is wound cylindrically. The rubber thus prepared is the finest that can be obtained. The cakes when completed are, in order to remove them from the mould, slit open with a sharp knife, which is kept wet, and are hung up to dry. The flat rounded cakes of rubber made in this manner are known in the London market as "biscuits." They retain about 15% of moisture. The scrapings from the tree, which contain fragments of wood, are mixed with the residues of the collecting pots and the refuse of the vessels employed, and are made up into large rounded balls, which form the inferior commercial quality called "negrohead," and often contain 25 or 35% of impurity. The yield of rubber varies, but it is stated on an average to be 10 ℔ of rubber per tree, and if carefully tapped one tree will yield this amount for many years in succession.

Plantations of Hevea brasiliensis.—*Hevea brasiliensis* was introduced to Ceylon and Singapore from seedlings raised at Kew from Brazilian seed, specially collected by Mr H. A. Wickham in S. America. The seedlings rapidly developed and in most places in which they were planted grew into large trees which furnished satisfactory latex when tapped in their sixth or seventh year. Ever since plantations of *Hevea* have been made on an increasing scale in the Straits Settlements, the Federated Malay States and in Ceylon, and at the present time rubber plantations form the principal industry in these colonies. Successful plantations of *Hevea* have also been established in Java, Sumatra and Borneo. Many of these plantations have not yet reached the productive stage—that is, the sixth or seventh year. A large number of plantations in British Malaya and Ceylon are now actively exporting increasing quantities of rubber. *Hevea* seedlings were also introduced into India, but did not apparently succeed except in Burma and S. India.

It may be estimated that between one and two million acres of land in the different countries referred to have been already appropriated for rubber plantations. Plantations are also being formed in British, French and German possessions in W. Africa and in the Congo, also in the tropical portions of Australia. In certain districts of British W. Africa the *Hevea* which has been planted promises well, especially in the Gold Coast, where good yields of latex are stated to have been obtained.

It may be useful to summarize here the experience which has been gained in the formation of plantations of *Hevea* and in the production of rubber.

Hevea brasiliensis as a rule flourishes to the greatest extent at low altitudes on rich soil capable of retaining moisture. The nature of the soil appears, however, to be of secondary importance, provided that it is able to hold moisture and that climatic conditions of high and even temperature with considerable rainfall and absence of wind are satisfied. Although the tree is sensitive to such conditions it appears to possess a certain capacity of adaptation which should be borne in mind. Generally a low altitude is desirable, but good results have been obtained in Ceylon in sheltered positions at elevations of 3000 ft. and over, although at higher altitudes the growth of these trees appears to be slower. In many plantations besides catch crops (cassava, sesame, ground-nuts, &c.) other crops, such as tea, coffee, cocoa and tobacco, are grown with rubber. It is improbable, except in the early stages of the rubber tree, that this procedure will succeed; the rubber will ultimately dominate the position to the detriment and ultimate extinction of the other crop, whilst the growth of the rubber tree will be retarded. A partial exception may perhaps be made in the case of cocoa, when the two plants are placed not too closely in about equal numbers. In these circumstances it appears that satisfactory results may be obtained from both crops, at any rate for a certain number of years.

The experience of planters in general is in favour of the complete removal of weeds from a rubber plantation. This practice, which involves periodical weeding, adds considerably to the cost of maintaining plantations, and, although justified so far by results, possesses several other disadvantages. During the tropical rains the soil is liable, to a greater or less extent, to denudation, which becomes very serious when the land slopes; and in any case, the soil is apt to become impoverished by the loss of its soluble constituents. These disadvantages are at their maximum when the rubber trees are quite young. At a later stage the shade of the large trees compensates to a considerable extent for the absence of cover on the ground. Another disadvantage of uncovered soil in a plantation of young rubber trees is that the ground under the heat of a tropical sun rapidly loses its moisture. For this reason proposals have been made to plant in the place of weeds low-growing leguminous plants, the growth of which will not only prevent impoverishment and loss of soil during the rains and conserve moisture in the heat, but will also have the effect of enriching the soil in nitrogenous constituents through the power leguminous plants possess of absorbing nitrogen from the air through nodules on their roots. Among the plants which are being tried for this purpose are various species of Crotolária, passion-flower, and the well-known sensitive plant of the East. The success of the method cannot yet be judged, but the experiment is one which deserves very full trial.

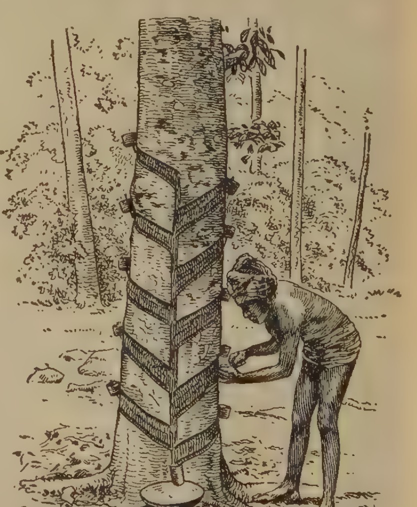


FIG. 2.—Tapping, herring-bone system.

One of the most important subjects in connexion with rubber plantations is the method to be adopted in tapping the trees for latex. The native methods in vogue in Brazil and Mexico are primitive and often injurious to the tree. At present it cannot be said that finality has been reached on the subject of the best method, giving a good return of latex with a minimum of damage to the tree. A method at one time largely adopted was to make a series of V-shaped incisions on four sides of the tree to a height of about 6 ft. from the base—that is, within the reach of an ordinary man without the need for ladder or scaffolding; the latex obtained from the upper part of the tree is said to furnish less rubber and of poor quality. The latex is collected in cups placed at the apex of each V. Other systems are the herring-bone plan of a vertical channel with lateral connecting channels about 1 ft. apart at an angle of about 45°, the latex being collected in cups placed at the base of the vertical channels (fig. 2); the spiral system, in which a series of spiral grooves are cut all round the trunk, by which means virtually the entire area of the trunk is tapped. In some instances a combination of these methods is employed. The V-system is the oldest, but is being largely superseded by the herring-bone; the spiral system is more recent and is still on trial.

Instead of the axe or large knives which frequently inflicted serious damage to the trees, special small knives and prickers are now employed so constructed as to avoid injury to the tree through making a larger incision than is necessary, and without penetrating into the wood below the laticiferous layer. It is possible to tap or prick trees daily for a number of years without apparent injury, but the practice of tapping on alternate days appears to be safer and to afford equally satisfactory if not better results. The yield of latex is at first small, but increases with successive tappings, which appear to stimulate the local production of latex, and finally reaches a maximum.

When the bark has been removed a period of from three to four years must elapse before it is so fully renewed as to render fresh incisions possible. In the case of a tree from seven to ten years old, tapping is so arranged that by the time the last incisions on the original growth are made, the new growths on other portions are at least four years old, and ready for new incisions to be made. Too frequent tapping leads to the production of latex poor in caoutchouc, whilst tapping of trees before they are six or seven years old, and from 20–25 in. in circumference, produces inferior rubber. As a rule, an annual yield of more than 1–2 ℔ of rubber per tree must not be looked for from recent plantations, although much higher yields up to 10–15 ℔ and over per tree are recorded from S. America, and it is therefore probable that with greater experience as to the best methods of tapping and with older trees considerably larger yields may be expected from plantations in the future. An average of 150 trees to the acre (20×15 ft.) and a yield of 1½ ℔ of rubber per annum per tree at 2s. 6d. per ℔ gives the result of £28, 2s. 6d. per acre. The cost of production may be assumed to be about 1s. per ℔, to which has to be added the expense of transport. The cost of clearing forest land and planting with rubber in Ceylon is estimated at about 100 Rs. per acre in the first year, and from 20–30 Rs. per acre in subsequent years until the sixth year, when the plantation would begin to be productive.

The point of next importance is the coagulation of the latex so as to produce rubber in the form and of the quality required by the manufacturer. The primitive methods of coagulation and curing practised in S. America undoubtedly are susceptible of considerable improvement, and certainly waste can be reduced to a minimum. It is, however, important to remember that rough as these native methods are they result in the production of rubber which commands the highest price. As the removal of the impurities of the latex is one of the essential points to be aimed at, it was thought that the use of a centrifugal machine to separate the caoutchouc as a cream from the watery part of the latex would prove to be a satisfactory process. This method is said to answer well with the latex of *Castilloa*, but it appears to be inapplicable to the latex of *Hevea*, which does not cream readily when centrifugalized.

The plan usually adopted is to collect the latex in rectangular tanks or casks. It is then coagulated by the addition of an acid liquid, acetic acid or lime juice being generally employed, and the mixture allowed to stand. The coagulated rubber separates as a mass of spongy caoutchouc. If the coagulation has been effected in shallow dishes, the rubber is obtained in a thin cake of similar shape known as a "biscuit."

The rubber thus formed is washed and dried. The coagulated rubber separated from the watery fluid is cut up into small pieces and passed through the grooved rollers of the washing machine, from which it issues in sheets, long crinkled ribbons or "crêpe," which are then dried in hot air chambers or in a vacuum dryer, by which means the water is dissipated at a lower temperature. In order to prevent decomposition of any proteid impurity which may remain incorporated with the rubber, the freshly coagulated rubber is sometimes cured in the smoke of burning wood or a small quantity of an antiseptic such as creosote is added during coagulation.

Plantation rubber comes into commerce in the form of the crinkled ribbons known as crêpe, in sheets or biscuits, and sometimes in large blocks made by compressing the crêpe rubber. Block rubber is considered to possess certain advantages in securing a constant proportion of water, and in being satisfactory for transport. The best condition and form in which to export rubber cannot be regarded as settled. The probabilities are that in the end the production of a rubber as nearly as possible free from water and impurities and of constant composition will be realized as best meeting the requirements of the modern manufacturer. The need for scrupulous cleanliness in the preparation of rubber is now recognized, and the arrangements of a rubber factory in Ceylon or Malaya are comparable with those of the modern dairy.

In the present transition stage of rubber production it is necessary for the manufacturer in Europe to wash all rubber. He receives both the wild rubber containing variable quantities of impurity and the purer plantation rubber, the latter, however, in much smaller amount. The fact that at present washing machinery exists in all European factories and that most of the rubber received needs washing, leads to the greater purity of plantation rubber, except for special purposes, being generally discounted by the manufacturer. As soon as the output of plantation rubber of constant composition has reached much larger dimensions it is probable that the manufacturer will be able to dispense with washing. This will operate to the advantage of plantation rubber and against the wild rubber, so long as the latter is not exported in a purer condition.

So far the *Hevea* plantations in Ceylon and the East have not been seriously troubled by insect or fungoid pests, and those which have occurred have succumbed to proper treatment. The most serious trouble has been occasioned in the Malay States by a white thread-like fungus (*Fomes semitostus*) which attacks the roots of the *Hevea* tree and eventually kills it. The development of this fungus is greatly promoted by the presence of decaying stumps and wood in the plantation. Vigorous measures are now taken in many plantations to remove all old wood and to extract stumps of old trees, which in the first instance it was considered unnecessary to remove.

2. *Manihot Glaziovii* belonging to the Euphorbiaceae is the tree of N.E. Brazil which furnishes Ceara or Maniçoba rubber (fig. 3). It is closely related to the Manioc, cassava or tapioca plant (*Manihot utilissima*) which it resembles when young and exhibits a similar tuberous root system. The tree grows well on dry and rocky soil without rain for a considerable period of the year, and flourishes at high altitudes up to about 4000 ft. It is therefore adapted for conditions which are unsuitable for *Hevea*. The tree grows about 30 ft. high, with a rounded head of foliage, and greyish-green 3 to 7-lobed palmate leaves, somewhat resembling the leaves of the castor-oil plant in shape and size. The seeds (fig. 3), which are abundant and retain their vitality well, have a hard thick coat. The seeds take a year to germinate, unless the edges near the end bearing the caruncular projecting are rasped off. Cuttings, if they have a single bud, strike readily.

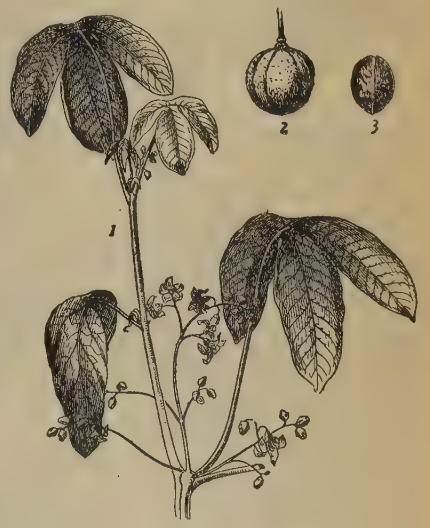


Fig. 3.—*Manihot Glaziovii*. 1, branch with flowers; 2, fruit; 3, seed.

The trees are tapped when they are about five years old. The mode of collecting the rubber is as follows. After brushing away the loose stones and dirt from the root of the tree by means of a handful of twigs, the collector lays down large leaves for the latex to drop upon. He then slices off the outer layer of the bark to the height of 4 or 5 ft. The latex, which exudes slowly and in many tortuous courses, some of it ultimately falling on the ground, is allowed to remain on the tree for several days, until it becomes dry and solid, when it is pulled off in strings, which are either rolled up into balls or put into bags in loose masses, in which form it enters commerce under the name of Ceara "scrap." Ceara rubber is also exported in the form of lumps and cakes. The annual yield of rubber is rather more than 1 ℔ per tree. The latex coagulates readily, especially if churned or if diluted with water, when a purer rubber is obtained.

The *Manihot* tree has been widely introduced into other countries, and appears to succeed wherever the rainfall is not excessive. In Ceylon and in some parts of India, especially in Madras, it has succeeded well. In W. Africa the tree flourishes, but it is under trial as a rubber producer. The *Manihot* tree also promises well in E. Africa, Nyasaland and the Mozambique. The pure Ceara rubber, as for example the "biscuits" prepared in Ceylon, is of excellent quality, scarcely if at all inferior to Para. That derived from Brazil, however, is generally inferior, being mixed with wood and dirt. The cultivation and collection of the rubber being troublesome, it is unlikely to be attended to in those countries in which *Hevea* is successful.

3. The source of "Ule" rubber exported from Central America, and of the "Caucho" rubber of Peru is *Castilloa elastica*, Cerv., a lofty tree, N. O. Urticaceae, with a trunk 3 ft. or more in diameter, and large hairy oblong lanceolate leaves often 18 in. long and 7 in. wide (fig. 4). The tree grows most abundantly in a sporadic manner

in the dense moist forests of the basin of the Rio San Juan, where the rain falls for nine months in the year. It prefers rich fertile soil on the banks of watercourses, but does not flourish in swamps. It is found also in Costa Rica, Guatemala, Honduras, Mexico, Cuba and Hayti, and in Panama with another species of *Castilloa*, and on the W. coast of S. America down to the slopes of Chimborazo; the Cordilleras of the Andes separating the *Castilloas* from the *Heveas* of Brazil.

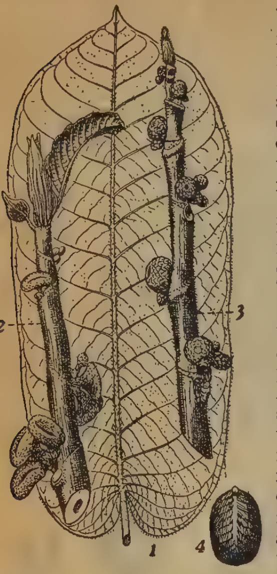


FIG. 4.—*Castilloa elastica.* 1, leaf; 2, twig with male flowers; 3, twig with female flowers; 4, seed; 4, nat. size.

In Nicaragua the latex is collected in April, when the old leaves begin to fall and the new ones are appearing, during which time the latex is richest. The tree is tapped either in the same manner as the *Hevea*, or by encircling the tree with a simple spiral cut at an inclination of 45°, or by two parallel spirals if the tree be large. At the bottom of the spiral an iron spout about 4 in. long is driven into the tree, and the milk is received in iron pails. A tree 20 to 30 ft. high to its first branches, and about 4 ft. in diameter, is expected to yield annually 20 gallons of milk, each gallon giving about 2 lb of rubber. In the evening the milk is strained through a wire sieve and transferred to barrels. The milk, which is acid, is coagulated by the addition of the alkaline juice of the "achete" plant, or of another plant called "coasso." The strained juice of either of these plants, obtained by bruising the moistened herb and subsequent expression, is added to the milk in the proportion of about 1 pint to the gallon. In British Honduras an alkaline decoction prepared from the Moon plant (*Calonictyon speciosum*) is used for the same purpose. If these plants are not procurable, two parts of water are added to one of the milk, and the mixture allowed to stand for twelve hours. The coagulum is next flattened out by a wooden or iron roller to get rid of the cavities containing watery liquid, and the sheets are then hung up for fourteen days to dry, when they weigh about 2 lb, the sheets being usually $\frac{1}{2}$ to $\frac{1}{8}$ in. thick and 20 in. in diameter. When coagulated in water, the mass is placed in vats in the ground and allowed to dry, this taking place in about a fortnight. It is then rolled into balls. That which dries on the incisions in the tree is called "bola" or "burucha," and is said to be highly prized in New York. The loss of Nicaragua rubber in drying is estimated at 15%. It is exported chiefly from San Juan del Norte, or Grey Town, and the larger proportion goes to the United States. The *Castilloa* tree appears to be suitable for cultivation only in districts where the Para rubber would grow equally well. The tree is ready for tapping at about the same age as *Hevea* and the average yield of rubber is about the same. Since the latex "creams" readily the rubber can be separated from the latex by centrifugalizing, and its quality and market value thus enhanced. Much of the native *Castilloa* rubber is of inferior quality. The tree has been introduced into S. India, Ceylon and the W. Indies, where it has succeeded well, especially in Trinidad and Tobago. It is also under trial in E. and W. Africa and Nyasaland. Several other species of *Castilloa* than *C. elastica* are known to furnish rubber, but little has been recorded as to their advantages.

4. *Funtumia elastica* (formerly known as *Kickxia* or *Kixia elastica*) is the W. African (Ire or Irai or Lagos) rubber tree, which belongs to the Apocynaceae, a natural order which includes the *Landolphia* vines as well as other rubber producers. It is a large forest tree of upright habit extending to 60 or 70 ft. in height and 3 to 4 ft. in diameter. The bright green, glabrous leaves are broad and oblong, about 6 in. in length (see fig. 5). The flowers are yellow, and the seeds enclosed in a pod are long and thin with numerous long silky fibres attached to them, which enable the seeds to be readily carried by the wind. The trees are common throughout the central regions of E. and W. Africa (from Uganda to Sierra Leone). The botanical name is taken from a W. African native name for a rubber tree—"Funtum."

Many of the trees in the accessible forests of W. Africa have been destroyed by over-tapping and felling. Plantations of *Funtumia* have been established in several districts, including the Gold Coast and S. Nigeria. The trees are tapped on the "herring-bone" plan and the milk collected in vessels at the base. This is then poured into the hollowed-out trunk of a tree, where it is allowed to stand covered with palm leaves for about a fortnight. The watery portion of the latex soaks into the trunk, and the soft spongy rubber which remains is kneaded and pressed into lumps or balls.

In some districts the collected milk is heated alone or diluted with water, to coagulate the rubber, but if heated alone an inferior rubber is apt to result owing to overheating.

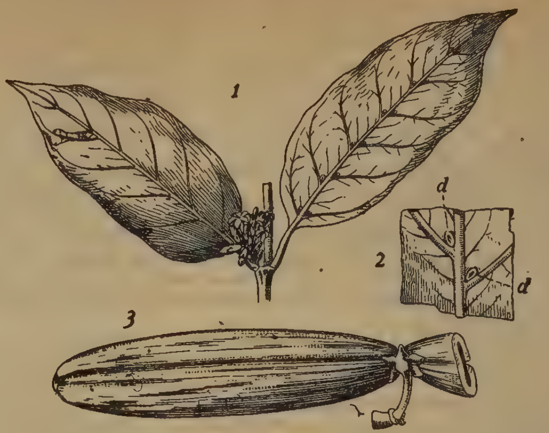


FIG. 5.—*Funtumia elastica* (Lagos rubber). 1, twig with flowers; 2, part of under side of leaf showing somatia at *d d* (about nat. size); 3, fruit (about $\frac{1}{3}$ nat. size).

The *Funtumia* latex can also be coagulated by the astringent infusion of *Bauhinia* leaves or by exposing it in shallow dishes, when the liquid "creams." The yield of rubber is stated as a rule to be less than that of Para. The rubber, if properly prepared, is of excellent quality, and the tree deserves further attention, especially in those regions of W. Africa which are unsuited to *Hevea*.

Funtumia africana furnishes a very inferior rubber, which is highly resinous.

5. *Ficus elastica* is the tree which produces Rambong or Assam rubber. It is well known in Europe as a small ornamental tree, but in the tropics it attains very large dimensions, and develops a system of branching roots which act as buttresses to the large trunk (see fig. 6). It is a native of India, Burma and the Malay Archipelago, and is most abundant in those regions in which the climate is distinctly humid, and subject to this condition the tree flourishes at high altitudes. In Assam and in upper Burma there are extensive forests of *Ficus elastica*, but to a large extent the trees have been damaged by careless tapping. Large plantations have been formed by the Government of India both in Assam and Bengal, but most of the rubber exported is still obtained from the forest trees. It has been found that although the tree grows well in many different countries and different localities, it only furnishes a satisfactory yield of rubber in mountainous districts, such as those of Assam and certain parts of Ceylon and Java. The trees are tapped when about ten years old, and as a rule annually furnish from 5–10 lb of rubber per tree. The latex flows fairly well, but is usually allowed to dry on the tree.

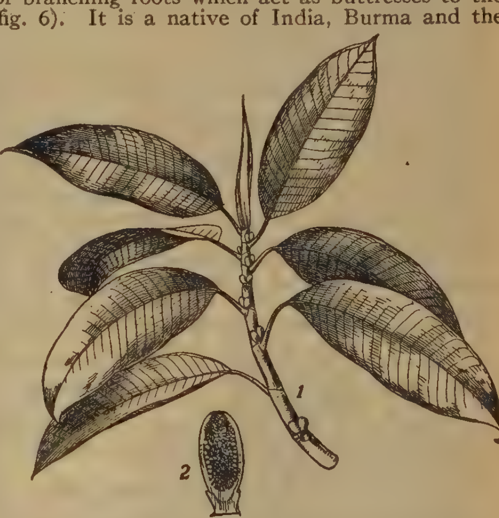
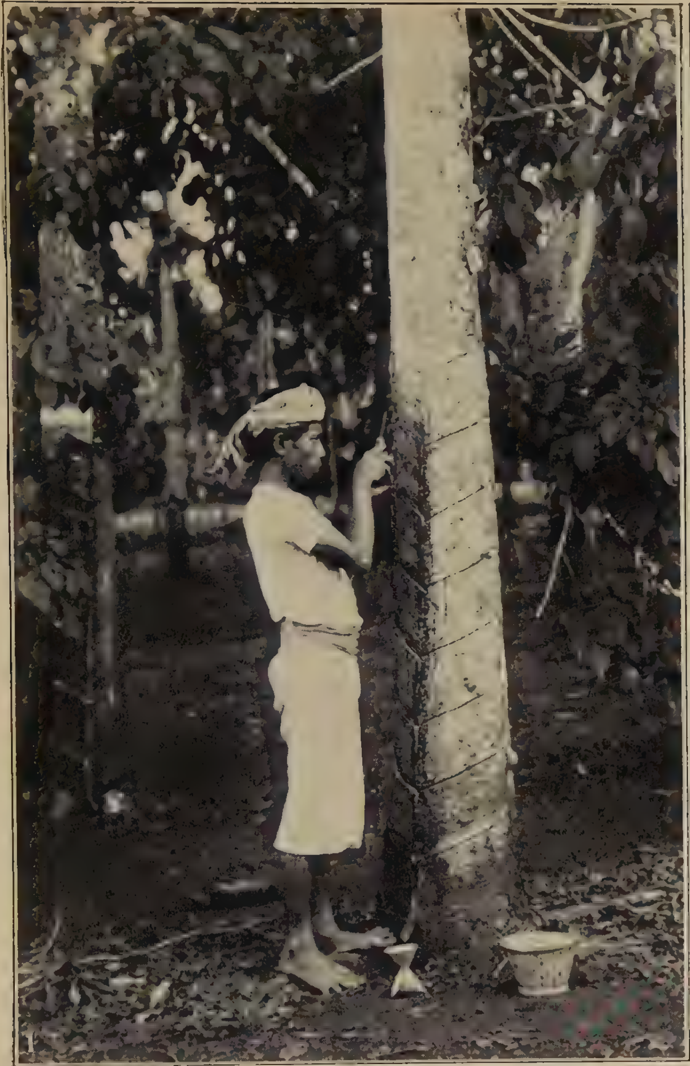


FIG. 6.—*Ficus elastica.* 1, twig; 2, section of inflorescence.

The rubber, if of good quality, sells at prices only slightly inferior to that of Para. When the plantations of *Ficus* in India are in full bearing it is possible that this tree may attract more attention, since the plantation rubber is likely to be of superior quality owing to the greater care taken in its preparation. It seems at present doubtful, however, whether the establishment of plantations of *Ficus* will be profitable under ordinary conditions in India.

In addition to the trees described above there are numerous plants of some importance as rubber producers. Among these may be mentioned the *Landolphia* vines, which are still the chief source of African rubber. The vines grow upon forest trees, and the stems are periodically tapped. There are numerous species of these climbing plants, of which the most important as furnishing good rubber are *Landolphia owariensis* (see fig. 7), which occurs throughout



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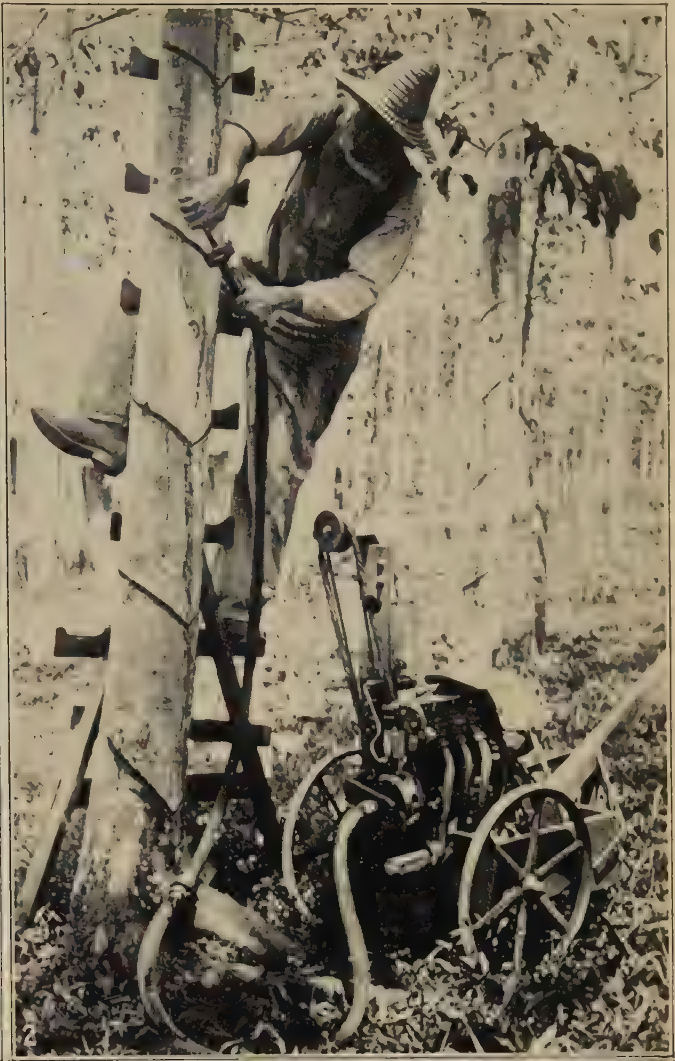

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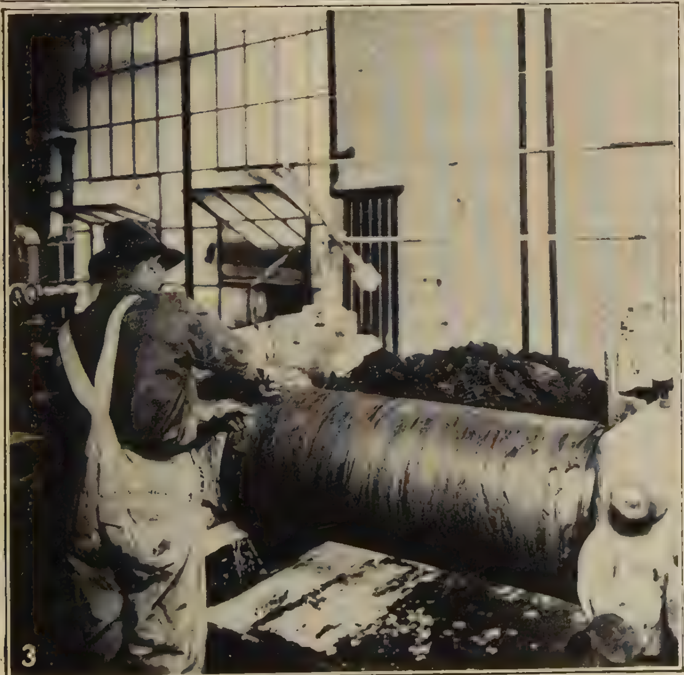

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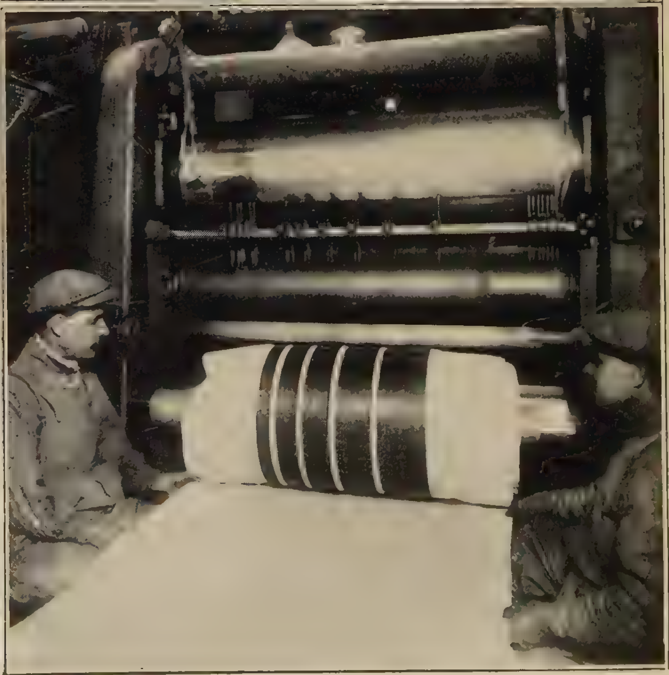

FIG. 1. A native tapping a rubber tree (Hevea brasiliensis) on a plantation in Java. FIG. 2. Experimental tapping of Castilloa elastica by machinery. FIG. 3. Mixing room in a tire plant, New York City. The crude rubber and ingredients are mixed and worked into sheets, and subsequently put through a set of hot rollers of a calender which presses it into the heavy cotton fabric. FIG. 4. Calendering thin strips of rubber on fabric to be used in making automobile tires. For the latest developments in production and technical methods, see the articles RUBBER and RAW MATERIAL, both in Vol. 31.

(Figs. 1, 3 and 4. Ewing Galloway. Fig. 2. "Wide World.")

W. Africa and the Sudan, *Landolphia Heudelotii* of W. Africa, and *Landolphia Kirkii* and *L. Dawei*, which are found in the forests of E. Africa. Other species of *Landolphia*, including *Landolphia florida*, abundant in both E. and W. Africa, furnish rubber of inferior quality.

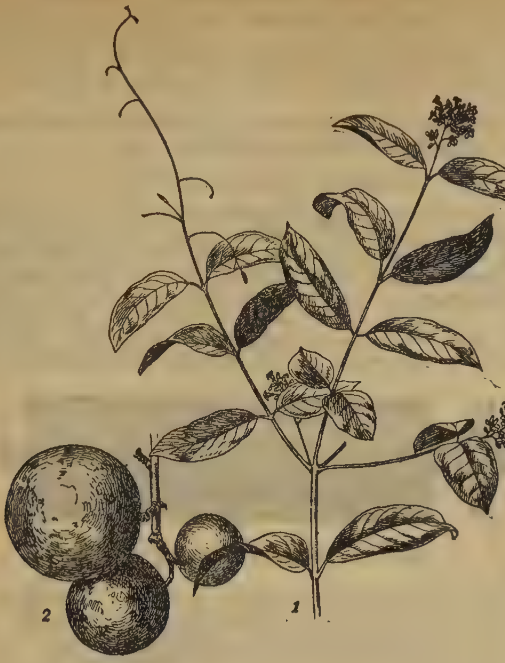

FIG. 7.—*Landolphia owariensis.* 1, twig with flowers; 2, fruit.

Among other shrubs and vines which yield rubber of fair quality may be mentioned *Willughbeia edulis* and *Urceola elastica* and *Parameria glandulifera*, which occur in Burma and Malaya.

The *Sapiums* of Colombia and Guiana are large trees resembling *Hevea*, and certain species furnish good rubber, especially the *Sapium Jenmani* of Guiana. Most of the native *Sapiums* have been destroyed by reckless tapping, and the merits of this genus have been somewhat overlooked and deserve reinvestigation. The same applies to certain species of *Hevea*, other than *H. brasiliensis*, which are known to produce good rubber in tropical America.

Pernambuco or Mangabeira rubber is obtained from *Hancornia speciosa*, Gom., an apocynaceous tree common on the S. American plateau in Brazil from Pernambuco to Rio de Janeiro, at a height of 3000 to 5000 ft. above the sea. It is about the size of an ordinary apple tree, with small leaves like the willow, and a drooping habit like a weeping birch, and has an edible fruit like a yellow plum called "mangaba," for which, rather than for the rubber, the tree is cultivated in some districts. Only a small quantity of this rubber comes to England, and it is not much valued, being a "wet" rubber. It is produced in "biscuits" or "sheets." The caoutchouc is collected in the following manner: about eight oblique cuts are made all round the trunk, but only through the bark, and a tin cup is fastened at the bottom of each incision by means of a piece of soft clay. The cups when full are poured into a larger vessel, and solution of alum is added to coagulate the latex. In two or three minutes coagulation takes place, and the rubber is then exposed to the air on sticks, and allowed to drain for eight days. About thirty days afterwards it is sent to market. Pernambuco rubber, as is the case with most rubbers coagulated by saline solutions, contains a large quantity of water. The tree has been planted in other countries, but has so far not received much attention. It will grow on a dry sandy soil, dislikes much moisture, and needs no shade.

Forsteronia gracilis of Guiana is a climbing plant which also belongs to the Apocynaceae. Like the *Forsteronia floribunda* of Jamaica it yields rubber of good quality. *Ficus Vogelii* of W. Africa yields rubber of variable quality. The production of rubber by this tree merits further investigation, as it grows readily in nearly every district of W. Africa and the Sudan.

Specimens of the best known and of many of the lesser known rubbers are included in the Colonial and Indian Collections and Sample Rooms of the Imperial Institute, and many of the authentic specimens have been chemically and technically examined in the Scientific and Technical Department of the Institute and commercially valued. Reports on many of the lesser known rubbers have been published in the *Bulletin of the Imperial Institute.*

Chemistry of Rubber.

Rubber is chiefly composed of the soft, solid, elastic substance known as caoutchouc. It is usually assumed that this substance is present as such in the latex. The globules in the latex, however, consist more probably of a distinct liquid substance which readily changes into the solid caoutchouc. The coagulation of the latex often originates with the "curding" of the proteids present, and this alteration in the proteid leads to the solidification of the globules into caoutchouc. The latter, however, is probably a distinct effect. Under certain conditions, as when latex is allowed to stand or is centrifugalized, a cream is obtained consisting of the liquid globules, which may be washed free from proteid without change, but, either by mechanical agitation or by the addition of acid or other chemical agent, the liquid gradually solidifies to a mass of solid caoutchouc. The phenomenon therefore resembles the change known to the chemist as polymerization, by which through molecular aggregation a liquid may pass into a solid without change in its empirical composition. The effect may, however, also be due to chemical change known as condensation, and be accompanied by the elimination of the elements of water. So far the chemical nature of the liquid globules of the latex is unknown, and the exact character of the change into solid caoutchouc remains to be determined. The watery liquid known as rubber milk or latex is an emulsion consisting chiefly of a weak watery solution of proteids, carbohydrates and salts holding the liquid globules in suspension. In connexion with the production of rubber the most important factor is the proportion of caoutchouc it contains. In a good rubber this ranges from 70–90% and over. The proportion and nature of the proteids or albuminous materials varies considerably in different latices. The proteids should be as far as possible removed during the preparation of the rubber, as these substances are chiefly responsible for the objectionable smell and colour of "native" rubbers, and their presence leads to subsequent change in the commercial material. All crude rubber contains more or less proteid, and in the opinion of some technical experts its presence even affords strength to the material, but this cannot be accepted as proved. The dissolved salts (potassium, sodium, ammonium, calcium, magnesium, &c.) of the latex are generally nearly entirely absent from the well-prepared rubber. Of considerable importance to the value of the rubber is the absence of the resinous constituents which are present in greater or smaller proportion in all latices. The presence of more than a small percentage of resin in the latex leads to the production of rubber containing much resin, which seriously depreciates its commercial value for most purposes. The percentage of resin in a good rubber should be as small as possible, and should in any case be less than 10%. There is no feasible method at present known of preventing the inclusion of the resin of the latex with the rubber during coagulation, and although the separation of the resin from the solid caoutchouc by means of solvents is possible, it is not practicable or profitable commercially. A complete examination of a series of different latices has shown that, in many cases, *e.g. Hevea* and *Castilloa*, the resin is present in large proportion in the latex derived from young trees, and diminishes in amount as the tree ages. This is one reason why young trees should not be tapped. The composition of latex and of typical rubbers is given below:—

			Rubbers				
Para Latex (Ceylon).			Para Rubber (Ceylon).	Ceara Rubber (Ceylon).	Castilloa Rubber (Ceylon).	*Ficus Elastica* (Bengal).	*Landolphia Kirkii* (E. Africa).
	%		%	%	%	%	%
Water	55·15	Caoutchouc	94·6	76.25	86·19	84·3	80·1
Caoutchouc	41·29	Resin	2·66	10·04	12·42	11·8	6·9
Proteids	2·18	Proteids	1·75	8·05	0·87	..	0·3
Sugar, etc.	0·36	Ash	0·14	2·46	0·20	0·8	7·7
Ash (salts)	0·41	Moisture	0·85	3·20	0.32	0·8	..

The chemical analysis of crude rubber is an important guide to its value. At present, however, the methods of analysis usually employed are not sufficiently delicate to afford all the necessary information as to the intrinsic value of the higher grades of rubber, and do not go much beyond the exclusion of inferior rubber. The tests of the physical properties of crude rubber usually applied to determine its value in the market are also very rough and cannot be relied upon. The development of the rubber industry has now reached a stage at which more exact methods of determining the chemical composition and physical properties (strength and elasticity) of rubber are required. At present the caoutchouc present in crude rubber is usually estimated indirectly, and it is possible that what generally passes as caoutchouc may be in some instances a mixture of similar chemical substances, which if separated would be found to differ in those physical properties on which the technical value of rubber depends.

It is already certain that some commercial rubbers contain a variable proportion of a substance of the nature of caoutchouc, but having different properties.

True caoutchouc, the principal constituent of all rubbers, is probably essentially one and the same substance, from whatever botanical source it may have been derived. This is an elastic solid, almost transparent in thin sheets, composed entirely of carbon and hydrogen, the empirical composition of which is represented by the formula C_5H_8. It thus possesses the same composition as the hydrocarbon of gutta-percha and as that of oil of turpentine and other terpenes which are the chief components of essential oils. The properties of caoutchouc clearly show, however, that its actual molecular structure is considerably more complex than is represented by the empirical formula, and that it is to be regarded as the polymer of a terpene or similar hydrocarbon and composed of a cluster of at least ten or twenty molecules of the formula C_5H_8.

When solid caoutchouc is strongly heated it breaks down, without change in its ultimate composition, into a number of simpler liquid hydrocarbons of the terpene class (dipentene, di-isoprene, isoprene, &c.), of which one, isoprene (C_5H_8), is of simpler structure than oil of turpentine ($C_{10}H_{16}$), from which it can also be obtained by the action of an intense heat.

When this volatile liquid hydrocarbon (isoprene) is allowed to stand for some time in a closed bottle, it gradually passes into a substance having the principal properties of natural caoutchouc. The same change of isoprene into caoutchouc may also be effected by the action of certain chemical agents. It may therefore be said that caoutchouc has been already artificially or synthetically prepared, and the possibility of producing synthetic rubber cheaply on a commercial scale remains the only problem. At present the change of isoprene into caoutchouc is mainly of scientific interest in indicating possibilities with regard to the conversion of the liquid globules of the latex into rubber and to the formation of rubber by plants. The exact chemical nature of caoutchouc is, however, not determined, and recent researches point to the view that its molecular structure may even be somewhat different from that of the terpenes.

The exact manner in which isoprene passes into caoutchouc is also not understood. These problems are, however, certain to be solved in the near future, and then probably caoutchouc may be formed in other ways than from isoprene.

The question as to whether synthetic rubber will ever be produced cheaply on a commerical scale is therefore the important one for those who are largely interested in the rubber-planting industry. No definite answer can be given to this question at the present time. Its settlement will depend in part on the cost of producing rubber from plants, which from their point of view it is to the interests of planters to reduce as far as possible. There are many substances produced by plants which can be synthetically prepared by chemical means, but, as with quinine, the process involved is too costly to enable the synthetic product to compete with the natural product.

The chief properties of caoutchouc and its employment for technical purposes may now be considered.

Caoutchouc is not dissolved by water or alcohol, and is not affected except by the strongest acids. Alkalis have little effect on it under ordinary circumstances, although prolonged contact with ammonia results in a partial change. The best solvents for rubber are carbon bisulphide, benzol and mineral naphtha, carbon tetrachloride and chloroform. These liquids, either alone or mixed, are employed in making the rubber solutions used for technical purposes. Vegetable and other oils rapidly penetrate caoutchouc and lead to deterioration of its properties. Sulphur when warmed with caoutchouc combines with it, and on this fact the vulcanization of rubber depends, and also the production, with an excess of sulphur, of the hard black material known as vulcanite or ebonite.

Caoutchouc is a soft elastic resilient solid. In this respect it differs from gutta-percha, which, like caoutchouc, is derived from the latices of certain plants. The technical value of caoutchouc chiefly depends on the extent to which it is capable of being stretched without breaking, and the extent to which it at once returns to its original dimensions. Caoutchouc is a bad conductor of heat and electricity, and alone or mixed with other materials is employed as an electrical insulator.

When caoutchouc is heated slightly above the temperature of boiling water it becomes softer and loses much of its elasticity, which, however, it recoveres on cooling. At about 150°–200° C. caoutchouc melts, forming a viscous liquid which does not solidify on cooling. This viscous liquid is present in small proportion in some commercial rubbers owing to overheating during their preparation. It appears to be the principal cause of stickiness or the "tacky" condition of some rubbers, which considerably depreciates their commercial value. There is some evidence that "tackiness" may be induced by a kind of fermentation which takes place in crude rubber.

At higher temperatures the viscous liquid suffers decomposition with the formation of various liquid hydrocarbons, principally members of the terpene series. Similar products are also formed by heating gutta-percha which closely resembles caoutchouc in its chemical structure.

Rubber slowly absorbs oxygen when exposed to air and light, the absorption of oxygen being accompanied by a gradual change in the characteristic properties of rubber, and ultimately to the production of a hard, inelastic, brittle substance containing oxygen. Ozone at once attacks rubber, rapidly destroying it. If ozone is passed into a solution of rubber in chloroform the caoutchouc combines with a molecule of ozone forming a compound of the empirical composition $C_5H_8O_3$. When this compound is acted on by water, hydrogen peroxide and levulinic aldehyde are formed, the aldehyde being subsequently oxidized by the hydrogen peroxide, forming levulinic acid. The hydrocarbon of gutta-percha yields similar results and is therefore closely related to caoutchouc.

The study of the action of ozone on caoutchouc has thrown new light on the complex question of the chemical structure of this substance, and discloses relationships with the sugars and other carbohydrates from certain of which levulinic acid is obtained by oxidation.

Caoutchouc, like other "unsaturated" molecules, forms compounds with chlorine, bromine, iodine and sulphur.

Commercial Treatment of Rubber.

In the industrial working of indiarubber, the various impurities present in the crude "wild" rubber (bark, dirt and the principal impurities derived from the latex, except resin) are removed by the following process: The lumps of crude caoutchouc are first softened by the prolonged action of hot water, and then cut into slices by means of a sharp knife—generally by hand, as thus any large stones or other foreign substances can be removed. The softened slices are now repeatedly passed between grooved rollers, known as washing rollers (fig. 8), a supply of hot or cold water being made to flow over them. Solid impurities speedily become crushed, and are carried away by the water, while the rubber takes the form of an irregular sheet perforated by numerous holes. The loss on washing ranges from 10–15 % with "fine Para" to 40 % with other "wild" rubbers. In the future this washing of "wild" rubber may be conducted in the tropics, thus furnishing the manufacturer with rubber which, like "plantation" rubber, need not be subjected to this process in the factory. The washed product contains in its pores a notable proportion of water, which is removed by hanging the rubber for some days in a warm room. It is now ready either for incorporation with sulphur and other materials, or for agglomeration into solid masses by means of the masticating machine—an apparatus which consists of a strong cylindrical cast-iron casing, inside which there revolves a metal cylinder with a fluted or corrugated surface. Some of the rubber having been placed in the annular space between the inner cylinder and the outer casing, the former is made to revolve; and the continued kneading action to which the rubber is subjected works it into a solid mass, something like a gigantic sausage. Before commencing the mastication it is generally necessary to warm the apparatus by means of steam; but as the operation proceeds the heat produced requires to be moderated by streams of cold water flowing through channels provided for the purpose. The inner cylinder is generally placed somewhat excentrically in the outer casing, in order to render the kneading more perfect than would otherwise be the case.

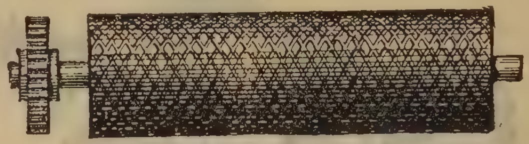

FIG. 8.—Roller of Washing Machine.

To convert the masticated rubber into rectangular blocks, it is first softened by heat, and then forced into iron boxes or moulds. The blocks are cut into thin sheets by means of a sharp knife, which is caused to move to and fro about two thousand times per minute, the knife being kept moistened with water, and the block fed up to it by mechanical means. Cut sheets are largely used for the fabrication of certain classes of rubber goods—these being made by cementing the sheets together with a solution of rubber in naphtha or benzol. Most articles made of cut sheet rubber would, however, be of very limited utility were they not hardened or vulcanized by the action of sulphur or some compound of that element. After vulcanization, rubber is no longer softened by a moderate heat, a temperature of 160° C. scarcely affecting it, nor is it rendered rigid by cold, and the ordinary solvents fail to dissolve it. It must, however, be distinctly understood that it is not the mere admixture but the actual combination of sulphur with indiarubber that causes vulcanization. If an article made of cut sheet be immersed for a few minutes in a bath of melted sulphur, maintained at a temperature of 120° C., the rubber absorbs about one-tenth of its weight of that element, and, although somewhat yellowish in colour from the presence of free sulphur, it is still unvulcanized, and unaltered as regards general properties. If, however, it be now subjected for an hour or so to a temperature of 140° C., a combination occurs, and vulcanized caoutchouc is the result. When a manufactured article has been saturated with sulphur in the melted sulphur bath, the heat necessary for vulcanization may be obtained either by high-pressure steam, by heated glycerin, or by immersion in a sulphur bath heated to about 140° C. In this last case absorption of the sulphur and its intimate combination with the rubber occur simultaneously. Cut sheets, or articles made from them, may be saturated by being laid in powdered sulphur maintained for some hours at about 110° C. Sheets sulphured in this way can be made up into articles and joined together either by warming the parts to be united, or by means of indiarubber solution; after which the true vulcanization, or "curing," as it is termed, can be brought about in the usual way.

Another method of vulcanizing articles made from cut sheet rubber consists in exposing them to the action of chloride of sulphur. Either they are placed in a leaden cupboard into which the vapour is introduced, or they are dipped for a few seconds in a mixture of one part of chloride of sulphur and forty parts of carbon disulphide or purified light petroleum. Vulcanization takes place in this instance without the action of heat; but it is usual to subject the goods for a short time to a temperature of 40° C. after their removal from the solution, in order to drive off the liquid which has been absorbed, and to ensure a sufficient action of the chloride of sulphur. Treatment with a warm alkaline solution is afterwards advisable, in order to remove traces of hydrochloric acid generated during the process. Another very excellent method of vulcanizing cut sheet goods consists in placing them in a solution of the polysulphides of calcium at a temperature of 140° C. Rubber employed for the manufacture of cut sheets is often coloured by such pigments as vermilion, oxide of chromium, ultramarine, orpiment, antimony, lamp black, or oxide of zinc, incorporation being effected either by means of the masticator or by a pair of rollers heated internally by steam, and so geared as to move in contrary directions at unequal speed (fig. 9). Most of the rubber now manufactured is not combined with sulphur when in the form of sheets, but is mechanically incorporated with about one-tenth of its weight of that substance by means of the mixing rollers—any required pigment or other matter, such as whiting or barium sulphate, being added. The mixed rubber thus obtained is readily softened by heat, and can be very easily worked into any desired form or rolled into sheets by an apparatus known as the calendering machine. Vulcanization is then ensured by exposure for half an hour or more to a temperature of 135°–150° C., usually in closed iron vessels into which high-pressure steam is admitted (fig. 10). Tubes are generally made up around mandrels, and allowed throughout the curing to remain imbedded in pulverized French chalk, which affords a useful support for many articles that tend to lose their shape during the process. Of late years a considerable amount of seamless tubing has been made, much in the same way as lead piping, by forcing the mixed rubber through a die, and curing as above. The calendered sheets are generally cured between folds of wet cloth, the markings of which they retain; and hollow articles, such as playing balls or injection bottles, are vulcanized in iron or brass moulds, tinned inside and very slightly greased. Before it is put in, the article is roughly put together, and the expansion of the included air forces the rubber into contact with the internal surface of the mould, or a little carbonate of ammonia is enclosed. Belting intended for driving machinery is built up of canvas which has been thoroughly frictioned with the soft mixed rubber, and is cured by placing it in a kind of press kept by means of steam at a dry heat of about 140° C. Packing for the stuffing boxes of steam engines is similarly prepared from strips of rubber and frictioned canvas, as also are the so-called insertion sheets, in which layers of rubber alternate with canvas or even wire gauze. Indiarubber stereotypes are now extensively made use of as hand stamps, and attempts have been made to introduce them for press and machine printing. A plaster cast of the type is, when dry, saturated with shellac varnish and redried. Rubber mixed in the usual way with about 10% of sulphur is now softened by heat, forced into the mould, and retained there by pressure during the operation of curing, which is usually effected in an iron box heated over a gas burner to 140° C.

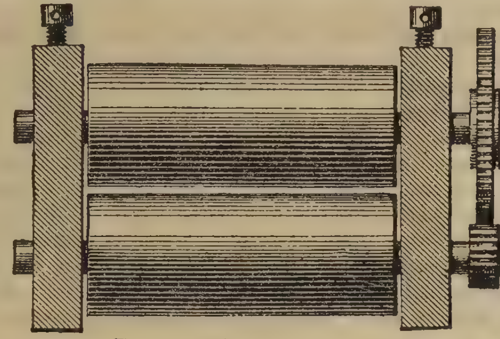

Fig. 9.—The Mixing Rollers.

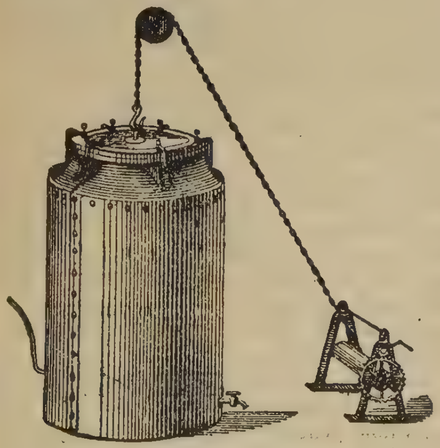

Fig. 10.—A Vulcanizer.

The ordinary macintosh or waterproof cloth is prepared by spreading on the textile fabric layer after layer of indiarubber paste or solution made with benzol or coal-naphtha. If cotton or linen is used, it is usual to incorporate sulphur with the paste, and to effect vulcanization by steam heat; but, when silk or wool is employed, no sulphur is added to the paste, the dried coating of rubber being merely brought into momentary contact with the mixture of chloride of sulphur and carbon disulphide already mentioned. Double texture goods are made by uniting the rubber surfaces of two pieces of the coated material. Air goods, such as cushions, beds, gas bags, and so forth, are made of textile fabrics which have been coated with mixed rubber either by the spreading process above described, or by means of heated rollers, the curing being then effected by steam heat. The manufacture of overshoes and fishing boots is an analogous process, only the canvas base is more thickly coated with a highly pigmented rubber of low quality. The articles are first fashioned by joining the soft material; they are then varnished, and afterwards cured in ovens heated to about 135° C. The fine vulcanized "spread sheets" are made by spreading layers of indiarubber solution, already charged with the requisite proportion of sulphur, on a textile base previously prepared with a mixture of paste, glue and treacle. Vulcanization is then effected by steam heat, and, the preparation on the cloth being softened by water, the sheet of rubber is readily removed. The required thickness of the spread sheet is very often secured by the rubber-faced surfaces of two cloths being united before curing. The threads used in making elastic webbing are usually cut from spread sheets. The manufacture of springs, valves and washers does not require any very special notice, these articles being generally fashioned out of mixed rubber, and vulcanized either in moulds or in powdered French chalk. Rollers are made to adhere to their metal spindles by the intervention of a layer of ebonite, and after vulcanization they are turned. In order to make spongy or porous rubber, some material is incorporated which will give off gas or vapour at the vulcanizing temperature,—such as carbonate of ammonia, crystallized alum, and finely ground damp sawdust. Uncombined sulphur is injurious, and often leads to the decay of vulcanized goods, but an excess of sulphur is generally required in order to ensure perfect vulcanization. Sometimes the excess is partially removed by boiling the finished goods with a solution of caustic soda, or some other solvent of sulphur. In other cases the injurious effects of free sulphur are obviated by using instead of it a metallic sulphide,—generally the orange sulphide of antimony; but, for the best results, it is necessary that this should contain from 20 to 30 % of uncombined sulphur.

It will thus be seen that for nearly all practical purposes, including tires, vulcanized rubber mixed with mineral matter is employed. Such articles contain varying proportions of rubber (12–60%), about 1–2 % of combined sulphur, and from 25–70 % of mineral matter. Vulcanized rubber is also now largely used as an electrical insulator for the construction of cables, &c., instead of gutta-percha.

When the vulcanization of rubber is carried too far, from the presence of a very large proportion of sulphur and an unduly long action of heat, the caoutchouc becomes hard, horn-like, and often black. Rubber hardened by over-vulcanization is largely manufactured under the name of ebonite or vulcanite. It is usually made by incorporating about 40 % of sulphur with purified Borneo rubber by means of the usual mixing rollers, shaping the required articles out of the mass thus obtained, and heating for six, eight or ten hours to from 135° to 150°. Ebonite takes a fine polish, and is valuable to the electrician on account of its insulating properties, and to the chemist and photographer because vessels made of it are unaffected by most chemical reagents. A kind of vulcanite which contains a large proportion of vermilion or other mineral pigment is used, under the name of dental rubber, for making artificial gums and supports for artificial teeth.

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(W. R. D.)

RUBBLE, broken stone, of irregular size and shape. This word is closely connected in derivation with "rubbish," which was formerly also applied to what we now call "rubble." The earlier Middle English form was *robeux* or *robows*. It would appear that the original is an O. Fr. *robel*. *Roba* (older form *robba*) is found in Italian in the sense of refuse, trash. *Robba* is explained by Florio as a gown, or mantle, robe, wealth, goods, trash. The original sense was "spoil". Thus, "robe," "rob," "rubbish" and "rubble" are all cognate.

"Rubble-work" is a name applied to several species of masonry (*q.v.*). One kind, where the stones are loosely thrown together in a wall between boards and grouted with mortar almost like concrete, is called in Italian *muraglia di getto* and in French *bocage*. Work executed with large stones put together without any attempt at courses is also called rubble.

RUBELLITE, a red variety of tourmaline (*q.v.*) used as a gem-stone. It generally occurs crystallized on the walls of cavities in coarse granitic rocks, where it is often associated with a pink lithia-mica (lepidolite). The most valued kinds are deep red; the colour being probably due to the presence of manganese. Some of the finest rubellite is found in Siberia, whence it is sometimes called siberite, or passes under the misleading name of "Siberian ruby." The mills at Ekaterinburg, where it is cut and polished, draw most of their supplies from the Ural Mountains—chiefly from Mursinka, Sarapulskaya and Shaitanka, near Ekaterinburg—but specimens are occasionally found at Nerchinsk in Transbaikalia. Burma is famous for rubellite, but little was known as to the conditions of its occurrence there until after the British annexation, when the old workings were visited and described by C. Barrington Brown and by F. Noetling. The pits which yield rubellite are dug in alluvial deposits in the Möng-long valley, some miles to the S.E. of Mogok, the centre of the ruby country. It was here that the Chinese obtained the rubellite so much valued in China for buttons of the caps of mandarins of certain rank. In the British Museum there is a remarkable specimen of crystallized rubellite of large size and fine form, but of poor colour, which was presented by the king of Ava to Colonel Michael Symes on the occasion of his mission in 1795. Very fine rubellite is found in the United States, notably at Mount Mica, near Paris, Oxford Co., Maine, where the crystals are often red at one end and green at the other. Mount Rubellite, near Hebron, and Mount Apatite at Auburn, are other localities in the same state from which fine specimens are obtained. Chesterfield and Goshen, Mass., also yield red tourmaline, frequently associated with green in the same crystal. Pink tourmaline also occurs, with lepidolite and kunzite, in San Diego Co., California. In Europe rubellite occurs sparingly at a few localities, as at San Piero in Elba and at Penig in Saxony; but the mineral is rarely if ever fit for the lapidary. (F. W. R.*)

RUBENS, PETER PAUL (1577–1640), Flemish painter, was born at Siegen, in Westphalia, on the 29th of June 1577. His father, Johannes Rubens, a druggist, although of humble descent was a man of learning, and councillor and alderman in his native town (1562). A Roman Catholic by birth, he became a zealous upholder of the Reformation, and we find him spoken of as *le plus docte Calviniste qui fust pour lors au Bas Pays*. After the plundering of the Antwerp churches in 1566, the magistrates were called upon for a justification. While openly they declared themselves devoted sons of the church, a list of the followers of the Reformed creed, headed by the name of Anthony Van Stralen, the burgomaster, got into the hands of the duke of Alva. This was a sentence of death for the magistrates, and Johannes Rubens lost no time in quitting Spanish soil, ultimately settling at Cologne (October 1568) with his wife and four children.

In his new residence he became legal adviser to Anne of Saxony, the second wife of the prince of Orange, William the Silent. Before long it was discovered that their relations were not purely of a business kind. Thrown into the dungeons of Dillenburg, Rubens lingered there for many months, his wife, Maria Pypelincx, never relaxing her endeavours to get the undutiful husband restored to freedom. Two years elapsed before the prisoner was released, and then only to be confined to the small town of Siegen. Here he lived with his family from 1573 to 1578, and here Maria Pypelincx gave birth to Philip, afterwards town-clerk of Antwerp, and Peter Paul. A year after (May 1578) the Antwerp lawyer got leave to return to Cologne, where he died on the 18th of March 1587, after having, it is said, returned to Roman Catholicism.

Rubens went to Antwerp with his mother when he was scarcely ten years of age. He was an excellent Latin scholar, and also proficient in French, Italian, Spanish, English, German and Dutch. Part of his boyhood he spent as a page in the household of the countess of Lalaing, in Brussels; but tradition adds that his mother allowed him to follow his proper vocation, choosing as his master Tobias Verhaecht. Not the slightest trace of this first master's influence can be detected in Rubens's works. Not so with Adam Van Noort, to whom the young man was next apprenticed. Van Noort, whose aspect of energy is well known through Van Dyck's beautiful etching, was the highly esteemed master of numerous painters—among them Van Balen, Sebastian Vrancx, and Jordaens, later his son-in-law.

Rubens remained with Van Noort for the usual period of four years, thereafter studying under Otto Vaenius or Van Veen, a gentleman by birth, a most distinguished Latin scholar and a painter of very high repute. He was a native of Leiden, and only recently settled in Antwerp. Though Rubens never adopted his style of painting, the tastes of master and pupil had much in common, and some pictures by Otto Vaenius can be pointed out as having inspired Rubens at a more advanced period. For example, the "Magdalene anointing Christ's Feet," painted for the cathedral at Malaga, and now at the Hermitage in St Petersburg, closely resembles in composition the very important work of Otto Vaenius in the church at Bergues near Dunkirk.

In 1598, Adam Van Noort acting as dean of the Antwerp gild of painters, Rubens was officially recognized as "master"—that is, was allowed to work independently and receive pupils. His style at this early period may be judged from the by no means satisfactory "Holy Trinity" at Antwerp Museum, which already shows his bold, vigorous handling, and the "Portrait of a Youth" in the Munich Pinakothek.

From 1600 to the latter part of 1608 Rubens belonged to the household of Vincenzo Gonzaga, duke of Mantua. The duke, who spent some time at Venice in July 1600, had his attention drawn by one of his courtiers to Rubens's genius, and immediately induced him to enter his service. The influence of the master's stay at Mantua was of extreme importance, and cannot be too constantly kept in view in the study of his later works.

Sent to Rome in 1601, to take copies from Raphael for his master, he was also commissioned to paint several pictures for the church of Santa Croce, by the archduke Albrecht of Austria, sovereign of the Spanish Netherlands, and once, when he was a cardinal, the titular of that see. A copy of "Mercury and Psyche" after Raphael is preserved in the museum at Pesth. The religious paintings— "The Invention of the Cross," "The Crowning with Thorns" and "The Crucifixion"—are to be found in the hospital at Grasse in Provence (Alpes Maritimes).

At the beginning of 1603, "The Fleming," as he was termed at Mantua, was sent to Spain with a variety of presents for Philip III. and his minister the duke of Lerma, and thus had opportunity to spend a whole year at Madrid and become acquainted with some of Titian's masterpieces. Of his own works, known to belong to the same period, in the Madrid Gallery, are "Heraclitus" and "Democritus." Of Rubens's abilities so far back as 1604 we get a more complete idea from an immense picture now in the Antwerp Gallery, the "Baptism of Our Lord," originally painted for the Jesuits at Mantua. Here it may be seen to what degree Italian surroundings had influenced the household painter of Vincenzo Gonzaga. Vigorous to the extreme in design, he reminds us of Michelangelo as much as any of the degenerate masters of the Roman school while in decorative skill he seems to be descended from Titian and in colouring from Giulio Romano. Equally with this picture, "The Transfiguration," now in the museum at Nancy, and the portraits of "Vincenzo and his Consort, kneeling before the Trinity," in the library at Mantua, claim a large share of attention.

Two years later we meet a very large altar-piece of "The Circumcision" at St Ambrogio at Genoa, the "Virgin in a Glory of Angels," and two groups of Saints, painted on the wall, at both sides of the high altar in the church of Santa Maria in Valicella in Rome. These works remind us of a saying of Baglione, who was acquainted with Rubens in Italy: *Apprese egli buon gusto, e diede in una maniera buona Italiana.*

While employed at Rome in 1608, Rubens received most alarming news as to the state of his mother's health. The duke of Mantua was then absent from Italy, but the dutiful son, without awaiting his return, at once set out for the Netherlands. When he arrived in Antwerp, Maria Pypelincx was no more. However strong his wish might now be to return to Italy, his purpose was overruled by the express desire of his sovereigns, Albrecht and Isabella, to see him take up a permanent residence in the Belgian provinces. On the 3rd of August 1609 Rubens was named painter in ordinary to their Highnesses, with a salary of 500 livres, and "the rights, honours, privileges, exemptions," &c., belonging to persons of the royal household, not to speak of the gift of a gold chain. Not least in importance for the painter was his complete exemption from all the regulations of the gild of St Luke, entitling him to engage any pupils or fellow-workers without being obliged to have them enrolled —a favour which has been of considerable trouble to the historians of Flemish art.

Although so recently returned to his native land, Rubens seems to have been, with one accord, accepted by his countrymen as the head of their school, and the municipality was foremost in giving him the means of proving his acquirements. The first in date among the numerous repetitions of the "Adoration of the Magi" is a picture in the Madrid Gallery, measuring 12 ft. by 17, and containing no fewer than eight-and-twenty life-size figures, many in gorgeous attire, warriors in steel armour, horsemen, slaves, camels, &c. This picture, painted in Antwerp, at the town's expense, in 1609, had scarcely remained three years in the town hall when it went to Spain as a present to Don Rodrigo Calderon, count of Oliva. The painter has represented himself among the horsemen, bareheaded, and wearing his gold chain. From a letter written in May 1611 we know that more than a hundred young men were desirous to become his pupils, and that many had, "for several years," been waiting with other masters until he could admit them to his studio.

Apart from the success of his works, another powerful motive had helped to detain the master in Antwerp—his marriage with Isabella Brant (October 1609). Many pictures have made us familiar with the graceful young woman who was for seventeen years to share the master's destinies. We meet her at the Hague, St Petersburg, Berlin, Florence, at Grosvenor House, but more especially at Munich, where Rubens and his wife are depicted at full length on the same canvas. "His wife is very handsome," observes Sir Joshua Reynolds, "and has an agreeable countenance;" but the picture, he adds, "is rather hard in manner." This, it must be noted, is the case with all those pictures known to have immediately followed Rubens's return, when he was still dependent on the assistance of painters trained by others than himself. Even in the "Raising of the Cross," now in the Antwerp cathedral, and painted for the church of St Walburga in 1610, the dryness in outline is very striking.

According to the taste still at that time prevailing, the picture is tripartite, but the wings only serve to develop the central composition, and add to the general effect. In Witdoeck's beautiful engraving the partitions even disappear. Thus, from the first, we see Rubens quite determined upon having his own way, and it is recorded that, when he painted the "Descent from the Cross," "St Christopher," the subject chosen by the Arquebusiers, was altered so as to bring the artistic expressions into better accordance with his views. Although the subject was frequently repeated by the great painter, this first "Descent from the Cross" has not ceased to be looked upon as his masterpiece. Begun in 1611, the celebrated work was placed in 1614, and certainly no more striking evidence could be given of the rapid growth of the author's abilities. Rubens received 2400 florins for this picture. In many respects, Italian influence remains conspicuous in the "Descent from the Cross." Rubens had seen Ricciarelli's fresco at the Trinita de' Monti, and was also acquainted with the grandiose picture of Baroccio in the cathedral of Perugia, and no one conversant with these works can mistake their influence. But in Rubens strength of personality could not be overpowered by reminiscence; and in type, as well as in colouring, the "Descent from the Cross" may be termed thoroughly Flemish and Rubenesque.

If Sir Dudley Carleton could speak of Antwerp in 1616 as *Magna civitas, magna solitudo*, there was no place nevertheless which could give a wider scope to artistic enterprise. Spain and the United Provinces were for a time at peace; almost all the churches had been stripped of their adornments; monastic orders were powerful and richly endowed, gilds and corporations eager to show the fervour of their Catholic faith, now that the "monster of heresy" seemed for ever quelled. Gothic churches began to be decorated according to the new fashion adopted in Italy. Altars magnified to monuments, sometimes reaching the full height of the vaulted roof, displayed, between their twisted columns, pictures of a size hitherto unknown. No master seemed better fitted to be associated with this kind of painting than Rubens. The temple erected by the reverend fathers in Antwerp was almost entirely the painter's work, and if he did not, as we often find asserted, design the front, he certainly was the inspirer of the whole building. Hitherto no Fleming had undertaken to paint ceilings with foreshortened figures, and blend the religious with the decorative art after the style of those buildings which are met with in Italy, and owe their decorations to masters like Titian, Veronese and Tintoretto. No fewer than forty ceiling-panels were composed by Rubens, and painted under his direction in the space of two years. All were destroyed by fire in 1718. Sketches in water-colour were taken some time before the disaster by de Wit, and from these were made the etchings by Du Pont which alone enable us to form a judgment of the grandiose undertaking. In the Madrid Gallery we find a general view of the church in all its splendour. The present church of St Charles in Antwerp is, externally, with some alteration, the building here alluded to.

Rubens delighted in undertakings of the vastest kind. "The large size of a picture," he writes to W. Trumbull in 1621, "gives us painters more courage to represent our ideas with the utmost freedom and semblance of reality. . . . I confess myself to be, by a natural instinct, better fitted to execute works of the largest size." The correctness of this appreciation he was very soon called upon to demonstrate most strikingly by a series of twenty-four pictures, illustrating the life of Marie de Médicis, queen-mother of France. The gallery at the Luxembourg Palace, which these paintings once adorned, has long since disappeared, and the complete work is not exhibited in the Louvre. Drawings, it seems, had been asked from Quentin Varin, the French master who incited Poussin to become a painter, but Rubens was ultimately preferred. This preference may in some degree be ascribed to his former connexion with the court at Mantua, Marie de Médicis and the duchess of Gonzaga being sisters. From the cradle to the day of her reconciliation with Louis XIII., we follow Marie de Médicis after the manner in which it was customary in those days to consider personages of superior rank. The Fates for her have spun the silken and golden thread; Juno watches over her birth and entrusts her to the town of Florence; Minerva, the Graces and Apollo take charge of her education; Love exhibits her image to the king, and Neptune conveys her across the seas; Justice, Health and Plenty endow her son; Prudence and Generosity are at her sides during the regency; and, when she resigns the helm of the state to the prince, Justice, Strength, Religion and Fidelity hold the oars. The sketches of all these paintings—now in the Munich Gallery—were painted in Antwerp, a numerous staff of distinguished collaborators being entrusted with the final execution. But the master himself spent much time in Paris, retouching the whole work, which was completed within less than four years. On the 13th of May 1625, Rubens writes from Paris to his friend Peiresc that both the queen and her son are highly satisfied with his paintings, and that Louis XIII. came on purpose to the Luxembourg, "where he never has set foot since the palace was begun sixteen or eighteen years ago." We also gather from this letter that the picture representing the "Felicity of the Regency" was painted to replace another, the "Departure of the Queen," which had caused some offence. Richelieu gave himself some trouble to get part of the work, intended to represent the life of Henry IV., bestowed upon Cavalier d'Arpina, but did not succeed in his endeavours. The queen's exile, however, prevented the undertaking from going beyond a few sketches, and two or three panels, one of which, the "Triumph of Henry IV.," now in the Uffizi Gallery, is one of the noblest works of Rubens or of any master.

On the 11th of May 1625, Rubens was present at the nuptials of Henrietta Maria at Notre Dame in Paris, when the scaffolding on which he stood gave way, and he tells us he was just able to catch an adjoining tribune.

No painter in Europe could now pretend to equal Rubens either in talent or in renown. Month after month productions of amazing size left the Antwerp studio; and to those unacquainted with the master's pictures magnificent engravings by Vorsterman, Pontius and others had conveyed singularly striking interpretations. "Whatever work of his I may require," writes Moretus, the celebrated Antwerp printer, "I have to ask him six months before, so as that he may think of it at leisure, and do the work on Sundays or holidays; no week days of his could I pretend to get under a hundred florins."

Of the numerous creations of his brush, none, perhaps, will more thoroughly disclose to us Rubens's comprehension of religious decorative art than the "Assumption of the Virgin" at the high altar of Antwerp cathedral, finished in 1625. It is, of twenty repetitions of this subject, the only example still preserved at the place for which it was intended. In spirit we are here reminded of Titian's "Assunta" in the cathedral at Verona, but Rubens's proves perhaps a higher conception of the subject. The work is seen a considerable way off, and every outline is bathed in light, so that the Virgin is elevated to dazzling glory with a power of ascension scarcely, if ever, attained by any master.

Although able to rely so greatly on his power as a colourist, Rubens is not a mere decorator. He penetrates into the spirit of his subjects more deeply than, at first sight, seems consistent with his prodigious facility in execution. The "Massacre of the Innocents," in the Munich Gallery, is a composition that can leave no person unmoved—mothers defending their children with nails and teeth. When St Francis attempts to shelter the universe from the Saviour's wrath (Brussels Gallery), Rubens recalls to our memory that most dramatic passage of the *Iliad* when Hecuba, from the walls of Troy, entreats her son Hector to spare his life. Rubens was a man of his time; his studies of Italian art in no way led him back to the Quattrocentisti nor the Raffaeleschi; their power was at an end. The influence of Michelangelo, Titian, Tintoretto, more especially Baroccio, Polidoro, and even Parmigiano, is no less visible with him than with those masters who, like Spranger, C. Schwartz and Goltzius, stood high in public estimation immediately before his advent.

In the midst of the rarest activity as a painter, Rubens was now called upon to give proofs of a very different kind of ability. The truce concluded between Spain and the Netherlands in 1609 ended in 1621; Archduke Albrecht died the same year. His widow sincerely wished to prolong the arrangement, still hoping to see the United Provinces return to the Spanish dominion, and in her eyes Rubens was the fittest person to bring about this conclusion. The painter's comings and goings, however, did not remain unheeded, for the French ambassador writes from Brussels in 1624—"Rubens is here to take the likeness of the prince of Poland, by order of the infanta; I am persuaded he will succeed better in this than in his negotiations for the truce." But, if Rubens was to fail in his efforts to bring about an arrangement with the Netherlands, other events enabled him to render great service to the state.

Rubens and Buckingham met in Paris in 1625; a correspondence of some importance had been going on between the painter and the Brussels court, and before long it was proposed that he should endeavour to bring about a final arrangement between the Crowns of England and Spain. The infanta willingly consented, and King Philip, who much objected to the interference of an artist, gave way on hearing, through his aunt, that the negotiator on the English side, Sir Balthasar Gerbier—a Fleming by birth—was likewise a painter. Rubens and Gerbier very soon met in Holland. Matters went on very well, and Rubens volunteered to go to Spain and lay before the council the result of his negotiations (1628). Nine months were thus spent at Madrid; they rank among the most important in Rubens's career. He had brought with him eight pictures of various sizes and subjects as presents from the infanta, and he was also commissioned to paint several portraits of the king and royal family. An equestrian picture of Philip IV., destroyed by fire in last century, became the subject of a poem by Lope de Vega, and the description enables us to identify the composition with that of a painting now in the Palazzo Pitti, ascribed to Velazquez.

Through a letter to Peiresc we hear of the familiar intercourse kept up between the painter and the king. Philip delighted to see Rubens at work in the studio prepared for him in the palace, where he not only left many original pictures, but copied for his own pleasure and profit the best of Titian's. An artistic event of some importance connected with the sojourn in Spain is the meeting of Rubens and Velazquez, to the delight, and, it may be added, advantage of both.

Great as was the king's admiration of Rubens as a painter, it seems to have been scarcely above the value attached to his political services. He now commissioned the painter to go to London as bearer of his views to Charles I., and Rubens, honoured with the title of secretary of the king's privy council in the Netherlands, started at once on his new mission. Although he stopped but four days in Antwerp, he arrived in London just as peace had been concluded with France. Received by Charles with genuine pleasure, he very soon was able to ingratiate himself so far as to induce the king to pledge his royal word to take part in no undertakings against Spain so long as the negotiations remained unconcluded, and all the subsequent endeavours of France, Venice and the States found the king immovable in this resolution. The tardiness of the Spanish court in sending a regular ambassador involved the unfortunate painter in distressing anxieties, and the tone of his despatches is very bitter. But he speaks with the greatest admiration of England and the English, regretting that he should only have come to know the country so late. His popularity must have been very great, for on the 23rd of September 1629 the university of Cambridge conferred upon him the honorary degree of master of arts, and on the 21st of February 1630 he was knighted, the king presenting him with the sword used at the ceremony, which is still preserved by the descendants of the artist.

Although, it seems, less actively employed as an artist in England than in Spain, Rubens, besides his sketches for the decoration of the Banqueting Hall at Whitehall, painted the admirable picture of "The Blessings of Peace" now in the

National Gallery. There is no reason to doubt, with Smith, that "His Majesty sat to him for his portrait, yet it is not a little remarkable that no notice occurs in any of the royal catalogues, or the writers of the period, of the existence of such a portrait." While in England, Rubens very narrowly escaped drowning while going to Greenwich in a boat. The fact is reported by Lord Dorchester in a letter to Sir Isaac Wake (Sainsbury, cxvi.). At the beginning of March the painter's mission came to a close.

Rubens was now fifty-three years of age; he had been four years a widower, and before the end of the year (December 1630) he entered into a second marriage with a beautiful girl of sixteen, named Helena Fourment. She was an admirable model, and none of her husband's works may be more justly termed masterpieces than those in which she is represented (Munich, St Petersburg, Blenheim, Liechtenstein, the Louvre, &c.).

Although the long months of absence could not be termed blanks in Rubens's artistic career, his return was followed by an almost incredible activity. Inspired more than ever by the glorious works of Titian, he now produced some of his best paintings. Brightness in colouring, breadth of touch and pictorial conception, are specially striking in those works we know to have been painted in the latter part of his lifetime. Could anything give a higher idea of Rubens's genius than, for example, the "Feast of Venus," the portrait of "Helena Fourment ready to enter the Bath," or the "St Ildefonso"? This last picture—now, as well as the two others just alluded to, in the Vienna Gallery—was painted for the church of the convent of St Jacques, in Brussels. On the wings are represented the archdukes in royal attire, under the protection of their patron saints. The presence of these figures has led to some mistake regarding the date of the production, but it has been proved beyond doubt, through a document published by Mr Castan (1884), that the "St Ildefonso" (at Vienna—there is another resembling it at St Petersburg) belongs to the series of works executed after the journeys to Spain and England. Archduke Albrecht had been dead ten years. The picture was engraved by Witdoeck in 1638.

Isabella died in 1633, and we know that to the end Rubens remained in high favour with her, alike as an artist and as a political agent. The painter was even one of the gentlemen she deputed to meet Marie de Médicis at the frontier in 1631, after her escape from France.

Spain and the Netherlands went to war again, the king never ceasing to look upon the Dutch as rebels, and much trouble and suspicion came upon the great artist. As to the real nature of his communings with Frederick Henry of Orange, whom he is known to have interviewed, nothing as yet has been discovered.

Ferdinand of Austria, the cardinal-infant of Spain, was called to the government of the Netherlands on the death of his aunt. He was the king's younger brother, and arrived at Antwerp in May 1635. The streets had been decorated with triumphal arches and "spectacula," arranged by Rubens, and certainly never equalled by any other works of the kind.[1] Several of the paintings detached from the arches were offered as presents to the new governor-general, a scarcely known fact, which accounts for the presence of many of these works in public galleries (Vienna, Dresden, Brussels, &c.). Rubens was at the time laid up with gout, but Prince Ferdinand was desirous of expressing his satisfaction, and called upon the painter, remaining a long time at his house. Rubens and Ferdinand had met at Madrid, and only a short time elapsed before the painter was confirmed in his official standing—a matter of small importance, if we consider that the last years of his life were almost exclusively employed in working much more for the king than for his brother. About a hundred and twenty paintings of considerable size left Antwerp for Madrid in 1637, 1638 and 1639; they were intended to decorate the pavilion erected at the Pardo, and known under the name of Torre de la Parada. Another series had been begun, when Ferdinand wrote to Madrid that the painter was no more, and Jordaens would finish the work. Rubens breathed his last on the 30th of May 1640.

More fortunate than many artists, Rubens left the world in the midst of his glory. Not the remotest trace of approaching old age, not the slightest failing of mind or skill, can be detected even in his latest works, such as the "Martyrdom of St Peter" at Cologne, the "Martyrdom of St Thomas" at Prague, or the "Judgment of Paris" at Madrid, where his young wife appears for the last time.

Rubens has little of the Italian grace and refinement; he was a Fleming throughout, nothwithstanding his frequent recollections of those Italian masters whom he most admired, and who themselves have little, if anything, in common with Raphael. But it must be borne in mind how completely his predecessors were frozen into stiffness through italianization, and how necessary it was to bring back the Flemish school to life and nature. Critics have spoken of Rubens's historical improprieties. Of course nobody could suppose that his classical learning did not go far enough to know that the heroines of the Old Testament or of Roman history were not dressed out as ladies of his time; but in this respect he only follows the example of Titian, Paolo Veronese, and many others. In no other school do we find these animated hunts of lions, tigers, and even the hippopotamus and the crocodile, which may be reckoned among the finest specimens of art; and here again are life and nature displayed with the utmost power. "His horses are perfect in their kind," says Reynolds; "his dogs are of the strong Flemish breed, and his landscapes the most charming pictures of Brabantine scenery, in the midst of which lay his seat of Steen. As a portrait painter, although less refined than Van Dyck, he shows that eminent master the way; and his pure fancy subjects, as the "Garden of Love" (Madrid and Dresden) and the "Village Feast" (Louvre), have never been equalled.

For nearly one hundred years the Flemish school may be said to have been but a reflection of the Rubenesque principles. Although Jordaens and Erasmus Quellin lived till 1678, the school might be termed a body without soul.

Some etchings have been ascribed to Rubens, but except a head of Seneca, the only copy of which is in the Print Room at the British Museum, and a beautiful figure of St Catherine, we can admit none of the other plates said to proceed from Rubens as authentic. Rubens nevertheless exercised an immense influence on the art of engraving. Under his direct guidance Soutman, Vorsterman, Pontius, Witdoeck, the two Bolswerts, Peter de Jode, N. Lauwers, and many others of less note, left an immense number of beautiful plates, reproducing the most celebrated of his paintings. To give an idea of what his influence was capable of accomplishing, pictorially speaking, it might be sufficient to notice the transformation undergone by the Antwerp school of engraving under Rubens; even the modern school of engraving, in more than one respect, is a continuation of the style first practised in Antwerp (see LINE ENGRAVING). His influence is scarcely less apparent in sculpture, and the celebrated Luke Fayd'herbe was his pupil.

Never did the Flemish school find a second Rubens. None of his four sons became a painter, nor did any of his three daughters marry an artist. According to Rubens's will, his drawings were to belong to that one of his sons who might become a painter, or in the event of one of his daughters marrying a celebrated artist, they were to be her portion. The valuable collection was dispersed only in 1659, and of the pictures sold in 1640 thirty-two became the property of the king of Spain. The Madrid Gallery alone possesses over sixty of his works. Four years after her husband's death, Helena Fourment married J. B. Van Brouckhoven de Bergheyck, knight of St James, member of the privy council, &c. She died in 1673. In 1746 the male line of Rubens's descendants was completely extinct. In the female line more than a hundred families of name in Europe trace their descent from him.

The paintings of Rubens are found in all the principal galleries in Europe: Antwerp and Brussels, Madrid, Paris, Lille, Dresden, Berlin, Munich, Vienna, St Petersburg, London, Florence, Milan, Turin exhibit several hundreds of his works. J. Smith's *Catalogue* gives descriptions of more than thirteen hundred compositions.

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[1] Many sketches of the arches are still preserved in the museums in Antwerp, St Petersburg, Cambridge, Windsor, &c. All the compositions were etched under the direction of Rubens by his pupil J. Van Thulden and published under the title of *Pompa introitus honori serenissimi Principis Ferdinandi Austriaci S. R. E. card. a S. P. Q. Antverp. decreta et ordinata.*

1877); J. Smith, *Catalogue raisonné of the Works of the most eminent Dutch and Flemish Painters*, pt. ii. (London, 1830); Waagen, *Peter Paul Rubens* (translated from the German by R. Noel; edited by Mrs Jameson, London, 1840); H. Hymans, *Histoire de la gravure dans l'école de Rubens* (Brussels, 1879); C. G. Voorhelm Schneevoogt, *Catalogue des estampes gravées d'après Rubens* (Haarlem, 1873); Max Rooses, *Rubens, sa vie et ses œuvres* (Antwerp, 1893); R. A. M. Stevenson, *P. P. Rubens* (Portfolio Monograph; London, 1898); Émile Michel, *Rubens: his Life, his Work and his Time* (London, 1899); H. Knackfuss, *Rubens* (London, 1904); and E. Dillon, *Rubens* (London, 1909). (H. H.; P. G. K.)

RUBIACEAE, in botany, a large natural order of seed plants, belonging to the series Rubiales of the subclass Sympetalae (Gamopetalae) of Dicotyledons, and containing about 350 genera with about 4500 species. It is mainly a tropical family of trees, shrubs and herbs, but some of the tribes, especially Galieae, to which the British representatives belong and which contains only herbs, are more strongly developed in temperate regions; some species of *Galium* reach the Arctic zone and are found at high elevations on mountains in the tropics.

The most striking characteristic of the family are the opposite-decussate, generally entire, stipulate leaves. The stipules are very varied in form; they generally stand between the petioles of a pair of leaves (interpetiolar). The two stipules of adjacent leaves are usually united, and in the Galieae, as well shown in the British species, are enlarged and leaf-like, forming with the two leaves an apparent whorl; by fusion or branching of the stipules the number of leaves in the whorl varies from four to eight or more. The flowers are rarely solitary, terminal or axillary, as in *Gardenia*; generally they are arranged in cymes or panicles or crowded into heads, and are often showy; in British members of the family they are very small, but may be conspicuous from their numbers, as in lady's bedstraw (*Galium verum*). The flowers are hermaphrodite and regular with parts in fours or fives; the four or five sepals, petals and stamens are placed above the ovary, which consists of two carpels, contains one to indefinite anatropous ovules in each of the two chambers, and is crowned by a simple style ending in a head or in two lobes. The sepals are often small, sometimes reduced to a narrow ring encircling the top of the ovary or altogether absent. The united petals form a corolla which varies widely in form in the different genera; it is often funnel- or salver-shaped, the honey, which is secreted by a disk round the base of the style, being at the bottom of a longer or shorter tube, in which case the flowers are adapted for pollination by Lepidoptera or bees, as in *Gardenia*, *Mussaenda*, *Guettarda*, &c.; in other cases it is bell-shaped or, as in *Galium*, rotate, with a short tube and sharply spreading segments; the honey is in these cases freely exposed or only slightly concealed and the flowers are pollinated by flies. The stamens are attached to the corolla-tube and alternate in position with its segments; the flowers are often dimorphic (or heterostyled) with short-styled and long-styled forms as in ipecacuanha (see fig.).

The fruit also varies widely in form and is dry or fleshy. When dry it forms a capsule with septicidal or loculicidal dehiscence, or is a schizocarp separating when dry into two one-seeded mericarps which, as in the British cleavers (*Galium Aparine*), sometimes bear hooked appendages which aid their dispersal.

Some genera show a remarkable association with ants. Thus *Myrmecodia*, *Hydnophytum* are epiphytic plants, in which the base of the stem forms a large tuber, which is attached to the support by numerous adventitious roots. The substance of the tuber is penetrated by numerous cork-lined cavities communicating by galleries, which are inhabited by ants. There is no evidence that the presence of the ants is of any service to the plant.

The order is divided into a large number of tribes based on the number of ovules in each ovary-chamber, the character of the fruit seed and ovule, and the aestivation of the corolla. These may be arranged in three families as follows:—

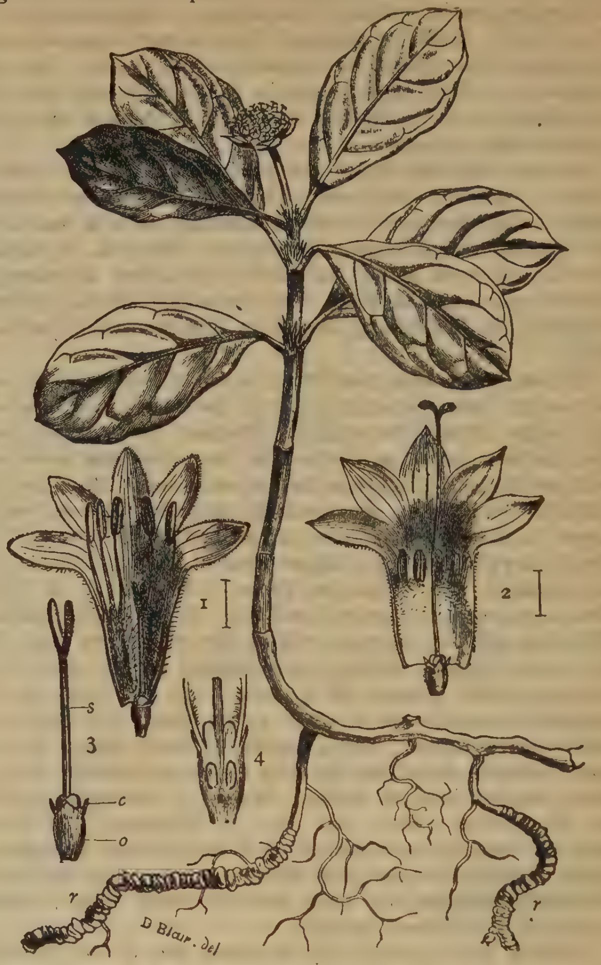
Cinchoneae, often woody plants with scale-like stipules, and numerous ovules in each ovary-chamber; the fruit is generally a capsule. To this belong *Cinchona* (*q.v.*), a genus of large trees with handsome flowers containing about forty species in the Andes of South America—it is well known as the source of Peruvian bark. An allied genus, *Bouvardia* (*q.v.*), from tropical America, is cultivated for its flowers. The species of *Uncaria* climb by means of hooks which are modified inflorescence-axes.

Mussaenda, *Gardenia* (*q.v.*), and other genera are characterized by having a fleshy fruit.

Coffeeae, often woody or shrubby plants with scale-like stipules; each ovary-chamber contains only one ovule. *Coffee* (*q.v.*), a genus of shrubs with about twenty-five species in the Old World tropics, includes the coffee plant (*C. arabica* and *C. liberica*); the fruit is a two-seeded drupe, the seed is the "coffee-bean." The thickened root of *Uragoga ipecacuanha* yields ipecacuanha (*q.v.*).

Stellateae, herbaceous plants with leaf-like stipules; each ovary-chamber contains one ovule only. Includes the four British genera *Rubia*, one species of which, *R. tinctorum*, is madder; *Galium*, including *G. verum* (lady's bedstraw), *G. Aparine* (goose-grass or cleavers), and other British species; *Asperula*, including *A. odorata* (woodruff) and *Sherardia*.

The order is closely allied to Caprifoliaceae, the chief distinction being the absence of stipules in the latter.



Ipecacuanha Plant.

RUBICON, a small stream of ancient Italy, which flowed into the Adriatic between Ariminum and Caesena, and formed the boundary between Italy and the province of Cisalpine Gaul. Hence Caesar's crossing of it in 49 B.C. was tantamount to a declaration of war against Rome as represented by Pompey and the Senate. The historic importance of this event gave rise to the phrase "crossing the Rubicon" for a step which definitely commits a person to a given course of action. There has been much controversy as to the identification of the stream; it appears that its upper course is represented by that of the Pisciatello (called Rubigone in the 11th or 12th century and now Rugone or Urgone), and its lower portion by the Fiumicino, which the Urgone once joined. The point was marked by a station on the Via Aemilia below their confluence, 12 m. N.W. of Ariminum, bearing the name *ad Confluentes*; and here is still preserved a three-arched bridge, larger than is necessary for the water carried by the present Fiumicino.

RUBIDIUM [symbol Rb, atomic weight 85·45 (O=16)], a metallic element belonging to the group of the alkali metals. It is found in the minerals lepidolite, petalite and in various specimens of mica and of carnallite, and in some mineral waters. It also occurs in tea, cocoa, coffee, tobacco and in the ashes of beetroot. It was discovered by R. Bunsen and Kirchhoff (*Ann.*, 1860, 113, p. 337), in the spectroscopic examination of the residues obtained on evaporation of water from a mineral spring at Dürkheim, being characterized by two distinctive red lines. The best source of rubidium salts is the residue left after extracting lithium salts from lepidolite, the method of separation being based on the different solubilities of the platino-chlorides of potassium, rubidium and caesium in water (R. Bunsen, *Ann.*, 1862, 122, p. 351). A somewhat similar process based on the varying solubilities of the corresponding alums has also been devised by Redtenbacher (*Jour. prak. Chem.*, 1865, 95, p. 148). The metal is prepared by distilling the carbonate with carbon (an explosive compound similar to that obtained from potassium and carbon monoxide is liable to be formed simultaneously); by reducing the hydroxide with aluminium: $4RbOH+2Al=Rb_2O\ Al_2O_3+2Rb+2H_2$ (N. Beketoff, *Ber.*, 1888, 21, p. 424 ref.); by reducing the carbonate (C. Winckler, *Ber.*, 1890, 23, p. 51) or the hydroxide with magnesium (H. Erdmann and P. Köthner, *Ann.*, 1899, 294, p. 55); and by heating the fused chloride with calcium in an exhausted glass tube at 400–500° C. (L. Hackspill, *Comptes rendus*, 1905, 141, p. 101). The metal was first obtained electrolytically in 1910 by electrolysing the fused hydroxide in a nickel vessel, with an iron wire cathode and iron cylinder anode; the product on cooling being opened under pyridine cooled by a freezing mixture (G. von Hevesy, *Zeit. anorg. Chem.*, 1910, 67, p. 242). It is a silvery white metal which melts at 38·5° C. and has a specific gravity of 1·52. It oxidizes rapidly on exposure to air, and decomposes cold water very rapidly. It closely resembles caesium and potassium in its general properties. The rubidium salts are generally colourless, mostly soluble in water and isomorphous with the corresponding potassium salts.

Rubidium hydride, RbH, was obtained in the form of colourless needles by H. Moissan (*Comptes rendus*, 1903, 136, p. 587) from the direct combination of its constituent elements. It rapidly dissociates when heated in vacuo to 300° C. The existence of the oxide Rb_2O appears to be doubtful, the results of Erdmann and Köthner (*loc. cit.*) pointing to the formation of RbO_2 by the direct union of the metal with dry oxygen. E. Rengade (*Comptes rendus*, 1907, 144, p. 920), by partially oxidizing the metal in a current of dry oxygen and removing excess of metal by distillation in vacuo, has obtained oxides of composition Rb_2O_2 (yellowish white), Rb_2O_3 (black) and Rb_2O_4 (yellow). Rubidium hydroxide, $RbOH$, is a colourless solid which is formed by the action of rubidium on water, or by the addition of baryta water to a solution of rubidium sulphate. It is readily soluble in water, the solution being very alkaline and caustic. It melts at 301°. Evaporation of the aqueous solution at 15° C. deposits a crystalline hydrated hydroxide of composition $RbOH{\cdot}2H_2O$ (R. de Forcrand, *Comptes rendus*, 1909, 149, p. 1341). Rubidium chloride, $RbCl$, is formed on burning rubidium in chlorine, or on dissolving the hydroxide in aqueous hydrochloric acid. It crystallizes in colourless cubes and volatilizes when heated very strongly. It is soluble in water and combines with many metallic chlorides to form double salts. It combines also with iodine chloride and bromide and with bromine chloride and with bromine (H. L. Wells and H. L. Wheeler, *Amer. Jour. Sci.*, 1891 (3), 43, p. 475).

Rubidium sulphate, Rb_2SO_4, is formed by the action of sulphuric acid on the carbonate or hydroxide of the metal, or by the action of milk of lime on rubidium alum, the excess of lime being precipitated by rubidium carbonate and the solution neutralized by sulphuric acid. It forms large colourless hexagonal crystals. Several sulphides of the metal have been described by W. Biltz and E. Wilke-Dörfurt (*Zeit. anorg. Chem.*, 1906, 48, p. 297). The normal sulphide, $Rb_2S{\cdot}4H_2O$, is colourless, and when heated in aqueous solution with the requisite amount of sulphur is transformed into the yellow tetrasulphide, $Rb_2S_4{\cdot}2H_2O$. A pentasulphide, Rb_2S_5, which crystallizes in red prisms melting at 223° C., is also obtained by the direct union of the normal sulphide with sulphur. When heated in a current of hydrogen it is transformed into the colourless disulphide, whilst if the heating be carried out in a current of nitrogen it yields the trisulphide, $Rb_2S_3{\cdot}H_2O$. These sulphides are much less hygroscopic than the corresponding caesium compounds. Rubidium nitrate, $RbNO_3$, obtained by the action of nitric acid on the carbonate, crystallizes in needles or prisms and when strongly heated is transformed into a mixture of nitrite and oxide. Rubidium ammonium, $RbNH_3$, was prepared by H. Moissan (*Comptes rendus*, 1903, 136, p. 1177) by the action of liquid ammonia on rubidium. The product combines with acetylene to form rubidium acetylide acetylene, $Rb_2C_2{\cdot}C_2H_2$, which on heating in vacuo loses acetylene and leaves a residue of rubidium carbide Rb_2C_2 (ibid. p. 1217). Rubidium carbonate, Rb_2CO_3, formed by the addition of ammonium carbonate to rubidium hydroxide, is a crystalline mass which melts in its water of crystallization when heated.

The atomic weight of rubidium was determined by R. Bunsen (*Pogg. Ann.*, 1861, 113, p. 339), Picard (*Zeit. anal. Chem.*, 1862, 1, p. 519) and Godeffroy (*Ann.*, 1876, 181, p. 185), the methods being based on the conversion of rubidium halides into the corresponding silver salt, and the values obtained vary from 85·40 to 85·50. The determination of E. H. Archibald (*Jour. Chem. Soc.*, 1904, 85, p. 776) from the analysis of the chloride and bromide gives the mean value as 85·485 ($O=16$).

RUBINSTEIN, ANTON GRIGOROVICH (1829–1894), Russian pianist, born of Jewish parentage on the 28th of November 1829 at Wechwotynetz, in Podolia, was the son of a pencil manufacturer who migrated to Moscow. The Rubinstein family, at the dictate of Anton's grandfather Roman Rubinstein, had all been baptized at the time of the ukase against the Jews issued in 1830 by the Tsar Nicholas. Anton was then one year old. Besides his mother he had but one teacher, the piano master Alexander Villoing, of whom he declared at the end of his own career that he had never met a better. In July 1838 Rubinstein appeared in the theatre of the Petrowski Park at Moscow; and in the year following he went to Paris after Villoing, and in 1840 played before Liszt. For some time after this Rubinstein travelled in Holland, Germany and Scandinavia, and reached England in 1842, where on the 20th of May he made his first appearance at a Choral Fund concert. In 1845, after a brief visit to Moscow in 1843, he went with his family (including his brother Nikolaus) to Berlin in order to complete his musical education. Dehn was their master, and Mendelssohn, whom Rubinstein had met previously in London, their best friend. The sudden death of Rubinstein's father necessitated the withdrawal of his mother and Nikolaus to Moscow, while Anton, on Dehn's advice, went to Vienna to seek a livelihood. Hence, after more hard study for nearly two years, he went with the flautist Heindl, and later alone, on a concert tour in Hungary; and the outbreak of the revolution in Vienna preventing his return there, he went via Berlin to St Petersburg, where the Grand Duchess Hélène appointed him Kammervirtuos. About this time an unfortunate error of the police nearly caused his expatriation to Siberia, from which he was saved by his patroness. During the next eight years Rubinstein spent most of his time in St Petersburg studying, playing and composing. His opera *Dmitri Donskoi* was produced there in 1851, and *Toms der Narr* in 1853. *Die Sibirischen Jäger*, written about the same time, was not produced. On the advice of his patroness and Count Wilhorski he visited Hamburg and Leipzig, and arrived for the second time in London in 1857, when at a Philharmonic concert he introduced his own concerto in G. In the following year he was in London again, having in the meantime been appointed Concert Director of the Royal Russian Musical Society. In 1862, in collaboration with Carl Schuberth, he founded the St Petersburg Conservatorium, of which he was director until 1867. In 1868 he travelled in Germany, France and England, and remained for some time in Vienna, where he introduced a large number of his own compositions. Thence he went to America in 1872 and 1873, when he returned to Russia, and after a short rest set off once more on concert tours. In this manner the rest of his life was spent, until in 1885 he began a series of historical recitals of immense interest, which he gave in most of the chief European capitals. He died on the 20th of November 1894.

In addition to the works already named, Rubinstein left compositions in almost every known form. Among other of his operas are *Die Kinder der Haide*, *Feramors* (*Lalla Roukh*), *Nero*, *Der Dämon* and *Die Makkabäer*, this last perhaps more frequently played than all the others, of which the chief defect is their lack of dramatic point. On the subject of oratorio Rubinstein held original views, though his attempt to realize them in *Moses* and *Christus* was not completely successful, while his efforts in Berlin and London to found a Sacred Theatre failed entirely. Nevertheless he himself regarded the *Christus* as his greatest achievement. The most familiar of his five symphonies are the "Ocean" and the "Dramatic." He wrote scores on scores of pianoforte works, from complex concertos to the most commonplace *salonstücke*; abundance of concerted chamber-music, and a number of songs and duets, which enjoyed some popularity. He also published several books, including his *Reminiscences* and *Die geistliche Oper*.

Rubinstein's fame as one of the greatest of pianists will live in history. His technique bore comparison with that of Liszt; he possessed a power for interpreting the most different kinds of music which has not been surpassed.

His brother Nikolaus (1835–1881) was also a remarkable pianist, and a marvellous teacher of music. He founded the conservatorium of music at Moscow.

See Bernhard Vogel, *Anton Rubinstein, Biographischer Abriss* (Leipzig, 1888); Alexander MacArthur, *Anton Rubinstein, a Biographical Sketch* (Edinburgh, 1889); Eugen Zabel, *Anton Rubinstein, Ein Künstlerleben* (Leipzig, 1892); Anton von Halten, *Anton Rubinstein* (Utrecht, 1886); Cuthbert H. Cronk, *The Works of Anton Rubinstein* (London, 1900).

RUBRIC (Fr. *rubrique*, Lat. *rubrica*, *ruber*, red), in its earliest and original sense, red earth or ochre, ruddle, and hence applied to words written or printed in red lettering, in MSS. or printed books, such as chapter headings, paragraphs, initial letters, &c., thus marking in a distinctive manner that to which attention is to be drawn. The term was also applied to the passages so marked, and more especially to the directions or rules as to the conduct of divine service in liturgical books. This is the chief current usage of the term (see Liturgy).

RUBRUQUIS (or Rubrouck), **WILLIAM OF** (*c.* 1215–1270; fl. 1253–55), Franciscan friar, one of the chief medieval travellers and travel-writers. Nothing is known of him save what can be gathered from his own narrative, and from Roger Bacon, his contemporary and brother Franciscan. The name of Rubruquis ("Fratris Willielmi de Rubruquis") is found in the imperfect MS. printed by Hakluyt in his collection, and followed in his English translation, as well as in the completer issue of the English by Purchas. Writers of the 16th, 17th and 19th centuries have called the traveller *Risbroucke* and *Rysbrokius* (*Rysbroeck* and *Ruysbroek* in the *Biographie universelle* and *Nouv. biog. générale*)—an error founded on the identification of his name of origin with Ruysbroeck in Brabant (a few miles south of Brussels) and perhaps promoted by the fame of John of Ruysbroeck or Rysbroeck (1294–1381), a Belgian mystic, whose treatises have been reprinted as late as 1848. It is only within the last twenty years that attention has been called to the fact that Rubrouck is the name of a village and commune in old (medieval) French Flanders, belonging to the canton of Cassel in the department du Nord, and lying some 8½ m. N.E. of St Omer. In the library of the latter city many medieval documents exist referring expressly to de Rubroucks[1] of the 12th and 13th centuries. It may be fairly assumed that Friar William came from this place;[2] thus Hakluyt's conclusion is justified, as expressed in the title he gives to Lord Lumley's MS. printed by him, now in the British Museum, MSS. Reg., 14 C. xiii. fol. 225 r.–36 r. (*Itinerarium fratris Willielmi de Rubruquis de ordine fratrum Minorum*, Galli, *Anno gratie 1253, ad partes Orientales.*

Friar William went to Tartary under orders from Louis IX. (St Louis). That king, at an earlier date, viz. December 1248, when in Cyprus, had been visited by alleged envoys from Elchigaday (Ilchikadai, Ilchikdai), who commanded the Mongol hosts in Armenia and Persia. The king then despatched a return mission consisting of Friar Andrew of Longjumeau or Lonjumel and other ecclesiastics, who carried presents and letters for both Ilchikadai and the Great Khan. They reached the court of the latter in the winter of 1249–50, when there was no actual khan on the throne; and they returned, along with Tatar envoys, bearing a letter to Louis from the Mongol regent-mother which was couched in terms so arrogant that the king repented sorely of having sent such a mission ("li rois se repenti fort quant il y envoia," Joinville, *Histoire de Saint Louis*, pp. 148–49, in Paris edition of 1858 by F. Michel, Paulin Paris and F. Didot). These returned envoys reached the king when he was at Caesarea, therefore between March 1251 and May 1252. But not long after the king, hearing that the Tatar prince Sartak, son of Batu, was a "baptized Christian," felt moved to open communication with him, and for this purpose deputed Friar William of Rubrouck. The former rebuff had made the king chary of sending formal embassies, and Friar William on every occasion, beginning with a sermon delivered in St Sophia's on Palm Sunday (*i.e.* April 13th) 1253, disclaimed that character.

Various histories of St Louis, and other documents, give particulars of the despatch of the mission of Friar Andrew from Cyprus, but none mention that of Friar William; and the first dates given by the latter are those of his sermon at Constantinople, and of his entrance into the Black Sea (May 7th, 1253). He must therefore have received his commission at Acre, where the king was residing from May 1252 to the 29th of June 1253; but he had travelled by way of Constantinople, as has just been indicated, and there received letters to some of the Tatar chiefs from the emperor, who was at this time Baldwin de Courtenay, the last of the Latin dynasty.

The narrative of the journey is everywhere full of life and interest. The vast conquests of Jenghiz Khan were still in nominal dependence on his successors, at this time represented by Mangu Khan, reigning on the Mongolian steppes, but practically these conquests were splitting up into several great monarchies. Of these the Ulus of Juji, the eldest son of Jenghiz, formed the most westerly, and its ruler was Batu Khan, established on the Volga. Sartak is known in the history of the Mongols as Batu's eldest son, and was appointed his successor, though he died immediately after his father (1256). The story of Sartak's Christianity seems to have had some foundation; it was currently believed among Asiatic Christians, and it is alleged by Armenian writers that he had been brought up and baptized among the Russians. Pope Innocent IV. (August 29, 1254) refers with enthusiasm to Sartak's baptism, of which he had just heard from a priest whom the khan had sent as envoy to the papal court.

Rubrouck and his party landed at Soldaia, or Sudak, on the Crimean coast, then a centre of intercourse between the Mediterranean world and what is now S. Russia. Equipped with horses and carts for the steppe, they travelled successively to the courts (*i.e.* the nomad camps) of Scacatai (Kadan?), Sartak and Batu, thus crossing the Don and arriving at the Volga: of both these rivers Friar William gives vivid and interesting sketches. Batu kept the travellers for some time in suspense, and then referred them to the Great Khan himself, an order involving the enormous journey to Mongolia. The actual travelling of the party from the Crimea to the khan's court near Karakorum cannot have been, on a rough calculation, less than 5000 m., and the return journey to Lajazzo in Cilicia would be longer by 500 to 700 m. The chief dates to be gathered from the narrative are as follows: the envoys embark on the "Euxine," May 7th, 1253; reach Soldaia, May 21st; set out thence, June 1st; reach the camp of Sartak, July 31st; begin the journey from the camp of Batu E. across the steppes, September 16th; turn S.E., November 1st; reach the Talas river, November 8th; leave Cailac[3] (S. of Lake Balkash), November 30th; reach the camp of the Great Khan, December 27th; leave the camp of the Great Khan on or about July 10th, 1254; reach camp of Batu again, September 16th; leave Batu's camp at Sarai, November 1st; arrive at the Iron Gate (Derbent), November 13th; Christmas spent at Nakhshivân or Nakhichevan (under Ararat); reach Antioch (from Lajazzo, Layes, or Ayas, of Cilicia, via Cyprus), June 29th, 1255; reach Tripoli, August 15th.

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[1] A detailed notice of such documents was published by M. E. Coussemaker of Lille. See remarks by M. d'Avezac in *Bull. de la Soc. de Géog.*, 2nd vol. for 1868, pp. 569–70.

[2] The county of Flanders was at this time a fief of the French crown (see Natalis de Wailly, *Notes on Joinville*, p. 576). William's mother-tongue may have been Flemish. From his representation to Mangu Khan (p. 361) that certain "Teutonici" who had been carried away as slaves by a Tatar chief were "nostrae linguae," Dr Franz Max Schmidt inclines to think this certain.

[3] Cailac, where Rubrouck halted twelve days, is undoubtedly the Kayalik of the historians of the Mongols, the position of which is somewhat indefinite. The narrative of Rubrouck shows that it must have been near the modern Kopal.

The camp of Batu was first reached near the northernmost point of his summer marches, therefore about Ukek or Uvyek, near Saratov (see Marco Polo, Paris ed. of 1824, p. 3). Before the camp was left they had marched with it five weeks down the Volga. The point of departure would lie on that river somewhere between 48° and 50° N. The route taken lay E. by a line running N. of the Caspian and Aral basins; then from about 70° E. to the basin of the Talas river; thence across the passes of the Kirghiz Ala-tau and S. of the Balkash Lake to the Ala-kul and the Baratula Lake (Ebi-nor). From this the travellers struck N. across the Barluk, or the Orkochuk Mountains, and thence, passing S. of the modern Kobdo, to the valley of the Jabkan river, whence they emerged on the plain of Mongolia, coming upon the Great Khan's camp at a spot ten days' journey from Karakorum and bearing in the main S. from that place, with the Khangai Mountains between.

This route is of course not thus defined in the narrative, but is a deduction from the facts stated therein. The key to the whole is the description given of that central portion intervening between the basin of the Talas and Lake Ala-kul, which enables the topography of that region, including the passage of the Ili, the plain S. of the Balkash, and the Ala-kul itself, to be identified past question.[1]

The return journey, being made in summer, after retraversing the Jabkan valley,[2] lay apparently farther to the N., and passed N. of the Balkash, probably with a fairly straight course, to the mouths of the Volga. Thence the party travelled S. by Derbent, and so by Shamakhi to the Araxes, Nakhshivan, Erzingan, Sivas and Iconium, to Lajazzo, Layas, or Ayas, where they embarked for Cyprus and Syria. St Louis had returned to France a year before.

We have alluded to Roger Bacon's mention of Friar William. Indeed, in the geographical section of the *Opus Majus* (*c.* 1262) he cites the traveller repeatedly and copiously, describing him as "frater Wilhelmus quem dominus rex Franciae misit ad Tartaros, Anno Domini 1253 . . . qui perlustravit regiones orientis et aquilonis et loca in medio his annexa, et scripsit haec praedicta illustri regi; quem librum diligenter vidi et cum ejus auctore contuli" (see *Opus Majus*, Oxford edition of 1897, i. 353–66). Add to this William's own incidental particulars as to his being—like his precursor, Friar John de Plano Carpini—a very heavy man (*ponderosus valde*), and we know no more of his personality, except the abundant indications of character afforded by the story itself. These paint for us an honest, pious, stout-hearted, acute and most intelligent observer, keen in the acquisition of knowledge, the author of one of the best narratives of travel in existence. His language indeed is dog-Latin of the most un-Ciceronian quality; but it is in his hands a pithy and transparent medium of expression. In spite of all the difficulties of communication, and of the badness of his *turgemannus* or dragoman,[3] he gathered a mass of particulars, wonderfully true or near the truth, not only as to Asiatic nature, geography, ethnography and manners, but as to religion and language. Of his geography a good example occurs in his account of the Caspian (eagerly caught up by Roger Bacon), which is perfectly accurate, except that he places the hill country occupied by the Mulahids, or Assassins, on the E. instead of the S. shore. He explicitly corrects the allegation of Isidore that it is a gulf of the ocean: "non est verum quod dicit Ysidorus . . . nusquam enim tangit oceanum, sed undique circumdatur terra" (265).[4] Of his interest and acumen in matters of language we may cite examples. The language of the Pascatir (or Bashkirs) and of the Hungarians is the same as he had learned from Dominicans who had been among them (274).[5] The language of the Ruthenians, Poles, Bohemians and Slavonians is one, and is the same with that of the Vandals, or Wends (275). In the town of Equius (immediately beyond the Ili, perhaps Aspara)[6] the people were Mahommedans speaking Persian, though so far remote from Persia (281). The Uighurs (or Yugurs) of the country about Cailac (see note above) had formed a language and character of their own, and in that language and character the Nestorians of that tract used to perform their office and write their books (281–82). The Uighurs are those among whom are found the fountain and root of the Turkish and Comanian tongue (289). Their character has been adopted by the Mongols. In using it they begin writing from the top and write downwards, whilst line follows line from left to right (286). The Nestorians say their service, and have their holy books, in Syriac, but know nothing of the language, just as some of our monks sing the mass without knowing Latin (293). The Tibet people write as we do, and their letters have a strong resemblance to ours. The Tangut people write from right to left like the Arabs, and their lines advance upwards (329). The current money of Cathay is of cotton paper, a palm in length and breadth, and on this they print lines like those of Mangu Khan's seal:—"imprimunt lineas sicut est sigillum Mangu"— a remarkable expression. They write with a painter's pencil and combine in one character several letters, forming one expression:—"faciunt in una figura plures literas comprehendentes unam dictionem,"—a still more remarkable utterance, showing an approximate apprehension of the nature of Chinese writing (329).

Yet this sagacious observer is denounced as an untruthful blunderer by Isaac Jacob Schmidt (a man of useful learning, of a kind rare in his day, but narrow, wrong-headed, and in natural acumen and candour far inferior to the 13th-century friar) simply because Rubrouck's evidence as to the Turkish dialect of the Uighurs traversed a pet heresy, long since exploded, which Schmidt entertained, viz. that the Uighurs were by race and language Tibetan.[7] Léon Cahun (*Introduction à l'histoire de l'Asie*, pp. 353–55, 384–86, 392) also shows a strange perversity in depreciating Rubrouck; all this detraction may be contrasted with Oscar Peschel's admirably fair judgment (*Geschichte der Erdkunde*, p. 165, &c.). At the same time, Rubrouck may be considered inferior as a politician and diplomatist to Carpini; and the latter's remarkable work has in its turn suffered from undiscriminating eulogy of his successor's *Itinerarium*. An attempt has been made to strike a balance in the judgment of these two great pioneers in the *Dawn of Modern Geography*, ii. 375–81.

The narrative of Rubrouck, after Roger Bacon's copious use of it, seems to have dropped out of sight, though five MSS. are still known to exist: the chief of these are (1) Corp. Chr. Coll., Cambridge, No. 66, fols. 67 v.–110 v. of about 1320; (2) No. 181 of the same library, fols. 321–98, of about 1270–90; (3) Leiden Univ. Libr., No. 77 (formerly 104), fols. 160 r.–190 r. of about 1290. It has no place in the famous collections of the 14th century, nor in the earlier *Speculum Historiale* of Vincent of Beauvais, which gives so much attention to the 13th-century intercourse of Latin Christendom with Tartary. It first appeared imperfectly in Hakluyt (1598 and 1599), as we have mentioned. But it was not till 1839 that any proper edition of the text was published. In that year the *Recueil de Voyages* of the Paris Geographical Society, vol. iv., contained an edition of the Latin text, and a collation of the MSS. put forth by M. d'Avezac, with the assistance of two young scholars, since of high distinction, viz. Francisque Michel and Thomas Wright. But there is no commentary on the subject-matter, such as M. d'Avezac attached to his edition of Friar John de Plano Carpini in the same volume. Something has been done to supply this deficiency by the two editions in the Hakluyt Society's publications, (i.) *William of Rubrouck . . . John of Pian de Carpine*, trans. and edited by William W. Rockhill (London, 1900); (ii.) *Texts and Versions of . . . Carpini and . . . Rubruquis . . .*, edited by C. Raymond Beazley (London, 1903). Richthofen in his *China*, i. 602–4, has briefly but justly noticed Rubrouck. A French version with some notes, issued at Paris in 1877, in the *Bibliothèque orientale Elzévirienne* hardly deserves mention. Dr Franz Max Schmidt's admirable monograph, *Über Rubruk's Reise* (Berlin, 1885), has been separately printed from vol. xx. of the *Zeitschrift* of the Berlin Geographical Society. See also d'Ohsson, *Histoire des Mongols* (1852), vol. ii. pp. 283–309; Bretschneider, *Mediaeval Researches from Eastern Asiatic Sources* (1888), i. 204–5, 262–63, 299, 301, 305–8, 311, 318, 327, 334; ii. 25, 38, 41–42, 70–71, 83–86, 91, 116, 120; Beazley, *Dawn of Modern Geography*, ii. 266, 278–79, 281, 298–99, 303, 320–82, 421, 449–52; iii. 17–18, 31–32, 46, 69, 84–85, 88, 98, 101, 105, 188, 236–37, 544. (H. Y.; C. R. B.)

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[1] See details in *Cathay and the Way Thither*, pp. ccxi–ccxiv, and Schuyler's *Turkistan*, i. 402–5. Mr Schuyler points out the true identification of Rubrouck's river with the Ili, instead of the Chu, which is a much smaller stream; and other amendments have been derived from Dr F. M. Schmidt (see below).

[2] This meaning may be put on Rubrouck's words: "Our going was in winter, our return in summer, and that by a way lying very much farther north, only that for a space of fifteen days' journey in going and coming we followed a certain river between mountains, and on these there was no grass to be found except close to the river." The position of the Chagan Takoi or upper Jabkan seems to suit these facts best; but Mr Schuyler refers them to the upper Irtish, and Dr F. M. Schmidt to the Uliungur.

[3] "Ego enim percepi postea, quando incepi aliquantulum intelligere idioma, quod quando dicebam unum ipse totum aliud dicebat, secundum quod ei occurrebat. Tum videns periculum loquendi per ipsum, elegi magis tacere" (248–49).

[4] The page references in the text are to d'Avezac's edition of the Latin (see below).

[5] The Bashkirs now speak a Turkish dialect; but they are of Finnish race, and it is quite possible that they then spoke a language akin to Magyar. There is no doubt that the Mussulman historians of that age identified the Hungarians and the Bashkirs (*e.g.* see extracts from Juvainī and Rashīduddīn in App. to D'Ohsson's *Hist. des Mongols*, ii. 620–23). The Bashkirs are also constantly coupled with the *Majār* by Abulghāzī. See Fr. tr. by Desmaisons, pp. 19, 140, 180, 189.

[6] *Asp* = *Equus.* Aspara is often mentioned by the historians of Timur and his successors; its exact place is uncertain, but it lay somewhere on the Ili frontier. Dr F. M. Schmidt thinks this identification impossible; but one of his reasons—viz. that Equius was only one day from Cailac—appears to be a misapprehension of the text.

[7] See *Forschungen im Gebiete . . . der Völker Mittel-Asiens* (St Petersburg, 1824), pp. 90–93.

RUBY (Lat. *rubeus*, red), the most valued of all gem-stones, a red transparent variety of corundum, or crystallized alumina. It is sometimes termed "oriental ruby" to distinguish it from the spinel ruby, which is a stone of inferior hardness, density and value (see SPINEL). When the word ruby is used without any qualifying prefix, it is always the true or so-called oriental stone that is meant in modern nomenclature. Ancient writers, relying chiefly on colour, classed together under a common name several brilliant red stones, such as the ruby, spinel and garnet: thus the ἄνθραξ of Theophrastus and the *Carbunculus* of Pliny were names which seem to have been applied to several distinct minerals. Although the word ruby is used in the English translation of the Old Testament it is improbable that the true ruby was known to the ancient Hebrews.

The ruby crystallizes in the hexagonal system (see CORUNDUM). The crystals have no true cleavage, but tend to break along certain gliding planes. The colour of ruby varies from deep cochineal to pale rose-red, in some cases with a tinge of purple, the most valued tint being that called by experts pigeon's-blood colour. On exposure to a high temperature, the ruby becomes green, but regains its original colour on cooling. The red colour of ruby may be due to chromium. When a ruby of the most esteemed tint is examined with the dichroscope, one image is generally seen to be carmine and the other aurora-red, the red colour inclining to orange. This test serves to distinguish the true ruby from spinel and from garnet, since these minerals, being cubic, are not dichroic. Another means of distinction is afforded by the specific gravity of ruby (about 4), which is higher than that of spinel and garnet, whilst the superior hardness of the ruby (about 9) furnishes yet another test. The high refractivity of ruby is also characteristic, the mean ordinary index being 1·77 and the extraordinary 1·76. When cut and polished the ruby is therefore a brilliant stone, but having weak dispersive power it lacks fire. Subjected to radiant discharge in a Crookes tube, the ruby, like other forms of corundum, phosphoresces with a vivid red glow.

The oriental ruby is a mineral of very limited distribution. Its most famous localities are in Upper Burma, but until the British annexation of the country in 1886 the mines were so jealously guarded that little was known as to the conditions under which the mineral occurred. Soon after the annexation, the ruby districts were officially visited, and reported on, by Mr C. Barrington Brown, and specimens from the mines were exhaustively studied by Professor J. W. Judd. The principal district is situated in the neighbourhood of Mogok, 90 m. N.N.E. of Mandalay. The ruby occurs in bands of a crystalline limestone, associated with granitic and gneissose rocks, some of which are highly basic; and it is from the anorthite, or lime-felspar, and the associated minerals in the pyroxene-gneisses, that the corundum, spinel and calcite, may, according to Judd, have been derived. Probably the felspar is first altered to scapolite, and this on decomposition would yield calcium carbonate and hydrous aluminium silicates, from which the anhydrous alumina might ultimately be separated. The limestone contains (in addition to the ruby) spinel, garnet, graphite, wollastonite, scapolite, felspar, mica, pyrrhotite and other minerals. The ruby, like other kinds of corundum, suffers alteration under certain conditions, and passes by hydration into gibbsite and diaspore, which by further alteration and union with silica, &c., may yield margarite, vermiculite, chlorite and other hydrous silicates.

The Burmese rubies are not generally worked in the limestone matrix, but are mostly found loose in detrital matter, which is clayey and sandy in character and yellowish-brown in colour, and is known locally as "byon." Some of the deposits occur in limestone caverns, where they may, like cave-earth, represent the insoluble residue of the limestone. Workings in the cave-deposits are called "loodwins" (crooked mines). In the alluvium of the valleys, the ruby-pits are known as "twinlones" (round pits), whilst workings in the ruby-earth on the hillsides are termed "hmyaudwins" (water mines). The byon contains, with the ruby, other coloured corundums and spinels. Burmese rubies are found also in crystalline limestone in the hills near Sagyin, about 20 m. N. of Mandalay, and it is of mineralogical interest to note that the limestone here contains chondrodite.

Rubies are found in Siam, at several localities in the provinces of Chantabun and Krat; and Professor H. Louis has described their occurrence at Moung Klung in this region. The rubies are found with sapphires and spinels, in gravels, resting in some cases on basic igneous rocks. The Siam rubies are generally of dark colour, often inclining to a deep reddish brown. Rubies occur, with sapphires and other minerals, in the gem-gravels of Ceylon, but are not usually of such good colour as the Burmese stones. A cloudy variety, which, when cut with a convex surface, exhibits a luminous star, is known as star-ruby (see ASTERIAS). In peninsular India rubies are rarely found, though they have been reported from the corundum deposits of Madras and Mysore. The ruby is known, however, to occur in a micaceous limestone at Jagdalak, near Kabul in Afghanistan.

Rubies, generally of pale colour, are found with the sapphires of Montana, especially at Yogo Gulch near Utica. In the corundum deposits of N. Carolina ruby is occasionally met with, especially at Cowee Creek, Macon county, where it occurs in crystals of tabular, rhombohedral and prismatic habit. These crystals, sometimes of fine colour, are found in gravels resting on a soft rock called saprolite, which results from the weathering of certain basic igneous rocks; and it is notable that the ruby crystals are associated with the variety of garnet termed rhodolite, as described by Professor Judd and W. E. Hidden. Australia has occasionally yielded rubies, but mostly of small size and inferior quality. In New South Wales and in Victoria they have been found in drift gravels, and a magenta-coloured turbid variety from Victoria has been described under the name of barklyite.

Rubies have been produced artificially with much success. At one time it was the practice to fuse together small fragments of the natural stone; and gems cut from such material were known as reconstructed rubies. This process has given way to Professor A. Verneuil's method of forming artificial ruby from purified ammonia-alum with a certain proportion of chrome-alum. The finely powdered material is caused to fall periodically into an oxyhydrogen flame, the heat of which decomposes the alum, and the alumina thus set free forms liquid drops which collect and solidify as a pear-shaped mass. When of the characteristic pigeon's-blood colour, the synthetical ruby contains about 2·5% of chromic oxide. The manufactured ruby possesses the physical characters of corundum, but may generally be distinguished by microscopic bubbles and striae. The manufacture is carried out commercially. (For other processes, see GEM, ARTIFICIAL.)

It should be noted that several minerals known popularly as rubies have no relation to the true red corundum. Thus, "Cape rubies" from the South African diamond mines, "Australian rubies" from South Australia, and "Arizona rubies" are merely fine garnets; "Siberian ruby" is red tourmaline (see RUBELLITE), and "Balas ruby" is spinel (*q.v.*). Ruby silver is a name applied to light red silver ore, or proustite; ruby copper is merely cuprite, in brilliant crystals; and ruby-blende is a clear red variety of zinc sulphide.

BIBLIOGRAPHY.—For the Burma ruby, see "The Rubies of Burma and Associated Minerals: their mode of occurrence, origin and metamorphoses," by C. Barrington Brown and Professor J. W. Judd, *Phil. Trans.*, 1897, 187, p. 151. For the ruby of Siam, see "The Ruby and Sapphire Deposits of Moung Klung, Siam," by H. Louis, *Mineralog. Mag.*, 1894, 10, p. 267. For synthetical ruby, see G. F. Herbert Smith, *Mineralog. Mag.*, 1908, 15, p. 153; and J. Boyer, *La Synthèse des pierres précieuses* (Paris, 1909).

(F. W. R.*)

RUBY MINES, a district in the Mandalay division of Upper Burma, lying along the Irrawaddy river between the Bhamo district on the N., the Shan States on the E., Mandalay district on the S. and Katha on the W. Including the Shan state of Mongmit, which is temporarily administered as part of the district, the total area is 5476 sq. m.; pop. (1901) 87,694. The district geographically forms part of the Shan plateau, and is to a great extent a mass of hills with a general N. and S. direction. It contains considerable numbers of Kachins (13,300) and Palaungs (16,400). The annual rainfall at Mogok averages 98 in. The administrative headquarters are at Mogok, which is also the centre of the ruby-mining industry. It stands in the centre of a valley 4000 ft. above sea-level, and is reached by a cart-road from Thabeikkyin, 61 m. distant, on the Irrawaddy. The Ruby Mines Company employs about 44 Europeans and Eurasians in its works, which are situated at the north end of the town. The company has constructed a dam across the Yeni stream and set up an electric installation of about 450 horse-power, which works pumps and the washing machinery. The mines were worked under Burmese rule, but were discontinued on account of the small profit. Now they seem to be established on a sound financial basis. The system adopted is to excavate large open pits, from which the ruby-earth or *byon* is removed *en masse* and washed and crushed by machinery. Spinels and sapphires are found with the rubies. In 1904, the produce of rubies alone was 200,000 carats, valued at £80,000, most of which were sent to London for sale. In addition, some mining is carried on by natives, working under a licence which does not permit the use of machinery. The district contains 994 sq. m. of reserved forests.

RÜCKERT, JOHANN MICHAEL FRIEDRICH (1788–1866), German poet, was born at Schweinfurt on the 16th of May 1788, the eldest son of a lawyer. He was educated at the gymnasium of his native place and at the universities of Würzburg and Heidelberg. For some time (1816–17) he worked on the editorial staff of the *Morgenblatt* at Stuttgart. Nearly the whole of the year 1818 he spent in Rome, and afterwards he lived for several years at Coburg. He was appointed a professor of Oriental languages at the university of Erlangen in 1826, and in 1841 he was called to a similar position in Berlin, where he was also made a privy councillor. In 1849 he resigned his professorship at Berlin, and went to live on his estate Neuses near Coburg. He died on the 31st of January 1866. When Rückert began his literary career, Germany was engaged in her life-and-death struggle with Napoleon; and in his first volume, *Deutsche Gedichte*, published in 1814 under the pseudonym "Freimund Raimar," he gave, particularly in the powerful "Geharnischte Sonette," vigorous expression to the prevailing sentiment of his countrymen. In 1815–18 appeared *Napoleon, eine politische Komödie in drei Stücken* (only two parts were published), and in 1817 *Der Kranz der Zeit*. He issued a collection of poems, *Östliche Rosen*, in 1822; and in 1834–38 his *Gesammelte Gedichte* were published in six volumes, a selection from which has passed through many editions. Rückert, who was master of thirty languages, made his mark chiefly as a translator of Oriental poetry and as a writer of poems conceived in the spirit of Oriental masters. Much attention was attracted by a translation of Hariri's *Makamen* (1826), *Nal und Damajanti*, an Indian tale (1828), *Rostem und Suhrab, eine Heldengeschichte* (1838), and *Hamasa, oder die ältesten arabischen Volkslieder* (1846). Among his original writings dealing with Oriental subjects are *Morgenländische Sagen und Geschichten* (1837), *Erbauliches und Beschauliches aus dem Morgenland* (1836–38), and *Brahmanische Erzählungen* (1839). The most elaborate of his works is *Die Weisheit des Brahmanen*, published in six volumes in 1836–39. This last and the *Liebesfrühling* (1844), a cycle of love-songs, are the best known of all Rückert's productions. In 1843–45 he issued the dramas *Saul und David* (1843), *Herodes der Grosse* (1844), *Kaiser Heinrich IV.* (1845) and *Christofero Colombo* (1845), all of which are greatly inferior to the work to which he owes his place in German literature. At the time of the Danish war in 1864 he wrote *Ein Dutzend Kampflieder für Schleswig-Holstein*, which, although published anonymously, produced a considerable impression. After his death many poetical translations and original poems were found among his papers, and several collections of them were published. Rückert had a splendour of imagination which made Oriental poetry congenial to him, and he has seldom been surpassed in rhythmic skill and metrical ingenuity. There are hardly any lyrical forms which are not represented among his works, and in all of them he wrote with equal ease and grace.

A complete edition of Rückert's poetical works appeared in 12 vols. in 1868–69. Subsequent editions have been edited by L. Laistner (1896), C. Beyer (1896), G. Ellinger (1897). See B. Fortlage, *F. Rückert und seine Werke* (1867); C. Beyer, *Friedrich Rückert, ein biographisches Denkmal* (1868), *Neue Mitteilungen über Rückert* (1873), and *Nachgelassene Gedichte Rückerts und neue Beiträge zu dessen Leben und Schriften* (1877); R. Boxberger, *Rückert-Studien* (1878); P. de Lagarde, *Erinnerungen an F. Rückert* (1886); F. Muncker, *Friedrich Rückert* (1890); G. Voigt, *Rückerts Gedankenlyrik* (1891).

RŪDAGĪ (d. 954). Farīd-eddīn Mahommed 'Abdallāh, the first great literary genius of modern Persia, was born in Rūdag, a village in Transoxiana, about 870–900. Most of his biographers assert that he was totally blind, but the accurate knowledge of colours shown in his poems makes this very doubtful. The fame of his accomplishments reached the ear of the Sāmānid Nasr II. bin Ahmad, the ruler of Khorāsān and Transoxiana (913–42), who invited the poet to his court. Rūdagī became his daily companion, rose to the highest honours and amassed great wealth. In spite of various predecessors, he well deserves the title of "father of Persian literature," "the Adam or Sultan of poets," since he was the first who impressed upon every form of epic, lyric and didactic poetry its peculiar stamp and its individual character. He is also said to have been the founder of the "dīwān"—that is, the typical form of the complete collection of a poet's lyrical compositions in a more or less alphabetical order which prevails to the present day among all Mahommedan writers. Of the 1,300,000 verses attributed to him, there remain only 52 kasīdas, ghazals and rubā'īs; of his epic masterpieces we have nothing beyond a few stray lines in native dictionaries. But the most serious loss is that of his translation of Ibn Mokaffa's Arabic version of the old Indian fable book *Kalilah and Dimnah*, which he put into Persian verse at the request of his royal patron. Numerous fragments, however, are preserved in the Persian lexicon of Asadī of Tus (ed. P. Horn, Göttingen, 1897). In his kasīdas, all devoted to the praise of his sovereign and friend, Rūdagī has left us unequalled models of a refined and delicate taste, very different from the often bombastic compositions of later Persian encomiasts. His didactic odes and epigrams express in well-measured lines a sort of Epicurean philosophy of human life and human happiness; more charming still are the purely lyrical pieces in glorification of love and wine. Rūdagī survived his royal friend, and died poor and forgotten by the world.

There is a complete edition of all the extant poems of Rūdagī, in Persian text and metrical German translation, together with a biographical account, based on forty-six Persian MSS., in Dr H. Ethé's "Rūdagī der Sāmānidendichter" (*Göttinger Nachrichten*, 1873, pp. 663–742); see also his "Neupersische Literatur" in Geiger's *Grundriss der iranischen Philologie* (ii.); P. Horn, *Gesch. der persischen Literatur* (1901), p. 73; E. G. Browne, *Literary History of Persia*, i. (1902); C. J. Pickering, "A Persian Chaucer" in *National Review* (May 1890).

RUDD, or RED-EYE (*Leuciscus erythrophthalmus*), a fish of the Cyprinid family, spread over Europe, N. and S. of the Alps, also found in Asia Minor, and common in localities where there are still waters with muddy bottom. The rudd and the roach are very similar and frequently confused by anglers; the former differs principally in the more posterior dorsal fin, which is situated exactly opposite the space between the ventral and anal fins. It is a fine fish, but little esteemed for food, and rarely exceeds 12 in. in length and 2 lb in weight. It feeds on small freshwater animals and soft vegetable matter, and spawns in April or May. It readily crosses with the white bream, and more rarely with the roach and bleak.

RUDDER (O.E. *Rother*, *i.e.* rower), that part of the steering apparatus of a ship which is fastened to the stern outside, and on which the water acts directly. The word may be found to be used as if it were synonymous with "helm." But the helm (A.S. *Hillf*, a handle) is the handle by which the rudder is worked. The tiller, which is perhaps derived from a provincial English name for the handle of a spade, has the same meaning as the helm. In the earliest times a single oar, at the stern, was used to row the vessel round. In later times oars with large blades were fixed on the sides near the stern. In Greek and Roman vessels two sets were sometimes employed, so that if the pitching of the ship lifted the after pair out of the water, the foremost pair could still act. As these ancient ships were, at least in some cases, sharp at both ends and could sail either way, steer (or steering) oars were fixed both fore and aft. The steer oar in this form passed through a ring on the side and was supported on a crutch, and was turned by a helm, or tiller. Norse and medieval vessels had, as far as we can judge, one steer oar only placed on the right side near the stern—hence the name "starboard," *i.e.* steerside, for the right side of the ship looking forward. In the case of small vessels the steer oar possesses an advantage over the rudder, for it can bring the stern round quickly. Therefore it is still used in whaling boats and rowing boats which have to work against wind and tide, and in surf when the rudder will not act. It is not possible to assign any date for the displacement of the side rudder by the stern rudder. They were certainly used together, and the second displaced the first in the course of the 14th century when experience had shown that the rudder was more effective at the stern than at the side. The rudder of a wooden ship when fully developed was composed of four pieces. The first or main piece was hung on to the stern post of the ship. Its upper portion was known as the rudder head, and was at first an oval shaft which passed into the ship through the rudder port, and to which the helm was fixed. A canvas bag called a rudder coat covered the opening to exclude the water. In later days Sir R. Seppings introduced the cylindrical form in order to prevent the water from coming into the round rudder port. Three back pieces were fastened to the main piece longitudinally. The whole were fastened together by iron bands called pintle straps, which had at the forward end a pin or pintle, which fitted into braces, *i.e.* fixed rings on the stern post, so that the rudder hung on hinges. The lower part of the main piece was bevelled, and so was the stern post, so as to allow the rudder to swing freely. A projecting piece called a chock or wood-lock was fixed in the head outside the ship in order to prevent the rudder from being lifted by the water out of its hinges. A small vessel can be steered by the helm or tiller, but in a larger it is necessary to apply a mechanical leverage. This was secured by carrying ropes, or in later times chains, to the sides of the ship, and then through blocks to the upper deck, round a barrel which is worked by the wheel. The principle of the rudder cannot alter, but the means employed to work it have been altered by the introduction of the screw, and by the increased size of ships. A single screw is placed in an open space before the stern post. As the opening thus created prevents the water from flowing directly on to the rudder, a screw steamer is sometimes difficult to steer. In order to make the rudder more manageable, it has been balanced, *i.e.* pivoted, on a shaft placed at about a third of its length from the foremost edge. In a double screw there is no opening, but the balanced rudder is still used, and the ship can be turned by reversing one of the screws. The need for more power to work the helm has led to the introduction of steam, and hydraulic steering apparatus which can be set in motion by a small wheel.

See Burney's *Falconer's Dictionary* (London, 1830), Torr's *Ancient Ships* (Cambridge, 1894); Nares, *Seamanship* (Portsmouth, 1882).

RUDDIMAN, THOMAS (1674–1757), Scottish classical scholar, was born in October 1674, at Raggal, Banffshire, where his father was a farmer. He was educated at Aberdeen University, and through the influence of Dr Archibald Pitcairne he was made assistant in the Advocates' Library, Edinburgh. His chief writings at this period were editions of Florence Wilson's *De Animi Tranquillitate Dialogus* (1707), and the *Cantici Solomonis Paraphrasis Poetica* (1709) of Arthur Johnston (1587–1641), editor of the *Deliciae Poetarum Scotorum.* On the death of Dr Pitcairne he edited his friend's Latin verses, and arranged for the sale of his valuable library to Peter the Great of Russia. In 1714 he published *Rudiments of the Latin Tongue*, which was long used in Scottish schools. In 1715 he edited, with notes and annotations, the works of George Buchanan in two volumes folio. As Ruddiman was a Jacobite, the liberal views of Buchanan seemed to him to call for frequent censure. A society of scholars was formed in Edinburgh to "vindicate that incomparably learned and pious author from the calumnies of Mr Thomas Ruddiman"; but Ruddiman's remains the standard edition, though George Logan, John Love, John Man and others attacked him with great vehemence. He founded (1715) a successful printing business, and in 1728 was appointed printer to the university. He acquired the *Caledonian Mercury* in 1729, and in 1730 was appointed keeper of the Advocates' Library, resigning in 1752. He died in Edinburgh, on the 19th of January 1757.

Besides the works mentioned, the following writings of Ruddiman deserve notice: An edition of Gavin Douglas's *Aeneid* of Virgil (1710); the editing and completion of Anderson's *Selectus Diplomatum et Numismatum Scotiae Thesaurus* (1739); *Catalogue of the Advocates' Library* (1733–42); and a famous edition of Livy (1751). He also helped Joseph Ames with the *Typographical Antiquities.* Ruddiman was for many years the representative scholar of Scotland. Writing in 1766, Dr Johnson, after reproving Boswell for some bad Latin, significantly adds—"Ruddiman is dead." When Boswell proposed to write Ruddiman's life, "I should take pleasure in helping you to do honour to him," said Johnson.

See Chalmers's *Life of Ruddiman* (1794); *Scots Magazine*, January 7, 1757.

RUDE, FRANÇOIS (1784–1855), French sculptor, was born at Dijon on the 4th of June 1784. Till the age of sixteen he worked at his father's trade as a stovemaker, but in 1809 he went up to Paris from the Dijon school of art, and became a pupil of Castellier, obtaining the Grand Prix in 1812. After the second restoration of the Bourbons he retired to Brussels, where he got some work under the architect Van der Straeten, who employed him to execute nine bas-reliefs in the palace of Tervueren. At Brussels Rude married Sophie Fremiet, the daughter of a Bonapartist compatriot to whom he had many obligations, but gladly availed himself of an opportunity to return to Paris, where in 1827 a statue of the Virgin for St Gervais and a "Mercury fastening his Sandals" (now in the Louvre) obtained much attention. His great success dates, however, from 1833, when he received the cross of the Legion of Honour for his statue of a "Neapolitan Fisher Boy playing with a Tortoise," which also procured for him the important commission for all the ornament and one group in the Arc de l'Étoile. This group, the "Départ des volontaires de 1792," a work full of energy and fire, immortalizes the name of Rude. Amongst other productions we may mention the statue of the mathematician Gaspard Monge (1848), Jeanne d'Arc, in the gardens of the Luxembourg (1852), a Calvary in bronze for the high altar of St Vincent de Paul (1855), as well as "Hebe and the Eagle of Jupiter," "Love Triumphant" and "Christ on the Cross," all of which appeared at the Salon of 1857 after his death. He died suddenly on the 3rd of November 1855.

See also P. G. Hamerton, *Modern Frenchmen, five biographies* (1878); Carl Adolf Rosenberg, *François Rude* (1884); Louis Gonse, *Les Chefs d'œuvre des musées de France* (Paris, 1900); L. de Fourcaud, *François Rude, sculpteur* (Paris, 1904).

RUDERAL (Lat. *rudus*, rubbish), a botanical term for plants growing on rubbish heaps or in waste places.

RÜDESHEIM, a town of Germany in the Prussian Rhine province on the right bank of the Rhine, 19 m. S.W. of

Wiesbaden by the main line from Frankfort-on-Main to Cologne. Pop. (1905) 4773. Its situation, at the lower end of the famous vineyard district of the Rheingau, opposite Bingen and just above the romantic gorge of the Rhine, renders it a popular tourist centre. Behind the town rises the majestic Niederwald (985 ft.), on the crest of which stands the national monument, "Germania," commemorating the war of 1870–71. Rüdesheim has some interesting towers. The Brömserburg, or Niederburg, a massive structure built in the 13th century, formerly belonging to the archbishops of Mainz; the Boosenburg, or Oberburg, which was rebuilt in 1868, with the exception of the keep; the Adlerturm, a relic of the fortifications of the town; and the Vorderburg, the remains of an old castle. The Gothic church of St James has some interesting paintings and monuments, and there is also a Protestant church. The town has electrical works, but its industries are mainly concerned with the preparation of wine, the best kinds being Rudesheimer **Berg**, Hinterhaus and Rottland.

See J. P. Schmelzeis, *Rüdesheim im Rheingau* (Rüdesheim, 1881); and Heiderlinden, *Rüdesheim und seine Umgebung* (Rüdesheim, 1888).

RUDINÌ, ANTONIO STARABBA, MARQUIS DI (1839–1908), Italian statesman, was born at Palermo on the 6th of April 1839. In 1859 he joined the revolutionary committee which paved the way for Garibaldi's triumphs in the following year; then after spending a short time at Turin as attaché to the Italian foreign office he was elected mayor of Palermo. In 1866 he displayed considerable personal courage and energy in quelling an insurrection of separatist and reactionary tendencies. The prestige thus acquired led to his appointment as prefect of Palermo, and while occupying that position he put down brigandage throughout the province; in 1868 he was prefect of Naples. In October 1869 he became minister of the interior in the Menabrea cabinet, but he fell with that cabinet a few months later, and although elected member of parliament for Canicatti held no important position until, upon the death of Minghetti in 1886, he became leader of the Right. Early in 1891 he succeeded Crispi as premier and minister of foreign affairs by forming a coalition cabinet with a part of the Left under Nicotera; his administration proved vacillating, but it initiated the economies by which Italian finances were put on a sound basis and also renewed the Triple Alliance. He was overthrown in May 1892 by a vote of the Chamber and succeeded by Giolitti. Upon the return of his rival, Crispi, to power in December 1893, he resumed political activity, allying himself with the Radical leader, Cavallotti. The crisis consequent upon the disaster of Adowa (1st March 1896) enabled Rudinì to return to power as premier and minister of the interior in a cabinet formed by the veteran Conservative, General Ricotti. He concluded peace with Abyssinia, but endangered relations with Great Britain by the unauthorized publication of confidential diplomatic correspondence in a Green-book on Abyssinian affairs. To satisfy the anti-colonial party he ceded Kassala to Great Britain, provoking thereby much indignation in Italy. His internal policy was marked by continual yielding to Radical pressure and by persecution of Crispi. By dissolving the Chamber early in 1897 and favouring Radical candidates in the general election, he paved the way for the outbreak of May 1898, the suppression of which entailed considerable bloodshed and necessitated a state of siege at Milan, Naples, Florence and Leghorn. Indignation at the results of his policy led to his overthrow in June 1898. During his second term of office he thrice modified his cabinet (July 1896, December 1897, and May 1898) without strengthening his political position. In many respects Rudinì, though leader of the Right and nominally a Conservative politician, proved a dissolving element in the Italian Conservative ranks. By his alliance with the Liberals under Nicotera in 1891, and by his understanding with the Radicals under Cavallotti in 1894–98; by abandoning his Conservative colleague, General Ricotti, to whom he owed the premiership in 1896; and by his vacillating action after his fall from power, he divided and demoralized a constitutional party which, with greater sincerity and less reliance upon political cleverness, he might have welded into a solid parliamentary organization. At the same time he was a thorough gentleman and *grand seigneur*. One of the largest and wealthiest landowners in Sicily, he managed his estates on liberal lines, and was never troubled by agrarian disturbances. The marquis, who had not been in office since 1898, died on the 6th of August 1908, leaving a son, Carlo, who married a daughter of Mr Henry Labouchere.

RUDOK, a small town on the Ladakh frontier of Tibet, through which all the trade of Tibet passes to Leh, and at which is maintained the Chinese outpost that for many years persistently interfered with European exploration. Rudok is picturesquely situated on the side of a hill standing isolated in the plain near the E. end of Lake Pangong, across which the official boundary between Tibet and Kashmir runs. The houses are built in tiers, whitewashed and walled in. At the top of the hill are a large palace and several monasteries painted red. About a mile away from the foot of the hill is another monastery. Rudok is about 13,300 ft. above sea-level, and the greatest altitude on the route connecting it with Lhasa at the pass of Mariom la (the water-parting between the Brahmaputra and the Sutlej) is 15,500 ft. The winter climate of Rudok and of all the towns of the Tsangpo basin, owing to the intense dryness of the air and the light fall of snow, seems to be bracing and exhilarating rather than severe. The thermometer never approaches the minimum record of Puetra (in the same latitude and at half the absolute elevation), according to the observations of native surveyors.

RUDOLF (otherwise known as BASSO NOROK and GALLOP), a large lake of E. equatorial Africa, forming the centre of an inland drainage system, occupying the S. of the Abyssinian highlands and a portion of the great equatorial plateau. The lake itself lies towards the N. of the great East African rift valley, between the parallels of 2° 26′ and 5° N., while the meridian of 36° E. is slightly W. of the centre of the northern wider part, the narrower southern portion bending to 36½° E. The length along the curved axis is 185 m., the maximum width 37, and the area roughly 3500 sq. m. Its altitude is 1250 ft. Towards the S. it seems to be deep, but it is comparatively shallow in the N. Its water is brackish, but drinkable. The country bordering the lake on almost every side is sterile and forbidding. The S. end, for some 50 m. on the W. and for a longer distance on the E., is shut in by high cliffs —the escarpments of a rugged lava-strewn country, which shows abundant signs of volcanic activity, great changes having been reported since 1889. In particular, the great volcano of Lubburua (Teleki's volcano) at the S. end of the lake is said to have been destroyed between 1889 and 1897 by a sudden explosion. The highest point of the S.E. side of the lake is Mount Kulal, 7812 ft., while the culminating height within the basin of the lake is Mount Sil, 9280 ft., which lies about 20 m. S. of Lubburua. Further N., on the W. side, sandy plains alternate with lines of low hills, the immediate shores (on which the water appears to have encroached in very modern times) being marked by spits of sand, which in places cut off lagoons from the main body of the lake. These are the haunt of great numbers of water-birds. In 3° 8′ N. the dry bed of the Turkwell—in its upper course a large river descending the slopes of Mount Elgon—approaches the lake. Near the N. end mountains again approach the shores, the most prominent being Mount Lubbur (5200 ft.), an extinct volcano with a well-preserved crater. At the extreme N.W. corner a bay some 35 m. long (Sanderson Gulf) is almost separated from the rest of the lake by two long points of land. On the E. side, open arid plains, with few trees, occupy most of the N. country. One hill, in 3° 20′ N., has a height of 3470 ft., and at the N.E. end, separating the lake from Lake Stefanie, is a hilly country, the highest point between the lakes being 3524 ft. Immediately N. of these hills rises the Hummurr Range, with one peak exceeding 7000 ft. Near the S. end is the volcanic island of Elmolo, 10 m. long, and there are a few small islets. Just N. of 4° N. is a small volcanic island with highest point 2100 ft. At the N. end of the lake a level swampy plain is traversed by various arms of the lake and by the Nianam river. This river has been shown to be identical with the Omo, the course of which was long one of the most debated questions of African geography. Its northernmost feeders rise on the high plateau S. of the Blue Nile, in 9° 10′ N., and being swollen by other streams from the E. and W., soon form a large river. During its lower course it makes two considerable bends to the W. before finally entering the lake as a deep stream a quarter of a mile wide. Lake Rudolf (previously known on the east coast by report) was discovered in 1888 by Count Samuel Teleki and Lieutenant Ludwig von Höhnel. It was subsequently visited by Dr Donaldson Smith, Vittorio Bottego, H. S. H. Cavendish, H. H. Austin, and others, and by 1905 its shores and the neighbouring country had become fairly well known. In 1907, by an agreement between the powers concerned, the N.E. end of the lake, into which the Omo debouches, was assigned to Abyssinia, the rest of the lake to Great Britain.

AUTHORITIES.—*Geographical Journal* (September 1896, April 1898, August 1899, May 1904; the last-named issue contains a map by Captain P. Maud, R.E.); Ludwig von Höhnel, *Discovery of Lakes Rudolf and Stefanie* (London, 1894); A. Donaldson Smith, *Through Unknown African Countries* (London, 1897); A. H. Neumann, *Elephant-Hunting in East Equatorial Africa* (London, 1898); L. Vannutelli and C. Citerni, *L'Omo* (Milan, 1899); M. S. Wellby, *'Twixt Sirdar and Menelik* (London, 1901); H. H. Austin, *Among Swamps and Giants in Equatorial Africa* (1902); C. H. Stigand, *To Abyssinia through an Unknown Land* (1910).

(E. HE.)

RUDOLPH I. (1218–1291), German king, son of Albert IV. count of Habsburg, and Hedwig, daughter of Ulrich count of Kyburg, was born at Limburg on the 1st of May 1218. At his father's death in 1239 Rudolph inherited the family estates in Alsace, and in 1245 he married Gertrude, daughter of Burkhard III. count of Hohenberg. He paid frequent visits to the court of his godfather the emperor Frederick II., and his loyalty to Frederick and to his son Conrad IV. was richly rewarded by grants of land, but in 1254 was excommunicated by Pope Innocent IV. The disorder in Germany after the fall of the Hohenstaufen afforded an opportunity for Rudolph to increase his possessions. His wife was an heiress; and on the death of his childless uncle, Hartmann VI. count of Kyburg, in 1264, he seized his valuable estates. Successful feuds with the bishops of Strassburg and Basel further augmented his wealth and his reputation; rights over various tracts of land were purchased from abbots and others; and he was also the possessor of large estates in the regions now known as Switzerland and Alsace.

These various sources of wealth and influence had rendered Rudolph the most powerful prince in S.W. Germany when, in the autumn of 1273, the princes met to elect a king. His election at Frankfort on the 29th of September 1273 was largely due to the efforts of his brother-in-law, Frederick III. of Hohenzollern, burgrave of Nuremberg. The support of Albert duke of Saxe-Lauenburg, and of Louis II. count palatine of the Rhine and duke of upper Bavaria, had been purchased by betrothing them to two of Rudolph's daughters; so that Ottakar II. king of Bohemia, a candidate for the throne, was almost alone in his opposition. Rudolph was crowned at Aix-la-Chapelle on the 24th of October 1273, and the feast which followed has been described by Schiller in *Der Graf von Hapsburg*. To win the approbation of the pope Rudolph renounced all imperial rights in Rome, the papal territory and Sicily, and promised to lead a new crusade; and Pope Gregory X., in spite of Ottakar's protests, not only recognized Rudolph himself, but persuaded Alphonso X. king of Castile, who had been chosen German king in 1257, to do the same. In November 1274 it was decided by the diet at Nuremberg that all crown estates seized since the death of the emperor Frederick II. must be restored, and that Ottakar of Bohemia must answer to the diet for not recognizing the new king. Ottakar refused to appear or to restore the provinces of Austria, Styria, Carinthia and Carniola which he had seized. He was placed under the ban; and in June 1276 war was declared against him. Having detached Henry I. duke of lower Bavaria from his side, Rudolph compelled the Bohemian king to cede the four provinces in November 1276. Ottakar was then invested with Bohemia by Rudolph, and his son Wenceslaus was betrothed to a daughter of the German king, who made a triumphal entry into Vienna. Ottakar, however, raised questions about the execution of the treaty, made an alliance with some Polish chiefs and procured the support of several German princes, including his former ally, Henry of lower Bavaria. To meet this combination Rudolph entered into alliance with Ladislaus IV. king of Hungary, and gave additional privileges to the citizens of Vienna. On the 26th of August 1278 the rival armies met on the banks of the river March near Dürnkrut, and Ottakar was defeated and killed. Moravia was subdued and its government entrusted to Rudolph's representatives, while Wenceslaus was again betrothed to one of his daughters.

Rudolph's attention was next turned to his new possessions in Austria and the adjacent countries. He spent several years in establishing his authority there, but found some difficulty in making these provinces hereditary in his family. At length the hostility of the princes was overcome, and in December 1282 Rudolph invested his sons Albert and Rudolph with the duchies of Austria and Styria at Augsburg, and so laid the foundations of the greatness of the house of Habsburg.

Turning to the west he compelled Philip I. count of upper Burgundy to cede some districts to him in 1281, forced the citizens of Berne to pay the tribute which they had previously refused, and in 1289 marched against Philip's successor, Otto IV., and compelled him to do homage. In 1281 his first wife died, and on the 5th of February 1284 he married Isabella, daughter of Hugh IV. duke of Burgundy. Rudolph was not very successful in restoring internal peace to Germany. Orders were indeed issued for the establishment of landpeaces in Bavaria, Franconia and Swabia, and afterwards for the whole of Germany; but the king lacked the power, or the determination, to enforce them, although in December 1289 he led an expedition into Thuringia where he destroyed a number of robber-castles. In 1291 he attempted to secure the election of his son Albert as German king; but the princes refused on the pretext of their inability to support two kings, but perhaps because they feared the increasing power of the Habsburgs. Rudolph died at Spires on the 15th of July 1291 and was buried in the cathedral of that city. He had a large family, but only one of his sons, Albert, afterwards the German king Albert I., survived him. Rudolph was a tall man with pale face and prominent nose. He possessed many excellent qualities, bravery, piety and generosity; but his reign is memorable rather in the history of the house of Habsburg than in that of the kingdom of Germany.

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The best modern authorities are K. Hagen, *Deutsche Geschichte von Rudolf von Habsburg bis auf die neueste Zeit* (Frankfort, 1854–57); O. Lorenz, *Geschichte Rudolfs von Habsburg und Adolfs von Nassau* (Vienna, 1863–67); Th. Lindner, *Deutsche Geschichte unter den Habsburgern und Luxemburgern* (Stuttgart, 1888–93); A. Huber, *Rudolf von Habsburg vor seiner Thronbesteigung* (Vienna, 1873); J. Hirn, *Rudolf von Habsburg* (Vienna, 1874); H. von Zeissberg, *Ueber das Rechtsverfahren Rudolf von Habsburg gegen Ottokar von Böhmen* (Vienna, 1882); H. Otto, *Die Beziehungen Rudolfs von Habsburg zu Papst Gregor X.* (Erlangen, 1893); A. Busson, *Der Krieg von 1278 und die Schlacht bei Dürnkrut* (Vienna, 1880); and O. Redlich, *Rudolf von Habsburg* (Innsbruck, 1903).

RUDOLPH II. (1552–1612), Roman emperor, son of the emperor Maximilian II. by his wife Maria, daughter of the emperor Charles V., was born in Vienna on the 18th of July 1552. In 1563 he was sent to Spain, where his natural abilities were improved by a good education, but he lacked the frank and tolerant spirit of his father, resembling rather his uncle Philip II. of Spain. In 1572 he was crowned king of Hungary, three years later king of Bohemia; and in October 1575 he was chosen king of the Romans, or German king, at Regensburg, becoming emperor on his father's death in October 1576. The importance of Rudolph's reign is negative rather than positive, consisting more in what he did not do than in what he did; although it is questionable whether any ruler could have prevented the religious struggles of Germany and the Thirty Years' War.

The more active part of the emperor's life was the period from his accession to about 1597. During that time he attended the infrequent imperial diets, and took an interest in the struggle in the Netherlands and the defence of the empire against the Turks. He was at times suspicious of the papal policy, while his relations with Spain were somewhat inharmonious. As a convinced Roman Catholic he forwarded the progress of the counter-reformation, and in general the tolerant policy of Maximilian II. was reversed. Political as well as religious privileges were attacked; the administration was conducted by Germans; and the result was a considerable amount of discontent which became very pronounced about the opening of the 17th century. Concurrently with the growth of this unrest Rudolph had become increasingly subject to attacks of depression and eccentricity, which were so serious as to amount almost to insanity. In 1604, after a war with Turkey had been in progress since 1593, many of the Hungarians rebelled against Rudolph and chose Stephen Bocskay as their prince. By this time the members of the Habsburg family were thoroughly alarmed at the indifference or incompetence of the emperor; and their anxieties were not diminished by the knowledge that he was in feeble health, was unmarried, and had refused to take any steps towards securing the election of a successor. In April 1606 they declared Rudolph incapable of ruling, and recognized one of his younger brothers, the archduke Matthias, afterwards emperor, as their head; and in the following June Matthias, having already with the emperor's reluctant consent taken the conduct of affairs into his own hands, made peace by granting extensive concessions to the rebellious Hungarians, and concluded a treaty with the sultan in November of the same year. Then shaking off his lethargy Rudolph prepared to renew the war with the Turks; a move which Matthias met by throwing himself upon the support of the national party in Hungary. Matthias also found adherents in other parts of his brother's dominions, with the result that in June 1608 the emperor was compelled to cede to him the kingdom of Hungary together with the government of Austria and Moravia. Rudolph now sought the aid of the princes of the empire, and even of the Protestants; but he had met with no success in this direction when trouble arose in Bohemia. Having at first rejected the demand of the Bohemians for greater religious liberty, the emperor was soon obliged to yield to superior force, and in 1609 he acceded to the popular wishes by issuing the Letter of Majesty (*Majestätsbrief*), and then made similar concessions to his subjects in Silesia and elsewhere. A short reconciliation with Matthias was followed by further disorder in Bohemia, which was invaded by Rudolph's cousin, the archduke Leopold (1586–1632). The Bohemians invoked the aid of Matthias, who gathered an army; and in 1611 the emperor, practically a prisoner at Prague, was again forced to cede a kingdom to his brother. Rudolph died at Prague, his usual place of residence, on the 20th of January 1612, and was succeeded as emperor by Matthias.

Rudolph was a clever and cultured man, greatly interested in chemistry, alchemy, astronomy and astrology; he was a patron of Tycho Brahe and Kepler, and was himself something of a scholar and an artist. He was the greatest collector of his age, his agents ransacking Europe to fill his museums with rare works of art. His education at the Spanish court and an hereditary tendency to insanity, however, made him haughty, suspicious and consequently very unpopular, while even in his best days the temper of his mind was that of a recluse rather than of a ruler.

The sources for the life and times of Rudolph II. are somewhat scanty, as many of the official documents of the reign, which were kept at Prague and not at Vienna, were destroyed, probably during the Thirty Years' War. The best authorities, however, are: *Rudolphi II. epistolae ineditae*, edited by B. Comte de Pace (Vienna, 1771); M. Ritter, *Quellenbeiträge zur Geschichte des Kaisers Rudolf II* (Munich, 1872); and *Deutsche Geschichte im Zeitalter der Gegenreformation und des dreissigjährigen Krieges* (Stuttgart, 1887 fol.); L. von Ranke, *Zur deutschen Geschichte: Vom Religionsfrieden bis zum 30-jährigen Kriege* (Leipzig, 1868); A. Gindely, *Rudolf II. und seine Zeit* (Prague, 1862–68); F. Stieve, *Die Verhandlungen über die Nachfolge Kaiser Rudolfs II.* (Munich, 1880); in the *Allgemeine Deutsche Biographie*, Band xxix. (Leipzig, 1889); and *Der Ursprung des dreissigjährigen Krieges* (Munich, 1875); F. von Bezold, *Kaiser Rudolf II. und die heilige Liga* (Munich, 1886); J. Janssen, *Geschichte des Deutschen Volks seit dem Ausgang des Mittelalters* (Freiburg, 1878 fol.), of which there is an English translation by M. A. Mitchell and A. M. Christie (London, 1896 fol.); and H. Moritz, *Die Wahl Rudolfs II.* (Marburg, 1895).

RUDOLPH, or Raoul (d. 936), king of the Franks and duke of Burgundy, was a son of Richard duke of Burgundy, and was probably a member of the Carolingian family. He became duke of Burgundy on his father's death in 921, and having married Emma, daughter of Robert duke of the Franks, assisted his father-in-law to drive the Frankish king, Charles III. (the Simple), from his throne. Robert then became king of the Franks, and when he was killed in battle in June 923 he was succeeded by Rudolph, who was crowned at Soissons in the following month. Giving Burgundy to his brother-in-law Giselbert of Vergi (d. 956), the new king was fully occupied in resisting the attacks of the Normans, and in combating the partisans of Charles the Simple; but his enterprises were mainly unsuccessful, and his authority was not generally recognized. But when engaged in a struggle with his brother-in-law, Herbert II. count of Vermandois, over the possession of the county of Laon, Rudolph experienced happier fortunes. At Limoges a great victory was gained over the Normans, whose duke, William I., did homage to him in 933; invasions of Aquitaine led to his recognition as king by the powerful lords of that district; and Herbert of Vermandois was defeated and put to flight. In 935 peace was made between these rivals; and on the 14th of January 936 Rudolph died at Auxerre, leaving no sons.

See W. Lippert, *König Rudolf von Frankreich* (Leipzig, 1886).

RUDOLPH (d. 1080), German king, and duke of Swabia, opponent of the emperor Henry IV., was a son of Kuno count of Rheinfelden, who possessed estates in both Burgundy and Swabia. He received the duchy of Swabia from Agnes, regent and mother of the young king, Henry IV., in 1057, and two years later married the king's sister Matilda (1045–1060), and was made administrator of the kingdom of Burgundy, or Arles. Differences soon arose between the king and his brother-in-law, whose loyalty was suspected during the Saxon War of 1073. When Henry was excommunicated and deposed by pope Gregory VII., the princes met at Forchheim, and elected Rudolph as German king. He renounced the right of investiture, disclaimed any intention of making the crown hereditary in his family, and was crowned at Mainz on the 27th of March 1077. He found no support in Swabia, but, uniting with the Saxons, won two victories over Henry's troops, and, in 1080, was recognized by the pope. On the 15th of October 1080, Rudolph was severely wounded at Hohenmölsen, and died the next day. He was buried at Merseburg, where his beautiful bronze tomb is still to be seen.

See O. Grund, *Die Wahl Rudolfs von Rheinfelden zum Gegenkönig* (Leipzig, 1880).

RUDOLPH, or Raoul, known as Rudolph Glaber (Rudolph the Bald) (d. *c.* 1050), French chronicler, was born in

Burgundy about 985, and was in turn an inmate of the monasteries of St Leger at Champeaux and St Bénigne at Dijon, afterwards entering the famous abbey of Cluny, and becoming a monk at St Germain at Auxerre before 1039. He also appears to have visited Italy. His *Historiarum sui temporis libri V.*, dedicated to St Odilon, abbot of Cluny, purports to be a universal history from 900 to 1044; but is an irregular narration of events in France and Burgundy. Rudolph was a strong believer in the approaching end of the world.

The *Historiarum* was first printed in 1596, and published by A. Duchesne in the *Historiae Francorum Scriptores*, tome iv. (Paris, 1639–49). Extracts are printed in the *Monumenta Germaniae historica*, Band vii.; but perhaps the best edition of the work is the one edited by M. Prou in the *Collection de textes pour servir à l'étude et l'enseignement de l'histoire* (Paris, 1886). Rudolph also wrote a *Vita S. Gulielmi, abbatis S. Benigni*, published by J. Mabillon in the *Acta Sanctorum*, tome vi. (Paris, 1668).

See A. Molinier, *Les Sources de l'histoire de France*, tome ii. (Paris, 1902); and A. Potthast, *Bibliotheca historica* (Berlin, 1896).

RUDOLSTADT, a town of Germany, capital of the principality of Schwarzburg-Rudolstadt, and the chief residence of the prince, lies on the left bank of the Saale, 18 m. S.W. of Jena, by the railway Grossheringen-Saalfeld, in one of the most beautiful districts of Thuringia. Pop. (1905) 12,494. The picturesque town is a favourite tourist resort. Besides containing the government buildings of the little principality, Rudolstadt is well provided with schools and other institutions, including a library of 65,000 volumes. The residence of the prince is the Heidecksburg, a palace on an eminence 200 ft. above the Saale, which was rebuilt after a fire in 1735, and contains a picture gallery, a magnificent banqueting hall and a library. The Ludwigsburg, another palace in the town, built in 1742, accommodates the natural history collections belonging to the prince. The principal church dates from the end of the 15th century and contains tombs and effigies of many former princes. In the Anger, a public park between the town and the river, is the theatre. The Rudolsbad—a handsome hydropathic establishment with a richly decorated interior—lying amidst extensive grounds, is also noticeable. Various memorials in and near the town commemorate the visits of Schiller to the neighbourhood in 1787 and 1788. The industries of the place include the manufacture of porcelain, chocolate and dyestuffs, wool-spinning and bell-founding.

The name of Rudolstadt occurs in an inventory of the possessions of the abbey of Hersfeld in the year 800. After passing into the possession of the German kings and then of the rulers of Orlamünde and of Weimar, it came into the hands of the counts of Schwarzburg in 1335. Its civic rights were confirmed in 1404, and since 1599 it has been the residence of the ruling house of Schwarzburg-Rudolstadt.

See Renovanz, *Chronik von Rudolstadt* (Rudolstadt, 1860); Anemüller, *Geschichtsbilder aus der Vergangenheit Rudolstadts* (Rudolstadt, 1888); and Woerl, *Rudolstadt* (2nd ed., Leipzig, 1890).

RUDRA (probably from the root *rud*, "to howl," hence "the howler"), in Hindu Vedic mythology, a storm god, and father of the Maruts who are frequently called Rudriyas. He shoots tempests at the earth, but is not essentially a malevolent deity, being invoked as a protector of cattle. In the Atharvaveda he is lord of life and death, and in later Hinduism one of the Hindu trinity, the god Siva.

See A. A. Macdonell, *Vedic Mythology* (Strassburg, 1897); Sir William Muir, *Original Sanskrit Texts*, iv. 299–420.

RUE (Fr. *rue*, Lat. *ruta*, from Gr. ῥυτή, the Peloponnesian word for the plant known as πήγανον), the name of a woody or bushy herb, belonging to the genus *Ruta*, especially *Ruta graveolens*, the "common rue," a plant with bluish green spotted leaves and greenish yellow flowers. It has a strong pungent smell and the leaves have a bitter taste. The plant was much used in medieval and later medicine as a stimulative and irritant drug. It was commonly supposed to be much used by witches. From its association with "rue," sorrow, repentance (O. Eng. *hrêow*, from *hrêowan*, to be sorry for, cf. Ger. *reuen*), the plant was also known as "herb of grace," and was taken as the symbol of repentance.

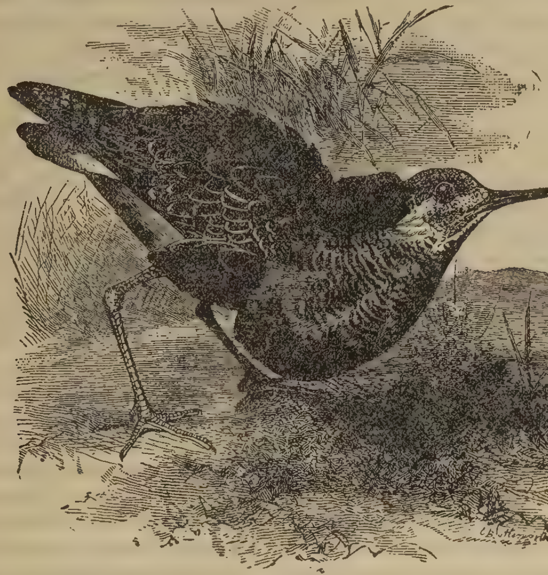
RUEDA, LOPE DE (1510?–1565?), Spanish dramatist, was born early in the 16th century at Seville, where, according to Cervantes, he worked as a metal-beater. His name first occurs in 1554 as acting at Benavente, and between 1558 and 1561 he was manager of a strolling company which visited Segovia, Seville, Toledo, Madrid, Valencia and Córdova. In the last-named city Rueda fell ill, and on the 21st of March 1565 made a will which he was too exhausted to sign; he probably died shortly afterwards, and is said by Cervantes to have been buried in Córdova cathedral. He was twice married; first to a disreputable actress named Mariana, who became the mistress of the duke de Medinaceli; and second to Rafaela Angela, who bore him a daughter. His works were issued posthumously in 1567 by Timoneda, who toned down certain passages in the texts. Rueda's more ambitious plays are mostly adapted from the Italian; in *Eufemia* he draws on Boccaccio, in *Medora* he utilizes Giancarli's *Zingara*, in *Armelina* he combines Raineri's *Attilia* with Cecchi's *Servigiale*, and in *Los Engañados* he uses *Gl'Ingannati*, a comedy produced by the *Intronati*, a literary society at Siena. These follow the original so closely that they give no idea of Rueda's talent; but in his *pasos* or prose interludes he displays an abundance of riotous humour, great knowledge of low life, and a most happy gift of dialogue. His predecessors mostly wrote for courtly audiences or for the study; Rueda with his strollers created a taste for the drama which he was able to gratify, and he is admitted both by Cervantes and Lope de Vega to be the true founder of the national theatre.

His works have been reprinted by the marquis de la Fuensanta del Valle in the *Colección de libros raros ó curiosos*, vols. xxiii. and xxiv.

RUEIL, a town of N. France, in the department of Seine-et-Oise, at the W. foot of Mt Valérien, 6 m. W. of Paris by tramway. Pop. (1906) 10,439. Rueil has a church rebuilt under Napoleon III. in exact imitation of a previous church in the Renaissance style, and containing the tombs of the Empress Josephine and her daughter Hortense de Beauharnais. In the 17th century Richelieu built a château which no longer exists. Rueil has important photographic works and manufactures of lime and cement, &c. Close to the town is the château of Malmaison, a building of the 18th century famous as the residence of the empress Josephine. It was afterwards occupied by Maria Christina, queen of Spain, and by the empress Eugénie. In 1900 the owner, Daniel Osiris, presented it and the park to the nation; the apartments have been as far as possible restored to the condition in which they were when inhabited by Josephine and Napoleon.

RUFF, a bird so called from the very beautiful and remarkable frill of elongated feathers that, just before the breeding-season, grow thickly round the neck of the male, who is considerably larger than the female, known as the reeve. In many respects this species, the *Tringa pugnax* of Linnaeus and the *Machetes pugnax* of modern ornithologists, is one of the most singular in existence. The best account is that given in 1813 by G. Montagu (*Suppl. Orn. Dictionary*), who seems to have been struck by the peculiarities of the species, and, to investigate them, visited the fens of Lincolnshire, possibly excited thereto by the example of T. Pennant, whose information, collected there in 1769, was of a kind to provoke further inquiry, while Daniel (*Rural Sports*, iii. p. 234) had added some other particulars, and subsequently G. Graves in 1816 repeated in the same district the experience of his predecessors. Since that time the great changes produced by the drainage of the fen-country have banished this species from nearly the whole of it, so that R. Lubbock (*Obs. Fauna of Norfolk*, pp. 68–73) and H. Stevenson (*Birds of Norfolk*, ii. pp. 261–271) can alone be cited as modern witnesses of its habits in England, while the trade of netting or snaring ruffs and fattening them for the table has for many years practically ceased.

The cock bird, when, to use the fenman's expression, he has not "his show on," and the hen at all seasons, offer no very remarkable deviation from ordinary sandpipers; outwardly[1] there is nothing, except the unequal size of the two sexes, to rouse suspicion of any abnormal peculiarity. But when spring comes all is changed. In a surprisingly short time the feathers clothing the face of the male are shed, and their place is taken by *papillae* or small caruncles of bright yellow or pale pink. From each side of his head sprouts a tuft of stiff curled feathers, while the feathers of the throat change colour, and beneath and around it sprouts the frill or ruff already mentioned as giving the bird his name. The feathers which form this remarkable adornment are, like those of the "ear-tufts," stiff and incurved at the end, but much longer—measuring more than 2 in. They are closely arrayed, capable of depression or elevation, and form a shield to the front of the breast impenetrable by the bill of a rival.[2] More extraordinary than this, from one point of view, is the great variety of coloration that obtains in these temporary outgrowths. Considering the really few colours that the birds exhibit, the variation is something marvellous, so that fifty examples may be compared without finding a very close resemblance between any two of them, while the individual variation is increased by the "ear-tufts," which generally differ in colour from the frill. The colours range from deep black to pure white, passing through chestnut or bay, and many tints of brown or ashy-grey, while often the feathers are more or less closely barred with some darker shade, and the black is very frequently glossed with violet, blue or green—or, in addition, spangled with white grey or gold-colour. The white, on the other hand, is not rarely freckled, streaked, or barred with grey, rufous-brown or black. In some examples the barring is most regularly concentric, in others more or less broken-up or undulating, and the latter may be said of the streaks. It was ascertained by Montagu, and has since been confirmed by A. D. Bartlett, that every ruff assumes tufts and frill exactly the same in colour and markings as those he wore in the preceding season; and thus, polymorphic as is the male as a species, as an individual he is unchangeable. The white frill is said to be the rarest, and birds exhibiting it have white necks even in winter.



Ruff.

That all this wonderful "show" is the consequence of the polygamous habit of the ruff can scarcely be doubted. No other species of Limicoline bird has, so far as is known, any tendency to it. Indeed, in many species of *Limicolae*, as the dotterel, the godwits (*q.v.*), phalaropes and perhaps some others, the female is larger and more brightly coloured than the male, who in such cases seems to take upon himself some at least of the domestic duties. Both Montagu and Graves, to say nothing of other writers, state that the ruffs, in England, were far more numerous than the reeves; and their testimony can hardly be doubted; though in Germany J. F. Naumann (*Vög. Deutschland's*, vii. p. 544) considers that this is only the case in the earlier part of the season, and that later the females greatly outnumber the males. By no one have the ruff's characteristics been more happily described than by J. Wolley, in a communication to W. C. Hewitson (*Eggs of Brit. Birds*, 3d ed., p. 346), as follows:—

> "The ruff, like other fine gentlemen, takes much more trouble with his courtship than with his duties as a husband. Whilst the reeves are sitting on their eggs, scattered about the swamps, he is to be seen far away flitting about in flocks, and on the ground dancing and sparring with his companions. Before they are confined to their nests, it is wonderful with what devotion the females are attended by their gay followers, who seem to be each trying to be more attentive than the rest. Nothing can be more expressive of humility and ardent love than some of the actions of the ruff. He throws himself prostrate on the ground, with every feather on his body standing up and quivering; but he seems as if he were afraid of coming too near his mistress. If she flies off, he starts up in an instant to arrive before her at the next place of alighting, and all his actions are full of life and spirit. But none of his spirit is expended in care for his family. He never comes to see after an enemy. In the [Lapland] marshes, a reeve now and then flies near with a scarcely audible *ka-ka-kuk*; but she seems a dull bird, and makes no noisy attack on an invader."

The breeding-grounds of the ruff extend from Great Britain across N. Europe and Asia; but the birds become less numerous towards the E. They winter in India, reaching even Ceylon, and Africa as far as the Cape of Good Hope. The ruff also occasionally visits Iceland, and there are several well-authenticated records of its occurrence on the E. coast of the United States, while an example is stated (*Ibis*, 1875, p. 332) to have been received from the N. of S. America. (A. N.)

RUFFIAN (Fr. *rufian*, It. *ruffiano*), a brutal, violent person, a swaggering, low bully. The etymology is obscure, but the word has been connected with "ruffler," a bully, swaggerer, one who "ruffles" (M. Du. *roffeln*, to pander). An early derivation, quoted in Du Cange, derives it from Lat. *rufus*, red, as the hair of the *meretrices*, with whom the *ruffiani* were generally associated, was red or gold, as contrasted with the black hair of sober matrons.

RUFFO, FABRIZIO (1744–1827), Neapolitan cardinal and politician, was born at San Lucido in Calabria on the 16th of September 1744. His father, Litterio Ruffo, was duke of Baranello, and his mother, Giustiniana, was of the family of Colonna. Fabrizio owed his education to his uncle, the cardinal Thomas Ruffo, then dean of the Sacred College. In early life he secured the favour of Giovanni Angelo Braschi di Cesera, who in 1775 became Pope Pius VI. Ruffo was placed by the pope among the *chierici di camera*—the clerks who formed the papal civil and financial service. He was later promoted to be treasurer-general, a post which carried with it the ministry of war. Ruffo's conduct in office was diversely judged. Colletta, the historian of Naples, speaks of him as corrupt, and Jomini repeats the charge. Ruffo's biographer, Sachinelli, says that he incurred hostility by restricting the feudal powers of some of the landowners in the papal states. In 1791 he was removed from the treasurership, but was created cardinal on the 29th of September, though he was not in orders. He never became a priest. Ruffo went to Naples, where he was named administrator of the royal domain of Caserta, and received the abbey of S. Sophia in Benevento *in commendam*. When in December 1798 the French troops advanced on Naples, Ruffo fled to Palermo with the royal family. He was chosen to head a royalist movement in Calabria, where his family, though impoverished by debt, exercised large feudal powers. He was named vicar-general on the 25th of January 1799. On the 8th of February he landed at

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[1] Internally there is a great difference in the form of the posterior margin of the sternum, as long ago remarked by Nitzsch.

[2] This "ruff" has been compared to that of Elizabethan or Jacobean costume, but it is essentially different, since that was open in front and widest and most projecting behind, whereas the bird's decorative apparel is most developed in front and at the sides and scarcely exists behind.

La Cortona with a small following, and began to raise the so-called "army of the faith" in association with Fra Diavolo and other brigand leaders. Ruffo had no difficulty in upsetting the republican government established by the French, and by June had advanced to Naples (see NAPLES and NELSON). The campaign has given rise to much controversy. Ruffo appears to have lost favour with the king by showing a tendency to spare the republicans. He resigned his vicar-generalship to the prince of Cassero, and during the second French conquest and the reigns of Joseph Bonaparte and Murat he lived quietly in Naples. Some notice was taken of him by Napoleon, but he never held an important post. After the restoration of the Bourbons he was received into favour. During the revolutionary troubles of 1822 he was consulted by the king, and was even in office for a very short time as a "loyalist" minister. He died on the 13th of December 1827.

The account of Ruffo given in Colletta's *History of Naples* (English translation, Edinburgh, 1860) must be taken with caution. Colletta was a violent liberal partisan, who wrote in exile, and largely from memory. He has been corrected by the Duca de Lauria, *Intorno alla storia del Reame di Napoli di Pietro Colletta* (Naples, 1877). Ruffo's own side of the question is stated in *Memorie Storiche sulla vita del Cardinale Fabrizio Ruffo*, by Domenico Sacchinelli (Naples, 1836). See also *Fabrizio Ruffo: Revolution and Gegen-Revolution von Neapel*, by Baron von Helfert (Vienna, 1882).

RUFIJI, a large river of German East Africa, entering the sea by a considerable delta, between 7° 45′ and 8° 13′ S. Its upper basin, which extends from N. to S. through over 300 m., is drained by three main branches, which unite to form the lower Rufiji. Of the three upper branches, the two southern, the Luvegu and the Ulanga, though shorter than the northernmost (the Ruaha), carry a greater volume of water, as they come from a more rainy region, and by their junction in 8° 35′ S., 37° 25′ E., the Rufiji proper may be said to be formed.

The Luvegu rises 10° 50′ S., 35° 50′ E., and flows N.E. in a wooded valley, generally narrow, and bordered by a broken country in great part uninhabited and covered with thin forest. In its lower course it is a large stream—100 to 150 yds. wide.

The Ulanga is formed by a number of streams descending from the outer escarpment of the high plateau which runs N.E. from the head of Lake Nyasa and in Uhehe becomes broken up in ranges of mountains. The most important head-stream, the Ruhudye, rises in about 9° 30′ S., 34° 40′ E. As a whole, the Ulanga valley is broad, level and swampy, the river running in a very winding course and sending off many diverging arms. It is navigable throughout the greater part of its course, having even in the dry season a general depth of 3 to 12 ft., with a width of 40 to 120 yds. In April and May nearly all the streams overflow their banks and cover a great part of the plain.

Just below the junction of the Luvegu and Ulanga, the Rufiji flows through a narrow pass by the Shuguli falls, and continues N.E. in a fairly straight course to the junction of the Ruaha, in 7° 55′ S., 37° 52′ E. The most remote branches of the Ruaha rise N. of Lake Nyasa in the Livingstone mountains. The united stream makes a wide sweep to the N. of the Uhehe mountains, from which it receives various tributaries, finally flowing S.E. and E. to the Rufiji. A little below the junction the Rufiji is broken by the Pangani falls, but is thence navigable by small steamers to its delta. In this part of its course the river receives no large tributaries but sends out divergent channels. The country on either side is a generally level plain, inundated, on the south, in the rains, and the river varies in width from 100 to 400 yds., with an average current of 3 m. an hour. The main mouth of the river is that known as Simba Uranga, the bar of which can be crossed by ocean vessels at high water, but all the branches are very shallow as the apex of the delta is approached. Much of the delta is suited for rice-growing.

RUFINUS, TYRANNIUS, presbyter and theologian, was born at or near Aquileia at the head of the Adriatic, probably between 340 an 345. In early manhood he entered the cloister as a catechumen, receiving baptism about 370. About the same time a visit of Jerome to Aquileia led to a close friendship between the two, and shortly after Jerome's departure for the East Rufinus also was drawn thither (in 372 or 373) by his interest in its theology and monasticism. He first settled in Egypt, hearing the lectures of Didymus, the Origenistic head of the catechetical school at Alexandria, and also cultivating friendly relations with Macarius the elder and other ascetics in the desert. In Egypt, if not even before leaving Italy, he had become intimately acquainted with Melania, a wealthy and devout Roman widow; and when she removed to Palestine, taking with her a number of clergy and monks on whom the persecutions of the Arian Valens had borne heavily, Rufinus (about 378) followed her. While his patroness lived in a convent of her own in Jerusalem, Rufinus, at her expense, gathered together a number of monks in a monastery on the Mount of Olives, devoting himself at the same time to the study of Greek theology. This combination of the contemplative life and the life of learning had already developed in the Egyptian monasteries. When Jerome came to Bethlehem in 386, the friendship formed at Aquileia was renewed. Another of the intimates of Rufinus was John, bishop of Jerusalem, and formerly a Nitrian monk, by whom he was ordained to the priesthood in 390. In 394, in consequence of the attack upon the doctrines of Origen made by Epiphanius of Salamis during a visit to Jerusalem, a fierce quarrel broke out, which found Rufinus and Jerome on different sides; and, though three years afterwards a formal reconciliation was brought about between Jerome and John, the breach between Jerome and Rufinus remained unhealed.

In the autumn of 397 Rufinus embarked for Rome, where, finding that the theological controversies of the East were exciting much interest and curiosity, he published a Latin translation of the *Apology* of Pamphilus for Origen, and also (398–99) a somewhat free rendering of the περὶ ἀρχῶν (or *De Principiis*) of that author himself. In the preface to the latter work he referred to Jerome as an admirer of Origen, and as having already translated some of his works with modifications of ambiguous doctrinal expressions. This allusion annoyed Jerome, who was exceedingly sensitive as to his reputation for orthodoxy, and the consequence was a bitter pamphlet war, very wonderful to the modern onlooker, who finds it difficult to see anything discreditable in the accusation against a biblical scholar that he had once thought well of Origen, or in the countercharge against a translator that he had avowedly exercised editorial functions as well. At the instigation of Theophilus of Alexandria, Anastasius (pope 398–402) summoned Rufinus from Aquileia to Rome to vindicate his orthodoxy; but he excused himself from a personal attendance in a written *Apologia pro fide sua*. The pope in his reply expressly condemned Origen, but left the question of Rufinus's orthodoxy to his own conscience. He was, however, regarded with suspicion in orthodox circles (cf. the *Decretum Gelassii*, § 20) in spite of his services to Christian literature. In 408 we find Rufinus at the monastery of Pinetum (in the Campagna?); thence he was driven by the arrival of Alaric to Sicily, being accompanied by Melania in his flight. In Sicily he was engaged in translating the *Homilies* of Origen when he died in 410.

The original works of Rufinus are—(1) *De Adulteratione Librorum Origenis*—an appendix to his translation of the *Apology* of Pamphilus, and intended to show that many of the features in Origen's teaching which were then held to be objectionable arise from interpolations and falsifications of the genuine text; (2) *De Benedictionibus XII Patriarcharum Libri II*—an exposition of Gen. xlix.; (3) *Apologia s. Invectivarum in Hieronymum Libri II*; (4) *Apologia pro Fide Sua ad Anastasium Pontificem*; (5) *Historia Eremitica*—consisting of the lives of thirty-three monks of the Nitrian desert;[1] (6) *Expositio Symboli*, a commentary on the creed of Aquileia comparing it with that of Rome, which is valuable for its evidence as to church teaching in the 4th century. The *Historiae Ecclesiasticae Libri XI* of Rufinus consist partly of a free translation of Eusebius (10 books in 9) and partly of a continuation (bks. x. and xi.) down to the death of Theodosius the Great. The other translations of Rufinus are—(1) the *Instituta Monachorum* and some of the *Homilies* of Basil; (2) the *Apology* of Pamphilus, referred to above; (3) Origen's *Principia*; (4) Origen's *Homilies* (Gen.–Kings, also Cant. and Rom.); (5) *Opuscula* of Gregory of Nazianzus; (6) the *Sententiae* of Sixtus, an unknown Greek philosopher; (7) the *Sententiae* of Evagrius; (8) the *Clementine Recognitions* (the only form in which that work is now extant); (9) the *Canon Paschalis* of Anatolius Alexandrinus. We can hardly overestimate the influence which Rufinus exerted on Western theologians by thus putting the great Greek fathers into the Latin tongue. D. Vallarsi's uncompleted edition of Rufinus (vol. i. fol., Verona, 1745) contains the *De Benedictionibus*, *the Apologies*, the

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[1] On this work see Dom Butler in *Texts and Studies*, vi. i. pp. 10 ff.

Expositio Symboli, the *Historia Eremitica* and the two original books of the *Hist. Eccl.* See also Migne, *Patrol.* (vol. xxi. of the Latin series). For the translations, see the various editions of Origen, Eusebius, &c.

See W. H. Freemantle in *Dict. Chr. Biog.* iv. 555–60; A. Ebert, *Allg. Gesch. d. Litt. d. Mittelalters im Abendlande*, i. 321–27 (Leipzig, 1889); G. Krüger in Hauck-Herzog's *Real-encyk. für prot. Theol.*, where there is a full bibliography.

RUFUS, GAIUS VALGIUS, Lain poet, friend of Horace and Maecenas, and consul in 12 B.C. He was known as a writer of elegies and epigrams, and his contemporaries believed him capable of great things in epic. The author of the panegyric on Messalla declares Rufus to be the only poet fitted to be the great man's Homer. Rufus did not, however, confine himself to poetry. He discussed grammatical questions by correspondence, translated the rhetorical manual of his teacher Apollodorus of Pergamum, and began a treatise on medicinal plants, dedicated to Augustus. Horace addressed to him the ninth ode of the second book.

Fragments in R. Weichert, *Poetarum Latinorum Vitae et Carminum Reliquiae* (1830); R. Unger, *De C. Valgii Rufi Poematis* (1848); O. Ribbeck, *Geschichte der römischen Dichtung* (1889), ii.; M. Schanz, *Geschichte der römischen Litteratur* (1899), ii. 1; Teuffel, *Hist. of Roman Literature* (Eng. trans., 1900), 241.

RUFUS, LUCIUS VARIUS (*c* 74–14 B.C.), Roman poet of the Augustan age. He was the friend of Virgil, after whose death he and Plotius Tucca prepared the *Aeneid* for publication, and of Horace, for whom he and Virgil obtained an introduction to Maecenas. Horace speaks of him as a master of epic and the only poet capable of celebrating the achievements of Vipsanius Agrippa (*Odes*, i. 6); Virgil (under the name of Lycidas, *Ecl.* ix. 35) regrets that he had hitherto produced nothing comparable to the work of Varius or Helvius Cinna. From Macrobius (*Saturnalia*, vi. 1, 39; 2, 19) we learn that Varius composed an epic poem *De Morte*, some lines of which are quoted as having been imitated or appropriated by Virgil; Horace (*Sat.* i. 10, 43) probably alludes to another epic, and, according to the scholiast on *Epistles*, i. 16, 27–29, these three lines are taken bodily from a panegyric of Varius on Augustus. But his most famous literary production was the tragedy *Thyestes*, which Quintilian (*Inst. Orat.* x. 1, 98) declares fit to rank with any of the Greek tragedies. The didascalia (which is preserved in a Paris MS.) informs us that it was produced at the games celebrated (29 B.C.) by Augustus in honour of the victory at Actium, and that Varius received a present of a million sesterces from the emperor.

Fragments in E. Bährens, *Frag. Poetarum Romanorum* (1886); monographs by A. Weichert (1836) and R. Unger (1870, 1878, 1898); M. Schanz, *Geschichte der römischen Litteratur* (1899), ii. 1; Teuffel, *Hist. of Roman Literature* (Eng. trans., 1900), 223.

RUG, a term of Scandinavian origin (cf. Swed. *rugg*, rough hair; Norw. dial. *rugga*, rough), and probably connected with "rough" and "rag," originally for a kind of coarse woollen material, like frieze; hence it is used of a piece of thick material used as a wrap or covering for the knees or body in travelling or in bed, and especially for a thick mat or small-sized carpet laid on the floor (see Carpet).

RUGBY, a market town in the Rugby parliamentary division of Warwickshire, England, finely situated on a tableland rising from the S. bank of the Avon, near the Oxford Canal. Pop. of urban district (1901), 16,830. It is an important junction on the London & North-Western railway, by which it is 82½ m. N.W. from London; it is served also by the Great Central railway and by a branch of the Midland railway from Leicester.

The boys' school, ranking as one of the most famous public schools in England, was founded and endowed under the will (1567) of Laurence Sheriff, a merchant grocer and servant to Queen Elizabeth, and a native either of Rugby or of the neighbouring village of Brownsover. The endowment consisted of the parsonage of Brownsover, Sheriff's mansion house in Rugby, and one-third (8 acres) of his estate in Middlesex, near the Foundling Hospital, London, which, being let on building leases, gradually increased to about £5000 a year. The full endowment was obtained in 1653. The school originally stood opposite the parish church, and was removed to its present site on the S. side of the town between 1740 and 1750. In 1809 it was rebuilt from designs by Henry Hakewill (1771–1830); the chapel, dedicated to St Lawrence, was added in 1820. At the tercentenary of the school in 1867 subscriptions were set on foot for founding scholarships, building additional schoolrooms, rebuilding or enlarging the chapel and other objects. The chapel was rebuilt and reconsecrated in 1872, and further additions were made in 1898. A swimming bath was erected in 1876; the Temple observatory, containing a fine equatorial refractor by Alvan Clark, was built in 1877, and the Temple reading-room with the art museum in 1878. The workshops underneath the gymnasium were opened in 1880, and a new big school and class-rooms were erected in 1885. From about 70 to 1777 the numbers attending the school have increased to nearly 600. A great impulse was given to the progress of the school during the headmastership of Thomas Arnold, 1827–42. Among Arnold's successors were Archibald Campbell Tait and Frederick Temple, both afterwards archbishops of Canterbury.

The parish church of St Andrew was rebuilt from designs by W. Butterfield and reconsecrated in 1879. A tower and spire were added in 1895. An aisle commemorates John Moultrie (1799–1874), rector, widely known as the "poet pastor." The church of Holy Trinity is by Sir G. G. Scott, and the Roman Catholic church of St Marie by A. W. Pugin. Trade is mainly agricultural; there is a large cattle market, and several fairs are held annually.

The early history of Rugby is obscure, but a settlement of the Danes is presumed from the name, and from the neighbouring tract of Dunsmore Heath (Danesmoor). Rugby was originally a hamlet of the adjoining parish of Clifton-on-Dunsmore, and is separately treated of as such in Domesday Book. Ernaldus de Bosco (Ernald de Bois), lord of the manor of Clifton, seems to have erected the first chapel in Rugby, in the reign of Stephen, about 1140. It was afterwards granted by him, with certain lands, to endow the abbey of St Mary, Leicester, which grant was confirmed by his successors and by royal charter of Henry II. In the second year of King John (1200) a suit took place between Henry de Rokeby, lord of the manor of Rugby, and Paul, abbot of St Mary, Leicester, which resulted in the former obtaining possession of the advowson of Rugby, on condition of homage and service to the abbot of Leicester. By virtue of this agreement the chapel was converted into a parish church and the vicarage into a rectory.

RUGE, ARNOLD (1802–1880), German philosopher and political writer, was born at Bergen, in the island of Rügen, on the 13th of September 1802. He studied at Halle, Jena and Heidelberg, and became an adherent of the party which sought to create a free and united Germany. For his zeal he was confined for five years in the fortress of Kolberg, where he studied Plato and the Greek poets. On his release in 1830 he published *Schill und die Seinen*, a tragedy, and a translation of *Oedipus in Colonus*. Ruge settled in Halle, where in 1837 with E. T. Echtermeyer he founded the *Hallesche Jahrbücher für deutsche Kunst und Wissenschaft*. In this periodical he discussed the questions of the time from the point of view of the Hegelian philosophy. The *Jahrbücher* was detested by the orthodox party in Prussia; and was finally suppressed by the Saxon government in 1843. In Paris Ruge tried to act with Karl Marx as co-editor of the *Deutsch-Französische Jahrbücher*, but had little sympathy with Marx's socialistic theories, and soon left him. In the revolutionary movement of 1848 he organized the Extreme Left in the Frankfort parliament, and for some time he lived in Berlin as the editor of the *Die Reform*. The Prussian government intervened and Ruge soon afterwards left for Paris, hoping, through his friend Alexandre Ledru-Rollin, to establish relations between German and French republicans; but in 1849 both Ledru-Rollin and Ruge had to take refuge in London. Here, in company with Giuseppe Mazzini and other advanced politicians, they formed a "European Democratic Committee." From this Ruge soon withdrew, and in 1850 went to Brighton, where he supported himself by teaching and writing. In 1866 and 1870 he vigorously supported Prussia against Austria, and Germany against France. In his last years he received from the German government a pension of 1000 marks. He died on the 31st of December 1880.

Ruge was a leader in religious and political liberalism, but did not produce any work of enduring importance. In 1846–48 his *Gesammelte Schriften* were published in ten volumes. After this time he wrote, among other books, *Unser System*, *Revolutionsnovellen*, *Die Loge des Humanismus*, and *Aus früherer Zeit* (his memoirs). He also wrote many poems, and several dramas and romances, and translated into German various English works, including the *Letters of Junius* and Buckle's *History of Civilization*. His *Letters and Diary* (1825–80) were published by Paul Nerrlich (Berlin, 1885–87). See A. W. Bolin's *L. Feuerbach*, pp. 127–52 (Stuttgart, 1891).

RUGELEY, a market town in the Lichfield parliamentary division of Staffordshire, England, in the Trent valley. Pop. of urban district (1901), 4447. The London & North-Western railway has stations on the main line (Trent Valley, 124½ m. N.W. from London), and at the town, on a branch line to Walsall. The Grand Trunk canal here follows the Trent. To the S.W. lie the hills of Cannock Chase. The church of St Augustine is modern; of the parish church of the 14th century only the tower and chancel remain. The municipal offices, market hall and assembly-room are contained in one building (1879). A grammar school was founded in 1611. There are ironfoundries, corn-mills and tanneries; and the parish includes several collieries.

RÜGEN, an island of Germany, in the Baltic, immediately opposite Stralsund, 1½ m. off the north-west coast of Pomerania in Prussia, from which it is separated by the narrow Strelasund, or Bodden. Its shape is exceedingly irregular, and its coastline is broken by numerous bays and peninsulas, sometimes of considerable size. The general name is applied by the natives only to the roughly triangular main trunk of the island, while the larger peninsulas, the landward extremities of which taper to narrow necks of land, are considered to be as distinct from Rügen as the various adjacent smaller islands which are also included for statistical purposes under the name. The chief peninsulas are those of Jasmund and Wittow on the north, and Mönchgut, at one time the property of the monastery of Eldena, on the south-east; and the chief neighbouring islands are Ummanz and Hiddensee, both off the north-west coast. Rügen is the largest island in Germany. Its greatest length from N. to S. is 32 m.; its greatest breadth is 25½ m.; and its area is 377 sq. m. The surface gradually rises towards the west to Rugard (335 ft.)—the "eye of Rügen"—near Bergen, but the highest point is the Hertaburg (505 ft.) in Jasmund. Erratic blocks are scattered throughout the island, and the roads are made with granite. Though much of Rügen is flat and sandy, the fine beech woods which cover a great part of it, and the bold northern coast scenery combine with the convenient sea-bathing offered by the various villages around the coast to attract large numbers of visitors. The most beautiful and attractive part of the island is the peninsula of Jasmund, which terminates to the north in the Stubbenkammer (Slavonic for "rock steps"), a sheer chalk cliff, the summit of which, the Königsstuhl, is 420 ft. above the sea. The east of Jasmund is clothed with an extensive beech wood called the Stubbenitz, in which lies the Borg, or Herta Lake. Connected with Jasmund by the narrow isthmus of Schabe to the west is the peninsula of Wittow, the most fertile part of the island. At its north-west extremity rises the height of Arcona, with a lighthouse.

A ferry connects the island with Stralsund, and from the landing-stage at Altefähr a railway traverses the island, passing the capital Bergen to Sassnitz, on the north-east coast. Hence a regular steamboat service connects with Trelleborg in Sweden, thus affording direct communication between Berlin and Stockholm. The other chief places are Garz, Sagard, Gingst and Putbus, the last being the old capital of a barony of the princes of Putbus. Sassnitz, Göhren, Sellin and Lauterbach-Putbus are among the favourite bathing resorts. Schoritz was the birthplace of the patriot and poet, Ernst Moritz Arndt. Ecclesiastically Rügen is divided into 75 parishes, in which the pastoral succession is said to be almost hereditary. The inhabitants are distinguished from those of the mainland by peculiarities of dialect, costume and habits; and even the various peninsulas differ from each other in these particulars. The peninsula of Mönchgut has best preserved its peculiarities; but there, too, primitive simplicity is yielding to the influence of the annual stream of summer visitors. The inhabitants raise some cattle, and Rügen has long been famous for its geese; but the only really considerable industry is fishing,—the herring-fishery being especially important. Rügen, with the neighbouring islands, forms a governmental department, with a population (1905) of 47,023.

The original Germanic inhabitants of Rügen were dispossessed by Slavs; and there are still various relics of the long reign of paganism that ensued. In the Stubbenitz and elsewhere Huns' or giants' graves are common; and near the Hertha Lake are the ruins of an ancient edifice which some have sought to identify with the shrine of the heathen deity Hertha or Nerthus, referred to by Tacitus. On Arcona in Wittow are the remains of an ancient fortress, enclosing a temple which was destroyed in 1168 by the Danish king Waldemar I., when he made himself master of the island. Rügen was ruled then by a succession of native princes, under Danish supremacy, until 1218. After being for a century and a half in the possession of a branch of the ruling family in Pomerania, it was finally united with that duchy in 1478, and passed with it into the possession of Sweden in 1648. With the rest of Western Pomerania Rügen has belonged to Prussia since 1815.

See Fock, *Rügensch-pommersche Geschichten* (6 vols., Leipzig, 1861–72); R. Baier, *Die Insel Rügen nach ihrer archäologischen Bedeutung* (Stralsund, 1886); R. Credner, *Rügen. Eine Inselstudie* (Stuttgart, 1893); Edwin Müller, *Die Insel Rügen* (17th ed., Berlin, 1900); Schuster, *Führer durch die Insel Rügen* (7th ed., Stettin, 1901); Boll, *Die Insel Rügen* (Schwerin, 1858); O. Wendler, *Geschichte Rügens seit der ältesten Zeit* (Bergen, 1895); A. Haas, *Rügensche Sagen und Märchen* (Greifswald, 1891); U. John, *Volkssagen aus Rügen* (Stettin, 1886); and E. M. Arndt, *Fairy Tales from the Isle of Rügen* (London, 1896).

RUHLA, a town of Germany, partly in the duchy of Saxe-Weimar and partly in that of Saxe-Coburg-Gotha. Pop. (1905) 7017. It stretches along the valley of the Erb in the Thuringian forest 8 m. S. of Eisenach, and attracts a number of visitors owing to its beautiful natural surroundings and its mineral springs. Its staple industry is the making of wooden and meerschaum pipes; it has also electrical works, and some small manufactures. Ruhla, which is known locally as *Die Ruhl*, was famous in the middle ages for its armourers, and subsequently for its cutlers.

See Ziegler, *Das Thüringerwalddorf Ruhla* (Dresden, 1876).

RUHNKEN, DAVID (1723–1798), one of the most illustrious scholars of the Netherlands, was of German origin, having been born in Pomerania in 1723. His parents had him educated for the church, but after two years at the university of Wittenberg he determined to live the life of a scholar. At Wittenberg Ruhnken lived in close intimacy with the two most distinguished professors, Ritter and Berger. To them he owed a thorough grounding in ancient history and Roman antiquities and literature; and from them he learned a pure and vivid Latin style. At Wittenberg, too, Ruhnken derived valuable mental training from study in mathematics and Roman law. Probably nothing would have severed him from his surroundings there but a desire which daily grew upon him to explore the inmost recesses of Greek literature. Neither at Wittenberg nor at any other German university was Greek in that age seriously studied. It was taught in the main to students in divinity for the sake of the Greek Testament and the early fathers of the church. F. A. Wolf is the real creator of Greek scholarship in modern Germany, and Porson's gibe that "the Germans in Greek are sadly to seek" was barbed with truth. It is significant of the state of Hellenic studies in Germany in 1743 that their leading exponents were Gesner and Ernesti. Ruhnken was well advised by his friends at Wittenberg to seek the university of Leiden, where, stimulated by the influence of Bentley, the great scholar Tiberius Hemsterhuis had founded the only real school of Greek learning which had existed on the Continent since the days of Joseph Scaliger and Isaac Casaubon.

Perhaps no two men of letters ever lived in closer friendship than Hemsterhuis and Ruhnken during the twenty-three years which passed from Ruhnken's arrival in the Netherlands in 1743 to the death of Hemsterhuis in 1766. A few years made it clear that Ruhnken and Valckenaer were the two pupils of the great master on whom his inheritance must devolve. As his reputation spread, many efforts were made to attract Ruhnken back to Germany, but after settling in Leiden, he only left the country once, when he spent a year in Paris, ransacking the public libraries (1755). For work achieved, this year of Ruhnken may compare even with the famous year which Ritschl spent in Italy. In 1757 Ruhnken was appointed lecturer in Greek, to assist Hemsterhuis, and in 1761 he succeeded Oudendorp, with the title of "ordinary professor of history and eloquence," but practically as Latin professor. This promotion drew on him the enmity of some native Netherlanders, who deemed themselves (not without some show of reason) to possess stronger claims for a chair of Latin. The only defence made by Ruhnken was to publish works on Latin literature which eclipsed and silenced his rivals. In 1766 Valckenaer succeeded Hemsterhuis in the Greek chair. The intimacy between the two colleagues was only broken by Valckenaer's death in 1785, and stood without strain the test of common candidature for the office (an important one at Leiden) of university librarian, in which Ruhnken was successful. Ruhnken's later years were clouded by severe domestic misfortune, and by the political commotions which, after the outbreak of the war with England in 1780, troubled the Netherlands without ceasing, and threatened to extinguish the university of Leiden. He died in 1798.

Personally, Ruhnken was as far as possible removed from being a recluse or a pedant. He had a well-knit and even handsome frame, attractive manners (though sometimes tinged with irony), and a nature simple and healthy, and open to impressions from all sides. Fond of society, he cared little to what rank his associates belonged, if they were genuine men in whom he might find something to learn. His biographer even says of him in his early days that he knew how to sacrifice to the Sirens without proving traitor to the Muses. Life in the open air had a great attraction for him; he was fond of sport, and would sometimes devote to it two or three days in the week. In his bearing towards other scholars Ruhnken was generous and dignified, distributing literary aid with a free hand, and meeting onslaughts for the most part with a smile. In the records of learning he occupies an important position. He forms a principal link in the chain which connects Bentley with the modern scholarship of the Continent. The spirit and the aims of Hemsterhuis, the great reviver of Continental learning, were committed to his trust, and were faithfully maintained. He greatly widened the circle of those who valued taste and precision in classical scholarship. He powerfully aided the emancipation of Greek studies from theology; nor must it be forgotten that he first in modern times dared to think of rescuing Plato from the hands of the professed philosophers—men presumptuous enough to interpret the ancient sage with little or no knowledge of the language in which he wrote.

Ruhnken's principal works are editions of (1) Timaeus's *Lexicon of Platonic Words*, (2) Thalelaeus and other Greek commentators on Roman law, (3) Rutilius Lupus and other grammarians, (4) Velleius Paterculus, (5) the works of Muretus. He also occupied himself much with the history of Greek literature, particularly the oratorical literature, with the Homeric hymns, the scholia on Plato and the Greek and Roman grammarians and rhetoricians. A discovery famous in its time was that in the text of the work of Apsines on rhetoric a large piece of a work by Longinus was embedded. Modern views of the writings attributed to Longinus have lessened the interest of this discovery without lessening its merit. The biography of Ruhnken was written by his great pupil, Wyttenbach, soon after his death. (J. S. R.)

RUHR, a river of Germany, an important right-bank tributary of the lower Rhine. It rises on the north side of the Winterberg in the Sauerland, at a height of about 2000 ft. above the sea. It first takes a northerly and north-westerly course, and in a deep and well-wooded valley winds past the romantically situated town of Arnsberg. Shortly after reaching Neheim it bends to the south-west, courses through the mining district around Hagen, and receives from the left the waters of the Lenne. Hence in a tortuous course it works its way past Witten, Steele, Kettwig and Mülheim, and, after a course of 142 m., discharges itself into the Rhine at Ruhrort. From this place the Ruhr canal connects it with Duisburg. The river is navigable from Witten downwards (43 m.), by the aid of eleven locks; but navigation is often greatly impeded through dearth of water.

RUHRORT, a town of Germany, in the Prussian Rhine province, situated at the junction of the Ruhr and the Rhine, in the midst of a productive coal district, 15 m. N. of Düsseldorf and 12 E. of Crefeld by rail. Ruhrort has the largest river harbour in Europe, with quays extending nearly 5 m. along the river, and it is the principal shipping port for the coal of the Westphalian coalfield, which is despatched in the fleet of steam-tugs and barges belonging to the port. The coal is sent principally to South Germany and the Netherlands. Grain and timber are also exported and iron ore is imported. In 1905 the port was entered and cleared by over 27,000 vessels of 7,418,065 tons. The industries of the town include large iron and steel works, shipbuilding yards and tanneries. Ruhrort has three Evangelical and three Roman Catholic churches, and several schools and public institutions.

Rurhort is first mentioned in 1379, and obtained civic rights in 1551. Having been in the possession of the counts of La Marck, it passed into that of Brandenburg in 1614. In 1905 it was united with Duisburg and Meiderich to form a single municipality, the joint population being 41,416.

See *Geschichte der Stadt Ruhrort* (Ruhrort, 1882).

RUIZ, JUAN (*c.* 1283–*c.* 1350), Spanish poet, was born probably at Alcalá de Henares, and became arch-priest of Hita. Though he draws his physical portrait in the *Libro de buen amor*, he gives no exact biographical details. It may be inferred from his writings that he was not an exemplary priest, and one of the manuscript copies of his poems states that he was imprisoned by order of Gil Albornoz, archbishop of Toledo. It is not known whether he was sentenced for his irregularities of conduct, or on account of his satirical reflections on his ecclesiastical superiors. Nor is it possible to fix the precise date of his imprisonment. Albornoz nominally occupied the see of Toledo from 1337 to 1368, but he fell into disgrace in 1351 and fled to Avignon. A consideration of these circumstances points to the probable conclusion that Ruiz was in prison from 1337 to 1350, but this is conjecture. What seems established is that he finished the *Libro de buen amor* in 1343 while in gaol, and that he was no longer arch-priest of Hita in January 1351; it is assumed that he died shortly before the latter date.

Ruiz is by far the most eminent poet of medieval Spain. His natural gifts were supplemented by his varied culture; he clearly had a considerable knowledge of colloquial (and perhaps of literary) Arabic; his classical reading was apparently not extensive, but he knew by heart the *Disticha* of Dionysius Cato, and admits his indebtedness to Ovid and to the *De Amore* ascribed to Pamphilus; his references to Blanchefleur, to Tristan and to Yseult, indicate an acquaintance with French literature, and he utilizes the *fabliaux* with remarkable deftness; lastly, he adapts fables and apologues from Aesop, from Pedro Alfonso's *Disciplina clericalis*, and from medieval bestiaries. All these heterogeneous materials are fused in the substance of his versified autobiography, into which he intercalates devout songs, parodies of epic or forensic formulae, and lyrical digressions on every aspect of life. Ruiz, in fact, offers a complete picture of picaresque society in Spain during the first half of the 14th century, and his impartial irony lends a deeper tone to his rich colouring. He knows the weaknesses of both clergy and laity, and he dwells with equal complacency on the amorous adventures of great ladies, on the perverse intrigues arranged by demure nuns behind their convent walls, and on the simpler instinctive animalism of country lasses and Moorish dancing-girls. In addition to the faculty of genial observation Ruiz has the gift of creating characters and presenting types of human nature: from his Don Furón is derived the hungry gentleman in *Lazarillo de Tormes*, in Don Melón and Doña Endrina he anticipates Calisto and Melibea in the *Celestina*, and Celestina herself is developed from Ruiz' Trotaconventos. Moreover, Ruiz was justly proud of his metrical innovations. The *Libro de buen amor* is mainly written in the *cuaderna via* modelled on the French alexandrine, but he imparts to the measure a variety and rapidity previously unknown in Spanish, and he experiments by introducing internal rhymes or by shortening the fourth line into an octosyllabic verse; or he boldly recasts the form of the stanza, extending it to six or seven lines with alternate verses of eight and five syllables. But his technical skill never sinks to triviality. All his writing bears the stamp of a unique personality, and, if he never attempts a sublime flight, he conveys with contagious force his enthusiasm for life under any conditions—in town, country, vagabondage or gaol.

His influence is visible in *El Corbacho*, the work of another jovial goliard, Alphonso Martinez de Toledo, arch-priest of Talavera, who wrote more than half a century before the *Libro de buen amor* was imitated by the author of the *Celestina*. Ruiz is mentioned with respect by Santillana, and that his reputation extended beyond Spain is proved by the surviving fragments of a Portuguese version of the *Libro de buen amor*. By some strange accident he was neglected, and apparently forgotten, till 1790, when an expurgated edition of his poems was published by Tomás Antonio Sanchez; from that date his fame has steadily increased, and by the unanimous verdict of all competent judges he is now ranked as the greatest Spanish poet of his century.

An accurate edition of his works was published by M. Jean Ducamin at Toulouse in 1901, and he is the subject of Sr. D. Julio Puyol y Alonso's critical study, *El Arcipreste de Hita* (Madrid, 1906). (J. F.-K.)

RUKWA (sometimes also Rikwa and Hikwa), a shallow lake in German East Africa, lying 2650 ft. above the sea in a N.W. continuation of the rift-valley which contains Lake Nyasa. The sides of the valley here run in steep parallel walls 30 to 40 m. apart, from S.E. to N.W., leaving between them a level plain extending from about $7\frac{1}{2}$° to $8\frac{1}{2}$° S. This whole area was probably once covered by the lake, but this has shrunk so that the permanent water occupies only a space of 30 m. by 12 at the S. immediately under the E. escarpment. In the rains its extends some 40 m. farther N., and the north of the plain is likewise then covered with water to a depth of about 4 ft. The rest of the plain is a bare expanse intensely heated by the sun in the dry season, and forming a tract of foul mud near the lake shores. But in 1903–4 the level of the lake rose so that the waters covered the whole depression. The lake has two large feeders, one coming from the W., the other from the S.E. The W. feeder, the Saisi, or Momba, rises in 80° 50′ S., 31° 30′ E., and traverses a winding valley cut out of the high plateau between lakes Nyasa and Tanganyika. It enters the lake on its N.W. side. The other chief feeder, the Songwe, rises in 9° 8′ S., 33° 30′ E. on the same plateau as the Saisi and flows N.W., entering Rukwa at its S. end. The Songwe is joined about 50 m. about its mouth by the Rupa, whose head-waters are in the high-lying land N.E. of Rukwa. The maximum depth of the lake is about $10\frac{1}{2}$ ft. Its water is very brackish and of a milky colour from the mud stirred up by the wind. It contains great quantities of fish. First seen from the north by Joseph Thomson in 1880, it was visited by Dr Kaiser, a German, in 1882, and has since been thoroughly explored by various British and German travellers.

See "Begleitworte zu der Karte der Gebiete am südlichen Tanganjika- und Rukwa-See," by Paul Sprigade, in *Mitteil. v. Forsch. u. Gelehrten a. d. deutschen Schutzgebieten* (Berlin, 1904), with map on the scale of 1 : 500,000.

RULHIÈRE (or Rulhières), **CLAUDE CARLOMAN DE** (1735–1791), French poet and historian, was born at Bondy, near Paris, on the 12th of June 1735. He became aide-de-camp to Marshal Richelieu, whom he followed through the Hanoverian campaign of 1757 and to his government at Bordeaux in 1758; and at twenty-five he was sent to St Petersburg as secretary of legation. Here he actually saw the revolution which seated Catherine II. on the throne, and thus obtained the facts of *Anecdotes sur la révolution de Russie en 1762*. Catherine made repeated efforts to secure the destruction of the MS., which remained unpublished until after the empress's death. Rulhière became secretary to the comte de Provence (afterwards Louis XVIII.) in 1773, and he was admitted to the Academy in 1787. The later years of his life were spent chiefly in Paris, where he held an appointment in the Foreign Office and went much into society; but he visited Germany and Poland in 1776. His unfinished *Histoire de l'anarchie de Pologne* (4 vols., 1807) was published posthumously under the editorship of P. C. F. Daunou. The only important historical work which he published during his lifetime was his *Éclaircissements historiques sur les causes de la révocation de l'édit de Nantes . . .* (2 vols., 1788), undertaken in view of the restoration to the Protestants of their civil rights. Rulhière died at Bondy on the 30th of January 1791.

His short sketch of the Russian revolution is justly ranked among the masterpieces of the kind in French. Of the larger *Poland* Carlyle, as justly, complains that its allowance of fact is too small in proportion to its bulk. The author was also a fertile writer of *vers de société*, short satires, epigrams, &c., and he had a considerable reputation among the witty and ill-natured group also containing Nicolas Chamfort, Antoine de Rivarol, Louis René de Champcenetz, &c. On the other hand he has the credit of caring for J. J. Rousseau in his morose old age, until Rousseau as usual quarrelled with him.

Rulhière's works were edited, with a notice by P. R. Anguis, in 1819 (Paris, 6 vols. 8vo). The *Russian Revolution* may be found in the *Chefs-d'œuvre historiques* of the Collection Didot, and the *Poland*, with title altered to *Révolutions de Pologne*, in the same collection. See also a notice by Eugène Asse prefixed to an edition 1890) of Rulhière's *Anecdotes sur le Maréchal de Richelieu*; Sainte-Beuve, *Causeries du lundi* (vol. iv.).

RULLUS, PUBLIUS SERVILIUS, Roman tribune of the people in 64 B.C., well known as the proposer of one of the most far-reaching agrarian laws brought forward in Roman history. This law provided for the establishment of a commission of ten, empowered to purchase land in Italy for distribution amongst the poorer citizens and for the foundation of colonies. Its professed object was to clear Rome of the large number of pauper citizens, who formed a standing menace to peace. The members of the commission were to be invested with powers so extensive that Cicero spoke of them as ten "kings." They were to be elected for five years by seventeen of the tribes chosen by lot from the thirty-five; the imperium was to be conferred upon them by the *lex curiata*, together with judicial powers and the rank of praetor. Only those were eligible who personally gave in their names, a clause obviously intended to exclude Pompey, who was at the time absent in the East. In fact, the commission as a whole was intended to act as a counterpoise to his power. The only land available for the purposes of the bill was the Ager Campanus and the Ager Stellatis, where 5000 citizens were to be settled at once, but as these were utterly insufficient, other lands were to be acquired by purchase. The necessary money was to be found by the sale of all the public property in Italy which had been ordered to be sold by resolutions of the senate (in 81, or subsequently), but which the fear of unpopularity had deterred the consuls from selling; by the sale of lands, &c., in the provinces which had become public property since 88, and even of the domains acquired during the Mithradatic war. A special article, the object of which was to pacify those who had received grants of land from Sulla, declared such possessions to be private property, for which compensation was to be paid in case of surrender. The revenues of the provinces which were now being organized by Pompey, and the booty and money taken or received by generals during war were also to be applied to this purpose. The places to which colonies were to be sent were not specified (with the exception mentioned above), so that the commissioners would be able to sell wherever they pleased, and it was left to them to decide what was public or private property.

Cicero delivered four speeches against the bill, of which three are still extant, although the first is mutilated at the beginning. The second is the most important for the history of the bill; nothing is known of the fourth. Very little enthusiasm was shown in the matter by the people, who preferred the distribution of doles in the city to the prospect of distant allotments. One of the tribunes even threatened to put his veto on the bill, which was withdrawn before the voting took place. The whole affair was obviously a political move, probably engineered by Caesar, his object being to make the democratic leaders the rulers of the state. Although Caesar could hardly have expected the bill to pass, the aristocratic party would be saddled with the odium of rejecting a popular measure, and the people themselves would be more ready to welcome a proposal by Caesar himself, an expectation fulfilled by the passing of the *lex Julia* in 59, whereby Caesar at least partly succeeded where Rullus had failed.

See the orations of Cicero *De lege agraria*, with the introduction in G. Long's edition, and the same author's *Decline of the Roman Republic*, iii. p. 241; Mommsen, *Hist. of Rome*, bk. v. ch. 5; art. Agrarian Laws.

RUM, or Roum (Arab. *ar-Rūm*), a very indefinite term in use among Mahommedans at different dates for Europeans generally and for the Byzantine empire in particular; at one time even for the Seljuk empire in Asia Minor, and now for Greeks inhabiting Ottoman territory. When the Arabs met the Byzantine Greeks, these called themselves Ῥωμαῖοι, or Romans, a reminiscence of the Roman conquest and of the founding of the new Rome at Byzantium. The Arabs, therefore, called them "the Rūm" as a race-name (already in Kor. xxx. 1), their territory "the land of the Rūm," and the Mediterranean "the Sea of the Rūm." The original ancient Greeks they called "Yūnān" (Ionians), the ancient Romans, "Rūm" and sometimes "Laṭīnīyūn" (Latins). Later, inasmuch as Muslim contact with the Byzantine Greeks was in Asia Minor, the term Rūm became fixed there geographically and remained even after the conquest by the Seljuk Turks, so that their territory was called the land of the Seljuks of Rūm. But as the Mediterranean was "the Sea of the Rūm," so all peoples on its N. coast were called sweepingly, "the Rūm." In Spain any Christian slave-girl who had embraced Islām was named Rūmīya, and we find the crew of a Genoese vessel being called Romans by a Muslim traveller. The crusades introduced the Franks (*Ifranja*), and later Arabic writers recognize them and their civilization on the N. shore of the Mediterranean W. from Rome; so Ibn Khaldūn in the latter part of the 14th century. But *Rūmī* is still used in Morocco for a Christian or European in general, instead of the now elsewhere commoner *Ifranjī*. (D. B. Ma.)

RUM (according to Skeat, a corruption of Malay *brum* or *bram*; the adjective "rum," *i.e.* "queer," being a distinct word, in Gipsy *rom*), a potable spirit distilled chiefly from fermented cane-sugar. It is mainly the produce of the West Indian Islands, notably Jamaica, and of Demerara. There are two kinds of Jamaica rum, namely, "common" or "clean" rum, and "flavoured" or "German" rum. The latter is used almost entirely for purposes of blending with lighter types of spirit. Compared with other potable spirits such as whisky and brandy, the Jamaica rums are distinguished by their very high proportion of secondary products, particularly of the compound esters. Among the latter butyric "ether" (ethyl butyrate) predominates. The Demerara rums are of a lighter character. Rum has a deep brown colour imparted by caramel or by storage in sherry casks, or, most generally, by both. "Tafia" is an inferior quality of rum produced in the French colonies. "Negro" rum, which is the lowest quality of all, and into the wash for which the *débris* of the sugar-cane enters, is consumed locally by the coloured workers. The spirit prepared from beet-sugar molasses cannot be regarded as rum, for, unless it is highly rectified, it possesses a disagreeable odour and taste. Fictitious rum is, however, sometimes prepared from highly rectified beet spirit and rum "essence"—a mixture of artificial esters (ethyl butyrate, &c.), birch bark oil and so on. Highly rectified beet spirit is also occasionally used for blending with genuine rum, particularly with the "flavoured" or "German" rum. The latter name originated in the fact that this kind of rum was exported very largely to Germany for the purpose of blending. The general composition of various kinds of rum is manifest from the annexed table. The consumption of rum in the United Kingdom has fallen off considerably of late years, concurrently with the general tendency of the public towards lighter and "drier" alcoholic beverages (see Spirits).

Composition of Different Varieties of Rum

(Analyses by W. Collingwood Williams; cf. *J. Soc. Chem. Ind.* 1907, p. 498.)

Description.	Alcohol per cent by vol.	Total Acid.	Volatile Acid.	Esters.	Higher Alcohols.	Furfural.	Aldehydes.
		(Results expressed in grams per 100 litres of absolute alcohol.)					
1. *Jamaica Rums*—							
A. *"Common Clear"*							
Average . .	79.1	78.5	61	366.5	98.5	4.5	15.3
Maximum . .	82.1	155	146	1058	150	11.5	30.0
Minimum . .	68.6	30	21	88	46	1.0	5.0
B. *"Flavoured"*							
Average . .	77.3	102.5	95.5	768.5	107	5.2	20.7
Maximum . .	80.0	145	137	1204	144	12.0	37.5
Minimum . .	66.1	45	39	391	80	2.7	13.0
2. *Demerara Rums* .		71 to 123	18.4 to 75	37 to 96		0.6 to 2.7	

RUMANIA, or Roumania [*România*], a kingdom of south-eastern Europe, situated to the north-east of the Balkan Peninsula,[1] and on the Black Sea. Pop. (1910, estimate) 6,850,000; area, about 50,720 sq. m., or about 6500 sq. m. less than the combined areas of England and Wales. Rumania begins on the seaward side with a band of territory called the Dobrudja (*q.v.*); and broadens westward into the form of a blunted crescent, its northern horn being called Moldavia, its southern Walachia.

Physical Features.—Along the inner edge of this crescent run the Carpathian Mountains, also called, towards their western extremity, the Transylvanian Mountains (*q.v.*) or Transylvanian Alps; and the frontier which marks off Rumania from Hungary is drawn along their crests. The eastern boundary is formed by the river Pruth (*Prutu*), between Moldavia and Russia; farther south by the Kilia mouth of the Danube (*Dunarea*), between the Dobrudja and Russia, and by the Black Sea. In the extreme south-east, an irregular line, traced from Ilanlâc, 10 m. S. of Mangalia, on the coast, as far as the Danube at Silistria, 85 m. inland, separates the Dobrudja from Bulgaria. Otherwise, the Danube constitutes the whole southern frontier; its right bank being Bulgarian for 290 m., and Servian, in the extreme west, for 50 m. The Danube (*q.v.*) enters Rumania through the Verciorova or Kazan[2] Pass. It here resembles a long lake, overshadowed by precipitous mountains, which vary from 1000 to 2000 ft. in height, and are covered by birches and pines. In this neighbourhood the channel contracts to about 116 yds. in width, with a depth of 30 fathoms. At the eastern end of the pass are the celebrated Iron Gates, a rapid so named by the Turks, not from the surrounding heights, which here descend gradually to the river, but from the number of submerged rocks in the waterway. As it flows eastward from the frontier, the Danube gains in breadth and volume. Islands are frequent; the banks recede and become lower until, after 50 m., they stand almost level with the water. Henceforward, for 290 m., the Rumanian shore is a desolate fen-country, varied only by a few hills, by cities, and by lagoons often 15 m. long. East of Bucharest, a chain of lagoons and partially drained marshes stretches inland for 45 m. At Silistria the river bends N.N.E. for 110 m. with the Dobrudja on its right, and a barren plain, called the Baragan Steppe, on its left. It here encloses two large swampy islands, the upper being 57 m., the lower 43 m. long. Both have an average breadth of 10 m. Beyond Galatz, the river again turns eastward, branching out, near Tulcea, into three great waterways, which wind through a low-lying alluvial delta to the sea. The northern estuary is named the Kilia Mouth; the central, the Sulina; the southern, the St George's. Between Verciorova and the Sulina Mouth, the Danube traverses 540 m. Its current is rapid, and supplies the motive

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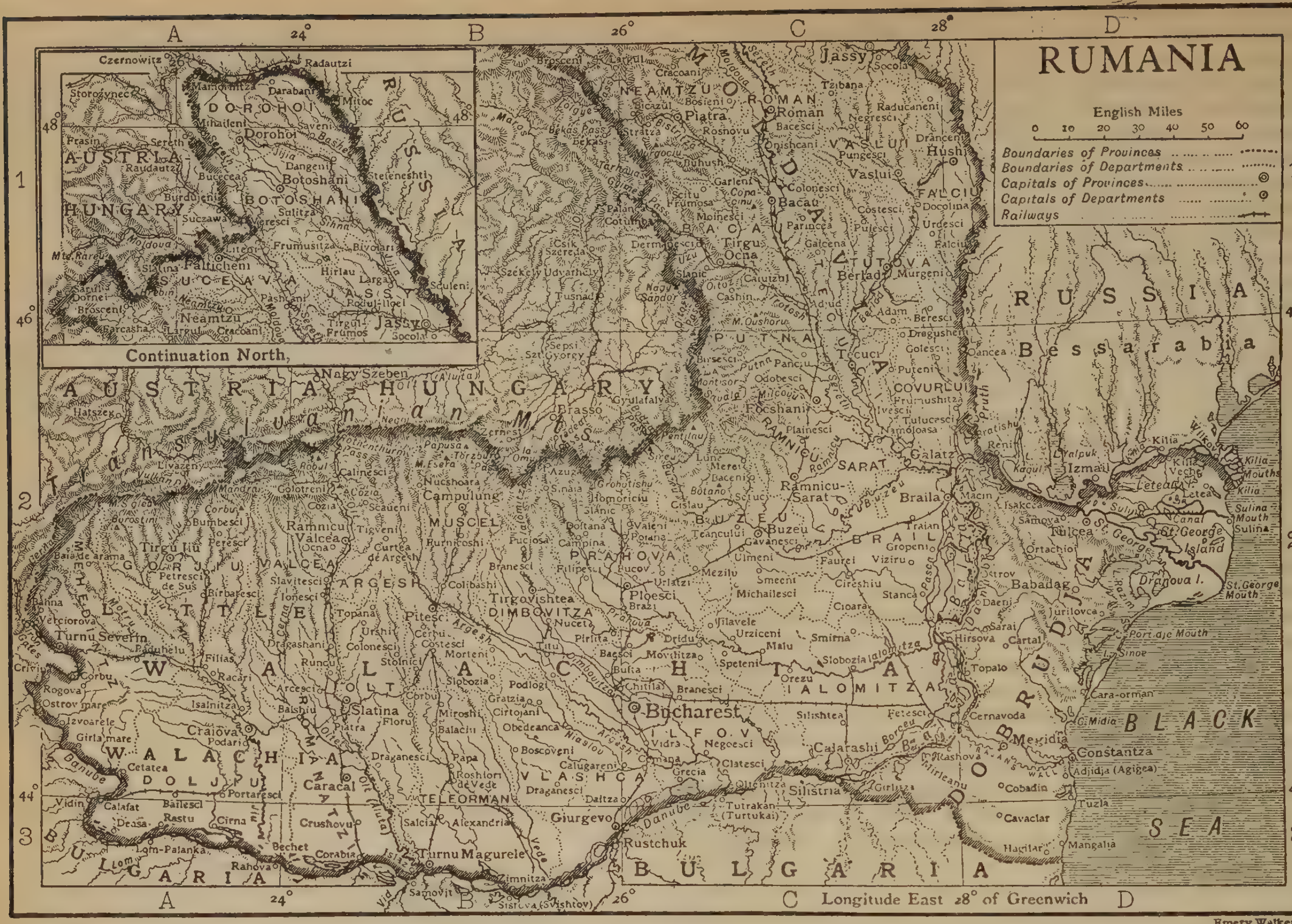
[1] In 1904, in a lecture read before the Rumanian Geographical Society, M. A. Sturdza showed that Rumania should not be included in the Balkan Peninsula, where it is placed by many writers and cartographers. This view was accepted by the Society, and a copy of the lecture was forwarded to all similar associations in Europe. See A. Sturdza, *La Roumanie n'appartient pas à la péninsule balkanique* (Bucharest, 1904).

[2] *I.e.* Cauldron.



Emery Walker sc.

power for thousands of floating watermills, which lie moored in the shallows. It is fed by many tributaries, which rise in the Carpathians as mountain torrents, growing broad and sluggish as they flow south-eastward through the central Rumanian plain. In Walachia, it is joined by the Jiu (or Schyl) opposite Rahova; by the Olt (ancient Aluta) at Turnu Magurele; by the united streams of the Dimbovitza (*Dambovița*) and Argesh (*Argeș*) at Oltenitza; by the Jalomitza (*Ialomița*) opposite Hirsova. The Olt pierces the Carpathians, by way of the Rothenthurm Pass, and forms the boundary of Little (*i.e.* western) Walachia, or Oltland. The Sereth (*Siretu* or *Seretu*) flows for about 340 m. from its Transylvanian source through Moldavia, and meets the Danube near Galatz, after receiving the Moldova, Bistritza (*Bistrița*), Trotosh (*Trotoșŭ*), Milcovŭ, Putna, Râmnicŭ and Buzĕu on the west; and the Bêrlad (*Bêrladŭ*) on the east. The Milcovŭ was the former boundary between Walachia and Moldavia. The Pruth rises on the northern limit of Moldavia, forms the eastern frontier for 330 m., and falls into the Danube 10 m. E. of Galatz. Its chief Rumanian tributaries are the Basheu (*Bașeŭ*) and Jijia, rivers of the north. The Dobrudja (*q.v.*) or Dobrogea covers about 2900 sq. m. between the Black Sea and the lower reaches of the Danube. Its high crystalline rocks, covered with sedimentary formations, descend abruptly towards the delta, but more gradually towards the south, where the Bulgarian steppes encroach upon Rumanian soil. The few small rivers which drain the hills generally flow seaward, but those of the delta and steppes belong to the Danubian system. The coast is a low-lying region of sandhills, meres and marshes with one lagoon, 42 m. long, connected by a short stream with the St George Mouth. Its outlet on the sea is named the Portidje Mouth (*Gura portiții*) of the Danube. North of this, the lagoon is called Lake Razim; while its southern half, shut off by three long islands, is the Blue Lake (*Sinoe Osëro*, in Bulgarian).

Apart from the Dobrudja, the whole of Rumania is included in the northern basin of the lower Danube. It consists of a single inclined plane stretching upwards, with a north-westerly direction, from the left bank of the river to the summits of the Carpathians. It is divided into three zones—steppe, forest and alpine. The first begins beyond the mud-flats and reed-beds which line the water's edge, and is a vast monotonous lowland, sloping so gently as to seem almost level. The surface is a yellow clay, with patches of brown or dark grey, outliers of the Russian "black earth." Cereals, chiefly maize, with green crops and fields of gourds, alternate with fallow land overgrown by coarse grasses, weeds and stunted shrubs. Among the scanty trees, willows and poplars are commonest. The second zone extends over the foothills and lower ridges of the Carpathians. This region, called by Rumans "the district of vines," is the most fertile portion of the country. In it grow most fruits and flowers which thrive in a temperate climate. Oaks, elms, firs, ashes and beeches are the principal forest trees. The third zone covers the higher mountains on their southern and eastern sides, whose violently contorted strata leave many transverse valleys, though usually inclining laterally towards the south-east. The birch and larch woods of this zone give way to pine forests as the altitude increases; and the pines to mosses, lichens and alpine plants, just below the jagged iron-grey peaks, many of which attain altitudes of 6000 to 8000 ft.

Geology.—The axis of the Transylvanian Alps consists of sericite schists and other similar rocks; and these are followed on the south by Jurassic, Cretaceous and Early Tertiary beds. The Jurassic and Cretaceous beds are ordinary marine sediments, but from the Cenomanian to the Oligocene the deposits are of the peculiar facies known in the Alps and Carpathians as Flysch. Farther north, the Flysch forms practically the whole of the Rumanian flank of the Carpathians. Along the foot of the Carpathians lies a broad trough of Miocene salt-bearing beds, and in this trough the strata are sometimes horizontal and sometimes strongly folded. Outside the band of Miocene beds the Sarmatian, Pontian and Levantine series, often concealed by Quaternary deposits, cover the great part of the Danube plain. Even the Pontian beds are sometimes folded. In the Dobrudja crystalline rocks, presumably of ancient date, rise through the Tertiary and recent deposits and form the hills which lie between the Danube and the Black Sea.[1]

Climate.—The Rumanian climate alternates between extreme cold in winter, when the thermometer may fall to −20° Fahrenheit and extreme heat in summer, when it may rise to 100° in the shade. Autumn is the mildest season; spring lasts only for a few weeks. Spring at Bucharest has a mean temperature of 53°; summer,

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[1] See L. Teisseyre and L. Mrazec, *Aperçu géologique sur les formations salifères et les gisements de sel en Roumanie*, *Moniteur des intérêts pétrolifères roumains* (1902), pp. 3–51; S. Stefanescu, *Étude sur les terrains tertiaires de Roumanie* (1897); J. Bergeron, "Observations relatives à la structure de la haute vallée de la Jalomita (Roumanie) et des Carpathes roumaines," *Bull. Soc. Géol. France*, ser. 4, vol. iv. (1904), pp. 54–77.

72·5°; autumn, 65°; winter, 27·5°. For about 155 days in each year, Rumania suffers from the bitter north-east wind (*crivets*) which sweeps over south Russia; while a scorching west or south-west wind (*austrŭ*) blows for about 126 days. Little snow falls in the plains, but among the mountains it may lie for five months. The frosts are severe, the Danube being often icebound for three months. The rainfall, which is heaviest in summer, averages about 15–20 in.

Fauna.—In its fauna, Walachia has far more affinity to the lands lying south of the Danube than to Transylvania, although several species of *Claudilia*, once regarded as exclusively Transylvanian, are found south of the Carpathians. Moldavia and the Baragan Steppe resemble the Russian prairies in their variety of molluscs and the lower kinds of mammals. Over 40 species of freshwater mussels (Unionidae) have been observed in the Rumanian rivers. The lakes of the Dobrudja likewise abound in molluscs; parent forms, in many cases, of species which reappear, greatly modified, in the Black Sea. Insect life is somewhat less remarkable; but besides a distinctive genus of Orthoptera (*Jaquetia Hospodar*), there are several kinds of weevils (Curculionidae) said to be peculiar to Rumania. Birds are very numerous, including no fewer than 4 varieties of crows, 5 of warblers, 7 of woodpeckers, 8 of buntings, 4 of falcons, and 5 of eagles; while among the hosts of waterfowl which people the marshes of the Danube are 9 varieties of ducks, and 4 of rails. Roe-deer, foxes and wolves find shelter in the forests, where bears are not uncommon; and chamois frequent the loftiest and most inaccessible peaks.

Minerals.—The mineral wealth of Rumania lies chiefly in the mountains. Petroleum, salt, lignite and brown coal are largely worked. Deposits of rock-salt, a valuable government monopoly, stretch from the department of Suceava in northern Moldavia to that of Gorjiu in Walachia, and are mined in the departments of Bacau, Prahova and Râmnicŭ Sărat. The presence of petroleum, indicated by many ancient workings in the shape of shallow hand-dug wells, can be traced continuously at the foot of the Transylvanian Alps, from Turnu Severin into Bukovina. Rumans claim for their product a higher percentage of pure oil than is found in the American, Galician and Caucasian wells; and, although American competition nearly destroyed this industry between 1873 and 1895, improved methods and legislation favouring the introduction of foreign capital enabled it to recover. At the beginning of the 20th century the Rumanian petroleum deposits were among the most important in the world. The industry is carried on by private producers as well as by the state, the American Standard Oil Company being largely interested. The total output, coming chiefly from the departments of Bacau, Buzeu, Dimbovitza and Prahova, was 250,000 metric tons in 1900, 615,000 in 1905, and 1,300,000 in 1909. Associated with petroleum is ozokerite, converted by the peasantry into candles. Lignite is used as fuel on the railways. The chief anthracite beds, those in the Gorjiu department, are leased until 1975 to an English capitalist, who has the right to construct railways. Extensive coalfields exist in the Dobrudja, and the Dimbovitza, Mehedintzi, Muscel, Prahova and Vâlcea departments. Iron, copper, lead, mercury, cinnabar, cobalt, nickel, sulphur, arsenic and china clay also occur. Among the mountains, gold was perhaps worked under Trajan, who first appointed a *Procurator Metallorum*, or overseer of mines, for Dacia; certainly in the 14th century, when immigrant Saxon miners established a considerable trade with Ragusa, in Dalmatia. Under the Turks, gold-washing was carried on by gipsy slaves, but it has long been abandoned as unprofitable. Until 1896 building materials were chiefly imported; but, after that year, many quarries were opened to develop the native resources of limestone, sandstone, serpentine, red, yellow and green granite, and marbles of all colours, including the white marble from Dorna in Suceava, said by Rumans to rival that of Carrara in Italy. Clear amber is found beside the Buzeu and its affluents, with brown and grey clouded amber, and a blue fluorescent variety, of considerable value.

Rumania has long been noted for its mineral springs. Ruins of a Roman bath exist near Curtea de Argesh. In the Vâlcea department, besides many other iodine, sulphur and mud baths, there are the state-supported spas of Calimanescii, Caciulata and Govora, situated among some of the finest Carpathian scenery. Most famous of all is Sinaia (*q.v.*), the summer residence of the Court; while important springs exist at Lake Sarat, near Braila; at Slanic, in the Prahova department, where flooded and abandoned salt-mines are fitted up as baths; at the Tekir Ghiol mere, near Constantza; and at Baltzatesti (*Balţateştiĭ*), in the Neamtzu (*Neamţŭ*) department, a favourite resort of invalids from many parts of eastern Europe.

Agriculture.—That, in 1900, Rumania ranked third,[1] after the United States and Russia, among the grain-growing countries of the world, is due partly to the fertile soil, whose chemical constituents are the same as in the "black earth" region of Russia, though even richer in nitrates; partly also to the improved methods and appliances introduced in the last quarter of the 19th century. The frail wooden ploughs with a lance-headed share that only scratched the surface soil, were then superseded by iron ploughs; steam threshers replaced the oxen which trod out the corn, and modern implements were widely adopted. Vast harvests of wheat and maize ripen on the plains and lower hills. Apart from cereals, the principal crops are beans, potatoes, beetroot and tobacco. Among the wine-producing countries of Europe, Rumania stood fifth in 1900, despite the ravages of *phylloxera*, old-fashioned culture, lack of storage and other drawbacks. The red wines of Moldavia, especially the brand known as *Piscul Cerbuluĭ*, resemble Bordeaux. The best white wines came from Cotnar in the Jassy department, but here *phylloxera* ruined the vineyards. Golden Cotnar was akin to Tokay. To combat the *phylloxera*, the government ordered the destruction of all infected vines, distributed immune American stocks and established schools of viticulture. On the upland fruit farms, although apples, pears, medlars, cherries, plums, peaches, apricots and melons thrive, the chief attention is given to damsons, from which is extracted a mild spirit (*tsuica*), highly esteemed throughout Rumania. This industry began to decline after 1860, but revived with the establishment of government schools of fruit-culture in many villages. Further instruction was given at various horticultural institutes in the towns, notably the Botanic Gardens and Institute of Bucharest, where the experiments in planting figs, almonds, hops and cotton yielded favourable results. Tobacco is largely cultivated, under state supervision.

There are three breeds of Rumanian oxen, besides the peculiar black buffaloes, with horns lying almost flat along their necks. Cheap transit enables the Rumanian farmers to compete successfully in the meat-markets of Austria, Germany and Holland. The southern Dobrudja and the Baragan Steppe, with the mountain pastures of Argeh, Buzeu, Dimbovitza, Muscel and Prahova, are occupied by large sheep-runs; 1200 farms were created in the Baragan by the Land Act of 1889. In winter the flocks are driven from the highlands to the plains. Cheeses of ewe's milk, packed in sheepskins or bark, are in great demand. Swine and pork are largely exported to Russia and Austria-Hungary. Besides the Moldavian and Servian breeds, thousands of so-called "swamp hogs" run wild among the marshes and on the islands of the Danube. Silkworm-rearing, once an important household industry, had been almost abandoned, when, in 1891, the government established mulberry nurseries, and distributed silkworms free of charge. Silkworm-rearing is taught in the monasteries and agricultural schools, especially in the College of Agriculture and Sylviculture, at Ferestriu, near Bucharest. Similar measures were adopted to check the decline of bee-keeping, and a model apiary was founded in 1890, under government control.

Forests.—The forests of Rumania were long either neglected or exploited in the most reckless fashion. Large tracts of woodland were cleared near the railways, and the communal rights of grazing and gathering firewood destroyed the aftergrowths. Nevertheless, in 1910 there were 2,760,000 acres under forests, chiefly in the mountains of north-western Moldavia. More than 1,000,000 acres are state property. Under King Charles, an ardent forester, the wholesale destruction of timber was arrested, and new plantations met with success. Lumber is floated down the rivers of the Carpathian watershed to the Danube, and so exported to Turkey and Bulgaria; casks, shaped planks and petroleum drums go chiefly to Austria and Russia. Wood-carving is taught in many schools, and a special school of forestry exists at Branesci in the Ilfov department. Estates in private hands are liable to state control, under the Forests Act of 1886.

Land Tenure.—The Rumanian system of land tenure dates from 1864, when most of the land was held in large estates, owned privately, or by the state or by monasteries. There was also a small class of peasant proprietors, called *mochenéni* in Walachia, *rèsèchi* in Moldavia, living and working in family communities; but the great mass of the peasantry cultivated the lands of the large proprietors, giving a certain number of days' work to their manorial lord, in addition to a tithe of the raw produce. They received in return a plot of ground proportionate to the number of animals they owned, and had also rights of grazing and of collecting fuel in the forests. In 1864, under the government of Prince Cuza, a new law was promulgated, conferring on each peasant family freehold property in lots varying from 7½ to 15 acres, according to the number of oxen that they owned. The man with no cattle received the minimum; the owner of 2 oxen got 10 acres, and the possessor of 4 received 12½ to 15 acres. The price of the land, which was calculated on the basis of the value of the forced labour to which the landlord had been entitled, was about £1, 16s. per acre, paid to the landlord by the state as compensation, and subsequently recovered from the peasants in fifteen annual instalments. In the first distribution, which took place almost immediately after the law was passed, 280,000 families in Walachia and about 127,000 in Moldavia became freeholders, holding nearly 4 million acres or one-third of the cultivated area of the country. These peasant plots were all declared inalienable for thirty years. The law of emancipation, although passed with the best of motives, did not to any great extent benefit the peasantry. The limited size of their farms, and the necessity for buying wood and paying for pasturage, both of which were formerly free, prevented them from obtaining complete independence of the large proprietors, on whose estates they still had to work for payment in money or kind, while their improvidence soon got them into the hands of Jewish money-lenders, who, fortunately for the peasants, were by law unable to become proprietors of the soil. In 1866 and 1872 laws were passed for still further improving the position of these small proprietors; and in 1879 a measure was carried for allotting lands to 48,000 recently married couples, and for restoring to many peasant families lands which had been alienated.

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[1] The relative importance of Rumania was afterwards lessened by the development of wheat-culture in Canada, Argentina and elsewhere.

By the Land Act of 1889, the state domains, amounting to nearly one-third of the total area of Rumania (originally the property of the church and the convents, confiscated by Prince Cuza in 1866), were distributed among the peasantry. The land was divided into lots of 12½, 25 and 37½ acres. Peasants having no land might purchase the smaller lots on very easy terms. Those who already held less than 12½ acres might purchase up to that amount. When a change of residence became necessary to enable the peasant to take up the new allotment, the state advanced £6 to each family to defray expenses. The price to be paid for the land differed in different districts, and was to be paid to the state in small annual instalments. If any land remained after satisfying the wants of the peasants, it was to be sold by public auction in lots of 50 to 62½ acres. All lots in both cases were declared inalienable for thirty years. The sale of the larger lots gave rise to so many abuses that in 1896 a law was passed abolishing their further sale. As a result of these measures the majority of Rumans are peasant proprietors; but the smallness of the holdings renders scientific farming difficult except by co-operation, and many proprietors can only live by working for the owners of large estates. Thus, though the average value of agricultural land increased by 60% between 1870 and 1900, the position of the peasantry is far from satisfactory, and the resultant discontent was the chief cause of the agrarian rising in 1907.

Fisheries.—Among European freshwater fishing-grounds, the Danube is only surpassed by the Volga; the most valuable fish being sturgeon and sterlet, mostly netted in the St George mouth; carp, often weighing 50 ℔; pike, perch, tench and eels. By an act of 1895, a close period was instituted, the lakes and rivers restocked, and the state fisheries, which are either farmed by private companies or directly administered, were set in order. The coarse-grained grey Rumanian caviare is forwarded to Berlin, and there blended with Russian caviare. Flounders and mullet are caught in the Black Sea, and there are oyster-beds in the delta and on the Dobrudja littoral. The principal markets for Rumanian fish are Turkey, Russia and Austria-Hungary. Fish of inferior quality is imported, chiefly from Russia.

Manufactures and Commerce.—The native mines, fields and forests provide raw material for most of the few factories which exist. These include petroleum refineries, iron foundries, distilleries, flour mills, sugar refineries, sawmills, paper mills, chemical works, glass works, soap and candle works, &c. A law passed in 1887 provided that any one undertaking to found an industrial establishment with a capital of at least £2000, or employing at least 25 workmen (of whom two-thirds should be Rumanians), should be granted 12 acres of state land, exemption for a term of years from all direct taxes, freedom from customs dues for machinery and raw material imported, exemption from road taxes, reduction in cost of carriage of materials on the state railways, and preferential rights to the supply of manufactured articles to the state.

The following table shows the value of Rumanian imports and exports for five years:—

Year.	Imports.	Exports.
1904	£12,455,000	£10,475,000
1905	13,510,000	18,284,000
1906	16,885,000	19,654,000
1907	17,220,000	22,157,000
1908	16,563,000	15,158,000

The principal imports are metals and machinery (£5,510,000 in 1908), textiles, silk, wool, hair and hides. Grain (£11,297,000 in 1908), petroleum (£1,543,000) and timber (£1,059,000) are by far the most important exports, the remainder consisting of live-stock the animal products, fruit, vegetables and mineral waters. In 1908 the chief consumers of Rumanian goods were (in order) Belgium, Great Britain and Italy; the chief exporters to Rumania were Germany, Austria-Hungary, Great Britain and France. The wide fluctuations in Rumanian commerce are largely due to the dependence of the country on the grain harvest.

Finance.—The state revenue is derived from customs; from public works and public land; from indirect taxes in the shape of stamp, inheritance, beer, spirit, petroleum and other duties; from direct taxes on land and buildings, with road-tolls, licences for the sale of alcohol and traders' registration fees; from the tobacco, salt, match, playing-card and cigarette-paper monopolies; and from the postal, telegraphic and telephonic services. The chief items of expenditure are interest on the national debt, and the cost of defence, public works and education.

The following table shows the estimated revenue and expenditure for five years:—

Year.	Revenue.	Expenditure.
1906–7	£9,557,000	£9,509,000
1907–8	10,099,000	9,979,000
1908–9	16,440,000	16,390,000
1909–10	17,427,000	17,146,000
1910–11	18,443,000	18,443,000

The great increase after 1907–8 is due to the inclusion of railway receipts and expenditure, with some other items not previously enumerated.

In May 1905 the outstanding public debt, which amounted to about £54,000,000, mainly placed in Germany and bearing interest at an average rate of 5%, was converted into a uniform 4% stock. Besides this reduction of interest, the state secured an extension of fourteen years in each of the various periods allotted for repayment of the component loans. But a considerable increase in the total debt was involved, because a bonus of 10½% in new 4% stock, issued at par, was offered to induce bondholders to convert, while, to cover the bonus, an additional 4% loan was riased at 90·70, amounting to £4,000,000, redeemable in 1945. At the beginning of the fiscal year 1909–10 (March 31st, O.S.) the total outstanding debt was £58,367,000, and the debt charges for the year were estimated at £3,518,080.

Banks and Currency.—Apart from the General Bank of Rumania (capital £200,000), which is owned by a syndicate mainly of Germans, the largest credit establishments belong to the state. They include the National Bank (capital and reserves in 1910, £1,560,000), founded in 1880; the Agricultural Loan Bank, founded in 1894; the Rural and Urban Land Credit Institutes, which lend money on agricultural and building land respectively; the Cassa Rurala, which buys estates for resale in small lots; savings banks in all the principal towns; and the Deposit and Trust Fund, which takes charge of estates left vacant through intestacy, surplus departmental and communal funds, securities given by contractors for public works, &c.

After the Crimean War, a bimetallic currency was adopted, with the *leŭ* (franc) of 100 *bani* (centimes) as the unit of value. But after 1878 the Russian silver rouble was rated so highly as to drive the native coins out of circulation; and in 1889 Rumania joined the Latin Monetary Union and adopted a gold standard. Besides the silver pieces worth ½, 1, 2 and 5 *leĭ*, gold coins of 5, 10 and 20 *leĭ* are used. Silver is legal tender only up to 50 *leĭ*. All taxes and customs dues must be paid in gold, and, owing to the small quantities issued from the Rumanian mint, foreign gold is current, especially French 20-franc pieces (equal at par to 20 *leĭ*), Turkish gold *lire* (22·70), Old Russian Imperials (20·60) and English sovereigns of (25·22). Besides bronze coins of less value than ½ *leŭ*, nickel pieces worth 5, 10 and 20 *bani* were authorized by a law of 1900. The French decimal system is in use for weights and measures, together with Turkish standards. On the railways and in post offices the Gregorian calendar is employed; elsewhere the Julian remains in use.

Chief Towns.—The chief towns, with their estimated population in 1910, are Bucharest, the capital (300,000); Jassy, the capital of Moldavia (80,000); Galatz (66,000), Braila (60,000), Ploesci (50,000), Craiova (46,000), Botoshani (34,000), Bêrlad (25,000), Focshani (25,000), Tulcea (20,000), Constantza (16,000), Giurgevo (15,000). Other towns which, like the foregoing, are described in separate articles are Alexandria, Babadag, Bacau, Buzeu, Calafat, Calarashi, Câmpulung, Caracal, Curtea de Argesh, Dorohoi, Dragashani, Falticeni, Hushi, Mangalia, Neamtzu, Oltenitza, Piatra, Pitesci, Râmnicu Sărat, Râmnicu Vâlcea, Roman, Sinaia, Sulina, Tîrgu Jiu, Tîrgu Ocna, Tîrgovishtea, Tecuci, Turnu Magurele, Turnu Severin and Vaslui.

Communications.—Until the 19th century, traffic was carried on in Rumania chiefly by means of ox-wagons, over the roughest of roads. After 1830, however, many highways were opened, these being usually excellent among the mountains but deteriorating as they descend into the lowlands, where stone is dear. Highways are maintained by the state, department or commune, according to their size and importance. In 1869, the first Rumanian railway was opened, between Bucharest and Giurgevo, its port. Other lines followed rapidly; some built by private enterprise, others by the state, which by 1888 had bought the entire system. This centres in one main line, carried southwards from Suczawa in Bukovina through the whole length of Moldavia, and turning westwards through Walachia to meet the Hungarian frontier at Verciorova. Branch lines extend, on one side, up the lateral valleys of the Carpathians, and, on the other, to Jassy and the principal Danubian ports. A direct line connects Jassy with Galatz; another traverses the Dobrudja from Constantza to Cernavoda, where it crosses the Danube and proceeds north-west to join the main line. The double bridge of Cernavoda, with the viaducts leading to it, stretches for 12½ m. across the river and surrounding marshes. Besides the junctions at Suczawa and Verciorova, the Rumania system meets the Hungarian through the Gyimes, Rothenthurm and Vulkan Passes; the Russian by lines from Jassy and Galatz to Kishinev in Bessarabia; the Bulgarian and Servian by means of numerous ferries. Rumania has no canals, and the canalization of its rivers is impeded by drought and floods. The Pruth and Sereth are navigable for a short distance by small sailing craft; the conservancy of the Danube (*q.v.*) is controlled by a European commission, which sits at Galatz. Besides river services, the state maintains lines of sea-going ships from Constantza to Constantinople and the Aegean Islands, and from Braila to Rotterdam. In 1908 the ports of Rumania were entered by 32,888 vessels of 9,269,000 tons, of which 30,504 of 6,529,000 tons belonged to the river (Danubian) trade. The merchant navy of Rumania comprised about 495 vessels of 145,000 tons, including 88 steamers.

Population.—The population of Rumania numbered 5,912,520 in 1899, and about 6,850,000 in 1910. Fully 6,000,000 of these were Rumans or Vlachs (*q.v.*). The population of foreign descent comprises many Jews, Armenians, gipsies, Greeks, Germans, Turks, Tatars and Magyars, Servians and Bulgarians. The Jews increase more rapidly than any of these peoples except the Armenians. They usually congregate in the larger towns, though in northern Moldavia there are a few purely Jewish villages, recalling those of Poland.

The bitter feeling against them in Rumania is not so much due to religious fanaticism as to the fear that if given political and other rights they will gradually possess themselves of the whole soil. In many towns in northern Moldavia the Jews are in a majority, and their total numbers in Rumania are about 300,000, *i.e.* about one-twentieth of the entire population, a larger ratio than exists in any other country in the world. In many places they have the monopoly of the wine and spirit shops, and retail trade generally; and as they are always willing to advance money on usury, and are more intelligent and better educated than the ordinary peasant, there is little doubt that in a country where the large landowners are proverbially extravagant, and the peasant proprietors needy, the soil would soon fall into the hands of the Jews were it not for the stringent laws which prevent them from owning land outside the towns. When in addition it is considered that the Moldavian Jews, who are mostly of Polish and Russian origin, speak a foreign language, wear a distinguishing dress and keep themselves aloof from their neighbours, the antipathy in which they are held by the Rumanians generally may be understood.

The gipsies, who are mostly converts to the Orthodox Church, still, as a rule, cling to their vagabond existence, though their skill at all handicrafts finds them ready employment in the towns. During their centuries of slavery, they were organized into castes, as musicians, metal workers, masons, &c.; but after about 1850 the bonds of caste were gradually relaxed and gipsies began to intermarry with Rumans. The Greeks form a floating population of merchants and small traders, anxious to amass a fortune and return home. German and Austrian business men visit the country in large numbers, and colonies of German farmers flourish among the mountains of Little Walachia. In central Moldavia there is a large population of Magyar descent, and the Servian and Bulgarian elements are strong near the Danube. The interior of the Dobrudja is occupied largely by Turks and Bulgarians, with Tatars, Russians and Armenians, but here the Ruman steadily gains ground at the expense of the alien. At Megidia, a flourishing town of about 10,000 inhabitants, which sprang up after 1860 between Cernavoda and Constantza, the Tatars predominate. Russians of the Lipovan sect live in exile in Bucharest and other cities, earning a livelihood as cab-drivers, and wearing the long coats and round caps of their countrymen.

National Characteristics.—Two dissimilar types are noticeable among the Rumans. One is fair-haired, florid and blue-eyed; the other, more frequent among the Carpathians, is dark, resembling the southern Italians. Both alike are hardy, though rarely tall; both, when of the peasant class, frugal and inured to toil amid the rigours of their native climate. Proud of their race and country, they acquired, with their independence, an ardent sense of nationality; and they look forward to the day which will reunite them to their kinsmen in Transylvania and Bessarabia. They have been taught, originally in the interests of Transylvanian Roman Catholicism, to regard themselves as true descendants of the Romans. The peasants retain their distinctive dress, long discarded, except on festivals and at court, by the wealthier classes. Men wear a long linen tunic, leather belt, white woollen trousers and leather gaiters, above Turkish slippers or sandals. The lowlanders' head-dress is generally a high cylindrical cap of rough cloth or felt, while the mountaineers prefer a small round straw hat. Sundays and holidays bring out a sleeveless jacket, embroidered in red and gold; and both sexes wear sheepskins in cold weather. The linen dresses of women are fastened by a long sash or girdle, wound many times round the waist: the holiday attire being a white gown covered with embroideries, one or more brightly coloured aprons and necklaces of beads or coins. The standard of comfort is lowest along the Danube and in parts of the Dobrudja. As the land becomes higher, the dwellings improve; but, despite the presence of a doctor in each commune, disease is everywhere rife. Many villages are wholly built of timber and thatch, especially amongst the Carpathians, the floors being frequently raised on piles, several feet above the ground. The inner walls are often hung with hand-woven tapestries, which harmonize well with the smoke-blackened rafters, the primitive loom and the huge Dutch stove characteristic of a prosperous Rumanian farm. Many pagan beliefs linger on in the country, where vampires, witches and the evil eye are dreaded by all. The peasants reassure themselves by the use of charms and spells, and by a strict observance of the forms which their creed prescribes. A cross guards every well or spring; every home has its *ikons* or sacred pictures. Church festivals and fasts are kept with equal care. For months together a Ruman will subsist on vegetables and *mamaliga*, the maize porridge that forms his staple diet. Beef and mutton are rarely touched, and in some districts pork is only eaten on St Hilary's day (the 20th of December, O.S.). Veal is the one kind of meat generally consumed. Wine and plum-spirit, or the more powerful brandy distilled from grain, are drunk in great quantities by the townsfolk, more sparingly by countrymen; Rumans generally being more sober than the western Europeans. The ceremonies which accompany a wedding preserve the tradition of marriage by capture; a peasant bride must enter her new home carrying bread and salt, and in parts of Walachia a flower is painted on the outer wall of cottages in which there is a girl old enough to marry. Young men swear eternal brotherhood; girls, eternal sisterhood; and the Church ratifies their choice in a service at which the feet of the pair are chained together. This relationship is morally and legally regarded as not less binding than kinship by birth. The dead are borne to the grave with uncovered faces, and a Rumanian funeral is a scene of much barbaric display. All classes delight in music and dancing. Women hold spinning-parties at which the leader begins a ballad, and each in turn contributes a verse. A number of satirical folk-tales (largely of Turkish origin) are current at the expense of Jew, gipsy or parish priest. The Rumanian folk-songs, sung and often improvised by the villagers, or by a wandering guitar-player (*cobzar*), are of exceptional interest and beauty (see *Literature*, below). The national dances and music closely resemble those of the Southern Slavs (see MONTENEGRO and BULGARIA).

Constitution.—In 1866, Prince Charles of Hohenzollern-Sigmaringen was chosen prince of Rumania by a constituent assembly elected under universal suffrage. This body at the same time drew up a constitution, which remains in force, though modified in 1879 and 1884. In 1881, Prince Charles was proclaimed king. As he proved childless, the succession was accepted by his brother, Prince Leopold, on behalf of his son William; and in 1888 William renounced his claim in favour of Ferdinand his younger brother. Thus the monarchy became hereditary in the family of Hohenzollern-Sigmaringen. No woman may ascend the throne; and, in default of a male heir, the representatives of the people can choose a king among the royal families of western Europe.

Parliament consists of a senate, elected for eight years, and a chamber of deputies, elected for four years. Senators must be forty years old and possess an income of 9400 leĭ (£376). They are chosen by two colleges of electors; one composed of citizens with an income of £80; the other, of citizens with incomes varying from £32 to £80. The heir-apparent, the two archbishops, the six bishops and the rectors of both universities, sit *ex officio* in the senate. For the chamber of deputies, all citizen taxpayers of full age may vote, being organized for the purpose into three colleges. All persons with an income of £50 vote in the first; all residents in an urban commune who pay taxes amounting to sixteen shillings yearly, with those who have been through the primary course of education, and all members of the liberal professions, retired officers and state pensioners, vote in the second. The third college is formed of the remaining taxpayers. Those who can read and write vote directly, the rest indirectly. Every fifty indirect electors choose a delegate, who votes along with the direct electors. The naturalization of Jews and Moslems is hedged about by many technical difficulties, and requires a separate vote of the legislature in every individual case. Deputies must be not less than twenty-five years of age. Both senators and deputies receive 20 leĭ for each day of actual attendance, and travel free on the railways. The king may temporarily veto any measure passed by parliament. Executive power is vested in a council under the presidency of a prime minister, and representing the ministers of foreign affairs; justice; the interior; religion and education; war; finance; agriculture, trade, industry and public domains; and public works. Entire liberty of speech, assembly and the press is guaranteed by the constitution, by which also the titles and privileges of the boiars or nobles were abolished.

For purposes of local government, Rumania is divided into 32 departments, each controlled by a prefect, and subdivided into sub-prefectures and communes. The sub-prefectures (*plasiĭ*) correspond with the French *arrondissements*. Prefects and sub-prefects are appointed by the state, but the chief civic officials are elected. Very heavy *octroi* duties provide the means of municipal administration.

Law and Justice.—Until the 17th century justice was administered according to custom and precedent, or, in ecclesiastical cases, by the rules of an ill-defined canon law. The first change was introduced by Matthew Bassaraba, prince of Walachia (1633–54), and by Basil the Wolf, prince of Moldavia (1634–53). Basil drew up a criminal code, on the principle of "an eye for an eye." Thus, a man guilty of arson was burned alive. No idea of equality before the law as yet existed: nobles might only be beheaded or banished. Bassaraba, besides reforming the canon law, issued a similar criminal code, with a number of civil enactments, based on Roman law, and regulating testaments, guardianship, &c. The next great advance began with the Russian protectorate over Rumania (1828–56), when magistrates were made irremovable, and new tribunals created, including a petty court in each rural commune. But nothing was yet done to modify the relative positions of noble and serf. The growth of the present system dates from the union of Moldavia and Walachia in 1859. The main provisions of Rumanian law are drawn from the codes of western powers, especially the *Code Napoléon*. Besides the communal courts, there are quarter-sessional or circuit courts, where simple cases are decided. An appeal from these lies to the departmental courts, which sit in every capital of a department, and in which sessions are held, at stated times, for the trial by jury of serious offences. Any appeal from the departmental courts is brought before the appeal courts of Bucharest, Craiova, Galatz or Jassy; and thence, if necessary, to the supreme tribunal, or court of cassation (*Curtea de Casatie*), which sits in Bucharest.

Defence.—At the accession of Prince Charles, the Rumanian army consisted of raw levies, led by adventurers from any country, provided with no uniform, and, in many cases, armed only with pikes or sabres. Under Prince Charles universal and compulsory service was introduced. The present system, in which his reforms culminated, rests upon a law of 1891, modified in 1900 and 1908.

By this law the forces are divided into three sections. The first is composed of men between the ages of 21 and 30, enrolled in the field army and its reserves. Every citizen capable of bearing arms must serve from his 30th to his 36th year in the second section, or territorial militia, which musters in spring for shooting-practice and in the autumn for field manœuvres. In the militia are included soldiers who have served their time in the ranks, and recruits chosen by lot from the yearly contingent of conscripts but not immediately summoned for duty in the field army. Finally, every citizen between the ages of 36 and 46 belongs to the third section, called the *Gloata* (*Landsturm*), which can only be called upon for home service in war. In time of peace the field army consists of four complete army corps, with headquarters at Craiova, Bucharest, Jassy and Galatz; besides an independent brigade in the Dobrudja, and a separate cavalry division with headquarters at Bucharest. Its peace strength in 1909–10 was 4415 officers, 89,227 non-commissioned officers and men, and 18,920 horses. The infantry was armed with the Mannlicher magazine rifle (model 1893), the cavalry with the Mannlicher carbine, the horse and field artillery with Krupp quick-firing guns. On a war footing the field army would contain 225,000 combatants. It was estimated that the militia should ultimately furnish an additional force of 100,000 men, but up to 1910 this branch of the service was not completely organized. The arrangements for mobilization are otherwise very complete, and the field army is maintained in a high state of efficiency. The war budget for 1909–10 was £2,271,300.

The fortifications designed in 1882 by the Belgian engineer, General Brialmont, and completed at a cost of more than £4,000,000, form the keystone of the national defences. They consist of the Sereth Line, an entrenchment extending over a front of 45 m. from Galatz to Focshani, and intended to cover an army of defence against invaders from the north-east, and of the outworks which make Bucharest the largest fortified camp in the world, except Paris. All these fortifications, including the additional works at Galatz and Focshani, are strongly armed with Krupp and Gruson guns.

The Rumanian navy is divided into two squadrons; one for the Danube, with headquarters at Galatz; one for the Black Sea, with headquarters at Constantza. In 1909–10 the fleet comprised one cruiser, seven gunboats, eight torpedo-boats, six coastguard vessels, a training-ship, a despatch-boat, a ship for the mining service and numerous vessels for naval police. The state possesses a floating dock and a marine arsenal at Galatz.

Religion.—The State Church of Rumania, which is governed by a Holy Synod, professes the Orthodox Oriental creed. Its independence was formally recognized by the oecumenical patriarch of Constantinople, in 1885. The Rumanian Church had claimed its independence from very ancient times, but under the Turkish suzerainty and Phanariote hospodars Greeks were generally elected as bishops, and the influence of the Greek patriarch at Constantinople came to be more and more felt. In 1864 it declared itself independent of all foreign prelates. In 1872 a law was passed by which the bishops were elected by the senate, the chamber of deputies, and the synod sitting as an assembly (the only other occasion on which provision is made for such an assembly is in the event of the throne becoming vacant without any apparent heir). It was subsequently decided to consecrate the holy oil in Rumania instead of procuring it from Russia or Constantinople; but the Greek patriarch protested. Secret negotiations were entered into which came to a successful issue. The patriarch feared on the one hand that the growing influence of the Russian Church would give a colour of Slavism to the whole church, and that a Russian might eventually be appointed oecumenical patriarch at Constantinople, while the Rumanians hoped by means of the independence of their church to deprive the Russians of all excuse for interfering in their internal affairs under the pretext of religion. The Rumanians, although obtaining complete independence, agreed to recognize the patriarch at Constantinople as the chief dignitary of the Orthodox Church.

The metropolitan archbishop of Bucharest, officially styled metropolitan primate of Rumania, presides over the Holy Synod; the other members being the metropolitan of Jassy (primate of Moldavia), the six bishops of Râmnicu Vâlcea, Roman, Hushi, Buzeu, Curtea de Argesh and the Lower Danube (Galatz); together with eight bishops *in partibus*, their coadjutors. Metropolitans and bishops are elected by the senate and deputies, sitting together. In Hungary there are a uniate metropolitan and three bishops belonging to the Rumanian church. The secular clergy marry before ordination; and only regular clergy (*kalugari*) are eligible for high preferment. Although many convents had been closed and utilized for secular purposes, there were in 1910 no less than 168, including nunneries. The older convents are usually built in places difficult of access and are strongly fortified; for in troublous times they served as refuges for the peasants or rallying-places for demoralized troops. The sequestration of the monastic estates, which in 1864 covered nearly one-third of Rumania, was due to flagrant abuses. Many estates were held by alien foundations, such as the convents of Mount Athos and Jerusalem; while the revenues of many more were spent abroad by the patriarch of Constantinople. Religious liberty is accorded to all churches, Jews, Moslems, Roman Catholics, Protestants, Armenians and Lipovans having their own places of worship.

Education.—Primary education is free and compulsory, "where schools are available," for children between seven and eleven years of age. At the close of the 19th century, however, the accommodation was insufficient, the attendance limited in consequence, and the percentage of illiterates high; reaching 88·5% in some of the rural communes. Great improvements were effected between 1900 and 1907, the number of schools increasing from 3643 to 4463, and the pupils from 298,000 to 515,000. The state contributes to the maintenance of elementary schools, for the Vlachs in Macedonia, Bulgaria and Transylvania.

Secondary and higher education are also free. There are gymnasia, or grammar schools of four classes, roughly corresponding with the German sub-gymnasia; and lyceums of eight classes, which answer to the German gymnasia. Up to the fourth class all pupils are taught alike in the lyceums; in the fifth, however, they are divided into a literary or "humanist" section, and a scientific or "realist" section. The four upper classes are taught French and German; English and Italian being added for the "realists," Greek and Latin for the "humanists." Technical instruction is given in the agricultural schools; in various arts and crafts institutes, such as those of Bucharest and Jassy; in the veterinary and engineering colleges of Bucharest; in numerous commercial schools, and in schools of domestic economy for girls. In 1909–10 there were four ecclesiastical seminaries, seven training schools for teachers and eight military schools. The cost of education is largely borne by the communes, as well as by the state. At Bucharest and Jassy there are universities with faculties of law, philosophy, science and medicine and theology.

Antiquities.—The history of primitive civilization in Rumania can be traced back to the Neolithic Age; numerous remains of this period have been found at Vodastra in the Romanatzi department. Roman rule left a deep imprint on the country. The following Roman towns have been identified: (1) in the Dobrudja, Cius (Hirsova), Troësmis (Iglitza), Arrubium (Machin), Viodunum (Isakcha), Istrus (Karaharman), Tropaeum (Adam Klissi), Kallatis (Mangalia), Tomi (Constantza); (2) in Moldavia, Dinogetia (Tiglina); (3) in Walachia, Drobetae (Turnu Severin), Malva (Celeiu), Castra Nova (Craiova), Romula (Resca), Sorium (Roshiori de Vede), Pelendava (Bradesci), Acidava (Jenuseshti), Rusidava (Dragaşani), Castra Traiana (Râmnicu Vâlcea), Arutela (Bivolari), Pons Vetus (Caineni), Komidava (Petroasa), Ramidava (Buzeu). A great military road encircled the Dobrudja hills and skirted the Bulgarian shore of the Danube. It was linked by a ferry at Celeiu to two lesser roads; one striking northwards into Transylvania, up the Olt valley, the other bending westwards until it reached the Jiu, and there diverging southwards to Turnu Severin, and northwards to the Vulcan Pass. The plains near the Olt and Jiu estuaries are rich in Roman remains, notably in the towns of Caracal, Grodjibod and Islaz. Ruins and inscriptions may be seen at Resca, a temple at Slaveni, villas and a statue of the emperor Commodus (A.D. 161–92) at Celeiu. All these lie within a radius of 60 m. Two ramparts, known as Trajan's wall, can be discerned, one on either side of the railway from Cernavoda to Constantza; and there were bridges over the Danube at Turnu Severin and Turnu Magurele. The *Tropaeum Trajani*, or Adam Klissi monument (found near Rassova in the Dobrudja and removed to Bucharest museum), is a round stone structure of 100 ft. circumference and 40 ft. high, carved in low relief with scenes representing Trajan's conquest of Dacia. (See G. Tocilescu, *Das Monument von Adam Klissi*, Vienna, 1895.) Few monuments were left by the barbarian invaders who ravaged Rumania from the 3rd century to the 14th save some vestiges of Gothic culture at Buzeu, and at Petroasa, close by. The celebrated treasure of Petroasa (commonly written Petrossa), preserved in Bucharest museum, consists of embossed and jewelled gold plate, and probably dates from the 6th century (see PLATE). Medieval tapestries, with ecclesiastical vestments, ornaments and some fine pieces of early woodwork, are also preserved in Bucharest museum. The attempt to create a national style of architecture, based on Greek and Byzantine models, began under Stephen the Great of Moldavia (1457–1504), lasting until the 17th century, when it was arrested, first by political disorders, and, later, by the commercial development which caused a demand for cheap and rapid building. Its chief accomplishment is the cathedral of Curtea de Argesh (*q.v.*). Painting and sculpture, like modern Rumanian architecture, are still in their infancy.

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HISTORY

Dacia.

(1) *Introduction.*—The earliest record of the lands which constitute the kingdom of Rumania begins with the period immediately preceding their conquest by the Romans. For information upon this period, and upon the subsequent centuries of Roman or Byzantine rule, see DACIA. From the 6th to the 12th century, wave after wave of barbarian conquerors, Goths, Tatars, Slavs and others, passed over the country, and, according to one school of historians, almost obliterated its original Daco-Roman population; the modern Vlachs, on this theory, representing a later body of immigrants from Transdanubian territory. According to others, the ancient inhabitants were, at worst, only submerged for a time, and their direct descendants are the Rumans of to-day. Each of these conflicting views is supported by strong evidence; and the whole controversy, too large and too obscure for discussion here, is considered under the heading VLACHS.

The Vlachs in the 13th century.

Towards the close of the 13th century, Walachia and Moldavia were occupied by a mixed population, composed partly of Vlachs, but mainly of Slavs and Tatars; in Great Walachia,[1] also called Muntenia, the Petchenegs and Cumanians predominated. Rumanian historians have striven, by piecing together the stray fragments of evidence which survive, to prove that their Vlach ancestors had not, as sometimes alleged, been reduced to a scattered community of nomadic shepherds, dwelling among the Carpathians as the serfs of their more powerful neighbours. The researches of Haşdeu, Xenopol and other historians tend to show the existence of a highly organized Vlach society in Transylvania, Oltland and certain districts of Hungary and Moldavia; of a settled commonalty, agricultural rather than pastoral; and of a hereditary feudal nobility, bound to pay tribute and render military service to the Hungarian crown, but enjoying many privileges, which were defined by a distinct customary law (*jus valahicum*). Although the characteristic titles of *voivode*, *knez* and *ban* (all implying military as well as civil authority) are of Slavonic origin, and perhaps derived from the practice of the later Bulgarian (or Bulgaro-Vlachian) empire, the growth of Vlach feudal institutions is attributed to German influences, which permeated through Hungarian channels into the Vlach world, and transformed the primitive tribal chiefs into a feudal aristocracy of *boiars* or *boyards*[2] (nobles).

Growth of Rumanian nationality.

With the 13th century, at latest, begins the authentic political history of the Vlachs in Rumania, but it is not the history of a united people. The two principalities of Walachia and Moldavia developed separately, and each has its separate annals. About the year 1774 it first becomes possible to trace the progress of these Danubian Principalities in a single narrative, owing to the uniform system of administration adopted by the Turkish authorities, and the rapid contemporary growth of a national consciousness among the Vlachs. At last, in 1859, the two principalities were finally united under the name of Rumania. The subjoined history of the country is arranged under the four headings: *Walachia*, *Moldavia*, the *Danubian Principalities* and *Rumania*, in order to emphasize this historical development.

Foundation of the Principality.

(2) *Walachia.*—Tradition, as embodied in a native chronicle of the 16th century, entitled the *History of the Ruman Land since the arrival of the Rumans* (*Istoria ţiereĭ Românéscĭ de cândŭ au descălicata Românīĭ*), gives a precise account of the founding of the Walachian state by Radu Negru, or Rudolf the Black (otherwise known as Negru Voda, the Black Prince), voivode of the Rumans of Fogaras in Transylvania, who in 1290 descended with a numerous people into the Transalpine plain and established his capital first at Câmpulung and then at Curtea de Argesh. Radu dies in 1310, and is succeeded by a series of voivodes whose names and dates are duly given; but this early chapter of Walachian history has been rudely handled by critical historians. A considerable body of Vlachs doubtless emigrated from Hungary at this time, and founded in Walachia a principality dependent

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[1] *i.e.* Walachia east of the Olt, not to be confused with the Μεγάλη Βλαχία in southern Macedonia (see BALKAN PENINSULA).

[2] In later Rumanian history there arose a class who obtained their rank by merit or favour, and did not necessarily bequeath it to their heirs. But the hereditary aristocracy also survived, and feudalism remained characteristic of Rumanian society up to 1860.

on the Hungarian crown; but material is lacking for a detailed description of the movement.

Hungarian Supremacy.

In 1330 the voivode John Bassaraba[1] or Bazarab the Great (1310–38) succeeded in inflicting a crushing defeat on his suzerain King Charles I. of Hungary, and for fourteen years Walachia enjoyed complete independence. Louis the Great (1342–82) succeeded for a while in restoring the Hungarian supremacy, but in 1367 the voivode Vlad or Vladislav inflicted another severe defeat on the Hungarians, and succeeded for a time in ousting the Magyar governor of Turnu Severin, and thus incorporating Oltland in his own dominions. Subsequently, in order to retain a hold on the loyalty of the Walachian voivode, the king of Hungary invested him with the title of duke of Fogaras and Omlas, Ruman districts in Transylvania.

Mircea.

Under the voivode Mircea (1386–1418), whose prowess is still celebrated in the national folk-songs, Walachia played for a while a more ambitious part. This prince during the earlier part of his reign sought a counterpoise to Hungarian influence in close alliance with King Ladislaus V. of Poland. He added to his other titles that of "count of Severin, despot of the Dobrudja, and lord of Silistria," and both Vidin and Sistora appear in his possession. A Walachian contingent, apparently Mircea's, aided the Servian tsar Lazar in his vain endeavour to resist the Turks at Kossovo (1389); later he allied himself with his former enemy Sigismund of Hungary against the Turkish sultan Bayezid I., who inflicted a crushing defeat on the allied armies at Nikopolis in 1396. Bayezid subsequently invaded and laid waste a large part of Walachia, but the voivode succeeded in inflicting considerable loss on the retiring Turks, and the capture of Bayezid by Timur in 1402 gave the country a reprieve. In the internecine struggle that followed amongst the sons of Bayezid, Mircea espoused the cause of Musa; but, though he thus obtained for a while considerable influence in the Turkish councils, this policy eventually drew on him the vengeance of the sultan Mahomet I., who succeeded in reducing him to a tributary position.

Relations with Hungary and the Turks.

During the succeeding period the Walachian princes appear alternately as the allies of Hungary or the creatures of the Turk. In the later battle of Kossovo of 1448, between the Hungarians, led by Hunyadi János and the sultan Murad II., the Walachian contingent treacherously surrendered to the Turks; but this did not hinder the victorious sultan from massacring the prisoners and adding to the tribute a yearly contribution of 3000 javelins and 4000 shields. In 1453 Constantinople fell; in 1454 Hunyadi died; and a year later the sultan invaded Walachia to set up Vlad IV. (1455–62), the son of a former voivode. The father of this Vlad had himself been notorious for his ferocity, but his son, during his Turkish sojourn, had improved on his father's example. He was known in Walachia as *Dracul*, or the Devil, and has left a name in history as Vlad the Impaler. The stories of his ferocious savagery exceed belief. He is said to have feasted amongst his impaled victims. When the sultan Mahomet, infuriated at the impalement of his envoy, the pasha of Vidin, who had been charged with Vlad's deposition, invaded Walachia in person with an immense host, he is said to have found at one spot a forest of pales on which were the bodies of men, women and children. The voivode Radu (1462–75) was substituted for this monster by Turkish influence, and constrained to pay a tribute of 12,000 ducats; but Vlad returned to the throne in 1476–77.

The shifting policy of the Walachian princes at this time is well described in a letter of the Hungarian king Matthias Corvinus (1458–90) to Casimir of Poland. "The voivodes," he writes, "of Walachia and Moldavia fawn alternately upon the Turks, the Tatars, the Poles and the Hungarians, that among so many masters their perfidy may remain unpunished." The prevalent laxity of marriage, the frequency of divorce, and the fact that illegitimate children could succeed as well as those born in lawful wedlock, by multiplying the candidates for the voivodeship and preventing any regular system of succession, contributed much to the internal confusion of the country. The elections, though often controlled by the Turkish Divan, were still constitutionally in the hands of the boiars, who were split up into various factions, each with its own pretender to the throne. The princes followed one another in rapid succession, and usually met with violent ends. A large part of the population led a pastoral life, and at the time of Verantius's visit to Walachia in the early part of the 16th century, the towns and villages were built of wood and wattle and daub. Tîrgovishtea alone, at this time the capital of the country, was a considerable town, with two stone castles.

Turkish oppressions.

A temporary improvement took place under Neagoe Bassaraba (1512–21). Neagoe was a great builder of monasteries; he founded the cathedrals of Curtea de Argesh (*q.v.*) and Tîrgovishtea, and adorned Mount Athos with his pious works. He transferred the direct allegiance of the Walachian Church from the patriarchate of Ochrida in Macedonia to that of Constantinople. On his death, however, the brief period of comparative prosperity which his architectural works attest was tragically interrupted, and it seemed for a time that Walachia was doomed to sink into a Turkish pâshalic. The Turkish commander, Mahmud Bey, became treacherously possessed of Neagoe's young son and successor, and, sending him a prisoner to Stambul, proceeded to nominate Turkish governors in the towns and villages of Walachia. The Walachians resisted desperately, elected Radu, a kinsman of Neagoe, voivode, and succeeded with Hungarian help in defeating Mahmud Bey at Grumatz in 1522. The conflict was prolonged with varying fortunes until in 1524 the dogged opposition of the Walachians triumphed in the sultan's recognition of Radu.

But the battle of Mohacs in 1526 decided the long preponderance of Turkish control. The unfortunate province served as a transit route for Turkish expeditions against Hungary and Transylvania, and was exhausted by continual requisitions. Turkish settlers were gradually making good their footing on Walachian soil, and mosques were rising in the towns and villages. The voivode Alexander, who succeeded in 1591, and like his predecessors had bought his post of the Divan, carried the oppression still further by introducing a janissary guard and farming out his possessions to his Turkish supporters. Meanwhile the Turkish governors on the Bulgarian bank never ceased to ravage the country, and again it seemed as if Walachia must share the fate of the Balkan States and succumb to the direct government of the Ottoman.

In the depth of the national distress the choice of the people fell on Michael, the son of Petrushko, ban of Craiova, the first dignitary of the realm, who had fled to Transylvania to escape Alexander's machinations. Supported at Constantinople by two influential personages, Sigismund Bâthory, prince of Transylvania (1581–98 and 1601–2), and the English ambassador, Edward Barton, and aided by a loan of 200,000 florins, Michael succeeded in procuring from the Divan the deposition of his enemy and his own nomination.

Michael the Brave.

The genius of Michael "the Brave" (1593–1601) secured Walachia for a time a place in universal history. The moment for action was favourable. The emperor Rudolph II. had gained some successes over the Turks, and Sigismund Bâthory had been driven by Turkish extortions to throw off the allegiance to the sultan. But the first obstacle to be dealt with was the presence of the enemy within the walls. By previous concert with the Moldavian voivode Aaron, on the 13th of November 1594, the Turkish guards and settlers in the two principalities were massacred at a given signal. Michael followed up these "Walachian Vespers" by an actual invasion of Turkish territory, and, aided by Sigismund Bâthory, succeeded in carrying by assault Rustchuk, Silistria and other places on the right bank of the lower Danube. A simultaneous invasion of Walachia by a large Turkish and Tatar host was successfully defeated;

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[1] A. Sturdza gives a genealogical table, showing that Radu belonged to the great native dynasty of Bassarab (*q.v.*) or Bassaraba, which continued, though not in unbroken succession, to rule in Walachia until 1658, and in Moldavia until 1669.

the Tatar khan withdrew with the loss of his bravest followers, and, in the great victory of Mantin on the Danube (1595), the Turkish army was annihilated, and its leader, Mustafa, slain. The sultan now sent Sinan Pasha, "the Renegade," to invade Walachia with 100,000 men. Michael withdrew to the mountains before this overwhelming force, but, being joined by Báthory with a Transylvanian contingent, the voivode resumed the offensive, stormed Bucharest, where Sinan had entrenched a Turkish detachment, and, pursuing the main body of his forces to the Danube, overtook the rearguard and cut it to pieces, capturing enormous booty. Sinan Pasha returned to Constantinople to die, it is said, of vexation; and in 1597, the sultan, weary of a disastrous contest, sent Michael a red flag in token of reconciliation, reinvested him for life in an office of which he had been unable to deprive him, and granted the succession to his son.

Conquest of Transylvania.

In 1599, on the abdication of Sigismund Báthory in Transylvania, Michael, in league with the imperialist forces, and in connivance with the Saxon burghers, attacked and defeated his successor Andreas Báthory near Hermannstadt, and, seizing himself the reins of government, secured his proclamation as prince of Transylvania. The emperor consented to appoint him his viceroy (*locum tenens per Transylvaniam*), and the sultan ratified his election. As prince of Transylvania he summoned diets in 1599 and 1600, and, having expelled the voivode of Moldavia, united under his sceptre three principalities. The partiality that he showed for the Ruman and Szekler parts of the population alienated, however, the Transylvanian Saxons, who preferred the direct government of the emperor. The imperial commissioner General Basta lent his support to the disaffected party, and Michael was driven out of Transylvania by a successful revolt, while a Polish army invaded Walachia from the Moldavian side. Michael's coolness and resource, however, never deserted him. He resolved to appeal to the emperor, rode to Prague, won over Rudolph by his singular address, and, richly supplied with funds, reappeared in Transylvania as imperial governor. In conjunction with Basta he defeated the superior Transylvanian forces at Goroszló, expelling Sigismund Báthory, who had again aspired to the crown, and taking one hundred and fifty flags and forty-five cannon. But at the moment of his returning prosperity Basta, who had quarrelled with him about the supreme command of the imperial forces, procured his murder on the 19th of August 1601. Not only had Michael succeeded in rolling back for a time the tide of Turkish conquest, but for the first and last time in modern history he united what once had been Trajan's Dacia, in its widest extent, and with it the whole Ruman race north of the Danube, under a single sceptre.

Michael's wife Florika and his son Nicholas were carried off into Tatar captivity, and Şerban or Sherban, of the Bassaraba family, was raised to the voivodeship of Walachia by imperialist influences, while Sigismund resumed the government of Transylvania. On his deposition by the Porte in 1610, there followed a succession of princes who, though still for the most part of Ruman origin, bought their appointment at Stambul. Walachian contingents were continually employed by the Turks in their Polish wars, and the settlement of Greeks in an official or mercantile capacity in the principality provoked grave discontent, which on one occasion took the form of a massacre.

Matthias Bassaraba.

The reign of the voivode Matthias Bassaraba (1633–54) was an interval of comparative prosperity. Matthias repulsed his powerful rival, Basil the Wolf, the voivode of Moldavia and his Tatar and Cossack allies. His last days were embittered, however, by an outbreak of military anarchy. His illegitimate son and successor, Constantine Şerban (1654–58), was the last of the Bassaraba dynasty to rule over Walachia; and on his death the Turkish yoke again weighed heavier on his country. The old capital, Tîrgovishtea, was considered by the Divan to be too near the Transylvanian frontier, and the voivodes were accordingly compelled to transfer their residence to Bucharest, which was finally made the seat of government in 1698.

Şerban Cantacuzene.

The mechanical skill of the Walachians was found useful by the Turks, who employed them as carpenters and pontonniers: and during the siege of Vienna in 1683 the Walachian contingent, which, under the voivode Şerban Cantacuzene, had been forced to co-operate with the Turks, was entrusted with the construction of the two bridges over the Danube above and below Vienna. The Walachian as well as the Moldavian prince, who had been also forced to bring his contingent, maintained a secret system of communication with the besieged, which was continued by Şerban after his return to Walachia. The emperor granted him a diploma creating him count of the empire and recognizing his descent from the imperial house of Cantacuzene, Şerban meanwhile collecting his forces for an open breach with the Porte. His prudence, however, perpetually postponed the occasion, and Walachia enjoyed peace to his death in 1688. This peaceful state of the country gave the voivode leisure to promote its internal culture, and in the year of his death he had the satisfaction of seeing the first part of a Walachian Bible issue from the first printing-press of the country, which he had established at Bucharest. He had also caused to be compiled a history of Walachia, and had called to the country many teachers of the Greek language, whose business it was to instruct the sons of the boiars in grammar, rhetoric and philosophy.

Constantine Brancovan.

Del Chiaro's description of Walachia.

Immediately on Şerban's death the boiars, to prevent the Porte from handing over the office to the Greek adventurer who bid the highest, proceeded to elect his sister's son Constantine Brancovan. The Turkish envoy then in Bucharest was persuaded to invest Brancovan with the *caftan*, or robe of office, in token of Turkish approval, and the patriarch of Constantinople, who was also present, and the archbishop of Walachia, Theodosius, consecrated him together at the high altar of the cathedral, where he took the coronation oath to devote his whole strength to the good of his country and received the boiars' oath of submission. Brancovan, it is true, found it expedient to devote his predecessor's treasure to purchasing the confirmation of his title from the Divan, but the account of his coronation ceremony remains an interesting landmark in the constitutional history of the country. In his relations with the Habsburg power he displayed the same caution as the voivode Şerban. In spite of defeats inflicted on the Turks by the imperial troops at Pozharevats, Nish and Vidin, in 1689, it was only by an exercise of force that they secured winter quarters in Walachia; and though, after the battle of Poltava in 1709, Brançovan concluded a secret treaty with the tsar Peter the Great, he avoided giving open effect to it. The tranquillity which he thus obtained was employed by Brancovan as by his predecessor in furthering the internal well-being of the country, with what success is best apparent from the description of Walachia left by the Florentine Del Chiaro, who visited the country in 1709 and spent seven years there. He describes the stoneless Walachian plain, with its rich pastures, its crops of maize and millet, and woods so symmetrically planted and carefully kept by Brancovan's orders that hiding in them was out of the question. Butter and honey were exported to supply the sultan's kitchen at Stambul; wax and cattle to Venice; and the red and white wine of Walachia, notably that of Pitesei, to Transylvania. The Walachian horses were in demand among the Turks and Poles. Near Ribnik and elsewhere were salt-mines which supplied all the wants of the Transdanubian provinces of Turkey; there were considerable copper mines at Maidan; and iron was worked near Tîrgovishtea. The gipsy community was bound to bring fifteen pounds weight of gold from the washings of the Argesh. Many of the boiars were wealthy, but the common people were so ground down with taxation that "of their ancient Roman valour only the name remained." To avoid the extortion of their rulers numbers had emigrated to Transylvania and even to the Turkish provinces. The principal Walachian city was Bucharest, containing a population of about 50,000; but, except for two large *hans* or merchants' halls built by Brancovan and his predecessor, and the recently erected palace, which had a marble staircase and a fine garden, the houses were of wood. The dress of the men was thoroughly Turkish except for their lambskin caps, that of the women half Greek, half Turkish. The houses were scrupulously clean and strewn with sweet herbs. Del Chiaro notices the great imitative capacity of the race, both artistic and mechanical. A Walachian in Venice had copied several of the pictures there with great skill; the copper-plates and wood engravings for the new press were executed by native hands. The Walachians imitated every kind of Turkish and European manufacture; and, though the boiars imported finer glass from Venice and Bohemia, a glass manufactory had been established near Tîrgovishtea which produced a better quality than the Polish. From the Bucharest press, besides a variety of ecclesiastical books, there were issued in the Ruman tongue a translation of a French work entitled *The Maxims of the Orientals* and *The Romance of Alexander the Great*. In 1700 Brancovan had a map of the country made and a copperplate engraving of it executed at Padua.

Fall of Brancovan.

The prosperity of Walachia, however, under its "Golden Bey," as Brancovan was known at Stambul, only increased the Turkish exactions; and, although all demands were punctually met, the sultan finally resolved on the removal of his too prosperous vassal. Brancovan was accused of secret correspondence with the emperor, the tsar, the king of Poland and the Venetian republic, of betraying the Porte's secrets, of preferring Tîrgovishtea to Bucharest as a residence, of acquiring lands and palaces in Transylvania, of keeping agents at Venice and Vienna, in both of which cities he had invested large sums, and of striking gold coins with his effigy.[1] An envoy arrived at Bucharest on the 4th of April 1714, and proclaimed Brancovan *mazil*, *i.e.* deposed. He was conducted to Constantinople and beheaded, together with his four sons. A scion of the rival Cantacuzenian family was elected by the pasha's orders, and he, after exhausting the principality for the benefit of the Divan, was in turn deposed and executed in 1716.

The Phanariote régime.

From this period onwards the Porte introduced a new system with regard to its Walachian vassals. The line of national princes ceased. The office of voivode or hospodar was sold to the highest bidder at Stambul, to be farmed out from a purely mercenary point of view. The princes who now succeeded one another in rapid succession were mostly Greeks from the Phanar quarter of Constantinople who had served the palace in the quality of dragoman (interpreter), or held some other court appointment. They were nominated by imperial firman without a shadow of free election, and were deposed and transferred from one principality to another, executed or reappointed, like so many pashas. Like pashas they rarely held their office more than three years, it being the natural policy of the Porte to multiply such lucrative nominations. The same hospodar was often reappointed again and again as he succeeded in raising the sum necessary to buy back his title. Constantine Mavrocordato was in this way hospodar of Walachia at six different times, and paid on one occasion as much as a million lion-dollars (£40,000) for the office. The princes thus imposed on the country were generally men of intelligence and culture. Nicholas Mavrocordato, the first of the series, was himself the author of a Greek work on duties, and maintained at his court Demeter Prokopios of Moschopolis in Macedonia, who wrote a review of Greek literature during the 17th and beginning of the 18th centuries. Constantine Mavrocordato was the author of really liberal reforms. He introduced an *urbarium* or land law, limiting to 24 the days of *angaria*, or forced labour, owed yearly by the peasants to their feudal lord. In 1747 he decreed the abolition of serfdom, but this enactment was not carried into effect. But the rule of the Phanariotes could not but be productive of grinding oppression, and it was rendered doubly hateful by the swarms of Greek adventurers who accompanied them. Numbers of the peasantry emigrated, and the population rapidly diminished. In 1745 the number of tax-paying families, which a few years before had amounted to 147,000, had sunk to 70,000. Yet the taxes were continually on the increase, and the hospodar Scarlat Ghica (1758–61), though he tried to win some popularity by the removal of Turkish settlers and the abolition of the *vakarit* or tax on cattle and horses, which was peculiarly hateful to the peasantry, raised the total amount of taxation to 25,000,000 lion-dollars, about £1,000,000. The Turks meantime maintained their grip on the country by holding on the Walachian bank of the Danube the fortresses of Giurgevo, Turnu Severin and Orsova, with the surrounding districts.

But the tide of Ottoman dominion was ebbing fast. Already, by the peace of Passarowitz Pozharevats in 1718, the banat of Craiova had been ceded to the emperor, though by the peace of Belgrade in 1739 it was recovered by the Porte for its Walachian vassal. In 1769 the Russian general Romanzov occupied the principality, the bishops and clergy took an oath of fidelity to the empress Catherine, and a deputation of boiars followed. The liberties of the country were guaranteed, taxation reformed and in 1772 the negotiations at Fokshâni between Russia and the Porte broke down because the empress's representatives insisted on the sultan's recognition of the independence of Walachia and Moldavia under a European guarantee. Turkish rule was, however, definitely restored by the treaty of Kutchuk Kainardji, in 1774; and as from this period onwards Walachian history is closely connected with that of Moldavia, it may be convenient before continuing this review to turn to the earlier history of the sister principality.

(3) *Moldavia.*—According to the native traditional account, as first given by the Moldavian chroniclers of the 16th, 17th and 18th centuries, Dragosh the son of Bogdan, the founder of the Moldavian principality, emigrated with his followers from the Hungarian district of Marmaros in the northern Carpathians. The dates assigned to this event vary from 1299, given by Urechia, to 1342, given by the monastic chronicle of Putna. The story is related with various fabulous accompaniments. From the aurochs (*zimbru*), in pursuit of which Dragosh first arrived on the banks of the Moldova, is derived the ox-head of the Moldavian national arms, and from his favourite hound who perished in the waters the name of the river. From the Hungarian and Russian sources, which are somewhat more precise, the date of the arrival of Dragosh, who is confused with the historical Bogdan Voda (1349–1365), appears to have been 1349, and his departure from Marmaros was carried out in defiance of his Hungarian suzerain.

Early History.

These legendary accounts seem to show that the Moldavian voivodate was founded, like that of Walachia, by Vlach immigrants from Hungary, during the first half of the 14th century. Its original strength lay probably in the compact Ruman settlements among the eastern Carpathians, first mentioned by Nicetas of Chonae, about 1164. The Moldavian lowlands were still held by a variety of Tatar tribes, who were only expelled after 1350, by the united efforts of Andrew Laszkovich, voivode of Transylvania, and Bogdan Voda, the first independent prince of Moldavia. Coins bearing the name of Bogdan are still extant; and there is an inscription over his tomb at the monastery of Radautzi, in Bukovina, placed there by Stephen the Great of Moldavia (1457–1504).

Rival claims of Poland and Hungary.

In the agreement arrived at between Louis of Hungary and the emperor Charles IV. in 1372, the voivodate of Moldavia was recognized as a dependency of the crown of St Stephen. The overlordship over the country was, however, contested by the king of Poland, and their rival claims were a continual source of dispute between the two kingdoms. In 1412 a remarkable agreement was arrived at between Sigismund, in his quality of king of Hungary, and King Ladislaus II. of Poland, by which both parties consented to postpone the question of suzerainship in Moldavia. Should, however, the Turks invade the country, the Polish and Hungarian forces were to unite in expelling them, the voivode was to be deposed, and the Moldavian territories divided between the allies. During the first half of the 15th century Polish influence was preponderant, and it was customary for the voivodes of Moldavia to do homage to the king of Poland at his cities of Kameniec or Snyatin.

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[1] One of these, with the legend "CONSTANTINVS BASSARABA DE BRANCOVAN D.G.VOEVODA ET PRINCEPS VALACHIAE TRANSALPINAE," and having on the reverse the crowned shield of Walachia containing a raven holding a cross in its beak between a moon and a star, is engraved by Del Chiaro. They were of 2, 3 and 10 ducats weight.

Stephen the Great.

In 1456 the voivode Peter, alarmed at the progress of the Turks, who were now dominant in Servia and Walachia, offered the sultan Mahomet II. a yearly tribute of 2000 ducats. On his deposition, however, in 1457 by Stephen, known as "the Great," Moldavia became a power formidable alike to Turk, Pole and Hungarian. Throughout the long reign of this voivode, which lasted forty-six years, from 1458 to 1504, his courage and resources never failed. In the early part of his reign he appears, in agreement with the Turkish sultan and the king of Poland, turning out the Hungarian vassal, the ferocious Vlad, from the Walachian throne, and annexing the coast cities of Kilia and Cetatea Alba or Byelgorod, the Turkish Akkerman. These cities he refused to cede to the sultan, and, about this period, he entered into negotiations with Venice and the shah of Persia, in the vain hope of organizing a world-wide coalition against the Turks. In the autumn of 1474 the sultan Mahomet entered Moldavia at the head of an army estimated by the Polish historian Dlugosz at 120,000 men. The voivode Stephen withdrew into the interior at the approach of this overwhelming host, but on the 17th of January 1475, turned to bay at Rahova (Podul Inalt, near Vaslui) and gained a complete victory over the Turks. Four pashas were among the slain; over a hundred banners fell into the Moldavian hands; and only a few survivors succeeded in reaching the Danube. In 1476 Mahomet again invaded Moldavia, but, though successful in the open field, the Turks were sorely harassed by Stephen's guerilla onslaughts, and, being thinned by pestilence, were again constrained to retire. In 1484 the same tactics proved successful against an invasion of Bayezid II. Three years later a Polish invasion of Moldavia under John Albert with 80,000 men ended in disaster, and shortly afterwards the voivode Stephen, aided by a Turkish and Tatar contingent, laid waste the Polish territories to the upper waters of the Vistula, and succeeded in annexing for a time the Polish province of Pokutia, between the Carpathians and the Dniester.

Moldavia circa 1500.

Exclusive of this temporary acquisition, the Moldavian territory at this period extended from the river Milcovu, which formed the boundary of Walachia, to the Dniester. It included the Carpathian region of Bukovina, literally "the beechwood," where lay Sereth and Suciava (Suczawa), the earliest residences of the voivodes, the maritime district of Budzak (the later Bessarabia), with Kilia, Byelgorod and the left bank of the lower Danube from Galatz to the Sulina mouth. The government, civil and ecclesiastical, was practically the same as that described in the case of Walachia, the officials bearing for the most part Slavonic titles derived from the practice of the Bulgaro-Vlachian tsardom. The church was Orthodox Oriental, and depended from the patriarch of Ochrida. In official documents the language used was Slavonic, the style of a Moldavian ruler being *Nachalnik i Voievoda Moldovlasi*, prince and duke (= Ger. *Fürst* and *Herzog*) of the Moldovlachs. The election of the voivodes, though in the hands of the boiars, was strictly regulated by hereditary principles, and Cantemir describes the extinction of the house of Dragosh in the 16th century as one of the unsettling causes that most contributed to the ruin of the country. The Moldavian army was reckoned 40,000 strong, and the cavalry were especially formidable. Verantius of Sebenico, an eye-witness of the state of Moldavia at the beginning of the 16th century, mentions three towns of the interior provided with stone walls—Suciava, Chotim (Khotin) and Neamtzu; the people were barbarous, but more warlike than the Walachians and more tenacious of their national costume, punishing with death any who adopted the Turkish.

Moldavia tributary to the Turks.

In 1504 Stephen the Great died, and was succeeded by his son, Bogdan III. "the One-eyed." At feud with Poland about Pokutia, despairing of efficacious support from hard-pressed Hungary, the new voivode saw no hope of safety except in a dependent alliance with the advancing Ottoman power, which already hemmed Moldavia in on the Walachian and Crimean sides. In 1513 he agreed to pay an annual tribute to the sultan Selim in return for the sultan's guarantee to preserve the national constitution and religion of Moldavia, to which country the Turks now gave the name of Kara Bogdan, from their first vassal. The terms of Moldavian submission were further regulated by a firman signed by the sultan Suleiman at Budapest in 1529 by which the yearly present or *backshish*, as the tribute was euphoniously called, was fixed at 4000 ducats, 40 horses and 25 falcons, and the voivode was bound at need to supply the Turkish army with a contingent of 1000 men. The Turks pursued much the same policy as in Walachia. The tribute was gradually increased. A hold was obtained on the country by the occupation of various fortresses on Moldavian soil with the surrounding territory—in 1538 Cetatea Alba, in 1592 Bender, in 1702 Chotim (Khotin). Already by the middle of the 16th century the yoke was so heavy that the voivode Elias (1546–51) became Mahommedan to avoid the sultan's anger.

Jacob Basilicus.

At this period occurs a curious interlude in Moldavian history. In 1561 the adventurer and impostor Jacob Basilicus succeeded with Hungarian help in turning out the voivode Alexander Lapusheanu (1552–61 and 1563–68) and seizing on the reins of government. A Greek by birth, adopted son of Jacob Heraklides, despot of Paros, Samos and other Aegean islands, acquainted with Greek and Latin literature, and master of most European languages; appearing alternately as a student of astronomy at Wittenberg, whither he had been invited by Count Mansfeld, as a correspondent of Melanchthon, and as a writer of historical works which he dedicated to Philip II. of Spain, Basilicus, finding that his Aegean sovereignty was of little practical value beyond the crowning of poet laureates, fixed his roving ambition on a more substantial dominion. He published an astounding pedigree, in which, starting from "Hercules Triptolemus," he wound his way through the royal Servian line to the kinship of Moldavian voivodes, and, having won the emperor Ferdinand to his financial and military support, succeeded, though at the head of only 1600 cavalry, in routing by a bold dash the vastly superior forces of the voivode, and even in purchasing the Turkish confirmation of his usurped title. He assumed the style of Βασιλεὺς Μολδαβίας, and eluded the Turkish stipulation that he should dismiss his foreign guards. In Moldavia he appeared as a moral reformer, endeavouring to put down the prevalent vices of bigamy and divorce. He erected a school, placed it under a German master, and collected children from every part of the country to be maintained and educated at his expense. He also busied himself with the collection of a library. But his taxes—a ducat for each family—were considered heavy; his orthodoxy was suspected, his foreign counsellors detested. In 1563 the people rose, massacred the Hungarian guards, the foreign settlers, and finally Jacob himself.

The expelled voivode Alexander was now restored by the Porte, the schools were destroyed, and the country relapsed into its normal state of barbarism under Bogdan IV. (1568–72). Bogdan's successor, John the Terrible (1572–74), was provoked by the Porte's demand for 120,000 ducats as tribute instead of 60,000 as heretofore to rise against the oppressor; but after gaining three victories he was finally defeated and slain (1574), and the country was left more than ever at the mercy of the Ottoman. Voivodes were now created and deposed in rapid succession by the Divan, but the victories of Michael the Brave in Walachia infused a more independent spirit into the Moldavians. The Moldavian dominion was now disputed by the Transylvanians and Poles, but in 1600 Michael succeeded in annexing it to his "Great Dacian" realm. On Michael's murder the Poles under Zamoyski again asserted their supremacy, but in 1618 the Porte once more recovered its dominion and set up successively two creatures of its own as voivodes—Gratiani, an Italian who had been court jeweller, and a Greek custom-house official, Alexander.

The Phanariote régime.

As in Walachia at a somewhat later date, the Phanariote régime seemed now thoroughly established in Moldavia, and it became the rule that every three years the voivode should procure his confirmation by a large baksheesh, and every year by a smaller one. But Prince Basil the Wolf (Vasilie Lupul), an Albanian, who succeeded in 1634, showed great ability, and for twenty years maintained his position on the Moldavian throne. He introduced several internal reforms, codified the written and unwritten laws of the country, established a printing press, Greek monastic schools, and also a Latin school. He brought the Moldavian Church into more direct relation with the patriarch of Constantinople, but also showed considerable favour to the Latins, allowing them to erect churches at Suciava, Jassy and Galatz. The last voivode of the Bassaraba family, Elias Voda, reigned from 1667 to 1669.

Demetrius Cantemir.

During the wars between Sobieski, king of Poland (1674–96), and the Turks, Moldavia found itself between hammer and anvil, and suffered terribly from Tatar devastations. The voivode Duka was forced like his Walachian contemporary to supply a contingent for the siege of Vienna in 1683. After Sobieski's death in 1696, the hopes of Moldavia turned to the advancing Muscovite power. In 1711 the voivode Demetrius Cantemir, rendered desperate by the Turkish exactions, concluded an agreement with the tsar Peter the Great by which Moldavia was to become a protected and vassal state of Russia, with the enjoyment of its traditional liberties, the voivodeship to be hereditary in the family of Cantemir. On the approach of the Russian army the prince issued a proclamation containing the terms of the Russian protectorate and calling on the boiars and people to aid their Orthodox deliverers. But the long Turkish terrorism had done its work, and at the approach of a Turkish and Tatar host the greater part of the Moldavians deserted their voivode. The Russian campaign was unsuccessful, and all that Peter could offer Cantemir and the boiars who had stood by him was an asylum on Russian soil.

Cantemir's description of Moldavia.

In his Russian exile Cantemir composed in a fair Latin style his *Descriptio Moldaviae*, the counterpart, so far as Moldavia is concerned, to Del Chiaro's contemporary description of Walachia. The capital of the country was now Jassy, to which city Stephen the Great had transferred his court from Suciava, the earlier residence of the voivodes. It had at this time forty churches—some of stone, some of wood. Fifty years before it had contained 12,000 houses, but Tatar devastations had reduced it to a third of its former size. The most important commercial emporium was the Danubian port of Galatz, which was frequented by vessels from the whole of the Levant from Trebizond to Barbary. The cargoes which they here took in consisted of Moldavian timber (oak, deal and cornel), grain, butter, honey and wax, salt and nitre. Kilia, at the north mouth of the Danube, was also frequented by trading vessels, including Venetian and Ragusan. Moldavian wine was exported to Poland, Russia, Transylvania, and Hungary; that of Cotnar was in Cantemir's opinion superior to Tokay. The excellence of the Moldavian horses is attested by a Turkish proverb; and annual droves of as many as 40,000 Moldavian oxen were sent across Poland to Danzig. Moldavia proper was divided into the upper country or *T'erra de sus*, and the lower country, or *T'erra de josu*. Bessarabia had been detached from the rest of the principality and placed under the direct control of the military authorities. It was divided into four provinces: that of Budzak, inhabited by the Nogai Tatars; that of Cetatea Alba, the Greek Monkastron, a strongly fortified place; and those of Ismaila and Kilia. The voivodes owed their nomination entirely to the Porte, and the great officers of the realm were appointed at their discretion. These were the Great Logothete (*Marele Logofetu*) or chancellor; the governor of Lower Moldavia—*Vorniculu de t'erra de josu*; the governor of Upper Moldavia—*Vorniculu de t'erra de sus*; the *Hatman* or commander-in-chief; the high chamberlain—*Marele Postelnicu*; the great *Spathar*, or sword-bearer; the great cupbearer—*Marele Paharnicu*; and the treasurer, or *Vistiernicu*, who together formed the prince's council and were known as *Boiari de Svatu*. Below these were a number of subordinate officers who acted as their assessors and were known as boiars of the Divan (*Boiari de Divanu*). The high court of justice was formed by the prince, metropolitan and boiars: the *Boiari de Svatu* decided on the verdict; the metropolitan declared the law; and the prince pronounced sentence. The boiars were able to try minor cases in their own residences, but subject to the right of appeal to the prince's tribunal. Of the character of the Moldavian people Cantemir does not give a very favourable account. Their best points were their hospitality and, in Lower Moldavia, their valour. They cared little for letters, and were generally indolent, and their prejudice against mercantile pursuits left the commerce of the country in the hands of Armenians, Jews, Greeks and Turks. The pure-blood Ruman population, noble and plebeian, inhabited the cities and towns or larger villages; the peasantry were mostly of Little Russian and Hungarian race, and were in a servile condition. There was a considerable gipsy population, almost every boiar having several Zingar families in his possession; these were mostly smiths.

Continuation of Phanariote régime.

From this period onwards the character of the Ottoman domination in Moldavia is in every respect analogous to that of Walachia. The office of voivode or hospodar was farmed out by the Porte to a succession of wealthy Greeks from the Phanar quarter of Constantinople. All formality of election by the boiars was now dispensed with, and the princes received their *caftan* of office at Constantinople, where they were consecrated by the Greek patriarch. The system favoured Turkish extortion in two ways: the presence of the voivode's family connexions at Stambul gave the Porte so many hostages for his obedience; on the other hand the princes themselves could not rely on any support due to family influence in Moldavia itself. They were thus mere puppets of the Divan, and could be deposed and shifted with the same facility as so many pashas—an object of Turkish policy, as each change was a pretext for a new levy of baksheesh. The chief families that shared the office during this period were those of Mavrocordato, Ghica, Callimachi, Ypsilanti and Murusi. Although from the very conditions of their creation they regarded the country as a field for exploitations, they were themselves often men of education and ability, and unquestionably made some praiseworthy attempts to promote the general culture and well-being of their subjects. In this respect, even the Phanariote régime was preferable to mere pasha rule, while it had the further consequence of preserving intact the national form of administration and the historic offices of Moldavia. Gregory Ghica (1774–77), who himself spoke French and Italian, founded a school or "gymnasium" at Jassy, where Greek, Latin and theology were taught in a fashion. He encouraged the settlement of German Protestant colonists in the country, some of whom set up as watchmakers in Jassy, where they were further allowed to build an evangelical church. J. L. Carra, a Swiss who had been tutor to Prince Ghica's children, and who published in 1781 an account of the actual state of the principalities, speaks of some of the boiars as possessing a taste for French literature and even for the works of Voltaire, a tendency actively combated by the patriarch of Constantinople.

Cession of Bukovina.

The Russo-Turkish War, which ended in the peace of Kutchuk Kainardji (1774), was fatal to the integrity of Moldavian territory. The house of Austria, which had already annexed Galicia in 1772, profited by the situation to arrange with both contending parties for the peaceful cession of Bukovina to the Habsburg monarchy. This richly wooded Moldavian province, containing Suciava

(Suczawa), the earliest seat of the voivodes, and Cernautiĭ or Czernovicz, was in 1774 occupied by Habsburg troops with Russian connivance, and in 1777 Baron Thugut procured its formal cession from the sultan.

Treaty of Kutchuk Kainardji.

(4) *The Danubian Principalities: 1774–1859.*—By the treaty of Kutchuk Kainardji Russia consented to hand back the principalities to the sultan, but by Article xvi. several stipulations were made in favour of the Walachians and Moldavians. The people of the principalities were to enjoy all the privileges that they had possessed under Mahomet IV.; they were to be freed from tribute for two years, as some compensation for the ruinous effects of the last war; they were to pay a moderate tribute; the agents of Walachia and Moldavia at Constantinople were to enjoy the rights of national representatives, and the Russian minister at the Porte should on occasion watch over the interests of the principalities. The stipulations of the treaty, though deficient in precision (the Walachians, for instance, had no authentic record of the privileges enjoyed under Mahomet IV.), formed the basis of future liberties in both principalities; but for the moment all reforms were postponed.

Russian protection.

The treaty was hardly concluded when it was violated by the Porte, which refused to recognize the right of the Walachian boiars to elect their voivode, and nominated Alexander Ypsilanti, a creature of its own. In 1777 Constantine Murusi was made voivode of Moldavia in the same high-handed fashion. The Divan seemed intent on restoring the old system of government in its entirety, but in 1783 the Russian representative extracted from the sultan a decree (*hattisherif*) defining more precisely the liberties of the principalities and fixing the amount of the annual tribute—for Walachia 619 purses exclusive of various "presents" amounting to 130,000 piasters, and for Moldavia 135 purses and further gifts to the extent of 115,000 piasters. By the peace of Jassy in 1792 the Dniester was recognized as the Russian frontier, and the privileges of the principalities as specified in the *hattisherif* confirmed. In defiance of treaties, however, the Porte continued to change the hospodars almost yearly and to exact extraordinary installation presents. The revolt of Pasvan Oglu in Bulgaria was the cause of great injury to Walachia. The rebels ravaged Little Walachia in 1801–2, and their ravages were succeeded by those of the Turkish troops, who now swarmed over the country. Exaction followed exaction, and in 1802 Russia resolved to assert her treaty rights in favour of the oppressed inhabitants of the principalities. On the accession of Constantine Ypsilanti (1802–6) in Walachia, and of Alexander Murusi (1802–6) in Moldavia, the Porte was constrained to issue a new *hattisherif* by which every prince was to hold his office for at least seven years, unless the Porte satisfied the Russian minister that there were good and sufficient grounds for his deposition. This clause of the *hattisherif* was not enforced. All irregular contributions were to cease, and all citizens, with the exception of the boiars and clergy, were to pay their share of the tribute. The Turkish troops then employed in the principalities were to be paid off, and one year's tribute remitted for the purpose. The boiars were to be responsible for the maintenance of schools, hospitals and roads; they and the prince together for the militia. The number of Turkish merchants resident in the country was limited. Finally, the hospodars were to be amenable to representations made to them by the Russian envoy at Constantinople, to whom was entrusted the task of watching over the Walachian and Moldavian liberties. This, it will be seen, was a veiled Russian protectorate.

In 1804 the Serbs under Karageorge rose against the Turkish dominion, and were secretly aided by the Walachian voivode Ypsilanti. The Porte, instigated by Napoleon's ambassador Sebastiani, resolved on Ypsilanti's deposition, but the hospodar succeeded in escaping to St Petersburg. In the war that now ensued between the Russians and the Turks, the Russians were for a time successful, and even demanded that the Russian territory should extend to the Danube. They occupied the principalities from 1806 to 1812. In 1808 they formed a governing committee consisting of the metropolitan, another bishop, and four or five boiars under the presidency of General Kusnikov. The seat of the president was at Jassy, and General Engelhart was appointed as vice-president at Bucharest. By the peace of Bucharest, however, in 1812, the principalities were restored to the sultan under the former conditions, with the exception of Bessarabia, which was ceded to the tsar. The Pruth thus became the Russian boundary.

The "Hetaerist" movement.

The growing solidarity between the two Ruman principalities received a striking illustration in 1816, when the Walachian and Moldavian hospodars published together a code applicable to both countries, and which had been elaborated by a joint commission. The Greek movement was now beginning to assume a practical shape. About 1780 Riga Velestiniul, a Hellenized Vlach from Macedonia who is also known by the purely Greek name of Rigas Phereos, had founded in Bucharest a patriotic and revolutionary association known as the Society of Friends (ἑταιρία τῶν φίλων) which gradually attained great influence. In 1810 Ignatius, the metropolitan of Walachia, founded a Greek literary society in Bucharest which soon developed into a political association, and many similar bodies were formed throughout the Greek world, and finally united into one powerful secret society, the Hetairia. Some of the members even cherished the fantastic hope of restoring the ancient Byzantine empire. In 1821 Alexander Ypsilanti, a son of the voivode, and an aide-de-camp of the tsar Alexander I., entered Moldavia at the head of the Hetaerists, and, representing that he had the support of the tsar, prevailed on the hospodar Michael Sutzu to aid him in invading the Ottoman dominions. To secure Walachian help, Ypsilanti advanced on Bucharest, but the prince, Theodore Vladimirescu, who represented the national Ruman reaction against the Phanariotes, repulsed his overtures with the remark "that his business was not to march against the Turks, but to clear the country of Phanariotes." Vladimirescu was slain by a Greek revolutionary agent, but Ypsilanti rashly continuing his enterprise after he had been repudiated by the Russian emperor, his forces were finally crushed by the Turks at Dragashani, in Walachia, and at Skuleni, in Moldavia; and the result of his revolt was a Turkish occupation of the principalities. In 1822 the Turkish troops, who had committed great excesses, were withdrawn on the combined representations of Russia, Austria and Great Britain. The country, however, was again ravaged by the retiring troops, quarters of Jassy and Bucharest burnt, and the complete evacuation delayed till 1824, when the British government again remonstrated with the Porte (see EASTERN QUESTION; GREECE; YPSILANTI; ALEXANDER).

Peace of Adrianople, 1829.

By the convention of Akkerman between the Russians and the Turks in 1826 the privileges of the principalities were once more confirmed, and they were again ratified in 1829, under Russian guarantee, by the peace of Adrianople. By this peace all the towns on the left bank of the Danube were restored to the principalities, and the Porte undertook to refrain from fortifying any position on the Walachian side of the river. A Russian army occupied the country until the Porte fulfilled its promises. The principalities were to enjoy commercial freedom, and the right of establishing a quarantine cordon along the Danube or elsewhere. The internal constitution of the countries was to be regulated by an "Organic Law," which was drawn up by assemblies of bishops and boiars at Jassy and Bucharest, acting, however, under Russian control. The Organic Law thus elaborated was by no means of a liberal character, and amongst other abuses maintained the feudal privileges of the boiars. It was ratified by the Porte in 1834, and the Russian army of occupation thereupon withdrew. The newly elected hospodars, Alexander Ghica (1834–42) and George Bibescu (1842–48) in Walachia, and Michael Sturdza (1834–49) in Moldavia, ruled in accordance with the Organic Law. Their reigns were marked by the social, financial and political predominance of Russia, which had steadily increased since 1711. The treaty of 1774 had given Russia a firm foothold in Rumanian politics. This had been strengthened by the *hattisherif* of 1802; while the treaties of 1812, 1826 and 1829 had respectively yielded up Bessarabia, the Sulina mouth of the Danube and the St George mouth to the tsar. From 1834 to 1848 the Russian consul at Bucharest was all-powerful.

Movement of 1848.

The revolutionary movement of 1848 extended from the Rumans of Hungary and Transylvania to their kinsmen of the Transalpine regions. Here its real object was the overthrow of Russian influence. In Moldavia the agitation was mostly confined to the boiars, and the hospodar Michael Sturdza succeeded in arresting the ringleaders. In Walachia, however, the outbreak took a more violent form. The people assembled at Bucharest, and demanded a constitution. Prince Bibescu, after setting his signature to the constitution submitted to him, fled to Transylvania, and a provisional government was formed. The Turks, however, urged thereto by Russian diplomacy, crossed the Danube, and a joint Russo-Turkish dictatorship restored the Organic Law. By the Balta-Liman convention of 1849 the two governments agreed to the appointment of Barbŭ Stirbeiŭ (Stirbey) as prince of Walachia, and Gregory Ghica for Moldavia.

Russian and Austrian occupation, 1853-54.

On the entry of the Russian troops into the principalities in 1853, the hospodars fled to Vienna, leaving the government in the hands of their ministers. During the Danubian campaign that now ensued great suffering was inflicted on the inhabitants, but in 1854 the cabinet of Vienna induced the Russians to withdraw. Austrian troops occupied the principalities, and the hospodars returned to their posts. One important consequence of the revolution had been the banishment of many rising politicians to western Europe, where they were brought into contact with a higher type of civilization. The practice initiated by the more liberal Phanariotes of sending Rumanian students to the French, German and Italian universities tended in the same direction. Statesmen such as I. C. Bratianu, D. A. Sturdza, S. I. Ghica, D. Ghica and Lascar Catargiu (whose biographies are given under separate headings) received their political training abroad, and returned to educate their countrymen. To this fact the surprisingly rapid progress of Rumania, as compared with the Balkan States, may very largely be attributed.

Treaty of Paris, 1856.

By the treaty of Paris in 1856 the principalities with their existing privileges were placed under the collective guarantee of the contracting Powers, while remaining under the suzerainty of the Porte—the Porte on its part engaging to respect the complete independence of their internal administration. A strip of southern Bessarabia was restored to Moldavia, so as to push back the Russian frontier from the Danube mouth. The existing laws and statutes of both principalities were to be revised by a European Commission, sitting at Bucharest, and their work was to be assisted by a Divan or national council which the Porte was to convoke for the purpose in each of the two provinces, and in which all classes of Walachian and Moldavian society were to be represented. The European commission, in arriving at its conclusions, was to take into consideration the opinion expressed by the representative councils; the Powers were to come to terms with the Porte as to the recommendations of the commission; and the final result was to be embodied in a *hattisherif* of the sultan, which was to lay down the definitive organization of the two principalities. In 1857 the commission arrived, and the representative councils of the two peoples were convoked. On their meeting in September they at once proceeded to vote with unanimity the union of the two principalities into a single state under the name of Romania (Rumania), to be governed by a foreign prince elected from one of the reigning dynasties of Europe, and having a single representative assembly. The Powers decided to undo the work of national union. By the convention concluded by the European congress at Paris in 1858, it was decided that the principalities should continue as heretofore to be governed each by its own prince. Walachia and Moldavia were to have separate assemblies, but a central commission was to be established at Fokshani for the preparation of laws of common interest, which were afterwards to be submitted to the respective assemblies. In accordance with this convention the deputies of Moldavia and Walachia met in separate assemblies at Bucharest and Jassy, but the choice of both fell unanimously on Prince Alexander John Cuza (January 1859). (A. J. E.; X.)

Union of the principalities.

Prince Cuza, 1859-66.

(5) *Rumania.*—Thus the union of the Rumanian nation was accomplished. A new conference met in Paris to discuss the situation, and in 1861 the election of Prince Cuza was ratified by the Powers and the Porte. The two assemblies and the central commission were preserved till 1862, when a single assembly met at Bucharest and a single ministry was formed for the two countries. The central commission was at the same time abolished, and a council of state charged with preparing bills substituted for it. In May 1864, owing to difficulties between the government and the general assembly, the assembly was dissolved, and a statute was submitted to universal suffrage giving greater authority to the prince, and creating two chambers (of senators and of deputies). The franchise was now extended to all citizens, a cumulative voting power being reserved, however, for property, and the peasantry were emancipated from forced labour. Up to this point the prince had ruled wisely; he had founded the universities of Bucharest and Jassy; his reforms had swept away the last vestiges of feudalism and created a class of peasant freeholders. But the closing years of his reign were marked by an attempt to concentrate all power in his own hands. He strove to realize his democratic ideals by despotic methods. His very reforms alienated the goodwill of all classes; of the nobles, by the abolition of forced labour; of the clergy, by the confiscation of monastic estates; of the masses, by the introduction of a tobacco monopoly and the inevitable collapse of the inflated hopes to which his agrarian reforms had given rise. His own dissolute conduct increased his unpopularity, and at last the leading statesmen in both provinces, who had long believed that the national welfare demanded the election of a foreign prince, conspired to dethrone him. In February 1866 he was compelled to abdicate; and a council of regency was formed under the presidency of Prince Ion Ghica. The count of Flanders, brother to the king of the Belgians, was proclaimed hospodar of the united provinces, but declined the proffered honour.

Election of Prince Charles, 1866.

Meanwhile a conference of the Powers assembled at Paris and decided by a majority of four to three that the new hospodar should be a native of the country. The principalities, however, determined to elect Prince Charles, the second son of Prince Charles Antony of Hohenzollern-Sigmaringen. On a referendum, 685,969 electors voted in his favour, against 224 dissentients. Prince Charles was an officer in the Prussian army, twenty-seven years of age, and was related to the French imperial family as well as to the royal house of Prussia: his nomination obtained not only the tacit consent and approval of his friend and kinsman King William of Prussia, but also the warm and more open support of Napoleon III. The king of Prussia, however, had agreed that the new hospodar should be a native of the principalities, and could not therefore openly approve of Prince Charles's election. Acting on the advice of Bismarck, the prince asked for a short leave of absence, resigned his commission in the Prussian army on crossing the frontier, and hastened down the Danube to Rumania, under a feigned name and with a false passport. On the 20th of May he landed at Turnu Severin, where he was enthusiastically welcomed. He reached Bucharest on the 22nd, and on the same day, in the presence of the provisional government, took the oaths to respect the laws of the country and to maintain its rights and the integrity of its territory. In October Prince Charles proceeded to Constantinople and was cordially received by his suzerain, the sultan, who bestowed on him the firman of investiture, admitted the principle of hereditary succession in his family, and allowed him the right of maintaining an army of 30,000 men. Rumania was to remain part of the Ottoman empire within the limits fixed by the capitulations and the treaty of Paris.

Foreign and domestic politics, 1866–70.

The first Rumanian ministry formed under the new prince was composed of the leading statesmen of all political parties, care being taken that the two provinces should be equally represented. A new constitution was unanimously passed by the chamber on the 11th of July. It provided for an Upper and Lower House of Representatives, and conferred on the prince the right of an absolute and unconditional veto on all legislation. Other reforms were urgently needed. There was an empty treasury, and the floating debt amounted to £7,000,000; maladministration was rampant in every department of the state; the national guard was mutinous, while the small army of regulars was badly organized and inefficient. The existence of famine and cholera added to the difficulties of the government, and in March 1867 the Lower House, by a majority of three, passed the laconic resolution, "The chamber inflicts a vote of blame on the government." As the result of this vote M. Kretzulescu, a Moderate Conservative, was called to the head of affairs, and I. C. Bratianu entered the government as minister of the interior. The new ministry, of which Bratianu was the leading spirit, showed considerable energy: a concession was granted for the construction of the first Rumanian railway, from Bucharest to Giurgevo, and the reorganization of the army was undertaken. Among other less judicious measures, a decree was passed ostensibly directed against all vagabond foreigners, but really aimed at the Jews, large numbers of whom, including many respected landowners and men of business, were imprisoned, or expelled, from Jassy, Bacau and other parts of Moldavia. This harsh treatment created intense indignation abroad, especially in France and Great Britain; and the emperor Napoleon wrote personally to Prince Charles, protesting against the persecution. The country could not afford to lose the goodwill of the emperor of the French, at that time one of the most powerful factors in Europe—in July 1869 Bratianu, although immensely popular, found it necessary to resign office, and with him fell the rest of the cabinet.

On the 15th of September 1869, Prince Charles married Princess Elizabeth of Wied, afterwards celebrated under her literary name of *Carmen Sylva*.[1] In the same year the army was reorganized, and a rural police created. Every able-bodied citizen was rendered liable to give three days' work yearly towards the construction of roads, or to pay a small tax as an equivalent. An important railway concession, which subsequently caused grave political complications, was granted to the German contractors Strausberg and Offenheim.

The rebellion of 1870.

Much excitement was aroused in Rumania by the outbreak of the war between Prussia and France. The sympathies of the Rumanians were entirely on the side of the French, whom they regarded as a kindred Latin race, while those of the prince were naturally with his native country. The excitement culminated in a revolutionary outbreak at Ploesci, where a hot-headed deputy, Candianu Popescu, after the mob had stormed the militia barracks, issued a proclamation deposing Prince Charles and appointing General Golescu regent. Owing to the loyalty of the regular army the insurrection was speedily quelled. But the feeling in the country was strong against the German sovereign, who seriously thought of abdicating when a jury acquitted the accused rebels. On the 7th of December he wrote confidentially to the sovereigns whose representatives had signed the treaty of Paris, suggesting that the future of Rumania should be regulated by a European congress.

The railway crisis of 1871.

A few days subsequently the prince learned that the German railway contractor Strausberg was unwilling or unable to pay the coupons of the railway bonds due on the 1st of January 1871, which were mostly held by influential people in Germany. This threw the responsibility of payment on Rumania, and was a severe blow to the prince, through whose instrumentality the loan had been placed. Matters were brought to a crisis by the Prussian government threatening to force the Rumanian government to provide for the unpaid coupons. The country was financially in no condition to comply. Bitter indignation prevailed against everything German, and culminated in an attack on the German colony in Bucharest on the 22nd of March 1871. On the following morning the prince summoned the members of the council of regency of 1866, and informed them of his intention to place the government in their hands. Lascar Catargiu and General Golescu, the only two members present, as well as Dimitrie Sturdza and other influential persons, declined to accept the responsibility. Catargiu offered to unite the different sections of the Conservative party in order to deal with the crisis. The prince accepted his offer. The elections took place early in May 1871, and the government, to which all the most respectable elements in the country had rallied, obtained a large majority. When parliament met in May the prince had a most enthusiastic reception. The anti-German feeling in the country had greatly subsided, in consequence of the crushing defeat of France; and in January 1872 the chambers passed a law by which Rumania undertook to pay the railway coupons. The German syndicate was satisfied, and the railway crisis ended.

The Catargiu ministry, 1871–75.

Catargiu's ministry was the tenth that had held office in the five years since the prince's arrival, but it was the first one that was stable. In March 1875 the budget for 1876, amounting to £4,000,000, nearly double in amount that of the year 1866, was passed without difficulty, and on the 28th of the month the parliamentary session closed. It was the first occasion in Rumania that the same chamber had sat for the whole constitutional period of four years, and also the first time that the same ministry had opened and closed the same parliament.

Only the fall of the Catargiu ministry saved the country from revolution. The leading Liberals had promoted a conspiracy for the arrest and expulsion of the prince, and the formation of a provisional government under General Dabija. The prospect of a return to power put an end to these machinations. Catargiu's ministry was succeeded by an administration under General Florescu, known as the "cabinet of the generals," and, a month later, by the so-called "ministry of conciliation" under M. Jepureanu. A commission of the chambers drew up an indictment against Catargiu and his late colleagues, accusing them of violating the constitution and the public liberties, squandering the state revenues, and other abuse of power. Unable to stem the tide of popular passion, which was crying for the impeachment of Catargiu, Jepureanu resigned office, and Bratianu formed a new Liberal cabinet, destined to guide the country through many eventful years.

The Russo-Turkish War of 1877–78.

But the re-opening of the Eastern Question was destined to bring to a climax the great struggle of Rumania for existence and independence, and temporarily to throw into the shade all domestic questions. The insurrection in Bulgaria, with its accompanying horrors, followed by the deposition of sultan Murad and the succession of the sultan Abdul Hamid, contributed to indicate the near approach of a Russo-Turkish war. Russia had shown symptoms of anger against Rumania for not having taken up a decided attitude in the approaching struggle, and the Russian ambassador Ignatiev had some months previously threatened that his government would seize Rumania as a pledge as soon as the Turks occupied Servia and Montenegro. Prince Charles decided to send a mission, composed of Bratianu and Colonel Slaniceanu (the minister of war), to the imperial headquarters at Livadia. They were well received by the emperor (October 1876), but in spite of mixed threats and cajoleries on the part of Gorchakov, Ignatiev and others, Bratianu returned without having definitively committed his country to active measures.

On the 14th of November six Russian army corps were mobilized to form the army of the south under the grand duke

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[1] For biographical details, see CHARLES, king of Rumania; and ELIZABETH, queen of Rumania.

Nicholas. A few days later two secret envoys arrived at Bucharest, the one M. de Nelidov, to negotiate on the part of the Russian government for the passage of their army through Rumania, the other Ali Bey, to arrange on behalf of the sultan a combination with Rumania against Russia. Prince Charles cleverly temporized with both powers. Negotiations with Russia were continued, and Bratianu was sent to Constantinople to put pressure upon Turkey to secure certain rights and privileges which would practically have made Rumania independent, except that it would still have paid a fixed tribute; but the conference of the powers assembled at that capital came to a definite end on the 19th of January 1877, when the Turkish government declined every proposal of the conference. Meanwhile the Porte, in issuing Midhat Pasha's famous scheme of reforms, had greatly irritated Rumanian politicians by including their country in the same category as the other privileged provinces, and designating its inhabitants as Ottoman subjects. A secret convention was signed between Russia and Rumania on the 16th of April, by which Rumania allowed free passage to the Russian armies, the tsar engaging in return to maintain its political rights and to protect its integrity, while all matters of detail connected with the passage of the Russian troops were to be regulated by a special treaty. On the 23rd of April Russia declared war against Turkey, and the grand duke Nicholas issued a proclamation to the Rumanian nation, announcing his intention of entering their territory in the hope of finding the same welcome as in former wars. The Rumanian government made a platonic protest against the crossing of the frontier, and the Rumanian troops fell back as the Russians advanced; provisions and stores of all kinds were supplied to the invading army against cash payments in gold, and the railways and telegraphs were freely placed at its disposal. The Rumanian chambers were assembled on the 26th of April, and the convention with Russia was sanctioned. The Ottoman government immediately broke off diplomatic relations with Rumania, and on the 11th of May the chambers passed a resolution that a state of war existed with Turkey. (For a detailed account of the subsequent campaign, in which Prince Charles and the Rumanian army contributed greatly to the success of the Russian arms, see RUSSO-TURKISH WARS, and PLEVNA.) The fall of Plevna left the Russian army free to march on Constantinople, and on the 31st of January 1878 the preliminaries of peace were signed at Adrianople. They stipulated that Rumania should be independent and receive an increase of territory.

The Berlin settlement.

1. Cession of Bessarabia.

Peace between Russia and Turkey was signed at San Stefano on the 3rd of March. On the 29th of January the Rumanian agent at St Petersburg was officially informed of the intention of the Russian government to regain possession of the Rumanian portion of Bessarabia, *i.e.* that portion which was ceded to Moldavia by Russia after the Crimean War. Rumania was to be indemnified at the expense of Turkey by the delta of the Danube and the Dobrudja as far as Constantza. The motive assigned was that this territory had not been ceded to Rumania, but to Moldavia, and had been separated from Russia by the almost obsolete treaty of Paris (1856). But the proposed exchange of territory aroused the most bitter indignation at Bucharest. Bratianu and Cogălniceanu were sent to Berlin to endeavour to prevail on the representatives of the Powers there assembled in June 1878 to veto the cession of Bessarabia to Russia; but the Rumanian delegates were not permitted to attend the sittings of the congress until the Powers had decided in favour of the Russian claim. The treaty of Berlin in dealing with Rumania decided to recognize its independence, subject to two conditions: First (Art. xlv.), that the principality should restore to the emperor of Russia that portion of the Bessarabian territory detached from Russia by the treaty of Paris in 1856, bounded on the west by the mid-channel of the Pruth, and on the south by the mid-channel of the Kilia branch and the Staryi Stambul mouth. Second (Art. xliv.), that absolute freedom of worship should be granted to all persons in Rumania; that no religious beliefs should be a bar to the enjoyment of any political rights; and, further, that the subjects of all the powers should be treated in Rumania on a footing of perfect equality. Article xlvi. declared that the islands forming the delta of the Danube, the Isle of Serpents, and the province of Dobrudja, as far as a line starting from the east of Silistria and terminating on the Black Sea south of Mangalia, should be added to Rumania. Other articles defined the international position of Rumania, while Article liii. decreed that it should have a representative on the European commission of the Danube. Bratianu wrote with some truth that the Great Powers by sacrificing Rumania were able to obtain more concessions for themselves from Russia, and Lord Beaconsfield was constrained to admit that "in politics ingratitude is often the reward of the greatest services." The Rumanians submitted reluctantly to the retrocession of Bessarabia; and the Dobrudja was occupied by Rumanian troops on the 26th of November 1878.

2. The Jewish question.

But Article xliv. of the treaty of Berlin caused tremendous agitation throughout the country, and almost provoked a revolution. Article vii. of the constitution of 1866 laid down that "only Christians can become citizens of Rumania"—in other words, all Jews were excluded from the rights of citizenship; and as no foreigner could own land in Rumania outside the towns, no Jew could become a country proprietor. Public opinion in Rumania rendered it almost impossible for any government to carry out the wishes of the Berlin tribunal. To do so involved a change in the constitution, which could only be effected by a specially elected constituent assembly. This body met on the 3rd of June, and sat through the entire summer. The irritation of the powers at the unexpected delay was so great that Great Britain proposed a collective note on the subject, to be executed by the Austrian cabinet; while Prince Bismarck threatened, if the Berlin proposition were not carried out, to refer to the suzerain power at Constantinople. At last, however, on the 18th of October, Article vii. was repealed, and it thus became possible for Rumanian Jews to become naturalized and to hold land. It was further decided to admit to naturalization the 883 Jewish soldiers who had served in the war; but with all other Jews individual naturalization was required, and this was hedged about by so many difficulties, a special vote of the legislature being required, with a two-thirds majority in each individual case, that although the compromise thus effected was accepted by the powers, the actual result was that, from 1880 to 1884, out of 385 persons who were naturalized in Rumania, only 71 were Rumanian Jews. As the process of naturalization has never been accelerated, the 300,000 Jews said to inhabit Rumania are still regarded as foreigners; and although liable to military service and to the payment of taxes, are unable to own rural land or possess electoral or other civil rights.

3. Establishment of the Rumanian kingdom.

Italy was the first of the Powers to notify its recognition of Rumanian independence (December 1879); but Bismarck succeeded in prevailing on the Western Powers not to give official recognition until Rumania should have purchased the railways from their German owners. This unpopular measure caused some delay; but Great Britain, France and Germany formally recognized the independence of the country on the 20th of February 1880. Early in 1881 it was generally felt that the time had arrived for Rumania to be created a kingdom. On the 13th of March the tsar Alexander II. was assassinated, and the Rumanian opposition chose this occasion to accuse the Liberal government of aiming at republican and anti-dynastic ideals. To refute this charge, the ministry proposed the elevation of the Rumanian principality into the kingdom of Rumania. The prince accepted the resolution; within ten days the new kingdom was recognized by all the Great Powers, and the coronation took place at Bucharest on the 22nd of May 1881. The royal crown was constructed of steel made from Turkish cannon captured at Plevna.

Relations with Russia and Austria-Hungary.

Rumania was now comparatively, but not entirely, free from fears of serious foreign complications. Austria and Russia alike resented the decision to fortify Bucharest and the Sereth line, adopted by the Rumanian government in 1882. Relations with Russia had remained strained ever since the war. The delimitation of the Dobrudja frontier was still unsettled, and owing to Russian opposition was not finally disposed of till 1884. Expenses incurred during the war led to much controversy, especially when the Russian government claimed the return of £120,000 advanced to enable the Rumanians to mobilize, and considered by them as a free gift. A compromise was made, both parties withdrawing their claims, in April 1882.

Relations with Austria-Hungary were also on a very unpleasant footing. There were two principal subjects of discord—the navigation of the Danube (*q.v.*) and the "national question," *i.e.* the status of the Vlach communities outside Rumania, and especially in Transylvania and Macedonia (see VLACHS and MACEDONIA). The Danube question became acute in 1881, 1883 and 1899; the national question is a more permanent source of trouble, affecting Austria-Hungary, Greece, Turkey and Bulgaria. King Charles, who naturally favoured the ally of Germany, and Bratianu, who regarded Russian policy with suspicion, endeavoured to promote a better understanding with Austria-Hungary. But there was a strong anti-German party in the country, especially among the old boiars and the peasantry. Community of creed, ancient traditional influence, the entire absence of Russian merchants, and the consequent avoidance of many small commercial rivalries, contributed to bring about a sort of passive preference for Russia, while the bitter disputes that had occurred with Germany on the question of railway finance had left a very hostile feeling.

Revision of the Constitution, 1883–84.

In March 1883 the government decided to introduce various important changes into the constitution. Three electoral colleges were formed instead of four; a considerable addition was made to the numbers of the senate and chamber; trial by jury was established for press offences, except those committed against the royal family and the sovereigns of foreign states; these were to be tried by the ordinary tribunals without jury. A bill was passed endowing the crown with state lands, giving an annual rent of £24,000 in addition to the civil list fixed in 1866 at £49,000; another measure granted free passes on the railways and an allowance of £1 daily during the sitting of parliament to all senators and deputies. The revision of the constitution had estranged the two heads of the Liberal party, I. C. Bratianu, who was mainly responsible for the new measures, and C. A. Rosetti, who unsuccessfully advocated reforms of a far more democratic character. These two had been united by a most intimate friendship. One had never acted without the other. Rosetti was said to be the soul whilst Bratianu was the voice of the same personality. Henceforward Bratianu had sole control of the Liberal government. The revising chambers having fulfilled their special mandate, were dissolved in September 1884, and a new parliament assembled in November, the government, as usual, obtaining a large majority in both houses.

Coalition of parties against I. C. Bratianu, 1883–88.

Since 1876 Bratianu had exercised an almost dictatorial power, and anything like a powerful parliamentary opposition had ceased to exist. But he had been too long in power; the numerous state departments were exclusively filled with his nominees; and some pecuniary scandals, in which the minister of war and other high officials were implicated, helped to augument his fast-growing unpopularity. New parties were formed in opposition, and the National Liberal and Liberal-Conservative parties combined to attack him. The first of these maintained that the government should be essentially Rumanian, and, while maintaining friendly relations with foreign Powers, should in no wise allow them to interfere with interal affairs. They also advocated reduction of expenditure and the independence of the magistracy. The Liberal-Conservatives held generally the same views, but had as their ideal of foreign policy a guaranteed neutrality. Another party which now attracted considerable attention was that of the Junimists, or Young Conservatives. The name was taken from the Junimea, a literary society formed in Jassy in 1874 by P. Carp, T. Rosetti, and Maiorescu, and transformed into a political association in 1881. Their programme for home affairs involved the amelioration of the position of the peasantry and artisan classes, whose progress they considered had been overlooked, the irremovability of the magistracy, and a revision of the communal law in the sense of decentralization. In financial matters they advocated the introduction of a gold standard and the removal of the agio on gold, also the introduction of foreign capital to develop industries in the country; and as regards foreign policy, they were strong advocates of intimate and friendly relations with Austria-Hungary. Elections for a new chamber took place in February 1888, and the whole of the leaders of the opposition were elected, including Dimitrie Bratianu, the premier's brother, and Lascar Catargiu. I. C. Bratianu definitely retired on the 4th of April, after having held the premiership for twelve eventful years. Had he continued much longer in office it is probable that there would have been a revolutionary movement against the dynasty. During the previous parliament a Conservative manifesto, signed by Catargiu, D. Bratianu and other leaders of the opposition, openly threatened that if the ministers were not removed before the general election, the responsibility would be thrown, "not on those who served the crown, but on him who bore it"; and the name of Prince George Bibescu had been openly mentioned as a possible successor.

The Conservative-Junimist coalition, 1888–95.

In the new chamber elected in October 1888 only five members of Bratianu's party retained their seats. The most prominent statesman in the new Conservative-Junimist administration was P. Carp, who in the spring of 1889 succeeded in passing a bill which authorized the distribution of state lands among the peasantry. Despite this admirable measure, he was unable to retain office, and three changes of ministry followed. The Conservative-Junimist parliament nevertheless restored tranquillity to the country. On the 22nd of May 1891, the 25th anniversary of the king's accession was celebrated with great enthusiasm. Meanwhile the gold standard had been introduced (1889), and the financial situation was regarded as satisfactory. In December 1891 a stable cabinet was at last formed by Lascar Catargiu. The new ministry during their four years' tenure of office passed several useful measures through parliament. The state credit was improved by the conversion of the public debt; the sale of the state lands to the peasantry was actively continued; a law was passed making irremovable the judges of the court of appeal and the presidents of tribunals, and other important judicial reforms were carried out; a mining law was passed with the object of introducing foreign capital; and the commercial marine was developed by the formation of a state ocean service of passsenger and cargo steamers. Great reforms, which had been unsuccessfully attempted by former governments, were made in the service of public instruction and in the organization of the clergy. In 1893 and 1894 commercial and extradition treaties and a trade-mark convention were made with Great Britain, Austria-Hungary and Germany. Meanwhile the Liberal opposition was being reorganized. On the death of I. C. Bratianu, in 1891, his brother Dimitrie was proclaimed chief of the united Liberal party, but he also died in June 1892, and the veteran statesman Dimitrie Sturdza was recognized as the head of the Liberals. In 1894 he started a very violent agitation in favour of the Rumanians in Hungary. Another popular opposition cry was "Rumania for the Rumanians." The new mining law, among other concessions, gave foreigners the right to lease lands for long periods for the working of petroleum, and this was denounced by the opposition as being hostile to national interests, and also as being against the spirit of the constitution, which prohibited foreigners from holding lands. The bill was carried by the government in April 1895, as well as another important measure favouring the construction of local railways by private contractors. The Liberal opposition protested, retired from the chamber, and took no further part in legislative proceedings. The Liberal party had been out of office for eight years, the Conservative-Junimist coalition had practically carried out its complete programme, and legislation was at a deadlock owing to the abstention of the Liberal opposition. As the electorate showed itself in favour of a change of ministry, Catargiu resigned, and a new Liberal government was formed by D. Sturdza.

The Liberal administration of 1895–99.

The advent to power of a statesman who had recently been making such violent attacks on the Hungarian government caused some anxiety in Austria-Hungary. When once office was obtained, it was to the interest of the new government that the agitation should subside. The official opening by the emperor of Austria of the new channel through the Iron Gates of the Danube, on the 27th of September 1896, was the means of bringing about a great improvement in the relations between the two countries. It led to an exchange of visits between the emperor and King Charles, who also visited the tsar Nicholas II. in August 1898. The visit was the symbol of a reconciliation between the Rumanians and the Russians, the relations between whom had been the reverse of cordial since 1878. As regards home politics, the overwhelming majority of the Liberal party at the elections of 1895, instead of being a source of strength, proved the very reverse. It caused the party to split up into factions—Sturdzists, Aurelianists and Flevists, so called after the names of their respective chiefs. Sturdza himself soon had to retire. The head of the Orthodox Church, the metropolitan Gennadius, had for some years past, as head of the philanthropic establishments founded by the princess Brancovan, desired to obtain the entire management of these wealthy foundations, and had made violent attacks on the two administrators, Prince George Bibescu and Prince Stirbei, both members of the Brancovan family. In the quarrel that ensued the prelate was openly accused of simony, of heresy, and other matters more suitable for a criminal court. After a public trial before the Holy Synod, he was found guilty of certain canonical offences, and sentenced to be deposed. The same night, he was seized by the police, and removed by force to a neighbouring monastery. This harsh treatment of the head of the Church led to an attack on Sturdza. On the 3rd of December 1896, the president of the council, M. Aurelian, was called on to reconstitute a Liberal cabinet, with the principal object of calming public opinion by the settlement of this question. Aurelian then appealed to the patriotic sentiments of the Conservative party to help to solve the difficulty, and with the aid of Lascar Catargiu and Tache Ionescu the following decision was reached: the Holy Synod was to reverse its judgment, and the metropolitan was to be restored to his ecclesiastical rank; but, after holding it for a few days, he was voluntarily to resign and to receive as compensation a handsome pension. Calm was thus restored, but Aurelian and his colleagues were not inclined to hand over their portfolios to Sturdza and his partisans. The struggle terminated in the success of Sturdza, who in April 1897 returned to power and remained president of the council until 1899. Few of the important measures promised in the Liberal programme were passed, one for the reform of public instruction being the most noteworthy. Sturdza's government, which had risen to power mainly on the national question, was also destined to fall on it. A popular agitation was raised on the subject of certain subsidies made by the Rumanians for the support of the Rumanian schools at Kronstadt in Transylvania, and Sturdza was accused of too great subserviency to the Hungarian government. The agitation culminated in street riots at Bucharest. On the same evening that Sturdza tendered his resignation to the king (April 1899) the veteran Conservative statesman Lascar Catargiu suddenly died.

The financial crisis of 1899–1901.

The Conservatives, led by G. G. Cantacuzene, returned to office with an overwhelming majority. They were immediately confronted by an acute economic crisis. The financial position of the country had hitherto on the surface been very satisfactory. The public debt, mostly placed in Germany, amounted to about £51,000,000. The interest had been regularly paid. But the facility with which money had always been borrowed gave rise to great extravagance. Expenses which ought to have been defrayed out of the ordinary budget, such as the erection of magnificent public offices at Bucharest, were frequently defrayed out of the loans; and the custom had arisen when money was scarce of issuing treasury bonds. When the Conservatives came into office they found that the payment of 2½ millions of these bonds would shortly become due, and there were no resources in the treasury to meet them. Owing to the Transvaal War and other causes, the money market was most unfavourable, especially in Germany; and there was an almost entire failure of the harvest. The value of cereals exported in 1898 was about 9 millions sterling, in 1899 only 3½ millions. The government managed to extricate itself from its immediate difficulties in the autumn of 1899, by raising a loan of £7,000,000 in Berlin, but on very stringent terms. Besides paying a much higher rate of interest than heretofore, it bound itself not to contract any further loans until this one was paid. The Conservatives were united in wishing to meet the financial crisis by a moderate reduction of expenditure and a large increase of taxation, while the Liberal opposition advocated the permanent reduction of the annual expenditure of £800,000, which would necessitate the raising of £200,000 only by fresh taxation. The Conservative programme was naturally unpopular; Carp and the Junimists were unwilling to co-operate with the government, and, on the 26th of February 1901, D. Sturdza again became premier.

Financial reform, 1901–5.

His administration lasted until the 31st of December 1904, and averted the impending bankruptcy of Rumania by a policy of strict retrenchment. In 1904 Sturdza was able to exceed the proposed limit of annual expenditure, £8,740,000, owing to a great increase in the value of the tobacco monopoly. Even a recurrence of agricultural depression during the same year left the national credit intact. Another financial reform was undertaken by the Conservatives, who returned to power on the 4th of January 1905, with G. G. Cantacuzene as prime minister, and in May floated the conversion loan, already described.

Agrarian rising of 1907.

The chief causes of the agrarian insurrection in March 1907 have been outlined above (under *Land Tenure*). But an additional cause was the harsh treatment of the peasants on the state and communal lands leased to Jewish middlemen. At first an attack on the Jews alone, the rising soon became a *jacquerie* directed against all the large landowners. Numerous towns and villages were sacked and partly burned, and 140,000 soldiers were employed to suppress the revolt. On the 24th of March the Cantacuzene ministry resigned and was succeeded by a Liberal government under the leadership of D. Sturdza, who completed the restoration of order by strong military measures and afterwards initiated remedial legislation. He abolished the system by which public lands were leased to middlemen, reduced the land tax on small holdings, and granted new facilities for obtaining credit to the peasants. After a general election in June 1907, Sturdza remained in office with an overwhelming majority. To meet the cost of agrarian reform, and of the reorganization of the army (1908), he introduced various fiscal changes, notably an alteration in the budget system, by which the total revenue and expenditure were shown for the first time (see *Finance*, above).

Rumania and the Macedonian question.

Rumania was little affected by the political changes in the Balkan Peninsula (1908-10) coincident with the Turkish revolution, the annexation of Bosnia and Herzegovina by the Dual Monarchy, the proclamation of Bulgarian independence and the erection of Montenegro into a kingdom. South of the Danube its chief political interest centred in the Kutzo-Vlach communities in Macedonia, which were the object of a Panhellenic propaganda most offensive to Rumanian nationalism. An *irade* of the sultan Abdul Hamid had in 1906 recognized the existence of the Kutzo-Vlachs as a religious body (*millet*), forming an integral part of the Rumanian Church. This decision was regarded by the Greeks as a blow to their own interests, and Greek revolutionary bands were accused of persecuting the Kutzo-Vlachs. (See also MACEDONIA.) Even before 1906 there was keen rivalry between Greece and Rumania, and the "Macedonian question" was the underlying cause of the disputes which, arising ostensibly from quite trivial causes, led temporarily to the rupture of diplomatic relations between Greece and Rumania in 1905, 1906 and 1910.

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LANGUAGE

Rumanian[1] is, geographically, an isolated eastern member of the group of Romance languages (*q.v.*), being severed from all the rest by countries in which the predominant speech is Slavonic or Magyar. It represents the original rustic Latin of the Roman provincials in Moesia and Dacia, as modified by centuries of alien rule. Structurally, its Latin characteristics have been well preserved; but its vocabulary has undergone great changes, becoming so far Slavonized that the ratio of words of Slavonic origin to words of Latin origin is approximately as three to two; large numbers of loan-words have also been added from Turkish, Greek, Magyar and other sources. It is noteworthy, however, that where Latin words have survived they are sometimes purer than in the Romance languages of the West (*e.g.* Lat. *domina* is better represented by Rum. *domnă*, "lady," than by Ital. *donna*, Span. *doña*, Port. *dona*, Fr. *dame*). Some words indeed[2]—such as *laudare*, to praise, *ducere*, to lead—retain unaltered the forms under which they were used by Virgil and Cicero. A feature of the language which distinguishes it from all other members of the group, and appears to be of even higher antiquity than the word-forms above mentioned, is the retention of a suffix article—*e.g. frate*, brother, *fratele*, the brother; *zi*, day, *ziua*, the day. This usage seems to have survived from the pre-Roman period. A similar suffix article is retained in Albanian, which almost certainly represents the original language of the Thraco-Illyrian tribes (see ALBANIA); and these tribes belonged to the same ethnical and linguistic group as the Daco-Moesians represented by the Vlachs.

Rumanian orthography remained in a transitional state throughout the 19th century. The Latin alphabet is used, with special signs to represent sounds borrowed from Slavonic, &c. All the unaccented vowels except *e* are pronounced as in Italian; *e* has the same phonetic value as in Old Slavonic (=French *é*) and is often similarly preiotized (=*ye* in *yet*), notably at the beginning of all words except neologisms. The accented vowels *é* and *ó* are pronounced as *ea* and *oa* (*pétra*, rock, =*peatra*; *mórte*, death, =*moarte*); they are written in full, as diphthongs, at the end of a word and sometimes in other positions. The sound of the Slavonic Ы (a guttural *y*) is represented by *ă*, *ĕ* or *ŏ*, though these letters occur as frequently in words of Latin origin (*e.g. cînd*=*quando*) as in those derived from Slavonic; Ѫ is represented by *â* or *î*, having the nasal sound of *un* in French; *ĭ* and *ŭ* at the end of a word are mute or short. Of the consonants, *c* followed by *e* or *i*=*ch* (as in *church*), otherwise *k*; *ḑ* or *ḍ* resembles the English *j*; *g* is hard before *e* and *i*, otherwise soft; *h* is guttural, as *ch* in *loch*; *j* is pronounced as in French; *r* as in Russian; *ş* or *ș* (Slav. Ш) as *sh*; *ţ* or *ț* (Slav. Ц,) as *ts* or *tz*; *w* is wanting. The remaining consonants have the same phonetic values as in English.

Rumanian is highly inflected. It possesses two regular substantive declensions and six cases, the vocative being in common use. The large class of heterogeneous nouns which are masculine in the singular and feminine in the plural constitute what is sometimes called the neuter declension. There are three regular conjugations, distinguished (as in Latin) according to the termination of the present infinitive in *a*, *e* or *i*; *e.g.* (1) *a ara* or *arare*, to plough, (2) *a crede* or *credere*, to believe, (3) *a dormi* or *dormire*, to sleep. Verbs ending in *î*, however, are sometimes classed as a fourth conjugation. The second form of the present infinitive (*arare*, *credere*, *dormire*) is used as a noun. The so-called "simple perfect" (*perfectul simplu*) has often the force of an aorist. Compound tenses are formed by the addition of certain particles and of the auxiliary verbs—*a ave*, to have, *a fi*, to be, and *a voi*, to will. For the passive voice, *a fi* is used, with the past participle of the required verb. All tenses of reflexive verbs except the imperative and present participle are formed by prefixing the pronoun which indicates the object to the verb, in the dative or genitive case (abbreviated) as the verb may require; but in the reflexive imperative and present participle the verb precedes the pronoun; *e.g. a propune*, to propose, *a şî propune*, to propose to oneself, but *propune ţî*, propose to yourself.

The accentuation of Rumanian, though complex, is governed by certain broad principles, except in the case of neologisms, many of which have been borrowed from French and Italian without change of accent. Nouns retain the accent of the nominative singular in all cases and in both numbers (*e.g. copīlă*, girl, vocative plur. *copīlelor*), except when a diminutive or augmentative suffix is added; the accent then shifts to the suffix. The language is very rich in diminutive and augmentative forms; *e.g.* the name *Ión* or *Ioan* (John), has the diminutives *Ionică*, *Ioniţa*, *Ionaşcŭ*, *Ianache*, *Ienăchel*, &c. In verbs—apart from a few exceptional tenses—the accent falls on the first syllable of the inflectional suffix, *e.g. eŭ dorm*, I sleep, but *eŭ dormīssem*, I had slept. For the sake of euphony, a vowel is frequently interpolated between two consonants; *e.g.* in masculine nouns terminating in a consonant, an interpolated *u* precedes *l* to form the suffix article (*om*, man, *om-u-l*, the man).

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[1] *i.e.* the so-called Daco-Rumanian, spoken by the vast majority of Rumans over the whole of Rumania, in Transylvania, Bukovina, the Banat, Bessarabia, and some districts of Servia and Bulgaria bordering on the Danube. The two most important dialects are the Istro-Rumanian, spoken in part of Istria but rapidly becoming extinct, and the Macedo-Rumanian, spoken by the Kutzo-Vlachs (see VLACHS). The Istro-Rumanian forms, as it were, a link—now completely severed—between the Romance of the Balkans and the Romance of the West. In the Macedo-Rumanian there are no Magyar loan-words, but there is a large Albanian element, and Greek loan-words are more numerous than Slavonic.

[2] Apart from certain instances in which the Latin form has been artificially restored in comparatively modern times. (See under *Literature*.)

din bătrânĭ (Bucharest, 1878–79); L. Şăineanu, *Istoria filologieĭ române* (Bucharest, 1895), *id.*, *Influenţa orientală asupra limbei şi culturei române* (3 vols., Bucharest, 1900); S. C. Mândrescu, *Elemente ungureşti în limba română* (Bucharest, 1892); S. Puşcariu, "Studii istromâne" in *Annalele* of the Academia Română, ser. 2, vol. xxviii.; T. Gartner, *Darstellung der rumänischen Sprache* (Halle, 1904); G. Weigand, *Praktische Grammatik der rumänischen Sprache* (Leipzig, 1903). Important studies on the separate dialects of Moldavia, Walachi, the Dobrudja, Bessarabia, Bukovina, the Banat, Macedonia, Istria, &c., have been published by G. Weigand, either in book form or in the Leipzig *Jahresbericht des Instituts für rumänische Sprache*, which he edited from its foundation in 1894. (X.)

LITERATURE

The intellectual development of Rumania has never until modern times been affected by Latin culture, but it has been profoundly influenced first by Slavonic literature, then by the Greek or Byzantine literature, and last, by the Western, notably French and Italian novels. The history of Rumanian literature can be divided into three distinct periods: the Slavonic, from the beginnings of Rumanian literature in the middle of the 16th century down to 1710; the Greek, from 1710–1830, corresponding with the era of Phanariote rule; and the modern period, from 1830 to the present. The change from Slavonic to Rumanian was very gradual. Slavonic had been the language of the Church from the early middle ages, and was therefore hallowed in the eyes of the people and the clergy; through the political connexion with the Slavonic kingdoms of the south, Bulgaria and Servia, it had also been the language of the chancelleries and of the court. Even when the Rumanian language at last supplanted the Slavonic, it did not emancipate itself from the original; the new was merely a translation from the old, and at the beginning it was as literal as possible. We have therefore in the first period a medieval literature transplanted to Rumania and consisting of translations from the Slavonic. The reason of the change from Slavonic into Rumanian is to be sought in the influence the Reformation had among the Rumanian inhabitants of Transylvania.

The second period is marked by a complete waning of Slavonic influence, through the literary activity of the Greek hospodars. The Slavonic kingdoms of the south had lost their independence; they had ceased to produce anything worth having, whilst the Greeks brought with them the old literature from Byzantium and thus drove out the last remnants of Slavonic. They also treated Rumanian as an uncouth and barbarian language, and imposed upon the Church their own Greek language, Greek literature and Greek culture. This literature may be taken to represent the period of the Renaissance in the West; but when the yoke of the Phanariotes was shaken off, the link that connected Rumanian literature with Greek was also broken, and under modern influences began the romantic movement which has dominated Rumanian literature since 1830.

Much of the Rumanian literature of the first two periods has been preserved only in MSS.; few of these have been investigated, and a still smaller number have been compared with their original. The Rumanian Academy keeps jealous watch over the treasures it has accumulated, and few have had access to the riches entombed in its archives; nor has any private or public collection been catalogued. An exhaustive history of Rumanian literature is, for the time being, a pious wish.

The Bible.

First Period: c. 1550–1710.—Rumanian literature begins, like all modern European literature, with translations from the Bible. The oldest of these are direct translations from Slavonic texts, following the original word for word, even in its grammatical construction. The first impetus towards the printing of the Rumanian translations came from the princes and judges in Transylvania. It is under their orders and often at their expense that the first Slavonic printing-presses were established in places like Kronstadt (Brashov) Oraştia, Sasz-Shebesh and Belgrad (Alba Julia, in Transylvania) where Slavonic and Rumanian books appeared. The foremost printer and translator was a certain Diakonus Koresi, of Greek origin, who had emigrated to Walachia and thence to Transylvania. He was assisted in his work by the "popes" (parish priests) of those places where he worked. The very first book published in Rumanian is the Gospels printed in Kronstadt between 1560 and 1561. An absolutely identical Slavonic text of the Gospels appeared in the same year, or one year earlier, which no doubt was the original for the Rumanian translation. Following up the list of publications of the books of the Bible in chronological order, we find Diakonus Koresi immediately afterwards—the date has not yet been definitely ascertained—printing a Rumanian translation of the Acts of the Apostles; in 1577 he printed at Sasz-Shebesh a Psalter in both Slavonic and Rumanian; the Rumanian follows the Slavonic verse for verse. A MS. Psalter more recently discovered shows close affinity to this edition, and, in spite of the opinions held by some critics, must be considered as a copy of it made about 1585; it even reproduces the printer's errors of Koresi's edition. To the 16th century belong also the first attempts to translate the historical books of the Old Testament which appeared in Oraştia in 1582, under the title *Palia*. The example thus set could not fail to react upon the Rumanians in Walachia, with whom the Transylvanians stood in close commercial and political connexion. The Slavonic language still reigned supreme in the Church; yet once the example had been set in Transylvania, and the influence of the Slavonic nations had begun to slacken, it was inevitable that the Rumanian language should sooner or later come to its own. It was in Transylvania that the first complete Rumanian translation of the New Testament appeared (Belgrad, 1648). This translation was based upon the Slavonic original, but the text had been verified and corrected, by comparison with a Calvinistic translation, and had been collated with the Greek. The chief author of this translation, which may be termed classical, seems to have been a certain Hieromonach Sylvestre who lived in Walachia and who had undertaken, by order of the prince Betlengabor of Transylvania (1613–29), a translation of the whole Bible. Upon this version, no doubt, are based the editions of Iordache Cantacuzene (Bucharest, 1682), and that of Şerban Greceanu (1693), in which for the first time the Greek text is printed side by side with the Rumanian; and the edition of Anthim the Iberian (1703). In these may also be traced a few reminiscences of the older version by Koresi, of which a copy, made by Radu Gramatik (1574), and once the property of Peter Cercel, is now in the British Museum. Sylvestre also prepared a new edition of the Psalter as part of his Bible (Belgrad, 1651), verifying the text by reference to the Hebrew and Greek originals. The first edition of the complete Bible was published (1688) by order of Prince Ioan Şerban Cantacuzene, by Radu Greceanu, assisted by his brother Şerban and by Metrofan the bishop of Buzeu. This may be considered as the supreme monument of Rumanian literature in Walachia in the 17th century. No other Rumanian translation approaches it in style and diction, although the authors, as they own, utilized the older translations, and for the New Testament and the Psalter they utilized Sylvestre's work. At least a hundred years had to pass ere a new edition of the whole Bible was undertaken, nor was the Bible used for private reading, except such passages as were included in the lessons read in church. These were translated independently by Dositheiu under the title of *Pirimiar* (Jassy, 1683), and were almost the last work that came from his prolific pen. As far back as 1600 Dositheiu had made a new translation of the Psalter from the Slavonic and printed it in both languages (Jassy, 1680). Upon this translation he based the rhymed Psalter at which he had worked from 1660–73, when it appeared in Uniev. This is the first example of rhymed psalms in Rumanian, the author following the Polish rhymed version of Ian Kohanowski. Albert Molnar had translated a French rhymed Psalter into Hungarian (1607) and this served as the basis for a literal translation made by Ianos Viski (1697). About the same time Theodor Korbea attempted to versify the Psalter and dedicated his work to Peter the Great of Russia. A new translation of the Psalter from Slavonic, with a commentary, the first of its kind, was made in 1697 by Alexander Dascalul (Alexander Preceptor Polonus). All these last-mentioned Psalters are still in MS.

Homilies.

Turning from the Bible to homilies and the liturgy, we find the ancient collections of homilies in Rumania to be due to the same proselytizing movement. Almost the first book printed by Koresi (at the expense of the magistrate of Kronstadt, Foro Miklaus, *c.* 1570), seems to have been a translation from some Calvinistic compilation of homilies, one for every Sunday in the year. A Slavonic original sent by the metropolitan Serafim of Walachia served as the basis for a second collection of homilies known as *Evangelie invâţătoare* (1580). It differs from the former in language and tendency and proves that Koresi was only a translator and printer. The first collection of homilies, henceforth known as *Cazanii*, appeared in Dlŭgopole, *i.e.* Câmpulung, in Walachia, in 1642. It was compiled by a certain Melchisedec and contained thirteen homilies. Very voluminous is the next collection, *Evangelie invâţătoare tâlcuită*, translated from the Russian by Sylvestre (Govora, 1643). One year later appeared the first book printed in Moldavia, the collection of homilies *Carte românească de invâţătură* (Jassy, 1643). It is a volume of 1000 folio pages, of which the first half is absolutely identical with Sylvestre's collection. A similar unacknowledged loan was made by Meletie the Macedonian, compiler of the homilies which appeared at Deal in 1644. Of special interest is the next publication of homilies *Cheea inţelesului*, "the Key of understanding," by the Walachian metropolitan Varlaam, translated from the Russian and printed at Bucharest in 1678. This, the first book printed in Bucharest, begins the long series of editions which have issued from the press of the "Mitropolie" in Bucharest. From this press originated also the no less important presses at Buzeu and Râmnicu Vâlcea, where in the following two centuries almost all the books for the Church service were printed. Two or three more collections may be mentioned here—one called *Sicriu de aur*, "the Golden treasury," by Ioan of Vinţi (Sasz-Shebesh, 1688), probably from some Hungarian Calvinistic collection of obituary sermons; and the "Pearls," *Mârgăritare*, an anthology made from the Greek homilies of St Chrysostom, Epiphanius, Anastasius Sinaita, &c., and translated from the Greek by the brothers Radu and Şerban Greceanu. The only collection of original sermons is the *Didahii* delivered by the metropolitan Anthim the Iberian (*q.v.*), the scholar, artist, translator, printer and great linguist, who was the first to issue books in Arabic and even in Georgian from his printing-presses in Bucharest. The *Didahii* were published at Bucharest in 1888.

The Liturgy.

The Rumanian language was not yet introduced into the Church. All the service books were in Slavonic, but during this period most of them were translated, and some of them printed, although not yet officially used. The burial service seems to have been the first to be translated. Two *Evhologia* appeared during the second half of the 17th century, one by the bishop Dositheiu (Jassy, 1679–80), which remained almost unknown, and the other based upon the Slavonic, by Ioan of Vinţi (Belgrad, 1689). This *Molitāvnic* (prayer-book) has been the basis of all subsequent editions of the Rumanian Prayer-book. The Liturgy proper was also translated by bishop Dositheiu in 1679, but a translation from the Greek, by Jeremia Kakavela (Jassy, 1697), was the one adopted in the churches. Passing over the numerous editions of the Akathist and Katavasiar, some partly in Rumanian, we may mention the Ceasoslov (Book of Hours), said to have been printed for the first time in Transylvania in 1696, but certainly printed or reprinted by the metropolitan Anthim (Tîrgovishtea, 1715). In 1694 Alexander Dascalul translated, and the bishops Mitrofan of Buseu and Kesarie of Râmnicu Vâlcea printed (among other church books) the twelve volumes of the *Mineu* in Slavonic with Rumanian rubrics, and short lives of the saints, as well as the *Triod* and the *Anthologion*.

In addition to the activity of the Reformers in Transylvania, there was also a Roman Catholic propaganda in Rumania, and the Orthodox Church found it necessary to convoke a synod in Jassy for the purpose of formulating anew its own dogmatic standpoint. It was held in 1642 under the presidency of Peter of Mogila, and a formulary of the Orthodox creed was drawn up. An answer to the Lutheran Catechism of Heidelberg (translated into Rumanian and printed at Fogaras in 1648) was also prepared by Bishop Varlaam. R. Greceanu translated the formulary from Greek into Rumanian under the title *Pravoslavnică mărturisire* (Bucharest, 1692). Of a more decided polemical character is the *Lumina* of Maxim of Peloponnesus, translated from the Greek (Bucharest, 1699).

Ethical literature.

Of far greater interest is the literature of maxims, and lives of saints, real or apocryphal, intended to teach by example. Such are the maxims in the *Floaerea darurilor*, translated from the Greek (Sneagov, 1700), and going back to the Italian *Fiore de virtù*; the *Invâtăţuri creştineşti*, "Christian teachings" of Filoteos (*ibid.*, 1700); the short moral guide, *Cărare pre scurt*, by Ioan of Vinţi (Belgrad, 1685), translated from some Hungarian original; the *Mântuirea păcătosilor*, or "Salvation of sinners," translated from the Greek by a certain Cozma in 1682, which is a storehouse of medieval exempla; and above all the *Mirror of Kings*, ascribed to Prince Neagoe Bassaraba, written originally in Slavonic (or Greek, if the prince be really the author), and translated (*c.* 1650) into Rumanian. This exceeds all the other publications of its class in purity of language and excellence of style. Of the lives of saints, the *Prolog*, translated from the Slavonic at the beginning of the 17th century (MS.), and the *Vieţile Sfinţilor*, by Dositheiu (2 vols., Jassy, 1682), are the most important. In the latter, which is his greatest work, Dositheiu uses not only Greek texts, but also Slavonic legends and other MS. material; and he includes a goodly number of the apocryphal legends of saints. To this kind of literature belongs also the *Lafsaikon*, *i.e.* the *Historia Lausiaca* of Palladius, differing, however, in some points from the original. The legends of the saints of the Pecherskaya in Kiev were translated by Alexander Dascalul. All these are still in MS.

Law.

The first law-books were also compiled during this period. The Slavonic *Nomokanon*, which rests on Greek legislation and embodies the canonical and civil law, had previously been used in Rumania. In 1640 there appeared in Govora the first canonical law-book, which was at the same time the first Rumanian book printed in Walachia. This *Pravilă* (code) was probably the work of the historian Moxa or Moxalie. In 1632 Evstratie the Logofet (logothete) also translated a *Pravilă* from the Greek, which remains in MS. In 1646 appeared the *Pravilă aleasă*, or "Selected Code," compiled, no doubt, by Evstratie and published with the authority of the then reigning Prince Vasile Lupul (Basil the Wolf), hence known as the Code of Vasile. In 1652 there appeared in Bucharest a complete code of laws, translated from the Greek and Slavonic and adapted to local needs under the direction of the prince of Walachia, Matthias Bassaraba. The *Indreptarea legii*, in which *Pravilă* of Vasile was incorporated without acknowledgment, remained the recognized code almost down to 1866. It embraces the canonical as well as the civil law. The chief authors were Uriil Năsturel and Daniil M. Panoneanul.

History.

The earliest historical works are short annals, written originally in Slavonic by monks in the monasteries of Moldavia and Walachia. In 1620 Moxa translated from the Slavonic a short history of the world down to 1498. Two other universal histories were translated from Greek and Slavonic chronographs. One by Pavel Danovici contains the history of the world told in the style of the Byzantine chroniclers; it includes the legend of Troy, the history of Pope Sylvester and the description of the various church councils; and it concludes at the year 1636. The second is the *Hrongraf* of Dorotheus of Monembasia, translated by a certain Ion Buburezău. Both are still in MS. The Old Slavonic annals were later on translated and new notes were added, each subsequent writer annexing the work of his predecessor, and prefixing his name to the entire compilation. Ancient Rumanian historiography is thus difficult to unravel. In Moldavia, where the influence of Poland had been great and Western writings were accessible, we find the best chroniclers. The writers are often actors in the dramas which they describe, and often also the victims. A history of Moldavia from the earliest times to 1594 is ascribed to Nestor or to his son, Gregorie Ureche, or to Simion Dascalul. It was continued by the Evstratie mentioned above, and probably also by Missail Călugărul. The most important author whose writings rank as classical is Miron Costin, who either took up the thread where it was left by Simion and Ureche and wrote the history of Moldavia from 1594–1662, or continued the history from where (probably) Evstratie had left it (*c.* 1630–62). Nicolae Costin (d. 1715), son of Miron, completed the history at both ends. He starts from the creation and endeavours to fill up the lacuna from 1662 to his own time, 1714. It is doubtful, however, whether the portion from 1662–1701 is his work or whether another compiler had filled up that section. Acsintie Uricariul, 1715, brings to a close the *corpus* of Moldavian Chronicles.

The same uncertainty holds good also for Walachia. The beginnings are the work of an anonymous author, whose chronicle, continued by a certain Constantin Capitanul, describes the history of Walachia from Radu Negru (*i.e.* Rudolph the Black), *c.* 1290–1688. An addition to this Chronicle from the time of the Roman Conquest to Attila is ascribed to Tudosie Vestemianul, twice metropolitan of Walachia (1669–73, 1677–1703). The Chronicle of Capitanul was further continued by Radu Greceanu to 1707, and finally by Radu Popescu to 1720. Two works remain still to be mentioned—a comprehensive history of both principalities by an anonymous author, probably the Spatar Milescu, who finished his eventful life as ambassador of Russia to China (still in MS.), and the *Hronicul Moldo-Vlahilor* of Prince Demetrius Cantemir (see CANTEMIR), more an apology for the Roman origin of the Rumanians than a true history. Cantemir wrote the original in Latin and translated it into Rumanian in 1710. His style shows an immense superiority to that of the previous historians. Of poetry there is scarcely a trace during the whole period under review except some rhymed Psalters and a few rhymed dedications to patrons.

Influence of Roman Catholicism.

Second Period: 1710–1830.—The Phanariote period has been described as one of total decay; the political degradation of Rumania was thought to be reflected in its spiritual life. But the facts do not warrant this opinion. The few who had taken the trouble to study Rumanian literature paid not the slightest attention to the vast MS. material accumulated during the years of the Phanariote dominion, and out of sheer ignorance and political bias condemned this period as sterile. Another influence was far more potent than the conduct of the Greek princes, though some of them were real benefactors of the people. In Transylvania one section of the Rumanian population had accepted the spiritual rule of the pope; they became now Greek-Catholic, instead of Greek Orthodox. Rome took good care to educate the priesthood far above the status of the Orthodox priests, and continued an extensive proselytizing activity. So long as the Rumanians were spiritually united with the other Orthodox nations, and so long as they used the Slavonic or Cyrillic alphabet, they would practically be cut off from the Latin West. If, however, they could be induced to discard the old Slavonic alphabet and substitute for it the Latin, and could be brought to recognize their national and ethnical unity with ancient Rome, it was hoped that then they would be more easily induced to enter into the unity of faith. Thus a great change was wrought towards the end of the 18th and in the first half of the 19th century in the whole current of Rumanian literature. It suited the promoters of that movement to pretend that they started a new era. But the Latin or Transylvanian movement wrought great havoc in Rumanian literature and caused the greatest confusion in the language. Only now are some authors beginning to free themselves from the evil influence.

Liturgical, theological and ethical literature.

By the end of the 17th century Rumanian had become the authorized language of the Church, and the Rumanian translation of the Gospels (printed 1693) had become the Authorized Version. Most of the liturgical books officially adopted and revised in this period are still used for church services. Such are the *Ceasoslov*, revised by Bishop Kliment of Râmnicu Vâlcea (1745), the *Evhologion* (1764), the *Katavasiar* (1753), The monumental publication of the *Mineiu*, in 12 folio volumes, by Bishops Kesarie and Filaret of Râmnicu Vâlcea (1776–80), is equal in importance if it be not superior to the no less monumental publication of the *Lives of Saints*, also in 12 huge folio volumes, published under the direction and with the assistance of the metropolitan Veniamin of Moldavia. The latter was translated from the Russian, appeared in Neamtzu (1809–12), and was reprinted in Bucharest (1835–36). In beauty, richness and lucidity of language, and in dignity of style, these two books resemble the Bible of 1688.

Slavonic having entirely disappeared from the sources of literature, writers and translators turned to Greek originals and for more than a century were busy translating into Rumanian the most important works of the older Fathers of the Church. Some of these translations were printed much later; thus the *Hexaemeron* of Basil the Great (and of Epiphanius) translated in the middle of the 18th century, was printed at Bucharest in 1827. The *Scala Coeli* of Joh. Klimakus, the *Treasury* of St Damascenus (MS. 1747 by a certain Mihalacea), the homilies of Cyril of Alexandria, and those of Ephraem the Syrian, were printed at Neamtzu in 1818. The *Panoplia* of Euthymius Zygabenus (1775) and the *Commentary* of Theophylact were printed by Veniamin (Jassy, 1805). The homilies of Theodor Studites (MS. of 1712) were edited by Bishop Filaret and published at Râmnicu Vâlcea in 1784; a translation of Gregory of Nazianzus appeared at Bucharest in 1727. The great polemical work of Simeon of Thessalonica, the Greek original of which was published by Dositheiu (Jassy, 1683), had been translated into Rumanian long before it was printed (Bucharest, 1756). The *Lafsaikon*, mentioned above, was printed at Bucharest in 1754. All these translations are written in good Rumanian. One can see how a language not originally suited for abstract problems and theological dialectics was slowly but surely improved and made capable of expressing profound and subtle ideas.

In Transylvania, with the conversion to Greek-Catholicism of Bishop Athanasius in 1701, the Greek Orthodox had to place themselves down to 1850 under the protection of the Servian metropolitan of Karlovatz. No writer of any consequence arose among them. The "United" fared better, and many a gifted young Rumanian was sent to Rome and helped from Vienna to obtain a serious education and occasionally also temporal promotion. With a view probably to counteract the literary activity in Rumania, the bishops P. P. Aaron and Ioan Bobb were indefatigable in the translation of Latin writers. First and foremost a new translation of the whole Bible was undertaken by Samuel Klain. It appeared in Blazh (1793–95). It falls short of the older version of 1688; it was modernized in its language, and no doubt a careful examination would reveal differences in the translation of those passages in which the Catholic tradition differs from the Eastern. Bobb translated Thomas à Kempis's *Imitatio Christi* (Blazh, 1812); he wrote a *Theologhie moralâ* (*ibid.* 1801) and adapted the Rumanian service-books to the new order of things. Popular catechisms and various histories of the Church were then written. Mention may be made of a few more moral treatises such as the *Uşa pocăinţei*, "Gate of Penitence" (Kronstadt, 1812); *Oglinda omului din ăuntru*, "The Mirror of the Inner Man"; or *Pilde filosofeşti*, "Philosophical Saws and Maxims" (Tîrgovishtea, 1715). Of greater importance was the collection of fables with their "moral" translated and modified from the Servian of Obrenovich—*Fabule moraliceşti*, by Tzikindeal (Budapest, 1814). These are heavy and follow the original too literally. Tzikindeal (d. 1818) and his contemporaries in Hungary had lost contact with the Rumanian literature in Walachia and Moldavia, and the same was the case with the other writers of their school. Radovici or Dinu din Goleşti, an enlightened Walachian boyar, who was one of the first Rumanians to describe a journey in Western Europe, is also the author of a collection of maxims and parables, *Adunare de pilde bisericeşti şi filosofeşti* (Budapest, 1824); he left a larger collection in MS. partly edited by Zane in his *Proverbele Românilor*, vols. xi.–xvi.

Law.

After 1727 Rumanian was recognized as the language of the law-courts, and through the annexation of Bukovina by Austria (1774) and of Bessarabia by Russia (1812), codes for the civil and political administration of those provinces were drawn up in Rumanian, either in accordance with the established law of the land or in consonance with the laws of Austria and Russia. Such legal codes reflect the German or Russian original. They were, however, of importance as they served as models (to some extent) for the new legislative code compiled in Moldavia under Prince Calimach; this was originally published in Greek (1816), and afterwards translated into Rumanian with the assistance of G. Asaki (Jassy, 1833). The Walachian civil laws and local usages were collected and arranged under the direction of Prince Ypsilanti (1780) in Greek and Rumanian; and under Prince Caragea another code was published (1817), which remained in force until 1832, when the "Organic Law" changed the whole trend of legislation. One more collection, an abstract from the Greek *Basilica*, published by Donici (Jassy, 1814), must be mentioned, for through it the legal terminology of the modern codes was more or less fixed.

History.

The last and probably the best writer of Rumanian history in the Phanariote period is Neculcea. He wrote a history of Moldavia to his own time, but for the period before 1684 his work is more or less an abstract from older writers. The original part covers the period from 1684–1743, and is to some extent an autobiography of a very adventurous life. Neculcea adds to his chronicle a collection of historical legends, many of them still found in the ballads of Moldavia. Among other historians might be mentioned N. Roset, the continuator of Neculcea. Enaki (Ianache) Cogălniceanu wrote a history of the period 1730–1774, and followed the example of Greek writers by introducing rhymes into it. He was also the author of some political satires and other poems on G. Ghica, M. Bogdan and Ioan Cuza. The historians of the time under pressure of political exigencies did not scruple to invent treaties between the Porte and the Rumanian principalities. A series of such spurious collections of treaties were submitted to the Powers for ratification; in them imaginary rights and privileges alleged to have been granted by the Turks were described, and the Rumanian representatives asked that after the peace negotiations of 1774 they should be sanctioned afresh. In Walachia there was not a single historian of importance in the first half of the 18th century. In the second we have the chronicle of Dionisie Eclesiarh (1764–1815), a simple-minded and uncritical writer who describes contemporary events. The ancestor of a great family of poets and writers, I. Vacarescu described the history of the Ottoman empire from the beginning to 1791, interpolating doggerel verses. Alexander Beldiman describes in a rhymed epic, *Eteria* (1821), the first battles between the Greeks and the Turks in Moldavia. It is a bitter satire upon the Greeks. Similar in tendency is another rhymed chronicle known under the name of *Zilot* (*c.* 1825).

Whilst a political and national revival was taking place in Moldavia and Walachia, towards the beginning of the 19th century, the Latin movement went on in Transylvania. There ethical and religious tendencies got the upper hand. Three historians had been partly educated in Rome under the protection of Prince Borgia and the influence of the Jesuit Minotto and the College of the Propaganda; they were Samuel Klain, Petru Maior and George Şincai. To Klain's initiative can be traced most of the work of the three. Unfortunately his writings, with a few exceptions, are still in MS. He is the author of the first history of the Rumanians in Dacia written according to the standards of Western science. It seems to have described the wars between the Romans and the Dacians, and to have been continued down to 1795; a history of the Rumanian Church also formed part of the book. P. Maior published an almost identical history (Budapest, 1812), and it is probable that he had made use of Klain's composition. In both the tendency is the same—to trace the modern Rumanians directly from the ancient Romans, and to prove their continuity in these countries from the time of Trajan to this day. Political and religious aims were combined in this new theory. A conflict was raging between the Hungarians and Rumanians, and history was required to furnish proofs of the greater antiquity of the Rumanians in Transylvania. George Şincai (1753–1816), who was an intimate friend of Klain and collaborated in most of his works, succeeded him as revisor at the printing office in Budapest. Şincai worked for nearly forty years at his monumental *History* of Rumania, which the Hungarian censor did not allow to be printed on account of its nationalist and anti-Magyar tendencies. It remained until 1853–54, when it was printed at the expense of Prince Gr. Ghica. The edition of 1886 is only a reprint, though both the original MS. and a better copy had meanwhile been discovered.

Imaginative Literature.

These books had no immediate influence in Walachia and Moldavia, where fiction and the drama had developed under the influence, first, of Greek and then to an increasing extent of French, Italian and German models. It was towards the end of the 18th century that Rumanian literature began to emancipate itself, very slowly of course, and to start on a career of its own in poetry and *belles lettres*. Curiously enough, the first novel to be translated was the "Ethiopic History" of Bishop Heliodorus. The *Odyssey* and *Iliad* were then translated into prose, and the *Arabian Nights*, after undergoing an extraordinary change in Italian and modern Greek, appear in Rumanian literature at the middle of the 18th century under the name of *Halima*. The Glykis, a Greek printing firm in Venice, published many popular books in Rumanian which found their way into the principalities. The epic of Vincenzo Cornaro was translated into prose alternating with verse, first under the name of *Erotocrit* and then slightly changed as *Filerot şi Antusa*. Anton Pann printed it as his own composition. *Kritil şi Andronius* (Jassy, 1794) is almost the last novel or story translated direct from the Greek. The young men of Walachia had come into contact with Western literature, which they were anxious to transplant to their own country. Some had been sent to Paris for their education, such as Poteca, Marcovici, the Voinescus, Moroiu and others, who developed an almost feverish activity in translation. Most of the writings of Florian, Marmontel, Le Sage, Montesquieu and others were rapidly translated into Rumanian. The picaresque novel *Lazarillo de Tormes* also found its translator, and appeared in 1839, *Paul and Virginia* in 1831. Campe's German *Robinson Crusoe* (1816) and his *Discovery of America* were translated by Draghici (1835). G. Asaki and Alexander Beldiman in Moldavia developed a similar activity. Beldiman copied a number of ancient chronicles, wrote a satire on the Greeks, and translated and adapted a number of French tragedies and dramas, in verse and prose.

The Drama.

Nowhere has the theatre played a more important rôle in the history of civilization than in Walachia and Moldavia, more in the former than in the latter. It formed the rallying-ground for the new generation which chafed under the tyranny of a Greek court. A certain Aristia, of Greek origin, but soon acclimatized to his surroundings as teacher at the high school in Bucharest, was the first to adapt foreign dramas for the Rumanian stage. These were first performed in Greek and afterwards translated into Rumanian. The plays produced on the Rumanian stage included most of the dramas of Molière, some of Corneille, Kotzebue and Metastasio, whose *Achille in Schiro* was the first drama translated into Rumanian (by Iordache Slătineau, printed at Şibiu in 1797). Schiller was also translated, and a few plays of Shakespeare (*Hamlet*, &c.) from a French version. Victor Hugo's *Angelo* and *Maria Tudor* were translated by Constantin Negruţin. Those who kept in touch with the old literature—men such as Beldiman, Marcovici and Negruţin—were able even in their metrical translations to do justice to the originals and at the same time not to distort the character of the Rumanian language. Among such translators was Skavinschi, who came originally from Transylvania to Jassy, and translated Regnald's *Democrit* into verse.

Poetry.

The lyrical and epic poetry of the time follows somewhat the same lines, but with certain notable differences. The individuality of the authors is more marked, and they advance much sooner from translations to independent poetry. Transylvania, which awoke to a new life towards the end of the 18th century, produced some of the most popular poets. Among them were Vasile Aaron (1770–1822) and Ion Barak (1779–1848). Aaron wrote the *Passion*, in 10,000 verses (1802; often reprinted); the lyrical romances of *Piram şi Tisbe* (1808) and *Sofronim şi Hăriti* (1821); and the humorous *Leonat şi Dorofata*, a satire on bad women and on drunken husbands, now a chapbook. Barak wrote *Răsipirea Ierusalimului* (1821), "The Destruction of Jerusalem," almost as long as Aaron's *Passion*; and he versified a Magyar folktale, *Arghir şi Elena*, which has also become a chapbook, and has been interpreted as a political poem with a hidden meaning. He also translated the *Arabian Nights* from the German. In Walachia a certain Ion Budai Deleanu, a man of great learning, author of a hitherto unpublished Rumanian dictionary of great value, wrote a satirical epos in which gipsies play the chief part. It is called *Ţiganiada* (1812) and consists of 12 songs and of many thousand verses. The author displays a profound knowledge of the life and the customs of the gipsies, and of Western literature from the *Batrachomyomachia* to the *Pucelle* of Voltaire.

The love-songs of the time are primitive imitations of the Neo-Greek lyric dithyrambs and rhapsodies, which through the teaching of the princes of Walachia were considered as the fountainhead of poetical inspiration. But a closer acquaintance with the West led to greater independence in poetical composition. In the three generations of the Vacarescu one can follow this process of rapid evolution. Ianache Vacarescu, author of the first native Rumanian grammar on independent lines, was also the first who tried his hand at poetry, following Greek examples. He then studied Italian, French and German poetry, and made translations from Voltaire and Goethe. His son Alecu (b. 1795) followed his example. Both were overshadowed by the grandson Ioan (b. 1818), who was more than any other man both the representative of an epoch fast vanishing and the harbinger of the new spirit that was stirring young Rumania. The collected poems of I. Vacarescu were published in 1848; but among them were some of the poems of Ianache and Alecu, which were confused with his own work. In this volume, *Colecţie din poeziile domnului mare logofet I. Vacarescu*, there are odes, hymns, patriotic poems, ballads, lyrical and didactic poems, some of them among the most beautiful in the language. A contemporary of his earlier period, Paris Mumuleanu (1794–1837), wrote his *Rost de poezie* (1820) under Greek influence, but afterwards passed under the spell of Maior and Tzikindea, whose Latin propaganda he was one of the first to advocate in Rumania. In his *Caractere* (Bucharest, 1828) Latin forms are common. One more poet, and a real one, is Vasile Cărlova (1809–1831), whose *Ruins of Tîrgovishtec* sufficed to place him among the foremost Rumanian poets of the 19th century.

In Moldavia a similar development took place, translations leading up to independent production. The most prominent figure is that of the scholar and linguist Constantin Konaki (1777–1849), who might be termed the Rumanian Longfellow for the facility and felicity of his translations from Western poetry and for his short poems, easily set to music and very popular. His *Alcătuiri şi tălmăciri* appeared in 1858. Constantin Negrutin, who was at first influenced by the Russian poets, notably Pushkin, successfully translated poems of Victor Hugo, and rivalled Konaki in his dexterity and fidelity to the original.

Third Period: 1830–.—The agitation for the transliteration of the alphabet, the elimination of all non-Latin words from the language and the ostracism of the old literature, completely crippled all literary activity, first in Transylvania and then in Rumania. The Latin movement was first brought into Walachia by a certain George Lazar from across the mountains. Lazar was appointed teacher at the St Sava school of Bucharest, where he spread the new doctrine of the Latin origin of the Rumanians; Latinizing tendencies were, however, not yet imported into the language. Of his pupils there was one whose influence became decisive: Ion Eliade (Heliade), afterwards also known as I. E. Radulescu (1802–1872), a man of immense activity, of great power of initiative and of still greater imagination. He it was who ushered in the new epoch, and for close upon forty years he stood at the head of almost every literary undertaking.

Eliade.

There were two periods in his life—the latter the exact opposite and negation of the former. Up to 1848 he was closely connected with politics, the theatre and the school—he was the successor to Lazar; he wrote grammars, and the introductions to his grammars are models of lucidity, combined with a wide historical view. He was the founder of the first political and literary review, and he had a genius for discovering talent, and the merit of assisting it. Through his reviews he trained the middle-class to read and to take an active interest in literary problems. Through his *Curier de ambe sexe* (1837–41) he disseminated translations from political and other works, thus paving the way for the political change of 1848. About this time he turned to philology, and fell under the spell of the Transylvanian school. Slowly he developed his theories about language and writing, and he ended as a fanatic wedded to extraordinary views. He was a prolific writer and translator of dramas and novels from French and Italian, the latter appearing mostly in his periodical. The number of his publications is legion.

Bolintineanu.

All the prominent Rumanians of that period were politicians; they strove to obtain the emancipation of the country from Turkish dominion, and, later on, the union of Walachia and Moldavia. Everything was placed at the service of this national aspiration, which is the keynote of the poems of Bolintineanu (1826–1873). He also was discovered by Radulescu, who published his first and best known poem, "The Dying Virgin." In 1848 he was exiled, together with the other leaders of the revolution, and he spent the next nine years in travels in the East. There he gathered the materials for his lyrical poems "Macedonele" and "Florile Bosforului?" Returning in 1857 to Walachia, he occupied high administrative posts, and he wrote a number of historical novels (*Traian*, *Mircea*, *Ştefan*, &c.), dramas (*Lăpuşneanu*, *Mihnea*, *Mihaiu*, &c.), longer poems (*Sorin*, *Conrad*), and his politico-philosophical novel *Elena*. These mostly patriotic compositions were as a rule less felicitous than his political satires (*Nemesis*, *Menade*, &c.). His peculiar strength lay in the historical ballad, which he was the first to introduce into Rumanian poetry, and in the vivid portraiture of Oriental scenery and emotions. He died in a lunatic asylum forgotten by all, and even his writings have, save in one early edition, not been published without unwarranted alterations by the editor Sion.

G. Alexandrescu.

A contemporary of Bolintineanu was Grigorie Alexandrescu (1812–1885), also a pupil of Eliade. Imperfect in his rhyme and rhythm, his poetry is of a didactical nature, and his best poems are rhymed fables, many of which are thinly disguised political satires. He also translated the *Alzire* (1834) and *Mérope* (1847) of Voltaire. Among his contemporaries may be mentioned G. Creţeanu (1829–1887) and A. Sihleanu (1834–1857), who left some weak poems of a sentimental and patriotic character. A Deparaţianu (1835–1865), whose language shows traces of the new Latinizing school; and Nicolae Nicoleanu (1833–1871), whose powerful poems, full of deep and often mystical reflections, lead on from Alexandrescu to Eminescu, all three being the poets of pessimism. In Teodor Şerbănescu (b. 1839) we find the reflex of Bolintineanu of the earlier period, in the beauty and simplicity of his lyrical poems—not yet published in complete form. Like Şerbănescu, Vasile Alecsandri (1821–1890), the greatest of Rumanian lyrical poets (see ALECSANDRI), was a Moldavian. In France, under the influence of Béranger and the romantic school, he was led to turn to popular

Alecsandri.

poetry for inspiration. He collected Rumanian popular songs and ballads (*Doine*, 1844) (*Lăcrămioare*, 1853). In *Pasteluri* (1867) he introduced admirable pictures of popular life into Rumanian poetry. In *Legende* (1871) and *Ostaşii noştrii* (1877) he strikes the patriotic note. His fame rests on his lyrical poetry alone, which retains some of the charm of popular poetry. Alecsandri is less successful in his dramas, most of which are adaptations from French originals; the only merit of his novels is that amidst the phonetic and philological turmoil he kept to the purer language of the people.

Eminescu.

From Alecsandri there is a natural transition to his great rival, who was also his superior in depth of thought and in mastery of form and language, the great poet of pessimism, Mihail Eminescu (*q.v.*). Mention may also be made of Matilde Cugler Poni (b. 1853), who published some admirable short poems in the Rumanian reviews (*Poesii*, 1888). Veronica Micle (1853–1889) belongs to the same circle of gifted Moldavian women (*Poesii*, 1887). But all these men or women disappear with the appearance of Eminescu, who, like Bolintineanu, started a new school of poetry and left a deep and growing influence upon the new generation. His best follower, though possessing originality of his own, is A. Vlahuţă (b. 1859). G. Coşbuc, who has risen more recently to fame, is the poet of the unfortunate Rumanian peasant, emancipated only in name and on paper, and a prey to greedy landowners and to a medieval administration. The poets of this school drew their inspiration from popular poetry, and all of them were sons of the lower middle class or of peasants, who by dint of heavy work and great hardship were able to rise above the narrow social conditions in which they were born.

Prose Writers.

Somewhat different has been the development of the Rumanian prose writers. They suffered in consequence of the philological confusion brought about by Eliade and his assistants, mostly men who after 1848 immigrated from Transylvania and brought with them their own prejudices and narrow intolerance. Too great influence was accorded to them, and the result was that for a long time scarcely a single Rumanian novelist or historian can be mentioned. It was only after N. Bălcescu had undertaken the edition of the ancient Walachian chronicles, and had found in them admirable prose writers, that he ventured on a continuous history (1851–52) of the Rumanians under Michael the Brave, written not as a didactic treatise but as a poem in prose—full of colour and of energy. A. Odobescu, the friend and literary executor of Bălcescu, was a consummate scholar of ancient and medieval antiquities, and wrote a history of ancient art. His *Pseudkynegetikos* is an unsurpassed model of elegant writing and of fine irony. What Alecsandri was for verse, Odobescu was for prose. He also created the Rumanian historical novel, by his *Mihnea Vodă* (1858) and *Doamna Kiajna* (1860). The first novel describing human nature in everyday life is the *Ciocoii vechi şi noi* (1863) of Nicolae Filimon (1819–1865). In Moldavia where the knowledge of the old chroniclers had not entirely died out and disturbing philological influences were not so acutely felt, we find the vigorous writings of Mihail Cogălniceanu—one of the leading spirits of the 19th century, the greatest mind and the real founder of Rumania. Cogălniceanu published various reviews, some of a political, others of a more literary character, such as the *Dacia literară* (1840) and *Archiva româneasca* (1845–46); he has also the great merit of having published for the first time a collection of the Moldavian chronicles. G. Asaki (1788–1871), a second Eliade, helped to inaugurate a literary reform in Moldavia; but the result was disappointing, until the literary society known as the Junimea was started, in the 'seventies, by Titu Maiorescu (b. 1839), who was then a professor at Jassy. Titu Maiorescu put a stop to the prevailing Latinism, and turned the current of Rumanian literature into a more healthy channel, by the publication of his *Critice* (1874).

Ioan Ghica, a contemporary of the revolutionaries of 1848, gathered his recollections of those agitated times into two volumes, *Amintiri* (1890) and *Scrisori către V. Alecsandri* (1887), which besides their historical value have become a model of Rumanian prose. Among writers of fiction three names stand out prominently: Ion Slavici (b. 1848) describes the life of the people, notably of the Transylvanian peasants, in short stories, *Nuvele din popor.* Barbu Stefănescu de la Vrancea (b. 1858) also wrote short popular stories characterized by a wealth of imagery and richness of language; but the characters are all mostly unreal and exaggerated. The best known collections are *Sultănica* (1885) and *Trubadurul* (1887). Ioan Caragiali (b. 1852), the most popular Rumanian dramatist of modern times, who has brought on the stage living types of the lower and middle classes, and has skilfully portrayed the effect of modern veneer on old customs, is also the author of the powerful short novel *Faclia de paşte.* Dobrogeanu Gherea (b. 1853) has in his *Studii critice* (1890 sqq.) been a ruthless but none the less judicious critic.

Curiously enough, there is not a single novel in the Rumanian literature with a sustained plot; none which presents a study of the development of human character amid the multifarious vicissitudes of life. The reason for this deficiency is perhaps the unsettled conditions of Rumanian life, and the lack of a profound and long-established civilization; or it may be found in the unstable and fickle character of the people. Whatever the cause may be, while Rumanian poetry could well compare with that of any Western nation, in the domain of prose writing, and of novels in particular, one must look to the future to fill up the gap now existing.

Popular literature: Folklore, Ballads, Tales.

There existed in Rumania another set of literary monuments at least as old as any of the books hitherto enumerated, but which appealed to a wider circle. Rumanian folk-literature contains both popular written books and oral songs, ballads, &c. It is advisable to group the material in three sections: (1) the romantic and secular literature; (2) the religious literature;—both of these being written—and (3) the modern collections of ballads, songs, tales, &c.

To the first belong the oldest books, such as the *History of Alexander the Great*, which was known in Rumania in the 17th century. It rests mostly upon a Sloveno-Greek text and is of the utmost interest for the study of this cycle of legends. The first printed copy appeared in 1794, and has been reprinted in innumerable editions. Next comes the legend of Constantine, of his town and his exploits—a remarkable collection of purely Byzantine legends. In addition to these there is the history of St Sylvester and the conversion of Constantine, &c., all still in MS. *The History of Barlaam and Ioasaf* (see BARLAAM AND JOSAPHAT) may also be mentioned here, for it appealed to the people not so much for its religious interest as for the romantic career of the hero. The parables and apologues contained in the legend were incorporated into the *Teachings of Prince Neagoe*, and were also circulated separately; they are found in many old MSS. Udrişte (Uriil) Năsturel translated the *History* from the Slavonic in 1640. One of its episodes, the farewell song of the prince departing into the forest, has since become one of the most widespread popular songs. Of similar oriental origin is the *Dream of Mamer*, the interpretation of which goes back to the *Panchatantra*, and must have reached Rumania early in the 18th century, probably in Slavonic. The history of *Syntippa and the Seven Masters* has also become a popular book. It was translated from the Greek version. To the same cycle of oriental tales belongs the *Halima*, already described, which G. Gorjeanu printed (3 vols., 1835–37) as his own work. The *History of Arkir and Anadam*, printed by Anton Pann from older MSS., is the now famous Old Testament apocryphon of Akyrios the Wise, mentioned in Tobit and found in many languages. In Rumanian it rests on an older Greek-Slavonic text, and owes its great popularity to the wise and witty proverbs it contains. "Esop," whose wonderful biography (by Planudes) agrees in many points with Arkir, has also become one of the Rumanian popular books. The history of *Bertoldo*, which, though of Italian origin, reached Rumania through a Greek translation, belongs to the same cycle of rustic wisdom and cunning, and is the last representative of an old series of legends clustering round the figures of Solomon and Ashmodai, or Solomon and Markolph. These books are of course anonymous, most of them being translations and adaptations. One man, however, stands out prominently in this section of romantic and secular folk-literature. This was Anton Pann, who was born in 1797 at Slivden, of Bulgarian parentage, and died at Bucharest in 1854. Carried away by the Russians in his early youth, he settled in Rumania, learned Church music, and became one of its best exponents, married four times, had an adventurous life, but lived among the people for whom he wrote and composed his tunes. In about twenty years he published no less than fifty books, all of them still popular. Besides his edition of the Rumanian Church service-books with musical notation, he published a series of tales, proverbs and songs either from older texts or from oral information; and he made the first collection of popular songs, *Spitalul amorului*, "The Hospital of Love" (1850–53), with tunes either composed by himself or obtained from the gipsy musicians who alone performed them. Of his numerous writings two or three are of the greatest interest to folklore. His *Povestea vorbii* (first ed. 1 vol., 1847; 2nd ed. 3 vols., 1851–53) is a large collection of proverbs ingeniously connected with one another and leading up to or starting from a popular tale exemplifying the proverb. The *Fabule şi istorioare* (2 vols., 1839–41) is a collection of short popular stories in rhyme; *Sezştoarea la tară* (1852–53) is a description of the Rumanian *Spinnstube*, for which the peasants gather in one of their houses on a winter's night, the girls and women spinning and working, the young men telling tales, proverbs, riddles, singing songs, &c. Pann also collected the jokes of the Turkish jester, Nasreddin, under the title of *Năsdrăvăniile lui Nastratin Hogea* (1853), also in rhyme. He also published a collection of Christmas carols, set to music by himself; these are still sung by boys on Christmas night.

Far larger than the secular is the religious popular literature; it comprises many apocryphal tales from the Old and the New Testaments, and not a few of the heretical tales circulated by the various sects of Asia Minor and Thracia, which percolated into Rumania through the medium of Slavonic. A brief enumeration of the chief tales must suffice. Only a few of them have hitherto been published. They exist in numerous MSS. which testify to their great popularity; in the popular songs one finds many traces of their influence upon the people's imagination. They include the *History of Adam and Eve*, the *Legend of the Cross*, *The Apocalypse of Abraham*, the *History of the Sibyl*, the *Legends of Solomon*; numerous New Testament apocryphal tales, starting with legends of St John the Baptist; a very remarkable version of the *Gospel of Nicodemus*; and the *Epistle of Pilate*. Printed in tens of thousands of copies are certain apocalyptic legends dealing with eschatological problems. The ancient *Apocalypse of Peter* appears here under the name of Paul, then there is an *Apocalypse of the Virgin Mary*, who, like Peter, is carried by the Archangel through the torments of Hell and the bliss of Paradise, and through whose intervention sufferers are granted pardon on certain days of the year. Combined with these is the *Sunday Epistle*, sent from Heaven, enjoining strict observance, not only of Sunday, but also of Friday and Wednesday, as holy days. Most of these texts date in their Rumanian form from the 16th and 17th centuries; the *Sunday Epistle* is well known in connexion with the Flagellants. In the same pamphlet as the *Sunday Epistle* was published the legend of St Sisoe and sometimes that of Avestitza,—the former saved the children of his sister from the attacks of the devil, who had devoured them and had to restore them alive; the latter is the female child-stealing demon, who is prevented by an angel from carrying out her evil design. In both cases the repetition of the legend and the recitation of a string of mystical names serve, like some other tales, apocryphal and otherwise, as amulets, sufficient to protect from the devil. Upon the recitation of some of these texts rest many popular charms and incantations. Therein lies the importance of this written literature, for it gives us the clue to much that now lives in the mouths of the people, and is by some considered to be of immemorial antiquity. A number of astrological calendars and *prognostica* are among the best known and most widely circulated popular books, and the lives of St Alexius, Xenophon, &c. have become chapbooks.

The whole of this popular literature belongs to what may be called the cycle of the Balkan nations, in every one of which exact parallels are to be found. Not that there was any direct, deliberate borrowing by one nation from the other, but all of them seem to have stood for a long time under identical psychological influences and to have developed on similar lines. The superstitions of one are often found to be those of the others, and in such a form that they could not have been taken over independently from a third source; they show too much family likeness. Thus also the popular songs of Rumania, the "doine," the "hora," the "cântece," "colinde," "legende," *i.e.* the love songs, the heroic ballads, legends, songs at the ring-dance, hymns and carols, though instinct with a charm of their own, find their counterparts in many a song, ballad, &c. of the Balkan nations. The heroes are often the same: Serbs, Bulgars and Rumanians sing the heroic deeds of Baba Novak and recite the legend of the Monastery of Argesh, or the ballad of Iorgovan, found in the Malorussian Byliny. One of the first to collect these treasures of Rumanian poetry was V. Alecsandri (1852–1866), who, however, retained only their poetical beauty and did not reproduce them with that strict accuracy which modern study of folklore demands. A. M. Marienescu collected those of Transylvania (1859); S. F. Marian, those of the Bukovina (1873); T. T. Burada, those of the Dobrudja (1880); but the most complete collection is that of G. Dem. Teodorescu, *Poesii populare române* (Bucharest, 1885). The collection of fairy tales started later than that of the ballads. The first collection is the German translation of tales heard by the Brothers Schott (1845). The most important collections, now deservedly considered as classical from every point of view, are the successive publications of P. Ispirescu. The collected tales of the Moldavian Ion Creanga (1837–89) appeared in his *Opere complecte* (1908). Excellent collections are those of D. Stancescu, *Basme* (1885–1893), I. G. Sbiera, *Basme* (1886), *Frăncu şi Candrea* (1888). Kutzo-Vlach tales and folklore will be found in G. Weigand, *Die Aromunen*, vol. ii. The only review devoted to the study of folklore is the *Şazatoare*, founded in 1892.

In recent times a kind of stagnation seems to have overtaken Rumania, and although attempts have been made to place the intellectual life of the nation on a sounder basis, the work of transition from the past to the present has hitherto absorbed more energy than appears necessary. Whatever the causes may have been, the fact remains, that now there is a great dearth of talent and great poverty in output.

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RUMELIA, or ROUMELIA (Turkish *Rumili*, "the land of the Romans," *i.e.* the East Roman or Byzantine empire), a name commonly used, from the 15th century onwards, to denote that part of the Balkan Peninsula which was subject to Turkey. More precisely it was the country bounded N. by Bulgaria, W. by Albania and S. by the Morea, or in other words the ancient provinces, including Constantinople and Salonica, of Thrace and Macedonia. The name was ultimately applied more especially to a province composed of central Albania and western Macedonia, having Monastir for its chief town. Owing to administrative changes effected between 1870 and 1875, the name ceased to correspond with any political division. Eastern Rumelia was constituted an autonomous province of the Turkish empire by the Berlin treaty of 1878; but on the 18th of September 1885, after a bloodless revolution, it was united with Bulgaria (*q.v.*).

RUMFORD, BENJAMIN THOMPSON, COUNT (1753–1814), British-American man of science, philanthropist and administrator, was born at Woburn, in Massachusetts, on the 26th of March 1753. The Thompson family had been settled in New England since the middle of the previous century, and belonged to the class of moderately wealthy farmers. His father died while he was very young, and his mother speedily married a second time. But he seems to have been well cared for, and he was at the age of fourteen sufficiently advanced "in algebra, geometry, astronomy, and even the higher mathematics," to calculate a solar eclipse within four seconds of accuracy. In 1766 he was apprenticed to a storekeeper at Salem, in New England, and while in that employment occupied himself in chemical and mechanical experiments, as well as in engraving, in which he attained to some proficiency. The outbreak of the American War put a stop to the trade of his master, and he thereupon left Salem and went to Boston, where he engaged himself as assistant in another store. He was at that period between seventeen and eighteen years old, and at nineteen, he says, "I married, or rather I was married." His wife was the widow of Colonel Benjamin Rolfe, and the daughter of Timothy Walker, "a highly respectable minister, and one of the first settlers at Rumford," now called Concord, in New Hampshire. His wife was possessed of considerable property, and was his senior by fourteen years.

This marriage was the foundation of his success. Soon after it he became acquainted with Governor Wentworth of New Hampshire, who conferred on him the majority of a local regiment of militia. He speedily became the object of distrust among the friends of the American cause, and it was considered prudent that he should seek an early opportunity of leaving the country. On the evacuation of Boston by the royal troops, therefore, in 1776, he was selected by Governor Wentworth to carry despatches to England. On his arrival in London Lord George Germain, secretary of state, appointed him to a clerkship in his office. Within a few months he was advanced to the post of secretary of the province of Georgia, and in about four years he was made under-secretary of state. His official duties, however, did not interfere with the prosecution of scientific pursuits, and in 1779 he was elected a fellow of the Royal Society. Among the subjects to which he especially directed his attention were the explosive force of gunpowder, the construction of firearms, and a system of signalling at sea. In connexion with the last, he made a cruise in the Channel fleet, on board the "Victory," as a volunteer under the command of Admiral Sir Charles Hardy. On the resignation of Lord North's administration, of which Lord George Germain was one of the least popular members, he left the civil service, and was nominated to a cavalry command in the revolted provinces of America. But the War of Independence was practically at an end, and in 1783 he finally quitted active service, with the rank and half-pay of a lieutenant-colonel. He now formed the design of joining the Austrian army, for the purpose of campaigning against the Turks, and so crossed over from Dover to Calais with Gibbon, who, writing to his friend Lord Sheffield, calls his fellow-passenger "Mr Secretary-Colonel-Admiral-Philosopher Thompson." At Strassburg he was introduced to Prince Maximilian, afterwards elector of Bavaria, and was by him invited to enter the civil and military service of that state. Having obtained the leave of the British government to accept the prince's offer, he received the honour of knighthood from George III., and during eleven years he remained at Munich as minister of war, minister of police, and grand chamberlain to the elector. His political and courtly employments, however, did not absorb all his time, and he contributed during his stay in Bavaria a number of papers to the *Philosophical Transactions.* But that he was sufficiently alert as the principal adviser of the elector the results of his labours in that capacity amply prove. He reorganized the Bavarian army; he immensely improved the condition of the industrial classes throughout the country by providing them with work and instructing them in the practice of domestic economy; and he did much to suppress mendicity. The multitude of beggars in Bavaria had long been a public nuisance and danger. In one day he caused no fewer than 2600 of these outcasts and depredators in Munich and its suburbs alone to be arrested by military patrols, and transferred by them to an industrial establishment which he had prepared for their reception. In this institution they were both housed and fed, and they not only supported themselves by their labours but earned a surplus for the benefit of the electoral revenues. The principle on which their treatment proceeded is stated by him in the following memorable words: "To make vicious and abandoned people happy," he says, "it has generally been supposed necessary first to make them virtuous. But why not reverse this order? Why not make them first happy, and then virtuous?"

In 1791 he was created a count of the Holy Roman Empire, and chose his title of Rumford from the name as it then was of the American township to which his wife's family belonged. In 1795 he visited England, one incident of his journey being the loss of all his private papers, including the materials for an autobiography, which were contained in a box stolen from off his postchaise in St Paul's Churchyard. During his residence in London he applied himself to the discovery of methods for curing smoky chimneys and the contrivance of improvements in the construction of fireplaces. But he was quickly recalled to Bavaria, Munich being threatened at once by an Austrian and a French army. The elector fled from his capital, and it was entirely owing to Rumford that a hostile occupation of the city was prevented. It was now proposed that he should be accredited as Bavarian ambassador in London; but the circumstance that he was a British subject presented an insurmountable obstacle. He, however, again came to England, and remained there in a private station for several years.

In 1798 he presented to the Royal Society his "Enquiry concerning the Source of Heat which is excited by Friction," in which he combated the current view that heat was a material substance, and regarded it as a mode of motion. In 1799 he, in conjunction with Sir Joseph Banks, projected the establishment of the Royal Institution. It received its charter of incorporation from George III. in 1800, and Rumford himself selected Sir Humphry Davy as scientific lecturer there. Until 1804 he lived at the Royal Institution in Albemarle Street, London, or at a house which he rented at Brompton, and he then established himself in Paris, marrying (his first wife having died in 1792) as his second wife the wealthy widow of Lavoisier, the celebrated chemist. With this lady he led an extremely uncomfortable life, till at last they agreed to separate. He took up his residence at Auteuil, where he died suddenly on the 21st of August 1814, in the sixty-second year of his age.

Rumford was the founder and the first recipient of the Rumford medal of the Royal Society. He was also the founder of the Rumford medal of the American Academy of Arts and Sciences, and of the Rumford professorship in Harvard University. His complete works with a memoir by G. E. Ellis were published by the American Academy of Arts and Sciences in 1870–75.

RŪMĪ, (1207–1273). Mahommed b. Mahommed b. Husain albalkhī, better known as Maulānā Jalāl-uddīn Rūmī (or simply Jalāl-uddin, or Jelāl-eddīn), the greatest Sūfic poet of Persia, was born on the 30th of September 1207 (604 A.H. 6th of Rabī' I.) at Balkh, in Khorāsān, where his family had resided from time immemorial. He claimed descent from the caliph Abūbekr, and from the Khwārizm-Shāh Sultān 'Alā-uddīn b. Tukush (1199–1220), whose only daughter, Malika-i-Jahān, had been married to Jalāl-uddīn's grandfather. Her son, Mahommed, commonly called Bahā-uddīn Walad, was famous for his learning and piety, but being afraid of the sultan's jealousy, he emigrated to Asia Minor in 1212. After residing for some time at Malatīa and afterwards at Erzingān in Armenia, Bahā-uddīn was called to Lāranda in Asia Minor, as principal of the local college. Here young Jalāl-uddīn grew up, and in 1226 married Jauhar Khātūn, the daughter of Lālā Sharaf-uddīn of Samarkand. Finally, Bahā-uddīn was invited to Iconium by 'Alā-uddīn Kaikubād (1219–1236), the sultān of Asia Minor, or, as it is commonly called in the East, Rūm—whence Jalāl-uddīn's surname (*takhallus*) Rūmī.

After Bahā-uddīn's death in 1231, Jalāl-uddīn went to Aleppo and Damascus for a short time to study, but, dissatisfied with the exact sciences, he returned to Iconium, where he became by and by professor of four separate colleges, and devoted himself to the study of mystic theosophy. His first spiritual instructor was Sayyid Burhān-uddīn Husainī of Tirmidh, one of his father's disciples, and, later on, the wandering Sūfī Shams-uddīn of Tabrīz, who soon acquired a most powerful influence over Jalāl-uddīn. Shams-uddīn's aggressive character roused the people of Iconium against him, and during a riot in which Jalāl-uddīn's eldest son, 'Alā-uddīn, was killed, he was arrested and probably executed; at least he was no more seen. In remembrance of these victims of popular wrath Jalāl-uddīn founded the order of the Maulawī (in Turkish Mevlevī) dervishes, famous for their piety as well as for their peculiar garb of mourning, their music and their mystic dance (samā), which is the outward representation of the circling movement of the spheres, and the inward symbol of the circling movement of the soul caused by the vibrations of a Sūfī's fervent love to God. The establishment of this order, which still possesses numerous cloisters throughout the Turkish empire, and the leadership of which has been kept in Jalāl-uddīn's family in Iconium uninterruptedly for the last six hundred years, gave a new stimulus to his zeal and poetical inspiration. Most of his matchless odes were composed in honour of the Maulawī dervishes, and even his *opus magnum*, the *Mathnawī* (*Mesnevi*), or, as it is usually called, *The Spiritual Mathnawī* (*mathnawī-i-ma'nawī*), in six books or daftars, with 30,000 to 40,000 double-rhymed verses, can be traced to the same source. The idea of this immense collection of ethical and moral precepts was first suggested to the poet by his favourite disciple Hasan, better known as Husām-uddīn, who in 1258 became Jalāl-uddīn's chief assistant. Jalāl-uddīn dictated to him, with a short interruption, the whole work during the remaining years of his life. Soon after its completion Jalāl-uddīn died, on the 17th of December 1273 (672 A.H. 5th of Jomādā II.). His first successor in the rectorship of the Maulawī fraternity was Husām-uddīn himself, after whose death in 1284 Jalāl-uddīn's younger and only surviving son, Shaikh Bahāudd-īn Ahmed, commonly called Sultān Walad, and favourably known as author of the mystical mathnawī *Rabābnāma*, or the Book of the Guitar (died 1312), was duly installed as grand-master of the order.

Jalāl-uddīn's life is fully described in Shams-uddīn Ahmed Aflākī's *Manākib-ul 'ārifīn* (written between A.D. 1318 and 1353), the most important portions of which have been translated by J. W. Redhouse in the preface to his English metrical version of *The Mesnevī, Book the First* (London, 1881); there is also an abridged translation of the *Mathnawī*, with introduction on Sufism, by E. H. Whinfield (2nd ed., 1898). Complete editions have been printed in Bombay, Lucknow, Tabriz, Constantinople and in Bulaq (with a Turkish translation, 1268 A.H.), at the end of which a seventh daftar is added, the genuineness of which is refuted by a remark of Jalāl-uddīn himself in one of the Bodleian copies of the poem, Ouseley, 294 (f. 328*a* seq.). A revised edition was made by 'Abd-ullatīf between 1024 and 1032 A.H., and the same author's commentary on the *Mathnawī*, *Latā'if-ulma'nawī*, and his glossary, *Latā'if-allughāt*, have been lithographed in Cawnpore (1876) and Lucknow (1877) respectively, the latter under the title *Farhang-i-mathnawī.* For the other numerous commentaries and for further biographical and literary particulars of Jalāl-uddīn, see Rieu's *Cat. of the Persian MSS.*

of the Brit. Mus., vol. ii. p. 584 seq.; A. Sprenger's *Oudh Cat.*, p. 489; Sir Gore Ouseley, *Notices of Persian Poets*, p. 112 seq.; H. Ethé, in *Morgenländische Studien* (Leipzig, 1870), p. 95 seq., and in Geiger and Kuhn's *Grundriss der iranischen Philologie* (Stuttgart, 1896–1904), vol. ii. pp. 287–292. Selections from Jalāl-uddīn's diwan (often styled *Dīwān-i-Shams-i-Tabrīz*) are translated in German verse by V. von Rosenzweig (Vienna, 1838); into English by R. A. Nicholson (2nd ed., 1898) and W. Hastie (1903). (H. E.)

RUMINANTIA, a term employed by Cuvier to include all the existing artiodactyle ruminating ungulate mammals now classed under the groups Pecora, Tylopoda and Tragulina. By Professor Max Weber it is employed as a collective designation for these groups, together with the extinct Anthracotheroidea and Dichobunoidea; but its use seems best restricted to a general term rather than a definite systematic group. (See Artiodactyla, Pecora, Tylopoda.)

RÜMKER, CARL LUDWIG CHRISTIAN (1788–1862), German astronomer, was born in Mecklenburg on the 28th of May 1788. He served in the British navy from 1807 until 1817, and was director of the school of navigation at Hamburg from 1819 till 1820. In 1821 he went to New South Wales as astronomer at the observatory built at Parramatta by Sir Thomas Brisbane. He returned to Europe in 1830 and took charge of the observatory at Hamburg. His chief work was concerned with the cataloguing of stars: a preliminary catalogue of the stars of the S. hemisphere was published in 1832 at Hamburg, and in 1846–52 he published his great catalogue of 12,000 stars. In 1857 he went to reside at Lisbon, where he died on the 21st of December 1862.

His son, George Friedrich Wilhelm (1832–1900), born on the 31st of December 1832, at Hamburg, was astronomer at the observatory at Durham, England, from 1853 to 1856. He then became assistant at the Hamburg observatory, and in 1862 was appointed director of the same institution. From 1884 he was the Hamburg delegate for the International Earth Measurement. He died on the 3rd of March 1900.

RUNCIMAN, ALEXANDER (1736–1785), Scottish historical painter, was born in Edinburgh in 1736. He studied at Foulis's Academy, Glasgow, and at the age of thirty proceeded to Rome, where he spent five years. It was at this time that he became acquainted with Fuseli. The painter's earliest efforts had been in landscape; he soon, however, turned to historical and imaginative subjects, exhibiting his "Nausicaa at Play with her Maidens" in 1767 at the Free Society of British Artists, Edinburgh. On his return from Italy, after a brief residence in London, where in 1772 he exhibited in the Royal Academy, he settled in Edinburgh, and was appointed master of the Trustees' Academy. He was patronized by Sir James Clerk, whose hall at Penicuik House he decorated with a series of subjects from Ossian. He also executed various religious paintings and an altar-piece in the Cowgate Episcopal Church, Edinburgh, and easel pictures of "Cymon and Iphigenia," "Sigismunda weeping over the Heart of Tancred," and "Agrippina landing with the Ashes of Germanicus." He died in Edinburgh on the 4th of October 1785. His works, while they show high intention and considerable imagination, are frequently defective in form and extravagant in gesture. His younger brother, John Runciman (1744–1766), who accompanied him to Rome, and died at Naples in 1766, was an artist of great promise. His "Flight into Egypt," in the National Gallery of Scotland, is remarkable for the precision of its execution and the mellow richness of its colouring.

RUNCORN, a market town and river-port in the Northwich parliamentary division of Cheshire, England, on the S. of the estuary of the Mersey 16 m. above Liverpool. Pop. of urban district (1901) 16,491. It is served by the London & North-Western railway, and has extensive communications by canal. The modern prosperity of the town dates from the completion in 1773 of the Bridgewater Canal, which here descends into the Mersey by a flight of locks. Runcorn is a sub-port of Manchester, with which it is connected by the Manchester Ship Canal, and has extensive wharfage and warehouse accommodation. The chief exports are coal, salt and pitch; but there is also a large traffic in potters' materials. A transporter bridge between Runcorn and Widnes, with a suspended car worked by electricity to convey passengers and vehicles (the first bridge of the kind in England) was constructed in 1902. The town possesses shipbuilding yards, iron foundries, rope works, tanneries, and soap and alkali works.

Owing to the Mersey being here fordable at low water, Runcorn was in early times of considerable military importance. On a rock which formerly jutted into the Mersey Æthelfleda erected a castle in 916, but of the building there are now no remains; while the rock was removed to further the cutting of the ship canal. Æthelfleda is also said to have founded a town, but it is not noticed in Domesday. The ferry is noticed in a charter in the 12th century.

RUNDALE (apparently from "to run" and "dale," valley, originally something separated off, cf. "deal"), the name of a form of occupation of land, somewhat resembling the English "common field" system. The land is divided into discontinuous plots, and cultivated and occupied by a number of tenants to whom it is leased jointly. The system was common in Ireland, especially in the western counties. In Scotland, where the system also existed, it was termed "run-rig" (from "run," and "rig" or "ridge").

RUNEBERG, JOHAN LUDVIG (1804–1877), Swedish poet, son of a sea-captain, was born at Jakobstad, in Finland, on the 5th of February 1804. He was brought up by an uncle at Uleåborg, and entered the university of Åbo in the autumn term of 1822. In 1823 he broke off his studies to act as tutor in two quiet Finnish villages, Saarijärvi and Ruovesi, where he gained a thorough knowledge of the popular life and poetry, and on his return to Åbo he began to contribute verses to the local newspapers. In the spring of 1827 he received the degree of doctor of philosophy. The university had been removed after the great fire of 1827 to Helsingfors, where Runeberg became, in 1830, amanuensis to the council of the university. In the same year he published at Helsingfors his first volume of *Dikter* (Poems), and a collection of *Serbiska folksånger* (Servian folksongs) translated into Swedish. In 1831 his verse romance of Finnish life, *Grafven i Perrho* (The Grave in Perrho), received the small gold medal of the Swedish Academy, and the poet married Fredrika Charlotta Tengström, daughter of the archbishop of Finland. In the same year he was appointed university lecturer on Roman literature. In 1832 he published his beautiful little idyll, *Elgskyttarne* (The Elk-Hunters); and in 1833 a second collection of lyrical poems. He founded in 1832 the *Helsingfors Morgonblad*, a paper which dealt chiefly with aesthetic and literary questions, and exercised great influence both in Sweden and Finland. In it appeared many of his own poems and tales. His comedy, *Friaren från Landet* (The Country Lover, 1834), was not a success, but in 1836 he published *Hanna*, a charming idyll of Finnish country life, written in hexameters. In 1837 Runeberg accepted the chair of Latin at Borgå College, and resided in that little town for the rest of his life.

He was now recognized in his remote Finland retirement as second only to Tegnér among the poets of Sweden. In 1841 he published *Nadeschda*, a romance of modern Russian life, and *Julqvällen* (Christmas Eve), another idyll of Finnish life. The third volume of his *Dikter* bears the date 1843, and the noble cycle of unrhymed verse romances called *Kung Fjalar*, the setting of which is taken from old Scandinavian legend, was published in 1844. Finally, in 1848, he achieved a great popular success by his splendid series of poems on the war of independence in 1808, when Swedes and Finns fought side by side. The series bears the name of *Fänrik Ståls Sägner* (Ensign Steel's Stories); a second series appeared in 1860. From 1847 to 1850 the poet was rector of Borgå College, a post which he resigned to take the only journey out of Finland which he ever accomplished, a visit to Sweden in 1851. In 1854 he collected his prose essays into a volume entitled *Smärre Berättelser*. In the same year he was made president of a committee for the preparation of a national Psalter, which issued, in 1857, a psalm-book largely contributed by Runeberg for public use. He once more attempted comedy in his *Kan ej* (Can't) in 1862, and tragedy, with infinitely more success, in his stately *Kungarne på Salamis* (The Kings at Salamis) in 1863. Runeberg died at Borgå on the 6th of May 1877. His writings were collected by C. R. Nyblom in six volumes in 1870, and his posthumous writings in three volumes (1878–79).

The poems of Runeberg show the influence of the Greeks and of Goethe upon his mind; but he possesses a great originality. It is hardly possible to over-estimate the value of his patriotic poems as a link between the Swedish and Finnish nations. He has remained one of the most popular Swedish poets, although his whole life was spent in Finland.

An account of his life and works by C. R. Nyblom is prefixed to the *Samlade Skrifter* of 1870. For a minute criticism of Runeberg's principal poems, with translations, see Gosse's *Studies in the Literature of Northern Europe* (1879). A selection of his lyrical pieces was published in an English translation by Messrs Magnusson & Palmer in 1878. There are also monographs on Runeberg by Dietrichson and Rancken (Stockholm, 1864), by Cygnäus (Helsingfors, 1873), by Ljunggren (Lund, 1882–83), and Peschier (Stuttgart, 1881).

RUNES, RUNIC LANGUAGE AND INSCRIPTIONS. The art of writing with an alphabet appears to have been introduced into Germanic Europe in the Iron Age. Something hieratic and mysterious was involved in the idea of letters as used to convey thought, and from the earliest recorded times they were called *runes*, from the Gothic *runa* (*rûn*, in Icelandic), which originally means a secret thing, a mystery, and was later used to describe a letter of the ancient language (see ALPHABET and SCANDINAVIAN LANGUAGES). The Iron Age is supposed to have existed from *circa* 200 to *circa* 650, and it is to the close of this epoch that the beginning of the writing on Scandinavian memorials is attributed. There are runes which have been discovered in England, and some also on the Germanic mainland of Europe, but it is in the Scandinavian peninsula that the vast majority of inscribed monuments have been discovered. The custom of erecting runic monuments, *i.e.* stones engraved with more or less literary statements, over the bodies of the dead, was practised first, there can be no doubt, in Norway and Sweden, then spread to Denmark and over the whole North of Europe. It is remarkable, however, that two of the three runic alphabets from which our knowledge of the whole range of rune-literature is founded, were discovered outside Scandinavia. These three alphabets exist, the first on a thin gold *bractea* found in 1774 at Vadstena, in Sweden; the second on a bracelet, dug up at Charnoy, in Burgundy; the third on a knife, found in the Thames in 1857, and now in the British Museum. There are two principal runic alphabets, the older consisting of 24 letters, and beginning with f; the later of 16 letters. During the last century before the introduction of Christianity, the larger alphabet was increased by 3 letters.

The oldest runes which have been examined are those found on the Thorsbjerg Shield-buckle, which is at present in the Kiel Museum; here the writing, which runs from right to left in straight lines, is of the fourth or fifth century. Other invaluable sources of runic knowledge are the diadem of Straarur, the Vimose comb and the brooch of Himlingöje, which was found in the Vier Fen. Still greater importance has the Golden Horn, discovered at Gellehuus, near Tondern, in 1734; this monument was stolen by thieves and melted down, but fortunately not until a careful copy of it had been made, which is now in the Museum at Copenhagen. It is not until the 6th century that the runic stones begin. The most ancient are believed to be those of Einang, of Tune, of Strand, of Varnum, of Tanum and of Berga. Perhaps a little later are the stones at Vaanga, Skärkind, Skaaäng, Torvik, Bö and others, too numerous to mention, but all, as seems likely, erected between 550 and 600. On the famous Tune-stone, the name of the author of the inscription is preserved, "I Wiwar made these runes," and this is not an isolated instance. The original direction of the runic writing was from left to right, like Latin, but quite early the reverse method was introduced. A union of these forms produced more complicated systems, in which much was left to the individual taste.

From the earliest times uninscribed memorial stones in Scandinavia, *bautasteinar*, were raised to preserve the memory of the dead, and these certainly partook of a more or less religious and sacrificial character. It is evident that, during the Iron Age, stones continued to be erected which had no inscriptions, after the runic alphabets had been invented, and that at first the runes were added only in cases of great importance or solemnity. These runic stones were as a rule posed on the top of the grave, or by the side of it, on mounds, of which only one example survives, that of the stone of Einang, in Norway. But runic stones were not infrequently placed in the grave itself. These were smaller than those erected outside the grave, and they did not lend themselves to lengthy or elaborate inscriptions. The majority of graves containing such small rune-stones, bearing merely the name of the deceased or a magical sentence, have been found in Norway. But the antiquity of most of these is questioned, that of Vatn, which is the oldest, being now placed no earlier than the 8th century. The very important stone of Valdby, which is the oldest Norwegian monument employing the shorter alphabet, is attributed by Wimmer to heathen times, indeed, but to a date no earlier than the second half of the 9th century. It is supposed that the most ancient of the runic stones of Sweden, those respectively of Vånga, Skärkind and Kinnevad, must have come from the interior of graves, but there is no certain proof of this. The latest criticism tends to the belief that when runes were first inscribed on Scandinavian monuments, they were placed both upon and inside graves, but that after the runic letters had been used for about a century, the latter custom tended to exclude the former. About the year 800 both customs began to invade Denmark, the practice of placing the rune-stones inside, however, soon getting the upper hand. It is a curious fact that in Iceland not a single rune-stone which can be referred back to heathen times is known to exist; the Icelandic rune-stones all date from a period well advanced in the middle ages. It was the old theory that the ancient stones had mouldered away under stress of weather, but that is abandoned, and it is now supposed that the aristocratic exiles from Norway, who settled in Iceland, had not yet adopted in their old home the practice of inscribed monuments to their dead. There were *bautasteinar* in Iceland, as we know, but there is no evidence that these bore runes upon them.

It is in Denmark that the runic inscriptions exist which possess the highest literary interest. These are all attributed to the beginning of the 9th century. The Kallerup Stone was discovered in 1826 at the village of Höjetostrup, a Danish mile E. of Roskilde; it has been lifted and placed in its original position. This monument contains a statement in old Danish, to the effect that it marks the grave of Hornbora, son of Swidi. The Stone of Snoldelev was discovered in 1768, not far from the spot where the Kallerup Stone was found; it is now in the Archaeological Museum at Copenhagen; this has a long and important inscription in a form of old Scandinavian, allied to the classical Icelandic. The Stone of Helnaes was found on the islet of that name in 1860, and is now at Copenhagen. The other most famous runic monuments are those of Flemlöse, Örja, Nörrenaerå, Glarendrup, Fryggevaelde and Rönninge, of all of which Wimmer has published full analytical descriptions.

These inscriptions are of remarkable value as historical documents, from a period of which no other definite records remain in existence. From a literary point of view, they represent what Germanic language was up to the point at which Ulfilas created a new alphabet for his version of the Bible, by adapting to the runic alphabets a number of Greek letters. It was an error, now exploded, to suppose that the *notae impressae*, which Tacitus describes in his *Germania*, were written runes; these were simply signs, or mystic marks, which had no linguistic significance. These are described in the staves of the *Edda* as having been revealed to mankind by the god Odin, and they were of a hieratic character. The suggestion is that the written runes were introduced from the south of Europe by a Phoenician agency, and that they were copied from Greek or Roman coins which had found their way to Scandinavia. In several of the sagas it is recorded that runes were inscribed on round pieces of wood, called *kefli*, or runic sticks. It has been suggested that the Eddaic poems were preserved in this way, but the only authority for this is that the *Sonatorrek* is said to have been taken down on a *kefli*. In Christian times runes came to be regarded as an archaic curiosity, and were engraved on sticks, chairs and spoons; a loto stick with runes on it is preserved in the Bodleian library. In the *Fornsögur* runes are mentioned as carved on the blade of an oar. Even cases occur in which the normal Latin alphabet was called *rúnamál* or a language of Runes. A runic letter was called a *rúnastafr* in Icelandic.

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RUNG, a short round bar or stick used as a cross-bar or rail in a chair, and particularly as one of the steps or rounds of a ladder. In Scottish the word retains the original meaning of a staff or stick, especially a short thick cudgel. The O.E. *hrung* is used only of a bar or rail in a wagon; the word also occurs in O.Du. *ronge*, beam of a plough, Ger. *Runge*, pin, bolt.

RUNNIMEDE, or RUNNYMEDE, a meadow on the S. bank of the river Thames, England, in the county of Surrey and the parish of Egham. It is celebrated in connexion with the signature of Magna Carta (*q.v.*) by King John on the 15th of June 1215. It has been disputed whether the ceremony took place actually in the meadow or on Magna Carta or Charter Island lying off it. The charter itself indicates Runnimede by name, but this may have included the island, which is the traditional site and was in 1217 the meeting-place of Henry III. and Louis (afterwards Louis VIII.) of France.

RUNNING, the most primitive form of athletic exercise considered as a sport. Athletic apparatus of every kind has been improved in modern times, but the spiked running-shoe may be said to represent the sole advantage enjoyed by the modern runner over his Olympic prototype. As an athletic sport running has been in vogue from the earliest times, and the simple foot-race (δρόμος), run straight away from starting-point to goal, or once over the course of the stadion (a little over 200 yds.), formed an event in the Greek *pentathlon*, or quintuple games (see GAMES, CLASSICAL). It was diversified with the race once over the course and return, and the διάυλος, a long run many times (often as many as twelve, *i.e.* about $2\frac{3}{4}$ m.) up and down the stadion. There was also the δρόμος ὁπλιτῶν, a short race for warriors, who wore full armour and carried sword and shield, which has been imitated by the modern military race in full marching order. Except in the warriors' race the Greek runners were naked, save occasionally for a pair of light shoes. No records of the times made by the runners in the Greek races have been handed down. It may be inferred that the contests were very severe, since the ancient Olympic chronicles preserve the memory of several runners, of whom Ladas was the most conspicuous, who fell dead at the completion of the long course, and were buried in state with their brows encircled by the victor's chaplet. In ancient Italy running was practised in circus exhibitions, as described by Virgil (*Aen.* v. 286 seq.).

In the middle ages the best runners were oftenest found among the couriers maintained by potentates and municipalities, those of Tartary, England, Scotland, Italy and the Basque country having enjoyed the greatest reputation, while the Peichs, or Persian couriers of the Turkish sultans, often ran from Constantinople to Adrianople and back, a distance of about 220 m., in two days and nights. Many couriers carried silver beads in their mouths to obviate thirst. Couriers (syce) who run before the carriages of their masters are still in use in the East. In the districts of India not traversed by railways dak runners are still employed to carry the mails from village to village, many wearing bells about their necks to frighten away the tigers. The runners of the American Indians were famous, and extraordinary tales are told of their swiftness and endurance.

In all parts of Great Britain, running at short distances, as well as steeplechases and cross-country runs, has been popular for many centuries, each district and period having its champions, some of whom achieved national reputation. During the Puritan rule and that of Charles II. athletic sports all but died out in England, only to be revived with renewed vigour in the early part of the 19th century, when the public schools and universities began to pay more attention to them. A significant event in the history of running was the institution of the famous "Crick Run" (cross-country) at Rugby in 1837. The establishment of the Cambridge University sports (1857), the Oxford sports (1860), and the British championship meetings (1866) placed athletics upon a formal and recognized basis. Records made thereafter received the stamp of authenticity, those made in former years being doubtful on account of lax measurements and timing. In the United States and Canada authentic records date from the institution of the American Championships in 1876. The National Association of Amateur Athletes of America was formed in 1880.

Running at the present day is divided into sprinting (distances up to one-quarter of a mile), middle-distance running (from one-quarter of a mile to 1000 yds.) and long-distance running (over 1000 yds.).

Sprinting consists of running over short distances with a full and continuous burst of speed, the chief distances being 100 yds., 220 yds. and quarter-mile. Distances up to and including 220 yds. are in America called *dashes*. The course for sprinting races, when run in the open air, is marked off in lanes for the individual runners by means of cords stretched upon short iron rods. Starting in sprints has now become very expert. The old method of dropping a handkerchief was the worst possible way to give the starting signal, since the muscles react most slowly to impressions of sight, less so to those of touch, and most quickly to those of sound, a difference of $\frac{4}{100}$ of a second in reaction amounting to over one foot in a run of 100 yds. All modern foot-races are therefore started by the pistol; the runners wait for the signal in a crouching attitude, with the fingers of both hands resting on the ground on each side of the body, from which position they spring upwards and forwards at the sound of the pistol. The crouching start was found to be much quicker in getting off the mark than the upright attitude formerly adopted, and by 1892 had been adopted by all first-class sprinters in America, and a year or two later in Great Britain. Another advantage is that the runner is steadier on the mark, and since its adoption the prescribed penalty of being placed one yard behind the mark for starting before the pistol-shot has been very seldom enforced, and the risky experiment of "beating the pistol," *i.e.* letting the body fall forward in the hope that the shot would come before the feet had to be moved, has practically disappeared.

The improvement in training and the adoption of the crouching start have resulted in the continued reduction of sprinting records. "Even time," or 10 secs., is still considered a fine performance for the hundred yards, but has been repeatedly beaten both in England and America. A. F. Duffey, who, like C. A. Bradley and J. W. Morton, won the English championship in four successive years, shares with D. J. Kelly the record, $9\frac{3}{5}$ secs., for 100 yds.; and J. W. Morton, a Scot, as well as J. H. Hempton and W. T. Macpherson of New Zealand, are credited with $9\frac{4}{5}$ secs. The excellence of American runners in the sprints is probably accounted for partly by temperament influenced by climate; but the American practice of running short races of from 50 to 75 yds. during the numerous indoor meetings held in winter-time offers excellent training in starting and getting rapidly into full stride.

The best time for the eighth mile (220 yds.), a distance often run in America, is 21⅕ secs., made in 1896 on a straightaway track by B. J. Wefers.

The quarter-mile (440 yds.) is almost always run on a curved track, and hence a quick start is important, for should the runner who has the advantage of the inside position allow himself to be outrun in the distance to the first turn, one of his opponents is likely to cut in and deprive him of it, while on the other hand a runner on the outside must actually outrun the inside man in order to be on even terms after the turn. The element of strategy, unknown in straight sprints, thus enters into the quarter. Speed is, of course, the chief requisite for a quarter-miler, but a certain amount of staying power is also necessary. The standard time for the quarter is 50 secs., which means an average speed of 11·3 secs. for each 100 yds. round the course. That of M.W. Long of Columbia University, who made the record, 47 secs., in 1900, was on that occasion 10·68 secs. for each hundred yards.

The system of "relay races," usually run by four men each going a quarter of the distance, is a popular variety. The favourite distance is a mile, each man running a quarter at top speed. This method of racing was introduced in the United States about the year 1890 on the model of the Massachusetts firemen's "bean-pot" races, and has since become very popular there. The old method was for the men running the second quarter of the course to wait on the mark for the first relay men to arrive, and then, snatching small flags from their hands, to continue the race, handing over the flags to the third relay upon completing their quarter. The flags, being cumbersome, were afterwards abandoned, and the new runners are now required only to touch the persons of the preceding contestants. The 1 m. record, 3 min. 21⅖ secs., was made in 1898 by B. J. Wefers, M. W. Long, T. E. Burke and H. S. Lyons of the New York Athletic Club.

Middle-Distance Running.—The chief middle distances are 600 yds., 660 yds., 880 yds. (half-mile) and 1000 yds., but of these the half-mile is the only one commonly recognized in championship sports. Endurance is more important at these distances, though speed is essential, and the element of strategy increases. An element unknown to sprinting enters into middle- and long-distance runs, namely that of pace-making; even when the real race is between two individuals at least one other runner on each side takes part in the contest, in order to "make the pace" for his principal. Emilio Lunghi (U.S.A.) holds the half-mile world's record of 1 min. 52⅘ secs., made in 1909. J. F. K. Cross of Oxford University ran the half-mile at Oxford in 1888 in 1 min. 54⅖ secs. The record for 1000 yds., 2 min. 13 secs., was made by L. E. Myers (U.S.A.). The distance of three-quarters of a mile is seldom run now at large meetings.

Long-Distance Running.—This includes all flat races of 1 m. or more, as well as steeplechasing, hare-and-hounds, and other forms of cross-country running. Great Britain has always been the home of long-distance running, different forms of cross-country racing having been popular all over the kingdom for centuries. In England at the championship meeting the distance events on the flat are the 1 m., 4 m. and 10 m. races, and in the inter-university sports the 1 m. and 3 m.; in America the distances are 1 m., 2 m. and 5 m.; but any and all of these distances are often included in important British and American programmes. Hard daily training is necessary for a distance runner. Good pace-making and strategy in general are of great importance. The runner must learn to "run to the watch," *i.e.* to cover the different portions of the distance in a certain time, in order to be placed most advantageously for the finish. The mile race requires speed as well as stamina. Most champion milers are capable of doing the half under 2 min. The record for the mile, made in 1886 at Lillie Bridge by W. G. George, as a professional, is 4 min., 12¾ secs.; the amateur record is 4 min. 15⅗ secs., made by T. P. Conneff in America, J. Binks, holding the British amateur record with 4 min. 16⅘ secs., made at Stamford Bridge in 1902. The longer-distance races require more stamina than speed, and a careful husbanding of strength.

The following table gives the records (up to 1908) for the distance runs on the flat, longer than 1 m.:—

Distance.	Name.	Time.	Date.	Place.
		h. m. s.		
2 miles	A. Shrubb	9 9⅗	1904	Glasgow
3 ,,	A. Shrubb	14 17⅗	1903	Stamford Bridge
4 ,,	A. Shrubb	19 23⅖	1904	Glasgow
5 ,,	A. Shrubb	24 33⅖	1904	Stamford Bridge
10 ,,	A. Shrubb	50 40⅗	1904	Glasgow
15 ,,	F. Appleby	1 20 4⅗	1902	Stamford Bridge
20 ,,	G. Crossland	1 51 54	1894	Stamford Bridge
30 ,,	J. A. Squires	3 17 36½	1885	Balham
40 ,,	J. E. Dixon	4 46 54	1884	Birmingham
50 ,,	J. E. Dixon	6 18 26⅕	1885	Balham.

In addition to the records for the above-mentioned distances, Shrubb held in 1908 the records for 6, 7, 8, 9 and 11 m., and also for the greatest distance covered in 1 h., namely, 11 m. 1316 yds. He won the 4 m. and the 10 m. British championship 1901–4 inclusive, and the 1 m. championship 1903 and 1904; also the French 1 m. and 3 m. championship 1902–4 inclusive. Shrubb was moreover a first-rate cross-country runner also; he won the British 10 m. cross-country championship 1901–4 inclusive, and the international 8 m. cross-country championship 1902–4. In 1863 a full-blooded Seneca Indian, L. Bennet, known as "Deerfoot," ran 12 m. in 1 h. 2 m. 2½ secs.

Real *cross-country running* is a fast jog over hill and dale. It may take the form of a race from the gymnasium or club-house across the fields to a given spot and back again, passing certain objects or buildings; of a practice run behind the coach preparatory to a long-distance race on the track; or of a paper-chase, or hare-and-hounds, the "hares," two or three in number, starting a few minutes before the "hounds," and leaving a trail of scraps of paper dropped from bags, which must be followed by the "hounds." In Great Britain the standard distance is 10 m., but in America it is somewhat less, the distance for the intercollegiate championship race being 6¼ m.

Steeplechasing was originally only a cross-country run over a course plentifully provided with natural obstacles, such as brooks, ditches, fences and hedges; but at the present day the steeplechase takes place in the inner enclosure of an athletic field and the obstacles are artificial. They are placed about 70 or 80 yds. apart, and consist of hurdles, a stone wall about 3 ft. high and 2 or 3 ft. broad, and a water-jump, a ditch about 6 ft. broad filled with water and guarded by a wall or fence covered with thick furze or other thick shrubbery. Steeplechase courses differ widely, but the usual distance both in Great Britain and America is 2 m. The time necessary to cover this distance varies according to the difficulties of the course, but a few seconds under 11 min. is considered very fast time.

Team-racing is a favourite form of distance running, each team consisting of 10 men and the distance usually 4 m., the standard of the modern Olympic Games. Different systems of scoring are in vogue, but the usual one allows the winner ten points, the second to arrive nine, and so on, the tenth arrival scoring one. The team aggregating the highest number of points wins.

Among modern distance events the *Marathon Run* of about 40 kilometres (24 m. 1500 yds.) is the most important. It was introduced in the first revived Olympic Games at Athens in 1896 (see ATHLETIC SPORTS) in memory of the famous Greek runner who was said to have brought the news of the battle of Marathon in Athens, dropping dead when his task was finished.

RUODLIEB, a romance in Latin verse by an unknown German poet who flourished about 1030; he was almost certainly a monk of the Bavarian abbey of Tegernsee. The poem is one of the earliest German romances of knightly adventure, and its vivid picture of feudal manners gives it a certain value as an historical document. The poet was probably an eye-witness of the episode (ll. 4231–5221) which represents the meeting of the emperor Henry II. with Robert of France on the banks of the Maas in 1023. *Ruodlieb* was left unfinished, and furthermore the MS. was cut up and used for binding books, so that the fragments were only gradually discovered (from 1807 onwards) and pieced together. The framework of the story is borrowed from a popular *märchen* of the youth who takes service away from home, and is paid in wise saws instead of current coin. He receives at the same time a loaf, with instructions not to cut it until he is once more at home. This contains the coins. The proverbs, usually three in number, were increased in *Ruodlieb* to twelve, each of which was the starting-point of an episode by which the hero was made to appreciate its value.

For examples of the three-proverb tale see W. Bottrell, *Traditions and Hearthside Stories* (Penzance, 2nd series, 1873); Cuthbert Bede, *The White Wife* . . . (London, 1868); K. V. K.[illinger], *Erin* (Stuttgart and Tübingen, 1849), and others in the French romance of the *Saint Graal*, in the *Gesta Romanorum* (the three proverbs bought by Domitian) and the old French *Dit des trois pommes*. The best edition of *Ruodlieb* is by F. Seiler (Halle, 1882). There is a modern version by M. Heine (Leipzig, 1897), and a full analysis of the contents is given by R. Koegel, *Gesch. d. deutschen Lit. bis zum Ausgange des Mittelalters* (Strassburg, 1894–97, ii. pp. 342–412).

RUPAR, a town of British India, in Umballa district of the Punjab, on the left bank of the river Sutlej, 43 m. N. of Umballa, 1120 ft. above sea-level. Pop. (1901) 8888. It was the scene of Ranjit Singh's visit to Lord William Bentinck when governor-general in 1831. Here are the head works of the Sirhind canal. Rupar has manufactures of cotton twill and hardware. Hindu and Mahommedan fairs are held.

RUPEE (Hindustani *rupiya*, from Sanskrit *rupya*), the standard coin of the monetary system in India. A silver coin of 175 grains Troy, called *tanka*, approximating to the rupee, was struck by the Mahommedan rulers of Delhi in the 13th century; but the rupee itself, of 179 grains, was introduced by Sher Shah in 1542. The English at first followed various indigenous standards; but since 1835 the rupee has uniformly weighed 180 grains, containing 165 grains of pure silver. The weight of the rupee (one *tola*) is also the unit upon which the Indian standard of weights is based. Down to about 1873 the gold value of the rupee was 2s., and ten rupees were thus equal to £1; but after 1873, owing to the depreciation of silver, the rupee at one time sank as low in value as 1s. In order to provide a remedy the government of India decided in 1893 to close the mints, and in 1899 to make the rupee legal tender at fifteen to £1. This policy proved successful, and since 1899 the exchange value of the rupee has practically remained at 1s. 4d. Therefore a lakh of rupees, which before 1873 was worth £10,000, is now only worth £6666, and a crore of rupees, which was formerly a million sterling, now only amounts to £666,666. The rupee is divided into sixteen annas, now worth 1d. each, and the anna is subdivided into 12 pies. (See India, and Money.)

RUPERT (Hrodbert), **ST,** according to the *Gesta Sancti Hrodberti*, which dates from the 9th century, was a kinsman of the Merovingian house, and bishop of Worms under Childebert III. (695–711). At the invitation of the duke of Bavaria, Theodo II., Rupert went to Regensburg (Ratisbon), where he began his apostolate. He founded the church of St Peter near the Wallersee, and subsequently, at Salzburg, the church of St Peter, together with a monastery and a dwelling for the clerks, as well as a convent for women "in superiori castro Iuvavensium." He died and was buried at Salzburg. He is regarded as the apostle of the Bavarians, not that the land was up to that time altogether heathen, but because of his services in the promotion and consolidation of its Christianity.

See *Bibliotheca hagiographica Latina* (Brussels, 1899), n. 7390–7403; W. Levison, "Die älteste Lebensbeschreibung Ruperts von Salzburg" in *Neues Archiv fur aeltere deutsche Geschichtskunde*, xxviii. 283 seq.; Hauck, *Kirchengeschichte Deutschlands* (3rd ed.), i. 372 seq. (H. De.)

RUPERT, PRINCE, Count Palatine of the Rhine and Duke of Bavaria (1619–1682), third son of the elector palatine and "winter king" of Bohemia, Frederick V., and of Elizabeth, daughter of James I. of England, was born at Prague on the 17th of December 1619. A year later his father was defeated at the battle of the Weisser-Berg, near Prague, and driven from Bohemia. After many wanderings the family took refuge in Holland, where Rupert's boyhood was spent. In 1633 the boy was present at the siege of Rheinberg in the suite of the Prince of Orange, and in 1635 he served in this prince's bodyguard. In 1636 he paid his first visit to England, was entered as an undergraduate, though only nominally, at St John's College, Oxford, and was named as the governor of a proposed English colony in Madagascar. But this scheme did not mature, and Charles sent his nephew back to Holland, having, however, formed a high opinion of his energy, talent and resolution. In 1637 he was again serving in the wars, and in 1638, after displaying conspicuous bravery, he was taken prisoner by the imperialists at the action of Vlotho (17th October) and held in a not very strict captivity for three years. In 1641 he was released, and, rejoining his mother in Holland, was summoned to England to the assistance of his uncle, for the Great Rebellion was about to break out.

In July 1642 he landed at Tynemouth. Charles at once made him general of the horse and independent of Lord Lindsey, the nominal commander of the whole army. From this point until the close of the first Civil War in 1646 Prince Rupert is the dominant figure of the war. His battles and campaigns are described in the article Great Rebellion. He was distinctively a cavalry leader, and it was not until the battle of Marston Moor in 1644 that the Royalist cavalry was beaten. The prince's strategy was bold as well as skilful, as was shown both in the Royalist movements of 1644 which he proposed, and in the two far-ranging expeditions which he carried out for the relief of Newark and of York. In November 1644, in spite of the defeat at Marston Moor, he was appointed general of the king's army. But this appointment, though welcome to the army, was obnoxious to the king's counsellors, who resented the prince's independence of their control, to some of the nobility over whose titles to consideration he had ridden roughshod, and to some of the officers whose indiscipline and rapacity were likely to be repressed with a heavy hand. These dissensions culminated, after the prince's surrender of Bristol to Fairfax, in a complete break with Charles, who dismissed him from all his offices and bade Rupert and his younger brother Maurice seek their fortunes beyond the seas.

Rupert's character had been tempered by these years of responsible command. By 1645, although the parliamentary party accused him not merely of barbarity but of ingratitude for the kindnesses which his family had received from English people in the days of the Palatinate War, Rupert had in fact become a good Englishman. He was convinced, after Marston Moor, that the king's cause was lost, in a military sense, and moreover that the king's cause was bad. When he surrendered Bristol without fighting to the uttermost, it was because Fairfax placed the political issue in the foreground, and after the capitulation the prince rode to Oxford with his enemies, frankly discussing the prospect of peace. Already he had deliberately advised Charles to make peace, and had come to be suspected, in consequence, by Charles's optimistic adviser Digby. But to Charles himself the news of the fall of Bristol was a thunderbolt. "It is the greatest trial to my constancy that has yet befallen me," he wrote to the prince, "that one that is so near to me in blood and friendship submits himself to so mean an action." Rupert was deeply wounded by the implied stain on his honour; he forced his way to the king and demanded a court-martial. The verdict of this court smoothed over matters for a time, but Rupert was now too far estranged from the prevailing party at court to be of any assistance, and after further misfortunes and quarrels they separated, Charles to take refuge in the camp of the Scots, Rupert to stay, as a spectator without command, with the Oxford garrison. He received at the capitulation a pass from the parliament to leave England, as did also his faithful comrade Maurice.

For some time after this Rupert commanded the troops formed of English exiles in the French army, and received a wound at the siege of La Bassée in 1647. Charles in misfortune had understood something of his nephew's devotion, and wrote to him in the friendliest terms, and though the prince had by no means forgiven Digby, Colepeper and others of the council, he obtained command of a Royalist fleet. The king's enemies were now no longer the Presbyterians and the majority of the English people but the stern Independent community, with whose aims and aspirations he could not have any sympathy whatever. A long and unprofitable naval campaign followed, which extended from Kinsale to Lisbon and from Toulon to Cape Verde. But the prince again quarrelled with the council, and spent six years (1654–60) in Germany, during which period nothing is known of him, except that he vainly attempted (as also before and afterwards) to obtain the apanage to which as a younger son he was entitled from his brother the elector palatine. At the Restoration he settled in England again, receiving from Charles II. an annuity and becoming a member of the privy council. He never again fought on land, but, turning admiral like Blake and Monk, he bore a brilliant part in the Dutch Wars. He died at his house in Spring Gardens, Westminster, on the 29th of November 1682.

Apart from his military renown, Prince Rupert is a distinguished figure in the history of art as one of the earliest mezzotinters. It has often been said that he was the inventor of mezzotint engraving, but this is erroneous, as he obtained the secret from a German officer, Ludwig von Siegen. One of the most beautiful and valuable of early mezzotints is his "Head of St John the Baptist." He was also interested in science, experimented with the manufacture of gunpowder, the boring of guns and the casting of shot, and invented a modified brass called "prince's metal."

Prince Rupert was duke of Cumberland and earl of Holderness in the English peerage. He was unmarried, but left two natural children; one a daughter who married General Emmanuel Scrope Howe and died in 1740, and the other a son, whose mother (who claimed that she was married to the prince) was Frances, daughter of Sir Henry Bard, Viscount Bellamont. The son was killed in 1686 at the siege of Buda.

See E. Warburton's *Life of Pr. Rupert* (London, 1849) and additional authorities quoted in the memoir by C. H. Firth in the *Dict. Nat. Biog.*

RUPERT (1352–1410), German king, and, as Rupert III., elector palatine of the Rhine, was a son of the elector Rupert II. and Beatrice, daughter of Peter II., king of Sicily. He was born at Amberg on the 5th of May 1352, and from his early years took part in the government of the Palatinate to which he succeeded on his father's death in 1398. He was one of the four electors who met at Oberlahnstein in August 1400 and declared King Wenceslaus deposed. This was followed by the election of Rupert as German king at Rense on the 21st of that month, and by his coronation at Cologne on the 6th of the following January. Winning some recognition in S. Germany, he made an expedition to Italy, where he hoped to receive the imperial crown, and to crush Gian Galleazzo Visconti, duke of Milan. In the autumn of 1401 he crossed the Alps, but his troops, checked before Brescia, melted away, and in 1402 Rupert, too poor to continue the campaign, returned to Germany. The news of this failure increased the disorder in Germany, but the king met with some success in his efforts to restore peace, and in October 1403 he was recognized by Pope Boniface IX. It was only the indolence of Wenceslaus that prevented his overthrow, and in 1406 he was compelled to make certain concessions. The quarrel was complicated by the papal schism, but the king was just beginning to make some headway when he died at his castle of Landskron near Oppenheim on the 18th of May 1410 and was buried at Heidelberg. He married Elizabeth, daughter of Frederick IV. of Hohenzollern, burgrave of Nuremburg, and left three sons and four daughters. Rupert, who earned the surname of *clemens*, was brave and generous, but his resources were totally inadequate to bear the strain of the German kingship.

Bibliography.—J. Chmel, *Regesta chronologico-diplomatica Ruperti regis Romanorum* (Frankfort, 1834); C. Höfler, *Ruprecht von der Pfalz genannt Clem römischer König* (Freiberg, 1861); L. Häusser, *Geschichte der Rheinischen Pfalz* (Heidelberg, 1845); Th. Lindner, *Geschichte des Deutschen Reiches vom Ende des 14 Jahrhunderts bis zur Reformation* (Brunswick, 1875–80), part i.; A. Winkelmann, *Der Romzug Ruprechts von der Pfalz* (Innsbruck, 1892); and J. Weizsäcker, *Die Urkunden der Approbation König Ruprechts* (Berlin, 1899).

RUPERT'S LAND, a former district of Canada. The generous charter of Charles II. given in 1670 to the Hudson's Bay Company gave rights of possession, trade and administration of justice "of all those seas, streights and bays, rivers, lakes, creeks and sounds, in whatsoever latitude they shall be, that lie within the entrance of the streights commonly called Hudson's streights, together with all the lands, countries and territories upon the coasts and confines of the seas, streights, bays, lakes, rivers, creeks and sounds aforesaid, which are not now actually possessed by any of our subjects, or by the subjects of any other Christian prince or state."

The general interpretation given to this was that it included all the country drained into Hudson Bay. As Prince Rupert was first governor of the Hudson's Bay Company his name was given to the concession under the name "Rupert's Land." It will be observed that Athabasca, New Caledonia and British Columbia were not included in this grant. They were held under the title Indian Territories by the Hudson's Bay Company by licence terminable every twenty-one years, the last term closing with 1859. Rupert's Land was transferred to Canada by the imperial government in 1870, and ceased to exist as a political name. It is still used as the title of the episcopal diocese, which is in the main coincident with the province of Manitoba.

RUPILIUS, PUBLIUS, Roman statesman, consul in 132 B.C. During the inquiry that followed the death of Tiberius Gracchus, conducted by himself and his colleague Popillius Laenas, he proceeded with the utmost severity against the supporters of Gracchus. In the same year he was despatched to Sicily, where he suppressed the revolt of the slaves under Eunus. During 131 he remained as proconsul of the island, and, with the assistance of ten commissioners appointed by the senate, drew up regulations for the organization of Sicily as a province. These regulations were known by the title of *leges Rupiliae*, though they were not laws in the strict sense. Rupilius was subsequently brought to trial (123 B.C.) and condemned for his treatment of the friends of Gracchus. The disgrace of his condemnation, added to disappointment at the failure of his brother to obtain the consulship in spite of the efforts of Scipio, caused his death shortly afterwards.

See Cicero, *De Am.* 19, *Tusc. disp.* iv. 17, *in Verr.* ii. 13, 15; Diod. Sic. xxxiv. 1, 20; Vell. Pat. ii. 7.

RUPPIN, or Neuruppin, a town of Germany, in the Prussian province of Brandenburg, lies on the W. bank of a small lake, the Ruppiner See, 37 m. N.W. of Berlin by rail. Pop. (1905) 18,555. The town, which was rebuilt in fine, regular fashion after a destructive fire in 1787, contains three Protestant churches, a Roman Catholic church and various educational and benevolent institutions. Its inhabitants are employed in the manufacture of cloth, starch and machinery, in iron-founding and lithography. Important cattle and horse fairs are held here. Ruppin received municipal rights in 1256.

The small town of Altruppin, lying at the north end of the lake, has a 15th-century church and some small manufactures. Pop. (1905) 1813.

See Heydemann, *Neuere Geschichte der Stadt Neuruppin* (Neuruppin, 1863); and G. Bittkau, *Altere Geschichte der Stadt Neuruppin* (Neuruppin, 1887).

RUSELLAE, an ancient town of Etruria, Italy, about 10 m. S.E. of Vetulonia and 5 m. N.E. of Grosseto, situated on a hill with two summits, the higher 636 ft. above sea-level. It was one of the twelve cities of the Etruscan confederation, and was taken in 294 B.C. by the Romans. In 205 B.C. it contributed grain and timber for the needs of Scipio's fleet. A colony was founded here either by the Triumviri or by Augustus. The place was deserted in 1138, and the episcopal see was transferred to Grosseto. The ruins are now thickly overgrown with brushwood; but the walls, nearly 2 m. in circumference, are in places well preserved. They consist of large unworked blocks of a travertine which naturally splits into roughly rectangular blocks; these are quite irregular, and often as much as 9 ft. long by 4 ft. wide: in the interstices smaller pieces are inserted. The walls are embanking walls, with a low breastwork in places. Within the circuit which they enclose, now under cultivation, are two summits, one occupied by a Roman amphitheatre [the other by a tower (?) of uncertain date]: a Roman cistern also is visible. Some 2 m. S.S.W. are modern baths, fed by hot springs, which were in use in Roman times also, as the discovery of remains of Roman buildings shows.

See G. Dennis, *Cities and Cemeteries of Etruria* (London, 1883), ii. 222. (T. As.)

RUSH, BENJAMIN (1745–1813), American physician, was born in Byberry township, near Philadelphia, on a homestead founded by his grandfather, a Quaker gunsmith, who had followed Penn from England in 1683. In 1760 he graduated at Princeton. After serving an apprenticeship of six years with a doctor in Philadelphia, he went for two years to Edinburgh, where he attached himself chiefly to William Cullen. He took his M.D. degree there in 1768, spent a year more in the hospitals of London and Paris, and began practice in Philadelphia at the age of twenty-four, undertaking at the same time the chemistry class at the Philadelphia medical college. He was a friend of Franklin, a member of Congress for the state of Pennsylvania in 1776, and one of those who signed the Declaration of Independence the same year. He had already written on the Test Laws, "Sermons to the Rich," and on negro slavery; and in 1774 he started along with James Pemberton the first anti-slavery society in America, and was its secretary for many years. In 1787 he was a member of the Pennsylvania convention which adopted the Federal constitution, and thereafter he retired from public life, and gave himself up wholly to medical practice. In 1789 he exchanged his chemistry lectureship for that of the theory and practice of physic; and when the medical college, which he had helped to found, was absorbed by the university of Pennsylvania in 1791 he became professor of the institutes of medicine and of clinical practice, succeeding in 1796 to the chair of the theory and practice of medicine. He gained great credit when the yellow fever devastated Philadelphia, in 1793, by his assiduity in visiting the sick, and by his bold and apparently successful treatment of the disease by bloodletting. He died in Philadelphia on the 19th of April 1813, after a five days' illness from typhus fever. His son Richard is separately noticed. Another son, James (1786–1869), was a physician, and author of various books, such as *Philosophy of the Human Voice* (1827) and *Analysis of the Human Intellect* (1865).

Benjamin Rush's writings covered an immense range of subjects, including language, the study of Latin and Greek, the moral faculty, capital punishment, medicine among the American Indians, maple sugar, the blackness of the negro, the cause of animal life, tobacco smoking, spirit drinking, as well as many more strictly professional topics. His last work was an elaborate treatise on the *Diseases of the Mind* (1812). He is best known by the five volumes of *Medical Inquiries and Observations*, which he brought out at intervals from 1789 to 1798 (two later editions revised by the author).

See eulogy by his friend Dr David Hosack (*Essays*, i., New York, 1824), with biographical details taken from a letter of Rush to President John Adams; also references in the works of Thacker, Gross and Bowditch on the history of medicine in America. His part in the yellow fever controversies is indicated by La Roche (*Yellow Fever in Philadelphia from 1699 to 1854*, 2 vols., Philadelphia, 1855) and by Bancroft (*Essay on the Yellow Fever*, London, 1811). His services as an abolitionist pioneer are recorded in Clarkson's *History of the Abolition of the African Slave Trade*.

RUSH, RICHARD (1780–1859), American statesman and diplomatist, son of Dr Benjamin Rush, was born in Philadelphia, Pennsylvania, on the 29th of August 1780 He graduated at Princeton in 1797, and was admitted to the bar in 1800. He was attorney-general of Pennsylvania in 1811, comptroller of the treasury of the United States in 1811–14, attorney-general in the cabinet of President James Madison in 1814–17, acting secretary of state from March to September 1817, minister to Great Britain in 1817–25, secretary of the treasury in the cabinet of President J. Q. Adams in 1825–29, and candidate for vice-president on the Adams ticket in 1828. In 1818, while minister to Great Britain, he, in association with Albert Gallatin, concluded with British plenipotentiaries the important treaty which determined the boundary line between the United States and Canada from the Lake of the Woods to the Rocky Mountains and provided for the joint occupation of Oregon for ten years. He also conducted the negotiations with Canning in 1823 relating to the S. American policy of the Holy Alliance. He followed the Adams-Clay faction of the Democratic-Republican party in the split of 1825–28, but returned to the Democratic party about 1834 on the bank issue. In 1835 he and Benjamin C. Howard, of Baltimore, Maryland, were sent by President Jackson to prevent an outbreak of hostilities in the Ohio-Michigan boundary dispute. In 1836–38 Rush was commissioner to receive the Smithson legacy (see SMITHSONIAN INSTITUTION), and in 1847–49 he was minister to France. He died at Philadelphia on the 30th of July 1859.

He published *A Narrative of a Residence at the Court of London from 1817 to 1825* (2 vols., 1833–45; all editions after the first edition of the 1st volume are entitled *Memoranda of a Residence*, &c.); *Washington in Domestic Life* (1857), compiled from letters written by Washington to his private secretary in 1790–98; and *Occasional Productions, Political, Diplomatic and Miscellaneous* (1860); and while attorney-general he suggested the plan for the compilation, *Laws of the Nation* (5 vols., 1815), edited by John B. Colvin.

RUSH. Under the name of rush or rushes, the stalks or hollow stem-like leaves of several plants have minor industrial applications. The common rushes (species of *Juncus*; see JUNCACEAE) are used in many parts of the world for chair-bottoms, mats and basket-work, and the pith serves as wicks in open oil-lamps and for tallow candles—whence rushlight. The fibrous stems and leaves of the bulrush or reed-mace, *Typha angustifolia*, are used in N. India for ropes, mats and baskets. *Scirpus* and other Cyperaceae are used for chair-bottoms, mats and thatch; the rush mats of Madras are made from a species of *Cyperus*. The sweet-rush, yielding essential oil, is a grass, *Andropogon Schoenanthus*, known also as lemon grass. Large quantities of the "horse-tail," *Equisetum hiemale*, are used under the name of Dutch or scouring rush for scouring metal and other hard surfaces on account of the large proportion of silica the plant contains. Flowering rush is *Butomus umbellatus* (see ALISMACEAE); wood-rush is the common name for *Luzula* (see JUNCACEAE). *Acorus Calamus*, sweet-flag, is also known as sweet-rush.

RUSHDEN, an urban district in the E. parliamentary division of Northamptonshire, England, 66 m. N.N.W. from London by the Midland railway. Pop. (1901) 12,453. The church of St Mary is a fine cruciform building with western tower and spire. It is mainly decorated, with perpendicular additions, but retains some Early English details. The growth of Rushden as a town is modern. The industrial population is employed in boot and shoe making, the local staple.

RUSHWORTH, JOHN (*c.* 1612–1690), the compiler of the *Historical Collections* commonly described by his name, was the son of Lawrence Rushworth of Acklington Park, Warkworth, Northumberland. When he was given the degree of M.A. at Oxford in 1649, he was said to belong to Queen's College, but there are no traces of his presence at the university. He was bred to the law, and in 1638 was appointed solicitor to the town of Berwick. He was enrolled in Lincoln's Inn in 1641, and was called to the bar in 1647. He made a point of attending on all public occasions of a political and judicial character, such as proceedings before the Star Chamber or the Council, and of making shorthand notes of them. On the 25th of April 1640 he was appointed an assistant clerk to the House of Commons. He was on duty when King Charles I. came down to arrest the five members on the 4th of January 1642, and made notes of his speech. The king insisted on taking the notes, and ordered them to be published. Rushworth attended the trial of the earl of Strafford, and took shorthand notes of the proceedings. He was much employed as a messenger between the king and the parliament, and from the 11th of April 1644 till the 9th of March 1647 was licenser of pamphlets. When the new model army was formed he was appointed secretary to the parliamentary general, Sir Thomas Fairfax. He was present at the battle of Naseby, of which he wrote an account. When Fairfax, who was offended by the execution of the king, resigned his command, Rushworth was for a short time secretary to Cromwell. He was afterwards employed by the council of state and during the protectorate, and sat in Cromwell's parliament for Berwick. When Richard Cromwell resigned the protectorate, Rushworth was employed by the Rump after it had been re-established by Monk. He made his peace with the government of Charles II., and though he was threatened with trial as a regicide he was not seriously molested. During the reign of Charles II. he continued to act as agent for the town of Berwick, and he sat for it in parliament. He was also for a time agent for Massachusetts, but the colony complained that it received no advantage from his services. During the last years of his life he fell into poverty, and from 1684 till his death on the 12th of May 1690 he was a resident in the King's Bench prison. At this time he had destroyed his memory by over-indulgence in drink. The collection of papers which he made was published in eight volumes folio between 1659 and 1701. The volumes from the fourth onwards appeared after his death. The first, which appeared with a dedication to Richard Cromwell, was recalled and the dedication was suppressed.

RUSKIN, JOHN (1819–1900), English writer and critic, was born in London, at Hunter Street, Brunswick Square, on the 8th of February 1819, being the only child of John James Ruskin and Margaret Cox. They were Scots, first cousins, the grandchildren of a certain John Ruskin of Edinburgh (1732–1780). In *Praeterita* the author professes small knowledge of his ancestry. But the memoirs published on the authority of the family trace their descent to the Adairs and Agnews of Galloway. In this family tree are men famous in arms and in the public service: Sir Andrew Agnew of Lochnaw, Admiral Sir John Ross, Field-Marshal Sir Hew Dalrymple Ross, Dr John Adair, in whose arms Wolfe died at Quebec, and the Rev. W. Tweddale of Glenluce, to whom the original Covenant, now in the Glasgow Museum, had been confided. The name Ruskin is said to be a variant of Erskine, or Roskeen, or Rogerkin, and even Roughskin. It is more probably Rusking, an Anglian family, which passed northwards and became Ruskyn, Rusken and Ruskin.

John Ruskin, the author's grandfather, a handsome lad of twenty, ran away with Catherine Tweddale, daughter of the Covenanting minister and of Catherine Adair, then a beautiful girl of sixteen. He settled in Edinburgh and engaged in the wine trade, lived liberally in the cultivated society of the city, lost his health and his fortune, and ended his days in debt. His son, John James Ruskin (1785–1864), father of the author, was sent to the High School at Edinburgh under Dr A. Adam, received a sound classical education, and was well advised by his friend Dr Thomas Brown, the eminent metaphysician. When of age, John James was sent to London to enter the wine trade. There, in 1809, he founded the sherry business of Ruskin, Telford & Domecq; Domecq being proprietor of a famous vineyard in Spain, Telford contributing the capital of the firm, and Ruskin having sole control of the business. John James Ruskin, a typical Scot, of remarkable energy, probity and foresight, built up a great business, paid off his father's debts, formed near London a most hospitable and cultured home, where he maintained his taste for literature and art, and lived and died, as his son proudly wrote upon his tomb, "an entirely honest merchant." He was also a man of strong brain, generous nature and fine taste. After a delay of nine years, having at last obtained an adequate income, he married his cousin, Margaret Cox, who had already lived for eighteen years with his mother, the widow of John Ruskin of Edinburgh. When this marriage of the two cousins, who had known each other all their lives, took place in 1818, neither of them was young. John James was thirty-three and Margaret was thirty-seven. In the following year (8th February 1819) their only child, John, was born in Hunter Street, London.

Margaret Ruskin, the author's mother, was a handsome, strong, stern, able, devoted woman of the old Puritan school, Calvinist in religion, unsparing of herself and others, rigid in her ideas of duty, proud, reserved and ungracious. She was the daughter of Captain Cox, of Yarmouth, master mariner in the herring fishery, who died young; whereupon his widow maintained herself as landlady of the King's Head Inn at Croydon. Her younger daughter married Mr Richardson, a baker, of Croydon; the elder, Margaret, married John James Ruskin. Jessie, a sister of John James, married Peter Richardson, a tanner, of Perth, so that the author had cousins of two Richardson families, unconnected with each other. In his own memoirs he speaks much more of these than of any Ruskins, Tweddales, Adairs or Agnews. The child was brought up under a rigid system of nursing, physical, moral and intellectual; kept without toys, not seldom whipped, watched day and night, but trained from infancy in music, drawing, reading aloud and observation of natural objects. When he was four the family removed to a house on Herne Hill, then a country village, with a garden and rural surroundings. The father, who made long tours on business, took his wife, child and nurse year after year across England as far as Cumberland and Scotland, visiting towns, cathedrals, castles, colleges, parks, mountains and lakes. At five the child was taken to Keswick; at six to Paris, Brussels and Waterloo; at seven to Perthshire. At fourteen he was taken through Flanders, along the Rhine, and through the Black Forest to Switzerland, where he first imbibed his dominant passion for the Alps. His youth was largely passed in systematic travelling in search of everything beautiful in nature or in art. And to one so precocious, stimulated by a parent of much culture, ample means and great ambition, this resulted in an almost unexampled aesthetic education. In childhood also he began a systematic practice of composition, both in prose and verse. His mother trained him in reading the Bible, of which he read through every chapter of every book year by year; and to this study he justly attributes his early command of language and his pure sense of style. His father read to him Shakespeare, Scott, Don Quixote, Pope and Byron, and most of the great English classics; and his attention was especially turned to the formation of sentences and to the rhythm of prose. He began to compose both in prose and verse as soon as he had learned to read and write, both of which arts he taught himself by the eye.

His first letter is dated 1823, when he was only four. In it he corrects his aunt, who had put up the wooden pillars of his Waterloo bridge "upside down." At five he was a bookworm. At seven he began a work in four volumes, with "copper-plates printed and composed by a little boy, and also drawn." His first poem, correct in rhyme and form, was written before he was seven. At nine he began "Eudosia, a poem of the Universe." From that year until his Newdigate Prize, at the age of twenty, he wrote enormous quantities of verse, and began dramas, romances and imitations of Byron, Pope, Scott and Shelley. What remain of these effusions have no special quality except good sense, refined feeling, accuracy of phrase, and a curious correctness of accent and rhythm. Of true poetry in the higher sense there is hardly a single line.

His schooling was irregular and not successful. At the age of eleven he was taught Latin and Greek by Dr Andrews, a scholar of Glasgow University. About the same time he had lessons in drawing and in oil painting from Runciman. French and Euclid were taught by Rowbotham. At fifteen he was sent for two years to the day-school of the Rev. T. Dale of Peckham, and at seventeen he attended some courses in literature at King's College, London. In painting he had lessons from Copley Fielding and afterwards from J. D. Harding. But in the incessant travelling, drawing, collecting specimens and composition in prose and verse he had gained but a very moderate classical and mathematical knowledge when he matriculated at Oxford; nor could he ever learn to write tolerable Latin. As a boy he was active, lively and docile; a good walker, but ignorant of all boyish games, as naïf and as innocent as a child; and he never could learn to dance or to ride. He was only saved by his intellect and his fine nature from turning out an arrant prig. He was regarded by his parents, and seems to have regarded himself, as a genius. As a child he had been "a savant in petticoats"; as a boy he was a poet in breeches. At the age of seventeen he saw Adèle, the French daughter of Monsieur Domecq, Mr Ruskin's partner, a lovely girl of fifteen. John fell rapturously in love with her; and, it seems, the two fathers seriously contemplated their marriage. The young poet wooed the girl with poems, romances, dramas and mute worship, but received nothing except chilling indifference and lively ridicule. To the gay young beauty, familiar with Parisian society, the raw and serious youth was not a possible *parti*. She was sent to an English school, and he occasionally saw her. His unspoken passion lasted about three years, when she married the Baron Duquesne. Writing as an old man, long after her death, Ruskin speaks of his early love without any sort of rapture. But it is clear that it deeply coloured his life, and led to the dangerous illness which for some two years interrupted his studies and made him a wanderer over Europe.

As the father was resolved that John should have everything that money and pains could give, and was one day to be a bishop at least, he entered him at Christ Church, Oxford, as a gentleman-commoner—then an order reserved for men of wealth and rank. Ruskin's Oxford career, broken by the two years passed abroad, was not very full of incident or of usefulness. Though he never became either a scholar or a mathematician, he did enough accurate work to be placed in the honorary fourth class both in classics and in mathematics. By the young bloods of the "House" he was treated pleasantly as a raw outsider of genius. By some of the students and tutors, by Liddell, Newton, Acland and others, he was regarded as a youth of rare promise, and he made some lifelong friendships with men of mark and of power. Both he and his college took kindly the amazing proceeding of his mother, who left her husband and her home to reside in Oxford, that she might watch over her son's health. The one success of his Oxford career was the winning the Newdigate Prize by his poem "Salsette and Elephanta," which he recited in the Sheldonian Theatre (June 1839). Two years of ill-health and absence from home ensued. And he did not become "a Graduate of Oxford" until 1842, in his twenty-fourth year, five years after his first entrance at the university. In fact, his desultory school and college life had been little more than an interruption and hindrance to his real education—the study of nature, of art and of literature. Long before Ruskin published books he had appeared in print. In March 1834, when he was but fifteen, Loudon's *Magazine of Natural History* published an essay of his on the strata of mountains and an inquiry as to the colour of the Rhine. He then wrote for Loudon's *Magazine of Architecture*, and verses of his were inserted in Messrs Smith & Elder's *Friendship's Offering*, by the editor, T. Pringle, who took the lad to see the poet Rogers. At seventeen he wrote for *Blackwood* a defence of Turner, which the painter, to whom it was first submitted, did not take the trouble to forward to the magazine. At eighteen he wrote a series of papers, signed Kata Phusin, *i.e.* "after Nature," for Loudon's *Magazine*, on "The Poetry of Architecture." In 1838 (he was then nineteen) Mr Loudon wrote to the father, "Your son is the greatest natural genius that ever it has been my fortune to become acquainted with."

Having recovered his health and spirits by care and foreign travel, and having taken his degree and left Oxford, Ruskin set to work steadily at Herne Hill on the more elaborate defence of Turner, which was to become his first work. *Modern Painters*, vol. i., by "a Graduate of Oxford," was published May 1843, when the author was little more than twenty-four. It produced a great and immediate sensation. It was vehemently attacked by the critics, and coolly received by the painters. Even Turner was somewhat disconcerted; but the painter was now known to both Ruskins, and they freely bought his pictures. The family then went again to the Alps, that John might study mountain formation and "Truth" in landscape. In 1845 he was again abroad in Italy, working on his *Modern Painters*, the second volume of which appeared in 1846. He had now plunged into the study of Bellini and the Venetian school, Fra Angelico and the early Tuscans, and he visited Lucca, Pisa, Florence, Padua, Verona and Venice, passionately devoting himself to architecture, sculpture and painting in each city of north Italy. He wrote a few essays for the *Quarterly Review* and other periodicals, and in 1849 (*aet.* 30) he published *The Seven Lamps of Architecture*, with his own etchings, which greatly increased the reputation acquired by his *Modern Painters*.

On the 10th of April 1848, a day famous in the history of Chartism, Ruskin was married at Perth to Euphemia Chalmers Gray, a lady of great beauty, of a family long intimate with the Ruskins. The marriage, we are told, was arranged by the parents of the pair, and was a somewhat hurried act. It was evidently ill-assorted, and brought no happiness to either. They travelled, lived in London, saw society, and attended a "Drawing-room" at Buckingham Palace. But Ruskin, immersed in various studies and projects, was no husband for a brilliant woman devoted to society. No particulars of their life have been made public. In 1854 his wife left him, obtained a nullification of the marriage under Scots law, and ultimately became the wife of John Everett Millais. John Ruskin returned to his parents, with whom he resided till their death; and neither his marriage nor the annulling of it seems to have affected seriously his literary career.

Ruskin's architectural studies, of which *The Seven Lamps* was the first fruit, turned him from Turner and *Modern Painters*. He planned a book about Venice in 1845, and *The Stones of Venice* was announced in 1849 as in preparation. After intense study in Italy and at home, early in 1851 (the year of the Great Exhibition in London) the first volume of *The Stones of Venice* appeared (*aet.* 32). It was by no means a mere antiquarian and artistic study. It was a concrete expansion of the ideas of *The Seven Lamps*—that the buildings and art of a people are the expression of their religion, their morality, their national aspirations and social habits. It was, as Carlyle wrote to the author, "a *sermon* in stones," "a singular sign of the times," "a new *Renaissance*." It appeared in the same year with the *Construction of Sheepfolds*—a plea for the reunion of Christian churches—in the same year with the essay on *Pre-Raphaelitism*, the year of Turner's death (19th December). *The Stones of Venice* was illustrated with engravings by some of the most refined artists of his time. The author spent a world of pains in having these brought up to the highest perfection of the reproductive art, and began the system of exquisite illustration, and those facsimiles of his own and other sketches, which make his works rank so high in the catalogues and price-lists of collectors. This delicate art was carried even farther in the later volumes of *Modern Painters* by the school of engravers whom Ruskin inspired and gathered round him. And these now rare and coveted pieces remain to rebuke us for our modern preference for the mechanical and unnatural *chiaroscuro* of photogravure—the successor and destroyer of the graver's art. Although Ruskin was practised in drawing from the time that he could hold a pencil, and had lessons in painting from some eminent artists, he at no time attempted to paint pictures. He said himself that he was unable to compose a picture, and he never sought to produce anything that he would call a work of original art. His drawings, of which he produced an enormous quantity, were always intended by himself to be studies or memoranda of buildings or natural objects precisely as they appeared to his eye. Clouds, mountains, landscapes, towers, churches, trees, flowers and herbs were drawn with wonderful precision, minuteness of detail and delicacy of hand, solely to recall some specific aspect of nature or art, of which he wished to retain a record. In his gift for recording the most subtle characters of architectural carvings and details, Ruskin has hardly been surpassed by the most distinguished painters.

In 1853 *The Stones of Venice* was completed at Herne Hill, and he began a series of *Letters* and *Notes* on pictures and architecture. In this year (*aet.* 34) he opened the long series of public lectures wherein he came forward as an oral teacher and preacher, not a little to the alarm of his parents and amidst a storm of controversy. The Edinburgh Lectures (November 1853) treated Architecture, Turner, and Pre-Raphaelitism. The Manchester Lectures (July 1857) treated the moral and social uses of art, now embodied in *A Joy for Ever*. Some other lectures are reprinted in *On the Old Road* and *The Two Paths* (1859). These lectures did not prevent the issue of various *Notes* on the Royal Academy pictures and the Turner collections; works on the *Harbours of England* (1856); on the *Elements of Drawing* (1857); the *Elements of Perspective* (1859); and at last, after prolonged labour, the fifth and final volume of *Modern Painters* was published in 1860 (*aet.* 41). This marks an epoch in the career of John Ruskin; and the year 1860 closed the series of his works on art strictly so called; indeed, this was the last of his regular works in substantial form. The last forty years of his life were devoted to expounding his views, or rather his doctrines, on social and industrial problems, on education, morals and religion, wherein art becomes an incidental and instrumental means to a higher and more spiritual life. And his teaching was embodied in an enormous series of *Lectures, Letters, Articles, Selections* and serial pamphlets. These are now collected in upwards of thirty volumes in the final edition. The entire set of Ruskin's publications amounts to more than fifty works having distinctive titles. For some years before 1860 Ruskin had been deeply stirred by reflecting on the condition of all industrial work and the evils of modern society. His lectures on art had dealt bitterly with the mode in which buildings and other works were produced. In 1854 he joined Mr F. D. Maurice, Mr T. Hughes, and several of the new school of painters, in teaching classes at the Working Men's College. But it was not until 1860 that he definitely began to propound a new social scheme, denouncing the dogmas of political economy. Four lectures on this topic appeared in the *Cornhill Magazine* until the public disapproval led the editor, then W. M. Thackeray, to close the series. They were published in 1862 as *Unto this Last*. In the same year he wrote four papers in the same sense in *Fraser's Magazine*, then edited by J. A. Froude; but he in turn was compelled to suspend the issue. They were completed and ultimately issued under the title *Munera Pulveris*. These two small books contain the earliest and most systematic of all Ruskin's efforts to depict a new social Utopia: they contain a vehement repudiation of the orthodox formulas of the economists; and they are for the most part written in a trenchant but simple style, in striking contrast to the florid and discursive form of his works on art.

In 1864 Ruskin's father died, at the age of 79, leaving his son a large fortune and a fine property at Denmark Hill. John still lived there with his mother, aged 83, infirm, and failing in sight, to whom came as a companion their cousin, Joanna Ruskin Agnew, afterwards Mrs Arthur Severn. At the end of the year 1864 Ruskin delivered at Manchester a new series of lectures—not on art, but on reading, education, woman's work and social morals—the expansion of his earlier treatises on economic sophisms. This afterwards was included with a Dublin lecture of 1868 under the fantastic title of *Sesame and Lilies* (perhaps the most popular of his social essays), of which 44,000 copies were issued down to 1900. He made this, in 1871, the first volume of his collected lectures and essays, the more popular and didactic form of his new Utopia of human life. It contains, with *Fors*, the most complete sketch of his conception of the place of woman in modern society. In the very characteristic preface to the new edition of 1871 he proposes never to reprint his earlier works on art; disclaims many of the views they contained, and much in their literary form; and specially regrets the narrow Protestantism by which they were pervaded. In the year 1866 he published a little book about girls, and written for girls, a mixture of morals, theology, economics and geology, under the title of *Ethics of the Dust*; and this was followed by a more important and popular work, *The Crown of Wild Olive*. This in its ultimate form contained lectures on "Work," "Traffic," "War," and the "Future of England." It was one of his most trenchant utterances, full of fancy, wit, eloquence and elevated thought. But a more serious volume was *Time and Tide* (1867), a series of twenty-five letters to a workman of Sunderland, upon various points in the Ruskinian Utopia. This little collection of "Thoughts," written with wonderful vivacity, ingenuity and fervour, is the best summary of the author's social and economic programme, and contains some of his wisest and finest thoughts in the purest and most masculine English that he had at his command. In 1869 he issued the *Queen of the Air*, lectures on Greek myths, a subject he now took up, with some aid from the late Sir C. Newton. It was followed by some other occasional pieces; and in the same year he was elected Slade professor of art in the university of Oxford. He now entered on his professorial career, which continued with some intervals down to 1884, and occupied a large part of his energies. His lectures began in February 1870, and were so crowded that they had to be given in the Sheldonian Theatre, and frequently were repeated to a second audience. He was made honorary fellow of Corpus Christi, and occupied rooms in the college. In 1871 his mother died, at the age of 90, and his cousin, Miss Agnew, married Mr Arthur Severn. In that year he bought from Mr Linton, Brantwood, an old cottage and property on Coniston Lake, a lovely spot facing the mountain named the Old Man. He added greatly to the house and property, and lived in it continuously until his death in 1900. In 1871, one of the most eventful years of his life, be began *Fors Clavigera*, a small serial addressed to the working men of England, and published only by Mr George Allen, engraver, at Keston, in Kent, at 7d., and afterwards at 10d., but without discount, and not through the trade. This was a medley of social, moral and religious reflections interspersed with casual thoughts about persons, events and art. *Fors* means alternatively Fate, Force or Chance, bearing the *Clavis*, Club, Key or Nail, *i.e.* power, patience and law. It was a desultory exposition of the Ruskinian ideal of life, manners and society, full of wit, play, invective and sermons on things in general. It was continued with intervals down to 1884, and contained ninety-six letters or pamphlets, partly illustrated, which originally filled eight volumes and are now reduced to four.

The early years of his Oxford professorship were occupied by severe labour, sundry travels, attacks of illness and another cruel disappointment in love. In spite of this, he lectured, founded a museum of art, to which he gave pictures and drawings and £5000; he sought to form at Oxford a school of drawing; he started a model shop for the sale of tea, and model lodgings in Marylebone for poor tenants. At Oxford he set his pupils to work on making roads to improve the country. He now founded "St George's Guild," himself contributing £7000, the object of which was to form a model industrial and social movement, to buy lands, mills and factories, and to start a model industry on co-operative or Socialist lines. In connexion with this was a museum for the study of art and science at Sheffield. Ruskin himself endowed the museum with works of art and money; a full account of it has been given in Mr E. T. Cook's *Studies in Ruskin* (1890), which contains the particulars of his university lectures and of his economic and social experiments. It is unnecessary to follow out the history of these somewhat unpromising attempts. None of them came to much good, except the Sheffield museum, which is an established success, and is now transferred to the town. In *Fors*, which was continued month by month for seven years, Ruskin poured out his thoughts, proposals and rebukes on society and persons with inexhaustible fancy, wit, eloquence and freedom, until he was attacked with a violent brain malady in the spring of 1878 (*aet.* 59); and, although he recovered in a few months sufficiently to do some occasional work, he resigned his professorship early in 1879. The next three years he spent at Brantwood, mainly in retirement, and unhappy in finding nearly all his labours interrupted by his broken health. In 1880 he was able to travel in northern France, and began the *Bible of Amiens*, finished in 1885; and he issued occasional numbers of *Fors*, the last of which appeared at Christmas 1884. In 1882 he had another serious illness, with inflammation of the brain; but he recovered sufficiently to travel to his old haunts in France and Italy—his last visit. And in the following year he was re-elected professor at Oxford and resumed his lectures; but increasing brain excitement, and indignation at the establishment of a laboratory to which vivisection was admitted, led him to resign his Oxford career, and he retired in 1884 to Brantwood, which he never left. He now suffered from frequent attacks of brain irritation and exhaustion, and had many causes of sorrow and disappointment. His lectures were published at intervals from 1870 to 1885 in *Aratra Pentelici*, *The Eagle's Nest*, *Love's Meinie*, *Ariadne Florentina*, *Val d'Arno*, *Proserpina*, *Deucalion*, *The Laws of Fesolê*, *The Bible of Amiens*, *The Art of England* and *The Pleasures of England*, together with a series of pamphlets, letters, articles, notes, catalogues and circulars.

In the retirement of Brantwood he began his last work, *Praeterita*, a desultory autobiography with personal anecdotes and reminiscences. He was again attacked with the same mental malady in 1885, which henceforth left him fit only for occasional letters and notes. In 1887 it was found that he had exhausted (spent, and given away) the whole of the fortune he had received from his father, amounting, it is said, to something like £200,000; and he was dependent on the vast and increasing sale of his works, which produced an average income of £4000 a year, and at times on the sale of his pictures and realizable property. In 1872 a correspondent had remonstrated with him in vain as to taking "usury," *i.e.* interest on capital lent to others for use. In 1874 Ruskin himself had begun to doubt its lawfulness. In 1876 he fiercely assailed the practice of receiving interest or rent, and he henceforth lived on his capital, which he gave freely to friends, dependants, public societies, charitable and social objects. The course of his opinions and his practice is fully explained in successive letters in *Fors*. Until 1889 he continued to write chapters of *Praeterita*, which was designed to record memories of his life down to the year 1875 (*aet.* 56). It was, in fact, only completed in regular series down to 1858 (*aet.* 39), with a separate chapter as to Mrs Arthur Severn, and a fragment called *Dilecta*, containing letters and early recollections of friends, especially of Turner. These two books were published between 1885 and 1889; and except for occasional letters, notes and prefaces, they form the last writings of the author of *Modern Painters*. His literary career thus extends over fifty years. But he has left nothing more graceful, naïve and pathetic than his early memories in *Praeterita*—a book which must rank with the most famous "Confessions" in any literature. The last ten years of his life were passed in complete retirement at Brantwood, in the loving care of the Severn family, to whom the estate was transferred, with occasional visits from friends, but with no sustained work beyond correspondence, the revision of his works, and a few notes and prefatory words to the books of others. He wished to withdraw his early art writings from circulation, but the public demand made this practically impossible. And now the whole of his writings are under the control of Mr George Allen, in several forms and prices, including a cheap series at 5s. per volume.

The close of his life was one of entire peace and honour. He was loaded with the degrees of the universities and membership of numerous societies and academies. "Ruskin Societies" were founded in many parts of the kingdom. His works were translated and read abroad, and had an enormous circulation in Great Britain and the United States. Many volumes about his career and opinions were issued in his lifetime both at home and abroad. His 80th birthday, 8th February 1899, was celebrated by a burst of congratulations and addresses, both public and private. His strength failed gradually: his mind remained feeble but unclouded, and his spirit serene. An attack of influenza struck him down, and carried him off suddenly after only two days' illness, 20th January 1900. He was buried in Coniston churchyard by his own express wish, the family refusing the offer of a grave in Westminster Abbey.

Ruskin's literary life may be arranged in three divisions. From 1837 to 1860 (*aet.* 18 to 41) he was occupied mainly with the arts. From 1860 to 1871 (*aet.* 41 to 52) he was principally occupied with social problems. From 1871 to 1885 (*aet.* 52 to 66) he was again drawn back largely to art by his lectures as professor, whilst prosecuting his social Utopia by speech, pen, example and purse. But the essential break in his life was in 1860, which marks the close of his main works on art and the opening of his attempt to found a new social gospel. With regard to his views of art, he himself modified and revised them from time to time; and it is admitted that some of his judgments are founded on imperfect study and personal bias. But the essence of his teaching has triumphed in effect, and has profoundly modified the views of artists, critics and the public, although it is but rarely accepted as complete or final. The moral of his teaching—that all living art requires *truth*, *nature*, *purity*, *earnestness*—has now become the axiom of all aesthetic work or judgment. John Ruskin founded the Reformation in Art.

With regard to his economic and social ideas there is far less general concurrence, though the years that have passed since *Unto this Last* appeared have seen the practical overthrow of the rigid plutonomy which he denounced. So, too, the vague and sentimental socialism which pervades *Munera Pulveris*, *Time and Tide* and *Fors* is now very much in the air, and represents the aspirations of many energetic reformers. But the negative part of Ruskin's teaching on economics, social and political problems, has been much more effective than the positive part of his teaching. It must be admitted that nearly the whole of his practical experiments to realize his dreams have come to nothing, which is not unnatural, seeing his defiance of the ordinary habits and standards of the world. A more serious defect was his practice of violently assailing philosophers, economists and men of science, of whom he knew almost nothing, and whom he perversely misunderstood: men such as Adam Smith, Comte, Mill, Spencer, Darwin and all who followed them. In art, Ruskin had enjoyed an unexampled training, which made him a consummate expert. In philosophy and science he was an amateur, seeking to found a new sociology and a Utopian polity out of his own inner consciousness and study of nature, of poetry and the Bible. It is not wonderful if, in doing this, he poured forth a quantity of crude conceits and some glaring blunders. But in the most Quixotic of his schemes, and the most Laputan of his theories, his pure and chivalrous nature, his marvellous insight into the heart of things and men, and his genius to seize on all that is true, real and noble in life, made his most startling proposals pregnant with meaning, and even his casual play full of fascination and moral suggestion.

In mastery of prose language he has never been surpassed, when he chose to curb his florid imagination and his discursive eagerness of soul. The beauty and gorgeous imagery of his art works bore away the public from the first, in spite of their heretical dogmatism and their too frequent extravagance of rhetoric. But his later economic and social pieces, such as *Unto this Last*, *Time and Tide*, *Sesame and Lilies*, are composed in the purest and most lucid of English styles. And many of his simply technical and explanatory notes have the same quality. Towards the close of his life, in *Fors* and in *Praeterita*, will be found passages of tenderness, charm and subtlety which have never been surpassed in our language.

Ruskin's life and writings have been the subject of many works composed by friends, disciples and admirers. The principal is the *Life*, by W. G. Collingwood, his friend, neighbour and secretary (1900). His pupil, Mr E. T. Cook, published his *Studies in Ruskin* in 1890, with full details of his career as professor. Mr J. A. Hobson, in *John Ruskin, Social Reformer* (2nd ed., 1899), has elaborately discussed his social and economic teaching, and claims him as "the greatest social teacher of his age." An analysis of his works has been written by Mrs Meynell (1900). His art theories have been discussed by Professor Charles Waldstein of Cambridge in *The Work of John Ruskin* (1894), by Robert de la Sizeranne in *Ruskin et la religion de la beauté* (1897), and by Professor H. J. Brunhes of Fribourg in *Ruskin et la Bible* (1901). The monumental "library edition" of Ruskin's works (begun in 1903), prepared by Mr E. T. Cook, with Mr A. Wedderburn, is the greatest of all the tributes of literary admiration. (F. Ha.)

RUSSELL (Family). The great English Whig house of the Russells, earls and dukes of Bedford, rose under the favour of Henry VIII. Obsequious genealogists have traced their lineage from "Hugh de Rozel," *alias* "Hugh Bertrand, lord of le Rozel," a companion of the Conqueror, padding their fiction with the pedigree of certain Russells who are found holding Kingston Russell in Dorset as early as the reign of King John. But the first undoubted ancestor of the Bedford line is Henry Russell, a Weymouth merchant, returned as a burgess for that borough in four parliaments between 1425 and 1442. He may well have been the son of Stephen Russell, another Weymouth merchant, whose name is just before his in the list of those men of substance in Dorsetshire who, in 1434, under the act of parliament, were to be sworn not to maintain breakers of the peace. Stephen Russell, having served the office of bailiff of Weymouth, was returned as burgess to the parliament of 1395, and one William Russell was returned for King's Melcombe in 1340. Both Stephen and Henry were in the wine trade with Bordeaux, and in 1427 Henry Russell was deputy to the chief butler of England for the port of Melcombe. In 1442 a pardon under the privy seal significantly describes Henry Russell of Weymouth, merchant, as *alias* Henry Gascoign, gentleman, and it is therefore probable that the ducal house of Bedford springs from a family of Gascon wine-merchants settled in a port of Dorsetshire, a county remarkable for the number of such French settlers.

Henry Russell of Weymouth made a firm footing upon the land by his marriage with Elizabeth Hering, one of the two daughters and co-heirs of John Hering of Chaldon Hering, a Dorsetshire squire of old family, heir of the Winterbournes of Winterbourne Clenston and of the Cernes of Draycot Cerne. John Russell, eldest son of this match, born before 1432, and returned to parliament for Weymouth in 1450, had his seat at Berwick in Swyre, he and his son and heir, James Russell, being buried in the parish church of Swyre.

Thus John Russell, son and heir of James, was born in a family of squire's rank, whose younger branches went on for many generations as merchants and shipowners at Weymouth. A happy accident is said to have brought him to court. The archduke Philip, son of the emperor Maximilian, was driven by heavy weather into Weymouth, whence Sir Thomas Trenchard had him escorted to the king at Windsor. According to tradition, John Russell, Trenchard's young kinsman, was lately home from his travels with a knowledge of foreign tongues, those travels being probably made in the mercantile interests of his family. As travelling companion, or as a spy upon the strange guests, young Russell was sent with the archduke, who is said to have commended him to King Henry. Certain it is that on the accession of Henry VIII. John Russell advanced rapidly, serving the crown as soldier and as diplomatic agent. He fought well at Thérouanne, saw the Field of Cloth of Gold and the French disaster at Pavia, lost an eye by an arrow at Morlaix. In 1523 he was knight-marshal of the king's household. In 1526 he married a rich widow, Anne, daughter and co-heir of Sir Guy Sapcotes by the co-heir of Sir Guy Wolston, a match which brought to the Russells the Buckinghamshire estate of Chenies, in whose chapel many generations of them lie buried. His peerage as Lord Russell of Chenies dated from 1539, and in the same year he had the Garter. Having held many high offices—lord high admiral, lord president of Devon, Cornwall, Dorset and Somerset, and lord privy seal—he was named by Henry VIII. as one of his executors. At the crowning of Edward VI. he was lord high steward, and after his defeat of the western rebels was raised, in 1550, to the earldom of Bedford. Queen Mary, like her brother, made him lord privy seal, although he is said to have favoured that Reformation which enriched him. He died in London in 1555, leaving to his son a vast estate of church lands and lands forfeited by less successful navigators of the troubled sea of Tudor politics. In the west he had the abbey lands of Tavistock, which give a marquess's title to his descendants. In Cambridgeshire he had the abbatial estate of Thorney, in Bedfordshire the Cistercian house of Woburn, now the chief seat of the Russells. In London he had Covent Garden with the "Long Acre." Thus the future wealth of his house was secured by those "immoderate grants" which made a text for Edmund Burke's furious attack upon a duke of Bedford.

He left an only son, Francis, second earl of Bedford, K.G. (*c.* 1527–1585), who, being concerned in Wyatt's plot, escaped to the Continent and joined those exiles at Geneva whose religious sympathies he shared. He returned in 1557, and was employed by Queen Mary before her death. Under Queen Elizabeth he governed Berwick, and was lord-lieutenant of the northern counties. Three of his four sons died before him, the third, killed in a border fray, being father of Edward, third earl of Bedford, who died without issue in 1627. The fourth son, William, created Lord Russell of Thornhaugh in 1603, was a soldier who fought fiercely before Zutphen beside his friend Sir Philip Sidney, whom he succeeded as governor of Flushing, and was from 1594 to 1597 lord-deputy of Ireland. He died in 1613, leaving an only son, Francis, who in 1627 succeeded his cousin as fourth earl of Bedford. This earl built the square of Covent Garden, and headed the "undertakers" who began the scheme for draining the great Fen Level. He opposed the king in the House of Lords, but might have played a part as mediator between the sovereign and the popular party who accepted his leadership had he not died suddenly of the smallpox in 1641 on the day of the king's assent to the bill for Strafford's attainder. William, the eldest surviving son, succeeded as fifth earl, Edward, the youngest son, being father of Edward Russell (1653–1727), admiral of the fleet, who, having held the chief command in the victory of La Hogue, was created in 1697 earl of Orford. The fifth earl of Bedford, after fighting for the parliament at Edgehill and for the king at Newbury, surrendered to Essex and occupied himself with completing the drainage of the Bedford Level. He carried St Edward's staff at the crowning of Charles II., but quitted political life after the execution of his son, Lord Russell, in 1683. In 1694 he was created duke of Bedford and marquess of Tavistock, titles to which his grandson, Wrothesley Russell, succeeded in 1700. The "patriot" Lord Russell had added to the family estates by his marriage with Rachel, daughter and co-heir of Thomas Wrothesley, the fourth earl of Southampton, from whom she finally inherited the earl's property in Bloomsbury, with Southampton House, afterwards called Bedford House. Her son, the second duke of Bedford, married the daughter of a rich citizen, John Howland of Streatham, a match strangely commemorated by the barony of Howland of Streatham, created for the bridegroom's grandfather, the first duke, in 1695. The third duke, another Wrothesley Russell (1708–1732), died without issue, his brother John (1710–1771) succeeding him. This fourth duke, opposing Sir Robert Walpole, became, by reason of his rank and territorial importance, a recognized leader of the Whigs. In the duke of Devonshire's administration he was lord-lieutenant of Ireland, and he served as lord high constable at the coronation in 1760. His son Francis, styled marquess of Tavistock, was killed in 1767 by a fall in the hunting field, and Lord Tavistock's son Francis (1765–1802) became the fifth duke. This was the peer whom Burke, smarting from a criticism of his own pension, assailed as "the Leviathan of the creatures of the crown," enriched by grants that "outraged economy and even staggered credibility." He pulled down Bedford House, built by Inigo Jones, Russell Square and Tavistock Square rising on the site of its gardens and courts. Dying unmarried, he was succeeded by his brother John, the sixth duke (1766–1839), whose third son was the statesman created in 1861, Earl Russell of Kingston Russell, better known as Lord John Russell. Lord Odo Russell, a nephew of "Lord John," and ambassador at Berlin from 1871 to his death in 1884, was created Lord Ampthill in 1881. Herbrand Arthur Russell (b. 1858), the eleventh duke and fifteenth earl, succeeded an elder brother in 1893. (O. Ba.)

RUSSELL, ISRAEL COOK (1852–), American geologist, was born at Garrattsville, New York, on the 10th of December 1852. He graduated at New York University in 1872, and later studied at the School of Mines, Columbia, where he was assistant professor of geology from 1875–77. He was assistant

Geologist on the United States Geographical and Geological Surveys in 1878, and in 1880 became attached to the Geological Survey of the United States. In 1892 he was appointed professor of geology in the university of Michigan.

His publications include *Sketch of the Geological History of Lake Lahontan* (1885); *The Newark System* (Bulletin No. 85 U.S. Geol. Survey, 1892); *Present and Extinct Lakes of Nevada* (1896); *Glaciers of North America* (1897); *Volcanoes of North America* (1897); *Glaciers of Mount Rainier* (Ann. Rep. U.S. Geol. Survey, 1898); and *North America* (1900).

RUSSELL, JOHN (1745–1806), British portrait painter in pastel, was born at Guildford, Surrey. At an early age he entered the studio of Francis Cotes, R.A., from whom he derived his artistic education, and set up his own studio in 1767. Russell was a man of remarkable religious character, a devout follower of Whitefield. He began an elaborate introspective diary in Byrom's shorthand in 1766 and continued it to the time of his death. In it he records his own mental condition and religious exercises, entering with a certain morbid ingenuity into long disquisitions, and only occasionally recording information concerning his sitters. His religious life is the key to his complex character, as it actuated his whole career. He obtained the gold medal at the Royal Academy for figure drawing in 1770 and exhibited from the beginning of the Academy down to 1805. He was the finest painter in crayons England ever produced, and although he painted in oil, in water-colours and in miniature, it was by his works in crayon that his reputation was made. He wrote the *Elements of Painting in Crayon*, and described in it his method. He made his own crayons, blending them on his pictures by a peculiar method termed "sweetening." This he carried out with his fingers, rubbing in the colours and softening them in outline, uniting colour to colour so accurately that they melt into one another with a characteristic cadence. His pastel work is to oil painting "what the vaudeville is to the tragedy or the sonnet to the epic." His colours were pure and his blending so perfect that no change is to be seen in his works since they were executed. Sir Joseph Banks, writing in 1789 respecting his portraits of the president, of Lady, Mrs and Miss Banks, stated that "the oil pictures of the present time fade quicker than the persons they are intended to present, but the colours made use of by Russell will stand for ever," and in that prophecy is so far justified.

An important picture by him hangs in the Louvre ("Child with Cherries"), and two, including "The Old Bathing Man at Brighton," are owned by the crown. At the Royal Academy, of which he was a member, he exhibited three hundred and thirty works, and his portraits were engraved by Collyer, Turner, Heath, Dean, Bartolozzi, Trotter and other prominent engravers. Russell received warrants of appointment to the king, queen, prince of Wales and the duke of York. He was interested in astronomy, a friend of Sir W. Herschell, and no mean mathematician. He drew an exceedingly accurate map of the moon, and invented a piece of complicated mechanism for exhibiting its phenomena, publishing a pamphlet, illustrated by his own drawings, describing the apparatus.

Two of his sons inherited their father's talent, and one of them, William (1780–1870), exhibited five fine portraits in the Royal Academy.

See George C. Williamson, *John Russell* (London, 1894). (G. C. W.)

RUSSELL, JOHN (d. 1494), English bishop and chancellor, was admitted to Winchester College in 1443, and in 1449 went to Oxford as fellow of New College. He resigned his fellowship in 1462, and appears to have entered the royal service. In April 1467 and January 1468 he was employed on missions to Charles the Bold at Bruges. He was there again in February 1470 as one of the envoys to invest Charles with the Garter: the Latin speech which Russell delivered on this last occasion was one of Caxton's earliest publications, probably printed for him at Bruges by Colard Mansion (see Blades, *Life of Caxton*, i. p. vii, ii. 29–31). In May 1474 he was promoted to be keeper of the privy seal, and retained his office even after his consecration as bishop of Rochester on the 22nd of September 1476, and translation to Lincoln on the 9th of September 1480. As a trusted minister of Edward IV., he was one of the executors of the king's will; but on the 13th of May 1483 he accepted the office of chancellor in the interest of Richard of Gloucester, apparently with great reluctance. He retained the great seal till the 29th of July 1485. Russell was above all things an official, and was sometimes employed by Henry VII. in public affairs. But his last years were occupied chiefly with the business of his diocese, and of the university of Oxford, of which he had been elected chancellor in 1483. He died at Nettleham on the 30th of December 1494, and was buried at Lincoln Cathedral.

Sir Thomas More calls Russell "a wise manne and a good, and of much experience, and one of the best-learned men, undoubtedly, that England had in hys time." Two English speeches composed by Russell, for the intended parliament of Edward V., and the first parliament of Richard III., are printed in Nichols's *Grants of Edward V.* (Camden Soc.). Some other writings of less interest remain in manuscript.

For contemporary notices see especially More's *Life of Richard III.*, the *Continuation of the Croyland Chronicle*, ap. Freeman *Scriptores*, and Bentley's *Excerpta Historica*, pp. 16–17. See also Wood's *History and Antiquities of the University of Oxford*, and T. Kirby, *Winchester Scholars*, and *Annals of Winchester College*. There are modern biographies in Campbell's *Lives of the Chancellors*, and Foss's *Judges of England*. (C. L. K.)

RUSSELL, JOHN RUSSELL, 1ST EARL (1792–1878), British statesman, third son of the 6th duke of Bedford, by Georgiana Elizabeth Byng, second daughter of the 4th Viscount Torrington, was born in London on the 18th of August 1792. He was sent to a private school at Sunbury in 1800, and from 1803 to 1804 he was at Westminster School, but was then withdrawn on account of his delicate health. From 1805 to 1808 he was with a private tutor at Woodnesborough, near Sandwich. After travelling in Scotland and in Spain, he studied from the autumn of 1809 to 1812 at the university of Edinburgh, then the academic centre of Liberalism, and dwelt in the house of Professor John Playfair. On leaving the university, he travelled in Portugal and Spain, but on the 4th of May 1813 he was returned for the ducal borough of Tavistock and thereupon came back to England.

In foreign politics Lord John Russell's oratorical talents were especially shown in his struggles to prevent the union of Norway and Sweden. In domestic questions he cast in his lot with those who opposed the repressive measures of 1817, and protested that the causes of the discontent at home should be removed by remedial legislation. When failure attended all his efforts he resigned his seat for Tavistock in March 1817, and meditated permanent withdrawal from public life, but was dissuaded from this step by the arguments of his friends, and especially by a poetic appeal from his friend Tom Moore. In the parliament of 1818–20 he again represented the family borough in Devon, and in May 1819 began his long advocacy of parliamentary reform by moving for an inquiry into the corruption which prevailed in the Cornish constituency of Grampound. During the first parliament (1820–26) of George IV. he sat for the county of Huntingdon, and secured in 1821 the disfranchisement of Grampound, but the seats were not transferred to the constituency which he desired. Lord John Russell paid the penalty for his advocacy of Catholic emancipation with the loss in 1826 of his seat for Huntingdon county, but he found a shelter in the Irish borough of Bandon Bridge. He led the attack against the Test Acts by carrying in February 1828 with a majority of forty-four a motion for a committee to inquire into their operations, and after this decisive victory they were repealed (9th of May 1828). He warmly supported the Wellington ministry when it realized that the king's government could only be carried on by the passing of a Catholic Relief Act (April 1829). For the greater part of the short-lived parliament of 1830–31 he served his old constituency of Tavistock, having been beaten in a contest for Bedford county at the general election by one vote; and when Lord Grey's

Reform ministry was formed, in November 1830, Lord John Russell accepted the office of paymaster-general without a seat in the cabinet. This exclusion was the more remarkable in that he was chosen (1st of March 1831) to explain the provisions of the Reform Bill, to which the cabinet had given its formal sanction. The Whig ministry was soon defeated, but an appeal to the country increased the number of their adherents, and Lord John Russell was returned by the freeholders of Devon. After many a period of doubt and defeat, "the bill, the whole bill, and nothing but the bill" passed into law (7th of June 1832), and Lord John stood forth in the mind of the people as its champion. After the passing of the Reform Bill he sat for the S. division of Devon, and continued to retain the place of paymaster-general in the ministries of Lord Grey and Lord Melbourne. The former of these cabinets was broken up by the withdrawal of Mr Stanley, afterwards Lord Derby.

Lord John Russell had visited Ireland in the autumn of 1833 and had come back with a keen conviction of the necessity for readjusting the revenues of the Irish church. To these views he gave expression in a debate on the Irish Tithe Bill (May 1834), whereupon Stanley, with the remark that "Johnny has upset the coach," resigned his place. The latter was abruptly, if not rudely, dismissed by William IV. when the death of Lord Spencer promoted the leader of the House of Commons, Lord Althorp, to the peerage, and Lord John Russell was proposed as the spokesman of the ministry in the Commons (Nov. 1834). At the general election which ensued the Tories received a considerable accession of strength, but not sufficient to ensure their continuance in office, and the adoption by the House of Commons of the proposition, that the surplus funds of the Irish church should be applied to general education, necessitated the resignation of Sir Robert Peel's ministry (April 1835). In Lord Melbourne's new administration Lord John Russell became home secretary and leader of the House of Commons, but on his seeking a renewal of confidence from the electors of South Devon, he was defeated and driven to Stroud. The Whig ministry succeeded in passing a Municipal Reform Bill (7th of Sept. 1835), and a settlement of the tithe question in England and Ireland (1836). In May 1839, on an adverse motion concerning the administration of Jamaica, the ministry was left with a majority of five only, and promptly resigned. Sir Robert Peel's attempt to form a ministry was, however, frustrated by the refusal of the queen to dismiss the ladies of the bedchamber, and the Whigs resumed their places with Lord John Russell as secretary of state for the colonies. Their prospects brightened when Sir John Yarde Buller's motion of "no confidence" at the opening of the session of 1840 was defeated by twenty-one, but a similar vote was some months later carried by a majority of one, whereupon the Whig leader announced a dissolution of parliament (June 1841). At the polling-booth his friends sustained a crushing defeat; the return of Lord John Russell for the City of London was almost their solitary triumph.

On Sir Robert Peel's resignation (1846) the task of forming an administration was entrusted to Lord John Russell, and he remained at the head of affairs from July 1846 to Feb. 1852, but his tenure of office was not marked by any great legislative enactments. His celebrated Durham letter (4th of Nov. 1850) on the threatened assumption of ecclesiastical titles by the Roman Catholic bishops weakened the attachment of the "Peelites" and alienated his Irish supporters. The impotence of their opponents, rather than the strength of their friends, kept the Whig ministry in power, and, although beaten by a majority of nearly two to one on Mr Locke King's County Franchise Bill in February 1851, it could not divest itself of office. Lord Palmerston's unauthorized recognition of the French *coup d'état* was followed by his dismissal from the post of foreign secretary (Dec. 1851), but he had his revenge in the ejectment of his old colleagues in February 1852. During Lord Aberdeen's administration Lord John Russell led the Lower House, at first as foreign secretary (to the 21st of February 1853), then without portfolio, and lastly as president of the council (June 1854). In 1854 he brought in a Reform Bill, but in consequence of the war with Russia the bill was allowed to drop. His popularity was diminished by this failure, and although he resigned in January 1855, on Mr Roebuck's motion for an inquiry into the conduct of the war in the Crimea, he did not regain his old position in the country. At the Vienna conference (1855) Lord John Russell was England's representative, and immediately on his return he became secretary of the colonies (May 1855), but the errors in his negotiations at the Austrian capital followed him and forced him to retire in July of the same year.

For some years after this he was the "stormy petrel" of politics. He was the chief instrument in defeating Lord Palmerston in 1857. He led the attack on the Tory Reform Bill of 1859. A reconciliation was then effected between the rival Whig leaders, and Lord John Russell consented to become foreign secretary in Lord Palmerston's ministry (1860) and to accept an earldom (July 1861). During the American War Earl Russell's sympathies with the North restrained his country from taking sides in the contest, and he warmly sympathized with the efforts for the unification of Italy, but he was not equally successful in preventing the spoliation of Denmark. On Lord Palmerston's death (October 1865) Earl Russell was once more summoned to form a cabinet, but the defeat of his ministry in the following June on the Reform Bill which they had introduced was followed by his retirement from public life. His leisure hours were spent after this event in the preparation of numberless letters and speeches, and in the composition of his *Recollections and Suggestions* (1875), but everything he wrote was marked by the belief that all philosophy, political or social, was summed up in the Whig creed of fifty years previously. Earl Russell died at Pembroke Lodge, Richmond Park, 28th May 1878.

Earl Russell was twice married—first in 1835, to Adelaide, daughter of Mr Thomas Lister, and widow of Thomas, second Lord Ribblesdale, and secondly, in 1841, to Lady Frances Ann Maria, daughter of Gilbert, second earl of Minto. By the former he had two daughters, by the latter three sons and one daughter. His eldest son, Lord Amberley, who married a daughter of the second Baron Stanley of Alderley, predeceased him on the 9th of January 1876, and their eldest son (b. 1865) succeeded as second Earl Russell.

Lord Russell played some part as an author. His tales, tragedies and essays (including *The Nun of Arrouca*, 1822, and *Essays and Sketches by a Gentleman who has left his Lodgings*, 1820) are forgotten, but his historical works, *Life of William Lord Russell* (1819), *Memoirs of the Affairs of Europe* (1824–29, 2 vols.), *Correspondence of John, 4th Duke of Bedford* (1842–46, 3 vols.), *Memorials and Correspondence of C. J. Fox* (1853–57, 4 vols.) and *Life and Times of C. J. Fox* (1859–66, 3 vols.) are among the chief authorities on Whig politics. He also edited the *Memoirs, Journal and Correspondence of Thomas Moore* (1853–56, 8 vols.).

The chief biography is that by Sir Spencer Walpole (1891, 2 vols.). The volume by Stuart J. Reid (1895, "Prime Ministers of Queen Victoria" Series) should also be consulted. (W. P. C.)

RUSSELL, JOHN SCOTT (1808–1882), British engineer, was born in 1808 near Glasgow, a "son of the manse," and was at first destined for the ministry. But this intention on his father's part was changed in consequence of the boy's early leanings towards practical science. He attended in succession the universities of St Andrews, Edinburgh and Glasgow,—taking his degree in the last-named at the age of sixteen. After spending a couple of years in workshops, he settled in Edinburgh as a lecturer on science, and soon attracted large classes. In 1832–33 he was engaged to give the natural philosophy course at the university, the chair having become vacant by the death of Sir John Leslie. In the following year he began his remarkable series of observations on waves. Having been consulted as to the possibility of utilizing steam-navigation on the Edinburgh & Glasgow canal, he replied that the question could not be answered without experiments, which he was willing to undertake if a portion of the canal were placed at his disposal. The results of this inquiry are to be found in the *Trans. Roy. Soc. Ed.* (vol. xiv.), and in the *British*

Association Reports (seventh meeting). The existence of the *long wave*, or *wave of translation*, with many of its most important features, was here first recognized, and it was clearly pointed out *why* there is a special rate, depending on the depth of the water, at which a canal-boat can be towed at the least expenditure of effort by the horse. The elementary mathematical theory of the long wave was soon supplied by commentators on Scott Russell's work, and a more complete investigation was subsequently given by Sir G. G. Stokes. Russell indulged in many extraordinary and groundless speculations, some of which were published in a posthumous volume, *The Wave of Translation* (1885). His observations led him to propose and experiment on a new system of shaping vessels, known as the *wave system*, which culminated in the building of the "Great Eastern." His activity and ingenuity were also displayed in many other fields,—steam-coaches for roads, improvements in boilers and in marine engines, the immense iron dome of the Vienna Exhibition, cellular double bottoms for iron ships, &c. With Mr Stafford Northcote (afterwards Lord Iddesleigh), he was joint-secretary of the Great Exhibition of 1851; and he was one of the chief founders of the Institution of Naval Architects. He died at Ventnor on the 8th of June 1882.

RUSSELL, THOMAS (1762–1788), English poet, was born at Beaminster, early in 1762. He was the son of John Russell, an attorney at Bridport, in Dorsetshire, and his mother was Miss Virtue Brickle, of Shaftesbury. He was educated at the grammar school of Bridport, and in 1777 proceeded to Winchester, where he stayed three years, under Dr Joseph Warton, and Thomas Warton, the professor of poetry. In 1780 Russell became a member of New College, Oxford. He graduated B.A. in 1784 and was ordained priest in 1786. During his residence at the university he devoted himself to French, Italian, Spanish, Portuguese, Provençal and even German literature. His health, however, broke down, and he retired to Bristol hot wells to drink the waters; but in vain, for he died there on the 31st of July 1788. He was buried in Powerstock churchyard, Dorset. In 1789 was published a thin volume, containing his *Sonnets and Miscellaneous Poems*, now a very rare book. It contained twenty-three sonnets, of regular form, and a few paraphrases and original lyrics. The sonnets are the best, and it is by right of these that Russell takes his place as one of the most interesting precursors of the romantic school. "War, Love, the Wizard, and the Fay he sung"—in other words, he rejected entirely the narrow circle of subjects laid down for 18th-century poets. In this he was certainly influenced both by Chatterton and by Collins. But he was still more clearly the disciple of Petrarch, of Boccaccio and of Camoens, each of whom he had carefully and enthusiastically studied. His sonnet, "Suppos'd to be written at Lemnos," is his masterpiece, and is unquestionably the greatest English sonnet of the 18th century.

The anonymous editor of Russell's solitary volume is said to have been William Howley (1766–1848), long afterwards archbishop of Canterbury, who was a youthful bachelor of New College when Russell, who had been his tutor, died. His memoir of the poet is very perfunctory, and the fullest account of Russell is that published in 1897 by T. Seccombe.

RUSSELL, WILLIAM CLARK (1844–), British author, was born at the Carlton House Hotel, New York, on the 24th of February 1844, the son of Henry Russell, author of "Cheer, Boys, Cheer," and other popular songs. He went to school at Winchester, and then at Boulogne, joining the merchant service at thirteen, and serving for eight years. This apprenticeship to a seafaring life was turned to account in a series of stories which have fascinated two generations of boy readers. *John Holdsworth, Chief Mate* (1874), immediately made his reputation. Other successful stories were: *The Wreck of the Grosvenor* (1875), in which he pleaded for better food for English seamen; *The Frozen Pirate* (1877), *An Ocean Tragedy* (1881), *The Emigrant Ship* (1894), *The Ship, Her Story* (1894), *The Convict Ship* (1895), *What Cheer!* (1895), *The Two Captains* (1897), *The Romance of a Midshipman* (1898), *The Ship's Adventure* (1899), *Overdue* (1903), *Abandoned* (1904), *His Island Princess* (1905). He joined the staff of the *Newcastle Daily Chronicle*, and afterwards became a leader writer on the *Daily Telegraph*, but the double labour of journalism and novel-writing threatened his health, and he resigned in 1887. Many of the papers which he contributed to the *Daily Telegraph* were collected in volume form in *Round the Galley Fire* and other volumes. He also wrote a Life of Lord Collingwood (1891), and, with W. H. Jacques, *Nelson and the Naval Supremacy of England* (New York, 1890).

RUSSELL, SIR WILLIAM HOWARD (1821–1907), English war correspondent, was born at Lilyvale, near Tallaght, in the county of Dublin, on the 28th of March 1821, being one of the Russells of Limerick, whose settlement in Ireland dates from the time of Richard II. He entered Trinity College in 1838. Three years later he was thrown very much on his own resources, but a relative, Mr R. W. Russell, who had been sent to Ireland by *The Times*, deputed him to report the Irish elections at Longford, and his success definitely turned his attention to journalism. Coming to London in 1842, he went to Cambridge, but left before taking a degree. In the following year he was sent by *The Times* to Ireland to report the O'Connell meetings. In 1845 he was appointed to superintend the reports on the Irish railways, and was shortly afterwards sent by *The Times* to inspect the O'Connell property in S.W. Ireland, when his plain speaking drew forth a characteristic tirade from the "Liberator." For a short period in 1847 his services were temporarily transferred to the *Morning Chronicle*, but with that exception he remained permanently connected with *The Times*. He was sent as special correspondent to Denmark in the war of 1849–50. He did not, however, at once relinquish a legal career, and was called to the bar at the Middle Temple in 1851. On the outbreak of the Crimean War in 1853 he went out as special correspondent, and, accompanying the light division to Gallipoli, proceeded with the first detachment to Varna. On the embarkation for the Crimea he was attached to the second division, and landed with it on the 14th of September. He was present at the battle of the Alma on the 20th of September, at the investment of Sevastopol, at Balaclava on the 25th of October and Inkerman on the 5th of November.

Towards the end of May 1855 he accompanied the expedition to Kertch, and did not return to the Crimea until the following August. In September and October he described the attacks on the Malakoff and Redan, the occupation of Sevastopol and the capture of Fort Kinburn. The popularity of *The Times* Crimea correspondence led to its republication in two volumes under the title of *The War, 1855–56*. Russell's letters to *The Times* were mainly responsible for the enlightenment of the public at home as to the conduct of affairs at the scene of action, and his exposure of the mismanagement during the winter of 1854 did more than anything else to cause the downfall of Lord Aberdeen's ministry. In 1856 Russell was sent to Moscow to describe the coronation of the tsar, and in the following year was attached to the headquarters of Lord Clyde in India. He was present at the siege and capture of Lucknow in 1858, the operations in Oude, the battle of Bareilly and the actions in Rohilkhand, and he received the Indian war medal with the Lucknow clasp. The events of those stirring times are vividly recorded in *My Diary in India in 1858–59*. Next year he was sent to Italy, but arrived on the eve of the armistice at Villafranca. On the 7th of January 1860 appeared the first number of the *Army and Navy Gazette*, which he founded, and of which he was editor and principal proprietor. In 1861 Russell proceeded to Washington, and reached M'Dowell's headquarters just before the first battle of Bull Run, and his account of the Federal retreat drew much hostile criticism. He published a full account of the war, in so far as he had witnessed it, in *My Diary, North and South, during the Civil War in America, 1862*. Returning to England in 1863, he remained at home until 1866, when he proceeded to the headquarters of General Benedek and witnessed the battle of Königgrätz, 3rd of July.

During the interval of peace that followed he accompanied the prince of Wales to the Nile, Constantinople, the Crimea and Greece in 1868, and published an account of the tour in the following year, when he also contested the borough of Chelsea unsuccessfully in the Conservative interest. On the outbreak of the Franco-Prussian War in 1870, Russell was with the crown prince from the battle of Wörth, 6th of August, and Sedan, 12th of September, till the capitulation of Paris. His account appeared in 1874 under the title of *My Diary during the Last Great War*. His description of the burning of Paris by the Communards was not the least of his journalistic triumphs. In 1875–76 he was honorary private secretary to the prince of Wales during his tour through India, of which he published an account in 1877. When Lord Wolseley was sent to quell the Zulu rebellion in 1879, Russell was attached to his staff as correspondent. In 1881 he went with the duke of Sutherland's party for a tour in the United States and Canada, described in *Hesperothen*, and in 1882 he was again with Lord Wolseley in the Egyptian campaign. In 1895 he published a personal retrospect entitled *The Great War with Russia*. Russell was knighted in May 1895, and was the recipient of numerous war medals and various foreign orders. He married twice, first in 1846 Miss Burrowes, who died not long afterwards, and secondly in 1884 the Countess A. Malvezzi. He died on the 11th of February 1907.

RUSSELL, LORD WILLIAM (1639–1683), English politician, was the third son of the 1st duke of Bedford and was born on the 29th of September 1639. About 1654 he was sent to Cambridge with his elder brother Francis (on whose death in 1678 he obtained the courtesy title of Lord Russell). On leaving the university, the two brothers travelled abroad, visiting Lyons and Geneva, and residing for some while at Augsburg. William's account of his impressions is spirited and interesting. He was at Paris in 1658, but had returned to Woburn in December 1659. At the Restoration he was elected for the family borough of Tavistock. For a long time he appears to have taken no part in public affairs, but rather to have indulged in the follies of court life and intrigue; for both in 1663 and 1664 he was engaged in duels, in the latter of which he was wounded. In 1669 he married Rachel (1636–1723), second daughter of the 4th earl of Southampton, and widow of Lord Vaughan, thus becoming connected with Shaftesbury, who had married Southampton's niece. With his wife Russell always lived on terms of the greatest affection and confidence. She corresponded with Tillotson and other distinguished men, and a collection of her admirable letters was published in 1773.

It was not until the formation of the "country party," in opposition to the policy of the Cabal and Charles's French-Catholic plots, that Russell began to take an active part in affairs. He then joined Cavendish, Birch, Hampden, Powell, Lyttleton and others in vehement antagonism to the court. With a passionate hatred and distrust of the Catholics, and an intense love of political liberty, he united the desire for ease to Protestant Dissenters. His first speech appears to have been on the 22nd of January 1673, in which he inveighed against the stop of the exchequer, the attack on the Smyrna fleet, the corruption of courtiers with French money, and "the ill ministers about the king." He also supported the proceedings against the duke of Buckingham. In 1675 he moved an address to the king for the removal of Danby (see LEEDS, DUKE OF) from the royal councils, and for his impeachment. On the 15th of February 1677, in the debate on the fifteen months' prorogation, he moved the dissolution of parliament; and in March 1678 he seconded the address praying the king to declare war against France. The enmity of the country party against Danby and James, and their desire for a dissolution and the disbanding of the army, were greater than their enmity to Louis. The French king therefore found it easy to form a temporary alliance with Russell, Hollis and the opposition leaders, by which they engaged to cripple the king's power of hurting France and to compel him to seek Louis's friendship,—that friendship, however, to be given only on the condition that they in their turn should have Louis's support for their cherished objects. Russell in particular entered into close communication with the marquis de Ruvigny (Lady Russell's maternal uncle), who came over with money for distribution among members of parliament. By the testimony of Barillon, however, it is clear that Russell himself utterly refused to take any part in the intended corruption.

By the wild alarms which culminated in the Popish Terror Russell appears to have been affected more completely than his otherwise sober character would have led people to expect. He threw himself into the party which looked to Monmouth as the representative of Protestant interests, a grave political blunder, though he afterwards was in confidential communication with Orange. On the 4th of November 1678 he moved an address to the king to remove the duke of York from his person and councils. At the dissolution of the pensionary parliament, he was, in the new elections, returned for Bedfordshire. Danby was at once overthrown, and in April 1679 Russell was one of the new privy council formed by Charles on the advice of Temple. Only six days after this we find him moving for a committee to draw up a bill to secure religion and property in case of a popish successor. He does not, however, appear to have taken part in the exclusion debates at this time. In June, on the occasion of the Covenanters' rising in Scotland, he attacked Lauderdale personally in full council.

In January 1680 Russell, along with Cavendish, Capell, Powell, Essex and Lyttleton, tendered his resignation to the king, which was received by Charles "with all my heart." On the 16th of June he accompanied Shaftesbury, when the latter indicted James at Westminster as a popish recusant; and on the 26th of October he took the extreme step of moving "how to suppress popery and prevent a popish successor"; while on the 2nd of November, now at the height of his influence, he went still further by seconding the motion for exclusion in its most emphatic shape, and on the 19th carried the bill to the House of Lords for their concurrence. The limitation scheme he opposed, on the ground that monarchy under the conditions expressed in it would be an absurdity. The statement, made by Echard alone (*Hist. of England*, ii.), that he joined in opposing the indulgence shown to Lord Strafford by Charles in dispensing with the more horrible parts of the sentence of death—an indulgence afterwards shown to Russell himself—is entirely unworthy of credence. On December 18 he moved to refuse supplies until the king passed the Exclusion Bill. The prince of Orange having come over at this time, there was a tendency on the part of the opposition leaders to accept his endeavours to secure a compromise on the exclusion question. Russell, however, refused to give way a hair's-breadth.

On the 26th of March 1681, in the parliament held at Oxford, Russell again seconded the Exclusion Bill. Upon the dissolution he retired into privacy at his country seat of Stratton in Hampshire. It was, however, no doubt at his wish that his chaplain wrote the *Life of Julian the Apostate*, in reply to Dr Hickes's sermons, in which the lawfulness of resistance in extreme cases was defended. In the wild schemes of Shaftesbury after the election of Tory sheriffs for London in 1682 he had no share; upon the violation of the charters, however, in 1683, he began seriously to consider as to the best means of resisting the government, and on one occasion attended a meeting at which treason, or what might be construed as treason, was talked. Monmouth, Essex, Hampden, Sidney and Howard of Escrick were the principal of those who met to consult. On the breaking out of the Rye House Plot, of which neither he, Essex, nor Sidney had the slightest knowledge, he was accused by informers of promising his assistance to raise an insurrection and compass the death of the king. Refusing to attempt to escape, he was brought before the council, when his attendance at the meeting referred to was charged against him. He was sent on the 26th of June 1683 to the Tower, and, looking upon himself as a dying man, betook himself wholly to preparation for death. Monmouth offered to appear to take his trial, if thereby he could help Russell, and Essex refused to abscond for fear of injuring his friend's chance of escape. Before a committee of the council Russell, on the 28th of June, acknowledged his presence at the meeting, but denied all knowledge of the proposed insurrection. He reserved his defence, however, until his trial. He would probably have saved his life but for the perjury of Lord Howard. The suicide of Essex, the news of which was brought into court during the trial, was quoted as additional evidence against him, as pointing to the certainty of Essex's guilt. On July 19 he was tried at the Old Bailey, his wife assisting him in his defence. Evidence was given by an informer that, while at Shaftesbury's hiding-place in Wapping, Russell had joined in the proposal to seize the king's guard, a charge indignantly denied by him in his farewell paper, and that he was one of a committee of six appointed to prepare the scheme for an insurrection. Howard, too, expressly declared that Russell had urged the entering into communications with Argyll in Scotland. Howard's perjury is clear from other witnesses, but the evidence was accepted. Russell spoke with spirit and dignity in his own defence, and, in especial, vehemently denied that he had ever been party to a design so wicked and so foolish as those of the murder of the king and of rebellion. It will be observed that the legality of the trial, in so far as the jurors were not properly qualified and the law of treason was shamefully strained, was denied in the act of 1 William & Mary which annulled the attainder. Hallam maintains that the only overt act of treason proved against Russell was his concurrence in the project of a rising at Taunton, which he denied, and which, Ramsay being the only witness, was not sufficient to warrant a conviction.

Russell was sentenced to die. Many attempts were made to save his life. The old earl of Bedford offered £50,000 or £100,000, and Monmouth, Legge, Lady Ranelagh, and Rochester added their intercessions. Russell himself, in petitions to Charles and James, offered to live abroad if his life were spared, and never again to meddle in the affairs of England. He refused, however, to yield to the influence of Burnet and Tillotson, who endeavoured to make him grant the unlawfulness of resistance, although it is more than probable that compliance in this would have saved his life. He drew up, with Burnet's assistance, a paper containing his apology, and he wrote to the king a letter, to be delivered after his death, in which he asked Charles's pardon for any wrong he had done him. A suggestion of escape from Lord Cavendish he refused. He behaved with his usual quiet cheerfulness during his stay in the Tower, spending his last day on earth as he had intended to spend the following Sunday if he had reached it. He received the sacrament from Tillotson, and Burnet twice preached to him. Having supped with his wife, the parting from whom was his only great trial, he slept peacefully, and spent the last morning in devotion with Burnet. He went to the place of execution in Lincoln's Inn Fields with perfect calmness, which was preserved to the last. He died on the 21st of July 1683, in the forty-fourth year of his age. His attainder was reversed in 1689, and his son Wriothesley (1680–1711) succeeded his grandfather as 2nd duke of Bedford in 1700.

A true and moderate summing-up of his character will be found in his *Life*, by Lord John Russell (1820). (O. A.)

RUSSELL OF KILLOWEN, CHARLES RUSSELL, Baron (1832–1900), lord chief justice of England, was born at Newry, county Down, on the 10th of November 1832. He was the elder son of Arthur Russell, a Roman Catholic gentleman, who was engaged in commerce and brewing in Newry. Educated first at Belfast, afterwards in Newry, and finally at St Vincent's College, Castleknock, Dublin, in 1849, he was articled to a firm of solicitors in Newry. In 1854 he was admitted, and began to practise his profession. Disturbances between Roman Catholics and Orangemen were at that time prevalent in this part of Ireland, and in the legal proceedings which ensued at quarter and petty sessions young Russell distinguished himself as a bold and skilful advocate in the cause of his co-religionists. The political zeal which always formed an important element in Russell's character happily harmonized with these professional duties. After practising, however, for two years, he determined to seek a wider field for his abilities, and to become a barrister in England. It was a wise ambition, early conceived by young Russell, stimulated by his present success, and encouraged by the counsel of at least one competent adviser, Judge Jones, who was much impressed by Russell's ability in the conduct of a case at the Newry quarter sessions. He believed, moreover, that to succeed at the Irish bar he would have (to use his own phrase) to "swallow his convictions." With this end in view Russell, whilst still practising and residing in Belfast, became a student of Trinity College, Dublin. He matriculated there in 1855, and passed examinations from time to time, but did not wait to become a graduate. In 1856 he went to London and became a student of Lincoln's Inn. In 1858 he married, in Belfast, Ellen, the eldest daughter of Dr Mulholland, a physician of distinction in that city. In 1859 he was called to the bar, after gaining by examination a first-class honour certificate, and joined the Northern Circuit. Except some valuable introductions to friends in London and Liverpool, which his uncle, the president of Maynooth, had given to him, Russell brought to the work of his profession no external aids. He had to rely upon himself. But the equipment was sufficient. A well-built frame; a strong, striking face, with broad forehead, keen grey eyes, and a full and sensitive mouth; a voice which, though not musical, was rich, and responded well to strong emotions, whether of indignation, or scorn, or pity; an amazing power of concentrating thought; an intellectual grasp, promptly seizing the real points of the most entangled case, and rejecting all that was secondary, or petty, or irrelevant; a faculty of lucid and forcible expression, which, without literary ornateness or grace of style, could on fit occasions rise to impassioned eloquence—all these things Russell had. But beyond and above all these was his immense personality, an embodiment of energetic will which riveted attention, dominated his audience, and bore down opposition. His successful advocacy in the Colin Campbell divorce case in 1886, and his famous cross-examination of hostile witnesses and still more famous speech before the Parnell Commission in 1888, afforded perhaps the best examples of Russell's characteristic powers. He was not a learned lawyer in the sense in which Willes, or Mellish, or Blackburn were learned lawyers; he did not possess the fine legal acumen of his great contemporary, Herschell; but he had a sufficient apprehension of legal principles. He handled a point of law with telling directness and force. His argument as the leading counsel for Great Britain in the Bering Sea Arbitration in 1893, and his address at Saratoga Springs on International Law and International Arbitration in August 1896, were expositions of law in its practical application to matters of state which the most learned jurist must admire for their thoroughness and perspicuity.

Russell's success, after he joined the Northern Circuit, did not, of course, come to him at once. For some time his work in court was principally in the Court of Passage at Liverpool, which he regularly attended from London. He wrote a book on its procedure, which was published in 1862. This ancient local court, possessing both common law and Admiralty jurisdiction, had as its presiding judge—then styled "assessor"—an eminent leader of the Northern Circuit, Mr Edward James. Substantial commercial cases were tried there, and of these Russell soon had a goodly portion. Steadily, and, for a barrister, speedily, Russell's fortune grew. His biographer, Mr Barry O'Brien, has given, in *The Life of Lord Russell of Killowen* (1901), an account of Russell's fees, which shows that they were, in round figures: in 1859, £117; in 1862, £1016; in 1866, £2367; and in 1870, £4230. At the beginning of this period Russell wrote occasionally for the newspapers, and especially for the Irish press. From early boyhood onwards he maintained a keen interest in politics, and pre-eminently in the public affairs of Ireland. In 1859 he published a pamphlet entitled *The Catholic in the Workhouse*, and an article from his pen is to be found in *The Dublin Review*, vol. xlviii. p. 497. His legal work was not wholly confined to the north of England. He was employed at the Guildhall and elsewhere by solicitors of position in the City of London. He was one of the counsel engaged in the Windham lunacy case in 1861, and in the action of *Saurin* v. *Starr* in 1869. In 1865 he argued in *ex parte* Chavasse before Lord Westbury, L.C., and soon afterwards was honoured by him with the offer of a county court judgeship.

In 1872 Russell took "silk," and from that date for some time he divided the best leading work of the circuit with Holker, Herschell and Pope. In 1874 Holker became solicitor-general in the Conservative administration. In 1880 Herschell accepted the same office in a Liberal ministry, and about the same time Pope practically left the circuit, to become in a short time one of the most successful advocates at the parliamentary bar. Russell's success as a Q.C. during this period of his career was prodigious. He excelled in the conduct alike of commercial cases and of those involving, as he used to say, "a human interest," although undoubtedly it was the latter which more attracted him. He was seen to the least advantage in cases which involved technical or scientific detail. If his advocacy suffered a defeat, however, it was never an inglorious defeat. Those who were on the Northern Circuit at the time will not easily forget the case of *Dixon* v. *Plimsoll*—a libel action brought by a Liverpool shipowner against Mr S. Plimsoll—tried before Baron Amphlett and a Liverpool special jury, in which Holker won a notable victory for the defendant; or *Nuttall* v. *Wilde*, a breach of promise action, in which Pope led brilliantly for the successful plaintiff, and Russell's speech for the defence was one of the finest in point of passion and pathos that was ever heard upon the Northern Circuit. At the same time, with all his fighting power, Russell was eminently a sagacious adviser. No barrister knew better how and when to settle a case, where the client's true interest called for a settlement.

In 1880 a new phase of Russell's arduous life began. He was returned to parliament as an independent Liberal member for Dundalk, a constituency which he had twice before unsuccessfully contested. From that time forward until his appointment to a lordship of appeal in succession to Lord Bowen in 1894, he sat in the House of Commons: for Dundalk until 1885, and afterwards for South Hackney, where he was returned as the Liberal member on four successive occasions—once in 1885, twice in 1886, and again in 1892. The entrance into parliament laid upon Russell's time and labour a heavy additional tax. His was a nature which could not, in work or even in pleasure, be content to do anything lightly or by halves. He was essentially a man of action; intensity—at times almost fierce intensity—both of purpose and of devotion to its fulfilment characterized everything he did. Upon such a man parliamentary life between 1880 and 1894 necessarily entailed a severe strain. During the whole of this epoch, in home affairs, Irish business almost monopolized the political stage; and Russell was Irish to the core. From 1880 to 1886, as a private member, and as the attorney-general in Mr Gladstone's administrations of 1886 and 1892, he worked in and out of parliament for the Liberal policy in regard to the treatment of Ireland as few men except Russell could or would work. He never spared himself. After a long day in the turmoil of the courts, he cheerfully gave a long evening to a distant and often, from the standpoint of personal notoriety, an obscure, platform. His position throughout was clear and consistent. Before 1886 on several occasions he supported the action of the Irish Nationalist party. He opposed coercion, voted for compensation for disturbance, advocated the release of political prisoners and voted for the Maamtrasna inquiry. He wrote to the *Daily Telegraph* a series of letters on the Irish land question, which were afterwards published (1889) in a collected form. But he never became a member of the Irish Home Rule or of the Parnellite party; he was elected at Dundalk as an independent Liberal, and such he remained. He was proud of the kingdom in whose might and glory Ireland could claim so large a part; and when, as attorney-general in the Gladstone administration, he warmly advocated the establishment of a subordinate parliament in Ireland, he did so because he sought the amelioration and not the destruction of Ireland's relations with the rest of that kingdom. "I am absolutely opposed," he said (*The Life of Lord Russell of Killowen*, p. 194) to the South Hackney voters, "to separation; but, reserving imperial control on all imperial questions, I think Irishmen on Irish soil should have the power of dealing in the way which seems best to them with all questions that concern them." It is impossible to say that Russell's success in the House of Commons, considerable as it was, was comparable to his success as an advocate in the courts of justice. He was listened to, always with respect and often with admiration, but he was not made for a debater; and the position of a law officer has generally not proved favourable to the attainment of parliamentary eminence. In great public affairs the law officer advises and supports, but not for him is the glory of initiating public policy.

Russell's parliamentary duties, fully as he discharged them, first as a private member and afterwards as attorney-general, were not allowed by him to obstruct his professional career. He rapidly became in London what he was already in Lancashire, the favourite leader in *nisi prius* actions. The list of *causes célèbres* in the period 1880–94 is really a record of Russell's cases, and, for a great part, of Russell's victories. The best known of the exceptions from the latter category was the libel action *Belt* v. *Lawes* in 1882, which, after a trial before Baron Huddleston and a special jury lasting more than forty days, resulted in a verdict for the plaintiff, for whom Sir Hardinge Giffard (afterwards Lord Chancellor Halsbury) appeared as leading counsel. The triumph of his client in the Colin Campbell divorce suit in 1886 afforded perhaps the most brilliant instance of Russell's forensic capacity in private litigation. His fees in 1885, the year before he became attorney-general, amounted to nearly £17,000. More important, however, as well as more famous, than any of his successes in the ordinary courts of law during this period were his performances as an advocate in two public transactions of mark in British history. The first of these in point of date was the Parnell Commission of 1888–90, in which Sir Charles Russell appeared as leading counsel for Mr Parnell. The commission held its first sitting on the 22nd of October 1888, and presented its report in February 1890. In April 1889, after 63 sittings of the commission, in the course of which 340 witnesses had been examined, Sir Charles Russell, who had already destroyed the chief personal charge against Mr Parnell by a brilliant cross-examination, in which he proved it to have been based upon a forgery, made his great opening speech for the defence. It lasted several days, and concluded on the 12th of April. This speech, besides its merit as a wonderful piece of advocacy, possesses permanent value as an historical survey of the Irish question during the last century, from the point of view of an Irish Liberal. It was in the same year published after careful revision by its author (1889). The second public transaction was the Bering Sea Arbitration, held in Paris in 1893. Sir Charles Russell, then attorney-general, with Sir Richard Webster (afterwards Lord Alverstone, L.C.J.), was the leading counsel for Great Britain. Russell, in the course of his very powerful argument before the tribunal, maintained the proposition, which he again handled in his Saratoga address to the American Bar Association in 1896, that "international law is neither more nor less than what civilized nations have agreed shall be binding on one another as international law." The award was, substantially, in favour of Great Britain. In recognition of their distinguished services, the queen bestowed upon both the leading representatives of Great Britain the honour of the grand cross of St Michael and St George.

In 1894 Russell's career as an advocate ended. A judgeship, if he had wished it, had been within his reach twelve years before. In 1894, on the death of Lord Bowen, he accepted the position of a lord of appeal. A month later he was appointed lord chief justice of England in succession to Lord Coleridge, to whose memory he devoted in the following September a paper in the *North American Review*. To the discharge of his functions as a judge Russell brought with him all the qualities of intellect and character which had made him so eminent as an advocate, and their greatness was not less conspicuous in his new position. Brief as was his tenure of the office, he proved himself well worthy of it. He was dignified without pompousness, quick without being irritable, and masterful without tyranny. He was scrupulously punctual. Suitors and hearers could not but be impressed by the manifest determination of the lord chief justice to get at the truth, and to do so without waste of time. If this was a fault, it was that of excessive zeal for despatch. When, occasionally, there were flashes of impatience, they were elicited by the exhibition, as he deemed it, of want of preparation, or slovenliness, or verbosity on the part of the advocate before him. Even the youngest and most obscure practitioner could always count upon the assiduous attention of the lord chief justice to a pertinent and thoughtful argument. In 1896 Lord Russell (Pollock B. and Hawkins J. being on this occasion his colleagues on the bench) presided at the trial at bar of the leaders of the Jameson Raid. It was a state trial of grave importance. Russell's conduct of it, in the midst of much popular excitement, was by itself sufficient to establish his reputation as a great judge. One other event at least in his career while lord chief justice deserves a record, namely, his share in the Venezuela Arbitration in 1899. Lord Herschell, who had been nominated to act with Lord Justice Collins (afterwards Master of the Rolls), as a British representative on the Commission of Arbitration, of which the distinguished Russian jurist M. Martens was president, died somewhat suddenly in America before the beginning of the proceedings. The lord chief justice accepted the invitation to take the vacant place, and performed his very onerous duty with conspicuous ability.

Nor was it only on the bench or as an international judge that Lord Russell of Killowen sought, during the last years of his busy life, to do service to his country. He signalized his zeal as a law reformer by the public advocacy of radical changes in the system of legal education in the Inns of Court, and by the promotion of measures to put down the vice of secret and illicit commissions in commercial and business life. On the former subject he delivered in 1895 an address in Lincoln's Inn Hall, under the auspices of the Council of Legal Education, which was afterwards printed and published. In 1899, dealing with the latter question, he introduced in the House of Lords a bill, which had its first reading. He again introduced a bill in the session of 1900, which was read a second time, but did not become law. On the 10th of August 1900 the great advocate and great judge passed quietly away at his London residence, after a short illness due to an internal malady.

In private as in public life Russell was always strenuous, and most attracted by things that called for the exercise of activity, whether bodily or intellectual. Inaction he disliked both for himself and in others. Though not an athlete, he took an interest in manly pastimes: he was fond of riding and of breeding horses; he liked being on the racecourse; and he enjoyed games, both of skill and of chance. A student of books he was not; he could lay no claim to wide learning or elegant scholarship; but he could appreciate a good book; he was versed in Shakespeare; and he knew and loved the poetry and the songs of his native land. When he wrote, his style, inornate, clear and forcible, reflected the character of his thought. He was a staunch and sympathetic friend, ever ready, in an unostentatious way, to help, where help was really needed. While he undoubtedly exhibited at times, chiefly during the earlier part of his career, a certain brusqueness and impetuousness of speech and demeanour, those who came into contact with him recognized that such occasional outbursts never sprang from any desire to hurt, or from any unkindness of disposition. In his contests at the bar he never made an enemy. He was a strong man, and he liked to have his way; but he was also large-hearted and without a tinge of rancour in his disposition. He was never offended by opposition. Whilst he did not himself shine as a wit or a humorist in conversation or in after-dinner oratory, he heartily enjoyed fun and humour in others; and, wherever he was, the force and distinctness of his personality never failed to impress his company. Probably no English lawyer ever excited abroad the admiration which was accorded to Lord Russell of Killowen, alike on the continent of Europe and in America. To the United States he paid two visits, the first in 1883 and the second in 1896. On both occasions he won golden opinions, which were manifested in widespread and warm expressions of sympathy and regret when the news of the death of Lord Russell of Killowen passed across the Atlantic. Between 1894 and 1897 Lord Russell of Killowen received the degree of Doctor of Laws *honoris causa* from the universities of Dublin, Edinburgh and Cambridge, and from the Laval university, Quebec. In 1892 he was treasurer of Lincoln's Inn. He left surviving him, besides his widow, five sons and four daughters. His sister Katherine (in religion, Sister Mary Baptist Joseph), pioneer sister of mercy in California, had died two years before at San Francisco. (W. R. K.)

RUSSELL OF THORNHAUGH, WILLIAM, 1st Baron (*c.* 1558–1613), English soldier, was a younger son of Francis Russell, 2nd earl of Bedford, and was educated at Magdalen College, Oxford. After spending a few years abroad, he went to Ireland in 1580, and having seen some service in that country he was knighted in September 1581. In 1585 he joined the English forces in the Netherlands, being made lieutenant-general of cavalry; in September 1586 he so distinguished himself at Zutphen that the Spaniards pronounced him "a devil and not a man"; and in 1587 he became governor of Flushing in succession to his late friend, Sir Philip Sidney. He differed with the estates of Holland and with his superior, Lord Willoughby de Eresby; consequently, on his own initiative, he was recalled to England in July 1588. In May 1594 Russell was made lord deputy of Ireland in place of Sir William Fitzwilliam. He relieved Enniskillen, but his attempts to capture the insurgent leaders, Hugh O'Neill, earl of Tyrone, and Fiagh MacHugh O'Byrne, came to nothing. In May 1595 Sir John Norris landed in Ireland, his orders being to help the lord deputy in his difficult task. Russell was somewhat chagrined at the choice, as he and Norris were not very good friends, but for a short time they acted together against the rebels in the N. of Ireland. Russell then led an expedition into Connaught, but soon he and Norris were at variance. Having captured O'Byrne in May 1597, Russell laid down his office and left Ireland later in the month. In 1603 he was created Baron Russell of Thornhaugh, and he died on the 9th of August 1613. In 1627 his only son Francis succeeded his cousin Edward as 4th earl of Bedford.

Russell's *Journal* of his doings in Ireland is in the Carew MSS., and many of his letters are in the British Museum. See J. H. Wiffen, *Historical Memoirs of the House of Russell* (1833), and R. Bagwell, *Ireland under the Tudors*, vol. iii. (1890).

RUSSIA (*Rossiya*), the general name for the European and Asiatic dominions of the "Tsar of All the Russias." Although the name is thus correctly applied, both in English and Russian, to the whole area of the Russian empire, its application is often limited, no less correctly, to European Russia, or even to European Russia exclusive of Finland and Poland. The use of the name in its most comprehensive sense dates only from the expansion of the empire in the 19th century; to the historian who writes of the earlier growth of the empire, Russia means, at most, Russia in Europe, or Muscovy, as it was usually called until the 18th century, from Moscow, its ancient capital. The origin of the term "Russia" has been much disputed. It is certainly derived, through *Rossiya*, from Slavonic *Rus* or *Ros* (Byzantine Ῥῶς or Ῥώσοι), a name first given to the Scandinavians who founded a principality on the Dnieper in the 9th century; and afterwards extended to the collection of Russian states of which this principality formed the nucleus. The word *Rus*, in former times wrongly connected with the tribal name Rhoxolani, is more probably derived from *Ruotsi*, a Finnish name for the Swedes, which seems to be a corruption of the Swedish *rothsmenn*, "rowers" or "seafarers."

I. The Russian Empire

The Russian empire stretches over a vast territory in E. Europe and N. Asia, with an area exceeding 8,660,000 sq. m., or one-sixth of the land surface of the globe (one twenty-third of its whole superficics). It is, however, but thinly peopled on the average, including only one-twelfth of the inhabitants of the earth. It is almost entirely confined to the cold and temperate zones. In Novaya Zemlya and the Taimyr peninsula, it projects within the Arctic Circle as far as 77° 6′ and 77° 40′ N. respectively; while its S. extremities reach 38° 50′ in Armenia, 35° on the Afghan frontier, and 42° 30′ on the coasts of the Pacific. To the W. it advances as far as 20° 40′ E. in Lapland, 17° in Poland, and 29° 42′ on the Black Sea; and its E. limit—East Cape on the Bering Strait—is in 191° E.

Boundaries.

The White, Barents and Kara Seas of the Arctic bound it on the N., and the northern Pacific—that is, the Seas of Bering, Okhotsk and Japan—bounds it on the E. The Baltic, with the Gulfs of Bothnia and Finland, limits it on the N.W.; and two sinuous lines of land frontier separate it respectively from Sweden and Norway on the N.W. and from Prussia, Austria and Rumania on the W. On the S. and E. the frontier has changed frequently according to the expansion and contraction of the empire under the pressure of political exigency and expedience. The Black Sea is the principal demarcating feature on the S. of European Russia. On the W. side of that sea the S. frontier touches the Danube for some 120 m.; on the E. side of the same sea it zigzags from the Black Sea to the Caspian, utilizing the river Aras (Araxes) for part of the distance. As the Caspian is virtually a Russian sea, Persia may be said to form the next link in the S. boundary of the Russian empire, followed by Afghanistan. On the Pamirs Russia has since 1885 been conterminous with British India (Kashmir); but the boundary then swings away N. round Chinese Turkestan and the N. side of Mongolia, and, since 1904–5, it has skirted the N. of Manchuria, being separated from it by the river Amur. As thus traced, the boundary in Central Asia includes the two khanates of Bokhara and Khiva, which, though nominally protected states, are to all intents and purposes integral parts of the Russian empire. But it excludes Manchuria, with the Liao-tung peninsula and Port Arthur, upon which Russia only placed her grasp in 1898–99, a grasp which she was compelled by Japan to release after the war of 1904–5. The total length of the frontier line of the Russian empire by land is 2800 m. in Europe, and nearly 10,000 m. in Asia, and by sea over 11,000 m. in Europe and between 19,000 and 20,000 m. in Asia.

Islands.

Russia has no oceanic possessions; her islands are all appendages of the mainland to which they belong. Such are Karlo, East Kvarken, the Åland archipelago, Dagö, and Ösel or Oesel in the Baltic Sea; Novaya Zemlya, with Kolguyev and Vaigach, in the Barents Sea; the Solovetski Islands in the White Sea; the New Siberian archipelago, Wrangel Land and Bear Islands, off the Siberian coast; the Commander Islands off Kamchatka; the Shantar Islands and the N. of Sakhalin in the Sea of Okhotsk. The Aleutian archipelago was sold to the United States in 1867, together with Alaska; and in 1875 the Kurile Islands were ceded to Japan.

Leading physical features.

If the border regions, that is, two narrow belts, on the N. and S., be left out of account, a striking uniformity of physical feature prevails throughout the whole vast extent of the Russian empire. High plateaus like that of Pamir (the "Roof of the World") and Armenia, and lofty mountain chains like the snow-clad Caucasus, the Alai, the Tian-shan, the Sayan Mountains, exist only on the outskirts of the empire.

Plateau formation of Asia.

Viewed broadly, the Russian empire may be said to occupy the territories to the N.W. of the great plateau formation of the old continent—the backbone of Asia—which stretches with decreasing altitude and width from the high tableland of Tibet and Pamir to the lower plateaus of Mongolia, and thence N.E. through the Vitim region to the farthest extremity of Asia. Thus it consists of the immense plains and flat lands which extend between the plateau formation and the Arctic Ocean, including the series of parallel chains and hilly spurs which skirt the former region on the N.W. And it is only to the E. of Lake Baikal that it climbs up on to the plateau, from which it descends again before it reaches the Pacific.

This plateau formation—the oldest geological continent of Asia—being unfit for agriculture and for the most part unsuited for permanent settlement, while its oceanic slopes have from the dawn of history been occupied by a relatively dense population, long prevented Slav colonization from reaching the Pacific. The Russians chanced to cross it in the 17th century at its narrowest and most N. part, and thus struck the Pacific on the foggy and frozen shores of the Sea of Okhotsk; but two centuries elapsed ere, after colonizing the depressions around Lake Baikal, they crossed over the plateau in a more genial zone and descended to the Pacific by the Amur. After that they spread rapidly S., up to the nearly uninhabited valley of the Usuri, to what is now the Gulf of Peter the Great. In the S.W. higher portions of the plateau formation the empire has only comparatively recently planted its foot on the Pamir, and it was only a few years earlier that it established itself firmly on the highlands of Armenia.

The alpine belt.

A broad belt of hilly tracts—in every respect alpine in character, and displaying the same variety of climate and organic life as alpine tracts usually do—skirts the plateau formation throughout its entire length on the N. and N.W., forming an intermediate region between the plateau and the plains. The Caucasus, the Elburz, the Kopet-dagh and Paropamisus, the intricate and imperfectly known network of mountains W. of the Pamir, the Tian-shan and the Ala-tau mountain regions, and farther N.E. the Altai, the still unnamed complex of the Minusinsk Mountains, the intricate mountain-chains of Sayan, with those of the Olekma, Vitim and Aldan all arranged *en échelon*—the former from N.W. to S.E., and the others from S.W. to N.E.—all these belong to the same alpine belt that borders the plateau from end to end of the series.

The flat lands.

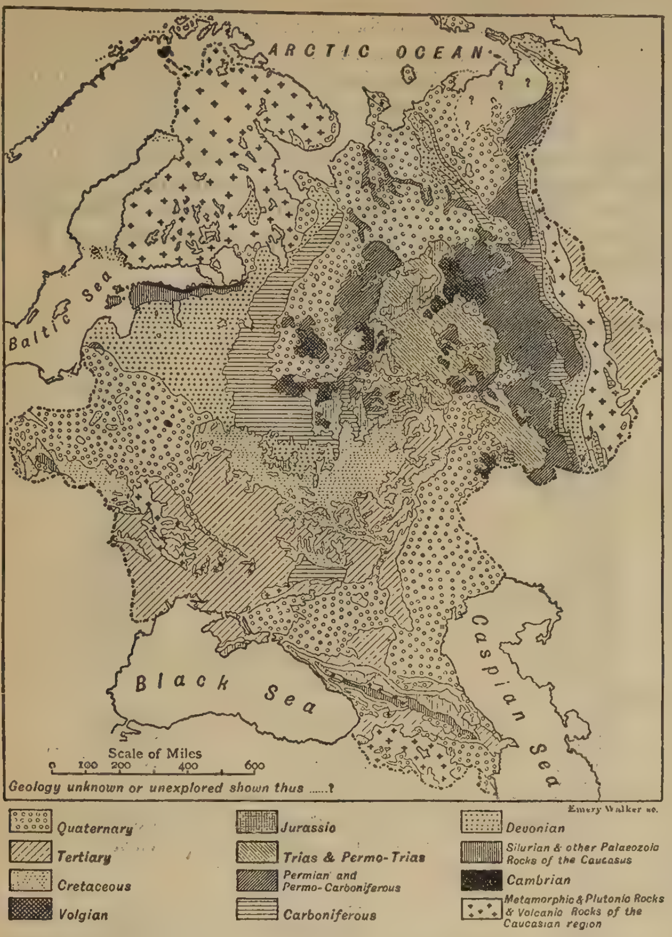
The flat lands which extend from the base of the Alpine foothills to the shores of the Arctic Ocean, assume the character either of dry deserts, as in the Aral-Caspian depression, or of low tablelands, as in central Russia and E. Siberia, of lacustrine regions in N.W. Russia and Finland, or of marshy prairies in W. Siberia, and of *tundras* in the far N. Throughout the whole of this vast area, their monotonous surfaces are diversified by only a few, and, for the most part, low, hilly tracts. Recently emerged from the Post-Pliocene sea, or freed from their mantle of ice, they persistently maintain the self-same features over immense areas; and the few portions that rise above the general elevation have more the character of broad and gentle swellings than of mountain-chains. Of this class are the swampy plateaus of the Kola peninsula, sloping gently S. to the lacustrine region of Finland and N.W. Russia; the Valdai tablelands, where all the great rivers of Russia take their rise; the broad and gently sloping meridional belt of the Ural Mountains; and lastly the Taimyr, Tunguzka and Verkhoyansk ranges in Siberia, which, notwithstanding their sub-Arctic position, do not reach the snow-line. The picturesque Bureya Mountains above the Amur, the forest-clad Sikhota-alin on the Pacific, and the volcanic chains of Kamchatka belong, however, to quite another orographical construction, being the border-ridges of the terraces by which the great plateau formation descends to the depths of the Pacific Ocean.

Rivers.

It is owing to these leading orographical features—divined by Carl Ritter, but only recently ascertained and established as fact by geographical research—that so many of the great rivers of the old continent are comprised within the limits of the Russian empire. Taking their rise on the plateau formation, or in its outskirts, they flow first along lofty longitudinal valleys formerly filled with great lakes, next they cleave their way through the rocky barriers, and finally they enter the lowlands, where they become navigable, and, describing wide curves to avoid here and there the minor plateaus and hilly tracts, they bring into water-communication with one another places thousands of miles apart. The double river-systems of the Volga and Kama, the Ob and Irtysh, the Angara and Yenisei, the Lena and Vitim on the Arctic slope, and the Amur and Sungari on the Pacific slope, are instances. These were the obvious channels of Russian colonization.

A broad depression—the Aral-Caspian desert—has arisen where the plateau formation reaches its greatest altitude, and at the same time suddenly changes its direction from N.W. to N.E. This desert is now filled to only a small extent by the salt waters of the Caspian, Aral and Balkash inland seas; but it bears unmistakable traces of having been during Post-Pliocene times an immense inland basin. There the Volga, the Ural, the Syr-darya and the Amu-darya discharge their waters without reaching the ocean, but they bring life to the rapidly desiccating Transcaspian steppes, and link together the most remote parts of Russia.

Geology.—The most striking feature in the geology of Russia is its remarkable freedom from disturbances, either in the form of mountain folding or of igneous intrusions. Over the greater part of the country the strata are still nearly as flat as when they were first laid down, and the deposits, even of the Cambrian period, are as soft as those of the Mesozoic and Tertiary formations in England. Only in the Urals, the Caucasus, the Timan Mountains, the region of the Donets coalfield, and the Kielce Hills is there any sign of the great folding from which nearly the whole of the rest of Europe has suffered at one time or another.


ARCTIC OCEAN
Baltic Sea
Black Sea
Caspian Sea
Scale of Miles
0 100 200 400 600
Geology unknown or unexplored shown thus ......?
Emery Walker sc.
Quaternary
Tertiary
Cretaceous
Volgian
Jurassic
Trias & Permo-Trias
Permian and Permo-Carboniferous
Carboniferous
Devonian
Silurian & other Palaeozoic Rocks of the Caucasus
Cambrian
Metamorphic & Plutonic Rocks & Volcanic Rocks of the Caucasian region

In the early part of the Palaeozoic era only the gneissic region of Finland and Olonets and probably the Archean mass of S. Russia remained constantly above the sea; but there were several oscillations. Gradually, however, the sea retreated from W. Russia and in the Upper Carboniferous and Permian periods it was confined to the E.

At the beginning of the Mesozoic era the whole country became land, bearing upon its surface the salt lakes in which the Trias was laid down. During the Jurassic period the sea again invaded the region, both from the N. and from the S., but still the W. of Russia rose above the waves. In the Cretaceous period the waters withdrew from the N.E., but in the S. they spread W., covering the whole of Poland and finally uniting with the ocean in which the chalk of W. Europe was deposited. The Tertiary era was marked by a gradual extension S. of the N. land-mass. In the later stages arms of the sea were cut off and were converted at first into lagoons and then into brackish or fresh-water lakes which continued to occupy much of S. Russia until the beginning of the Quaternary period.

During the first part of the Glacial period Russia seems to have been covered by an immense ice-sheet, which extended also over central Germany, and of which the E. limits cannot yet be determined.

The Archean rocks have a broad extension in Finland, N. Russia, the Ural Mountains and the Caucasus. In S. Russia they form the floor upon which lies a thin covering of Tertiary beds, and they are exposed to view in the valleys of the Dnieper and the Bug. They consist for the most part of red and grey gneisses and granulites, with subordinate layers of granite and granitite. The Finland *rappa-kivi*, the Serdobol gneiss, and the Pargas and Rustiala marble (with the so-called *Eozoon canadense*) yield good building stone; while iron, copper and zinc-ore are common in Finland and in the Urals. Rocks regarded as representing the Huronian system appear also in Finland, in N.W. Russia, as a narrow strip on the Urals, and in the Dnieper ridge. They consist of a series of unfossiliferous crystalline slates.

The Cambrian is represented by blue clays, ungulite sandstones and bituminous slates in Esthonia and St Petersburg. The Ordovician and Silurian systems are widely developed, and it is most probable that, with the exception of the Archean continents of Finland and the S., the sea covered the whole of Russia. Being concealed, however, by more recent deposits, the deposits appear on the surface only in N.W. Russia (Esthonia, Livonia, St Petersburg and on the Volkhov), where all the subdivisions of the system have been found; in the Timan ridge; on the W. slope of the Urals; in the Pai-kho ridge; and in the islands of the Arctic Ocean. In Poland the rocks of these periods are met with in the Kielce Mountains, and in Podolia in the deeper ravines.

The Devonian dolomites, limestones and red sandstones cover immense tracts and appear on the surface over a much wider area. From Esthonia these rocks extend N.E. to Lake Onega, and S.E. to Mogilev; they form the central plateau, as also the slopes of the Urals and the Petchora region. In N.W. and middle Russia they contain a special fauna, and it appears that the Lower Devonian series of W. Europe, represented in Poland and in the Urals, is missing in N.W. and central Russia, where only the Middle and Upper Devonian divisions are found.

Carboniferous deposits occur over nearly the whole of E. Russia, their W. boundary being a line drawn from Archangel to the upper Dnieper, thence to the upper Don, and S. to the mouth of the last-named river, with a long narrow gulf extending W. to encircle the plateau of the Donets. They are visible, however, only on the W. borders of this region, being covered towards the E. by thick Permian and Triassic strata. Russia has three large coal-bearing regions—the Moscow basin, the Donets region and the Urals. In the Valdai plateau there are only a few beds of mediocre coal. In the Moscow basin, which was a broad gulf of the Carboniferous sea, coal appears as isolated inconstant seams amidst littoral deposits, the formation of which was favoured by frequent minor subsidences of the seacoast. The coal is here confined to the lower division of the system; the Upper Carboniferous (corresponding with the English Coal-Measures) is exclusively marine, consisting chiefly of *Fusulina* limestone. The Donets Coal-Measures, containing abundant remains of a rich land-flora, cover nearly 16,000 sq. m., and comprise a valuable stock of excellent anthracite and coal, together with iron-mines. In this basin, as in W. Europe generally, the principal coal seams occur in the Upper Carboniferous, while the Lower Carboniferous is mainly composed of marine deposits, with, however, the first bed of coal near its summit. Several smaller coalfields on the slopes of the Urals and on the Timan ridge may be added to the above. The Polish coalfields belong to another Carboniferous area of deposit, which extended over Silesia.

The Permian limestones and marls occupy a strip in E. Russia of much less extent than that assigned to them by Murchison. The variegated marls of E. Russia, rich in salt-springs, but very poor in fossils, are now held by most Russian geologists to be Triassic. The Permian deposits contain marine shells and also remains of plants similar to those of England and Germany. But in the government of Vologda, on the rivers Sukhona and N. Dvina, *Glossopteris*, *Noeggerathiopsis* and other ferns characteristic of the Indian Gondwana beds have been found; and with these are numerous remains of reptiles similar to those which occur in the Indian deposits. In the Urals the marine facies is more fully developed and the fauna shows affinities with that of the *Productus* limestone of the Central Asian mountain belt.

During the Jurassic period the sea began again to invade Russia from S.E. and N.W. The limits of the Russian Jurassic system may be represented by a line drawn from the double valley of the Sukhona and Vytchegda to that of the upper Volga, and thence to Kieff, with a wide gulf penetrating towards the N.W. Within this space three depressions, all running S.W. to N.E., are filled up with Upper Jurassic deposits. They are much denuded in the higher parts of this region, and appear but as isolated islands in central Russia. In the S.E. all the older subdivisions are represented, the deposits having the characters of a deep-sea formation in the Aral-Caspian region and on the Caucasus.

Cretaceous beds—sands, loose sandstones, marls and white chalk—occupy nearly the whole of the region S. of a line drawn from the Niemen to the upper Oka and Don, and thence N.E. to Simbirsk. Over a large part of this area, however, they are concealed by the later Tertiary deposits, and they are absent over the Dnieper and Don ridge in the Yaila Mountains and in the higher parts of the Caucasus. They are rich in grinding stone, and in phosphatic deposits.

The Tertiary formations occupy large areas in S. Russia. The Eocene covers wide tracts from Lithuania to Tsaritsyn, and is represented in the Crimea and Caucasus by thick deposits belonging to the same ocean which left its deposits on the Alps and the Himalayas. Oligocene, quite similar to that of N. Germany, and containing brown coal and amber, has been met with only in Poland, Courland and Lithuania. The Miocene (Sarmatian stage) occupies extensive tracts in S. Russia, S. of a line drawn through Lublin to Ekaterinoslav and Saratov. Not only the higher chains of Caucasus and Yaila, but also the Donets ridge, rose above the level of the Miocene sea, which was very shallow to the N. of this last ridge, while farther S. it was connected both with the Vienna basin and with the Aral-Caspian. The Pliocene appears only in the coast region of the Black and Azov Seas, but it is widely developed in the Aral-Caspian region, where, however, the Ust-Urt and the Obshchiy Syrt rose above the sea.

The thick Quaternary, or Post-Pliocene, deposits which cover nearly all Russia were for a long time a puzzle to geologists. They consist of a boulder clay in the N. and of loess in the S. The former presents an intimate mixture of boulders brought from Finland and Olonets (with an addition of local boulders) with small gravel, coarse sand and the finest glacial mud,—the whole bearing no trace of ever having been washed up and sorted by water in motion, except in subordinate layers of glacial sand and gravel; the size of the boulders decreases on the whole from N. to S., and the boulder clay, especially in N. and central Russia, often takes the shape of ridges parallel to the direction of the motion of the boulders. Its S. limits, roughly corresponding with those established by Murchison, but not yet settled in the S.E. and E., are, according to M. Nikitin, the following:—from the S. frontier of Poland to Ovrutch, Umañ, Kremenchug, Połtava and Razdornaya (50° N. latitude), with a curve N. to Kozelsk (?); thence due N. to Vetluga (58° N. latitude), E. to Glazova in Vyatka, and from this place towards the N. and W. along the watershed of the Volga and Pechora (?). S. of the 50th parallel appears the loess, with all its usual characters (land fossils, want of stratification, &c.), showing a remarkable uniformity of composition over very large surfaces; it covers both watersheds and valleys, but chiefly the former. Such being the characters of the Quaternary deposits in Russia, the majority of Russian geologists now adopt the opinion that Russia was covered, as far as the above limits, with an immense ice-sheet which crept over central Russia and central Germany from Scandinavia and N. Russia. Another ice-covering was probably advancing at the same time from the N.E., that is, from the N. of the Urals, but the question as to the glaciation of the Urals still remains open. As to the loess, the usual view is that it was a steppe-deposit due to the drifting of fine sand and dust during a dry episode in the Pleistocene period.

The deposits of the Post-Glacial period are represented throughout Russia, Poland and Finland, as also throughout Siberia and Central Asia, by very thick lacustrine deposits, which show that, after the melting of the ice-sheet, the country was covered with immense lakes, connected by broad channels (the *fjärden* of the Swedes), which later on gave rise to the actual rivers. On the outskirts of the lacustrine region, traces of marine deposits, not higher than 200 or perhaps even 150 ft. above present sea-level, are found alike on the Arctic Sea and on the Baltic and Black Sea coasts. A deep gulf of the Arctic Sea advanced up the valley of the Dvina; and the Caspian, connected by the Manych with the Black Sea, and by the Uzboy valley with Lake Aral, penetrated N. up the Volga valley, as far as its Samara bend. Unmistakable traces show that, while during the Glacial period Russia had an arctic flora and fauna, the climate of the Lacustrine period was more genial than it is now, and a dense human population at that time peopled the shores of the numberless lakes.

The Lacustrine period has not yet reached its close in Russia. Finland and the N.W. hilly plateaus are still in the same geological phase, and are dotted with numberless lakes and ponds, while the rivers continue to dig out their yet undetermined channels. But the great lakes which covered the country during the Lacustrine period have disappeared, leaving behind them immense marshes like those of the Pripet and in the N.E. The disappearance of what still remains of them is accelerated not only by the general decrease of moisture, but also perhaps by the gradual upheaval of N. Russia, which is going on from Esthonia and Finland to the Kola peninsula and Novaya Zemlya, at an average rate of about two feet per century. This upheaval—the consequences of which have been felt even within the historic period, by the drainage of the formerly impracticable marshes of Novgorod and at the head of the Gulf of Finland—together with the destruction of forests (which must be considered, however, as a quite subordinate cause), contributes towards a decrease of precipitation over Russia and towards increased shallowness of her rivers. At the same time, as the gradients are gradually increasing on account of the upheaval of the continent, the rivers dig their channels deeper and deeper. Consequently central and especially S. Russia witness the formation of numerous miniature cañons, or *ovraghi* (deep ravines), the summits of which rapidly advance and ramify in the loose surface deposits. As for the S. steppes, their desiccation, the consequence of the above causes, is in rapid progress.[1]

Population.—The population of the empire, which was estimated at 74,000,000 in 1859, was found to be over 129,200,000 at the census of 1897, taken over all the empire except Finland. In 1904 it was estimated to be 143,000,000, and in 1906, according to a detailed estimate of the Central Statistical Committee, it was 149,299,300. Thus from 1860 to 1897 the population increased 74½%, and from 1897 to 1904 26·3, an average annual increase of about 3½% as compared with an average annual increase of 2¾% during the period 1860–97. The increase took place chiefly in the large cities, in Siberia, Poland, Lithuania, S. Russia and Caucasia. The official divisions of the empire are given here, and details are given in separate articles.

Province or Government

European Russia—
- Archangel
- Astrakhan
- Bessarabia
- Chernigov
- Courland
- Don Cossacks' territory
- Ekaterinoslav
- Esthonia
- Grodno
- Kaluga
- Kazan
- Kiev
- Kostroma
- Kovno
- Kursk
- Kharkov
- Kherson
- Livonia
- Minsk
- Mogilev
- Moscow
- Nizhniy-Novgorod
- Novgorod
- Olonets
- Orel
- Orenburg
- Penza
- Perm
- Podolia
- Połtava
- Pskov
- Ryazan
- St Petersburg
- Samara
- Saratov
- Simbirsk
- Smolensk
- Tambov
- Taurida
- Tula
- Tver
- Ufa
- Vilna
- Vitebsk
- Vladimir
- Volhynia
- Vologda
- Voronezh
- Vyatka
- Yaroslavl

Poland—
- Kalisz
- Kielce
- Lomza
- Lublin
- Piotrkow
- Plock
- Radom
- Siedlce
- Suwalki
- Warsaw

Grand-Duchy of Finland—
- Åbo-Björneborg
- Kuopio
- Nyland
- St Michel
- Tavastehus
- Uleåborg
- Viborg
- Vasa

Caucasia—
- Kuban
- Baku
- Black Sea territory
- Daghestan
- Stavropol
- Elizavetpol
- Erivan
- Kars
- Terek
- Kutais
- Tiflis with Zakataly

Russia in Asia—
- The Steppes
  - Akmolinsk
  - Semipalatinsk
  - Turgai
  - Uralsk
- Semiryechensk
- Samarkand

Turkestan—
- Ferghana
- Syr-darya
- Transcaspia

Western Siberia—
- Tobolsk
- Tomsk

Eastern Siberia—
- Irkutsk
- Transbaikalia
- Yakutsk
- Yeniseisk

Amur Region—
- Amur
- Maritime Province
- Sakhalin

It has been found, from a comparison of the densities of population of the various provinces in 1859 with the distribution in 1897, that the centre of density has distinctly moved S., towards the shores of the Black Sea, and W., the greatest increase having taken place in the E. Polish and in the Lithuanian provinces, along the S.W. border, in the prairie belt beside the Black Sea, and in Orenburg. N. Caucasia and S.W. Siberia likewise show a considerable increase. The census of 1897 revealed in several provinces a remarkably low proportion of men to women. This was owing to the fact that large numbers of the men engaged in agricultural pursuits during the summer temporarily move every year into the large industrial centres for the winter. Consequently there were only 87·4 and 89·8 women to every 100 men in the governments of St Petersburg and Taurida respectively, but as many as 133·8 in Yaroslavl, 119 in Tver and 117 in Kostroma. The average number of women to every 100 men in the Russian governments proper was 102·9; in Poland, 98·6; in Finland, 102·2; in Caucasia, 88·9; in Siberia, 93·7; and in Turkestan and Transcaspia, 83·0.

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[1] Bibliography: *Memoirs*, *Izvestia* and Geological Maps of the Committee for the Geological Survey of Russia; *Memoirs* and *Sborniks* of the Mineralogical Society, of the Academy of Science and of the Societies of Naturalists at the Universities; *Mining Journal*; Murchison's *Geology of Russia*; Helmersen's and Möller's *Geological Maps* of Russia and the Urals; Inostrantsev in Appendix to Russian translation of Reclus's *Géogr. Univ.*, and *Manual of Geology* (Russian).

The effects of emigration and immigration cannot be estimated with accuracy, because only those who cross the frontier with passports are taken account of. The statistics of these show that there was during the thirty-two years, 1856–88, an excess of emigration over immigration of 1,146,052 in the case of Russians, and a surplus of immigration of 2,304,717 foreigners. On the other hand, in the six years, 1892–97, the excess of Russian emigration over immigration was 207,353, as compared with an excess of foreign immigration over emigration of only 136,740. During the years 1900–4 inclusive the total emigrants from Russia numbered 2,358,539, of whom 1,144,246 were Russians; while the immigrants numbered 2,333,053, of whom 1,432,057 were foreigners. It is also known that the number of Russian immigrants into the United States in 1891–1902 was 742,869, as compared with 313,469 in 1873–90, or a grand total since 1873 of 1,056,338. By far the greater part of these were Jews. The emigration to Siberia varies much from year to year. It was 26,129 in 1888, and 60,000 in 1898. During the two following years it amounted to an average of over 160,000, but in the years 1901–3 to an average of 84,638 per annum. Altogether some 800,000 peasants are estimated to have settled in Siberia during the period 1886–96, but during the years 1893–1905 no less than four millions in all. There is also some emigration from central Russia to the S. Urals, as well as to some of the steppe governments.

Within the empire a very great diversity of nationalities is comprised, due to the amalgamation or absorption by the Slav race of a variety of Ural-Altaic stocks, of Turko-Tatars, Turko-Mongols and various Caucasian races. In some cases their ethnical relations have not yet been completely determined. According to the results obtained by the census committee of 1897, working on a linguistic basis, the distribution of races was as given in the table opposite:[1]—

Cities.

Taken as a whole, only 13% of the population of Russia lived in towns in 1897, but in the years 1857–60 less than 10% was urban. In Russia proper less than 2% emigrated from the villages to the towns during the forty years ending 1897. The following table shows the urban population in the various divisions of the empire in 1897:—

	Urban Population.	Percentage of Total.
European Russia	12,027,038	12·8
Poland	2,055,892	21·7
Finland	281,216	11·0
Caucasia	1,010,615	10·9
Siberia	473,796	9·3
Central Asia	936,655	12·0
Russian Empire	16,785,212	13·0

There were in European Russia and Poland only twelve cities with more than 100,000 inhabitants in 1884; in 1900 there were sixteen, namely, St Petersburg, Moscow, Warsaw, Odessa, Lódz, Riga, Kiev, Kharkov, Vilna, Saratov, Kazañ, Ekaterinoslav, Rostov-on-the Don, Astrakhan, Tula and Kishinev. In other parts of the empire there were four cities each having over 100,000 inhabitants in that year, namely, Baku, Tiflis, Tashkent and Helsingfors. While only three of these are in middle Russia (Moscow, Tula and Kazañ), eight are in S. Russia. There are thirty-four cities in European Russia and Poland, and forty in the entire empire, with from 50,000 to 100,000 inhabitants each. The rural population live for the most part in villages, not as a rule scattered about the country. In the inclement regions of the N. and in the N. parts of the forest zone the villages are very small. They are larger, but still small, in White Russia, Lithuania and the region of the lakes; but in the steppe governments they are very appreciably bigger, some of the Cossack *stanitsas* or settlements exceeding 20,000, and many of them numbering more than 10,000 inhabitants each. The houses are generally built of wood and wear a poverty-stricken aspect. Owing to the great risks from fire the villages usually cover a large area of ground, and the houses are scattered and straggling. The mortality in most towns is so great that during the last ten years of the 19th century, in a very great number of cities, the deaths exceeded the births by 1 to 4 in the thousand. (P. A. K.; J. T. Be.)

Government and Administration.—Russia was described in the *Almanach de Gotha* for 1910 as "a constitutional monarchy under an autocratic tsar." This obvious contradiction in terms well illustrates the difficulty of defining in a single formula the system, essentially transitional and meanwhile *sui generis*, established in the Russian empire since October 1905. Before this date the fundamental laws of Russia described the power of the emperor as "autocratic and unlimited." The imperial style is still "Emperor and Autocrat of All the Russias"; but in the fundamental laws as remodelled between the imperial manifesto of 17/30 October and the opening of the first *Duma* on the 27th of April 1906, while the name and principle of autocracy was jealously preserved, the word "unlimited" vanished. Not that the régime in Russia had become in any true sense constitutional, far less parliamentary; but the "unlimited autocracy" had given place to a "self-limited autocracy," whether permanently so limited, or only at the discretion of the autocrat, remaining a subject of heated controversy between conflicting parties in the state.[2] Provisionally, then, the Russian governmental system may perhaps be best defined—as M. Chasles suggests[3]—as "a limited monarchy under an autocratic emperor."

The emperor.

At the head of the government is the emperor,[4] whose power is limited only by the provisions of the fundamental laws of the empire. Of these some are ancient and undisputed: the empire may not be partitioned, but descends entire in order of primogeniture, and by preference to the male heir; the emperor and his consort must belong to the Eastern Orthodox Church; the emperor can wear no crown that entails residence abroad. By the manifesto of the 17/30th of October 1905 the emperor voluntarily limited his legislative power by decreeing that no measure was to become law without the consent of the Imperial Duma, a freely elected national assembly. By the law of the 20th of February 1906 the Council of the Empire was associated with the Duma as a legislative Upper House; and from this time the legislative power has been exercised normally by the emperor only in concert with the two chambers.

The Council of the Empire.

The Council of the Empire, or Imperial Council (*Gosudarstvenniy Sovyet*), as reconstituted for this purpose, consists of 196 members, of whom 98 are nominated by the emperor, while 98 are elective. The ministers, also nominated, are *ex officio* members. Of the elected members 3 are returned by the "black" clergy (the monks), 3 by the "white" clergy (seculars),[5] 18 by the corporations of nobles, 6 by the academy of sciences and the universities, 6 by the chambers of commerce, 6 by the industrial councils, 34 by the governments having *zemstvos*, 16 by those having no *zemstvos*, and 6 by Poland. As a legislative body the powers of the Council are co-ordinate with those of the Duma; in practice, however, it has seldom if ever initiated legislation.[6]

The Duma.

The Duma of the Empire or Imperial Duma (*Gosudarstvennaya Duma*), which forms the Lower House of the Russian parliament, consists (since the *ukaz* of the 2nd of June 1907) of 442 members, elected by an exceedingly complicated process, so manipulated as to secure an overwhelming preponderance for the wealthy, and especially the landed classes, and also for the representatives of the Russian as opposed to the subject peoples.

Electoral system.

Each province of the empire, except the now disfranchised steppes of Central Asia,[7] returns a certain proportion of members (fixed in each case by law in such a way as to give a preponderance to the Russian element), in addition to those returned by certain of

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[1] See A. Aïtoff, *Peuples et langages de la Russie* (Paris, 1906), based on the report of the Russian Census Committee of 1897.

[2] M. Stolypin defended the *ukaz* of the 2nd of June 1907, which in flat contradiction of the provisions of the fundamental laws altered the electoral law without the consent of the legislature, on the ground that what the autocrat had granted the autocrat could take away. The members of the Opposition, on the other hand, quoting Art. 84 of the fundamental laws ("The empire is governed on the immutable basis of laws issued according to the established order"), argued that the emperor himself could only act within the limits of the order established by those laws. It is noteworthy that even the third Duma in its address to the throne, if it avoided the tabooed word "Constitution," avoided also all mention of autocracy.

[3] *Le Parlement russe*, p. 151.

[4] *Imperator* is the official style. The Russian translation is *Gosudar*. Popularly, however, the emperor is known by his old Russian title of *tsar* (*q.v.*).

[5] This is the first time since Peter the Great that the clergy have been given a voice in secular affairs in Russia.

[6] The number of the council was formerly not fixed, and there are still honorary councillors who have no right to sit. Thus in 1910 the honorary president of the council was the grand-duke Michael Nicolaievich, the actual president M. G. Akimov. The judicial and administrative work of the old council was in 1906 assigned to separate committees.

[7] These returned 23 members in the first and second Dumas.

TABLE SHOWING DISTRIBUTION OF RACES

			Russia in Europe.	Poland.	Caucasia.	Siberia.	Central Asia.	Finland.	Totals.[1]
ARYANS	*Slavs*	Great Russians	48,558,721	267,160	1,829,793	4,423,803	587,992	5,939	55,673,408
		Little Russians	20,414,866	335,337	1,305,463	223,274	101,611	..	22,380,551
		White Russians	5,823,383	29,347	19,642	12,346	829	..	5,885,547
		Poles	1,109,934	6,755,503	25,117	29,177	11,576	..	7,931,307
		Other Slavs[2]	213,268	7,365	3,855	182	189	..	224,859
	Lithuanians	Lithuanians[3]	1,345,160	305,322	5,121	1,877	1,042	..	1,658,532
		Letts	1,422,021	5,064	1,511	6,714	627	..	1,435,937
	Latin and Teutonic Races	Rumanians	1,121,669	5,223	7,232	..	..	..	1,134,124
		Germans	1,312,188	407,274	56,729	5,424	8,874	1,925	1,790,489
		Greeks	86,626	..	100,299	..	..	..	186,925
		Other Europeans[4]	29,841	..	1,435	..	..	..	34,276
		Swedes	14,199	..	..	..	..	349,733	363,932
	Iranians	Armenians	76,635	..	1,096,461	..	4,862	..	1,173,096
		Persians	1,630	..	29,278	..	8,015	..	38,923
		Tajiks	..	..	..	..	350,397	..	350,397
		Talyshes and Tates	..	..	130,347	..	..	..	130,347
		Kurds	..	..	99,836	..	..	..	99,836
		Ossetes	..	..	171,716	..	..	..	171,716
		Gypsies	16,004	1,056	3,041	6,253	771	..	27,125
SEMITES		Jews	3,714,995	1,267,194	40,498	32,597	7,872	..	5,063,156
URAL-ALTAIANS	*Finns*	Esthonians	989,883	4,372	4,281	4,202	..	..	1,002,738
		Finns	143,068	..	..	..	..	2,352,990	2,496,058
		Lapps	1,812	..	..	..	..	1,300	3,112
		Mordvinians	989,959	..	..	20,802	13,080	..	1,023,841
		Karelians	208,101	..	..	..	..	..	208,101
		Cheremisses	375,439	..	..	..	..	..	375,439
		Syryenians	146,535	..	..	7,083	..	..	153,618
		Permiaks	103,339	..	..	..	..	..	103,339
		Votyaks	420,970	..	..	..	..	..	420,970
		Other Finns[5]	43,393	..	..	24,453	..	..	67,846
		Samoyedes	3,940	..	..	11,929	..	..	15,869
	Turko-Tatars	Tatars	1,953,155	4,336	1,509,785	210,154	60,197	..	3,737,627
		Chuvashes	837,872	929	411	4,232	311	..	843,755
		Bashkirs	1,488,297	83	953	978	2,672	..	1,492,983
		Turks (Osmanlis)	68,807	156	139,419	172	268	..	208,822
		Turkomans	7,938	6	24,522	124	248,767	..	281,357
		Kirghiz	264,059	123	98	32,648	3,988,893	..	4,084,139
		Sarts	184	..	158	305	968,008	..	968,655
		Uzbegs	43	..	..	77	726,414	..	726,534
		Yakuts	..	..	..	227,384	..	..	227,384
		Kara-kalpaks	..	..	1	2	104,271	..	104,274
		Others	466	..	204,561	63	518,949	..	724,039
		Tunguses	..	..	..	70,064	..	..	70,064
	Mongols	Kalmucks	170,865	..	14,409	..	..	..	185,274
		Buriats	..	..	..	288,663	..	..	288,663
CAUCASIANS	*Georgian Races*[6]		..	..	1,352,455	..	..	..	1,352,455
	Circassians and other Caucasians[7]		..	..	1,091,782	..	..	..	1,091,782
KORYAKS, CHUKCHIS, &C.			..	..	..	39,349	..	..	39,349
CHINESE, JAPANESE AND KOREANS			..	..	..	86,113	..	..	86,113

the great cities. The members of the Duma are elected by electoral colleges in each government, and these in their turn are elected, like the *zemstvos* (see below), by electoral assemblies chosen by the three classes of landed proprietors, citizens and peasants. In these assemblies the large proprietors sit in person, being thus electors in the second degree; the lesser proprietors are represented by delegates, and therefore elect in the third degree. The urban population, divided into two categories according to their taxable wealth, elects delegates direct to the college of the government (*Guberniya*), and is thus represented in the second degree; but the system of division into categories, according not to the number of taxpayers but to the amount they pay, gives a great preponderance to the richer classes. The peasants are represented only in the fourth degree, since the delegates to the electoral college are elected by the *volosts* (see below). The workmen, finally, are specially treated. Every industrial concern employing fifty hands or over elects one or more delegates to the electoral

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[1] These totals include in some cases small linguistic groups not mentioned in the table.

[2] About 77% Bulgarians, the rest mostly Bohemians (Czechs).

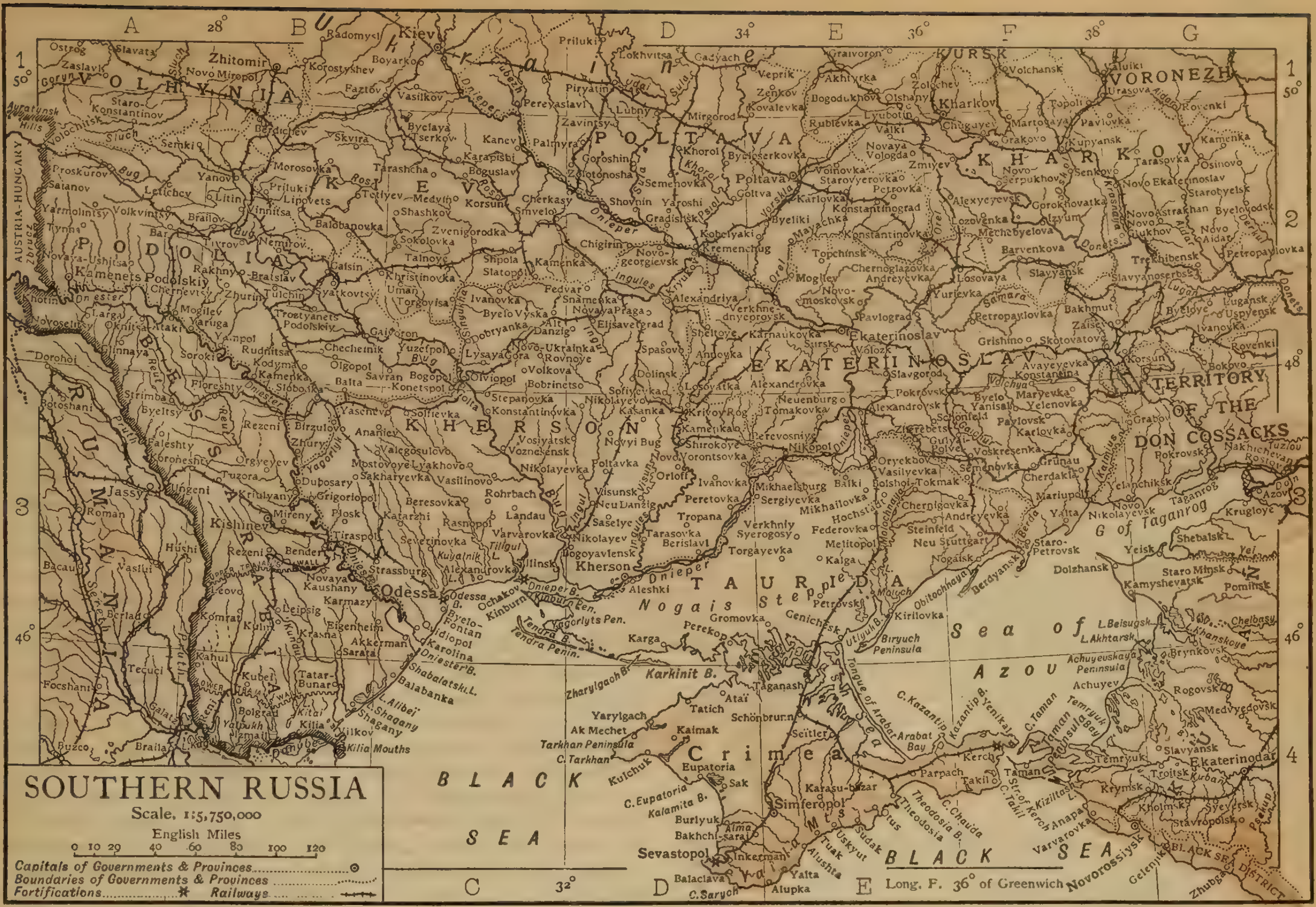
[3] Inclusive of 448,022 Zhmuds.

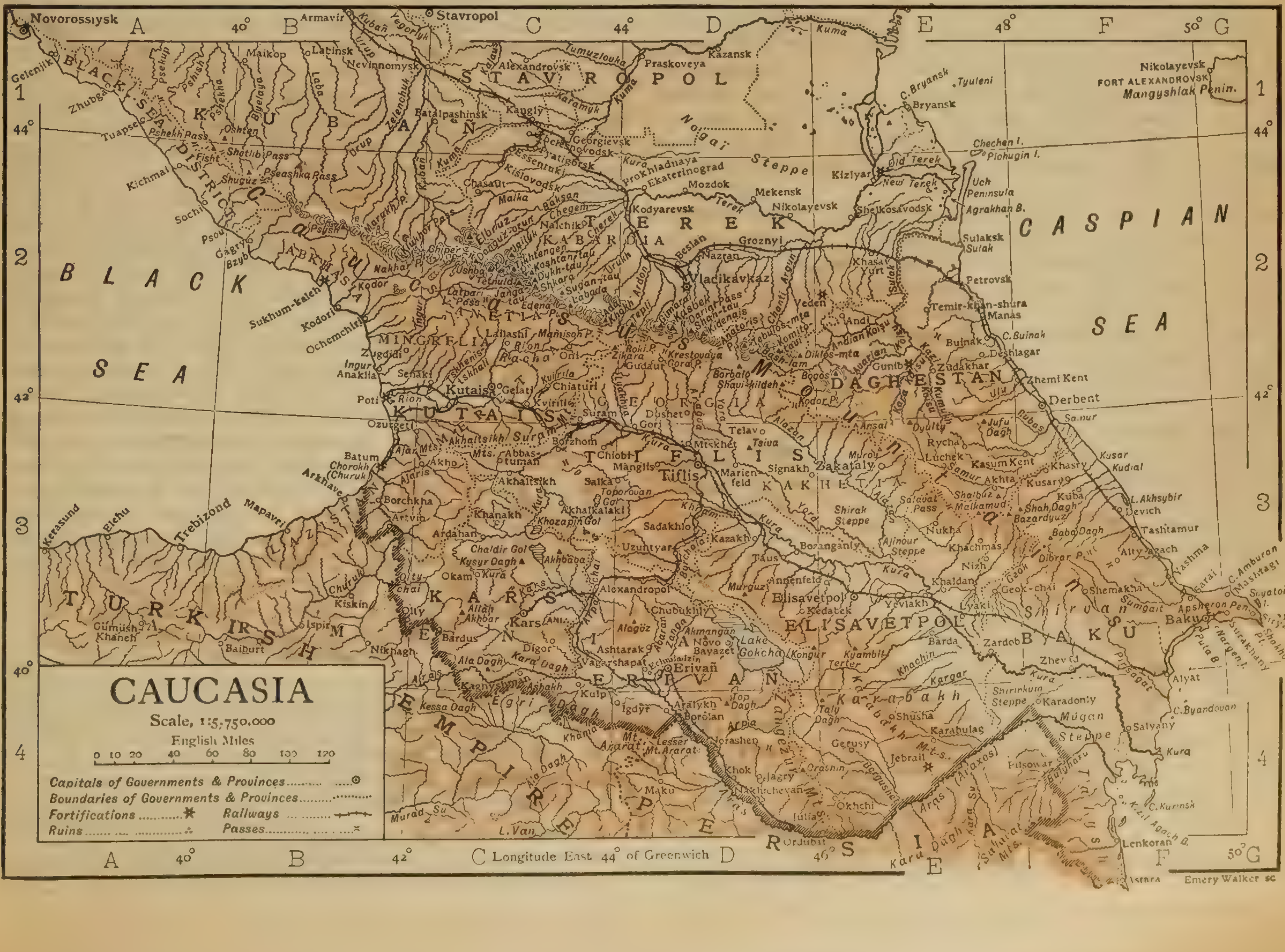
[4] Principally Frenchmen, with Englishmen, Italians, Norwegians, Danes, Dutchmen and Spaniards.

[5] Ethnologically the Bulgarians ought perhaps to come here; but, as a large admixture of Slav blood flows in their veins and they speak a distinctly Slav language, they have in this table been grouped with the Slavs.

[6] Includes Georgians, Mingrelians, Imeretians, Lazes and Svanetians.

[7] For details, see table under the heading CAUCASIA. Of the total given here, 20% are Circassians.


SOUTHERN RUSSIA
Scale, 1:5,750,000
English Miles
0 10 20 40 60 80 100 120
Capitals of Governments & Provinces
Boundaries of Governments & Provinces
Fortifications
Railways
Long. E. 36° of Greenwich
BLACK SEA
Sea of Azov
VOLHYNIA
PODOLIA
KIEV
POLTAVA
KHARKOV
KHERSON
EKATERINOSLAV
TAURIDA
Crimea
TERRITORY OF THE DON COSSACKS
RUMANIA
BESSARABIA
AUSTRIA-HUNGARY


CAUCASIA
Scale, 1:5,750,000
English Miles
0 10 20 40 60 80 100 120
Capitals of Governments & Provinces
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Longitude East 44° of Greenwich
BLACK SEA
CASPIAN SEA
STAVROPOL
KUBAN
TEREK
DAGHESTAN
KUTAIS
TIFLIS
ELISAVETPOL
ERIVAN
BAKU
KARS
TURKISH EMPIRE
PERSIA

Emery Walker sc

college of the government, in which, like the others, they form a separate *curia*.

In the college itself the voting—secret and by ballot throughout—is by majority; and since this majority consists, under the actual system, of very conservative elements (the landowners and urban delegates having $\frac{5}{8}$ths of the votes), the progressive elements—however much they might preponderate in the country—would have no chance of representation at all save for the curious provision that one member at least in each government must be chosen from each of the five classes represented in the college. For example, were there no reactionary peasant among the delegates, a reactionary majority might be forced to return a Social Democrat to the Duma. As it is, though a fixed *minimum* of peasant delegates *must* be returned, they by no means probably represent the opinion of the peasantry. That in the Duma any Radical elements survive at all is mainly due to the peculiar franchise enjoyed by the seven largest towns—St Petersburg, Moscow, Kiev, Odessa, Riga and the Polish cities of Warsaw and Lodz. These elect their delegates to the Duma direct, and though their votes are divided into two *curias* (on the basis of taxable property) in such a way as to give the advantage to wealth, each returning the same number of delegates, the democratic colleges can at least return members of their own complexion.[1]

Powers of the Duma.

The competence of the Russian parliament[2] thus constituted is strictly limited. It shares with the emperor the legislative power, including the discussion and sanctioning of the budget. But, so far as the parliament is concerned, this power is subject to numerous and important exceptions. All measures, *e.g.* dealing with the organization of the army and navy are outside its competence; these are no longer called "laws" but "ordinary administrative rules." Moreover, the procedure of the Houses practically places the control of legislation in the hands of ministers. Any member may bring in a "project of law;" but it has to be submitted to the minister of the department concerned, who is allowed a month to consider it, and himself prepares the final draft laid on the table of the House. Amendments, however, may be and have been carried against the government. Ministers are responsible, moreover, not to parliament but to the emperor. They may be interpellated, but only on the legality, not the policy, of their acts. In the words of M. Stolypin, there is no intention of converting the ministerial bench into a prisoners' dock. If by a two-thirds majority the action of a minister be arraigned, the president of the Imperial Council lays the case before the emperor, who decides. The powers of the parliament over the budget are even more limited, though not altogether illusory. No legislation by means of the budget is allowed, *i.e.* no alteration may be made in credits necessary for carrying out a law. This deprives parliament of control over the administrative departments, all the ministries being thus "armour-plated"—to use the cant phrase current in Russia—except that of ways and communications (railways). The sum of 700,000,000 roubles per annum is thus excepted from the control of the chambers. Other exceptions are the "Institutions of the Empress Marie," which absorb, *inter alia*, the duties on playing-cards and the taxes on places of public entertainment; the imperial civil list, so far as this does not exceed the sum fixed in 1906 (16,359,595 roubles!); the expenses of the two imperial chanceries, 10,000,000 roubles per annum, which constitute in effect a secret service fund. Altogether, half the annual expenditure of the country is outside the control of parliament. Nor is this all. If the budget be not sanctioned by the emperor, that of the previous year remains in force, and the government has power, *motu proprio*, to impose the extra taxes necessary to carry out new laws. In certain circumstances, too, the emperor reserves the right to raise fresh loans. Further, the emperor has the power to issue ordinances having the force of law, *i.e.* under extraordinary circumstances when the Duma is not sitting. These ordinances must, however, be of a temporary nature, must not infringe the fundamental laws or statutes passed by the two chambers, or change the electoral system, and must be laid upon the table of the Duma at the first opportunity. Since, however, the emperor has the power of proroguing or dissolving the Duma as often as he pleases, it is clear that these temporary ordinances might in effect be made permanent. Finally, the emperor has the right to proclaim anywhere and at any time a state of siege. In this way the fundamental laws were suspended not only in Poland but in St Petersburg and other parts of the empire during the greater part of the four years succeeding the grant of the constitution.

It should be noted, none the less, that the third Duma succeeded in establishing its position, and that in view of its useful activities even the extreme Right came to realize that there could be no return to the old undisguised absolutist régime (see *History*, below, *ad fin.*).

Council of Ministers.

By the law of the 18th of October (November 1) 1905, to assist the emperor in the supreme administration a Council of Ministers (*Sovyet Ministrov*) was created, under a minister president, the first appearance of a prime minister in Russia. This council consists of all the ministers and of the heads of the principal administrations. The ministries are as follows: (1) of the Imperial Court, to which the administration of the apanages, the chapter of the imperial orders, the imperial palaces and theatres, and the Academy of Fine Arts are subordinated; (2) Foreign Affairs; (3) War and Marine; (4) Finance; (5) Commerce and Industry (created in 1905); (6) Interior (including police, health, censorship and press, posts and telegraphs, foreign religions, statistics); (7) Agriculture; (8) Ways and Communications; (9) Justice; (10) Public Instruction. Dependent on the Council of Ministers are two other councils: the Holy Synod and the Senate.

Holy Synod.

The Holy Synod (established in 1721) is the supreme organ of government of the Orthodox Church in Russia. It is presided over by a lay procurator, representing the emperor, and consists, for the rest, of the three metropolitans of Moscow, St Petersburg and Kiev, the archbishop of Georgia, and a number of bishops sitting in rotation.

The Senate.

The Senate (*Pravitelstvuyushchi Senat*, *i.e.* directing or governing senate), originally established by Peter the Great, consists of members nominated by the emperor. Its functions, which are exceedingly various, are carried out by the different departments into which it is divided. It is the supreme court of cassation (see *Judicial System*, below); an audit office, a high court of justice for all political offences; one of its departments fulfils the functions of a heralds' college. It also has supreme jurisdiction in all disputes arising out of the administration of the empire, notably differences between the representatives of the central power and the elected organs of local self-government. Lastly, it examines into registers and promulgates new laws, a function which, in theory, gives it a power, akin to that of the Supreme Court of the United States, of rejecting measures not in accordance with the fundamental laws.

Provincial administration.

For purposes of provincial administration Russia is divided into 78 governments (*guberniya*), 18 provinces (*oblast*) and 1 district (*okrug*). Of these 11 governments, 17 provinces and 1 district (Sakhalin) belong to Asiatic Russia. Of the rest 8 governments are in Finland, 10 in Poland. European Russia thus embraces 59 governments and 1 province (that of the Don). The Don province is under the direct jurisdiction of the ministry of war; the rest have each a governor and deputy-governor, the latter presiding over the administrative council. In addition there are governors-general, generally placed over several governments and armed with more extensive powers,

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[1] Thus M. Guchkov, leader of the Octobrists, and M. Miliukov, leader of the cadets, were both returned by the second *curia* of St Petersburg to the third Duma.

[2] Strictly speaking, the title is inapplicable, there being no collective official name for the two chambers. The word parliament may, however, be used as a convenient term, failing a better.

Police.

usually including the command of the troops within the limits of their jurisdiction. In 1906 there were governors-general in Finland, Warsaw, Vilna, Kiev, Moscow and Riga. The larger cities (St Petersburg, Moscow, Odessa, Sevastopol, Kertch-Yenikala, Nikolayev, Rostov) have an administrative system of their own, independent of the governments; in these the chief of police acts as governor. As organs of the central government there are further, the *ispravniki*, chiefs of police in the districts into which the governments are divided. These are nominated by the governors,[1] and have under their orders in the principal localities commissaries (*stanovoï pristav*). *Ispravniki* and *stanovoï* alike are armed with large and ill-defined powers; and, since they are for the most part illiterate and wholly ignorant of the law, they have proved exasperating engines of oppression. Towards the end of the reign of Alexander II., the government, in order to preserve order in the country districts, also created a special class of mounted rural policemen (*uryadniki*, from *uriad*, order), who, armed with power to arrest all suspects on the spot, rapidly became the terror of the countryside.[2] Finally, in the towns every house is provided with a detective policeman in the person of the porter (*dvornik*), who is charged with the duty of reporting to the police the presence of any suspicious characters or anything else that may interest them.[3]

Secret police.

In addition to the above there is also a police organization, in direct subordination to the ministry of the interior, of which the principal function is the discovery, prevention and extirpation of political sedition. A secret police, armed with inquisitorial and arbitrary powers, has always existed in autocratic Russia. Its most famous development was the so-called "Third Section" (of the imperial chancery) instituted by the emperor Nicholas I. in 1826. This was entirely independent of the ordinary police, but was associated with the previously existing corps of gendarmes (*Korpus Zhandarmov*), whose chief was placed at its head. Its object had originally been to keep the emperor in close touch with all the branches of the administration and to bring to his notice any abuses and irregularities (see NICHOLAS I.), and for this purpose its chief was in constant personal intercourse with the sovereign. Actually, however, its activity, directed mainly to the discovery of political offences, degenerated into a hideous reign of terror. Its organization was spread all over Russia; its procedure was secret and summary (transportation by administrative order); and, its instruments being for the most part ignorant and largely corrupt, its victims were counted by thousands.

The "Third Section" was suppressed by Alexander II. in 1880, but only in name. In fact it was transformed into a separate department of the ministry of the interior, and, provided with an enormous secret service fund, soon dominated the whole ministry. The corps of gendarmes was also incorporated in this department, the under-secretary of the interior being placed at its head and at that of the police generally, with practically unlimited jurisdiction in all cases which, in the judgment of the minister of the interior, required to be dealt with by processes outside the ordinary law. In 1896 the powers of the minister were extended at the expense of those of the under-secretary, who remained only at the head of the corps of gendarmes; but by a law of the 24th of September 1904 this was again reversed, and the under-secretary was again placed at the head of all the police with the title of under-secretary for the administration of the police.

The mir.

Local Elected Administrative Bodies.—Alongside the local organs of the central government in Russia there are three classes of local elected bodies charged with administrative functions: (1) the peasant assemblies in the *mir* and the *volost*, (2) the *zemstvos* in the 34 governments of Russia proper, (3) the municipal *dumas*. Of these the peasant assemblies are the most interesting and in some respects the most important, since the peasants (*i.e.* three-quarters of the population of Russia) form a class apart,[4] largely excepted from the incidence of the ordinary law, and governed in accordance with their local customs. The *mir* itself, with its customs, is of immemorial antiquity (see VILLAGE COMMUNITIES); it was not, however, till the emancipation of the serfs in 1861 that the village community was withdrawn from the patrimonial jurisdiction of the landowning nobility and endowed with self-government. The assembly of the *mir* consists of all the peasant householders of the village.[5] These elect a head-man (*starosta*) and a collector of taxes, who was responsible, at least until the *ukaz* of October 1906, which abolished communal responsibility for the payment of taxes, for the repartition among individuals of the taxes imposed on the commune.

The volost.

A number of *mirs* are united into a *volost*, or canton, which has an assembly consisting of elected delegates from the *mirs*. These elect an elder (*starshina*) and, hitherto, a court of justice (*volostnye sud*). See *Judicial System*, below. The self-government of the *mirs* and *volosts* is, however, tempered by the authority of the police commissaries (*stanovoï*) and by the power of general oversight given to the nominated "district committees for the affairs of the peasants."

The zemstvos.

The system of local self-government is continued, so far as the 34 governments of old Russia are concerned,[6] in the elective district and provincial assemblies (*zemstvos*). These bodies, one for each district and another for each province or government, were created by Alexander II. in 1864. They consist of a representative council (*zemskoye sobranye*) and of an executive board (*zemskaya uprava*) nominated by the former. The board consists of five classes of members: (1) large landed proprietors (nobles owning 590 acres and over), who sit in person; (2) delegates of the small landowners, including the clergy in their capacity of landed proprietors; (3) delegates of the wealthier townsmen; (4) delegates of the less wealthy urban classes; (5) delegates of the peasants, elected by the *volosts*.[7] The rules governing elections to the *zemstvos* were taken as a model for the electoral law of 1906 and are sufficiently indicated by the account of this given below. The *zemstvos* were originally given large powers in relation to the incidence of taxation, and such questions as education, public health, roads and the like. These powers were, however, severely restricted by the emperor Alexander III. (law of 12/25 June 1890), the *zemstvos* being absolutely subordinated to the governors, whose consent was necessary to the validity of all their decisions, and who received drastic powers of discipline over the members.[8] It was not till 1905 that the *zemstvos* regained, at least *de facto*, some of their independent initiative. The part played by the congress of *zemstvos* in the earlier stages of the Russian revolution is outlined below (see *History:* § 2. *Development of the Russian Constitution*).

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[1] From Catherine II.'s time to that of Alexander II. they were elected by the nobles. This was changed in consequence of the emancipation of the serfs.

[2] They were soon nicknamed *Kuryadniki*, chicken-stealers (from *Kura*, hen). See Leroy-Beaulieu, *L'Empire des tsars*, ii. 134.

[3] The *dvornik* is on duty for sixteen hours at a stretch, during which he is not allowed to sleep or even to shelter in the porch.

[4] Until the *ukaz* of October 18, 1906, the peasant class was stereotyped under the electoral law. No peasant, however rich, could qualify for a vote in any but the peasants' electoral colleges. The *ukaz* allowed peasants with the requisite qualifications to vote as landowners. At the same time the Senate interpreted the law so as to exclude all but heads of families actually engaged in farming from the vote for the Duma.

[5] None but peasants—not even the noble-landowner—has a voice in the assembly of the *mir*.

[6] Sixteen provinces have no *zemstvos*, *i.e.* the three Baltic provinces, the nine western governments annexed from Poland by Catherine II., and the Cossack provinces of the Don, Astrakhan, Orenburg and Stavropol.

[7] By the law of the 12th (25th) of June 1890 the peasant members of the *zemstvos* were to be nominated by the governor of the government or province from a list elected by the *volosts*.

[8] In spite of these restrictions and of an electoral system which tended to make these assemblies as strait-laced and reactionary as any government bureau, the *zemstvos* did good work, notably educational, in those provinces where the proprietors were inspired with a more liberal spirit. Many *zemstvos* also made extensive and valuable inquiries into the condition of agriculture, industry and the like.

Municipal dumas.

Since 1870 the municipalities in European Russia have had institutions like those of the *zemstvos*. All owners of houses, and tax-paying merchants, artisans and workmen are enrolled on lists in a descending order according to their assessed wealth. The total valuation is then divided into three equal parts, representing three groups of electors very unequal in number, each of which elects an equal number of delegates to the municipal *duma*. The executive is in the hands of an elective mayor and an *uprava*, which consists of several members elected by the *duma*. Under Alexander III., however, by laws promulgated in 1892 and 1894, the municipal *dumas* were subordinated to the governors in the same way as the *zemstvos*. In 1894 municipal institutions, with still more restricted powers, were granted to several towns in Siberia, and in 1895 to some in Caucasia.

Baltic provinces.

In the Baltic provinces (Courland, Livonia and Esthonia) the landowning classes formerly enjoyed considerable powers of self-government and numerous privileges in matters affecting education, police and the administration of local justice. But by laws promulgated in 1888 and 1889 the rights of police and manorial justice were transferred from the landlords to officials of the central government. Since about the same time a process of rigorous Russification has been carried through in the same provinces, in all departments of administration, in the higher schools and in the university of Dorpat, the name of which was altered to Yuriev. In 1893 district committees for the management of the peasants' affairs, similar to those in the purely Russian governments, were introduced into this part of the empire.

System before 1864.

Judicial System.—Not the least valuable of the gifts of the "tsar emancipator," Alexander II., to Russia was the judicial system established by the statute (*Sudebni Ustav*) of the 20th of November 1864. The system which this superseded was not indigenous to Russia, but had been set up by Peter the Great, who had taken as his model the inquisitorial procedure at that time in vogue on the continent of western Europe. Both civil and criminal procedure were secret. All the proceedings were conducted in writing, and the judges were not confronted with either the parties or the witnesses until they emerged to deliver judgment. This secrecy, combined with the fact that the judges were very ill paid, led to universal bribery and corruption. To check this courts were multiplied (there were five, six or more instances), which only multiplied the evil. Documents accumulated from court to court, till none but the clerks who had written them could tell their gist; costs were piled up; and all this, combined with the confusion caused by the chaotic mass of imperial ukazes, ordinances and ancient laws—often inconsistent or flatly contradictory—made the administration of justice, if possible, more dilatory and capricious than in the old, unreformed English court of chancery. Above all, there was no dividing line between the judiciary and the administrative functions. The judges were not so by profession; they were merely members of the official class (*chinovniks*), the prejudices and vices of which they shared.

Law of 1864.

Of this system—except so far as the confusion of the laws is concerned—the reform of 1864 made a clean sweep. The new system established—based partly on English, partly on French models—was built up on certain broad principles: the separation of the judicial and administrative functions, the independence of the judges and courts, the publicity of trials and oral procedure, the equality of all classes before the law. Moreover, a democratic element was introduced by the adoption of the jury system and—so far as one order of tribunal was concerned—the election of judges. The establishment of a judicial system on these principles constituted, as M. Leroy-Beaulieu justly observes, a fundamental change in the conception of the Russian state, which, by placing the administration of justice outside the sphere of the executive power, ceased to be a despotism. This fact made the new system especially obnoxious to the bureaucracy, and during the latter years of Alexander II. and the reign of Alexander III. there was a piecemeal taking back of what had been given. It was reserved for the third Duma, after the revolution, to begin the reversal of this process.[1]

The system established by the law of 1864 is remarkable in that it set up two wholly separate orders of tribunals, each having their own courts of appeal and coming in contact only in the senate, as the supreme court of cassation. The first of these, based on the English model, are the courts of the elected justices of the peace, with jurisdiction over petty causes, whether civil or criminal; the second, based on the French model, are the ordinary tribunals of nominated judges, sitting with or without a jury to hear important cases.

Justices of the peace.

The justices of the peace, who must be landowners[2] or (in towns) persons of moderate property, are elected by the municipal *dumas* in the towns, and by the *zemstvos* in the country districts, for a term of three years. They are of two classes: (1) acting justices (*uchastokvye mirovye sudi*); (2) honorary justices (*pochetnye mirovye sudi*). The acting justice sits normally alone to hear causes in his canton of the peace (*uchastok*), but, at the request of both parties to a suit, he may call in an honorary justice as assessor or substitute.[3] In all civil cases involving less than 30 roubles, and in criminal cases punishable by no more than three days' arrest, his judgment is final. In other cases appeal can be made to the "assize of the peace" (*mirovye syezd*), consisting of three or more justices of the peace meeting monthly (cf. the English quarter sessions), which acts both as a court of appeal and of cassation. From this again appeal can be made on points of law or disputed procedure to the senate, which may send the case back for retrial by an assize of the peace in another district.

The ordinary tribunals.

The ordinary tribunals, in their organization, personnel and procedure, are modelled very closely on those of France (see FRANCE, *Law and Institutions*). From the town judge (*ispravnik*), who, in spite of the principle laid down in 1864, combines judicial and administrative functions, an appeal lies (as in the case of the justices of the peace) to an assembly of such judges; from these again there is an appeal to the district court (*okrugniya sud*), consisting of three judges;[4] from this to the court of appeal (*sudebniya palata*); while over this again is the senate, which, as the supreme court of cassation, can send a case for retrial for reason shown. The district court, sitting with a jury, can try criminal cases without appeal, but only by special leave in each case of the court of appeal. The senate, as supreme court of cassation, has two departments, one for civil and one for criminal cases. As a court of justice its main drawback is that it is wholly unable to cope with the vast mass of documents representing appeals from all parts of the empire.

Ecclesiastical courts.

Two important classes in Russia stood more or less outside the competence of the above systems: the clergy and the peasants. The ecclesiastical courts still retain a jurisdiction over the clergy which they have lost elsewhere in Europe; and in them the old secret written procedure survives. Their interest for the laity lies mainly in the fact that marriage and divorce fall within their competence; and their reform has been postponed largely because the wealthy and corrupt society of the Russian capital preferred a system which makes divorce easily purchasable and avoids at the same time the scandal of publicity. The case of the peasants is more interesting, and deserves a somewhat more detailed notice.

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[1] An *ukaz* of 1879 gave the governors the right to report secretly on the qualifications of candidates for the office of justice of the peace. In 1889 Alexander III. abolished the election of justices of the peace, except in certain large towns and some outlying parts of the empire, and greatly restricted the right of trial by jury. The confusion of the judicial and administrative functions was introduced again by the appointment of officials as judges. In 1909 the third Duma restored the election of justices of the peace.

[2] The justices, though noble-landowners, are almost exclusively of very moderate means, and, though elected by the land-owning class, they are—according to M. Leroy-Beaulieu—prejudiced in favour of the poor *mujik* rather than of the wealthy landlord.

[3] These honorary justices are mainly recruited from the ranks of the higher bureaucracy and the army.

[4] This corresponds to the French *cour d'arrondissement*, but its jurisdiction is, territorially, much wider, often covering several districts or even a whole government.

Volost courts.

The peasants, as already stated, form a class apart, untouched by the influence of Western civilization, the principles of which they are quite incapable of understanding or appreciating. This fact was recognized by the legislators of 1864, and beneath the statutory tribunals created in that year the special courts of the peasants were suffered to survive. These were indeed but a few years older. Up to 1861, the date of the emancipation, the peasant serfs had been under the patrimonial jurisdiction of their lords. The edict of emancipation abolished this jurisdiction, and set up instead in each *volost* a court particular to the peasants (*volostnye sud*), of which the judges and jury, themselves peasants, were elected by the assembly of the *volost* (*volostnye skhod*) each year. In these courts the ordinary written law had little to say; the decisions of the *volost* courts were based on the local customary law, which alone the peasants, and the peasants alone, understand. The justice administered in them was patriarchal and rough, but not ineffective. All civil cases involving less than 100 roubles value were within their competence, and more important cases by consent of the parties. They acted also as police courts in the case of petty thefts, breaches of the peace and the like. They were also charged with the maintenance of order in the *mir* and the family, punishing infractions of the religious law, husbands who beat their wives, and parents who ill-treated their children. The penalty of flogging, preferred by the peasants to fine or imprisonment, was not unknown. The judges were, of course, wholly illiterate, and this tended to throw the ultimate power into the hands of the clerk (*pisar*) of the court, who was rarely above corruption.

In 1880, according to the observations of M. Leroy-Beaulieu,[1] the fines inflicted by the court were commonly paid in *vodka*, which was consumed on the premises by the judges and the parties to the suit; there is no reason to suppose that this amiable custom has been abandoned.

The peasants are not compelled to go to the *volost* court. They can apply to the police commissaries (*stanovoï*) or to the justices of the peace; but the great distances to be traversed in a country so sparsely populated makes this course highly inconvenient.[2] On the other hand, from the *volost* court there is no appeal, unless it has acted *ultra vires* or illegally. In the latter case a court of cassation is provided in the district committee for the affairs of the peasants (*Uyezdnoe po krestianskim dolam prisutstviye*), which has superseded the assembly of arbiters of the peace (*mirovye posredniki*) established in 1866.[3]

(W. A. P.)

Education.

Previous to the revolution of 1905 but little progress had been made in Russia as regards education.[4] Distrust of the natural sciences, even in their technical applications, and of Western ideas of free government; desire to make university education, and even secondary education, a privilege of the wealthier classes; neglect of primary education, coupled with suppression by the ministry of public instruction of all initiative, private and public, in the matter of disseminating education among the illiterate classes—these were the distinctive features of the educational policy of the last twenty years of the 19th century. It was only towards its close that a change took place in the attitude of the government towards technical education, and a few high and middle technical schools were opened. It was only then, too, that a reform was started in secondary education, with the object of revising the so-called "classical" system favoured in the lyceums since the 'seventies, the complete failure of which has been demonstrated after nearly thirty years of experiment. Apart from the schools under the ministry of war (Cossack *voiskos* and schools at the barracks), the great bulk of the primary schools are either under the ministry of public instruction or of the Holy Synod. Those under the latter body are of recent growth, the policy of the last twenty years of the 19th century having been to hand over the budget allowances for primary instruction to the Holy Synod, which opened parish schools under the local priests. The schools under the Synod are themselves divided into two categories: parish schools and reading schools of an inferior grade. No teaching certificate is required by the teachers in either class of school, the permission of the bishop (like the French *lettre d'obédience* of 1849) being sufficient. The consequence is, that the village priests, being too much occupied with their parochial duties, cannot give more than casual or perfunctory attention to the schools, and the numerous pupils either exist on paper only, or are handed over to half-educated cantors, deacons or hired teachers. One good feature of the Russian primary school system, however, is that in many villages there are school gardens or fields; in nearly 1000 schools, bee-keeping, and in 300 silkworm culture is taught; while in some 900 schools the children receive instruction in various trades; and in 300 schools in *slöjd* (a system of manual training originated in Finland). Girls are taught handwork in many schools. Nearly 50% of the teachers are women. The total expenditure on primary schools in 1900 was £5,300,000 (about the average in recent years), of which 20% was supplied by the state, 23% by the *zemstvos*, 35½% by the village communities and the municipalities and 11½% by private persons. The middle schools are maintained by the state, which contributes 25% of the expenditure of the classical and technical schools, by the fees of the pupils (30%), and by donations from the *zemstvos* and municipalities. The total grants from the state exchequer for education of all grades in all parts of the empire amounted in 1906 to £8,107,000. The progress of primary education is illustrated by the fact that, while in 1885 there was one school for every 2665 inhabitants and one pupil for every 48 inhabitants, in 1898 the figures were 1643 and 31 inhabitants respectively. According to the census of 1897 the number of illiterates varied from 89·2 to 44·9% of the population in the rural districts, and from 63·6 to 37·2% in the urban.

For higher education there were in 1904 only 9 universities (Yuriev or Dorpat, Kazañ, Kharkov, Kiev, Moscow, Odessa, St Petersburg, Warsaw and Tomsk), with 19,400 students, 6 medical academies (one for women), 6 theological academies, 6 military academies, 5 philological institutes, 3 Eastern languages institutes, 3 law schools, 4 veterinary institutes, 4 agricultural colleges, 2 mining institutes, 4 engineering institutes, 2 universities for women (930 students at St Petersburg), 3 technical pedagogic schools, 10 technical institutes, 1 forestry and 1 topographical school. There has, however, been much activity since 1905 in the establishment of new educational institutions, notably technical and commercial schools, which are placed under the new minister of commerce and industry. Finland has a university of its own at Helsingfors.

The standard of teaching in the universities is on the whole very high, and may be compared to that of the German universities. The students are hard working, and generally very intelligent. Mostly sons of poor parents, they live in extreme poverty, supporting themselves chiefly by translating and by tutorial work.

The state of secondary education still leaves much to be desired. The steady tendency of Russian society towards increasing the number of secondary schools, where instruction would be based on the study of the natural sciences, is checked by the government in favour of the classical gymnasiums.[5] Sunday schools and public lectures are virtually prohibited.

A characteristic feature of the intellectual movement in Russia is its tendency to extend to women the means of higher instruction. The gymnasiums for girls are both numerous and good. In addition to these, notwithstanding government opposition, a series of higher schools, in which careful instruction is given in natural and social sciences, have been opened in the chief cities under the name of "pedagogical courses." At St Petersburg a women's medical academy, the examinations of which were even more searching than those of the ordinary academy (especially as regards diseases of women and children), was opened, but after about one hundred women had received the degree of M.D. it was suppressed by government. In several university towns there are free teaching establishments for women, supported by subscription, with programmes and examinations equal to those of the universities.

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[1] *L'Empire des tsars*, ii. p. 310.

[2] In the ordinary tribunals weight is given to the "customs" of the peasants, even when these conflict with the written law.

[3] The abolition of the special courts of the peasants was announced in the same imperial *ukaz* (18th of October 1906) which promised the relief of the peasants from the arbitrary control of the communes, and permission for them to migrate elsewhere without losing their communal rights. This was made part of the general reform of Russian local government, which in the autumn of 1910 was still under the consideration of the Duma.

[4] Of the effects of the political changes in Russia on the educational system of the country it was, even in the autumn of 1910, too early to say anything save that an undoubted impetus had been given to the effort for improvement, and that the question had been seriously taken in hand by the imperial administration and the Duma. What form it would ultimately take depended still on the balance between the forces of conservatism and change, the suspicious temper of the autocracy being revealed, during the years of unstable equilibrium, by the alternate concession and withdrawal of privileges, *e.g.* in the matter of the independence of the universities. Any account of the educational system cannot, therefore, be otherwise than historical and provisional [Ed.].

[5] An imperial rescript of 10th of June 1902 foreshadowed a reorganization of secondary education, and an imperial *ukaz* of 15th of March 1903 laid down the lines on which this was to proceed. The old curriculum of the *Real* schools is now superseded.

Scientific societies. The natural sciences are much cultivated in Russia. Besides the Academy of Science, the Moscow Society of Naturalists, the Mineralogical Society, the Geographical Society, with its Caucasian and Siberian branches, the archaeological societies and the scientific societies of the Baltic provinces, all of which are of old and recognized standing, there have lately sprung up a series of new societies in connexion with each university, and their serials are yearly growing in importance, as, too, are those of the Moscow Society of Friends of Natural Science, the Chemico-Physical Society, and various medical, educational and other associations. The work achieved by Russian savants, especially in biology, physiology and chemistry, and in the sciences descriptive of the vast territory of Russia, is well known to Europe.

Finance. The ordinary revenue of the empire is in excess of the ordinary expenditure, but the extraordinary expenditure not only swallows up this surplus, but necessitates the raising of fresh loans every year. On the other hand, there is a good deal to show for this extraordinary expenditure. A considerable number of new railways, including the Siberian, have been built with money obtained from that source. But since 1894 all extraordinary items of expenditure, with the exception of those for the construction of new lines of railway, have been defrayed out of ordinary revenue. The only sources of extraordinary revenue still remaining under that head are the money derived from loans and the perpetual deposits in the Imperial Bank. The ordinary revenue, obtained principally from the sale of spirits (28%), which is a state monopoly, from state railways (23½%) and customs (10½%), steadily rose from a total of £132,750,000 in 1895 to a total of £214,360,000 in 1905. Other noteworthy sources of revenue are trade licences, direct taxes on lands and forests, stamp duties, posts and telegraphs, indirect taxes on tobacco, sugar and other commodities, the crown forests, and land redemption payable annually by the peasants since 1861. At the same time the total ordinary expenditure has increased at a similarly steady rate, namely, from £119,391,000 in 1895 to £202,544,000 in 1905. In 1904, 81½% of the extraordinary expenditure, namely, £71,550,000, was incurred in consequence of the war with Japan, and to this must be added in 1906 a further expenditure of £42,085,000. The total national debt of Russia nearly trebled between 1852 (£57,038,600) and 1862 (£145,500,000), and again between 1872 (£242,277,000) and 1892 (£526,109,000) it more than doubled, while by 1906 it amounted altogether to £812,040,000. Of the total, 77% stands at 4% and 17 at less than 4%.

Army. The system of obligatory military service for all, introduced in 1874, has been maintained, but the six years' term of service has been reduced to five, while the privileges granted to young men who have received various degrees of education have been slightly extended. During the reign of Alexander III. efforts were mainly directed towards—(1) reducing the time required for the mobilization of the army; (2) increasing the immediate readiness of cavalry for war and its fitness for serving as mounted infantry (dragoon regiments taking the place of hussars and lancers); (3) strengthening the W. frontier by fortresses and railways; and (4) increasing the artillery, siege and train reserves. Further, the age releasing from service was raised from 40 to 43 years and the militia (*landsturm*) was reorganized. The measures taken during the reign of Nicholas II. have been chiefly directed towards increasing the fighting capacity and readiness for immediate service of the troops in Asia, and towards the better reorganization of the local irregular militia forces. Broadly speaking, the army is divided into regulars, Cossacks and militia. The peace strength of the army is estimated at 42,000 officers and 1,100,000 men (about 950,000 combatants), while the war strength is approximately 75,000 officers and 4,500,000 men. However, this latter figure is merely nominal, the available artillery and train service being much below the strength which would be required for such an army; estimates which put the military forces of Russia in time of war at 2,750,000—irrespective of the armies which may be levied during the war itself—seem to approach more nearly the strength of the forces which could actually be mustered. The infantry and rifles are armed with small-bore magazine rifles, and the active artillery have steel breech-loaders with extreme ranges of 4150 to 4700 yds.

Navy. Before the Japanese war Russia maintained four separate squadrons: the Baltic, the Black Sea, the Pacific and the Caspian. But in the operations before Port Arthur and in the disastrous battle of Tsushima the Russian fleets were almost completely annihilated. The bulk of the Black Sea fleet and a few other battleships were, however, still left, and since 1904 steps have been taken to build new ships, both battleships and powerful cruisers. Kronstadt is the naval headquarters in the Baltic, Sevastopol in the Black Sea and Vladivostok on the Pacific.

Fortresses.—The chief first-class fortresses of Russia are Warsaw and Novogeorgievsk in Poland, and Brest-Litovsk and Kovno in Lithuania. The second-class fortresses are Kronstadt and Sveaborg in the Gulf of Finland, Ivangorod in Poland, Libau on the Baltic Sea, Kerch on the Black Sea and Vladivostok on the Pacific. In the third class are Viborg in Finland, Ossovets and Ust Dvinsk (or Dünamünde) in Lithuania, Sevastopol and Ochakov on the Black Sea, and Kars and Batum in Caucasia. There are, moreover, 46 forts and fortresses unclassed, of which 6 are in Poland, 8 in W. and S.W. Russia, and the remainder (mere fortified posts) in the Asiatic dominions.

II. European Russia

Geography.—**Boundaries.** The administrative boundaries of European Russia, apart from Finland, coincide broadly with the natural limits of the East-European plains. In the N. it is bounded by the Arctic Ocean; the islands of Novaya-Zemlya, Kolguyev and Vaigach also belong to it, but the Kara Sea is reckoned to Siberia. To the E. it has the Asiatic dominions of the empire, Siberia and the Kirghiz steppes, from both of which it is separated by the Ural Mountains, the Ural river and the Caspian—the administrative boundary, however, partly extending into Asia on the Siberian slope of the Urals. To the S. it has the Black Sea and Caucasia, being separated from the latter by the Manych depression, which in Post-Pliocene times connected the Sea of Azov with the Caspian. The W. boundary is purely conventional: it crosses the peninsula of Kola from the Varanger Fjord to the Gulf of Bothnia; thence it runs to the Kurisches Haff in the southern Baltic, and thence to the mouth of the Danube, taking a great circular sweep to the W. to embrace Poland, and separating Russia from Prussia, Austrian Galicia and Rumania.

It is a special feature of Russia that she has no free outlet to the open sea except on the ice-bound shores of the Arctic Ocean. Even the White Sea is merely a gulf of that ocean. The deep indentations of the gulfs of Bothnia and Finland are surrounded by what is ethnologically Finnish territory, and it is only at the very head of the latter gulf that the Russians have taken firm foothold by erecting their capital at the mouth of the Neva. The Gulf of Riga and the Baltic belong also to territory which is not inhabited by Slavs, but by Finnish races and by Germans. It is only within the last hundred and thirty years that the Russians have definitely taken possession of the N. shores of the Black Sea and the Sea of Azov. The E. coast of the Black Sea belongs properly to Transcaucasia, a great chain of mountains separating it from Russia. But even this sheet of water is an inland sea, the only outlet of which, the Bosphorus, is in foreign hands, while the Caspian, an immense shallow lake, mostly bordered by deserts, possesses more importance as a link between Russia and her Asiatic settlements than as a channel for intercourse with other countries.

Configuration. The great territory occupied by European Russia—1600 m. in length from N. to S., and nearly as much from E. to W.—is on the whole a broad elevated plain, ranging between 500 and 900 ft. above sea-level, deeply cut into by river-valleys, and bounded on all sides by broad swellings or low mountain-ranges: the lake plateaus of Finland and the Maanselkä heights in the N.W.; the Baltic coast-ridge and spurs of the Carpathians in the W., with a broad depression between the two, occupied by Poland; the Crimean and Caucasian mountains in the S.; and the broad but moderately high swelling of the Ural Mountains in the E.

From a central plateau, which comprises the governments of Tver, Moscow, Smolensk and Kursk, and projects E. towards Samara, attaining an average elevation of 800 to 900 ft. above the sea, the surface slopes gently in all directions to a level of 300 to 500 ft. Then it again rises gradually as it approaches the hilly tracts which enclose the great plain. This central swelling may be considered a continuation towards the E.N.E. of the great line of upheavals of N.W. Europe; the elevated grounds of Finland would then represent a continuation of the Scanian plateaus of S. Sweden, and the northern mountains of Finland a continuation of Kjölen (the Keel) which separate Sweden from Norway, while the other great line of upheaval of the old continent, which runs N.W. to S.E., would be represented in Russia by the Caucasus in the S. and by the Timan ridge of the Pechora basin in the N.

The hilly aspect of several parts of the central plateau is not due to foldings of the strata, which for the most part appear to be horizontal, but chiefly to the excavating action of the rivers, whose valleys are deeply eroded in the plateau, especially on its borders. The round flattened summits of the Valdai plateau do not rise above 1100 ft., and they present the appearance of mountains only in consequence of the depths of the valleys—the rivers which flow towards the depression of Lake Peipus being only 200 to 250 ft. above the sea. The same is true of the plateaus of Livonia, "Wendish Switzerland," and the government of Kovno, which do not exceed 1000 ft. at their highest points; and again of the E. spurs of the Baltic coast-ridge between the governments of Grodno and Minsk. The same elevation is reached by a very few flat summits of the plateau about Kursk, and farther E. on the Volga about Kamyshin, where the valleys are excavated to a depth of 800 or 900 ft., giving quite a hilly aspect to the country. It is only in the S.W., where spurs of the Carpathians enter the governments of Volhynia, Podolia and Bessarabia, that ridges reaching 1100 ft. are met with, these again intersected by deep ravines.

The depressions which gap the borders of the central plateau thus acquire a greater importance than the small differences in its vertical elevation. Such is the broad depression of the middle Volga and lower Kama, bounded on the N. by the faint swelling of the Uvaly, the watershed between the Arctic Ocean and the Volga basin. Another broad depression, 250 to 500 ft. above the sea, still filled by Lakes Peipus, Ladoga, Onega, Byelo-ozero, Lacha, Vozhe, and many thousands of smaller lakes, skirts the central plateau on the N., and follows the same E.N.E. direction. Only a few low swellings penetrate into it from the N.W., about Lake Onega, and reach 900 ft., while in the N.E. it is enclosed by the Timan ridge (1000 ft.). A third depression, traversed by the Pripet and the middle Dnieper, extends to the W. and penetrates into Poland. This immense lacustrine basin is now broken up into numberless ponds, lakes and marshes (see MINSK). It is bounded on the S. by the broad plateaus which spread out E. of the Carpathians. S. of 50° N. the central plateau slopes gently towards the S., and we find there a fourth depression stretching W. and E. through Poltava and Kharkov, but still reaching in its higher parts 500 to 700 ft. It is separated from the Black Sea by a gentle swelling which may be traced from Kremenets in Volhynia to the lower Don, and perhaps farther S.E. This swelling includes the Donets coal-measures and the middle granitic ridges which give rise to the rapids of the Dnieper. Finally a fifth depression, which descends below the level of the ocean, extends for more than 200 m. to the N. of the Caspian, comprising the lower Volga and the Ural and Emba rivers, and establishing a link between Russia and the Aral-Caspian region. It is continued farther N. by plains below 300 ft., which join the depression of the middle Volga, and extend as far as the mouth of the Oka.

The Ural Mountains present the aspect of a broad swelling whose strata no longer exhibit the horizontality which is characteristic of central Russia, and moreover are deeply cut into by rivers. They are connected in the W. with broad plateaus which join those of central Russia, but their orographical relations to other upheavals must be more closely studied before they can be definitely pronounced on.

The rhomboidal peninsula of the Crimea, connected by only a narrow isthmus with the continent, is occupied by an arid plateau sloping gently N. and E., and bordered on the S.E. by the Yaila Mountains, the summits of which range between 4000 and 5000 ft.

Rivers.

Owing to the orographical structure of the East-European plains, the river systems have become more than usually prominent and important features of the configuration. Taking their origin from a series of lacustrine basins scattered over the plateaus and differing slightly in elevation, the Russian rivers describe immense curves before reaching the sea, and flow with a very gentle gradient, while numerous large tributaries collect their waters from over vast areas. Thus the Volga, the Dnieper and the Don attain respectively lengths of 2325, 1410 and 1325 m., and their basins run to 563,300, 202,140 and 166,000 sq. m. respectively. Moreover, the chief rivers, the Volga, the W. Dvina, the Dnieper, and even the Lovat and the Oka, take their rise (in the N.W. of the central plateau) so close to one another that they may be said to radiate from the same centre. The sources of the Don interlace with the tributaries of the Oka, while the upper tributaries of the Kama join those of the N. Dvina and Pechora. In consequence of this, the rivers of Russia have been from remote antiquity the principal channels of trade and migration, and have contributed much more to the elaboration of national unity than any political institutions. Boats could be conveyed over flat and easy portages from one river-basin to another, and these portages were subsequently transformed with a relatively small amount of labour into navigable canals, and even at the present day the canals have more importance for the traffic of the country than have most of the railways. By their means the plains of the central plateau—the very heart of Russia, whose natural outlet was the Caspian—were brought into water-communication with the Baltic, and the Volga basin was connected with the Gulf of Finland. The White Sea has also been brought into connexion with the central Volga basin while the sister-river of the Volga—the Kama—became the main artery of communication with Siberia.

But although the rivers of Russia rank before the rivers of W. Europe in respect of length, they are far behind them as regards the volumes of water which they discharge. They freeze in winter and dry up in summer, and most of them are navigable only during the spring floods; even the Volga becomes so shallow during the hot season that none but boats of light draught can pass over its shoals.

Arctic Ocean Basin.—The Pechora rises in the N. Urals, and enters the ocean by a large estuary at the Gulf of Pechora. Its basin, thinly-peopled and available only for cattle-breeding and for hunting, is quite isolated from Russia by the Timan ridge. The river is navigable for 770 m.; grain and a variety of goods conveyed from the upper Kama are floated down, while furs, fish and other products of the sea are shipped up the river to be transported to Cherdyn on the Kama. The Mezeñ enters the Bay of Mezeñ; it is navigable for 450 m., and is the channel of a considerable export of timber. The N. Dvina is formed by the union of the Yug and the Sukhona. The latter, although it flows over a great number of rapids, is navigable throughout its length (330 m.); it is connected by canal with the Caspian and the Baltic. The Vychegda, which flows W.S.W. to join the Sukhona, through a woody region, thinly peopled, is navigable for 500 m. and in its upper portion is connected by a canal with the upper Kama. The N. Dvina flows with a very slight gradient through a broad valley, and reaches the White Sea at Archangel. Notwithstanding serious obstacles offered by shallows, corn, fish, salt and timber are largely shipped to and from Archangel. The Onega, which flows into Onega Bay, has rapids; but timber is floated down in spring, and fishing and some navigation are carried on in the lower portion.

Baltic Basin.—The Neva (40 m.) flows from Lake Ladoga into the Gulf of Finland. The Volkhov, discharging into Lake Ladoga, and forming part of the Vyshniy-Volochok system of canals, is an important channel for navigation; it flows from Lake Ilmen, which receives the Msta, connected with the Volga, and the Łovat. The Svir, also discharging into Lake Ladoga, flows from Lake Onega, and, being part of the Mariinsk canal system, is of great importance for navigation. The Narova flows out of Lake Peipus into the Gulf of Finland at Narva; it has remarkable rapids, which are used to generate power for cotton-mills; in spite of this, the river is navigated. Lake Peipus, or Chudskoye, receives the Velikaya, a channel of traffic with S. Russia from a remote antiquity, but now navigable only in its lower portion, and the Embach, navigated by steamers to Dorpat (Yuryev). The S. Dvina, which falls into the sea below Riga, is shallow above the rapids of Jacobstadt, but navigation is carried on as far as Vitebsk—corn, timber, potash, flax, &c., being the principal shipments of its navigable tributaries (the Obsha, Ulla and Kasplya). The Ulla is connected by the Berezina canals with the Dnieper. The Memel (Niemen), with a course of 470 m. in Russia, rises in the N. of Minsk, leaves Russia at Yurburg, and enters the Kurisches Haff; rafts are floated upon it almost from its source, and steamers ply as far as Kovno; it is connected by the Oginsky canal with the Dnieper. For the Vistula, with the Bug and Narew, see POLAND.

Black Sea Basin.—The Pruth rises in Austrian Bukovina, and separates Russia from Rumania; it enters the Danube, which flows along the Russian frontier for 100 m. below Reni, touching it with its Kilia branch. The Dniester (530 m. in Russia) rises in Galicia. Light boats and rafts are floated at all points, and steamers ply on its lower portion; its estuary has important fisheries. The Dnieper, with a basin of 202,140 sq. m., drains 13 governments, the aggregate population of which numbers over 28,000,000. It also originates in the N.W. parts of the central plateau, in the same marshy lakes which give rise to the Volga and the W. Dvina, and enters the Black Sea. In the middle navigable part of its course, from Dorogobuzh to Ekaterinoslav, it is an active channel for traffic. It receives several large tributaries:—on the right, the Berezina, connected with the W. Dvina, and the Pripet, both very important for navigation—as well as several smaller tributaries on which rafts are floated; on the left the Sozh, the Desna, one of the most important rivers of Russia, navigated by steamers as far as Bryansk, the Suła, the Psioł and the Vorskła. Below Ekaterinoslav the Dnieper flows for 46 m. over a series of rapids. At Kherson it enters its long (40 m.) but shallow estuary, which receives the S. Bug and the Inguł. The Don, with a basin of 166,000 sq. m., and navigable for 880 m., rises in the government of Tula and enters the Sea of Azov at Rostov, after describing a great curve to the E. at Tsaritsyn, approaching the Volga, with which it is connected by a railway (45 m.). Its navigation is of great importance, especially for goods brought from the Volga, and its fisheries are extensive. The chief tributaries are the Sosna and North Donets on the right, and the Voronezh, Khoper, Medvyeditsa and Manych on the left. The Ylya, the Kubañ and the Rion belong to Caucasia.

The Caspian Basin.—The Volga, the chief river of Russia, has a length of 2325 m., and its basin, about 563,300 sq. m. in area, contains a population of nearly 40,000,000. It is connected with the Baltic by three systems of canals (see VOLGA). The Ural, in its lower part, constitutes the frontier between European Russia and the Kirghiz steppe; it receives the Sakmara on the right and the Ilek on the left. The Kuma, the Terek and the Kura, with the Aras, which receives the waters of Lake Gok-cha, belong to Caucasia.[1]

Soil. The soil of Russia depends chiefly on the distribution of the boulder-clay and loess, on the degree to which the rivers have severally excavated their valleys, and on the moistness of the climate. Vast areas in Russia are quite unfit for cultivation, 19% of the aggregate surface of European Russia (apart from Poland and Finland) being occupied by lakes, marshes, sand, &c., 39% by forests, 16% by prairies, and only 26% being under cultivation. The distribution of all these is, however, very unequal, and the five following subdivisions may be established:—(1) the tundras; (2) the forest region; (3) the middle region, comprising the surface available for agriculture and partly covered with forests; (4) the black-earth (*chernozyom*) region; and (5) the steppes. Of these the black-earth region—about 150,000,000 acres—which reaches from the Carpathians to the Urals, from the Pinsk marshes in the S.W. to the upper Oka in the N.E., is the most important. It is covered with a thick sheet of black earth, a kind of loess, mixed with 5 to 15% of humus, due to the decomposition of an herbaceous vegetation, which developed luxuriantly during the Lacustrine period on a continent relatively dry even at that epoch. On the three-fields system corn has been grown upon it for fifty to seventy consecutive years without manure. Isolated black-earth islands, though less fertile, occur also in Courland and Kovno, in the Oka-Volga-Kama depression, on the slopes of the Urals, and in a few patches in the N. Towards the Black Sea coast its thickness diminishes, and it disappears in the valleys. In the extensive region covered with boulder-clay the black earth appears only in isolated places, and the soil consists for the most part of a sandy clay, containing a much smaller admixture of humus. There cultivation is possible only with the aid of a considerable quantity of manure. Drainage finding no outlet through the thick clay, the soil of the forest region is often hidden beneath extensive marshes, and the forests themselves are often mere thickets choking marshy ground; large tracts of sand appear in the W., and the admixture of boulders with the clay in the N.W. renders agriculture difficult. On the Arctic coast the forests disappear, giving place to the tundras. Finally, in the S.E., towards the Caspian, on the slopes of the southern Urals and the plateau of Obshchiy Syrt, as also in the interior of the Crimea, and in several parts of Bessarabia, there are large tracts of real desert, buried under coarse sand and devoid of vegetation.

Climate. Notwithstanding the fact that Russia extends from N. to S. through 30° of latitude, the climate of its different portions, apart from the Crimea and Caucasia, presents a striking uniformity. The aerial currents—cyclones, anti-cyclones and dry S.E. winds—prevail over extensive areas, and sweep across the flat plains without hindrance. Everywhere the winter is cold and the summer hot, both varying in their duration, but differing relatively little in the extremes of temperature recorded. There is no place in Russia, Archangel and Astrakhan included, where the thermometer does not rise in summer nearly to 86° Fahr. and descend in winter to −13° and −22°. It is only on the Black Sea coast that the absolute range of temperature does not exceed 108°, while in the remainder of Russia it reaches 126° to 144°, the oscillations being between −22° and −31°, occasionally going down as low as −54°, and rising as high as 86° to 104°, or even 109°. Everywhere the rainfall is small: if Finland and Poland on the one hand and Caucasia with the Caspian depression on the other be excluded, the average yearly rainfall varies between 16 and 28 in. Nowhere does the maximum rainfall take place in winter (as in W. Europe), but it occurs in summer, and everywhere the months of advanced spring are warmer than the corresponding months of autumn.

Though thus exhibiting the distinctive features of a continental climate, Russia does not lie altogether outside the reach of the moderating influence of the ocean. The Atlantic cyclones penetrate to the Russian plains, mitigating to some extent the cold of winter, and in summer bringing with them their moist winds and thunderstorms. Their influence is chiefly felt in W. Russia, though it does reach as far as the Urals and beyond. They thus check the extension and limit the duration of the cold anticyclones.

Throughout Russia the winter is of long duration. The last days of frost are experienced for the most part in April, but as late as May to the N. of 55° N. The spring is exceptionally beautiful in central Russia; late as it usually is, it sets in with vigour, and vegetation develops with a rapidity which gives to this season in Russia a special charm, unknown in warmer climates. The rapid melting of the snow at the same time causes the rivers to swell, and renders a great many minor streams navigable for a few weeks. But a return of cold weather, injurious to vegetation, is very frequently observed in central and E. Russia between May the 18th and the 24th, so that it is only in June that warm weather sets in definitely, and it reaches its maximum in the first half of July (or of August on the Black Sea coast). In S.E. Russia the summer is much warmer than in the corresponding latitudes of France, and really hot weather is experienced everywhere. It does not, however, prevail for long, and in the first half of September frosts begin on the middle Urals. They descend upon W. and S. Russia in the beginning of October, and are felt on the Caucasus about the middle of November. The temperature drops so rapidly that a month later, about October the 10th on the middle Urals and November the 15th throughout Russia, the thermometer ceases to rise above the freezing-point. The rivers freeze rapidly; towards November 20th all the streams of the White Sea basin are ice-bound, and so remain for an average of 167 days; those of the Baltic, Black Sea and Caspian basins freeze later, but about December the 20th nearly all the rivers of the country are highways for sledges. The Volga remains frozen for a period varying between 150 days in the N. and 90 days at Astrakhan, the Don for 100 to 110 days, and the Dnieper for 83 to 122 days. On the W. Dvina ice prevents navigation for 125 days, and even the Vistula at Warsaw remains frozen for 77 days. The lowest temperatures are experienced in January, the average being as low as 20° to 5° Fahr. throughout Russia; in the west only does it rise above 22°. On the whole, February and March continue to be cold, and their average temperatures rise above zero nowhere except on the Black Sea coast. Even at Kiev and Lugañsk the average of March is below 30°, while in central Russia it is 25° to 22°, and as low as 20° and 16° at Samara and Orenburg.

All Russia is comprised between the isotherms of 32° and 54°. On the whole, they are more remote from one another than even on the plains of N. America, those of 46° to 32° being distributed over twenty degrees of latitude. They are, on the whole, inclined towards the S. in E. Russia; thus the isotherm of 39° runs from St Petersburg to Orenburg, and that of 35° from Torneå in Finland to Uralsk. The inflexion is still greater for the winter isotherms. Closely following one another, they run almost N. and S.; thus Odessa and Königsberg are situated on the same winter isotherm of 28°; St Petersburg, Orel and the mouth of the Ural river on about 20°; and Mezeñ and Ufa on 9°. The summer isotherms cross the winter isotherms nearly at right angles, so that Kiev and Ufa, Warsaw and Tobolsk, Riga and the upper Kama have the same average summer temperatures of 64°, 62½° and 61° respectively.

The laws and relations of the cyclones and anti-cyclones in Russia are not yet thoroughly understood. It appears, however, that in January the cyclones mostly travel across N.W. Russia (N. of 55° and W. of 40° E.), following directions which vary between N.E. and S.E. In July they are pushed farther towards the N., and cross the Gulf of Bothnia, while another series of cyclones sweep across middle Russia, between 50° and 55° N. Nor are the laws of the anti-cyclones established. The winds closely depend on the routes followed by both. Generally, however, it may be said that alike in January and in July W. and S.W. winds prevail in W. Russia, while E. winds are most common in S.E. Russia. N. winds are predominant on the Black Sea coast. The strength of the wind is greater, on the whole, than in the continental parts of W. Europe, and it attains its maximum velocity in winter. Terrible tempests blow from October to March, especially on the S. steppes and on the tundras. Hurricanes accompanied with snow (*burans*, *myatels*), and lasting from two to three days, or N. blizzards without snow, are especially dangerous to man and beast. The average relative moisture reaches 80 to 85% in the N., and only 70 to 81% in S. and E. Russia. In the steppes it is only 60% during summer, and still less (57) at Astrakhan. The average amount of cloud is 73 to 75% on the White Sea and in Lithuania, 68 to 64 in central Russia, and only 59 to 53 in the S. and S.E. The amount of rainfall is shown in the Table on next page.[2]

Flora. The flora of Russia, which represents an intermediate link between the flora of Germany and the flora of Siberia, is strikingly uniform over a very large area. Though not poor at any given place, it appears so if the space occupied by Russia be taken into account, only 3300 species of phanerogams and ferns being known. Four regions may be distinguished: the Arctic, the Forest, the Steppe and the Circum-Mediterranean.

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[1] Bibliography of Geography: see Tillo, in *Izvestia* of Russian Geogr. Soc. (1883); P. P. Semenov, *Geogr. and Statist. Dictionary of the Russian Empire* (in Russian, 5 vols., St Petersburg, 1863–84), the most trustworthy source for the geography of Russia; the official *Svod Materialov*, with regard to Russian rivers (1876); Statistical *Sbornik* of the Ministry of Communications, vol. x. (freezing of Russian rivers, and navigation). A great variety of monographs dealing with separate rivers and basins are available; *e.g.* S. Martynov, *Das Petschoragebiet* (St Petersburg, 1905); G. von Helmersen, *Das Olonezische Bergrevier* (St Petersburg, 1860); Turbin, *The Dnieper*; Prasolenko, "The Dniester," in *Engin. Journ.* (1881); Danilevsky, "Kubañ," in *Mem. Geogr. Soc.* i.; K. E. von Baer, *Kaspische Studien* (St Petersburg, 1857–59); V. Ragozin, *Volga* (St Petersburg, 1890); Peretyatkovich, *Volga*; and Mikhailov, *Kama*. An orohydrographical map of Russia in four sheets was published in 1878.

[2] Bibliography of Meteorology: *Memoirs* of the Central Physical Observatory; *Repertorium für Meteorologie* and *Meteorological Sbornik*, published by the same body; Veselovsky, *Climate of Russia* (Russian); H. Wild, *Temperatur-Verhältnisse des Russ. Reiches* (1881); Voyeikov, *The Climates of the Globe* (Russ., 1884), containing the best general information about the climate of Russia.

	North Latitude.	Height above Sea in Feet.	Average Temperatures.			Average Rainfall in Inches.	
			Year.	January.	July.	Year.	November to March.
	° ′		°	°	°		
Archangel	64 34	30	32·7	7·6	60·6	16·2	4·3
Petrozavodsk	61 47	160	36·4	11·8	62·1	..	..
Helsingfors	60 10	40	39·0	19·5	61·5	19·6	7·3
St Petersburg	59 57	20	38·4	15·0	64·0	18·3	5·3
Bogoslovsk	59 45	630?	29·4	−3·8	62·5	15·8	3·1
Dorpat	58 22	220	39·5	17·6	63·1	24·9	7·3
Kostroma	57 46	360	37·3	9·4	66·3	19·4	5·2
Ekaterinburg	56 49	890	32·8	2·2	63·5	14·1	1·6
Kazañ	55 47	260	37·2	7·0	67·3	18·0	5·4
Moscow	55 45	520	39·0	12·1	66·0	23·0	7·3
Vilna	54 41	390	43·8	22·1	65·6	..	..
Warsaw	52 14	360	44·9	23·8	65·4	22·8	6·7
Orenburg	51 45	360	37·9	4·7	70·9	17·1	5·8
Kursk	51 44	690	41·0	13·7	67·2	19·9	5·6
Kiev	50 27	590	44·2	21·0	66·3	20·1	6·0
Tsaritsyn	48 42	100	44·4	13·4	74·6	..	..
Lugansk	48 27	200	45·6	17·0	73·0	14·3	4·3
Odessa	46 29	270	49·0	24·8	72·3	15·6	5·4
Astrakhan	46 21	−70	49·0	19·2	77·9	5·7	1·5
Sevastopol	44 37	130	53·7	35·2	73·8	15·4	7·2
Poti	42 9	0	58·4	39·0	73·3	64·9	23·4
Tiflis	41 42	1440	54·5	33·0	75·7	19·3	4·3

The *Arctic Region* comprises the tundras of the Arctic littoral beyond the N. limit of the forests, which closely follows the coastline, with deviations towards the N. in the river valleys (70° N. in Finland and on the Arctic Circle about Archangel, 68° N. on the Urals, 71° in W. Siberia). The shortness of the summer, the deficiency of drainage and the depth to which the soil freezes in winter, are the circumstances which determine the characteristic features of the vegetation of the tundras. Their flora is far closer akin to the floras of N. Siberia and N. America than to that of central Europe. Mosses and lichens are distinctive, as also are the birch, the dwarf willow and several shrubs; but where the soil is drier, and humus has been able to accumulate, a variety of herbaceous flowering plants, some of them familiar in W. Europe, make their appearance. Only 275 to 280 phanerogams are found within this region.

The *Forest Region* of the Russian botanists includes the greater part of the country, from the Arctic tundras to the steppes, and over this immense expanse it maintains a remarkable uniformity of character. Beketov subdivides it into two portions—the forest region proper and the "Ante-Steppe" (*predstepie*). The N. limit of the ante-steppe is represented by a line drawn from the Pruth through Zhitomir, Kursk, Tambov and Stavropol-on-Volga to the sources of the Ural river. But the forest region proper presents a different aspect in the N. from that in the S., and must in turn be subdivided into two parts—the coniferous region and the region of the oak forests—these being separated by a line drawn through Pskov, Kostroma, Kazañ and Ufa. Of course the oak occurs farther N. than this, and coniferous forests extend farther S., advancing even to the border-region of the steppes. To the N. of this line the forests are of great extent and densely grown, more frequently diversified by marshes than by meadows or cultivated fields. Vast and impenetrable forests, impassable marches and thickets, numerous lakes, swampy meadows, with cleared and dry spaces here and there occupied by villages, are the leading features of this region. Fishing and hunting are the most important sources of livelihood. The characteristics of the oak region, which comprises all central Russia, are totally different. The surface is undulatory; marshy meadow lands no longer exist on the flat watersheds, and only a few in the deeper and broader river valleys. Forests are still numerous where they have not been destroyed by the hand of man, but their character has changed. Conifers are rare, and the Scotch pine, which is abundant on the sandy plains, takes the place of the *Abies*. The forests are composed of the birch, oak and other deciduous trees, the soil is dry, and the woodlands are divided by green prairies. Viewed from rising ground, the landscape presents a pleasing variety of cornfield and forest, while the horizon is broken by the bell-towers of the numerous villages strung along the banks of the streams.

Viewed as a whole, the flora of the forest region is to be regarded as European-Siberian; and, though certain species disappear towards the E., while new ones make their appearance, it maintains, on the whole, the same features throughout from Poland to Kamchatka. Thus the beech (*Fagus sylvatica*) is unable to survive the continental climate of Russia, and does not penetrate beyond Poland and the S.W. provinces, reappearing again in the Crimea. The silver fir does not extend over Russia, and the oak does not cross the Urals. On the other hand, several Asiatic species (Siberian pine, larch, cedar) grow freely in the N.E., while numerous shrubs and herbaceous plants, originally from the Asiatic steppes, have found their way into the S.E. But all these do not greatly alter the general character of the vegetation. The coniferous forests of the north contain, besides conifers, the birch (*Betula alba*, *B. pubescens*, *B. fruticosa* and *B. verrucosa*), which extends from the Pechora to the Caucasus, the aspen, two species of alder, the mountain-ash (*Sorbus aucuparia*), the wild cherry and three species of willow. S. of 62°–64° N. appears the lime tree, which multiplies rapidly and, notwithstanding the rapidity with which it is being exterminated, constitutes entire forests in the east (central Volga, Ufa). Farther S. the ash (*Fraxinus excelsior*) and the oak make their appearance, the latter (*Quercus pedunculata*) reaching in isolated groups and single trees as far N. as St Petersburg and South Finland (*Q. Robur* appears only in the S.W.). The hornbeam is prevalent in the Ukraine, and the maple begins to appear in the S. of the coniferous region. In the forest region no fewer than 772 flowering species are found, of which 568 dicotyledons occur in the Archangel government (only 436 to the E. of the White Sea, which is a botanical limit for many species). In central Russia the species become still more numerous, and, though the local floras are not yet complete, they number 850 to 1050 species in the separate governments, and about 1600 in the best explored parts of the S.W. Corn is cultivated throughout this region. Its N. limits advance almost to the Arctic coast at Varanger Fjord, farther E. they hardly reach N. of Archangel, and the limit is still lower towards the Urals. The N. boundary of rye closely corresponds to that of barley. Wheat is cultivated in S. Finland, but in W. Russia it hardly gets N. of 58° N. Its true domains are the oak region and the steppes. Fruit trees are cultivated as far as 62° N. in Finland, and as far as 58° in the E. Apricots and walnuts flourish at Warsaw, but in Russia they do not thrive beyond 50°. Apples, pears and cherries are grown throughout the oak region.

The *Region of the Steppes*, which is coincident with the whole of S. Russia, may be subdivided into two zones—an intermediate zone and that of the steppes proper. The ante-steppe of the preceding region and the intermediate zone of the steppes include those tracts in which the W. European climate contends against the Asiatic, and where a struggle is carried on between the forest and the steppe. It is comprised between the summer isotherms of 59° and 63°, being bounded on the S. by a line which runs through Ekaterinoslav and Lugañsk. S. of this line begin the steppes proper, which extend to the sea and penetrate to the foot of the Caucasus.

The steppes proper are very fertile, elevated plains, slightly undulating, and intersected by numerous ravines which are dry in summer. The undulations are scarcely apparent. Not a tree is to be seen, the few woods and thickets being hidden in the depressions and deep valleys of the rivers. On the thick layer of black earth by which the steppe is covered a luxuriant vegetation develops in spring; after the old grass has been burned a bright green prevails over immense stretches, but this rapidly disappears under the burning rays of the sun and the hot E. winds. The colouring of the steppe changes as if by magic, and only the silvery plumes of the steppe-grass (*Stipa pennata*) wave in the wind, tinting the steppe a bright yellow. For days together the traveller sees no other vegetation; even this, however, disappears as he approaches the regions recently left dry by the Caspian, where saline clays, bearing a few Salsolaceae, or mere sand, take the place of the black earth. Here begins the Aral-Caspian desert. The steppe, however, is not so devoid of trees as at first sight appears. Innumerable clusters of wild cherries (*Prunus Chamaecerasus*), wild apricots (*Amygdalus nana*), the Siberian pea-tree (*Caragana frutescens*), and other deep-rooted shrubs grow at the bottoms of the depressions and on the slopes of the ravines, imparting to the steppe that charm which manifests itself in the popular poetry. Unfortunately the spread of cultivation is fatal to these oases (they are often called "islands" by the inhabitants); the axe and the plough ruthlessly destroy them.

The vegetation in the marshy bottoms of the ravines and in the valleys of the streams and rivers is totally different. The moist soil encourages luxuriant thickets of willows (Salicineae), surrounded by dense *chevaux-de-frise* of wormwood and thorn-bearing Compositae, and interspersed with rich but not extensive prairies, harbouring a great variety of herbaceous plants; while in the deltas of the Black Sea rivers impenetrable beds of reeds (*Arundo phragmites*) shelter a forest fauna. But cultivation rapidly changes the physiognomy of the steppe. The prairies are superseded by wheat-fields, and flocks of sheep destroy the true steppe-grass (*Stipa pennata*).

A great many species unknown in the forest region make their appearance in the steppes. The Scotch pine still grows on all sandy spaces, and the maple (*Acer tatarica* and *A. campestre*), the hornbeam and the black and white poplar are very common. The number of species of herbaceous plants rapidly increases, while beyond the Volga a variety of Asiatic species are added to the W. European flora.

The *Circum-Mediterranean Region* is represented by a narrow strip on the S. coast of the Crimea, where a climate similar to that of the Mediterranean coast has permitted the development of a flora closely resembling that of the valley of the Arno in Italy. Human cultivation has destroyed the abundant forests which sixty years ago made deer-hunting possible at Khersones. The olive and the chestnut are rare; but the beech reappears, and the *Pinus pinaster* recalls the Italian pines. At a few points, such as Nikita near Livadia and Alupka, where plants have been acclimatized by human agency, the Californian *Wellingtonia*, the Lebanon cedar, many evergreen trees, the laurel, the cypress, and even the Anatolian palm (*Chamaerops excelsa*) flourish. The grass vegetation is very rich, and, according to lists still incomplete, no fewer than 1654 flowering plants are known. But on the whole, the Crimean flora has little in common with that of the Caucasus.[1]

Fauna.

Russia belongs to the same zoo-geographical region as central Europe and N. Asia, the same fauna extending in Siberia as far as the Yenisei and the Lena. In the forests not many animals which have disappeared from W. Europe have held their ground; while in the Urals only a few—now Siberian, but formerly also European—are met with. In S.E. Russia, however, towards the Caspian, there is a notable admixture of Asiatic species. Three separate sub-regions may, however, be distinguished on the E. European plains—the tundras, including the Arctic islands, the forest region, especially the coniferous part of it, and the ante-steppe and steppes of the black earth region. The Ural Mountains might be distinguished as a fourth sub-region, while the S. coast of the Crimea and Caucasia, as well as the Caspian deserts, have each their own individuality.

The fauna of the Arctic Ocean off the Norwegian coast corresponds, in its W. parts at least, to that of the N. Atlantic Gulf Stream. The White Sea and the Arctic Ocean to the E. of Svyatoi Nos on the Kola peninsula belong to a separate zoological region, connected with, and hardly separable from, that part of the Arctic Ocean which washes the Siberian coast as far as the mouth of the Lena. The Black Sea, the fauna of which appears to be very rich, belongs to the Mediterranean region, slightly modified, while the Caspian partakes of the characteristic fauna inhabiting the lakes and seas of the Aral-Caspian depression.

In the region of the tundras life has to contend with such unfavourable conditions that it cannot be abundant. Still, the reindeer frequents it for its lichens, and on the drier slopes of the moraine deposits there occur four species of lemming, hunted by the Arctic fox (*Vulpes lagopus*). The willow-grouse (*Lagopus albus*), the ptarmigan (*L. alpinus* or *mutus*), the lark, the snow-bunting (*Plectrophanes nivalis*), two or three species of *Sylvia*, one *Phylloscopus* and a *Motacilla* must be added. Numberless aquatic birds visit it for breeding purposes. Ducks, divers, geese, gulls, all the Russian species of snipes and sandpipers (*Limicolae*, *Tringae*), &c., swarm on the marshes of the tundras and on the crags of the Lapland coast.

The forest region, and especially its coniferous portion, though it has lost some of its representatives within historic times, still possesses an abundant fauna. The reindeer, rapidly disappearing, is now met with only in the governments of Olonets and Vologda; *Cervus pygargus* is found everywhere, and reaches Novgorod. The weasel, the fox and the hare are exceedingly common, as also are the wolf and the bear in the N., but the glutton (*Gulo borealis*), the lynx and the elk (*C. alces*) are rapidly disappearing. The wild boar is confined to the basin of the W. Dvina, and the *Bison europea* to the Byelovyezh forest in Grodno. The sable has quite disappeared, being found only on the Urals; the beaver may be trapped at a few places in Minsk, and the otter is very rare. On the other hand, the hare, grey partridge (*Perdix cinerea*), hedgehog, quail, lark, rook and stork find their way into the coniferous region as the forests are cleared. The avifauna of this region is very rich; it includes all the forest and garden birds known in W. Europe, as well as a very great variety of aquatic birds. A list, still incomplete, of the birds of St Petersburg runs to 251 species. Hunting and shooting give occupation to a great number of persons. The reptiles are few. As for fishes, all those of W. Europe, except the carp, are met with in the lakes and rivers in immense quantities, the characteristic feature of the region being its wealth in *Coregoni* and in Salmonidae generally.

In the ante-steppe the forest species proper, such as *Pteromys volans* and *Tamias striatus*, disappear, but common squirrel (*Sciurus vulgaris*), weasel and bear are still met with in the forests. The hare is increasing rapidly, as well as the fox. The avifauna, of course, becomes poorer; nevertheless, the woods of the steppe, and still more the forests of the ante-steppe, give refuge to many birds, even to hazel-hen (*Tetrao bonasa*), capercailzie (*T. tetrix*) and woodcock (*T. urogallus*). The fauna of the scrub in the river valleys is decidedly rich, and includes aquatic birds. The destruction of the forests and the advance of wheat into the prairies are rapidly thinning the steppe fauna. The various species of rapacious animals are disappearing, together with the colonies of marmots; the insectivores are also becoming scarce in consequence of the destruction of insects; while vermin, such as the suslik, or pouched marmot (*Spermophilus*), and the destructive insects which are a scourge to agriculture, become a real plague. The absence of *Coregoni* is a characteristic feature of the fish-fauna of the steppes; the carp, on the contrary, reappears, and the rivers abound in sturgeon (Acipenseridae). In the Volga below Nizhniy-Novgorod the sturgeon (*Acipenser ruthenus*), and others of the same family, as well as a very great variety of ganoids and *Teleostei*, appear in such quantities that they give occupation to nearly 100,000 people. The mouths of the Caspian rivers are especially celebrated for their wealth of fish.[2]

Ethnography.—Remains of Palaeolithic man, contemporary with the large Quaternary mammals, are few in Russia; they have been discovered only in Poland, Poltava and Voronezh, and perhaps also on the Oka. Those of the later Lacustrine period, on the contrary, are so numerous that there is scarcely one lacustrine basin in the regions of the Oka, the Kama, the Dnieper, not to speak of the lake-region itself, and even the White Sea coasts, where remains of Neolithic man have not been discovered. The Russian plains have been, however, the scene of so many migrations of successive races, that at many places a series of deposits belonging to widely distant epochs are found one upon another. Settlements belonging to the Stone age, and manufactories of stone implements, burial-grounds of the Bronze epoch, earthen forts and burial-mounds (*kurgans*)—of this last four different types are known, the earliest belonging to the Bronze period—are superposed, rendering the task of unravelling their several relations one of great difficulty.

Two different races—a brachycephalic and a dolichocephalic—can be distinguished among the remains of the earlier Stone period (Lacustrine period) as having inhabited the plains of E. Europe. But they are separated by so many generations from the earliest historic times that sure conclusions regarding them are impossible; at all events, as yet Russian archaeologists are not agreed as to whether the ancestors of the Slavs were Sarmatians only or Scythians also, whose skulls have nothing in common with those of the Mongol race. The earliest *data* which may be regarded as established belong to the 1st century, when the Finns migrated from the N. Dvina region towards the W., and the Sarmatians were compelled to abandon the region of the Don, and cross the Russian steppes from E. to W., under the pressure of the Aorzes (the Mordvinian Erzya) and Siraks, who in their turn were soon followed by the Huns and Uigur-Turkish Avars.

In the 7th century S. Russia was the seat of the empire of the Khazars, who drove the Bulgarians, descendants of the Huns, from the Don, one section of them migrating up the Volga to found there the Bulgarian empire, and the remainder travelling towards the Danube. This migration compelled the N. Finns to advance farther W., and a body of intermingled Tavasts and Karelians penetrated to the S. of the Gulf of Finland.

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[1] Bibliography of Flora: Beketov, Appendix to Russian translation of Griesebach and Reclus's *Géogr. univ.*; C. F. von Ledebour, *Flora Rossica* (Stuttgart, 1842–53); E. R. von Trautvetter, *Rossiae Arcticae Plantae* (1880), and *Florae Rossicae Fontes* (St Petersburg, 1880). For flora of the tundras, Beketov's "Flora of Archangel," in *Mem. Soc. Natur.* of St Petersburg University, xv. (1884); Regel, *Flora Rossica* (1884); Brown, *Forestry in the Mining Districts of the Urals* (1885); *Reports* by Commissioners of Woods and Forests in Russia (1884).

[2] Bibliography of Fauna: see Pallas, *Zoographia Rosso-Asiatica*; Syevertsov for the birds of south-eastern Russia; M. A. Bogdanov, *Birds and Mammals of the Black-Earth Region of the Volga Basin* (in Russian, Kazan, 1871); Karelin for the southern Urals; Kessler for fishes; Strauch, *Die Schlangen des Russ. Reiches*, for reptiles generally; Rodoszkowski and the publications of the Entomological Society generally for insects; Czerniavsky for the marine fauna of the Black Sea; Kessler for that of Lakes Onega and Ladoga; Grimm for the Caspian. The fauna of the Baltic provinces is described in full in the *Memoirs* of the scientific bodies of these provinces. A. T. von Middendorf's *Sibirische Reise*, vol. iv., *Zoology* (St Petersburg, 1875), though dealing more especially with Siberia, is an invaluable source of information for the Russian fauna generally. A. E. Nordenskiöld's *Vega-expeditionens Vetenskapliga Iakttagelser* (5 vols., Stockholm, 1872–87) may be consulted for the mammals of the tundra region and marine fauna. For more detailed bibliographical information see *Aperçu des travaux zoo-géographiques*, published at St Petersburg in connexion with the Exhibition of 1878; and the index *Ukazatel Russkoi Literatury* for natural science, mathematics and medicine, published since 1872 by the Society of the Kiev University.

As early as the 8th century, and probably still earlier, a stream of Slav colonization, advancing E. from the Danube, poured over the plains of S.W. Russia. It is also most probable that another similar stream—the N., coming from the Elbe, through the basin of the Vistula—ought to be distinguished. In the 9th century the Slavs occupied the upper Vistula, the S. of the Russian lacustrine region, and the W. of the central plateau. They had Lithuanians to the W.; various Finnish tribes, intermingled towards the S.E. with Turkish (the present Bashkirs); the Bulgars, whose origin still remains doubtful, on the middle Volga and Kama; and to the S.E. the Turkish-Mongol races of the Pechenegs, Polovtsi, Uzes, &c., while in the S., along the Black Sea, was the empire of the Khazars, who had under their rule several Slav tribes, and perhaps also some of Finnish origin. In the 9th century also the Ugrians are supposed to have left their Ural abodes and to have traversed S.E. and S. Russia on their way to the basin of the Danube. If the Slavs be subdivided into three branches—the W. (Poles, Czechs and Wends), the S. (Servians, Bulgarians, Croatians, &c.), and the E. (Great, Little and White Russians), it will be seen that, with the exception of some 3,000,000 Little Russians, now settled in East Galicia and in Poland, and of a few on the southern slope of the Carpathians, the whole of the E. Slavs occupy, as a compact body, W., central and S. Russia.

Like other races of mankind, the Russian race is not pure. The Russians have absorbed and assimilated in the course of their history a variety of Finnish and Turko-Finnish elements. Still, craniological researches show that, notwithstanding this fact, the Slav type has been maintained with remarkable persistency: Slav skulls ten and thirteen centuries old exhibit the same anthropological features as those which characterize the Slavs of our own day. This may be explained by a variety of causes, of which the chief is the maintenance by the Slavs down to a very late period of gentile or tribal organization and gentile marriages, a fact vouched for, not only in the pages of the Russian chronicler Nestor, but still more by visible social evidences, the *gens* later developing into the village community, and the colonization being carried on by large co-ordinated bodies of people. The Russians do not emigrate as isolated individuals; they migrate in whole villages. The overwhelming numerical superiority of the Slavs, and the very great differences in ethnical type, belief and mythology between the Indo-European and the Ural-Altaic races, may have contributed to the same end. Moreover, while a Russian man, far away from home among Siberians, readily marries a native, the Russian woman seldom does the like. All these causes, and especially the first-mentioned, have enabled the Slavs to maintain their ethnical purity in a relatively high degree, whereby they have been enabled to assimilate foreign elements and make them intensify or improve the ethnical type, without giving rise to half-breed races. The very same N. Russian type has thus been maintained from Novgorod to the Pacific, with but minor differentiations on the outskirts—and this notwithstanding the great variety of races with which the Russians have come into contact. But a closer observation of what is going on in the recently colonized confines of the empire—where whole villages live without mixing with the natives, but slowly bringing them over to the Russian manner of life, and then slowly taking in a few female elements from them—gives the key to this feature of Russian life.

Not so with the national customs. There are features—the wooden house, the oven, the bath—which the Russian never abandons, even when swamped in an alien population. But when settled among these the Russian—the N. Russian—readily adapts himself to many other differences. He speaks Finnish with Finns, Mongolian with Buriats, Ostiak with Ostiaks; he shows remarkable facility in adapting his agricultural practices to new conditions, without, however, abandoning the village community; he becomes hunter, cattle-breeder or fisherman, and carries on these occupations according to local usage; he modifies his dress and adapts his religious beliefs to the locality he inhabits. In consequence of all this, the Russian peasant (not, be it noted, the trader) proves himself to be an excellent colonist.

Sub-divisions of Russians.

Three different branches can be distinguished among the Russians from the dawn of their history:—the Great Russians, the Little Russians (Malorusses or Ukrainians), and the White Russians (the Byelorusses). These correspond to the two currents of immigration mentioned above—the N. and S., with perhaps an intermediate stream, the proper place of the White Russians not having been as yet exactly determined. The primary distinctions between these branches have been increased during the last nine centuries by their contact with different nationalities—the Great Russians absorbing Finnish elements, the Little Russians undergoing an admixture of Turkish blood, and the White Russians submitting to Lithuanian influence. Moreover, notwithstanding the unity of language, it is easy to detect among the Great Russians themselves two separate branches, differing from one another by slight divergences of language and type and deep diversities of national character—the Central Russians and the Novgorodians. The latter extend throughout N. Russia into Siberia. Many minor anthropological differentiae can be distinguished among both the Great and the Little Russians, depending probably on the assimilation of various minor subdivisions of the Ural-Altaians.

The Great Russians occupy in one compact mass the space enclosed by a line drawn from the White Sea to Lake Pskov, the upper courses of the W. Dvina and the Donets, and thence, through the mouth of the Sura, by the Vetluga, to the Mezeñ. To the E. of this boundary they are intermingled with Turko-Finns, but in the Ural mountains they reappear in a second compact body, and thence extend through S. Siberia and along the courses of the Lena and the Amur. Great Russian Nonconformists are disseminated among Little Russians in the governments of Chernigov and Mogilev, and they reappear in greater masses in Novoroissa (*i.e.* S. Russia), as also in N. Caucasia.

The Little Russians occupy the steppes of S. Russia, the S.W. slopes of the central plateau and those of the Carpathian and Lublin mountains, and the Carpathian plateau, that is, the governments of Podolia, Volhynia, Poltava, and Kiev. The Zaporozhian Cossacks colonized the steppes farther E., towards the Don, where they met with a large population of Great Russian runaways, constituting the present Don Cossacks. The Zaporozhian Cossacks, sent by Catherine II. to colonize the E. coast of the Sea of Azov, constituted there the Black Sea and later the Kubañ Cossacks (part of whom, the Nekrasovsty, migrated to Turkey). They have also peopled large parts of the government of Stavropol and of N. Caucasia.

The White Russians, intermingled to some extent with Great and Little Russians, Poles and Lithuanians, occupy the upper parts of the W. slope of the central plateau.

The Finnish races, which in prehistoric times extended from the Ob all over N. Russia, even then were subdivided into Ugrians, Permyaks, Bulgarians and Finns proper, who drove back the previous Lapp population from what is now Finland, and about the 7th century penetrated to the S. of the Gulf of Finland, in the region of the Livs and Kurs, where they fused to some extent with the Lithuanians and the Letts. At present the races of Finnish origin are represented in Russia by the following: (*a*) the W. Finns; the Tavasts, in central Finland; the Kvaens, in N.W. Finland; the Karelians, in the E., who also occupy the lake regions of Olonets and Archangel, and have settlements in Novgorod and Tver; the Izhores, on the Neva and the S.E. coast of the Gulf of Finland; the Esths, in Esthonia and the N. of Livonia; the Livs, on the Gulf of Riga; and the Kurs, intermingled with the Letts; (*b*) the N. Finns, or Lapps, in N. Finland and on the Kola peninsula, and the Samoyedes in Archangel and W. Siberia; (*c*) the Volga Finns, or rather the old Bulgarian branch, to which belong the Mordvinians, and the Cheremisses in Kazañ, Kostroma and Vyatka, though they are classified by some authors with the following: (*d*) the Permyaks, or Cis-Uralian Finns, including the Votiaks on the E. of Vyatka, the Permyaks in Perm, the Syryenians or Zyryans in Vologda, Archangel, Vyatka and Perm; (*e*) the Ugrians, or Trans-Uralian Finns, including the Voguls on both slopes of the Urals, the Ostiaks in Tobolsk and partly in Tomsk, and the Magyars, or Ugrians.

The following are the chief subdivisions of the Turko-Tatars in European Russia:—(1) The Tatars, of whom three different branches must be distinguished: (*a*) the Kazañ Tatars on both banks of the Volga, below the mouth of the Oka, and on the lower Kama, but penetrating farther S. in Ryazañ, Tambov, Samara, Simbirsk and Penza; (*b*) the Tatars of Astrakhan at the mouth of the Volga; and (*c*) those of the Crimea, a great many of whom emigrated to Turkey after the Crimean War (1854–56). There are, besides, a certain number of Tatars in the S.E. in Minsk, Grodno and Vilna. (2) The Bashkirs, who inhabit the slopes of the S. Urals, that is, the steppes of Ufa and Orenburg, extend also into Perm and Samara. (3) The Chuvashes, on the right bank of the Volga, in Kazañ and Simbirsk. (4) The Meshcheryaks, a tribe of Finnish origin who formerly inhabited the basin of the Oka, and, driven thence during the 15th century by the Russian colonists, immigrated into Ufa and Perm, where they now live among the Baskhirs, having adopted their religion and customs. (5) The Teptyars, also of Finnish origin, settled among the Tatars and Bashkirs in Samara and Vyatka. The Bashkirs, Meshcheryaks and Teptyars rendered able service to the Russian government against the Khirgiz, and until 1863 they constituted a separate Cossack army. (6) The Khirgiz, whose true abodes were in Asia, in the Ishim and Khirgiz steppe. One section of them crossed the Urals and occupied the steppes between the Urals and the Volga; the remainder belong to Turkestan and Siberia.

The Mongol race is represented in Russia by the Kalmucks, who inhabit the steppes of Astrakhan between the Volga, the Don and the Kuma. They are Lamaists by religion and immigrated to the mouth of the Volga from Dzungaria, in the 17th century, driving out the Tatars and Nogais, and after many wars with the Don Cossacks, one part of them was taken in by the Don Cossacks, so that even now there are among these Cossacks several Kalmuck *sotnias* or squadrons. They live for the most part in tents, and support themselves by breeding live stock, and partly by agriculture.

The Semitic race is represented by upwards of 5,000,000 Jews. They first entered Poland from Germany during the era of the crusades, and soon spread through Lithuania, Courland, the Ukraine, and, in the 18th century, Bessarabia. The rapidity with which they peopled certain towns (*e.g.* Odessa) and the whole provinces was really prodigious. The law of Russia prohibits them from entering Great Russia, only the wealthiest and best educated enjoying this privilege; nevertheless they are met with everywhere, even on the Urals. Their chief abodes, however, continue to be Poland, the W. provinces of Lithuania, White and Little Russia, and Bessarabia. In Russian Poland they constitute 13½ % of the total population. In Kovno, Vilna, Mogilev, Grodno, Volhynia, Podolia, Minsk, Vitebsk, Kiev, Bessarabia and Kherson, they constitute, on the average, 12 to 17½ % of the population, while in the cities and towns of these governments they reach 30 to 59 % of the population. Organized as they are into a kind of community for mutual protection and mutual help, they soon become masters of the trade wherever they penetrate. In the villages they are mostly innkeepers, intermediaries in trade and pawnbrokers. In many towns most of the skilled labourers and a great many of the unskilled (for instance, the grain-porters at Odessa and elsewhere) are Jews.

The Jews of the Karaite sect differ entirely from the orthodox Jews both in worship and in mode of life. They, too, are inclined to trade, but they also carry on agriculture successfully. Those inhabiting the Crimea speak Tatar, and the few who are settled in W. Russia speak Polish. They are on good terms with the Russians.

Of W. Europeans, the Germans only attain considerable numbers in European Russia. In the Baltic provinces they constitute the ennobled landlord class, and are the tradesmen and artisans in the towns. Considerable numbers of Germans, tradesmen and artisans, settled at the invitation of the Russian government in many of the larger towns as early as the 16th century, and to a much greater extent in the 18th century. Numbers were invited in 1762 to settle in S. Russia, as separate agricultural colonies, and these have since then gradually extended into the Don region and N. Caucasia. Protected as they were by the right of self-government, exempted from military service, and endowed with considerable allotments of good land, these colonies are much wealthier than the neighbouring Russian peasants, from whom they have adopted the slowly modified village community. They are chiefly Lutherans, but many of them belong to other religious sects—Anabaptists, Moravians, Mennonites. During the closing years of the 19th century great numbers of Germans flocked into the industrial governments of Poland, namely, Piotrkow, Warsaw and Kalisz.

The Rumanians (Moldavians) inhabit the governments of Bessarabia, Podolia, Kherson and Ekaterinoslav. In Bessarabia they constitute from one-fourth to three-fourths of the population of certain districts, and nearly 50 % of the entire population of the government. On the whole the Novorossian governments (Bessarabia, Kherson, Ekaterinoslav and Taurida) exhibit the greatest variety of population. Little and Great Russians, Rumanians, Bulgarians, Germans, Greeks, Frenchmen, Poles, Tatars and Jews are mingled together and scattered about in small colonies, especially in Bessarabia. The Greeks inhabit chiefly the towns, where they are traders, as also do the Armenians, scattered through the towns of S. Russia, and appearing in larger numbers only in the district of Rostov.

The Lithuanians prevail in Kovno, Vilna and Suwalki; and the Letts, who are, however, more scattered, are chiefly concentrated in Vitebsk, Courland and Livonia.

In the Baltic provinces (Esthonia, Livonia and Courland) the prevailing population is Esthonian, Kuronian or Lettish, the Germans being respectively only 3·8, 7·6 and 8·2 % of the population. The relations of the Esths and Letts with their landlords are anything but friendly.

The governments of St Petersburg (apart from the capital), Olonets and Archangel contain an admixture of Karelians, Samoyedes and Syryenians, the remainder being Great Russians. In the E. and S.E. provinces of the Volga (Nizhniy-Novgorod, Simbirsk, Samara, Penza and Saratov) the Great Russians prevail, the remainder being chiefly Mordvinians, Tatars, Chuvashes and Bashkirs, Germans in Samara and Saratov, and Little Russians in the last named. In the Ural governments of Perm and Vyatka Great Russians are in the majority, the remainder being a variety of Finno-Tatars. In the S. Ural governments (Uralsk, Orenburg, Ufa) the admixture of Turko-Tatars—of Kirghiz in Uralsk, Bashkirs in Orenburg and Ufa, and less important races—becomes considerable.

Religion.

The state religion is that of the Orthodox Greek Church (Orthodox Catholic or Orthodox Eastern Church). Its head is the tsar; but although he makes and annuls all appointments, he does not determine questions of dogmatic theology. The principal ecclesiastical authority is the Holy Synod, the head of which, the Procurator, is one of the council of ministers and exercises very wide powers in ecclesiastical matters. In theory all religions may be freely professed, except that certain restrictions, such as domicile,[1] are laid upon the Jews; but in actual fact the dissenting sects are more or less severely treated. According to returns published in 1905 the adherents of the different religious communities in the whole of the Russian empire numbered approximately as follows, though the heading Orthodox Greek includes a very great many *Raskolniki* or Dissenters. Indeed it is estimated that there are more than 12,000,000 Dissenters in Great Russia alone.

Orthodox Greek	87,123,600
Dissenters	2,204,600
Armenian Gregorians	1,179,240
Armenian Catholics	38,840
Roman Catholics	11,468,000
Lutherans	3,572,650
Reformed	85,400
Baptists	38,140
Mennonites	66,560
Anglicans	4,180
Other Christians	3,950
Karaite Jews	12,900
Jews	5,215,800
Mahommedans	13,907,000
Buddhists	433,860
Other non-Christians	285,300
Total	125,640,020

The ecclesiastical heads of the national Orthodox Greek Church consist of three metropolitans (St Petersburg, Moscow, Kiev), fourteen archbishops and fifty bishops, all drawn from the ranks of the monastic (celibate) clergy. The parochial clergy are celibate in so far as they must be married when appointed, but if left widowers may not marry again.

All Russians, with the exception of a number of White Russians who belong to the United Greek Church (see ROMAN CATHOLIC CHURCH), profess the Orthodox Greek faith or belong to one or other of the numberless dissident sects. The Poles and most of the Lithuanians are Roman Catholics. The Esths and all other Western Finns, the Germans and the Swedes are Protestant. The Tatars, Bashkirs and Kirghiz are Mahommedans; but the last-named have to a great extent maintained along with Mahommedanism their old Shamanism. The same holds good of the Meshcheryaks, both Moslem and Christian. The Mordvinians are nearly all Orthodox Greek, as also are the Votyaks, Voguls, Cheremisses and Chuvashes, but their religions are, in reality, modifications of Shamanism under the influence of some Christian and Moslem beliefs. The Moguls, though baptized, are in fact believers in fetishism as much as the unconverted Samoyedes. Finally, the Kalmucks are Lamaite Buddhists.

In his relations with Moslems, Buddhists and even fetishists the Russian peasant looks rather to conduct than to creed, the latter being in his view simply a matter of nationality. Indeed, towards paganism, at least, he is perhaps even more than tolerant, preferring on the whole to keep on good terms with pagan divinities. The numerous outbreaks against the Jews are directed, not against their creed, but against them as keen business men and extortionate money-lenders. Any idea of proselytism is quite foreign to the ordinary Russian mind, and the outbursts of proselytizing zeal occasionally manifested by the clergy are really due to the desire for "Russification," and traceable to the influence of the higher clergy and of the government.

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[1] The restrictions on domicile were to some extent relaxed in the beginning of 1907.

The Raskolniki.

It is this political rather than religious spirit which also underlies the repressive attitude of the government, and of the Orthodox Church as the organ of the government, towards the various dissident sects (*Raskolniki*, from *raskol*, schism), which for more than two centuries past have played an important part in the popular life of Russia, and, since the political developments of the end of the 19th and early years of the 20th century, have tended to do so more and more. To understand the problem of the *Raskolniki* it is necessary to bear two things in mind: the fundamental principle of Eastern Orthodoxy as distinct from Western Catholicism, and the practical identification in Russia of the National Church with the National State. The very basis of Orthodoxy is that the Church is by Christ's ordinance unalterable, that its traditional forms, every one of which is a vehicle of saving grace, were established in the beginning by Christ and his apostles, and that consequently nothing may be added or altered. The trouble began early in the 17th century with the attempt, made in connexion with the printing of the liturgical books, to emend certain ritual details in which there was proved to have been a departure from primitive usage;[1] it came to a head under the patriarch Nikon (*q.v.*). Under his influence a synod endorsed the changes in 1654; one bishop alone, Paul of Colomna, dissented, and he was deposed, knouted and kept in prison till he died mad. In 1656 the synod anathematized the adherents of the old forms, and the anathema was confirmed by those of 1666 and 1667. To the conservatives, known subsequently as Old Ritualists or Old Believers, this marked the beginning of the reign of Antichrist (was not 666 the number of the Beast?); but they continued the struggle, conservative opposition to the Westernizing policy of the tsars, which was held responsible for the introduction of Polish luxury and Latin heresy, giving it a political as well as a religious character. The rising of the Strelitsi in 1682 all but gave them the victory; the crushing of the rising relegated them definitely to the status of schismatics. They were placed in still completer antagonism to the established Orthodox Church by the innovations of Peter the Great. The Muscovite tsars had pursued them with fire and sword. The Russian emperors, having established themselves as heads of the Church and the Holy Synod as a state department, were not likely willingly to tolerate their existence.

The *Raskol* was threatened with extinction by the gradual dying out of its priests, which led to a further schism within itself, into the *Popovshchina* (with priests) and the *Bezpopovshchina* (without priests). The *Popovsti*, who were served by priests converted from the Orthodox Church, made their headquarters in the island of Werka, in a tributary of the Dnieper, in Poland (1695), and after its destruction by the government in 1735 and again in 1764, at Starodubye in the government of Chernigov, whence their doctrine spread in the country of the Don. In 1771 their headquarters were fixed at Moscow, in the Rogoshkiy cemetery assigned to them during the plague; here they had a monastery, seminary and consistory, until they were ejected by the emperor Nicholas I. In 1832 priests were forbidden to join them, and they had to apply to a deposed Bosnian metropolitan, who became their chief bishop, establishing his see in the monastery of Belokrinitsa in Bukovina. In 1862 the synod of the *Popovshchina* passed a circular letter making advances to the government with a view to a compromise, which was arranged on the basis of the Old Believers consenting to accept the ministrations of Orthodox priests on condition that they should use the unrevised books. This led to a further schism into three sections: those who recognize the metropolitan and the compromise (*Edinovyertsi*), those who recognize the metropolitan but repudiate the compromise, those who repudiate both (*Bieglopopovtsi*). There had already been other schisms on such questions as the right way to swing a censer and the legality of self-immolation for the Lord's sake.

The *Bezpopovtsi*, known also as *Pomoranye*, because they are mainly found in the sparsely populated country near the White Sea, are in some ways more remarkable. They reject the ministration of priests altogether, since in the time of Antichrist (*i.e.* the heretic tsar) the only sacrament that remains is baptism. They therefore elect elders, who expound the Scriptures, baptize and hear confessions. They are, however, in no sense evangelicals in the Western sense; for they observe rigorous fasts, reverence icons, and believe implicitly in the efficacy of the multiplication of crossings, bowings and prostrations. They have, moreover, thrown off from time to time a number of extravagant offshoots. Such are the *Philippovsti*, founded by one Philip (who burned himself alive for Christ's sake in 1743), who have exalted self-immolation into a principle; the *Stranniki* (pilgrims) and *Byeguni* (runners), who interpret Matt. x. 37 ff. literally, and reject legal marriage; the *Nyetovsti* (denyers), who deny the necessity for common worship, since there are no priests; the *Molchalyniki* (mutes), whom no torture can persuade to utter a word.

Closely akin to these, though not derived from the Old Believers, are certain mystic sects which deny the efficacy of the sacraments altogether. Of these the most remarkable are the so-called *Khlysti* (" flagellants," from *klyesat*, " to strike, lash," but possibly a corruption of Khristi, " Christs "). They originated in 1645, when, according to their belief, God the Father descended in a chariot of fire on Mount Gorodim, in the province of Vladimir, and took up his abode in a peasant named Daniel Philippov, who chose another peasant, named Ivan Suslov, for his son, the Christ. Suslov selected a " mother of God " and twelve apostles. Though twice crucified and once flayed by order of the tsar, he always rose again, and did not die till 1716. Suslov chose a successor in one Prokopiy Lupkin, and since then—in the belief of the sect—every generation, even every community, has had its Christ and its " mother of God," who are worshipped by reason of the Divine Spirit dwelling in them. It is the duty of all believers to strive to become one or other of these by subduing the flesh, which is the product of Evil, and all motions of the will. Each community is presided over by an " angel," or prophet, and a prophetess, whose word is law. All alike are subject to the twelve commandments issued by the " Sabaoth," that is to say Daniel Philippov. These include the prohibition of alcoholic drink, of fleshly sins and of marriage, and the inculcation of faith in the Holy Ghost and complete surrender to his influence. At their prayer-meetings the Khlysti dance to the accompaniment of hymns, the dance gradually developing into a wild dervish-like spinning which is kept up till they drop, foaming at the mouth and prophesying. Perhaps the most remarkable fact about this sect is that it is secret, and that its members ostensibly belong to the Orthodox Church.

An offshoot of the Khlysti is the more celebrated secret sect of the *Skoptsi* (*skopets*, a eunuch), which represents an extreme ascetic reaction from the promiscuous immorality of some (by no means all) of the Khlysti. Their idea of attaining salvation is self-mutilation according to the counsel of perfection implied in Matt. xix. 12 and xviii. 8, 9. The " royal seal " is complete self-castration; partial mutilation is known as the " second purity." In the case of women the mutilation usually takes the form of amputation of the breasts. This horrible sect, which was founded by one Selivanov in the last quarter of the 18th century, seems to have a morbid attraction for people of all classes in Russia, and all the efforts of the government have not succeeded in stamping it out (see SKOPTSI).

Closer akin to certain Western forms of dissidence from traditional Catholicism, though of native growth, are the *Molokani*, so called popularly because they continue to drink milk (*moloko*) during fasts. Their origin is unknown, but they are officially mentioned as early as 1765. They style themselves " truly spiritual Christians," and in their rejection of the sacraments, their indifference to outward forms, and their insistence on the spiritual interpretation of the Bible (" the letter killeth "), they are closely akin to the Quakers, whom they resemble also in their inoffensive mode of life and the practice of mutual help.

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[1] The most important alterations were the repetition twice, instead of three times, of the " Alleluiah " at the Eucharist, and the making the sign of the cross with two fingers instead of three.

From the Molokani the *Dukhobortsi*, in England better known as Doukhobors (*q.v.*), are distinguished by their subordination of the Scriptures to the authority of the "inner light." They are dualists, like the Bogomils (*q.v.*), ascribing the body to a fall from a state when the soul was on the same plane as God. The Incarnation was no isolated historical occurrence, but it is repeated over and over again in the faithful, each one of whom is in a certain sense God, by virtue of the indwelling Spirit. Both the Molokani and the Dukhobortsi deny the authority of the civil government as such, and object on principle to military service. The former, however, give little trouble; on the other hand, the government has from time to time proceeded with extreme severity against the Dukhobortsi, whose refusal to serve in the army, if allowed to go unpunished, would have set a contagious example.

Dissidence of all kinds has made a considerable advance since the emancipation of the serfs in 1861, the increase—as might be expected in a wholly illiterate population—being greatest in the more extravagant sects. On the other hand, Western Protestantism has also made great headway, notably the Stundists, whose rationalistic-Protestant teaching has gained a firm foothold especially in Little Russia, where the *Raskol* never penetrated. The Baptists have also made considerable progress, notably among the Molokani.[1]

Social Conditions.—The old subdivisions of the population into orders possessed of unequal rights is still maintained. The great mass of the people, 81·6%, belong to the peasant order, the others being: nobility, 1·3%; clergy, 0·9; the burghers and merchants, 9·3; and military, 6·1. Thus more than 88 millions of the Russians are peasants. Half of them were formerly serfs (10,447,149 males in 1858)—the remainder being "state peasants" (9,194,891 males in 1858, exclusive of the Archangel government) and "domain peasants" (842,740 males the same year).

The serfdom which had sprung up in Russia in the 16th century, and became consecrated by law in 1609, taking, however, nearly one hundred and fifty years to attain its full growth, was abolished in 1861. This act liberated the serfs from a yoke which was really terrible, even under the best landlords, and from this point of view it was obviously an immense benefit.[2] But it was far from securing corresponding economic results.

The household servants or dependents attached to the personal service of their masters were merely set free; and they entirely went to reinforce the town proletariat. The peasants proper received their houses and orchards, and allotments of arable land. These allotments were given over to the rural commune (*mir*), which was made responsible, as a whole, for the payment of taxes for the allotments. For these allotments the peasants had to pay, as before, either by personal labour or by a fixed rent. The allotments could be redeemed by them with the help of the crown, and then they were freed from all obligations to the landlord. The crown paid the landlord in obligations representing the capitalized rent, and the peasants had to pay the crown, for forty-nine years, 6% interest on this capital. The redemption was not calculated on the value of the allotments of land, but was considered as a compensation for the loss of the compulsory labour of the serfs; so that throughout Russia, with the exception of a few provinces in the S.E., it was—and still remains, notwithstanding a very great increase in the value of land—much higher than the market value of the allotment. Moreover, many proprietors contrived to curtail seriously the allotments which the peasants had possessed under serfdom, and frequently they deprived them of precisely the parts which they were most in need of, namely, pasture lands around their houses, and forests. The effect of this, craftily calculated beforehand, was to compel the peasants to rent pasture lands from the landlord at any price.

The present condition of the peasants—according to official documents—appears to be as follows. In the twelve central governments they grow, on the average, sufficient rye-bread for only 200 days in the year—often for only 180 and 100 days. One quarter of them have received allotments of only 2·9 acres per male, and one-half less than 8·5 to 11·4 acres—the normal size of the allotment necessary to the subsistence of a family under the three-fields system being estimated at 28 to 42 acres. Land must thus of necessity be rented from the landlords at fabulous prices. The aggregate value of the redemption and land taxes often reaches 185 to 275% of the normal rental value of the allotments, not to speak of taxes for recruiting purposes, the church, roads, local administration and so on, chiefly levied from the peasants. The arrears increase every year; one-fifth of the inhabitants have left their houses; cattle are disappearing. Every year more than half the adult males (in some districts three-fourths of the men and one-third of the women) quit their homes and wander throughout Russia in search of labour. In the governments of the black-earth region the state of matters is hardly better. Many peasants took the "gratuitous allotments," whose amount was about one-eighth of the normal allotments.

The average allotment in Kherson is only 0·90 acre, and for allotments from 2·9 to 5·8 acres the peasants pay 5 to 10 roubles of redemption tax. The state peasants are better off, but still they are emigrating in masses. It is only in the steppe governments that the situation is more hopeful. In Little Russia, where the allotments were personal (the *mir* existing only among state peasants), the state of affairs does not differ for the better, on account of the high redemption taxes. In the W. provinces, where the land was valued cheaper and the allotments somewhat increased after the Polish insurrection, the general situation might be better were it not for the former misery of the peasants. Finally, in the Baltic provinces nearly all the land belongs to the German landlords, who either farm the land themselves, with hired labourers, or let it in small farms. Only one-fourth of the peasants are farmers, the remainder being mere labourers, who are emigrating in great numbers.

The situation of the former serf-proprietors is also unsatisfactory. Accustomed to the use of compulsory labour, they have failed to accommodate themselves to the new conditions. The millions of roubles of redemption money received from the crown have been spent without any real or lasting agricultural improvements having been affected. The forests have been sold, and only those landlords are prospering who exact rack-rents for the land without which the peasants could not live upon their allotments. During the years 1861 to 1892 the land owned by the nobles decreased 30%, or from 210,000,000 to 150,000,000 acres; during the following four years an additional 2,119,500 acres were sold; and since then the sales have gone on at an accelerated rate, until in 1903 alone close upon 2,000,000 acres passed out of their hands. On the other hand, since 1861, and more especially since 1882, when the Peasant Land Bank was founded for making advances to peasants who were desirous of purchasing land, the former serfs, or rather their descendants, have between 1883 and 1904 bought about 19,500,000 acres from their former masters. There has been an increase of wealth among the few, but along with this a general impoverishment of the mass of the people, and the peculiar institution of the *mir*, framed on the principle of community of ownership and occupation of the land, was not conducive to the growth of individual effort. In November 1906, however, the emperor Nicholas II. promulgated a provisional *ukaz* permitting the peasants to become freeholders of allotments made at the time of emancipation, all redemption dues being remitted. This measure, which was endorsed by the third Duma in an act passed on the 21st of December 1908, is calculated to have far-reaching and profound effects upon the rural economy of Russia. Thirteen years previously the government had endeavoured to secure greater fixity and permanence of tenure by providing that at least twelve years must elapse between every two redistributions of the land belonging to a *mir* amongst those entitled to share in it.[3] The *ukaz* of November 1906 had provided that the various strips of land held by each peasant should be merged into a single holding; the Duma, however, on the advice of the government, left this to the future, as an ideal that could only gradually be realized.

"Artels."

The co-operative spirit of the Great Russians shows itself in another sphere in the *artel*, which has been a prominent feature of Russian life since the dawn of history. The artel very much resembles the co-operative society of W. Europe, with this difference that it makes its appearance without any impulse from theory, simply as a spontaneous outgrowth of popular life. When workmen from any province come, for instance, to St Petersburg to engage in the textile industries, or to work as carpenters, masons, &c., they immediately unite in groups of ten to fifty persons, settle in a house together, keep a common table and pay each his part of the expense to the elected elder of the artel. All over Russia there is a network of such artels—in the cities, in the forests, on the banks of the rivers, on journeys and even in the prisons.

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[1] See N. Tsakni, *Russie sectaire* (1888); A. Leroy-Beaulieu, *L'Empire des Tsars*, tome iii. (1889; trans. 1896); C. K. Grass, *Russische Sekten* (1907 sqq.). Further useful references are given in Bonwetsch's article, "Raskolniken," in Herzog-Hauck, *Realencyklop.* (3rd ed., 1905), vol. xvi. p. 436.

[2] It was only as late as 1904, however, that the landed proprietors were forbidden by law to inflict corporal punishment upon the peasants.

[3] See *Collection of Materials on the Village Community*, vol. i.; *Collection of Materials on Landholding*, and *Statistical Descriptions* of Separate Governments, published by several zemstvos (Moscow, Tver, Nyzhniy-Novgorod, Tula, Ryazañ, Tambov, Połtava, Saratov, &c.); Kawelin, *The Peasant Question*; Vasilchikov, *Land Property and Agriculture* (2 vols.), and *Village Life and Agriculture*; Ivanukov, *The Fall of Serfdom in Russia*; Shashkov, "Peasantry in the Baltic Provinces," in *Russkaya Mysl.* (1883), iii. and ix.; V. V., *Agric. Sketches of Russia*; Golovachov, *Capital and Peasant Farming*; Engelhardt's *Letters from the Country*.

The industrial artel is almost as frequent as the preceding in all those trades which admit of it. Artels of one or two hundred carpenters, bricklayers, &c., are common wherever new buildings have to be erected, or railways or bridges constructed; the contractors always prefer to deal with an artel, rather than with separate workmen. It is needless to add that the wages divided by the artels are higher than those earned by isolated workmen.

Finally, a great number of artels on the stock exchange, in the seaports, in the great cities, during the great fairs and on railways have grown up, and have acquired the confidence of tradespeople to such an extent that considerable sums of money and complicated banking operations are frequently handed over to an artelshik (member of an artel) without any receipt, his number or his name being accepted as sufficient guarantee. These artels are recruited only on personal acquaintance with the candidates for membership. Co-operative societies have also been organized by several *zemstvos.* They have achieved good results, but do not exhibit, on the whole, the same unity of organization as those which have arisen in a natural way among the peasants and artisans.

Agriculture.

The chief occupation of approximately seven-eighths of the population of European Russia is agriculture, but its character varies considerably according to the soil, the climate and the geographical position of the different regions. A sinuous line drawn from Zhitomir via Kiev, Tula and Kazañ to Ufa—that is, from W.S.W. to E.N.E.—separates the "northern soils" from the "southern soils." To the S. of this line, as far as the sandy deserts of Astrakhan and the steppes of N. Caucasia, lies the "black earth" region. Broadly speaking, the forests here yield to steppes, and the soil is very fertile; but the whole region suffers periodically from drought. The "northern soils," which are glacial deposits more or less redistributed by water, are much less fertile as a rule, and consist of all possible varieties from a tough boulder clay to loose sand. Both N. and S. of this line it is customary to distinguish several zones, lying, generally, parallel to it, and differentiated chiefly by climatic differences. In the tundras of the extreme N. agriculture does not exist; the reindeer constitutes the principal wealth of the nomad Samoyedes and Lapps. In the forest region S. of the tundras, which extends over an area of more than 500,000 sq. m., agriculture is carried on with great difficulty, not only because of the infertility of the soil, but also because of the severity of the climate and the fact that there are only three to four months in the year during which agriculture can be carried on. Apart from hunting and fishing, the exploitation of the forests provides the principal occupation of the inhabitants. Crops, chiefly barley, rye, oats, turnips and green crops, are, however, grown on clearings in the forest, though the yield is poor. S. of 60° N. agriculture becomes the predominant industry, while the exploitation of the forests plays only a secondary part. In this zone, which extends over an area of nearly 600,000 sq. m., and on the S. touches the agrarian line already mentioned, the principal crops are rye and oats, with barley and wheat coming next, though flax and green crops are also grown. Cattle have to be housed for the winter. In the W. of this zone, that is in the Baltic provinces, the climate is less severe as well as moister. Agriculture is carried on in a more intelligent manner, and the yield is higher. Flax is almost of as much importance as wheat, and the potato is more cultivated than in any other part of Russia. Hardy fruit thrives, and live-stock breeding prospers. In the W. governments of Kovno, Vitebsk, Vilna, Mogilev, Minsk and Grodno the climate is more temperate, but agriculture is more backward than in the Baltic provinces. The three-field system of cropping a patch of land until its fertility is exhausted, and then allowing it to revert to the primeval condition, is still pursued, and both landowners and peasantry suffer from want of capital and lack of agricultural training. Flax is one of the principal exports of this region, timber being another.

In middle Russia the winters are both longer and harder, and agriculture is consequently carried on under greater difficulties. One of the most serious of these is caused not by the unfavourable character of the climate but by the shortness of labour. Since their emancipation in 1861, the peasants of the central governments of Russia have in large numbers drifted away into the black earth zone, or have gone to the factories. The methods of agriculture are still unscientific and unprogressive. Rye is the staple crop, though buckwheat, flax, green crops and the potato are cultivated in considerable quantities.

Agriculture is most advanced in the W. of the black earth zone, that is in the governments of Kiev, Podolia, Poltava and in part of Kharkov. The winters are less severe, and modern agricultural machinery is generally employed, at all events on the larger estates. In consequence of these more favourable conditions there is greater variety in the cropping; a good deal of wheat is grown, as well as beetroot for sugar, fibre plants and oleaginous plants, fruit, and even (W. of the Dnieper) the vine. Live-stock breeding is likewise in a more prosperous condition. The rest of the black earth zone, which stretches from these governments N.E. to the Volga, is less favoured by nature; the winters are longer and more inclement, and droughts are not uncommon. When this happens there is great suffering from famine, for wheat is the crop upon which the people principally depend, though rye, buckwheat and oats are also cultivated. But a long course of continuous cropping with these grain crops, without affording compensation to the soil in the form of manure or deep cultivation, has so exhausted it that its productiveness has sadly deteriorated. The consequence is that the peasantry are constantly in a state bordering on destitution, and exposed to the horrors of famine, like those which visited them in 1890 and 1898, and threatened in 1907.

S. of the above zone come the S. steppes. In the W., in Bessarabia, the three chief products are maize, wine and hardy fruit, especially plums. Here the climate is temperate and fairly moist, but farther E. it is distinctly more arid. Wheat is the principal crop, with barley second. Water-melons, sun-flowers and flax, both the last two for oil, are usual crops. But the breeding of horses and sheep is of equal importance with agriculture. Here again both capital and labour are short, and the cultivation of the soil suffers from the fact that, owing to the absence of timber, dry dung is used for fuel instead of being employed as manure. The steppe conditions extend over the greater part of the Crimea and up to the foothills of the Caucasus. The actual distribution of arable land, forests and meadows, in European Russia and Poland is shown in the following table:—

	European Russia.		Poland.	
	Acres.	Percentage.	Acres.	Percentage.
Arable land	301,435,000	26	16,900,000	53
Meadows and pasturages	185,498,000	16	6,059,000	19
Forests	452,152,000	39	7,334,000	23
Uncultivated	220,279,000	19	1,594,000	5
Total	1,159,364,000	100	31,887,000	100

The land in European Russia and Poland (Caucasia being excluded) is divided amongst the different classes of owners as follows:—

	European Russia.		Poland.	
	Acres.	Percentage.	Acres.	Percentage.
State and imperial family	400,816,000	35	1,808,000	5½
Peasants	446,657,000	38½	13,584,000	42½
Private owners, towns, &c.	245,835,000	21	15,106,000	47½
Unfit for cultivation	66,056,000	5½	1,389,000	4½
Total	1,159,364,000	100	31,887,000	100

Down to January 1st 1903, the peasants had actually redeemed out of the land allotted to them in 1861 a total of 280,530,516 acres. In Poland the peasants as a body have, in addition to the land thus assigned to them by the government, bought some 2½ million acres since 1863, and of this quantity they purchased no less than 1,600,000 acres, or 64% of the whole, between 1893 and 1905.

Taking the whole of European Russia and Poland, almost exactly two-thirds of the total area is sown every year with cereals. But generally in from 18 to 33 out of the 72 governments in European Russia (including Caucasia) and Poland the yield of cereals is not sufficient for the wants of the people. In 30 to 40 governments, however, there is in most years a surplus available for export. Out of the total acreage under cereals 34% is generally sown with rye, 26% with wheat, 20% with oats and 10½% with barley. Beetroot (6–8 million tons annually) for sugar is especially cultivated in Poland, the governments of Kiev, Podolia, Volhynia, Kharkov, Bessarabia and Kherson. About 100,000 tons of tobacco are grown annually in the S. Flax and hemp occupy considerable acreages in central and N.W. Russia. The vine is cultivated as far N. as 49° N. (in Bessarabia, Crimea, Don Cossacks territory and Caucasia), the annual production of wine amounting to 35–50 million gallons, three-fifths in Caucasia. Market-gardening and fruit-growing are profitable occupations in certain parts of S. and central Russia, and have led recently to the establishment of factories for canning fruit and for making jam and pickles. Transcaucasia supplies, chiefly from the government of Erivan, some 12,000 tons of raw cotton annually. The tea plant thrives and is being planted fairly rapidly on the Black Sea littoral in Transcaucasia.

Live-stock are diminishing in numbers all round: in the case of horses, from 21 per 100 inhabitants in 1882 to 11 per 100 inhabitants in 1904; of cattle, from 31 in 1851 to 23 in 1882 and 27 in 1904; sheep, from 56 to 46 and 41 in the years named respectively; and pigs, from 13 to 9 and 10 respectively. Recent investigations in the government of Moscow have revealed that 40% of the peasant households possessed no horses, and similar inquiries in 41 governments elicited the fact that 28% of the peasant households were without horses, although of the total number of horses in the country 82% belong to the peasantry. The animal commonly met with is small and possessed of very little strength; the best are those of Poland, the W. governments and the S. steppe country. Both the horses of the Cossacks and the *bityug* race of S. Russia are fine animals, and those of the Kirghiz, though not big, are famous for their endurance. Finland ponies are exported in large numbers. The best bred races of cattle are those of Poland, the W. provinces, Little Russia and the far N. (Kholmogory). Of the 55 million sheep kept in Russia only about 15 millions belong to the fine merino breed, and these are pastured chiefly on the Black Sea steppes. Modern dairy-farming is only just beginning in Russia, but butter is being exported in increasing quantities to W. Europe, including Great Britain. Poultry-farming is being more extensively engaged in, and vast numbers of eggs are exported.

Agriculture stands at a low level in Russia. The landowners are often poor, and suffer from want of capital and lack of enterprise. The peasantry are impoverished, and in many parts live on the verge of starvation for the greater part of the year. While the methods of agriculture have generally shown little, if any, advance, the population is increasing rapidly; and although since the emancipation of the peasants the average annual export of cereals has increased from less than 1½ million tons in 1860 to over 6 million tons in 1900, this result has been attained largely by the repeated cropping to exhaustion of the soil. Thus the cultivators, whether noble or peasant, have not profited much from the change in their economic circumstances brought about by the social emancipation of 1861. Agriculture suffers from the widespread poverty of the agricultural classes, from the taxation which weighs unjustly upon the peasantry, from their lack of education, their technical ignorance and national indolence, and from the absence of those progressive institutions (*e.g.* co-operative buying) by means of which the peasantry of Denmark have so wonderfully improved their position. As illustrating the general impoverishment of the Russian peasantry, it may be stated that the arrears of taxation owed by them have increased enormously since 1882, when they amounted to £2,854,000, until in 1900 the total amount was put at £15,222,000. And, strange to say, the heaviest arrears are due from the fertile black earth region of S. Russia, namely, 80% of their total indebtedness. Within recent years, however, some efforts have been made both by the Ministry of Agriculture and by the more enlightened of the *zemstvos* to improve the education of the peasantry, but the progress achieved has been small. The methods adopted by the *zemstvos* for improving the condition of agriculture have included the formation of agricultural councils, the appointment of inspectors, and the founding of museums, meteorological stations and depots for the sale of agricultural machinery. Measures are being taken by the *zemstvos* to increase the very low productivity of the forests. These cover a considerable area, as may be seen by the following table for 1904:—

Region.	Square Miles.	Percentage of Total Area.
European Russia	706,500	39
Poland	11,500	23
Finland	79,000	55
Caucasia	29,200	16
Total	826,200	39

The distribution of forests is very unequal, the area covered by them in the various governments varying from 70% of the total area in the Ural governments of Perm and Ufa, and 68% in Olonets and Archangel, down to 2% in the S.E. The state is the chief owner of forests (almost exclusive owner in Archangel), and owns no less than 289,226,000 acres in European Russia and Poland (235,000,000 acres of good forests), while private persons own 171,800,000 acres, the peasant communities 67,250,000 and the imperial family 22,400,000 acres.

Sericulture, which was in a flourishing condition in the 'sixties both in Caucasia and in S. Russia, was reduced to a very low ebb, in consequence of the silkworm disease, and was only renewed with any vigour towards the end of the 'eighties. At the beginning of the 20th century it was most developed in Transcaucasia (Kutais, Elisavetpol), and extended into N. Caucasia. Sericulture is taught in a number of special schools and in a great number of village schools. Attempts are being made to re-establish the silkworm industry in S. Russia and in Poland. Altogether raw silk and silk yarn to an annual value exceeding 1½ millions sterling are exported from Russia.

Mining and related industries.

Notwithstanding the wealth of the country in minerals and metals of all kinds, and the endeavours made by government to encourage mining, including the imposition of protective tariffs even against Finland (in 1885), this and the related industries are still at a low stage of development. The remoteness of the mining from the industrial centres, the want of technical instruction and of capital, and the existence of vexatious regulations, aggravated by the disturbed condition of the country, which hinder credit, confidence and enterprise, are amongst the chief reasons for this. The imports of foreign metals in the rough and of coal are steadily increasing, while the exports, never otherwise than insignificant, show no advance. As a producer of iron Russia nevertheless runs France neck and neck for the fourth place amongst the iron-producing countries of the world, her annual output having increased from 1,004,800 metric tons in 1891 to 2,808,000 in 1901 and to 2,900,000 in 1904. The two principal mining centres of European Russia are the Urals, Ekaterinoslav, Kharkov and the Don Cossacks territory. The Ural industry is the older, and is still conducted on primitive methods, wood being largely used for fuel, and the ore and metals being transported by water down the Kama and other rivers. The minerals chiefly produced in the Urals are iron, coal, gold, platinum, copper, salt and precious stones. The production of pig-iron nearly doubled between 1890 and 1900, increasing from 446,800 tons in the former year to 801,600 in the latter; but since 1900 the output has declined, the total for 1904 (inclusive of Siberia) being 644,000 tons. The amount of iron and steel produced in the Urals is not quite 20% of the total in all European Russia and Poland. The output of coal in the Urals is, altogether, less than 3% of the total for all the empire and 4% of the output of European Russia (exclusive of Poland) alone. The annual increase is but small, 261,300 tons having been the total in 1891, and 517,000 tons the total in 1904. Gold has been mined in the Urals since 1820; but since 1892 the output has fallen off very considerably. Whereas in the latter year the yield amounted to 395,500 oz., in 1900 it was only 291,250 oz. No less than 96% of the world's supply of platinum comes from the Urals; but the total output only ranges between 10,000 and 16,000 ℔ annually. The copper industry has greatly declined since the 18th century; whereas then it kept 20 smelting works employed, now one-tenth of that number can hardly be kept going. The output for the year is less than 4000 tons. At one time all Russia was supplied with salt from the Urals, but at the present time the output is extremely small, less than 350 tons annually. Salt has been mined there since the 16th century.

The mining region of S. Russia is much more important. It is of comparatively recent foundation (1860), and is carried on largely with French and Belgian capital, with modern appliances and with modern scientific knowledge. Out of an average of some 2,700,000 tons of pig-iron produced annually in the whole of the Russian empire, 61·5% is produced in the basin of the Donets, and out of an average of 2,160,500 tons of worked iron and steel 48·7% are prepared in the same region. The principal consumer of this iron and steel is the government, for its railways, locomotives, wagons, arsenals, artillery, &c. The output of coal in the Russian empire has increased from a total of less than 300,000 tons in 1860 to 3,280,000 in 1880, 15,878,200 in 1900, and 18,620,000 tons in 1904. Of these totals something like 70% is produced in the S. coal-field. Coal takes, however, an altogether secondary place as a fuel in Russia; wood is much more extensively used, not only for domestic, but also for industrial purposes. It is estimated that for domestic purposes nearly 150,000,000 tons of wood are consumed every year, while the steamships, railways and factories consume another 20 or 25 million tons. At the same time large quantities of petroleum refuse are used as fuel in the railways of S.E. Russia and Caucasia, and on the steamboats of the Volga system. For the petroleum industry and the mining of the Caucasus region, see CAUCASIA. Mining in Poland and Siberia are more fully discussed under those headings.[1]

Manufactures and petty industries.

Since the time of Peter the Great, the Russian government has been unceasing in its efforts for the creation and development of home manufactures. Important monopolies in the 18th century, and prohibitive import duties, as well as large money bounties, in the 19th, contributed towards the accumulation of immense private fortunes, but manufactures have on the whole developed but slowly. A great upward movement has, however, been observable since 1863. About that time a thorough reform of the machinery in use was effected whereby the number of hands employed was reduced, but the yearly production doubled or trebled. Manufacturing industry in the modern sense can hardly be said to have existed in Russia before the 19th century, that is to say, industries carried on with capital and machinery in large factories. Industry of this character was first established in Poland in 1820, and it has grown there rapidly, though never so rapidly as during the last few years of the 19th century. The principal centre is Lodz in the government of Piotrkow, the staple industry being cottons. A good many factories have sprung up also in Warsaw and at Sosnowice and Bendzin in the extreme S.W. corner of Poland. Besides cottons the products include woollens and cloth, silks, chemicals, machinery, ironware, beer and flour. At Lodz alone the workmen, in great part Germans and Jews, number between 50,000 and 60,000, and the total output of the factories is estimated at £9,000,000 to £10,500,000 annually. Similar industries, carried on by similar methods, exist at St Petersburg, Riga, Narva and Odessa. In S. Russia, more particularly at Ekaterinoslav, a very vigorous metallurgical industry has grown up since 1860 in conjunction with the iron and coal mining.

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[1] See *Russian Journal of Financial Statistics*, in English (2 vols., St Petersburg, 1901).

The peculiar feature of Russian industry is the development out of the domestic petty handicrafts of central Russia of a semi-factory on a large scale. Owing to the forced abstention from agricultural labour in the winter months the peasants of central Russia, more especially those of the governments of Moscow, Vladimir, Yaroslavl, Kostroma, Tver, Smolensk and Ryazañ have for centuries carried on a variety of domestic handicrafts during the period of compulsory leisure. The usual practice was for the whole of the people in one village to devote themselves to one special occupation. Thus, while one village would produce nothing but felt shoes, another would carve sacred images (*ikons*), and a third spin flax only, a fourth make wooden spoons, a fifth nails, a sixth iron chains, and so on. In the same way certain governments become famous for certain commodities, as Moscow for osier baskets, flower baskets, wicker furniture and lace; Kostroma for lace, wooden utensils, toys, wooden spoons, cups and bowls, bast sacks and mats, bast boots and garden products; Yaroslavl for furniture, brass samovars, saucepans, spurs, rings, &c.; Vladimir for furniture, osier baskets and flower-stands and sickles; Nizhniy-Novgorod for bast mats and sacks, knives, forks and scissors; Tver for lace, nails, sieves, anchors, fish-hooks, locks, coarse clay pottery, saddlery and harness, boots and shoes, and so on. Out of these have grown large factories, employing as many as 10,000 to 12,000 men each; but when harvest comes round, these men leave the factories and repair to their fields, and meantime the factories stand still for two or three months. Nor do the people work on the holidays of the church, the number of days they lose in this way amounting to nearly one-third of the whole year. Hence, although wages are painfully low, the cost of production to the manufacturer is relatively high; and it is still further increased by the cost of the raw materials, by the heavy rates of transport owing to the distance from the sea, by the dearness of capital and by the scarcity of fuel. As a consequence this central Russian industry, even when supported by very high protective duties, is only able to produce for the home market and the markets of the adjacent territories in Asia which are under Russian political control. Here again cotton is the principal product; and the remarkable growth of the industry is illustrated by the fact that, whereas in 1843 there were only 350,000 spindles at work, fifty years later there were 4,332,000 so employed, and in 1900, 6,554, 600. The number of looms increased from 87,190 in 1890 to 154,600 in 1900. Next after cottons come woollens, silk, cloth, chemicals, machinery, paper, furniture, hats, cement, leather, glass and china and other products. From the governments of Vyatka and Vladimir large numbers of bricklayers, carpenters and other handicraftsmen migrate temporarily to the S. governments every year, and similarly plasterers and painters from the government of Moscow.

The growth of Russian industry is set forth in the following table, which compares the number of workers for 1887, 1897 and 1902, of all factories throughout the empire of which the annual production was valued at more than £210:—

Branch of Industry.	Number of Workers.		
	1887.	1897.	1902.
Textiles	399,178	642,520	708,186
Food products . . .	205,223	255,357	303,213
Animal products . . .	38,876	64,418	—
Wood	30,703	86,273	79,664
Paper	19,491	46,190	78,395
Chemical products . .	21,134	35,320	60,108
Ceramics	67,346	143,291	150,809
Mining and metals . .	390,915	544,333	549,000
Metal goods . . .	103,300	214,311	252,215
Various	41,882	66,249	78,183
Total .	1,318,048	2,098,262	2,259,773

With regard to Russian industry generally, the extravagant prices which have to be paid for iron and all iron goods, owing to the prohibitive tariffs, combined with the obstacles put in the way of education, hamper the development of all industries. The cotton factories excel chiefly in the production of red and printed cottons. In the flax-mills the tendency is to produce the finest tissues as well as the coarser. The silk-mills employ silk obtained from the Caucasus, Italy and France. The growth of the sugar industry is shown by the fact that in 1888–93 the average annual production of sugar was 444,520 tons, in 1902–3 it was 1,180,293 tons. Since 1894 the government has had a monopoly in retailing spirituous liquors, but not wine or beer; but distilling, a very widespread industry, is left in private hands. Beer is chiefly brewed in Poland and the Baltic provinces. Tanneries exist in nearly every government, but it is especially at Warsaw and St Petersburg, and after these at Moscow, that the largest and best modern tanneries and shoe and glove factories are established. The governments of Orel (shoe factories), Kherson, Vyatka, Nizhniy-Novgorod, Perm, Kiev and Kazañ rank next in this respect. Furniture factories are developing greatly, as is the paper industry. Flour-mills play an important part in the general industry of Russia, and there are several tobacco and hemp factories.

Far from being destroyed by the competition of the "modern" factories, domestic industries have well maintained their ground, new branches of petty trade having sprung up in some districts, among them the manufacture of agricultural machinery (thrashing machines in Ryazañ, Vyatka and Perm; ploughs in Smolensk, &c.) deserves notice.

Inland trade.

The wealth of Russia consisting mainly of raw produce, the trade of the country turns chiefly on the purchase of this for export, and on the sale of manufactured and imported goods in exchange. This traffic is in the hands of a great number of middlemen,—in the W. Jews, and elsewhere Russians,—to whom the peasants are for the most part in debt, as they purchase in advance on security of subsequent payments in corn, tar, wooden wares, &c. A good deal of the internal trade is carried on by travelling merchants.

The fairs are very numerous. Those of Nizhniy-Novgorod, with a return of 20 millions sterling, of Irbit and Kharkov, of Menzelinsk in Ufa, and Omsk and Ishim in Siberia, have considerable importance both for trade and for home manufactures. Altogether, no fewer than 16,600 fairs are held in Russia, 85% of them in European Russia. Of these, 30 show returns of goods imported to the value of over £100,000 each, 41 from £50,000 to £100,000, and 437 from £10,000 to £50,000 each.

The external trade of the Russian empire (bullion and the external trade of Finland not included) since the year 1886 is shown in the following table:—

Years (average).	Exports.	Imports.
1886–1891 . .	£72,200,000	£43,250,000
1892–1896 . .	60,360,000	46,100,000
1897–1901 . .	68,500,000	55,180,000
1902–1905 . .	103,448,000	66,533,000

The exports rank in the following order:—cereals (wheat, barley, rye, oats, maize, buckwheat) and flour, 49·2%; timber and wooden wares, 7·2; petroleum, 5·8; eggs, 5·4; flax, 5; butter, 3; sugar, 2·4; cottons and oilcake, 2 each; oleaginous seeds, &c., 1·5; with hemp, spirits, poultry, game, bristles, hair, furs, leather, manganese ore, wool, caviare, live-stock, gutta-percha, vegetables and fruit, and tobacco. The two best customers of Russia are Germany, which takes 23·3% of her total exports, and the United Kingdom, which takes 22·9%. Then follow the Netherlands (9·8%), France, Italy, Finland, Belgium, Austria-Hungary, Denmark, Turkey and Sweden. The commodities which the United Kingdom principally takes are wheat, wool, barley, eggs, oats and flax. With regard to the imports into Russia—they consist mainly of raw materials and machinery for the manufactures, and of provisions, the principal items being raw cotton, 17% of the aggregate; machinery and metal goods, 13%; tea, 5%; mineral ores, 5%; gums and resins, 4%; wool and woollen yarns, 3½%; textiles, 3%; fish, 3%; with leather and hides, chemicals, silks, wine and spirits, colours, fruits, coffee, tobacco and rice. The countries from which Russia buys most extensively are Germany (34%), the United Kingdom (15½) and the United States (9½). Machinery, coal, iron, woollens, ships, lead and copper are the commodities supplied by the United Kingdom.

Shipping.

The total mercantile marine of Russia does not aggregate 700,000 tons; and it is distributed in the following proportions: 35·4% in the Caspian Sea, 34·7% in the Black Sea and Sea of Azov, 24·7% in the Baltic Sea and 5·2% in the White Sea. And these proportions represent fairly well the tonnages entering and clearing at the ports of these respective seas. But of the vessels that visit the Russian ports in the way of trade every year only 8·3% are Russian, the rest being of course foreign. Russian craft play, however, a much more important part on the internal waterways, the traffic on which increases rapidly, *e.g.* whilst in 1894 it amounted to an aggregate of 23,293,400 tons, in 1904 it reached a total of 38,720,240, or an increase of over 66% in the ten years. During the same period the tonnage of the craft themselves more than doubled, while the crews increased 19½ %, the number of men employed in the latter year being approximately 150,000.

Railways.

In 1860 Russia possessed less than 1000 m. of railways; by 1885 this had increased to 16,155 m., and by the middle of 1905 there were open for traffic over 40,500 m. of railway, of which 34,150 m. or 84·3 % were in European Russia and nearly 6400 m. (15·7 %) in Asiatic Russia. Between 1895 and 1905 the building of railways proceeded at a rapid rate, the total length nearly doubling within the ten years, namely, from 22,600 to 40,500 m. The European railways cost on an average £10,465 per mile to construct, and the Asiatic railways £5092 per mile.

A considerable number of new railways, some of great strategic as well as commercial importance, were built during the last twenty years of the 19th century. At the same time the chief lines of railway which had been built by public companies with a state guarantee, and which represented a loss to the empire of £3,171,250 per annum, as well as a growing indebtedness, were bought by the state. On the whole, the state derives profit from its railways, although several of the later lines, while imperative for state purposes, must necessarily yield but a very small revenue, or be worked at a loss. The most important of the new railways is the Siberian, of which the first section, Chelyabinsk to Omsk, was opened in December 1895, and which, except for a short section round Lake Baikal, in 1901 was completed right through to Stryetensk, on the Shilka, the head of navigation on the Shilka and the Amur, 2710 m. from Chelyabinsk and 4076 miles from Moscow, via Samara and Chelyabinsk. The section round the S. end of Lake Baikal was completed in 1905. At the Pacific end of the Siberian railway a line connecting Vladivostok with Khabarovsk (479 m.) at the junction of the Amur and the Usuri, was first of all built, following the valley of the Usuri. But it was soon found that the cost of the section required to complete the railway between Stryetensk and Khabarovsk, along the Shilka (246 m.) and the Amur (1160 m.), would be enormous, while neither the wild mountainous tracts of the lower Shilka and upper Amur, nor the marshy, often inundated region between Khabarovsk and the Little Khingan mountains, could ever be the seat of a numerous population. Consequently a company was formed by the Russian government in 1896 to construct, with the consent of the Chinese government, a railway from Vladivostok across Manchuria to Karymskaya near Chita in Transbaikalia. This runs for 222 m. on Russian territory and for 1080 m. on Manchurian territory, and from Kharbin sends off a branch to Dalny near Port Arthur on the Liao-tung peninsula. The first portion of the Manchurian railway, built by Russian engineers, with Chinese labour, was finished in 1902. At the same time several secondary lines were built in connexion with the Siberian line. Chelyabinsk was linked by a transverse line with the middle Urals railway, which connects Perm, the head of navigation in the Volga basin, with Tyumen, the head of navigation on the Ob and Irtysh, passing through Ekaterinburg and other mining centres of the middle Urals. Tomsk is now connected with the main line by a short side branch. A railway has also been built to connect Perm with Kotlas, near the confluence of the Sukhona with the Yug, at the head of the N. Dvina. This N. portion of the Russian railway system was further completed by the opening in 1906 of a line from St Petersburg via Vologda to Vyatka, intersecting the Moscow-Archangel line at Vologda.

Another line of great strategic importance was built across the Transcaspian territory to Ferghana. Starting from Krasnovodsk, it runs S.E. to Merv (560 m.), with a branch line (194 m.) to Kushk, near Herat, then N.E. across the desert to Charjui, on the Amur river, Bokhara and the Russian fort Katta-kurgan, and then to Samarkand, Kokand and Andijan in Ferghana, 710 m. from Merv, with a branch to Tashkent (220 m.). This railway has become important for the export of raw cotton from Central Asia to Russia. In 1905 a second totally independent line was opened from Tashkent down the Syr-darya to Kazalinsk, and thence to Orenburg.

A third line of great importance is the junction line between the Transcaucasian railway—which runs from Batum and Poti to Baku, via Tiflis, with a branch line to Kars—and the railway system of Russia proper. This junction has been effected not across the main Caucasus range, but at its E. extremity, that is, via the Caspian ports of Baku and Petrovsk, which are connected with Vladikavkaz (Beslan junction). The Black Sea port of Novorossiysk, in W. Caucasia, having been connected with the Rostov-Vladikavkaz line, has consequently also been brought into touch with the Russian railways. The Volga is reached from central Russia by seven lines of railways, including one to Kazañ, and three main lines radiate from the Volga E. (one to Siberia and two to the Ural river), while the upper Volga (Yaroslavl) is connected with Archangel by a line 523 m. long. A zone tariff was introduced on the Russian railways in 1894, and the cost of long journeys was considerably reduced; a journey of 623 m. can be made third class at a cost of only about 17 shillings, while for less than twice as much 1990 m. can be covered.

Fishing.

Fish form an important article of national food. The numerous fasts of the national church prescribe a fish diet on many days in the year, and the continuous frost of winter is favourable to the transportation of fish for great distances. Along the Murman coast of the Arctic Ocean and in the White Sea, where many millions of herrings are caught annually by some 3000 persons, the yearly produce is estimated at the value of £140,000. In the Baltic Sea, as well as in the lakes of its basin (Ladoga, Onega, Ilmeñ, &c.), the yearly value is estimated at £200,000. Of anchovies alone, 10,000,000 jars are prepared annually, while salted fish is, next after bread, the staple food of large masses of the population. The Black Sea fisheries, in which about 4000 men are engaged, yield fish valued at £300,000 per annum. The value of the fish has much increased owing to the introduction of cold storage; as a result of the employment of this method of packing, fish is now exported in a fresh state from the Black Sea to all parts of S.W. Russia, and even to Moscow. The annual yield of the Azov Sea fisheries, occupying 15,000 men, is valued at £600,000. In the Volga section of the Caspian Sea fish are caught to the value of about £1,000,000 annually; in the Ural section over 40,000 tons of fish and nearly 1500 tons of caviare are obtained. The total value of the Caspian fisheries is estimated at £3,000,000 per annum. Taking the Lake Aral and Siberian river fisheries into account, it is estimated that altogether the fishing industries yield a revenue to the state of £330,000 annually.[1] In addition from 13,000 to 60,000 seals and about 200 whales are killed annually off the Murman coast. Hunting is an occupation of considerable importance in N. and N.E. Russia, and along the shores of the Arctic Ocean.

AUTHORITIES.—The *Russkiy Encyclopedicheskiy Slovar*, edited by Brockhaus and Efron, was begun in 1890, with the idea of giving a Russian version of Brockhaus's *Conversations Lexikon*, but from the very first volumes it became a monumental encyclopaedia, and is, indeed, an inexhaustible source of information on everything Russian. A general popular description of Russia entitled *Rossiya*, containing excellent geographical, geological and other descriptions of separate regions, and very well-chosen illustrations, was begun in 1899 under the editorship of V. P. Semenov. *La Russie à la fin du xixᵉ siècle*, under the editorship of W. W. Kovalevsky, is especially worthy of notice. See also H. Norman, *All the Russias* (London, 1902); Sir D. Mackenzie Wallace, *Russia* (2 vols., new ed., 1905, London); A. Leroy-Beaulieu, *L'Empire des tsars* (3 vols., 1882–88; Eng. trans., London, 1893–96); A. Hettner, *Das europäische Russland* (Leipzig, 1905); R. Martin, *The Future of Russia* (Eng. trans., London, 1906); M. M. Kovalevsky, *Russian Political Institutions* (Chicago, 1902), *Modern Customs and Ancient Laws of Russia* (London, 1891), *Le Régime économique de la Russie* (Paris, 1898), and *Die produktiven Kräfte Russlands* (Paris, 1896); A. M. B. Meakin, *Russia* (London, 1906); G. von Schulze-Gävernitz, *Volkswirthschaftliche Studien aus Russland* (Leipzig, 1899); J. Machat, *La Développement économique de la Russie* (Paris, 1902); *Industries of Russia*, by the Department of Trade and Manufactures (English by J. M. Crawford, 5 vols., St Petersburg, 1893); A. F. Rittich, "Die Ethnographie Russlands" in *Petermanns Mitteilungen*, Ergänzungsheft 54 (Gotha, 1878); C. Joubert, *Russia as it really is* (London, 1904). (P. A. K.; J. T. BE.)

HISTORY

The history of Russia may be conveniently divided into four consecutive periods: (1) the period of Independent Principalities; (2) the Mongol Domination; (3) the Tsardom of Muscovy; and (4) the Modern Empire.

Origin of the Russians.

1. *A Conglomeration of Independent Principalities.*—The first period, like the early history of many other countries, begins with a legend. Nestor, an old monkish chronicler of Kiev, relates that in the middle of the 9th century the Slav and Finnish tribes inhabiting the forest region around Lake Ilmen, between Lake Ladoga and the upper waters of the Dnieper, paid tribute to military adventurers from the land of Rūs, which is commonly supposed to have been a part of Sweden. In the year 859 these tribes expelled the Northmen, but finding that they quarrelled among themselves, they invited them, three years later, to return. Our land, said the deputation sent to Rūs for this purpose, is great and fertile, but there is no order in it; come and reign and rule over us. Three brothers, princes of Rūs, called respectively Rurik, Sineus and Truvor, accepted the invitation and founded a dynasty, from which many of the Russian princes of the present day claim descent.

Who were those warlike men of Rūs who are universally recognized as the founders of the Russian Empire? This question has given rise to an enormous amount of discussion among learned men, and some of the disputants have not yet laid down their arms; but for impartial outsiders who have carefully studied the evidence there can be little doubt that the men of Rūs, or Variags, as they were sometimes called, were simply the hardy Norsemen or Normans who at that time, in various countries of Europe, appeared first as armed marauders and then lived in the invaded territory as a dominant military caste until they were gradually absorbed by the native population. Lake Ilmen and the river Volkhov, on which stands Novgorod, Rurik's capital, formed part of the great waterway from the Baltic to the Black Sea, and we know that by this route travelled from Scandinavia to Constantinople the tall fair-haired Northmen who composed the famous Varangian bodyguard of the Byzantine emperors.

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[1] See *Researches into the State of Fisheries in Russia* (9 vols.), edited by Minister of Finance (1896, Russian); Kusnetzow's *Fischerei und Thiererbeutung in den Gewässern Russlands* (1898).

Early conditions. The grand-princes.

The new rulers did not long confine their attention to the tribes who had invited them. They at once began to conquer the surrounding country in all directions, and before two centuries had passed they had established themselves firmly at Kiev on the Dnieper, invaded Byzantine territory, threatened Constantinople with a fleet of small craft, obtained as consort for one of their princes, Vladimir I, (*q.v.*), a sister of the Byzantine emperor on condition of the prince becoming a Christian, adopted Christianity for themselves and their subjects, learned to hold in check the nomadic hordes of the steppe, and formed matrimonial alliances with the reigning families of Poland, Hungary, Norway and France. In short, they became a considerable power in eastern Europe, and might be regarded as one of the claimants for the inheritance of the decrepit East Roman Empire. Unfortunately for the political future of this new state, its internal consolidation did not keep pace with its territorial expansion. In theory the whole Russian land was a gigantic family estate belonging to the Rurik dynasty, and each member of that great family considered himself entitled to a share of it. It had to be divided, therefore, into a number of independent principalities, but it continued to be loosely held together by the dynastic sentiment of the descendants of Rurik and by the patriarchal authority—a sort of *patria potestas*—of the senior member of the family, called the grand-prince, who ruled in Kiev, "the mother of Russian cities." His administrative authority was confined to his own principality, but when territorial disputes arose between two or more of his relations, his paternal influence was exercised in the interests of peace and justice. What added to the practical difficulties of this arrangement was that the post of grand-prince was not an hereditary dignity in the sense of descending from father to son, but was always to be held by the senior member of the dynasty; and in the subordinate principalities the same principle of succession was applied, so that reigning princes had to be frequently shifted about from one district to another, according as they could establish the strongest claim to vacant principalities. What constituted in this primitive system of inheritance the strength of a claim was often not easily determined, and even when the legal question was clear enough the law was not always respected by the contending parties. Hence family quarrels became very frequent. These princes were, in fact, men of like passions with ourselves, and acted as powerful men generally do in a rude state of society. Instead of conforming to abstract principles of public law and hereditary succession, they strove to enlarge their territories at the expense of their rivals, and to leave them at their death to their sons rather than to their brothers, nephews and more distant relations. In these circumstances, the traditional authority of the grand-prince, never very great, rapidly declined, and the complicated law of succession, never scrupulously respected, was gradually replaced by "the good old rule, the simple plan, that he should take who has the power, and he should keep who can." Yaroslav, surnamed the Great, a man of commanding personality, was the last grand-prince who upheld vigorously the old system. After his death in 1054 the process of disintegration went on apace and the family feuds multiplied at an alarming rate. During the next 170 years (1054–1224) no less than 64 principalities had a more or less ephemeral existence, 293 princes put forward succession-claims, and their disputes led to 83 civil wars.

During these interminable struggles of rival princes, Kiev, which had been so long the residence of the grand-prince and of the metropolitan, was repeatedly taken by storm and ruthlessly pillaged, and finally the whole valley of the Dnieper fell a prey to the marauding tribes of the steppe. Thereupon Russian colonization and political influence retreated northwards, and from that time the continuous stream of Russian history is to be sought in the land where the Vikings first settled and in the adjoining basin of the upper Volga. Here new principalities were founded and new agglomerations of principalities came into existence, some of them having a grand-prince who no longer professed allegiance to Kiev. Thus appeared the grand-prince of Suzdal or Vladimir, of Tver, of Ryazan and of Moscow—all irreconcilable rivals with little or no feeling of blood-relationship. The more ambitious and powerful among them aspired not to succeed but to subdue the others and to take possession of their territory, and the armed retainers, who were wont formerly to wander about as free lances, gave up their roving mode of life, settled down permanently in one principality, became landed proprietors, and sought to share as boyars the princes' authority.

Republic of Novgorod.

Among the principalities of that northern region the first place was long held by Novgorod. Since the days when Rurik had first chosen it as his headquarters, the little town on the Volkhov had grown into a great commercial city and a member of the Hanseatic league, and it had brought under subjection a vast expanse of territory, stretching from the shores of the Baltic to the Ural Mountains, and containing several subordinate towns, of which the principal were Pskov, Nizhniy-Novgorod and Vyatka. Unlike the ordinary Russian principalities, it had a republican rather than a monarchical form of government. Indeed, it was not so much a principality as a municipal republic of the Venetian type. It always had a prince, no doubt, but he was engaged by formal contract without much attention being paid to hereditary rights, and he was merely leader of the troops, while all the political power remained in the hands of the civil officials and the *Vetche*, a popular assembly which was called together in the market-place, as occasion required, by the tolling of the great bell. Descendants of Rurik, impregnated with the pride of a dominant military caste, did not much like serving those truculent, wilful burghers, and some of them, after a time, voluntarily laid down their office and retired to more congenial surroundings. Those of them who tried to have their own way and came into conflict with the authorities had always to yield in the long run, and they were liable to be treated very unceremoniously, so that the vulgar adage, "If the prince is bad, into the mud with him!" became a maxim of state policy.

There was here in the Russian land the germ of republicanism or constitutional monarchy, but it was not destined to be developed. The principality which was to become the nucleus of the future Russian empire was not Novgorod with its democratic institutions, but its eastern neighbour Moscow, in which the popular assembly played a very insignificant part, and the supreme law was the will of the prince. The opposition which he encountered came not from the burghers but from the boyars and the nobles.

Mongol and Tatar Invasions.

II. *The Mongol or Tatar Domination, 1238–1462.*—Between Moscow and Novgorod there was a long and bitter rivalry, breaking out occasionally into armed conflicts, and among the princes of the other principalities the old struggle for precedence and territory went on unceasingly until it was suddenly interrupted, in the first half of the thirteenth century, by the unexpected irruption of an irresistible foreign foe coming from the mysterious regions of the Far East. "For our sins," says the Russian chronicler of the time, "unknown nations arrived. No one knew their origin or whence they came, or what religion they practised. That is known only to God, and perhaps to wise men learned in books." The Russian princes first heard of them from the wild nomadic Polovtsi, who usually pillaged the Russian settlers on the frontier but who now preferred

The Golden Horde.

friendship and said: "These terrible strangers have taken our country, and to-morrow they will take yours if you do not come and help us." In response to this call some Russian princes formed a league and went out eastward to meet the foe, but they were utterly defeated in a great battle on the banks of the Kalka (1224), which has remained to this day in the memory of the Russian common people. Now the country was at the mercy of the invaders, but, instead of advancing, they suddenly retreated and did not reappear for thirteen years, during which the princes went on quarrelling and fighting as before, till they were startled by a new invasion much more formidable than its predecessor. This time the invaders came to stay, and they built for themselves a capital, called Sarai, on the lower Volga. Here the commander of "the Golden Horde," as the western section of the Mongol empire was called, fixed his headquarters and represented the majesty of his sovereign the grand khan who lived with the Great Horde in the valley of the Amur. About the origin and character of these terrible invaders we are much better informed than the early Russian chroniclers. The nucleus of the invading horde was a small pastoral tribe in Mongolia, the chief of which, known subsequently to Europe as Jenghiz Khan (*q.v.*), became a mighty conqueror and created a vast empire stretching from China, across northern and central Asia, to the shores of the Baltic and the valley of the Danube—a heterogeneous state containing many nationalities held together by purely administrative ties and by an enormous military force. For forty years after the death of its founder it remained united under the authority of a series of grand khans chosen from among his descendants, and then it began to fall to pieces till the various fractions of it became independent khanates.

The khanate closely connected with the history of Russia was that of Kipchak or the Golden Horde, the khans of which settled, as we have seen, on the lower Volga and built for themselves a capital called Sarai. Here they had their headquarters and held Russia in subjection for nearly three centuries.

Character of Tatar rule.

The term by which this subjection is commonly designated, the Mongol or Tatar yoke, suggests ideas of terrible oppression, but in reality these barbarous invaders from the Far East were not such cruel, oppressive taskmasters as is generally supposed. In the first place, they never settled in the country, and they had not much direct dealings with the inhabitants. In accordance with the admonitions of Jenghiz to his children and grandchildren, they retained their pastoral mode of life, so that the subject races, agriculturists and dwellers in towns, were not disturbed in their ordinary avocations. In religious matters they were extremely tolerant. When they first appeared in Europe they were idolaters or Shamanists, and as such they had naturally no religious fanaticism; but even when they adopted Islam they remained as tolerant as before, and the khan of the Golden Horde (Berkai) who first became a Mussulman allowed the Russians to found a Christian bishopric in his capital. One of his successors, half a century later, married a daughter of the Byzantine emperor, and gave his own daughter in marriage to a Russian prince. These represent the bright side of Tatar rule. It had its dark side also. So long as a great horde of nomads was encamped on the frontier the country was liable to be invaded by an overwhelming force of ruthless marauders. These invasions were fortunately not frequent, but when they occurred they caused an incalculable amount of devastation and suffering. In the intervals the people had to pay a fixed tribute. At first it was collected in a rough-and-ready fashion by a swarm of Tatar tax-gatherers, but about 1259 it was regulated by a census of the population, and, finally, the collection of it was entrusted to the native princes, so that the people were no longer brought into direct contact with the Tatar officials.

By the princes the "yoke" was felt more keenly, and it was very galling. In order to reply to accusations brought against them, or in order to be confirmed in their functions, they had to travel to the Golden Horde on the Volga or even to the camp of the grand khan in some distant part of Siberia, and the journey was considered so perilous that many of them, before setting out, made their last will and testament and wrote a parental admonition for the guidance of their children. Nor were these precautions by any means superfluous, for not a few princes died on the journey or were condemned to death and executed for real or imaginary offences. Even when the visit to the Horde did not end so tragically, it involved a great deal of anxiety and expense, for the Mongol dignitaries had to be conciliated very liberally, and it was commonly believed that the judges were more influenced by the amount of the bribes than by the force of the arguments. The grand khan was the lord paramount or suzerain of the Russian princes, and he had the force required for making his authority respected. Ambitious members of the Rurik dynasty, instead of seeking to acquire territory by conquest in the field, now sought to attain their ends by intrigue and bribery at the Mongol court.

The princes of Moscow. Dimitri Donskoi, 1362–1389.

Of all the princes who sought to advance their fortunes in this way the most dexterous and successful were those of Moscow. They made themselves responsible for the tribute of other principalities as well as of their own, and gradually they became lieutenants-general of their Mongol suzerain. So long as the Mongol empire remained united and strong, they were most submissive and obsequious, but as soon as it was weakened by internal dissensions and began to fall to pieces, they assumed airs of independence, intrigued with the insubordinate Tatar generals, retained for their own use the tribute collected for the grand khan, and finally put themselves at the head of the patriotic movement which aimed at throwing off completely the hated Mongol yoke. For this purpose Dimitri Donskoi formed in 1380 a coalition of Russian princes, and gained a great victory over Khan Mamai of the Golden Horde on the famous battlefield of Kulikovo, the memory of which still lives in the popular legends. For some time longer the Tatars remained troublesome neighbours, capable of invading and devastating large tracts of Russian territory and of threatening even the city of Moscow, but the Horde was now broken up into independent and mutually hostile khanates, and the Moscow diplomatists could generally play off one khanate against the other, so that there was no danger of the old political domination being re-established.

Having thus freed themselves from Tatar control, the Moscow princes continued to carry out energetically their traditional policy of extending and consolidating their dominions at the expense of their less powerful relations. Already Dimitri of the Don was called the grand-prince of all Russia, but the assumption of such an ambitious title was hardly justified by facts, because there were still in his time principalities with grand-princes who claimed to be independent. The complete suppression of these small moribund states and the creation of the autocratic tsardom of Muscovy were the work of Ivan III., surnamed the Great, his son Basil and his grandson Ivan IV., commonly known as Ivan the Terrible, whose united reigns cover a period of 122 years (1462–1584).

Ivan III. 1462–1505.

Basil III. 1505–1533.

III. *The Tsardom of Muscovy.*—What may be called the home policy of these three remarkable rulers consisted in absorbing the few principalities which still remained independent, and in creating for themselves an uncontrolled monarchical authority. In the pursuit of both of these objects they were completely successful. When Ivan III. came to the throne the remaining independent principalities were Great Novgorod, Pskov, Tver, Ryazan and Novgorod-Seversk. He first directed his attention to Novgorod, and by gradually undermining and then destroying the ancient republican liberties he reduced the haughty city, which had long styled itself Lord Novgorod the Great, to the rank of a provincial town. Then he annexed its colonies and thereby extended his dominions to the Polar Ocean and the Ural Mountains. At the same time he took possession of Tver, on the ground that the prince had allied himself with Lithuania. His successor Basil followed in his footsteps, and dealt with the municipal republic of Pskov was Ivan had dealt with Novgorod. Finding the inhabitants too much attached to their ancient liberties, he abolished the popular assembly, removed the great bell to Novgorod, installed his own boyars in the administration, transported 300 of the leading families to other localities, replaced them by 300 families from Moscow, and left in the town a strong garrison of his own troops. Ryazan shared the same fate. In 1521 the prince, being suspected of forming an alliance with the Crimean Tatars, was summoned to Moscow and arrested. Two years later the prince of Novgorod-Seversk was accused of intriguing with the Poles and imprisoned for the rest of his life. Thus all the principalities were brought under the power of Moscow, and in that respect there remained nothing for Ivan the Terrible to do. He took precautions, however, against any of the dead or moribund principalities being resuscitated, and punished with merciless severity any attempt to resist or undermine his authority.

Character of the tsardom.

With the suppression and absorption of the independent principalities the problem was only half solved. The tsars of Muscovy meant to be autocratic rulers alike in their old and in their new territories. Their forefathers had been trained in the Tatar school of politics and administration, and in their ideas of government they had come to resemble Tatar khans much more than grand-princes of the old patriarchal type. Their autocratic tendencies were fostered also by the Church. As Christianity was brought into Russia from Constantinople it was only natural that the ecclesiastics, many of whom were Greeks, should admire Byzantine ideals and recommend them as models to be imitated. For the ambitious Moscow princes many of the Byzantine ideas were very acceptable. They liked to consider themselves as the Lord's anointed, placed high above all ordinary mortals even of the most exalted rank; and when Constantinople fell into the hands of the infidel they began to imagine that, as the most powerful potentates of the Eastern Orthodox world they were the protectors of the Orthodox faith and the political heirs of the East Roman emperors. With a view to strengthen this claim Ivan III. married a niece of the emperor Constantine Palaeologus, who had fallen fighting when his capital was taken by the Turks (1453). From that moment Ivan's subjects noticed a change in his attitude towards them, and attributed it to the evil influence of the Greek princess. In the old times the grand-prince was simply *primus inter pares* among the minor princes, and these lived with their boyars almost on a footing of equality. Now the tsar of Muscovy and of all Russia adopted the airs and methods of a Tatar khan and surrounded himself with the pomp and splendours of a Byzantine emperor. Ivan III., notwithstanding the influence of his Greek consort, showed some respect for the ancient traditions and the susceptibilities of those around him, but his successor Basil did not follow his father's example. All through his reign he preferred to employ as officials men of humble origin, and habitually treated the boyars and great nobles very unceremoniously. For disobedience to his orders he imprisoned a boyar who was his own brother-in-law, and he caused another to be beheaded for complaining that the boyar-council was not consulted in important affairs of state. A boyar of Nizhniy-Novgorod who allowed himself to criticize the new order of things, and attributed the change to the influence of the Greek princess, had his tongue cut out. From the ecclesiastics Basil likewise insisted on unquestioning obedience, and he did not hesitate to depose by his own authority a metropolitan who was at that time the highest dignitary of the Russian Church. According to Siegmund von Herberstein (1486–1566), an Austrian envoy who visited Moscow at that period, no sovereign in Europe was obeyed like the grand-prince of Muscovy, and his court was remarkable for barbaric luxury. In his palace were numerous equerries, chamberlains and other court dignitaries, and when he went out he was attended by a guard of young nobles dressed in gaudy costumes and armed with silver halberds.[1]

Such radical changes naturally produced a great deal of dissatisfaction among men of Slavonic temperament, whose grandfathers had been independent princes, boyars or free lances, and the malcontents could not adopt the old practice of emigrating to some other principality. There was no longer within the Russian land any independent principality in which an asylum could be found, and emigration to a principality beyond the frontier, such as Lithuania, was regarded as treason, for which the property of the fugitive would be confiscated and his family might be punished. In these circumstances the only outlet for discontent was sedition, and the malcontents awaited impatiently a favourable opportunity for an attempt to curb or overthrow the autocratic power. That opportunity came when Basil died in 1533, leaving as successor a child only three years old, and the chances seemed all on the side of the nobles; but the result belied the current expectations, for the child came to be known in history as Ivan the Terrible, and died half a century later in the full enjoyment of unlimited autocratic power. The fierce struggle between autocratic tyranny and oligarchic disorder, which went on in intermittent fashion during the whole of his reign, cannot be here described in detail, but the chief incidents may be mentioned.

Ivan the Terrible, 1533–84.

During Ivan's minority the country was governed, or rather misgoverned, first by his mother, and then by rival factions led by great nobles such as the princes Shuiski and Bêlski. Only once during this period did the young tsar come forward and assert his authority. Having convoked his boyars he reproached them collectively with robbing the treasury and committing acts of injustice, and he caused one of them, a Prince Shuiski who happened to be in power at the moment, to be seized by his huntsmen and torn in pieces by a pack of hounds, as a warning to others. Thus apparently he asserted his authority, but in reality, being only thirteen years old, he was a mere puppet in the hands of one of the opposition factions, who wished to oust their rivals, and for the next four years the misgovernment of the nobles went on as before. It was not till he was about seventeen that he took an active part in the administration, and one of his first acts foreshadowed his future policy: he insisted on the metropolitan crowning him, not as grand-prince of Muscovy, but as tsar of all Russia (1547). From the earliest times the term tsar—a contraction of the word Caesar—had been applied to the kings in Biblical history and the Byzantine emperors, and Ivan III. had already been described in the Church service as "the ruler and autocrat of all Russia, the new Tsar Constantine in the new city of Constantine Moscow," but on no previous occasion had a grand-prince been crowned under that title. A few months later occurred in Moscow a great fire, which destroyed nearly the whole of the city, and a serious popular tumult, in which the tsar's uncle was murdered by the populace. Ivan regarded these events as a punishment from Heaven for the neglect of his duties, and he began to attend to public affairs under the influence of an enlightened priest called Sylvester and an official of humble origin called Adashev. With the assistance of these two counsellors he held in check the lawless, turbulent nobles, and ruled justly, to the satisfaction of the people, for fourteen years. Then suddenly, for reasons which cannot easily be explained, he inaugurated a reign of terror which lasted for twenty-four years and earned for him the epithet of "the Terrible." Though there had been no open insurrection, he caused many boyars and humbler persons to be executed, and when some of the great nobles, fearing a similar fate, fled across the frontier and tendered their allegiance to the prince of Lithuania, his suspicion and indignation increased and he determined to adopt still more drastic measures. For this purpose he organized, outside the regular administration, a large corps of civil officials and armed retainers, whose duty it was to obey him implicitly in all things; and with this force, which rose rapidly from 1000 to 6000 men, he acted like a savage invader in a conquered country. Accompanied by these so-called *Oprichniki*, who have been compared to the Turkish Janissaries of the worst period, he ruthlessly devastated large districts—with no other object apparently than that of terrorizing the population and rewarding his myrmidons—and during a residence of six weeks in Novgorod, lest the old turbulent spirit of the municipal republic should revive, he massacred, it is said, no less than 60,000 of the inhabitants, including many women and children. It is quite possible, as some apologists suggest, that the number of his victims may have been exaggerated, but that they are to be counted by thousands there can be no doubt. In the monastery of St Cyril has been preserved a list of those for whom he requested the prayers of the Church, the total being 3470. The only reference to Novgorod in this curious document is: "Remember, O Lord, the souls of thy Novgorodian servants to the number of 1505 persons." According to the Novgorodian annalists as many as 1500 persons were sometimes put to death in a single day. Perhaps the discrepancy is to be explained by supposing that the pious tsar did not consider all his victims as servants of the Lord, whose souls deserved the prayers of the faithful.

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[1] See Friedrich Adelung, *Siegmund Freiherr von Herberstein, mit besonderer Rücksicht auf seine Reisen in Russland geschildert.* (St Petersburg, 1818); autobiography of Herberstein in *Fontes rerum Austriacarum*, part i. vol. i. pp. 67–396.

The Cossacks.

While thus uniting under their vigorous autocratic rule the small rival principalities, the Moscow princes had to keep a watchful eye on their eastern neighbours. The Golden Horde, long weakened by internal dissensions, had now fallen into several khanates, the chief of which were Kazan, Astrakhan and the Crimea. As these independent Tatar states were always jealous of each other, and their jealousy often broke out in open hostility, it was easy to prevent any combined action on their part; and as in each khanate there were always several pretenders and contending factions, Muscovite diplomacy had little difficulty in weakening them individually and preparing for their annexation. In the case of Kazan and Astrakhan the annexation was effected without any great effort in 1552–54, and two years later the Bashkirs, who had likewise formed part of the great Mongol empire, consented to pay tribute. On the other hand, the khans of the Crimea were able, partly from their geographical position and partly from having placed themselves under the protection of the sultans of Turkey, to resist annexation for more than two centuries and to give the Muscovites a great deal of trouble, not only by frequent raids and occasional invasions, but also by allying themselves with the Western enemies of the tsars. As late as 1571 Moscow was pillaged by a Tatar horde; but there was no longer any question of permanent political subjection to the Asiatics, and the Russian frontier was being gradually pushed forward at the expense of the nomads of the steppe by the constant advance of the agricultural population in quest of virgin soil. These latter, like the colonists in the American Far West, had to be constantly on the alert against the attacks of their troublesome neighbours, and they accordingly organized themselves in semi-military fashion. Those of them who lived on the outskirts of the pacified territory adopted a mode of life similar to that of their hereditary opponents, and constituted a peculiar class known as Cossacks, living more by flocks and herds and by marauding expeditions than by agriculture. In the basins of the southern rivers they formed semi-independent military communities. Those of the Volga and the Don professed allegiance to the tsar of Muscovy, whilst those of the Dnieper recognized at first as their suzerain the king of Poland. In neither case did the allegiance involve strict obedience to orders from the superior, and their loyalty was always in danger of being troubled by their love of independence and equality and their desire for loot. More than once they raided and pillaged in wholesale fashion the territory they were supposed to protect. On the whole, however, at that period as in more recent times, they contributed largely to the process of territorial expansion. (See also POLAND: *History*.)

Relations with Poland and Lithuania.

Before the Eastern menace had been entirely removed the ambitious Moscow princes had begun to look with envious eyes beyond their western frontier. Here lay the principality of Lithuania and beyond it the kingdom of Poland, two loosely conglomerated states which had been created by the Piast and Gedymin dynasties in pretty much the same way as the tsardom of Muscovy had been created by the descendants of Rurik. When the two became united under one ruler towards the end of the 14th century they formed a broad strip of territory stretching from the Baltic to the Black Sea and separating Russia from central Europe. For Russian ambition the barrier was a formidable one, but it did not entirely preclude possibilities of expansion in a more or less remote future. When examined closely it was found to contain many internal flaws. In no sense could it be considered a homogeneous political unit, for in Lithuania the majority of the population were Russian in nationality, language and religion, whereas in Poland the great majority of the inhabitants were Polish and Roman Catholic. Gradually, it is true, the Lithuanian nobles, who possessed all the land and held the peasantry in a state of serfage, adopted Polish nationality and culture, but this change did not secure homogeneity, because the masses clung obstinately to their old nationality and religion, and all the efforts of the Church of Rome to bring them under papal authority proved fruitless. A further source of weakness was the political organization. Nominally it was an hereditary monarchy, but the warlike, turbulent nobles systematically encroached on the sovereign power till they reduced it to a mere shadow and made it elective, with the result that the kingdom of Poland, including the principality of Lithuania, was at last, politically speaking, the most anarchical country in Europe.

As the Muscovite and the Lithuano-Polish princes were equally ambitious and equally anxious to widen their borders, they naturally came into conflict. At first the Muscovite was decidedly the aggressor. On the death of Casimir, king of Poland and grand-prince of Lithuania, in 1492, the kingdom and the principality ceased to be united and Ivan III. considered he had a good opportunity for attacking the latter. After a short campaign a peace was concluded and Ivan's daughter was given in marriage to the Lithuanian grand-prince, but the matrimonial alliance did not improve the relations between the two countries. On the contrary it served as a pretext for Ivan to interfere in Lithuanian affairs. He not only insisted that his daughter's religion should be duly respected, but he constituted himself the protector of the Orthodox population and this led to a new war in 1499, which went on till 1503, when it was concluded by the cession to Russia of Chernigov, Starodub and 17 other towns. His successor, Basil, tried to get himself elected grand-prince of Lithuania when the throne became vacant by the death of his brother-in-law in 1506, but the choice fell on the late prince's brother Sigismund, who was likewise elected king of Poland. The two countries were thus once more united and better able to resist aggression, but some of the great nobles were discontented and Basil hoped with their assistance to attain his ends. He began war therefore in 1514 and at once captured Smolensk, but in the following year he was defeated, and the war dragged on during more than seven years, with varying successes and without any important result. In the negotiations for peace the inordinate pretensions of the Muscovite prince were put forward boldly: he not only refused to restore Smolensk, but claimed Kiev and a number of other towns on the ground that in the old time of the independent principalities they had belonged to descendants of Rurik.

Ivan IV. and western Europe.

The policy of expansion westwards, inaugurated by Ivan III., was modified and enlarged by Ivan the Terrible. The former had aimed simply at making annexations in Lithuania; the latter aspired to obtaining a firm footing on the Baltic coast and establishing direct relations, diplomatic and commercial, with the Western Powers. In this respect he was a precursor of Peter the Great, but he greatly underestimated the difficulties of the task. To reach the Baltic he had to overcome the resistance, not only of the Lithuanians and the Poles, but also of the Teutonic and Livonian military orders, the Swedes and the Danes, who all had possessions in the intervening territory and who all objected to the barbarous Muscovites, already sufficiently formidable, strengthening themselves by direct foreign trade with western Europe and especially by the importation of arms and cunning foreign artificers. Like the European settlers on the coast of Africa in more recent times, they wished the barbarians of the interior to be restricted to the use of their primitive weapons. One of the Polish kings, for example, threatened with death the English sailors who should attempt to carry on the illicit trade in arms, on the ground that "the Muscovite, who is not only our opponent of to-day but the eternal enemy of all free nations, should not be allowed to supply himself with cannons, bullets, and munitions or with artisans who manufacture arms hitherto unknown to those barbarians." This was precisely the reason why Ivan IV. was so anxious to force his way to the coast. His grandfather had obtained from Venice an "artist" who undertook "to build churches and palaces, to cast big bells and cannons, to fire off the said cannons and to make every sort of castings very cunningly"; and with the aid of that clever Venetian he had become the proud possessor of a "cannon-house," subsequently dignified with the name of "arsenal." In imitation of the grandfather the grandson gave a commission to a Saxon, in whom he had confidence, to collect artists and artisans in Germany and bring them to Moscow, but he was prevented from carrying out his scheme by the Livonian Order (1547). A few years later (1553) he found unexpectedly a different route for communication with the West. A ship of an English squadron which was trying to reach China by the North-East passage, entered the northern Dvina, and her captain, Richard Chancellor, journeyed to Moscow in quest of opportunities for trade. He met with such a favourable reception from the tsar that on his return to England a special envoy was sent to Moscow by Queen Mary, and he succeeded in obtaining for his countrymen the privilege of trading freely in Russian towns. In return the Russians were allowed to trade freely in England. This afforded great satisfaction to Ivan, but it did not entirely satisfy his requirements, because the new route by the White Sea and North Cape was long and uncertain and for a great part of the year communications were stopped by the ice. He continued, therefore, his efforts to reach the Baltic coast, and he soon came into collision with the Swedes. After a dilatory war of three years he concluded a peace on the ground of free commercial relations, and then he attacked the Livonian Order, on the pretext that the Livonian town of Dorpat had not paid tribute according to ancient treaties. Finding himself unable to resist the Muscovites, the grand master of the Order put himself under Polish protection, and this led to a seven years' war (1563–70) with Poland, during which the Swedes and Danes intervened on their own account. Ivan did not display much military talent, but he showed a remarkable amount of tenacity. No sooner had he made peace with the Poles and failed to get himself elected as their king, than he began a war with the Swedes which dragged on for more than a decade (1572–1583), and before it was ended he was again at war with Poland (1579–81). Though severely tried by disappointments and defeats he never lost hope, and when he died in 1584 he was preparing to renew the struggle and endeavouring to form for that purpose an alliance with England; his great idea, however, was not to be realized till more than a century later, and meanwhile the tsardom of Muscovy had to pass through a severe internal crisis in which its existence was seriously endangered.

First relations with England.

Theodore I., 1584–1598.

Ivan the Terrible had succeeded in stamping out ruthlessly all open resistance to his will, and had created an autocratic government of the Oriental type; but the elements of disorder were still lying beneath the surface, and as soon as the cunning, energetic despot died they reappeared. His son and successor, Theodore (Feodor), was a weak man of saintly character, very ill fitted to consolidate his father's work and maintain order among the ambitious, turbulent nobles; but he had the good fortune to have an energetic brother-in-law, with no pretensions to sanctity, called Boris Godunov, who was able, with the tsar's moral support, to keep his fellow-boyars in order. This he did during fourteen years, and his administration was signalized by two important innovations—the attaching of the peasants to the land (*adscriptio glebae*) and the creation of the patriarchate—both of which deserve a passing notice.

Beginnings of serfdom.

Boris has often been called the creator of serfage in Russia, but in reality he merely accelerated a process which was the natural result of economic conditions. In a primitive, thinly populated, agricultural country, in which the demand for agricultural labour greatly exceeds the supply, the value of land is in proportion to the number of permanent labourers settled on it, and the landed proprietors naturally try to attract to their estates as many peasants as possible; and in this competition the large proprietors have evidently an advantage over their humbler and weaker rivals. Such had been for a considerable time the condition of Russia, and the small proprietors were now becoming so impoverished that they could no longer fulfil their duties to the state. The remedy they proposed was that the labourers should be prohibited from migrating from one estate to another, and an order to that effect was issued, with the result that the peasants, being no longer able to change their domicile and seek new employers, fell practically under the unlimited power of the proprietors on whose land they resided. This change was, of course, popular among the lower and middle ranks of the landlord class, but was very displeasing to the great nobles.

The patriarchate.

The second of the two innovations above mentioned was popular among all classes. Hitherto the highest authority in the Russian Church was the metropolitan, who was nominally under the jurisdiction of the patriarch of Constantinople, and as soon as Constantinople fell into the hands of the infidel, and the tsars of Muscovy claimed to be the successors of the Byzantine emperors, it seemed right and proper that the Russian Church should become autocephalous and be governed by an independent Russian patriarch. The change was very dexterously effected by Godunov, with the formal assent of the Eastern Orthodox Church as a whole, and one of his adherents was placed on the patriarchal throne.

Boris Godunov, 1598–1605.

The pseudo-Demetriuses.

Having thus gained the support of a large majority of the landed proprietors and the ecclesiastics, Boris Godunov increased his influence to such an extent that on the death of Tsar Feodor without male issue in 1598 he was elected his successor by a Great National Assembly. His short reign was not so successful as his administration under the weak Feodor. The oligarchical party considered it a disgrace to obey a simple boyar; conspiracies were frequent, the rural districts were desolated by famine and plague, great bands of armed brigands roamed about the country committing all manner of atrocities, the Cossacks on the frontier were restless, and the government showed itself incapable of maintaining order. Under the influence of the great nobles who had unsuccessfully opposed the election of Godunov, the general discontent took the form of hostility to him as a usurper, and rumours were heard that the late tsar's younger brother Dimitri (Demetrius), supposed to be dead, was still alive and in hiding. In 1603 a man calling himself Dimitri, and professing to be the rightful heir to the throne, appeared in Poland, and a few months later he crossed the frontier with a large force of Poles, Russian exiles, German mercenaries and Cossacks from the Dnieper and the Don. In reality the younger son of Ivan the Terrible had been strangled before his brother's death—by orders, it was said, of Godunov—and the mysterious individual who was impersonating him was an impostor; but he was regarded as the rightful heir by a large section of the population, and immediately after Boris's death in 1605 he made his triumphal entry into Moscow. Thus began a period of Russian history commonly called "the Troublous Times," which lasted until 1613. (See DEMETRIUS, PSEUDO-.)

Basil Shuiski, 1606–10.

The reign of Dimitri was short and uneventful. Before a year had passed a conspiracy was formed against him by an ambitious noble called Basil (Vassili) Shuiski, and he was assassinated in the Kremlin. The chief conspirator, Shuiski, seized the power and was elected tsar by an Assembly composed of his faction, but neither

Pseudo-Demetrius II., 1608–10.

the ambitious boyars, nor the pillaging Cossacks, nor the German mercenaries were satisfied with the change, and soon a new impostor, likewise calling himself Dimitri, son of Tsar Ivan, came forward as the rightful heir. Like his predecessor, he enjoyed the protection and support of the Polish king, Sigismund III., and was strong enough to compel Shuiski to abdicate; but as soon as the throne was vacant Sigismund put forward as a candidate his own son, Wladislaus. To this latter the people of Moscow swore allegiance on condition of his maintaining Orthodoxy and granting certain rights, and on this understanding the Polish troops were allowed to occupy the city and the Kremlin. Then Sigismund unveiled his real plan, which was to obtain the throne not for his son but for himself. This scheme did not please any of the contending factions and it roused the anti-Catholic fanaticism of the masses. At the same time it was displeasing to the Swedes, who had become rivals of the Poles on the Baltic coast, and they started a false Dimitri of their own in Novgorod.

Accession of the house of Románov.

Russia was thus in a very critical condition. The throne was vacant, the great nobles quarrelling among themselves, the Catholic Poles in the Kremlin of Moscow, the Protestant Swedes in Novgorod, and enormous bands of brigands everywhere. The severity of the crisis produced a remedy, in the form of a patriotic rising of the masses under the leadership of a butcher called Minin and a Prince Pozharski. In a short time the invaders were expelled, and a Grand National Assembly elected as tsar Michael Románov, the young son of the metropolitan Philaret, who was connected by marriage with the late dynasty.

Michael, 1613–45.

During the reign of Michael (1613–45) the new dynasty came to be accepted by all classes, and the country recovered to some extent from the disorders and exhaustion from which it had suffered so severely; but it was not strong enough to pursue at once an aggressive foreign policy, and the tsar prudently determined to make peace with Sweden and conclude an armistice of fourteen years with Poland. At the conclusion of the armistice in 1632, during a short interregnum in Poland, he attempted to avenge past injuries and recover lost territory; but the campaign was not successful, and in 1634 he signed a definitive treaty by no means favourable to Russia. That lesson was laid to heart, and he subsequently maintained a purely defensive attitude. As a precaution against Tatar invasions he founded fortified towns on his southern frontiers—Tambov, Kozlov, Penza and Simbirsk; but when the Don Cossacks offered him Azov, which they had captured from the Turks, and a National Assembly, convoked for the purpose of considering the question, were in favour of accepting it as a means of increasing Russian influence on the Black Sea, he decided that the town should be restored to the sultan, much to the disappointment of its captors.

Alexius, 1645–76.

In the reign of Michael's successor, Alexius (1645–76), the country recovered its strength so rapidly that the tsar was tempted to revive the energetic aggressive policy and put forward claims to Livonia, Lithuania and Little Russia, but he was obliged to moderate his pretensions. Livonia continued to be under Swedish rule, and Lithuania remained united with Poland. Some advantages, however, were obtained. Smolensk and Chernigov were definitely incorporated in the tsardom of Muscovy, and great progress was made towards the absorption of Little Russia.

The Ukraine.

Roughly speaking, Little Russia, otherwise called the Ukraine, may be described as the basin of the Dnieper southward of the 51st parallel of latitude. In the 16th century it was a thinly populated region inhabited chiefly by Cossacks, speaking the so-called Little Russian dialect, and until 1569 it formed nominally part of Lithuania, but was practically independent. In that year, when Lithuania and Poland were permanently united, it fell under Polish rule, and the Polish government considered it necessary to tame the wild inhabitants and bring them under regular administration. For this decision there were good reasons, for those turbulent sons of the steppe paid no taxes and were much given to brigandage, and their raiding propensities occasionally created international difficulties with the khan of the Crimea and the sultan of Turkey. It was proposed, therefore, in 1576, that 6000 families should be registered as a militia under a Polish Hetman for the protection of the country against Tatar raids, and that the remainder of the inhabitants should be assimilated to the ordinary peasants of Poland. This arrangement was very distasteful to all classes. The registered Cossacks objected to being placed under a Hetman not freely chosen by themselves, and those who were not included in the militia objected still more strongly to the prospect of being reduced to the miserable condition of Polish serfs. To escape this danger many of them moved down the river and settled on the waste lands beyond the rapids. Here, about 1590, was founded an independent military colony called the *Setch*, the members of which, recognizing no authority but that of their own elected officers, lived by fishing, hunting and making raids on the Tatars, and were always ready to assist their less fortunate countrymen in resisting Polish aggression. For half a century the struggle between the two races went on with varying success, but on the whole the Polish government proved stronger than its insubordinate subjects, and about 1638 it seemed to have attained its object. Polish proprietors settled in large numbers on the Cossack territory, and great efforts were made, with the assistance of the Jesuits, to bring the Orthodox population under papal authority. But for both proprietors and Jesuits a surprise was in store. Threatened seriously in their liberty and their faith, the people rose with greater enthusiasm than before, and a general insurrection, in which the peasants joined, spread over the whole country under the leadership of Bogdan Chmielnicki or Khmelnitski (*q.v.*), whose name is still remembered in the Ukraine. As in all previous insurrections the Poles proved stronger in the field, and Khmelnitski in desperation sought foreign assistance, first in Constantinople and then in Moscow. For some time Tsar Alexius hesitated, because he knew that intervention could entail a war with Poland, but after consulting a National Assembly on the subject, he decided to take Little Russia under his protection, and in January 1654 a great Cossack assembly ratified the arrangement, on the understanding that a large part of the old local autonomy should be preserved. In the expected war with Poland, which followed quickly, the Russians were so successful that the arrangement was upheld; but it was soon found that the Cossacks, though they professed unbounded devotion to the Orthodox tsar, disliked Muscovite, quite as much as Polish, interference in their internal affairs, and some of their leaders were in favour of substituting federation with Poland for annexation by Russia. In these circumstances the tsar was induced to accept a compromise, and signed in 1667 the treaty of Andrussovo, by which the territory in dispute was partitioned and the middle course of the Dnieper became the frontier between Russia and Poland.

The tsar and the patriarch.

In the reign of Alexius a conflict took place between the tsar and the patriarch, which is often described as a conflict between Church and State, and which illustrates the relations between the temporal and the spiritual power in Russian state-organization. Until the beginning of the 17th century the Byzantine tradition that in all matters outside the sphere of dogma the ecclesiastical is subordinate to the civil power had been observed in Russia; but the traditional conceptions had been to some extent undermined during the reign of Michael, when the metropolitan Philaret, who was the tsar's father (*vide supra*), became patriarch and was associated with his son in the government on a footing of equality. Like the tsar, he had the official title of "Great Lord" (*veliki gosudár*), and he had his palace, his court-dignitaries, his retinue, his boyars and his officials all organized on the model of those of the sovereign. Without his assent and blessing no important decisions were taken, all state documents emanating from the highest authority bore his signature, and he was regarded, both in the official world and by the public generally, as the tsar's equal in rank and dignity. His immediate successors, being men of humble origin and submissive character, made no pretensions to such an exalted position, but when the haughty, ambitious and energetic Nikon, who enjoyed in large measure the affection and favour of the devout Tsar Alexius, became patriarch, he took Philaret as his model, and propounded, like the popes in western Europe, the doctrine that the spiritual is higher than the temporal power, the former corresponding to the sun and the latter to the moon in the firmament. In accordance with this view he declared that the patriarch was the image of Christ, the head of the Church, and was therefore subject to no earthly authority, and he complained of the tsar's interference in ecclesiastical affairs. His pretensions and his haughty dictatorial manner at last exhausted the tsar's patience, and he was formally deposed and exiled to a monastery. As no voice was raised in his defence and the decision of the ecclesiastical council which condemned him was universally accepted without protest, we must conclude that the conflict was not really between Church and State but simply between the haughty, ambitious Patriarch Nikon and the devout, long-suffering Tsar Alexius. The incident afforded a new proof, where no proof was required, that the autocratic power in Russia was supreme. In order to prevent such incidents in future, Peter the Great abolished the patriarchate altogether, and entrusted the administration of the Church to a synod entirely dependent on the government.

Reforms of Nikon.

Much more important in its consequences was Nikon's activity as an ecclesiastical reformer. During the Russian Dark Ages certain clerical errors had crept into the liturgical books and certain peculiarities had been adopted in the ritual. These had been detected and pointed out by learned ecclesiastics of Kiev, where some of the ancient learning of Byzantium had been preserved, and Nikon determined to make the necessary corrections. He determined also to introduce into the Church many desirable reforms. His project was approved by an ecclesiastical council and was supported by the tsar, but it met with violent opposition from a large section of the clergy, and it alarmed the ignorant masses, who regarded any alterations in the ritual, however insignificant they might be, as heretical and very dangerous to salvation. When put into execution the project produced in the Russian Church a great schism and numerous fantastic sects. The cruel persecutions instituted by the authorities with a view to securing conformity increased the number and fanaticism of the schismatics and heretics, and created among them a widespread belief that the reign of Antichrist, foretold in the Apocalypse, was at hand. In support of this idea, independently of the ecclesiastical innovations, many significant facts could be adduced. Numerous foreigners had been allowed to settle in Moscow and to build for themselves a heretical church, and their strange unholy customs had been adopted by not a few courtiers and great dignitaries. Matveyev, the most influential of the boyars, had married a foreigner who conversed freely with her husband's male friends, contrary to the Muscovite notions of respectability and decorum, and his house, in which the tsar was a frequent visitor, was furnished and decorated in foreign fashion. Books on mundane subjects, not at all conducive to the spiritual edification of the faithful, were read by the tsar's counsellors, and a theatre had been erected, in which the tsar often witnessed very unedifying dramas and ballets. Worst of all, the Orthodox tsar occasionally abandoned the decorous flowing robes of his venerated ancestors, and appeared publicly in the unseemly costume of heretical foreigners, whilst his consort, when carried through the streets in a litter, did not conceal her face from the public gaze. Such innovations troubled deeply the pious souls of the conservative Muscovites, and confirmed them in their repugnance to accept the ecclesiastical reforms. Though this original fanaticism gradually cooled and the rigorists had to make many concessions to the exigencies of practical life, a large section of the Russian people remained outside the official fold, so that at the present day, if we may credit the most competent authorities, the schismatics and heretics number more than twelve millions.

Foreign relations.

While the Muscovites of the upper classes were thus beginning to abandon their old oriental habits, their government was preparing to make a political evolution of a similar kind. Notwithstanding the efforts of the Poles and the Military Orders to exclude Russia from the shores of the Baltic and keep her in a state of isolation, she was coming slowly into closer relations with central and western Europe. The emperor, the governments of England, Holland, France and Sweden, and even the Grand Turk made advances to the tsar. Some of them wished to gain him as an ally against their rivals, whilst others hoped to obtain from him commercial privileges and permission to trade directly with Persia. The political and the commercial proposals were alike received with coldness, because the native diplomatists had aims which could not be reconciled completely with the policy of any other country, and the native merchants were afraid of foreign competition. The negotiations gave, therefore, little tangible result, but they helped to prepare the way for the new order of things which was soon to be introduced by Alexius's son, Peter the Great.

Theodore III., 1676–82.

Sophia Alexeyevna.

Ivan V. (II.), 1682–89.

Before reaching the new order of things, the country had to pass through an internal crisis similar to that which followed the death of Ivan the Terrible, but not nearly so severe. Alexius had been twice married and had left several children by each of his wives, and, as generally happened in such cases, a struggle for power ensued between the two rival families. The late tsar's eldest son, Theodore, was weak in health and died without male issue after an uneventful reign of six years (1676–82). As the second son, Ivan, next in the order of succession, was almost an imbecile, the third son, Peter, born of the second marriage, was proclaimed tsar, and his maternal relations became the dominant faction, but their triumph was of very short duration. An ambitious, energetic sister of Ivan, well known in Russian history as Sophia Alexeyevna, instigated the *stryeltsi* (*strelitz*), as the troops of the unreformed standing army were called, to upset the arrangement. After making a tumult in the Kremlin and assassinating several of the men in power, they insisted that Ivan should be proclaimed tsar conjointly with Peter, and that Sophia should act as regent during the minority of the two young sovereigns. She accepted unhesitatingly the difficult and dangerous post, and ruled autocratically for seven years (1682–89), but this did not satisfy her ambition. Having discovered that Peter, who had reached the age of seventeen, was thinking of taking the administration into his own hands, she conspired against him with the commander of the *stryeltsi* and some of his maternal relations; but she was circumvented by the rival faction and interned in a convent, and Peter's mother was put in her place. The importance of these incidents, which are very characteristic of political life in the tsardom of Muscovy, will appear in the sequel.

Peter the Great, 1689–1725.

If Peter really thought of taking the administration into his own hands, he very soon abandoned the idea and returned to the irregular suburban life he had led during his half-sister's regency—associating with foreigners who could teach him the mechanical arts of the West, drilling troops, building and sailing boats, forming projects for the creation of a great navy, indulging publicly in Bacchanalian revels and boisterous amusements not at all to the taste of his pious countrymen, and appearing in Moscow as Orthodox tsar only on great ceremonial occasions. Already the desire to make his country a great naval power was becoming his ruling passion, and when he found by experience that the White Sea, Russia's sole maritime outlet, had great practical inconveniences as a naval base, he revived the project of getting a firm footing on the shores of the Black Sea or the Baltic. At first he gave the preference to the former, and with the aid of a flotilla of small craft, constructed on a tributary of the Don, he succeeded in capturing Azov from the Turks. Greatly elated by this success, he recommended to the council of boyars the construction of a powerful fleet for carrying on war with the infidel, and he himself went abroad to learn more about shipbuilding and useful foreign inventions, and to prepare diplomatically the projected crusade. His foreign tour, during which he visited Germany, Holland, England, France and Austria, lasted nearly a year and a half, and was suddenly interrupted, when on his way from Vienna to Venice to study the construction of war-galleys, by the alarming news that the turbulent *stryeltsi* of Moscow had mutinied anew with the intention of placing Sophia on the throne. On arriving in Moscow he found that the mutiny had been suppressed and the ringleaders punished, but he considered it necessary to reopen the investigation and act with exemplary severity. Of the surviving mutineers over twelve hundred were executed, some of them by his own hand, and the entire corps was disbanded.

From this moment may be dated the personal reign of Peter, for he now began to direct personally all branches of the administration, and governed with indefatigable vigour for twenty-seven years, during which he greatly increased the area and profoundly modified the internal condition of his country. At first he concentrated his attention on foreign affairs. During his foreign tour he had discovered that the idea of a grand crusade against the infidel was irrealizable, for France was, according to her traditional policy, the ally of the sultan, Austria wished to avoid trouble on her eastern frontier in order to devote her energies to the question of the Spanish succession, and all the other countries which he wished to draw into the coalition had good reasons of their own for desiring the maintenance of peace in eastern Europe. For his Baltic schemes, on the contrary, he had found the ground well prepared. During a halt of a few days in Poland on his way back from Vienna, King Augustus had explained to him a project for partitioning the trans-Baltic provinces of Sweden, by which Poland should recover Livonia and annex Esthonia, Russia should obtain Ingria and Karelia, and Denmark should take possession of Holstein. As Sweden was known to be exhausted by the long wars of Gustavus Adolphus and his successors, and weakened by internal dissensions, the dismemberment seemed an easy matter, and Peter embarked on the scheme with a light heart; but his illusions were quickly dispelled by the eccentric young Swedish king, Charles XII., who arrived suddenly in Esthonia and completely routed the Russian army before Narva. Thus began the so-called Northern War, which lasted intermittently for more than twenty years, and was terminated by the treaty of Nystad (Sept. 10, 1721). By that treaty Peter acquired not only Ingria and Karelia, as originally contemplated, but also Livonia, Esthonia and part of Finland. The problem of obtaining a firm footing on the Baltic coast, on which Ivan the Terrible had squandered his resources to no purpose, was now solved satisfactorily.

Peter's other favourite scheme, that of acquiring the command of the Black Sea, was as far from realization as ever. In the midst of the Northern War, shortly after the great Russian victory of Poltava (1709), the sultan, at the instigation of Swedish and French agents, determined to recover Azov, and made great military preparations for that purpose. Having annihilated at Poltava the army of Charles XII., Peter was not at all indisposed to renew the struggle with Turkey, and began the campaign in the confident hope of making extensive conquests; but he had only got as far as the Pruth when he found himself surrounded by a great Turkish army, and, in order to extricate himself from his critical position, he had to sign a humiliating treaty by which Azov and other conquests were restored to the sultan. His dreams of freeing the Christians from the yoke of the infidel had to be abandoned, and the conquest of the northern shores of the Black Sea was postponed till the reign of Catherine II.

Peter the Great's reforms.

Those tedious and exhausting wars did not prevent Peter from attending to internal affairs, and he displayed as a reformer even more vigour and tenacity than as a general in the field. His first reforms were connected with the army. Several of his immediate predecessors had come to recognize that Russia, with her antiquated military organization, was unable to cope with her Western neighbours, and had begun to organize, with the help of foreigners, a military force more in accordance with modern requirements; but the progress made in that direction had been slow and unsatisfactory. Unlike his predecessors, Peter was in a hurry to realize his plans, and he set to work at once. In less than two years from the time of disbanding the *stryeltsi* he contrived to create an army of 40,000 men. This army, it is true, was so inefficient that it was completely routed by the Swedish king with a most inferior force, but it was improved gradually until it learned to conquer its Swedish opponents. To accomplish such a feat it was necessary, of course, to expend large sums of money; and as the country could ill bear an increase of taxation, the whole financial system had to be improved and the natural resources of the country had to be developed. At the same time the military and financial requirements dislocated the local and central administration, and consequently a series of radical administrative reforms had to be undertaken. Thus one reform led to another; but Peter was not dismayed by the magnitude of the task, and worked vigorously in all departments with a sublime disregard for the clamour of reactionary opponents and for the feelings and prejudices of his subjects in general. A prudent ruler in his position would have sought to preserve the outward forms while changing the inner substance, but Peter was not at all prudent in that sense. Very often he wantonly provoked opposition, as when he shaved off his beard and compelled his chief officials to do likewise, though he well knew that the operation was regarded by the ignorant masses and the pious of all ranks as a sinful defacing of the image of God. In his eyes the beard was a symbol of the old régime, and as such it must be removed. Reckless of consequences, he swept away the venerated ceremonial formalities which his ancestors had scrupulously observed, openly scoffed at ancient usage, habitually dressed in foreign costume, and generally chose foreign heretics as his boon companions. In adopting foreign innovations, he showed, like the Japanese of the present day, no sentimental preference for any particular nation, and was ready to borrow from the Germans, Dutch, English, Swedes or French whatever seemed best suited for his purpose. The innovations, it must be admitted, did not prove so efficient as he expected, because human nature and traditional habits cannot be changed as quickly as institutions. When the Boyar Duma became the Senate, and the *Prikazi* or administrative departments were organized under the name of Colleges, and when every important town was endowed with a *Rathhaus*, a *Polizeimeister*, gilds, aldermen, and all the municipal paraphernalia of western Europe, the vices of the old institutions survived in the new. Notwithstanding the changes in organization and terminology, the officials remained ignorant, indolent, careless, indifferent to the public welfare, high-handed and extortionate, and the local self-government which was intended to enlighten and control them proved sadly wanting in vitality and practically worthless. So inefficient, indeed, were the reforms as a whole, and so unsuited to the national character and customs, that the Slavophil critics of a later date could maintain plausibly the paradoxical thesis that in regard to internal administration Peter was anything but a national benefactor. However that may be, it must be confessed even by Slavophils that he dragged his countrymen, more by force than by persuasion, from the paths of traditional routine and pushed them along with all his might on the broad road of progress in the modern sense of the term. Abandoning the ancient Muscovite capital, where many influential personages were fanatically hostile to his innovations and not a few of the superstitious inhabitants regarded him with horror as Antichrist, he built at the mouth of the Neva a new capital which was to serve as "a window through which his people might look into Europe"; and laying aside the national title of tsar he proclaimed himself (1711) emperor (Imperator) of all Russia—much to the surprise and indignation of foreign diplomatic chancelleries, which resented the audacity of a semi-barbarous potentate in claiming to be

Foundation of St Petersburg.

equal in rank with the head of the Holy Roman Empire. Gradually, however, the chancelleries had to withdraw their protests, for it came to be generally recognized that the semi-barbarian, who died at the early age of fifty-three, had transformed the oriental tsardom of Muscovy into a state of the Western type and had made it a powerful member of the European family of nations (see PETER I.).

Catherine I., 1725–27.

Peter II., 1727–30.

Anne, 1730–40.

Elizabeth, 1741–61.

IV. *The Modern Empire.*—On the death of Peter (1725) the internal tranquillity and progress of the empire were again seriously threatened by the uncertainty of the order of succession, and the autocratic power which he had wielded so vigorously passed into the hands of a series of weak, indolent sovereigns who were habitually guided by personal caprice and the advice of intriguing favourites rather than by serious political considerations. During this period, which lasted from 1725 to 1762, the male line of the Romanov dynasty became extinct, and the succession passed to various members of the female line, which intermarried with German princes. In this way German influence was enormously increased, and was represented by men of considerable capacity holding the highest official positions, such as Biren, Münnich and Ostermann. The main events of the period may be summarized very briefly. Peter, by his first marriage, had a son, the unhappy cesarevich Alexius (*q.v.*), who figures more largely in imaginative literature than in history—a narrow-minded, obstinate, pious youth, who had no sympathy with his father's violent innovations, and was completely under the influence of the old Muscovite reactionary faction. Intimidated by the paternal anger and threats he took refuge in Austria, and when he had been induced by illusory promises to return to Russia he was tried for high treason by a special tribunal, and after being subjected to torture died in prison (1718). To avert the danger of a man of this type succeeding to the throne Peter made a law by which the reigning sovereign might choose his successor according to his own judgment, and two years later he caused his second wife, Catherine, the daughter of a Lithuanian peasant, to be crowned with all due solemnity, "in recognition of the courageous services rendered by her to the Russian Empire." This gave Catherine a certain right to the throne at her husband's death, and her claims were supported by Peter's most influential coadjutors, especially by Prince Menshikov, an ambitious man of humble origin who had been raised by his patron to the highest offices of state. On the other hand the great nobles of more conservative tendencies wished to get the young son of the cesarevich Alexius made emperor under their own control. The former faction triumphed, and Catherine reigned for about a year and a half, after which the son of the cesarevich Alexius, Peter II., occupied the throne from 1727 to 1730. At first he was under the tutelage of Menshikov, who wished him to marry his daughter, but he soon contrived, with the aid of the Dolgorukis and other old families, to get his imperious tutor arrested and exiled to Siberia. The Dolgorukis and their friends thus came into power, and on the death of Peter II. in 1730 they offered the throne to Anne, duchess of Courland, a daughter of Ivan V., elder brother of Peter the Great, on condition of her signing a formal document by which the seat of government should be transferred from St Petersburg to Moscow, and the autocratic power should be limited and controlled by a grand council composed of their own faction. Anne accepted the condition and became empress, but when she discovered that the attempt to limit her powers in favour of a small conservative oligarchy was extremely unpopular among all classes, she submitted the question to an assembly of 800 ecclesiastical and lay dignitaries, and at their request the unlimited autocratic rule was re-established. Her reign (1730–40) was a régime of methodical German despotism on the lines laid down by her uncle, Peter the Great, and as she was naturally indolent and much addicted to frivolous amusements, the administration was directed by her favourite Biren (*q.v.*) and other men of German origin. Having no male issue, she chose as her successor the infant son of her niece, Anna Leopoldovna, duchess of Brunswick, and at her death the child was duly proclaimed emperor, under the name of Ivan VI., but in little more than a year he was dethroned by the partisans of the Princess Elizabeth, a daughter of Peter the Great and Catherine I. As a true daughter of the great Russian reformer, Elizabeth (1741–61) relegated the German element to a subordinate position in the administration and gave her confidence to genuine Russians like Bestuzhev, Vorontsov, Razumovski (her morganatic husband) and the Shuvalovs. Her hatred of Germans showed itself likewise in her persistent struggle with Frederick the Great, which cost Russia 300,000 men and 30 millions of roubles—an enormous sum for those days—but in the choice of a successor she could not follow her natural inclinations, for among the few descendants of Michael Romanov there was no one, even in the female line, who could be called a genuine Russian. She proclaimed, therefore, as heir-apparent the son of her deceased elder sister Anna, Charles Peter Ulrich, duke of Holstein-Gottorp, a German in character, habits and religion, and tried to Russianize him by making him adopt the Eastern Orthodox faith and live in St Petersburg during the whole of her reign; but her well-meant efforts were singularly unsuccessful. Impervious to Russian influence, he remained true to his original nationality, and by his undisguised aversion to everything in his adopted country and his passionate, childish admiration of Frederick the Great, he made himself so unpopular that within a few months of his accession, in December 1761, he was dethroned and assassinated by the partisans of his ambitious and able consort, the famous Catherine II.[1]

Catherine II., 1762–96.

During the long reign of Catherine II. (1762–96) Russia made rapid progress in civilization, and came to be fully recognized as one of the Great Powers. Coming after a series of incompetent rulers, the German princess proved herself a worthy successor to Peter the Great both in home and in foreign affairs; but she was not a mere imitator. Peter had endeavoured to import from western Europe the essentials of good government and such of the useful arts as were required for the development of the natural resources of the country; Catherine did likewise, but she did not restrict herself to purely utilitarian aims in the narrower sense of the term. She strove to impart also something of the refinement and ornamental attributes of Western civilization, and aspired to raise her adopted fatherland intellectually and artistically to the west-European level. This new departure she lost no time in proclaiming to the world. Within a few months of her accession, having heard that the publication of the famous French *Encyclopédie* was in danger of being stopped by the French government on account of its irreligious spirit, she proposed to Diderot that he should complete his great work in Russia under her protection. Four years later she endeavoured to embody in a legislative form the principles of enlightenment which she had imbibed from the study of the French philosophers. A Grand Commission, which might be called a consultative parliament, composed of 652 members of all classes—officials, nobles, burghers and peasants—and

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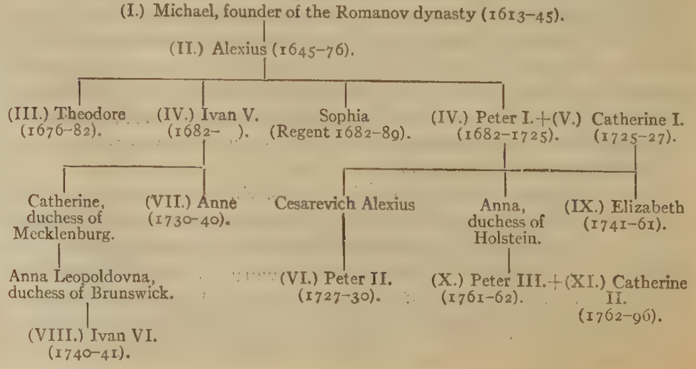
[1] To assist the reader in threading the genealogical maze briefly described above, the following tabular statement is inserted:—


(I.) Michael, founder of the Romanov dynasty (1613–45).
(II.) Alexius (1645–76).
(III.) Theodore (1676–82).
(IV.) Ivan V. (1682–).
Sophia (Regent 1682–89).
(IV.) Peter I.+(V.) Catherine I.
(1682–1725).
(1725–27).
Catherine, duchess of Mecklenburg.
(VII.) Anne (1730–40).
Cesarevich Alexius
Anna, duchess of Holstein.
(IX.) Elizabeth (1741–61).
Anna Leopoldovna, duchess of Brunswick.
(VI.) Peter II. (1727–30).
(X.) Peter III.+(XI.) Catherine II.
(1761–62).
(1762–96).
(VIII.) Ivan VI. (1740–41).

of various nationalities, was called together at Moscow to consider the needs of the empire and the means of satisfying them. The instructions for the guidance of the Assembly were prepared by the empress herself and were, as she frankly admitted, the result of "pillaging the philosophers of the West," especially Montesquieu and Beccaria. As many of the democratic principles frightened her more moderate and experienced advisers, she wisely refrained from immediately putting them into execution. After holding more than 200 sittings the so-called Commission was dissolved without getting beyond the realm of theory and *pia desideria*. Subsequently very important reforms were introduced, not by the vote of an assembly, but by the *fiat* of the autocratic power. The large territorial units of administration created by Peter the Great were broken up into so-called "governments" (*gubernii*) and further subdivided into districts (*uyezdy*), and each government was confided to the care of a governor and a vice-governor assisted by a council. A certain amount of local self-government was entrusted to the nobles and the burghers, and the judicial administration was thoroughly reorganized in an enlightened and humane spirit. The great estates of the Church, on which were settled about a million serfs, were secularized and assimilated with the state-domains. At one moment the idea of emancipating all the serfs was entertained, but the project was speedily abandoned, because it would have alienated the nobles—the only class on which Catherine could rely for support. To conciliate them she greatly extended the area of serfage by making large grants of land and serfs to courtiers and public servants who had specially distinguished themselves. About education a great deal was spoken and written, and a certain amount of progress was effected. Whilst primary education was neglected, secondary schools were created in the principal towns and a Russian Academy was founded in St Petersburg. In the imperial court, so far as outward decorum and refinement were concerned, there was an immense improvement, and the upper section of the old Russian *Dvorianstvo* became a noblesse with French aristocratic conceptions and ideals. A taste for French literature spread rapidly, and the poets and dramatists of Paris found clever imitators in St Petersburg.

Administrative reforms.

By such means Catherine made herself very popular in the upper ranks of society, but as a woman and a usurper who did little or nothing to lighten the burdens of the people she failed to gain the loyalty and devotion of the masses. In the first part of her reign popular discontent found expression in various forms, and on one occasion it produced a serious insurrection. In 1773 a Don Cossack called Pugachev, who was so uneducated that he could not even sign the manifestoes written for him, declared himself to be Peter III., and announced that he was going to St Petersburg to punish his faithless wife and place his son Paul on the throne. Many believed, or affected to believe, in the pretender, and in a short time he gathered around him a large force of Cossacks, peasants, Tatars and Tchuvash, swept over the basin of the lower Volga, executed mercilessly the landed proprietors, seized and pillaged the town of Kazan, and kept the whole country in a state of alarm for more than a year. Finally, after a crushing defeat in which 2000 of the insurgents were killed and 6000 taken prisoners, he was betrayed by some of his followers and executed in Moscow. His name and exploits still live in the popular legends, and the insurrection is often referred to in revolutionary pamphlets as a laudable popular protest against tyrannical autocracy.

Foreign policy of Catherine.

In foreign affairs Catherine devoted her attention mainly to pushing forward the Russian frontier westwards and southwards, and as France was the traditional ally of Sweden, Poland and Turkey, she adopted at first the so-called *système du Nord*, that is to say, a close alliance with Prussia, England and Denmark against France and Austria, who had buried their traditional enmity in the famous alliance of 1756. The first step westwards was taken in Courland, which lay between Russian territory and the Baltic coast. At the time of her accession the duchy was ruled by a son of the Polish king Augustus III., and he gave a pretext for aggression by refusing to allow Russian troops returning from the Seven Years' War to pass through his territory. For this unfriendly act he was deposed and replaced by Biren, who had previously been duke of Courland (1737–40) and had since been an exile in Siberia and Yaroslav. Under Biren (1763–69) and his son and successor (1769–95), as nominees of Catherine, Courland was completely under Russian influence until 1795, when it was formally incorporated with the empire. The next country to feel the expansive tendencies of Russia was Poland, which had now very little power of resistance. Whilst Russia, Austria, Prussia and France were becoming powerful monarchies with centralized administration, Poland had remained a weak feudal republic with an elected king chosen under foreign influence and fettered by constitutional restrictions. All political authority was in the hands of turbulent nobles who quarrelled among themselves, who were always inclined to submit the questions at issue to the arbitrament of arms, and who did not scruple to invite foreign powers to intervene on their behalf. The middle classes, which were making other countries rich and powerful, existed only in an embryonic condition. Instead of a well-organized army of the modern type there was merely an undisciplined militia composed almost exclusively of irregular cavalry; and the national defences as a whole were so weak that, in the opinion of such a competent authority as Maurice of Saxony, the country might easily be conquered by a regular army of 48,000 men. Here was a tempting field for the application of Catherine's aggressive policy, and if she had had to deal merely with the Poles she would have had an easy task. Unfortunately for the success of her schemes she had to reckon with stronger states which were anxious to check the Russian advance, and which were determined, in the event of aggression, to have a share of the plunder. Frederick the Great was at that moment impatient to extend and consolidate his kingdom by getting possession of the basin of the lower Vistula, which separated eastern Prussia from the rest of his dominions, while Austria had also claims on Polish territory and would certainly not submit to be excluded by her two rivals. In these circumstances Catherine hesitated to bring matters to a crisis, but her hand was forced by Frederick, and in 1772 the first partition of Poland took place without any very strenuous resistance on the part of the victim. This national disaster opened the eyes of many Polish patriots to the necessity of changing radically the old order of things, and an attempt was made by them to remove some of the more glaring absurdities of the existing constitution: the throne was declared to be hereditary, the *liberum veto* by which any petty noble could annul the most important decision of the national assembly was abolished, the royal authority was greatly strengthened, and the towns were empowered to send deputies to the Diet (1791). Such salutary reforms were naturally unwelcome to the aggressive neighbours who wished to preserve the traditional anarchy in order to have new facilities for intervention, and as Russia had signed with the puppet-king in 1768 a treaty by which the constitution could not be modified without her consent, she had a plausible ground for protest. She waited, however, until a deputation of the malcontents, who regretted the loss of *liberum veto* and who were afraid that the party of reform might undertake the emancipation of the serfs, came to St Petersburg and asked for support in defence of the ancient liberties. Then an imperial manifesto reminding the Poles of the treaty of 1768 was issued and a large Russian force entered the Ukraine. This led to the second partition (1793), by which Russia obtained the eastern provinces with three millions of inhabitants. Even now the work of spoliation was not complete. When the patriots under Kosciusko made a desperate effort to recover the national independence the struggle produced a third partition (1795), by which the remainder of the kingdom was again divided between Russia, Prussia and Austria. Thus Poland disappeared for a time from the map of Europe.

Poland.

Treaty of Kuchuk-Kainarji, 1774.

Russia's advance westward raised indirectly the Eastern Question, because it threatened two of France's traditional allies, Sweden and Poland, and Choiseul considered that the best means of checkmating Catherine's aggressive schemes was to incite France's third traditional ally, Turkey, to attack her. This was not a difficult matter, because the Sublime Porte had many things to complain of in the past and had good reason to fear aggression in the near future. War was accordingly declared in 1768, but it proved disastrous for the sultan; and he had to sign in 1774 the treaty of Kuchuk-Kainarji, which gave Russia a firm hold on the Black Sea and the lower Danube (see TURKEY: *History*). The Tatars of the Bug, of the Crimea and of the Kuban were liberated from the suzerainty of the Porte; Azov, Kinburn and all the fortified places of the Crimea were ceded to Russia; the Bosphorus and Dardanelles were opened to Russian merchant vessels; and Russian ambassadors obtained the right to intervene in favour of the inhabitants of the Danubian principalities. Ten years later the semblance of independence which was left to the khans of the Crimea was destroyed and the peninsula formally annexed to the empire.

The peace concluded at Kuchuk-Kainarji was not of long duration. Catherine had conceived an ambitious plan of solving radically the Eastern Question by partitioning Turkey as she and her allies had partitioned Poland, and she had persuaded the emperor Joseph II. to take part in the scheme. It was intended that Russia should take what remained of the northern coast of the Black Sea, Austria should annex the Turkish provinces contiguous to her territory, the Danubian principalities and Bessarabia should be formed into an independent kingdom called Dacia, the Turks should be expelled from Europe, the Byzantine empire should be resuscitated, and the grand-duke Constantine, second son of the Russian heir-apparent, should be placed on the throne of the Palaeologi. Rumours of this gigantic scheme reached Constantinople, and as Catherine's menacing attitude left little doubt as to her aggressive intentions the Porte presented an ultimatum and finally declared war (1787). Fortune again favoured the Russian arms, but as Austria was less successful and signed a separate peace at Sistova in 1791, Catherine did not obtain much material advantage from the campaign. By the peace of Jassy, signed in January 1792, she retained Ochakov and the coast between the Bug and the Dniester, and she secured certain privileges for the Danubian principalities, but the Turks remained in Constantinople, and the realization of the famous Greek project, as it was termed, had to be indefinitely postponed.

Catherine and the Revolution.

During the first years of the French Revolution Catherine's sympathy with philosophic liberalism rapidly evaporated, and she did all in her power to stimulate the hostility of the European sovereigns to the democratic movement; but she carefully abstained from joining the Coalition, and waited patiently for the moment when the complications in western Europe would give her an opportunity of solving independently the Eastern Question in accordance with Russian interests. That moment never came. In November 1796, when the country was not yet prepared to enter on a decisive struggle with Turkey, Catherine died at the age of sixty-six, and was succeeded by her son Paul, whom she had kept during her long reign in a state of semi-captivity.

Paul.

The short reign of Paul (1796–1801) resembled in many points the still shorter one of his father, Peter III. Both sovereigns were childishly wayward and capriciously autocratic; both were recklessly indifferent to the feelings, convictions and wishes of those around them; both took a passionate interest in the minutiae of military affairs; as Peter had conceived a boundless admiration for Frederick the Great, so Paul conceived a similar admiration for Napoleon, and both suddenly reversed the national policy to suit this feeling; both were singularly blind to the consequences of their foolish conduct; and both fell victims to court conspiracies which could be in some measure justified, or at least excused, on patriotic grounds.

Paul left no deep, permanent mark on Russian history. In internal affairs he wished to undo what his mother had done, but his impulsive, incoherent efforts in that direction merely dislocated the administrative mechanism without producing any tangible results. In foreign affairs he displayed the same capriciousness and want of perseverance. After proclaiming his intention of conferring on his subjects the blessings of peace, he joined in 1798 an Anglo-Austrian coalition against France; but when Austria paid more attention to her own interests than to the interests of monarchical institutions in general, and when England did not respect the independence of Malta, which he had taken under his protection, he succumbed to the artful blandishments of Napoleon and formed with him a plan for ruining the British empire by the conquest of India. Having roused, by what ought perhaps to be called his insanity, the enmity, distrust and fear of all around him, including some members of his own family, he was assassinated on the night of the 23rd to 24th of March 1801, and was succeeded by his son Alexander I.

Alexander I., 1801–25.

The early part of Alexander's reign (1801–25) was a period of generous ideas and liberal reforms. Under the influence of his Swiss tutor, Frederick César de Laharpe, he had imbibed many of the democratic ideas of the time, and he aspired to put them in practice, with the assistance at first of three young friends, Novosiltsov, Adam Czartoryski and Strogonov, who were his intimate counsellors and were popularly known as the Triumvirate, and later of Mikhail Speranski (*q.v.*). Some of the more oppressive measures of the previous reign were abolished; the clergy, the nobles and the merchants were exempted from corporal punishment; the central organs of administration were modernized and the Council of the Empire was created; the idea of granting a constitution was academically discussed; great schemes for educating the people were entertained; parish schools, gymnasia, training colleges and ecclesiastical seminaries were founded; the existing universities of Moscow, Vilna and Dorpat were reorganized and new ones founded in Kazan and Kharkov; the great work of serf-emancipation was begun in the Baltic provinces. In all these schemes Alexander took a keen personal interest; but his enthusiasm was soon cooled by practical difficulties, and his attention became more and more engrossed by foreign affairs.

Alexander and Napoleon.

At that time, in respect of foreign affairs, Russia was entering on a new phase of her history. Hitherto she had confined her efforts to territorial expansion in eastern Europe and in Asia, and she had sought foreign alliances merely as temporary expedients to facilitate the attainment of that object. Now she was beginning to consider herself a powerful member of the European family of nations, and she aspired to exercise a predominant influence in all European questions. This tendency was already shown by Catherine when she created the League of Neutrals as an arm against the naval supremacy of England, and by Paul when he insisted that his peace negotiations with Bonaparte should be regarded as part of a general European pacification, in which he must be consulted. Alexander insisted still more strongly on this claim, and in the convention which he concluded with the First Consul in October 1801 it was agreed that the maintenance of a just equilibrium between Austria and Prussia should be taken as an invariable principle in the plans of both parties, that the integrity of the kingdom of the Two Sicilies should be respected, that the duke of Württemberg should receive in Germany an indemnity proportionate to his losses, that the dominions of the elector of Bavaria should be preserved intact, and that the independence of the Ionian Islands should not be violated. Having obtained these important concessions the tsar imagined for a moment that in any further territorial changes he would be consulted and his advice allowed due weight, and he seems even to have indulged in the hope that the affairs of Europe might be directed by himself and his new ally. His illusion was soon dispelled, because the aims and policy of the two potentates were utterly irreconcilable. Whilst the one strove to erect bulwarks against French aggression, the other was preparing the ground for fresh annexations. During 1803–4 the breach between the two rivals widened, because Napoleon became more and more aggressive and unceremonious in Italy and Germany. Before the end of 1803 Alexander had come to perceive the necessity of resisting him energetically in order to save Europe from complete subjection, and in August 1804 he recognized that an armed conflict was inevitable. It broke out in the following year, and after the battles of Austerlitz (December 1805) and Friedland (June 1807), in which the Russians were completely defeated, the two sovereigns had their famous interviews at Tilsit, at which they not only made peace but agreed to divide the world between them, with a sublime indifference to the interests of other states. The grandiose project was at once vaguely outlined in three formal documents, to the intense satisfaction of both parties, and on both sides there was much rejoicing at the conclusion of such an auspicious alliance; but the diplomatic honeymoon was not of long duration. The mutual assurances of unbounded confidence, admiration and sympathy, if there was any genuine sincerity in them, represented merely a transient state of feeling. Napoleon, who could brook no equal, was nourishing the secret hope that his confederate might be used as a docile subordinate in the realization of his own plans, and the confederate soon came to suspect that he was being duped. His suspicions were intensified by the hostile criticisms of the Tilsit arrangement among his own subjects and by the arbitrary conduct of his ally, who continued his aggressions in reckless fashion as if he were sole master of Europe. The sovereigns of Sardinia, Naples, Portugal and Spain were dethroned, the pope was driven from Rome, the Rhine Confederation was extended till France obtained a footing on the Baltic, the grand-duchy of Warsaw was reorganized and strengthened, the promised evacuation of Prussia was indefinitely postponed, an armistice between Russia and Turkey was negotiated by French diplomacy in such a way that the Russian troops should evacuate the Danubian principalities, which Alexander intended to annex to his empire, and the scheme for breaking up the Ottoman empire and ruining England by the conquest of India, which had been one of the most attractive baits in the Tilsit negotiations, but which had not been formulated in the treaty, was no longer spoken of. At the same time Napoleon threatened openly to crush Austria, and in 1809 he carried out his threat by defeating the Austrian armies at Wagram and elsewhere, and dictating the treaty of Schönbrunn (October 14).

Alexander and the reaction in Europe.

Russia now remained the only unconquered power on the continent, and it was evident that the final struggle with her could not be long delayed. It began in 1812 by the advance of the *Grande Armée* on Moscow, and it ended in 1815 at Waterloo. During those three years Alexander was the chief antagonist of Napoleon, and it was largely due to his skill and persistency that the allies held together and freed Europe permanently from the Napoleonic domination. When peace was finally concluded, he had obtained that predominant position in European politics which had been the object of his ambition since the commencement of his reign, and he now believed firmly that he had been chosen by Providence to secure the happiness of the world in general and of the European nations in particular. In the fulfilment of this supposed mission he was not very successful, because his conception of national happiness and the means of obtaining it differed widely from that of the peoples whom he wished to benefit. They had fought for freedom in order to liberate themselves not only from the yoke of Napoleon but also from the tyranny of their own governments, whereas he expected them to remain submissively under the patriarchal institutions which their native rulers imposed on them. Thus, in spite of his academic sympathy with liberal ideas, he became, together with Metternich, a champion of political stagnation, and co-operated willingly in the reactionary measures against the revolutionary movements in Germany, Italy and Spain. In the affairs of his own country he refrained from developing and extending the liberal institutions which he had created immediately after his accession, and he finally adopted in all departments of administration a strongly reactionary policy. This naturally caused profound disappointment and dissatisfaction in the liberal section of the educated classes and especially among the young officers of the regiments which had spent some years in western Europe. Some of these officers had been in touch with the revolutionary movements, and had adopted the idea then prevalent in France, Germany and Italy that the best instrument for assuring political progress was to be found in secret societies. In Russia such societies began to be formed about 1816. The tsar, though he came to know of their existence, refrained from taking repressive measures against them, and when he died suddenly at Taganrog on the 1st of December 1825, two of them made an attempt to realize their political aspirations. The heir to the throne was the late tsar's eldest brother, Constantine, but he declined, for private reasons, to accept the succession, and a few days elapsed before the second brother, Nicholas, was proclaimed emperor. Taking advantage of this short interregnum, some members of the secret societies, mostly officers of the Guards, organized a mutiny among the troops quartered in St Petersburg and in Podolia, with a view to effecting a political revolution, but the movement was easily suppressed, and the ringleaders, known subsequently as the Decembrists, were severely punished (see Nicholas I.).

Nicholas I., 1825–55.

Nicholas was a blunt soldier incapable of comprehending his brother's sentimental sympathy with liberalism. The Decembrists' abortive attempt at revolution and the Polish insurrection of 1831, which he crushed with great severity, confirmed him in his conviction that Russia must be ruled with a strong hand. That conviction he put into practice with extreme rigour during the thirty years of his reign (1825–55), endeavouring by every means at his disposal to prevent revolutionary ideas from germinating spontaneously among his subjects and from being imported from abroad. For this purpose he created a very severe press-censorship and an expensive system of passports, which made it more difficult for Russians to visit foreign countries. It would be unjust, however, to say that he was the determined enemy of all progress. Progress was to be made in certain directions and in a certain way. Not only was the army to be well drilled and the fleet to be carefully equipped, but railways were to be constructed, river-navigation was to be facilitated, manufacturing industry was to be developed, commerce was to be encouraged, the administration was to be improved, the laws were to be codified and the tribunals were to be reorganized. All this was to be done, however, under the strict supervision and guidance of the autocratic power, with as little aid as possible from private initiative and with no control whatever of public opinion, because influential public opinion is apt to produce insubordination. When the results proved unsatisfactory, remedies were sought in increased administrative supervision, draconian legislation and severe punishment, and no attempt was made to get out of the vicious circle. In the last months of his life, under the influence of a great national disaster, the conscientious, persistent autocrat began to suspect that his system was a mistake, but he still clung to it obstinately. "My successor," he is reported to have said on his death-bed, "may do as he pleases, but I cannot change!"

This steadfast faith in autocratic methods and the exaggerated fear of revolutionary principles were shown in foreign as well as in home affairs. Like Alexander in the last period of his reign, Nicholas considered himself the supreme guardian of European order, and was ever on the watch to oppose revolution in all its forms. Hence he was generally in strained relations with France, especially in the time of Louis Philippe, who became king not by the grace of God but by the will of the people. During the revolutionary ferment of 1848–49 he urged the Prussian king to refuse the imperial crown, co-operated with the Austrian emperor in suppressing the Hungarian insurrection, and compelled the Prussians to withdraw their support from the insurgents

Nicholas I. and the Ottoman empire.

in Schleswig-Holstein. Unfortunately for the peace of the world his habitual policy of maintaining the existing state of things was frequently obscured and disturbed by his desire to maintain and increase his own and his country's prestige, influence and territory. By the Persian War, which broke out in 1826, in consequence of frontier disputes, he annexed the provinces of Erivan and Nakhichevan, and during the whole of his reign the conquest of the Caucasus was systematically carried on. With regard also to the Ottoman empire his policy cannot be said to have been strictly conservative. As protector of the Orthodox Christians he espoused the cause of the rayahs in Greece, Servia and Rumania. Under a threat of war he obtained in 1826 the Convention of Akerman, by which the autonomy of Moldavia, Walachia and Servia was confirmed, free passage of the straits was secured for merchant ships and disputed territory on the Asiatic frontier was annexed, and in July 1827 he signed with England and France the treaty of London for the solution of the Greek question by the mediation of the Powers. As the sultan rejected the mediation, his fleet was destroyed by the combined squadrons of the three Powers at Navarino; and as this "untoward event" did not suffice to overcome his resistance, a Russian army crossed the Danube and after two hard-fought campaigns advanced to Adrianople. Here, on the 14th of September 1829, was signed a treaty by which the Porte ceded to Russia the islands at the mouth of the Danube and several districts on the Asiatic frontier, granted full liberty to Russian navigation and commerce in the Black Sea, and guaranteed the autonomous rights previously accorded to Moldavia, Walachia and Servia. By the 10th article of the treaty, moreover, Turkey acceded to the protocol of the 22nd of March 1829, by which the Powers had agreed to the erection of Greece into a tributary principality. This attempt of Russia to secure the sole prestige of liberating Greece was, however, frustrated by the action of the other Powers in putting forward the principle of the independence of the new Greek state, with a further extension of frontiers.

Treaty of Unkiar-Skelessi, 1833.

The Holy Places.

The Crimean War.

The result of the war was to make Russia supreme at Constantinople; and before long an opportunity of further increasing her influence was created by Mehemet Ali, the ambitious pasha of Egypt, who in November 1831 began a war with his sovereign in Syria, gained a series of victories over the Turkish forces in Asia Minor and threatened Constantinople. Sultan Madmud II. after appealing in vain to Great Britain for active assistance turned in despair to Russia. Nicholas immediately sent his Black Sea fleet into the Bosphorus, landed on the Asiatic shore a force of 10,000 men, and advanced another large force towards the Turkish frontier in Bessarabia. Under pressure from England and France the Egyptians retreated and the Russian forces were withdrawn, but the tsar had meanwhile (July 8, 1833) concluded with the sultan the treaty of Unkiar-Skelessi, which constituted ostensibly a defensive and offensive alliance between the two Powers and established virtually a Russian protectorate over Turkey. In a secret article of the treaty the sultan undertook in the event of a *casus foederis* arising, and in consideration of being relieved of his obligations under the articles of the public treaty, to close the Dardanelles to the warships of all nations "*au besoin*," which meant in effect that in the event of Russia being threatened with an attack from the Mediterranean he would close the Dardanelles against the invader. England and France protested energetically and the treaty remained a dead letter, but the question came up again in 1840, after Mahmud's renewed attempt to crush Mehemet Ali had ended in the utter defeat of the Turks by Ibrahim at Nezib (June 24, 1839). This time Mehemet Ali was supported by the French government, which aimed at establishing predominant influence in Egypt, but he was successfully opposed by a coalition of Great Britain, Russia, Austria and Prussia, which checkmated the aggressive designs of France by the convention of London (July 15, 1840) (see MEHEMET ALI and TURKEY). In this way the development of Russian policy with regard to Turkey was checked for some years, but the project of confirming and extending the Russian protectorate over the Orthodox Christians was revived in 1852, when Napoleon III. obtained for the Roman Catholics certain privileges with regard to the Holy Places in Palestine. At the same time Austria intervened in Montenegrin affairs and induced the sultan to withdraw his troops from the principality. In these two incidents the tsar perceived a diminution of Russian prestige and influence in Turkey, and Prince Menshikov was sent on a special mission to Constantinople to obtain reparation in the form of a treaty which should guarantee the rights of the Orthodox Church with regard to the Holy Places and confirm the protectorate of Russia over the Orthodox rayahs, established by the treaties of Kainarji, Bucharest and Adrianople. The resistance of the sultan, supported by Great Britain and France, led to the Crimean War, which was terminated by the taking of Sevastopol (September 1855) and the treaty of Paris (March 30, 1856). By that important document Russia reluctantly consented to a strict limitation of her armaments in the Black Sea, to withdrawal from the mouths of the Danube by the retrocession of Bessarabia which she had annexed in 1812, and finally to a renunciation of all special rights of intervention between the sultan and his Christian subjects. Nicholas did not live to experience this humiliation. He had died at St Petersburg on the 2nd of March 1855 and had been succeeded by his eldest son, Alexander II.

Alexander II., 1855–81.

The first decade of Alexander's reign is commonly known in Russia as "the epoch of the great reforms," and may be described as a violent reaction against the political and intellectual stagnation of the preceding period. The repressive system of Nicholas, in which all other public interests were sacrificed to that of making Russia a great military power, the guardian of order in Europe and the predominant factor in the Eastern Question, had been tried and found wanting. Ending in a military disaster and a diplomatic humiliation, it had failed to attain even the narrow object for which it had been created. This was clearly perceived and keenly felt by the educated classes, and as soon as the strong hand of the uncompromising autocrat was withdrawn, they clamoured loudly for radical changes in the aims and methods of their rulers. Russia must adopt, it was said, those enlightened principles and liberal institutions which made the Western nations superior to her not only in the arts of peace but even in the art of war; only by imitating her rivals could she hope to overtake and surpass them in the race of progress. On that subject there was wonderful unanimity, and the few persons who could not join in the chorus had the prudence to remain silent. For the first time in the history of Russia public opinion in the modern sense became a power in the state and influenced strongly the policy of the government. Though the young emperor was of too phlegmatic a temperament to be carried away by the prevailing excitement and of too practical a turn of mind to adopt wholesale the doctrinaire theories of his self-constituted, irresponsible advisers, he recognized that great administrative and economic changes were required, and after a short period of hesitation he entered on a series of drastic reforms, of which the most important were the emancipation of the serfs, the thorough reorganization of the judicial administration and the development of local self-government. All these undertakings, in which the humane, liberal-minded autocrat received the sympathy, support and co-operation of the more enlightened of his subjects, were successfully accomplished. The serfs were liberated entirely from the arbitrary rule of the landowners and became proprietors of the communal land; the old tribunals which could be justly described as "dens of iniquity and incompetence," were replaced by civil and criminal law-courts of the French type, in which justice was dispensed by trained jurists according to codified legislation, and from which the traditional bribery and corruption were rigidly excluded; and the administration of local affairs—roads, schools, hospitals, &c.—was entrusted to provincial and district councils freely elected by all classes of the population. In addition to these great and beneficent changes, means were taken for developing more rapidly the vast natural resources of the country, public instruction received an unprecedented impetus, a considerable amount of liberty was accorded to the press, a strong spirit of liberalism pervaded rapidly all sections of the educated classes, a new imaginative and critical literature dealing with economic, philosophical and political questions sprang into existence, and for a time the young generation fondly imagined that Russia, awakening from her traditional lethargy, was about to overtake, and soon to surpass, on the path of national progress, the older nations of western Europe.

These sanguine expectations were not fully realized. The economic and moral condition of the peasantry was little improved by freedom, and in many districts there were signs of positive impoverishment and demoralization. The local self-government institutions after a short period of feverish and not always well-directed activity, showed symptoms of organic exhaustion. The reformed tribunals, though incomparably better than their predecessors, did not give universal satisfaction. In the imperial administration, the corruption and long-established abuses which had momentarily vanished, began to reappear. Industrial enterprises did not always succeed. Education produced many unforeseen and undesirable practical results. The liberty of the press not unfrequently degenerated into licence, and sane liberalism was often replaced by socialistic dreaming. In short, it became only too evident that there was no royal road to national prosperity, and that Russia, like other nations, must be content to advance slowly and laboriously along the rough path of painful experience. In these circumstances sanguine enthusiasm naturally gave way to despondency, and the reforming zeal of the government was replaced by tendencies of a decidedly reactionary kind. Partly from disappointment and nervous exhaustion, and partly from a conviction that the country required rest in order to judge the practical results of the reforms already accomplished, the tsar refrained from further initiating new legislation, and the government gave it to be understood that the epoch of the great reforms was closed.

Revolutionary propaganda.

In the younger ranks of the educated classes this state of things produced keen dissatisfaction, which soon found vent in revolutionary agitation. At first the agitation was of an academic character and was dealt with by the press-censure; but it gradually took the form of secret associations, and the police had to interfere. There were no great, well-organized secret societies, but there were many small groups, composed chiefly of male and female students of the universities and technical schools, which worked independently for a common purpose. Finding that the walls of autocracy could not be overturned by blasts of revolutionary trumpets in the periodical press and in clandestinely printed seditious proclamations, the young enthusiasts determined to seek the support of the masses, or, as they termed it, "to go in among the people" (*idti v naròd*). Under the disguise of doctors, midwives, school teachers, governesses, factory hands or common labourers, they sought to make proselytes among the peasantry and the workmen in the industrial centres by revolutionary pamphlets and oral explanations. For a time the propaganda had very little success, because the uneducated peasants and factory workers could not understand the phraseology and abstract principles of socialism; but when the propagandists descended to a lower platform and spread rumours that the tsar had given all the land to the peasants, and was prevented by the proprietors and officials from carrying out his benevolent intentions, there was a serious danger of agrarian disorders, and energetic measures were adopted by the authorities. Wholesale arrests were made by the police, and many of the accused were imprisoned or exiled to distant provinces, some by the regular tribunals, and others by so-called "administrative procedure" without a formal trial. The activity of the police and the sufferings of the victims naturally produced intense excitement and bitterness among those who escaped arrest, and a secret organization calling itself the Executive Committee announced in its clandestinely printed organs that the functionaries who distinguished themselves in the suppression of the propaganda would be "removed." A number of prominent officials were accordingly condemned to death by this secret terrorist tribunal, and in some cases the sentences were carried out. General Mezentsov, the head of the political police, was assassinated in broad daylight in one of the principal streets of St Petersburg, and in the provinces a good many officials of various grades shared the same fate. As these acts of terrorism had quite the opposite of the desired effect, repeated attempts were made on the life of the emperor, and at last the carefully laid plans of the conspirators were successful. On the 13th of March 1881, when returning from a military parade to the Winter Palace, Alexander II. was terribly wounded by the explosion of a bomb, and died shortly afterwards. (For details of this revolutionary movement, see NIHILISM.)

Foreign policy

In respect of foreign policy the reign of Alexander II. differed widely from that of Nicholas. The Eastern Colossus no longer inspired respect and fear in Europe. Until the country had completely recovered from the exhaustion of the Crimean War the government remained in the background of European politics. Its attitude was graphically described in the famous declaration of Prince Gorchakov: "La Russie ne boude pas; elle se recueille." On one point, however, this description was not accurate; Russia sulked so far as Austria was concerned, for she could not forget that the emperor Francis Joseph, by his wavering and unfriendly conduct towards her during the Crimean War, had ill repaid her assistance to the Habsburg Monarchy in 1849, and had fulfilled the cynical prediction of Prince Schwarzenberg that his country would astonish the world by her ingratitude. It was not without secret satisfaction, therefore, that Prince Gorchakov watched the repeated defeats of the Austrian army in the Italian campaign of 1859, and he felt inclined to respond to the advances made to him by Napoleon III.; but the germs of a Russo-French alliance, which had come into existence immediately after the Crimean War, ripened very slowly, and they were completely destroyed in 1863 when the French emperor wounded Russian sensibilities deeply by giving moral and diplomatic support to the Polish insurrection. On that occasion Bismarck helped Gorchakov to ward off the threatened intervention of France and England, and he thereby founded the cordial relations which subsisted between the cabinets of Berlin and St Petersburg down to 1878, and which contributed powerfully to the creation of the German empire by defending the Prussian cabinet against the jealousy and enmity of Austria and France. In return for these services Bismarck helped Russia to recover a portion of what she had lost by the Crimean War, for it was thanks to his connivance and diplomatic support that she was able in 1871 to denounce with impunity the clauses of the treaty of Paris which limited Russian armament in the Black Sea. Had the tsar been satisfied with this important success, which enabled him to rebuild Sevastopol and construct a Black Sea fleet, his reign might have been a peaceful and prosperous one, but he tried to recover the remainder of what had been lost by the Crimean War, the province of Bessarabia and predominant influence in Turkey. To effect this, he embarked on the Turkish War of 1877–78, which ended in disappointment. Though the campaign enabled him to recover Bessarabia at the expense of his Rumanian ally, it did not increase Russian prestige in the East, because the Russian army was repeatedly repulsed by the Turks, and when at last it reached Constantinople, it was prevented from entering the city by the threatening attitude of England and Austria. In the field of diplomacy there was likewise disappointment. The concessions extorted from the Porte in the preliminary treaty of San Stefano (March 3, 1878) were revived and considerably modified in favour of Turkey by the congress of Berlin (June 13–July 13, 1878); see EUROPE: *history.*

Russo-Turkish War of 1877–78.

Russian expansion in Asia.

Much greater success attended the efforts of Russian diplomacy and Russian arms in Asia. By the treaty of Aigun (May 28, 1858), and without any military operations, the cession of a great part of the basin of the Amur was obtained from China. Six years later began the rapid expansion of Russia in Central Asia, and at the end of Alexander II.'s reign her domination had been firmly established throughout nearly the whole of the vast expanse of territory lying between Siberia on the north and Persia and Afghanistan on the south, and stretching without interruption from the eastern coast of the Caspian to the Chinese frontier. The greater part of the territory was formally incorporated into the empire, and the petty potentates, such as the khan of Khiva and the amir of Bokhara, who were allowed to retain a semblance of their former sovereignty, became obsequious vassals of the White Tsar.

Alexander III., 1881-94.

Reaction under Alexander III.

The assassination of Alexander II. by the terrorists made a profound impression on his son and successor, and determined the general character of his rule. Alexander III. (1881–94), who had never sympathized with liberalism in any form, entered frankly on a reactionary policy, which was pursued consistently during the whole of his reign. He could not, of course, undo the great reforms of his predecessor, but he amended them in such a way as to counteract what he considered the exaggerations of liberalism. Local self-government in the village communes, the rural districts and the towns was carefully restricted, and placed to a greater extent under the control of the regular officials. The reformers of the previous reign had endeavoured to make the emancipated peasantry administratively and economically independent of the landed proprietors; the conservatives of this later era, proceeding on the assumption that the peasants did not know how to make a proper use of the liberty prematurely conferred upon them, endeavoured to re-establish the influence of the landed proprietors by appointing from amongst them "land-chiefs," who were to exercise over the peasants of their district a certain amount of patriarchal jurisdiction. The reformers of the previous reign had sought to make the new local administration (*zemstvo*) a system of genuine rural self-government and a basis for future parliamentary institutions; these later conservatives transformed it into a mere branch of the ordinary state administration, and took precautions against its ever assuming a political character. Even municipal institutions, which had never shown much vitality, were subjected to similar restrictions. In short, the various forms of local self-government, which were intended to raise the nation gradually to the higher political level of western Europe, were condemned as unsuited to the national character and traditions, and as productive of disorder and demoralization. They were accordingly replaced in great measure by the old autocratic methods of administration, and much of the administrative corruption which had been cured, or at least repressed, by the reform enthusiasm again flourished luxuriantly.

In a small but influential section of the educated classes there was a conviction that the revolutionary tendencies, which culminated in Nihilism and Anarchism, proceeded from the adoption of cosmopolitan rather than national principles in all spheres of educational and administrative activity, and that the best remedy for the evils from which the country was suffering was to be found in a return to the three great principles of Nationality, Orthodoxy and Autocracy. This doctrine, which had been invented by the Slavophils of a previous generation, was early instilled into the mind of Alexander III. by Pobêdonostsev (*q.v.*), who was one of his teachers, and later his most trusted adviser, and its influence can be traced in all the more important acts of the government during that monarch's reign. His determination to maintain autocracy was officially proclaimed a few days after his accession. Nationality and Eastern Orthodoxy, which are so closely connected as to be almost blended together in the Russian mind, received not less attention. Even in European Russia the regions near the frontier contain a great variety of nationalities, languages and religions. In Finland the population is composed of Finnish-speaking and Swedish-speaking Protestants; the Baltic provinces are inhabited by German-speaking, Lett-speaking and Esth-speaking Lutherans; the inhabitants of the south-western provinces are chiefly Polish-speaking Roman Catholics and Yiddish-speaking Jews; in the Crimea and on the Middle Volga there are a considerable number of Tatar-speaking Mahommedans; and in the Caucasus there is a conglomeration of races and languages such as is to be found on no other portion of the earth's surface. Until recent times these various nationalities were allowed to retain unmolested the language, religion and peculiar local administration of their ancestors; but when the new nationality doctrine came into fashion, attempts were made to spread among them the language, religion and administrative institutions of the dominant race. In the reigns of Nicholas I. and Alexander II. these attempts were merely occasional and intermittent; under Alexander III. they were made systematically and with very little consideration for the feelings, wishes and interests of the people concerned. The local institutions were assimilated to those of the purely Russian provinces; the use of the Russian language was made obligatory in the administration, in the tribunals and to some extent in the schools; the spread of Eastern Orthodoxy was encouraged by the authorities, whilst the other confessions were placed under severe restrictions; foreigners were prohibited from possessing landed property; and in some provinces administrative measures were taken for making the land pass into the hands of Orthodox Russians. In this process some of the local officials displayed probably an amount of zeal beyond the intentions of the government, but any attempt to oppose the movement was rigorously punished. Of all the various races the Jews were the most severely treated. The great majority of them had long been confined to the western and south-western provinces. In the rest of the country they had not been allowed to reside in the villages, because their habits of keeping vodka-shops and lending money at usurious interest were found to demoralize the peasantry, and even in the towns their numbers and occupations had been restricted by the authorities. But, partly from the usual laxity of the administration and partly from the readiness of the Jews to conciliate the needy officials, the rules had been by no means strictly applied. As soon as this fact became known to Alexander III. he ordered the rules to be strictly carried out, without considering what an enormous amount of hardship and suffering such an order entailed. He also caused new rules to be enacted by which his Jewish subjects were heavily handicapped in education and professional advancement. In short, complete Russification of all non-Russian populations and institutions was the chief aim of the government in home affairs.

Foreign policy.

In the foreign policy of the empire Alexander III. likewise introduced considerable changes. During his father's reign its main objects were: in the west, the maintenance of the alliance with Germany; in south-eastern Europe, the recovery of what had been lost by the Crimean War, the gradual weakening of the Sultan's authority, and the increase of Russian influence among the minor Slav nationalities; in Asia, the gradual but cautious expansion of Russian domination. In the reign of Alexander III. the first of these objects was abandoned. Already, before his accession, the bonds of friendship which united Russia to Germany had been weakened by the action of Bismarck in giving to the cabinet of St Petersburg at the Berlin congress less diplomatic support than was expected, and by the Austro-German treaty of alliance (October 1879), concluded avowedly for the purpose of opposing Russian aggression; but the old relations were partly re-established by secret negotiations in 1880, by a meeting of the young tsar and the old emperor at Danzig in 1881, and by the meeting of the three emperors at Skierniewice in 1884, by which the Three Emperors' League was reconstituted for a term of three years (see EUROPE: *History*). Gradually, however, a great change took place in the tsar's views with regard to the German alliance. He suspected Bismarck of harbouring hostile designs against Russia, and he came to recognize that the permanent weakening of France was not in accordance with Russian political interests. He determined, therefore, to oppose any further disturbance of the balance of power in favour of Germany, and when the treaty of Skierniewice expired in 1887 he declined to renew it. From that time Russia gravitated slowly towards an alliance with France, and sought to create a counterpoise against the Triple Alliance of Germany, Austria and Italy. The tsar was reluctant to bind himself by a formal treaty, because the French government did not offer the requisite guarantees of stability, and because he feared that it might be induced, by the prospect of Russian support, to assume an aggressive attitude towards Germany. He recognized, however, that in the event of a great European war the two nations would in all probability be found fighting on the same side, and that if they made no preparations for concerted military action they would be placed at a grave disadvantage in comparison with their opponents of the Triple Alliance, who were believed to have already worked out an elaborate plan of campaign. In view of this contingency the Russian and French military authorities studied the military questions in common, and the result of their labours was the preparation of a military convention, which was finally ratified in 1894. During this period the relations between the two governments and the two countries became much more cordial. In the summer of 1891 the visit to Kronstadt of a French squadron under Admiral Gervais was made the occasion for an enthusiastic demonstration in favour of a Franco-Russian alliance; and two years later (October 1893) a still more enthusiastic reception was given to the Russian Admiral Avelan and his officers when they visited Toulon and Paris. But it was not till after the death of Alexander III. that the word "alliance" was used publicly by official personages. In 1895 the term was first publicly employed by M. Ribot, then president of the council, in the Chamber of Deputies, but the expressions he used were so vague that they did not entirely remove the prevailing doubts as to the existence of a formal treaty. Two years later (August 1897), during the official visit of M. Félix Faure to St Petersburg, a little more light was thrown on the subject. In the complimentary speeches delivered by the president of the French Republic and the tsar, France and Russia were referred to as allies, and the term "nations alliées" was afterwards repeatedly used on occasions of a similar kind.

In south-eastern Europe Alexander III. adopted an attitude of reserve and expectancy. He greatly increased and strengthened his Black Sea fleet, so as to be ready for any emergency that might arise, and in June 1886, contrary to the declaration made in the Treaty of Berlin (Art. 59), he ordered Batum to be transformed into a fortified naval port, but in the Balkan Peninsula he persistently refrained, under a good deal of provocation, from any intervention that might lead to a European war. The Bulgarian government, first under Prince Alexander and afterwards under the direction of M. Stamboloff, pursued systematically an anti-Russian policy, but the cabinet of St Petersburg confined itself officially to breaking off diplomatic relations and making diplomatic protests, and unofficially to giving tacit encouragement to revolutionary agitation.

In Asia, during the reign of Alexander III. the expansion of Russian domination made considerable progress. A few weeks after his accession he sanctioned the annexation of the territory of the Tekke Turkomans, which had been conquered by General Skobelev, and in 1884 he formally annexed the Merv oasis without military operations. He then allowed the military authorities to push forward in the direction of Afghanistan, until in March 1885 an engagement took place between Russian and Afghan forces at Panjdeh. Thereupon the British government, which had been for some time carrying on negotiations with the cabinet of St Petersburg for a delimitation of the Russo-Afghan frontier, intervened energetically and prepared for war; but a compromise was effected, and after more than two years of negotiation a delimitation convention was signed at St Petersburg on 20th July 1887. The forward movement of Russia was thus stopped in the direction of Herat, but it continued with great activity farther east in the region of the Pamirs, until another Anglo-Russian convention was signed in 1895. During the whole reign of Alexander III. the increase of territory in Central Asia is calculated by Russian authorities at 429,895 square kilometres.

Death of Alexander III.; accession of Nicholas II.

On 1st November 1894 Alexander III. died, and was succeeded by his son, Nicholas II., who, partly from similarity of character and partly from veneration for his father's memory, continued the existing lines of policy in home and foreign affairs. The expectation entertained in many quarters that great legislative changes would at once be made in a liberal sense was not realized. When an influential deputation from the province of Tver, which had long enjoyed a reputation for liberalism, ventured to hint in a loyal address that the time had come for changes in the existing autocratic régime, they received a reply which showed that the emperor had no intention of making any such changes. Private suggestions in the same sense, offered directly and respectfully, were no better received, and no important changes were made in the legislation of the preceding reign. But a great alteration took place noiselessly in the manner of carrying out the laws and ministerial circulars. Though resembling his father in the main points of his character, the young tsar was of a more humane disposition, and he was much less of a doctrinaire. With his father's aspiration of making Holy Russia a homogeneous empire he thoroughly sympathized in principle, but he disliked the systematic persecution of Jews, heretics and schismatics to which it gave rise, and he let it be understood, without any formal order or proclamation, that the severe measures hitherto employed would not meet with his approval. The officials were not slow to take the hint, and their undue zeal at once disappeared. Nicholas II. showed, however, that his father's policy of Russification was neither to be reversed nor to be abandoned. When an influential deputation was sent from Finland to St Petersburg to represent to him respectfully that the officials were infringing the local rights and privileges solemnly accorded at the time of the annexation, it was refused an audience, and the leaders of the movement were informed indirectly that local interests must be subordinated to the general welfare of the empire. In accordance with this declaration, the policy of Russification in Finland was steadily maintained, and caused much disappointment, not only to the Finlanders, but also to the other nationalities who desired the preservation of their ancient rights.

In foreign affairs Nicholas II. likewise continued the policy of his predecessor, with certain modifications suggested by the change of circumstances. He strengthened the cordial understanding with France by a formal agreement, the terms of which were not divulged, but he never encouraged the French government in any aggressive designs, and he maintained friendly relations with Germany. In the Balkan Peninsula a slight change of attitude took place. Alexander III., indignant at what he considered the ingratitude of the Slav nationalities, remained coldly aloof, as far as possible, from all intervention in their affairs. About three months after his death, de Giers, who thoroughly approved of this attitude, died (26th January 1895), and his successor, Prince Lobanov, minister of foreign affairs from 19th March 1895 to 30th August 1896, endeavoured to recover what he considered Russia's legitimate influence in the Slav world. For this purpose Russian diplomacy became more active in south-eastern Europe. The result was perceived first in Montenegro and Servia, and then in Bulgaria. Prince Ferdinand of Bulgaria had long been anxious to legalize his position by a reconciliation, and as soon as he got rid of Stamboloff he made advances to the Russian government. They were well received, and a reconciliation was effected on certain conditions, the first of which was that Prince Ferdinand's eldest son and heir should become a member of the Eastern Orthodox Church. As another means of opposing Western influence in south-eastern Europe, Prince Lobanov inclined to the policy of protecting rather than weakening the Ottoman empire. When the British government seemed disposed to use coercive measures for the protection of the Armenians, he gave it clearly to be understood that any such proceeding would be opposed by Russia. After Prince Lobanov's death and the appointment of Count **Muraviev** as his successor in January 1897, this tendency of Russian policy became less marked. In April 1897, it is true, when the Greeks provoked a war with Turkey, they received no support from St Petersburg, but at the close of the war the tsar showed himself more friendly to them; and afterwards, when it proved extremely difficult to find a suitable person as governor-general of Crete (see CRETE), he recommended the appointment of his cousin, Prince George of Greece—a selection which was pretty sure to accelerate the union of the island with the Hellenic kingdom. How far the recommendation was due to personal feeling, as opposed to political considerations, it is impossible to say.

Russia and Japan in the Far East.

In Asia, after the accession of Nicholas II., the expansion of Russia, following the line of least resistance and stimulated by the construction of the Trans-Siberian railway, took the direction of northern China and the effete little kingdom of Korea. A great part of the eastern section of the railway was constructed on Chinese territory, and elaborate preparations were made for bringing Manchuria within the sphere of Russian influence. With this view, the cabinet of St Petersburg, at the close of the Chino-Japanese War in 1895, objected to all annexations by Japan in that quarter, and insisted on having the treaty of Shimonoseki modified accordingly. Subsequently, by obtaining from the Tsungli-Yaman a long lease of Port Arthur and Talienwan and a concession to unite those ports with the Trans-Siberian by a branch line, she tightened her hold on that portion of the Chinese empire and prepared to complete the work of aggression by so-called "spontaneous infiltration." From Manchuria, it was assumed, the political influence and spontaneous infiltration would naturally spread to Korea, and on the deeply indented coast of the Hermit Kingdom might be constructed new ports and arsenals more spacious and strategically more important than Port Arthur.

This grandiose project was unexpectedly destroyed by the energetic resistance of Japan, who had ear-marked the Hermit Kingdom for herself, and who declared plainly that she would never tolerate the exclusive influence of Russia in Manchuria. In vain the Russian diplomatists sought to overcome her opposition by dilatory negotiations, in the firm conviction that a small island kingdom in the Pacific would never have the audacity to attack a power which had conquered and absorbed the whole of Northern Asia. Their calculations proved erroneous. Convinced that the onward march of the Colossus could not be permanently arrested by mere diplomatic conventions, the cabinet of Tokio suddenly broke off diplomatic relations and commenced hostilities (February 8, 1904). For Russia the war proved a series of uninterrupted reverses both on land and on sea, until it was terminated by the treaty of Portsmouth in October 1905 (see RUSSO-JAPANESE WAR).

Revolutionary movement in Russia.

What contributed powerfully to the conclusion of peace was the fact that the Russian government was hampered by internal troubles. The old Liberal movement and the terrorist organizations which had been suppressed by Alexander III. were being resuscitated, and the liberal and revolutionary leaders, taking advantage of the unpopularity of the war, were agitating for the convocation of a Constituent Assembly, which should replace the hated bureaucratic régime by democratic institutions. With great reluctance the tsar consented to convoke a consultative chamber of deputies as a sop to public opinion, but that concession stimulated rather than calmed public opinion, and shortly after the conclusion of peace the Liberals and the Revolutionaries, combining their forces, brought about a general strike in St Petersburg together with the stoppage of railway communication all over the empire. Panic-stricken for a moment, the government issued a manifesto proclaiming Liberal principles and promising in vague language all manner of political reforms (October 30, 1905), and when the inordinate expectations created by this extraordinary document were not at once realized, preparations were made for overthrowing the existing régime by means of an armed insurrection. Many believed that the end of autocracy had come, and an extemporized Council of Labour Deputies, anxious to play the part of a *Comité de Salut Public*, was ready to take over the supreme power and exercise it in the interests of the proletariat. In reality the revolutionary movement was not so strong and the government not so weak as was generally supposed. Mutinies occurred, it is true, during the next few weeks in Kronstadt and Sevastopol, and in December there was street-fighting for several days in Moscow, but such serious disorders were speedily suppressed, and thereafter the revolutionary manifestations were confined to mass meetings, processions with red flags, attempts on the lives of officials and policemen, robberies under arms and agrarian disturbances.

Notwithstanding the unsatisfactory results of the October manifesto the tsar kept his promise of convoking a legislative assembly, and on the 10th of May 1906 the first Duma was opened by his majesty in person; but it was so systematically and violently hostile to the government and so determined to obtain executive, in addition to its legislative, functions, that it was dissolved on the 23rd of July without any legislative work being accomplished. The second Duma, which met on the 5th of March 1907, avoided some of the mistakes of its predecessor, but as a legislative assembly it showed itself equally incompetent, and a large section of its members were implicated in a well-organized attempt to spread sedition in the army by revolutionary propaganda. It was dissolved, therefore, on the 16th of June 1907, and the electoral law which had given such unsatisfactory results was modified by imperial ukase.

The third Duma was subsequently convoked for the 14th of November 1907. (D. M. W.)

The Russian revolution.

Development of the Russian Constitution.—At the end of 1910 the Russian revolution, which seemed at one time to promise an overturn as complete as that of the *ancien régime* in France, would seem to have entered on a path of orderly and conservative development, and it is possible, now that the smoke of combat has cleared away, to form some estimate of the forces through the interplay of which this result has been achieved. At the outset the superficial resemblance between the revolutionary movement in Russia and that of 1789 in France was striking: there was the same breakdown of the traditional machinery of government, the same general outcry for control by a representative national assembly, the same gradual and reluctant concessions wrung from the crown under pressure of disaffection in the army, popular *émeutes*, the assassination of unpopular officials, and the burning of country houses by organized bands of peasants. Similar, too, was the revelation, when freedom of speech was at last allowed, of the unhappy effect of the long divorce of the intellect of the country from any experience of practical politics. But here the analogy breaks down. France in 1789, though its ancient provincial boundaries survived, had long since been welded into a nation conscious of its common interests; Russia remains a vast empire, composed of the most heterogeneous, sometimes even mutually hostile, elements, whose antagonisms were bound to be an element of weakness in any assembly truly representative of all sections of the people. In France the Revolution had been the work of the middle classes; in Russia an indigenous middle class has, comparatively speaking, no existence, the peasants forming the overwhelming majority of the population.[1] The supreme peril to the autocracy in Russia lay in the genuine grievances of the peasants, less political than economic, which had opened their minds to revolutionary propaganda. These grievances once removed, and their legitimate land-hunger satisfied, the peasants would become a bulwark of the established order, whatever that might be, as had happened in similar circumstances in Austria in 1849. As for the revolutionary "intellectuals," without the lever of agrarian discontent they were practically powerless, the more so as their political activity consisted mainly in "building theories for an imaginary world." The *bourgeois* revolutionists of France had all been *philosophes*, but their philosophy had at least paid lip-service to "reason"; the Russian revolutionists who formed the majority of the first and second Dumas, as though inspired by the exalted nonsense preached by Tolstoi,[1] subordinated reason to sentiment, until—their impracticable temper having been advertised to all the world—it became easy for the government to treat them as a mere excrescence on the national life, a malignant growth to be removed by a necessary operation. In 1909 the number of exiles for political reasons from Russia was reckoned at 180,000; but the third Duma, purged and packed by an ingenious franchise system, was in its third year passing measures of beneficent legislation, in complete harmony with the government. It is proposed to trace briefly the steps by which this result was obtained.

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[1] In 1897 only 15% of the population were engaged in commerce or industry, including the work-people. Of the middle class, moreover, a large proportion were Jews and Germans. The peasants numbered 75%.

Previous reforms.

Reaction under Alexander III.

In order to explain the course of the revolution which came to a head in 1905 it is necessary to say a few words about constitutional plans and liberal experiments, initiated from above, which had preceded it. Of the ancient *zemski sobor* (assembly of the country) it is unnecessary here to say much, though Nicholas II. was pressed by the more reactionary elements to model his parliament on this rough equivalent of the Western states-general. The *zemski sobor*, which had played a considerable part in the struggle of the tsars against the great boyars in the 17th century, had met but once since the days of Peter the Great.[2] The origin of the present constitution of Russia must be sought, not in this ancient and obsolete institution, but in the artificial constitution elaborated by Mikhail Speranski (*q.v.*) in 1809 at the instance of the emperor Alexander I. Of Speranski's plan only the establishment of the Imperial Council (January 1st, 1810) was realized in his lifetime.[3] In 1864, however, the emperor Alexander II. carried the scheme a step further by the creation of elected provincial assemblies (*zemstvos*), to which in 1870 elected municipal councils (*dumas*) were added. The opportunity thus given for debate naturally stimulated the movement in favour of constitutional government, which received new impulses from the sympathetic attitude of the emperor Alexander II., his grant in 1879 of a constitution to the liberated principality of Bulgaria, and the multiplication of Nihilist outrages which pointed to the necessity of conciliating Liberal opinion in order to present a united front against revolutionary agitation. In January 1881 Count Loris-Melikov, minister of the interior, proposed to convene a "general commission" to examine legislative proposals before these were laid before the Imperial Council; this commission was to consist of members elected by the *zemstvos* and the larger towns, and others nominated in the provinces having no *zemstvos*. The plan was approved by Alexander II. on the very morning of his assassination (February 17th, 1881), but it was never promulgated. The new tsar, Alexander III., was an apt pupil of his tutor Pobedonostsev (*q.v.*), the celebrated procurator of the Holy Synod, for whom the representative system was "a modern lie," and his reign covered a period of frank reaction, during which there was not only no question of granting any fresh liberties but those already conceded (*e.g.* the principle of the separation of the administrative and judicial functions) were largely curtailed. The result of this policy of repression, associated as it was with gross incompetence and corruption in the organs of the administration, was the rapid spread of the revolutionary movement, which gradually permeated the intelligent classes and ultimately affected even the stolid and apparently immovable masses of the peasantry.

Influence of the Japanese War.

Meeting of zemstvos.

Agitation and outrages.

The movement came to a head, as a result of the disasters of the war with Japan, in 1904. The assassination of the minister of the interior Plehve, on the 14th of July, by the revolutionist Sazonov was remarkable as a symptom mainly owing to the widespread sympathy of the European press of all shades of opinion with the motives of the assassin. It was clear that the system with which the murdered minister's name had been associated stood all but universally condemned, and in the appointment of the conciliatory Prince Sviatopolk-Mirski as his successor the tsar himself seemed to concede the necessity for a change of policy.[4] In November, with the tacit consent of the police, a private assembly of eminent members of local *zemstvos* and municipal *dumas* was held in St Petersburg to discuss the situation. The majority of this decided to approach the crown with a suggestion for a reform of the Russian system on the basis of a national representative assembly, an extension of local self-government, and wider guarantees for individual liberty. The day on which the deputation laid these views before Prince Mirski was hailed by public opinion as recalling the 5th of May 1789, the date of the meeting of the French states-general at Versailles. The emperor, however, whatever his own views, was surrounded by reactionary influences, of which the most powerful were the empress-mother, Pobedonostsev the procurator of the Holy Synod, Count Muraviev and the Grand-duke Sergius. The imperial *ukaz* of the 12th of December enunciating reforms affecting the peasants, workmen and local *zemstvos* failed to satisfy public opinion; for there was no word in it of constitutional government. Petitions continued to flow in to the emperor's cabinet, praying for a national representation, from the *zemstvos*, from the nobles and from the professional classes, and their moral was enforced by general agitation, by partial strikes, and by outrages which culminated at Moscow in the murder of the Grand-duke Sergius (February 4th, 1905). In the imperial counsels the resisting forces still seemed to have the upper hand. Prince Mirski resigned, his resignation being immediately followed by a reactionary imperial manifesto reaffirming the principle of autocracy (February 18th). Bulygin, Mirski's successor, had no knowledge of this until after its publication; he hastened to the tsar and obtained the issue on the same day of a rescript which, while reserving the "fundamental laws of the empire" inviolate, stated the emperor's intention of summoning the representatives of the people to aid in "the preparation and examination of legislative proposals." A commission of inquiry, under the emperor's presidency, was now established to elaborate the means for carrying this promise into effect. On the 6th of June, in reply to a deputation of the second congress of *zemstvos* headed by Prince Trubetzkoi, the emperor promised the speedy convocation of a National Assembly. When, however, on the 6th of August, the new law was promulgated, it was found that the "Imperial Duma"[5] was to be no more than a consultative body, charged with the examination of legislative proposals before these came before the Imperial Council, the duty and right of passing them into law being still reserved for the autocrat alone. The members of the Duma, moreover, were placed at the mercy of the government by a clause empowering the Directing Senate to suspend or deprive them. The promulgation of this truncated constitution was greeted by a furious agitation, culminating in September in a general strike, rightly described as the most remarkable political phenomenon of modern times. For days the whole mechanism of civilized existence in Russia was at a standstill, all intercourse with the outside world cut off; until at last the government was forced to yield, and on the 17/30th of October 1905 the tsar issued the famous manifesto promising to Russia a constitution based on the main principles of modern Liberalism: national representation, freedom of conscience and opinion, guarantees for individual liberty.

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[1] "Tolstoi observed that that was argument and reason, and that he paid no attention to them; he only guided himself (he said) by sentiment, which he felt sure told him what was good and right!"—Interview with Metchnikoff in Sir Ray Lankester's *Science from an Easy Chair*, p. 43.

[2] In 1767, when Catherine II.—in a mood of encyclopaedist enlightenment—summoned it. The meeting confined its attention to economic questions, and had no political character whatever.

[3] In his speech at the opening of the first Polish parliament at Warsaw in 1818, Alexander I. publicly announced his intention of granting free institutions to Russia.

[4] Sazonov's sentence of twenty years' hard labour was commuted by Nicholas II. to fourteen years.

[5] *Duma* = council, assembly (*dumat*, to think over, reflect upon). The name was first suggested by Speranski, under Alexander I., for the suggested parliament of delegates from the *zemstvos* and local *dumas*.

Constitutional manifesto of October 17/30, 1905.

The "Union of the Russian People."

The enormous programme of constitutional reform foreshadowed in the manifesto had to be elaborated in haste by Count Witte, the minister of the interior, under circumstances by no means promising. The organs of government seemed paralysed by the repudiation of the principle on which their authority was based, and the empire to be in danger of falling into complete anarchy. The revolutionary terrorists took advantage of the situation to multiply outrages; popular agitation was fomented by a multitude of new journals preaching every kind of extravagant doctrine, now that the censor no longer dared to act; in December the trouble culminated in a formidable rising in Moscow. The revolutionary terrorists were countered by the terrorists of the reaction who, under the name of "the Union of the Russian People," began an organized extermination of the elements supposed to be hostile to the traditional régime. The "black band" (*chernaya sotnia*), or "black hundreds," as they were branded by public opinion, directed their attacks especially against the Jews, and *pogroms*,[1] *i.e.* organized wholesale robbery and murder of Jews, occurred in many places, it was believed with the connivance of the police and veiled approval in exalted quarters.

Development of political parties.

Meanwhile the political parties which were to divide the new Duma had taken shape. Apart from the extremists on one side or the other, frank reactionaries on the Right and Socialists on the Left, two main divisions of opinion revealed themselves in the congresses of the *zemstvos* that met at Moscow in September and November. In the former there had been a fusion between the Radicals, supporters of the autonomy of Poland and a federal constitution for the empire, and the Independence party (*Osvobozhdenya*) formed by political exiles at Paris in 1903, the fusion taking the name of Constitutional Democrats, known (from a word-play on the initials K.D.) as "Cadets." The more moderate elements found a rallying cry in the manifesto of October, took the name of "the Party of 17 October," and became known as "Octobrists." In the *zemstvo* congress of November the "Cadets" protested against the "grant" of a constitution already elaborated, and demanded the convocation of a Constituent Assembly. The Octobrists, on the other hand, supported Count Witte's moderate programme, the most important provisions of which were the extension (11 December 1905) of the suffrage under the stillborn constitution of August, and (20 February 1906) the reorganization of the Duma as the Lower House, and of the Imperial Council (half of which was to be elective) as the Upper House[2] in the new parliament.

The first Duma.

The elections were held in March 1906, and on the 27th of April the emperor Nicholas II. solemnly opened the first Duma of the Empire. The "Cadets" commanded an overwhelming majority in the Lower House, and their intractable temper and ignorance of affairs became at once apparent. The address in reply to the speech from the throne, voted after a debate in which abstract theories had triumphed over common sense, demanded universal suffrage, the establishment of pure parliamentary government, the abolition of capital punishment, the expropriation of the landlords, a political amnesty, and the suppression of the Imperial Council. When the minister of the interior, M. Goremykin, who had succeeded Witte at the head of the government, met these preposterous demands with a flat refusal, the House voted, on the motion of M. Kuzmin-Karaviev, for an appeal to the people (July 4).[3] Four days later the government dissolved the Duma, M. Goremykin at the same time being replaced by M. Stolypin. The "Cadets" refused to accept this action and, in imitation of the famous meeting in the tennis-court at Versailles, adjourned to Vyborg in Finland, where, under the ex-president of the Duma, M. Muromtsov, they drew up and issued a manifesto calling on the Russian people to refuse taxes and military service. Its sole result, apart from the punishment which afterwards fell on its authors,[4] was to show how little the majority of the dissolved Duma had represented the Russian people. Isolated mutinies in the army followed, and terrorist outrages here and there—notably, in August, the dastardly bomb outrage in the Isle of Apothecaries at St Petersburg, which seriously injured one of M. Stolypin's little daughters; but the mass of the nation and of the army remained wholly unmoved, while the repetition of troubles was made more difficult by the establishment of field courts martial with summary powers.

The Vyborg manifesto.

The second Duma.

Alteration by ukaz of the electoral law.

The second Duma met on the 6th of March 1907. M. Stolypin had not ventured to alter the electoral law without parliamentary consent, but with the aid of a complaisant Senate the provisions of the existing law were interpreted in a restrictive sense for the purpose of influencing the elections. The result was, however, hardly more satisfactory to the government. The "Cadets," it is true, lost many seats both to the Socialists and to the extreme Right, but they held the balance of the House, of which the Octobrists and the Right together only constituted one-fifth, and their leader, M. Golovin, was elected president of the House. The temper of the second Duma, was, indeed, even more democratic than that of the first; but M. Stolypin did his best to work in harmony with it, realizing that under the existing law another dissolution could but lead to a like result, and shrinking from the only alternative—an alteration of the law by a *coup d'état*, a course which could only be justified on the plea of extreme necessity. On the 19th of March he laid before the House his programme of reforms, which included the emancipation of the peasants from the control of the communes and the handing over to them of the crown lands and imperial estates. The majority, however, refused to be reconciled. The abolition of the field courts martial was demanded; on the 13th of April a bill for the expropriation of landlords was carried by a two-thirds majority,[5] and the 30th the Army Bill would have been lost but for the Polish vote. The crisis came with the discovery of a treasonable plot for the subornation of the army, in which many Socialist members of the Duma were involved. On the 14th of June Stolypin's proposal for the arrest of 16 members and the indictment of 55 was shelved by being referred to a committee. The excuse for which the government had been waiting was thus provided, and two days later the Duma was dissolved. An imperial *ukaz* fixed the new elections for the 14th of September, and the meeting of the third Duma for the 14th of November; at the same time, in violation of the October manifesto, the electoral law was altered, so as to secure a representation at once more Russian and more conservative. The non-Russian frontier provinces (*okrainas*) had even before been under-represented (one member for every 350,000 inhabitants, as against one for every 250,000 in the central provinces); the members returned by Poland, the Caucasus and Siberia were now reduced from 89 to 39, those from the Central Asian steppes (23) were swept away altogether; the total number of deputies was reduced from 524 to 442. Even more drastic were the changes in the electoral machinery, by far the most complicated in Europe, established by the law of 1905.[6] This was based on the principle of indirect

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[1] *Pogrom* = pillage, destruction.

[2] See the section *Government and Administration*, above.

[3] Of this M. Chasles remarks that it would have been a revolutionary act even in republican France.

[4] They were condemned in 1907 to three months' imprisonment and loss of civil rights.

[5] This was reversed, on the 8th of June, by 238 votes to 191, after a patient exposition by M. Stolypin of the fact that there was plenty of land in Russia for the peasants without any attack on private property.

[6] The electoral law covers 107 octavo pages.

The third Duma.

election, through a series of electoral colleges. It was a simple matter to manipulate these so as to throw the effective power into the hands of the propertied classes without ostensibly depriving any one of the vote.[1] The result was that in the third Duma, which met on the 15th of November 1907, the conservative Right preponderated as much as the Left had done in its two predecessors. Its president, M. Khomiakov, had been one of the founders of the "Union of 17 October," but even the Octobrists formed but a third of the House and were compelled to act with the reactionaries of the Right; and the vice-president, Prince Volkonsky, was a member of the Union of the Russian People.

On the whole, the new Duma was fairly representative of the changed temper of the Russian people, disillusioned and weary of anarchy. The government had done wisely in obscuring the passion for democratic ideals by an appeal to Russian chauvinism, an appeal soon to bear fruit in disuniting the revolutionary parties. The congress of *zemstvos*, hitherto the focus of Liberalism, had petitioned the government, before the opening of the third Duma, to take measures for the restoration of order. The authorities began to exhibit something of their old spirit. M. Dubrovin, president of the Union of the Russian People and organizer of *pogroms*, having written a letter of congratulation to the tsar on the occasion of the *coup d'état*, received a gracious reply; the hideous reign of terror of the "Black Hundred" in Odessa did not prevent the Grand-duke Constantine from accepting the badge of membership of the Union. The ordinary laws, too, had been suspended; the fining and confiscation of newspapers had been resumed, and the "Cadets" had been forbidden to hold a congress. All this, however, did not argue an intention on the part of the government to revert to the autocratic *status quo*. M. Stolypin indeed defended the *coup d'état* in the Duma on the ground that the autocrat had merely altered what the autocrat had originally granted; but, while laying stress on the necessity for restoring order in the body politic, he announced a long programme of reforms, including agrarian measures, reform of local government and its extension in the frontier provinces, and state insurance of workmen. The most far-reaching of these reforms, carried in the first session of the third Duma, was the partial abolition of the communal and family ownership of land, which involved the establishment of a class of true peasant-proprietors.[2] Besides this, the Duma had passed before its adjournment on the 28th of October 1908 much useful legislation, some 300 bills in all, including two for the building of important railways on the Amur and in Siberia. Nor had it exhibited by any means a wholly docile spirit. On the 7th of June, for instance, M. Guchkov attacked the maladministration in the navy, pointing out that no reforms were possible so long as grand-dukes were at the head of its departments. The Duma endorsed this all but unanimously, and as the result the Grand-dukes Peter and Sergius resigned their posts of inspector-general of Engineers and Ordnance respectively, and the Grand-duke Nicholas his chairmanship of the Committee of National Defence. A year later the Duma again came into collision with the government in a matter highly illuminating of the struggle between the ancient traditions and the new ideas in Russia. On the 14th of June 1909 a bill was passed removing the disabilities hitherto attaching to some 15,000,000 of Old Believers. In spite of strenuous government opposition, inspired by the authorities of the Orthodox Church, amendments were carried allowing dissident ministers to assume ecclesiastical titles and to preach, and permitting Christians to join non-Christian religions or even to describe themselves as unbelievers. Thus a step forward was made in securing the freedom of conscience proclaimed in the October manifesto and denounced by a synod of Orthodox bishops at Kiev in 1908, though the rights granted by the Duma were seriously curtailed in the Imperial Council, and have been largely rendered a dead letter by the action of the administration.

Neo-Slav and pan-Russian movements.

The Duma and Finland.

Meanwhile the pan-Russian movement had been gaining apace. At first it had seemed that the new birth of Russia would lead to a revival of pan-Slavism, directed not, as in the middle of the 19th century, against Austria but against Germany. In May 1908 a deputation of the Slav members of the Austrian *Reichsrat* paid a ceremonial visit to the Duma at St Petersburg, and in this "neo-Slav" demonstration M. Dmowski, leader of the Polish party in the Duma, took part. In the following year, however, the situation was completely altered, a result due to the growing anti-Polish feeling in the Duma and, more especially, to the support given by the Austrian Slavs to the annexation of Bosnia and Herzegovina. This event caused the utmost excitement in Russia; the crown prince of Servia, who arrived in St Petersburg on the 28th of October to ask for the armed assistance of the tsar, was received with enthusiasm by all classes of the people; and, though armed intervention was impossible, M. Isvolsky took the lead in the abortive demand for a European conference (see EUROPE: *History*). Neo-Slav dreams were now replaced by a passionate desire to consolidate the Russian empire on a purely Russian basis. Even the remnant of the "Cadets" had by this time renounced their sympathy with Polish aspirations, and in the matter of Finland the Duma proved itself even more imperial than the emperor himself. The Finnish question is dealt with elsewhere (see FINLAND: *History*). Here it may suffice to mention, as illustrating the changed temper of the Russian national assembly, that the Russian majority of the Duma included among the imperial questions in Finland which the Finnish diet ought to refer to the imperial legislature not only all military matters—as the tsar demanded (Rescript of October 14)—but the question of the use of the Russian language in the grand-duchy, the principles of the Finnish administration, police, justice, education, formation of business companies and of associations, public meetings, the press, the customs tariff, the monetary system, means of communication, and the pilot and lighthouse system. The old tendency illustrated by the outcome of the revolutionary movements of 1848 was once more in evidence—the tendency of merely artificial theories of democratic liberty to succumb to the immemorial instinct of race and race ascendancy.

International position of Russia.

As an international force Russia had been, of course, all but completely crippled by the outcome of the Japanese War and the subsequent revolution. Her recovery, however, revealed the immense reserves of her strength. On the 30th of July 1907 she signed a convention with Japan of mutual respect for treaty and territorial rights, and guaranteeing the integrity of China. On the 31st of August of the same year the long period of mutual suspicion between Great Britain and Russia was closed by a convention for an amicable settlement of all questions likely to disturb the relations of the two Powers in Asia generally, including the demarcation of Persia into spheres of influence (see PERSIA: *History*). This new *entente* with Great Britain, cemented by a visit paid by King Edward VII. to the tsar at Reval on the 9th June 1908, helped to knit close once more the loosened alliance with France, and so to preserve the threatened balance of Europe. That in the work of restoring its military position the Russian government had the support of the Russian parliament was proved by a subsidy of £11,000,000 voted by the Duma, on the 30th of December 1909, for the special service of the reorganization and redistribution of the army. (W. A. P.)

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[1] See above, *Government and Administration*.

[2] The law establishing individual peasant-proprietorship was passed on December 21st.

Sources.—See Sienkiewicz, *Recueil de documents relatifs à la Russie, 1502–1842* (1852); Soloviev, *Russian Historical Writers* (*Pisateli russkoe ist.* in collected works, vol. xviii. sqq.); Nikolai Ivanovich Kostomarov (1817–1885), professor of history at Kiev and St Petersburg, whose monographs and researches are collected in his *Sobranye sochinenye* (collected works, 21 vols., St Petersburg, 1903–6); V. Burtsev and S. M. Kravchinski, *Za sto lyet, 1800–1896.* Documents relating to the political and social movements in Russia (London, 1897). There is a French translation by L. Leger (Paris, 1884), of the chronicle of Nestor, the main source for early Russian history. The publications of the Imperial Russian Historical Society of St Petersburg, amounting to upwards of 100 vols., are of great value. For diplomatic history, see F. F. de Martens, *Recueil des traités conclus par la Russie avec les puissances étrangères* (St Petersburg, from 1878 still incomplete), which contains valuable historical introductions based on unpublished sources; A. N. Rambaud, *Recueil des instructions aux ambassadeurs de France*, vols. viii. and ix., *Russie, 1657–1793* (Paris, 1890).

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(W. A. P.)

RUSSIAN LANGUAGE. For the characteristics which this special branch of the Slavonic family shares with the rest, for a table showing the Russian alphabet and the transliterations of it used in this and in other (non-linguistic) articles of the *Encyclopaedia*, and for the points which distinguish Russian alike from the Southern (Balkan) and from the North-Western (Polish, Čech, &c.) branches of Slavonic, see Slavs. These latter points, fully treated under corresponding sections of the article Slavs, are here summarized:—

I. Proto-Slavonic (Proto-Sl.) half vowels *ŭ* and *ĭ* have disappeared as such: *ŭ* (ъ), though still written at the ends of words, is mute; it serves but to show that the foregoing consonant is "hard." See V. below for "hard" and "soft" (denoted by ′) consonants, *not* the "hard" = surd, *tenuis*, "soft" = sonant, *media* of Eng. usage. Where a vowel was indispensable to help out a group of consonants, *ŭ* has been replaced by *o* or *e*, but these vowels sometimes appear without such justification (*e.g. ogonĭ*, Lat. *ignis*); *ĭ* when so needed becomes *e*, otherwise it disappears or else leaves a trace in the "softness" of the preceding consonant, in which case it is still written: Old Slavonic (O.S.), *sŭnŭ*, "sleep"; *dĭnĭ*, "day"; R. *sonŭ* (*ŭ* mute), *denĭ*(d′en′).

II. Proto-Sl. *y* survives in R. and Polish. The sound is a "high-mixed-narrow *i*," pronounced with the lips as for *i* and the tongue as for *u*, not unlike Eng. *y* in "rhythm." After labials there is a distinct *w* sound before the vowel. After gutturals it has become *i*.

III. Treatment of Liquids: retention of *r′* instead of the *ř* of N.W. Slav.; retention as in Polish of hard *l* (between *l* and *w*, not unlike Eng. *l* in "milk," "people"); helping out of sonant *r* and *l* by a vowel put in before the *r* or *l*; especially the so-called full vocalism by which, *e.g.* Proto-Sl. **gordŭ*, "town," became R. *gorodŭ*, O.S. *gradŭ*, Polish, *gród*; Proto-Sl. **melko*, "milk," R. *moloko*, O.S. *mlěko*, Polish, *mleko*.

IV. Proto-Sl. nasals: *ą* (Fr. *on*), became R. *u*; *ę* (Fr. *in*), R. *′a*, *ja*: O.S. *pątĭ*, "way"; *pętĭ*, "five," R. *putĭ*, *p′atĭ*.

V. Softening (Palatalization, &c): Proto-Sl. *tj*, *dj* gave R. *č*, *ž*, Proto-Sl. **světja*, "candle"; **medja*, "boundary"; R. *svěča*, *m′eža*. Proto-Sl. *pj*, *bj*, *vj*, *mj* gave R. and S. Slav. *pl*, *bl*, *vl*, *ml*, *e.g.* R. *z′ eml′a*; Polish, *ziemia*, "land." Before Proto-Sl. soft vowels *e*, *ě*, *ę*, *i*, *ĭ* consonants were affected, the tongue being raised in anticipation of the narrow vowel, and so not making so clean a contact with the palate. Then what amounted to a new *j* developed in R., as *ĭ* became practically *j*; *e* and *ě* (orig. *ē*) came to sound as *je*, *ę* as *ja* at the beginning of a syllable, and all together with *i* began very much to soften the preceding consonant in literary R.; however, this new *j* never broke down the consonant into a palatalized sibilant or affricate, though it had this effect in White Russian (Wh. R.) and Polish.

The result is that almost every consonant in Russian can be pronounced "hard" or "soft," a distinction which is very difficult for a foreigner to make, as his tendency is to overdo the softness and pronounce a full *j* after the consonant instead of the palatal element melting into it. This is encouraged by the alphabetic system by which the letters е (ѣ), ю, я, stand for *je*, *ju*, *ja* at the beginning of a syllable, but after a consonant merely indicate that the consonant is soft, the vowel being the same as in э, у, а (*e*, *u*, *a*), *e.g.* т я stands for *t′-a* rather than for *t-ja*. A soft consonant in its turn narrows the vowel before it, *e.g.* the vowel in *jelĭ*, "fir," is like *a* in "Yale"; that in *jĕlŭ*,

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* marks a hypothetical form.

"ate," like *e* in "yell": *e* and ѣ (*ě*) are now indistinguishable, except that accented e before a hard consonant has a tendency to be pronounced *jo*, *e.g.* *s′ elŭ*, "of villages," is pronounced *s′ ol*, but *sělŭ*, "sat," *s′ el*: е =*jo* is sometimes denoted by ë.

VI. Great Russian has kept *g* where Little Russian (Lit. R.) and Wh. R., like Čech and High Sorb, now have *h*.

VII. A specially Russian point is that Proto-Sl. *je* and *ju* beginning a word, appear in R. as *o* and *u*; O.S. *jedinŭ*, "one," *jutro*, "morning," R. *odinŭ*, *utro*.

VIII. Russian has lost the distinctions of quantity which survive in Čech and S. Slav., but its accent is free as in S. Slav. The accent is extremely capricious, often falling differently in different cases of the same noun, or persons of the same tense, also it is an expiratory accent, so strong that the unaccented syllables are much slurred over and their vowels dulled. In learning Russian it is therefore most important to pay great attention to the accent, and at first to read accented texts.

The above phonetic peculiarities have marked Russian as far back as we can trace it. In the earliest documents it appears with an apparatus of grammatical forms practically identical with that ascribed to primitive Slavonic. The history of the language is not so much that of its phonetic decay as that of its morphological simplification and syntactic development. The tracing of this process is rendered difficult by the fact that O.S. was the ecclesiastical and literary language until the 17th century, and though in the end the O.S. texts suffer modifications, producing the Russian form of Church Slavonic, it is only by accident that the Russian forms appear in them. Russian is better represented in additions made by the scribe, as in the colophon of the Ostromír gospel (A.D. 1056/57), the oldest dated O.S. MS. In a certain number of legal documents dating from the 12th century onwards Russian forms definitely predominate, but the subject-matter is too limited to offer much material.

Borrowings.—The effect of the Church language upon Russian has been very strong, comparable to that of Latin upon French or English: O.S. forms of words and suffixes, betrayed by their phonetic peculiarities though pronounced more or less *à la russe*, have in some cases ousted the native forms, in other cases the two exist side by side; the Slav. form generally has the more dignified or metaphorical, the Russian the simpler and more direct sense: even some of the grammatical terminations (*e.g.* pres. part. act.; certain forms of the adj., &c.) are Slavonic; but speakers are quite unconscious of using anything that is not Russian (see S. Bulič, *Church Slavonic Elements in Modern Russian*, St P., 1893), and not till the 18th century did even grammarians understand the difference. Less important elements have been the Tatar which gave names for many Oriental things such as weapons, jewels, stuffs, garments and some terms concerned with government, and the Polish, which during the 17th century supplied many terms needed to express European things and ideas. In the 18th century such importations were made from Latin and all the Western European languages, in Peter's time mostly from German and Dutch (for nautical terms, English supplied some), in Catherine's rather from French, which had become the language of the aristocracy. During the first quarter of the 19th century modern Russian found itself and discarded superfluous Slavonic and European borrowings alike. Since then fresh loan-words have mostly belonged to the international quasi-Greek terminology, though like German R. sometimes prefers analogous compounds made from its own roots.

Literary Russian as spoken by educated people throughout the empire is the Moscow dialect (see below) modified by these influences. It is still a highly inflected language, comparable in that respect rather to Latin and Greek than to the languages of western Europe, though during historic time it has lost many of the grammatical forms whose full development we can study in O.S., and whose presence we can assert in the scanty remains of Old R. This process has relieved it of the dual number, save for certain survivals; in the nouns, of the vocative case (save for certain ecclesiastical forms), and many of the distinctions between the declensions, especially in the plural, the oblique cases of the simple, and the more cumbrous forms of the compound, adjective; in the verbs, of the supine, the imperfect, the aorist and the conditional (now reduced to a particle); but this simplification leaves it with six cases, Nom., Acc., Gen., Dat., Instrumental and Locative, three genders, three substantival declensions, *-a*, *-o*, *-i*, and traces of *-u* and consonantal stems, a special pronominal declension with many tricky forms, an adjective which takes its place between them, and a system of numerals in which a compromise between grammar and logic has produced a kind of maze. The forms of the verb are easier, as only the present indic. has three persons, the imperat. has but the 2nd, and the past is a participle, which, having discarded the copula, distinguishes only gender and number. The infinitive and four participles offer no special difficulty, but the gerundives or verbal adverbs, from the old masc. nom. sing., are troublesome. The curious mechanism by which these few verbal forms are by means of the aspects made to express most of our tenses and other shades of meaning of which even English is incapable, is briefly explained under SLAVS. On the whole the syntax is simple, the periods which imitation of Latin and German once brought into fashion having given place to the shorter sentences of French and English models.

Such a language, though less difficult than it is generally supposed, is learned much better if some preliminary study is devoted to the accidence, before the student launches out into conversation, as otherwise the habit may be acquired of disregarding the terminations and speaking very incorrectly.

Dialects.—Russian dialects fall into two main divisions—Great (Velikorusskij), including White (Bělorusskij) Russian, and Little Russian (Malorusskij). The latter is spoken in a belt reaching from Galicia and the Northern Carpathians (see RUTHENIANS) through Podolia and Volhynia and the governments of Kíev, Chernígov, Poltáva, Khárkov and the southern part of Vorónezh to the Don and the Kubán upon which the Dněpr Cossacks were settled. To the south of this belt in "New Russia" the population is much mixed, but Little Russians on the whole predominate. In all there must be about 30,000,000 Little Russians.

The Great Russian division includes all other Russian speakers—the main body to the N. and E. of the Little Russians, the settlers in Siberia, the Caucasus and along the southern coast, the educated classes, officials and many townsmen throughout the empire, probably not less than 70,000,000 speakers exclusive of White Russians. On the whole it is very conservative, and therefore, in spite of its vast extent, is wonderfully uniform. It falls into two main dialect groups—the northern or *o* group and the southern or *a* group. The line between them runs roughly E.S.E. from Pskov to the Oka and then eastwards to the Urals. The northern group is the more conservative and pronounces very nearly according to the spelling, unaccented *o* remaining *o*, but *o* is in general rather like *u*, while *e* before hard consonants is apt to be *jo* and before soft consonants *i*. The southern part of this group, comprising most of the governments of Vladímir and Yaroslávl with adjoining parts of Tver and Kostromá, are alone free from a further peculiarity, a tendency to mix up *c* and *č* which can be traced in the ancient documents of Nóvgorod and has spread with the Nóvgorod colonists across the whole of N. Russia to the Urals and Siberia. These distant dialects have adopted many words from the Ugro-Finnish natives. The southern or *a* group of dialects pronounces unaccented *o*, *e* and even *i* as *a* or *ja*; with this goes a tendency to pronounce *g* as *h*, and to mix up *u* and *v*. The Moscow dialect, which is the foundation of the literary language, and White Russian, are both best classed with the *a* dialect.

The Moscow dialect really covers a very small area, not even the whole of the government of Moscow, but political causes have made it the language of the governing classes and hence of literature. It is a border dialect, having the southern pronunciation of unaccented *o* as *a*, but in the *jo* for accented *e* before a hard consonant it is akin to the North and it has also kept the northern pronunciation of *g* instead of the southern *h*. So too unaccented *e* sounds like *i* or *ji*.

White Russian, in the governments of Vitébsk, Mohilĕv and Minsk, and adjoining parts of Pskov, Smolénsk, Chernígov and Vílna (some 10,000,000 speakers), appears at first so different from Great Russian that it was long classed as a separate division. It was the official language of the Lithuanian principality afterwards merged in Poland and hence was under strong Polish influence. Little R. was under somewhat similar influence, so that the two dialects have approximated in some respects; but originally White Russian was not much nearer Lit. R. than was any other south Gt. R. dialect. In its main characteristic Wh. R. approximates to Polish, but this likeness goes deeper than the surface Polonisms above referred to, as it falls into its natural place in the classification of Slavonic languages by the phenomena of "softening." Accordingly *t* and *d*, when soft or before soft *v*, become *ć* and *dź*, *e.g.* R.*t'ělo*, "body," *d'ělo*, "deed," *m'edv'ědĭ*, "bear," Wh. R. *ćelo*, *dźelo*, *m'adźv'edz'*, Polish *ciało*, *dzieło*, *niedźwiedź*. Other special points which distinguish Wh. R. from the other *a* dialects are a tendency to confuse *u* and *v* and to pronounce either of them as a *w*, the same sound also taking the place of hard *l* closing a syllable; *r* is always hard; *f*, a sound essentially non-Slavonic, appears as *ch* or *chv*, *e.g.* *chrancuz*, R. *francuz*, "a Frenchman," *Chv'odar*, R. *F'odor*, "Theodore."

In accidence we may note the preservation of the vocative; of the sibilants before case terminations where R. has restored gutturals by analogy, *e.g.* locatives *nazě*, *rucě*, *sasě*, R. *nogě*, *rukě*, *sochě*, from *nogá*, "foot," *ruká*, "hand," *sochá*, "plough"; and of the 3rd sing. pres. ind. in *ć* for *t'*, or without any *t*. *V'adz'eć* or *v'adz' e* for R. *ved' otŭ*, "leads."

On the boundary between Wh. R. and the Novgorod dialect the former has the latter's confusion of *c* and *č*.

The best account of Wh. R. is E. Karskij, *Sketch of the Sounds and Forms of Wh. R. Speech* (Moscow, 1886); there is a dictionary by Nosovič (St P., 1875). Bezsonov, *Wh. R. Songs* (Moscow, 1871), and P. V. Schein in a whole series of publications give good specimens of the dialect.

The Little Russian dialect claims to be a literary language; it has established this claim in Galicia (see RUTHENIANS), but its use as such is much restricted in Russia. The Little Russians differ from the Great Russians not only in language but in physical type, customs, domestic architecture and folk-lore; but though Russophobes have tried to prove that this is due to the Finnish element in the Great Russians, it cannot be substantiated, and the Little Russians, especially the descendants of the Cossacks, have no small Tatar element in them. For the last three centuries they have been under strong Polish influence, and this has had great effect upon the vocabulary but not much on phonetics or morphology. Little Russian is divided into three main groups of dialects: those of Hungary, which show an approximation to Slovak; those of Galicia, which rather recall Polish; and those of the Ukrain and other districts in Russia, which gradually shade into South Great Russian and White R., though the love of the sound *a* is noticeably absent. Little Russian is rather characterized by itacism; for original *y* and original *i* have coincided in a sound between *i* and *y* not unlike the Eng. short *i*, and original *ě*, also *e* and even *o* after having been lengthened in compensation for lost semi-vowels are now represented by *i*.

Further, Little Russian has reduced the common Russian softening, only keeping it before *a* and *o* and *i* for *ě* and *o*, and hardening the consonant before *e* and original *i*. In common with Wh. R. it has *h* for *g*, a vocative case, gutturals made sibilant before *i* (for *ě*) in oblique cases, 3rd sing. without the *t*, 1st plur. in *-mo* and *-me* instead of *mŭ*, *nn* for *nj*, *ll* for *lj*, *tt* for *tj*, *w* for *u*, *v* and hard *l*, but all these occur more or less throughout S. Russian and only tend to a superficial resemblance.

These phonetic peculiarities are not universal, but the presence of the narrowed *ě*, *e* and *o* is sufficient to mark a dialect as Little Russian. The Russian alphabet is modified for Little Russian use as г=*h* and hence ґ=*g*; є is used for the *e* which does not soften the preceding vowel, и for the thick and i for the pure *i*.

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Little Russian Grammar: St. Smal'-Stockyi and Fed. Gartner, *Ruska Grammatyka* (Lemberg, 1893); see also Miklosich, *Vergl. Gram. d. Slav. Sprachen, passim* (Vienna, 1875–83).

Many accented texts are published by R. Gerhard, Leipzig. Th. Buslaev, *Historical R. Chrestomathy* (Moscow, 1861), gives specimens of Russo-Slavonic, Old R. and Dialects. The chief periodicals containing scientific papers on the R. language are the *Sbornik* (Miscellany) and *Izvestia* (Bulletin) of the Second Section of the St P. Academy, and the *Zapiski* (Transactions) of the Philological Faculties of the Russian universities. Old Russian Texts are published mostly by the Obščestvo L'ubitelej Drevnej Pis'mennosti (Soc. of Lovers of Ancient Literature) in St Petersburg. (E. H. M.)

RUSSIAN LITERATURE. To get a clear idea of Russian literature, it will be most convenient for us to divide it into oral and written. The first of these sections includes the interesting *byliny*, or "tales of old time," as the word may be translated, which have come down to us in great numbers, as they have been sung by wandering minstrels all over the country. The scholars who have given their attention to these compositions have made the following division of them into cycles: (1) that of the older heroes; (2) that of Vladimir, prince of Kiev; (3) that of Novgorod; (4) that of Moscow; (5) that of the Cossacks; (6) that of Peter the Great; (7) the modern period. These poems, if they may be so styled, are not in rhyme; the ear is satisfied with a certain cadence which is observed throughout. For a long time they were neglected, and the collection of them began only towards the conclusion of the 17th century. The style of Russian literature which prevailed from the time of Lomonosov was wholly based upon the French or pseudo-classical school. It was, therefore, hardly likely that these peasant songs would attract attention. But when the gospel of romanticism was preached and the *History* of Karamzin appeared, a new impulse was given to the collection of all the remains of popular literature. In 1804 appeared a volume based upon those which had been gathered together by Cyril or Kirsha Danilov, a Cossack, at the beginning of the 18th century. They were received with much enthusiasm, and a second edition was published in 1818. In the following year there appeared at Leipzig a translation of many of these pieces into German, in consequence of which they became known much more widely. This little book of 160 pages is important because the originals of some of the *byliny* translated in it are now lost. Since that time large collections of these poems have been published, edited by Rybnikov, Hilferding, Sreznevskiy, Avenarius and others.

Peasant songs.

These curious productions have all the characteristics of popular poetry in the endless repetitions of certain conventional phrases—the "green wine," "the bright sun" (applied to a hero), "the damp earth" and others. The heroes of the first cycle are monstrous beings, and seem to be merely impersonifications of the powers of nature; such are Volga Vseslavich, Mikula Selianinovich and Sviatogor. They are called the *bogatyri starshie*. Sometimes we have the giants of the mountain, as Sviatogor, and the serpent Gorinich, the root of part of both names being *gora* (mountain). The serpent Gorinich lives in caves, and has the care of the precious metals. Sometimes animal natures are mixed up with them, as *zmei-bogatyr*, who unites the qualities of the serpent and the giant, and bears the name of Tugarin Zmievich. There is the Pagan Idol (*Idolistche Poganskoe*), a great glutton, and Nightingale the Robber (*Solovey Razboinik*), who terrifies travellers and lives in a nest built upon six oaks.

In the second cycle the legends group themselves round the celebrated Prince Vladimir of Kiev. The chief hero is Ilya Muromets, who performs prodigies of valour, and is of gigantic stature and superhuman strength. The cycle of Novgorod deals with the stories of Vasilii Buslaevich and Sadko, the rich merchant. The fourth cycle deals with the autocracy; already Moscow has become the capital of the future empire. We are told of the taking of Kazan, of the conquest of Siberia by Yermak, of Ivan the Terrible and his confidant Maliuta Skurlatovich. It is observable that in the popular tradition Ivan is not spoken of with any hatred. As early as 1619 some of these *byliny* were committed to writing by Richard James, an Oxford graduate who was in Russia as chaplain of the embassy. The most pathetic is that relating to the unfortunate Xenia, the daughter of Boris Godunov. Yermak, the conqueror of Siberia, forms the subject of a very spirited lay, and there is another on the death of Ivan the Terrible. Considering the relation in which she stood to the Russians, we cannot wonder that Marina, the wife of the false Demetrius, appears as a magician. Many spirited poems are consecrated to the achievements of Stenka Razin, the bold robber of the Volga, who was for a long time a popular hero. The cycle of Peter the Great is a very interesting one. We have songs in abundance on the achievements of the tsar, as the taking of Azov in 1696. There is also a poem on the execution of the *streltsy*, and another on the death of Peter. In the more modern period there are many songs on Napoleon. The Cossack songs, written in the Little Russian language, dwell upon the glories of the *sech*, the sufferings of the people from the invasions of the Turks and Mongols, the exploits of the Haidamaks and, lastly, the fall of the Cossack republic. Besides these, the Russians can boast of large collections of religious poems, many of them containing very curious legends. In them we have a complete store of the beliefs of the Middle Ages. A rich field may be found here for the study of comparative mythology and folk-lore. Many of them are of considerable antiquity, and some seem to have been derived from the Midrash. Some of the more important of these have been collected by Beszonov. Besides the *byliny* or legendary poems, the Russians have large collections of *skazki* or folk-tales, which have been gathered together by Sakharov, Afanasiev and others. They also are full of valuable materials for the study of comparative mythology.

Earliest written literature.

Leaving the popular and oral literature, we come to what has been committed to writing. The earliest specimen of Russian, properly so called, must be considered the Ostromir Codex, written by the *diak* Gregory at the order of Ostromir, the *posadnik* or governor of Novgorod. This is a Russian recension of the Slavonic Gospels, of the date 1056–57. Of the year 1073 we have the *Izbornik* or "Miscellany" of Sviatoslav. It was written by John the *diak* or deacon for that prince, and is a kind of Russian encyclopaedia, drawn from Greek sources. The date is 1076. The style is praised by Buslaev as clear and simple. The next monument of the language is the *Discourse concerning the Old and New Testament*, by Hilarion, metropolitan of Kiev. In this work there is a panegyric on Prince Vladimir of Kiev, the hero of so much of the Russian popular poetry. Other writers are Theodosius, a monk of the Pestcherskiy cloister, who wrote on the Latin faith and some *Pouchenia* or "Instructions," and Luke Zhidiata, bishop of Novgorod, who has left us a curious *Discourse to the Brethren.* From the writings of Theodosius we see that many pagan habits were still in vogue among the people. He finds fault with them for allowing these to continue, and also for their drunkenness; nor do the monks escape his censures. Zhidiata writes in a more vernacular style than many of his contemporaries; he eschews the declamatory tone of the Byzantine authors.

Annalists and travellers.

With the so-called *Chronicle* of Nestor (*q.v.*) begins the long series of the Russian annalists. There is a regular catena of these chronicles, extending with only two breaks to the time of Alexis Mikhailovich, the father of Peter the Great. Besides the work attributed to Nestor, we have chronicles of Novgorod, Kiev, Volhynia and many others. Every town of any importance could boast of its annalists, Pskov and Suzdal among others. In some respects these compilations, the productions of monks in their cloisters, remind us of the *Anglo-Saxon Chronicle*, dry details alternating with here and there a picturesque incident; and many of these annals abound with the quaintest stories. There are also works of early travellers, as the igumen Daniel, who visited the Holy Land at the end of the 11th and beginning of the 12th century. A later traveller was Athanasius Nikitin, a merchant of Tver, who visited India in 1470. He has left a record of his adventures, which has been translated into English and published for the Hakluyt Society. Later also is the account written by the two merchants, Korobeinikov and Grekov. They were sent with a sum of money to the Holy Sepulchre to entreat the monks to pray without ceasing for the soul of the son of Ivan the Terrible, whom his father had killed. A curious monument of old Slavonic times is the *Pouchenie* ("Instruction"), written by Vladimir Monomakh for the benefit of his sons. This composition is generally found inserted in the *Chronicle* of Nestor; it gives a quaint picture of the daily life of a Slavonic prince.

Religious literature.

In the 12th century we have the sermons of Cyril, the bishop of Turov, which are attempts to imitate in Russian the florid Byzantine style. In his sermon on Holy Week, Christianity is represented under the form of spring, Paganism and Judaism under that of winter, and evil thoughts are spoken of as boisterous winds. And here may be mentioned the many lives of the saints and the Fathers to be found in early Russian literature. Some of these have been edited by Count Bezborodko in his *Pametniki Starinnoy Russkoy Literatury* ("Memorials of Ancient Russian Literature").

The Story of Igor.

We now come to the story of the expedition of Prince Igor, which is a kind of *bylina* in prose, and narrates the expedition of Igor, prince of Novgorod-Severskiy, against the Polovtzes. The manuscript was at one time preserved in a monastery at Yaroslavl, but was burnt in the great fire at Moscow in the year 1812. Luckily the story had been edited (after a fashion) by Count Musin-Pushkin, and a transcript was also found among the papers of the empress Catherine. The original was seen by several men of letters in Russia, Karamzin among the number. There is a mixture of Christian and heathen allusions, but there are parallels to this style of writing in such a piece as the "Discourse of a Lover of Christ and Advocate of the True Faith," from which an extract has been given by Buslaev in his *Chrestomathy.* There is a great deal of poetical spirit in the story of Igor, and the metaphors are frequently very vigorous. Mention is made in it of another bard named Boyan, but none of his inspirations have come down to us.

Other popular tales.

A strange legend is that of the tsar Solomon and Kitovras, but the story occurs in the popular literatures of many countries. Some similar productions among the Russians are merely adaptations of old Bulgarian tales, especially the so-called apocryphal writings. The *Zadonstchina* is a sort of prose poem much in the style of the "Story of Igor," and the resemblance of the latter to this piece and to many other of the *skazania* included in or attached to the Russian chronicle, furnishes an additional proof of its genuineness. The account of the battle of the "Field of Woodcocks," which was gained by Dmitri Donskoy over the Mongols in 1380, has come down in three important versions. The first bears the title "Story of the Fight of the Prince Dmitri Ivanovich with Mamai"; it is rather meagre in details but full of expressions showing the patriotism of the writer. The second version is more complete in its historical details, but still is not without anachronisms. The third is altogether poetical. The *Poviest o Drakule* ("Story of Drakula") is a collection of anecdotes relating to a cruel prince of Walachia who lived in the 15th century. (See RUMANIA, *History*.) Several of the barbarities described in it have also been assigned to Ivan the Terrible.

Codes of laws.

The early Russian laws present many features of interest, such as the *Russkaya Pravda* of Yaroslav, which is preserved in the chronicle of Novgorod; the date is between 1018 and 1054. The laws show Russia at that time to have been in civilization quite on a level with the rest of Europe. But the evil influence of the Mongols was soon to make itself felt. The next important code is the *Sudebnik* of Ivan III., the date of which is 1497; this was followed by that of Ivan IV. of the year 1550, in which we have a republication by the tsar of his grandfather's laws, with additions. In the time of this emperor also was issued the *Stoglav* (1551), a body of ecclesiastical regulations. Mention must also be made of the *Ulozhenie* or "Ordinance" of the tsar Alexis. This abounds with enactments of sanguinary punishment: women are buried alive for murdering their husbands; torture is recognized as a means of procuring evidence; and the knout and mutilation are mentioned on almost every page. Some of the penalties are whimsical: for instance, the man who uses tobacco is to have his nose cut off; this was altered by Peter the Great, who himself practised the habit and encouraged it in others.

Introduction of printing.

In 1553 a printing press was established at Moscow, and in 1564 the first book was printed, an "Apostol," as it is called, *i.e.* a book containing the Acts of the Apostles and the Epistles. The printers were Ivan Feodorov and Peter Timofieiev; a monument has been erected to the memory of the former. As early as 1548 Ivan had invited printers to Russia, but they were detained on their journey. Feodorov and his companions were soon, however, compelled to leave Russia, and found a protector in Sigismund III. The cause appears to have been the enmity of the copyists of books, who succeeded in drawing over to their side the more fanatical priests. The first Slavonic Bible was printed at Ostrog in Volhynia in 1581. Another press, however, was soon established at Moscow; up to 1600 sixteen books had been issued there.

Time of Ivan the Terrible.

A curious work of the time of Ivan the Terrible is the *Domostroy*, or "Book of Household Management," which is said to have been written by the monk Sylvester. This priest was at one time very influential with Ivan, but ultimately was banished to the Solovetskoy monastery on the White Sea. The work was originally intended by Sylvester for his son Anthemius and his daughter-in-law Pelagia, but it soon became very popular. We have a faithful picture of the Russia of the time, with all its barbarisms and ignorance. We see the unbounded authority of the husband in his own household: he may inflict personal chastisement upon his wife; and her chief duty lies in ministering to his wants. To the reign of Ivan the Terrible must also be assigned the *Chetii-Minei* or "Book of Monthly Readings," containing extracts from the Greek fathers, arranged for every day of the week. The work was compiled by the metropolitan Macarius, and was the labour of twelve years. An important writer of the same period was Prince Andrew Kurbskiy, descended from the sovereigns of Yaroslavl, who was born about 1528. In his early days Kurbskiy saw a great deal of service, having fought at Kazan and in Livonia. But he quarrelled with Ivan, who had begun to persecute the followers of Sylvester and Adashev, and fled to Lithuania in 1563, where he was well received by Sigismund Augustus. From his retreat he commenced a correspondence with Ivan, in which he reproached him for his many cruelties. Ivan in his answer declared that he was quite justified in taking the lives of his slaves if he thought it right to do so. Kurbskiy died in exile in 1583. He also wrote a life of Ivan, but Bestuzhev Riumin thinks that his hatred of Ivan led him to exaggerate, and he regrets that Karamzin should have followed him so closely. Besides the answers of Ivan to Kurbskiy, there is his letter to Cosmas and the brotherhood of the Cyrillian monastery on the White Lake (Bielo Ozero), in which he reproaches them for the self-indulgent lives they are leading. Other works of the 16th century are the *Stepennaya Kniga*, or "Book of Degrees" (or "Pedigrees"), in which historical events are grouped under the reigns of the grand-dukes, whose pedigrees are also given; and the *Life of the Tsar Feodor Ivanovich* (1584–98), written by the patriarch Job.

17th century.

To the beginning of the 17th century belongs the *Chronograph* of Sergius Kubasov of Tobolsk. His work extends from the creation of the world to the accession of Michael Romanov, and contains interesting accounts of such of the members of the Russian royal family as Kubasov had himself seen. Something of the same kind must have been the journal of Prince Mstislavskiy, which he showed the English ambassador Jerome Horsey, but which is now lost.[1]

Kotoshikhin.

Krzhanich.

Polotzki.

To the time of the first Romanovs belongs the story of the siege of Azov, a prose poem, which tells us, in an inflated style, how in 1637 a body of Cossacks triumphantly repelled the attacks of the Turks. There is also an account of the siege of the Troitza monastery by the Poles during the "Smutnoe Vremya," or Period of Troubles, as it is called—that which deals with the adventures of the false Demetrius and the Polish invasion which followed. But all these are surpassed by the work on Russia of Gregory Karpov Kotoshikhin. He served in the ambassador's office (*posolskiy prikaz*), and when called upon to give information against his colleagues fled to Poland about 1664. Thence he passed into Sweden and wrote his account of Russia under Alexis Mikhailovich at the request of Count Delagardie, the chancellor. He was executed in 1667 for slaying in a quarrel the master of the house in which he lived. The manuscript was found by Professor Soloviev of Helsingfors at Upsala and printed in 1840. The picture which Kotoshikhin draws of his native country is a sad one, and from his description, and the facts we gather from the *Domostroy*, we can reconstruct the Old Russia of the time before Peter the Great. Perhaps, as an exile, Kotoshikhin allowed himself to write too bitterly. A curious work is the *Uriadnik Sokolnichia Puti* ("Directions for Falconry"), which was written for the use of the emperor Alexis, who, like many Russians of old time, was much addicted to this pastime. The Serb, Yuri Krzhanich, who wrote in Russian, was the first pan-Slavist, anticipating Kollar by one hundred and fifty years or more. He wrote a critical Servian grammar (with comparison of the Russian, Polish, Croatian and White Russian), which was edited from the manuscripts by Bodianski in 1848. For his time he had a very good insight into Slavonic philology. His pan-Slavism, however, sometimes took a form by no means practical. He went so far as to maintain that a common Slavonic language might be made for all the peoples of that race—an impossible project which has been the dream of many enthusiasts. He was banished to Siberia, and finished his grammar at Tobolsk. He also wrote a work on the Russian empire in the middle of the 17th century, completed in 1676, which was edited by Beszonov in 1860. The picture drawn, as in the corresponding production of Kotoshikhin, is a very gloomy one. To this period belongs the life of the patriarch Nikon by Shusherin. The struggles of Nikon with the tsar, and his emendations of the sacred books, which led to a great schism in Russia, are well known. They have been made familiar to Englishmen by the eloquent pages of the late Dean Stanley.[2] From this revision may be dated the rise of the Raskolniks (Dissenters) or Staro-obriadtsi (those who adhere to the old ritual). With Simeon Polotzki (Polotskiy) (1628–1680) the old period of Russian literature may be closed. He was tutor to the tsar Feodor, son of Alexis, and may be said to have helped to introduce the culture of the West into Russia, as he was educated at Kiev, then a portion of Polish territory. Polotzki came to Moscow about 1664. He wrote religious works (*Vienets Viery*, "The Garland of Faith"), and composed poems and religious dramas (*The Prodigal Son*, *Nebuchadnezzar*, &c.). He has left us some droll verses on the tsar's new palace of Kolomenskoe, which are very curious doggerel. The artificial lions that roared, moved their eyes, and walked especially delighted him. There does not seem to be any ground for the assertion (often met with even in Russian writers) that Sophia, the sister of Peter the Great, was acquainted with French, and translated some of the plays of Molière.

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[1] Horsey says: "I read in their cronickells written and kept in secreat by a great priem prince of that country named Knez Ivan Fedorowich Mistisloskoie, who, owt of his love and favour, imparted unto me many secreats observed in the memory and procis of his tyme, which was fowerscore years, of the state, natur, and government of that comonweelth."—Bond, *Russia at the Close of the Sixteenth Century* (Hakluyt Society, 1856).

[2] *Lectures on the Eastern Church.*

And now all things were to be changed. Russia was to adopt the forms of literature in use in the West. **The modern period.** One of the chief helpers of Peter the Great in the education of the people was Feofane (Theophanes) Procopovich (1681–1736), author of the Ecclesiastical Regulations and some plays, who advocated the cause of science; the old school was defended by Stephen Yavorskiy (1658–1722), whose *Rock of Faith* was written to refute the Lutherans and Calvinists. Another remarkable writer of the times of Peter the Great was Pososhkov (b. 1673), a peasant by birth, who produced a valuable work on *Poverty and Riches*. Antiokh Kantemir (1708–1744), son of a former hospodar of Moldavia, wrote some clever satires still read; they are imitated from Boileau. He also translated parts of Horace. Besides his satires, he published versions of Fontenelle's *Pluralité des Mondes* and the histories of Justin and Cornelius Nepos. He was for some time Russian ambassador at the courts of London and Paris. **Lomonosov.** But more celebrated than these men was Michael Lomonosov (*q.v.*). He was an indefatigable writer of verse and prose, and has left odes, tragedies, didactic poetry, essays and fragments of epics.

Vassilii Tatistchev (1686–1750) was the author of a Russian history which is interesting as the first attempt in that field. He was disgraced for peculation, and died at Astrakhan, as governor, in 1750. His work was not given to the world till after his death. There had been a slight sketch published before by Khilkov, entitled the *Marrow of Russian History*. **Trediakovski.** Basil Trediakovski (1703–1769) was born at Astrakhan, and we are told that Peter, passing through that city at the time of his Persian expedition, had Trediakovski pointed out to him as one of the most promising boys of the school there. Whereupon, having questioned him, the tsar said, with truly prophetic insight, "A busy worker, but master of nothing." His *Telemakhida*, a poem in which he versified the *Télémaque* of Fénelon, drew upon him the derision of the wits of the time. He had frequently to endure the rough horse-play of the courtiers, for the position of a literary man at that time in Russia was not altogether a cheerful one. His services, however, to the Russian language were great.

From the commencement of the reign of Elizabeth Russian literature made great progress, the French furnishing models. **Sumarokov.** Alexander Sumarokov (1718–1777) wrote prose and verse in abundance—comedies, tragedies, idyls, satires and epigrams. He is, perhaps, best entitled to remembrance for his plays, which are rhymed, and in the French style. His *Dmitri Samozvanets* ("Demetrius the Pretender") is certainly not without merit. **Kniazhnin.** Some of the pieces of Kniazhnin had great success in their time, such as *The Chatterbox*, *The Originals* and especially *The Fatal Carriage*. He is now almost forgotten. In 1756 the first theatre was opened at St Petersburg, the director being Sumarokov. Up to this time the Russians had acted only religious plays, such as those written by Simeon Polotzki. The reign of Catherine II. (1762–96), herself a voluminous writer, saw the rise of a whole generation of court poets. Everything in Russia was to be forced like plants in a hot-house; she was to have Homers, Pindars, Horaces and Virgils. **Kheraskov.** Michael Kheraskov (1733–1807) wrote besides other poems two enormous epics—the *Rossiada* in twelve books, and *Vladimir* in eighteen; they are now but little read. **Bogdanovich.** Hippolitus Bogdanovich (1743–1803) wrote a pretty lyric piece, *Dushenka*, based upon La Fontaine, and telling the old story of the loves of Cupid and Psyche. **Khemnitzer.** With Ivan Khemnitzer begins the long list of fabulists; this half-oriental form of literature, so common in countries ruled absolutely, has been very popular in Russia. Khemnitzer (1744–1784), whose name seems to imply a German origin, began by translating the fables of Gellert, but afterwards produced original specimens. **Visin.** A writer of real national comedy appeared in Denis von Visin, probably of German extraction, but born at Moscow (1744–1792). His best production is *Nedorosl* ("The Minor"), in which he satirizes the coarse features of Russian society, the ill-treatment of the serfs, and other matters. He saw France on the eve of the great Revolution, and has well described what he did see. Russian as he was, and accustomed to serfdom, he was yet astonished at the wretched condition of the French peasants. **Derzhavin.** The great poet of the age of Catherine, the laureate of her glories, was Gabriel Derzhavin (1743–1816). He essayed many styles of composition, and was a great master of his native language. There is something grandiose and organ-like in his high-sounding verses; unfortunately he occasionally degenerates into bombast. His versification is perfect; and he had the courage to write satirically of many persons of high rank. His *Ode to God* is the best known of his poems in Western countries. He was a student of Ossian, and of Edward Young, the author of the *Night Thoughts*. Other celebrated poems of Derzhavin are *Felitza*, *Odes on the Death of Prince Mestcherskiy*, *The Nobleman*, *The Taking of Ismail*, and *The Taking of Warsaw*. His Memoirs were published in 1857.

Radistchev. An unfortunate author of the days of Catherine was Alexander Radistchev (1749–1802), who, having, in a small work, *A Journey to St Petersburg and Moscow*, spoken too severely of the miserable condition of the serfs, was punished by banishment to Siberia, from which he was afterwards allowed to return, but not till his health had been permanently injured by his sufferings. **Novikov.** An equally sad fate befell the spirited writer Nicholas Novikov (1744–1818), who, after having worked hard as a journalist, and done much for education in Russia, fell under the suspicion of the government, and was imprisoned by Catherine. On her death he was released by her successor. The short reign of Paul was not favourable to literary production; the censorship of the press was extremely severe, and many foreign books were excluded from Russia.

Karamzin. But a better state of things came with the reign of Alexander, one of the glories of whose day was Nicholai Karamzin (*q.v.*). His chief work is his *History of the Russian Empire*, but he appeared in the fourfold aspect of historian, novelist, essayist and poet. **Platon.** Nor need we do more than mention the celebrated Archbishop Platon (*q.v.*). **Dmitriev.** Ivan Dmitriev (1760–1837) wrote some pleasing lyrics and epistles, but without much force. He appears from his translations to have been well acquainted with the English poets. **Ozerov.** Ozerov (1769–1816) wrote a great many tragedies, which are but little read now. They are in rhyming alexandrines. He occasionally handled native subjects with success, as in his *Dmitri Donskoy* (1807) and *Yaropolk and Oleg* (1798). **Kriloff.** In Ivan Krîloff (*q.v.*) the Russians found their most genial fabulist. **Zhukovskiy.** As Derzhavin was the poet of the age of Catherine, so Vasilii Zhukovskiy (1783–1852) may be said to have been that of the age of Alexander. He is more remarkable, however, as a translator than as an original poet. With him Romanticism began in Russia. He became reader to the empress and afterwards tutor to her children. In 1802 he published his version of Gray's *Elegy*, which at once became a highly popular poem in Russia. Zhukovskiy translated many pieces from the German (Goethe, Schiller, Uhland) and English (Byron, Moore, Southey). One of his original productions, "The Poet in the Camp of the Russian Warriors," was on the lips of every one at the time of the War of the Fatherland (*Otechestvennaia Voina*) in 1812. He produced versions of the episode of Nala and Damayanti from the *Mahabharata*, of Rustum and Zohrab from the *Shah-Namah*, and of a part of the *Odyssey*. In the case of these three masterpieces, however, he was obliged to work from literal translations (mostly German), as he was unacquainted with the original languages. **Gnedich.** The *Iliad* was translated during this period by Gnedich, who was familiar with Greek. He has produced a faithful and spirited version, and has naturalized the hexameter in the Russian language with much skill. **Batiushkov.** Constantine Batiushkov (1787–1855) was the author of many elegant poems, and at the outset of his career promised much, but sank into imbecility, and lived in this condition to an advanced age. Merzliakov and Tzîganov deserve a passing notice as the writers of songs some of which still keep their popularity. **Pushkin.** During his short life (1799–1837) Alexander Pushkin produced many celebrated poems, which will be found enumerated in the article devoted to him (see PUSHKIN). **Griboyedov.** In Alexander Griboyedov (1795–1829) (*q.v.*) the Russians saw the writer of one of their most clever comedies (*Gore ot Uma*), which may perhaps be translated "The Misfortune of being Too Clever" (lit. "Grief out of Wit"). **Kozlov.** Ivan Kozlov (1774–1838) was author of some pretty original lyrics, and some translations from the English, among others Burns's *Cottar's Saturday Night*. He became a cripple and blind, and his misfortunes elicited some cheering and sympathetic lines from Pushkin, which will always be read with pleasure.

Pushkin found a successor in Michael Lermontov (*q.v.*), who has left us many exquisite lyrics. **Lermontov.** A genuine bard of the people, and one of their most truly national authors, was Alexis Koltsov (1809–1842), the son of a tallow merchant of Voronezh. **Koltsov.** He has left us a few exquisite lyrics, which are to be found in all the collections of Russian poetry. He died of consumption after a protracted illness. Another poet who much resembled Koltsov was Ivan Nikitin (1826–1861), born in the same town, Voronezh. **Nikitin.** His best poem was *Kulak*. Nikitin, to support his relations, was obliged to keep an inn; this he was afterwards enabled to change for the more congenial occupation of a bookseller. The novel in Russia has had its cultivators in Zagoskin and Lazhechnikov, who imitated Sir Walter Scott. **Zagoskin.** The most celebrated of the romances of Zagoskin was *Yuri Miloslavskiy*, a tale of the expulsion of the Poles from Russia in 1612. The book may even yet be read with interest: it gives a very spirited picture of the times; unfortunately, a gloss is put upon the barbarity of the manners of the period. Among the better known productions of Lazhechnikov are *The Heretic* and *The Palace of Ice*. A flashy but now forgotten writer of novels was Thaddeus Bulgarin (1789–1859) author of *Ivan Vyshigin*, a work which once enjoyed considerable popularity.

Gogol.

The first Russian novelist of great and original talent was Nicholai Gogol (1809–1852) (*q.v.*). In his *Dead Souls* he satirized all classes of society, some of the portraits being wonderfully vivid. Being a native of Little Russia, he describes its scenery and the habits of the people, especially in such stories as the *Old-Fashioned Household*, or in the more powerful *Taras Bulba*. This last is a highly wrought story, giving us a picture of the savage warfare carried on between the Cossacks and Poles. Gogol was also the author of a good comedy, *The Reviser*, wherein the petty pilferings of Russian municipal authorities are satirized. In his *Memoirs of a Madman* and *Portrait*, he shows a weird and fantastic power which proves him to have been a man of strong imagination. The same may be said of *The Cloak*, and the curious tale *Vii* (" The Demon "), where he gives us a picture of Kiev in the old days.

Later novelists.

In the field of fiction Gogol had various famous successors, concerning whom details will be found in separate articles. It must suffice here to enumerate Alexander Herzen (d. 1869); Ivan Goncharov (1812–1891); Dmitri Grigorovich (1822–1899), author of *The Fisherman* and *The Emigrants*; Alexis Pisemskiy (1822–1900); Michael Saltikov (1826–1889); Feodor Dostoievskiy (1821–1881); Alexander Ostrovskiy (1823–1886); Feodor Rieshetnikov (1841–1871); Count A. Tolstoy (1817–1875), also famous as a dramatist; and greater than all these Ivan Turgeniev (1819–1883), and Count L. Tolstoy (1828–1910), the last of whom ranks as much more than a man of letters.

In Vissarion Belinski the Russians produced their best critic. For thirteen years (1834–47) he was the Aristarchus of Russian literature and exercised a healthy influence. In his later days he addressed a withering epistle to Gogol on the newly adopted reactionary views of the latter.

Historians.

Since the time of Karamzin the study of Russian history has made great strides. He was followed by Nicholas Polevoy (1775–1842), who wrote what he called the *History of the Russian People* (6 vols., 1829–33), but his work was not received with much favour. Polevoy was a self-educated man, the son of a Siberian merchant; besides editing a well-known Russian journal, *The Telegraph* (suppressed in 1834), he was also the author of many plays, among others a translation of *Hamlet*. Since his time, however, the English dramatist has been produced in a more perfect dress by Kroneberg, Druzhinin and others. Sergius Soloviev (1820–1879) was the author of a *History of Russia* which may be described rather as a quarry of materials for future historians of Russia than an actual history. In 1885 died N. Kostomarov, the writer of many valuable monographs, of which those on Bogdan Khmelnitskiy and the False Demetrius deserve special mention. From 1847 to 1854 Kostomarov, whose interest in the history of Little Russia and its literature made him suspected of separatist views, wrote nothing, having been banished to Saratov, and forbidden to teach or publish. But after this time his literary activity began again, and, besides separate works, the leading Russian reviews, such as *Old and New Russia*, *The Historical Messenger*, and *The Messenger of Europe*, contained many contributions from his pen of the highest value. Constantine Kavelin (1818–1855) was the author of many valuable works on Russian law, and Kalatchev published a classical edition of the old Russian codes. Ilovaiskiy and Gedeonov attempted to upset the general belief that the founders of the Russian empire were Scandinavians. A good history of Russia (1855) was published by N. Ustrialov, but his most celebrated work was his *Tzarstvovanie Petra Velikago* (" Reign of Peter the Great "); in this many important documents first saw the light, and the circumstances of the death of the unfortunate Alexis were made clear. Russian writers of history have not generally occupied themselves with any other subject than that of their own country, but an exception may be found in the writings of Timofei Granovskiy (1813–1855), such as *Abbé Suger* (1849) and *Four Historical Portraits* (1850). So also Kudriavtsov, who died in 1850, wrote on " The Fortunes of Italy, from the Fall of the Roman Empire of the West till its Reconstruction by Charlemagne." He also wrote on " The Roman Women as described by Tacitus." We may add Kareyev, professor at Warsaw, who wrote on the condition of the French peasantry before the Revolution. Other writers on Russian history have been H. Pogodine (d. 1873), who compiled a *History of Russia till the Invasion of the Mongols* (1871), and especially I. Zabielin, who has written a *History of Russian Life from the most Remote Times* (1876), and the *Private Lives of the Czarinas* and *Czars* (1869 and 1872) and a *History of Moscow*. Leshkov has written a *History of Russian Law to the 18th Century*, and Tchitcherin a *History of Provincial Institutions in Russia in the 17th Century* (1856). To these must be added the work of Zagoskin, *History of Law in the State of Muscovy* (Kazan, 1877). Professor Michael Kovalevskiy, of the university of Moscow, wrote an excellent work on *Communal Land Tenure*, in which he investigates the remains of this custom throughout the world. In 1885 Dubrovin published an excellent history of the revolt of Pugachev. The valuable work by Alexander Pypin (b. 1833) and Vladimir Spasovich, *History of Slavonic Literatures*, is the most complete account of the subject, and has been made more generally accessible by the German translation of Pech. N. Tikhonravov (1832–1893) wrote a *Chronicle of Russian Literature and Antiquities* (5 vols., 1859–61). The *History of Slavonic Literature* by Schafarik, published in 1826, has long been antiquated. A history of Russian literature by Paul Polevoy has appeared, which has gone through two editions. The account of the Polish rebellion of 1863 by Berg, published in 1873, which gave many startling and picturesque episodes of the celebrated struggle, was withdrawn from circulation. It appeared originally in the pages of the Russian magazine *Starina*.

Poets.

Nicholas Nekrasov, who died in 1877, left six volumes of poetry which in many respects remind us of the writings of Crabbe; the poet is of that realistic school in which Russian authors so much resemble English. Another writer of poetry deserving mention is Ogariev, for a long time the companion in exile of Herzen in England; many of his compositions appeared in the *Polar Star* of the latter, which contains the interesting autobiographical sketches of Herzen, entitled *Byloe i Dumî* (" The Past and my Thoughts "). Apollon Maikov (1821–1847) at one time enjoyed great popularity as a poet; he is a kind of link with Pushkin, of whose elegance of versification he is an imitator. Another poet of a past generation was Prince Viazemskiy (1792–1878). Graceful lyrics were written by Mei, Fet (whose name would apparently prove Dutch extraction, Veth), Stcherbina, and, going a little further back, Yazykov, the friend of Pushkin, and Khomiakov, celebrated for his Slavophile propensities. To these may be added Mdlle Zhadovskaya, Benediktov, Podolinskiy and Tiutchev. Polonskiy (1820–1898) contributed exquisite lyrics to the *Viestnik Yevropî*.

Philologists.

Excellent works on subjects connected with Slavonic philology have been published by Vostokov, who edited the Ostromir Codex; and Sreznevskiy and Bodianskiy, who put forth an edition of the celebrated codex used at Reims for the coronation of the French kings. After their deaths their work was carried on by Professor Grot (*Philological Investigations*, also many critical editions of Russian classics), Budilovich, professor at Warsaw, Potebnya of Kharkov, and Baudoin de Courtenay, who, among other services to philology, has described the Slavonic dialect spoken by the Resanians, a tribe living in Italy, in two villages of the Julian Alps. The songs (*byliny*) of the Russians have been collected by Zakrevskiy, Rybnikov, Hilferding, Barsov and others, and their national tales by Sakharov, Afanasiev and Erlenvein. Kotliarevskiy, Tereshenko and others have treated of their customs and superstitions. S. Stanislaus Mikutskiy, professor at the university of Warsaw, has published his *Materials for a Dictionary of the Roots of the Russian and all Slavonic Dialects*, but it represents a somewhat obsolete school of philology. The Early Russian Text Society continues its useful labours, and has edited many interesting monuments of the older Slavonic literature. Two valuable codices have been printed in Russia, Zographus and Marianus, interesting versions of the Gospels in Palaeoslavonic. They were edited by the learned Croat Jagić, who occupied the chair of Sreznevskiy in St Petersburg. An excellent *Tolkovi Slovar Velikorusskago Yazîka* (" Explanatory Dictionary of the Great Russian Language ") was compiled by Vladimir Dahl. Alexander Hilferding published some valuable works on ethnology and philology, among others on the Polabs, an extinct Slavonic tribe who once dwelt on the banks of the Elbe. The Russians have not exhibited many works in the field of classical or other branches of philology. Exception, however, must be made of the studies of Tchubinov in Georgian, Minayev in the Indian and Tsvetayev in the old languages of Italy.

In moral and mental philosophy the Russians have produced but few authors. We meet with some good mathematicians, Lobachevskiy among others, and in natural science the publications of the Society for Natural History at Moscow have attracted considerable attention.

Recent Literature.—The death of Nekrasov in 1877 deprived Russia of her most eminent poet since the days of Pushkin and

Lermontov. During the last generation of the 19th century most of the Titans of her literature departed, and cannot be said to have left successors of equal merit. Dostoievskiy, Pisemskiy, Turgeniev, Goncharov, Ostrovskiy and Saltikov followed each other to the grave in rapid succession. Leo Tolstoy alone remained, a veritable patriarch, whose views on life gave him a world-interest beyond even the contributions of his great prose fiction. In 1895 Apukhtin, author of many graceful lyrics, died; in 1897 Apollon Maikov, and soon afterwards Polonskiy. These men were well known throughout Russia. A new school of poets has sprung up, consisting for the most part of the so-called decadents and symbolists. Among them may be mentioned A. Korinfskiy; Ivan Bunin, who has published an excellent translation of Longfellow's *Hiawatha*; and Constantine Balmont. The last of these has given to the public several volumes of lyrics, many of which exhibit a graceful imagination. He has been a successful translator of Shelley, and of Edgar Allan Poe, Ibsen and Calderon. We must also mention V. Briusov and K. Sluchevskiy, Mme. Gippius-Merezhkovskaya and Mme. Myrrha Lokhvitskaya. Excellent historical novels have been written by Merezhkovskiy (Merejkovsky (*q.v.*)). The drama is not in a flourishing condition. Very little of merit has been produced since the great trilogy (1866–69) of Alexis Tolstoy dealing with the reign of Ivan the Terrible—full of picturesque horrors for the dramatist—and the *bourgeois* comedies of Ostrovskiy.

If we turn to history, in which the Russians have always shown considerable talent, we can cite some really good work. We cannot here find room to discuss the memoirs and other documents which appear in the *Russian Antiquary* (*Russkaya Starina*), the *Historical Messenger* (*Istoricheskiy Viestnik*) and other journals, the name of which is legion. In 1897 Professor Bestuzhev-Riumin, of the university of St Petersburg, died. He had held his chair of history since 1865. His valuable *History of Russia* must now remain a torso only, the first volume and the first half of the second having alone appeared. Soloviev and Kostomarov are dead. The famous school of Russian historians is thus almost extinct. But some excellent writers in this department have come to the front. Professor Miliukov has started his *Sketches of the History of Russian Culture* (*Ocherki po istorii russkoi kulturi*), which has been much read. Professor Bilbasov wrote a *History of Catherine II.* and N. Shilder a *Life of Alexander I.* D. Evarnitskiy has added a third volume to his interesting work on the Zaporozhian Cossacks. The Russians have always enjoyed a considerable reputation as memoir-writers, and the *Recollections of Mme. Smirnov*, which first appeared in the *Northern Messenger* (*Sieverny Viestnik*), proved very interesting. Pushkin appears here before us in the most minute details of his everyday life. The centenary of his birth (1899) was signalized by the publication of many interesting monographs on his strange career. The details furnished by his nephew, L. Pavlistchev, were especially noteworthy. The second volume appeared of the classical *History of the Russian Church*, by E. Golubinskiy. A valuable contribution to early Russian history was furnished by the *Legal Antiquities* (*Yuridicheskia Drevnosti*) of V. Serguievich, by which quite a new light has been thrown upon the Russian *sobor*. The well-known savant, Maxime Kovalevskiy, published the second volume of his *Economic Development of Europe to the Rise of Capitalism.* N. Rozhkov wrote an important work entitled *Village Economy in Muscovy in the Sixteenth Century.* This book analyses the conditions under which economic production was developed in Old Russia. S. Platonov published a *History of the Insurrections in Russia in the Sixteenth and Seventeenth Centuries.* He holds entirely new views on the *oprichina*, the famous bodyguard of Ivan the Terrible. Professor B. Kliuchevskiy, of the university of Moscow, published in 1883 a valuable book on the Russian Duma, as the privy council of the emperors was called, and in 1899 he issued his *Aids to Lectures on Russian History.* Russian writers have not often devoted themselves to the political and social conditions of other countries, but an exception must be made in the case of the books by Professor Vinogradov, formerly of Moscow, notably his *Investigations into the Social History of England in the Middle Ages* (1887). The learned author, who was called to Oxford as Corpus professor of jurisprudence, also prepared an edition of this work for the English public. In fiction no new writers appeared of equal calibre to Gogol, Turgeniev, Dostoievskiy and Tolstoy. But A. Chekhov showed considerable power in his short stories. Some of the tales of Gorki (*q.v.*), Ertel and Yasinskiy are also of great merit. The brilliant Garshin died insane in 1888.

The Little Russian dialect, or Malo-Russian.

A few words must be said on the literature of the Russian dialects, the Little and White Russian. The Little Russian is rich in *skazki* (tales) and songs. Peculiar to them is the *duma*, a narrative poem which corresponds in many particulars with the Russian *bylina*. Since the commencement of the 19th century, the Little Russian *dumy* have been repeatedly edited, as by Maksimovich Metlinskiy and others, and an elaborate edition was undertaken by Dragomanov and Antonovich. Just as the *byliny* of the Great Russians, so also these *dumy* of the Little Russians admit of classification, and they have been divided by their latest editors as follows: (1) the songs of the *druzhina*, treating of the early princes and their followers; (2) the Cossack period (*Kozachestvo*), in which the Cossacks are found in continual warfare with the Polish *pans* and the attempts of the Jesuits to introduce the Roman Catholic religion; (3) the period of the Haidamaks, who formed the nucleus of the national party, and prolonged the struggle.

The foundation of the Little Russian literature (written, as opposed to the oral) was laid by Ivan Kotliarevskiy (1769–1838), whose travesty of part of the *Aeneid* enjoys great popularity among some of his countrymen. Others, however, object to it as tending to bring the language or dialect into ridicule. A truly national poet appeared in Taras Shevchenko, born at the village of Kirilovka, in the government of Kiev, in the condition of a serf. The strange adventures of his early life he has told us in his autobiography. He did not get his freedom till some time after he had reached manhood, when he was purchased from his master by the generous efforts of the poet Zhukovskiy and others. Besides poetry, he occupied himself with painting, with considerable success. He unfortunately became obnoxious to the government, and was punished with exile to Siberia from 1847 to 1857. He did not long survive his return, dying in 1861, aged forty-six. No one has described with greater vigour than Shevchenko the old days of the Ukraine. In his youth he listened to the village traditions handed down by the priests, and he has faithfully reproduced them. In the powerful poem entitled *Haidamak* we have a graphic picture of the horrors enacted by Gonta and his followers at Uman. The funeral of the poet was a vast public procession; a great cairn, surmounted with a cross, was raised over his remains, where he lies buried near Kaniov on the banks of the Dnieper. His grave has been styled the "Mecca of the South Russian Revolutionists." A complete edition of his works, with interesting biographical notices—one contributed by the novelist Turgeniev—appeared at Prague in 1876. Besides the national songs, excellent collections of the South Russian folk-tales have appeared, edited by Dragomanov, Rudchenko, and others. Many of these are still recited by the *tchumaki*, or wandering pedlars. A valuable work is the *Zapiski o Yuzhnoy Rossii* ("Papers on Southern Russia"), published at St Petersburg in 1857 by Panteleimon Kulish. After he got into trouble (with Kostomarov and Shevchenko) for his political views, the late works of this author show him to have undergone a complete change. Other writers using the Little Russian language are Marko-Vovchok (that is, Madame Eugenia Markovich) and Yuri Fedkovich, who employs a dialect of Bukovina. Fedkovich, like Shevchenko, sprang from a peasant family, and served as a soldier in the Austrian army against the French during the Italian campaign. Naturally we find his poems filled with descriptions of life in the camp. Like the Croat Preradović, he began writing poetry in the German language, till he was turned into more natural paths by some patriotic friends. A collection of songs of Bukovina was published at Kiev in 1875 by Lonachevskiy. Eugene Zelechovskiy compiled a valuable *Dictionary of Little Russian.* There is a good grammar by Osadtsa, a pupil of Miklosich.

White Russian dialect.

In the White Russian dialect are to be found only a few songs, with the exception of portions of the Scriptures and some legal documents. A valuable dictionary has been published by Nosovich, but this is one of the most neglected of the Russian dialects. Collections of White Russian songs have been published by Shein and others.

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(W. R. M.)

RUSSO-JAPANESE WAR, 1904–5. The seizure by Russia of the Chinese fortress of Port Arthur, which she had a few years previously, in concert with other powers, compelled Japan to relinquish, was from the Russian point of view the logical outcome of her eastward expansion and her need for an ice-free harbour on the Pacific. The extension of the Trans-Siberian railway through Manchuria to Port Arthur and a large measure of influence in Manchuria followed equally naturally. But the whole course of this expansion had been watched with suspicion by Japan, from the time of the Saghalien incident of 1875, when the island power, then barely emerging from the feudal age, had to cede her half of the island to Russia, to the Shimonoseki treaty of 1895, when the powers compelled her to forego the profits of her victory over China. The subsequent occupation of Port Arthur and other Chinese harbours by European powers, and the evident intention of consolidating Russian influence in Manchuria, were again and again the subject of Japanese representations at St Petersburg, and these representations became more vigorous when, in 1903, Russia seemed to be about to extend her Manchurian policy into Korea. No less than ten draft treaties were discussed in vain between August 1903 and February 1904, and finally negotiations were broken off on February 5th.[1] Japan had already on the 4th decided to use force, and her military and naval preparations, unlike those of Russia, kept pace with her diplomacy.

This was in fact an eventuality which had been foreseen and on which the naval and military policy of Japan had been based for ten years. She too had her projects of expansion and hegemony, and by the Chino-Japanese War she had gained a start over her rival. The reply of the Western powers was first to compel the victor to maintain the territorial integrity of China, and then within two years to establish themselves in Chinese harbours. From that moment Japanese policy was directed towards establishing her own hegemony and meeting the advance of Russia with a *fait accompli*. But her armaments were not then adequate to give effect to a strong-handed policy, so that for some years thereafter the government had both to impose heavy burdens on the people and to pursue a foreign policy of marking time, and endured the fiercest criticism on both counts, for the idea of war with Russia was as popular as the taxes necessary to that object were detested. But as the army and the navy grew year by year, the tone of Japanese policy became firmer. In 1902 her position was strengthened by the alliance with England; in 1903 her army, though in the event it proved almost too small, was considered by the military authorities as sufficiently numerous and well prepared, and the arguments of the Japanese diplomatists stiffened with menaces. Russia, on the other hand, was divided in policy and consequently in military intentions and preparations. In some quarters the force of the new Japanese army was well understood, and the estimates of the balance of military power formed by the minister of war, Kuropatkin, coincided so remarkably with the facts that at the end of the summer of 1903 he saw that the moment had come when the preponderance was on the side of the Japanese. He therefore proposed to abandon Russian projects in southern Manchuria and the Port Arthur region and to restore Port Arthur to China in return for considerable concessions on the side of Vladivostok. His plan was accepted, but "a lateral influence suddenly made itself felt, and the completely unexpected result was war." Large commercial interests were in fact involved in the forward policy, "the period of heavy capital expenditure was over, that of profits about to commence," and the power and intentions of Japan were ignored or misunderstood. Further, Dragomirov, a higher military authority even than Kuropatkin, declared that "Far Eastern affairs were decided in Europe." Thus Russia entered upon the war both unprepared in a military sense, and almost entirely indifferent to its causes and its objects. To the guards and patrols of the Manchurian railway and the garrisons of Port Arthur and Vladivostok, 80,000 in all, Japan could, in consequence of her recruiting law of 1896, oppose a first-line army of some 270,000 trained men. Behind these, however, there were scarcely 200,000 trained men of the older classes, and at the other end of the long Trans-Siberian railway Russia had almost limitless resources.[2] The strategical problem for Japan was, how to strike a blow sufficiently decisive to secure her object, before the at present insignificant forces of the East Siberian army were augmented to the point of being unassailable. It turned, therefore, principally upon the efficiency of the Trans-Siberian railway and in calculating this the Japanese made a serious under-estimate. In consequence, far from applying the "universal service" principle to its full extent, they trained only one-fifth of the annual contingent of men found fit for service. The quality of the army, thus composed of picked men (a point which is often forgotten), approximated to that of a professional force; but this policy had the result that, as there was no adequate second-line army, parts of the first-line had to be reserved, instead of being employed at the front. And when for want of these active troops the first great victory proved indecisive, half-trained elements had to be sent to the front in considerable numbers—indeed the ration strength of the army was actually trebled. The aim of the war, "limited" in so far that the Japanese never deluded themselves with dreams of attacking Russia at home, was to win such victories as would establish the integrity of Japan herself and place her hegemony in the Far East beyond challenge. Now the integrity of Japan was worth little if the Russians could hope ultimately to invade her in superior force, and as Port Arthur was the station of the fleet that might convoy an invasion, as well as the symbol of the longed-for hegemony, the fortress was necessarily the army's first objective, a convincing Sedan was the next. For the navy, which had materially only a narrow margin of superiority over the Russian Pacific Squadron, the object was to keep the two halves of that squadron, at Port Arthur and Vladivostok respectively, separate and to destroy them in detail. But in February weather these objects could not be pursued simultaneously. Prior to the break-up of the ice, the army could only disembark at Chemulpo, far from the objective, or at Dalny under the very eyes of its defenders. The army could therefore, for the moment, only occupy Korea and try to draw upon itself hostile forces that would otherwise be available to assist Port Arthur when the land attack opened. For the navy, instant action was imperative.

Objectives of the Japanese attack.

On the 8th of February the main battle-fleet, commanded by Vice-Admiral Togo, was on the way to Port Arthur. During the night his torpedo-boats surprised the Russian squadron in harbour and inflicted serious losses, and later in the day the battleships engaged the coast batteries. Repulsed in this attempt, the Japanese established a stringent blockade, which tried the endurance of the ships and the men to the utmost. From time to time the torpedo-craft tried to run in past the batteries, several attempts were made to block the harbour entrance by sinking vessels in the fairway, and free and deadly use was made by both sides of submarine mines. But, though not destroyed, the Port Arthur squadron was paralysed by the instantaneous assertion of naval superiority.

Admiral Alexeiev, the tsar's viceroy in the Far East and the evil genius of the war, was at Port Arthur and forbade the navy to take the risks of proceeding to sea.[3] For a time, when in place of Admiral Starck (who was held responsible for the surprise of February), Admiral Makárov, an officer of European reputation, commanded the fleet, this lethargy was shaken off. The new commander took his ships to sea every day. But his energetic leadership was soon ended by a tragedy. A field of electro-mechanical mines was laid by the Japanese in the night of April 12th–13th, and on the following day the Japanese cruisers stood inshore to tempt the enemy on to the mine-field. Makárov, however, crossed it without accident, and pursued the cruisers until Togo's battle-fleet appeared, whereupon he went about and steamed for port. In doing so he recrossed the mine-field, and this time the mines were effectual. The flagship "Petropavlovsk" was struck and went down with the admiral and 600 men, and another battleship was seriously injured. Then the advocates of passivity regained the upper hand and kept the squadron in harbour, and henceforward for many months the Japanese navy lay unchallenged off Port Arthur, engaging in minor operations, covering the transport of troops to the mainland, and watching for the moment when the advance of the army should force the Russian fleet to come out. Meantime seven Japanese cruisers under Vice-Admiral Kaimamura went in search of the Russian Vladivostok squadron; this, however, evaded them for some months, and inflicted some damage on the Japanese mercantile marine and transports. The Japanese had not waited to gain command of the sea before beginning the sea transport of that part of their troops allotted to Korea. The roads of that country were so poor that the landing had

Makárov at Port Arthur.

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[1] Belated declarations of war appeared on the 10th.

[2] The total Russian army on a *peace* footing is almost 1,000,000 strong.

[3] A vivid picture of the state of affairs in the navy at this period is given in Semenov's *Rasplata* (Eng. trans.).

The Japanese 1st Army in Korea.

to be made, not on the Straits of Tsushima, but as far north as possible. Chemulpo, nearer by 50 m. to Port Arthur than to Japan, was selected. On the first day of hostilities Rear-Admiral Uriu disembarked troops at Chemulpo under the eyes of the Russian cruiser "Variag," and next day he attacked and destroyed the "Variag" and some smaller war-vessels in the harbour, and the rest of the 1st Army (General Kuroki) was gradually brought over during February and March, in spite of an unbeaten and, under Makárov's régime, an enterprising hostile navy. But owing to the thaw and the subsequent break-up of the miserable Korean roads, six weeks passed before the columns of the army (Guard, 2nd and 12th divisions), strung out along the "Mandarin road" to a total depth of six days' march, closed upon the head at Wiju, the frontier town on the Yalu. Opposite to them they found a large Russian force of all arms.

The Russian commanders, at this stage at least, had not and could not have any definite objective. Both by sea and by land their policy was to mass their resources, repulsing meantime the attacks of the Japanese with as much damage to the enemy and as little to themselves as possible. Their strategy was to gain time without immobilizing themselves so far that the Japanese could impose a decisive action at the moment that suited them best. Both by sea and by land, such strategy was an exceedingly difficult game to play. But afloat, had Makárov survived, it would have been played to the end, and Togo's fleet would have been steadily used up. One day, indeed (May 15th), two of Japan's largest battleships, the "Hatsume" and the "Yashima," came in contact with free mines and were sunk. One of them went to the bottom with five hundred souls. But the admiral was not on board. The Russian sailors said, when Makárov's fate was made known, "It is not the loss of a battleship. The Japanese are welcome to two of them. It is *he*." Not only the skill, but the force of character required for playing with fire, was wanting to Makárov's successors.

Kuropatkin's plan.

It was much the same on land. Kuropatkin, who had taken command of the army, saw from the first that he would have to gain three months, and disposed his forces as they came on the scene, unit by unit, in perfect accord with the necessities of the case. His expressed intention was to fight no *battle* until superiority in numbers was on his side. He could have gained his respite by concentrating at Harbin or even at Mukden or at Liao-Yang. But he had to reckon with the fleet[1] at Port Arthur. He knew that the defences of that place were defective, and that if the fleet were destroyed whilst that of Togo kept the sea, there would be no Russian offensive. He therefore chose Liao-Yang as the point of concentration, and having thus to gain time by force instead of by distance, he pushed out a strong covering detachment towards the Yalu.

But little by little he succumbed to his *milieu*, the atmosphere of false confidence and passivity created around him by Alexeiev. After he had minutely arranged the Eastern Detachment in a series of rearguard positions, so that each fraction of it could contribute a little to the game of delaying the enemy before retiring on the positions next in rear, the commander of the detachment, Zasulich, told him that "it was not the custom of a knight of the order of St George to retreat," and Kuropatkin did not use his authority to recall the general, who, whether competent or not, obviously misunderstood his mission. Thus, whilst the detachment was still disposed as a series of rearguards, the foremost fractions of it stood to fight on the Yalu, against odds of four to one.

Battle of the Yalu.

The Japanese 1st Army was carefully concealed about Wiju until it was ready to strike. Determined that in this first battle against a white nation they would show their mettle, the Japanese lavished both time and forethought on the minutest preparations. Forethought was still busy when, in accordance with instructions from Tokio, Kuroki on the 30th of April ordered the attack to begin at daybreak on the 1st of May. For several miles above Antung the rivers Yalu and Aiho are parallel and connected by numerous channels. The majority of the islands thus formed were held and had been bridged by the Japanese. The points of passage were commanded by high ground a little farther up where the valleys definitely diverge, and beyond the flank of the ill-concealed positions of the defence. The first task of the right division (12th) was to cross the upper Yalu and seize this. To the Guard and 2nd divisions was assigned the frontal attack on the Chiuliencheng position, where the Russians had about one-half of their forces under Major-General Kashtalinski. On the 30th of April, Inouye's 12th division accomplished its task of clearing the high ground up to the Aiho. The Russians, though well aware that the force in their front was an army, neither retired nor concentrated. Zasulich's medieval generalship had been modified so far that he intended to retreat when he had taught the Japanese a lesson, and therefore Kuropatkin's original arrangements were not sensibly modified. So it came about that the combined attack of the 2nd and Guard divisions against the front, and Inouye on the left flank and rear, found Kashtalinski without support. After a rather ineffective artillery bombardment the Japanese advanced in full force, without hesitation or finesse, and plunging into the river, stormed forward under a heavy fire. A few moments afterwards Zasulich ordered the retreat. But the pressure was far too close now. Broken up by superior numbers the Russian line parted into groups, each of which, after resisting bravely for a time, was driven back. Then the frontal attack stopped and both divisions abandoned themselves to the intoxication of victory. Meanwhile, the right attack (12th division) encountering no very serious resistance, crossed the Aiho and began to move on the left rear of the Russians. On the side of the defence, each colonel had been left to retire as best he could, and thus certain fractions of the retreating Russians encountered Inouye's advancing troops and were destroyed after a most gallant resistance. The rearguard itself, at Hamatan, was almost entirely sacrificed, owing to the wrong direction taken in retreating by its left flankguard. Fresh attempts were made by subordinates to form rearguards, but Zasulich made no stand even at Feng-hwang-cheng, and the Japanese occupied that town unopposed on the 5th of May. The Japanese losses were 1100 out of over 40,000 present, the Russian (chiefly in the retreat) at least 2500 out of some 7000 engaged.

The Yalu, like Valmy, was a moment in the world's history. It mattered little that the Russians had escaped or that they had been in inferior numbers. The serious fact was that they had been beaten.

The general distribution of the Russian forces was now as follows: The main army under Kuropatkin was forming, by successive brigades, in two groups—I. Siberian Corps (Stakelberg), Niu-chwang and Kaiping; II. Siberian Corps, Liao-Yang. Zasulich (III. Corps and various other units) had still 21,000. In the Port Arthur "fortified rayon," under Lieut.-General Stoessel (IV. Corps), were 27,000 men, and General Linievich around Vladivostok had 23,000. These are, however, paper strengths only, and the actual number for duty cannot have been higher than 110,000 in all. The Trans-Siberian railway was the only line of communication with Europe and western Siberia, and its calculated output of men was 40,000 a month in the summer. In October 1904, therefore, supposing the Japanese to have used part of their forces against Port Arthur, and setting this off against the absence of Linievich and Stoessel, Kuropatkin could expect to have a sufficient superiority in numbers to take the offensive. His policy was still, "No battle before we are in superior force."

Landing of the Japanese 2nd Army.

For the moment it was equally Japan's interest to mark time in Manchuria. Still intent upon the Russian Port Arthur squadron, she had embarked her 2nd Army (General Oku, 1st, 3rd, 4th and 5th divisions) during April, and sent it to Chinampo whence, as soon as the ice melted and Kuroki's victory cleared the air, it sailed to the selected landing-place near Pitszewo. Here, under the protection of a continuous chain of war-vessels between the Elliot

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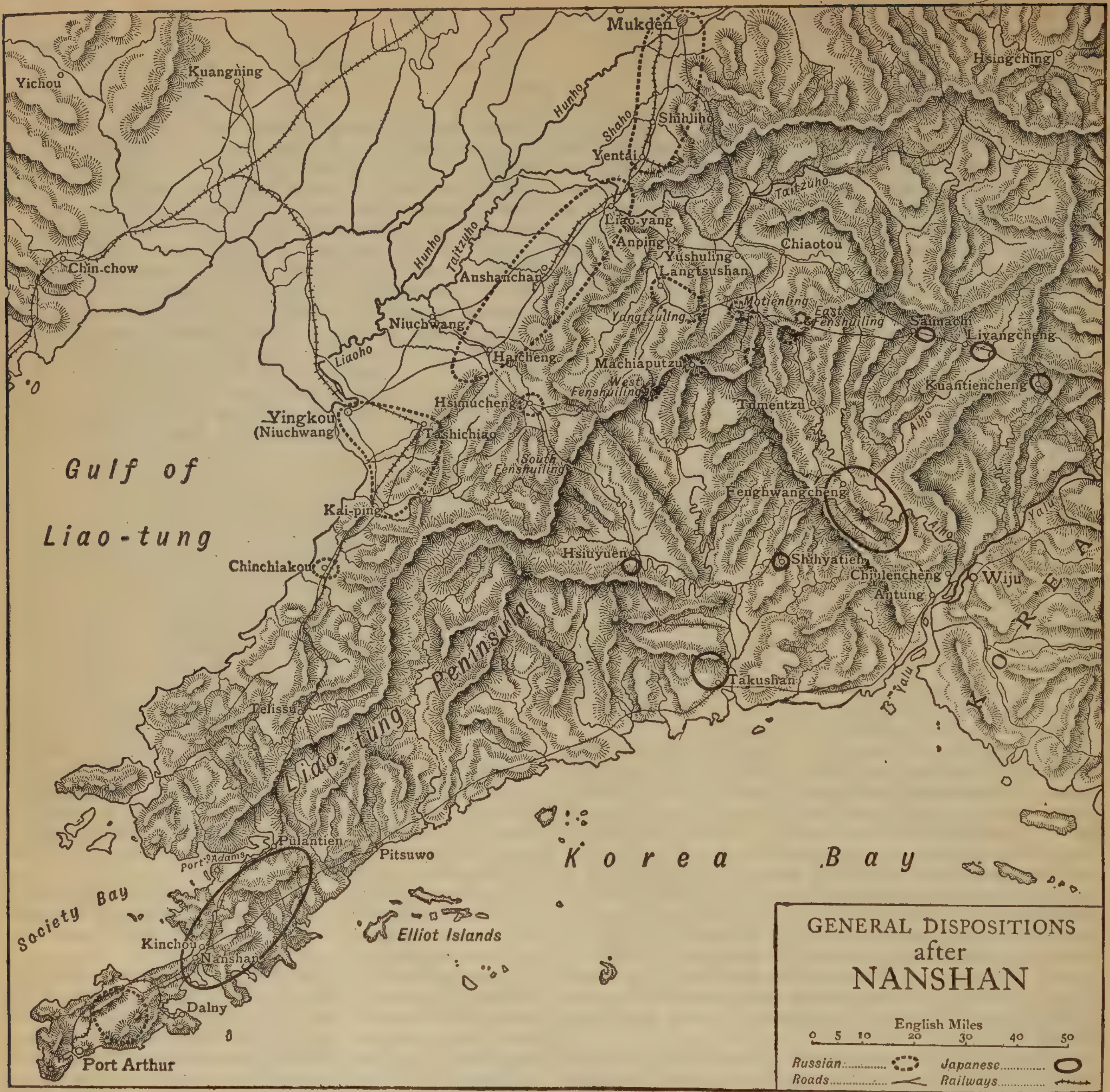
[1] Not, as is often assumed. the fortress itself.


Mukden
Hsingching
Yichou
Kuangning
Hunho
Shaho
Shihlihe
Yentai
Taitzuho
Liao-yang
Anping
Yushuling
Chiaotou
Langtsushan
Chin-chow
Hunho
Taitzuho
Anshanchan
Motienling
East Fenshuiling
Yangtzuling
Saimachi
Liyangcheng
Niuchwang
Liaoho
Haicheng
Machiaputzu
West Fenshuiling
Kuantiencheng
Hsimucheng
Tumentzu
Yingkou (Niuchwang)
Tashichiao
Gulf of Liao-tung
South Fenshuiling
Fenghwangcheng
Aiho
Yalu
Kai-ping
Hsiuyuen
Shihyatien
Chiulencheng
Wiju
Chinchiakou
Antung
KOREA
Peninsula
Takushan
Yalu
Telissu
Liao-tung
Pulantien
Pitsuwo
Port Adams
Korea Bay
Society Bay
Elliot Islands
Kinchou
Nanshan
Dalny
Port Arthur
GENERAL DISPOSITIONS after NANSHAN
English Miles
0 5 10 20 30 40 50
Russian
Japanese
Roads
Railways

Emery Walker sc.

Islands and the mainland, Oku began to disembark on the 5th of May. But the difficulties of the coast were such that it took three weeks to disembark the whole and to extend across the peninsula to Port Adams. Oku then, leaving the 5th division behind, moved down with the rest towards Kinchow, and after storming that place found himself face to face with a position of enormous strength, Nanshan Hill, at the narrowest part of the peninsula, where part of a Russian division (3000 only out of 12,000 were actually engaged) had fortified itself with extreme care. On the 26th of May took place the battle of Nanshan. The Japanese attack was convergent, but there was no room for envelopment; the Russian position moreover was "all-round" and presented no flanks, and except for the enfilade fire of the Japanese and Russian gunboats in the shallow bays on either side the battle was locally at every point a frontal attack and defence. The first rush of the assailants carried them up to the wire and other obstacles, but they were for many hours unable to advance a step farther. But the resolute Oku attacked time after time, and at last the 4th division on his right, assisted by its gunboats, forced its way into the Russian position. The Russians had just begun to retreat, in accordance with orders from higher authorities. But it was a second undeniable victory. It was, moreover, a preface to those furious assaults on Port Arthur which, because they were the expression of a need that every soldier felt, and not merely of a tactical method, transcend all cool-blooded criticism. The Japanese losses were 4500 out of 30,000 engaged or 15%, that of the Russians fully half of the 3000 engaged. The victors captured many guns, but were too exhausted to pursue the Russians, whose retirement was not made in the best order.

Nanshan.

The transports were now conveying the 6th and 11th divisions to Pitszewo; these were to form the 3rd Army (Nogi) for operations against Port Arthur. Oku exchanged his 1st division for the 6th. The 2nd Army then turned northward (3rd, 4th, 5th and 6th divisions). The 10th division, forming the nucleus of the 4th Army, had begun to land at Takushan on the 19th of May. The 2nd and 4th Armies were the left wing of a widespread converging movement on Liao-Yang. Oku had the greatest distance to march, Kuroki the smallest. The latter therefore had to stand fast in the face of the Russian Eastern Detachment, which was three days' march at most from Feng-hwang-cheng and could be supported in three more days by Kuropatkin's main body, whereas the pressure of Oku's advance would not begin to be felt by the Russian Southern Detachment until the twelfth day at earliest. It was necessary therefore for the first objective to make a slight concession to the second. Oku had to start at the earliest possible moment, even though operations against Port Arthur were thereby delayed for a week or two. In fact, Oku's march began on June 13th, Kuroki's on June 24th; the moves of the intermediate forces at various dates within this time.

Meanwhile Kuropatkin, assembling the main army week by week, was in a difficult position. His policy of gaining time had received a severe blow in the failure of his executive officer to realize it, and that officer, though his unpursued troops quickly regained their *moral*, had himself completely lost confidence. On the news of the battle (coupled with that of a fresh army appearing on the Korean coast),[1] Kuropatkin instantly sent off part of his embryo central mass to bar the mountain passes of Fenshuiling and Motienling against the imagined relentless pursuit of the victors, and prepared to shift his centre of concentration back to Mukden. The subsidiary protective forces on either flank of Zasulich had promptly abandoned their look-out positions and fallen back to join him. But the commander-in-chief, soon realizing that the Japanese were not pursuing, reasserted himself, sent the protective troops back to their posts, and cancelled all orders for the evacuation of Liao-Yang. From this time forward, Kuropatkin allowed his subordinates little or no initiative. A few days later, Zasulich's persistent requests to be allowed to retreat and the still uncertain movements of the 2nd Army induced him once more to prepare a concentration on Mukden. But on the 6th of May he learned that the Japanese 1st Army had again halted at Feng-hwang-cheng and that the 2nd Army was disembarking at Pitszewo, and he resumed (though less confidently) his original idea. The Eastern protective detachment, now strengthened and placed under the orders of Count Keller, was disposed with a view to countering any advance on Liao-Yang from the east by a combination of manœuvre and fighting.[2] It was at this moment of doubt that Alexeiev, leaving Port Arthur just in time and profoundly impressed with the precarious state of affairs in the fleet and the fortress, gave the order, as commander-in-chief by land and sea, for an "active" policy (19th May). Kuropatkin, thus required to abandon his own plan, had only to choose between attacking the 1st Army and turning upon Oku. He did not yield at once; a second letter from the viceroy, the news of Nanshan, and above all a signed order from the tsar himself, "Inform General Kuropatkin that I impose upon him all the responsibility for the fate of Port Arthur," were needed to bring him definitely to execute a scheme which in his heart he knew to be perilous. The path of duty for a general saddled with a plan which he disapproves is not easily discoverable. Napoleon in like case refused, at the risk of enforced resignation, but so did Moreau; the generality of lesser men have obeyed, but so did Suvárov.

Alexeiev and Kuropatkin.

Stakelberg's I. Siberian Corps was therefore reinforced towards the end of May up to a strength of above 35,000. But it remained a detachment only. The Liao-Yang central mass was still held in hand, for the landing of the 4th Army—really only a division at present—at Takushan and the wrong placing of another Japanese division supposed to be with Kuroki (really intended for Nogi) had aroused Kuropatkin's fears for the holding capacity of Keller's detachment. Moreover, disliking the whole enterprise, he was most unwilling to use up his army in it. The Russians, then, at the beginning of June, were divided into three groups, the Southern, or offensive group (35,000), in the triangle Neuchwang-Haicheng-Kaiping; the Eastern or defensive group (30,000), the main body of it guarding the passes right and left of the Wiju-Liao-Yang road, the left (Cossacks) in the roadless hills of the upper Aiho and Yalu valleys, the right (Mishchenko's Cossacks and infantry supports) guarding Fenshuiling pass and the road from Takushan; the reserve (42,000) with Kuropatkin at Liao-Yang; the "Ussuri Army" about Vladivostok; and Stessel's two divisions in the Kwantung peninsula.

On the other side the 1st Army was at Feng-hwang-cheng with one brigade detached on the roads on either hand, the left being therefore in front of the Takushan division and facing the Fenshuiling. Oku's 2nd Army (4 divisions or 60,000 combatants) was about Port Adams. This last was the objective of the attack of Stakelberg's 35,000. Kuropatkin's orders to his subordinate were a compromise between his own plan and Alexeiev's. Stakelberg was to crush by a rapid and energetic advance the covering forces of the enemy met with, and his object was "the capture of the Nanshan position and thereafter an advance on Port Arthur." Yet another object was given him, to "relieve the pressure on Port Arthur by drawing upon himself the bulk of the enemy's forces," and he was not to allow himself to be drawn into a decisive action against superior numbers. Lastly, on June 7th, while Stakelberg was proceeding southward on his ill-defined errand, Kuropatkin, imposed upon by the advance of the Takushan column to Siu-yen, forbade him to concentrate to the front, only removing the veto when he learned that the 4th Army had halted and entrenched at Siu-yen.

Stakelberg's expedition.

On the 14th, all his arrangements for supply and transport being at last complete, Oku moved north. Although he was still short of part of the 6th division, he was in superior force. He had, moreover, the perfectly definite purpose of fighting his way north, and at Telissu or Wafangkou on the 14th of June, as he expected, he came upon Stakelberg's detachment in an entrenched position. On the 14th and 15th, attacking sharply on the Russian front and lapping round both its flanks, Oku won an important and handsome victory, at a cost of 1200 men out of 35,000 engaged, while the Russians, with a loss of at least 3600 out of about 25,000 engaged, retired in disorder. Thus swiftly and disastrously ended the southern expedition.

Telissu.

Meantime, except for the movement on Siu-yen already mentioned,[3] and various reconnaissances in force by Keller's main body and by Rennenkampf's Cossacks farther inland, all was quiet along the Motienling front. Kuroki entrenched himself carefully about Feng-hwang-cheng, intending, if attacked by the Russian main army, to defend to the last extremity the ground and the prestige gained on the 1st of May.

From this point to the culmination of the advance at Liao-Yang, the situation of the Japanese closely resembles that of the Prussians in 1866. Haicheng represents Münchengrätz, Liao-Yang Gitschin, and the passes east of Liao-Yang Nachod and Trautenau. The concentration of the various Japanese armies on one battlefield was to be made, not along the circumference of the long arc they occupied, but towards the centre. Similarly, Kuropatkin was in the position of Benedek. He possessed the interior lines and the central reserve which enables interior lines to be utilized, and a stroke of good fortune prolonged the period in which he could command the situation, for on the 23rd of June an unexpected sortie of the Russian Port Arthur squadron paralysed the Japanese land offensive. In the squadron were seen the battleships damaged in the February attacks, and the balance of force was now against Togo, who had lost the "Yashima" and the "Hatsuse." The squadron nevertheless tamely returned to harbour, Togo resumed the blockade and Nogi began his advance from Nanshan, but the 2nd and 4th Armies came to a standstill at once (naval escort for their sea-borne supplies being no longer available), and the 1st Army, whose turn to advance had just arrived, only pushed ahead a few miles to cover a larger supply area. On the 1st of July the Vladivostok squadron appeared in the Tsushima Straits, and then vanished to an unknown destination, and whether this intensified the anxiety of the Japanese or not, it is the fact that the 2nd Army halted for eleven days at Kaiping, bringing the next on its right, 4th Army, to a standstill likewise. Its next advance brought it to the fortified position of Tashichiao, where Kuropatkin had, by drawing heavily upon his central reserve and even on the Eastern Detachment, massed about two army corps.

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[1] This was the 2nd Army, waiting in the port of Chinampo for the moment to sail for Pitszewo.

[2] One isolated incident which deserves mention took place at this time, the bold raid of Colonel Madritov and 500 Cossacks against the communications of the 1st Army. The raid (involving a ride of 240 m. forward and back) was carried out in entire ignorance of the battle of the Yalu, and on arriving at Anju Madritov found nothing to attack, the 1st Army having after its victory adopted a short line of communication from a sea base near the Yalu mouth. This incident suggests two reflections—first that raids or attacks in rear of the "centre of operations" are valueless, however daring, and second that had Zasulich, in his determination to be worthy of his knighthood, concentrated for battle, the presence of the Madritov detachment on the field would have prevented the lamentable and costly misunderstandings of the retreat on Hamatan.

[3] The occupation of Siu-yen was chiefly the work of the brigade pushed out to his left by Kuroki. Only a portion of the 10th division from Takushan helped to drive away Mishchenko's Cossacks.

Tashichiao.

On the 24th Oku attacked, but the Russian general, Zarubayev, handled his troops very skilfully, and the Japanese were repulsed with a loss of 1200 men. Zarubayev, who had used only about half his forces in the battle, nevertheless retired in the night, fearing to be cut off by a descent of the approaching 4th Army on Haicheng, and well content to have broken the spell of defeat. Oku renewed the attack next day, but found only a rearguard in front of him, and without following up the retiring Russians he again halted for six days before proceeding to Haicheng to effect a junction with the 4th Army (Nozu), which meantime had won a number of minor actions and forced the passage of the mountains at Fenshuiling South.[1]

Actions on the eastern front.

The 1st Army, after its long halt at Feng-hwang-cheng, which was employed in minutely organizing the supply service—a task of exceptional difficulty in these roadless mountains—reopened the campaign on the 24th of June, but only tentatively on account of the discouraging news from Port Arthur. A tremendous rainstorm imposed further delays, for the coolies and the native transport that had been laboriously collected scattered in all directions. The Motienling pass, however, had been seized without difficulty, and Keller's power of counter-attack had been reduced to nothing by the despatch of most of his forces to the concentration at Tashichiao. But Oku's 2nd Army was now at a standstill at Kaiping, and until he was further advanced the 1st Army could not press forward. The captured passes were therefore fortified (as Feng-hwang-cheng had been) for passive resistance. This, and the movements of the 4th Army, which had set its face towards Haicheng and no longer seemed to be part of a threat on Liao-Yang, led to the idea being entertained at Kuropatkin's headquarters that the centre of gravity was shifting to the south. To clear up the situation Keller's force was augmented and ordered to attack Kuroki. It was repulsed with a loss of nearly 1000 men in the action at the Motienling (17th July), but it was at least ascertained that considerable forces were still on the Japanese right, and upon the arrival of a fresh army corps from Europe Kuropatkin announced his intention of attacking Kuroki. And in effect he succeeded in concentrating the equivalent of an army corps, in addition to Keller's force, opposite to Kuroki's right. But having secured this advantage he stood still for five days, and Kuroki had ample time to make his arrangements. The Japanese general occupied some 20 m. of front in two halves, separated by 6 m. of impassable mountain, and knowing well the danger of a "cordon" defensive, he met the crisis in another and a bolder fashion. Calling in the brigade detached to the assistance of Nozu as well as all other available fractions of his scattered army, he himself attacked on the 31st of July, all along the line. It was little more than an assertion of his will to conquer, but it was effectual. On his left wing the attacks of the Guard and 2nd divisions (action of Yang-tzu-ling) on the Russian front and flank failed. the frontal attack because of the resolute defence, the flank attack from sheer fatigue of the troops. Count Keller was killed in the defence. Meantime on the Japanese right the 12th division attacked the large bodies of troops that Kuropatkin had massed (Yu-shu-ling) equally in vain. But one marked success was achieved by the Japanese. The Russian 35th and 36th regiments (10th European Corps) were caught between two advancing columns, and, thanks to the initiative of one of the column leaders, Okasaki, destroyed. At night, discouraged on each wing by the fall of Count Keller and the fate of the 35th and 36th, the whole Russian force retired on Anping, with a loss of 2400, to the Japanese 1000 men.

Russian retirement on Liao-Yang.

This was the only manifestation of the offensive spirit on Kuropatkin's part during the six months of marking time. It was for defence, sometimes partial and elastic, sometimes rigid and "at-all-costs," that he had made his dispositions throughout. His policy now was to retire on Liao-Yang as slowly as possible and to defend himself in a series of concentric prepared positions. In his orders for the battle around his stronghold there is no word of counter-attack, and his central mass, the special weapon of the commander-in-chief, he gave over to Bilderling and to Zarubayev to strengthen the defence in their respective sections or posted for the protection of his line of retreat. Nevertheless he had every intention of delivering a heavy and decisive counterstroke when the right moment should come, and meantime his defensive tactics would certainly have full play on this prearranged battlefield with its elaborate redoubts, bombproofs and obstacles, and its garrison of a strength obviously equal (and in reality superior) to that of the assailants.

The Japanese, too, had effected their object, and as they converged on their objective, the inner flanks of the three armies had connected and the supreme commander Marshal Oyama had taken command of the whole. But, as the event was to prove, the military policy of Japan had failed to produce the requisite number of men for the desired Sedan, and so, instead of boldly pushing out the 1st Army to such a distance that it could manœuvre, as Moltke did in 1866 and 1870, he attached it to the general line of battle. It was not in two or three powerful groups but in one long chain of seven deployed divisions that the advance was made.

Battle of Liao-Yang.

On the 25th of August the 2nd and 4th Armies from Haicheng and the 1st Army from the Yin-tsu-ling and Yu-shu-ling began the last stage of their convergent advance. The Russian first position extended in a semicircle from Anshantien (on the Liao-Yang-Hai-cheng railway) into the hills at Anping, and thence to the Taitse river above Liao-Yang; both sides had mixed detachments farther out on the flanks. The first step in the Japanese plan was the advance of Kuroki's army to Anping. Throughout the 25th, night of 25th–26th, and 26th of August, Kuroki advanced, fighting heavily all along the line, until on the night of the 26th the defenders gave up the contested ground at Anping. Hitherto there had only been skirmishing on a large scale on the side of Hai-cheng. Kuropatkin having already drawn in his line of defence on the south side towards Liao-Yang, the 2nd and 4th Japanese Armies delivered what was practically a blow in the air. But on the 27th there was a marked change in the Japanese plan. The right of the 1st Army, when about to continue the advance west on Liao-Yang, was diverted northward by Oyama's orders and ordered to prepare to cross the Taitszeho. The retirement of the Russian Southern Force into its entrenchments emboldened the Japanese commander-in-chief to imitate Moltke's method to the full. On the 28th, however, the 1st Army made scarcely any progress. The right (12th) division reached the upper Taitszeho, but the divisions that were to come up on its left were held fast by their

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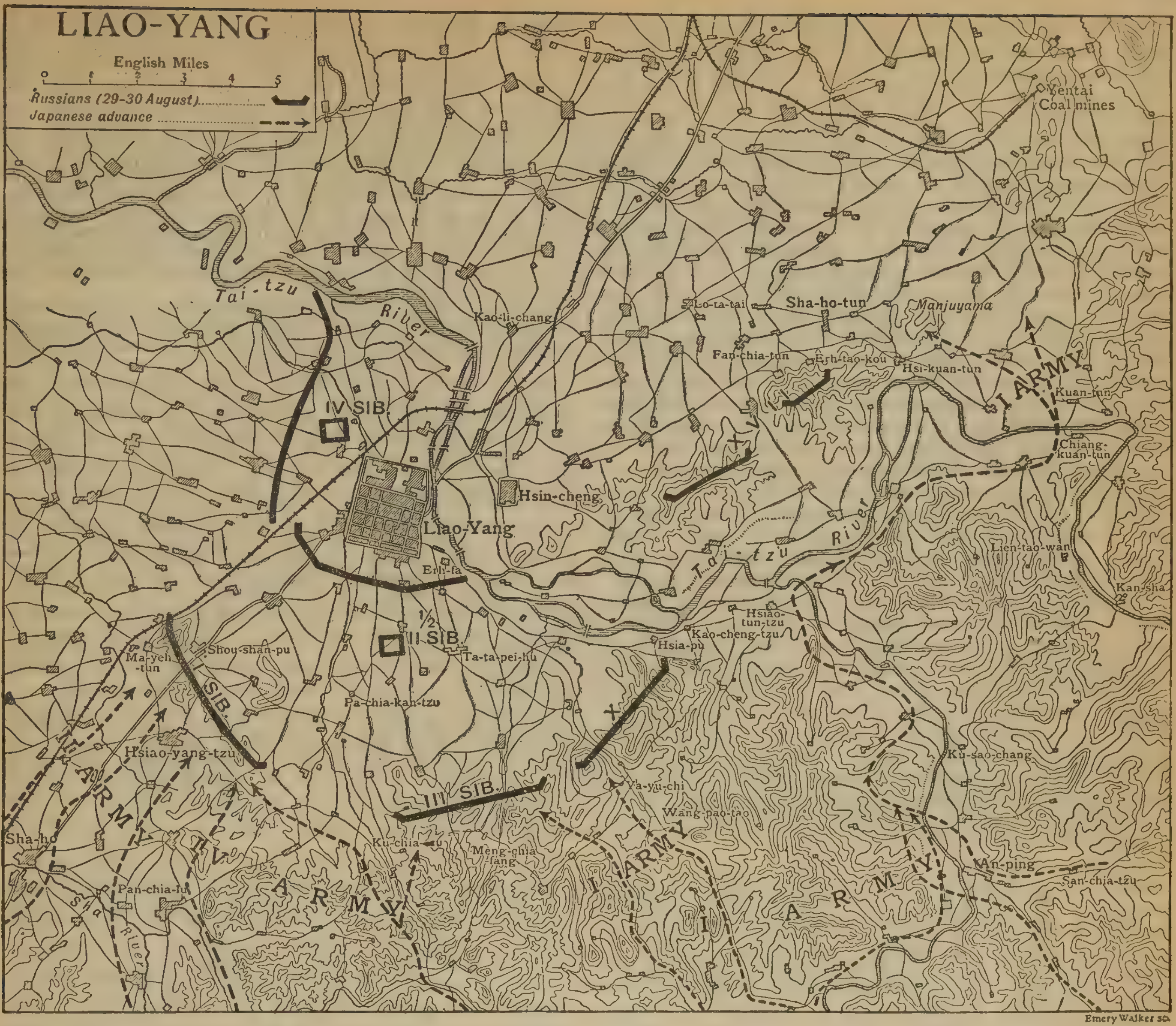
[1] The 5th division of the 2nd Army had been sent to join the 10th as the latter approached Hsimucheng. The Guard brigade of Kuroki's army which had served with Nozu in the advance had now returned to Feng-hwang-cheng.


LIAO-YANG
English Miles
0 1 2 3 4 5
Russians (29-30 August)
Japanese advance
Yentai Coal mines
Tai-tzu River
Kao-li-chang
Lo-ta-tai
Sha-ho-tun
Manjuyama
Fan-chia-tun
Erh-tao-kou
Hsi-kuan-tun
I ARMY
Kuan-tun
Chiang-kuan-tun
IV SIB.
XVII
Hsin-cheng
Liao-Yang
Erh-fa
Lien-tao-wan
Kan-sha
1/2
II SIB.
Hsiao-tun-tzu
Kao-cheng-tzu
Hsia-pu
Shou-shan-pu
Ma-yeh-tun
I SIB.
Ta-ta-pei-hu
Pa-chia-kan-tzu
X
Hsiao-yang-tzu
II ARMY
III SIB.
Ya-yu-chi
Wang-pao-tao
Ku-sao-chang
Sha-ho
Ku-chia-tzu
Meng-chia-fang
IV ARMY
GUARD
An-ping
San-chia-tzu
Pan-chia-fu
Sha River
I ARMY
Emery Walker sc.

opponents. The 29th was an uneventful day, on which both sides prepared for the next phase.

The Russians' semicircle, now contracted, rested on the Taitszeho above and below the town, and their forces were massed most closely on either side of the "Mandarin" road that the 1st Army had followed. Opposite this portion of the line was the Guard and the 4th Army. Oku was astride the railway, Kuroki extending towards his proposed crossing-points just beyond Kuropatkin's extreme left (the latter was behind the river). On the 30th the attack was renewed. The Guard, the 4th Army and the 2nd Army were completely repulsed.

On the night of the 30th the first Japanese troops crossed the Taitszeho near Lien-Tao-Wun, and during the 31st three brigades were deployed north of Kwan-tun, facing west. The Russian left wing observed the movement all day, and within its limited local resources made dispositions to meet it. Kuropatkin's opportunity was now come. The remainder of the 2nd division was following the 12th, leaving a nine-mile gap between Kuroki and Nozu, as well as the river. It was not into this gap, which had no military significance, but upon the isolated divisions of the 1st Army that the Russian general proposed to launch his counterstroke. Reorganizing his southern defences on a shorter front, so as to regain possession of the reserves that he had so liberally given away to his subordinates, he began to collect large bodies of troops opposite Kuroki, while Stakelberg and Zarubayev, before withdrawing silently into the lines or rather the fortress of Liao-Yang, again repulsed Oku's determined attacks on the south side. But it was not in confidence of victory that Kuropatkin began the execution of the new plan—rather as a desperate expedient to avoid being cut off by the 1st Army, whose strength he greatly overestimated.

On the morning of the 1st of September—the anniversary of Sedan, as the Japanese officers told their men—Oyama, whose intentions the active Kuroki had somewhat outrun, delivered a last attack with the 2nd and 4th Armies, and the Guard on the south front, in the hope of keeping the main body of the Russians occupied and so assisting Kuroki, but the assailants encountered no resistance, Zarubayev having already retired into the fortress. North of the Taitszeho the crisis was approaching. Kuroki's left, near the river, vigorously attacked a hill called Manjuyama which formed part of the line of defence of the XVII. Corps from Europe. But the right of the 1st Army (12th division) was threatened by the gathering storm of the counterstroke from the side of Yentai Mines, and had it not been that the resolute Okasaki continued the attack on Manjuyama alone, the Japanese offensive would have come to a standstill. Manjuyama, thanks to the courage of the army commander and of a single brigadier, was at last carried after nightfall, and the dislodged Russians made two counter-attacks in the dark before they would acknowledge themselves beaten. Next morning, when Kuroki, who had conceived the mistaken idea of a general retreat of the Russians on Mukden, was preparing to pursue, the storm broke. Kuropatkin had drawn together seven divisions on the left rear of the XVII. Corps, the strength of the whole being about 90,000. On the extreme left was Orlov's brigade of all arms at Yentai Mines, then came the I. Siberian Corps (Stakelberg), then the X. Corps, then the XVII. But Orlov, perplexed by conflicting instructions and caught in an unfavourable situation by a brigade of the 12th division which was executing the proposed "pursuit," gave way—part of his force in actual rout—and the cavalry that was with him was driven back by the Kobi (reserve army) brigade of the Guard. The fugitives of Orlov's command disordered the on-coming corps of Stakelberg, and the outer flank of the great counterstroke that was to have rolled up Kuroki's thin line came to an entire standstill. Meantime the X. Corps furiously attacked Okasaki on the Manjuyama, and though its first assault drove in a portion of Okasaki's line, a second and a third, made in the night, failed to shake the constancy of the 15th brigade. Misunderstandings and movements at cross-purposes multiplied on the Russian side, and at midnight Kuropatkin at last obtained information of events on the side of Yentai Mines. This was to the effect that Orlov was routed, Stakelberg's command much shaken, and at the same time Zarubayev in Liao-Yang, upon whom Oku and Nozu had pressed a last furious attack, reported that he had only a handful of troops still in reserve. Then Kuropatkin's resolution collapsed, although about three divisions were still intact, and he gave the order to retreat on Mukden.

Russian retreat on Mukden.

Thus the Japanese had won their great victory with inferior forces, thanks "in the first instance to the defeat of General Orlov. But at least as large a share in the ruin of the Russian operations must be attributed to the steadfast gallantry of the 15th brigade on Manjuyama." The losses of the Japanese totalled 23,000, those of the Russians 19,000. Coming, as it did, at a moment when the first attacks on Port Arthur had been repulsed with heavy losses, this brilliantly successful climax of the four months' campaign more than restored the balance. But it was not the expected Sedan. Had the two divisions still kept in Japan been present Kuroki would have had the balance of force on his side, the Russian retreat would have been confused, if not actually a rout, and the war would have been ended on Japan's own terms. As it was, after another day's fighting, Kuropatkin drew off the whole of his forces in safety, sharply repulsing an attempt at pursuit made by part of the 12th division on the 4th of September. The railway still delivered 30,000 men a month at Mukden, and Japan had for a time outrun her resources. At St Petersburg the talk was not of peace but of victory, and after a period of reorganization the Russians advanced afresh to a new trial of strength. But the remainder of the Manchurian campaign, like the second half of the war of 1859, was nothing more than a series of violent and resultless encounters of huge armies—armies far larger than those which had fought out the real struggle for supremacy at Liao-Yang and Magenta.

Nogi's advance on Port Arthur.

At this time the siege of Port Arthur had only progressed so far that the besiegers were able to realize the difficulties before them. Nogi landed on the 1st of June, and his army (1st and 11th divisions) gradually separated itself from Oku's and got into position for the advance on Port Arthur. Dalny, the commercial harbour, was seized without fighting, and a month was spent in preparing a base there. But so far from retiring within his fort-line Stessel took up a strong position outside. Dislodged from this on the 26th of June, the Russians checked Nogi's further advance on July 3–4 by a fierce, though unsuccessful, counterstroke. Having been reinforced by the 9th division and two extra brigades of infantry, Nogi advanced again on the 26th. The Russians, having had a month wherein to intrench themselves, held out all along the line; but after two days and one night of fighting amongst rocks and on precipitous hill-sides, the Japanese broke through on the night of July 27–28. Stessel then withdrew in good order into Port Arthur, which in the two months he had gained by his fighting manœuvre had been considerably strengthened. Nogi had already lost 8000 men.

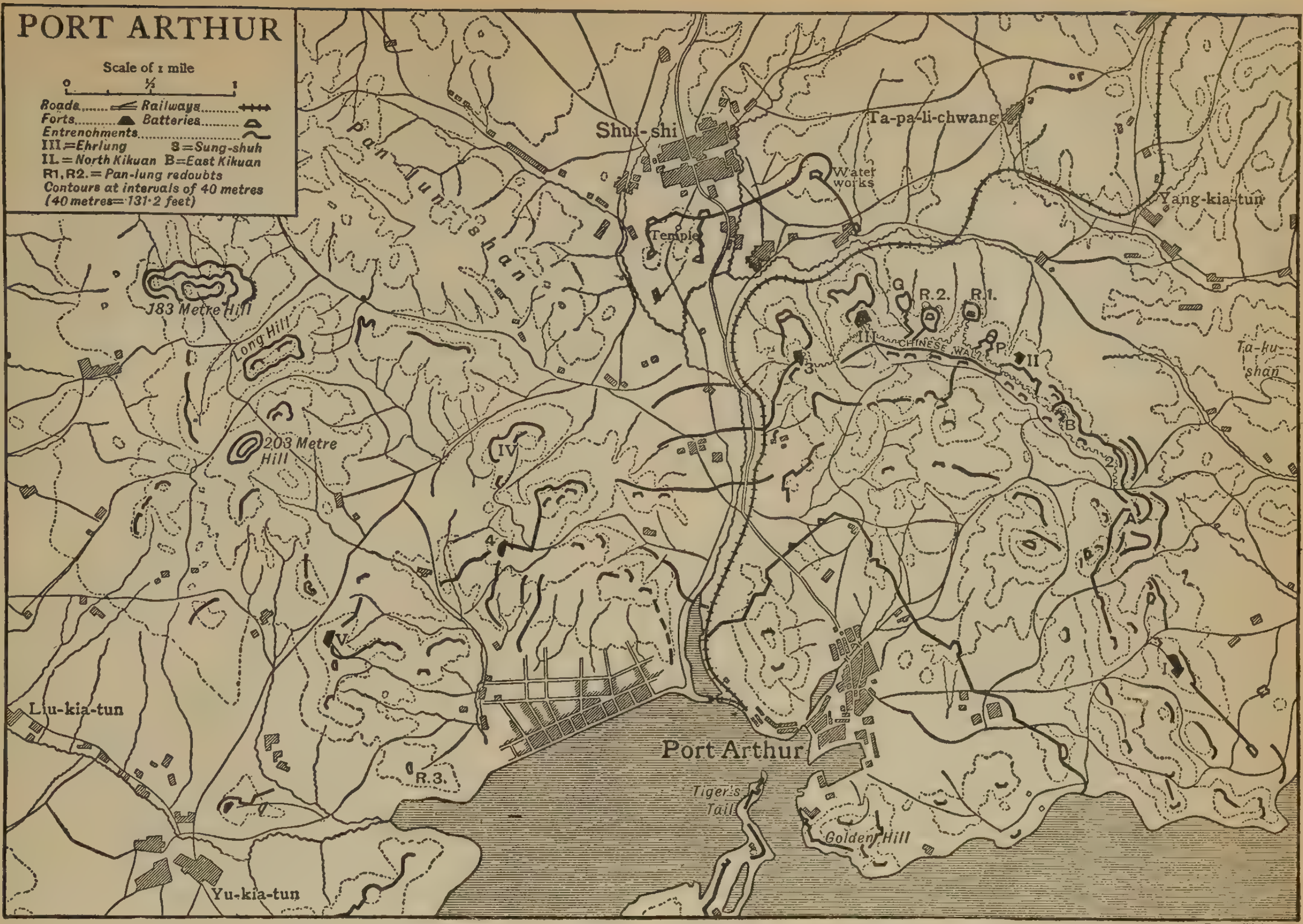
The defences of Port Arthur, as designed by the Russians in 1900, and owing to the meagre allotment of funds only partially carried out before the war, had some tincture, but no more, of modern continental ideas. There was a continuous enceinte of plain trace round the Old Town, at a distance of 1000 to 2000 yds. from it, which had not and could not have had any influence on the issue of the siege. The main line of defence followed the outer edge of the amphitheatre of hills surrounding the harbour. These hills had their greatest development on the N.E. side, their outer crests being some 4000 yds. from the Old Town. West of the Lun river the defensive line offered by the hills is less defined, and the line adopted for the permanent works was on the north only 3000 yds. from the harbour and 2000 yds. from the New Town. Running S.W. and S. back to the coast, it gradually draws in quite close to the S.W. end of the harbour. The total length of this line from sea to sea is some 12 m. Its most obvious weakness is that 5000 yds. N.W. of the harbour and New Town the now famous "203-Metre Hill" overlooks both. Here it had been intended to construct permanent works, but considerations of expenditure had caused this to be deferred.

Defences of Port Arthur.

On this main line of defence some seven or eight permanent works had been disposed (it is difficult to define with accuracy, as some of the concreted works were little better than semi-permanent in character). Some of these had been prepared with interior parapets and platforms of concrete for medium guns. Fort Erh-Lung was of this character. The general design appears to have been grounded on the French detached forts of the 'seventies (see FORTIFICATION), as the front parapet was designed for infantry and the interior, 10 ft. higher, for guns. The ditch, 30 ft. deep, excavated in the rock, was flanked by counterscarp galleries. The living casemates were under the gorge parapet. A grave defect in the design was that there was no covered communication between these casemates and the parapets. Fort Chi-Kuan had no artillery parapet. The ditch, 12 to 15 ft. deep, was defended by counterscarp galleries. The casemates in the gorge, partially cut off from the terreplein by a couple of deep sunk yards or areas, could be defended in the last resort as a keep. In addition to this the terreplein was retrenched. In both of these forts there was an apparently meaningless projection at the gorge. It is possible that these were embryonic "batteries traditores" to flank the intervals. Fort Sung-Shu was of the same type as Chi-Kuan. These three were the only permanent forts seriously attacked.

The permanent works were supplemented before the siege began by a prodigious development of semi-permanent works and trenches. Every knoll had its redoubt or battery, and the trenches were arranged line behind line, to give supporting, cross and enfilade fire in every direction. Thus on the north front, from Chi-Kuan battery to Sung-Shu, a distance of about two miles, there were three permanent forts and seven semi-permanent works and batteries. Behind these was the "Chinese Wall," and behind that more batteries and trenches. On the north-west front, 203-Metre Hill, in advance of the main line, was occupied by strong semi-permanent works, with trenches and redoubts to either flank; and 174-Metre Hill, 1500 yds. beyond it, was also held. The Lun-Ho valley where it cut through the line was closed by entanglements and fougasses, and swept by batteries on each side. In front of the centre, the Waterworks Redoubt, a semi-permanent work covering the Port Arthur water supply, and connected by trenches with the four Temple Redoubts a mile away to the west, formed a strong advanced position. Wire entanglements were disposed in repeated lines in front of the defences, but they were not of a strong type. The Russians, with the resources of the fleet at their disposal (just as at Sevastopol), used great numbers of machine guns and electric lights, and the available garrison at first was probably, including sailors, 47,000 men.

Such were the defences that the Japanese attacked, with a force at the outset (30th of July) little more than superior numerically to the defenders, and an entirely inadequate siege train (18 6-in. howitzers, 60 4·7-in. guns and howitzers, and about 200 field and mountain guns). They were imperfectly informed of the strength of the garrison and the nature of the defences. Recollections of their easy triumph in 1894 and perhaps thoughts of Sevastopol, German theories of the "brusque attack," the fiery ardour of the army, and above all the need of rapidly crushing or expelling the squadron in harbour, combined to suggest a bombardment and general assault. The bombardment began on the 19th of August and continued for three days, while the infantry was spreading along the front and gaining ground where it could. The real assault was made on the night of the 21st on the two Pan-Lung forts (semi-permanent) on the centre of the north-eastern front. The fighting was of the utmost severity, and continued through the 22nd; and although the stormers captured the two forts they were absolutely unable to make any further progress under the fire of the permanent forts Erh-Lung and Chi-Kuan on either side of, and the Wan-tai fort behind, Pan-Lung. Every attempt to bring up supports to the captured positions failed, and the Russians concentrated on the spot from all quarters. On the night of the 23rd–24th, just as the assault was being renewed, Stessel delivered a fierce counter-attack against the lost positions, and the result of an all-night battle was that though the forts were not recaptured, the assault was repulsed with over 5000 casualties, and the Japanese in Pan-Lung were isolated. This sortie raised the spirits of the Russians to the highest pitch. They seemed indeed to have broken the spell of defeat. On the Japanese side 15,000



men had been killed and wounded in three weeks. The Russians strengthened their works around the captured forts in such a way as effectually to prevent farther advance, and the Japanese 3rd Army had now to resign itself to a methodical siege. Small sorties, partial attacks[1] and duels between the Japanese guns and the generally more powerful ordnance of the fortress continued. The siege approaches were first directed against the Temple-Waterworks group, which was stormed on the 19th and 20th of September. Pan-Lung was connected with the Japanese lines by covered ways, approaches were begun towards several of the eastern forts, and on the 20th of September 180-Metre Hill was stormed, though the crest was untenable under the fire from 203-Metre Hill. The Japanese were now beginning to pay more attention to the western side of the fortress, and from the 19th to the 22nd there was hard fighting around 203-Metre Hill, the attack being eventually repulsed with the loss of 2000 men. Operations in the west were thereupon abandoned for the time being, and the eastern forts remained the principal objective of the attack. Heavier howitzers had been sent for from Japan, and on the 1st of October the first batteries of 28 centimetre (11 in.) howitzers came into action. They fired a shell weighing 485 ℔ with a bursting charge of 17 ℔. On the 12th, the Japanese took the trenches between the Waterworks Redoubt and Erh-Lung, and cut the water-supply. Saps were then pushed on against Erh-Lung, and to help in their progress a Russian advanced work called "G" was captured on the 16th, by a skilfully combined attack of infantry and artillery. From this time forward there was a desperate struggle at the sapheads on the north front.[2]

Attacks on the north front.

On the 26th of October another assault was made on Chi-Kuan Fort and Battery, and was continued at intervals, varied by Russian counter-attacks, till the 2nd of November. By this time the Japanese were becoming disheartened. They had incurred an additional loss of 13,000 men without substantial gain, except a lodgment on the counterscarp of Sung-Shu. This prepared the way for mining, which had already been begun at Erh-Lung. On the 17th of November seven mines were exploded at Sung-Shu, which blew in the back of the counterscarp galleries. At Erh-Lung on the 20th of November three mines were exploded, which half filled the ditch, and the Japanese later on sapped across to the escarp over the *débris*. At Chi-Kuan, the counterscarp gallery had been breached by an ill-managed Russian mine on the 23rd of October and the Japanese got in through the breach and made a lodgment. They did not, however, get possession of the whole of the counterscarp galleries before about the middle of November. On the 22nd of November the Japanese assaulted the trench round Chi-Kuan battery. It was captured and retaken by counter-attack twice between 6 p.m. and 1 a.m. In this fight each side was using corpses as breastworks.

On the 26th of November another assault was made on the same lines as that of the 30th of October. By this time the besiegers were sapping under the escarps of the northern forts, and it would have been better to delay. But the situation was serious in the extreme. In Manchuria Kuropatkin's army had reasserted itself. From Europe Rozhestvenski's squadron was just setting sail for the Far East. Marshal Oyama sent his principal staff officers to stimulate Nogi to fresh efforts, and some exhausted units of the besieging army were replaced by fresh troops from Japan. With 100,000 men and this urgent need of immediate victory, Nogi and the marshal's staff officers felt bound to make a third general assault. The siege works had indeed made considerable progress. The ditches of Sung-Shu and Erh-Lung were partially filled. They held most of the ditch of Chi-Kuan Fort and were cutting down the escarp, and two parallels had been made only 30 yds. from the Chinese Wall at "G" and Pan-Lung.

The general attack was made at 1 p.m. At Sung-Shu the stormers got into the fort, but suffered much from the artillery on the western side of the Lun-ho valley, and were beaten out of it again in 20 minutes; 2000 men tried in vain to get up the Lun-ho valley to take Sung-Shu in rear. At Erh-Lung they could not get over the outer parapet. At "G" they took a portion of the Chinese Wall and lost it again, other trenches with a cross fire being behind. At Pan-Lung the machine guns on the Wall prevented them from leaving the parallel. At Chi-Kuan Fort the terreplein of the fort had been covered with entanglements defended by machine guns on the gorge parapets, and the Japanese could make no way. Briefly, there was a furious fight all along the line, and nothing gained. On the 27th of November, after losing 12,000 men, the assault was abandoned. On the north front the Japanese returned to mining.

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[1] A particular feature of these constant night-fights was the effective use of the defenders' searchlight, not only to show up the enemy but to blind him.

[2] Hand grenades and extemporized trench mortars were used on both sides with very great effect. The Japanese hand grenades consisted of about 1 ℔ of high explosive in a tin case; the Russian cases were of all sorts, including old Chinese shell. The Japanese employed wire-netting screens to stop the Russian grenades. Various means were tried for the destruction of entanglements. Eventually it was found that the best plan was to sap through them.

203-Metre Hill.

But so urgent was the necessity of speedy victory that the fighting had to continue elsewhere. And at last, after every other point had been attempted, the weight of the attack was directed on 203-Metre Hill. A battery of 11-inch howitzers was established only one mile away. On the 28th of November assaults were made and failed. On the 30th of November an attack with fresh troops failed again. On the 1st of December there was a heavy bombardment by the big howitzers, which obliged the Russians to take shelter in rear of the ruined works. On the 2nd of December the Russians tried a counter-attack. During the next two days the artillery were busy. The engineers sapped up to the ruins of the western work, saw the shelters on the reverse slope and directed artillery fire by telephone. Thirty-six guns swept the ground with shrapnel. Finally on the 5th of December the Japanese attacked successfully. Their losses in the last ten days at 203-Metre Hill had been probably over 10,000. Those of the Russians were about 5000, chiefly from artillery fire.

This was the turning-point of the siege. At once the 11-inch howitzers, assisted by telephone from 203-Metre, opened upon the Russian ships; a few days later these were wholly *hors de combat*, and at the capitulation only a few destroyers were in a condition to escape. The siege was now pressed with vigour by the construction of batteries at and around 203 Metre, by an infantry advance against the main western defences, and by renewed operations against the eastern forts. The escarp of Chi-Kuan was blown up, and at the cost of 800 men, General Sameyeda (11th division), personally leading his stormers, captured the great fort on the 19th of December. The escarp of Ehr-Lung was also blown up, and the ruins of the fort were stormed by the 9th division on the 28th of December, though a mere handful of the defenders prolonged the fighting for eight hours and the assailants lost 1000 men. Sung-Shu suffered a worse fate on the 31st, the greater part of the fort and its defenders being blown up, and on this day the whole defence of the eastern front collapsed. The Japanese 7th and 1st divisions were now advancing on the western main line; the soul of the defence, the brave and capable General Kondratenko, had been killed on the 15th of December, and though the Japanese seem to have anticipated a further stand,[1] Stessel surrendered on the 2nd of January 1905, with 24,000 effective and slightly wounded and 15,000 wounded and sick men, the remnant of his original 47,000. The total losses of the 3rd Japanese Army during the siege were about 92,000 men (58,000 casualties and 34,000 sick).

Fall of Port Arthur.

Naval battle of August 10.

Meanwhile the Japanese navy had scored two important successes. After months of blockade and minor fighting, the Russian Port Arthur squadron had been brought to action on the 10th of August. Admiral Vitheft, Makárov's successor, had put to sea shortly after the appearance of the 3rd Army on the land front of Port Arthur. The battle opened about noon, 20 m. south of the harbour; the forces engaged on each side varied somewhat, but Togo finally had a superiority. Admiral Vitheft was killed. As the Russians became gradually weaker, the Japanese closed in to within 3 m. range, and Prince Ukhtomsky (who succeeded to the command on Vitheft's fall) gave up the struggle at nightfall. The Russians scattered, some vessels heading southward, the majority with the admiral making for Port Arthur, whence they did not again emerge. All the rest were either forced into neutral ports (where they were interned) or destroyed, among the latter being the third-class cruiser "Novik," which had already earned a brilliant reputation for daring, and now steamed half round Japan before she was brought to action and run ashore. The victors blockaded Port Arthur, until near the close of the siege, when, after going ashore and examining the remnant of the Russian fleet from 203-Metre Hill, Togo concluded that it would be safe to return to Japan and give his ships a complete refit. Kaimura's squadron, after various adventures, at last succeeded on the 14th of August in engaging and defeating the Russian Vladivostok squadron (Admiral Jessen). Thus the Russian flag disappeared from the Pacific, and thenceforward only the Baltic fleet could hope seriously to challenge the supremacy of the Japanese navy.

The remainder of the war on land, although it included two battles on a large scale and numerous minor operations, was principally a test of endurance. After Liao-Yang there were no extended operations, the area of conflict being confined to the plain of the coast side of the Hun-ho and the fringe of the mountains. Japan had partially accomplished her task, but had employed all her trained men in this partial accomplishment. It was questionable, even in October 1904, whether she could endure the drain of men and money, if it were prolonged much further. On the other hand, in Russia opposition to the war, which had never been popular, gradually became the central feature of a widespread movement against irresponsible government. Thus while the armies in Manchuria faced one another with every appearance of confidence, behind them the situation was exceedingly grave for both parties. A state of equilibrium was established, only momentarily disturbed by Kuropatkin's offensive on the Sha-ho in October, and by the Sandepu incident in the winter, until at last Oyama fought a battle on a grand scale and won it. Even then, however, the results fell far short of anticipation, and the armies settled down into equilibrium again.

Sha-ho.

After the battle of Liao-Yang Kuropatkin reverted for a moment to the plan of a concentration to the rear at Tieling. Politically, however, it was important to hold Mukden, the Manchurian capital, and since the Japanese, as on previous occasions, reorganized instead of pursuing, he decided to stand his ground, a resolution which had an excellent effect on his army. Moreover, growing in strength day by day, and aware that the Japanese had outrun their powers, he resolved, in spite of the despondency of many of his senior officers, to take the offensive. He disposed of about 200,000 men, the Japanese had about 170,000. The latter lay entrenched north of Liao-Yang, from a point 9 m. west of the railway, through Yentai Station and Yentai Mines, to the hills farther east. There had been a good deal of rain, and the ground was heavy. Kuropatkin's intention was to work round the Japanese right on the hills with his eastern wing (Stakelberg), to move his western wing (Bilderling) slowly southwards, entrenching each strip of ground gained, and finally with the centre—*i.e.* Bilderling's left—and Stakelberg, to envelop and crush the 1st Army, which formed the Japanese right, keeping the 4th Army (Nozu) and the 2nd Army (Oku) in countenance by means of Bilderling's main body. The manœuvre began on the 5th of October, and by the evening of the 10th, after four days of fairly heavy advanced-guard fighting, chiefly between Bilderling and Nozu, Stakelberg was in his assigned position in the mountainous country, facing west towards Liao-Yang, with his left on the Taitseho. The advance of Bilderling, however, necessarily methodical and slow in any case, had taken more time than was anticipated. Still, Bilderling crossed the Sha-ho and made some progress towards Yentai, and the demonstration was so far effectual that Kuroki's warnings were almost disregarded by the Japanese headquarters. The commander of the 1st Army, however, took his measures well, and Stakelberg found the greatest trouble in deploying his forces for action in this difficult country. Oyama became convinced of the truth on the 9th and 10th, and prepared a great counter-attack. Kuroki with only a portion of the 1st Army was left to defend at least 15 m. of front, and the entire 2nd and 4th Armies and the general reserves were to be thrown upon Bilderling. On the 11th the real battle opened. Kuroki displayed the greatest skill, but he was of course pressed back by the four-to-one superiority of the Russians. Still the result of Stakelberg's attack, for which he was unable to deploy his whole force, was disappointing, but the main Japanese attack on Bilderling was not much more satisfactory, for the Russians had entrenched every step of their previous advance, and fought splendidly. The Russian commander-in-chief states in his work on the war that Bilderling became engaged *à fond* instead of gradually withdrawing as Kuropatkin intended, and at any rate it is unquestioned that in consequence of the serious position of affairs on the western wing, not only did Stakelberg use his reserves to support Bilderling, when the 12th division of Kuroki's army was almost at its last gasp and must have yielded to fresh pressure, but Kuropatkin himself suspended the general offensive on the 13th of October. In the fighting of the 13th–16th of October the Russians gradually gave back as far as the line of the Sha-ho, the Japanese following until the armies faced roughly north and south on parallel fronts. The fighting, irregular but severe, continued. Kuropatkin was so far averse to retreat that he ordered a new offensive, which was carried out on the 16–17th. Putilov and Novgorod hills, south of the Sha-ho, were stormed by the Russians, and the Japanese made several efforts to retake these positions without success. Kuropatkin wished to continue the offensive, but his corps commanders offered so much opposition to a further offensive that he at last gave up the idea. The positions of the rival armies from the 18th of October, the close of the battle of the Sha-ho, to the 26th of January 1905, the opening of the battle of Sandepu (Heikoutai)—a period almost entirely devoid of incident—may be described by the old-fashioned term "winter quarters." The total losses of the Russians are stated as 42,000 men, but this is very considerably exaggerated; the Japanese acknowledged 20,000 casualties.

In January 1905, apart from Mishchenko's cavalry raid in rear

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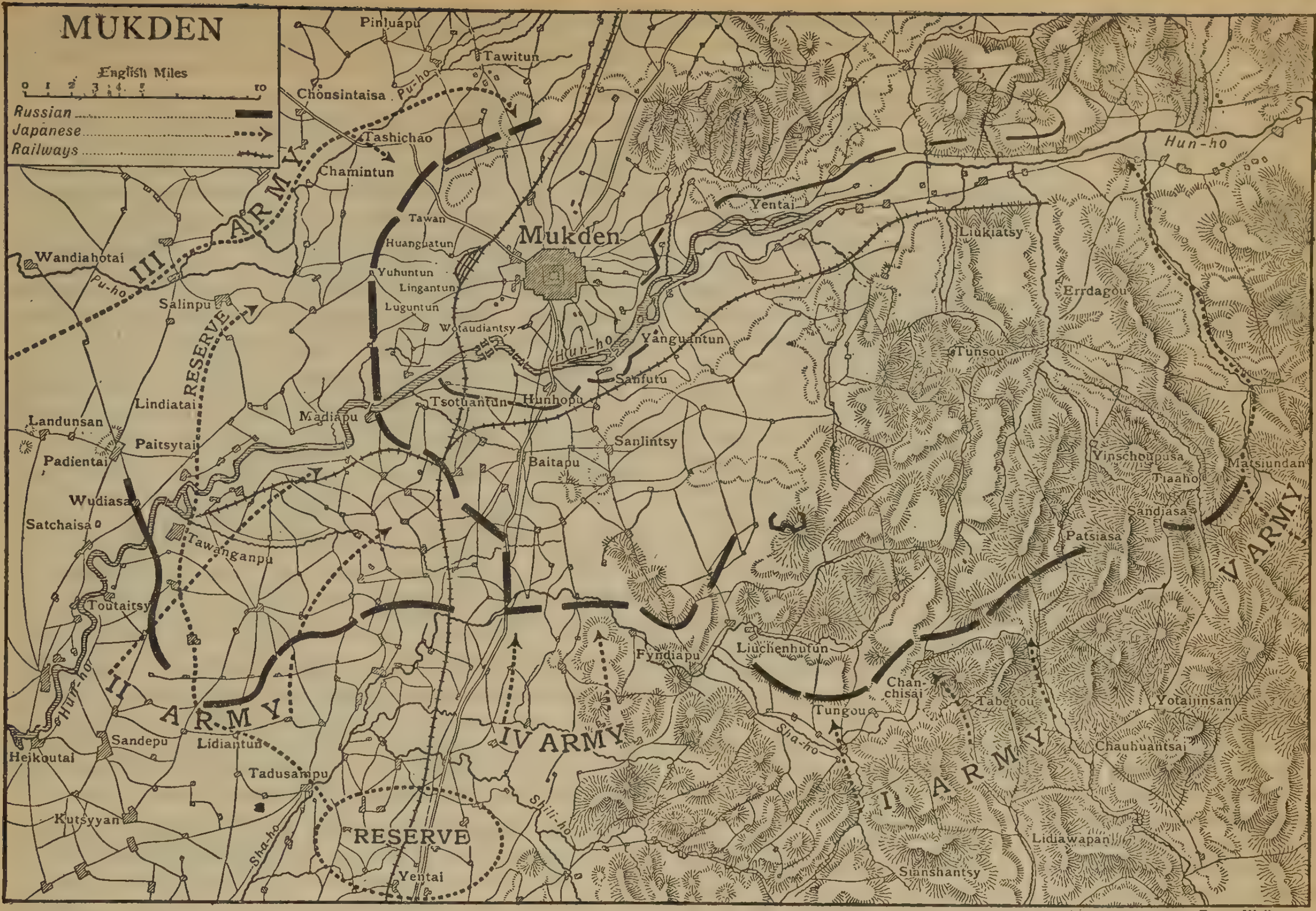
[1] As regards food and ammunition, the resources of the defence were not by any means exhausted, and General Stessel and other senior officers of the defence were tried by courts-martial, and some of them convicted, on the charge of premature surrender.


MUKDEN
English Miles
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Russian
Japanese
Railways
Pinluapu
Tawitun
Chonsintaisa
Pu-ho
Tashichao
Chamintun
III. ARMY
Wandiahotai
Pu-ho
Salinpu
RESERVE
Tawan
Huangbatun
Yuhuntun
Lingantun
Luguntun
Mukden
Wotaudiantsy
Hun-ho
Yanguantun
Sanfutu
Tsotuantun
Hunhopu
Madiapu
Lindiatai
Landunsan
Paitsytai
Padientai
Wudiasa
Satchaisa
Tawanganpu
Baitapu
Sanlintsy
Toutaitsy
II. ARMY
Hun-ho
Sandepu
Heikoutai
Lidiantun
Tadusampu
Kutsyyan
Sha-ho
RESERVE
Yentai
IV ARMY
Fyndiapu
Liuchenhutun
Chan-chisai
Tungou
Sha-ho
Taberou
I. ARMY
Chauhuantsai
Lidiawapan
Sianshantsy
Yotaijinsan
Patsiasa
Sandjasa
Tiaaho
Yinschoupusa
Matsiundan
V ARMY
Tunsou
Errdagou
Liukiatsy
Yentai
Hun-ho

Emery Walker sc.

of Oyama's forces (January 8th–16th) the only change in the relative positions of Oyama and Kuropatkin as they stood after the battle of the Sha-ho was that the Japanese had extended somewhat westwards towards the Hun-ho. The Russians, 300,000 strong, were now organized in three armies, commanded by Generals Linievich, Grippenberg and Kaulbars; the total strength of the Japanese 1st, 2nd and 4th Armies and reserve was estimated by the Russians at 220,000. Towards the end of January, Kuropatkin took the offensive. He wished to inflict a severe blow before the enemy could be reinforced by the late besiegers of Port Arthur, and sent Grippenberg with seven divisions against Oku's two on the Japanese left. The battle of Sandepu (Heikoutai), fought in a terrible snowstorm on the 26th and 27th of January 1905, came near to being a great Russian victory. But the usual *décousu* of Russian operations and their own magnificent resistance saved the Japanese, and after two days' severe fighting, although Grippenberg had not been checked, Kuropatkin, in face of a counter-attack by Oyama, decided to abandon the attempt. The losses were roughly 8000 Japanese to over 10,000 Russians.

Both sides stood fast in the old positions up to the verge of the last and greatest battle. Kuropatkin was reinforced, and appointed Kaulbars to succeed Grippenberg and Bilderling to the command of the 3rd Army vacated by Kaulbars. On the other hand, Nogi's 3rd Army, released by the fall of Port Arthur, was brought up on the Japanese left, and a new army under Kawamura (5th), formed of one of the Port Arthur and two reserve divisions, was working from the upper Yalu through the mountains towards the Russian left rear. The Russian line in front of Mukden from the Hun-ho, through the Putilov and Novgorod hills on the Sha-ho, to the mountains, was 47 m. long, the armies from right to left being II. (Kaulbars), III. (Bilderling) and I. (Linievich); a general reserve was at Mukden. On the other side from left to right, on a line 40 m. long, were Oku (2nd Army), Nozu (4th), Kuroki (1st) and Kawamura (5th), the general reserve in rear of the centre at Yentai and the 3rd Army in rear of Oku. Each side had about 310,000 men present. The entire front of both armies was heavily entrenched. The Russians had another offensive in contemplation when the Japanese forestalled them by advancing on the 21st of February. The 5th Army gradually drove in Kuropatkin's small detachments in the mountains, and came up in line with Kuroki, threatening to envelop the Russian left. The events on this side and misleading information induced Kuropatkin to pay particular attention to his left. The Japanese 1st and 5th Armies were now engaged (25th February), and elsewhere all was quiet. But on the 27th the fighting spread to the centre, and Nogi (originally behind Oku) was on the march to envelop the Russian right. He was held under observation throughout by Russian cavalry, but it seems that little attention was paid to their reports by Kuropatkin, who was still occupied with Kuroki and Kawamura, and even denuded his right of its reserves to reinforce his left. With a battle-front exceeding two days' marches the wrong distribution of reserves by both sides was a grave misfortune. Kuropatkin was at last convinced, on the 28th of February, of the danger from the west, and did all in his power to form a solid line of defence on the west side of Mukden. Nogi's first attack (1st–2nd March) had not much success, and a heavy counterstroke was delivered on the 2nd. Fighting for localities and alterations in the interior distribution of the opposing forces occupied much time, and by the 3rd, though the battle had become severe, Kuropatkin had merely drawn in his right and right centre (now facing W. and S.W. respectively) a little nearer Mukden. His centre on the Sha-ho held firm, Kuroki and Kawamura made but slight progress against his left in the mountains. Nogi and Oyama were equally impressed with the strength of the new (west) Russian front, and like Grant at Petersburg in 1864, extended farther and farther to the outer flank, the Russians following suit. The Japanese marshal now sent up his army reserve, which had been kept far to the rear at Yentai, to help Nogi. It was not before the evening of the 6th of March that it came up with the 3rd Army and was placed in position opposite the centre of the Russian west front. **On**

Mukden.

the rest of the line severe local fighting had continued, but the Russian positions were quite unshaken, and Kuropatkin's reserves—which would have been invaluable in backing up the counter-attack of the 2nd of March—had returned to face Nogi. He had organized another counterstroke for the 6th, to be led by Kaulbars, but this collapsed unexpectedly after a brief but severe fight.

Russian retreat on Tieling.

Kuropatkin now decided to draw in his centre and left towards Mukden. On the 7th, the various columns executed their movement to the Hun-ho with complete success, thanks to good staff work. The Japanese followed up only slowly. Nogi and Kaulbars stood fast, facing each other on the west front; after the arrival of the general reserve, Nogi was able to prolong his line to the north and eventually to bend it inwards towards the Russian line of retreat. Bilderling and Linievich were now close in to Mukden and along the Hun-ho. On the other side Oku had taken over part of Nogi's line, thus freeing the 3rd Army for further extension to the north-west, and the rest of the 2nd Army, the 4th, the 1st and the 5th were approaching the Hun-ho from the south (March 8th). On this day the fighting between Nogi and Kaulbars was very severe, and Kuropatkin now made up his mind to retreat towards Tieling. On the 9th, by Oyama's orders, Nogi extended northward instead of further swinging in south-eastward, Oku now occupied all the original line of the 3rd Army, Nozu alone was left on the south front, and Kuroki and Kawamura began to engage Linievich seriously. But Nogi had not yet reached the Mukden–Tieling railway when, on the night of the 9th, every preparation having been made, Kuropatkin's retreat began. On the 10th, covered by Kaulbars, who held off Nogi, and by strong rearguards at and east of Mukden, the movement continued, and though it was not executed with entire precision, and the rearguards suffered very heavily, the Russians managed to draw off in safety to the northward. On the evening of the 10th, after all their long and hardly contested enveloping marches, Nogi's left and Kawamura's right met north of Mukden. The circle was complete, but there were no Russians in the centre, and a map of the positions of the Japanese on the evening of the 10th shows the seventeen divisions thoroughly mixed up and pointing in every direction but that of the enemy. Thus the further pursuit of the Russians could only be undertaken after an interval of re-organization by the northernmost troops of the 5th and 3rd Armies. But the material loss inflicted on the Russians was far heavier than it had ever been before. It is generally estimated that the Russian losses were no less than 97,000, and the Japanese between 40,000 and 50,000. Japan had had to put forth her supreme effort for the battle, while of Russia's whole strength not one-tenth had been used. But Russia's strength in Europe, with but one line whereby it could be brought to bear in the Far East, was immaterial, and on the theatre of war a quarter of the Russian field forces had been killed, wounded or taken.

Rozhestvenski's voyage.

Battle of Tsushima (Sea of Japan).

It remains to narrate briefly the tragic career of the Russian Baltic fleet. Leaving Libau on the 13th–15th of October 1904, the fleet steamed down the North Sea, expecting every night to be attacked by torpedo-boats. On the 21st, in their excitement, they opened fire on a fleet of British trawlers on the Dogger Bank (*q.v.*), and several fishermen were killed. This incident provoked the wildest indignation, and Russia was for some days on the verge of war with England. A British fleet "shadowed" Rozhestvenski for some time, but eventually the Russians were allowed to proceed. On reaching Madagascar, Rozhestvenski heard of the fall of Port Arthur, and the question of returning to Russia arose. But a reinforcement under Rear-Admiral Nebogatov was despatched from the Baltic via Suez early in March 1905, and the armada proceeded by the Straits of Malacca, Nebogatov joining at Kamranh Bay in Cochin China. The united fleet was formidable rather in number than in quality; the battleships were of very unequal value, and the faster vessels were tied to the movements of many "lame ducks." Rozhestvenski had, moreover, numerous store-ships, colliers, &c. Nevertheless, the Japanese viewed his approach with considerable anxiety, and braced themselves for a final struggle. Of the various courses open to him, Togo prudently chose that of awaiting Rozhestvenski in home waters. The Russians left Kamranh on the 14th of May, and for a time disappeared into the Pacific. It was assumed that they were making for Vladivostok either via Tsushima strait or by the Pacific. Rozhestvenski chose the former course, and on the 27th of May the fleets met near Tsushima. About 1.45 p.m., the Russians, who were still in a close cruising formation, attempted to open out for battle as the Japanese approached. The Russian battleships, originally heading N.N.E., swerved to the E. as the Japanese battle squadron passed across their front. Togo's fire was concentrated first on the "Osliabia," the leading Russian battleship, and by 2.25 she was *hors de combat*. At this time both the battle-fleets were running E. Togo, concentrating his fire on each ship in succession, and seeking by superior speed to head off the Russians, now inclined towards the S.E., and the Russians conformed. At 3, the Russian flagship "Suvarov" had fallen out of the line, though still firing. Rozhestvenski himself had been wounded, and the command had devolved on Nebogatov. Shortly afterwards the Russians suddenly turned N., and sought to pass, across the wake of Togo's battle-fleet, up the straits. Thereupon the leading Japanese ships promptly turned together, covered by the rear ships, which ran past them on the original course and then came round in succession; this manœuvre was so well executed that the Japanese again headed off their enemy, who swerved for the second time towards the E. The Japanese thereupon executed the same manœuvre as before, and steamed S.E. again (about 4.40). They were not unscathed, but the Russians were suffering far more severely. Meanwhile, the cruisers on both sides had been heavily engaged. The Russian cruisers kept on the right of their battleships, while the Japanese, very superior in speed, ran S., S.E. and E. across the rear of the enemy's main squadron, and about 3 ranged up alongside the Russian cruisers. The latter were slower, and hampered by the crowd of damaged battleships, store-ships and colliers; before 5 they were in the greatest confusion, which was presently increased by the battleship squadron, now turned back and heading W., with Togo in pursuit. The Russians again broke out northward; but some of the Japanese squadrons hung on to the remnant of the enemy's battle-fleet, and the others dealt with the numerous Russian vessels that were unable to keep up. Then Togo called off his ships, and gave the torpedo craft room and the night in which to act. At daylight the larger ships joined in again, and before long the whole Russian fleet, with few exceptions, had been captured or sunk.

The Peace of Portsmouth.

After the disasters of Mukden and Tsushima, and being threatened with internal disorder in European Russia, the tsar, early in June, accepted the mediation of the president of the United States, and *pourparlers* were set on foot. The war meanwhile drifted on through May, June and July. Linievich, who succeeded Kuropatkin shortly after the battle of Mukden, retired slowly northward, re-organizing his forces and receiving fresh reinforcements from Europe. A Japanese expedition occupied Saghalien (July 8–30), and another, General Hasegawa, advanced through Korea towards Vladivostok. But the fighting was desultory. The peace negotiations were opened at Portsmouth, New Hampshire, on the 9th of August, and by the end of the month the belligerents had agreed as to the main points at issue, that Russia should cede the half of Saghalien, annexed in 1875, surrender her lease of the Kwangtung peninsula and Port Arthur, evacuate Manchuria and recognize Japan's sphere of influence in Korea. The treaty of peace was signed on the 23rd of August 1905.

Bibliography.—The first place in the already numerous works on the war is by the general consent of military Europe awarded to General Sir I. S. M. Hamilton's *A Staff Officer's Scrap Book*, and the second to the reports of the British attachés (*The Russo-Japanese War: British Officers' Reports*, War Office, 1908). Other first-hand narratives of importance are the American officers' reports (*Reports of Military Observers*, General Staff, U.S.A.); Major v. Tettau's *18 Monate beim Heere Russlands*; von Schwarz, *Zehn Monate beim Heere Kuropatkin's*, and Kuropatkin's own work (part of which has been translated into English). Of detailed military histories the principal are the semi-official series of narratives and monographs produced by the Austrian military journal "Streffleur" (*Einzelschriften über den russ.-japanischen Krieg*); the volumes of lectures delivered at the Russian Staff College after the war, French translation (*Conférences sur la guerre russo-japonaise faites à l'Academie Nicolas*); British official *History of the Russo-Japanese War* (1907–); German official *Russisch-japanischer Krieg* (1906– ; English translation by K. von Donat); Löffler, *Der Russisch-Japanische Krieg* (Leipzig, 1907; French trans.); L. Gianni Trapani, *La Guerra russo-giapponese* (Rome, 1908); E. Bujac, *La Guerre russo-japonaise* (1909). Of critical studies the most important are Cordonnier's "Les Japonais en Mandchourie" (*Revue d'Infanterie*, 1910); and Culmann, *Étude sur les caractères généraux de la guerre en extrême-orient* (Paris, 1909). One naval narrative of absorbing interest has, however, appeared, Semenov's *Rasplata* (English trans.).

RUSSO-TURKISH WARS (1828–29 and 1877–78). The earlier wars between Russia and Turkey possess little military interest to-day, and are scarcely remembered except as the occasion of Suvarov's exploits. The first of the three 19th-century (1806–1812) wars, however, though much less vigorously fought than the preceding wars, at any rate introduced the "Eastern question" into European politics as a factor affecting the balance of power, and its cessation at the moment of Napoleon's advance on Moscow had a great effect on the emperor's Russian campaign.

The second war is more celebrated. It was a reflex of the Greek War of Independence, and began with the invasion of Rumania by the Russians in May 1828. One corps invested and took Braila, another passed by Bucharest and besieged Rustchuk and Silistria, and a third crossed the Danube below Isacka. The first and the last were united as an army under the tsar and advanced through the Dobrudja on Shumla. But after a considerable amount of fighting it was decided that the Turks here were too strong for the invaders, and the tsar drew off his forces by degrees towards Varna, which was besieged next. But the Shumla troops were thus gradually set free to join the Turkish field army under the grand vizier, which, however, merely menaced, without seriously attacking, the besiegers of Varna. The place surrendered on the 10th of October 1828, and the tsar at once turned upon the grand vizier, attacked him on the river Kamchik (15th October) and forced him to retreat to Aidos.

Meantime, however, Silistria offered a gallant resistance. Even when the besiegers were reinforced from the main army they could not master the defence, and when winter came on the siege was abandoned, and the Russians drew off into Rumania into winter quarters. In Asia, meanwhile, a Russian army under Prince Paskievich had advanced from Tiflis, and captured Kars and other places, while the Black Sea fleet secured the surrender of Poti. Paskievich next defeated the Turks at Akhalzik (27th August), captured Ardahan, and advanced by Bayazid to the upper Euphrates. But coming there into conflict with the fierce Kurds, he gave up further enterprises and, leaving garrisons in the strong places, took his army back into the Caucasus for the winter.

In 1829 Diebitsch took over the command of the 70,000 men on the Danube, and resolved to carry the war over the Balkans. As a preliminary the fleet seized Sozopolis (Sisepol). A second and vigorously pressed siege of Silistria ended with the surrender of the place on June 30th, the Turkish operations for the expulsion of the Sozopolis garrison and the relief of Silistria being dilatory as before. The Turkish army was at this time in process of reorganization on a European model, which added to the difficulties of their situation. The grand vizier, Reschid Mehmet, in May attempted to combine the Rustchuk and Shumla garrisons for the expulsion of the Russians from Varna, but unsuccessfully, the two columns being beaten in detail. Soon afterwards Diebitsch, with part of the army investing Silistria, marched against him and defeated him at Tcherkovna (11th June). Immediately after this Diebitsch carried out the brilliant passage of the Balkans and advanced to Adrianople, which laid Constantinople at his mercy, and brought about an immediate peace. A month after its signature, a Turkish army from the west, attempting to recapture Adrianople behind Diebitsch, was defeated on the 16th October at Arnaut Kaliessi. In Asia, meantime, Paskievich, after relieving Akhalzik, where his garrison had been blockaded, won two victories on two successive days at Kainly and Milli Duzov (1st and 2nd June), and captured a number of fortresses, his victorious advance being arrested only by the terms of peace. (X.)

The War of 1877–78.—On 24th April 1877, the tsar declared war against Turkey, with the avowed object of righting the wrongs of the Christians in Turkey. The Turco-Servian war was just over. Contrary to expectation the Turks had proved victorious. Hostilities had ceased in October 1876, though it was not till 1st March 1877 that peace had been signed. During 1876 the Turks had also quelled an insurrection of the Christians in Bulgaria, when the treatment they meted out to the Christians and the cry of "Bulgarian atrocities" had aroused the sentimental sympathies of Europe.

The Danube formed the Turkish frontier. Flowing west to east along the southern boundary of Rumania, it turned to the north and then to the east to the Black Sea, enclosing the Dobrudja, an inhospitable and difficult region, of rectangular shape, some 100 m. N. to S. by 30 to 60 m. E. to W., which was the extreme northern part of the Turkish dominions.

The Russians did not anticipate that the opposition to be encountered from the Turkish forces would be of a serious nature. As for natural obstacles, there were the Danube and the Balkans directly across their route, but the passage of these was not likely to cause any serious delay.

The Turkish fortresses of the Quadrilateral—Rustchuk, Silistria, Shumla and Varna—could be avoided, and Nikopol and Vidin were more or less isolated. It would only be necessary to cover the lines of communication from the action of the garrisons of these places. It was known that Osman Pasha was at Vidin with what remained of the Turkish force which had defeated the Servians the previous year, and it would be necessary to detach a force to operate against him. There would be some delay in the forwarding of supplies, due to the fact that the Rumanian railway was of different gauge to the railways of Russia, but this would not be serious. This line, the only railway through Rumania, ran from Galatz to Bucharest, where one branch ran west by Slatina and the other to Giurgevo on the Danube, where it connected with a line south of the river from Rustchuk to Shumla and Varna through Rasgrad. It was generally imagined that the advance to Constantinople would be of the nature of a triumphal march. By a clause of the Treaty of Paris of 1856 the Russian naval forces in the Black Sea had been destroyed, and though this clause was revoked in 1871, in 1877 the Turks possessed the undoubted command of the sea. Had things been different, an advance through the Dobrudja, with a safe line of supply by water, would have offered many advantages. Under existing circumstances, with Turkish gunboats on the Danube and ironclads on the Black Sea, such a course was out of the question.

Plans of campaign.

The plan of campaign formed by the Russians was as follows: One corps was to enter the Dobrudja to protect the line of communication against any Turkish advance east of the Danube, while the remainder would cross the Danube between Rustchuk and Nikopol, cross the Balkans and advance on Adrianople. Detached forces would meanwhile mask the "Quadrilateral" and the Turkish force at Vidin.

A Convention had been made with Rumania, allowing the passage of the Russians through the country. The Rumanians proclaimed their independence of Turkey, and although the tsar declined their offer of active co-operation for the time being, their troops occupied Calafat, facing Vidin, and early in May their batteries engaged the guns of Vidin across the river. The Russian army with which it was proposed to carry on the war, consisted of six army corps and two rifle brigades. Each corps was formed of one cavalry and two infantry divisions. There were in addition 74 squadrons and 52 guns of Cossacks. Each infantry division had 48, and each cavalry division 12 guns. This force had been mobilized in the November of the previous year, and was now distributed as follows:—

Commander-in-chief: The grand-duke Nicholas, with headquarters at Kishinev.

VII. Army Corps . .	Odessa and Tatar Bunar.
XI. ,, . .	Tarutinskaja and Kanszany.
VIII. ,, . .	Kishinev.
XII. ,, . .	Ungheni.
IX. ,, . .	Winnica.
X. ,, . .	Crimea.
Rifle Brigades . .	Bestomak.

The mobilization of the IV., XIII., and XIV. Army Corps had been ordered in December 1876, but they would not be ready to move till the following month—May 1877. In addition to the above, there were heavy artillery with 400 siege guns, engineers with pontoon trains, naval launches, and the necessary supply trains. The total Russian forces numbered 200,000 combatants of all arms, with 850 field and 400 siege guns.

For some months prior to the tsar's declaration, Turkey had realized that war was inevitable, but such preparations as were made were far from adequate. Abdul Kerim, who had commanded in Servia the previous year, was still acting as commander-in-chief, but the task set him was not an easy one. With the Russians in front, the Servians and Montenegrins, whose action was known to be uncertain, on the flank, and the Christian population of Bulgaria, in sympathy with the Russians, in the midst, it required a younger and more energetic man, with a greater knowledge of the art of war than he possessed, to plan and to carry out a successful defence of the Moslem dominions. The prospect of war had aroused the Turks, and the nation had taken steps to prepare for the conflict, but they lacked trained leaders. The Turkish officers were but ill-instructed. Works on the art of war did not exist in the Turkish language General conscription existed in Turkey, but there was an entire absence of organization. Theoretically, each of the six districts into which the empire was divided should have produced an army of four corps, but it was only on paper. Practically the troops were not organized in corps. At the outbreak of war, Osman's force, some 30,000 strong, was at Vidin; a few battalions were spread along the Danube from Vidin to Silistria, with a brigade of infantry at Nikopol, another at Sistova, and the best part of two divisions at Rustchuk. Abdul Kerim's headquarters were at Shumla where there were two more infantry divisions. A cavalry division was in process of organization. Varna was the base of supply and was connected by rail with Shumla and Rustchuk. Suleiman Pasha with some 40,000 men was still in Montenegro. The total Turkish forces in Europe at that time were about 120,000 men with 450 guns, but they were disseminated instead of being concentrated, or grouped in view of a rapid concentration. Abdul Kerim's plan, or rather his idea, was, that the Russians would find some difficulty in the first place in forcing the passage of the Danube, and when they had succeeded in this, they would be bound to enter the zone of the Quadrilateral, where he hoped, operating with the fortresses as supports, to deal with them successfully. As regards the Turkish fleet, at the outset, in addition to a fleet of 8 ironclads below Braila, there were 7 monitors and 18 wooden ships of war on the Danube between Hirsova and Vidin.

In the matter of armament the Turks had the advantage. The artillery were armed with a Krupp breech-loading gun, which was better than the Russian bronze gun, while the Peabody-Martini rifles of the infantry were superior to the Russian Krenk. The firearm of the Turkish cavalry was the Winchester repeating carbine, which was inferior to the short Berden with which the Russian cavalry was armed. But this advantage in armament was discounted by the fact that, from motives of economy, the Turkish soldier had done but little rifle practice.

1st Period.—The Russian advance and passage of the Danube.

Hostilities commenced on the 24th of April, when the Russian army advanced in three columns towards Bucharest, the eastern flank covered by the XI. Corps which marched to Galatz. By the end of May the bulk of the Russian forces were assembled at Bucharest practically opposite the intended point of passage, with the advanced guard under General Skobelev at Giurgevo, and cavalry observing the river line from Turnu Magureli to Kalarashi. It was now decided to await the arrival of the IV., XIII., and XIV. Corps and the necessary bridging material for the passage of the Danube.

On June 15th the troops were disposed as follows: 8th Cavalry Division at Turnu Magureli; 12th at Oltenitza; 2nd at Kalarashi; Advanced Guard at Giurgevo; XI. Army Corps at Oltenitza and Giurgevo; VIII., XII., XIII., ½IX., at Bucharest; ½IX. at Slatina; IV. at Slobodsia; XIV. at Galatz; VII. at Odessa; X. in the Crimea. Meanwhile steam launches were brought overland, and the Russians, by means of torpedoes, submarine mines and their shore batteries, had succeeded in clearing the Danube of Turkish vessels between Nikopolis and Rustchuk. Two of the smaller ironclads had been sunk, the remainder of the flotilla driven under the shelter of the fortresses, while barricades of mines effectually isolated them and prevented them from again entering the zone of operations. Of the large ironclads on the lower Danube, one was sunk near Sulina, and from that time the remainder stayed in Sulina harbour.

On June 22nd the XIV. Army Crops crossed into the Dobrudja at Galatz and advanced south, the Turkish detachment there retiring before them. Pontoons having been brought by rail, the necessary rafts and boats (which had been constructed at Slatina on the Aluta) were floated down to the neighbourhood of Zimnitza, and on June 24th siege batteries opened fire on Nikopol and Rustchuk, while the IX. Army Corps made a feint of crossing just below Nikopol. These measures were effective in confusing the Turkish commander as to the Russian intentions, and on the night of June 26/27th, 12 companies of rifles, with a squadron and 6 guns, were landed on the south bank opposite Zimnitza, and within twenty-four hours the whole of the VIII. Corps had crossed the river. By July 2nd the Russians had completed a bridge over the river, which is 1000 yds. wide at this part. At Sistova was a Turkish brigade of infantry. The commander, in the early morning of the 27th, received information from his outposts of the crossing, but instead of moving with his whole force, sent two battalions to oppose it. The Russians drove them back, and when reinforced, advanced against the heights in rear of Sistova, which were occupied with a loss of 800 men, the Turkish troops retreating to Tirnova and Nikopol. The Turks had remained ignorant of the Russians' concentration in Rumania and no attempt had been made to discover their plans. Abdul Kerim remained inactive in the fortresses of the Quadrilateral, and even when he heard of the crossing at Sistova, decided that it was but a demonstration. No measures were taken to observe the Russians. They were thus able to complete their crossing practically undisturbed, and this although it was never likely that the Russians would voluntarily select a point of passage leading into the Quadrilateral. Everything pointed to a crossing between Nikopol and Rustchuk. The best course for the Turks under existing circumstances would have been to leave garrisons in the fortresses, to observe the river line and to push reconnaissances to the north of the river, and to dispose the field army in a central position, whence it could concentrate on any point as soon as the enemy's intentions were revealed.

2nd Period.—Operations in Bulgaria to the fall of Plevna.

On June 30th Lieut.-General Gurko was put in command of a detachment composed of 10 battalions, 31 squadrons and 32 guns, with which he was ordered to advance rapidly to Tirnova to gain possession of a pass over the Balkans, to damage railways and telegraphs, and to endeavour to stir up a Bulgarian revolt. He crossed the Danube by the Russian bridge on July 3rd and occupied Tirnova on July 7th, the Turkish garrison retreating to Osman Bazar. At Tirnova he learned that the Shipka Pass was occupied by 3000 Turks, and that none of the remaining passes were held in any force. He then determined to cross by the Hainkioi Pass and to turn the Shipka. He started from Tirnova on the 12th July, on which day the head of the VIII. Corps reached the town. Hainkioi was occupied on the 14th, a detachment of 300 Turks being driven away. Gurko then sent two squadrons to cut the telegraph at Yeni Zagra, and leaving a garrison to hold the pass, set out for Kazanlik on July 16th. It had been arranged that a force from the VIII. Corps should attack the Shipka Pass (*q.v.*) from the north on the 17th, Gurko attacking simultaneously from the south; but his advance was delayed by small bodies of the enemy, and he failed to co-operate, with the result that the attack from the north was repulsed. The Turkish commander, however, evacuated the pass that night (July 18th/19th). It was occupied by the Russians on July 19th, and held till the end of the war. Gurko's detachment was followed across the Danube bridge by the XII. and XIII. Army Corps, which crossed between July 3rd and 8th and moved towards the Jantra river; the IX. Corps was across by July 10th and advanced on Nikopol; the XI. Corps crossed July 10th–15th; and finally the IV. Corps between July 20th and 30th. The VIII. Corps had meanwhile advanced on Tirnova, as we have seen.

On July 3rd Abdul Kerim received orders from Constantinople to advance against the Russians, and set out with the force from Shumla for Rustchuk, immediately preceded by the cavalry division. Still no attempt was made to gain contact with the Russians and discover their intentions. From Rustchuk, Abdul Kerim advanced towards the Jantra, and after a skirmish between the Turkish cavalry and a Russian cavalry brigade again retired. Realizing Abdul Kerim's incapacity, and rendered anxious by Gurko's successful advance, the authorities at Constantinople now decided to give the command to Mehemet Ali. He superseded Abdul Kerim on July 19th, and at once ordered the concentration of all available forces at Rasgrad. Meanwhile Osman Pasha, who had till now been condemned to inactivity at Vidin, received permission to march.

Vidin, with its modern fortifications and heavy armament, and with the Danube on one side and marshy ground towards the interior, was a place of considerable strength. But with the Russians south of the Danube there could no longer be any justification for keeping Osman's 30,000 men isolated. Leaving garrisons in Vidin and the other towns along the Danube from Nikopol to Rakovitza, and to bar the roads from Servia, Osman left Vidin with the remaining 19 battalions, 6 squadrons and 9 batteries on July 13th. His original plan was to join the 10 battalions under Hairi Pasha, then garrisoning Nikopol, and attack the Russian flank between Biela and Tirnova; but on July 15th he received news that the Russians were attacking Nikopol, and he then decided to march straight to Plevna, where there was a garrison of 3000 men under Atouf Pasha.

First battle of Plevna.

Osman reached Plevna (*q.v.*) on July 19th, and at once took up a position which had been previously reconnoitred by Atouf Pasha, on the hills to the north-east and east of the town. He had arrived just in time. On July 16th the Russian IX. Corps had taken Nikopol, and on the 18th orders were received to occupy Plevna with one division. At 5 a.m. on July 20th General Schilder-Schuldner, with the 5th Division IX. Corps and other forces, attacked Osman's position. No preliminary reconnaissance was made, and the Russians, after an artillery bombardment lasting about an hour, attacked at four points with separate columns. By midday the Russians were in retreat, having lost over 2800 men. There was no pursuit. On July 20th Osman was reinforced by fourteen battalions from Sofia, and the following day sent Rifaat Pasha with six battalions, a battery and some Circassian cavalry to occupy Lovcha in order to secure his communications with Sofia.

Osman's force at Plevna, within three days' march of the one Russian bridge over the Danube and flanking their line of operations, could not be neglected, and General Krüdener, commanding the IX. Corps, received orders to attack again as soon as possible. After the battle of the 20th he had been reinforced by brigades of the IV. and XII. Corps and a cavalry division.

Second battle of Plevna.

With this force, 30,000 in all, he attacked on July 30th. Krüdener advanced in two columns, cavalry covering both flanks. Skobelev, with the cavalry on the southern flank, was subsequently reinforced by infantry, so there were practically three columns of attack. A general reserve of one brigade was kept at Karagatsch (16 m. east of Plevna). After an artillery engagement which lasted from 8.30 a.m. till 2.30 p.m. the infantry advanced. The fighting lasted till sunset, when the Russians withdrew to Karagatsch, having lost 7300 officers and men. The Turkish casualties were 2000. General Krüdener, having reconnoitred the position, had hesitated to attack with the force available, and only acted in obedience to the orders received from headquarters, then 80 m. distant at Tirnova. His defeat was an unpleasant surprise for the Russians. Their plans were rudely upset, and their attention was now directed solely to the taking of Plevna. Headquarters were moved from Tirnova back to Bulgareni, Gurko was called back from south of the Balkans, the Rumanian army was called in to co-operate, orders were issued for the Guards and Grenadier Corps and the 24th and 26th infantry divisions to mobilize, 188,000 of the 1st Ban militia and three divisions of the reserve were called out, and the 2nd and 3rd infantry divisions and the 3rd Rifle Brigade from Moscow district, where they had been mobilized, were at once ordered to the front.

At this time the position of the Russians was as follows: the XIV. and part of the VII. Corps were north of the Danube, covering the communications; the IV. and IX. Corps were opposed to Osman Pasha at Plevna and his garrisons of Lovcha and Orchanie (the advanced depot of the Plevna force); the XI., XII. and XIII. Corps were along the White Lom facing Mehemet Ali, who was on the line Rasgrad-Eski Djuma with a force of about 80,000 infantry with 60 guns and a few regiments of cavalry, in addition to the garrisons of the fortresses; a small garrison on the Shipka Pass. Gurko was south of the Balkans, where Suleiman Pasha had a force of some 30,000 men. The Russian casualties since the commencement had reached 15,000, and their numbers south of the Danube did not exceed 130,000. Suleiman Pasha could have joined Osman or Mehemet Ali, avoiding the Shipka, and a vigorous offensive against the Russian flank at that time held out every prospect of success. The Shipka Pass would of necessity have been evacuated, but all through we find the Turkish commanders with their eyes fixed on geographical, which were sometimes strategical, points, and losing sight of the fact that the Russian army was their first objective. It is true that the ministers at Constantinople were largely responsible for the faulty strategy, but the generals in the field were also to blame. It was the moment for vigorous action on the part of the Turks. The moral equilibrium of the enemy was upset and the whole army demoralized by this second defeat at Plevna, but not a move was made. Again Osman failed to pursue. He was weak in cavalry, but he had sufficient to keep in touch with the enemy, who were utterly demoralized, and could have followed on with his whole force. He was but 35 m. distant from Sistova, and the result of the demolition of the bridge would have been incalculable. He was subsequently forbidden by Constantinople to assume the offensive, but it was not necessary to consult ministers as to pursuit after a successful battle, and they cannot be held responsible for this. The other Turkish commanders received news of the results of the battles of Plevna with incredulity, and likewise failed to turn them to account.

South of the Balkans was Suleiman's army. He was ordered from Montenegro on July 1st, and, leaving garrisons along the Montenegrin frontier, embarked at Antivari on July 15th. Disembarking at Dedeagatch on the 21st, he moved thence by train to Adrianople. His command, increased by some 15 battalions under Reouf Pasha, raised in the Balkan zone, amounted to approximately 30,000 men, and he was ordered to retake the Shipka Pass and to join Osman Pasha. Suleiman arrived at Karabunar on July 20th and moved to Eski Sagra, where he was joined by Reouf Pasha. Gurko, who had been resting about the Shipka Pass, ignorant of the arrival of Suleiman, moved against Reouf Pasha on the 27th of July, and found himself confronted by their combined forces on the 31st. He was attacked by Suleiman that day and was forced to retire. His force consisted of 15,000 men, including six battalions of Bulgarian volunteers which had just been raised. The following day he retreated across the Balkans by Hainkioi, where he left two brigades to hold the Hainkioi and Elena Passes, the

Suleiman's attack on Shipka Pass.

Bulgarian troops joining the garrison on the Shipka. Suleiman remained at Yeni Zagra till the 17th of August, when he set out for the Shipka. On August 21st the heights east of the pass were taken, and during the next few days there was desperate fighting; but the original garrison was gradually reinforced, and the Russians held on. In this fighting the Russian losses amounted to close on 4000, while the Turkish casualties were about treble that number. Suleiman now intrenched himself close to the Russian position, and there he remained till Sept. 17th, when after a three days' bombardment he again assaulted the position, but was repulsed with considerable loss. This was the last assault made on the Russian position. Suleiman replaced Mehemet Ali as commander-in-chief on Oct. 2nd, and was himself succeeded by Reouf Pasha. Thus, under orders from Constantinople, Suleiman frittered away his opportunity and his army in a fruitless attempt to retake the Shipka Pass.

The fighting on the Lom.

It was not till the middle of August that Mehemet Ali decided to move against the Russians and ordered an advance. The Cesarevich (afterwards Alexander III.), who was opposing him with the XI., XII. and XIII. Corps, in all about 50,000, was extended on the line of the White Lom from Pirgos to Eski Djuma. On August 22nd and 23rd there were engagements about Ayaslar, resulting in the retirement of the Russians. On August 30th he attacked at Karahassankoi and drove the Russians across the river. On September 3rd he crossed the White Lom and again defeated them at Katzelevo, the enemy retiring behind the Banitcha Lom. On September 12th Mehemet Ali continued his advance, but halted on the 14th for a week. He then made an attack on Cerkovna on the 21st, but was repulsed with a loss of 1600 men, and two days later retired his army behind the White Lom. He had effected nothing. As will be seen later, the Russian operations against Plevna had not been in any way disturbed. The containing force under the Cesarevich had retired a certain distance, but it still held the main Turkish army. Mehemet Ali's original plan had been to advance by Osman Bazar, effect a junction with Suleiman, and move on Tirnova. But Suleiman was averse to his plan and it was negatived at Constantinople, though if this plan had been carried out with vigour, the position of the Russians should have been critical. He then advanced on a front of 50 m. instead of moving concentrated, which is the explanation of his failure. It is true that he was much hampered by the state of his cavalry, which was exhausted, and consequently was without information, while the Russians were well served. Mehemet Ali now concentrated his force, but at this juncture he was superseded by Suleiman Pasha.

Third battle of Plevna.

To return to Plevna. At this time the Russians were disposed in a semicircle round Plevna, their right or N. flank resting on Ribina and the S. flank resting on Bogot. On August 30th Osman had moved out with a column of all arms towards Pelishat. The following day he engaged the Russians. The Turks lost 300 killed and 1000 wounded, and the Russian losses were about 1000. It is difficult to say what was the object of this sortie, which was of the nature of a reconnaissance in force. It achieved nothing. The Turks were not defeated, but retired again into Plevna the same evening. By the end of August the whole of the Rumanian army had crossed the Danube, and during the first days of September the first Russian reinforcements, consisting of the 2nd and 3rd infantry divisions and the 3rd Rifle Brigade, had arrived and joined the forces round Plevna. Mehemet Ali's advance and the assaults on the Shipka had been repulsed. The Russians could expect no further reinforcements before October, and it was therefore decided to make a third attempt to take Plevna, but first of all to occupy Lovcha.

Lovcha.

Skobelev had already made an unsuccessful attempt on August 6th, and General Prince Imeretinski, with a force of two infantry divisions and a brigade of Cossacks, in addition to Skobelev's mixed brigade, was now entrusted with the task. The garrison under Rifaat Pasha amounted to 8 battalions, 6 guns and some Circassians. Fighting commenced on Sept. 1st and on the 3rd the Turks were driven out, most of the survivors finding their way to Plevna, and bringing 5 guns with them. The Russians lost 1500, the Turks 2500. On Sept. 2nd, Osman set out with a strong relieving column from Plevna, but on the 4th, hearing that the Russians had already occupied the town, he turned back and reached Plevna on the 6th. On Sept. 5th, 8 battalions and 2 batteries reached Orkhanie, and Osman's force, including the Lovcha troops, numbered about 30,000 men and 72 guns. The Russian forces, including the Rumanians, numbered about 90,000. Their plan was, after a long artillery bombardment, to attack the eastern front with the Rumanian forces, the south-eastern front with the IV. and IX. Corps and the southern front with Imeretinski's command. The attacks were to be simultaneous. The cavalry divisions were to be kept in rear and close to the flank of the attacking infantry. During the night of Sept. 6th/7th the troops were moved into preparatory position, and batteries were constructed at 3000 to 5000 yds. from the outer works. The artillery bombardment was commenced at 6 a.m. on Sept. 7th and continued till midday Sept. 11th. So far the infantry had only been engaged on the south flank, where Skobelev had succeeded Imeretinski in the command. He had succeeded in advancing to within 2000 yds. of the southern Turkish redoubts and had entrenched himself. The orders for Sept. 11th were for the infantry assaults to be delivered at 3 p.m. after a six hours' cannonade. A dense fog interfered with the artillery bombardment. At the end of the day the Rumanians had taken No. 1 Grivitza redoubt, the attack on the S.E. front had been repulsed and Skobelev had established himself within 1000 yds. of Plevna, having taken Kavanlik and Issa forts. On Sept. 12th the Turks retook these forts and drove Skobelev back. During the next two days the Russians continued to bombard the works, but no further attack was made. The Rumanians remained in possession of the Grivitza redoubt, defeating an attempt made by the Turks to retake it on Sept. 14th. The Russians then decided to retire and entrenched themselves on a line with Verbitza-Radischevo, with their cavalry extending to the Vid on either flank. There was no question of pursuit; in the first and second battles the numbers had been about equal, but now the Russians were vastly superior and Osman would have been crushed by a powerful counter-attack.

In their third battle the Turks had lost 5000, while the Russian casualties amounted to close on 20,000. The Russian bombardment, lasting four days, had effected nothing. It had not caused 200 casualties. The object of the artillery is to cover the advance of the infantry, and the arms must work in combination. The defender does not expose himself to the artillery fire unless compelled to do so by the approaching infantry. The Russians failed to realize this and practically wasted their ammunition. They had again failed to reconnoitre the position and attacked along the whole front instead of pressing home in strength at the decisive points. Their attacks were not even simultaneous, and Osman was able to shift his reserves from point to point. In addition to this, when the Russians retired one-third of their force had not been engaged. The defects in their plan of action are largely attributable to the fact that though control was nominally centred in one man, senior officers were present who interfered with his arrangements.

Investment and fall of Plevna.

It was now decided to complete the investment of Plevna, and Todleben, the defender of Sevastopol, was entrusted with supreme control of the operations. He arrived on the scene on Sept. 28th, but it was not till Oct. 24th that the investment was completed, and, meanwhile, on Sept. 24th and again on Oct. 8th, stong reinforcements arrived, raising the Turkish force under Osman to 84 battalions, 25 squadrons and 96 guns, with an effective of 48,000 men. Plevna had been re-victualled and the sick and wounded had been sent back to Orchanie. General Krilov, who had been operating west of the Vid, with 52 squadrons and 30 horse artillery guns, had failed to prevent these movements, and was superseded by General Gurko on Oct. 8th. The Russian

Guards Corps had all reached Plevna by Oct. 20th, and two divisions were at once placed under Gurko's orders, raising his command to 35,000 infantry, 10,000 cavalry and 48 guns. His instructions were to capture the Turkish positions along the Sofia road. He compelled the garrison of Dolni-Dubnik to retire into Plevna, and captured Gorni Dubnik and Telis with their garrisons after severe fighting on Oct. 24th and 28th. Osman's force was thereby reduced by 12 battalions. About the middle of November the opposing forces were distributed as follows: 6 divisions along the Lom, under the Cesarevich, facing Suleiman's army; 3 divisions holding the Shipka under Radetzky; 1 division at Lovcha; 2½ divisions west of the Vid under Gurko; and 12 divisions east of the Vid, investing Plevna. The XIV. Corps was in the Dobrudja, the VII. Corps about Odessa and the X. Corps in the Crimea.

Turkish movements.

On the Turkish side Suleiman advanced across the Lom, leaving small garrisons in the fortresses, and attacked at Mechka on Nov. 19th, and at Mechka and Tristenik on Nov. 26th, and again on Dec. 12th, but each time without success, and he retired across the Lom. South of the Balkans Vessil Pasha had succeeded Reouf Pasha on the Shipka. He continued to contain the three Russian divisions there, but made no attempt to dislodge them, beyond small offensive demonstrations made with the object of concealing the departure of large drafts which were sent to Sofia.

At Sofia and Orkhanie, the Turks were forming an army of recruits and reservists with the object of advancing to the relief of Osman. Mehemet Ali was entrusted with the command. Osman had already asked the sultan's permission to evacuate Plevna, with a view to co-operating with Mehemet Ali, but permission was refused. It was not till the investment was completed that the sultan changed his mind, too late, and gave his sanction to the move. The Russians received information of Mehemet Ali's intended advance, and as the force round Plevna amounted to 191 battalions, 120 squadrons and 650 guns, it was decided that Gurko should move with his detachment towards Sofia. He concentrated his force at Yablonitza on Nov. 5th and succeeded in driving the Turkish advanced guard from Orkhanie. Mehemet Ali now occupied a strong position covering the Arabi Konak Pass over the Balkans, and, with a force of 43 battalions with cavalry and guns, made no attempt to relieve Osman.

3rd Period.—Passage of the Balkans and advance to Constantinople.

Osman Pasha, his supplies having given out, eventually decided on a sortie. His troops had been short of food since the beginning of November, and the number of sick had risen to 10,000. His plan was to break through to the west and make for Sofia via Berkovitz. The Russians observed the preparations made and concentrated sufficient force at the threatened point, with the result that Osman and his army of 40,000 men capitulated. The Turkish losses in the action were about 6000 and the Russians lost about 1500. The Russians now decided, notwithstanding the difficulties due to the winter season, to push on across the Balkans. The VII. and X. Corps were still left guarding the Russian coasts. The Cesarevich was left north of the Balkans with 71,000 men to guard the communications. Gurko's force was raised to 80,000. Leaving a containing force to oppose the Turks at the Arabi Konak Pass positions, he crossed by the Curiak Pass. The Turks retired unobserved, and after a feeble stand at Tashkosen retreated to Kustendil. Gurko occupied Sofia on Jan. 4th. Radetzky's force at the Shipka was raised to 66,000, with which force, having defeated Vessil Pasha, he was to join Gurko south of the Balkans. Radetzky commenced operations on Jan. 5th. Keeping one division to hold the works on the Shipka, he moved the remainder of the force in two columns under Skobelev and Prince Mirski, who were to cross one on each side and attack simultaneously from the south. Vessil Pasha held an entrenched camp at Shenovo with some 12,000 men; the remainder of his force was in position on the mountains. Owing to the difficulties of the crossing, Skobelev was delayed. Mirski attacked on Jan. 8th and was repulsed. The following day Skobelev and Mirski attacking together were successful, and Vessil Pasha capitulated with his force, some 36,000, of whom 6000 were sick and wounded. Vessil Pasha had pointed out the danger of his position on Jan. 7th, but, contrary to Suleiman's advice, the war minister, believing an armistice imminent, had ordered him to hold on to the Shipka Pass. Mehemet Ali's force, dangerously delayed owing to interference by the minister of war, eventually reached Tatar-Bazardjik, which was selected by Suleiman (now commander-in-chief) for the concentration of his forces. Having received news of the capture of the Shipka force he retired on Philippopolis, with Gurko's forces closely pursuing. But Radetzky's forces had already pushed on and practically cut Suleiman off from Adrianople. After some engagements about Philippopolis on Jan. 15th, 16th and 17th, he retreated towards the Aegean Sea through the Rhodope mountains, having lost most of his guns, and reached Enos about Jan. 28th, whence what remained of his force was conveyed by water to Constantinople.

Suleiman had again missed his opportunity. The Russians crossed the Balkans in a wide front of about 180 miles, and there was opportunity for successful action by a capable commander. There were not only the columns commanded by Gurko and Radetzky, but also a third column under General Kartzoff, which crossed by the Trojan Pass, after which it joined Gurko's force. There were the troops under Mehemet Ali about Sofia, Vessil Pasha's force about the Shipka, and the main army on the Lom, which had been withdrawn south of the Balkans after the fall of Plevna, so that Suleiman, who had been appointed commander-in-chief, had an available force of 130 battalions, 120 guns and a proportion of cavalry. The fortified town of Adrianople offered a strong central position at which to concentrate his forces, and with this point as support, acting on interior lines, he could have dealt with the invading and widely separated columns in detail. But he missed his opportunity and left his scattered forces to be overwhelmed by superior numbers in each instance. The minister for war was undoubtedly responsible to a great extent for this faulty strategy, but the blame falls on the head of Suleiman as commander-in-chief. There was no object in leaving Vessil Pasha on the Shipka. All available forces should have been concentrated in a sound strategical situation.

The Servians had crossed the frontier after the fall of Plevna, and the Montenegrins were also pressing on. On Jan. 16th the Russians occupied Adrianople, and on Jan. 30th they were facing the Buyuk Tchemedji lines, with their flanks resting on the Black Sea and the Sea of Marmora. Mehemet Ali was in command of what remained of the Turkish armies behind the lines. On Jan. 31st an armistice was arranged, and on March 3rd the treaty of San Stefano was signed, the terms of which were modified later at the Berlin Conference in June and July 1878.

The Russo-Turkish War proved once for all the great value of improvised fortifications, in other words, of spade work in warfare, and the advantages of field works as regards invisibility against artillery fire. It was not only at Plevna that field intrenchments were made use of. Notable instances were the defence of Lovcha by the small Turkish garrison of 8 battalions with one battery, which from their entrenchments kept Skobelev with over 20,000 men and 90 guns at bay for three days, inflicting on him a loss of over 1500 men. Again, at Gorni Dubnik on Oct. 24th, 3500 Turks with 4 guns held their works throughout the day against 20,000 Russians with 60 guns, inflicting a loss on them of over 3300, and eventually were forced to surrender by a surprise attack under cover of darkness, when their ammunition had run short, and their numbers had been reduced by 1500 casualties. In the attack the success of Skobelev stands out, and we find that he had realized the necessity of intrenching the ground he had gained.

The war was brought to a conclusion, but the Turks had not been beaten in battle. With the exception of the fighting round Plevna and the rout of Suleiman's army at Philippopolis there had been no decisive battles. The Turks had been defeated owing to the incapacity of their leaders, none of whom had previously commanded an army organized according to modern ideas. They were ignorant of strategic principles. Then, again, the interference with the generals in the field by the authorities at Constantinople had in each case resulted in the disasters which invariably follow the attempt of civilian amateurs to control warlike operations.

On the Russian side, the enemy had been at first despised, and consequently the forces originally employed were inadequate, which meant subsequent delays, losses and expense. The command of the sea had proved of little value to the Turks. Their flotilla rendered them no assistance. In the early stages it could have materially assisted by landing reconnoitring parties N. of the Danube, and by interfering with the Russians when crossing the river. The Russian bridge offered a tempting objective throughout the campaign, but commanders with the requisite dash and initiative were not forthcoming. The defeat of the Turks was due in the first place to the failure of their politicians to ensure the adequate organization and training of the army during peace time, in the second place to the want of a commander who had educated himself to undertake the responsibilities entrusted to him. (J. H. V. C.)

A separate campaign had been waged, as before, in Asia Minor. Here the Turks under Mukhtar Pasha had 57,000 men in two corps, the one on the side of Batoum and Ardahan, the other between Erzerum and Kars. His opponent, Loris Melikov, had at first only some 28,000 infantry, but a disproportionate number of Cossack Sotnias. The Russians advanced in three weak columns. On the 17th of May after bombardment the right column stormed Ardahan. The right and centre columns then closed inwards upon Kars, which they besieged, but the siege was given up in July, after Mukhtar, advancing to its relief with 35,000 men, had repulsed Melikov's attack at Zivin (June 26th). The left column occupied Bayazid without difficulty, but when it had proceeded thence on the Erzerum road the Russian garrison was blockaded by the Turks and the column retraced its steps to relieve the place. After this it halted at Igdir in the Araxes valley. Meanwhile the Turks on the coast had advanced, in concert with their fleet, and raised an insurrection amongst the Mahommedans of the littoral. They were eventually repulsed, but the insurrection was not completely suppressed until the summer of 1878.

In August Mukhtar, who had followed up Melikov's retreat from Kars, and won the victory of Kizil-Tepe, led 30,000 men in front of this position, and behind them the Kars garrison of 10,000. Ismail on the Bayazid side had 40,000; Dervish, at Batoum 17,000. But after an interval of two months Melikov was reinforced, while drafts for the armies in Europe were taken from Mukhtar, and the grand-duke Michael, assuming command of the Russians, defeated his opponent completely in the battle of the Aladja Dagh (Oct. 15th). The remnants of Mukhtar's army retreated on Erzerum, and while part of the Russian army besieged Kars, and part attempted to cut off the retreat of Ismail on the Bayazid road, while the corps from the Araxes valley followed the latter up. Ismail slipped past them, however, and rejoined Mukhtar at Erzerum. But the two together were no longer able to resist the superior numbers of the Russians, who defeated them in a last battle at Dexe Boyun (Nov. 4th). Kars was stormed on the night of the 11th of November.

RUST (O.E. *rúst*, a word which appears in many Teutonic languages, cf. Du. *roest*, Ger. *rost*); in origin it is allied with "ruddy" and "red," the reddish-brown powdery substance which forms on the surface of iron or steel exposed to atmospheric corrosion. Formerly the process was regarded as oxidation pure and simple, and, although it was known that iron did not rust in dry air, yet no attempt was made to explain why water was necessary to the action. F. Crace-Calvert in 1871 showed that the carbon dioxide of the atmosphere was a factor; and in 1888 Crum Brown published the theory—termed the "carbonic acid theory"—that water and carbon dioxide react with iron to form ferrous carbonate and hydrogen, the ferrous carbonate being subsequently oxidized by moist oxygen to ferric hydrate and regenerating carbon dioxide, which again reacts with more iron. This theory was controverted by Wyndham Dunstan, who attempted to prove that carbon dioxide was not necessary to rusting; and in place of the acid theory, he set up a scheme which involved the production of hydrogen peroxide. G. T. Moody has since shown that when all traces of carbon dioxide are removed (which is a matter of great experimental difficulty) iron may be left in contact with oxygen and water for long periods without rust appearing, but on the admission of carbon dioxide specks are rapidly formed. It also appears that rust changes in composition on exposure to the atmosphere, both the ferrous oxide and carbonate being in part oxidized to ferric oxide. Acids, other than carbonic, may promote rusting; this is particularly the case with ironwork exposed to the acids—sulphurous, nitric, &c.—contained in smoke. It is probable that the action depends upon the presence of iron, oxygen and water, and some acid which makes the water an electrolyte.

Steel differs in many ways from iron in respect of atmospheric corrosion; the heterogeneous nature of steel gives occasion to a selective rusting, ferrite is much more readily attacked than the cementite and pearlite; moreover, the introduction of other elements may retard rusting; this is particularly the case with the nickel-steels.

RUSTCHUK (Bulg. *Russé*), the capital of the department of Rustchuk, Bulgaria, on the right bank of the Danube, where it receives the E. Lom. Pop. (1906) 33,552. Rustchuk is the headquarters of a military division and of a naval flotilla stationed on the Danube. As a river-port and the terminus of railways from Varna and from Sofia via Trnovo, it has much commercial importance; and it possesses tobacco and cigarette factories, soap-works, breweries, aerated water factories, dyeworks, tanneries, sawmills, brick and tile works and a celebrated pottery.

In the time of the Romans Rustchuk was one of the fortified points along the line of the Danube. In the *Tabula Peutingeriana* it appears as Prisca, in the *Antonine Itinerary* as Serantaprista, in the *Notitia* as Seragintaprista and in Ptolemy as Priste Polis. Destroyed by barbarian invaders in the 7th century the town recovered its importance only in comparatively modern times. In 1810 it was captured by the Russians, who destroyed the fortifications. It played an important part in the Russo-Turkish Wars of 1828–29, 1853–54 and 1877–78. In 1877 it was nearly destroyed by the Russian artillery stationed in the Rumanian town of Giurgevo, on the opposite bank of the Danube.

RUSTENBURG, a district and town of the Transvaal, South Africa. The district originally included all the N.W. part of the country, but is now of much smaller dimensions. Its S. border is marked by the Magaliesberg and other hills forming the N. escarpment of the high veld and the watershed between the Vaal and Limpopo. Several of the headstreams of the Limpopo rise within the district on the N. slopes of the Magaliesberg. The climate of the district is sub-tropical and the principal cultivation is that of tobacco, and fruit trees, notably oranges. The opening of the railway to Pretoria in 1906 led to a marked development of trade. In an amphitheatre formed by the hills and 61 m. by rail W. of Pretoria is the town of Rustenburg with a population (1904) of 1815. The town is one of the oldest in the Transvaal, having been founded in 1850 by the *Voortrekkers*. It was at Rustenburg that the volksraad met in March 1852 to ratify the Sand River Convention granting independence to the Transvaal Boers. At the time it was feared that there would be civil war between Hendrik Potgieter and Andries Pretorius, but they were reconciled in Potgieter's tent. Later Rustenburg became the home of the Kruger family. It was occupied by the British under R. S. Baden Powell in June 1900.

RUSTICATION (*i.e.* the making "rustic" or countrified, from Lat. *rus*, country; thus the term "rusticate" is used for taking a country holiday, or in academic circles to be "rusticated" is to be sent away from a university for punishment), in architecture, the technical term (French equivalent *bossage*) given to masonry in which the centre part of the face of the stone is either left rough as it came from the quarry, or is worked in various ways to give variety to the surface. The earliest example exists in the platform at Pasargadae in Persia (560 B.C.), erected by Cyrus, where the edge round the four sides of the stone forms a draft, two or three inches wide, worked with a chisel, the centre part being left rough. Similar work exists at Arak-el-Emir in Palestine (151 B.C.). The finest examples are those of the walls of the temple at Jerusalem, and at Hebron, where the stones are of immense size and the rustication projects sometimes over a foot. The Crusaders' castles in Palestine are all boldly rusticated, but the projecting portions have been worked over with a chisel in diagonal lines, and this enables them to be distinguished from the earlier masonry. In the five-sided tower at Nuremberg and the Burg-Capelle at Rothenburg, the rustication has a decorative value, so that in later work it was employed for the quoin-stones of towers. The masonry of the Palazzo Vecchio, and of the Pitti, Strozzi and Riccardi palaces, all in Florence, and of other palaces in Siena and Volterra, is rusticated. Rustication was employed in terraces and grottos in Italy, where on account of its extravagances it gave rise to the term "grotesque." In the later Renaissance the edges of the stone were bevelled off, with a sunk joint in addition; and the treatment was known as vermiculated, if in imitation of earth burrowed by worms; marine, if with small shell holes; stalactitic, if carved in imitation of lime deposits, &c. In Italy the projecting portions were sometimes worked into facets. Rustication was introduced into England by Inigo Jones, who, in old Somerset House, York Stairs Watergate, the gateway of the Botanical Garden at Oxford, and elsewhere, used it only in alternate courses, his example being followed by other architects of the Renaissance. The term is now applied to the ashlar blocks of masonry which alternate with the circular drums of columns in many public buildings.

RÜSTOW, FRIEDRICH WILHELM (1821–1878), Swiss soldier and military writer, was a Prussian by birth. He entered the service of his native country, and served for some years, until the publication of *Der Deutsche Militärstaat vor und während der Revolution* (Zürich, 1850) brought him official condemnation. He was sentenced by a court-martial to a long term of fortress imprisonment, but succeeded in escaping to Switzerland. He obtained military employment in the service of the Republic, and in 1857 was major on the engineer staff. Three years later he accompanied Garibaldi in the famous expedition against the two Sicilies as colonel and chief of the staff, and to him must be ascribed the victories of Capua (19th Sept. 1860) and the Volturno (1st Oct. 1860). At the end of the campaign he once more settled down at Zürich. At the outbreak of the war of 1870 he offered his services to Prussia, but was not accepted. In 1878, on the foundation of a military professorship at Zürich, Rüstow applied for the post, and, on its being given to another officer, lost heart and committed suicide.

Two younger brothers, both Prussian soldiers, were also distinguished men. The elder, ALEXANDER (1824–1866), is remembered for his work *Der Küstenkrieg* (Berlin, 1848); the younger, CAESAR (1826–1866), was one of the foremost experts of his time in the design and construction of military rifles, and the writer of several treatises on that subject, of which we may mention *Die Kriegshandfeuerwaffen* (Berlin, 1857–64). Both Alexander and Caesar fell on the field of battle in the war of 1866, at Königgrätz and Dermbach respectively.

Amongst F. W. Rüstow's works, which covered nearly every branch of the military art, a large number must be mentioned. Historical—*Heerwesen und Kriegführung Julius Cäsars* (Gotha, 1855; 2nd ed., Nordhausen, 1862), *Kommentar zu Napoleon III.'s Geschichte Julius Cäsars* (Stuttgart, 1865–67), *Geschichte des Griechischen Kriegswesens* (in collaboration with Köchly, Aarau, 1852), *Militär. Biographen* (*David, Xenophon, Montluc*) (Zürich, 1858), *Geschichte der Infanterie* (Gotha, 1857–58; 3rd ed., 1884), *Die Ersten Feldzüge Napoleons 1796–1797* (Zürich, 1867), *Der Krieg von 1805 in Deutschland und Italien* (Frauenfeld, 1854), *Geschichte des Ungarischen Insurrektionkrieges 1848–49* (Zürich, 1860), reminiscences of 1860 in Italy (Leipzig, 1861) and monographs on the campaigns of 1848–49 in Italy (Zürich, 1849) and the Crimean War (Zürich, 1855–56). Critical and General—*Allgemeine Taktik* (Zürich, 1858; 2nd ed., 1868), *Kriegspolitik und Kriegsgebrauch* (Zürich, 1876), *Militär-Handwörterbuch* (Zürich, 1859), *Die Feldherrnkunst des XIX Jahrhunderts* (Zürich, 1857; 3rd ed., 1878–79), *Der Krieg und seine Mittel* (Leipzig, 1856). He also wrote *Annalen des Königreichs Italien* (Zürich, 1862–63).

See Zernim, "F. W. Rüstow," in *Unsere Zeit.* vol. 2 (Leipzig, 1882).

RUTEBEUF, or RUSTEBUEF (fl. 1245–1285), French *trouvère.* was born in the first half of the 13th century. His name is nowhere mentioned by his contemporaries. He frequently plays in his verse on the word Rutebeuf, which was probably a *nom de guerre,* and is variously explained by him as derived from *rude bœuf* and *rude œuvre.* He was evidently of humble birth, and he was a Parisian by education and residence. Paulin Paris thought that he began life in the lowest rank of the minstrel profession as a *jongleur.* Some of his poems have autobiographical value. In *Le Mariage de Rutebeuf* he says that on the 2nd of January 1261 he married a woman old and ugly, with neither dowry nor amiability.[1] In the *Complainte de Rutebeuf* he details a series of misfortunes which have reduced him to abject destitution. In these circumstances he addresses himself to Alphonse, comte de Poitiers, brother of Louis IX., for relief. Other poems in the same vein reveal that his own miserable circumstances were chiefly due to a love of play, particularly a game played with dice, which was known as *griesche.* It would seem that his distress could not be due to lack of patrons, for his metrical life of Saint Elizabeth of Hungary was written by request of Erard de Valéry, who wished to present it to Isabel, queen of Navarre; and he wrote elegies on the deaths of Anceau de l'Isle Adam, the third of the name, who died about 1251, Eude, comte de Nevers (d. 1267), Thibaut V. of Navarre (d. 1270), and Alphonse, comte de Poitiers (d. 1271), which were probably paid for by the families of the personages celebrated. In the *Pauvreté de Rutebeuf* he addresses Louis IX. himself.

The piece which is most obviously intended for popular recitation is the *Dit de l'Herberie,* a dramatic monologue in prose and verse supposed to be delivered by a quack doctor. Rutebeuf was also a master in the verse *conte,* and the five of his *fabliaux* that have come down to us are gay and amusing. The matter, it may be added, is sufficiently gross. The adventures of *Frère Denyse le cordelier,* and of "*la dame qui alla trois fois autour du moûtier,*" find a place in the *Cent Nouvelles nouvelles.*

Rutebeuf's serious work as a satirist probably dates from about 1260. His chief topics are the iniquities of the friars, and the defence of the secular clergy of the university of Paris against their encroachments; and he delivered a series of eloquent and insistent poems (1262, 1263, 1268, 1274) exhorting princes and people to take part in the crusades. He was a redoubtable champion of the university of Paris in its quarrel with the religious orders who were supported by Pope Alexander IV., and he boldly defended Guillaume de Saint-Amour when he was driven into exile. The libels, indecent songs and rhymes condemned by the pope to be burnt together with the *Périls des derniers temps* attributed to Saint-Amour, were probably the work of Rutebeuf. The satire of *Renart le Bestourné,* which borrows from the Reynard cycle little but the names under which the characters are disguised, was directed, according to Paulin Paris, against Philip the Bold. To his later years belong his religious poems, and also the *Voie de Paradis,* the description of a dream, in the manner of the *Roman de la Rose.*

The best work of Rutebeuf is to be found in his satires and verse *contes.* A miracle play of his, *Le Miracle de Théophile,* is one of the earliest dramatic pieces extant in French. The subject of Theophilus, the Cilician monk who made a pact with the devil, which was afterwards returned to him by the intervention of the Virgin, was a familiar one with the story-tellers of the middle ages. Rutebeuf can claim no priority in the choice of the subject, which had been treated dramatically in the Latin piece ascribed to the nun Hroswitha of Gandersheim, but his piece has considerable importance in dramatic history.

The *Œuvres* of Rutebeuf were edited by Achille Jubinal in 1839 (new edition, 1874); a more critical edition is by Dr Adolf Kressner

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[1] It has been suggested that Brunetto Latini was thinking of Rutebeuf when he wrote in his *Livre du Trésor*: "Le Rire, le jeu, voilà la vie du jongleur, qui se moque de lui-même, de sa femme, de ses enfants, de tout le monde."

(*Rustebuef's Gedichte*; Wolfenbüttel, 1885). See also the article by Paulin Paris in *Hist. litt. de la France* (1842), vol. xx. pp. 719–83, and *Rutebeuf* (1891), by M. Léon Clédat, in the *Grands Écrivains français* Series.

RUTH, BOOK OF, in the Old Testament. The story of Ruth (the Moabitess, great-grandmother of David) is one of the Old Testament Hagiographa and is usually reckoned as the second of the five *Megilloth* (Festal Rolls). This position corresponds to the Jewish practice of reading the book at the feast of Pentecost; Spanish MSS., however, place it at the head of the *Megilloth*; and the Talmud (*Baba Bathra*, 14*b*) gives it the first place among all the Hagiographa. On the other hand, it follows Judges in the Septuagint, the Vulgate and the English version. But although it was very natural that a later rearrangement should transfer Ruth from the Hagiographa to the historical books, and place it between Judges and Samuel, no motive can be suggested for the opposite change, and the presumption is that it found a place in the last part of the Jewish canon after the second (with the historical books) had been definitely closed. See BIBLE: *Old Testament*, section I. "Canon"; CANTICLES; LAMENTATIONS.

That the book of Ruth did not originally form part of the series of "Former Prophets" (Joshua–Kings) is further probable from the fact that it is quite untouched by the process of "prophetic" or "Deuteronomistic" editing, which helped to give that series its present shape after the fall of the kingdom of Judah. The narrative has no affinity with the point of view which looks on the history of Israel as a series of examples of divine justice and mercy in the successive rebellions and repentances of the people of God.[1] But if the book had been known at the time when the history from Joshua to Kings was edited it could hardly have been excluded from the collection; the ancestry of David (iv. 17, 18–22) was of greater interest than that of Saul, which is given in 1 Sam. ix. 1, whereas the old history names no ancestor of David beyond his father Jesse.

Date.

In truth the book of Ruth presents itself as dealing with times far back (Ruth i. 1), and takes delight in depicting details of antique life and obsolete usages (iv. 7); it views the stormy period before the institution of the kingship through the softening atmosphere of time, which imparts to the scene a gentle sweetness very different from the harsher colours of the old narratives of the book of Judges. It has indeed been argued that, as the author seems to take no offence at the marriage of Israelites with Moabite women, he must have lived before the time of Ezra and Nehemiah (Ezra ix.; Neh. xiii.); but the same argument would prove that the book of Esther was written before Ezra. The very designation of a period of Hebrew history as "the days of the judges" is based on the Deuteronomistic additions to the book of Judges (ii. 16 sqq.) and does not occur till the period of the exile. It is true that the language has some features which appear to link it with the narratives in Samuel and Kings, but it might fairly be assumed either that the book is the work of a late author well acquainted with the earlier literature, or that an old narrative had undergone some rewriting at a later age. No definite conclusion can be drawn from the fact that the language stands in marked contrast to that of Chronicles, Ezra, Nehemiah, &c., since writings presumably more or less contemporary did not necessarily share the same characteristics (observe, for example, the prose parts of Job).

Design.

Like the stories appended to Judges (by a post-Deuteronomic hand) the book of Ruth connects itself with Bethlehem, the traditional birthplace of David. Some connexion between Bethlehem and Moab has been found in the (now corrupt) text of 1 Chron. iv. 22 (where the Targum and late rabbinical exegesis discover references to the story of Ruth), and is more explicitly suggested by the isolated 1 Sam. xxii. 3 seq. which evidently knew of some relationship between Moab and the illustrious descendant of Boaz and Ruth. Next, the writer claims the sympathy of his readers for Ruth, upon whose Moabite origin he frequently insists, and this feature is noteworthy in view of the aversion with which intermarriage was regarded at a certain period (Deut. xxiii. 3; Neh. xiii.; Ezra ix. seq.). The independent evidence for the present post-exilic form of the book has consequently led many scholars to the conclusion that it was directed against the drastic steps associated with the reforms of Ezra and Nehemiah, which, as is known, were not everywhere acceptable. Thus, not only do we have a beautiful portrait of a woman of Moabite origin, but she becomes the ancestress of David himself, and in the days of these measures the charming and simple story would inevitably suggest the question whether the exclusiveness of Judaism could not be carried too far. There is no reason, however, to believe that this was the original object of the story. It contains other features of considerable interest to which more importance seems to be attached, and the writer is evidently an artist who takes manifest delight in the touching and graceful details of his picture, and is not simply guided by a desire to impart historical information or to enforce some particular lesson.

Critical problems.

One does not look for absolute consistency in oriental narratives, and even this little book contains several internal intricacies which demand investigation. The genealogy from Perez to David in iv. 18–22 is of little value since Salma (Salmon), father of Boaz, is a Calebite clan-name, not associated with its earlier seat S. of Hebron as in Judges i., 1 Sam. xxv., &c., but as "father" of Bethlehem, representing exilic or later conditions (1 Chron. ii. 51; see CALEB). Apart from other signs of a late date in this list of the ancestors and descendants of Boaz, iv. 12 certainly implies that the genealogical lines of Perez and Boaz were not identical, and thus verses 18–22 in the opinion of most scholars are a later addition.

Further, the story involves points of old family usage which are no longer clear. The well-known custom which gives the nearest heir of the dead a right to inherit the widow is naturally distinct from the levirate (*q.v.*), where it is the brother's duty to marry his widowed sister-in-law if childless, and where the eldest son succeeds to the name and inheritance of the deceased. In Hebrew usage the refusal to perform the levirate brought ignominy (see Deut. xxv. 5–10), and Gen. xxxviii. relates how Tamar, when Shelah was not given to her, obtained a child through her father-in-law Judah (see esp. vers. 14, 26).[2] In addition to these customs to prevent the alienation of the estate and to perpetuate the family name, the post-exilic story in Num. xxvii. 1–11, xxxvi. gives daughters the right of inheritance provided they do not marry outside the tribe. Although the levirate still continued (Matt. xxii. 24 sqq.), the late laws in Lev. xviii. 16, xx. 21, as also this story, may be aimed against it. Finally, the *gōēl* ("next kinsman," lit. "avenger"; see Driver, *Ency. Bib.* col. 1745 sqq.) has the first right of purchase to an estate (Jer. xxxii. 6–15), and indeed must redeem the property which his needy relative might be compelled to sell (Lev. xxv., see ver. 25). Now it appears that Boaz combines the essential duty of the *gōēl* in purchasing the estate over which Naomi holds rights, and at the same time marries, not Naomi, who is now old, but her daughter-in-law Ruth, in order to perpetuate her husband's family. Naomi, who had realized the impossibility of the levirate in her case (i. 11 seq.), returned home a disconsolate and childless widow (i. 20 seq.), but the filial Ruth fell in with her plans and put herself entirely into the hands of the kinsman Boaz (iii.). In the happy finale, Naomi is the recipient of congratulations upon the birth of a son to the faithful Ruth (iv. 17*a*, "there is a son born to Naomi"); the name of the dead is thus "raised up" (iv. 5, 10), and the child Obed is clearly recognized as of the line of Elimelech and Mahlon (Naomi's husband and son). In point of fact, a nearer kinsman than Boaz had agreed to purchase the estate (as *gōēl*), which Naomi evidently had not yet sold (see commentaries on iv. 3); but he was unwilling to marry Ruth (reading in ver. 5, "and also Ruth thou must buy"; cf. ver. 10), recognizing that if a son were born the estate would revert to the line of Elimelech, thus leaving him at a disadvantage. He was evidently unprepared for what seems a novel condition (contrast Boaz in iii. 12 seq.), although, from the felicitations in iv. 11–13, the issue of the marriage is actually reckoned to the husband (Boaz). It is improbable that these conflicting features in v. 11–13 and ver. 17*a*, and all that they involve, co-existed, and it is possible that the former (with the implied reference to the coming David) is not part of the original. However, as in the equally complicated story in Gen. xxxviii., it is difficult to trace the extent or growth of the various motives, *e.g.* the primary interest in Naomi, the romantic marriage of Ruth, the selling of the land (which comes only in ch. iv.), &c.

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[1] The religious pragmatism lacking in the original is in part supplied by the Targum (i. 5, 6).

[2] See further, W. R. Smith, *Kinship and Marriage in Early Arabia*, 2nd ed. p. 105; Wellhausen, *Götting. Gelehrte Anzeig.* (1893), pp. 455 seq. Ruth iv. 7 refers to the custom of drawing off the shoe as a sign of renunciation (cf. Deut. *loc. cit.*, and G. A. Smith, *Ency. Bib.* col. 5196 head), and ver. 12 to the story of Tamar and Judah. Compare, for the retention of simple methods of transacting business, the striking of hands (Prov. vi. 1, xxii. 26).

Literature.—See S. R. Driver, *Literature of Old Testament*, who, with C. F. Kent (*Beginnings of Heb. Hist.* p. 310 seq.), favours a pre-exilic origin. An exilic date has found the support of Ewald and König, but that it is now of the post-exilic age is the opinion of most writers. See further W. R. Smith's art. "Ruth" in *Ency. Brit.* 9th ed. (several portions of which have been retained by the present writer), revised and supplemented by T. K. Cheyne in *Ency. Bib.*; A. Bertholet, *Kurzer Handkommentar* (1898); W. Nowack, *Handkommentar* (1902); and (with special reference to traces of earlier mythological motives) H. Winckler, *Altorient. Forschungen* (iii. 66 sqq.). For the customs discussed above, see I. Benzinger, *Ency. Bib.* col. 2949 seq.; J. A. Bewer, *Theol. Stud. u. Krit.* (1903), pp. 328 seq., 502 sqq. (with G. A. Barton's art. "Ruth" in *Jew. Encyc.*); and T. W. Juynboll, *Theolog. Tijdschr.* (1906), pp. 158 sqq.

(W. R. S.; S. A. C.)

RUTHENIANS, a name applied to those of the Little Russians who are Austrian subjects. The name is a form of the word *Russian*. The Ruthenians were separated from the bulk of Russians by the accident of the two feudal principalities of the old Red Russia, Halič and Volhynia, having fallen to Lithuania, which in turn was united with Poland. At the partition of Poland no one troubled about ethnological boundaries. The language is in substance like the Little Russian of the Ukraine, though it has marked differences; the most interesting dialects are those in the extreme W., which approach to Slovak and that of the Huzuli in Bukovina. The Ruthenians number some three million in Galicia, Bukovina, and in the Carpathians along the edges of Hungary from the 21st meridian eastwards. Throughout Galicia the Poles form the aristocracy, though in two-thirds of it Ruthenians form the bulk of the population, while the middle class is Jewish or German. The Ruthenians are therefore under an alien yoke both politically and economically: in religion they mostly belong to the Uniate Church, acknowledging the Pope but retaining their Slavonic liturgy and most of the outward forms of the Greek Church. Their intellectual centre is Lemberg (Lviv or Lwów), where some lectures in the university are given in their language, and they are agitating for it to have equal rights with Polish. Yet here Little Russian is freer than in the Russian empire, and in Lemberg is the centre of its literature, the society called by the name of Ševčenko, the Little Russian poet. This society publishes voluminous transactions in a special orthography and deals with everything concerning Little Russia, its archaeology, people and language.

See summary of the work of the Ševčenko for ten years in *Archiv f. slavische Phil.* xxvii. (1905), p. 279.

RUTHENIUM [symbol Ru, atomic weight 101·7 (O=16)], in chemistry, a metallic element, found associated with platinum, in platinum ore and in osmiridium. The metal may be obtained from the residues obtained in the separation of osmium from osmiridium. These are washed with ammonium chloride until the filtrate is colourless, ignited, fused with caustic potash and nitre, the melt dissolved in water and nitric acid added to the solution until the colour of potassium ruthenate disappears. A precipitate of ruthenium oxide gradually separates; this is collected and ignited in a graphite crucible and finally fused in the oxyhydrogen furnace (H. Sainte-Claire Deville and H. J. Debray, *Ann. chim. phys.*, 1859, (3), 56, p. 406). For other methods see C. E. Claus, *Pogg. Ann.*, 1845, 65, p. 200; E. Frémy, *Comptes rendus*, 1854, 38, p. 1008; T. Wilm, *Ber.*, 1883, 16, p. 1524. A purer ruthenium is obtained by A. Gutbier and L. Trenkner (*Zeit. anorg. Chem.*, 1905, 45, p. 166) by heating the crude metal (obtained by other processes) in a current of oxygen until all the osmium is volatilized as tetroxide. The residue is then fused with caustic potash and nitre, dissolved in water, saturated with chlorine and distilled on the water-bath in a current of chlorine. Pure ruthenium tetroxide distils over. This is then dissolved in water, reduced by alcohol and ignited in oxygen. Ruthenium in bulk resembles platinum in its general appearance, and has been obtained crystalline by heating an alloy of ruthenium and tin in a current of hydrochloric acid gas. Its specific gravity (after fusion) is 12·063 (A. Joly, *Comptes rendus*, 1893, 116, p. 430). It fuses easily in the electric arc. It oxidizes superficially when heated, but fairly rapidly when ignited in an oxidizing blowpipe flame, forming a black smoke of the oxide. It is also oxidized when fused with caustic potash and nitre, forming a ruthenate. Acids have practically no action on the metal, but it is soluble in solutions of the alkaline hypochlorites. Like most of the other metals of the group, it absorbs gases. A colloidal form has been obtained by A. Gutbier and G. Hofmeier (*Jour. prakt. Chem.*, 1905, (2), 71, p. 452) by reducing ruthenium salts with hydrazine hydrate in the presence of gum-arabic.

Several oxides of ruthenium have been described, the definite existence of some of which appears to be doubtful. The dioxide, RuO_2, is formed by heating sulphate, or by heating the metal in a current of oxygen. It crystallizes in octahedra isomorphous with stannic oxide. It is insoluble in acids and decomposes when heated to a sufficiently high temperature. Fusion with caustic potash converts it into a mixture of potassium ruthenate and ruthenium sesquioxide, Ru_2O_3, which is a black, almost insoluble powder. An oxide of composition Ru_4O_9 is obtained as a black hydrated powder when the peroxide is heated with water for some time. It becomes anhydrous at about 360° C., and is unattacked by acids and alkalis. The peroxide, RuO_4, is formed when a solution of potassium ruthenate is decomposed by chlorine, or by oxidizing ruthenium compounds with potassium chlorate and hydrochloric acid, or with potassium permanganate and sulphuric acid. It forms a golden yellow crystalline mass, which sublimes slowly in vacuo, and melts at 25·5° C. It blackens on exposure to moisture, and decomposes when exposed to light. It is insoluble in water, but gradually decomposes, forming a hydrated oxide, $Ru_2O_5 \cdot H_2O$. It is readily reduced. Its vapour possesses a characteristic smell, somewhat resembling that of ozone. Ruthenium dichloride, $RuCl_2$, is obtained (in solution) by reducing the sesquichloride by sulphuretted hydrogen or zinc. It is stable in the cold. The sesquichloride, Ru_2Cl_6, is formed when a mixture of chlorine and carbon monoxide is passed over finely divided ruthenium heated to 350° C. (Joly, *Comptes rendus*, 1892, 114, p. 291). It is a brown powder which is readily decomposed by boiling water. It absorbs ammonia readily, forming $Ru_2Cl_6 \cdot 7NH_3$. Numerous double chlorides are known, *e.g.* $Ru_2Cl_6 \cdot 4KCl$; $Ru_2Cl_6 \cdot 4NH_4Cl$, &c. The pure tetrachloride, $RuCl_4$, has not been isolated, but is chiefly known in the form of its double salts, such as potassium ruthenium chloride, K_2RuCl_6, which is obtained when finely divided ruthenium is fused with caustic potash and potassium chloride is gradually added to the fused mass (U. Antony and A. Luchesi, *Gazz*, 1899, 29, II. p. 82). It is a red-brown crystalline powder, which is soluble in water. A similar ammonium salt has been obtained. Ruthenium sulphides are obtained when the metal is warmed with pyrites and some borax, and the fused mass treated with hydrochloric acid first in the cold and then hot. The insoluble residue contains a mixture of two sulphides, one of which is converted into the sulphate by nitric acid, whilst the other (a crystalline solid) is insoluble in acids. Ruthenium sulphate, $Ru(SO_4)_2$, as obtained by oxidizing the sulphide, is an orange-yellow mass which is deliquescent and dissolves in water, the solution possessing a strongly acid reaction. *Rouge de Ruthene*, $Ru_2(OH)_2 \cdot Cl_4 \cdot (NH_4)_7$, is obtained from ammonia and ruthenium sesquichloride at 40° C., the product being purified by crystallization from ammonia. It forms small brown lamellae which dissolve slowly in water to give a fuchsin-red solution possessing a violet reflex. The solution possesses a considerable tinctorial power, dyeing silk in the cold. Potassium ruthenium cyanide, $K_4Ru(CN)_6 \cdot 3H_2O$, formed when potassium ruthenate is boiled with a solution of potassium cyanide, crystallizes in colourless plates which are soluble in water. A ruthenium silicide, RuSi, has been prepared by H. Moissan (*Comptes rendus*, 1903, 137, p. 229) by the direct combination of the two elements in the electric furnace. It forms very hard metallic-looking crystals, burns in oxygen and is not attacked by acids. Potassium ruthenate, $K_2RuO_4 \cdot H_2O$, obtained by fusion of the metal with caustic potash and nitre, crystallizes in prisms which become covered with a black deposit on exposure to moist air. It is soluble in water, giving an orange-red solution which becomes green on standing, and gradually deposits the hydrated pentoxide, $Ru_2O_5 \cdot H_2O$ (H. Debray and A. Joly, *Comptes rendus*, 1888, 106, p. 1494). The *per-ruthenate*, $KRuO_4$, formed by the action of chlorine on the ruthenate, or of alkalis on the peroxide at 50° C., is a black crystalline solid which is stable in dry air but decomposes when heated strongly. On the nitroso, nitroso-ammonium and nitroso-diammonium compounds see C. E. Claus, *Ann.*, 1856, 98, p. 317; A. Joly, *Comptes rendus*, 1888, 107, p. 994; 1889, 108, pp. 854, 1300; 1890, 111, p. 969; L. Brizard, ibid., 1896, 122, p. 730; 1896, 123, p. 182. The atomic weight of ruthenium was determined by A. Joly (*Comptes rendus*, 1889, 188, p. 946), who obtained the values 101·5 and 101·3.

RUTHERFORD, MARK, the pen-name of William Hale White, English author, who was born at Bedford about 1830. His father, William White, a member of the nonconformist community of the Bunyan Meeting, removed to London, where he was well known as a doorkeeper of the House of Commons; he wrote sketches of parliamentary life for the *Illustrated Times*, papers afterwards collected by his son as *The Inner Life of the House of Commons* (1897). The son was educated for the Congregational ministry, but the development of his views prevented his taking up that career, and he became a clerk in the admiralty. He had already served an apprenticeship to journalism before he made his name as a novelist by the three books "edited by Reuben Shapcott," *The Autobiography of Mark Rutherford* (1881), *Mark Rutherford's Deliverance* (1885), and *The Revolution in Tanner's Lane* (1887). Under his own name he translated Spinoza's *Ethic* (1883). Later books are *Miriam's Schooling, and other Papers* (1890), *Catherine Furze* (2 vols., 1893), *Clara Hopgood* (1896), *Pages from a Journal, with other Papers* (1900), and *John Bunyan* (1905). Though for a long time little appreciated by the public, his novels—particularly the earlier ones—have a power and style which must always give his works a place of their own in the literary history of their time.

RUTHERFORD, WILLIAM GUNION (1853–1907), English scholar, was born in Peeblesshire on the 17th of July 1853. He was educated at St Andrews and Oxford, where he graduated in natural science, with a view to following the medical profession, which he abandoned in favour of a scholastic career. From 1883 to 1901 he was headmaster of Westminster school; and his death, on the 19th of July 1907, deprived classical scholarship in England of one of its most brilliant modern representatives. Rutherford devoted special attention to Attic idioms and the language of Aristophanes. His most important work, the *New Phrynichus* (1882), dealing with the Atticisms of the grammarian, was supplemented by his *Babrius* (1883), a specimen of the later Greek, which was the chief subject of C. A. Lobeck's earlier commentary (1820) on Phrynichus. His edition (1896–1905) of the Aristophanic scholia from the Ravenna MS. was less successful. Mention may also be made of his *Elementary Greek Accidence* and *Lex Rex*, a list of cognate words in Greek, Latin and English.

RUTHERFURD (or RUTHERFORD), **SAMUEL** (*c.* 1600–1661), Scottish divine, was born about 1600 at the village of Nisbet, Roxburghshire. He went to college at Edinburgh in 1617, graduating M.A. in 1621, and two years afterwards was elected professor of humanity. On account of an alleged indiscretion before his marriage in 1626 he was dismissed his professorship in that year, but, after studying theology, he was in 1627 appointed minister of Anwoth, Kirkcudbrightshire, and soon took a leading place among the clergy of Galloway. In 1636 his first book, entitled *Exercitationes Apologeticae pro Divina Gratia*—an elaborate treatise against Arminianism—appeared at Amsterdam. Its severe Calvinism led to a prosecution by the bishop, Thomas Sydserf, in the High Commission Court, first at Wigtown and afterwards at Edinburgh, with the result that Rutherfurd was deposed from his pastoral office, and sentenced to confinement in Aberdeen during the king's pleasure. His banishment lasted from September 1636 to February 1638, and the greater number of his published *Letters* belong to this period of his life. He was present at the signing of the Covenant in Edinburgh in 1638, and at the Glasgow Assembly of the same year he was restored to his parish. In 1639 he was appointed professor of divinity in St Mary's College, St Andrews. He only accepted the position on the condition that he should be allowed to act as colleague to Robert Blair in the church of St Andrews. He was sent up to London in 1643 as one of the eight commissioners from Scotland to the Westminster Assembly. Remaining at his post over three years, he did great service to the cause of his party. In 1642 he had published his *Peaceable and Temperate Plea for Paul's Presbyterie in Scotland*, and the sequel to it in 1644 on *The Due Right of Presbyteries* provoked Milton's contemptuous reference to "mere A. S. and Rutherfurd" in his sonnet *On the New Forcers of Conscience under the Long Parliament*. In 1644 also appeared Rutherfurd's *Lex Rex, a Dispute for the Just Prerogative of King and People*, which gives him a recognized place among the early writers on constitutional law; it was followed by *The Divine Right of Church Government and Excommunication* (1646), and *Free Disputation against Pretended Liberty of Conscience* (1648), characterized by Bishop Heber as "perhaps the most elaborate defence of persecution which has ever appeared in a Christian country." Among his other works are the *Tryal and Triumph of Faith* (1645), *Christ Dying and Drawing Sinners to Himself* (1647), and *Survey of the Spiritual Antichrist* (1648). In 1647 he returned to St Andrews to become principal of the New College there, and in 1648 and 1651 he declined successive invitations to theological chairs at Harderwijk and Utrecht. After the Restoration in 1660, his *Lex Rex* was ordered to be burned. He was deprived of all his offices, and on a charge of high treason was cited to appear before the ensuing parliament. His health utterly broke down, and he drew up, on the 26th of February 1661, a *Testimony*, which was posthumously published. He died on the 23rd of the following March.

The fame of Rutherfurd now rests principally upon his remarkable *Letters*, which, to the number of 215, were first published anonymously by M'Ward, an amanuensis, as *Joshua Redivivus, or Mr Rutherfoord's Letters*, in 1664. They have been frequently reprinted, the best edition (365 letters) being that by Rev. A. A. Bonar (1848), with a sketch of his life. In addition to the other works already mentioned, Rutherfurd published in 1651 a treatise, *De Divina Providentia*, against Molinism, Socinianism and Arminianism, of which Richard Baxter, not without justice, remarked that "as the *Letters* were the best piece so this was the worst he had ever read."

See also a short *Life* by Rev. Dr Andrew Thomson (1884); Dr A. B. Grosart in *Representative Nonconformists*; Dr Alexander Whyte, *Samuel Rutherford and some of his Correspondents* (1894); Rev. R. Gilmour, *Samuel Rutherford* (1904).

RUTHERGLEN (locally pronounced *Rŭglen*), a royal municipal and police burgh of Lanarkshire, Scotland. Pop. of royal burgh (1901) 18,279. It is situated on the left bank of the Clyde, 2½ m. by the Caledonian railway S.E. of Glasgow, with the E. of which it is connected by a bridge. The parish church stands near the spire of the ancient church where, according to tradition, the treaty was made in 1297 with Edward I., by which Sir John Menteith undertook to betray Wallace to the English. The principal public building is the town hall, dating from 1861. The industries include collieries, chemical works, dye-works, cotton- and paper-mills, chair-making, tube-making, pottery, rope- and twine-works and some shipbuilding. It forms one of the Kilmarnock group of parliamentary burghs, with Dumbarton, Port-Glasgow, Renfrew and Kilmarnock.

Rutherglen was erected into a royal burgh by David I. in 1126. It then included a portion of Glasgow, but in 1226 the boundaries were rectified so as to exclude the whole of the city. In early times it had a castle, which was taken by Robert Bruce from the English in 1313. It was kept in good repair till after the battle of Langside (1568), when it was burnt by order of the regent Moray. In 1679 the Covenanters published their "Declaration and Testimony" at Rutherglen prior to the battles of Drumclog and Bothwell Brig (1679).

RUTHIN (*Rhudd ddin*, "red fortress"), a municipal and contributory parliamentary borough (with Denbigh and Holt) and market town of Denbighshire, N. Wales, situated on a hill rising from the river Clwyd, 21 m. from Chester, and 215 from London by rail. Pop. (1901) 2643. It is on the Great Western railway (Denbigh, Corwen & Ruthin branch). Apart from the legends of Arthur and his limestone block (shown in the market-place), the first event of note in its history is its connexion with the de Grey de Ruthyn family (the first lord died 1353). Owen Glendower attacked it unsuccessfully in 1400. It was sold by the de Greys to Henry VII., and Elizabeth gave it to the earl of Warwick. In 1646, after two months' siege, it was dismantled by the Parliamentarians. The new castle occupies the same site, and is built of the same coloured sandstone as the old. New buildings for the Free Grammar School (founded in 1595 by Gabriel Goodman, dean of Westminster, who also in 1590 had built the hospital for twelve decayed housekeepers), were opened in the town in 1893. The old (conventual) Anglican church of St Peter, once belonging to "Les Bonshommes," and made collegiate in 1310 by John de Grey, has a Perpendicular north aisle roof, nearly 500 panels of carved oak, and cloisters which have been made into a house for the warden of the hospital. Agriculture is the staple, but there are chemical, aerated waters, bricks, terra-cotta and other manufactures.

RUTHVEN, the name of a noble Scottish family which traces its descent from a certain Thor, who settled in Scotland during the reign of David I. In 1488 one of its members, Sir William Ruthven (d. 1528), was created a lord of parliament as Lord Ruthven. His eldest son William was killed at Flodden in 1513, and consequently his grandson William succeeded him in the title, and after holding the offices of extraordinary lord of session and keeper of the privy seal died in December 1552, leaving three sons. The eldest of these, Patrick, 3rd Lord Ruthven (*c.* 1520–1566), played an important part in the political intrigues of the 16th century as a strong Protestant and a supporter of the lords of the congregation. He favoured the marriage of Mary with Darnley, and was the leader of the band which murdered Rizzio. This event was followed by his flight into England, where he died on the 13th of June 1566. Ruthven wrote for Queen Elizabeth a *Relation* of the murder, which is preserved in MSS. in the British Museum.

A descendant of the 1st Lord Ruthven in a collateral line, also named Patrick Ruthven (*c.* 1573–1651), distinguished himself in the service of Sweden, which he entered about 1606. As a negotiator he was very useful to Gustavus Adolphus because of his ability to "drink immeasurably and preserve his understanding to the last," and he also won fame on the field of battle. Having taken part in the Thirty Years' War and been governor of Ulm, he left the Swedish service and returned to Scotland, where he was employed by Charles I. He defended Edinburgh Castle for the king in 1640, and when the Civil War broke out he joined Charles at Shrewsbury. He led the left wing at the battle of Edgehill, and after this engagement was appointed general-in-chief of the Royalist army. For his services he was created Lord Ruthven of Ettrick in 1639, earl of Forth in 1642 and earl of Brentford in 1644. The earl compelled Essex to surrender Lostwithiel, and was wounded at both battles of Newbury. But his faculties had begun to decay, and in 1644 he was superseded in his command by Prince Rupert. After visiting Sweden on a mission for Charles II., Brentford died at Dundee on the 2nd of February 1651. He left no sons and his titles became extinct.

Patrick, 3rd Lord Ruthven, was succeeded as 4th lord by his son William (*c.* 1541–1584), who like his father was prominent in the political intrigues of the period and was also concerned in the Rizzio murder. In 1582 he devised the plot to seize King James VI., known as the raid of Ruthven, and he was the last-known custodian of the famous silver casket containing the letters alleged to have been written by Mary, queen of Scots, to Bothwell. In 1581 he was created earl of Gowrie, but all his honours were forfeited when he was attainted and executed in May 1584 (see GOWRIE, 3RD EARL OF).

The 2nd Lord Ruthven left a son, Alexander (d. 1599), the founder of the family of Ruthven of Freeland, and the grandfather of Sir Thomas Ruthven (d. 1673), on whom Charles II. bestowed the title of Lord Ruthven of Freeland in 1651. When his son David died unmarried in April 1701 the title of Baroness Ruthven was assumed by the latter's sister, Jean (d. 1722), although according to some authorities the peerage had become extinct. It was, however, assumed in 1722 by Isobel (d. 1732), wife of James Johnson, who took the name of Ruthven on succeeding to the family estates; and their son, James Ruthven (d. 1783), took the title and was allowed to vote at the elections of Scots representative peers. In 1853 the barony again descended to a female, Mary Elizabeth Thornton (*c.* 1784–1864), the wife of Walter Hore (d. 1878). She and her husband took the name of Hore-Ruthven, and their grandson, Walter James Hore-Ruthven (b. 1838), became the 8th baron in 1864.

See the *Ruthven Correspondence*, edited with introduction by the Rev. W. D. Macray (1868); J. H. Round, "The Barony of Ruthven of Freeland" in Joseph Foster's *Collectanea Genealogica* (1881–85); and Sir R. Douglas, *The Peerage of Scotland* (new ed. by Sir J. B. Paul).

RUTILE, the most abundant of the three native forms of titanium dioxide (TiO_2); the other forms being anatase (*q.v.*) and brookite (*q.v.*). Like anatase, it crystallizes in the tetragonal system, but with different angles and cleavages, it being crystallographically related to cassiterite, with which it is isomorphous. The crystals resemble cassiterite in their prismatic habit and terminal pyramid planes (fig. 1) and also in the twinning: the prism planes are striated vertically. Geniculated twins, with *e* (101) as twin-plane, are of frequent occurrence, and the twinning is usually several times repeated, giving rise to triplets (fig. 2), sextets and octets. Twin-lamellae are often present in the crystals. Acicular crystals are sometimes twinned together to form reticulated skeletal plates to which the name "sagenite," from Gr. σαγήνη (a net), is applied. A rarer type of twinning, on the plane (301), gives rise to heart-shaped or kite-shaped forms. There are distinct cleavages parallel to the faces of the prisms *m* (110) and *a* (100). The colour is usually reddish-brown, though yellowish in the very fine needles, and black in the ferruginous varieties ("nigrine" and "ilmenorutile"): the streak is pale brown. The name rutile, given by A. G. Werner in 1803, refers to the colour, being from the Latin *rutilus* (red). Crystals are transparent to opaque, and have a brilliant metallic-adamantine lustre. The hardness is $6\frac{1}{2}$ and the specific gravity 4·2, ranging, however, up to 5·2 in varieties containing 10% of ferric oxide. The refractive indices and the positive birefringence are high.

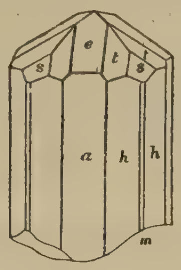

FIG. 1.

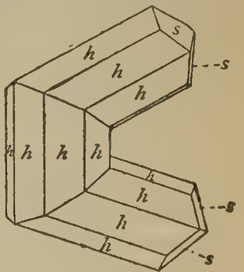

FIG. 2.

Rutile occurs as a primary constituent in eruptive rocks, but more frequently in schistose rocks. As delicate acicular crystals it is often enclosed in mica and quartz: in mica (*q.v.*) it gives rise to the phenomenon of asterism; and clear transparent quartz (rock-crystal) enclosing rutile is often cut as a gem under the name of "Venus' hair stone" (*Veneris crinis* of Pliny). Larger crystals occur in the cavities of granite and crystalline schists; very large twinned crystals have been found at Graves Mountain in Lincoln county, Georgia, and good specimens have been obtained from several places in Norway and the Swiss and Tirolese Alps. As a secondary mineral, rutile in the form of minute needles is of wide distribution in various sedimentary rocks, especially clays and slates. As rounded grains it is often met with in auriferous sands and gravels. The mineral has little economic value: it has been used for imparting a yellow colour to glass and porcelain, and for this purpose is mined at Risör and other places in Norway. (L. J. S.)

RUTILIUS CLAUDIUS NAMATIANUS, Roman poet, flourished at the beginning of the 5th century A.D. He was the author of a Latin poem, *De Reditu Suo*, in elegiac metre, describing a coast voyage from Rome to Gaul in A.D. 416. The literary excellence of the work, and the flashes of light which it throws across a momentous but dark epoch of history, combine to give it exceptional importance among the relics of late Roman literature. The poem was in two books; the exordium of the first and the greater part of the second have been lost. What remains consists of about seven hundred lines.

The author is a native of S. Gaul (Toulouse or perhaps Poitiers), and belonged, like Sidonius, to one of the great governing families of the Gaulish provinces. His father, whom he calls Lachanius, had held high offices in Italy and at the imperial court, had been governor of Tuscia (Etruria and Umbria), then imperial treasurer (*comes sacrarum largitionum*), imperial recorder (*quaestor*), and governor of the capital itself (*praefectus urbi*). Rutilius boasts his career to have been no less distinguished than his father's, and particularly indicates that he had been secretary of state (*magister officiorum*) and governor of the capital (i. 157, 427, 467, 561). After reaching manhood, he passed through the tempestuous period between the death of Theodosius (395) and the fall of the usurper Attalus, which occurred near the date when his poem was written. He witnessed the chequered career of Stilicho as actual, though not titular, emperor of the West; he saw the hosts of Radagaisus rolled back from Italy, only to sweep over Gaul and Spain; the defeats and triumphs of Alaric; the three sieges and final sack of Rome, followed by the marvellous recovery of the city; Heraclian's vast armament dissipated; and the fall of seven pretenders to the Western diadem. Undoubtedly the sympathies of Rutilius were with those who during this period dissented from and, when they could, opposed the general tendencies of the imperial policy. We know from himself that he was the intimate of those who belonged to the circle of the great orator Symmachus—men who scouted Stilicho's compact with the Goths, and led the Roman senate to support the pretenders Eugenius and Attalus in the vain hope of reinstating the gods whom Julian had failed to save.

While making but few direct assertions about historical characters or events, the poem forces on us important conclusions concerning the politics and religion of the time. The attitude of the writer towards paganism is remarkable. The whole poem is intensely pagan, and is penetrated by the feeling that the world of literature and culture is and must remain pagan; that outside paganism lies a realm of barbarism. The poet wears an air of exalted superiority over the religious innovators of his day, and entertains a buoyant confidence that the future of the ancient gods of Rome will not belie their glorious past. Invective and apology he scorns alike, nor troubles himself to show, with Claudian, even a suppressed grief at the indignities put upon the old religion by the new. As a statesman, he is at pains to avoid offending those politic Christian senators over whom pride in their country had at least as great power as attachment to their new religion. Only once or twice does Rutilius speak directly of Christianity, and then only to attack the monks, whom the temporal authorities had hardly as yet recognized, and whom, indeed, only a short time before, a Christian emperor had forced by thousands into the ranks of his army. Judaism Rutilius could assail without wounding either pagans or Christians, but he intimates, not obscurely, that he hates it chiefly as the evil root whence the rank plant of Christianity had sprung.

We read in Gibbon that "Honorius excluded all persons who were adverse to the catholic church from holding any office in the state," that he "obstinately rejected the service of all those who dissented from his religion," and that "the law was applied in the utmost latitude and rigorously executed." Far different is the picture of political life impressed upon us by Rutilius. His voice is assuredly not that of a partisan of a discredited and overborne faction. We see by the aid of his poem a senate at Rome composed of past office-holders, the majority of whom were certainly pagan still. We discern a Christian section whose Christianity was political rather than religious, who were Romans first and Christians afterwards, whom a new breeze in politics might easily have wafted back to the old religion. Between these two sections the broad old Roman toleration reigns. Some ecclesiastical historians have fondly imagined that after the sack of Rome the bishop Innocent returned to a position of predominance. No one who fairly reads Rutilius can cherish this idea. The air of the capital, perhaps even of Italy, was still charged with paganism. The court was far in advance of the people, and the persecuting laws were in large part incapable of execution.

Perhaps the most interesting lines in the whole poem are those in which Rutilius assails the memory of "dire Stilicho," as he names him. Stilicho, "fearing to suffer all that had caused himself to be feared," annihilated those defences of Alps and Apennines which the provident gods had interposed between the barbarians and the Eternal City, and planted the cruel Goths, his "skin-clad" minions, in the very sanctuary of the empire. His wile was wickeder than the wile of the Trojan horse, than the wile of Althaea or of Scylla. May Nero rest from all the torments of the damned, that they may seize on Stilicho; for Nero smote his own mother, but Stilicho the mother of the world!

We shall not err in supposing that we have here (what we find nowhere else) an authentic expression of the feeling entertained by a majority of the Roman senate concerning Stilicho. He had but imitated the policy of Theodosius with regard to the barbarians; but even that great emperor had met with passive opposition from the old Roman families. The relations, however, between Alaric and Stilicho had been closer and more mysterious than those between Alaric and Theodosius, and men who had seen Stilicho surrounded by his body-guard of Goths not unnaturally looked on the Goths who assailed Rome as Stilicho's avengers. It is noteworthy that Rutilius speaks of the crime of Stilicho in terms far different from those used by Orosius and the historians of the lower empire. They believed that Stilicho was plotting to make his son emperor, and that he called in the Goths in order to climb higher. Rutilius holds that he used the barbarians merely to save himself from impending ruin. The Christian historians assert that Stilicho designed to restore paganism. To Rutilius he is the most uncompromising foe of paganism. His crowning sin (recorded by the poet alone) was the destruction of the Sibylline books—a sin worthy of one who had decked his wife in the spoils of Victory, the goddess who had for centuries presided over the deliberations of the senate. This crime of Stilicho alone is sufficient in the eyes of Rutilius to account for the disasters that afterwards befell the city, just as Merobaudes, a generation or two later, traced the miseries of his own day to the overthrow of the ancient rites of Vesta.

With regard to the form of the poem, Rutilius handles the elegiac couplet with great metrical purity and freedom, and betrays many signs of long study in the elegiac poetry of the Augustan era. The Latin is unusually clean for the times, and is generally fairly classical both in vocabulary and construction. The taste of Rutilius, too, is comparatively pure. If he lacks the genius of Claudian, he also lacks his overloaded gaudiness and his large exaggeration, and the directness of Rutilius shines by comparison with the laboured complexity of Ausonius. It is common to call Claudian the last of the Roman poets. That title might fairly be claimed for Rutilius, unless it be reserved for Merobaudes. At any rate, in passing from Rutilius to Sidonius no reader can fail to feel that he has left the region of Latin poetry for the region of Latin verse.

Of the many interesting details of the poem we can only mention a few. At the outset we have an almost dithyrambic address to the goddess Roma, whose glory has ever shone the brighter for disaster, and who will rise once more in her might and confound her barbarian foes. The poet shows as deep a consciousness as any modern historian that the grandest achievement of Rome was the spread of law. Next we get incidental but not unimportant references to the destruction of roads and property wrought by the Goths, to the state of the havens at the mouths of the Tiber, and the general decay of nearly all the old commercial ports on the coast. Most of these were as desolate then as now. Rutilius even exaggerates the desolation of the once important city of Cosa in Etruria, whose walls have scarcely changed from that day to ours. The port that served Pisae, almost alone of all those visited by Rutilius, seems to have retained its prosperity, and to have foreshadowed the subsequent greatness of that city. At one point on the coast the villagers everywhere were "soothing their wearied hearts with holy merriment," and were celebrating the festival of Osiris.

AUTHORITIES.—All existing MSS. of Rutilius are later than 1494, and are copies from a lost copy of an ancient MS. once at the monastery of Bobio, which disappeared about 1700. The *editio princeps* is that by J. B. Pius (Bologna, 1520), and the principal editions since have been those by Barth (1623), P. Burman (1731, in his edition of the minor Latin poets), Wernsdorf (1778, part of a similar collection), Zumpt (1840), and the critical edition by Lucian Müller (Teubner, Leipzig, 1870), and another by Vessereau (1904); also an annotated edition by Keene, with a translation by G. F. Savage-Armstrong (1906). Müller writes the poet's name as Claudius Rutilius Namatianus, instead of the usual Rutilius Claudius Namatianus; but if the identification of the poet's father with the Claudius mentioned in the Theodosian Code (2, 4, 5) be correct, Müller is probably wrong. Rutilius receives more or less attention from all writers on the history or literature of the times, but a lucid chapter in Beugnot, *Histoire de la destruction du Paganisme en Occident* (1835), may be especially mentioned, and one in Pichon's *Derniers écrivains profanes* (1906). (J. S. R.)

RUTILIUS RUFUS, PUBLIUS, Roman statesman, orator and historian, born *c.* 158 B.C. He was on intimate terms with the younger Scipio, under whom he served in the Numantine War (134), and he also accompanied Q. Metellus Numidicus in the campaign against Jugurtha (109). In 105 he was elected to the consulship, and restored the discipline of the army and introduced an improved system of drill. Subsequently, he went as legate to Q. Mucius Scaevola, governor of Asia. By assisting his superior in his efforts to protect the provincials from the extortions of the *publicani*, or farmers of taxes, Rufus incurred the hatred of the equestrian order, to which the *publicani* belonged. In 92 he was charged with the very offence of extortion which he had done his utmost to prevent. The charge was absurd, but as the juries at that time were chosen from the equites, his condemnation was only to be expected. Rufus accepted the verdict with the resignation befitting a Stoic and pupil of Panaetius. He retired to Mytilene, and afterwards to Smyrna, where he spent the rest of his life, and where Cicero saw him as late as the year 78. Although invited by Sulla to return to Rome, Rufus refused to do so. It was doubtless during his stay at Smyrna that he wrote his autobiography and a history of Rome in Greek, part of which is known to have been devoted to the Numantine War. He possessed a thorough knowledge of law, and wrote treatises on that subject, some fragments of which are quoted in the Digests. He was also well acquainted with Greek literature.

See Cicero, *Pro Fonteio*, 17, *Brutus*, 22, 30; Livy, *epit.* 70; Macrobius, *Sat.* I. xvi. 34; Appian, *Hisp.* 88; Athenaeus iv. p. 168; W. H. Suringar, *De Romanis Autobiographis* (Leiden, 1846); H. Peter, *Hist. Rom. Reliquiae*, I. cclxi.-cclxviii. (life), frags. p. 187; A. H. J. Greenidge, *Hist. of Rome*, i. p. 484.

RUTLAND, EARLS AND DUKES OF. The 1st earl of Rutland was Edward Plantagenet (1373–1415), son of Edmund, duke of York, and grandson of King Edward III. In 1390 he was created earl of Rutland, but was to hold the title only during the lifetime of his father, on whose death in 1402 the earldom accordingly became extinct, the earl then becoming duke of York. The title earl of Rutland seems to have been assumed subsequently by different members of the house of York, though it does not appear that any of them had a legal right to it. One of these was the 1st earl's nephew, Richard Plantagenet, duke of York, father of King Edward IV. Richard's daughter Anne married for her second husband Sir Thomas St Leger, and their daughter Anne married George Manners, 12th Baron Ros, or Roos (d. 1513). Their son, Thomas Manners (d. 1543), was therefore great-grandson of Richard Plantagenet, who had styled himself earl of Rutland among other titles. In 1525 Thomas Manners was created earl of Rutland, and his descendants have held this title to the present day.

Thomas was a favourite of Henry VIII., who conferred on him many offices and extensive grants of land, including Belvoir Castle, in Leicestershire, which became henceforth the chief residence of his family. He was succeeded in the earldom by his son Henry (*c.* 1516–1563); and his second son, Sir John Manners, acquired Haddon Hall, Derbyshire, by his marriage with Dorothy, daughter of Sir George Vernon, called "the king of the Peak." Henry, the 2nd earl, was an admiral of the fleet in the reign of Queen Mary, and later enjoyed the favour of Queen Elizabeth. His son Edward, 3rd earl (*c.* 1548–1587), who was also a favourite with Elizabeth, left no sons, and the barony of Ros, which had hitherto descended with the earldom, passed to his daughter Elizabeth (d. 1591), wife of William Cecil, earl of Exeter; his successor in the earldom was his brother John (d. 1588), whose son Roger, 5th earl (1576–1612), married a daughter of Sir Philip Sidney. The barony of Ros was restored to the main line of the family in the person of Francis, 6th earl (1578–1632), who inherited it in 1618 as heir general of his cousin William Cecil, Lord Ros (1590–1618); but it was again separated from the earldom of Rutland on the death of Francis without male issue, and the assumption of the courtesy title of Lord Ros by the eldest son of subsequent earls of Rutland appears to have had no legal basis.

The 8th earl, a cousin of his predecessor and also of the 6th earl, was John (1604–1679), eldest son of Sir George Manners (d. 1623) of Haddon, a descendant of Sir John Manners, the second son of the 1st earl. His son John, 9th earl (1638–1711), a partisan of the revolution of 1688, received the Princess Anne at Belvoir Castle on her flight from London; after the accession of Anne to the throne she created him marquess of Granby and duke of Rutland in 1703. The 1st duke was three times married; the divorce in 1670, while he was still known as Lord Ros, of his first wife, Anne, daughter of the marquess of Dorchester, was a very celebrated legal case, being the first instance of divorce *a vinculo* by act of parliament, a divorce *a mensa et thoro* having previously been granted by the ecclesiastical courts. His grandson John, the 3rd duke (1696–1779), was the father of John Manners, marquess of Granby (*q.v.*), a distinguished soldier, whose son Charles, 4th duke of Rutland (1754–1787), succeeded his grandfather. When marquess of Granby he represented Cambridge University in the House of Commons, and hotly opposed the policy that led to war with the American colonies. He was instrumental in procuring the entrance of the younger Pitt to the House of Commons, and remained through life an intimate friend of that statesman. After succeeding to the dukedom in 1779, he sat in the cabinets of Shelburne and of Pitt, and became lord lieutenant of Ireland in 1784. He was one of the earliest to advocate a legislative union between Ireland and Great Britain, which he recommended in a letter to Pitt in June 1784. The poet Crabbe was for some time private chaplain to the duke at Belvoir. His wife, Mary Isabella (1756–1831), "the beautiful duchess," whose portrait was four times painted by Sir Joshua Reynolds, was a daughter of the 4th duke of Beaufort. His eldest son, John Henry, 5th duke (1778–1857), was "the duke" in Disraeli's *Coningsby*; the latter's two sons, the marquess of Granby and Lord John Manners, figuring in the same novel as "the marquis of Beaumanoir" and "Lord Henry Sidney" respectively. Both these sons succeeded in turn to the dukedom, Lord John Manners succeeding his brother Charles Cecil John, the 6th duke (1815–1888), as 7th duke of Rutland (see below) in 1888. In 1891 he was made a knight of the Garter, being the tenth earl and the sixth duke of Rutland of the same creation to wear this illustrious order.

RUTLAND, JOHN JAMES ROBERT MANNERS, 7TH DUKE OF (1818–1906), English statesman, was born at Belvoir Castle on the 13th of December 1818, being the younger son of the 5th duke of Rutland by Lady Elizabeth Howard, daughter of Byron's guardian, the 5th earl of Carlisle. Lord John Manners, as he then was, was educated at Eton and Trinity College, Cambridge. In 1841 he was returned for Newark in the Tory interest, along with W. E. Gladstone, and sat for that borough until 1847. Subsequently he sat for Colchester, 1850–57; for North Leicestershire, 1857–85; and for East Leicestershire from 1885 until in 1888 he took his seat in the House of Lords upon succeeding to the dukedom.

Melbourne's Whig government had been doomed for some time before it went out in June 1841. The Tories came in with a large majority under Peel, and among Manners's friends who were successful in the constituencies, besides Gladstone, were Smythe, afterwards 7th Viscount Strangford, at Canterbury; Baillie-Cochrane, afterwards 1st Lord Lamington, at Bridport; and Disraeli at Shrewsbury. Cherishing many of the ideas of the cavaliers of the 17th century, and full of political and literary ardour, Lord John was soon prominent in the social group which revolved round Lady Blessington. In 1841 he committed some of his loyalist and other fancies to a volume called *England's Trust, and other Poems*, which he dedicated to his friend Smythe, and in which occurred the familiar line about "laws and learning" and "our old nobility." Before the end of this year Manners had definitely associated himself with the "Young England" party, under the leadership of Disraeli. This party sought to extinguish the predominance of the middle-class *bourgeoisie*, and to re-create the political prestige of the aristocracy by resolutely proving its capacity to ameliorate the social, intellectual, and material condition of the peasantry and the labouring classes. At the same time its members looked for a regeneration of the Church, and the rescue of both the Church and Ireland from the trammels inherited from the Whig predominance of the 18th century. Manners made an extensive tour of inspection in the industrial parts of N. England, in the course of which he and his friend Smythe expounded their views with a brilliancy which frequently extorted compliments from the leaders of the Manchester school. In 1843 he supported Lord Grey's motion for an inquiry into the condition of England, the serious disaffection of the working classes of the north being a subject to which he was constantly drawing the attention of parliament. Among other measures that he urged were the disestablishment of the Irish Church, the modification of the Mortmain Acts, and the resumption of regular diplomatic relations with the Vatican. In the same year he issued in pamphlet form a strong *Plea for National Holydays*. In 1844 Lord John vigorously supported the Ten-hours Bill, which, though strongly opposed by Bright, Cobden, and other members of the Manchester school, was ultimately passed in May 1847. In October during that year he took part in, and spoke at, the brilliant *soirée* held at the Manchester Athenaeum under the presidency of Disraeli. A few days later he and his friends attended a festival at Bingley, in Yorkshire, to celebrate the allotment of land for gardens to working men, a step which, through the agency of his father, he had done a great deal to further. About the same time Smythe dedicated to him his *Historic Fancies* as to "the Sir Philip Sidney of our generation." Manners figured as Lord Henry Sidney in Disraeli's *Coningsby*, and not a few of his ideas are represented as those of Egremont in *Sybil* and Waldershare in *Endymion*. But the disruption of the Young England party was already impending. Lord John's support to Peel's decision to increase the Maynooth grant in 1845 led to a difference with Disraeli. Divergences of opinion with regard to Newman's secession from the English Church produced further defections in the ranks, and the rupture was completed by Smythe acquiescing in Peel's conversion to Free Trade. Lord John produced another volume of verse, known as *English Ballads*, chiefly patriotic and historical, in 1850. In the same year he wrote the letterpress for an atlas of coloured views by J. C. Schetky; and he published several pamphlets, one on the *Church of England in the Colonies*, in 1851. During the three short administrations of Lord Derby (1851, 1858, and 1866) he sat in the cabinet as first commissioner of the office of works. On the return of the Conservatives to power in 1874 he became postmaster-general in Disraeli's administration, and was made G.C.B. on his retirement in 1880. He was again postmaster-general in Lord Salisbury's administration, 1885–86, and was head of the department when sixpenny telegrams were introduced. Finally, in the Conservative government of 1886–92 he was chancellor of the duchy of Lancaster. He had succeeded to the dukedom of Rutland in March 1888, upon the death of his elder brother. He died on the 4th of August 1906 at Belvoir Castle.

He was succeeded as 8th duke by his eldest son (b. 1852), who had been Conservative M.P. for the Melton division of Leicestershire from 1888 to 1895; and whose wife, as marchioness of Granby, became well known as a clever artist, a volume of her *Portraits* of various distinguished men and women being published in 1899.

RUTLAND, a midland county of England, bounded N. and E. by Lincolnshire, N. and W. by Leicestershire, and S.E. by Northamptonshire. It is the smallest county in England, having an area of 152 sq. m. The surface is pleasantly undulating, ridges of high ground running E. and W., separated by rich valleys. The principal of these valleys is the vale of Catmose, in the Oakham district, to the N. of which rises a tableland commanding wide views into Leicestershire. The vale maintains its reputation for richness of soil assigned to it by Drayton in his *Poly-Olbion*. This, the N.W. part of the county, is also the district of the well-known Cottesmore hunt. The royal forest of Lyfield, or Leafield, which included the greater part of the hundreds of Oakham and Martinsley, once extended over the county between Oakham and Uppingham, and patches of it still exist. To the S. of Uppingham it was known as Beaumont Chase. The river Welland, flowing N.E., forms the S.E. boundary of Rutland with Northamptonshire. The Gwash, or Wash, which rises in Leicestershire, flows eastward through the centre of the county, and just beyond its borders in Lincolnshire joins the Welland. The Chater, also rising in Leicestershire and flowing E., enters the Welland about 2 m. from Stamford. The Eye, forming part of the S.W. boundary, is also tributary to the Welland.

Geology.—The county consists entirely of Jurassic formations, viz. of Liassic and Oolitic strata—the harder beds, chiefly limestone containing iron, forming the hills and escarpments, and the clay-beds the slopes of the valleys. The oldest rocks are those belonging to the Lower Lias in the N.W. The bottom of the vale of Catmose is formed of marlstone rock belonging to the Middle Lias, and its sides are composed of long slopes of Upper Lias clay. The Upper Lias also covers a large area in the W. of the county, and is worked for bricks at Luffenham and Seaton. The lowest of the Oolitic formations is the Northampton sand, which has yielded iron ore at Manton and Cottesmore. The Lincolnshire Oolitic limestone prevails in the E. of the county N. of Stamford. It is largely quarried for building purposes, the quarries at Ketton, Clipsham, and Casterton being famous beyond the boundaries of the county. The Great Oolite and Estuarine beds prevail towards the S.E. Glacial deposits of boulder clay, sand and gravel, mask the older strata in many places.

Industries.—In the E. and S.E. districts the soil is light and shallow. In the other districts it consists chiefly of a tenacious but fertile loam, and in the vale of Catmose the soil is either clay or loam, or a mixture of the two. The prevailing redness, which colours even the streams, is owing to the ferruginous limestone carried down from the slopes of the hills. The name of the county is by some authorities derived from this characteristic of the soil, but the explanation is doubtful. The E. of the county is chiefly under tillage and the W. in grass. Nearly nine-tenths of the total area (a high proportion) is under cultivation, wheat being by far the most important grain crop. Turnips and swedes occupy the greater part of the area under green crops. The rearing of sheep (Leicesters and South Downs) and cattle (Shorthorns) occupies the chief attention of the farmer. Large quantities of cheese are manufactured and sold as Stilton. Agriculture is practically the only industry of importance, but there is some quarrying and boot-making.

The main line of the Great Northern railway intersects the N.E. corner, and branches of that system, of the London & North-Western, and of the Midland railways, serve the remainder of the county.

Population and Administration.—The area of the ancient and administrative county is 97,273 acres, with a population in 1891 of 20,659, and in 1901 of 19,709. The county contains five hundreds. There are no municipal boroughs or urban districts. The county town is Oakham (pop. 3294), and other towns are Uppingham (2588) and Ketton (1041). The county is in the midland circuit, and assizes are held at Oakham. It has one court of quarter sessions, but is not divided for petty-sessional purposes. There are 58 civil parishes. The county is in the diocese of Peterborough, and contains 42 ecclesiastical parishes or districts, wholly or in part. It returns one member to parliament.

History.—The district which is now Rutland was probably occupied by a tribe of Middle Angles in the 6th or 7th century, and was subsequently absorbed in the kingdom of Mercia. Although mentioned by name in the will of Edward the Confessor, who bequeathed it to his queen Edith for life with remainder to Westminster Abbey, Rutland did not rank as a county at the time of the Domesday Survey, in which the term Rutland is only applied to that portion assessed under Nottinghamshire, while the S.E. portion of the modern county is surveyed under Northamptonshire, where it appears as the wapentake of Wiceslea. Rutland is first mentioned as a distinct county under the administration of a separate sheriff in the pipe roll of 1159, but as late as the 14th century it is designated "Rutland Soke" in the *Vision of Piers Plowman*, and the curious connexion with Nottinghamshire, a county which does not adjoin it at any point, was maintained up to the reign of Henry III., when the sheriff of Nottingham was by statute appointed also escheator in Rutland. Of the five modern hundreds of Rutland, Alstoe and Martinsley appear in the Domesday Survey of Nottinghamshire as wapentakes, Martinsley at that date including the modern hundred of Oakham Soke; East hundred and Wrangdike hundred are mentioned in the middle of the 12th century, the latter formerly including the additional hundred of Little Casterton. The shire-court for Rutland was held at Oakham.

Rutland was originally included in the diocese of Lincoln, and in 1291 formed a rural deanery within the archdeaconry of Northampton; but on the erection of Peterborough to an episcopal see by Henry VIII. in 1541, the archdeaconry of Northampton, with the deanery of Rutland, was transferred to that diocese. In 1879 the deanery of Rutland was subdivided into three portions, and in 1876 it was placed within the newly-founded archdeaconry of Oakham.

Among the most conspicuous of the Norman lords connected with this county was Walkelin de Ferrers, who founded Oakham Castle in the 12th century. The castle was subsequently bestowed by Richard II., together with the earldom of Rutland (see above), on Edward, son of Edmund, duke of York. Essendine (Essenden or Essingdon) was purchased in 1545 by Richard Cecil of Burleigh, and the title of baron of Essenden bestowed on his grandson is retained by the earls of Salisbury. Sir Everard Digby, one of the conspirators in the Gunpowder plot, belonged to the family of Digby, of Stoke Dry. Burley-on-the-hill was held by Henry Despenser, the warlike bishop of Norwich, in the reign of Richard II., and was purchased by George Villiers, duke of Buckingham, who entertained James I. there with Ben Jonson's *Mask of the Gypsies*.

The battle of Stamford was fought at Horn, near Exton, in March 1470 between Edward IV. and the Lancastrians, when from the precipitate flight of the latter the engagement became known as Losecoat Field. On the outbreak of the Civil War Rutland displayed a strong puritanical and anti-royalist sentiment, and in 1642 the sheriff and a large number of the gentry and nobility of the county forwarded a petition to the House of Lords begging that the county might be placed in a state of defence, and that the votes of papists and prelates might be disallowed; and again, in 1648, a memorial addressed to Lord Fairfax protested against the design of the parliament to treat with Charles.

Rutland has always been mainly an agricultural county. The Domesday Survey mentions numerous mills in Rutland, and a fishery at Ayston rendered 325 eels. In the 14th century the county exported wool. Stilton cheese has long been made in Leyfield Forest and the vale of Catmose, and limestone is dug in many parts of the county. The development of the economic resources of Rutland was helped in 1793 by the extension of the Melton Mowbray canal to Oakham.

Two members were returned to parliament for the county of Rutland from 1295 until under the Redistribution of Seats Act of 1885 the representation was reduced to one member.

The only old castle of which there are important remains is Oakham, dating from the time of Henry II. and remarkable for its Norman hall. Of Essendine Castle only the moat remains. The Bede-house at Liddington dates from the end of the 14th century. Hambleton Hall, now a farm-house, is a good specimen of Jacobean architecture. Many old houses of the 17th and 18th centuries are to be met with in the villages. An interesting feature of the ecclesiastical architecture of the county is the frequent continuation of the round-headed arch after the Early English style had become fully developed; as, for instance, in the Early English churches at Great Casterton, Stretton, Empingham, Clipsham (Early English and Decorated), and St Peter's, Preston, where the nave arcade is Norman on one side and Early English on the other, but yet retains round-headed arches on both sides. Tickencote church is a remarkable specimen of late Norman work, with one of the finest chancel-arches extant in this style. Ketton church is transitional Norman, Early English, and early Decorated, the broach spire being of later date. St Mary's, Greetham, is a good example of Decorated, with fine tower and spire.

See *Victoria County History, Rutland*; James Wright, *History and Antiquities of the County of Rutland* (London, 1684); T. Blore, *History and Antiquities of the County of Rutland*, vol. i. pt. 2 (containing the East hundred and including the hundred of Casterton Parva; Stamford, 1811); C. G. Smith, *A Translation of that portion of Domesday Book which relates to Lincolnshire and Rutland* (London, 1870).

RUTLAND, a city and the county seat of Rutland county, Vermont, U.S.A., on Otter creek, about 67 m. S. by E. of Burlington. Pop. (1900) 11,499, of whom 1533 were foreign-born; (1910 census) 13,546. Area, 8⅓ sq. m. It is served by the Delaware & Hudson (being a terminus of one of its branches) and the Rutland (New York Central system) railways. It is pleasantly situated within sight of the Green Mountains. Among its public buildings and institutions are the United States Government Building, the State House of Correction, the Rutland Free Library (1886, with 17,500 volumes in 1908), the H. H. Baxter Memorial Library, a Memorial Hall, the County Court House, the City Hall, and the City Hospital. The famous Rutland marble is quarried in W. Rutland (pop. in 1910, 3427 and Proctor (pop. in 1910, 2871), which were parts of the township of Rutland until 1886. In 1905 the value of the city's factory products was $2,522,856 (28·8% more than in 1900). The township of Rutland was granted by New Hampshire in 1761 to John Murray of Rutland, Massachusetts, and about the same time it was granted (as Fairfield) by New York. No settlement was made until 1770, and in 1772 the place was again granted by New York under the name of Socialborough. From 1784 to 1804 Rutland was one of the capitals of Vermont, and the Capitol, built in 1784, is the second oldest building in the state. The *Rutland Herald*, one of the oldest newspapers in Vermont still published, was established as a Federalist weekly in 1794—a daily edition first appeared in 1861, and is now Republican. In 1847 the village of Rutland was incorporated, and in 1892 a portion of the township including the village was chartered as a city.

RUTLEDGE, JOHN (1739–1800), American jurist and politician, was born in Charleston, South Carolina, in 1739. He studied law in London and began to practise in Charleston in 1761. He was a delegate to the Stamp Act Congress in 1765, and to the Continental Congress in 1774–77 and 1782–83; he was chairman of the committee which framed the state constitution of 1776, and the first "president" (governor) of South Carolina in 1776–78. Disapproving of certain changes in the constitution, he resigned in 1778, but was elected governor in the following year, and served until 1782. From 1784 to 1789 he was a member of the state court of chancery. In the Constitutional Convention of 1787 he urged that the president and the Federal judges should be chosen by the national legislature, and preferably by the Senate alone, and that the president should be chosen for a term of seven years, and should be ineligible to succeed himself. Rutledge championed the Constitution in the South Carolina convention by which that instrument was adopted on behalf of the state. He was associate justice of the United States Supreme Court in 1789–91, and chief justice of the supreme court of South Carolina in 1791–95. Nominated chief justice of the Supreme Court of the United States in 1795, he presided during the August term, but the Senate refused to confirm the nomination, apparently because of his opposition to the Jay Treaty. His mind failed late in 1795, and he died in Charleston on the 23rd of July 1800.

His brother, EDWARD RUTLEDGE (1749–1800), a signer of the Declaration of Independence, was born in Charleston on the 23rd of November 1749. He studied law in his brother's office, and in London in 1769–73, and began to practise in Charleston in 1773. He served in the Continental Congress in 1774–77, and was sent with John Adams and Benjamin Franklin to confer on terms of peace with Lord Howe on Staten Island in September 1776. As captain of artillery and later as lieutenant-colonel he served against the British in South Carolina in 1779–80, but he was captured near Charleston in 1780, and was imprisoned at St Augustine, Florida, for a year. He was a member of the state legislature from 1782 to 1798, and in 1791 drafted the act which abolished primogeniture in South Carolina. From 1798 until his death in Charleston, on the 23rd of January 1800, he was governor of South Carolina.

RUTLEY, FRANK (1842–1904), English geologist and petrographer, was born at Dover on the 14th of May 1842. He was educated partly at Bonn, but his interest in geology was kindled at the Royal School of Mines, where he studied from 1862–64; he then joined the army, and served as lieutenant until 1867, when he became an Assistant Geologist on the Geological Survey. Working then in the Lake district, he began to make a special study of rocks and rock-forming minerals, and soon qualified as acting petrographer on the Geological Survey. For several years he worked in this capacity at the Museum in Jermyn Street: he described the volcanic rocks of E. Somerset and the Bristol district in 1876, and wrote special memoirs on *The Eruptive Rocks of Brent Tor* (1878), and on *The Felsitic Lavas of England and Wales* (1885). He was the author of an exceedingly useful little book on *Mineralogy* (1874; 12th ed., 1900); also of *The Study of Rocks* (1879; 2nd ed., 1881), *Rock-forming Minerals* (1888), and *Granites and Greenstones* (1894); and of a number of petrographical papers, dealing with perlitic and spherulitic structures, with the rocks of the Malvern Hills, &c. In 1882 he was appointed lecturer on Mineralogy in the Royal College of Science, and held this post until ill-health compelled him to retire in 1898. He died in London on the 16th of May 1904.

Obituary (by H. B. Woodward), with bibliography, in *Geol. Mag.* (July 1904).

RUTULI, a people of ancient Italy inhabiting Ardea and the district round it on the coast of Latium, at no great distance from Aricia, and just W. of the territory of the Volsci. They are ranked by the form of their name with the Siculi and Appuli (Apuli), probably also with the Itali, whose real Italic name would probably have been Vituli (see ITALY). This suggests that they belong to a fairly early stratum of the Indo-European population of Italy. The same is suggested by the tradition adopted or moulded by Virgil, by which the leader of the people of the soil in their resistance to the settlement of Aeneas was the Rutulian prince Turnus, a name which, if any conjecture could be founded on it, might be held to point rather to Etruria than to any pure Italic source; he is represented as the *hospes* of the exiled Etruscan king Mezentius, and as taking up arms to defend him against his angry subjects. Pliny (iii. § 6) classes them, with the Siculi, among the primitive tribes that at one time or another inhabited part of Latium, and it is to be observed that they are not included in the thirty Latin communities who once took part in the Latin Festival on the Alban Mount (see further SICULI). (R. S. C.)

RUVIGNY, HENRI DE MASSUE, MARQUIS DE, afterwards EARL OF GALWAY (1648–1720), was born at Paris on the 9th of April 1648, and was the son of the 1st Marquis de Ruvigny, a distinguished French diplomatist, and a relative of Rachel, the wife of Lord William Russell. He saw service under Turenne, who thought very highly of him. Probably on account of his English connexions he was selected in 1678 by Louis XIV. to carry out the secret negotiations for a compact with Charles II., a difficult mission which he executed with great skill. Succeeding his father as "general of the Huguenots," he refused Louis's offer, at the revocation of the Edict of Nantes, to retain him in that office, and in 1690, having gone into exile with his fellow Huguenots, he entered the service of William III. of England as a major-general, forfeiting thereby his French estates. In July 1691 he distinguished himself at the battle of Aughrim, and in 1692 he was for a time commander-in-chief in Ireland. In November of that year he was created Viscount Galway and Baron Portarlington, and received a large grant of forfeited estates in Ireland. In 1693 he fought at Neerwinden and was wounded, and in 1694, with the rank of lieutenant-general, he was sent to command a force in English pay which was to assist the duke of Savoy against the French, and at the same time to relieve the distressed Vaudois. But in 1695 the duke changed sides, the Italian peninsula was neutralized, and Galway's force was withdrawn to the Netherlands. From 1697 to 1701, a critical period of Irish history, the Earl of Galway (he was advanced to that rank in 1697) was practically in control of Irish affairs as lord justice of Ireland. After some years spent in retirement, he was appointed in 1704 to command the allied forces in Portugal, a post which he sustained with honour and success until the battle of Almanza in 1707, in which Galway, in spite of care and skill on his own part, was decisively defeated. But he scraped together a fresh army, and, although infirm, was reappointed to his command by the home government. After taking part in one more campaign, and distinguishing himself by his personal bravery in action, he retired from active life. His last service was rendered in 1715, when he was sent as one of the lords justices to Ireland during the Jacobite insurrection. As most of his property in Ireland had been restored to its former owners, and all his French estates had long before been forfeited, parliament voted him pensions amounting to £1500 a year. He died unmarried on the 3rd of September 1720. The English peerage died with him, but not the French marquisate.[1]

RUVO, a town and episcopal see of Apulia, Italy, in the province of Bari, 21 m. W. of the city of that name by steam tramway, 853 ft. above sea-level. Pop. (1901) 25,245. The cathedral, a basilica with a very lofty nave (so high, indeed, that the gable of the façade is only slightly above the steep sloping roofs of the aisles, and the clerestory is very small), and with two aisles, has three apses, a square campanile and a rich façade with three portals. It belongs probably to the 13th century. The interior has a fine triforium; it contains some interesting frescoes of the 15th century, and is unique in Apulia in having a gallery supported by corbels round the nave (see A. Avena, *Monumenti dell' Italia Meridionale*, Rome, 1902, 117). S. Giovanni Rotondo is an ancient circular baptistery with two large fonts. In the Palazzo Jatta is a famous and beautiful collection of vases and coins found in the Apulian tombs around the city; part of these, however, are now to be found in the museum at Naples. The Palazzo Spinola has an interesting Renaissance court. Ruvo occupies the site of the ancient Rubi, on the Via Trajana (see APPIA, VIA). Coins were issued by the city before it became Roman. (T. As.)

RUWENZORI, more correctly Runsoro, said to be known also as Kokora, a mountain range in Central Africa, lying just north of the equator, and intersected near its eastern edge by 30° E. It has a length of about 65 m., with a maximum breadth of about 30 m., and its highest peaks rise above the limits of perpetual snow. The range as a whole, the major axis of which runs a little east of north, falls steeply on the west to the Central African rift-valley traversed by the Semliki, the western headstream of the Nile, while on the east the fall is somewhat more gradual towards the highlands of western Uganda. The upper parts are separated by fairly low passes into six groups of snowy summits, lying a little to the west of the central line, rising in each case more than 15,000 ft. above the sea and reaching, in the culminating point of the western group (Mount Stanley), about 16,800 ft.

The origin of the range seems connected with that of the rift-valley on the west, both being due to vertical displacements of the earth's crust. Ruwenzori has been formed by an upheaval *en masse* of a portion of the archaean floor of the continent, bounded east and west by lines of fracture, but resulting in a general dip from west to east. A further upheaval seems to have produced an ellipsoidal anticline, causing the strata to dip outwards at a generally high angle. Traces of volcanic action are almost non-existent. Composed in its outer parts of gneisses and mica-schists offering no great resistance to denudation, in its centre the range consists of much more refractory rocks (amphibolites, diorites, diabases, &c.), to which fact, coupled with the existence of vertical fractures, the persistence and separation of the higher summits is probably due. The snow-clad area does not now extend more than ten miles in any direction, though there is abundant evidence that the glaciers were formerly far more extensive.

The upper region is almost entirely enveloped by day in thick cloud, which descends on the east to about 9000 ft., and lower still on the west. It sometimes lifts towards evening, giving a sight of the snowy peaks, but by 9 a.m. these have once more been hidden. As a result, the climate is very humid, the rainfall being probably at least 100 in. annually, and the slopes are furrowed by numberless streams, the most important fed by the glaciers of the upper region, and afterwards flowing in deeply cut valleys between the outer spurs. From the innermost recesses between Mounts Stanley, Speke and Baker, the main branches of the Mobuku descend to the east, while the four principal streams on the west unite to form the Butagu, the drainage on both sides ultimately finding its way to the Semliki, either directly or through Lake Dweru and the Albert Edward Nyanza.

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[1] The later Viscounts Galway are descended from John Monckton (1695–1751), who was created viscount in 1727. His first wife's mother, wife of the 2nd duke of Rutland, was a daughter of Lady William Russell, and thus a connexion of the Ruvignys.

As in other ranges of Central Africa the vegetation displays well-marked zones, varying with the altitude; but owing to the lower level to which the cloud descends on the west (probably an outcome of the general climatic régime of Central Africa, as the range lies between the east African plateau and the relatively low-lying basin of the Congo), the limits of the several zones reach a lower level on the west than on the east. They have been defined as follows by Mr R. B. Woosnam of the British Museum scientific expedition of 1906–7:—

Zones.	Upper Limits (East Side).
Grass	6,500 ft.
Forest	8,500 ,,
Bamboos	10,000 ,,
Tree heaths	12,500 ,,
Lobelias and Senecios	14,500 ,,

above which is the summit region of snow and bare rock. The boundaries between the zones are not of course hard and fast lines, but merely indicate the levels between which the respective forms are specially characteristic, though they occur also in higher or lower zones. The forest zone is perhaps the best marked, being visible from a distance as a dark ring. On the west it merges in part with the low-lying forest of the Semliki valley. Owing to the abundance of moisture, mosses, hepaticae and lichens are prevalent in several of the zones, and bogs, with Vaccinium and other low-growing plants, are common above the forest zone. Helichrysums are abundant in the zone immediately below the snow, where they form large bushes. The larger mammals are found chiefly on the lower slopes, but bushbuck, pigs, leopards, monkeys, a hyrax and a serval cat occur at higher altitudes. The birds include kites, buzzards, ravens, sun-birds, touracos, a large swift, and various warblers and other small kinds. The upper limit of human settlement, with cultivation of colocasia and beans, has been placed at 6700 ft.

Attempts have been made to identify the range with the "Mountains of the Moon" of Ptolemy and other ancient writers, the snows of which were thought to feed the Nile lakes. But in view of the extreme vagueness of the statements and the absence of all detailed knowledge of the geography, it is far more likely that the rumours of snowy mountains really referred to Mounts Kenya and Kilimanjaro, especially as they seem to have been obtained rather from the east coast than from the direction of the Nile. In modern times the existence of a snowy range in this part of Africa was first made known by Sir Henry Stanley during the Emin Pasha relief expedition of 1887–89, though hints of high mountains had been obtained by Stanley himself and by Romolo Gessi in 1876 and by others from the neighbourhood of the Albert Nyanza. Stanley named the main mass Ruwenzori, and outlying eastern peaks he called Mt. Gordon Bennett, Mt. Lawson, Mt. Edwin Arnold, &c.—the last named lying N.E. of Lake Dweru. Subsequently Stanley's own name was given to the chief summit. One of Stanley's officers, Lieut. Stairs, ascended the western slopes to over 10,000 ft. in 1889, and partial ascents were afterwards made by Dr Stuhlmann, Mr Scott Elliot, Mr J. E. Moore, Sir Harry Johnston, Mr Douglas Freshfield, and others. Early in 1906 some of the secondary ridges above the snow-line were scaled by Messrs Grauer, Tegart and Maddox, and by Dr Wollaston and other members of the British Museum expedition, while later in the year the duke of the Abruzzi led a well-equipped expedition, including various scientists, to the upper parts of the range, and with the help of trained Alpine guides ascended not only the culminating twin summits (which he named Margharita and Alexandra after the queens of Italy and England), but all the principal snow-clad peaks. The expedition produced for the first time a detailed map of the upper region, and threw much light on the geology and natural history of the range.

Authorities.—Sir H.M.Stanley, *In Darkest Africa* (London, 1890); F. Stuhlmann, *Mit Emin Pasha ins Herz von Afrika* (Berlin, 1894); G. F. Scott-Elliot, *A Naturalist in Mid-Africa* (London, 1896); J. E. S. Moore, "Tanganyika," &c., *Geog. Jnl.* (January 1901); *To the Mountains of the Moon* (London, 1901); Sir H. H. Johnston, *The Uganda Protectorate* (London, 1902); The Duke of the Abruzzi, in *Geog. Jnl.* (February 1907); R. B. Woosnam, ibid. (December 1907); F. de Filippi, *Ruwenzori* (London, 1908), the general account of the Abruzzi expedition, and *Il Ruwenzori, Parte Scientifica* (2 vols., Milan, 1909); A. R. F. Wollaston, *From Ruwenzori to the Congo* (London, 1908); R. G. T. Bright, "The Uganda-Congo Boundary," *Geog. Jnl.* (1909). (E. He.)

RUYSBROEK (or Ruysbroeck), **JAN VAN** (1293–1381), Dutch mystic, was born at Ruysbroek, near Brussels, in 1293. In 1317 he was ordained priest and became vicar of St Gudule, Brussels. When sixty years of age he withdrew with a few companions to the monastery of Groenendael, near Waterloo, giving himself to meditation and mystical writing, and to a full share of the practical tasks of the society. He was known as the "Ecstatic Teacher," and formed a link between the Friends of God and the Brothers of the Common Life, sects which helped to bring about the Reformation. Ruysbroek insisted that "the soul finds God in its own depths," and noted three stages of progress in what he called "the spiritual ladder" of Christian attainment: (1) the active life, (2) the inward life, (3) the contemplative life. He did not teach the fusion of the self in God, but held that at the summit of the ascent the soul still preserves its identity. His works, of which the most important were *De vera contemplatione* and *De septem gradibus amoris*, were published in 1848 at Hanover; also *Reflections from the Mirror of a Mystic* (1906) and *Die Zierde der geistlichen Hochzeit* (1901).

See Rufus M. Jones, *Studies in Mystical Religion*, pp. 308–14 (1909); M. Maeterlinck, *Ruysbroek and the Mystics, with selections from The Adornment of the Spiritual Marriage* (tr. by J. T. Stoddart, London, 1894); and art. Mysticism.

RUYSDAEL (or Ruisdaal), **JACOB VAN** (*c.* 1628–1682), the most celebrated of the Dutch landscapists, was born at Haarlem. He appears to have studied under his father Izaak Ruysdael, a landscape painter, though other authorities make him the pupil of Berghem and of Albert van Everdingen. The earliest date that appears on his paintings and etchings is 1645. Three years later he was admitted a member of the gild of St Luke in Haarlem; in 1659 he obtained the freedom of the city of Amsterdam, and in 1668 his name appears there as a witness to the marriage of Hobbema. During his lifetime his works were little appreciated, and he seems to have suffered from poverty. In 1681 the sect of the Mennonites, with whom he was connected, petitioned the council of Haarlem for his admission into the almshouse of the town, and there the artist died on the 14th of March 1682.

The works of Ruysdael may be studied in the Louvre and the National Gallery, London, and in the collections at the Hague, Amsterdam, Berlin, and Dresden. His favourite subjects are simple woodland scenes, similar to those of Everdingen and Hobbema. He is especially noted as a painter of trees, and his rendering of foliage, particularly of oak leafage, is characterized by the greatest spirit and precision. His views of distant cities, such as that of Haarlem in the possession of the marquess of Bute, and that of Katwijk in the Glasgow Corporation Galleries, clearly indicate the influence of Rembrandt. He frequently paints coast-scenes and sea-pieces, but it is in his rendering of lonely forest glades that we find him at his best. The subjects of certain of his mountain scenes seem to be taken from Norway, and have led to the supposition that he had travelled in that country. We have, however, no record of such a journey, and the works in question are probably merely adaptations from the landscapes of Van

Everdingen, whose manner he copied at one period. Only a single architectural subject from his brush is known—an admirable interior of the New Church, Amsterdam, in the possession of the marquess of Bute. The prevailing hue of his landscapes is a full rich green, which, however, has darkened with time, while a clear grey tone is characteristic of his sea-pieces. The art of Ruysdael, while it shows little of the scientific knowledge of later landscapists, is sensitive and poetic in sentiment, and direct and skilful in technique. Figures are sparingly introduced into his compositions, and such as occur are believed to be from the pencils of Adrian Vandevelde, Philip Wouwerman, and Jan Lingelbach.

Unlike the other great Dutch landscape painters, Ruysdael did not aim at a pictorial record of particular scenes, but he carefully thought out and arranged his compositions, introducing into them an infinite variety of subtle contrasts in the formation of the clouds, the plants and tree forms, and the play of light. He particularly excels in the painting of cloudy skies which are spanned dome-like over the landscape, and determine the light and shade of the objects.

Characteristic of his early period, from about 1646 to 1653, is the choice of very simple *motifs* and the careful and laborious study of the details of nature. The time between his departure from Haarlem and his settling in Amsterdam may have been spent in travelling and helped him to gain a broader view of nature and to widen the horizon of his art. Mr Otto Beit owns a magnificent view of the "Castle of Bentheim," dated 1654, from which it may be concluded that his wanderings extended to Germany. In his last period, from about 1675 onwards, he shows a tendency towards overcrowded compositions, and affects a darker tonality, which may partly be due to the use of thin paint on a dark ground. Towards the end, in his leaning towards the romantic mood, he preferred to draw his inspiration from other masters, instead of going to nature direct, his favourite subjects being rushing torrents and waterfalls, and ruined castles on mountain crests, which are frequently borrowed from the Swiss views by Roghman.

Ruysdael etched a few plates, which were reproduced by Amand Durand in 1878, with text by Georges Duplessis. The "Cornfield" and the "Travellers" are characterized by M. Duplessis as prints of a high order which may be regarded as the most significant expressions of landscape art in the Low Countries.

RYAN, LACY (*c.* 1694–1760), English actor, appeared at the Haymarket about 1709. By 1718 he had joined the company at Lincoln's Inn Fields, where he shared the lead with his friend Quin. In 1732 he followed the company to Covent Garden, and there he remained until his death. Iago, Cassius, Edgar (in *King Lear*) and Macduff were among his best parts.

RYAZAN, a government of central Russia, bounded by the governments of Moscow and Tula on the W., by Vladimir on the N., and by Tambov on the E. and S., with an area of 16,250 sq. m. Ryazan is an intermediate link between the central Great Russian governments and the steppe governments of the S.E.—the wide and deep valley of the Oka being the natural boundary between the two. On the left of the Oka the surface often consists of sand, marshes and forests; while on the right the fertile black-earth prairies begin, occupying especially the districts of Ranenburg, Sapozhok and Dankov. The whole of Ryazan is a plateau about 700 ft. above the sea, but deeply cut by the river valleys and numerous ravines. Iron-ores, limestone, grindstone grits, potters' clays, and thick beds of peat are worked, besides coal. The N. belongs to the forest regions, and, notwithstanding the wholesale destruction of forests, these (chiefly coniferous) in several districts still cover one-third of the surface. In the S., where the proximity of the steppes is felt, they are much less extensive, the prevailing species being oak, birch, and other deciduous trees. Altogether forests cover about one-fifth of the total area.

The Oka is the chief river; it is navigable throughout, and receives the navigable Pronya and Pra, besides a great many smaller streams utilized for floating timber. Steamers ply on the Oka to Kasimov and Nizhniy-Novgorod. The Don belongs to Ryazan in its upper course only. On the whole, the S. districts are not well watered. Small lakes are numerous in the broad depression of the Oka and elsewhere, while extensive marshes occur in the N.E. districts; a few attempts at draining some of these beside the Oka have resulted in the reclamation of excellent pasture lands. The climate is a little warmer than at Moscow, the average temperature at the city of Ryazan being 40°; February, 3°·2; July, 67°.

The estimated population in 1906 was 2,100,900, and is nearly Great Russian throughout, containing only a trifling admixture of Tatars, Poles and Jews in towns. Some Tatars immigrated into the Kasimov region in the 15th century, and are noted for their honesty of character as well as for their agricultural prosperity. The people of the Pra river are described as Meshcheryaks, but their manners and customs do not differ from those of the Russians. The chief occupation is agriculture. Out of the total area only 8% is unfit for tillage, and between 50 and 60% is under crops; although the area under cultivation and the crops themselves are increasing, yet even here, in one of the wealthiest governments of Russia, the situation of the peasants is far from satisfactory. Live-stock breeding is rapidly falling off on account of want of pasture lands, but hay, which is abundant, especially on the rich meadow lands of the Oka, is exported. More than half of the land (52%) is owned by the village communities, 40% by private owners, 5% by the crown, and 2% by various institutions. During the last thirty years of the 19th century the nobles sold 36% (1,261,000 acres) of their lands, mainly to merchants and peasants; the latter cultivate two-thirds of the total cultivated area.

The principal crops are oats, rye and potatoes, with wheat, barley, buckwheat, flax, hemp, tobacco, hops and fruit. But the crops are insufficient for the needs of the inhabitants. Tobacco, hops, vegetables and fruit, however, are grown for export. Bee-keeping is developing and manufactures increasing, the factories being chiefly cotton and flax mills, flour mills, machine works, tanneries, soap works, boot, cement, glass and match factories, distilleries, and chemical works.

The government is divided into twelve districts, the chief towns of which are Ryazan, Dankov, Egorievsk, Kasimov, Mikhailov, Pronsk, Ranenburg, Ryazhsk, Sapozhok, Skopin, Spask and Zaraisk. Small industries, such as boat-building, the preparation of pitch and tar, the making of wooden vessels and sledges, mat-weaving and boot-making, are carried on in the villages, especially in the N., which belongs, properly speaking, to the Vladimir industrial region. Domestic trades, such as lace-making (supported by two schools) and embroidering on leather, give occupation to 40,000 women. Trade, especially in corn and manufactured goods, is brisk, and has been stimulated by the opening of coal-mines, *e.g.* in the district of Skopin. Considerable efforts have been made by the local governing bodies to increase the number of schools. Most interesting archaeological finds have been made in the government, and have been placed in the new museum at the city of Ryazan.

The Slavs began to colonize the region of Ryazan as early as the 9th century, penetrating thither both from the N.W. (Great Russians) and from the Dnieper (Little Russians). As early as the 10th century the principality of Murom and Ryazan is mentioned in the chronicles. During the following centuries this principality increased both in extent and in wealth, and included parts of what are now the governments of Kaluga and Moscow. Owing to the fertility of the soil, its Russian population rapidly increased, while the Finnish tribes which formerly inhabited it migrated farther E., or became merged among the Slavs. The Mongol invasion of 1239–42 stopped all development. The principality, however, still continued to exist; its princes strongly opposed the annexation by Moscow, making alliance with the Mongols and with Lithuania, but they finally succumbed, and the principality was definitely annexed in 1517.

RYAZAN, a town of Russia, capital of the government of the same name, 124 m. by rail S.E. of Moscow, on the elevated right bank of the Trubezh, a mile above its confluence with the Oka. Pop. (1897) 44,552. A wide prairie dotted with large villages, the bottom of a former lake, spreads out from the base of the crag on which Ryazan stands, and actually has the aspect of an immense lake when it is inundated in the spring. Ryazan is the see of an archbishop of the Orthodox Greek Church. The cathedral, first built in the 17th century, was reconstructed in 1776. The Krestovozdvizhensk church contains tombs of the princes of the 15th and 16th centuries.

The capital of Ryazan principality was Ryazan—now Old Ryazan, a village close to Spask, also on the Oka. It is mentioned in annals as early as 1097, but continued to be the chief town of the principality only until the 14th century. In the 11th century one of the Kiev princes founded, on the banks of a small lake, a fort which received the name of Pereyaslav-Ryazanskiy. In 1294 (or in 1335) the bishop of Murom, compelled to leave his own town, settled in Pereyaslav-Ryazanskiy. The princes of Ryazan followed his example, and by and by completely abandoned the old republican town of Ryazan. In 1300 a congress of Russian princes was held there, and in the following year the town was taken by the Moscow prince. It continued, however, to be the residence of the Ryazan princes until 1517. In 1365 and 1377 it was plundered and burned by the Tatars, but in 1460, 1513, 1521 and 1564 it was strong enough to repel them. Earthen walls with towers were erected after 1301; and in the 17th century a *kreml* or citadel still stood on the high crag above the Trubezh.

RYAZHSK, a town of Russia, in the government of Ryazan, 72 m. by rail S. of the city of Ryazan. Pop. (1897) 12,993. It is one of the chief railway junctions of Russia, where meet the lines from Moscow to S. Russia and Caucasia and from Poland to Samara and Siberia. It has become a centre for all the corn-growing regions of Russia, and is a wealthy place.

RYBINSK, or RUIBINSK, a town of Russia, in the government of Yaroslavl, 60 m. by river N.W. of Yaroslavl. It is connected by rail (186 m.) with Bologoye, on the line between St Petersburg and Moscow. It derives its importance from its situation on the Volga, opposite the mouth of the Sheksna, which connects the Volga with the regions around Lake Ladoga. Rybinsk has also an active trade in agricultural products from the neighbouring districts. The permanent population, which was 25,223 in 1897, is increased in the summer by nearly 100,000 workers from different parts of Russia.

RYDBERG, ABRAHAM VIKTOR (1828–1895), Swedish author and publicist, was born in Jönköping on 18th December 1828. He was educated at the high school of Växiö, and passed on to the university of Lund in 1851. While at school he was publishing verse and prose in the periodicals; some of these early miscellanies he collected in 1894 in the volumes called *Varia*. As a student he turned to more precise labours, and devoted himself to science. He had almost determined to adopt the profession of an engineer, when he was offered in 1855 a post on the staff of one of the largest Swedish newspapers. This caused his thoughts to return to imaginative literature, and it was in the feuilleton of this journal (the *Göteborgs Handels-och sjöfartstidning*) that Viktor Rydberg's romances successively appeared; he was editorially connected with it until 1876. *The Freebooter on the Baltic* (1857) and *The Last of the Athenians* (1859) gave Rydberg a place in the front rank of contemporary novelists. It was a surprise to his admirers to see him presently turn to theology, but with *The Bible's Teaching about Christ* (1862), in which the aspects of modern Biblical criticism were first placed before Swedish readers, he enjoyed a vast success. He followed this up by a number of contributions to the popular philosophy of religion, all inspired by the same reverent and yet searching spirit of inquiry. The modernity of his views led to his being opposed by the orthodox clergy, but by the wider public he was greatly esteemed. Nevertheless, it is said that it was his religious criticism which so long excluded him from the Swedish Academy, since he was not elected until 1877, when he had long been the first living author of Sweden. *Roman Days* is a series of archaeological essays on Italy (1876). He collected his poems in 1882; his version of *Faust* dates from 1876. In 1884 he was appointed professor of ecclesiastical history at Stockholm. He died, after a short illness, on the 22nd of September 1895. In Viktor Rydberg Sweden possessed a writer of the first order, who carried on the tradition of Boström and Geijer in philosophy and history, and possessed in addition a glow of imagination and a marvellous charm of style. He was an idealist of the old romantic type which Sweden had known for three-quarters of a century; he was the last of that race, and perhaps, as a mere writer, the greatest. In personal character Rydberg was extremely like his writings—stately, ardent and ceremonious, with a fund of amiability which made him universally beloved. His premature death was the subject of national mourning, and had even a historical significance, for with him the old romantic influence in Swedish literature ceased to be paramount. (E. G.)

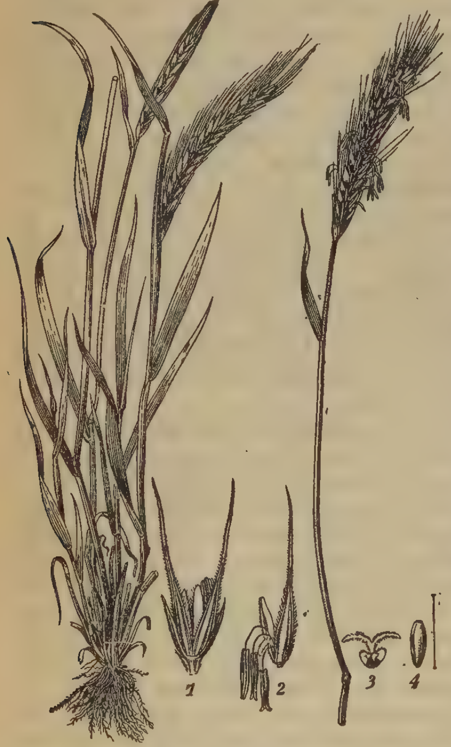
RYDE, a municipal borough and watering-place in the Isle of Wight, England, 5 m. S.S.W. of Portsmouth. Pop. (1901) 11,043. It is beautifully situated on rising ground on the N.E. coast, overlooking Spithead. It occupies the site of a village called La Rye or La Riche, which was destroyed by the French in the reign of Edward II. About the close of the 18th century it was a small fishing hamlet, but it rapidly grew into favour as a watering-place. Ryde is connected by rail with the other towns in the island, and there is also steamboat communication with Portsmouth, Southampton, Southsea, Portsea and Stoke's Bay. The pier, built originally in 1812, but since then greatly extended, forms a delightful promenade half a mile in length. The railway trains run out to its head, and an electric tramway also runs along it. The principal buildings are All Saints church, erected in 1870 from the designs of Sir Gilbert Scott, and other churches, the market house and town hall, the Royal Victoria Yacht club-house, the theatre and the Royal Isle of Wight Infirmary. There are golf-links near the town. The town was incorporated in 1868, and is governed by a mayor, 6 aldermen and 18 councillors. Area, 819 acres.

RYDER, ALBERT PINKHAM (1847–), American artist, was born at New Bedford, Mass., on the 19th of March 1847. He was a pupil of William E. Marshall and of the schools of the National Academy of Design. Among his better known paintings are: "Temple of the Mind," "Jonah and the Whale," "Christ appearing unto Mary," "The Flying Dutchman," "Charity," and "The Little Maid of Arcadie." He became a member of the Society of American Artists in 1878, and a National Academician in 1906.

RYE, a market town and municipal borough in the Rye parliamentary division of Sussex, England, 11 m. N.E. by E. from Hastings, on the South-Eastern & Chatham railway. Pop. (1901) 3900. It rises on a sharp eminence above the S. of Romney Marsh, which within historic times was an inlet of the English Channel. The sea began to recede in the 16th century, and now the river Rother forms a small estuary with its mouth 2 m. from the town; this serves as a small harbour with a depth of 15 ft. at high tide, and there is some trade in coal, grain and timber. Fishing and shipbuilding are carried on, and there is a market for sheep (which are pastured in great numbers on the marshes), wool, grain and hops. The church of St Mary is of mixed architecture, chiefly Transitional, Norman and Early English; it is cruciform, with a low central tower. Of the old fortifications there remain portions of the town wall, a strong quadrangular tower built by William of Ypres, earl of Kent, and lord warden in the time of Stephen, and now forming part of the police station, and a handsome gate with a round tower on each side, known as the Land Gate, at the entrance into Rye from the London road. Picturesque old houses are numerous. In the low land S. of the town stands Camber Castle, one of the coastal defensive works of Henry VIII. In the vicinity are golf-links, to which a steam tram runs from the town. The municipal borough is under a mayor, 4 aldermen and 12 councillors. Area, 985 acres.

In the time of Edward the Confessor, Rye (Ria, Ryerot, La Rie) was a fishing village and, as part of the manor of "Rameslie," was granted by the king to the abbot and convent of Fécamp, by whom it was retained until Henry III. resumed it. By 1086 Rye was probably a port of consequence, and a charter of Richard I. shows that in the reign of Henry II., if not before, it had been added to the Cinque Ports. The fluctuations of the sea and attacks of the French caused its decline in the 13th and 14th centuries, and the walls were therefore built in the reign of Edward III. The decay of Winchelsea contributed to the partial revival of Rye in the 15th and 16th centuries, when it was a chief port of passage. Towards the end of the 16th century the decay of the port began, and notwithstanding frequent attempts to improve the harbour it never recovered its ancient prosperity. Rye was incorporated under a mayor and jurats by the beginning of the 14th century, but possesses no charter distinct from the Cinque Ports. As a member of the Cinque Ports, which were summoned from 1322 onwards, Rye returned two representatives to parliament from 1366 until 1832; after that date one only until 1885. In 1290 the barons of the royal port of Rye were granted a three days' fair in September, altered in 1305 to March. The mayor and commonalty evidently held weekly markets on Wednesday and Friday before 1405, as in that year the Friday market was changed to Saturday. Shipbuilding has been carried on since the 13th century.

RYE. This cereal, known botanically as *Secale cereale*, is supposed to be the cultivated form of *S. montanum*, a wild perennial species occurring in the more elevated districts of parts of the Mediterranean region, and W. to Central Asia. Its cultivation does not appear to have been practised at a very early date, relatively speaking. Alphonse de Candolle, who has collected the evidence on this point, draws attention to the fact that no traces of this cereal have hitherto been found in Egyptian monuments, or in the earlier Swiss dwellings, though seeds have been found in association with weapons of the Bronze period at Olmütz. The absence of any special name for it in the Semitic, Chinese and Sanskrit languages is also adduced as an indication of its comparatively recent culture. On the other hand, the general occurrence of the name in the more modern languages of N. Europe, under various modifications, points to the cultivation of the plant then, as now, in those regions. The origin of the Latin name *secale*, which exists in a modified form among the Basques and Bretons, is not explained. Rye is a tall-growing annual grass, with fibrous roots, flat, narrow, ribbon-like bluish-green leaves, and erect or decurved cylindrical slender spikes like those of barley. The spikelets contain two or three flowers, of which the uppermost is usually imperfect. The outer glumes are acute and glabrous, the flowering glumes lance-shaped, with a comb-like keel at the back, and the outer or lower one prolonged at the apex into a very long bristly awn. Within these are three stamens surrounding a compressed ovary, with two feathery stigmas. When ripe, the grain is of an elongated oval form, with a few hairs at the summit. When the ovaries of the plant become affected with a peculiar fungus (*Claviceps purpurea*) they become blackened and distorted, constituting ergot (*q.v.*).



Rye (*Secale cereale*), about ¼ nat. size. 1, single spikelet; 2, single flower with awned plume and palea; 3, pistil; 4, grain. 1, 2, 4, about two-thirds nat. size.

In the S. of Great Britain rye is chiefly or solely cultivated as a forage-plant for cattle and horses, being usually sown in autumn for spring use, after the crop of roots, turnips, &c., is exhausted, and before the clover and lucerne are ready. For forage purposes it is best to cut early, before the leaves and haulms have been exhausted of their supplies to benefit the grain. In the N. of Europe, and more especially in Scandinavia, Russia and parts of N. Germany, rye is the principal cereal; and in nutritive value, as measured by the amount of gluten it contains, it stands next to wheat, a fact which furnishes the explanation of its culture in N. latitudes ill-suited for the growth of wheat. Rye bread or black bread is in general use in N. Europe. The straw, which is prized on account of its length, is used for making hats and in the manufacture of paper. The bran is used for cattle-food and poultices, and the grain in the distillery.

RYEZHITSA, a town of Russia, in the government of Vitebsk, 150 m. N.W. from the town of Vitebsk and on the railway between St Petersburg and Warsaw. Its population increased from 7306 in 1867 to 10,681 in 1897; but its importance is mainly historical. The cathedral is a modern building (1846). Ryezhitsa, or, as it is called in the Livonian chronicles, Roziten, was founded in 1285 by the Teutonic Knights to keep in subjection the Lithuanians and Letts. The castle was continually the object of hostile attacks. In 1561 the Teutonic Knights gave it in pawn to Poland, and, though it was captured by the Russians in 1567 and 1577, and had its fortifications dismantled by the Swedes during the war of 1656–60, it continued Polish till 1773, when White Russia was united with the Russian empire.

RYLAND, WILLIAM WYNNE (1738–1783), English engraver, was born in London in July 1738, the son of an engraver and copper-plate printer. He studied under Ravenet, and in Paris under Boucher and J. P. le Bas. After spending five years on the continent he returned to England, and having engraved portraits of George III. and Lord Bute after Ramsay, and a portrait of Queen Charlotte and the Princess Royal after Francis Cotes, R.A., he was appointed engraver to the king. In 1766 he became a member of the Incorporated Society of Artists, and he exhibited with them and in the Royal Academy. In his later life Ryland abandoned line-engraving, and introduced "chalk-engraving," in which the line is composed of stippled dots, and in which he transcribed Mortimer's "King John Signing Magna Charta," and copied the drawings of the old masters and the works of Angelica Kauffman. In consequence of his extravagant habits his affairs became involved; he was convicted of forging bills upon the East India Company, and, after attempting to commit suicide, was executed at Tyburn on the 29th of August 1783.

RYLANDS, JOHN (1801–1888), English manufacturer and merchant, was born at St Helens, Lancashire, on the 7th of February 1801, and was educated at the grammar school in that town. In 1819 he, his elder brothers and his father, a manufacturer of cotton goods, founded the firm of Rylands & Sons, cotton goods and linen manufacturers, at Wigan. The business rapidly increased, dye-works and bleach-works were added, and the discovery of coal under some of the firm's property added materially to its wealth. In 1825 the partners became merchants as well as manufacturers, and subsequently acquired spinning mills at Bolton and elsewhere. In 1847, his father being dead and his brothers having retired, John Rylands assumed entire control of the business, which in 1873 was turned into a limited liability company. It has mills at Manchester, Bolton, and Wigan, and is now probably the largest concern of the kind in Great Britain. John Rylands was a benefactor to various charities, and was one of the original financiers of the Manchester Ship Canal. He died at Stretford on the 11th of December 1888. A permanent memorial, the John Rylands Library, was erected by his widow in Manchester in 1899.

RYLE, JOHN CHARLES (1816–1900), English bishop, was born at Macclesfield on the 10th of May 1816, and was educated at Eton and at Christ Church, Oxford, where he was Craven Scholar in 1836. After holding a curacy at Exbury in Hampshire, he became rector of St Thomas's, Winchester (1843), rector of Helmingham, Suffolk (1844), vicar of Stradbroke (1861), honorary canon of Norwich (1872), and dean of Salisbury (1880); but before taking this office was advanced to the new see of Liverpool, where he remained until his resignation, which took place three months before his death at Lowestoft on the 10th of June 1900.

Ryle was a strong supporter of the evangelical school. Among his longer works are *Christian Leaders of the Eighteenth Century* (1869), *Expository Thoughts on the Gospels* (7 vols., 1856–69), *Principles for Churchmen* (1884). His second son, HERBERT EDWARD RYLE (b. 1856), a distinguished Old Testament scholar, was made bishop of Exeter in 1901, and in 1903 bishop of Winchester.

RYLSK, a town of Russia, in the government of Kursk, 71 m. by rail W.S.W. of the town of Kursk. It is connected by a branch line with the Kursk-Kiev railway. Pop. (1897) 11,415. It has oil works, blast furnaces, and manufactories of soap and tallow, and an active trade in corn, hemp, and scythes imported from Austria. It was founded in the 9th century, and is frequently mentioned in the annals from 1152 onwards. Its cathedral was built in the 15th century.

RYMER, THOMAS (1641–1713), English historiographer royal, was the younger son of Ralph Rymer, lord of the manor of Brafferton in Yorkshire, described by Clarendon as "possessed of a good estate," and executed for his share in the "Presbyterian rising" of 1663. Thomas was probably born at Yafforth Hall early in 1641, and was educated at a private school kept at Danby-Wiske by Thomas Smelt, a noted Royalist, with whom Rymer was "a great favourite," and "well known for his great critical skill in human learning, especially in poetry and history."[1]

He was admitted as *pensionarius minor* at Sidney Sussex College, Cambridge, on April 29, 1658, but left the university without taking a degree. On May 2, 1666, he became a member of Gray's Inn, and was called to the bar on June 16, 1673. His first appearance in print was as translator of *Cicero's Prince* (1668), from the Latin treatise (1608) drawn up for Prince Henry. He also translated Rapin's *Reflections on Aristotle's Treatise of Poesie* (1674), with a preface in defence of the classical rules for unity in the drama, and followed the principles there set forth in a tragedy in verse, licensed September 13, 1677, called *Edgar, or the English Monarch*, which was a failure. The printed editions of 1678, 1691 and 1693 belong to the same issue, with new title-pages. Rymer's views on the drama were again given to the world in the shape of a printed letter to Fleetwood Shepheard, the friend of Prior, under the title of *The Tragedies of the Last Age Consider'd* (1678, 2nd ed. 1692). To *Ovid's Epistles Translated by Several Hands* (1680), with preface by Dryden, "Penelope to Ulysses" was contributed by Rymer, who was also one of the "hands" who "Englished" the Plutarch of 1683–86. The life of Nicias fell to his share. He furnished a preface to Whitelocke's *Memorials of English Affairs* (1682), and wrote in 1681 *A General Draught and Prospect of the Government of Europe*, reprinted in 1689 and 1714 as *Of the Antiquity, Power, and Decay of Parliaments*, where, ignorant of his future dignity, the critic had the misfortune to observe, "You are not to expect truth from an historiographer royal." He contributed three pieces to the collection of *Poems to the Memory of Edmund Waller* (1688), afterwards reprinted in Dryden's *Miscellany Poems*, and is said to have written the Latin inscription on Waller's monument in Beaconsfield churchyard. The preface to the posthumous *Historia Ecclesiastica* (1688) of Thomas Hobbes is said to have been by Rymer, but the *Life of Hobbes* (1681) sometimes ascribed to him was written by Richard Blackburne. He produced a congratulatory poem upon the arrival of Queen Mary in 1689. His next piece of authorship was to translate the sixth elegy of the third book of Ovid's *Tristia* for Dryden's *Miscellany Poems* (1692, p. 148). On the death of Thomas Shadwell in 1692 Rymer received the appointment of historiographer royal, at a yearly salary of £200. Immediately afterwards appeared his much discussed *Short View of Tragedy* (1693), criticizing Shakespeare and Ben Jonson, which produced *The Imperial Critick* (1693) of Dennis, the epigram of Dryden,[2] and the judgment of Macaulay that Rymer was "the worst critic that ever lived." John Dunton (*Life and Letters*, p. 354), however, considered him "orthodox and modest," and Pope "one of the best critics we ever had" (*Spence's Anecdotes*). Rymer contended that although Shakespeare possessed humour he had no genius for tragedy, Othello being merely "a bloody farce without salt or savour."

Within eight months of his official appointment Rymer was directed (August 26, 1693) to carry out that great national undertaking with which his name will always be honourably connected, and of which there is reason to believe that Lords Somers and Halifax were the original promoters. The *Codex Juris Gentium Diplomaticus* (1693) of Leibnitz was taken by the editor as the model of the *Foedera*. The plan was to publish all records of alliances and other transactions in which England was concerned with foreign powers from 1101 to the time of publication, limiting the collection to original documents in the royal archives and the great national libraries. Unfortunately, this was not uniformly carried out, and the work contains some extracts from printed chronicles. From 1694 he corresponded with Leibnitz, by whom he was greatly influenced with respect to the plan and formation of the *Foedera*. While collecting materials, Rymer unwisely engraved a spurious charter of King Malcolm, acknowledging that Scotland was held in homage from Edward the Confessor. When this came to be known the Scottish antiquaries were extremely indignant. G. Redpath published a MS. on the independence of the Scottish crown, by Sir T. Craig, entitled *Scotland's Sovereignty Asserted* (1695), and the subject was referred to by Bishop Nicolson in his *Scottish Historical Library* (1702). This led Rymer to address three *Letters to the Bishop of Carlisle* (1702–1706) explaining his action, and discussing other antiquarian matters. Sir Robert Sibbald answered the second letter (1704). The first and second letters are usually found together; the third is extremely rare. Rymer had now been for some years working with great industry, but was constantly obliged to petition the crown for money to carry on the undertaking. Up to August 1698 he had expended £1253, and had only received £500 on account.

At last, on November 20, 1704, was issued the first folio volume of the *Foedera, Conventiones, Litterae et cujuscunque generis Acta Publica inter reges Angliae et alios quosvis imperatores, reges, &c., ab. A.D. 1101 ad nostra usque tempora habita aut tractata*. The publication proceeded with great rapidity, and fifteen volumes were brought out by Rymer in nine years. Two hundred and fifty copies were printed; but, as nearly all of them were presented to persons of distinction, the work soon became so scarce that it was priced by booksellers at one hundred guineas. A hundred and twenty sheets of the fifteenth volume and the copy for the remainder were burnt at a fire at William Bowyer's, the printer, on January 30, 1712–13. Rymer died shortly after the appearance of this volume, but he had prepared materials for carrying the work down to the end of the reign of James I. These were placed in the hands of Robert Sanderson, his assistant.

For the greater part of his life Rymer derived his chief subsistence from a mortgage assigned to him by his father. His miscellaneous literary work could not have been very profitable. At one time he was reduced to offer his MSS. for a new edition for sale to the earl of Oxford. About 1703 his affairs became more settled, and he afterwards regularly received his salary as historiographer, besides an additional £200 a year as editor of the *Foedera*. Twenty-five copies of each volume were also allotted to him. He died at Arundel Street, Strand, December 14, 1713, and was buried in the church of St Clement Danes. His will was dated July 10, 1713. Tonson issued an edition of Rochester's *Works* (1714), with a short preface by the late historiographer. Another posthumous publication was in a miscellaneous collection called *Curious Amusements*, by M. B. (1714), which included "some translations from Greek, Latin and Italian poets, by T.

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[1] See Hickes, *Memoirs of John Kettlewell* (1718), pp. 10–14.

[2] "The corruption of a poet is the generation of a critic" (*Ded. of the Third Miscellany*, in *Works* (1821), xii. p. 49), which is much more pointed than Beaconsfield's reference to critics as "men who have failed in literature and art" (*Lothair*, chap. xxxv.) or Balzac's sly hit at Mérimée in similar terms. The poet's remarks on the *Tragedies of the Last Age* have been reprinted in his *Works* (1821), xv. pp. 383–396, and in Johnson's *Life of Dryden*. See also Dryden's *Works*, i. 377, vi. 251, xi. 60, xiii. 20. "I never came across a worse critic than Thomas Rymer," says Prof. George Saintsbury, who discusses his theories at length in *History of Criticism* (1902), pp. 391–397. See also A. Hofherr, *T. Rymers dramatische Kritik* (1908).

Rymer." Some of his poetical pieces were also inserted in J. Nichols's *Select Collection* (1780–86, 8 vols.), and two are reproduced in A. H. Bullen's *Musa Proterva* (1895).

Two more volumes of the *Foedera* were issued by Sanderson in 1715 and 1717, and the last three volumes (xviii., xix. and xx.) by the same editor, but upon a slightly different plan, in 1726–35. The latter volumes were published by Tonson, all the former by Churchill. Under Rymer it was carried down to 1586, and continued by Sanderson to 1654. The rarity and importance of the work induced Tonson to obtain a licence for a second edition, and George Holmes, deputy keeper of the Tower records, was appointed editor. The new edition appeared between 1727 and 1735. The last three volumes are the same in both issues. There are some corrections, enumerated in a volume, *The Emendations in the New Edition of Mr Rymer's Foedera*, printed by Tonson in 1730, and on the whole the second is an improvement upon the first edition. A third edition, embodying Holmes's collation, was commenced at the Hague in 1737 and finished in 1745. It is in smaller type than the others, and is compressed within ten folio volumes. The arrangement is rather more convenient; there is some additional matter; the index is better; the type is not so good, but it is to be preferred to either of the previous editions. When the volumes of the *Foedera* first appeared they were analysed by Leclerc and Rapin in the *Bibliothèque choisie* and *Bibliothèque ancienne et moderne*. Rapin's articles were collected together and appended, under the title of *Abregé historique des actes publiques de l'Angleterre*, to the Hague edition. A translation, called *Acta Regia*, was published by Stephen Whatley, (1726–27), 4 vols. 8vo, reprinted both in 8vo and folio, the latter edition containing an analysis of the cancelled sheets, relating to the journals of the first parliament of Charles I., of the 18th volume of the *Foedera*.

In 1810 the Record Commissioners authorized Dr Adam Clarke to prepare a new and improved edition of the *Foedera*. Six parts, large folio, edited by Clarke, Caley and Holbrooke, were published between 1816 and 1830. Considerable additions were made, but the editing was performed in so unsatisfactory a manner that the publication was suspended in the middle of printing a seventh part. The latter portion, bringing the work down to 1383, was ultimately issued in 1869. A general introduction to the *Foedera* was issued by the Record Commission in 1817, 4to.

The wide learning and untiring labours of Rymer have received the warmest praise from historians. His industry was praised by Hearne (*Collections*, ii. 296). Sir T. D. Hardy styles the *Foedera* "a work of which this nation has every reason to be proud, for with all its blemishes—and what work is faultless?—it has no rival in its class" (*Syllabus*, vol. ii. xxxvi.), and Mr J. B. Mullinger calls it "a collection of the highest value and authority" (Gardiner and Mullinger's *Introduction to English History*, p. 224).

The best account of Rymer is to be found in the prefaces to Sir T. D. Hardy's *Syllabus* (1869–85, 3 vols. 8vo). There is an unpublished life by Des Maizeaux (Brit. Mus. Add. MS. No. 4223), and a few memoranda in Bishop Kennet's collections (Lansd. MS. No. 987). See also *Dict. of Nat. Biogr.* vol. l. In Caulfield's *Portraits*, &c. (1819), i. 50, may be seen an engraving of Rymer, with a description of a satirical print of him as "a garreteer poet." Rymer's two critical works on the drama are discussed by Sir T. N. Talfourd in the *Retrospective Review* (1820), vol. i. pp. 1–15.

Sir T. D. Hardy's *Syllabus* gives in English a condensed notice of each instrument in the several editions of the *Foedera*, arranged in chronological order. The third volume contains a complete index of names and places, with a catalogue of the volumes of transcripts collected for the Record edition of the *Foedera*. In 1869 the Record Office printed, for private destribution, Appendices A to E "to a report on the *Foedera* intended to have been submitted by C. Purton Cooper to the late Commissioners of Public Records," 3 vols. 8vo (including accounts of MSS. in foreign archives relating to Great Britain, with facsimiles). In the British Museum is preserved (Add. MS. 24699) a folio volume of reports and papers relating to the Record edition. Rymer left extensive materials for a new edition of the *Foedera*, bound in 59 vols. folio, and embracing the period from 1115 to 1698. This was the collection offered to the earl of Oxford. It was purchased by the Treasury for £215 from a Mrs Anna Parnell, to whom Rymer left all his property, and is now in the British Museum (Add. MSS. Nos. 4573 to 4630, and 18911). A catalogue and index may be consulted in the 17th volume of Tonson's edition of the *Foedera*. The Public Record Office possesses a MS. volume, compiled by Robert Lemon about 1800, containing instruments in the Patent Rolls omitted by Rymer. In the same place may be seen a volume of reports, orders, &c., on the *Foedera*, 1808–11, and the transcripts collected for the new and unfinished edition. (H. R. T.)

RYOT, or Rayat (from the Arabic *ra'a*, "to pasture"), properly a subject, then a tenant of the soil. The word is used throughout India for the general body of cultivators; but it has a special meaning in different provinces. The ryotwari tenure is one of the two main revenue systems in India. Where the land revenue is imposed on an individual or community owning an estate, and occupying a position analogous to that of a landlord, the assessment is known as zamindari; and where the land revenue is imposed on individuals who are the actual occupants, the assessment is known as ryotwari. Under zamindari tenure the land is held as independent property; while under ryotwari tenure it is held of the crown in a right of occupancy, which is under British rule both heritable and transferable. The former system prevails in northern and central India, and the latter in Bombay, Madras, Assam and Burma.

RYSWICK, TREATY OF, the peace which in 1697 ended the war between France on the one side and the Empire, England, Spain and Holland, on the other. Begun in 1689 under the leadership of the new king of England, William III., its object was to put a check on the ambitious designs of Louis XIV., and it raged in the Netherlands, the Rhineland, Italy, Ireland and Spain, in India and America and on the sea (see Grand Alliance, War of the). Negotiations for peace had begun in 1696, but they were soon broken off, William III. and the English parliament at this time refusing to treat except "with our swords in our hands." But in May 1697 they were renewed under the mediation of the king of Sweden. The French representatives had their headquarters at the Hague and those of the allies at Delft, the conferences between them taking place at Ryswick. For the first few weeks no result was reached, and in June William III. and Louis XIV., the protagonists in the struggle, each appointed one representative to meet together privately. The two chosen were William Bentinck, earl of Portland, and marshal Boufflers, and they soon drew up the terms of an agreement, to which, however, the emperor Leopold I. and the king of Spain would not assent. But in a short time Spain gave way, and on the 20th of September 1697 a treaty of peace was signed between France and the three powers, England, Spain and Holland, the Empire still holding aloof. William then persuaded Leopold to make peace, and a treaty between France and the Empire was signed on the 30th of October following.

The basis of the peace was that all towns and districts seized since the treaty of Nijmwegen in 1679 should be restored. Then France surrendered Freiburg, Breisach and Philippsburg to Germany, although she kept Strassburg. On the other hand, she regained Pondicherry and Nova Scotia, while Spain recovered Catalonia, and the barrier fortresses of Mons, Luxemburg and Courtrai. The duchy of Lorraine, which for many years had been in the possession of France, was restored to Leopold Joseph, a son of duke Charles V., and the Dutch were to be allowed to garrison some of the chief fortresses in the Netherlands, including Namur and Ypres. Louis undertook to recognize William as king of England, and promised to give no further assistance to James II.; he abandoned his interference in the electorate of Cologne and also the claim which he had put forward to some of the lands of the Rhenish Palatinate.

For further details see C. W. von Koch and F. Scholl, *Histoire abregée des traités de paix* (1817–18); A. Moetjens, *Actes et mémoires de la paix de Ryswick* (The Hague, 1725); A. Legrelle, *Notes et documents sur la paix de Ryswick* (Lille, 1894); and H. Vast, *Les Grands Traités du règne de Louis XIV* (Paris, 1893–99). See also L. von Ranke, *Englische Geschichte*, English translation as *History of England* (Oxford, 1875).

RZHEV, or Rzhov, a town of Russia, in the government of Tver, 76 m. S.W. of the town of Tver, occupying the bluffs on both banks of the Volga (here 350 ft. wide) near the confluence of the Vazuza. Pop. (1900) 31,514. It is the terminus of a branch line (85 m.) from the St Petersburg & Moscow railway, and is the centre of a large transit trade between Orel, Kaluga and Smolensk and the ports of St Petersburg and Riga. In the 12th century Rzhev belonged to the principality of Smolensk. Under the rulers of Novgorod it became from 1225 a subordinate principality, and in the 15th century the two portions of the town were held by two independent princes.

S the twenty-first letter of the Phoenician alphabet, is one of the four sibilants which that alphabet possesses. In the Phoenician alphabet it takes a form closely resembling the English W, and this when moved through an angle of 90° is the ordinary Greek *sigma* Σ. In Phoenician itself and in the other Semitic alphabets the position of the middle legs of the W is altered so that the symbol takes such forms as Ѱ or Ʋ or ш, ultimately ending sometimes in a form like K laid sideways, ⋌. In Greek, where Σ is the twentieth letter of the alphabet, or, if the merely numerical ϛ and ϙ are excluded, the eighteenth, another form Ƨ or ϟ according to the direction of the writing is also widespread. This, which is the only form of the earliest period at Cumae, where it is also found more rounded ς, is the origin of the Latin S and its descendants. The development from the angular to the curved shape of S may be seen in its occurrences on the early cippus found in the Roman Forum in 1899. Apart from doubtful instances it is there six times clearly engraved; four of the instances are angular, the other two are more or less rounded. The Semitic name of the symbol is *shin*; the Greek name *sigma* may mean merely the hissing letter and may be a genuine Greek derivative from the verb σίζω, hiss. Some, however, see in it a corruption of the Semitic name *samekh*, the letter which corresponds in alphabetic position and in shape to the Greek ξ (*x*). The Dorian Greeks, however, as Herodotus tells us (i. 139), called that letter *san* which the Ionian Greeks called *sigma*; *san* seems more likely to be an attempt to reproduce the Semitic name. Herodotus says nothing of a difference in shape, but most authorities regard the form M, which with the value of *s* is practically confined to Doric areas, as being *san*. In the compound σαμφόρας, *san* like koppa (κοππατίας) was known to the Athenians as a brand for highbred horses (cf. Aristophanes, *Clouds*, 122, 1298, 23, 438). For the symbol Ͳ which was used at Ephesus and other places in Asia Minor and elsewhere for the sound represented by -σσ- in Ionic Greek, by -ττ- in Attic, see ALPHABET. Further points of difficulty in connexion with the sibilants are discussed under X and Z. The pronunciation of *s* was originally unvoiced: in English it is often used for the voiced sound as well, compare *lose* with *loose*, *house* with *houses*. At the end of words the voiced sound is often written with *-s*, the unvoiced with *-ss* as in *his* and *hiss*. In other cases the pronunciation can be ascertained only from the context, as in *use*, unvoiced for the substantive, voiced for the verb. Sometimes a difference of meaning is indicated by difference of spelling though the sounds in the two words are identical, as in *furs* and *furze*. The voiced form of *s* (i.e. *z*) readily passes into *r* in many languages: compare the Eng. *hare* with the Ger. *Hase*, the Eng. *ear* and Lat. *auris* with the Gothic *auso* and Lithuanian *ausìs*, "ear." Here also should be mentioned the sound *sh*, which, like *th*, is not a combination of sounds though written with two symbols. Hence in transcription from foreign languages and in works on phonetics it is represented by ṣ or š. The difference in formation between *s'* and ṣ is that the former is dental or alveolar, the latter is produced farther back and has at least two varieties. In the usual Eng. *sh* the tip of the tongue is bent backwards so that the tongue becomes spoon-shaped. The voiced sound to this is generally written *z* as in *azure*, but sometimes *s* as in *pleasure*. The sound of *sh* is also sometimes represented by *s*, as in *sure*, *sugar*. This is occasioned by the *y*-sound with which *u* now begins, and is carried further in dialect than in the literary language, *sue* and *suit*, for example, being pronounced in Scotland like the Eng. *shoe* and *shoot*. The *sh* sound is sometimes not even written with a sibilant, as in the pronunciation of the *ci* and *ti* of words like *rhetorician* and *nation*. (P. Gi.)

SAALE, a river of Germany, a tributary of the Elbe, rises between Bayreuth and Hof in the N.E. of Bavaria, springing out of the Fichtelgebirge at an altitude of 2390 ft. It pursues a winding course in a northerly direction, and after passing the manufacturing town of Hof, flows amid well-wooded hills until it reaches the pleasant vale of Saalberg. Here it receives the waters of the Schwarza, in whose romantic valley lies the castle of Schwarzburg, the ancestral seat of the princes of the ruling house of Schwarzburg-Rudolstadt. From Saalberg the Saale enters the dreary limestone formation of Thuringia, sweeps beneath the barren, conical hills lying opposite to the university town of Jena, passes the pleasant watering-place of Kösen, washes numerous vine-clad hills and, after receiving at Naumburg the deep and navigable Unstrut, flows past Weissenfels, Merseburg, Halle, Bernburg and Kalbe, and joins the Elbe just above Barby, after traversing a distance of 226 m. It is navigable from Naumburg, 100 m., with the help of sluices, and is connected with the Elster near Leipzig by a canal. The soil of the lower part of its valley is of exceptional fertility, and produces, amongst other crops, large supplies of sugar beetroot. Among its affluents are the Elster, Regnitz and Orla on the right bank, and the Ilm, Unstrut, Salza, Wipper and Bode on the left. Its upper course is rapid. Its valley, down to Merseburg, is picturesque, and even romantic, because of the many castles which crown the enclosing heights. It is sometimes called the Thuringian or Saxon Saale, to distinguish it from another Saale (70 m. long), a right-bank tributary of the Main, in the Bavarian district of Lower Franconia.

See Hertzberg, *Die historische Bedeutung des Saaletals* (Halle, 1895).

SAALFELD, a town of Germany, in the duchy of Saxe-Meiningen, picturesquely situated on the left bank of the Saale, 24 m. S. of Weimar and 77 S.W. of Leipzig by rail. Pop. (1905) 13,245. One of the most ancient towns in Thuringia, Saalfeld, once the capital of the extinct duchy of Saxe-Saalfeld, is still partly surrounded by old walls and bastions, and contains some interesting medieval buildings, among them being a palace, built in 1679 on the site of the Benedictine abbey of St Peter, which was destroyed during the Peasants' War. Other notable edifices are the Gothic church of St John, dating from the beginning of the 13th century; the Gothic town hall, completed in 1537; and, standing on an eminence above the river, the Kitzerstein, a palace said to have been originally erected by the German king Henry I., although the present building is not older than the 16th century. But perhaps the most interesting relic of the past in Saalfeld is the striking ruin of the Hoher Schwarm, called later the Sorbenburg, said to have been erected in the 7th century. Saalfeld is situated in one of the busiest parts of Meiningen and has a number of prosperous industries, including the manufacture of machinery, bricks, colours, malt, cigars, hosiery and vinegar. Other industries are brewing, printing and iron-founding, and there are ochre and iron mines in the neighbourhood.

Saalfeld grew up around the abbey founded in 1075 by Anno, archbishop of Cologne, and the palace built by the emperor Frederick I. In 1389 it was purchased by the landgrave of Thuringia, and with this district it formed part of Saxony. In 1680 it became the capital of a separate duchy, but in 1699 it was united with Saxe-Coburg, passing to Saxe-Meiningen in 1826. On the 10th of October 1806 a battle took place near Saalfeld between the French and the Prussians, during which Prince Louis Ferdinand of Prussia was killed.

See Wagner and Grobe, *Chronik der Stadt Saalfeld* (Saalfeld, 1865–1867), and Thümmel, *Kriegstage aus Saalfelds Vergangenheit* (Berlin, 1882).

SAAR, a river of Germany, a right-bank tributary of the Mosel. It rises in the Donon, an eminence of the Vosges, close to the Franco-German frontier, and flows at first north, then north-west and finally north again to its junction with the Mosel at Konz. Its length is 143 m. The middle part of its valley is an important industrial district, with coal-mines and a variety of manufactures; the Saar wines are also well known. The principal towns on the Saar are Saargemünd, Saarbrücken and St Johann (which face each other across the river), Saarlouis and Saarburg. The river is navigable up to Saargemünd, a distance of 75 m. From here there is connexion with the Rhine-Marne canal by way of the Saar canal, built in 1862, and 40 m. in length, following the Saar valley upwards for about half that distance.

SAARBRÜCKEN, a town of Germany, in the Prussian Rhine Province, on the left bank of the Saar, a navigable tributary of the Mosel, is situated 49 m. by rail N.E. of Metz, at the south end of one of the most extensive coal-fields in Europe, to which it has given its name. Pop. (1885) 10,453; (1905) 26,944. With the towns of St Johann, immediately opposite on the right bank of the river, and Malstatt-Burbach, Saarbrücken forms a single community, the three places having been united in 1909. Saarbrücken has four Protestant churches, a Roman Catholic and an Old Catholic church, and a town hall adorned with paintings by Anton von Werner, illustrating episodes of the war of 1870. Other buildings are the castle, until 1793 the residence of the princes of the house of Nassau-Saarbrücken; a gymnasium, founded in 1615, and a celebrated mining academy. The industries of St Johann-Saarbrücken include wool-spinning, brewing, and the manufacture of leather, tobacco, chemicals and iron wares. The trade is chiefly connected with the produce of the neighbouring coal-mines and that of the numerous important iron and glass works of the district. The Saarbrücken coal-fields extend over 70 sq. m., are estimated to yield about 10,000,000 tons annually, and give employment to nearly 50,000 men.

Saarbrücken owes its name to a bridge which existed in Roman times. Its early lords were the bishops of Metz, the counts of the lower Saargau, and the counts of the Ardennes. From 1381 to 1793 it belonged to the counts of Nassau-Saarbrücken, and then, after having been in the possession of France from 1801 to 1815, it passed to Prussia. In the Franco-Prussian War Saarbrücken was seized by the French on the 2nd of August 1870, but the first German victory on the heights of Spicheren, 3 m. to the south, relieved it four days later.

See Köllner, *Geschichte der Städte Saarbrücken und St Johann* (Saarbrücken, 1865); Ruppersberg, *Geschichte der ehemaligen Grafschaft Saarbrücken* (Saarbrücken, 1899–1903); and H. Kniebe, *Bilder aus Saarbrückens Vergangenheit* (Saarbrücken, 1894).

SAARBURG, a town of Germany, in the imperial province of Alsace-Lorraine, on the Saar, 44 m. N.W. from Strassburg by rail. Pop. (1905) 9818. Its chief industries are the manufacture of watch springs, gloves, lace, beer and machinery, and it has a trade in grain. Saarburg, which has been identified with the *Pons Saravi* of the Romans, belonged to France from 1661 to 1871, its earlier owners having been the bishops of Metz and the dukes of Lorraine.

Another Saarburg is a town in Prussia at the confluence of the Saar and the Leuk. Pop. (1905) 2186. It has the ruins of a castle, formerly belonging to the electors of Trier, and is still partly surrounded by walls. It has manufactures of bells, furniture and cigars, other industries being tanning and vine-growing. Saarburg dates from the 10th century and received municipal rights in 1291. From 1036 until 1727, when it passed into the possession of France, it belonged to the electors of Trier. It became Prussian in 1815.

See Hewer, *Geschichte der Burg und Stadt Saarburg* (Trier, 1862).

SAARGEMÜND (Fr. *Sarreguemines*), a town of Germany, in the imperial province of Alsace-Lorraine, situated at the confluence of the Blies and the Saar, 40 m. E. of Metz, 60 m. N.W. of Strassburg by rail, and at the junction of lines to Trier and Saarburg. Pop. (1905) 14,932. It carries on considerable manufactures of faience, plush, velvet, leather, porcelain and earthenware, and is a chief depot for the papier-maché boxes, mostly snuff-boxes, which are made in great quantities in the neighbourhood.

Saargemünd, originally a Roman settlement, obtained civic rights early in the 13th century. In 1297 it was ceded by the count of Saarbrücken to the duke of Lorraine, and passed with Lorraine in 1766 to France, being transferred to Germany in 1871.

See Thomire, *Notes historiques sur Sarreguemines* (Strassburg, 1887); and Box, *Notice sur le pays de la Saare* (Nancy, 1903).

SAARLOUIS, a town and former fortress of Germany, in the Prussian Rhine Province, situated in a fertile district on the left bank of the Saar, and on the railway from Saarbrücken to Trier, 40 m. S. of the latter. Pop. (1905) 8313. The town is well laid out and has spacious streets and a handsome market square. It contains a Roman Catholic and a Protestant church, a town hall, the walls of the council chamber in which are hung with Gobelins, the gift of Louis XIV., a classical school and a hospital. There are coal-mines in the vicinity, and the town has considerable manufactures of porcelain, enamel wares and leather, as well as a brisk trade in cattle and grain.

Saarlouis was founded in 1681 by Louis XIV. of France, and was fortified by Vauban in 1680–1685. By the peace of Paris, in 1815, it was ceded to the allies and by them was made over to Prussia. The fortifications were dismantled in 1889. Marshal Ney was born here.

See Niessen, *Geschichte des Kreises Saarlouis* (Saarlouis, 1893 and 1897); and Baltzer, *Historische Notizen über die Stadt Saarlouis* (Trier, 1865).

SAAVEDRA, ANGEL DE, Duke of Rivas (1791–1865), Spanish poet and politician, was born at Cordova on the 19th of March 1791. He fought in the war of independence, was a prominent member of the advanced Liberal party from 1820 to 1823, and in the latter year was condemned to death. He escaped to London and lived successively in Italy, Malta and France, until the amnesty of 1834, when he returned to Spain, shortly afterwards succeeding his brother as duke of Rivas. In 1835 he became minister of the interior under Istúriz, and along with his chief had again to leave the country. Returning in 1837, he joined the moderate party, became prime minister, and was subsequently ambassador at Paris and Naples. He died on the 22nd of June 1865. In 1813 he published *Ensayos poéticos*, and between that date and his first exile several of his tragedies (the most notable being *Alatar*, 1814, and *Lanuzá*, 1822) were put upon the stage. Traces of foreign influence are observable in *El Moro Expósito* (1833), a narrative poem dedicated to John Hookham Frere; these are still more marked in *Don Alvaro ó La Fuerza del sino* (first played on the 22nd of March 1835), a drama of historical importance inasmuch as it established the new French romanticism in Spain.

Bibliography.—*Obras completas del Duque de Rivas* (Madrid, 1894–1904); L. A. de Cueto, "Discurso," in *Memorias de la academia española* (Madrid, 1870); M. Cañete, *Escritores españoles é hispano-americanos* (Madrid, 1884); J. Valera in *El Ateneo* (Madrid, December 1888–February 1889); E. Piñeyro, *El Romanticismo en España* (Paris, 1904).

SAAVEDRA FAJARDO, DIEGO DE (1584–1648), diplomatist and man of letters, was born of a noble family at Algezares (Murcia) on the 6th of May 1584. Educated for the church at Salamanca, he took orders, and in 1606 was appointed secretary to Cardinal Gaspar Borgia, the Spanish ambassador at Rome. Ultimately he became Spanish plenipotentiary at Regensburg in 1636 and at Münster in 1645. He returned to Spain in 1646 and took up the post of member of the council of the Indies to which he had been nominated in 1636, but shortly afterwards retired to a monastery, where he died in 1648. In 1640 he published his *Empresas politicas, ó idea de un principe politico cristiano*, a hundred short essays on the education of a prince; these were written primarily for the son of Philip IV. Its sententious style is still admired in Spain. It passed through a number of editions and was translated in several languages, the English version being by Astry (2 vols., 8vo, London, 1700). An unfinished historical work, entitled *Corona gótica, castellana, y austriaca politicamente ilustrada*, appeared in 1646. Another work ascribed to Saavedra, the *República literaria*, was published posthumously in 1670; it is a satirical discussion on some of the leading characters in the ancient and modern world of letters.

Collected editions of his works appeared at Antwerp in 1677–1678, and again at Madrid in 1789–1790; see also vol. xxv. of the *Bibl. de aut. esp.* (1853).

SAAZ (Czech *Žatec*), a town of Bohemia, Austria, 64 m. N.W. of Prague by rail. Pop. (1900) 16,168, mostly German. It lies on the Eger, which is spanned here by a suspension bridge, 210 ft. long, which is the oldest of its kind in Bohemia, having been constructed in 1826. It possesses several ancient churches, of which one is said to date from 1206, and a town hall built in 1559. Saaz is the centre of the extensive hop trade of the neighbourhood. In early times it was the seat of a royal count (Župan or *gaugraf*). A coat-of-arms was given to the inhabitants by Ladislaus for their courage during the storming of Milan; and the place is mentioned as a royal town under Ottokar II. From the outbreak of the Hussite Wars to the Thirty Years' War Saaz was Hussite or Protestant, but after the battle of the White Mountain (1620) the greater part of the Bohemian inhabitants left the town, which became German and Roman Catholic.

SABADELL, a town of north-eastern Spain, in the province of Barcelona; on the river Ripoll and on the Barcelona-Saragossa railway. Pop. (1900) 23,294. The town has handsome modern public buildings, including the town hall, schools for primary and higher education, hospitals and theatres. Cloth, linen, paper, flour and brandy are manufactured, and there are iron foundries and saw-mills. About half the inhabitants are employed in the textile factories. Sabadell is said to be the Roman *Sebendunum*, but in Spanish annals it is not noticed until the 13th century.

SABAEANS. The ancient name of the people of Yemen (*q.v.*) was Saba (Saba' with final *hemza*); and the oldest notices of them are in the Hebrew Scriptures. The list of the sons of Joktan in Gen. x. 26-29 contains in genealogical form a record of peoples of South Arabia which must rest on good information from Yemen itself. Many of these names are found on the inscriptions or in the Arabic geographers—Sheba (Saba'), Hazarmaveth (Ḥaḍramut), Abimael (Abimeʽathtar), Jobab (Yuhaibib, according to Halévy), Jerah (Warāḥ of the geographers), Joktan (Arab Qaḥtan; *waqata* = *qaḥata*). On the other hand, the names of some famous nations mentioned on the inscriptions are lacking, from which it may be concluded that they did not rise to prominence till a later date. Saba' (Sheba) itself, which was in later times the chief name, has in Gen. x. 28 a subordinate place; it was perhaps only a collective name for the companies of merchants who conducted the South-Arabian export trade (the root *saba'* in the inscriptions meaning to make a trading journey), and in that case would be of such late origin as to hold one of the last places in a list that has genealogical form. Two other accounts in Genesis, originally independent, give supplementary information drawn from the Sabaean colonies, the stations and factories established to facilitate trade through the desert. The inscriptions of Al-ʽOla published by D. H. Müller show that there were Minaean colonies in North Arabia. Other South Arabs, and especially the Sabaeans, doubtless also planted settlers on the northern trade routes, who in process of time united into one community with their North-Arab kinsmen and neighbours. Thus we can understand how in Gen. xxv. 2-3 Sheba and Dedan appear among the North-Arab "sons of Keturah." Again, the Sabaeans had colonies in Africa and there mingled with the black Africans; and so in Gen. x. 7 Sheba and Dedan, the sons of Raamah (Raghma), appear in the genealogy of the Cushites. With the Ethiopians *Saba'* means "men," a clear indication of their Sabaean descent.

The queen of Sheba who visited Solomon may have come with a caravan trading to Gaza, to see the great king whose ships plied on the Red Sea. The other biblical books do not mention the Sabaeans except incidentally, in allusion to their trade in incense and perfumes, gold and precious stones, ivory, ebony, and costly garments (Jer. vi. 20; Ezek. xxvii. 15, 20, 22 seq.; Isa. lx. 6; Job vi. 19). These passages attest the wealth and trading importance of Saba from the days of Solomon to those of Cyrus. When the prologue to Job speaks of plundering Sabaeans (and Chaldaeans) on the northern skirts of Arabia, these may be either colonists or caravans, which, like the old Phoenician and Greek traders, combined on occasion robbery with trade. The prologue may not be historical; but it is to be presumed that it deals with historical possibilities, and is good evidence thus far.

The biblical picture of the Sabaean kingdom is confirmed and supplemented by the Assyrian inscriptions. Tiglath-Pileser II. (733 B.C.) tells us that Teima, Saba', and Ḥaipā (= Ephah, Gen. xxv. 4 and Isa. lx. 6) paid him tribute of gold, silver and much incense. Similarly Sargon (715 B.C.) in his *Annals* mentions the tribute of Shamsi, queen of Arabia, and of Itamara of the land of Saba'—gold and fragrant spices, horses and camels.

The earliest Greek accounts of the Sabaeans and other South-Arabian peoples are of the 3rd century B.C. Eratosthenes (276–194 B.C.) in Strabo (xv. 4. 2) says that the extreme south of Arabia, over against Ethiopia, is inhabited by four great nations—the Minaeans (Μειναῖοι, Μηναῖοι; Maʽīn of the inscriptions) on the Red Sea, whose chief city is Carna; next to them the Sabaeans, whose capital is Mariaba (Mariab of the inscriptions); then the Catabanes (Qatabān of the inscriptions), near the Straits of Bāb-el-Mandeb, the seat of whose king is Tamna; fourthly, and farthest east, the people of Ḥaḍramut (Chatramotitae), with their city Sabota. The Catabanes produce frankincense and Ḥaḍramut myrrh, and there is a trade in these and other spices with merchants who make the journey from Aelana (Elath, on the Gulf of ʽAkaba) to Minaea in seventy days; the Gabaeans (the Gaba'ān of the inscriptions, Pliny's Gebanitae) take forty days to go to Ḥaḍramut. This short but important and well-informed notice is followed a little later by that of Agatharchides (120 B.C.), who speaks in glowing terms of the wealth and greatness of the Sabaeans, but seems to have less exact information than Eratosthenes. He knows only the Sabaeans and thinks that Saba is the name of their capital. He mentions, however, the "happy islands" beyond the straits, the station of the Indian trade (§ 103). Artemidorus (100 B.C.), quoted by Strabo, gives a similar account of the Sabaeans and their capital Mariaba, of their wealth and trade, adding the characteristic feature that each tribe receives the wares and passes them on to its neighbours as far as Syria and Mesopotamia.

The accounts of the wealth of the Sabaeans brought back by traders and travellers excited the cupidity of Rome, and Augustus entrusted Aelius Gallus with an expedition to South Arabia, of which we have an authentic account in Strabo (xvi. 4. 22). He hoped for assistance from the friendly Nabataeans; but, as they owed everything to their position as middlemen for the South-Arabian trade, which a direct communication between Rome and the Sabaeans would have ruined, their viceroy Syllaeus, who did not dare openly to refuse help, sought to frustrate the emperor's scheme by craft. Instead of showing the Romans the caravan route, he induced them to sail from Cleopatris to Leucocome, and then led them by a circuitous way through waterless regions, so that they reached South Arabia too much weakened to effect anything. But the expedition brought back a considerable knowledge of the country and its products, and the Roman leader seems to have perceived that the best entrance to South Arabia was from the havens on the coast. So at least we may conclude when, a hundred years later (A.D. 77, as Dillmann has shown), in the *Periplus* of an anonymous contemporary of Pliny (§ 23) we read that Charibael of Ẓafar, "the legitimate sovereign of two nations, the Homerites and Sabaeans," maintained friendly relations with Rome by frequent embassies and gifts. Pliny's account of Yemen, too, must be largely drawn from the expedition of Gallus, though he also used itineraries of travellers to India, like the *Periplus Maris Erythraei* just quoted.

Nautical improvements, and the discovery that the south-west monsoon (Hippalus) gave sure navigation at certain seasons, increased the connexion of the West with South Arabia, but also wrought such a change in the trade as involved a revolution in the state of that country. The hegemony of the Sabaeans now yields to that of a new people, the Homerites or Ḥimyar, and the king henceforth bears the title "king of the Himyarites and Sabaeans." Naval expeditions from Berenice and Myoshormus to the Arabian ports brought back the information on which Claudius Ptolemy constructed his map, which still surprises us by its wealth of geographical names.

Sabaean colonies in Africa have been already mentioned. That Abyssinia was peopled from South Arabia is proved by its language and writing; but the difference between the two languages is such as to imply that the settlement was very early and that there were many centuries of separation, during which the Abyssinians were exposed to foreign influences. New colonies, however, seem to have followed from time to time, and, according to the *Periplus* (§ 16), some parts of the African coast were under the suzerainty of the Sabaean kings as late as the Sabaeo-Himyaritic period; the district of Azania was held for the Sabaean monarch by the governor of Maphoritis (Maʽāfir), and was exploited by a Sabaean company. Naturally difficulties would arise between Abyssinia and the Sabaean power. In the inscription of Adulis (2nd century) the king of Ethiopia claims to have made war in Arabia from Leucocome to the land of the Sabaean king. And the Ethiopians were not without successes, for on the Greek inscription of Axūm (*c.* the middle of the 4th century) King Aeizanes calls himself "king of the Axūmites, the Homerites, and Raidān, and of the Ethiopians, Sabaeans, and Silee." More serious was the conflict under Dhū-Nu'ās (Dhū-Nuwās of the Arab historians) in the beginning of the 6th century; it ended in the overthrow of the Himyarite king and the subjugation of Yemen, which was governed by a deputy of the Axūmite king, till (about 570) the conquerors were overthrown by a small band of Persian adventurers.

With the exception of what the South-Arabian Hamdānī relates of his own observation or from authentic tradition, the Mahommedan Arabic accounts of South Arabia and Sabaea are of little worth. The great event they dwell on is the bursting of the dam of Ma'rib, which led to the emigration northwards of the Yemenite tribes. We may be sure that this event was not the cause but the consequence of the decline of the country. When the inland trade fell away and the traffic of the coast towns took the sea route, the ancient metropolis and the numerous inland emporia came to ruin, while the many colonies in the north were broken up and their population dispersed. To this the Koran alludes in its oracular style, when it speaks (xxxiv. 17) of well-known cities which God appointed as trading stations between the Sabaeans and the cities He had blessed (Egypt and Syria), and which He destroyed because of their sins.

Inscriptions.—This abstract of the history of Yemen from ancient sources can now be verified and supplemented from inscriptions. Doubts as to the greatness and importance of the Sabaean state, as attested by the ancients, and as to the existence of a special Sabaean writing, called "Musnad," of which the Arabs tell, were still current when Niebuhr, in the 18th century, brought to Europe the first account of the existence of ancient inscriptions (not seen by himself) in the neighbourhood of Yarīm. Following this hint, Seetzen, in 1810, was able to send to Europe, from porphyry blocks near Yarīm, the first copies of Sabaean inscriptions. They could not, however, be read. But the inscriptions found by Wellsted in 1834 at Ḥiṣn Ghorāb were deciphered by Gesenius and Rödiger. Soon after this the courageous explorer Arnaud discovered the ancient Mariab, the royal city of the Sabaeans, and at great risk copied fifty-six inscriptions and took a plan of the walls, the dam, and the temple to the east of the city. These, with other inscriptions on stone and on bronze plates brought home by Englishmen, found a cautious and sound interpreter in Osiander. The historical and geographical researches of Kremer and Sprenger gave a fresh impulse to inquiry. Then Joseph Halévy made his remarkable journey through the Jauf, visiting districts and ruins which no European foot had trod since the expedition of Gallus, and returned with almost 800 inscriptions. Of more recent travellers S. Langer and E. Glaser have done most for epigraphy, while Manzoni is to be remembered for his excellent geographical work.

The *alphabet* of the Sabaean inscriptions is most closely akin to the Ethiopic, but is purely consonantal, without the modifications in the consonantal forms which Ethiopic has devised to express vowels. There are twenty-nine letters, one more than in Arabic, *Samech* and *Sin*, being distinct forms, as in Hebrew. This alphabet, which is probably the parent of the South-Indian character, is undoubtedly derived from the so-called Phoenician alphabet, the connecting link being the forms of the Ṣafa inscriptions and of the Thamudaean inscriptions found by Doughty and Euting. Of the latter we can determine twenty-six characters, while a twenty-seventh probably corresponds to Arabic ẓ (ظ). A sign for ص also probably existed, but does not occur in the known inscriptions. In the Thamudaean and Sabaean alphabets the twenty-two original Phoenician characters are mostly similar, and so are the differentiated forms for غ and خ, while ش, ذ, and probably also ط and ص, have been differentiated in many ways. This seems to imply that the two alphabets had a common history up to a certain point, but parted company before they were fully developed. The Thamudaean inscriptions are locally nearer to Phoenicia, and the letters are more like the Phoenician; this character therefore appears to be the link connecting Phoenician with Sabaean writing. It may be noticed that a Thamudaean legend has been found on a Babylonian cylinder of about 1000 B.C., and it is remarkable that the Sabaean *saṭara*, "write," seems to be borrowed from Assyrian *shaṭāru*.

The *language* of the inscriptions is South Semitic, forming a link between the North Arabic and the Ethiopic, but is much nearer the former than the latter. Of the two dialects commonly called Sabaean and Minaean the latter might be better called Hadramitic, inasmuch as it is the dialect of the inscriptions found in Ḥadramut, and the Minaeans seem undoubtedly to have entered the Jauf from Ḥadramut.

The inscriptions not only give names of nations corresponding to those in the Bible and in classical authors, but throw a good deal of fresh light on the political history of Yemen. The inscriptions and coins give the names of more than forty-five Sabaean kings. The chronology is still vague, since only a few very late inscriptions are dated by an era and the era itself is not certain. But the rulers named can be assigned to three periods, according as they bear the title "mukrab of Saba," "king of Saba," or "king of Saba and Raidān." The last, as we know from the Axūm inscriptions, are the latest, and those with the title "mukrab" must be the earliest. Four princes of the oldest period bear the name Yathaʽamar, and one of these may, with the greatest probability, be held to be the "Itamara Sabai" who paid tribute to Sargon of Assyria. This helps us to the age of some buildings also. The famous dam of Ma'rib and its sluices were the work of this ancient prince—structures which Arnaud in the 19th century found in the same state in which Hamdānī saw them a thousand years ago. The power of these old sovereigns extended far beyond Ma'rib, for their names are found on buildings and monuments in the Jauf.

We cannot tell when the kings took the place of the mukrab, but the Sabaeo-Himyaritic period seems to begin with, or a little after, the expedition of Aelius Gallus. A fragmentary inscription of Ma'rib (Br. Mus., 33) was made by "Ilsharḥ Yaḥḍib and Ya'zil Bayyin, the two kings of Saba and Raidān, sons of Farʽm Yanhab, king of Saba." If this Ilsharḥ is identical with the Ἰλάσσαρος of Strabo, king of Mariaba at the time of the Roman invasion, the inscription preserves a trace of the influence of that event on the union of the two kingdoms.

The inscriptions of the latest period present a series of dates—669, 640, 582, 573, 385—of an unknown era. Reinaud thought of the Seleucid era, which is not impossible; but Halévy observes that the fortress of Mawiyyat (now Ḥiṣn Ghorāb) bears the date 640, and is said to have been erected "when the Abyssinians overran the country and destroyed the king of Himyar and his princes." Referring this to the death of Dhū Nuwās (A.D. 525), Halévy fixes 115 B.C. as the epoch of the Sabaean era. This ingenious combination accords well with the circumstance that the oldest dated inscription, of the year 385 (A.D. 270), mentions ʽAthtar, Shams and other heathen deities, while the inscriptions of 582 (A.D. 467) and 573 (A.D. 458), so far as they can be read, contain no name of a heathen god, but do speak of a god Raḥmānān—that is, the Hebrew Raḥmān, "the compassionate" (Arabic, al-Raḥmān), agreeably with the fact that Jewish and Christian influences were powerful in Arabia in the 4th century. The only objections to Halévy's hypothesis are (1) that we know nothing of an epoch-making event in 115 B.C., and (2) that it is a little remarkable that the latest dated inscription, of the year 669 (A.D. 554), should be twenty-five years later than the Abyssinian conquest. An inscription found by Wrede at ʽObne is dated "in the year 120 of the Lion in Heaven," which we must leave the astronomers to explain.

The inscriptions throw considerable light not only on the Sabaeans but on other South-Arabian nations. The Minaeans, whose importance has been already indicated, appear in the inscriptions as only second to the Sabaeans, and with details which have put an end to much guesswork, *e.g.* to the idea that they are connected with Minâ near Mecca. Their capital, Maʽīn, lay in the heart of the Sabaean country, forming a sort of enclave on the right hand of the road that leads northward from Ma'rib. South-west of Maʽīn, on the west of the mountain range and commanding the road from Sanʽa to the north, lies Barāqish, anciently Yathil, which the inscriptions and Arabic geographers always mention with Maʽīn. The third Minaean fortress, probably identical with the Κάρνα of the Greeks, lies in the middle of the northern Jauf, and north of the other two.

The three Minaean citadels lie nearly in this position (∴), with old Sabaean settlements (Raiam) all round them, and even with some Sabaean places (*e.g.* Nask and Kamnā) within the triangle they form. The dialect of the Minaeans is sharply distinguished from the Sabaeans (see above). The inscriptions have yielded the names of twenty-seven Minaean kings, who were quite independent, and, as it would seem, not always friends of the Sabaeans, for neither dynasty mentions the other on its inscriptions, while minor kings and kingdoms are freely mentioned by both, presumably when they stood under the protection of the one or the other respectively. The Minaeans were evidently active rivals of the Sabaean influence, and a war between the two is once mentioned. In Ḥaḍramut they disputed the hegemony with one another, the government there being at one time under a Minaean, at another under a Sabaean prince, while the language shows now the one and now the other influence. The religions also of the two powers present many points of agreement, with some notable differences. Thus, puzzling as the fact appears, it is clear that the Minaeans formed a sort of political and linguistic island in the Sabaean country. The origin of the Minaeans from Ḥaḍramut is rendered probable by the predominance of their dialect in the inscriptions of that country (except in that of Ḥisn Ghorāb), by the rule, already mentioned, of a Minaean prince in Ḥaḍramut, and by Pliny's statement (*H.N.* xii. 63) that frankincense was collected at Sabota (the capital of Ḥaḍramut; inscr. שבות), but exported only through the Gebanites, whose kings received custom dues on it, compared with xii. 69, where he speaks of Minaean myrrh "in qua et Atramitica est et Gebbanitica et Ausaritis Gebbanitarum regno," &c., implying that Minaean myrrh was really a Hadramite and Gebanite product. All this suggests a close connexion between the Minaeans and Ḥaḍramut; and from the Minaean inscriptions we know that the Gebanites were at one time a Minaean race, and stood in high favour with the queen of Ma'īn. Thus we are led to conclude that the Minaeans were a Hadramite settlement in the Jauf, whose object was to secure the northern trade road for their products. We cannot but see that their fortified posts in the north of the Sabaean kingdom had a strategical purpose; and so Pliny (xii. 54) says, "Attingunt et Minaei, pagus alius, per quos evehitur *uno tramite angusto* [from Ḥaḍramut]. Hi primi commercium turis fecere maximeque exercent, a quibus et Minaeum dictum est." Besides this road, they had the sea-route, for, according to Pliny, their allies, the Gebanites, held the port of Ocelis. If the Minaeans were later immigrants from Ḥaḍramut, we can understand how they are not mentioned in Gen. x. In later times, as is proved by the Minaean colony in Al-'Olā, which Euting has revealed to us, they superseded the Sabaeans in some parts of the north. In the 'Olā inscriptions we read the names of Minaean kings and gods. Notable also is the mention in I. Chron. iv. 41 of the "Bedouin encampments (אהלים) and the Ma'īnīm" smitten by the Simeonites, which may possibly refer to the destruction of a Minaean caravan protected by these Bedouins. The LXX. at least renders Ma'īnīm by Μιναίους. It seems bold to conjecture that the Minaeans were in accord with the Romans under Aelius Gallus, yet it is noteworthy that no Minaean town is named among the cities which that general destroyed, though ruin fell on Nask and Kamna, which lie inside the Minaean territory.

The inscriptions seem to indicate that the monarchies of South Arabia were hereditary, the son generally following the father, though not seldom the brother of the deceased came between, apparently on the principle of seniority, which we find also in North Arabia. Eratosthenes (in Strabo xvi. 4, 3) says that the first child born to one of the magnates after a king came to the throne was his designated successor; the wives of the magnates who were pregnant at the king's accession were carefully watched, and the first child born was brought up as heir to the kingdom. There seems to be a mistake in the first part of this statement; what Eratosthenes will have said is that the oldest prince after the king was the designated successor. This law of succession explains how we repeatedly find two kings named together among the Sabaeans, and almost always find two among the Minaeans; the second king is the heir. The principle of seniority, as we know from North Arabian history, gives rise to intrigues and palace revolutions, and was probably often violated in favour of the direct heir. On the other hand, it readily leads to a limited power of election by the magnates, and in fact good Arabian sources speak of seven electoral princes. Some inscriptions name, besides the king, an eponymus, whose office seems to have been priestly, his titles being *dhū ḥarīf*, *eponymus* and *rashūw*, "sacrificer." All royal inscriptions are signed by him at the beginning and the end, and he appears with the king on coins.

Religion.—In spite of the many ruins of temples and inscriptions, the religion of the Sabaeans is obscure. Most of the many names of gods are mere names that appear and vanish again in particular districts and temples. Of the great national gods of the Sabaeans and Minaeans we know a little more. The worship of the heavenly bodies, for which there is Arabic evidence, had really a great place in Yemen. Sun-worship seems to have been peculiar to the Sabaeans and Hamdanites; and, if the Sabis of Sabota (Pliny) was in fact the sun deity Shams, this must be ascribed to Sabaean influence. The Sabaean Shams was a goddess, while the chief divinity of the Minaeans was the god 'Athtar, a male figure, worshipped under several forms, of which the commonest are the Eastern 'Athtar and 'Athtar Dhū Kabḍ. Wadd and Nikrah, the gods of love and hate, are possibly only other forms of the two 'Athtars. The Sabaeans also recognize 'Athtar; but with them he is superseded by Almaqah, who, according to Hamdānī, is the planet Venus, and therefore is identical with 'Athtar. The moon-god Sīn appears on an inscription of Shabwat; but, according to Hamdānī, Haubas, "the drier," was the Sabaean moon-god. On the Shabwat inscription 'Athtar is the father of Sīn, and it is noteworthy that these two deities also appear as nearly related in the Babylonian legend of 'Ishtar's descent to Hades, where 'Ishtar is conversely the daughter of the god Sīn. The mother of 'Athtar on another inscription is probably the sun. We find also the common Semitic Il (El) and a Dhū Samai answering to the northern Ba'al Shamayim. Three gods of the inscriptions are named in the Koran—Wadd, Yaghūth and Nasr. In the god-name Ta'lab there may be an indication of tree-worship. The many minor deities may be passed over; but we must mention the sanctuary of Riyām, with its images of the sun and moon, and, according to tradition, an oracle. In conformity with old Semitic usage, pilgrimages were made at definite seasons to certain deities, and the Sabaean pilgrim month, Dhū Ḥijjatān, is the northern Dhū'l-Ḥijja. The outlines, and little more, of a few of the many temples can still be traced. Noteworthy are the elliptic form of the chief temples in Ma'rib and Ṣirwāh, and the castle of Naqab-al-Ḥajar with its entrances north and south.

Sacrifices and incense were offered to the gods. The names for altar (*midhbaḥ*) and sacrifice (*dhibḥ*) are common Semitic words, and the altar of incense has among other names that of *miḳṭar*, as in Hebrew. A variety of spices—the wealth of the land—are named on these altars, as *rand*, *ladanum*, *costus*, *tarum*, &c. Frankincense appears as *lubān*, and there are other names not yet understood. The gods received tithes of the produce of trade and of the field, in kind or in ingots and golden statues, and these tributes, with freewill offerings, erected and maintained the temples. Temples and fortifications were often combined. The golden statues were votive offerings; thus a man and his wife offer four statues for the health of their four children, and a man offers to Dhū Samai statues of a man and two camels, in prayer for his own health and the protection of his camels from disease of the joints.

Their commerce brought the Sabaeans under Christian and Jewish influence; and, though the old gods were too closely connected with their life and trade to be readily abandoned, the great change in the trading policy, already spoken of, seems to have affected religion as well as the state. The inland gods lost importance with the failure of the overland trade, and Judaism and Christianity seem for a time to have contended for the mastery in South Arabia. Jewish influence appears in the name Raḥmān (see above), while efforts at Christianization seem to have gone forth from several places at various times. According to Philostorgius, the Homerites were converted under Constantius II. by the Indian Theophilus, who built churches in Ẓafar and Aden. Another account places their conversion in the reign of Anastasius (491–518). In Nejrān Syrian missionaries seem to have introduced Christianity (Nöldeke). But, as the religion of the hostile Ethiopians, Christianity found political obstacles to its adoption in Yemen; and, as heathenism had quite lost its power, it is intelligible that Dhū Nuwās, who was at war with Ethiopia before the last fatal struggle, became a Jew. His expedition against Christian Nejrān had therefore political as well as religious motives. The Ethiopian conquest rather hurt than helped Christianity. The famous *qalīs* (ἐκκλησία) of Abraha in San'ā seems to have been looked on as a sign of foreign dominion, and Islām found it easy to supersede Christianity in Yemen.

Coins.—In older times and in many districts coins were not used, and trade was carried on mainly by barter. Nor have there been many great finds of coins; indeed most of the pieces in European collections probably come from the same hoard. At the same time the coins throw a general light on the relations of ancient Yemen. The oldest known pieces are imitations of the Athenian mintage of the 4th century B.C., with the legend ΑΘΕ and the owl standing on an overturned amphora. The reverse has the head of Pallas with a Sabaean N. Of younger coins the first series has a king's head on the reverse, and the old obverse is enriched with two Sabaean monograms, which have been interpreted as meaning "majesty" and "eponymus" respectively. In a second series the Greek legend has disappeared, and, instead of the two Sabaean monograms, we have the names of the king and the eponymus. A third series shows Roman influence and must be later than the expedition of Gallus. As the standard of the coins of Attic type is not Attic but Babylonian, we must not think of direct Athenian influence. The type must have been introduced either from Persia or from Phoenicia (Gaza). One remarkable tetradrachm with the Sabaean legend Abyath'ā is imitated from an Alexander of the 2nd century B.C., the execution being quite artistic and the weight Attic. There are also coins struck at Raydān and Ḥarib, which must be assigned to the Himyarite period (1st and 2nd century A.D.). The inscriptions speak of "bright Hayyilī coins in high relief," but of these none have been found. They also speak of sela' pieces. The sela' in late Hebrew answers to the older shekel, and the mention of it seems to point to Jewish or Christian influence.

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The lexical material, in so far as it touches the Hebrew, was incorporated by D. H. Müller in the 10th-12th edition of the Gesenius Lexicon and is now incorporated by O. Weber in the 15th edition of the Gesenius-Buhl Lexicon. For collected literature see: up to 1892, F. Hommel's *Südarabische Chrestomathie*; from 1892 to 1907, O. Weber's *Studien zur südarabischen Altertumskunde*, iii. (D. H. M.)

SABAKI, a river of British East Africa which enters the Indian Ocean in 3° 12′ S., just north of Malinda. The Sabaki rises (as the Athi) in 1° 42′ S., and after flowing north-east 70 m. across the Kapote and Athi plains, turns south-south-east under the wooded slopes of the Yatta ridge, which shuts in its basin on the east. In 3° S. it turns east, and in its lower course (known as the Sabaki) traverses the sterile quartz-land of the outer plateau. The valley is in parts low and flat, covered with forest and scrub, and containing small lakes and backwaters connected with the river in the rains. At this season the stream—which rises as much as 30 ft. in places—is deep and strong and of a turbid yellow colour; but navigation is interrupted by the Lugard falls, about 100 m. from its mouth. Its total length is about 400 m. Apart from the numerous small feeders of the upper river, almost the only tributary is the Tsavo, from the east side of Kilimanjaro, which enters in about 3° S.

SABAS, ST (439–531), a Palestinian monk, born near Caesarea of Cappadocia. Becoming a monk in his childhood, he went to Jerusalem and lived as a hermit. After a time he established the "Great Laura" monastery in the neighbourhood of the Dead Sea, and later on the "New Laura," under St Basil's Rule. In the Lauras the young monks lived a cenobitical life, but the elders a semi-eremitical one, each in his own hut within the precincts of the Laura, attending only the solemn church services. Sabas was made exarch or superior of all the monasteries in Palestine, and composed a *Typicon* or Rule for their guidance. He took a prominent part, on the orthodox side, in the Monophysite and Origenistic controversies. His Laura long continued to be the most influential monastery in those parts, and produced several distinguished monks, among them St John of Damascus. It is now known as the monastery of Mar Sâba. He is commemorated on the 5th of December.

Another saint of this name, surnamed "the Goth," suffered martyrdom at the hands of Athanaric the Visigoth in the reign of Valentinian, and he is commemorated on the 12th of April in the Roman Martyrology, on varying days from 12th to 18th in the Greek Menologies.

Sabas's Life was written by his disciple Cyril of Scythopolis. The chief modern authority is A. Ehrhard in Wetzer u. Welte's *Kirchenlexikon* (ed. 2) and *Römische Quartalschrift*, vii.; see also Helyot, *Histoire des ordres religieux* (1714), i. c. 16, and Max Heimbucher, *Orden u. Kongregationen* (1907), i, § 10. (E. C. B.)

SABATIER, LOUIS AUGUSTE (1839–1901), French Protestant theologian, was born at Vallon (Ardèche), in the Cévennes, on the 22nd of October 1839, and was educated at the Protestant theological faculty of Montauban and the universities of Tübingen and Heidelberg. After holding the pastorate at Aubenas in the Ardèche from 1864 to 1868 he was appointed professor of reformed dogmatics in the theological faculty of Strassburg. His markedly French sympathies during the war of 1870 led to his expulsion from Strassburg in 1872. After five years' effort he succeeded in establishing a Protestant theological faculty in Paris, and became professor and then dean. In 1886 he became a teacher in the newly founded religious science department of the École des Hautes Études of the Sorbonne. Among his chief works were *The Apostle Paul* (3rd ed., 1896); *Mémoire sur la notion hébraïque de l'Esprit* (1879); *Les Origines littéraires de l'Apocalypse* (1888); *The Vitality of Christian Dogmas and their Power of Evolution* (1890); *Religion and Modern Culture* (1897); *Historical Evolution of the Doctrine of the Atonement* (1903); *Outlines of a Philosophy of Religion* (1897); and his posthumous *Religions of Authority and the Religion of the Spirit* (1904), to which his colleague Jean Réville prefixed a short memoir. These works show Sabatier as "at once an accomplished dialectician and a mystic in the best sense of the word." He died on the 12th of April 1901.

On his theology see E. Ménégoz in *Expository Times*, xv. 30, and G. B. Stevens in *Hibbert Journal* (April 1903).

His brother, PAUL SABATIER, was born at St Michel de Chabrillanoux in the Cévennes on the 3rd of August 1858, and was educated at the faculty of theology in Paris. In 1885 he became vicar of St Nicolas, Strassburg, and in 1889, declining an offer of preferment which was conditional on his becoming a German subject, he was expelled. For four years he was pastor of St Cierge in the Cévennes and then devoted himself entirely to historical research. He had already produced an edition of the *Didachē*, and in November 1893 published his important *Life of St Francis d'Assisi*. This book gave a great stimulus to the study of medieval literary and religious documents, especially of such as are connected with the history of the Franciscan Order. In 1908 he delivered the Jowett Lectures on Modernism at the Passmore Edwards Settlement, London.

SABAZIUS, a Phrygian or Thracian deity, frequently identified with Dionysus, sometimes (but less frequently) with Zeus. His worship was closely connected with that of the great mother Cybele and of Attis. His chief attribute as a chthonian god was a snake, the symbol of the yearly renovation of the life of nature. Demosthenes (*De corona*, p. 313) mentions various ceremonies practised during the celebration of the mysteries of this deity. One of the most important was the passing of a golden snake under the clothes of the initiated across their bosom and its withdrawal from below—an old rite of adoption. From Val. Max. i. 3, 2 it has been concluded that Sabazius was identified in ancient times with the Jewish Sabaoth (Zebaoth). Plutarch (*Symp.* iv. 6) maintains that the Jews worshipped Dionysus, and that the day of Sabbath was a festival of Sabazius. Whether he was the same as Sozon, a marine deity of southern Asia Minor, is doubtful. Some explain the name as the "beer god," from an Illyrian word *sabaya*, while others suggest a connexion with Σαϝο (god of "health") or σέβας. His image and name are often found on "votive hands," a kind of talisman adorned with emblems, the nature of which is obscure. His ritual and mysteries (*Sacra Savadia*) gained a firm footing in Rome during the 2nd century A.D., although as early as 139 B.C. the first Jews who settled in the capital were expelled by virtue of a law which proscribed the propagation of the cult of Jupiter Sabazius.

See J. E. Harrison, *Prolegomena to Greek Religion* (1908), p. 414; H. Usener, *Götternamen* (1896), p. 44; F. Cumont, "Hypsistes" in *Revue de l'instruction publique en Belgique*, xl. (1899); C. S. Blinkenberg, *Archäologische Studien* (1904).

SABBATAI SEBI (1626–1676), Jewish mystic, whose Messianic claims produced an unparalleled sensation throughout the world, was born in Smyrna. He was of Spanish descent and was gifted with a personality of rare fascination. As a lad he was attracted by the mysticism of Luria (*q.v.*), which impelled him to adopt the ascetic life. He passed his days and nights in a condition of ecstasy. He began to dream of the fulfilment of Messianic hopes, being supported in his vision by the outbreak of English Millenarianism. Christian visionaries fixed the year 1666 for the millennium, and in his appeal to Cromwell on behalf of the return of the Jews to England Menasseh ben Israel (*q.v.*) made strong appeal to this belief. Sabbatai's father (Mordecai) was the Smyrna agent for an English house, and often heard of the expectations of the English Fifth Monarchy men. Dazzled by this confirmation of his nascent confidence, Sabbatai for a time found himself the object of suspicion and even persecution. This treatment, so far from extinguishing the flame, eventually converted it into a conflagration. It was in 1648 (the year which Kabbalists had calculated as the year of salvation) that Sabbatai proclaimed himself Messiah, and in Constantinople came across an able but somewhat unscrupulous man, who pretended that he had been warned by a prophetic voice that Sabbatai was indeed the long-awaited Redeemer. Others believed in him, but at first his adherents were a small circle of devotees who kept their faith a secret. He charmed men by his sweet singing of Psalms, and children were always fascinated by him. And now the era of his miracles begins. He journeyed to Jerusalem, and there was the instrument for conferring unexpected services on the community. An oppressive exaction was imposed by a local pasha, and in order to win the succour of Raphael Halebi, Sabbatai repaired to Cairo, being on his route at Hebron hailed as Messiah. His mission was completely successful. At Cairo Sabbatai married. As a boy he had been married and divorced twice—but these were merely nominal unions. Now, however, the romantic story of a beautiful girl (Sarah) was on people's lips; she was firm in her assertion that she was the destined bride of the Messiah. Sabbatai had, at the same time, announced that in a dream a spiritual bride had been promised to him. At the house of Halebi bride and bridegroom met. The adhesion of Halebi produced many imitators, and with a retinue of believers, a charming wife and considerable funds, Sabbatai returned in triumph to the Holy Land. Nathan of Gaza assumed the rôle of Elijah, the Messiah's forerunner, proclaimed the coming restoration of Israel and the salvation of the world through the bloodless victory of Sabbatai "riding on a lion with a seven-headed dragon in his jaws" (Graetz). Again 1666 was given as the apocalyptic year. Threatened with excommunication by the Rabbis of Jerusalem, Sabbatai returned to Smyrna (autumn of 1665). Here he was received with wild enthusiasm, and the masses were carried beyond all bounds. With delirious joy the Jews of Smyrna—men, women and children—fell down and worshipped. They prepared for the return. Men left their work to make ready for the start. They fasted, they rejoiced; one hour they chilled themselves in the cemeteries, the next they rushed frantically through the streets singing Psalmic refrains. Nor did Sabbatai's adherents all belong to the ignorant classes. The Rabbi Ḥayim Benveniste and other men of repute and learning shared the general delusion. It is unnecessary to tell the rest of the story in detail. Many letters are extant, written home to English and Dutch business-houses, in which the marvels of Sabbatai are reported, sometimes with apparent belief in them. From the Levant the Sabbataean movement spread to Venice, Amsterdam, Hamburg and London. Sabbatai was no longer able to doubt the reality of his mission. Day by day he was hailed from all the world as king of the Jews. But his character was too weak to sustain the part. Though he was almost deified by many of his brethren, who at his word agreed to modify their religious observances, yet he was unable to turn the enthusiasm of thousands to any account. Had he boldly led the way to Jerusalem, he would probably have carried everything before him. At the beginning of the fateful year 1666 Sabbatai went (or was summoned) to Constantinople. Here he was arrested, but reports of miracles continued, and many of the Turks were inclined to become converts. Soon he was transferred to Abydos, amidst the almost tragic consternation of his deluded followers. In September Sabbatai was brought before the Sultan, and he had not the courage to refuse to accept Islam. And so the Messianic imposture ended in the apostacy of Sabbatai. The reaction among the Jews was terrible, and a sense of shame was joined to feelings of despair. But the sober-minded among the Jews—these had throughout been the vast majority—seized their opportunity to reclaim those who had been the victims of a terrible wrong. Yet many continued to believe in him, as he from time to time attempted to resume his rôle. In 1676 he died in obscurity in Albania. A sect of Sabbataeans—the Dormeh of Salonica—survived him, and for many a long year the controversy for and against his claims left an echo in Jewish life.

The literature on the life and career of this remarkable man is very extensive. Sabbatai Sebi figures largely in English books of the period. A valuable account is given in particular by Graetz, *History of the Jews*, vol. v. ch. iv. 1. Zangwill has a brilliant sketch of Sabbatai's career in his *Dreamers of the Ghetto*. (I. A.)

SABBATH, the day of cessation from work,[1] which among the Hebrews followed six days of labour and closed the week.

1. *Observance.*—The later Jewish Sabbath, observed in accordance with the rules of the Scribes, was a very peculiar institution, and formed one of the most marked distinctions between the Hebrews and other nations, as appears in a striking way from the fact that on this account alone the Romans found themselves compelled to exempt the Jews from all military service. The rules of the Scribes enumerated thirty-nine main kinds of work forbidden on the Sabbath, and each of these prohibitions gave rise to new subtilties. Jesus's disciples, for example, who plucked ears of corn in passing through a field on the holy day, had, according to Rabbinical views, violated the third of the thirty-nine rules,[2] which forbade harvesting; and in healing the sick Jesus Himself broke the rule that a sick man should not receive medical aid on the Sabbath unless his life was in danger. In fact, as our Lord puts it, the Rabbinical theory seemed to be that the Sabbath was not made for man but man for the Sabbath, the observance of which was so much an end in itself that the rules prescribed for it did not require to be justified by appeal to any larger principle of religion or humanity. The precepts of the law were valuable in the eyes of the Scribes because they were the seal of Jewish particularism, the barrier erected between the world at large and the exclusive community of Yahweh's grace. The ideal of the Sabbath which all these rules aimed at realizing was absolute rest from everything that could be called work; and even the exercise of those offices of humanity which the strictest Christian Sabbatarians regard as a service to God, and therefore as specially appropriate to His day, was looked on as work. To save life was allowed, but only because danger to life "superseded the Sabbath." In like manner the special ritual at the temple prescribed for the Sabbath by the Pentateuchal law was not regarded as any part of the hallowing of the sacred day; on the contrary, the rule was that, in this regard, "Sabbath was not kept in the sanctuary." Strictly speaking, therefore, the Sabbath was neither a day of relief to toiling humanity nor a day appointed for public worship; the positive duties of its observance were to wear one's best clothes, eat, drink and be glad (justified from Isa. lviii. 13). A more directly religious element, it is true, was introduced by the practice of attending the synagogue service; but it is to be

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[1] The grammatical inflexions of the word "Sabbath" would show that it is a feminine form, properly *shabbat-t* for *shabbāt-t*. The root has nothing to do with resting in the sense of enjoying repose; in transitive forms and applications it means to "sever," to "put an end to," and intransitively it means to "desist," to "come to an end." The grammatical form of *shabbāth* suggests a transitive sense, "the divider," and apparently indicates the Sabbath as dividing the month. It may mean the day which puts a stop to the week's work, but this is less likely. It certainly cannot be translated "the day of rest."

[2] From the Thirty-ninth was deduced the familiar "Sabbath day's journey" (Acts i. 12), based primarily, it would seem, upon the command in Ex. xvi. 29. It was a distance of 2000 cubits.

remembered that this service was primarily regarded not as an act of worship but as a meeting for instruction in the law.

2. *Attitude of Jesus.*—So far, therefore, as the Sabbath existed for any end outside itself it was an institution to help every Jew to learn the law, and from this point of view it is regarded by Philo and Josephus, who are accustomed to seek a philosophical justification for the peculiar institutions of their religion. But this certainly was not the leading point of view with the mass of the Rabbins;[1] and at any rate it is quite certain that the synagogue is a post-exilic institution, and therefore that the Sabbath in old Israel must have been entirely different from the Sabbath of the Scribes. But that it was destitute of any properly religious observance or meaning is inconceivable, for, though many of the religious ideas of the old Hebrews were crude, their institutions were never arbitrary and meaningless, and when they spoke of consecrating the Sabbath they must have had in view some religious exercise of an intelligible kind by which they paid worship to Yahweh. Indeed, that the old Hebrew Sabbath was quite different from the Rabbinical Sabbath is demonstrated in the trenchant criticism which Jesus directed against the latter (Matt. xii. 1-14; Mark ii. 27). The general position which He takes up, that "the Sabbath is made for man and not man for the Sabbath,"[2] is only a special application of the wider principle that the law is not an end in itself but a help towards the realization in life of the great ideal of love to God and man, which is the sum of all true religion. But Jesus further maintains that this view of the law as a whole, and the interpretation of the Sabbath law which it involves, can be historically justified from the Old Testament. And in this connexion He introduces two of the main methods to which historical criticism of the Old Testament has recurred in modern times: He appeals to the oldest history rather than to the Pentateuchal code as proving that the later conception of the law was unknown in ancient times (Matt. xii. 3 seq.), and to the exceptions to the Sabbath law which the Scribes themselves allowed in the interests of worship (v. 5) or humanity (v. 11), as showing that the Sabbath must originally have been devoted to purposes of worship and humanity, and was not always the purposeless arbitrary thing which the schoolmen made it to be. Modern criticism of the history of Sabbath observance among the Hebrews has done nothing more than follow out these arguments in detail, and show that the result is in agreement with what is known as to the dates of the several component parts of the Pentateuch.

3. *Old Usage.*—Of the legal passages that speak of the Sabbath all those which show affinity with the doctrine of the Scribes—regarding the Sabbath as an arbitrary sign between Yahweh and Israel, entering into details as to particular acts that are forbidden, and enforcing the observance by severe penalties, so that it no longer has any religious value, but appears as a mere legal constraint—are post-exilic (Exod. xvi. 23-30, xxxi. 12-17, xxxv. 1-3; Num. xv. 32-36); while the older laws only demand such cessation from daily toil, and especially from agricultural labour, as among all ancient peoples naturally accompanied a day set apart as a religious festival, and in particular lay weight on the fact that the Sabbath is a humane institution, a holiday for the labouring classes (Exod. xxiii. 12; Deut. v. 13-15). As it stands in these ancient laws, the Sabbath is not at all the unique thing which it was made to be by the Scribes. "The Greeks and the barbarians," says Strabo (x. 3, 9), "have this in common, that they accompany their sacred rites by a festal remission of labour." So it was in old Israel: the Sabbath was one of the stated religious feasts, like the new moon and the three great agricultural sacrificial celebrations (Hosea ii. 11); the new moons and the Sabbaths alike called men to the sanctuary to do sacrifice (Isa. i. 14); the remission of ordinary business belonged to both alike (Amos viii. 5), and for precisely the same reason. Hosea even takes it for granted that in captivity the Sabbath will be suspended, like all the other feasts, because in his day a feast implied a sanctuary. This conception of the Sabbath, however, necessarily underwent an important modification when the local sanctuaries were abolished under the "Deuteronomic" reform, and those sacrificial rites and feasts which in Hosea's time formed the essence of every act of religion were limited to the central altar, which most men could visit only at rare intervals. From this time forward the new moons, which till then had been at least as important as the Sabbath and were celebrated by sacrificial feasts as occasions of religious gladness, fall into insignificance, except in the conservative temple ritual. The Sabbath did not share the same fate, but with the abolition of local sacrifices it became for most Israelites an institution of humanity divorced from ritual. So it appears in the Deuteronomic decalogue, and presumably also in Jer. xvii. 19 seq. In this form the seventh day's rest was one of the few outward ordinances by which the Israelite could still show his fidelity to Yahweh and mark his separation from the heathen. Hence we understand the importance attached to it in the exilic literature (Isa. lvi. 2 seq., lviii. 13), and the character of a sign between Yahweh and Israel ascribed to it in the post-exilic law. This attachment to the Sabbath, beautiful and touching so long as it was a spontaneous expression of continual devotion to Yahweh, acquired a less pleasing character when, after the exile, it came to be enforced by the civil arm (Neh. xiii.), and when the later law even declared Sabbath-breaking a capital offence. This increasing strictness is exemplified by the attitude of the Book of Jubilees (ii. 17-32, l. 6-13). But it is just to remember that without the stern discipline of the law the community of the second temple could hardly have escaped dissolution, and that Judaism alone preserved for Christianity the hard-won achievements of the prophets.[3]

4. *Early Christian Church.*—The Sabbath exercised a twofold influence on the early Christian church. On the one hand, the weekly celebration of the resurrection on the Lord's day could not have arisen except in a circle that already knew the week as a sacred division of time; and, moreover, the manner in which the Lord's day was observed was directly influenced by the synagogue service. On the other hand, the Jewish Christians continued to keep the Sabbath, like other points of the old law. Eusebius (*H.E.* iii. 27) remarks that the Ebionites observed both the Sabbath and the Lord's day; and this practice obtained to some extent in much wider circles, for the *Apostolical Constitutions* recommend that the Sabbath shall be kept as a memorial feast of the creation as well as the Lord's day as a memorial of the resurrection. The festal character of the Sabbath was long recognized in a modified form in the Eastern church by a prohibition of fasting on that day, which was also a point in the Jewish Sabbath law (comp. Judith viii. 6). On the other hand, Paul had quite distinctly laid down from the first days of Gentile Christianity that the Jewish Sabbath was not binding on Christians (Rom. xiv. 5 seq.; Gal. iv. 10; Col. ii. 16), and controversy with Judaizers led in process of time to direct condemnation of those who still kept the Jewish day (*e.g.* Co. of Laodicea, A.D. 363). Nay, in the Roman church a practice of fasting on Saturday as well as on Friday was current before the time of Tertullian. The steps by which the practice of resting from labour on the Lord's day instead of on the Sabbath was established in Christendom and received civil as well as ecclesiastical sanction are dealt with under SUNDAY; it is enough to observe here that this practice is naturally and even necessarily connected with the religious observance of the Lord's day as a day of worship and religious gladness, and is in full accordance with the principles laid down by Jesus in His criticism of the Sabbath of the Scribes. But of course the

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[1] See the Mishnah, tract. "Shabbath" and the alleviation permitted in the tract. "Erūbīn"; and compare Schürer, *Gesch. d. jud. Volkes*$^{(3)}$, pp. 393 seq., where the Rabbinical Sabbath is well explained and illustrated in detail.

[2] Cp. the discussion in Talmud *Yōmā*, fol. 85*b*: "The sabbath is delivered into your hands, not you into the hands of the Sabbath" (cited by S. R. Driver, *Hastings' Dict. Bible*, art. "Sabbath," iv. p. 322). See also art. Midrash, § 4, *end.*

[3] In actual life the Sabbath was often far from being the burden which the Rabbinical enactments would have led us to expect. It "is celebrated by the very people who did observe it, in hundreds of hymns, which would fill volumes, as a day of rest and joy, of presentiment of the pure bliss and happiness which are stored up for the righteous in the world to come" (S. Schechter, *Jewish Quart. Review*, iii. p. 763; cp. id., *Studies in Judaism*, pp. 296 sqq.).

complete observance of Sunday rest was not generally possible to the early Christians before Christendom obtained civil recognition.[1]

5. *Origin.*—As the Sabbath was originally a religious feast, the question of the origin of the Sabbath resolves itself into an inquiry why and in what circle a festal cycle of seven days was first established. In Gen. ii. 1-3 and in Exod. xx. 11 the Sabbath is declared to be a memorial of the completion of the work of creation in six days. But it appears certain that the decalogue as it lay before the Deuteronomist did not contain any allusion to the creation (see DECALOGUE), and it is generally believed that this reference was added by the same post-exilic hand that wrote Gen. i. 1–ii. 4*a*. The older account of the creation in Gen. ii. 4*b* seq. does not recognize the hexaemeron, and it is even doubtful whether the original sketch of Gen. i. distributed creation over six days. The connexion, therefore, between the seven days' week and the work of creation is now generally recognized as secondary.[2] But, if the week as a religious cycle is older than the idea of the week of creation, we cannot hope to find more than probable evidence of the origin of the Sabbath. Unless the Sabbath was already an institution peculiarly Jewish, it could not have served as a mark of distinction from heathenism. This, however, does not necessarily imply that in its origin it was specifically Hebrew, but only that it had acquired distinguishing features of a marked kind. What is certain is that the origin of the Sabbath must be sought within a circle that used the week as a division of time. Here again we must distinguish between the week as such and the astrological week, *i.e.* the week in which the seven days are named each after the planet which is held to preside over its first hour.[3] It is plain, however, that there is a long step between the astrological assignation of each hour of the week to a planet and the recognition of the week as an ordinary division of time by people at large. Astrology is in its nature an occult science, and there is no trace of a day of twenty-four hours among the ancient Hebrews. Moreover, it is doubtful from extant remains of Assyrian calendars whether the astrological week prevailed in civil life even among the Babylonians and Assyrians. They did not dedicate each day in turn to its astrological planet; and it is therefore precarious to assume that the Sabbath was in its origin what it is in the astrological week, the day sacred to Saturn, and that its observance is to be derived from an ancient Hebrew worship of that planet.[4]

The week, however, is found in various parts of the world in a form that has nothing to do with astrology or the seven planets, and with such a distribution as to make it pretty certain that it had no artificial origin, but suggested itself independently, and for natural reasons, to different races. In fact, the four quarters of the moon supply an obvious division of the month; and, wherever new moon and full moon are religious occasions, we get in the most natural way a sacred cycle of fourteen or fifteen days, of which the week of seven or eight days (determined by half moon) is the half. Thus the old Hindus chose the new and the full moon as days of sacrifice; the eve of the sacrifice was called *upavasatha*, and in Buddhism the same word (*upōsatha*) has come to denote a Sabbath observed on the full moon, on the day when there is no moon, and on the two days which are eighth from the full and the new moon respectively, with fasting and other religious exercises.[5] From this point of view it is most significant that in the older parts of the Hebrew Scriptures the new moon and the Sabbath are almost invariably mentioned together.[6]

Nor are other traces wanting of the connexion of sacrificial occasions—*i.e.* religious feasts—with the phases of the moon among the Semites. Thus the Harranians had four sacrificial days in every month, and of these two at least were determined by the conjunction and opposition of the moon.[7] That full moon as well as new moon had a religious significance among the ancient Hebrews seems to follow from the fact that, when the great agricultural feasts were fixed to set days, the full moon was chosen. In older times these feast-days appear to have been Sabbaths (Lev. xxiii. 11; comp. the article PASSOVER). A week determined by the phases of the moon has an average length of $29\frac{1}{2}\div4=7\frac{3}{8}$ days, *i.e.* three weeks out of eight would have eight days. But there seems to be in 1 Sam. xx. 27, compared with verses 18, 24, an indication that in old times the feast of the new moon lasted two days.[8] In that case a week of seven working days would occur only once in two months. We cannot tell when the Sabbath became dissociated from the month; but the change seems to have been made before the Book of the Covenant, which already regards the Sabbath simply as an institution of humanity and ignores the new moon. In both points it is followed by Deuteronomy.[9] (W. R. S.; S. A. C.)

[6. *The Babylonian and Assyrian Sabbath.*—The Babylonian calendars contain explicit directions for the observance of abstention from certain secular acts on certain days which forms a close parallel to the Jewish Sabbatical rules. Thus for the 7th, 14th, 21st. 28th and also the 19th days of the intercalary Elul it is prescribed that "the shepherd of many nations is not to eat meat roast with fire nor any food cooked by fire, he is not to change the clothes on his body nor put on gala dress, he may not bring sacrifices nor may the king ride in his chariot, he is not to hold court nor may the priest seek an oracle for him in the sanctuary, no physician may attend the sick room, the day is not favourable for invoking curses, but at night the king may bring his gift into the presence of Marduk and Ishtar. Then he may offer sacrifice so that his prayers be accepted." Clearly, then, it was a day of suspended activity, but it will be noted that no religious observances are prescribed in place of the forbidden secular matters. So far no evidence is forthcoming that the same days of each month were observed as these of this special rarely occurring month. Calendars exist for other months which make no such regulations for any days. These abstentions are prescribed for the king and a few other persons; there is no evidence that they were observed by all the people. The 19th day is supposed to have had its sacred nature as the 49th day from the commencement of the preceding month, assuming that to have had 30 days. The months often had only 29 days, when the same character ought to have applied to the 20th day of the following month. There is no evidence that these days were called *shabattu*, a word which is rendered by *ūmu nūḥ libbi*, "day of rest of the heart," and has been thought to be the origin of Sabbath. This name *shabattu* was certainly applied to the 15th day of the month, and *ūm nūḥ libbi* could mean "day of rest in the middle," referring to the moon's pause at the full. The frequent Old Testament association of "new moons and Sabbaths" may point to an original observance of the 1st and 15th days of the month. Many days are indicated in the calendar as *nubattu*, a term which signifies rest, pause, and especially a god's connubial rest with his consort goddess. The observance of such days was a bar to attending even to important diplomatic business or setting out on a journey. Such *nubattu* days fell on the 3rd, 7th and 16th of the intercalary month of Elul, and were noted as the *nubattu* of Marduk and his consort. It would be precarious to assume that the same days in each month were *nubattu*, for the *nubattu* fell on the 4th of Iyar on one occasion.

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[1] See, further, E. Schürer in *Zeit. f. Neu-Test. Wissens.* (1905), pp. 1-66. For the theological discussions whether and in what sense the fourth commandment is binding on Christians, see DECALOGUE.

[2] "The week, ended by the Sabbath, determined the 'days' of creation, not the 'days' of creation the week" (S. R. Driver, *Genesis* (1909), p. 35). At the same time, there was a peculiar appropriateness in associating the Sabbath with the doctrine that Yahweh is the Creator of all things; for we see from Isa. xl.-lxvi. that this doctrine was a mainstay of Jewish faith in those very days of exile which gave the Sabbath a new importance for the faithful.

[3] If the day is divided into twenty-four hours and the planets preside in turn over each hour of the week in the order of their periodic times (Saturn, Jupiter, Mars, Sun, Venus, Mercury, Moon), we get the order of days of the week with which we are familiar. For, if the Sun presides over the first hour of Sunday, and therefore also over the eighth, the fifteenth and the twenty-second, Venus will have the twenty-third hour, Mercury the twenty-fourth, and the Moon, as the third in order from the Sun, will preside over the first hour of Monday. Mars, again, as third from the Moon, will preside over Tuesday (Dies Martis, Mardi), and so forth. This astrological week became very current in the Roman empire, but was still a novelty in the time of Dio Cassius (xxxvii. 18).

[4] The evidence of the worship of Saturn among the oldest Hebrews is doubtful. Amos v. 26 (where Chiun is taken to represent Kawān-Saturn) is of uncertain interpretation, see W. R. Harper's discussion, *Hosea*, pp. 139-141 (*International Crit. Comm.*, 1905).

[5] Childers, *Pali Dict.* p. 535; Kern, *Manual of Buddhism*, p. 99, *Mahāvagga*, ii. 1, 1 (Eng. trans. i. 239, 291).

[6] Both were days of cessation from business (Amos viii. 5), and were fitting occasions to visit a prophet (2 Kings iv. 23). They naturally take their rise among an agricultural folk. On abstinence from work on the New Moon by Jewish women of the present time, see M. Friedmann, *Jew. Quart. Rev.* iii. (1891), p. 712. See also I. Benzinger, *Encyc. Biblica*, cols. 3401 sqq.

[7] The others—according to the *Fihrist*, 319, 14—are the 17th and the 28th; see Chwolsohn, *Ssabier*, ii. 8, 94 seq.

[8] It appears from Judith viii. 6 that even in later times there were two days at the new moon on which it was not proper to fast.

[9] See further J. M. Meinhold, *Sabbat und Woche im Alten Test.* (Göttingen, 1905); *Zeit. f. Alttest. Wissens.* 1909, pp. 81-112.

Possibly the intercalary month was abnormal, the incidence of observances depending not on the day of the month in ordinary months but on the day of the week reckoned consecutively through the year. For it is obvious that if each 7th day during the year was observed as above, it would, like our Sunday or a Jewish Sabbath, fall on a different day of the month in different months. It is quite possible that *shabattum* and *nubattum* are from the same root and originally denoted much the same thing—a pause, abstention, from whatever cause or for ceremonial purposes. The intercalary month being purely arbitrary may exhibit a normal arrangement, supposing that the month and the week begin together.

There are traces of what may be called a "five-day week," but also some traces of a period of seven days. The former would be an exact submultiple of the 30-day month, but the exact relation of seven days to the month is not very clear. If the 15th always was full moon day, the 7th would coincide well with half moon, but the 21st and 28th would fall away considerably from the moon's phases. The significance of seven throughout Babylonian literature is very marked, and most of the material has been collected by J. Hehn, *Siebenzahl und Sabbat* (1907). It is quite consistent with the evidence to suppose that a seven-day week was in use in Babylonia, but each item may be explained differently, and a definite proof does not exist. The enormous number of dated documents has induced some scholars to attempt a statistical research into the observance of the 7th, 14th, 21st, 28th and 19th days of the months as Sabbaths. This has not been carried out with sufficient caution. If the Sabbath involved abstention from all such business as recorded in dated documents and always fell on these days, then the 7th, &c., should show a marked falling off in the number of dated documents. This appears actually to be the case in the period of the First Dynasty of Babylon and also in the 7th century in Assyria, where early Babylonian customs were kept up conservatively. In other cases the inclusion of documents relating to the temple business, payments of tithes and other dues, salaries to temple officials, and such ceremonies as marriages, &c., which may have demanded the presence of the congregation and were at least partly religious in nature, have been allowed to complicate the matter. Such business as did not profane the Sabbath according to Babylonian ideas cannot be quoted against their observance of their Sabbath. Further, if the Sabbaths fell on each 7th day through the year, any indication by dated documents of a falling off in the number of transactions on the 7th day of the month must obviously be completely disguised. As most of the records appealed to are from temple archives, it may be expected that the Sabbath days would show an increased number of records.

For reasons above indicated the whole subject is in its infancy. Even if it could be shown that the Pentateuchal regulations were universally observed in Israel from Mosaic times, it would not preclude a certain indebtedness to Babylonia for at least the germ of the institution. On the other hand, complete indentity of regulations and observance in Babylonia and Israel at one period need not show more than development on the same lines. The evidence of Babylonian observance has not yet been exhaustively considered. Its most suggestive likenesses are indicated above, but further evidence may render the similarity less striking when the meaning of it is more fully understood. (C. H. W. J.)]

7. *Sabbatical Year.*—The Jews under the second temple observed every seventh year as a Sabbath according to the (post-exilic) law of Lev. xxv. 1-7. It was a year in which all agriculture was remitted, in which the fields lay unsown and the vines grew unpruned, only the spontaneous yield of the land might be gathered. That this law was not observed before the captivity we learn from Lev. xxvi. 34 seq. (cp. 2 Chron. xxxvi. 21); indeed, so long as the Hebrews were an agricultural people, in a land often ravaged by severe famines, the law of the Sabbatical year could not have been observed. Even in later times it was occasionally productive of great distress (1 Mac. vi. 49, 53; Jos. *Ant.* xiv. 16, 2). In the older legislation, however, we already meet with a seven years' period in more than one connexion. The release of a Hebrew servant after six years' labour (Exod. xxi. 2 seq.; Deut. xv. 12 seq.) has only a remote analogy to the Sabbatical year. But in Exod. xxiii. 10 seq. it is prescribed that the crop of every seventh year shall be left for the poor, and after them for the beasts. The difference between this and the later law is that the seventh year is not called a Sabbath, and that there is no indication that all land was to lie fallow on the same year. In this form a law prescribing one year's fallow in seven may have been anciently observed, but it scarcely originated from the analogy of a seventh day of rest. It is extended in v. 11 to the vineyard and the olive oil, but here the culture necessary to keep the vines and olive trees in order is not forbidden; the precept is only that the produce is to be left to the poor. In Deuteronomy this law is not repeated, but a fixed seven years' period is ordained for the benefit of poor debtors, apparently in the sense that in the seventh year no interest is to be exacted by the creditor from a Hebrew, or that no proceedings are to be taken against the debtor in that year (Deut. xv. 1 seq.). See the discussion by Driver, *Internat. Crit. Comm., ad. loc.*, and the commentaries on Neh. v. 11.

Literature.—In addition to the references already made, see the articles in *Ency. Bib.* and Hastings' *Dict. Bible* (with references); Fr. Bohn, *Sabbat im Alten Testament u. altjüdisch relig. Aberglauben* (Gütersloh, 1903: an interesting list of unlucky days from an old Egyptian calendar on p. 57 seq.); and for post-Biblical literature, F. Weber's *Jüdische Theologie* (Index), by Franz Delitzsch and Schnedermann (1897). (W. R. S.; S. A. C.)

SABBATION, or Sambatyon, a river (real or imaginary) in Media—named in some old authorities (Palestinian Talmud, and Midrash Gen. Rabba, lxxiii.)—the site of the exile of the Ten Tribes. But Josephus (*War*, vii. v. 1) has this curious passage, from which, no doubt, many of the subsequent legends were derived:—

> "Now Titus Caesar tarried some time at Berytus (Beirūt) and then removed thence and gave magnificent shows in all the cities of Syria through which he went, and exhibited the captive Jews as proof of the destruction of that nation. He saw on his march a river (identified by Sir C. W. Wilson with 'the stream running from the intermittent spring *Fauwār ed-Deir* in the Lebanon') of such a nature as deserves to be recorded in history. It runs between Arcaea ('Arka), which is part of Agrippa's kingdom, and Rapharaea (Rafanīyeh, at north end of the Lebanon), and has something very wonderful and peculiar in it. For when it runs, its current is strong, and has plenty of water; after which its springs fail for six days together, and leave its channel dry, as any one may see. After this it runs on the seventh day as it did before, and as though it had undergone no change at all, and it has been observed to keep this order perpetually and exactly: *whence they call it the Sabbatic river*, so naming it from the sacred Sabbath of the Jews."

Whiston, in his notes to Josephus, already points out that Pliny describes the same river (*Hist. Nat.* xxxi. 11), but according to his account the river ran for six days and rested on the seventh. This is the favourite form of the legend, for though there are intermittent streams in various parts of Asia, none has yet been found to correspond to the fixed regularity posited in the tradition. Various medieval travellers reported such rivers, *e.g.* Petahiah of Regensburg, who states that such a stream may be found near Jabneh, but his assertion is unfounded. Mahommedans still assert that Josephus's statement is true of the *Nahr-al-Arus* in the neighbourhood in which he locates his Sabbatic river, but modern travellers report that this stream runs every third day. Such facts would, however, be sufficient to explain the origin of the legend. The accounts of Josephus and Pliny do not assert that the intermittence of the current had any connexion with Saturday. Aqība (*q.v.*) in the early part of the 2nd century A.D., however, assumes this connexion (*Sanhedrin* 65 *b*), and a confusion between the Sambatyon of the Lost Tribes and the Sabbatical river of Syria begins to manifest itself. It is owing to the narrative of Eldad the Danite (*q.v.*) that the Sambatyon river rose into wide fame in the 9th century. His diary became the *Arabian Nights* not only of the Jews but also of many medieval Christians and Moslems. Eldad describes the *Children of Moses*, a powerful and Utopian race, whose territory is surrounded by a wonderful river. He describes it in these terms:—

> "The river Sambatyon is 200 yds. broad, about as far as a bow-shot. It is full of sand and stones, but without water; the stones make a great noise like the waves of the sea and a stormy wind, so that in the night the noise is heard at a distance of half a day's journey. There are sources of water which collect themselves in one pool, out of which they water the fields. There are fish in it, and all kinds of clean birds fly round it. And this river of stone and sand rolls during the six working days and rests on the Sabbath day. As soon as the Sabbath begins, fire surrounds the river, and the flames remain until the next evening, when the Sabbath ends."

Nöldeke (*Beiträge zur Geschichte des Alexanderromans*, 48) has shown that the Sambatyon appears in one version of the Alexander Legend. Kaswini, the author of the Arab *Cosmography*, also refers to the Sambatyon. So does Prester John in his letter addressed to the emperor Frederick; in his account it is the violence of the current of sand and stone that prevents the Lost Tribes from reuniting. It is unnecessary to summarize the various embellishments of the legend; in one version the river attains a width of 17 m. and throws stones as high as a house. But there are no stones on Saturday; it then resembles a lake of snow-white sand. Menasseh ben Israel (*q.v.*), who gave vogue to this latter story in his *Hope of Israel*, adds the detail that if sand from Sambatyon be kept in a bottle it agitates itself during six days but remains still on the Saturday.

The site of the Sambatyon varies considerably in the different narratives. Media, Ethiopia, Persia, India, the Caspian district,—all these are suggested. Reggio identified the river with the Euphrates, Fünn with the Zeb in Adiabene. But as Neubauer remarks: "It would be lost time to trouble ourselves about the identification of this stream."

See Neubauer, "Where are the Ten Tribes?" in *Jewish Quarterly Review*, vol. i. *passim*; M. Seligsohn in *Jewish Encyclopedia*, x. 681. (I. A.)

SABBIONETA, a town of Lombardy, Italy, in the province of Mantua, from which it is 20 m. S.W. by steam tramway, not far from the N. bank of the Po, 59 ft. above sea-level. Pop. (1901) 1835 (town); 7016 (commune). Its period of prosperity was under Vespasiano Gonzaga (d. 1591), who was its duke; by him it was transformed into a small "Residenzstadt." It was well fortified and built, and from this period date the ducal palace (now the Municipio), the theatre designed by Scomozzi, &c. The church and the summer palace contain frescoes by the Campi of Cremona. Here in 1567 a Hebrew printing-press was set up.

SABELLIC,[1] the name originally given by Mommsen in his *Unteritalische Dialekte* to the pre-Roman dialects of Central Italy which was neither Oscan nor Umbrian. The progress of study has, however, grouped them under more specific names, such as the "North Oscan" group (see PAELIGNI) and the "Latinian" group (see LATIN LANGUAGE), and the only content now left for the term Sabellic consists of a group of 8 or 9 inscriptions to which it certainly cannot be applied with truth. They are probably, if not certainly, the most ancient inscriptions in existence on Italian soil. Since they were all found on a strip of the eastern coast running from the mouth of the Aternus on the south to Pesaro on the north, it is probably best to call them simply "East Italic" or "Adriatic."

Not even the transcription of their alphabet has reached the stage of certainty, for even in this small number of inscriptions the alphabet seems to vary. The chief doubt is about the value of V and V (or A and Λ) which appear beside the symbol Á on the same inscriptions; and of the dots in the middle of the line which are certainly not interpuncts. They may conceivably have some connexion with the dots in Venetic inscriptions, which R. S. Conway has endeavoured to explain (see VENETI). The most striking characteristic of the group of inscriptions is that the direction of the writing in alternate lines is not merely reversed but inverted ("serpentine boustrophedon" as on the Etruscan stele of Capua of the 5th century B.C.) (see ETRURIA: *Language*). Thus if the first line consisted of the letters ABC. in that order, the next would be ℲƎᗡ, *i.e.* with each letter turned so as to face the left, and with its head downwards. This arrangement appears in some of the Venetic inscriptions also. The longest of the inscriptions is that from Grecchio, now preserved in the Naples Museum. The probability is that this and all the rest were epitaphs, but a translation is as yet out of the question. The stone from Castrignano gives us certain forms which seem to be recognizable as Indo-European, namely *paterefo*, *materefo*, though it is far from certain that the symbol ⋈, which is here represented by *f*, really has that value.

Pauli's conjecture that these inscriptions probably represented the language of some settlers from Illyria has little support except that of some coincidences in tribal and local names on the two sides of the Adriatic (*e.g.* "Truentum, quod solum Liburnorum in Italia relicuum est" (Plin. *Nat. Hist.* iii. 110), *-entum* being a frequent Illyrian ending, and *Liburni* an Illyrian tribe), though it is a priori likely enough.

For the authorities for the alphabets and the text of the inscriptions as known down to 1897, see R. S. Conway's *Italic Dialects* (Cambridge, 1897), ii. 528; and nothing has yet (1908) been added to what was written about the alphabets by Karl Pauli (*Altital. Stud.* iii., "Die Veneter," Leipzig, 1891, pp. 220 seq. and p. 423). Some plausible (but wholly uncertain) conjectures by W. Deecke as to the meaning of some of the inscriptions may be sought in the appendix to Zvetaieff's *Inscrr. Italiae inferioris dialecticae*; and since 1897 a further inscription of this class has been found at Belmonte Piceno, which is preserved in the museum at Bologna and reported by Brizio in *Notiz. degli scavi*, 1903, p. 104.

It is to be noticed that a much longer and far more legible inscription from Novilara (now in the museum at Pesaro—a cast of it is at Bologna) sometimes spoken of as Sabellic, whose first two words are *mimnis erût*, is perhaps more probably to be regarded as containing some variety of Etruscan, though its character is far from certain. Its alphabet closely resembles Etruscan of the 4th century B.C. It is a very interesting monument both for its own sake, since it is sculptured as well as inscribed (there is one—or more—hunting or pastoral scene on the back), and because the archaeological stratum (late Bronze period) of the cemetery from which it is believed to have come is clearly marked.

With a companion fragment it is fully described by Brizio in *Monumenti antichi*, v. (1895), and it has also been discussed by Elia Lattes in *Hermes* (xxxi. 465 and xliii. 32). (R. S. C.)

SABELLIUS (fl. 230), early Christian presbyter and theologian, was of Libyan origin, and came from the Pentapolis to Rome early in the 3rd century. To understand his position a brief review of the Christian thought of the time is necessary. Even after the elimination of Gnosticism the church remained without any uniform Christology; the Trinitarians and the Unitarians continued to confront each other, the latter at the beginning of the 3rd century still forming the large majority. These in turn split into two principal groups—the Adoptianists and the Modalists—the former holding Christ to be the man chosen of God, on whom the Holy Spirit rested in a quite unique sense, and who after toil and suffering, through His oneness of will with God, became divine, the latter maintaining Christ to be a manifestation of God Himself. Both groups had their scientific theologians who sought to vindicate their characteristic doctrines, the Adoptianist divines holding by the Aristotelian philosophy, and the Modalists by that of the Stoics; while the Trinitarians (Tertullian, Hippolytus, Origen, Novatian), on the other hand, appealed to Plato.

In Rome Modalism was the doctrine which prevailed from Victor to Calixtus or Callistus (*c.* 190–220). The bishops just named protected within the city the schools of Epigonus and Cleomenes, where it was taught that the Son is identical with the Father. But the presbyter Hippolytus was successful in convincing the leaders of that church that the Modalistic doctrine taken in its strictness was contrary to Scripture. Calixtus saw himself under the necessity of abandoning his friends and setting up a mediating formula designed to harmonize the Trinitarian and the Modalistic positions. But, while excommunicating the strict Unitarians (Monarchians), he also took the same course with Hippolytus and his followers, declaring their teaching to be ditheism. The mediation formula, however, proposed by Calixtus became the bridge by which, in the course of the decades immediately following, the doctrine of the Trinity made its way into the Roman Church. In the year 250, when the Roman presbyter Novatian wrote his book *De Trinitate*, the doctrine of Hippolytus, once discredited as ditheism, had already become official there. At the same time Rome and most of the other churches of the West still retained a certain leaning towards Modalistic monarchianism. This appears, on the one hand, in the use of expressions having a Modalistic ring about them—see especially the poems of Commodian, written about the time of Valerian—and, on the other hand, in the rejection of the doctrine that the Son is subordinate to the Father and is a creature (witness the controversy between Dionysius of Alexandria and Dionysius of Rome), as well as in the readiness of the West to accept the formula of Athanasius, that the Father and the Son are one and the same in substance (ὁμοούσιοι).

The strict Modalists, whom Calixtus had excommunicated along with their most zealous opponent Hippolytus, were led by Sabellius. His party continued to subsist in Rome for a considerable time afterwards,[1] and withstood Calixtus as an unscrupulous apostate. In the West, however, the influence of Sabellius seems never to have been important; in the East, on the other hand, after the middle of the 3rd century his doctrine found much acceptance, first in the Pentapolis and afterwards in other provinces.[2] It was violently controverted by the bishops, notably by Dionysius of Alexandria, and the development in the East of the philosophical doctrine of the Trinity after Origen (from 260 to 320) was very powerfully influenced by the opposition to Sabellianism. Thus, for example, at the great synod held in Antioch in 268 the word *ὁμοούσιος* was rejected, as seeming to favour Unitarianism. The Sabellian doctrine itself, however, during the decades above mentioned underwent many changes in the East and received a philosophical dress. In the 4th century this and the allied doctrine of Marcellus of Ancyra were frequently confounded, so that it is exceedingly difficult to arrive at a clear account of it in its genuine form. Sabellianism, in fact, became a collective name for all those Unitarian doctrines in which the divine nature of Christ was acknowledged. The teaching of Sabellius himself was very closely allied to the older Modalism ("Patripassianism") of Noetus and Praxeas, but was distinguished from it by its more careful theological elaboration and by the account it took of the Holy Spirit. His central proposition was to the effect that Father, Son and Holy Spirit are the same person, three names thus being attached to one and the same being. What weighed most with Sabellius was the monotheistic interest. The One Being was also named by him *υἱοπάτωρ*—an expression purposely chosen to obviate ambiguity. To explain how one and the same being could have various forms of manifestation, he pointed to the tripartite nature of man (body, soul, spirit), and to the sun, which manifests itself as a heavenly body, as a source of light and also as a source of warmth. He further maintained that God is not at one and the same time Father, Son and Spirit, but, on the contrary, has been active in three apparently consecutive manifestations or energies—first in the *πρόσωπον* of the Father as Creator and Lawgiver, then in the *πρόσωπσν* of the Son as Redeemer, and lastly in the *πρόσωπον* of the Spirit as the Giver of Life. It is by this doctrine of the succession of the *πρόσωπα* that Sabellius is distinguished from the older Modalists. In particular it is significant, in conjunction with the reference to the Holy Spirit, that Sabellius regards the Father also as merely a form of manifestation of the one God—in other words, has formally put Him in a position of complete equality with the other Persons. This view prepares the way for Augustine's doctrine of the Trinity. Sabellius himself appears to have made use of Stoical formulas (*πλατύνεσθαι,συστέλλεσθαι*), but he chiefly relied upon Scripture, especially such passages as Deut. vi. 4; Exod. xx. 3; Isa. xliv. 6; John x. 38. Of his later history nothing is known; his followers died out in the course of the 4th century.

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[1] For the Sabellian *tribes*, see SABINE.

The sources of our knowledge of Sabellianism are Hippolytus (*Philos.* bk. ix.), Epiphanius (*Haer.* lxii.) and Dionys. Alex. (*Epp.*); also various passages in Athanasius and the other fathers of the 4th century. For modern discussions of the subject see Schleiermacher (*Theol. Ztschr.* 1822, Hft. 3); Lange (*Ztschr. f. hist. Theol.* 1832, ii. 2); Döllinger (*Hippolyt u. Kallist.* 1853), Zahn (*Marcell v. Ancyra*, 1867); R. L. Ottley, *The Doctrine of the Incarnation* (1896); various histories of Dogma, and Harnack (*s.v.* "Monarchianismus," in Herzog-Hauck, *Realencyk. für prot. Theol. und Kirche*, xiii. 303). (A. Ha.)

ṢĀBIANS. The Ṣābians (*aṣ-Ṣābi'ūn*) who are first mentioned in the Koran (ii. 59, v. 73, xxii. 17) were a semi-Christian sect of Babylonia, the Elkesaites, closely resembling the Mandaeans or so-called "Christians of St John the Baptist," but not identical with them. Their name is probably derived from the Aramaic צבא, a dialectical form of צבע, and signifies "those who wash themselves"; the term *al-mughtasila*, which is sometimes applied to them by Arab writers, has the same meaning, and they were also known as *ἡμεροβαπτισταί*. How Mahomet understood the term "Ṣābians" is uncertain, but he mentions them together with the Jews and Christians. The older Mahommedan theologians were agreed that they possessed a written revelation and were entitled accordingly to enjoy a toleration not granted to mere heathen. Curiously enough, the name "Ṣābian" was used by the Meccan idolaters to denote Mahomet himself and his Moslem converts, apparently on account of the frequent ceremonial ablutions which formed a striking feature of the new religion.

From these true Ṣābians the pseudo-Ṣābians of Ḥarrān (*Carrhae*) in Mesopotamia must be carefully distinguished. In A.D. 830 the Caliph Ma'mūn, while marching against the Byzantines, received a deputation of the inhabitants of Ḥarrān. Astonished by the sight of their long hair and extraordinary costume, he inquired what religion they professed, and getting no satisfactory answer threatened to exterminate them, unless by the time of his return from the war they should have embraced either Islam or one of the creeds tolerated in the Koran. Consequently, acting on the advice of a Mahommedan jurist, the Ḥarrānians declared themselves to be "Ṣābians," a name which shielded them from persecution in virtue of its Koranic authority and was so vague that it enabled them to maintain their ancient beliefs undisturbed. There is no doubt as to the general nature of the religious beliefs and practices which they sought to mask. Since the epoch of Alexander the Great Ḥarrān had been a famous centre of pagan and Hellenistic culture; its people were Syrian heathens, star-worshippers versed in astrology and magic. In their temples the planetary powers were propitiated by blood-offerings, and it is probable that human victims were occasionally sacrificed even as late as the 9th century of our era. The more enlightened Ḥarrānians, however, adopted a religious philosophy strongly tinged with Neoplatonic and Christian elements. They produced a brilliant succession of eminent scholars and scientists who transmitted to the Moslems the results of Babylonian civilization and Greek learning, and their influence at the court of Baghdad secured more or less toleration for Ṣābianism, although in the reign of Harūn al-Rashīd the Ḥarrānians had already found it necessary to establish a fund by means of which the conscientious scruples of Moslem officials might be overcome. Accounts of these false Ṣābians reached the West through Maimonides, and then through Arabic sources, long before it was understood that the name in this application was only a disguise. Hence the utmost confusion prevailed in all European accounts of them till Chwolsohn published in 1856 his *Ssabier und der Ssabismus*, in which the authorities for the history and belief of the Ḥarrānians in the middle ages are collected and discussed.

See also "Nouveaux documents pour l'étude de la religion des Harraniens," by Dozy and De Goeje, in the *Actes* of the sixth Oriental congress, ii. 281 f. (Leiden, 1885). (R. A. N.)

SABICU WOOD is the produce of a large leguminous tree, *Lysiloma Sabicu*, a native of Cuba. The wood has a rich mahogany colour; it is exceedingly heavy, hard and durable, and therefore most valuable for shipbuilding. Sabicu, on account of its durability, was selected for the stairs of the Great Exhibition (London) of 1851, and, notwithstanding the enormous traffic which passed over them, the wood at the end was found to be little affected by wear.

SABINE, SIR EDWARD (1788–1883), English astronomer and geodesist, was born in Dublin on the 14th of October 1788, a scion of a family said to be of Italian origin. He was educated at the Royal Military Academy, Woolwich, and obtained a commission in the royal artillery at the age of fifteen, attaining the rank of major-general in 1859. His only experience of warfare seems to have been at the siege of Fort Erie (Canada) in 1814. In early life he devoted himself to astronomy and physical geography, and in consequence he was appointed astronomer to various expeditions, among others that of Sir J. Ross (1818) in search of the North-West Passage, and that of Sir E. Parry soon afterwards. Later, he spent long periods on the intertropical coasts of Africa and America, and again among the snows of Spitzbergen. He was associated with Henry Williams Chisholm and others as a member of the Royal Commission of

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[1] In the 18th century there was discovered in one of the catacombs of Rome an inscription containing the words "qui et Filius diceris et Pater inveniris." This can only have come from a Sabellian.

[2] Whether Sabellius himself ever visited the East is unknown.

1868–1869 for standardizing weights and measures. Sabine was for ten years (1861–1871) president of the Royal Society, and was made K.C.B. in 1869. He died at East Sheen, Surrey, on the 26th of May 1883.

Of Sabine's scientific work two branches in particular deserve very high credit—his determination of the length of the second's pendulum, and his extensive researches connected with terrestrial magnetism. The establishment of a system of magnetic observatories in various parts of British territory all over the globe was accomplished mainly on his representations; and a great part of his life was devoted to their direction, and to the reduction and discussion of the observations. While the majority of his researches bear on one or other of the subjects just mentioned, others deal with such widely different topics as the birds of Greenland, ocean temperatures, the Gulf Stream, barometric measurement of heights, arcs of meridian, glacier transport of rocks, the volcanoes of the Hawaiian Islands, and various points of meteorology.

SABINI, an ancient tribe of Italy, which was more closely in touch with the Romans from the earliest recorded period than any other Italic people. They dwelt in the mountainous country east of the Tiber, and north of the districts inhabited by the Latins and the Aequians in the heart of the Central Apennines. Their boundary, between the southern portion of the Umbrians on the north-west, and of the Picentines on the north-east, was probably not very closely determined. The traditions connect them closely with the beginning of Rome, and with a large number of its early institutions, such as the worship of Jupiter, Mars and Quirinus, and the patrician form of marriage (*confarreatio*).

Of their language as distinct from that of the Latins no articulate memorial has survived, but we have a large number of single words attributed to them by Latin writers, among which such forms as (1) *fircus*, Lat. *hircus*; (2) *ausum*, Lat. *aurum*; (3) *nouensiles*, Lat. *nouensides* ("gods of the nine seats"); (4) the river name *Farfarus*, beside pure Lat. *Fabaris* (Servius, *ad Aen.* vii. 715); and (5) the traditional name of the Sabine king, *Numa Pompilius* (contrasted with Lat. *Quinctilius*), indicate clearly certain peculiarities in Sabine phonology: namely, (1) the representation of the Indo-European palatal aspirate *gh* by *f* instead of Lat. *h*; (2) the retention of *s* between vowels; (3) the change of medial and initial *d* to *l*; (4) the retention of medial *f* which became in Latin *b* or *d*; and (5) the change of Ind.-Eur. *q* to *p*. Not less clear is the well attested tradition (*e.g.* Paul *ex Fest.* 327 M.) that the Sabines were the parent stock of the Samnites, and this is directly confirmed by the name which the Samnites apparently used for themselves, which, with a Latinized ending, would be *Safini* (see SAMNITES and the other articles there cited, dealing with the minor Samnite tribes).

It is one of the most important problems in ancient history to determine what was the ethnological relation of these tribes, whom we may call "Safine," to the people of Rome on the one hand, and the earlier stratum or strata of population in Italy on the other. Much light has been thrown on this group of questions in recent years both from linguistic and from archaeological sources. For the historical and archaeological evidence which connects the Sabines with the patricians of Rome, see ROME, *Ancient History*. The linguistic side of the matter may be conveniently dealt with here. From this point of view the question to be asked is what language did the Safines speak? Was it most nearly akin to Latin or to Oscan or again to Umbrian and Volscian?

A single monument of 5th- or 4th-century Safine would be of unique value; but in the absence of any such direct evidence we are thrown back on a few cardinal facts: (1) Festus, though he continually cites the *Lingua Osca* never spoke of *Lingua Sabina*, but simply of Sabini, and the same is practically true of Varro, who never refers to the language of the Sabines as a living speech, though he does imply (v. 66 and 74) that the dialect used in the district differed somewhat from urban Latin. The speech therefore of the Sabines by Varro's time had become too Latinized to give us more than scanty indications of what it had once been. (2) The language of the Samnites was that which we now call Oscan (see OSCA LINGUA). (3) The evidence of the glosses and place-names already referred to confirms tradition by the resemblance which they show to the phonological characteristics of Oscan. On the other hand there are two or three forms called Sabine by Latin writers which do appear to show the sound *q* unchanged, especially the name of the Sabine god *Quirinus*, which seems to be at least indirectly connected with the name of the Sabine town *Cures*. We do not, however, know that the initial sound of this word was originally a Velar *q*, and Professor Ridgeway ("Who were the Romans," London, 1908, in *Proceedings of the British Academy*, iii. 19) rightly lays some stress on the fact that the name in Greek form is simply *κυρῖνος* (not *κοιρῖνος*: whereas Lat. *Quintus* is regularly transcribed *κοίντος*), and suggests that the initial sound may have been slightly modified so as to correspond with the pure Latin word *quirites* (spearmen). In one or two other examples of an apparent *q* in Safine names or glosses it is not difficult to show that the sound was originally a pure palatal followed by a suffixal *u* (*e.g. tesqua*, "desert places," probably for **ters-c-ua*, cf. *pas-c-ua*, and Greek *τερσα-ίνειν*, Lat. *terra*, "dry land," from *tersā*), so that they would in fact offer no difficulty.

There is further an important piece of evidence which connects together all the Safine tribes and distinguishes them sharply, at least in the 5th and following centuries B.C., from the earlier strata of population in Italy. As this point arises in connexion with so many tribes it is desirable to offer the evidence for it here once for all. It rests upon the different character of the suffixes used by particular tribes and communities to form their ethnic name.

There are only six suffixes so used among the names of ancient Italy.[1] These suffixes are: -ulo-, -io-, -co-, -no-, -ti- (or -ati-), -ensi-.

1. The suffix *-ulo-* appears only in a few old names, *Siculi*, *Rutuli*, *Appuli*, *Poediculi* and **Vituli*, which would have been the pure Latin form instead of *Itali*, which was taken over from the Grecized form *Ἰταλοί*.

2. Excluding this small group, the frequency of the occurrence of these suffixes in ancient Italy is shown by the following table:

Table of Ethnic Suffixes in Ancient Italy.

Dialectic Area.	-IO-.	-CO-.	-NO-.	-TI-.	-ENSI-.	Totals.
Messapii . . .	2	. .	16	. .	2	20
Peucetii . . .	1	. .	15	. .	3	19
Daunii . . .	1	. .	8	3	2	14
Bruttii . . .	2	. .	11	2	4	19
Lucani . . .	2	. .	13	3	2	20
Hirpini . . .	. .	. .	33	1	2	36
Frentani . . .	. .	. .	4	4	2	10
Samnites . . .	1	(1)	5	4	3	13
Campani . . .	3	(1)	43	5	3	54
Aurunci . . .	1	2 (1)	2	. .	1	5
Volsci . . .	. .	1	29	10	1	42
Hernici . . .	1	1	3	2	. .	6
Marsi . . .	1	. .	3	4	1	9
Aequi . . .	. .	. .	6	2	. .	9
Latini . . .	4	1 (2)	44	8	20	77
Early Rome . .	2	. .	19	. .	6	27
Sabini . . .	. .	. .	13	4	2	19
Etruria (including the Falisci) .	5	2	34	9	20	70
Marrucini . .	1	(1)	2	1	. .	4
Paeligni . . .	. .	. .	5	. .	2	7
Vestini . . .	. .	. .	8	4	2	14
Piceni . . .	. .	(1)	15	5	14	34
Umbri . . .	. .	. .	23	35	15	73
Totals . .	27	7 (7)	354	106	107	601

The figures in brackets refer to the forms in -CINO-; see below.

3. The names in *-io-* seem to have been evenly distributed over the Italian area and not to mark any particular tribe or epoch.

4. The suffix *-ensi-* can be shown to have borne a political significance,

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[1] This statement with those which follow is based upon the collections of the place-names of ancient Italy, arranged according to their locality, by R. S. Conway in *The Italic Dialects* (Cambridge, 1897).

that is to say, it was used by the Romans to form the names of the inhabitants of municipal towns, as for instance *Foro-iulienses*, the inhabitants of Forum Julii. There remain, therefore, the three suffixes *-co-*, *-no-*, and *-ti-*, and it will be seen from the table that the relative frequency of these suffixes in different dialect-areas varies very greatly. The suffix *-no-*, for example, has almost driven out any other in the district of the Hirpini, and it is greatly preponderant among the Campani, in the district of the Lucani, and among the Latini and Sabini themselves.

5. On the other hand, the *-co-* suffix, which is nowhere frequent, is practically confined to the central areas.

6. The *-ti-* suffix is comparatively frequent in the Volscian district and very frequent in the Umbrian; it is also fairly well represented in Latium and Etruria.

7. In the article VOLSCI it is shown that the addition of the *-no-* suffix is often a mark of the conquest of an original *-co-* folk by a Safine tribe. It is also fairly frequently added to names formed with the *-ti-* suffix: *Ardea* gave first *Ardeates* and then *Ardeatini*; the *Picentes* became *Picentini*, the *Camertes Camertini*; of such forms there are no fewer than 54.

8. The addition of the *-ati-* suffix to the *-no-* ethnicon, as in *Iguvinates*, is comparatively rare, and no doubt denotes the opposite process, namely, the absorption of a *-no-* tribe by a population to whom it was natural to use the suffix *-ti-*. The two opposite processes confirm the inference that both are due to some change of race, not merely to a change of custom in the same population in a later age; for in that case the change would have been in one direction only.

The assumption of the Safine origin of the *-no-* suffix is further confirmed by the practice of the Romans themselves. The folk of Latium after the Safine conquest were no longer *Latiares* but *Latini*; and over against the old name *Quiritis* was the new *Populus Romanus*. Just the same rough and ready nomenclature was applied to communities conquered on foreign soil; the Σπαρτιάται became *Spartani*, the Συρακόσιοι *Syracusani*, and the Ἀσιατικοί *Asiani*, and so on.

The assumption that Latin was properly the language of the Latian plain and of the Plebs at Rome, which the conquering patrician nobles learnt from their subjects, and substituted for their own kindred but different Safine idiom, renders easier to understand the borrowing of a number of words into Latin from some dialect (presumably Sabine) where the velars had been labialized; for example, the very common word *bos*, which in pure Latin should have been **vos*. And in general it may be stated that the hypothesis of such an intermixture of forms from neighbouring dialects has been rendered in recent years far more credible by the striking evidence of such continual intermixture going on within quite modern periods of time afforded by the *Atlas linguistique de la France*, even in the portion which has already been published.

The conclusion, therefore, to which the evidence appears to lead us is that in, say, the 7th century, B.C., the Safines spoke a language not differing in any important particulars from that of the Samnites, generally known as Oscan; and that when this warlike tribe combined with the people of the Latian plain to found or fortify or enlarge the city of Rome, and at the end of the 6th century to drive out from it the Etruscans, who had in that century become its masters, they imposed upon the new community many of their own usages, especially within the sphere of politics, but in the end adopted the language of Latium henceforth known as *lingua Latina*, just as the Normans adopted the language of the conquered English.

The glosses and place-names of the ancient Sabine district are collected by R. S. Conway, the *Italic Dialects* (Cambridge, 1897), p. 351. For the history of the Sabine district see Mommsen, *C.I.L.* ix. p. 396; and Beloch, "Der italische Bund unter römischer Hegemonie" (Leipzig, 1880) and "La Conquista Romana della regione Sabina," in the *Rivista di storia antica* (1905), ix. p. 269. (R. S. C.)

SABINIANUS, pope from 604 to 606, successor of St Gregory the Great. He incurred unpopularity by his unseasonable economies. The erudite Italian Augustinian Onofrio Panvinio (1529–1568) in his *Epitome pontificum Romanorum* (Venice, 1557) attributes to this pope the introduction of the custom of ringing bells at the canonical hours and for the celebration of the eucharist.

SABLE, the name of a small quadruped, closely akin to the martens, and known by the zoological name of *Mustela zibellina*. It is a native of Siberia and famous for its fur. The name appears to be Slavonic in origin, cf. Russian *sŏbŏl*, whence it has been adapted into various languages, cf. Ger. *Zobel*, Dutch *Sabel*; the Mod. Fr. *zibelline* and Med. Lat. *zibellina* derive from the Ital. form. The Eng. and Med. Lat. *sabellum* are from the O. Fr. *sable* or *saible* (see MARTEN and FUR). "Sable" in English is a rhetorical or poetical synonym for "black." This comes from the usage in heraldry (first in French) for the colour equivalent to black, represented conventionally by a cross-hatching of vertical and horizontal lines. It has usually been assumed that this is an extension of the name of the fur, but sable fur is brown.

SABLÉ, MADELEINE DE SOUVRÉ, MARQUISE DE (1599–1678) French writer, was born in 1599, the daughter of Gilles de Souvré, marquis de Courtenvaux, tutor of Louis XIII., and marshal of France. In 1614 she married Philippe Emmanuel de Laval, marquis de Sablé, who died in 1640, leaving her in somewhat straitened circumstances. With her friend the comtesse de St Maur she took rooms in the Place Royale, Paris, and established a literary *salon*. Here originated that class of literature of which the *Maximes* of La Rochefoucauld are the best-known example. The *Maximes* of the marquise de Sablé were in fact composed before those of La Rochefoucauld, though not published till after her death. In 1655 she retired, with the comtesse de St Maur, to the Convent of Port Royal des Champs, near Marly, removing in 1661, when that establishment was closed, to Auteuil. In 1669 she took up her residence in the Port Royal convent in Paris, where she died on the 16th of January 1678.

SABLÉ, a town of western France, in the department of Sarthe, on the river Sarthe, 30 m. W.S.W. of Le Mans by rail. Pop. (1906) 4952. Sablé has a château of the 18th century, a fortified gateway, relic of a medieval stronghold, and a modern church with fine stained glass of the early 15th century. Its importance, however, is chiefly due to the marble quarries of the vicinity, the products of which are worked in the town, where flour-milling, the manufacture of farm-implements and trade in cattle are also carried on. A communal college is among the public institutions. From the 11th century Sablé was the seat of a powerful barony, which in 1602 was made a duchy-peerage in favour of Urbain de Laval, marshal of France. The place afterwards came into the possession of Colbert de Torcy, nephew of the great Colbert who built the château. In 1488 a treaty which resulted in the union of France and Brittany was concluded at Sablé, between Charles VIII. and Duke Francis II.

SABLE ANTELOPE, the English name for a large and handsome South African antelope (*Hippotragus niger*), exhibiting the rare feature of blackness or dark colour in both sexes. The sable and the roan antelope (*H. equinus*) belong to a genus nearly related to the oryxes, with which they form a group or subfamily. In all these antelopes long cylindrical horns are present in both sexes; the muzzle is hairy; there is no gland below the eye; the tail is long and tufted; and in the breadth of their tall crowns the upper molar-teeth resemble those of the oxen. The sable and roan antelopes are distinguished from *Oryx* by the stout and thickly ringed horns rising vertically from a ridge over the eyes at an obtuse angle to the plane of the lower part of the face, and then sweeping backwards in a bold curve. Sable antelope are among the handsomest of South African antelopes, and are endowed with great speed and staying power. They are commonly met with in herds including from ten to twenty individuals, but on rare occasions as many as fifty have been seen together. Forest-clad highlands are their favourite resorts. The roan antelope is a larger animal, with shorter horns, whose general colour in both sexes is strawberry-roan. It is typically a South African species, but is represented by a local race in the eastern Sudan (*H. equinus bakeri*) distinguished by its redder colour and different face-makings.

SABLE ISLAND, an island of Nova Scotia, Canada, 110 m. S.E. of Cape Canso, in 43° 56′ N. and 60° W. It is composed of shifting sand, and is about 20 m. in length by 1 m. in breadth, rising in places to a height of 85 ft. In the interior is a lake about 10 m. in length. At either end dangerous sandbars run out about 17 m. into the ocean. It has long been known as "the graveyard of the Atlantic"; over 200 known wrecks have been catalogued, and those unrecorded are believed greatly to exceed this number. The coast is without a harbour and liable to fogs and storms; irregular ocean currents of great strength sweep round it, and its colour makes it indistinguishable until close at hand. Since 1873 an efficient lighthouse system and life-saving station has been maintained by the Canadian government, and the danger has been much lessened. Since 1904 it has been connected with the mainland by wireless telegraphy. The island is constantly changing in shape, owing to the action on the sand of wind and wave, and tends to diminish in size. Since 1763, when taken over by Britain, it has shrunk from 40 m. in length to 20, from $2\frac{1}{2}$ in breadth to 1, and from 200 ft. in height to 85; since 1873 the western lighthouse has thrice been removed eastward. As this makes navigation still more dangerous, the Canadian government has planted thousands of trees and quantities of root-binding grass, and the work of destruction has been somewhat stayed. Wild fruits grow plentifully during the summer, and cranberries are exported. Wild ducks, gulls, and other birds nest in large numbers, and a native breed of ponies has long flourished.

Sable Island, estimated as being then over 100 m. in length, was known to the early navigators under the name of Santa Cruz. Early in the 16th century horses were left on its shores by the Portuguese, and the native ponies, supposed to be their descendants, are still exported. In 1598 a band of convicts were left by the marquis de la Roche, but in 1603 the survivors were restored to France.

See Rev. Geo Patterson in *Transactions of Royal Society of Canada* (1894 and 1897).

SABRE-FENCING, the art of attack and defence with the sabre, or broad-sword. Besides the heavy German basket-sabre and the *Schläger* (see below) there are two varieties of sabre used for fencing, the military sword and the so-called light sabre. These are nearly identical in shape, being composed of a slightly curved blade about 34 in. in length and a handle furnished with a guard to protect the hand; but the military sword, or broad-sword proper, the blade of which is about $\frac{5}{8}$ in. wide near the guard, tapering to $\frac{1}{2}$ in. near the point, is considerably heavier than the light sabre and is generally preferred by military instructors, being almost identical with the regulation army sabre in size and weight. Until 1900 it was the common fencing sabre in Great Britain, the United States, and most European countries, although its use was practically confined to military circles. About 1900 the light Italian sabre was introduced and became the recognized cut-and-thrust weapon among fencers throughout the world. In Austria-Hungary it became popular as early as 1885, while in Italy, the country of its origin, it has been in use since the middle of the 19th century. Its blade is about $\frac{7}{16}$ in. wide a little below the guard, tapering to $\frac{5}{16}$ in. just under the point. For practice this is truncated and the edge blunt, but in scoring both edge and point are assumed to be sharp, while in countries on the continent of Europe (though not in Great Britain or the United States) the back-edge (false-edge) is also supposed to be sharpened for some 8 in. from the point. In Italy when used for duelling the point and both edges are actually sharpened.

The modern sabre is a descendant of the curved light cavalry sword of the late 18th century, which was introduced into Europe from the Orient by the Hungarians.

The old-time European swords used for cutting were nearly all straight, like the Ital. *schiavona* and *spadroon*, the English and German two-handers and the Scotch claymore (see SWORD). There was indeed a heavy curved fencing weapon called *dussack*, very popular in the German fencing schools of the 16th and 17th centuries, which was of wood, very broad and as long as the fencer's arm, with an elliptical hole for the hand in place of a guard. But the *dussack* was introduced from Bohemia, where, as in Hungary, swords were oriental in shape, and as it completely disappeared in the last half of the 17th century it can hardly be considered in any way as the ancestor of the modern sabre. The old English *back-sword*, the traditional English weapon, though the curved form was not quite unknown, was almost invariably straight. The ancient English sword-and-buckler play (see FENCING) was, to the disgust of its devotees, driven out as a method of serious combat by the introduction at the beginning of the Elizabethan era of the Italian thrusting rapier. Nevertheless it survived as a sport up to the first half of the 18th century, being practised, together with the back-sword or broad-sword play, cudgelling or single-stick fencing, foiling and boxing, by the fencing masters of that period, whose exhibitions, given for the most part in the popular bear-gardens, were described by Pepys, Steele and others. The masters who figured in these "stage-fights" were called "prize-fighters"; and at that period they regarded boxing only as an unimportant part of their art. The most famous of them was Figg, the "Atlas of the Sword" (see FENCING). The back-sword of Figg's time was essentially the military sword then in use, having a single straight edge. The blows were aimed at the head, body or legs. Towards the close of the 18th century sticks began to be used for back-swording, the play at first being aimed at any part of the person; but the head soon came to be the sole object of attack, blows on the body and arms being used only to gain an opening. The usual defence was from a high hanging guard. No lunging was allowed. Fencing with the broad-sword did not, however, at any period entirely disappear in England, and was taught by all the regular masters, especially by the celebrated Angelo. The earlier play, of the time of Figg and later, was simple and safe. The prevailing defensive position was the hanging guard, high or medium, with the arm extended and the point downwards. There were also high inside and outside, tierce, quarte, low prime, seconde, and the head or "St George," parries; the last, a guard with the blade nearly horizontal above the head, being the supposed position of England's patron saint from which he dealt his fatal blow at the dragon. Owing to the great weight of the old back-sword wristplay was almost impossible, the cuts being delivered with a chopping stroke. Later in the 18th century a nimbler style, called the Austrian, came into fashion, owing to the introduction of a lighter, curved sabre, the principal guards being the medium, with extended hand and sword held perpendicularly with the point up; the hanging, with the point down, both outside and inside; the half-circle; the "St George"; and the spadroon, with horizontal arm and sword pointing downwards. The spadroon (Ital. *spadrone*), a light, straight, flat-bladed and two-edged sword, was also a popular 18th-century weapon, and was used both for cutting and thrusting. The thrusting attacks and parries were generally similar to those of the small-sword (see FOIL-FENCING), but few or no circular parries were used. The cuts were like those of the broad-sword. The Germans, like the British, were once masters of the edge in fencing, but the art declined with the introduction of the point, and sabre-playing survived only in the army and in academic circles with the heavy basket-sabre (see below).

The school of sabre still taught in most armies, and up to the end of the 19th century by fencing-masters of all countries except Italy and Austria-Hungary, shows little advance from that in vogue in Angelo's time. Two fundamental guards are usual, one (taught at the French army school at Joinville-le-Pont) corresponding to the guard of tierce in foil-fencing, except that the left forearm rests in the small of the back; and the other a high hanging guard, with crooked arm and the point of the sabre directed slightly forwards. The methods of coming on guard differ considerably, but have nothing to do with fencing proper. In 1896 the Florentine (Radaelli) system of sabre was introduced into the British army, the cavaliere F. Masiello spending some time at Aldershot for the purpose of training the army sword-masters; but since the year 1901 regular instruction in swordsmanship has practically been abandoned.

Fencing on horseback for cavalry is simple in comparison with light sabre-play. The cavalry sword is of two patterns, one the heavy, straight cuirassier's sword, and the other somewhat lighter with a slightly curved blade. On the attack straight point thrusts, and wide sweeping cuts are used. The three principal parries are the "head" (or "high prime") with horizontally held blade; the "tierce," on the right, parrying cuts at the left side of the head and body; and the "quarte," on the opposite side.

The modern style of fencing with the light sabre was perfected in Italy during the last quarter of the 19th century, the most important pioneer in its development having been G. Radaelli, a Milanese master, who became chief instructor of the sabre in the Royal Italian Military Fencing Academy in 1874, when it was transferred to Milan from Parma. Radaelli's system was described by F. Masiello, an army officer whose works remain the chief authority on the light sabre. An old-time rivalry between the Neapolitan and the northern Italian fencing methods came to a crisis when M. Parise, an expert of the southern school, secured first place for foil-fencing in a tournament instituted by the military authorities, the result being the transfer of the Military Fencing Academy to Rome under the title of *Scuola Magistrale di Roma*. There was, however, less difference between the two schools in sabre than in foil play, and the Radaelli system for the former was so generally esteemed that a master of that method was established at the Roman Academy.

The light fencing-sabre is made up of two principal parts, the blade and the handle. The blade, from 33½ to 34 in. long and slightly and gradually curved from hilt to point (which is truncated), has the tongue, or tang, which runs through the handle; the heel, or thick uppermost part of the blade fitting on to the guard; the edge, running from heel to point; the back-edge or false-edge (sometimes not allowed), running from the point along the back for about 8 in.; and the back, running from point to heel (unless there is a back-edge). The blade is fluted on both sides from the heel where the back-edge begins. The handle consists of the guard, of thin metal, extending from the pummel to the heel of the blade, to protect the hand; the grip (of wood, fish-skin, or leather, often backed with metal), shaped to fit the hand, through which the tongue of the blade passes; and the pummel, or knob, a button which finishes off the handle and holds the tongue in place.

The recognition of the light fencing-sabre as a practice weapon only, related to the heavier military sword as the foil is to the duelling-sword, at once makes apparent the difference between the play of the two cut- and thrust-weapons. As a light cut with the military sabre will be of little advantage in battle, however prettily delivered, it is evident that in order to produce a shock of impact sufficient to put an adversary out of action, a wide sweeping movement with the sword (*moulinet*; Ital. *molinelli*) is necessary. With the fencing-sabre a hit is a hit if properly delivered with the edge or point, however light it may be. For hits of this kind less force is necessary, and wide moulinets are not only useless but dangerous, since in making them the point must for a moment be directed away from the opponent, and momentary openings are thus left of which the opponent may take advantage by attacks on the preparation. For this reason the cuts of the Radaelli school are delivered with moulinets of very narrow radius, made as much as possible by a movement of the elbow only, keeping the point directed menacingly towards the opponent. Again, whereas in battle a wound on any part of the person may be effective and the school of the heavy sabre has to reckon with this fact, in fencing with the light sabre no hit lower than the hips counts, although hits upon any part of the person above the hips are good; in England cuts on the outside of the thigh are allowed. This somewhat narrows the scope of the fencing-sabre, just as the scope of the foil is narrower than that of the duelling-sword.

The military sword is, on account of its weight, usually held firmly in the hand with the thumb overlapping the fingers; but in holding the light sabre the thumb is placed on the flat of the grip, giving a perfect command over the movements of the blade, called by the Italians *pasteggio*. Both attacks and parries are executed as narrowly as possible, avoiding the wide movements common in heavy sabre-play, and the moulinets (which are ellipses described by the point as it is drawn back for a cut) are made, not by swinging the sword round the head, but by drawing back the hand held in front of the body, and with the point directed forward. The thrusts with the light sabre are made with the thumb to the left; whereas in the French school it is turned down, so that the blade curves upward. The modern school allows no such parries as the "St George," in executing which the blade is held at right angles to the body, but teaches that the point should always be directed towards the adversary as much as possible. The attacks are either "simple," "complex" or "secondary," and bear a general resemblance to those in foil-fencing (*q.v.*); simple attacks being such as are not preceded by other movements, as feints; complex attacks those preceded by feints, advances, or some other preliminary manœuvre; and secondary attacks those carried out while the adversary is himself attacking or preparing to attack. The parries also correspond in nomenclature, and generally in nature, to those used in foil-play, but no circular or counter-parries are taught, though sometimes employed.

Terms used in Sabre-Fencing.—"Absence of the blade": a guard so wide as apparently to leave the body uncovered, so as to entice the adversary to attack. "Appuntata" (Fr. *remise*): a supplementary cut or thrust after the failure of an attack, when the adversary replies slowly or with a feint. "Assault" (Ital. *assalto*), a regular bout. "Attacks on the blade" (see below under "beat," "disarmament," "graze" and "press"). "Beat" (Ital. *battuta*): a hard dry stroke on the adversary's blade, in order to drive it aside and push home an attack; a "re-beat" is made by beating lightly on one side, then dropping the point quickly under the adversary's blade and beating violently on the other side. *Cavazione* (see below under "disengage"). "Completion" (see below under *riposte*). "Controtempo": to parry an attack in such a manner that the adversary is hit at the same time. "Deceive the blade": when the adversary attempts an "attack on the blade" to avoid contact by a narrow circular movement of the point and hand; this is generally followed by a straight thrust or cut, as the force of his blow will carry his blade wide and leave an opening. "Development" (attacks on the): attacks made while the adversary is making a complex attack, *i.e.* one consisting of at least two movements (feint and real attack). *Deviamento* (see below under "press"). "Disarmament" (Ital. *sforzo*): striking the adversary's weapon from his hand by means of a sweeping stroke along his blade from the point downwards. "Disengage" (Ital. *cavazione*): being on guard (engaged) in one line, to draw one's point under the adversary's sword and lunge on the other side: to avoid a cut by retiring the right foot behind the left; a time-cut at the adversary's arm is usually made at the same time. "Graze" (Ital. *filo*): to run one's blade along that of the adversary and push home the attack suddenly. "Invitation guard": a guard in any line with the blade intentionally so wide that the adversary lunges into the apparent opening, only to meet a prepared counter. *Incontro* (Ital. for double-hit): both fencers attacking at the same instant. "Lines" (of engagement): the four quarters into which the trunk is divided, attacks and parries opposite them being called after them. These are, with the hand held in "supination" (thumb on top of sabre-grip): upper right, "sixte"; upper left hand, "quarte"; lower right "octave" (not used in sabre); lower left "half-circle" (not used in sabre). When the hand is held in "pronation" (thumb down) the lines are: upper right, "tierce"; upper left, "prime"; lower right, "seconde"; lower left, "low prime" ("seconde" generally used). *Quinte* and *septime* are also lines of the Italian school. "Lunge": the advance of the body by stepping forward with the right foot in order to deliver a cut or thrust. "Opposition": pressing the hand and blade in attack towards the side the adversary's blade is on; the object being to occupy his blade and cover one's person from a "riposte." "Press": forcing the adversary's blade aside by a sudden push in order to create an opening for an attack, either directly or on the same side after he has recovered his blade and parried too wide on his supposed threatened side. "Preparation" (attacks on the): mostly made by "deceiving" when the adversary attempts a beat, graze or press. "Re-beat" (see "beat"). "Remise" (see "appuntata"). "Riposte": a quick cut or thrust made after parrying an attack, without lunging. When the riposte in its turn is parried and replied to with another riposte, the French call this second riposte the *tac-au-tac*. *Sforzo* (see "disarmament"). *Scandaglio*: studying an opponent's style at the beginning of a bout. "Stop-thrust"; a direct thrust made as the adversary begins a complex attack, *i.e.* one of more than one movement. The stop-thrust must get home palpably before the adversary's attack or the attack alone is counted, the rule of scoring being that he who is attacked must take the parry. "Time-cut": a quick slash at the adversary's arm as he begins a complex attack. *Toccato!*: Ital. for "hit!" *Touché!*: French for "hit!"

Manchette-Fencing (Fr. *manchette*, a cuff) is a variety of sabre-play popular in Germany, in which the fencers stand at such a distance from each other that only hand and fore-arm can be reached with the last few inches of the sword nearest the point, both edges being supposed to be sharp. No thrusts are allowed, and both feet must remain stationary where they are planted when the bout begins. Narrow parries are necessary, though many cuts are avoided by withdrawing the hand. Manchette-fencing is not considered good practice for the light sabre and is therefore losing ground.

The German Basket-Sabre (*Krummer Säbel*, or *Krummsäbel*) is a descendant of the heavy cavalry sabre once in use in some branches of the German horse. It is now used almost exclusively by students. It has a strongly curved blade about 32 in. long and 1 in. broad, tapering slightly towards the end, which is truncated, no thrusts being allowed. The hand is protected by a large guard of heavy steel basket-work, and the handle is shaped to fit the hand, the forefinger being run through a leathern loop. On account of the great weight of the weapon (about 2½ ℔, more than half of which is in the guard) blows delivered with a full swing are impracticable, and all cuts are made from the elbow and wrist, the hand being generally kept as high as possible. The *Mensur* is the distance at which the combatants stand from one another. There are three recognized distances, that in general use being the middle, from which two sabres can be crossed at about 15 in. from the points. Neither combatant may move his left foot (the right in the case of a left-handed fencer) from the position in which it is placed at the beginning of the bout, all advances and retreats being made by the movements of the right foot and the body. The position of the engagement is in high tierce, the arm being held straight out towards the adversary. The feet are planted about 24 in. apart, the right in advance. The right shoulder is bent forward and the stomach drawn back, imparting a slight stoop to the fencer. There are eight cuts and as many parries. The basket-sabre is used in the more serious students' duels; the neck, wrist, armpits and body below the nipples being heavily bandaged.

Rapier-fencing among the students of the German universities and technical high-schools of Germany, Austria, Switzerland and Russia may be considered under the sabre, as the rapier, although originally used for thrusting as well as cutting, is now employed by students only to cut. According to the association of German fencing-masters the modern weapon when blunt and used only for practice is called *Rapier* or *Haurapier*, but when sharpened for duelling, *Schläger* (striker). It is derived from the long straight sword of the German *Reiters*, or light cavalry, who were famous in the 16th century and later. Its use, however, was only occasional before the middle of the 19th century, when it gradually took the place of the dangerous *Pariser*, or long French small-sword, for the semi-serious duels (*Mensuren*) of the students. There are two varieties of rapier, each having a thin flat blade about 33½ in. long and $\frac{7}{16}$ in. wide and truncated at the point, but distinguished by the shape of the handle. The bell-rapier (*Glockenrapier*), used only at the north German universities of Leipzig, Berlin, Halle, Breslau, Königsberg and Greifswald, is furnished with a guard consisting of a cup or bell of iron about 4¼ in. in diameter and 2 in. deep, joined to the pummel by a steel shaft protecting the hand. Its total weight is about 1¾ ℔. The basket-rapier (*Korbrapier*), used at all universities except those named above, has a handle protected by a sort of basket of heavy steel wire. Its total weight is 2 ℔. The balance is just below the guard. The blade of the rapier is divided conventionally into the *forte*, the half next the hilt, and the *foible*. These are again divided into full and half forte and full and half foible, the half foible being the weakest quarter of the blade, nearest the point. Every bout, whether with sharp or blunt weapons, is preceded by the command *Auf die Mensur!* (on the mark, literally distance). The two fencers take position with feet apart and the right slightly in advance just far enough from one another to allow their heads to be reached by the sword without moving the feet, which remain firm during the entire bout. During the first half of the 19th century the objective points of the rapier included the upper arm and breast; but later the head, including the face, became the sole target. In practice a heavy mask of wire with felt top, a glove with padded arm-piece (*Stulp*) and a padded apron to protect body and legs are worn. There is one defensive position, which is with the arm stretched upward bringing the hand and hilt about 6 in. in front of and above the forehead, and the point of the rapier directed diagonally downward across the body and to the outside of the adversary's knees. The fencers having at the command *Bindet die Klingen!* (Join blades!) placed their hilts together with the points of the rapiers directed upwards, attack simultaneously at the command *Los!* (Go!). All blows are delivered from the wrist, slightly helped by the forearm, the hand never being dropped below the level of the eyes. No movement of the head or body is allowed except such as is unavoidably connected with that of the sword-arm.

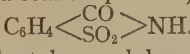
Bibliography.—For the light sabre see *La Scherma italiana di spada e di sciabola*, by Ferdinando Masiello (Florence, 1887); *Infantry Sword Exercise* (British War Office, London, 1896), practically the system of Masiello; *Istruzione per la scherma*, &c., by S. de Frate (Milan, 1885); *La Scherma per la sciabola*, by L. Barbasetti (Vienna, 1898); a German translation of the foregoing, *Das Säbelfechten* (Vienna, 1899); *Die Fechtkunst*, by Gustav Hergsell (Vienna, 1892). For the old-style sabre see *Cold Steel*, by Alfred Hutton (London, 1889); *Broadsword and Singlestick*, by R. G. Allanson Winn and C. Phillips Wolley, "All England" series (London, 1898); *Foil and Sabre*, by L. Rondelle (Boston, 1892), an exposition of the French military system. For sabre-fencing for cavalry see *The Cavalry Swordsman*, by Alfred Hutton (London, 1867); *L'Escrime du sabre à cheval*, by A. Alessandri and Émile André (Paris, 1895). For German basket-sabre and schläger, *Die deutsche Hiebfechtschule für Korb- und Glockenrapier* (Leipzig, 1887), published by the association of German academic fencing-masters; *L'Escrime dans les universités allemandes, &c*, by L. C. Roux (Paris, 1885), a French exposition of the German student fencing. (E. B.)

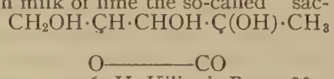
SABZAWAR, a town of Afghanistan, situated at an elevation of 3550 ft. on the left bank of the river Harud, 93 m. S. of Herat. Sabzawar was once a city of considerable size, and still possesses a fortress with sides of about 200 or 250 yds. This fortress has been abandoned, and the town, which is the centre of a group of villages, is now fairly prosperous, with a bazaar of about 800 shops and a busy traffic with Seistan. The plains about Sabzawar are highly cultivated by the Nurzai Duranis, and each village boasts its own little mud fort.

SABZEVAR, a district of the province of Khorasan in Persia, formerly called Baihak. It is situated between Nishapur on the east and Shahrud-Bostam on the west, and has a length of about 80 m. and a breadth of 50; its population is about 60,000, and it pays to the government a yearly revenue of £8000. The district has many flourishing villages and much cultivation; it produces much wool, excellent cotton, some silk, partly exported to Russia, partly manufactured into various stuffs in the district, and fruits, exported dried in large quantities. The export trade is chiefly done by a few Russian Armenians who reside in Sabzevar town.

Sabzevar, the capital of the district, is situated 150 m. E. of Shahrud and 65 m. W. of Nishapur, in 36° 12′ N., 57° 39′ E., at an elevation of 3100 ft. The population, which was 30,000 before the famine in 1871, is now about 15,000. There are some good caravanserais, a well-supplied bazaar, three colleges, two large and thirty small mosques, and post and telegraph offices.

SACCHARIC ACID, $C_6H_{10}O_8$ or $HO_2C[CH\cdot OH]_4CO_2H$, in chemistry, a tetraoxydicarboxylic acid which exists in three stereoisomeric forms. The ordinary or dextro (*d*)-saccharic acid is formed in the oxidation of cane sugar, grape sugar, *d*-gluconic acid and many other carbohydrates with nitric acid. It forms a deliquescent mass. On standing, the syrupy acid gives the crystalline lactonic acid, $C_6H_8O_7$. Sodium amalgam reduces it to glucuronic acid, $C_6H_{10}O_7$ or $OHC[CH\cdot OH]_4CO_2H$, whilst hydriodic acid reduces it to adipic acid, $HO_2C[CH_2]_4CO_2H$. Nitric acid oxidizes it to dextro-tartaric acid and oxalic acid. Laevo (*l*)-saccharic acid is formed by oxidizing *l*-gluconic acid with nitric acid, whilst the inactive $(d+l)$-acid is obtained similarly from inactive gluconic acid. These acids closely resemble the *d* acid except in their action on polarized light. For their relations to the glucoses see SUGAR. Mucic acid (*q.v.*) is isomeric with these acids.

SACCHARIN, the name given to several distinct chemical substances. The saccharin of commerce, so named from its excessively sweet taste, is a coal-tar product, being the imide of orthosulphobenzoic acid,  $C_6H_4{<}\begin{smallmatrix}CO\\ SO_2\end{smallmatrix}{>}NH$. It may be prepared by the oxidation of ortho-toluenesulphonamide $CH_3{\cdot}C_6H_4{\cdot}SO_2NH_2$, with potassium permanganate (C. Fahlberg and I. Remsen, *Ber.*, 1879, 12, p. 469); by the electrolytic oxidation of the above sulphonamide (German patent 35211); by the action of concentrated sulphuric acid on ortho-sulphamidobenzoic acid, $NH_2{\cdot}SO_2{\cdot}C_6H_4{\cdot}CO_2H$ (German patent 113720); by warming the chloride of ortho-sulphobenzoic acid phenyl ester ($SO_2Cl{\cdot}C_6H_4{\cdot}CO_2C_6H_5$) with excess of aqueous ammonia (R. List and M. Stein, *Ber.*, 1898, 31, p. 1662); and from benzaldehyde orthosulphonic acid by conversion into its acid chloride, which with ammonia yields the corresponding acid-amide, which gives saccharin on oxidation with atmospheric oxygen (German patent 94948). It is a crystalline powder which melts at 220° C. with partial decomposition. It is soluble with difficulty in cold water, but is moderately soluble in hot water and readily soluble in alcohol. By the action of concentrated hydrochloric acid at 150° C. it is decomposed into ammonia and ortho-sulphobenzoic acid. With phosphorus pentachloride above 200° C. it yields orthochlornitrobenzene. Sodium saccharin, $C_6H_4(CO){\cdot}(SO_2){\cdot}N{\cdot}Na, 2H_2O$, is used under the name of "soluble saccharin" or "crystallose," and is readily soluble in hot water. The ammonium salt is named "sucramine." Saccharin is largely used for sweetening purposes, pure saccharin being 500 times sweeter than sugar. Until 1891 the commercial product contained about 40 % of the tasteless para compound and was only 300 times as sweet as sugar; the mixture, however, is now separated by dissolving out the saccharin with xylene, in which solvent the para compound is insoluble. Saccharin is used as a sugar substitute for diabetic patients. It is interesting to note that *o*-sulphobenzoic acid has an acid taste, and the sulphamide is tasteless; the sweetness of saccharin therefore appears to be connected with the formation of a cyclic anhydride. In the United Kingdom there is an import duty of 1s. 3d. per oz. on saccharin and similar products, and manufacturers have to take out a licence. In the United States the import duty is \$1·50+10% *ad valorem* per ℔. Austria-Hungary, France, Belgium and Germany prohibit the importation. On the estimation of saccharin in commercial samples and for its detection in foods and beverages see J. H. Kastle, *Jour. Chem. Soc.*, 1905, 87, p. 503; E. M‘K. Chace, *Jour. Amer. Chem. Soc.*, 1904, 39, p. 1627.

The lactones of the saccharic acids are also known as "saccharins." By boiling dextrin or laevulose with milk of lime the so-called "saccharin," a lactone of the formula,  $$\begin{array}{l}\mathrm{CH_2OH{\cdot}CH{\cdot}CHOH{\cdot}C(OH){\cdot}CH_3}\\ \qquad\qquad\mathrm{O{-}{-}{-}{-}{-}{-}CO}\end{array}$$ is obtained (E. Péligot, *Ber.*, 1880, 13, p. 196; H. Kiliani, *Ber.*, 1882, 15, p. 2954). It crystallizes in large prisms, has a bitter taste, and is easily soluble in hot water. Potassium permanganate oxidizes it to carbonic and acetic acids. Heating with caustic potash to 200 °C. gives formic and lactic acids, and when reduced by hydriodic acid and phosphorus it is converted into αγ-dimethylbutyrolactone. "Iso-saccharin" and "meta-saccharin" are formed by the action of lime on milk sugar (H. Kiliani, *Ber.*, 1885, 18, p. 631). The former melts at 95 C., and on reduction by hydriodic acid and phosphorus is converted into αγ-dimethylvalerolactone. Meta-saccharin melts at 141-142° C. and is easily soluble in water.

SACCHETTI, FRANCO (*c.* 1335–*c.* 1400), Italian poet and novelist, was the son of Benci di Uguccione, surnamed "Buono," of the noble and ancient Florentine family of the Sacchetti (comp. Dante, *Par.* c. xvi.), and was born at Florence about the year 1335. While still a young man he achieved repute as a poet, and he appears to have travelled on affairs of more or less importance as far as to Genoa, Milan and "Ischiavonia." When a sentence of banishment was passed upon the rest of the house of Sacchetti by the Florentine authorities in 1380 it appears that Franco was expressly exempted, "per esser tanto uomo buono," and in 1383 he was one of the "eight," discharging the office of "prior" for the months of March and April. In 1385 he was chosen ambassador to Genoa, but preferred to go as podestà to Bibbiena in Casentino. In 1392 he was podestà of San Miniato, and in 1396 he held a similar office at Faenza. In 1398 he received from his fellow-citizens the post of captain of their then province of Romagna, having his residence at Portico. The date of his death is unknown; most probably it occurred about 1400, though some writers place it as late as 1410.

Sacchetti left a considerable number of *sonnetti*, *canzoni*, *ballate*, *madrigali*, &c., which have never been printed, but which are still extant in at least one MS. in the Laurentian library of Florence. His *Novelle* were first printed in 1724, from the MS. in the same collection, which, however, is far from complete. They were originally 300 in number, but only 258 in whole or in part now survive. They are written in pure and elegant Tuscan, and, based as they are for the most part on real incidents in the public and domestic life of Florence, they are valuable for the light they throw on the manners of that age, and occasionally also for the biographical facts preserved in them.

SACCHI, ANDREA (*c.* 1600–1661), Italian painter of the later Roman school, was born at Nettuno near Rome in 1600, or perhaps as early as 1598. His father, Benedetto, a painter of undistinguished position, gave him his earliest instruction in the art; Andrea then passed into the studio of Albani, of whom he was the last and the most eminent pupil, and under Albani he made his reputation early. The painter of Sacchi's predilection was Raphael; he was the jealous opponent of Pietro da Cortona, and more especially of Bernini. In process of time he became one of the most learned designers and one of the soundest colourists of the Roman school. He went to Venice and to Parma to study Venetian colour and the style of Correggio; but he found the last-named master unadaptable for his own proper methods in art, and he returned to Rome. Sacchi was strong in artistic theory, and in practice slow and fastidious; it was his axiom that the merit of a painter consists in producing, not many middling pictures, but a few and perfect ones. His works have dignity, repose, elevated yet natural forms, severe but not the less pleasing colour, a learned treatment of architecture and perspective; he is thus a painter of the correct and laudable academic order, admired by connoisseurs rather than by ambitious students or the large public. His principal painting, often spoken of as the fourth best easel-picture in Rome—in the Vatican Gallery—is "St Romuald relating his Vision to Five Monks of his Order." The pictorial *crux* of dealing with these figures, who are all in the white garb of their order, has often been remarked upon; and as often the ingenuity and judgment of Sacchi have been praised in varying the tints of these habits according to the light and shade cast by a neighbouring tree. The Vatican Gallery contains also an early painting of the master—the "Miracle of St Gregory," executed in 1624; a mosaic of it was made in 1771 and placed in St Peter's. Other leading examples are the "Death of St Anna," in S Carlo ai Catinari; "St Andrew," in the Quirinal; "St Joseph," at Capo alle Case; also, in fresco, a ceiling in the Palazzo Barberini—"Divine Wisdom"—reckoned superior in expression and selection to the rival work of Pietro da Cortona. There are likewise altarpieces in Perugia, Foligno and Camerino. Sacchi, who worked almost always in Rome, left few pictures visible in private galleries: one, of "St Bruno," is in Grosvenor House. He had a flourishing school: Nicholas Poussin and Carlo Maratta were his most eminent scholars; Luigi Garzi and Francesco Lauri were others, and Sacchi's own son Giuseppe, who died young, after giving very high hopes. This must have been an illegitimate son, for Andrea was unmarried when he died at Nettuno in 1661.

SACCHINI, ANTONIO MARIA GASPARE (1734–1786), Italian musical composer, was born at Pozzuoli, on the 23rd of July 1734. He was the son of a poor fisherman and was heard singing on the sands by Durante, who undertook his education at the Conservatorio di Sant' Onofrio at Naples. Durante and Piccinni taught him composition, and Nicola Fiorenza the violin. The intermezzo *Fra Donato* was written for the theatre of the Conservatorio in 1756, but his first serious opera was produced at Rome in 1762, and was followed by many others, nearly all of which were successful. In 1769 he went to Venice, and in consequence of the great success achieved there by the production of his opera *Alessandro nell' Indie* he was appointed director of the Conservatorio dell' Ospedaletto, where he trained some admirable female singers and wrote church music. In 1772 he visited London, where, notwithstanding a cruel cabal formed against him, he achieved a brilliant success, especially in his four new operas, *Tamerlano*, *Lucio Vero*, *Nitetti e Perseo* and *Il Gran Cid.* Later he met with an equally enthusiastic reception in Paris, where in 1783 his *Rinaldo* was produced under the immediate patronage of Queen Marie Antoinette, to whom he had been recommended by the emperor Joseph II. But neither in England nor in France did his reputation continue to the end of his visit. He seems everywhere to have been the victim of bitter jealousy. Even Marie Antoinette was not able to support his cause in the face of the general outcry against the favour shown to foreigners; and by her command, given with the utmost reluctance, his last opera and undoubted masterpiece, *Œdipe à Colone*, was set aside in 1786 to make room for Lemoine's *Phèdre*—a circumstance which so preyed upon his mind that he died of chagrin on the 7th (or 8th) of October 1786.

Sacchini's style was rather graceful than elevated, and he was deficient both in creative power and originality. But the dramatic truth of his operas, more especially the later ones, is above all praise, and he never fails to write with the care and finish of a thorough and accomplished musician. *Œdipe* was extremely successful after his death, and was performed at the Académie nearly six hundred times.

SACERDOTALISM (from Lat. *sacerdos*, priest, literally one who presents sacred offerings, *sacer*, sacred, and *dare*, to give), a term applied, usually in a hostile sense, to the system, method and spirit of a priestly order or class, under which the functions, dignity and influence of the members of the priesthood are exalted in the ministry of religion, and in the church at the expense of the laity. This exalting of the priesthood in the Christian church is based on the claim that the priest exercises sacrificial and supernatural powers in the celebration of the Eucharist.

SACHEVERELL, HENRY (1674–1724), English ecclesiastic and politician, was the son of Joshua Sacheverell, rector of St Peter's, Marlborough. He was adopted by his godfather, Edward Hearst, and his wife, and was sent to Magdalen College, Oxford, in 1689, was demy of his college from 1689 to 1701 and fellow from 1701 to 1713. Addison, another Wiltshire lad, entered at the same college two years earlier, but was also elected a demy in 1689; he inscribed to Sacheverell in 1694 his account of the greatest English poets. Sacheverell took his degree of B.A. in 1693, and became M.A. in 1695 and D.D. in 1708. His first preferment was the small vicarage of Cannock in Staffordshire; but he leapt into notice when holding a preachership at St Saviour's, Southwark. His famous sermons on the church in danger from the neglect of the Whig ministry to keep guard over its interests were preached, the one at Derby on the 15th of August, the other at St Paul's Cathedral on the 5th of November 1709. They were immediately reprinted, the latter being dedicated to the lord mayor and the former to the author's kinsman, George Sacheverell, high sheriff of Derby for the year; and, as the passions of the whole British population were at this period keenly exercised between the rival factions of Whig and Tory, the vehement invectives of this furious divine on behalf of an ecclesiastical institution which supplied the bulk of the adherents of the Tories made him their idol. The Whig ministry, then slowly but surely losing the support of the country, were divided in opinion as to the propriety of prosecuting this zealous parson. Somers was against such a measure; but Godolphin, who was believed to be personally alluded to in one of these harangues under the nickname of "Volpone," urged the necessity of a prosecution, and gained the day. The trial lasted from 27th February to 23rd March 1710, and the verdict was that Sacheverell should be suspended for three years and that the two sermons should be burnt at the Royal Exchange. This was the decree of the state, and it had the effect of making him a martyr in the eyes of the populace and of bringing about the downfall of the ministry. Immediately on the expiration of his sentence (13th April 1713) he was instituted to the valuable rectory of St Andrew's, Holborn, by the new Tory ministry, who despised the author of the sermons, although they dreaded his influence over the mob. He died at the Grove, Highgate, on the 5th of June 1724.

See Hearne's *Diaries*, Bloxam's *Register of Magdalen* and Hill Burton's *Queen Anne*, vol. ii. There is an excellent bibliography by Falconer Madan (1887).

SACHEVERELL, WILLIAM (1638–1691), English statesman, son of Henry Sacheverell, a country gentleman, was born in 1638. His family had held a good position in Derbyshire and Nottinghamshire since the 12th century, the name appearing as Sent Cheveroll in the roll of Battle Abbey, and William inherited large estates from his father. He was admitted at Gray's Inn in 1667, and in 1670 he was elected member of parliament for Derbyshire. He immediately gained a prominent position in the party hostile to the Court, and before he had been six months in the House of Commons he proposed a resolution that all "popish recusants" should be removed from military commands; the motion, enlarged so as to include civil employment, was carried without a division on the 28th of February 1672–1673. This resolution was the forerunner of the Test Act, in the preparation of which Sacheverell took an active part, and which caused the break up of the cabal. He now took part in nearly every debate in the House of Commons, being recognized as one of the most able of the leaders of the opposition or country party. He strongly opposed the king's policy of alliance with France, advocating a league with the Dutch instead, and the refusal of supplies until the demands of the Commons should be complied with. Sacheverell took especial interest in the state of the navy and spoke in many debates on this question. In 1677 he carried an address to the king calling upon him to conclude an alliance with the United Provinces against Louis XIV., and when the Speaker adjourned the House by Charles's order Sacheverell made an eloquent protest, asserting the right of the House itself to decide the question of its adjournment. When parliament met early in 1678 assurances were received from Charles II. that he had arranged the treaties demanded by the Commons; but Sacheverell boldly questioned the king's good faith, and warned the Commons that they were being deceived. When the secret treaty with France became known, thus confirming Sacheverell's insight, the latter called for the disbandment of the forces and advocated the refusal of further supplies for military purposes; and in June 1678 he resolutely opposed Lord Danby's proposal to grant £300,000 per annum to Charles II. for life. Barillon mentions Sacheverell among the Whig leaders who accepted bribes from Louis XIV., but the evidence against him is not conclusive.

When Titus Oates began his pretended revelations in 1678 Sacheverell was among those who most firmly believed in the existence of a Popish plot. He was one of the most active investigators of the affair, and one of the managers of the impeachment of the five Catholic peers. He also acted for a time as chairman of the secret committee of the Commons, and drew up the report on the examination of the Jesuit Coleman, secretary to the duchess of York. He was a member of the committee for drafting the articles of impeachment against Danby in 1678, and was appointed one of the managers of the Commons; and in 1679, when the impeachment, interrupted by the dissolution of parliament, was resumed in the new parliament, he spoke strongly against the validity of Danby's plea of pardon by the king. The allegations made in Sacheverell's report on the examination of Coleman prompted the country party to demand the exclusion of James, duke of York, from the succession to the throne, the first suggestion of the famous Exclusion Bill being made by Sacheverell on the 4th of November 1678 in a debate—"the greatest that ever was in Parliament," as it was pronounced by contemporaries—raised by Lord Russell with the object of removing the duke from the King's Council. He vigorously promoted the bill in the House of Commons and opposed granting supplies till it should pass. When Charles offered an alternative scheme (1679) for limiting the powers of a Catholic sovereign, Sacheverell made a great speech in which he pointed out the insufficiency of the king's terms for securing the object desired by the Whigs. In the conflict between the Petitioners and the Abhorrers he supported the former, and on the 27th of October 1680 brought forward a motion asserting the right of petitioning the king to summon parliament, and proposed the impeachment of Chief Justice North as the author of the proclamation against tumultuous petitioning. Sacheverell was one of the managers on behalf of the Commons at the trial of Lord Stafford in Westminster Hall; but took no further part in public affairs till after the elections of March 1681, when he was returned unopposed for Derbyshire. He was prosecuted for riot in connexion with the surrender of the charter of Nottingham in 1682, being tried before Chief Justice Jeffreys, who fined him 500 marks.

At the general election following the death of Charles II. in 1685 Sacheverell lost his seat, and for the next four years he lived in retirement on his estates. In the convention parliament summoned by the prince of Orange, in which he sat for Heytesbury, he spoke in favour of a radical resettlement of the constitution, and served on a committee, of which Somers was chairman, for drawing up a new constitution in the form of the Declaration of Right; and he was one of the representatives of the Commons in their conference with the peers on the question of declaring the throne vacant. William III. appointed Sacheverell a lord of the admiralty, but he resigned the office after a few months. He procured the omission of Lord Jeffreys's name from the Act of Indemnity. In 1690 he moved a famous amendment to the Corporation Bill, proposing the addition of a clause—the purport of which was misrepresented by Macaulay—for disqualifying for office for seven years municipal functionaries who in defiance of the majority of their colleagues had surrendered their charters to the Crown. A celebrated debate on this question took place in the House of Commons in January 1690; but the evident intention of the Whigs to perpetuate their own ascendancy by tampering with the franchise contributed largely to the Tory reaction which resulted in the defeat of the Whigs in the elections of that year. Sacheverell was elected member for Nottinghamshire; but he died on the 9th of October 1691, before taking his seat. In the judgment of Speaker Onslow, Sacheverell was the "ablest parliament man" of the reign of Charles II. He was one of the earliest of English parliamentary orators; his speeches greatly impressed his contemporaries, and in a later generation, as Macaulay observes, they were "a favourite theme of old men who lived to see the conflicts of Walpole and Pulteney." Though his fame has become dimmed in comparison with that of Shaftesbury, Russell and Sidney, he was not less conspicuous in the parliamentary proceedings of Charles II.'s reign, and he left a more permanent mark than any of them on the constitutional changes of the period.

Sacheverell was twice married. His first wife was Mary, daughter of William Staunton of Staunton; and his second was Jane, daughter of Sir John Newton. His eldest son Robert represented the borough of Nottingham in six parliaments and died in 1714. The family became extinct in 1724.

Bibliography.—Many of Sacheverell's speeches are reported in Anchitell Grey's *Debates of the House of Commons, 1667–1694* (10 vols., London, 1769). See also Sir George Sitwell, *The First Whig* (Scarborough, 1894); Gilbert Burnet, *History of my own Time* (6 vols., Oxford, 1833); Sir John Reresby, *Memoirs, 1634–1689*, edited by J. J. Cartwright (London, 1875); Roger North, *Autobiography*, edited by A. Jessopp (London, 1887); and *Lives of the Right Hon. F. North, Baron Guilford*, &c. (3 vols., London, 1826); *The Hatton Correspondence*, edited by E. M. Thompson for the Camden Society (2 vols., London, 1878); Laurence Eachard, *History of England* (3 vols., London, 1707–1718); and the Histories of England by Lingard, Von Ranke and Macaulay. (R. J. M.)

SACHS, HANS (1494–1576), German poet and dramatist, was born at Nuremberg on the 5th of November 1494. His father was a tailor, and he himself was trained to the calling of a shoemaker. Before this, however, he received a good education at the Latin school of Nuremberg, which left behind it a lasting interest in the stories of antiquity. In the spring of 1509 he began his apprenticeship, and was at the same time initiated into the art of the Meistersingers by a weaver, Leonhard Nunnenpeck. In 1511 he set out on his *Wanderjahre*, and worked at his craft in many towns, including Regensburg, Passau, Salzburg, Munich, Osnabrück, Lübeck and Leipzig. In 1516 he returned to Nuremberg, where he remained during the rest of his life, working steadily at his handiwork and devoting his leisure time to literature. In 1517 he became master of his gild and in 1519 married. The great event of his intellectual life was the coming of the Reformation; he became an ardent adherent of Luther, and in 1523 wrote in Luther's honour the poem beginning *Die wittenbergisch Nachtigall, Die man jetzt höret überall*, and four remarkable dialogues in prose, in which his warm sympathy with the reformer is tempered by counsels of moderation. In spite of this, his advocacy of the new faith brought upon him a reproof from the town council of Nuremberg; and he was forbidden to publish any more *Büchlein oder Reimen*. It was not long, however, before the council itself openly threw in its lot with the Reformation. After the death of Hans Sachs's first wife in 1560 he married again. His death took place on the 19th of January 1576.

Hans Sachs was an extraordinarily fertile poet. By the year 1567 he had composed, according to his own account, 4275 *Meisterlieder*, 1700 tales and fables in verse, and 208 dramas, which filled no fewer than 34 large manuscript volumes; and this was not all, for he continued writing until 1573. The *Meisterlieder* were not printed, being intended solely for the use of the Nuremberg Meistersinger school, of which Sachs was the leading spirit. His fame rests mainly on the *Spruchgedichte*, which include his dramatic writings. His "tragedies" and "comedies" are, however, little more than stories told in dialogue, and divided at convenient pauses into a varying number of acts; of the essentials of dramatic construction or the nature of dramatic action Sachs has little idea. The subjects are drawn from the most varied sources, the Bible, the classics and the Italian novelists being especially laid under contribution. He succeeds best in the short anecdotal *Fastnachtsspiel* or Shrovetide play, where characterization and humorous situation are of more importance than dramatic form or construction. Farces like *Der fahrende Schüler im Paradies* (1550), *Das Wildbad* (1550), *Das heiss Eisen* (1551), *Der Bauer im Fegefeuer* (1552) are inimitable in their way, and have even been played with success on the modern stage.

Hans Sachs himself made a beginning to an edition of his collected writings by publishing three large folio volumes (1558–1561); after his death two other volumes appeared (1578, 1579). A critical edition has been published by the Stuttgart *Literarischer Verein*, edited by A. von Keller and E. Goetze (23 vols., 1870–1896); *Sämtliche Fastnachtsspiele*, ed. by E. Goetze (7 vols., 1880–1887); *Sämtliche Fabeln und Schwänke*, by the same (3 vols., 1893). There are also editions of selected writings by J. Tittmann (3 vols., 1870–1871; new ed., 1883–1885) and B. Arnold (2 vols., 1885). See E. K. J. Lützelberger, *Hans Sachs* (1876); C. Schweitzer, *Étude sur la vie et les œuvres de Hans Sachs* (1887); K. Drescher, *Hans Sachs-Studien* (1890, 1891); E. Goetze, *Hans Sachs* (1891); A. L. Stiefel, *Hans Sachs-Forschungen* (1894); R. Genée, *Hans Sachs und seine Zeit* (1894; 2nd ed., 1902); E. Geiger, *Hans Sachs als Dichter in seinen Fastnachtsspielen* (1904).

SACHS, JULIUS VON (1832–1897), German botanist, was born at Breslau on the 2nd of October 1832. At an early age he showed a taste for natural history, and on leaving school he became, in 1851, private assistant to the physiologist J. E. Purkinje at Prague. In 1856 he graduated as doctor of philosophy, and then adopted a botanical career, establishing himself as *Privatdozent* for plant physiology in the university of Prague. In 1859 he was appointed physiological assistant to the Agricultural Academy of Tharandt in Saxony; and in 1861 he was called to be director of the Polytechnic at Chemnitz, but was almost immediately transferred to the Agricultural Academy at Poppelsdorf, near Bonn, where he remained until 1867, when he was nominated professor of botany in the university of Freiburg-im-Breisgau. In 1868 he accepted the chair of botany in the university of Würzburg, which he continued to occupy (in spite of calls to all the important German universities) until his death on the 29th of May 1897.

Sachs achieved distinction as an investigator, a writer and a teacher; his name will ever be especially associated with the great development of plant physiology which marked the latter half of the 19th century, though there is scarcely a branch of botany to which he did not materially contribute. His earlier papers, scattered through the volumes of botanical journals and of the publications of learned societies (a collected edition was published in 1892–93), are of great and varied interest. Prominent among them is the series of "Keimungsgeschichten," which laid the foundation of our knowledge of microchemical methods, as also of the morphological and physiological details of germination. Then there is his resuscitation of the method of "water-culture," and the application of it to the investigation of the problems of nutrition; and further, his discovery that the starch-grains to be found in chloroplastids are the first visible product of their assimilatory activity. His later papers were almost exclusively published in the three volumes of the *Arbeiten des botanischen Instituts in Würzburg* (1871–88). Among these are his investigation of the periodicity of growth in length, in connexion with which he devised the self-registering auxanometer, by which he established the retarding influence of the highly refrangible rays of the spectrum on the rate of growth; his researches on heliotropism and geotropism, in which he introduced the "clinostat"; his work on the structure and the arrangement of cells in growing-points; the elaborate experimental evidence upon which he based his "imbibition-theory" of the transpiration-current; his exhaustive study of the assimilatory activity of the green leaf; and other papers of interest. Sachs' first published volume was the *Handbuch der Experimentalphysiologie der Pflanzen* (1865; French edition, 1868), which gives an admirable account of the state of knowledge in certain departments of the subject, and includes a great deal of original information. This was followed in 1868 by the first edition of his famous *Lehrbuch der Botanik*, by far the best book of its kind. It is a comprehensive work, giving an able summary of the botanical science of the period, enriched with the results of many original investigations. The fourth and last German edition was published in 1874, and two English editions were issued by the Oxford Press in 1875 and 1882 respectively. The *Lehrbuch* was eventually superseded by the *Vorlesungen über Pflanzenphysiologie* (1st ed., 1882; 2nd ed., 1887; Eng. ed., Oxford, 1887), a work more limited in scope, but yet covering more ground than its title would imply; though it is a remarkable book, it has not gained the general recognition accorded to the *Lehrbuch.* Finally, there is the *Geschichte der Botanik* (1875), a brilliant and learned account of the development of the various branches of botanical science from the middle of the 16th century up to 1860, of which an English edition was published in 1890 by the Oxford Press. As a teacher Sachs exerted great influence, for his vigorous personality and his ready and lucid utterance enabled him not only to instruct, but to fire his students with something of his own enthusiasm.

A full account of Sachs' life and work was given by Professor Goebel, formerly his assistant, in *Flora* (1897), of which an English translation appeared in *Science Progress* for 1898. There is also an obituary notice of him in the *Proc. Roy. Soc.* vol. lxii. (S. H. V*.)

SACHS, MICHAEL (1808–1864), German Rabbi. He was one of the first of Jewish graduates of the modern universities, taking his Ph.D. degree in 1836. He was appointed Rabbi in Prague in 1836, and in Berlin in 1844. He took the conservative side against the Reform agitation, and so strongly opposed the introduction of the organ into the Synagogue that he retired from the Rabbinate rather than acquiesce. Sachs was one of the greatest preachers of his age, and published two volumes of Sermons (*Predigten*, 1866–1891). He co-operated with Zunz (*q.v.*) in a new translation of the Bible. Sachs is best remembered for his work on Hebrew poetry, *Religiöse Poesie der Juden in Spanien* (1845); his more ambitious critical work (*Beiträge zur Sprach- und Alterthumsforschung*, 2 vols., 1852–1854) is of less lasting value. His poetical gifts he turned to admirable account in his translation of the Festival Prayers (*Mahzor*, 9 vols., 1855), a new feature of which was the metrical rendering of the medieval Hebrew hymns. Another very popular work by Sachs contains poetical paraphrases of Rabbinic legends (*Stimmen vom Jordan und Euphrat*, 1853). (I. A.)

SACK, a large bag made of a coarse material such as is described under SACKING below. The word occurs with very little variation in all European languages, cf. Gr. σάκκος, Lat. *saccus*, Fr. *sac*, Span. *saco*, Du. *zak*, &c. All are borrowed from the Hebrew *sag*, properly a coarse stuff made of hair, hence a bag made of this material. Most etymologists attribute the widespread occurrence of the word to the story of Joseph and his brethren in Gen. xliv. The Hebrew word itself is probably Egyptian, as is evidenced by the Coptic *sok*. Apart from its ordinary meaning, the word is used as a unit of dry measure, which has varied considerably at different times and places and for different goods; it is the customary British measure for coals, potatoes, apples and some other goods, and is equivalent to three bushels. From the end of the 17th to the middle of the 18th century the sack or "sacque" was a fashionable type of gown for women, having a long flowing loose back—hanging in pleats from the neck. It is still used as a tailor's or dressmaker's term for a loose straight-back coat. The Fr. *sac* meant also pillage, plunder, whence *saccager*, to plunder a town, especially after it had been taken by assault or after a siege. There is no doubt that it is an extension of "sack," a bag, with a reference to the most obvious receptacle for booty. The slang expression "to give the sack," "to get the sack," of a person who has been turned out of a situation or been given notice to leave is an old French proverbial expression. Cotgrave gives *On luy a donné sa sac et ses quilles*, "he hath his passport given him, he is turned out to grazing, said of a servant whom his master hath put away." The *New English Dictionary* finds the expression also in 15th-century Dutch.

It remains to distinguish the name, familiar from English literature of the 16th and 17th centuries, of a Spanish wine, which was of a strong, rough, dry kind (in Fr. *vin sec*, whence the name), and therefore usually sweetened and mixed with spice and mulled or "burnt." It became a common name for all the stronger white wines of the South.

SACKBUT, SHAKBUSSHE, SAGBUT, DRAW or DRAWING TRUMPET (Scotland, *draucht trumpet*) or FLAT TRUMPET (Fr. *saquebute*, *saqueboute*, *cacbouc*, *trompette harmonique*; Ger. *Posaune*, *Busaun*, *Pusin*, *Zug-Trommet*; Ital. *tromba da tirarsi* or *tromba spezzata*; Span. *sacabuche*; Dutch *bazuin Schuijftrompette*), the earliest form of slide trumpet, which afterwards developed into the trombone. As soon as the effect of the slide in lengthening the main tube and therefore proportionally deepening the pitch of the instrument was understood, and its capabilities had been fully realized, the development of a family of powerful tenor and bass instruments followed as a matter of course. It is not known exactly in what country the principle of the slide was first discovered and applied to musical instruments; if it be not an Oriental device, then the credit is probably due to the Netherlands or to South Germany before or during the 13th century.

The early history of the sackbut is among the most interesting of all instruments. Various attempts have been made to fix the etymology of the word as derived from Span. *sacabuche* through French. The Rev. F. W. Galpin[1] suggests a derivation from *sacar*, to draw out, and *buche*, identical with *bucha* (Lat. *buxus*), used in the sense of a tube or pipe originally of boxwood. To accept this etymology would be to lose sight of the fact that all the technical names applied to the sackbut in various languages directly acknowledge its descent from the buccina (*q.v.*), with the exception of Italian, in which the recognition is indirectly made through the synonym *tromba*. A clue to the etymology of *sacabuche* is afforded by the well-known fact that not only did the Arabs after the conquest introduce oriental musical instruments by way of Spain to western Europe, but the Arabic names also clung to the instruments in many cases. The Arabs had a military trumpet they called *Buk* or *Buque*, a word they had borrowed from the Christians,[2] and it is mentioned in a musical treatise of the 14th century (Escorial MS. 69) among the musical instruments then in use in Spain. It has been claimed on philological grounds that England derived her knowledge of the sackbut from France, but the oldest known form of the word in English is *shakbusshe*, which occurs in the accounts of Henry VII.

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[1] "The Sackbut, its Evolution and History," in *Proc. Mus. Assoc. London* (1906–1907).

[2] See Edw. W. Lane, *Arabic-English Lexicon* (London, 1863), bk. i. pt. i. p. 276.

for the 3rd of May 1495,[1] and is obviously of Spanish origin. Sackbut appears early in the 16th century.

The word *sacabuche* was at some time applied in Spain to the ship's pump; and the questions naturally arise, Which came first, and Was the musical instrument named after the pump from the great resemblance in their respective actions as well as in outward form?[2] It is certainly significant that the Ital. *tromba*, from which sprang "trumpet" and "trombone," means a pump as well as a trumpet and the trunk of an elephant. Even if it could be proved beyond doubt that the slide had been applied to the trumpet before the word *tromba* was used for it, there would still remain several difficulties to be disposed of. (1) The word *trumba*, *trumbin*, *trompe*, already general in the romances of the 12th and 13th centuries, was at first applied to the tubas and curved horns, probably from the similar curve of the elephant's trunk. (2) If *tromba* referred to the pump, it must have been applied to the slide trumpet, and *tromba da tirarsi* for "sackbut" is senseless tautology. (3) The etymology given above from *buk* or *buque*, trumpet, supported by similarly compounded words in English, Scotch, Dutch, Italian, would have to be regarded as a strange but not unparalleled philological coincidence. The earliest instance yet discovered of the use of *sacabuche* as a musical instrument seems to be in the 14th century.[3]

The transformation of the busine (*buccina*) into the sackbut involved two or three processes, the addition of the slide being accomplished in at least two stages. It was applied first to the straight busine made in three or four sections having rings or knobs at the joints. The sliding portions or joints here doubtless served much as in our modern wood wind instruments for tuning purposes or for changing the key. The long slide, added for the purpose of obtaining a diatonic compass, denoted a further step in the evolution. When applied to the straight busine it differed materially from the slide of the sackbut or trombone, for the normal position of the instrument was with the slide fully drawn out, so that the knobs were equidistant; on the slide being gradually closed the pitch was proportionally raised in order to fill in the gaps of the first fifth by new fundamentals, upon each of which the harmonic series would be obtainable. An example of this early use of the slide is to be found in a miniature from a psalterium executed in the south of France during the 13th century, now preserved in the library of the university of Munich (MS. 24, 4to fol. 96*b*). Here (fig. 1) the performer is represented playing on a busine in which two of the knobs or rings denoting the joints or sections are shown touching each other. The hand is grasping the instrument just under the lower ring in the act of pushing it up to close the slide, as is indicated by the position of the wrist. This is the earliest indication of the existence of the slide yet found by the writer, and the instrument, although straight, is one of the earliest sackbuts. The manipulation of the slide on the long straight busine must have been exceedingly difficult, requiring not only skill, but a long arm. This led to the next step in the evolution, *i.e.* the bending of the tube in three parallel branches like a flattened S, an example of which, also of the 13th century, is found on some carved woodwork from the abbey of Cluny.[4]

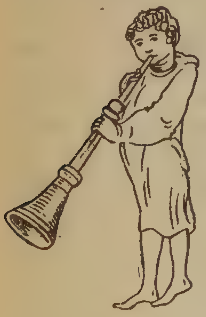

FIG. 1.

The folding of the busine marks the advent of the new double slide, like a U, made to draw out and lower the pitch. This radical change did not come all at once, the intermediate step being the folding of the busine, with the old single slide, the whole S being drawn up and down, as the slide closed and opened again. This interesting development is shown (fig. 2) in a miniature by Taddeo Crivelli in the Borso Bible[5] (1450–1471). The two upper joints defined by rings are clearly drawn of larger calibre than the lower folded portion, which has been drawn out to what would approximately correspond to the third position on the trombone lowering the pitch one tone. A single slide would require to be extended about twice the distance of the double or folded tube on the trombone to produce any given effect. This drawing of the sackbut must not be taken as showing the instrument in use in Crivelli's day; it is clearly retrospective, for sackbuts in a more advanced stage are not uncommon in works of art of the same century. In a MS.[6] preserved in the library of the Arsenal in Paris, executed for the dukes of Burgundy in the middle of the 15th century, is seen a trumpet of the cavalry type with a single straight slide drawn out so far that the bell rests on the performer's foot (fig. 3).

The last transition immediately preceding the change into the trombone consisted in folding the tube to form two U-shaped bends, one of which pointed downwards and the other over the shoulder, reaching to the level of the back of the head; the third branch was bent over between the other two, but in a plane almost at right angles above them, the bell extending downwards beyond the first bend. Sackbuts of this type are to be seen in Dürer's picture in the Nuremberg town hall, and in others by artists of the 15th century, as, for instance, in Gentile Bellini's *Processione in piazza S. Marco* among the band to the right of the picture.

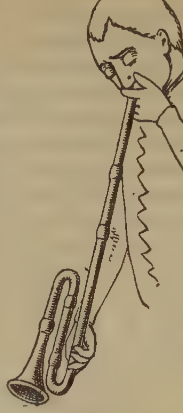

FIG. 2.

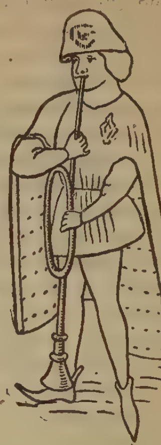

FIG. 3.

The further history and development of the sackbut are given under TROMBONE. See also TRUMPET and BUCCINA. (K. S.)

SACKETT'S HARBOR, a village in Jefferson county, New York, U.S.A., at the eastern end of Lake Ontario, on the south shore of Black River Bay, about 1 m. from its mouth, and about 10 m. W. by S. of Watertown. Pop. (1890) 787; (1900) 1266; (1905) 903; (1910) 868. Sackett's Harbor is served by the New York Central & Hudson River railway. It is built on low land, around a small, nearly enclosed harbour, the northern shore of which is formed by Navy Point, a narrow tongue of land extending about $\frac{1}{4}$ m. nearly due eastward from the mainland. About 1 m. to the W. by S. is Horse Island, approximately $\frac{1}{4}$ m. long (east and west), and nearly as broad, only a few feet above the lake level and separated from the mainland by a narrow strait, always fordable, and sometimes almost dry; at its eastern end is Sackett's Harbor Lighthouse. The harbour is deep enough for the largest lake vessels. The village is a summer resort. At Sackett's Harbor are Madison Barracks, a United States military post, established in 1813 and including a reservation of 99 acres; and a United States Naval Station. In the post cemetery is the grave of General Zebulon M. Pike, who was killed at York (now Toronto) on the 27th of April 1813.

The first settlement was made in 1801 by Augustus Sackett, and the village was incorporated in 1821. In the War of 1812 Sackett's Harbor was an important strategic point for the Americans, who had here a naval station, Fort Tompkins, at the base of Navy Point, and Fort Volunteer, on the eastern side of the harbour. In July 1812 a British squadron unsuccessfully attempted to capture a brig and schooner in the harbour. From Sackett's Harbor American expeditions against York (now Toronto) and Fort George respectively set out in April and May 1813; though scantily garrisoned it was successfully defended by General Jacob Brown (who had just taken command) against an attack, on the 29th of May, of Sir George Prevost with a squadron under Sir James Lucas Yeo. The British losses were 259; the American 157, including Lieut.-Colonel Electus Backus, commander of the garrison before General Brown's arrival. Almost all the American stores at the naval station were destroyed to save them from the enemy. The blockade of the harbour by Yeo was abandoned in June 1814 after the defeat of a force from the squadron sent out to capture guns which were being brought from Oswego to Sackett's Harbor to equip the "Superior," an American vessel launched on the 1st of May, and a smaller vessel nearly completed. Sackett's Harbor was the starting-point of a force of 700 men under a Pole named von Schultz, who in November 1838, during the uprising in Upper Canada (Ontario) attempted to invade Canada, was taken prisoner near Prescott, was tried at Kingston, being defended by Sir John Macdonald, and with nine of his followers was executed in Kingston in December.

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[1] See W. H. Black, Sir N. H. Nicolas, etc., *Excerpta historica* (London, 1833), p. 102.

[2] This question has been thoroughly investigated by the late Professor George Case in his work on the trombone.

[3] See Felipe Pedrell, *Organographia musical. antigua española*, p. 116.

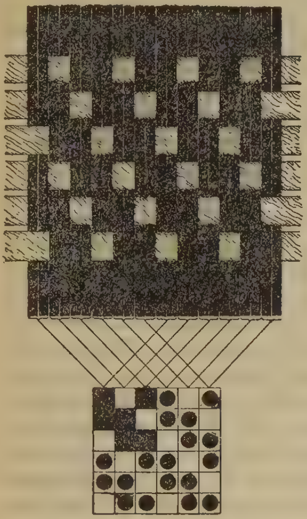
[4] Illustration in Du Sommerard, *Les Arts au moyen âge*, Atlas, pl. i. ch. xii.

[5] See Hermann Julius Hermann, "Zur Gesch. d. Miniaturmalerei am Hofe der Este in Ferrara," in *Jahrb. d. Kunstsamml. d. allerhöchsten Kaiserhauses* (Vienna, 1900), bd. xxi. pl. xiii.

[6] Illustration in Du Sommerard, *op. cit.*, album, 4e série, pl. xvii.

See A. T. Mahan, *Sea-Power in its Relation to the War of 1812* (2 vols., Boston, 1905); and William Kingsford, *The History of Canada*, vol. viii. (Toronto, 1895).

SACKING AND SACK MANUFACTURE. Sacking is a heavy closely-woven fabric, originally made of flax, but now almost exclusively made of jute or of hemp. The more expensive kinds, such as are used for coal sacks for government and other vessels, are made of hemp, but the jute fibre is extensively used for the same purpose, and almost entirely for coal sacks for local house supplies. The same type of fabric is used for wool sacks, cement bags, ore bags, pea sacks and for any heavy substance; it is also made up into a special form of bag for packing cops and rolls of jute and flax yarns for delivery from spinners to manufacturers. Proper sacking is essentially a twilled fabric, in which the number of warp threads per inch greatly exceeds the number per inch of weft. The illustration shows a typical kind of three-leaf twill, double warp sacking. All three-leaf twill sackings are double in the warp, but four-leaf sackings are single. They are usually 27 in. wide, but other widths are made.



The lower part of the illustration shows four repeats of the three-leaf twill, while the lines drawn to the plan of the fabric show that each line of the design is reproduced in the cloth by two warp threads. The weft is single, but each one is usually about four times the weight of the warp for the same length (about 8 ℔ warp and 32 ℔ weft). Large quantities of cotton sacks are made for flour, sugar and similar produce: these sacks are usually plain cloth, some woven circular in the loom, others made from the piece.

Large quantities of seamless bags or sacks for light substances are woven in the loom, but these are almost invariably made with what is termed the double plain weave, *i.e.* the cloth, although circular except at the end, is perfectly plain on both sides. Circular bags have been made both with three-leaf and four-leaf twills, but it is found much more convenient and economical to make the cloth for these kinds, and in most cases for all other types, in the piece, and then to make it up into sacks by one or other of the many types of sewing machines. The pieces are first cut up into definite lengths by special machinery, which may be perfectly automatic, or semi-automatic—usually the latter, as many thicknesses may be cut at the same time, each of the exact length. The lengths of cloth are then separately doubled up, the sides sewn by special sewing machines of the Laing or Union make (of which there are seven or eight different kinds for different types of bags), and the ends hemmed. It will thus be seen that the length required is twice the length of the sack plus the amount for hemming the mouth.

The sack is now ready for delivery, unless the name of the owner, some trade mark, or other particulars are required to appear on it. These particulars are printed on in one or more colours by the Kinmond and Kidd patent multicolour sack-printing machine.

The chief centres for these goods are Dundee and Calcutta, all varieties of sacks and bags being made in and around the former city. (T. Wo.)

SACKVILLE, GEORGE, 1st Viscount (1716–1785), generally remembered as Lord George Sackville or Lord George Germain, third son of Lionel Cranfield Sackville, 1st duke of Dorset, was born on the 26th of January 1716. Educated at Westminster School and Trinity College, Dublin, he was gazetted captain in the 7th Cathcart's Horse (now 6th Dragoon Guards) in 1737, and three years later was transferred to Bragg's regiment of foot (Gloucestershire Regiment) as lieutenant-colonel; immediately afterwards the regiment sailed for active service on the Rhine, and although it was not present at the battle of Dettingen, its lieutenant-colonel was made brevet colonel and aide-de-camp to the king. It was not until two years later that Sackville took part in his first battle, Fontenoy. Wounded in the charge of Cumberland's infantry column, he was taken to the tent of King Louis XV. to have his wound dressed. Released, by what means does not appear, he was sent home to serve against the Pretender in Scotland. He was given the colonelcy of the 20th (Lancashire Fusiliers), but was too late to take part in the battle of Culloden. In 1747–1748 he was again with the duke of Cumberland in the Low Countries, and in 1749 was transferred to the cavalry, receiving the colonelcy of the 7th (3rd) Irish Horse (Carabineers). With this office he combined those of first secretary to his father, the lord-lieutenant of Ireland, and Irish secretary of war, and a seat in each of the two Houses of Commons at Westminster and Dublin, winning at the same time the repute of being "the gayest man in Ireland except his father." In 1755 he was promoted major-general, took an English command, and vacated his Irish offices. In 1757 he was made lieutenant-general of the ordnance, and transferred to a fourth colonelcy. In 1758, under the duke of Marlborough, he shared in the ineffective raid on Cancale Bay, and the troops, after a short sojourn in the Isle of Wight, were sent to join the allied army of Duke Ferdinand of Brunswick in Germany. Marlborough died shortly after they landed, and Sackville succeeded him as commander-in-chief of the British contingent. But no sooner had he taken over the command than his haughty and domineering temper estranged him both from his second-in-command, Lord Granby, and the commander-in-chief, Prince Ferdinand. This culminated on the day of Minden (August 1, 1758). The British infantry, aided by some of the Hanoverians, had won a brilliant success, and every man in the army looked to the British cavalry to charge and to make it a decisive victory. But Sackville, in spite of repeated orders from Prince Ferdinand, sullenly refused to allow Granby's squadrons to advance. The crisis passed, and the victory remained an indecisive success. Popular indignation was unbounded, and Sackville was dismissed from his offices. But his courage, though impugned, was sufficient to make him press for a court-martial, and a court at last assembled in 1760. This pronounced him guilty of disobedience, and adjudged him "unfit to serve his Majesty in any military capacity whatsoever." The sentence was executed with gratuitous harshness. It was read out on parade to every regiment in the service, with a homily attached, and placed on record in every regimental order book. Further, it was announced in the Gazette that his Majesty had expunged Sackville's name from the roll of the Privy Council. This, and Sackville's own dogged perseverance, turned the scale in his favour. No reverses to the British arms occurred to keep alive the memory of his lost opportunity, and in 1763 his name was restored to the list of the Privy Council. Hitherto without party ties in parliament, in 1769 he allied himself with Lord North. To this period belong the famous Junius Letters, with the authorship of which Sackville was erroneously credited. In 1770, under the terms of a will, he assumed the name of Germain. In the same year his coolness and courage in a duel with Captain George Johnstone, M.P., assisted to rehabilitate him, and in 1775, having meantime taken an active part in politics, he became secretary of state for the colonies in the North cabinet. Thus, though still standing condemned as unfit for any military employment, he exercised a powerful and unfortunate influence on the military affairs of the nation. Some of the business of the war department in those days fell to the colonial office, and Germain was practically the director of the war for the suppression of the revolt in the American colonies. What hopes of success there were in such a struggle Germain and the North cabinet dissipated by their misunderstanding of the situation and their friction with the generals and the army in the theatre of war. But this failure was not on the same footing as that of Minden, and in spite of virulent party attacks, King George III., on the resignation of the North ministry, offered him a peerage. Sackville, in characteristic fashion, stipulated for a viscounty, as otherwise he would be junior to his secretary, his lawyer and to Amherst, who had been page to his father. There was some opposition to his taking his seat in the House of Lords. But his health was failing and he withdrew from politics, spending his last years as a benevolent and autocratic country magnate. He died at

Stoneland Lodge (Buckhurst Park), Sussex, on the 26th of August 1785.

SACKVILLE, MORTIMER SACKVILLE-WEST, 1st Baron (1820–1888), was descended from Sir Richard Sackville, a Kentish gentleman, and a cousin of Ann Boleyn. A member of parliament and courtier under Henry VIII., Richard Sackville became chancellor of the court of augmentations in 1548 and was knighted in 1549. He amassed a great deal of wealth, and Sir Robert Naunton said his name should be "fill-sack," rather than "Sack-ville." He was on friendly terms with Roger Ascham, whom he advised to write his *Scholemaster*. In 1604 his son Thomas was created earl of Dorset, and from him the earls and dukes of Dorset (*q.v.*) of the Sackville family were descended.

Mortimer Sackville-West was a younger son of George John Sackville-West, 5th Earl de la Warr (See de la Warr): his mother, Elizabeth, Baroness Buckhurst, being a daughter of John Frederick Sackville, 3rd duke of Dorset. When in 1873 his elder brother, Reginald Windsor, became 7th Earl de la Warr, Mortimer succeeded by arrangement to the extensive estates of the Sackvilles, including Knole Park, their beautiful Kentish residence, which had come to his family through his mother. In 1876 he was created Baron Sackville of Knole, and died on the 1st of October 1888.

His brother, Lionel Sackville-West (1827–1908), succeeded as 2nd baron. He had a long career in the diplomatic service. From 1872 to 1878 he was ambassador to the Argentine Republic; from 1878 to 1881 he represented his country at Madrid, and from 1881 to 1888 at Washington. His retirement was due to an unfortunate interference in American domestic politics, or what was taken as such, which caused some stir. He died in September 1908 and was succeeded by his nephew Lionel Edward (b. 1867) as 3rd baron. By a Spanish dancer, Josefa Duran de Ortega, known also as Pepita de Oliva, Mr Sackville-West, as the 2nd baron then was, had several children, and soon after his death one of these, calling himself Ernest Henri Jean Baptiste Sackville-West, claimed to be a lawful son and his father's heir. He asserted that between 1863 and 1867 Sackville-West had married his mother. The case came before the English courts of law in 1909–1910, and it was decided that the children of this union were all illegitimate, as Pepita's husband, Jean Antonio Gabriel de Oliva, was alive during the whole period of his wife's connexion with Sackville-West.

SACO, a city of York county, Maine, U.S.A., on the Saco river, and the Atlantic Ocean, opposite Biddeford, with which it is connected by bridges, and 14 m. S.W. of Portland. Pop. (1890), 6075; (1900) 6122 (903 foreign-born); (1910) 6583. It is served by the Boston & Maine railway, and is connected with Portland by an electric line. The actual municipal limits include an area of about 40 sq. m., but much of this is sparsely settled, and the centre of settlement, or city proper, is about 5 m. above the mouth of the Saco. The city has a public park (Pepperrell Park) of 30 acres, the Dyer Library (1790), containing in 1908 16,000 volumes, and York Institute (established in 1866 and incorporated in 1867), with a library of 5000 volumes in 1908; and is the seat of Thornton Academy (co-educational), incorporated in 1811, opened in 1813, but closed during 1848–1889 after the burning of the old building. Old Orchard Beach, in the vicinity, extending along the shore front of the township of Old Orchard (pop. in 1900, 964) and part of the shore fronts of Saco and Scarboro, is a popular summer resort; in August 1907 nearly all the hotels were burnt, but others have since been built. At Saco the river falls about 55 ft. and provides excellent water-power. The city's principal manufactures are cotton goods and cotton-mill machinery. Saco was settled as early as 1631, and was the seat of the Gorges government from 1636 to 1653, when it passed under the jurisdiction of Massachusetts. Until 1762 Saco and Biddeford formed one town or plantation—until 1718 under the name of Saco, and from 1718 to 1762 under the name of Biddeford. In 1716 Sir William Pepperrell acquired title to the principal part of what is now Saco, in 1752 this was made a separate parish, and ten years later it was incorporated as a separate township under the name of Pepperellboro. In 1779 the Pepperrell property was confiscated as that of a loyalist, and in 1805 the name of the township was changed to Saco. In 1867 Saco was chartered as a city.

SACRAMENT, in religion, a property or rite defined in the Anglican catechism as "an outward and visible sign of an inward and spiritual grace"; if the grace be allowed to be inherent in the external symbolic thing or act as well as in the faithful who receive or do it, this definition holds good not only for the Latin Church, but for more primitive religions as well. In the Greek Church the equivalent word is μυστήριον, a mystery, a usage which is explained below.

The Latin word *sacramentum* originally meant any bodily or sensible thing, or an action, or a form of words solemnly endowed with a meaning and purpose which in itself it has not. Thus the money deposited by each of two litigants in a sacred precinct or with a priest, was called a sacrament. The winner of the suit got back his deposit, but the loser forfeited his to the god or to the winning party. In Livy it signifies the oath (*q.v.*) which soldiers took among themselves not to run away or desert. Pliny uses it similarly of the oath by which the Christians of Bithynia bound themselves at their solemn meetings not to commit any act of wickedness. Tertullian (*c.* 160–240) uses it in both senses, of an oath, as in the passage of his treatise *About Spectacles*, where he says that no Christian "passes over to the enemy's camp without throwing away his arms, without abandoning the standards and sacraments of his chief." In the treatise *To the Nations*, i. 16, he speaks of "the sacraments of our religion," intending, it would appear, the love-feast and Eucharist. So in the *Apology*, ch. vii., he speaks of "the sacrament of infanticide and of the eating of a murdered child and of incest following the banquet," the crimes of which the Christians were commonly accused. In the work *Against Marcion*, iv. 34, he speaks of the sacrament of baptism and Eucharist. In the work against the Jews, ch. xi., he speaks of the letter *Tau* set in ink on the foreheads of the men of Jerusalem (Ezek. ix. 4), as "the sacrament of the sign," *i.e.* of the cross; and in chap. xiii. of the same work he dwells on the sacrament of the wood prefigured in 2 Kings vi. 6. The *stick* with which Elisha made the iron to swim in that passage, and the wood which Isaac carried up the mountain for his own pyre "were sacraments reserved for fulfilment in the time of Christ." In other words they were types, things which had a prophetic significance. In the same work, chap. x., he speaks of "the Sacrament of the Passion foreshadowed in prophecies." In his work *On the Soul*, chap. xviii., the aeons and genealogies of the Gnostics are "the sacraments of heretical ideas." In the work *About the Crown*, chap. iii., he describes how the faithful "take the sacrament of the Eucharist also in their meetings held before dawn." Elsewhere he speaks of "the sacraments of water, oil, bread." In the work *Against Valentinians*, chap. xxxix., he speaks of the "great sacrament of the name," here rendering the Greek word μυστήριον, mystery. In the tract *On Monogamy*, chap. xi., he speaks of "the sacrament of monogamy." Elsewhere he talks of the "sacrament of faith," and "of the Resurrection," and "of human salvation," and "of the Pascha," and "of unction," and "of the body of Christ." Later Latin fathers use the word with similar vagueness, *e.g.* Augustine speaks of the salt administered to catechumens before baptism and of their exorcism as sacraments; and as late as 1129 Godefrid so calls the salt and water, oil and chrism, the ring and pastoral staff used in ordinations. But by this time the tendency was in the West to restrict the sense of the word. Thus Isidore Hispalensis, *c.* 630, in his book of *Origins*, vi. 19, recognized as sacraments baptism and the chrism, and the Body and Blood, and he writes thus: "Under the screen of corporeal objects a divine virtue of the sacraments in question secretly brings about salvation; wherefore they are called sacraments from their secret or sacred virtues." Bernard (*In coen. Dom.* § 4, op. ii. 88) calls the rite of washing feet a sacrament, because without it we have no portion with Christ (John xiii. 8), and therefore it is necessary to salvation. Hugo de St Victor, *c.* 1120, in his work *On the*

Sacraments, distinguishes six, but of different grades of importance. The two principal ones necessary to salvation are baptism and the Eucharist; then come the water of aspersion and the wearing of cinders, and so forth; these advance a man in sanctity. Lastly come those needful to the hallowing and instituting of other sacraments, those which concern the conferring of orders or of monkish habit. In his *Summa* he declares that as there are seven chief sins, either original or of act, so there must be seven sacraments to remedy them; but he only enumerates six, namely baptism and the sacraments of confirmation, of the altar, of penance, last unction and matrimony. Peter Lombard (*c.* 1150) added as a seventh that of ordination, and to this number the Latin Church adhered at the councils of Florence and Trent. This enumeration was also adopted in 1575 as against the Augustan confession of the year 1540 by Jeremiah Patriarch of Constantinople, and again in a council held in the same city in 1639 to anathematize Cyril Lucar, who with the Anglicans recognized two only, baptism and the Eucharist. It is hardly fair on the strength of these two pronouncements to attribute the doctrine of seven sacraments to the Eastern churches in general; except under a sporadic Latin influence, they have not troubled themselves so to define their number.

In this article it is impossible to attempt a history of the sacraments and of the controversies which in every age have arisen about them. It is enough to formulate a few general considerations of a kind to orientate and guide inquirers. To begin with, it is obvious that the number of sacraments must vary according to the criterions we use of what constitutes a sacrament. The Anglicans recognize baptism and the Eucharist alone, under the impression that Christ ordained these and none other. The Latin doctors by arguments as good as those usually put forth in such controversies have no difficulty in proving that Christ instituted all seven. How, they argue, could Paul (1 Cor. iv. 1) call himself and others "*ministers* of Christ and *stewards* of the mysteries of God" unless the mysteries in question had been directly instituted by Christ. They contend even that extreme unction was so instituted, and that St James in his Epistle did but promulgate it. So Christ instituted confirmation *non exhibendo sed promittendo*, not by undergoing it and so setting it forth in His own person, but by promising to send the Paraclete. The sacrament of confession and penance He equally instituted when He assigned the power of the keys to the Apostles.

The Latin Church, following Gulielmus Antissiodorensis (*c.*1215), distinguishes in each sacrament the matter from the form. The matter is the sensible thing which in accordance with Christ's institution can be raised to a sacramental plane. It is, *e.g.* water with immersion in the case of baptism; bread and wine in the Eucharist; anointing and laying on of hands in confirmation; contrition in the sacrament of penance. The form consists of the words used in the rite, *e.g.* in penance, of the formula "I absolve thee"; in the Eucharist, of the words "This is my body" and "This is the cup of my blood" or "This is my blood"; in confirmation, of the words "I sign thee with sign of the cross and confirm thee with chrism of salvation in name of Father and Son and Holy Spirit"; in baptism, of the words "I baptize thee in the name of Father, Son and Holy Spirit (or among the Greeks "N. or M. is baptized in the name," &c.). Merely verbal change in these formulae made without prejudicing the sense does not invalidate the sacrament. On the part of the minister or priest officiating must be present also an inward intention or will to do what the Church does. Thus a drunkard's or a madman's sacraments would only be mockery, even though the recipients received them in good faith and devoutly. On the other hand, sanctity of life on the part of the minister is not necessary in order to the validity of the sacraments which he confers, although this was held to be the case by the Donatists in the 4th century, and following them by the Waldensians and Albigenses in the 12th, and by the followers of Hus and Wycliffe in the 14th. The latter enunciated the following rule: "If a bishop or priest be living in mortal sin, then he neither ordains, nor consecrates, nor baptizes." The Cathars even held it necessary, in case a bishop fell into mortal sin, to repeat his baptisms and ordinations, for they had been vitiated by his sins. On such points the Catholics followed the more sensible course.

Certain of the sacraments can obviously only be once conferred, *e.g.* baptism, confirmation and orders; but can be conditionally repeated, if there is a doubt of their having been validly conferred. In conditional baptism the Latins, since about the year 1227, use the formula, "If thou art not baptized, then do I baptize thee," &c. The Latins further insist on a strict observance of the traditional matter and form. Thus baptism is not valid if wine or ice be used instead of water, nor the Eucharist if water be consecrated in place of wine, nor confirmation unless the chrism has been blessed by a bishop; also olive oil must be used. The distinction, be it noted, of form and matter seems more appropriate to the sacraments of baptism, Eucharist, confirmation and last unction, than to those of orders, penance and matrimony. The recognition by the Church of the last-named as a sacrament was, in spite of the commendation uttered by Jesus (Mark x. 9), slow and arduous, owing to the encratite enthusiasms of the first generations of believers. In many regions baptism involved renunciation of married life, and for at least the first two hundred years marriage was a civil rite preceding baptism, which was deferred until the age of thirty or even later. Liturgical forms for consecrating marriage are of late development, and the Church took the institution under its protection through outside social pressure rather than of its own will and wish.

In any Latin pontifical or Greek euchologion we find numerous prayers for the consecration, not only of men, but of things. Here is an example of such a petition from the 9th century codex of Heribert, archbishop of Milan:[1] "Be thou graciously pleased by the infusion of the Holy Spirit to strengthen and enhance the substance, of old approved by thee, of this oil here before thee; to the end that whatsoever in the human kind hath been touched therewith may speedily pass to a higher nature, and that the ancient Enemy may not, after anointing with the same, claim aught for himself, but that he may grieve for that he is exposed to the shafts of this blessed engine of defence, and groan because by the oil of peace the swellings of his antique fury are kept down and repressed: through our Lord Jesus Christ," &c.

Or again the following prayer for baptism over the water from the Ethiopic Statutes of the Apostles as translated by the Rev. G. Horner (London, 1904, p. 165): "God, my Lord almighty, who madest heaven and earth . . . who mingledst and unitedst the immortal with the mortal, who madest living man a combination of the two, and gavest to that which was made body a soul also, which thou causest to dwell within: stir this water and fill it up with thy Holy Spirit, that it may become water and Spirit for regeneration to those who are to be baptized: work a holy work and make them to become sons and daughters of thy holy name."

Such petitions as the above are common in the more ancient of the Christian cults, and are all alike inspired by the idea that a spirit or divine virtue can be confined in material objects which are to be brought into contact with or swallowed by men and animals. The same idea pervades old medical treatises; for a drug was not a chemical substance taking effect naturally on the human system, but something into which a supernatural virtue had been magically introduced, in order the more easily and efficaciously to be brought to bear upon the patient. The spirits which take possession of man or animal can equally take possession of a material substance, and even replace the substance, leaving the outward accidents of colour, shape and size unchanged. This primitive belief, termed "animism" by E. B. Tylor, asserts itself everywhere in Christianity; and objects thus invested with spiritual or curative powers are called by the Latin doctors sacramentals. Thus in the *Theologia dogmatica*

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[1] *Monumenta veteris liturgiae Ambrosianae*, by M. Magistretti and A. Ceriani (Milan, 1897), p. 99.

et moralis of P. M. Belmont, bishop of Claremont (8th ed., Paris, 1899, vol. iii. p. 119) the following definition is given of *sacramentalia*: "Sacramentals are certain things or actions instituted or consecrated by the Church for the production of certain spiritual effects, and sometimes for the obtaining of a temporal effect."

Some of the older authorities, like Caietanus and Soto, taught that sacramentals as above defined have power to produce their effects *ex opere operato*, *i.e.* by their own inherent virtue; others that they produce them *ex opere operantis*, *i.e.* through the merit and disposition of the user. But in the latter case, argues M. Belmont, what is the use of the prayers offered up over the substances; and how account for the differences of effects which by the testimony of the faithful are respectively caused by water duly blessed and by water falsely blessed? If the mere state of mind of the person using the water determines the effect, then in the case of both kinds of benediction, the true and the false alike, it would be one and the same. He therefore inclines to the opinion that there is no inherent virtue in sacramentals, but that God is moved by the prayers uttered in their consecration to produce salutary effects in those who use them. Thus he avoids on the one side the *opus operatum* view, and on the other a merely receptionist position.

The consecration of material objects and in general their use in religion and cult was consistently avoided by the Manicheans; not because they failed to share the universal belief of earlier ages that spirits can be inducted by means of fitting prayers and incantations into inanimate things, but because the external material world was held to be the creation of an evil demiurge and so incapable of harbouring a pure spirit. The sacramentals of the great Church were denounced by them as vehicles of the evil one; and this class of prejudice was carried to such a length that some of them eschewed even baptism with water and the sacrament of bread and wine. That they retained the laying on of hands in their spiritual baptism was an inconsistency which their orthodox opponents did not fail to note; the human hand, argued the latter, is, like the rest of the body, no less the work of the evil creator than water, oil, bread and wine, or than the wood, metal and stone out of which altars, images and churches are made. Relics for the same reason were abhorred by the Manicheans; the Catholics defending them on the ground that the bodies of saints participate in a divine virtue and have a power of making men whole and working miracles in the same manner as had the cloak of Elijah (2 Kings ii. 14), or the corpse of Elisha (*ibid.* xiii. 21), the hem of Christ's garment (Matt. ix. 20), Peter's shadow (Acts v. 15), the handkerchiefs or aprons off Paul's body (*ibid.* xix. 12). The Manicheans' answer to such arguments was that miracles worked by Christ and the Apostles in the material world were only apparitional and not real, while those of the Old Testament were satanic.

It has been argued that the sacramental rites of the Christians were largely imitated from the pagan mysteries; but for the first two hundred years this is hardly true, except perhaps in the case of certain Gnostic sects whose leaders intentionally amalgamated the new faith with old pagan ideas and rites. It is true that Gentile converts carried over into the new religion many ideas and habits of cult contracted under the old; this was inevitable, for no one lightly changes his religious habits and categories. For long generations the doctors of the Church fought bravely against such an infusion of heathen customs; thus in Latin countries we find the rule to keep New Year's day as a fast, just because the pagans feasted on it, giving one another gifts (*strenae*, Fr. *étrennes*) and taking omens for the coming year. But in the 4th century this puritanic zeal gave way; and this and other pagan feasts were taken over by the Church; a century earlier in Asia Minor Gregory the Thaumaturge was actively transforming into shrines and cult of martyrs the temples and idolatrous rites of heroes and demigods. In proportion as such conversion was facile and rapid, it was probably imperfect.

That baptism is called the Seal (σφραγίς), and Illumination (φωτισμός) in the 2nd century has been set down to the influence of the pagan mysteries; but as a matter of fact the former term is a metaphor from military discipline, and the idea conveyed in the latter that *gnosis* or imparting of divine love is an illumining of the soul is found both in the Old and New Testaments. Nor because the pagans regarded the close meetings of the Christians usually held in private houses as mysteries in which incest and cannibalism were rife, does it follow that the Christians themselves accepted the comparison. On the contrary, as a thousand passages in the earlier apologists attest, they viewed the pagan mysteries with horror and detestation. Nor were they so solicitous, as it is pretended, to conceal from the authorities what they did and said in their liturgical meetings. The Christians[1] of Bithynia were evidently quite frank about them to Pliny (*c.* 112), and Justin in his Apology reveals everything to a pagan emperor (*c.* 150). That catechumens could not participate in the *agapē* or love-feast (of which in this epoch the Eucharist was merely an episode) does not give to those feasts the character of a Greek mystery. The uncircumcized proselyte was similarly excluded from the Paschal meal on which the Eucharist was largely modelled, even though it may not have been in any way a continuation of the same. Baptism and the agapé took their rise in Palestine, and in their origin certainly owed little or nothing to outside influences. For both there can be found Jewish models, if necessary. The sacred feasts of the Essenes and Therapeutae in particular, as described by Josephus and Philo, closely resembled the Eucharistic agapé.

Undeniably Clement of Alexandria and Origen apply the language of the Greek mysteries to Christian *gnōsis* and life. "These are," says Clement, "divine mysteries, hidden from most and revealed to the few who can receive them." And Origen compares them to the sacred vessels, and would have them "guarded secretly behind the veil of the conscience and not lightly produced before the public." He who so produces them "dances out the word of the true philosophy,"—a technical description of the profanation of the mysteries. It is not even safe, according to these two fathers, to commit too much to writing; and Clement undertakes not to reveal in writing many secrets known to the initiated among his readers; otherwise the indiscreet eye of the heathen may rest on them, and he will have cast his pearls before swine. But we may discount most such talk in these writers as bellettristic pedantry, copied as a rule from Philo of Alexandria, their literary model. In the latter's description of the *Therapeutae* (ed. Mangey, ii. 475) we read how each ascetic had "in his house a room in which in solitude they celebrated the mysteries of the holy life, introducing nothing therein, either to drink or to eat, nor anything else necessary for the uses of the flesh." And in scores of other passages Philo dwells on "the ineffable mysteries" of Jewish faith and allegory. He even writes thus: "O ye initiated ones, with purified sense of hearing, shall ye accept in your souls these truly sacred mysteries, nor divulge them to any of the uninitiated. . . . I have been initiated by Moses the friend of God in the great mysteries." But because he uses the language of the Greek mysteries, Philo never imitated the thing itself; and he is ever ready to denounce it in the bitterest terms. Clement and Origen really meant no more than he. At a later period, however, the difficulty of screening the rites of baptism and Eucharist from the eyes of catechumens and from their ears the creeds and liturgies—a difficulty which had ever been formidable and which after the overthrow of paganism must have become insurmountable—seems to have provoked not only a great outpouring on the part of the Christian rhetors, like Basil, Chrysostom, the Gregories and the Cyrils, of phrases borrowed from the Greek mysteries, but perhaps an actual use of precautions. Thus the bishop of Rome, Julius (*c.* 340), complained (Athanasius, *Apol. cont. Arian.* 31, Migne 25, 300) that a court of law had not been cleared of catechumens, Jews and pagans, in a case where the legal discussion introduced the topic of the table of Christ; and the preachers of the 4th and

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[1] Perhaps, however, Pliny refers only to the renegades among them.

5th centuries in their discourses often make a point of not citing the creed or describing the Eucharist; they stop short and ejaculate such remarks as *ἴσασιν οἱ πιστοί*, *norunt fideles* ("the faithful know it"). Such was the *Disciplina arcani*. All will admit who study the post-Nicene Church, that the Christian sacraments have stolen the clothes of the pagan mysteries, dethroned and forbidden by the Christian emperors. The catechumenate, an old institution, older in most regions than the mysteries themselves, suggested and rendered feasible such wholesale theft, especially in an age in which the sacerdotal class wished to be pre-eminent, and left nothing undone to enhance in the eyes of the multitude the importance and solemnity of rites which it was their prerogative to administer. The disappearance, too, of the pagan mysteries must have left a void in many hearts, and the clerics tried to fill it up by themselves masquerading as hierophants.

In the age of the Council of Nice the custom arose of baptizing children of three, because at that age they can already talk and utter the baptismal vows and responses. Not a few homilies of that age survive, denouncing the deferring of baptism, and urging on parents the duty of initiating their young children. Thus there is much evidence to show that long before A.D. 500 child baptism was in vogue. But in that case how can the creed and ritual of baptism, the Lord's Prayer and the Eucharistic formulae, have been kept secret? How can they have been the "awful mysteries," the "dread and terrible canons," the "mystic teachings," the "ineffable sentences," the "oracles too sacred to be committed to writing" which the homilists of that age pretend them to have been? Could our modern freemasons continue to hide their watchwords and ritual, or even make a pretence of doing so, if they were constrained by public opinion to initiate every child three years of age? The thing is absurd. When, therefore, we find such phrases in Greek and Latin homilies of the period of 350 to 550 we must regard them as elaborate make-believe. Because catechumens as well as the faithful were present at the sermons, the preachers thought it becoming to throw them in; but the audience must have been aware that their secrets were open ones.

LITERATURE.—*Theologia dogmatica et moralis ad mentem S. Thomae Aquinatis et S. Alphonsi de Ligorio* (6 vols., Paris, 1899); Gustav Anrich, *Das antike Mysterienwesen* (Göttingen, 1894); L. Duchesne, *Origines du culte chrétien* (Paris, 1898); Joseph Bingham, *Origines ecclesiasticae* (London, 1834); Adolf Harnack, *Dogmengeschichte* (Freiburg, 1897). (F. C. C.)

SACRAMENTALS (*Sacramentalia*), in the Roman Catholic Church certain acts or ordinances instituted not by Christ, but by the Catholic Church with divine authority. They are believed, in their application to persons and things, to communicate *quasi ex opere operato* through ordained priests the grace of God, consisting in purification, supernatural revivification and sanctification. The term is thus used to cover the rites of dedication, consecration and benediction, and, closely connected with the last-named, exorcism.

SACRAMENTARIANS, the name given to those who during the Reformation controversies not only denied the Roman Catholic "transubstantiation," but also the Lutheran "consubstantiation." They comprised two parties: (1) the followers of Capito, Carlstadt and Bucer, who at the diet of Augsburg presented the *Confessio Tetrapolitana* from Strassburg, Constance, Lindau and Memmingen; (2) the followers of the Swiss reformer Zwingli, who to the same diet presented his private confession of faith. The doctrinal standpoint was the same—an admission of a spiritual presence of Christ which the devout soul can receive and enjoy, but a total rejection of any physical or corporeal presence. After holding their own view for some years the four cities accepted the Confession of Augsburg, and were merged in the general body of Lutherans; but Zwingli's position was incorporated in the Helvetic Confession. It is a curious inversion of terms that in recent years has led to the name Sacramentarians being applied to those who hold a high or extreme view of the efficacy of the sacraments.

SACRAMENTO, the capital of California, U.S.A., and the county-seat of Sacramento county, 91 m. (by rail) N.E. of San Francisco, on the eastern bank of the Sacramento river, about 61 m. above its mouth, at the point where it is joined by the American. Pop. (1850) 6820, (1890) 26,386, (1900) 29,282, of whom 6723 were foreign-born (1371 Germans, 1293 Irish, 964 Chinese, 655 English, 446 English Canadian and 337 Japanese) and 402 were negroes, (1910, census) 44,696. Land area (1906) 4·49 sq. m. Sacramento is on the direct eastward line to Ogden, Utah, of the Southern (once the Central) Pacific railway (which has its main shops here), the starting point of the Southern Pacific line to Portland, Oregon, the terminus of several shorter branches of the Southern Pacific and on the Western Pacific, which has repair shops here, and it is served by interurban electric railways connecting with places in the Sacramento and San Joaquin valleys. The city is about 200 m. below Red Bluff, the head of river navigation for boats drawing 2 or 2½ ft. of water; for boats drawing 4 to 5 ft. Colusa, 91 m. above Sacramento, is the head of navigation; at low water, vessels drawing 7 ft. of water go up the river to Sacramento. There are two daily steamer lines to San Francisco, besides freight lines.

The city site is level (formerly in many parts 5 ft. below flood-level of the river) and is about 30 ft. above sea-level, and the street plan is rectangular. The business quarter has been filled in, and levees have been built along the Sacramento and American rivers. The climate is mild: the average annual temperature is 60·5° F.; average for winter months, 48·3°; for spring, 59·5°; for summer, 71·7°; for autumn, 61·5°; average rainfall, 19·94 in.; average number of clear days *per annum*, 244. The principal buildings are: a very fine state capitol (cornerstone laid, 1860; completed, 1874) in a wooded park of 35 acres, in which is an Insectary where parasites of injurious insects are propagated; Roman Catholic and Protestant Episcopal cathedrals; the county court-house; the city hall; the public library (in 1908, 41,400 volumes); and the Crocker Art Gallery, which was presented to the city by the widow of Judge E. B. Crocker, one of the founders of the Central Pacific, with an art school and an exhibit of the minerals of the state. There is a state library of 140,000 volumes in the capitol; connected with it are travelling libraries sent out through the rural districts of the state. In Sacramento are the large state printing establishment, in which, in addition to other books and documents, text-books for the entire state school system are printed; the College of the Christian Brothers, Howe's Academy, Atkinson's Business College, St Joseph's Academy, the Stanford-Lathrop Memorial Home for Friendless Girls (1900), under the Sisters of Mercy, two other orphanages, the Southern Pacific Railway Hospital (1868), the Mater Misericordiae Hospital (1895, Sisters of Mercy), Wentworth Hospital, a City Receiving Hospital (1884), the Marguerite Home (for old ladies), the Mater Misericordiae Home (1895, Sisters of Mercy) and the Peniel Rescue Home (1899). Just outside the city limits is the State Agricultural Pavilion, with race track and live-stock exhibition grounds (where the State Agricultural Society holds its annual "State Exposition" in September).

The city has a large wholesale trade. Its prosperity rests upon that of the splendid Sacramento Valley, a country of grain and fruit farms, along whose eastern side lie the gold-producing counties of the state. It is the centre of the greatest deciduous fruit region of California, and shipped about 11,000 car-loads east of the Rocky Mountains in 1909. Sacramento derives electric power from Folsom, on the American river, 22 m. away, and from Colgate, on the Yuba river, 119 m. distant. The manufacturing interests of the city are large and varied: the city's manufactures include flour (1905, value $1,172,747), lumber, distilled liquors, canned and preserved vegetables and fruits, packed meats, cigars and harness. In 1905 the total value of the factory product was $10,319,416. In 1909 the assessed valuation of the city was about $30,400,000, and the bonded indebtedness about $1,100,000. The city owns its own water system, which has a capacity of 22 million gallons daily, and is a financial success.

In 1839 John Augustus Sutter (1803–1880), a Swiss military officer, was allowed to erect a fort on the then frontier of California, on the present site of Sacramento. He became a Mexican official (1840), and in 1841 obtained from the Mexican government a grant of 11 square leagues of land. Sutter's fort, or "New Helvetia" (a reproduction of which, with a historical museum, in Fort Sutter Park, is one of the objects of interest in the city), was on the direct line of overland immigration from the East, and its position—purposely selected by Sutter with a view to freedom of interference from Mexican officials—made Sutter a man of great importance in the last years of the Mexican régime. After the discovery of gold in 1848, made on Sutter's land, near the present Coloma, about 45 m. E.N.E. of Sacramento, several rival towns were started on Sutter's property near the fort. Of these fortune finally favoured Sacramento—a name already frequently applied to the fort, and adopted for the name of the settlement about its embarcadero or river landing in 1848. The first sale of town lots was in January 1849. Here began the determined movement for the organization of a state government. The extraordinary richness of the placer mines of '49 caused the city to grow with wonderful rapidity. In October 1849 its population was probably 2000, in December 4000 and a year later 10,000. Trouble with land "squatters" almost led to local war in 1850. In 1849 the city offered $1,000,000 for the honour of being the state capital, which it finally secured in February 1854 (the legislature having already met here once in 1851). Between November 1849 and January 1853 the city was thrice devastated by fearful floods, and it was two-thirds destroyed by fire in November 1852; but though these misfortunes caused a collapse of inflated realty values they did not seriously cripple the city in its development. A city government was organized in August 1849, and in February 1850 this government was incorporated, and in 1863 reincorporated; the city and county governments were consolidated from 1858 to 1863; and a new city charter was received in 1893, coming into effect in 1894. The first local steam railway of California was opened from Sacramento in 1855, and here in 1863 was begun the building of the Central Pacific railway across the Sierras, the first train from the Atlantic coast reaching Sacramento in May 1869. In 1862 there was another flood, the most destructive in the history of the city; since then the measures taken for protection have secured safety from the river. The government of the city in the 'fifties was excessively corrupt and expensive. Progress since the end of the flush mining days has been steady and conservative.

SACRARIUM, the term in classic architecture given to the cella of a temple, and to the apartment in a dwelling-house which was sacred to a deity. In medieval architecture the term is applied on the European continent to that portion of a chancel, which, enclosed with a railing or balustrade in front of the altar, is devoted to the celebration of the Holy Eucharist; this in England is generally known as the presbytery.

SACRED HEART. Devotion to the Sacred Heart of Jesus is a cult peculiar to the modern Roman Catholic Church. The principal object of this devotion is the Saviour Himself. The secondary and partial object is that Heart which was the seat or organ of His love, and which forms the natural symbol thereof. Heart and love are viewed, not physiologically, but in their moral connexion. The chief liturgical expressions of this cult are the institution of a feast of the Sacred Heart and public representations of it by statues and pictures.

Private worship of Christ's heart in particular is of great antiquity in the Church, and is prominent in St Gertrude and other mystics. It was greatly stimulated in the 17th century by St Francis of Sales (*q.v.*) who gave this symbol to his Order (the Visitation) as its badge. The Venerable Fr. Eudes must also be mentioned as a great propagator of the devotion, in the same century, and he was the first to obtain a certain public, though only local, authorization of the new pious practices. Blessed Margaret Mary Alacoque (1647–1690), a Visitation nun of Paray-le-Monial, assisted by her director, the Venerable Claude de la Colombière, S.J. (1641–1682), was the instrument of the introduction of the specific worship of the Sacred Heart into the Church by a decision of the supreme authority, although their work only took effect long after their death. Mary of Modena, the exiled queen of James II., at the instance of the Visitation, petitioned in 1697 for a proper Feast of the Sacred Heart. Neither then, however, nor on the presentation of new petitions in 1726, was an affirmative answer obtained. Meanwhile the chief objection, that of "novelty," was gradually removed by the multiplication of local manifestations, the genuineness of which was proved to the satisfaction of the Roman Congregation of Rights, and in 1765 it was allowed for houses of the Visitation and certain countries. It must be added that this devotion was strongly opposed, not only by the Jansenists, but by others within the Church, under the mistaken idea that the Heart of Christ was viewed in it as separate from the rest of His Being. The formulation of this objection by the synod of Pistoia,[1] in 1786, however, only provoked a clearer explanation of the doctrine, which contributed to confirm the cult. In 1856 Pius IX. introduced the feast into the general calendar of the Roman Catholic Church, fixing the Friday after the Octave of Corpus Christi for its celebration. The Beatification of Blessed M.M. Alacoque in 1864 gave a new impetus to the cause of which she had been the apostle.

See Nic. Nilles, S.J., *De rationibus festorum SS. Cordis Jesu*, &c. (3rd ed., Innsbruck, 1873); E. Letrierce, S.J., *Études sur le Sacré Cœur et la Visitation* (Paris, 1890). These two works contain bibliographical lists. Dalgairns, *The Devotion to the Heart of Jesus* (1853); H. E. Manning, *The Glories of the Sacred Heart* (1876); Jos. Nix, *Cultus SS. Cordis Jesu . . . cum additamento de cultu purissimi cordis B.V. Mariae* (2nd ed., Freiburg-i.-B., 1891). (H. B. M.)

SACRIFICE (from Lat. *sacrificium; sacer*, holy, and *facere*, to make), the ritual destruction of an object, or, more commonly, the slaughter of a victim by effusion of blood, suffocation, fire or other means. While the Hebrew for sacrifice, זבח, makes the killing of the victim the central feature of the ceremony, the Latin word brings out the fact that an act of sacralization (see TABOO) is an essential element in many cases. The sacrifice of desacralization is, however, also found; hence MM. Hubert and Mauss describe a sacrifice as "a religious act, which, by the consecration of a victim, modifies the moral state of the sacrificer or of certain material objects which he has in view," *i.e.* it either confers sanctity or removes it and its analogue, impurity. It is, in fact, "a procedure whereby communication is established between the sacred and profane spheres by a victim, that is to say by an object destroyed in the course of the ceremony." By this definition the term sacrifice is extended to cover the inanimate offering which is consumed by fire, broken or otherwise rendered useless for the purpose of human life.

Theories of Sacrifice.—Explanations of sacrifice, as of other rites, are naturally not wanting among the peoples who have practised or still practise it; but they are often of the nature of aetiological myths and give no clue to the original meaning. Scientific theories date from the second half of the last century, and were originated in the first instance by the English anthropological school.

(*a*) According to the view put forward by Dr Tylor, the sacrifice is originally a gift, offered to supernatural beings by man for the purpose of securing their favour or minimizing their hostility. By a natural series of transitions the gift theory became transformed, in the minds of the sacrificers, into the homage theory, which again passed by an easy transition into the renunciation theory. These were, in fact, simply the popular theories of sacrifice put on an evidential basis by facts drawn from various stages of culture.

(*b*) With W. Robertson Smith, on the other hand, a new era was reached, in which the recently recognized existence of Totemism (*q.v.*) was made the basis of an attempt to give a theory of origins. The first form of his theory distinguishes (i.) honorific, (ii.) piacular and (iii.) mystical or sacramental sacrifices; but the latter type is traced back to the same cycle of ideas as that in which the piacular sacrifice originated. (i.) The essential feature of this type was that the god and his worshippers shared the sacrifice and might thus be regarded as commensals, or table companions. The human commensals were the totem-kin, whom Robertson Smith conceived to have been in the habit of sharing a common meal in daily life, or at least of not mixing with other kins. The object of sharing the meal with the god was to renew the blood bond. The victim was the animal of a hostile totem-kin or an animal commonly offered to the god. The god was originally a stranger, taken into the kin by a rite of blood brotherhood, and this constitutes the dark point of the theory; for Robertson Smith regards the blood bond as relatively late; hence we do not see how the god became associated with the kin. (ii.) The piacular sacrifice arose from the need of atoning for bloodshed within the kinship group; properly speaking, the culprit himself should suffer: should he be unknown or beyond the reach of vengeance, a substitute had to be found. This was naturally found in the non-human member of the totem-kin—the totem animal; in a sense, therefore, the god died for his people. (iii.) In the mystical sacrifice the god is himself slain and eaten by his worshippers. In the *Religion of the Semites* (2nd ed., 1894) the theory was remodelled so as to overcome the difficulty pointed out above. The god, the victim and the human group are regarded as of the same kin; the animal (totem) is the earlier form of the god; the deity was originally female, for under matrilineal rules the mother alone is of kin to her children, but, with the rise of descent in the male line, the god was transformed into a male. The sacrifice is in its origin a communion; god and worshippers have a bond of kinship between them; but it is liable to be interrupted or its strength diminished. Ceremonies of initiation are the means by which the alliance is established between the deity and the young man, when the latter enters upon the rights of manhood; and the supposed bond of kinship is thus regarded as an artificial union from the outset, so far as the individual is concerned, although Robertson Smith still maintains the theory of the fatherhood of the god, where it is a question of the origin of the totem-kin. From the communion sacrifice sprang the *piaculum*, which here becomes a subsidiary form and finds its full explanation in the ideas connected with the mystic union of god and worshippers. For the object of the *piaculum* is the re-establishment of the broken alliance, which was precisely that of the communion sacrifice. With the decline of totemism arose the need for human sacrifice—the only means of re-establishing the broken tie of kinship when the animal species was no longer akin to man.

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[1] Scipione de Ricci, bishop of Pistoia from 1780 to 1791, on the ex-Jesuits requesting him to consecrate a bell dedicated to this object, issued a pastoral letter (3rd June 1784) in which he pointed out that the spirit of true religion was "far removed from fetichism," and warned his flock against "cardiolatry." This pastoral was subsequently in 1786 annexed to the resolutions passed by the reforming synod of Pistoia (*q.v.*), and was condemned with eighty-four other propositions by papal bull in 1794.—ED.

This theory of Robertson Smith's has been attacked from two sides. In the first place, L. Marillier (*Rev. de l'hist. des religions*, xxxvi. 243) argues that if there was an original bond of kinship between the god and the kin, there is no need to maintain it by sacrificial rites, and cites against Smith's view the practice of totemic groups. To this it might be replied that the real significance of initiation ceremonies is still obscure; it is a plausible argument that the child does not form part of the kin till after initiation, but this argument seems inconclusive, for in West Australia there is solidarity, according to Grey (*Journals*, ii. 239), between the whole of the kinship group, whether adult or not; and, moreover, nowhere are rites found which are intended to strengthen the union between a man and his totem by means of the blood bond, unless we include the aberrant totemism of the Arunta (Spencer and Gillen, *Native Tribes of Central Australia*, 167), who eat their totems in order to gain magical powers of increasing the stock of the totem animal. Marillier further argues that if, on the other hand, there was no bond between god and people but that of the common meal, it does not appear that the god is a totem god; there is no reason why the animal should have been a totem; and in any case this idea of sacrifice can hardly have been anything but a slow growth and consequently not the origin of the practice. In the second place, MM. Hubert and Mauss point out that Robertson Smith is far from having established either the historical or the logical connexion between the common meal and the other types of sacrifice; the simplest Semitic forms known to us are the most recently recorded; further their simplicity may mean no more than documentary insufficiency, and in any case does not imply any priority; the *piaculum* is found side by side with the communion at all times. Moreover, under *piaculum* are confused purification, propitiations and expiations; Smith's contention that purifications, whose magical character he recognizes but interprets as late, are not sacrificial, is far from conclusive.

(*c*) Building in part on the foundation laid by Robertson Smith, Dr J. G. Frazer has put forward the view that while the sacrifice of the god may have been piacular, it was also intended to preserve his divine life against the inroads of old age. This theory he exemplifies by two orders of cases, (i.) the putting to death of the man-god, who is often also the king, on whose health is held to depend the safety of his people, of the world, or even of the universe; and (ii.) the annual killing of the representative of the spirit of vegetation or of the Corn-spirit (see DEMONOLOGY).

(*d*) For L. Marillier sacrifice was, at its origin, essentially a magical rite—the liberation by the effusion of a victim's blood of a magical force which was to bend the gods to the will of man; from this arose, under the influence of cult of the dead, the gift theory of sacrifice. Adopting the theory of W. R. Smith, Marillier also maintained, but without clearly explaining the relation of this part of his theory to the preceding, that a human kinship group conceived the idea of allying itself with one god in particular. This they did by sacrificing a victim and effecting communion with the god by the application of its blood to the altar; or, more directly, by the sacrifice of the animal-god and the contact of the sacrificer with its blood.

(*e*) Dr Westermarck takes the view that human sacrifice is as a rule an act of substitution, in that men offer a victim in the hope of saving themselves; but he also recognizes funeral sacrifices of various kinds. Certain sacrifices of animals he explains as intended to transfer a conditional curse.

(*f*) The preceding theories are attempts, in the main, to derive from one source all the forms of sacrifice. MM. Hubert and Mauss, while admitting that in all sacrifices is found some idea of purchase or substitution, decline to admit that all have issued from one primitive form. In their view, based on an analysis of Hebrew and Hindu forms of sacrifice, the unity of sacrifice consists in the immediate aim of the ritual, not in the ultimate end to be attained; for we rarely find a rite other than complex and by the same sacrifice more than one result may be sought or attained. The unity of procedure consists in the fact that every sacrifice involves putting the divine in communication with the profane by an intermediary—the victim—which may be piacular or honorific, a messenger or a means of divination, a means of alimenting the eternal life of the species or a source of magical energy which the rite diffuses over objects in its neighbourhood.

(*g*) Our knowledge of primitive forms of sacrifice is meagre; even were it more extensive, it would probably be impossible to determine the origin or origins of sacrifice; for no ritual has necessarily survived unchanged in form and meaning since its inception, and even permanence of form cannot be taken to imply a corresponding permanence of meaning for the worshippers. If, however, we turn to Australia, where sacrifice is unknown, we find more than one class of rites in which we can trace an idea akin to some forms of sacrifice. Just as the German reaper leaves the last ears of corn as an offering to Wodan, so the Australian black offers a portion of a find of honey; in New South Wales a pebble is said to have been offered or a number of spears, in Queensland the skin removed in forming the body-scars. Thus it appears that the gift theory may after all be primitive; the worship of, or care for, the dead may have supplied in other areas the motive for the transition from offering to sacrifice or the evolution may have been due to the spiritualization of the gods. In Australia, among the Hottentots, in the Malay Peninsula and elsewhere, blood ceremonies are in use which are unconnected with the slaughter of a victim; in this blood ritual we may see another possible source of sacrifice. The Arunta hold that the spirits of kangaroos are expelled by human blood from certain rocks. By parity of reasoning a blood ritual may have been adopted by peoples who practise the expulsion of evils, conceiving them either animistically or as powers; catharsis, in the sense of removal of uncleanness, is not necessarily primitive.

Principles of Classification.—It is possible to classify sacrifices according to (*a*) the occasion of the rite, (*b*) the end to be achieved, (*c*) the material object to be affected or (*d*) the form of the rite. (*a*) The division into periodical and occasional is important in Hindu and other higher religions, and the *sutras* constantly draw the distinction; the former class is obligatory, the latter facultative. In less developed creeds the difference tends to remain in the background; but where sacrifices are found, solemn annual rites, communal, purificatory or expiatory, are celebrated, and these are held to be in like manner obligatory. (*b*) The end to be achieved is, as has been shown by Hubert and Mauss, sometimes sacralization, sometimes desacralization. In the former case the sacrificer is raised to a higher level; he enters into closer communion with the gods. In the latter either some material object, not necessarily animate, is deprived of a portion of its sanctity and made fit for human use, or the sacrificer himself loses a portion of his sanctity or impurity. In the sacrifice of sacralization the sanctity passes from the victim to the object; in that of desacralization, from the object to the victim. (*c*) Sacrifices may be classified into (i.) subjective or personal, where the sacrificer himself gains or loses sanctity or impurity; (ii.) objective, where the current of *mana* (see TABOO) is directed upon some other person or object, and only a secondary effect is produced on the sacrificer himself. (*d*) The form of the sacrifice is discussed in the next section.

Ritual.—For Hinduism and later Judaism we possess a wealth of material on which to base a comparative study of the forms of sacrifice; a form of this—animal sacrifice in the Vedas—has been analysed by MM. Hubert and Mauss. For Greece and Rome, where the instructions as to ritual were not embodied in the elaborate codes handed down in Hinduism or Judaism, our material is far less complete. For other areas we have often no description of the procedure at all, but merely the briefest outline of the actual process of slaughter, and we are ignorant whether the form of the rite is in reality simple (either from a loss of primitive elements or from never having advanced beyond the stage at which we find it), or whether the absence of detail is due to the inattention or lack of interest of the observer. It must therefore be understood that the following analysis of ritual, based on the most elaborate codes known to us, is by no means conclusive as to the primitive form or forms of sacrifice. The necessary elements of a Hindu sacrifice are: (1) the *sacrificer*, who provides the victim, and is affected, directly or indirectly, by the sacrifice; he may or may not be identical with (2) the *officiant*, who performs the rite; we have further (3) the *place*, (4) the *instruments* of sacrifice and (5) the *victim*; where the sacrificer enjoys only the secondary results, the direct influence of the sacrifice is directed towards (6) the *object;* finally, we may distinguish (7) three *moments of the rite*—(*a*) the *entry*, (*b*) the *slaughter*, (*c*) the exit.

The sacrifices of sacralization and desacralization mentioned above find their analogues in the Hindu scheme of the rite; sacralization and desacralization, sometimes performed by means of subsidiary sacrifices, are the essential elements of the preparation for sacrifice and the subsequent lustration. In the most developed forms, such as the offering of *soma*, they assumed a great importance; (1) the sacrificer had to pass from the world of man into a world of the gods; consequently he was separated from the common herd of mankind and purified; he underwent ceremonies emblematic of rebirth and was then subject to numberless taboos imposed for the purpose of maintaining his ceremonial purity. In like manner (2) the officiant prepared himself for his task; but in his case the natural sanctity of the priest relieved him of the necessity of undergoing all that the common man had to pass through; in fact, this was one of the causes which brought him into existence, the other being the need of a functionary familiar with the ritual, who would avoid disastrous errors of procedure, destructive of the efficacy of the sacrifice. (3) Where there was an appointed place of sacrifice—the Temple at Jerusalem, according to later Jewish prescription—there was no need of preparation of a place of sacrifice; but the Hindu chose, each for himself, the site of his altar. (4) The necessary rites included (*a*) the establishment of the fires, friction being the only permitted method of kindling it, (*b*) the tracing on the ground of the *vedi*, or magical circle, to destroy impurities, (*c*) the digging of the hole which constituted the real altar, (*d*) the preparation of the post which represented the sacrificer and to which the victim was tied, and other minor details. (5) The victim might be naturally sacred or might have to undergo sanctification. In the former case (*a*) individual animals might be distinguished by certain marks, or (*b*) the whole species might be allied to the god; in the latter case the victim had to be without blemish; (*c*) the age, colour or sex of the victim might differ according to the purpose of the sacrifice. It was first cleansed; then plied with laudatory epithets; and, thirdly, soothed, so that it might be more acceptable to the gods and less likely to do an injury after its death, when its spirit was set free. It had now reached a degree of sanctity and only the priest might touch it; it was sprinkled with water, and anointed with butter; finally, the priest made three turns round it with a lighted torch in his hand, which finally separated it from the world and fitted it for its high purpose. The object of the sacrifice being to bridge the gulf between the sacred and profane worlds, the sacrificer had to remain in contact with the victim, either personally, or, to avoid ritual perils, by the intermediary of the priest. After excuses made to the animal or to the species in general, the victim was placed in position, and silence observed by all who were present. The cord was drawn tight and the victim ceased to breathe; its spirit passed into the world of the gods. But this did not conclude the ceremony, even as far as the victim was concerned; it remained to dispose of the corpse. After a rite intended to secure its perfect ceremonial purity, a part of the victim, the *vapā*, was removed, held over the fire and finally cast into it. The remainder, divided into eighteen portions, was cooked; seven fell to the sacrificer, after an invocation, which made them sacred by calling the deity to descend into the offering and thus sanctify the sacrificer. (6) Then followed the rites of desacralization, including burning of certain of the instruments, lustration of the post, destruction of the butter, &c. Finally the priest, the sacrificer and his wife performed a lustration, found in an exaggerated form in the "bath" which concluded the *soma* sacrifice, and the ceremonies were at an end.

How far this scheme of sacrifice holds good for other areas, and in particular for more primitive peoples, is an open question. Our data are nowhere so full as for India; where they are comparatively abundant they refer either to a civilized or semi-civilized people, or to an area, like West Africa, where the influence of Islam has introduced a disturbing element. Though the moralization of gods has only proceeded *pari passu* with the moralization of mankind, the deities of the more advanced nations are perhaps felt by them to be more terrible and more difficult of access than the divinities of lower races; herein lies one explanation of the power of the priesthood. Even if the conception of the relative sanctity of gods and men remained unaltered, it by no means follows that in primitive times the same precautions were necessary in approaching the former as were demanded by the consciousness of later generations. With our present knowledge the problem of the original form of sacrifice, if there be a single primary form, is insoluble.

No general survey of sacrificial ritual is possible here, but a few details as to the mode of slaying the victim and disposing of the body may be given. The head of the animal or man may be cut off (and custom often requires that a single blow shall suffice), its spine broken or its heart torn out; it may be stoned, beaten to death or shot, torn in pieces, drowned or buried, burned to death or hung, thrown down a precipice, strangled or squeezed to death. The sacrificer may aim at causing a speedy death or a slow one. The corpse may be burnt, in part or as a whole; portions may be assigned to the priest, the sacrificer and the gods; the skull, bones, &c., may receive special treatment; the fat or blood may be set aside, and they or the ashes may be singled out as the share of the god, to be offered upon the altar; the skin of the victim may be employed as a covering for the idol or material representative of the god, either permanently or till the next annual sacrifice. The blood of the victim may be drunk by the priest as a means of inducing inspiration, its entrails may be employed in divination, its flesh consumed in a common meal, exposed to the birds and beasts of prey or buried in the earth.

It is equally impossible to give a general survey of the purposes of sacrifice; not only are they too numerous but it is rare to find any but mixed forms; the scapegoat, for example, is also a messenger to the dead, and its flesh is eaten by the sacrificers. Certain main types may, however, be enumerated.

Cathartic Sacrifice.—In primitive cults the distinction between sacred and unclean is far from complete or well defined (see Taboo); consequently we find two types of cathartic sacrifice —(i.) one to cleanse of impurity and make fit for common use, (ii.) the other to rid of sanctity and in like manner render suitable for human use or intercourse.

(i.) The most conspicuous example of the first class is the scapegoat. Two goats were provided by the ancient Hebrews on the Day of Atonement; the high priest sent one into the desert, after confessing on it the sins of Israel; it was not permitted to run free but was probably cast over a precipice; the other was sacrificed as a sin-offering. In like manner in the purification of lepers two birds were used; the throat of one was cut, the living bird dipped in the blood mingled with water and the leper sprinkled; then the bird was set free to carry away the leprosy. In both these rites we seem to have a duplication of ritual, and the parallelism of sacrifice and liberation is clear.

(ii.) As an example of the second class may be taken the sacrifice of the bull to Rudra. MM. Hubert and Mauss interpret this to mean that the sanctity of the remainder of the herd was concentrated on a single animal; the god, incarnate in the herd, was eliminated by the sacrifice, and the cattle saved from the dangers to which their association with the god exposed them. In the Feast of Firstfruits we have another example of the same sort; comparable with this concentration of holiness is the respect or veneration shown to a single animal as representative of its species (see Animal Worship). In both these cases the object of the rite is the elimination of impurity or of a source of danger. But the Nazarite was equally bound to lay aside his holiness before mixing with common folk and returning to ordinary life; this he did by a sacrifice, which, with the offering of his hair upon the altar, freed him from his vow and reduced him to the same level of sanctity as ordinary men.

With regard to the scapegoat, it must be noted that we also meet with a more concrete idea of expulsion of evil (see Demonology, Exorcism), which is present among the most primitive peoples, such as the Australians. This raises the problem of how far the catharsis dealt with above is in its original form an elimination of impurity, and how far something more definite—a spirit or other principle of evil—is held to be expelled by scapegoat and allied ceremonies.

Communal Sacrifice.—In spite of the importance attached to the idea of the common meal by Robertson Smith, it is not a primitive rite of adoption. The custom of eating the body of the victim does not necessarily spring from any idea of communion with the god; it may also arise from a desire to incorporate the sanctity which has been imparted to it—an idea on a level with many other food customs (see Couvade), and based on the idea that eating anything causes its qualities to pass into the eater. Where the victim is an animal specially associated with a god (the most conspicuous case is perhaps that of the corn spirit), it may be granted that the god is eaten; but precisely in these cases there is no custom of giving a portion of the victim to the god.

Deificatory Sacrifice.—The object of certain sacrifices is to provide a tutelary deity of a house, town or frontier. (*a*) In Burma, as in many other countries, those who die a violent death are held to haunt the place where they met their fate; consequently when a town is built living men are interred beneath the ramparts and the pillars of the gates. (*b*) In parts of North America the *nagual* or *manitu* animal, of which the Indian dreams during the initiation fast and which is to be his tutelary spirit, is killed with certain rites. (*c*) Human representatives of the corn or vegetation spirits are killed; in these, as in other cases of the sacrifice of the man-god cited by Dr Frazer, the killing of the old god is at the same time the making of a new god. (*d*) Suicide is treated as a means of raising a human being to the rank of a god. (*e*) Gods may be sacrificed (in theriomorphic form) to themselves as a means of renewing the life of the god. (*f*) The method of creating a fetish (see Fetishism) on the Congo resembles deificatory sacrifice; but here there is no actual slaughter of a human being; magical means are alone relied upon.

Honorific Sacrifices.—Whatever their origin, sacrifices tend to be interpreted as gifts to the god. Man seeks to influence his fellow men in various ways, by intimidation, by deceit, by bribery; and it is quite natural to find the same ideas in the sphere of religion. Food is often given to a god because he is believed to take pleasure in eating; the germ of this idea may have been identical with that of some funerary sacrifices—to nourish the divine life. At a later period, *pari passu* with the spiritualization of the god, comes a refinement of the tastes attributed to him, and the finer parts of the sacrifice, finally it may be only its savour, are alone regarded as acceptable offerings. Just as attendants are provided for the dead, so the god receives sacrifices intended to put slaves at his disposal. This latter idea was the more likely to arise, as the gift theory of sacrifice is closely associated with that of the god as the ruler or king to whom man brings a tribute, just as he had to appear before his earthly king bearing gifts in his hands. The honorific sacrifice is essentially a propitiation; it must be distinguished from the *piaculum* (see below), to which in some aspects it is allied.

Mortuary Sacrifice.—Sacrifices, especially of human beings, are offered immediately after a death or at a longer interval. Their object may be (*a*) to provide a guide to the other world; (*b*) to provide the dead with servants or a retinue suitable to his rank; (*c*) to send messengers to keep the dead informed of the things of this world; (*d*) to strengthen the dead by the blood or life of a living being, in the same way that food is offered to them or blood rituals enjoined on mourners.

Piacular Sacrifice.—Whereas the god receives a gift in the honorific sacrifice, he demands a life in the piacular. This, according to Westermarck, is the central idea of human sacrifice: the victim is substituted for the sacrificer, to deliver him from perils by disease, famine or, more indefinitely, from the wrath of the god in general. The essential feature of the *piaculum* is that it is an expiation for wrong-doing, and the victim is often human.

Human Sacrifice.—Many theories of the relation of human to animal sacrifice have been put forward, most of them on an insufficient basis of facts. It has been held that animal sacrifice is the primitive form and that the decay of totemism or lack of domestic animals has brought about the substitution of a human victim; but it has also been urged that in many cases animal victims are treated like human beings and must consequently have replaced them, that human beings are smeared with the blood of sacrifice, and must therefore have themselves been sacrificed before a milder régime allowed an animal to replace them. If tradition is any guide, human sacrifice seems in many important areas to be of secondary character; in spite of the great development of the rite among the Aztecs, tradition says that it was unknown till two hundred years before the conquest; in Polynesia human sacrifices seem to be comparatively modern; and in India they appear to have been rare among the Vedic peoples. On the whole, human sacrifice is far commoner among the semi-civilized and barbarous races than in still lower stages of culture. In Australia, however, where sacrifice of the ordinary type is unknown, the ritual killing of a child is practised in connexion with the initiation of a magician; it is therefore by no means axiomatic that animals were offered before human beings; the problem of priority is one to be solved for each area separately, but probably no solution is possible; in the absence of Aztec traditions it would hardly have seemed probable that two centuries had seen so great a transformation.

Among the forms of human sacrifice must be reckoned religious suicide. This is perhaps mainly found in India but is not unknown in Africa and other parts of the world. Human sacrifices were known in ancient India and survived till late in the 19th century (see below); both Greeks and Romans practised them, no less than the wilder races of ancient Europe. Semites and Egyptians, Peruvians and Aztecs, slew human victims; Africa, especially the West Coast, till recently saw thousands of human victims perish annually; in Polynesia, Tahiti and Fiji were great centres of the rite—in fact, it is not easy to name an area where it has not been known.

No general survey of sacrifice on geographical lines is possible, but some of the more important features in each area may be noticed.

Sacrifice in Greece and Rome.—Both the mainland of Greece and the Greek colonies practised human sacrifice, usually as a means towards expulsion of evil. Thus, the Athenians maintained a number of outcasts, from whom in times of national calamity two were selected, one for the men, one for the women, and stoned to death outside the city; at the Thargelia two victims were annually put to death in the same way. Many animal sacrifices were known; of especial importance is the annual sacrifice of a goat on the Acropolis, though at other times the animal was not permitted to enter the temple.

Important features of Greek sacrifice, though not necessarily found in every rite, were the putting of wreaths and pieces of wool on the victim, the gilding of its horns, the lustration of the officiant and the sprinkling of those present with holy water. It was held inauspicious if the animal were unwilling; if it nodded all was well. Barley meal [1] was strewn on its neck, and a lock of hair cut from its forehead and burned. The animal was then clubbed, its throat cut and the altar sprinkled with its blood. Finally the body was skinned and cut up and the god's share burned on the altar.

The important Attic sacrifice of the Dipolia, known as *τὰ βουφονία*, demands some notice. Cakes were laid on the altar of Zeus Polieus and oxen driven round; the one which touched the cakes was the victim. An officiant at once struck it with his axe and another cut its throat; then all save the one who struck the first blow partook of its flesh. Then the hide was stuffed with grass and yoked to a plough; the participants were charged with ox murder and each laid the blame on the other; finally the axe was thrown into the sea. The interpretation of the rite is uncertain; it may perhaps be connected with agrarian rites.

At Rome the scapegoat did not suffer death; but in the Saturnalia a human victim seems to have been slain till the 4th century A.D. Many forms of animal sacrifice were found; the generalized account given above for Greece is true also for the Romans.

Sacrifice in Egypt.—Of Egyptian ritual little is known; our knowledge rests mainly on the evidence of pictures. At Deir el Bahri we see that the animal had its throat cut in Mahommedan fashion; it lay on its side, the legs tied together; the heart was taken out, then the liver; the burnt sacrifice was hardly known.

Sacrifice in India.—An account of animal sacrifice has been given above. Among human sacrifices may be mentioned the *suttee*, or custom of immolating a widow on the funeral pyre of the husband, and the Khond sacrifice of the Meriah, who was either purchased or the son of a victim father. Some days before the sacrifice, the victim, who was often kept in captivity for long periods, was devoted by the cutting of his hair, previously unshorn, and his sanctity was increased later by various ceremonies of anointing. Finally he was taken in procession, stupefied or otherwise rendered incapable of resistance, and put to death by strangulation or pressure. The remains were dismembered and carried to the fields, excepting the portion offered to the earth goddess, which was buried.

Sacrifice in Africa.—Especially in West Africa many forms of sacrifice are found. In the annual "customs" of Dahomey, now abolished, hundreds of human victims were offered. Three main forms of human sacrifice existed in this area: (1) the scapegoat; (2) the messenger; and (3) the expiation, but combinations were not infrequent. The victim was often kept in captivity and well fed; to transfer their sins people laid their hands upon him as he was led in procession, his head covered with ashes; on the way to the place of sacrifice were three enclosures, the second open to chiefs and priest only, the third to the officiant and his helper alone; the blood of the victim was offered to the gods. At the present day the animal victim may be burned or drowned, buried in the earth or simply exposed. Sometimes the sacrificer's hands are laid on the victim before it is slain, or he may be smeared with its blood; in other cases the blood is smeared on the door posts, or the sacrificer is touched on every part of the body with the victim's body. On the Congo, if a man commits a murder, the community votes whether he shall die or be expelled; if the latter, a victim is killed, of which all must partake; but this is not, as might be imagined, a case of Robertson Smith's *piaculum* for the re-establishment of the tribal bond; for the criminal is driven out of the community.

Sacrifice in America.—Sacrifice was relatively infrequent and undeveloped among the Red Indians. The Pawnees, however, had an elaborate ritual, in which a human victim was sacrificed to the Morning Star; the blood of the victims was sprinkled on the fields, and the details of the rite are not unlike those of the Khond custom. The Iroquois sacrifice of the white dog bore in later times the character of a scapegoat festival; but it is doubtful how far this was an original feature. The animals were decorated with wampum and strangled, and then the sins of the people were transferred to them; then the remains were burned and the ashes gathered up, taken through the village and sprinkled before every house. In Mexico human sacrifices were very common; the lowest estimate is 20,000 annually. The victims were often fêted for a whole year and treated as divine; the heart was an offering to the god, the body was eaten by the priests and nobles and the head was preserved with those of previous victims.

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(N. W. T.)

The Idea of Sacrifice in the Christian Church.

There can be no doubt that the idea of sacrifice occupied an important place in early Christianity. It had been a fundamental element of both Jewish and Gentile religions, and Christianity tended rather to absorb and modify such elements than to abolish them. To a great extent the idea had been modified already. Among the Jews the preaching of the prophets had been a constant protest against the grosser forms of sacrifice, and there are indications that when Christianity arose bloody sacrifices were already beginning to fall into disuse; a saying which was attributed by the Ebionites to Christ repeats this protest in a strong form, "I have come to abolish the sacrifices; and if ye do not cease from sacrificing the wrath of God will not cease from you" (Epiph. xxx. 16). Among the Greeks the philosophers had come to use both argument and ridicule against the idea that the offering of material things could be needed by or acceptable to the Maker of them all. Among both Jews and Greeks the earlier forms of the idea had been rationalized into the belief that the most appropriate offering to God is that of a pure and penitent heart, and among them both was the idea that the vocal expression of contrition in prayer or of gratitude in praise is also acceptable. The best instances of these ideas in the Old Testament are in Psalms l. and li., and in Greek literature the striking words which Porphyry quotes from an earlier writer, "We ought, then, having been united and made like to God, to offer our own conduct as a holy sacrifice to Him, the same being also a hymn and our salvation in passionless excellence of soul" (Euseb. *Dem. ev.* 3). The ideas are also found both in the New Testament and in early Christian literature: "Let us offer up a sacrifice of praise to God continually, that is, the fruit of lips which make confession to His name" (Heb. xiii. 15); "That prayers and thanksgivings, made by worthy persons, are the only perfect and acceptable sacrifices I also admit" (Just. Mart. *Trypho*, c. 117); "We honour God in prayer, and offer this as the best and holiest sacrifice with righteousness to the righteous Word" (Clem. Alex. *Strom.* vii. 6).

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[1] This sprinkling of the victims with sacrificial meal (Lat. *mola*) is the origin of the word *immolare*, to sacrifice, slaughter; Eng. "immolate," "immolation."

But among the Jews two other forms of the idea expressed themselves in usages which have been perpetuated in Christianity, and one of which has had a singular importance for the Christian world. The one form, which probably arose from the conception of Yahweh as in an especial sense the protector of the poor, was that gifts to God may properly be bestowed on the needy, and that consequently alms have the virtue of a sacrifice. Biblical instances of this idea are—"He who doeth alms is offering a sacrifice of praise" (Ecclus. xxxii. 2); "To do good and to communicate forget not, for with such sacrifices God is well pleased" (Heb. xiii. 16); so the offerings sent by the Philippians to Paul when a prisoner at Rome are "an odour of a sweet smell, a sacrifice acceptable, well pleasing to God" (Phil. iv. 18). The other form, which was probably a relic of the conception of Yahweh as the author of natural fertility, was that part of the fruits of the earth should be offered to God in acknowledgment of His bounty, and that what was so offered was especially blessed and brought a blessing upon both those who offered it and those who afterwards partook of it. The persistence of this form of the idea of sacrifice constitutes so marked a feature of the history of Christianity as to require a detailed account of it.

In the first instance it is probable that among Christians, as among Jews, every meal, and especially every social meal, was regarded as being in some sense a thank-offering. Thanksgiving, blessing and offering were co-ordinate terms. Hence the Talmudic rule, "A man shall not taste anything before blessing it" (*Tosephta Berachoth*, c. 4), and hence St Paul's words, "He that eateth, eateth unto the Lord, for he giveth God thanks" (Rom. xiv. 6; cp. 1 Tim. iv. 4). But the most important offering was the solemn oblation in the assembly on the Lord's day. A precedent for making such oblations elsewhere than in the temple had been afforded by the Essenes, who had endeavoured in that way to avoid the contact with unclean persons and things which a resort to the temple might have involved (Jos. *Antiq.* xviii. 1. 5), and a justification for it was found in the prophecy of Malachi, "In every place incense is offered unto my name and a pure offering; for my name is great among the Gentiles, saith the Lord of hosts" (Mal. i. 11, repeatedly quoted in early Christian writings, *e.g. Teaching of the Twelve Apostles*, c. 14; Just. Mart. *Trypho*, c. 28, 41, 116; Irenaeus iv. 17. 5).

The points in relation to this offering which are clearly demonstrable from the Christian writers of the first two centuries, but which subsequent theories have tended to confuse, are these. (1) It was regarded as a true offering or sacrifice; for in the *Teaching of the Twelve Apostles*, in Justin Martyr and in Irenaeus it is designated by each of the terms which are used to designate sacrifices in the Old Testament. (2) It was primarily an offering of the fruits of the earth to the Creator; this is clear from both Justin Martyr and Irenaeus, the latter of whom not only explicitly states that such oblations are continued among Christians, but also meets the current objection to them by arguing that they are offered to God not as though He needed anything but to show the gratitude of the offerer (Iren. iv. 17, 18). (3) It was offered as a thanksgiving partly for creation and preservation and partly for redemption: the latter is the special purpose mentioned (*e.g.*) in the *Teaching of the Twelve Apostles*; the former is that upon which Irenaeus chiefly dwells; both are mentioned together in Justin Martyr (*Trypho*, c. 41). (4) Those who offered it were required to be not only baptized Christians but also "in love and charity one with another"; there is an indication of this latter requirement in the Sermon on the Mount (Matt. v. 23, 24, where the word translated "gift" is the usual LXX. word for a sacrificial offering, and is so used elsewhere in the same Gospel, viz. Matt. viii. 4, xxiii. 19), and still more explicitly in the *Teaching*, c. 14, "Let not any one who has a dispute with his fellow come together with you (*i.e.* on the Lord's day) until they have been reconciled, that your sacrifice be not defiled." This brotherly unity was symbolized by the kiss of peace. (5) It was offered in the assembly by the hands of the president; this is stated by Justin Martyr (*Apol.* i. 65, 67), and implied by Clement of Rome (*Ep.* i. 44. 4).

Combined with this sacrifice of the fruits of the earth to the Creator in memory of creation and redemption, and probably always immediately following it, was the sacred meal at which part of the offerings was eaten. Such a sacred meal had always, or almost always, formed part of the rites of sacrifice. There was the idea that what had been solemnly offered to God was especially hallowed by Him, and that the partaking of it united the partakers in a special bond both to Him and to one another. In the case of the bread and wine of the Christian sacrifice, it was believed that, after having been offered and blessed, they became to those who partook of them the body and blood of Christ. This "communion of the body and blood of Christ," which in early writings is clearly distinguished from the thank-offering which preceded it, and which furnished the materials for it, gradually came to supersede the thank-offering in importance, and to exercise a reflex influence upon it. In the time of Cyprian, though not before, we begin to find the idea that the body and blood of Christ were not merely partaken of by the worshippers but also offered in sacrifice, and that the Eucharist was not so much a thank-offering for creation and redemption as a repetition or a showing forth anew of the self-sacrifice of Christ. This idea is repeated in Ambrose and Augustine, and has since been a dominant idea of both Eastern and Western Christendom. But, though dominant, it has not been universal; nor did it become dominant until several centuries after its first promulgation. The history of it has yet to be written. For, in spite of the important controversies to which it has given birth, no one has been at the pains to distinguish between (i.) the theories which have been from time to time put forth by eminent writers, and which, though they have in some cases ultimately won a general acceptance, have for a long period remained as merely individual opinions, and (ii.) the current beliefs of the great body of Christians which are expressed in recognized formularies. A catena of opinions may be produced in favour of almost any theory; but formularies express the collective or average belief of any given period, and changes in them are a sure indication that there has been a general change in ideas.

It is clear from the evidence of the early Western liturgies that, for at least six centuries, the primitive conception of the nature of the Christian sacrifice remained. There is a clear distinction between the sacrifice and the communion which followed it, and that which is offered consists of the fruits of the earth and not of the body and blood of Christ. Other ideas no doubt attached themselves to the primitive conception, of which there is no certain evidence in primitive times, *e.g.* the idea of the propitiatory character of the offering, but these ideas rather confirm than disprove the persistence of those primitive conceptions themselves.

All Eastern liturgies, in their present form, are of later date than the surviving fragments of the earlier Western liturgies, and cannot form the basis of so sure an induction; but they entirely confirm the conclusions to which the Western liturgies lead. The main points in which the pre-medieval formularies of both the Eastern and the Western Churches agree in relation to the Christian sacrifice are the following. (1) It was an offering of the fruits of the earth to the Creator, in the belief that a special blessing would descend upon the offerers, and sometimes also in the belief that God would be propitiated by the offerings. The bread and wine are designated by all the names by which sacrifices are designated (*sacrificia*, *hostiae*, *libamina*, and at least once *sacrificium placationis*), and the act of offering them by the ordinary term for offering a sacrifice (*immolatio*). (2) The offering of bread and wine was originally brought to the altar by the person who offered it, and placed by him in the hands of the presiding officer. In course of time there were two important changes in this respect: (*a*) the offerings of bread and wine were commuted for money, with which bread and wine were purchased by the church-officers; (*b*) the offerings were sometimes handed to the deacons and by them taken to the bishop at the altar, and sometimes, as at Rome, the bishop and deacons went round the church to collect them.[1] (3) In offering the bread and wine the offerer offered, as in the ancient sacrifices, primarily for himself, but inasmuch as the offering was regarded as having a general propitiatory value he mentioned also the names of others in whom he was interested, and especially the departed, that they might rest in peace. Hence, after all the offerings had been collected, and before they were solemnly offered to God, it became a custom to recite the names both of the offerers and of those for whom they offered, the names being arranged in two lists, which were known as diptychs. Almost all the old rituals have prayers to be said "before the names," "after the names." It was a further and perhaps much later development of the same idea that the good works of those who had previously enjoyed the favour of God were invoked to give additional weight to the prayer of the offerer. In the later series of Western rituals, beginning with that which is known as the *Leonine Sacramentary*, this practice is almost universal. (4) The placing of the bread and wine upon the altar was followed by the kiss of peace. (5) Then followed the actual offering of the gifts to God (*immolatio missae*). It was an act of adoration or thanksgiving, much longer in Eastern than in Western rituals, but in both classes of rituals beginning with the form "Lift up your hearts," and ending with the Ter Sanctus or Trisagion.[2] The early MSS. of Western rituals indicate the importance which was attached to this part of the liturgy by the fact of its being written in a much more ornate way than the other parts, *e.g.* in gold uncial letters upon a purple ground, as distinguished from the vermilion cursive letters of the rest of the MS. With this the sacrifice proper was concluded. (6) But, since the divine injunction had been "Do this in remembrance of me," the sacrifice was immediately followed by a commemoration of the passion of Christ, and that again by an invocation of the Holy Spirit (*epiclesis*) that He would make the bread and wine to become the body and blood of Christ. Of this invocation, which is constant in all Eastern rituals, there are few, though sufficient, surviving traces in Western rituals.[3] Then after a prayer for sanctification, or for worthy reception, followed the Lord's Prayer, and after the Lord's Prayer the communion.

In the course of the 8th and 9th centuries, by the operation of causes which have not yet been fully investigated, the theory which is first found in Cyprian became the dominant belief of Western Christendom. The central point of the sacrificial idea was shifted from the offering of the fruits of the earth to the offering of the body and blood of Christ. The change is marked in the rituals by the duplication of the liturgical forms. The prayers of intercession and oblation, which in earlier times are found only in connexion with the former offering, are repeated in the course of the same service in connexion with the latter. The designations and epithets which are in earlier times applied to the fruits of the earth are applied to the body and blood. From that time until the Reformation the Christian sacrifice was all but universally regarded as the offering of the body and blood of Christ. The innumerable theories which were framed as to the precise nature of the offering and as to the precise change in the elements all implied that conception of it. It still remains as the accepted doctrine of the Church of Rome. For, although the council of Trent recognized fully the distinction which has been mentioned above between the Eucharist and the sacrifice of the mass, and treated of them in separate sessions (the former in Session xiii., the latter in Session xxii.), it continued the medieval theory of the nature of the latter. The reaction against the medieval theory at the time of the Reformation took the form of a return to what had no doubt been an early belief,—the idea that the Christian sacrifice consists in the offering of a pure heart and of vocal thanksgiving. Luther at one period (in his treatise *De captivitate Babylonica*) maintained, though not on historical grounds, that the offering of the oblations of the people was the real origin of the conception of the sacrifice of the mass; but he directed all the force of his vehement polemic against the idea that any other sacrifice could be efficacious besides the sacrifice of Christ. In the majority of Protestant communities the idea of a sacrifice has almost lapsed. That which among Catholics is most commonly regarded in its aspect as an offering and spoken of as the "mass" is usually regarded in its aspect as a participation in the symbols of Christ's death and spoken of as the "communion." But it may be inferred from the considerable progress of the Anglo-Catholic revival in most English-speaking countries that the idea of sacrifice has not yet ceased to be an important element in the general conception of religion. (E. Ha.)

SACRILEGE, the violation or profanation of sacred things, a crime of varying scope in different religions. It is naturally much more general and accounted more dreadful in those primitive religions in which cultual objects play so great a part, than in more highly spiritualized religions where they tend to disappear. But wherever the idea of sacred exists, sacrilege is possible. The word itself comes from the Lat. *sacrilegium*, which originally meant merely the theft of sacred things, although already in Cicero's time it had grown to include in popular speech any insult or injury to them.

The history of sacrilege reflects a large phase of the evolution of religion. In primitive religions inclusive of almost every serious offence even in fields now regarded as merely social or political, its scope is gradually lessened to a single part of one section of ecclesiastical criminology, following inversely the development of the idea of holiness from the concrete to the abstract, from fetishism to mysticism. The primitive defence against sacrilege lay directly in the nature of sacred things, those that held a curse for any violation or profanation. This brings us at once into the whole field of taboo (*q.v.*). From it we pass without a break, merely narrowing the application as the conception of sacredness grew clearer and less associated with magic, into early criminal law with its physical sanctions. The Levitical code exacted of the offender reparation for the damage with the addition of one-fifth of the amount, and an expiatory sacrifice (Lev. v. 15, 16). Even the gold and silver ornaments of the images of false gods were not to be coveted nor appropriated for fear of being contaminated with the curse which they could impart (cf. Deut. vii. 25). The tragic story of the stoning of Achan, who stole some of the spoils of Jericho which Joshua had consecrated to the treasury of Yahweh, is one of the most

[1] Of this proceeding an elaborate account exists in the very interesting document printed by Mabillon in his *Museum Italicum* as "Ordo Romanus I."; the small phials of wine which were brought were emptied into a large bowl, and the loaves of bread were collected in a bag.

[2] The elements of the form are preserved exactly in the liturgy of the Church of England.

[3] It is found, *e.g.*, in the second of Mone's masses from the Reichenau palimpsest, and in Mabillon's *Missale Gothicum*, No. 12; it is expressly mentioned by Isidore of Seville as the sixth element in the Eucharistic service, *De offic. eccles.* i. 15.

graphic details of Old Testament history (cf. Joshua vii. 20-25).

No religion was more prodigal in rules to safeguard that which was holy or consecrated than the Jewish, especially in its temple laws; violation of them often led to mob violence as well as divine chastisement. The temple rules do not apply to synagogues, however, and unseemly conduct in them is liable only to civil action. The whole wide field of Jewish taboo naturally involves sacrilege as its reverse side. Such violations of holy things as making mock of the Scriptures, or even reciting them as one would ordinary literature, was sacrilege in the eyes of the rabbi. Even imitation of the style of the Talmud has also been accounted sacrilege.

While the Roman cults were amply protected by taboos, there was no comprehensive term in Roman law for religious violations and profanations in general. *Sacrilegium* was narrowly construed as the theft of sacred things from a sacred place. Sacred things, according to Gaius, were those things that had been definitely consecrated to the gods—and so had come to partake of their holiness. Sacred places did not include private shrines. According to Ulpian the punishment for *sacrilegium* varied according to the position and standing of the culprit and the circumstances under which the crime was committed. For the lower classes it was crucifixion, burning or the wild beasts. The latter penalty was also attached to theft of sacred things by night, but stealing by day from a temple objects of little value brought only sentence to the mines. People of higher rank were deported. During classical times the law kept to the narrow meaning of *sacrilegium*, but in popular usage it had grown to mean about the same as the English word. Traces of this usage are frequent in Augustan writers. The early church Fathers use the word most frequently in the restricted sense, although an effort has been made to read the wider meaning in Tertullian. But by the middle of the 4th century the narrower meaning had disappeared. In Ambrose, Augustine and Leo I., *sacrilegium* means sacrilege. The wider meaning had invaded the law as well. Mommsen was of the opinion that *sacrilegium* had no settled meaning in the laws of the 4th century. But it was rather that an enlarged application of the idea of sacred made the crime of sacrilege in the sense of *violatio sacri* a more general one. This was partly due to the influence of Christianity, which sought to include as objects of sacrilege all forms of church property, rather than merely those things consecrated in pagan cults, partly to the efforts of the later emperors to surround themselves and everything emanating from them with highest sanctions. In the Theodosian Code the various crimes which are accounted sacrilege include—apostasy, heresy, schism, Judaism, paganism, attempts against the immunity of churches and clergy or privileges of church courts, the desecration of sacraments, &c. and even Sunday. Along with these crimes against religion went treason to the emperor, offences against the laws, especially counterfeiting, defraudation in taxes, seizure of confiscated property, evil conduct of imperial officers, &c. There is no formal definition of sacrilege in the code of Justinian but the conception remains as wide. The church had found in the imperial law a strong protector.

The penitentials (*q.v.*), or early collections of disciplinary canons, gave much attention to sacrilege. In the earliest of them, sacrilege in the narrower sense is not a separate class of crime, but the wider usage goes with variations through the different collections. There is also the greatest difference in the penalties assigned, reaching from little more than restitution of property to penance of one to five or even fifteen years. The Frankish synods emphasize the crime of seizing church property of every kind, including the vast estates so envied by the lay nobility. In the Pseudo-Isidore the attempt was made to include even property on which the church had merely a legal claim. The murder or injury of the clergy is also sacrilege in both penitentials and capitularies. The practice of magic, superstition, &c., are also frequently referred to as sacrilege, especially during the long struggle with German heathenism. With the definite triumph of the church, the profanation of its sanctuaries became less frequent, and once robbery or seizure of ecclesiastical possessions or violation of its privileges tended to absorb the attention of synods and popes. Gratian's Decretum mirrors two tendencies, the church legislation with its growingly less extended application, and the wide meaning as in Justinian's Code, owing to the revival of Roman law in the 11th century. It thus was once more declared to include all violations of the divine law. A somewhat distorted, but well-substantiated use of the word *sacrilegium* in medieval Latin was its application to the fine paid by one guilty of sacrilege to the bishop.

The penalties in the canon law included, in addition to restitution, penance, fines and excommunication; and right of asylum was denied to the culprit. The jurisdiction was something jointly shared with the temporal power in case corporal punishment were involved. The numerous enactments of councils to ensure the proper care of church property, prohibiting the use of churches for secular purposes, for the storing of grain or valuables, for dances and merry-making, do not technically come under the head of legislation against sacrilege. The worst sacrilege of all, defiling the Host, is mentioned frequently, and generally brought the death penalty accompanied by the cruellest and most ignominious tortures. The period of the Reformation naturally increased the commonness of the crime. Under the emperor Charles V. the penalty for stealing the Host was the stake; that for other crimes was graded accordingly. In France, in 1561, under Charles IX. it was forbidden under penalty of death to demolish crosses and images and to commit other acts of scandal and impious sedition. In the declaration of 1682, Louis XIV. decreed the same penalty for sacrilege joined to superstition and impiety, and in the somewhat belated religious persecution of the duke of Bourbon in 1724 those convicted of larceny in churches, together with their accomplices, were condemned, the men to the galleys for life or for a term of years, the women to be branded with the letter V and imprisoned for life, or for a term. When one takes into account that the next article of the declaration decreed death for domestic theft, the legislation is not relatively cruel. Yet even in the enlightened 18th century popular fanaticism made of sacrilege the most heinous offence. The trial of La Barre in 1766 at Abbeville (see VOLTAIRE) is the most famous in modern times. Convicted of wearing his hat while a religious procession was passing—as well as of blasphemy—he was accused as well of having mutilated a crucifix standing on the town bridge. Declared guilty, after torture, he was sentenced to have his tongue cut out, to be beheaded and the body to be burned, a sentence which was confirmed by the parlement of Paris and the bigoted king Louis XV. In the midst of the French Revolution respect for *civic* festivals was sternly enacted, but sacrilege was an almost daily matter of state policy. In the penal code the penalty for interfering with and molesting worshippers is slight, a fine of from 16 to 300 francs and prison from six days to three months, while damage or insult to the objects of worship brought only 16 francs to 500 francs fine, and prison from fifteen days to six months. In 1825 the reactionary parlement once more brought back the middle ages, by decreeing the death penalty for public profanation, the execution to be preceded by the *amende honorable* before the church doors. "Theft sacrilege" was treated in a separate series of equally savage clauses. This was a crime not recognized in the penal code, which was therefore to be modified by this law. No attenuating circumstances were to be recognized, as in the general scheme of the penal code. This ferocious legislation was expressly and summarily abrogated in 1830. (J. T. S.*)

English Law.—In English law, sacrilege is the breaking into a place of worship and stealing therefrom. At common law benefit of clergy was denied to robbers of churches. A statute of 1553 made the breaking or defacing of an altar, crucifix or cross in any church, chapel or churchyard punishable with three months' imprisonment on conviction before two justices, the imprisonment to be continued unless the offender entered into surety for good behaviour at quarter sessions. The tendency of the later law has been to put the offence of sacrilege in the same position as if the offence had not been committed in a sacred building. Thus breaking into a place of worship at night, says Coke, is burglary, for the church is the mansion house of Almighty God. The Larceny Act of 1861 punishes the breaking into, or out of, a place of divine worship in the same way as burglary, and the theft of things sacred in the same way as larceny. Now by the Malicious Damage Act 1861 the unlawful and malicious destroying or damaging any picture, statue, monument or other memorial of the dead, painted glass or other monument or work of art, in any church, chapel, meeting-place or other place of divine worship is a misdemeanour punishable by imprisonment for six months, and in the case of a male under the age of sixteen years with whipping. (T. A. I.)

SACRISTY (through Fr. *sacristie*, from med. Lat. *sacristia* or *sacristina*), the term in ecclesiastical architecture given to the room or hall in a large church wherein are kept the vestments and utensils (*sacra*) used in the services and celebrations. Like the *diaconicon* in the Greek Church, it was usually situated on the north side of the chancel, but its position varies according to that of the chapter-house, as it is generally placed between the latter and the church.

SACRO BOSCO, JOHANNES DE [JOHN HOLYWOOD] (d. 1244 or 1256), astronomical author, studied at Oxford and was afterwards professor of mathematics at the university of Paris. He wrote a treatise on spherical astronomy, *Tractatus de sphaera*, first printed at Ferrara in 1472. This was the second astronomical work to be printed. Although recording no advance on the Arabian commentaries on Ptolemy, it gained a great reputation; twenty-four editions appeared before 1500, and at least forty between 1500 and 1647, in which year the last edition was published at Leiden. About the year 1232 he wrote *De anni ratione* or *De computo ecclesiastico* (printed editions at Paris in 1538 (?), 1550, 1572 and at Antwerp in 1547 and 1566), in which he points out the increasing error of the Julian calendar, and suggests a remedy which is nearly the same as that actually used under Gregory XIII. three hundred and fifty years later.

He also wrote *Algorismus* or *De arte numerandi*, printed in 1490 (?), in 1517 (Vienna), 1521 (Cracow), 1523 (Venice); *De astrolabio* and *Breviarum juris*.

SADDLE (a word common to Teutonic languages, cf. Ger. *Sattel*, Dut. *zadel*, also in Russ. *siedlo* and Lat. *sella*, for *sedla*; it is not derived directly from Lat. *sedile*, which means a chair, but all the words are to be referred to the root *sad-*, which gives Lat. *sedere*, Eng. "sit," "settle," "seat," &c.), a seat, usually of leather, fixed by girths to the back of a horse for riding; also a padded cushion for the back of a draught horse, fastened by girths and crupper; to it are attached the supports for the shafts, and rings for the reins (see SADDLERY). The word is also applied to many objects resembling a saddle in shape or function, such as a block to support a spar in a ship, or in machinery to support a rod, or in masonry (*q.v.*) the top or "apex stone" of the gable of a roof, &c.

Saddle bars, in architecture (Fr. *traverses*), are narrow horizontal iron bars passing from mullion to mullion, and often through the whole window from side to side, to steady the stone work, and to form stays, to which the lead work is secured. When the bays of the windows are wide, the lead lights are further strengthened by upright bars, passing through eyes forged on the saddle bars, and called stanchions. When saddle bars pass right through the mullions in one piece, and are secured to the jambs, they have sometimes been called "*stay bars*."

SADDLERY and HARNESS, two terms which embrace the whole equipment for the horse when used for riding or driving. "Harness" (O. Fr. *harneis*, mod. *harnais*, Ger. *Harnisch*, of unknown origin) was originally a general term for equipment, *e.g.* the body armour of a soldier. It is now usually confined to the draught horse's equipment, "saddle and bridle" being used of that of the riding horse.

Saddlery is principally a leather trade, and the craft has been established in England as a separate trade since the 13th century, when the London Saddlers' Company received its charter from Edward I. There is evidence also of its early prosperity at Birmingham; the principal seat of the cheaper saddlery trade is now at Walsall. Saddler's ironmongery embraces the making of buckles, chains, stirrups, spurs, bits, hames, &c.

The "bridle" (O.E. *bridel* for *brigdel*, from *bregdan*, to pull) is the combination of straps and buckles which fits on the horse's head, the headstall, together with the bit and reins which it keeps in position. The headstall consists of the headpiece passing behind the ears and joining the head-band over the forehead; the cheek-straps run down the head to the bit to which they are fastened; in the driving bridle the "blinkers," rectangular or round leather flaps which prevent the horse from seeing anything except what lies in front, are attached to the cheek-straps; the nose-band passes round the head above the nostrils and the throat-lash from the top of the cheek-straps underneath the head. The "martingale" passes between the horse's legs with one end fastened to the girth and the other to the bridle or nose-band. It prevents the horse throwing up his head. The bit is the metal contrivance inserted in the mouth to which the reins are attached. There are innumerable patterns of bits, but they may be divided into the "snaffle" (Du. *snavel*, horse's muzzle), the "curb" and combinations of the two. The "snaffle" for the riding horse has a smooth jointed steel mouthpiece, with straight cheek-bars, the rings for the reins and cheek-pieces of the headstall being fixed in the bars at the junction with the mouthpiece. A severer snaffle has the mouthpiece twisted and fluted. The bars prevent the horse pulling the bit through the mouth. The snaffle without bars is generally termed a "bridoon." The commonest form of bit used in driving is the double-ring snaffle, in which the rings work one within the other, the headstall straps fastening to one and the reins to the other, or, if the horse is driven on the double ring, the reins are buckled to both rings. The curb-bit (Fr. *courbe*, Lat. *curvus*, bent, crooked) is one to which a curb-chain or strap is attached, fastened to hooks on the upper ends of the cheek-bars of the bit and passing under the horse's lower jaw in the chin groove. The reins are attached to rings at the lower ends of the cheek-bars, the leverage thus pressing the curb-chain against the jaw. The mouthpiece of the curb-bit is unjointed and has in the centre a "port," *i.e.* a raised curve allowing liberty for the tongue and bringing the pressure on the base of the horse's jaw. The curb-bit and the bridoon can be used together with separate headstalls and reins, but there are many combination bits, such as the Pelham. In this the mouthpiece, without port, is that of the snaffle bit (it may be unjointed), with the rings fixed at the junction of the mouthpiece and cheek-bars; the lower ends have rein rings as in the plain curb-bit.

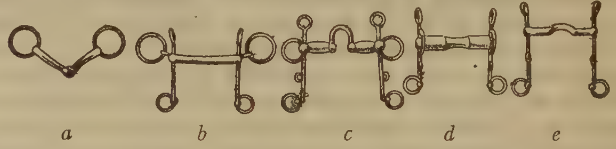

FIG. 1.—*a*, Bridoon or snaffle; *e*, Curb. Polo bits:—*b*, Rugby Pelham; *c*, Hanoverian with rubber mouth; *d*, Kerro Pelham. (From Messrs Champion and Wilton.)

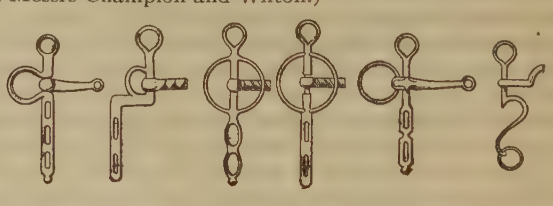

FIG. 2.—Some Types of Driving Bits. (From Messrs. Champion and Wilton.)

The riding saddle is composed of the "tree," the framework or skeleton, the parts of which are the pommel or head, the projection which fits over the withers, and the side bars which curve round into the cantle or hind-bow. The tree in the best saddles is made of beechwood split with the grain; thin canvas is glued over the wood to prevent splitting, and iron or steel plates then riveted on the head and on the cantle. Linen webs are fastened lengthwise and across, over which is nailed canvas and serge between which the padding is stuffed. To the tree are fastened the stirrup-bars. The leather covering of the tree should be of pig-skin; cheap saddles are made of sheep-skin stamped to imitate pig-skin. The various parts of the man's saddle are the seat, the skirt, *i.e.* the fold or pad of leather on either side of the head, and the hanging flaps; knee-rolls are not used as much as they were, except where roughly broken-in horses are ridden. The saddle is cut straight over the withers with a square-ended cantle, as in the hunting saddle, or cut back over the withers with a round-ended cantle, as in the polo saddle. The saddles in use on the continent of Europe still retain the high pommel and cantle and heavy knee-rolls discarded by riders trained in the British school and the hunting-field. The saddles of the East and of the Arabs keep their primitive shape, and they are really seats *in* which rather than *on* which the rider sits. The Mexican saddle, with its silver adornments and embossed leather, is a characteristic type. It has a very high padded pommel and a round-headed projecting cantle.

The lady's side-saddle when first fully developed had two heads or pommels, between which the right leg was supported, the support for the left being the stirrup. The third pommel or "leaping head," against which the left leg rests, was, it is said, invented as the result of a match between two gentlemen riders to ride a steeplechase on side-saddles; the winner had provided himself this support for his left leg. At first the "leaping head" was only used in the hunting-field and the double cow-horn was still retained; as its usefulness became apparent the second pommel practically disappeared.

Space forbids the discussion of the varieties of harness for the pair-horse carriage, the four-horse coach, the farm wagon, &c., or the different kinds of ornamentation that are or have been lavished upon it. The leather collar, heavily padded, passes over the head and rests firmly on the shoulders; the hames, linked pieces of metal, fit tightly round it and are fastened at the top by the hame-strap; they bear the traces, or straps which pass along the horse's sides and the shafts and are attached by loops slipped over hooks in the body of the carriage. Where the collar is dispensed with, the traces are attached to a breast-strap against which the horse works. This breast harness is much used for the lightly harnessed American trotting horses, and for military draught horses. The saddle pad is a narrow leather cushion girthed under the belly and held in position by the crupper-dock and the crupper, a loop strap passing under the tail. The saddle supports the shafts by the back-band and its tugs and by the belly-band. The reins pass from the bit through "terrets" or rings on the hames and pad. The harness on the horse's hind-quarters consists of the breeching, passing round behind the horse and helping in backing and stopping the vehicle, the hip-strap fastened to the breeching and passing over the hind-quarters, and the kicking-strap falling across the loins and fastened to the shafts. The bearing rein, when used merely as a support to the head, or as an aid to the improvement of the paces, consists of a separate bridoon-bit with the reins passing through rings on the throat-band and thence slipped over a hook on the pad. The severer form, which brings the rein over the head-stall, keeps the horse's head up in a cramped attitude and the mouth continually working on the bit. A recent modification of the severer form is not attached to the bit.

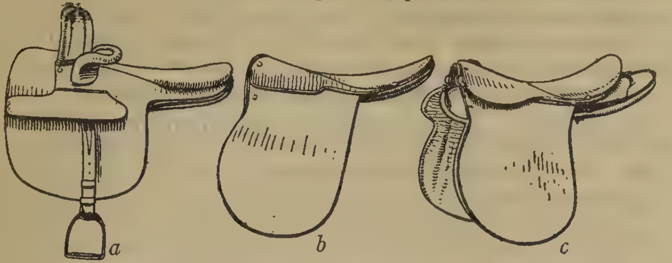

FIG. 3.—*a*, Side-saddle; *b*, hunting saddle; *c*, officer's regulation saddle (British army). (From models made by Messrs Champion and Wilton.)

Historical Sketch.—Questions as to the epoch in the history of mankind when the horse was first trained for draught and riding are for archaeologists and anthropologists to discuss (see HORSE, § *History*). With the domestication of the horse came the development of the bit; first a halter of hide bound the muzzle, then a thong slipped into the mouth, finally replaced by wood or bone. Stone age objects have been found in lake-dwellings, such as that at Robenhausen, near Zürich which may have been bits; one is slightly curved, with two knobs grooved at either end for the reins. Bits from the bronze age and the iron age can be seen in most museums showing that the forms have changed little. The Scandinavian museums are particularly rich in early remains of harness and horse-trappings. An early bronze age bit of bone with horn cheek-pieces and with holes on the upper ends for the head-stall, and on the lower ends for the reins, was found at the Corcelletes lake dwelling, and a twisted bronze bit jointed by interlocking rings with straight cheek-pieces and rings and loops for headstall and reins is in the National Museum at Zürich. In the late iron age burial of a Gaulish chief with his chariot at Somme-Bionne were found two horse's bits of the ordinary jointed snaffle type (see ARCHAEOLOGY, plate VI). A heavy snaffle unjointed bit with red and blue enamel ornamentation is illustrated in the British Museum *Guide to the Late Iron Age.* Assyrian and Babylonian monuments show the harness of the chariot horses and the bridling of the riding horse, cf. BABYLONIA AND ASSYRIA, Plate II, fig. 2.

In ancient Greece and Rome the bit and bridle were used during historic times, and allusions to riding without them refer to exhibitions of horsemanship. On Trajan's column the Numidians ride without bridles or bits, and various North African tribes trained their horses to obey their voice alone (cf. Claudian, *Epig.* i. 10, of the Gaulish *essedarii*, driving without bridle and reins). The *locus classicus* for the bridling and saddling of the Greek horse is Xenophon, Περὶ ἱππικῆς. The Greek name for the bridle bit and reins collectively is χαλινός (Lat. *frenum*), the bit proper is στόμιον; in Lat. *frenum* is also used of the bit itself. The headstall (κορυφαία) and cheek-straps (παρήϊα) were richly decorated. In Homer (*Il.* iv. 142) the latter are ornamented with ivory plates stained with purple, and such have been found on the site of Troy (Schliemann, *Ilios*, 476, 631). The head-band also bore a crest (λοφός, *crista*), and in front the ἄμπυξ (*frontale*) might be extended down the face to serve as a defence, as in the medieval *chaufrein.* This frontal was a special subject of decoration. Of the two principal types of ancient bits, the unjointed and the jointed mouthpiece, the latter is the most common form. There are also other forms of bits; those with sharp points were called *lupata* (Virg. *Georg.* iii. 208). There is a Greek bit in the British Museum with revolving disks, a device which occurs in medieval bits, to give the horse something to keep turning in his mouth. The curb was also used: Xenophon distinguishes between the snaffle (λεῖος χαλινός) and the curb. The curb-strap or chain was termed ὑποχαλινιδία or ψάλιον, which, however, may mean a muzzle. A bronze bit found at Pompeii has a twisted and jointed metal mouthpiece and a plain curved bar acting as a curb-strap. The cheek-bars of the bit take a variety of forms: straight bars, circles with rays, square or oblong plaques, triangles and the swan-necked or S-shaped type are all found. In medieval times complicated and severe bits were used, and heavy bits with cruel mouth-pieces and long elaborately curved cheek-bars are still used by Arabs and the riders of Central and South America. The bit of the armed war-horse in the middle ages was sometimes provided with very long cheek-bars covered with sharp spikes to prevent the foot-soldier catching hold of the bridle (see R. Tschille and R. Forrer, *Die Pferdetrense in ihrer Formen-Entwicklung*, 1903, for illustrations of bits from prehistoric times to the 16th century).

The saddle was not used in Egypt; the Assyrian monuments (cf. the illustration noticed above) chiefly show decorated saddle-cloths rather than any form of the saddle proper. The harness of the chariots of Egypt and Assyria are also illustrated on the monuments (see especially Sir J. G. Wilkinson, *Manners and Customs of the Ancient Egyptians*). The ancient Greeks rode bare-backed as in the Panathenaic frieze of the Parthenon or used a saddle-cloth (ἐφίππιον, Lat. *ephippium*; *sella* as applied to a saddle is quite late). Even the saddle-cloth does not appear to have been in use till the 5th century. A 6th-century vase, found at Daphnae, Lower Egypt (Flinders-Petrie and Murray, *Tanis*, 1888, ii. pl. xxix.), shows a woman riding astride on a cloth, with fully developed headstall and powerful bit. A black-figured sarcophagus, now in the British Museum, from Clazomenae, shows a long pointed *ephippium* with a chest-strap. These indicate Asiatic influence, for Daphnae was an Ionian and Carian settlement of the 7th century B.C. In Xenophon (*l.c.*) we find that the saddle-cloth had been adopted by the Athenian cavalry, and from his advice as to the seat to be adopted pads or rolls seem to have been added. There were no stirrups (till the time of the emperor Maurice, A.D. 602), and the rider mounted at a vault or by blocks; mounting by the spear used as a vaulting pole was also practised as an athletic feat. On a funeral monument of the time of Nero in the museum at Mainz is the figure of a horseman on a saddle-cloth with something resembling the pommel and cantle of a saddle, but the first saddle proper is found in the so-called column of Theodosius at Constantinople (usually ascribed to the end of the 4th century A.D., though it may be more than 100 years earlier), where two figures are riding on high-peaked saddles resting on embroidered saddle-cloths. In medieval times the saddle was much like that of the Oriental saddle of to-day with high peaks before and behind. In the military saddle of the 14th and 15th century the high front parts of the saddle were armoured and extended to protect the legs of the rider. The jousting saddle (cf. the example in the Tower of London) becomes almost a box into which the rider is fixed; the high cantle fits round the rider's loins and when charging he lifted himself into practically a standing position in the stirrups. The saddle for use on the road or hunting was much like the Arab saddle of to-day, and similar forms are in use in Europe and elsewhere where the British saddle has not been adopted. Women rode astride or on a pillion behind a male rider. The side-saddle is said to date from the end of the 12th century. For the harness of the ancient draught horse see CHARIOT.

BIBLIOGRAPHY.—J. C. Ginzrot, *Wagen u. Fahrwerke d. Griechen u. Römer, &c.* (1817); Daremberg and Saglio's *Dict. des antiquités grecques et rom.*, *s.vv.* "Ephippium," "Frenum," &c.; Viollet-le-Duc's *Dict. rais. du mobilier français*, and the works referred to in the text. See also DRIVING, RIDING and HORSE. (C. WE.)

SADDLEWORTH, an urban district in the Colne Valley parliamentary division of the West Riding of Yorkshire, England, 14 m. N.E. of Manchester, on the London & North Western railway. Pop. (1901) 12,320. It lies on the western side of the elevation of Stanedge, which here forms the watershed between streams flowing westward to the Irish Sea and eastward to the North Sea. Early earthworks and tumuli are numerous in the locality. The Huddersfield canal follows the valley, and, like the railway, is carried under Stanedge by a long tunnel.

SADDUCEES, a sect or party of the Jews mentioned in the historical books of the New Testament (with the exception of the fourth Gospel), by Josephus, and in the Talmud. According to all the authorities, the essential qualification for the title is the denial of certain beliefs which the Pharisees held to be implicitly contained in Scripture, and therefore necessarily part of Judaism as soon as they were formulated. From their own point of view they were orthodox conservatives, so far as they really cared to remain—for whatever reason—within the pale of Jewry and to justify their presence there. From the standpoint of the Pharisees who championed the hope of everlasting life and believed in the existence of angels, through whom God could communicate with men, they were infidels. As the Pharisees accumulated the oral tradition which was afterwards codified and elaborated or preserved by fragments, which served some useful purpose, in the Talmud and other Rabbinic writings, the Sadducees acquired concrete regulations to oppose so long as they dared. The Pharisees even improved upon the Temple ritual, and their popularity enabled them to force the Sadducees into adopting the improvements.

But though some of those who bore the title may be reckoned at their best as orthodox conservatives, their position was, as far as our mainly *Pharisaic* authorities permit us to learn, merely negative; and all the information we possess, whether it rests on facts or on prejudice, points to their close affinity with the Jews who renounced their faith altogether and advertised the fact—say by habitual and unwarranted breach of the Sabbath, for example. In fact, broadly speaking, the Sadducees for the period during which they are reported to exist, represent and embody the tendency to conformity with neighbouring Gentiles, which is deplored and denounced by Jewish writers from Moses to Philo. And there is this to be said that idolatry may be an outward symbol of a real indebtedness to idolaters which is not necessarily wiped out when the tangible idols are smashed. Idolatry is plainly incompatible with the law of Moses: so were Greek caps; but the Jews who conformed to Hellenism in the time of Antiochus Epiphanes acquired much that was conserved and utilized in that great attempt to convert the Greek world to Judaism, whose best monument is the works of Philo. The process is normal: first, there is an unqualified adoption of a foreign culture by the Sadducees of the time being: then, after unqualified opposition, the Pharisees of the time admit whatever is admissible within the four corners of the Law and are confronted by other Sadducees who have not followed the first into temporary or permanent separation from the existing Jewish way of life and absorption in the immediate foreign environment, and who, therefore, will have none of the current innovations which the Pharisees have in course of time selected as capable of assimilation and reconciliation with the existing body of growing doctrine and practice. The Jews spoiled the Egyptians: some made a golden calf and worshipped it: others destroyed it and turned the spoils into vessels for the sanctuary: some again sighed for the fleshpots of Egypt, if they did not actually return thither.

The controversies of the Pharisees and Sadducees afford a typical example of this process. With the approval of Antiochus Epiphanes, the Sadducean section embraced the outward forms of Hellenism, and out of the persecution of the orthodox which followed was born the hope of a future life which was in the circumstances the necessary corollary of God's righteousness and was discovered to be latent in Scripture. Later Sadducees, who actually bore the name, resisted this and all the characteristics of the Pharisees and continued to flatter the predominant foreigner—Greek or Roman—by imitating him with less reckless bravado than the first Hellenizers and with growing assurance. They were men of the world, and men of *this* world, and, so far as they still professed and practised Judaism, they preferred to repudiate the additions for which they felt no need, but which had entered into the faith of their fathers. The Pharisees, who pruned and fed the tree of Judaism so that it might bear fruit for the healing of the Nation—and the nations in the latter days—gave them the opportunity of posing as the champions of the primitive standards. But, though the reformers thus played into the hands of the Sadducees, the people were not deceived by the badge which Sadducean priests adopted and paraded to save their faces: they loved the Pharisees and were ready to go to death at their bidding. The Sadducees were the hypocrites of the Jewish world, just as the Epicureans were the hypocrites of the Greek world. The rest of the Jews rated the Sadducees as atheists, just as the rest of the Greeks rated the Epicureans as atheists and discerned, as Plutarch said, the sardonic grin behind the mask of their obsequious devotion to the ceremonies at which the force of public opinion compelled their attendance. The Sadducee was a Jew outwardly so long as he so retained place, power and profit. The destruction of Jerusalem, long before it was consummated in A.D. 70, robbed them of the place and nation which alone compensated them for the inconveniences of their nominal allegiance. They knew well enough the power of invincible Rome; and her advance warned them to take themselves and their talents to the market of the wide world, to which in heart and mind they had always belonged.

Josephus (*Ant.* xiii. 5. 9, §§ 171-173, Niese) introduces the Sadducees along with the Pharisees and Essenes in his account of Jonathan's reign (161–143 B.C.) as the third of the sects of the Jews, and defines their tenets thus: "They deny the existence of God (Josephus says 'Fate,' as he is speaking to pagans) and the Divine government of human affairs; and they assert that everything lies in our power, so that we are responsible for our good or bad fortune." Similarly, in the earlier history of the Jewish War (ii. 8. 14, §§ 164-166, Niese) to which he refers, he says: "The Sadducees do away with Destiny altogether and set God beyond the possibility of punishing or supervising men. They assert that man is free to choose good or evil since both are set before him, and that he receives good or evil according to his choice. They deny the immortality of the soul and the punishments and rewards of Hades. In contrast with the mutual friendliness and loyalty of the Pharisees, their behaviour towards one another is lacking in courtesy, and when they mix with their fellow-countrymen, they are as offhanded as if their fellows were aliens." Josephus might have added that they were disposed to treat aliens as they should have treated their friends.

In the New Testament there is already a tendency to ignore the Sadducees and to transfer to the surviving and active sect of the Pharisees denunciations addressed to hypocrites. The feud which set Pharisee and Sadducee against one another is ignored, and generally the condign oblivion which overtook this sect of the Jews is already beginning. The Christian Fathers seem to confound them with the Samaritans, and the confusion is natural enough. The Sadducees were as little loyal to the Judaism of Jerusalem as the Samaritans—and they were less sincere and less interested in religion.

The Talmud reports ancient controversies on points of law; and gives the Sadducees a founder, Zadok the disciple of Antigonus the man of Soco who prohibited the hope of reward for service done to God. But this explanation of the name is as worthless as the rest of the Talmudic accounts of the Sadducees who were already dead and gone. For the present the explanation put forward by A. E. Cowley (*Ency. Bib.* 4236) holds the field: a Persian word *Zindik* meaning *Zoroastrian*, and therefore infidel in the mouths of those who did not hold with Zoroaster, was applied to them by their opponents, and gradually altered so as to mean something in Hebrew—*i.e.* *Zadokite* or *Righteous*. Its acquired significance could be varied by the inflexion of the voice or the suggestion of inverted commas.

Schürer (*Geschichte des jüdischen Volkes*, ii., 4th ed., pp. 447-456, 475-489) gives the evidence of the ancient authorities and references to modern studies of the subject. See also JEWS. (J. H. A. H.)

SADE, DONATIEN ALPHONSE FRANÇOIS, COUNT [usually called the MARQUIS DE SADE] (1740–1814), French licentious writer, was born in Paris on the 2nd of June 1740. He entered the light-horse at fourteen and saw considerable military service before returning to Paris in 1766. Here his vicious practices became notorious, and in 1772 he was condemned to death at Aix for an unnatural offence, and for poisoning. He fled to Italy, but in 1777 he was arrested in Paris, removed to Aix for trial, and there found guilty. In 1778 he escaped from prison, but was soon re-arrested and finally committed to the Bastille. Here he began to write plays and obscene novels. In 1789 he was removed to the Charenton Lunatic Asylum, but was discharged in 1790, only to be recommitted as incurable in 1803. He died there on the 2nd of December 1814. Among his works, all of the type indicated, were *Justine* (1791), *Juliette* (1792), *Philosophie dans le boudoir* (1793) and *Les Crimes de l'amour* (1800). The word Sadism, meaning a form of sexual perversion, is derived from his name.

SÁ DE MIRANDA, FRANCISCO DE (1485–1558), Portuguese poet, was the son of a canon of Coimbra belonging to the ancient and noble family of Sá, and passed his early years by the banks of the river Mondego, the source of inspiration to poets in every age. He probably made his first studies of Greek, Latin and philosophy in one of the colleges of the Old City, and in 1505 went to Lisbon University, beginning at the same time to frequent the court. Verse-making and gallantry occupied much of his time there, and by virtue of his talents and name he became one of a group comprising the greatest nobles and most celebrated poets of the age, including Bernadim Ribeiro and Christovão Falcão, who surrounded the beautiful and gifted D. Leonor de Mascarenhas. He seems to have resided for the most part in the capital down to 1521, dividing his time between the palace and the university, in the latter of which he had taken the degree of doctor of law by 1516. Honoured by the friendship of Prince John (afterwards John III.), he accompanied the court as it moved from place to place during the reign of King Manoel, and witnessed the triumphs of the Fortunate Monarch; and at a time when the flag of Portugal floated victorious in every sea and her ships encircled the globe, it was not surprising that the youthful poet should aspire to be the Virgil of a new Augustus ruling a universal monarchy. His studious and reflective mind and sound sense did not allow him, however, to nourish these illusions for long, and we find him pointing out in tones of prophetic melancholy the signs of decadence and future disaster. He had come out of the university so good a lawyer that he was able to act as *ad interim* professor of his faculty, and he was offered a judicial post, but his independent spirit and punctilious conscience led him to refuse it. He had only embarked on a legal career to please his father, and on the latter's death he abandoned law for moral and stoic philosophy and poetry, and resolved to travel. He had observed with regret the modest intellectual position of his country, for all her wealth and epic achievements, the latter of which had found no echo in poetry; and if he were to learn and be able to introduce new forms of art fed by fresh ideals, as he desired, he felt he must go abroad. The *Cancioneiro de Resende*, which represented the poetical efforts of courtiers for almost a century and contained Miranda's early verses, showed the extent of the national poverty by its artificiality, and lack of ideas, of sincerity and of good taste. These defects are not surprising, seeing that during most of that long period the literary movement had been confined to court circles and had remained essentially imitative of Spanish models, with hardly a vestige of national or popular inspiration about it. Portugal had been too busy building up a world-empire to imbibe much of the mental culture of the Renaissance, and even the classics were for the most part only known through Spanish translations. Direct intercourse between Portugal and Italy partook of a commercial rather than a literary or artistic character, and, previously to Miranda's journey, Italian poetry was practically unknown.

In the middle of July 1520 he set out across Spain for Italy, and spent the years 1521 to 1525 abroad, visiting Milan, Venice, Florence, Rome, Naples and Sicily " with leisure and curiosity." He enjoyed intimacy with Giovanni Ruccellai, Lattanzio Tolomei and Sanazarro; he saluted the illustrious Vittoria Colonna, a distant connexion of his family, and in her house he probably talked with Bembo and Ariosto, and perhaps met Machiavelli and Guicciardini. He assisted at the rebirth of the Italian drama and saw the performance of classical prose comedies, a form of art which he was to transplant to Portugal. Lastly he heard the echoes of the Protestant revolt, and witnessed with horror the dissolution of morals which prepared the way for the Reformation.

Returning home in 1525, he brought with him the sonnet and canzone of Petrarch, the tercet of Dante, the *ottava rima* of Ariosto, the eclogue in the manner of Sanazarro, and Italian endecasyllabic verse. He did not, however, like his disciple Antonio Ferreira (*q.v.*), abandon the national *redondilha*, but rather continued to employ it and carried it to perfection in his *Cartas*. Settling down in Coimbra or its environs, he lived there from 1526–1527 until 1532. The visit of King John III. and his court to the city enabled him to resume his old relations with the reigning house and the cultivated members of the nobility, who received him affably and listened with interest to the story of his Italian tour. Gil Vicente, the court dramatist, was then at the height of his fame, but his *autos* appeared poor things to Sá de Miranda as compared with the comedies he had seen in Italy; and urged by his friends to present an example of the new style, he wrote the *Estrangeiros*. Produced in 1527–1528, it was the first Portuguese prose comedy, and was composed on the lines of the classical Roman drama as modified by contemporary Italian authors like Ariosto; it had a great and immediate success, notwithstanding the opposition of the partisans of the popular auto, who saw themselves attacked in the prologue. In 1528 Miranda made his first real attempt to introduce the new forms of verse by writing in Spanish a canzon entitled *Fabula do Mondego*, and in 1530–1532 he followed it up with the eclogue *Aleixo*, which among its redondilhas has some endecasyllables—the earliest attempt at *ottava rima* in Portuguese. Various sonnets dedicated to friends also belong to this period. The foundations of the Italian school were now laid, and henceforth Miranda's reputation as a poet grew visibly, while he was also one of the most esteemed of courtiers; but the opposition of his literary foes increased with his very success. Moreover, in the sphere of politics pessimism had taken firm hold of him. From being a land of promise, India had become for him, as for Camoens, " the mother of villains, the stepmother of men of honour "; and though the wealth of the East poured into Lisbon, Portugal remained poor because agriculture was neglected and corn had to be imported from abroad. Miranda protested in vigorous terms against the fever of adventure and lust of gold, but few gave ear to his moralizings or had leisure to read poetry, and in 1534 he left the court.

The year 1532 had marked his passage from the active to the contemplative life, and the eclogue *Basto*, in the form of a pastoral dialogue written in redondilhas, opened his new manner. It has a pronounced personal note, and its episodes are described in a genuinely popular tone. The shepherds Gil and Bento represent, the one city sociability, the other rustic aloofness, or the contrast between life at court and in the country, and serve as a vehicle for the poet's ideas. The same epoch saw the composition of his *Cartas* or sententious letters in quintilhas, which, with *Basto* and his satires, make up the most original, if not the most valuable, portion of his legacy, and served as models for two centuries. His allusion in *Aleixo* to the exile of Bernardim Ribeiro, and his defence of his friend, seem to have offended that powerful grandee, the count of Castanheira, and probably hastened his retirement from court, and the royal gift of a Commenda of the Order of Christ, situate by the river Neiva on the borders of Galicia, came opportunely, because the rents Sá de Miranda drew from it and a small private fortune enabled him to live in modest comfort at the neighbouring Quinta da Tapada. Poetry with him was never a mere pastime, and, after a short period of repose, the gift of a MS. of the verses of Garcilasso and Boscan, founders of the Italian school in Castile, encouraged him to resume the work of reform commenced at Coimbra; between 1535 and 1538 he composed five eclogues in endecasyllables, four in Spanish and one in Portuguese, which show evident traces of their influence.

Before long he heard echoes of his new song, first from the province, then from the court. In 1536 he married D. Briolanja de Azevedo, a lady of rare qualities and education, belonging to an illustrious Minho family. He spent the rest of his life in retirement at the Quinta da Tapada, which became a centre from which the reform of Portuguese poetry spread; for he developed great poetical activity in his retreat, and while he read and annotated Homer in the original Greek, he did not disdain domestic pleasures and country sports. His evenings were occupied by music and the performance of comedies and mimes, and by readings of Bembo and Ariosto with cultivated neighbours; and he extended hospitality to savants like Nicholas Cleynarts and Francisco de Hollanda, and launched on the career of letters such men as Diogo Bernardes, the author of the *Lima*.

In 1538 he wrote his second classical prose comedy, the *Vilhalpandos*, which was played before the Cardinal Infant Henry, afterwards king, at his request, and on the poet's death that prince saw to the printing of this and the earlier comedy. During the years 1543 to 1553, except for a few occasional poems Sá de Miranda kept silence, and the cause is not far to seek; the Inquisition had got to work, and the Jesuits had acquired control of the university and displaced the humanists. When the king and court lent their presence to *autos da fé* and organized public penances, initiating a reign of fanaticisms and sadness, there was no place for poetry. Sá de Miranda could only deplore in private the misfortunes of his country and devote himself to polishing his verses and educating his children. His life's work was done, for the year 1550 saw Camoens writing his admirable sonnets, canzons and elegies, and the Italian school had definitely triumphed. The last eight years of Sá de Miranda's life produced a cycle of beautiful poems evoked by the personality of Prince John, the heir-apparent, who loved letters and especially poetry, and whose precocity of talent made him the hope of all patriots. In 1550 and 1551, after the prince's visit to the university of Coimbra, he honoured the master by asking for a collection of his poems, and on three occasions we find the latter despatching portions of his song-book to Lisbon accompanied by dedicatory sonnets. Moreover, he had the further gratification of receiving verses from Antonio Ferreira, Jorge de Montemayor, Diogo Bernardes, and André Falcão de Resende, which were so many proofs of the vitality of his school. Three misfortunes, however, came on him in quick succession. He lost his eldest son in 1553, Prince John died in 1554, and in 1555 his wife died. His friend King John III. passed away in 1557, and on the 15th of March 1558 Sá de Miranda followed him to the grave.

He was not a great writer and never entered into the hearts of his countrymen, remaining the poet of the cultured, who could understand him and pardon his metrical imperfections. He led the way, however, in a revolution in literature, and especially in poetry, which under his influence became higher in aim, purer in tone and broader in sympathy. He is obviously not at ease in the new forms which he had introduced, and his verse is, as a rule, austere, unharmonious and often difficult of understanding, but these remarks do not, of course, apply to his redondilhas. Some of his sonnets are, however, admirable, and display a grave tenderness of feeling, a refinement of thought, and a simplicity of expression which give them a high value. As examples it is only necessary to mention the one beginning "O sol he grande . . . ." and the lines he composed on the death of his wife. Sá de Miranda wrote much and successfully in Castilian, several of his best eclogues being in that language. The charm of these compositions lies in their convincing descriptions of natural scenery and country life, which he loved and comprehended to perfection.

Sá de Miranda's works were first published in 1595, but the admirable critical edition of Madame Michäelis de Vasconcellos (Halle, 1885), containing life, notes and glossary, supersedes all others so far as the poems are concerned. His plays can best be read in the 1784 edition of the collected works. No modern or critical edition is available. See also Oswald Crawford, *Portugal Old and New* (London, 1880); Dr Sousa Viterbo, *Estudos sobre Sá de Miranda* (3 parts, Coimbra, 1895–1896); Decio Carneiro, *Sá de Miranda e a sua obra* (Lisbon, 1895); and Dr Theophilo Braga, *Sá de Miranda* (Oporto, 1896). (E. Pr.)

SADHU, a Hindu ascetic, corresponding to the Mahommedan fakir (*q.v.*). The Sadhus, who are known also as Sanyasis, Gosains and Bairagis, are of various sects, hold peculiar opinions, indulge in strange practices, and subject themselves in many cases to cruel hardships and fantastic disciplines. They range in moral standing from the peripatetic philosopher to the idle vagabond. Some lead the life of contemplation, which Hindus consider especially holy; others pose as alchemists, physicians, fortune-tellers, palmists or acrobats; while others yet again practise voluntary tortures, such as holding one arm upright until it withers, or lying continually upon a bed of spikes. Some go about almost naked, or smeared all over with ashes; but the usual garment of an ascetic is stained an orange red with ochre. Hence was derived the colour of the Mahratta flag. Alone among Hindus their dead are buried instead of being burned, usually in a sitting posture, and often in salt. During the disturbed period of Indian history, before British rule was firmly established, armed bodies of Sanyasis or Gosains attached themselves to the Mahratta armies, and also ravaged Northern Bengal in the time of Warren Hastings.

SA‘DĪ (*c.* 1184–1292). MUṢLIḤ-UDDĪN, or more correctly MUSHARRIF-UDDĪN B. MUṢLIḤ-UDDĪN, the greatest didactic poet and the most popular writer of Persia, was born about 1184 (A.H. 580) in Shiraz. After the premature death of his father he was taken under the protection of Sa‘d b. Zengī, the atābeg of Fars, who sent him to pursue his studies in the famous medresseh of Baghdād, the Nizāmiyya, where he remained about thirty years (1196–1224). About 1210 (A.H. 606) his literary fame had spread as far as Kashgar in Turkistan, which the young poet (who in honour of his patron had assumed the name of Sa‘dī) visited in his twenty-sixth or twenty-seventh year. After mastering all the dogmatic disciplines of the Islamitic faith he turned his attention first to practical philosophy, and later on to the more ideal tenets of Sufic pantheism, under the spiritual guidance of the famous sheikh Shihāb-uddīn Umar Suhrawardī (died 1234; A.H. 632). Between 1220 and 1225 he paid a visit to a friend in Isfahan, went from there to Damascus, and returned to Isfahan just at the time of the inroads of the Mongols, when the atābeg Sa‘d had been deposed by the victorious Khwarizm ruler of Ghiyāss-uddīn (1226). Sadly grieved by the misfortune of his patron and disgusted with the miserable condition of Persia, Sa‘dī quitted Shīrāz and entered upon the second period of his life—that of his wanderings (1226–1256). He proceeded via Balkh, Ghaznī and the Punjab to Gujarāt, on the western coast of which he visited the famous shrine of Sīva in Somnath. After a prolonged stay in Delhi, where he learnt Hindūstānī, he sailed for Yemen. Overcome with grief at the loss of a beloved child (when he had married is not known), he undertook an expedition into Abyssinia and a pilgrimage to Mecca and Medina. Thence he directed his steps towards Syria and lived as a renowned sheikh for a considerable time in Damascus, which he had once already visited. There and in Baalbek he added to his literary renown that of a first-rate pulpit orator. Specimens of his spiritual addresses are preserved in the five homilies (on the fugitiveness of human life, on faith and fear of God, on love towards God, on rest in God and on the search for God). At last, weary of Damascus, he withdrew into the desert near Jerusalem and led a solitary wandering life, till one day he was taken captive by a troop of Frankish soldiers, brought to Tripoli, and condemned to forced labour in the trenches of the fortress. After enduring countless hardships, he was eventually rescued by a rich friend in Aleppo, who paid his ransom, and gave him his daughter in marriage. But Sa‘dī, unable to live with his quarrelsome wife, set out on fresh travels, first to North Africa and then through the length and breadth of Asia Minor and the adjoining countries. Not until he had passed his seventieth year did he return to Shiraz (about 1256; A.H. 653). Finding the place of his birth tranquil and prosperous under the wise rule of Abūbakr b. Sa‘d, the son of his old patron (1226–1260; A.H. 623–658), the aged poet took up his permanent abode, interrupted only by repeated pilgrimages to Mecca, and devoted the remainder of his life to Ṣūfic contemplation and poetical composition. He died at Shīrāz in 1292 (A.H. 691) according to Ḥamdallāh Mustaufī (who wrote only forty years later), or in December 1291 (A.H. 690), at the age of 110 lunar years.

The experience of the world gained during his travels, his intimate acquaintance with the various countries he had visited, his insight into human character, together with an inborn loftiness of thought and the purest moral standard, made it easy for Sa‘dī to compose in the short space of three years his two masterpieces, which have immortalized his name, the *Būstān* or "Fruit-garden" (1257) and the *Gulistān* or "Rose-garden" (1258), both dedicated to the reigning atābeg Abū Bekr. The former, also called *Sa‘dīnāma*, is a kind of didactic epopee in ten chapters and double-rhymed verses, which passes in review the highest philosophical and religious questions, not seldom in the very spirit of Christianity, and abounds with sound ethical maxims and matchless gems of transcendental speculation. The latter is a prose work of a similar tendency in eight chapters, interspersed with numerous verses and illustrated, like the *Būstān*, by a rich store of clever tales and charming anecdotes; it discusses more or less the same topics as the larger work, but has acquired a much greater popularity in both the East and the West, owing to its easier and more varied style, its attractive lessons of practical wisdom, and its numerous *bons mots.* But Sa'dī's *Diwān*, or collection of lyrical poetry, far surpasses the *Būstān* and *Gulistān*, at any rate in quantity, whether in quality also is a matter of taste. Other minor works are the Arabic *qaṣīdas*, the first of which laments the destruction of the Arabian caliphate by the Mongols in 1258 (A.H. 656); the Persian *qaṣīdas*, partly panegyrical, partly didactical; the *marāthī*, or elegies, beginning with one on the death of Abū Bekr and ending with one on the defeat and demise of the last caliph, Mosta'sim; the *mulamma'āt*, or poems with alternate Persian and Arabic verses, of a rather artificial character; the *tarjī'āt*, or refrain-poems; the *ghazals*, or odes; the *ṣāhibiyyah* and *muḳatta'āt*, or moral aphorisms and epigrams; the *rubā'iyyāt*, or quatrains; and the *mufradāt*, or distichs. Sa'dī's lyrical poems possess neither the easy grace and melodious charm of Ḥāfiẓ's songs nor the overpowering grandeur of Jelālud-dīn Rūmī's divine hymns, but they are nevertheless full of deep pathos and show such a fearless love of truth as is seldom met with in Eastern poetry. Even his panegyrics, although addressed in turn to almost all the rulers who in those days of continually changing dynasties presided over the fate of Persia, are free from that cringing servility so common in the effusions of Oriental encomiasts.

The first who collected and arranged his works was 'Alī b. Ahmad b. Bīsutūn (1326–1334; A.H. 726–734). The most exact information about Sa'dī's life and works is found in the introduction to Dr W. Bacher's *Sa'dī's Aphorismen und Sinngedichte* (*Ṣāhibiyyah*) (Strassburg, 1879; a complete metrical translation of the epigrammatic poems), and in the same author's "Sa'dī Studien," in *Zeitschrift der morgenländischen Gesellschaft*, xxx. pp. 81-106; see also H. Ethé in W. Geiger's *Grundriss der iranischen Philologie*, ii. pp. 292-296, with full bibliography; and E. G. Browne, *Literary History of Persia*, pp. 525-539. Sa'dī's *Kulliyyāt* or complete works have been edited by Harrington (Calcutta, 1791–1795) (with an English translation of some of the prose treatises and of Daulat Shah's notice on the poet, on which a German version is found in Graf's *Rosengarten* (Leipzig, 1846, p. 229 sq.); for the numerous lithographed editions, see Rieu's *Pers. Cat. of the Brit. Mus.* ii. p. 596. The *Būstān* has been printed in Calcutta (1810 and 1828), as well as in Lahore, Cawnpore, Tabriz, &c., a critical edition with Persian commentary was published by K. H. Graf at Vienna in 1850 (German metrical translations by the same, Jena, 1850, and by Schlechta-Wssehrd, Vienna, 1852); English prose translations by H. W. Clarke (London, 1879); and Ziauddin Gulam Moheiddin (Bombay, 1889); verse by G. S. Davie (1882); French translation by Barbier de Meynard (Paris, 1880). The best editions of the *Gulistān* are by A. Sprenger (Calcutta, 1851) and by Platts (London, 1874); the best translations into English by Eastwick (1852) and by Platts (1873), the first four *bābs* in prose and verse by Sir Edwin Arnold (1899); into French by Defrémery (1858); into German by Graf (1846); see also S. Robinson's *Persian Poetry for English Readers* (1883), pp. 245-366. The *Pandnāmah*, or book of wisdom (of doubtful genuineness) has been translated by A. N. Wollaston (1908), with Persian text. Select qaṣīdas, ghazals, elegies, quatrains and distichs have been edited, with a German metrical translation, by Graf, in the *Z.D.M.G.* ix. p. 92 sq., xii. p. 82 sq., xiii. p. 445 sq., xv. p. 541 sq. and xviii. p. 570 sq. On the Sūfic character of Sa'dī in contrast to Ḥāfiẓ and Rūmī, comp. Ethé, "Der Sūfismus und seine drei Hauptvertreter," in *Morgenländische Studien* (Leipzig, 1870), pp. 95-124. (H. E.)

SADIYA, the extreme north-east frontier station of British India, in the Lakhimpur district of Eastern Bengal and Assam. It stands high on a grassy plain, nearly surrounded by forest-clad mountains, on the right bank of what is locally (but erroneously) considered the main stream of the Brahmaputra. On the opposite bank a railway has recently been opened which connects with the Assam-Bengal line. Sadiya is garrisoned by detachments of native infantry and military police, and is the base of a chain of outposts. There is a bazaar, to which the hillmen beyond the frontier—Mishmis, Abors and Khamtis—bring down rubber, wax, ivory and musk, to barter for cotton-cloth, salt, metal goods, &c.

SADLER, MICHAEL THOMAS (1780–1835), English social reformer and economist, was born at Snelston, Derbyshire, on the 3rd of January 1780. Settling down in business in Leeds in 1800, he early took an active part in political life, devoting himself particularly to the administration of the poor law. In 1828 he wrote *Ireland: its Evils and their Remedies*, in which he advocated a poor-law, and a tax on absenteeism. He also took a share in the Malthusian controversy, writing *The Law of Population: a Treatise in Disproof of the Super-fecundity of Human Beings and developing the Real Principle of their Increase* (1830). He entered parliament in 1829 as member for Newark, and devoted his efforts to questions of social reform. He took a leading part in the agitation for the prevention of child labour in factories—he was chairman of the committee appointed to inquire into the subject. He contested Leeds after the Reform Bill of 1832 (Aldborough, for which he had sat after Newark, being deprived of its member), but was defeated by Macaulay. In 1834 he was unsuccessful at Huddersfield, and failing health prevented any further attempts to re-enter parliament. He settled down in Belfast, where his firm had business interests, and died at New Lodge on the 29th of July 1835.

See R. B. Seeley, *Memoirs of M. T. Sadler* (1842).

SADLER (or Sadleir), **SIR RALPH** (1507–1587), English statesman, the son of Henry Sadler, steward of the manor of Cilney, near Great Hadham, Hertfordshire, was born at Hackney, Middlesex, in 1507. While a child he was placed in the family of Thomas Cromwell, afterwards earl of Essex, whose secretary he eventually became. Between 1525 and 1529 his patron's letters are full of Sadler's name in connexion with Cardinal Wolsey's suppression of the monasteries; this probably brought him under the king's notice, for in 1536 he was made gentleman of the privy chamber, and from that time was continually employed by Henry VIII. In 1537 Sadler went first to Scotland to try to reconcile Margaret to her son King James V., and then to France on the same mission to James himself. He seems to have been successful, and was again in Scotland in 1540 trying to induce the king to follow his uncle's ecclesiastical policy. In or about January 1540, he was made secretary of state along with Sir Thomas Wriothesly, and was knighted, probably about the same time. On James V.'s death Sadler again went to Scotland (March 1543) to negotiate a marriage between prince Edward and his cousin Mary; he was unsuccessful, but still retained Henry's confidence. On Henry's death in 1547, Sadler was by his will made one of the councillors to the sixteen noblemen entrusted with the young king's guardianship. In the same year he was appointed treasurer to the army sent to Scotland, and for his services in rallying the repulsed cavalry at the battle of Musselburgh or Pinkie, he was created a knight-banneret. He also received many grants of land, including the manor of Standon in Hertfordshire, where he built a magnificent house in 1546. When Mary ascended the throne he retired, living quietly till Elizabeth's accession. He issued the writs for the privy council meeting at Hatfield on the 20th of November 1558, and during the first year of the queen's reign he once more became a privy councillor. He sat in the parliament of January 1558–1559 as member for Hertford, which he had already represented in 1541, 1542 and 1553. Not long afterwards his strong Protestant sympathies and his acquaintance with Scotch affairs induced Elizabeth to send him (1559) to Scotland, ostensibly to settle the border disputes, but in reality to secure a union with the Protestant party there, and he was largely instrumental in bringing about the treaty of Leith, July 6th, 1560. In 1568 Sadler was appointed chancellor of the duchy of Lancaster, and in the same year was one of the English Commissioners employed in treating on the matters arising from the flight of the Queen of Scots. From this time he seems to have been continually engaged as a discreet and trusty servant in connexion with Mary's captivity, and was frequently sent with messages to her. On the 25th of August 1584, when, owing to the imputations made by his countess, George 6th earl of Shrewsbury was allowed to resign his guardianship of the Queen, Sadler was appointed to succeed him. In September Mary was removed from Sheffield to Wingfield and thence early in 1585 to Tutbury. In April, Sadler, after numerous petitions on his part, was permitted to resign his distasteful charge. He is said by some to have been sent to Scotland to announce to James VI. his mother's death, but this is not corroborated by the state papers. On the 30th of March 1587 Sadler died at Standon, and was buried in the church there. He had married about 1534 Elizabeth Mitchell, whose first husband Matthew Barre had deserted her and was believed to be dead. Barre, however, re-appeared a few years later, and Sadler then obtained an act of parliament legitimatizing his children. Sadler was not a brilliant statesman, but a most faithful and intelligent servant. His letters, particularly those on Scottish affairs, are most interesting.

Bibliography.—*Letters and Negotiations of Sir Ralph Sadler* (Edinburgh, 1720); *The State Papers and Letters of Sir R. Sadler*, ed. Arthur Clifford, with a memoir by Sir Walter Scott (Edinburgh, 1809, 3 vols.); article by N. H. N. in *Gentleman's Magazine* for March 1835; J. M. Cussans, *Hist. of Hertfordshire* (1870–1873, 3 vols.); *Memoir of the Life and Times of Sir R. Sadleir*, by F. Sadleir Stoney (1877); *Life and Letters of Thomas Cromwell*, by R. B. Merriman (Oxford, 1902, 2 vols.).

SADO, an island belonging to Japan, lying 32 m. W. of Niigata, on 38° N., 138° 30′ E. It has a circumference of 130 m., an area of 336 sq. m. and a population of 113,000. The port is Ebisa, on the east coast; and at a distance of 16½ m., near the west coast, is the town of Aikawa, having in its vicinity gold and silver mines, for which Sado is famous. They have been worked from very early times. Sado consists of two parallel hill ranges separated by a lower isthmus; the loftiest peak is that of Kimpokuzan (3815 ft.), to the north of Aikawa.

SADOLETO, JACOPO (1477–1547), Italian humanist and churchman, was born at Modena in 1477, and, being the son of a noted jurist, was designed for the same profession. He gave himself, therefore, to humanistic studies and acquired reputation as a Latin poet, his best-known piece being one on the group of Laocoon. Passing to Rome, he obtained the patronage of Cardinal Carafa and adopted the ecclesiastical career. Leo X. chose him as his secretary along with Pietro Bembo, and in 1517 made him bishop of Carpentras. Sadoleto had a remarkable talent for affairs and approved himself a faithful servant of the papacy in many difficult negotiations under successive popes, especially as a peacemaker; but he was no bigoted advocate of papal authority, and the great aim of his life was to win back the Protestants by peaceful persuasion—he would never countenance persecution—and by putting Catholic doctrine in a conciliatory form. Indeed his chief work, a *Commentary on Romans*, though meant as a prophylactic against the new doctrines, gave great offence at Rome and Paris. Sadoleto was a diligent and devoted bishop and left his diocese with reluctance even after he was made cardinal (1536). His piety and tolerant spirit, combined with his reputation for scholarship and eloquence and his diplomatic abilities, give him a unique place among the churchmen of his time. He died in 1547.

His collected works appeared at Mainz in 1607, and include, besides his theologico-irenical pieces, a collection of *Epistles*, a treatise on education (first published in 1533), and the *Phaedrus*, a defence of philosophy, written in 1538. The best collection is that published at Verona (1737–1738); it includes the life by Fiordibello. See also Péricaud, *Fragments biographiques sur Jacob Sadolet* (Lyons, 1849); Joty, *Étude sur Sadolet* (Caen, 1857); Balan, *Monumenta*, vol. i. (Innsbruck, 1885); Rochini's edition of the letters (Modena, 1872).

SADOLIN, JÖRGEN (*c.* 1499–1559) Danish reformer, the son of Jens Christensen, a curate and subsequently a canon of Viborg cathedral, and consequently, in all probability, born (*c.* 1499) out of wedlock, as his Catholic opponents frequently took care to remind him. He himself never used the name Sadolinus, which seems to have been invented subsequently by his son Hans, and points to the fact that the family were originally saddle-makers. We first hear of him on the 1st of December 1525, when Frederick I. permitted him to settle at Viborg to teach young persons of the poorer classes "whatever might be profitable." On this occasion he is described as "magister" and no doubt got his degree abroad, where he seems to have been won for the Reformation. He sided with Hans Tausen when the latter first began to preach the gospel at Viborg, and Tausen, though himself only in priest's orders, shortly before he left the place, ordained Sadolin (1529). Amongst "the free priests" who attended the *herredag* of Copenhagen in 1530 Sadolin occupied a prominent place. Frederick subsequently transferred him to Funen, where he acted, according to his own expression, as "adjutor in verbo" to Knud Gyldenstjerne, bishop of Odense. At the diocesan council held on the 27th of May 1532, during the absence of the bishop, he presented to the assembled priests a translation of Luther's catechism, with Luther's name omitted, preceded by an earnest plea in favour of a better system of education and a more practical application of the Christian life, which occupies a conspicuous place in the literature of the Danish Reformation. In the following year Sadolin published the first Danish translation of the Confession of Augsburg. He disappears during the troublous times of "C'-revens Fejde" (1533–1536), though we get a glimpse of him at the end of 1536 as one of the preachers at *Vor Frue Kirke*, the principal church of Copenhagen. On the 2nd of September 1537 he was consecrated by the German reformer, Johann Bugenhagen, who himself only had priest's orders, superintendent, or first evangelical bishop, of Funen. As bishop he was remarkable for the success with which he provided the necessary means for the support of churches, schools and hospitals in his widespread diocese, which had been deprived of its usual sources of income by the wholesale confiscation of church property. Towards the Catholics he adopted a firm, but moderate and reasonable, tone, and his indulgence towards the monks in St Knud's cloister drew down upon him a fierce attack from the Puritan clergyman of Odense, who absurdly accused him of being a crypto-Catholic. He gave the funeral oration over Christian III. in St John's Church at Odense in February 1559, though now very infirm and blind, and died at the end of the same year.

See Bricka, *Dansk Biografish Lx. Art. Sadolin* (Copenhagen, 1887). (R. N. B.)

SADOWA (Czech, *Sádová*), a village of Bohemia, Austria, 4 m. N.W. of Königgrätz. Pop. (1900) 183, exclusively Czech. Sadowa, with the small adjoining wood, was one of the principal and most hotly contested Prussian positions in the decisive battle now usually called by the name of Königgrätz (see Seven Weeks' War).

SAEPINUM (mod. Altilia, near Sepino), a Samnite town 9 m. S. of the modern Campobasso, on the ancient road from Beneventum to Corfinium. It was captured by the Romans in 293 B.C. The position of the original town is on the mountain far above the Roman town, and remains of its walls in Cyclopean masonry still exist. The city walls (in *opus reticulatum*) of the Roman town were erected by Tiberius before he became emperor, the date (between 2 B.C. and A.D. 4) being given by an inscription. Within them are remains of a theatre and other buildings, including temples of Jupiter and Apollo, and there still exists, by the gate leading to Bovianum, an important inscription of about A.D. 168, relating to the *tratture* (see Apulia) in Roman days, forbidding the natives to harm the shepherds who passed along them (*Corp. inscr. Lat.* ix. 2438).

See L. Fulvio in *Not. degli scav.* (1878), 374.

SAETERSDAL, a district in the south of Norway, comprising the valleys of the Otter river and its tributaries. The river rises in the fjelds above the Bukken Fjord, and flows south to Christiansund. The natives preserve old customs and an individual costume. A railway follows the valley to Byglands Fjord (48 m.), on the lake of that name, fostering the local agricultural and timber trade, and a driving road continues to Viken i Valle from which bridle-paths lead to Dalen in Telemarken, and over the Enden and Malen fjelds to Lake Suldal on the Bratlandsdal route.

SAFED KOH ("white mountain"), in many respects the most remarkable range of mountains on the north-west frontier of India, extending like a 14,000 ft. wall, straight and rigid, towering above all surrounding hills, from the mass of mountains which overlook Kabul on the south-east to the frontiers of India, and preserving a strike which—being more or less perpendicular to the border line—is in strange contrast to the usual conformation of frontier ridge and valley. The highest peak, Sikaram, is 15,620 ft. above sea-level, and yet it is not a conspicuous point on this unusually straight-backed range. Geographically the Safed Koh is not an isolated range, for there is no break in the continuity of water divide which connects it with the great Shandur offshoot of the Hindu Kush except the narrow trough of the Kabul river, which cuts a deep waterway across where it makes its way from Dakka into the Peshawar plains. Strategically it is an important topographical feature, for it divides the basin of the Kabul river and the Khyber route from the valley of Kurram, leaving no practicable pass across its rugged crest to connect the two. Its western slopes, where it abuts on the mountain masses which dominate the Kabul plain, are forest-covered and picturesque, with deep glens intersecting them, and bold craggy ridges; the same may be said of the northern spurs which reach downward through the Shinwari country towards Gandamak and Jalalabad. Here the snow lies late and moisture is abundant—but on the southern sun-scorched cliffs but little vegetation is to be seen. Approaching the Peshawar plains the Safed Koh throws off long spurs eastward, and amongst the foothills of these eastern spurs the Afridi Tirah long remained hidden from European eyes.

SAFES, STRONG-ROOMS AND VAULTS. The term "safe," whilst really including any receptacle for the secure custody of valuables provided with a lock or other device intended to prevent any person except the owner or some person authorized by him gaining access thereto, has gradually come to be confined to such receptacles when fitted with a vertical door, as distinguished from a lid, and of such a size that they can be moved into position, by the use of proper appliances, in one piece. Such receptacles, when so large as to require that their parts should be assembled *in situ*, fall under the term "strong-rooms," or in the case of safe-deposits "vaults," and when constructed with hinged lids, as distinct from doors, under the terms "cash-box," "deed-box" and "coffer." The term "coffer" is probably the most ancient, and in earlier days included, as it still does in France, what are now known as safes.

Although it is practically certain that boxes provided with locks or coffers must have followed closely on the development of locks (*q.v.*) and been in use in ancient Egypt, yet no examples remain to us of earlier date than the middle ages. The earliest examples extant were constructed of hard wood banded with hammered iron, and subsequent development took place rather on artistic than on practical lines up to the time of the introduction of boxes entirely of iron. On the continent of Europe the iron box was developed to a very high standard of artistic beauty and craftsmanship, but with no real increase of security. Several specimens of these coffers supposed to be of 17th-century workmanship are preserved in the museum at Marlborough House. Cast-iron chests seem to have been made in various parts of Great Britain in the early part of the 19th century, but the use of wrought iron was probably confined to London until 1820, or thereabouts, when the trade spread to Wolverhampton.

Up to this time no attempt had been made to make coffers fireproof, for though a patent for fireproofing had been taken out in 1801 by Richard Scott, it does not appear to have been used. In 1834, however, a patent was obtained by William Marr for the application of non-conducting linings, followed about four years later by a similar patent in the name of Charles Chubb. The foundation, however, of the modern safe industry was laid by Thomas Milner, originally a tinsmith of Sheffield, who after a few years' business in Manchester established, in 1830, works at Liverpool for the manufacture of tinplate and sheet iron boxes and who later made plate iron chests or coffers and, probably the earliest, safes about the year 1846. To him is due the modern system of fireproofing, which owes its merit to the use not of non-conductors but of an absorbent material which in the case of fire will be permeated with moisture present in it, either in the form of liquid contained in tubes which burst or otherwise discharge their contents when subjected to heat, or mixed with it as water of crystallization in combination with an inorganic salt. The patent he obtained in 1840 contains the following claim: "Constructing, forming, or manufacturing boxes, safes, or other depositories of an outer case of iron or other metal or material, enclosing one, two, or more inner cases, with spaces or chambers between them, containing an absorbent material or composition, such as porous wood, dust of wood, dust of bones, or similar substances, in which are distributed vessels, pipes or tubes filled with an alkaline solution or any other liquid or matter evolving steam or moisture, the tubes or vessels bursting or otherwise discharging themselves on the exposure of the box or other depository to heat or fire, into the surrounding absorbent matter, which thus pervaded with moisture and rendered difficult of destruction, protects the inner cases or boxes and their contents." In 1843, Edward Tann, Edward Tann, Junr., and John Tann took out a patent for securing the presence of moisture by means of a chemical salt. In their patent they give preference to alum in combination with Austin's cement or gypsum, but they also claim "any non-conductors of heat may be used, and for alum may be substituted sulphate of potash, muriate of ammonia, borax, impure potash, nitrate of soda, soda in cake, pearlash, or any of the known alkalis." Milner considered this an infringement of his patent of 1840, and in an action before Lord Campbell and a special jury in the Queen's Bench, on the 3rd of June 1851, a verdict was given upholding his contention.

For some years no marked improvements in safes were made, although the manufacture had been taken up in various places by different firms. Safes had, however, been constructed of thicker materials, and some attention had been paid to the more secure attachment of the various parts; also, with the advent of the wrought-iron safe, as distinct from the coffer, the practice had developed of securing the door by a number of bolts operated by a handle and fastening them in the locked position by the lock proper, in order that a small key might be used (Charles Chubb's patent, 1845).

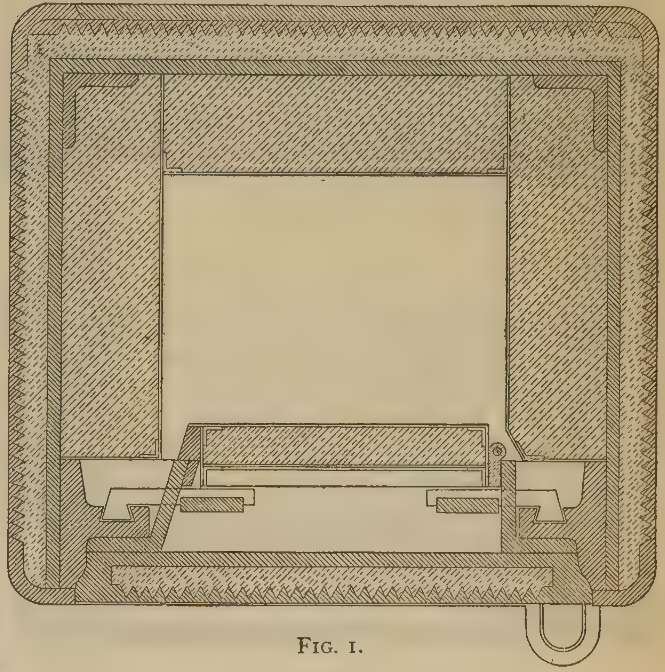
FIG. 1.

Concurrently with the increase of strength in safes and probably with the increased value of articles preserved in safes, the skill of the professional thief had also increased, and this went on for some years until the Cornhill burglary of 1865 called general attention to the question. In 1860 a patent was taken out by Samuel Chatwood for a safe constructed of an outer and inner body with the intervening space filled with ferro-manganese or speigeleisen in a molten state, the total thickness being 2 in. (fig. 1). The drilling of conical holes in the inner surface of the outer plate as shown in the figure renders the use of drills of any materials at present known quite inoperative; as the drill, even if it could be made sufficiently hard to pierce the speigeleisen, would on meeting it be bedded in the soft steel and unable to free itself. The construction of such a safe was an expensive matter, and it was not till after the robbery above referred to that he was enabled to sell a single example; it is, however, still in demand for the preservation of diamonds, as probably the only absolutely drill-proof receptacle. This patent is noteworthy as being the only one connected with the lock and safe industry which has been extended by the privy council.

It is about this period (1860–1870), perhaps the most important in the history of safes, that the opening of safes by wedges seems to have become prominent. The effect of wedges was to bend out the side of the safe sufficiently to allow of the insertion of a crowbar between the body and the edge of the door, and various devices were adopted by different makers with the object of resisting this mode of attack. These devices may be placed in three classes: (1) the fixing to the door of studs or projections which, when the door closed, passed into holes or recesses in the frame of the body; (2) the use of bolts hooking into the side framing or entering the bolt holes at an angle; (3) the strengthening of the side framing and of the attachment of the bolts to the outer door-plate. The third of these methods (fig. 2) was patented by Samuel Chatwood in 1862, and is still very commonly employed. The second method was used by Chubb and Chatwood, but is not to-day in general use. The first method was used by all makers of repute, but has now been abandoned, as the increased structural strength of the better class of safes renders such devices unnecessary.

To prevent safes from being opened by the drilling of one or two small holes in such positions as to destroy the security of the lock itself, advantage was taken of the improvements in the manufacture of high carbon steel, and even in what is to-day called the "fire-proof" safe a plate of steel which offers considerable resistance to drilling is placed between the outer door plate and the lock.

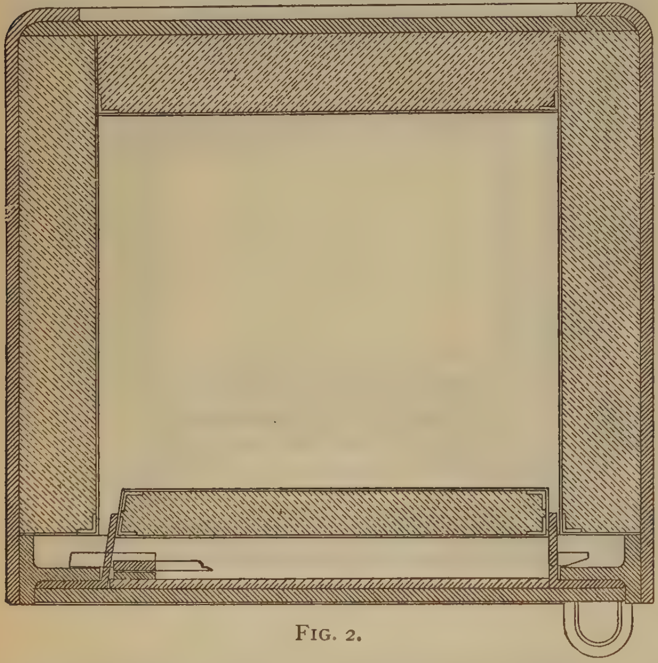

FIG. 2.

For many years little advance was made except such as consisted in substituting steel for iron and in general gaining increased strength by the utilization of better materials, although many safes are made and sold to-day which offer little if any more resistance to fire and thieves than those of 1860–1870. About 1888 the "solid" safe was introduced. In this the top, bottom and two sides of the safe, together with the flanges at the back only or at both back and front, are bent from a single steel plate (fig. 3). This construction, with solid corners, also illustrated in figs. 1 and 2, only became practicable in consequence of the great improvements which had been made in the quality of steel plates; the credit of its invention formed the subject of litigation, which, however, was not carried to an issue. The abolition of corner joints, which up to 1888 had been made by dovetailing and by the use of angle irons, had been previously attempted by welding, but the process was abandoned as commercially impracticable.

In the early days of the safe industry in America the conditions as far as protection from fire was concerned were entirely different from those obtaining in Great Britain. The timber construction employed in American buildings rendered fires much more fierce, but at the same time of very short duration, not more than an hour or two. To meet this condition of affairs thick sides of non-conducting materials were more efficacious than the chambers of steam-generating materials employed in British construction, but the gradual abandonment of timber and the increasing size of buildings have called for changes in the methods of fire-proofing.

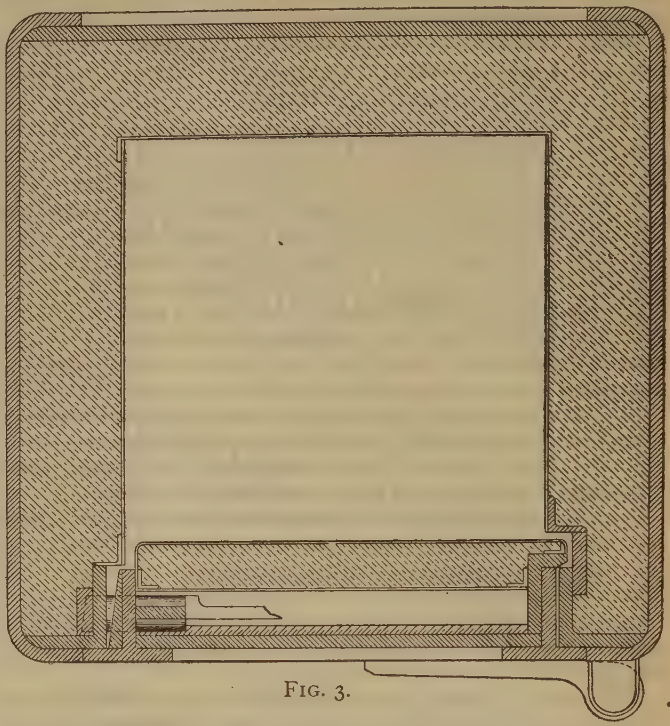

FIG. 3.

The American "burglar proof" safe (fig. 4) seems to have developed from the fire-proof (fig. 5) simply by the addition of extra thicknesses of metal, usually alternately hard and soft, without any serious increase of structural strength; this construction, known as the "laminated" or "built up," offers little resistance to burglars, as the various layers can be separated from one another by the use either of explosives, especially nitroglycerine, or of wedges. In 1890 a commission was appointed by the U.S.A. government to report upon the strong-rooms or vaults of the treasury at Washington; and their report[1] was presented in September 1893. This commission based their conclusions on experiments conducted in their presence, as well as on well-authenticated experiments performed by safe-makers on their own and other makers' productions, and they found that, with the single exception of the Corliss safe, all the safes which came under their notice—and these comprised all the best-known American makes—could be opened by burglars by

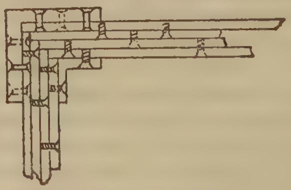

FIG. 4.—American Burglar-proof Construction.

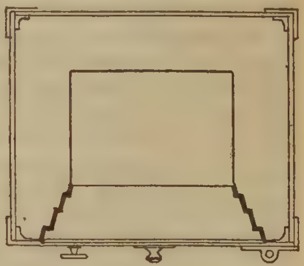

FIG. 5.—American Fire-proof Safe.

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[1] *Report of Special Commission of Experts as to Means of improving Vault Facilities of the Treasury Department* (Washington, 1894).

drilling, by the use of explosives, and by the use of wedges and similar well-known tools. This Corliss safe consists of a spherical shell of cast iron several inches thick and with its exterior hardened by "chilling." It is fitted with a ground-in door rotating concentrically with the shell and internally. The spherical form and great thickness render the useful space in the interior very small and of inconvenient shape.

The requirements of a modern safe may be briefly summarized.

In fire- and thief-proof safes, the body and door must be constructed of sufficient thickness, and the joints as well as the attachment of the door to the body frame of sufficient strength, to remain uninjured by a fall from the highest position in which the safe may be placed to the basement, or by the impact of any debris, coping stones, girders, &c., falling from the highest part of the building to the basement. The space between the outer body and the inner casing must be properly charged with a steam-generating mixture in sufficient quantity to keep the interior of the safe moist for the whole time during which it may be subjected to heat in the case of a fire. The same requirements must be satisfied in burglar-proof safes. In addition, the body and door must be of such material and of such thickness that it is impossible to cut a sufficiently large hole to extract the contents, and so constructed that they cannot be dismembered; the framing and attachment of the bolts to the door must be able to resist the action of wedges or forcing screws; the vital parts of the lock and boltwork must be further protected so that it is impossible to attack them by drilling, and this protection must not be liable to be destroyed by the action of heat; the lock itself must not be capable of having its security destroyed by the explosion of the largest quantity of explosive which can be inserted. If these conditions are satisfied there is little fear that the oxy-acetylene blowpipe, the electric arc or the use of the higher explosives can be made effective. The amount of protection required to meet the above conditions must, in each case, depend on what tools it is reasonable to anticipate may be employed by the burglar and the maximum time which he may have at his disposal. The use of high explosives has become a more frequent method of attack by burglars in Great Britain, but where the safes have been of the best quality, of solid construction and good workmanship, this means of attack has been rendered ineffective.

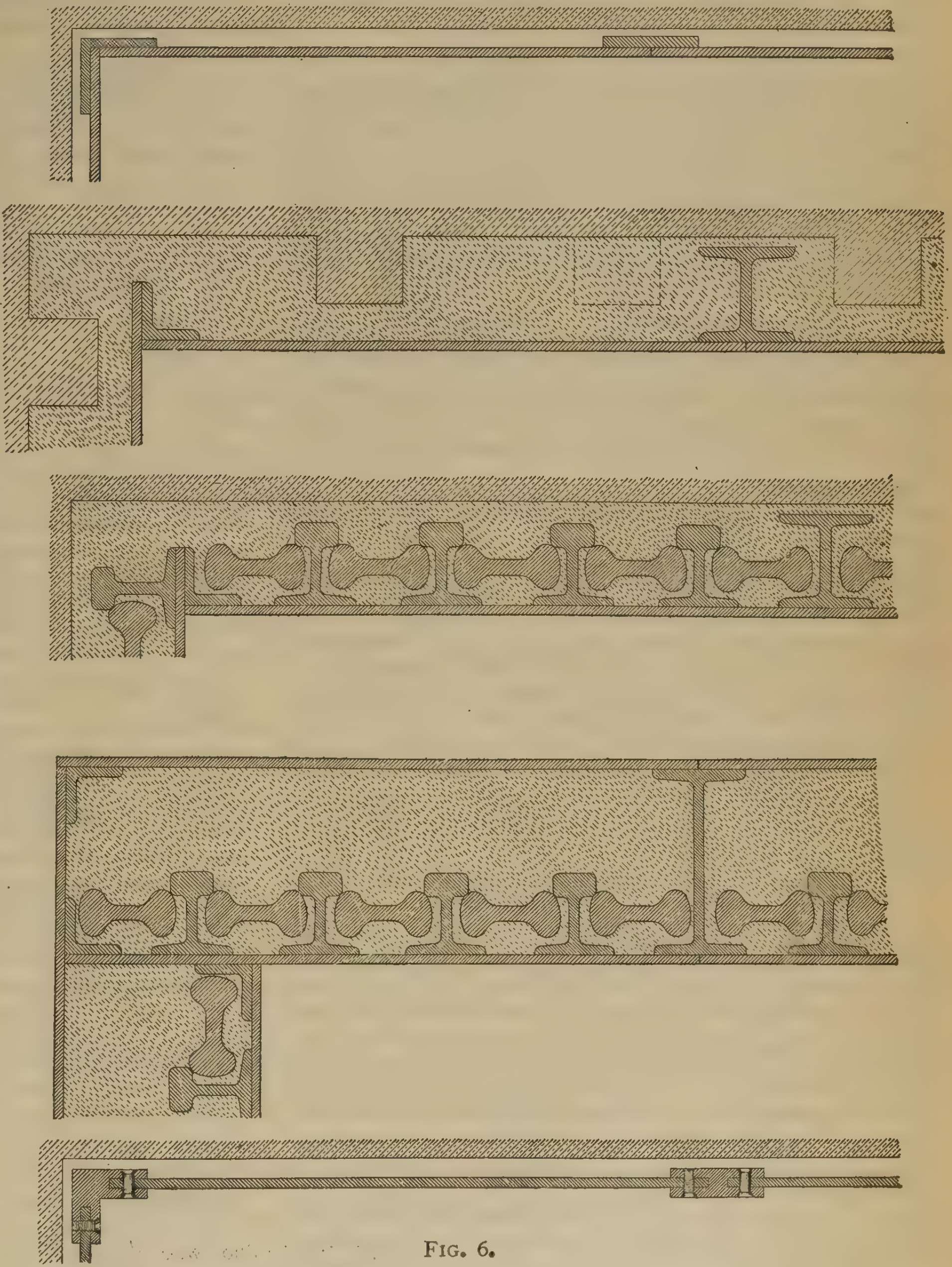


Fig. 6.

Strong-rooms and Vaults.—It is not hard to imagine that the use of strong-rooms was much earlier than that of safes; in fact, there can be no doubt that masonry rooms provided with heavy wooden doors secured by locks were in use in ancient Egypt, and that the development of strong-room doors attached to masonry rooms followed that of the old coffers very closely. No exact date can be obtained as to the introduction of what we may call modern strong-rooms, but it is only reasonable to suppose that, where larger quantities of valuables had to be preserved than a safe would conveniently hold, a safe-door of larger dimensions would be made and attached to a masonry or brick room. The next step would be the discovery that the walls of such a room offered little protection against even unskilled violence, and the lining of the room with metal would immediately follow; the door frame, as a matter of course, being attached to the plating. Strong-rooms of this construction are in common use to-day by banks and other institutions; and, as with safes, so with strong-rooms, development has taken place in the direction of increasing the thickness and the structural strength as well as in the application of superior locking devices (see Locks).

This increase of structural strength has been carried along somewhat different lines by different makers in Great Britain and along still more diverse lines in America. Masonry or brickwork alone is now rarely relied on for the protection of goods of any great value; concrete, however, reinforced by old railway metals imbedded therein and sometimes connected together to form, as it were, a cage, is in use. Railway metals attached to steel plates and also bedded in concrete are very largely employed. Thick plates of steel and latterly of manganese and other special steels are also in common use. Various forms of strong-room walls are illustrated in fig. 6.

Usually a strong-room is provided with an open-work gate or "grille" as well as a door, so that the contents may be protected by the gate during business hours without preventing the free access of air; they are usually also fitted for convenient subdivision. Safe deposit vaults do not differ in any way from strong-rooms, except that they are fitted up with small safes or *integers* provided with special locks, so that the renter can gain access to his own integer only, and this only with the assistance of a custodian.

Many electrical devices have been introduced, having for their object the giving of an alarm when strong-rooms or safes are improperly approached or tampered with. Most of these devices were quite useless, as they could at once be rendered inoperative; but though others displayed greater ingenuity, it is very questionable whether they are of any real utility, and they have not remained in common use. Where the value known to be contained in a strong-room is sufficiently great, an attack by tunnelling must be specially guarded against, and as in this form of attack the time which may be devoted to preparing for the actual breaking through is practically unlimited, the use of some device which will give warning of any such attack before the floor of the strong-room itself is reached is of very great importance. Probably the best of such devices, and one which is in practical use, consists of a network of small pipes, laid in concrete below the floor, and filled with glycerin or other liquid. To this network a mercury manometer is connected. If any breach is made in the pipe system, a leakage takes place, causing an alteration in the level of the mercury in the manometer, which may, if desired, be arranged to ring a bell. The manometer should in any case be observed regularly on the opening of the strong-room. (A. B. CH.)

SAFETY-LAMP, a form of lamp, used especially in mines, which is so constructed that it will burn without igniting a gaseous explosive mixture by which it is surrounded. To effect this end, the flame is encircled with a protecting metal case which is perforated with numerous small holes. Through these air for feeding the flame can enter freely and the products of combustion escape; but the flame or gases cannot pass out at a sufficiently high temperature to cause the ignition of the explosive mixture outside, because on arriving at the perforations they give up much of their heat to the large metallic surface they encounter, by which it is conducted away. In 1816 Sir Humphry Davy discovered the suitability of wire gauze as the material of the metal case, when the substance of the wire was rightly proportioned to the size of the aperture. The standard adopted as the limit for safety at that time was a gauze of 28 iron wires to the linear inch, having 784 apertures per square inch, but in some lamps the apertures are occasionally made still smaller.

The common safety or Davy lamp consists of a small cylindrical oil lamp, covered with a cylinder of wire gauze about 6 in. long and 1½ in. in diameter, with a flat gauze top. The upper part of the gauze is doubled to prevent it from being worn into holes by the products of combustion, and the air for feeding the flame enters round the wick. The gauze is mounted in a cage, consisting of three upright wires, screwed into a flat brass ring at each end. A handle is attached to the upper ring, while the lower one screws on to a collar on the oil-vessel of the lamp. When the two parts are screwed together the lamp is locked by a bolt passing through both parts, which is screwed down flush with or below the surface of the outer ring, so that the gauze cannot be removed without the use of a key.

In Stephenson's safety-lamp, generally known as the "Geordie" from its inventor George Stephenson, the light is covered by a glass chimney, surrounded by an outer casing and top of wire gauze. The feed air is admitted through numerous small holes in a copper ring a little below the level of the wick. This is one of the safest forms of lamp, but requires considerable care in use, especially in keeping the small feed holes clear from dust and oil; the glass protects the gauze from becoming overheated, and when the air is dangerously charged with gas the light is extinguished.

In the lamp invented by Dr W. Reid Clanny (1776–1850) about the same time as those of Davy and Stephenson, a glass cylinder is substituted for the lower portion of the wire gauze. The air for supplying the flame, entering at the bottom of the gauze and passing down the inner side of the glass, protects the latter to some extent from becoming overheated, but a large amount of light is lost by absorption in the glass, so that there is no great advantage over the ordinary Davy lamp to compensate for the extra weight and cost, especially as the safety property of the lamp depends upon the glass cylinder, which may be readily broken when subjected to the ordinary accidents of working. A more perfect form of lamp of the same character is that of Mueseler, which is extensively used in Belgium. It differs from Clanny's lamp by the addition of a conical chimney above the flame, which produces a rapid draught, and consequently a more perfect cooling of the glass cylinder by the downflow of feed air for the flame.

The safety of the Davy lamp is endangered by exposure to a current of gas moving at more than 6 ft. a second, as the flame is then liable to be forced through the gauze, and the Clanny and Stephenson lamps are not safe in currents exceeding 8 and 10 ft. respectively. These early forms have therefore been improved and modified to meet the requirements of safety in air-currents travelling at a high velocity. In the Hepplewhite-Gray lamp there is a conical glass surrounding the light, with a gauze chimney, protected by an outer metal cylinder; the air supply to the flame is carried downwards through three tubes forming the standards of the cage. This lamp, in addition to giving a good light overhead owing to the shape of the glass, is peculiarly sensitive to gas, and therefore valuable in testing for fire-damp. Other approved lamps are the Deflector and those of Marsaut and Mueseler when specially bonneted to resist extra high-speed currents. The illuminant now generally used in Great Britain is a mixture of rape oil with half its volume or more of petroleum, which is more suitable than vegetable or animal oil alone. In Germany, and also in America, Wolf's lamp, burning benzoline or petroleum spirit upon an asbestos wick, is very popular as giving a much better light than oil. Special care is, however, required in filling, so that no free liquid may be left in the holder; the spirit must be entirely absorbed by a filling of sponge, and any superfluous quantity poured off. Portable electric lamps, supplied by accumulators or dry batteries, have been introduced into coal-mines; but owing to the weight and cost their use is as yet very restricted.

The ordinary safety-lamp affords indications of the presence of fire-damp (marsh gas) in the air of a mine. When the amount exceeds 2 or 2½%, it may be detected by reducing the flame till it is practically non-luminous, when a pale blue flame or luminous cap will be seen above the ordinary flame. This varies in size with the percentage of fire-damp, until when there is about 10% the blue flame fills the whole interior of the gauze cylinder. If the lamp is allowed to remain too long in such a fiery atmosphere, it becomes dangerous, because the gauze, becoming heated to redness, may fire the external gas. For detecting the presence of fire-damp in amounts less than 2½%, special lamps with non-luminous flames are adopted. In Pieler's lamp, which is of the ordinary Davy form, alcohol is burned on a silk wick, and a screen is provided so that the flame can be hidden. When exposed in air containing ¼% a cap of 1⅛ in. is formed, which increases to 2 in. with ½%, and with 1¼% the lamp is filled with a deep blue glow. Another and more useful method is that of Dr F. Clowes, who uses a hydrogen flame 0·4 in. long, obtained by attaching a cylinder containing compressed hydrogen to an ordinary safety-lamp. When used for gas testing the hydrogen is turned into the oil flame, which is for the time extinguished, and relighted when the observation is finished. So small a proportion as 0·2% of gas can be detected by this method.

The locking of safety-lamps, so as to render them incapable of being opened by the miners when at work, is a point that has given play to a large amount of ingenuity. One of the most favourite devices is a combination of the wick-holder with the locking bolt, so that the latter cannot be withdrawn without lowering the wick and extinguishing the flame. Another method consists in the use of a lead rivet, uniting the two parts of the lamp, impressed with a seal, which cannot be removed without defacing the device. All this class of contrivances have the defect of only being efficacious when the miners are not provided with matches or other means of obtaining a light. A more physically perfect method is that adopted by Bidder, where the locking bolt is magnetized and held in place by a force which can only be overcome by the application of a battery of heavy and powerful steel magnets. These are kept in the lamp cabin at the pit bottom, where the lamps are cleaned and served out lighted to the miners at the commencement of the shift, and are collected before they return to the surface. (H. B.)

ṢAFFĀRIDS, a Persian dynasty of the 9th century, founded by Yaḳub (Yaqub) b. Laith b. Saffār ("coppersmith") about 866, who, originally a leader of bandits and outlaws, became governor of Sejistan. He soon added to his province Herat, Fars, Balkh and Tokharistan, overthrew the Tahirids in Khorasan, and, nominally still dependent on the caliphs of Bagdad, established a dynasty in Sejistan (see CALIPHATE, section C, *Abbasids*, § 10, and PERSIA: *History*, section B). Soon after 900 the dynasty became subordinate to the Sāmānids (*q.v.*) and few of its rulers had any real authority. Under the last of the dynasty, Taj ud-din Binaltagin (1225–1229), a usurper of the royal family of the Khwarizm shahs, the country was captured by the Mongols.

See S. Lane Poole, *Mahommedan Dynasties* (1894), p. 129; Stockvis, *Manuel d'histoire* (Leiden, 1888), vol. i. p. 137; on the later Ṣaffārids, H. Sauvaire, in the *Numismatic Chronicle* (1881).

SAFFI, or ASFI, a seaport on the west coast of Morocco, in 32° 20′ N. 9° 12′ W., 106 m. W.N.W. of Marrākesh. (Pop. about 15,000.) Although the principal wool and grain port of central Morocco, the anchorage is an open roadstead and communication with the shore is at times difficult. The old palace with beautifully decorated courts in fair repair, built by Mohammed XVII., is a prominent object above the town, and there are many interesting buildings and ruins.

SAFFLOWER (ultimately from the Arabic *safra*, yellow) or BASTARD SAFFRON (*Carthamus tinctorius*), a plant of the natural order compositae; its flowers form the basis of the safflower dye of commerce. The plant is a native of the East Indies, but is cultivated in Egypt and to some extent in southern Europe. To obtain the dyeing principle—carthamin, $C_{14}H_{14}O_7$—the flowers are first washed to free them from a soluble yellow colouring matter they contain; they are then dried and powdered, and digested in an alkaline solution in which pieces of clean white cotton are immersed. The alkaline solution having been neutralized with weak acetic acid, the cotton is removed and washed in another alkaline solution. When this second solution is neutralized with acid, carthamin in a pure condition is precipitated as a dark red powder. It forms a brilliant but fugitive scarlet dye for silk, but is principally used for preparing toilet rouge.

SAFFRON (Arab. *zaʿfarān*), a product manufactured from the dried stigmas and part of the style of the saffron crocus, a cultivated form of *Crocus sativus*; some of the wild forms (var. *Thomasii*, *Cartwrightianus*) are also employed for the manufacture. The purple flower, which blooms late in autumn, is very similar to that of the common spring crocus, and the stigmas, which are protruded from the perianth, are of a characteristic orange-red colour. The fruit is rarely formed. The Egyptians, though acquainted with the bastard safflower, do not seem to have possessed saffron; but it is named in Canticles iv. 14 among other sweet-smelling herbs. It is also repeatedly mentioned (κρόκος) by Homer, Hippocrates and other Greek writers; and the word "crocodile" was long supposed to have been derived from κρόκος and δειλός, whence we have such stories as that "the crocodile's tears are never true save when he is forced where saffron groweth" (Fuller's *Worthies*). It has long been cultivated in Persia and Kashmir, and is supposed to have been introduced into China by the Mongol invasion. It is mentioned in the Chinese materia medica (*Pun tsaou*, 1552–1578). The chief seat of cultivation in early times, however, was the town of Corycus (modern Korghoz) in Cilicia, and from this central point of distribution it may not improbably have spread east and west. According to Hehn, the town derived its name from the crocus; Reymond, on the other hand, with more probability, holds that the name of the drug arose from that of the town. It was cultivated by the Arabs in Spain about 961, and is mentioned in an English leechbook of the 10th century, but seems to have disappeared from western Europe till reintroduced by the crusaders. According to Hakluyt, it was brought into England from Tripoli by a pilgrim, who hid a stolen corm in the hollow of his staff. It was especially cultivated near Hinton in Cambridgeshire and in Essex at Saffron Walden, its cultivators being called "crokers."

Saffron was used as an ingredient in many of the complicated medicines of early times. That it was very largely used in cookery is evidenced by many writers; thus Laurenbergius (*Apparatus plantarum*, 1632) makes the large assertion "In te familiari vix ullus est telluris habitatus angulus ubi non sit croci quotidiana usurpatio aspersi vel incocti cibis." The Chinese used also to employ it largely, and the Persians and Spaniards still mix it with their rice. As a perfume it was strewn in Greek halls, courts and theatres, and in the Roman baths. The streets of Rome were sprinkled with saffron when Nero made his entry into the city.

It was, however, mainly used as a dye. It was a royal colour in early Greek times, though afterwards, perhaps from its abundant use in the baths and as a scented salve, it was especially appropriated by the hetairae. In ancient Ireland a king's mantle was dyed with saffron, and even down to the 17th century the "lein-croich," or saffron-dyed shirt, was worn by persons of rank in the Hebrides. In medieval illumination it furnished, as a glaze upon burnished tinfoil, a cheap and effective substitute for gold. The sacred spot on the forehead of a Hindu pundit is also partly composed of it. Its main use in England was to colour pastry and confectionery, and it is still used for this purpose in some parts of the country (notably Cornwall).

One grain of saffron rubbed to powder with sugar and a little water imparts a distinctly yellow tint to ten gallons of water. This colouring power is due to the presence of polychlorite, a substance whose chemical formula appears to be $C_{48}H_{60}O_{18}$, and which may be obtained by treating saffron with ether, and afterwards exhausting with water. Under acids it yields the following reaction—

$$\underset{\text{Polychlorite.}}{C_{48}H_{60}O_{18}} + H_2O = \underset{\text{Crocin.}}{2C_{16}H_{18}O_6} + \underset{\text{Essential oil.}}{C_{10}H_{14}O} + \underset{\text{Sugar.}}{C_6H_{12}O_6}.$$

Crocin, according to Watts, *Dict. of Chem.*, has a composition of $C_{29}H_{42}O_{15}$ or $C_{58}H_{42}O_{30}$. This crocin is a red colouring matter, and it is surmised that the red colour of the stigmas is due to this reaction taking place in nature.

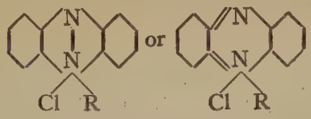
Saffron is chiefly cultivated in Spain, France, Sicily, on the lower spurs of the Apennines and in Persia and Kashmir. The ground has to be thoroughly cleared of stones, manured and trenched, and the corms are planted in ridges. The flowers are gathered at the end of October, in the early morning, just when they are beginning to open after the night. The stigmas and a part of the style are carefully picked out, and the wet saffron is then scattered on sheets of paper to a depth of 2 or 3 in.; over this a cloth is laid, and next a board with a heavy weight. A strong heat is applied for about two hours so as to make the saffron "sweat," and a gentler temperature for a further period of twenty-four hours, the cake being turned every hour so that every part is thoroughly dried. This is known as *cake saffron* to distinguish it from *hay saffron*, which consists merely of the dried stigmas.

The drug has naturally always been liable to great adulteration in spite of penalties, the severity of which suggests the surviving tradition of its sacred character. Thus in Nuremberg a regular saffron inspection was held, and in the 15th century we read of men being burned in the market-place along with their adulterated saffron, while on another occasion three persons convicted of the same crime were buried alive. Grease and butter are still very frequently mixed with the cake, and shreds of beef dipped in saffron water are also used. Good saffron has a deep orange-red colour; if it is light yellow or blackish, it is bad or too old.

SAFFRON WALDEN, a market-town and municipal borough in the Saffron Walden parliamentary division of Essex, England, beautifully situated near the Cam in a valley surrounded by hills, on a branch of the Great Eastern railway, 43½ m. N.N.E. from London. Pop. (1901) 5896. It has a somewhat ancient appearance and possesses a spacious market-place. Of the old castle, dating probably from the 12th century, but in part protected by much earlier earthworks, the keep and a few other portions still remain. Near it are a series of curious circular excavations in the chalk, called the Maze, of unknown date or purpose. The earthworks west and south of the town are of great extent; there was a large Saxon burial-ground here. The church of St Mary the Virgin, a beautiful specimen of the Perpendicular style, dating from the reign of Henry VII., but frequently repaired and restored, contains the tomb of Lord Audley, chancellor to Henry VIII. There is an Edward VI. grammar school, occupying modern buildings. The town possesses a museum with good archaeological and natural history collections, a literary institute and a horticultural society. The benevolent institutions include the hospital and the Edward VI. almshouses. There is a British and Foreign School Society's training college for mistresses. In the neighbourhood is the fine mansion of Audley End, built by Thomas, 1st earl of Suffolk, in 1603 on the ruins of the abbey, converted in 1190 from a Benedictine priory founded by Geoffrey de Mandeville in 1136. Brewing, malting and iron-founding are carried on. The borough is under a mayor, 4 aldermen and 12 councillors. Area, 7502 acres.

Saffron Walden (*Waledana*) was almost certainly fortified by the Britons, and probably by some earlier race. The town corporation grew out of the Gild of the Holy Trinity, which was incorporated under Henry VIII., the lord of the town, in 1514. It was dissolved under Edward VI., and a charter was obtained for Walden, appointing a treasurer and chamberlain and twenty-four assistants, all elective, who, with the commonalty, formed the corporation. In 1694 William and Mary made Walden a free borough, with a mayor, 4 aldermen and 12 town councillors. The corporation became a local board of health under the act of 1858, and a municipal borough in 1875. The culture of saffron was the most characteristic industry at Walden from the reign of Edward III. until its gradual extinction about 1768.

SAFRANINE, in chemistry, the azonium compounds of symmetrical diamino-phenazine and containing the ring system annexed:—



They are obtained by the joint oxidation of one molecule of a paradiamine with two molecules of a primary amine; by the condensation of para-aminoazo compounds with primary amines (O. Witt, *Ber.*, 1877, 10, p. 874), and by the action of para-nitrosodialkylanilines with secondary bases such as diphenylmetaphenylenediamine. They are crystalline solids showing a characteristic green metallic lustre; they are readily soluble in water and dye red or violet. They are strong bases and form stable monacid salts. Their alcoholic solution shows a yellow-red fluorescence.

Phenosafranine is not very stable in the free state; its chloride forms green plates. It can be readily diazotized, and the diazonium salt when boiled with alcohol yields aposafranine or benzene induline, $C_{18}H_{12}N_3$. F. Kehrmann showed that aposafranine could be diazotized in the presence of cold concentrated sulphuric acid, and the diazonium salt on boiling with alcohol yielded phenylphenazonium salts. Aposafranone, $C_{18}H_{12}N_2O$, is formed by heating aposafranine with concentrated hydrochloric acid. These three compounds are perhaps to be represented as ortho- or as paraquinones (see papers by F. Kehrmann, O. Fischer and E. Hepp; R. Nietzki and others, *Ber.*, 1895 et seq.). The "safranine" of commerce is a tolusafranine. The first aniline dye-stuff to be prepared on a manufacturing scale was *mauveine*, $C_{27}H_{25}N_4Cl$, which was obtained by Sir W. H. Perkin by heating crude aniline with potassium bichromate and sulphuric acid. It is a N-phenylsafranine (see INDULINES).

SAGA (literally a story committed to writing), a word derived from Icel. *segja*, to say. The term is common to most of the Teutonic languages, where we find Eng. *say*, Ger. *sagen*, the O. Eng. *secgan*, Dan. *sige* and Swed. *segja*, all identical in meaning. A saga, therefore, was originally something reported, *segin saga*, a tale told, in English a *saw*. But the earliest literature of Scandinavia goes back to an age before writing was invented, and when the legends were first put down they were called sagas because they were things which had been told or repeated from mouth to mouth. The early books speak of sagas which, apparently, had never been written down and were in consequence lost; but, as soon as the art of writing was understood, the word *saga* began for the future to be used exclusively for written historical books. A volume made up of such histories was known as a *sögubók* or book of sagas. They were not rigidly historical; any story which was written down, and repeated according to the literary formula, was called a saga. The telling of tales was a recognized form of entertainment at Icelandic banquets, and in *Haraldssaga Harðráða* there are very interesting details regarding these public saga-tellings; the person who repeated or read the tale being known as the *sögumaðr* or saga-man, and being held in high honour at the feast.

The saga was properly a creation of the peculiar conditions under which Icelandic society was constituted in the earliest medieval times. The aristocratic Icelander had no diversions, except games of strength and skill out of doors and the listening to professional story-tellers indoors. As has been often pointed out, the saga is a prose epic, and in its various kinds it follows strict laws of composition. The lesser epic, in its original form, was the biography of some heroic Icelander who had lived in the 10th or 11th century. It was composed with great regularity, so as to proceed uniformly from the birth of the hero to his death, and indeed from before the one date until after the other. The style is brief, clear and conversational; the hero was often a distinguished poet, and in that case some of the best of his verses are interwoven into the narrative, being put in his mouth on striking occasions. Alliteration takes a great part in the ornament of the style. The skill with which the story is told, the high romantic sense of honour and courage which is displayed, the quick turns of the dialogue, the brilliant evolution of the plot, all these give enduring charm to the more successful and ample of the sagas, and in the earlier examples these qualities are very rarely missing. It is to be remembered, however, that the saga was intended to be listened to, not read, by an audience which was mainly interested in three subjects, namely fighting, litigation and pedigree. It was illegitimate for the saga-man, in the preparation of his epic, to allow himself to stray for any length of time from one of those three themes; since even love must be considered in the light of an episode.

The period of the saga-age, as it was called, the *sögu-öld* or epoch celebrated in the sagas, is now confined between the years 890 and 1030, and opens with the original colonization of Iceland. The deaths in 1030 of two great statesmen, Snorri and Skapti the Lawman, mark its close; almost immediately afterwards, before the end of the 11th century, the actual age of saga-composition is in full action; and lastly comes the *rit-öld*, or age of writing when the sagas were preserved in their present literary form, the blossoming time of which was the 13th century. According to the definite statement of the great historian, Sturla, the first man who wrote down in the Norse tongue, in Iceland, "histories relating to times ancient and modern," was Ari Fróði (1067–1148), who was therefore the earliest of the saga-writers. He, as we know, was the author of three works of vast importance in the history of Icelandic literature. These were *Konunga-bók* or the Book of King, *Landnama-bók* or the Book of Settlements and *Islendinga-bók* or the Book of Icelanders. The second of these, in which Ari was assisted by Kolsegg Asbjornsson, survives and is of priceless value. Of the first and third, we possess abbreviations and summaries. It is believed that the admirable style in which the sagas are composed was the invention of Ari, to whose individual genius the form of classic prose tradition is attributed. He has no rival in this respect, and is the true father of the Icelandic saga. The works of Saemund Vigfusson (1056–1133), who succeeded Ari as a writer of the lives of kings, are unfortunately lost.

We now pass to what are called the Greater or Islendinga sagas, which are of a more intense and romantic character than the historical biographies. Among these the greatest is *Njalssaga* (or *Njala*), which few critics will question to be the most eminent masterpiece of Icelandic literature. There is no clue to the name of the author, who was evidently a lawyer; extensive as is the work, it is evidently written by one hand, for peculiarities and felicitous originalities of style recur throughout the whole saga. It must have been composed between 1230 and 1280. Vigfusson has described *Njala* as being, *par excellence*, the saga of law, and adds, "the very spirit indeed of Early Law seems to breathe through its pages." The scene in which Njal, the Lawman of judgment and peace, is burned in his homestead by his enemies is perhaps the most magnificent passage which has been preserved in the whole ancient literature of the North. The story of *Njala* is placed at the close of the 10th and the first years of the 11th century. *Eyrbyggiasaga* deals with politics as *Njalssaga* deals with law; it is a precious compendium of history and tradition handed down from heathen times. It has been suggested that it may be, at all events in part, the work of Sturla the Lawman, who died in 1284. Extremely beautiful in its relation to external nature, a matter often ignored in the sagas, is *Laxdaelasaga*, which is also the most romantic in sentiment. It was probably written about 1235, but by whom is unknown. The aristocratic spirit of the great Icelandic families finds its most characteristic exposition in *Egilssaga*, a very vigorous tale of adventure, the central figure of which, Egil, is depicted with more psychological subtlety than is usual in the sagas; it probably belongs to about 1230. Into *Grettissaga* there enter biographical and mythical elements, curiously mingled; it is also confused in form, and is probably a recension, made about 1310, of two or more earlier sagas now lost, the finest parts of which it is thought that Sturla may have written. These are the five famous groups of anonymous narrative which are known as the Greater Sagas.

The Minor Sagas must be treated more briefly. *Hensaþorissaga*, belonging to the south-west of Iceland, deserves attention because of its extreme antiquity; it has been dated 993. *Gunnlaugssaga Ormstungu* (The story of Gunnlaug Worm-

Tongue) is a love-story of great sentimental charm. In *Gislasaga* the gloom of the Icelandic outlaw-life is strikingly depicted in the adventures of Gisli, who is under a ban and is hunted from place to place. A very unusual specimen of the minor saga is *Bandamannasaga*, a comic story of manners in the north of Iceland in the 11th century, in which an intrigue of the old families banded against the pretensions of a wealthy *parvenu*, is told in a spirit of broad humour. The most archaic of the minor sagas is *Kormakssaga*, the story of the loves of the dark-eyed Kormak and Steingerda; this is, according to Vigfusson, the most primitive piece of Icelandic prose writing that has come down to us. Another very ancient and very simple saga is *Vatzdaelasaga*. Among sagas which deal with the earliest history of America in the chronicles of Greenland and Vinland, a foremost place is taken by *Floamannasaga*, which possesses peculiar interest from its description of the shipwreck of colonists on the coast of Greenland; this belongs to the close of the 10th century. We possess a late (13th century) recension of what must have been equally important as a record of the Greenland colony in the 11th century, *Fostbraedrasaga*. Vigfusson formed a class of still shorter sagas than these, *thaettir* or "morsels" of narrative. At the close of the great period of the composition of all these anonymous sagas, of which few can have been written later than 1260, a work of enormous length and value was composed or compiled by a poet and historian of great eminence, Sturla Thordsson (1215–1284). About the year 1270 he began to compile the mass of sagas which is now known by his name as *Sturlungasaga*. The theory that Sturla was the author of the whole of this bulky literature is now abandoned; it is certain that *Hrafn Sveinbiornssaga*, for instance, belongs to an earlier generation, and the same is true of *Guðmundar Saga Góða*. Vigfusson distinguished these and other sagas, which Sturla evidently only edited, from those which it is certain that he composed, and gathered the latter together under the title of *Islendingasaga*. It is certain that it is to Sturla that we owe almost all our knowledge of Icelandic history from 1200 to 1260. *Islendinga* is divided into two main sections, the former closing in a general massacre of the characters of the story in about 1240, the latter dealing much more minutely with new persons and subsequent events. To Sturla also are attributed two saga-biographies, the *Hakonssaga* and the *Magnussaga*. It is a remarkable fact that while Icelandic saga-literature begins and ends with a definite figure of a writer, all that lies between is wholly anonymous. Ari was the earliest and Sturla the latest of the saga-writers of the classical period, but in the authors of *Njala* and *Laxdaela* we have nameless writers whose genius was still greater than that of the pioneer and of the rear-guard of Icelandic literature. These unknown men deserve a place of honour among the best narrative-writers who have ever lived. The elder brother of Sturla was called Olaf Hvitaskald, or the White Poet (1209?–1259); he was a learned man, who worked at the arrangement and compilation of the sagas which form the mass of *Sturlunga*. In another class are the stories of bishops, *Biskupasögur*, which are not sagas in the true sense, but have considerable value as biographical material for reconstructing Icelandic social life in the 12th century. The admirable saga of Bishop Laurence (1266–1331) was composed by his private secretary, Einar Haflidason (1304–1393), who also wrote *Annals*, and is the latest Icelandic biographer. After his time a long silence fell on the literature of the country, a silence not broken until the revival of Icelandic learning in the 17th century.

It is evident that a vast number of sagas must be lost; when we consider how many are preserved, we can only express amazement at the fecundity of the art of saga-telling in the classic age. The MSS., on which what we have were preserved, were all on vellum, and there were no sagas written on paper until the time of Bishop Odd, who died in 1630; there was an enormous destruction of vellums during the dark age. After 1640 it became the practice to make transcripts on paper from the perishing vellum MSS. The best authority on the history of the sagas is the copious *prolegomena* to Dr Gudbrandr Vigfusson's edition of the text of *Sturlungasaga*, published in 2 vols., by the Clarendon Press at Oxford in 1878. See also the edition of *Biskupasögur*, issued by the same author, at Copenhagen, in 1858. Möbius and Vigfusson published the *Fornsögur* or archaic sagas in 1860, and all the work of Vigfusson calls for the closest attention from those interested in this subject. In connexion with the descents of Northmen on the shores of Britain particular interest attaches to the four volumes of sagas edited for the "Rolls" series (1887–1894). William Morris, who had done much to interpret the spirit of the sagas to English readers, and who published a translation of *Grettissaga* in 1869, started in 1891 the "Saga Library," in conjunction with Mr E. Magnússon; of this a sixth volume appeared in 1906. Mr Sephton has published versions of several of the purely historical sagas. No account has been given above of the famous *Heimskringla* or "Round of the World," of Snorri Sturlason, because this great work, although it contains stories of the kings of Norway, hardly belongs to the same class as the biographical sagas of Iceland. The *Heimskringla* is purely a storehouse of primitive Norwegian history.

See also Jónnson, *Der oldnordiske og oldislandske Literaturshistorie* (Copenhagen, 1893–1902); F. W. Horn, *Geschichte der Literatur des skandinavischen Nordens* (Leipzig, 1879). (E. G.)

SAGAING, a district and division of Upper Burma, lying to the south and west of Mandalay. The district has an area of 1862 sq. m.; pop. (1901) 282,658, showing an increase of 15% in the decade. It occupies both banks of the Irrawaddy, at its confluence with the river Chindwin. The chief crops are sesamum, millet, rice, peas, wheat and cotton. The total rainfall in 1905 was 34·76 in., taken at Sagaing. In the hot season the maximum shade temperature rises to a little over 100° F. The lowest readings in the cold season average about 56° F.

Sagaing, the headquarters town, is opposite Ava, a few miles below Mandalay; pop. (1901) 9643. It was formerly a capital of Burma. It is the terminus of the railway to Myitkyina. A steam ferry connects with the Rangoon-Mandalay line, and the steamers of the Irrawaddy Flotilla Company call daily.

The Sagaing division includes the four districts of Upper and Lower Chindwin, Shwebo and Sagaing; area, 29,566 sq. m.; pop. (1901) 1,000,483.

SAGALLO, a small settlement on the north shore of the Gulf of Tajura, French Somaliland. A dismantled fort built by the Egyptians (who occupied the place between 1875 and 1884) is the most prominent object. In January 1889 Sagallo was occupied by a Cossack chief named Achinov, who was accompanied by the archimandrite Païsi and some 200 people, including priests, women and children. Païsi had been entrusted by the metropolitan of Novgorod with an evangelistic mission to the Abyssinian Church; while Achinov stated that he had a commission from the Negus for the purchase of arms and ammunition. The presence of Achinov at Sagallo (where he occupied the fort, which he found deserted) was regarded by the French government as an invasion of French territorial rights. The Russian foreign office having disavowed (7th of February) any connexion with Achinov, instructions were sent from Paris to secure the removal of the Cossacks. On the 17th of February French warships appeared off the port, and an ultimatum was sent to Achinov calling on him to surrender, but without effect. The fort was bombarded, and seven persons killed, two being women and four children. The Cossacks then surrendered, not having fired a shot. They were subsequently deported to Suez, whence they returned to Russia. Achinov was interned by the Russian government for some months (until October 1889). In 1891 he returned to Abyssinia. Païsi was promoted by his ecclesiastical superiors. In Paris the incident caused great excitement amongst the Russophils, and the consequent demonstrations led to the suppression of the League of Patriots and the prosecution of M. Paul Déroulède.

See *L'Archimandrite Païsi et l'Ataman Achinoff*, by vicomte de Constantin (Paris, 1891).

SAGAN, a town of Germany, in the Prussian province of Silesia, situated on the Bober, a tributary of the Oder, 60 m. S.S.E. of Frankfort-on-Oder and 102 m. S.E. of Berlin by the direct main line of railway to Breslau. Pop. (1905) 14,208. It is still partly surrounded by its old fortifications and has numerous medieval houses. It contains the handsome palace of the dukes of Sagan. Among other buildings are an Evangelical church with a conspicuous steeple and containing the burial vaults of the ducal family, and Augustine and a Jesuit monasterial church, a medieval town-hall with old cloisters attached, a Roman Catholic gymnasium and a large hospital, named after its founder, the duchess Dorothea (1793–1862), wife of Edmund, duke of Talleyrand-Périgord-Dino. The leading industry of the town is cloth-weaving, with wool and flax spinning; there is also some trade in wool and grain.

The mediate principality of Sagan, now forming a portion of the Prussian governmental district of Liegnitz, and formed in 1397 out of a portion of the duchy of Glogau, has several times changed hands by purchase as well as by inheritance. One of its most famous possessors was Wallenstein, who held it for seven years before his death in 1634. Bought by Prince Lobkowitz in 1646, the principality remained in his family until 1787, when it was sold to Peter, duke of Courland, whose descendant, Prince Bozon (b. 1832), son of Napoleon Louis (1811–1898), duke of Talleyrand-Périgord, owned it in 1910. The principality has an area of nearly 500 sq. m. and a population of 65,000.

SAGAR or SAUGOR ISLAND, an island at the mouth of the Hugli river, in the Twenty-four Parganas district of Bengal. The word means " sea "; and, as being the place where the sacred stream of the Ganges is believed to mingle with the ocean, the island is one of the most frequented places of Hindu pilgrimage in all India, the time for the greatest annual gathering being in January. On the seaward face is a lighthouse, and farther out are the Sandheads, the cruising-ground of the Calcutta pilots.

SAGASTA, PRAXEDES MATEO (1827–1903), Spanish statesman, was born on the 21st of July 1827 at Torrecilla de Cameros, in the province of Logroño. He began life as an engineer, and from his college days he displayed very advanced Liberal inclinations. He entered the Cortes in 1854 as a Progressist deputy for Zamora. After the *coup d'état* of Don Leopold O'Donnell in 1856, Sagasta had to go into exile in France, but promptly returned, to become the manager of the Progressist paper *La Iberia*, and to sit in the Cortes from 1859 to 1863. He seconded the Progressist and revolutionary campaign of Prim and the Progressists against the throne of Queen Isabella, conspiring and going into exile with them. He returned, via Gibraltar, with Prim, Serrano and others, to take part in the rising at Cadiz, which culminated in the revolution of September 1868, and Sagasta was in succession a minister several times under Serrano and then under King Amadeo of Savoy, 1868–1872. Sagasta ultimately headed the most Conservative groups of the revolutionary politicians against Ruiz Zorrilla and the Radicals, and against the Federal Republic in 1873. He took office under Marshal Serrano during 1874, after the *pronunciamiento* of General Pavia had done away with the Cortes and the Federal Republic. He vainly attempted to crush the Carlists in 1874, and to check the Alphonsist military conspiracy that overthrew the government of Marshal Serrano at the end of December 1874. Barely eight months after the restoration of the Bourbons in the autumn of 1875, Sagasta accepted the new state of things, and organized the Liberal dynastic party that confronted Canovas and the Conservatives for five years in the Cortes, until the Liberal leader used the influence of his military allies, Jovellar, Campos and others, to induce the king to ask him to form a Cabinet in 1881. The Liberals only retained the confidence of the king by postponing the realization of almost all their democratic and reforming programme, and limiting their efforts to financial reorganization and treaties of commerce. A military and republican rising hastened Sagasta's fall, and he was not readmitted into the councils of Alphonso XII. On the death of that king in 1885, Sagasta became premier with the assent of Canovas, who suspended party hostility in the early days of the regency of Queen Christina. Sagasta remained in office until 1890, long enough to carry out all his reform programme, including universal suffrage and the establishment of trial by jury. A coalition of generals and Conservatives turned Sagasta out in July 1890, and he only returned to the councils of the regency in December 1892, when the Conservative party split into two groups under Canovas and Silvela. He was still in office when the final rising of the Cubans began in February 1895, and he had to resign in March because he could not find superior officers in the army willing to help him to put down the turbulent and disgraceful demonstrations of the subalterns of Madrid garrison against newspapers which had given offence to the military. Sagasta kept quiet until nearly the end of the struggle with the colonies, when the queen-regent had to dismiss the Conservative party, much shorn of its prestige by the failure of its efforts to pacify the colonies, and by the assassination of its chief, Canovas del Castillo. Sagasta's attempt to conciliate both the Cubans and the United States by a tardy offer of colonial home rule, the recall of General Weyler, and other concessions, did not avert the disastrous war with the United States and its catastrophe. The Liberal party and Sagasta paid the penalty of their lack of success, and directly the Cortes met in March 1899, after the peace treaty of the 10th of December 1898 with the United States, they were defeated in the senate. He pursued his policy of playing into the hands of the sovereign whilst keeping up the appearances of a Liberal, almost democratic, leader, skilful in debate, a trimmer *par excellence*, and abler in opposition than in office. He returned with the Liberals to power in March 1901. His task, however, was beyond his years. The economic situation was of the gravest. Strikes and discontent were rife. Still, Sagasta held on long enough to witness the surrender of the regency by Queen Christina into the hands of her son, Alfonso XIII., in May 1902. In the following December Sagasta was defeated on a vote of censure and resigned office. Shortly afterwards he fell into ill-health, and died at Madrid on the 15th of January 1903.

SAGE, RUSSELL (1816–1906), American financier, was born in Verona township, Oneida county, New York, on the 4th of August 1816. He worked as a farm-hand until he was 15, when he became an errand boy in a grocery conducted by his brother, Henry R. Sage, in Troy, New York. He had a part interest in 1837–1839 in a retail grocery in Troy, and in a wholesale store there in 1839–1857. He served as an alderman of Troy in 1841–1848, and as treasurer of Rensselaer county in 1845–1849. In 1853–1857 he was a Whig representative in Congress. He became an associate of Jay Gould in the development and sale of railways; and in 1863 removed to New York City, where, besides speculating in railway stocks, he became a money-lender and a dealer in " puts " and " calls " and " privileges," and in 1874 bought a seat in the New York Stock Exchange. He gradually accumulated a fortune, which at his death was variously estimated as from $60,000,000 to $80,000,000. On the 4th of December 1891 an attempt was made to assassinate him in his office by one Henry Norcross, who demanded a large sum of money, and upon being refused exploded a dynamite bomb, and was himself killed.[1] Sage died in New York on the 22nd of July 1906. In 1869 he had married Miss Margaret Olivia Slocum (b. 1828), a graduate (1847) of the Troy Female Seminary (now the Emma Willard School). She inherited nearly all of his great fortune, and out of it she gave away a long series of liberal benefactions to various institutions

SAGINAW, a city and the county-seat of Saginaw county, Michigan, U.S.A., situated on both banks of the Saginaw river, about 16 m. from its entrance into Saginaw Bay and about 96 m. N.W. of Detroit. Pop. (1890) 46,322, (1900) 42,345, of whom 11,435 were foreign-born, (1910) 50,510. Saginaw is served by the Grand Trunk, seven divisions of the Père Marquette (which has repair shops here) and four divisions of the Michigan Central railways, by interurban electric railways to Detroit and Bay City, and by steamboat lines to several of the lake ports. The city is built on level ground covering an area of about 13 sq. m. and somewhat more elevated than the surrounding country. In the city are St Vincent's Orphan Home (1875) and St Mary's Hospital (1874) under the Sisters of Charity, a Woman's Hospital (1888) and the Saginaw General Hospital

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[1] Mr Sage's secretary was also killed, and one of his clerks, W. R. Laidlaw, jr., was badly injured. Laidlaw afterward repeatedly sued Sage for damages, claiming that Sage had used him as a shield at the moment of the explosion, but his suits were unsuccessful.

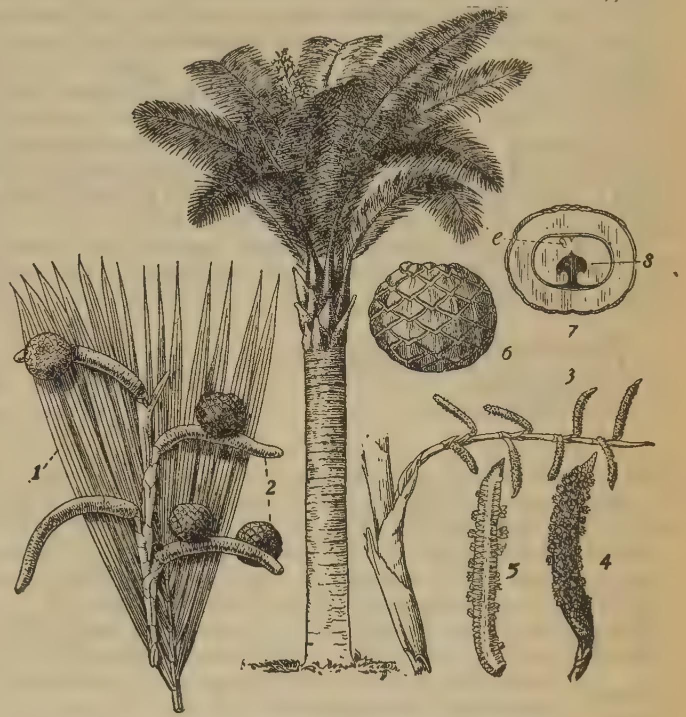
(1887); the Hoyt Library and the Public Library; a large auditorium, belonging to the city; an armoury; the Germania Institute, with a kindergarten, a gymnastic school and a German library; and a free bathhouse and manual training school (1903), a part of the public school system. There is an annual music festival in May. The city has parks, including Hoyt Park (27 acres), used for athletic sports, Rust Park (150 acres), occupying an island in the river, and Riverside Park, a pleasure resort. Saginaw is situated in a good farming region with a fertile soil, especially adapted to the culture of sugar beets; other important crops are beans, cabbages, tomatoes, cucumbers, hay, apples and grains. In the vicinity of the city there are salt wells, and Saginaw county is the most productive coalfield in the state—in 1907 its output was 1,047,927 tons, more than half the total for the state. The city is an important distributing centre, has a large wholesale trade (especially in groceries, hardware, boots and shoes, and dry goods), and in 1904 in the value of its factory products ($10,403,508, 20·2% more than in 1900) it ranked fifth among the cities of the state. The municipality owns and operates the water-works. The first settlement was made on the west bank of the river in 1815 and was called Saginaw City; the settlement on the east side of the river made in 1849 was called East Saginaw and was financed by Eastern capitalists. East Saginaw in 1855 was incorporated as a village. East Saginaw and Saginaw City each received a city charter in 1859, but in 1890 the two were consolidated as the city of Saginaw, and in 1897 the charter was revised.

SAGITTA ("the arrow" or "dart"), in astronomy, a constellation of the northern hemisphere, mentioned by Eudoxus (4th century B.C.) and Aratus (3rd century B.C.), and catalogued by Ptolemy, Tycho Brahe and Hevelius, who each described 5 stars. The fable was that this constellation was one of the arrows with which Hercules killed the vulture which gnawed the liver of Prometheus. *S. Sagittae* is a short period variable, period 8·38 days, range in magnitude 5·6 to 6·4.

SAGITTARIUS ("the archer"), in astronomy, the 9th sign of the zodiac (*q.v.*) denoted by the symbol ♐, an arrow or dart. It is also a constellation, mentioned by Eudoxus (4th century B.C.) and Aratus (3rd century B.C.), and catalogued by Ptolemy, 31 stars, Tycho Brahe 14 and Hevelius 22. The Greeks represented this constellation as a centaur in the act of shooting an arrow, and professed it to be Crotus, son of Eupheme, the nurse of the Muses. Several short period variables occur in the constellation, *e.g.* X3 *Sagittarii*, $W\gamma_1$ *Sagittarii* and Y *Sagittarii*, having periods of 7·01, 7·59, 5·77 days respectively. *Nova Sagittarii* is a "new" star, which was discovered by Mrs Fleming in 1899; the nebula M. 17 *Sagittarii* is an omega or horseshoe nebula, while the nebula and cluster M. 8 *Sagittarii* is a splendid irregular nebula associated with a great number of faint stars.

SAGO, a food-starch prepared from a deposit in the trunk of several palms, the principal source being the sago palm (*Metroxylon Sagu*) (see fig.), a native of the East Indian Archipelago, the sago forests being especially extensive in the island of Ceram. The trees flourish only in low marshy situations, seldom attaining a height of 30 ft., with a thick-set trunk. They attain maturity as starch-yielding plants at the age of about fifteen years, when the stem is gorged with an enormous mass of spongy medullary matter, around which is an outer rind consisting of a hard dense woody wall about 2 in. thick. When the fruit is allowed to form and ripen, the whole of this starchy core disappears, leaving the stem a mere hollow shell; and the tree immediately after ripening its fruit dies. When ripe the palms are cut down, the stems divided into sections and split up, and the starchy pith extracted and grated to a powder. The powder is then kneaded with water over a strainer, through which the starch passes, leaving the woody fibre behind. The starch settles in the bottom of a trough, in which it is floated, and after one or two washings is fit for use by the natives for their cakes and soups. That intended for exportation is mixed into a paste with water and rubbed through sieves into small grains, from the size of a coriander seed and larger, whence it is known according to size as pearl sago, bullet sago, &c. A large proportion of the sago imported into Europe comes from Borneo, and the increasing demand has led to a large extension of sago-palm planting along the marshy river-banks of Sarawak.

Sago is also obtained from *Metroxylon Rumphii* as well as from various other East Indian palms such as the Gomuti palm (*Arenga saccharifera*), the Kittul palm (*Caryota urens*), the cabbage palm (*Corypha umbraculifera*), besides *Corypha Gebagan*, *Raphia flabelliformis* and *Phoenix farinifera*, also from *Mauritia flexuosa* and *Guilielma speciosa*, two South American species. It is also obtained from the pith of species of *Cycas*.



Sago Palm (*Metroxylon Sagu*), much reduced.

1, Portion of leaf.
2, Portion of female inflorescence in fruiting stage.
3, Branch of male inflorescence.
4, Spike of male flowers.
5, Same cut lengthwise.
6, Fruit.
7, Section of fruit and seed, *s*; *e*, embryo.

SAGUENAY, a river of Quebec province, Canada, flowing into the St Lawrence 120 m. N.E. of Quebec. It drains Lake St John, from which it issues by two impassable rapids, La Grande and La Petite Décharge. Thence for 40 m. it flows E.S.E. in a series of rapids, navigable only by skilled boatmen in canoes, to Chicoutimi, the seat of a Roman Catholic bishop, a prosperous little town exporting great quantities of lumber. Six miles farther down is Ha Ha Bay, a favourite summer resort. From Chicoutimi the river is navigable by small steamers, and from Ha Ha Bay to the mouth by vessels of the largest size. It is indeed rather a loch or bay than a river, containing neither rock nor shoal, and having at its mouth a depth of some 600 ft. greater than that of the St Lawrence. Its width varies from three-quarters of a mile to two miles, and the waters are blackened by the shadow of treeless cliffs, over 1000 ft. in height, separated here and there by narrow wooded valleys, and culminating in Capes Trinity and Eternity, 1600 and 1800 ft. in height. Above Chicoutimi it runs through hills of about 400 ft. in height, densely wooded with spruce, maple and birch. Tadoussac, at its mouth, is the oldest European trading post in Canada.

Lake St John is a shallow basin, 26 m. by 20, with an area of 365 sq. m. It receives the waters of the Ashuapmuchuan, often spoken of as the upper course of the Saguenay, the Mistassini, the Peribonka and various other important streams. A numerous farming population live near its shores. It is well known to anglers as containing the celebrated *ouinaniche*, or land-locked salmon, which attains a weight of about 6 lb.

SAGUNTUM, now Sagunto or Murviedro, an ancient town in a fertile district of eastern Spain (Castellon de la Plana) 20 m. N. of Valencia, close to the coast. Its history comprises one brief flash of tragic glory and a long obscure happiness. At the outbreak of the Second Punic War (219 B.C.) it was a large and commercially prosperous town of native—not Greek—origin. It sided with Rome against Carthage, and drew Hannibal's first assault. Its long and noble resistance, told by the Roman historian Livy in no less noble language, ranks with the Spanish defence of Saragossa in the Peninsular War. Finally in 218 Hannibal took it and passed on into Italy. Then we hear little more of it till at the opening of the Christian era it appears as a flourishing Romano-Spanish town with a Latin-speaking population and the rank of *municipium*. This later prosperity lasted most of the empire through, and is attested by inscriptions and ruins (notably a theatre, demolished by Suchet).

SAHARA, the great desert of northern Africa. The Sahara has an area, according to Dr A. Bludau's calculation of the areas of African river basins, of 3,459,500 sq. m., made up as follows:—

	Sq. m.
Drainage or slope to Atlantic	131,000
Drainage or slope to Mediterranean	502,000
Drainage inland	2,602,500
Slope to Niger basin	224,000
Total	3,459,500

This includes Tripoli and Fezzan, which practically belong to the desert zone, but does not include arid portions of the basins of the Nile and Niger, in which the drainage is at most intermittent, and which might with reason be included in the Sahara. The area would thus be brought up to at least 3½ million sq. m., about the area of Europe minus the Scandinavian peninsula.

Area and boundaries.

The physical limits of this region are in some directions marked with great precision, as in parts of Morocco and Algeria, where the southern edge of the Atlas range looks out on what has almost the appearance of a boundless sea, and forms, as it were, a bold coast-line, whose sheltered bays and commanding promontories are occupied by a series of towns and villages—Tizgi, Figuig, El Aghuat, &c. In other directions the boundaries are vague, conventional and disputed. This is especially the case towards the south, where the desert sometimes comes to a close as suddenly as if it had been cut off with a knife, but at other times merges gradually and irregularly into the well-watered and fertile lands of the Sudan. While towards the east the valley of the Nile at first sight seems to afford a natural frontier, the characteristics of what is usually called the Nubian desert are so identical in most respects with those of the Sahara proper that some authorities extend this designation to the shores of the Red Sea. The desert, indeed, does not end with Africa, but is prolonged eastwards through Arabia towards the desert of Sind. As the Nubian region is described under SUDAN: § *Anglo-Egyptian*, the present article is confined to the country west of the Nile Valley, the Libyan desert inclusive. Its greatest length, along the 20th parallel of north latitude, is some 3200 m.; its breadth north to south varies from 800 to 1400 m.

General aspect.

The sea-like aspect of certain portions of the Sahara has given rise to much popular misconception, and has even affected the ideas and phraseology of scientific writers. Instead of being a boundless plain broken only by wave-like mounds of sand hardly more stable than the waves of ocean, the Sahara is a region of the most varied surface and irregular relief, ranging from 100 ft. below to 5000 and 6000 and even in isolated instances to 8000 ft. above the sea-level, and, besides sand-dunes and oases, containing rocky plateaus, vast tracts of loose stones and pebbles, ranges of the most dissimilar types, and valleys through which abundant watercourses must once have flowed.

In the centre of the Sahara is a vast mountain region known as the Ahaggar (Hoggar) Tasili or plateau. The culminating peaks of this plateau, Mounts Watellen and Hikena, are about 900 m. in a straight line almost due S. of the city of Algiers and about 1200 m. due N. of the mouth of the Niger. They also occupy, speaking roughly, a central position between the Atlantic and the Nile. The Ahaggar plateau is not inferior to the Alps in area, but its highest peaks do not greatly exceed 8000 ft. They are believed to be volcanic like those of Auvergne. Upon their summits snow is reputed to lie from December to March. South-east of the main plateau, and partly filling the valley between the Ahaggar plateau and the Tasili of the Asjer (see *infra*), are the Anahef mountains. To the north the valley is again contracted by the Irawen mountains.

Mountain ranges.

Besides this central group of mountains, sometimes spoken of as the Atakor-'n-Ahaggar (Summits of the Ahaggar), there are various other massifs in the Sahara. On the north-west of the Ahaggar, and separated from it by a wide plain, is the Muidir plateau, which extends nearly east and west 200 m. North-east of the Ahaggar (in the direction of Tripoli) is the Tasili of the Asjer (4000-5000 ft.), which runs for 300 m. in a N.E. to S.E. direction. South-east of the Tasili of the Asjer is a range of hills known as the Tummo (or War) mountains. Still farther south is the mountainous region of Tibesti (or Tu), with an average height of some 7000 ft., the volcanic cone of Tussid rising to an estimated height of 8800 ft. Towards the south and east the Tibesti highlands are connected with the lower ranges of Borku and Ennedi, which merge into the plains of Wadai and Darfur. The slopes are bare and rocky. By some authorities the Tasili of the Asjer, the Tummo, Tibesti and Borku ranges are considered "the orographic backbone" of the Sahara.

In addition to the plateaus and ranges named, there are several disconnected mountain masses. Midway between the Atakor-'n-Ahaggar and Nigeria are the Air or Asben hills in which Dr Erwin von Bary discovered (1877) the distinct volcanic crater of Teginjir with a vast lava-bed down its eastern side. By some writers Air (*q.v.*) is not included in the Sahara, as it lies within the limit of the tropical rains; but the districts farther south have all the characteristics of the desert. West of Air, and north-east of the bend of the Niger, lies the hilly region sometimes known as Adrar of the Iforas or of the Awellimiden (the southern confederacy of the Tuareg). To the N.E., in FEZZAN (*q.v.*), are the dark mountains of Jebel-es-Soda, which are continued S.E. towards Kufra by the similar range of the Haruj; and in the extreme S.W., at no great distance from the Atlantic, is the hilly country of the western Adrar (*q.v.*).

Nearly all the rest of the Sahara consists in the main of undulating surfaces of rock (distinguished as *hammada*), vast tracts of water-worn pebbles (*serir*) and regions of sandy dunes (variously called *maghter*, *erg* or *areg*, *igidi*, and in the east *rhart*), which occupy about one-ninth or one-tenth of the total area. The following is the general distribution of the dunes:—

Sand-dunes.

From a point on the Atlantic coast south of Cape Blanco a broad belt extends N.E. for about 1300 m., with a breadth varying from 50 to 300 m. This is usually called the Igidi or Gidi, from the Berber word for dunes. In part it runs parallel with the Atlas mountains. Eastward it is continued, south of Algeria and Tunisia, by the Western Erg and Eastern Erg, separated by a narrow valley at Golea. South of the Eastern Erg (which extends as far north as the neighbourhood of the Gulf of Gabes) the continuity of the sandy tract is completely broken by the Hammada al-Homra (or Red Rock Plateau), but to the south of this region lie the dunes of Edeyen, which, with slight interruptions, extend to Murzuk in Fezzan. South of the hammada of Murzuk the dunes of Murzuk stretch south-east. This series of tracts may be called the northern zone of the Sahara; it forms a kind of bow, with its extremities respectively at the Atlantic and the Libyan desert and its apex in the south of Tunisia. In the south are the Juf (depressions), covering a vast area to the south-east of the middle portion of the Igidi, another area between the Adghagh plateau and the Ahaggar, and a third between Air and Tibesti. The Juf or depressions are not, except in rare instances, below sea-level. In the Libyan desert is a vast region of dunes of unascertained limits; the characteristics of the Libyan desert being thought typical of the whole of the Sahara originated the idea of "a sea of shifting sand" as descriptive of the entire desert. Here a region of over 500,000 sq. m. extending east from the Tibesti mountains to the valley of the Nile, bounded south by Wadai and Darfur and north by Fezzan and the Cyrenaica, appears to be almost entirely sterile and increasingly covered by dunes. There is only one known route through this dreadful wilderness—one running north and south to the oases of Kufra, which lie in its centre. The dunes in the Libyan desert, so far as is known, run N.N.W. and S.S.E. In the Eastern Erg the dunes also lie in long lines in a N.N.W. and S.S.E. direction, presenting a gradual slope to windward and an abrupt descent to leeward. There they are generally about 60 or 70 ft. high, but in other parts of the Sahara they are said to attain a height of upwards of 300 ft.

Under the influence of the wind the surface of the dunes is subject to continual change, but in the mass they have attained such a state of comparative equilibrium that their topographic distribution may be considered as permanent, and some of them, such as Gern (Peak) al-Shuf and Gern Abd-al-Kader, to the south of Golea, have names of their own. The popular stories about caravans and armies being engulfed in the moving sands are regarded as apocryphal (save perhaps in some instances in the Libyan desert), but there is abundant evidence against the theory of M. Vatonne as to the dunes having been formed *in situ*.

Skeleton river-system.

Although now mainly waterless, the Sahara possesses the skeleton of a regular river-system. From the north side of the Atakor-'n-Ahaggar, through which runs the "water-parting" between the basins of the Mediterranean and Atlantic, begins Wadi Igharghar, which, running northwards between the Tasili plateau and the Irawen mountains, appears to lose itself in the sands of the Eastern Erg, but can be traced northwards for hundreds of miles. Its bed contains rolled fragments of lava and freshwater shells (*Cyrena* and *Planorbis*). In a line almost parallel to Wadi Igharghar, Wadi Mya descends from the plateau of Tademayt, and shows the importance of its ancient current by deep erosion of the Cretaceous rocks, in which a large number of left-hand tributaries have also left their mark. The streams flowing south from the Atlas, which seem to be absorbed in the sands of the desert, evidently find a series of underground reservoirs or basins capable of being tapped by artesian wells over very extensive areas. As Olympiodorus (quoted by Photius) mentions that the inhabitants of the Sahara used to make excavations from 100 to 120 ft. deep, out of which jets of pure water rose in columns, it is clear that this state of matters is (historically) of ancient date. Since 1856 French engineers have carried on a series of borings which have resulted in the fertilizing of extensive tracts. In Wadi Righ (otherwise Rhir), which runs for 80 m. towards the south-west of the Shat Melrir (department of Constantine, Algeria), the water-bearing stratum is among permeable sands, which are covered to a depth of 200 ft. by impermeable marls, by which the water is kept under pressure. In this valley many artesian wells have been sunk by the French. Connexions probably exist with subterranean water-supplies in the mountains to the north. That the water in the artesian reservoirs is kept aerated is shown by the existence below ground of fishes, crabs and freshwater molluscs, all of which were ejected by the well called Mezer in Wadi Righ. Further west the Wadis Zusfana and Ghir unite to form the Saura, known in Tuat as the Messaud. These rivers still carry water as far as the northern part of Tuat; thence the course of the Messaud was, apparently, S.W. to the eastern Juf. There are also well-marked river-beds in the central Sahara. The Wadi Telemsi, rising in Adrar, of the Iforas, apparently joined the Niger near Gao, while the Wadi Taffassassent, which rose in the Ahaggar mountains, is believed to have been the ancient upper course of the lower Niger. The oases are also proofs of the presence of a steady supply of underground moisture, for vegetation under the Saharan climate (beyond the few plants specially adapted to desert conditions) is exceptionally thirsty.

Denudation.

The existence of these wadis or river-beds is a factor in the consideration of the cause of the desert nature of the country. In all parts of the Sahara there is evidence of denudation carried out on a scale of unusual magnitude. The present surface of the desert has been exposed to the protracted wear and tear of the elements. But to determine the exact method by which the elements have done their work has hitherto proved beyond the power of science. The theory of *submarine* denudation was accepted by many scientists of the mid-Victorian era. The sand-dunes, the salt efflorescence and deposits, and the local occurrence of certain modern marine molluscs all go to help the hypothesis of a diluvial sea. Nor is evidence lacking that in cretaceous times portions of the Sahara were covered by the sea. Colonel P. L. Monteil brought home (1892) a fossil sea-urchin from Bilma. In 1902 at Tamaske, some 250 m. W. of Zinder, and a little north of Sokoto, a nautilus and four sea-urchins (fossils) were found by Captain Gaden in a limestone bed. Similar fossils occur in the region between Zinder and Aïr, and others of the same age have been found near Dakar. Basing his conclusions on these and other facts, de Lapparent held that an arm of the sea extended inland from the Atlantic to the eastern Sahara. This sea was bounded on the north and east by the mountains of Aïr, Ahaggar, the Asjer Tasili, &c. An extensive acquaintance with Saharan characteristics shows, however, that a sea for the Sahara as a whole is impossible. Henri Schirmer, who in 1893 published an admirable summary of Saharan geography up to that date, argued that the desert nature of the Sahara is due to forces which have been at work for ages, although, as in all deserts, the dryness is probably progressively increasing. The primary cause is to be sought in the existing distribution of land and sea, the great land mass of North Africa causing an outflow of air in all directions (and consequent absence of rain) in winter, and an indraught in summer, when the surface is intensely heated and the relative humidity of the atmosphere becomes so small that condensation is all but impossible. The vicinity of the comparatively cool Mediterranean in the north accentuates the force of the winds from that direction, which, blowing towards a lower latitude, are in their very nature dry winds. The influence of mountain ranges, such as the Atlas, round the border of the desert, is thus but a subordinate cause of the latter's dryness, which would probably be little diminished did the Atlas not exist. This dryness reacts again on the temperature conditions of the Sahara, accentuating both the daily and annual variation. The intense heat of the day is compensated by the cold of the nights, so that the mean annual temperature is not excessive. The difference between the mean temperature of the hottest and coldest month has been found to be as high as 45° F., and the extreme range at least 90° F., maxima of 112° and over having been frequently observed. As a result of the extreme dryness of the air, evaporation is excessive, and, being greater than the precipitation, involves a progressive desiccation of the Sahara. The surface of the rocks, heated by the sun and suddenly chilled by rapid radiation at night, gets fractured and crumbled; elsewhere the cliffs have been scored and the sand thus formed is at once turned by the wind into an active instrument of abrasion. In many places it has planed the flat rocks of the hammada as smooth as ice. Elsewhere it has scored the vertical faces of the cliffs with curious imitations of glacial striation, and helped to undercut the pillar or table-like eminences—remains of former more extensive plateaus—which, under the name *gur*, are among the most familiar products of Saharan erosion. The softer quartz rocks of the Quaternary and Cretaceous series have been made to yield the sand which, drifted and sifted by the winds, has taken on the form of dunes. The slighest breeze is enough to make the surface "smoke" with dust; and at times the weird singing of the sands, waxing louder and louder, tells the scientific traveller that the motion is not confined to the superficial particles. The dry wind of the Sahara is known in southern Europe as the Sirocco. It brings with it clouds of fine red dust, as noted long since by Idrisi, the Arabian geographer. Dr Theobald Fischer and Dr Oscar Fraas agree in believing that the desiccation has markedly increased in historic times. Evidence derived from ancient monuments combined with the statements of Herodotus and Pliny are held to prove that the elephant, the rhinoceros, and the crocodile existed in North African regions where the environment is now utterly alien, and on the other hand that the camel is a late introduction.

Any attempt to improve the climatic conditions of the Sahara as a whole can hardly meet with success when the causes of its desiccation are considered. Much may, however, be done to modify local conditions, and fairly satisfactory results have been obtained in the direction of fixing the dunes and covering them with a growth of vegetation. Experiments carried out by the French at Ain Sefra, on the northern border of the desert, have shown that by protecting the sand from the action of the wind by a litter of alfa grass, time is given for the establishment of suitable trees, which include the tamarisk, acacia, eucalyptus, prickly pear, peach and aspen poplar, the last-named having proved the most capable of all of resisting the desert conditions. Such planting operations can only be carried out in favourable localities, such as valleys in which a certain amount of water is available. Wide areas like the arid stony plateaus (hammada) must be abandoned as hopeless.

Geological structure.

As already stated, the popular conception of the Sahara as a sand desert is erroneous. It is really a stony, wind-swept waste with much bare rock visible, the actual area of pure sand forming a relatively small portion. A broad belt of Archaean rocks extends throughout the desert, appearing at intervals in the form of hills and plateaus from beneath the superficial sands and Quaternary deposits. Examples are the granite of Aïr and the gneiss and mica-schists of this massif and of the Ahaggar plateau. Flanking this zone are immense tracts occupied by rocks of Devonian and Carboniferous ages, from which characteristic marine fossils have been obtained at the springs of El Hassi and between Wad Draa and the dunes of Igidi. *Productus africanus* is a common fossil of the Carboniferous rocks. At the close of the Carboniferous period it has been generally considered that the southern and central Sahara became dry land and has remained so up to the present day. Marine fossils of Cretaceous age have, however, been found within recent years in the central regions; while Eocene echinoids have been obtained near Sokoto (*Geol. Mag.*, 1904). During Lower Cretaceous times the Mediterranean covered the Algerian and Tripolitan Sahara and the northern portion of the eastern desert; the extensive development of the Cretaceous system being one of the most striking features of Saharan geology. At the close of the Cretaceous period the Tripolitan Sahara completely emerged, but parts of the Tunisian and Algerian Sahara seem to have remained below sea-level until the end of the Lower Eocene. Only on the extreme borders of the desert, however, do tertiary formations play any prominent part. During the Quaternary period the Sahara possessed a moister climate than the present. This is shown by the numerous water-cut valleys, now dry, and by the remains of hippopotamus in the Quaternary deposits.

The idea so long held that the Sahara represented the recently dried-up bed of an extension of the Mediterranean has been disproved by the investigations of French geologists. The sand is mainly derived from the wide expanse of Cretaceous sandstones, which become rapidly disintegrated by the contraction caused by the wide range of temperature between day and night. The loose sands of the Quaternary deposits also furnish abundant material. The true dune sand is remarkable for the uniformity of its composition and the geometrical regularity of its grains, which measure less than ·03937 in. While individually these appear transparent or reddish yellow (from the presence of iron), they have in the mass a rich golden hue. According to Tissandier animal organisms, such as the microscopic shells of Rhizopoda, abundant in sea-sand, are strikingly absent.

Botanically the Sahara is the meeting-ground of representatives

Botany and Zoology.

of the "Mediterranean" and the "Tropical" floras which have accommodated themselves to the peculiar climatic conditions. The line of demarcation between the two floral areas, almost coinciding in the west with the Tropic of Cancer and in the east dipping south towards the meridian of Lake Chad, assigns by far the greater portion of the area to "Mediterranean" influences. Uniformity, in spite of differences of altitude and soil, is a general characteristic of the vegetation, which outside of the oases consists mainly of plants with a tufty, dry, stiff habit of growth. The oases are the special home of the date-palm, of which there are about 4,000,000 in the Algerian oases alone. In company with this tree, without which life in the Sahara would be practically impossible, are grown apples, peaches, oranges, citrons, figs, grapes, pomegranates, &c. From December to March wheat, barley and other northern grain crops are successfully cultivated, and in the hotter season rice, dukhn, durra and other tropical products. Altogether the oasal flora has considerable variety; thirty-nine species are known from the Kufra group, forty-eight from the Aujila group.

Zoologically the Sahara is also partly Mediterranean, partly Tropical. Apart from the domestic animals (camels, asses, &c., and very noticeably a black breed of cattle in Adrar), the list of fifteen mammals comprises the jerboa, the fennek or fox, the jackal, the sand rat (*Psammomys obesus*), the hare, the wild ass and three species of antelope. In Borku, Air, &c., baboons, hyaenas and mountain sheep are not uncommon. Without counting migratory visitants, about eighty species of birds have been registered—the ostrich, the *Certhilauda deserti* or desert-lark (which often surprises the traveller with its song), *Emberiza Saharae*, three species of *Dromolea*, &c. Tortoises, lizards, chameleons, geckos, skinks, &c. of fifteen different species were collected by the single Rohlfs expedition of 1873–1874; the serpents comprise the horned viper, *Psammophis sibilans*, *Coelopeltis lacertina*, the python and several other species. The edible frog also occurs. *Cyprinodon dispar*, a fish not unlike *Cyprinodon calaritanus*, is found in all the brackish waters of north Sahara and swarms in the lake of the Sīwa oasis.

Centres of population.

The chief centres of population in the Sahara are, firstly, the oases, which occupy positions where the underground water makes its way to the surface or is readily reached by boring; and, secondly, certain mountainous districts where the atmospheric moisture is condensed, and a moderate rainfall is the result. Except in the south of Algeria, where cultivation has been extended by means of artesian wells, the condition of the Sahara oases is far from prosperous. Prior to the French occupation, a feeling of insecurity had been engendered by the marauding habits of the nomad tribes; cultivation had become more restricted; and the decline of the caravan trade had brought ruin to certain centres, such as Murzuk. The most important are the oases of the Tuat region, especially Insalah; those of Ghat and Ghadames on the route from Tripoli to Zinder; and of Kufra, in eastern Sahara (see TUAT and TRIPOLI). The various confederations of the Tuareg, in the central Sahara, are grouped round hilly districts. The most important are the Awellimiden, on the left bank of the Middle Niger; and the Kel-Ui, grouped around the mountainous districts of Air or Asben; the two northern confederations, those of the Ahaggar and Asjer, being less powerful. Much information respecting the Awellimiden confederation was obtained during the voyage down the Niger, in 1896, of Lieutenant Hourst of the French Navy, who was much struck with its powerful organization under the chief Madidu. Northwest of Timbuktu in the district or "Kingdom" of Biru is the oasis and town of Walata, a Tuareg settlement. Other mountainous districts in which a certain amount of rain falls regularly, and which contain a population above the average for the Sahara, are Tibesti and Borku, in the east centre, and Adrar in the west. Tibesti and Borku are peopled by Tibbus; the western Adrar by Moors (Berbers). The northern portions of the Sahara are inhabited by nomad Arabs.

Ethnology.

Attempts have been made by many explorers and writers to trace in certain of the existing inhabitants the remnants of an aboriginal race of negro affinities, which inhabited the Sahara before the arrival of the Berbers and Arabs. E. F. Gautier, writing in 1908, maintained that the evidence available (for the central Sahara) rendered probable the hypothesis that at a period perhaps as recent as the Roman conquest of North Africa the Sahara was still neolithic and peopled by a race of agricultural negroes, who extended to the confines of Algeria. Negro influence is undoubtedly seen in various parts of the Sahara, but it may date from a much more recent period than has been supposed. For example, the connexion between many of the place-names in Fezzan and the language of Bornu is attributable to the northward extension of the influence of the Bornu-Kanem empire between the 11th and 14th centuries A.D. The allusions by classical writers to Ethiopians as inhabitants of the Sahara prove little, in view of the very vague and general meaning attached to the word. The physical characteristics, and especially the dark colour, of many of the Saharan populations is apparently a stronger argument, but even this is capable of another explanation. Caravans of negro slaves from time immemorial passed northwards along the main desert routes, and it is just in the oases on these routes that the dark element in the population is chiefly found. It may therefore be attributed to the intermarriage of the original lighter inhabitants of the oases with such slaves. The Tibbu (*q.v.*) or Tebu, once thought to be almost pure negroes, proved, when examined by Gustav Nachtigal in Tibesti, where they are found in greatest purity, to be a superior race with well-formed features and figures, of a light or dark bronze rather than black. Their language is related to that of the Kanuri in Bornu, but it appears that the Kanuri have derived theirs from the Tibbu, not the Tibbu from the Kanuri. Physically, the Tibbu appear to resemble somewhat the Tuareg, and there is little doubt that they are a Hamitic, not a negro, people.

Commerce.

The commerce of the Sahara is not inconsiderable. Among the more important trade routes are (1) from Morocco to Cairo by Insalah and Ghadames, which is followed by the pilgrims of western Africa bound for Mecca; this route has been largely superseded by the sea route from Tangier to Alexandria; (2) from Kuka (Lake Chad) to Murzuk and Tripoli; (3) from Kano and Zinder to Tripoli by Air and Ghat; (4) from Timbuktu to Insalah, Ghadames and Tripoli; (5) from Timbuktu to Insalah and thence to Algeria and Tunisia; (6) from Timbuktu to Morocco. The Senussi movement brought into prominence the desert routes between Wadai in the south and Jalo and Benghazi in the north, which partially superseded some of the older routes. Other causes tended to reduce the importance of the old routes. The long-established route from Darfur to the Kharga and Dakhila oases fell into disuse on the closing of the eastern Sudan by the Mahdist troubles. The great route leading from Tripoli via Ghadames and Ghat, to Zinder, Kano, and other great centres of the Hausa States maintains its importance, but the opening of trade from the side of the Niger by the British in the early years of the 20th century affected its value. The route across the western Sahara to Timbuktu is less used than formerly owing to the establishment by the French of a route from Senegal via Nioro to the Upper Niger. The old route, however, retains some importance on account of the salt trade from the Sahara, which centres at Timbuktu. Salt and date palms are the chief products of the Sahara. The principal sources of the salt supply are the rock-salt deposits of the Juf (especially Taudeni), the lakes of Kufra and the rock salt and brine of Bilma (*q.v.*).

Trans-Saharan Railway Schemes.

The hope of an eventual commercial exploitation of the Sahara rests mainly on the possible existence of mineral wealth. To supply easy communication between Algeria and Nigeria the construction of a railway across the desert has found many advocates. Two principal routes have been suggested, the one taking an easterly line from Biskra through Wargla to Air (Agades) and Zinder—generally, the route followed by Foureau (see below); the other starting from the terminus of the most westerly railway already existing, and reaching Timbuktu via Igli and the Tuat oases. A third suggested route is one from Igli to the Senegal, still farther west.

The Flooding of the Sahara.

Reference may also be made to the proposal, strenuously advocated between 1870 and 1885, to open up the region to the south of Algeria and Tunisia by the construction of an inland sea. According to Colonel François Roudaire (1836–1885), the author of this scheme, deceptively styled the "flooding of the Sahara," it was possible to create an inland sea with an average depth of 78 ft. and an area of 3100 sq. m., or about fourteen times the size of the Lake of Geneva. A French government commission decided that the excavation of the necessary canal would not be difficult, and that in spite of silting-up processes the canal when cut would at least last 1000 to 1500 years. Ferdinand de Lesseps, Roudaire's principal supporter, visited the district in 1883 and reported that the canal would cost five years' labour and 150,000,000 francs. The scheme (which fell into abeyance on the death of Roudaire) was based on the following facts. The Gulf of Gabes is separated by a ridge 13 m. across and 150 ft. high from Shat-al Fejej, a depression which extends S.W. into the Shat Jerid, which in its turn is separated from the Shât Rharsa only by a still narrower ridge. Shat Garsa is succeeded westwards by a series of smaller depressions, and beyond them lies the Shat Melrir, whose N.W. end is not far from the town of Biskra.

Political Divisions.

Politically the Sahara belongs partly to Morocco (Tafilet, &c.), partly to the Turkish empire (Tripoli, Egypt, &c.), but principally to France. The French first acquired an interest in the Sahara by their conquest of Algiers (1830–45). They gradually extended their influence southward with the purpose of forming a junction with their possessions on the Senegal. The acquisition of Tunisia (1881) largely increased the hold of the French on the Sahara, and the work of French pioneers to the south of Algeria was recognized by the Anglo-French agreement of 1890, which assigned to France the whole central Sahara from Algeria to a line from Say on the Niger to Lake Chad. The southern limit of the territory was, however, not strictly defined until 1898, when a new agreement gave to France a rectangular block south of the line mentioned, including the important frontier town of Zinder. A further agreement in 1904 again modified the frontier in favour of France. To the north-east and east the boundary of the French sphere was extended, by an Anglo-French Declaration of March 1899, and defined as running south-east, from the intersection of the Tropic of Cancer with 16° E., until it meets the meridian of 24° E., following this south to the frontier of Darfur. French Sahara is thus connected with the French possessions in West Africa and with the Congo-Shari territories of France on the south-east. On the west, where Spain claimed the Sahara coast between Capes Blanco and Bojador, the inland frontier was defined by the Franco-Spanish agreement of 1900, whereby Spain was apportioned a *Hinterland* with an average depth of 240 m. from the sea-shore.

Exploration.

It is impossible to ascertain the extent of the knowledge of the Sahara possessed by the ancients. The Egyptians penetrated the Libyan and Nubian deserts at points, and Carthaginians and Phoenicians were acquainted with the northern fringe of the desert in the west. European exploration dates from the beginning of the 19th century. In 1819 Captain G. F. Lyon and Joseph Ritchie penetrated from Tripoli to Murzuk, where Ritchie died. In 1822 came the great journey of Walter Oudney, Hugh Clapperton and Dixon Denham, from Tripoli to Lake Chad, and a year or two later Major A. G. Laing succeeded in reaching Timbuktu, also from Tripoli. In 1828 René Caillié crossed from Timbuktu to Morocco. Heinrich Barth in the course of his great journey (1849–1856), commenced from Tripoli under the leadership of James Richardson, traversed a considerable portion of the Sahara. Between 1859 and 1861 Henri Duveyrier explored parts of the Tuareg domain. Knowledge of the northern Sahara, from Morocco to Tripoli, was largely increased by the journeys of Gerhard Rohlfs, begun in 1861; Rohlfs subsequently crossing (1865) from Tripoli to Lake Chad by nearly the same route as that previously taken by Barth. In 1873–1874 Rohlfs visited the oases in the north of the Libyan desert and in 1878–1879 reached the oasis of Kufra. In 1876–1877 another German traveller, Erwin von Bary, made his way to Ghat and Air, but was assassinated. A French expedition under Colonel Paul Flatters after penetrating far south of Algeria was massacred (1881) by Tuareg. Farther west success was attained in 1880 by a German explorer, Dr Oskar Lenz, who, starting from Morocco made his way, partly by a new route, to Timbuktu. In 1892 the Sahara was crossed from Lake Chad to Tripoli by the French Colonel Monteil.

It was not until 1899 that the central Sahara, from Algeria to Air, was traversed for the first time by Europeans. This was accomplished under the leadership of Fernand Foureau. This journey was undertaken in pursuance of the efforts of the French to obtain effective control of the Sahara. South of Algeria military posts had been gradually pushed into the desert, Golea being until 1900 the farthest point which acknowledged French rule. The great desideratum was the opening up of a route to the Niger countries which might in time divert the trade from Tripoli to Algeria, but all attempts long proved fruitless, owing to the opposition of the tribes inhabiting central Sahara. In 1886 Lieutenant Palat was murdered a little south of Gurara, and in 1889 the same fate befell Camille Douls in Tidikelt (Tuat) in his attempt to reach Timbuktu from the north. In 1890 Foureau—who in 1883 had undertaken a first journey of exploration south of Wargla—reached the Tademayt plateau in 28° N., fixing the position of 35 places, and in 1892–1893 came the first of his long series of expeditions undertaken with a view of penetrating the country of the Azjer Tuareg, the powerful confederacy which lay on the route to Air and Lake Chad, never traversed in its entirety by a European. All efforts to obtain a passage were unavailing until in 1898–1899 Foureau, accompanied by an escort of troops under Major Lamy, at last attained his object, finally reaching Zinder, the important trade centre on the borders of Nigeria, and midway between the river Niger and Lake Chad, on the 2nd of November 1899.

The important section of Foureau's route began at Ain El-Hajaj, in about 26½° N., immediately beyond which the frowning *massif* of Tindesset had to be crossed by a most difficult route among a chaos of rocks and ravines, the geological formation being principally sandstone. After descending the southern escarpment of the "Tasili," the expedition crossed the mountainous region named Anahef, composed of quartz and granite, through which the line of partition between the basins of the Mediterranean and Atlantic was found to run. Thence the route lay across the wide plain of quartz gravel, strewn with blocks of granite, known to the Tuareg as Tiniri, to the well of In-Azaua, beyond which a march of eleven days, with a water-supply at one point only, led to the first village of Air, where the Tuareg proved hostile. Agades, the capital of Air, was reached by a march through difficult mountains, with valleys which gradually opened into a wide plain. From Agades to Zinder the route lay, first, through the bare and arid district of Azauak; next, through the bush-covered Tagama, a district abounding in game; and, lastly, through the cultivated country of Damerghu. Zinder had only once before been reached by way of Air—by Barth's expedition in 1850. It was now occupied by a French force which had advanced from the Niger (see SENEGAL: Colony).

Foureau's achievement was quickly followed by increased political activity of the French in the Sahara south of Algeria, where, in addition to the work of other explorers, surveys had been carried by French officers (especially Captains Germain and Laperrine in 1898) as far as the important centre of Insalah, the position of which had, as a result, been shifted some 25 m. E. of its former position on the maps, being found to lie in 2° 16′ E., 20° 17′ 30″ N. Early in 1900 G. B. M. Flamand, who had been entrusted with a scientific mission to the Tuat oases, came into collision with the natives, and Insalah was occupied by the military escort which accompanied him. This was quickly followed by the occupation of Tuat, and Igli (see TUAT).

Simultaneously with these events, an attempt was made to pave the way for the establishment of French influence in western Sahara by the expedition of Paul Blanchet to Adrar, which had not been visited since the middle of the 19th century. It returned in September 1900, only partially successful, Blanchet and his companions having been detained for some time as virtual prisoners on the borders of Adrar. The leader almost immediately succumbed to fever. In 1903–1909 the country N. of the lower Senegal, including Adrar, was brought under French control and organized as the territory of Mauretania.

The most marked progress was, however, effected in the central Sahara, where the French posts were gradually pushed farther south under a military organization, which resulted in the complete pacification of the Tuareg countries. Travel was thus made possible from one border of the desert to the other, and a number of successful expeditions gathered a rich harvest of results respecting the mapping, geology, and other features of this part of the Sahara. Some of the best work was done by Laperrine, Arnaud, Cortier and Nieger on the military side, and, on the civilian, by Villatte, Gautier and Chudeau. Apart from these French enterprises, Hanns Vischer, a Swiss in the service of British Nigeria, in 1906 travelled from Tripoli to Bornu through Murzuk and Bilma. In 1910 Capt. A. H. Haywood traversed the Sahara, being the first Englishman to cross the desert from Gao to Insalah.

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SAHARANPUR, a city and district of British India, in the Meerut division of the United Provinces. The city is situated on a stream called the Damaula Nadi, 907 ft. above sea-level, 998 m. by rail from Calcutta. Pop. (1901) 66,254, of whom more than half are Mahommedans. It is an important junction of the North-Western railway with the Oudh and Rohilkhand line. The government botanical gardens were established in 1817. There are railway workshops, and a large industry is pursued in wood-carving.

The District of Saharanpur has an area of 2228 sq. m. It forms the most northerly portion of the Doab, or alluvial tableland between the Ganges and Jumna. The Siwalik hills rise precipitously on its northern frontier; at their base stretches a wild submontane tract, with much forest and jungle. Cultivation generally in this part is backward, the surface of the country being broken by ravines. South of this tract lies the broad alluvial plain of the Doab, with fertile soil and good natural water-supply. This portion of the country is divided into parallel tracts by numerous streams from the Siwaliks, while the Eastern Jumna and Ganges canals cover the district with a network of irrigation channels. The annual rainfall averages about 37 in. The population in 1901 was 1,045,230, showing an increase of 4·4% in the decade. The principal crops are wheat, rice, pulse, millet, and maize, with some sugar-cane and cotton. The district contains the towns of Roorkee and Hardwar.

During the later years of the Mogul empire, Saharanpur suffered much from the perpetual raids of the Sikhs, but in 1785 the district under Ghulam Kadir enjoyed comparative tranquillity. On his death the country fell into the hands of the Mahrattas. It was afterwards again overrun by the Sikhs, remaining practically in their hands until their defeat at Charaon November 1804, when it passed under British rule. Several disturbances subsequently took place among the native chiefs; but from 1824 to 1857 nothing occurred to disturb the peace of the district. The Mutiny in this part was soon quelled.

SAHEL (Arabic for "shore"); a common place-name in countries where Arabic is the dominant language. By *sahel* any coast belt may be indicated, but the name has become the definite designation of certain districts, *e.g.* the Tunisian coast between the gulfs of Hammamet and Gabes. Another region so called is that part of the Sahara washed by the Atlantic. The name is also used to designate the territory under French jurisdiction west of Timbuktu and north of the Senegal. Sahel thus understood comprises regions which form the intermediate zone between the fertile lands of the Sudan and the desert. In its plural form, Swahili, the word has become the tribal name of the natives inhabiting the coast strip opposite Zanzibar.

SAHIB, a title of respect in India, specially used to designate Europeans. The word is Arabic, and originally means a companion. It is generically fixed to the titles of men of rank, as Khan Sahib, Nawab Sahib, Raja Sahib, and is equivalent to master. The proper feminine form is sahiba; but the hybrid term memsahib (from madam and sahib) is universally used in India for European ladies.

SAHOS, or Shohos, Africans of Hamitic stock living to the W. of Massawa. Some authorities regard them as true Abyssinians, but more probably they are akin to the Gallas and Afars. They are for the most part Mahommedans, but some few are Christians.

SAHYADRI, a mountain range of India. The term, which is Sanskrit rather than vernacular, is applied to the entire system of the Western Ghats (*q.v.*) from the Tapti river to Cape Comorin, but more especially to that part of the system in the Bombay Presidency. In this restricted sense the Sahyadri hills begin in Khandesh district, and run S. as far as Gao.

In the territory of the Nizam of Hyderabad, the cross range forming the watershed between the river systems of the Tapti and the Godavari, is locally known as Sahyadri Parbat.

SAIDAPET, a town of British India, administrative headquarters of Chingleput district, Madras, on the South Indian railway, 5 m. S.W. of Madras city, from which it is separated by a line of tanks. Pop. (1901) 14,254. The government teachers' college has a hostel or boarding-house for Brahmans, opened in 1897. The agricultural college, originally (1865) a model farm, has been transferred to Coimbatore.

SAID PASHA (*c.* 1830–), surnamed Kuchuk, Turkish statesman, was at one time editor of the Turkish newspaper *Jeridé-i-Havadis*. He became first secretary to Sultan Abd-ul-Hamid II. shortly after his accession, and is said to have contributed to the realizations of his majesty's design of concentrating power in his own hands; later he became successively minister of the interior and Vali of Brussa, reaching the high post of grand vizier in 1879. A Turkish statesman of the old school, he was regarded as somewhat bigoted and opposed to the extension of foreign influence in Turkey. He was grand vizier four more times under Abd-ul-Hamid. In 1896 he took refuge at the British embassy at Constantinople, and, though then assured of his personal liberty and safety, remained practically a prisoner in his own house. He came into temporary prominence again during the revolution of 1908. On the 22nd of July he succeeded Ferid Pasha as grand vizier, but on the 6th of August was replaced by Kiamil Pasha, a man of more liberal views, at the instance of the young Turkish committee.

SAID PASHA KURD (1834–1907), Turkish statesman, son of Hussein Pasha, was born at Suleimanié. After holding various administrative posts he became governor-general of the Archipelago (1881), minister for foreign affairs (1882), ambassador at Berlin (1883) and again foreign minister in 1885. He was afterwards president of the Council of State, an office which he held till his death on the 29th of October 1907.

SAIGA (*Saiga tatarica*), the native designation of a desert-dwelling antelope, easily recognized by its extraordinary swollen and puffy nose, in which the apertures of the tubular nostrils are directed downwards. The ringed lyrate horns of the males are amber-coloured, and wide apart on the head. There is a small gland on each side of the face below the eye; and the ears are remarkable for their short and rounded form. The colour is whitish in winter and sandy in summer. It is the sole representative of its genus. At the present day the headquarters of this antelope are the Kirghiz Steppes, but a century ago its range extended as far west as Poland. During the latter part of the Tertiary period the saiga was much more widely distributed, fossilized remains having been obtained from many parts of Western Europe, including Britain.

SAIGO, TAKAMORI (1832–1877), Japanese patriot, was born in Satsuma in 1832. From early youth he took a prominent part in the politics of his clan, and owing to his extreme opinions with regard to the expediency of abolishing the Tokugawa administration, he was banished (1858) to the island of Oshima (Satsuma), where he attempted unsuccessfully to commit suicide. Ultimately he rose to high rank in the newly organized imperial government, but in 1873 he retired from the cabinet by way of protest against its decision not to take armed action against Korea. Thenceforth he became the rallying point of a large number of men dissatisfied with the new administration, and in 1877 he headed a rebellion which taxed all the resources of the central government. After several months of desperate fighting, Saigo and a small remnant of his followers made a swift retreat to Kagoshima, and fell fighting (September 14) within sight of their homes. Saigo's patriotism and his great services in the cause of the restoration of the administrative power to the throne were so fully recognized that his son was raised to the peerage with the title of marquess, and his own memory was honoured by the erection of a bronze statue in Tokyo.

SAIGON, a town of French Indo-China, capital of the colony of Cochin-China, on the right bank of the river Saigon, 34 m. from the sea. Pop. (1905) 54,745, of whom 8749 were French (exclusive of troops), 152 Europeans of other nationalities, about 30,000 Annamese, 14,000 Chinese. The town is enclosed by the river Saigon on the east, the Chinese Arroyo on the south and the Arroyo of the Avalanche on the north, while on the west it extends towards the neighbouring town of Cholon. Double rows of trees give shade in all the streets, the width and uniformity of which, together with the beautiful gardens (including the zoological gardens), make Saigon one of the finest towns of the Far East. It is lighted chiefly by electricity and its water-supply is secured by a filtering reservoir. The chief public buildings are the government house, the palace of the lieutenant-governor of Cochin-China, the law courts, the theatre, the post-office and the cathedral. The commercial port, at the mouth of the Chinese Arroyo, carries on a large rice trade. The naval harbour comprises an arsenal and has a repairing dock.

Saigon is the seat of two chambers of the court of appeal of French Indo-China, of tribunals of first instance and of commerce, and of the vicar apostolic of Cochin-China. Its municipal council consists of eight French and four native members elected by universal suffrage. This body elects a mayor and two assistants.

Before the French conquest, Saigon, then known as *Gia-dinh-thanh*, was the capital of Lower Cochin-China, which consisted of the "six southern provinces" of the Annamese empire, and constituted a vice-royalty under the government of a *kinhluoc*. In 1836 it was fortified for the emperor Gia Long by Colonel Ollivier. The French captured it in 1859, and it was part of the territory ceded in 1862.

SAIL, the English equivalent of the common Teutonic word for one of the two universal means of propulsion of a vessel through the water, the other being the oar (*q.v.*). For the various types of sail see RIGGING, and for the textile material used see SAILCLOTH below. The origin of the O. Eng. *segl* or *segel* and its cognates, *e.g.* Dutch *zeil*, Dan. *seil*, Ger. *Segel*, &c., is not known; it is certainly not connected with the Lat. *sagulum*, cloak, mantle. It may be derived from the Indo-European root *sagh-*, seen in Sanskrit *sah*, endure, the idea being of that which bears up against or resists the wind.

SAILCLOTH, now more commonly called canvas (*q.v.*), usually a double warp, single weft fabric of the same structure as bagging (*q.v.*), although it is sometimes made with single threads of warp. Hemp and ramie are occasionally used in the manufacture of this cloth, but flax and cotton are the chief fibres employed. Many of the sails of fishing smacks and similar vessels are made entirely of cotton—the fabric sometimes retaining its natural colour, but more often dyed or stained tan. Since most of the larger vessels are now driven by steam, the quantity of cloth used for sails is comparatively small. A large quantity of cloth, however, is used on steamships for covers, and for coal bags, sailcloth buckets, &c.

The very best kind of sailcloth is made from long flax, as this fibre possesses flexibility, lightness and strength combined. The number of threads per inch of warp varies from 14 double threads to 48 double threads, and from 12 to 36 shots per inch of weft, while the usual widths are 18, 24, 30 and 36 in. Cotton canvas has for its limits about 26 to 54 threads of warp per inch, and 15 to 46 shots per inch; the warp yarn for cottons may be 2, 3 or several ply.

Great care has to be exercised in the manufacture of canvas for the British Admiralty. The yarns must be made wholly from long flax, well and evenly spun, and properly twisted. They must also be free from blacks, and be twice boiled in order to remove all injurious matter. From the grey state to the cleaned state the yarns must lose 10% of weight, and no deleterious substance whatever must be used in any stage. The mill washing and first boiling reduce the weight about 8%, while about 2% is removed during the second boiling. Finally, the yarn is thoroughly washed to remove all traces of alkali. The successive processes which the yarn is subjected to remove all impurities, and leave the yarn in the best condition for weaving. Canvas is made in sixteen different qualities: the heaviest is No. 0000, then follow Nos. 000, 00, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12. Of these sixteen varieties Nos. 1 to 8 are mostly in use. Nos. 1, 2, 4, 6 and 7 are used for royal navy canvas, and Nos. 4 and 6 for the merchant navy. The canvas for the Admiralty is 24 in. wide, and the pieces, termed bolts, should be as nearly as practicable 40 yds. of legal measure in length, and to be completely manufactured—particular attention being given to the weaving; the selvages to be evenly and well manufactured, the thrum to be left on each end of the bolt, and to be made as nearly as possible in the proportion of weights given below.

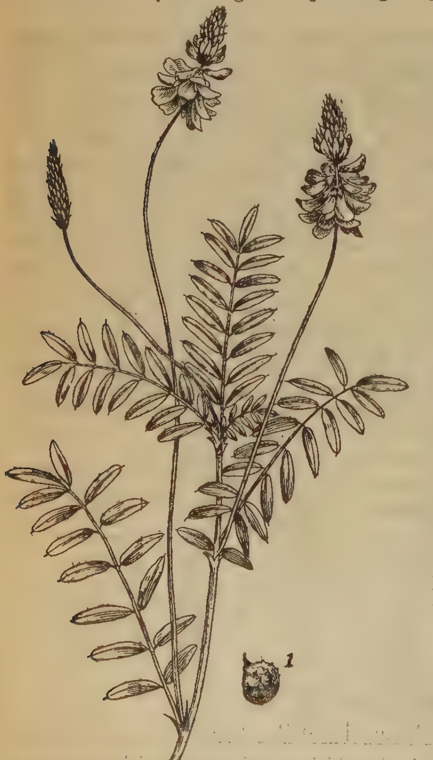
The breaking tests for red and grey canvas are 5% below those for white canvas.

Sailmaking is a very ancient industry, but it is, naturally, much less important than it was before the introduction of steamships. The operations of the sailmaker may be stated as follows. The dimensions of mast and yards and sail plan being supplied, the master sailmaker is enabled to determine the dimensions of each sail—after due allowance for stretching—in terms of cloths and depth in yards—if a square sail, the number of cloths in the head, number in the foot and the depth in yards; if a fore-and-aft sail (triangular), the number of cloths in the foot and the depth in yards of the luff or stay and of leech or after-leech; if a fore-and-aft sail (trapezium form), the number of cloths in the head, number in foot, and the depth of mast or luff and of after-leech. These particulars obtained, there is got out what is technically termed a "casting," which simply means the shape, length, &c., of each individual cloth in the sail. These figures are given to the cutter, who proceeds to cut out the sail cloth by cloth in consecutive order, numbering them 1, 2, 3, 4, &c.; the series of cloths thus cut out are handed over to the workman, who joins them together by carefully made double flat seams, sewn with twine specially prepared for the purpose, with about 120 stitches in a yard. In the heavy sails the seam is about 1½ in. in width, and in the British navy stuck or stitched in the middle of the seam to give additional strength; the seams in the lighter sails are about 1 in. wide. The whole of the cloths are then brought together, and spread out, and the tabling (or hemming, so to speak) is turned in and finished off with about 72

Canvas Number.	Weight of Warp.	Weight of Bolt.	Length of Bolt.	Reed.	No. of Threads.	Breaking Test for Warp.	Breaking Test for Weft.	Dimensions of Testing Strip.
	lb.	lb.	yds.	Score.	Double.	lb.	lb.	in.
1	26	46	39	16½	660	340	480	24×1
2	24	43	39	16½	660	320	460	24×1
3	22	40	39	16½	660	300	440	24×1
4	21	36	39	17	680	280	400	24×1
5	19	33	39	17	680	260	370	24×1
6	18	30	39	17	680	250	350	24×1
7	15	27	40	20	800 single	330	390	24×1½
8	14	23	40	20	800 ,,	310	380	24×1½

stitches to a yard. Strengthening pieces or "linings" are affixed where considered necessary, in courses and top-sails such pieces as reef-bands, middle-bands, foot-bands, leech-linings, bunt-line cloths; in top-sails (only) a top-lining or brim; in other and lighter sails such pieces as mast-lining clew and head, tack and corner pieces; holes, such as head, reef, stay (luff), mast, cringle, bunt-line, &c., are also made where required, a grommet of line of suitable size being worked in them to prevent their being cut through. The next thing to be done is to secure the edges of the sail. Bolt-rope, a comparatively soft laid rope made from the finer hemp yarn (Italian) is used for this purpose; in the British navy it ranges from 1 in. (increasing in size by quarter inches) up to 8 in. inclusive; it is then neatly sewn on with roping twine specially prepared, the needle and twine passing between and clear of every two strands of the rope in roping. Where slack sail has to be taken in, it is the practice to leave it to the judgment of the sail-maker; but where possible it is better to set up the rope by means of a tackle to a strain approximate to what it will have to bear when in use, and whilst on the stretch mark it off in yards, as also the edge of the sail in yards, so that by bringing the marks together in roping the sail will stand flat. In the British navy the largest size of rope sewn on to a sail is 6 in; sizes above this are used for foot and clew ropes of top-sails and courses, being first wormed, parcelled (that is, wound round with strips of worn canvas), tarred and served over with spun yarn; the foot of the sail is then secured to it by being marled in. Where two sizes of bolt-rope used in roping a sail have to be connected, it is effected by a tapered splice. Cringles (similar to the handle of a maund) formed by a strand of bolt-rope, mostly having a galvanized iron thimble in them as a protection, are then stuck where necessary, as at the corners, sides or leeches, mast or luff; they are required either for making stationary or hauling "taut" by tackle or otherwise certain parts of the sail when in use. Fore-and-aft sails, such as spankers, gaff-sails and storm try-sails, are reduced in size by reef-points made of stout line (4 to 20 lb), crow-footed in the middle, a hole being pierced through every seam; one-half of the point is passed through and the crowfoot sewn firmly to the sail; the number of reefs depends upon the size of the sail, and the reefs are placed parallel to the foot. The sails—now finished in respect of making—have to be fitted, that is, such ropes have to be attached to each of them as are necessary for proper use; such ropes may be summarily stated as follows: head-earings, robands, reef-earings, reef-lines, spilling and slab lines, reef-tackle pendant, reef-points, bow-line bridles, bunt-line toggles, bunt-becket, leech-line strops and toggles, toggles in clews, sheet ropes, down-haul, lacings, head and stay, tack-rope (gaff top-sail), tack lashing, bending strops, matting and gaskets.

The tools and appliances of a sailmaker are not very numerous: a bench about 7 ft. long and 15 in. high, upon which he sits; palms for seaming and roping to fit the hand, made of hide lined with leather, a plate properly tempered being fixed in it having chambers to catch the head of the needle, thus acting as a thimble; needles of various sizes, that for seaming being the smallest; and fids, splicing, serving and stretching knife, rubber, sail-hook, bobbin for twine, and sundry small articles. (T. Wo.)



Sainfoin (*Onobrychis sativa*). 1, Fruit, nat. size.

SAINFOIN (*Onobrychis sativa*) in botany is a low-growing perennial plant with a woody rootstock, whence proceed the stems, which are covered with fine hairs and bear numerous long pinnate leaves, the segments of which are elliptic. The flowers are borne in close pyramidal or cylindrical clusters on the end of long stalks. Each flower is about half an inch in length with lanceolate calyx-teeth shorter than the corolla, which latter is papilionaceous, pink, with darker stripes of the same colour. The indehiscent pods or legumes are flattened from side to side, wrinkled, somewhat sickle-shaped and crested, and contain a single olive-brown seed shaped like a small bean. In Great Britain the plant is a native of the calcareous districts of the southern counties, but elsewhere it is considered as an escape from cultivation. It is native throughout the whole of Central Europe and Siberia; but it does not seem to have been cultivated in Great Britain till 1651, when it was introduced from France or French Flanders, its French name being retained. Alphonse de Candolle (*Origin of Cultivated Plants*, p. 104) considers that the cultivation of sainfoin originated in the south of France as late perhaps as the 15th century. It is grown as a forage plant, being especially well adapted for dry limestone soils. It has about the same nutritive value as lucerne, and is esteemed for milch cattle and for sheep in winter. Besides the common form, a second known as giant sainfoin is met with in cultivation, being more rapid in its growth.

SAINT (lat. *sanctus*, "holy"), the term originally applied, *e.g.* in the New Testament and in the most ancient monuments of Christian thought, to all believers. In this sense it is still used by those modern Christian sects which profess to base their polity on the Bible only (*e.g.* the Mormons or "Latter Day Saints"). In ancient inscriptions it often means those souls who are enjoying eternal happiness, or the martyrs. Thus we find inscriptions in the Catacombs such as *vivas inter sanctos, refrigera cum spiritu sancto*, and people were buried *ad sanctos*. For a long time, too, *sanctus* was an official title, particularly reserved for bishops (v. *Analecta Bollandiana*, xviii. 410-411). It was not till almost the 6th century that the word became a title of honour specially given to the dead whose cult was publicly celebrated in the churches. It was to the martyrs that the Church first began to pay special honour. We find traces of this in the 2nd half of the 2nd century, in the *Martyrium Polycarpi* (xviii. 3) in connexion with a meeting to celebrate the anniversary of the martyr's death. Another passage in the same document (xvii. 3) shows clearly that this was not an innovation, but a custom already established among the Christians. It does not follow that it was henceforth universal. The Church of Rome does not seem to have inscribed in its calendar its martyrs of an earlier date than the 3rd century. The essential form of the cult of the martyrs was that of the honours paid to the illustrious dead; and these honours were officially paid by the community. They consisted in a gathering at the martyr's tomb on the anniversary of his death. St Cyprian, speaking of the confessors who died in prison, wrote to his priests, "Denique et dies eorum, quibus excedunt, adnotate, ut commemorationes eorum inter memorias martyrum celebrare possimus" (*Epist.* xii. 2). The list of anniversaries of a church formed its Martyrology (*q.v.*). In the early days each church confined itself to celebrating its own martyrs; but it was not long before it became customary to celebrate the anniversaries of martyrs of other churches. In the oldest Roman ferial we already find festivals of Carthaginian martyrs, and similarly, in the Carthaginian calendar, Roman festivals, while Wright's *Syriac Martyrology* contains numerous traces of this exchange of festivals. From the 5th century onwards certain celebrated saints were honoured almost universally; St Augustine (*Sermo*, 276, § 4) says that the festival of St Vincent was celebrated throughout the whole of the Christian world. The same was the case of the festivals of St Stephen, St James and St John, and St Peter and St Paul, as is shown by the liturgical documents, but these festivals were held in connexion with that of Christmas (26th, 27th and 28th December), and were not strictly speaking anniversaries.

The calendars at first included only martyrs, but their scope was gradually widened. The first to find a place in them were the bishops. Apparently they were at first arranged in a series of anniversaries separate from that of the martyrs, as seems to be shown by the existence at Rome of the *Depositio episcoporum* side by side with the *Depositio martyrum*; the two lists seem to have been combined, as in the calendar of Carthage, which includes the *dies natalicioruin martyrum et depositiones episcoporum*. Some of the most famous bishops also ended by passing from one calendar into the other. Finally, the ascetics came to share in the honours paid to the martyrs, and we see in the *Historia religiosa* of Theodoret how quickly this assimilation took place. In times of persecution the martyrs were buried among the rest of the faithful, but one can understand that their tombs, at which gatherings took place at least on the day of their anniversary, were distinguished from the ordinary tombs by some sign. When the peace of the Church permitted it, they were enshrined in chapels and often in sumptuous basilicas. In the West these buildings were raised over the tomb, which was left intact; but in the East there was no hesitation in disturbing the graves of the saints and removing the bodies to a basilica built to receive them. It is in this way that the relics of St Babylas were placed in the sanctuary built by Gallus at Daphne (Socrates, *Hist. eccl.* iii. 18; Sozomen, *Hist. eccl.* v. 19). As a matter of fact, the discipline of the Eastern churches with regard to the relics was, from the very beginning, much less severe than that of Rome and a great number of the Western churches. From the 4th century on are recorded cases of translation of the bodies of saints, and they did not even shrink from dividing the sacred relics. In the West the principle already laid down by St Gregory the Great in his letter to Constantia, namely that of not disturbing the bodies of the saints, was for a long time the rule in all cases, and the portions distributed to the churches were simply *brandea*, that is to say, linen which had lain upon the tomb of the saint, or, in other words, representative relics. But as early as the 7th century there is proof of a relaxation of this rule which had so well safeguarded the authenticity of the relics. It was finally disregarded altogether; in the 9th century translations of relics were extremely frequent, and led to inextricable confusion in the future.

As to the belief in the efficacy of the prayers of the saints for those still living on earth, and similarly in the efficacy of the prayers addressed to the saints, St Cyril of Jerusalem indicates in the following words the advantages of the commemoration of the saints: "Then we make mention also of those who have fallen asleep before us, first of patriarchs, prophets, apostles, martyrs, that God would at their prayers and intercessions receive our supplication" (Cat. *Myst.* v. 9). It is difficult to understand a much-discussed passage of Origen (*De oratione*, 14), except as applying to prayer addressed to the saints. The Fathers of the 4th century, and notably the Cappadocian Fathers, provide us with a quantity of evidence on this subject, which leaves no doubt as to the practice of the invocation of saints, nor of the complete approval with which it was viewed. St Basil, for example, says: "I accept also the holy apostles, prophets and martyrs, and I call upon them for their intercession to God, that by them, that is by their mediation, the good God may be propitious to me, and that I may be granted redemption for my offences" (*Epist.* 360).

The cult of the saints early met with opposition, in answer to which the Church Fathers had to defend its lawfulness and explain its nature. The Church of Smyrna had early to explain its position in this matter with regard to St Polycarp: "We worship Christ, as the Son of God; as to the martyrs, we love them as the disciples and imitators of the Lord" (*Martyrium Polycarpi*, xvii. 3). St Cyril of Alexandria defends the worship of the martyrs against Julian; St Asterius and Theodoret against the pagans in general, and they all lay emphasis on the fact that the saints are not looked upon as gods by the Christians, and that the honours paid to them are of quite a different kind from the adoration reserved to God alone. St Jerome argued against Vigilantius with his accustomed vehemence, and especially meets the objection based on the resemblance between these rites and those of the pagans. But it is above all St Augustine who in his refutation of Faustus, as well as in his sermons and elsewhere, clearly defined the true character of the honours paid to the saints: "Non eis templa, non eis altaria, non sacrificia exhibemus. Non eis sacerdotes offerunt, absit, Deo praestantur. Etiam apud memorias sanctorum martyrum cum offerimus, nonne Deo offerimus? . . . Quando audistis dici apud memoriam sancti Theogenis: offero tibi, sancte Theogenis: aut? offero tibi Petre, aut: offero tibi Paule?" (*Sermo*, 273. 7; cf. *Contra Faustum*, xx. 21). The undoubted abuses which grew up, especially during the middle ages, raised up, at the time of the Reformation, fresh adversaries of the cult of the saints. The council of Trent, while reproving all superstitious practices in the invocation of the saints, the veneration of relics and the use of images, expresses as follows the doctrine of the Roman Church: "That the saints who reign with Christ offer to God their prayers for men; that it is good and useful to invoke them by supplication and to have recourse to their aid and assistance in order to obtain from God His benefits through His Son our Saviour Jesus Christ, who alone is our Saviour and Redeemer" (*Sess.* xxv.). At the present day the canonization (*q.v.*) of saints is reserved in the Roman Church to the sovereign pontiff. The Anglican Church, while still commemorating many of the Catholic saints, has not, since the Reformation, admitted any new names to the authoritative list, with the single exception of that of King Charles I., whose "martyrdom" was celebrated by authority from the Restoration until the year 1859.

See D. Petavius, *De theologicis dogmatibus*, *De incarnatione*, l., xiv.; F. Suarez, *Defensio fidei catholicae* (against King James I.); L. Duchesne, *Les Origines du culte chrétien*, ch. viii.; E. Lucius, *Die Anfänge des Heiligenkults* (Tübingen, 1904); H. R. Percival, *The Invocation of Saints* (London, 1896); A. P. Forbes, *An Explanation of the Thirty-nine Articles* (Oxford, 1878). (H. De.)

ST AFFRIQUE, a town of Southern France, capital of an arrondissement in the department of Aveyron, on the Sorgues, 68 m. N.N.W. of Beziers on a branch line of the railway to Clermont Ferrand. Pop. (1906) town, 4473; commune 6571. An old bridge over the Sorgues and some megaliths in the neighbourhood, especially the dolmen at Tiergues, are of antiquarian interest. There is considerable trade in wool and Roquefort cheese.

St Affrique grew up in the 6th century around the tomb of St Africain, bishop of Comminges. In the 12th century a fortress was built on the neighbouring rock of Caylus. The possession of St Affrique was vigorously contested during the wars of religion. It was eventually occupied by the Huguenots till 1629, when it was seized and dismantled by a royal army.

ST ALBANS, EARLS AND DUKES OF. The English title of earl of St Albans was first borne by Richard Bourke, or de Burgh, 4th earl of Clanricarde (d. 1635), who was lord president of Connaught from 1604 to 1616 and governor of Galway in 1616. In 1624 he was made Baron Somerhill and Viscount Tunbridge in the English peerage, and in 1628 earl of St Albans, Baron Imanney and Viscount Galway. He became the third husband of Frances, dowager countess of Essex, whose first husband had been Sir Philip Sidney, and his English titles became extinct on the death of his only son, Ulick, 2nd earl of St Albans and marquess of Clanricarde, in 1657.

The second creation of an earl of St Albans was in 1660, when Henry, Baron Jermyn, was made an earl under this title; but again it became extinct on his death in 1684.

The dukedom of St Albans was created in 1684 in favour of Charles Beauclerk (1670–1726), a natural son of Charles II. by Nell Gwynne. Born in London on the 8th of May 1670, Charles was made Baron Hedington and earl of Burford in December 1676. He became colonel in the 8th regiment of horse in 1687, and took service with the emperor Leopold I., being present at the siege of Belgrade in 1688. After the battle of Landen in 1693, William III. made him captain of the gentlemen pensioners, and four years later gentleman of the bedchamber His father had given him the reversion of the office of hereditary master falconer and that of hereditary registrar of the Court of Chancery, which fell vacant in 1698. His Whig sentiments prevented his advancement under Anne, but he was restored to favour at the accession of George I. He died at Bath on the 10th of May 1726. His wife Diana, daughter and heiress of Aubrey de Vere, last earl of Oxford, was a well-known beauty, who became lady of the bedchamber to Caroline, princess of Wales, and survived until the 15th of January 1742. Charles was succeeded by his eldest son, Charles Beauclerk, 2nd duke of St Albans (1696–1751), while his youngest son, Lord Aubrey Beauclerk (*c.* 1710–1741), became a captain in the royal navy, and perished in a fight in the West Indies on the 22nd of March 1741. The second duke's son and heir, George Beauclerk, 3rd duke (1730–1786), was followed by his second cousin, George Beauclerk (1758–1787), 4th duke, who died unmarried, and was succeeded as 5th duke by his cousin, Aubrey Beauclerk (1740–1802). He was succeeded by his son Aubrey, the 6th duke (1765–1815), whose infant son Aubrey, 7th duke (b. 1815), died within a year of his father. The 8th duke, William (1766–1825), was the second son of the 5th duke. His son William (1801–1849), the 9th duke, married the actress Harriot Mellon, widow of the banker Thomas Coutts. She was celebrated for her beauty, and was painted by Romney. Her fortune derived from her first husband passed to her granddaughter Angela, Baroness Burdett-Coutts in her own right. The 9th duke was succeeded by his son by a second marriage, William Amelius Aubrey de Vere (1840–1898), whose son, Charles Victor Albert Aubrey de Vere, became the 11th holder of the title.

ST ALBANS, HENRY JERMYN, Earl of (*c.* 1604–1684), was the third son of Sir Thomas Jermyn of Rushbroke, Suffolk. At an early age he won the favour of Queen Henrietta Maria, whose vice-chamberlain he became in 1628, and master of the horse in 1639. He was a consummate courtier, a man of dissolute morals, and much addicted to gambling. He was member for Bury St Edmunds in the Long Parliament and an active and reckless royalist. He took a prominent part in the army plot of 1641, and on its discovery fled to France. Returning to England in 1643, he resumed his personal attendance on the queen, and after being raised to the peerage as Baron Jermyn of St Edmundsbury in that year, he accompanied Henrietta Maria in 1644 to

France, where he continued to act as her secretary. In the same year he was made governor of Jersey, whence he conducted the prince of Wales to Paris. He conceived the idea of ceding the Channel Islands to France as the price of French aid to Charles against the parliament; and in other respects also he meddled with foreign politics, his great influence with the queen being a continual embarrassment to royalist statesmen, especially after the execution of Charles I. When Charles II. went to Breda, Jermyn remained in Paris with Henrietta Maria, who persuaded her son to create him earl of St Albans in 1660. Gossip which the historian Hallam accepted as authentic, but which is supported by no real evidence, asserted that Jermyn was secretly married to the widow of Charles I. At the Restoration St Albans became lord chamberlain, and received other appointments. He supported the policy of friendship with France, and he contributed largely to the close secret understanding between Charles II. and Louis XIV., being instrumental in arranging the preliminaries of the treaty of Dover in 1669. In 1664 he obtained a grant of land in London near St James's Palace, where Jermyn Street preserves the memory of his name, and where he built the St Albans' market on a site afterwards cleared for the construction of Regent Street and Waterloo Place. The earl, who was a friend and patron of Abraham Cowley, died in St James's Square, for the building of which he had provided the plan in January 1684. St Albans being unmarried, the earldom became extinct at his death, while the barony of Jermyn of St Edmundsbury passed by special remainder, together with his property, to his nephew Thomas Jermyn, and after the latter's death to Thomas's brother Henry Baron Dover (*q.v.*).

ST ALBANS, a city, municipal borough, and market town in the St Albans parliamentary division of Hertfordshire, England, on the main line of the Midland railway and on branches of the London & North-Western and the Great Northern lines, 20 m. N.W. of London. Pop. (1891) 12,898; (1901) 16,019. St Albans became the seat of a bishop in 1877; the diocese covering the greater part of Essex and Hertfordshire, with small portions of Cambridgeshire, Bedfordshire and Buckinghamshire. The great cathedral, or abbey church, is finely situated on the steep hill, above the small river Ver, on which the central part of the city is placed.

Shortly after the martyrdom of St Alban, probably in 303, a church was built on the spot where he was slain, and in 793 Offa, king of Mercia, who professed to have discovered the relics of the martyr, founded in his honour a monastery for Benedictines, which became one of the richest and most important houses of that order in the kingdom. The abbots, Ealdred and Ealmer, at the close of the 10th century began to break up the ruins of the old Roman city of Verulamium for materials to construct a new abbey church; but its erection was delayed till the time of William the Conqueror, when Paul of Caen, a relative of Archbishop Lanfranc, was in 1077 appointed abbot. The cathedral at Canterbury as built by Lanfranc was almost a reproduction of St Stephen's, Caen; but Paul, while adopting the same model for St Albans, built it on a much larger scale. The church was consecrated in 1115, but had been finished some years before. Of the original Norman church the principal portions now remaining are the eastern bays of the nave, the tower and the transepts, but the main outlines of the building are still those planned by Paul. It is thus one of the most important specimens of Norman architecture in England, with the special characteristic that, owing to the use of the flat broad Roman tile, the Norman portions are peculiarly bare and stern. The western towers were pulled down in the 13th century. About 1155 Robert de Gorham repaired and beautified the early shrine and rebuilt the chapter-house and part of the cloister; but nothing of his work now remains except part of a very beautiful doorway discovered in recent times. About 1200 Abbot John de Cella pulled down the west front and portions of the north and south aisles. He began the erection of the west front in a new and enriched form, and his work was continued by his successor William de Trumpyngtone in a plainer manner. In 1257 the eastern portion was pulled down, and between the middle of the 13th and the beginning of the 14th century a sanctuary, ante-chapel and lady chapel were added, all remarkably fine specimens of the architecture of the period. In 1323 two great columns on the south side suddenly fell, and this necessitated the rebuilding of five bays of the south aisle and the Norman cloisters. Various incongruous additions were made during the Perpendicular period, and much damage was also done during the dissolution of the abbeys to the finer work in the interior. Structural dangers gave rise to an extensive restoration and partial rebuilding, begun under the direction of Sir Gilbert Scott, and completed in 1894 by Lord Grimthorpe, some of whose work was, and remains, the subject of much adverse criticism. The abbey's extreme length outside is 550 ft., which is exceeded by Winchester by 6 ft. The nave (292 ft.) is the longest Gothic nave in the world and exceeds that of Winchester by about 20 ft. The length of the transepts is 175 ft. inside. The monastic buildings have all disappeared except the great gateway.

St Michael's church, within the site of Verulamium, was originally constructed in the 10th century. Considerable portions of the Norman building remain. The church contains the tomb of Lord Chancellor Bacon. St Stephen's church, dating from the same period, contains some good examples of Norman architecture. St Peter's church has been in great part rebuilt, but the Early Perpendicular nave remains. The restored clock-house in the market-place was built by one of the abbots in the reign of Henry VIII. There is an Edward VI. grammar school. The principal modern buildings are the corn exchange, the court-house, the prison, the public baths, a technical school and the public library. There are two hospitals (one for infectious diseases), a dispensary and almshouses founded in 1734 by Sarah, duchess of Marlborough. The principal industries are the manufacture of silk, straw-plaiting, brush-making, letterpress and chromo-lithographic printing. There are also breweries and iron-foundries. A public park of 24 acres was opened in 1894, and a recreation ground in 1898. The increase in population is largely due to the growth of a residential district on the outskirts, owing mainly to the convenient proximity to London. The city is governed by a mayor, 4 aldermen, and 12 councillors. Area, 997 acres.

To the south-west of the present city of St Albans stood the ancient Verulamium (*q.v.*), one of the oldest towns in Britain, on Watling Street. The ruins served as a quarry not only to the builders of the Abbey, but also for the other churches and the monastic buildings of St Albans, and Roman bricks are found even in the fabric of the churches of neighbouring villages, as at Sandridge, 2½ m. N.E. After being burnt by Boadicea, Verulamium revived, and its church was famous early in the 8th century. The origin of the royal castle of Kingsbury is variously assigned to the 6th and 8th centuries. In the 9th and 10th centuries the abbots enlarged the town, which was confirmed to them as a borough by Henry II. In 1253 a charter gave borough jurisdiction to the good men of St Albans; but the borough court was, apparently, discontinued for about 200 years after the rebellion of 1381. A charter of 1533, confirmed in 1553 and 1559–1560, incorporated the mayor and burgesses. Charters of 1663, 1664 and 1685, and the Municipal Corporations Act of 1835, altered the form of the corporation; and in 1877 St Albans became a city. Two burgesses were returned to the parliament of 1306–1307, and to others, until, after 1336, such right fell into abeyance until its resumption in 1553. Its abolition, as a result of corrupt electioneering practices, took place in 1852.

During Wat Tyler's insurrection the monastery was besieged by the townspeople, many of whom were executed in consequence. At St Albans the Lancastrians were defeated on the 21st of May 1455, their leader, the duke of Somerset, being killed, and Henry VI. taken prisoner; here, too, Queen Margaret defeated the earl of Warwick on the 17th of February 1461. During the civil wars the town was garrisoned for the parliament. On a printing press, one of the earliest in the kingdom, set up in the abbey the first English translation of the Bible was printed.

See *Victoria County History, Herts*, vol. ii.; Peter Newcome, *The History of the Abbey of St Albans* (London, 1793); and *Chronica monasterii S. Albani*, edited by H. T. Riley for the "Rolls" series (1863–1876).

SAINT ALBANS, a city and the county-seat of Franklin county, Vermont, U.S.A., 57 m. (by rail) N.N.W. of Montpelier. Pop. (1909) 6239, including 1201 foreign-born; (1910) 6381. St Albans is served by the Central Vermont railway, which has general offices and shops here, and by an electric line connecting with Lake Champlain at St Albans Bay and with Swanton, 9 m. N. The city is built on a plain less than 3 m. from Lake Champlain and about 300 ft. above it; surrounding hills (Aldis and Bellevue) rise still higher and command charming views of the Green Mountains, Lake Champlain and the Adirondacks. Among the prominent buildings are a U.S. customs-house, the city hall, the court house, a public library, a hospital (1882), the Warner Home for Little Wanderers (1882), two Roman Catholic parochial schools and two convents. There are marble quarries in the vicinity, but the surrounding country is devoted largely to dairying. St Albans has a large creamery, manufactures condensed milk and ships large quantities of butter.

The first permanent settlement here was established in 1786; the township of St Albans (pop. in 1900, 1715) was incorporated in 1859, and the larger part of it was chartered as the city of St Albans in 1897. On the 19th of October 1864 Lieut. Bennett H. Young led from Canada about twenty-five un-uniformed Confederate soldiers in a raid on St Albans. They looted three banks, wounded several citizens, one mortally, and escaped to Canada, where Young and twelve others were arrested and brought to trial. But they were never punished, and even the $75,000 which had been taken from them on their arrest was returned to them. Later, however, the Canadian government refunded this amount to the banks. In 1866 and again in 1870 the Fenians made St Albans a base for attacks on Canada, and United States troops were sent here to preserve neutrality.

SAINT ALBIN, ALEXANDER CHARLES OMER ROUSSELIN DE CORBEAU, Comte de (1773–1847), French politician, was born in Paris, of a noble Dauphinois family, and was educated at the Collège d'Harcourt. He embraced the revolutionary ideas with enthusiasm. As civil commissioner at Troyes he was accused of terrorism by some, and by the revolutionary tribunal of moderation. He was imprisoned for a short time in 1794. On his release the Citoyen Rousselin entered the ministry of the interior, and under the Directory he became secretary-general, and then civil commissioner of the Seine. Attached to the party of Bernadotte, he was looked on with suspicion by the imperial police, and during the later years of the empire spent his time in retirement at Provence. During the Hundred Days, however, he served under Carnot at the ministry of the interior. Under the Restoration he defended Liberal principles in the *Constitutionnel,* of which he was the founder. Although Louis Philippe had been his friend since the days of the Revolution, he accepted no office from the monarchy of July. He retired from the *Constitutionnel* in 1838, and died on the 15th of June 1847. His chief works deal with the soldiers of the Revolution. They are: *Vie de Lazare Hoche* (2 vols., 1798); *Notice historique sur le général Marbot* (1800); *M. de Championnel* (1860); and notices of others posthumously published by his son, Hortensius de Saint Albin, as *Documents relatifs à la Révolution Française . . .* (1873).

ST ALDEGONDE, PHILIPS VAN MARNIX, Heer van (1538–1598), Dutch writer and statesman, was born at Brussels, the son of Jacob van Marnix, baron of Pottes. He studied theology under Calvin and Beza at Geneva and, returning to the Netherlands in 1560, threw himself energetically into the cause of the Reformation, taking an active part in the compromise of the nobles in 1565 and the assembly of St Trond. He made himself conspicuous by issuing a pamphlet in justification of the iconoclasts who devastated Flanders in 1566, and on Alva's arrival next year had to fly the country. After spending some time in Friesland and in the Palatinate he was in 1570 taken into the service of William, prince of Orange, and in 1572 was sent as his representative to the first meeting of the States-general assembled at Dordrecht. In 1573 he was taken prisoner by the Spaniards at Maaslandsluys, but was exchanged in the following year. He was sent as the representative of the insurgent provinces to Paris and London, where he in vain attempted to secure the effective assistance of Queen Elizabeth. In 1578 he was at the diet of Worms, where he made an eloquent but fruitless appeal for aid to the German princes. Equally vain were his efforts in the same year to persuade the magistrates of Ghent to cease persecuting the Catholics in the city. He took a conspicuous part in arranging the Union of Utrecht, and in 1583 was chosen burgomaster of Antwerp. In 1585 he surrendered the city, after a 13 months' siege, to the Spaniards. Violently attacked by the English and by his own countrymen for this act, he retired from public affairs and, save for a mission to Paris in 1590, lived henceforth in Leiden or on his estate in Zeeland, where he worked at a translation of the Bible. He died at Leiden on the 15th of December 1598.

St Aldegonde, or Marnix (by which name he is very commonly known), is celebrated for his share in the great development of Dutch literature which followed the classical period represented by such writers as the poet and historian Pieter Hooft. Of his works the best known is the *Roman Bee-hive* (*De roomsche byen-korf*), published in 1569 during his exile in Friesland, a bitter satire on the faith and practices of the Roman Catholic Church. This was translated or adapted in French, German and English. As a poet, St Aldegonde is mainly known through his admirable metrical translation of the Psalms (1580), and the celebrated *Wilhelmus van Nassauwe*, one of the two officially recognized national anthems of Holland, is also ascribed to him. His complete works, edited by Lacroix and Quinet, were published at Brussels in 7 vols. (1855–1859), and his religious and theological writings, edited by Van Turenenbergen, at Paris, in 3 vols. (1871–1891).

See E. Quinet, *Marnix de St Aldegonde* (Paris, 1854); Juste, *Vie de Marnix* (The Hague, 1858); Frédéricq, *Marnix en zijne nederlandsche geschriften* (Ghent, 1882); Tjalma, *Philips van Marnix, heer van Sint-Aldegonde* (Amsterdam, 1896).

ST ALDWYN, MICHAEL EDWARD HICKS BEACH, 1st Viscount (1837–), English statesman, son of Sir Michael Hicks Beach, 8th Bart., whom he succeeded in 1854, was born in London in 1837, and was educated at Eton and Christ Church, Oxford, where he graduated with a first class in the school of law and modern history. In 1864 he was returned to parliament as a Conservative for East Gloucestershire, the county in which his estates of Williamstrip Park were situated; and during 1868 he acted both as parliamentary secretary to the Poor Law Board and as under-secretary for the Home Department. In 1874 he was made chief secretary for Ireland, and was included in the Cabinet in 1877. From 1878 to 1880 he was secretary of state for the colonies. In 1885 he was elected for West Bristol, and the Conservative party having returned to power, became chancellor of the exchequer and leader of the House of Commons. After Mr Gladstone's brief Home Rule Ministry in 1886 he entered Lord Salisbury's next Cabinet again as Irish secretary, making way for Lord Randolph Churchill as leader of the House; but troubles with his eyesight compelled him to resign in 1887, and meanwhile Mr Goschen replaced Lord Randolph as chancellor of the exchequer. From 1888 to 1892 Sir Michael Hicks Beach returned to active work as president of the Board of Trade, and in 1895—Mr Goschen being transferred to the Admiralty—he again became chancellor of the exchequer. In 1899 he lowered the fixed charge for the National Debt from twenty-five to twenty-three millions—a reduction imperatively required, apart from other reasons, by the difficulties found in redeeming Consols at their then inflated price. When compelled to find means for financing the war in South Africa, he insisted on combining the raising of loans with the imposition of fresh taxation; and besides raising the income-tax each year, up to 1s. 3d. in 1902, he introduced taxes on sugar and exported coal (1901), and in 1902 proposed the reimposition of the registration duty on corn and flour which had been abolished in 1869 by Mr Lowe. The sale of his Netheravon estates in Wiltshire to the War Office in 1898 occasioned some acrid criticism concerning the valuation, for which, however, Sir Michael himself was not responsible. On Lord Salisbury's retirement in 1902 Sir Michael Hicks Beach also left the government. He accepted the chairmanship of the Royal Commission on Ritualistic Practices in the Church, and he did valuable work as an arbitrator; and though when the fiscal controversy arose he became a member of the Free-food League, his parliamentary loyalty to Mr Balfour did much to prevent the Unionist free-traders from precipitating a rupture. When Mr Balfour resigned in 1905 he was raised to the peerage as Viscount St Aldwyn.

ST AMAND-LES-EAUX, a town of northern France, in the department of Nord, at the junction of the Elnon with the Scarpe, 22 m. S.E. of Lille by rail. Pop. (1906), town, 10,195; commune, 14,454. The town has a communal college and a school of drawing, and carries on iron-founding and the manufacture of porcelain, hosiery, chains and nails, but is better known for its mineral waters and mud baths. There are five springs; the water (67° to 77° F.) contains sulphate of lime and sulphur, and deposits white gelatinous threads without smell or taste. The mud baths are of benefit to patients suffering from rheumatism, gout and certain affections of liver and skin. Though from the discovery of statues and coins in the mud it is evident that these must have been frequented during the Roman period, it was only at the close of the 17th century that they again became of more than local celebrity. Of the abbey there remain an entrance pavilion serving as town hall and the richly decorated façade of the church, both dating from the 17th century.

St Amand owes its name to St Amand, bishop of Tongres, who founded a monastery here in the 7th century. The abbey was laid waste by the Normans in 882 and by the count of Hainaut in 1340. The town was captured by Mary of Burgundy in 1477, by the count of Ligne, Charles V.'s lieutenant, in 1521, and finally in 1667 by the French. In 1793 St Amand was the headquarters of General Dumouriez in revolt against the Republican government.

ST-AMAND-MONT-ROND, a town of central France, capital of an arrondissement in the department of Cher, 39 m. S. by E. of Bourges on the railway to Montluçon. Pop. (1906), 7711. The town stands at the foot of the hill of Mont-Rond on the right bank of the Cher, at its confluence with the Marmande and on the canal of Berry. A church of the period of transition from the Romanesque to Gothic style and several old houses are the more interesting buildings. The beautiful château of Meillant, built from 1500 to 1510 by the admiral Charles of Amboise, is 5½ m. from St Amand; and the abbey of Noirlac, a fine type of Cistercian abbey with a 12th-century church, is 2½ m. from the town.

The town grew up round a monastery founded by St Amand, a follower of St Columban, in the 7th century. Its ruined stronghold, on the hill of Mont-Rond, was of importance in the middle ages, and during the Fronde, when it belonged to the great Condé, was a centre of resistance to the royal troops, by whom it was taken after a siege of eleven months in 1652. It was for a time the property of Sully, who retired to it under the regency of Marie de' Medici.

SAINT-AMANT, MARC ANTOINE DE GÉRARD, Sieur de (1594–1661), French poet, was born near Rouen in the year 1594. His father was a merchant who had, according to his son's account, been a sailor and had commanded for 22 years *une escadre de la reine Élizabeth*—a vague statement that lacks confirmation. The son obtained a patent of nobility, and attached himself to different great noblemen—the duc de Retz and the comte d'Harcourt among others. He saw military service and sojourned at different times in Italy, in England—a sojourn which provoked from him a violent poetical attack on the country, *Albion* (1643)—in Poland, where he held a court appointment for two years, and elsewhere. Saint-Amant's later years were spent in France; and he died at Paris on the 29th of December 1661.

Saint-Amant has left a not inconsiderable body of poetry. His *Albion* and *Rome ridicule* set the fashion of the burlesque poem, a form in which he was excelled by his follower Paul Scarron. In his later years he devoted himself to serious subjects and produced an epic, *Moïse sauvé* (1653). His best work consists of Bacchanalian songs, his *Débauche* being one of the most remarkable convivial poems of its kind.

The standard edition is that in the *Bibliothèque Elzévirienne*, by M. C. L. Livet (2 vols. Paris, 1855).

SAINT ANDRÉ, ANDRÉ JEANBON (1749–1813), French revolutionist, was born at Montauban (Tarn-et-Garonne) on the 25th of February 1749, the son of a fuller. Although his father was a Protestant, St André was brought up by the Jesuits at Marseilles and took orders. He turned Protestant, however, and became pastor at Castras and afterwards at Montauban. The proclamation of liberty of worship made him a supporter of the Revolution, and he was sent as deputy to the Convention by the department of Lot. He sat on the Mountain, voted for the death of Louis XVI. and opposed the punishment of the authors of the September massacres. In July 1793 he was president of the Convention, entered the Committee of Public Safety the same month and was sent on mission to the Armies of the East. On the 20th of September 1793 he obtained a vote of one hundred million francs for constructing vessels, and from September 1793 to January 1794 reorganized the military harbours of Brest and Cherbourg. In May 1794 he took part with Admiral Villaret de Joyeuse in a fight with the English. Finally, after a mission in the south, which lasted from July 1794 to March 1795 and in which he showed great moderation, he was arrested on the 28th of May 1795, but was released by the amnesty of the year IV. He was then appointed consul at Algiers and Smyrna (1798), was kept prisoner by the Turks for three years, and subsequently became prefect of the department of Mont-Tonnerre (1801) and commissary-general of the three departments on the left bank of the Rhine. He died at Mainz on the 10th of December 1813.

See Lévy-Schneider, *Le Conventionnel Jeanbon St André* (Paris, 1901).

SAINT ANDRÉ, JACQUES D'ALBON, Seigneur de (*c.* 1505–1562), French soldier and favourite of Henry II. of France. He was made marshal of France, governor of Lyonnais and ambassador in England. He served with great bravery against the emperor Charles V. in 1552. In 1557 he was taken prisoner at the battle of Saint Quentin, but was released the following year, and took part in negotiating the peace of Cateau-Cambrésis. After the death of Francis II. he formed in 1561 with the constable de Montmorency and Francis, duke of Guise, an alliance known as "the triumvirate" against the Protestants and the queen-mother. He perished at the battle of Dreux by the hand of a private enemy.

ST ANDREWS, a city, royal burgh, university town and seaport of Fifeshire, Scotland. Pop. (1901), 7621. It is situated on a bay of the North Sea, 12½ m. S.E. of Dundee by the North British railway, via Leuchars junction. It occupies a plateau of sandstone rock about 50 ft. high, on the north breaking off in precipitous cliffs in which the sea has worn numerous caves. The Eden enters St Andrews Bay to the north-west of the Links; and Kinness Burn, skirting the south side of the town, flows into the harbour. Almost the whole activity of St Andrews is centred in education and golf. There are a few small businesses, however, such as brewing, tanning, shipping and fishing. The harbour, which is somewhat difficult of access, is protected by a pier 630 ft. long. The city has been called the "Mecca of Golf," partly because the Royal and Ancient Golf Club, founded in 1754, is the legislative authority of the game, and partly because its beautiful links—acquired by the town in 1894 and containing three courses—rank amongst the finest in the world. For the sake of the game, the bracing air and the bathing which the sandy beach of its bay affords, visitors are attracted to St Andrews in great numbers. The chief modern buildings include the town hall, the Templars' Hall, the Volunteer Hall, the Gibson Hospital, the Memorial Cottage Hospital, the Marine Biological Station (erected by Dr C. H. Gatty and opened in 1896), the Library and the Golf Club House, erected in 1853. The city was never surrounded by walls, and of its ancient gates the West Port only remains. The Martyrs' Memorial, erected to the honour of Patrick Hamilton, George Wishart, and other martyrs of the Reformation epoch, stands at the west end of the Scores on a cliff overlooking the sea.

The cathedral originated partly in the priory of Canons Regular founded by Bishop Robert (1122–1159). At the end of the 17th century some of the priory buildings were still entire and considerable remains of others existed, but nearly all traces have now disappeared except portions of the priory wall and the archways, known as the Pends. The wall is about three-quarters of a mile long, and bears turrets at intervals. The 3rd marquis of Bute undertook the restoration of the priory, but the work was interrupted by his death in 1900. The cathedral was founded by Bishop Arnold (1159–1162), to supply more ample accommodation than was afforded by the church of St Regulus. Of this church in the Romanesque style, probably dating from the 10th century, there remain the square tower, 108 ft. in height, and the choir, of very diminutive proportions. On a plan of the town, about 1530, a chancel appears, and on seals affixed to the city and college charters there are representations of other buildings attached. The cathedral was constructed in the form of a Latin cross, the total length inside the walls being 355 ft., the length of the nave 200 ft., of the choir and lateral aisles 62 ft. and of the lady chapel at the eastern extremity 50 ft. The width at the transepts was 166 ft. and of the nave and choir 62 ft. The building was finished in the time of Bishop Lamberton (1297–1328), and was dedicated on the 5th of July 1318, the ceremony being witnessed by Robert Bruce. When entire it had, besides a central tower, six turrets, of which two at the east and one of the two at the west extremity, rising to a height of 100 ft., remain. The building was partly destroyed by fire in 1378, and the restoration and further embellishment were completed in 1440. It was stripped of its altars and images in 1559. It is believed that about the end of the 16th century the central tower gave way, carrying with it the north wall. Afterwards large portions of the ruins were taken away for building purposes, and nothing was done to preserve them until 1826. Since then it has been tended with scrupulous care, an interesting feature being the cutting out of the ground-plan in the turf. The principal portions extant, partly Norman and partly Early English, are the east and west gables, the greater part of the south wall of the nave and the west wall of the south transept.

The picturesque ruins of the castle are situated on a rocky promontory much worn away by the sea. It is supposed to have been erected by Bishop Roger about the beginning of the 13th century as an episcopal residence, and was strongly fortified. It was frequently taken by the English, and after it had been captured by the Scottish regent, Andrew Murray, in 1336–1337, was destroyed lest it should fall into their hands. Towards the close of the century it was rebuilt by Bishop Trail in the form of a massive fortification with a moat on the south and west sides. James I. spent some of his early years within it under the care of Bishop Wardlaw, and it was the birthplace of James III. (1445). From a window in the castle Cardinal Beaton witnessed the burning of George Wishart in front of the gate (1546), and in the same year he was murdered within it by a party of Reformers. The castle was taken from the conspirators by the French, among the prisoners captured being John Knox. Some years afterwards it was repaired by Archbishop Hamilton, but in less massive and less substantial form. By 1656, however, it had fallen into such disrepair that the town council ordered the materials to be used for repairing the pier. The principal remains are a portion of the south wall enclosing a square tower, the "bottle dungeon"—so named from its shape: it was a cell hewn out of the solid rock—below the north-west tower, the kitchen tower and a curious subterranean passage. The grounds have been laid out as a public garden.

The town church, formerly the church of the Holy Trinity, was originally founded in 1112 by Bishop Turgot. The early building was a beautiful Norman structure, but at the close of the 18th century the whole, with the exception of little else than the square tower and spire, was re-erected in a plain and ungainly style. In this church John Knox first preached in public (May or June 1547), and in it, on June 4th 1559, he delivered the famous sermon from St Matthew xxi. 12, 13, which led to the stripping of the cathedral and the destruction of the monastic buildings. The church contains an elaborate monument in white marble to James Sharp, archbishop of St Andrews (assassinated 1679). In South Street stands the lovely ruin of the north transept of the chapel of the Blackfriars' monastery founded by Bishop Wishart in 1274; but all traces of the Observantine monastery founded about 1450 by Bishop Kennedy have disappeared, except the well.

The great university of St Andrews owed its origin to a society formed in 1410 by Lawrence of Lindores, abbot of Scone, Richard Cornwall, archdeacon of Lothian, William Stephen, afterwards archbishop of Dunblane, and a few others. A charter was issued in 1411 by Bishop Henry Wardlaw (d. 1440), who attracted the most learned men in Scotland as professors, and six bulls were obtained from Benedict XIII. in 1413 confirming the charter and constituting the society a university. The lectures were delivered in various parts of the town until 1430, when Wardlaw allowed the lecturers the use of a building called the Paedagogium, or St John's. St Salvator's College was founded and richly endowed by Bishop Kennedy in 1456; seven years later it was granted the power to confer degrees in theology and philosophy, and by the end of the century was regarded as a constituent part of the university. In 1512 St Leonard's College was founded by Prior John Hepburn and Archbishop Alexander Stewart on the site of the buildings which at one time were used as a hospital for pilgrims. In the same year Archbishop Stewart nominally changed the original Paedagogium into a college and annexed to it the parish church of St Michael of Tarvet; but its actual erection into a college did not take place until 1537, when it was dedicated to the Blessed Virgin Mary of the Assumption. The outline of the ancient structure is preserved, but its general character has been much altered by various restorations. It forms two sides of a quadrangle, the library and principal's residence being on the north and the lecture rooms and the old dining-hall on the west. The University library, which now includes the older college libraries, was founded about the middle of the 17th century, rebuilt in 1764, and improved in 1829 and 1889–1890. The lower hall in the older part of the building was used at times as a provincial meeting-place for the Scottish parliament. When the constitution of the colleges was remodelled in 1579 St Mary's was set apart for theology; and in 1747 the colleges of St Salvator and St Leonard were formed into the United College. The buildings of St Leonard's are now occupied as a school for girls. The college chapel is in ruins. The United College occupies the site of St Salvator's College, but the old buildings have been removed, with the exception of the college chapel, now used as the university chapel and the parish church of St Leonard's, a fine Gothic structure, containing an elaborate tomb of Bishop Kennedy and Knox's pulpit; the entrance gateway, with a square clock tower (152 ft.); and the janitor's house with some class-rooms above. The modern building, in the Elizabethan style, was erected between 1827 and 1847. University College, Dundee, was in 1890 affiliated to the university of St Andrews. This arrangement was set aside by the House of Lords in 1895, but a reaffiliation took place in 1897. In 1887–1888 a common dining-hall for the students was established; in 1892 provision was made within the university for the instruction of women; and for the board and residence of women students a permanent building was opened in 1896. To the south of the library medical buildings, erected by the munificence of the 3rd marquess of Bute, were opened in 1899. It was during the principalship of Dr James Donaldson, who succeeded John Tulloch (1823–1886), that most of the modern improvements were introduced.

Madras College, founded and endowed by Dr Andrew Bell (1755–1832), a native of the city, is a famous higher-class school.

The town, which is governed by a council, provost and bailies, gives its name to the district group of burghs for returning one member to parliament, the other constituents being the two Anstruthers, Crail, Cupar, Kilrenny and Pittenweem.

Four miles N.W. is Leuchars (pop. 711), the church of which, dating from 1100, contains some beautiful Norman work in the chancel and apse, the nave being modern. It was in this church that Alexander Henderson (1583–1646) heard the sermon that led him to give up Episcopacy. At Guard Bridge (pop. 715), so named from the six-arched bridge erected by Bishop Wardlaw at the mouth of the Eden, are a large paper-mill and brickworks. Mt Melville, to the S.W. of the city, was the residence of the novelist G. J. Whyte-Melville (1821–1878), and Kinaldie, to the S., was the birthplace of Sir Robert Ayton the poet (1570–1638). On the shore, to the S.E., stands the huge detached rock which, from its shape, bears the name of the Spindle rock.

History.—St Andrews was probably the site of a Pictish stronghold, and tradition declares that Kenneth, the patron saint of Kennoway, established a Culdee monastery here in the 6th century. The foundations of the little church dedicated to the Virgin were discovered on the Kirkheugh in 1860. Another Culdee church of St Mary on the Rock is supposed to have stood on the Lady's Craig, now covered by the sea. At that period the name of the place was Kilrymont (Gaelic, "The church of the King's Mount") or Muckross. Another legend tells how St Regulus or Rule, the bishop of Patras in Achaea, was guided hither bearing the relics of Saint Andrew. The Pictish king Angus gave him a tract of land called the Boar Chase, no doubt the Boar hills of the present day, and the name of the spot was changed to St Andrews, the saint soon afterwards (747) becoming the patron-saint of Scotland (but see ANDREW, ST). St Andrews is said to have been made a bishopric in the 9th century, and when the Pictish and Scottish churches were united in 908, the primacy was transferred to it from Dunkeld, its bishops being thereafter known as bishops of Alban. It became an archbishopric during the primacy of Patrick Graham (1466–1478). The town was created a royal burgh in 1124. In the 16th century St Andrews was one of the most important ports north of the Forth and is said to have numbered 14,000 inhabitants, but it fell into decay after the Civil War. Defoe says that when he saw it one-sixth of its houses were ruinous and the sea had so encroached on the harbour that it was never likely to be restored; but the slight improvement in trade and public spirit which Bishop Pococke seemed to detect in 1760 continued throughout the 19th century.

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SAINT ARNAUD, JACQUES LEROY DE (1801–1854), marshal of France, was born at Paris on the 20th of August 1801. He entered the army in 1817, and after ten years of garrison service, which he varied by gambling and wild courses, he still held only the lowest commissioned grade. He then resigned, led a life of adventure in several lands and returned to the army at thirty as a sub-lieutenant. He took part in the suppression of the Vendée émeute, and was for a time on General (Marshal) Bugeaud's staff. But his debts and the scandals of his private life compelled him to go to Algeria as a captain in the Foreign Legion. There he distinguished himself on numerous occasions, and after twelve years had risen to the rank of *maréchal de camp*. In 1848 he was placed at the head of a brigade during the revolution in Paris. On his return to Africa, it is said because Louis Napoleon considered him suitable to be the military head of a *coup d'état*, an expedition was made into Little Kabylia, in which St Arnaud showed his prowess as a commander-in-chief and provided his superiors with the pretext for bringing him home as a general of division (July 1851). He succeeded Marshal Magnan as minister of war and superintended the military operations of the *coup d'état* of the 2nd of December (1851) which placed Napoleon III. on the throne. A year later he was made marshal of France and a senator, remaining at the head of the war office till 1854, when he set out to command the French in the Crimea, his British colleague being Lord Raglan. He died on board ship on the 29th of September 1854 shortly after commanding at the battle of the Alma. His body was conveyed to France and buried in the Invalides.

See *Lettres du Maréchal de Saint Arnaud* (Paris, 1855; 2nd edition with memoir by Sainte-Beuve, 1858).

ST ARNAUD, a town of Kara-Kara county, Victoria, Australia, 158 m. by rail N.W. of Melbourne. Pop. (1901), 3656. It is a flourishing town with a fine town hall, a school of mines and the court house, in which sittings of the supreme court are held. There are tanneries, chaff and wood yards, and flour- and bone-mills in the town, which lies in a gold-mining, pastoral and agricultural district, the mining being chiefly quartz. To the N.W. is some of the finest agricultural land in the colony.

ST ASAPH, a cathedral city and a contributory parliamentary borough of Flintshire, N. Wales, on the Rhyl-Denbigh branch of the London & North-Western railway, about 6 m. from each of these towns. Pop. (1901), 1788. Its Welsh name, Llanelwy, is derived from the Elwy, between which stream and the Clwyd it stands. Asaph, to whom the cathedral (one of the smallest in Great Britain) is dedicated, was bishop here after Kentigern's return hence to Glasgow, and died in 596. The small, irregularly built town has also a parish church (Anglican), remains of a Perpendicular chapel near Ffynnon Fair (St Mary's Well), a bishop's house, a grammar school (1882) and almshouses for eight poor widows, founded in 1678 by Bishop Barrow. The hill on which St Asaph stands is Bryn Paulin, supposed to have been the camping-ground of Suetonius Paulinus, on his way to Anglesey. The early cathedral, of wood, was burned by the English in 1247 and 1282, and that built by Bishop Anian in the 13th century (Decorated) was mostly destroyed during the war of Owen Glendower in 1402; Bishop Redman's building (*c.* 1480) was completed by the erection of the choir about 1770. During the Civil War the Parliamentarians did not spare the building. The choir and chancel were restored, from designs by Sir Gilbert Scott, in 1867–1868, the nave in 1875. The church is plain, cruciform, and in style chiefly Decorated but partly Early English, with a square tower; it has a library of nearly 2000 volumes (some rare); memorials to Bishop Dafydd ab Owain (d. 1502), to Bishop Luxmore (d. 1830), to the poetess Felicia Hemans, a resident near St Asaph (d. 1835); and Perpendicular oak choir stalls. In the neighbourhood is the modern mansion of Bodelwyddan, of which the estate was bought by Sir W. Williams, speaker of the House of Commons in Charles II.'s time.

ST AUGUSTINE, a city and the county-seat of St John's county, Florida, U.S.A., in the N.E. part of the state, about 36 m. S.E. of Jacksonville. Pop. (1900) 4272, including 1735 negroes; (1910) 5494; many of the native whites are descendants of those Minorcans who were settled at New Smyrna, Florida, by Andrew Turnbull in 1769, and subsequently removed to St Augustine. St Augustine is served by the Florida East Coast railway and by the Florida East Coast Canal, an inland waterway from the St John's river to the Florida Keys.

The city stands on a narrow, sandy peninsula, about 12 ft. above the sea, formed by the Matanzas and San Sebastian rivers, and is separated from the ocean by the northern end of Anastasia Island. St George, the chief street in St Augustine, is only 17 ft. wide, and Treasury Street is, at its east end, an alley across which two people may clasp hands. There are many old houses, some of which have balconies projecting above the streets. At its northern end is the old fort of San Marco (now renamed Fort Marion in honour of General Francis Marion), a well-preserved specimen of Spanish military architecture, begun, it is supposed, about 1656 and finished in 1756. The St Francis barracks (now the state arsenal) occupy the site of the old Franciscan convent, whose walls still remain as the first storey. In the military cemetery are buried a number of soldiers who were massacred by the Seminoles near the Great Wahoo Swamp on the 28th of August 1835. At the end of St George Street and near Fort Marion is the City Gate (two pillars, each 20 ft. high); from this gate a line of earthworks formerly stretched across the northern end of the peninsula. In the centre of the city is the Plaza de la Constitucion, in which are an obelisk erected in 1813 to commemorate the Spanish Liberal Constitution of 1812, and a monument (1872) to citizens who died in the Confederate Army. On this square are the market (built in 1840, partially burned in 1887, and afterwards rebuilt), often erroneously spoken of as "the slave market"; a Roman Catholic cathedral (built in 1791, burned in 1887, and rebuilt and enlarged in 1887–1888); Trinity church (Protestant Episcopal); and the post office (once the Spanish government building). In the western part of the city is the beautiful Memorial Presbyterian Church, built in 1889 as a memorial to his daughter, by Henry M. Flagler. Facing King Street (the Alameda) is the magnificent Hotel Ponce de Leon (Spanish Renaissance), of shell-concrete, also by Flagler. The Alcazar (with a large swimming pool fed by a sulphurous artesian well), in the Moorish style, and the Alcazar Annex (with a large sun parlour), formerly the Cordova Hotel, designed and built by Franklin W. Smith, in the Hispano-Moorish style, are also famous hostelries. In an old building (restored) is housed the Wilson Free Public Library. Another old building houses the collections of the St Augustine Institute of Science and Historical Society, organized in 1884. St Augustine is the seat of the state school for the deaf and blind (1885).

At St Augustine are car and machine shops of the Florida East Coast railway. Oyster canning and fishing are engaged in to some extent, and cigars are manufactured, but the city is important chiefly as a winter resort, the number of its visitors approximating 25,000 a year. The climate is delightful, the mean temperature for the winter months being about 58° F. and for the entire year about 70° F.

St Augustine is the oldest permanent settlement of Europeans in the United States. It was founded by Spanish colonists under the leadership of Pedro Menendez de Avilés, who sighted land here in 1565, on the 28th of August, St Augustine's day, whence the name. On the 6th of September he landed and began his fortifications. St Augustine's colonial history is almost identical with the history of Florida (*q.v.*) under Spanish dominion. In 1586 it was burned by Sir Francis Drake, who captured the fort, and in 1665 it was pillaged by Captain John Davis, an English freebooter. There were frequent conflicts with the English settlements in South Carolina and Georgia, beginning in 1681 with an attack by the Spanish on Port Royal, South Carolina. In 1702 Governor James Moore of South Carolina captured St Augustine, but not the fort; and there were subsequent expeditions under General James Edward Oglethorpe (see GEORGIA). When Florida was ceded to England in 1763, nearly all the Spanish inhabitants of St Augustine went to Cuba. Under English control the city prospered, but when in 1783 Florida was re-ceded to Spain, nearly all the English inhabitants left for the Carolinas, Georgia or the West Indies, and it became merely a military post. In 1821 St Augustine, with the rest of Florida, passed under American control. The Spanish inhabitants remained. On the 7th of January 1861, three days before Florida passed her Ordinance of Secession, the small United States garrison was compelled by a state force to evacuate; but on the 11th of March 1862 the fort was recaptured without bloodshed by a Federal force, and was held by the Federals until the close of the Civil War.

See George R. Fairbanks, *The History and Antiquities of the City of St Augustine* (New York, 1858); Charles B. Reynolds, *Old St Augustine* (St Augustine, 1885); and D. Y. Thomas, "Report upon the Historic Buildings, Monuments and Local Archives of St Augustine," in vol. i. pp. 333-352 of the *Annual Report* (1905) of the American Historical Association.

ST AUSTELL, a market town in the St Austell parliamentary division of Cornwall, England, 14 m. N.E. of Truro, on the Great Western railway. Pop. of urban district (1901) 3340. It is pleasantly situated on a steep slope 2 m. inland from St Austell bay on the south coast. To the north the high ground culminates at 1034 ft. above the sea in Hensbarrow Downs, so called from a barrow standing at the loftiest point. The church of the Holy Trinity is Perpendicular, with Decorated chancel, richly ornamented in a manner unusual in the county. The town is the centre of a district productive of china clay (kaolin), about 400,000 tons being annually exported by sea to the potteries of Staffordshire and to Lancashire, when it is used in the calico-works for sizing. The deposits of clay became important about 1763, and Josiah Wedgwood acquired mines in the neighbourhood. Mines were previously worked for tin and copper, and in some cases after being exhausted of ore continued to be worked for clay. The Carclaze mine to the north-east is notably rich; it is a shallow excavation of great superficial extent, which appears to have been worked from very early times. Close to St Austell is a good example of an ancient baptistery, called Menacuddle Well, the little chapel being Early English.

ST BARTHOLOMEW, or ST BARTHÉLEMY, an island in the French West Indies. It lies in 17° 55′ N. and 63° 60′ W., about 130 m. N.W. of Guadeloupe, of which it is a dependency. It is shaped like an irregular crescent, the horns, enclosing the bay of St Jean, pointing to the N.; its surface is hilly, culminating near the centre in a limestone hill 1003 ft. high. It is 8 sq. m. in area, and devoid of forests, and water has often to be imported from the neighbouring island of St Kitts. The surrounding rocks and shallows make the island difficult of access. Despite the lack of water, sugar, cotton, cocoa, manioc and tobacco are grown. The capital, Gustavia, on the S.W. coast, possesses a small but safe harbour. Lorient is the only other town. The inhabitants, mainly of French and negro descent, are English-speaking, and number about 3000. St Bartholomew was occupied by France in 1648 and ceded to Sweden in 1784. In 1877 it was again acquired by France at the cost of £11,000.

ST BARTHOLOMEW, MASSACRE OF, the name given to the massacre of the Huguenots, which began in Paris on St Bartholomew's day, the 24th of August 1572. The initiative for the crime rests with Catherine de' Medici. Irritated and disquieted by the growing influence of Admiral Coligny, who against her wishes was endeavouring to draw Charles IX. into a war with Spain, she resolved at first to have him assassinated. The blow failed, and the admiral was only wounded. The attempt, however, infuriated the Huguenots, who had flocked to Paris for the wedding of Henry of Navarre and Marguerite de Valois. Charles IX. declared that the assassin should receive condign punishment. Catherine then conceived the idea of killing at a blow all the Huguenot leaders, and of definitely ruining the Protestant party. After holding a council with the Catholic leaders, including the duke of Anjou, Henry of Guise, the marshal de Tavannes, the duke of Nevers, and René de Birague, the keeper of the seals, she persuaded the king that the massacre was a measure of public safety, and on the evening of the 23rd of August succeeded in wringing his authorization from him. The king himself arranged the manner of its execution, but it is scarcely probable that he fired upon the Huguenots from a window of the Louvre. The massacre began on Sunday at daybreak, and continued in Paris till the 17th of September. Once let loose, it was impossible to restrain the Catholic populace. From Paris the massacre spread to the provinces till the 3rd of October. The duc de Longueville in Picardy, Chabot-Charny (son of Admiral Chabot) at Dijon, the comte de Matignon (1525–1597) in Normandy, and other provincial governors, refused to authorize the massacres. François Hotman estimates the number killed in the whole of France at 50,000. There were many illustrious victims, among them being Admiral Coligny, his son-in-law Charles de Téligny and the logician Peter Ramus. Catherine de' Medici received the congratulations of all the Catholic powers, and Pope Gregory XIII. commanded bonfires to be lighted and a medal to be struck.

See H. Bordier, *La St Barthélemy et la critique moderne* (Paris, 1879); H. Baumgarten, *Vor der Bartholomäusnacht* (Strassburg, 1882); and H. Mariéjol, "La Réforme et la Ligue" (Paris, 1904), in vol. vi. of the *Histoire de France*, by E. Lavisse, which contains a more complete bibliography of the subject.

ST BENOÎT-SUR-LOIRE, a village of north-central France, in the department of Loiret, on the right bank of the Loire, 22 m. E.S.E. of Orléans by road. St Benoît (Lat. *Floriacum*) possesses a huge basilica, the only survival of a famous monastery founded in the 7th century to which the relics of St Benedict were brought from Monte Cassino. Of great importance during the middle ages, owing partly to its school, the establishment began to decline in the 16th century. In 1562 it was pillaged by the Protestants and, though the buildings were restored by Richelieu, the abbey did not recover its former position. The basilica was built between *c.* 1025 and 1218. Its narthex has a second storey supported on columns with remarkable carved capitals; there are two sets of transepts, above which rises a square central tower. In the interior are the tomb of Philip I., stalls of the 15th century, and, in the crypt, a modern shrine containing the remains of St Benedict, which still attract many pilgrims.

ST BERNARD PASSES, two of the best-known passes across the main chain of the Alps, both traversed by carriage roads. The Great St Bernard (8111 ft.) leads (53 m.) from Martigny (anc. *Octodurus*) in the Rhone valley (Switzerland) to Aosta (anc. *Augusta Praetoria*) in Italy. It was known in Roman times. The hospice on the pass was founded (or perhaps re-founded) by St Bernard of Menthon (d. about 1081), and since the 12th or early 13th century has been in charge of a community of Austin canons, the mother-house being at Martigny. Annually the servants of the canons, and the famous dogs, save many lives, especially of Italian workmen crossing the pass. In May 1800 Napoleon led his army over the pass, which was then traversed by a bridle road only. The Little St Bernard (7179 ft.) also was known in Roman times, and the hospice refounded by St Bernard of Menthon, though it is now in charge of the military and religious order of SS. Maurice and Lazarus. The pass leads (39 m.) from Bourg St Maurice in the Isère valley (French department of Savoie) to Aosta, but is much less frequented by travellers than its neighbour opposite. (W. A. B. C.)

There is no certain mention of the road over the pass of the Great St Bernard (*Alpis Poenina*, *Poeninus Mons*) before 57 B.C. when Julius Caesar sent Servius Galba over it, "because he wished that the pass, by which traders had been accustomed to go at great risk and with very high transport charges, should be opened." But even in Strabo's time it was impassable for wheeled traffic; and we find that Augusta Praetoria originally had but two gates, one opening on the road towards the Little St Bernard (*Alpis Graia*), the other towards Eporedia (Ivrea), but none towards the Alpis Poenina. But the military arrangement of the German provinces rendered the construction of the road necessary, and it is mentioned as existing in A.D. 69. Remains of it cut in the rock, some 12½ ft. in width, still exist near the lake at the top of the pass. On the plain at the top of the pass is the temple of Jupiter Poeninus (Penninus), remains of which were excavated in 1890–1893, though objects connected with it had long ago been found. The oldest of the votive-tablets which can be dated belongs to the time of Tiberius, and the temple may be attributed to the beginning of the empire; objects, however, of the first Iron age (4th or 5th century B.C.) were also found[1] and many Gaulish coins. Other buildings, probably belonging to the post station at the top of the pass, were also discovered. Many of the objects found then and in previous years, including many votive-tablets, are in the museum at the hospice of the Great St Bernard.

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[1] So *Not. degli scavi* (1891), 81; but the statement is contradicted, ibid. (1894), 44.

See *Notizie degli scavi, passim*, especially E. Ferrero (1890), 294; C. Promis, *Antichità di Aosta* (Turin, 1862).

The Little St Bernard was known to the Romans as Alpis Graia. It derived its name from the legend that Hercules, returning from Spain with the oxen of Geryon, crossed the Alps by this route, though the legend rather suits the route through the Maritime Alps. According to many modern scholars, Hannibal passed this way over the Alps, though the question has been much discussed (see art. HANNIBAL, and Partsch in Pauly-Wissowa, *Realencyklopädie* i., 1604). In any case it was the principal pass over the Alps into Gallia Comata until the pass of the Alpis Cottia (Mont Genèvre) was opened by Cn. Pompeius in 75 B.C., and became the principal route, though the road was only completed under Augustus by Cottius in 3 B.C. Various remains of the road are visible, and those of a building (possibly a temple of Jupiter) have been found on the summit of the pass.

See *Notizie degli scavi* (1883), 7 (1894), 46; and C. Promis, *Antichità di Aosta* (Turin, 1862), 115 sqq. (T. As.)

ST BERTRAND-DE-COMMINGES, a village of south-western France at the foot of the Pyrenees in the department of Haute-Garonne, about 70 m. S.W. of Toulouse by rail and road. St Bertrand stands about 1 m. from the left bank of the Garonne on the slopes of an isolated hill crowned by its celebrated cathedral of Notre Dame. The façade of the church with its square tower and the first bay with its aisles are Romanesque, and belong to a church begun about the end of the 11th century by Bishop Bertrand (1075–1123), afterwards canonized. The nave with its side chapels and the choir, in the Gothic style, date from the first half of the 14th century and were chiefly the work of Bertrand de Goth, bishop from 1295 to 1299 and afterwards Pope Clement V. The choir screen, rood-loft and altar, which form an enclosure within the church, are masterpieces of Renaissance wood-carving, as are also the choir stalls. The church contains several tombs, the most interesting of which are the fine white marble tomb of Bishop Hugh of Châtillon (d. 1352), and the mausoleum of St Bertrand (both of the 15th century), whose relics are preserved in the treasury. On the south side of the church there is a ruined cloister of Romanesque architecture.

St Bertrand-de-Comminges (Lugdunum Convenarum) was founded in 72 B.C., and before the end of the 5th century became the seat of a bishopric suppressed at the Revolution. The town was destroyed towards the end of the 6th century by Guntrum, king of Burgundy, after it had served as a refuge to Gondowald, pretender to the crown of Aquitaine.

SAINT-BON, SIMONE ARTURO (1823–1892), Italian admiral, was born at Chambéry on the 20th of March 1823. Leaving the Naval Academy in 1847, he attained the rank of commander in 1860, and that of vice-admiral in 1867. He took part in the Crimean war, distinguished himself in 1860 at the siege of Ancona, and was decorated for valour at the siege of Gaeta. At the battle of Lissa, in 1866, his vessel, the "Formidabile," forced the entrance of the port of San Giorgio and silenced the Austrian batteries, for which exploit he received a gold medal. In 1873 he was elected deputy, and appointed by Minghetti to be minister of marine, in which position he revolutionized the Italian navy. Insisting upon the need for large battleships with high powers of attack and defence, and capable of fighting as single units, he introduced the colossal types of which the "Duilio" and the "Dandolo" were the earliest examples. Falling from power with the Right in 1876, he resumed active service, but in 1891 was again appointed minister of marine. He died on the 26th of November 1892, while still in office. He is remembered in Italy as the originator of the modern Italian fleet.

ST BRIEUC, a town of western France, capital of the department of Côtes-du-Nord, 63 m. N.W. of Rennes by the railway to Brest. Pop. (1906) town 15,270; commune 23,041. It stands 290 ft. above the sea, between 1 and 2 m. from the English Channel and less than a mile from the right bank of the Gouët, at the mouth of which is its seaport, Le Légué. St Brieuc is the seat of a bishopric in the province of Rennes, and has a cathedral dating from the 13th century, but partially rebuilt in the 18th, and afterwards extensively restored. In the interior the tombs of the bishops and a Renaissance organ-loft deserve mention. The oldest part of the episcopal palace date back to the 16th century. The hôtel-de-ville contains a museum and picture gallery. An Ursuline convent serves as barracks. There are numerous houses of the 15th and 16th centuries, in one of which James II., king of England, is said to have lodged in 1689. A colossal image of the Virgin looks down upon the town from an eminence on the north, and there is a statue of Du Guesclin. The industries include wool-spinning, timber-sawing, iron and steel-working, and the manufacture of brushes and agricultural implements.

St Brieuc owes its origin and its name to the missionary St Briocus, who came from Wales in the 5th century, and whose tomb afterwards attracted crowds of pilgrims. The place was defended in 1375 by Olivier de Clisson against the duke of Brittany, and again attacked by the same Clisson in 1394, the cathedral suffering greatly in both sieges. In 1592 the town was pillaged by the Spaniards, in 1601 ravaged by the plague, and in 1628 surrounded by walls of which no traces remain. Between 1602 and 1768 the states of Brittany several times met at St Brieuc. During the Reign of Terror Chouans and Republicans carried on a ruthless conflict with each other in the vicinity. The ancient fort of Péran, built of vitrified granite, is about 5 m. S. of St Brieuc.

ST CATHARINES, a city of Ontario, Canada, and the capital of Lincoln county, on the Welland Canal and the Grand Trunk, and St Catharines and Niagara Central railways, 35 m. S. of Toronto, with which it has steamer connexion. Pop. (1901) 9946. It is connected by electric tramways with the neighbouring towns and villages, and is in the midst of a fine fruit-growing district. Its excellent water-power provides motive force for numerous industries, among which are flour-mills and factories for the manufacture of edge tools and agricultural implements. Bishop Ridley College, under Anglican control, is an important residential school. There are mineral springs which are much visited by invalids.

ST CHAMOND, a manufacturing town of east-central France, in the department of Loire, 7½ m. E.N.E. of St Étienne, on the railway from St Étienne to Lyons. Pop. (1906) 14,147. The town lies in a small basin surrounded by mountains at the confluence of the Janon with the Gier, an affluent of the Rhone. It has coal-mines forming part of the Rive-de-Gier basin. The milling of raw silk, the manufacture of ribbons and laces of every kind, dyeing and the construction of naval and railway material are the foremost industries. There are also metal-foundries, manufactories of nails, heavy iron goods, looms and other industrial establishments.

St Chamond, founded in the 7th century by St Ennemond or Chamond, archbishop of Lyons, became the chief town of the Jarret, a little principality formed by the valley of the Gier. Silk-milling was introduced in the town in the middle of the 16th century by Gayotti, a native of Bologna. Remains are found at St Chamond of a Roman aqueduct, which conveyed the waters of the Janon along the valley of the Gier to Lyons.

ST CHARLES, a city and the county-seat of St Charles county, Missouri, U.S.A., situated on the N. bank of the Missouri river, about 20 m. above its mouth, and about 23 m. N.W. of St Louis. Pop. (1910) 9437. It is served by the Wabash and the Missouri, Kansas & Texas railway systems, and by an electric railway to St Louis. A great steel bridge, 6535 ft. long (built 1868–1871), crosses the river and gives entry to the Wabash railroad from St Louis. It has three spans of 305 to 321 ft., which at the time of their construction were the longest of their kind in the world. A highway bridge also crosses the river, and is the only waggon bridge between Jefferson City and the mouth of the river. At St Charles are a Presbyterian school for women (Lindenwood College); St Charles Military College (Methodist Episcopal, 1837), the Academy of the Sacred Heart (1818); St Joseph's Hospital, and the Emmaus Asylum for Epileptics. St Charles has important car works (among the largest in the United States), a large shoe factory, flour mills, brick and tile yards and breweries. St Charles county is very fertile, and its yield of wheat is especially large. At the sand works at Klondike, in the southern part of the county, large quantities of silica are blasted, crushed, bolted and shipped.

A French settlement was begun at St Charles in 1769, and soon thereafter a Spanish official was placed in residence. St Charles was organized as a village under territorial law in 1809, and in 1849 was chartered as a city. It was the first capital of the state (1820–1826).

SAINT CLAIR, a borough of Schuylkill county, Pennsylvania, U.S.A., on Mill Creek, 3 m. N. of Pottsville, and about 40 m. by rail N.N.W. of Reading. Pop. (1910) 6455. Saint Clair is served by the Pennsylvania and the Philadelphia & Reading railways. It is engaged chiefly in the mining (very largely surface-stripping) and shipping of anthracite coal, and in the manufacture of miners' supplies. Saint Clair was settled in 1825 and was incorporated as a borough in 1850.

ST CLAIR, a lake and river of North America, forming part of the boundary between the state of Michigan, U.S.A., and the province of Ontario, Canada. The lake is 29 m. long and 20 broad. It contains numerous islands, receives from the Canadian side several rivers, the largest of which is the Thames, and is drained into Lake Erie by the Detroit river. At its foot are the cities of Detroit (Michigan) and Windsor (Ontario). On the north it receives the St Clair river, the outlet of Lake Huron. The shores of both lake and river are flat, and their waters shallow, but, owing to the enormous traffic which passes through, they have been in great part canalized, and can accommodate the largest steamers.

ST CLAUDE, a town of eastern France, capital of an arrondissement in the department of Jura, 42 m. S.S.E. of Lons-le-Saunier by rail. Pop. (1906) 9558. The town is beautifully situated 1300 ft. above sea-level at the western base of Mont Bayard, among the heights of the eastern Jura at the confluence of the Bienne and the Tacon. The latter river is crossed by a fine suspension bridge. The cathedral of St Pierre, once the abbey-church, a building of the 14th to the 18th centuries, contains fine 15th-century stalls and a reredos of the Renaissance period. The town is the seat of a bishop, suffragan of Lyons, and of a sub-prefect. St Claude has been noted since the close of the middle ages for its fancy articles in horn, tortoise-shell, hardwood, ivory, &c., and there are manufactures of briar-root pipes. Diamond-cutting and lapidary work and the manufacture of measures are also prosperous industries.

The town derives its name from that of an archbishop of Besançon who died in the 7th century in the monastery founded here in the 5th century. This monastery subsequently acquired almost independent sovereignty in the locality, and held its retainers in a state of serfdom till the Revolution. Voltaire pleaded the cause of the serfs, though unsuccessfully, before the *parlement* of Besançon, and in memory of his services a statue was erected to him in 1887. St Claude was constituted a bishopric in 1762. The abbey-buildings and most of the town were destroyed by fire in 1799.

ST CLOUD, a town of northern France, in the department of Seine-et-Oise, on the left bank of the Seine, 2 m. W. of the fortifications of Paris by road. Pop. (1906) 7316. Picturesquely built on a hill-slope, St Cloud overlooks the river, the Bois de Boulogne and Paris; and, lying amid the foliage of its magnificent park and numerous villa gardens, it is one of the favourite resorts of the Parisians. The palace of St Cloud, which had been a summer residence for Napoleon I., Louis XVIII., Charles X., Louis Philippe and Napoleon III., was burned by the Prussians in 1870 along with part of the village. In spite of the damage inflicted on the park at the same period its magnificent avenues and ornamental water still make it one of the pleasantest spots in the neighbourhood of Paris. Every year in September, at the time of the pilgrimage of St Cloud, a fair lasting four weeks is held in the park. Within its precincts are situated the national Sèvres porcelain manufactory and the Breteuil pavilion, the seat of the international commission on the metre. St Cloud possesses a modern church in the style of the 12th century with an elegant stone spire; and here, too, is established the higher training college for male teachers for the provincial training colleges of primary instruction.

Clodoald or Cloud, grandson of Clovis, adopted the monastic life and left his name to the spot where his tomb was discovered after the lapse of 1200 years, in a crypt near the present church. He had granted the domain to the bishops of Paris, who possessed it as a fief till the 18th century. At St Cloud Henry III. and the king of Navarre (Henry IV.) established their camp during the League for the siege of Paris; and there the former was assassinated by Jacques Clément. The castle was at that time a plain country house belonging to Pierre de Gondi, archbishop of Paris; in 1658 it was acquired by the duke of Orleans, who was the originator of the palace which perished in 1870. Peter the Great of Russia was received there in 1717 by the regent, whose grandson sold the palace to Marie Antoinette. It was at St Cloud that Bonaparte executed the *coup d'état* of 18th Brumaire (1799); after he became emperor the palace was his favourite residence, and there he celebrated his marriage with Marie Louise. In 1815 it was the scene of the signing of the capitulation of Paris; and in 1830 from St Cloud Charles X. issued the orders which brought about his fall. Napoleon III. was there when he received the senatusconsult which restored the empire in his favour (1st December 1852). Seized by the Prussians at the beginning of the investment of Paris in 1870, St Cloud was sacked during the siege.

ST CLOUD, a city in Stearns, Benton and Sherburne counties, Minnesota, U.S.A., and the county-seat of Stearns county, about 65 m. N.W. of Minneapolis, on both banks of the Mississippi river, and about 970 ft. above sea-level. Pop. (1900) 8663, of whom 1907 were foreign-born; (1910 U.S. census) 10,600. It is served by the Great Northern and the Northern Pacific railways. It is the seat of one of the State Normal Schools (1869), and of the Minnesota State Reformatory (1887). In the city are a Carnegie library, a Federal building, a Roman Catholic cathedral, St Raphael's Hospital (Roman Catholic), St Clotilda's Academy of Music and two business colleges. The Mississippi has a considerable fall here, and provides valuable water-power. Among the manufactures are flour, barrels, bricks, and foundry and machine-shop products—the Great Northern maintains extensive car and repair shops here. In 1905 the value of the city's factory product was $1,994,476, an increase of 27·8% since 1900. There are large lumber yards, and excellent grey and red granites (St Cloud is called "the Granite City") from neighbouring quarries are exported. The city lies in a large grain-growing and stock-raising district. St Cloud was settled in 1852, platted in 1854, incorporated as a village in 1868, and chartered as a city in 1889. Until reached by the Great Northern railway, St Cloud was the Hudson's Bay Company's terminus for the unloading of furs from the wooden ox-carts ("Red river" carts).

ST CROIX or **SANTA CRUZ,** the largest island in the Danish West Indies. It lies 65 m. S.E. of Puerto Rico, in 17° 40′ N. and 64° 14′ W., is 22 m. long, varies in breadth from 1 m. to 6 m., and has an area of 84 sq. m. Pop. (1901) 18,590. Parallel with the western coast is a range of hills, culminating in Mount Eagle (1164 ft.). The narrower western part is also hilly, but on the S. shore there are marshy tracts with lagoons of brackish water. Sugar is the staple product, and near Christianstäd there is a central factory conducted by the government. The planters are mostly English, and their language predominates. The capital, Christianstäd (locally known as "Bassin"), is situated at the head of an inlet on the N. coast, but its harbour is to a large extent choked with mud. It is a picturesque town, and the seat of the Danish governor during half the year. The only other town, Frederickstäd, stands on an open roadstead on the W. coast. It is locally known as "West End," and part of the town, wrecked by the blacks in 1878, lies in ruins. The climate is healthy, the mean annual temperature being 74° F. and the average rainfall 45·7 in. per annum.

St Croix was discovered in 1493 by Columbus, and was owned in turn by the Dutch, British and Spanish. In 1651 it was taken by France, and two years later was given to the Knights of Malta by Louis XIV. In 1733 it was purchased by Denmark. Slavery was abolished in 1848 after a violent insurrection which had broken out among the slaves.

See Sir H. H. Johnston, *The Negro in the New World* (1910).

SAINT-CYRAN, a French Benedictine abbey in the province of Berry, now comprised in the department of the Loiret. From 1620 to 1643 it was held by the famous Jansenist reformer, DuVergier (*q.v.*), who is consequently often spoken of by French writers as the Abbé de Saint-Cyran.

ST CYR-L'ÉCOLE, a town of northern France in the department of Seine-et-Oise, 3 m. W. of Versailles at the end of the old park of Louis XIV. Pop. (1906) 2696. Its importance is due to the famous military school (*école spéciale militaire*) in which officers for the cavalry and infantry are trained. It was established in 1808 in the convent which Madame de Maintenon founded for the education of noble young ladies in poor circumstances. Racine's *Esther* and *Athalie* were first acted here, having been written expressly for the pupils. Madame de Maintenon's tomb is still preserved in the chapel. The convent was suppressed at the Revolution, and the gardens are now partly transformed into parade-grounds.

ST DAVIDS (*Tyddewi*), a cathedral town of Pembrokeshire, Wales, situated near the sea to the S.E. of St David's Head, the most westerly promontory of South Wales. Pop. (1901) 1710. St Davids is 10 m. distant from the station of Letterston on the Great Western railway, and about 16 m. from Fishguard to the N.E., and 16 m. from Haverfordwest to the E. The little town, locally known as "the city," stands in a lofty position east of the Cathedral Close, and consists of five streets, which converge on an open space called the Cross Keys, formerly used as a market-place and distinguished by its High Cross, a single shaft erect on a square base of six steps, restored in 1873. From the cross a lane leads westward to the Tower Gate, flanked by two ancient towers in a ruinous condition. From this point is obtained a superb view of the close with the cathedral and ruined palace in the valley of the Alun below, to which the rocky outline of Carn Llidi forms an imposing background.

The cathedral church of SS. Andrew and David, in spite of centuries of neglect and ill-advised alterations, remains the largest and most interesting pile of ecclesiastical buildings in the Principality. It is largely built of a beautiful purple-hued sandstone, which is quarried locally. Its proportions are: length (exclusive of the Trinity and Lady chapels), 254½ ft.; breadth of nave and aisles, 51⅓ ft.; breadth of transepts including tower, 116 ft.; and height of central tower, 116 ft. In spite of the antiquity of its foundation, the earliest and main portion of the existing fabric was erected under Bishop Peter de Leia (1176–1198) in the transitional Norman-English style. Bishop David Martyn (1290–1328) built the Lady Chapel; Bishop Henry de Gower (1328–1347), one of the greatest of ecclesiastical builders in Wales, made many additions in the Decorated style, including the stone rood-screen and southern porch; and Bishop Edward Vaughan (1509–1522) erected the Trinity Chapel between the choir and Lady Chapel. Under the last-named prelate the magnificence of St Davids reached its height, but owing to the changes during the Reformation and the unscrupulous rapacity of Bishop William Barlow (1536–1548) the fabric suffered severely; nor was it spared later during the Civil Wars, when the Lady Chapel, the aisles of the presbytery, and even the transepts were unroofed and partially dismantled. In 1793 the cathedral was repaired by Thomas Nash, who rebuilt the western front in a debased Perpendicular style. The work of much-needed restoration was carried out throughout the latter half of the 19th century, especially between 1862 and 1869, when Sir Gilbert Scott strengthened the building at a cost of over £43,000. In 1873 Nash's incongruous work was replaced by a new façade intended to harmonize with the original design of Bishop de Leia, and at the beginning of the 20th century the Lady Chapel and Bishop Vaughan's chapel were restored in memory of Bishop Basil Jones (d. 1897) and of Deans Allen and Phillips. The interior of the nave, separated by six wide bays from the aisles, is singularly imposing with its triforium and clerestory windows. It possesses an elaborate roof of Irish oak, the gift of Treasurer Owen Pole (*c.* 1500). The nave is divided from the choir by Bishop Gower's fine stone screen, whilst the choir itself contains the richly carved stalls erected by Bishop Tully (1460–1481), the episcopal throne, and an elegant oaken screen that serves to separate choir and presbytery. The painted roof (freely restored) exhibits the coats-of-arms of Bishops Tully and Richard Martin, Treasurer Owen Pole and other benefactors. The eastern wall of the choir has been greatly altered by the addition of modern Venetian mosaic designs in the original lower triplet of lights, and by the insertion of lancet windows in place of a large Perpendicular window of the 15th century. Bishop Vaughan's chapel contains fine Tudor fan vaulting, and the Lady Chapel good decorated sedilia. The cathedral, before the Reformation, was remarkably rich in sculptured tombs and monuments, but many of these have perished and all the brasses have disappeared. In the presbytery stands prominent the altar tomb with modern brasses inserted of Edmund Tudor, earl of Richmond (d. 1456), father of King Henry VII. Among the other surviving monuments, all more or less injured and defaced, are the tombs of Bishop Gower and of several bishops of St Davids; the canopied effigies popularly but erroneously attributed to Prince Rhys (d. 1196) and his son Rhys; the stone base of the destroyed shrine of St David; a priest's effigy formerly believed to be that of the celebrated Giraldus Cambrensis; and the large Jacobean monument of Treasurer Thomas Lloyd (d. 1612). To the north of the cathedral is to be seen the ruined shell of the beautiful chapel with an adjoining tower, forming part of the college of St Mary, founded by John of Gaunt and Bishop Adam Houghton in 1377.

On the west bank of the Alun stands the splendid and indeed unique ruin of the episcopal palace erected by Bishop Gower (*c.* 1342). Built for the purpose of culture and entertainment rather than for defence, Bishop Gower's ecclesiastical mansion is "essentially a palace and not a castle; and it is hardly too much to affirm that it is altogether unsurpassed by any existing English edifice of its kind." Built upon vaulted cellars, the palace occupies three sides of a quadrangle 120 ft. square, and though roofless and deserted for nearly three hundred years it retains most of its principal features. The great hall, 96 ft. by 33 ft., possesses a traceried wheel-window; the chief portal is still imposing; and the chapel retains its curious bell-turret; while the peculiar but singularly graceful arcaded parapet of the roof extends intact throughout the whole length of the building. Partially dismantled by Bishop Barlow (*c.* 1540) the half-ruined palace was occasionally occupied by succeeding bishops prior to the Civil Wars, and in 1633 a chapter was held within its walls under Bishop Field.

The Close, 18 acres in extent and extra-parochial, contains the deanery and other residences of the cathedral clergy, mostly occupying the sites of ancient buildings. It formerly owned four gateways, of which the South or Tower Gate alone remains. The whole of the wild and bleak but picturesque neighbourhood of St Davids teems with legendary and historical associations, and cromlechs and ruined chapels are numerous, amongst the latter the chapels of St Justinian (Capel Stinan) and St Non being the most remarkable.

History.—At some unknown period in the 6th century the celebrated patron saint of Wales, Dewi or David, removed the chief seat of South Welsh ecclesiastical life to Menevia or Menapia (Mynyw), which is traditionally reported to have been the saint's birthplace. The site chosen for this new foundation was the marshy valley of the Alun—the *Vallis Rosina* of medieval historians—and this spot became known henceforth as Tyddewi or St Davids. The dread of an imminent Anglo-Saxon invasion of Gwent, the determination to remove his monastic clergy from court influence, and the desire of opening closer communication with the sister Churches of Ireland, are among the various reasons suggested for David's remarkable policy, which made St Davids the leading religious centre in South Wales for nearly a thousand years. From the 7th to the 11th centuries the successors of St David occasionally ventured to exercise metropolitan rights over South Wales, and even over all land west of the Severn, and the character and extent of these ancient claims have frequently been made the subject of speculation or controversy among historians, some of whom have not hesitated to designate the early Celtic holders of the see by the title of "archbishop." These ill-defined claims were destroyed by St Anselme's forcible appointment of the Norman monk Bernard to the bishopric in 1115, from which date to the present time St Davids has ranked as a suffragan see of Canterbury; nor has its ancient independence ever been seriously asserted, save by the intrepid Gerald de Barri (Giraldus Cambrensis), who vainly strove from 1199 to 1203 to induce Pope Innocent III. to acknowledge the power of the cathedral chapter to elect its own bishops without reference to English king or primate. St Davids early became popular as a place of pilgrimage, and amongst the many suppliants who visited St David's shrine were William the Conqueror, Henry II. and Edward I. with Queen Eleanor. Probably with a view to conciliate the native clergy for Anselme's unpopular policy in Wales, Henry I. obtained from Pope Calixtus II. the canonization of St David about 1120, and in local esteem two pilgrimages to St Davids were vulgarly supposed to be equivalent to one journey to Rome itself: a sentiment preserved in the curious monkish hexameter:

> "Roma semel quantum bis dat Menevia tantum."

From 1115 to the Reformation the see was held by prelates (many of them natives of Wales) who did much to enrich and beautify the vast group of ecclesiastical buildings in the Close. But with the partial destruction of the palace and the removal of the episcopal residence to Abergwili, it was not long before St Davids sank into a mere monument of its former splendour and importance. In 1539 Bishop Barlow even petitioned Thomas Cromwell for permission to remove the see itself to Carmarthen, a request which tradition declares Henry VIII. refused to grant solely out of respect for the memory of his grandfather Edmund Tudor, whose tomb had recently been taken from the suppressed priory of Grey Friars at Carmarthen and set up before the high altar of the cathedral. During the 17th and 18th centuries all the ancient buildings of the Close, except the cathedral (which served also as a parish church for the village of St Davids), were allowed to fall into hopeless ruin. Amongst the 119 bishops who have held the see since its foundation by St David may be mentioned Asser, the friend of King Alfred (d. 906); Samson (10th century), honoured by the Welsh chroniclers with the proud title of "Archbishop of the Isle of Britain"; Rhyddmarch (d. 1096), the first biographer of St David; Henry de Gower (d. 1347), the munificent patron of art; Robert Ferrar, burned at Carmarthen in 1555 under Queen Mary; Richard Davies (d. 1581), patriot and translator of the Welsh Book of Common Prayer; Archbishop William Laud, bishop of the see between 1621 and 1627; George Bull, divine (d. 1710); and Connop Thirlwall, scholar and historian (d. 1875). The official title of the bishops of St Davids is *Episcopus Menevensis*. (H.M.V.)

ST DENIS, an industrial town of northern France, capital of an arrondissement in the department of Seine, 5 m. N. of Paris. Pop. (1906) 62,323. St Denis, an important junction on the northern railway, stands in a plain on the right bank of the Seine, which is here joined by the canal of St Denis. It has numerous metallurgical works, where railway material, naval engines and the like are constructed, distilleries of spirits, glass-works, potteries and manufactories of drugs, chemical products, oils, nickel plate and pianos. The name and fame of the town are derived from the abbey founded by Dagobert I. on the spot where St Denis, the apostle of Paris, was interred. The abbey buildings, occupied by a school for daughters of members of the Legion of Honour, founded by Napoleon I., date from the 18th century.

The church exhibits the transition from the Romanesque to the Gothic style. The west front was built between 1137 and 1140. The right-hand tower is almost pure Romanesque; that on the left was Gothic, and its spire was carried to a height of 280 ft., but it was struck by lightning in 1837 and reconstructed in so clumsy a manner that it had to be reduced to the level of the roof of the nave. The rose window, now occupied by a clock face, dates from the 13th century. Under one of the three rows of arches above the main entrance runs an inscription recording the erection of the church by Abbot Suger (*q.v.*), minister of Louis VI., with abbatial funds and its consecration in 1140. The porch formed by the first three bays of the church contains some remains of the basilica of Pippin the Short and Charlemagne, by whom the church was rebuilt. The nave proper (235 ft. long and 57 wide) has seven bays, and dates, as well as most of the choir and transepts, from the reign of St Louis. The secondary apse (*rondpoint*) and its semicircular chapels (consecrated in 1144) are considered as the first perfected attempt at Gothic. The transepts have fine façades, the north of the 12th, the south of the 13th century, each with two unfinished towers; if the plan had been fully carried out there would have been six towers besides a central spire in lead. The church contains a series of tombs of the kings and princes of the royal houses of France. The most remarkable are those of Louis XII. and Anne of Brittany, executed from 1516 to 1532; of Henry II. and Catherine de' Medici, a masterpiece by Germain Pilon (1564–1583); of Louis of Orleans and Valentine of Milan, from the old church of the Celestines at Paris (1502–1515); of Francis I. and Claude of France, one of the most splendid tombs of the Renaissance, executed under the direction of Philibert Delorme (1550–1560); and that of Dagobert, which, though considerably dilapidated, ranks as one of the most curious of medieval (13th-century) works of art. In the apse some stained glass of the time of Suger remains. The crypt dates partly from the 10th or 11th century. In the centre is the vault where the coffin of the king used to lie until, to make room for that of his successor, it was removed to its final resting-place. It is at present occupied by the coffin of Louis XVIII., the last sovereign whose body was borne to St Denis. Besides fine statues, the crypt contains the Bourbon vault, in which among other coffins are deposited the remains of Louis XVI. and Marie Antoinette.

St Denis, the ancient *Catulliacum*, was a town of no pretensions till the foundation of its abbey, which became one of the most powerful in France. The rebuilding of the church, begun in the 12th century by Suger, was completed in the 13th century. Among the many domains of the abbey was the French Vexin. It was held during the later middle ages by the French kings and vassals of the abbey, and to this fact is due their adoption of the oriflamme or red banner of St Denis as the royal standard. St Louis caused mausoleums to be erected with figures of the princes already buried in the abbey; and from his time to that of Henry II. every monarch in succession had his monument. Louis XIV. reduced the abbey to the rank of a priory; and at the Revolution it was suppressed, the tombs being violated and the church sacked (1793). Two years later all the remains that could be recovered were placed in the museum of the Petits Augustins at Paris; but the bronze tombs had been melted down, the stained-glass windows shattered, and large numbers of interesting objects stolen or lost. Louis XVIII. caused all the articles belonging to St Denis to be brought back to their original site, and added numerous other monuments from the suppressed abbeys. But it was not till after 1848 that, under the direction of Viollet le Duc, the basilica recovered its original appearance. St Denis, which was the key of Paris on the north, was more than once pillaged in the Hundred Years' War, suffering especially in 1358 and 1406. A sanguinary battle, in which the Catholic leader Constable Anne de Montmorency found victory and death, was fought between Huguenots and Catholics in the neighbourhood on the 10th of November 1567.

See F. de Guilhermy, *Monographie de l'église royale de St Denis* (Paris, 1848).

ST DIÉ, a town of eastern France, capital of an arrondissement in the department of Vosges, 38 m. N.E. of Épinal by rail. Pop. (1906) town, 16,783; commune, 22,136. St Dié is situated on the Meurthe in a basin surrounded by well-wooded hills. The town, part of which was laid out in a uniform style after the fire of 1757, is built largely of red sandstone. Its cathedral has a Romanesque nave (12th century) and a Gothic choir; the portal of red stone dates from the 18th century. A fine cloister (13th century), containing a stone pulpit, communicates with the Petite-Église or Notre-Dame, a well-preserved specimen of Romanesque architecture (12th century). The hôtel-de-ville contains a theatre, a library with some valuable manuscripts, and a museum of antiquities. There is a monument by Mercié to Jules Ferry, born in the town in 1832. St Dié is the seat of a bishop and of a sub-prefect. The town benefited from the immigration of Alsatians after the Franco-German War of 1870–71, and its industries include the spinning and weaving of cotton, bleaching, wire-drawing, metal-founding, and the manufacture of hosiery, woodwork of various kinds, machinery, iron goods and wire-gauze.

St Dié (*Deodatum*, *Theodata*, *S. Deodati Fanum*) grew up round a monastery founded in the 7th century by St Deodatus of Nevers, who gave up his episcopal functions to retire to this place. In the 10th century the community became a chapter of canons; among those who subsequently held the rank of provost or dean were Giovanni de' Medici, afterwards Pope Leo X., and several princes of the house of Lorraine. Among the extensive privileges enjoyed by them was that of coining money. Though they co-operated in building the town walls, the canons and the dukes of Lorraine soon became rivals for the authority over St Dié. Towards the end of the 15th century one of the earliest printing-presses of Lorraine was founded at St Dié. The institution of a town council in 1628, and the establishment in 1777 of a bishopric which appropriated part of their spiritual jurisdiction, contributed greatly to diminish the influence of the canons; and with the Revolution they were completely swept away. During the wars of the 15th, 16th and 17th centuries the town was repeatedly sacked. It was also partially destroyed by fire in 1065, 1155, 1554 and 1757. Funds for the rebuilding of the portion of the town destroyed by the last fire were supplied by Stanislas, last duke of Lorraine.

ST DIZIER, a town of north-eastern France, in the department of Haute-Marne, 45 m. N.N.W. of Chaumont by rail, on the Marne and the Haute-Marne canal. Pop. (1906) town, 10,316; commune, 14,661. The town is a very important centre of the iron trade, with foundries, forges and engineering works, and has trade in grain and timber. It dates from the 3rd century, when the relics of Bishop St Didier (whence the name of the town) were brought thither after the destruction of Langres by the Germans. It sustained a memorable siege against Charles V. in 1544.

STE ANNE DE BEAUPRÉ, a post-village of Montmorency county, Quebec, Canada, at the junction of the Ste Anne river with the St Lawrence, and on the Quebec, Montmorency & Charlevoix railway, 22 m. below the city of Quebec. It stands in a rolling agricultural country, with hills in the background; and near by, on the Ste Anne river, are beautiful falls and excellent fishing. For over two centuries Ste Anne has been known as a Roman Catholic place of pilgrimage, and many miracles are still said to be performed through the intercession of the saint, the mother of the Virgin. In the basilica, an over-ornate building, are ever-increasing piles of crutches and other aids, cast aside by the cured. The resident population is about 1500, chiefly composed of hotel-keepers and members of religious orders, but throughout the year many pilgrimages are made, and on such days as the feast day of Ste Anne (26th of July) 30,000 people are often present. The total number of pilgrims in 1905 was 170,000. In addition to the basilica the village contains numerous religious edifices, the chief being the Scala Santa, built in imitation of the Holy Stairs at Rome.

SAINTE-BEUVE, CHARLES AUGUSTIN (1804–1869), French critic, was born at Boulogne-sur-Mer (No. 16 Rue du Pot d'Étain) on the 23rd of December 1804. He was a posthumous child, his father, a native of Picardy, and controller of town-dues at Boulogne, having married in this same year, at the age of fifty-two. The father was a man of literary tastes, and used to read, like his son, pencil in hand; his copy of the Elzevir edition of Virgil, covered with his notes, was in his son's possession, and is mentioned by him in one of his poems. Sainte-Beuve's mother was half English, her father, a mariner of Boulogne, having married an Englishwoman. The little Charles Augustin was brought up by his mother, who never remarried, and an aunt, his father's sister, who lived with her. They were poor, but the boy, having learnt all he could at his first school at Boulogne, persuaded his mother to send him, when he was near the age of fourteen, to finish his education at Paris. He boarded with a M. Landry, and had for a fellow-boarder and intimate friend Charles Neate, afterwards fellow of Oriel College and member of parliament for the city of Oxford. From Landry's boarding-house he attended the classes, first of the Collège Charlemagne, and then of the Collège Bourbon, winning the head prize for history at the first, and for Latin verse at the second. In 1823 he began to study medicine, attending lectures on anatomy and physiology and walking the hospitals. But meanwhile a Liberal newspaper, the *Globe*, was founded in 1827 by Paul François Dubois, one of Sainte-Beuve's old teachers at the Collège Charlemagne. Dubois called to his aid his former pupil, who, now quitting the study of medicine, contributed historical and literary articles to the *Globe*, among them two, which attracted the notice of Goethe, on Victor Hugo's *Odes et ballades*. These articles led to a friendship with Victor Hugo and to Sainte-Beuve's connexion with the romantic school of poets, a school never entirely suited to his nature. In the *Globe* appeared also his interesting articles on the French poetry of the 16th century, which in 1828 were collected and published,[1] and followed by a second volume containing selections from Ronsard. In 1829 he made his first venture as a poet with the *Vie, poésies, et pensées de Joseph Delorme*. His own name did not appear; but Joseph Delorme, that "Werther in the shape of Jacobin and medical student," as Guizot called him, was the Sainte-Beuve of those days himself. About the same time was founded the *Revue de Paris*, and Sainte-Beuve contributed the opening article, with Boileau for its subject. In 1830 came his second volume of poems, the *Consolations*, a work on which Sainte-Beuve looked back in later life with a special affection. To himself it marked and expressed, he said, that epoch of his life to which he could with most pleasure return, and at which he could like best that others should see him. But the critic in him grew to prevail more and more and pushed out the poet.[2] In 1831 the *Revue des deux mondes* was founded in rivalry with the *Revue de Paris*, and from the first Sainte-Beuve was one of the most active and important contributors. He brought out his novel of *Volupté* in 1834, his third and last volume of poetry, the *Pensées d'août*, in 1837. He himself thought that the activity which he had in the meanwhile exercised as a critic, and the offence which in some quarters his criticism had given, were the cause of the less favourable reception which this volume received. He had long meditated a book on Port-Royal. At the end of 1837 he quitted France, accepting an invitation from the academy of Lausanne, where in a series of lectures his work on Port-Royal came into its first form of being. In the summer of the next year he returned to Paris to revise and give the final shape to his work, which, however, was not completed for twenty years.[3] In 1840 Victor Cousin, then minister of public instruction, appointed him one of the keepers of the Mazarin Library, an appointment which gave him rooms at the library, and, with the money earned by his pen, made him for the first time in his life easy in his circumstances, so that, as he afterwards used to say, he had to buy rare books in order to spend his income. A more important consequence of his easier circumstances was that he could study freely and largely. He returned to Greek, of which a French schoolboy brings from his *lycée* no great store. With a Greek teacher, M. Pantasides, he read and re-read the poets in the original, and thus acquired, not, perhaps, a philological scholar's knowledge of them, but a genuine and invaluable acquaintance with them as literature. His activity in the *Revue des deux mondes* continued, and articles on Homer, Theocritus, Apollonius of Rhodes, and Meleager were fruits of his new Greek studies. He wrote also a very good article in 1844 on the Italian poet Leopardi; but in general his subjects were taken from the great literature which he knew best, that of his own country—its literature both in the past and in the contemporary present. Seven volumes of *Portraits*, contributed to the *Revue de Paris* and the *Revue des deux mondes*, exhibit his work in the years from 1832 to 1848, a work constantly increasing in range and value.[4] In 1844 he was elected to the French Academy as successor to Casimir Delavigne, and was received there at the beginning of 1845 by Victor Hugo.

From this settled and prosperous condition the revolution of February 1848 dislodged him. In March of that year was published an account of secret-service money distributed in the late reign, and Sainte-Beuve was put down as having received the sum of one hundred francs. The smallness of the sum would hardly seem to suggest corruption; it appears probable that the money was given to cure a smoky chimney in his room at the Mazarin Library, and was wrongly entered as secret-service money. But Sainte-Beuve, who piqued himself on his independence and on a punctilious delicacy in money matters, was indignant at the entry, and thought the proceedings of the minister of public instruction and his officials, when he demanded to have the matter sifted, tardy and equivocal. He resigned his post at the Mazarin and accepted an offer from the Belgian government of a chair of French literature in the university of Liége. There he gave the series of lectures on Chateaubriand and his contemporaries which was afterwards (in 1860) published in two volumes.[5] He liked Liége, and the Belgians would have been glad to keep him; but the attraction of Paris carried him back there in the autumn of 1849. Louis Napoleon was then president. Disturbance was ceasing; a time of settled government, which lasted twenty years and corresponds with the second stage of Sainte-Beuve's literary activity, was beginning. Dr Véron, the editor of the *Constitutionnel*, proposed to him that he should supply that newspaper with a literary article for every Monday; and thus the *Causeries du lundi* were started. They at once succeeded, and "gave the signal," as Sainte-Beuve himself says with truth, "for the return of letters." Sainte-Beuve now lived in the small house in the Rue Montparnasse (No. 11), which he occupied for the remainder of his life, and where in 1850 his mother, from whom he seems to have inherited his good sense, tact and finesse, died at the age of eighty-six. For three years he continued writing every Monday for the *Constitutionnel*; then he passed, with a similar engagement, to the *Moniteur*. In 1857 his Monday articles began to be published in volumes, and by 1862 formed a collection in fifteen volumes; they afterwards were resumed under the title of *Nouveaux lundis*, which now make a collection of thirteen volumes more. In 1854 he was nominated to the chair of Latin poetry at the college of France. His first lecture there (in 1855) was received with interruptions and marks of disapprobation by many of the students, displeased at his adherence to the empire; at a second lecture the interruption was renewed. Sainte-Beuve had no taste for public speaking and lecturing; his *frontis mollities*, he said, unfitted him for it. He was not going to carry on a war with a party of turbulent students; he proposed to resign, and when the minister would not accept his resignation of his professorship he resigned its emoluments. The *Étude sur Virgile*, a volume published in 1857, contains what he had meant to be his first course of lectures. He was still a titular official of public instruction; and in 1858 his services were called for by Gustave Rouland, then minister of public instruction, as a lecturer (*maître de conférences*) on French literature at the École Normale Supérieure. This work he discharged with assiduity and success for four years. In 1859 he was made commander of the Legion of Honour, having twice previously to 1848 refused the cross. During the years of his official engagement his Monday contributions to the *Moniteur* had no longer been continuous; but in 1862 an arrangement was proposed by which he was to return to the *Constitutionnel* and again supply an article there every Monday. He consented, at the age of fifty-seven, to try this last pull, as he called it, this "dernier coup de collier"; he resigned his office at the École Normale and began the series of his *Nouveaux lundis*. They show no falling off in vigour and resource from the *Causeries*. But the strain upon him of his weekly labour was great. "I am not a *monsieur* nor a gentleman," he writes in 1864, "but a workman by the piece and by the hour." "I look upon myself as a player forced to go on acting at an age when he ought to retire, and who can see no term to his engagement." He had reason to hope for relief. Except himself, the foremost literary men in France had stood aloof from the empire and treated it with a hostility more or less bitter. He had not been hostile to it: he had accepted it with satisfaction, and had bestowed on its official journal, the *Moniteur*, the lustre of his literature. The prince Napoleon and the princess Mathilde were his warm friends. A senatorship was mentioned; its income of £1600 a year would give him opulence and freedom. But its coming was delayed, and when at last in April 1865 he was made senator, his health was seriously compromised. The disease of which he died, but of which the doctors did not ascertain the presence until his body was opened after his death—the stone—began to distress and disable him. He could seldom attend the meetings of the senate; the part he took there, however, on two famous occasions—when the nomination of Ernest Renan to the college of France came under discussion in 1867, and the law on the press in the year following—provoked the indignation of the great majority in that conservative assembly. It delighted, however, all who "belonged," to use his own phrase, "to the diocese of free thought"; and he gave further pleasure in this diocese by leaving the *Moniteur* at the beginning of 1869, and contributing to a Liberal journal, the *Temps*.[1] His literary activity suffered little abatement, but pain made him at last unable to sit to write; he could only stand or lie. He died in his house in the Rue Montparnasse on the 13th of October 1869.

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[1] *Tableau historique et critique de la poésie française au XVI^{e} siècle* (2nd ed., 1842).

[2] Sainte-Beuve was at this time a devoted Catholic and a little later for a very short period a disciple of Lamennais. But he gradually separated from his Catholic friends, and at the same time a coldness grew up between him and Victor Hugo. He became the lover of Madame Hugo, and a definite separation between the former friends ensued in 1834. [Ed.]

[3] *Port-Royal* (1840–1848, 5 vols.; 3rd and revised ed., 1866; 5th ed. with index, 1888–1891).

[4] He was a friend of Madame Récamier, at whose house he met Chateaubriand. He became an especially close friend of Louis Mathieu, Comte Molé, for whose niece, Mme d'Arbouville, he conceived a lasting attachment. [Ed.]

[5] *Chateaubriand et son groupe littéraire sous l'Empire.*

The work of Sainte-Beuve divides itself into three portions—his poetry, his criticism before 1848 and his criticism after that year. His novel of *Volupté* may properly go with his poetry.

We have seen his tender feeling for his poetry, and he always maintained that, when the "integrating molecule," the foundation of him as a man of letters, was reached, it would be found to have a poetic character. And yet he declares, too, that it is never without a sort of surprise and confusion that he sees his verses detached from their context and quoted in public and in open day. They do not seem made for it, he says. This admirable critic knew, indeed, the radical inadequacy of French poetry. It is to English poetry that he resorts in order to find his term of comparison, and to award the praise which to French poetry he refuses. "Since you are fond of the poets," he writes to a friend, "I should like to see you read and look for poets in another language, in English for instance. There you will find the most rich, the most dulcet and the most new poetical literature. Our French poets are too soon read; they are too slight, too mixed, too corrupted for the most part, too poor in ideas even when they have the talent for strophe and line, to hold and occupy for long a serious mind."

But, even as French poetry, Sainte-Beuve's poetry had faults of its own. Critics who found much in it to praise yet pronounced it a poetry "narrow, puny and stifled," and its style "slowly dragging and laborious." Here we touch on a want which must no doubt be recognized in him, which he recognized in himself, and whereby he is separated from the spirits who succeed in uttering their most highly inspired note and in giving their full measure—some want of flame, of breath, of pinion. Perhaps we may look for the cause in a confession of his own: "I have my weaknesses; they are those which gave to King Solomon his disgust with everything and his satiety with life. I may have regretted sometimes that I was thus extinguishing my fire, but I did not ever pervert my heart." It is enough for us to take his confession that he extinguished or impaired his fire.

Yet his poetry is characterized by merits which make it readable still and readable by foreigners. So far as it exhibits the endeavour of the romantic school in France to enlarge the vocabulary of poetry and to give greater freedom and variety to the alexandrine, it has interest chiefly for readers of his own nation. But it exhibits more than this. It exhibits already the genuine Sainte-Beuve, the author who, as M. Duvergier de Hauranne said in the *Globe* at the time, "sent à sa manière, écrit comme il sent," the man who, even in the forms of an artificial poetry, remains always "un penseur et un homme d'esprit." That his Joseph Delorme was not the Werther of romance, but a Werther in the shape of Jacobin and medical student, the only Werther whom Sainte-Beuve by his own practical experience really knew, was a novelty in French poetical literature, but was entirely characteristic of Sainte-Beuve. All his poetry has this stamp of direct dealing with common things, of plain unpretending reality and sincerity; and this stamp at that time made it, as Béranger said, "a kind of poetry absolutely new in France."

It has been the fashion to disparage the criticism of the *Critiques et portraits littéraires*, the criticism anterior to 1848, and to sacrifice it, in fact, to the criticism posterior to that date. Sainte-Beuve has himself indicated what considerations ought to be present with us in reading the *Critiques et portraits*, with what reserves we should read them. They are to be considered, he says, "rather as a dependency of the elegiac and romanesque part of my work than as express criticisms." They have the copiousness and enthusiasm of youth; they have also its exuberance. He judged in later life Chateaubriand, Lamartine, Victor Hugo more coolly, judged them differently. But the *Critiques et portraits* contain a number of articles on personages, other than contemporary French poets and romance-writers, which have much of the soundness of his later work, and, in addition, an abundance and fervour of their own which are not without their attraction. Many of these are delightful reading. The articles on the Greek poets and on Leopardi have been already mentioned. Those on Boileau, Molière, Pierre Daunou and Charles Claude Fauriel, on Madame de la Fayette and Mademoiselle Aïssé may be taken as samples of a whole group which will be found to support perfectly the test of reading, even after we have accustomed ourselves to the later work of the master. Nay, his soberness and tact show themselves even in this earlier stage of his criticism, and even in treating the objects of his too fervid youthful enthusiasm. A special object of this was Victor Hugo, and in the first article on him in the *Portraits contemporains* we have certainly plenty of enthusiasm, plenty of exuberance. We have the epithets "adorable," "sublime," "supreme," given to Victor Hugo's poetry; we are told of "the majesty of its high and sombre philosophy." But the article next following this, and written only four years later, in 1835, is the article of a critic, and takes the points of objection, seizes the weak side of Victor Hugo's poetry, how much it has of what is "creux," "sonore," "artificiel," "voulu," "théâtral," "violent," as distinctly as the author of the *Causeries* could seize it. "The Frank, energetic and subtle, who has mastered to perfection the technical and rhetorical resources of the Latin literature of the decadence," is a description never to be forgotten of Victor Hugo as a poet, and Sainte-Beuve launches it in this article, written when he was but thirty years old, and still a painter of "portraits de jeunesse" only.

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[1] This course of action definitely separated him from the Bonapartists and led to a quarrel with Princess Mathilde.—[Ed.]

He had thus been steadily working and growing; nevertheless, 1848 is an epoch which divides two critics in him of very unequal value. When, after that year of revolution and his stage of seclusion and labour at Liége, he came back to Paris in the autumn of 1849 and commenced in the *Constitutionnel* the *Causeries du lundi*, he was astonishingly matured. Something of fervour, enthusiasm, poetry, he may have lost, but he had become a perfect critic—a critic of measure, not exuberant; of the centre, not provincial; of keen industry and curiosity, with "Truth" (the word engraved in English on his seal) for his motto; moreover, with gay and amiable temper, his manner as good as his matter—the "critique souriant," as, in Charles Monselet's dedication to him, he is called.

The root of everything in his criticism is his single-hearted devotion to truth. What he called "fictions" in literature, in politics, in religion, were not allowed to influence him. Some one had talked on his being tenacious of a certain set of literary opinions. "I hold very little," he answers, "to literary opinions; literary opinions occupy very little place in my life and in my thoughts. What does occupy me seriously is life itself and the object of it." "I am accustomed incessantly to call my judgments in question anew, and to re-cast my opinions the moment I suspect them to be without validity." "What I have wished" (in *Port-Royal*) "is to say not a word more than I thought, to stop even a little short of what I believed in certain cases, in order that my words might acquire more weight as historical testimony." To all exaggeration and untruth, from whatever side it proceeded, he had an antipathy. "I turn my back upon the Michelets and Quinets, but I cannot hold out my hand to the Veuillots."

But Sainte-Beuve could not have been the great critic he was had he not had, at the service of this his love of truth and measure, the conscientious industry of a Benedictine. "I never have a holiday. On Monday towards noon I lift up my head, and breathe for about an hour; after that the wicket shuts again and I am in my prison cell for seven days." The *Causeries* were at this price. They came once a week, and to write one of them as he wrote it was indeed a week's work. The "irresponsible indolent reviewer" should read his notes to his friend and provider with books, M. Paul Chéron of the National Library. Here is a note dated the 2nd of January 1853: "Good-day and a happy New Year. To-day I set to work on Grimm. A little dry; but after St François de Sales" (his Monday article just finished) "one requires a little relief from roses. I have of Grimm the edition of his *Correspondance* by M. Taschereau. I have also the *Memoirs* of Madame d'Épinay, where there are many letters of his. But it is possible that there may be *notices* of him mentioned in the bibliographical book of that German whose name I have forgotten. I should like, too, to have the *first editions* of his *Correspondance*; they came out in successive parts." Thus he prepared himself, not for a grand review article once a quarter, but for a newspaper review once a week.

His adhesion to the empire caused him to be represented by the Orleanists and Republicans as without character and patriotism, and to be charged with baseness and corruption. The Orleanists had, in a great degree, possession of the higher press in France and of English opinion—of Liberal English opinion more especially. And with English Liberals his indifference to parliamentary government was indeed a grievous fault in him; "you Whigs," as Croker happily says, "are like quack doctors, who have but one specific for all constitutions." To him either the doctrine of English Liberals, or the doctrine of Republicanism, applied absolutely, was what he called a "fiction," one of those fictions which "always end by obscuring the truth." Not even on M. de Tocqueville's authority would he consent to receive "les hypothèses dites les plus honorables"—"the suppositions which pass for the most respectable." All suppositions he demanded to sift, to see them at work, to know the place and time and men to which they were to be applied. For the France before his eyes in 1849 he thought that something "solid and stable"—*un mur*, "a wall," as he said—was requisite, and that the government of Louis Napoleon supplied this wall. But no one judged the empire more independently than he did, no one saw and enounced its faults more clearly; he described himself as being, in his own single person, "the *gauche* of the empire," and the description was just.

To these merits of mental independence, industry, measure, lucidity, his criticism adds the merit of happy temper and disposition. Goethe long ago noticed that, whereas Germans reviewed one another as enemies whom they hated, the critics of the *Globe* reviewed one another as gentlemen. This arose from the higher social development of France and from the closer relations of literature with life there. But Sainte-Beuve has more, as a critic, than the external politeness which once at any rate distinguished his countrymen: he has a personal charm of manner due to a sweet and humane temper. He complained of *un peu de dureté*, "a certain dose of hardness," in the new generation of writers. The personality of an author had a peculiar importance for him; the poetical side of his subjects, however latent it might be, always attracted him, and he always sought to extricate it. This was because he had the moderate, gracious, amiably *human* instincts of the true poetic nature. "Let me beg of you," he says in thanking a reviewer who praised him, "to alter one or two expressions at any rate. I cannot bear to have it said that I am the *first* in anything whatever, as a writer least of all; it is not a thing which can be admitted, and these ways of classing people give offence." Literary man and loyal to the French Academy as he was, he can yet write to an old friend after his election: "All these academies, between you and me, are pieces of childishness; at any rate the French Academy is. Our least quarter of an hour of solitary reverie or of serious talk, yours and mine, in our youth, was better employed; but, as one gets old, one falls back into the power of these nothings; only it is well to know that nothings they are."

Perhaps the best way to get a sense of the value and extent of the work done in the last twenty years of his life by the critic thus excellently endowed is to take a single volume of the *causeries du lundi*, to look through its list of subjects, and to remember that with the qualities above mentioned all these subjects are treated. Any volume will serve; let us take the fourth. This volume consists of articles on twenty-four subjects. Twenty of these are the following: Mirabeau and Sophie, Montaigne, Mirabeau and Comte de la Marck, Mademoiselle de Scudéry, André Chénier as politician, Saint-Évremond and Ninon, Joseph de Maistre, Madame de Lambert, Madame Necker, the Abbé Maury, the Duc de Lauzun of Louis XVI.'s reign, Marie Antoinette, Buffon, Madame de Maintenon, De Bonald Amyot, Mallet du Pan, Marmontel, Chamfort, Rulhière. Almost every personage is French, it is true; Sainte-Beuve had a maxim that the critic should prefer subjects which he possesses familiarly. The great place of France in the world is very much due to her eminent gift for social life and development; and this gift French literature has accompanied, fashioned, perfected, and continues to reflect. And nowhere shall we find such interest more completely and charmingly brought out than in Sainte-Beuve's *Causeries du lundi* and the *Nouveaux lundis*. As a guide to bring us to a knowledge of the French genius and literature he is unrivalled.

(M. A.)

Authorities.—See his "Ma Biographie" in *Nouveaux lundis*, xiii., *Lettres à la princesse* (1873); *Correspondance* (1877–1878) and *Nouvelle Correspondance* (1880); the Vicomte d'Haussonville's *Sainte-Beuve* (1875); Scherer, *Études sur la littérature contemporaine*, iv.; G. Michaut, *Sainte-Beuve avant les Lundis* (1903). Sainte-Beuve's centenary was celebrated in various ways; for centenary criticism see the *Edinburgh Review* (April 1905) ("Sainte-Beuve and the Romantics"); *Monthly Review* (April 1905) (by F. Brunetière); *Revue des Deux Mondes* (March 1905) (by Victor Giraud). In the *Œuvres choisies de Juste Olivier* (1879) are some "Souvenirs"; and in 1903 the *Revue des Deux Mondes* published several interesting articles on a correspondence of Sainte-Beuve with Olivier.

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INITIALS USED IN VOLUME 24 TO IDENTIFY INDIVIDUAL CONTRIBUTORS,[1] WITH THE HEADINGS OF THE ARTICLES IN THIS VOLUME SO SIGNED.

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A. E. J.	Arthur Ernest Jolliffe, M.A. Fellow, Tutor and Mathematical Lecturer, Corpus Christi College, Oxford. Senior Mathematical Scholar, 1892.	**Series.**
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[1] A complete list, showing all individual contributors, appears in the final volume.

A. No.	Adolf Gotthard Noreen, Ph.D. Professor of Scandinavian Languages at the University of Upsala. Author of *Geschichte der Nordischen Sprachen*; *Altislandische und Altnorwegische Grammatik*; &c.	**Scandinavian Languages.**
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D. F. T.	Donald Francis Tovey. Author of *Essays in Musical Analysis*: comprising *The Classical Concerto, The Goldberg Variations*, and analyses of many other classical works.	**Scherzo;** **Serenade.**
D. G. H.	David George Hogarth, M.A. Keeper of the Ashmolean Museum, Oxford, and Fellow of Magdalen College. Fellow of the British Academy. Excavated at Paphos, 1888; Naucratis, 1899 and 1903; Ephesus, 1904–1905. Assiut, 1906–1907. Director, British School at Athens, 1897–1900. Director, Cretan Exploration Fund, 1899.	**Samsun; Sardis;** **Scala Nuova;** **Schliemann, Heinrich.**
D. H.	David Hannay. Formerly British Vice-Consul at Barcelona. Author of *Short History of the Royal Navy*; *Life of Emilio Castelar*; &c.	**Saints, Battle of the;** **St Vincent, Earl of;** **St Vincent, Battle of;** **Santa Cruz, Marquis of;** **Seamanship;** **Seven Years' War:** *Naval Operations.*
D. O.	Douglas Owen. Barrister-at-Law, Inner Temple. Lecturer at the Royal Naval War College, Portsmouth, and at London School of Economics. Hon. Secretary and Treasurer of the Society of Nautical Research. Author of *Declaration of War*; *Belligerents and Neutrals*; *Ports and Docks*; &c.	**Shipping.**
E. A. M.	Edward Alfred Minchin, M.A., F.Z.S. Professor of Protozoology in the University of London. Formerly Fellow of Merton College, Oxford, and Jodrell Professor of Zoology and Comparative Anatomy, University College, London.	**Scyphomedusae.**
E. B. T.	Edward Burnett Tylor, D.C.L., LL.D. See the biographical article: Tylor, Edward Burnett.	**Salutations.**
E. C. B.	Rt. Rev. Edward Cuthbert Butler, M.A., O.S.B., Litt.D. Abbot of Downside Abbey, Bath. Author of "The Lausiac History of Palladius" in *Cambridge Texts and Studies*.	**Servites.**
E. F.	Rt. Hon. Sir Edward Fry. See the biographical article: Fry, Sir Edward.	**Selborne, 1st Earl of.**
E. G.	Edmund Gosse, LL.D., D.C.L. See the biographical article: Gosse, Edmund.	**Samain, Albert Victor;** **Sermon.**
E. Gr.	Ernest Arthur Gardner, M.A. See the biographical article: Gardner, Percy.	**Samos** (*in part*).
E. H. B.	Sir Edward Herbert Bunbury, Bart., M.A., F.R.G.S. (d. 1895). M.P. for Bury St Edmunds, 1847–1852. Author of *A History of Ancient Geography*; &c.	**Samos** (*in part*).
E. H. M.	Ellis Hovell Minns, M.A. University Lecturer in Palaeography, Cambridge. Lecturer and Assistant Librarian at Pembroke College, Cambridge. Formerly Fellow of Pembroke College.	**Sarmatae;** **Scythia.**
E. J. D.	Edward Joseph Dent, M.A., Mus.Bac. Formerly Fellow of King's College, Cambridge. Author of *A. Scarlatti: his Life and Works*.	**Scarlatti, Alessandro.**
E. K. C.	Edmund Kerchever Chambers. Assistant Secretary, Board of Education. Sometime Scholar of Corpus Christi College, Oxford. Chancellor's English Essayist, 1891. Author of *The Medieval Stage*. Editor of the "Red Letter" *Shakespeare*; Donne's *Poems*; Vaughan's *Poems*; &c.	**Shakespeare.**
Ed. M.	Eduard Meyer, Ph.D., D.Litt., LL.D. Professor of Ancient History in the University of Berlin. Author of *Geschichte des Alterthums*; *Geschichte des alten Aegyptens*; *Die Israeliten und ihre Nachbarstämme*.	**Sanatruces; Satrap;** **Seleucia; Shapur I.-III.**
E. M. T.	Sir Edward Maunde Thompson, G.C.B., I.S.O., D.C.L., Litt.D., LL.D. Director and Principal Librarian, British Museum, 1898–1909. Sandars Reader in Bibliography, Cambridge University, 1895–1896. Hon. Fellow of University College, Oxford. Correspondent of the Institute of France and of the Royal Prussian Academy of Sciences. Author of *Handbook of Greek and Latin Palaeography*. Editor of *Chronicon Angliae*. Joint-editor of publications of the Palaeographical Society, the New Palaeographical Society, and of the Facsimile of the Laurentian Sophocles.	**Seals;** **Shorthand:** *Greek and Roman Tachygraphy.*
E. O.*	Edmund Owen, F.R.C.S., LL.D., D.Sc. Consulting Surgeon to St Mary's Hospital, London, and to the Children's Hospital, Great Ormond Street, London. Chevalier of the Legion of Honour. Author of *A Manual of Anatomy for Senior Students*.	**Scalp:** *Surgery*; **Shock.**
E. R. B.	Edwyn Robert Bevan, M.A. New College, Oxford. Author of *The House of Seleucus*; *Jerusalem under the High Priests*.	**Seleucid Dynasty.**
E. Wa.	Rev. Edmond Warre, M.A., D.D., D.C.L., C.B., C.V.O. Provost of Eton. Hon. Fellow of Balliol College, Oxford. Headmaster of Eton College, 1884–1905. Author of *Grammar of Rowing*; &c.	**Ship:** *History to the Invention of Steamships.*

F. E. Br.	Rev. Frank Edward Brightman, M.A., Ph.D., D.Litt. Fellow and Tutor of Magdalen College, Oxford. Prebendary of Lincoln Cathedral. Pusey Librarian, Oxford, 1884–1903. Author of *Liturgies: Eastern and Western*; &c.	**Serapion.**
F. G. M. B.	Frederick George Meeson Beck, M.A. Fellow and Lecturer of Clare College, Cambridge.	**Saxons.**
F. G. P.	Frederick Gymer Parsons, F.R.C.S., F.Z.S., F.R.Anthrop.Inst. Vice-President, Anatomical Society of Great Britain and Ireland. Lecturer on Anatomy at St Thomas's Hospital and the London School of Medicine for Women, London. Formerly Hunterian Professor at the Royal College of Surgeons.	**Scalp.**
F. J. G.	Major-General Sir Frederick John Goldsmid. See the biographical article: Goldsmid (family).	**Seistan** (*in part*).
F. Ll. G.	Francis Llewellyn Griffith, M.A., Ph.D., F.S.A. Reader in Egyptology, Oxford University. Editor of the Archaeological Survey and Archaeological Reports of the Egypt Exploration Fund. Fellow of Imperial German Archaeological Institute. Author of *Stories of the High Priests of Memphis*; &c.	**Sais;** **Scarab;** **Serapis;** **Sesostris.**
F. N. M.	Col. Frederic Natusch Maude, C.B. Lecturer in Military History, Manchester University. Author of *War and the World's Policy*; *The Leipzig Campaign*; *The Jena Campaign*; &c.	**Sedan:** *Battle of*; **Seven Weeks' War** (*in part*); **Seven Years' War** (*in part*).
F. R. C.	Frank R. Cana. Author of *South Africa from the Great Trek to the Union*.	**St Helena** (*in part*); **Senegal; Senussi.**
F. S.	Francis Storr. Trinity College, Cambridge. Editor of the *Journal of Education*, London. Officier d'Académie, Paris.	**Sand, George.**
F. W. R.*	Frederick William Rudler, I.S.O., F.G.S. Curator and Librarian of the Museum of Practical Geology, London, 1879–1902. President of the Geologists' Association, 1887–1889.	**Sapphire;** **Serpentine.**
G. A. B.	George A. Boulenger, D.Sc., F.R.S. In charge of the Collections of Reptiles and Fishes, Department of Zoology, British Museum. Vice-President of the Zoological Society of London.	**Salmon and Salmonidae.**
G. C. T. B	Sir George Christopher Trout Bartley, K.C.B. (1842–1910). Founder of the National Penny Bank. M.P. for North Islington, 1885–1906. Author of *Schools for the People*; *Provident Knowledge Papers*; &c.	**Savings Banks** (*in part*).
G. D.	George Dobson. Author of *Russia's Railway Advance into Central Asia*; &c.	**Saltykov, Michael.**
G. E. D.	George Edward Dobson, M.A., M.B., F.Z.S., F.R.S. (1848–1895). Army Medical Department, 1868–1888. Formerly Curator of the Royal Victoria Museum, Netley. Author of *Monograph of the Asiatic Chiroptera, &c.*; *A Monograph of the Insectivora, Systematic and Anatomical*.	**Shrew.**
G. G. S.	George Gregory Smith, M.A. Professor of English Literature, Queen's University, Belfast. Author of *The Days of James IV.*; *The Transition Period*; *Specimens of Middle Scots*, &c.	**Scotland:** *Literature*; **Scott, Alexander.**
G. H. Bo.	Rev. George Herbert Box, M.A. Rector of Sutton Sandy, Beds. Formerly Hebrew Master, Merchant Taylors' School, London. Lecturer in the Faculty of Theology, University of Oxford, 1908–1909. Author of *Translation of Book of Isaiah*; &c.	**Shekinah.**
G. Sa.	George Saintsbury, LL.D., D.C.L. See the biographical article: Saintsbury, George Edward Bateman.	**Saint-Simon, Duc de;** **Sévigné, Madame de.**
G. W. R.	Major George William Redway. Author of *The War of Secession, 1861–1862*; *Fredericksburg: a Study in War*.	**Seven Days' Battle;** **Shenandoah Valley Campaigns.**
G. W. T.	Rev. Griffithes Wheeler Thatcher, M.A., B.D. Warden of Camden College, Sydney, N.S.W. Formerly Tutor in Hebrew and Old Testament History at Mansfield College, Oxford.	**Shahrastānī;** **Shi'ites.**
H. A. R.	Henry A. Rowland. See the biographical article: Rowland, Henry Augustus.	**Screw:** *Errors of Screws*.
H. Ch.	Hugh Chisholm, M.A. Formerly Scholar of Corpus Christi College, Oxford. Editor of the 11th edition of the *Encyclopaedia Britannica*; Co-editor of the 10th edition.	**Salisbury, Marquess of;** **Shakespeare:** *The Shakespeare-Bacon Theory*; **Sherbrooke, Viscount.**
H. De.	Rev. Hippolyte Delehaye, S.J. Bollandist. Joint-editor of the *Acta Sanctorum*; and the *Analecta Bollandiana*.	**Sebastian, St;** **Sergius, St.**
H. F. G.	Hans Friedrich Gadow, F.R.S., Ph.D. Strickland Curator and Lecturer on Zoology in the University of Cambridge. Author of "Amphibia and Reptiles" in the *Cambridge Natural History*; &c.	**Sauropsida.**
H. F. T.	Rev. Henry Fanshawe Tozer, M.A., F.R.G.S. Hon. Fellow, formerly Fellow and Tutor of Exeter College, Oxford. Fellow of the British Academy. Corresponding Member of the Historical Society of Greece. Author of *History of Ancient Geography*; *Classical Geography*; *Lectures on the Geography of Greece*; &c.	**Santorin.**

H. L. H.	Harriet L. Hennessy, M.D. (Brux.), L.R.C.P.I., L.R.C.S.I.	**Sepsis.**
H. R. T.	Henry Richard Tedder, F.S.A. Secretary and Librarian of the Athenaeum Club, London.	**Shakespeare:** ***Bibliography.***
I. A.	Israel Abrahams, M.A. Reader in Talmudic and Rabbinic Literature in the University of Cambridge. Formerly President, Jewish Historical Society of England. Author of *A Short History of Jewish Literature*; *Jewish Life in the Middle Ages*; *Judaism*; &c.	**Samuel of Nehardea;** **Shekel.**
J. A. M.	James Alexander Manson. Formerly Literary Editor of the *Daily Chronicle*, and Chief Editor, Cassell & Co., Ltd. Author of *The Bowler's Handbook*; &c.	**Scotland:** *Geography* (*in part*).
J. A. Pl.	John Arthur Platt, M.A. Professor of Greek in University College, London. Formerly Fellow of Trinity College, Cambridge. Author of editions of Homer's *Iliad* and *Odyssey*; &c.	**Sappho.**
J. A. R.	Very Rev. Joseph Armitage Robinson, M.A., D.D. Dean of Wells. Dean of Westminster, 1902–1911. Fellow of the British Academy. Chaplain-in-Ordinary to the King. Hon. Fellow of Christ's College, Cambridge. Norrisian Professor of Divinity in the University of Cambridge, 1893–1899. Author of *Some Thoughts on the Incarnation*; &c.	**Scillitan Martyrs.**
J. Bt.	James Bartlett. Lecturer on Construction, Architecture, Sanitation, Quantities, &c., King's College, London. Member of Society of Architects, Institute of Junior Engineers, Quantity Surveyors' Association. Author of *Quantities.*	**Scaffold;** **Sewerage;** **Shoring.**
J. B. A.	Joseph Beavington Atkinson. Formerly Art-critic of the *Saturday Review.* Author of *An Art Tour in the Northern Capitals of Europe*; *Schools of Modern Art in Germany.*	**Schadow.**
J. E.	H. Julius Eggeling, Ph.D. Professor of Sanskrit and Comparative Philology, Edinburgh University. Formerly Secretary and Librarian to the Royal Asiatic Society.	**Sanskrit.**
J. E. S.*	John Edwin Sandys, M.A., Litt.D., LL.D. Public Orator in the University of Cambridge. Fellow of St John's College, Cambridge. Fellow of the British Academy. Author of *History of Classical Scholarship*; &c.	**Scaliger** (*in part*).
J. F. S.	Rev. John Frederick Smith. Author of *Studies in Religion under German Masters*; translated G. H. A. von Ewald's *Commentaries* on the *Prophets of the Old Testament* and the *Book of Job.*	**Schleiermacher** (*in part*).
J. G. Fr.	James George Frazer, M.A., D.C.L., LL.D., Litt.D. Professor of Social Anthropology, Liverpool University. Fellow of Trinity College, Cambridge. Fellow of the British Academy. Author of *The Golden Bough*; &c.	**Saturn** (*in part*).
J. G. H.	Joseph G. Horner, A.M.I.Mech.E. Author of *Plating and Boiler Making*; *Practical Metal Turning*; &c.	**Screw.**
J. G. K.	John Graham Kerr, M.A., F.R.S. Regius Professor of Zoology in the University of Glasgow. Formerly Demonstrator in Animal Morphology in the University of Cambridge. Fellow of Christ's College, Cambridge, 1898–1904. Walsingham Medallist, 1898. Neill Prizeman, Royal Society of Edinburgh, 1904.	**Selachians;** **Shark** (*in part*).
J. G. R.	John George Robertson, M.A., Ph.D. Professor of German Language and Literature, University of London. Editor of the *Modern Language Journal.* Author of *History of German Literature*; *Schiller after a Century*; &c.	**Schiller.**
J. G. Sc.	Sir James George Scott, K.C.I.E. Superintendent and Political Officer, Southern Shan States. Author of *Burma*; *The Upper Burma Gazetteer.*	**Salween:** *River*; **Shan States**
J. G. Si.	Rev. James Gilliland Simpson, M.A. Canon of St Paul's, London. Principal of Leeds Clergy School and Lecturer of Leeds Parish Church, 1900–1910.	**Scotland, Episcopal Church of.**
J. H. A. H.	John Henry Arthur Hart, M.A. Fellow, Theological Lecturer and Librarian, St John's College, Cambridge.	**Scribes.**
J. H. M.	John Henry Middleton, M.A., Litt.D., F.S.A., D.C.L. (1846–1896). Slade Professor of Fine Art in the University of Cambridge, 1886–1895. Director of the Fitzwilliam Museum, Cambridge, 1889–1892. Art Director of the South Kensington Museum, 1892–1896. Author of *The Engraved Gems of Classical Times*; *Illuminated Manuscripts in Classical and Mediaeval Times.*	**Sangallo;** **Sculpture** (*in part*).
J. H. R.	John Horace Round, M.A., LL.D. Balliol College, Oxford. Author of *Feudal England*; *Studies in Peerage and Family History*; *Peerage and Pedigree.*	**Scutage;** **Serjeanty.**
J. Hl. R.	John Holland Rose, M.A., Litt.D. Christ's College, Cambridge. Lecturer on Modern History to the Cambridge University Local Lectures Syndicate. Author of *Life of Napoleon I.*; *Napoleonic Studies*; *The Development of the European Nations*; *The Life of Pitt*; &c.	**Savary.**

J. H. V. C.	John Henry Verrinder Crowe. Lieut.-Colonel, Royal Artillery. Commandant of the Royal Military College of Canada. Formerly Chief Instructor in Military Topography and Military History and Tactics at the Royal Military Academy, Woolwich. Author of *Epitome of the Russo-Turkish War, 1877–1878*; &c.	**Shipka Pass.**
J. K. I.	John Kells Ingram, LL.D. See the biographical article: Ingram, John Kells.	**Say, Jean Baptiste;** **Senior, Nassau.**
J. L. M.	John Linton Myres, M.A., F.S.A., F.R.G.S. Wykeham Professor of Ancient History in the University of Oxford, and Fellow of Magdalen College. Formerly Gladstone Professor of Greek and Lecturer in Ancient Geography, University of Liverpool. Lecturer in Classical Archaeology in the University of Oxford, and Student and Tutor of Christ Church. Author of *A History of Rome*; &c.	**Salamis;** *Cyprus.*
J. M. M.	John Malcolm Mitchell. Sometime Scholar of Queen's College, Oxford. Lecturer in Classics, East London College (University of London). Joint-editor of Grote's *History of Greece*.	**Schelling** (*in part*); **Shaftesbury, 3rd Earl of** (*in part*).
J. P.-B.	James George Joseph Penderel-Brodhurst. Editor of the *Guardian*, London.	**Sheraton, Thomas.**
J. S. F.	John Smith Flett, D.Sc., F.G.S. Petrographer to the Geological Survey of the United Kingdom. Formerly Lecturer on Petrology in Edinburgh University. Neill Medallist of the Royal Society of Edinburgh. Bigsby Medallist of the Geological Society of London.	**Sand; Sandstone;** **Scapolite** (*Rocks*); **Schorl.**
J. S. R.	James Smith Reid, M.A., LL.D., Litt.D. Professor of Ancient History and Fellow and Tutor of Gonville and Caius College, Cambridge. Hon. Fellow, formerly Fellow and Lecturer of Christ's College. Browne's and Chancellor's Medals. Editor of editions of Cicero's *Academia*; *De Amicitia*; &c.	**Severus, Lucius Septimius.**
J. T. Be.	John Thomas Bealby. Joint-author of Stanford's Europe. Formerly Editor of the *Scottish Geographical Magazine*. Translator of Sven Hedin's *Through Asia, Central Asia and Tibet*; &c.	**St Petersburg** (*in part*); **Sakhalin** (*in part*); **Samara:** *Government* (*in part*); **Samarkand:** *City* (*in part*); **Saratov:** *Government* (*in part*).
J. T. C.	Joseph Thomas Cunningham, M.A., F.Z.S. Lecturer on Zoology at the South-Western Polytechnic, London. Formerly Fellow of University College, Oxford. Assistant Professor of Natural History in the University of Edinburgh. Naturalist to the Marine Biological Association.	**Scaphopoda;** **Sea-Serpent** (*in part*).
J. T. S.*	James Thomson Shotwell, Ph.D. Professor of History in Columbia University, New York City.	**Saint-Simon, Comte de** (*in part*).
J. W.	James Williams, M.A., D.C.L., LL.D. All Souls' Reader in Roman Law in the University of Oxford, and Fellow of Lincoln College. Author of *Wills and Succession*; &c.	**Seamen, Laws relating to;** **Sheriff.**
J. W. He.	James Wycliffe Headlam, M.A. Staff Inspector of Secondary Schools under the Board of Education, London. Formerly Fellow of King's College, Cambridge. Professor of Greek and Ancient History at Queen's College, London. Author of *Bismarck and the foundation of the German Empire*; &c.	**Schmerling, Anton von.**
K. G. J.	Kingsley Garland Jayne. Sometime Scholar of Wadham College, Oxford. Matthew Arnold Prizeman, 1903. Author of *Vasco da Gama and his Successors*.	**Salamanca.**
K. S.	Kathleen Schlesinger. Editor of the *Portfolio of Musical Archaeology*. Author of *The Instruments of the Orchestra*.	**Sambuca; Saxhorn;** **Saxophone; Serpent:** *Music*; **Shawm; Shofar.**
L. Be.	Léonce Bénédite. Keeper of the Musée National du Luxembourg, Paris. Chevalier of the Legion of Honour. President of the Société des Peintres orientalistes français. Author of *Histoire des Beaux Arts*; &c.	**Sculpture:** *Modern French.*
L. J. S.	Leonard James Spencer, M.A. Assistant in the Department of Mineralogy, British Museum. Formerly Scholar of Sidney Sussex College, Cambridge, and Harkness Scholar. Editor of the *Mineralogical Magazine*.	**Scapolite;** **Scolecite.**
L. V.	Linda Mary Villari. See the biographical article: Villari, Pasquale.	**Savonarola.**
L. V.*	Luigi Villari. Italian Foreign Office (Emigration Department). Formerly Newspaper Correspondent in the East of Europe. Italian Vice-Consul in New Orleans, 1906, Philadelphia, 1907, and Boston, U.S.A., 1907–1910. Author of *Italian Life in Town and Country*; &c.	**Savoy, House of.**
M. A. C.	Maurice Arthur Canney, M.A. Assistant Lecturer in Semitic Languages in the University of Manchester. Formerly Exhibitioner of St John's College, Oxford. Pusey and Ellerton Hebrew Scholar, Oxford, 1892; Kennicott Hebrew Scholar, 1895; Houghton Syriac Prize, 1896.	**Schenkel, Daniel.**

M. Be.	Malcolm Bell. Author of *Pewter Plate*; &c.	**Sheffield Plate.**
M. Bt.	Michael Brett. Barrister-at-Law, Middle Temple.	**Salvage:** *Military.*
M. D. Ch.	Sir Mackenzie Dalzell Chalmers, K.C.B., C.S.I., M.A. Trinity College, Oxford, Barrister-at-Law. Formerly Permanent Under-Secretary of State for the Home Department, London, and First Parliamentary Counsel to the Treasury. Author of *Digest of the Law of Bills of Exchange*; &c.	**Sale of Goods.**
M. Ha.	Marcus Hartog, M.A., D.Sc., F.L.S. Professor of Zoology, University College, Cork. Author of "Protozoa," in the *Cambridge Natural History*; and papers for various scientific journals.	**Sarcodina.**
M. H. S.	Marion H. Spielmann, F.S.A. Formerly Editor of the *Magazine of Art*. Member of Fine Art Committee of International Exhibitions of Brussels, Paris, Buenos Aires, Rome and the Franco-British Exhibition, London. Author of *History of "Punch"*; *British Portrait Painting to the Opening of the 19th Century*; *Works of G. F. Watts, R.A.*; *British Sculpture and Sculptors of To-Day*; *Henriette Ronner*; &c.	**Sculpture** (*in part*); **Shakespeare:** *Portraits.*
M. Ja.	Morris Jastrow, Ph.D. Professor of Semitic Languages, University of Pennsylvania. Author of *Religion of the Babylonians and Assyrians*; &c.	**Shamash.**
M. O. B. C.	Maximilian Otto Bismarck Caspari, M.A. Reader in Ancient History in London University. Lecturer in Greek in Birmingham University, 1905–1908.	**Salamis;** **Samos** (*in part*).
M. P.*	Léon Jacques Maxime Prinet. Auxiliary of the Institute of France (Academy of Moral and Political Sciences). Author of *L'Industrie du sel en Franche-Comté*.	**St Nectaire;** **St Pol, Counts of.**
M. T. H.	M. Th. Houtsma. Professor of Semitic Languages in the University of Utrecht.	**Seljūks.**
O. A.	Osmund Airy, M.A., LL.D. H.M Inspector of Schools and Inspector of Training Colleges, Board of Education, London. Author of *Louis XIV. and the English Restoration*; *Charles II.*; &c. Editor of the *Lauderdale Papers*; &c.	**Shaftesbury, 1st Earl of.**
P. A. K.	Prince Peter Alexeivitch Kropotkin. See the biographical article: Kropotkin, Prince, P. A.	**St Petersburg** (*in part*); **Sakhalin** (*in part*); **Samara:** *Government* (*in part*); **Samarkand:** *City* (*in part*); **Saratov:** *Government* (*in part*).
P. C. M.	Peter Chalmers Mitchell, M.A., F.R.S., F.Z.S., D.Sc., LL.D. Secretary of the Zoological Society of London. University Demonstrator in Comparative Anatomy and Assistant to Linacre Professor at Oxford, 1888–1891. Author of *Outlines of Biology*; &c.	**Sex.**
P. G.	Percy Gardner, LL.D., F.S.A., D.Litt. See the biographical article: Gardner, Percy.	**Scopas.**
P. G. K.	Paul George Konody. Art Critic of the *Observer* and the *Daily Mail*. Formerly Editor of the *Artist*. Author of *The Art of Walter Crane*; *Velasquez, Life and Work*; &c.	**Sculpture** (*in part*).
P. St.	Percy Somers Tyringham Stephens, J.P. Contributor to the *Badminton Magazine*.	**Shooting.**
P. Vi.	Paul Vinogradoff, D.C.L., LL.D. See the biographical article: Vinogradoff, Paul.	**Serfdom.**
P. Wa.	Sir Phillip Watts, K.C.B., F.R.S., LL.D. Director of Naval Construction for the British Navy. Chairman of the Federation of Shipbuilders. Naval Architect and Director of War Shipbuilding Department of Sir W. G. Armstrong, Whitworth & Co., Ltd., 1885–1901.	**Ship:** *History since the Invention of Steamships:* **Shipbuilding.**
R. Ad.	Robert Adamson, LL.D. See the biographical article: Adamson, Robert.	**Schelling** (*in part*).
R. A. S. M.	Robert Alexander Stewart Macalister, M.A., F.S.A. St John's College, Cambridge. Director of Excavations for the Palestine Exploration Fund.	**Samaria;** **Shechem.**
R. A. W.	Colonel Robert Alexander Wahab, C.B., C.M.G., C.I.E. Formerly H.M. Commissioner, Aden Boundary Delimitation. Served with Tirah Expeditionary Force, 1897–1898, and on the Anglo-Russian Boundary Commission, Pamirs, 1895.	**Sana.**
R. C. C.	Richard Copley Christie. See the biographical article: Christie, Richard Copley.	**Scaliger** (*in part*).
R. D. H.	Robert Drew Hicks, M.A. Fellow, formerly Lecturer in Classics, Trinity College, Cambridge.	**Seneca** (*in part*).
R. G.	Richard Garnett, LL.D. See the biographical article: Garnett, Richard.	**Sarpi, Paolo;** **Satire.**
R. I. P.	Reginald Innes Pocock, F.Z.S. Superintendent of the Zoological Gardens, London.	**Scorpion.**

R. J. M.	Ronald John McNeill, M.A. Christ Church, Oxford. Barrister-at-Law. Formerly Editor of the *St James's Gazette* (London).	**St John, Oliver; St Leger, Sir Anthony; Scroggs, Sir William; Scrope Family; Ship-money; Shrewsbury, Duke of.**
R. L.*	Richard Lydekker, F.R.S., F.G.S., F.Z.S. Member of the Staff of the Geological Survey of India, 1874–1882. Author of *Catalogue of Fossil Mammals, Reptiles and Birds in the British Museum*; *The Deer of all Lands*; *The Game Animals of Africa*; &c.	**Seal** (*in part*); **Serow; Sheep** (*in part*).
R. L. A.	Sir Reginald Laurence Antrobus, K.C.M.G. Crown Agent for the Colonies, London. Assistant Under-Secretary of State for the Colonies, 1898–1909.	**St Helena** (*in part*).
R. N. B.	Robert Nisbet Bain (d. 1909). Assistant Librarian, British Museum, 1883–1909. Author of *Scandinavia: The Political History of Denmark, Norway and Sweden, 1513–1900*; *The First Romanovs, 1613–1725*; *Slavonic Europe: The Political History of Poland and Russia from 1469 to 1796*; &c.	**Sehested, Hannibal; Shafirov, Peter.**
R. P.*	Robert Peele. Professor of Mining in Columbia University, New York.	**Shaft-sinking.**
R. S. C.	Robert Seymour Conway, M.A., D.Litt. Professor of Latin and Indo-European Philology in the University of Manchester. Formerly Professor of Latin in University College, Cardiff; and Fellow of Gonville and Caius College, Cambridge. Author of *The Italic Dialects.*	**Samnites.**
R. W.	Robert Wallace, F.R.S. (Edin.), F.L.S. Professor of Agriculture and Rural Economy at Edinburgh University, and Garton. Lecturer on Colonial and Indian Agriculture. Professor of Agriculture, R.A.C., Cirencester, 1882–1885. Author of *Farm Live Stock of Great Britain*; *The Agriculture and Rural Economy of Australia and New Zealand*; *Farming Industries of Cape Colony*; &c.	**Sheep** (*in part*).
S. A. C.	Stanley Arthur Cook, M.A. Lecturer in Hebrew and Syriac, and formerly Fellow, Gonville and Caius College, Cambridge. Editor for the Palestine Exploration Fund. Author of *Glossary of Aramaic Inscriptions*; *The Laws of Moses and the Code of Hammurabi*; *Critical Notes on Old Testament History*; *Religion of Ancient Palestine*; &c.	**Samson; Samuel; Samuel, Books of; Saul; Serpent-worship.**
S. N.	Simon Newcomb, LL.D., D.Sc. See the biographical article: Newcomb, Simon.	**Saturn:** *Planet.*
T. As.	Thomas Ashby, M.A., D.Litt. Director of the British School of Archaeology at Rome. Formerly Scholar of Christ Church, Oxford. Craven Fellow, 1897. Conington Prizeman, 1906. Member of the Imperial German Archaeological Institute. Author of *The Classical Topography of the Roman Campagna.*	**Salerno; Sardinia; Sassari; Satricum; Saturnia; Segesta; Segusio; Selinus; Sessa Aurunca; Severiana, Via.**
T. A. A.	Thomas Andrew Archer, M.A. Author of *The Crusade of Richard I.*; &c.	**Salvian.**
T. A. I.	Thomas Allan Ingram, M.A., LL.D. Trinity College, Dublin.	**Savings Banks** (*in part*).
T. Ba.	Sir Thomas Barclay, M.P. Member of the Institute of International Law. Officer of the Legion of Honour. Author of *Problems of International Practice and Diplomacy*; &c. M.P. for Blackburn, 1910.	**Search.**
T. C. A.	Sir Thomas Clifford Allbutt, K.C.B., M.A., M.D., D.Sc., LL.D., F.R.S. Regius Professor of Physic in the University of Cambridge, and Fellow of Gonville and Caius College. Physician to Addenbrooke's Hospital, Cambridge. Editor of *Systems of Medicine.*	**Semmelweiss, Ignatz.**
T. F.	Rev. Thomas Fowler, M.A., D.D., LL.D. (1832–1904). President of Corpus Christi College, Oxford, 1881–1904. Honorary Fellow of Lincoln College. Professor of Logic, 1873–1888. Vice-Chancellor of the University of Oxford, 1899–1901. Author of *Elements of Deductive Logic*; *Shaftesbury and Hutcheson*; &c.	**Shaftesbury, 3rd Earl of** (*in part*).
T. G. C.	Thomas Gilbert Carver, M.A., K.C. (1848–1906). Formerly Judge of County Courts. Author of *On the Law relating to the Carriage of Goods by Sea.*	**Salvage.**
T. K.	Thomas Kirkup, M.A., LL.D. Author of *An Inquiry into Socialism*; *Primer of Socialism*; &c.	**Saint-Simon, Comte de** (*in part*).
T. K. C.	Rev. Thomas Kelly Cheyne, D.Litt., D.C.L., D.D. See the biographical article: Cheyne, T. K.	**Seraphim.**
T. L. H.	Sir Thomas Little Heath, K.C.B., D.Sc. Assistant Secretary to the Treasury. Formerly Fellow of Trinity College, Cambridge. Author of *Treatise on Conic Sections*; &c.	**Serenus "of Antissa."**

Th. N.	Theodor Nöldeke. See the biographical article: Nöldeke, Theodor.	**Semitic Languages.**
T. T.	Sir Travers Twiss, K.C., D.C.L., F.R.S. See the biographical article: Twiss, Sir Travers.	**Sea Laws.**
T. W. F.	Thomas William Fox. Professor of Textiles in the University of Manchester. Author of *Mechanics of Weaving*.	**Shuttle.**
T. W. R. D.	Thomas William Rhys Davids, LL.D., Ph.D. Professor of Comparative Religion, Manchester University. President of the Pali Text Society. Fellow of the British Academy. Secretary and Librarian of the Royal Asiatic Society, 1885–1902. Author of *Buddhism*; *Sacred Books of the Buddhists*; *Early Buddhism*; *Buddhist India*; *Dialogues of the Buddha*; &c.	**Sānchi;** **Sāriputta;** **Sāsána Vamsa.**
W. A. B. C.	Rev. William Augustus Brevoort Coolidge, M.A., F.R.G.S., Ph.D. Fellow of Magdalen College, Oxford. Professor of English History, St David's College, Lampeter, 1880–1881. Author of *Guide du Haut Dauphiné*; *The Range of the Todi*; *Guide to Grindelwald*; *Guide to Switzerland*; *The Alps in Nature and in History*; &c. Editor of the *Alpine Journal*, 1880–1881; &c.	**St Gall:** *Canton*; **St Gall:** *Town*; **St Gotthard Pass;** **St Moritz; Sarnen;** **Saussure, Horace Bénédict de;** **Savoie; Schaffhausen:** *Canton*; **Schaffhausen:** *Town*; **Scheuchzer, Johann;** **Schwyz; Sempach.**
W. A. D.	William Archibald Dunning, Ph.D., LL.D. Lieber Professor of History and Political Philosophy, Columbia University, New York. Author of *Essays on the Civil War and Reconstruction*; *A History of Political Theories*.	**Sherman, John.**
W. A. P.	Walter Alison Phillips, M.A. Formerly Exhibitioner of Merton College and Senior Scholar of St John's College, Oxford. Author of *Modern Europe*; &c.	**St John of Jerusalem, Order of;** **Schleswig-Holstein Question.**
W. Ba.	William Bacher, Ph.D. Professor of Biblical Science at the Rabbinical Seminary, Budapest.	**Shammai.**
W. C. D. W.	William Cecil Dampier Whetham, M.A., F.R.S. Fellow and Tutor of Trinity College, Cambridge. Author of *Theory of Solution*; *Recent Development of Physical Science*; &c.	**Science.**
W. E. A. A.	William Edmund Armytage Axon, LL.D. Formerly Deputy Chief Librarian of the Manchester Free Libraries. On Literary Staff of *Manchester Guardian*, 1874–1905. Member of the Gorsedd, with the bardic name of Manceinion. Author of *Annals of Manchester*; &c.	**Salford.**
W. E. Ho.	William Evans Hoyle, M.A., D.Sc., F.Z.S., M.R.C.S. Christ Church, Oxford. Director of the National Museum of Wales. Director of the Manchester Museum, 1889–1899.	**Sea-Serpent** (*in part*).
W. Fr.	William Fream, LL.D. (d. 1906). Formerly Lecturer on Agricultural Entomology, University of Edinburgh, and Agricultural Correspondent of *The Times*.	**Sheep** (*in part*).
W. F. K.	Winifred F. Knox. Author of *The Court of a Saint*.	**Saladin.**
W. Hu.	Rev. William Hunt, M.A., Litt.D. President of the Royal Historical Society, 1905–1909. Author of *History of the English Church, 597–1066*; *The Church of England in the Middle Ages*; *Political History of England, 1760–1801*.	**Seeley, Sir J. R.**
W. H. Be.	William Henry Bennett, M.A., D.D., D.Litt. Professor of Old Testament Exegesis in New and Hackney Colleges, London. Formerly Fellow of St John's College, Cambridge, and Lecturer in Hebrew at Firth College, Sheffield. Author of *Religion of the Post-Exilic Prophets*; &c.	**Seth.**
W. H. F.	Sir William Henry Flower, F.R.S. See the biographical article: Flower, Sir W. H.	**Seal** (*in part*).
W. H. Ha.	William Henry Hadow, M.A., Mus.Doc. Principal of Armstrong College, Newcastle-on-Tyne. Formerly Fellow and Tutor of Worcester College, Oxford. Member of Council, Royal College of Music. Editor of *Oxford History of Music*. Author of *Studies in Modern Music*; &c.	**Schubert.**
W. L. F.	Walter Lynwood Fleming, A.M., Ph.D. Professor of History in Louisiana State University. Editor of *Documentary History of Reconstruction*; &c.	**Secession.**
W. L. G.	William Lawson Grant, M.A. Professor of History at Queen's University, Kingston, Canada. Formerly Beit Lecturer in Colonial History at Oxford University. Editor of *Acts of the Privy Council (Colonial Series)*; *Canadian Constitutional Development*.	**St John:** *Canada*; **St Pierre and Miquelon.**
W. L.-W.	Sir William Lee-Warner, M.A., G.C.S.I. Member of the Council of India. Formerly Secretary in the Political and Secret Department of the India Office. Author of *Life of the Marquis of Dalhousie*; *Memoirs of Field-Marshal Sir Henry Wylie Norman*; &c.	**Sayyid Ahmad Khan, Sir.**

W. M.	WILLIAM MINTO, M.A. See the biographical article: MINTO, WILLIAM.	**Scott, Sir Walter** (*in part*).
W. M. R.	WILLIAM MICHAEL ROSSETTI. See the biographical article: ROSSETTI, DANTE G.	**Sebastiano del Piombo;** **Shelley.**
W. P. A.	LIEUT.-COLONEL WILLIAM PATRICK ANDERSON, M.INST.C.E., F.R.G.S. Chief-Engineer, Department of Marine and Fisheries of Canada. Member of the Geographic Board of Canada. Past President of Canadian Society of Civil Engineers.	**St Lawrence:** ***River.***
W. R. S.	WILLIAM ROBERTSON SMITH, LL.D. See the biographical article: SMITH, W. R.	**Salt:** ***Ancient History and Religious Symbolism.***
W. T. Ca.	WILLIAM THOMAS CALMAN, D.Sc., F.Z.S. Assistant in charge of Crustacea, Natural History Museum, South Kensington. Author of "Crustacea," in a *Treatise on Zoology*, edited by Sir E. Ray Lankester.	**Shrimp.**
W. W.	WILLIAM WALLACE. See the biographical article: WALLACE, WILLIAM (1844–1897).	**Schopenhauer** (*in part*).
W. W. R.*	WILLIAM WALKER ROCKWELL, LIC. THEOL. Assistant Professor of Church History, Union Theological Seminary, New York. Author of *Die Doppelehe des Landgrafen Philipp von Hessen.*	**Saragossa, Councils of.**

PRINCIPAL UNSIGNED ARTICLES

St Vitus's Dance.
Sal Ammoniac.
Salicylic Acid.
Salisbury.
Salt Lake City.
Saltpetre.
Salt.
Salvador.
Salvation Army.
Salzburg.
Samoa.
Samoyedes.
Sanctuary.
San Francisco.
Santo Domingo.
Sarsaparilla.
Saskatchewan.
Savannah.
Saxe-Coburg-Gotha.
Saxe-Meiningen.
Saxe-Weimar-Eisenach.
Saxony.
Scarlet Fever.
Schleswig-Holstein.
Scilly Isles.
Scipio.
Scrophulariaceae.
Scurvy.
Seal-Fisheries.
Seattle.
Sea-Urchin.
Sedition.
Seismometer.
Selenium.
Selkirkshire.
Senna.
Sennar.
Sequoia.
Serjeant.
Servo-Bulgarian War.
Settlement.
Severn.
Sewing Machines.
Sextant.
Seychelles.
Shadow.
Shakers.
Shamash.
Sheffield.
Shell-heaps.
Shell-money.
Sheridan.
Shetland.
Shoe.
Shorthand (*modern*).
Shropshire.

THE
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VOLUME 24

SAINTE-CLAIRE DEVILLE TO SHUTTLE

SAINTE-CLAIRE DEVILLE, ÉTIENNE HENRI (1818–1881), French chemist, was born on the 11th of March 1818 in the island of St Thomas, West Indies, where his father was French consul. Together with his elder brother Charles he was educated in Paris at the Collège Rollin. In 1844, having graduated as doctor of medicine and doctor of science, he was appointed to organize the new faculty of science at Besançon, where he acted as dean and professor of chemistry from 1845 to 1851. Returning to Paris in the latter year he succeeded A. J. Balard at the École Normale, and in 1859 became professor at the Sorbonne n place of J. B. A. Dumas, for whom he had begun to lecture in 1853. He died at Boulogne-sur-Seine on the 1st of July 1881.

He began his experimental work in 1841 with investigations of oil of turpentine and tolu balsam, in the course of which he discovered toluene. But his most important work was in inorganic and thermal chemistry. In 1849 he discovered anhydrous nitric acid (nitrogen pentoxide), a substance interesting as the first obtained of the so-called "anhydrides" of the monobasic acids. In 1855, ignorant of what Wöhler had done ten years previously, he succeeded in obtaining metallic aluminium, and ultimately he devised a method by which the metal could be prepared on a large scale by the aid of sodium, the manufacture of which he also developed. With H. J. Debray (1827–1888) he worked at the platinum metals, his object being on the one hand to prepare them pure, and on the other to find a suitable metal for the standard metre for the International Metric Commission then sitting at Paris. With L. J. Troost (b. 1825) he devised a method for determining vapour densities at temperatures up to 1400° C., and, partly with F. Wöhler, he investigated the allotropic forms of silicon and boron. The artificial preparation of minerals, especially of apatite and isomorphous minerals and of crystalline oxides, was another subject in which he made many experiments. But his best known contribution to general chemistry is his work on the phenomena of reversible reactions, which he comprehended under a general theory of "dissociation." He first took up the subject about 1857, and it was in the course of his investigations on it that he devised the apparatus known as the "Deville hot and cold tube."

His brother, CHARLES JOSEPH SAINTE-CLAIRE DEVILLE (1814–1876), geologist and meteorologist, was born in St Thomas on the 26th of February 1814. Having attended at the École des Mines in Paris, he assisted Elie de Beaumont in the chair of geology at the Collège de France from 1855 until he succeeded him in 1874. He made researches on volcanic phenomena, especially on the gaseous emanations. He investigated also the variations of temperature in the atmosphere and ocean. He died at Paris on the 10th of October 1876.

His published works include: *Études géologiques sur les îles de Ténériffe et de Fogo* (1848); *Voyage géologique aux Antilles et aux îles de Ténériffe et de Fogo* (1848–1859); *Recherches sur les principaux phénomènes de météorologie et de physique générale aux Antilles* (1849); *Sur les variations périodiques de la température* (1866), and *Coup d'œil historique sur la géologie* (1878).

ST ELMO'S FIRE, the glow accompanying the slow discharge of electricity to earth from the atmosphere. This discharge, which is identical with the "brush" discharge of laboratory experiments, usually appears as a tip of light on the extremities of pointed objects such as church towers, the masts of ships, or even the fingers of the outstretched hand: it is commonly accompanied by a crackling or fizzing noise. St Elmo's fire is most frequently observed at low levels through the winter season during and after snowstorms.

The name St Elmo is an Italian corruption through *Sant' Ermo* of St Erasmus, a bishop, during the reign of Domitian, of Formiae, Italy, who was broken on the wheel about the 2nd of June 304. He has ever been the patron saint of Mediterranean sailors, who regard St Elmo's fire as the visible sign of his guardianship. The phenomenon was known to the ancient Greeks, and Pliny in his *Natural History* states that when there were two lights sailors called them Castor and Pollux and invoked them as gods. To English sailors St Elmo's fires were known as "corposants" (Ital. *corpo santo*).

See Hazlitt's edition of Brand's *Antiquities* (1905) under "Castor and Pollux."

ST EMILION, a town of south-western France, in the department of Gironde, 2½ m. from the right bank of the Dordogne and 27 m. E.N.E. of Bordeaux by rail. Pop. (1906), town, 1091; commune, 3546. The town derives its name from a hermit who lived here in the 7th and 8th centuries. Picturesquely situated on the slope of a hill, the town has remains of ramparts of the 12th and 13th centuries, with ditches hewn in the rock, and several medieval buildings. Of these the chief is the parish, once collegiate, church of the 12th and 13th centuries. A Gothic cloister adjoins the church. A fine belfry (12th, 13th and 15th centuries) commanding the town is built on the terrace, beneath which are hollowed in the rock the oratory and hermitage of St Emilion, and adjoining them an ancient monolithic church of considerable dimensions. Remains of a monastery of the Cordeliers (15th and 17th centuries), of a building (13th century)known as the Palais Cardinal, and a square keep (the chief relic of a stronghold founded by Louis VIII.) are also to be seen. Disused stone quarries in the side of the hill are used as dwellings by the inhabitants. St Emilion is celebrated for its wines. Its medieval importance, due to the pilgrimages to the tomb of the saint and to the commerce in its wines, began to decline towards the end of the 13th century owing to the foundation of Libourne. In 1272 it was the first of the towns of Guyenne to join the confederation headed by Bordeaux.

SAINTE-PALAYE, JEAN BAPTISTE LA CURNE (or LACURNE) **DE** (1697–1781), French scholar, was born at Auxerre on the 6th of June 1697. His father, Edme, had been gentleman of the bed-chamber to the duke of Orleans, brother of Louis XIV. Sainte-Palaye had a twin brother to whom he was greatly attached, refusing to marry so as not to be separated from him. For some time he held the same position under the regent Orleans as his father had under the duke of Orleans. He had received a thorough education in Latin and Greek, and had a taste for history. In 1724 he had been elected an associate of the *Académie des Inscriptions et Belles-Lettres*, merely from his reputation, as nothing had been written by him before that date. From this time he devoted himself exclusively to the work of this society. After having published numerous memoirs on Roman history, he began a series of studies on the chroniclers of the middle ages for the *Historiens des Gaules et de la France* (edited by Dom Bouquet): Raoul Glaber, Helgaud, the *Gesta* of Louis VII., the chronicle of Morigny, Rigord and his continuator, William le Breton, the monk of St Denis, Jean de Venette, Froissart and the Jouvencel. He made two journeys into Italy with his brother, the first in 1739–1740, accompanied by his compatriot, the president Charles de Brosses, who related many humorous anecdotes about the two brothers, particularly about Jean Baptiste, whom he called "the bilious Sainte-Palaye!" On returning from this tour he saw one of Joinville's manuscripts at the house of the senator Fiorentini, well known in the history of the text of this pleasing memorialist. The manuscript was bought for the king in 1741 and is still at the Bibliothèque nationale. After the second journey (1749) Lacurne published a letter to de Brosses, on *Le Goût dans les arts* (1751). In this he showed that he was not only attracted by manuscripts, but that he could see and admire works of art. In 1759 he published the first edition of his *Mémoires sur l'ancienne chevalerie, considérée comme un établissement politique et militaire*, for which unfortunately he only used works of fiction and ancient stories as sources, neglecting the heroic poems which would have shown him the nobler aspects of this institution so soon corrupted by "courteous" manners; a second edition appeared at the time of his death (3 vols. 1781, 3rd ed. 1826). He prepared an edition of the works of Eustache Deschamps, which was never published, and also made a collection of more than a hundred volumes of extracts from ancient authors relating to French antiquities and the French language of the middle ages. His *Glossaire de la langue française* was ready in 1756, and a prospectus had been published, but the great length of the work prevented him finding a publisher. It remained in manuscript for more than a century. In 1764 a collection of his manuscripts was bought by the government and after his death were placed in the king's library; they are still there (fonds Moreau), with the exception of some which were given to the marquess of Paulmy in exchange, and were later placed in the Arsenal. Lacurne de Sainte-Palaye ceased work about 1771; the death of his brother was greatly felt by him, he became childish, and died on the 1st of March 1781.

Sainte-Palaye had been a member of the Académie Française since 1758. His life was written for this *Académie* by Chamfort and for the Académie des Inscriptions by Dupuy; both works are of no value. See, however, the biography of Lacurne, with a list of his published works and those in manuscript, at the beginning of the tenth and last volume of the *Dictionnaire historique de l'ancien langage françois, ou glossaire de la langue françoise depuis son origine jusqu'au siècle de Louis XIV.*, published by Louis Favre (1875–1882).

SAINTES, a town of western France, capital of an arrondissement in the department of Charente-Inférieure, 47 m. S.E. of La Rochelle by the railway from Nantes to Bordeaux. Pop. (1906), town, 13,744; commune, 19,025. Saintes is pleasantly situated on the left bank of the Charente, which separates it from its suburb of Les Dames. It is of interest for its Roman remains, of which the best preserved is the triumphal arch of Germanicus, dating from the reign of Tiberius. This formerly stood on a Roman bridge destroyed in 1843, when it was removed and reconstructed on the right bank of the river. Ruins of baths and of an amphitheatre are also to be seen. The amphitheatre, larger than that of Nîmes, and in area surpassed only by the Coliseum, dates probably from the close of the 1st or the beginning of the 2nd century and was capable of holding 20,000 spectators. A Roman building known as the Capitol was destroyed after the capture of the town from the English by Charles of Alençon, brother of Philip of Valois, in 1330, and its site is occupied by a hospital. Saintes was a bishop's see till 1790; the cathedral of St Peter, built in the first half of the 12th century, was rebuilt in the 15th century, and again after it had been almost destroyed by the Huguenots in 1568. The interior has now an unattractive appearance. The tower (15th century) is 236 ft. high. The church of St Eutropius (founded at the close of the 6th century, rebuilt in the 11th, and had its nave destroyed in the Wars of Religion) stands above a very interesting well-lighted crypt—the largest in France after that of Chartres—adorned with richly sculptured capitals and containing the tomb of St Eutropius (4th or 5th century). The fine stone spire dates from the 15th century. Notre-Dame, a splendid example of the architecture of the 11th and 12th centuries, with a noble clock-tower, is no longer devoted to religious purposes. The old hôtel de ville (16th and 18th centuries) contains a library, and the present hôtel de ville a museum. Bernard Palissy, the porcelain-maker, has a statue in the town, where he lived from 1542 to 1562. Small vessels ascend the river as far as Saintes, which carries on trade in grain, brandy and wine, has iron foundries, works of the state railway, and manufactures earthenware, tiles, &c.

Saintes (*Mediolanum* or *Mediolanium*), the capital of the Santones, was a flourishing town before Caesar's conquest of Gaul; in the middle ages it was capital of the Saintonge. Christianity was introduced by St Eutropius, its first bishop, in the middle of the 3rd century. Charlemagne rebuilt its cathedral. The Normans burned the town in 845 and 854. Richard Cœur de Lion fortified himself within its walls against his father Henry II., who captured it after a destructive siege. In 1242 St Louis defeated the English under its walls and was received into the town. It was not, however, till the reign of Charles V. that Saintes was permanently recovered from the English. The Protestants did great damage during the Wars of Religion.

ST ÉTIENNE, an industrial town of east-central France, capital of the department of Loire, 310 m. S.S.E. of Paris and 36 m. S.S.W. of Lyons by rail. Pop. (1906), town, 130,940; commune, 146,788. St Étienne is situated on the Furens, which flows through it from S.E. to N.W., partly underground, and is an important adjunct to the silk manufacture. The town is uniformly built, its principal feature being the straight thoroughfare nearly 4 m. long which traverses it from N. to S. The chief of the squares is the Place Marengo, which has a statue of F. Garnier, the explorer, and is overlooked by the town hall and the prefecture, both modern. The church of St Étienne dates from the 15th century, and the Romanesque church of the abbey of Valbenoîte is on the S.E. outskirts of the town. A valuable collection of arms and armour, a picture gallery, industrial collections, and a library with numerous manuscripts are in the Palais des Arts. St Étienne is the seat of a prefect, and has an important school of mining, and schools of music, chemistry and dyeing, &c.

The town owes its importance chiefly to the coal-basin which extends between Firminy and Rive-de-Gier over an area 20 m. long by 5 m. wide, and is second only to those of Nord and Pas-de-Calais in France. There are concessions giving employment to some 18,000 workmen and producing annually between 3,000,000 and 4,000,000 tons. The mineral is of two kinds—smelting coal, said to be the best in France, and gas coal. There are manufactures of ribbons, trimmings and other goods made from silk and mixtures of cotton and silk. This industry dates from the early 17th century, is carried on chiefly in small factories (electricity supplying the motive power), and employs at its maximum some 50,000 hands. The attendant industry of dyeing is carried on on a large scale. The manufacture of steel and iron and of heavy iron goods such as armour-plating occupies about 3000 workmen, and about half that number are employed in the production of ironmongery generally. Weaving machinery, cycles, automobiles and agricultural implements are also made. The manufacture of fire-arms, carried on at the national factory under the direction of artillery officers, employs at busy times more than 10,000 men, and can turn out 480,000 rifles in the year. Private firms, employing 4500 hands, make both military rifles and sporting-guns, revolvers, &c. To these industries must be added the manufacture of elastic fabrics, glass, cartridges, liqueurs, hemp-cables, &c.

At the close of the 12th century St Étienne was a parish of the Pays de Gier belonging to the abbey of Valbenoîte. By the middle of the 14th century the coal trade had reached a certain development, and at the beginning of the 15th century Charles VII. permitted the town to erect fortifications. The manufacture of fire-arms for the state was begun at St Étienne under Francis I. and was put under the surveillance of state inspectors early in the 18th century. In 1789 the town was producing at the rate of 12,000 muskets per annum; between September 1794 and May 1796 they delivered over 170,000; and 100,000 was the annual average throughout the period of the empire. The first railways opened in France were the line between St Étienne and Andrézieux on the Loire in 1828 and that between St Étienne and Lyons in 1831. In 1856 St Étienne became the administrative centre of the department instead of Montbrison.

ST EUSTATIUS and **SABA,** two islands in the Dutch West Indies. St Eustatius lies 12 m. N.W. of St Kitts in 17° 50′ N. and 62° 40′ W. It is 8 sq. m. in area and is composed of several volcanic hills and intervening valleys. It contains Orangetown, situated on an open roadstead on the W., with a small export trade in yams and sweet potatoes. Pop. (1908) 1283.

A few miles to the N.W. is the island of SABA, 5 sq. m. in extent. It consists of a single volcanic cone rising abruptly from the sea to the height of nearly 2800 ft. The town, Bottom, standing on the floor of an old crater, can only be approached from the shore 800 ft. below, by a series of steps cut in the solid rock and known as the "Ladder." The best boats in the Caribbees are built here; the wood is imported and the vessels, when complete, are lowered over the face of the cliffs. Pop. (1908) 2294. The islands form part of the colony of Curaçao (*q.v.*).

SAINT-ÉVREMOND, CHARLES DE MARGUETEL DE SAINT-DENIS, SEIGNEUR DE (1610–1703), was born at Saint-Denis-le-Guast, near Coutances, the seat of his family in Normandy, on the 1st of April 1610. He was a pupil of the Jesuits at the *Collège de Clermont* (now Louis-le-Grand), Paris; then a student at Caen. For a time he studied law at the *Collège d'Harcourt.* He soon, however, took to arms, and in 1629 went with Marshal Bassompierre to Italy. He served through great part of the Thirty Years' War, distinguishing himself at the siege of Landrecies (1637), when he was made captain. During his campaigns he studied the works of Montaigne and the Spanish and Italian languages. In 1639 he met Gassendi in Paris, and became one of his disciples. He was present at Rocroy, at Nordlingen, and at Lerida. For a time he was personally attached to Condé, but offended him by a satirical remark and was deprived of his command in the prince's guards in 1648. During the Fronde, Saint-Évremond was a steady royalist. The duke of Candale (of whom he has left a very severe portrait) gave him a command in Guienne, and Saint-Évremond, who had reached the grade of *maréchal de camp*, is said to have saved 50,000 livres in less than three years. He was one of the numerous victims involved in the fall of Fouquet. His letter to Marshal Créqui on the peace of the Pyrenees, which is said to have been discovered by Colbert's agents at the seizure of Fouquet's papers, seems a very inadequate cause for his disgrace. Saint-Évremond fled to Holland and to England, where he was kindly received by Charles II. and was pensioned. After James II.'s flight to France Saint-Évremond was invited to return, but he declined. Hortense Mancini, the most attractive of Mazarin's attractive group of nieces, came to England in 1670, and set up a *salon* for love-making, gambling and witty conversation, and here Saint-Évremond was for many years at home. He died on the 29th of September 1703 and was buried in Westminster Abbey, where his monument still is in Poet's Corner close to that of Prior.

Saint-Évremond never authorized the printing of any of his works during his lifetime, though Barbin in 1668 published an unauthorized collection. But he empowered Des Maizeaux to publish his works after his death, and they were published in London (2 vols., 1705), and often reprinted. His masterpiece in irony is the so-called *Conversation du maréchal d'Hocquincourt avec le père Canaye* (the latter a Jesuit and Saint-Évremond's master at school), which has been frequently classed with the *Lettres provinciales.*

His *Œuvres mêlées*, edited from the MSS. by Silvestre and Des Maizeaux, were printed by Jacob Tonson (London, 1705, 2 vols.; 2nd ed., 3 vols., 1709), with a notice by Des Maizeaux. His correspondence with Ninon de Lenclos, whose fast friend he was, was published in 1752; *La Comédie des académistes*, written in 1643, was printed in 1650. Modern editions of his works are by Hippeau (Paris, 1852), C. Giraud (Paris, 1865), and a selection (1881) with a notice by M. de Lescure.

ST FLORENTIN, a town of north-central France, in the department of Yonne, 37 m. S.E. of Sens on the Paris-Lyon-Méditerranée railway. Pop. (1906) 2303. It stands on a hill on the right bank of the Armance, half a mile from its confluence with the Armançon and the canal of Burgundy. In the highest part of the town stands the church, begun in the latter half of the 15th century, and though retaining the Gothic form, with great flying buttresses, is mainly in the Renaissance style. It is approached through a narrow alley up a steep flight of steps, and contains a fine Holy Sepulchre in bas-relief and a choir-screen and stained glass of admirable Renaissance workmanship. The nave, left incomplete, was restored and finished between 1857 and 1862. The market-gardens of St Florentin produce large quantities of asparagus. The town stands on the site of the Roman military post *Castrodunum*, the scene of the martyrdom in the 3rd century of Saints Florentin and Hilaire, round whose tomb it grew up. The abbey established here in the 9th century afterwards became a priory of the abbey of St Germain at Auxerre. The town and its territory belonged, under the Merovingians, to Burgundy, and in later times to the counts of Champagne, from whom it passed to the kings of France. Louis XV. raised it from the rank of viscounty to that of county and bestowed it on Louis Phelypeaux, afterwards Duc de la Vrillière.

ST FLOUR, a town of south-central France, capital of an arrondissement in the department of Cantal, situated at a height of 2900 ft. on a basaltic plateau overlooking the Lander, a tributary of the Truyère, 47 m. E.N.E. of Aurillac by rail. Pop. (1906) 4090. The streets are dark and narrow, but the town has spacious promenades established in the 18th century. St Flour grew up round the tomb of St Florus, the apostle of Auvergne, who died there in the 4th century. The abbey founded there about the beginning of the 11th century became in 1317 an episcopal chapter, and the town is still the seat of a bishopric. The cathedral (1396–1466) is the principal building. The manufacture of coarse woollen fabrics, of earthenware and candles is carried on. A few miles S.E. of the town the gorge of the Truyère is spanned by the fine railway viaduct of Garabit over 600 yds. long and at a height of 400 ft. above the river.

ST GALL (Ger. *St Gallen*), one of the cantons of north-east Switzerland, on the border of the Austrian province of the Vorarlberg and of the independent principality of Liechtenstein. It entirely surrounds the canton of Appenzell, which, like a great part of this canton, formerly belonged to the abbots of St Gall, while the "enclave" of Horn is in the canton of Thurgau.

Its area is 779·3 sq. m., of which 710·1 sq. m. are reckoned "productive," forests covering 157·1 sq. m. and vineyards 1·8 sq. m., while of the remainder 2·8 sq. m. are occupied by glaciers. The altitude above the sea-level varies from 1306 ft. (the lake of Constance) to 10,667 ft. (the Ringelspitz). The canton includes portions of the lake of Constance (21½ sq. m.), of the Walensee (rather over 7 sq. m.), and of the lake of Zürich (4 sq. m.), and several small lakes wholly within its limits. Hilly in its N. region, the height gradually increases towards the S. border, while to its S.W. and E. extend considerable alluvial plains on the banks of the Linth and of the Rhine. The two rivers just named form in part its frontiers, the principal stream within the canton being the Thur (as regards its upper course), with the middle reach of its principal affluent, the Sitter, both forming part of the Rhine basin. It has ports on the lake of Constance (Rorschach) and of Zürich (Rapperswil), as well as Weesen and Walenstadt on the Walensee, while the watering place of Ragatz (*q.v.*) is supplied with hot mineral waters from Pfäfers. The main railway lines from Zürich past Sargans for Coire, and from Sargans past Altstätten and Rorschach for Constance, skirt its borders, while the capital is on the direct railway line from Zürich past Wil to Rorschach, and communicates by rail with Appenzell and with Frauenfeld. In 1900 the population of the canton was 250,285, of whom 243,358 were German-speaking, 5300 Italian-speaking and 710 French-speaking, while there were 150,412 "Catholics" (whether

Roman or "Old"), 99,114 Protestants and 556 Jews (mostly in the town of St Gall). Its capital is St Gall, the other most populous places being Tablat (pop. 12,590), Rorschach (9140), Altstätten (8724), Straubenzell (8090), Gossau (6055) and Wattwil (4971). In the southern and more Alpine portion of the canton the inhabitants mainly follow pastoral pursuits. In 1896 the number of "alps" or mountain pastures in the canton amounted to 304, capable of supporting 21,744 cows, and of an estimated total value of nearly 14 million francs. In the central and northern regions agriculture is generally combined with manufactures.

The canton is one of the most industrial in Switzerland. Cotton-spinning is widely spread, though cloth-weaving has declined. But the characteristic industry is the manufacture, mostly by machines, of muslin, embroidery and lace. It is reckoned that the value of the embroideries and lace exported from the canton amounts to about one-seventh of the total value of the exports from Switzerland. The canton is divided into fifteen administrative districts, which comprise ninety-three communes.

The existing constitution dates from 1890. The legislature or *Grossrat* is elected by the communes, each commune of 1500 inhabitants or less having a right to one member, and as many more as the divisor 1500, or fraction over 750, justifies. Members hold office for three years. For the election of the seven members of the executive or *Regierungsrat*, who also hold office for three years, all the communes form a single electoral circle. The two members of the federal *Ständerat* are named by the legislature, while the thirteen members of the federal *Nationalrat* are chosen by a popular vote. The right of "facultative referendum" or of "initiative" as to legislative projects belongs to any 4000 citizens, but in case of the revision of the cantonal constitution 10,000 must sign the demand. The canton of St Gall was formed in 1803 and was augmented by many districts that had belonged since 1798 to the canton Linth or Glarus—the upper Toggenburg, Sargans (held since 1483 by the Swiss), Gaster and Uznach (belonging since 1438 to Schwyz and Glarus), Gams (since 1497 the property of the same two members), Werdenberg (owned by Glarus since 1517), Sax (bought by Zürich in 1615), and Rapperswil (since 1712 under the protection of Zürich, Bern and Glarus).

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ST GALL, capital of the Swiss canton of that name, is situated in the upland valley of the Steinach, 2195 ft. above the sea-level. It is by rail 9 m. S.W. of Rorschach, its port on the lake of Constance, and 53 m. E. of Zürich. The older or central portion of the town retains the air of a small rural capital, but the newer quarters present the aspect of a modern commercial centre. At either extremity considerable suburbs merge in the neighbouring towns of Tablat and of Straubenzell. Its chief building is the abbey church of the celebrated old monastery. This has been a cathedral church since 1846. In its present form it was constructed in 1756–1765. The famous library is housed in the former palace of the abbot, and is one of the most renowned in Europe by reason of its rich treasures of early MSS. and printed books. Other portions of the monastic buildings are used as the offices of the cantonal authorities, and contain the extensive archives both of this monastery and of that of Pfäfers. The ancient churches of St Magnus (Old Catholics) and of St Lawrence (Protestant) were restored in the 19th century. The town library, which is rich in Reformation and post-Reformation MSS. and books, is in the buildings of the cantonal school. The museum contains antiquarian, historical and natural history collections, while the new museum of industrial art has an extensive collection of embroideries of all ages and dates. There are a number of fine modern buildings, such as the Bourse. The town is the centre of the Swiss muslin, embroidery and lace trade. About 10,000 persons were in 1900 occupied in and near the town with the embroidery industry, and about 49,000 in the canton. Cold and fogs prevail in winter (though the town is protected against the north wind), but the heat in summer is rarely intense. In 1900 the population was 33,116 (having just doubled since 1870), of whom almost all were German-speaking, while the Protestants numbered 17,572, the Catholics (Roman or "Old") 15,006 and the Jews 419.

The town of St Gall owes its origin to St Gall, an Irish hermit, who in 614, built his cell in the thick forest which then covered the site of the future monastery, and lived there, with a few companions, till his death in 640. Many pilgrims later found their way to his cell, and about the middle of the 8th century the collection of hermits' dwellings was transformed into a regularly organized Benedictine monastery. For the next three centuries this was one of the chief seats of learning and education in Europe. About 954 the monastery and its buildings were surrounded by walls as a protection against the Saracens, and this was the origin of the town. The temporal powers of the abbots vastly increased, while in the 13th century the town obtained divers privileges from the emperor and from the abbot, who about 1205 became a prince of the Empire. In 1311 St Gall became a free imperial city, and about 1353 the gilds, headed by that of the cloth-weavers, obtained the control of the civic government, while in 1415 it bought its liberty from the German king Sigismund. This growing independence did not please the abbot, who struggled long against it and his rebellious subjects in Appenzell, which formed the central portion of his dominions. After the victory of the Appenzellers at the battle of the Stoss (1405) they became (1411) "allies" of the Swiss confederation, as did the town of St Gall a few months later, this connexion becoming an "everlasting" alliance in 1454, while in 1457 the town was finally freed from the abbot. The abbot, too, became (in 1451) the ally of Zürich, Lucerne, Schwyz and Glarus. In 1468 he bought the county of the Toggenburg from the representatives of its counts, a family which had died out in 1436, and in 1487 built a monastery above Rorschach as a place of refuge against the turbulent citizens, who, however, destroyed it in 1489. The Swiss intervened to protect the abbot, who (1490) concluded an alliance with them which reduced his position almost to that of a "subject district." The townsmen adopted the Reformation in 1524, and this new cause of difference further envenomed their relations with the abbots. Both abbot and town were admitted regularly to the Swiss diet, occupying a higher position than the rest of the "allies" save Bienne, which was on the same footing. But neither succeeded in its attempts to be received a full member of the Confederation, the abbot being too much like a petty monarch and at the same time a kind of "subject" already, while the town could not help much in the way of soldiers. In 1798 and finally in 1805 the abbey was secularized, while out of its dominions (save the Upper Toggenburg, but with the Altstätten district, held since 1490 by the Swiss) and those of the town the canton Säntis was formed, with St Gall as capital. (W. A. B. C.)

SAINT-GAUDENS, AUGUSTUS (1848–1907), American sculptor, was born in Dublin, Ireland, of a French father (a shoemaker by trade), and an Irish mother, Mary McGuinness, on the 1st of March 1848, and was taken to America in infancy. He was apprenticed to a cameo-cutter, studying in the schools of the Cooper Union (1861) and the National Academy of Design, New York (1865–1866). His earliest work in sculpture was a bronze bust (1867) of his father, Bernard P. E. Saint-Gaudens. In 1868 he went to Paris and became a pupil of Jouffroy in the École des Beaux-Arts. Two years later, with his fellow-student Mercié, he went to Italy, where he spent three years. At Rome he executed his statues "Hiawatha" and "Silence." He then settled in New York. In 1874 he made a bust of the statesman, William M. Evarts, and was commissioned to execute a large relief for St Thomas's Church, New York, which brought him into prominence. His statue of Admiral Farragut, Madison Square, New York, was commissioned in 1878, exhibited at the Paris Salon in 1880 and completed in 1881. It immediately brought the sculptor widespread fame, which was increased by his statue of Lincoln (unveiled 1887), for Lincoln Park, Chicago. In Springfield, Mass., is his "Deacon Chapin," known as "The Puritan." His figure of "Grief" (also known as "Death" and "The Peace of God") for the Adams (Mrs Henry Adams) Memorial, in Rock Creek Cemetery, Washington, D.C., has been described as "an idealization complete and absolute, the rendering of a simple, natural fact—a woman in grief—yet with such deep and embracing comprehension that the individual is magnified into a type." His Shaw Memorial in Boston, a monument to Robert G. Shaw, colonel of a negro regiment in the Civil War, was undertaken in 1884 and completed in 1897; it is a relief in bronze, 11 ft. by 15, containing many figures of soldiers, led by their young officer on horseback, a female figure in the clouds pointing onward. In 1903 was unveiled his equestrian statue (begun in 1892) to General Sherman, at 59th street and Fifth avenue, New York; preceding the Union commander is a winged figure of "Victory." This work, with others, formed a group at the Paris Exposition of 1900. A bronze copy of his "Amor Caritas" is in the Luxembourg, Paris. Among his other works are relief medallion portraits of Robert Louis Stevenson (in St Giles's Cathedral, Edinburgh) and the French painter Jules Bastien-Lepage; Garfield Memorial, Fairmount Park, Philadelphia; General Logan, Chicago; the Peter Cooper Memorial; and Charles Stewart Parnell in Dublin. Saint-Gaudens was made an officer of the Legion of Honour and corresponding member of the Institute of France. He died at Cornish, N.H., on the 3rd of August 1907. His monument of Phillips Brooks for Boston was left practically completed. Saint-Gaudens is rightly regarded as the greatest sculptor produced by America, and his work had a most powerful influence on art in the United States. In 1877 he married Augusta F. Homer and left a son, Homer Saint-Gaudens. His brother Louis (b. 1854), also a sculptor, assisted Augustus Saint-Gaudens in some of his works.

See Royal Cortissoz, *Augustus Saint-Gaudens* (1907); Lorado Taft, *History of American Sculpture* (1903), containing two chapters devoted to Saint-Gaudens; Kenyon Cox, *Old Masters and New* (1905); C. Lewis Hind, *Augustus Saint-Gaudens* (1908).

ST GAUDENS, a town of south-western France, capital of an arrondissement in the department of Haute-Garonne, 1 m. from the left bank of the Garonne, 57 m. S.S.W. of Toulouse, on the railway to Tarbes. Pop. (1906), town, 4535; commune, 7120. The church, once collegiate, dates chiefly from the 11th and 12th centuries, but the main entrance is in the flamboyant Gothic style. The town has sawing-, oil- and flour-mills, manufactures woollen goods, and is a market for horses, sheep and agricultural produce. St Gaudens derives its name from a martyr of the 5th century, at whose tomb a college of canons was afterwards established. It was important as capital of the Nébouzan, as the residence of the bishops of Comminges and for its cloth industry.

SAINT-GELAIS, MELIN DE (1487–1558), French poet, was born at Angoulême on the 3rd of November 1487. He was the natural son of Octavien de St Gelais (1466–1502), afterwards bishop of Angoulême, himself a poet who had translated the Aeneid into French. Melin, who had studied at Bologna and Padua, had the reputation of being doctor, astrologer and musician as well as poet. He returned to France in 1515, and soon gained favour at the court of Francis I. by his skill in light verse. He was made almoner to the Dauphin, abbot of Reclus in the diocese of Troyes and librarian to the king at Fontainebleau. He enjoyed immense popularity until the appearance of Du Bellay's *Deffense et illustration* . . . in 1549, where St Gelais was not excepted from the scorn poured on contemporary poets. He attempted to ridicule the innovators by reading aloud the Odes of Ronsard with burlesque emphasis before Henry II., when the king's sister, Margaret of Valois, seized the book and read them herself. Ronsard accepted Saint-Gelais's apology for this incident, but Du Bellay satirized the offender in the *Poète courtisan*. In 1554 he collaborated, perhaps with François Habert (1520–1574?), in a translation of the *Sophonisbe* of Trissino which was represented (1554) before Catherine de Medicis at Blois. Saint-Gelais was the champion of the *style marotique* and the earliest of French sonneteers. He died in 1558.

His *Œuvres* were edited in 1873 (3 vols., *Bibl. elzévirienne*) by Prosper Blanchemain.

SAINT-GEORGES, GEORGES HENRI VERNOY DE (1799–1875), French dramatist, was born in Paris on the 7th of November 1799. *Saint-Louis ou les deux dîners* (1823), a vaudeville written in collaboration with Alexandre Tardif, was followed by a series of operas and ballets. In 1829 he became manager of the Opéra Comique. Among his more famous libretti are: *Le Val d'Andorre* (1848) for Halévy, and *La Fille du régiment* (1840) for Donizetti. He wrote some fifty pieces in collaboration with Eugène Scribe, Adolphe de Leuven, or Joseph Mazillier, and a great number in collaboration with other authors. Among his novels may be mentioned *Un Mariage de prince*. Saint-Georges died in Paris on the 23rd of December 1875.

SAINT-GERMAIN, Comte de (*c.* 1710–*c.* 1780) called *der Wundermann*, a celebrated adventurer who by the assertion of his discovery of some extraordinary secrets of nature exercised considerable influence at several European courts. Of his parentage and place of birth nothing is definitely known; the common version is that he was a Portuguese Jew, but various surmises have been made as to his being of royal birth. It was also stated that he obtained his money, of which he had abundance, from acting as spy to one of the European courts. But this is hard to maintain. He knew nearly all the European languages, and spoke German, English, Italian, French (with a Piedmontese accent), Portuguese and Spanish. Grimm affirms him to have been the man of the best parts he had ever known. He was a musical composer and a capable violinist. His knowledge of history was comprehensive, and his accomplishments as a chemist, on which be based his reputation, were in many ways real and considerable. He pretended to have a secret for removing flaws from diamonds, and to be able to transmute metals. The most remarkable of his professed discoveries was of a liquid which could prolong life, and by which he asserted he had himself lived 2000 years. After spending some time in Persia, Saint-Germain is mentioned in a letter of Horace Walpole's as being in London about 1743, and as being arrested as a Jacobite spy and released. Walpole says: "He is called an Italian, a Spaniard, a Pole; a somebody that married a great fortune in Mexico and ran away with her jewels to Constantinople; a priest, a fiddler, a vast nobleman." At the court of Louis XV., where he appeared about 1748, he exercised for a time extraordinary influence and was employed on secret missions by Louis XV.; but, having interfered in the dispute between Austria and France, he was compelled in June 1760, on account of the hostility of the duke of Choiseul, to remove to England. He appears to have resided in London for one or two years, but was at St Petersburg in 1762, and is asserted to have played an important part in connexion with the conspiracy against the emperor Peter III. in July of that year, a plot which placed Catherine II. on the Russian throne. He then went to Germany, where, according to the *Mémoires authentiques* of Cagliostro, he was the founder of freemasonry, and initiated Cagliostro into that rite. He was again in Paris from 1770 to 1774, and after frequenting several of the German courts he took up his residence in Schleswig-Holstein, where he and the Landgrave Charles of Hesse pursued together the study of the "secret" sciences. He died at Schleswig in or about 1780–1785, although he is said to have been seen in Paris in 1789.

Andrew Lang in his *Historical Mysteries* (1904) discusses the career of Saint-Germain, and cites the various authorities for it. Saint-Germain figures prominently in the correspondence of Grimm and of Voltaire. See also Oettinger, *Graf Saint-German* (1846); F. Bülau, *Geheime Geschichten und räthselhafte Menschen*, Band i. (1850–1860); Lascelles Wraxall, *Remarkable Adventures* (1863); and U. Birch in the *Nineteenth Century* (January 1908).

SAINT-GERMAIN, CLAUDE LOUIS, Comte de (1707–1778), French general, was born on the 15th of April 1707, at the Château of Vertamboz. Educated at Jesuit schools, he intended to enter the priesthood, but at the last minute obtained from

Louis XV. an appointment as sub-lieutenant. He left France, according to the gossip of the time, because of a duel; served under the elector palatine; fought for Hungary against the Turks, and on the outbreak of the war of the Austrian Succession (1740) joined the army of the elector of Bavaria (who later became emperor under the name of Charles VII.), displaying such bravery that he was promoted to the grade of lieutenant field-marshal. He left Bavaria on the death of Charles VII., and after brief service under Frederick the Great joined Marshal Saxe in the Netherlands and was created a field-marshal of the French army. He distinguished himself especially at Lawfeld, Rancoux and Maastricht. On the outbreak of the Seven Years' War (1756) he was appointed lieutenant-general, and although he showed greater ability than any of his fellow-commanders and was admired by his soldiers, he fell a victim to court intrigues, professional jealousy and hostile criticism. He resigned his commission in 1760 and accepted an appointment as field-marshal from Frederick V. of Denmark, being charged in 1762 with the reorganization of the Danish army. On the death of Frederick in 1766 he returned to France, bought a small estate in Alsace near Lauterbach, and devoted his time to religion and farming. A financial crisis swept away the funds that he had saved from his Danish service and rendered him dependent on the bounty of the French ministry of war. Saint-Germain was presented at court by the reformers Turgot and Malesherbes, and was appointed minister of war by Louis XVI. on the 25th of October 1775. He sought to lessen the number of officers and to establish order and regularity in the service. His efforts to introduce Prussian discipline in the French army brought on such opposition that he resigned in September 1777. He accepted quarters from the king and a pension of 40,000 livres, and died in his apartment at the arsenal on the 15th of January 1778.

ST GERMAIN-EN-LAYE, a town of northern France, in the department of Seine-et-Oise, 13 m. W.N.W. of Paris by rail. Pop. (1906), town, 14,974; commune, 17,288. Built on a hill on the left bank of the Seine, nearly 300 ft. above the river, and on the edge of a forest 10,000 to 11,000 acres in extent, St Germain has a bracing climate, which makes it a place of summer residence for Parisians. The terrace of St Germain, constructed by A. Lenôtre in 1672, is 1½ m. long and 100 ft. wide; it was planted with lime trees in 1745 and affords an extensive view over the valley of the Seine as far as Paris and the surrounding hills: it ranks as one of the finest promenades in Europe.

A monastery in honour of St Germain, bishop of Paris, was built in the forest of Laye by King Robert. Louis VI. erected a castle close by. Burned by the English, rebuilt by Louis IX., and again by Charles V., this castle did not reach its full development till the time of Francis I., who may be regarded as the real founder of the building. A new castle was begun by Henry II. and completed by Henry IV.; it was subsequently demolished, with the exception of the so-called Henry IV. pavilion, where Thiers died in 1877. The old castle has been restored to the state in which it was under Francis I. The restoration is particularly skilful in the case of the chapel, which dates from the first half of the 13th century. In the church of St Germain is a mausoleum erected by George IV. of England (and restored by Queen Victoria) to the memory of James II. of England, who after his deposition resided in the castle for twelve years and died there in 1701. In one of the public squares is a statue of Thiers. At no great distance in the forest is the Couvent des Loges, a branch of the educational establishment of the Legion of Honour (St Denis). The fête des Loges (end of August and beginning of September) is one of the most popular in the neighbourhood of Paris.

ST GERMANS, a small town in the Bodmin parliamentary division of Cornwall, England, pleasantly situated on the river Lynher, 9½ m. W. by N. of Plymouth by the Great Western railway. Pop. (1901) 2384. It contains a fine church dedicated to St Germanus. The west front is flanked by towers both of which are Norman in the lower parts, the upper part being in the one Early English and in the other Perpendicular. The front itself is wholly Norman, having three windows above a porch with a beautiful ornate doorway. Some Norman work remains in the body of the church, but the most part is Perpendicular or Decorated. Port Eliot, a neighbouring mansion, contains an excellent collection of pictures, notably several works of Sir Joshua Reynolds.

St Germans is supposed to have been the original seat of the Cornish bishopric. It was the see of Bishop Burhwold, who died in 1027. Under Leofric, who became bishop of Crediton and Cornwall in 1046, the see was removed to Exeter. Bishop Leofric founded a priory at St Germans and bestowed upon it twelve of the twenty-four hides which in the time of the Confessor constituted the bishops' manor of St Germans. There was then a market on Sundays, but at the time of the Domesday Survey this had been reduced to nothing owing to a market established by the count of Mortain on the same day at Trematon castle. In 1302 the grant of infangenethef, assize of bread and ale, waif and stray by Henry III. was confirmed to the bishop, who in 1311 obtained a further grant of a market on Fridays and a fair at the feast of St Peter ad Vincula. In 1343 the prior sustained his claim to a prescriptive market and fair at St Germans. After the suppression the borough belonging to the priory remained with the crown until 1610. Meanwhile Queen Elizabeth created it a parliamentary borough. From 1563 to 1832 it returned two members to the House of Commons. In 1815 John Eliot was created earl of St Germans, and in 1905 the first suffragan bishop of Truro was consecrated bishop of St Germans.

ST GILLES, a town of southern France, in the department of Gard, on the canal from the Rhone to Cette, 12½ m. S.S.E. of Nîmes by road. Pop. (1906) 5292. In the middle ages St Gilles, the ancient *Vallis Flaviana*, was the seat of an abbey founded towards the end of the 7th century by St Aegidius (St Gilles). It acquired wealth and power under the counts of Toulouse, who added to their title that of counts of St Gilles. The church, which survives, was founded in 1116 when the abbey was at the height of its prosperity. The lower part of the front (12th century) has three bays decorated with columns and bas-reliefs, and is the richest example of Romanesque art in Provence. The rest of the church is unfinished, only the crypt (12th century) and part of the choir, containing a spiral staircase, being of interest. Besides the church there is a Romanesque house serving as presbytery. The decadence of the abbey dates from the early years of the 13th century when the pilgrimage to the tomb of the saint became less popular; the monks also lost the patronage of the counts of Toulouse, owing to the penance inflicted by them on Raymond VI. in 1209 for the murder of the papal legate Pierre de Castelnau. St Gilles was the seat of the first grand priory of the Knights Hospitallers in Europe (12th century) and was of special importance as their place of embarkation for the East. In 1226 the countship of St Gilles was united to the crown. In 1562 the Protestants ravaged the abbey, which they occupied till 1622, and in 1774 it was suppressed.

ST GIRONS, a town of south-western France, capital of an arrondissement in the department of Ariège, 29 m. W. of Foix by rail. Pop. (1906) 5216. The town is situated on the Salat at the foot of the Pyrenees. There are mineral springs at Audinac in the vicinity, and the watering-place of Aulus, about 20 m. to the S.S.E., is reached by road from St Girons. St Lizier-de-Couserans (*q.v.*), an ancient episcopal town, is 1 m. N.N.W.

ST GOAR, a town of Germany, in the Prussian Rhine Province, on the left bank of the Rhine, opposite St Goarshausen and just below the famous Lorelei, 12 m. above Boppard by the railway from Coblenz to Mainz. Pop. (1905) 1475. It is in part surrounded by the ruins of its old walls, and contains an Evangelical church, with some Renaissance monuments, and a Roman Catholic church with an image of St Goar of Aquitania, around whose chapel the place originally arose. Below the town, high on an eminence above the Rhine, stands Schloss Rheinfels, the property of the king of Prussia, the most perfect of the feudal castles on the banks of the river. In the later middle ages St Goar was the capital of the county of Katzenelnbogen, and on the extinction of this family it passed to Hesse-Cassel. It came into the possession of Prussia in 1815.

ST GOTTHARD PASS, the principal route from northern Europe to Italy. It takes its name (it is not known wherefore) from St Gotthard, bishop of Hildesheim (d. 1038), but does not seem to be mentioned before the early 13th century, perhaps because the access to it lies through two very narrow Alpine valleys, much exposed to avalanches. The hospice on the summit is first mentioned in 1331, and from 1683 onwards was in charge of two Capuchin friars. But in 1775 the buildings near it were damaged by an avalanche, while in 1799–1800 everything was destroyed by the French soldiery. Rebuilt in 1834, the hospice was burnt in March 1905. The mule path (dating from about 1293) across the pass served for many centuries, for though Mr Greville, in 1775, succeeded in taking a light carriage across, the carriage-road was only constructed between 1820 and 1830. Now the pass is deserted in favour of the great tunnel (pierced in 1872–1880, 9¼ m. in length, and attaining a height of 3786 ft.), through which runs the railway (opened in 1882) from Lucerne to Milan (175½ m.), one of the greatest engineering feats of the 19th century. It runs mainly along the eastern shore of the Lake of Lucerne, from Lucerne to Flüelen (32¼ m.), and then up the Reuss valley past Altdorf and Wassen, near which is the first of the famous spiral tunnels, to Goeschenen (56 m. from Lucerne). Here the line leaves the Reuss valley to pass through the tunnel and so gain, at Airolo, the valley of the Ticino or the Val Leventina, which it descends, through several spiral tunnels, till at Biasca (38 m. from Goeschenen) it reaches more level ground. Thence it runs past Bellinzona to Lugano (30½ m. from Biasca) and reaches Italian territory at Chiasso, 35 m. from Milan. In 1909 the Swiss government exercised the right accorded to it by the agreement of 1879 of buying the St Gotthard Railway from the company which built it within thirty years of that date. (W. A. B. C.)

ST HELENA, an island and British possession in the South Atlantic in 15° 55′ 26″ S., 5° 42′ 30″ W. (Ladder Hill Observatory). It lies 700 m. S.E. of the island of Ascension (the nearest land), 1200 m. W. of Mossamedes (the nearest African port), 1695 N.W. of Cape Town, and is distant from Southampton 4477 m. It has an area of about 47 sq. m., the extreme length from S.W. to N.E. being 10¼ m. and the extreme breadth 8¼. The island is of volcanic formation, but greatly changed by oceanic abrasion and atmospheric denudation. Its principal feature, a semicircular ridge of mountains, open towards the south-east and south, with the culminating summit of Diana's Peak (2704 ft.) is the northern rim of a great crater; the southern rim has disappeared, though its débris apparently keeps the sea shallow (from 20 to 50 fathoms) for some 2 m. S.E. of Sandy Bay, which hypothetically forms the centre of the ring. From the crater wall outwards water-cut gorges stretch in all directions, widening as they approach the sea into valleys, some of which are 1000 ft deep, and measure one-eighth of a mile across at bottom and three-eighths across the top (Melliss). These valleys contain small streams, but the island has no rivers properly so called. Springs of pure water are, however, abundant. Along the enclosing hillsides caves have been formed by the washing out of the softer rocks. Basalts, andesites and phonolites, represent the chief flows. Many dikes and masses of basaltic rock seem to have been injected subsequently to the last volcanic eruptions from the central crater. The Ass's Ears and Lot's Wife, picturesque pinnacles standing out on the S.E. part of the crater ridge, and the Chimney on the coast south of Sandy Bay, are formed out of such injected dikes and masses. In the neighbourhood of Man and Horse (S.W. corner of the island), throughout an area of about 40 acres, scarcely 50 sq. yds. exist not crossed by a dyke. On the leeward (northern) side of St Helena the sea-face is generally formed by cliffs from 600 to 1000 ft. high, and on the windward side these heights rise to about 2000 ft., as at Holdfast Tom, Stone Top and Old Joan Point. The only practicable landing-place is on the leeward side at St James's Bay—an open roadstead. From the head of the bay a narrow valley extends for 1½ m. The greatest extent of level ground is in the N.E. of the island, where are the Deadwood and Longwood plains, over 1700 ft. above the sea.

Climate.—Although it lies within the tropics the climate of the island is healthy and temperate. This is due to the south-east trade-wind, constant throughout the year, and to the effect of the cold waters of the South Atlantic current. As a result the temperature varies little, ranging on the sea level from 68° to 84° in summer and 57° to 70° in winter. The higher regions are about 10° cooler. The rainfall varies considerably, being from 30 to 50 in. a year in the hills.

Flora.—St Helena is divided into three vegetation zones: (1) the coast zone, extending inland for 1 m. to 1½ m., formerly clothed with a luxuriant vegetation, but now "dry, barren, soilless, lichen-coated, and rocky," with little save prickly pears, wire grass and *Mesembryanthemum*; (2) the middle zone (400-1800 ft.), extending about three-quarters of a mile inland, with shallower valleys and grassier slopes—the English broom and gorse, brambles, willows, poplars, Scotch pines, &c., being the prevailing forms; and (3) the central zone, about 3 m. long and 2 m. wide, the home, for the most part, of the indigenous flora. According to W. B. Hemsley (in his report on the botany of the Atlantic Islands),[1] the certainly indigenous species of plants are 65, the probably indigenous 24 and the doubtfully indigenous 5; total 94. Of the 38 flowering plants 20 are shrubs or small trees. With the exception of *Scirpus nodosus*, all the 38 are peculiar to the island; and the same is true of 12 of the 27 vascular cryptogams (a remarkable proportion). Since the flora began to be studied, two species—*Melhania melanoxylon* and *Acalypha rubra*—are known to have become extinct; and at least two others have probably shared the same fate—*Heliotropium pennifolium* and *Demazeria obliterata*. *Melhania melanoxylon*, or "native ebony," once abounded in parts of the island now barren; but the young trees were allowed to be destroyed by the goats of the early settlers, and it is now extinct. Its beautiful congener *Melhania erythroxylon* ("redwood") was still tolerably plentiful in 1810, but is now reduced to a few specimens. Very rare, too, has become *Pelargonium cotyledonis*, called "Old Father Live-for-ever," from its retaining vitality for months without soil or water. *Commidendron robustum* ("gumwood"), a tree about 20 ft. high, once the most abundant in the island, was represented in 1868 by about 1300 or 1400 examples; and *Commidendron rugosum* ("scrubwood") is confined to somewhat limited regions. Both these plants are characterized by a daisy- or aster-like blossom. The affinities of the indigenous flora of St Helena were described by Sir Joseph Hooker as African, but George Bentham points out that the *Compositae* shows, at least in its older forms, a connexion rather with South America. The exotic flora introduced from all parts of the world gives the island almost the aspect of a botanic garden. The oak, thoroughly naturalized, grows alongside of the bamboo and banana. Among other trees and plants are the common English gorse; *Rubus pinnatus*, probably introduced from Africa about 1775; *Hypochaeris radicata*, which above 1500 ft. forms the dandelion of the country; the beautiful but aggressive *Buddleia Madagascariensis*; *Physalis peruviana*; the common castor-oil plant; and the pride of India. The peepul is the principal shade tree in Jamestown, and in Jamestown valley the date-palm grows freely. Orange and lemon trees, once common, are now scarce.

Fauna.—St Helena possesses no indigenous vertebrate land fauna. The only land groups well represented are the beetles and the land shells. T. V. Wollaston, in *Coleoptera Sanctae Helenae* (1877), shows that out of a total list of 203 species of beetles 129 are probably aboriginal and 128 peculiar to the island—an individuality perhaps unequalled in the world. More than two-thirds are weevils and a vast majority wood-borers, a fact which bears out the tradition of forests having once covered the island. The *Hemiptera* and the land-shells also show a strong residuum of peculiar genera and species. A South American white ant (*Termes tenuis*, Hagen.), introduced from a slave-ship in 1840, soon became a plague at Jamestown, where it consumed a large part of the public library and the woodwork of many buildings, public and private. Practically everything had to be rebuilt with teak or cypress—the only woods the white ant cannot devour. Fortunately it cannot live in the higher parts of the island. The honey-bee, which throve for some time after its introduction, again died out (cf. A. R. Wallace, *Island Life*, 1880). Besides domestic animals the only land mammals are rabbits, rats and mice, the rats being especially abundant and building their nests in the highest trees. Probably the only endemic land bird is the wire bird, *Aegialitis sanctae Helenae*; the averdevat, Java sparrow, cardinal, ground-dove, partridge (possibly the Indian *chukar*), pheasant and guinea-fowl are all common. The pea-fowl, at one time not uncommon in a wild state, is long since exterminated. There are no freshwater fish, beetles or shells. Of sixty-five species of sea-fish caught off the island seventeen are peculiar to St Helena; economically the more important kinds are gurnard, eel, cod, mackerel, tunny, bullseye, cavalley, flounder, hog-fish, mullet and skulpin.

Inhabitants.—When discovered the island was uninhabited. The majority of the population are of mixed European (British, Dutch, Portuguese), East Indian and African descent—the Asiatic strain perhaps predominating; the majority of the early settlers having been previously members of the crews of ships returning to Europe from the East. From 1840 onward for a considerable period numbers of freed slaves of West African origin were settled here by men-of-war engaged in suppressing the slave trade. Their descendants form a distinct element in the population. Since the substitution of steamships for sailing vessels and the introduction of new methods of preserving meat and vegetables (which made it unnecessary for sailing vessels to take fresh provisions from St Helena to avoid scurvy) the population has greatly diminished. In 1871 there were 6444 inhabitants; in 1909 the civil population was estimated at 3553. The death-rate that year, 6·4 per 1000, was the lowest on record in the island. The only town, in which live more than half the total population, is Jamestown. Longwood, where Napoleon died in 1821, is 3½ m. E. by S. of Jamestown. In 1858 the house in which he lived and died was presented by Queen Victoria to Napoleon III., who had it restored to the condition, but unfurnished, in which it was at the time of Bonaparte's death.

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[1] In the "Challenger" expedition reports, *Botany*, vol. i. (1885).

Agriculture, Industries, &c.—Less than a third of the area of the island is suitable for farming, while much of the area which might be (and formerly was) devoted to raising crops is under grass. The principal crop is potatoes, which are of very good quality. They were chiefly sold to ships—especially to "passing" ships. They are now occasionally exported to the Cape. Cattle and sheep were raised in large numbers when a garrison was maintained, so that difficulty has been found in disposing of surplus stock now that the troops have been withdrawn. The economic conditions which formerly prevailed were entirely altered by the substitution of steamers for sailing vessels, which caused a great decrease in the number of ships calling at Jamestown. A remedy was sought in the establishment of industries. An attempt made in 1869–1872 to cultivate cinchona proved unsuccessful. Attention was also turned to the aloe (*Furcraea gigantea*), which grows wild at mid elevations, and the New Zealand flax (*Phormium tenax*), an introduced plant, for their utilization in the manufacture of fibre. From 1875 to 1881 a company ran a mill at which they turned out both aloe and flax fibre, but the enterprise proved unremunerative. In 1907 the government, aided by a grant of £4070 from the imperial exchequer, started a mill at Longwood for the manufacture of phormium fibre, with encouraging results. Fish curing and lace making are also carried on to some extent.

Trade is chiefly dependent upon the few ships that call at Jamestown—now mostly whalers or vessels in distress. There is also some trade with ships that "pass" without "calling."[1] In thirty years (1877–1907) the number of ships "calling" at the port sank from 664 with 449,724 tonnage to 57 with 149,182 tonnage. In the last-named year the imports were valued at £35,614; the exports (excluding specie) at £1787—but the goods supplied to "passing" vessels do not figure in these returns. In 1908 fibre and tow (valued at £3557) were added to the exports, and in 1909 a good trade was done with Ascension in sheep. St Helena is in direct telegraphic communication with Europe and South Africa, and there is a regular monthly mail steamship service.

Government, Revenue, &c.—St Helena is a Crown colony. The island has never had any form of local legislative chamber, but the governor (who also acts as chief justice) is aided by an executive council. The governor alone makes laws, called ordinances, but legislation can also be effected by the Crown by order in council. The revenue, £10,287 in 1905, had fallen in 1909 to £8778 (including a grant in aid of £2500), the expenditure in each of the five years (1905–1909) being in excess of the revenue. Elementary education is provided in government and private schools. St Helena is the seat of an Anglican bishopric established in 1859. Ascension and Tristan da Cunha are included in the diocese.

History.—The island was discovered on the 21st of May 1502 by the Portuguese navigator João de Nova, on his voyage home from India, and by him named St Helena. The Portuguese found it uninhabited, imported live stock, fruit-trees and vegetables, built a chapel and one or two houses, and left their sick there to be taken home, if recovered, by the next ship, but they formed no permanent settlement. Its first known permanent resident was Fernando Lopez, a Portuguese in India, who had turned traitor and had been mutilated by order of Albuquerque. He preferred being marooned to returning to Portugal in his maimed condition, and was landed at St Helena in 1513 with three or four negro slaves. By royal command he visited Portugal some time later, but returned to St Helena, where he died in 1546. In 1584 two Japanese ambassadors to Rome landed at the island. The first Englishman known to have visited it was Thomas Cavendish, who touched there in June 1588 during his voyage round the world. Another English seaman, Captain Kendall, visited St Helena in 1591, and in 1593 Sir James Lancaster stopped at the island on his way home from the East. In 1603 the same commander again visited St Helena on his return from the first voyage equipped by the East India Company. The Portuguese had by this time given up calling at the island, which appears to have been occupied by the Dutch about 1645. The Dutch occupation was temporary and ceased in 1651, the year before they founded Cape Town. The British East India Company appropriated the island immediately after the departure of the Dutch, and they were confirmed in possession by a clause in their charter of 1661. The company built a fort (1658), named after the duke of York (James II.), and established a garrison in the island. In 1673 the Dutch succeeded in obtaining possession, but were ejected after a few months' occupation. Since that date St Helena has been in the undisturbed possession of Great Britain, though in 1706 two ships anchored off Jamestown were carried off by the French. In 1673 the Dutch had been expelled by the forces of the Crown, but by a new charter granted in December of the same year the East India Company were declared "the true and absolute lords and proprietors" of the island. At this time the inhabitants numbered about 1000, of whom nearly half were negro slaves. In 1810 the company began the importation of Chinese from their factory at Canton. During the company's rule the island prospered, thousands of homeward-bound vessels anchored in the roadstead in a year, staying for considerable periods, refitting and revictualling. Large sums of money were thus expended in the island, where wealthy merchants and officials had their residence. The plantations were worked by the slaves, who were subjected to very barbarous laws until 1792, when a new code of regulations ensured their humane treatment and prohibited the importation of any new slaves. Later it was enacted that all children of slaves born on or after Christmas Day 1818 should be free, and between 1826 and 1836 all slaves were set at liberty.

Among the governors appointed by the company to rule at St Helena was one of the Huguenot refugees, Captain Stephen Poirier (1697–1707), who attempted unsuccessfully to introduce the cultivation of the vine. A later governor (1741–1742) was Robert Jenkin (*q.v.*) of "Jenkin's ear" fame. Dampier visited the island twice, in 1691 and 1701; Halley's Mount commemorates the visit paid by the astronomer Edmund Halley in 1676–1678—the first of a number of scientific men who have pursued their studies on the island.

In 1815 the British government selected St Helena as the place of detention of Napoleon Bonaparte. He was brought to the island in October of that year and lodged at Longwood, where he died in May 1821. During this period the island was strongly garrisoned by regular troops, and the governor, Sir Hudson Lowe, was nominated by the Crown. After Napoleon's death the East India Company resumed full control of St Helena until the 22nd of April 1834, on which date it was in virtue of an act passed in 1833 vested in the Crown. As a port of call the island continued to enjoy a fair measure of prosperity until about 1870. Since that date the great decrease in the number of vessels visiting Jamestown has deprived the islanders of their principal means of subsistence. When steamers began to be substituted for sailing vessels and when the Suez Canal was opened (in 1869) fewer ships passed the island, while of those that still pass the greater number are so well found that it is unnecessary for them to call (see also § *Inhabitants*). The withdrawal in 1906 of the small garrison, hitherto maintained by the imperial government, was another cause of depression. During the Anglo-Boer war of 1899–1902 some thousands of Boer prisoners were detained at St Helena, which has also served as the place of exile of several Zulu chiefs, including Dinizulu.

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[1] "Calling" ships are those which have been boarded by the harbour master and given pratique. Since 1886 boatmen are allowed to communicate with ships that have not obtained pratique, and these are known as "passing" ships.

(London, 1816); *Extracts from the St Helena Records from 1673 to 1835* (compiled by H. R. Janisch, sometime governor of the island, Jamestown, 1885); Charles Darwin, *Geological Observations on Volcanic Islands* (1844). For a condensed general account consult (Sir) C. P. Lucas, *Historical Geography of the British Colonies* (vol. iii., *West Africa*, 2nd ed., Oxford, 1900). See also M. Danvers, *Report on the Records of the India Office*, vol. i. pt. i. (London, 1887); *The Africa Pilot*, pt. ii. (5th ed., 1901); *Report on the Present Position and Prospects of the Agricultural Resources of the Island of St Helena*, by (Sir) D. Morris (1884; reprinted 1906). (R. L. A.; F. R. C.)

ST HELENS, a market town and municipal, county, and parliamentary borough of Lancashire, England, 14 m. E.N.E. from Liverpool, on the London & North-Western and Great Central railways. Pop. (1891) 72,413; (1901) 84,410. A canal communicates with the Mersey. The town is wholly of modern development. Besides the town hall and other public buildings and institutions there may be mentioned the Gamble Institute, erected and presented by Sir David Gamble, Bart., for a technical school, educating some 2000 students, and library. Among several public pleasure grounds the principal are the Taylor Park of 48 acres, and the smaller Victoria and Thatto Heath Parks. This is the principal seat in England for the manufacture of crown, plate, and sheet glass; there are also art glass works, and extensive copper smelting and refining works, as well as chemical works, iron and brass foundries, potteries and patent medicine works. There are collieries in the neighbourhood. To the north of the town are a few ecclesiastical ruins, known as Windleshaw Abbey, together with a well called St Thomas' well, but the history of the foundation is not known. The parliamentary borough (1885) returns one member. The county borough was created in 1888. The town was incorporated in 1868, and the corporation consists of a mayor, 9 aldermen and 27 councillors. Area 7285 acres.

ST HELIER, the chief town of Jersey, the largest of the Channel Islands. Pop. (1901) 27,866. It lies on the south coast of the island on the eastern side of St Aubin's Bay. The harbour is flanked on the W. by a rocky ridge on which stands Elizabeth Castle, and commanded on the east by Fort Regent on its lofty promontory. The parish church is a cruciform building with embattled tower, dating in part from the 14th century. It contains a monument to Major Peirson, who on the occasion of a French attack on Jersey in 1781 headed the militia to oppose them, and forced them to surrender, but was killed as his followers were at the point of victory. The French leader, Baron de Rullecourt, is buried in the churchyard. The spot where Peirson fell, in what is now called Peirson Place, is marked by a tablet. A large canvas by John Singleton Copley depicting the scene is in the National Gallery, London, and a copy is in the court house of St Helier. This building (*la Cohue*), in Royal Square, is the meeting-place of the royal court and deliberative States of Jersey. Victoria College was opened in 1852 and commemorates a visit of Queen Victoria and the prince consort to the island in 1846. A house in Marine Terrace is distinguished as the residence of Victor Hugo (1851–1855). Elizabeth Castle, which is connected with the mainland by a causeway, dates from 1551–1590; and in 1646 and 1649 Prince Charles resided here. In 1649 he was proclaimed king, as Charles II., in Jersey by the royalist governor George Carteret. On actually coming to the throne he gave the island the mace which is still used at the meetings of the court and States. Close to the castle are remnants of a chapel or cell, from which the rock on which it stands is known as the Hermitage, dating probably from the 9th or 10th century, and traditionally connected with the patron saint Helerius.

SAINT-HILAIRE, AUGUSTIN FRANÇOIS CÉSAR PROUVÉNÇAL DE, commonly known as Auguste de (1799–1853), French botanist and traveller, was born at Orleans on the 4th of October 1799. He began to publish memoirs on botanical subjects at an early age. In 1816–1822 and in 1830 he travelled in South America, especially in south and central Brazil, and the results of his study of the rich flora of the regions through which he passed appeared in several books and numerous articles in scientific journals. The works by which he is best known are the *Flora Brasiliae Meridionalis* (3 vols., folio, with 192 coloured plates, 1825–1832), published in conjunction with A. de Jussieu and J. Cambessèdes, *Histoire des plantes les plus remarquables du Brésil et de Paraguay* (1 vol. 4to, 30 plates, 1824), *Plantes usuelles des Brésiliens* (1 vol. 4to, 70 plates, 1827–1828), also in conjunction with De Jussieu and Cambessèdes, and *Voyage dans le district des diamants et sur le littoral du Brésil* (2 vols., 8vo, 1833). His *Leçons de botanique, comprenant principalement la morphologie végétale* (1840), was a comprehensive exposition of botanical morphology and of its application to systematic botany. He died at Orleans on the 30th of September 1853.

ST HUBERT, a small town of Belgium in the province of Luxemburg and in the heart of the Ardennes. Pop. (1904) 3204. It is famous for its abbey church containing the shrine of St Hubert, and for its annual pilgrimage. According to tradition the church and a monastery attached to it were founded in the 7th century by Plectrude, wife of Pippin of Herstal. The second church was built in the 12th century, but burnt by a French army under Condé in the 16th century. The present building is its successor, but has been restored in modern times and presents no special feature. The tomb of St Hubert—a marble sarcophagus ornamented with bas-reliefs and having four statuettes of other saints at the angles—stands in one of the side chapels. The legend of the conversion of St Hubert—a hunter before he was a saint—by his meeting in the forest a stag with a crucifix between its antlers, is well known, and explains how he became the patron saint of huntsmen. The place where he is supposed to have met the stag is still known as "*la converserie*" and is almost 5 m. from St Hubert on the road to La Roche. The pilgrimage of St Hubert in May attracts annually between thirty and fifty thousand pilgrims. The buildings of the old monastery have been utilized for a state training-school for waifs and strays, which contains on an average five hundred pupils. In the middle ages the abbey of St Hubert was one of the most important in Europe, owning forty villages with an annual income of over 80,000 crowns. During the French Revolution, when Belgium was divided into several departments, the possessions of the abbey were sold for £75,000, but the bishop of Namur was permitted to buy the church itself for £1350.

ST HYACINTHE, a city and port of entry of Quebec, Canada, and capital of St Hyacinthe county, 32 m. E.N.E. of Montreal, on the left bank of the river Yamaska and on the Grand Trunk, Canadian Pacific, Intercolonial, and Quebec Southern railways. Pop. (1901) 9210. It is the seat of a Roman Catholic bishop, and contains a classical college, dairy school, two monasteries and several other educational and charitable institutions. It has manufactures of organs, leather, woollens and agricultural implements, and is an important distributing centre for the surrounding district.

SAINTINE, JOSEPH XAVIER (1798–1865), French novelist and dramatist, whose real surname was Boniface, was born in Paris on the 10th of July 1798. In 1823 he produced a volume of poetry in the manner of the Romanticists, entitled *Poèmes, odes, épîtres*. In 1836 appeared *Picciola*, the story of the comte de Charney, a political prisoner in Piedmont, whose reason was saved by his cult of a tiny flower growing between the paving stones of his prison yard. This story is a masterpiece of the sentimental kind, and has been translated into many European languages. He produced many other novels, none of striking individuality with the exception of *Seul* (1857), which purported to be the authentic record of Alexander Selkirk on his desert island. Saintine was a prolific dramatist, and collaborated in some hundred pieces with Scribe and others, usually under the name of Xavier. He died on the 21st of January 1865.

ST INGBERT, a town of Germany, in the kingdom of Bavaria on the Rohrbach, 14 m. by rail W. of Zweibrücken. Pop. (1905) 15,521. It has coal-mines and manufactures of glass and machinery. There are also large iron and steel works in the town, and other industries are the making of powder, leather, cigars, soap and cotton. St Ingbert is named after the Irish saint, St Ingobert, and belonged for 300 years to the electorate of Trier.

ST IVES, a market town, municipal borough and seaport in the St Ives parliamentary division of Cornwall, England, 10 m. N.N.E. of Penzance, on a branch of the Great Western railway. Pop. (1901) 6699. It lies near the W. horn of St Ives Bay on the N. coast. The older streets near the harbour are narrow and irregular, but on the upper slopes there are modern terraces with good houses. The small harbour, protected by a breakwater, originally built by John Smeaton in 1767, has suffered from the accumulation of sand, and at the lowest tides is dry. The fisheries for pilchard, herring and mackerel are important. Boat-building and sail-making are carried on. An eminence south of the town is marked by a granite monument erected in 1782 by John Knill, a native of the town, who intended to be buried here; to maintain a quinquennial celebration on the spot he bequeathed property to the town authorities. The borough is under a mayor, 4 aldermen and 12 councillors. Area, 1890 acres.

The town takes name from St Hya, or Ia, an Irish virgin and martyr, who is said to have accompanied St Piran on his missionary journey to Cornwall in the 5th century, and to have landed near this place. The Patent Rolls disclose an almost continuous series of trials for piracy and plunder by St Ives sailors from the beginning of the 14th to the end of the 16th century. A mere chapelry of Lelant and the less important member of the distant manor of Ludgvan Leaze, which in Domesday Book appears as Luduam, it had no fostering hand to minister to its growth. In order to augment the influence of the Tudors in the House of Commons, Philip and Mary in 1558 invested it with the privilege of returning 2 members. Its affairs were at that time administered by a headwarden, who after 1598 appears under the name of portreeve, 12 chief burgesses and 24 ordinary burgesses. The portreeve was elected by the 24; the 12 by the chief inhabitants. This body had control over the fishing, the harbour and harbour dues, the fabric of the church, sanitation and the poor. In 1639 a charter of incorporation was granted under which the portreeve became mayor, the 12 became aldermen, and the 24 were styled burgesses. Provision was made for four fairs and for markets on Wednesdays and Saturdays, also for a grammar school. This charter was surrendered to Charles II. and a new one granted in 1685, the latter reducing the number of aldermen to 10 and of burgesses also to 10. It ratified the parliamentary franchise and the fairs and markets, and provided a court of pie-powder; it also contained a clause safeguarding the rights of the marquess of Winchester, lord of the manor of Ludgvan Leaze and Porthia. In 1835 a mayor, 4 aldermen and 12 councillors were invested with the administration of the borough. In 1832 St Ives lost one of its members, and in 1885 the other. Both markets are now held, but only one of the fairs. This takes place on the Saturday nearest St Andrew's day.

ST IVES, a market town and municipal borough in the northern parliamentary division of Huntingdonshire, England, mainly on the left (north) bank of the Ouse, 5 m. E. of Huntingdon by the Great Eastern railway. Pop. (1901) 2910. The river is crossed by an old bridge said to have been built by the abbots of Ramsey early in the 15th century. A building over the centre pier of the bridge was once used as a chapel. The causeway (1827) on the south side of the river is built on arches so as to assist the flow of the river in time of flood. The church of All Saints is Perpendicular, with earlier portions. A curious custom is practised annually in this church in connexion with a bequest made by a certain Dr Robert Wilde in 1678: it is the distribution of Bibles to six boys and six girls of the town. The original provision was that the Bibles should be cast for by dice on the Communion table. Oliver Cromwell was a resident in St Ives in 1634–1635, but the house which he inhabited—Slepe Hall—was demolished in the middle of the 19th century. St Ives has a considerable agricultural trade. It is governed by a mayor, 4 aldermen and 12 councillors. Area 2326 acres.

The manor of "Slepe" is said to have been given by Æthelstan "Mannessune" to the abbot of Ramsey and confirmed to him by King Edgar. It owed its change of name to the supposed discovery of the grave of St Ive, a Persian bishop, in 1001, and a priory was founded in the same year by Abbot Ednoth as a cell to Ramsey. St Ives was chiefly noted for its fair, which was first granted to the abbot of Ramsey by Henry I. to be held on Monday in Easter week and eight days following. In the reign of Henry III. merchants from Flanders came to the fair, which had become so important that the king granted it to be continued beyond the eight days if the abbot agreed to pay a farm of £50 yearly for the extra days. The fair, with a market on Monday granted to the abbot in 1286, survives, and was purchased in 1874 by the corporation from the duke of Manchester. The town was incorporated in 1874.

ST JEAN-D'ANGÉLY, a town of western France, capital of an arrondissement in the department of Charente-Inférieure, 33 m. E. of Rochefort by rail. Pop. (1906) 6242. St Jean lies on the right bank of the Boutonne, which is navigable for small vessels. The parish church of St Jean stands on the site of an abbey church of the 13th century, of which some remains are left. In 1568 the monastery was destroyed by the Huguenots, but much of it was rebuilt in the 17th and 18th centuries, to which period belong two towers and the façade of an unfinished church.

St Jean owes the suffix of its name to the neighbouring forest of Angéry (*Angeriacum*). Pippin I. of Aquitaine in the 9th century established there a Benedictine monastery which was afterwards reputed to possess the head of John the Baptist. This relic attracted hosts of pilgrims; a town grew up, took the name of St Jean d'Angeri, afterwards d'Angély, was fortified in 1131, and in 1204 received a charter from Philip Augustus. The possession of the place was disputed between French and English in the Hundred Years' War, and between Catholics and Protestants at a later date. In 1569 it capitulated to the duke of Anjou (afterwards Henry III.). Louis XIII. again took it from the Protestants in 1621 and deprived it of its privileges and its very name, which he changed to Bourg-Louis.

ST JEAN-DE-LUZ, a coast town of south-western France, in the department of Basses-Pyrénées, at the mouth of the Nivelle, 14 m. S.W. of Bayonne on a branch of the Southern railway. Pop. (1906) 3424. St Jean-de-Luz is situated in the Basque country on the bay of St Jean-de-Luz, the entrance to which is protected by breakwaters and moles. It has a 13th-century church, the chief features of which are the galleries in the nave, which, according to the Basque custom, are reserved for men. The Maison Lohobiague, the Maison de l'Infante (both 17th cent.), and the hôtel de ville (1657) are picturesque old buildings. St Jean is well known for its bathing and as a winter resort. Fishing is a considerable industry.

From the 14th to the 17th century St Jean-de-Luz enjoyed a prosperity due to its mariners and fishermen. Its vessels were the first to set out for Newfoundland in 1520. In 1558, owing to the depredations of its privateers, the Spaniards attacked and burned the town. In 1627, however, it was able to equip 80 vessels, which succeeded in saving the island of Ré from the duke of Buckingham. In 1660 the treaty of the Pyrenees was signed at St Jean-de-Luz, and was followed by the marriage there of the Infanta Maria Theresa and Louis XIV. At that time the population numbered 15,000. The cession of Newfoundland to England in 1713, the loss of Canada, and the silting-up of the harbour were the three causes which contributed to the decline of the town.

ST JOHN, CHARLES WILLIAM GEORGE (1809–1856), English naturalist and sportsman, son of General the Hon. Frederick St John, second son of Frederick, second Viscount Bolingbroke, was born on the 3rd of December 1809. He was educated at Midhurst, Sussex, and about 1828 obtained a clerkship in the treasury, but resigned in 1834, in which year he married a lady with some fortune. He ultimately settled in the "Laigh" of Moray, "within easy distance of mountain sport." In 1853 a paralytic seizure deprived him of the use of his limbs, and for the benefit of his health he removed to the south of England. He died at Woolston, near Southampton, on the 22nd of July 1856. His works are *Wild Sports and Natural History of the Highlands* (1846, 2nd ed. 1848, 3rd ed. 1861); *Tour in Sutherland* (1849, 2nd ed., with recollections by Captain H. St John, 1884); *Notes of Natural History and Sport in Morayshire,* with Memoir by C. Innes (1863, 2nd ed. 1884). They are written in a graphic style, and illustrated with engravings, many of them from clever pen-and-ink sketches of his own.

ST JOHN, JAMES AUGUSTUS (1801–1875), British author and traveller, was born in Carmarthenshire, Wales, on the 24th of September 1801. He received private instruction in the classics, and also acquired proficiency in French, Italian, Spanish, Arabic and Persian. He obtained a connexion with a Plymouth newspaper, and when, in 1824, James Silk Buckingham started the *Oriental Herald*, St John became assistant editor. In 1827, together with D. L. Richardson, he founded the *London Weekly Review*, subsequently purchased by Colburn and transformed into the *Court Journal*. He lived for some years on the Continent and went in 1832 to Egypt and Nubia, travelling mostly on foot. The results of his journey were published under the titles *Egypt and Mohammed Ali, or Travels in the Valley of the Nile* (2 vols., 1834), *Egypt and Nubia* (1844), and *Isis, an Egyptian Pilgrimage* (2 vols., 1853). On his return he settled in London, and for many years wrote political "leaders" for the *Daily Telegraph*. In 1868 he published a *Life of Sir Walter Raleigh*, based on researches in the archives at Madrid and elsewhere. He died in London on the 22nd of September 1875.

Besides the works mentioned St John was also the author of *Journal of a Residence in Normandy* (1830); *Lives of Celebrated Travellers* (1830); *Anatomy of Society* (1831); *History, Manners and Customs of the Hindus* (1831); *Margaret Ravenscroft, or Second Love* (3 vols., 1835); *The Hellenes, or Manners and Customs of Ancient Greece* (1842); *Sir Cosmo Digby*, a novel (1844); *There and Back Again in Search of Beauty* (1853); *The Nemesis of Power* (1854); *Philosophy at the Foot of the Cross* (1854); *The Preaching of Christ* (1855); *The Ring and the Veil*, a novel (1856); *Life of Louis Napoleon* (1857); *History of the Four Conquests of England* (1862); and *Weighed in the Balance*, a novel (1864). He also edited, with notes, various English classics.

Of his four sons, all journalists and authors of some literary distinction—Percy Bolingbroke (1821–1889), Bayle, Spenser and Horace Roscoe (1832–1888)—the second, BAYLE ST JOHN (1822–1869), began contributing to the periodicals when only thirteen. When twenty he wrote a series of papers for *Fraser* under the title "De re vehiculari, or a Comic History of Chariots." To the same magazine he contributed a series of essays on Montaigne, and published in 1857 *Montaigne the Essayist, a Biography*, in 4 volumes. During a residence of two years in Egypt he wrote *The Libyan Desert* (1849). While in Egypt he learnt Arabic and visited the oasis of Siwa. On his return he settled for some time in Paris and published *Two Years in a Levantine Family* (1850) and *Views in the Oasis of Siwah* (1850). After a second visit to the East he published *Village Life in Egypt* (1852); *Purple Tints of Paris: Characters and Manners in the New Empire* (1854); *The Louvre, or Biography of a Museum* (1855); the *Subalpine Kingdom, or Experiences and Studies in Savoy* (1856); *Travels of an Arab Merchant in the Soudan* (1854); *Maretimo, a Story of Adventure* (1856); and *Memoirs of the Duke of Saint-Simon in the Reign of Louis XIV.* (4 vols., 1857).

ST JOHN, OLIVER (*c.* 1598–1673), English statesman and judge, was the son of Oliver St John. There were two branches of the ancient family to which he belonged, namely, the St Johns of Bletso in Bedfordshire, and the St Johns of Lydiard Tregoze in Wiltshire, both descendants of the St Johns of Staunton St John in Oxfordshire. Oliver St John was a member of the senior branch, being great-grandson of Oliver St John, who was created Baron St John of Bletso[1] in 1559, and a distant cousin of the 4th baron who was created earl of Bolingbroke in 1624, and who took an active part on the parliamentary side of the Civil War, being killed at the battle of Edgehill. Oliver was educated at Queens' College, Cambridge, and was called to the bar in 1626. He appears to have got into trouble with the court in connexion with a seditious publication, and to have associated himself with the future popular leaders John Pym and Lord Saye. In 1638 he defended Hampden on his refusal to pay Ship Money, on which occasion he made a notable speech. In the same year he married, as his second wife, Elizabeth Cromwell, a cousin of Oliver Cromwell, to whom his first wife also had been distantly related. The marriage led to an intimate friendship with Cromwell. St John was member for Totnes in both the Short and the Long Parliament, where he acted in close alliance with Hampden and Pym, especially in opposition to the impost of Ship Money (*q.v.*). In 1641, with a view of securing his support, the king appointed St John solicitor-general. None the less he took an active part in promoting the impeachment of Strafford and in preparing the bills brought forward by the popular party in the Commons, and was dismissed from office in 1643. On the outbreak of the Civil War, he became recognized as one of the parliamentary leaders. In the quarrel between the parliament and the army in 1647 he sided with the latter, and throughout this period he enjoyed Cromwell's entire confidence.

In 1648 St John was appointed chief justice of the common pleas; and from this time he devoted himself mainly to his judicial duties. He refused to act as one of the commissioners for the trial of Charles. He had no hand in Pride's Purge, nor in the constitution of the Commonwealth. In 1651 he went to the Hague as one of the envoys to negotiate a union between England and Holland, a mission in which he entirely failed; but in the same year he successfully conducted a similar negotiation with Scotland. After the Restoration he published an account of his past conduct (*The Case of Oliver St John*, 1660), and this apologia enabled him to escape any more severe vengeance than exclusion from public office. He retired to his country house in Northamptonshire till 1662, when he went to live abroad. He died on the 31st of December 1673.

By his first wife St John had two sons and two daughters. His daughter Johanna married Sir Walter St John of Lydiard Tregoze and was the grandmother of Viscount Bolingbroke. By his second wife he had two children, and after her death he married, in 1645, Elizabeth, daughter of Daniel Oxenbridge.

See the above-mentioned *Case of Oliver St John* (London, 1660), and St John's *Speech to the Lords, Jan. 7th, 1640, concerning Ship-money* (London, 1640). See also Mark Noble, *Memoirs of the Protectoral House of Cromwell*, vol. ii. (2 vols., London, 1787); Anthony à Wood, *Fasti Oxonienses*, edited by P. Bliss (4 vols., London, 1813); Edward Foss, *The Judges of England*, vol. vi. (9 vols., London, 1848); S. R. Gardiner, *History of the Great Civil War* (3 vols., London, 1886–1891), and *History of the Commonwealth and Protectorate* (3 vols., London, 1894–1901); Lord Clarendon, *History of the Rebellion and Civil Wars in England* (7 vols., Oxford, 1839); *Thurloe State Papers* (7 vols., London, 1742); Edmund Ludlow, *Memoirs*, edited by C. H. Firth (2 vols., Oxford, 1894); Thomas Carlyle, *Oliver Cromwell's Letters and Speeches*; C. H. Firth's art. in *Dict. of Nat. Biog.*, vol. l. (London, 1897). (R. J. M.)

ST JOHN, the capital of St John county, New Brunswick, Canada, in 45° 14′ N., and 66° 3′ W., 481 m. from Montreal by the Canadian Pacific railway. Pop. (1901) 40,711. It is situated at the mouth of the St John river on a rocky peninsula. With it are incorporated the neighbouring towns of Carleton and (since 1889) Portland. The river, which is spanned by two bridges, enters the harbour through a rocky gorge, which is passable by ships for forty-five minutes during each ebb and flow of the tide. The harbour level at high tide (see FUNDY, BAY OF) is 6 to 12 ft. higher than that of the river, but at low tide about as much below it, hence the phenomenon of a fall outwards and inwards at every tide. St John is an important station of the Intercolonial, Canadian Pacific, and New Brunswick Southern railways, and shares with Halifax the honour of being the chief winter port of the Dominion, the harbour being deep, sheltered and free from ice. It is the distributing centre for a large district, rich in agricultural produce and lumber, and has larger exports than Halifax, though less imports. It is also the centre of fisheries which employ nearly 1000 men, and has important industries, such as saw, grist, cotton and woollen mills, carriage, box and furniture factories, boiler and engine shops. The beauty of the scenery makes it a pleasant residential city.

St John was visited in 1604 by the Sieur de Monts (1560–*c.* 1630) and his lieutenant Champlain, but it was not until 1635 that Charles de la Tour (d. 1666) established a trading post, called Fort St Jean (see Parkman, *The Old Régime in Canada*), which existed under French rule until 1758, when it passed into the hands of Britain. In 1783 a body of United Empire Loyalists landed at St John and established a city, called Parr Town until 1785, when it was incorporated with Conway (Carleton), under royal charter, as the city of St John. It soon became and has remained the largest town in the province, but for military reasons was not chosen as the capital (*see* FREDERICTON). Its growth has been checked by several destructive fires, especially that of June 1877, when half of it was swept away, but it has since been rebuilt in great part of more solid materials. (W. L. G.)

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[1] This title is still held by the family lineally descended from the 1st baron, said by J. H. Round to be the only peerage family descended in the male line from an ancestor living in the time of Domesday Book.

ST JOHN, an island in the Danish West Indies. It lies 4 m. E. of St Thomas, is 10 m. long and 2½ m. wide; area 21 sq. m. It is a mass of rugged mountains, the highest of which is Camel Mountain (1270 ft.). Although one of the best watered and most fertile of the Virgin Group, it has little commerce. It is a free port, and possesses in Coral Bay the best harbour of refuge in the Antilles. The village of Cruxbay lies on the northern coast. Pop. (1901) 925.

ST JOHN, a river of New Brunswick, Canada, rising in two branches, in the state of Maine, U.S.A., and in the province of Quebec. The American branch, known as the Walloostook, flows N.E. to the New Brunswick frontier, where it turns S.E. and for 80 m. forms the international boundary. A little above Grand Falls the St John enters Canada and flows through New Brunswick into the Bay of Fundy at St John. Its total length is about 450 m. It is navigable for large steamers as far as Fredericton (86 m.), and in spring and early summer for smaller vessels to Grand Falls (220 m.), where a series of falls and rapids form a descent of 70 or 80 ft. Above the falls it is navigable for 65 m. It drains an area of 26,000 sq. m., of which half is in New Brunswick, and receives numerous tributaries, of which the chief are the Aroostook, Allagash, Madawaska (draining Lake Temiscouata in Quebec), Tobique and Nashwaak.

ST JOHN OF JERUSALEM, KNIGHTS OF THE ORDER OF THE HOSPITAL OF (*Ordo fratrum hospitalariorum Hierosolymitanorum*, *Ordo militiae Sancti Johannis Baptistae hospitalis Hierosolymitani*), known also later as the KNIGHTS OF RHODES and the SOVEREIGN ORDER OF THE KNIGHTS OF MALTA. The history of this order divides itself naturally into four periods: (1) From its foundation in Jerusalem during the First Crusade to its expulsion from the Holy Land after the fall of the Latin kingdom in 1291; (2) from 1309–1310, when the order was established in Rhodes, to its expulsion from the island in 1522; (3) from 1529 to 1798, during which its headquarters were in Malta; (4) its development, as reconstituted after its virtual destruction in 1798, to the present day.

Early Developments.—Medieval legend set back the beginnings to the days of the Maccabees, with King Antiochus as the founder and Zacharias, father of the Baptist, as one of the first masters; later historians of the order maintained that it was established as a military order contemporaneously with the Latin conquest of Jerusalem, and that it had no connexion with any earlier foundation (so P. A. Paoli, *De origine*). This view would now seem to be disproved, and it is clear that the order was connected with an earlier *Hospitale Hierosolymitanum.*[1] Such a hospital had existed in the Holy City, with rare interruptions, ever since it had become a centre of Christian pilgrimage. About 1023 certain merchants of Amalfi had purchased the site of the Latin hospice established by Charlemagne, destroyed in 1010 with the other Christian establishments by order of the fanatical caliph Hakim Biamrillah,[2] and had there founded a hospital for pilgrims, served by Benedictines and later dedicated to St John the Baptist.[3] When, in 1087, the crusaders surrounded the Holy City, the head of this hospital was a certain Gerard or Gerald,[4] who earned their gratitude by assisting them in some way during the siege.[5] After the capture of the city he used his popularity to enlarge and reconstitute the hospital. If, as M. Le Roulx surmises, he had previously been affiliated to the Benedictines, he now left them and adopted for his order the Augustinian rule. Donations and privileges were showered upon the new establishment. Godfrey de Bouillon led the way by granting to it in Jerusalem itself the *casal Hessilia* (Es Silsileh) and two bakehouses.[6] Kings, nobles and prelates followed suit, not in the Holy Land only, but in Provence, France, Spain, Portugal, England and Italy: in Portugal a whole province was in 1114 made over to Gerard and his brethren (*Cartul.* i. No. 34). In 1113 Pope Paschal II. took the order and its possessions under his immediate protection (bull of Feb. 15th to Gerard, *Cartul.* i. No. 30), his act being confirmed in 1119 by Calixtus II. and subsequently by other popes. Gerard was indeed, as Pope Paschal called him, the "institutor" of the order, if not its founder. It retained, however, during his lifetime its purely eleemosynary character. The armed defence of pilgrims may have been part of its functions, but its organization as an aggressive military force was the outcome of special circumstances—the renewed activity of the Saracens—and was the work of Raymond du Puy, who succeeded as grand master on the death of Gerard (3rd of September 1120).[7]

Not that Raymond can be proved to have given to his order anything of its later aristocratic constitution. There is no mention in his Rule[8] of the division into knights, chaplains and sergeants; indeed, there is no mention of any military duties whatever. It merely lays down certain rules of conduct and discipline for the brethren. They are to be bound by the threefold vow of chastity, poverty and obedience. They are to claim nothing for themselves save bread, water and raiment; and this latter is to be of poor quality, "since our Lord's poor, whose servants we say we are, go naked and sordid, and it is a disgrace for the servant to be proud when his master is humble." Finally, the brethren are to wear crosses on the breast of their capes and mantles, "ut Deus per ipsum vexillum et fidem et operationem et obedientiam nos custodiat."[9] Yet that Raymond laid down military regulations for the brethren is certain. Their underlying principle is revealed by a bull of Pope Alexander III. addressed (1178–1180) to the grand master Roger des Moulins, in which he bids him, "according to the custom of Raymond," abstain from bearing arms save when the standard of the Cross is displayed either for the defence of the kingdom or in an attack on a "pagan" city.[10]

The statesmanlike qualities of Raymond du Puy rendered his long mastership epoch-making for the order. When it was decided to fortify Ibelin (Beit-Jibrin) as an outpost against attacks from the side of Ascalon, it was to the Hospitallers that the building and defence of the new castle were assigned; and from 1137 onwards they took a regular part in the wars of the Cross. It was owing to Raymond's diplomatic skill, too, that the order was enabled to profit by the bequest made to it by Alphonso I. of Aragon, who had died childless, of a third of his kingdom. To have claimed the literal fulfilment of this bequest would have been to risk losing it all, and Raymond acted wisely in transferring the bequest, with certain important reservations, to Raymond Berenger IV., count of Barcelona and regent of

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[1] Cf. the bull of Pope Celestine II. to Raymond du Puy, in the matter of the Teutonic order, which describes the Hospital as "Hospitalem domum sancte civitatis Jerusalem, que a longis retro temporibus Christi pauperum usibus dedicata, tam christianorum quam etiam Sarracenorum tempore . . . ." (Le Roulx, *Cartulaire*, i. No. 154).

[2] This solution of the much debated question of the connexion of the Hospital with the Benedictine foundation of Sancta Maria Latina is worked out in much detail by M. Delaville Le Roulx in his *Les Hospitaliers en Terre Sainte*, chap. i.

[3] William of Tyre says that they erected in that place an altar to St John Eleemon, patriarch of Alexandria, renowned for his charities. This mistake led to the widespread belief that this saint, and not St John the Baptist, was the original patron of the order. A passage in the bull addressed by Pope Paschal to Gerard (*Cartulaire*, No. 30) would seem to leave the dedication in doubt: "Xenodochium, quod . . . juxta beati Johannis Baptistae ecclesiam instituisti." The patronage of St John may thus have merely been the result of this juxtaposition, as the Templars took their name from the site of the mother-house.

[4] In spite of his fame, nothing is known of his origin. The surname "Tunc" or "Tonque" often given to him is, as Le Roulx points out, merely the result of a copyist's error for "Gerardus tunc . . ."

[5] According to the legend, he joined the defenders on the walls and, instead of hurling stones, hurled bread at the Christians, who were short of supplies. Haled before the Mussulman governor, his accusers were confounded when the incriminating loaves they produced were discovered to be turned into stones.

[6] "Fours." So the charter of Baldwin I. (*Cartul.* No. 20; cf. No. 225). In his *Hospitaliers* Le Roulx has "tours," *i.e.* two towers, probably a misprint.

[7] The existence of a certain Roger as grand master between Gerard and Raymond, maintained by some historians, is finally disproved by Raymond's own testimony: "Reginmundus, per gratiam Dei post obitum domini Giraldi factus servus pauperum Christi" (*Cartul.* i. No. 46).

[8] The date of this can only be approximately assigned, in so far as it was confirmed by Pope Eugenius III., who died in 1153.

[9] For text see *Cartulaire*, i. No. 70.

[10] *Cartul.* i. No. 527.

Aragon (16th of September 1140).[1] It was probably also during his sojourn in the West for the above purpose that Raymond secured from Pope Celestine II. the bull dated December 7th, 1143, subordinating to his jurisdiction the Teutonic hospice, founded in 1128 by a German pilgrim and his wife in honour of the Blessed Virgin, which was the nucleus of the Teutonic Order (*q.v.*). This order was to remain subordinate to the Hospitallers actually for some fifty years, and nominally for some thirty years longer.[2] Raymond took part in the Second Crusade and was present at the council of the leaders held at Acre, in 1148, which resulted in the ill-fated expedition against Damascus. The failure before Damascus was repaired five years later by the capture of Ascalon (19th of August 1153), in which Raymond du Puy and his knights had a conspicuous share.

Meanwhile, in addition to its ever-growing wealth, the order had received from successive popes privileges which rendered it, like the companion order of the Temple, increasingly independent of and obnoxious to the secular clergy. In 1135 Innocent II. had confirmed to Raymond the privileges accorded by Paschal II., Calixtus II. and Honorious II., and in addition forbade the diocesan bishops to interdict the churches of the Hospitallers, whom he also authorized, in case of a general interdict, to celebrate mass for themselves alone.[3] In 1137 he gave them the privilege of Christian burial during such interdicts and the right to open interdicted churches once a year in order to say mass and collect money.[4] These bulls were confirmed by Eugenius III. in 1153[5] and Anastasius IV. in 1154, the latter adding the permission for the order to have its own priest, independent of the diocesan bishops.[6] In vain the patriarch of Jerusalem, attended by other bishops, journeyed to Rome in 1155 to complain to Adrian IV. of the Hospitallers' abuse of their privileges and to beg him to withdraw his renewal of his predecessor's bull.[7]

Far different was the effect produced by Raymond du Puy's triumphant progress through southern Europe from the spring of 1157 onward. From the popes, the emperor Frederick I., kings and nobles, he received fresh gifts, or the confirmation of old ones. After the 25th of October 1158, when his presence is attested at Verona, this master builder of the order disappears from history; he died some time between this date and 1160, when the name of another grand master appears.

During the thirty years of his rule the Hospital, which Gerard had instituted to meet a local need, had become universal. In the East its growth was beyond calculation: kings, prelates and laity had overwhelmed it with wealth. In the West, all Europe combined to enrich it; from Ireland to Bohemia and Hungary, from Italy and Provence to Scandinavia, men vied with each other to attract it and establish it in their midst. It was clear that for this vast institution an elaborate organization was needed, and this need was probably the occasion of Raymond's presence in Europe. The priory of St Gilles already existed as the nucleus of the later system; the development of this system took place after Raymond's death.

Constitution and Organization.—The rule of the Hospital, as formulated by Raymond du Puy, was based on that of the Augustinian Canons (*q.v.*). Its further developments, of which only the salient characteristics can be mentioned here, were closely analogous to those of the Templars (*q.v.*), whose statutes regulating the life of the brethren, the terms of admission to the order, the maintenance of discipline, and the scale of punishments, culminating in expulsion (*pert de la maison*), are, *mutatis mutandis*, closely paralleled by those of the Hospitallers. These, too, were early (probably in Raymond's time) divided into three classes: knights (*fratres milites*), chaplains (*fratres capellani*), and serjeants (*fratres servientes armigeri*), with affiliated brethren (*confratres*) and "donats" (*donati*, *i.e.* regular subscribers, as it were, to the order in return for its privileges and the ultimate right to enter the ranks of its knights). Similar, too, was the aristocratic rule which confined admission to the first class to sons born in lawful wedlock of knights[8] or members of knightly families, a rule which applied also to the donats.[9] For the serjeant men-at-arms it sufficed that they should not be serfs. Below these a host of *servientes* did the menial work of the houses of the order, or worked as artisans or as labourers on the farms.

All the higher offices in the order were filled by the knights, except the ecclesiastical—which fell to the chaplains—and those of master of the squires and *turcopolier* (commander of the auxiliary light cavalry), which were reserved for the serjeants-at-arms. Each knight was allowed three horses, each serjeant two. The *fratres capellani* ranked with the knights as eligible for certain temporal posts; at their head was the "conventual prior" (*clericorum magister et ecclesie custos, prior clericorum Hospitalis*).

In two important respects the Knights of St John differed from the Templars. The latter were a purely military organization; the Hospitallers, on the other hand, were at the outset preponderatingly a nursing brotherhood, and, though this character was subordinated during their later period of military importance, it never disappeared. It continued to be a rule of the order that in its establishments it was for the sick to give orders, for the brethren to obey. The chapters were largely occupied with the building, furnishing, and improvement of hospitals, to which were attached learned physicians and surgeons, who had the privilege of messing with the knights. The revenues of particular properties were charged with providing luxuries (*e.g.* white bread) for the patients, and the various provinces of the order with the duty of forwarding blankets, clothes, wine and food for their use. The Hospitallers, moreover, encouraged the affiliation of women to their order, which the monastic and purely military rule of the Templars sternly forbade. So early as the First Crusade a Roman lady named Alix or Agnes had founded at Jerusalem a hospice for women in connexion with the order of St John. Until 1187, when they fled to Europe, the sisters had devoted themselves to prayer and sick-nursing. In Europe, however, they developed into a purely contemplative order.[10]

The habit of the order, both in peace and war, was originally a black *cappa clausa* (*i.e.* the long monastic bell-like cloak with a slit on each side for the arms) with a white, eight-pointed "Maltese" cross on the breast. As this was highly inconvenient for fighting, Innocent IV. in 1248 authorized the brethren to wear *in locis suspectis* a large super-tunic with a cross on the breast (*Cartul.* ii. No. 2479), and in 1259 Alexander IV. fixed the habit as, in peace time, a black mantle, and in war a red surcoat with a white cross (*Cartul.* ii. No. 2928).

The unit of the organization of the order was the commandery (preceptory), a small group of knights and serjeants living in community under the rule of a commander, or preceptor,[11] charged with the supervision of several contiguous properties. The commanderies were grouped into priories, each under the rule of a prior (styled unofficially "grand prior," *magnus prior*), and these again into provinces corresponding to certain countries, under the authority of grand commanders. These largest groups crystallized in the 14th century as national divisions under the name of "langues" (languages).[12] At the head of the whole organization was the grand master. The grand master was elected, from the ranks of the knights of justice, by the same process as the grand master of the Templars (*q.v.*). Alone of the bailiffs (*bailivi*), as the officials of the order were generically termed, he held office for life. His authority was very great, but not absolute. The supreme legislative and controlling power was vested in the general chapter of the knights, at the periodical meetings of which the great officers of the order had to give an account of their stewardship, and which alone had the right to pass statutes binding on the order. The executive power of the grand master, like that of the great dignitaries immediately subordinate to him, was in the nature of a delegation from the chapter. He was assisted in its exercise by four councils: (1) the "convent" or ordinary chapter, a committee of the general chapter,[1] for administrative business; (2) a secret council, for criminal cases and affairs of state; (3) a full council, to hear appeals from the two former;[2] and (4) the "venerable chamber of the treasury" for financial matters. To the general chapter at headquarters corresponded the chapters of the priories and the commanderies, which controlled the action of the priors and commanders.

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[1] *Cartul.* i. No. 136. The arrangement was confirmed by the pope in 1158 (Le Roulx, *Hospitaliers*, p. 59).

[2] The foundation of the Teutonic Order as a separate organization was solemnly proclaimed in the palace of the Templars at Tyre on the 5th of March 1198. Its rule was confirmed by Pope Innocent III. on Feb. 15th, 1198 (*Cartul.* i. No. 1072).

[3] *Cartul.* i. No. 113.

[4] *Ib.* i. No. 122.

[5] *Ib.* i. No. 217.

[6] *Ib.* i. No. 226.

[7] This renewal was dated 19th of December 1154 (*Ib.* i. No. 229).

[8] The knights were ultimately distinguished as "Knights of Justice" (*chevaliers de justice*) and "Knights of Grace" (*chevaliers de grâce*). The former were those who satisfied the conditions as to birth, and were therefore knights "justly"; the latter were those who were admitted "of grace" for superlative merits.

[9] An exception was made in favour of the natural sons of counts and greater personages (Statute 7 of 1270; *Cartul.* ii. 3396).

[10] Their premier house in Europe was at Sigena in Aragon, which they still occupy. It was granted to them by Sancia of Navarre, queen of Aragon, in 1184, the order being definitively established there in 1188. Their rule, which is that of Augustinian Canonesses, and dates from October 1188, is printed by Le Roulx, *Cartulaire*, i. No. 859. There is no word about nursing in it. In England the most important house was Buckland. The chief Danish house survives in the Lutheran convent of St John the Baptist at Schleswig, a *Stift* for noble ladies, whose superior has the title of prioress. On solemn occasions a realistic wax head of St John the Baptist on a charger is still produced.

[11] Commander (*comandeor*, *commandeur*), with its Latin translation *preceptor*, came into use as the title of these officials somewhat late. In earlier documents they are styled *ospitalarius*, *bajulus* (bailiff), *magister* (master).

[12] Omitting the Anglo-Bavarian *langue*, created in 1782, the *langues* (in the 15th century) were eight in number. They were (1) Provence (grand priories of St Gilles and Toulouse), (2) Auvergne (grand priory of Auvergne), (3) France (grand priories of France, Aquitaine, Champagne), (4) Italy (grand priories of Lombardy, Rome, Venice, Pisa, Capua, Barletta, Messina), (5) Aragon (castellany of Amposta, grand priories of Catalonia and Navarre), (6) England (grand priories of England—including Scotland—and Ireland), (7) Germany (grand priories of Germany or Heitersheim, Bohemia, Hungary, Dacia—*i.e.* Scandinavia—and the Bailiwick (*Ballei*) o

Immediately subordinate to the grand master were the seven great dignitaries of the order, known as the conventual bailiffs: the grand preceptor,[3] marshal, draper (Fr. *drapier*) or grand conservator, hospitaller, treasurer, admiral, turcopolier.[4] The grand preceptor, elected by the chapter at the same time as the grand master and subject to his approval, was the lieutenant of the latter in his absence, empowered to seal for him and, in the event of his capture by the enemy, to act as vice-master. The functions of the marshal, draper, treasurer and turcopolier were practically identical with those of the officials of the same titles in the order of Knights Templars. That of hospitaller, on the other hand, was naturally a charge of exceptional importance in the order of St John; he had a seal of his own, and was responsible for everything concerning the hospitals of the order, the dispensing of hospitality, and of alms. The admiral, as the name implies, was at sea what the marshal was on land. The office first appears in 1299 when the knights, after their expulsion from the Holy Land, had begun to organize their new sea-power in Cyprus. As to the equipage and suites of the grand master and the great dignitaries, these were practically on the same scale and of the same nature as those described in the article TEMPLARS for the sister order. The grand master had the right himself to nominate his companions and the members of his household (seneschal, squires, secretaries, chaplains, &c.), which, as Le Roulx points out, was such as to enable him to figure as the equal of the kings and princes with whom he consorted.

The grand-mastership of Gilbert d'Assailly was signalized by the participation of the Hospitallers in the abortive expeditions of Amalric of Jerusalem into Egypt in 1162, 1168 and 1169. On the 10th of August 1164 also they shared in the disastrous defeat inflicted by Nur-ed-din at Harran on the count of Tripoli. The important position occupied by them in the councils of the kingdom is shown by the fact that the grand preceptor Guy de Mauny was one of the ambassadors sent in 1169 to ask aid of the princes of the West. Another important development was the bestowal on the order by Bohemund III., prince of Antioch, in 1168, and King Amalric, as regent of Tripoli, in 1170, of considerable territories on the north-eastern frontier, to be held with almost sovereign power as a march against the Saracens (*Cartulaire*, i. Nos. 391, 411). The failure of the expedition to Egypt, however, brought considerable odium on Gilbert d'Assailly, who resigned the grand-mastership, probably in the autumn of 1170.[5] Under the short rule of the grand master Jobert (d. 1177) the question of a renewed attack on Egypt was mooted; but the confusion reigning in the Latin kingdom and, not least, the scandalous quarrels between the Templars and Hospitallers, rendered all aggressive action impossible. In 1179 the growing power of the two military orders received its first set back when, at the instance of the bishops, the Lateran Council forbade them to receive gifts of churches and tithes at the hands of laymen without the consent of the bishops, ordered them to restore all "recent"[6] gifts of this nature, and passed a number of decrees in restraint of the abuse of their privileges.

A more potent discipline was to befall them, however, at the hands of Saladin, sultan of Egypt, who in 1186 began his systematic conquest of the kingdom. It was the Hospitallers who, with the other religious orders, alone offered an organized resistance to his victorious advance. On the 1st of May 1187 occurred the defeat of Tiberias, in which the grand master Gilbert des Moulins fell riddled with arrows, and this was followed on the 4th of July by the still more disastrous battle of Hittin. The flower of the Christian chivalry was slain or captured; the Hospitallers and Templars who fell into his hands Saladin massacred in cold blood. On the 2nd of October Jerusalem fell. Ten brethren of the Hospital were allowed to remain for a year to look after the sick; the rest took refuge at Tyre. In these straits Armengaud d'Asp was elected grand master (1188) and the headquarters of the order were established at Margat (Markab), near the coast some distance northwards of Tripoli. In the interior the knights still held some scattered fortresses; but their great stronghold of Krak[7] was reduced by famine in September 1188 and Beauvoir in the following January.

The news of these disasters once more roused the crusading spirit in Europe; the offensive against Saladin was resumed, the Christians concentrating their forces against Acre in the autumn of 1189. In the campaigns that followed, of which Richard I. of England was the most conspicuous hero, and which ended in the recovery of Acre and the sea-coast generally for the Latin kingdom, the Hospitallers, under their grand master Garnier de Naplouse[8] (Neapoli), played a prominent part. The grand-mastership of Geoffroy de Donjon, who succeeded Garnier in 1192 and ruled the order till 1202,[9] was signalized, not by feats of arms, since the Holy Land enjoyed a precarious peace, but by a steady restoration and development of the property and privileges of the order, by renewed quarrels with the Templars, and in 1198 by the establishment—in face of the protests of the Hospitallers—of the Teutonic knights as a separate order. Under the grand-mastership of the pious Alphonso of Portugal, and of Geoffrey le Rat, who was elected on Alphonso's resignation in 1206, the knights took a vigorous part in the quarrel as to the succession in Antioch; under that of Garin de Montaigu (elected 1207) they shared in the expedition to Egypt (1218–1221), of which he had been a vigorous advocate (see CRUSADES: *The Fifth Crusade*). In 1222, at the instance of the emperor Frederick II., the grand master accompanied the king of Jerusalem and others to Europe to discuss the preparation of a new crusade, visiting Rome, proceeding thence to Paris and London, and returning to the Holy Land in 1225. The expedition failed of its object so far as the organization of

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Brandenburg), (8) Castile (grand priories of Castile and Leon, and Portugal). Of the grand priories the most ancient and by far the most important was that of St Gilles, founded early in the 12th century, the authority of which extended originally over the whole of what is now France and a great part of Spain. In the 16th century its seat was transferred to Arles. Out of this developed the *langues* of Auvergne, France, Aragon and Castile, with their subsidiary priories. The date of the creation of the various grand commanderies differs greatly: that of Italy was established in the 13th century, the *langue* of Germany in 1422, that of Castile was split off from Aragon in 1462. The castellany of Amposta (founded 1157) ranked as a priory. The bailiwick of Brandenburg, which had long been practically independent of the grand prior of Germany, obtained the right to elect its own bailiff (*Herrenmeister*) in 1382, subject to the approval of the grand prior. In the Holy Land there were no priors; the commanderies were directly under the grand master, and the commanders (who retained the style of *bailli, bailivus*) ranked with the grand priors elsewhere.

[1] This seems to have consisted in practice of the great dignitaries of the order. See Le Roulx, *Hospitaliers*, p. 314.

[2] A peculiarity of the order of St John was the *esgart des frères* (*esgart*, Lat. *sguardium* = court) which could be demanded by any knight who thought himself wronged by a decision of his superiors, even of the grand master.

[3] To be carefully distinguished from the regional grand preceptors or grand commanders, and also from the grand commander *d'oultremer*, who represented the grand master in the West generally.

[4] To these the grand bailiff (German, *langue*) and grand chancellor (Castile) were added later.

[5] See Le Roulx, *Hospitaliers*, p. 76 sqq. The resignation led to bitter divisions in the order. It was urged that the resignation was invalid without the consent of the general chapter and the pope; and a temporary schism was the result. Gilbert was drowned in 1183 crossing from Dieppe to England, whither he had gone at the invitation of Henry II.

[6] The words "tempore moderno" were interpreted by Pope Alexander III. in a bull of the 1st of June 1179 as within ten years of the opening of the council (*Cartul.* i. No. 566).

[7] The stupendous ruins of Krak-des-Chevaliers (at Kerak, S.E. of the Dead Sea) attest the wealth and power of the knights (for a restoration see CASTLE, fig. 5). The castle had been given to the Hospitallers by Guillaume du Crac in 1142. In 1193 it was again in their hands, and was subsequently greatly enlarged and strengthened. It was finally captured by the Egyptians under Bibars in 1271.

[8] Garnier had been prior of England and later of France.

[9] So Le Roulx, p. 119.

a general crusade was concerned; but the Hospital received everywhere enormous accessions of property.[1] Garin de Montaigu died in 1228, after consolidating by his statesmanlike attitude the position and power of his order, on the eve of Frederick II.'s crusade. In this crusade, conducted in spite of a papal excommunication, the Hospitallers took no part, being rewarded with the approval of Pope Gregory IX., who, in August 1229, issued a bull to the patriarch of Jerusalem ordering him to maintain the jurisdiction of the Hospital over the Teutonic knights, who had dared to assist the German emperor.[2] In 1233, under the grand master Guerin, the Hospitallers took a leading part in the successful attack on the principality of Hamah. The motive of this, however—which was no more than the refusal of the emir to pay them the tribute due—seems to point to an increasing secularization of their spirit. In 1236 Pope Gregory IX. thought it necessary to threaten both them and the Templars with excommunication, to prevent their forming an alliance with the Assassins,[3] and in 1238 issued a bull in which he inveighed against the scandalous lives and relaxed discipline of the Hospitallers.[4]

Events were soon to expose the order to fresh tests. Under the grand-mastership of Pierre de Vieille Bride[5] occurred the brief "crusade" of Richard of Cornwall (11th of October 1240 to 3rd of May 1241). The truce concluded by Richard with the sultan of Egypt was accepted by the Hospitallers, rejected by the Templars, and after his departure something like a war broke out between the two bodies. In the midst of the strife of parties, in which Richard of Cornwall had recognized the fatal weakness of the Christian cause to lie, came the news of the invasion of the Chorasmians. On the 23rd of August the Tatar horde took and sacked Jerusalem. On the 17th of October, in alliance with the Egyptians under Bibars, it overwhelmed the Christian host at Gaza. Of the Hospitallers only sixteen escaped; 325 of the knights were slain; and among the prisoners was the grand master, Guillaume de Châteauneuf.[6] Amid the general ruin that followed this defeat, the Hospitallers held out in the fortress of Ascalon, until forced to capitulate on the 15th of October 1247. Under the vice-master, the grand preceptor Jean de Ronay, they took part in 1249 in the Egyptian expedition of St Louis of France, only to share in the crushing defeat of Mansurah (11th of February 1250). Of the knights present all were slain, except five who were taken prisoners, the vice-master and one other.[7] At the instance of St Louis, after the conclusion of peace, 25 Hospitallers, together with the grand master Guillaume de Châteauneuf, were released.[8]

On the withdrawal of St Louis from the Holy Land (April 1254), a war of aggression and reprisals broke out between Christians and Mussulmans; and no sooner was this ended by a precarious truce than the Christians fell to quarrelling among themselves. In the war between the Genoese and Venetians and their respective partisans, the Hospitallers and Templars fought on opposite sides. In spite of so great a scandal and of the hopeless case of the Christian cause, the possessions of the order were largely increased during Guillaume de Châteauneuf's mastership, both in the Holy Land and in Europe.

Under the grand-mastership of Hugues de Revel, elected probably in 1255, the menace of a new Tatar invasion led to serious efforts to secure harmony in the kingdom. In 1258 the Templars, Hospitallers, and Teutonic knights decided to submit their disputes in Syria, Cyprus and Armenia to arbitration, a decision which bore fruit in 1260 in the settlement of their differences in Tripoli and Margat. The satisfactory arrangement was possibly affected by the result of a combined attack made in 1259 on the Hospitallers by the Templars and the brethren of St Lazarus and St Thomas, which had resulted in the practical extermination of the aggressors, possibly also by the crushing defeat of the Templars and the Syrian barons by the Turcomans at Tiberias in 1260. However achieved, the concord was badly needed; for Bibars, having in 1260 driven back the Tatars and established himself in the sultanate of Egypt, began the series of campaigns which ended in the destruction of the Latin kingdom. In 1268 Bibars conquered Antioch, and the Christian power was confined to Acre, Château Pélerin, Tyre, Sidon, and the castles of Margat, Krak and Belda (Baldeh), in which the Hospitallers still held out. The respite afforded by the second crusade of St Louis was ended by his death at Tunis in 1270. On the 30th of March 1271 the great fortress of Krak, the key to the county of Tripoli, surrendered after a short siege. The crusade of Prince Edward of England did little to avert the ultimate fate of the kingdom, and with it that of the Hospitallers in the Holy Land. This was merely delayed by the preoccupations of Bibars elsewhere, and by his death in 1277. In 1280 the Mongols overran northern Syria; and the Hospitallers distinguished themselves by two victories against enormous odds, one over the Turcomans and one over the emir of Krak (February 1281). The situation, however, was desperate, and the grand master Nicolas Lorgne, who had succeeded Hugues de Revel in 1277, wrote despairing letters of appeal to Edward I. of England. On the 25th of May 1285, Margat surrendered to the sultan Kalaun (Mansur Saifaldin). Not even the strong character and high courage of Jean de Villiers, who succeeded Nicolas Lorgne as grand master in 1285, could do more than stave off the ultimate disaster. The Hospitallers assisted in the vain defence of Tripoli, which fell on the 26th of April 1289. On the 18th of May 1291 the Mussulmans stormed Acre, the last hope of the Christians in the Holy Land. Jean de Villiers, wounded, was carried on board a ship, and sailed to Limisso in Cyprus, which became the headquarters of the order. For the remaining two years of his life Jean de Villiers was occupied in attempting the reorganization of the shattered order. The demoralization in the East was, however, too profound to admit a ready cure. The knights, represented by the grand dignitaries, addressed a petition to Pope Boniface VIII. in 1295 asking for the appointment of a permanent council of seven *difinitores* to control the grand master, who had become more and more autocratic. The pope did not consent; but in a severe letter to the new grand master, Eudes de Pin, he sternly reproved him for the irregularities of which he had been guilty.[9] In 1296 Eudes was succeeded by Guillaume de Villaret, grand prior of St Gilles, who for three years after his election remained in Europe, regulating the affairs of the order. In 1300, in response to the urgent remonstrances of the knights, he appeared in Cyprus. In 1299 an unnatural alliance of the Christians and Mongols gave a momentary prospect of regaining the Holy Land; in 1300 the Hospitallers took part in the raid of King Henry II. (de Lusignan) of Cyprus in Egypt, and gained some temporary successes on the coast of Syria. Of more advantage for the prestige of the order, however, were the immense additions of property and privileges which Guillaume de Villaret had secured in Europe from the pope and many kings and princes,[10] and the reform of the rule and drastic reorganization of the order promulgated in a series of statutes between 1300 and 1304, the year of Guillaume's death.[11] Of these changes the most significant was the definition of the powers and status of the admiral, a new great dignitary created in 1299.

The grand-mastership of Foulques de Villaret, Guillaume's nephew and successor,[1] was destined to be eventful for the order. On the 5th of June 1305 Bertrand de Got became pope as Clement V. The new pope consulted the grand master of the Templars and Hospitallers as to the organization of a new crusade, and at the same time raised the question of the fusion of the military orders, a plan which had already been suggested by St Louis, discussed at the council of Lyons in 1274, and approved by the pope's patron Philip IV. of France. The proposal broke down on the opposition of Jacques de Molay, grand master of the Temple; but the desired result was obtained by other and more questionable means. In October 1307 Philip IV. caused all the Templars in France, including the grand master, to be arrested on charges of heresy and gross immorality; Pope Clement V., a creature of the French king, reluctantly endorsed this action, and at his instance the other sovereigns of Europe followed the example of Philip. The famous long-drawn-out trial of the Templars followed, ending at the council of Vienne in 1314, when Pope Clement decreed the dissolution of the order of the Temple and at the same time assigned the bulk of its property to the Hospital.[2] (See TEMPLARS, KNIGHTS.)

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[1] Detailed by Le Roulx, *Hospitaliers*, pp. 149-156.

[2] *Cartul.* ii. No. 1944. The Teutonic knights refused to obey. In January 1240 Gregory called on them to explain their insubordination (No. 2247) and in March 1241 again ordered them to submit (No. 2270).

[3] *Cartul.* ii. No. 2149.

[4] *Cartul.* ii. No. 2186.

[5] Not Villebride. The name is a corruption of *Vieille Brioude* (Le Roulx, *Hosp.* p. 183).

[6] It has been generally supposed, on the authority of the *chronica majora* of Matthew of Paris (iv. 307-311), that the grand-master was killed at Gaza.

[7] See the contemporary letter, *Cartulaire*, ii. No. 2521.

[8] *Cartul.* ii. Nos. 2540-2541.

[9] *Cartulaire*, iii. Nos. 4267, 4293; cf. the letter of the chapter-general to Guillaume de Villaret, iii. No. 4310.

[10] Le Roulx, *Hospitaliers*, p. 259 sqq.

[11] These statutes are printed in the *Cartulaire*, iii. Nos. 4515, iv. Nos. 4549, 4574, 4612.

Meanwhile an event had occurred which marks an epoch in the history of the order of the Hospital. In 1306 Foulques de Villaret, anxious to find a centre where the order would be untrammelled by obligations to another power as in Cyprus, came to an agreement with a Genoese pirate named Vignolo de' Vignoli for a concerted attack on Rhodes and other islands belonging to the Greek emperor. The exact date of their completed conquest of the island is uncertain;[3] nor is it clear that the grand master took a personal part in it. By command of the pope he had left Cyprus for Europe at the end of 1306 or the beginning of 1307, and he did not return to the East till late in 1309. He returned, however, not to Cyprus but to Rhodes, and it is with 1310, therefore, when its headquarters were established in the latter island, that the second period of the history of the order of the Hospital opens.[4]

The Knights in Rhodes.—The history of the order for the next fifty years is very obscure. Certain changes, however, took place which profoundly modified its character. The most important of these was its definitive division into "langues." The beginnings of this had been made long before; but the system was only legalized by the general chapter at Montpellier in 1330. Hitherto the order had been a cosmopolitan society, in which the French element had tended to predominate; henceforth it became a federation of national societies united only for purposes of commerce and war. To the headship of each "langue" was attached one of the great dignitaries of the order, which thus came to represent, not the order as a whole but the interests of a section.[5] The motive of this change was probably, as Prutz suggests,[6] fear of the designs of Philip IV. of France and his successors to which point had been given by the fate of the Templars, and the consequent desire to destroy the preponderance of the French element.[7]

The character and aims of the order were also profoundly affected by their newly acquired sovereignty—for the shadowy overlordship of the Eastern emperor was soon forgotten—and above all by its seat. The Teutonic order had established its sovereignty in Prussia, in wide and ill-defined spheres beyond the north-eastern marches of Germany. The Hospitallers ruled an island too narrow to monopolize their energies, but occupying a position of vast commercial and strategic importance. Close to the Anatolian mainland, commanding the outlet of the Archipelago, and lying in the direct trade route between Europe and the East, Rhodes had become the chief distributing point in the lively commerce which, in spite of papal thunders, Christian traders maintained with the Mahommedan states; and in the new capital of the order representatives to every language and religion of the Levant jostled, haggled and quarrelled.[8] The Hospitallers were thus divided between their duty as sovereign, which was to watch over the interests of their subjects, and their duty as Christian warriors, which was to combat the Infidel. In view of the fact that the crusading spirit was everywhere declining, it is not surprising that their policy was henceforth directed less by religious than by political and commercial considerations. Not that they altogether neglected their duty as protectors of the Cross. Their galleys policed the narrow seas; their consuls in Egypt and Jerusalem watched over the interests of pilgrims; their hospitals were still maintained for the service of the sick and the destitute. But, side by side with this, secularization proceeded apace. In 1341 Pope Clement VI. wrote to the grand master denouncing the luxury of the order and the misuse of its funds; in 1355 Innocent VI. sent the celebrated Juan Fernandez de Heredia, castellan of Amposta and grand commander of Aragon, as his legate to Rhodes, armed with a bull which threatened the order with dissolution if it did not reform itself and effect a settlement in Turkey. In 1348, indeed, the Hospitallers, in alliance with Venice and Cyprus, had captured Smyrna; but the chief outcome of this had been commercial treaties with their allies. Such treaties were, in fact, a matter of life and death; for the island was not self-supporting, and even towards the Infidel the attitude of the knights was necessarily influenced by the fact that their supplies of provisions were mainly drawn from the Mussulman mainland. By the 15th century their crusading spirit had grown so weak that they even attempted to negotiate a commercial treaty with the Ottoman sultan; the project broke down on the refusal of the knights to accept the sultan's suzerainty.

The earlier history of the Hospitallers bristles with obscure questions on which modern scholarship (notably the labours of Delaville Le Roulx) has thrown new light. From 1355 onward, however, the case is different; the essential facts have been established by writers who were able to draw on a mass of well-ordered materials.

Their history during the two centuries of the occupation of Rhodes, so far as its general interest for Europe is concerned, is that of a long series of naval attacks and counter-attacks; its chief outcome, for which the European states owed a debt of gratitude but ill acknowledged, the postponement for some two centuries of the appearance of the Ottomans as a first-rate naval power in the Mediterranean. The seaward advance of Osman the Turk was arrested by their victories; in 1358 they successfully defended Smyrna; in 1365 under their grand master Raymond Béranger (d. 1374), and in alliance with the king of Cyprus, they captured and burned Alexandria. The Ottoman peril, however, grew ever more imminent, and in 1395, under their grand master Philibert de Naillac, the Hospitallers shared in the disastrous defeat of Nicopolis. The invasion followed of Timur the Tatar, invited to his aid by the Eastern emperor. Sultan Bayezid, the victor of Nicopolis, was overthrown; but Timur turned against the Christians and in 1402 captured Smyrna, putting the Hospitallers who defended it to the sword. It was after this disaster that the knights built, on a narrow promontory jutting from the mainland opposite the island of Kos, the fortress of St Peter the Liberator. The castle, which still stands, its name corrupted into Budrun (from Bedros, Peter), was long a place of refuge for Christians flying from slavery.[1] Some years later the position of the order as a Mediterranean sea-power was strengthened by commercial treaties with Venice, Pisa, Genoa, and even with Egypt (1423). The zenith of its power was reached a few years later, when, under the grand master Jean Bonpar de Lastic, it twice defeated an Egyptian attack by sea (1440 and 1444). A new and more imminent peril, however, arose with the capture of Constantinople by the Turks in 1453, for Mahommed II. had announced his intention of making Rhodes his next objective. The attack was delayed for twenty-seven years by the sultan's wars in south-eastern Europe; and meanwhile, in 1476, Pierre d'Aubusson (*q.v.*), the second great hero of the order, had been elected grand master. Under his inspiration, when in June 1480 the Turks, led by three renegades, attacked the island, the knights made so gallant a resistance that, in July, after repeated and decisive repulses, the Turks retreated. In 1503 Pierre d'Aubusson was succeeded by Aymar d'Amboise, who directed a long series of naval battles. In 1521 the famous Philippe de Villiers de l'Isle d'Adam was elected grand master, just as the dreaded sultan Suleiman the Magnificent directed his attack on Rhodes. In 1522 he besieged the island, reinforcements failed, the European powers sent no assistance, and in 1523 the knights capitulated, and withdrew with all the honours of war to Candia (Crete). The emperor Charles V., when the news was brought to him, exclaimed, "Nothing in the world has been so well lost as Rhodes!" But he refused to assist the grand master in his plans for its recovery, and instead, five years later (1530), handed over to the Hospitallers the island of Malta and the fortress of Tripoli in Africa.

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[1] M. Le Roulx dates his election between the 23rd of November 1304 and the 3rd of November 1305 (*Hosp.* p. 268).

[2] The Templars' property in the Spanish peninsula and Majorca was specially excepted, being subsequently assigned to the sovereigns, who transferred some of it to the native military orders. Nor did the Hospitallers receive by any means all of the rest. Philip IV, charged against the Hospital an enormous bill for expenses incurred in the trial of the Templars, including, as one item, those for torturing the knights. In France at least the Hospitallers complained that they were actually out of pocket. See Finke, *Papsttum und Untergang des Tempelherrenordens*, i. *ad fin.* None the less, the great accession of territorial property necessitated the subdivision of the great regional jurisdictions, notably that of the priory of St Gilles, into new grand priories.

[3] The question is discussed in detail by M. Le Roulx, *Hospitaliers*, pp. 278 sqq. He himself dates the surrender of the castle of Rhodes in 1308. Cf. Hans Prutz, "Anfänge der Hospitaliter auf Rhodos" in *Sitzungsber. der K. Bay. Akad. d. Wissenschaften* (1908), i. Abhandlung.

[4] Foulques de Villaret's head seems to have been turned by his success. His early vigour and statesmanlike qualities gave place to luxury, debauchery and a tyrannical temper. He was ultimately deposed, and died at the castle of Teyran in Languedoc in 1327.

[5] The great dignitaries were distributed as follows: Grand commander of Provence, the grand preceptor; Auvergne, the grand marshal; France, the grand hospitaller; Italy, the grand admiral; Aragon, the grand conservator or draper; England, the turcopolier; Germany, the grand bailiff; Castile, the grand chancellor.

[6] "Die Anfänge der Hospitaliter auf Rhodos."

[7] Philip IV. strenuously opposed the change for this reason. Prutz, *Die geistlichen Ritterorden*, pp 358 sqq. Compare the division of the general councils of Basel and Constance into "nations."

[8] See the regulations made, soon after the capture of the island, in the *Capitula Rodi*, a fragment of a code, published by Ewald in *Neues Archiv* iv. pp. 265–269

The Knights in Malta.—The settlement of the Hospitallers in Malta was contemporaneous with the Reformation, which profoundly affected the order. The master and knights of the bailiwick of Brandenburg accepted the reformed religion, without, however, breaking off all connexion with the order (see below). In England, on the other hand, the refusal of the grand prior and knights to acknowledge the royal supremacy led to the confiscation of their estates by Henry VIII., and, though not formally suppressed, the English "langue" practically ceased to exist.[2] The knights of Malta, as they came to be known, none the less continued their vigorous warfare. Under Pierre du Pont, who succeeded Villiers de l'Isle d'Adam in 1534, they took a conspicuous part in Charles V.'s attack on Goletta and Tunis (1535). In 1550 they defeated the redoubtable corsair Dragut, but in 1551 their position in Tripoli, always precarious, became untenable and they capitulated to the Turks under Dragut, concentrating their forces in Malta. In 1557 Jean Parisot de la Vallette (1494–1548) was elected grand master, and under his vigorous rule strenuous efforts were made to put the defences of Malta into a fit state to resist the expected Turkish attack. On the 18th of May 1565 the Ottoman fleet, under Dragut, appeared before the city, and one of the most famous sieges in history began.[3] It was ultimately raised on the 8th of September, on the appearance of a large relieving force despatched by the Spanish viceroy of Sicily, after Dragut and 25,000 of his followers had fallen. The memory of La Vallette, the hero of the siege, who died in 1568, is preserved in the city of Valletta, which was built on the site of the struggle.

In 1571 the knights shared in the victory of Lepanto; but this crowning success was followed during the 17th century by a long period of depression, due to internal dissensions and culminating during the Thirty Years' War, the position of the order being seriously affected by the terms of the peace of Westphalia (1648). The order was also troubled by quarrels with the popes, who claimed to nominate its officials (a claim renounced by Innocent XII. in 1697), and by rivalry with the Mediterranean powers, especially Venice. In Malta itself there were four rival claimants to independent jurisdiction: the grand master, the bishop of Malta, the grand inquisitor, whose office was instituted in 1572, and the Society of Jesus, introduced by Bishop Gargallo in 1592. The order, indeed, saw much fighting: *e.g.* the frequent expeditions undertaken during the grand-mastership of Alof de Vignacourt (1601–1622); the defence of Candia—which fell after a twenty years' siege in 1669—under Nicholas Cottoner, grand master from 1665 to 1680; and, during the grand mastership of Gregorio Caraffa (1680–1690), a campaign (1683) with John Sobieski, king of Poland, against the Turks in Hungary, and the attack in alliance with Venice on the Morea in 1687, which involved the Hospitallers in the defeat at Negropont in 1689. The decline of the order was hastened by the practice of electing aged grand masters to ensure frequent vacancies; such were Luiz Mendez de Vasconcellos (1622–1623) and Antonio da Paula (1623–1636) and Giovanni Paolo Lascaris (de Castellar), in 1636, who died twenty-one years later at the age of ninety-seven. The character of the order at this date became more exclusively aristocratic, and its wealth, partly acquired by commerce, partly derived from the contributions of the commanderies scattered throughout Europe, was enormous. The wonderful fortifications, planned by French architects and improved by every grand master in turn, the gorgeous churches, chapels and *auberges*, the great library founded in 1650, were the outward and visible sign of the growth of a corresponding luxury in the private life of the order. Nevertheless, under Raymond Perellos de Roccaful (1697–1720) and Antonio Manoel de Vilhena (1722–1736), the knights restored their prestige in the Mediterranean by victories over the Turks. In 1741 Emmanuele Pinto de Fonseca, a man of strong character, became grand master. He expelled the Jesuits, resisted papal encroachments on his authority and, refusing to summon the general chapter, ruled as a despot.

Emanuel, prince de Rohan, who was elected grand master in succession to Francesco Jimenes de Texada in 1775, made serious efforts to revive the old spirit of the order. Under him, for the first time since 1603, a general chapter was convoked; the orders of St Anthony and St Lazarus were incorporated, and the statutes were revised and codified (1782). In 1782 also Rohan, with the approval of George III. established the new Anglo-Bavarian "langue." The last great expedition of the Maltese galleys was worthy of the noblest traditions of the order; they were sent to carry supplies for the sufferers from the great earthquake in Sicily. They had long ceased to be effective fighting ships, and survived mainly as gorgeous state barges in which the knights sailed on ceremonial pleasure trips.

The French Revolution was fatal to the order. Rohan made no secret of his sympathy with the losing cause in France, and Malta became a refuge-place for the *émigrés*. In 1792 the vast possessions of the order in France were confiscated, and six years later the Directory resolved on the forcible seizure of Malta itself. Rohan had died in 1797, and his feeble successor, Baron Ferdinand von Hompesch,[1] though fully warned, made no preparations to resist. In the early summer of 1798, after a siege of only a few days, he surrendered the island, with its impregnable fortifications, to Bonaparte, and retired ignominiously to Trieste, carrying with him the precious relics of the order—the hand of St John the Baptist presented by the sultan Bayezid, the miraculous image of Our Lady of Philermo, and a fragment of the true cross.

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[1] There is a reduction of a photograph of the castle in Bedford and Holbeche's *Order of the Hospital*, p. 20. The building materials were largely taken from the Mausoleum of Halicarnassus.

[2] The great priory church at Clerkenwell in London was almost wholly destroyed by the Protector Somerset, who used the materials for his palace in the Strand. Only the great gateway, spanning St John Street, now survives above ground of the priory buildings. It is the headquarters of the revived English "langue." Sir John Rawson, prior of Kilmainham, the headquarters of the order in Ireland, accepted the royal supremacy and was created Lord Clontarf. In 1679 the duke of Ormonde erected the present hospital on the site of the ancient priory. The preceptory of Torphichen, headquarters of the order in Scotland, was surrendered in 1547 by the preceptor Sir James Sandilands of Calder, who was created Lord Torphichen. As "Lord of St John" he had had precedence of all the barons of Scotland, and this right—originally exercised as a spiritual peer—was retained by him and his successors.

[3] In Protestant England public prayers were offered for the success of the knights. Yet a few years later Queen Elizabeth was seeking the alliance of the sultan against Spain, on the ground of their common religion as against "the idolators"!

With this the history of the order of St John practically ends. Efforts were, however, made to preserve it. Many of the knights had taken refuge at the court of Paul I. of Russia, with whom in 1797 Hompesch had made an alliance. In October 1798 these elected the emperor Paul grand master, and in the following year Hompesch was induced to resign in his favour. The half-mad tsar took his new functions very seriously, but his murder in 1801 ruined any hope of recovering Malta with Russian assistance. A chapter of the order now granted the right of nomination to the pope, who appointed Giovanni di Tommasi grand master. From his death in 1805 until 1879, when Leo XIII. restored the title of grand master in favour of Fra Giovanni Ceschi a Santa Croce, the heads of the order received only the title of lieutenant master. In 1814 the French knights summoned a chapter general and elected a permanent commission for the government of the order, which was recognized by the Italian and Spanish knights, by the pope and by King Louis XVIII. In the Italian states much of the property of the order was restored at the instance of Austria, and in 1841 the emperor Ferdinand founded the grand priory of Lombardo-Venetia.

Present Constitution of the Order.—The "Sovereign Order of Malta" is now divided into the Italian and German langues, both under the Sacred Council (Sagro consiglio) at Rome. The Italian langue embraces the grand priories of Rome, Lombardy and Venice, and Sicily; the German langue consists of (1) the grand priory of Bohemia, (2) the association of the honorary knights (*Ehrenritter*) in Silesia, (3) the association of *Ehrenritter* in Westphalia and the Rhine country, (4) the association of English knights (not to be confused with the English order), (5) the knights received *in gremio religionis*, *i.e.* those not attached to any of the preceding divisions. At the head of the order is the grand master. Each priory has a certain number of bailiffs (grand commanders, *commendatori*), commanders, professed knights (*i.e.* those who have taken the vows), knights of justice (novices), honorary knights, knights of grace, donats and chaplains.

Candidates for knighthood have to prove sixteen quarterings of nobility and, if under age, must be sons of a landowner of the province and of a mother born within its limits. If an Austrian subject, the postulant must obtain the emperor's leave to join the order; the election is by the chapter, and subject to confirmation by the pope. Knights of justice take a yearly oath to fulfil the duties laid on them by the order. After ten years they may take the full oath as professed knights. At any time before doing so, however, they are free to retire from the order and may receive the *croix de dévotion* as honorary knights, their sole obligation being an annual subscription to the order. The *croix de dévotion* is also bestowed on ladies of sufficiently impeccable descent. The grand master also has the right, *motu proprio*, to bestow the cross on distinguished people not of noble birth, who are known as knights of grace. The grand cross[2] of the order is sometimes given, *honoris causa*, to sovereigns and others, who then rank as honorary bailiffs. This is a gold, white enamelled "Maltese" cross, surmounted by a crown, which is worn suspended round the neck by a black ribbon. Bailiffs, professed knights and chaplains wear in addition a white linen cross sewn on to the left breast. The grand priory of Bohemia has made the nursing of the sick its speciality, and especially the organization of military hospitals. The hospice between Bethlehem and Jerusalem is under the protection of the Austrian emperor.

Protestant Orders.—In addition to the Sovereign Order of the Knights of Malta, there exist two Orders of St John of Jerusalem which derive their origin from the same source: the Prussian *Johanniterorden* and the English Order of St John of Jerusalem. Of these the Prussian order has the most interesting history. At the Reformation the master and knights of the bailiwick of Brandenburg adopted the new religion. They continued, however, like other *Ritterstifter*, to enjoy their corporate rights; they even continued to acknowledge the jurisdiction of the grand preceptor of the German langue, in so far as the confirmation of official appointments was concerned, and to send their contributions to the common fund of the order. On the 30th of October 1810, under stress of the miseries of the Napoleonic occupation of Prussia, the order was secularized and its estates confiscated; in 1812 King Frederick William III. founded the chivalrous order of St John, to which the expropriated knights were admitted as honorary knights. In 1853 Frederick William IV. reversed this action, abolished the new chivalrous order and reconstituted the bailiwick of Brandenburg, on the ostensible ground that its maintenance had been guaranteed by the treaty of Westphalia (1648). The master (*Herrenmeister*) is elected by the chapter. All members of the order must be of noble birth and belong to the Evangelical Church. The cross worn is of white enamelled gold with four black eagles between the arms; a white linen cross is also sewn on the left breast of the red tunic which forms part of the uniform. The order has founded, and supports, many hospitals, including a hospice at Jerusalem (see Herrlich, *Die Ballei Brandenburg*, 4th ed., Berlin, 1904).

As already mentioned, the English langue, though deprived of its lands, was never formally suppressed. In 1826–1827 the commission instituted by the French knights in 1814, which was aiming at taking advantage of the Greek War of Independence to reconquer Rhodes or to secure some other island in the Levant, suggested the restoration of the English langue, obviously with the idea of securing the help of Great Britain for their project. Certain eminent Englishmen, *e.g.* Sir Sydney Smith, had already been affiliated to the order by the grand master Baron von Hompesch; the commission now placed itself in communication with the Rev. Sir William Peat, chaplain to King George IV., and other English gentlemen of position. The negotiations resulted in articles of convention reviving the English langue. In 1834 Sir William Peat, elected prior of the English langue, qualified himself by taking the oath *de fideli administratione* in the court of King's Bench, under the charter (never repealed) of Philip and Mary re-establishing the order.[3] For fifty years this was all the official recognition obtained by this curious and characteristic sham-Gothic restoration of the Romantic period. The "English langue," however, though somewhat absurd, did good service in organizing hospital work, notably in the creation of the St John's Ambulance Association, and this work was recognized in high quarters, the princess of Wales (afterwards Queen Alexandra) becoming a lady of justice in 1876 and the duke of Albany joining the order in 1883. In 1888 Queen Victoria granted a charter formally incorporating the order, the headquarters of which had been established in the ancient gate-way of the priory at Clerkenwell. In 1889 the prince of Wales (King Edward VII.) was installed as grand prior.

The objects and constitution of the order are practically the same as those of its Prussian equivalent. The sovereign is its supreme head and patron, the heir to the throne for the time being its grand prior. It is essentially aristocratic, though—for obvious reasons—proof of sixteen quarterings of nobility is not exacted as a condition of membership. The cross is the gold, white-enamelled Maltese cross, differenced by two lions and two unicorns placed between the arms. The order also gives medals to persons of all ranks "for service in the cause of humanity." Among other good works, it supports an ophthalmic hospital at Jerusalem. Unlike the Prussian order, the members need not be Protestants, though they must profess Christianity.[4]

AUTHORITIES.—From the 12th century onwards the knights exercised peculiar care in the preservation of their records, and the vast archives of the order are still preserved, all but intact, at Malta. These include not only those of the central establishment but also a large number of those of the separate commanderies. They include papal bulls, the records of the general chapter, the statutes of the grand masters, title deeds, charters, and from 1629 onwards the special transactions of the *Conseil d'état*. These materials were exploited by several writers in the 17th and 18th centuries. The first was Giacomo Bosio, the 3rd edition of whose *Istoria della . . . illustrissima militia di S. Giov. Gierosolimitano* was published in 3 vols. at Rome in 1676. This was followed by S. Pauli's *Codice diplomatico del sacro militare ordine Geros.* (2 vols., Lucca, 1733–1737) and P. A. Paoli's *Dell' origine ed istituto del sacro militar ordine, &c.* (Rome, 1781). These are still useful sources as containing references to, and extracts from, documents since lost. In 1883 J. Delaville Le Roulx published *Les Archives de l'Ordre de Saint-Jean*, an analysis of the records preserved at Malta. This was followed in 1904 by his monumental *Cartulaire général des Hospitaliers de Saint-Jean de Jérusalem* (1100–1310), 4 vols. folio. This gives (1) all documents anterior to 1120, (2) all those emanating from the great dignitaries of the order, (3) all those emanating from popes, emperors, kings and great feudatories, (4) those which fix the date of the foundation of particular commanderies, (5) those regulating the relations of the Hospitallers with the lay and ecclesiastical authorities and with the other military orders, (6) the rules, statutes and customs of the order. Hitherto unpublished documents (from the archives of Malta and elsewhere) are published in full; those already published, and the place where they may be found, being indicated in proper sequence. Based on the *Cartulaire* is Le Roulx's *Les*

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[1] He was the only German in the list of grand masters.

[2] So called because the dignitaries wore a larger cross than the generality of the knights.

[3] See Bedford and Holbeche, Appendix D.

[4] The medieval vows are, of course, not taken.

Hospitaliers en Terre Sainte et en Chypre (Paris, 1904), an invaluable work in which many hitherto obscure problems have been solved. It contains a full list of published authorities. Of English works may be mentioned John Taaffe's *History of the Order of Malta* (1852); J. M. Kemble's Historical introduction to *The Knights Hospitallers in England* (Camden Soc., London, 1857); W. Porter, *Hist. of the Knights of Malta* (2 vols. 1858, new ed. 1883); Bedford and Holbeche, *The Order of the Hospital of St John of Jerusalem* (1902), for the modern order. (W. A. P.)

ST JOHNS, the capital of Newfoundland, situated on the east coast of the island, in the peninsula of Avalon, in 47° 33′ 54″ N., and 52° 40′ 18″ W. It is the most easterly city of America, only 1700 m. from Queenstown in Ireland, and 2030 from Liverpool. It stands on rising ground on the north side of a land-locked harbour, which opens suddenly in the lofty iron-bound coast. The entrance, known as The Narrows, guarded by Signal Hill (520 ft.) and South Side Hill (620 ft.), is about 1400 ft. wide, narrowing to 600 ft. between Pancake and Chain Rocks. At the termination of the Narrows the harbour trends suddenly to the west, thus completely shutting out the ocean swell. Vessels of the largest tonnage can enter at all periods of the tide. There is good wharf accommodation and a well-equipped dry dock. St Johns practically monopolizes the commerce of the island (see NEWFOUNDLAND), being the centre of the cod, seal and whale fisheries. The chief industries are connected with the fitting out of the fishing vessels, or with the disposal and manufacture of their catch. Steamship lines run to Liverpool, New York, Halifax (N.S.) and Saint Pierre. Nearly all the commerce of the island is sea-borne, and well-equipped steamers connect St Johns with the numerous bays and outports. It is the eastern terminus of the government railway across the island to Port-aux-Basques, whence there is steamer connexion with the mainland at Sydney.

The finest buildings in the city are the Anglican and Roman Catholic cathedrals. Education is controlled by the various religious bodies; many of the young men complete their studies in Canada or Great Britain. St Johns is not an incorporated town. A municipal council was abolished after having largely increased the debt of the city, and it is now governed by commissioners appointed by the governor in council.

St Johns was first settled by Devonshire fishermen early in the 16th century. It was twice sacked by the French, and captured by them in the Seven Years' War (1762), but recaptured in the same year, since when it has remained in British possession. Both in the War of American Independence and in that of 1812 it was the headquarters of the British fleet, and at one time the western end of the harbour was filled up with American prizes. The old city, built entirely of wood, was twice destroyed by fire (1816–1817 and 1846). Half of it was again swept away in 1892, but new and more substantial buildings have been erected.

The population, chiefly of the Roman Catholic faith and of Irish descent, increases slowly. In 1901 the electoral district of St Johns contained 39,994 inhabitants, of whom 30,486 were within the limits of the city.

ST JOHNS, a town and port of entry of Quebec, Canada, and capital of St Johns county, 27 m. S.E. of Montreal by rail, on the river Richelieu and at the head of the Chambly canal. Pop. (1901) 4030. A large export trade in lumber, grain and farm produce is carried on, and its mills and factories produce flour, silk, pottery, hats, &c. Three railways, the Grand Trunk, Canadian Pacific and Central Vermont, enter St Johns. On the opposite bank of the river is the flourishing town of St Jean d'Iberville (usually known simply as Iberville), connected with St Johns by several bridges.

SAINT JOHNSBURY, a township and the county-seat of Caledonia county, Vermont, U.S.A., on the Passumpsic river, about 34 m. E.N.E. of Montpelier. Pop. (1890) 6567; (1900) 7010; (1910) 8098; of the village of the same name (1900) 5666 (1309 foreign-born); (1910) 6693. Area of the township, about 47 sq. m. Saint Johnsbury is served by the Boston & Maine and the Saint Johnsbury & Lake Champlain railways. The farms of the township are devoted largely to dairying. In the village are a Y.M.C.A. building (1885); the Saint Johnsbury Academy (1842); the Saint Johnsbury Athenaeum (1871), with a library (about 18,000 volumes in 1909) and an art gallery; the Fairbanks Museum of Natural Science (1891), founded by Colonel Franklin Fairbanks; St Johnsbury Hospital (1895); Brightlook Hospital (1899, private); the large scales manufactory of the E. & T. Fairbanks Company (see FAIRBANKS, ERASTUS), and also manufactories of agricultural implements, steam hammers, granite work, furniture and carriages. There are two systems of water-works, one being owned by the village.

The township of Saint Johnsbury was granted to Dr Jonathan Arnold (1741–1793) and associates in 1786; in the same year a settlement was established and the place was named in honour of Jean Hector Saint John de Crèvecœur (1731–1813), who wrote *Letters of an American Farmer* (1782), a glowing description of America, which brought thither many immigrants, and who introduced potato planting into France. The township government was organized in 1790, and the village was incorporated in 1853.

ST JOHN'S WORT, in botany, the general name for species of *Hypericum*, especially *H. perforatum*, small shrubby plants with slender stems, sessile opposite leaves which are often dotted with pellucid glands, and showy yellow flowers. *H. Androsaenium* is Tutsan (Fr. *tout saine*), so called from its healing properties. *H. calycinum* (Rose of Sharon), a creeping plant with large almost solitary flowers 3 to 4 in. across, is a south-east European plant which has become naturalized in Britain in various places in hedges and thickets.

SAINT JOSEPH, a city and the county-seat of Berrien county, Michigan, U.S.A., on Lake Michigan at the mouth of the Saint Joseph river, near the S.W. corner of the state. Pop. (1890) 3733; (1900) 5155, of whom 1183 were foreign-born; (1910 U.S. census) 5936. It is served by the Michigan Central and the Père Marquette railways, by electric interurban railway to South Bend, Indiana, and by a steamboat line to Chicago. Benton Harbor, about 1 m. S.W., with which St Joseph is connected by electric line, is a terminus of the Cleveland, Cincinnati, Chicago & St Louis railway. The U.S. government has deepened the harbour channel to 18 ft.; and the St Joseph river has been made navigable for vessels drawing 3 ft. from St Joseph to Berrien Springs (25 m. by river). A canal, 1 m. long, extends from the upper part of the harbour to Benton Harbor. St Joseph has a public library. The city is a summer and health resort; it has mineral (saline sulphur) springs and a large mineral-water bath house. The general offices and the hospital (1902) of the Michigan Children's Home Society are here. The city has an important trade in fruit, and has various manufactures, including paper, fruit packages, baskets, motor boats, gasolene launches, automobile supplies, hosiery and knit goods, air guns and sashes and blinds. The municipality owns and operates its water-works and electric-lighting plant.

On or near the site of the present city La Salle built in 1679 Fort Miami. In the same county, on or near the site of the present city of Niles (pop. 1910, 5156), French Jesuits established an Indian mission in 1690, and the French government in 1697 erected Fort St Joseph, which was captured from the English by the Indians in 1763, and in 1781 was seized by a Spanish party from St Louis. Fort Miami has often been confused with this Fort St Joseph, 60 m. farther up the river. St Joseph was settled in 1829, incorporated as a village in 1836 and first chartered as a city in 1891.

SAINT JOSEPH, a city and the county-seat of Buchanan county, Missouri, U.S.A., and a port of entry, situated in the north-western corner of the state on the E. bank of the Missouri river. It is the third in size among the cities of the state. Pop. (1880) 32,431; (1890) 52,324; (1900) 102,979, of whom 8424 were foreign-born and 6260 were negroes; (1910 census) 77,403. St Joseph is a transportation centre of great importance. It is served by six railways, the Atchison, Topeka & Santa Fé, the Chicago, Burlington & Quincy, the Chicago Great Western, the Chicago, Rock Island & Pacific, the Missouri Pacific, and the St Joseph & Grand Island; in addition there are two terminal railways. A steel bridge across the Missouri (built in 1872; rebuilt in 1906) connects the city with Elwood, Kansas (pop. 1910, 636), and is used by two railways. The city is laid out on hills above the bluffs of the river. The site was completely remade, however (especially in 1866–1873), and the entire business portion has been much graded down. The principal public buildings are the Federal building, the court house, an auditorium seating 7000, a Union Station and a public library. There are six city parks, of which the largest are Krug Park (30 acres) and Bartlett Park (20 acres). The State Hospital (No. 2) for the Insane (opened 1874) is immediately E. of St Joseph; in the city are the Ensworth, St Joseph and Woodson hospitals, a Memorial Home for needy old people and the Home for Little Wanderers. South St Joseph, a manufacturing suburb, has a library and so has the northern part of the city. The great stock-yards of South St Joseph are sights of great interest. In 1909 the state legislature provided for a commission form of government which took effect in April 1910; a council of five, elected by the city at large, has only legislative powers; the mayor appoints members of a utilities commission, a park commission and a board of public works, and all officers except the city auditor and treasurer; and the charter provides for the initiative, the referendum and the recall. The city maintains a workhouse (1882), also two market houses, and owns and manages an electric-lighting plant. Natural gas is also furnished to the city from oil-fields in Kansas. A private company owns the water-works, first built in 1879 and since greatly improved. The water is drawn from the Missouri, 3 m. above the city, and is pumped thence into reservoirs and settling basins. Beside the local trade of a rich surrounding farming country, the railway facilities of St Joseph have enabled it to build up a great jobbing trade (especially in dry goods), and this is still the greatest economic interest of the city. Commerce and transport were the only distinctive basis of the city's growth and wealth until after 1890, when there was a great increase in manufacturing, especially, in South St Joseph, of the slaughtering and meat-packing industry in the last three years of the decade. In 1900 the manufactured product of the city and its immediate suburbs was valued at $31,690,736, of which $19,009,332 were credited to slaughtering and packing. In the decade of 1890–1900 the increase in the value of manufactures (165·9%) was almost five times as great in St Joseph as in any other of the largest four cities of the state, and this was due almost entirely to the growth of the slaughtering and meat-packing business, which is for the most part located outside the municipal limits. In 1905 the census reports did not include manufactures outside the actual city limits; the total value of the factory product of the city proper in 1905 was $11,573,720; besides slaughtering and packing the other manufactures in 1905 included men's factory-made clothing (valued at $1,556,655) flour and grist-mill products (valued at $683,464), saddlery and harness (valued at $524,918), confectionery ($437,096), malt liquors ($407,054), boots and shoes ($350,384) and farm implements.

In 1826 Joseph Robidoux, a French half-breed trader, established a trading post on the site of St Joseph. Following the purchase from the Indians of the country, now known as the Platte Purchase, in 1836, a settlement grew up about this trading post, and in 1843 Robidoux laid out a town here and named it St Joseph in honour of his patron saint. St Joseph became the county-seat in 1846, and in 1851 was first chartered as a city. It early became a trading centre of importance, well known as an outfitting point for miners and other emigrants to the Rocky Mountain region and the Pacific coast. During the Civil War it was held continuously by the Unionists, but local sentiment was bitterly divided. After the war a rapid development began. In 1885 St Joseph became a city of the second class. Under the state constitution of 1875 it has had the right, since attaining a population of 100,000, to form a charter for itself. In September 1909, at a special election, it adopted the commission charter described above.

ST JUNIEN, a town of west-central France in the department of Haute-Vienne, on the right bank of the Vienne, 26 m. W. by N. of Limoges on the railway from Limoges to Angoulême. Pop. (1906) town, 8484; commune, 11,400. The 12th century collegiate church, a fine example of the Romanesque style of Limousin, contains a richly sculptured tomb of St Junien, the hermit of the 6th century from whom the town takes its name. Another interesting building is the Gothic chapel of Notre-Dame, with three naves, rebuilt by Louis XI., standing close to a medieval bridge over the Vienne. The town, which ranks second in the department in population and industry, is noted for leather-dressing and the manufacture of gloves and straw paper.

SAINT-JUST, ANTOINE LOUIS LÉON DE RICHEBOURG DE (1767–1794), French revolutionary leader, was born at Decize in the Nivernais on the 25th of August 1767. At the outbreak of the Revolution, intoxicated with republican ideas, he threw himself with enthusiasm into politics, was elected an officer in the National Guard of the Aisne, and by fraud—he being yet under age—admitted as a member of the electoral assembly of his district. Early in 1789 he had published twenty cantos of licentious verse, in the fashion of the time, under the title of *Organt au Vatican*. Henceforward, however, he assumed a stoical demeanour, which, united to a policy tyrannical and pitilessly thorough, became the characteristic of his life. He entered into correspondence with Robespierre, who, flattered by his worship, admitted him to his friendship. Thus supported, Saint-Just became deputy of the department of Aisne to the National Convention, where he made his first speech on the condemnation of Louis XVI.—gloomy, fanatical, remorseless in tone—on the 13th of November 1792. In the Convention, in the Jacobin Club, and among the populace his relations with Robespierre became known, and he was dubbed the "St John of the Messiah of the People." His appointment as a member of the Committee of Public Safety placed him at the centre of the political fever-heat. In the name of this committee he was charged with the drawing up of reports to the Convention upon the absorbing themes of the overthrow of the party of the Gironde (report of the 8th of July 1793), of the Hérbertists, and finally, of that denunciation of Danton which consigned him and his followers to the guillotine. What were then called reports were rather appeals to the passions; in Saint-Just's hands they furnished the occasion for a display of fanatical daring, of gloomy eloquence, and of undoubted genius; and—with the shadow of Robespierre behind him—they served their turn. Camille Desmoulins, in jest and mockery, said of Saint-Just—the youth with the beautiful countenance and the long fair locks—"He carries his head like a Holy Sacrament." "And I," savagely replied Saint-Just, "will make him carry his like a Saint Denis." The threat was not vain: Desmoulins accompanied Danton to the scaffold. The same ferocious inflexibility animated Saint-Just with reference to the external policy of France. He proposed that the National Convention should itself, through its committees, direct all military movements and all branches of the government (report of the 10th of October 1793). This was agreed to, and Saint-Just was despatched to Strassburg, in company with another deputy, to superintend the military operations. It was suspected that the enemy without was being aided by treason within. Saint-Just's remedy was direct and terrible: he followed his experience in Paris, "organized the Terror," and soon the heads of all suspects sent to Paris were falling under the guillotine. But there were no executions at Strassburg, and Saint-Just repressed the excesses of J. G. Schneider (*q.v.*), who as public prosecutor to the revolutionary tribunal of the Lower Rhine had ruthlessly applied the Terror in Alsace. Schneider was sent to Paris and guillotined. The conspiracy was defeated, and the armies of the Rhine and Moselle having been inspirited by success—Saint-Just himself taking a fearless part in the actual fighting—and having effected a junction, the frontier was delivered and Germany invaded. On his return Saint-Just was made president of the Convention. Later, with the army of the North, he placed before the generals the dilemma of victory over the enemies of France or trial by the dreaded revolutionary tribunal; and before the eyes of the army itself he organized a force specially charged with the slaughter of those who should seek refuge by flight. Success again crowned his efforts, and Belgium was gained for France (May, 1794). Meanwhile affairs in Paris looked gloomier than ever, and Robespierre recalled Saint-Just to the capital. Saint-Just proposed a dictatorship as the only remedy for the convulsions of society. At last, at the famous sitting of the 9th Thermidor, he ventured to present as the report of the committees of General Security and Public Safety a document expressing his own views, a sight of which, however, had been refused to the other members of committee on the previous evening. Then the storm broke. He was vehemently interrupted, and the sitting ended with an order for Robespierre's arrest (see Robespierre). On the following day, the 28th of July 1794, twenty-two men, nearly all young, were guillotined. Saint-Just maintained his proud self-possession to the last.

See *Œuvres de Saint-Just, précédées d'une notice historique sur sa vie* (Paris, 1833–1834); E. Fleury, *Études révolutionnaires* (2 vols., 1851), with which cf. articles by Sainte Beuve (*Causeries du lundi*, vol. v.), Cuvillier-Fleury (*Portraits politiques et révolutionnaires*); E. Hamel, *Histoire de Saint-Just* (1859), which brought a fine to the publishers for outrage on public decency; F. A. Aulard, *Les Orateurs de la Législative et de la Convention* (2nd ed., Paris, 1905). The *Œuvres complètes de Saint-Just* have been edited with notes by C. Vellay (Paris, 1908).

ST JUST (St Just in Penwith), a market town in the St Ives parliamentary division of Cornwall, England, 7½ m. by road W. of Penzance. Pop. of urban district (1901) 5646. This is the most westerly town in England, lying in a wild district 1 m. inland from Cape Cornwall, which is 4 m. N. of Land's End. The urban district has an area of 7633 acres, and includes the small industrial colonies near some of the most important mines in Cornwall. The Levant mine is the chief, the workings extending beneath the sea. Traces of ancient workings and several exhausted mines are seen. The church of St Just is Perpendicular, with portions of the fabric of earlier date. There are ruins of an oratory dedicated to St Helen on Cape Cornwall.

ST KILDA, a city of Bourke county, Victoria, Australia, 3½ m. by rail S. of, and suburban to, Melbourne. Pop. (1901) 20,544. It is a fashionable watering-place on Hobson's Bay, and possesses the longest pier in Australia. The esplanade and the public park are finely laid out; and portions of the sea are fenced in to protect bathers. The town hall, the public library, the assembly hall, and the great Anglican church of All Saints are the chief buildings.

ST KILDA (Gaelic *Hirta*, "the western land"), the largest of a small group of about sixteen islets of the Outer Hebrides, Inverness-shire, Scotland. It is included in the civil parish of Harris, and is situated 40 m. W. of North Uist. It measures 3 m. from E. to W. and 2 m. from N. to S., has an area of about 3500 acres, and is 7 m. in circumference. Except at the landing-place on the south-east, the cliffs rise sheer out of deep water, and on the north-east side the highest eminence in the island, Conagher, forms a precipice 1220 ft. high. St Kilda is probably the core of a Tertiary volcano, but, besides volcanic rocks, contains hills of sandstone in which the stratification is distinct. The boldness of its scenery is softened by the richness of its verdure. The inhabitants, an industrious Gaelic-speaking community (110 in 1851 and 77 in 1901), cultivate about 40 acres of land (potatoes, oats, barley), keep about 1000 sheep and a few head of cattle. They catch puffins, fulmar petrels, guillemots, razor-birds, Manx shearwaters and solan geese both for their oil and for food. Fishing is generally neglected. Coarse tweeds and blanketing are manufactured for home use from the sheep's wool which is plucked from the animal, not shorn. The houses are collected in a little village at the head of the East Bay. The island is practically inaccessible for eight months of the year, but the inhabitants communicate with the outer world by means of "sea messages," which are despatched in boxes when a strong west wind is blowing, and generally make the western islands or mainland of Scotland in a week.

The island has been in the possession of the Macleods for hundreds of years. In 1779 the chief of that day sold it, but in 1871 Macleod of Macleod bought it back, it is stated, for £3000. In 1724 the population was reduced by smallpox to thirty souls. They appear to catch what is called the "boat-cold" caused by the arrival of strange boats, and at one time the children suffered severely from a form of lockjaw known as the "eight days' sickness."

See works by Donald Munro, high dean of the Isles (1585), M. Martin (1698), Rev. K. Macaulay (1764), R. Connell (1887); Miss Goodrich-Freer, *The Outer Isles*; Richard and Cherry Kearton, *With Nature and a Camera* (1896).

ST KITTS, or St Christopher, an island in the British West Indies, forming, with Nevis and Anguilla, one of the presidencies in the colony of the Leeward Islands. It is a long oval with a narrow neck of land projecting from the south-eastern end; total length 23 m., area 63 sq. m. Mountains traverse the central part from N.W. to S.E., the greatest height being Mount Misery (3771 ft.). The island is well watered, fertile and healthy, and its climate is cool and dry (temperature between 78° and 85° F.; average annual rainfall 38 in.). The circle of land formed by the skirts of the mountains, and the valley of Basseterre constitute nearly the whole of the cultivated portion. The higher slopes of the hills afford excellent pasturage, while the summits are crowned with dense woods. Sugar, molasses, rum, salt, coffee and tobacco are the chief products; horses and cattle are bred. Primary education is compulsory. The principal towns are Old Road, Sandy Point and the capital Basseterre, which lies on the S.W. coast (pop. about 10,000). One good main road, macadamized throughout, encircles the island. The local legislature consists of 6 official and 6 unofficial members nominated by the Crown. St Kitts was discovered by Columbus in 1493 and first settled by Sir Thomas Warner in 1623. Five years later it was divided between the British and the French, but at the Peace of Utrecht in 1713 it was entirely ceded to the British Crown. Population, mostly negroes, 29,782.

SAINT-LAMBERT, JEAN FRANÇOIS DE (1716–1803), French poet, was born at Nancy on the 26th of December 1716. He entered the army and, when Stanislaus Leszczynski was established in 1737 as duke of Lorraine, he became an official at his court at Lunéville. He left the army after the Hanoverian campaign of 1756–57, and devoted himself to literature, producing a volume of descriptive verse, *Les Saisons* (1769), now never read, many articles for the *Encyclopédie*, and some miscellaneous works. He was admitted to the Academy in 1770. His fame, however, comes chiefly from his amours. He was already high in the favour of the marquise de Boufflers, Stanislaus's mistress, whom he addressed in his verses as *Doris* and *Thémire*, when Voltaire in 1748 came to Lunéville with the marquise de Châtelet. Her infatuation for him and its fatal termination are known to all readers of the life of Voltaire. His subsequent liaison with Madame d'Houdetot, Rousseau's Sophie, though hardly less disastrous to his rival, continued for the whole lives of himself and his mistress. Saint-Lambert's later years were given to philosophy. He published in 1798 the *Principe des mœurs chez toutes les nations ou catéchisme universel*, and published his *Œuvres philosophiques* (1803), two years before his death on the 9th of February 1803. Madame d'Houdetot survived until the 28th of January 1813.

See G. Maugras, *La Cour de Lunéville* (1904) and *La Marquise de Boufflers* (1907); also the literature dealing with Rousseau and Voltaire.

ST LAWRENCE. The river St Lawrence, in North America, with the five fresh-water inland seas (see Great Lakes), Superior, Michigan, Huron, Erie and Ontario, forms one of the great river systems of the world, having a length, from the source of the river St Louis (which rises near the source of the river Mississippi and falls into the head of Lake Superior) to Cape Gaspé, where it empties into the Gulf of St Lawrence, of 2100 m. The river is here considered as rising at the foot of Lake Ontario, in 44° 10′ N., 76° 30′ W., where the name St Lawrence is first applied to it.

The river, to the point where it crosses 45° N. in its north-westerly course, forms the boundary line between the state of New York and the province of Ontario; thence to the sea it is wholly within Canadian territory, running through the province of Quebec. At Point des Monts, 260 m. below Quebec, it is 26 m. wide, and where it finally merges into the Gulf of St Lawrence, 150 m. farther on, it is 90 m. wide, this stretch being broken by the large island of Anticosti, lying fairly in the mouth. The character of the river banks varies with the geological formations through which it runs. Passing over the Archaean rocks of the Laurentian from Kingston to Brockville the shores are very irregular, and the river is broken up by protrusions of glaciated summits of the granites and gneisses into a large number of picturesque islands, "The Thousand Islands," greatly frequented as a summer resort. From Brockville to Montreal the river runs through flat-bedded Cambro-silurian limestones, with rapids at several points, which are all run by light-draught passenger boats. For the up trip the rapids are avoided by canalization. From Montreal to Three Rivers the course is through an alluvial plain over-lying the limestones, the river at one point expanding into Lake St Peter, 20 m. long by 10 m. wide, with a practically uniform depth of 10 ft. Below Three Rivers the banks grow gradually higher until, after passing Quebec through a cleft in slate rocks of Cambrian age, the river widens, washing the feet of the Laurentian Mountains on its north shore; while a more moderately hilly country, terminating in the Shickshock Mountains of the Gaspé Peninsula, skirts its south shore.

From Kingston, at the head of the river, to Montreal, a distance of 170 m., navigation is limited to vessels of 14 ft. draught by the capacity of the canals. From Montreal to Quebec, 160 m., a ship channel has been dredged to a depth of 30 ft.; below Quebec the river is tidally navigable by vessels of any draught. The canals on the St Lawrence above Montreal have been enlarged to the capacity of the Welland canal, the improved system having been opened to commerce in the autumn of 1899. Instead of enlarging the Beauharnois canal, on the south side of the river, a new canal, the "Soulanges," was built from Coteau Landing to Cascades Point, on the north side, the Beauharnois canal still being used for small barges. The locks of the enlarged canals are all 45 ft. wide, with an available depth of 14 ft. and a minimum length of 270 ft. The following table shows the canalized stretches in this portion of the river:—

Name.	From	To	Length in Miles.	Number of Locks.	Fall in Feet.
Galops	Head of Galops Rapids	Iroquois	7⅓	3	15½
River	..	..	4	..	..
Rapide Plat	Head of Ogden Island	Morrisburg	3⅔	2	11½
River	..	..	10½	..	..
Farran Point	Head of Croil Island	Farran Point	1	1	3½
River	..	..	5	..	..
Cornwall Canal	Dickinson Landing	Cornwall	11	6	48
Lake St Francis	..	..	30½	..	..
Soulanges	Coteau Landing	Cascades Point	14	4	82½
Lake St Louis	..	..	14	..	..
Lachine	Lachine	Montreal	8½	5	45
			109½	21	206

In the stretch between Montreal and Quebec the ship channel, begun by the Montreal Harbour Commissioners, has been assumed by the Dominion government as a national work, and improvements, involving extensive dredging, have been undertaken with the aim of securing everywhere a minimum depth of 30 ft. with a minimum width of 450 ft. The whole river from Kingston to the sea is well supplied with aids to navigation. In the dredged portions lights are arranged in pairs of leading lights on foundations sufficiently high and solid to resist the pressure of ice movement, and there is an elaborate system of fog alarms, gas-lighted and other buoys, as well as telegraphic, wireless and telephonic communication, storm signal, weather and ice reporting stations and a life-saving service.

Montreal, at the head of ocean navigation, the largest city in Canada, is an important distributing centre for all points in western Canada, and enjoys an extensive shipping trade with the United Kingdom, the sea-going shipping exceeding 1,500,000 tons, and the inland shipping approximating 2,000,000 tons, annually. Quebec is the summer port used by the largest steamers in the Canadian trade. There are numerous flourishing towns on both banks of the river, from Kingston, a grain transferring port, to the sea. Large quantities of lumber, principally spruce (fir) and paper pulp, are manufactured at small mills along the river, and shipped over sea directly from the place of production. The mail steamers land and embark mails at Rimouski, to or from which they are conveyed by rail along the south shore.

The importance to Canada of the river St Lawrence as a national trade route cannot be over-estimated. As a natural highway between all points west of the Maritime Provinces and Europe it is unique in permitting ocean traffic to penetrate 1000 m. into the heart of a country. It is, moreover, the shortest freight route from the Great Lakes to Europe. From Buffalo to Liverpool via New York involves rail or 7-ft. canal transport of 496 m. and an ocean voyage of 3034 nautical miles. Via Montreal there is a 14-ft. transport of 348 m. and river and ocean voyage of 2772 nautical miles. From Quebec to Liverpool by Cape Race is 2801 nautical miles, while the route by Belle Isle, more nearly a great circle course, usually taken between July and October, is only 2633 nautical miles. On the other hand the St Lawrence is not open throughout the year; the average time between the arrival of the first vessel at Montreal from sea and the departure of the last ocean vessel is seven months. From Kingston to Quebec the river freezes over every winter, except at points where the current is rapid. Below Quebec, although there is heavy border ice, the river never freezes over. For a few winters, while the bridge accommodation at Montreal was restricted to the old single-track Victoria bridge, railway freight trains were run across the ice bridge on temporary winter tracks. Efforts have been made to lengthen the season of navigation by using specially constructed steamers to break the ice; and it is claimed that the season of navigation could be materially lengthened, and winter floods prevented by keeping the river open to Montreal. Winter ferries are maintained at Quebec, between Prince Edward Island and Nova Scotia, and between Newfoundland and Sydney, Cape Breton. In the winter of 1898–1899 an attempt was made to run a winter steamer from Paspebiac to England, but it was not successful, principally because an unsuitable vessel was used. To pass through the field of ice that is always present in the gulf, in greater or lesser quantity, specially strengthened vessels are required.

The river above tide water is not subject to excessive flooding, the maximum rise in the spring and early summer months, chiefly from northern tributaries from the Ottawa eastward, being 10 ft. The Great Lakes serve as impounding reservoirs for the gradual distribution of all overflows in the west. At Montreal, soon after the river freezes over each winter, there is a local rise of about 10 ft. in the level of the water in the harbour, caused by restriction of the channel by anchor ice; and in the spring of the year, when the volume of the water is augmented, this obstruction leads to a further rise, in 1886 reaching a height of 27 ft. above ordinary low water. To prevent flooding of the lower parts of the city a dike was in 1887 built along the river front, which prevented a serious flooding in 1899.

Tides enter the Gulf of St Lawrence from the Atlantic chiefly through Cabot Strait (between Cape Breton and Newfoundland), which is 75 m. wide and 250 fathoms deep. The tide entering through Belle Isle Strait, 10 m. wide and 30 fathoms deep, is comparatively little felt. The tidal undulation, in passing through the gulf, expands so widely as to be almost inappreciable in places, as, for example, at the Magdalen Islands, in the middle of the gulf, where the range amounts to about 3 ft. at springs, becoming effaced at neaps. There is also little more tide than this at some points on the north shore of Prince Edward Island. The greatest range is attained in Northumberland Strait and in Chaleur Bay, where it amounts to 10 ft. At the entrance to the estuary at Anticosti it has again the oceanic range of about 6 ft., and proceeds up the estuary with an ever-increasing range, which attains its maximum of 19 ft. at the lower end of Orleans Island, 650 m. from the ocean at Cabot Strait. This must be considered the true head of the estuary. At Quebec, 30 m. farther up, the range is nearly as great; but at 40 m. above Quebec it is largely cut off by the Richelieu Rapids, and finally ceases to be felt at Three Rivers, at the lower end of Lake St Peter, 760 m. from the ocean.

The St Lawrence provides ample water-power, which is being increasingly used. Its rapids have long been used for milling and factory purposes; a wing dam on the north side of Lachine Rapids furnishes electricity to Montreal; the falls of Montmorency light Quebec and run electric street cars; and from Lake Superior to the gulf there are numerous points on the tributaries to the St Lawrence where power could be used.

Nearly all the rivers flowing into the St Lawrence below Quebec are stocked with salmon (*Salmo salar*), and are preserved and leased to anglers by the provincial government. In the salt water of the gulf and lower river, mackerel, cod, herring, smelt, sea-trout, striped bass and other fish are caught for market.

The St Lawrence is spanned by the following railway bridges: (1) A truss bridge built near Cornwall in 1900 by the New York & Ottawa railroad, now operated by the New York Central railroad. (2) A truss bridge with a swing, built in 1890 by the Canada Atlantic railway at Coteau Landing. (3) A cantilever bridge built in 1887 by the Canadian Pacific railway at Caughnawága. (4) The Victoria Jubilee bridge, built as a tubular bridge by the Grand Trunk railway in 1860, and transformed into a truss bridge in 1897–1898. The new bridge rests on the piers of the old one, enlarged to receive it, is 6592 ft. long by 67 ft. wide, has 25 spans, double railway and trolley tracks, driveways and sidewalks, and was erected without interruption of traffic. (5) A very large cantilever bridge, having a central span of 1800 ft., crosses the river at a point 7 m. above Quebec. The southern half of the superstructure, while in course of erection in August 1907, fell, killing 78 men, and necessitating a serious delay in the completion of the work.

The river St Lawrence was discovered by Jacques Cartier, commissioned by the king of France to explore and trade on the American coast. Cartier entered the strait of Belle Isle in 1534; but Breton fishermen had previously resorted there in summer and penetrated as far as Brest, eleven leagues west of Blanc Sablon, the dividing line between Quebec and Labrador. Cartier circled the whole gulf, but missed the entrance to the river. On his second voyage in 1536 he named a bay on the north shore of the gulf, which he entered on the 10th of August, the feast of St Lawrence, *Baye Sainct Laurens*, and the name gradually extended over the whole river, though Cartier himself always wrote of the River of Canada. Early in September, he reached "Canada," now Quebec, and on the 2nd of October reached Hochelaga, now Montreal. No permanent settlement was then made. The first, Tadousac, at the mouth of the Saguenay, was established by Champlain in 1603, and Quebec was settled by him in 1608. Between that time and 1616 Champlain explored the whole river system as far west as Lake Huron, reaching it by way of the Ottawa river, and taking possession of the country in the name of the king of France. It became British by the treaty of Paris, in 1763.

See S. E. Dawson, *The St Lawrence, its Basin and Border Lands* (New York, 1905) (historical); *St Lawrence Pilot* (7th ed., Hydrographic Office, Admiralty, London, 1906); *Sailing Directions for the St Lawrence River to Montreal* (United States Hydrographic Office publication, No. 108 D, Washington, 1907); *Annual Reports* of the Canadian Departments of Marine and Fisheries, Public Works, and Railways and Canals, Ottawa); *Transactions* (Royal Society, Canada, 1898–1899), vol. iv. sec. iii.; T. C. Keefer on "Ice Floods and Winter Navigation of the St Lawrence," *Transactions* (Canadian Society of Civil Engineers, Presidential Address of W. P. Anderson, on improvements to navigation on St Lawrence, 1904). (W. P. A.)

ST LEGER, SIR ANTHONY (*c.* 1496–1559), lord deputy of Ireland, eldest son of Ralph St Leger, a gentleman of Kent, was educated abroad and at Cambridge. He quickly gained the favour of Henry VIII., and was appointed in 1537 president of a commission for inquiring into the condition of Ireland. This work he carried out with ability and obtained much useful knowledge of the country. In 1540 he was appointed lord deputy of Ireland. His first task was to repress disorder, and he at once proceeded with severity against the Kavanaghs, permitting them, however, to retain their lands, on their accepting feudal tenure on the English model. By a similar policy he exacted obedience from the O'Mores, the O'Tooles and the O'Conors in Leix and Offaly; and having conciliated the O'Briens in the west and the earl of Desmond in the south, the lord deputy carried an act in the Irish parliament in Dublin conferring the title of king of Ireland on Henry VIII. and his heirs. Conn O'Neill, who in the north had remained sullenly hostile, was brought to submission by vigorous measures. For the most part, however, St Leger's policy was one of moderation and conciliation—rather more so, indeed, than Henry VIII. approved. He recommended The O'Brien, when he gave token of a submissive disposition, for the title of earl of Thomond; O'Neill was created earl of Tyrone; and administrative council was instituted in the province of Munster; and in 1544 a levy of Irish soldiers was raised for service in Henry VIII.'s wars. St Leger's personal influence was proved by an outbreak of disturbance when he visited England in 1544, and the prompt restoration of order on his return some months later. St Leger retained his office under Edward VI., and again effectually quelled attempts at rebellion by the O'Conors and O'Byrnes. From 1548 to 1550 he was in England. He returned charged with the duty of introducing the reformed liturgy into Ireland. His conciliatory methods brought upon him the accusation that he lacked zeal in the cause, and led to his recall in the summer of 1551. After the accession of Mary he was again appointed lord deputy in October 1553, but in consequence of a charge against him of keeping false accounts he was recalled for the third time in 1556. While the accusation was still under investigation, he died on the 16th of March 1559.

By his wife Agnes, daughter of Hugh Warham, a niece of Archbishop Warham, he had three sons, William, Warham and Anthony. William died in his father's lifetime leaving a son, Sir Warham St Leger (d. 1600), who was father of Sir William St Leger (d. 1642), president of Munster. Sir William took part in "the flight of the earls" (see O'Neill) in 1607, and spent several years abroad. Having received a pardon from James I. and extensive grants of land in Ireland, he was appointed president of Munster by Charles I. in 1627. He warmly supported the arbitrary government of Strafford, actively assisting in raising and drilling the Irish levies destined for the service of the king against the Parliament. In the great rebellion of 1641 he bore the chief responsibility for dealing with the insurgents in Munster; but the forces and supplies placed at his disposal were utterly inadequate. He executed martial law in his province with the greatest severity, hanging large numbers of rebels, often without much proof of guilt. He was still struggling with the insurrection when he died at Cork on the 2nd of July 1642. Sir William's daughter Margaret married Murrough O'Brien, 1st earl of Inchiquin; his son John was father of Arthur St Leger, created Viscount Doneraile in 1703.

A biography of Sir Anthony St Leger will be found in *Athenae Cantabrigienses*, by C. H. Cooper and T. Cooper (Cambridge, 1858); see also *Calendar of State Papers relating to Ireland, Hen. VIII.-Eliz.*; *Calendar of Letters and Papers of the Reign of Henry VIII.*; *Calendar of State Papers* (*Domestic Series*), *Edward VI.—James I.*; *Calendar of Carew MSS.*; J. O'Donovan's edition of *Annals of Ireland by the Four Masters* (7 vols., Dublin, 1851); Richard Bagwell, *Ireland under the Tudors* (3 vols., London, 1885–1890); J. A. Froude, *History of England* (12 vols., London, 1856–1870). For Sir William St Leger, see *Strafford's Letters and Despatches* (2 vols., London, 1739); Thomas Carte, *History of the Life of James, Duke of Ormonde* (6 vols., Oxford, 1851); *History of the Irish Confederation and the War in Ireland*, edited by Sir J. T. Gilbert (Dublin, 1882–1891). (R. J. M.)

ST LEONARDS, EDWARD BURTENSHAW SUGDEN, 1st Baron (1781–1875), lord chancellor of Great Britain, was the son of a hairdresser of Duke Street, Westminster, and was born on the 12th of February 1781. After practising for some years as a conveyancer, he was called to the bar at Lincoln's Inn in 1807, having already published his well-known treatise on the *Law of Vendors and Purchasers* (14th ed., 1862). In 1822 he was made king's counsel and chosen a bencher of Lincoln's Inn. He was returned at different times for various boroughs to the House of Commons, where he made himself prominent by his opposition to the Reform Bill of 1832. He was appointed solicitor-general in 1829, was named lord chancellor of Ireland in 1834, and again filled the same office from 1841 to 1846. Under Lord Derby's first administration in 1852 he became lord chancellor and was raised to the peerage as Lord St Leonards. In this position he devoted himself with energy and vigour to the reform of the law; Lord Derby on his return to power in 1858 again offered him the same office, which from considerations of health he declined. He continued, however, to take an active interest especially in the legal matters that came before the House of Lords, and bestowed his particular attention on the reform of the law of property. He died at Boyle Farm, Thames Ditton, on the 29th of January 1875.

After his death his will was missing, but his daughter, Miss Charlotte Sugden, was able to recollect the contents of a most intricate document, and in the action of *Sugden* v. *Lord St Leonards* (L.R. 1 P.D. 154) the court accepted her evidence and granted probate of a paper propounded as containing the provisions of the lost will. This decision established the proposition that the contents of a lost will may be proved by secondary evidence, even of a single witness.

Lord St Leonards was the author of various important legal publications, many of which have passed through several editions. Besides the treatise on purchasers already mentioned, they include *Powers*, *Cases decided by the House of Lords*, *Gilbert on Uses*, *New Real Property Laws* and *Handybook of Property Law*, *Misrepresentations in Campbell's Lives of Lyndhurst and Brougham*, *corrected by St Leonards*. See *The Times* (30th of January 1875); E. Manson, *Builders of our Law* (1904); J. R. Atlay, *Lives of the Victorian Chancellors*, vol. ii.

ST LIZIER-DE-COUSERANS, a village of south-western France in the department of Ariège on the right bank of the Salat, 1 m. N.N.W. of St Girons. Pop. (1906) 615; commune 1295. St. Lizier, in ancient times one of the twelve cities of Novempopulania under the name of *Lugdunum Consoranorum*, was later capital of the Couserans and seat of a bishopric (suppressed at the Revolution) to the holders of which the town belonged. It has a cathedral of the 12th and 14th centuries with a fine Romanesque cloister and preserves remarkable remains of Roman ramparts. The old episcopal palace (17th century) and the adjoining church (14th and 17th centuries), once the cathedral with its fine chapter-hall (12th century), form part of a lunatic asylum. The Salat is crossed by a bridge of the 12th or 13th century. The town owes its name to its bishop Lycerius, who is said to have saved it from the Vandals in the 7th century. The chief event in its history was its devastation in 1130 by Bernard III., count of Comminges, a disaster from which it never completely recovered.

ST LÔ, a town of north-western France, capital of the department of Manche, 47½ m. W. by S. of Caen by rail. Pop. (1906) town 9379; commune, 12,181. St Lô is situated on a rocky hill on the right bank of the Vire. Its chief building is the Gothic church of Notre-Dame, dating mainly from the 16th century. The façade, flanked by two lofty towers and richly decorated, is impressive, despite its lack of harmony. There is a Gothic pulpit outside the choir. In the hôtel-de-ville is the "Torigni marble," the pedestal of an ancient statue, the inscriptions on which relate chiefly to the annual assemblies of the Gallic deputies held at Lyons under the Romans. The modern church of Sainte-Croix preserves a Romanesque portal which belonged to the church of an ancient Benedictine abbey. St Lô is the seat of a prefect and has tribunals of first instance and of commerce, a training college for masters, a school of drawing, a branch of the Bank of France, a chamber of arts and manufactures, and a government stud. The town has trade in grain, fat stock, troop-horses and farm produce, and carries on tanning, wool-spinning and bleaching and the manufacture of woollen and other fabrics.

St Lô, called *Briovera* in the Gallo-Roman period, owes its present name to St Lô (Laudus), bishop of Coutances (d. 568). In the middle ages St Lô became an important fortress as well as a centre for the weaving industry. It sustained numerous sieges, the last in 1574, when the town, which had embraced Calvinism, was stormed by the Catholics and many of its inhabitants massacred. In 1800 the town was made capital of its department in place of Coutances.

ST LOUIS, the chief city and a port of entry of Missouri, and the fourth in population among the cities of the United States, situated on the W. bank of the Mississippi river, about 20 m. below its confluence with the Missouri, 200 m. above the influx of the Ohio, and 1270 m. above the Gulf of Mexico, occupying a land area of 61·37 sq. m. in a commanding central position in the great drainage basin of the Mississippi system, the richest portion of the continent. Pop. (1880) 350,518, (1890) 451,770, (1900) 575,238, (1910) 687,029.

The central site is marked by an abrupt terraced rise from the river to an easily sloping tableland, 4 or 5 m. long and somewhat less than 1 m. broad, behind which are rolling hills. The length of the river-front is about 19 m. The average elevation of the city is more than 425 ft.; and the recorded extremes of low and high water on the river are 379 and 428 ft. (both established in 1844). The higher portions of the city lie about 200 ft. above the river level, and in general the site is so elevated that there can be no serious interruption of business except by extraordinary floods. The natural drainage is excellent, and the sewerage system, long very imperfect, has been made adequate. The street plan is approximately rectilinear. The stone-paved wharf or river-front, known as the Levee or Front Street, is 3·7 m. long. Market Street, running E. and W., is regarded as the central thoroughfare; and the numbering of the streets is systematized with reference to this line and the river. Broadway (or Fifth Street, from the river) and Olive Street are the chief shopping centres; Washington Avenue, First (or Main) and Second Streets are devoted to wholesale trade; and Fourth Street is the financial centre. The most important public buildings are the Federal building, built of Maine granite; the county court house (1839–1862, $1,199,872),—a semi-classic, plain, massive stone structure, the Four Courts (1871, $755,000), built of cream-coloured Joliet stone, and a rather effective city hall (1890–1904, $2,000,000), in Victorian Gothic style in brick and stone. The chief slave-market before the Civil War was in front of the Court House. The City Art Museum, a handsome semi-classic structure of original design, and the Tudor-Gothic building of the Washington University, are perhaps the most satisfying structures in the city architecturally. Among other noteworthy buildings are the Public Library, the Mercantile Library, the Mercantile, the Mississippi Valley, the Missouri-Lincoln, and the St Louis Union Trust Company buildings; the German-Renaissance home of the Mercantile Club; the florid building of the St Louis Club; the Merchants' Exchange; the Missouri School for the Blind; the Coliseum, built in 1897 for conventions, horse shows, &c., torn down in 1907 and rebuilt in Jefferson Avenue, and the Union Station, used by all the railways entering the city. This last was opened in 1894, and cost, including the site, $6,500,000; has a train-shed with thirty-two tracks, covers some eleven acres, and is one of the largest and finest railway stations in the world. The city owns a number of markets. In 1907 a special architectural commission, appointed to supervise the construction of new municipal buildings, purchased a site adjacent to the City Hall, for new city courts and jail, which were begun soon afterwards.

The valley of Mill Creek (once a lake bed, "Chouteau Pond," and afterwards the central sewer) traverses the city from W. to E. and gives entry to railways coming from the W. into the Union Station. The terminal system for connecting Missouri with Illinois includes, in addition to the central passenger station, vast centralized freight warehouses and depots; an elevated railway along the levee; passenger and freight ferries across the Mississippi with railway connexions; two bridges across the river; and a tunnel leading to one of them under the streets of the city along the river front. The Merchants' Bridge (1887–1890, $3,000,000), used solely by the railways, is 1366·5 ft. long in channel span, with approaches almost twice as long. The Eads Bridge (1868–1874; construction cost $6,536,730, total cost about $10,000,000) is 3 m. farther down the river; it carries both wagon ways and railway tracks, is 1627 ft. clear between shore abutments, and has three spans. Built entirely of steel above the piers, it is a happy combination of strength and grace, and was considered a marvel when erected.

St Louis has exceptionally fine residential streets that are accounted among the handsomest in the world. The most notable are Portland Place, Westmoreland Place, Vandeventer Place, Kingsbury Place, &c., in the neighbourhood of Forest Park: broad parked avenues, closed with ornamental gateways, and flanked by large houses in fine grounds. The park system of the city is among the finest in the country, containing in 1910 2641·5 acres (cost to 1909, $6,417,745). Forest Park (1372 acres), maintained mainly in a natural, open-country state, is the largest single member of the system. In one end of it was held the Louisiana Purchase Exposition in 1904. Tower Grove Park (277 acres) and the Missouri Botanical Gardens

(45 acres), probably the finest of their kind in the country, were gifts to the city from a public-spirited citizen, Henry Shaw (1800–1889), who also endowed the botanical school of Washington University. Carondelet (180 acres), O'Fallon (158 acres), and Fairground (129 acres, including a 65-acre athletic field) are the finest of the other parks. King's Highway is a boulevard (partly completed in 1910) from the Mississippi on the S. to the Mississippi on the N., crossing the western part of the city. In accord with a general movement in American cities late in the 19th century, St Louis made a beginning in the provision of small "neighbourhood parks," intended primarily to better the lives of the city's poor, and vacation playgrounds for children; and for this purpose five blocks of tenements were condemned by the city. In the different parks and public places are statues of Columbus, Shakespeare (Tower Grove Park) and Humboldt (Tower Grove Park), by Ferdinand von Mueller of Munich; a replica of the Schiller monument at Marbach in Germany, and of Houdon's Washington (Lafayette Park); statues of Thomas Hart Benton (Lafayette Park; by Harriet Hosmer), of Francis Preston Blair (W. W. Gardner) and Edward Bates (J. W. McDonald), both in Forest Park, and of General Grant (R. P. Bringhurst) in the City Hall Park; all of these being in bronze. In the cemeteries of the city—of which the largest are Bellefontaine (350 acres) and Calvary (415 acres)—there are notable monuments to Henry Shaw, and to Nathaniel Lyon, Sterling Price, Stephen W. Kearny and W. T. Sherman, all closely associated with St Louis or Missouri. There are various lake, river and highland pleasure-resorts near the city; and about 12 m. S. is Jefferson Barracks, a national military post of the first class. The old arsenal within the city, about which centred the opening events of the Civil War in Missouri, has been mainly abandoned, and part of the grounds given to the municipality for a park.

The annual fair, or exposition, was held in the autumn of each year—except in war time—from 1855 to 1902, ceasing with the preparations for the World's Fair of 1904. One day of Fair Week ("Big Thursday") was a city holiday; and one evening of the week was given over after 1878 to a nocturnal illuminated pageant known as the Procession of the Veiled Prophet, with accompaniments in the style of the carnival (Mardi Gras) at New Orleans; this pageant is still continued.

Among the educational institutions of the city, Washington University, a largely endowed, non-sectarian, co-educational school opened in 1857, is the most prominent. Under its control are three secondary schools, Smith Academy and the Manual Training School for Boys, and Mary Institute for Girls. The university embraces a department of arts and sciences, which includes a college and a school of engineering and architecture, and special schools of law, medicine (1899), dentistry, fine arts, social economy and botany. Affiliated with the university is the St Louis School of Social Economy, called until 1909 the St Louis School of Philanthropy, and in 1906–1909 affiliated with the university of Missouri. The Russell Sage Foundation co-operates with this school. In 1909 Washington University had 1045 students. In 1905 the department of arts and sciences and the law school were removed to the outskirts of the city, where a group of buildings of Tudor-Gothic style in red Missouri granite were erected upon grounds, which with about $6,000,000 for buildings and endowment, were given to the university. St Louis University had its beginnings (1818) as a Latin academy, became a college in 1820, and was incorporated as a university in 1832. One of the leading Jesuit colleges of the United States, it is the parent-school of six other prominent Jesuit colleges in the Middle West. In 1910 it comprised a school of philosophy and science (1832), a divinity school (1834), a medical school (1836), a law school (1843), a dental school (1908), a college, three academies and a commercial department; and its enrolment was 1181. It is the third largest, and the Christian Brothers' College (1851), also Roman Catholic, is the fourth largest educational institution in the state. The Christian Brothers' College had in 1910 30 instructors and 500 students, most of whom were in the preparatory department. Besides the Divinity School of St Louis University, there are three theological seminaries, Concordia (Evangelical Lutheran, 1839), Eden Evangelical College (German Evangelical Synod of North America, 1850) and Kenrick Theological Seminary (Roman Catholic, 1894). There are two evening law schools, Benton College (1896) and Metropolitan College (1901).

The public school system came into national prominence under the administration (1867–1880) of William T. Harris, and for many years has been recognized as one of the best in the United States. The first permanent kindergarten in the country in connexion with the public schools was established in St Louis in 1873 by W. T. Harris (*q.v.*), then superintendent of schools, and Miss Susan Ellen Blow. The first public kindergarten training school was established at the same time. There is a teachers' college in the city school system, and there are special schools for backward children. Several school buildings have been successfully used as civic centres. The city has an excellent educational museum, material from which is available for object lessons in nature study, history, geography, art, &c., in all public schools. In the year 1907–1908 the total receipts for public education were $4,219,000, and the expenditure was $3,789,604. The City Board of Education was chartered in 1897.

The German element has lent strength to musical and gymnastic societies. The Museum and School of Fine Arts was established in 1879 as the Art Department of Washington University. In 1908 it first received the proceeds of a city tax of one-fifth mill per dollar, and in 1909 it was reorganized as the City Art Museum. In its building (the "Art Palace," built in 1903–1904 at a cost of $943,000 for the Louisiana Purchase Exposition; now owned by the city) in Forest Park are excellent collections (largely loaned) of sculpture and paintings (illustrating particularly the development of American art) and of art objects. The School of Fine Arts, now separate from the museum and a part of Washington University, has classes in painting, drawing, design, illustration, modelling, pottery, bookbinding, &c. Among the libraries the greatest collections are those of the Mercantile Library (in 1910, 136,000 volumes and pamphlets), a subscription library founded in 1846, and the public library (1865)—a fine city library since 1894, with 312,000 volumes in 1910 and six branch libraries, the gift of Andrew Carnegie, who also gave the city $500,000 towards the new public library, which was begun in 1909 and cost $1,500,000. Other notable collections are those of the St Louis Academy of Science and of the Missouri Botanical Gardens. There are at least three newspapers of national repute: the *Republic*, established in 1808 as the *Missouri Gazette*, and in 1822–1886 called the *Missouri Republican*; the *Globe-Democrat* (1852); and the *Westliche Post* (1857).

In trade, industry and wealth St Louis is one of the most substantial cities of the Union. Its growth has been steady; but without such "booms" as have marked the history of many western cities, and especially Chicago, of which St Louis was for several decades the avowed rival. The primacy of the northern city was clear, however, by 1880. St Louis has borne a reputation for conservatism and solidity. Its manufactures aggregate three-fifths the value of the total output of the state. In 1880 their value was $114,333,375, and in 1890 $228,700,000; the value of the factory product was $193,732,788 in 1900, and in 1905 $267,307,038 (increase 1900–1905, 38%).

Tobacco goods, malt liquors, boots and shoes and slaughtering and meat-packing products were the leading items in 1905. The packing industry is even more largely developed outside the city limits and across the river in East St Louis. St Louis is the greatest manufacturer of tobacco products among American cities, and probably in the world; the total in 1905 was 8·96% of the total output of manufactured tobacco in the United States; and the output of chewing and smoking tobacco and snuff in 1900 constituted 23·5% and in 1905 23·7% of the product of the country. St Louis is also the foremost producer of white lead, street and railway cars, and wooden ware; and in addition to these and the items above particularized, has immense manufactories of clothing, coffee and spices (roasted), paints, stoves and furnaces, flour, hardware, drugs and chemicals and clay products. One of its breweries is said to be the largest in the world.

Aside from traffic in its own products, the central position of the city in the Mississippi Valley gives it an immense trade in the products of that tributary region, among which grains, cotton, tobacco, lumber, live stock and their derived products are the staples. In addition, it is a jobbing centre of immense interests in the distribution of other goods. The greatest lines of wholesale trade are dry goods, millinery and notions; groceries and allied lines; boots and shoes; tobacco; shelf and heavy hardware; furniture; railway supplies; street and railway cars; foundry and allied products; drugs, chemicals and proprietary medicines; beer; wooden-ware; agricultural implements; hides; paints; paint oils and white lead; electrical supplies; stoves, ranges and furnaces; and furs—the value of these different items ranging from 70 to 10 million dollars each.[1] According to the St Louis Board of Trade, St Louis is the largest primary fur market of the world, drawing supplies even from northern Canada. As a wool market Boston alone surpasses it, and as a vehicle market it stands in the second or third place. In the other industries just named, it claims to stand first among the cities of the Union. It is one of the greatest interior cotton markets of the country—drawing its supplies mainly from Arkansas, Texas and Oklahoma—but a large part of its receipts are for shipment on through bills of lading, and are not net receipts handled by its own factors. The gross cotton movement continues to increase, but the field of supply has been progressively lessened by the development of Galveston and other ports on the gulf. As a grain and stock market St Louis has felt the competition of Kansas City and St Joseph.

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[1] These are arranged in the order shown by the *Annual Statement* for 1906 reported to the Merchants' Exchange.

River and railway transportation built up in turn the commanding commercial position of the city. The enormous growth of river traffic in the decade before 1860 gave it at the opening of the Civil War an incontestable primacy in the West. In 1910 about twenty independent railway systems, great and small (including two terminal roads within the city), gave outlet and inlet to commerce at St Louis; and of these fifteen are among the greatest systems of the country: the Baltimore & Ohio South-Western, the Chicago, Burlington & Quincy, the Chicago & Alton, the Cleveland, Cincinnati, Chicago & St Louis, the St Louis & San Francisco, the Illinois Central, the Missouri, Kansas & Texas, the Missouri Pacific, the Pennsylvania, the St Louis South-Western, the Southern, the Wabash, the Louisville & Nashville, the Mobile & Ohio, and the Toledo, St Louis & Western. The construction of the Missouri Pacific Railway system was begun at St Louis in 1850, and various other roads were started in the next two years. For several decades railway development served only to increase the commercial primacy of the city in the southern Mississippi Valley, but in more recent years the concentration of roads at Kansas City enabled that place to draw from the west and south-west an immense trade once held by St Louis. River freighting is of very slight importance. St Louis is a port of entry for foreign commerce; its imports in 1907 were valued at $7,442,967; in 1909 at $6,362,770.

The population of St Louis in 1840 was 16,469; in 1850 it was 77,860 (seventh in size of the cities of the country); in 1860, 160,773; in 1870, 310,864 (third in size); in 1880, 350,518; in 1890, 451,770; in 1900, 575,238; and in 1910, 687,029. Since 1890 it has been fourth in population among the cities of the United States. Of the population in 1900 (575,238) 111,356 were foreign-born and 35,516 were negroes. Of the foreign-born in 1900, 58,781 were Germans, 19,421 were Irish, 5800 were English, 4785 Russian. In 1900, 154,746 inhabitants of St Louis were children of German parents.

Under the state constitution of 1875 St Louis, as a city of 100,000 inhabitants, was authorized to frame its own charter, and also to separate from St Louis county. These rights were exercised in 1876. The General Assembly of the state holds the same powers over St Louis as over other cities. The electorate may pass upon proposed amendments to the charter at any election, after due precedent publication thereof. The mayor holds office for four years. In 1823 the mayor was first elected by popular vote and the municipal legislature became unicameral. The bicameral system was again adopted in 1839. The municipal assembly consists of a Council of 13 chosen at large for four years—half each two years—and a House of Delegates, 28 in number, chosen by wards for two years. A number of chief executive officers are elected for four years; the mayor and Council appoint others, and the appointment is made at the middle of the mayor's term in order to lessen the immediate influence of municipal patronage upon elections. Single commissioners control the parks, streets, water service, harbour and wharves, and sewers, and these constitute, with the mayor, a board of public improvement. Under an enabling act of 1907 the municipal assembly in 1909 created a public service commission, of three members, appointed by the mayor. The measure of control exercised by the state is important, the governor appointing the excise (liquor-licence) commissioner, the board of election commissioners, the inspector of petroleum and of tobacco, and (since 1861) the police board. St Louis is normally Republican in politics, and Missouri Democratic. Taxes for state and municipal purposes are collected by the city. The school board, as in very few other cities of the country, has independent taxing power. The city owns the steamboat landings and draws a small revenue from their rental. The heaviest expenses are for streets and parks, debt payments, police and education. The bonded debt in 1910 was $27,815,312, and the assessed valuation of property in that year was $550,207,640. The city maintains hospitals, a poor-house, a reformatory work-house, an industrial school for children, and an asylum for the insane.

The water-supply of the city is derived from the Mississippi, and is therefore potentially inexhaustible. Settling basins and a coagulant chemical plant (1904) are used to purify the water before distribution. After the completion of the Chicago drainage canal the state of Missouri endeavoured to compel its closure, on the ground that it polluted the Mississippi; but it was established to the satisfaction of the Supreme Court of the United States that the back-flush from Lake Michigan had the contrary effect upon the Illinois river, and therefore upon the Mississippi. Except for sediment the water-supply is not impure or objectionable. No public utilities, except the water-works, markets and public grain elevators, are owned by the city. The street railways are controlled—since a state law of 1899 permitted their consolidation—by one corporation, though a one-fare, universal transfer 5-cent rate is in general operation. A single corporation has controlled the gas service from 1846 to 1873 and since 1890, though under no exclusive franchise; and the city has not the right of purchase.

St Louis was settled as a trading post in 1764 by Pierre Laclède Liguest (1724–1778), representative of a company to which the French crown had granted a monopoly of the trade of the Missouri river country. When, by the treaty of Paris of 1763, the portion of Louisiana E. of the Mississippi was ceded by France to Great Britain, many of the French inhabitants of the district of the Illinois removed into the portion of Louisiana W. of the river, which had passed in 1762 under Spanish sovereignty; and of this lessened territory of upper Louisiana St Louis became the seat of government. In 1767 it was a log-cabin village of perhaps 500 inhabitants. Spanish rule became an actuality in 1770 and continued until 1804, when it was momentarily supplanted by French authority—existent theoretically since 1800—and then, after the Louisiana Purchase, by the sovereignty of the United States. In 1780 the town was attacked by Indian allies of Great Britain. Canadian-French hunters and trappers and boatmen, a few Spaniards and other Europeans, some Indians, more half-breeds, and a considerable body of Americans and negro slaves made up the motley population that became inhabitants of the United States. The fur trade was growing rapidly. Under American rule there was added the trade of a military supply-point for the Great West, and in 1817–1819 steamship traffic was begun with Louisville, New Orleans, and the lower Missouri river. Meanwhile, in 1808, St Louis was incorporated as a town, and in 1823 it became a city. The city charter became effective in March 1823. The early 'thirties marked the beginning of its great prosperity, and the decade 1850–1860 was one of colossal growth, due largely to the river trade. All freights were being moved by steamship as early as 1825. The first railway was begun in 1850. At the opening of the Civil War the commercial position of the city was most commanding. Its prosperity, however, was dependent upon the prosperity of the South, and received a fearful set-back in the war. When the issue of secession or adherence to the Union had been made up in 1861, the outcome in St Louis, where the fate of the state must necessarily be decided, was of national importance. St Louis was headquarters for an army department and contained a great national arsenal. The secessionists tried to manœuvre the state out of the Union by strategy, and to seize the arsenal. The last was prevented by Congressman Francis Preston Blair, Jr., and Captain Nathaniel Lyon, first a subordinate and later commander at the arsenal. The garrison was strengthened; in April the president entrusted Blair and other loyal civilians with power to enlist loyal citizens, and put the city under martial law if necessary; in May ten regiments were ready—made up largely of German-American Republican clubs ("Wide Awakes"), which had been at first purely political, then—when force became necessary to secure election rights to anti-slavery men—semi-military, and which now were quickly made available for war; and on the 10th of May Captain Lyon surrounded and made prisoners a force of secessionists quartered in Camp Jackson on the outskirts of the city. A street riot followed, and 28 persons were killed by the volleys of the military. St Louis was held by the Union forces throughout the war.

During a quarter century following 1857 the city was the centre of an idealistic philosophical movement that has had hardly any counterpart in American culture except New England transcendentalism. Its founders were William T. Harris (*q.v.*) and Henry C. Brockmeyer (b. 1828), who was lieutenant-governor of the state in 1876–1880. A. Bronson Alcott was one of the early lecturers to the group which gathered around these two, a group which studied Hegel and Kant, Plato and Aristotle. Brockmeyer published excellent versions of Hegel's *Unabridged Logic*, *Phenomenology* and *Psychology*. Harris became the greatest of American exponents of Hegel. Other members of the group were Thomas Davidson (1840–1900), Adolph E. Kroeger, the translator of Fichte, Anna Callender Brackett (b. 1836), who published in 1886 an English version of Rosenkranz's *History of Education*, Denton Jaques Snider (b. 1841), whose best work has been on Froebel, and William McKendree Bryant (b. 1843), who wrote *Hegel's Philosophy of Art* (1879) and *Hegel's Educational Ideas* (1896). This Philosophical Society published (1867–1893) at St Louis *The Journal of Speculative Philosophy*, the first periodical of the sort in English.

Since the war the city's history has been signalized chiefly by economic development. A period in this was auspiciously closed in 1904 by the holding of a world's fair to celebrate the centennial of the purchase from France, in 1803, of the Louisiana territory—since then divided into 13 states, and containing in 1900 some 12,500,000 inhabitants. Preparations for this Louisiana Purchase Exposition began in 1898. It was the largest world's fair held to date, the site covering 1240 acres, of which 250 were under roof. The total cost, apart from individual exhibitions, was about $42,500,000, of which the national government contributed $5,000,000 and the city of St Louis and its citizens $10,000,000. Altogether 12,804,616 paid admissions were collected (total admissions 19,694,855) during the seven months that it was open, and there was a favourable balance at the close of about $1,000,000.

Up to 1848 St Louis was controlled in politics almost absolutely by the Whigs; since then it has been more or less evenly contested by the Democrats against the Whigs and Republicans. The Republicans now usually have the advantage. As mentioned before, the state is habitually Democratic; "boss" rule in St Louis was particularly vicious in the late 'nineties, and corruption was the natural result of ring rule—the Democratic bosses have at times had great power—and of the low pay—only $25 monthly—of the city's delegates and councilmen. But the reaction came, and with it a strong movement for independent voting. Fire, floods, epidemics, and wind have repeatedly attacked the city. A great fire in 1849 burned along the levee and adjacent streets, destroying steamers, buildings, and goods worth, by the estimate of the city assessor, more than $6,000,000. Cholera broke out in 1832–1833, 1849–1851, and 1866, causing in three months of 1849 almost 4000 deaths, or the death of a twentieth of all inhabitants. Smallpox raged in 1872–1875. These epidemics probably reflect the one-time lamentable lack of proper sewerage. Great floods occurred in 1785, 1811, 1826, 1844, 1872, 1885 and 1903; those of 1785 and 1844 being the most remarkable. There were tornadoes in 1833, 1852 and 1871; and in 1896 a cyclone of 20 minutes' duration, accompanied by fire but followed fortunately by a tremendous rain, destroyed or wrecked 8500 buildings and caused a loss of property valued at more than $10,000,000.

EAST ST LOUIS, a city of St Clair county, Illinois, U.S.A., on the E. bank of the Mississippi, lies opposite St Louis, Missouri. Pop. (1880), 9185; (1890), 15,169; (1900), 29,655, of whom 3920 were foreign born (mostly German and Irish); (1910 census) 58,547. It is one of the great railway centres of the country. Into it enter from the east sixteen lines of railway, which cross to St Louis by the celebrated steel arch bridge and by the Merchants' Bridge. It is also served by three interurban electric railways. The site of East St Louis is in the "American Bottom," little above the high-water mark of the river. This "bottom" stretches a long distance up and down the river, with a breadth of 10 or 12 m. It is intersected by many sloughs and crescent-shaped lakes which indicate former courses of the river. The manufacturing interests of East St Louis are important, among the manufactories being packing establishments, iron and steel works, rolling-mills and foundries, flour-mills, glass works, paint works and wheel works. By far the most important industry is slaughtering and meat packing: both in 1900 and in 1905 East St Louis ranked sixth among the cities of the United States in this industry; its product in 1900 was valued at $27,676,818 (out of a total for all industries of $32,460,957), and in 1905 the product of the slaughtering and meat-packing establishments in and near the limits of East St Louis was valued at $39,972,245, in the same year the total for all industries within the corporate limits being only $37,586,198. The city has a large horse and mule market. East St Louis was laid out about 1818, incorporated as a town in 1859, and chartered as a city in 1865.

Consult the *Encyclopaedia of the History of St Louis* (4 vols., St Louis, 1899); J. T. Scharf, *History of St Louis City and County . . . including Biographical Sketches* (2 vols., Philadelphia, 1883); E. H. Shepherd, *Early History of St Louis and Missouri . . . 1763–1843* (St Louis, 1870); F. Billon, *Annals of St Louis . . . 1804 to 1821* (2 vols., St Louis, 1886–1888); G. Anderson, *Story of a Border City during the Civil War* (Boston, 1908); *The Annual Statement of the Trade and Commerce of St Louis . . . reported to the Merchants' Exchange*, by its secretary.

ST LOUIS, the capital of the French colony of Senegal, West Africa, with a population (1904) of 24,070, or including the suburbs, 28,469. St Louis, known to the natives as N'dar, is 163 m. by rail N.N.E. of Dakar and is situated on an island 11½ m. above the mouth of the Senegal river, near the right bank, there separated from the sea by a narrow strip of sand called the Langue de Barbarie. This strip of sand is occupied by the villages of N'dar Toute and Guet N'dar. Three bridges connect the town with the villages; and the Pont Faidherbe, 2132 ft. long, affords communication with Bouetville, a suburb on the left bank, and the terminus of the railway to Dakar. The houses of the European quarter have for the most part flat roofs, balconies and terraces. Besides the governor's residence the most prominent buildings are the cathedral, the great mosque, the court-house, the barracks and military offices, and the docks. The round beehive huts of Guet N'dar are mainly inhabited by native fishermen. N'dar Toute consists of villas with gardens, and is a summer watering-place. There is a pleasant public garden, and N'dar Toute is approached by a magnificent alley of palm-trees. The low-lying position of St Louis and the extreme heat render it unhealthy, whilst the sandy nature of the soil causes intense inconvenience. The mouth of the Senegal being obstructed by a shifting bar of sand, the steamships of the great European lines do not come up to St Louis; passengers embark and land at Dakar, on the eastern side of Cape Verde. Ships for St Louis have often to wait outside or inside the bar for days or weeks, and partial unloading is frequently necessary. From July to the end of September—that is during flood-time—the water over the bar is, however, deep enough to enable vessels to reach St Louis without difficulty.

St Louis is believed to have been the site of a European settlement since the 15th century, but the present town was founded in 1626 by Dieppe merchants known as the *Compagnie normande*. It is the oldest colonial establishment in Africa belonging to France (see SENEGAL). Its modern development dates from 1854. The town, however, did not receive municipal government till 1872. All citizens, irrespective of colour, can vote. From 1895 to 1903 St Louis was not only the capital of Senegal, but the residence of the governor-general of French West Africa. In November of the last-named year the governor-general removed to Dakar. Small forts defend St Louis from the land side—the surrounding country, the Cayor, being inhabited by a warlike race, which previously to the building (1882–1885) of the St Louis-Dakar railway was a continual source of trouble.

The town carries on a very active trade with all the countries watered by the Senegal and the middle Niger. St Louis is connected with Brest by a direct cable, and with Cadiz via the Canary Islands.

ST LUCIA, the largest of the British Windward Islands, West Indies, in 14° N., 61° W., 24 m. S. of Martinique and 21 m. N.E. of St Vincent. Its area is 233 sq. m., length 42 m., maximum breadth 12 m., and its coast-line is 150 m. long. It is considered one of the loveliest of all the West Indian islands. It is a mass of mountains, rising sheer from the water, their summits bathed in perpetual mist. Impenetrable forests alternate with fertile plains, and deep ravines and frowning precipices with beautiful bays and coves. Everywhere there is luxuriant vegetation.

Les Pitons (2720 and 2680 ft.) are the chief natural feature—two immense pyramids of rock rising abruptly from the sea, their slopes, inclined at an angle of 60°, being clad on three sides with densest verdure. No connexion has been traced between them and the mountain system of the island. In the S.W. also is the volcano of Soufrière (about 4000 ft.), whose crater is 3 acres in size and covered with sulphur and cinders. The climate is humid, the rainfall varying from 70 to 120 in. per annum, with an average temperature of 80° F. The soil is deep and rich; the main products are sugar, cocoa, logwood, coffee, nutmegs, mace, kola-nuts and vanilla, all of which are exported. Tobacco also is grown, but not for export. The *usine* or central factory system is established, there being four government sugar-mills. Snakes, formerly prevalent, have been almost exterminated by the introduction of the mongoose. Only about a third of the island is cultivated, the rest being crown land under virgin forest, abounding in timber suitable for the finest cabinet work. The main import trade up to 1904 was from Great Britain; since then, owing to the increased coal imports from the United States, the imports are chiefly from other countries. The majority of the exports go to the United States and to Canada. In the ten years 1898–1907 the imports averaged £322,000 a year; the exports £195,000 a year. Bunker coal forms a large item both in imports and exports. Coal, sugar, cocoa and logwood form the chief exports.

Education is denominational, assisted by government grants. The large majority of the schools are under the control of the Roman Catholics, to whom all the government primary schools were handed over in 1898. There is a government agricultural school. St Lucia is controlled by an administrator (responsible to the governor of the Windward Islands), assisted by an executive council. The legislature consists of the administrator and a council of nominated members. Revenue and expenditure in the period 1901–1907 balanced at about £60,000 a year. The law of the island preserves, in a modified form, the laws of the French monarchy.

Castries, the capital, on the N.W. coast, has a magnificent landlocked harbour. There is a concrete wharf 650 ft. long with a depth alongside of 27 ft., and a wharf of wood 552 ft. in length. It is the principal coaling station of the British fleet in the West Indies, was strongly fortified, and has been the military headquarters. (The troops were removed and the military works stopped in 1905.) It is a port of registry, and the facilities it offers as a port of call are widely recognized, the tonnage of ships cleared and entered rising from 1,555,000 in 1898 to 2,627,000 in 1907. Pop. (1901) 7910. Soufrière, in the south, the only other town of any importance, had a population of 2394. The Caribs have disappeared from the island, and the bulk of the inhabitants are negroes. Their language is a French *patois*, but English is gradually replacing it. There is a small colony of East Indian coolies, and the white inhabitants are mostly creoles of French descent. The total population of the island (1901) is 49,833.

History.—St Lucia is supposed to have been discovered by Columbus in 1502, and to have been named by the Spaniards after the saint on whose day it was discovered. It was inhabited by Caribs, who killed the majority of the first white people (Englishmen) who attempted to settle on the island (1605). For two centuries St Lucia was claimed both by France and by England. In 1627 the famous Carlisle grant included St Lucia among British possessions, while in 1635 the king of France granted it to two of his subjects. In 1638 some 130 English from St Kitts formed a settlement, but in 1641 were killed or driven away by the Caribs. The French in 1650 sent settlers from Martinique who concluded a treaty of peace with the Caribs in 1660. Thomas Warner, natural son of the governor of St Kitts, attacked and overpowered the French settlers in 1663, but the peace of Breda (1667) restored it to France and it became nominally a dependency of Martinique. The British still claimed the island as a dependency of Barbadoes, and in 1722 George I. made a grant of it to the duke of Montague. The year following French troops from Martinique compelled the British settlers to evacuate the island. In 1748 both France and Great Britain recognized the island as "neutral." In 1762 its inhabitants surrendered to Admiral Rodney and General Monckton. By the treaty of Paris (1763), however, the British acknowledged the claims of France, and steps were taken to develop the resources of the island. French planters came from St Vincent and Grenada, cotton and sugar plantations were formed, and in 1772 the island was said to have a population of 15,000, largely slaves. In 1778 it was captured by the British; its harbours were a rendezvous for the British squadrons and Gros Ilet Bay was Rodney's starting-point before his victory over the Comte de Grasse (April 1782). The peace of Versailles (1783) restored St Lucia to France, but in 1794 it was surrendered to Admiral Jervis (Lord St Vincent). Victor Hugues, a partisan of Robespierre, aided by insurgent slaves, made a strenuous resistance and recovered the island in June 1795. Sir Ralph Abercromby and Sir John Moore, at the head of 12,000 troops, were sent in 1796 to reduce the island, but it was not until 1797 that the revolutionists laid down their arms. By the treaty of Amiens St Lucia was anew declared French. Bonaparte intended to make it the capital of the Antilles, but it once more capitulated to the British (June 1803) and was finally ceded to Great Britain in 1814. In 1834, when the slaves were emancipated, there were in St Lucia over 13,000 negro slaves, 2600 free men of colour and 2300 whites. The development of the island—half ruined by the revolutionary war—has been retarded by epidemics of cholera and smallpox, by the decline of the sugarcane industry and other causes, such as the low level of education. The depression in the sugar trade led to the adoption of cocoa cultivation. Efforts were also made to plant settlers on the crown lands—with a fair amount of success. The colony successfully surmounted the financial stringency caused by the withdrawal of the imperial troops in 1905.

Pigeon Island, formerly an important military port, lies off the N.W. end of St Lucia, by Gros Ilet Bay.

See Sir C. P. Lucas, *Historical Geography in the British Colonies*, vol. ii., "The West Indies" (2nd ed. revised by C. Atchley, Oxford, 1905), and the works there cited; also the annual reports on St Lucia issued by the Colonial Office.

ST MACAIRE, a town of south-western France, in the department of Gironde, on the Garonne, 29 m. S.E. of Bordeaux by rail. Pop. (1906), 2085. St Macaire is important for its medieval remains, which include a triple line of ramparts with old gateways. There are also several houses of the 13th and 14th centuries. The imposing church of St Sauveur (11th to 15th centuries) has a doorway with beautiful 13th-century carving and interesting mural paintings. St Macaire (anc. *Ligena*) owes its name to the saint whose relics were preserved in the monastery of which the church of St Sauveur is the principal remnant.

ST MAIXENT, a town of western France, in the department of Deux-Sèvres, on the Sèvre Niortaise, 15 m. N.E. of Niort by rail. Pop. (1906), 4102. The town has a fine abbey church built from the 12th to the 15th century, but in great part destroyed by the Protestants in the 16th century and rebuilt from 1670 to 1682 in the flamboyant Gothic style. The chief parts anterior to this date are the nave, which is Romanesque, and a lofty 15th-century tower over the west front. The crypt contains the tomb of Saint Maxentius, second abbot of the monastery, which was founded about 460. The town has a communal college, a chamber of arts and manufactures, and an infantry school for non-commissioned officers preparing for the rank of sub-lieutenant. It was the birthplace of Colonel Denfert-Rochereau, defender of Belfort in 1870–1871, and has a statue to him. The industries include dyeing and the manufacture of hosiery, mustard and plaster. The prosperity of the town was at its height after the promulgation of the edict of Nantes, when it numbered 12,000 inhabitants.

ST MALO, a seaport of western France, capital of an arrondissement in the department of Île-et-Vilaine, 51 m. N.N.W. of Rennes by rail. Pop. (1906) town, 8727; commune, 10,647. St Malo is situated on the English Channel on the right bank of the estuary of the Rance at its mouth. It is a garrison town surrounded by ramparts which include portions dating from the 14th, 15th and 16th centuries, but as a whole were rebuilt at the end of the 17th century according to Vauban's plans, and restored in the 19th century. The most important of the gates are that of St Vincent and the Grande Porte, defended by two massive 15th-century towers. The granite island on which St Malo stands communicates with the mainland on the northeast by a causeway known as the "Sillon" (furrow), 650 ft. long, and at one time only 46 ft. broad, though now three times that breadth. In the sea round about lie other granite rocks, which have been turned to account in the defences of the coast; on the islet of the Grand Bey is the tomb (1848) of François Auguste, vicomte de Chateaubriand, a native of the town. The rocks and beach are continually changing their appearance, owing to the violence of the tides; spring-tides sometimes rise 50 ft. above low-water level, and the sea sometimes washes over the ramparts. The harbour of St Malo lies south of the town in the creek separating it from the neighbouring town of St Servan. Including the contiguous and connected basins belonging more especially to St Servan, it comprises an outer basin, a tidal harbour, two wet-docks and an inner reservoir, affording a total length of quayage of over 2 m. The wet-docks have a minimum depth of 13 to 15 ft. on sill, but the tidal harbour is dry at low water. The vessels entered at St Malo-St Servan in 1906 numbered 1004 of 279,217 tons; cleared 1023 of 298,720 tons. The great bulk of trade is with England, the exports comprising large quantities of fruit, dairy-produce, early potatoes and other vegetables and slate. The chief imports are coal and timber. The London and South-Western railway maintains a regular service of steamers between Southampton and St Malo. The port carries on shipbuilding and equips a fleet for the Newfoundland cod-fisheries. The industries also include iron- and copper-founding and the manufacture of portable forges and other iron goods, cement, rope and artificial manures. The town is the seat of a sub-prefect and has tribunals of first instance and of commerce. Communication between the quays of St Malo and St Servan is maintained by a travelling bridge.

St Malo is largely frequented for sea-bathing, but not so much as Dinard, on the opposite side of the Rance. The town presents a tortuous maze of narrow streets and small squares lined with high and sometimes quaint buildings (*e.g.* the 16th-century house in which René Duguay-Trouin was born). Above all rises the stone spire (1859) of the cathedral, a building begun in the 12th century but added to and rebuilt at several subsequent periods. The castle (15th cent.), which defends the town towards the "Sillon," is flanked with four towers, one of which, the great keep, is an older and loftier structure, breached in 1378 by the duke of Lancaster. St Malo has statues to Chateaubriand, Duguay-Trouin and the privateer Robert Surcouf (1773–1827), natives of the town. The museum contains remains of the ship "La Petite Hermine," in which Jacques Cartier sailed to the St Lawrence (*q.v.*), and a natural history collection.

In the 6th century the island on which St Malo stands was the retreat of Abbot Aaron, who gave asylum in his monastery to Malo (Maclovius or Malovius), a Cambrian priest, who came hither to escape the episcopal dignity, but afterwards became bishop of Aleth (now St Servan); the see was transferred to St Malo only in the 12th century. Henceforth the bishops of St Malo claimed the temporal sovereignty over the town, a claim which was resolutely disputed by the dukes of Brittany. The policy of the citizens themselves, who thus gained substantial powers of self-government, was directed by consistent hostility to England and consequently to the dukes. They took the side of Bishop Josselin de Rohan and his successor in their quarrel with dukes John IV. and John V., and it was not till 1424 that John V., by the agency of Charles VI. of France and with the sanction of the pope, finally established his authority over the town. In 1488 St Malo unsuccessfully resisted the French troops on behalf of the duke. During the troubles of the League the citizens hoped to establish a republican government, and on the 11th of March 1590 they exterminated the royal garrison and imprisoned their bishop and the canons. But four years later they surrendered to Henry IV. of France. During the following century the maritime power of St Malo attained some importance. In November 1693 and July 1695 the English vainly bombarded it. The people of St Malo had in the course of a single war captured upwards of 1500 vessels (several of them laden with gold and other treasure) and burned a considerable number more. Enriched by these successes and by the wealth they drew from the New World, the shipowners of the town not only supplied the king with the means necessary for the famous Rio de Janeiro expedition conducted by Duguay-Trouin in 1711, but also lent him large sums for carrying on the war of the Spanish Succession. In June 1758 the English sent a third expedition against St Malo under the command of Charles Spencer, third duke of Marlborough, and inflicted great loss on the royal shipping in the harbour of St Servan. But another expedition undertaken in the following September received a complete check. In 1778 and during the wars of the Empire the St Malo privateers resumed their activity. In 1789 St Servan was separated from St Malo and in 1801 St Malo lost its bishopric. During the Reign of Terror the town was the scene of sanguinary executions.

See M. J. Poulain, *Histoire de Saint-Malo . . . d'après les documents inédits* (2nd ed., Lille, 1887).

SAINT-MARC GIRARDIN (1801–1873), French politician and man of letters, whose real name was MARC GIRARDIN, was born in Paris on the 22nd of February 1801. After a brilliant university career in Paris he began in 1828 to contribute to the *Journal des Débats*, on the staff of which he remained for nearly half a century. At the accession of Louis Philippe he was appointed professor of history at the Sorbonne and master of requests in the Conseil d'État. Soon afterwards he exchanged his chair of history for one of poetry, continuing to contribute political articles to the *Débats*, and sitting as deputy in the chamber from 1835 to 1848. He was charged in 1833 with a mission to study German methods of education, and issued a report advocating the necessity of newer methods and of technical instruction. In 1844 he was elected a member of the Academy. During the revolution of February 1848 Girardin was for a moment a minister, but after the establishment of the republic he was not re-elected deputy. After the war of 1870–71 he was returned to the Bordeaux assembly by his old department—the Haute Vienne. His Orleanist tendencies and his objections to the republic were strong, and though he at first supported Thiers, he afterwards became a leader of the opposition to the president. He died, however, on the 1st of April 1873 at Morsang-sur-Seine, before Thiers was actually driven from power.

His chief work is his *Cours de littérature dramatique* (1843–1863), a series of lectures better described by its second title *De l'usage des passions dans le drame.* The author examines the passions, discussing the mode in which they are treated in ancient and modern drama, poetry and romance. The book is really a defence of the ancients against the moderns, and Girardin did not take into account the fact that only the best of ancient literature has come down to us. Against the Romanticists he waged untiring war. Among his other works may be noticed *Essais de littérature* (2 vols. 1844), made up chiefly of contributions to the *Débats*, his *Notices sur l'Allemagne* (1834), and many volumes of collected *Souvenirs*, *Réflexions*, &c., on foreign countries and passing events. His latest works of literary importance were *La Fontaine et les Fabulistes* (1867) and an *Étude sur J.-J. Rousseau* (1870) which had appeared in the *Revue des deux mondes.*

See Ch. Labitte, "Saint-Marc Girardin," in the *Revue des deux mondes* (Feb. 1845); Tamisier, *Saint-Marc Girardin; étude littéraire* (1876); Hatzfield and Meunier, *Les Critiques littéraires du XIX^{e} siècle* (1894).

SAINT-MARTIN, LOUIS CLAUDE DE (1743–1803), French philosopher, known as "le philosophe inconnu," the name under which his works were published, was born at Amboise of a poor but noble family, on the 18th of January 1743. By his father's desire he tried first law and then the army as a profession. While in garrison at Bordeaux he came under the influence of Martinez de Pasquales, usually called a Portuguese Jew (although later research has made it probable that he was a Spanish Catholic), who taught a species of mysticism drawn from cabbalistic sources, and endeavoured to found thereon a secret cult with magical or theurgical rites. In 1771 Saint-Martin left the army to become a preacher of mysticism. His conversational powers made him welcome in Parisian salons, but his zeal led him to England, where he made the acquaintance of William Law (*q.v.*), the English mystic, to Italy and to Switzerland, as well as to the chief towns of France. At Strassburg in 1788 he met Charlotte de Boecklin, who initiated him into the writings of Jacob Boehme, and inspired in his breast a semi-romantic attachment. His later years were devoted almost entirely to the composition of his chief works and to the translation of those of Boehme. Although he was not subjected to any persecution in consequence of his opinions, his property was confiscated after the Revolution because of his social position. He was brought up a strict Catholic, and always remained attached to the church, although his first work, *Of Errors and Truth*, was placed upon the Index. He died at Aunay, near Paris, on the 23rd of October 1803.

His chief works are—*Lettre à un ami sur la Révolution Française*; *Éclair sur l'association humaine*; *De l'esprit des choses*; *Ministère de l'homme-esprit*. Other treatises appeared in his *Œuvres posthumes* (1807). Saint-Martin regarded the French Revolution as a sermon in action, if not indeed a miniature of the last judgment. His ideal society was "a natural and spiritual theocracy," in which God would raise up men of mark and endowment, who would regard themselves strictly as "divine commissioners" to guide the people. All ecclesiastical organization was to disappear, giving place to a purely spiritual Christianity, based on the assertion of a faculty superior to the reason—moral sense, from which we derive knowledge of God. God exists as an eternal personality, and the creation is an overflowing of the divine love, which was unable to contain itself. The human soul, the human intellect or spirit, the spirit of the universe, and the elements or matter are the four stages of this divine emanation, man being the immediate reflection of God, and nature in turn a reflection of man. Man, however, has fallen from his high estate, and matter is one of the consequences of his fall. But divine love, united to humanity in Christ, will work the final regeneration.

See J. B. Gence, *Notice biographique* (1824); L. I. Moreau, *Le Philosophe inconnu* (1850); E. M. Caro, *Essai sur la vie et la doctrine de Saint-Martin* (1852); Sainte-Beuve, *Causeries du lundi*, x. 190; A. J. Matter, *Saint-Martin, le philosophe inconnu* (1862); A. Franck, *La Philosophie mystique en France à la fin du dix-huitième siècle* (1866); A. E. Waite, *The Life of Louis Claude de Saint-Martin* (1901). There are English translations of *The Ministry of Man the Spirit* (1864) and of *Select Correspondence* (1863) by E. B. Penny.

ST MARTIN, an island in the West Indies, about 5 m. S. of the British island of Anguilla in 18° N. and 63° W. It is 38 sq. m. in area and nearly triangular in form, composed of conical hills, culminating in Paradise Peak (1920 ft.). It is the only island in the Antilles owned by two European powers; 17 sq. m. in the N., belonging to France, form a dependency of Guadeloupe, while the rest of the island, belonging to Holland, is a dependency of Curaçao. Sugar, formerly its staple, has been succeeded by salt. The chief town of the French area is Marigot, a free port on the W. coast; of the Dutch, Philipsburg, on the S. St Martin was first occupied by French freebooters in 1638, but ten years later the division between France and Holland was peaceably made. The inhabitants, mostly English-speaking negroes, number about 3000 in the French part, and in the Dutch the population in 1908 was 3817.

ST MARY (Santa Maria), an island in the Atlantic Ocean, belonging to Portugal and forming part of the Azores (*q.v.*). Pop. (1900), 6383; area, 40 sq. m. St Mary is the southernmost and easternmost of the Azores, lying south of the larger island of St Michael's, through the medium of which its trade is conducted, as it has no good harbours of its own. It produces wheat in abundance, of which a considerable quantity is exported. Various volcanic rocks are the predominant formations, but beds of limestone also occur, giving rise to numerous stalactite grottoes all over the island. The chief town is Villa do Porto (2506).

ST MARYLEBONE (commonly called MARYLEBONE), a north-western metropolitan borough of London, England, bounded N. by Hampstead, E. by St Pancras and Holborn, S. by the City of Westminster, and W. by Paddington. Pop. (1901), 133,301. It is mainly a rich residential quarter; the most fashionable part is found in the south, in the vicinity of Cavendish and Portman Squares, but there are numerous fine houses surrounding Regent's Park and in the north-western district of St John's Wood. Oxford Street, with its handsome shops, bounds the borough on the south, crossing Regent Street at Oxford Circus; Edgware Road on the west; Marylebone Road crosses from east to west, and from this Upper Baker Street gives access to Park, Wellington, and Finchley Roads; and Baker Street leads southward. Poor and squalid streets are found, in close proximity to the wealthiest localities, between Marylebone Road and St John's Wood Road, and about High Street in the south, the site of the original village. The formation of the Great Central Railway, the Marylebone terminus of which, in Marylebone Road, was opened in 1899, caused an extensive demolition of streets and houses in the west central district. St Marylebone was in the manor of Tyburn, which takes name from the Tyburn, a stream which flowed south to the Thames through the centre of the present borough. The church was called St Mary at the Bourne. The name Tyburn (*q.v.*) was notorious chiefly as applied to the gallows which stood near the existing junction of Edgware Road and Oxford Street (Marble Arch). The manor at the Domesday Survey was in the possession of the nunnery at Barking, but the borough includes several estates, such as the manor of Lyllestone in the west, the name of which is preserved in Lisson Grove. From 1738 to 1776 Marylebone Gardens (which had existed under other names from the close of the 17th century) became one of the most favoured evening resorts in London. They extended east of High Street as far as Harley Street, but by 1778 the ground was being built over. Another historic site is Horace Street near Edgware Road, formerly Cato Street, from which the conspiracy which bore that name was directed against the ministry in 1820.

The borough includes almost the whole of Regent's Park, with a portion of Primrose Hill north of it. These have altogether an area of 472 acres. The park, originally Marylebone Park, was enclosed by James I., and received its modern name from the Prince Regent, afterwards George IV. It contains the Zoological Gardens, one of the most noteworthy institutions of its kind, attracting numerous visitors to its splendid collections of living animals. Here are also the gardens of the Royal Botanic Society, incorporated in 1839. They are enclosed and beautifully laid out, and contain hot-houses and a museum. Exhibitions are held each year. The Toxophilite Society, founded in 1781, has also occupied grounds here since 1883. The picturesque lake is supplied by the ancient Tyburn. The Regent's Canal skirts the north side of the park. Another famous enclosure is Lord's Cricket Ground, St John's Wood Road. The founder, Thomas Lord (1814), at first established a cricket ground in the present Dorset Square, but it was soon moved here. Lord's, as it is called, is the headquarters of the M.C.C. (Marylebone Cricket Club), the governing body of the game; here are played the home matches of this club and of the Middlesex County Cricket Club, the Oxford and Cambridge, Eton and Harrow, and other well-known fixtures. The Wallace Art Collection, Hertford House, Manchester Square, was bequeathed by Sir Richard Wallace to the nation on the death of his wife in 1897. The waxwork exhibition named after Madame Tussaud, who founded it in Paris in 1780, occupies large buildings in Marylebone Road. The Parkes Museum of the Sanitary Institute is in Margaret Street. The Queen's Hall, Langham Place, is used for concerts, including a notable annual series of orchestral promenade concerts. St Marylebone contains a great number of hospitals, among which are the Middlesex, Mortimer Street; Throat Hospital and Dental Hospital and School, Great Portland Street; Lying-in and Ophthalmic Hospitals, Marylebone Road; Samaritan Hospital for women, Seymour Street; Consumption Hospital, Margaret Street; and the Home for incurable children, St John's Wood Road. There are also several industrial homes. Harley Street, between Marylebone Road and Cavendish Square, is noted as the residence of medical practitioners. Educational institutions include the Trinity and the Victoria Colleges of Music, in Manchester Square and Berners Street respectively; the Bedford College for women, and the Regent's Park Baptist College. The parliamentary borough of Marylebone has east and west divisions, each returning one member. The borough council consists of a mayor, 10 aldermen and 60 councillors. Area, 1472·8 acres.

SAINT MARYS, a city of Auglaize county, Ohio, U.S.A., on the Saint Marys river and the Miami & Erie canal, about 85 m. W.N.W. of Columbus. Pop. (1910), 5732. Saint Marys is served by the Lake Erie & Western, the Western Ohio (electric), and the Toledo & Ohio Central railways. About 1 m. west is a feeding reservoir of the canal covering about 17,600 acres. Saint Marys is in the Ohio oil region. The city occupies the site of a former Shawnee village, in which a trading post was established in 1782 by James Girty,[1] from whom the place was for some years called Girty's Town. Fort St Marys was built in 1784 or 1785 by a detachment of General Anthony Wayne's troops, and in 1812 Ft. Barbee was erected at the instance of General W. H. Harrison by Colonel Joshua Barbee. During the War of 1812 the place was for some time the headquarters of General Harrison's army. St Marys was laid out as a town in 1823, and became a city in 1903 under the general municipal code which came into effect in that year.

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[1] James Girty (1743–1817) was one of the notorious Girty brothers, the sons of Simon Girty (d. 1751), an Irish immigrant. The brothers were taken prisoners by the French and Indian force which in 1756 captured Fort Granville, in what is now Mifflin county, Pennsylvania. James was adopted by the Shawnees and lived among them for three years, after which he acted as an interpreter and trader; he frequently accompanied the Indians against the English settlers, and exhibited the greatest ferocity. He conducted a profitable trading business with the Indians at St Marys in 1783–1794, when he withdrew to Canada upon the approach of General Wayne, and again from 1795 until just before the War of 1812, when he again withdrew to Canada, where he died. His brother Simon (1741-1818), who lived with the Senecas for several years after his capture, was even more bloodthirsty; he served against the Indians in Lord Dunmore's War, and in 1776, during the War of Independence, entered the

ST MARY'S LOCH, a fresh-water lake of Selkirkshire, Scotland. It lies in the high land towards the western border, and is visited from Selkirk (16 m. E. by N.) or Moffat (15 m. S.W.). It is 814 ft. above the sea, is from 80 to 90 ft. deep, 3 m. long, about 1 m. wide at its widest, and has a shore-line of 7½ m. A narrow isthmus divides its head from the small Loch of the Lowes (about 1 m. long), which is believed to have been once part of it, the difference of level being only 15 in. St Mary's is emptied by the Yarrow, and its principal feeder is Megget Water, a noted angling stream. It takes its name from St Mary's Kirk, the ruins of which lie near the northern shore. From the 13th century, when the church is first mentioned, till its destruction in 1557, it was variously known as the Forest Kirk (in which William Wallace was elected Warden of Scotland), St Mary's of Farmainishope, an old name of the adjoining lands of Kirkstead, St Mary of the Lowes, and the Kirk of Yarrow. It had been partly restored, but gradually fell into decay, its place being taken by the church of Yarrow farther down the vale. In the graveyard was buried John Grieve (1781–1836), the Edinburgh hatter, a poet of some capacity, patron of James Hogg, the Ettrick Shepherd. At the head of the lake is the celebrated inn opened by Tibbie Shiel (Mrs Richardson, d. 1878), which was visited by many distinguished men of letters.

ST MAUR-DES-FOSSÉS, a south-eastern suburb of Paris, on the right bank of the Marne, 7 m. from the centre of the city. Pop. (1906), 28,016. St Maur and the residential district surrounding it cover a peninsula formed by a loop in the Marne, the neck of which is crossed by the canal of St Maur. In the reign of Clovis II. the monastery of Les Fossés was founded; the amplification of the name came when the body of St Maurus was brought there by the monks of St Maur-sur-Loire. About the same time was inaugurated the pilgrimage of Notre-Dame des Miracles, which still takes place annually. In 1465 a treaty of peace, putting an end to the "War of the Public Weal," was concluded between Louis XI. and his revolted barons at St Maur.

ST MAUR-SUR-LOIRE, a village of western France in the department of Maine-et-Loire on the Loire about 15 m. below Saumur. Here St Maurus towards the middle of the 6th century founded the first Benedictine monastery in Gaul. About the middle of the 9th century it was reduced to ruins by the Normans; in anticipation of the disaster the relics of the saint were transferred to the abbey of Fossés (afterwards St Maur-des-Fossés: see above). St Maur-sur-Loire was afterwards restored and fortified; the extant remains consist of a part of the church (12th and 17th centuries) and buildings of the 17th and 18th centuries.

ST MAWES, a small seaport in the St Austell parliamentary division of Cornwall, England, beautifully situated on an arm of Falmouth Harbour. Pop. (1901), 1178. The inlet admits only small vessels to the little harbour, but there is a considerable fishing industry. A large circular castle, *vis-à-vis* with that of Pendennis near Falmouth, and dating from the same period (Henry VIII.), guards the entrance. Near the shore of the inlet opposite St Mawes is the small church of St Anthony in Roseland, an excellent example of Early English work, retaining a good Norman doorway.

The history of St Mawes is simple. The saint of that name is said to have made the creek of the Fal a halting-place in the 5th century. The chapel of St Mawes, pulled down in 1812, was licensed by the bishop in 1381, and both chapel and village were situated within the manor of Bogullos, which in the 16th century belonged to the family of Wydeslade. In the 16th century John Leland speaks of the castle as lately begun and describes St Mawes as "a quarter of a mile from the castle, a pretty village or fishertown with a pier called St Mawes and there is a chapel of the saint and his chair of stone and hard by his well." The number of houses half a century later did not exceed twenty, and John Wydeslade, as lord of the manor of Bogullos, owned the village. For the part which he took in the rebellion of 1549 Wydeslade was hanged and his lands forfeited, and in 1562 the manor was granted by Queen Elizabeth to Sir Reginald Mohun of Hall. In the same year St Mawes was incorporated and invested with the right of returning two members to the House of Commons, a privilege which it enjoyed until 1832. In 1607 the portion of the manor of Bogullos which embraced St Mawes was sold by Sir Thomas Arundell, who had married a daughter of Sir William Mohun, to Thomas Walker, and by the latter it was resold to Sir George Parry, who represented the borough in parliament from 1640 to 1642. Sir George Parry sold St Mawes to John Tredenham, whose sons, Sir William and Sir Joseph, and Sir Joseph's son, John Tredenham, became successively its parliamentary representatives. On the death of the last named St Mawes passed by sale to John Knight, whose widow married Robert Nugent, afterwards Earl Nugent, and until the Reform Act of 1832 the Nugents controlled the elections at St Mawes. The corporation, founded in 1562, which consisted of a mayor, or portreeve, and other officers elected by about twenty free tenants, was dissolved under the Municipal Corporations Act in 1835. Its silver mace now belongs to the corporation of Wolverhampton, to whom it passed after the great sale of the effects of the duke of Buckingham at Stowe in 1848, the duke having obtained it as the heir of the Earls Nugent.

ST MICHAEL'S (*São Miguel*), the largest island in the Portuguese archipelago of the Azores. Pop. (1900), 121,340; area, 297 sq. m. The east end of St Michael's rises from a headland 1400 ft. high to the inland peak of Vara (3573 ft.), whence a central range (2000 to 2500 ft.) runs westward, terminating on the south coast in the Serra da Agoa do Pau, about halfway across the island. The range gradually declines in approaching its last point, where it is not more than 100 ft. high. The middle part of the island is lower, and more undulating, its western extremity being marked by the conspicuous Serra Gorda (1572 ft.); its shores on both sides are low, broken and rocky. The aspect of the western portion of the island is that of a vast truncated cone, irregularly cut off at an elevation of about 800 ft., and falling on the north, south and west sides to a perpendicular coast between 300 and 800 ft. high. In the highest parts an undergrowth of shrubs gives the mountains a rich and wooded appearance. Like all volcanic countries, the island has an uneven surface with numerous ravines, and streams of semi-vitrified and scoriaceous lava which resist all atmospheric influences and repel vegetation. Heavy rains falling on the mountains afford a constant supply of water to four lakes at the bottom of extinct craters, to a number of minor reservoirs, and through them, to small rapid streams on all sides.

Hot springs abound in many parts, and vapour issues from almost every crevice. But the most remarkable phenomena are the *Caldeiras* ("Cauldrons"), or *Olhos* ("Eyes"), *i.e.* boiling fountains, which rise chiefly from a valley called the Furnas ("Furnaces"), near the western extremity of the island. The water rises in columns about 12 ft. high and dissolves in vapour. The ground in the vicinity is entirely covered with native sulphur, like hoar-frost. At a small distance is the Muddy Crater, 45 ft. in diameter, on a level with the plain. Its contents are in a state of continual and violent ebullition, accompanied with a sound resembling that of a tempestuous ocean. Yet they

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British service as an interpreter, and after the war instigated Indian attacks on the frontier and fought with the Indians against General Arthur St Clair and General Anthony Wayne. Another brother, George Girty (1745–*c.* 1812), lived among the Delawares for several years, was also a trader and interpreter, and was likewise a renegade. Thomas (1739–1820), though he associated much with the Indians, did not participate in their wars. See W. Butterfield's *History of the Girtys* (Cincinnati, 1890).

never rise above its level, unless occasionally to throw to a small distance a spray of the consistence of melted lead. The Furnas abounds also in hot springs, some of them of a very high temperature. There is almost always, however, a cold spring near the hot one. These have long been visited by sufferers from palsy, rheumatism, scrofula and similar maladies. Bath-rooms and other buildings have been erected.

The plains of St Michael's are fertile, producing wheat, barley and Indian corn; vines, oranges and other fruit trees grow luxuriantly on the sides of the mountains. The plants are made to spring even from the interstices of the volcanic rocks, which are sometimes blasted to receive them. Raised in this manner, these fruits are of superior quality; but the expense of such a mode of cultivation necessarily restricts it. The western part of the island yields hemp. The principal town and seaport is Ponta Delgada (*q.v.*), with 17,675 inhabitants in 1900. The other chief towns are Arrifes (5644), Lagoa (7950), Povoacão (5093), Ribeira Grande (8496) and Villa Franca do Campo (8162). (See also AZORES.)

ST MICHAEL'S MOUNT, a lofty pyramidal island, exhibiting a curious combination of slate and granite, rising 400 yds. from the shore of Mount's Bay, in Cornwall, England. It is united with Marazion by a natural causeway cast up by the sea, and passable only at low tide. If its identity with the Mictis of Timaeus and the Ictis of Diodorus Siculus be allowed, St Michael's Mount is one of the most historic spots in the west of England. It was possibly held by a body of religious in the Confessor's time and given by Robert, count of Mortain, to Mount St Michael, of which Norman abbey it continued to be a priory until the dissolution of the alien houses by Henry V., when it was given to the abbess and Convent of Syon. It was a resort of pilgrims, whose devotions were encouraged by an indulgence granted by Pope Gregory in the 11th century. The Mount was captured on behalf of Prince John by Henry Pomeroy in the reign of Richard I. John de Vere, earl of Oxford, seized it and held it during a siege of twenty-three weeks against 6000 of the king's troops in 1473. Perkin Warbeck occupied the Mount in 1497. Humphry Arundell, governor of St Michael's Mount, led the rebellion of 1549. During the reign of Queen Elizabeth it was given to Robert, earl of Salisbury, by whose son it was sold to Sir Francis Basset. Sir Arthur Basset, brother of Sir Francis, held the Mount against the parliament until July 1646. It was sold in 1659 to Colonel John St Aubyn and is now the property of his descendant Lord Levan. The chapel is extra-diocesan and the castle is the residence of Lord St Levan.

Many relics, chiefly armour and antique furniture, are preserved in the castle. The chapel of St Michael, a beautiful 15th-century building, has an embattled tower, in one angle of which is a small turret, which served for the guidance of ships. Chapel rock, on the beach, marks the site of a shrine dedicated to the Virgin Mary, where pilgrims paused to worship before ascending the Mount. A few houses are built on the hillside facing Marazion, and a spring supplies them with water. The harbour, widened in 1823 to allow vessels of 500 tons to enter, has a pier dating from the 15th century, and subsequently enlarged and restored. Pop. (1901), 111.

ST MIHIEL, a town of north-eastern France, in the department of Meuse, on the right bank of the Meuse and the Canal de l'Est, 23 m. S. by E. of Verdun by rail. Pop. (1906) of the town, 5943 (not including a large garrison), of the commune, 9661. St Mihiel is famous for its Benedictine abbey of St Michael, founded in 709, to which it owes its name. The abbey buildings (occupied by the municipal offices) date from the end of the 17th century and the beginning of the 18th century, and the church from the 17th century. The latter contains a wooden carving of the Virgin by the sculptor Ligier Richier, born at St Mihiel in 1506. Other interesting buildings are the church of St Étienne, chiefly in the flamboyant Gothic style, which contains a magnificent Holy Sepulchre by Ligier Richier, and several houses dating from the 15th, 16th and 17th centuries. On the road to Verdun are seven huge rocks, in one of which a sepulchre (18th century), containing a life-sized figure of Christ, has been hollowed. St Mihiel formerly possessed fortifications and two castles which were destroyed in 1635 by the royal troops in the course of a quarrel between Louis XIII. and Charles IV., duke of Lorraine. The town is the seat of a court of assizes, and has the tribunal of first instance belonging to the arrondissement of Commercy and a communal college.

ST MORITZ (in Ladin, *San Murezzan*), the loftiest (6037 ft.) and the most populous village of the Upper Engadine in the Swiss canton of the Grisons. It is built above the north shore of the lake of the same name (formed by the Inn), and is by rail 56 m. from Coire by the Albula railway, or by road 48½ m. from Martinsbruck (the last village in the Engadine), or by road 30 m., over the Maloja Pass, from Chiavenna. In 1900 it had a population of 1603, 475 being German-speaking, 433 Ladin-speaking, and 504 (railway workmen) Italian-speaking, while 837 were Protestants and 743 Catholics. The village is about 1 m. north of the baths, an electric tramway connecting the two. Both are now much frequented by foreign visitors. The baths (chalybeate, sparkling with free carbonic acid) were known and much resorted to in the 16th century, when they were described by Paracelsus; they were visited in 1779 by Archdeacon W. Coxe. They are frequented chiefly by non-English visitors in summer, the English season at St Moritz being mainly the winter, for the sake of skating and tobogganing. (W. A. B. C.)

ST NAZAIRE, a town of western France, capital of an arrondissement in the department of Loire-Inférieure, 40 m. W.N.W. of Nantes by rail and 29 m. by river. Pop. (1906), 30,345. St Nazaire, situated on the right bank of the Loire at its mouth, is a modern town with straight thoroughfares crossing one another at right angles. It possesses nothing of antiquarian interest except a granite dolmen 10 ft. long and 5 ft. wide resting horizontally on two other stones sunk in the soil, above which they rise 6½ ft. The only noteworthy building is a modern church in the Gothic style of the 14th century. The harbour, which constitutes the outport of Nantes and is accessible to ships of the largest size, is separated from the estuary by a narrow strip of land, and comprises an outer harbour and entrance, two floating docks (the old dock and the Penhouët dock), three graving docks, and the extensive shipbuilding yards of the Loire Company and of the General Transatlantic Company whose steamers connect St Nazaire with Mexico, the Antilles and the Isthmus of Panama. Ships for the navy and the mercantile marine are built, and there are important steel-works, blast-furnaces, forges, and steam saw-mills. The town is the seat of a sub-prefect, and has a tribunal of first instance, a board of trade-arbitration, an exchange, a chamber of commerce, a communal college, and schools of navigation and industry. Next to British and French, Spanish, Norwegian and Swedish vessels most frequent the port. In the decade 1898–1907 the value of imports greatly fluctuated, being highest in 1898 (£2,800,000) and lowest in 1904 (£1,688,000), the average for each of the ten years being £2,280,000. The value of the exports in the same period varied between £3,724,000 in 1899 and £1,396,000 in 1906, the average being £2,935,200. Imports include coal and patent fuel, iron ore and pyrites, timber, rice and hemp; exports include iron ore, coal and patent fuel, pit wood, sugar, garments and woven goods, preserved fish, and wine and spirits.

According to remains discovered on excavating the docks, St Nazaire seems to occupy the site of the ancient *Corbilo*, placed by Strabo among the more important maritime towns of Gaul. At the close of the 4th century the site of Corbilo was occupied by Saxons, and, their conversion to Christianity being effected one or two hundred years later by St Felix of Nantes, the place took the name of St Nazaire. It was still only a little "bourg" of some 3000 inhabitants when under the second empire it was chosen as the site of the new harbour for Nantes, because the ascent of the Loire was becoming more and more difficult. In 1868 the sub-prefecture was transferred to St Nazaire from Savenay.

ST NECTAIRE (corrupted into Sennecterre and Senneterre), the name of an estate in Auvergne, France, which gave its name to a feudal house holding distinguished rank in the 13th century. The eldest branch of this family held the marquisate of La Ferté (*q.v.*), and produced a heroine of the religious wars of the 16th century, Madeleine de St Nectaire, who married Guy de St Exupéry, seigneur de Miremont, in 1548, and fought successfully at the head of the Protestants in her territory against the troops of the League. To the same house belonged the branches of the marquises of Châteauneuf, the seigneurs of Brinon-sur-Sauldre and St Victour, and the seigneurs of Clavelier and Fontenilles, all of which are now extinct. (M. P.*)

ST NEOTS (pronounced St Neets), a market town in the southern parliamentary division of Huntingdonshire, England, on the right (east) bank of the Ouse, 51½ m. N. of London by the Great Northern railway. Pop. of urban district, (1901) 3880. A stone bridge crosses the river, built in 1589 from the ruins of a former priory. The parish church of St Mary is a fine Perpendicular building of the later 15th century. The original oak roof is noteworthy. Among other buildings may be mentioned the Victoria museum (1887), the library and literary institute, and the endowed school (1760). Paper-mills, breweries, flour-mills, and engineering works furnish the chief industries of the town.

The name of St Neots is derived from the monastery founded in the adjoining parish of Eynesbury in the reign of King Edgar (967–975). St Neot, a priest of Glastonbury Abbey in Somerset, became a recluse at a place which he named Neotstoke, near Bodmin in Cornwall, where he died about the end of the 9th century. His shrine at Eynesbury being threatened by the incursion of the Danes early in the 11th century, the relics were conveyed to Crowland Abbey, in Lincolnshire, of which he became one of the patron saints. But in 1112 the monastery was refounded from that of Bec in Normandy. An Anglo-Saxon enamelled mosaic in the Ashmolean Museum at Oxford is supposed to contain a portrait of St Neot. In 1648 a troop of Royalists under the command of Villiers, duke of Buckingham, was routed in St Neots by the Parliamentarians.

ST NICOLAS, a town of Belgium in the province of East Flanders, about 12 m. S.W. of Antwerp. Pop. (1904), 32,767. It is the principal town of Waes, formerly a district of bleak and barren downs, but now the most productive part of Belgium. St Nicolas is the centre and distributing point of this district, being an important junction on the direct line from Antwerp to Ghent; it has also many manufactures of its own. The principal church dedicated to St Nicolas was finished in 1696, but the other public buildings are only of the 19th century.

ST NICOLAS, or St Nicolas du Port, a town of north-eastern France, in the department of Meurthe-et-Moselle, on the left bank of the Meurthe, 8 m. S.E. of Nancy by rail. Pop. (1906), 4796. The town has a fine Gothic church dating from the end of the 15th and the first half of the 16th century, and possessing a finger-joint of St Nicolas formerly the object of pilgrimages which were themselves the origin of well-known fairs. The latter became less important after 1635, when the Swedes sacked the town. There are important salt-workings in the vicinity; cotton spinning and weaving are carried on. Its port, shared with Varangéville on the opposite side of the river, has an active trade.

ST OMER, a town and fortress of northern France, capital of the department of Pas-de-Calais, 42 m. W.N.W. of Lille on the railway to Calais. Pop. (1906), 17,261. At St Omer begins the canalized portion of the Aa, which reaches the sea at Gravelines, and under its walls it connects with the Neuffossé canal, which ends at the Lys. The fortifications were demolished during the last decade of the 19th century and boulevards and new thoroughfares made in their place. There are two harbours outside and one within the city. St Omer has wide streets and spacious squares, but little animation. The old cathedral belongs almost entirely to the 13th, 14th and 15th centuries. A heavy square tower finished in 1499 surmounts the west portal. The church contains interesting paintings, a colossal statue of Christ seated between the Virgin and St John (13th century, originally belonging to the cathedral of Thérouanne and presented by the emperor Charles V.), the cenotaph of St Omer (13th century) and numerous ex-votos. The richly decorated chapel in the transept contains a wooden figure of the Virgin (12th century), the object of pilgrimages. Of St Bertin, the church of the abbey (built between 1326 and 1520 on the site of previous churches) where Childeric III. retired to end his days, there remain some arches and a lofty tower, which serve to adorn a public garden. Several other churches or convent chapels are of interest, among them St Sepulchre (14th century), which has a beautiful stone spire and stained-glass windows. A fine collection of records, a picture-gallery, and a theatre are all accommodated in the town hall, built of the materials of the abbey of St Bertin. There are several houses of the 16th and 17th centuries; of the latter the finest is the Hôtel Colbert, once the royal lodging, and now occupied by an archaeological museum. Among the hospitals the military hospital is of note as occupying the well-known college opened by the English Jesuits in 1592. The old episcopal palace adjoining the cathedral is used as a court-house. The chief statue in the town is that of Jacqueline Robin (see below). St Omer is the seat of a sub-prefect, of a court of assizes, of tribunals of first instance and of commerce, of a chamber of commerce, and of a board of trade arbitration. Besides the lycée, there are schools of music and of art. The industries include the manufacture of linen goods, sugar, soap, tobacco-pipes, and mustard, the distilling of oil and liqueurs, dyeing, salt-refining, malting and brewing. The suburb of Haut Pont to the north of St Omer is inhabited by a special stock, which has remained faithful to the Flemish tongue, its original costume and its peculiar customs, and is distinguished by honesty and industry. The ground which these people cultivate has been reclaimed from the marsh, and the *lègres* (*i.e.* the square blocks of land) communicate with each other only by boats floated on the ditches and canals that divide them. At the end of the marsh, on the borders of the forest of Clairmarais, are the ruins of the abbey founded in 1140 by Thierry d'Alsace, to which Thomas Becket betook himself in 1165. To the south of St Omer, on a hill commanding the Aa, lies the camp of Helfaut, often called the camp of St Omer. On the Canal de Neuf-Fossé, near the town, is the Ascenseur des Fontinettes, a hydraulic lift enabling canal boats to surmount a difference of level of over 40 ft.

Omer, bishop of Thérouanne, in the 7th century established the monastery of St Bertin, from which that of Notre-Dame was an offshoot. Rivalry and dissension, which lasted till the Revolution, soon sprang up between the two monasteries, becoming especially virulent when in 1559 St Omer became a bishopric and Notre-Dame was raised to the rank of cathedral. In the 9th century the village which grew up round the monasteries took the name of St Omer. The Normans laid the place waste about 860 and 880, but ten years later found town and monastery surrounded by walls and safe from their attack. Situated on the borders of territories frequently disputed by French, Flemish, English and Spaniards, St Omer long continued subject to siege and military disaster. In 1071 Philip I. and Count Arnulf III. of Flanders were defeated at St Omer by Robert the Frisian. In 1127 the town received a communal charter from William Clito, count of Flanders. In 1493 it came to the Low Countries as part of the Spanish dominion. The French made futile attempts against it between 1551 and 1596, and again in 1638 (under Richelieu) and 1647. But in 1677, after seventeen days' siege, Louis XIV. forced the town to capitulate; and the peace of Nijmwegen permanently confirmed the conquest. In 1711 St Omer, on the verge of surrendering to Prince Eugene and the duke of Marlborough, owing to famine, was saved by the daring of Jacqueline Robin, who risked her life in bringing provisions into the place. St Omer ceased to be a bishopric in 1801.

See L. Deschamps de Pas, *Hist. de la ville de Saint-Omer* (2nd ed., Arras, 1881). For a full bibliography of other works see U. Chevalier, *Répertoire des sources hist. topo-bibliographie* (Montbéliard, 1903), ii. 2743 *seq.*

SAINTON, PROSPER PHILIPPE CATHERINE (1813–1890), French violinist, was the son of a merchant at Toulouse, where he was born on the 5th of June 1813. He entered the Paris Conservatoire under Habeneck in 1831, and became professor of the violin in the Conservatoire of Toulouse. In 1844 he made his first appearance in England, at a Philharmonic concert directed by Mendelssohn. Settling in London, he was in 1845 appointed professor at the Royal Academy of Music. In the early organizations for chamber music which culminated in the establishment of the Popular concerts, Sainton bore an important part; and when the Royal Italian Opera was started at Covent Garden, he led the orchestra under Costa, with whom he migrated to Her Majesty's Theatre in 1871. From 1848 to 1855 he was leader of the Queen's Band, and in 1862 he conducted the music at the opening of the International Exhibition. In 1860, he married the famous contralto singer, Miss Charlotte Dolby (see below). He was leader of the principal provincial festivals for many years, and gave a farewell concert at the Albert Hall in 1883. He died on the 17th of October 1890. His method was sound, his style artistic, and his educational work of great value, the majority of the most successful orchestral violinists having been his pupils.

SAINTON-DOLBY, CHARLOTTE HELEN (1821–1885), English contralto singer, was born in London on the 17th of May 1821, studied at the Royal Academy of Music from 1832 to 1837, Crivelli being her principal singing-master. In 1837 she was elected to a king's scholarship, and first appeared at a Philharmonic concert in 1841. In October 1845 she sang at the Gewandhaus, Leipzig, through the influence of Mendelssohn, who had been delighted by her singing in *St Paul.* The contralto music in his *Elijah* was written for her voice, but she did not appear in that work till the performance at Exeter Hall on the 16th of April 1847. She married M. Sainton in 1860, and in 1870 she retired from the career of a public singer, but two years afterwards started a "vocal academy" in London. She made various successful attempts as a composer, and the cantatas "The Legend of St Dorothea" (1876), "The Story of the Faithful Soul"(1879), and "Florimel" (1885), enjoyed considerable success. Her last public appearance was at her husband's farewell concert in June 1883, and she died on the 18th of February 1885. A scholarship in her memory was founded at the Royal Academy of Music. Her voice was of moderate power and of fine quality, but it was her dignified and artistic style that gave her the high place she held for so many years both in oratorio and ballads.

SAINTONGE, one of the old provinces of France, of which Saintes (*q.v.*) was the capital, was bounded on the N.W. by Aunis, on the N.E. by Poitou, on the E. by Angoumois, on the S. by Guienne, and on the W. by Guienne and the Atlantic. It now forms a small portion of the department of Charente and the greater part of that of Charente Inférieure. In the time of Caesar, Saintonge was occupied by the Santones, whose capital was Mediolanum; afterwards it was part of Aquitania Secunda. The *civitas Santonum*, which formed the bishopric of Saintes, was divided into two *pagi*: *Santonicus* (whence *Sanctonia*, Saintonge) and *Alienensis*, later *Alniensis* (Aunis). Halved by the treaty of 1259, it was wholly ceded to the king of England in 1360, but reconquered by Du Guesclin in 1371. Up to 1789 it was in the same *gouvernement* with Angoumois, but from a judiciary point of view Saintonge was under the parlement of Bordeaux and Angoumois under that of Paris.

See D. Massiou, *Histoire politique, civile et religieuse de la Saintonge et de l'Aunis* (6 vols., 1836–1839; 2nd ed., 1846); P. D. Rainguet, *Biographie saintongeaise* (1852). See also the publications of the *Société des archives historiques de la Saintonge et de l'Aunis* (1874 fol.).

ST OUEN, an industrial town of northern France, in the department of Seine, on the right bank of the Seine 1 m. N. of the fortifications of Paris. Pop. (1906) 37,673. A château of the early 19th century occupies the site of a château of the 17th century bought by Madame de Pompadour in 1745, where in 1814 Louis XVIII. signed the declaration promising a constitutional charter to France. Previously there existed a château built by Charles of Valois in the early years of the 14th century, where King John the Good inaugurated the short-lived order of the Knights of "Notre Dame de la noble maison," called also the "ordre de l'étoile." The industries of St Ouen include metal founding, engineering and machine construction and the manufacture of government uniforms, pianos, chemical products, &c. It has important docks on the Seine and a race-course.

ST PANCRAS, a northern metropolitan borough of London, England, bounded E. by Islington, S.E. by Finsbury, S. by Holborn, and W. by St Marylebone and Hampstead, and extending N. to the boundary of the county of London. Pop. (1901) 235,317. In the south it includes a residential district, containing boarding-houses and private hotels. In the centre are Camden Town and Kentish Town, and in the north, where part of Highgate is included, are numerous villas, in the vicinity of Parliament Hill, adjoining Hampstead Heath. A thoroughfare called successively Tottenham Court Road, Hampstead Road, High Street Camden Town, Kentish Town Road, and Highgate Road, runs from south to north; Euston Road crosses it in the south, and Camden Road and Chalk Farm Road branch from it at Camden Town. Besides the greater part of Parliament Hill (267 acres), purchased for the public use in 1886, the borough includes a small part of Regent's Park (mainly in the borough of St Marylebone) and Waterlow Park (29 acres) on the slope of Highgate Hill. It also contains the termini, King's Cross, St Pancras, and Euston, of the Great Northern, Midland, and London and North Western railways, with extensive goods depôts of these companies. The parish church of St Pancras in the Fields, near Pancras Road, has lost its ancient character owing to reconstruction, though retaining several early monuments. The new church in Euston Road (1822) is a remarkable adaptation of classical models. Among institutions, University College, Gower Street, was founded in 1826, and provides education in all branches common to universities excepting theology. With the department of medicine is connected the University College Hospital (1833) opposite the College. There are several other hospitals; among them the Royal Free Hospital (Gray's Inn Road), the North-west London hospital, Kentish Town, and, in Euston Road, the British (Forbes Winslow memorial) hospital for mental disorders, British hospital for skin diseases, and New hospital for women, administered by female physicians. St Katherine's Hospital, a picturesque building overlooking Regent's Park, with a chapel containing some relics of antiquity, was settled here (1825) on the formation of the St Katherine's Docks near the Tower of London, where it was founded by Queen Matilda in 1148. Its patronage has always been associated with queens, and here was established the Queen Victoria Home for Nurses of the poor, founded out of the women's gift of money to the Queen at her jubilee (1887). Other institutions are the London School of Medicine for women, the Royal Veterinary College and the Aldenham technical institute. The Passmore Edwards Settlement, taking name from its principal benefactor, was founded largely through the instrumentality of Mrs Humphry Ward. Near Regent's Park is Cumberland Market. The parliamentary borough of St Pancras has north, south, east and west divisions, each returning one member. The borough council consists of a mayor, 10 aldermen and 60 councillors. Area, 2694·4 acres.

St Pancras is mentioned in Domesday as belonging to the chapter of St Paul's Cathedral, in which body the lordship of the manors of Cantelows (Kentish Town) and Totenhall (Tottenham Court) was also invested. Camden Town takes name from Baron Camden (d. 1794), lord chancellor under George III. King's Cross was so called from a statue of George IV., erected in 1830, greatly ridiculed and removed in 1845, but an earlier name, Battle Bridge, is traditionally derived from the stand of Queen Boadicea against the Romans, or from one of Alfred's contests with the Danes. Somers Town, between King's Cross and Camden Town, was formerly inhabited by refugees from the French Revolution, many of whom were buried in St Pancras churchyard. In the locality of Somers Town there were formerly to be traced earthworks of unknown age, which William Stukeley argued had belonged to a Roman camp of Julius Caesar. Attached to the former manor-house of Totenhall was one of the famous pleasure resorts of the 17th and 18th centuries, and from *c.* 1760 to the middle of the 19th century the gardens at Bagnigge Wells (King's Cross Road) were greatly favoured; there were here, moreover, medicinal springs.

ST PAUL, a volcanic island in the southern Indian Ocean, in 38° 42′ 50″ S., 77° 32′ 29″ E., 60 m. S. of Amsterdam Island, belonging to France. The two islands belong to two separate eruptive areas characterized by quite different products; and the comparative bareness of St Paul contrasts with the dense vegetation of Amsterdam. On the north-east of St Paul, which has an area of 2¾ sq. m., is a land-locked bay, representing the old crater, with its rim broken down on one side by the sea.

The highest ridge of the island is not more than 820 ft. above the sea. On the south-west side the coasts are inaccessible. According to Vélain, the island originally rose above the ocean as a mass of rhyolitic trachyte similar to that which still forms the Nine Pin rock to the north of the entrance to the crater. Next followed a period of activity in which basic rocks were produced by submarine eruptions—lavas and scoriae of anorthitic character, palagonitic tuffs, and basaltic ashes; and finally from the crater, which must have been a vast lake of fire like those in the Sandwich Islands, poured forth quiet streams of basaltic lavas which are seen dipping from the centre of the island towards the cliffs at angles of 20° to 30°. The only remaining indications of volcanic activity are the warm springs and emanations of carbon dioxide.

See C. Vélain, *Passage de Vénus sur le soleil (9 décembre 1874). Expédition française aux Îles St Paul et Amsterdam* (Paris, 1877); *Description géologique de la presqu'île d'Aden . . . Réunion . . . St Paul et Amsterdam* (Paris, 1878); and an article in *Annales de géographie*, 1893.

ST PAUL, the capital of Minnesota, U.S.A., and the county-seat of Ramsey county, situated on the Mississippi river, about 2150 m. above its mouth, at the practical head of navigation, just below the Falls of St Anthony. It is about 360 m. N.W. of Chicago, Illinois, and its W. limits directly touch the limits of Minneapolis. Pop. (1880) 41,473; (1890) 133,156; (1900) 163,632, of whom 46,819 were foreign-born (12,935 Germans, 9852 Swedes, 4892 Irish, 3557 English-Canadians, 2900 Norwegians, 2005 English, 1488 Austrians, 1343 Bohemians, 1206 Danes, and 1015 French-Canadians), 100,599 of foreign parentage (*i.e.* both parents foreign born), and 2263 negroes; (1910 census) 214,744. Land area (1906) 52·28 sq. m. St Paul is served by the Chicago, Burlington & Quincy, the Chicago Great Western, the Chicago, Rock Island & Pacific, the Northern Pacific, the Minneapolis, St Paul & Sault Ste Marie, the Chicago & North-western, the Chicago, Milwaukee & St Paul, the Great Northern, and the Minneapolis & St Louis railways. Five bridges span the Mississippi, the largest of which, known as High Bridge, is 2770 ft. long and 200 ft. high. Four interurban lines connect with Minneapolis.

St Paul is attractively situated 670-880 ft. above sea-level, on a series of lofty limestone terraces or bluffs, formerly heavily wooded. It lies on both sides of the river, but the principal part is on the east bank. In its park system the numerous lakes within and near the city have been utilized. Of the parks, Como Park (425 acres; including Lake Como and a fine Japanese garden and a lily pond), and Phalen Park (600 acres, more than 400 of which are water area), are the largest. There are also 47 smaller squares and "neighbourhood parks" aggregating 560 acres. In Indian Park (135 acres), at the crest of the bluffs (Dayton's Bluffs), in the east central part of the city, are burial-mounds of the Sioux. Summit Avenue Boulevard, 200 ft. wide and extending for 2½ m. along the heights, is a fine residential street. Boulevards along the bluffs on either side of the river connect with the Minneapolis park system. Harriet Island, in the Mississippi river opposite the business centre of the city, is attractively parked, and on it are public paths. Adjoining the city on the south-west, at the junction of the Minnesota and Mississippi rivers, is the Fort Snelling U.S. Government Military Reservation, with a round stone fort, built in 1820. The principal public building is the State Capitol, completed in 1905. It was designed by Cass Gilbert (b. 1859), is of Minnesota granite and white Georgia marble with a massive central white dome, and has sculptural decorations by D. C. French and interior decorations by John La Farge, E. H. Blashfield, Elmer E. Garnsey (b. 1862), and Edward Simmons (b. 1852). Other prominent buildings are the City Hall and Court House, a Gothic greystone structure; the Federal building, of greystone, opposite Rice Park; a Young Men's Christian Association building; the Metropolitan Opera House; the Auditorium, which was built by public subscription; the St Paul armoury (1905), with a drill hall; the Chamber of Commerce; and the Union railway station. Among the principal churches are the Roman Catholic Cathedral, and the People's, the Central Presbyterian, the Park Congregational, and the First Baptist churches. The wholesale district is in the lower part of the city near the Union railway station; the retail shops are mostly in an area bounded by Wabasha, Seventh, Fourth and Roberts streets.

St Paul has an excellent public school system, which included in 1909 three high schools, a teachers' training school, a manual training high school, forty-eight grade schools, and a parental school. Among other educational institutions are the Freeman School; St Paul Academy; Barnard School for Boys; St Paul College of Law (1900); the College of St Thomas (Roman Catholic, 1885); St Paul Seminary (Roman Catholic, 1894), founded by James J. Hill as the provincial seminary of the ecclesiastical province of St Paul with an endowment of $500,000, 40 acres of land, and a library of 10,000 volumes; Luther Theological Seminary (1885); Hamline University (co-educational; Methodist Episcopal), chartered in 1854, with a medical school in Minneapolis (chartered 1883; part of Hamline since 1895), and having in the college and preparatory school, in 1908–1909, 17 instructors and 384 students; Macalester College (Presbyterian; co-educational), founded as Baldwin Institute in 1853, reorganized and renamed in 1874 in honour of a benefactor, Charles Macalester (1798–1873) of Philadelphia; and the School of Agriculture (1888) and the Agricultural Experiment Station (1887) of the University of Minnesota, in St Anthony Park, west of Como Park and south of the fair grounds. Among the libraries are the City Public Library, the State Law Library and the Minnesota Historical Society Library. The Minnesota Historical Society, organized in 1849, has an archaeological collection in the east wing of the Capitol. In the private residence of James J. Hill is a notable art gallery, containing one of the largest and best collections of the Barbizon School in existence. The principal newspapers are the *Dispatch* (Independent, 1878) and the *Pioneer-Press*, the latter established by James M. Goodhue (1800–1852) in 1849. Among the hospitals and charitable institutions are the City and County, St Joseph's and St Luke's hospitals, all having nurses' training schools; the Swedish Hospital, the Scandinavian Orphan Asylum, the Home for the Friendless, the Magdalen Home and the Women's Christian Home. Within the city limits (east of Indian Mounds Park) is the Willowbrook (state) Fish Hatchery, second to none in the United States in completeness of equipment; and adjoining the city on the north-west are the extensive grounds (200 acres) and buildings of the State Agricultural Society, where fairs are held annually.

Although as a manufacturing city St Paul, not possessing the wonderful water-power of its sister city, does not equal Minneapolis, yet as a commercial and wholesale distributing centre it is in some respects superior, and it is the principal jobbing market of the North-west. Situated at the natural head of navigation on the Mississippi, it has several competing lines of river steamboats in addition to the shipping facilities provided by its railways and the lines of the Minnesota Transfer Co., a belt line with 62 m. of track encircling St Paul and Minneapolis. St Paul is the port of entry for the Minnesota Customs District, and imports from Canada and from the Orient via the Pacific railways constitute an important factor in its commercial life, its imports and exports were valued at $6,154,289 and $9,909,940 respectively in 1909. Coal and wood, grain, farm produce and dairy products are important exports. St Paul is the principal market in the United States for the furs of the North-west, and there are extensive stock-yards and slaughtering and packing houses in the neighbouring city of South St Paul (pop. in 1910, 4510). St Paul ranks second to Minneapolis among the cities of the state as a manufacturing centre. The total value of its factory products in 1905 was $38,318,704, an increase of 27·5% since 1900. The following were among the largest items: fur goods; printing and publishing—book (especially law-book) and job, newspapers and periodicals; malt liquors; steam-railway car building and repairing; boots and shoes; foundry and machine-shop products; lumber and planing-mill products; men's clothing; tobacco, cigars and cigarettes; and saddlery and harness.

St Paul is governed under a charter of 1900, which may be amended by popular vote on proposals made by a permanent charter commission. The mayor, comptroller and city treasurer are elected for two years. The mayor has the veto power and appoints the members of boards of police, parks, library, fire, water-supply and education. The legislature is bicameral, consisting of an assembly of nine members elected on a general city ticket and a board of aldermen chosen one from each of the twelve wards. The water-supply is pumped through 275 m. of water mains from a group of lakes north of the city, and the system has a capacity of 40,000,000 gallons per day.

History.—The earliest recorded visit of a European to the site of St Paul was that of the Jesuit Louis Hennepin in 1680. The traders Pierre Le Sueur and Nicholas Perrot visited the region between 1690 and 1700, and apparently established a temporary trading post somewhere in the neighbourhood. The first man of English descent to record his visit was Jonathan Carver, who, according to his journal, spent some time in the vicinity in 1767–1768. In 1805 Lieut. Zebulon M. Pike concluded a treaty with the Sioux. The first steamboat made its way up the river in 1823. The site of St Paul was opened to settlement by the treaty of Prairie du Chien, negotiated by Governor Henry Dodge of Wisconsin with the Chippewas in 1837. Two years later (1839) the first permanent settlement was made by Swiss and Canadian refugees from Lord Selkirk's Red River colony. In 1841 Father Lucien Gaultier erected a log mission chapel, which he named St Paul's; from this the settlement was named St Paul's Landing and finally St Paul. On the erection of Minnesota Territory in 1849, St Paul was incorporated as a village and became the Territorial capital. Its population in 1850 was only 1112. It was chartered as a city in 1854, and continued as the capital of the new state after its admission (1858). The first railway connecting St Paul and Minneapolis was completed in 1862, at which time St Paul's population exceeded 10,000 and in 1869 through railway connexion with Chicago was effected. The city of West St Paul was annexed in 1874. The growth of the city had been comparatively slow until 1870, in which year the population was 20,030; but the rapid railway construction and the settlement and clearing of the Western farm lands increased its commercial and industrial importance as it did that of its sister city, Minneapolis. In 1884 the city limits were extended to the Minneapolis line.

See F. C. Bliss, *St Paul, its Past and Present* (St Paul, 1888); C. C. Andrews, *History of St Paul, Minnesota* (Syracuse, N.Y., 1890); Warner and Foote, *History of Ramsey County and the City of St Paul* (Minneapolis, 1881); C. D. Elfelt, "Early Trade and Traders in St Paul," and A. L. Larpenteur, "Recollections of the City and People of St Paul," both in the Minnesota Historical Society's *Collections*, vol. ix. (1901).

ST PAUL'S CATHEDRAL, the cathedral church of the diocese of London, England, standing in the heart of the City, at the head of Ludgate Hill. (For plan, &c., see ARCHITECTURE: *Renaissance in England.*) The name of a bishop of London, Restitutus, is recorded in 314, but his individuality and even his existence are somewhat doubtful, and nothing is known of the existence of a church until Bede's notice that early in the 7th century one was built here by Æthelberht of Kent at the instance of the missionary Mellitus, who became bishop. Tradition placed upon the site a Roman temple of Diana. The church was dedicated to St Paul, and, after passing through many vicissitudes, was removed in 1083, when Bishop Maurice, with the countenance of William the Conqueror, undertook the erection of a new cathedral. The building was not pressed forward with vigour, and in 1135 much of it was damaged by fire. The tower was completed in 1221; an Early English choir followed shortly after, and was enlarged after 1255 when Bishop Fulk brought great energy to bear upon the repair and elaboration of the building. At the close of the century the cathedral was regarded as finished; but a new spire was built early in the 14th century. Much of the Norman work, particularly in the nave, had been left untouched by the Early English builders (who in other parts merely encased it), and the cathedral was a magnificent monument of these styles, and of the early Decorated. Perpendicular additions were not extensive, and the cathedral remained with little alteration until 1561, when lightning struck the spire and fired the church. The spire was never rebuilt. In the time of James I. the fabric had so far decayed that the king was prevailed upon to make a personal examination of it, and Inigo Jones was entrusted with the work of restoration. In accordance with the architectural tendencies of his time he added a classical portico to the west front, and made similar alterations to the transepts. Again, however, in 1666 the bad state of the fabric necessitated extensive repair, and Dr (afterwards Sir) Christopher Wren furnished a scheme including a central dome. All his plans were complete in August of that year, but in September the great fire of London almost destroyed the building, and rendered what was left unsafe and beyond restoration.

Estimates of the dimensions of the old cathedral differ, Stow making the extreme length 690 ft., but modern investigations give 596 ft. The internal height of the choir was 101 ft., and that of the nave, which was of twelve bays, 93 ft., and the extreme breadth of the building was 104 ft. The summit of the wonderful spire was 489 ft. above the ground. The present building is wider than the old, and its orientation is more northerly, but its northern, eastern and southern extremities approximately correspond with those of old St Paul's, the west front of which, however, with its flanking towers, lay nearly 100 ft. west of Wren's front. It should be noticed that the eastern part of the old cathedral incorporated the original parish church of St Faith after 1255, when part of the new crypt was allotted to the parish in return. Moreover, the ancient church of St Gregory by St Paul actually adjoined the cathedral on the south-west. In the angle west of the south transept lay a cloister, in the midst of which was the octagonal chapter house, dating from 1332. To the north-east of the cathedral stood Paul's Cross, in an open space devoted to public meetings; it included a pulpit, and here religious disputations were held and papal bulls promulgated. In 1643 it was removed, but a new cross, erected under the will of H. C. Richards, K.C., M.P., was unveiled in 1910.

The formal provision for the rebuilding of the cathedral was made in 1668, and the foundation stone was laid in 1675. The first service was held in it in 1697, and the last stone was set in place in 1710. The cost is curiously estimated, but was probably about £850,000, the greater part of which was defrayed by a duty on sea-borne coal. The material is Portland stone. Wren had to face many difficulties. He naturally insisted on the style of the Renaissance, and his first design was for a building in the form of a Greek cross, but the general desire was that at least the ground-plan of the old English cathedrals should be followed, and the form of a Latin cross was forced upon him. He offered various further designs, and one was accepted, but Wren set the broadest construction upon the permission granted him to alter its ornamental details, and luckily so. The extreme length of the building is 513 ft., the breadth across the transepts 248 ft., of the nave 122 ft., of the west front 179 ft. The length of the nave is 223 ft., and of the choir 168 ft., leaving 122 ft. beneath the dome at the crossing. The cross at the top of the lantern above the dome is 363 ft. above the ground.

The cathedral is approached on the west from an open pavement, on which stands a statue of Queen Anne. There is also an inscription marking the spot on which Queen Victoria returned thanks on the occasion of her Diamond Jubilee (1897). A broad flight of steps leads up to the west front, of two orders, flanked by towers. In the north tower is a chime of bells; in the south the clock, with the old great bell (1716), tolled on the death of certain high personages, and the new great bell, placed in 1882, weighing about 17 tons. The nave is of four bays, with aisles, and chapels of one bay width immediately east of the western towers. The transepts are of two bays, and are entered by north and south porches approached by circular flights of steps. On the pediment of the south porch is sculptured a phoenix with the inscription *Resurgam* (I shall rise again), in allusion to a famous episode. Wren, planning his site and desiring to mark in the ground the point of the centre of his dome, bade a workman bring a piece of stone for the purpose. He picked up at hazard a fragment of an ancient tombstone bearing this single word, which Wren adopted as a motto. The choir of four bays terminates in an apse, but the rich and lofty modern reredos stands forward, and the apse is thus divided off from the body of the church and forms the Jesus chapel. The choir stalls are a fine example of the work of Grinling Gibbons. The dome is supported by the four vast piers in the angles of the cross, within which are small chambers, and by eight inner piers. The spandrels between the arches which stand upon these piers are ornamented with mosaics, from the designs of G. F. Watts and others, executed by Salviati. Wren had looked forward to a comprehensive scheme of decoration in mosaic. The later extension of this work was entrusted to Sir W. B. Richmond. Above the arches is a circular gallery known as the Whispering Gallery from the fact that a whisper can be easily heard from one side to the other. Above this there are pilasters, with square-headed windows, in three out of every four intervening spaces; and above again, the domed ceiling, ornamented in monochrome by Sir James Thornhill immediately after its completion; but the paintings have suffered from the action of the atmosphere and are hardly to be distinguished from below. The inner wall of the dome begins to slope inward from the level of the Whispering Gallery, but this is masked outside by a colonnade, extending up to a point a little above the top of the internal pilasters. From this point upward the dome is of triple construction, consisting of (1) the inner dome of brick, pierced at the top to render the lantern visible from below; (2) a brick cone, the principal member of the structure, bearing the lantern; (3) the dome visible from without, of lead on a wooden frame. The golden gallery at the base of the lantern (top of the outer dome) is about 65 ft. above the top of the inner dome.

The monuments in St Paul's are numerous, though not to be compared with those in Westminster Abbey. The most notable is that in the nave to the duke of Wellington (d. 1852) by Alfred Stevens. In the crypt, which extends beneath the entire building, are many tombs and memorials—that of Nelson in the centre beneath the dome, those of many famous artists in the so-called Painters' Corner, and in the south choir aisle that of Wren himself, whose grave is marked only by a plain slab, with the well-known inscription ending *Si monumentum requiris, circumspice* ("If thou seekest a monument, look about thee"). Above the south-west chapel in the nave is the chapter library, with many interesting printed books, MSS. and drawings relating to the cathedral. For St Paul's School, established by John Colet, dean, and formerly adjacent to the cathedral, see the article on HAMMERSMITH, whither it was subsequently removed.

AUTHORITIES.—*Parentalia or Memoirs* (of Sir Christopher Wren), *completed by his son Christopher, now published by his Grandson, Stephen Wren* (London, 1758); Sir William Dugdale, *History of St Paul's* (1818); Dean Milman, *Annals of St Paul's* (1868); William Longman, *The Three Cathedrals dedicated to St Paul* (1873); *Documents illustrating the History of St Paul's* (Camden Society, 1880); Rev. W. Sparrow-Simpson, *Chapters in the History of Old St Paul's* (1881); *Gleanings from Old St Paul's* (1889); and *St Paul's and Old City Life* (1894); Rev. A. Dimock, *St Paul's* (in Bell's "Cathedral" series, 1901); Rev. Canon Benham, *Old St Paul's* (1902). In this last work and elsewhere are shown the valuable drawings of Wenceslaus Hollar, showing the old cathedral immediately before the great fire.

ST PAUL'S ROCKS, a number of islets in the Atlantic, nearly 1° N. of the equator and 540 m. from South America, in 29° 15′ W. The whole space occupied does not exceed 1400 ft. in length by about half as much in breadth. Besides sea-fowl the only land creatures are insects and spiders. Fish are abundant, seven species (one, *Holocentrum sancti pauli*, peculiar to the locality) being collected by the "Challenger" during a brief stay. Darwin (*On Volcanic Islands*) decided that St Paul's Rocks were not of volcanic origin; later investigators maintain that they probably are eruptive.

See Reports of the *Voyage of H.M.S. Challenger: Narrative of the Cruise*, vol. i.

ST PETER, a city and the county-seat of Nicollet county, Minnesota, U.S.A., on the Minnesota river, about 75 m. S.W. of Minneapolis. Pop. (1905, state census) 4514 (875 foreign-born); (1910) 4176. It is served by the Chicago & North-Western railway and by steamboat lines on the Minnesota river, which is navigable for light draft steamboats to this point. The neighbouring lakes with their excellent fishing attract many summer visitors. The city has a Carnegie library, and is the seat of the Minnesota Hospital for the Insane (1866), and of Gustavus Adolphus College (Swedish Evangelical Lutheran; co-educational), which was founded in 1862 and has a college, an Academy and School of Pedagogy, a School of Commerce and a School of Music. St Peter is an important market for lumber and grain; it has stone quarries and various manufactures. Settled about 1852, St Peter was incorporated as a village in 1865, and was chartered as a city in 1891. In 1857 the legislature, a short time before its adjournment for the session, passed a bill to remove the capital of Minnesota to St Peter, but the bill was not presented to the governor for his signature within the prescribed time, and when the legislature re-convened a similar bill could not be passed.

ST PETER PORT, the chief town of Guernsey, one of the Channel Islands. Pop. (1901) 18,264. It lies picturesquely on a steep slope above its harbour on the east coast of the island. The harbour is enclosed by breakwaters, the southern of which connects with the shore and continues beyond a rocky islet on which stands Castle Cornet. It dates from the 12th century and retains portions of that period. Along the sea-front of the town there extends a broad sea-wall, which continues northward nearly as far as the small port of St Sampson's, connected with St Peter Port by an electric tramway. To the south of the town Fort George, with its barracks, stands high above the sea. On the quay there is a bronze statue of Albert, Prince Consort (1862), copied from that on the south side of the Albert Hall, London. St Peter Port was formerly walled, and the sites of the five gates are marked by stones. St Peter's, or the town church, standing low by the side of the quay, was consecrated in 1312, but includes little of the building of that date. It has, however, fine details of the 14th and 15th centuries, and is, as a whole, the most noteworthy ecclesiastical building in the islands. The other principal buildings are the court house, used for the meetings of the royal court and the states, the Elizabeth College for boys, founded by Queen Elizabeth, but occupying a house of the year 1825, and the Victoria Tower, commemorating a visit of Queen Victoria in 1846. Hauteville House, the residence of Victor Hugo from 1856 to 1870, is preserved as he left it, and is open to the public. The harbour is the chief in the island, and a large export trade is carried on especially in vegetables, fruit and flowers. The construction of the harbour was ordered by King Edward I. in 1275.

ST PETERSBURG, a government of north-western Russia, at the head of the Gulf of Finland, stretching for 130 m. along its south-east shore and the southern shore of Lake Ladoga, and bordering on Finland, with an area of 17,221 sq. m. It is hilly on the Finland border, but flat and marshy elsewhere, with the exception of a small plateau in the south (Duderhof Hills), 300 to 550 ft. high. It has a damp and cold climate, the average temperatures being: at St Petersburg, for the year 39° F., for January 15°, for July 64°; yearly rainfall, 18·7 in.; at Sermaks, at the mouth of the Svir on the E. side of Lake Ladoga (60° 28′ N.), for the year 37°, for January 13°, for July 62°; yearly rainfall, 20·8 in. Numerous parallel ridges of glacier origin intersect the government towards Lake Peipus and north of the Neva. Silurian and Devonian rocks appear in the south, the whole covered by a thick glacial deposit with boulders (bottom moraine) and by thick alluvial deposits in the valley of the Neva. The bays of Kronstadt, Koporya, Luga and Narva afford good anchorage, but the coast is for the most part fringed with reefs and sandbanks. The chief river is the Neva. The feeders of Lake Ladoga—the Volkhov, the Syas, and the Svir, the last two forming part of the system of canals connecting the Neva with the Volga—are important channels of commerce, as also is the Narova. Marshes and forests cover about 45% of the area (70% at the end of the 18th century). The population, which was 635,780 in 1882, numbered 873,043 in 1897, without the capital and its suburbs; including the latter it was 2,103,965. Of this latter number 466,750 were women and 160,499 lived in towns. The estimated pop. in 1906 was 2,510,100. The average density was 121 per sq. m. The population is chiefly Russian, with a small admixture of Finns and Germans, and according to religion it is distributed as follows: Greek Orthodox, 78%; Nonconformists, 1·6%; Lutherans, 17%; and Roman Catholics, 2·4%. A remarkable feature is the very slow natural increase of the population. During the 25 years 1867 to 1891 the natural increase was only 867. The government is divided into eight districts, the administrative headquarters of which, with their populations in 1897, are: St Petersburg (*q.v.*), Gdov (2254 inhabitants), Luga (5687), Novaya Ladoga (4144), Peterhof (11,300), Schlüsselburg (5285), Tsarskoye Selo (22,353) and Yamburg (4166). Most of the towns are summer resorts for the population of the capital. Till the latter part of the 19th century education stood at a very low level, but progress has since been made, and now three-quarters of all who enter the army from this government are able to read. The *zemstvo* (provincial council) has organized village libraries and lectures on a wide scale. Many improvements have been made, especially since 1897, in sanitary organization. Generally speaking, agriculture is at a low ebb. The principal crops are cereals (rye, oats and barley), potatoes and green crops, the total area under cultivation being only 13%. These crops, which are often ruined by heavy rains in the late summer, are insufficient for the population. Flax is cultivated to some extent. Nearly 21% of the area consists of meadows and pasture. Dairy-farming is developing. Timber, shipping, stone-quarrying and fishing are important industries; the chief factories are cotton, tobacco, machinery, sugar, rubber and paper mills, chemical works, distilleries, breweries and printing works.

ST PETERSBURG, the capital of the Russian empire, situated at the head of the Gulf of Finland, at the mouth of the Neva, in 59° 56′ N., and 30° 20′ E., 400 m. from Moscow, 696 m. from Warsaw, 1400 m. from Odessa (via Moscow), and 1390 m. from Astrakhan (also via Moscow). The Neva, before entering the Gulf of Finland, forms a peninsula, on which the main part of St Petersburg stands, and itself subdivides into several branches. The islands so formed are only 10 or 11 ft. above the average level of the water. Their areas are rapidly increasing, while the banks which continue them seaward are gradually disappearing. The mainland is not much higher than the islands. As the river level rises several feet during westerly gales, extensive portions of the islands and of the mainland are flooded every winter. In 1777, when the Neva rose 10·7 ft., and in 1824, when it rose 13·8 ft., nearly the whole of the city was inundated, and the lower parts were again under water in 1890, 1897 and 1898, when the floods rose 8 ft. A ship canal, completed in 1875–1888 at a cost of £1,057,000, has made the capital a seaport. Beginning at Kronstadt, it terminates at Gutuyev Island in a harbour capable of accommodating fifty sea-going ships. It is 23 ft. deep and 17½ m. long. The Neva is crossed by three permanent bridges—the Nicholas, the Troitsky or Trinity (1897–1903), and the Alexander or Liteinyi; all three fine specimens of architecture. One other bridge—the Palace—across the Great Neva connects the left bank of the mainland with Vasilyevskiy or Basil Island; but, being built on boats, it is removed during the autumn and spring. Several wooden or floating bridges connect the islands, while a number of stone bridges span the smaller channels. In winter, when the Neva is covered with ice 2 to 3 ft. thick, temporary roadways for carriages and pedestrians are made across the ice and artificially lighted. In winter, too, thousands of peasants come in from the villages with their small Finnish horses and sledges to ply for hire.

The Neva continues frozen for an average of 147 days in the year (25th November to 21st April). It is unnavigable, however, for some time longer on account of the ice from Lake Ladoga, which is sometimes driven by easterly winds into the river at the end of April and beginning of May. The climate of St Petersburg is changeable and unhealthy. Frosts are made much more trying by the wind which accompanies them; and westerly gales in winter bring oceanic moisture and warmth, and melt the snow before and after hard frosts. The summer is hot, but short, lasting barely more than five or six weeks; a hot day, however, is often followed by cold weather: changes of temperature amounting to 35° Fahr. within twenty-four hours are not uncommon. In autumn a chilly dampness lasts for several weeks, and in spring cold and wet weather alternates with a few warm days.

	January.	July.	The Year.
Mean temperature, Fahr.	15°·0	64°·0	38°·6
Rainfall, inches	0·9	2·6	18·8
Prevailing winds	S.W.	W.	W.
Average daily range of temperature, Fahr.	2°·2	10°·2	7°·7

Topography.—The greater part of St Petersburg is situated on the mainland, on the left bank of the Neva, including the best streets, the largest shops, the bazaars and markets, the palaces, cathedrals and theatres, as well as all the railway stations, except that of the Finland railway. From the Liteinyi bridge to that of Nicholas a granite embankment, bordered by palaces and large private houses, lines the left bank of the Neva. About midway, behind a range of fine houses, stands the Admiralty, the very centre of the capital. Formerly a wharf, on which Peter the Great caused his first Baltic ship to be built in 1706, it is now the seat of the ministry of the navy and of the hydrographical department, the new Admiralty building standing farther down the Neva on the same bank. A broad square, partly laid out as a garden (Alexander Garden), surrounds the Admiralty on the west, south and east. To the west, opposite the senate, stands the fine memorial to Peter the Great, erected in 1782, and now backed by the cathedral of St Isaac. A bronze statue, a masterpiece by the French sculptor Falconet, represents the founder of the city on horseback, at full gallop, ascending a rock and pointing to the Neva. South of the Admiralty is the ministry of war and to the east the imperial winter palace, the work of Rastrelli (1764), a fine building of mixed style; but its admirable proportions mask its huge dimensions. It communicates by a gallery with the Hermitage Fine Arts Gallery. A broad semi-circular square, adorned by the Alexander I. column (1834), separates the palace from the buildings of the general staff and the foreign ministry. The range of palaces and private houses facing the embankment above the Admiralty is interrupted by the macadamized "Field of Mars," formerly a marsh, but transformed at incredible expense into a parade-ground, and the Lyetniy Sad (summer-garden) of Peter the Great. The Neva embankment is continued to a little below the Nicholas bridge under the name of "English embankment," and farther down by the new Admiralty buildings.

The topography of St Petersburg is very simple. Three long streets, the main arteries of the capital, radiate from the Admiralty—the Prospekt Nevskiy(Neva Prospect), the Gorokhovaya, and the Prospekt Voznesenskiy (Ascension Prospect). Three girdles of canals, roughly speaking concentric, intersect these three streets—the Moika, the Catherine and the Fontanka; to these a number of streets run parallel. The Prospekt Nevskiy is a very broad street, running straight east-south-east for 3200 yds. from the Admiralty to the Moscow railway station, and thence 1650 yds. farther, bending a little to the south, until it again reaches the Neva at Kalashnikov Harbour, near the vast complex of the Alexander Nevski monastery (1713), the seat of the metropolitan of St Petersburg. The part of the street first mentioned owes its picturesque aspect to its width, its atrractive shops, and still more its animation. But the buildings which border it are architecturally poor. Neither the cathedral of the Virgin of Kazan (an ugly imitation on a small scale of St Peter's in Rome), nor the still uglier Gostiniy Dvor (a two-storied quadrilateral building divided into second-rate shops), nor the Anichkov Palace (which resembles immense barracks), nor even the Roman Catholic and Dutch churches do anything to embellish it. About midway between the public library and the Anichkov Palace an elegant square hides the old-fashioned Alexandra theatre; nor does a profusely adorned memorial (1873) to Catherine II. beautify it much. The Gorokhovaya is narrow and badly paved, and is shut in between gloomy houses occupied mostly by artizans. The Voznesenskiy Prospekt, on the contrary, though as narrow as the last, has better houses. On the north, it passes into a series of large squares connected with that in which the monument of Peter the Great stands. One of them is occupied by the cathedral of St Isaac (of Dalmatia), and another by the memorial (1859) to Nicholas I., the gorgeousness and bad taste of which contrast strangely with the simplicity and significance of that of Peter the Great. The general aspect of the cathedral is imposing both without and within; but on the whole this architectural monument, built between 1819 and 1858 according to a plan of Montferrant, under the personal direction of Nicholas I., does not correspond either with its costliness (£2,431,300) or with the efforts put forth for its decoration by the best Russian artists.

The eastern extremity of Vasilyevskiy Island is the centre of commercial activity; the stock exchange is situated there as well as the quays and storehouses. The remainder of the island is occupied chiefly by scientific and educational institutions—the academy of science, with a small observatory, the university, the philological institute, the academy of the first corps of cadets, the academy of arts, the marine academy, the mining institute and the central physical observatory, all facing the Neva. Petersburg Island contains the fortress of St Peter and St Paul (1703–1740), opposite the Winter Palace; but the fortress is now a state prison. A cathedral which stands within its walls is the burial-place of the emperors and the imperial family. The mint and an artillery museum are also situated within the fortress. The remainder of the island is meanly built, and is the refuge of the poorer officials (*chinovniks*) and of the intellectual proletariat. Its northern part, separated from the main island by a narrow channel, bears the name of Apothecaries' Island, and is occupied by a botanical garden of great scientific value and several fine private gardens and parks. Krestovskiy, Elagin and Kamennyi Islands, as also the opposite (right) bank of the Great Nevka (one of the branches of the Neva) are occupied by public gardens, parks and summer residences. The mainland on the right bank of the Neva above its delta is known as the Viborg Side, and is connected with the main city by the Liteinyi bridge, closely adjoining which are the buildings of the military academy of medicine and spacious hospitals. The small streets (many of them unpaved), with numerous wooden houses, are inhabited by students and workmen; farther north are great textile and iron factories. Vast orchards and the yards of the artillery laboratory stretch north-eastwards, while the railway and the high road to Finland, running north, lead to the park of the Forestry Institute. The two villages of Okhta, on the right bank, are suburbs; higher up, on the left bank, are several factories (Alexandrovsk) which formerly belonged to the crown. The true boundary of St Petersburg on the south is the Obvodnyi Canal, running parallel to the three canals already mentioned and forming a sort of base to the Neva peninsula; but numerous orchards, cemeteries and factories, and even unoccupied spaces, are included within the city boundaries in that direction, though they are being rapidly covered with buildings. Except in a few principal streets, which are paved with wood or asphalt, the pavement is usually of granite setts. There are two government dockyards, the most important of which is the new admiralty yard in the centre of the city. At this yard there are three building slips and a large experimental basin, some 400 ft. in length, for trials with models of vessels. The Galerny Island yard is a little lower down the river, and is devoted entirely to construction. There are two building slips for large vessels, besides numerous workshops, storehouses and so forth. The Baltic Yard is near the mouth of the Neva, and was taken over by the ministry of marine in 1894. Since that time the establishment has been enlarged, and a new stone building slip, 520 ft. in length, completely housed in, has been finished.

Population.—The population of St Petersburg proper at the censuses specified was as follows:—

Year.	Total.	Men.	Women.	Proportion of Men to every 100 Women.
1869	667,207	377,380	289,827	130
1881	861,303	473,229	388,074	122
1890	954,400	512,718	441,682	116
1897	1,132,677	616,855	515,822	119

A further increase was revealed by the municipal census of 1900, when the population of the city was 1,248,739, having thus increased 30·9% in ten years. In 1905 the total population was estimated to number 1,429,000. The population of the suburbs was 134,710 in 1897, and 190,635 in 1900. Including its suburbs, St Petersburg is the fifth city of Europe in point of size, coming after London, Paris, Berlin and Vienna. The large proportion of men in its population is due to the fact that great numbers come from other parts of Russia to work during the winter in the textile factories, and during the summer at unloading the boats. Russians numbered 828,354 in 1897, or 73·1% of the population; Germans 43,798, or 3·9%; Poles 22,307, or 1·9%; Finns, 16,731, or 1.5%; and Jews 10,353, or 0·9%. The various religions are represented by 84·9% Orthodox Greeks, 9·9 Protestants and 3·3 Roman Catholics. The proportion of illegitimate children is ten times higher than in the rest of Russia, namely 250 to 286 per thousand births. It is thus nearly the same as in Paris, but lower than in Moscow (292 per thousand) and Vienna (349 per thousand). The mortality varies very much in different parts of the city—from 12 per thousand in the best situated, the admiralty quarter, to 16 in other central parts, and 25 and 27 in the outlying quarters. The mortality has, however, notably decreased, as it averaged 36 per thousand in the years 1870 to 1874, and only 27 from 1886 to 1895, and 24 in 1897. Infectious diseases, *i.e.* turberculosis, diphtheria, inflammation of the lungs, typhoid, scarlet fever and measles, are the cause of 37 to 38% of all deaths. The high mortality in certain quarters is largely due to overcrowding and bad water.

An interesting feature of the Russian capital is the very high proportion of people living on their own earnings or income ("independent") as compared with those who live on the earnings or income of some one else ("dependent"). Only a few industrial establishments employ more than twenty workmen, the average being less than ten and the figure seldom falling below five. The large factories are beyond the limits of St Petersburg. Although 36% of the population above six years old are unable to read, the workmen are amongst the most intelligent classes in Russia.

Education, Science and Art.—Notwithstanding the hardships and prosecutions to which it is periodically subjected, the university (nearly 4000 students) exercises a pronounced influence on the life of St Petersburg. The medical faculty forms a separate academy, under military jurisdiction, with about 1500 students. There are, moreover, a philological institute, a technological institute, a forestry academy, an engineering academy, two theological academies (Orthodox Greek and Roman Catholic), an academy of arts, five military academies and a high school of law. Higher instruction for women is provided by a medical academy, a free university, four other institutions for higher education, and a school of agriculture. The scientific institutions include an academy of sciences, opened in 1726, which has rendered immense service in the exploration of Russia. The oft-repeated reproach that it keeps its doors shut to Russian *savants*, while opening them too widely to German ones, is not without foundation. The Pulkovo astronomical observatory, the chief physical (meteorological) observatory (with branches throughout Russia and Siberia), the astronomical observatory at Vilna, the astronomical and magnetical observatory at Peking, and the botanical garden, are all attached to the academy of sciences. The Society of Naturalists and the Physical and Chemical Society have issued most valuable publications. The geological committee is ably pushing forward the geological survey of the country; the Mineralogical Society was founded in 1817. The Geographical Society, with branch societies for West and East Siberia, Caucasus, Orenburg, the north-western and south-western provinces of European Russia, is well known for its valuable work, as is also the Entomological Society. There are four medical societies, and an archaeological society (since 1846), an historical society, an economical society, gardening, forestry, technical and navigation societies. The conservatory of music, with a new building (1891–1896), gives superior musical instruction. The Musical Society is worthy of notice. Art, on the other hand, has not freed itself from the old scholastic methods at the academy. Several independent artistic societies seek to remedy this drawback, and are the true cradle of the Russian *genre* painters.

The imperial public library contains valuable collections of books (1,000,000) and MSS. The library of the academy of sciences contains more than 500,000 volumes, 13,000 MSS., rich collections of works on oriental languages, and valuable collections of periodical publications from scientific societies throughout the world. The museums of the Russian capital occupy a prominent place among those of Europe. That of the Academy of Sciences, of the Navy, of Industrial Art (1896), of the Mineralogical Society, of the Academy of Arts, the Asiatic museum, the Suvorov museum (1901), with pictures by Vereshchagin, the Zoological museum and several others are of great scientific value. The Hermitage Art Gallery contains a first-rate collection of the Flemish school, some pictures of the Russian school, good specimens of the Italian, Spanish and old French schools, invaluable treasures of Greek and Scythian antiquities, and a good collection of 200,000 engravings. Old Christian and old Russian arts are well represented in the museums of the Academy of Arts. The New Michael Palace was in 1895–1898 converted into a museum of Russian art—the Russian museum; it is one of the handsomest buildings in the city.

In the development of the Russian drama St Petersburg has played a far less important part than Moscow, and the stage there has never reached the same standard of excellence as that of the older capital. On the other hand, St Petersburg is the cradle of Russian opera and Russian music. There are in the city only four theatres of importance—all imperial—two for the opera and ballet, one for the native drama, and one for the French and German drama.

Industries and Trade.—St Petersburg is much less of a manufacturing city than Moscow or Berlin. The period 1880 to 1890 was very critical in the history of the northern capital. With the development of the railway system the southern and south-western provinces of Russia began to prosper more rapidly than the upper Volga provinces; St Petersburg began to lose its relative importance in favour of the Baltic ports of Riga and Libau, and its rapid growth since the Crimean War seemed in danger of being arrested. The danger, however, passed away, and in the last decade of the 19th century the city continued its advance with renewed vigour. A great influx of functionaries of all sorts, consequent upon the state taking into its hands the administration of the railways, spirits, &c., resulted in the rapid growth of the population, while the introduction of a cheap railway tariff, and the subsidizing and encouraging in other ways of the great industries, attracted to St Petersburg a considerable number of workers, and favoured the growth of its larger industrial establishments. St Petersburg is now one of the foremost industrial provinces in Russia, its yearly returns placing it immediately after Moscow and before Piotrków, in Poland. The chief factories are cottons and other textiles, metal and machinery works, tobacco, paper, soap and candle factories, breweries, distilleries, sugar refineries, ship-building yards, printing works, potteries, carriage works, pastry and confectionery and chemicals. The export trade of St Petersburg is chiefly in grain (especially rye and oats), flour and bran, oil seeds, oil cakes, naphtha, eggs, flax and timber. It shows very great fluctuations, varying in accordance with the crops, the range being from £8,000,000 to £10,000,000. The exports are almost entirely to western Europe by sea (from £5,500,000 to £6,500,000), and to Finland (£1,500,000 to £3,000,000). The imports consist chiefly of coal, metals, building materials, herrings, coffee and tea, better-class timber, raw cotton, wood pulp and cellulose, and manufactured goods, and amount to about £14,000,000 annually.

Six railways meet at St Petersburg. Two run westwards along both shores of the Gulf of Finland to Hangöudd and to Port Baltic respectively; two short lines connect Oranienbaum, opposite Kronstadt and Tsarskoye Selo (with Pavlovsk) with the capital; and three great trunk lines run—south-west to Warsaw (with branches to Riga and Smolensk), south-east to Moscow (with branches to Novgorod and Rybinsk), and east to Vologda, Vyatka and Perm. The Neva is the principal channel for the trade of St Petersburg with the rest of Russia, by means of the Volga and its tributaries.

Administration.—The municipal affairs of the city are in the hands of a municipality, elected by three categories of electors, and is practically a department of the chief of the police. The city is under a separate governor-general, whose authority, like that of the chief of police, is unlimited.

Environs.—St Petersburg is surrounded by several fine residences, mostly imperial palaces with large and beautiful parks. Tsarskoye Selo, 15 m. to the south-east, and Peterhof, on the Gulf of Finland, are summer residences of the emperor. Pavlovsk, 17 m. S. of the city, has a fine palace and parks, where summer concerts attract thousands of people. There is another imperial palace at Gatchina, 29 m. S. Oranienbaum, 25 m. W. on the south shore of the Gulf of Finland, is a rather neglected place. Pulkovo, on a hill 9 m. S. from St Petersburg, is well known for its observatory; while several villages north of the capital, such as Pargolovo and Murino, are visited in summer by the less wealthy inhabitants.

History.—The region between Lake Ladoga and the Gulf of Finland was inhabited in the 9th century by Finns and some Slavs. Novgorod and Pskov made efforts to secure and maintain dominion over this region, so important for their trade, and in the 13th and 14th centuries they built the forts of Koporya (in the present district of Peterhof), Yam (now Yamburg), and Oryeshek (now Schlüsselburg) at the point where the Neva issues from Lake Ladoga. They found, however, powerful opponents in the Swedes, who erected the fort of Landskrona at the junction of the Okhta and the Neva, and in the Livonians, who had their fortress at Narva. Novgorod and Moscow successively were able by continuous fighting to maintain their supremacy over the region south of the Neva throughout the 16th century; but early in the 17th century Moscow was compelled to cede it to Sweden, which erected a fortress on the Neva at the mouth of the Okhta. In 1700 Peter the Great began his wars with Sweden. Oryeshek was taken in 1702, and in the following year the Swedish fortress on the Neva. Two months later (29th June 1703) Peter laid the foundations of a cathedral to St Peter and St Paul, and of a fort which received his own name (in its Dutch transcription, "Piterburgh"). Next year the fort of Kronslott was erected on the island of Kotlin, as also the Admiralty on the Neva, opposite the fortress. The emperor took most severe and almost barbarous measures for increasing his newly founded city, which was built on marshy ground, the buildings resting on piles. Thousands of people from all parts of Russia were removed thither and died in erecting the fortress and building the houses. Under Elizabeth fresh compulsory measures raised the population to 150,000, and this figure was nearly doubled during the reign of Catherine II. (1762–1796). The chief embellishments of St Petersburg were effected during the reigns of Alexander I. (1801–1825) and Nicholas I. (1825–1855). From the earliest years of Russian history trade had taken this northern direction. Novgorod owed its wealth to this fact; and as far back as the 12th century the Russians had their forts on Lake Ladoga and the Neva. In the 14th and 15th centuries they exchanged their wares with the Danzig merchants at Nu or Nü—now Vasilyevskiy Island. By founding St Petersburg Peter the Great only restored the trade to its old channels. The system of canals for connecting the upper Volga and the Dnieper with the great lakes of the north completed the work; the commercial mouth of the Volga was thus transferred to the Gulf of Finland, and St Petersburg became the export harbour for more than half Russia. Foreigners hastened thither to take possession of the growing export trade, and to this the Russian capital is indebted for its cosmopolitan character. The development of the railway system and the colonization of southern Russia now operate, however, adversely to St Petersburg, while the rapid increase of population in the Black Sea region is tending to shift the Russian centre of gravity; new centres of commercial, industrial, and intellectual life are being developed at Odessa and Rostov. The revival of Little Russia is another influence operating in the same direction. Since the abolition of serfdom and in consequence of the impulse given to Russian thought by this reform, the provinces are coming more and more to dispute the right of St Petersburg to guide the political life of the country. It has been often said that St Petersburg is the head of Russia and Moscow its heart. The first part at least of this saying is true. In the development of thought and in naturalizing in Russia the results of west European culture and philosophy St Petersburg has played a prominent part. It has helped greatly to familiarize the public with the teachings of west European science and thinking, and to give to Russian literature its liberality of mind and freedom from the trammels of tradition. St Petersburg has no traditions, no history beyond that of the palace conspiracies, and there is nothing in its past to attract the writer or the thinker. But, as new centres of intellectual life and new currents of thought develop again at Moscow and Kiev, or arise anew at Odessa and in the eastern provinces, these places claim the right to their own share in the further development of intellectual life in Russia.

(P. A. K., J. T. Be.)

SAINT-PIERRE, CHARLES IRÉNÉE CASTEL, (Abbé de (1658–1743), French writer, was born at the château de Saint-Pierre–l'Église near Cherbourg on the 18th of February 1658. His father was *bailli* of the Cotentin, and Saint-Pierre was educated by the Jesuits. In Paris he frequented the salons of Madame de la Fayette and of the marquise de Lambert. He was presented to the abbacy of Tiron, and was elected to the Academy in 1695. In the same year he gained a footing at court as almoner to Madame. But in 1718, in consequence of the political offence given by his *Discours sur la polysynodie*, he was expelled from the Academy. He afterwards founded the club of the *Entre sol*, an independent society suppressed in 1731. He died in Paris on the 29th of April 1743.

Saint-Pierre's works are almost entirely occupied with an acute though generally visionary criticism of politics, law and social institutions. They had a great influence on Rousseau, who left elaborate examinations of some of them, and reproduced not a few of their ideas in his own work. His *Projet de paix perpêtuelle*, which was destined to exercise considerable influence on the development of the various schemes for securing universal peace which culminated in the Holy Alliance, was published in 1713 at Utrecht, where he was acting as secretary to the French plenipotentiary, the Abbé de Polignac, and his *Polysynodie* contained severe strictures on the government of Louis XIV., with projects for the administration of France by a system of councils for each department of government. His works include a number of memorials and projects for stopping duelling, equalizing taxation, treating mendicancy, reforming education and spelling, &c. It was not, however, for his suggestions for the reform of the constitution that he was disgraced, but because in the *Polysynodie* he had refused to Louis XIV. the title of *le Grand*. Unlike the later reforming abbés of the *philosophe* period, Saint-Pierre was a man of very unworldly character and quite destitute of the Frondeur spirit.

His works were published at Amsterdam in 1738–1740 and his *Annales politiques* in London in 1757. A discussion of his principles, with a view to securing a just estimation of the high value of his political and economic ideas, is given by S. Siégler Pascal in *Un Contemporain égaré au XVIII^e siècle. Les Projets de l'abbé de Saint-Pierre, 1658–1743* (Paris, 1900).

SAINT-PIERRE, JACQUES HENRI BERNARDIN DE (1737–1814), French man of letters, was born at Havre on the 19th of January 1737. He was educated at Caen and at Rouen, and became an engineer. According to his own account he served in the army, taking part in the Hesse campaign of 1760, but was dismissed for insubordination, and, after quarrelling with his family, was in some difficulty. He appears at Malta, St Petersburg, Warsaw, Dresden, Berlin, holding brief commissions as an engineer and rejoicing in romantic adventures. But he came back to Paris in 1765 poorer than he set out. He came into possession of a small sum at his father's death, and in 1768 he set out for the Isle of France (Mauritius) with a government commission, and remained there three years, returning home in 1771. These wanderings supplied Bernardin with the whole of his stock-in-trade, for he never again quitted France. On his return from Mauritius he was introduced to D'Alembert and his friends, but he took no great pleasure in the company of any literary man except J. J. Rousseau, of whom in his last years he saw much, and on whom he formed both his character and his style. His *Voyage à l'Île de France* (2 vols., 1773) gained him a reputation as a champion of innocence and religion, and in consequence, through the exertions of the bishop of Aix, a pension of 1000 livres a year. It is soberest and therefore the least characteristic of his books. The *Études de la nature* (3 vols., 1784) was an attempt to prove the existence of God from the wonders of nature; he set up a philosophy of sentiment to oppose the materializing tendencies of the Encyclopaedists. His masterpiece, *Paul et Virginie*, appeared in 1789 in a supplementary volume of the *Études*, and his second great success, much less sentimental and showing not a little humour, the *Chaumière indienne*, not till 1790. In 1792 he married a very young girl, Félicité Didot, who brought him a considerable dowry. For a short time in 1792 he was superintendent of the Jardin des Plantes, and on the suppression of the office received a pension of 3000 livres. In 1795 he became a member of the Institute. After his first wife's death he married in 1800, when he was sixty-three, another young girl, Désirée Pelleport, and is said to have been very happy with her. On the 21st of January 1814 he died at his house at Eragny, near Pontoise.

Paul et Virginie has been pronounced gaudy in style and unhealthy in tone. Perhaps Bernardin is not fairly to be judged by this famous story, in which the exuberant sensibility of the time finds equally exuberant expression. His merit lies in his breaking away from the arid vocabulary which more than a century of classical writing has brought upon France, in his genuine preference for the beauties of nature, and in his attempt to describe them faithfully. After Rousseau, and even more than Rousseau, Bernardin was in French literature the apostle of the return to nature, though both in him and his immediate follower Chateaubriand there is still much mannerism and unreality.

Aimé Martin, disciple of Bernardin and the second husband of his second wife, published a complete edition of his works in 18 volumes (Paris, 1818–1820), afterwards increased by seven volumes of correspondence and memoirs (1826). *Paul et Virginie*, the *Chaumière indienne*, &c. have often been separately reprinted. See also Arvède Barin's *Bernardin de Saint Pierre* (1891).

ST PIERRE and **MIQUELON,** two islands 10 m. off the south coast of Newfoundland, united area about 91 sq. m. Both are rugged masses of granite, with a few small streams and lakes, a thin covering of soil and scanty vegetation. Miquelon, the larger of the two, consists of Great Miquelon and Little Miquelon, or Langlade; previous to 1783 these were separated by a navigable channel, but they have since become connected by a dangerous mudbank. St Pierre has a sheltered harbour with about 14 ft. of water, and a good roadstead for large vessels. Their importance is due to their proximity to the great Banks, which makes them the centre of the French Atlantic fisheries. These are kept up by an elaborate system of bounties by the French government, which considers them of great importance as training sailors for the navy. Fishing lasts from May till October, and is carried on by nearly five hundred vessels, of which about two-thirds are fitted out from St Pierre, the remainder coming from St Malo, Cancale and other French coast towns. The resident population, which centres in the town of St Pierre, is about 6500, swelled to over 10,000 for a time each year by extra fishing hands from France, but is steadily declining owing to emigration into Canada. Owing to the low rates of duty, vast quantities of goods, especially French wines and liquors, are imported, and smuggled to Newfoundland, the United States and Canada, though of late years this has been checked by a gradual rise in the scale of duties, and by the presence since 1904 of a British consul. St Pierre is connected with Halifax (N.S.) and St Johns (Newfoundland) by a regular packet service, and is a station of the Anglo American Cable Co. and the *Compagnie française des câbles télégraphiques*. Excellent facilities for primary and secondary education are given, but the attraction of the fisheries prevents their being fully used.

The islands were occupied by the French in 1660, and fortified in 1700. In 1702 they were captured by the British, and held till 1763, when they were given back to France as a fishing station. They are thus the sole remnant of the French colonies in North America. Destroyed by the English in 1778, restored to France in 1783, again captured and depopulated by the English in 1793, recovered by France in 1802 and lost in 1803, the islands have remained in undisputed French possession since 1814 (Treaty of Paris).

See Henrique, *Les Colonies françaises*, t. ii. (Paris, 1889); Levasseur, *La France*, t. ii. (Paris, 1893); *L'Année coloniale*, yearly since 1899, contains statistics and a complete bibliography; P. T. McGrath in *The New England Magazine* (May 1903) describes the daily life of the people. (W. L. G.)

ST POL, COUNTS OF. The countship of St Pol-sur-Ternoise in France (department of Pas-de-Calais), belonged in the 11th and 12th centuries to a family surnamed Candavène. Elizabeth, heiress of this house, carried the countship to her husband, Gaucher de Châtillon, in 1205. By the marriage of Mahaut de Châtillon with Guy VI. of Luxemburg, St Pol passed to the house of Luxemburg. It was in possession of Louis of Luxemburg, constable of France, who was beheaded in 1475. The constable's property was confiscated by Louis XI., but was subsequently restored in 1488 to his granddaughters, Marie and Françoise of Luxemburg. Marie (d. 1542) was countess of St Pol, and married François de Bourbon, count of Vendôme. Their son, François de Bourbon, count of St Pol (1491–1545), was one of the most devoted and courageous generals of Francis I. Marie, daughter of the last-mentioned count, brought the countship of St Pol to the house of Orleans-Longueville. In 1705 Marie of Orleans sold it to Elizabeth of Lorraine-Lillebonne, widow of Louis de Melun, prince of Épinoy, and their daughter married the prince of Rohan-Soubise, who thus became count of St Pol. (M. P.*)

ST POL-DE-LÉON, a town of north-western France, in the department of Finistère, about 1 m. from the shore of the English Channel, and $13\frac{1}{2}$ m. N. of Morlaix by the railway to Roscoff. Pop. (1906), town, 3353; commune, 8140. St Pol-de-Léon is a quaint town with several old houses. The cathedral is largely in the Norman Gothic style of the 13th and early 14th centuries. The west front has a projecting portico and two towers 180 ft. high with granite spires. Within the church there are beautifully carved stalls of the 16th century and other works of art. On the right of the high altar is a wooden shrine containing the bell of St Pol de Léon, which was said to cure headache and diseases of the ear, and at the side of the main entrance is a huge baptismal font, popularly regarded as the stone coffin of Conan Mériadec, king of the Bretons. Notre Dame de Kreizker, dating mainly from the second half of the 14th century, has a celebrated spire, 252 ft. high, which crowns the central tower. The north porch is a fine specimen of the flamboyant style. In the cemetery, which has a chapel of the 15th century, there are ossuaries of the year 1500.

In the 6th century a Welsh monk, Paul, became bishop of the small town of Léon, and lord of the domain in its vicinity, which passed to his successors and was increased by them. In 1793 the town was the centre of a serious but unsuccessful rising provoked by the recruiting measures of the Convention.

SAINT PRIEST, FRANÇOIS EMMANUEL GUIGNARD, CHEVALIER, then COMTE DE (1735–1821), French statesman, was born at Grenoble on the 12th of March 1735. He was admitted a knight (*chevalier*) of the Order of Malta at five years of age, and at fifteen entered the army. He left active service in 1763 with the grade of colonel, and for the next four years represented the court of France at Lisbon. He was sent in 1768 to Constantinople, where he remained with one short interval till 1785, and married Wilhelmina von Ludolf, daughter of the Neapolitan ambassador. His *Mémoires sur l'ambassade de France en Turquie et le commerce des Français dans le Levant*, prepared during a visit to France, were only published in 1877, when they were edited by C. Schefer. After a few months spent at the court of the Hague, he joined the ministry of Necker as minister without a portfolio, and in Necker's second cabinet in 1789 was secretary of the royal household and minister of the interior. He became a special object of the popular hatred because he was alleged to have replied to women begging for bread, "You had enough while you had only one king; demand bread of your twelve hundred sovereigns." Nevertheless he held office until December 1790. Shortly after his resignation he went to Stockholm, where his brother-in-law was Austrian ambassador. In 1795 he joined the comte de Provence at Verona as minister of the household. He accompanied the exiled court to Blankenburg and Mittau, retiring in 1808 to Switzerland. After vainly seeking permission to return to France he was expelled from Switzerland, and wandered about Europe until the Restoration. Besides the memoirs already mentioned he wrote an *Examen des assemblées provinciales* (1787).

His eldest son, GUILLAUME EMMANUEL (1776–1814), became major-general in the Russian service, and served in the campaigns of Alexander I. against Napoleon. He died at Laon in 1814. The second, ARMAND EMMANUEL CHARLES (1782–1863), became civil governor of Odessa, and married Princess Sophie Galitzin. The third, EMMANUEL LOUIS MARIE GUIGNARD, vicomte de Saint Priest (1789–1881), was a godson of Marie Antoinette. Like his elder brother he took part in the invasion of France in 1814. At the Restoration he was attached to the service of the duke of Angoulême, and during the Hundred Days tried to raise Dauphiné in the royal cause. He served with distinction in Spain in 1823, when he was promoted lieutenant-general. After two years at Berlin he became French ambassador at Madrid, where he negotiated in 1828 the settlement of the Spanish debt. When the revolution of July compelled his retirement, Frederick VII. made him a grandee of Spain, with the title of duke of Almazan, in recognition of his services. He then joined the circle of the duchess of Berry at Naples, and arranged her escapade in Provence in 1832. Saint Priest was arrested, and was only released after ten months' imprisonment. Having arranged for an asylum in Austria for the duchess, he returned to Paris, where he was one of the leaders of legitimist society until his death, which occurred at Saint Priest, near Lyons, on the 26th of February 1881.

ALEXIS GUIGNARD, comte de Saint Priest (1805–1851), was the son of Armand de Saint Priest and Princess Galitzin. Educated in Russia, he returned to France with his father in 1822, and soon made his mark in literary circles. His most important works were *Histoire de la royauté considérée dans ses origines jusqu'à la formation des principales monarchies de l'Europe* (2 vols., 1842); *Histoire de la chute des Jésuites* (1844); *Histoire de la conquête de Naples* (4 vols., 1847–1848). He was elected to the Academy in January 1849. Meanwhile he had departed from the legitimist tradition of his family to become a warm friend to the Orleans monarchy, which he served between 1833 and 1838 as ambassador in Brazil, at Lisbon and at Copenhagen. He died, while on a visit to Moscow, on the 29th of September 1851.

SAINT PRIVAT, a village of Lorraine, 7 m. N.W. of Metz. The village and the slopes to the west played a great part in the battle of Gravelotte (August 18, 1870). (See METZ and FRANCO-GERMAN WAR.) At St Privat occurred the famous repulse of the Prussian Guard by Marshal Canrobert's corps.

ST QUENTIN, a manufacturing town of northern France, capital of an arrondissement in the department of Aisne, 32 m. N.N.W. of Laon by rail. Pop. (1906) 49,305. The town stands on the right bank of the Somme, at its junction with the St Quentin Canal (which unites the Somme with the Scheldt) and the Crozat Canal (which unites it with the Oise). The port carries on an active traffic in building materials, coal, timber, iron, sugar and agricultural produce. Built on a slope, with a southern exposure, the town is dominated by the collegiate church of St Quentin, one of the finest Gothic buildings in the north of France, erected during the 12th, 13th, 14th and 15th centuries. The church, which has no west façade, terminates at that end in a tower and portal of Romanesque architecture; it has double transepts. Its length is 436 ft. and the height of the nave 124 ft. The choir (13th century) has a great resemblance to that of Reims; like the chapels of the apse it is decorated with polychromic paintings. There are remains of a choir-screen of the 14th century. Under the choir is a crypt of the 11th century, rebuilt in the 13th century, and containing the tombs of St Quentin (Quintin) and his fellow-martyrs Victoricus and Gentianus. The Champs Élysées, an extensive promenade, lies east of the cathedral. The hôtel-de-ville of St Quentin is a splendid building of the 14th, 15th and 16th centuries, with a flamboyant façade, adorned with curious sculptures. The council-room is a fine hall with a double wooden ceiling and a huge chimneypiece, partly Gothic partly Renaissance. A monument commemorates the siege of 1557 (see below), and another close to the river the part played by the town in 1870 and 1871. A building of the 20th century is appropriated to the law court, the learned societies, the museum and the library. St Quentin is the seat of a sub-prefect, of tribunals of first instance and of commerce, and of a board of trade-arbitration, and has an exchange, a chamber of commerce and lycées for both sexes. The town is the centre of an industrial district which manufactures cotton and woollen fabrics. St Quentin produces chiefly piqué and window-curtains, and carries on the spinning and preliminary processes and the bleaching and finishing. Other industries are the making of embroideries by machinery and by hand, and the manufacture of iron goods and machinery. Trade is in grain, flax, cotton and wool.

St Quentin (anc. *Augusta Veromanduorum*) stood at the meeting-place of five military roads. In the 3rd century it was the scene of the martyrdom of Gaius Quintinus, who had come thither from Italy as a preacher of Christianity. The date of the foundation of the bishopric is uncertain, but about 532 it was transferred to Noyon. Towards the middle of the 7th century St Eloi (Eligius), bishop of Noyon, established a collegiate chapter at St Quentin's tomb, which became a famous place of pilgrimage. The town thus gained an importance which was increased during the middle ages by the rise of its cloth manufacture. After it had been thrice ravaged by the Normans, the town was surrounded by walls in 883. It became under Pippin, grandson of Charlemagne, one of the principal domains of the counts of Vermandois, and in 1080 received from Count Herbert IV. a charter which was extended in 1103 and is the earliest of those freely granted to the towns of northern France. From 1420 to 1471 St Quentin was occupied by the Burgundians. In 1557 it was taken by the Spaniards (see below). Philip commemorated the victory over the relieving force under the Constable Montmorency by the foundation of the Escurial. Two years later the town was restored to the French, and in 1560 it was assigned as the dowry of Mary Stuart. The fortifications erected under Louis XIV. were demolished between 1810 and 1820. During the Franco-Prussian War St Quentin repulsed the German attacks of the 8th of October 1870; and in January 1871 it was the centre of the great battle fought by General Faidherbe (below).

1. *Battle of 1557.*—An army of Spaniards under Emmanuel Philibert of Savoy, invading France from the Meuse, joined an allied contingent of English troops under the walls of St Quentin, which was then closely besieged. Admiral Coligny threw himself on to the town, and the old Constable Montmorency prepared to relieve it. On St Lawrence's Day, 10th August, the relieving column reached the town without difficulty, but time was wasted in drawing off the garrison, for the pontoons intended to bridge the canal had marched at the tail of the column, and when brought up were mismanaged. The besiegers, recovering from their surprise, formed the plan of cutting off the retreat of the relieving army. Montmorency had thrown out the necessary protective posts, but at the point which the besiegers chose for their passage the post was composed of poor troops, who fled at the first shot. Thus, while the constable was busy with his boats, the Spanish army filed across the Bridge of Rouvroy, some distance above the town, with impunity, and Montmorency, in the hope of executing his mission without fighting, refused to allow the cavalry under the duc de Nevers to charge them, and miscalculated his time of freedom. The Spaniards, enormously superior in force, cut off and destroyed the French gendarmerie who formed the vanguard of the column, and then headed off the slow-moving infantry south of Essigny-le-Grand. Around the 10,000 French gathered some 40,000 assailants with forty-two guns. The cannon thinned their ranks, and at last the cavalry broke in and slaughtered them. Yet Coligny gallantly held St Quentin for seventeen days longer, Nevers rallied the remnant of the army and, garrisoning Péronne, Ham and other strong places, entrenched himself in front of Compiègne, and the allies, disheartened by a war of sieges and skirmishes, came to a standstill. Soon afterwards Philip, jealous of the renown of his generals and unwilling to waste his highly trained soldados in ineffective fighting, ordered the army to retreat (17th October), disbanded the temporary regiments and dispersed the permanent corps in winter quarters.

2. The *Battle of 1871* was fought between the German I. army under General von Goeben and the French commanded by General Faidherbe. The latter concentrated about St Quentin on the 18th of January, and took up a defensive position on both sides of the Somme Canal. The Germans, though inferior in numbers, were greatly superior in discipline and training, and General von Goeben boldly decided to attack both wings of the French together on the 19th. The attack took the customary enveloping form. After several hours' fighting it was brought to a standstill, but Goeben, using his reserves in masterly fashion, drove a wedge into the centre of the French line between the canal and the railway, and followed this up with another blow on the other bank of the canal, along the Ham road. This was the signal for a decisive attack by the whole of the left wing of the Germans, but the French offered strenuous resistance, and it was not until four o'clock that General Faidherbe made up his mind to retreat. By skilful dispositions and orderly movement most of his infantry and all but six of his guns were brought off safely, but a portion of the army was cut off by the victorious left wing of the Germans, and the defeat, the last act in a long-drawn-out struggle, was sufficiently decisive to deny to the defenders any hope of taking the field again without an interval of rest and reorganization. Ten days later the general armistice was signed.

SAINT-RÉAL, CÉSAR VICHARD DE (1639–1692), French historian, was born in Savoy, but educated in Paris by the Jesuits. Varillas gave him his taste for history and served as his model; he wrote hardly anything but historical novels. The only merit of his *Don Carlos* (1673) is that of having furnished Schiller with several of the speeches in his drama. In the following year he produced the *Conjuration des Espagnols contre la République de Venise en 1618*, which had a phenomenal success, but is all the same merely a literary *pastiche* in the style of Sallust. This work and his reputation as a free-thinker brought him to the notice of Hortense Mancini, duchesse de Mazarin, whose reader and friend he became, and who took him with her to England (1675). The authorship of the duchess's *Mémoires* has been ascribed to him, but without reason. Among his authentic works is included a short treatise *De la critique* (1691), directed against Andry de Boisregard's *Réflexions sur la langue françoise.* His *Œuvres complètes* were published in 3 volumes (1745); a second edition (1757) reached 8 volumes, but this is due to the inclusion of some works falsely attributed to him. Saint-Réal was, in fact, a fashionable writer of his period; the demand for him in the book-market was similar to that for Saint-Évremond, to whom he was inferior. He wrote in an easy and pleasant, but mediocre style.

See Père Lelong, *Bibliothèque historique de la France*, No. 48, 122; Barolo, *Memorie spettanti alla vita di Saint-Réal* (1780; Saint-Réal was an associate of the Academy of Turin); Sayous, *Histoire de la littérature française à l'étranger.*

ST RÉMY, a town of south-eastern France in the department of Bouches-du-Rhône, 15 m. N.E. of Arles by road. Pop. (1906), town, 3668; commune, 6148. It is prettily situated to the north of the range of hills named the Alpines or Alpilles in a valley of olive trees. The town has a modern church with a lofty 14th-century spire. About a mile to the south are Gallo-Roman relics of the ancient Glanum, destroyed about 480. They comprise a triumphal arch and a fine three-storied mausoleum of uncertain date. Near by is the old priory of St Paul-de-Mausole with an interesting church and cloister of Romanesque architecture. In the vicinity of St Rémy there are quarries of building stone, and seed-cultivation is an important industry.

ST RIQUIER, a town of northern France, in the department of Somme, 8 m. N.E. of Abbeville by rail. Pop. (1906) 1158. St Riquier (originally *Centula*) was famous for its abbey, founded about 625 by Riquier (*Richarnis*), son of the governor of the town. It was enriched by King Dagobert and prospered under the abbacy of Angilbert, son-in-law of Charlemagne. The buildings (18th century) are occupied by an ecclesiastical seminary. The church, a magnificent example of flamboyant Gothic architecture of the 15th and 16th centuries, has a richly sculptured west front surmounted by a square tower. In the interior the fine vaulting, the Renaissance font and carved stalls, and the frescoes in the treasury are especially noteworthy. The treasury, among other valuable relics, possesses a copper cross said to be the work of St Eloi (Eligius). The town has a municipal belfry of the 13th or 14th centuries. In 1536 St Riquier repulsed an attack by the Germans, the women especially distinguishing themselves. In 1544 it was burnt by the English, an event which marks the beginning of its decline.

See Hénocque, "Hist. de l'abbaye et de la ville de St Riquier," in *Mém. soc. antiq. Picardie. Documents inédits*, ix.-xi. (Paris, 1880–1888).

SAINTS, BATTLE OF THE. This battle is frequently called by the date on which it took place—the 12th of April 1782. The French know it as the battle of Dominica, near the coast of which it was fought. The Saints are small rocky islets in the channel between the islands of Dominica and Guadaloupe in the West Indies. The battle is of exceptional importance in naval history; it was by far the most considerable fought at sea in the American War of Independence, and was to Great Britain of the nature of a deliverance, since it not only saved Jamaica from a formidable attack, but after the disasters in North America went far to restore British prestige. The comte de Grasse, with 33 sail of the line, was at Fort Royal in Martinique. His aim was to effect a combination with a Spanish force from Cuba, and invade Jamaica. A British fleet (36 sail of the line), commanded by Sir George, afterwards Lord Rodney (*q.v.*), was anchored in Gros Islet Bay, Santa Lucia. On the 8th of April the British lookout frigates reported that the French were at sea, and Rodney immediately sailed in pursuit. Light and variable sea or land breezes made the movements of both fleets uncertain. Some of the ships of each might have a wind, while others were becalmed. On the 9th of April eight ships of the British van, at some distance from the bulk of their fleet, and nearly opposite the mountain called the Morne au Diable in Dominica, were attacked by fifteen of the French. The comte de Grasse, whose own ships were much scattered and partly becalmed, and who moreover was hampered by the transports carrying soldiers and stores, did not press the attack home. His chief wish was to carry his fleet through the channel between Dominica and Guadaloupe, while Rodney was anxious to force a battle. During the night of the 11th-12th the greater part of the French had cleared the channel, but a collision took place between two of their ships by which one was severely damaged. The crippled vessel was seen and pursued by four ships of the

British van. The comte de Grasse recalled all his vessels, and bore down towards the British. Rodney ordered the last of his ships to lead into action, the others following her in succession, and the detached ships falling in behind as they returned from the pursuit. The two fleets in line of battle passed one another, the French steering in a southerly, the British in a northerly direction. Both were going very slowly. Fire was opened about 8 o'clock, and by 10 o'clock the leading British ship had passed the last of the French. While the action was in progress, one of the variable winds of the coast began to blow from the south, while the northern extremities of the fleets were in an easterly breeze. Confusion was produced in both forces, and a great gap was created in the French line just ahead of the "Formidable" (100), Rodney's flagship. The captain of the fleet, Sir Charles Douglas, called his attention to the opening, and urged him to steer through it. The fighting instructions then in force made it incumbent on an admiral to preserve the order in which he began the action unchanged. Rodney hesitated to depart from the traditional order, but after a few moments of doubt accepted the suggestion. The "Formidable" was steered through the opening, followed by six of those immediately behind her. The ships towards the rear passed through the disordered French in the smoke, which was very thick, without knowing what they had done till they were beyond the enemy. About 1 o'clock the British had all either gone beyond the French or were to the east of them. The French were broken into three bodies, and were completely disordered. The comte de Grasse, in his flagship the "Ville de Paris," with five other vessels, was isolated from his van and rear. Rodney directed his attack on these six vessels, which were taken after a very gallant resistance. It was the general belief of the fleet that many more would have been captured if Rodney had pursued more vigorously, but he was content with the prizes he had taken. Two more of the French were captured by Sir Samuel Hood, afterwards Lord Hood, in the Mona Passage on the 19th of April.

See Beatson, *Naval and Military Memoirs* (London, 1804), vol. 5; and a careful analysis from the French side by Chevalier, *Histoire de la marine française pendant la guerre de l'indépendance américaine* (Paris, 1877). (D. H.)

SAINT-SAËNS, CHARLES CAMILLE (1835–), French composer, was born in Paris on the 3rd of October 1835. After having as a child taken lessons on the piano, and learned the elements of composition, he entered the Paris Conservatoire in the organ class, then presided over by Eugène Benoist, obtaining the second prize in 1849, and the first two years later. For a short time he studied composition under Halévy, and in 1852, and again in 1864, competed without success for the Grand Prix de Rome. Notwithstanding these unaccountable failures, Saint-Saëns worked indefatigably. In 1853, when only eighteen, he was appointed organist at the Church of St Merry, and from 1861 to 1877 was organist at the Madeleine, in succession to Lefébure-Wély. An overture entitled "Spartacus," which has remained unpublished, was crowned at a competition instituted in 1863 by the Société Sainte Cécile of Bordeaux. The greatest triumph of his early career was, however, attained in 1867, when the prize was unanimously awarded to him for his cantata "Les Noces de Prométhée" in the competition organized during the International Exhibition of that year—a prize competed for by over two hundred musicians.

Though he had acquired a great name as a pianist, and had made successful concert tours through Europe, he had not succeeded in reaching the ears of the larger public by the production of an opera, which in France counts for more than anything else. After the tragic events of 1870, when Saint-Saëns did his duty as a patriot by serving in the National Guard, the opportunity at last offered itself, and a one-act opera from his pen, *La Princesse jaune*, with words by Louis Gallet, was produced at the Opéra Comique with moderate success on the 12th of June 1872. *Le Timbre d'argent*, a four-act opera performed at the Théâtre Lyrique in 1877, was scarcely more successful. In the meanwhile his "symphonic poems" "Le Rouet d'Omphale," "Danse Macabre," "Phaéton" and "La Jeunesse d'Hercule" obtained for him a world-wide celebrity. These admirable examples of "programme music" count among his best known works.

At last, through the influence of Liszt, his Biblical opera *Samson et Dalila* was brought out at Weimar in 1877. This work, generally accepted as his operatic masterpiece, had been begun as far back as 1869, and an act had been heard at one of Colonne's concerts in 1875. Notwithstanding its great success at Weimar, its first performance on French soil took place at Rouen in 1890. The following year it was given in Paris at the Eden Theatre, and finally in 1892 was produced at the Grand Opéra, where it has remained one of the most attractive works of the *rêpertoire*. Its Biblical subject stood in the way of its being performed on the London stage until 1909, when it was given at Covent Garden with great success. None of his works is better calculated to exemplify the dual tendencies of his style. The first act, with its somewhat formal choruses, suggests the influence of Bach and Handel, and is treated rather in the manner of an oratorio. The more dramatic portions of the opera are not uninfluenced by Meyerbeer, while in the mellifluous strains allotted to the temptress there are occasional suggestions of Gounod. Of Wagner there is but little trace, save in the fact that the composer has divided his work into scenes, thus avoiding the old-fashioned denominations of "air," "duet," "trio," &c. The score, however, is not devoid of individuality. The influences mentioned above, possibly excepting that of Bach in the earlier scenes, are rather of a superficial nature, for Saint-Saëns has undoubtedly a style of his own. It is a composite style, certainly, and all the materials that go towards forming it may not be absolutely his; that is, the eclecticism of his mind may lead him at one moment to adopt an archaic form of expression, at another to employ the current musical language of his day, and sometimes to blend the two. It is perhaps in the latter case that he shows most individuality; for although his works may denote the varied influences of such totally dissimilar masters as Bach, Beethoven, Liszt and Gounod, he ever contrives to put in something of his own.

After the production of *Samson et Dalila* Saint-Saëns stood at the parting of the ways—looked at askance by the reactionary section of the French musicians, and suspected of harbouring subversive Wagnerian ideas, but ready to be welcomed by the progressive party. Both sides were doomed to disappointment, for in his subsequent operas Saint-Saëns attempted to effect a compromise between the older and the newer forms of opera. He had already entertained the idea of utilizing the history of France for operatic purposes. The first and only result of this project has been *Étienne Marcel*, an opera produced at Lyons in 1879. Although of unequal merit, owing partly to its want of unity of style, this work contains much music of an attractive kind, and scarcely deserves the neglect into which it has fallen. Forsaking the history of France he now composed his opera *Henry VIII.*, produced at the Paris Grand Opéra in 1883. The librettists had concocted a piece that was sufficiently well knit and abounded in dramatic contrasts. While adhering to his system of compromise by retaining certain conventional operatic features, Saint-Saëns had in this instance advanced somewhat by employing *leit motivs* in a more rigorous fashion than hitherto, although he had not gone so far as to discard airs cut after the old pattern, duets and quartets. *Henry VIII.*, which was given at Covent Garden in 1898, occupies an honourable place among the composer's works. *Proserpine*, a lyrical drama produced at the Paris Opéra Comique in 1887, achieved a *succès d'estime* and no more. A not much better fate befell *Ascanio*, an opera founded on Paul Meurice's drama *Benvenuto Cellini*, and brought out at the Grand Opéra in 1890. *Phrynê*, however, a two-act trifle of a light description, produced at the Opéra Comique in 1893, met with success. In 1895 *Frêdêgonde*, an opera begun by Ernest Guiraud and completed by Saint-Saëns, was produced in Paris. The "lyrical drama" *Les Barbares*, given at the Grand Opéra in 1901, was received with marked favour.

Saint-Saëns worked successfully in every field of his art. Besides the operas above alluded to, he composed the following oratorios and cantatas: "Oratorio de Noël," "Les Noces de Prométhée," Psalm "Coeli enarrant," "Le Déluge," "La Lyre et la harpe"; three symphonies; four symphonic poems ("Le Rouet d'Omphale," "Phaéton," "Danse Macabre," "La Jeunesse d'Hercule"); five pianoforte concertos; three violin concertos; two suites, marches, and other works for orchestra; the ballet *Zavotte*; music to the drama *Déjanire*, given at the open-air theatre of Béziers; a quintet for piano and strings, a quartet for piano and strings, two trios for piano and strings, a string quartet, a septet, violoncello sonata, two violin sonatas; a Mass, a Requiem, besides a quantity of piano and organ music, and many songs, duets and choruses. He also published three books, entitled *Harmonie et mélodie*, *Portraits et souvenirs*, and *Problèmes et mystères*, besides a volume of poems, *Rimes familières*. The honorary degree of Doctor of Music was conferred upon him by Cambridge University in 1893.

SAINTSBURY, GEORGE EDWARD BATEMAN (1845–), English man of letters, was born at Southampton on the 23rd of October 1845. He was educated at King's College School, London, and at Merton College, Oxford (B.A., 1868), and spent six years in Guernsey as senior classical master of Elizabeth College. From 1874 to 1876 he was headmaster of the Elgin Educational Institute. He began his literary career in 1875 as a critic for the *Academy*, and for ten years was actively engaged in journalism, becoming an important member of the staff of the *Saturday Review*. Some of the critical essays contributed to the literary journals were afterwards collected in his *Essays in English Literature, 1780–1860* (2 vols., 1890–1895), *Essays on French Novelists* (1891), *Miscellaneous Essays* (1892), *Corrected Impressions* (1895). His first book, *A Primer of French Literature* (1880), and his *Short History of French Literature* (1882; 6th ed., Oxford, 1901), were followed by a series of editions of French classics and of books and articles on the history of French literature, which made him the most prominent English authority on the subject. His studies in English literature were no less comprehensive, and included the valuable revision of Sir Walter Scott's edition of Dryden's *Works* (Edinburgh, 18 vols., 1882–1893), *Dryden* (1881) in the "English Men of Letters" series, *History of Elizabethan Literature* (1887), *History of Nineteenth Century Literature* (1896), *A Short History of English Literature* (1898, 3rd ed. 1903), an edition of the *Minor Caroline Poets of the Caroline Period* (2 vols., 1905–1906), a collection of rare poems of great value, and editions of English classics. He edited the series of "Periods of European Literature," contributing the volumes on *The Flourishing of Romance and the Rise of Allegory* (1897), and *The Earlier Renaissance* (1901). In 1895 he became professor of rhetoric and English literature at Edinburgh university, and subsequently produced two of his most important works, *A History of Criticism* (3 vols., 1900–1904), with the companion volume *Loci Critici, Passages Illustrative of Critical Theory and Practice* (Boston, U.S.A., and London, 1903), and *A History of English Prosody from the 12th Century to the Present Day* (i., 1906; ii., 1908; iii., 1910); also *The Later Nineteenth Century* (1909).

ST SERVAN, a town of western France, in the department of Ille-et-Vilaine, on the right bank of the Rance, south of St Malo, from which it is separated by the Anse des Sablons, a creek 1 m. wide (see St Malo). Pop. (1906) 9765. It is not enclosed by walls, and with its new houses, straight wide streets and numerous gardens forms a contrast to its neighbour. North of the town there is a wet-dock, 27 acres in extent, forming part of the harbour of St Malo. The creek on which it opens is dry at low water, but at high water is 30 to 40 ft. deep. The dock is used chiefly by coasting and fishing vessels, a fleet starting annually for the Newfoundland cod-fisheries. Two other ports on the Rance, south-west of the town at the foot of the tower of Solidor, are of small importance. This stronghold, erected towards the close of the 14th century by John IV., duke of Brittany, for the purpose of contesting the claims to the temporal sovereignty of the town of Josselin de Rohan, bishop of St Malo, consists of three distinct towers formed into a triangle by loopholed and machicolated curtains. To the west St Servan terminates in a peninsula on which stands the "cité," inhabited by work-people, and the "fort de la cité"; near by is a modern chapel which has replaced the cathedral of St Peter of Aleth, the seat of a bishopric from the 6th to the 12th century. The parish church is modern (1742–1842). St Servan has a communal college. It carries on steam-sawing, boat-building, rope-making and the manufacture of ship's biscuits.

The "Cité" occupies the site of the city of Aleth, which at the close of the Roman empire supplanted Corseul as the capital of the Curiosolites. Aleth was a bulwark of Druidism in those regions and was not Christianized till the 6th century, when St Malo became its first bishop. On the removal of the bishopric to St Malo Aleth declined and was almost destroyed by St Louis in 1235; the houses that remained standing became the nucleus of a new community, originating from St Malo, which placed itself under the patronage of St Servan, apostle of the Orkneys. It was not till the Revolution that St Servan became a separate commune from St Malo with a municipality and police of its own.

ST SEVER, a town of south-western France, capital of an arrondissement in the department of Landes, 11 m. S.S.W. of Mont de Marsan on the Southern railway between that town and Bayonne. Pop. (1906) town, 2508; commune, 4644. St Sever stands on an eminence on the left bank of the Adour in the district of the Chalosse. Its streets, bordered in places by old houses, are narrow and winding. The promenade of Morlanne laid out on the site of a Roman camp called Palestrion commands a fine view of the Adour and the pine forests of the Landes. The church of St Sever, a Romanesque building of the 12th century, with seven apses, once belonged to the Benedictine abbey founded in the 10th century. The public institutions of the town include the sub-prefecture, a tribunal of first instance, and a practical school of agriculture and viticulture which occupies a former Dominican convent. There is trade in the agricultural products of the Chalosse, especially geese.

SAINT-SIMON, CLAUDE DE ROUVROY, Duc de (1607–1693), French courtier, was born in August 1607, being the second son of Louis de Rouvroi, seigneur du Plessis (d. 1643), who had been a warm supporter of Henry of Guise and the League. With his elder brother he entered the service of Louis XIII. as a page and found instant favour with the king. Named first equerry in March 1627 he became in less than three years captain of the châteaux of St Germain and Versailles, master of the hounds, first gentleman of the bed-chamber, royal councillor and governor of Meulan and of Blaye. On the fall of La Rochelle he received lands in the vicinity valued at 80,000 livres. About three years later his seigniory of Saint-Simon in Vermandois was erected into a duchy, and he was created a peer of France. He was at first on good terms with Richelieu and was of service on the Day of Dupes (11th of November 1630). Having suffered disgrace for taking the part of his uncle, the baron of Saint-Léger, after the capture of Catelet (15th of August 1636), he retired to Blaye. He fought in the campaigns of 1638 and 1639, and after the death of Richelieu returned to court, where he was coldly received by the king (18th of February 1643). Thenceforth, with the exception of siding with Condé during the Fronde, he took small part in politics. He died in Paris on the 3rd of May 1693. By his first wife, Diane de Budos de Portes, a relative of Condé, whom he married in 1644 and who died in 1670, he had three daughters. By his second wife, Charlotte de l'Aubespine, whom he married in 1672, he had a son Louis, the "author of the memoirs" (see below).

SAINT-SIMON, CLAUDE HENRI DE ROUVROY, Comte de (1760–1825), the founder of French socialism, was born in Paris on the 17th of October 1760. He belonged to a younger branch of the family of the duc de Saint-Simon (above). His education was directed by D'Alembert. At the age of nineteen he assisted the American colonies in their revolt against Britain. From his youth Saint-Simon felt the promptings of an eager ambition. His valet had orders to awake him every morning with the words, "Remember, monsieur le comte, that you have great things to do." Among his early schemes was one to unite the Atlantic and the Pacific by a canal, and another to construct a canal from Madrid to the sea. Although he was imprisoned in the Luxembourg during the Terror, he took no part of any importance in the Revolution, but profited by it to amass a little fortune by land speculation—not on any selfish account, however, as he said, but to facilitate his future projects.

Accordingly, when he was nearly forty years of age he went through a varied course of study and experiment, in order to enlarge and clarify his view of things. One of these experiments was an unhappy marriage—undertaken merely that he might have a salon—which, after a year's duration, was dissolved by mutual consent. The result of his experiments was that he found himself completely impoverished, and lived in penury for the remainder of his life. The first of his numerous writings, *Lettres d'un habitant de Genève*, appeared in 1802; but his early writings were mostly scientific and political. In 1817 he began in a treatise entitled *L'Industrie* to propound his socialistic views, which he further developed in *L'Organisateur* (1819), a periodical on which Augustin Thierry and Auguste Comte collaborated. The first number caused a sensation, but it brought few converts. In 1821 appeared *Du système industriel*, and in 1823–1824 *Catéchisme des industriels*. The last and most important expression of his views is the *Nouveau Christianisme* (1825), which he left unfinished. For many years before his death in 1825 (at Paris on the 19th of May), Saint-Simon had been reduced to the greatest straits. He was obliged to accept a laborious post, working nine hours a day for £40 a year, to live on the generosity of a former valet, and finally to solicit a small pension from his family. In 1823 he attempted suicide in despair. It was not till very late in his career that he attached to himself a few ardent disciples.

As a thinker Saint-Simon was entirely deficient in system, clearness and consecutive strength. But his great influence on modern thought is undeniable, both as the historic founder of French socialism and as suggesting much of what was afterwards elaborated into Comtism. Apart from the details of his socialistic teaching, which are vague and unsystematic, we find that the ideas of Saint-Simon as to the reconstruction of society are very simple. His opinions were conditioned by the French Revolution and by the feudal and military system still prevalent in France. In opposition to the destructive liberalism of the Revolution he insisted on the necessity of a new and positive reorganization of society. So far was he from advocating fresh social revolt that he appealed to Louis XVIII. to inaugurate the new order of things. In opposition, however, to the feudal and military system, the former aspect of which had been strengthened by the restoration, he advocated an arrangement by which the industrial chiefs should control society. In place of the medieval church the spiritual direction of society should fall to the men of science. What Saint-Simon desired, therefore, was an industrialist state directed by modern science in which universal association should suppress war. In short, the men who are fitted to organize society for productive labour are entitled to bear rule in it. The social aim is to produce things useful to life. The contrast between labour and capital so much emphasized by later socialism is not present to Saint-Simon, but it is assumed that the industrial chiefs, to whom the control of production is to be committed, shall rule in the interest of society. Later on the cause of the poor receives greater attention, till in his greatest work, *The New Christianity*, it takes the form of a religion. It was this development of his teaching that occasioned his final quarrel with Comte. Previous to the publication of the *Nouveau Christianisme*, Saint-Simon had not concerned himself with theology. Here he starts from a belief in God, and his object in the treatise is to reduce Christianity to its simple and essential elements. He does this by clearing it of the dogmas and other excrescences and defects which have gathered round the Catholic and Protestant forms of it. He propounds as the comprehensive formula of the new Christianity this precept—"The whole of society ought to strive towards the amelioration of the moral and physical existence of the poorest class; society ought to organize itself in the way best adapted for attaining this end." This principle became the watchword of the entire school of Saint-Simon.

During his lifetime the views of Saint-Simon had very little influence; and he left only a few devoted disciples, who continued to advocate the doctrines of their master, whom they revered as a prophet. Of these the most important were Olinde Rodrigues, the favoured disciple of Saint-Simon, and Barthélemy Prosper Enfantin (*q.v.*), who together had received Saint-Simon's last instructions. Their first step was to establish a journal, *Le Producteur*, but it was discontinued in 1826. The sect, however, had begun to grow, and before the end of 1828, had meetings not only in Paris but in many provincial towns. An important departure was made in 1828 by Amand Bazard, who gave a "complete exposition of the Saint-Simonian faith" in a long course of lectures at Paris, which were well attended. His *Exposition de la doctrine de St Simon* (2 vols., 1828–1830), which is by far the best account of it, won more adherents. The second volume was chiefly by Enfantin, who along with Bazard stood at the head of the society, but who was superior in metaphysical power, and was prone to push his deductions to extremities. The revolution of July (1830) brought a new freedom to the socialist reformers. A proclamation was issued demanding the community of goods, the abolition of the right of inheritance, and the enfranchisement of women. Early next year the school obtained possession of the *Globe* through Pierre Leroux (*q.v.*), who had joined the school, which now numbered some of the ablest and most promising young men of France, many of the pupils of the École Polytechnique having caught its enthusiasm. The members formed themselves into an association arranged in three grades, and constituting a society or family, which lived out of a common purse in the Rue Monsigny. Before long, however, dissensions began to arise in the sect. Bazard, a man of logical and more solid temperament, could no longer work in harmony with Enfantin, who desired to establish an arrogant and fantastic sacerdotalism with lax notions as to marriage and the relation of the sexes. After a time Bazard seceded and many of the strongest supporters of the school followed his example. A series of extravagant entertainments given by the society during the winter of 1832 reduced its financial resources and greatly discredited it in character. They finally removed to Ménilmontant, to a property of Enfantin, where they lived in a communistic society, distinguished by a peculiar dress. Shortly after the chiefs were tried and condemned for proceedings prejudicial to the social order; and the sect was entirely broken up (1832). Many of its members became famous as engineers, economists, and men of business.

In the school of Saint-Simon we find a great advance on the vague and confused views of the master. In the philosophy of history they recognize epochs of two kinds, the critical or negative and the organic or constructive. The former, in which philosophy is the dominating force, is characterized by war, egotism and anarchy; the latter, which is controlled by religion, is marked by the spirit of obedience, devotion, association. The two spirits of antagonism and association are the two great social principles, and on the degree of prevalence of the two depends the character of an epoch. The spirit of association, however, tends more and more to prevail over its opponent, extending from the family to the city, from the city to the nation, and from the nation to the federation. This principle of association is to be the keynote of the social development of the future. Under the present system the industrial chief exploits the proletariat, the members of which, though nominally free, must accept his terms under pain of starvation. The only remedy for this is the abolition of the law of inheritance, and the union of all the instruments of labour in a social fund, which shall be exploited by association. Society thus becomes sole proprietor, intrusting to social groups and social functionaries the management of the various properties. The right of succession is transferred from the family to the state. The school of Saint-Simon insists strongly on the claims of merit; they advocate a social hierarchy in which each man shall be placed according to his capacity and rewarded according to his works. This is, indeed, a most special and pronounced feature of the Saint-Simon socialism, whose theory of government is a kind of spiritual or scientific autocracy, degenerating into the fantastic sacerdotalism of Enfantin. With regard to the family and the relation of the sexes the school of Saint-Simon advocated the complete emancipation of woman and her entire equality with man. The "social individual" is man and woman, who are associated in the exercise of the triple function of religion, the state and the family. In its official declarations the school maintained the sanctity of the Christian law of marriage. Connected with these doctrines was their famous theory of the "rehabilitation of the flesh," deduced from the philosophic theory of the school, which was a species of Pantheism, though they repudiated the name. On this theory they rejected the dualism so much emphasized by Catholic Christianity in its penances and mortifications, and held that the body should be restored to its due place of honour. It is a vague principle, of which the ethical character depends on the interpretation; and it was variously interpreted in the school of Saint-Simon. It was certainly immoral as held by Enfantin, by whom it was developed into a kind of sensual mysticism, a system of free love with a religious sanction.

An excellent edition of the works of Saint-Simon and Enfantin was published by the survivors of the sect (47 vols., Paris, 1865–1878). See, in addition to the works cited above, L. Reybaud, *Études sur les réformateurs contemporains* (7th edition, Paris, 1864); Paul Janet, *Saint-Simon et le Saint-Simonisme* (Paris, 1878); A. J. Booth, *Saint-Simon and Saint-Simonism* (London, 1871); Georges Weill, *Un Précurseur du socialisme, Saint-Simon et son œuvre* (Paris, 1894), and a history of the *École Saint-Simonienne*, by the same author (1896); G. Dumas, *Psychologie de deux messies positivistes St Simon et Comte* (1905); E. Levasseur's *Études sociales sous la Restauration*, contains a good section on Saint-Simon.

(T. K.; J. T. S.*)

SAINT-SIMON, LOUIS DE ROUVROY, Duc de (1675–1755), French soldier, diplomatist and writer of memoirs, was born at Versailles on the 16th of January 1675. The peerage granted to his father, Claude de St Simon (*q.v.*), is the central fact in his history. The French peerage under the old régime was a very peculiar thing, difficult to comprehend at all, but quite certain to be miscomprehended if any analogy of the English peerage is imported into the consideration. No two things could be more different in France than ennobling a man and making him a peer. No one was made a peer who was not ennobled, but men of the noblest blood in France and representing their houses might not be, and in most cases were not, peers. Derived at least traditionally and imaginatively from the *douze pairs* of Charlemagne, the peers were supposed to represent the chosen of the noblesse, and gradually, in an indefinite and constantly disputed fashion, became associated with the parlement of Paris as a quasi-legislative (or at least law-registering) and directly judicial body. But the peerage was further complicated by the fact that not persons but the holders of certain fiefs were made peers. Strictly speaking, neither Saint-Simon nor any one else in the same case was made a peer, but his estate was raised to the rank of a *duché pairie* or a *comté pairie* as the case might be. Still the peers were in a way a standing committee representative of the entire body of nobles, and it was Saint-Simon's lifelong ideal, and at times his practical effort to convert them into a sort of great council of the nation.

His mother, Charlotte de l'Aubespine, belonged to a family not of the oldest nobility but one which had been distinguished in the public service at least since the time of Francis I. Her son Louis was well educated, to a great extent by herself, and he had had for godfather and godmother Louis XIV. and the queen. After some tuition by the Jesuits (especially by Sanadon, the editor of Horace), he joined the *mousquetaires gris* in 1692. He was present at the siege of Namur, and the battle of Neerwinden. But it was at this very time that he chose to begin the crusade of his life by instigating, if not bringing, an action on the part of the peers of France against Luxembourg, his victorious general, on a point of precedence. He fought, however, another campaign or two (not under Luxembourg), and in 1695 married Gabrielle de Durfort, daughter of the maréchal de Lorges, under whom he latterly served. He seems to have regarded her with a respect and affection not very usual between husband and wife at the time; and she sometimes succeeded in modifying his aristocratic ideas. But as he did not receive the promotion he desired he flung up his commission in 1702. Louis took a dislike to him, and it was with difficulty that he was able to keep a footing at court. He was, however, intensely interested in all the transactions of Versailles, and by dint of a most heterogeneous collection of instruments, ranging from dukes to servants, he managed to obtain the extraordinary secret information which he has handed down. His own part appears to have been entirely subordinate. He was appointed ambassador to Rome in 1705, but the appointment was cancelled before he started. At last he attached himself to the duke of Orleans and, though this was hardly likely to conciliate Louis's goodwill to him, it gave him at least the status of belonging to a definite party, and it eventually placed him in the position of tried friend to the acting chief of the state. He was able, moreover, to combine attachment to the duke of Burgundy with that to the duke of Orleans. Both attachments were no doubt all the more sincere because of his undying hatred to "the bastards," that is to say, the illegitimate sons of Louis XIV. It does not appear that this hatred was founded on moral reasons or on any real fear that these bastards would be intruded into the succession. The true cause of his wrath was that they had precedence of the peers.

The death of Louis seemed to give Saint-Simon a chance of realizing his hopes. The duke of Orleans was at once acknowledged regent, and Saint-Simon was of the council of regency. But no steps were taken to carry out his favourite vision of a France ruled by the nobles for its good, and he had little real influence with the regent. He was indeed gratified by the degradation of "the bastards," and in 1721 he was appointed ambassador to Spain to arrange for the marriage (not destined to take place) of Louis XV. and the infanta. His visit was splendid; he received the grandeeship, and, though he also caught the smallpox, he was quite satisfied with the business. After his return he had little to do with public affairs. His own account of the cessation of his intimacy with Orleans and Dubois, the latter of whom had never been his friend, is, like his own account of some other events of his life, obscure and rather suspicious. But there can be little doubt that he was practically ousted by the favourite. He survived for more than thirty years; but little is known of his life. His wife died in 1743, his eldest son a little later; he had other family troubles, and he was loaded with debt. When he died, at Paris on the 2nd of March 1755, he had almost entirely outlived his own generation (among whom he had been one of the youngest) and the prosperity of his house, though not its notoriety. This last was in strange fashion revived by a distant relative born five years after his own death, Claude Henri, comte de Saint-Simon (*q.v.*).

It will have been observed that the actual events of Saint-Simon's life, long as it was and high as was his position, are neither numerous nor noteworthy. He is, however, an almost unique example of a man who has acquired great literary fame entirely by posthumous publications. He was an indefatigable writer, and he began very early to set down in black and white all the gossip he collected, all his interminable legal disputes of precedence, and a vast mass of unclassified and almost unclassifiable matter. Most of his manuscripts came into the possession of the government, and it was long before their contents were published in anything like fulness. Partly in the form of notes on Dangeau's *Journal*, partly in that of original and independent memoirs, partly in scattered and multifarious tracts and disquisitions, he had committed to paper an immense amount of matter. But the mere mass of these productions is their least noteworthy feature, or rather it is most remarkable as contrasting with their character and style. Saint-Simon, though careless and sometimes even ungrammatical, ranks among the most striking memoir-writers of France, the country richest in memoirs of any in the world. His pettiness, his absolute injustice to his private enemies and to those who espoused public parties with which he did not agree, the bitterness which allows him to give favourable portraits of hardly any one, his omnivorous appetite for gossip, his lack of proportion and perspective, are all lost sight of in admiration of his extraordinary genius for historical narrative and character-drawing of a certain sort. He has been compared to Tacitus, and for once the comparison is just. In the midst of his enormous mass of writing phrases scarcely inferior to the Roman's occur frequently, and here and there are passages of sustained description equal, for intense concentration of light and life, to those of Tacitus or of any other historian. As may be expected from the vast extent of his work, it is in the highest degree unequal. But he is at the same time not a writer who can be "sampled" easily, inasmuch as his most characteristic phrases sometimes occur in the midst of long stretches of quite uninteresting matter. A few critical studies of him, especially those of Sainte-Beuve, are the basis of much, if not most, that has been written about him. Yet no one is so little to be taken at second-hand. Even his most famous passages, such as the account of the death of the dauphin or of the Bed of Justice where his enemy the duke of Maine was degraded, will not give a fair idea of his talent. These are his gallery pieces, his great "machines," as French art slang calls them. Much more noteworthy as well as more frequent are the sudden touches which he gives. The bishops are "cuistres violets"; M. de Caumartin "porte sous son manteau toute la fatuité que M. de Villeroy étale sur son baudrier"; another politician has a "mine de chat faché." In short, the interest of the *Memoirs*, independent of the large addition of positive knowledge which they make, is one of constant surprise at the novel and adroit use of word and phrase. Some of Macaulay's most brilliant portraits and sketches of incident are adapted and sometimes almost literally translated from Saint-Simon.

The first edition of Saint-Simon (some scattered pieces may have been printed before) appeared in 1788. It was a mere selection in three volumes and was much cut down before it was allowed to appear. Next year four more volumes made their appearance, and in 1791 a new edition, still further increased. The whole, or rather not the whole, was printed in 1829–1830 and reprinted some ten years later. The real creator of Saint-Simon, as far as a full and exact text is concerned, was M. Chéruel, whose edition in 20 volumes dates from 1856, and was reissued again revised in 1872. So immense, however, is the mass of Saint-Simon's MSS. that still another recension was given by M. de Boislisle in 1882, with M. Chéruel's assistance, while a newer edition, yet once more revised from the MS., was begun in 1904. It must, however, be admitted that the matter other than the *Memoirs* is of altogether inferior interest and may be pretty safely neglected by any one but professed antiquarian and historical students. For criticism on Saint-Simon there is nothing better than Sainte-Beuve's two sketches in the 3rd and 15th volumes of the *Causeries du lundi*. The latter was written to accompany M. Chéruel's first edition. In English by far the most accurate treatment is in a Lothian prize essay by E. Cannan (Oxford and London, 1885). (G. Sa.)

ST THOMAS, an incorporated city and port of entry of Ontario, Canada, capital of Elgin county, on Kettle creek, 13 m. S. of London and 8 m. N. of Lake Erie. Pop. (1901) 11,485. It is an important station on the Grand Trunk, Michigan Central, Lake Erie & Detroit River, and Canadian Pacific railways. It has numerous schools, a collegiate institute, and Alma ladies' college. The Michigan Central railway shops, car-wheel foundry, flour, flax and planing mills are the principal industries.

ST THOMAS (São Thomé), a volcanic island in the Gulf of Guinea immediately north of the equator (0° 23′ N.) and in 6° 40′ E. With the island of Principe (Prince's Island), it forms the Portuguese province of St Thomas. From the Gabun, the nearest point of the mainland of Africa, St Thomas is distant 166 m., and from Cameroon 297 m. The extreme length of the island is 32 m. the breadth W. to E. 21 m.; the area is about 400 sq. m.

From the coast the land rises towards lofty verdant mountains (St Thomas over 7000 ft.). At least a hundred streams, great and small, descend the mountain-sides through deep-cut ravines, many of them forming beautiful waterfalls, such as those of Blu-blu on the Agua Grande. The island during its occupation by the Netherlands acquired the name of "The Dutchman's Churchyard," and the death-rate is still very high. Malaria is common in the lower regions, but the unhealthiness of the island is largely due to the absence of hygienic precautions. During the dry season (June to September) the temperature ranges in the lower parts between 66·2° and 80·6° F., and in the higher parts between 57·2° and 68°; in the rainy season it ranges between 69·8° and 89·6° in the lower parts, and between 64·4° and 80·6° in the higher parts. On Coffee Mount (2265 ft.) the mean of ten years was 68·9°, the maximum 90·5° and the minimum 47·3°. The heat is tempered by the equatorial ocean current. The rainfall is very heavy save on the north coast.

The soil is exceedingly fertile and a considerable area is densely forested. Among the products are oranges, lemons, figs, mangoes, and in the lower districts the vine, pineapple, guava and banana. The first object of European cultivation was sugar, and to this the island owed its prosperity in the 16th century; sugar has been displaced by coffee and, principally, cocoa, introduced in 1795 and 1822 respectively. In 1907 the export of cocoa (including that from Principe) was over 24,000 tons, about a sixth of the world's supply. The cocoa zone lies between 650 and 2000 ft. above the sea. Vanilla and cinchona bark both succeed well, the latter at altitudes of from 1800 to 3300 ft. Rubber, quinine, cinnamon, camphor and the kola-nut are also produced, but since 1890—when the production was under 3000 tons—cocoa has been almost exclusively grown. About 175 sq. m. were in 1910 under cultivation. The value of the imports was £175,000 in 1896 and £708,000 in 1908; that of the exports was £398,000 in 1896 and £1,760,000 in 1908. The shipping trade (190 vessels of 490,000 tons in 1908) is chiefly in the hands of the Portuguese. The revenue (1909–1910) was about £195,000, the expenditure £162,000.

At the census of 1900 the inhabitants were returned at 37,776, of whom 1012 were whites (mainly Portuguese). The town of St Thomas, capital and chief port of the province, residence of the governor and of the Curador (the legal guardian of the *serviçaes*, *i.e.* labourers), is situated on Chaves Bay on the N.E. coast. It is the starting-point of a railway 9 m. long, which connects with the Decauville railways on the cocoa estates. The inhabitants, apart from the Europeans, consist (1) of descendants of the original settlers, who were convicts from Portugal, slaves and others from Brazil and negroes from the Gabun and other parts of the Guinea coast. They number about 8000, are a brown-skinned, indolent race, and occupy rather than cultivate about one-eighth of the island. They are known as "natives" and use a Negro-Portuguese "lingua de S Thomé." (2) On the south-west coast are Angolares—some 3000 in number—descendants of two hundred Angola slaves wrecked at Sete Pedras in 1544. They retain their Bunda speech and customs, and are expert fishermen and canoemen. (3) Contract labourers from Cape Verde, Kabinda, &c., and Angola. These form the bulk of the population. In 1891, before the great development of the cocoa industry, the population was only 22,000.[1]

St Thomas was discovered on the 21st of December 1470 by the Portuguese navigators João de Santarem and Pero de Escobar, who in the beginning of the following year discovered Annobom ("Good Year"). They found St Thomas uninhabited. The first attempts at colonization were João de Paiva's in 1485; but nothing permanent was accomplished till 1493, when a body of criminals and of young Jews taken from their parents to be baptized were sent to the island, and the present capital was founded by Alvaro de Carminha. In the middle of the 16th century there were over 80 sugar mills on the island, which then had a population of 50,000; but in 1567 the settlement was attacked by the French, and in 1574 the Angolares began raids which only ended with their subjugation in 1693. In 1595 there was a slave revolt; and from 1641 to 1644 the Dutch, who had plundered the capital in 1600, held possession of the island. The French did great damage in 1709; the sugar trade had passed to Brazil and internal anarchy reduced St Thomas to a deplorable state. It was not until the later half of the 19th century that prosperity began to return.

The greatly increased demand for cocoa which arose in the last decade of the century led to the establishment of many additional plantations, and a very profitable industry was developed. Planters, however, were handicapped by the scarcity of labour, for though a number of Cape Verde islanders, Krumen and Kabindas sought employment on short-term agreements, the "natives" would not work. The difficulty was met by the recruitment of indentured natives from Angola, as many as 6000 being brought over in one year. The mortality among these labourers was great, but they were very well treated on the plantations. No provision was, however, made for their repatriation, while the great majority were brought by force from remote parts of Central Africa and had no idea of the character of the agreement into which they were compelled to enter. From time to time governors of Angola endeavoured to remedy the abuses of the system, which both in Portugal and Great Britain was denounced as indistinguishable from slavery, notwithstanding that slavery had been legally abolished in the Portuguese dominions in 1878. In March 1909 certain firms, British and German, as the result of investigations made in Angola and St Thomas, refused any longer to import cocoa from St Thomas or Principe Islands unless the recruitment of labourers for the plantations was made voluntary. Representations to Portugal were made by the British government, and the Lisbon authorities stopped recruitment entirely from July 1909 to February 1910, when it was resumed under new regulations. British consular agents were stationed in Angola and St Thomas to watch the working of these regulations. (See statement by Sir E. Grey reported in *The Times*, July 2nd, 1910). As one means of obviating the difficulties encountered in Angola the recruitment of labourers from Mozambique was begun in 1908, the men going out on a yearly contract.

Principe Island lies 90 m. N.E. of St Thomas, has an area of 42 sq. m. and is also of volcanic origin. Pop. (1900) 4327. The tsetse fly (which is not found in St Thomas) infests the wooded part of the island, and through it sleeping sickness has been spread among the inhabitants. The principal industry is the cultivation of cocoa. The chief settlement is St Antonio.

See A. Negreiros, *Historia ethnographica da Ilha de S Thomé* (Lisbon, 1895) and *Île de San Thomé* (Paris, 1901); C. Gravier "Mission scientifique à l'île de San Thomé" *Nouv. Arch. Miss. Scient.* t. xv. (Paris, 1907); A. Pinto de Miranda Guedes, "Viação em S Thomé" in *B.S.G. Lisboa* (1902) pp. 299-357; E. de Campos

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[1] According to Aug. Chevalier (in *O. Occidente*, May 20th, 1910) the population of St Thomas and Principe combined in Dec. 1909 was 68,221, the "natives" being given at over 23,000.

"S. Thomé" *B.S.G. Lisboa* (1908), pp. 113-134; W. A. Cadbury, *Labour in Portuguese West Africa* (2nd ed., London, 1910); *A ilha de S Thomé* (Lisbon, 1907); *The Boa Entrada Plantations* (Edinburgh, 1907); and British Consular reports.

ST THOMAS, an island in the Danish West Indies. It belongs to the Virgin Island group, and lies 40 m. E. of Porto Rico, in 18° 20′ N. and 64° 55′ W. Pop. (1901) 11,012, mostly negroes. It is 13 m. long, varies in width from 1 m. to 4 m. and has an area of 33 m. It consists of a single mountain ridge, the peaks of a submerged range, culminating in West Mountain (1555 ft.). St Thomas stands on a prolongation of the range which supports the Greater Antilles, and is built up of much disintegrated eruptive rock (porphyry and granite). The climate is tropical, varying in temperature between 70° F. and 80° F., modified, however, by the sea breezes. The average yearly rainfall is about 45 in., earthquakes are not unknown, and hurricanes at times sweep over the island. The only town, Charlotte Amalie (pop. 8540), lies in the centre of the S. coast, at the head of one of the finest harbours in the West Indies. This consists of an almost land-locked basin, about ¾ m. across, varying in depth from 27 to 36 ft., and entered by a narrow channel only 300 yds. wide. It is equipped with a floating dock, which can accommodate ships up to 3000 tons, a patent slip for smaller vessels and a repairing yard. Danish is the official language, but English predominates, while French, Spanish and Dutch are also spoken. St Thomas was once the greatest distributing centre in the West Indies, but the introduction of steamships and cables led to its decline, and the removal of the Royal Mail Steamship Company's headquarters to Barbados in 1885 was the final blow. The production of sugar, which decayed gradually after the abolition of slavery, is practically extinct. Aloes, fibrous plants and fruit are grown. St Thomas is the seat of government for the Danish West Indies (St Thomas, St John and St Croix), a crown colony administered by a governor, who is assisted by a colonial council. The governor resides for half the year in St Thomas, and in St Croix for the rest. The chief importance of St Thomas lies in the fact that it is a coaling station for ships plying to and from the West Indies.

The island was discovered by Columbus in 1493, and first colonized by the Dutch in 1657. After their departure in 1667 the island came into the hands of the British, and it was held by them till 1671, when it passed into the hands of the Danish West India Company, which was succeeded in 1685 by the so-called Brandenburg Company, the shareholders of which were mainly Dutch. The king of Denmark having taken over the island in 1754, declared it a free port, and during the European wars of the 18th century the neutrality of Denmark gave a great impetus to the trade of St Thomas. It was during this period that the distributing trade of the island grew up. It was held by the British in 1801 and again from 1807 to 1815, during which it was the great rendezvous of British merchant vessels waiting for convoy. In 1867, when the islands were governed at a loss to the mother country, a treaty was concluded under which the United States agreed to buy them for 7½ million dollars, but, although the suggestion first emanated from the United States, its Senate refused to ratify the treaty. In 1902 another treaty of cession was signed by which the United States was to buy the islands for 5 million dollars, but the Danish parliament rejected it. The importance of the islands to the United States consists in their suitability as a West Indian naval base.

ST TROND, a town of Belgium in the province of Limburg about 18 m. N.W. of Liége. Pop. (1904) 15,116. It occupies an important strategical position with regard to the N.E. frontier of Belgium, and General Brialmont recommended its fortification. In the middle ages it was a fortified town belonging to the bishops of Liége, and Charles the Bold captured it in 1467. In 1566 the Assembly of Compromise met at St Trond.

SAINT-VICTOR, PAUL BINS, Comte de (1827–1881), known as Paul de Saint-Victor, French author, was born in Paris on the 11th of July 1827. His father Jacques B. M. Bins, comte de Saint-Victor (1772–1858), is remembered by his poem *L'Espérance*, and by an excellent verse translation of Anacreon. Saint-Victor, who ceased to use the title of count as being out of keeping with his democratic principles, began as a dramatic critic on the *Pays* in 1851, and in 1885 he succeeded Théophile Gautier on the *Presse*. In 1866 he migrated to the *Liberté*, and in 1869 joined the staff of the *Moniteur universel*. In 1870, during the last days of the second empire, he was made inspector-general of fine arts. Almost all Saint-Victor's work consists of articles, the best known being the collection entitled *Hommes et dieux* (1867). His death interrupted the publication of *Les Deux Masques*, in which the author intended to survey the whole dramatic literature of ancient and modern times. Saint-Victor's critical faculty was considerable, though rather one-sided. He owed a good deal to Théophile Gautier, but he carried ornateness to a pitch far beyond Gautier's. Saint-Victor died in Paris on the 9th of July 1881.

See also Deljant, *Paul de Saint-Victor* (1887).

ST VINCENT, JOHN JERVIS, Earl of (1735–1823), British admiral, was the second son of Swynfen Jervis, solicitor to the admiralty, and treasurer of Greenwich hospital. He was born at Meaford in Staffordshire on the 9th of January 1735, and entered the navy on the 4th of January 1749. He became lieutenant on the 19th of February 1755, and served in that rank till 1759, taking part in the conquest of Quebec. He was made commander of the "Scorpion" sloop in 1759, and post-captain in 1760. During the peace he commanded the "Alarm" 32 in the Mediterranean, and when he was put on half pay he travelled widely in Europe, taking professional notes everywhere. While the War of American Independence lasted, he commanded the "Fourroyant" (80) in the Channel, taking part in the battle of Ushant on the 27th of July 1778 (see Keppel, Viscount) and in the various reliefs of Gibraltar. His most signal service was the capture of the French "Pégase" (74) after a long chase on the 19th of April 1782, for which he was made K.B. In 1783 he entered parliament as member for Launceston, and in the general election of 1784 as member for Yarmouth. In politics he was a strong Whig. On the 24th of September 1787 he attained flag rank, and was promoted vice-admiral in 1793. From 1793 till 1795 he was in the West Indies co-operating with the army in the conquest of the French islands. On his return he was promoted admiral. In November 1795 he took command in the Mediterranean, where he maintained the blockade of Toulon, and aided the allies of Great Britain in Italy.

But in 1796 a great change was produced by the progress of the French armies on shore and the alliance of Spain with France. The occupation of Italy by the French armies closed all the ports to his ships, and Malta was not yet in the possession of Great Britain. Then the addition of the Spanish fleet to the French altered the balance of strength in the Mediterranean. The Spaniards were very inefficient, and Jervis would have held his ground, if one of his subordinates had not taken the extraordinary course of returning to England, because he thought that the dangerous state of the country required that all its forces should be concentrated at home. He was therefore obliged to act on the instructions sent to him and to retire to the Atlantic, withdrawing the garrisons from Corsica and other places. His headquarters were now on the coast of Portugal, and his chief duty was to watch the Spanish fleet at Cadiz. On the 14th of February 1797 he gained a most complete victory against heavy odds (see St Vincent, Battle of). The determination to fight, and the admirable discipline of his squadron, which was very largely the fruit of his own care in preparation, supply the best proof that he was a commander of a high order. For this victory, which came at a very critical time, he was made an earl and was granted a pension of £3000. His qualities as a disciplinarian were soon to be put to a severe test. In 1797 the grievances of the sailors, which were of old standing, and had led to many mutinies of single ships, came to a head in the great general mutinies at Spithead and the Nore. Similar movements took place on the coast of Ireland and at the Cape of Good Hope (see the article Navy: *History*). The spirit spread to the fleet under St Vincent, and there was an undoubted danger that some outbreak would take place in his command. The peril was averted by his foresight and severity. He had always taken great care of the health of his men, and was as strict with the officers as with sailors. It must in justice be added that he was peculiarly fitted for the work. We have ample evidence from his contemporaries that he found a pleasure in insulting officers whom he disliked, as well as in hanging and flogging those of his men who offended him. He carried his strictness with his officers to an extent which aroused the actual hatred of many among them, and exasperated Sir John Orde (1751–1824) into challenging him to fight a duel. Yet he cannot be denied the honour of having raised the discipline of the navy to a higher level than it had reached before; he was always ready to promote good officers, and the efficiency of the squadron with which Nelson won the battle of the Nile was largely due to him. His health broke down under the strain of long cruising, and in June 1799 he resigned his command.

When the earl's health was restored in the following year he took the command of the Channel fleet, into which he introduced his own rigid system of discipline to the bitter anger of the captains. But his method was fully justified by the fact that he was able to maintain the blockade of Brest for 121 days with his fleet. In 1801 he became first lord and held the office till Pitt returned to power in 1803. His administration is famous in the history of the navy, for he now applied himself to the very necessary task of reforming the corruptions of the dockyards. Naturally he was fiercely attacked in and out of parliament. His peremptory character led him to do the right thing with the maximum of dictation at Whitehall as on the quarter-deck of his flagship. He also gave an opening to his critics by devoting himself so wholly to the reform of the dockyards that he neglected the preparation of the fleet for war. He would not recognize the possibility that the peace of Amiens would not last. Pitt made himself the mouthpiece of St Vincent's enemies, mainly because he considered him as a dangerous member of the party which was weakening the position of England in the face of Napoleon. When Pitt's second ministry was formed in 1803, St Vincent refused to take the command of the Channel fleet at his request. After Pitt's death he resumed the duty with the temporary rank of admiral of the fleet in 1806, but held it only till the following year. After 1810 he retired to his house at Rochetts in Essex. The rank of admiral of the fleet was conferred on him in 1821 on the coronation of George IV., and he died on the 14th of March 1823. Lord St Vincent married his cousin Martha Parker, who died childless in 1816. There is a monument to the earl in St Paul's Cathedral, and portraits of him at different periods of his life are numerous. The earldom granted to Jervis became extinct on his death, but a viscounty, created for him in 1801, passed by special remainder to Edward Jervis Ricketts (1767–1857), the second son of his sister Mary who had married William Henry Ricketts, of Longwood, Hampshire. The 2nd viscount took the name of Jervis, and the title is still held by his descendants.

See *Life* by J. S. Tucker (2 vols.), whose father had been the admiral's secretary (marred by excessive eulogy). The life by Captain Brenton is rather inaccurate. The *Naval Career of Admiral John Markham* contains an account of the reforms in the navy. His administrations produced a swarm of pamphlets. Many mentions of him will be found in the correspondence of Nelson.

(D. H.)

ST VINCENT, one of the British Windward Islands in the West Indies, lying about 13° 15′ N., 61° 10′ W., west of Barbados and south of St Lucia. It is about 18 m. long by 11 in extreme width, and has an area of 140 sq. m. A range of volcanic hills forms the backbone of the island; their slopes and spurs are beautifully wooded, and the valleys between the spurs are fertile and picturesque. The culminating point is the volcano called the Soufrière (3500 ft.) in the north, the disastrous eruption of which in May 1902 devastated the most fertile portion of the island, a comparatively level tract lying to the north, called the Carib Country (see below). The climate of St Vincent is fairly healthy and in winter very pleasant; the average annual rainfall exceeds 100 in., and the temperature ranges from 88° F. in August to 66° in December and January. Hurricanes are not uncommon. The capital of the island is Kingstown, beautifully situated on the south-west coast near the foot of Mount St Andrew (2600 ft.).

The population of the island in 1891 was 41,054 (2445 white, 7554 coloured, 31,055 black); in 1906 it was estimated at 44,000. There were about 3300 East Indian coolies, a large number of whom were introduced in 1861 and following years, but on the expiry of their indentures mostly returned home; there were also a few Caribs of mixed blood, the majority of the aboriginal Caribs having been deported to British Honduras in 1797. Kingstown has a population of about 4000. The principal products of the island are sugar (but the sugar-industry has here, as elsewhere, undergone various vicissitudes), arrowroot and rum; and the cultivation of Sea Island cotton, introduced about 1903, has been successfully developed by the government, which established a ginnery at Kingstown. Other articles of export are cacao, cotton, spices, fruit, vegetables, live stock and poultry. The average annual value of exports in 1896–1906 was £63,157 (in 1903–1904, the year following that of the great eruption, it was £38,174, and in 1905–1906 it was £53,078) and of imports, £80,467. In 1905–1906 the value of imports from the United Kingdom was £25,471, and that of exports to the United Kingdom £24,405.

The present constitution dates from 1877, when the legislative council, consisting of four official and four nominated unofficial members, was formed. In 1899 an important scheme was entered upon, by means of a grant of £15,000 from the Imperial treasury, for settling the labouring population, distressed by the failures of the sugar industry, in the position of peasant proprietors. Estates were acquired from private owners for this purpose, and besides this a number of small holdings on crown lands (which are situated mainly in the high-lying central parts of the island) have been sold. Education is carried on in 27 state-aided schools, and there are at Kingstown a grammar school and an agricultural school. The Anglican, Wesleyan and Roman Catholic churches are well represented, and there are some Presbyterians.

St Vincent is generally stated to have been discovered on St Vincent's day, the 22nd of January 1498 by Columbus. Its Carib inhabitants, however, remained undisturbed for many years. In 1627 Charles I. granted the island to the earl of Carlisle; in 1672 it was re-granted to Lord Willoughby, having been previously (1660) declared neutral. In 1722 a further grant of the island was made, to the duke of Montague, and now for the first time a serious effort at colonization was made, but the French insisted on the maintenance of neutrality, and this was confirmed by the treaty of Aix-la-Chapelle (1748). In 1762, however, General Monckton captured the island; the treaty of Paris in 1763 confirmed the British possession, and settlement proceeded in spite of the refusal of the Caribs to admit British sovereignty. Recourse was had to arms, and in 1773 a treaty was concluded with them, when they were granted lands in the north of the island as a reserve. In 1779 the island was surrendered to the French, but it was restored to Britain by the treaty of Versailles (1783). In 1795 the Caribs rose, assisted by the French, and were only put down after considerable fighting by Sir Ralph Abercromby in 1796, after which the majority of them were deported. The emancipation of negro slaves in the island took place in 1838; in 1846 the first Portuguese labourers were introduced, and in 1861 the first East Indian coolies. St Vincent suffered from a terrific hurricane in 1780, and the Soufrière was in eruption in 1821. Severe distress was occasioned by the hurricane of the 11th of September 1898, from which the island had not recovered when it was visited by the eruption of the Soufrière in 1902. This eruption was synchronous with that of Mont Pelé in Martinique (*q.v.*). There had been signs of activity since February 1901, but the most serious eruption took place on the 6th/7th of May 1902. There were earthquakes in the following July, and further eruptions on the 3rd of September and the 15th of October, and on the 22nd of March 1903. Many sugar and arrowroot plantations were totally destroyed, and the loss of life was estimated at 2000. A Mansion House Fund was at once started in London for the relief of the sufferers, and subscriptions were sent from all parts of the civilized world, and notably from the United States.

ST VINCENT, BATTLE OF, fought on the 14th of February 1797, between the British and Spanish fleets, the most famous and important of many encounters which have taken place at the same spot. The battle of 1797 is of peculiar significance in British naval history, not only because it came at a vital moment, but because it first revealed the full capacity of Nelson, which was well known in the navy, to all his countrymen. In the course of 1796 the Spanish government had made the disastrous alliance with the French republic, which reduced its country to the level of a pawn in the game against England. The Spanish fleet, which was in a complete state of neglect, was forced to sea. It consisted of 27 sail of the line under the command of Don José de Córdoba—fine ships, but manned in haste by drafts of soldiers, and of landsmen forced on board by the press. Even the flagships had only about eighty sailors each in their crews. Don José de Córdoba, who had gone out with no definite aim, was in reality drifting about with his unmanageable ships in two confused divisions separated from one another, in light winds from the W. and W.S.W., at a distance of from 25 to 30 m. S.W. of the Cape. While in this position he was sighted by Sir John Jervis, of whose nearness to himself he was ignorant, and who had sailed from Lisbon to attack him with only 15 sail of the line. Jervis knew the inefficient condition of the Spaniards, and was aware that the general condition of the war called for vigorous exertions. He did not hesitate to give battle in spite of the numerical superiority of his opponent. Six of the Spanish ships were to the south of him, separated by a long interval from the others which were to the south west. The British squadron was formed into a single line ahead, and was steered to pass between the two divisions of the Spaniards. The six vessels were thus cut off. A feeble attempt was made by them to molest the British, but being now to leeward as Jervis passed to the west of them, and being unable to face the rapid and well directed fire to which they were exposed, they sheered off. One only ran down the British line, and passing to the stern of the last ship succeeded in joining the bulk of her fleet to windward. As the British line passed through the gap between the Spanish divisions the ships were tacked in succession to meet the windward portion of the enemy. If this movement had been carried out fully, all the British ships would have gone through the gap and the Spaniards to windward would have been able to steer unimpeded to the north, and perhaps to avoid being brought to a close general action. Their chance of escape was baffled by the independence and promptitude of Nelson. His ship, the "Captain" (74), was the third from the end of the British line. Without waiting for orders he made a sweep to the west, threw himself across the bows of the Spaniards. His movement was seen and approved by Jervis, who then ordered the other ships in his rear to follow Nelson's example. The British force was thrown bodily on the enemy. As the Spanish crews were too utterly unpractised to handle their ships, and could not carry out the orders of their officers which they did not understand, their ships were soon driven into a herd, and fell on board of one another. Their incompetence as gunners enabled the "Captain" to assail their flagship, the huge "Santisima Trinidad" (130), with comparative impunity. The "San Josef" (112), and the "San Nicolas" (80), which fell aboard of one another, were both carried by boarding by the "Captain." Four Spanish ships, the "Salvador del Mundo" and "San Josef" (112), the "San Nicolas" (80), and the "San Isidro" (74), were taken. The "Santisima Trinidad" is said to have struck, but she was not taken possession of. By about half-past three the Spaniards were fairly beaten. More prizes might have been taken, but Sir John Jervis put a stop to the action to secure the four which had surrendered. The Spaniards were allowed to retreat to Cadiz. Sir John Jervis was made Earl St Vincent (*q.v.*) for his victory. The battle, which revealed the worthlessness of the Spanish navy, relieved the British government from a load of anxiety, and may be said to have marked the complete predominance of its fleet on the sea.

AUTHORITIES.—A very interesting account of the battle of Cape St Vincent, *A Narrative of the Proceedings of the British Fleet, &c.* (London, 1797), illustrated by plans, was published immediately afterwards by Colonel Drinkwater Bethune, author of the *History of the Siege of Gibraltar*, who was an eyewitness from the "Lively" frigate. See also James's *Naval History* (London, 1837); and Captain Mahan, *The Influence of Sea Power on the French Revolution and Empire* (London, 1892). (D. H.)

ST VITUS'S DANCE,[1] or CHOREA, a disorder of the nervous system occurring for the most part in children, and characterized mainly by involuntary jerking movements of the muscles throughout almost the entire body (see NEUROPATHOLOGY). Among the predisposing causes age is important, chorea being essentially an ailment of childhood and particularly during the period of the second dentition between the ages of nine and twelve. It is not often seen in very young children nor after puberty; but there are many exceptions. It is twice as frequent with girls as with boys. Hereditary predisposition to nervous troubles is apt to find expression in this malady, especially if the general health becomes lowered. Of exciting causes strong emotions, such as fright, ill-usage or hardship of any kind, insufficient feeding, overwork or anxiety, are among the most common; while, again, some distant source of irritation, such as teething or intestinal worms, appears capable of giving rise to an attack. It is an occasional but rare complication of pregnancy. The connexion of chorea with rheumatism is now universally recognized, and is shown not merely by its frequent occurrence before, after or during the course of attacks of rheumatic fever in young persons, but even independently of this by the liability of the heart to suffer in a similar way in the two diseases. Poynton and Paine have demonstrated a diplococcus, which they regard as the specific micro-organism of rheumatism, and which has been found in the lymph spaces in the cortex in chorea. An attempt has recently been made to demonstrate the infectious nature of the chorea.

The symptoms of St Vitus's dance sometimes develop suddenly as the result of fright, but much more frequently they come on insidiously. They are usually preceded by changes in disposition, the child becoming sad, irritable and emotional, while at the same time the general health is somewhat impaired. The first thing indicative of the disease is a certain awkwardness or fidgetiness of manner together with restlessness. In walking, too, slight dragging of one limb may be noticed. The convulsive muscular movements usually first show themselves in one part, such as an arm or a leg, and in some instances they may remain localized to that limited extent, while in all cases there is a tendency for the disorderly symptoms to be more marked on one side than on the other. When fully developed the phenomena of the disease are very characteristic. The child when standing or sitting is never still, but is constantly changing the position of the body or limbs or the facial expression in consequence of the sudden and incoordinate action of muscles or groups of them. These symptoms are aggravated when purposive movements are attempted or when the child is watched. Speech is affected both from the incoordinate movements of the tongue and from phonation sometimes taking place during an act of inspiration. The taking of food becomes a matter of difficulty, since much of it is lost in the attempts to convey it to the mouth, while swallowing is also interfered with owing to the irregular action of the pharyngeal muscles. When the tongue is protruded it comes out in a jerky manner and is immediately withdrawn, the jaws at the same time closing suddenly and sometimes with considerable force. In locomotion the muscles of the limbs act incoordinately and there is a marked alteration of the gait, which is now halting and now leaping, and the child may be tripped by one limb being suddenly jerked in front of the other. In short, the whole muscular system is deranged in its operations, and the term "insanity of the muscles" not inaptly expresses the condition, for they no longer act in harmony or with purpose, but seem, as Trousseau expresses it, each to have a will of its own. The muscles of organic life (involuntary muscles) appear scarcely, if at all, affected in this disease, as, for example, the heart, the rhythmic movements of which are not as a rule impaired. But the heart may suffer in other ways, especially from inflammatory conditions similar to those which attend upon rheumatism and which frequently lay the foundation of permanent heart-disease. In severe cases of St Vitus's dance the child comes to present a distressing appearance, and the physical health declines. Usually, however, there is a remission of the symptoms during sleep. The mental condition of the patient is more or less affected, as shown in emotional tendencies, irritability and a somewhat fatuous expression and bearing, but this change is in general of transient character and ceases with convalescence.

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[1] This name was originally employed in connexion with those remarkable epidemic outbursts of combined mental and physical excitement which for a time prevailed among the inhabitants of some parts of Germany in the middle ages. It is stated that sufferers from this dancing mania were wont to resort to the chapels of St Vitus (more than one in Swabia), the saint being believed to possess the power of curing them. The transference of the name to the disease now under consideration was a manifest error, but so closely has the association now become that the original application of the term has been comparatively obscured.

This disease occasionally assumes a very acute and aggravated form, in which the disorderly movements are so violent as to render the patient liable to be injured, and to necessitate forcible control of the limbs, or the employment of anaesthetics to produce unconsciousness. Such cases are of very grave character, if, as is common, they are accompanied with sleeplessness, and they may prove rapidly fatal by exhaustion. In the great majority of cases, however, complete recovery is to be anticipated sooner or later, the symptoms usually continuing for from one to two months, or even sometimes much longer.

The remedies proposed have been innumerable, but it is doubtful whether any of them has much control over the disease, which under suitable hygienic conditions tends to recover of itself. These conditions, however, are all-important, and embrace the proper feeding of the child with nutritious light diet, the absence of all sources of excitement and annoyance, and the rectification of any causes of irritation and of irregularities in the general health. For a time, and especially if the symptoms are severe, confinement to the house or even to bed may be necessary, but as soon as possible the child should be taken out into the open air and gently exercised by walking. Ruhräh, recognizing the importance of rest, recommends a modified Weir-Mitchell treatment. Of medicinal remedies the most serviceable appear to be zinc, arsenic and iron, especially the last two, which act as tonics to the system and improve the condition of the blood. In view of the connexion of chorea with rheumatism, Koplik and Dr D. B. Lees recommend salicylate of soda in large doses. Recently ergot, hot packs and monobromate of camphor have found advocates, while cessation of the movements has followed the application of an ether spray to the spine twice daily. As sedatives in cases of sleeplessness, bromide of potassium and chloral are of use. In long-continued cases of the disease much benefit will be obtained by a change of air as well as by the employment of moderate gymnastic exercises. The employment of massage and of electricity is also likely to be beneficial. After recovery the general health of the child should for a long time receive attention, and care should be taken to guard against excitement, excessive study or any exhausting condition, physical or mental, from the fact that the disease is apt to recur, and that other nervous disorders still more serious may be developed from it.

In the rare instances of the acute form of this malady, where the convulsive movements are unceasing and violent, the only measures available are the use of chloral or chloroform inhalation to produce insensibility and muscular relaxation, but the effect is only palliative.

SAINT-WANDRILLE, a village of north-western France, in the department of Seine-Inférieure, 28 m. W.N.W. of Rouen by rail. It is celebrated for the ruins of its Benedictine abbey. The abbey church belongs to the 13th and 14th centuries; portions of the nave walls supported by flying buttresses are standing, and the windows and vaulting of the side aisles are in fair preservation. The church communicates with a cloister, from which an interesting door of the Renaissance period opens into the refectory. Beside this entrance is a richly ornamented *lavabo* of the Renaissance period. The refectory is a room over 100 ft. long, lighted by graceful windows of the same period. The abbey was founded in the 7th century by St Wandrille, aided by the donations of Clovis II. It soon became renowned for learning and piety. In the 13th century it was burnt down, and the rebuilding was not completed till the beginning of the 16th century. Later in the same century it was practically destroyed by the Huguenots, and again the restoration was not finished for more than a hundred years. The demolition of the church was begun at the time of the Revolution, but proceeded slowly and in 1832 was entirely stopped.

SAINT YON, a family of Parisian butchers in the 14th and 15th century. Guillaume de Saint Yon is cited as the richest butcher of the Grande Boucherie in the 14th century. The family played an important rôle during the quarrels of the Armagnacs and Burgundians. They were among the leaders of the Cabochian revolution of 1413. Driven out by the Armagnacs, they recovered their influence after the return of the Burgundians to Paris in 1418, but had to flee again in 1436 when the constable, Arthur, earl of Richmond, took the city. Garnier de Saint Yon was *échevin* of Paris in 1413 and 1419; Jean de Saint Yon, his brother, was *valet de chambre* of the dauphin Louis, son of King Charles VI. Both were in the service of the king of England during the English domination. Richard de Saint Yon was master of the butchers of the Grande Boucherie in 1460.

See A. Langnon, *Paris pendant la domination anglaise* (Paris, 1878); A. Colville, *Les Cabochiens et l'ordonnance de 1413.*

ST YRIEIX, a town of west central France, capital of an arrondissement in the department of Haute-Vienne, on the left bank of the Loue, 26 m. S. of Limoges on the railway to Brive. Pop. (1906) town 3604, commune 7916. The town possesses a church in the early Gothic style known as Le Moûtier, dating from the 12th and 13th centuries, and a tower of the 12th century which is a relic of its fortifications. Its quarries of kaolin discovered in 1765 were the first known in France. The town owes its name to Aredius (popularly St Yrieix) who in the 6th century founded a monastery to which its origin was due.

SAIS (Egyptian *Sai*), an ancient city of the Egyptian Delta, lying westward of the Thermuthiac or Sebennytic branch of the Nile. It was capital of the 5th nome of Lower Egypt and must have been important from remote times. In the 8th century B.C. Sais held the hegemony of the Western Delta, while Bubastite families ruled in the east and the kings of Ethiopia in Upper Egypt. The Ethiopians found their most vigorous opponents in the Saite princes Tefnachthus and his son Bocchoris "the Wise" of the XXIVth Dynasty. After reigning six years the latter is said to have been burnt alive by Sabacon, the founder of the Ethiopian XXVth Dynasty. At the time when invasions by the Assyrians drove out the Ethiopian Taracus again and again, the chief of the twenty princes to whom Esarhaddon and Assur-bani-pal successively entrusted the government was Niku, king of Sais and Memphis. His son Psammetichus (*q.v.*) was the founder of the XXVIth Dynasty. Although the main seat of government was at Memphis, Sais remained the royal residence throughout this flourishing dynasty. Neith, the goddess of Sais, was identified with Athena, and Osiris was worshipped there in a great festival.

The brick enclosure wall of the temple is still plainly visible near the little village of Sa el hagar (Sa of stone) on the east bank of the Rosetta branch, but the royal tombs and other monuments of Sais, some of which were described by Herodotus, and its inscribed records, have all gone. Only crude brick ruins and rubbish heaps remain on the site, but a few relics conveyed to Alexandria and Europe in the Roman age have come down to our day, notably the inscribed statue of a priest of Neith who was high in favour with Psammetichus III., Cambyses and Darius. Bronze figures of deities are now the most interesting objects to be found at Sa el hagar.

(F. Ll. G.)

SAISSET, BERNARD (d. *c.* 1314), French bishop, was abbot of Saint Antonin de Pamiers in 1268. Boniface VIII., detaching the city of Pamiers from the diocese of Toulouse in 1295, made it the seat of a new bishopric and appointed Saisset to the see. Of a headstrong temperament, Saisset as abbot energetically sustained the struggle with the counts of Foix, begun two centuries before, for the lordship of the city of Pamiers, which had been shared between the counts and abbots by the feudal contract of *pariage*. The struggle ended in 1297 by an agreement between the two parties as to their common rights, and when the pope raised the excommunication incurred by the count, Saisset absolved him in the refectory of the Dominican monastery in Pamiers (1300). Saisset is, however, famous in French history for his opposition to King Philip IV. As an ardent Languedocian he hated the French, and spoke openly of the king in disrespectful terms. But when he tried to organize a general rising of the south, he was denounced to the king, perhaps by his old enemies the count of Foix and the bishop of Toulouse. Philip IV. charged Richard Leneveu, archdeacon of Auge in the diocese of Lisieux, and

Jean de Picquigni, vidame of Amiens, to make an investigation, which lasted several months. Saisset was on the point of escaping to Rome when the vidame of Amiens surprised him by night in his episcopal palace. He was brought to Senlis, and on the 24th of October 1301 appeared before Philip and his court. The chancellor, Pierre Flotte, charged him with high treason, and he was placed in the keeping of the archbishop of Narbonne, his metropolitan. Philip IV. tried to obtain from the pope the canonical degradation of Saisset. Boniface VIII., instead, ordered the king in December 1301 to free the bishop, in order that he might go to Rome to justify himself. At the same time, he sent the famous bulls *Salvator mundi*, a sort of repetition of *Clericis laicos*, and *Ausculta fili*, which opened a new stage of the quarrel between the pope and king. In the heat of the new struggle Saisset was forgotten. He had been turned over in February 1302 into the keeping of Jacques des Normands, the papal legate, and was ordered to leave the kingdom at once. He lived at Rome until after the incident at Anagni. In 1308 the king pardoned him, and restored him to his see. He died, still bishop of Pamiers, about 1314.

There is no proof for the legend that Bernard Saisset earned Philip IV.'s hatred in 1300–1301 by boldly sustaining the pope's demand for the liberation of the count of Flanders, and by publicly proclaiming the doctrine of papal supremacy.

See Dom Vaissete, *Histoire générale de Languedoc*, ed. Privat, t. ix. pp. 216-310; *Histoire littéraire de la France*, t. xxvi. pp. 540-547; E. de Rozière, *Le Passage de Pamiers*, in Bibliothèque de l'École des Chartes (1871); Ch. V. Langlois in Lavisse's *Histoire de France*, t. iii., pt. ii., pp. 142-146.

SAISSET, ÉMILE EDMOND (1814–1863), French philosopher, was born at Montpellier on the 16th of September 1814, and died at Paris on the 17th of December 1863. He studied philosophy in the school of Cousin, and carried on the eclectic tradition of his master along with Ravaisson and Jules Simon. He was professor of philosophy at Caen, at the École Normale in Paris and later at the Sorbonne.

His chief works are a monograph on Aenesidemus the Sceptic (1840); *Le Scepticisme: Ænésidème, Pascal, Kant* (1845); a translation of Spinoza (1843); *Précurseurs et disciples de Descartes* (1862); *Discours de la philosophie de Leibnitz* (1857)—a work which had great influence on the progress of thought in France; *Essai de philosophie religieuse* (1859); *Critique et histoire de la philosophie* (1865).

SAKA, or SHĀKA, the name of one or more tribes which invaded India from Central Asia. The word is used loosely, especially by Hindu authors, to designate all the tribes which from time to time invaded India from the north, much as all the tribes who invaded China are indiscriminately termed Tatars. Used more accurately, it denotes the tribe which invaded India 130–140 B.C. They are the Sacae and Sakai of classical authors and the Se of the Chinese, which may represent an original Sek or Sök. The Chinese annalists state that they were a pastoral people who lived in the neighbourhood of the modern Kashgar. About 160 B.C. they were driven southward by the advance of the Yue-Chi from the east. One portion appears to have settled in western Afghanistan, hence called Sakasthāna, in modern Persian Sejistan. The other section occupied the Punjab and possessed themselves of the territory which the Graeco-Bactrian kings had acquired in India, that is Sind, Gujarat and Malwa. The rulers of these provinces bore the title of Satrap (Kshatrapa or Chhatrapa) and were apparently subordinate to a king who ruled over the valley of Kabul and the Punjab. In 57 B.C. the Sakas were attacked simultaneously by Parthians from the west and by the Malava clans from the east and their power was destroyed. It should be added that what we know of Saka history is mostly derived from coins and inscriptions which admit of various interpretations and that scholars are by no means agreed as to names and dates. In any case their power, if it lasted so long, must have been swept away by the Kushan conquest of Northern India.

Nothing is known of the language or race of the Sakas. Like most of the invaders of India at this period they adopted Buddhism, at least partially. They can be traced to the neighbourhood of Kashgar, but not like the Yue-Chi to the frontiers of China. They may have been Turanians akin to that tribe, or they may have been Iranians akin to the Iranian element in Transoxiana and the districts south of the Pamirs. They cannot be the same as the Scythians of Europe, though the name and original nomadic life are points in common.

See Vincent Smith, *Early History of India* (1908); O. Franke, *Beiträge aus chinesischen Quellen zur Kenntnis der Türkvölker und Skythen* (1904); P. Gardner, *Coins of Greek and Scythian Kings in India* (1886); and various articles by Vincent Smith, Fleet, Cunningham, A Stein, Sylvain Levi and others in the *Journal* of the Royal Asiatic Society, *Journal asiatique*, *Indian Antiquary*, *Zeitsch. der Deutschen Morgenländischen Gesellschaft*, &c. (C. EL.)

SAKAI, an aboriginal people of the Malay peninsula found chiefly in south Perak, Selangor and Pahang. Representatives are widely scattered among Malayan villages, but these are so crossed with the Malays as to be no longer typical. An attempt has been made to identify the Sakai with the Mon-Annam group of races, *i.e.* the tribes which till 600 years ago possessed what is now Siam, and some of whom still occupy Pegu and Cambodia. Professor Virchow suggested that the Sakai belong to what he calls the Dravido-Australian race, the chief representatives of which he finds in the Veddahs of Ceylon, the civilized Tamils of south India and the aborigines of Australia. In essential characteristics of hair and head there is a remarkable agreement. The difficulty in accepting the theory is in the colour of the skin, which among the Sakais is often a light shade of yellowish brown, whereas among Tamils black is the prevailing colour. Virchow meets this by pointing out that Sinhalese, though admittedly Aryans, are often so dark as to be practically black. The Sakais are, however, it is now generally held, kinsmen of their Negrito neighbours, the Semangs (*q.v.*), and are, like the latter, dwarfish, seldom exceeding 4 ft. 9 in. Their skins are usually a darkish brown, but showing a reddish tinge about the breast and extremities. The head is long, and the hair a black brown, rather wavy then woolly. The face inclines to be long, and would be hatchet-shaped but for the breadth of the cheek bones. The chin is long and pointed, the forehead high and flat, the brows often beetling. The nose is small, slightly tilted or rounded off at the tip, but broad and with deep-set nostrils. The beard is usually scanty. The arm-stretch is almost always greater than their height. Their food is varied; the wilder tribes living on jungle fruits and game they hunt with the blow-pipe, while the more civilized grow yams, sweet potatoes, maize, sugar cane, rice and tapioca. The Sakai blow-pipe is a tube 6 to 8 ft. long formed of a single joint of a rare species of bamboo (*Bambusa Wrayi*). This tube is inserted into another for protection. The darts are made of fine slivers from the mid-rib of the leaf of certain palms, and are about the size of a knitting needle. The point is usually coated with poison compounded from the sap of the Upas tree (*Antiaris toxicaria*) and of a species of strychnos. Each dart is carried in a separate reed, thirty to fifty of these latter being rolled up and carried in a bamboo quiver. The Sakais can kill at thirty paces with these blow-pipes. They are nomads, building mere leaf-shelters in or under the trees. Their dress is of bark-cloth and they scar their faces, as do the Semangs. They are skilful in mat-making and basket-work, but they have no kind of weaving or pottery. They are musical, using a rough lute of bamboo and a nose-flute, and they sing well in chorus. They have in common with the Semangs curious marriage ceremonies. The dead are slung from a pole and carried to a distant spot in the jungle. Here, wrapped in new bark-cloth, the body is buried in a shallow trench, the clothes worn by the deceased being burned in a fire lighted near the grave. When filled up, rice is sown on the grave and watered, and some herbs and bananas are planted round it for the soul to feed on. Afterwards a three-cornered hutch, not unlike a doll's-house but mounted on high piles, is built at the foot, in which the soul may live. This soul-house is about 1½ ft. high, is thatched with leaves and has a ladder by which the soul can climb in.

SAKÉ, the national beverage of Japan. In character it stands midway between beer and wine. It is made chiefly from rice (see BREWING). Saké contains 12 to 15% of alcohol and about 3% of solid matter (extractives), 0·3% of lactic acid, a small quantity of volatile acid, 0·5 % of sugar and 0·8 % of glycerin. There are about 20,000 saké breweries in Japan, and the annual output is about 150 million gallons. Saké is a yellowish-white liquid, its flavour somewhat resembling that of madeira or sherry. It is warmed prior to consumption, as the flavour is thereby improved and it is rendered more digestible. The name is said to be derived from the town of Osaka which, from time immemorial, has been famous for its saké. According to Morewood it is probable that the wine called "sack" in England derived its name from the Japanese liquor, being introduced by Spanish and Portuguese traders (see Wine).

SAKHALIN, or Saghalien, a large elongated island in the North Pacific, lying between 45° 57′ and 54° 24′ N., off the coast of the Russian Maritime Province in East Siberia, divided between the Russian and Japanese empires. Its proper Ainu name, *Karafuto* or *Karaftu*, has been restored to the island by the Japanese since 1905. Sakhalin is separated from the mainland by the narrow and shallow Strait of Tartary or Mamiya Strait, which often freezes in winter in its narrower part, and from Yezo (Japan) by the Strait of La Pérouse. The island is 600 m. long, and 16 to 105 broad, with an area of 24,560 sq. m.

Its orography and geological structure are imperfectly known. Two, or perhaps three, parallel ranges of mountains traverse it from north to south, reaching 2000 to 5000 ft. (Mt. Ichara, 4860 ft.) high, with two or more wide depressions, not exceeding 600 ft. above the sea. Crystalline rocks crop out at several capes; Cretaceous limestones, containing an abundant and specific fauna of gigantic ammonites, occur at Dui on the west coast, and Tertiary conglomerates, sandstones, marls and clays, folded by subsequent upheavals, in many parts of the island. The clays, which contain layers of good coal and an abundant fossil vegetation, show that during the Miocene period Sakhalin formed part of a continent which comprised north Asia, Alaska and Japan, and enjoyed a comparatively warm climate. The Pliocene deposits contain a mollusc fauna more arctic than that which exists at the present time, indicating probably that the connexion between the Pacific and Arctic Oceans was broader than it is now. Only two rivers are worthy of mention. The Tym, 250 m. long and navigable by rafts and light boats for 50 m., flows north and north-east with numerous rapids and shallows, and enters the Sea of Okhotsk. The Poronai flows south-south-east to the Gulf of Patience or Shichiro Bay, on the south-east coast. Three other small streams enter the wide semicircular Gulf of Aniva or Higashifushimi Bay at the southern extremity of the island.

Owing to the influence of the raw, foggy Sea of Okhotsk, the climate is very cold. At Dui the average yearly temperature is only 33·0° Fahr. (January 3·4°; July 61·0°), 35·0° at Kusunai and 37·6° at Aniva (January, 9·5°; July, 60·2°). At Alexandrovsk near Dui the annual range is from 81° in July to −38° in January, while at Rykovsk in the interior the minimum is −49° Fahr. The rainfall averages 22⅓ in. Thick clouds for the most part shut out the sun; while the cold current from the Sea of Okhotsk, aided by north-east winds, brings immense ice-floes to the east coast in summer. The whole of the island is covered with dense forests, mostly coniferous. The Ayan spruce (*Abies ayanensis*), the Sakhalin fir (*Abies sachalensis*) and the Daurian larch are the chief trees; on the upper parts of the mountains are the Siberian rampant cedar (*Cembra pumila*) and the Kurilian bamboo (*Arundinaria kurilense*). Birch, both European and Kamchatkan (*Betula alba* and *B. Ermani*), elder, poplar, elm, wild cherry (*Prunus padus*), *Taxus baccata* and several willows are mixed with the conifers; while farther south the maple, mountain ash and oak, as also the Japanese *Panax ricinifolium*, the Amur cork (*Philodendron amurense*), the spindle tree (*Euonymus macropterus*) and the vine (*Vitis thunbergii*) make their appearance. The underwoods abound in berry-bearing plants (*e.g.* cloudberry, cranberry, crowberry, red whortleberry), berried elder (*Sambucus racemosa*), wild raspberry and *Spiraea*. Bears, foxes, otters and sables are numerous, as also the reindeer in the north, and the musk deer, hares, squirrels, rats and mice everywhere. The avi-fauna is the common Siberian, and the rivers swarm with fish, especially species of salmon (*Oncorhynchus*). Numerous whales visit the sea-coast. Sea-lions, seals and dolphins are a source of profit.

Sakhalin was inhabited in the Neolithic Stone Age. Flint implements, exactly like those of Siberia and Russia, have been found at Dui and Kusunai in great numbers, as well as polished stone hatchets, like the European ones, primitive pottery with decorations like those of Olonets and stone weights for nets. Afterwards a population to whom bronze was known left traces in earthen walls and kitchen-middens on the Bay of Aniva. The native inhabitants consist of some 2000 Gilyaks, 1300 Ainus, with 750 Orochons, 200 Tunguses and some Yakuts. The Gilyaks in the north support themselves by fishing and hunting. The Ainus inhabit the south part of the island. There are also 32,000 Russians, of whom over 22,150 are convicts. A little coal is mined and some rye, wheat, oats, barley and vegetables are grown, although the period during which vegetation can grow averages less than 100 days. Fishing is actively prosecuted, especially by the Japanese in the south.

History.—Sakhalin, which was under Chinese dominion until the 19th century, became known to Europeans from the travels of Martin Gerritz de Vries in the 17th century, and still better from those of La Pérouse (1787) and Krusenstern (1805). Both, however, regarded it as a peninsula, and were unaware of the existence of the Strait of Tartary, which was discovered in 1809 by a Japanese, Mamiya Rinzo. The Russian navigator Nevelskoi in 1849 definitively established the existence and navigability of this strait. The Russians made their first permanent settlement on Sakhalin in 1857; but the southern part of the island was held by the Japanese until 1875, when they ceded it to Russia. By the treaty of Portsmouth (U.S.A.) of 1905 the southern part of the island below 50° N. was re-ceded to Japan, the Russians retaining the other three-fifths of the area.

See C. H. Hawes, *In the Uttermost East* (London, 1903).
(P. A. K.; J. T. Be.)

SAKI, the native name of a group of tropical American monkeys nearly allied to those known as uakaris (see Uakari), with which they agree in the forward inclination of the lower incisor teeth, the depth of the hinder part of the lower jaw, and the non-prehensile tail. The sakis, which form the genus *Pithecia*, are specially characterized by their long and generally bushy tails, distinct whiskers and beard, and the usually elongated hair on the crown of the head, which may either radiate from a point in the centre, or be divided by a median parting. They are very delicate animals, difficult to keep in confinement, and in that state exhibiting a gentle disposition, and being normally silent (see Primates).

SAKURA-JIMA, a Japanese island, oval in shape and measuring 7 m. by 5 m., lying in the northern part of the Bay of Kagoshima (31° 40′ N., 130° 35′ E.). It has a volcano 3743 ft. high (of which an eruption was recorded in 1779), and is celebrated for its hot springs, its oranges and its giant radishes (*daikon*), which sometimes weigh as much as 70 ℔.

SALA, GEORGE AUGUSTUS HENRY (1828–1895), English journalist, was born in London, on the 24th of November 1828. His father, Augustus John James Sala (1792–1828), was the son of Claudio Sebastiano Sala, an Italian, who came to London to arrange ballets at the theatres; his mother, Henrietta Simon (1789–1860), was an actress and teacher of singing. Sala was at school in Paris and studied drawing in London. In his earlier years he did odd jobs in scene-painting and book illustration. He wrote a tragedy in French, *Frédégonde*, before he was ten years old, and in 1851 attracted the attention of Charles Dickens, who published articles and stories by him in *Household Words* and *All the Year Round*, and in 1856 sent him to Russia as a special correspondent. About the same time he got to know Edmund Yates, with whom, in his earlier years, he was constantly connected in his journalistic ventures. From 1860 to 1886, over his own initials, he wrote "Echoes of the Week" for the *Illustrated London News*. Afterwards they were continued in a syndicate of weekly newspapers almost to his death. Thackeray, when editor of the *Cornhill*, published articles by him on Hogarth in 1860, which were issued in volume form in 1866. In 1860 he started *Temple Bar*, which he edited till 1866 when the magazine was taken over by Messrs Bentley. Meanwhile he had become in 1857 a contributor to the London *Daily Telegraph*, and it was in this capacity that he did his most characteristic work, whether as a foreign correspondent in all parts of the world, or as a writer of leaders or special articles. His literary style was highly coloured, bombastic, egotistic and full of turgid periphrases, but his articles were invariably full of interesting matter and helped to make the reputation of the paper. He collected a large library and had an elaborate system of commonplace-books, so that he could bring into his articles enough show or reality of special information to make excellent reading for a not very critical public; he had an extraordinary faculty for never saying the same thing twice in the same way. He earned a large income from the *Telegraph* and other sources, but he never could keep his money. In 1863 he started on his first tour as special foreign correspondent to his paper. He spent the year 1864 in America and published a *Diary* of the war. Expeditions to Algiers, to Italy during Garibaldi's 1866 campaign, to Metz during the Franco-German war, to Spain in 1875 at the end of the Carlist war, were among his early journalistic enterprises, the long list of which closed with his journey through America and Australia in 1885. In 1892, when his reputation was at its height, he started a weekly paper called *Sala's Journal*, but it was a disastrous failure; and in 1895 he had to sell his library of 13,000 volumes. Lord Rosebery gave him a civil list pension of £100 a year, but he was a broken-down man, and he died at Brighton on the 8th of December 1895. Sala published many volumes of fiction, travels and essays, and edited various other works, but his *métier* was that of ephemeral journalism.

See *The Life and Adventures of George Augustus Sala, written by himself* (2 vols., 1895).

SALAAM (Arab. *salam*, "peace"), the Oriental term for a salutation. The word is used for any act of salutation, as of an ambassador to a monarch, and so in a secondary sense of a compliment. Properly it is the oral salutation of Mahommedans to each other; but it has acquired the special meaning of an act of obeisance.

SALAD (Med. Lat. *salata*, salted, pickled, *salare*, to sprinkle with salt), a dish, originally dressed with salt, of green uncooked herbs, such as lettuce, endive, mustard, cress, &c., usually served with a flavouring of onion, garlic or leeks, and with a dressing of vinegar, oil, mustard, pepper and salt, or with a cream, for which there are many receipts; hard-boiled eggs, radishes and cucumber are also added.

SALADE, Sallet or Salet, a head-piece introduced in the early 15th century replacing the heavy helmet. Its essential features are its smooth rounded surface, like an inverted bowl, and its long projecting neck guard. Usually there was no movable vizor, but the front fixed part covered most of the face, a slit being left for the eyes. The word is said to come through the Old Fr. from the Span. *celada*, Ital. *celata*, Lat. *caelata*, sc. *cassis*, engraved helmet, *caelare*, to engrave, chase (see Helmet).

SALADIN (Arab. *Sala-ud-din*, "Honouring the Faith") (1138–1193), first Ayyubite sultan of Egypt, was born at Tekrit in 1138. The brilliance of his career was only made possible by the condition of the East in the 12th century. Such authority as remained to the orthodox caliph of Bagdad (see Caliphate) or the heretical Fatimites (*q.v.*) of Cairo was exercised by their viziers. The Seljukian empire had, after 1076, been divided and subdivided among Turkish atabegs. The Latin kingdom of Jerusalem had existed since 1089 only because it was a united force in the midst of disintegration. Gradually, however, Christian enthusiasm had aroused a counter enthusiasm among the Moslems. Zengi, atabeg of Mosul, had inaugurated the sacred war by his campaigns in Syria (1137–1146). Nur-ed-din, his son, had continued his work by further conquests in Syria and Damascus, by the organization of his conquered lands, and, in 1157, by "publishing everywhere the Holy War." The opportunity of Saladin lay therefore in the fact that his lifetime covers the period when there was a conscious demand for political union in the defence of the Mahommedan faith. By race Saladin was a Kurd of Armenia. His father, Ayyub (Job), and his uncle Shirkuh, sons of a certain Shadhy of Ajdanakan near Dawin, were both generals in Zengi's army. In 1139 Ayyub received Baalbek from Zengi, in 1146 he moved, on Zengi's death, to the court of Damascus. In 1154 his influence secured Damascus to Nur-ed-din and he was made governor. Saladin was therefore educated in the most famous centre of Moslem learning, and represented the best traditions of Moslem culture.

His career falls into three parts, his conquests in Egypt 1164–1174, the annexation of Syria 1174–1187, and lastly the destruction of the Latin kingdom and subsequent campaigns against the Christians, 1187–1192. The conquest of Egypt was essential to Nur-ed-din. It was a menace to his empire on the south, the occasional ally of the Franks and the home of the unorthodox caliphs. His pretext was the plea of an exiled vizier, and Shirkuh was ordered to Egypt in 1164, taking Saladin as his lieutenant. The Christians under Count Amalric immediately intervened and the four expeditions which ensued in 1164, 1167, 1168 and 1169 were duels between Christians and Saracens. They resulted in heavy Christian losses, the death of Shirkuh and the appointment of Saladin as vizir. His relations towards the unorthodox caliph Nur-ed-din were marked by extraordinary tact. In 1171 on the death of the Fatimite caliph he was powerful enough to substitute the name of the orthodox caliph in all Egyptian mosques. The Mahommedan religion was thus united against Christianity. To Nur-ed-din he was invariably submissive, but from the vigour which he employed in adding to the fortifications of Cairo and the haste with which he retreated from an attack on Montréal (1171) and Kerak (1173) it is clear that he feared his lord's jealousy.

In 1174 Nur-ed-din died, and the period of Saladin's conquests in Syria begins. Nur-ed-din's vassals rebelled against his youthful heir, es-Salih, and Saladin came north, nominally to his assistance. In 1174 he entered Damascus, Emesa and Hamah; in 1175 Baalbek and the towns round Aleppo. The next step was political independence. He suppressed the name of es-Salih in prayers and on the coinage, and was formally declared sultan by the caliph 1175. In 1176 he conquered Saif-ud-din of Mosul beyond the Euphrates and was recognized as sovereign by the princes of northern Syria. In 1177 he returned by Damascus to Cairo, which he enriched with colleges, a citadel and an aqueduct. From 1177 to 1180 he made war on the Christians from Egypt, and in 1180 reduced the sultan of Konia to submission. From 1181–1183 he was chiefly occupied in Syria. In 1183 he induced the atabeg Imad-ud-din to exchange Aleppo for the insignificant Sinjar and in 1186 received the homage of the atabeg of Mosul. The last independent vassal was thus subdued and the Latin kingdom enclosed on every side by a hostile empire.

In 1187 a four years' truce was broken by the brilliant brigand Renaud de Châtillon and thus began Saladin's third period of conquest. In May he cut to pieces a small body of Templars and Hospitallers at Tiberias, and, on July 4th, inflicted a crushing defeat upon the united Christian army at Hittin. He then overran Palestine, on September 20th besieged Jerusalem and on October 2nd, after chivalrous clemency to the Christian inhabitants, crowned his victories by entering and purifying the Holy City. In the kingdom only Tyre was left to the Christians. Probably Saladin made his worst strategical error in neglecting to conquer it before winter. The Christians had thus a stronghold whence their remnant marched to attack Acre in June 1189. Saladin immediately surrounded the Christian army and thus began the famous two years' siege.

Saladin's lack of a fleet enabled the Christians to receive reinforcements and thus recover from their defeats by land. On the 8th of June 1191 Richard of England arrived, and on the 12th of July Acre capitulated without Saladin's permission. Richard followed up his victory by an admirably ordered march down the coast to Jaffa and a great victory at Arsuf. During 1191 and 1192 there were four small campaigns in southern Palestine when Richard circled round Beitnuba and Ascalon with Jerusalem as objective. In January 1192 he acknowledged his impotence by renouncing Jerusalem to fortify Ascalon. Negotiations for peace accompanied these demonstrations, which showed that Saladin was master of the situation. Though in July Richard secured two brilliant victories at Jaffa, the treaty made on the 2nd of September was a triumph for Saladin. Only the coast line was left to the Latin kingdom, with a free passage to Jerusalem; and Ascalon was demolished. The union of the Mahommedan East had beyond question dealt the death-blow to the Latin kingdom. Richard returned to Europe, and Saladin returned to Damascus, where on the 4th of March 1193, after a few days' illness, he died. He was buried in Damascus and mourned by the whole East.

The character of Saladin and of his work is singularly vivid. In many ways he was a typical Mahommedan, fiercely hostile towards unbelievers—"Let us purge the air of the air they breathe" was his aim for the demons of the Cross,—intensely devout and regular in prayers and fasting. He showed the pride of race in the declaration that "God reserved this triumph for the Ayyubites before all others." His generosity and hospitality were proved in his gifts to Richard and his treatment of captives. He had the Oriental's power of endurance, alternating with violent and emotional courage. Other virtues were all his own, his extreme gentleness, his love for children, his flawless honesty, his invariable kindliness, his chivalry to women and the weak. Above all he typifies the Mahommedan's utter self-surrender to a sacred cause. His achievements were the inevitable expression of his character. He was not a statesman, for he left no constitution or code to the East; his empire was divided among his relatives on his death. As a strategist, though of great ability, he cannot be compared to Richard. As a general, he never organized an army. "My troops will do nothing," he confessed, "save when I ride at their head and review them." His fame lives in Eastern history as the conqueror who stemmed the tide of Western conquest on the East, and turned it definitely from East to West, as the hero who momentarily united the unruly East, and as the saint who realized in his personality the highest virtues and ideals of Mahommedanism.

AUTHORITIES.—The contemporary Arabian authorities are to be found in Michaud's *Recueil des historiens des Croisades* (Paris. 1876). This contains the work of Baha-ud-din (1145–1234), diplomatist, and secretary of Saladin, the general history of Ibn-Athir (1160–1233), the eulogist of the atabegs of Mosul but the unwilling admirer of Saladin, and parts of the general history of Abulfeda. The biography of the poet Osema ibn Murkidh (1095–1188), edited by Derenbourg (Paris, 1886), gives an invaluable picture of Eastern life. Later Arabian authorities are Ibn Khallikan (1211–1282) and Abu-Shama (born 1267). Of Christian authorities the following are important, the history of William of Tyre (1137–1185), the *Itinerarium peregrinorum*, probably the Latin version of the *Carmen Ambrosii* (ed. by Stubbs, "Rolls" series, London, 1864), and the *Chronique d'outremer*, or the French translation of William of Tyre's history and its continuation by Ernoul, the squire of Balian, seigneur of Ibelin, 1228. The best modern authority is Stanley Lane-Poole's *Saladin* ("Heroes of the Nations" series, London, 1903). See also the bibliography to CRUSADES. (W. F. K.)

SALAMANCA, a frontier province of eastern Spain, formed in 1833 out of the southern part of the ancient kingdom of Leon, and bounded on the N. by Zamora and Valladolid, E. by Ávila, S. by Cáceres and W. by Portugal. Pop. (1900) 320,765; area, 4829 sq. m. Salamanca belongs almost entirely to the basin of the Duero (Portuguese *Douro, q.v.*), its principal rivers being the Tormes, which follows the general slope of the province towards the north-west, and after a course of 135 m. flows into the Duero, which forms part of the north-west boundary; the Yeltes and the Agueda, also tributaries of the Duero; and the Alagon, an affluent of the Tagus. The northern part of the province is flat, and at its lowest point (on the Duero) is 488 ft. above sea-level. The southern border is partly defined along the crests of the Grédos and Gata ranges, but the highest point is La Alberca (5692 ft.) in the Sierra de Peña Francia, which rises a little farther north. The rainfall is irregular; but where it is plentiful the soil is productive and there are good harvests of wine, oil, hemp, and cereals of all kinds. Forests of oak, pine, beech and chestnut cover a wide area in the south and south-west; and timber is sent in large quantities to other parts of Spain. Sheep and cattle also find good pasturage, and out of the forty-nine Spanish provinces only Badajoz, Cáceres and Teruel have a larger number of live stock. Gold is found in the streams, and iron, lead, copper, zinc, coal and rock crystal in the hills, but the mines are only partially developed, and it is doubtful if the deposits would repay exploitation on a larger scale. The manufactures of the province are few and mostly of a low class, intended for home consumption, such as frieze, coarse cloth, hats and pottery. The capital, Salamanca (pop. 1900, 25,690), and the town of Ciudad Rodrigo (8930) are described in separate articles. Béjar (9488) is the only other town of more than 5000 inhabitants. The railways from Zamora, Medina, Plasencia and Peñaranda converge upon the capital, whence two lines go westward into Portugal—one via Barca d'Alva to Oporto, the other via Villar Formoso to Guarda. Few Spanish provinces lose so small a number of emigrants, and the population tends gradually to increase. See also LEON.

SALAMANCA (anc. *Salmantica* or *Elmantica*), the capital of the Spanish province of Salamanca, on the right bank of the river Tormes, 2648 ft. above sea-level and 172 m. by rail N.W. of Madrid. Pop. (1900) 25,690. Salamanca is the centre of a network of railways which radiate N. to Zamora, N.E. to Medina, E. to Peñaranda, S. to Plasencia, W.S.W. to Guarda in Portugal, and W. to Oporto in Portugal. The river is here crossed by a bridge 500 ft. long built on twenty-six arches, fifteen of which are of Roman origin, while the remainder date from the 16th century. The city is still much the same in outward appearance as when its tortuous streets were thronged with students. The university was naturally the chief source of wealth to the town, the population of which in the 16th century numbered 50,000, 10,000 of whom were students. Its decay of course reacted on the townsfolk, but it fortunately also arrested the process of modernization. The ravages of war alone have wrought serious damage, for the French in their defensive operations in 1811–1812 almost destroyed the western quarter. The ruins still remain, and give an air of desolation which is not borne out by the real condition of the inhabitants, however poverty-stricken they may appear. Side by side with the remains of a great past are the modern buildings: two theatres, a casino, bull-ring, town hall and electric light factory. The magnificent Plaza Mayor, built by Andres Garcia de Quiñones at the beginning of the 18th century, and capable of holding 20,000 people to witness a bull-fight, is one of the finest squares in Europe. It is surrounded by an arcade of ninety arches on Corinthian columns, one side of the square being occupied by the municipal buildings. The decorations of the façades are in the Renaissance style, and the plaza as a whole is a fine sample of Plateresque architecture.

The University.—Salamanca is still rich in educational establishments. It still keeps up its university, with the separate faculties of letters, philosophy, sciences, law and medicine; its university and provincial public library, with 80,000 volumes and 1000 MSS.; its Irish college, provincial institute, superior normal school, ecclesiastical seminary (founded in 1778), economic and other learned societies, and very many charitable foundations. The city has still its 25 parishes, 25 colleges, and as many more or less ruinous convents, and 10 yet flourishing religious houses. The university, the oldest in the Peninsula, was founded about 1230 by Alphonso IX. of Leon, and refounded in 1242 by St Ferdinand of Castile. Under the patronage of the learned Alphonso X. its wealth and reputation greatly increased (1252–1282), and its schools of canon law and civil law attracted students even from Paris and Bologna. In the 15th and 16th centuries it was renowned throughout Europe. Here Columbus, to whom a statue was erected in 1891, lectured on his discoveries, and here the Copernican system was taught long before it had won general acceptance. But soon after 1550 a period of decline set in. The university statutes were remodelled in 1757, but financial troubles and the incessant wars which checked almost every reform in Spain prevented any recovery up to 1857, when a fresh reorganization was effected. At the beginning of the 20th century the number of students was about 1200, and the number of professors 19—fewer than in any other Spanish university.

Principal Buildings.—The chief objects of interest in the city are the old and new cathedrals. The old cathedral is a cruciform building of the 12th century, begun by Bishop Jerónimo, the confessor of the Cid (*q.v.*). Its style of architecture is that Late Romanesque which prevailed in the south of France, but the builder showed much originality in the construction of the dome, which covers the crossing of the nave and transepts. The inner dome is made to spring, not from immediately above the arches, but from a higher stage of a double arcade pierced with windows. The thrust of the vaulting is borne by four massive pinnacles, and over the inner dome is an outer pointed one covered with tiles. The whole forms a most effective and graceful group. On the vault of the apse is a fresco of Our Lord in Judgment by the Italian painter Nicolas Florentino (15th century). The reredos, which has the peculiarity of fitting the curve of the apse, contains fifty-five panels with paintings mostly by the same artist. There are many fine monuments in the south transept and cloister chapels. An adjoining building, the Capilla de Talavera, is used as a chapel for service according to the Mozarabic rite, which is celebrated there six times a year. On the north of and adjoining the old church stands the new cathedral, built from designs by Juan Gil de Ontañon. Though begun in 1509 the work of construction made little progress until 1513, when it was entrusted to Ontañon under Bishop Francisco de Bobadilla; though not finished till 1734, it is a notable example of the late Gothic and Plateresque styles. Its length is 340 ft. and its breadth 160 ft. The interior is fairly Gothic in character, but on the outside the Renaissance spirit shows itself more clearly, and is fully developed in the dome. Everywhere the attempt at mere novelty or richness results in feebleness. The main arch of the great portal consists of a simple trefoil, but the label above takes an ogee line, and the inner arches are elliptical. Above the doors are bas-reliefs, foliage, &c., which in exuberance of design and quality of workmanship are good examples of the latest efforts of Spanish Gothic. The church contains paintings by J. F. de Navarrete (1526–1579) and L. de Morales (*c.* 1509–1586), and some overrated statues by Juan de Juni (16th century). The treasury is very rich, and amongst other articles possesses a custodia which is a masterpiece of goldsmith's work, and a bronze crucifix of undoubted authenticity, which was borne before the Cid in battle. The great bell weighs over 23 tons. Of the university buildings the façade of the library is a peculiarly rich example of late 15th-century Gothic. The cloisters are light and elegant; the grand staircase ascending from them has a fine balustrade of foliage and figures. The Colegio de Nobles Irlandeses, formerly Colegio de Santiago Apostol, was built in 1521 from designs by Pedro de Ibarra. The double arcaded cloister is a fine piece of work of the best period of the Renaissance. The Jesuit College is an immense and ugly Renaissance building begun in 1614 by Juan Gomez de Mora. The Colegio Viejo, also called San Bartolomé, was rebuilt in the 18th century, and now serves as the governor's palace. The convent of Santo Domingo, sometimes called San Esteban, shows a mixture of styles from the 13th century onwards. The church is Gothic with a Plateresque façade of great lightness and delicacy. It is of purer design than that of the cathedral; nevertheless it shows the tendency of the period. The reredos, one of the finest Renaissance works in Spain, contains statues by Salvador Carmona, and a curious bronze statuette of the Virgin and Child on a throne of champlevé enamel of the 12th century. The chapter-house, built by Juan Moreno in 1637, and the staircase and sacristy are good examples of later work. The convent of the Augustinas Recoletas, begun by Fontana in 1616, is in better taste than any other Renaissance building in the city. The church is rich in marble fittings and contains several fine pictures of the Neapolitan school, especially the Conception by J. Ribera (1588–1656) over the altar. The convent of the Espirita Santo has a good door by A. Berruguete (*c.* 1480–1561). There is also a rather effective portal to the convent of Las Dueñas. The church of S. Marcos is a curious circular building with three eastern apses; and the churches of S. Martin and S. Matteo have good early doorways. Many of the private houses are untouched examples of the domestic architecture of the prosperous times in which they were built. Such are the Casa de las Conchas, the finest example of its period in Spain; the Casa de la Sal, with a magnificent courtyard and sculptured gallery; and the palaces of Maldonado, Monterey and Espinosa.

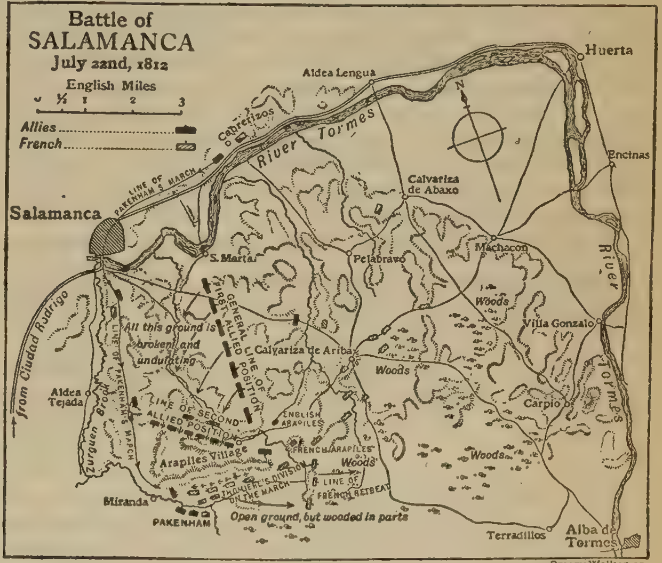
In the middle ages the trade of Salamanca was not insignificant, and the stamped leather-work produced there is still sought after. Its manufactures are now of little consequence, and consist of china, cloth and leather. The transport trade is, however, of more importance, and shows signs of increasing, as a result of the extension of railway communication between 1875 and 1900. During this period the population increased by nearly 7000.

History.—The town was of importance as early as 222 B.C., when it was captured by Hannibal from the Vettones; and it afterwards became under the Romans the ninth station on the Via Lata from Merida to Saragossa. It passed successively under the rule of the Goths and the Moors, till the latter were finally driven out about 1055. About 1100 many foreign settlers were induced by Alphonso VI. to establish themselves in the district, and the city was enlarged and adorned by Count Raymond of Burgundy and his wife, the Princess Urraca. The *Fuero de Salamanca*, a celebrated code of civil law, probably dates from about 1200. Thenceforward, until the second half of the 16th century, the prosperity of the university rendered the city one of the most important in Spain. But in 1593 the establishment of an independent bishopric at Valladolid (then the seat of the court), which had previously been subject to the see of Salamanca, dealt a serious blow to the prestige of the city; and its commerce was shattered by the expulsion of the Moriscos in 1610 and the wars of the 18th and 19th centuries.

See Villar y Macias, *Historia de Salamanca* (3 vols., Salamanca, 1887); H. Rashdall, *Universities of Europe in the Middle Ages*, vol. ii. pt. 1. (London, 1895); Lapunya, *La Universidad de Salamanca y la cultura española en el siglo XIII.* (Paris, 1900). (K. G. J.)

Battle of Salamanca, 1812. (For the operations which preceded this battle see PENINSULAR WAR.) On the 22nd of July 1812 the Allied army under Wellington (about 46,000 with 60 guns) was drawn up south of Salamanca, the left resting on the river Tormes at Santa Marta, with a division under Pakenham and some cavalry on the north bank at Cabrerizos; the right near the village of Arapiles and two hills of that name. Wellington's object was to cover Salamanca and guard his communications through Ciudad Rodrigo with Portugal. The French under Marshal Marmont (about 42,000 with 70 guns) were collecting towards Wellington's right, stretching southwards from Calvariza de Ariba. The country generally is undulating, but crossed by some marked ridges and streams.

Until the morning of the battle it had been uncertain whether Marmont wished to reach Salamanca by the right or left bank of the Tormes, or to gain the Ciudad Rodrigo road, but Wellington now felt that the latter was his real objective. At daylight there was a rush by both armies for the two commanding hills of the Arapiles; the Allies gained the northern (since termed the "English"), and the French the southern (since termed the "French") Arapiles. While Marmont was closing up his forces, a complete change of position was carried out by Wellington. Pakenham was directed to march through Salamanca, crossing the Tormes, and move under cover to a wood near Aldea Tejada, while Wellington, holding the village of Arapiles and the northern hill, took up a line with four infantry divisions, a Portuguese brigade (Bradford), a strong force of cavalry, and Don Carlos's Spanish brigade, under cover of a ridge between Arapiles and Aldea Tejada. By noon his old right had become his left, and he was nearer to the Ciudad Rodrigo road, flanking Marmont should he move towards it.



Emery Walker sc.

Redrawn from Maj.-Gen. C. W. Robinson's *Wellington's Campaigns*, by permission of Hugh Rees, Ltd.

It was not Wellington's wish (*Despatches*, July 21, 1812) to fight a battle "unless under very advantageous circumstances." He knew that large reinforcements were nearing the French, and, having determined to fall back towards Portugal, he began to pass his baggage along the Ciudad Rodrigo road. Marmont, about 2 P.M., seeing the dust of his baggage column, ignorant of his true position, and anxious to intercept his retreat, ordered two divisions under Maucune, the leading one of which became afterwards Thomières',[1] to push westward, while he himself attacked Arapiles. Maucune moved off, flanked by some cavalry and fifty guns, leaving a gap between him and the rest of the French. Wellington instantly took advantage of this. Directing Pakenham to attack the head of the leading French division, and a Portuguese brigade (Pack) to occupy the enemy by assaulting the south (or French) Arapiles, he prepared to bear down in strength upon Maucune's right flank. The French attack upon Arapiles was after hard fighting repulsed; and, at about 5 P.M., Maucune's force, when in confusion from the fierce attack of Pakenham and Wellington in front and flank and suffering severely, was suddenly trampled down "with a terrible clamour and disturbance" (Napier) by an irresistible charge of Le Marchant's and Anson's cavalry under Sir Stapleton Cotton. This counterstroke decided the battle, Marmont's left wing being completely broken. The French made a gallant but fruitless effort to retrieve the day, and repulsed Pack's attack upon the French Arapiles; but, as the light waned, Clausel, Marmont being wounded, drew off the French army towards Alba de Tormes and retired to Valladolid. Both armies lost heavily, the Allies about 6000, the French some 15,000 men, 12 guns 2 eagles and several standards. The rout would have been even more thorough had not the castle and ford at Alba de

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[1] Some authorities differ as to this (see *The Salamanca Campaign*, by Captain A. H. Marindin, 1906, appendix, pp. 51-59).

Tormes been evacuated by its Spanish garrison without Wellington's knowledge.

Salamanca was a brilliant victory, and followed as it was by the capture of Madrid, it severely shook the French domination in Spain. (C. W. R.)

SALAMANCA, a village in Cattaraugus county, New York, U.S.A., in the township of Salamanca, about 52 m. S. by E. of Buffalo. Pop. (1900), 4251, of whom 789 were foreign-born; (1910, census), 5792. Salamanca is served by the Erie, the Buffalo, Rochester & Pittsburg and the Pennsylvania railways, and by interurban electric lines connecting with Olean, N. Y., Bradford, Pennsylvania, and Little Valley (pop in 1910, 1368), the county-seat, about 8 m. N. The village is built on both sides of the Allegany river. The agricultural and industrial development of the region has been retarded by its being within the Allegany Indian Reservation (allotted originally to the Seneca Indians by the Big Tree Treaty of 1798 and still including the valley of the Allegany river for several miles above and below Salamanca); but land is now held under a 99 year lease authorized by Congress in 1892. The village is a railway centre and division terminal, and has repair shops of the Erie and the Buffalo, Rochester & Pittsburg railways. The first settlement in the district (which was included within the "Holland Purchase" of 1792–1793) was made in 1815 near the site of West Salamanca (pop. in 1910, 530), 1½ m. W. of Salamanca, and in the same township. Salamanca (until 1873 known as East Salamanca) was incorporated in 1879, taking its name from the township, which was erected in 1854 as Buck Tooth Township and in 1862 was renamed in honour of a Spanish banker who was a large stockholder of the Atlantic & Great Western railway, built through the township this year, and later merged with the Erie railway.

See *History of Cattaraugus County, New York* (Philadelphia, Pa., 1879).

SALAMANDER. Salamanders in the restricted sense (genus *Salamandra* of N. Laurenti) are close allies of the newts, but of exclusively terrestrial habits, indicated by the shape of the tail, which is not distinctly compressed. The genus is restricted in its habitat to the western parts of the Palaearctic region and represented by four species only: the spotted salamander, *S. maculosa*, the well-known black and yellow creature inhabiting Central and Southern Europe, North-West Africa and South-Western Asia; the black salamander, *S. atra*, restricted to the Alps; *S. caucasica* from the Caucasus, and *S. luschani* from Asia Minor. Salamanders, far from being able to withstand the action of fire, as was believed by the ancients, are only found in damp places, and emerge in misty weather only or after thunderstorms, when they may appear in enormous numbers in localities where at other times their presence would not be suspected. They are usually much dreaded by country people, and although they are quite harmless to man, the large glands which are disposed very regularly on their smooth, shiny bodies, secrete a very active, milky poison which protects them from the attacks of many enemies.

The breeding habits of the two well-known European species are highly interesting. They pair on land, the male clasping the female at the arms, and the impregnation is internal. Long after pairing the female gives birth to living young. *S. maculosa*, which lives in plains or at low altitudes (up to 3000 ft.), deposits her young, ten to fifty in number, in the water, in springs or cool rivulets, and these young at birth are of small size, provided with external gills and four limbs, in every way similar to advanced newt larvae. *S. atra*, on the other hand, inhabits the Alps between 2000 and 9000 ft. altitude. Localities at such altitudes not being, as a rule, suitable for larval life in the water, the young are retained in the uterus, until the completion of the metamorphosis. Only two young, rarely three or four, are born, and they may measure as much as 50 mm. at birth, the mother measuring only 120. The uterine eggs are large and numerous, as in *S. maculosa*, but as a rule only one fully develops in each uterus, the embryo being nourished on the yolk of the other eggs, which more or less dissolve to form a large mass of nutrient matter. The embryo passes through three stages—(1) still enclosed within the egg and living on its own yolk; (2) free, within the vitelline mass, which is directly swallowed by the mouth; (3) there is no more vitelline mass, but the embryo is possessed of long external gills, which serve for an exchange of nutritive fluid through the maternal uterus, these gills functioning in the same way as the chorionic villi of the mammalian egg. Embryos in the second stage, if artificially released from the uterus, are able to live in water, in the same way as similarly developed larvae of *S. maculosa*. But the uterine gills soon wither and are shed, and are replaced by other gills differing in no respect from those of its congener.

AUTHORITIES.—Marie von Chauvin, *Zeitschr. Wiss. Zool.* xxix. (1877), p. 324; P. Kammerer, *Arch. f. Entwickel.* xvii. (1904), p. 1; Mme. Phisalix-Picot, *Recherches embryologiques, histologiques et physiologiques sur les glandes à venin de la salamandre terrestre* (Paris, 1900, 8vo).

SALAMIS, an island of Greece in the Saronic Gulf of the Aegean Sea, extending along the coasts of Attica and Megaris, and enclosing the Bay of Eleusis between two narrow straits on the W. and S. Its area is 36 sq. m., its greatest length in any direction 10 m.; its extremely irregular shape gives rise to the modern popular name Κουλλοῦρι, *i.e.* baker's crescent. In Homer Salamis was the home of the Aeginetan prince Telamon and his sons Ajax and Teucer, and this tradition is confirmed by the position of the ancient capital of the island opposite Aegina. It subsequently passed into the hands of the Megarians, but was wrested from them about 600 B.C. by the Athenians under Solon (*q.v.*) and definitely awarded to Athens by Sparta's arbitration. Though Attic tradition claimed Salamis as an ancient possession the island was not strictly Athenian territory; a 6th-century inscription shows that it was treated either as a cleruchy or as a privileged foreign dependency. The town of Salamis was removed to an inlet of the E. coast opposite Attica. In 480 Salamis became the base of the allied Greek fleet after the retreat from Artemisium, while the Persians took their station along the Attic coast off Phalerum. Through the stratagem of the Athenian Themistocles the Greeks were enclosed in the straits by the enemy, who had wheeled by night across the entrance of the E. channel and detached a squadron to block the W. outlet. The Greeks had thus no resource but to fight, while the Persians could not utilize their superior numbers, and as they advanced into the narrow neck of the east strait were thrown into confusion. The allies, among whom the Athenians and Aeginetans were conspicuous, seized this opportunity to make a vigorous attack which probably broke the enemy's line. After waging a losing fight for several hours the Persians retreated with the loss of 200 sail and of an entire corps landed on the islet of Psyttaleia in the channel; the Greeks lost only 40 ships out of more than 300. During the Peloponnesian War Salamis served as a repository for the country stock of Attica. About 350 Salamis obtained the right of issuing copper coins. In 318 Cassander placed in it a Macedonian garrison which was finally withdrawn through the advocacy of the Achaean statesman Aratus (232). The Athenians thereupon supplanted the inhabitants by a cleruchy of their own citizens. By the 2nd century A.D. the settlement had fallen into decay. In modern times Salamis, which is chiefly peopled by Albanians, has regained importance through the transference of the naval arsenal to Ambelaki near the site of the ancient capital. Excavations in this region have revealed large numbers of late Mycenaean tombs.

AUTHORITIES.—Strabo pp. 383, 393-394; Pausanias i. 35-36; Plutarch, *Solon*, 8-10; Aeschylus, *Persae*, 337-471; Herodotus viii. 40-95; Diodorus xi. 15-19; Plutarch, *Themistocles*, 11-15; W. Goodwin, *Papers of the American School of Classical Studies at Athens*, I. p. 237 ff. (Boston, 1885); G. B. Grundy, *Great Persian War* (London, 1901), ch. ix.; B. V. Head, *Historia numorum* (Oxford, 1887), pp. 328-329; A. Wilhelm in *Athenische Mitteilungen* (1898), pp. 466-486; W. Judeich, *ibid.* (1899), pp. 321-338; C. Horner, *Quaestiones Salaminiae* (Basle, 1901); H. Raase, *Die Schlacht bei Salamis* (Rostock, 1904); R. W. Macan, Appendix to *Herodotus vii.-ix.* (London, 1908); J. Beloch in *Klio* (1908). (M. O. B. C.)

SALAMIS, the principal city of ancient Cyprus, situated on the east coast a little north of the river Pedias (Pediaeus). It had a good harbour, well situated for commerce with Phoenicia, Egypt and Cilicia, which was replaced in medieval times by Famagusta (Ammochostos), and is wholly silted now. Its trade was mainly in corn, wine and oil from the midland plain (*Mesaoria*), and in salt from the neighbouring lagoons. Traditionally, Salamis was founded after the Trojan War (*c.* 1180 B.C.) by Teucer from Salamis, the island off Attica, but there was an important Mycenaean colony somewhat earlier. The spoils of its tombs excavated in 1896 are in the British Museum.

A king Kisu of Silna (Salamis) is mentioned in a list of tributaries of Assur-bani-pal of Assyria in 668 B.C., and Assyrian influence is marked in the fine terra-cotta figures from a shrine at Toumba excavated in 1890–1891. The revolts of Greek Cyprus against Persia in 500 B.C., 386–380 B.C. and 352 B.C. were led respectively by kings Onesilaus, Evagoras (*q.v.*) and Pnytagoras, who seem to have been the principal Hellenic power in the island. In 306 Demetrius Poliorcetes won a great naval victory here over Ptolemy I. of Egypt. Under Egyptian and Roman administration Salamis flourished greatly, though under the Ptolemaic priest-kings and under Rome the seat of government was at New Paphos (see PAPHOS). But it was greatly damaged in the Jewish revolt of A.D. 116–117; it also suffered repeatedly from earthquakes, and was wholly rebuilt by Constantius II. under the name Constantia. There was a large Jewish colony in Ptolemaic and early Roman times, and a Christian community founded by Paul and Barnabas in A.D. 45–46. Barnabas was himself a Cypriote, and his reputed tomb, discovered in A.D. 477, is still shown, a little inland, near the monastery of Ai Barnába. St Epiphanius was archbishop A.D. 367–402. The Greek city was destroyed by the Arabs under the Caliph Moawiya in 647, and does not seem to have revived. In later times the site was plundered for the building of Famagusta; it is now covered by sandhills, and its plan is imperfectly known. The market-place and a few public buildings were excavated in 1890–1891, but nothing of importance was found.

See W. H. Engel, *Kypros* (Berlin, 1841; classical allusions); J. A. R. Munro and H. A. Tubbs, *Journ. Hellenic Studies*, xii. 59 ff., 298 ff. (site and monuments); British Museum, *Excavations in Cyprus* (London, 1900; Mycenaean tombs); G. F. Hill, *Brit. Mus. Cat. Coins of Cyprus* (London, 1904; coins). (J. L. M.)

SAL AMMONIAC,[1] or AMMONIUM CHLORIDE, NH_4Cl, the earliest known salt of ammonia (*q.v.*), was formerly much used in dyeing and metallurgic operations.

The name *Hammoniacus sal* occurs in Pliny (*Nat. Hist.* xxxi. 39), who relates that it was applied to a kind of fossil salt found below the sand, in a district of Cyrenaica. The general opinion is, that the sal ammoniac of the ancients was the same as that of the moderns; but the imperfect description of Pliny is far from being conclusive. The native sal ammoniac of Bucharia, described by Model and Karsten, and analysed by M. H. Klaproth, has no resemblance to the salt described by Pliny. The same remark applies to the sal ammoniac of volcanoes. Dioscorides (v. 126), in mentioning sal ammoniac, makes use of a phrase quite irreconcilable with the description of Pliny, and rather applicable to rock-salt than to our sal ammoniac. Sal ammoniac, he says, is peculiarly prized if it can be easily split into rectangular fragments. Finally, we have no proof whatever that sal ammoniac occurs at present, either near the temple of Jupiter Ammon, or in any part of Cyrenaica. Hence we conclude that the term sal ammoniac was applied as indefinitely by the ancients as most of their other chemical terms. It may have been given to the same salt which is known to the moderns by that appellation, but was not confined to it.

In any case there can be no doubt that it was well known to the alchemists as early as the 13th century. Albertus Magnus, in his treatise *De alchymia*, informs us that there were two kinds of sal ammoniac, a natural and an artificial. The natural was sometimes white, and sometimes red; the artificial was more useful to the chemist. He does not tell us how it was prepared, but he describes the method of subliming it, which can leave no doubt that it was real sal ammoniac. In the *Opera mineralia* of Isaac Hollandus the elder, there is likewise a description of the mode of subliming sal ammoniac. Basil Valentine, in his *Currus triumphalis antimonii*, describes some of the peculiar properties of sal ammoniac in, if possible, a still less equivocal manner.

Egypt is the country where sal ammoniac was first manufactured, and from which Europe for many years was supplied with it. This commerce was first carried on by the Venetians, and afterwards by the Dutch. Nothing was known about the method employed by the Egyptians till the year 1719. In 1716 C. J. Geoffroy read a paper to the French Academy, showing that sal ammoniac must be formed by sublimation; but his opinion was opposed so violently by W. Homberg and N. Lemery, that the paper was not printed. In 1719 D. Lemaire, the French consul at Cairo, sent the Academy an account of the mode of manufacturing sal ammoniac in Egypt. The salt, it appeared, was obtained by simple sublimation from soot. In the year 1760 Linnaeus communicated to the Royal Society a correct detail of the whole process, which he had received from Dr F. Hasselquist, who had travelled in that country as a naturalist (*Phil. Trans.*, 1760, p. 504). The dung of black cattle, horses, sheep, goats, &c., which contains sal ammoniac ready formed, is collected during the first four months of the year, when the animals feed on the spring grass, a kind of clover. It is dried, and sold to the common people as fuel. The soot from this fuel is carefully collected and sold to the sal ammoniac makers, who work only during the months of March and April, for it is only at that season of the year that the dung is fit for their purpose.

The composition of this salt seems to have been first discovered by J. P. Tournefort in 1700. The experiments of C. J. Geoffroy in 1716 and 1723 were still more decisive, and those of H. L. Duhamel de Monceau, in 1735, left no doubt upon the subject. Dr Thomson first pointed out a process by synthesis, which has the advantage of being very simple, and at the same time rigidly accurate, resulting from his observation that when hydrochloric acid gas and ammonia gas are brought in contact with each other, they always combine in equal volumes.

The first attempt to manufacture sal ammoniac in Europe was made, about the beginning of the 18th century, by Mr Goodwin, a chemist of London, who appears to have used the mother ley of common salt and putrid urine as ingredients. The first successful manufacture of sal ammoniac in Great Britain was established in Edinburgh about the year 1760. It was first manufactured in France about the same time by A. Baumé. Manufactories of it were afterwards established in Germany, Holland and Flanders.

It is now obtained from the ammoniacal liquor of gas works by distilling the liquor with milk of lime and passing the ammonia so obtained into hydrochloric acid. The solution of ammonium chloride so obtained is evaporated and the crude ammonium chloride purified by sublimation. The subliming apparatus consists of two parts: (1) a hemispherical stoneware basin placed within a close-fitting iron one, or an enamelled iron basin, and (2) a hemispherical lead or stoneware lid, or dome, cemented on the top of the basin to prevent leakage. The dome has a small aperture in the top which remains open to preclude accumulation of pressure. The carefully dried crystallized salt is pressed into the basin, and, after the lid has been fitted on, is exposed to a long-lasting moderate heat. The salt volatilizes (mostly in the form of a mixed vapour of the two components, which reunite on cooling), and condenses in the dome in the form of a characteristically fibrous and tough crust.

The pure salt has a sharp saline taste and is readily soluble in water. It readily volatilizes, and if moisture be rigorously excluded, it does not dissociate, but in the presence of mere traces of water it dissociates into ammonia and hydrochloric acid (H. B. Baker, *Journ. Chem. Soc.*, 1895, 65, p. 612).

Sal ammoniac (ammonium chloride, British and United States pharmacopoeiae) as used in medicine is a white crystalline odourless powder having a saline taste. It is soluble in 1 in 3 of cold water and in 1 in 50 of 90% alcohol. It is incompatible with carbonates of the alkalis. The dose is 5 to 20 grs. Ammonium chloride has a different action and therapeutic use from the rest of the ammonium salts. It possesses only slight influence over the heart and respiration, but it has a specific effect on mucous membranes as the elimination of the drug takes place largely through the lungs, where it aids in loosening bronchial secretions. This action renders it of the utmost value in bronchitis and pneumonia with associated bronchitis. The drug may be given in a mixture with glycerine or liquorice to cover the disagreeable taste or it may be used in a spray by means of an atomizer. The inhalation of the fumes of nascent ammonium chloride by filling the room with the gas has been recommended in foetid bronchitis. Though ammonium chloride has certain irritant properties which may disorder the stomach, yet if its mucous membrane be depressed and atonic the drug may improve its condition, and it has been used with success in gastric and intestinal catarrhs of a subacute type and is given in doses of 10 grains half an hour before meals in painful dyspepsia due to hyperacidity. It is also an intestinal and hepatic stimulant and a feeble diuretic and diaphoretic, and has been considered a specific in some forms of neuralgia.

SALARIA, VIA, an ancient highroad of Italy, which ran from Rome by Reate and Asculum to Castrum Truentinum (Porto d'Ascoli) on the Adriatic coast, a distance of 151 m. Its first portion must be of early origin, and was the route by which the Sabines came to fetch salt from the marshes at the mouth of the Tiber. Of its course through the Apennines considerable remains exist.

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[1] Some derive the name sal ammoniac from Jupiter Ammon, near whose temple it is alleged to have been found; others, from a district of Cyrenaica called Ammonia. Pliny's derivation is from the sand (ἄμμος) in which it occurred.

See T. Ashby in *Papers of the British School at Rome*, iii. 3-38; N. Persichetti, *Viaggio archeologico sulla Via Salaria nel Circondario di Cittâducale* (Rome, 1893); and in *Römische Mitteilungen* (1903), 276 seq.

SALAR JUNG, SIR (1829–1883), Indian statesman of Hyderabad, born in 1829, descendant of a family which had held various appointments, first under the Adil Shahi kings of Bijapur, then under the Delhi emperors and lastly under the Nizams. While he was known to the British as Sir Salar Jung, his personal name was Mir Turab Ali, he was styled by native officials of Hyderabad the Mukhtaru 'l-Mulk, and was referred to by the general public as the Nawab Sahib. He succeeded his uncle Suraju 'l-Mulk as prime minister in 1853. The condition of the Hyderabad state was at that time a scandal to the rest of India. Salar Jung began by infusing a measure of discipline into the Arab mercenaries, the more valuable part of the Nizam's army, and employing them against the rapacious nobles and bands of robbers who had annihilated the trade of the country. He then constituted courts of justice at Hyderabad, organized the police force, constructed and repaired irrigation works, and established schools. On the outbreak of the Mutiny he supported the British, and although unable to hinder an attack on the residency, he warned the British minister that it was in comtemplation. The attack was repulsed; the Hyderabad contingent remained loyal, and their loyalty served to ensure the tranquillity of the Deccan. Salar Jung took advantage of the preoccupation of the British government with the Mutiny to push his reforms more boldly, and when the Calcutta authorities were again at liberty to consider the condition of affairs his work had been carried far towards completion. During the lifetime of the Nizam Afzulu'd-dowla, Salar Jung was considerably hampered by his master's jealous supervision. When Mir Mahbub Ali, however, succeeded his father in 1869, Salar Jung, at the instance of the British government, was associated in the regency with the principal noble of the state, the Shamsu 'l-Umara or Amir Kabir, and enjoyed an increased authority. In 1876 he visited England with the object of obtaining the restoration of Berar. Although he was unsuccessful, his personal merits met with full recognition. He died of cholera at Hyderabad on the 8th of February 1883. He was created G.C.S.I. on the 28th of May 1870, and received the honorary degree of D.C.L. from the University of Oxford on the 21st of June 1876. His grandson enjoyed an estate of 1486 sq. m., yielding an income of nearly £60,000.

See *Memoirs of Sir Salar Jung*, by his private secretary, Syed Hossain Bilgrami, 1883.

SALARY, a payment for services rendered, usually a stipulated sum paid monthly, quarterly, half-yearly or yearly, and for a permanent or lengthy term of employment. It is generally contrasted with "wages," a term applied to weekly or daily payment for manual services. As laid down by Bowen, L. J., *In re Shine* (1892)) 1 Q.B. 529, "Salary means a definite payment for personal services under some contract and computed by time." The Latin *salarium* meant originally salt money (Lat. *sal*, salt), *i.e.* the sum paid to soldiers for salt. In post-Augustan Latin the word was applied to any allowance, pension or stipend.

SALAS, or San Martin de Salas, a town of southern Spain, in the province of Oviedo; on the road from Tineo to Grado, and on a small sub-tributary of the river Narcea. Pop. (1900), 17,147. The official total of the inhabitants includes not only the actual residents in the town, but also the population of the district of Salas, a mountainous region in which coal-mining and agriculture are the principal industries. The products of this region are sent for export to Cudillero, a small harbour on the Bay of Biscay.

SALAS BARBADILLO, ALONSO JERÓNIMO DE (*c.* 1580–1635), Spanish novelist and playwright, born at Madrid about 1580, and educated at Alcalá de Henares and Valladolid. His first work, *La Patrona de Madrid restituida* (1609), is a dull devout poem, which forms a strange prelude to *La Hija de Celestina* (1612), a malicious transcription of picaresque scenes reprinted under the title of *La Ingeniosa Elena*. This was followed by a series of similar tales and plays, the best of which are *El Cavallero puntual* (1614), *La Casa de placer honesto* (1620), *Don Diego de Noche* (1623) and a most sparkling satirical volume of character-sketches, *El Curioso y Sabio Alexandro* (1634). He died in poverty at Madrid on the 10th of July 1635. Some of his works were translated into English and French, and Scarron's *Hypocrites* is based on *La Ingeniosa Elena*; he deserved the vogue which he enjoyed till late in the 17th century, for his satirical humour, versatile invention and pointed style are an effective combination.

SALDANHA BAY, an inlet on the south-western coast of South Africa, 63 m. by sea N. by W. of Cape Town, forming a land-locked harbour. The northern part of the inlet is known as Hoetjes Bay. It has accommodation for a large fleet with deep water close inshore, but the arid nature of the country caused it to be neglected by the early navigators, and with the growth of Cape Town Saldanha Bay was rarely visited. Considerable deposits of freestone in the neighbourhood attracted attention during the later 19th century. Proposals were also made to create a port which could be supplied by water from the Berg river, 20 m. distant. From Kalabas Kraal on the Cape Town-Clanwilliam railway, a narrow gauge line runs via Hopefield to Hoetjes Bay—126 m. from Cape Town.

Saldanha Bay is so named after Antonio de Saldanha, captain of a vessel in Albuquerque's fleet which visited South Africa in 1503. The name was first given to Table Bay, where Saldanha's ship cast anchor. On Table Bay being given its present name (1601) the older appellation was transferred to the bay now called after Saldanha. In 1781 a British squadron under Commodore George Johnstone 1731–1787) seized six Dutch East Indiamen, which, fearing an attack on Cape Town, had taken refuge in Saldanha Bay. This was the only achievement, so far as South Africa was concerned, of the expedition despatched to seize Cape Town during the war of 1781–1783.

SALDERN, FRIEDRICH CHRISTOPH VON (1719–1785), Prussian soldier and military writer, entered the army in 1735, and (on account of his great stature) was transferred to the Guards in 1739. As one of Frederick's aides-de-camp he was the first to discover the approach of Neipperg's Austrians at Mollwitz. He commanded a guard battalion at Leuthen, again distinguished himself at Hochkirch and was promoted major-general. In 1760 at Liegnitz Frederick gave him four hours in which to collect, arrange and despatch the spoils of the battle, 6000 prisoners, 100 wagons, 82 guns and 5000 muskets. His complete success made him a marked man even in Frederick's army. At Torgau, Saldern and Möllendorf (*q.v.*) with their brigades converted a lost battle into a great victory by their desperate assault on the Siptitz Heights. The manœuvring skill, as well as the iron resolution, of the attack, has excited the wonder of modern critics, and after Torgau Saldern was accounted the "completest general of infantry alive" (Carlyle). In the following winter, however, being ordered by Frederick to sack Hubertusburg, Saldern refused on the ground of conscience. Nothing was left for him but to retire, but Frederick was well aware that he needed Saldern's experience and organizing ability, and after the peace the general was at once made inspector of the troops at Magdeburg. In 1766 he became lieutenant-general. The remainder of his life was spent in the study of military sciences in which he became a pedant of the most pronounced type. In one of his works he discussed at great length the question between 76 and 75 paces to the minute as the proper cadence of infantry. There can be no question that "Saldern-tactics" were the most extreme form of pedantry to which troops were ever subjected, and contributed powerfully to the disaster of Jena in 1806. His works included *Taktik der Infanterie* (Dresden, 1784) and *Taktische Grundsätze* (Dresden, 1786), and were the basis of the British "Dundas" drill-book.

See Küster, *Charakterzüge des Generalleutenants von Saldern* (Berlin, 1792).

SALE, GEORGE (*c.* 1697–1736), English orientalist, was the son of a London merchant. In 1720 he was admitted a student of the Inner Temple, but subsequently practised as a solicitor. Having studied Arabic for some time in England, he became, in 1726, one of the correctors of the Arabic version of the New Testament, begun in 1720 by the Society for Promoting Christian Knowledge, and subsequently took the principal part in the work. He made an extremely paraphrastic, but, for his time, admirable English translation of the Koran (1734 and often reprinted), and had a European reputation as an orientalist. He died on the 13th of November 1736. His collection of oriental manuscripts is now in the Bodleian library, Oxford.

SALE, SIR ROBERT HENRY (1782–1845), British soldier, entered the 36th Foot in 1795, and went to India in 1798, as a lieutenant of the 12th Foot. His regiment formed part of Baird's brigade of Harris's army operating against Tippoo Sahib, and Sale was present at Mallavelly (Mallawalli) and Seringapatam, subsequently serving under Colonel Arthur Wellesley in the campaign against Dhundia. A little later the 12th was employed in the difficult and laborious attack on Paichi Raja. Promoted captain in 1806, Sale was engaged in 1808–1809 against the Raja of Travancore, and was at the two actions of Quilon, the storm of Travancore lines and the battle of Killianore. In 1810 he accompanied the expedition to Mauritius, and in 1813 obtained his majority. After some years he became major in the 13th, with which regiment he was for the rest of his life associated. In the Burmese War he led the 13th in all the actions up to the capture of Rangoon, in one of which he killed the enemy's leader in single combat. In the concluding operations of the war, being now lieutenant-colonel, he commanded a brigade, and at Malown (1826) he was severely wounded. For these services he received the C.B. In 1838, on the outbreak of the Afghan War, Brevet-Colonel Sale was assigned to the command of the 1st Bengal brigade of the army assembling on the Indus. His column arrived at Kandahar in April 1839, and in May it occupied the Herat plain. The Kandahar force next set out on its march to Kabul, and a month later Ghazni was stormed, Sale in person leading the storming column and distinguishing himself in single combat. The place was well provisioned, and on its supplies the army finished its march to Kabul easily. For his services Sale was made K.C.B. and received the local rank of major-general, as well as the Shah's order of the Duranee Empire. He was left, as second-in-command, with the army of occupation, and in the interval between the two wars conducted several small campaigns ending with the action of Parwan which led directly to the surrender of Dost Mahommed. By this time the army had settled down to the quiet life of cantonments, and Lady Sale and her daughter came to Kabul. But the policy of the Indian government in stopping the subsidy to the frontier tribes roused them into hostility, and Sale's brigade received orders to clear the line of communication to Peshawar. After severe fighting Sale entered Jalalabad on the 12th of November 1841. Ten days previously he had received news of the murder of Sir Alexander Burnes, along with orders to return with all speed to Kabul. These orders he, for various reasons, decided to ignore; suppressing his personal desire to return to protect his wife and family, he gave orders to push on, and on occupying Jalalabad at once set about making the old and half-ruined fortress fit to stand a siege. There followed a close and severe investment rather than a siege, and the garrison's sorties were made usually with the object of obtaining supplies. At last Pollock and the relieving army appeared, only to find that the garrison had on the 7th of April 1842 relieved itself by a brilliant and completely successful attack on Akbar's lines. Sir Robert Sale received the G.C.B.; a medal was struck for all ranks of defenders, and salutes fired at every large cantonment in India. Pollock and Sale after a time took the offensive, and after the victory of Haft Kotal, Sale's division encamped at Kabul again. At the end of the war Sale received the thanks of parliament. In 1845, as quartermaster-general to Sir H. Gough's army, Sale again took the field. At Moodkee (Mudki) he was mortally wounded, and he died on the 21st of December 1845. His wife, who shared with him the dangers and hardships of the Afghan war, was amongst Akbar's captives. Amongst the few possessions she was able to keep from Afghan plunderers was her diary (*Journal of the Disasters in Afghanistan*, London, 1843).

See Gleig, *Sale's Brigade in Afghanistan* (London, 1846); Kaye, *Lives of Indian Officers* (London, 1867); W. Sale, *Defence of Jellalabad* (London, 1846); Regimental History of the 13th Light Infantry.

SALE, a town of Tanjil county, Victoria, Australia, the principal centre in the agricultural Gippsland district, on the river Thomson, 127½ m. by rail E.S.E. of Melbourne. Pop. (1901), 3462. It is the seat of the Anglican bishop of Gippsland, and contains the cathedral of the Roman Catholic bishop of Sale. Attached to its mechanics' institute are schools of mines, art and technology, and a fine free library. The finest buildings, excluding a number of handsome churches, are the Victoria Hall and the convent of Notre Dame de Sion. The Agricultural Society has excellent show grounds, in which meetings are annually held. Sale is the head of the Gippsland lakes navigation, the shipping being brought from the lakes to the town by canal. Daily communication is maintained with Cunningham at the lakes' entrance, and ocean-going steamers ply frequently between Sale and Melbourne.

SALE, an urban district in the Altrincham parliamentary division of Cheshire, England, 5 m. S.W. of Manchester. Pop. (1901), 12,088. It is served by the Manchester, South Junction & Altrincham and the London & North-Western railways, and the Cheshire Lines, and has become a large residential suburb of Manchester. At the beginning of the 19th century the greater part of the township was still waste and unenclosed. There are numerous handsome villas. Market gardening is carried on in the neighbourhood; and there are large botanical gardens.

SALEM, a city and district of British India, in the Madras presidency. The city is on both banks of the river Tirumanimuttar, 3 m. from a station on the Madras railway, 206 m. S.W. of Madras city. Pop. (1901), 70,621. There is a considerable weaving industry and some manufacture of cutlery. Its situation in a green valley between the Shevaroy and Jarugumalai hills is picturesque.

The District of Salem has an area of 7530 sq. m. Except towards the south it is hilly, with extensive plains lying between the several ranges. It consists of three distinct tracts, formerly known as the Talaghat, the Baramahal and the Balaghat. The Talaghat is situated below the Eastern Ghats on the level of the Carnatic generally; the Baramahal includes the whole face of the Ghats and a wide piece of country at their base; and the Balaghat is situated above the Ghats on the tableland of Mysore.

The western part of the district is mountainous. Amongst the chief ranges (5000-6000 ft.) are the Shevaroys, the Kalrayans, the Melagiris, the Kollimalais, the Pachamalais and the Yelagiris. The chief rivers are the Cauvery with its numerous tributaries, and the Ponniar and Palar; the last, however, only flows through a few miles of the north-western corner of the district. The forests are of considerable value. The geological structure of the district is mostly gneissic, with a few irruptive rocks in the form of trap dikes and granite veins. Magnetic iron ore is common in the hill regions, and corundum and chromate of iron are also obtainable. The qualities of the soil differ very much; in the country immediately surrounding the town of Salem a thin layer of calcareous and red loam generally prevails, through which quartz rocks appear on the surface in many places. The climate, owing to the great difference of elevation, varies considerably; on the hills it is cool and bracing, and for a great part of the year very salubrious; the annual rainfall averages about 32 in.

The population in 1901 was 2,204,974, showing an increase of 12% in the decade. The principal crops are millets, rice, other food grains and oil-seeds, with a little cotton, indigo and tobacco. Coffee is grown on the Shevaroy hills. The chief irrigation work is the Barur tank system. Salem suffered severely from the famine of 1877–1878. The Madras railway runs through the district, with two narrow-gauge branches. The chief industry is cotton-weaving, and there is some manufacture of steel from magnetic iron ore. There are many saltpetre refineries, but no large industries. The district was acquired partly by the treaty of peace with Tippoo Sultan in 1792 and partly by the partition treaty of Mysore in 1799. By the former the Talaghat and Baramahal were ceded, and by the latter the Balaghat or what is now the Hosur *taluk*.

SALEM, a city and one of the county-seats (Lawrence is the other) of Essex county, Massachusetts, about 15 m. N.E. of Boston. Pop. (1900), 35,956, of whom 10,902 were foreign-born (including 4003 French Canadians, 3476 Irish, and 1585 English

Canadians), 23,038 were of foreign parentage (one or the other parent foreign-born) and 156 were negroes; (1910), 43,697. Area, 8·2 sq. m. Salem is served by the Boston & Maine and by interurban electric railways westward to Peabody, Danvers and Lawrence, eastward to Beverly, and southward to Marblehead, Swampscott, Lynn and Boston. It occupies a peninsula projecting toward the north-east, a small island (Winter Island) connected with the neck of the peninsula (Salem Neck) by a causeway, and some land on the mainland. Salem has many historical and literary landmarks. There are three court-houses, one of granite (1839–1841) with great monolithic Corinthian pillars, another (1862), adjoining it, of brick, and a third (1908–1909) of granite, for the probate court. The City Hall was built in 1837, and enlarged in 1876. The Custom House (1818–1819) is described in the introduction to Hawthorne's *Scarlet Letter*, and in it Hawthorne worked as surveyor of the port in 1845–1849. The public library building (1888) was given to the city by the heirs of Captain John Bertram.

The Essex Institute (1848) is housed in a brick building (1851) with freestone trimmings and in old Plummer Hall (1857); its museum contains some old furniture and a collection of portraits; it has an excellent library and publishes quarterly (1859 sqq.) *Historical Collections*. The Peabody Academy of Science, founded by the gift in 1867 of $140,000 from George Peabody and incorporated in 1868, is established in the East India Marine Hall (1824), bought for this purpose from the Salem East India Marine Society. The Marine Society was organized in 1799, its membership being limited to "persons who have actually navigated the seas beyond the Cape of Good Hope or Cape Horn, as masters or supercargoes of vessels belonging to Salem"; it assists the widows and children of members. Its museum, like the ethnological and natural history collection of the Essex Institute, was bought by the Peabody Academy of Science, whose museum now includes Essex county collections (natural history, mineralogy, botany, prehistoric relics, &c.), type collections of minerals and fossils; implements, dress, &c. of primitive peoples, especially rich in objects from Malaysia, Japan and the South Seas; and portraits and relics of famous Salem merchants, with models and pictures of Salem merchant vessels. The Salem Athenaeum (1810), the successor of a Social Library (1760) and a Philosophical Library (1781) is housed in Plummer Hall (1908), a building in the southern Colonial style, named in honour of a benefactor of the Athenaeum, Caroline Plummer (d. 1855), who endowed the Plummer Professorship of Christian Morals at Harvard. Some of the old houses were built by ship-owners before the War of Independence, and more were built during the first years of the 19th century when Salem privateersmen made so many fortunes. Many of the finest old houses are of the gambrel type; and there are many beautiful doorways, doorheads and other details. Nathaniel Hawthorne's birthplace was built before 1692; another house—now reconstructed and used as a social settlement—is pointed out as the original "house of seven gables." The Corwin or "Witch" house, so called from a tradition that Jonathan Corwin, one of the judges in the witchcraft trials, held preliminary examinations of witches here, is said to have been the property of Roger Williams. The Pickering house, built before 1660, was the homestead of Timothy Pickering and of other members of that family. Among the other buildings and institutions are Hamilton Hall (1805); the Franklin Building (1861) of the Salem Marine Society; a large armoury; a state normal school (1854); an orphan asylum (1871), under the Sisters of the Grey Nuns; the Association for the Relief of Aged and Destitute Women (1860), occupying a fine old brick house formerly the home of Benjamin W. Crowninshield (1772–1851), a member of the national House of Representatives in 1824–1831 and Secretary of the Navy in 1814; the Bertram Home for Aged Men (1877) in a house built in 1806–1807; the Plummer Farm School for Boys (incorporated 1855, opened 1870), another charity of Caroline Plummer, on Winter Island; the City Almshouse (1816) and the City Insane Asylum (1884) on Salem Neck; a home for girls (1876); the Fraternity (1869), a club-house for boys; the Marine Society Bethel and the Salem Seamen's Bethel; the Seamen's Orphan and Children's Friend Society (1839); an Associated Charities (1901), and the Salem Hospital (1873).

Among the Church organizations are: the First (Unitarian; originally Trinitarian Congregational), which dates from 1629 and was the first Congregational church organized in America; the Second or East Church (Unitarian) organized in 1718; the North Church (Unitarian), which separated from the First in 1772; the Third or Tabernacle (Congregational), organized in 1735 from the First Church; the South (Congregational), which separated from the Third in 1774; several Baptist churches; a Quaker society, with a brick meeting-house (1832); St Peter's, the oldest Episcopalian church in Salem, with a building of English Gothic erected in 1833, and Grace Church (1858).

Washington Square or the Common (8 acres) is in the centre of the city. The Willows is a 30-acre park on the Neck shore, and in North Salem is Liberty Hill, another park. On a bluff projecting into South river is the old "Burying Point," set apart in 1637, and the oldest cemetery in the city; its oldest stone is dated 1673; here are buried Governor Simon Bradstreet, Chief-Justice Benjamin Lynde (1666–1745) and Judge John Hathorne (1641–1717) of the witchcraft court. The Broad Street Burial Ground was laid out in 1655. On Salem Neck is Fort Lee and on Winter Island is Fort Pickering (on the site of a fort built in 1643), near which is the Winter Island Lighthouse.

The main trade of Salem is along the coast, principally in the transhipment of coal; and the historic Crowninshield's or India wharf is now a great coal pocket. The harbour is not deep enough for ocean-going vessels, and manufacturing is the most important industry. In 1905 the total value of the factory products was $12,202,217 (13.9% more than in 1900), and the principal manufactures were boots and shoes and leather. The largest single establishment is the Naumkeag Steam Cotton Company, which has 2800 looms and about 1500 mill-hands. Another large factory is that of the silversmiths, Daniel Low & Co.

History.—Salem was settled in 1626 by Roger Conant (1593–1679) and a company of "planters," who in 1624 (under the Sheffield patent of 1623 for a settlement on the north shore of Massachusetts Bay) had attempted a plantation at Cape Ann, whither John Lyford and others had previously come from Plymouth through "dissatisfaction with the extreme separation from the English church." Conant was not a separatist, and the Salem settlement was a commercial venture, partly agricultural and partly to provide a wintering place for Banks fishermen so that they might more quickly make their spring catch. Cape Ann was too bleak, but Naumkeag was a "pleasant and fruitful neck of land," which they named Salem in June 1629, probably in allusion to Psalm lxxvi. 2. In 1628 a patent for the territory was granted by the New England Council to the Dorchester Company, in which the Rev. John White of Dorchester, England, was conspicuous, and which in the same year sent out a small company under John Endecott as governor. Under the charter for the Colony of Massachusetts Bay (1629), which superseded the Dorchester Company patent, Endecott continued as governor until the arrival in 1630 of John Winthrop, who soon removed the seat of government from Salem first to Charlestown and then to Boston. In July or August 1629 the first Congregational Church (see CONGREGATIONALISM, § *American*) in America was organized here; its "teacher" in 1631 and 1633 and its pastor in 1634–1635 was Roger Williams, a close friend of Governor Endecott and always popular in Salem, who in 1635 fled thence to Rhode Island to escape arrest by the officials of Massachusetts Bay. In 1686, fearing that they might be dispossessed by a new charter, the people of Salem for £20 secured a deed from the Indians to the land they then held. Although not strictly Puritan the character of Salem was not essentially different from that of the other Massachusetts towns. The witchcraft delusion of 1692 centred about Salem Village, now in the township of Danvers, but then a part of Salem. Ten girls, aged nine to seventeen years, two of them house servants, met during the winter of 1691–1692 in the home of Samuel Parris, pastor of the Salem Village church, and after learning palmistry and various "magic" tricks from Parris's West Indian slave, Tituba, and influenced doubtless by current talk about witches, accused Tituba and two old women of bewitching them. The excitement spread rapidly, many more were accused, and, within four months, hundreds were arrested, and many were tried before commissioners of oyer and terminer (appointed on the 27th of May 1692, including Samuel Sewall, *q.v.*, of Boston, and three inhabitants of Salem, one being Jonathan Corwin); nineteen were hanged,[1] and one was pressed to death in September for refusing to plead when he was accused. All these trials were conducted in accordance with the English law of the time; there had been an execution for witchcraft at Charlestown in 1648; there was a case in Boston in 1655; in 1680 a woman of Newbury was condemned to death for witchcraft but was reprieved by Governor Simon Bradstreet; in England and Scotland there were many executions long after the Salem delusion died out. The reaction came suddenly in Salem, and in May 1693 Governor William Phips ordered the release from prison of all then held on the charge of witchcraft.

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[1] There is nothing but tradition to identify the place of execution with what is now called Gallows Hill, between Salem and Peabody.

Salem was an important port after 1670, especially in the India trade, and Salem privateers did great damage in the Seven Years' War, in the War of Independence (when 158 Salem privateers took 445 prizes), and in the War of 1812. On this foreign trade and these rich periods of privateering the prosperity of the place up to the middle of the 19th century was built.

The First Provincial Assembly of Massachusetts met in Salem in 1774. On the 20th of February 1775 at the North Bridge (between the present Salem and Danvers) the first armed resistance was offered to the royal troops, when Colonel Leslie with the 64th regiment, sent to find cannon hidden in the Salem "North Fields," was held in check by the townspeople. Salem was the birthplace of Nathaniel Hawthorne, W. H. Prescott, Nathaniel Bowditch, Jones Very and W. W. Story.

Marblehead was separated from Salem township in 1649; Beverly in 1668, a part of Middleton in 1728, and the district of Danvers in 1752. Salem was chartered as a city in 1836.

See Charles S. Osgood and Henry M. Batchelder, *Historical Sketch of Salem, 1626–1879* (Salem, 1879); Joseph B. Felt, *Annals of Salem* (ibid., 1827; 2nd ed., 2 vols., 1845–1849); Charles W. Upham, *Salem Witchcraft* (2 vols., Boston, 1867); H. B. Adams, *Village Communities of Cape Ann and Salem* (Baltimore, 1883); Eleanor Putnam (the pen-name of Mrs Arlo Bates), *Old Salem* (Boston, 1886); C. H. Webber and W. S. Nevins, *Old Naumkeag* (Salem, 1877); R. D. Paine, *Ships and Sailors of Old Salem* (New York, 1909), and *Visitor's Guide to Salem* (Salem, 1902) published by the Essex Institute.

SALEM, a city and the county-seat of Salem county, New Jersey, U.S.A., in the S.W. part of the state, on Salem Creek, about 38 m. S.W. of Philadelphia. Pop. (1900), 5811, of whom 263 were foreign-born and 809 were negroes; (1910 U.S. census), 6614. It is served by the West Jersey & Seashore railroad, and has steamer connexion with Philadelphia. Among its institutions is the John Tyler Library, established as Salem Library in 1804 and said to be the third oldest public library in the state. In Finn's Point National Cemetery, about 4 m. N. of Salem, there are buried some 2460 Confederate soldiers, who died during the Civil War while prisoners of war at Fort Delaware, on an island in Delaware river nearly opposite the mouth of Salem Creek. Salem lies in a rich agricultural region. Among the city's manufactures are canned fruits and vegetables, condiments, glass-ware, brass and iron-work, hosiery, linoleum and oil-cloth. Near the present site in 1643 colonists from Sweden built Fort Elfsborg; but the Swedish settlers in 1655 submitted to the Dutch at New Amsterdam, and the latter in turn surrendered to the English in 1664. In 1675 John Fenwicke, an English Quaker, entered the Delaware river and founded the first permanent English settlement on the Delaware (which he called Salem). After purchasing lands from the Indians, Fenwicke attempted to maintain an independent government, but in 1682 he submitted to the authority of the proprietors of West Jersey. During the War of Independence Salem was plundered on the 17th of March 1778 by British troops under Colonel Charles Mawhood, and on the following day a portion of these troops fought a sharp but indecisive engagement at Quinton's Bridge, 3 m. S. of the town, with American militia under Colonel Benjamin Holmes. Salem was incorporated as a town in 1695, and was chartered as a city in 1858.

SALEM, a city of Columbiana county, Ohio, U.S.A., 67 m. N.W. of Pittsburg and about the same distance S.E. of Cleveland. Pop. (1900), 7582, including 667 foreign-born and 227 negroes; (1910) 8943. Salem is served by the Pennsylvania (the Pittsburg, Fort Wayne & Chicago division) and the Youngstown & Ohio River railways, and by an interurban electric line to Canton. The city has a Carnegie library (1896), two beautiful cemeteries, a park, and a Home for Aged Women. It is situated in a fine agricultural region; coal is mined in the vicinity; natural gas is obtained in abundance; and the city has various manufactures. It was settled by Friends in 1806, incorporated as a town in 1830 and as a village in 1852, and chartered as a city in 1887. For several years preceding the Civil War it was a station on the "underground railway" and the headquarters of "the Western Anti-Slavery Society," which published here the *Anti-Slavery Bugle.*

SALEM, the capital of Oregon, U.S.A., and the county-seat of Marion county, on the east bank of the Willamette river, 52 m. S.S.W. of Portland. Pop. (1900), 4258, including 522 foreign-born; (1910) 14,094. It is served by the Southern Pacific railway, by the Oregon Electric line (to Portland), and by a steamship line to Portland. The city is in the centre of the Willamette Valley, a rich farming and fruit-growing country. It has wide, well-shaded streets, and two public parks. Among the public buildings and institutions are the State Capitol, the State Library, a city public library, the county court-house, the Federal building, the state penitentiary and several charitable institutions. Salem is the seat of Willamette University (Methodist Episcopal, 1844), an outgrowth of the mission work of the Methodist Episcopal church begun in 1834 about 10 m. below the site of the present city; of the Academy of the Sacred Heart (Roman Catholic, 1860) and of two business colleges. Immediately north of the city at Chemawa is the Salem (non-reservation) government school for Indians, with an excellently equipped hospital. Water power is derived (in part, by an 18 m. canal) from the Santiam, an affluent of the Willamette river. The city is a market for the produce of the Willamette Valley. The settlement here, gathering about the Methodist mission and school, began to grow in the decade 1840–1850. Salem was chartered as a city in 1853, and in 1860 was made the capital of the state. It grew rapidly after 1900, and its territory was increased in 1903.

SALEM, a town and the county-seat (since 1838) of Roanoke county, Virginia, U.S.A., on the Roanoke river, about 60 m. W. by S. of Lynchburg. Pop. (1900), 3412, including 798 negroes; (1910) 3849. It is served by the Norfolk & Western and the Virginian railways, and has electric railway connexion with Roanoke, about 6 m. E. The town is a summer resort about 1000 ft. above the sea, surrounded by the Alleghany and Blue Ridge mountains. There are chalybeate and sulphur springs in the vicinity. Salem is the seat of a Lutheran Orphan Home (1888), of the Baptist Orphanage of Virginia (1892) and of Roanoke College (co-educational; Lutheran; chartered, 1853). The town is in a dairying, agricultural and fruit-growing region. The Roanoke river provides water-power. The water supply is obtained from a spring within the town limits, from which there flows about 576,000 gallons a day, and from an artesian well. This part of Roanoke county was granted in 1767 to General Andrew Lewis, to whom there is a monument in East Hill Cemetery, where he is buried. Salem, laid out in 1802, was incorporated as a town in 1813.

SALE OF GOODS. Sale (O.Eng. *sala, sellan, syllan,* to hand over, deliver) is commonly defined as the transfer of property from one person to another for a price. This definition requires some consideration in order to appreciate its full scope. The law of sale is usually treated as a branch of the law of contract, because sale is effected by contract. Thus Pothier entitles his classical treatise on the subject, *Traité du contrat de vente,* and the Indian Contract Act (ix. of 1872) devotes a chapter to the sale of goods. But a completed contract of sale is something more. It is a contract plus a transfer of property. An agreement to sell or buy a thing, or, as lawyers call it, an executory contract of sale, is a contract pure and simple. A purely personal bond arises thereby between seller and buyer. But a complete or executed contract of sale effects a transfer of ownership with all the advantages and risks incident thereto. By an agreement to sell a *jus in personam* is created; by a sale a *jus in rem* is transferred. The essence of sale is the transfer of property for a price. If there be no agreement for a price, express or implied, the transaction is gift, not sale, and is regulated by its own peculiar rules and considerations. So, too, if commodity be exchanged for commodity, the transaction is called barter and not sale, and the rules relating to sales do not apply in their entirety. Again, a contract of sale must comtemplate an absolute transfer of the property in the thing sold or agreed to be sold. A mortgage may be in the form of a conditional sale, but English law regards the substance and not the form of the transaction. If in substance the object of the transaction is to secure the repayment of a debt, and not to transfer the absolute property in the thing sold, the law at once annexes to the transaction the complex consequences which attach to a mortgage. So, too, it is not always easy to distinguish a contract for the sale of an article from a contract for the supply of work and materials. If a man orders a set of false teeth from a dentist the contract is one of sale, but if he employs a dentist to stop one of his teeth with gold the contract is for the supply of work and materials. The distinction is of practical importance, because very different rules of law apply to the two classes of contract. The property which may be the subject of sale may be either movable or immovable, tangible or intangible. The present article relates only to the sale of goods—that is to say, tangible movable property. By the laws of all nations the alienation of land or real property is, on grounds of public policy, subject to special regulations. It is obvious that the assignment of “things in action,” such as debts, contracts and negotiable instruments, must be governed by very different principles from those which regulate the transfer of goods, when the object sold can be transferred into the physical possession of the transferee.

The Code of 1893.

In 1847, when Mr Justice Story wrote his work on the sale of personal property, the law of sale was still in process of development. Many rules were still unsettled, especially the rules relating to implied conditions and warranties. But for several years the main principles have been well settled. In 1891 the subject seemed ripe for codification, and Lord Herschell introduced a codifying bill which two years later passed into law as the Sale of Goods Act, 1893 (56 & 57 Vict. c. 71). Sale is a consensual contract. The parties to the contract may supplement it with any stipulations or conditions they may see fit to agree to. The code in no wise seeks to fetter this discretion. It lays down a few positive rules—such, for instance, as that which reproduces the 17th section of the Statute of Frauds. But the main object of the act is to provide clear rules for those cases where the parties have either formed no intention or have failed to express it. When parties enter into a contract they contemplate its smooth performance, and they seldom provide for contingencies which may interrupt that performance—such as the insolvency of the buyer or the destruction of the thing sold before it is delivered. It is the province of the code to provide for these contingencies, leaving the parties free to modify by express stipulation the provisions imported by law. When the code was in contemplation the case of Scotland gave rise to difficulty. Scottish law varies widely from English. To speak broadly, the Scottish law of sale differs from the English by adhering to the rules of Roman law, while the English common law has worked out rules of its own. Where two countries are so closely connected in business as Scotland and England, it is obviously inconvenient that their laws relating to commercial matters should differ. The Mercantile Law Commission of 1855 reported on this question, and recommended that on certain points the Scottish rule should be adopted in England, while on other points the English rule should be adopted in Scotland. The recommendations of the Commission were partially and rather capriciously adopted in the English and Scottish Mercantile Law Amendment Acts of 1856. Certain rules were enacted for England which resembled but did not really reproduce the Scottish law, while other rules were enacted for Scotland which resembled but did not really reproduce the English law. There the matter rested for many years. The Codifying Bill of 1891 applied only to England, but on the advice of Lord Watson it was extended to Scotland. As the English and Irish laws of sale were the same, the case of Ireland gave rise to no difficulty, and the act now applies to the whole of the United Kingdom. As regards England and Ireland very little change in the law has been effected. As regards Scotland the process of assimilation has been carried further, but has not been completed. In a few cases the Scottish rule has been saved or re-enacted, in a few other cases it has been modified, while on other points, where the laws were dissimilar, the English rules have been adopted.

Now that the law has been codified, an analysis of the law resolves itself into an epitome of the main provisions of the statute. The act is divided into six parts, the first dealing with the formation of the contract, the second with the effects of the contract, the third with the performance of the contract, the fourth with the rights of an unpaid seller against the goods, and the fifth with remedies for breach of contract. the sixth part is supplemental. The 1st section, which may be regarded as the keystone of the act, is in the following terms: “A contract of sale of goods is a contract whereby the seller transfers or agrees to transfer the property in goods to the buyer for a money consideration called the price. A contract of sale may be absolute or conditional. When under a contract of sale the property in the goods is transferred from the seller to the buyer the contract is called a ‘sale,’ but when the transfer of the property in the goods is to take place at a future time or subject to some condition thereafter to be fulfilled the contract is called an ‘agreement to sell.’ An agreement to sell becomes a sale when the time elapses or the conditions are fulfilled subject to which the property in the goods is to be transferred.” This section clearly enunciates the consensual nature of the contract, and this is confirmed by section 55, which provides that “where any right, duty or liability would arise under a contract of sale by implication of law,” it may be negatived or varied by express agreement, or by the course of dealing between the parties, or by usage, if the usage be such as to bind both parties to the contract. The next question is who can sell and buy. The act is framed on the plan that if the law of contract were codified, this act would form a chapter in the code. The question of capacity is therefore referred to the general law, but a special provision is inserted (section 2) relating to the supply of necessaries to infants and other persons who are incompetent to contract. Though an infant cannot contract he must live, and he can only get goods by paying for them. The law, therefore, provides that he is liable to pay a reasonable price for necessaries supplied to him, and it defines necessaries as “goods suitable to the condition in life of such minor or other person, and to his actual requirements at the time of the sale and delivery.”

The 4th section of the act reproduces the famous 17th section of the Statute of Frauds, which was an act “for the prevention of frauds and perjuries.” The object of that statute was to prevent people from setting up bogus contracts of sale by requiring material evidence of the contract. The section provides that “a contract for the sale of any goods of the value of ten pounds or upwards shall not be enforceable by action unless the buyer shall accept part of the goods so sold, and actually receive the same, or give something in earnest to bind the contract, or in part payment, or unless some note or memorandum in writing of the contract be made and signed by the party to be charged, or his agent in that behalf.” It is a much disputed question whether this enactment has done more good or harm. It has defeated many an honest claim, though it may have prevented many a dishonest one from being put forward. When judges and juries have been satisfied of the *bona fides* of a contract which does not appear to satisfy the statute, they have done their best to get round it. Every expression in the section has been the subject of numerous judicial decisions, which ran into almost impossible refinements, and illustrate the maxim that hard cases make bad law. It is to be noted that Scotland is excluded from the operation of section 4. The Statute of Frauds has never been applied to Scotland, and Scotsmen appear never to have felt the want of it.

As regards the subject-matter of the contract, the act provides that it may consist either of existing goods or “future goods”—that is to say, goods to be manufactured or acquired by the seller after the making of the contract (§ 5). Suppose that a man goes into a gunsmith's shop and says, “This gun suits me, and if you will make or get me another like it I will buy the pair.” This is a good contract, and no question as to its validity would be likely to occur to the lay mind. But lawyers have seriously raised the question, whether there could be a valid contract of sale when the subject-matter of the contract was not in existence at the time when the contract was made. The price is an essential element in a contract of sale. It may be either fixed by the contract itself, or left to be determined in some manner thereby agreed upon, *e.g.* by the award of a third party. But there are many cases in which the parties intend to effect a sale, and yet say nothing about the price. Suppose that a man goes into a hotel and orders dinner without asking the price. How is it to be fixed? The law steps in and says that, in the absence of any agreement, a reasonable price must be paid (§ 8). This prevents extortion on the part of the seller, and unreasonableness or fraud on the part of the buyer.

Warranty.

The next question dealt with is the difficult one of conditions and warranties (§§ 10 and 11). The parties may insert what stipulations they like in a contract of sale, but the law has to interpret them. The term “warranty” has a peculiar and technical meaning in the law of sale. It denotes a stipulation which the law regards as collateral to the main purpose of the contract. A breach, therefore, does not entitle the buyer to reject the goods, but only to claim damages. Suppose that a man buys a particular horse, which is warranted quiet to ride and drive. If the horse turns out to be vicious, the buyer's only remedy is to claim damages, unless he has expressly reserved a right to return it. But if, instead of buying a particular horse, a man applies to a dealer to supply him with a quiet horse, and the dealer supplies him with a vicious one, the stipulation is a condition. The buyer can either return the horse, or keep it and claim damages. Of course the right of rejection must be exercised within a reasonable time. In Scotland no distinction has been drawn between conditions and warranties, and the act preserves the Scottish rule by providing that, in Scotland, “failure by the seller to perform any material part of a contract of sale” entitles the buyer either to reject the goods within a reasonable time after delivery, or to retain them and claim compensation (§ 11 (2)). In England it is a very common trick for the buyer to keep the goods, and then set up in reduction of the price that they are of inferior quality to what was ordered. To discourage this practice in Scotland the act provides that, in that country, the court may require the buyer who alleges a breach of contract to bring the agreed price into court pending the decision of the case (§ 59). It seems a pity that this sensible rule was not extended to England.

In early English law *caveat emptor* was the general rule, and it was one well suited to primitive times. Men either bought their goods in the open market-place, or from their neighbours, and buyer and seller contracted on a footing of equality. Now the complexity of modern commerce, the division of labour and the increase of technical skill, have altogether altered the state of affairs. The buyer is more and more driven to rely on the honesty, skill and judgment of the seller or manufacturer. Modern law has recognized this, and protects the buyer by implying various conditions and warranties in contracts of sale, which may be summarized as follows: First, there is an implied undertaking on the part of the seller that he has a right to sell the goods (§ 12). Secondly, if goods be ordered by description, they must correspond with that description (§ 13). This, of course, is a universal rule—*Si aes pro auro veneat, non valet.* Thirdly, there is the case of manufacturers or sellers who deal in particular classes of goods. They naturally have better means of judging of their merchandise than the outside public, and the buyer is entitled within limits to rely on their skill or judgment. A tea merchant or grocer knows more about tea than his customers can, and so does a gunsmith about guns. In such cases, if the buyer makes known to the seller the particular purpose for which the goods are required, there is an implied condition that the goods are reasonably fit for it, and if no particular purpose be indicated there is an implied condition that the goods supplied are of merchantable quality (§ 14). Fourthly, in the case of a sale by sample, there is "an implied condition that the bulk shall correspond with the sample in quality," and that the buyer shall have a reasonable opportunity of comparing the bulk with the sample (§ 15).

Effects of Contract.

The main object of sale is the transfer of ownership from seller to buyer, and it is often both a difficult and an important matter to determine the precise moment at which the change of ownership is effected. According to Roman law, which is still the foundation of most European systems, the property in a thing sold did not pass until delivery to the buyer. *Traditionibus et usucapionibus dominia rerum, non nudis pactis, transferuntur.* English law has abandoned this test, and has adopted the principle that the property passes at such time as the parties intend it to pass. Express stipulations as to the time when the property is to pass are very rare. The intention of the parties has to be gathered from their conduct. A long train of judicial decisions has worked out a more or less artificial series of rules for determining the presumed intention of the parties, and these rules are embodied in sections 16 to 20 of the act. The first rule is a negative one. In the case of unascertained goods, *i.e.* goods defined by description only, and not specifically identified, "no property in the goods is transferred to the buyer unless and until the goods are ascertained." If a man orders ten tons of scrap iron from a dealer, it is obvious that the dealer can fulfil his contract by delivering any ten tons of scrap that he may select, and that until the ten tons have been set apart, no question of change of ownership can arise. But when a specific article is bought, or when goods ordered by description are appropriated to the contract, the passing of the property is a question of intention. Delivery to the buyer is strong evidence of intention to change the ownership, but it is not conclusive. Goods may be delivered to the buyer on approval, or for sale or return. Delivery to a carrier for the buyer operates in the main as a delivery to the buyer, but the seller may deliver to the carrier, and yet reserve to himself a right of disposal. On the other hand, when there is a sale of a specific article, which is in a fit state for delivery, the property in the article prima facie passes at once, even though delivery be delayed. When the contract is for the sale of unascertained goods, which are ordered by description, the property in the goods passes to the buyer, when, with the express or implied consent of the parties, goods of the required description are "unconditionally appropriated to the contract." The cases which determine what amounts to an appropriation of goods to the contract are numerous and complicated. Probably they could all be explained as cases of constructive delivery, but at the time when the law of appropriation was worked out the doctrine of constructive delivery was not known. It is perhaps to be regretted that the codifying act did not adopt the test of delivery, but it was thought better to adhere to the familiar phraseology of the cases. Section 20 deals with the transfer of risk from seller to buyer, and lays down the prima facie rule that "the goods remain at the seller's risk until the property therein is transferred to the buyer, but when the property therein is transferred to the buyer, the goods are at the buyer's risk whether delivery has been made or not." *Res perit domino* is therefore the maxim of English, as well as of Roman law.

Title.

In the vast majority of cases people only sell what they have a right to sell, but the law has to make provision for cases where a man sells goods which he is not entitled to sell. An agent may misconceive or exceed his authority. Stolen goods may be passed from buyer to buyer. Then comes the question, Which of two innocent parties is to suffer? Is the original owner to be permanently deprived of his property, or is the loss to fall on the innocent purchaser? Roman law threw the loss on the buyer, *Nemo plus juris in alium transferre potest quam ipse habet.* French law, in deference to modern commerce, protects the innocent purchaser and throws the loss on the original owner. "En fait de meubles, possession vaut titre" (*Code civil*, art. 1599). English law is a compromise between these opposing theories. It adopts the Roman rule as its guiding principle, but qualifies it with certain more or less arbitrary exceptions, which cover perhaps the majority of the actual cases which occur (§§ 21 to 26). In the first place, the provisions of the Factors Act, 1889 (52 and 53 Vict. c. 45, extended to Scotland by 53 and 54 Vict. c. 40), are preserved. That act validates sales and other dispositions of goods by mercantile agent acting within the apparent scope of their authority, and also protects innocent purchasers who obtain goods from sellers left in possession, or from intending buyers who have got possession of the goods while negotiations are pending. In most cases a contract induced by fraud is voidable only, and not void, and the act provides, accordingly, that a voidable contract of sale shall be avoided to the prejudice of an innocent purchaser. The ancient privilege of market overt[1] is preserved intact, section 22 providing that "where goods are sold in market overt, according to the usage of the market, the buyer acquires a good title to the goods provided he buys them in good faith, and without notice of any defect or want of title on the part of the seller." The section does not apply to Scotland, nor to the law relating to the sale of horses which is contained in two old statutes, 2 & 3 Phil. and Mar. c. 7, and 31 Eliz. c. 12. The minute regulations of those statutes are never complied with, so their practical effect is to take horses out of the category of things which can be sold in market overt. The privilege of market overt applies only to markets by prescription, and does not attach to newly-created markets. The operation of the custom is therefore fitful and capricious. For example, every shop in the City of London is within the custom, but the custom does not extend to the greater London outside. If then a man buys a stolen watch in Fleet Street, he may get a good title to it, but he cannot do so if he buys it a few doors off in the Strand. There is, however, a qualification of the rights acquired by purchase even in market overt. When goods have been stolen and the thief is prosecuted to conviction, the property in the goods thereupon revests in the original owner, and he is entitled to get them back either by a summary order of the convicting court or by action. This rule dates back to the statute 21 Hen. VIII. c. 11. It was probably intended rather to encourage prosecutions in the interests of public justice than to protect people whose goods were stolen.

Performance.

Having dealt with the effects of sale, first, as between seller and buyer, and, secondly, as between the buyer and third parties, the act proceeds to determine what, in the absence of convention, are the reciprocal rights and duties of the parties in the performance of their contract (§§ 27 to 37). "It is the duty of the seller to deliver the goods and of the buyer to accept and pay for them in accordance with the terms of the contract of sale" (§ 27). In ordinary cases the seller's duty to deliver the goods is satisfied if he puts them at the disposal of the buyer at the place of sale. The normal contract of sale is represented by a cash sale in a shop. The buyer pays the price and takes away the goods: "Unless otherwise agreed, delivery of the goods and payment of the price are concurrent conditions" (§ 27). But agreement, express or implied, may create infinite variations on the normal contract. It is to be noted that when goods are sent to the buyer which he is entitled to reject, and does reject, he is not bound to send them back to the seller. It is sufficient if he intimate to the seller his refusal to accept them (§ 36).

Rights of Unpaid Sellers.

The normal theory of sale is cash against delivery, but in the great majority of actual cases, especially in commercial transactions, this theory is departed from in practice. The interests of the seller are therefore protected by two rules—namely, those as to lien and as to stoppage *in transitu*. In the absence of any different agreement, as, for instance, where there is a stipulation for sale on credit, the unpaid seller has a right to retain possession of the goods until the price is paid or tendered. The right may, of course, be waived, even when it is not negatived by the contract. It is to be noted that when the seller takes a bill of exchange or other negotiable instrument for the price, the instrument operates as conditional payment. On the dishonour of the instrument the seller's rights revive (§§ 38-43). If the buyer becomes insolvent the unpaid seller has a further right founded on ancient mercantile usage. He may have parted with both the property in and possession of the goods sold, but he can attach the goods as long as they are in the hands of a carrier or forwarding agent, and have not reached the actual possession of the seller or his immediate agent. "Subject to the provisions of this Act, when the buyer of goods becomes insolvent, the unpaid seller who has parted with the possession of the goods has the right of stopping them *in transitu*—that is to say, he may resume possession of the goods as long as they are in course of transit, and may retain them until payment or tender of the price" (§ 44). The right of stoppage, however, cannot be exercised to the prejudice of third parties to whom the bill of lading or other document of title to goods has been lawfully transferred for value (§ 47).

The ultimate sanction of a contract is the legal remedy for its

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[1] That is, "open market," where the goods on sale are exposed to view.

Remedies of buyer and seller.

breach. Seller and buyer have each their appropriate remedies. If the property in the goods has passed to the buyer, or if, under the contract, "the price is payable on a day certain irrespective of delivery," the seller's remedy for breach of the contract is an action for the price (§ 49). In other cases his remedy is an action for damages for non-acceptance. In the case of ordinary goods of commerce the measure of damages is the difference between the contract price and the market or current price at the time when the goods ought to have been accepted. But this test is often applicable. For instance, the buyer may have ordered some article of special manufacture for which there would be no market. The convenient market-price rule is therefore subordinate to the general principle that "the measure of damages is the estimated loss directly and naturally resulting in the ordinary course of events from the buyer's breach of contract" (§ 56). Similar considerations apply to the buyer's right of action for non-delivery of the goods (§ 51). Section 52 deals with a peculiar feature of English law. In Scotland, as a general rule, a party who complains of a breach of contract is entitled to claim that the contract shall be specifically performed. In England a court of common law could only award damages, and apart from certain recent statutes, a claim for specific performance could only be entertained by a court of equity in a very narrow class of cases when the remedy by damages was deemed inadequate. But now, under the act of 1893, "in any action for breach of contract to deliver specific or ascertained goods the court may, if it thinks fit, direct that the contract shall be performed specifically without giving the defendant the option of retaining the goods on payment of damages." The buyer who complains of a breach of warranty on the part of the seller has two remedies. He may either set up the breach of warranty in reduction of the price, or he may pay the price and sue for damages. The prima facie measure of damages is the difference between the value of the goods at the time of delivery and the value they would have had if they had answered to the warranty (§ 53).

The sixth part of the act is supplemental, and is mainly concerned with drafting explanations, but section 58 contains some rules for regulating sales by auction. It prohibits secret bidding on behalf of the seller to enhance the price, but is silent as to combination by buyers to reduce the price. Such a combination, commonly known as a "knock out," is left to be dealt with by the ordinary law of conspiracy.

The Sale of Goods Act 1893 was the third attempt made by the English parliament to codify a branch of commercial law. It would be out of place here to discuss the policy of mercantile codification, but it may be noted that there are very few reported cases on the construction of the act, so that its interpretation does not seem to have given rise to difficulty. As has been noted above, the act preserves some curious anomalies and distinctions between English and Scottish law. But the amendments required to remove them would be few and simple, should the legislature ever think it worth while to undertake the task.

United States.—The law as to the sale of real estate agrees generally with English law. It is considerably simplified by a system of registration. The covenant of warranty, unknown in England, is the principal covenant for title in the United States. It corresponds generally to the English covenant for quiet enjoyment. The right of judicial sale of buildings under a mechanic's lien for labour and materials is given by the law of many states. The sale of public lands is regulated by Act of Congress. In the law of sale of personal property American law is also based upon English law. The principal differences are that the law of market overt is not recognized by the United States, and that an unpaid vendor is the agent of the vendee to resell on non-payment, and is entitled to recover the difference between the contract price and the price of resale. Warranty of title is not carried as far as in England. United States decisions draw a distinction between goods in the possession and goods not in the possession of the vendor at the time of sale. There is no warranty of title of the latter. The Statute of Frauds has been construed in some respects differently from the English decisions. As to unlawful sales, it has been held that a sale in a state where the sale is lawful is valid in a state where it is un-lawful by statute, even though the goods are in the latter state.

The ordinary text-books on the law of sale are constantly re-edited and brought up to date. The following among the others may be consulted: Benjamin's *Sale of Personal Property*; Blackburn's *Contract of Sale*; Campbell's *Law of Sale and Mercantile Agency*; Brown's *Sale of Goods Act* (*Scotland*); Chalmers's *Sale of Goods Act*; Moyle's *Contract of Sale in the Civil Law*; E. J. Schuster's *Principles of German Civil Law*; Beddarride's *Des achats et ventes commerciales*; Story's *Sale of Personal Property* (United States).

(M. D. Ch.)

SALEP (Arab. *sahleb*, Gr. ὄρχις), a drug extensively used in oriental countries as a nervine restorative and fattener, and also much prescribed in paralytic affections. It probably owed its original popularity to the belief in the "doctrine of signatures." It is not used in European medicine. It consists of the tuberous roots of various species of *Orchis* and *Eulophia*, which are decorticated, washed, heated until horny in appearance, and then dried. Its most important constituent is a mucilaginous substance which it yields with cold water to the extent of 48%.

SALERNO (anc. *Salernum*), a seaport and archiepiscopal see of Campania, Italy, capital of the province of Salerno, on the west coast, 33 m. by rail S.E. of Naples. Pop. (1901), 28,936 (town); 45,313 (commune). The ruins of its old Norman castle stand on an eminence 905 ft. above the sea with a background of graceful limestone hills. The town walls were destroyed in the beginning of the 19th century; the seaward portion has given place to the Corso Garibaldi, the principal promenade. The chief buildings are the theatre, the prefecture, and the cathedral of St Matthew (whose bones were brought from Paestum to Salerno in 954), begun in 1076 by Robert Guiscard and consecrated in 1084 by Gregory VII. In front is a beautiful quadrangular court (112 by 102 ft.), surrounded by arcades formed of twenty-eight ancient pillars mostly of granite from Paestum, and containing twelve sarcophagi of various periods; the middle entrance into the church is closed by remarkable bronze doors of 11th-century Byzantine work. The nave and two aisles end in apses. Two magnificent marble ambones, the larger dating from 1175, a large 11th-century altar frontal in the south aisle, having scenes from the Bible carved on thirty ivory tablets, with 13th-century mosaics in the apse, given by Giovanni da Procida, the promotor of the Sicilian Vespers, and the tomb of Pope Gregory VII., and that of Queen Margaret of Durazzo, mother of King Ladislaus, erected in 1412, deserve to be mentioned. In the crypt is a bronze statue of St Matthew. The cathedral possesses a fine Exultet roll. S. Domenico near it has Norman cloisters, and several of the other churches contain paintings by Andrea Sabbatini da Salerno, one of the best of Raphael's scholars. A fine port constructed by Giovanni da Procida in 1260 was destroyed when Naples became the capital of the kingdom, and remained blocked with sand till after the unification of Italy, when it was cleared; but it is now unimportant. The chief industries are silk and cotton-spinning and printing. Good wine is produced in the neighbourhood. A branch railway runs N. up the Irno valley to Mercato S. Severino on the line from Naples to Avellino.

A Roman colony (Salernum) was founded in 194 B.C. to keep the Picentini in check. It was captured by the Samnites in the Social War. It was the point at which the coast road to Paestum diverged from the Via Popillia, rejoining it again E. of Buxentum. In the 4th century the *correctores* of Lucania and the territory of the Bruttii resided here, but it did not attain its full importance till after the Lombard conquest. Dismantled by order of Charlemagne, it became in the 9th century the capital of an independent principality, the rival of that of Benevento, and was surrounded by strong fortifications. The Lombard princes, who had frequently defended their city against the Saracens, succumbed before Robert Guiscard, who took the castle after an eight months' siege and made Salerno the capital of his new territory. The removal of the court to Palermo and the sack of the city by the emperor Henry VI. in 1194 put a stop to its development. The medical school of the *Civitas Hippocratica* (as it called itself on its seals) held a high position in medieval times. Salerno university, founded in 1150, and long one of the great seats of learning in Italy, was closed in 1817.

See A. Avena, *Monumenti dell' Italia Meridionale* (Naples, 1902), i. 371 sqq. (T. As.)

SALERS, a village of central France, in the department of Cantal, 30 m. N. of Aurillac by road. Pop. (1906), 659. Salers dates from the 9th or 10th century and its lords were already powerful in the 11th century. It is finely situated on a plateau overlooking the valley of the Maronne. It is a quaint old town with a church of the 13th and 15th centuries, remains of its ancient ramparts and many houses of the 15th and 16th centuries. Salers has given its name to a celebrated breed of red cattle raised in the district.

SALESBURY (or Salisbury), **WILLIAM** (*c.* 1520–*c.* 1600), Welsh scholar, was a native of Denbighshire, being the son of Foulke Salesbury, who belonged to a family said to be descended from a certain Adam of Salzburg, a member of the ducal house of Bavaria, who came to England in the 12th century. Salesbury was educated at Oxford, where he accepted the Protestant faith, but he passed most of his life at Llanrwst, working at his literary undertakings. The greatest Welsh scholar of his time, Salesbury was acquainted with nine languages, including Latin, Greek and Hebrew, and was learned in philology and botany. He died about 1600. About 1546 he edited a collection of Welsh proverbs (*Oll synwyr pen kembero*), probably the first book printed in Welsh, and in 1547 his *Dictionary in Englyshe and Welshe* was published (facsimile edition, 1877). In 1563 the English parliament ordered the Welsh bishops to arrange for the translation of the Scriptures and the book of common prayer into Welsh. The New Testament was assigned to Salesbury, who had previously translated parts of it. He received valuable assistance from Richard Davies, bishop of St Davids, and also from Thomas Huet, or Hewett (d. 1591), but he himself did the greater part of the work. The translation was made from the Greek, but Latin versions were consulted, and in October 1567 the New Testament was published for the first time in Welsh. This translation never became very popular, but it served as the basis for the new one made by Bishop William Morgan (*c.* 1547–1604). Salesbury and Davies continued to work together, translating various writings into Welsh, until about 1576 when the literary partnership was broken. After this event, Salesbury, although continuing his studies, produced nothing of importance.

Other noteworthy members of the family (the modern spelling is Salusbury) are: John Salesbury (*c.* 1500–1573), who held many preferments under the Tudor sovereigns and was bishop of Sodor and Man from 1571 to 1573; Thomas Salesbury (*c.* 1555–1586), an associate of Anthony Babington, who was executed for conspiring against Queen Elizabeth; Henry Salesbury (1561–*c.* 1637), the author of a Welsh grammar published in 1593; Thomas Salesbury (d. 1643), a poet, who probably fought for Charles I. at Edgehill; and another royalist, William Salesbury (*c.* 1580–*c.* 1659), governor of Denbigh Castle, which, in 1646, he gallantly defended in the interests of the king.

SALEYER (Dutch, *Saleijer*), a group of islands belonging to the government of Celebes and its dependencies in the Dutch East Indies, numbering altogether 73, the principal being Saleyer, Tambalongang, Pulasi and Bahuluwang; between 5° 36′ and 7° 25′ S. and 119° 50′ and 121° 30′ E. The main island, Saleyer, is over 50 m. long and very narrow; area, 248 sq. m. The strait separating it from Celebes is more than 100 fathoms deep and, running in a strong current, is dangerous for native ships to navigate. The strata of the island are all sedimentary rocks: coralline limestone, occasionally sandstone; everywhere, except in the north and north-west, covered by a fertile soil. The watershed is a chain running throughout the island from N. to S., reaching in Bontona Haru 5840 ft., sloping steeply to the east coast.

The population, mainly a mixed race of Macassars, Buginese, the natives of Luvu and Buton, is estimated at 57,000 on the main island and 24,000 on the dependent isles. They use the Macassar language, are for the most part nominally Mahommedans (though many heathen customs survive), and support themselves by agriculture, fishing, seafaring, trade, the preparation of salt (on the south coast) and weaving. Field work is largely performed by a servile class. Raw and prepared cotton, tobacco, trepang, tortoise-shell, coco-nuts and coco-nut oil, and salt are exported. There are frequent emigrations to Celebes and other parts of the archipelago. For that reason, and also on account of its excellent horses and numerous buffaloes, Saleyer is often compared with Madura, being of the same importance to Celebes as is Madura to Java.

SALFORD, a municipal, county and parliamentary borough of Lancashire, England, 189 m. N.W. by N. of London and 31 m. E. by N. of Liverpool. Pop. (1908 estimate), 239,234. Salford also gives its name to the hundred of south-west Lancashire in which Manchester is situated; probably because when the district was divided into hundreds Manchester was in a ruinous condition from Danish ravages. The parliamentary and municipal boundaries of Salford are identical; area, 5170 acres. The parliamentary borough has three divisions, each returning a member. The borough, composed of three townships identical with the ancient manors of Salford, Pendleton and Broughton, is for the most part separated from Manchester by the river Irwell, which is crossed by a series of bridges. The valley of the Irwell, now largely occupied by factories, separates the higher ground of Broughton from that of Pendleton, and is flattest at the south where it joins the Manchester boundary. At the other extremity of Salford it joins the borough of Eccles. The chief railway station is Exchange station, which is in Salford, but has its main approach in Manchester. The Lancashire & Yorkshire and the London & North-Western railways serve the town.

Until 1634 Salford was entirely dependent upon Manchester in its ecclesiastical arrangements. In that year Sacred Trinity Church ("Salford Chapel") was built and endowed under the will of Humphrey Booth the elder, who also founded charities which have grown greatly in value. The yearly income of more than £17,000 is disposed of in pensions and in hospital grants. His grandson, Humphrey Booth the younger, left money for the repair of the church and the residue is distributed amongst the poor. The yearly revenue is about £1400. Salford is the seat of a Roman Catholic bishopric, and its cathedral, St John's, with its spire of 240 ft., is the most noteworthy ecclesiastical building in the borough. Salford has been to a large extent overshadowed by Manchester, and the two boroughs, in spite of their separate government, are so closely connected as to be one great urban area. Many of the institutions in Manchester are intended for the service also of Salford, which, however, has resisted all attempts at municipal amalgamation.

The chief public buildings are the museum and art gallery at Peel Park, the technical school, the education offices and the Salford Hospital. The town hall, built in 1825, is no longer adequate for municipal needs. Broughton and Pendleton have each a separate town hall. The large and flourishing technical school was developed from a mechanics' institution. Peel Park, bought by public subscription in 1846, was the first public recreation ground in the borough. In the grounds are Langworthy Gallery and a museum. In the park are statues of Queen Victoria, the Prince Consort, Sir Robert Peel, Joseph Brotherton and Richard Cobden. The only other monument—a South African War memorial—is outside and almost opposite Peel Park. Other parks are at Seedley, Albert and Buile Hill; the last contains a museum, the contents of which have been transferred from Peel Park. There is also Kersal Moor, 21 acres of Moorland, crossed by a Roman road, which has been noticed for the variety of its flora, and for the capture of the *Oecophara Woodiella*, of which there is no other recorded habitat. The David Lewis recreation ground at Pendleton may also be named. Altogether Salford has thirty parks and open spaces having a total area of 217 acres. The corporation have also provided two cemeteries.

When the municipal museum was founded in 1849 a reference library formed part of the institution, and from this has developed a free library system in which there are also nine lending libraries.

The commercial and industrial history of Salford is closely bound up with that of Manchester. It is the seat of extensive cotton, iron, chemical and allied industries. It owes its development to the steam-engine and the factory system, and in recent years has shared in the increase of trade owing to the construction of the Manchester Ship Canal, which has added greatly to its prosperity. This will be seen by an examination of the rateable value of the three townships now comprised in the borough. This in 1692 was £1404; in 1841, £244,853; in 1884, £734,220; in 1901, £967,727; in 1908–1909, £1,022,172.

The municipal government is in the hands of a town council consisting of 16 aldermen and 48 councillors elected in 16 wards. The water-supply is from Manchester. The corporation have an excellent tramway service. There are also municipal baths. Salford has a separate commission of the peace.

There are no certain figures as to the population before 1773, when at the instance of Dr Thomas Percival a census was taken of Manchester and Salford. The latter had then 4755 inhabitants. Census returns show that its population in 1801 was 14,477; in 1851, 63,850; and in 1901, 220,956. The death-rate in 1906 was 18·5 per thousand.

Within the present borough area there have been found neolithic implements and British urns, as well as Roman coins. In 1851 traces of a Roman road were still visible. Domesday Book mentions Salford as held by Edward the Confessor and as having a forest three leagues long and the same broad. At the Conquest it was part of the domain granted to Roger of Poitou, but reverted to the crown in 1102. After successively belonging to the earls of Chester and of Derby it passed to Edward Crouchback, earl of Lancaster. It was erected into a duchy and county palatine in 1353, and when the house of Lancaster succeeded to the throne their Lancashire possessions were kept separate. Salford and Pendleton are still parts of the ancient duchy of Lancaster, belonging to the English crown. In 1231 Ranulf de Blundeville, earl of Chester, granted a charter constituting Salford a "free borough." But the government notwithstanding was essentially manorial and not municipal. In the Civil Wars between Charles I. and the parliament, Salford was royalist, and the unsuccessful siege of Manchester was conducted from its side of the Irwell. Its later history is mainly identical with that of Manchester (*q.v.*). In 1844 it received a municipal charter and became a county borough in 1889.

BIBLIOGRAPHY.—There is no separate history of Salford; see publications named under MANCHESTER. The MS. records of the Portmote or Court Leet, 1597–1669, were edited by J. G. Mandley for the Chetham Society, but others still remain in manuscript in the State Paper Office. (W. E. A. A.)

SALICETI, ANTOINE CHRISTOPHE (1757–1809), French revolutionist, was born at Saliceto, in Corsica, on the 26th of August 1757, of a family of Piacenza. After studying law in Tuscany, he became an *avocat* at the upper council of Bastia, and was elected deputy of the Third Estate to the French states-general in 1789. As deputy to the Convention, Saliceti voted for the death of Louis XVI., and was sent to Corsica on mission to oppose the counter-revolutionary intrigues. But the success of his adversaries compelled him to withdraw to Provence, where he took part in repressing the revolts at Marseilles and Toulon. It was on this mission that he met and helped his compatriot Bonaparte. On account of his friendship with Robespierre, Saliceti was denounced at the revolution of 9 Thermidor, and was saved only by the amnesty of the year IV. He subsequently organized the army of Italy and the two departments into which Corsica had been divided, was deputy to the Council of the Five Hundred, and accepted various offices under the Consulate and the Empire, being minister of police and of war at Naples under Joseph Bonaparte (1806–1809). He died at Naples on the 23rd of December 1809—it has been alleged by poison.

SALICIN, SALICINUM, $C_{13}H_{18}O_7$, the bitter principle of willow-bark, discovered by Leroux in 1831. It exists in most species of *Salix* and *Populus*, and has been obtained to the extent of 3 or 4% from the bark of *S. helix* and *S. pentandra*.

Salicin is prepared from a decoction of the bark by first precipitating the tannin by milk of lime, then evaporating the filtrate to a soft extract, and dissolving out the salicin by alcohol. As met with in commerce it is usually in the form of glossy white scales or needles. It is neutral, odourless, unaltered by exposure to the air, and has a bitter taste. It is soluble in about 30 parts of water and 80 parts of alcohol at the ordinary temperature, and in 0·7 of boiling water or in 2 parts of boiling alcohol, and more freely in alkaline liquids. It is also soluble in acetic acid without alteration, but is insoluble in chloroform and benzol. From phloridzin it is distinguished by its ammoniacal solution not becoming coloured when exposed to the air. Chemically, it is a glucoside derived from glucose and *saligenin* (o-oxy-benzyl alcohol), into which it is decomposed by the enzymes ptyaline and emulsin. Oxidation converts it into *helicin* (salicyl-aldehyde-glucose). *Populin*, a benzoyl salicin, is a glucoside found in the leaves and bark of *Populus tremula*.

Salicin is used in medicine for the same purposes as salicylic acid and the salicylates. It is also used as a bitter tonic, *i.e.* a gastric stimulant, in doses of five grains. The ordinary dose may go up to forty grains or more with perfect safety, though the British Pharmacopoeia limits it to twenty. The remote action of the drug is that of salicylic acid or the numerous compounds that contain it (see SALICYLIC ACID).

SALIC LAW, and OTHER FRANKISH LAWS. The Salic Law is one of those early medieval Frankish laws which, with other early Germanic laws (see GERMANIC LAWS), are known collectively as *leges barbarorum*. It originated with the Salian Franks, often simply called Salians, the chief of that conglomeration of Germanic peoples known as Franks.

The Salic Law has come down to us in numerous MSS. and in divers forms. The most ancient form, represented by Latin MS. No. 4404 in the Bibliothèque Nationale at Paris, consists of 65 chapters. The second form has the same 65 chapters, but contains interpolated provisions which show Christian influence. The third text consists of 99 chapters, and is divided into two groups, according as the MSS. contain or omit the "Malberg glosses."[1] The fourth version, as emended by Charlemagne, consists of 70 chapters with the Latinity corrected and without the glosses. Though he added some new provisions, Charlemagne respected the ancient ones, even those which had long fallen into disuse. The last version, published by B. J. Herold at Basel in 1557 (*Originum ac Germanicarum antiquitatum libri*) from a MS. now lost, is founded on the second recension, but contains additions of considerably later date.

The law is a compilation, the various chapters were composed at different periods, and we do not possess the original form of the compilation. Even the most ancient text, that in 65 chapters, contains passages which a comparison with the later texts shows to be interpolations. It is possible that chapter i., *De mannire*, was taken from a Merovingian capitulary and afterwards placed at the beginning of the Salic Law. This granted, internal evidence would go to show that the first compilation dates back to the time of Clovis, and doubtless to the last years of his reign, after his victory over the Visigoths (507–511). Many facts combine to preclude the assignment of an earlier date to the compilation of the law. The Germanic tribes had no need to use the Latin language until they had coalesced with the Gallo-Roman population. The scale of judicial fines is given in the *denarius* ("which makes so many *solidi* "), and it is known that the monetary system of the *solidus* did not appear until the Merovingian period. Even in its earliest form the law contains no trace of paganism—a significant fact when we consider how closely law and religion are related in their origins. As pointed out by H. Brunner in his *Deutsche Rechtsgeschichte* (i. 438), the Salic Law contains imitations of the Visigothic laws of Euric (466–485). Finally, chapter xlvii. seems to indicate that the Frankish power extended south of the Loire, since it speaks of men dwelling "trans Legerem" being summoned to the *mallus* (judicial assembly) and being allowed eighty nights for their journey. On the other hand, it is impossible to place the date of compilation later. The Romans are clearly indicated in the law as subjects, but as not yet forming part of the army, which consists solely of the *antrustions*, *i.e.* Frankish warriors of the king's bodyguard. As yet the law is not impregnated with the Christian spirit; this absence of both Christian and Pagan elements is due to the fact that many of the Franks were still heathens, although their king had been converted to Christianity. Christian enactments were introduced gradually into the later versions. Finally, we find capitularies of the kings immediately following Clovis being gradually incorporated in the text of the law—*e.g.* the *Pactum pro tenore pacis* of Childebert I. and Clotaire I. (511–558), and the *Edictum Chilperici* (561–584), chapter iii. of which cites and emends the Salic Law.

The law as originally compiled underwent modifications of varying importance before it took the form known to us in Latin MS. No. 4404, to which the edict of Childebert I. and Clotaire I. is already appended. The classes of MSS. distinguished above give evidence of further changes, the law being supplemented by other capitularies and sundry *extravagantia*, prologues and epilogues, which some historians have wrongly assumed to be parts of the main text. Finally, Charlemagne, who took a keen interest in the ancient documents, had the law emended, the operation consisting in eliminating the Malberg glosses, which were no longer intelligible, correcting the Latinity of the ancient text, omitting a certain number of interpolated chapters, and adding others which had obtained general sanction.

The Salic Law is a collection of ancient customs put into writing by order of the prince. In the sense that they already existed and came ready-made to the prince's hand, it is legitimate to speak of these customs as a popular law, a *Volksrecht*; but it was the prince who gave them force of law, emended them, and rejected such of the ancient usages as appeared to him antiquated. The king, moreover, had the right to add provisions to the law; and we find capitularies of Charlemagne and Louis the Pious in the form of *additamenta* to the Salic Law.

From this it will be seen that the Salic Law is not a political law; it is in no way concerned with the succession to the throne of France, and it is absolutely false to suppose that it was the Salic Law that was invoked in 1316 and 1322 to exclude the daughters of Louis X. and Philip V. from the succession to the throne. The Salic Law is pre-eminently a penal code, which shows the amount of the fines for various offences and crimes, and contains, besides, some civil law enactments, such as the famous chapter on succession to private property (*de alode*), which declares that daughters cannot inherit land. The text is filled with valuable information on the state of the family and property in the 6th century, and it is astonishing to find Montesquieu describing the Salic Law as the law of a people ignorant of landed property. The code also contains abundant information on the organization of the tribunals (tribunal of the hundred and tribunal of the king) and on procedure.

Like all the barbarian laws, the law of the Salian Franks was a personal law; it applied only to the Salian Franks. As the Salians, however, were the victorious race, the law acquired an authority in excess of the other barbarian laws, and in the additions made to the Ripuarian, Lombard, and other allied laws, the Carolingians endeavoured to bring these laws into harmony with the Salic Law. Moreover, many persons, even of foreign race, declared themselves willing to live under the Salic Law. The principle of personality, however, gradually gave way to that of territoriality; and in every district, at least north of the Loire, customs were formed in which were combined in varying proportions Roman law, ecclesiastical law and the various Germanic laws. So late as the 10th and 11th centuries we find certain texts invoking the Salic Law, but only in a vague and general way; and it would be rash to conclude from this that the Salic Law was still in force.

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[1] Some of the MSS. contain words in a barbarian tongue and often preceded by the word "malb." or "malberg." These are admitted to be Frankish words, and are known as the Malberg glosses. Opinions differ as to the true import of these glosses; some scholars hold that the Salic Law was originally written in the Frankish vernacular, and that these words are remnants of the ancient text, while others regard them as legal formulae such as would be used either by a plaintiff in introducing a suit, or by the judge to denote the exact composition to be pronounced. It is more probable, however, that these words served the Franks, who were ignorant of Latin, as clues to the general sense of each paragraph of the law.

Of the numerous editions of the Salic Law only the principal ones can be mentioned: J. M. Pardessus, *Loi salique* (Paris, 1843), 8 texts; G. Waitz, *Das alte Recht der salischen Franken* (1846), text of the first version; J. F. Behrend, *Lex Salica* (1873; 2nd ed., Weimar, 1897); J. H. Hessels, *Lex Salica: the Ten Texts with the Glosses, and the Lex Emendata*, with notes on the Frankish words in the *Lex Salica* by H. Kern (1880), the various texts shown in synoptic tables; A. Holder, *Lex Salica* (1879 seq.), reproductions of all the MSS. with all the abbreviations; H. Geffcken, *Lex Salica* (Leipzig, 1898), the text in 65 chapters, with commentary paragraph by paragraph, and appendix of *additamenta*; and the edition undertaken by Mario Krammer for the *Mon. Germ. hist.* For further information see the dissertations prefixed to the editions of Pardessus, Waitz and Hessels; Jungbohn Clement, *Forschungen über das Recht der salischen Franken* (Berlin, 1876); R. Sohm, *Der Prozess der Lex Salica* (Weimar, 1867; French trans. by M. Thévenin) and *Die fränkische Reichs- und Gerichtsverfassung* (Weimar, 1876); J. J. Thonissen, *L'Organisation judiciaire, le droit pénal et la procédure de la loi salique* (2nd ed., Brussels and Paris, 1882); P. E. Fahlbeck, *La Royauté et la droit royal francs* (Lund, 1883); Mario Krammer, " Kritische Untersuchungen zur Lex Salica " in the *Neues Archiv*, xxx. 263 seq.; H. Brunner, *Deutsche Rechtsgeschichte* (2nd ed., Leipzig, 1906), i. 427 seq.

The *Lex Ripuaria* was the law of the Ripuarian Franks, who dwelt between the Meuse and the Rhine, and whose centre was Cologne. We have no ancient MSS. of the law of the Ripuarians; the 35 MSS. we possess, as well as those now lost which served as the basis of the old editions, do not go back beyond the time of Charlemagne (end of 8th century and 9th century). In all these MSS. the text is identical, but it is a revised text—in other words, we have only a *lex emendata*.

On analysis, the law of the Ripuarians, which contains 89 chapters, falls into three heterogeneous divisions. Chapters i.-xxxi. consist of a scale of compositions; but, although the fines are calculated, not on the unit of 15 *solidi*, as in the Salic Law, but on that of 18 *solidi*, it is clear that this part is already influenced by the Salic Law. Chapters xxxii.-lxiv. are taken directly from the Salic Law; the provisions follow the same arrangement; the unit of the compositions is 15 *solidi*; but capitularies are interpolated relating to the affranchisement and sale of immovable property. Chapters lxv.-lxxxix. consist of provisions of various kinds, some taken from lost capitularies and from the Salic Law, and others of unknown origin. The compilation apparently goes back to the reign of Dagobert I. (629–639), to a time when the power of the mayors of the palace was still feeble, since we read of a mayor being threatened with the death penalty for taking bribes in the course of his judicial duties. It is probable, however, that the first two parts are older than the third. Already in the Ripuarian Law the divergences from the old Germanic law are greater than in the Salic Law. In the Ripuarian Law a certain importance attaches to written deeds; the clergy are protected by a higher *wergild*—600 *solidi* for a priest, and 900 for a bishop; on the other hand, more space is given to the *cojuratores* (sworn witnesses); and we note the appearance of the judicial duel, which is not mentioned in the Salic Law.

There is an edition of the text of the Ripuarian Law in *Mon. Ger. hist. Leges* (1883), v. 185 seq. by R. Sohm, who also brought out a separate edition in 1885 for the use of schools. For further information see the prefaces to Sohm's editions; Ernst Mayer, *Zur Entstehung der Lex Ribuariorum* (Munich, 1886); Julius Ficker, " Die Heimat der Lex Ribuaria " in the *Mitteilungen für österreichische Geschichtsforschung* (supplt., vol. v.); H. Brunner *Deutsche Rechtsgeschichte* (2nd ed., Leipzig, 1906), i., 442.

Lastly, we possess a judicial text in 48 paragraphs, which bears the title of *Notitia vel commemoratio de illa ewa (law), quae se ad Amorem habet.* This was in use in the district along the Yssel formerly called Hamalant. The name Hamalant is unquestionably derived from the Frankish tribe of the Chamavi, and the document is often called *Lex Francorum Chamavorum.* This text, however, is not a law, but rather an abstract of the special usages obtaining in those regions—what the Germans call a *Weistum.* It was compiled by the itinerant Frankish officials known as the *missi Dominici*, and the text undoubtedly goes back to the time of Charlemagne, perhaps to the years 802 and 803, when the activity of the *missi* was at its height. In certain chapters it is possible to discern the questions of the *missi* and the answers of the inhabitants.

There is an edition of this text by R. Sohm in *Mon. Germ. hist. Leges*, v. 269, and another appended to the same writer's school edition of the *Lex Ribuaria.* For further information see E. T. Gaupp, *Lex Francorum Chamavorum* (Breslau, 1855; French trans. in vol. i. of the *Revue historique de droit français et étranger*); Fustel de Coulanges, *Nouvelles Recherches sur quelques problèmes d'histoire* (Paris, 1891), pp. 399-414; H. Froidevaux, *Recherches sur la lex dicta Francorum Chamavorum* (Paris, 1891). (C. Pf.)

SALICYLIC ACID (ortho-hydroxybenzoic acid), an aromatic acid, $C_6H_4(OH)(CO_2H)$, found in the free state in the buds of *Spiraea Ulmaria* and, as its methyl ester, in gaultheria oil and in the essential oil of *Andromeda Leschenaultii.* It was discovered in 1838 by Piria as a decomposition product of salicin. It may be obtained by the oxidation of saligenin and of salicylic aldehyde; by the distillation of copper benzoate; by the decomposition of anthranilic acid with nitrous acid; by fusion of ortho-chlor or ortho-brom benzoic acid with potash; by heating ortho-cyanphenol with alcoholic potash; by heating a mixture of phenol, carbon tetrachloride and alcoholic potash to 100° C. (F. Tiemann and K Reimer, *Ber.*, 1876, 9, p. 1285); and by the action of sodium on a mixture of phenol and chlorcarbonic ester (T. Wilm and G. Wischin, *Zeit. f. Chemie*, 1868, 6).

It is manufactured by Kolbe's process or by some modification of the same. Sodium phenolate is heated in a stream of carbon dioxide in an iron retort at a temperature of 180-220° C., when half the phenol distils over and a basic sodium salicylate is left. The sodium salt is dissolved in water and the free acid precipitated by hydrochloric acid (H. Kolbe, *Ann.*, 1860, 115, p. 201). R. Schmitt (*Jour. prak. Chem.*, 1885 (2), 31, p. 407) modified the process by saturating sodium phenolate at 130° C. with carbon dioxide, in an autoclave, sodium phenyl carbonate $C_6H_5O{\cdot}CO_2Na$ being thus formed; by continuing the heating under pressure this carbonate gradually changes into mono-sodium salicylate. S. Manasse (German patent 73,279) prepared an intimate mixture of phenol and potassium carbonate, which is then heated in a closed vessel with carbon dioxide, best at 130-160° C. The Chemische Fabrik vorm. Hofmann and Schötensack decompose a mixture of phenol (3 molecules) and sodium carbonate (4 mols.) with carbonyl chloride at 140-200° C. When 90 % of the phenol has distilled over, the residue is dissolved and hydrochloric acid added, any phenol remaining is blown over in a current of steam, and the salicylic acid finally precipitated by hydrochloric acid. The acid may also be obtained by passing carbon monoxide over a mixture of sodium phenolate and sodium carbonate at 200° C.: $Na_2CO_3 + C_6H_2ONa + CO = C_7H_4O_2Na_2 + HCO_2Na$; and by heating sodium phenolate with ethyl phenyl carbonate to 200° C.: $C_6H_5O{\cdot}CO_2C_2H + C_6H_5ONa = HO{\cdot}C_6H_4CO_3Na + C_6H_5{\cdot}C_2H_5$. It is to be noted in the Kolbe method of synthesis that potassium phenolate may be used in place of the sodium salt, provided that the temperature be kept low (about 150° C.), for at the higher temperature (220° C.) the isomeric para-oxybenzoic acid is produced.

Salicylic acid crystallizes in small colourless needles which melt at 155° C. It is sparingly soluble in cold water, but readily dissolves in hot. It sublimes, but on rapid heating decomposes into carbon dioxide and phenol. It is volatile in steam. Ferric chloride colours its aqueous solution violet. Potassium bichromate and sulphuric acid oxidize it to carbon dioxide and water; and potassium chlorate and hydrochloric acid to chloranil. On boiling with concentrated nitric acid it yields picric acid. When heated with resorcin to 200° C. it gives trioxybenzophenone. Bromine water in dilute aqueous solution gives a white precipitate of tribromophenol-bromide $C_6H_2Br_3{\cdot}OBr$. Sodium reduces salicylic acid in boiling amyl alcohol solution to *n*-pimelic acid (A. Einhorn and R. Willstätter, *Ber.*, 1893, 26, pp. 2, 913; 1894, 27 p. 331). Potassium persulphate oxidizes it in alkaline solution, the product on boiling with acids giving hydroquinone carboxylic acid (German Patent 81,297). When boiled with calcium chloride and ammonia, salicylic acid gives a precipitate of insoluble basic calcium salicylate, $C_6H_4 < \substack{CO_2 \\ O} > Ca$, a reaction which serves to distinguish it from the isomeric meta- and para-hydroxybenzoic acids. It yields both esters and ethers since it is an acid and also a phenol.

Methyl Salicylate, $C_6H_4(OH)\cdot CO_2CH_3$, found in oil of wintergreen, in the oil of *Viola tricolor* and in the root of varieties of *Polygala*, is a pleasant-smelling liquid which boils at 222° C. On passing dry ammonia into the boiling ester, it gives *salicylamide* and dimethylamine. When boiled with aniline it gives methylaniline and phenol. *Ethyl salicylate*, $C_6H_4(OH)\cdot CO_2C_2H_5$, is obtained by boiling salicylic acid with alcohol and a little sulphuric acid, or by dropping an alcoholic solution of salicylic acid into β-naphthalene sulphonic acid at a temperature of 140-150° C. (German Patent 76,574). It is a pleasant-smelling liquid which boils at 233° C. It is practically unchanged when boiled with aniline. *Phenyl salicylate*, $C_6H_4(OH)\cdot C\cdot O_2C_6H_5$, or salol, is obtained by heating salicylic acid, phenol and phosphorus oxychloride to 120-125° C.; by heating salicylic acid to 220° C.; or by heating salicyl metaphosphoric acid and phenol to 140-150° C. (German Patent 85,565). It crystallizes in rhombic plates which melt at 42° C. and boil at 172° C. (12 mm.). Its sodium salt is transformed into the isomeric $C_6H_4(OC_6H_5)\ CO_2Na$ when heated to 300°. When heated in air for many hours it decomposes, yielding carbon dioxide, phenol and xanthone. *Acetyl-salicylic acid* (salacetic acid), $C_6H_4(O\cdot COCH_3)\cdot CO_2H$, is obtained by the action of acetyl chloride on the acid or its sodium salt (K. Kraut, *Ann.*, 1869, 150, p. 9). It crystallizes in needles and melts at 132° C. (with decomposition). Hydrolysis with baryta water gives acetic and salicylic acids. It is used in medicine under the names aspirin, acetysal, aletodin, saletin, xaxa, &c. It has the same action as salicylic acid and salicylates, but is said to be much freer from objectionable secondary effects. *Salicylo-salicylic acid* $O\cdot(C_6H_4CO_2H)_2$ is obtained by continued heating of salicylic acid and acetyl chloride to 130-140° C. It is an amorphous yellow mass which is easily soluble in alcohol.

Applications.—The addition of a little of the acid to glue renders it more tenacious; skins to be used for making leather do not undergo decomposition if steeped in a dilute solution; butter containing a small quantity of it may be kept sweet for months even in the hottest weather. It also prevents the mouldiness of preserved fruits and has been found useful in the manufacture of vinegar. The use of salicylic acid as a food preservative, was, however, condemned in the findings of the commission appointed by the government of the United States of America, in 1904.

Medicine.—The pharmacopeial dose of the acid is 5-20 grains, but it is so unrelated to experience and practice that it may be ignored. The British Pharmacopeia contains only one preparation, an ointment containing one part of acid to 49 of white paraffin ointment. Salicylic acid is now never given internally, being replaced by its sodium salt, which is much cheaper, more soluble and less irritating to mucous membranes. The salt has a sweet, mawkish taste.

Salicylic acid and salicin (*q.v.*) share the properties common to the group of aromatic acids, which, as a group, are antiseptic without being toxic to man—a property practically unique; are unstable in the body; are antipyretic and analgesic; and diminish the excretion of urea by the kidneys. As an antiseptic salicylic acid is somewhat less powerful than carbolic acid, but its insolubility renders it unsuitable for general use. It is much more powerful than carbolic acid in its inhibitory action upon unorganized ferments such as pepsin or ptyalin. Salicyclic acid is not absorbed by the skin, but it rapidly kills the cells of the epidermis, without affecting the immediately subjacent cells of the dermis ("true skin"). It has a very useful local anhidrotic action. Salicylic acid is a powerful irritant when inhaled or swallowed in a concentrated form, and even when much diluted it causes pain, nausea and vomiting. When salicin is taken internally no irritant action occurs, nor is there any antisepsis. Whatever drug of this group be taken, the product absorbed by the blood is almost entirely sodium salicylate. When the salt is taken by the mouth, absorption is extremely rapid, the salt being present in the peripheral blood within ten minutes.

Sodium salicylate circulates in the blood unchanged, decomposition occurring in the kidney, and probably in tissues suffering from the *Diplococcus rheumaticus* of Poynton and Paine. It used to be stated that these drugs are marked cardiac depressants; and the heart being invariably implicated in rheumatic fever, it is supposed that these drugs must be given with great caution. It has now been established that, provided the kidneys be healthy, natural salicylic acid, sodium salicylate prepared from the natural acid, and salicin, are not cardiac depressants. Of the two latter, 300 grains may be given in a dose and 1½ oz. in twenty-four hours, without any toxic symptoms. The artificial acid and its salt contain ortho-, para- and meta-cresotic acids, which are cardiac depressants. The vegetable product—which is extremely expensive—must be prescribed or the synthetic product guaranteed "physiologically pure," *i.e.* tested upon animals and found to have no toxic properties. Salicylates are the next safest to quinine of all antipyretics, whilst being much more powerful in all febrile states except malaria. Sodium salicylate escapes from the blood mainly by the kidneys, in the secretion of which sodium salicylate and salicyluric acid can be detected within fifteen minutes of its administration. After large doses haematuria has been observed in a few cases. The rapid excretion by the kidneys is one of the cardinal conditions of safety, and also necessitates the very frequent administration of the drug.

Therapeutics.—Salicylic acid is used externally for the removal of corns and similar epidermic thickenings. It causes some pain, so that a sedative should be added. A common formula has 11 parts of the acid, 3 of extract of Indian hemp, and 86 of collodion. There is probably no better remedy for corns. Perspiration of the feet cannot be attacked locally with more success than by a powder consisting of salicylic acid, starch and chalk.

These drugs are specific for acute rheumatism (rheumatic fever). The drug is not a true specific, as quinine is for malaria, since it rarely, if ever, prevents the cardiac damage usually done by rheumatic fever; but it entirely removes the agonizing pain, shortly after its administration, and, an hour or two later, brings down the temperature to normal. In thirty-six hours no symptoms are left. If the drug be now discontinued, they will return in over 90% of cases. In acute gonorrhoeal arthritis, simulating rheumatic fever, salicylates are useless. They may thus afford a means of diagnosis. In rheumatic hyperpyrexia, where the poison has attacked the central nervous system, salicylates almost always fail. The mode of their administration in rheumatic fever is of the utmost importance. At first 20 grains of sodium salicylate should be given every hour: the interval being doubled as soon as the pain disappears, and extended to three hours when the temperature becomes normal. The patient should continue to take about 100 grains a day for at least a fortnight after he is apparently convalescent, otherwise a recrudescence is very probable.

Salicylate of soda may occasionally be of use in cases of gallstone, owing to its action on the bile. It often relieves neuralgia, especially when combined with caffeine and quinine.

Salicylism, or salicylic poisoning, occurs in a good many cases of the use of these drugs. Provided the kidneys be healthy, the symptoms may be ignored. If nephritis be present, it may be seriously aggravated, and the drug must therefore be withheld. The headache, deafness, ringing in the ears and even delirium of salicylism, are practically identical with the symptoms of cinchonism. The drug must be at once withheld if haemorrhages (subcutaneous, retinal, &c.) are observed. As in the case of quinine, the administration of small doses of hydrobromic acid often relieve the milder symptoms.

SALIERI, ANTONIO (1750–1825), Italian composer, was born at Legnano, on the 19th of August 1750. His father was a merchant who died a bankrupt. Through the family of Mocenigo he obtained free admission to the choir school of St Mark's, Venice. In 1766 he was taken to Vienna by F. L. Gassmann, who introduced him to the emperor Joseph. His first opera, *Le Donne letterate*, was produced at the Burg-Theater in 1770. Others followed in rapid succession, and his *Armida* (1771) was a triumphant success.

On Gassmann's death in 1774, he became *Kapellmeister* and, on the death of Bonno in 1788, *Hofkapellmeister*. He held his offices for fifty years, though he made frequent visits to Italy and Paris, and composed music for many European theatres. His *chef d'œuvre* was *Tarare* (afterwards called *Axur, re d'Ormus*), a work which was preferred by the public of Vienna to Mozart's *Don Giovanni*. It was first produced at Vienna on the 8th of June 1787, and was revived at Leipzig in 1846, though only for a single representation. His last opera was *Die Neger*, produced in 1804. After this he devoted himself to the composition of church music, for which he had a very decided talent. Salieri lived on friendly terms with Haydn, but was a bitter enemy to Mozart, whose death he was suspected of having produced by poison; but no evidence was ever forthcoming to give colour to the accusation. He retired from office on his full salary in 1824, and died at Vienna on the 7th of May 1825. Salieri gave lessons in composition to Cherubini and to Beethoven, who dedicated to him his "Three Sonatas for Pianoforte and Violin," *Op.* 12.

See also Albert von Hermann, *Antonio Salieri, eine Studie* (1897); J. F. Edler von Mosel, *Über das Leben und die Werke des Antonio Salieri* (Vienna, 1827).

SALII, the "dancers," an old Italian priesthood, said to have been instituted by Numa for the service of Mars, although later tradition derived them from Greece. They were originally twelve in number, called Salii Palatini to distinguish them from a second college of twelve, Salii Agonales or Collini, said to have been added by Tullus Hostilius; the Palatini were consecrated to Mars, the Collini to Quirinus. All the members were patricians, vacancies being filled by co-optation from young men whose parents were both living; membership was for life, subject to certain exceptions. The officials of the college were the magister, the praesul, and the vates (the leaders in dance and song).

Each college had the care of twelve sacred shields called ancilia. According to the story, during the reign of Numa a small oval shield fell from heaven, and Numa, in order to prevent its being stolen, had eleven others made exactly like it. They were the work of a smith named Mamurius Veturius, probably identical with the god Mamers (Mars) himself. These twelve shields (amongst which was the original one) were in charge of the Salii Palatini. The greater part of March (the birth-month of Mars), beginning from the 1st, on which day the ancile was said to have fallen from heaven and the campaigning season began, was devoted to various ceremonies connected with the Salii. On the 1st, they marched in procession through the city, dressed in an embroidered tunic, a brazen breastplate and a peaked cap; each carried a sword by his side and a short staff in his right hand, with which the shield, borne on the left arm, was struck from time to time. A halt was made at the altars and temples, where the Salii, singing a special chant, danced a war dance. Every day the procession stopped at certain stations (*mansiones*), where the shields were deposited for the night, and the Salii partook of a banquet (see Horace, *Odes*, i. 37. 2). On the next day the procession passed on to another *mansio*; this continued till the 24th, when the shields were replaced in their sacrarium. During this period the Salii took part in certain other festivities: the Equirria (Ecurria) on the 14th, a chariot race in honour of Mars on the Campus Martius (in later times called Mamuralia, in honour of Mamurius), at which a skin was beaten with staves in imitation of hammering; the Quinquatrus on the 19th, a one-day festival, at which the shields were cleansed; the Tubilustrium on the 23rd, when the trumpets of the priests were purified. On the 19th of October, at the Armilustrium or purification of arms, the ancilia were again brought out and then put away for the winter. The old chant of the Salii, called *axamenta*, was written in the old Saturnian metre, in language so archaic that even the priests themselves could hardly understand it.

See Quintilian, *Instit.* i. 6. 40; also J. Wordsworth, *Fragments and Specimens of Early Latin* (1874). The best account of the Salii generally will be found in Marquardt, *Römische Staatsverwaltung*, iii. (1885) pp. 427-438.

SALIMBENE, or more usually Salimbene of Parma (1221–c. 1290), the name taken by the Italian writer, Ognibene di Guido di Adamo. The son of a crusader, Gui di Adamo, and born at Parma on the 9th of October 1221, Ognibene entered the order of the Minorites in 1238, and was known as brother Salimbene. He passed some years in Pisa and other Italian towns; then in 1247 he was sent to Lyons, and from Lyons he went to Paris, returning through France to Genoa, where he became a priest in 1249. From 1249 to 1256 he resided at Ferrara, engaged in writing and in copying manuscripts, but later he found time to move from place to place. His concluding years were mainly spent in monastic retirement in Italy, and he died soon after 1288.

Salimbene was acquainted with many of the important personages of his day, including the emperor Frederick II., the French king St Louis and Pope Innocent IV.; and his *Chronicon*, written after 1281, is a work of unusual value. This covers the period 1167–1287. Salimbene is a very discursive and a very personal writer, but he gives a remarkably vivid picture of life in France and Italy during the 13th century. The manuscript of the chronicle was found during the 18th century, and passed into the Vatican library, where it now remains. The part of the *Chronicon* dealing with the period between 1212 and 1287 was edited by A. Bertani and published at Parma in 1857. This edition, however, is very defective, but an excellent and more complete one has been edited by O. Holder-Egger, and is printed in Band xxxii. of the *Monumenta Germaniae historica. Scriptores* (Hanover, 1905).

See U. Balzani, *Le Croniche italiane nel medio evo* (Milan, 1884); L. Clédat, *De fratre Salimbene et de ejus chronicae auctoritate* (Paris, 1878); E. Michael, *Salimbene und seine Chronik* (Innsbruck, 1889); A. Molinier, *Les Sources de l'histoire de France*, tome iii. (1903); D. W. Duthie, *The Case of Sir John Fastolf and other Historical Studies* (1907); G. G. Coulton, *From St Francis to Dante* (1906).

SALINA, a city and the county-seat of Saline county, Kansas, U.S.A., on the Smoky Hill river, near the mouth of the Saline river, about 100 m. W. of Topeka. Pop. (1905) 7829; (1910) 9688. It is served by the Atchison, Topeka & Santa Fé, the Chicago, Rock Island & Pacific, the Missouri Pacific and the Union Pacific railways. Salina has a Carnegie library, and is the seat of Kansas Wesleyan University (Methodist Episcopal; chartered in 1885, opened in 1886) and of St John's Military School (Protestant Episcopal). The city is the see of a Protestant Episcopal bishop. Salina is the central market of a fertile farming region. Power is furnished by the river, and among the manufactures are flour, agricultural implements, foundry products and carriages. The first settlement on the site of Salina was made in 1857. Its first railway, the Union Pacific, came through in 1867. Salina was first chartered as a city in 1870.

SALINA CRUZ, a seaport of Mexico, in the state of Oaxaca, at the southern terminus of the Tehuantepec National Railway. It is situated near the mouth of the Tehuantepec river, on the open coast of the Isthmus of Tehuantepec, and has no natural harbour. There was only a small Indian village here before Salina Cruz was chosen as the Pacific terminus of the railway. Since then a modern town has been laid out and built on adjacent higher ground. The new port was opened to traffic in 1907 and in 1909 its population was largely composed of labourers. A costly artificial harbour has been built by the Mexican government to accommodate the traffic of the Tehuantepec railway. It is formed by the construction of two breakwaters, the western 3260 ft. and the eastern 1900 ft. long, which curve toward each other at their outer extremities and leave an entrance 635 ft. wide. The enclosed space is divided into an outer and inner harbour by a double line of quays wide enough to carry six great warehouses with electric cranes on both sides and a number of railway tracks. Connected with the new port works is one of the largest dry docks in the world—610 ft. long and 89 ft. wide, with a depth of 28 ft. on its sill at low water. The works were planned to handle an immense volume of transcontinental freight, and before they were finished four steamship lines had arranged regular calls at Salina Cruz; this number has since been largely increased.

SALINS, a town of eastern France, in the department of Jura, on a branch line of the Paris-Lyon railway. Pop. (1906) 4293. Salins is situated in the narrow valley of the Furieuse, between two fortified hills, while to the north rises Mont Poupet (2798 ft.). The town possesses an interesting Romanesque church (which has been well restored) and an hôtel de ville of the 18th century. A Jesuit chapel of the 17th century contains a library (established in 1593) and a museum. Salins owes its name to its saline waters, used for bathing and drinking. There are also salt workings and gypsum deposits.

The territory of Salins, which was enfeoffed in the 10th century by the abbey of Saint Maurice in Valais to the counts of Mâcon, remained in possession of their descendants till 1175. Maurette de Salins, heiress of this dynasty, left the lordship to the house of Vienne, and her granddaughter sold it in 1225 to Hugh IV., duke of Burgundy, who ceded it in 1237 to John of Chalon (d. 1267) in exchange for the countship of Chalon-sur-Saône. John's descendants—counts and dukes of Burgundy, emperors and kings of the house of Austria—bore the title of sire de Salins. In 1477 Salins was taken by the French and temporarily made the seat of the *parlement* of Franche-Comté by Louis XI. In 1668 and 1674 it was retaken by the French and thenceforward remained in their power. In 1825 the town was almost destroyed by fire. In 1871 it successfully resisted the German troops.

SALISBURY, EARLS OF. The title of earl of Salisbury was first created about 1149, when it was conferred on Patrick de Salisbury (sometimes from an early date called in error Patrick Devereux), a descendant of Edward de Salisbury, mentioned in Domesday as *vicecomes* of Wiltshire. His granddaughter Isabella became countess of Salisbury *suo jure* on the death of her father, William the 2nd earl, without male heirs, in 1196, and the title was assumed by her husband, William de Longespée (d. 1226), illegitimate son of King Henry II. possibly by Rosamond Clifford ("The fair Rosamond"). Isabella survived her husband, and outlived both her son and grandson, both called Sir William de Longespée, and on her death in 1261 her great-granddaughter Margaret (d. 1310), wife of Henry de Lacy, earl of Lincoln, probably became *suo jure* countess of Salisbury; she transmitted the title to her daughter Alice, who married Thomas Plantagenet, earl of Lancaster. Lancaster having been attainted and beheaded in 1322, the countess made a surrender of her lands and titles to Edward II., the earldom thus lapsing to the crown.

The earldom of Salisbury was granted in 1337 by Edward III. to William de Montacute, Lord Montacute (1301–1344), in whose family it remained till 1400, when John, 3rd earl of this line, was attainted and his titles forfeited. His son Thomas (1388–1428) was restored in blood in 1421; and Thomas's daughter and heiress, Alice, married Sir Richard Neville (1400–1460), a younger son of Ralph Neville, 1st earl of Westmorland and a grandson of John of Gaunt, who sat in parliament in right of his wife as earl of Salisbury; he was succeeded by his son Richard, on whose death without male issue in 1471 the earldom fell into abeyance. George Plantagenet, duke of Clarence, brother of Edward IV., who married Richard's daughter and co-heiress, Isabel, became by a separate creation earl of Salisbury in 1472, but by his attainder in 1478 this title was forfeited, and immediately afterwards was granted to Edward Plantagenet, eldest son of Richard duke of Gloucester, afterwards Richard III., on whose death in 1484 it became extinct.

Richard III.'s queen, Anne, was a sister of the above-mentioned Isabel, duchess of Clarence, and co-heiress with her of Richard Neville, earl of Salisbury. On the death of Queen Anne in 1485 the abeyance of the older creation terminated, Edward Plantagenet, eldest son of George duke of Clarence by Isabel Neville, becoming earl of Salisbury as successor to his mother's right. He was attainted in 1504, five years after his execution, but the earldom then forfeited was restored to his sister Margaret (1474–1541), widow of Sir Richard Pole, in 1513. This lady was also attainted, with forfeiture of her titles, in 1539.

Sir Robert Cecil, second son of the 1st Lord Burghley (*q.v.*), was created earl of Salisbury (1605), having no connexion in blood with the former holders of the title. (See SALISBURY, ROBERT CECIL, 1ST EARL OF.) In his family the earldom has remained till the present day, the 7th earl of the line having been created marquess of Salisbury in 1789.

See G. E. C., *Complete Peerage*, vol. vii. (1896).

Early years in Parliament.

SALISBURY, ROBERT ARTHUR TALBOT GASCOYNE-CECIL, 3RD MARQUESS OF (1830–1903), British statesman, second son of James, 2nd marquess, by his first wife, Frances Mary Gascoyne, was born at Hatfield on the 3rd of February 1830, and was educated at Eton and Christ Church, Oxford, where he took his degree in 1850. At Oxford he was an active member of the Union Debating Society. The first few years after leaving the university were spent by Lord Robert Cecil (as he then was) in travel, as far afield as New Zealand; but in 1853 he was returned unopposed to the House of Commons as Conservative member for Stamford, being elected in the same year a fellow of All Souls. He made his maiden speech in Parliament on the 7th of April 1854, in opposition to Lord John Russell's Oxford University Bill. The speech was marked by scepticism as to the utility of reforms, and Lord Robert prophesied that if the wishes of founders were disregarded, nobody would in future care to found anything. In 1857 he appeared as the author of his first Bill—for establishing the voting-paper system at parliamentary elections; and in the same year he married Georgina Caroline, daughter of Sir Edward Holt Alderson, a baron of the Court of Exchequer, a large share of whose great intellectual abilities she inherited. Lord Robert Cecil continued to be active not only in politics, but, for several years, in journalism, the income he earned by his pen being then a matter of pecuniary importance to him. One of his contemporaries at Oxford had been Thomas Hamber of Oriel, who became editor of the *Standard*, and during these years Cecil was an occasional contributor of "leaders" to that paper. He also contributed to the *Saturday Review*, founded in 1855 by his brother-in-law Beresford Hope, and edited by his friend Douglas Cook; not infrequently he wrote for the *Quarterly* (where, in 1867, he was to publish his famous article on "the Conservative Surrender"); and in 1858 he contributed to *Oxford Essays* a paper on "The Theories of Parliamentary Reform," giving expression to the more intellectual and aristocratic antagonism to doctrinaire Liberal views on the subject, while admitting the existence of many anomalies in the existing electoral system. In February of the next year, when Disraeli introduced his Reform Bill with its "fancy franchises," the member for Stamford was prominent among its critics from the Tory point of view. During the seven years that followed Lord Robert was always ready to defend the Church, or the higher interests of Conservatism and property; and his speeches then, not less than later, showed a caustic quality and a tendency to what became known as "blazing indiscretions." For example, when the repeal of the paper duty was being discussed in 1861, he asked whether it "could be maintained that a person of any education could learn anything worth knowing from a penny paper"—a question the answer to which has been given by the powerful, highly organized, and admirable Conservative penny press of a subsequent day. A little later he declared the proceedings of the Government "more worthy of an attorney than of a statesman"; and on being rebuked, apologized—to the attorneys. He also charged Lord John Russell with adopting "a sort of tariff of insolence" in his dealings with foreign Powers, strong and weak.

Cabinet minister: the Franchise question: resignation 1867.

It was not, however, till the death of Palmerston and the removal of Lord John Russell to the House of Lords had brought Gladstone to the front that Lord Robert Cecil—who became Lord Cranborne by the death of his elder brother on the 14th of June 1865—began to be accepted as a politician of the first rank. His emergence coincided with the opening of the new area in British politics, ushered in by the practical steps taken to extend the parliamentary franchise. On the 12th of March 1866 Gladstone brought forward his measure to establish a £7 franchise in boroughs and a £14 franchise in counties, which were calculated to add 400,000 voters to the existing lists. Lord Cranborne met the Bill with a persistent opposition, his rigorous logic and merciless hostility to clap-trap tending strongly to reinforce the impassioned eloquence of Robert Lowe. But though he attacked the Government Bill both in principle and detail, he did not absolutely commit himself to a position of hostility to Reform of every kind; and on the defeat of Gladstone's Ministry no surprise was expressed at his joining the Cabinet of Lord Derby as secretary of state for India, even when it became known that a settlement of the Reform question was part of the Tory programme. The early months of the new Government's tenure were marked by the incident of the Hyde Park riots; and if there had been members of the Cabinet and party who believed up to that time that the Reform question was not urgent the action of the Reform League and the London populace forced them to a different conclusion. On the 11th of February Disraeli informed the House of Commons that the Government intended to ask its assent to a series of thirteen resolutions; but when, on the 26th of February, the Liberal leaders demanded that the Government should produce a Bill, Disraeli at once consented to do so. The introduction of a Bill was, however, delayed by the resignation of Lord Cranborne, General Peel and Lord Carnarvon. The Cabinet had been considering two alternative measures, widely different in kind and extent, and the final decision between the two was taken in ten minutes (whence the nickname of the "Ten Minutes Bill") at an informal gathering of the Cabinet held just before Derby was engaged to address a general meeting of the party. At a Cabinet council held on the 23rd of February measure A had been agreed upon, the three doubtful ministers having been persuaded that the checks and safeguards provided were sufficient; in the interval between Saturday and Monday they had come to the conclusion that the checks were inadequate; on Monday morning they had gone to Lord Derby and told him so; at two o'clock the rest of the Cabinet, hastily summoned, had been informed of the new situation, and had there and then, before the meeting at half-past two, agreed, in order to retain their three colleagues, to throw over measure A, and to present measure B to the country as the fruit of their matured and unanimous wisdom. Derby at the meeting, and Disraeli a few hours later in the House of Commons, explained their new measure—a measure based upon a £6 franchise; but their own side did not like it, the Opposition were furious, and the moral sense of the country was revolted by the undisguised adoption of almost the very Bill which the Conservatives had refused to accept from their opponents only a year before. The result was that the Government reverted to measure A, and the three ministers again handed in their resignations. In the debate on the third reading of the Bill, when its passage through the House of Commons without a division was assured, Lord Cranborne showed with caustic rhetoric how the "precautions, guarantees, and securities" with which the Bill had bristled on its second reading had been dropped one after another at the bidding of Gladstone.

In the House of Lords.

In countries where politics are conducted on any other than the give-and-take principles in vogue in England, such a breach as that which occurred in 1867 between Lord Cranborne and his former colleagues, especially Disraeli, would have been beyond repair. But Cranborne, though an aristocrat both by birth and by conviction, was not impracticable; moreover, Disraeli, who had himself risen to eminence through invective, admired rather than resented that gift in others; and their common opposition to Gladstone was certain to reunite the two colleagues. In the session of 1868 Gladstone announced that he meant to take up the Irish question, and to deal especially with the celebrated "Upas tree," of which the first branch was the Established Church. By way of giving full notice to the electorate, he brought in a series of resolutions on this question; and though the attitude adopted by the official Conservatives towards them was not one of serious antagonism, Lord Cranborne vigorously attacked them. This was his last speech in the House of Commons, for on the 12th of April his father died, and he became 3rd marquess of Salisbury. In the House of Lords the new Lord Salisbury's style of eloquence—terse, incisive and wholly free from false ornament—found an even more appreciative audience than it had met with in the House of Commons. The questions with which he was first called upon to deal were questions in which his interest was keen—the recommendations of the Ritual Commission and, some time later, the Irish Church Suspensory Bill. Lord Salisbury's argument was that the last session of an expiring parliament was not the time in which so grave a matter as the Irish Church Establishment should be judged or prejudged; that a Suspensory Bill involved the question of disestablishment; and that such a principle could not be accepted by the Lords until the country had pronounced decisively in its favour. Even then there were those who raised the cry that the only business of the House of Lords was to register the decisions of the Commons, and that if they refused to do so it was at their peril. Lord Salisbury met this cry boldly and firmly:—

> "When the opinion of your countrymen has declared itself, and you see that their convictions—their firm, deliberate, sustained convictions—are in favour of any course, I do not for a moment deny that it is your duty to yield."

In the very next session Lord Salisbury was called upon to put his view into practice, and his influence went far to persuade the peers to pass the Irish Church Disestablishment Bill. In his opinion the general election of the autumn of 1868 had been fought on this question; his friends had lost, and there was nothing for them to do but to bow to the necessities of the situation. The story of his conduct in the matter has been told in some fulness in the *Life* of Archbishop Tait, with whom Salisbury acted, and who throughout those critical weeks played a most important part as mediator between the two extreme parties—those of Lord Cairns (representing Ulster) and Gladstone. October 1869 saw the death of the old Lord Derby, who was still the titular leader of his party; and he was succeeded as leader of the House of Lords by Cairns. For the dignified post of chancellor of the university of Oxford Convocation unanimously chose as Derby's successor the marquess of Salisbury. Derby had translated the *Iliad* very well, but his successor was far more able to sympathize with the academic mind and temper. He was at heart a student, and found his best satisfaction in scientific research and in scientific speculation; while still a young man he had made useful contributions to the investigation of the flora of Hertfordshire, and at Hatfield he had his own laboratory, where he was able to satisfy his interest in chemical and electrical research. As regards his connexion with Oxford may be mentioned in particular his appointment, in 1877, of a second University Commission, and his appearance, in September 1894, in the Sheldonian Theatre as president of the British Association.

Disraeli Cabinet of 1874.

It is not necessary to dwell at any length upon the part taken by Lord Salisbury between 1869 and 1873 in respect of the other great political measures of Gladstone's Government—the Irish Land Act, the Act Abolishing Purchase in the Army, Forster's Education Act, &c. Nor does his attitude towards the Franco-German War of 1870–71 call for any remark; a British leader of Opposition is bound, even more than a minister, to preserve a discreet silence on such occasions. But early in 1874 came the dissolution, suddenly announced in Gladstone's famous Greenwich letter, with the promise of the abolition of the income-tax. For the first time since 1841 the Conservatives found themselves in office with a large majority in the House of Commons. In Disraeli's new Cabinet in 1874 Salisbury accepted his old position at the India Office. The first task with which the new secretary of state had to deal was one of those periodical famines which are the great scourge of India; he supported the action of Lord Northbrook, the viceroy, and refused to interfere with private trade by prohibiting the export of grain. This attitude was amply justified, and Lord Salisbury presently declared that the action of the Government had given so much confidence to private traders that, by their means, "grain was pouring into the distressed districts at a greater rate than that which was being carried by the public agency, the amount reaching nearly 2000 tons a day." The Public Worship Regulation Bill of 1874 was the occasion of a famous passage of arms between Salisbury and his chief. The Commons had inserted an amendment which, on consideration by the Lords, Salisbury opposed, with the remark that it was not for the peers to attend to the "bluster" of the lower House merely because a small majority there had passed the amendment. The new clause was accordingly rejected, and the Commons eventually accepted the situation; but Disraeli, banteringly criticizing Salisbury's use of the word "bluster," alluded to him as "a man who does not measure his phrases. He is one who is a great master of gibes and flouts and jeers."

The Eastern question.

From the middle of 1876 the Government was occupied with foreign affairs. In regard to the stages of Eastern fever through which the nation passed between the occurrence of the Bulgarian "atrocities" and the signature of the Treaty of Berlin, the part played by Salisbury was considerable. The excesses of the Bashi-Bazouks took place in the early summer of 1876, and were recorded in long and highly-coloured despatches to English newspapers; presently there followed Gladstone's pamphlet on *Bulgarian Horrors*, his speech on Blackheath and his enunciation of a "bag-and-baggage" policy towards Turkey. The autumn went by, Servia and Montenegro declared war upon Turkey and were in imminent danger of something like extinction. On the 31st of October Russia demanded an armistice, which Turkey granted; and Great Britain immediately proposed a conference at Constantinople, at which the powers should endeavour to make arrangements with Turkey for a general pacification of her provinces and of the inflammable communities adjoining. At this conference Great Britain was represented by Lord Salisbury. It met early in December, taking for its basis the British terms, namely, the *status quo ante* in Servia and Montenegro; a self-denying ordinance on the part of all the powers; and the independence and territorial integrity of the Ottoman empire, together with large administrative reforms assured by guarantees. General Ignatieff, the Russian ambassador, was effusively friendly with the British envoy; but though the philo-Turkish party in England professed themselves scandalized, Salisbury made no improper concessions to Russia, and departed in no way from the agreed policy of the British

Cabinet. On the 20th of January the conference broke up, Turkey having declared its recommendations inadmissible; and Europe withdrew to await the inevitable declaration of war. Very early in the course of that war the intentions of Great Britain were clearly indicated in a despatch of Lord Derby to the British representative at St Petersburg, which announced that so long as the struggle concerned Turkish interests alone Great Britain would be neutral, but that such matters as Egypt, the Suez Canal, the regulations affecting the passage of the Dardanelles, and the possession of Constantinople itself would be regarded as matters to which she could not be indifferent. For some nine months none of these British interests appeared to be threatened, nor had Lord Salisbury's own department to concern itself very directly with the progress of the belligerents. Once or twice, indeed, the Indian secretary committed himself to statements which laid him open to a good deal of attack, as when he rebuked an alarmist by bidding him study the Central Asian question "in large maps." But with the advance of Russia through Bulgaria and across the Balkans, British anxiety grew. In mid-December explanations were asked from the Russian Government as to their intentions with regard to Constantinople. On the 23rd of January the Cabinet ordered the fleet to sail to the Dardanelles. Lord Carnarvon resigned, and Lord Derby handed in his resignation, but withdrew it. The Treaty of San Stefano was signed on the 3rd of March; and three weeks later, when its full text became known, the Cabinet decided upon measures which finally induced Lord Derby, at the end of the month, to retire from the Foreign Office, his place being immediately filled by Lord Salisbury. The new foreign secretary at once issued the famous "Salisbury circular" to the British representatives abroad, which appeared in the newspapers on the 2nd of April. This elaborate and dignified State paper was at once a clear exposition of British policy, and practically an invitation to Russia to reopen the negotiations for a European congress. These negotiations, indeed, had been proceeding for several weeks past; but Russia having declared that she would only discuss such points as she pleased, the British Cabinet had withdrawn, and the matter for the time was at an end. The bulk of the document consisted of an examination of the Treaty of San Stefano and its probable effects, Lord Salisbury justifying such an examination on the ground that as the position of Turkey and the other countries affected had been settled by Europe in the Treaty of Paris in 1856, the powers which signed that treaty had the right and the duty to see that no modifications of it should be made without their consent.

Succeeds Lord Derby as Foreign Minister.

At Berlin Congress.

The effect of the circular was great and immediate. At home the Conservatives were encouraged, and many moderate Liberals rallied to the Eastern policy of the Government. Abroad it seemed as if the era of divided councils was over, and the Russian Government promptly recognized that the circular meant either a congress or war with Great Britain. For the latter alternative it was by no means prepared, and very soon negotiations were reopened, which led to the meeting of the congress at Berlin on the 13th of June. The history of that famous gathering and of its results is narrated under EUROPE. Lord Beaconsfield on two or three subsequent occasions referred to the important part that his colleague had played in the negotiations, and he was not using merely the language of politeness. Rumours had appeared in the London press as to a supposed Anglo-Russian agreement that had been signed between Salisbury and the Russian ambassador, Count Shuvaloff, and these rumours or statements were described by the foreign secretary in the House of Lords, just before he left for Berlin, as "wholly unauthentic." But on the 14th of June what purported to be the full text of the agreement was published by the *Globe* newspaper through a certain Charles Marvin, at that time employed in occasional transcribing work at the Foreign Office, and afterwards known by some strongly anti-Russian books on the Central Asian question. Besides the general inconvenience of the disclosure, the agreement, which stipulated that Batum and Kars might be annexed by Russia, made it impossible for the congress to insist upon Russia entirely withdrawing her claim to Batum, though at the time of the meeting of the congress it was known to some of the negotiators that she was not unwilling to do so. In one respect Salisbury's action at the congress was unsuccessful. Much as he disliked Gladstone's sentimentalism, he was not without a certain sentimentalism of his own, and at the Berlin Congress this took the form of an unexpected and, as it happened, useless pushing of the claims of Greece. But in the main Salisbury must be held to deserve, almost equally with his great colleague, the credit for the Berlin settlement. Great, however, as was the work done at Berlin, and marked the relief to all Europe which was caused by the signing of the treaty, much work, and of no pleasant kind, remained for the British Foreign Office and for the Indian Government before the Beaconsfield parliament ended and the Government had to render up its accounts to the nation. Russia, foreseeing a possible war with Great Britain, had during the spring of 1878 redoubled her activity in Central Asia, and, almost at the very time that the treaty was being signed, her mission was received at Kabul by the Amir Sher Ali. Out of the Amir's refusal to receive a counterbalancing British mission there grew the Afghan War; and though he had ceased to control the India Office, Salisbury was naturally held responsible for some of the preliminary steps which, in the judgment of the Opposition, had led to these hostilities. But the Liberals entirely failed to fix upon Salisbury the blame for a series of events which was generally seen to be inevitable. A defence of the foreign policy of the Government during the year which followed the Berlin Treaty was made by Salisbury in a speech at Manchester (October 1879), which had a great effect throughout Europe. In it he justified the occupation of Cyprus, and approved the beginnings of a league of central Europe for preserving peace.

Leader of Conservative Party.

In the spring of 1880 the general election overthrew Beaconsfield's Government and replaced Gladstone in power, and the country entered upon five eventful years, which were to see the consolidation of the Parnellite party, the reign of outrage in Ireland, disasters in Zululand and the Transvaal, war in Egypt, a succession of costly mistakes in the Sudan, and the final collapse of Gladstone's Government on a trifling Budget question. The defeat of 1880 greatly depressed Beaconsfield, who till then had really believed in that "hyperborean" theory upon which he had acted in 1867—the theory that beyond and below the region of democratic storm and violence was to be found a region of peaceful conservatism and of a dislike of change. After the rude awakening of April 1880 Beaconsfield seems to have lost heart and hope, and to have ceased to believe that wealth, birth and education would count for much in future in England. Salisbury, who on Beaconsfield's death a year later was chosen, after the claims of Cairns had been withdrawn, as leader of the Conservative peers (Sir Stafford Northcote continuing to lead the Opposition in the lower House), was not so disposed to counsels of despair. After the Conservative reaction had come in 1886, he was often taunted with pessimism as regards the results, and he certainly spoke on more than one occasion in a way which appeared to justify the caricatures which appeared of him in the Radical press in his character of Hamlet; but in the days of Liberal ascendancy Salisbury was confident that the tide would turn. We may pass briefly over the years of Opposition between 1880 and 1885; the only policy that could then wisely be followed by the Conservative leaders was that of giving their opponents sufficient rope. In 1884 a new Reform Bill was introduced, extending household suffrage to the counties; this was met in the Lords by a resolution, moved by Cairns, that the peers could not pass it unaccompanied by a Redistribution Bill. The Government, therefore, withdrew their measure. In the summer and autumn there was a good deal of agitation; but in November a redistribution scheme was settled between the leaders of both parties, and the Bill passed. When, in the summer of 1885, Gladstone resigned, it became necessary for the country to know whether Salisbury or Northcote was the real Conservative leader; and the Queen settled the matter by at once sending for Lord Salisbury, who became prime minister for the first time in 1885.

Prime Minister, 1885.

Unionism: Prime Minister, 1886.

The "Forwards" among the Conservatives, headed by Lord Randolph Churchill, brought so much pressure to bear that Northcote was induced to enter the House of Lords as earl of Iddesleigh, while Sir Michael Hicks Beach was made leader of the House of Commons, Lord Randolph Churchill secretary for India, and Mr Arthur Balfour president of the Local Government Board. The new Government had only to prepare for the general election in the autumn. The ministerial programme was put forward by Salisbury on the 7th of October in an important speech addressed to the Union of Conservative Associations assembled at Newport, in Monmouthshire; and in this he outlined large reforms in local government, poured scorn upon Mr Chamberlain's Radical policy of "three acres and a cow," but promised cheap land transfer, and opposed the disestablishment of the Church as a matter of life or death to the Conservative party. In this Lord Salisbury was declaring war against what seemed to be the danger should Mr Chamberlain's "unauthorized programme" succeed; while the comparative slightness of his references to Ireland showed that he had no more suspicion than anybody else of the event which was about to change the whole face of British politics, to break up the Liberal party and to change the most formidable of the advanced Radicals into an ally and a colleague. The general election took place, and there were returned to parliament 335 Liberals, 249 Conservatives and 86 Home Rulers; so that if the last two parties had combined, they would have exactly tied with the Liberals. The Conservative Government met parliament, and after a short time were put into a minority of 79 on a Radical land motion, brought in by Mr Chamberlain's henchman, Mr Jesse Collings. Mr Gladstone's return to office, and his announcement of a Bill giving a separate parliament to Ireland, were quickly followed by the secession of the Unionist Liberals; the defeat of the Bill; an appeal to the country; and the return of the Unionist party to power with a majority of 118. Salisbury at once offered to make way for Lord Hartington, but the suggestion that the latter should form a Government was declined; and the Conservatives took office alone, with an Irish policy which might be summed up, perhaps, in Salisbury's words as "twenty years of resolute government." For a few months, until just before his sudden death on the 12th of January 1887, Lord Iddesleigh was foreign secretary; but Salisbury, who meantime had held the post of lord privy seal, then returned to the Foreign Office. Meanwhile the increasing friction between him and Lord Randolph Churchill, who, amid many qualms on the part of more old-fashioned Conservatives, had become chancellor of the exchequer and leader of the House of Commons, had led to the latter's resignation, which, to his own surprise, was accepted; and from that date Salisbury's effective primacy in his own party was unchallenged.

1886–1902.

Only the general lines of Salisbury's later political career need here be sketched. As a consequence of the practical monopoly of political power enjoyed by the Unionist party after the Liberal disruption of 1886—for even in the years 1892–1895 the situation was dominated by the permanent Unionist majority in the House of Lords—Salisbury's position became unique. These were the long-looked-for days of Conservative reaction, of which he had never despaired. The situation was complicated, so far as Salisbury personally was concerned, by the coalition with the Liberal Unionists, which was confirmed in 1895 by the inclusion of the duke of Devonshire, Mr Chamberlain, and other Liberal Unionists in the Cabinet. But though it appeared anomalous that old antagonists like Lord Salisbury and Mr Chamberlain should be working together in the same ministry, the prime minister's position was such that he could disregard a superficial criticism which paid too little heed to his political faculty and his patriotic regard for the requirements of the situation. Moreover, the practical work of reconciling Conservative traditions with domestic reform depended rather on Salisbury's nephew, Mr Balfour, who led the House of Commons, than on Salisbury, who devoted himself almost entirely to foreign affairs. The new Conservative movement, moreover, in the country at large, was, in any case, of a more constructive type than Salisbury himself was best fitted to lead, and he was not the real source of the political inspiration even of the Conservative wing of the Unionist party during this period. He began to stand to some extent outside party and above it, a moderator with a keenly analytic and rather sceptical mind, but still the recognized representative of the British empire in the councils of the world, and the trusted adviser of his sovereign. Though himself the last man to be selected as the type of a democratic politician—for his references to extensions of popular government, even when made by his own party, were full of mild contempt—Salisbury gradually acquired a higher place in public opinion than that occupied by any contemporary statesman. His speeches—which, though carelessly composed, continued to blaze on occasion with their old fire and their somewhat mordant cynicism—were weightier in tone, and became European events. Without the genius of Disraeli or the personal magnetism of Gladstone, he yet inspired the British public with a quiet confidence that under him things would not go far wrong, and that he would not act rashly or unworthily of his country. Even political opponents came to look on his cautious and balanced conservatism, and his intellectual aloofness from interested motives or vulgar ambition, as standing between them and something more distasteful. Moreover, in the matter of foreign affairs his weight was supreme. He had lived to become, as was indeed generally recognized, the most experienced working diplomatist in Europe. His position in this respect was shown in nothing better than in his superiority to criticism. In foreign affairs many among his own party regarded him as too much inclined to "split the difference" and to make "graceful concessions"—as in the case of the cession of Heligoland to Germany—in which it was complained that Great Britain got the worst of the bargain. But though occasionally, as in the withdrawal of British ships from Port Arthur in 1898, such criticism became acute, the plain fact of the preservation of European peace, often in difficult circumstances, reconciled the public to his conduct of affairs. His patience frequently justified itself, notably in the case of British relations with the United States, which were for a moment threatened by President Cleveland's message concerning Venezuela in 1895. And though his loyalty to the European Concert in connexion with Turkey's dealings with Armenia and Crete in 1895–1898 proved irritatingly ineffectual—the pace of the concert, as Lord Salisbury explained, being rather like that of a steam-roller—no alternative policy could be contemplated as feasible in any other statesman's hands. Salisbury's personal view of the new situation created by the methods of the sultan of Turkey was indicated not only by a solemn and unusual public warning addressed to the sultan in a speech at Brighton, but also by his famous remark that in the Crimean War Great Britain had "put her money on the wrong horse." Among his most important strokes of diplomacy was the Anglo-German agreement of 1890, delimiting the British and German spheres of influence in Africa. The South African question from 1896 onwards was a matter for the Colonial Office, and Salisbury left it in Mr Chamberlain's hands.

A peer premier must inevitably leave many of the real problems of democratic government to his colleagues in the House of Commons. In the Upper House Lord Salisbury was paramount. Yet while vigorously opposing the Radical agitation for the abolition of the House of Lords, he never interposed a *non possumus* to schemes of reform. He was always willing to consider plans for its improvement, and in May 1888 himself introduced a bill for reforming it and creating life peers; but he warned reformers that the only result must be to make the House stronger. To abolish it, on the other hand, would be to take away a necessary safeguard for protecting "Philip drunk" by an appeal to "Philip sober."

Lord Salisbury suffered a severe loss by the death in 1900 of his wife, whose influence with her husband had been great, as her devotion had been unswerving. Her protracted illness was one among several causes, including his own occasional ill-health, which after 1895 made him leave as much as possible of the work of political leadership to his principal colleagues—Mr Arthur Balfour more than once acting as foreign secretary for several weeks while his uncle stayed abroad. But for some years it was felt that his attempt to be both prime minister and foreign secretary was a mistake; and after the election of 1900 Salisbury handed over the seals of the foreign office to Lord Lansdowne, remaining himself at the head of the government as lord privy seal. In 1902, upon the conclusion of peace in South Africa, he felt that the time had come to retire from office altogether; and on the 11th of July his resignation was accepted by the king, and he was succeeded as prime minister by Mr Arthur Balfour.

From this moment he remained in the political background, and his ill-health gradually increased. He died at Hatfield on the 22nd of August 1903, and was succeeded in the marquessate by his eldest son Lord Cranborne (b. 1861), who entered the house of commons for the Darwen division of Lancashire (1885–1892) and since 1893 had been member for Rochester. The new marquess had been under-secretary for foreign affairs since 1900, and in October 1903 he became lord privy seal in Mr Balfour's ministry. Of the other four sons, Lord Hugh Cecil (b. 1869) became a prominent figure in parliament as Conservative member for Greenwich (1895–1906), first as an ardent and eloquent High Churchman in connexion with the debates on education, &c., and then as one of the leaders of the Free-Trade Unionists opposing Mr Chamberlain; and his elder brother Lord Robert Cecil (b. 1864), who had at first devoted himself to the bar and become a K.C., entered parliament in 1906 for Marylebone, holding views in sympathy with those of Lord Hugh, who had been defeated through the opposition of a Tariff Reform Unionist in a triangular contest at Greenwich, which gave the victory to the Radical candidate. In the elections of January 1910 Lord Robert Cecil resigned his candidature for Marylebone, owing to the strong opposition of the Tariff Reformers, which threatened to divide the party and lose the seat; he stood for Blackburn as a Unionist Free Trader and was defeated. On the other hand Lord Hugh Cecil was returned for Oxford University in place of the Rt. Hon. J. G. Talbot. Lord Hugh's candidature, which was announced in 1909 simultaneously with the resignation of the sitting member, was opposed by many who disagreed with his fiscal views and his attitude on Church questions; but it was found that he had the support of the great majority of the electors, and he was ultimately returned unopposed. (H. Ch.)

SALISBURY, ROBERT CECIL, 1st Earl of (*c.* 1565–1612), English lord treasurer, the exact year of whose birth is unrecorded, was the youngest son of William Cecil, 1st Lord Burghley, and of his second wife Mildred, daughter of Sir Anthony Cooke, of Gidea Hall in Essex. He was educated in his father's house and at Cambridge University. In 1584 he was sent to France, and was returned the same year to parliament, and again in 1586, as member for Westminster. In 1588 he accompanied Lord Derby in his mission to the Netherlands to negotiate peace with Spain, and sat in the parliament of 1588, and in the assemblies of 1593, 1597 and 1601 for Hertfordshire. About 1589 he appears to have entered upon the duties of secretary of state, though he did not receive the official appointment till 1596. On the 20th of May 1591 he was knighted, and in August sworn of the privy council. In 1597 he was made chancellor of the duchy of Lancaster, and in 1598 despatched on a mission to Henry IV. of France, to prevent the impending alliance between that country and Spain. The next year he succeeded his father as master of the court of wards. On Lord Burghley's death on the 4th of August both Essex and Bacon desired to succeed him in the supreme direction of affairs, but the queen preferred the son of her last great minister. On Essex's disgrace, consequent on his sudden and unauthorized abandonment of his command in Ireland, Cecil's conduct was worthy of high praise. "By employing his credit with Her Majesty in behalf of the Earl," wrote John Petit (June 14, 1600), "he has gained great credit to himself both at home and abroad." At this period began Cecil's secret correspondence with James in Scotland. Hitherto Cecil's enemies had persuaded James that the secretary was unfavourable to his claims to the English throne. An understanding was now effected by which Cecil was able to assure James of his succession, ensure his own power and predominance in the new reign against Sir Walter Raleigh and other competitors, and secure the tranquillity of the last years of Elizabeth, the conditions demanded by him being that all attempts of James to obtain parliamentary recognition of his title should cease, that an absolute respect should be paid to the queen's feelings, and that the communications should remain a profound secret. Writing later in the reign of James, Cecil says: "If Her Majesty had known all I did, how well these (? she) should have known the innocency and constancy of my present faith, yet her age and orbity, joined to the jealousy of her sex, might have moved her to think ill of that which helped to preserve her."[1]

Such was the nature of these secret communications, which, while they aimed at securing for Cecil a fresh lease of power in the new reign, conferred undoubted advantages on the country. Owing to Cecil's action, on the death of Elizabeth on the 24th of March 1603, James was proclaimed king, and took possession of the throne without opposition. Cecil was continued in his office, was created Baron Cecil of Essendon in Rutlandshire on the 13th of May, Viscount Cranborne on the 20th of August 1604, and earl of Salisbury on the 4th of May 1605. He was elected chancellor of the University of Cambridge in February 1601, and obtained the Garter in May 1606. Meanwhile Cecil's success had completed the discontent of Raleigh, who, exasperated at his dismissal from the captaincy of the guard, became involved —whether innocently or not is uncertain—in the treasonable conspiracy known as the "Bye Plot." Cecil took a leading part in his trial in July 1603, and, though probably convinced of his guilt, endeavoured to ensure him a fair trial and rebuked the attorney-general, Sir Edward Coke, for his harshness towards the prisoner. On the 6th of May 1608 the office of lord treasurer was added to Salisbury's other appointments, and the whole conduct of public affairs was placed solely in his hands. His real policy is not always easy to distinguish, for the king constantly interfered, and Cecil, far from holding any absolute or continuous control, was often not even an adviser but merely a follower, simulating approval of schemes opposed to his real judgment. In foreign affairs his aim was to preserve the balance of power between France and Spain, and to secure the independence of the Netherlands from either state. He also hoped, like his father, to make England the head of the Protestant alliance abroad; and his last energies were expended in effecting the marriage in 1612 of the princess Elizabeth, James's daughter, with the Elector Palatine. He was in favour of peace, preoccupied with the state of the finances at home and the decreasing revenue, and, though sharing Raleigh's dislike of Spain, was instrumental in making the treaty with that power in 1604. In June 1607 he promised the support of the government to the merchants who complained of Spanish ill-usage, but declared that the commons must not meddle with questions of peace and war. In 1611 he disapproved of the proposed marriage between the prince of Wales and the Infanta. His bias against Spain and his fidelity to the national interests render, therefore, his acceptance of a pension from Spain a surprising incident in his career. At the conclusion of the peace in 1604 the sum Cecil received was £1000, which was raised the following year to £1500; while in 1609 he demanded an augmentation and to be paid for each piece of information separately. If, as has been stated,[2] he received a pension also from France, it is not improbable that, like his contemporary Bacon, who accepted presents from suitors on both sides and still gave an independent decree, Cecil may have maintained a freedom from corrupting influences, while his acceptance of money as the price of information concerning the intentions of the government may have formed part of a general policy of cultivating good relations with the two great rivals of England (one advantage of which was the communication of plots formed against the government), and of maintaining the balance of power between them. It is difficult, however, in the absence of complete information, to understand the exact nature and signification of these strange relations.

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[1] *Correspondence of King James VI. of Scotland with Sir R. Cecil*, ed. by J. Bruce (Camden Soc., 1861), p. xl.

[2] Gardiner, *History of England*, i. 214.

As lord treasurer Salisbury showed considerable financial ability. During the year preceding his acceptance of that office the expenditure had risen to £500,000, leaving, with an ordinary revenue of about £320,000 and the subsidies voted by parliament, a yearly deficit of £73,000. Lord Salisbury took advantage of the decision by the judges in the court of exchequer in Bates's case in favour of the king's right to levy impositions; and (on the 28th of July 1608) imposed new duties on articles of luxury and those of foreign manufacture which competed with English goods, while lowering the dues on currants and tobacco. By this measure, and by a more careful collection, the ordinary income was raised to £460,000, while £700,000 was paid off the debt, leaving at the beginning of 1610 the sum of £300,000. This was a substantial reform, and if, as has been stated, the "total result of Salisbury's financial administration" was "the halving of the debt at the cost of doubling the deficiency,"[1] the failure to secure a permanent improvement must be ascribed to the extravagance of James, who, disregarding his minister's entreaties and advice, continued to exceed his income by £149,000. But a want of statesmanship had been shown by Salisbury in forcing the king's legal right to levy impositions against the remonstrances of the parliament. In the "great contract," the scheme now put forward by Salisbury for settling the finances, his lack of political wisdom was still more apparent. The Commons were to guarantee a fixed annual subsidy, on condition of the abandonment of impositions and of the redress of grievances by the king. An unworthy and undignified system of higgling and haggling was initiated between the crown and the parliament. Salisbury could only attribute the miscarriage of his scheme to the fact "that God did not bless it." But Bacon regarded it with severe disapproval, and in the parliament of 1613, after the treasurer's death, he begged the king to abandon these humiliating and dangerous bargainings, "that your majesty do for this parliament put off the person of a merchant and contractor and rest upon the person of a king." In fact, the vicious principle was introduced that a redress of grievances could only be obtained by a payment of subsidies. The identity of interests between the crown and the nation which had made the reign of Elizabeth so glorious, and which she herself had consummated on the occasion of her last public appearance by a free and voluntary concession of these same impositions, was now destroyed, and a divergence of interests, made patent by vulgar bargaining, was substituted which stimulated the disastrous struggle between sovereign and people, and paralysed the national development for two generations.

This was scarcely a time to expect any favours for the Roman Catholics, but Salisbury, while fearing that the Roman Church in England would become a danger to the state, had always been averse from prosecution for religion, and he attempted to distinguish between the large body of law-abiding and loyal Roman Catholics and those connected with plots and intrigues against the throne and government, making the offer in October 1607 that if the pope would excommunicate those that rebelled against the king and oblige them to defend him against invasion, the fines for recusancy would be remitted and they would be allowed to keep priests in their houses. This was a fair measure of toleration. His want of true statesmanship was shown with regard to the Protestant Nonconformists, towards whom his attitude was identical with that afterwards maintained by Laud, and the same ideal pursued, namely that of material and outward conformity, Salisbury employing almost the same words as the archbishop later, that "unity in belief cannot be preserved unless it is to be found in worship."[2]

Bacon's disparaging estimate of his cousin and rival was probably tinged with some personal animus, and instigated by the hope of recommending himself to James as his successor; but there is little doubt that his acute and penetrating description of Salisbury to James as one "fit to prevent things from growing worse but not fit to make them better," as one "greater *in operatione* than *in opere*," is a true one.[3] Elsewhere Bacon accuses him "of an artificial animating of the negative"—in modern language, of official obstruction and "red tape." But in one instance at least, when he advised James not to press forward too hastily the union of England and Scotland, a measure which especially appealed to Bacon's imagination and was ardently desired by him, Salisbury showed a prudence and judgment superior to his illustrious critic. It can scarcely be denied that he rendered substantial services to the state in times of great difficulty and perplexity, and these services would probably have been greater and more permanent had he served a better king and in more propitious times. Both Elizabeth and James found a security in Salisbury's calm good sense, safe, orderly official mind and practical experience of business, of which there was no guarantee in the restlessness of Essex, the enterprise of Raleigh or the speculation of Bacon. On the other hand, he was neither guided nor inspired by any great principle or ideal, he contributed nothing towards the settlement of the great national problems, and he precipitated by his ill-advised action the disastrous struggle between crown and parliament.

Lord Salisbury died on the 24th of May 1612, at the parsonage house at Marlborough, while returning to London from taking the waters at Bath. During his long political career he had amassed a large fortune, besides inheriting a considerable portion of Lord Burghley's landed estate. In 1607 he exchanged, at the king's request, his estate of Theobalds in Hertfordshire for Hatfield. Here he built the magnificent house of which he himself conceived the plans and the design, but which he did not live to inhabit, its completion almost coinciding with his death. In person and figure he was in strange contrast with his rivals at court, being diminutive in stature, ill-formed and weak in health. Elizabeth styled him her pygmy; his enemies delighted in vilifying his "wry neck," "crooked back" and "splay foot," and in Bacon's essay on "Deformity," it was said, "the world takes notice that he paints out his little cousin to the life."[4] Molin, the Venetian ambassador in England, gives a similar description of his person, but adds that he had "a noble countenance and features."[5] Lord Salisbury wrote *The State and Dignitie of a Secretaire of Estate's Place* (publ. 1642, reprinted in *Harleian Miscellany*, ii. and *Somers Tracts* (1809), v.; see also *Harleian MSS.* 305 and 354), and *An Answer to Certain Scandalous Papers scattered abroad under Colour of a Catholick Admonition* (1606), justifying his attitude towards recusants after the discovery of the Gunpowder Plot (*Harl. Misc.* ii.; *Somers Tracts*, v.). He married Elizabeth, daughter of William Brooke, 5th Baron Cobham, by whom, besides one daughter, he had William (1591–1668), his successor as 2nd earl.

No complete life of Robert Cecil has been attempted, but the materials for it are very extensive, including *Hist. MSS. Comm. Series, Marquis of Salisbury's MSS.* (superseding former reports in the series), from which MSS. selections were published in 1740 by S. Haynes, by Wm. Murdin in 1759, by John Bruce, in *The Correspondence of King James VI. with Sir Robert Cecil*, in 1861 (Camden Society), and by Ed. Lodge, in *Illustrations of English History*, in 1838.

The 2nd earl of Salisbury, who sided with the parliament during the Civil War and represented his party in negotiations with the king at Uxbridge and at Newport, was succeeded by his grandson James (1648–1683) as 3rd earl. James's descendant, James, the 7th earl (1748–1823), who was lord chamberlain of the royal household from 1783 to 1804, was created marquess of Salisbury in 1789. His son and successor, James Brownlow William, the 2nd marquess (1791–1868), married Frances Mary, daughter of Bamber Gascoyne of Childwall Hall, Lancashire, and took the name of Gascoyne before that of Cecil. He was lord privy seal in 1852 and lord president of the council in 1858–1859; his son and heir was the famous prime minister.

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[1] Spedding, *Life and Letters of Bacon*, iv. 276.

[2] Gardiner, *History of England*, i. 199.

[3] Spedding, *Life and Letters of Bacon*, iv. 278 note, 279.

[4] Chamberlain to Carleton, Birch's *Court of King James*, i. 214.

[5] *Cal. of State Papers: Venetian*, x. 515.

SALISBURY, THOMAS DE MONTACUTE, 4th Earl of (1388–1428), was son of John, the third earl, who was executed in 1400 as a supporter of Richard II. Thomas was granted part of his father's estates and summoned to parliament in 1409, though not fully restored till 1421. He was present throughout the campaign of Agincourt in 1415, and at the naval engagement before Harfleur in 1416. In the expedition of 1417–18 he served with increasing distinction, and especially at the siege of Rouen. During the spring of 1419 he held an independent command, capturing Fécamp, Honfleur and other towns, was appointed lieutenant-general of Normandy, and created earl of Perche. In 1420 he was in chief command in Maine, and defeated the Maréchal de Rieux near Le Mans. When Henry V. went home next year Salisbury remained in France as the chief lieutenant of Thomas, duke of Clarence. The duke, through his own rashness, was defeated at Baugé on the 21st of March 1421. Salisbury came up with the archers too late to retrieve the day, but recovered the bodies of the dead, and by a skilful retreat averted further disaster. He soon gathered a fresh force, and in June was able to report to the king "this part of your land stood in good plight never so well as now." (*Foedera*, x. 131). Salisbury's success in Maine marked him out as John of Bedford's chief lieutenant in the war after Henry's death. In 1423 he was appointed governor of Champagne, and by his dash and vigour secured one of the chief victories of the war at Cravant on the 30th of July. Subsequent operations completed the conquest of Champagne, and left Salisbury free to join Bedford at Verneuil. There on the 17th of August, 1424, it was his "judgment and valour" that won the day. During the next three years Salisbury was employed on the Norman border and in Maine. After a year's visit to England he returned to the chief command in the field in July, 1428. Against the judgment of Bedford he determined to make Orleans his principal objective, and began the siege on the 12th of October. Prosecuting it with his wonted vigour he stormed Tourelles, the castle which protected the southern end of the bridge across the Loire, on the 24th of October. Three days later whilst surveying the city from a window in Tourelles he was wounded by a cannon-shot, and died on the 3rd of November 1428. Salisbury was the most skilful soldier on the English side after the death of Henry V. Though employed on diplomatic missions both by Henry V. and Bedford, he took no part in politics save for a momentary support of Humphrey, duke of Gloucester, during his visit to England in 1427–1428. He was a patron of John Lydgate, who presented to him his book *The Pilgrim* (now Harley MS. 4826, with a miniature of Salisbury, engraved in Strutt's *Regal Antiquities*). By his first wife Eleanor Holand, daughter of Thomas, earl of Kent, Salisbury had an only daughter Alice, in her right earl of Salisbury, who married Richard Neville, and was mother of Warwick the Kingmaker. His second wife Alice was grand-daughter of Geoffrey Chaucer, and after his death married William de la Pole, duke of Suffolk.

The chief accounts of Salisbury's campaigns are to be found in the *Gesta Henrici Quinti*, edited by B. Williams for the Eng. Hist. Soc. (London, 1850) in the *Vita Henrici Quinti* (erroneously attributed to Thomas of Elmham), edited by T. Hearne (Oxford, 1727); the *Chronique* of E. de Monstrelet, edited by L. D. d'Arcq (Paris, 1857–1862); the *Chroniques* of Jehan de Waurin, edited by W. and E. L. C. P. Hardy (London, 1864–1891); and the *Chronique de la Pucelle* of G. Cousinot, edited by Vallet de Viriville (Paris, 1859). For modern accounts see Sir J. H. Ramsay, *Lancaster and York* (Oxford, 1892); and C. Oman, *Political History of England*, 1377–1485 (London, 1906). (C. L. K.)

SALISBURY, WILLIAM LONGSWORD (or Longespée), Earl of (d. 1226), was an illegitimate son of Henry II. In 1198 he received from King Richard I. the hand of Isabella, or Ela (d. 1261), daughter and heiress of William, earl of Salisbury, and was granted this title with the lands of the earldom. He held many high offices under John, and commanded a section of the English forces at Bouvines (1214), when he was made a prisoner. He remained faithful to the royal house except for a few months in 1216, when John's cause seemed hopelessly lost. He was also a supporter of Hubert de Burgh. In 1225 he went on an expedition to Gascony, being wrecked on the Isle of Ré on the return voyage. The hardships of this adventure undermined his health, and he died at Salisbury on the 7th of March 1226, and was buried in the cathedral there. The eldest of Longsword's four sons, William (*c.*1212–1250) did not receive his father's earldom, although he is often called earl of Salisbury. In 1247 he led the English crusaders to join the French at Damietta and was killed in battle with the Saracens in February 1250.

SALISBURY, a township of Litchfield county, in the north-western corner of Connecticut, U.S.A. Pop. (1910) 3522. Area, about 58 sq. m. Salisbury is served by the Central New England, and the New York, New Haven & Hartford railways. In the township are several villages, including Salisbury, Lakeville, Lime Rock, Chapinville and Ore Hill. Much of the township is hilly, and Bear Mountain (2355 ft.), near the Massachusetts line, is the highest elevation in the state. The Housatonic river forms the eastern boundary. The township is a summer resort. In it are the Scoville Memorial Library (about 8000 volumes in 1910); the Hotchkiss preparatory school (opened in 1892, for boys); the Salisbury School (Protestant Episcopal, for boys), removed to Salisbury from Staten Island in 1901 and formerly St Austin's school; the Taconic School (1896, for girls); and the Connecticut School for Imbeciles (established as a private institution in 1858). Among the manufactures are charcoal, pig-iron, car wheels and general castings at Lime Rock, cutlery at Lakeville, and knife-handles and rubber brushes at Salisbury. The iron mines are among the oldest in the country; mining began probably as early as 1731.

The first settlement within the township was made in 1720 by Dutchmen and Englishmen, who in 1719 had bought from the Indians a tract of land along the Housatonic, called "Weatogue"—an Indian word said to mean "the wigwam place." In 1732 the township was surveyed with its present boundaries, and in 1738 the land (exclusive of that held under previous grants) was auctioned by the state at Hartford. In that year the present name was adopted, and in 1741 the township was incorporated.

See Malcolm D. Rudd, *An Historical Sketch of Salisbury, Connecticut* (New York, 1899); and Ellen S. Bartlett, "Salisbury," in *The Connecticut Quarterly*, vol. iv. No. 4, pp. 345 sqq. (Hartford, Conn., 1898).

SALISBURY, a city and municipal and parliamentary borough, and the county town of Wiltshire, England, 83¼ m. W. by S. of London, on the London and South-Western and Great Western railways. Pop. (1901) 17,117. Its situation is beautiful. Viewed from the hills which surround it the city is seen to lie among flat meadows mainly on the north bank of the river Avon, which is here joined by four tributaries. The magnificent cathedral stands close to the river, on the south side of the city, the streets of which are in part laid out in squares called the "Chequers." To the north rises the bare upland of Salisbury Plain.

The cathedral church of St Mary is an unsurpassed example of Early English architecture, begun and completed, save its spire and a few details, within one brief period (1220–1266). There is a tradition, supported by probability, that Elias de Derham, canon of the cathedral (d. 1245), was the principal architect. He was at Salisbury in 1220–1229, and had previously taken part in the erection of the shrine of Thomas à Becket at Canterbury. The building is 473 ft. in extreme length, the length of the nave being 229 ft. 6 in., the choir 151 ft., and the lady chapel 68 ft. 6 in. The width of the nave is 82 ft. and the height 84 ft. The spire, the highest in England, measures 404 ft. (For plan, see Architecture: *Romanesque and Gothic in England*.) The cathedral, standing in a broad grassy close, consists of a nave of ten bays, with aisles and a lofty north porch, main transepts with eastern aisles, choir with aisles, lesser transepts, presbytery and lady chapel. The two upper storeys of the tower and the spire above are early Decorated. The west front, the last portion of the original building completed, bears in its rich ornamentation signs of the transition to the Decorated style. The perfect uniformity of the building is no less remarkable within than without. The frequent use of Purbeck marble for shafts contrasts beautifully with the delicate grey freestone which is the principal building material. In the nave is a series of monuments of much interest, which were placed here by James Wyatt, who, in an unhappy restoration of the cathedral (1782–1791), destroyed many magnificent stained-glass windows which had escaped the Reformation, and also removed two Perpendicular chapels and the detached belfry which stood to the north-west of the cathedral. One of the memorials is a small figure of a bishop in robes. This was long connected with the ceremony of the "boy bishop," which, as practised both here and elsewhere until its suppression by Queen Elizabeth, consisted in the election of a choir-boy as "bishop" during the period between St Nicholas' and Holy Innocents' Days. The figure was supposed to represent a boy who died during his tenancy of the office. But such small figures occur elsewhere, and have been supposed to mark the separate burial-place of the heart. The lady chapel is the earliest part of the original building, as the west end is the latest. The cloisters, south of the church, were built directly after its completion. The chapter-house is of the time of Edward I., a very fine octagonal example, with a remarkable series of contemporary sculptures. The library contains many valuable MSS. and ancient printed books. The diocese covers nearly the whole of Dorsetshire, the greater part of Wiltshire and very small portions of Berkshire, Hampshire, Somersetshire and Devonshire.

There are three ancient parish churches: St Martin's, with square tower and spire, and possessing a Norman font and Early English portions in the choir; St Thomas's (of Canterbury), founded in 1240 as a chapel to the cathedral, and rebuilt in the 15th century; and St Edmund's, founded as the collegiate church of secular canons in 1268, but subsequently rebuilt in the Perpendicular period. The residence of the college of secular priests is occupied by the modern ecclesiastical college of St Edmund's, founded in 1873. St John's chapel, founded by Bishop Robert Bingham in the 13th century, is occupied by a dwelling-house. There is a beautiful chapel attached to the St Nicholas hospital. The poultry cross, or high cross, an open hexagon with six arches and a central pillar, was erected by Lord Montacute before 1335. In the market-place is Marochetti's statue to Sidney Herbert, Lord Herbert of Lea. The modern public buildings include the court-house, market, corn exchange and theatre. A park was laid out in 1887 to commemorate the jubilee of Queen Victoria, and in the same year a statue was erected to Henry Fawcett, the economist, who was born at Salisbury. Among remaining specimens of ancient domestic architecture may be mentioned the banqueting-hall of John Halle, wool merchant, built about 1470; and Audley House, belonging also to the 15th century, and repaired in 1881 as a diocesan church house. There are a large number of educational and other charities, including the bishop's grammar school, Queen Elizabeth's grammar school, the St Nicholas hospital and Trinity hospital, founded by Agnes Bottenham in 1379. Brewing, tanning, carpet-making and the manufacture of hardware and of boots and shoes are carried on, and there is a considerable agricultural trade. The city is governed by a mayor, 7 aldermen and 21 councillors. Area, 1710 acres.

Old Sarum.

History.—The neighbourhood of Salisbury is rich in antiquities. The famous megalithic remains of Stonehenge (*q.v.*) are not far distant. From Milford Hill and Fisherton many prehistoric relics have been brought to the fine Blackmore Museum in the city. But the site most intimately associated with Salisbury is that of *Old Sarum*, the history of which forms the preface to that of the modern city. This is a desolate place, lying a short distance north of Salisbury, with a huge mound guarded by a fosse and earthworks. The summit is hollowed out like a crater, its rim surmounted by a rampart so deeply cut away that its inner side rises like a sheer wall of chalk 100 ft. high.

Old Sarum was probably one of the chief fortresses of the early Britons and was known to the Romans as *Sorbiodunum.* Cerdic, founder of the West Saxon kingdom, fixed his seat there in the beginning of the 6th century. Alfred strengthened the castle, and it was selected by Edgar as a place of national assembly to devise means of checking the Danes. Under Edward the Confessor it possessed a mint. The ecclesiastical importance of Old Sarum begins with the establishment of a nunnery by Edward the Confessor. Early in the 8th century Wiltshire had been divided between the new diocese of Sherborne and that of Winchester. About 920 a bishopric had been created at Ramsbury, east of Savernake Forest; to this Sherborne was joined in 1058 and in 1075/6 Old Sarum became the seat of a bishopric, transferred hither from Sherborne. Osmund, the second bishop, revised the form of communion service in general use, compiling a missal which forms the groundwork of the celebrated "Sarum Use." The "Sarum Breviary" was printed at Venice in 1483, and upon this, the most widely prevalent of English liturgies, the prayer-books of Edward VI. were mainly based. Osmund also built a cathedral, in the form of a plain cross, and this was traceable in the very dry summer of 1834. Old Sarum could have afforded little room for a cathedral, bishop's palace, garrison and townsfolk. The priests complained of their bleak and waterless abode, and still more of its transference to the keeping of lay castellans. Soldiers and priests were at perpetual feud; and after a licence had been granted by Pope Honorius III., it was decided to move down into the fertile Avon valley. In 1102 the notorious bishop, Roger Poore, by virtue of his office of sheriff, obtained custody of the castle and the grant of a comprehensive charter from Henry I. which confirmed and extended the possessions of the ecclesiastical establishment, annexed new benefactions and granted perpetual freedom in markets and fairs from all tolls and customs. This was confirmed by Henry II., John, and Henry III. With the building of New Sarum in the 13th century and the transference to it of the see, Old Sarum lapsed to the crown. It has since changed hands several times, and under James I. formed part of the property of the earldom of Salisbury. By the 16th century it was almost entirely in ruins, and in 1608 it was ordered that the town walls should be entirely demolished. The borough returned two members to parliament from 1295 until 1832 when it was deprived of representation by the Reform Act, the privilege of election being vested in the proprietors of certain free burgage tenures. In the 14th century the town appears to have been divided into aldermanries, the will of one John atte Stone, dated 1361, including a bequest of land within the aldermanry of Newton. In 1102 Henry I. granted a yearly fair for seven days, on August 14 and for three days before and after. Henry III. granted another fair for three days from June 28, and Richard II. for eight days from September 30.

New Sarum.

The new city, under the name of New Sarum (New Saresbury, Salisbury) immediately began to spring up round the cathedral close. A charter of Henry III. in 1227 recites the removal from Old Sarum, the king's ratification and his laying the foundation-stone of the church. It then grants and confirms to the bishops, canons and citizens, all liberties and free customs previously enjoyed, and declares New Sarum to be a free city and to constitute forever part of the bishop's demesne. During the three following centuries periodical disputes arose between the bishop and the town, ending generally in the complete submission of the latter. One of these resulted in 1472 in the grant of a new charter by Edward IV. empowering the bishop to enforce the regular election of a mayor, and to make laws for governing the town. In 1611 the city obtained a charter of incorporation from James I. under the title of "mayor and commonalty" of the city of New Sarum, the governing body to consist of a mayor, recorder and twenty-four aldermen, with power to make by-laws. This charter was renewed by Charles I. and confirmed by Cromwell in 1656. The latter recites that since the deprivation of archbishops and bishops, by parliament, the mayor and commonalty have bought certain possessions of the late bishop of New Sarum, together with fairs and markets. These it confirms, constitutes the town a city and county, subjects the close to its jurisdiction and invests the bailiff with the powers of a sheriff. In 1659 with the restoration of the bishops, the ancient charter of the city was revived and that of 1656 cancelled. In 1684 during the friction between Charles II. and the towns, Salisbury surrendered its charter voluntarily. Four years later in 1688 James II. restored to all cities their ancient charters, and the bishop continued to hold New Sarum as his demesne until 1835. The Municipal Corporations Act of that year reported that Salisbury was still governed under the charter of 1611, as modified by later ones of Charles II., James II. and Anne.

In 1221 Henry III. granted the bishop a fair for two days from August 14, which in 1227 was prolonged to eight days. Two general fairs were obtained from Cromwell in 1656, on the Tuesday before Whit-Sunday and on the Tuesday in the second week before Michaelmas. In 1792 the fairs were held on the Tuesday after January 6, on the Tuesday and Wednesday after March 25, on Whit-Monday, on the second Tuesday in September, on the second Tuesday after October 10, and on the Tuesday before Christmas Day; in 1888 on July 15 and October 18; and now on the Tuesdays after January 6 and October 10. A large pleasure-fair was held until recently on Whit-Monday and

Tuesday, but in 1888 this was reported as of bad character and it is now discontinued. A grant of a weekly market on Tuesday was obtained from Henry III. in 1227. In 1240 this privilege was being abused, a daily market being held, which was finally prohibited in 1361. In 1316 a market on Saturday was granted by Edward II. and in 1656 another on every second Tuesday by Cromwell. In 1769 a wholesale cloth market was appointed to be held yearly on August 24. In 1888 and 1891 the market days were Tuesday and Saturday. A great corn market is now held every Tuesday, a cattle market on alternate Tuesdays, and a cheese market on the second Thursday in the month. Salisbury returned two members to parliament until 1885 when the number was reduced to one. As early as 1334 the town took part in foreign trade and was renowned for its breweries and woollen manufactories, and the latter industry continued until the 17th century, but has now entirely declined. Commercial activity gave rise to numerous confraternities amongst the various trades, such as those of the tailors, weavers and cutlers. The majority originated under Edward IV., though the most ancient—that of the tailors—was said to have been formed under Henry VI. and still existed in 1835. The manufacture of cutlery, once a flourishing industry, is now decayed.

See *Victoria County History. Wiltshire*; Sir R. C. Hoare, *History of New Sarum* (1843); and *History of Old Sarum* (1843).

SALISBURY, a town and the county-seat of Wicomico county, Maryland, U.S.A., on the Wicomico river, about 23 m. from its mouth. Pop. (1900) 4277, including 1006 negroes; (1910) 6690. It is served by the Baltimore, Chesapeake & Atlantic (which has shops here), and the New York, Philadelphia & Norfolk railways, and by steamers on the Wicomico river, which has a channel 9 ft. deep; Salisbury is the head of navigation. Grain, vegetables and lumber are shipped along the coast. Salisbury was founded in 1732, organized as a town in 1812, and incorporated in 1854 and again in 1888.

SALISBURY, a city and the county-seat of Rowan county, North Carolina, U.S.A., about 120 m. W. by S. of Raleigh. Pop. (1890) 4418; (1900) 6277 (2408 negroes); (1910) 7153. Salisbury is served by the Southern railway, which has repair shops here. It is the seat of Livingstone College (African Methodist Episcopal, removed from Concord to Salisbury in 1882, chartered 1885). There is a national cemetery here, in which 12,147 Federal soldiers are buried. The city has various manufactures and is the trade centre of the surrounding farming country. Salisbury was founded about 1753, was first incorporated as a town in 1755 and first chartered as a city in 1770. During the Civil War there was a Confederate military prison here. On the 12th of April 1865 the main body of General George Stoneman's cavalry encountered near Salisbury a force of about 3000 Confederates under General William M. Gardner, and captured 1364 prisoners and 14 pieces of artillery.

SALISHAN, the name of a linguistic family of North American Indian tribes, the more important of which are the Salish (Flatheads), Bellacoola, Clallam, Colville, Kalispel, Lummi, Nisqually, Okinagan, Puyallup, Quinault, Sanpoil, Shushwap, Skokomish, Songeesh, Spokan and Tulalip. They number about 20,000, and live in the southern part of British Columbia, the coast of Oregon, and the north-west of Washington, Montana and Idaho.

SALLI (*Slā*), a seaport on the Atlantic coast of Morocco, on the north side of the Bu Ragrag opposite Rabat (*q.v*). Pop. about 30,000. The shrine of Sidi Abd Allah Hasūn in Salli is so sacred as to close the street in which it stands to any but Moslems. Outside the town walls there is no security for life or property. A bar at the mouth of the river excludes vessels of more than two hundred tons; steamers lie outside, communicating with the port by lighters of native build manned by descendants of the pirates known as "Salli Rovers." (See Barbary Pirates.)

SALLO, DENIS DE, Sieur de la Coudraye [pseudonym *Sieur d'Hédonville*] (1626–1669), French writer, and founder of the first French literary and scientific journal, was born at Paris in 1626. In 1665 he published the first number of the *Journal des savants*. The *Journal*, under his direction, was suppressed after the thirteenth number, but was revived shortly afterwards. He died in Paris on the 14th of May 1669.

SALLUST [Gaius Sallustius Crispus] (86–34 B.C.), Roman historian, belonging to a well-known plebeian family, was born at Amiternum in the country of the Sabines. After an ill-spent youth he entered public life, and was elected tribune of the people in 52, the year in which Clodius was killed in a street brawl by the followers of Milo. Sallust was opposed to Milo and to Pompey's party and to the old aristocracy of Rome. From the first he was a decided partisan of Caesar, to whom he owed such political advancement as he attained. In 50 he was removed from the senate by the censor Appius Claudius Pulcher on the ground of gross immorality, the real reason probably being his friendship for Caesar. In the following year, no doubt through Caesar's influence, he was reinstated and appointed quaestor. In 46 he was praetor, and accompanied Caesar in his African campaign, which ended in the decisive defeat of the remains of the Pompeian party at Thapsus. As a reward for his services, Sallust was appointed governor of the province of Numidia. In this capacity he was guilty of such oppression and extortion that only the influence of Caesar enabled him to escape condemnation. On his return to Rome he purchased and laid out in great splendour the famous gardens on the Quirinal known as the *Horti Sallustiani*. He now retired from public life and devoted himself to historical literature. His account of the Catiline conspiracy (*De conjuratione Catilinae* or *Bellum Catilinarium*) and of the Jugurthine War (*Bellum Jugurthinum*) have come down to us complete, together with fragments of his larger and most important work (*Historiae*), a history of Rome from 78–67, intended as a continuation of L. Cornelius Sisenna's work. The *Catiline Conspiracy* (his first published work) contains the history of the memorable year 63. Sallust adopts the usually accepted view of Catiline, and describes him as the deliberate foe of law, order and morality, without attempting to give any adequate explanation of his views and intentions. Catiline, it must be remembered, had supported the party of Sulla, to which Sallust was opposed. There may be truth in Mommsen's suggestion that he was particularly anxious to clear his patron Caesar of all complicity in the conspiracy. Anyhow, the subject gave him the opportunity of showing off his rhetoric at the expense of the old Roman aristocracy, whose degeneracy he delighted to paint in the blackest colours. On the whole, he is not unfair towards Cicero. His *Jugurthine War*, again, though a valuable and interesting monograph, is not a satisfactory performance. We may assume that he had collected materials and put together notes for it during his governorship of Numidia. Here, too, he dwells upon the feebleness of the senate and aristocracy, too often in a tiresome, moralizing and philosophizing vein, but as a military history the work is unsatisfactory in the matter of geographical and chronological details. The extant fragments of the *Histories* (some discovered in 1886) are enough to show the political partisan, who took a keen pleasure in describing the reaction against the dictator's policy and legislation after his death. The loss of the work is to be regretted, as it must have thrown much light on a very eventful period, embracing the war against Sertorius, the campaigns of Lucullus against Mithradates of Pontus, and the victories of the great Pompey in the East. Two letters (*Duae epistolae de republica ordinanda*), letters of political counsel and advice addressed to Caesar, and an attack upon Cicero (*Invectiva* or *Declamatio in Ciceronem*), frequently attributed to Sallust, are probably the work of a rhetorician of the first century A.D., also the author of a counter-invective by Cicero. Sallust is highly spoken of by Tacitus (*Annals*, iii. 30); and Quintilian (ii. 5, x. 1), who regards him as superior to Livy, does not hesitate to put him on a level with Thucydides. On the whole the verdict of antiquity was favourable to Sallust as an historian. He struck out for himself practically a new line in literature, his predecessors having been little better than mere dry-as-dust chroniclers, whereas he endeavoured to explain the connexion and meaning of events, and was a successful delineator of character. The contrast between his early life and the high moral tone adopted by him in his writings was frequently made a subject of reproach against him; but there is no reason why he should not have reformed. In any case, his knowledge of his own former weaknesses may have led him to take a pessimistic view of the morality of his fellow-men, and to judge them severely. His model was Thucydides, whom he imitated in his truthfulness and impartiality, in the introduction of philosophizing reflections and speeches, and in the brevity of his style, sometimes bordering upon obscurity. His fondness for old words and phrases, in which he imitated his contemporary Cato, was ridiculed as an affectation; but it was just this affectation and his rhetorical exaggerations that made Sallust a favourite author in the 2nd century A.D. and later.

Editions and translations in various languages are numerous. Editio princeps (1470); (text) R. Dietsch (1874); H. Jordan (1887); A. Eussner (1887); (text and notes) F. D. Gerlach (1823–1831); F. Kritz (1828–1853; ed. minor, 1856); C. H. Frotscher (1830); C. Merivale (1852); F. Jacobs, H. Wirz (1894); G. Long, revised by J. G. Frazer, with chief fragments of *Histories* (1884); W. W. Capes (1884); English translation by A. W. Pollard (1882). There are many separate editions of the *Catilina* and *Jugurtha*, chiefly for school use. The fragments have been edited by F. Kritz (1853) and B. Maurenbrecher (1891–1893); and there is an Italian translation (with notes) of the supposititious letters by G. Vittori (1897). On Sallust generally J. W. Löbell's *Zur Beurtheilung des S.* (1818) should still be consulted; there are also treatises by T. Vogel (1857) and M. Jäger (1879 and 1884), T. Rambeau (1879); L. Constans, *De sermone Sallustiano* (1880); P. Bellezza, *Dei fonti e dell' autorità storica di Sallustio* (1891); and special lexicon by O. Eichert (1885). The sections in Teuffel-Schwabe's *History of Roman Literature* are full of information; see also bibliography of Sallust for 1878–1898 by B. Maurenbrecher in C. Bursian, *Jahresbericht über die Fortschritte der klassischen Altertumswissenschaft* (1900).

SALMASIUS, CLAUDIUS, the Latinized name of CLAUDE SAUMAISE (1588–1653), French classical scholar, born at Semur-en-Auxois in Burgundy on the 15th of April 1588. His father, a counsellor of the parlement of Dijon, sent him, at the age of sixteen, to Paris, where he became intimate with Casaubon. He proceeded in 1606 to the university of Heidelberg, where he devoted himself to the classics.

Here he embraced Protestantism, the religion of his mother; and his first publication (1608) was an edition of a work by Nilus Cabasilas, archbishop of Thessalonica, in the 14th century, against the primacy of the pope (*De primatu Papae*), and of a similar tract by the Calabrian monk Barlaam (d. *c.* 1348). In 1609 he brought out an edition of Florus. He then returned to Burgundy, and qualified for the succession to his father's post, which he eventually lost on account of his religion. In 1620 he published Casaubon's notes on the *Augustan History*, with copious additions of his own. In 1623 he married Anne Mercier, a Protestant lady of a distinguished family; the union was by no means a happy one, his wife being represented as a second Xanthippe. In 1629 Salmasius produced his *magnum opus* as a critic, his commentary on Solinus's *Polyhistor*, or rather on Pliny, to whom Solinus is indebted for the most important part of his work. Greatly as this commentary may have been overrated by his contemporaries, it is a monument of learning and industry. Salmasius learned Arabic to qualify himself for the botanical part of his task. After declining overtures from Oxford, Padua and Bologna, in 1631 he accepted the professorship formerly held by Joseph Scaliger at Leiden. Although the appointment in many ways suited him, he found the climate trying; and he was persistently attacked by a jealous clique, led by Daniel Heinsius, who as university librarian refused him access to the books he wished to consult. Shortly after his removal to Holland, he composed at the request of Prince Frederick of Nassau, his treatise on the military system of the Romans (*De re militari Romanorum*), which was not published until 1657. Other works followed, mostly philological, but including a denunciation of wigs and hair-powder, and a vindication of moderate and lawful interest for money, which, although it drew down upon him many expostulations from lawyers and theologians, induced the Dutch Church to admit money-lenders to the sacrament. His treatise *De primatu Papae* (1645), accompanying a republication of the tract of Nilus Cabasilas, excited a warm controversy in France, but the government declined to suppress it.

In November 1649 appeared the work by which Salmasius is best remembered, his *Defensio regia pro Carolo I.* His advice had already been sought on English and Scottish affairs, and, inclining to Presbyterianism or a modified Episcopacy, he had written against the Independents. It does not appear by whose influence he was induced to undertake the *Defensio regia*, but Charles II. defrayed the expense of printing, and presented the author with £100. The first edition was anonymous, but the author was universally known. A French translation which speedily appeared under the name of Claude Le Gros was the work of Salmasius himself. This celebrated work, in our day principally famous for the reply it provoked from Milton, even in its own time added little to the reputation of the author. His reply to Milton, which he left unfinished at his death, and which was published by his son in 1660, is insipid as well as abusive. Until the appearance of Milton's rejoinder in March 1651 the effect of the *Defensio* was no doubt considerable; and it probably helped to procure him the flattering invitation from Queen Christina which induced him to visit Sweden in 1650. Christina loaded him with gifts and distinctions, but upon the appearance of Milton's book was unable to conceal her conviction that he had been worsted by his antagonist. Milton, addressing Christina herself, ascribes Salmasius's withdrawal from Sweden in 1651 to mortification at this affront, but this appears to be negatived by the warmth of Christina's subsequent letters and her pressing invitation to return. The claims of the university of Leiden and dread of a second Swedish winter seem fully adequate motives. Nor is there any foundation for the belief that Milton's invectives hastened his death, which took place on the 3rd of September 1653, from an injudicious use of the Spa waters.

As a commentator and verbal critic, Salmasius is entitled to very high rank. His notes on the *Augustan History* and Solinus display not only massive erudition but massive good sense as well; his perception of the meaning of his author is commonly very acute, and his corrections of the text are frequently highly felicitous. His manly independence was shown in many circumstances, and the bias of his mind was liberal and sensible. He was accused of sourness of temper; but the charge, if it had any foundation, is extenuated by the wretched condition of his health.

The life of Salmasius was written at great length by Philibert de la Mare, counsellor of the parlement of Dijon, who inherited his MSS. from his son. Papillon says that this biography left nothing to desire, but it has never been printed. It was, however, used by Papillon himself, whose account of Salmasius in his*Bibliothèque des auteurs de Bourgogne* (Dijon, 1745) is by far the best extant, and contains an exhaustive list of his works, both printed and in MS. There is an *éloge* by A. Clément prefixed to his edition of Salmasius's *Letters* (Leiden, 1656), and another by C. B. Morisot, inserted in his own *Letters* (Dijon, 1656). See also E. Haag, *La France protestante*, (ix. 149-173); and, for the *Defensio regia*, G. Masson's *Life of Milton*.

SALMERON Y ALFONSO, NICOLAS (1838–1908), Spanish statesman, was born at Alhama la Seca in the province of Almeria, on the 10th of April 1838. He was educated at Granada and became assistant professor of literature and philosophy at Madrid. The last years of the reign of Isabella II. were times of growing discontent with her bad government and with the monarchy. Salmeron joined the small party who advocated the establishment of a republic. He was director of the Opposition paper *La Discusion*, and co-operated with Don Emilio Castelar on *La Democracia*. In 1865 he was named one of the members of the directing committee of the Republican party. In 1867 he was imprisoned with other suspects. When the revolution of September 1868 broke out, he was at Almeria recovering from a serious illness. Salmeron was elected to the Cortes in 1871, and though he did not belong to the Socialist party, defended its right to toleration. When Don Amadeo of Savoy resigned the Spanish crown on the 11th of February 1873 Salmeron was naturally marked out to be a leader of the party which endeavoured to establish a republic in Spain. After serving as minister of justice in the Figueras cabinet, he was chosen president of the Cortes, and then, on the 18th of July 1873, president of the republic, in succession to Pi Margall. He became president at a time when the Federalist party had thrown all the south of Spain into anarchy. Salmeron was compelled to use the troops to restore order. When, however, he found that the generals insisted on executing rebels taken in arms, he resigned on the ground that he was opposed to capital punishment (7th September). He resumed his seat as president of the Cortes on the 8th of September. His successor, Castelar, was compelled to restore order by drastic means. Salmeron took part in the attack made on him in the Cortes on the 3rd of January 1874, which provoked the generals into closing the chamber and establishing a provisional military government. Salmeron went into exile and remained abroad till 1881, when he was recalled by Sagasta. In 1886 he was elected to the Cortes as Progressive deputy for Madrid, and unsuccessfully endeavoured to combine the jarring republican factions into a party of practical moderate views. On the 18th of April 1907 he was shot at, but not wounded, in the streets of Barcelona by a member of the more extreme Republican party. He died at Pau on the 21st of September 1908.

SALMON, GEORGE (1819–1904), British mathematician and divine, was born in Dublin on the 25th of September 1819 and educated at Trinity College in that city. Having become senior moderator in mathematics and a fellow of Trinity, he took holy orders, and was appointed regius professor of divinity in Dublin University in 1866, a position which he retained until 1888, when he was chosen provost of Trinity College. He was provost until his death on the 22nd of January 1904. As a mathematician Salmon was a fellow of the Royal Society, and was president of the mathematical and physical section of the British Association in 1878. He was a D.C.L. of Oxford and an LL.D. of Cambridge.

His published mathematical works include: *Analytic Geometry of Three Dimensions* (1862), *Treatise on Conic Sections* (4th ed., 1863) and *Treatise on the Higher Plane Curves* (2nd ed., 1873); these books are of the highest value, and have been translated into several languages. As a theologian he wrote *Historical Introduction to the Study of the New Testament* (1885), *The Infallibility of the Church* (1888), *Non-Miraculous Christianity* (1881) and *The Reign of Law* (1873).

SALMON and **SALMONIDAE.**[1] The Salmonidae are an important family of fishes belonging to the Malacopterygian Teleosteans, characterized as follows: Margin of the upper jaw formed by the premaxillaries and the maxillaries—supraoccipital in contact with the frontals, but frequently overlapped by the parietals, which may meet in a sagittal suture; opercular bones all well developed. Ribs sessile, parapophyses very short or absent; epineurals, sometimes also epipleurals, present. Post-temporal forked, the upper branch attached to the epiotic, the lower to the opisthotic; postclavicle, as usual, applied to the inner side of the clavicle. A small adipose dorsal fin. Air-bladder usually present, large. Oviducts rudimentary or absent, the ova falling into the cavity of the abdomen before extrusion.

The Salmonidae are very closely related to the Clupeidae, or herring family, from which they are principally distinguished by the position of the postclavicle and by the presence of a rayless fin on the back, at a considerable distance from the true or rayed dorsal fin; this so-called adipose fin is an easy recognition-mark of this family, so far as British waters are concerned, for, if it is present in several other families, these have no representatives in the area occupied by the fresh-water salmonids, with the exception of the North American Siluridae and Percopsidae, which are readily distinguished by the pungent spine or spines which precede the rays of the first dorsal fin. The imperfect condition of the oviducts, quite exceptional among fishes, owing to which the large ripe eggs may be easily squeezed out of the abdomen, is a feature of great practical importance, since it renders artificial impregnation particularly easy, and to it is due the fact that the species of *Salmo* have always occupied the first place in the annals of fish-culture.

The Salmonidae inhabit mostly the temperate and arctic zones of the northern hemisphere, and this is the case with all fresh-water forms, with one exception, *Retropinna*, a smelt-like fish from the coasts and rivers of New Zealand. A few deep-sea forms (*Argentina, Microstoma, Nansenia, Bathylagus*) are known from the Arctic ocean, the Mediterranean and the Antarctic ocean, down to 2000 fathoms. The question has been discussed whether the salmonids, so many of which live in the sea, but resort to rivers for breeding purposes, were originally marine or fresh-water. The balance of opinion is in favour of the former hypothesis, which is supported by the fact that the overwhelming majority of the members of the suborder of which the salmonids form part permanently inhabit the sea. The clupeids, for instance, which are their nearest allies, are certainly of marine origin, as proved by their abundance in Cretaceous seas, yet a few, like the shads, ascend rivers to spawn, in the same way as the salmon does, without this ever having been adduced as evidence in favour of a fresh-water origin of the genus *Clupea* to which they belong.

No remains older than Miocene (*Osmerus, Prothymallus, Thaumaturus*) are certainly referable to this family, the various Cretaceous forms originally referred to it, such as *Osmeroides* and *Pachyrhizodus*, being now placed with the *Elopidae*. There is probably no other group of fishes to which so much attention has been paid as to the Salmonidae, and the species have been unduly multiplied by some writers. Perhaps not more than 80 should be regarded as valid, but some of them fall into a number of local forms which are distinguished as varieties or subspecies by some authors, whilst others would assign them full specific rank. These differences of opinion prevail whether we deal with *Salmo* proper or with *Coregonus*.

Classification.—The recent genera may be arranged in five groups: The first, which includes *Salmo, Brachymystax, Stenodus, Coregonus, Phylogephyra* and *Thymallus*, has 8 to 20 branchiostegal rays, 9 to 13 rays in the ventral fin, the pyloric appendages more or less numerous (17 to 200) and breeding takes place in fresh water. The second group, with the single genus *Argentina*, is, like the following, marine, and is characterized by 6 branchiostegal rays, 11 to 14 ventral rays, the stomach caecal, with pyloric appendages in moderate numbers (12 to 20). The third group, genera *Osmerus, Thaleichthys, Mallotus, Plecoglossus, Hypomesus*, has 6 to 10 branchiostegal rays, 6 to 8 ventral rays, the stomach caecal, with pyloric appendages few (2 to 11) or rather numerous. The fourth group, genera *Microstoma, Nansenia, Bathylagus*, deep-sea forms with the branchiostegal rays reduced to 3 or 4, ventral rays 8 to 10, the stomach caecal and pyloric appendages absent; whilst the fifth group, with the genera *Retropinna* and *Salanx*, is distinguished from the preceding in having no air-bladder, branchiostegal rays 3 to 6, ventral rays 6 or 7, stomach siphonal and pyloric appendages absent.

The genus *Salmo*, the most important from the economical and sporting points of view, is characterized by small smooth scales, which at certain seasons may become embedded in the slimy skin, a moderately high dorsal fin with 10 to 12 well-developed rays, and a large mouth provided with strong teeth, which are present not only in the jaws and on the palate, but also on the tongue; the maxillary or posterior bone of the upper jaw extends to below or beyond the eye. Young specimens (see PARR) are marked with dark vertical bars on the sides (parr-marks), which in some trout are retained throughout life, and have the caudal fin more or less deeply forked or marginate, the form of the fin changing with the age and sexual development of the fish. Adult males have the jaws more produced in front than females, and both snout and chin may become curved and hooked. As pointed out by A. Günther, who was the first to make a profound study of the members of this genus, and especially of the British forms, there is probably no other group of fishes which offers so many difficulties to the ichthyologist with regard to the distinction of species, as well as to certain points in their life-history, the almost infinite variations which they undergo being dependent on age, sex and sexual development, food and the properties of the water. The difficulties in their study have rather been increased by the excessive multiplication of so-called specific forms. Opinions also vary as to the importance to be attached to the characters which serve to group the principal species into natural divisions. Whilst A. Günther admitted two genera, *Salmo* and *Oncorhynchus*, D. S. Jordan and B. W. Evermann go so far as to recognize five, *Oncorhynchus, Salmo, Hucho, Cristivomer* and *Salvelinus*. The latter arrangement is certainly the more logical, the difference between the first genus and the second being of rather less importance than that between the second and the third. However, considering the slightness of the distinctive characters on which these divisions are based, and the complete passage which obtains between them, the writer of this article thinks it best to maintain the genus *Salmo* in the wide sense, whilst retaining the divisions as subordinate divisions or sub-genera, with the following definitions:—

Oncorhynchus (Pacific salmon).—Vomer flat, toothed along the shaft, at least in the young; anal fin with 12 to 17 well-developed rays.

Salmo (true salmon and trout).—Vomer flat, toothed along the shaft, at least in the young; anal fin with 8 to 12 well-developed rays.

Salvelinus (char).—Vomer boat-shaped, the shaft strongly depressed behind the head, which alone is toothed, the teeth forming an isolated fascicle; anal fin with 8 to 10 well-developed rays.

Hucho (huchens).—Vomer as in the preceding, but teeth forming a single arched transverse series continuous with the palatine teeth; anal fin with 8 to 10 well-developed rays.

The salmon itself (*Salmo salar*), the type of the family, is a large fish, attaining a length of 4 or 5 ft., and living partly in the sea, partly in fresh water, breeding in the latter. Fish which thus ascend rivers to spawn are called "anadromous." It may be briefly defined as of silvery coloration, with small black spots usually confined to the side above the lateral line, with the teeth on the shaft of the vomer disappearing in the adult, with 18 to 22 gill-rakers on the first branchial arch, with 11 or 12 well-developed rays in the dorsal fin, 110 to 125 scales in the lateral line, and 11 or 12 (exceptionally 13) between the latter and the posterior border of the adipose fin. The young, called "parr" or "samlet," characterized by a smaller mouth, the maxillary bone not extending much beyond the vertical of the centre of the eye, the presence of an alternating double or zigzag series of teeth on the shaft of the vomer, the presence of dark vertical bars on the sides of the body, together with more or less numerous small red spots, is hatched in the spring, and usually remains for about two years in the rivers, descending at the third spring to the sea, where it is known as "smolt." In the sea it soon assumes a more uniform silvery coloration and from this state, or "grilse," develops its sexual organs and re-enters rivers to breed, after which operation, much emaciated and unwholesome as food, it is known as "kelt," and returns to the sea to recuperate. It has now been ascertained by the investigations instituted in Norway by K. Dahl that the smolts, immediately after leaving the rivers, make for the open sea, and do not return to the coast until they have reached the grilse stage. Thus specimens measuring between 8 and 18 in. hardly ever fall into the hands of the angler.

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[1] The Latin name *salmo* possibly means literally "the leaper," from *salire*, to leap, jump.

The salmon inhabits the North Atlantic and its tributary waters. It is known to extend as far north as Scandinavia, Lapland, Iceland, Greenland and Labrador, and as far south as the north-west of Spain and the state of Connecticut. It ascends the Rhine as far as Basel. There are land-locked forms in Scandinavia and in Canada and Maine, which are regarded by some authors as distinct species (*S. hardinii* from Lake Wener, *S. sebago* from Sebago Lake in Maine, *S. ouananiche* from Lake St John, Canada and neighbouring waters). These non-migratory forms are smaller than the typical salmon, never exceeding a weight of 25 lb, the ouananiche, the smallest of all, rarely weighing 7½ lb and averaging 3½. Although spending their whole life in fresh waters, the habits of these fish are very similar to those of the sea salmon, ascending tributary streams to spawn in their higher ranges, and then returning to the deep parts of the lakes, which are to them what the sea is to the anadromous salmonids.

The salmon breeds in the shallow running waters of the upper streams of the rivers it ascends. The female, when about to deposit her eggs, scoops out a trough in the gravel of the bed of the stream. This she effects by lying on her side and ploughing into the gravel by energetic motions of her body. She then deposits her eggs in the trough; while she is engaged in these operations she is attended by a male, who sheds milt over the eggs as the female extrudes them, fertilization being, as in the great majority of *Teleostei*, external. The parent fish then fill up the trough and heap up the gravel over the eggs until these are covered to a depth of some feet. The gravel heap thus formed is called a "redd." The period of the year at which spawning takes place in the British Isles, and in similar latitudes of the northern hemisphere, varies to a certain extent with the locality, and in a given locality may vary in different years; but, with rare exceptions, spawning is confined to the period between the beginning of September and the middle of January.

The eggs are spherical and non-adhesive; they are heavier than water, and are moderately tough and elastic. The size varies slightly with the age of the parent fish, those from full-sized females being slightly larger than those from very young fish. According to rough calculations made at salmon-breeding establishments, there are 25,000 eggs to a gallon; the diameter is about a quarter of an inch. It is usually estimated that a female salmon produces about 900 eggs for each pound of her own weight; but this average is often exceeded.

The time between fertilization and hatching, or the escape of the young fish from the egg-membrane, varies considerably with the temperature to which the eggs are exposed. It has been found that at a constant temperature of 41° F. the period is 97 days; but the period may be as short as 70 days and as long as 150 days without injury to the health of the embryo. It follows therefore that in the natural conditions eggs deposited in the autumn are hatched in the early spring. The newly hatched fish, or "alevin," is provided with a very large yolk-sac, and by the absorption of the yolk is nourished for some time; although its mouth is fully formed and open, it takes no food. The alevin stage lasts for about six weeks, and at the end of it the young fish is about 1¼ in. long.

The grilse, after spawning in autumn, return again to the sea in the winter or following spring, and reascend the rivers as mature spawning salmon in the following year. Both salmon and grilse after spawning are called "kelts." The following recorded experiment illustrates the growth of grilse into salmon: a grilse-kelt of 2 lb was marked on March 31, 1858, and recaptured on August 2 of the same year as a salmon of 8 lb.

The ascent of rivers by adult salmon is not so regular as that of grilse, and the knowledge of the subject is not complete. Although salmon scarcely ever spawn before the month of September, they do not ascend in shoals just before that season; the time of ascent extends throughout the spring and summer. A salmon newly arrived in fresh water from the sea is called a clean salmon, on account of its bright, well-fed appearance; during their stay in the rivers the fish lose the brilliancy of their scales and deteriorate in condition. The time of year at which clean salmon ascend from the sea varies greatly in different rivers; and rivers are, in relation to this subject, usually denominated early or late. The Scottish rivers flowing into the German Ocean and Pentland Firth are almost all early, while those of the Atlantic slope are late. The Thurso in Caithness and the Naver in Sutherlandshire contain fresh-run salmon in December and January; the same is the case with the Tay. In Yorkshire salmon commence their ascent in July, August or September if the season is wet, but if it is dry their migration is delayed till the autumn rains set in. In all rivers more salmon ascend immediately after a spate or flood than when the river is low, and more with the flood tide than during the ebb. In their ascent salmon are able to pass obstructions, such as waterfalls and weirs of considerable height, and the leaps they make in surmounting such impediments and the persistence of their efforts are very remarkable.

We reproduce here, with additions, Professor Noel Paton's summary (published first in the 10th edition of this *Encyclopædia*) of observations on the life-history of the salmon. Important advances in our knowledge of the life-history of the salmon have been made through the investigations of Professor F. Miescher on the Rhine at Basel, of Professor P. P. C. Hoek in Holland, of Mr Archer as lessee of the river Sands in Norway and as inspector of salmon fisheries for Scotland in conjunction with Messrs Gray and Tosh, and of a number of workers in the laboratory of the Royal College of Physicians of Edinburgh. With regard to the *food* of salmon, the enormously rapid growth of smolts to grilse and of salmon from year to year shows that they feed in the sea. In a few months a smolt will increase from a few ounces to 4 or 5 lb; while Archer's weighings of 16 salmon which had been marked and recaptured in the following year showed an average gain of 36%, reckoned on from kelt stage to kelt stage. During the season of 1895 Tosh, at Berwick-on-Tweed, opened between March and August 514 fish, and found food in the stomachs of 76, or over 14% of the whole. As to the nature of the food, it was found to be as follows:—

Herring	36	or	47%
Crustacea, amphipods, &c.	14	,,	18%
Sand eels	11	,,	14%
Haddock and whiting	8	,,	10%
Feathers and vegetable matter	7	,,	9%

Excluding the feathers and vegetable matter, which are not really of the nature of food, all the material found in the stomach was of marine origin. Hoek, out of 2000 fish examined by him, found 7 with food in the stomach, and, curiously enough, 4 of these were taken on the same day. In each case marine fish constituted the food. As to where salmon go to feed in the sea, our information is still very deficient, but the prevalence of herring in the stomach would seem to indicate that they must follow the shoals of these fish which approach the coast during the summer months. While there can be no doubt that salmon feed in the sea, the question of whether they feed in fresh water has been much debated. It is difficult for the popular mind to conceive of an active fish like the salmon subsisting for several months without food, and the fact that the fish so frequently not only takes into its mouth but actually swallows worms and various lures has still further tended to confirm many people in the conviction that salmon do feed in fresh water. In discussing the question it is well clearly to understand what is meant by feeding. It is the taking, digesting and absorbing of material of use in the economy in such quantities as to be of benefit to the individual. Accepting this definition, it may at once be said that all the evidence we possess is entirely opposed to the view that salmon feed when in fresh water. Miescher examined the stomachs of about 2000 salmon captured at Basel, about 500 m. from the mouth of the Rhine, and in only two did he find any indication of feeding. These two fish were male kelts. One contained the remains of a cyprinoid fish, and the other had a dilated stomach with an acid secretion, but no food remains. Hoek, who, as already stated, examined about 2000 fish, found food of marine origin in 7, but in none food derived from fresh water. Of the 132 stomachs of salmon from the estuaries and upper waters of Scottish rivers examined in the laboratory of the College of Physicians not one contained any food remains. The stomach of salmon captured in fresh water is collapsed and shrunken. Its mucous membrane is thrown into folds, and it contains a small amount of mucus of a neutral reaction. The intestine, which usually contains numerous tape-worms, is full of a greenish-yellow viscous material which, when examined under the microscope, is found to consist of mucus with shed epithelial and other cells and with masses of crystals of carbonate of lime. In no case does the microscope reveal any food remains such as fish-scales, plates of crustacea or bristles of worms or annelids. In the fish taken in the estuaries up to the month of August the gall-bladder is distended; in those taken later in the year it is empty. In all the fish from the upper waters the gall-bladder is empty and collapsed. According to the investigations of Hoek and of Gulland, the lining membrane of the stomach and intestine degenerates while the fish is in the river, but the correctness of these observations has been denied by F. B. Brown and J. Kingston Barton. Gillespie finds that the activity of the digestive processes is low in fish taken from the rivers, and that micro-organisms, which would be killed by the hydrochloric acid of the gastric juice were it actively secreted, flourish in the intestines of the fish from the upper waters. Those who believe that the salmon feeds in fresh water explain the fact that the stomach is always found empty by the supposition that the fish vomits any food when it is captured, and several descriptions of cases in which this has been observed might be quoted; but such observations must be accepted with caution, and the contracted state of the stomach, the absence of the hydrochloric acid of the gastric juice, and lastly the absence of any traces of digested food remains in the contents of the intestine, negative this explanation.

The question may be presented in another way. Is there any reason why the salmon should feed while in fresh water? The investigations carried on in the laboratory of the College of Physicians have definitely shown that the salmon leaves the sea with an enormous supply of nourishment stored in its muscles, and that during its sojourn in fresh water it gets its energy and builds up its rapidly growing ovaries and testes from this stored material. Briefly stated, these investigations show that the supply of albuminous material and fats stored in the muscles and used while the fish is in the river is amply sufficient for the greatest requirements of the fish. The amount of energy liberated from the fats and albuminous material is 570 times more than is required to raise the fish from the level of the estuary to that of the upper waters! These analyses further show that all the materials required for the construction of the ovaries and the testes are found in sufficient quantity in the muscles, with the exception of iron, which is, however, abundantly present in the blood.

It is a very common opinion that kelts feed voraciously while still in fresh water, and this has been used as an argument that they should be destroyed. It is not easy to bring forward such satisfactory evidence as has been adduced in the case of unspawned salmon, since it is illegal to kill kelts; but none of the 25 kelts procured by the Scottish Fishery Board, and examined in the College of Physicians' laboratory, contained any food, and Mr Anderson, formerly of Dunkeld, informs Professor Paton that in the old days, when kelts were habitually killed when captured, he has opened a large number and never found any trace of food in the stomach. Some fishers declare that they have seen kelts devouring salmon fry, but it is not easy to make accurate observations in deep water. According to Dr Gulland's investigations, the mucous membrane of the stomach and intestine is completely regenerated while the gall-bladder contains bile, and the digestive activity of the alimentary canal is greater than in salmon before spawning. Kelts thus appear at least to be capable of feeding.

The rate of growth of the genitalia has been carefully studied by Miescher, Archer and Hoek. From January till about the end of May the growth of the ovaries is slow. In Hoek's series of observations, which are the most complete, they increased from ·35 to ·85 % of the body weight. After this they enlarge more rapidly, and by the end of August are about 3 % in salmon taken at the mouth of the Tweed, about 4 % in the salmon from the mouth of the Rhine and about 8 % in the salmon from the Basel fisheries. By November they have risen to 20 % in the Tweed and in Holland, and to 23 % in the upper reaches of the Rhine. According to Archer's observations, the development of the ovaries in grilse in the earlier months somewhat lags behind that in the salmon. The growth of the testes has been chiefly investigated by Archer and Tosh in the Tweed and by Miescher at Basel. From March to the middle of July in the Tweed these organs increase from about ·19 to ·35 % of the weight of the fish. In July their rate of growth increases, and they reach their maximum development at the end of September, when they are about 6 % of the body weight. In the Rhine in March they weigh about ·1 %, and they reach their maximum development of about 5 % in October.

What leads to the migration of salmon from sea to river and river to sea? It is usually supposed that they come to the river to spawn; that it is the *nisus generativus* that drives them from the sea, where their ova will not develop, to the fresh water where development is possible. But it is found that salmon are passing from sea to river at all seasons of the year, and with their genitalia in all stages of development—some fish, running in March with ovaries only 1 % of the body weight, other fish not running till October with ovaries 15 or 16 % of the body weight. It is difficult, then, to accept the theory that the sexual act is the governing factor. That it is a secondary factor seems to be indicated by the great run of fish in June, July and August, when the genitalia are most rapidly growing. There is one respect, however, in which all the fish leaving the sea for the river agree, and that is in the amount of stored material accumulated in their bodies. In the early running fish this material is largely confined to the muscles, but in the later coming fish it is more equally distributed between muscles and genitalia. The amount of stored material may be measured by the amount of solids, and if we express the results of all the fish examined in terms of fish of uniform size—100 cm. in length— the following results are obtained:—

	Nov.[1]	Feb.	Mar.	April.	May and June.	July and Aug.	Oct. and Nov.	Kelts.
Muscles	2481	2214	2355	2599	2210	2270	1750	946
Ovaries	23	24	24	33	47	72	545	9
Total	2504	2238	2379	2632	2257	2342	2295	955

It would thus appear that, when the salmon has in the sea accumulated a certain definite amount of nourishment, it ceases to feed, and returns to the river irrespective of the state of its genital organs. Nutrition, and not the *nisus generativus*, appears to be the motive power. That the fish after spawning returns to the sea in search of food is fully recognized by all.

Course of Migration.—It is well known that while salmon run all the year through in greater or lesser numbers, the run of grilse takes place in the summer months, from May to August. But it is further possible to divide the salmon into classes—the so-called winter salmon of the Rhine, large fish running from October to February, with unripe ovaries and testes; and the summer salmon, running for the most part from March to October, with genitalia more or less ripe. These summer fish are small in the early months, but increase in size as the autumn advances. The winter salmon, along with the early summer or spring fish, appear to pass directly to the upper reaches of the river, and to spawn there, while the larger late-coming fish appear to populate the lower waters. This seems to be indicated by the comparison of upper-water and estuary fish throughout the year. The period at which male and female fish enter the rivers also appears to be somewhat different. The observations of Tosh, Miescher and Hoek show that throughout the year the female fish exceed the males in number, and, secondly, that during the earlier months of the year female fish run in much larger numbers than do male fish. It is only in September that anything like an equality between the two sexes is established. But in Great Britain it is not until the end of August that the nets are removed, and one cannot but believe that the destruction of such a very large proportion of females as are captured during the early months of the season must have a most prejudicial effect upon the breeding stock.

Rate of Migration.—By a comparison of the first appearance of winter salmon and of grilse in the markets of Holland and of Basel—500 m. up the river—Miescher gives some data for the determination of the average rate at which salmon ascend an unobstructed stream. It was found that winter salmon appeared at Basel about 54 days after their appearance in Holland, which would give a rate of passage of about 10 m. per diem. From a smaller number of observations on grilse, it appears that they travel at a somewhat slower rate. It is, however, doubtful how far these figures are of value in deciding the rate at which fish pass up the lower reaches of the river.

Great difficulties have been experienced in ascertaining the age and rate of growth of salmon. The practice has long ago been resorted to of "marking" salmon, the most satisfactory mark being a small oblong silver label, oxidized or blackened, bearing distinctive letters and numbers, to the dorsal fin. But of late the structure of the scales has been studied with the object of obtaining indications of the age, growth and spawning habit. H. W. Johnston in 1905 contributed an interesting paper on the subject. The scales bear concentric lines, which vary in number and relative distance according to the growth of the fish, and during the feeding periods these lines are added with more rapidity and a greater degree of separation than at other times. Johnston has endeavoured to ascertain their meaning in Tay salmon, and he has shown that the number of lines external to their last annual ring gives some clue to the time at which they left the sea; he is thus able to distinguish among ascending salmon such as are on their first return from such as have made the journey once or oftener before.

The group of Pacific salmon, or king salmon, commonly designated as *Oncorhynchus*, contains the largest and commercially the most important of the Salmonidae. They are anadromous species inhabiting the North Pacific and entering the rivers of America as well as of Asia. The best known and most valuable is the quinnat (*S. quinnat*), ascending the large rivers in spring and summer, spawning from July to December. They die after the breeding season is over, and never return to the sea. For the important Salmonidae known as Trout, Char, Whitefish, Smelt, Grayling, &c., see the separate articles. The huchen (*S. hucho*) of the Danube is an elongate, somewhat pike-like form, growing to the same size as the salmon, of silvery coloration, with numerous small black dots, extending on the dorsal fin. Allied to it are *S. fluviatilis* from Siberia and *S. perryi* or *blackistoni* from the northern island of Japan.

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[1] Winter fish not due to spawn till following November.

The genus *Stenodus* is intermediate between *Salmo* and *Coregonus* (whitefish). *S. leucichthys* is an anadromous species, inhabiting the Caspian Sea and ascending the Volga and the Ural; it is also found in the Arctic ocean, ascending the Ob, Lena, &c. It grows to a length of 5 ft. A second species occurs in Arctic North America; this is the "Inconnu," *S. mackenzii*, from the Mackenzie river and its tributaries.

The capelin (*Mallotus villosus*, so called from the villous bands formed by the scales of mature males) is a salmonid of the coasts of Arctic America and north-eastern Asia; it deposits its eggs in the sand along the shores in incredible numbers, the beach becoming a quivering mass of eggs and sand. *Plecoglossus*, a salmonid from Japan and Formosa, is highly remarkable for its lamellar, comb-like, lateral teeth. The siel-smelts, *Argentina*, are deep-sea salmonids, of which examples have occasionally been taken off the coasts of Scotland and Ireland. *Bathylagus*, another salmonid discovered by the "Challenger" expedition, is still better adapted for life at great depths (down to 1700 fathoms), the eyes being of enormous size.

Authorities.—On the systematic and life histories: A. Günther, *Catalogue of Fishes in the British Museum*, vol. vi. (1866); F. Day, *British and Irish Salmonidae* (London, 1887); F. A. Smitt, *Kritisk Förteckning öfver de i Riksmuseum befintliga Salmonider* (Stockholm, 1886); V. Fatio, *Faune des vertébrés de la Suisse*, vol. v. (1890); D. S. Jordan and B. W. Evermann, *Fishes of North America*, vol. i. (1896), and *American Food and Game Fishes* (London and New York, 1902); F. F. Kavraisky, *Die Lachse der Kaukasusländer* (Tiflis, 1896). On growth and migrations: *Die histochemischen und physiologischen Arbeiten von Friedrich Miescher*, Band ii., pp. 116, 192, 304, 325 (Leipzig, 1897); P. P. C. Hoek, *Statische und biologische Untersuchungen an in den Niederländern gefangenen Lachsen* (Charlottenburg, 1895); *Annual Reports of the Fishery Board for Scotland*, part ii., "Report on Salmon Fisheries," Nos. 11, 12, 13, 14 (1893–1894–95–96); *Report of Investigations on the Life-History of the Salmon to the Fishery Board for Scotland*, edited by Noël Paton, presented to parliament and published 1898; K. Dahl, *Orret og unglahs samt lovgivningens forhold til dem* (Christiania, 1902); H. W. Johnston, "The Scales of Tay Salmon as indicative of Age, Growth and Spawning Habit," *Ann. Rep. Fish. Board, Scotland*, xxiii., appendix ii. (1905). Introduction in Tasmania and New Zealand: M. Allport, *Proc. Zool. Soc.* (1870), pp. 14 and 750; A. Nichol, *Acclimatization of the Salmonidae at the Antipodes* (London, 1882); W. Arthur, "History of Fish Culture in New Zealand," *Tr. N. Zeal. Inst.* xiv. (1881) p. 180; P. S. Seager, "Concise History of the Acclimatization of the Salmonids in Tasmania," *Proc. R. Soc. Tasm.* (1888) p. 1; also R. M. Johnston, *l.c.* p. 27. On the salmon disease: T. H. Huxley, *Quart. Jour. Micr. Sci.* xxii. (1882) p. 311. (G. A. B.)

SALMONEUS, in Greek mythology, son of Aeolus (king of Magnesia in Thessaly, the mythic ancestor of the Aeolian race), grandson of Hellen and brother of Sisyphus. He removed to Elis, where he built the town of Salmone, and became ruler of the country. His subjects were ordered to worship him under the name of Zeus; he built a bridge of brass, over which he drove at full speed in his chariot to imitate thunder, the effect being heightened by dried skins and caldrons trailing behind, while torches were thrown into the air to represent lightning. At last Zeus smote him with his thunderbolt, and destroyed the town (Apollodorus i. 9. 7; Hyginus, *Fab.* 60, 61; Strabo viii. p. 356; Manilius, *Astronom.* 5, 91; Virgil, *Aen.* vi. 585, with Heyne's excursus). Joseph Warton's idea that the story is introduced by Virgil as a protest against the Roman custom of deification is not supported by the general tone of the *Aeneid* itself. According to Frazer (*Early History of the Kingship*, 1905; see also *Golden Bough*, i., 1900, p. 82), the early Greek kings, who were expected to produce rain for the benefit of the crops, were in the habit of imitating thunder and lightning in the character of Zeus. At Crannon in Thessaly there was a bronze chariot, which in time of drought was shaken and prayers offered for rain (Antigonus of Carystus, *Historiae mirabiles*, 15). S. Reinach (*Revue archéologique*, 1903, i. 154) suggests that the story that Salmoneus was struck by lightning was due to the misinterpretation of a picture, in which a Thessalian magician appeared bringing down lightning and rain from heaven; hence arose the idea that he was the victim of the anger or jealousy of Zeus, and that the picture represented his punishment.

SALOME, in Jewish history the name borne by several women of the Herod dynasty. (1) Sister of Herod the Great, who became the wife successively of Joseph, Herod's uncle, Costobar, governor of Idumaea, and a certain Alexas. (2) Daughter of Herod by Elpis, his eighth wife. (3) Daughter of Herodias by her first husband Herod Philip. She was the wife successively of Philip the Tetrarch and Aristobulus, son of Herod of Chalcis. This Salome is the only one of the three who is mentioned in the New Testament (Matt. xiv. 3 sqq.; Mark vi. 17 sqq.) and only in connexion with the execution of John the Baptist. Herod Antipas, pleased by her dancing, offered her a reward "unto the half of my kingdom"; instructed by Herodias, she asked for John the Baptist's "head in a charger."[1] (see Herod II. Antipas).

Salome is also the name of one of the women who are mentioned as present at the Crucifixion (Mark xv. 40), and afterwards in the Sepulchre (xvi. 1). Comparison with Matt. xxvii. 56 suggests that she was also the wife of Zebedee (cf. Matt. xx. 20-23). It is further conjectured that she was a sister of Mary the mother of Jesus, in which case James and John would be cousins of Jesus. In the absence of specific evidence any such identification must be regarded with suspicion.

SALON, a town of south-eastern France, in the department of Boûches-du-Rhône, 40 m. N.N.W. of Marseilles by rail. Pop. (1906), town, 9927; commune, 14,050. Salon is situated on the eastern border of the plain of Crau and on the irrigation canal of Craponne, the engineer of which, Adam de Craponne (1519–1559, has a statue in the town, where he was born. The chief buildings are the church of St Laurent (14th century), which contains the tomb of Michael Nostradamus, the famous astrologer, who died at Salon in 1565, and the church of St Michel (12th century), with a fine Romanesque portal. The central and oldest part of the town preserves a gateway of the 15th century and the remains of fortifications. There are remains of Roman walls near Salon, and in the hôtel-de-ville (17th century) there is a milestone of the 4th century. The town carries on an active trade in oil and soap, which are the chief of its numerous manufactures. Olives are largely grown in the district, and there is a large trade in them and in almonds.

SALONICA, Salonika or Saloniki (anc. *Thessalonica*, Turkish *Selanik*, Slav. *Solun*); the capital of the Turkish vilayet of Salonica, in western Macedonia, and one of the principal seaports of south-western Europe. Pop. (1905) about 130,000, including some 60,000 Sephardic Jews, whose ancestors fled hither in the 16th century to escape religious persecution in Spain and Portugal: their language is a corrupt form of Spanish, called Ladino (*i.e.* Latin), and spoken to some extent by other communities in the city. Salonica lies on the west side of the Chalcidic peninsula, at the head of the Gulf of Salonica (*Sinus Thermaicus*), on a fine bay whose southern edge is formed by the Calamerian heights, while its northern and western side is the broad alluvial plain produced by the discharge of the Vardar and the Bistritza, the principal rivers of western Macedonia. Built partly on the low ground along the edge of the bay and partly on the hill to the north (a compact mass of mica schist), the city with its white houses enclosed by white walls runs up along natural ravines to the castle of the Heptapyrgion, or Seven Towers, and is rendered picturesque by numerous domes and minarets and the foliage of elms, cypresses and mulberry trees. The commercial quarter of the town, lying to the north-west, towards the great valleys by which the inland traffic is conveyed, is pierced by broad and straight streets paved with lava. There are electric tramways and a good water-supply, but most of the older houses are fragile wooden structures coated with lime or mud, and the sanitation is defective. Apart from churches, mosques and synagogues, there are a few noteworthy modern buildings, such as the Ottoman Bank, the baths, quarantine station, schools and hospitals; but the chief architectural interest of Salonica is centred in its Roman and Byzantine remains.

Antiquities.—The Via Egnatia of the Romans (mod. Jassijol or Grande Rue de Vardar) traverses the city from east to west, between the Vardar Gate and the Calamerian Gate. Two Roman triumphal arches used to span the Via Egnatia. The arch near the Vardar Gate—a massive stone structure probably erected towards the end of the 1st century A.D., was destroyed in 1867 to furnish material for repairing the city walls; an imperfect inscription from it is preserved in the British Museum. The other arch, popularly called the arch of Constantine, but with greater probability assigned to the reign of Galerius (A.D. 305–311), is built of brick and partly faced with sculptured marble. A third example of Roman architecture—the remains of a white marble portico supposed to have formed the entrance to the hippodrome—is known by the Judaeo-Spanish designation of Las Incantadas, from the eight Caryatides in the upper part of the structure. There are also numerous fragments of Roman inscriptions and statuary. The conspicuous mosques of Salonica are nearly all of an early Christian origin; the remarkable preservation of their mural decorations makes them very important for the history of Byzantine architecture. The principal are those dedicated to St Sophia, St George and St Demetrius.

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[1] Charger, a large flat plate (see Charge).

St Sophia (Aya Sofia), formerly the cathedral, and probably erected in the 6th century by Justinian's architect Anthemius, was converted into a mosque in 1589. It is cased with slabs of white marble. The whole length of the interior is 110 ft. The nave, forming a Greek cross, is surmounted by a hemispherical dome, the 600 sq. yds. of which are covered with a rich mosaic representing the Ascension. St Demetrius, which is probably older than the time of Justinian, consists of a long nave and two side aisles, each terminating eastward in an atrium the full height of the nave, in a style not known to occur in any other church. The columns of the aisles are half the height of those in the nave. The internal decoration is all produced by slabs of different-coloured marbles. St George's, conjecturally assigned to the reign of Constantine (d. 337), is circular in plan, measuring internally 80 ft. in diameter. The external wall is 18 ft. thick, and at the angles of an inscribed octagon are chapels formed in the thickness of the wall, and roofed with wagon-headed vaults visible on the exterior; the eastern chapel, however, is enlarged and developed into a bema and apse projecting beyond the circle, and the western and southern chapels constitute the two entrances of the building. The dome, 72 yds. in circumference, is covered throughout its entire surface of 800 sq. yds. with what is the largest work in ancient mosaic still extant, representing a series of fourteen saints standing in the act of adoration in front of temples and colonnades. The Eski Juma, or Old Mosque, is another interesting basilica, evidently later than Constantine, with side aisles and an apse without side chapels. The churches of the Holy Apostles and of St Elias also deserve mention. Of the secular buildings, the Caravanserai, usually attributed to Murad II. (1422–1451), probably dates from Byzantine times.

Salonica is the see of an Orthodox Greek archbishop. Each religious community has its own schools and places of worship, among the most important being the Jewish high-school, the Greek and Bulgarian gymnasia, the Jesuit college, a high-school founded in 1860 and supported by the Jewish Mission of the Established Church of Scotland, a German school, dating from 1887, and a college for boys and a secondary school for girls, both managed by the French *Mission Laïque* and subsidized since 1905 by the French government.

Railways, Harbour and Commerce.—Salonica is the principal Aegean seaport of the Balkan Peninsula, the centre of the import trade of all Macedonia and two-thirds of Albania, and the natural port of shipment for the products of an even larger area. It is the terminus of four railways. One line goes north to Nish in Servia, where it meets the main line (Paris-Vienna-Constantinople) of the Oriental railways; another, after following the same route as far as Usküb in Macedonia, branches off to Mitrovitza in Albania; the extension of this line to Serajevo in Bosnia was projected in 1908 in order to establish direct communication between Austria and Salonica. A third line, intended ultimately to reach the Adriatic, extends westward from Salonica to Monastir. A fourth, the Constantinople junction railway to Constantinople, is of great strategic importance; during the war with Greece in 1897 it facilitated the rapid concentration of Ottoman troops on the borders of Thessaly, and in 1908 it helped to secure the triumph of the Young Turks by bringing the regiments favourable to their propaganda within striking distance of Constantinople.

The new harbour, which was opened to navigation in December 1901, allows the direct transhipment of all merchandise whatever may be the direction of the wind, which was previously apt to render shipping operations difficult. The harbour works consist of a breakwater 1835 ft. long, with 28 ft. depth of water on its landward side for a width of 492 ft. Opposite the breakwater is a quay 1475 ft. long, which was widened in 1903–1907 to a breadth of 306 ft.; at each end of the quay a pier 656 ft. long projects into the sea. Between the extremities of these two piers and those of the breakwater are the two entrances to the harbour. The average number of ships, including small coasters, which entered the port in each of the three years 1905–1907 was 3400, of 930,000 tons. Salonica exports grain, flour, bran, silk cocoons, chrome, manganese, iron, hides and skins, cattle and sheep, wool, eggs, opium, tobacco and fennel. The average yearly value of the imports from 1900 to 1905 was £2,500,000, and that of the exports £1,200,000. The imports consist principally of textiles, iron goods, sugar, tobacco, flour, coffee and chemicals. The volume of the export trade tended to decrease in the first decade of the 20th century. The making of morocco leather and other leather-work, such as saddlery, harness and boots and shoes, affords employment to a large number of persons. Other industries are cotton-spinning, brewing, tanning, iron-founding, and the manufacture of bricks, tiles, soap, flour, ironmongery and ice. The spirit called mastic or raki is largely produced.

History.—Thessalonica was built on the site of the older Greek city of Therma, so called in allusion to the hot-springs of the neighbourhood. It was founded in 315 B.C. by Cassander, who gave it the name of his wife, a sister of Alexander the Great. It was a military and commercial station on a main line of communication between Rome and the East, and had reached its zenith before the seat of empire was transferred to Constantinople. It became famous in connexion with the early history of Christianity through the two epistles addressed by St Paul to the community which he founded here; and in the later defence of the ancient civilization against the barbarian inroads it played a considerable part. In 390 7000 citizens who had been guilty of insurrection were massacred in the hippodrome by command of Theodosius. Constantine repaired the port, and probably enriched the town with some of its buildings. During the iconoclastic reigns of terror it stood on the defensive, and succeeded in saving the artistic treasures of its churches: in the 9th century Joseph, one of its bishops, died in chains for his defence of image-worship. In the 7th century the Macedonian Slavs strove to capture the city, but failed even when it was thrown into confusion by a terrible earthquake. It was the attempt made to transfer the whole Bulgarian trade to Thessalonica that in the close of the 9th century caused the invasion of the empire by Simeon of Bulgaria. In 904 the Saracens from the Cyrenaica took the place by storm; the public buildings were grievously injured, and the inhabitants to the number of 22,000 were carried off and sold as slaves throughout the countries of the Mediterranean. In 1185 the Normans of Sicily took Thessalonica after a ten days' siege, and perpetrated endless barbarities, of which Eustathius, then bishop of the see, has left an account. In 1204 Baldwin, conqueror of Constantinople, conferred the kingdom of Thessalonica on Boniface, marquis of Montferrat; but in 1222 Theodore, despot of Epirus, one of the natural enemies of the new kingdom, took the city and had himself there crowned by the patriarch of Macedonian Bulgaria. On the death of Demetrius, who had been supported in his endeavour to recover his father's throne by Pope Honorius III., the empty title of king of Salonica was adopted by several claimants. In 1266 the house of Burgundy received a grant of the titular kingdom from Baldwin II. when he was titular emperor, and it was sold by Eudes IV. to Philip of Tarentum, titular emperor of Romania, in 1320. The Venetians to whom the city was transferred by one of the Palaeologi, were in power when Murad II. appeared, and on the 1st of May 1430, in spite of the desperate resistance of the inhabitants, took the city, which had thrice previously been in the hands of the Turks. They cut to pieces the body of St Demetrius, the patron saint of Salonica, who had been the Roman proconsul of Greece, under Maximian, and was martyred in A.D. 306. In 1876 the French and German consuls at Salonica were murdered by the Turkish populace. On the 4th of September 1890 more than 2000 houses were destroyed by fire in the south-eastern quarters of the city. During the early years of the 20th century Salonica was the headquarters of the Committee of Union and Progress, the central organization of the Young Turkey Party, which carried out the constitutional revolution of 1908. Before this event the weakness of Turkey had encouraged the belief that Salonica would ultimately pass under the control of Austria-Hungary or one of the Balkan States, and this belief gave rise to many political intrigues which helped to delay the solution of the Macedonian Question.

Vilayet.—The vilayet of Salonica has an area of 13,510 sq. m. and an estimated population of 1,150,000. It is rich in minerals, including chrome, manganese, zinc, antimony, iron, argentiferous lead, arsenic and lignite, but some of these are unworked. The chief agricultural products are grain, rice, beans, cotton, opium and poppy seed, sesame, fennel, red pepper, and much of the finest tobacco grown in Europe; there is also some trade in timber, live-stock, skins, furs, wool and silk cocoons. The growth of commerce has been impeded by the ignorance of cultivators, the want of good roads and the unsettled political condition of Turkey. Apart from the industries carried on in the capital, there are manufactures of wine, liqueurs, sesame oil, cloth, macaroni and soap. The principal towns, Seres (pop. 30,000), Vodena (25,000) and Cavalla (24,000), are described in separate articles; Tikvesh (21,000) is the centre of an agricultural region, Caraferia (14,000) a manufacturing town, and Drama (13,000) one of the centres of tobacco cultivation.

SALOON, a large room for the reception of guests in a mansion. The French *salon* itself is formed from *salle*, Ger. *Saal*, hall, reception-room, represented in Old English by the cognate *sæl*, hall, properly "abiding-place," from the root seen in Gothic *saljan*, to dwell, cf. Russ. *selo*, village. The word in its proper sense has now a somewhat archaistic flavour, being chiefly used of the 18th century, and it has come principally to be used (1) of the large rooms on passenger steamers; (2) on English railways of carriages for the accommodation of large parties not divided into compartments, and in the United States of the so-called "drawing-room cars"; and (3) of a bar or place for the sale of intoxicants.

SALSAFY, or SALSIFY, *Tragopogon porrifolius*, a hardy biennial, with long, cylindrical, fleshy, esculent roots, which, when properly cooked, are extremely delicate and wholesome; it occurs in meadows and pastures in the Mediterranean region, and in Britian is confined to the south of England, but is not native. The salsafy requires a free, rich, deep soil, which should be trenched in autumn, the manure used being placed at two spades' depth from the surface. The first crop should be sown in March, and the main crop in April, in rows a foot from each other, the plants being afterwards thinned to 8 in. apart. In November the whitish roots should be taken up and stored in sand for immediate use, others being secured in a similar way during intervals of mild weather. The genus *Tragopogon* belongs to the natural order Compositae, and is represented in Britain by goat's beard, *T. pratensis*, found in meadows, pastures and waste places. The flowers close at noon, whence the popular name "John-go-to-bed-at-noon."

SALSETTE (="sixty-six villages"), a large island in British India, N. of Bombay city, forming part of Thana district. Area, 246 sq. m. It is connected with Bombay Island and also with the mainland by bridge and causeway. Salsette is a beautiful, well-wooded tract, its surface being diversified by hills and mountains, some of considerable height, while it is rich in rice fields. In various parts of the island are ruins of Portuguese churches, convents and villas; while the cave temples of Kanheri form a subject of interest. There are 109 Buddhist caves, which date from the end of the 2nd century A.D., but are not so interesting as those of Ajanta, Ellora and Karli. Salsette is crossed by two lines of railway, which have encouraged the building of villa residences by the wealthier merchants of Bombay. The population in 1901 was 146,933. The island was taken from the Portuguese by the Mahrattas in 1739, and from them by the British in 1774; it was formally annexed to the East India Company's dominions in 1782 by the treaty of Salbai.

There is another Salsette in the Portuguese settlement of Goa, a district with a population (1900) of 113,061.

SALSOMAGGIORE, a village of Emilia, Italy, in the province of Parma, 6 m. S.W. of Borgo San Donnino by steam tramway. Pop. (1901) 1387 (village); 7274 (commune). It is situated 525 ft. above sea-level at the foot of the Apennines, and is a popular watering-place, the baths being especially frequented. The water is strongly saline.

SALT, SIR TITUS, BART. (1803–1876), English manufacturer, was born on the 20th of September 1803, at Morley, Yorkshire. In 1820 he was apprenticed to learn wool-stapling at Bradford, and his father, having followed him there and started in that business, took him into partnership in 1824. His success in introducing the coarse Russian wool (*donskoi*) into English worsted manufacture, due to special machinery of his own devising, gave his firm a great impetus. In 1836 he solved the difficulties of working alpaca (*q.v.*) wool, created an enormous industry in the production of the staple goods for which that name was retained, and became one of the richest manufacturers in Bradford. In 1853 he opened, a few miles out of the city on the Aire, the extensive works and model manufacturing town of Saltaire. From 1859–1861 Salt was M. P. for Bradford, of which city he had been mayor in 1848, and in 1869 he was created a baronet. He died on the 20th of September 1876, and was accorded a public funeral. After his death his many benevolent institutions at Saltaire, at first continued by his widow, were transferred to a trust.

See R. Balgarnie, *Sir Titus Salt, his Life and its Lessons.*

SALT (a common Teutonic word, cf. Dutch *zout*, Ger. *Salz*, Scand. *salt*; cognate with Gr. ἅλς, Lat. *sal*). In chemistry the term salt is given to a compound formed by substituting the hydrogen of an acid by a metal or a radical acting as a metal, or, what comes to the same thing, by eliminating the elements of water between an acid and a base (see ACID; CHEMISTRY).

Common Salt.

Common salt, or simply salt, is the name given to the native and industrial forms of sodium chloride, NaCl. Pure sodium chloride, which may be obtained by passing hydrochloric acid gas into a saturated solution of the commercial salt, whereupon it is precipitated, forms colourless, crystalline cubes (see also below under *Rock salt*) which melt at 815.4°, and begins to volatilize at slightly higher temperatures. It is readily soluble in water, 100 parts of which dissolve 35·52 parts at 0° and 39.16 parts at 100°. The saturated solution at 109.7° contains 40·35 parts of salt to 100 of water. On cooling a saturated solution to −10°, or by cooling a solution in *hot* hydrochloric acid, the hydrate $NaCl.2H_2O$ separates; on further cooling an aqueous solution to −20° a cryohydrate containing 23·7% of the salt is deposited. The consideration of this important substance falls under two heads, relating respectively to sea salt or "bay" salt and "rock" salt or mineral salt. The one is probably derived from the other, most rock salt deposits bearing evidence of having been formed by the evaporation of lakes or seas.

Sea Salt.—Assuming that each gallon of sea water contains 0·2547 ℔ of salt, and allowing an average density 2·24 for rock-salt, it has been computed that the entire ocean if dried up would yield no less than four and a half million cubic miles of rock-salt, or about fourteen and a half times the bulk of the entire continent of Europe above high-water mark. The proportion of sodium chloride in the water of the ocean, where it is mixed with small quantities of other salts, is on the average about 3.33%, ranging from 2·9% for the polar seas to 3·55% or more at the equator. Enclosed seas, such as the Mediterranean, the Red Sea, the Black Sea, the Dead Sea, the Caspian and others, are dependent of course for the proportion and quality of their saline matter on local circumstances (see OCEAN).

At one time almost the whole of the salt in commerce was produced from the evaporation of sea water, and indeed salt so made still forms a staple commodity in many countries possessing a seaboard, especially those where the climate is dry and the summer of long duration. In Portugal there are salt works at Setubal, Alcacer do Sal, Figueira and Aveiro. Spain has salt works at the Bay of Cadiz, the Balearic Islands, &c.; Italy at Sicily, Naples, Tuscany and Sardinia. France has its "marais salants du midi" and also works on the Atlantic seaboard; whilst Austria has "Salzgärten" at various places on the Adriatic (Sabbioncello, Trieste, Pirano, Capo d'Istria, &c.). In England and Scotland the industry has greatly fallen off under the competition of the rock-salt works of Cheshire.

The process of the spontaneous evaporation of sea water was studied by Usiglio on Mediterranean water at Cette. The density at first was 1·02. Primarily but a slight deposit is formed (none until the concentration arrives at specific gravity 1·0509), this deposit consisting for the most part of calcium carbonate and ferric oxide. This goes on till a density of 1·1315 is attained, when hydrated calcium sulphate begins to deposit, and continues till specific gravity 1·2646 is reached. At a density of 1·218 the deposit becomes augmented by sodium chloride, which goes down mixed with a little magnesium chloride and sulphate. At specific gravity 1·2461 a little sodium bromide has begun also to deposit. At specific gravity 1·311 the volume of the water contained—

Magnesium sulphate	11·45 %
Magnesium chloride	19·53 %
Sodium chloride	15·98 %
Sodium bromide	2·04 %
Potassium chloride	3·30 %

Up to the time then that the water became concentrated to specific gravity 1·218 only 0·150 of deposit had formed, and that chiefly composed of lime and iron, but between specific gravity 1·218 and 1·313 there is deposited a mixture of—

Calcium sulphate	0·0283 %
Magnesium sulphate	0·0624 %
Magnesium chloride	0·0153 %
Sodium chloride	2·7107 %
Sodium bromide	0·0222 %
	2·8389 %

Of this about 95 % is sodium chloride. Up to this point the separation of the salts has taken place in a fairly regular manner, but now the temperature begins to exert an influence, and some of the salts deposited in the cold of the night dissolve again partially in the heat of the day. By night the liquor gives nearly pure magnesium sulphate; in the day the same sulphate mixed with sodium and potassium chlorides is deposited. The mother-liquor now falls to a specific gravity of 1·3082 to 1·2965, and yields a very mixed deposit of magnesium bromide and chloride, potassium chloride and magnesium sulphate, with the double magnesium and potassium sulphate, corresponding to the kainite of Stassfurt. There is also deposited a double magnesium and potassium chloride, similar to the carnallite of Stassfurt, and finally the mother-liquor, which has now again risen to specific gravity 1·3374, contains only pure magnesium chloride.

The application of these results to the production of salt from sea water is obvious. A large piece of land, barely above high-water mark, is levelled, and if necessary puddled with clay. In tidal seas a "jas" (or storage reservoir) is constructed alongside, similarly rendered impervious, in which the water is allowed to settle and concentrate to a certain extent. In non-tidal seas this storage basin is not required. The prepared land is partitioned off into large basins (*adernes* or *muants*) and others (called in France *aires*, *œuillets* or *tables salantes*) which get smaller and more shallow in proportion as they are intended to receive the water as it becomes more and more concentrated, just sufficient fall being allowed from one set of basins to the other to cause the water to flow slowly through them. The flow is often assisted by pumping. The sea salt thus made is collected into small heaps on the paths around the basins or the floors of the basins themselves, and here it undergoes a first partial purification, the more deliquescent salts (especially the magnesium chloride) being allowed to drain away. From these heaps it is collected into larger ones, where it drains further, and becomes more purified. The salt is collected from the surface by means of a sort of wooden scoop or scraper, but in spite of every precaution some of the soil on which it is produced is inevitably taken up with it, communicating a red or grey tint.

Generally speaking this salt, which may contain up to 15% of impurities, goes into commerce just as it is, but in some cases it is taken first to the refinery, where it either is simply washed and then stove-dried before being sent out, or is dissolved in fresh water and then boiled down and crystallized like white salt from rock-salt brine. The salt of the "salines du midi" of the south-east of France is far purer, containing about 5% of impurities. In northern Russia and in Siberia sea water is concentrated by freezing, the ice which separates containing little salt; the brine is then boiled down when an impure sea salt is deposited.

Rock-salt.—To mineralogists rock-salt is often known as *halite*—a name suggested in 1847 by E. F. Glocker from the Greek ἅλς (salt). The word halite, however, is sometimes used not only for the species rock-salt but as a group-name to include a series of haloid minerals, of which that species is the type. Halite or rock-salt crystallizes in the cubic system, usually in cubes, rarely in octahedra; the cubes being solid, unlike the skeleton-cubes obtained by rapid evaporation of brine. The mineral has perfect cubic cleavage. Percussion-figures, readily made on the cleavage-faces, have rays parallel to faces of the rhombic dodecahedron; whilst figures etched with water represent the four-faced cube. Rock-salt commonly occurs in cleavable masses, or sometimes in laminar, granular or fibrous forms, the finely fibrous variety being known as "hair-salt." The hardness is 2 to 2·5 and the spec. grav. 2·1 to 2·6. Rock-salt when pure is colourless and transparent, but is usually red or brown by mechanical admixture with ferric oxide or hydroxide. The salt is often grey, through bituminous matter or other impurity, and rarely green, blue or violet. The blue colour, which disappears on heating or dissolving the salt, has been variously ascribed to the presence of sodium subchloride, sodium, sulphur or of a certain compound of iron, or again to the existence of minute cavities with parallel walls. Halite occasionally exhibits double refraction, perhaps due to natural pressure. It is remarkably diathermanous, or capable of transmitting heat-rays, and has therefore been used in certain physical investigations. Pure halite consists only of sodium chloride, but salt usually contains certain magnesium compounds rendering it deliquescent. Minute vesicular cavities are not infrequently present, sometimes as negative cubes, and these may contain saline solutions or carbon dioxide or gaseous hydrocarbons. Some salt decrepitates on solution (*Knistersalz*), the phenomenon being due to the escape of condensed gases.

Halite may occur as a sublimate on lava, as at Vesuvius and some other volcanoes, where it is generally associated with potassium chloride; but its usual mode of occurrence is in bedded deposits, often lenticular, and sometimes of great thickness. The salt is commonly associated with gypsum, often also with anhydrite, and occasionally with sylvite, carnallite and other minerals containing potassium and magnesium. Deposits of rock-salt have evidently been formed by the evaporation of salt water, probably in areas of inland drainage or enclosed basins, like the Dead Sea and the Great Salt Lake of Utah, or perhaps in some cases in an arm of the sea partially cut off, like the Kara Bughaz, which forms a natural salt-pan on the east side of the Caspian. Such beds of salt are found in strata of very varied geological age; the Salt Range of the Punjab, for instance, is probably of Cambrian age, while the famous salt-deposits of Wieliczka, near Cracow, have been referred to the Pliocene period. In many parts of the world, including the British area, the Triassic age offered conditions especially favourable for the formation of large salt-deposits.

In England extensive deposits of rock-salt are found near the base of the Keuper marl, especially in Cheshire. The mineral occurs generally in lenticular deposits, which may reach a thickness of more than 100 ft.; but it is mined only to a limited extent, most of the salt being obtained from brine springs and wells which derive their saline character from deposits of salts. Much salt is obtained from north Lancashire, as also from the brine pits of Staffordshire, Worcestershire, Yorkshire, Durham and the Isle of Man (Point of Ayre). The salt of N.E. Yorkshire and S. Durham is regarded by some authorities as Permian, but that near Carrickfergus in Co. Antrim, Ireland, is undoubtedly of Triassic age. The Antrim salt was discovered in 1850 during a search for coal: one of the beds at Duncrue mine has a thickness of 80 ft. Important deposits of rock-salt occur in the Keuper at Berchtesgaden, in the Bavarian Alps; at Hall in Tirol and at Hallein, Hallstatt, Ischl and Aussee in the Salzkammergut in Austria. Salt occurs in the Muschelkalk at Friedrichshall and some other localities in Württemberg and Thuringia; and in the Bunter at Schöningen near Brunswick.

The Permian system (Zechstein) yields the great salt-deposits worked at Stassfurt and at Halle in Prussian Saxony. The Stassfurt deposits are of special importance for the sake of the associated salts of potassium and magnesium, such as carnallite and kainite. These deposits, in addition to having a high commercial importance, present certain problems which have received much attention, more particularly at the hands of van't Hoff and his collaborators, whose results are embodied in his *Zur Bildung der ozeanischen Salzablagerungen*, vol. i. (1905), vol. ii. (1909). (A summary is given in A. W. Stewart, *Recent Advances in Physical and Inorganic Chemistry*, 1909; see also van't Hoff, *Lectures on Theoretical and Physical Chemistry*, vol. i.) A typical section is as follows: Beneath the surface soil of sandstone there is a layer up to 100 ft. in thickness of carnallite, $MgCl_2 \cdot KCl \cdot 6H_2O$, mixed with a little salt; this is followed by a thicker deposit of kieserite, $MgSO_4 \cdot H_2O$, containing rather more salt than the upper bed. Deeper down there are successively strata of polyhalite, $MgSO_4 \cdot K_2SO_4 \cdot 2CaSO_4 \cdot 2H_2O$, and anhydrite, $CaSO_4$, interspersed with regular layers of rock-salt; whilst below the anhydrite we have the main rock-salt deposits. A bed of rock-salt in the Zechstein at Sperenberg near Berlin has been proved by boring to have a thickness of upwards of 4000 ft. The salt of Bex in Switzerland is Jurassic, whilst Cretaceous salt occurs in Westphalia and Algiers. Important deposits of salt are developed in many parts of the Tertiary strata. At Cardona, near Barcelona, Tertiary salt forms hill-masses, while the Carpathian sandstone in Galicia and Transylvania is rich in salt. The extensive mines at Wieliczka are in this rock-salt, as also is the salt of Kalusz in Galicia, which is associated with sylvite, KCl.

In North America salt is widely distributed at various geological horizons. In New York it occurs in the Salina beds of the Onondaga series, of Silurian age; and Silurian salt is found also in parts of Michigan and in Ontario, Canada. Some of the salt of Michigan is regarded as Carboniferous. Rock-salt is mined in several states, as New York, Kansas and Louisiana; but American salt is mostly obtained from brine. Deposits of salt, regarded as either Cretaceous or Tertiary, occur in the island of Petite Anse, west of Vermilion Bay, in Louisiana. Salt often occurs in association with petroleum and natural gas, and extensive beds were discovered in the Wyoming valley in boring for petroleum. In the dry regions of the West salt occurs as an incrustation on the surface of the soil—a mode of occurrence found in desert areas in various parts of the world.

Cubic pseudomorphs representing rock-salt are sometimes seen in strata which have been deposited in shallow water, especially on the margin of a salt-lake. The salt has been dissolved out of its original matrix, and the cavity so formed has then been filled with fine clayey or other mineral matter, forming a cubic cast. Such casts are not infrequent in the Keuper marls and sandstones, and in the Purbeck beds of England.

Manufacture.—The chief centres of manufacture in England are at Northwich, Middlewich, Winsford and Sandbach in Cheshire, Weston-on-Trent in Staffordshire, Stoke Prior and Droitwich in Worcestershire and Middlesbrough in Yorkshire.[1] The Cheshire and Worcestershire salt deposits are by far the most important. Although brine springs have been known to exist in both these counties ever since the Roman occupation, and salt had been made there from time immemorial, it was not till 1670 that rock-salt about 30 yds. thick was discovered at Marbury near Northwich by some men exploring for coal, at a depth of 34 yds. In 1779 three beds of rock-salt were discovered at Lawton, separated from one another by layers of indurated clay. The old Marston or Marston Rock mine is the largest and perhaps the oldest in England. It was worked for about a hundred years in only its upper bed, but in 1781, after traversing a layer of indurated clay intersected with small veins of salt 10½ yds. thick, a layer of rock-salt 33 to 37 yds. thick was found. Beneath it are others, but they are thin and impure. The total depth of the mine to the bottom of the lower level is 120 yds. At Winsford, where the same formation seems to recur, it is 159 yds. from the surface. The Marston mine covers an area of about 40 acres. The salt is first reached at 35-40 yds. in the Northwich district, and the upper layer is 25-50 yds. in thickness (Marston 23-26 yds.); it has above it, apparently lying in the recesses of its surface, a layer of saturated brine. This is the brine which is raised at the various pumping stations in Northwich and elsewhere around, and which serves to produce white salt. The beds are reached by sinking through the clays and variegated marls typical of this formation. The salt is blasted out with gunpowder. The Middlesbrough deposit was discovered by Bolckow and Vaughan in boring for water in 1862 at a depth of 400 yds., but was not utilized, and was again found by Messrs Bell Brothers at Port Clarence at a depth of 376 yds. In Cheshire the surface-water trickling through the overlying strata dissolves the salt, which is subsequently pumped as brine, but at Middlesbrough the great depth and impermeability of the strata precludes this, so another method has been resorted to. A bore is made into the salt, and lined with tubing, and this tube where it traverses the salt is pierced with holes. Within this is hung loosely a second tube of much smaller dimensions so as to leave an annular space between the two. Through this space the fresh surface water finds its way, and dissolving the salt below rises in the inner tube as brine, but only to such a level that the two columns bear to one another the relation of ten to twelve, this being the inverse ratio of the respective weights of saturated brine and fresh water. For the remaining distance the brine is raised by a pump. The fresh water, however, as it descends rises to the surface of the salt, tending rather to dissolve its upper layers and extend superficially, so that after a time the superincumbent soil, being without support, falls in. These interior landslips, besides choking the pipes and breaking the communication, often produce sinkings at the surface. The same inconvenience is felt in the environs of Nancy, and a similar one produces on a larger scale the sinking and subsidences at Winsford and Northwich.

In the United States extensive deposits and brine springs are worked, and also incrustations (see above). Canada also is a producer. South America possesses several salt deposits and brine springs. Asiatic Russia is very abundantly supplied with salt, as likewise is China; and Persia is perhaps one of the countries most abundantly endowed with this natural and useful product. In India there is the great salt range of the Punjab, as well as the Sambhur Lake, and salt is obtained from sea water at many places along its extensive seaboard.

Rock-salt is the origin of the greater part of the salt manufactured in the world. It occurs in all degrees of purity, from that of mere salty clay to that of the most transparent crystals. In the former case it is often difficult to obtain the brine at a density even approaching saturation, and chambers and galleries are sometimes excavated within the saliferous beds to increase the dissolving surface, and water let down fresh is pumped up as brine. Many brine springs also occur in a more or less saturated condition. In cases where the atmospheric conditions are suitable the brine is run into large tanks and concentrated merely by solar heat, or it may be caused to trickle over faggots arranged under large open sheds called "graduation houses" (*Gradirhäuser*), whereby a more extensive surface of evaporation is obtained and the brine becomes rapidly concentrated. After settling it is evaporated in iron pans. The use, however, of the "graduation houses" is dying out, as both their construction and their maintenance are expensive. The purer rock-salt is often simply ground for use, as at Wieliczka and elsewhere, but it is more frequently pumped as brine, produced either by artificial solution as at Middlesbrough and other places, or by natural means, as in Cheshire and Worcestershire. One great drawback to the use of even the purest rock-salt simply ground is its tendency to revert to a hard unwieldy mass, when kept any length of time in sacks. As usually made, white salt from rock-salt may be classified into two groups: (1) boiled: known as fine, table, lump, stoved lump, superfine, basket, butter and cheese salt (Fr. *sel fin-fin*, *sel à la minute*, &c.); (2) unboiled: common, chemical, fishery, Scotch fishery, extra fishery, double extra fishery and bay salt (Fr. *sel de 12*, *24*, *48*, *60* and *72 heures*). All these names are derived from the size and appearance of the crystals, their uses and the modes of their production. The boiled salts, the crystals of which are small, are formed in a medium constantly agitated by boiling. The fine or stoved table salts are those white masses with which we are all familiar. Basket salt takes its name from the conical baskets from which it is allowed to drain when first it is "drawn" from the pan. Butter and cheese salts are not stove-dried, but left in their more or less moist condition, as being thus more easily applied to their respective uses. Of the unboiled salts the first two, corresponding to the Fr. *sel de 12 heures* and *sel de 24 heures*, show by their English names the use to which they are applied, and the others merely depend for their quality on the length of time which elapses between successive "drawings," and the temperature of the evaporation. The time varies for the unboiled salts from twelve hours to three or four weeks, the larger crystals being allowed a longer time to form, and the smaller ones being formed more quickly. The temperature varies from 55° to 180° F.

One difference between the manufacture of salt from rock-salt brine as carried on in Britain and on the Continent lies in the use in the latter case of closed or covered pans, except in the making of fine salt, whereas in Britain open ones are employed. With open pans the vapour is free to diffuse itself into the atmosphere, and the evaporation is perhaps more rapid. When covered pans are used, the loss of heat by radiation is less, and the salt made is also cleaner. It has also been proposed to concentrate the brines under diminished pressure. In S. Pick's system a triple effect is obtained by evaporating in these connected vessels, so that the steam from one heats the second into which it is led (see *Soc. of Eng.*, 1891, p. 115).

In Britain the brine is so pure that, keeping a small stream of it running into the pan to replace the losses by evaporation and the removal of the salt, it is only necessary occasionally (not often) to reject the mother-liquor when at last it becomes too impure with magnesium chloride; but in some works the mother-liquor not only contains more of this impurity but becomes quite brown from organic matter on concentration, and totally unfit for further service after yielding but two or three crops of salt crystals. Sometimes, to get rid of these impurities, the brine is treated in a large tub (*bessoir*) with lime; on settling it becomes clear and colourless, but the dissolved lime forms a skin on its surface in the pan, retards the evaporation and impedes the crystallization. At times sodium sulphate is added to the brine, producing sodium chloride and magnesium sulphate by double decomposition with the magnesium chloride. A slight degree of acidity seems more favourable to the crystallization of salt than alkalinity; thus it is a practice to add a certain amount of alum, 2 to 12 ℔ per pan of brine, especially when, as in fishery salt, fine crystals are required. The salt is "drawn" from the pan and placed (in the case of boiled salts) in small conical baskets hung round the pan to drain, and thence moulded in square boxes and afterwards stove-dried, or (in case of unboiled salts) "drawn" in a heap on to the "hurdles," on which it drains, and thence is carried to the store.

In most European countries a tax is laid on salt; and the coarser as well as the finer crystals are therefore often dried so as not to pay duty on more water than can be helped.

The brine used in the salt manufacture in England is very nearly saturated, containing 25 or 26% of sodium chloride, the utmost water can take up being 27%; and it ranges from 38 to 42 oz. of salt per gallon. In some other countries the brine has to be concentrated before use.

Saltmaking is by no means an unhealthy trade, some slight soreness of the eyes being the only affection sometimes complained of; indeed the atmosphere of steam saturated with salt in which the workmen live seems specially preservative against colds, rheumatism, neuralgia, &c.

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[1] The termination "wich" in English place-names often points to ancient salt manufacture—the word "wich" (creek, bay; Icel. *vik*) having acquired a special sense in English usage. In Germany the various forms of the non-Teutonic words Hall, Halle occurring in place-names point in the same way to ancient salt-works.

A parliamentary commission was appointed in 1881 to investigate the causes of the disastrous subsidences which are constantly taking place in all the salt districts, and the provision of a remedy. It led to no legislative action; but the evil is recognized as a grave one. At Northwich and Winsford scarcely a house or a chimney stack remains straight. Houses are keyed up with "shaps," "face plates" and "bolts," and only kept from falling by leaning on one another. The doors and windows have become lozenge-shaped, the walls bulged and the floors crooked. Buildings have sunk—some of them disappearing altogether. Lakes have been formed where there was solid ground before, and incalculable damage done to property in all quarters. At the same time it is difficult to see how this grievance can be remedied without inflicting serious injury, almost ruin, upon the salt trade. The workings in Great Britain represent the annual abstraction of rather more than a mass of rock equal to a foot in thickness spread over a square mile. The table gives the outputs in metric tons of the most important producers in 1900 and 1905 (from Rothwell, *Mineral Industry*, 1908).

Salt Production in Metric Tons.

	1900.	1905.
Austria	330,277	343,375
France	1,088,634	1,130,000
Germany	1,514,027	1,777,557
Hungary	189,363	195,410
India	1,021,426	1,212,600
Italy	367,255	437,699
Japan	669,694	483,506
Russia	1,768,005	1,844,678
Spain	450,041	493,451
United Kingdom . .	1,873,601	1,920,149
United States . . .	2,651,278	3,297,285

See F. A. Fürer, *Salzbergbau- und Salinenkunde* (Braunschweig, 1900); J. O. Freiherr von Buschmann, *Das Salz: dessen Vorkommen und Verwertung* (Leipzig, vol. 1, 1909, vol. 2, 1906). (X.)

Ancient History and Religious Symbolism.—Salt must have been quite unattainable to primitive man in many parts of the world. Thus the *Odyssey* (xi. 122 seq.) speaks of inlanders (in Epirus ?) who do not know the sea and use no salt with their food. In some parts of America, and even of India (among the Todas), salt was first introduced by Europeans; and there are still parts of central Africa where the use of it is a luxury confined to the rich. Indeed, where men live mainly on milk and flesh, consuming the latter raw or roasted, so that its salts are not lost, it is not necessary to add sodium chloride, and thus we understand how the Numidian nomads in the time of Sallust and the Bedouins of Hadramut at the present day never eat salt with their food. On the other hand, cereal or vegetable diet calls for a supplement of salt, and so does boiled meat. The important part played by the mineral in the history of commerce and religion depends on this fact; at a very early stage of progress salt became a necessary of life to most nations, and in many cases they could procure it only from abroad, from the sea-coast, or from districts like that of Palmyra where salty incrustations are found on the surface of the soil. Sometimes indeed a kind of salt was got from the ashes of saline plants (*e.g.* by the Umbrians, Aristotle, *Met.* ii. p. 459), or by pouring the water of a brackish stream over a fire of (saline) wood and collecting the ashes, as was done in ancient Germany (Tac. *Ann.* xiii. 57), in Gaul and in Spain (Plin. *H.N.* xxxi. 7. 82 seq.); but these were imperfect surrogates. Among inland peoples a salt spring was regarded as a special gift of the gods. The Chaonians in Epirus had one which flowed into a stream where there were no fish; and the legend was that Heracles had allowed their forefathers to have salt instead of fish (Arist. *ut supra*). The Germans waged war for saline streams, and believed that the presence of salt in the soil invested a district with peculiar sanctity and made it a place where prayers were most readily heard (Tac. *ut sup.*). That a religious significance was attached to a substance so highly prized and which was often obtained with difficulty is no more than natural. And it must also be remembered that the habitual use of salt is intimately connected with the advance from nomadic to agricultural life, *i.e.* with precisely that step in civilization which had most influence on the cults of almost all ancient nations. The gods were worshipped as the givers of the kindly fruits of the earth, and, as all over the world "bread and salt" go together in common use and common phrase, salt was habitually associated with offerings, at least with all offerings which consisted in whole or in part of cereal elements. This practice is found alike among the Greeks and Romans and among the Semitic peoples (Lev. ii. 13); Homer calls salt "divine," and Plato names it "a substance dear to the gods" (*Timaeus*, p. 60; cf. Plutarch, *Sympos.* v. 10). As covenants were ordinarily made over a sacrificial meal, in which salt was a necessary element, the expression "a covenant of salt" (Numb. xviii. 19) is easily understood; it is probable, however, that the preservative qualities of salt were held to make it a peculiarly fitting symbol of an enduring compact, and influenced the choice of this particular element of the covenant meal as that which was regarded as sealing an obligation to fidelity. Among the ancients, ~~as~~ among Orientals down to the present day, every meal that included salt had a certain sacred character and created a bond of piety and guest friendship between the participants. Hence the Greek phrase *ἅλας καὶ τράπεζαν παραβαίνειν*, the Arab phrase "there is salt between us," the expression "to eat the salt of the palace" (Ezra iv. 14, R.V.), the modern Persian phrase *namak harām*, "untrue to salt," *i.e.* disloyal or ungrateful, and many others. Both early in the history of the Roman army and in later times an allowance of salt was made to officers and men. In imperial times, however, this *salarium* was an allowance of money for salt (see SALARY).

It has been conjectured that some of the oldest trade routes were created for traffic in salt; at any rate salt and incense, the chief economic and religious necessaries of the ancient world, play a great part in all that we know of the ancient highways of commerce. Thus one of the oldest roads in Italy is the *Via Salaria*, by which the produce of the salt pans of Ostia was carried up into the Sabine country. Herodotus's account of the caravan route uniting the salt-oases of the Libyan desert (iv. 181 seq.) makes it plain that this was mainly a salt-road, and to the present day the caravan trade of the Sahara is largely a trade in salt. The salt of Palmyra was an important element in the vast trade between the Syrian ports and the Persian Gulf (see PALMYRA), and long after the glory of the great merchant city was past "the salt of Tadmor" retained its reputation (Masʿūdi viii. 398). In like manner the ancient trade between the Aegean and the coasts of southern Russia was largely dependent on the salt pans at the mouth of the Dnieper and on the salt fish brought from this district (Herod. iv. 53; Dio Chrys. p. 437). In Phoenician commerce salt and salt fish—the latter a valued delicacy in the ancient world—always formed an important item. The vast salt mines of northern India were worked before the time of Alexander (Strabo v. 2, 6, xv. 1, 30) and must have been the centre of a widespread trade. The economic importance of salt is further indicated by the almost universal prevalence in ancient and medieval times, and indeed in most countries down to the present day, of salt taxes or of government monopolies, which have not often been directed, as they were in ancient Rome, to enable every one to procure so necessary a condiment at a moderate price. In Oriental systems of taxation high imposts on salt are seldom lacking and are often carried out in a very oppressive way, one result of this being that the article is apt to reach the consumer in a very impure state largely mixed with earth. "The salt which has lost its savour" (Matt. v. 13) is simply the earthy residuum of such an impure salt after the sodium chloride has been washed out.

Cakes of salt have been used as money in more than one part of the world—for example, in Abyssinia and elsewhere in Africa, and in Tibet and adjoining parts. See the testimony of Marco Polo (bk. ii. ch. 48) and Colonel Yule's note upon analogous customs elsewhere and on the use of salt as a medium of exchange in the Shan markets down to our own time, in his translation of Polo ii. 48 seq. In the same work interesting details are given as to the importance of salt in the financial system of the Mongol emperors (ii. 200 seq.). (W. R. S.)

SALTA, a N.W. province of Argentina, bounded N. by Bolivia and the province of Jujuy, E. by the territories of Formosa and the Chaco, S. by Santiago del Estero and Tucuman, and W. by the Los Andes territory and Bolivia. Area, 62,184 sq. m.; pop. (1904, estimated) 136,059. The western part of the province is mountainous, being traversed from N. to S. by the eastern chains of the Andes. Indenting these, however, are large valleys, or bays, of highly fertile and comparatively level land, like that in which the city of Salta is situated. The eastern part of the province is chiefly composed of extensive areas of alluvial plains belonging to the Chaco formation, whose deep, fertile soils are among the best in Argentina. This part of the province is well wooded with valuable construction timbers and furniture woods. The drainage to the Paraguay is through the Bermejo, whose tributaries cover the northern part of the province; and through the Pasage or Juramento, called Salado on its lower course, whose tributaries cover the southern part of the province and whose waters are discharged into the Paraná. The climate is hot, and the year is divided into a wet and a dry season, the latter characterized by extreme aridity. Irrigation is necessary in a great part of the province, though the rainfall is abundant in the wet season, about 21 in. Fever and ague, locally called *chucho*, is prevalent on the lowlands, but in the mountain districts the climate is healthy. There is considerable undeveloped mineral wealth, including gold, silver and copper, but its inhabitants are almost exclusively agriculturist. Its principal products are sugar, rum (*aguardiente*), wine, wheat, Indian corn, barley, tobacco, alfalfa and coffee. The Cafayate wines are excellent, but are chiefly consumed in the province.

Various tropical fruits are produced in abundance, but are not sent to market on account of the cost of transportation. Stock-raising is carried on to a limited extent for the home and Bolivian markets. The province is traversed by a government railway (the Central Northern) running northward from Tucuman to the Bolivian frontier, with a branch from General Güemes westward to the city of Salta (*q.v.*), the provincial capital. The principal towns are Oran (1904, 3000) on a small tributary (the Zenta) of the Bermejo, in the northern part of the province, formerly an important depot in the Bolivian trade, and nearly destroyed by earthquakes in 1871 and 1873; Rosario de Lerma (pop. 1904, 2500), 30 m. N.W. of Salta in the great Lerma valley; and Rosario de la Frontera (pop. 1904, 1200) near the Tucuman frontier, celebrated for its hot mineral baths and gambling establishment.

Salta was at one time a part of the great Inca empire, which extended southward into Tucuman and Rioja. It was overrun by adventurers after the Spanish conquest. The first Spanish settlement within its borders was made by Hernando de Lerma in 1582. Salta was at first governed from Tucuman, but in 1776 was made capital of the northern intendencia, which included Catamarca, Jujuy and Tucuman. After the War of Independence there was a new division, and Salta was given its present boundaries with the exception of the disputed territory on the Chilean frontier, now the territory of Los Andes.

SALTA, a city of Argentina, capital of a province of the same name, and see of a bishopric, on a small tributary (the Arias) of the Pasage, or Juramento, 976 m. by rail N.N.W. of Buenos Aires. Pop. (1904, estimated) 18,000. Salta is built on an open plain 3560 ft. above the sea, nearly enclosed with mountains. The climate is warm and changeable, malarial in summer. The city is laid out regularly, with broad, paved streets and several parks. Some of the more important public buildings face on the *plaza mayor.* There are no manufactures of importance. Salta was once largely interested in the Bolivian trade, and is still a chief distributing centre for the settlements of the Andean plateau. Near the city is the battlefield where General Belgrano won the first victory from the Spanish forces (1812) in the War of Independence. There is a large *mestizo* element in the population, and the Spanish element still retains many of the characteristics of its colonial ancestors. In Salta Spanish is still spoken with the long-drawn intonations and melodious " ll " of southern Spain.

Salta was founded in 1582 by Governor Abreu under the title of San Clemente de Nueva Sevilla, but the site was changed two years later and the new settlement was called San Felipe de Lerma. In the 17th century the name Salta came into vogue.

SALTA (Italian for "Jump!"), a table-game for two introduced at the end of the 19th century, founded on the more ancient game of Halma. It is played on a board containing 100 squares, coloured alternately black and white. Each player has a set of 15 pieces, one set being green, the other pink. These are placed upon the black squares of the first three rows nearest the player, and are classified in these rows as *stars*, *moons* and *suns*. The pawns move forward one square at a time, except when a pawn is situated in front of a hostile piece with an unoccupied space on the further side, in which case the hostile pawn must be jumped, as at draughts, but without removing the jumped pawn from the board. The object of the game is to get one's pieces on the exact squares corresponding to their own on the enemy's side, the stars in the star-line, the moons in the moon-line, &c. Salta tournaments have taken place in which chess masters of repute participated.

See *Salta*, by Schubert (Leipzig, 1900).

SALTASH, a municipal borough in the Bodmin parliamentary division of Cornwall, England, 5 m. N.W. of Plymouth, on the Great Western railway. Pop. (1901) 3357. It is beautifully situated on the wooded shore of the Tamar estuary, on the lower part of which lies the great port and naval station of Plymouth. Local communications are maintained by river steamers. At Saltash the Royal Albert bridge (1857–1859) carries the railway across the estuary. It was built by Isambard Brunel at a cost of £230,000, and is remarkable for its great height. The church of St Nicholas and St Faith has an early Norman tower, and part of the fabric is considered to date from before the Conquest; but there was much alteration in the Decorated and Perpendicular periods. The church of St Stephen, outside the town, retains its ornate Norman font. The fisheries for which Saltash was famous have suffered from the chemicals brought down by the Tamar; but there is a considerable seafaring population, and the town is a recruiting ground for the Royal Navy. The borough is under a mayor, 4 aldermen and 12 councillors. Area, 194 acres.

The Sunday market established by the count of Mortain at his castle of Trematon, which ruined the bishop of Exeter's market at St Germans, was probably held at Saltash a short distance from the castle. Saltash (Esse, 1297; Ash, 1302; Assheburgh, 1392) belonged to the manor of Trematon and the latter at the time of the Domesday Survey was held by Reginald de Valletort of the count. Reginald's descendant and namesake granted a charter (undated) to Saltash about 1190. It confirms to his free burgesses of Esse the liberties enjoyed by them under his ancestors, viz.: burgage tenure, exemption from all jurisdiction save the " hundred court of the said town," suit of court limited to three times a year, a reeve of their own election, pasturage in his demesne lands on certain terms, a limited control of trade and shipping, and a fair in the middle of the town. This charter was confirmed in the fifth year of Richard II. Roger de Valletort, the last male heir of the family, gave the honour of Trematon and with it the borough of Saltash to Richard, king of the Romans and earl of Cornwall. Thenceforth, in spite of attempts to set aside the grant, the earls and subsequently the dukes of Cornwall were the lords of Saltash. It was probably to this relation that the burgesses owed the privilege of parliamentary representation, conferred by Edward VI. In 1584 Queen Elizabeth granted a charter of incorporation to Saltash. This was superseded by another in 1683 under which the governing body was to consist of a mayor and six aldermen. In 1774, the corporation being in danger of extinction, burgesses were added, but it was not until 1886 that the ratepayers acquired the right of electing representatives to the council, the right up to that time having been exercised by the members of the corporation. The parliamentary franchise was enjoyed by the mayor, aldermen and the holders of burgage tenements. In 1814 they numbered 120. In 1832 Saltash was deprived of its two members. The count of Mortain's Sunday market had given place in 1337 to one on Saturday and this is still held. Queen Elizabeth's charter provided for one on Tuesday also, but this has disappeared. A fair on the feast of St Faith yielded 6s. 8d. in 1337. This is no longer held, but fairs at Candlemas and St James, of ancient but uncertain origin, remain. Saltash was sufficiently considerable as a port in the 16th century to furnish a frigate at the town's expense against the Armada. This probably represents the zenith of its prosperity.

SALTBURN BY THE SEA, a seaside resort in the Cleveland parliamentary division of the North Riding of Yorkshire, England, 21 m. E. of Middlesbrough by a branch of the North Eastern railway. Pop. of urban district (1901) 2578. A firm sandy beach extends westward to Redcar and the mouth of the Tees, while eastward towards Whitby the cliffs become very fine, Boulby Cliff (666 ft.) being the highest sea cliff in England. Several fishing villages occur along this coast, of which none is more picturesque than Staithes, lying in a steep gully in the cliff. There are brine baths supplied from wells near Middlesbrough, a pier, gardens and promenades. Inland the county is hilly and picturesque, though in part defaced by the Cleveland iron mines.

SALT-CELLAR, a vessel containing salt, placed upon the table at meals. The word is a combination of "salt" and "saler," assimilated in the 16th and 17th centuries to "cellar" (Lat. *cellarium*, a storehouse). " Saler " is from the Fr. (Mod. *salière*), Lat. *salarium*, that which belongs to salt, cf. " salary." Salt cellar is, therefore, a tautological expression. There are two types of salts, the large ornamental salt which during the medieval ages and later was one of the most important pieces of household plate, and the smaller " salts," actually used and placed near the plates or trenchers of the guests at table; they were hence styled " trencher salts." The great salts, below which the inferior guests sat, were, in the earliest form which survives, shaped like an hour-glass and have a cover. New College, Oxford, possesses a magnificent specimen, dated 1493. Later salts take a square or cylindrical shape. The Elizabethan salt, kept with the regalia in the Tower of London, has a cover with numerous figures. The London Livery Companies possess many salts of a still later pattern, rather low in height and without a cover. The "trencher salts" are either of triangular or circular shape, some are many-sided. The circular silver salt with legs came into use in the 18th century.

SALTER, JOHN WILLIAM (1820–1869), English naturalist and palaeontologist, was born on the 15th of December 1820. He was apprenticed in 1835 to James de Carle Sowerby, and was engaged in drawing and engraving the plates for Sowerby's *Mineral Conchology*, the *Supplement* to his *English Botany*, and other Natural History works. In 1842 he was employed for a short time by Sedgwick in arranging the fossils in the Woodwardian Museum at Cambridge, and he accompanied the professor on several geological expeditions (1842–1845) into Wales. In 1846 he was appointed on the staff of the Geological Survey and worked under Edward Forbes until 1854; he was then appointed palaeontologist to the survey and gave his chief attention to the palaeozoic fossils, spending much time in Wales and the border counties. He contributed the palaeontological portion to A. C. Ramsay's *Memoir on the Geology of North Wales* (1866), assisted Murchison in his work on *Siluria* (1854 and later editions), and Sedgwick by preparing *A Catalogue of the Collection of Cambrian and Silurian Fossils contained in the Geological Museum of the University of Cambridge* (1873). Salter prepared several of the Decades of the Geological Survey and became the leading authority on Trilobites, contributing to the Palaeontographical Society four parts of *A Monograph of British Trilobites* (1864–1867). He resigned his post on the Geological Survey in 1863, and died on the 2nd of August 1869.

SALTILLO, a city and the capital of the state of Coahuila, Mexico, about 615 m. by rail N. by W. of the city of Mexico. Pop. (1900) 23,996. Saltillo is on the Mexican National railway and another railway connects it with the important mining and industrial town of Torreon, on the Mexican Central. The city is on the great central plateau of Mexico, about 5200 ft. above sea-level. It has a cool and healthy climate, and is a resort in summer for the people of the tropical coast districts, and in winter for invalids from the north. The city is laid out in regular squares, with shady streets and plazas. The residences are of the Spanish colonial type, with heavy walls and large rooms to insure coolness during the heat of the day. Among its public institutions are a national college, an athenaeum, the Madero Institute with a good library, some fine churches, and the charitable institutions common to all Mexican cities. Saltillo is an active commercial and manufacturing town, and an important railway centre. Its manufactures include cotton and woollen fabrics, knitted goods and flour. The woollen "zarapes" or "ponchos" of Saltillo are among the finest produced in Mexico. There are undeveloped coal deposits in the vicinity.

Saltillo was founded in 1586 as an outpost against the Apache Indians. It became an incorporated city in 1827. In 1824 the capital of the state of Coahuila and Texas was at Saltillo. A partisan controversy removed the seat of government to Monclova in 1833, but it was returned to Saltillo in 1835. The battle of Buena Vista was fought near Saltillo on the 22nd-23rd of February 1847. After leaving San Luis Potosí, President Juarez established his capital at Saltillo for a brief period.

SALT LAKE CITY, the capital city of Utah and the county-seat of Salt Lake county, in the N.W. part of Utah, immediately E. of the Jordan river in the Salt Lake Valley, near the base of the Wasatch mountains, at an altitude of about 4350 ft., about 11 m. S.E. of the Great Salt Lake, about 710 m. W. by N. of Denver and about 930 m. E. of San Francisco. Pop. (1860) 8236; (1900) 53,531; (1910 census) 92,777. Area, 51·25 sq. m. Of the total population in 1900, 12,741 (nearly one-fourth) were foreign-born, including 5157 English,[1] 1687 Swedes, 965 Danes, 963 Germans and 912 Scotch; 35,152 were of foreign-parentage (one or the other parent foreign-born); 278 were negroes, 214 Chinese, 22 Japanese. Salt Lake City is served by the Denver & Rio Grande, the Union Pacific, the Western Pacific, the Oregon Short Line, and the San Pedro, Los Angeles & Salt Lake railways; it is also a terminus of shorter roads to Ogden, to Los Angeles and to Mercur, a mining town in the Oquirrh mountains (S. of Great Salt Lake) whose ores are reduced by the cyanide process. The Oregon Short Line and the San Pedro, Los Angeles & Salt Lake have a union railway station (1909), and the Denver & Rio Grande and the Western Pacific also have a large union railway station (1910). The street railway system is excellent; electric cars were introduced in 1889; and the street railways were reorganized by E. H. Harriman, who bought a controlling interest in them.

The situation of the city is striking, with views of mountains and of the Great Salt Lake, and the climate is dry and salubrious. The city is the headquarters of the Church of Jesus Christ of Latter-Day Saints (see MORMONS). The streets are laid out, according to the plan of Brigham Young, with city blocks of 10 acres each (660 ft. sq.) and streets 132 ft. wide, and well shaded with trees planted along irrigating ditches, fed by mountain streams. Brigham (or South Temple) Street is a fine boulevard running 3 m. from the Temple to Fort Douglas. Most of the streets are numbered and named "East" or "West," "North" or "South," from their direction from the centre of the city, the Temple Block. State Street is the official name of First East Street; and East Temple Street is called Main, and South Temple Street (east of the Temple block) is called Brigham. The only developed parks are Pioneer and City Hall, both small, and Liberty Park (110 acres), in which Brigham Young built a grist mill in 1852 and which was bought from his estate by the city in 1880. There are bathing parks on the shores of Great Salt Lake, 11-15 m. W. of the city—the best known being Saltair, which has a Moorish pavilion; and 5 m. S. is Wandamere (formerly Calder's) Park (64 acres). Three miles E. of the city is Fort Douglas, established as Camp Douglas in 1862 by Colonel P. Edward Connor (1820–1891), afterwards prominently connected with the development of the mineral resources of Utah; the fort overlooks the city, being more than 4900 ft. above sea-level. In the city there are medicinal and thermal springs, and water at a temperature of 98-104° F. is piped to a large bath-house (1850) in the N. part of the city.

The most prominent buildings are those of the Church of Latter-Day Saints, particularly, in Temple Square, the Temple, Tabernacle, and Assembly Hall. The great Mormon Temple (1853–1893) has grey granite walls 6 ft. thick, is 99 × 186 ft., and has six spires, the highest (220 ft.) having a copper statue of the angel Moroni. The elliptical Tabernacle (1870) has a rounded, turtle-shell shaped roof, unsupported by pillars or beams, seats nearly 10,000, and has a large pipe organ (5000 pipes). The Assemby Hall (1880), also of granite, has an auditorium which seats about 2500. In 1909 a bishopric building, with many of the business offices of the church, was built. Other buildings connected with the history of the Mormon church are three residences of Brigham Young, called the Lion House, the Beehive (the beehive is the symbol of the industry of the Mormon settlers in the desert and appears on the state seal), and the Amelia Palace or Gardo House (1877), which is now privately owned and houses an excellent private art gallery. Three blocks E. of the Temple is St Mary's, the Roman Catholic cathedral (1909, 100-200 ft.; with two towers 175 ft. high). Other large churches are: St Mark's Cathedral (1869, Protestant Episcopal) and the First Presbyterian Church (1909). There is a large city and county building (1894), built of rough grey sandstone from Utah county; it has a dome on the top of which is a statue of Columbia; over its entrances are statues of Commerce, Liberty and Justice; its balconies command views of the neighbouring country and of the Great Salt Lake; the interior is decorated with Utah onyx. Other buildings are: the Federal building; the Packard Library, the public library of the city (1905), one block E. of Temple Block, which housed in 1910 about 40,000 volumes; and several business buildings. Typical of the city is the great building of the Zion's Co-operative Mercantile Institution, a concern established by Brigham Young in 1868—there are several large factories connected with it, and its annual sales average more than $5,000,000. A monument to Brigham Young and the Utah Pioneers, crowned by a statue of Brigham Young, by C. E. Dallin, was unveiled in 1897, at the intersection of Main and Brigham Streets. The city has numerous hospitals and charities, and there is a state penitentiary here. In the S.E. part is the Judge Miner's Home and Hospital (Roman Catholic), a memorial to John Judge, a successful Utah miner.

Salt Lake City has a good public school system In the city is the University of Utah, chartered in 1850 as the University of the state of Deseret and opened in November 1850; it was practically discontinued from 1851 until 1867, and then was scarcely more than a business college until 1869; its charter was amended in 1884 and a new charter was issued in 1894, when the present style of the corporation was assumed; in 1894 60 acres from the Fort Douglas reservation were secured for the campus. In 1909–1910 the university consisted of a school of arts and sciences, a state school of mines (1901), a normal school, and a preparatory department. Other institutions of learning are: the Latter-Day Saints University (1887) and the Latter-Day Saints High School, St Mary's Academy (1875; under the Roman Catholic Sisters of the Holy Cross), All Hallows College (1886; Roman Catholic), Gordon Academy (1870; Congregational), Rowland Hall Academy (1880; Protestant Episcopal) and Westminster College (1897; Presbyterian). There is a state Art Institute, which gives an annual exhibition, provides for a course of public lectures on art, and houses in its building the state art collection. The city has always been interested in music and the drama: the regular choir of 500 voices of the Mormon Tabernacle (organized in 1890) is one of the best choruses in the country, and closely connected with its development are the Symphony Orchestra and the Salt Lake Choral Society. Brigham Young was an admirer of the drama, and the Salt Lake Theatre (1862) has had a brilliant history. There is a Young Men's Christian Association (organized in 1890). The principal clubs are the Alta, University, Commercial, Country, and Women's. There are a Masonic Temple and buildings of the Elks and Odd Fellows.

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[1] The early Mormon missions in England were very successful, and many of the leaders of the church and those otherwise prominent in Salt Lake City have been of English birth.

Salt Lake City is the great business centre of Utah and one of the main shipping points of the West for agricultural products, live stock (especially sheep), precious metals and coal; and the excellent railway facilities contribute greatly to the commercial importance of the city. In 1905 the value of the factory products was $7,543,983, being 76·3% more than in 1900 and being nearly one-fifth of the total value of the factory products of all Utah. There are three large steam-car repair shops in the city. Among the more valuable manufactures are: newspapers, books, &c. ($924,495 in 1905), malt liquors, confectionery, flour, foundry and machine-shop products, dairy products, salt, knit goods, mattresses, sugar, cement, &c. Electricity is largely used in the newer factories, the power being derived from Ogden river, near Ogden, about 35 m. away, and from cataracts in Cottonwood canyon and other canyons.

The city is governed under a charter of 1851. The government is in the hands of a mayor, elected for two years, and of a unicameral municipal council, consisting of 15 members, elected from the five wards of the city for two years or for four years. The municipality owns the water works. In 1909 the assessed valuation, real and personal, was $52,180,789; the tax levy was $677,411; and the city debt was $4,399,400 (exclusive of $1,528,000, the bonded indebtedness of the city schools).

The history of the city is largely that of the Mormons (*q.v.*) and in its earlier years that of Utah (*q.v.*). The Mormons first came here in 1847; an advance party led by Orson Pratt and Erastus Snow entered the Salt Lake Valley on the 22nd of July. President Brigham Young upon his arrival on the 24th approved of the site, saying that he had seen it before in a vision; on the 28th of July he chose the site for the temple. In August the city was named "the City of the Great Salt Lake," and this name was used until 1868 when the adjective was dropped by legislative act. In the autumn the major body of the pioneers arrived. The first government was purely ecclesiastical, the city being a "stake of Zion" under a president; "Father" Joseph Smith was the first president. The gold excitement of 1849 and the following years was the source of the city's first prosperity: the Mormons did not attempt to do any mining—Brigham Young counselled them not to abandon agriculture for prospecting—but they made themselves rich by outfitting those of the gold-seekers who went to California overland and who stopped at the City of the Great Salt Lake, the westernmost settlement of any importance. On the 4th of March 1849 a convention met here which appointed a committee to draft a constitution; the constitution was immediately adopted, the independent state of Deseret was organized and on the 12th of March the first general election was held. In 1850 the city had a population of 6000, more than half the total number of inhabitants of the Great Salt Lake Valley, which, as well as the rest of Utah, was largely settled from Salt Lake City. In January 1851 the general assembly of the state of Deseret chartered the city; and the first municipal election was held in April of the same year; the charter was amended in 1865. Immigration from Europe and especially from England was large in the earlier years of the city, beginning in 1848. Salt Lake City was prominently identified with the Mormon church in its struggle with the United States government; in 1858 it was entirely deserted upon the approach of the United States troops. Since the Civil War, the non-Mormon element (locally called "Gentile") has steadily increased in strength, partly because of industrial changes and partly because the city is the natural point of attack on the Mormon church of other denominations, which are comparatively stronger here than elsewhere in Utah.

See the bibliography under MORMONS and under UTAH; and particularly E. W. Tullidge, *History of Salt Lake City* (Salt Lake City, 1886), the famous descriptions in Captain Stansbury's report (1850), and in R. F. Burton's *The City of the Saints* (1861), and H. H. Bancroft, *History of Utah* (San Francisco, 1890).

SALTO, a town and river port of Uruguay and capital of a department of the same name, on the Uruguay river 60 m. above Paysandú. Pop. (1900, estimate) 12,000. It has railway connexion with Montevideo via Paysandú and Rio Negro (394 m.), and with Santa Rosa, on the Brazilian frontier (113 m.). It is also connected with Montevideo and Buenos Aires by river steamers, Salto being at the head of high water navigation for large vessels. There are reefs and rocks in the river between Paysandú and Salto that make navigation dangerous except at high water. Above Salto the river is obstructed by reefs all the way up to the Brazilian frontier, about 95 m., and is navigable for light-draft vessels only at high water. Farther up, the river is freely navigable to Santo Tomé (Argentina)—a distance of about 170 m. Travellers wishing to ascend the river above Salto usually cross to Concordia, Entre Rios, and go up by railway to Ceibo, near Monte Caseros, from which point small steamers ascend to Uruguayana, Itaqui, and other river ports. The streets of Salto are well paved and lighted with electricity, and there are some good public buildings. The town has two meat-curing establishments (*saladeros*) and is the shipping port for north-western Uruguay and, to some extent, for western Rio Grande do Sul (Brazil). Behind Salto lies a rich, undulating grazing country, whose large herds supply its chief exports.

The department of Salto—area, 4866 sq. m., pop. (1900) 40,589, (1907, estimate) 53,154—is an undulating, well-watered region occupying the north-west angle of Uruguay. Its industries are almost exclusively pastoral About one-third of its population are foreigners, chiefly Brazilians.

SALTPETRE (from the Lat. *sal*, salt, *petra*, a rock), the commercial name given to three naturally occurring nitrates, distinguished as (1) ordinary saltpetre, nitre, or potassium nitrate, (2) Chile saltpetre, cubic nitre, or sodium nitrate, (3) wall-saltpetre or calcium nitrate. These nitrates generally occur as efflorescences caused by the oxidation of nitrogenous matter in the presence of the alkalies and alkaline earths.

1. *Ordinary Saltpetre or Potassium Nitrate*, KNO_3, occurs, mingled with other nitrates, on the surface and in the superficial layers of the soil in many countries, especially in certain parts of India, Persia, Arabia and Spain. The deposits in the great limestone caves of Kentucky, Virginia and Indiana have been probably derived from the overlying soil and accumulated by percolating water; they are of no commercial value. The actual formation of this salt is not quite clear; but it is certainly conditioned by the simultaneous contact of decaying nitrogenous matter, alkalies, air and moisture. The demand for saltpetre as an ingredient of gunpowder led to the formation of saltpetre plantations or nitriaries, which at one time were common in France, Germany, and other countries; the natural conditions were simulated by exposing heaps of decaying organic matter mixed with alkalies (lime, &c.) to atmospheric action. The salt is obtained from the soil in which it occurs naturally, or from the heaps in which it is formed artificially, by extracting with water, and adding to the solution wood-ashes or potassium carbonate. The liquid is filtered and then crystallized. Since potassium nitrate is generally more serviceable than the sodium salt, whose deliquescent properties inhibit its use for gunpowder manufacture, the latter salt, of which immense natural deposits occur (see below (2) *Chile saltpetre*), is converted into ordinary saltpetre in immense quantities. This is generally effected by adding the calculated amount of potassium chloride (of which immense quantities are obtained as a by-product in the Stassfurt salt industry) dissolved in hot water to a saturated boiling solution of sodium nitrate; the common salt, which separates on boiling down the solution, is removed from the hot solution, and on cooling the potassium nitrate crystallizes out and is separated and dried.

As found in nature, saltpetre generally forms aggregates of delicate acicular crystals, and sometimes silky tufts; distinctly developed crystals are not found in nature. When crystallized from water, crystals belonging to the orthorhombic system, and having a prism angle of 61° 10′, are obtained; they are often twinned on the prism planes, giving rise to pseudo-hexagonal groups resembling aragonite. There are perfect cleavages parallel to the dome (011). The hardness is 2, and the specific gravity 2·1. It is fairly soluble in water; 100 parts at 0° dissolving 13·3 parts of the salt, and about 30 parts at 20°; the most saturated solution contains 327·4 parts of the salt in 100 of water; this solution boils at 114·1°. It fuses at 339° to a colourless liquid, which solidifies on cooling to a white fibrous mass, known in pharmacy as *sal prunella*. It is an energetic oxidizing agent, and on this property its most important applications depend. At a red heat it evolves oxygen with the formation of potassium nitrite, which, in turn, decomposes at a higher temperature. Heated with many metals it converts them into oxides, and with combustible substances, such as charcoal, sulphur, &c., a most intense conflagration occurs. Its chief uses are in glass-making to promote fluidity, in metallurgy to oxidize impurities, as a constituent of gunpowder and in pyrotechny; it is also used in the manufacture of nitric acid.

Potassium nitrate was used at one time in many different diseased conditions, but it is now never administered internally, as its extremely depressant action upon the heart is not compensated for by any useful properties which are not possessed by many other drugs. One most valuable use it has, however, in the treatment of asthma. All nitrites (*e.g.* sodium nitrite, ethyl nitrite, amyl nitrite) cause relaxation of involuntary muscular fibre and therefore relieve the asthmatic attacks, which depend upon spasm of the involuntary muscles in the bronchial tubes. Saltpetre may be made to act as a nitrite by dissolving it in water in the strength of about fifty grains to the ounce, soaking blotting-paper in the solution and letting the paper dry. Pieces about 2 in. square are then successively put into a jar and lighted. The patient inhales the fumes, which contain a considerable proportion of nitrogen oxides. This treatment is frequently very successful indeed in relaxing the bronchial spasm upon which the most obvious features of an attack depend.

2. *Chile saltpetre, cubic nitre* or sodium nitrate, $NaNO_3$, occurs under the same conditions as ordinary saltpetre in deposits covering immense areas in South America, which are known locally as *caliche* or *terra salitrosa*, and abound especially in the provinces of Tarapaca and Antofagasta in Chile. The nitrate fields are confined to a narrow strip of country, averaging 2½ m. in width, situated on the eastern slopes of the coast ranges and extending from north to south for 260 geographical miles, between the latitudes 25° 45′ and 19° 12′ S. The nitrate forms beds, varying in thickness from 6 in. to 12 ft., under a covering of conglomerate locally known as *lostra*, which is itself overlain by a loose sandy soil. The conglomerate consists of rock fragments, sodium chloride and various sulphates, cemented together by gypsum to form a hard compact mass 6 to 10 ft. in thickness. The caliche has often a granular structure, and is yellowish-white, bright lemon-yellow, brownish or violet in colour. It contains from 48 to 75% of sodium nitrate and from 20 to 40% of common salt, which are associated with various minor saline components, including sodium iodate and more or less insoluble mineral, and also some organic matter, *e.g.* guano, which suggests the idea that the nitrate was formed by the nitrification of this kind of excremental matter. The caliche is worked up *in loco* for crude nitrate by extracting the salts with hot water, allowing the suspended earth to settle, and then transferring the clarified liquor, first to a cistern where it deposits part of its sodium chloride at a high temperature, and then to another where, on cooling, it yields a crop of crystals of purified nitrate. The nitre thus refined is exported chiefly from Valparaiso, whence the name of "Chile saltpetre." The mother liquors used to be thrown away, but are now utilized for the extraction of their iodine (*q.v.*).

Chemically pure sodium nitrate can be obtained by repeated recrystallization of Chile saltpetre or by synthesis. It forms colourless, transparent rhombohedra, like those of Iceland spar; the angles are nearly equal to right angles, being 73° 30′, so that the crystals look like cubes: hence the name of "cubic saltpetre." There are perfect cleavages parallel to the rhombohedral faces, and the crystals exhibit a strong negative double refraction, like calcite. One hundred parts of water at 0° and at 100° dissolve 72·9 and 180 parts of the salt; at 120° the boiling-point of the saturated solution, 216 parts. The salt fuses at 316°; at higher temperatures it loses oxygen (more readily than the corresponding potassium salt) with the formation of nitrite which, at very high temperatures, is reduced ultimately to a mixture of peroxide, Na_2O_2, and oxide, Na_2O. The chief applications of Chile saltpetre are in the nitric acid industry, and in the manufacture of ordinary saltpetre for making gunpowder, ordinary Chile saltpetre being unsuitable by reason of its deliquescent nature, a property, however, not exhibited by the perfectly pure salt. It is also employed as a manure. For references to memoirs descriptive of the Chilian nitrate deposits, ~~see~~ G. P. Merrill, *The Non-Metallic Minerals* (New York, 1904).

3. *Wall-saltpetre or lime saltpetre*, calcium nitrate, $Ca(NO_3)_2$, is found as an efflorescence on the walls of stables; it is now manufactured in large quantities by fixing atmospheric nitrogen, *i.e.* by passing a powerful electric arc discharge through moist air and absorbing the nitric acid formed by lime. Its chief applications are as a manure and in the nitric acid industry.

SALT RANGE, a hill system in the Punjab and North-West Frontier Provinces of India, deriving its name from its extensive deposits of rock-salt. The range commences in Jhelum district in the lofty hill of Chel (3701 ft.), on the right bank of the river Jhelum, traverses Shahpur district, crosses the Indus in Mianwali district, thence a southern branch forms the boundary between Bannu and Dera Ismail Khan until it finally merges in the Waziristan system of mountains. The salt range contains the great mines of Mayo, Warcha and Kalabagh, which yield an inexhaustible supply of salt, and supply the wants of all Northern India. Coal of an inferior quality is also found.

SALTYKOV (STCHEDRIN), MICHAEL EVGRAFOVICH (1826–1889), Russian satirist, was born on his father's estate in the province of Tula, 15th (27th) January 1826. His early education was completely neglected, and his youth, owing to the severity and the domestic quarrels of his parents, was full of the most melancholy experiences. Left entirely to himself, he developed a love for reading; but the only book in his father's house was the Bible, which he studied with deep attention. At ten years of age he entered the Moscow Institute for the sons of the nobility, and subsequently the Lyceum at St Petersburg, where Prince Lobánov Rostofski, afterwards minister for foreign affairs, was one of his schoolfellows. While there he published poetry, and translations of some of the works of Byron and Heine; and on leaving the Lyceum he obtained employment as a clerk in the Ministry of War. In 1884 he published *Zaputennoye Dyelo* ("A Complicated Affair"), which, in view of the revolutionary movements at that time in France and Germany, was the cause of his banishment to Vyatka, where he spent eight years as a minor government official. This experience enabled him to study the life and habits of civil servants in the interior, and to give a clever picture of Russian provincial officials in his *Gubernskie Otcherki* ("Provincial Sketches"). On his return to St Petersburg as he was quickly promoted to administrative posts of considerable importance. After making a report on the condition of the Russian police, he was appointed deputy governor, first of Ryazan and then of Tver. His predilection for literary work induced him to leave the government service, but pecuniary difficulties soon compelled him to re-enter it, and in 1864 he was appointed president of the local boards of taxation successively at Penza, Tula and Ryazan. In 1868 he finally quitted the civil service. Subsequently he wrote his principal works, namely, *Poshekhonskaya Starina* ("The Old Times of Poshekhona"), which possesses a certain autobiographical interest; *Istoria odnavo Goroda* ("The History of a Town"); A Satirical History of Russia; *Messieurs et Mesdames Pompadours*; and *Messieurs Golovloff*. At one time, after the death of the poet Nekrasov, he acted as editor of a leading Russian magazine, the *Contemporary*. He died in St Petersburg on the 30th of April (12th May) 1889. (G. D.)

SALUS, in Roman mythology the personification of health and prosperity. In 302 B.C. a temple was dedicated to Salus on the Quirinal (Livy x. 1); and in later times public prayers were offered to her on behalf of the emperor and the Roman people at the beginning of the year, in time of sickness, and on the emperor's birthday. In 180 B.C., on the occasion of a plague, vows were made to Apollo, Aesculapius and Salus (Livy xl. 37). Here the special attribute of the goddess appears to be health; and in later times she was identified with the Greek goddess of health, Hygieia.

SALUTATIONS, or GREETINGS, the customary forms of kindly or respectful address, especially on meeting or parting or on occasions of ceremonious approach. Etymologically the word *salutation* (Lat. *salutatio*, "wishing health") refers only to words spoken.

Forms of salutation frequent among savages and barbarians may last on almost unchanged in civilized custom. The habit of affectionate clasping or embracing is seen at the meetings of the Andaman islanders and Australian blacks, or where the Fuegians in friendly salute hug "like the grip of a bear."[1] This natural gesture appears in old Semitic and Aryan custom: "Esau ran to meet him (Jacob) and embraced him, and fell on his neck, and kissed him, and they wept" (Gen. xxxiii. 4); so, when Odysseus makes himself known, Philoetius and Eumaeus cast their arms round him with kisses on the head, hands and shoulders (*Odyss.* xxi. 223).

The idea of the kiss being an instinctive gesture is negatived by its being unknown over half the world, where the prevailing salute is that by smelling or sniffing (often called by travellers "rubbing noses"), which belongs to Polynesians, Malays, Burmese and other Indo-Chinese, Mongols, &c., extending thence eastward to the Eskimo and westward to Lapland, where Linnaeus saw relatives saluting by putting their noses together.[2] This seems the only appearance of the habit in Europe. On the other hand the kiss, the salute by tasting, appears constantly in Semitic and Aryan antiquity, as in the above cases from the book of Genesis and the *Odyssey*, or in Herodotus's description of the Persians of his time kissing one another—if equals on the mouth, if one was somewhat inferior on the cheek (Herod. i. 134). In Greece in the classic period it became customary to kiss the hand, breast or knee of a superior. In Rome the kisses of inferiors became a burdensome civility (Martial xii. 59). The early Christians made it the sign of fellowship: "greet all the brethren with an holy kiss" (1 Thess. v. 26; cf. Rom. xvi. 16, &c.). It early passed into more ceremonial form in the kiss of peace given to the newly baptized and in the celebration of the Eucharist;[3] this is retained by the Oriental Church. After a time, however, its indiscriminate use between the sexes gave rise to scandals, and it was restricted by ecclesiastical regulations—men being only allowed to kiss men, and women women, and eventually in the Roman Church the ceremonial kiss at the communion being only exchanged by the ministers, but a relic or cross called an *osculatorium* or *pax* being carried to the people to be kissed.[4] While the kiss has thus been adopted as a religious rite, its original social use has continued. Among men, however, it has become less effusive, the alteration being marked in England at the end of the 17th century by such passages as the advice to Sir Wilfull by his London-bred brother: "in the country, where great lubberly brothers slabber and kiss one another when they meet; . . . 'T is not the fashion here."[5] Court ceremonial keeps up the kiss on the cheek between sovereigns and the kissing of the hand by subjects, and the pope, like a Roman emperor, receives the kiss on his foot. A curious trace which these osculations have left behind is that when ceasing to be performed they are still talked of by way of politeness: Austrians say, "Küss d'Hand!" and Spaniards, "Beso a Vd. las manos!" "I kiss your hands!"

Strokings, pattings and other caresses have been turned to use as salutations, but have not a wide enough range to make them important. Weeping for joy, often occurring naturally at meetings, is sometimes affected as a salutation; but this seems to be different from the highly ceremonious weeping performed by several rude races when, meeting after absence, they renew the lamentations over those friends who have died in the meantime. The typical case is that of the Australian natives, where the male nearest of kin presses his breast to the new comer's, and the nearest female relative, with piteous lamentations, embraces his knees with one hand, while with the other she scratches her face till the blood drops.[6] Obviously this is no joy-weeping, but mourning, and the same is true of the New Zealand *tangi*, which is performed at the reception of a distinguished visitor, whether he has really dead friends to mourn or not.[7]

Cowering or crouching is a natural gesture of fear or inability to resist that belongs to the brutes as well as man; its extreme form is lying prostrate face to ground. In barbaric society, as soon as distinctions are marked between master and slave, chief and commoner, these tokens of submission become salutations. The sculptures of Egypt and Assyria show the lowly prostrations of the ancient East, while in Dahomey or Siam subjects crawl before the king, and even Siberian peasants grovel and kiss the dust before a noble. A later stage is to suggest, but not actually perform, the prostration, as the Arab bends his hand to the ground and puts it to his lips or forehead, or the Tongan would touch the sole of a chief's foot, thus symbolically placing himself under his feet. Kneeling prevails in the middle stages of culture, as in the ceremonial of China; Hebrew custom sets it rather apart as an act of homage to a deity (1 Kings xix. 18; Isa. xlv. 23); medieval Europe distinguishes between kneeling in worship on both knees and on one knee only in homage, as in the *Boke of Curtasye* (15th century):—

> "Be curtayse to god, and knele doun
> On bothe knees with grete deuocioun;
> To mon þou shalle knele opon be toñ,
> þe toþer to þy self þou halde aloñ."

Bowing, as a salute of reverence, appears in its extreme in Oriental custom, as among the ancient Israelites: "bowed himself to the ground seven times" (Gen. xxxiii. 3).[8] The Chinese according to the degree of respect implied bow kneeling or standing.[9] The bowing salutation, varying in Europe from something less than the Eastern salaam down to the slightest inclination of the head, is interesting from being given mutually, the two saluters each making the sign of submission to the other, which would have been absurd till the sign passed into mere civility. Uncovering is a common mode of salutation, originally a sign of disarming or defencelessness or destitution in the presence of a superior. Polynesian or African chiefs require more or less stripping, such as the uncovering to the waist which Captain Cook describes in Tahiti.[10] Taking off the hat by men has for ages been the accepted mode in the Western world. Modern usage has moderated this bowing and scraping (the scrape is throwing back the right leg as the body is bent forward), as well as the curtseys (*courtoisie*) of women. Some Eastern nations are apt to see disrespect in baring the head, but insist on the feet being uncovered. Burma was agitated for years by "the great shoe question," whether Europeans should be called on to conform to native custom rather than their own, by taking off their shoes to enter the royal presence.[11] Grasping hands is a gesture which makes its appearance in antiquity as a legal act symbolic of the parties joining in compact, peace or friendship; this is well seen in marriage, where the hand grasp was part of the ancient Hindu ceremony, as was the "dextrarum junctio" in Rome, which passed on into the Christian rite. In the classic world we see it passing into a mere salutation, as where the tiresome acquaintance met by Horace on his stroll along the Via Sacra seizes his hand (Hor., *Sat.* i. 9).

Giving the right hand of fellowship (Gal. ii. 9) passed naturally into a salutation throughout Christendom, and spread, probably from Byzantium, over the Moslem world. The emphatic form of the original gesture in "striking hands" is still used to make the greeting more hearty. The variety called in English "shaking hands" (Ger. *Hände-schütteln*) only appears to have become usual in the middle ages.[12] In the Moslem legal form of joining hands the parties press their thumbs together.[13] This has been adopted as a salute by African tribes.

As to words of salutation, it is found even among the lower races that certain ordinary phrases have passed into formal greetings. Thus among the Tupis of Brazil, after the stranger's silent arrival in the hut, the master, who for a time had taken no notice of him, would say "*Ereioubé?*" that is, "Art thou come?" to which the proper reply was, "Yes, I am come"![14] Many formulas express difference of rank and consequent respect, as where the Basuto salute their chiefs with *Tama sevata! i.e.* "Greeting, wild beast!" Congo negroes returning from a journey salute their wives with an affectionate *Okowe!* but they meekly kneeling round him may not repeat the word, but must say *Ka! ka!*[15] Among cultured nations, salutations are apt to be expressions of peace and goodwill, as in the Biblical instances, "Is it well with thee?" (2 Kings iv. 26); "Peace to thee, and peace to thine house," &c. (1 Sam. xxv. 6; see Ezra iv. 17). Such formulas run on from age to age, and the latter may be traced on to the Moslem greeting, *Salām 'alaikum!* "The peace be on you," to which the reply is *Wa-'alaikum as-salām!* "And on you be the peace (*sc.* of God)!" This is an example how a greeting may become a pass-word among fellow-believers, for it is usually held that it may not be used by or to an infidel. From an epigram of Meleager (*Anth.*, ed. Jacobs vii. 119; cf. Plautus, *Poen.* v. *passim*) we learn that, while the Syrian salutation was *Shelōm* ("Peace!"), the Phoenicians greeted by wishing life (חוו ארני, the

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[1] W. P. Snow in *Trans. Ethnol. Soc.*, n.s., i. 263.

[2] J. E. Smith, *Linnaeus's Tour in Lapland*, i. 315.

[3] Bingham, *Antiquities of the Chr. Church*, bk. xii. c. 4, xv. c. 3.

[4] The latter term has supplied the Irish language with its term for a kiss, *póg*, Welsh *poc*; see Rhys, *Revue Celtique*, vi. 43.

[5] Congreve's *Way of the World*, act iii.

[6] Grey, *Journals*, ii. 255.

[7] A. Taylor, *New Zealand*, p. 221.

[8] See the Egyptian bow with one hand to the knee; Wilkinson, *Anc. Eg.*

[9] S. Wells Williams, *Middle Kingdom*, i. 801.

[10] See references to these customs in Tylor, *Early History of Mankind*, ch. iii.

[11] Shway Yoe, *The Burman*, ii. 158, 205.

[12] See Tylor in *Macmillan's Mag.* (May 1882), p. 76.

[13] Lane, *Mod. Eg.* i. 219.

[14] Jean de Lery, part ii. p. 204.

[15] Magyar, *Reise in Süd-Afrika.*

חוא, &c., of Neo-Punic gravestones). The cognate Babylonian form, "O king, live for ever!" (Dan. iii. 9), represents a series of phrases which continue still in the *Vivat rex!* "Long live the king!" The Greeks said χαῖρε, "Be joyful!" both at meeting and parting; the Pythagorean ὑγιαίνειν and the Platonic εὖ πράττειν, wish health; at a later time ἀσπάζομαι, "I greet!" came into fashion. The Romans applied *Salve!* "Be in health!" especially to meeting, and *Vale!* "Be well!" to parting. In the modern civilized world, everywhere, the old inquiry after health appears, the "How do you do?" becoming so formal as often to be said on both sides without either waiting for an answer. Hardly less wide in range is the set of phrases "Good day!" "Good night!" &c., varying according to the hour and translating into every language of Christendom. Among other European phrases, some correspond to our "welcome!" and "farewell!" while the religious element enters into another class, exemplified by our "Good-bye!" ("God be with you!"), and French *Adieu!* Attempts have been made to shape European greetings into expressions of orthodoxy, or even tests of belief, but they have had no great success. Examples are a Protestant German salutation "*Lobe Jesum Christum!*" answered by "*In Ewigkeit, Amen!*" and the formula which in Spain enforces the doctrine of the Immaculate Conception, "*Ave Maria purisima!*" answered by "*Sin pecado concebida!*" On the whole, though the half-meaningless forms of salutation may often seem ridiculous, society would not carry them on so universally unless it found them useful. They serve the purpose of keeping up social intercourse, and establishing relations between the parties in an interview, of which their tone may strike the keynote. (E. B. T.)

SALUZZO, a city and episcopal see of Piedmont, Italy, in the province of Cuneo, 42 m. S. of Turin by rail, 1296 ft. above sea-level. Pop. (1901) 10,306 (town), 16,208 (commune). The upper town preserves some part of the fortifications which protected it when, previous to the plague of 1630, the city had upwards of 30,000 inhabitants. The old castle of the marquises of Saluzzo now serves as a prison. Besides the Gothic cathedral (1480–1511), with the tombs of the marquises, the churches of San Giovanni (formerly San Domenico), San Bernardo and the Casa Cavazza, now the municipal museum, are noteworthy. Railways run to Cuneo and Airasca (the latter on the Turin-Pinerolo line) and steam tramways in various directions. The castle of Manta, in the vicinity, contains interesting 15th-century frescoes by a French artist (see P. d'Ancona in *L'Arte* for 1905; 94, p. 184).

The line of the marquises of Saluzzo began (1142) with Manfred, son of Boniface, marquis of Savona, and continued till 1548, when the city and territory were seized by the French. The marquises being opponents of the house of Savoy, and taking part in the struggles between France and the empire, the city often suffered severely from the fortunes of war. Henry IV. restored the marquisate to Charles Emmanuel I. of Savoy at the peace of Lyons in 1601. Among the celebrities of Saluzzo are Silvio Pellico, Bodoni, the famous printer of Parma of the late 18th and early 19th centuries, and Casalis the historian of Sardinia. The history of the marquisate was written by Delfino Muletti (5 vols., 1829–1833).

SALVADOR, or SAN SALVADOR (*República del Salvador*), the smallest but most densely peopled of the republics of Central America, bounded on the N. and E. by Honduras, S. by the Pacific Ocean, and W. by Guatemala. (For map, see CENTRAL AMERICA.) Pop. (1906) 1,116,253; area, about 7225 sq. m. Salvador has a coastline extending for about 160 m. from the mouth of the Rio de la Paz to that of the Goascoran in the Bay of Fonseca (*q.v.*). Its length from E. to W. is 140 m., and its average breadth about 60 m.

Physical Features.—With the exception of a comparatively narrow seaboard of low alluvial plains, the country consists mainly of a plateau about 2000 ft. above the sea, broken by a large number of volcanic cones. These are geologically of more recent origin than the main chain of the Cordillera which rises farther N. The principal river of the republic is the Rio Lempa, which, rising just beyond the frontier of Guatemala and crossing a corner of Honduras, enters Salvador N. of Citalá. After receiving the surplus waters of the Laguna de Guija, it flows E. through a magnificent valley between the plateau and the Cordillera, and then turning S. skirts the base of the volcano of Siguatepeque and reaches the Pacific in 88° 40′ W. Among its numerous tributaries are the Rio Santa Ana, rising near the city of that name, the Asalguate, which passes the capital San Salvador, the Sumpul, and the Torola, draining the N.E. of Salvador and part of Honduras. The Lempa is for two-thirds of its course navigable by small steamers. The Rio San Miguel drains the country between the bay of Fonseca and the basin of the Lempa. The volcanic mountains do not form a chain but a series of clusters: the Izalco group in the W.—including Izalco (formed in 1770), Marcelino, Santa Ana, Naranjos, Aguila, San Juan de Dios, Apaneca, Tamajaso and Lagunita; the San Salvador group, about 30 m. E.; Cojutepeque to the N.E. and the San Vicente group to the E. of the great volcanic lake of Ilopango; the Siguatepeque summits to the N.E. of San Vicente; and the great S.E. or San Miguel group—San Miguel, Chinameca, Buenapa, Usulatan, Tecapa, Taburete. Cacaguateque and Sociedad volcanoes in the N.E. belong to the inland Cordillera. Santa Ana (8300 ft.) and San Miguel (7120 ft.) are the loftiest volcanoes in the country.

The neighbourhood of the capital is subject to earthquakes. San Miguel is described as one of the most treacherous burning mountains in America, sometimes several years in complete repose and then all at once bursting out with terrific fury. In 1879–1880 the Lake of Ilopango was the scene of a remarkable series of phenomena. With a length of 5½ m. and a breadth of 4½, it forms a rough parallelogram with deeply indented sides, and is surrounded in all directions by steep mountains except at the points where the villages of Asino and Apulo occupy little patches of level ground. Between the 31st of December 1879 and the 11th of January 1880 the lake rose 4 ft. above its level. The Jiboa, which flows out at the S.E., became, instead of a very shallow stream 20 ft. broad, a raging torrent which soon scooped out for itself in the volcanic rocks a channel 30 to 35 ft. deep. A rapid subsidence of the lake was thus produced, and by the 6th of March the level was 34⅝ ft. below its maximum. Towards the centre of the lake a volcanic centre about 500 ft. in diameter rose 150 ft. above the water, surrounded by a number of small islands.

Climate.—The lowlands are generally hot and, on the coast, malarial; but on the tablelands and mountain slopes of the interior the climate is temperate and healthy. There are only two seasons: the wet, which Salvadorians call winter, from May to October; and the dry, or summer, season, from November to April. In July and August there are high winds, followed by torrents of rain and thunderstorms; in September and October the rain, not heavy, is continuous. For an account of the geology, fauna and flora of Salvador, see CENTRAL AMERICA.

Inhabitants.—The population in 1887 was stated to be 664,513, (1901) 1,006,848, (1906) 1,116,253. The number of Ladinos (whites and persons of mixed blood) is about 775,000 and of Indians about 230,000. The various elements were, before 1901, estimated as follows, and the proportion still holds good in the main: whites (creoles and foreigners) 10%, half-castes 50%, Indians 40%, and a very small proportion of negroes. The whites of pure blood are very few, a liberal estimate putting the proportion at 2·5%. There is no immigration into the country, and the rapid increase with which the population is credited can be due only to a large surplus of births over deaths. The chief towns, which are described in separate articles, comprise San Salvador the capital (pop. 1905, about 60,000), Santa Ana (48,000), San Miguel (25,000), San Vicente (18,000), Sonsonate (17,000), Nueva San Salvador or Santa Tecla (18,000) and the seaport of La Union (4000). For the ancient Indian civilization of Salvador, see CENTRAL AMERICA: *Archaeology*, and MEXICO: *History*.

Agriculture.—The only industry extensively carried on is agriculture, but the methods employed are still primitive. The more important products are coffee, sugar, indigo and balsam. The country is rich in medicinal plants. Peruvian balsam (*Myrospermum Salvatorense* or *Myroxylon Pereirae*) is an indigenous balm, rare except on the Balsam Coast, as the region about Cape Remedios is named. It is not cultivated in Peru, but owes its name to the fact that, during the early period of Spanish rule, it was forwarded to the Peruvian port of Callao for transhipment to Europe. Rubber is collected; tobacco is grown in small quantities; cocoa, rice, cereals and fruits are cultivated. The government seeks to encourage cotton-growing, and has established in the suburbs of the capital an agricultural college and model farm.

Mining.—In the Cordillera, which runs through Salvador, there are veins of various metals—gold, silver, copper, mercury and lead being found mostly in the E., and iron in the W. Coal has been discovered at various points in the valley of the Lempa. In the republic there are about 180 mining establishments, about half of them being in the department of Morazan; they are owned by British, United States and Salvadorian companies. Only gold and silver are worked. The output, chiefly gold, was valued at £250,000 in 1907.

Commerce.—The trade of Salvador is almost entirely confined to the import of cotton goods, woollen goods, sacks and machinery, and to the export of coffee and a few other agricultural products. In 1900 the formation of a statistical office was decreed. The average yearly value of the imports for the five years 1904–1908 was £804,000, of the exports £1,250,000. The coffee exported in 1908 was valued at £830,000. The imports, comprising foodstuffs, hardware, drugs, cottons, silk and yarn, come (in order of value) chiefly from Great Britain, the United States, France and Germany; the exports are mostly to the United States and France.

Shipping and Communications.—Until 1855 the roads of Salvador were little better than bridle-paths, and fords or ferries were the sole means of crossing the larger rivers. During the next half-century about 2000 m. of highways were built, and the rivers were bridged. The first railway, a narrow-gauge line, between the port of Acajutla and Sonsonate, was opened in 1882, and afterwards extended to Ateos on the E. and Santa Ana on the N.W. A railway from the capital to Nueva San Salvador was also constructed, and in 1900 was linked to the older system by a line from Ateos to San Salvador. In 1903, a concession was granted for an extension from Nueva San Salvador to the port of La Libertad. From 350 to 450 vessels annually entered and cleared at Salvadorian ports (chiefly Acajutla, La Libertad and La Union), during the years 1895 to 1905. The old port of Acajutla has been closed, and a new port opened in a more sheltered position about 1 m. N., where an iron pier, warehouses and custom-house have been erected. Salvador joined the postal union in 1879.

Currency and Credit.—In 1910 there were three commercial banks and an agricultural bank within the republic. In 1897 a law was passed adopting a gold standard. The currency of the country in 1910 consisted entirely of silver pesos, the fractional money under ·900 fine having, by arrangement with the government, been all exported by the banks. The peso or dollar at par is valued at four shillings; its actual value was about 1s. 8d. in 1910. The metric system of weights and measures was adopted by decree of January 1886, but the old Spanish weights and measures still continue in general use.

Finance.—The revenue is mainly derived from import and export duties, but considerable sums are also obtained from excise, and smaller amounts from stamps and other sources. The principal branches of expenditure are the public debt, defence and internal administration. The official figures showing the revenue and expenditure for the five years 1904–1908 are as follows (pesos being converted into sterling at the rate of 12 to £1):—

Years.	Revenue.	Expenditure.
1904	675,000	734,000
1905	711,000	837,000
1906	707,000	1,024,000
1907	728,000	886,000
1908	1,064,000	1,019,000

The foreign debt, amounting to £726,420 (£240,000 of a 6% loan of 1889, and £485,720 of another of 1892) was in 1899 converted into 5% mortgage debentures of the Salvador Railway Company Limited, to which the government has guaranteed, for eighteen years from the 1st of January 1899, a fixed annual subsidy of £24,000. In March 1908 a new foreign loan was raised, amounting to £1,000,000. The bonds were issued at 86, and bore 6% interest, secured partly upon the special import duty of $3.60 (American gold) on every kilogramme of imported merchandise, partly upon the export duty of 40 c. (American gold) on every quintal (100 ℔) of coffee up to 500,000 ℔. The 4% internal debt amounted in 1905 to £840,170.

Government.—The constitution proclaimed in 1824, and modified in 1859, 1864, 1871, 1872, 1880, 1883 and 1886, vests the legislative power in a chamber of 70 deputies, including 42 landowners (3 for each department), all chosen by the direct vote of the people. The president and vice-president are likewise chosen by direct popular vote, and they hold office for 4 years. The president is not eligible for the presidency or vice-presidency during the following presidential term. He is assisted by 4 ministers. Local government is carried on in each of the 14 departments by governors appointed by the central executive. The municipalities are administered by officers (*alcaldes*, *regidores*, &c.) elected by the inhabitants.

Religion and Education.—The Roman Catholic religion prevails throughout the republic, but there is complete religious freedom, so far as is compatible with public order. Civil marriage is legal, monastic institutions are prohibited, and education is in the hands of laymen. Primary education is gratuitous and obligatory. For secondary instruction there are about 20 higher schools, including 3 technical institutes, and 2 schools for teachers, one for men and the other for women—these five institutions being supported by the government. At San Salvador there is a national college for the higher education of women. Superior and professional instruction is provided at the national university in the capital.

Justice is administered by a supreme court, and in district, circuit and local courts. The active army consists of about 3000 men, and the militia, of about 18,000. In time of war all males between the ages of eighteen and sixty are liable for service. The navy consists of one customs cruiser.

History.—Salvador received its name from Pedro de Alvarado, who conquered it for Spain in 1525–26. Its independence of the Spanish Crown dates from 1822; (see Central America: *History*). Revolutions have been frequent. In July 1906 war broke out between Salvador, Honduras and Guatemala, but was terminated within the month by the arbitration of the United States president (see as above). In 1907 Salvador supported Honduras (*q.v.*) against Nicaragua; its prosperity was not, however, seriously impaired by the defeat of its ally.

See E. G. Squier, *The States of Central America* (London, 1868); D. Guzman, *Apuntamientos sobre la topografía física de la república del Salvador* (San Salvador, 1883); D. Gonzalez, *Datos sobre la republica de El Salvador* (San Salvador, 1901); No. 58 of the *Bulletins* of the Bureau of American Republics (Washington, 1892); annual reports of the Council of the Corporation of Foreign Bondholders (London) and of the British Foreign Office.

SALVAGE (from Lat. *salvus*, safe). There is no general rule or principle of law which entitles one who saves the life or property of another to be rewarded by him. But in certain special classes of cases the law does require the appointed courts to reward those who by their exertions have rescued lives or property from probable damage or destruction. The reward so given is called *salvage* and the same word is often used to denote the service rewarded. Apart from the application of the term by analogy to the saving of property from fire on land, the recovery of property from destruction by the aid of voluntary payments (as in the case of payments to prevent the forfeiture of an insurance policy), or a solicitor's charges for property recovered by his means, the subject of salvage divides into (1) civil salvage, (2) military salvage.

1. *Civil Salvage* in English law is defined as such a service as may become the ground of a reward in the (admiralty) court on the civil side of its jurisdiction, and consists in the preservation of life or property from some of the dangers of the sea. The jurisdiction to give it is an admiralty jurisdiction. But the right to reward was recognized in the courts of common law before the admiralty court became, as it now is, a part of the High Court of Justice, *e.g.* by enforcing a possessory lien of the salvor over the salved property. The origin of the rule has been traced

to the doctrine of Roman law that "spontaneous services" in the protection of lives and property should be rewarded. But that doctrine has not found a place in English law except, as part of the maritime law administered in the court of admiralty. Thus services on land, say in rescuing lives or houses or goods from fire, do not entitle the person rendering those services to reward, unless he has acted under some contract or employment. But at sea the right to reward springs from the service itself if it has been rendered to a ship, or her passengers, crew or cargo, or to property which has been thrown or washed out of her. And such a service entitles to salvage though the ship may be in harbour, or within a river, or even in a dock. This connexion of the lives or property with a ship seems essential. The right does not arise upon saving goods which have got adrift in river or harbour, even if they have been washed out to sea, nor upon saving property of other kinds which may be in peril on the sea or on the seashore. Thus a claim to reward for saving a gas-buoy or beacon, which had broken from its moorings in the Upper Humber, and was aground on the Lincolnshire coast, was disallowed by the House of Lords, affirming the court of appeal, in the case of the gas-float "*Whitton No. 2*," 1897, A.C. 337.

The definite right to salvage for saving lives from ships is the creation of modern statutes. Formerly the Admiralty judges treated the fact that lives had been saved as enhancing the merit of a salvage of property by the same salvors, where the two could be connected; and so indirectly gave life salvage. And this is still the position in cases where the Merchant Shipping Act of 1894 does not apply. This act (§544) applies to all cases in which the "services are rendered wholly or in part within British waters in saving life from any British or foreign vessel, or elsewhere in saving life from any British vessel." Also (§ 545) it can be applied, by Order in Council, to life salvage from ships of any foreign country whose government "is willing that salvage should be awarded by British courts for services rendered in saving life from ships belonging to that country where the ship is beyond the limits of British jurisdiction." By section 544 the life salvage is made payable "by the owner of the vessel, cargo or apparel saved"; and is to be paid in priority to all other claims for salvage. Where the value of the vessel, cargo and apparel saved is insufficient to pay the life salvage, the Board of Trade may in their discretion make up the deficiency, in whole or in part, out of the Mercantile Marine Fund. The effect of the act is to impose a common responsibility upon the owners of ship and cargo to the extent of their property saved. Whatever is saved becomes a fund out of which life salvors may be rewarded, and to which they are entitled in priority to other salvors. In the case of the cargo *ex* "*Schiller*" (1877, 2 P.D. 145) salvage was allowed out of specie raised by divers from the sunken wreck, to persons who had saved some of the passengers and crew.

This limitation of liability to the amount of the property salved is also true with regard to salvage of property. The ordinary remedy of the salvor is against the property itself; by proceedings *in rem*, to enforce the maritime lien given him by the law upon that property. This enables him to arrest the property, if within the jurisdiction, into whose hands soever it may have come; and, if necessary, to obtain a sale, and payment of his claim out of the proceeds. The salvor has also a remedy *in personam*, used only in exceptional cases, against the owners or others interested in the property saved (Five steel barges, 15 P.D. 142); but it seems certain that that depends upon property having been saved, and having come to the owner's hands; and that the amount which can be awarded is limited by the value of that property.

An essential condition is that the lives or property saved must have been in danger—either in immediate peril, or in a position of "difficulty and reasonable apprehension." Danger to the salvor is not essential, though it enhances his claim to reward; but to constitute a salvage service there must have been danger to the thing salved. Again, the service must have helped usefully towards saving the lives or property. Ineffectual efforts, however strenuous and meritorious, give rise to no claim. But the service need not be completely successful. If it has contributed to an ultimate rescue it will be rewarded, though that may have been accomplished by others. And as we have seen, there must have been ultimate success. Some of the property involved in the adventure must have been saved. And the value of that, or the fund realized by its sales, limits the total of the awards to all the salvors. Cases, of course, occur in which services at sea are employed by ships in danger: as where a steamer with a broken propeller shaft employs another steamer to tow her; or where a vessel which has lost her anchors employs another to procure anchors for her from shore. In such cases the conditions of reward above set out may not apply. Reward may be payable, notwithstanding entire failure of success, by the express or implied terms of the employment. But such a reward is not truly "salvage."

Services rendered in the performance of a duty owed do not entitle to salvage. The policy of the law is to stimulate voluntary effort, not to weaken obligation. Thus the crew cannot (while still the crew) be salvors of the ship or cargo; nor can the passengers, unless they have voluntarily stayed on the ship for the purpose of saving her. Nor can a pilot employed as such be salvor, unless he has boarded her in such exceptional circumstances that his doing so for pilotage fees could not reasonably be required; or unless the circumstances of the service, entered upon as pilotage, have so changed as to alter its character; and it may be doubted whether such a change of circumstances is a valid ground for a claim of salvage remuneration by the pilot where he has had no opportunity of leaving the ship. So again of the owners and crew of a tug employed to tow a ship. They cannot claim salvage for rescuing her from a danger which may arise during the towage, unless circumstances have supervened which were not contemplated, and are such as to require extraordinary aid from the tug, or to expose her to extraordinary risk. Officers and crew of a ship of the royal navy may have salvage where they have rendered services outside the protection which their ship ought to afford. But by the Merchant Shipping Act 1894, § 557, such a claim must be with consent of the Admiralty; and no claim can be made in respect of the ship herself.

The kinds and degrees of service are very various. The rewards given vary correspondingly. Regard is paid, first, to the degree of the danger to the property salved, to its value, and to the effect of the services rendered; next, to the risks run by the salvors, the length and severity of their efforts, the enterprise and skill displayed, and to the value and efficiency of the vessel or apparatus they have used, and the risks to which they have exposed her. In a modern case (the "*Glengyle*," 1898, A.C. 519) a specially large award was given to vessels kept constantly ready for salving operations in Gibraltar Bay. It was owing to that readiness that the rescue had been possible. On the other hand, any negligent or improper conduct of the salvors will be considered in diminution of the award: as where they have negligently exposed the ship to damage, or have plundered the cargo, or dealt with it contrary to the owner's interests. And where the rescue has been from a danger which was brought about by the negligent or improper conduct of those who effected the rescue, no salvage is allowed. So that where two colliding ships were both to blame for the collision, the master and crew of one of them were not allowed salvage for services in saving cargo of the other (cargo *ex* "*Capella*," L.R. 1 A. and E. 356).

In apportioning the total award given for a salvage service among the owners, master and crew of the vessel by means of which it has been rendered, the special circumstances of each case have to be considered. In nearly all cases a large portion goes to the owners, and as in recent times the value and efficiency of ships (especially of steamships) have increased, so the proportion of the whole usually awarded to the owners has also increased. In an ordinary case of salvage by a steamship towing a distressed ship into safety, the share of the owners is usually about three-fourths; of the remainder the master usually gets about one-third, and the officers and crew divide the rest in proportion to their ratings. But where the salving ship has sustained special damage in the service, or her owners have been put to loss by it, that is taken into account. On the other hand, where special personal services have been rendered by members of the crew they are specially rewarded.

As an illustration take the case of the "*Rasche*" (L.R. 4 A. and E. 127). The brigantine "Rasche," derelict, was fallen in with by the ship "Scythia" (carrying a very valuable cargo) 220 m. N. of the Lizard. The mate and three hands of the "Scythia" were put on board, and in circumstances of much hardship and danger they brought her after eighteen days safely to Liverpool. After deducting expenses incurred by the owners of the "Scythia," the value of the property saved was £6294. Sir R. Phillimore awarded £3290; and of this he gave £600 to the mate, £510 to each of the three men who had accompanied him; £500 to the owners of the "Scythia"; and £350 to her other officers and crew.

An agreement as to the salvage to be paid is sometimes made at the time the assistance is given. When made fairly the court will act upon it, though it may turn out to be a bad bargain for one or other of the parties. But if the facts were not correctly apprehended by one or both, or if the position was one of such difficulty that those salved had no real option as to accepting the salvor's terms, the courts will set the agreement aside.

This happened, for instance, where the salving ship refused to rescue 550 wrecked pilgrims from the Parkin Rock in the Red Sea for a less sum than £4000. An agreement had in consequence been signed for their conveyance for that sum to Jedda, two or three days' sail. The Parkin Rock stands 6 ft. above the water, and had bad weather come on the lives would have been in great danger. It was held that the sum asked for was exorbitant; and that the agreement, made under practical compulsion, could not stand (the "*Medina*," 2 P.D. 5). On the other hand, an agreement to tow, for a fixed sum, a vessel which had suffered considerable damage, was set aside, and salvage awarded, on the ground that the damaged condition had not been disclosed to the tug when the contract was made (the "*Kingaloch*," 1 Spink, 265).

The award of salvage is generally made in one sum against ship, freight and cargo; and those interests contribute to the amount in proportion to the value saved. No distinction is made between the degree of service rendered to one interest and another. But, with a possible exception in the case of life salvage, there is not a joint liability of the several interests. Each is liable to the salvors for his own share, and for no more. The ship cannot be made to pay the cargo's share, nor the cargo the ship's. If, however, the shipowner pays the cargo's share, he has a lien upon it for the amount. In practice the liabilities for salvage are ordinarily adjusted as part of general average. Strictly, however, there is a difference. The liability to pay salvage is a direct liability to the salvors, arising at once, *e.g.* at the port of refuge, and proportional to the values there; whereas the liability to contribute to a general average loss or expenditure is postponed until the completion or break up of the adventure, and depends upon the values of the interests which have arrived there; which may be very different. (See AVERAGE, INSURANCE, *Marine*, and also ADMIRALTY JURISDICTION.)

AUTHORITIES.—Kennedy, *On the Law of Civil Salvage* (London, 1907); Abbott, *Law of Merchant Ships and Seamen* (14th ed., London, 1901); Carver, *Carriage by Sea* (5th ed., London, 1909).

(T. G. C.)

2. *Military Salvage* is analogous to civil salvage. It is defined as such a service as may become the ground for the demand of a reward in the court as a prize court, and consists in the rescue of property from the enemy in time of war. Such cases almost invariably relate to ships and their cargoes; and they have always been dealt with by courts having Admiralty jurisdiction, sitting as prize courts. They involve the determination of two questions: first, whether the property is to be restored to its original owner or condemned as prize to the recaptor; and second, what amount of salvage, if any, is to accompany restitution. Generally speaking, the first question depends upon the law of nations, which may be taken to be that where a ship has been carried by an enemy *infra præsidia*, and especially after a sentence of condemnation, the title of the original owner is divested, and does not revest upon recapture by third parties. In such a case, therefore, *jure gentium* restitution cannot be claimed. The municipal law of civilized countries, however, does not encourage subjects to "make reprisals upon one another" (the "*Renard*," Marr. Adm. Dec. 222), and laws are generally found, as in England, which as between subjects of that particular state provide for restitution irrespective of any change in the title to the subject matter which may have occurred. But (speaking henceforth of England) in cases which do not fall strictly within these acts, the old maritime law, which was in unison with the general law of nations, is applied by the courts. Moreover, the English Prize Acts do not apply to foreign owners of recaptured prizes, and therefore no award can be made against them unless in accordance with the law of nations. In practice the courts have acted upon the "rule of reciprocity" where recaptures have been made of the property of formal allies, dealing with them as the allied state would have dealt with English property. In the case of neutral recaptures restitution is always ordered. An exception to the rule of restitution as between British subjects is made in the case of a British ship which has been "set forth as a ship of war" by the captor, and subsequently retaken by a British ship. Such a ship is not liable to restoration, but is the prize of the recaptor. This exception, the object of which is to encourage the capture of armed ships, dates from 1793, previous acts having provided for restitution upon payment of a moiety as salvage. The condition of setting forth as a ship of war is satisfied, where under a fair semblance of authority, which is not disproved, the ship "has been used in the operations of war, and constituted a part of the naval force of the enemy" (the "*Ceylon*," 1 Dod. 105). Such a user permanently obliterates the ship's original character, and extinguishes all future claims to restitution ("*L'Actif*," Edw. 185).

As to the right to salvage and the amount which will be allowed, this is also a question of the *jus gentium*, though usually governed by municipal law. The right was recognized so long ago as the 11th century, when the "*Consolato del Mare*" (see CONSULATE OF THE SEA) laid down elaborate provisions on the subject. In England the first statutory recognition of the right occurs in 1648, when an act of the Commonwealth, which in its outline has been the model for all subsequent Prize Acts, provides that British vessels captured by an enemy and retaken by British ships shall be restored upon payment of one-eighth of the value of the property in lieu of salvage, or one-half in the case of a prize "set forth as a ship of war." From that date until 1864, the date of the act now in force, there have been thirteen Prize Acts dealing with recapture, each of which, except that of 1864, has been passed to meet a particular occasion, and has expired with the cessation of the then existing hostilities. Since the first act, and down to the act of 1805 inclusive, a distinction has always been drawn between a recapture effected by one of the royal ships of war and a recapture by a privateer or other vessel. In the former case the allowance has always been one-eighth, in the latter it varied, but was usually one-sixth. In the act of 1692 a clause taken from a Dutch law gave salvage to a privateer, rising in amount from one-eighth to one-half according to the number of hours the prize had been in the enemy's possession, but this clause has disappeared since 1756. There is no provision in the present act for the payment of salvage, except in case of recapture by one of His Majesty's ships, but it seems beyond question that recaptors are entitled at law to salvage, although they may hold no commission from the crown. "It is the duty of every subject of the king to assist his fellow-subjects in war, and to retake their property in the possession of the enemy: no commission is necessary to give a person so employed a title to the reward which the policy of the law allots to that meritorious act of duty" (the "*Helen*," 3 C. Rob. 226, *per* Sir W. Scott). Though it is improbable that privateers will figure in any future war, it may reasonably be anticipated that recaptures may be made by private vessels, and in such cases salvage would probably be awarded, the proportion lying in the discretion of the court. Similarly, salvage is awarded in the case of recapture from pirates or from a mutinous crew. In the case of royal ships the present act allows one-eighth salvage, which in cases of "special difficulty or danger" the court may increase to a quarter. The latter provision is an innovation.

It may appear that the grant of salvage to ships of war, the duty of whose commanders it is, according to the naval instructions, "if possible, to rescue any British vessel which he may find attacked or captured by the enemy," needs some justification. Objections on this ground have never been seriously treated, it being urged that it is politic to encourage the undertaking of such enterprises, even where they coincide with the path of duty. Where, however, a transport was rescued from under the guns of an enemy by a ship of war, under whose charge she sailed, salvage was refused on the ground that the salvor was only doing what he was bound to do (the "*Belle*," Edw. 66). So no salvage is due to a crew who rescue a ship from mutineers, this being only their duty under a subsisting contract (the "*Governor Raffles*," 2 Dod. 14). On the other hand, a crew who rescue their ship from the prize crew of a belligerent are entitled to salvage, since the capture discharges them from their contract with the owner, and they act as volunteers (the "*Two Friends*," 1 C. Rob. 271). In the case of a neutral captured by one belligerent and recaptured by the other, which has been already alluded to, no salvage is as a rule allowed, upon the supposition that if the vessel had been carried into the port of the enemy justice would have been done and the vessel restored. In the case of the French war at the opening of the 19th century no such supposition existed, and salvage was usually awarded on the recapture of neutral property from the French. (M. Bt.)

SALVAGE CORPS. The London Salvage Corps is maintained by the fire offices of London. The corps was first formed in 1865 and began operations in March 1866. The staff of the corps when first formed consisted of 64. Since that time, owing to the many improvements that have taken place in the system of dealing with salvage, and the increase in the work to be done, the corps has necessarily been strengthened, and the staff now numbers over 100. The various stations of the corps are well placed, and the Metropolis has been mapped out so that when a fire takes place it may be attended to at the earliest possible moment. The headquarters are situated at Watling Street, which is called the No. 1 station, and this station protects the City of London enclosed by the Euston Road, Tottenham Court Road, City Road and the river Thames; this is known as the "B" district. No. 2 station is at Commercial Road, and attends to the whole of the E. and N.E. portion of London to the N. of the Thames, and is known as the "C" district. No. 3 station, opposite the headquarters of the Metropolitan Fire Brigade Station in the Southwark Bridge Road, protects the whole of S. London, and is known as the "D" district. No. 4 station, at Shaftesbury Avenue, is called the "A" district, and covers the West End and Kensington. Finally, No. 5 station, in Upper Street, Islington, guards the parish of Islington. The working staff, which is mainly recruited from the royal navy, consists of the chief officer and a superintendent, foreman and crew of men at each station. The stations of the corps are connected by telephone with the fire brigade stations from whence the "calls" are received. In addition to the home staff, there is also a staff constantly employed during the daytime in inspecting docks, wharves, Manchester goods and uptown warehouses, and reports are made weekly to the committee.

Generally speaking, the work of the Corps may be divided into two distinct classes—(1) services at fires; (2) watching and working salvage.

(1) *Services at Fires* form the most important feature of the work. Much depends upon the method of dealing with the salvage. If, for instance, a large Manchester goods warehouse was on fire in the top part, it would be very little advantage to the offices interested in the risk if the men were set to work removing the stock off the ground floor. The best method would be to cover up with tarpaulin all goods there, and prevent the water from collecting on the lower floors. It will be gathered that the most important work of the corps is to prevent damage to goods, and that water is mostly looked after. The damage from fire is left almost entirely to the fire brigade. The traps, which immediately on receipt of an alarm proceed to the scene of the fire with their crew of men, carry every kind of appliance for the saving of goods from destruction by fire or damage by water, as well as lime-light apparatus for use in working after the fire has been extinguished, thus enabling the men to note the position of dangerous walls, &c.; and a portable coal-gas apparatus, which can be employed in the interior of buildings when the ordinary means of illumination has failed; in addition to ambulance appliances for emergencies.

(2) *Working Salvage.*—When a fire takes place, a man is left behind in charge of the salvage if the property is insured; or if that fact cannot be ascertained, but it appears probable that it is, a man is left until the information is obtained later. The duty, if an important one, is divided into a day and night duty. This enables an experienced man to be sent on day duty to meet the surveyor, and to carry out his instructions regarding the working out of the salvage; and a junior man at night. The day man, if working out salvage, would employ a number of men called strangers, over whom he acts as a kind of foreman. The "working out" may take the form of dividing up damaged goods into lots ready for a sale to be held by the surveyor, or of sifting over the débris to find remains of certain articles claimed for. If, for instance, a large fire occurred at a pianoforte manufacturer's, and the débris was all in one common heap, the London Salvage Corps might have to arrange certain quantities of pegs and wires in order to give an idea of the number of pianos before the fire. The watching continues until the loss is settled, when the charge of the premises is given over to the assured.

There are also salvage corps on similar lines, but on a smaller scale, in Liverpool and Glasgow. (C. J. F.)

SALVANDY, NARCISSE ACHILLE (1795–1856), French politician, was born at Condom (Gers) on the 11th of June 1795, of a poor family Irish by extraction. He entered the army in 1813, and next year was admitted to the household troops of Louis XVIII. A patriotic pamphlet on *La Coalition et la France* (1816) attracted the attention of Decazes, who employed him to disseminate his views in the press, and he waged war against the Villèle ministry of 1822–1828. Under the July monarchy he sat almost continuously in the Chamber of Deputies from 1830 till 1848, giving his support to the Conservative party. Minister of education in the Molé cabinet of 1837–1839, and again in 1845, he superintended the reconstitution of the Council of Education, the foundation of the French School at Athens and the restoration of the École des Chartes. For short periods in 1841 and 1843 he was ambassador at Madrid and at Turin, and became a member of the French Academy in 1835. Under the Empire he took no part in public affairs, and died at Graveron (Eure) on the 16th of December 1856.

SALVATION ARMY, a religious philanthropic organization founded by William Booth (*q.v.*), who in 1865 began to hold meetings for preaching in the streets in London and in tents, music halls, theatres and other hired buildings. Large numbers attended, many of whom had never entered a place of worship, and presently an organized society was formed called "The Christian Mission." Booth was assisted by his wife, Catherine Booth, a woman of remarkable gifts, who won for the new movement the sympathy of many among the cultured classes. In 1878 the Mission, which had spread beyond London, was reorganized on a quasi-military basis, and the title of "The Salvation Army" was definitely adopted in June 1880. The local societies became "Corps," and their evangelists "Field Officers," with Booth as "General" of the whole body. The spiritual operations of the Army at once rapidly expanded in spite of much disorderly opposition in some places. In 1878 there were 75 corps and 120 officers in the United Kingdom, the amount contributed by the outside public being £1925. Since then the number of corps and officers has greatly increased. Very large numbers who have "professed conversion" are reported annually. No figures of membership, however, are published. In doctrine, the Army is in harmony with the main principles of the evangelical bodies, "as embodied in the three creeds of the Church." Its preaching is practical and direct, asseverating the reality of Sin, "the everlasting punishment of the wicked," and Redemption. The Army proclaims the supreme duty of self-sacrifice for the sake of the salvation of others.

The Army is under the control of the General for the time being, who issues all orders and regulations. Large powers devolve upon other officers, such as the "Chief of the Staff," the "Foreign Secretary," and the "Chancellor," who direct affairs from the "International Headquarters" in London. The system of government is autocratic, "unquestioning obedience" being required throughout all ranks. The Army is divided, usually in harmony with national boundaries, into "territories," each under a "Commissioner," with headquarters in the capital of the country. The Territories are generally divided into "Provinces" and these again into "Divisions," which include a number of corps, each supporting its own "Captain" and "Lieutenant." The "soldiers" or members are drawn from all classes of the community. The property of the Army in the United Kingdom is held by the General for the time being, for the benefit of the Army exclusively, he being constituted the sole trustee of the property, in the disposal of which and in the appointment of his successor he is placed under the government of a deed poll, executed by Booth while the body was still known as "The Christian Mission," and enrolled in the Court of Chancery in August 1878. In other countries various modifications have been necessary, but the General's ultimate control has been practically assured. A further deed poll providing for the removal of a General in the contingency of "mental incapacity" or other "unfitness," and for the election of a successor, was executed by Booth in July 1904.

Funds are raised from the voluntary offerings of the corps, from open-air and other collections, from friends interested in evangelical and charitable work, and from the profits on publications and general trading. The financial statements of the various national headquarters funds are annually published, certified by public accountants, in each country. In 1909 the general income and expenditure account of International Headquarters in London dealt with a total of £64,345. Details of the aggregate income raised in the United Kingdom by the corps are not published. The annual Self-Denial offering (Great Britain) was £12,663 in 1888, £72,562 in 1906 and £69,034 in 1910. The value of the assets of the spiritual work in the United Kingdom increased from £558,992 in 1891 to £1,357,706 in 1909, the liabilities on account of loans upon mortgage and otherwise amounting at the latter date to £662,235. The assets of the Trade Departments were valued at £110,657 in 1909.

Statistics of Spiritual Operations
(*Compiled from the "S.A. Year Book, 1910"*).

	Corps and Outposts.	Officers and Cadets.
The British Isles	1447	3,191[1]
The United States	871	2,983
South America and West Indies	128	188
Canada and Newfoundland	465	950
Australasia and Java	1283	1,721
India, Ceylon, Japan and Korea	2584	1,626
South Africa and St Helena	113	278
France, Belgium, Switzerland and Italy	374	499
Germany and Holland	248	772
Sweden, Norway, Finland, Denmark and Iceland	1067	1,513
Gibraltar and Malta	2	5
Total	8582	13,726

Employees (without rank), 6269.

[1] Officers and employees (British Isles), 7538.

Booth's scheme for *Social Relief*, described in *In Darkest England, and the Way Out* (1890), attracted wide-spread interest, and was started with subscriptions amounting to over £100,000. A separate deed poll, making the General sole trustee, was executed by Booth in regard to the property and funds of this branch of work. Since then, both in Great Britain and abroad, the scheme has been actively carried on. The amount received in the year ending 30th September 1909 for cheap food and lodging in the United Kingdom was returned at £42,022 for the men's work, and £6417 for the women's. Large numbers of unemployed, ex-criminal and other needy persons have been aided or dealt with. In the year ending 30th September 1909, the number of persons received into the "elevators" or factories was reported as 6425, of women and girls received into rescue homes as 2559. The farm colony at Hadleigh in Essex has a large acreage under cultivation, with fruit and market gardens and various industrial undertakings. The emigration department, although a development of the Darkest England Scheme, has no connexion with the rescue work; in 1907 the passage money received amounted to £85,014, and in 1909 to £38,179. An "anti-suicide bureau" was opened in 1907, and at Boxted, near Colchester, a scheme for Small Holdings has been initiated. In 1909 the value of the property held under the Darkest England Scheme in the United Kingdom was returned at £329,645, and the income of the central fund at £50,594.

Summary of Social Operations throughout the World
(*Compiled from the "S.A. Year-Book, 1910"*).

	Number of Institutions.			
	United Kingdom.	Abroad.	Total.	Total Accommodation.
Men's Work—				
Shelters and Food Depots	31	156	187	18,531
Labour Bureaus	8	50	58	..
Labour Homes and Factories	28	117	145	4,936
Ex-criminal Homes	..[1]	18	18	486
Farm Colonies	2	15	17	..
Women's Work—				
Rescue and Maternity Homes	32	107	139	3,469
Shelters and Food Depots	10	20	30	1,934
Children's Homes and Crèches	2	57	59	..
Slum Posts	44	103	147	..
Other Social Institutions	17	87	104	..
Total Institutions	174	730	904	29,356

Total number of officers engaged exclusively in social work, 2520.

[1] In the United Kingdom ex-criminals are now received in the ordinary labour homes and factories.

There are a number of subsidiary branches of work, such as the Young People's Legion, and the Naval and Military League for work among men in the military, naval and merchant services. In England there is a bank (the Reliance Bank, Ltd.) and a Life Assurance Society, the funds of the latter amounting to £566,309 in 1909. All officers and many of the rank and file wear a uniform. Music is universally employed. While the organization has succeeded in securing recognition and favour in high places both in England and abroad, it has been seriously criticized at times, notably by Huxley and others in 1890–1891, and more recently by J. Manson in *The Salvation Army and the Public*, a work which led to much public discussion of the Army's religious, social and financial operations and methods. In 1910 some resignations took place among the higher officials.

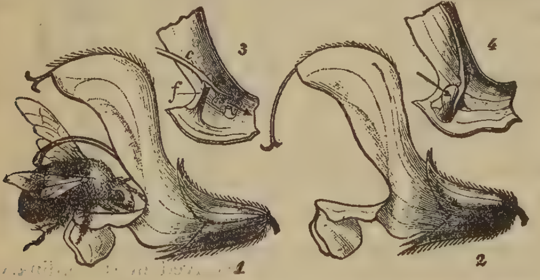
AUTHORITIES.—William Booth, *Orders and Regulations for Soldiers*; *Orders and Regulations for Field Officers*; *Orders and Regulations for Staff Officers*; *Salvation Soldiery*; *Interview with W. E. Gladstone*; *In Darkest England and the Way Out* (1890); Bramwell Booth, *Social Reparation*; *Servants of All* (1899); Booth-Tucker, *The Life of Catherine Booth* (1892); Railton, *Heathen England*; *Twenty-one Years' Salvation Army*; Arnold White, *Truth about the Salvation Army* (1892, 1900 and 1906); *The Great Idea* (1909; 2nd ed., 1910); T. F. G. Coates, *The Life Story of General Booth* (2nd ed., 1906); Harold Begbie, *Broken Earthenware* (1909); various reports and accounts; *The War Cry*, *The Social Gazette*, *The Salvation Army Year Book*, &c. Criticism; Thomas H. Huxley, "Social Diseases and Worse Remedies" in *Collected Essays*, vol. ix. (1895); John

Manson, *The Salvation Army and the Public* (1906; 3rd ed., 1908); Salvation Army Headquarters, *A Calumny Refuted: A Reply to the Unfounded Charges of Sweating*, &c. (1908); United Workers' Anti-Sweating Committee, *Salvation Army Sweating: A Reply to the Mis-statements of General Booth and his Officials* (1908; 2nd ed., 1910); *Reports of the Trades Union Congress* (1907 to 1910).

SALVER, a flat tray of silver or other metal used for carrying or serving glasses, cups, dishes, &c., at table or for the presenting of a letter or card by a servant. In a royal or noble household the fear of poisoning led to the custom of tasting the food or drink before it was served to the master and his guests; this was known as the "assay" of meat and drink, and in Spanish was called *salva* (*salvar*, to preserve from risk, Lat. *salvare*, to save). The term *salva* was also applied to the dish or tray on which the food or drink was presented after the tasting process. There seems no doubt that this Spanish word is the source of the English "salver"; a parallel is found in the origin of the term "credence-table," which is from the Ital. *credenza*, Lat. *credere*, to believe, trust (see CREDENCE AND CREDENCE-TABLE).

SALVIA, a large genus belonging to the natural order Labiatae (*q.v.*), containing about 500 species in the temperate and warmer regions of both hemispheres. The name is derived from the Lat. *salvo*, from the healing properties of sage, *S. officinalis* (see figure under LABIATAE). *S. verbenaea*, Clary, is a native of Britain found in dry pastures and waste places.

Some of the Salvias are among the most showy of the soft-wooded winter-flowering plants, the blossoms being of a bright glowing scarlet. The three most useful species are *S. splendens*, *S. Heerii* and *S. gesneriflora*, the first beginning to flower early in the autumn and lasting till Christmas, while the others follow immediately in succession, and continue in full beauty till April. Young plants should be propagated annually about February, and after nursing through the spring should be grown outdoors in a fully exposed situation, where they can be plunged in some non-conducting material, such as half-decomposed leaves. The young shoots should be stopped to secure bushy plants, but not later than the middle of August. The most suitable compost for them is a mixture of mellow fibry loam enriched with a little mild thoroughly decomposed manure, made sufficiently porous by the addition of sand or grit. In spring, and during the blooming period, the temperature should be intermediate between that of a stove and greenhouse. There are other very ornamental species of easy growth, increased by cuttings in spring, and succeeding well in ordinary rich loamy soil. Of these *S. angustifolia* bears spikes of fine bright-blue flowers in May or June; *S. chamaedryoides*, a dwarfish subject, has deep-blue flowers in August; *S. fulgens* produces scarlet flowers in August; and *S. involucrata* produces fine red flowers during the autumn. *S. patens* is a lovely blue free-blooming sort, flowering in August, the colour being unique.



From Strasburger's *Lehrbuch der Botanik*, by permission of Gustav Fischer.

Pollination of *Salvia Pratensis*.

1, Flower visited by a bumble-bee, showing the projection of the curved connective from the helmet-shaped upper lip and the deposition of the pollen on the back of the bumble-bee.
2, Older flower, with connective drawn back, and elongated style.
4, The staminal apparatus at rest, with connective enclosed within the upper lip.
3, The same when disturbed by the entrance of the proboscis of the bee in the direction of the arrow.
f, Filament.
c, Connective.
s, The obstructing half of the anther.

SALVIAN, a Christian writer of the 5th century, was born probably at Cologne (*De gub. Dei*, vi. 8, 13), some time between 400 and 405. He was educated at the school of Treves and seems to have been brought up as a Christian. His writings appear to show that he had made a special study of the law; and this is the more likely as he appears to have been of noble birth and could describe one of his relations as being "of no small account in her own district and not obscure in family" (*Ep.* i.). He was certainly a Christian when he married Palladia, the daughter of heathen parents, Hypatius and Quieta, whose displeasure he incurred by persuading his wife to retire with him to a distant monastery, which is almost certainly that founded by St Honoratus at Lerins. For seven years there was no communication between the two branches of the family, till at last, when Hypatius had become a Christian, Salvian wrote him a most touching letter in his own name, his wife's, and that of his little daughter Auspiciola, begging for the renewal of the old affection (*Ep.* iv.). This whole letter is a most curious illustration of Salvian's reproach against his age that the noblest man at once forfeited all esteem if he became a monk (*De gub.* iv. 7; cf. viii. 4).

It was presumably at Lerins that Salvian made the acquaintance of Honoratus (*ob.* 429), Hilary of Arles (*ob.* 449), and Eucherius of Lyons (*ob.* 449). That he was a friend of the former and wrote an account of his life we learn from Hilary (*Vita Hon.*, ap. Migne, l. 1260). To Eucherius's two sons, Salonius and Veranus, he acted as tutor in consort with Vincent of Lerins. As he succeeded Honoratus and Hilary in this office, this date cannot well be later than the year 426 or 427, when the former was called to Arles, whither he seems to have summoned Hilary before his death in 429 (*Eucherii Instructio ad Salonium*, ap. Migne, l. 773; Salv., *Ep.* ii.). Salvian continued his friendly intercourse with both father and sons long after the latter had left his care; it was to Salonius (then a bishop) that he wrote his explanatory letter just after the publication of his treatise *Ad ecclesiam*; and to the same prelate a few years later he dedicated his great work, the *De gubernatione Dei*. If French scholars are right in assigning Hilary's *Vita Honorati* to 430, Salvian, who is there called a priest, had probably already left Lyons for Marseilles, where he is known to have spent the last years of his life (Gennadius, ap. Migne, lviii. 1099). It was probably from Marseilles that he wrote his first letter—presumably to Lerins—begging the community there to receive his kinsman, the son of a widow of Cologne, who had been reduced to poverty by the barbarian invasions. It seems a fair inference that Salvian had divested himself of all his property in favour of that society and sent his relative to Lerins for assistance (*Ep.* i., with which compare *Ad eccles.* ii. 9, 10; iii. 5). It has been conjectured that Salvian paid a visit to Carthage; but this is a mere inference based on the minute details he gives of the state of this city just before its fall (*De gub.* vii. viii.). He seems to have been still living at Marseilles when Gennadius wrote under the papacy of Gelasius (492–496).

Of Salvian's writings there are still extant two treatises, entitled respectively *De gubernatione Dei* (more correctly *De praesenti judicio*) and *Ad ecclesiam*, and a series of nine letters. The *De gubernatione*, Salvian's greatest work, was published after the capture of Litorius at Toulouse (439), to which he plainly alludes in vii. 40, and after the Vandal conquest of Carthage in the same year (vi. 12), but before Attila's invasion (450), as Salvian speaks of the Huns, not as enemies of the empire, but as serving in the Roman armies (vii. 9). The words "proximum bellum" seem to denote a year very soon after 439. In this work, which furnishes a valuable if prejudiced description of life in 5th-century Gaul, Salvian deals with the same problem that had moved the eloquence of Augustine and Orosius. Why were these miseries falling on the empire? Could it be, as the pagans said, because the age had forsaken its old gods? or, as the semi-pagan creed of some Christians taught, that God did not constantly overrule the world he had created (i. 1)? With the former Salvian will not argue (iii. 1). To the latter he replies by asserting that, "just as the navigating steersman never looses the helm, so does God never remove his care from the world." Hence the title of the treatise. In books i. and ii. Salvian sets himself to prove God's constant guidance, first by the facts of Scripture history, and secondly by the enumeration of special texts declaring this truth. Having thus "laid the foundations" of his work, he declares in book iii. that the misery of the Roman world is all due to the neglect of God's commandments and the terrible sins of every class of society. It is not merely that the slaves are thieves and runaways, wine-bibbers and gluttons—the rich are worse (iv. 3). It is their harshness and greed that drive the poor to join the Bagaudae and fly for shelter to the barbarian invaders (v. 5 and 6). Everywhere the taxes are heaped upon the needy, while the rich, who have the apportioning of the impost, escape comparatively free (v. 7). The great towns are wholly given up to the abominations of the circus and the theatre, where decency is wholly set at nought, and Minerva, Mars, Neptune and the old gods are still worshipped (vi. 11; cf. vi. 2 and viii. 2). Treves was almost destroyed by the barbarians; yet the first petition of its few surviving nobles was that the emperor would re-establish the circus games as a remedy for the ruined city (vi. 15). And this was the prayer of Christians, whose baptismal oath pledged them to renounce "the devil and his works . . . the pomps and shows (spectacula)," of this wicked world (vi. 6). Darker still were the iniquities of Carthage, surpassing even the unconcealed licentiousness of Gaul and Spain (iv. 5); and more fearful to Salvian than all else was it to hear men swear "by Christ" that they would commit a crime (iv. 15). It would be the atheist's strongest argument if God left such a state of society unpunished (iv. 12)—especially among Christians, whose sin, since they alone had the Scriptures, was worse than that of barbarians, even if equally wicked, would be (v. 2). But, as a matter of fact, the latter had at least some shining virtues mingled with their vices, whereas the Romans were wholly corrupt (vii. 15, iv. 14). With this iniquity of the Romans Salvian contrasts the chastity of the Vandals, the piety of the Goths, and the ruder virtues of the Franks, the Saxons, and the other tribes to whom, though heretic Arians or unbelievers, God is giving in reward the inheritance of the empire (vii. 9, 11, 21). It is curious that Salvian shows no such hatred of the heterodox barbarians as was rife in Gaul seventy years later. It is difficult to credit the universal wickedness adduced by Salvian, especially in face of the contemporary testimony of Symmachus, Ausonius and Sidonius. Salvian was a 5th-century socialist of the most extreme type, and a zealous ascetic who pitilessly scourged everything that fell short of an exalted morality, and exaggerated, albeit unconsciously, the faults that he desired to eradicate.

Ad ecclesiam is explained by its common title, *Contra avaritiam.* It strongly commends meritorious almsgiving to the church. It is quoted more than once in the *De gubernatione*. Salvian published it under the name of Timothy, and explained his motives for so doing in a letter to his old pupil, Bishop Salonius (*Ep.* ix.). This work is chiefly remarkable because in some places it seems to recommend parents not to bequeath anything to their children, on the plea that it is better for the children to suffer want in this world than that their parents should be damned in the next (iii. 4). Salvian is very clear on the duty of absolute self-denial in the case of sacred virgins, priests and monks (ii. 8-10). Several works mentioned by Gennadius, notably a poem "in morem Graecorum" on the six days of creation (hexaemeron), and certain homilies composed for bishops, are now lost (Genn. 67).

The *Ad ecclesiam* was first printed in Sichard's *Antidoton* (Basel, 1528); the *De gubernatione* by Brassican (Basel, 1530). The two appeared in one volume at Paris in 1575. Pithoeus added variae lectiones and the first seven letters (Paris, 1580); Ritterhusius made various conjectural emendations (Altorf, 1611), and Baluze many more based on MS. authority (Paris, 1663–1669). Numerous other editions appeared from the 16th to the 18th century, all of which are now superseded by the excellent ones of C. Halm (Berlin, 1877) and F. Pauly (Vienna, 1883). The two oldest MSS. of the *De gubernatione* belong to the 10th century (Cod. Paris, No. 13,385) and the 13th (Brussels, 10,628); of the *Ad ecclesiam* to the 10th (Paris, 2172) and the 11th (Paris, 2785); of *Epistle IX.* to the 9th (Paris, 2785); of *Epistle VIII.* to the 7th or 8th century (Paris, 95,559) and to the 9th or 10th century (Paris, 12,237, 12,236). Of the first seven epistles there is only one MS. extant, of which one part is now at Bern (No. 219), the other at Paris (No. 3791). See *Histoire littéraire de France*, vol. ii.; Zschimmer's *Salvianus* (Halle, 1875). Salvian's works are reprinted (after Baluze) in Migne's *Cursus patrologiae*, ser. lat. vol. liii. For bibliography, see T. G. Schoenemann's *Bibliotheca patrum* (ii. 823), and the prefaces to the editions of C. Halm (*Monum. Germ.*, 1877) and F. Pauly (Vienna, *Corp. scr. eccl. Lat.*, 1883). Gennadius, Hilary and Eucherius may be consulted in Migne, vols. lviii. and l. See also S. Dill, *Roman Society in the Last Century of the Western Empire*, pp. 115-120. (T. A. A.)

SALVINI, TOMMASO (1829–), Italian actor, was born at Milan on the 1st of January 1829. His father and mother were both actors, and Tommaso first appeared when he was barely fourteen as Pasquino in Goldoni's *Donne curiose.* In 1847 he joined the company of Adelaide Ristori, who was then at the beginning of her brilliant career. It was with her as Elettra that he won his first success in tragedy, playing the title rôle in Alfiero's *Oreste* at the Teatro Valle in Rome. He fought in the cause of Italian independence in 1849; otherwise his life was an unbroken series of successes in his art. He acted frequently in England, and made five visits to America, his first in 1873 and his last in 1889. In 1886 he played there Othello to the Iago of Edwin Booth. Apart from Othello, which he played for the first time at Vicenza in June 1856, his most famous impersonations included Conrad in Paolo Giacometti's *La Morte civile*, Egisto in Alfieri's *Merope*, Saul in Alfieri's *Saul*, Paolo in Silvio Pellico's *Francesca da Rimini*, Oedipus in Nicolini's play of that name, Macbeth and King Lear. Salvini retired from the stage in 1890, but in January 1902 took part in the celebration in Rome of Ristori's eightieth birthday (see the *Century Magazine* for June 1902, vol. lxiii.). Salvini published a volume entitled *Ricordi, anedotti ed impressioni* (Milan, 1895). Some idea of his career may be gathered from *Leaves from the Autobiography of Tommaso Salvini* (London, 1893).

His son Allessandro (1861–1896), also an actor, had several notable successes in America, particularly as D'Artagnan in *The Three Guardsmen.*

SALWEEN, a river of Burma. This river, called Nam Kōng by the Shans, Thanlwin by the Burmese, Lu Kiang, or Nu Kiang, or Lu Tzu Kiang by the Chinese, is the longest river in Burma, and one of the wildest and most picturesque streams in the world. Its sources are still undetermined, but there seems little doubt that it rises in the Tanla mountains, S. of the Kuen Lun, somewhere in 32° or 33° N., and that perhaps it draws some of its water from the Kara Nor. It is thus a much longer river than the Irrawaddy. From the time it leaves Tibet it has a very narrow basin, and preserves the character of a gigantic ditch, or railway cutting, with for long stretches no other affluents than the mountain torrents from the hills, which rise from 3000 to 5000 or 6000 ft. above the level of the river-bed. In the dry season the banks are alternate stretches of blinding white, fine sand, and a chaos of huge boulders, masses and slabs of rock, with here and there, usually where a tributary enters, long stretches of shingle. In the rains all these disappear, and the water laps against forest trees and the abrupt slope of the hills. The average difference between high and low water level of the Salween throughout the Shan States is between 50 and 60 ft., and in some places it is as much as 90. There are many rapids, caused by reefs of rock running across the bed, or by a sudden fall of from one to several feet, which produce very rough water below the swift glide; but the most dangerous places for navigation are where a point juts out into the stream, and the current, thrown back, causes a violent double backwater. Nevertheless, long stretches of the river, extending to scores of miles, are habitually navigated by native boats. The current is extremely variable, from ½ m. an hour to ten knots. Launches ply regularly from Moulmein to the mouth of the Yōnzalin, in Lower Burma. The worst part of the whole Salween, so far as is known, is the gorge between the mouth of the Yōnzalin and Kyaukhnyat. It is quite certain that steam launches could ply over very long sections of the river above that, perhaps as far as the Kaw ferry, or even the Kunlong ferry. In British territory, however, there are very few settlements on the river itself, and frequently the ferry villages are built 1000 ft. above the river.

The Chinese believe the Salween valley to be deadly to all strangers, but it is in Chinese territory—particularly in the Lu Kiang, or Möng Hkö state—that there is the largest population on the river until Lower Burma is reached. A description of the Salween resolves itself into a list of the ferries at which it can be crossed, for no one marches up the river. The river is bridged by the Chinese on the main route from Tēng Yüeh (Momien) and Bhamo to Tali-fu. There are two spans; these are not in a straight line, but parallel to one another at the distance of the breadth of the central pillar. Each span is formed by twelve or fourteen massive iron chains, with planks laid across them. There was a bridge some 20 m. lower down, but this was destroyed in 1894. In British territory there are no bridges, and the ferries are the same as those maintained before annexation. There are a great number of these ferries, but only a few are used, except by the local people. From Ta Hsang Lè large trading boats ply regularly to Kyaukhnyat, whence the traders make their way by land over the hill to Papun, and so down the Yōnzalin.

The chief tributaries of the Salween in British territory are the Nam Yu and the Nam Oi or Nam Mwe on the right bank, and the Hsipa Haw on the left. These are short but fair-sized streams. Near the Kunlong ferry the Nam Nim, on the right bank, and the Nam Ting, on the left, are considerably longer, and the Nam Ting is navigable by native craft for considerable stretches up to Mēng Ting and farther. To the S. the next tributary is the Nam Kyek, on the right bank, down the valley of which the railway will reach the Salween. Below this are two streams called Nam Ma, one entering on the right bank, the other on the left, at no great distance from one another, but of no great length. A little below is the Nam Nang, on the left bank, coming from the Wa country. The Nam Kao enters in a cascade of nearly 200 ft. in the cold weather from the right, and then there are no affluents till the Nam Hka comes in on the left.

This has a great volume of water, but is unnavigable because of its steep gradient and many gorges. After the Hwe Lōng, entering from the left at Ta Kaw, is passed, the Nam Pang comes in 22 m. lower down on the right bank. This is probably the largest tributary of the Salween; some distance above its mouth, at Kēng Hkam, it is 400 yds. wide and quite unfordable. The next important tributary is the Nam Hsim, on the left bank, rising in the latitude of Kēng Tūng. It is a large but quite unnavigable stream. Except the Mē Sili and Mē Sala, from opposite sides, and the Nam Hang, which burrows its way through a range of hills from the E., and the Nam Pan, coming from the W., there is no considerable tributary till 19° 52′ N., where the Nam Tēng comes in on the right from the central Shan States. This is a considerable river, and navigable for long stretches in its upper course, but the last few miles before it enters the Salween are little better than a cataract. Below this the only large affluent is the Nam Pawn, which drains all Karenni and a considerable portion of the Shan States, but is quite unnavigable. Below this the tributaries are again only mountain streams till the Thaung-yin comes in from the S.E. Thirty m. lower down is Kyodan, the great timber depot. Here a cable, stretched across the river, catches all the timber, which is then made up into rafts and floated down to Kado, near Moulmein, where the revenue is collected. The Yōnzalin enters the Salween from the right about 10 m. below Kyodan. Boats can ply from Kyodan S., and light draught steamers ascend as far as Shwegōn, 63 m. from Moulmein. The Salween cuts the British Shan States nearly in half, and is a very formidable natural obstacle. It seems probable, however, that long stretches of it can be opened to trade. It is certainly no less navigable than the Middle Mekong or the Yangtsze-kiang above I-chang. (J. G. Sc.)

SALWEEN, a district in the Tenasserim division of Lower Burma. Area, 2666 sq. m. Pop. (1901) 37,837, consisting largely of aboriginal tribes, Karens (33,448) and Shans (2816). Nearly the whole district is a maze of mountains intersected by deep ravines, the only level land of any considerable extent being found in the valley of the Yōnzalīn, while the country is covered with dense forest, of which 128 sq. m. are reserved. The district is drained by three principal rivers, the Salween, Yōnzalīn and Bilīn, fed by mountain torrents. The Yōnzalīn, which rises in the extreme N., is navigable with some difficulty in the dry season as far as Papun; the Bilīn is not navigable within the limits of the district except by small boats and rafts. The district is in charge of a superintendent of police, with headquarters at Papun. The total rainfall in 1905 was 114·48 in., recorded at Papun. Apart from cotton-weaving, there are no manufactures. A considerable trade is carried on with Siam by bridle paths across the mountains.

SALYANY, a town of Russian Transcaucasia, in the government of Baku, 80 m. S.S.W. from Baku, on the river Kura, and on an island of the same name. In 1897 its population was 10,168, chiefly Tatars. It is a fishing centre, where thousands of workers gather from all parts of Russia during the season. Salyany was annexed to Russia in the 18th century, but was retaken by the Persians, and only became Russian finally in 1813.

SALYES (Gr. Σάλυες: also SALLYES, SALYI, SALLUVII), in ancient geography, a people occupying the plain S. of the Druentia (Durance) between the Rhone and the Alps. According to Strabo (iv. p. 203) the older Greeks called them Ligyes, and their territory Ligystikē. By some authorities they were considered a mixed race of Galli and Ligurians (hence Celtoligyes); by others a purely Celtic people, who subjugated the Ligures in the Provincia. They are said to have been the first transalpine people subdued by the Romans (Florus iii. 2). In 154 B.C. the inhabitants of Massilia, who had been connected with the Romans by ties of friendship since the second Punic war, appealed for aid against the Oxybii and Decietes (or Deciates). These people, called by Livy (*Epit.* 47) "transalpine Ligurians," were perhaps two smaller tribes included under the general name of Salyes. They were defeated by Quintus Opimius. In 125–124 hostilities broke out between the Romans and the Salyes from the same cause. The successful operations of Marcus Fulvius Flaccus were continued by Gaius Sextius Calvinus (123–122), who definitely subdued the Salyes, destroyed their chief town, and founded near its ruins the colony of Aquae Sextiae (Aix). Part of their territory was handed over to the Massaliots. Their king, Tutomotulus (or Teutomalius), took refuge with the Allobroges. From this time the Salyes practically disappear from history. Among other important Roman towns in their territory may be mentioned Tarusco or Tarasco (Tarascon), Arelate (Arles), Glanum (St Remy) and Ernaginum (St Gabriel).

For ancient authorities see A. Holder, *Altceltischer Sprachschatz*, ii. (1904).

SALZA, HERMANN VON (*c.* 1170–1239), Master of the Teutonic Order, and councillor of the emperor Frederick II., was a scion of the family of Langensalza in Thuringia. He entered the Teutonic Order in early life, became very intimate with Frederick II., took part in the expedition to Damietta in 1221, and accompanied the emperor on the crusade of 1228, which was joined by many princes owing to his influence. About 1210 he was appointed master of the Teutonic Order, and was offered, in 1226, the province of Kulm by Conrad I., duke of Masovia, in return for help against the Prussians; this he accepted and obtained the investiture from Frederick. In 1230 the conquest of Prussia was begun by the Order, although not under his immediate leadership. In 1225 he reconciled Valdemar II., king of Denmark, with Henry I., count of Schwerin, and thus won again the land on the right bank of the Elbe for the Empire, and the recognition of imperial superiority over Denmark. Trusted by Pope Gregory IX. and the emperor alike, he brought about the treaty of San Germano between them in 1230, was the only witness when they met in conference at Anagni in the same year, and it was he who, in 1235, induced Frederick's son, Henry, to submit to his father. He died on the 19th of March 1239 at Barletta in Apulia, and was buried there in the chapel of his Order.

Vide: A. Koch, *Hermann von Salza, Meister des deutschen Ordens* (Leipzig, 1885).

SALZBRUNN, a watering-place of Germany, in the Prussian province of Silesia, at the foot of a well-wooded spur of the Riesengebirge, 30 m. S.W. of Breslau, by the railway to Halberstadt. Pop. (1905) 10,412. It consists of Ober-, Neu- and Nieder-Salzbrunn, has a Roman Catholic and an Evangelical church and manufactures of glass, bricks and porcelain. Its alkalo-saline springs, especially efficacious in pulmonary and urinary complaints, were known as early as 1316, but fell into disuse until rediscovered early in the 19th century. The waters are used both for drinking and bathing, and of the two chief springs, the Oberbrunnen and the Kronenquelle, nearly two million bottles are annually exported. The number of summer visitors is about 7000 a year.

See Valentiner, *Der Kurort Obersalzbrunn* (Berlin, 1877); Biefel, *Der Kurort Salzbrunn* (Salzbrunn, 1872); and Deutsch, *Schlesiens Heilquellen und Kurorte* (Breslau, 1873).

SALZBURG, a duchy and crownland of Austria, bounded E. by Upper Austria and Styria, N. by Upper Austria and Bavaria, W. by Bavaria and Tirol and S. by Carinthia and Tirol. It has an area of 2762 sq. m. Except a small portion in the extreme N., near Bavaria, the country is mountainous and belongs to the N. and central zone of the Eastern Alps. It is divided into three regions; the region of the Hohe Tauern, extending S. of the Salzach, the region of the limestone Alps and the undulating foothill region. The Hohe Tauern contains many high lying valleys, traversed by the streams which flow into the Salzach, as well as numerous depressions and passes, here called popularly Tauern. The deepest depression of the whole range is the Velber Tauern valley (8334 ft.) between the Velber and the Tauern, and the principal pass is the Niederer (Mallnitzer) Tauern (7920 ft.). This pass which leads from the Gastein valley to Carinthia is the oldest bridle-path over the Hoher Tauern. Between the passes is the ridge of Sonnblick, where a meteorological observatory was established in 1886 at an altitude of 10,170 ft. The region of the limestone Alps is composed of several detached groups: a portion of the Kitzbühler Alps, which contain the famous Thurn pass (4183 ft.); then the Salzburg Alps, which contain the Loferer Steinberge and the peak Birnhorn (8637 ft.); the Reitalm or the Reiteralpe with the peak Stadelhorn (7495 ft.); and the broad mass of the Schönfeldspitze (8708 ft.), from which the great glacier-covered block of the Ewiger Schnee, or Übergossene Alps projects into the Salzach valley. Farther N. are the Hagengebirge (7844 ft.); the beautiful summit of the Hoher Göll (8263 ft.); the Tennegebirge (7217 ft.); and the Untersberg, an outpost of the Berchtesgaden group. Between the Hagengebirge and the Tennengebirge, which are situated on each side of the Salzach valley, is one of the most magnificent narrow passes of the Alps. It is below Werfen, and near its exit, just at the narrowest part, is the Lueg Pass, which was fortified as early as 1316 and offered a firm resistance to the French in the years 1800, 1805 and 1809. A portion of the Ischler Alps, as well as of the Dachstein group, also belongs to Salzburg. The principal river of Salzburg is the Salzach. The Enns and the Mur also rise in this province. The four Krimmler falls, together 2085 ft. high, are the most important falls in the Eastern Alps. The two falls at Wildbad-Gastein (196 and 296 ft.); the fall, by which the Gasteiner Ache discharges itself into the Salzach, near Lend; the Tauern fall (660 ft.), formed by the Tauern Ache on the N. side of the Radstäter Tauern; and the Gollinger fall (202 ft.) also deserve notice. Among the *Klammen*, *i.e.* narrow passages leading from the Salzach valley to the valleys of smaller rivers, the most celebrated are the Kitzloch Klamm and the Liechtenstein Klamm. The Kitzloch Klamm is formed by the Rauris Thal and the Liechtenstein Klamm by the Gross-Arle Thal. A path through the last Klamm leads to the magnificent fall (174 ft.) of the Gross-Arle river, which discharges itself in a series of cascades into the Salzach. The most important lake is the Zeller-see (2424 ft. above sea-level, 2 sq. m. in extent, 238 ft. deep), whose waters are carried off by the Salzach. The Waller-see or Lake of Seekirchen (1653 ft. above sea-level), the Fuschl-see (2095 ft.), the Hinter-see (2580 ft.), the Ober-Trumer-see and Nieder-Trumer-see are all situated in the Alpine foothill region. The Mond-see (1560 ft.) and Aber-see, or Lake St Wolfgang, are on the frontier between Salzburg and Upper Austria. The climate, although healthy, is very changeable, with great extremes of temperature and heavy rainfall, especially in the summer. The most settled season is the autumn. The annual mean temperature at Salzburg is 46°·4 F. The population of the duchy in 1900 was 193,247, which is equivalent to 69 inhabitants per square mile. It is the most sparsely populated province of Austria. Between 1880 and 1900 the population increased by 17·5%. The inhabitants are a handsome and powerfully built peasant race, very conservative in religion, manners, customs and national costume. They are almost exclusively of German stock and are Roman Catholics. Elementary education is much more advanced here than in any other Alpine province. Although 13·71% of the soil is unproductive and 32·4% is covered with forests, Salzburg is one of the principal pastoral regions of Austria. Of its total area, 28·9% consists of Alpine pastures available during the summer months, 4·95% of lowland pasturages and 8·3% of meadows, while only 9·2% is arable. Cattle-breeding and dairy-farming are very developed and constitute the chief resources of the province. Next in importance comes the timber trade; game is also plentiful. The mineral wealth of Salzburg includes salt at Hallein, copper at Mitterberg, iron-ore at Werfen, marble in the Untersberg region and small quantities of gold near the Goldberg in the Rauris valley and at Böckstein in the Gastein valley. The duchy contains also a great number of mineral springs, as the celebrated springs at Gastein, alkaline springs at Mauterndorf and at St Wolfgang, and saline springs at Golling and Hallein. Commerce and manufacture are poorly developed. The duchy is divided into six departments, of which the capital, Salzburg, is one and its environs the second. The other four are Hallein, St Johann, Tamsweg and Zell-am-See. The local diet, of which the archbishop is a member *ex-officio*, is composed of 28 members, and the duchy sends 7 members to the reichsrat at Vienna. At Hallein, pop. (1900) 6608, with celebrated saline springs known since the beginning of the 12th century, in October 1809, encounters between the French and the Tirolese under Joachim Johann Haspinger took place. To the N.E. lies Adnet with extensive marble quarries, and to the N. Oberalm, with manufacture of marble articles. The ascent of the Hoher Göll is made from here. Zell-am-See (2473 ft.), pop. 1561, is a favourite tourist resort. To the E. is the Schmittenhöhe (6455 ft.), which is easily accessible. On the summit is a meteorological station. Sankt Johann (pop. 1343) was one of the earliest settlements in the Salzach valley, and was a principal centre of Protestantism. Near it is the Liechtenstein Klamm.

For the history of the archbishopric and duchy see the article on the town of Salzburg (below).

SALZBURG, capital of the Austrian duchy and crownland of Salzburg and formerly of the archbishopric of the same name, 195 m. W. by S. of Vienna by rail. Pop. (1900) 32, 934. The city occupies a position of singular beauty on the Salzach which passes at this point between two isolated hills, the Mönchsberg (1646 ft.) on the left and the Capuzinerberg (2132 ft.) on the right. In the lovely valley so formed, and stretching into the plain beyond, lies Salzburg. The older and main part of the city lies on the left bank of the Salzach, in a narrow semicircular plain at the base of the Mönchsberg; the newer town is on the right bank at the foot of the Capuzinerberg, which is separated from the river by the narrow suburb of Stein. At the S. of the old town, below the Nonnberg, of S.E. spur of the Mönchsberg, is the suburb of Nonnthal; and at the N. end is Mülln. The steep sides of the Mönchsberg rise directly from amidst the houses of the town, some of which have cellars and rooms hewn out of the rock; and the ancient cemetery of St Peter, the oldest in Salzburg, is bounded by a row of vaults cut in the side of the hill. The narrowest part of the ridge, which has a length of above 2 m. is pierced by the Neu Thor, a tunnel 436 ft. long and 23 ft. broad, completed in 1767, to form a convenient passage from the town to the open plain. The S. end of the Mönchsberg is occupied by the imposing Hohen-Salzburg, a citadel originally founded in the 9th century, though the present buildings, the towers of which rise 400 ft. above the town, date chiefly from 1496–1519. Its chapel contains statues of the twelve apostles in red marble. The citadel is now used for barracks. The streets in the older quarters are narrow, crooked and gloomy; but the newer parts of the city, especially those laid out since the removal of the fortifications about 1861, are handsome and spacious. Owing to the frequent fires the private buildings of Salzburg are comparatively modern; and the existing houses, lavishly adorned with marble, are, like many of the public buildings, monuments of the gorgeous taste of the archbishops of the 17th and 18th centuries. From the style of the houses, the numerous open squares, and the abundant fountains which give an Italian aspect to the town, Salzburg has received the name of " the German Rome." Both sides of the river are bordered by fine promenades, planted with trees. The Salzach is spanned by four bridges, including a railway bridge.

Salzburg is full of objects and buildings of interest. The cathedral, one of the largest and most perfect specimens of the Renaissance style in Germany, was built in 1614–1668 by the Italian architect Santino Solari, in imitation of St Peter's at Rome. On three sides it is bounded by the Dom-Platz, the Kapitel-Platz and the Residenz-Platz; and opening on the N.E. and N.W. of the last are the Mozart-Platz and the Markt-Platz. In the Mozart-Platz is a statue of Mozart by Schwanthaler erected in 1842. On one side of the Residenz-Platz is the palace, an irregular though imposing building in the Italian style, begun in 1592 and finished in 1725. It contains a picture-gallery and is now occupied by the grand-duke of Tuscany. Opposite is the Neu Bau, begun in 1588, in which are the government offices and the law courts. In the middle of the Residenz-Platz is a handsome fountain, the Residenz-Brunnen, 46 ft. high, executed in marble by Antonio Dario in 1664–1680. The palace of the present archbishop is in the Kapitel-Platz. Across the river, with its French garden adjoining the public park, is the Mirabell palace, formerly the summer residence of the archbishops. Built in 1607, and restored after a fire in 1818, it was presented to the town in 1867 by the emperor Francis Joseph. The town hall of Salzburg was built in 1407 and restored in 1675. Other interesting secular buildings are the Chiemseehof, founded in 1305 and rebuilt in 1697, formerly the palace of the suffragan bishop of Chiemsee, and now the meeting-place of the Salzburg diet and the Carolino-Augusteum-Museum, containing an interesting collection of antiquities and a library of 20,000 volumes.

Of the twenty-five churches the majority are interesting from their antiquity, their architecture or their associations. Next to the cathedral, the chief is perhaps the abbey church of St Peter, a Romanesque basilica of the 12th century which was tastelessly restored in 1745, and which contains a monument to St Rupert. St Margaret's, in the midst of St Peter's churchyard, built in 1485, and restored in 1865, is situated near the cave in the side of the Mönchsberg, said to have been the hermitage of St Maximus, who was martyred by the pagan Heruli in 477. The Franciscan church, with an elegant tower built in 1866, is an interesting example of the transition style of the 13th century, with later baroque additions. St Sebastian's, on the right bank, built in 1505–1512 and restored in 1812, contains the tomb of Paracelsus, who died here. The oldest and most important of the eight convents at Salzburg is the Benedictine abbey of St Peter founded by St Rupert as the nucleus of the city. It was completely rebuilt in 1131 and contains a library of 40,000 volumes, besides MSS. The Capuchin monastery, dating from 1599, gives name to the Capuzinerberg. The oldest nunnery is that founded on the Nonnberg by St Rupert, the Gothic church of which dates from 1423 and contains some fine stained glass and some old frescoes. The single Protestant church in Salzburg was not built until 1865. A theological seminary is the only relic now left of the university of Salzburg, founded in 1623 and suppressed in 1810. The city is the see of an archbishop with a cathedral chapter and a consistory. Salzburg, situated at an altitude of 1351 ft. above sea-level, has a healthy climate and is visited annually by over 60,000 tourists. It has a mean annual temperature of 46·4° F. and a mean annual rainfall of 45·59 in. The town carries on a variety of small manufactures, including musical instruments, iron-wares, marble ornaments. Other industries are brewing and book-binding. It was the birthplace of Mozart and of the painter Hans Makart (1840–1884). The house in which Mozart was born has been transformed into a museum, which contains many interesting relics.

Numerous places of interest and beautiful spots are to be found round Salzburg. To the E. rises the Gaisberg (4206 ft.), which is ascended by a rack-and-pinion railway, which starts from Parsch. At the foot of the Gaisberg is Aigen, a renowned castle and park. Three miles S. of Salzburg is the palace of Hellbrunn, built about 1615, which contains a famous mechanical theatre and some fine fountains. About 2 m. to the S.W. of Salzburg is the castle of Leopoldskron, and from this point the Leopoldskroner Moos stretches S. to the base of the Untersberg. A few peat-baths, as the Ludwigsbad and the Marienbad, are in the neighbourhood of Leopoldskron. Three and a half miles N. of Salzburg, at an altitude of 1720 ft., stands the pilgrimage church of Maria Plain, erected in 1674.

The origin and development of Salzburg were alike ecclesiastical, and its history is involved with that of the archbishopric to which it gave its name. The old Roman town of Juvavum was laid in ruins, and the incipient Christianity of the district overwhelmed, by the pagan Goths and Huns. The nucleus of the present city was the monastery and bishopric founded here about 700 by St Rupert of Worms, who had been invited by Duke Theodo of Bavaria to preach Christianity in his land. The modern name of the town, due like several others in the district to the abundance of salt found there, appears before the end of the 8th century. After Charlemagne had taken possession of Bavaria in the 8th century, Bishop Arno of Salzburg was made an archbishop and papal legate. Thenceforward the dignity and power of the see steadily increased and in the course of time the archbishops obtained high secular honours. In 1278 Rudolph of Habsburg made them imperial princes.

The strife between lord and people was always keen in Salzburg. Archbishop Leonhard II., who expelled the Jews from Salzburg in 1498, had to face a conspiracy of the nobles and was besieged in Hohen-Salzburg by the inhabitants in 1511. The Peasants' War also raged within the see in 1525 and 1526, and was only quelled with the aid of the Swabian League. From the beginning an orthodox stronghold of the Roman Catholic faith, Salzburg energetically opposed the Reformation. Under Archbishop Wolfgang Dietrich (d. 1611) many Protestant citizens were driven from the town and their houses demolished. In spite, however, of rigorous persecution the new faith spread, and a new and more searching edict of expulsion was issued by Archbishop Leopold Anton von Firmian (d. 1744). The Protestants invoked the aid of Frederick William I. of Prussia, who procured for them permission to sell their goods and to emigrate; and in 1731 and 1732 Salzburg parted with about 30,000 industrious and peaceful citizens, about 6000 of these coming from the capital. The last independent archbishop was Hieronymus von Colloredo (1732–1812), who ruled with energy and justice but without gaining popularity.

By the peace of Lunéville (1802) the see was secularized and given to the archduke of Austria and grand-duke of Tuscany in exchange for Tuscany, its new owner being enrolled among the electoral princes. In the redistribution following the peace of Pressburg in 1805, Salzburg fell to Austria. Four years later it passed to Bavaria, but after the peace of Paris it was restored to Austria in 1816, except a portion on the left bank of the Salzach. Under the designation of a duchy the territory formed the department of Salzach in Upper Austria until 1849, when it was made a separate crownland, and finally in 1861 the management of its affairs was entrusted to a local diet. The actual duchy does not correspond exactly with the old bishopric. Salzburg embraced at the time of the peace of Westphalia (1648) an area of 3821 sq. m. with a population of 190,000. A part of its territory was ceded to Bavaria in 1814, and when Salzburg became a separate crownland in 1849 several of its districts were added to Tirol.

For the history of the archbishopric see Meiller, *Regesta archiepiscoporum Salisburgensium, 1106–1246* (Vienna, 1866); Dümmler. *Beiträge zur Geschichte des Erzbistums von Salzburg im 9-12 Jahrhundert* (Vienna, 1859); the *Salzburger Urkundenbuch*, edited by W. Hauthaler (Salzburg, 1899); Pichler, *Salzburgs Landesgeschichte* (Salzburg, 1865); Doblhoff, *Beiträge zum Quellenstudium Salzburgischer Landeskunde* (Salzburg, 1893–1895); Greinz, *Die Erzdiözese Salzburg* (Vienna, 1898); Rieder, *Kurze Geschichte des Landes Salzburg* (Vienna, 1905); E. Richter, *Das Herzogtum Salzburg* (1881); Thym, *Das Herzogtum Salzburg* (1901), and F. von Pichl, *Kritische Abhandlungen über die älteste Geschichte Salzburgs* (Innsbruck, 1889). For the town see Widmann, *Geschichte Salzburgs* (Gotha, 1907); F. von Zillner, *Geschichte der Stadt Salzburg* (Salzburg, 1885–1890); Trautwein, *Salzburg* (12th ed., Innsbruck, 1901); J. Meurer, *Führer durch Salzburg* (Vienna, 1889), and Purtscheller, *Führer durch Salzburg und Umgebung* (Salzburg, 1905). See also C. F. Arnold, *Die Ausrottung des Protestantismus in Salzburg unter Erzbischof Firmian* (1900).

SALZKAMMERGUT, a district of Austria in the S.W. angle of the duchy of Upper Austria situated between Salzburg and Styria. It forms a separate imperial domain of about 250 sq. m. and is famous for its fine scenery, which has gained for it the title of the "Austrian Switzerland"; but it owes its name (literally "salt-exchequer property") and its economic importance to its valuable salt mines. It belongs to the region of the Eastern Alps, and contains the Dachstein group with the Dachstein (9830 ft.) and the Thorstein (9657 ft.). In the Dachstein group are found the most easterly glaciers of the Alps, of which the largest is the Karls-Eisfeld, nearly 2½ m. long and 1½ m. broad; the Ischler Alps with the Gamsfeld (6640 ft.), the Höllengebirge with the great Höllenkogel (6106 ft.), and the Schafberg (5837 ft.), which is called the "Austrian Rigi." Then comes the Todtes Gebirge, with the Grosser Priel (8246 ft.) and the Traunstein (5446 ft.) on the E. shore of the Traun lake; the Pyhrgas group with the Grosser Pyhrgas (7360 ft.) and the Sengsen or Sensen group, with the Hoher Nock (6431 ft.). The chief lakes are the Traun-see or Lake of Gmunden (1383 ft. above sea-level, 9 sq. m. in extent, 623 ft. deep); the Hallstätter-see or Lake of Hallstatt (1629 ft. above sea-level, 3½ sq. m. in extent, 409 ft. deep); the Atter-see or Kammer-see (1527 ft. above sea-level, 18 sq. m. in extent, 560 ft. deep), the largest lake in Austria; the Mond-see (1560 ft. above the sea, 9 sq. m. in extent, 222 ft. deep) and the Aber-see or Lake of St Wolfgang (1742 ft. above sea-level, 5½ sq. m. in extent, 369 ft. deep). Salzkammergut had in 1900 a population of over 18,000. The capital of the district is Gmunden, and other places of importance are Ischl, Hallstatt and Ebensee (7656), which are important salt-mining centres. The salt extracted in Salzkammergut amounts to nearly 30% of the total Austrian production. Cattle-rearing and forestry form the other principal occupations of the inhabitants.

See Kegele, *Das Salzkammergut* (Wien, 1897).

SALZWEDEL, a town in the Prussian province of Saxony, in a plain on the navigable Jeetze, a tributary of the Elbe, 32 m. N.W. of Stendal and 106 m. by rail N.W. of Berlin, on the line to Bremen. Pop. (1905) 11,122. Salzwedel is partly surrounded by medieval walls and gates. The church of St Mary is a fine Gothic structure of the 13th century with five naves and a lofty spire. The old town hall, burnt down in 1895, has been replaced by a modern edifice. The industries include linen and damask weaving, tanning, brewing and the manufacture of pins, chemicals and machinery, and a brisk river trade is carried on in agricultural produce.

Salzwedel, formerly Soltwedel, was founded by the Saxons, and was from 1070 to 1170 the capital of the old or north Mark, also for a time called the "mark of Soltwedel," the kernel of Brandenburg-Prussia. The old castle, perhaps founded by Charlemagne, was purchased in 1864 by the king of Prussia. Salzwedel was also a member of the Hanseatic League, and at the beginning of the 16th century seems to have transacted a great part of the inland commerce of North Germany.

See Pohlmann, *Geschichte der Stadt Salzwedel* (Halle, 1811), and Danneil, *Geschichte der königlichen Burg zu Salzwedel* (Salzwedel, 1865).

SAMAIN, ALBERT VICTOR (1858–1900), French poet, was born at Lille on the 4th of April 1858. He was educated at the lycée of that town, and on leaving it entered a bank as a clerk. He enjoyed no literary associations, and his talent developed slowly in solitude. About 1884 Samain went to Paris, having obtained a clerkship in the Préfecture de la Seine, which he held for most of his life. He presently began to send poems to the *Mercure de France*, and these attracted attention. In 1893 he allowed a friend to print his earliest volume of poems, *Au Jardin de l'infante*, in a very small edition. This led to the sudden recognition of his talent, and to applause from critics of widely different schools. In 1897 this book was reprinted in a more popular form, with the addition of a section entitled *L'Urne penchée*. Samain's second volume, *Aux flancs du vase*, appeared in 1898. His health began to fail and he withdrew to the country, where he died, in the neighbourhood of the village of Magny-les-Hameaux, on the 18th of August 1900. A third volume of his poems, *Le Chariot d'or*, appeared after his death, with a lyrical drama, *Polyphème* (1901), which was produced at the Théâtre de l'Œuvre in 1904. The fame of Samain rapidly advanced when he was dead, and the general public awakened to the fact that this isolated writer was a poet of rare originality. He cultivated a delicate, languid beauty of imagery and an exquisite sense of verbal melody without attempting any revolution in prosody or identifying himself with any theory. Samain had no great range of talent, nor was he ambitious of many effects. Samain's natural life was patiently spent in squalid conditions; he escaped from them into an imaginative world of the most exquisite refinement. He has been compared to Watteau and Schumann; in his own art he bore some resemblance to Charles Baudelaire, and to the English poet Arthur O'Shaughnessy.

See also R. Doumic, "Trois Poètes," in the *Revue des deux mondes* (Oct. 1900); L. Bocquet, *Albert Samain, sa vie, son œuvre* (1905); and E. W. Gosse, *French Profiles* (1905). (E. G.)

SAMANA RANGE, a mountain ridge in Kohat district of the N.W. Frontier Province of India, commanding the S. boundary of Tirah. The ridge lies between the Khanki Valley on the N. and the Miranzai Valley on the S., and extends for some 30 m. W. from Hangu to the Samana Suk. It is some 6000 to 7000 ft. high. Beyond the Samana Suk lies the pass, known as the Chagru Kotal, across which the Tirah Expedition marched in 1897. On the opposite hill on the other side of this road is the famous position of Dargai (see TIRAH CAMPAIGN). After the Miranzai Expedition of 1891 this range was occupied by British troops and eleven posts were established along its crest, the two chief posts being Fort Lockhart and Fort Gulistan. In 1897 all the forts on the Samana were attacked by the Orakzais, and this and the Afridi attack on the Khyber Pass were the two chief causes of the Tirah Expedition. When Lord Curzon reorganized the frontier in 1900, British garrisons were withdrawn from the Samana forts, which are now held by a corps of tribal police 450 strong, called the Samana Rifles.

SĀMĀNIDS, the first great native dynasty which sprang up in the 9th century in E. Persia, and, though nominally provincial governors under the suzerainty of the caliphs of Bagdad, succeeded in a very short time in establishing an almost independent rule over Transoxiana and the greater part of Persia. Under the caliphate of Mamun, Sāmān, a Persian noble of Balkh, who was a close friend of the Arab governor of Khorasan, Asad b. Abdallah, was converted from Zoroastrianism to Islam. His son Asad, named after Asad b. Abdallah, had four sons who rendered distinguished services to Mamun. In return they all received provinces: Nūḥ obtained Samarkand; Aḥmad, Ferghana; Yahyā, Shash; Ilyās, Herat. Of these Aḥmad and his second son Ismā‘īl overthrew the Saffārids (*q.v.*) and the Zaidites of Tabaristan, and thus the Sāmānids established themselves with the sanction of the caliph Motamid in their capital Bokhara.

The first ruler (874) was Naṣr I. (Naṣr or Naṣir b. Aḥmad b. Asad. b. Sāmān). He was succeeded by his brother Ismā‘īl b. Aḥmad (892). His descendants and successors, all renowned for the high impulse they gave both to the patriotic feelings and the national poetry of modern Persia (see PERSIA: *Literature*), were Aḥmad b. Ismā‘īl (907–913); Naṣr II. b. Aḥmad, the patron and friend of the great poet Rūdagi (913–942); Nūḥ I. b. Naṣr (942–954); Abdalmalik I. b. Nūḥ (954–961); Manṣūr I. b. Nūḥ, whose vizier Bal‘amī translated Tabarī's universal history into Persian (961–976); Nūḥ II. b. Manṣūr, whose court-poet Daqiqi (Daḳiḳi) began the *Shāhnāma* (976–997); Manṣūr II. b. Nūḥ (997–999); and Abdalmalik II. b. Nūḥ (999), under whom the Sāmānid dynasty was conquered by the Ghaznevids. The rulers of this powerful house, whose silver dirhems had an extensive currency during the 10th century all over the N. of Asia, and were brought, through Russian caravans, even so far as to Pomerania, Sweden and Norway, where Sāmānid coins have been found in great number, were in their turn overthrown by a more youthful and vigorous race, that of Sabuktagīn, which founded the illustrious Ghaznevid dynasty and the Mussulman empire of India. Under Abdalmalik I. a Turkish slave, Alptagīn, had been entrusted with the government of Bokhara, but, showing himself hostile to Manṣūr I., he was compelled to fly and to take refuge in the mountainous regions of Ghazni, where he soon established a semi-independent rule, to which, after his death in 977 (367 A.H.), his son-in-law Sabuktagīn, likewise a former Turkish slave, succeeded. Nūḥ II., in order to retain at least a nominal sway over those Afghan territories, confirmed him in his high position and even invested Sabuktagīn's son Maḥmūd with the governorship of Khorasan, in reward for the powerful help they had given him in his desperate struggles with a confederation of disaffected nobles of Bokhara under the leadership of Fā'iq and the troops of the Dailamites, a dynasty that had arisen on the shores of the Caspian Sea and wrested already from the hands of the Sāmānids all their western provinces. Unfortunately, Sabuktagīn died in the same year as Nūḥ II. (997, 387 A.H.), and Maḥmūd (*q.v.*), confronted with an internal contest against his own brother Ismā‘īl, had to withdraw his attention for a short time from the affairs in Khorasan and Transoxiana. This interval sufficed for the old rebel leader Fā'iq, supported by a strong Tatar army under the Ilek Khān Abu'l Ḥosain Naṣr I., to turn Nūḥ's successor Manṣūr II. into a mere puppet, to concentrate all the power in his own hand, and to induce even his nominal master to reject Maḥmūd's application for a continuance of his governorship in Khorasan. Maḥmūd refrained for the moment from vindicating his right; but, as soon as, through court intrigues, Manṣūr II. had been dethroned, he took possession of Khorasan, deposed Manṣūr's successor Abdalmalik II., and assumed as an independent monarch for the first time in Asiatic history the title of "sultān." The last prince of the house of Sāmān, Montaṣir, a bold warrior and a poet of no mean talent, carried on for some years a kind of guerilla warfare against both Mahmūd and the Ilek Khān, who had occupied Transoxiana, till he was assassinated in 1005 (395 A.H.). Transoxiana itself was annexed to the Ghaznevid realm eleven years later, 1016 (407 A.H.).

See S. Lane Poole, *Mahommedan Dynasties* (1894), pp. 131-133; Stockvis, *Manuel d'histoire* (Leiden, 1888), vol. i. p. 113; also articles CALIPHATE and PERSIA: *History*, section B, and for the later period MAḤMŪD, SELJUKS, MONGOLS.

SAMANIEGO, FELIX MARIA DE (1745–1801), Spanish fabulist, was born at Laguardia (Álava) on the 12th of October 1745, and was educated at Valladolid. A government appointment was secured for him by his uncle the count de Peñaflorida. His *Fábulas* (1781–1784), one hundred and fifty-seven in number, were originally written for the boys educated in the school founded by the Biscayan Society. In the first instalment of his fables he admits that he had taken Iriarte for his model, a statement which proves that he had read Iriarte's fables in manuscript; he appears, however, to have resented their publication in 1782, and this led to a rancorous controversy between the former friends. Samaniego holds his own in the matters of quiet humour and careless grace, and his popularity continues. He died at Laguardia on the 11th of August 1801.

SAMARA, a government of S.E. Russia, on the W. side of the lower Volga, bounded on the N. by the governments of Kazan and Ufa, on the W. by Simbirsk and Saratov, on the E. by Ufa and Orenburg, and on the S. by Astrakhan, the Kirghiz Steppes and the territory of the Ural Cossacks. The area is 58,302 sq. m., and the population, in 1897, 2,763,478. A line drawn E. from the great bend of the Volga—the Samarskaya Luka—would divide the government into two parts, differing in orographical character. In the N. are flat hills and plateaus intersected by deep rivers. In their highest parts these elevations rise about 1000 ft. above the sea, while the level of the Volga at Samara is only 43 ft. S. of the Samarskaya Luka the country assumes the character of a low, flat steppe, recently emerged from the post-Pliocene Aral-Caspian basin. The government is built up chiefly of Carboniferous sandstones, conglomerates, clay slates and limestones, representing mostly deep-sea deposits. The Permian formation appears along the rivers Sok and Samara, and is represented by limestones, sands and marls containing gypsum, all of marine origin, and by continental deposits dating from the same period; sandstones impregnated with petroleum also occur. In the N. these deposits are covered with "variegated marls" and with a variety of Triassic, Jurassic and Cretaceous deposits. The Tertiary formation (Eocene) appears only at Novo-uzensk; the remainder of a vast sheet of this formation, which at one time covered all the region between the Volga and the Urals, was removed during the Glacial period. Post-Tertiary Caspian deposits penetrate far into the government along the main valleys, and a thick layer of loess occurs in the N. Selenites, rock-crystal and agates are found, as also copper ores, rock-salt and sandstone extracted for building purposes. The soil is on the whole very fertile. All the N. of the government is covered with a thick sheet of black earth; this becomes thinner towards the S., clays—mostly fertile—cropping out from underneath it; salt clays appear in the S.E.

Samara is inadequately drained, especially in the S. The Volga flows for 550 m. along its W. border. Its tributaries, the Great Cheremshan (220 m.), the Sok (195 m.), the Samara (340 m.), with its tributaries, are not navigable, partly on account of their shallowness and partly because of water-mills. When the water is high, boats can penetrate up some of them 15 to 30 m. The Great Irgiz alone, which has an exceedingly winding course of 335 m., is navigated to Kushum, and rafts are floated from Nikolayevsk. The banks of both Karamans are densely peopled. The Great and Little Uzeñ drain S.E. Samara and lose themselves in the Kamysh sands before reaching the Caspian. Salt marshes occur in the S.E.

The whole of the region is rapidly drying up. The forests, which are disappearing, are extensive only in the N. Altogether they cover 8% of the surface; prairie and grazing land occupies 32%, and 12% is uncultivable.

The climate is one of extremes, especially in the steppes, where the depressing heat and drought of summer are followed in winter by severe frosts, often accompanied by snowstorms. The average temperature at Samara (53° 11′ N.) is only 39°·2 (January, 9°·3; July, 70°·4).

The population, which was 1,388,500 in 1853, numbered 2,763,478 in 1897, of whom 1,398,263 were women and 159,485 lived in towns. The estimated pop. in 1906 was 3,276,500. Great and Little Russians formed 69% of the inhabitants; Mordvinians 8·6%, Chuvashes and Votiaks 2·3%, Germans 8·1%, Tatars 3·6% and Bashkirs 2%. The Great Russians immigrated in compact masses. A special feature of Samara is its German colonists, from Württemberg, Baden, Switzerland and partly also from Holland and the Palatinate, whose immigration dates from the time of Catherine II. in 1762. Favoured as they were by free and extensive grants of land, by exemption from military service and by self-government, they have developed into wealthy colonies of Roman Catholics, Protestants, Unitarians, Anabaptists, Moravians and Mennonites. As regards religion, the great bulk of the population are Orthodox Greeks; the Nonconformists, who are settled chiefly on both the rivers Uzeñ, number officially 100,000, but their real numbers are higher; next come Mahommedans, 12%; various Protestant sects, 5%; Roman Catholics, about 2%; and some 4000 pagans.

The chief occupation is agriculture—wheat, rye, oats, millet, oil-yielding plants, potatoes and tobacco being the principal crops. Owing to its great fertility, Samara usually has a surplus of grain for export, varying from 1½ to 4 million quarters (exclusive of oats) annually. Notwithstanding this production, the government is periodically liable to famine to such an extent that men die by thousands of hunger-typhus, or are forced to go by thousands in search of employment on the Volga. The population have no store of corn, or reserve capital for years of scarcity, and some 210,000 males have each an average of only four acres of arable and pasture land. But even this soil, although all taxed as arable, is often of such quality that only 50% to 55% of it is under crops, while the peasants are compelled to rent from two to two and a half million acres for tillage from large proprietors. Over 8½ million acres, or not far short of one-quarter of the total area of the government, purchased from the crown or from the Bashkirs—very often at a few pence per acre—are in the hands of no more than 1704 persons. The general impoverishment may be judged from the death-rate, 46 to 48 per thousand. Out of the total area, 4,143,800 acres belong to the crown, 7,979,000 to private persons and 22,486,700 acres to the peasants, who rent, moreover, about 6½ million acres. Water melons and sunflowers are extensively cultivated, and gardening is widely engaged in; mustard and inferior qualities of tobacco are grown. Hemp-seed, linseed, and other oil-seeds and bran are exported, as well as cereals and flour. Livestock are extensively bred. Bee-keeping is another pursuit that is widely followed. The export of poultry, especially of geese, has increased greatly. The principal manufactures are flour-mills, tanneries, distilleries, candle and tallow works, breweries and sugar refineries. Petty domestic industries, especially the weaving of woollen cloth, are carried on in the S. Both the external and the internal trade are very flourishing, nearly 250 fairs being held in the government every year; the chief are those at Novo-uzensk and Bugulma. Owing to the efforts of the local *zemstvos* there are more than the average number of primary schools, namely, one for every 1810 inhabitants. The government is divided into seven districts, the chief towns of which are Samara, Bugulma, Buguruslan, Buzuluk, Nikolayevsk, Novo-Uzen and Stavropol. The Sergiyevsk sulphurous mineral springs, 57 m. from Buguruslan, are visited by numbers of patients.

The territory now occupied by Samara was until the 18th century the abode of nomads. The Bulgarians who occupied it until the 13th century were followed by Mongols of the Golden Horde. The Russians penetrated thus far in the 16th century, after the conquest of the principalities of Kazan and Astrakhan. To secure communication between these two cities, the fort of Samara was erected in 1586, as well as Saratov, Tsaritsyn and the first line of Russian forts, which extended from Byelyi-yar on the Volga to the neighbourhood of Menzelinsk near the Kama. In 1670 Samara was taken by the insurgent leader Stenka Razin. In 1732 the line of forts was removed a little farther E., and the Russian colonists advanced E. as the forts were pushed forwards. In 1762, on the invitation of Catherine II., emigrants from various parts of Germany settled in this region, as also did the Raskolniks, whose communities on the Irgiz became the centre of a formidable insurrection in 1775 under Pugachev. At the end of the 18th century Samara became an important centre for trade. In the first half of the 19th century the region was rapidly colonized by Great and Little Russians. In 1847–1850 the government introduced about 120 Polish families; in 1857–1859 Mennonites from Danzig founded settlements; and in 1859 a few Circassians were brought hither by government; while the influx of Great Russian peasants still goes on.

(P. A. K.; J. T. Be.)

SAMARA, a town of E. Russia, capital of the government of the same name, 305 m. by river S.S.E of Kazan and 261 m. by rail W.N.W of Orenburg. Its population, which was 63,479 in 1883, numbered 91,672 in 1897. Owing to its situation on the left bank of the Volga, at the convergence of the Siberian and Central Asian railways, it has great commercial importance, especially as a depôt for cereals and a centre for flour-milling. A considerable trade is also carried on in animal products, particularly hides. The other industries include iron-foundries, soap, candles, vehicles and glue factories, cooperages, tanneries, breweries and brick-works. The port is the best on the Volga. Three great fairs are held every year. The city, which gives title to a bishop of the Orthodox Greek Church, has three cathedrals, built in 1685, 1730–1735 and 1894 respectively, three public libraries, and a natural history and archaeological museum. It is famous for its kumis (mare's milk) cures. Its foundation took place in 1586–1591 for the purpose of protecting the Russian frontier against the Bashkirs, the Kalmucks and the Nogai Tatars.

SAMARIA, an ancient city of Palestine. The name Samaria is derived through the Gr. *Σαμάρεια* from the Hebrew שֹׁמְרוֹן, "an outlook hill," or rather from the Aramaic form שָׁמְרַיִן, whence also comes the Assyrian form *Samirina*. According to 1 Kings xvi. 24, Omri, king of Israel, bought Samaria from a certain Shemer (whose name is said to be the origin of that of the city), and transferred thither his capital from Tirzah. But the city, as a superficial inspection of the site shows, must have existed as a settlement long before Omri, as potsherds of earlier date lie scattered on the surface. The city was occupied by Ahab, who here built a temple to "Baal" (1 Kings xvi. 32) and a palace of ivory (1 Kings xxii. 39). It sustained frequent sieges during the troubled history of the Israelite kingdom. Ben-Hadad II. of Syria assaulted it in the reign of Ahab, but was repulsed and obliged to allow the Israelite traders to establish a quarter in Damascus, as his predecessor Ben-Hadad I. had done in Samaria (1 Kings xx. 34). Ben-Hadad II. in the time of Jehoahaz again besieged Samaria, and caused a famine in the city; but some panic led them to raise the siege (2 Kings vi., vii.). The history of the city for the following 120 years is that of Israel (see JEWS).

In 727 died Tiglath-Pileser, to whom the small kingdoms of W. Asia had been in vassalage; in the case of Israel at least since Menahem (2 Kings xv. 19). He was succeeded by Shalmaneser IV., and the king of Israel, with the rest, attempted to revolt. Shalmaneser accordingly invaded Syria, and in 724 began a three-years' siege of Samaria (2 Kings xvii. 5). He died before it was completed, but it was finished by Sargon, who reduced the city, deported its inhabitants, and established within it a mixed multitude of settlers (who were the ancestors of the modern Samaritans). These people themselves seem to have joined a revolt against the Assyrians, which was soon quelled. The next event we hear of in the history of the city is its conquest by Alexander the Great (331 B.C.), and later by Ptolemy Lagi and Demetrius Poliorcetes. It quickly recovered from these injuries: when John Hyrcanus besieged it in 120 B.C. it was "a very strong city" which offered a vigorous resistance (Jos. *Ant.* xiii. x. 2). It was rebuilt by Pompey, and restored by Aulus Gabinius: but it was to Herod that it owed much of its later glory. He built a great temple, a hippodrome and a street of columns surrounding the city, the remains of which still arrest the attention. It was renamed by him *Sebaste*, in honour of Augustus: this name still survives in the modern name *Sebusteh*.[1] Philip here preached the gospel (Acts viii. 5). The rise of Neapolis (Shechem) in the neighbourhood caused the decay of Sebaste. It was quite small by the time of Eusebius. The crusaders did something to develop it by establishing a bishopric with a large church, which still exists (as a mosque); here were shown the tombs of Elisha, Obadiah and St John the Baptist. From this time onward the village dwindled to the poor dirty place it is to-day.

The site of Samaria is an enormous mound of accumulation, one of the largest in Palestine. In some places it is estimated the débris is at least 40 ft. deep. The crusaders' church remains almost intact, and numerous fragments of carved stone are built into the village houses, beneath which in some places are some interesting tombs. The hippodrome remains in the valley below, and the columns of the street of columns are in very good order. The walls can be traced almost all round the town: at the end of the mound opposite the modern village are the dilapidated ruins of a large gate. The site stands in the very centre of Palestine, and, built on a steep and almost isolated hill, with a long and spacious plateau for its summit, is naturally a position of much strength, commanding two of the most important roads—the great N. and S. road which passes immediately under the E. wall, and the road from Shechem to the maritime plain which runs a little to the W. of the city. The hill of Samaria is separated from the surrounding mountains (Amos iii. 9) by a rich and well-watered plain, from which it rises in successive terraces of fertile soil to a height of 400 or 500 ft. Only on the E. a narrow saddle, some 200 ft. beneath the plateau, runs across the plain towards the mountains; it is at this point that the traveller coming from Shechem now ascends the hill to the village of Sebusteh, which occupies only the extreme E. of a terrace beneath the hill-top, behind the crusaders' church, which is the first thing that attracts the eye as one approaches the town. The hill-top, the longer axis of which runs W. from the village, rises 1450 ft. above the sea, and commands a superb view towards the Mediterranean, the mountains of Shechem and Mount Hermon. Excavations under the auspices of Harvard University began here in 1908. (R. A. S. M.)

SAMARITANS. This term, which primarily means "inhabitants of Samaritis, or the region of Samaria," is specially used, in the New Testament and by Josephus, as the name of a peculiar religious community which had its headquarters in the Samaritan country, and is still represented by a few families at Nâblus, the ancient Shechem. By the Jews they are called Shomronim, a gentilic form from Shomron = Samaria; among themselves they sometimes use the name Shemêrem (= Heb. Shomerim) which is explained to mean "Keepers," sc. of the Law, but they usually style themselves "Israel" or "Children of Israel." They claim to be descendants of the ten tribes, and to possess the orthodox religion of Moses, accepting the Pentateuch and transmitting it in a Hebrew text which for the most part has only slight variations from that of the Jews. But they regard the Jewish temple and priesthood as schismatical, and declare that the true sanctuary chosen by God is not Zion but Mount Gerizim, over against Shechem (St John iv. 20). The sanctity of this site they prove from the Pentateuch, reading Gerizim for Ebal in Deut. xxvii. 4. With this change the chapter is interpreted as a command to select Gerizim as the legitimate sanctuary (cf. verse 7). Moreover, in Exod. xx. 17 and Deut. v. 21 a commandment (taken from Deut. xxvii.) is found in the Samaritan text, at the close of the decalogue, giving directions to build an altar and do sacrifice on Gerizim, from which of course it follows that not only the temple of Zion but the earlier shrine at Shiloh and the priesthood of Eli were schismatical. Such at least is the express statement of the later Samaritans: in earlier times, as they had no sacred books except the Pentateuch, they probably ignored the whole history between Joshua and the captivity, thus escaping many difficulties.

According to modern views the books of Moses were not reduced to their present form till after the exile, when their regulations were clearly intended to apply to the rebuilt temple of Zion. The Samaritans must in that case have derived their Pentateuch from the Jews after Ezra's reforms of 444 B.C. Before that time Samaritanism cannot have existed in the form in which we know it, but there must have been a community ready to accept the Pentateuch. The city of Samaria had been taken by Assyria (2 Kings xvii. 6 sqq. and xviii. 9-11) in 722 B.C., and the inhabitants deported, but in point of fact the district of Mount Ephraim was not entirely stripped of its old Hebrew population by this means. In the Annals of Sargon the number of the exiles is put at 27,290, representing no doubt the more prominent of the inhabitants, for this number cannot include the whole of N. Israel. The poorer sort must have remained on the land, and among them the worship of Jehovah went on as before at the old shrines of N. Israel, but probably corrupted by the religious rites of the new settlers. The account of the country given in 2 Kings xvii. 25 seq. dwells only on the partial adoption of Jehovah-worship by the foreigners settled in the land, and by no means implies that these constituted the whole population. Josiah extended his reforms to Bethel and other Samaritan cities (2 Kings xxiii. 19), and the narrative shows that at that date things were going on at the N. sanctuaries much as they had done in the time of Amos and Hosea. To a considerable extent his efforts to make Jerusalem the sanctuary of Samaria as well as of Judah must have been successful, for in Jer. xli. 5 we find fourscore men from Shechem, Shiloh and Samaria making a pilgrimage to "the house of Jehovah," after the catastrophe of Zedekiah. It is therefore not surprising that the people of this district came to Zerubbabel and Jeshua after the restoration, claiming to be of the same religion with the Jews and asking to be associated in the rebuilding of the Temple. They were rejected by the leaders of the new theocracy, who feared the result of admitting men of possibly mixed blood and of certainly questionable orthodoxy; and so the Jehovah-worshippers of Samaria were driven to the ranks of "the adversaries of Judah and Benjamin" (Ezra iv.). Nevertheless, down to the time of Nehemiah, the breach was not absolute; but the expulsion from Jerusalem in 432 B.C. of a man of high-priestly family (Neh. xiii. 28), who had married a daughter of Sanballat, made it so. It can hardly be doubted that this priest is the Manasseh of Josephus

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[1] Accentuated on the second syllable. Guide- and travel-books generally spell the name *Sebastīyeh*, which is not a correct rendering of the local pronunciation.

(*Ant.* xi. 8), who carried the Pentateuch to Shechem, and for whom the temple of Gerizim was perhaps built. For, though the story in Josephus is put a century too late and is evidently based on a confusion, it agrees with Neh. xiii. in essentials too closely to be altogether rejected,[1] and supplies exactly what is wanted to explain the existence in Shechem of a community bitterly hostile to the Jews, yet constituted in obedience to Ezra's Pentateuch.

It is remarkable that, having got the Pentateuch, they followed it with a fidelity as exact as that of the Jews, except in regard to the sanctuary on Mt Gerizim. The text of the sacred book was transmitted with as much conscientiousness as was observed by Jewish scribes;[2] and even from the unwilling witness of the Jews[3] we gather that they fulfilled all righteousness with scrupulous punctiliousness so far as the letter of the law was concerned. They did not however, receive the writings even of the prophets of N. Israel (all of which are preserved to us only by the Jews) nor the later oral law[4] as developed by the Pharisees.

But although these differences separated the two communities, their internal development and external history ran parallel courses till the Jewish state took a new departure under the Maccabees. The religious resemblance between the two bodies was increased by the institution of the synagogue, from which there grew up a Samaritan theology and an exegetical tradition. The latter is embodied in the Samaritan Targum, or Aramaic version of the Pentateuch, which in its present form is probably not much earlier than the 4th century A.D., but in general is said to agree with the readings of Origen's τὸ Σαμαρειτικόν. Whether the latter represents a complete translation of the Law into Greek may be doubted, but at any rate the Samaritans began already in the time of Alexander to be influenced by Hellenism. They as well as Jews were carried to Egypt by Ptolemy Lagi, and the rivalry of the two parties was continued in Alexandria (Jos. *Ant.* xii. 1.1), where such a translation may have been produced. Of the Samaritan contributions to Hellenistic literature some fragments have been preserved in the remains of Alexander Polyhistor.[5]

The troubles that fell upon the Jews under Antiochus Epiphanes were not escaped by the Samaritans (2 Macc. v. 23; vi. 2), for the account in Josephus (*Ant.* xii. 5. 5), which makes them voluntarily exchange their religion for the worship of the Grecian Zeus, is evidently coloured to suit the author's hostility. Under the Maccabees their relations with Judaea became very bitter. They suffered severely at the hands of Hyrcanus, and the temple on Mt Gerizim was destroyed. Although this treatment established an unalterable enmity to the Jews, as we see in the New Testament, in Josephus and in Jewish tradition, the two sects had too much in common not to unite occasionally against a common enemy, and in the struggles of the Jews with Vespasian the Samaritans took part against the Romans. They were not, however, consistent, for under Hadrian they helped the Romans against the Jews and were allowed to rebuild their temple on Mt Gerizim. They seem to have shared in the Jewish dispersion, since in later times we hear of Samaritans and their synagogues in Egypt, in Rome and in other parts of the empire. In the 4th century they enjoyed a certain degree of prosperity, according to their own chronicles, under Baba the Great, who (re-)established their religious and social organization. In 484, in consequence of attacks on the Christians, the Gerizim temple was finally destroyed by the Romans, and an insurrection in 529 was suppressed by Justinian so effectively that, while retaining their distinctive religion, they became henceforth politically merged in the surrounding population, with a merely domestic history. They are mentioned in later times by the Jewish travellers Benjamin of Tudela (1173) and Obadiah Bertinoro (1488 in Egypt), by Sir John Maundeville and others, but little was known of them in Europe till Scaliger opened communications with them in 1583.[6] In consequence of the interest thus aroused, the traveller Pietro della Valle visited them in 1616 and succeeded in obtaining a copy of their Pentateuch and of their Targum. Towards the end of the same century Robert Huntington (afterwards bishop of Raphoe), who was chaplain to the Turkey merchants at Aleppo, interested himself in them[7] and acquired some interesting manuscripts now in the Bodleian Library at Oxford. Since his time there has been intermittently a good deal of correspondence with them,[8] and in recent years owing to the increased facilities for travelling they have been much visited by tourists, not altogether for their good, as well as by scholars. At the present day they live only at Nâblus (Shechem), about 150 in number, the congregations formerly existing in Gaza, Cairo, Damascus and elsewhere having long since died out. Politically they are under the Turkish governor of Nâblus; their ecclesiastical head is the "Priest-levite" (in 1909 Jacob b. Aaron), who claims descent from Uzziel the younger son of Kohath (Exod. vi. 18). The line of the high-priests, so called as being descended from Aaron, became extinct in 1623.

In religion, since they recognize no sacred book but the Pentateuch, they agree with the Jews in such doctrines and observances only as are enjoined in the law of Moses. They do not therefore observe the feast of Purim, nor the fast of the 9th of Ab, nor any of the later rabbinical extensions or modifications of the law. It is this conservatism which has caused them to be confused with the Sadducees, who likewise rejected the later traditional teaching; but it is not correct to say that they deny the resurrection (as Epiphanius, *Haeres.* ix., and others) and the existence of angels (Leontius, *de Sectis*, ii. 8), or that they are entirely free from later religious developments. Briefly summarized, their creed is as follows: (*a*) God is one, and in speaking of Him all anthropomorphic expressions are to be avoided: creation was effected by his word: divine appearances in the Pentateuch are to be explained as vicarious, by means of angels (so as early as the 4th century A.D.); (*b*) Moses is the only prophet: all who have since claimed to be so are deceivers; (*c*) the Law, which was created with the world, is the only divine revelation; (*d*) Mt Gerizim is the house of God, the only centre of worship; (*e*) there will be a day of judgment. Closely connected with this are the doctrines (also found in the 4th century) of a future life and of a messiah (Ta'eb), who shall end the period of God's displeasure (Fanuta) under which his people have suffered since the schism of Eli and the disappearance of the Ark, and shall restore Israel to favour (Re'uta, Riḍwân).

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[1] There are, however, many difficulties in the story, which is not rendered clearer by references to Sanballat in the documents from Elephantine (dated in 408/407 B.C.) published by Sachau in the *Abhandlungen d. Kgl. preuss. Akad. d. Wiss.* for 1907.

[2] This appears by the frequent agreement of the Samaritan Pentateuch with the Septuagint. The Samaritan character is an independent development of the old Hebrew writing, as it was about the time when they first got the Pentateuch, and this in itself is an indication that from the first their text ran a separate course. Differences between MSS. existed down to the time of the Massoretes (see art. HEBREW), and it was from one of these divergent texts that the Samaritan was derived, the Septuagint from another. But while the Jews constantly revised their text with skill and success, the rigid conservatism of the Samaritans prevented any changes except the corruptions naturally due to human infirmity. The story that they possess a copy of the Law written by Abisha, the great-grandson of Aaron, seems to have aroused a strangely widespread interest, so that tourists invariably ask to see it and usually claim to have succeeded in doing so. Considering the extreme reverence with which it is regarded, it may safely be said that *this* manuscript is never shown to them. The origin of the legend is no doubt due to a pious fraud. It is first mentioned by Abu'l-fatḥ in 1355, from which year its "invention" dates. Obviously an old copy would be chosen for the purpose of such a discovery, but it is unlikely to be earlier than the 10th or 11th century A.D.

[3] Not, indeed, without exceptions, nor at all periods, but such is the general intention of the Massekheth Kuthim; see Montgomery, *Samaritans*, cap. x.

[4] For details see Nutt, *Fragments*, p. 37, and more fully, Montgomery, *l.c.* No doubt, in addition to the legal ordinances, the Samaritans retained some ancient traditional practices (cf. Gaster in *Transactions of the 3rd Internat. Congr. for the History of Religions*, i. p. 299, Oxford, 1908), or introduced some new observances. Their Passover, for instance, has some peculiar features, one of which, the application of the sacrificial blood to the faces of the children, has a parallel in the old Arabic *'aqiqah.* See the account of an eyewitness (Professor Socin) in Baedeker's *Palestine*; Mills, *Three Months' Residence at Nablus* (London, 1864), p. 248; Stanley, *The Jewish Church* i. app. iii.

[5] Chiefly in quotations by Eusebius (*Praep. Ev.*, ed. Gifford, Oxon., 1903, bk. ix. 17). See Freudenthal, *Hellenistische Studien*, i., ii. (Breslau, 1875); Schürer, *History of the Jewish People in the Time of Jesus Christ* (Eng. ed., 1891), ii. 3. p. 197.

[6] See Eichhorn's *Repertorium*, xiii. p. 257.

[7] See his letters ed. by T. Smith (London, 1704).

[8] See especially de Sacy in *Notices et extraits*, xii. The later letters are of less interest.

The Samaritan language properly so called is a dialect of Palestinian Aramaic, of which the best examples are found in the literature of the 4th century A.D. An archaic alphabet, derived from the old Hebrew, was retained, and is still used by them for writing Aramaic, Hebrew and sometimes even Arabic. After the Moslem conquest of Syria in 632 the native dialect of Aramaic gradually died out, and by the 11th century Arabic had become the literary as well as the popular language In the Liturgy Hebrew was no doubt used from the earliest times side by side with Aramaic, and after the 11th century it became, in a debased form, the only language for new liturgical compositions.

The literature of the Samaritans is, like that of the Jews, almost entirely of a religious character Reference has been made above to Samaritan Hellenistic works which have perished except for a few fragments. According to Samaritan tradition, their books were destroyed under Hadrian and Commodus, but of the language and contents of them nothing is recorded There can be no doubt that some, perhaps much, of the literature has been lost; for nothing[1] is extant which can be dated before the 4th century A.D The Targum, or Samaritan-Aramaic version of the Pentateuch was most probably written down about that time, though it was clearly based on a much older tradition and must have undergone various recensions. To the same period belong the liturgical compositions of Amram Darah and Marqah, and the latter's midrashic commentary (called the "Book of Wonders") on parts of the Pentateuch, all in Aramaic. With the possible exception of one or two hymns there is nothing further till the 11th century when there appears the Arabic version of the Pentateuch, usually ascribed to Abu Sa'id, but perhaps really by Abu'l-ḫasan[2] of Tyre, who also wrote three Arabic treatises, still extant, on theological subjects, besides some hymns. Of the same date (1053) is an anonymous commentary[3] on Genesis, preserved in the Bodleian Library at Oxford (MS. Opp. add. 4°, 99), interesting because it quotes from books of the Bible other than the Pentateuch. In the 12th century, Munajja[4] and his son Ṣadaqah wrote on theology; the earlier part of the chronicle called al-Taulidah[5] was compiled, in Hebrew (1149); and about the same time treatises on Grammar[6] by Abu Sa'id and Abu Isḥaq Ibrahim ibn Faraj. The next 100 years were rather barren. Ghazal ibn-al-Duwaik, who wrote on the story of Balak and on the restoration of the kingdom to Israel, is said to have lived in the 13th century, and another chronicle (in Arabic), called the Book of Joshua, is dated about the same time by T. W. J. Juynboll.[7] In the second half of the 14th century lived three important liturgical writers, Abisha b. Phinehas (ob. 1376), Abdallah b. Solomon and Sa'd-allah (or Sa'd-ed-din) b. Ṣadaqah: Abu'l-fatḥ, who composed his chronicle[8] in 1355: a high priest Phinehas, author of a lexicon: and the anonymous writer of the commentary on the Kitab al-asaṭir,[9] a work, ascribed to Moses, containing legends of the Patriarchs. Another famous liturgist Abraham Qabaẓi lived in the early part of the 16th century, and his pupil Isma'il Rumaiḥi in 1537 wrote a work on the praise of Moses. Probably about the same time, or a little later, is another anonymous commentary on Genesis in the Huntington Collection in the Bodleian Library (MS. Hunt. 301). Several members of the Danfi family were prominent in the 18th century as liturgists, among them Abraham b. Jacob, who also wrote a commentary[10] on Gen.-Num., and of the levitical family Ghazal ibn Abi Sarur, who commented on Gen.-Exod. Another Ghazal (=Ṭabiah n. Isaac), priest-levite, who died in 1786, was a considerable writer of liturgy. Subsequent authors are few and of little interest. Mention need only be made of the chronicle[11] written (*i.e.* compiled) in Hebrew by Ab Sakhwah (=Murjan[12]) b. As'ad, of the Danfi family, in 1900, chiefly on the basis of al-Taulidah and Abu'l-fatḫ; an Arabic chronicle[13] by Phinehas b. Isaac (ob. 1898) of the levitical family; and a theological work,[14] also in Arabic, by the present priest-levite, Jacob b. Aaron.

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Texts: the Pentateuch in the Paris and London Polyglotts; separately by Blayney (Oxford, 1790). A critical edition is in preparation by the Freiherr von Gall. Targum in the Polyglotts; reprinted in square character by Brüll (Frankfurt, 1874–1879); with critical apparatus by Petermann and Vollers (Berolini, 1872–1891); cf. also Nutt, *op. cit.*; Kohn, "Zur Sprache . . . der Samaritaner," pt. ii. (Leipzig, 1876) (in *Abhandlungen f. d. Kunde d. Morgenlandes*, v. 4); Kahle, *Textkritische . . . Bemerkungen . . .* (Leipzig, 1898) and *Zeitsch. f. Assyr.* xvi., xvii. Arabic version, ed. by Kuenen (Gen.-Lev.), Lugd. Bat. (1851); cf. Bloch, *Die Sam.-arab. Pent.-übersetzung*, Deut. i.-xi. (Berlin, 1901); Kahle, *Die arab. Bibelübersetzungen* (Leipzig, 1904); Heidenheim, *Der Commentar Marqahs* (Weimar, 1896). Parts also in dissertations by Baneth (1888), Munk (1890), Emmerich (1897), Hildesheimer (1898). Various texts and translations, mostly liturgical, in Heidenheim's *Deutsche Vierteljahrsschrift* (Gotha, 1864–1865, Zurich 1867– ?) often incorrect, cf. Geiger in *ZDMG*, xvi.-xxii. Cowley, *The Samaritan Liturgy* (Oxford, 1909), text and introduction. For editions of other works see the foregoing footnotes. (A. Cy.)

SAMARIUM [symbol Sm, atomic weight 150·4 (O=16)], a rare earth metal (see RARE EARTHS). The separation has been worked at by A. v. Welsbach, L. de Boisbaudran, Urbain and Lacombe (*Comptes rendus*, 1903, 137, pp. 568, 792); Demarçay (*ibid.* 1900, 130, p. 1019); Benedicks; Feit and Przibylla (*Zeit. anorg. Chem.*, 1905, 43, p. 202) and others. The metal may be obtained by reduction of its oxide with magnesium. It combines with hydrogen to form a hydride. The salts are mostly of a yellowish colour. The *chloride*, $SmCl_3 \cdot 6H_2O$, is a deliquescent solid which when heated in hydrochloric acid gas to 180° C. yields the anhydrous chloride. This anhydrous chloride is reduced to a lower chloride, of composition $SmCl_2$, when heated to a high temperature in a current of hydrogen or ammonia (Matignon and Cazes, *Comptes rendus*, 1906, 142, p. 183). The chloride, $SmCl_2$, is a brown crystalline powder which is decomposed by water with liberation of hydrogen and the formation of the oxide, Sm_2O_3, and an oxychloride, SmOCl. The *fluoride*, $SmF_3 . H_2O$, was prepared by H. Moissan by acting with fluorine on the carbide. The *sulphate*, $Sm_2(SO_4)_3 . 8H_2O$, is obtained by the action of sulphuric acid on the nitrate. It forms double salts with the alkaline sulphates. The *carbide*, SmC_2, is formed when the oxide is heated with carbon in the electric furnace.

SAMARKAND, a province of Russian Turkestan, formerly Zarafshan or Zerafshan. It is the ancient Sogdiana and was known as Sughd to the Moslems of the middle ages. It has on the N. and N.E. the province of Syr-darya, on the E. Ferghana, on the W. Bokhara and on the S. the khanates of Hissar, Karateghin and Darvaz. Its area is 26,627 sq. m. It is very hilly in the S., where it is intersected by ranges belonging to the Alai system. The Hissar range is the water-parting between the Zarafshan and the upper tributaries of the Amu-darya; another high range, the Zarafshan, runs between the two parallel rivers, the Zarafshan and its tributary, the Yagnob; while a third range, often called the Turkestan chain, stretches W. to E. parallel to the Zarafshan, on its N. bank. It is very probable that the three ranges referred to really possess a much more complicated character than is supposed. All three ranges are snow-clad, and their highest peaks reach altitudes of 18,500 ft. in the W. and 22,000 ft. in the E., while the passes over them, which are difficult as a rule, lie at altitudes of 12,000 ft. Several Alpine lakes, such as Iskander-kul, 7000 ft. high, have been found under the precipitous peaks.

The Alpine zone extends as far N. as the 40th parallel, beyond which the province is steppe-land, broken by only one range of mountains, the Nuratyn-tau, also known as Sanzar and Malguzar in the S.E. and as Kara-tau in the N.W. This treeless range stretches 160 m. N.W., has a width of about 35 m. and reaches altitudes of 7000 ft. It is pierced, in the Sanzar gorge, or Tamerlane's Gate, by the railway leading from Samarkand to Tashkent,

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[1] Except, of course, the Pentateuch itself (see BIBLE) which cannot be properly regarded as a Samaritan work.

[2] So Kahle, see the bibliography.

[3] See Neubauer in *Journ. asiat.* (1873), p. 341.

[4] See Wreschner, *Samaritanische Traditionen* (Berlin, 1888).

[5] Ed. by Neubauer in *Journ. asiat.* (1869). The chronicle was continued in 1346, and was subsequently brought down to 1856–1857 by the present priest.

[6] See Nöldeke, *Gött. Gel. Nachr.* (1862), Nos. 17, 20.

[7] *Chronicon Sam. . . . Liber Josuae* (Lugd. Bat., 1848). It narrates the history from the death of Moses to the 4th century A.D. and is derived from sources of various dates. A Hebrew book of Joshua announced by Gaster in *The Times* of June 9, 1908, and published in *ZDMG*, vol. 62 (1908) pt. ii., is a modern compilation; see Yahuda in *Sitzgsber. d. Kgl. Preuss. Akad.* (1908), p. 887, and Gaster's reply in *ZDMG*, 62, pt. iii.

[8] Ed. by Vilmar (Gotha, 1865). Partly translated by Payne Smith in Heidenheim's *Vierteljahrsschrift*, vol. ii.

[9] Translated by Leitner in Heid. *Viert.* iv. 184, &c.

[10] An account of the work (of which the only MS. is in Berlin) was given by Geiger in *ZDMG*, xx. p. 143 and later. Parts of it were published as dissertations by Klumel in 1902 and Hanover 1904.

[11] Ed. by E. N. Adler and M. Seligsohn in the *Revue des études juives*, vols. 44-46.

[12] The same who compiled Gaster's book of Joshua.

[13] Mentioned by Yahuda, *op. cit.* p. 895, as existing in a Berlin MS.

[14] Translated in *Bibliotheca sacra* (1906), p. 385, &c.

The other mountains in the province are well wooded, and it is estimated that nearly 4,500,000 acres are under forests. The N.W. portion is occupied by the Famine Steppe—which probably might be irrigated—and by the desert of Kyzyl-kum. The Famine or Hungry Steppe (not to be confounded with another desert of the same name, the Bek-pak-dala, to the W. of Lake Balkash) occupies nearly 5,000,000 acres, covered with loess-like clay. In the spring the steppe offers good pasture-grounds for the Kirghiz, but the grass withers as summer advances. Nearly 1,500,000 acres might, however, be irrigated and rendered available for the cultivation of cotton; indeed a beginning has been made in that direction. The Kyzyl-kum Steppe, 88,000 sq. m., is crossed by rocky hills, reaching an altitude of 3500 ft., and consists in part of saline clays, patches of prairie land and sand. The sand is especially prevalent on the margin, where the moving *barkhans* (crescent-shaped sandhills) invade the Kara-kul oasis of Bokhara. The vegetation is very poor, as a rule; grass and flowers (tulips, *Rheum*, various *Umbelliferae*) only appear for a short time in the spring. The *barkhans* produce nothing except *Haloxylon ammodendron*, *Poligonum*, *Halimodendron*, *Atraphaxis* and other steppe bushes; occasionally *Stipa* grass is seen on the slopes of the sandhills, while *Artemisia* and *Tamarix* bushes grow on the more compact sands. Water can only be obtained from wells, sometimes 140 ft. deep. A few Kirghiz are the sole inhabitants, and they are only found in the more hilly parts.

The chief river is the Zarafshan, which, under the name of Mach, rises in the Zarav glacier in the Kok-su mountain group. Navigation is only possible by rafts, from Penjikent downwards. The river is heavily drawn upon for irrigation; and to this it probably owes its name ("gold-spreading") rather than to the gold which is found in small quantities in its sands. Over 80 main canals (*ariks*) water 1200 sq. m. in Samarkand, while 1640 sq. m. are watered in Bokhara by means of over 40 main canals. Beyond Lake Kara-kul it is lost in the sands, before reaching the Amu-darya to which it was formerly tributary. The N.E. of the province is watered by the Syr-darya. One of the lakes, the Tuz-kaneh (40 m. from Jizakh) yields about 1300 tons of salt annually.

The average temperature for the year is 55·4° F. at Samarkand, and 58° at Khojent and Jizakh; but the average temperature for the winter is only 34°, and frosts of 4° and 11° have been experienced at Samarkand and Khojent respectively; on the other hand, the average temperature for July is 79° at Samarkand and 85° at Khojent and Jizakh. The total precipitation (including snow in winter) is only 6·4 in. at Khojent, 12 in. at Samarkand and 24 in. at Jizakh. The hilly tracts have a healthy climate, but malaria and mosquitoes prevail in the lower regions.

The estimated population in 1906 was 1,090,400. The Uzbegs form two-thirds of the population, and after them the Kirghiz and Tajiks (27%) are the most numerous; Jews, Tatars, Afghans and Hindus are also met with.

In 1898 nearly 1,000,000 acres were irrigated, and about 800,000 acres partly irrigated. The chief crops are wheat, rice and barley. Sorghum, millet, Indian corn, peas, lentils, haricots, flax, hemp, poppy, lucerne, madder, tobacco, melons and mushrooms are also grown. Two crops are often taken from the same piece of land in one season. Cotton is extensively grown, and 21,000 acres are under vineyards. Sericulture prospers, especially in the Khojent district. Live-stock breeding is the chief occupation of the Kirghiz. Weaving, saddlery, boot-making, tanneries, oil works and metal works exist in many villages and towns, while the nomad Kirghiz excel in making felt goods and carpets. There are glass works, cotton-cleaning works, steam flour mills and distilleries. Some coal, sulphur, ammonia and gypsum are obtained. Trade is considerable, the chief exports being rice, raw cotton, raisins, dried fruit, nuts, wine and silk. The Central Asian railway crosses the province from Bokhara to Samarkand and Tashkent. The province is divided into four districts, the chief towns of which, with their populations in 1897, are: Samarkand (*q.v*), Jizakh (16,041), Kati-kurgan (10,083) and Khojent (30,076).

SAMARKAND, a city of Russian Central Asia, anciently *Maracanda*, the capital of Sogdiana, then the residence of the Moslem Sāmānid dynasty, and subsequently the capital of the Mongol prince Tamerlane, is now chief town of the province of the same name. It lies 220 m. by rail S.W. of Tashkent, and 156 m. E. of Bokhara, in 39° 39′ N. and 66° 45′ E., 2260 ft. above the sea, in the fertile valley of the Zarafshan, at the point where it issues from the W. spurs of the Tian-shan before entering the steppes of Bokhara. The Zarafshan now flows 5 m. N. of the city. In 1897 the population numbered 40,000 in the native city, and 15,000 in the new Russian town, inclusive of the military (80% Russians). The total population was 58,194 in 1900, and of these only 23,194 were women.

Maracanda, a great city, was destroyed by Alexander the Great in 329 B.C. It reappears as Samarkand at the time of the conquest by the Arabs, when it was finally reduced by Kotaiba ibn Moslim in A.D. 711–712. Under the Samanids it became a brilliant seat of Arabic civilization, and was so populous that, when besieged by Jenghiz Khan in 1221, it is reported to have been defended by 110,000 men. Destroyed and pillaged by that chieftain, its population was reduced to one-quarter of what it had been. When Timur made it his residence (in 1369) the inhabitants numbered 150,000. The magnificent buildings of the successors of Timur, which still remain, testify to its former wealth. But at the beginning of the 18th century it is reported to have been almost without inhabitants. It fell under Chinese dominion, and subsequently under that of the amir of Bokhara. But no follower of Islam enters it without feeling that he is on holy ground; although the venerated mosques and beautiful colleges are falling into ruins, its influence as a seat of learning has vanished, and its very soil is profaned by infidels. It was not without a desperate struggle that the Mahommedans permitted the Russians to take their holy city.

The present city is quadrangular and is enclosed by a low wall 9 m. long. The citadel is in the W., and to the W. of this the Russians have laid out since 1871 a new town, with broad streets and boulevards radiating from the citadel.

The central part of Samarkand is the Righistan—a square fenced in by the three *madrasahs* (colleges) of Ulug-beg, Shir-dar and Tilla-kari; in its architectural symmetry and beauty this is rivalled only by some of the squares of certain Italian cities. An immense doorway decorates the front of each of these large quadrilateral buildings. A high and deep-pointed porch, reaching almost to the top of the lofty façade, is flanked on each side by a broad quadrilateral pillar of the same height. Two fine columns, profusely decorated, in turn flank these broad pillars. On each side of the high doorway are two lower archways connecting it with two elegant towers, narrowing towards the top and slightly inclined. The whole of the façade and also the interior courts are profusely decorated with enamelled tiles, whose colours—blue, green, pink and golden, but chiefly turquoise-blue—are wrought into the most fascinating designs, in striking harmony with the whole and with each part of the building. Over the interior are bulbed or melon-like domes, perhaps too heavy for the façade. The most renowned of these three madrasahs is that of Ulug-beg, built in 1434 by a grandson of Timur. It is smaller than the others, but it was to its school of mathematics and astronomy that Samarkand owed its renown in the 15th century.

A winding street, running N.E. from the Righistan, leads to a much larger square in which are the college of Bibikhanum on the W., the graves of Timur's wives on the S. and a bazaar on the E. The college was erected in 1388 by a Chinese wife of Timur. To the N., outside the walls of Samarkand, but close at hand, is the Hazret Shah-Zindeh, the summer-palace of Timur, and near this is the grave of Shah-Zindeh, or, more precisely, Kasim ibn Abbas, a companion of Timur. This was a famous shrine in the 14th century (Ibn Batuta's *Travels*, iii. 52); it is believed that the saint will one day rise for the defence of his religion. The Hazret Shah-Zindeh stands on a terrace reached by forty marble steps. The decoration of the interior halls is marvellous. Another street running S.W. from the Righistan leads to the

Gur-Amir, the tomb of Timur. This consists of a chapel crowned with a dome, enclosed by a wall and fronted by an archway. Time and earthquakes have greatly injured this fine building. The interior walls are covered with elegant turquoise arabesques and inscriptions in gold. The citadel (reconstructed in 1882 and preceding years) is situated on a hill whose steep slopes render it one of the strongest in Central Asia. Its walls, 3000 yds. in circuit and about 10 ft. high, enclose a space of about 90 acres. Within it are the palace of the amir of Bokhara—a vulgar modern building now a hospital—and the audience hall of Timur—a long narrow court, surrounded by a colonnade, and containing the *kok-tash*, or stone of justice. Ruins of former buildings—heaps of plain and enamelled bricks, among which Graeco-Bactrian coins have been found—occur over a wide area round the present city, especially on the W. and N. The name of Aphrosiab is usually given to these ruins. Five m. S.W. of Samarkand is the college Khoja Akrar; its floral ornamentation in enamelled brick is one of the most beautiful in Samarkand. Nothing but the ruins of a palace now mark the site of a once famous garden, Baghchi-sarai. Of the Graeco-Armenian library said to have been brought to Samarkand by Timur no traces have been discovered, and Vambéry regards the legend as invented by the Armenians. Every trace of the renowned high school Kalinder-khaneh has also disappeared.

The present Moslem city is an intricate labyrinth of narrow, winding streets, bordered by dirty courtyards and miserable houses. The chief occupation of the inhabitants is gardening. There is a certain amount of industry in metallic wares, tallow and soap, tanneries, potteries, various tissues, dyeing, harness, boots and silver and gold wares. The best harness, ornamented with turquoises, and the finer products of the goldsmith's art, are imported from Bokhara and Afghanistan. The products of the local potteries are very fine. The bazaars of Samarkand are more animated and kept with much greater cleanliness than those of Tashkent and Namangan. The trade is very brisk, the chief items being cotton, silk, wheat and rice, horses, asses, fruits and cutlery. Wheat, rice and silk are exported chiefly to Bokhara; cotton to Russia, via Tashkent. Silk wares and excellent fruits are imported from Bokhara, and rock-salt from Hissar. (P. A. K.; J. T. Be.)

SAMBALPUR, a town and district of British India, in the Orissa division of Bengal. The town is on the left bank of the river Mahanadi, 495 ft. above sea-level, the terminus of a branch of the Bengal-Nagpur railway. Pop. (1901) 12,870. It contains a ruined fort with old temples. The garrison of native infantry was withdrawn in 1902. There is considerable trade, and hand-weaving of tussore silk and cotton cloth are carried on.

The District of Sambalpur has an area of 3773 sq. m. The Mahanadi, which is the only important river, divides it into unequal parts. The greater portion is an undulating plain, with ranges of rugged hills running in every direction, the largest of which is the Bara Pahar, covering an area of 350 sq. m., and attaining at Debrigarh a height of 2267 ft. above the plain. The Mahanadi affords means of water communication for 90 m.; its principal tributaries in Sambalpur are the Ib, Kelo and Jhira. To the W. of the Mahanadi the district is well cultivated. The soil is generally light and sandy. It is occupied for the greater part by crystalline metamorphic rocks; but part of the N.W. corner is composed of sandstone, limestone and shale. Gold dust and diamonds have been found near Hirakhuda or Diamond Island, at the junction of the Ib and Mahanadi. The climate of Sambalpur is considered very unhealthy; the annual rainfall averages 59 in. The population in 1901 was 640,243, showing an increase of 3·2% in the decade. The registered death-rate for 1897 was only 30 per thousand, as against 68 for the province generally. This figure shows that Sambalpur entirely escaped the famine of 1896–1897, which indeed can be said to have brought prosperity to the district by causing high prices for a good rice crop, rice being the staple of cultivation. It was almost equally fortunate in 1900. The main line of the Bengal-Nagpur railway runs along the N. border of the district, with a branch S. to Sambalpur town.

Sambalpur lapsed to the British in 1849, and was attached to Bengal until 1862, when it was transferred to the Central Provinces. The early revenue administration was not successful. On the outbreak of the Mutiny in 1857 a general rising of the chiefs took place, and it was not until the final arrest of Surandra Sa, in 1864, that tranquillity was restored. In October 1905 Sambalpur was transferred back again to Bengal, without the subdivisions of Phuljhar and Chandarpur-Padampur.

See *Sambalpur District Gazetteer* (Calcutta, 1909).

SAMBHAR LAKE, a salt lake in Rajputana, India, on the borders of the two states of Jodhpur and Jaipur. The town of the same name has a railway station 53 m. N.E. from Ajmer: pop. (1901) 10,873. The area of the lake when full is about 90 sq. m., but it usually dries up altogether in the hot season. Since 1870 the British government has worked the salt under a lease from the two states interested, supplying great part of N. and Central India. The annual output averages about 126,000 tons, yielding a profit of more than half a million sterling.

SAMBLANÇAY, or Semblançay, a French noble family of Touraine, sprung from the merchant class. The founder of the family was Jean de Beaune (d. *c.* 1489), treasurer of Louis XI., who narrowly escaped death for conspiracy under Charles VIII. His son, Jacques de Beaune, baron de Samblançay, vicomte de Tours, became general of finances before 1497, and from 1518 was superintendent of finances. Convicted of peculation in connexion with the supplies for the army in Italy, he was executed at Montfaucon on the 9th of August 1527. His eldest son, Martin de Beaune, who became archbishop of Tours in 1520, died in the same year as his father. Another son, Guillaume de Beaune, general of finances under his father, and banished from 1527 to 1535, was the father of the famous prelate, Renaud de Beaune (1527–1606), archbishop of Bourges (1581) and of Sens (1595). His efforts at pacification during the wars of religion culminated in the conversion of Henry IV., and it was he who presided at the ceremony of the king's abjuration of Protestantism on the 25th of July 1593. Renaud was one of the most famous orators of his time, and some of his productions have come down to us, as well as his *Réformation de l'université de Paris* (1605 and 1667). A less honourable descendant of Jacques de Beaune was Charlotte de Beaune-Samblançay (*c.*1550–1617), a courtesan whom Catherine de Medici employed to discover the secrets of her courtly enemies. She counted among her lovers and dupes the king of Navarre (Henry IV.), the duc d'Alençon (Henry III.), Henry I., duc de Guise and others. The duc de Guise was killed when leaving her apartments in the early morning of Christmas Day 1588. She was married early in life to Simon de Fizes, baron de Sauves, a secretary of state, and again in 1584 to François de la Trémoille, marquis de Noirmoutiers, by whom she had a son, Louis, 1st duc de Noirmoutiers, a ducal line which became extinct in 1733. Charlotte died on the 30th of September 1617.

SAMBOURNE, EDWARD LINLEY (1844–1910), English draughtsman, illustrator and designer, was born in London, on the 4th of January 1844. He was educated at the City of London School, and also received a few months' education at the South Kensington School of Art. After a six years' "gentleman apprenticeship" with John Penn & Son, marine engineers, Greenwich, his humorous and fanciful sketches made surreptitiously in the drawing-office of that firm were shown to Mark Lemon, editor of *Punch*, and at once secured him an invitation to draw for that journal. In April 1867 appeared his first sketch, "Pros and Cons," and from that time his work was regularly seen, with rare exceptions, in the weekly pages of *Punch*. In 1871 he was called to the *Punch* "table." At the beginning he made his name by his "social" drawings and especially by his highly elaborated initial letters. He drew his first political cartoon, properly so-called, in 1884, and ten years later began regularly to design the weekly second cartoon, following Sir John Tenniel as chief cartoonist in 1901. Examples of his best work in book illustration are in Sir F. C. Burnand's *New Sandford and Merton* (1872), and in Charles Kingsley's *Water Babies* (1885), which contains some of his most delicate and delightful drawings. The design for the Diploma for the Fisheries Exhibition (1883) is of its kind one of the most extraordinary things in English art. As a political designer, while distinguished for wit and force, he was invariably refined and good-humoured to the uttermost; yet it is essentially as an artist that he takes his highest place. He died on the 3rd of August 1910.

See M. H. Spielmann, *The History of Punch* (London, 1895).

SAMBUCA, Sambute, sambiut, Sambue, Sambuque, an ancient stringed instrument of Asiatic origin generally supposed to be a small triangular harp of shrill tone (Arist. Quint. Meib. ii. p. 101). The sambuca was probably identical with the Phoenician *sabecha* and the Aramaic *sabka*, the Greek form being *σαμβύχη*. The sabka is mentioned in Dan. iii. 5, 10, 15, where it is erroneously translated sackbut. The sambuca has been compared to the military engine of the same name by some classical writers; Polybius likens it to a rope ladder; others describe it as boat-shaped. Among the musical instruments known, the Egyptian *nanga* best answers to these descriptions. These definitions are doubtless responsible for the medieval drawings representing the sambuca as a kind of tambourine,[1] for Isidor elsewhere defines the symphonia as a tambourine. During the middle ages the word sambuca was applied (1) to a stringed instrument about which little can be discovered, (2) to a wind instrument made from the wood of the elder tree (*sambūcus*). In an old glossary (*Fundgruben*, i. 368), article *vloyt* (flute), the sambuca is said to be a kind of flute. "Sambuca vel sambucus est quaedam arbor parva et mollis, unde haec sambuca est quaedam species symphoniae qui fit de illa arbore." Isidor of Seville (*Etym.* 2. 20) describes it as "Sambuca in musicis species est symphoniarum. Est enim genus ligni fragilis unde et tibiae componuntur." In a glossary by Papias of Lombardy (*c.* 1053), first printed at Milan in 1476, the sambuca is described as a cithara, which in that century was generally glossed "harp," *i.e.* "Sambuca, genus cytherae rusticae."

In *Tristan* (7563-72) the knight is enumerating to King Marke all the instruments upon which he can play, the *sambiut* being the last mentioned:

> "Waz ist daz, lieber mann?
> —Daz veste Seitspiel daz ich kann."

In a Latin-French glossary (M.S. at Montpelier, H. 110, fol. 212 *v.*) Psalterium = sambue. During the later middle ages sambuca was often translated sackbut in the vocabularies, whether merely from the phonetic similarity of the two words has not yet been established. The great Boulogne Psalter (xi. c.) contains, among other fanciful instruments which are evidently intended to illustrate the equally vague and fanciful descriptions of instruments in the apocryphal letter of S. Jerome, *ad Dardanum*, a *Sambuca*, which resembles a somewhat primitive sackbut (*q.v.*) without the bell joint. It is reproduced by Coussemaker, Lacroix and Viollet-le-Duc, and has given rise to endless discussions without leading to any satisfactory solution. (K. S.)

SAMLAND, a peninsula of Germany, in the province of East Prussia, on the Baltic. It separates the Frisches Haff on the W. from the Kurisches Haff on the N.E., and is bounded on the S. by the river Pregel and on the E. by the Deime. Its shape is oblong; it is 43 m. long, and 18 broad, and has an area of 900 sq. m. The surface is mostly flat, but on the W. sand-hills rise to a height of 300 ft. The chief product is amber. The former episcopal see of Samland was founded by Pope Innocent IV. in 1249 and subordinated to the archbishop of Riga. Bishop Georg von Polentz embraced the Reformation in 1523, and in 1525 the district was incorporated with the duchy of Prussia.

See Reusch, *Sagen des preussischen Samlandes* (2nd ed., Königsberg, 1863); Jankowsky, *Das Samland und seine Bevölkerung* (Königsberg, 1902); Hensel, *Samland Wegweiser* (4th ed., Königsberg, 1905); and the *Urkundenbuch des Bistums Samland*, edited by Wölky and Mendthal (Leipzig, 1891–1904).

SAMNAN, Simnan, or Semnan, a small province of Persia, which, including the city and district of Damghan, is generally known as "Samnan va Damghan." It is bounded on the W. by the districts of Khar (the ancient Choara) and Firuzkuh, on the N. by Mazandaran, and on the E. by Shahrud and Bostam. In the S. it extends beyond the oasis of Jendek in the desert N. of Yezd. Its northern part is still known as Komush or Komish, the ancient Commisene. The revenue amounts to about £7000 per annum.

Samnan, the capital of the province, is situated 145 m. E. of Teheran, on the high road thence to Meshed, at an altitude of 3740 ft. in 35° 34′ N., 53° 22′ E. It has a population of about 10,000, post and telegraph offices, and a fine minaret, built in the 12th century. It exports pistachios, almonds and coarse tobacco. A dialect with many old Persian forms and resembling the Mazandaran dialect is spoken.

A. Houtum-Schindler, "Bericht über d. Samnán Dialect," *Zeitsch. d. morgenl. Gesellschaft*, vol. xxxii. (1878).

SAMNITES, the name given by the Romans to the warlike tribes inhabiting the mountainous centre of the S. half of Italy. The word *Samnites* was not the name, so far as we know, used by the Samnites themselves, which would seem rather to have been (the Oscan form of) the word which in Latin appears as Sabini (see below). The ending of *Samnites* seems to be connected with the name by which they were known to the Greeks of the Campanian coast, which by the time of Polybius had become Σαυνῖται; and it is in connexion with the Greeks of Cumae and Naples that we first hear of the collision between Rome and the Samnites.[2] We know both from tradition and from surviving inscriptions (see Osca Lingua and R. S. Conway, *The Italic Dialects*, pp. 169 to 206) that they spoke Oscan; and tradition records that the Samnites were an offshoot of the Sabines (see *e.g.* Festus, p. 326 Mueller). On two inscriptions, of which one is unfortunately incomplete, and the other is the legend on a coin of the Social War, we have the form *Safinim*, which would be in Latin **Sabinium*, and is best regarded as the nominative or accusative singular, neuter or masculine, agreeing with some substantive understood, such as *nummum* (see R. S. Conway, ibid. pp. 188 and 216).

The abundance of the ethnica ending in the suffix *-no-* in all the Samnite districts classes them unmistakably with the great Safine stock, so that linguistic evidence confirms tradition (see further Sabini). The Samnites are thus shown to be intimately related to the patrician class at Rome (see Rome: *history, ad init.*); so that it was against their own stock that the Romans had to fight their hardest struggle for the lordship of Italy, a struggle which might never have arisen but for the geographical accident by which the Etruscan and Greek settlements of Campania divided into two halves the Safine settlements in central Italy.

The longest and most important monument of the Oscan language, as it was spoken by the Samnites (in, probably, the 3rd century B.C.) is the small bronze tablet, engraved on both sides, known as the *Tabula Agnonensis*, found in 1848 at the modern village Agnone, in the heart of the Samnite district, not very far from the site of Bovianum, which was the centre of the N. group of Samnites called Pentri (see below). This inscription, now preserved in the British Museum, is carefully engraved in full Oscan alphabet, and perfectly legible (facsimile given by Mommsen, *Unteritalische Dialekte*, Taf. 7, and by I. Zvetaieff, *Sylloge inscriptionum Oscarum*). The text and commentary will be found in Conway, *op. cit.* p. 191: it contains a list of deities to whom statues were erected in the precinct sacred to Ceres, or some allied divinity, and on the back a list of deities to whom altars were erected in the same place. Among those whose names are immediately intelligible may be mentioned those of "Jove the Ruler" and of "Hercules Cerealis." The other names are full of interest for the student of both the languages and the religions of ancient Italy. The latest attempts at interpretation will be found in R. S. Conway, *Dialectorum Italicarum exempla selecta* (*s.v.*) and C. D. Buck, *Oscan and Umbrian Grammar*, p. 254.

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[1] See Michael Praetorius, *Synt. Mus.* (Wolfenbüttel, 1618), p. 248 and pl. 42, where the illustration resembles a tambourine, but the description mentions strings, showing that the author himself was puzzled.

[2] For the difficult questions involved in the obscure and fragmentary accounts of the so-called First Samnite War, which ended in 341 B.C., the reader is referred to J. Beloch, *Campanien*, 2nd ed., pp. 442 ff., and to the commentators on Livy vii. 29 ff.

The Samnite towns in or near the upper valley of the Volturnus, namely, Telesia, Allifae, Aesernia, and the problematic Phistelia, learnt the art of striking coins from their neighbours in Campania, on the other side of the valley, Compulteria and Venafrum, in the 4th century B.C. (see Conway, *op. cit.* p. 196).

The Samnite alliance when it first appears in history, in the 4th century B.C., included those tribes which lay between the Paeligni to the N., the Lucani to the S., the Campani to the W., the Frentani and Apuli to the E.: that is to say, the Hirpini, Pentri and Caraceni, and perhaps also the Caudini (J. Beloch, *Italischer Bund*, p. 167, and R. S. Conway, *The Italic Dialects*, pp. 169 and 183); but with these are sometimes classed other friendly and kindred communities in neighbouring territory, like the Frentani and Atina (Liv. x. 39). But after the war with Pyrrhus the Romans for ever weakened the power of the Italic tribes by dividing this central mountainous tract into two halves. The territories of the Latin colony Beneventum (268 B.C.) and the Ager Taurasinus (Livy xl. 38, *C.I.L.*, 1st ed., i. 30) united that of Saticula on the W. (313 B.C.) to that of Luceria on the E., and cut off the Hirpini from their kinsmen by a broad belt of land under Latin occupation (Velleius Pat. i. 14; Liv. lx. 26). At the same time Allifae and Venafrum became praefectures (Fest. p. 233 M), and the Latin colony of Aesernia was founded in 263 B.C. in purely Samnite territory to command the upper Volturnus valley. We hear of no further resistance in the N. of Samnium till the general rising of Italy in 90 B.C.; but the more southerly Hirpini (*q.v.*) henceforth acted independently. (R. S. C.)

SAMOA, an archipelago in the Pacific Ocean, about 150 m. N. of Tonga and nearly midway between the New Hebrides and Tahiti, 1600 m. from Auckland (New Zealand), 2410 from Sydney and 4200 from San Francisco. (For Map, see Pacific Ocean.) It consists of 14 islands forming a slightly curved chain from W. by N. to E. by S., between 13° 30′ and 14° 30′ S., 168° and 173° W. as follows: Savaii, Manono, Apolima, Upolu, Fanuatapu, Manua, Nuutele and Nuulua, belonging to Germany, and Tutuila, Anua, Ofu, Olosenga, Tau and Rose, belonging to the United States of America. The principal of these are Savaii (area, 660 sq. m., pop. 13,200), Upolu (340 sq. m., pop. 18,400), Tutuila (54 sq. m., pop. 3800), and the Manua group, which includes Tau with Ofu and Olosenga (25 sq. m., pop. 2000). Some of the smaller islands are also thickly populated, so that the total population is about 39,000, whites numbering about 500. With the exception of Rose Island, which is an uninhabited coral islet 70 m. E. of its nearest neighbour, and therefore scarcely belongs geographically to the group, all the islands are considerably elevated, with several extinct or quiescent craters rising from 2000 ft. in Upolu to 4000 (Mua) in Savaii. Although there are no active cones, Upolu has in comparatively recent times been subject to volcanic disturbances, and according to a local tradition, outbreaks must have occurred in the 17th or 18th century. In 1866 a submarine volcano near the islet of Olosenga was the scene of a violent commotion, discharging rocks and mud to a height of 2000 ft. Earthquakes are not uncommon and sometimes severe. Coral reefs protect the coasts in many parts; they are frequently interrupted, but the passages through them are often difficult of navigation. The whole group is abundantly watered, and the igneous soil is marvellously fertile. The scenery of the islands is extremely beautiful. Upolu is long and narrow; it has a backbone of mountains whose flanks are scored with lovely valleys, at the foot of which are flat cultivable tracts. Of its harbours Apia and Saluafata, both on the N. coast, are most important. Mount Vaea, which overlooks Apia and Vailima, the home of Robert Louis Stevenson, is his burial-place and bears a monument to his memory. Tutuila, the principal island belonging to the United States, resembles Upolu, and has on its S. side the harbour of Pago Pago or Pango Pango, the finest in the group.

Climate, Flora, Fauna.—The climate is moist and sometimes oppressively hot, though pleasant on the whole. A fine season extends from April to September; a wet season from October to March. The temperature is equable—at Apia the mean annual temperature is 78° F., the warmest month being December (80°) and the coldest July (75°-76°). The prevalent winds, which temper the heat, are the S.E. trades, but W. winds supervene from January to March. The archipelago lies in the track of the fierce hurricanes which occur usually in this period. On the 16th of March 1889 the heavy tidal waves created havoc in the harbour of Apia. The American warship "Nipsic" was cast upon the beach, but was afterwards floated and saved. Two other United States warships, "Trenton" and "Vandalia," were beaten to pieces on the coral reef; and the German warships "Olga" and "Eber" were wrecked with great loss of life. The British warship "Calliope" (Captain Pearson) was in the harbour, but succeeded in getting up steam and, standing out to sea, escaped destruction. In *A Footnote to History* R. L. Stevenson vividly describes the heroism of the captain and crew.

The Samoan forests are remarkable for the size and variety of their trees, and the luxuriance and beauty of tree-ferns, creepers and parasites. The coco-nut palm and bread-fruit are of peculiar value to the inhabitants; there are sixteen varieties of the one, and twenty of the other. Hand timber trees, of use in boat-building, &c., are especially characteristic of Savaii.

Of the extremely limited Samoan fauna, consisting mainly of an indigenous rat, four species of snakes and a few birds, the most interesting member is the *Didunculus strigirostris*, a ground pigeon of iridescent greenish-black and bright chestnut plumage, which forms a link between the extinct dodo and the living African *Treroninae.*

Natives.—The Samoans are pure Polynesians, and according to the traditions of many Polynesian peoples Savaii was the centre of dispersion of the race over the Pacific Ocean from Hawaii to New Zealand. Apart from tradition, Samoan is the most archaic of all the Polynesian tongues, and still preserves the organic letter *s*, which becomes *h* or disappears in nearly all the other archipelagos. Thus the term *Savaii* itself, originally *Savaiki*, is supposed to have been carried by the Samoan wanderers over the ocean to Tahiti, New Zealand, the Marquesas and Sandwich groups, where it still survives in such variant forms as *Havaii*, *Hawaiki*, *Havaiki* and *Hawaii.* In any case, the Samoans are the most perfect type of Polynesians, of a light brown colour, splendid physique, and handsome regular features, with an average height of 5 ft. 10 in. Their mental and social standard is high among Pacific peoples; they are simple, honourable, generous and hospitable, but brave fighters. Their idolatry (polytheistic) was unaccompanied by human sacrifice. The dead were buried, and their spirits believed to travel to a world entered by a pool at the western extremity of Savaii. They have become mainly Protestants, Catholics or Mormons, but retain many superstitions connected with their native religion. The women and children are well treated. A youth is not regarded as eligible to marry till tattooed from the hips to the knees. The principal foods of the Samoans are vegetables, coco-nut, bread-fruit, fish and pork. They are famous as sailors and boat-builders. The Samoan language is soft and liquid in pronunciation, and has been called "the Italian of the Pacific." It is difficult to learn thoroughly, owing to its many inflexions and accents, and its being largely a language of idioms. (See also Polynesia.)

Administration and Trade.—The German islands form a crown colony. There is an imperial governor, having under him a native high chief assisted by a native council; and there are both German and native judges and magistrates. The United States, on assuming sovereignty over Tutuila and the islands E. of it in 1900, with the written consent of the native chiefs, appointed a naval governor. Cultivation has been extended under European and American rule, and in 1904 the exports from the German islands had reached a value of £83,750, and those from the American islands of £4200. Copra and cocoa beans are the chief articles of export.

History.—It is generally considered that the Manua group was sighted by the Dutch navigator Jacob Roggeveen in 1722, and named by him the Baaumann islands after the captain of one of his ships. Louis de Bougainville obtained a fuller acquaintance with the archipelago in 1768, and called them the Navigators' Islands (*Îles des Navigateurs*). This name is still used. La Pérouse was among the islands in 1787, and on Tutuila lost some of his crew in a conflict with some natives of Upolu visiting the island. Subsequent explorers were Captain Edwards of the "Pandora" in 1791, and Otto von Kotzebue in 1824. In 1830 the respected missionary John Williams paid his first visit to Samoa. Surveys of the archipelago were made by the American explorer Charles Wilkes. The islands, especially Upolu, now began to attract American and European (mostly German) capitalists, and the Hamburg firm of J. C. Godeffroy & Son developed the trade of the island. Meanwhile a series of petty civil wars greatly interfered with the prosperity of the native population, who grouped themselves into two opposing political parties. Americans and Europeans began to discuss the question of annexation, recognizing the importance of the geographical position of the islands. In 1877 the American consul hoisted his country's flag, but the action was repudiated by his government, which, however, in 1878 obtained Pago Pago as a coaling station and made a trading treaty with the natives. In 1879 Germany obtained the harbour of Saluafata. Great Britain followed suit, but under a political arrangement between the powers no single power was to appropriate the islands. But in 1887 and 1888 civil war prevailed on the question of the succession to the native kingship, the Germans supporting Tamasese, and the British and American residents supporting Malietoa. After the latter had been deported by the Germans, the British and American support was transferred to his successor, Mataafa. In the course of the fighting which ensued some fifty German sailors and marines were killed or wounded by the adherents of Mataafa. A conference between the three powers was thereupon held at Berlin, and a treaty was executed by those powers and by Samoa, on the 14th of June 1889, by virtue of which the independence and autonomy of the islands were guaranteed, Malietoa was restored as king, and the three powers constituted themselves practically a protectorate over Samoa, and provided a chief justice and a president of the municipality of Apia, to be appointed by them, to aid in carrying out the provisions of the treaty. The government was administered under this treaty, but with considerable friction, until the end of 1898, when, upon the death of Malietoa, two rival candidates for the throne again appeared, and the chief justice selected by the three powers decided against the claims of Mataafa, and in favour of a boy, Malietoa Tanu, a relative of the deceased Malietoa. Civil war immediately ensued, in which several American and British officers and sailors were killed by the natives, the Germans upholding the claims of Mataafa, and the British and Americans supporting the rival candidate. The three powers thereupon sent a commission to Samoa to investigate and adjust the difficulties. The situation, however, was found to be so complicated and embarrassing that, early in 1900, the so-called Berlin treaty was abrogated, Great Britain withdrew her claims to any portion of the islands and received compensation from Germany by concessions in other parts of the world, and the United States withdrew from all the islands W. of Tutuila. In 1902 the king of Sweden, as arbitrator under a convention signed at Washington in 1899, decided that Great Britain and the United States were liable for injuries due to action taken by their representatives during the military operations of 1899.

See Robert Louis Stevenson, *A Footnote to History* (London, 1892), and *Vailima Letters* (London, 1895); G. Turner, *Samoa a Hundred Years Ago and Long Before* (London, 1884); W. B. Churchward, *My Consulate in Samoa* (London, 1887); J. B. Stair, *Old Samoa* (London, 1897); Mary S. Boyd, *Our Stolen Summer* (London, 1900); L. P. Churchill, *Samoa ‘Uma’* (London, 1902); *Journal des museums Godeffroy* (Hamburg, 1871–1874); G. Kurze, *Samoa, das Land, die Leute und die Mission* (Berlin, 1899); O. Ehlers, *Samoa, die Perle der Südsee* (Berlin, 1900); F. Reinecke, *Samoa* (Berlin, 1901); A. Kramer, *Die Samoa Inseln* (Stuttgart, 1902 seq.); parliamentary papers, *Correspondence respecting the Affairs of Samoa* (London, 1899, &c.), and 1902 (*Samoa*, Cd. 1083) for the arbitration of the king of Sweden.

SAMOS, one of the principal and most fertile of the islands in the Aegean Sea that closely adjoin the mainland of Asia Minor, from which it is separated by a strait of only about a mile in width. It is about 27 m. in length, by about 14 in its greatest breadth, and is occupied throughout the greater part of its extent by a range of mountains, of which the highest summit, near its western extremity, called Mount Kerkis, is 4725 ft. high. This range is in fact a continuation of that of Mount Mycale on the mainland, of which the promontory of Trogilium, immediately opposite to the city of Samos, formed the extreme point. Samos is tributary to Turkey in the sum of £2700 annually, but otherwise is practically an independent principality, governed by a prince of Greek nationality nominated by the Porte. As chief of the executive power the prince is assisted by a senate of four members, chosen by him out of eight candidates nominated by the four districts of the island—Vathy, Chora, Marathocumbo and Carlovasi. The legislative power belongs to a chamber of 36 deputies, presided over by the metropolitan. The seat of the government is Vathy (6000). There is a telephone service. The island is remarkably fertile, and a great portion of it is covered with vineyards, the wine from the Vathy grapes enjoying a specially high reputation. There are three ports: Vathy, Tegani and Carlovasi. The population in 1900 was about 54,830, not comprising 15,000 natives of Samos inhabiting the adjoining coasts. The predominant religion is the Orthodox Greek, the metropolitan district including Samos and Icaria. In 1900 there were 634 foreigners on the island (523 Hellenes, 13 Germans, 29 French, 28 Austrians and 24 of other nationalities).

History.—Concerning the earliest history of Samos literary tradition is singularly defective. At the time of the great migrations it received an Ionian population which traced its origin to Epidaurus in Argolis. By the 7th century B.C. it had become one of the leading commercial centres of Greece. This early prosperity of the Samians seems largely due to the island's position near the end of the Maeander and Caÿster trade-routes, which facilitated the importation of textiles from inner Asia Minor. But the Samians also developed an extensive oversea commerce. They helped to open up trade with the Black Sea and with Egypt, and were credited with having been the first Greeks to reach the Straits of Gibraltar. Their commerce brought them into close relations with Cyrene, and probably also with Corinth and Chalcis, but made them bitter rivals of their neighbours of Miletus. The feud between these two states broke out into open strife during the Lelantine War (7th century B.C.), with which we may connect a Samian innovation in Greek naval warfare, the use of the trireme. The result of this conflict was to confirm the supremacy of the Milesians in eastern waters for the time being; but in the 6th century the insular position of Samos preserved it from those aggressions at the hands of Asiatic kings to which Miletus was henceforth exposed. About 535 B.C., when the existing oligarchy was overturned by the tyrant Polycrates (*q.v.*), Samos reached the height of its prosperity. Its navy not only protected it from invasion, but ruled supreme in Aegean waters. The city was beautified with public works, and its school of sculptors, metal-workers and engineers achieved high repute (see below). After Polycrates' death Samos suffered a severe blow when the Persians conquered and partly depopulated the island. It had regained much of its power when in 499 it joined the general revolt of the Ionians against Persia; but owing to its long-standing jealousy of Miletus it rendered indifferent service, and at the decisive battle of Lade (494) part of its contingent of sixty ships was guilty of downright treachery. In 479 the Samians led the revolt against Persia. In the Delian League they held a position of special privilege and remained actively loyal to Athens until 440, when a dispute with Miletus, which the Athenians had decided against them, induced them to secede. With a fleet of sixty ships they held their own for some time against a large Athenian fleet led by Pericles himself, but after a protracted siege were forced to capitulate and degraded to the rank of tributary state. At the end of the Peloponnesian War Samos appears as one of the most loyal dependencies of Athens; it served as a base for the naval war against the Peloponnesians, and as a temporary home of the Athenian democracy during the revolution of the Four Hundred at Athens (411 B.C.), and in the last stage of the war was rewarded with the Athenian franchise. This friendly attitude towards Athens was the result of a series of political revolutions which ended in the establishment of a democracy. After the downfall of Athens Samos was besieged by Lysander and again placed under an oligarchy. In 394 the withdrawal of the Spartan navy induced the island to declare its independence and re-establish a democracy, but by the peace of Antalcidas (387) it fell again under Persian dominion. It was recovered by the Athenians in 366 after a siege of eleven months, and received a strong body of military settlers. After the Samian War (322), when Athens was deprived of Samos, the vicissitudes of the island can no longer be followed. For some time (about 275–270 B.C.) it served as a base for the Egyptian fleet, at other periods it recognized the overlordship of Syria; in 189 B.C. it was transferred by the Romans to the kings of Pergamum. Enrolled from 133 in the Roman province of Asia, it sided with Aristonicus (132) and Mithradates (88) against its overlord, and consequently forfeited its autonomy, which it only temporarily recovered between the reigns of Augustus and Vespasian. Nevertheless, Samos remained comparatively flourishing, and was able to contest with Smyrna and Ephesus the title "first city of Ionia"; it was chiefly noted as a health resort and for the manufacture of pottery (see below). Under Byzantine rule Samos became the head of the Aegean *theme* (military district). After the 13th century it passed through much the same changes of government as Chios (*q.v.*), and, like the latter island, became the property of the Genoese firm of Giustiniani (1346–1566). At the time of the Turkish conquest it was severely depopulated, and had to be provided with new settlers, partly Albanians.

During the Greek War of Independence Samos bore a conspicuous part, and it was in the strait between the island and Mount Mycale that Canaris set fire to and blew up a Turkish frigate, in the presence of the army that had been assembled for the invasion of the island, a success that led to the abandonment of the enterprise, and Samos held its own to the very end of the war. On the conclusion of peace the island was indeed again handed over to the Turks, but since 1835 has held an exceptionally advantageous position, being in fact self-governed, though tributary to the Turkish empire, and ruled by a Greek governor nominated by the Porte, who bears the title of "Prince of Samos," but is supported and controlled by a Greek council and assembly. The prosperity of the island bears witness to the wisdom of this arrangement. Its principal article of export is its wine, which was celebrated in ancient times, and still enjoys a high reputation in the Levant. It exports also silk, oil, raisins and other dried fruits.

The ancient capital, which bore the name of the island, was situated on the S. coast at the modern Tigani, directly opposite to the promontory of Mycale, the town itself adjoining the sea and having a large artificial port, the remains of which are still visible, as are the ancient walls that surrounded the summit of a hill which rises immediately above it, and now bears the name of Astypalaea. This formed the acropolis of the ancient city, which in its flourishing times covered the slopes of Mount Ampelus down to the shore. The aqueduct cut through the hill by Polycrates may still be seen. From this city a road led direct to the far famed temple of Hera, which was situated close to the shore, where its site is still marked by a single column, but even that bereft of its capital. This fragment, which has given to the neighbouring headland the name of Capo Colonna, is all that remains standing of the temple that was extolled by Herodotus as the largest he had ever seen, and which vied in splendour as well as in celebrity with that of Diana at Ephesus. Though so little of the temple remains, the plan of it has been ascertained, and its dimensions found fully to verify the assertion of Herodotus, as compared with all other Greek temples existing in his time, though it was afterwards surpassed by the later temple at Ephesus.

The modern capital of the island was, until recently, at a place called Khora, about 2 m. from the sea and from the site of the ancient city; but since the change in the political condition of Samos the capital has been transferred to Vathy, situated at the head of a deep bay on the N. coast, which has become the residence of the prince and the seat of government. Here a new town has grown up, well built and paved, with a convenient harbour.

Samos was celebrated in ancient times as the birth-place of Pythagoras. His name and figure are found on coins of the city of imperial date. It was also conspicuous in the history of art, having produced in early times a school of sculptors, commencing with Rhoecus and Theodorus, who are said to have invented the art of casting statues in bronze. Rhoecus was also the architect of the temple of Hera. The vases of Samos are among the most characteristic products of Ionian pottery in the 6th century. The name Samian ware, often given to a kind of red pottery found wherever there are Roman settlements, has no scientific value. It is derived from a passage in Pliny, *N.H.* xxxv. 160 sqq. Another famous Samian sculptor was Pythagoras, who migrated to Rhegium.

See Herodotus, especially book iii.; Thucydides, especially books i. and viii.; Xenophon, *Hellenica*, books i. ii.; Strabo xiv. pp. 636-639; L. E. Hicks and G. F. Hill, *Greek Historical Inscriptions* (Oxford, 1901), No. 81; B. V. Head, *Historia Numorum* (Oxford, 1887), pp. 515-518; Panofka, *Res Samiorum* (Berlin, 1822); Curtius, *Urkunden zur Geschichte von Samos* (Wesel, 1873); H. F. Tozer, *Islands of the Aegean* (London, 1890); J. Boshlan, *Aus ionischen und italischen Nekropolen.* (E. H. B.; M. O. B. C.; E. Gr.)

SAMOSATA (Σαμόσατα, *-ατων*, Ptol. v. 15 § 11; Strabo xvi. 749), called in Arabic literature Sumeisāṭ,[1] is now represented by the village of Samsāṭ, occupying a corner of the ancient site. On a broad plain 1500 ft. above sea-level, Samosata practically marks the place where the mountain course of the Euphrates ends (see Mesopotamia). When the water is high enough it is possible to descend in a *kelek* in one day to Bīrejiḳ. The rocky banks contain many ancient cave-dwellings.

The stele found there and published by Humann and Puchstein (*Reisen in Kleinasien u. Nord-Syrien*, Atlas, plate xlix. 1-3) shows that it was at an early time a Hittite centre, probably marking an important route across the Euphrates: whether or not it was the place where later the Persian "royal road" crossed the Euphrates, in Strabo's time it was connected by a bridge with a Seleucia on the Mesopotamian side, and it is now connected by road with Severek and Diarbekr and with Raḳḳa, connecting further, through Edessa and Ḥarrān, with other eastward routes. The Hittite sculptured object referred to above shows influences of an Assyrian type (P. Jensen, *Hittiter u. Armenier*, 1898, 13); but no cuneiform text referring to Samosata by name seems yet to have been published. Kummukh, however, the district to which it belonged, was overrun by early Assyrian kings. In consequence of revolt it was made an Assyrian province in 708 B.C. When the Assyrian empire passed through the hands of Babylon and Persia into those of the successors of Alexander, Samosata was the capital of Kummukh, called in Greek Commagene. How soon it became a Greek city we do not know. Although its ruler Ptolemy renounced allegiance to Antiochus IV. the dynasty of Iranian origin which ruled at Samosata, described by Strabo (*l.c.*) as a fortified city in a very fertile if not extensive district, allied itself with the Seleucids, and bore the dynastic name of Antiochus. There, not long after the little kingdom was in A.D. 72 made a province by the Romans, and its capital received the additional name of Flavia (Suet. *Vesp.* 8; Eutrop. 8. 19), the celebrated Greek writer Lucian the Satirist was born in the 2nd century (see Lucian), and more than a century later another Lucian, known as the Martyr, and Paul called "of Samosata." The remains of a fine aqueduct that once brought water from the Kiakhta Chai, which begins some 6 m. above the town, are probably of the 3rd century A.D. (*Geog. Journ.* viii. 323). Under Constantine Samosata gave place as capital of Euphratensis to Hierapolis (Malal. *Chron.* xiii. p. 317). It was at Samosata that Julian had ships made in his expedition against Sapor, and it was a natural crossing-place in the struggle between Heraclius and Chosroes in the 7th century. Masʿūdi in the 10th century says it was known also as Ḳalʿat aṭ-Ṭīn ("the Clay Castle"). It was one of the strong fortresses included in the county of Edessa (*q.v.*). In the 13th century, according to Yāqūt, one of its quarters was exclusively inhabited by Armenians. It is now a Kurdish village, which in 1894 consisted of about 100 houses, three of which were Armenian (*Geog. Journ.* viii. 322).

SAMOTHRACE (Turk. *Semadrek*), an island in the N. of the Aegean Sea, nearly opposite the mouth of the Hebrus, and lying N. of Imbros and N.E. of Lemnos. The island is a kaza of the Lemnos sanjak, and has a population of 3500, nearly all Greek. It is still called Samothraki, and though of small extent is, next to Mount Athos, by far the most important natural feature in this part of the Aegean, from its great elevation—the group of mountains which occupies almost the whole island rising to the height of 5240 ft. Its conspicuous character is attested by a well-known passage in the *Iliad* (xiii. 12), where the poet represents Poseidon as taking post on this lofty summit to survey the plain of Troy and the contest between the Greeks and the Trojans. This mountainous character and the absence of any tolerable harbour—Pliny, in enumerating the islands of the Aegean, calls it "importuosissima omnium"—prevented it from ever attaining to any political importance, but it enjoyed great celebrity from its connexion with the worship of the Cabeiri (*q.v.*), a mysterious triad of divinities, concerning whom very little is known, but who appear, like all the similar deities venerated in different parts of Greece, to have been a remnant of a previously existing Pelasgic mythology. Herodotus expressly tells us that the "orgies" which were celebrated at Samothrace were derived from the Pelasgians (ii. 51). The only occasion on which the island is mentioned in history is during the expedition of Xerxes (B.C. 480), when the Samothracians sent a contingent to the Persian fleet, one ship of which bore a conspicuous part in the battle of Salamis (Herod. viii. 90). But the island appears to have always enjoyed the advantage of autonomy, probably on account of its sacred character, and even in the time of Pliny it ranked as a free state. Such was still the reputation of its mysteries that Germanicus endeavoured to visit the island, but was driven off by adverse winds (Tac. *Ann.* ii. 54).

After visits by travellers, including Cyriac of Ancona (1444), Richter (1822), and Kiepert (1842), Samothrace was explored in 1857 by Conze, who published an account of it, as well as the larger neighbouring islands, in 1860. The "Victory of Samothrace," set up by Demetrius Poliorcetes *c.* 305 B.C., was discovered in the island in 1863, and is now in the Louvre. The ancient city, of which the ruins are called Palaeopoli, was situated on the N. side of the island close to the sea; its site is clearly marked, and considerable remains still exist of the ancient walls, which were built in massive Cyclopean style, as well as of the sanctuary of the Cabeiri, and other temples and edifices of Ptolemaic and later date. The modern village is on the hill above. A considerable sponge fishery is carried on round the coasts by traders from Smyrna. On the N. coast are much-frequented hot sulphur springs. In 1873 and 1875 excavations were carried out under the Austrian government.

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[1] Not to be confused, as Yāqūt remarks, with Shamshāṭ, the classical Arsamosata (Ptol. v. 13).

Conze, *Reise auf den Inseln des Thrakischen Meeres* (Hanover, 1860); Conze, Hauser and Niemann, *Archäologische Untersuchungen auf Samothrake* (Vienna, 1875 and 1880); H. F. Tozer, *Islands of the Aegean* (London, 1890).

SAMOVAR (Russ. *samovarŭ*), an urn for making tea after the Russian fashion; it is usually of copper, and is kept boiling by a tube filled with live charcoal passing through the centre. The word is usually taken in Russia to mean "self-boiler" (*samŭ*, self, and *baritĭ*, boil), but it is more probably an adaptation of a Tatar word *sanabar*, a tea-urn.

SAMOYEDES, a tribe of the Ural-Altaic group, scattered in small groups over an immense area, from the Altai mountains down the basins of the Ob and Yenisei, and along the shores of the Arctic ocean from the mouth of the latter river to the White Sea. The tribe may be subdivided into three main groups: (*a*) The Yuraks in the coast-region from the Yenisei to the White Sea; (*b*) the Tavghi Samoyedes, between the Yenisei and the Khatanga; (*c*) the Ostiak Samoyedes, intermingled with Ostiaks, to the S. of the others, in the forest regions of Tobolsk and Yeniseisk. Their whole number may be estimated at from 20,000 to 25,000. The so-called Samoyedes inhabiting the S. of the governments of Tomsk and Yeniseisk have been much under Tatar influence and appear to be of a different stock; their sub-groups are the Kamasin Tatars, the Kaibals, the Motors, the Beltirs, the Karagasses and the Samoyedes of the middle Ob.

The proper place of the Samoyedes among the Ural-Altaians is very difficult to determine. As to their present name, signifying in its present Russian spelling "self-eaters," many ingenious theories have been advanced, but that proposed by Schrenk, who derived the name "Samo-yedes" from "Syroyadtsy," or "raw-eaters," leaves much to be desired. Perhaps the etymology ought to be sought in quite another direction, namely, in the likeness to Suomi. The names assumed by the Samoyedes themselves are Hazovo and Nyänyäz. The Ostiaks know them under the names of Orghoy, or Workho, both of which recall the Ugrians; the name of Hui is also in use among the Ostiaks, and that of Yaron among the Syrgenians.

The language now spoken by the Samoyedes belongs to the Finno-Ugrian group, and is allied to Finnish but has a more copious system of suffixes (see FINNO-UGRIC). It is a sonorous speech, pleasant to the ear. No fewer than three separate dialects and a dozen sub-dialects are known in it.

The conclusions deducible from their anthropological features—apart from the general difficulty of arriving at safe conclusions on this ground alone, on account of the variability of the ethnological type under various conditions of life—are also rather indefinite. The Samoyedes are recognized as having the face more flattened than undoubtedly Finnish stocks; their eyes are narrower, their complexion and hair darker. Zuyev describes them as like the Tunguses, with flattened nose, thick lips, little beard and black, hard hair. At first sight they may be mistaken for Ostiaks—especially on the Ob—but they are undoubtedly different. Castrén considers them as a mixture of Ugrians with Mongolians, and Zograf as brachycephalic Mongolians. Quatrefages classes them, together with the Voguls, as two families of the Ugrian sub-branch, this last, together with the Sabmes (Lapps), forming part of the Ugrian or Boreal branch of the yellow or Mongolic race.

It is probable that formerly the Samoyedes occupied the Altai mountains, whence they were driven N. by Turco-Tatars. Thus, the Kaibals left the Sayan mountains and took possession of the Abakan steppe (Minusinsk region), abandoned by the Kirghizes, in the earlier years of last century, and in N.E. Russia the Zyrians are still driving the Samoyedes farther N., towards the Arctic coast. Since the researches of Schrenk it may be regarded as settled that in historical times the Samoyedes were inhabitants of the so-called Ugria in the northern Urals, while Radlov considers that the numberless graves containing remains of the Bronze Period which are scattered throughout W. Siberia, on the Altai, and on the Yenisei in the Minusinsk region, are relics of Ugro-Samoyedes. According to his views this nation, very numerous at that epoch—which preceded the Iron-Period civilization of the Turco-Tatars,—were pretty well acquainted with mining; the remains of their mines, sometimes 50 ft. deep, and of the furnaces where they melted copper, tin and gold, are very numerous; their weapons of a hard bronze, their pots (one of which weighs 75 ℔), and their melted and polished bronze and golden decorations testify to a high development of artistic feeling and industrial skill, strangely contrasting with the low level reached by their earthenware. They were not nomads, but husbandmen, and their irrigation canals are still to be seen. They kept horses (though in small numbers), sheep and goats, but no traces of their rearing horned cattle have yet been found. The Turkish invasion of S. Siberia, which took place in the 5th century, drove them farther N., and probably reduced most of them to slavery.

The Samoyedes, who now maintain themselves by hunting and fishing on the lower Ob, partly mixed in the S. with Ostiaks, recall the condition of the inhabitants of France and Germany at the epoch of the reindeer. Clothed in skins, like the troglodytes of the Weser, they make use of the same implements in bone and stone, eat carnivorous animals—the wolf included—and cherish the same superstitions (of which those regarding the teeth of the bear are perhaps the most characteristic) as were current among the Stone-Period inhabitants of W. Europe. Their heaps of reindeer horns and skulls—memorials of religious ceremonies—are exactly similar to those dating from the similar period of civilization in N. Germany. Their huts often resemble the well-known stone huts of the Esquimaux; their graves are mere boxes left in the tundra. The religion is fetishism mixed with Shamanism, the shaman (*tadji-bei*) being a representative of the great divinity, the Num. The Yalmal peninsula, where they find great facilities for hunting, is especially venerated by the Ob Ostiak Samoyedes, and there they have one of their chief idols, Khese. They are more independent than the Ostiaks, less yielding in character, although as hospitable as their neighbours. They are said to be disappearing owing to the use of ardent spirits and the prevalence of smallpox. They still maintain the high standard of honesty mentioned by historical documents, and never will take anything left in the tundra or about the houses by their neighbours. The Yurak Samoyedes are courageous and warlike; they offered armed resistance to the Russian invaders, and it is only since the beginning of the century that they have paid tribute. The exact number of the Ostiak Samoyedes is not known; the Tavghi Samoyedes may number about 1000, and the Yuraks, mixed with the former, are estimated at 6000 in Obdorsk (about 150 settled), 5000 in European Russia in the tundras of the Mezeñ, and about 350 in Yeniseisk.

Of the S. Samoyedes, who are completely Tatarized, the Beltirs live by agriculture and cattle-breeding in the Abakan steppe. They profess Christianity, and speak a language closely resembling that of the Sagai Tatars. The Kaibals, or Koibals, can hardly be distinguished from the Minusinsk Tatars, and support themselves by rearing cattle. Castrén considers that three of their stems are of Ostiak origin, the remainder being Samoyedic. The Kamasins, in the Kansk district of Yeniseisk, are either herdsmen or agriculturists. They speak a language with an admixture of Tatar words, and some of their stems contain a large Tatar element. The interesting nomadic tribe of Karagasses, in the Sayan mountains, is disappearing; the few representatives are rapidly losing their anthropological features, their Turkish language and their distinctive dress. The Motors are now little more than a memory. One portion of the tribe emigrated to China and was there exterminated; the remainder have disappeared among the Tuba Tatars and the Soyotes. The Samoyedes on the Ob in Tomsk may number about 7000; they have adopted the Russian manner of life, but have difficulty in carrying on agriculture, and are a poverty-stricken population with little prospect of holding their own.

The works of M. A. Castrén are still the best authority on the Samoyedes. See *Grammatik der samoyedischen Sprachen* (1854); *Dictionary* (1855); *Ethnologische Vorlesungen über die altaischen Völker* (1857); *Versuch einer koibalischen und karagassischen Sprachlehre* (1857). See also A. Middendorf, *Reise in den äussersten Norden und Osten Sibiriens* (1875).

SAMPAN, the name of the typical light boat of far Eastern rivers and coastal waters; it is usually propelled by a single scull over the stern, and the centre and after part is covered by an awning or screen of matting. The word is said to be Chinese, *san*, thin, and *pan*, board. Others take it to be of Malay origin.

SAMPIERDARENA (*San Pier d'Arena*, *i.e.* St Peter of the Sands), a town of Liguria, Italy, in the province of Genoa, 2½ m. by rail W. of the city of that name, 16 ft. above sea-level. Pop. (1906) 37,582 (town); 43,654 (commune). It is practically a suburb of Genoa and contains a number of handsome palaces, including the Palazzo Spinola and the Palazzo Scassi, both probably built by G. Alessi. It has become a place of great industrial and commercial activity, the Ansaldo ship-building yard being the most important of its workshops. Near the neighbouring town of Cornigliano is a bridge, where Masséna signed the capitulation of Genoa.

SAMPLE (through the O. Fr. *essemple*, from Lat. *exemplum*; a doublet of "example"), a small portion of merchandise taken from the whole to serve as a specimen or evidence of the whole; hence a pattern or model. Sale by sample obviates the necessity on the part of sellers of keeping large quantities of goods on premises unsuitable for storage, and on the part of buyers of having to make a special visit to inspect the goods in bulk. The sale of goods by sample is dealt with in England by the Sale of Goods Act 1893, s. 15, which provides that a contract of sale shall be a contract for sale by sample where there is a term in the contract, express or implied, to that effect. In the case of such a contract, there must be (*a*) an implied condition that the bulk shall correspond with the sample in quality; (*b*) an implied condition that the buyer shall have a reasonable opportunity of comparing the bulk with the sample; (*c*) an implied condition that the goods shall be free from any defect, rendering them unmerchantable, which would not be apparent on reasonable examination of the sample. (See also SALE OF GOODS.)

SAMPLER (from O. Fr. *essemplaire*, with dropping of initial *a*, Late Lat. *exemplariam*, from *exemplum*, example; it is a doublet of "examplar" or "exempler," as "sample" is of "example"), a model or pattern to be copied, particularly a small rectangular piece of embroidery worked on canvas or other material as a pattern or example of a beginner's skill in needlework, as a means of teaching the stitches. Down to comparatively recent times every little girl worked her "sampler," and examples of 17th-century work are still found and have become the object of the collector's search. They usually contained the alphabet, the worker's name, the date, and Bible texts, verses, mottoes, the whole surrounded with some conventional design.

The earliest sampler in existence is dated 1643 and is in the Victoria and Albert Museum, South Kensington (see M. B. Huish, *Samplers and Tapestry Embroideries*, 1900, and *List of Samplers in the Victoria and Albert Museum, South Kensington*, Board of Education, South Kensington, 1906).

SAMPSON, WILLIAM THOMAS (1840–1902), American naval commander, was born at Palmyra, New York, on the 9th of February 1840, and graduated at the head of his class from the U.S. Naval Academy in 1861. In this year he was promoted to master, and in the following year was made lieutenant. He was executive officer in the "Patapsco" when she was blown up in Charleston Harbor in January 1865. He served on distant stations and (1868–1871 and 1876–1878) at the Naval Academy, and became lieutenant-commander in 1866 and commander in 1874. He was a member of the International Prime Meridian and Time Conference in 1884, and of the Board of Fortifications in 1885–1886; was superintendent of the Naval Academy from 1886 to 1890; and was promoted to captain and served as delegate at the International Maritime Conference at Washington in 1889. He was chief of the Bureau of Ordnance in 1893–1897. About 95% of the guns employed in the Spanish-American War were made under his superintendence. His influence was felt decisively in the distribution of guns and armour, and in the training of the *personnel* of the navy. He superintended the gunnery training and prepared a new drill-book for the fleet. In February 1898 Sampson, then a captain, was president of Board of Inquiry as to the cause of destruction of the "Maine." At the outbreak of the war with Spain he was placed in charge of the N. Atlantic squadron, and conducted the blockade of Cuba. When it was known that Admiral Cervera, with a Spanish fleet, had left the Cape Verde Islands, Sampson withdrew a force from the blockade to cruise in the Windward Passage, and made an attack upon the forts at San Juan, Porto Rico. After his return to the coast of Cuba he conducted the blockade of Santiago, and the ships under his command destroyed the Spanish vessels when they issued from the harbor of Santiago and attempted to escape (see SPANISH-AMERICAN WAR). Sampson himself was not actually present at the battle, having started for Siboney just before it began to confer with General Shafter, commanding the land forces. He reached the scene of battle as the last Spanish vessel surrendered, and the engagement was fought in accordance with his instructions. He was promoted to commodore in 1898, to rear-admiral on the 3rd of March 1899, and was made commandant of the Boston (Charlestown) Navy Yard in October of the same year. He died on the 6th of May 1902.

SAMSON (cf. Heb. *shĕmesh*, "sun"), in the Bible, the antagonist of the Philistines, reckoned as one of the "judges" of Israel (Judg. xv. 20, xvi. 31); the story itself (Judg. xiii. 2–xvi. 31*a*), however, represents him not as a judge but as a popular hero of vast strength and sarcastic humour. He is consecrated from his birth to be a Nazarite or religious devotee (ch. xiii., cf. Samuel), and it is possible that this was conceived simply as a vow of revenge, which is the meaning it would have in an Arab story (W. R. Smith). But he is inspired by no serious religious or patriotic purpose, and becomes the enemy of the Philistines only from personal motives of revenge, the one passion which is stronger in him than the love of women. The stories of his exploits are plainly taken from the mouths of the people and have all the appearance of folk-tales, not unmixed with mythical motives. Samson commenced his career by strangling a lion on his way to visit a Philistine woman. On his return he found that the carcase, like the skull of Onesilus (Herod. v. 114), was occupied by a swarm of bees; he took the honey and the incident suggested a riddle. The narrative of Samson's marriage and riddle is of peculiar interest as a record of manners; specially noteworthy is the custom of the wife remaining with her parents after marriage.[1] His next exploit, an act of revenge for the faithlessness of his wife, was to catch 300 foxes and set them loose in the fields with firebrands tied to their tails. (Analogous customs, *e.g.* the Roman Cerealia, are referred to in G. F. Moore's *Commentary*, p. 341.) The Philistines retaliated by burning her and her father's household, and Samson in his turn smote them "hip and thigh" and slew a thousand men with the jawbone of an ass.[2] The story has apparently been influenced by the existence of a rock, called by reason of its shape, "Ass's Jawbone," from which issued a fountain called *En-hakkōrē*, "the spring of the caller" (a name for the partridge). The well-known removal of the gates of Gaza to Hebron, 40 m. distant—"no journey of the Sabbath-day" (Milton, *Samson Agonistes*)—has been rendered still more marvellous by a later exaggeration (xvi. 2). Finally the Philistine Delilah (*q.v.*) worms out of Samson the secret of his strength, and by shaving his head[3] renders him an easy captive. He is blinded and put to menial work, and as his hair grows again his invincible strength returns. At a festival of Dagon he is led out before the Philistines in the temple, and by pulling down the house upon their heads kills more at his death than in all his life-time.

Points of similarity between Samson and the Babylonian Gilgamesh, the Egyptian Horus-Ra and Hercules, have been observed by many writers, and it has been inferred that the whole story of Samson is a solar myth. His name, and the proximity of Beth-shemesh ("house of the sun") to his father's home, favour the view that mythical elements have attached themselves to what may have been originally a legendary figure of the Danites, the tribe whose subsequent fortunes are narrated in the chapters immediately following (Judg. xvii.–xviii.).

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[1] In Judg. xiv. 1-10 the narrative has been revised; originally Samson went down alone to Timnath to contract his marriage. The metrical riddle and its answer are thus translated by G. F. Moore (*Sacred Books of the Old Testament: Judges*):

> "Out of the eater came something to eat,
> And out of the strong came something sweet."
>
> "If with my heifer ye did not plough,
> Ye had not found out my riddle, I trow."

No doubt the Hebrews, like the Arabs, were fond of enigmas; see 1 Kings x. 1, and *Ency. Biblica*, *s.v.* "Riddle."

[2] The punning couplet of the original is thus rendered by G. F. Moore: "with the jawbone of an ass, I assailed my assailants" (more literally "I piled them in heaps," or perhaps "flayed them clean").

[3] For the hair as the seat of strength cf. J. G. Frazer, *Golden Bough*,^{2} iii. 390 seq. In ch. xiii. the consecration of the hair is regarded differently.

On the mythological interpretations, see further Ed. Stucken, *Mitteil. d. vorderasiat. Gesells.* (1902), iv. 54 (with references); Völter, *Ägypten und die Bibel* (Leiden, 1909), pp. 119-132; A. Jeremias, *Alte Testament im Lichte des alten Orients* (Leipzig, 1906), pp. 478 sqq., and the commentaries on the Book of JUDGES (*q.v.*). (S. A. C.)

SAMSON (1135–1211), abbot of St Edmund's, was educated in Paris and became a teacher in Norfolk, the county of his birth. In 1166 he entered the great Benedictine abbey of St Edmund's as a monk and was chosen abbot in February 1182. He was a careful and vigilant guardian of the property of the abbey, but he found time to attend royal councils and to take part in public business; also he was frequently entrusted with commissions from the pope. During the absence of Richard I. from England he acted with vigour against John and visited the king in his prison in Germany. He did some building at the abbey, where he died on the 30th of December 1211. Samson is famous for the encouragement which he gave to the town of Bury St Edmunds, the liberties of which he extended in spite of his own monks. His name is most familiar owing to the references to him in Carlyle's *Past and Present*.

See the chronicle of Jocelyn of Brakeloud in vol. i. of the *Memorials of St Edmund's Abbey*, edited by T. Arnold (1890); and J. R. Green, *Stray Studies* (1892).

SAMSON, JOSEPH ISIDORE (1793–1871), French actor and playwright, was born at St Denis on the 2nd of July 1793, the son of a restaurant keeper. He took the first prize for comedy at the Conservatoire in 1812, married an actress with whom he toured France, and came to the Comédie Française in 1826. Here he remained until 1863, creating more than 250 parts. He became a professor at the Conservatoire in 1829, and under him Rachel, Rose Chéri (1824–1861), the Brohans and others were trained. He wrote several comedies, among them *La Belle-Mère et le gendre* (1826), and *La Famille poisson* (1846). Samson died in Paris on the 28th of March 1871.

SAMSUN (anc. *Amisus*), the chief town of the Janik sanjak of the Trebizond vilayet of Asiatic Turkey, situated on the S. coast of the Black Sea between the deltas of the Kizil and Yeshil Irmaks. Pop. about 15,000, two-thirds Christian. It is connected by metalled roads with Sivas and Kaisarieh, and by sea with Constantinople. It is a thriving town, and the outlet for the trade of the Sivas vilayet. Steamers lie about 1 m. from the shore in an open roadstead, and in winter landing is sometimes impossible. Its district is one of the principal sources of Turkish tobacco, a whole variety of which is known as "Samsun." Samsun exports cereals, tobacco and wool. Both exports and imports are about stationary, the Angora railway having neutralized any tendency to rise. Amisus, which stood on a promontory about 1½ m. N.W. of Samsun, was, next to Sinope, the most flourishing of the Greek settlements on the Euxine, and under the kings of Pontus it was a rich trading town. By the 1st century A.D. it had displaced Sinope as the N. port of the great trade route from Central Asia, and later it was one of the chief towns of the Comneni of Trebizond. There are still a few remains of the Greek settlement. (D. G. H.)

SAMUEL, a prominent figure in Old Testament history, was born at Ramah and was dedicated to the service of Yahweh at the sanctuary of Shiloh where his youth was spent with Eli (*q.v.*).[1] Here he announced the impending fate of the priesthood and gained reputation throughout Israel as a prophet. Best known as "king-maker," two distinct accounts are preserved of his share in the institution of the monarchy. In one, the Philistines overthrow Israel at Ebenezer near Aphek, Eli's sons are slain, and the ark is captured (1 Sam. iv.). After a period of oppression, Samuel suddenly reappears as a great religious leader of Israel, summons the people to return to Yahweh, and convenes a national assembly at Mizpah. The Philistines are defeated at Ebenezer (near Mizpah) through the direct interposition of Yahweh, and Samuel rules peacefully as a theocratic judge (vii). But in his old age the elders demand a king, his sons are corrupt, a monarchy and a military leader are wanted (viii. 3, 5, 20). The request for a monarchy is a deliberate offence against Yahweh (viii. 7, cf. x. 19, xii. 12); nevertheless, an assembly is called, and the people are warned of the drawbacks of monarchical institutions (viii. 11-21; note the milder attitude in Deut. xvii. 14-20). At Mizpah, after another solemn warning, the sacred lot is taken and falls upon Saul of Benjamin, who, however, is not at first unanimously accepted (x. 17-27*a*). About a month later (x. 27*b*; see Revised Version, margin), Saul—with Samuel (xi. 7)—leads an army of Israel and Judah to deliver Jabesh-Gilead from the Ammonites, and is now recognized as king. Samuel in a farewell address formally abdicates his office, reviews the past history, and, after convincing the people of the responsibility they had incurred in choosing a king, promises to remain always their intercessor (xii., cf. Jer. xv. 1). So, according to one view, Samuel's death marks a vital change in the fortunes of Israel (xxv. 1, xxviii. 3, 6, 15). But, according to an earlier account, instead of a state of peace after the defeat of the Philistines (vii. 14) the people groan under their yoke, and the position of Israel moves Yahweh to pity. Samuel is a local seer consulted by Saul, and is bidden by Yahweh to see in the youth the future ruler. Saul is privately anointed and receives various signs as proof of his new destiny (ix. 1–x. 16). Despite the straitened circumstances of Israel, an army is mustered, a sudden blow is struck at the Philistines, and, as before, supernatural assistance is at hand. The Hebrews who had fled across the Jordan (xiii. 7), or who had sought refuge in caverns (xiii. 6, xiv. 11), or had joined the enemy (xiv. 21), rallied together and a decisive victory is obtained. That these two accounts are absolutely contradictory is now generally recognized by Biblical scholars, and it is to the former (and later) of them that the simple story of Samuel's youth at Shiloh will belong. Next we find that Samuel's interest on behalf of the Israelite king is transferred to David, the founder of the Judaean dynasty, and it is his part to announce the rejection of Saul and Yahweh's new decision (xiii. 7*b*-15*a*, xv. 10-35, xxviii. 17), to anoint the young David, and, as head of a small community of prophets, to protect him from the hostility of Saul (xvi. 1-13, xix. 18-24).

All these features in the life of Samuel reflect the varying traditions regarding a figure who, like Elijah and Elisha, held an important place in N. Israelite history. That he was an Ephrathite and lived at Ramah may only be due to the incorporation of one cycle of specifically local tradition; the name of his grandfather Jeroham (or Jeraḥmeel, so Septuagint) suggests a southern origin, and one may compare the relation between Saul and the Kenites (1 Sam. xv. 6) or Jehu and the Rechabites (2 Kings x. 15). But, although his great victory in 1 Sam. vii. may imply that he was properly a secular leader, comparable to Othniel, Gideon or Jephthah (see 1 Sam. xii. 11, cf. Heb. xi. 32), the idea of non-hereditary rulers over all Israel in the pre-monarchical age is a later theory (see JUDGES). However, so epoch-making an event as the institution of the monarchy naturally held a prominent place in later ideas and encouraged the growth of tradition. The Saul who became the first king of N. Israel must needs be indebted to the influence of the prophet (cf. Jehu in 2 Kings ix.). While the figure of Samuel grows in grandeur, the disastrous fate of Saul invited explanation, which is found in his previous acts of disobedience (1 Sam. xv., xxviii. 16–18; cf. Ahab, 1 Kings xx. 35-43). Further, while on the one side the institution of the monarchy is subsequently regarded as hostile to the preeminence of Yahweh, Samuel's connexion with the history of David belongs to a relatively late stage in the history of the written traditions where events are viewed from a specifically Judaean aspect. Samuel's name ultimately becomes a by-word for the inauguration and observance of religious custom (see 1 Chron. ix. 22, xxvi. 28, 2 Chron. xxxv. 18, Ps. xcix. 6, Ecclus. xlvi. 13 sqq.). According to the late post-exilic genealogies he was of Levitical origin (1 Chron. vi. 28, 33). See further DAVID; SAMUEL, BOOKS OF; SAUL. (S. A. C.)

SAMUEL OF NEHARDEA, usually called MAR SAMUEL or YARḤINAI (*c.* 165–*c.* 257), Babylonian Rabbi, was born in Nahardea in Babylonia and died there *c.* 257. He is associated with the fame of his great contemporary Rab (Abba Araka *q.v.*). Besides his mastery in the traditional Law, which added much to the growing reputation of the Rabbinic Academy of his native town, Samuel was famed for his scientific attainments. In particular his knowledge of astronomy was profound, and he was one of the first to compile a Calendar of the Jewish year, thus preparing the way for the fixation of the festivals by means of scientific calculations. But Samuel's fame rests on the service which he rendered in adapting the life of the Jews of the diaspora to the law of the land. "The law of the State is binding law," was the principle which Samuel enunciated, here carrying to its logical outcome the admonition of Jeremiah. When the king of Persia, Shapur, captured Mazaca-Caesarea, the Cappadocian capital, Samuel refused to mourn for the 12,000 Jews who lost their lives in its defence. As Graetz says: "To Jeremiah and Mar Samuel Judaism owes the possibility of existence in a foreign country."

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[1] The name Samuel (*Shĕmū'ēl*), on the analogy of Penuel, Reuel, seems to mean "name (*i.e.* manifestation) of El" (God). Other interpretations are "posterity of God" or "his name (*shĕmō*; perhaps Yahweh's) is God." "Heard of God," based on 1 Sam. i. 20, is quite impossible and the interpretation of the passage is really only appropriate to Saul ("the asked one"): the two names are sometimes confused in the Septuagint (*Ency. Bib.* col. 4303, n. 3). Ramah is presumably er-Rām, 5 m. N. of Jerusalem (probably the Arimathaea of Matt. xxvii. 57), or Bēt Rīma, W. of Jiljilia (Gilgal), and N.W. of Beitīn, *i.e.* Bethel (cf. the Ramathaim of 1 Macc. xi. 34).

See Graetz, *History of the Jews* (English translation), vol. ii. ch. xix. (I. A.)

1. Position and contents.

SAMUEL, BOOKS OF, two books of the Old Testament, which in the Jewish canon are ranked among the Former Prophets (Joshua-Kings), in contrast to the Latter Prophets (Isaiah-Malachi). The division into two (like the two Hebrew books of Kings) follows the Septuagint and the Vulgate, whose four books of "kingdoms" correspond to the Hebrew books of Samuel and Kings. Both Samuel and Kings, like Judges, are made up of a series of extracts and abstracts from various sources, worked over from time to time by successive editors, and freely handled by copyists down to a comparatively late date, as is shown by the numerous and often important variations between the Hebrew text and the Greek version (Septuagint). The main redaction of Judges and Kings was made under the influence of the ideas which characterize Deuteronomy, that is, after the reforms ascribed to Josiah (2 Kings xxiii.); but in Samuel the "Deuteronomistic" hand is much less prominent and the chronological system which runs through Judges and Kings occurs only sporadically. The book of Samuel completes the history of the "judges" of Israel, (11th century B.C.), and begins by relating the events which led to the institution of the monarchy under Saul, the part played by Samuel being especially prominent (1 Sam. i.–xiv.). The interest is then transferred to David, the founder of the Judaean dynasty, and his early life is narrated with great wealth of detail. As Saul loses the divine favour, David's position advances until, after the death of Saul and the overthrow of Israel, he gains the allegiance of a disorganized people (1 Sam. xv.–2 Sam. iv.), and Jerusalem becomes the centre of his empire (v.–viii.) —*c.* 1000 B.C. A more connected narrative is now given of the history of David (ix.–xx.), which is separated from the account of his death and Solomon's accession (1 Kings i. ii.) by an appendix of miscellaneous contents (xxi.-xxiv.). Three lines of interest are to be recognized: (*a*) that naturally taken by Israel (the northern kingdom) in the history of its first king, Saul; (*b*) the leading position of the prophets in the political and religious events; and (*c*) the superiority of the Judaean dynasty, a feature of paramount importance in the study of a book which has come ultimately through Judaean hands. (On the ambiguity of the name "Israel," see JEWS, § 5.)

Proof of the diversity of sources is found in the varying character of the narratives (historical, romantic, &c.); in the different literary styles (annalistic, detailed and vivid, Deuteronomic); in the representation of different standpoints and tastes; in the concluding summaries, 1 Sam. xiv. 47-51 compared with xv., 2 Sam. viii. compared with x.; in the double lists in 2 Sam. viii. 15-18, xx. 23-26, &c. The religious views are so varied that a single writer or even a single age cannot be postulated; note especially 1 Sam. xv. 22 seq. contrasted with the use of teraphim in xix. 13, and the different conceptions of Yahweh (1 Sam. xii. 21 seq., xv. 22 and xxvi. 19, &c.).[1] Unsystematic additions appear to have been made from time to time on a considerable scale, and we not seldom find two accounts of the same events which not only differ in detail but are certainly of very different date. Thus, the saying "Is Saul also among the prophets?" (1 Sam. x. 12) finds another explanation in xix. 18-24, where Samuel holds a new position as head of a community of prophets and the words are adapted to an incident in the history of David, who flees *north* (not south) and is wondrously preserved. The episode, with the interview between Saul and Samuel, and with its interesting attitude to Saul and to the prophets, was evidently unknown to the writer of xv. 35. Other and more profound differences relating to the rise of the monarchy (§ 2), the career of Saul (§ 3) and David's conquest of Jerusalem (§ 4) represent irreconcilable historical background.

2. Institution of the monarchy.

The first part of the book is concerned with *Samuel and Saul*. The introductory account (i.-iv. 1*a*) of the birth, dedication and calling of the young prophet Samuel is a valuable picture of religious life at the sanctuary at Shiloh. It is connected by the prophecy of the punishment of the house of Eli (iii. 11 sqq.) with the defeat of the Israelites by the Philistines at Ebenezer near Aphek, the loss of the ark (iv. 1*b*-22), and its subsequent fortunes (v.–vii. 1). A Philistine oppression of twenty years ends when Samuel, here the recognized "judge" of Israel, gains a great victory at Ebenezer near Mizpah (vii.). But the overthrow of the Philistines is also ascribed to Saul (xiv.), there is no room for both in the history of the prophet (see vii. 14), and it is now generally recognized that two conflicting representations have been combined. In one (*a*) Samuel, after his victory, continues to rule peacefully as a theocratic judge over the Israelites, the people demand a king, and although their request is viewed as hostile to the worship of Yahweh the tribes are summoned at Mizpah and the sacred lot falls upon Saul of Benjamin (vii. viii. x. 17-27). But in the other (*b*) the Philistines have occupied the heart of the land, the Israelites are thoroughly disorganized, and their miserable condition moves Yahweh to send as a deliverer the otherwise unknown Saul, who is anointed by Samuel, a seer of local renown (ix. 1–x. 16, xiii. xiv.). The conclusion of the former is found in Samuel's farewell address (xii.) and the entire representation of Samuel's position, Saul's rise, and the characteristic attitude towards the monarchy (viii. 7, x. 19, xii. 12, cf. Deut. xvii. 14-20, Judg. viii. 22 seq., Hos. viii. 4, xiii. 11), separate it sharply from the relatively fragmentary narrative in (*b*); see further SAMUEL. The former, now predominating, account (*a*) is that of the Deuteronomic school, and, although a running narrative, appears on closer inspection to be based upon earlier sources of different origin. The account of Eli, Shiloh and the ark (i.–iii.) is the natural prelude to iv.–vii. 1, where, however, we lose sight of Samuel and the prophecy. The punishment of Eli and his sons (iv.) becomes a passing interest, and the fate of the ark is by no means so central an idea as its wonder-working in the Philistine territory. Moreover, the sequel of the defeat in iv. is not stated, although other allusions to the fall of Shiloh (Jer. vii. 12-15, xxvi. 6, 9, Ps. lxxviii. 60 sqq.), and the subsequent reappearance of the priestly family at Nob (xxi. seq.) have led most scholars to the conclusion that a fuller account of the events must have been extant. A narrative of Eli and the priesthood of Shiloh has probably been used to form an introduction to Samuel's victory (vii.), and it has been supplemented partly by the account of the early life of the future prophet and judge (note the present abrupt introduction of Eli in i. 3) and partly by narratives of the history of the ark (v. seq.). That this section was handled at a relatively late period is clear not only from the presence of the Deuteronomic prophecy in ii. 27-36 (see § 6), but also from the insertion of Hannah's psalm (ii. 1-10)—the prototype of the "Magnificat"—a post-exilic passage, "probably composed in celebration of some national success" (Driver), the present suitability of which rests upon the interpretation placed on verse 5.

For the more fragmentary account of Saul's rise (ix. 1–x. 16, xiii. 2-7*a*, 15*b*-23, xiv. 1-47), see above, page 194. Chapter xi., where he leads Israel and Judah to the rescue of their kinsmen of Jabesh-Gilead, represents a situation which belongs to (*a*) rather than to the state of chaos represented in (*b*); it describes how the newly-elected king proved his worth (cf. x. 27; xi. 12 seq.). The compiler has used a story in which Saul is a private individual of Gibeah, whither the messengers came in the course of their mission (xi. 4 seq.). This valuable narrative is of quite distinct origin. Further, Samuel's speech includes himself among the past judges (xii. 11, cf. vii.), and refers to an Ammonite invasion (*v.* 12). The latter finds no place in the present history, although the local story of Jephthah's deliverance of Gilead (Judg. xi.) has been treated as the occasion of a general Ammonite oppression, which leads to an Israelite gathering, also at Mizpah (Judg. x. 7, 9, 17). For other evidence of compositeness in this section, see A. Lods, *Études de théologie* (Paris, 1901), pp. 259-284, and below, § 6.

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[1] It is of course necessary to note carefully whether the religious ideas have any real chronological value. Thus, 1 Sam. xvii. 36, 46 seq. contain ideas of Yahweh characteristic of exilic and post-exilic writings (see T. K. Cheyne, *Ency. Bib.* col. 1755), but no proof of an early date is furnished by xxvi. 19*b* (cf. Ruth i. 16, 1 Kings xx. 23, 2 Kings xvii. 26 seq.); or 2 Sam. xxiv. 1 (cf. 1 Kings xxii. 20, Ezek. xlv. 9), or 2 Sam. xxi. 1 (note drought as the punishment for not rebuilding the temple, Hag. i.; or for not attending the feast of Tabernacles, Zech. xiv. 16-19).

3. The kingdom of Saul.

Saul.—Saul's reign is introduced in xiii. 1 where a blank has been left for his age at accession (some MSS. insert “ thirty ”); the duration of his reign is also textually uncertain. The formula is parallel to that in 2 Sam. ii. 10 seq., v. 4 seq., and frequently in the Book of Kings, with the additional feature that the age at accession, there usually confined to the Judaean kings, is here given for the Israelite Saul and his son Ishbosheth (*i.e.* Ishbaal). The summary in xiv. 47 sqq. is evidently by an admirer; it is immediately followed by a reference to the continuous Philistine warfare (*v.* 52, contrast vii. 13) which forms an introduction to the life of David. This summary gives a picture of Saul's ability and position which differs so markedly from the subsequent more extensive narratives of David's history that its genuineness has sometimes been questioned; nevertheless it is substantiated by the old poem quoted from the Book of Jashar in 2 Sam. i. 19-27, and a fundamental divergence in the traditions may be assumed. Similarly in 2 Sam. ii. 8-10*a*, the length of Ishbaal's reign conflicts with the history of David (ii. 11 and iv. 1–v. 3), and the reorganization of (north) Israel with the aid of Abner does not accord with other traditions which represent David as the deliverer of (all?) Israel from the Philistine yoke (iii. 18, xix. 9). But ii. 8-10*a*, in common with 1 Sam. xiii. 1, xiv. 47-51 (cf. also the introduction in 1 Sam. vii. 2 and the conclusion vii. 15-17), are of a literary character different from the detailed narratives; the redactional or annalistic style is noticeable, and they contain features characteristic of the annals which form the framework of Kings.[1] In Kings the Israelite and Judaean records are kept carefully separate and the independent standpoint of each is at once obvious. Here, however, much complication arises from the combination of traditions of distinct origin: independent records of Saul having been revised or supplemented by writers whose interest lay in David. Little old tradition of Saul is preserved. The disastrous overthrow of Israel in the north (xxxi.) finds its explanation in an interview with the dead Samuel (xxviii. 3-25, here a famous prophet), where the Israelite catastrophe is foreshadowed, and Saul learns that he has lost the favour of Yahweh, and that his kingdom will pass to David (*vv.* 16-19). Allusion is made to his campaign against Amalek (mentioned in xiv. 48 apparently as an active enemy), the story of which contains another denunciation and again a reference to the coming supremacy of David (xv. 28). This peculiar treatment of Saul's history by writers of the prophetical school (cf. Ahab in 1 Kings xx. 35-43) has been adapted to the life of David, and the Amalekite war (1 Sam. xv.) is now the prelude to the anointing of the youth of Bethlehem by Samuel (xvi. 1 sqq.). Yet another account of Saul's rejection is found in xiii. 8-14, even before his defeat of the Philistines, and Saul is warned of the impending change (cf. *v.* 13 seq. with 2 Sam. vii. 11-16). But the incident was evidently unknown to the author of chap. xv., and in this subordination of the history of Saul to that of David, in the reshaping of writings by specifically Judaean hands, we have a preliminary clue to the literary growth of the book.

The unambiguous allusions in xiii. 13 seq., xv 26-28, and the anointing of David by Samuel in xvi. are ignored in the narratives of the relations between David and Saul, of whose first meeting two contradictory accounts are given (contrast xvi. 21 sqq. and xvii. 55 sqq.). The independent stories of David place him in the south of Judah, an outlaw with a large following, or a vassal of the Philistines; and his raids upon south Judaean clans are treated as attacks upon Saul's kingdom (xxvii. 10-12). But the earlier stages are extremely confused. Two very similar narratives describe Saul's pursuit of David in the Judaean desert (xxiv. xxvi.)[2] The main points are Saul's confession and his recognition that David would prevail (xxvi. 21-25); the latter is more emphatic when he foresees that David will gain the kingdom of Israel and he adjures him to spare his seed (xxiv. 20-22). This last feature is prominent in xxiii. 15-18 (the prelude to xxiv.), where a passage is inserted to describe the covenant between David and Saul's son Jonathan. The account of David's flight is equally intricate. The tradition that David slew Goliath, brought his head to Jerusalem, and deposited his sword in Nob (xvii., cf. xxi. 9, xxii. 10) is incompatible with the simpler notice in 2 Sam. xxi. 19 (1 Chron. xx. 5 seeks to avoid the discrepancy); and even if the *name* Goliath be a later addition to the story of some great exploit (A. R. S. Kennedy, *Sam.*, pp. 122, 149), or a descriptive title (W. E. Barnes, *Chron.*, p. 104), it is surely difficult, on historical grounds, to reconcile David's recurring fights with the Philistines with his subsequent escape from Saul to Achish of Gath (xxvii.; already anticipated in xxi. 10-15); see further § 6. Saul's jealousy, however, is in some way kindled, and there is already a hint at David's succession (xviii. 8 sqq., Septuagint omits 10 seq.). The stories of Merab (xviii. 17-19) and Michal (*vv.* 20 sqq.) are duplicate, and a number of internal difficulties throughout are only partially removed in the shorter text of the Septuagint. In xx. David has realized Saul's hatred; but Jonathan scarcely credits it, although in xix. 1-7 Saul had instructed his attendants to slay the youth and his son had effected a reconciliation. This is ignored also in xix. 8-10 (cf. xviii. 10 seq., xx. 31 sqq.), and again in *vv.* 11-17 where David is saved by Michal his wife (see xxv. 44), and in *vv.* 18-24 (David with Samuel, see § 1 end). Even in xx. the urgent preparations for flight are delayed in *vv.* 11-17, where Jonathan entreats David's kindness for his descendants (see 2 Sam. ix. 1, below), and again in *vv.* 40-42, where the second meeting with a renewal of the covenant stultifies the preceding plans.[3]

4. The kingdom of David.

David.—All the stories of the relations between the founders of the respective monarchies are so closely interwoven that the disentanglement of distinct series of narratives is a task of the greatest difficulty.[4] They reflect in varying forms the popular interest in David and are of the greatest value in illustrating current traditions, thought and styles of literature. Apart from the more detailed and continuous history, there are miscellaneous passages in 2 Sam. v.–viii., with introduction (v. 1-3), and a concluding chapter rounding off his reign (viii.). A similar collection in xxi.–xxiv. severs the narratives in ix.–xx. from David's death in 1 Kings i.–ii. Their contents range over all periods, from the Amalekite war (viii. 12, cf. 1 Sam. xxx.) to David's “ last words ” (xxiii. 1, but see 1 Kings i. and ii. 1). In particular they narrate the capture of Jerusalem from the Jebusites (v. 6-10) and other fights in that district as far as Gezer (*vv.* 17-25), the purchase of land from a Jebusite for the erection of an altar (xxiv.; see 1 Chron. xxi.–xxii. 1, 2 Chron. iii. 1), and the remarkable story of the pacification of the Gibeonites (xxi. 1-14). With the conflicts in v. are closely connected the exploits in xxi. 15 sqq., xxiii. 8 sqq., and the probability of some disarrangement is supported by the repetition of the list of officials in viii. 15-18 and xx. 23-26, which many scholars (after Budde) attribute to the later insertion of ix.–xx. 22. On this view, at an earlier stage the two groups v.–viii., xxi.–xxiv. were contiguous—though not necessarily in their *present* form or order.[1] Budde's further conclusion that 1 Kings i. ii. 1-9, 13 sqq. were likewise wanting (*Sam.* p. xi.) is also valuable, since (*a*) 2 Sam. v.-viii. (with xxi.-xxiv.) finds its natural continuation, on the analogy of the Deuteronomic compiler's framework in Kings, in 1 Kings ii. 10-12, iii. 2, and (*b*) 1 Kings v. 3 seq. (also Deuteronomic) explicitly points back to the summary of the wars in 2 Sam. viii. It is commonly recognized that the compiler of 2 Sam. v.-viii. has wrongly placed *after* the capture of Jerusalem (v. 6 sqq.) the conflict with the Philistines (v. 17 sqq.), where the "hold" is not Zion but some place of retreat, perhaps Adullam (cf. xxiii. 14). This being so, the conflicts in xxi. 15 sqq., xxiii. 8 sqq., which are located around Gath, Lehi (so read xxiii. 11), Pasdammim (so *v.* 9; see 1 Chron. xi. 13), Bethlehem, and the valley of Rephaim, should also precede the occupation of Jerusalem and the subsequent partition of territory among David's sons and others (*e.g.* xiii. 23, near Bethel). These passages combine to furnish a representation of the events leading to the capture of the capital which is distinct from and now superseded by the detailed narratives in ii. 12-iv. Here, Ishbaal is east of the Jordan, David's men are engaged in fighting Benjamin and Israel—even at Gibeon (about 6 m. N.W. of Jerusalem), the interest of the history is in David's former relations with Israel at Saul's court, and he is regarded as the future deliverer of the oppressed people. These stories are, in fact, of a stamp with the detailed narratives already noticed (§ 3), and they conflict with the fragmentary traditions of David's steps to Jerusalem as seriously as the popular narratives of Saul conflicted with older evidence. But already Josh. ix. 17, xv. 63; Judg. i. 21, 29, 35, xix. 10-12; 2 Sam. v. 6 (cf. xxi. 2), indicate the presence of a line of alien cities including Jerusalem itself, and would point to an important alien district, the existence of which obviously bears upon the trustworthiness of the group of narratives encircling Bethlehem of Judah and Gibeah of Benjamin, the traditional homes of David and Saul.[2] On the other hand, this would ignore the representation of (north) Israelite extension over Judah by Joshua and Saul,[3] and it may be inferred that we have to allow for absolutely different and conflicting standpoints in regard to the history of the district, and that the Judaean traditions of David once had their own independent account of the occupation of Jerusalem and its neighbourhood. The fragments preserved in 2 Sam. v.-viii., xxi.-xxiv. are quite distinct from ii. 12-iv.; they throw another light upon David's relations to Saul's family (xxi. 1-14); and the stories of heroic conflicts with giant-like figures of Gath, &c. (xxiii. 9 seq., 18, cf. 1 Chron. xi. 11, 20) find no place by the side of the more detailed records of David's sojourn under the protection of a king of Gath, one of a confederation of Philistine cities (1 Sam. xxvii., xxix.). It is probable that popular stories of the conquest of the earlier inhabitants have been applied to the Philistines; their general character associates them with the legends of the "sons of Anak" who enter into Judaean (perhaps originally Calebite) tradition elsewhere (Num. xiii. 22; Josh. xi. 21 seq., xv. 14; see Budde, *Sam.*, p. 310 seq.).[4] Several intricate literary problems however at once arise in connexion with the two series v.-viii., xxi.-xxiv., and ix.-xx., since, apart from their earlier literary growth as distinct units, they have undergone some revision and alteration when compilers brought them into their present form.

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[1] Characteristic expressions of Deuteronomic writers are found in 1 Sam. xiv. 47 seq. (cp. Judg. ii. 14 sqq.); similarly in the (north) Israelite writer in 2 Kings xiii. 3 sqq. (see KINGS).

[2] It is difficult to decide which is the older; for xxvi. see especially M. Löhr, *Sam.*, p. xlv.; H. Gressmann, *Schriften d. A. T.*, *ad loc.*; for xxiv. see W. W. Guth, *Journ. of Bibl. Lit.* (1906), pp. 114 sqq.

[3] The keen interest in Jonathan is also conspicuous at the very commencement of Saul's career, where the youth (in ix. Saul himself appears to be represented as an inexperienced youth) is the centre of the narrative (see xiii. 3, xiv. 1-14, 17, 21, 27-45), rather than the father who now achieves the task to which he was called by Yahweh. But the revision has been too complicated for any satisfactory discussion of the literary stages.

[4] On the attempts (especially of K. Budde, *Richter u. Samuel*, 1890, and elsewhere) to recover here the Yahwistic (or Judaean) and Elohistic (or Ephraimite) sources of the Hexateuch, see the criticisms of B. Stade, *Theolog. Lit. Zeitung* (1896), No. 1; Steuernagel, *ib.* (1903), No. 17; W. Riedel, *Theol. Lit. Blatt* (1904), No. 3, col. 28; also H. P. Smith, *Journ. Bibl. Lit.*, 15 (1896), pp. 1-8; and W. W. Guth, *Die ältere Schicht in den Erzählungen über Saul u. David* (1904); and “ Unity of the Older Saul-David Narratives ” (see note 2 above).

The story of David and Bathsheba, an incident placed in the account of the Ammonite campaign, upon which it now depends (x.-xii.; with x. 15-19 cf. viii. 3-8), connects itself through the prophecy in xii. 10-12 with the subsequent family feuds, in particular with Absalom's rebellion (cf. xvi. 21 seq.), and again with 1 Kings i., where Adonijah's revolt rouses Bathsheba to persuade David to fulfil some promise of his to recognize her young son Solomon as his heir (i. 13, 17, 21, 29 seq.). The section is an admirable specimen of historiography. The whole is closely linked together for an ostensible purpose, a chronological scheme runs throughout (xiii. 23, 38, xiv. 28 and xv. 7),[5] and the section concludes with an account both of David's death and of Solomon's accession (see further SOLOMON). But 2 Sam. xii. 10-12 is an insertion (Wellhausen, Cornill, Kittel, &c.), even if xii. 1-15*a* itself be not of secondary origin (Winckler, Schwally, H. P. Smith, Nowack, Budde, Dhorme); and of the related passages, xv. 16 is a gloss (Budde), on xx. 3 see below, and the authenticity of xvi. 21-23 in its present context is not beyond doubt (see also AHITHOPHEL). Although xxi. 1-14 and ix. are of entirely distinct standpoints,[6] both are presupposed in xvi. 5-14, xix. 16-23, and in xvi. 1-4, xix. 24-30 respectively; the gloss xxi. 7 evidently dates *after* the insertion of ix., while the opening words of ix. 1 point back, not to xxi. which is ignored, but rather to iv., from which it is now severed by the miscellaneous group of passages in v.-viii.[7] In view of a few recognized signs of diverse origin (contrast xiv. 27 with xviii. 18, and see Budde on xv. 24 sqq., xvii. 17), it is possible that xvi. 1-14, xix. 16-30 are also secondary. In any case the new revolt of Sheba (xx. 1-22), can hardly be the original sequel to Absalom's rebellion (Winckler, H. P. Smith, B. Luther, E. Meyer); there is no historical prelude to 1 Kings i. (note the opening verse, David's old age, and cf. 2 Sam. xxiii. 1), and the literary introduction to the story of Sheba is to be found in the closing scene of xix., apparently at the point where David returns to the Jordan on his way to Gilgal (*v.* 40).[8] It is to be noticed that the murder of Amasa (xx. 8 sqq.) is parallel to that of Asahel (ii. 12 sqq.), and the two (now preceding the separate groups v.-viii. and xxi.-xxiv.) are closely associated in 1 Kings ii. 5.

The miscellaneous groups, v.-viii., xxi.-xxiv., are also certainly not in their original form. The introduction in v. 1-3 is twofold (*v.* 3 and the incomplete *v.* 1 seq.), and the list in iii. 2-5 (note the resuming link *v.* 6 after *v.* 1) is similar in character to that in v. 13-16, and has probably been removed from the context of the latter (cf. 1 Chron. iii. 1-8). The presence of a late hand is also proved by the psalm in xxii. (Ps. xviii.) and by David's "last words," which sever xxi. 15-22 and xxiii. 8 sqq. These in turn part two related narratives in xxi. 1-14 and xxiv., and the latter (with which note the divergent features in 1 Chron. xxi.) shows several signs of later origin or revision. Chap. vii. is to be read in the light of 1 Kings v. 3-5, viii. 14 sqq., all Deuteronomic passages, though not of one stamp. Continuous warfare prevented the building of the temple (1 Kings v. 3-5, cf. 2 Sam. viii.), and David's proposal to erect a house to Yahweh seems unnecessary after vi. 17 seq.; but vii. 1, 9, in fact, presuppose ch. viii., and the main object of the narrative is to emphasize Yahweh's promise to build David's house, *i.e.* his dynasty. vii. is connected with 1 Kings viii. but an important variation (*v.* 16 contrast 2 Sam. vii. 6-8) illustrates the complexity of the Deuteronomic sources. It is important to notice that, as in the account of the temple in the history of Solomon, the introduction to it in these chapters (2 Sam. vi. seq.) divides miscellaneous though closely-related material (see KINGS). On their prelude in 1 Sam. vi. see below, § 6.

5. Narratives of Saul and David.

Thus, the account of David's conflicts with giant heroes and the conquest of Jerusalem and its district seems to belong to a cycle of Judaean tradition (cf. Num. xiii. 22, 28; Josh. xi. 21, xv. 14), which has been almost superseded by other traditions of the rise of the Hebrew monarchy and by the more popular narratives of early relations between the Judaean David and the (north) Israelite king and people. The persistent emphasis upon such features as the rejection of Saul, his enmity towards David, the latter's chivalry, and his friendship for Jonathan, will partly account for the present literary intricacies; and, on general grounds, traditions of quite distinct origin (Calebite or Jerahmeelite; indigenous Judaean; North Israelite or Benjamite) are to be expected in a work now in post-exilic form.[1] David's history is handled independently of Saul in 1 Sam. xxv.; and the narrative, now editorially connected with the context (*v.* 1, see xxviii. 3, and *v.* 44, see 2 Sam. iii. 15), gives a valuable picture of his life in the south of Palestine.[2] With this notice his relations with south Judaean cities in xxx. 26-31. His flight northwards to the Philistine king of Gath (xxvii.) is hardly connected with the preceding situations in xxiv. 17-22, xxv. or xxvi. 21-25, and his previous slaughter of the Philistines at Keilah (xxiii. 1-15) raises historical difficulties. This is not to mention his earlier successes over the same people, which are very explicitly ignored in xxix. 5, although the famous couplet there quoted now finds its only explanation in xviii. 7 after the death of Goliath and the defeat of the Philistines. The traditions of varying relations between Judah and the Philistines attached to David (cf. xxvii. 5 seq.) are quite distinct from the popular stories of giants of Gath, and now form part of the joint history of David and Saul. The independent narratives of the latter's fate seem to represent one of those disastrous attacks upon the north which are familiar in the later history of the northern kingdom (xxviii. 4, xxix; see JEWS: *History*, § 12). The geographical data are confused by the stories of David (see 1 Sam. xxviii. 4, xxix. 1, and the commentaries), and, while the "Philistines" for once march north to Jezreel to deliver their attack, David's presence is not discovered until Aphek is reached (xxix.). His journey is the opportunity for an Amalekite raid (xxx. cf. xxvii. 8 seq.), and this new defeat of Amalek, ascribed to David, proves a more successful undertaking than that which led to the rejection of Saul (xv. 20 seq. 26-28). Similarly, Saul's disaster leaves Israel again in the hands of the "Philistines" (xxxi. 7, cf. xiii. 6 seq.), and it is for David to save the people of Israel out of their hands (2 Sam. iii. 18, cf. 1 Sam. ix. 16).[3] The sequel to the joint history has another version of Saul's death (2 Sam. i. 6-10, 13-16), and an Amalekite is the offender; contrast his death in i. 15 seq. with iv. 10 seq. The chapter explains the transference of the royal insignia from Israel to Judah. Here is quoted (from the "Book of Jashar") the old poetical lament over the death of the valiant friends Saul and Jonathan, describing their successful warlike career, the wealth they brought the people, and the vivid sense of national misfortune (i. 19-27). It is utilized for the history of David, to whom its authorship is attributed. In general, it appears that those narratives wherein the histories of Saul and David are combined—very much in the favour of the latter—were originally distinct from those where (*a*) Saul's figure is more in accord with the old poem from the Book of Jashar, and (*b*) where David's victories over prehistoric giants and his warlike movements to Jerusalem pave the way for the foundation—from a particular Judaean standpoint—of his remarkably long dynasty.

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[1] Cornill, Nowack, Stenning and Kennedy (see *Literature*, below) accept Budde's suggestion that ix.-xx. were inserted by a hand later than the first Deuteronomic editor of viii.; but the further assumption that this editor had deliberately omitted ix.-xx. from his edition cannot be proved, and deals with a literary stage too early for any confident opinion or even for any critical investigation of value.

[2] "Jerusalem" in 1 Sam. xvii. 54 is usually treated as an anachronism, because of its occupation by the Jebusites, and Kirjath-jearim (vii. 1, 2, perhaps *Kiryat el-Enab*, 9 m. W. of Jerusalem) is commonly admitted to be in alien hands. But it is clear that Nob (1 Sam. xxi. seq.), about 2 m. N. of the capital, on this view, was scarcely an Israelite city, yet the presence of the priests of Shiloh there is essential to the present structure of the book.

[3] For Joshua, see the older portions of Josh. x., and for Saul, 1 Sam. xiv. 47-51 (his wars), xv. 4 (his Judaean army), xvii. 54 (Jerusalem), xxvii. 7-12 (south Judaean clans under Israelite suzerainty) and 2 Sam. i. 12 (Septuagint).

[4] For this cf. the "Anakim" of Gaza, Gath and Ashdod, &c., in Josh. xi. 21 seq., with the "Philistine" lords, *ib.* xiii. 3, and see PHILISTINES.

[5] In xv. 7 we must read *four* for *forty* (the vow in this verse refers to Absalom's exile some years previously).

[6] On this and on the character of the detailed narratives in general, see B. Luther in E. Meyer, *Israeliten u. ihre Nachbarstämme*, pp. 184-199. See, generally, the studies by W. Caspari, *Aufkommen u. Krise d. israel. Königtums unter David* (1909) and *Theol. Stud. u. Krit.* (1909), pp. 317 sqq., 619 sqq.; and also H. Gressmann (*Literature*, below).

[7] Chap. ix. belongs to the joint traditions of David and Saul (cf. ii. 5-iv.); *v.* 13, which presupposes chap. v., appears to be an addition (see H. P. Smith, Dhorme).

[8] xix. 40 (all Judah and *half* Israel) resumes *v.* 15 (where Israel is not mentioned). For the view that Absalom's revolt originally concerned Judah alone, see the related section in DAVID. Dhorme, it may be observed, finds in ix.-xx. another source for x. 1-14, xii. 1-15*a*, xv. 1-6, 10, 24-26, 29, xvi. 5-14, xvii. 27-29, xix. 16-23 and xx. 1-22.

6. Literary and historical problems. The literary problems of the books of Samuel are those of the writing of the history of the monarchies from different points of view; and the intimate connexion of the books with those that precede and follow shows that a careful consideration of the internal literary and historical features of these also is necessary. The first step is the recognition of a specific Deuteronomic redaction in Joshua—Kings, an intricate process which extended into the post-exilic age.[4] Certain phenomena suggest that the first compilation was made outside Judah—in Israel, whereas others represent a Judaean and anti-Israelite feeling. The close interconnexion of Judg. x.–1 Sam. xii. is as crucial as that of 2 Sam. v.–1 Kings ii. The (probably Deuteronomic) framework of Israelite history in Kings can be traced in Samuel, and it is a natural assumption that it should have gone back beyond the time of Jeroboam I. While the detailed history of Israelite kings and prophets in 1 Kings xvii.–2 Kings x. (Ahab to Jehu) finds more developed parallels in the narratives of Saul and Samuel, the peculiar treatment of the lives of David and Solomon (Judaean kings over a united Israel) and of the division of the monarchy has complicated the present sources. Although the contents of 2 Sam. v.-viii., xxi.-xxiv., 1 Kings ii. 10-12, iii. 2, appear to have been consecutive (in some form) at an earlier stage, the connexion has been broken by ix.-xx., 1 Kings i. ii. 1-9, 13 sqq., and the further vicissitudes can scarcely be recovered; and while there are clear signs of more than one Deuteronomic hand in the former group, the latter shows in 1 Kings ii. 2-4 a Deuteronomic revision, either of independent origin or in the combination of the sources in their present form. Moreover, Samuel's farewell address (1 Sam. xii.) belongs to the Deuteronomic and later account of Saul's rise, and closes the period of (*a*) the Israelite "judges" (see Judg. ii. 6–iii. 6, an extremely composite passage), and (*b*) the Ammonite and Philistine oppression (*ib.* x. 6 sqq.).[5] The former follows upon Joshua's two concluding speeches, one given by a Deuteronomic writer in xxiii., and the other incorporated by another though similar hand in xxiv. Although the pre-monarchical age is viewed as one of kinglike "judges," the chiefs are rather local heroes (so Ehud, Gideon, Jephthah), and the boisterous giant Samson (Judg. xiii.-xvi.), and the religious leaders Eli and Samuel are "judges" from other standpoints. Perplexity is caused, also, in the oldest account of Saul's rise (1 Sam. ix.) by the sudden introduction of a Philistine oppression which cannot be connected with vii. 2–viii., or even with 1 Sam. iv.–vii. 1.[6] On the other hand, Judg. x. 6 sqq. refers to a Philistine oppression which has no sequel. It may be conjectured that there was an original literary connexion between the two which has been broken by the insertion of traditions relating to Samuel and Saul.[7] This finds support (*a*) in the internal evidence for the later addition of Judg. xvii.-xxi., and of certain portions of the opening chapters of 1 Samuel; (*b*) in the absence of any continuity in the intervening history; and (*c*) in the material relationship between portions of the highly composite Judg. x. 6 sqq. and the rise of Saul. The literary processes thus involved find an analogy in the original connexion between 2 Sam. v.-viii. and xxi.-xxiv., or between Exod. xxxiii. seq. and Num. x. 29-36, xi. (see SAUL).

The section 1 Sam. iv.-vii. 1 forms the prelude to Samuel's great victory and belongs to the history of Shiloh and the priesthood of Eli. But the fall of this sanctuary scarcely belongs to this remote age (11th century); it was sufficiently recent to serve as a warning to Jerusalem in the time of Jeremiah (close of 7th century). This event of supreme importance to north Israel (cf. Judg. xviii. 30 seq.) is already connected with Samuel's prophecy in iii., but the latter is strengthened by the Deuteronomic passage, ii. 27-36, which links the disaster, not with the history of Samuel, but with the rise of the Zadokite Levites of Jerusalem, and thus represents a specifically Judaean standpoint. This is analogous to the Judaean adaptation of the prophetical treatment of Saul's life, and it also reflects certain priestly rivalries (see LEVITES). With the loss of Shiloh is explained the appearance of the priests at Nob outside Jerusalem (xxi. 1, xxii. 9), which is followed by their massacre, the flight of Abiathar (xxii.), and the transference of the sacred ephod to David (xxiii. 6).[8] Here, however, the emphasis laid upon the ephod brought by Abiathar, the survivor of the house of Eli (cf. ii. 28, xxi. 9), points away from what was once a common object of cult to the late and post-exilic restriction of its use to the Aaronite high priests (see EPHOD).

Moreover, according to 1 Kings ii. 26, Abiathar bore the *ark*, and while some traditions traced its history to Shiloh, or even found it at Bethel (Judg. xx. 27 seq.), others apparently ran quite another course, associated it with southern clans ultimately settled in Judah, and supposed that Jerusalem was its first resting-place. The author of 2 Sam. vii. 6 (cf. also 1 Chron. xxiii. 25 sq.) can scarcely have known 1 Sam. i.-iii. with its temple at Shiloh, and although 2 Sam. vi. finds its present prelude in 1 Sam. vi. 17–vii. 1, that passage actually brings the story of its fortunes to a close by relating the return of the ark from Philistine territory to the care of Abinadab and Eleazar at Kirjath-jearim (note the "Levitical" type of the names; Budde, *Sam.* p. 47). From Josh. ix. 17 (post-exilic source) it might indeed be argued that the district was not under Israelite jurisdiction (see Kennedy, *Sam.* p. 325 seq.), although to judge from the older traditions of Saul it was doubtless part of his kingdom. It may be that the narrative (which presupposes some account of the fall of Shiloh) is part of an attempt to co-ordinate different traditions of the great palladium.[1]

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[1] The late genealogy of Saul in 1 Chron. viii. 29 sqq., ix. 35 sqq., is evidence for a keen interest in the Saulidae in post-exilic times.

[2] The chapter with the prophecy of Abigail may be of Calebite origin.

[3] So also, David's wars (2 Sam. viii.) bear a certain resemblance to those of Saul (1 Sam. xiv. 47).

[4] See G. F. Moore, *Ency. Bib.* "Historical Literature," § 6 seq. "Joshua," §§ 5, 11; "Judges," § 14.

[5] With the length of office in 1 Sam. iv. 18 (cf. vii. 15) compare the similar notices in Judg. x. 2 seq., xii. 7 sqq., xv. 20, xvi. 31, and with the length of oppression in vii. 2, cf. Judg. iii. 8, 14, iv. 3, vi. 1, x. 8, xiii. 1.

[6] Nowack, p. 39; Riedel, *Theolog. Lit. Blatt* (1904), No. 3, col. 28.

[7] S. A. Cook, *Critical Notes*, p. 127 seq. (cf. Dhorme, *Rev. Bibl.*, 1908, p. 436; Godbey, *Amer. Journ. Theol.*, 1909, p. 610).

[8] Although writers sought to explain Saul's disastrous end (cf. 1 Chron. x. 13), it is only Josephus (*Ant.* vi. 14, 9) who refers to the atrocity at Nob. The significance of the tradition is unknown; some connexion with Saul's religious zeal at Gibeon has been conjectured (2 Sam. xxi. 2). That the actual murderer was an Edomite may perhaps be associated with other traditions of Edomite hostility.

7. Summary. Consequently, the literary structure of the Book of Samuel is throughout involved with a careful criticism of the historical traditions ascribed to the 11th and beginning of the 10th century B.C. The perspective of the past has often been lost, earlier views have been subordinated to later ones, conflicting standpoints have been incorporated. The intricacy of the Deuteronomic redactions still awaits solution, and the late insertion of earlier narratives (which have had their own vicissitudes) complicates the literary evidence. Greater care than usual was taken to weave into the canonical representation of history sources of diverse origin, and it is scarcely possible at present to do more than indicate some of the more important features in the composition of a book, one of the most important of all for the critical study of biblical history and theology.

The Hebrew text is often corrupt but can frequently be corrected with the help of the Septuagint. The parallel portions in Chronicles also sometimes preserve better readings, but must be used with caution as they may represent other recensions or the result of rewriting and reshaping. As a whole, Chronicles presents the period from a later ecclesiastical standpoint, presupposing (in contrast to Samuel) the fully developed "Mosaic" ritual (see CHRONICLES). After tribal and priestly lists (1 Chron. i.-ix.), Saul's end is suddenly introduced (x., note *v.* 13 seq.). David appears no less abruptly, the sequence being 2 Sam. v. 1-3, 6-10, xxiii. 8-39 (with additions, xi. 41-47, and a list of his supporters at Ziklag and Hebron). To 2 Sam. vi. 2-11 there is a "Levitical" prelude (xiii. 1-5), then follow v. 11-25, and vi. 12-19, which is embedded in novel material. Next, 2 Sam. vii. seq., x., xi. 1, xii. 30 seq., xxi. 18-22, and finally xxiv. (Chron. xxi.). The last is the prelude to an account of the preparation for the temple and the future sovereignty of Solomon, and ends with David's army and government (Chron. xxvii.), and his concluding acts (xxviii. seq.). The compiler was not ignorant of other sources (see x. 13, xii. 19, 21, 23), and, in general, carries out, though from a later standpoint, tendencies already manifest in Samuel. The latter in fact is no less the result of editorial processes and since it is now in post-exilic form, this is the starting-point for fresh criticism. The representation of the remote past in Samuel must be viewed, therefore, in the light of that age when, after a series of vital internal and external vicissitudes in Judah and Benjamin, Judaism established itself in opposition to rival sects and renounced the Samaritans who had inherited the traditions of their land. See further JEWS, §§ 6-8, 20-23, PALESTINE: *Old Test. History*, pp. 614-616.

LITERATURE.—See further the commentaries of M. Löhr (1898); W. Nowack, K. Budde (1902); H. P. Smith in the *International Critical Commentary* (1899), with his *Old Testament History*, pp. 107-155, and the small but well-annotated edition of A. R. S. Kennedy in the *Century Bible* (1905). All these give fuller bibliographical information, for which see also S. R. Driver, *Introduction to Literature of Old Testament*, and the articles by J. Stenning in Hastings's *Dictionary* and B. Stade in *Ency. Bib.* For the text, see especially J. Wellhausen's model *Text-Bücher Sam.* (1871); S. R. Driver, *Text of Samuel* (1890); K. Budde's edition in Haupt's *Sacred Books of the Old Testament* (1894); P. Dhorme, *Livres de Samuel* (1910). Of special value for the psychological character of the various narratives is H. Gressmann's *Schriften d. A. T. in Auswahl*, i.-iii. (Göttingen, 1909–1910). In so far as the present article takes other views of the results of literary analysis in the light of historical criticism, see S. A. Cook, *American Journ. of Sem. Lang.* (1900), pp. 145 sqq.; and *Critical Notes on Old Testament History* (1907) (*passim*). (S. A. C.)

SANA (*Senāʽa*), a town in S. Arabia, the capital of the Turkish vilayet of Yemen. It is situated in 15° 22′ N. and 44° 10′ E. in a broad valley running nearly N. and S., 7250 ft. above sea-level, on the E. slope of the great meridional range, over which the road runs to Hodeda, on the Red Sea coast 130 m. distant, crossing the Karn al Waʽl pass, over 9000 ft., about 25 m. W. of the city. The mean temperature of the year is 60° F., with a summer maximum of 77°, and a regular rainfall which falls chiefly during the S.W. monsoon from June to September. The usual cereals, fruits and vegetables of the temperate zone, wheat, barley, apples, apricots, vines, potatoes, cabbages, beans, &c., are abundant and excellent.

The town consists of three parts—(1) the Medina, the old city, now the Arab quarter, on the E. containing the principal mosques, baths, &c., with the citadel, el Kasr, at its S.E. corner at the foot of Jebel Nukum on the crest of which 2000 ft. above the valley are the ruins of the old fort of el Birash, traditionally attributed to Shem the son of Noah, and the Mutawakkil, formerly containing the palace and gardens of the imams, covering its W. face; (2) the Bir Azab W. of the city, consisting of detached houses and gardens, chiefly occupied by the higher Turkish officials, and (3) on the extreme W. the Kaʽel Yahud or Jewish quarter. The city with the Kasr and Mutawakkil is surrounded by ramparts built of clay and sun-dried brick, 25 to 30 ft. high and of great thickness. The Bir Azab and Kaʽel Yahud are enclosed in a similar enceinte but of more recent construction, connected with that of the city by the Mutawakkil; the whole forms a rough figure of eight, some 2½ m. long from E. to W., and ¾ m. in breadth. The walls are pierced by several gates; the principal are the Bab esh Shuʽb and the Bab el Yemen in the N. and S. faces of the city respectively, and the Bab es Sabah in its W. face leading into the Mutawakkil, and thence by a broad street through the Bir Azab and Kaʽel Yahud to the Bāb el Kaʼ, the main entrance to the town from the Hodeda road. The city itself has narrow, paved streets, with massive, flat-roofed houses of several storeys, and many extensive groups of buildings, mosques, serais and baths. The Jāmi ʽMasjid, or principal mosque, stands on the site of the Christian church built by Abraha ruler of Yemen during the period of Ethiopian domination, about A.D. 530. It consists of a great rectangular courtyard paved with granite, surrounded by a triple arcade, the domed roofs of which are supported by numerous columns of stone or brick; in the centre there is a model of the Kaʽba at Mecca covered with stone flags of various colours arranged chequer-wise. Among the other mosques, of which there are forty-eight in all, that of Salah ed din with its beautiful minaret is one of the finest. Of the Kasr Ghumdan and other ancient buildings, the splendours of which were sung by the poets of the early days of Islam, nothing but mutilated ruins remain; the old palace of the imams, the Mutawakkil, was destroyed during the years of anarchy preceding the Turkish occupation, and the site is now occupied by a military hospital standing in well-kept gardens. The houses consist generally of a ground floor built of dressed stone, surmounted by two or three storeys of burnt brick; as a rule the lower storey has no openings but an arched doorway; the façade of the upper storeys is pierced by long narrow window recesses, divided into three parts, the lowest of which forms a square window closed by carved wooden shutters, while the upper ones contain round or pointed windows fitted with coloured glass, or thin slabs of alabaster which admit a subdued light.

The valley in which Sana lies is generally sterile, but in places where water is brought from the hill streams on the W. fields of barley, lucerne and market gardens are to be seen, particularly at Randa, the garden suburb, 6 m. N. of the town, and in the deep gorges of the Wadi Dhahr and W. Hadda, the terraced orchards of which are celebrated for their fine fruit-trees. The water supply of the town is derived from numerous wells, and from the Ghail Aswad, a small canal which supplies the military cantonment outside and S. of the walls, and runs through the gardens in the Mutawakkil.

The population was estimated by R. Manzoni in 1887 at 20,000 Arabs, 3000 Turks and 1700 Jews, or less than 25,000 altogether; H. Burchardt in 1891 put it at 50,000; the city has, however, suffered severely from the state of unrest which has been chronic in Yemen since 1893, and more particularly in 1905, when it was taken by the insurgents, and held by them for three months, and the actual numbers at present do not probably exceed Manzoni's estimate.

Arabic writers give many discordant and fabulous traditions about the oldest history of Sana and its connexion with the ancient kingdom of Ḥimyar. But most agree that its oldest name was Azāl, which seems to be the same word with Uzal in Gen. x. 27. A Himyarite nation of Auzalites occurs in a Syriac writer of the 6th century. The better-informed Arab writers knew also that the later name is due to the Abyssinian conquerors of Yemen, and that it meant in their language "fortified" (Bakrī, p. 606; Nöldeke, *Gesch. d. Pers. u. Arab.* p. 187). Sana became the capital of the Abyssinian Abraha (*c.* 530 A.D.) who built here the famous church (*Kalis*), which was destroyed two centuries later by order of the caliph Manṣur (Azrakī, p. 91).

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[1] This is on the usual assumption that there was only *one* ark in the history of Judah and Israel.

AUTHORITIES.—Niebuhr, *Travels in Arabia* (Amsterdam, 1774); R. Manzoni, *Il Yemen* (Rome, 1884); D. Charnay and A. Deflers, *Excursions au Yēmen. Tour du monde* (Paris, No. 24, 1898).
(R. A. W.)

SANĀ'Ī, the common name of ABULMAJD MAJDŪD B. ĀDAM, the earliest among the great Ṣūfic poets of Persia, was a native of Ghazni (in Afghanistan). He flourished in the reigns of the Ghaznevid sultāns Ibrāhīm (1059–1099, 451–492 A.H.), his son Mas'ūd (1099–1114), and his grandson Bahrām (1118–1152). Persian authorities are greatly at variance as to the dates of the poet's birth and death. At any rate, he must have been born in the beginning of the second half of the 11th century and have died between 1131 and 1150 (525 and 545 A.H.). He composed chiefly *qaṣīdas* in honour of his sovereign Ibrāhīm and the great men of the realm, but the ridicule of a half-mad jester is said to have caused him to abandon the career of a court panegyrist and to devote his poetical abilities to higher subjects. For forty years he led a life of retirement and poverty, and, although Bahrām offered him a high position at court and his own sister in marriage, he remained faithful to his austere and solitary life. But, partly to show his gratitude to the king, partly to leave a lasting monument of his genius behind him, he began to write his great double-rhymed poem on ethics and religious life, which served as model to the masterpieces of Farīd-uddīn 'Attār and Jelāl ud-dīn Rūmī, the *Ḥadīqat ul-ḥaqīqat*, or "Garden of Truth" (also called *Alkitāb alfakhrī*), in ten cantos. This poem deals with such topics as: the unity of the Godhead, the divine word, the excellence of the prophet, reason, knowledge and faith, love, the soul, worldly occupation and inattention to higher duties, stars and spheres and their symbolic lore, friends and foes, separation from the world. One of Sanā'ī's earliest disciples, Mahommed b. 'Alī Raqqām, generally known as 'Alī al-Raffā, who wrote a preface to this work, assigns to its composition the date 1131 (525 A.H.), and states besides that the poet died immediately after the completion of his task. Now, Sanā'ī cannot possibly have died in 1131, as another of his mathnawīs, the *Ṭarīq-i-taḥqīq*, or "Path to the Verification of Truth," was composed, according to a chronogram in its last verses, in 1134 (528 A.H.), nor even in 1140, if he really wrote, as the Ātashkada says, an elegy on the death of Amīr Mu'izzī; for this court-poet of Sultan Sinjar lived till 1147 or 1148 (542 A.H.). It seems, therefore, that Taqī Kāshī is right in fixing Sanā'ī's death in 1150 (545 A.H.), the more so as 'Alī al-Raffā himself distinctly says in his preface that the poet breathed his last on the 11th of Sha'bān, "which was a Sunday," and it is only in 1150 that this day happened to be the first of the week. Sanā'ī left, besides the *Ḥadīqah* and the *Ṭarīq-i-taḥqīq*, several other Ṣūfic mathnawīs of similar purport: for instance, the *Sair ul'ibād ilā'lma'ād*, or "Man's Journey towards the Other World" (also called *Kunūz-urrumūz*, "The Treasures of Mysteries"); the *'Ishqnāma*, or "Book of Love"; the *'Aqlnāma* or "Book of Intellect"; the *Kārnāma*, or "Record of Stirring Deeds," &c.; and an extensive dīwān or collection of lyrical poetry. His tomb, called the "Mecca" of Ghazni, is still visited by numerous pilgrims.

See Abdullatīf al-'Abbāsi's commentary (completed 1632 and preserved in a somewhat abridged form in several copies of the India Office Library); on the poet's life and works, Ouseley, *Biogr. Notices*, 184-187; Rieu's and Flügel's *Catalogues*, &c.; E. G. Browne, *Literary History of Persia* (1906), ii. 317-322; H. Ethé in W. Geiger's *Grundriss der iranischen Philologie*, ii. 282-284.

SAN ANTONIO, a city and the county-seat of Bexar county, Texas, U.S.A., about 80 m. S.S.W. of Austin, on the San Antonio river, at the mouth of the San Pedro. Pop. (1900) 53,321, of whom 18,880 were of foreign parentage, 9348 were foreign-born (including 3288 Mexicans and 3031 Germans) and 7538 were negroes; (1910 census), 96,614. San Antonio is the largest city of Texas. It is served by the Galveston, Harrisburg & San Antonio, the International & Great Northern, the San Antonio & Aransas Pass, and the Missouri, Kansas & Texas railways. The city lies at an elevation of 610-750 ft. above the sea. The San Antonio river (which has a winding course of 13 m. within the city limits) and its affluent, the San Pedro (which is 10 m. long in its course through San Antonio), divide the city into three main portions, and these water-courses and the Acequia (7 m. long) are spanned by 17 large iron bridges and about 2500 smaller bridges and culverts. Among the public buildings are the city hall in Military Plaza, the court-house on Main Plaza, the Federal building on the N. side of Alamo Plaza, the Carnegie library and the convention hall and market house on Milam Square. The most interesting building is the historic Alamo (named from the grove of cottonwood—alamo, the *Populus monilifera*—in which it stands) on the E. side of the Alamo Plaza, E. of the San Antonio river; it was begun probably in 1744 and was the chapel of the Mission San Antonio de Valero (often called "the Alamo mission"); in 1883 it was bought by the state and has since been maintained as a public monument. The San Fernando Cathedral[1] on Main Plaza was built in 1734, but there is very little of the original structure in the present building, which really dates from 1868–1873; the former governor's palace, built in 1749, is at No. 105 Military Plaza; at 128 Soledad is the Veramendi Palace, the residence of Governor Veramendi, father-in-law of Colonel James Bowie, and in this palace Colonel B. R. Milam was killed on the 5th of December 1835 by a sharpshooter hidden in a cypress tree; there is a monument to Colonel Milam in Milam Square. One mile N. of the city on Government Hill is Fort Sam Houston (established in 1865), headquarters of the Department of Texas, with an army hospital (1885) and a tower 88 ft. high. There are several old missions near the city, notably the Mission La Purisima Concepción de Acuna (the "First Mission"), 2 m. S. of the city, built here in 1731–1752, having formerly been in E. Texas; the Mission San José de Aguayo (the "Second Mission"), 4 m. S. of San Antonio, built in 1720–1731; the Mission San Juan de Capistrano (the "Third Mission"), 6 m. S. of the Main Plaza built in 1731; and San Francisco de la Espada (the "Fourth Mission," also built in 1731 and also removed here from E. Texas), which is 8 m. S. of the Main Plaza and is now used for service by the local Mexicans. The city has 21 parks and plazas. Within the city limits in its N. central part is Brackenridge Park (200 acres) along the San Antonio; 1 m. N.E. of the city is San Pedro Park (40 acres), the source of the San Pedro river; in Travis Park is a Confederate monument; and 3 m. S. of the city are the International Fair Grounds, where in 1898 Colonel Theodore Roosevelt organized his "Rough Riders," and Riverside Park. The most notable of the plazas are Military, Main and Alamo. The anniversary of the Battle of San Jacinto, the 21st of April, is annually celebrated by a "Battle of Flowers." Annually in October an International Fair is held, to which Mexico sends an exhibit of Mexican products and manufactures. The climate is mild with a mean summer temperature of 82° F. and a winter average of 54°, and this and the dry purity of the air make it a health resort; it is also the winter home of many Northerners. There is good shooting (doves, quail, wild turkey and deer) in the vicinity; there are fine golf links and there is a large ranch for breeding and training polo ponies. In the southern suburbs two artesian wells, 1800-2000 ft. deep, discharge 800,000 gallons a day of strong sulphur water (temperature 103°-106° F.), which is used for treating rheumatism and skin diseases. Near one of these wells is the South-western (State) Hospital for the Insane (1892). The city has a good public school system, including, besides the usual departments, departments of manual training and domestic science. In 1910 there were 30 schools —26 for whites and 4 for negroes. Among the educational institutions in San Antonio are the San Antonio Female College (Methodist Episcopal, South; 1894), the West Texas Military Academy; Peacock Military School; St Mary's Hall (Roman Catholic); St Louis College; and the Academy of Our Lady of the Lake (under the Sisters of Divine Providence, who have a convent here). The city is the see of Protestant Episcopal and

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[1] The cathedral is the centre of the city according to the charter, which describes the city as including "six miles square, of which the sides shall be equi-distant from what is known as the cupola of the cathedral of San Fernando and three miles therefrom."

Roman Catholic bishops. Among the charitable institutions are the City Hospital (1886), the Santa Rosa Infirmary (1869), maintained by Sisters of Charity, a House of Refuge (1897), a Rescue Home (1895), a home for destitute children and aged persons (1897), the St Francis Home for the Aged (1893), St John's Orphan Asylum (1878), St Joseph's Orphan Asylum (1871) and the Protestant Home for Destitute Children (1887).

The principal manufactures are malt liquors, flour and grist-mill products and steam railway cars. San Antonio is the commercial centre of a great live stock and farming region.

Under the charter of 1903, as amended in 1907, the municipal government consists of a city council, composed of the mayor, four aldermen, elected at large, and eight ward aldermen, all elected for a term of two years, as are the other elective officers; a city attorney, an assessor, a collector, a treasurer, an auditor and judge of the Corporation Court. Any elective officer may be removed by the vote of eight members of the council. Other officers are appointed by the mayor with the confirmation of the council. The city water supply, owned by a private corporation, is obtained from artesian wells with a capacity of 40,000,000 gallons a day. The city has a sewer-farm of 530 acres which the charter forbids it to sell.

San Antonio was the capital of Texas during the periods of Spanish and Mexican rule. The presidio of San Antonio de Bexar and the mission of San Antonio de Valero were founded in 1718 under the direction of Martin de Alarcón, governor of Coahuila. San Antonio was accordingly from the beginning a combination of two of the three types of Spanish settlement, the military and the ecclesiastical (see TEXAS: *History*). To these was added the third, the civil type, in 1731, when the *villa* of San Fernando was established. Several missions were established in the neighbourhood, including those already mentioned and San Xavier de Náxera (1722), a new foundation. All of these missions decreased in importance with the disappearance of the Indians and by the close of the period of Spanish rule (1821) had been abandoned. San Antonio was captured by the Magee-Gutierrez party in 1813, but was recovered by the Mexican royalists (see TEXAS: *History*). It was besieged by the Texan army under General Stephen F. Austin and Edward Burleson in 1835 and was finally taken early in December as the result of an attack led by Colonel Benjamin R. Milam. Its recapture by Santa Anna, February–March 1836, was distinguished by the heroic defence of the mission (particularly the chapel of the Alamo) by Colonels William Barrett Travis, James Bowie and Davy Crockett, and 178 others against the attack of about 4000 Mexicans. After a bombardment lasting from the 23rd of February to the 6th of March, the Mexicans assaulted on the 6th, were twice beaten back, and then overpowered and slaughtered the garrison, the five survivors being subsequently bayonetted in cold blood. Three women, one a Mexican, two children and a negro servant were spared. "Remember the Alamo" became a war-cry of the Texans. The Mexicans again invaded Texas in 1842, and San Antonio was twice captured and held for short periods, first by General Vasquez and later by General Woll. After 1836 there was a large influx of Anglo-Americans and Germans, and the Mexican element long ago ceased to predominate. Charters of incorporation were granted in 1837, 1842, 1852, 1856, 1870 and 1903. At San Antonio in February 1861 General David E. Twiggs (1790–1862), a veteran of the Mexican War, surrendered the Department of Texas, without resistance, to the Confederate general, Ben McCulloch; for this General Twiggs was dismissed from the United States army, and in May he became a major-general in the Confederate service. The rapid growth of San Antonio dates from 1878, when the first railway entered the city.

See William Corner, *San Antonio de Bexar* (San Antonio, 1890); *The Quarterly of the Texas State Historical Association*, ii. 217-226, viii. 277-352; and George P. Garrison, *Texas* (Boston and New York, 1903), in the "American Commonwealths Series."

SAN ANTONIO DE LOS BAÑOS, a small town in Havana Province, Cuba, about 23 m. (by rail) S.W. of Havana. Pop. (1907) 9125. San Antonio de los Baños is served by the W. branch of the United Railways of Havana. It is on the banks of the Ariguanabo river, which drains a lake of the same name, and is itself one of the many "disappearing rivers" of the island; it disappears in a cave near San Antonio. The town has mineral springs and baths, and is a summer resort of the people of Havana. Though spreading over hills, the plan of the town is regular. The tobacco of the Vuelta Abajo lands immediately around the city is famous. The pueblo arose in the middle of the 18th century as a camp for convicts from Mexico. It became a *villa* in 1794. Early in the 19th century refugees from Santo Domingo settled here and founded coffee estates that gave the place great prosperity until the expulsion of the French in 1809; subsequently the cultivation of tobacco renewed its prosperity.

SANATORIUM (a modern Latinism, formed from *sanare*, to cure, restore to health, *sanus*, whole, healthy, well; often wrongly spelled *sanatarium* or *sanitarium*), an establishment where persons suffering from disease, or convalescents, may be received for medical treatment, rest cures and the like; in recent modern usage particularly used for establishments where patients suffering from phthisis may undergo the open-air treatment (see THERAPEUTICS). The mis-spellings of the word, *sanitarium* and *sanatarium*, are due to a confusion of "sanatory," *i.e.* giving health, from *sanare*, and "sanitary," pertaining to health, from *sanitas*, health.

SANATRUCES (*Sinatruces*, Pers. *Sanatruk*), Parthian king. In the troublous times after the death of Mithradates II. (*c.* 88 B.C.) he was made king by the Sacaraucae, a Mongolian tribe who had invaded Iran in 76 B.C. He was eighty years old and reigned seven years; his successor was his son Phraates III. (Lucian, *Macrob.* 15; Phlegon, fr. 12 *ap.* Phot. cod. 97; Appian, *Mithr.* 104; Dio Cass. xxxvi. 45). Another Sanatruces (Sanatrucius) is mentioned as an ephemeral Parthian king in A.D. 115 (Malalas, *Chron.* p. 270, 273). (ED. M.)

SAN BERNARDINO, a city and the county-seat of San Bernardino county, California, U.S.A., about 60 m. E. of Los Angeles. Pop. (1900) 6150 (873 foreign-born); (1910) 12,779. It is served by the Atchison, Topeka & Santa Fé, the Southern Pacific and the San Pedro, Los Angeles & Salt Lake railways, and by an interurban electric line. The city is situated in a valley at an altitude of about 1050 ft., at the S. base of the San Bernardino mountain range and 20 m. W. of San Bernardino mountain (11,600 ft.). Among the public buildings are a Carnegie library (1903; the library was established in 1891), with 10,000 volumes in 1909, and the county court house. There are two public parks, Lugo, near the centre of the city, and Meadowbrook, on the E. outskirts. San Bernardino is one of several places (Redlands, Highland, Rialto, Colton, Bloomington, Riverside, Pomona) that lie near together in part of the citrus fruit, alfalfa and grain region of S. California. The Santa Fé railway has extensive repair and construction shops here. San Bernardino is popularly known as the "Gate City of Southern California." Five miles N. of the city, and connected with it by electric railway, at the base of a mountain on whose side is a great blaze shaped like an arrow-head, are the Arrowhead Hot Springs (196° F.), resembling the Carlsbad waters; the hotel at the Springs is heated by their waters. Other hot springs near San Bernardino are the Urbita, 1¼ m. S., and the Harlem, 4 m. N.E. About 1822 Spanish missionaries settled about 5 m. from the site of the present city and called their mission San Bernardino (from St Bernardin of Siena). In 1851 the Mormons established here a colony, which was abandoned in 1857. The county was organized in 1853 with the county-seat at San Bernardino, which was incorporated as a town in 1854. It was deprived of its charter in 1861, but received a new one in 1864. The Southern Pacific in 1876 gave the city connexion with the ocean, and the Santa Fé in 1885 connected it with the East. Under a state enactment in 1905 San Bernardino adopted a new charter which provides for the "recall" by petition, the initiative and the referendum.

SANCERRE, a town of central France, capital of an arrondissement in the department of Cher, 34 m. N.E. of Bourges by rail. Pop. (1906) 2232. Sancerre, which gives its name to the small district of Sancerrois, is situated on an isolated vine-clad hill

(1000 ft.) about 1 m. from the left bank of the Loire. It has a modern château, in the grounds of which there is a cylindrical keep of the 15th century, the only relic of an ancient stronghold. From 1037 to 1152 the title of count of Sancerre was held by the counts of Champagne; from the latter year till 1640 it had its own counts, who were descended from Theobald IV. of Champagne, but in 1226 came under the suzerainty of the crown. In 1640 it became the property of Henri de Condé, whose descendants possessed it till the Revolution. During the religious wars it was a stronghold of Protestantism, and in 1573 was besieged by the Catholics, who did not succeed in capturing it till after nearly eight months of siege. The town has a subprefecture, a tribunal of first instance and a communal college. Good wine is grown in the vicinity.

SANCHEZ. Three persons of this name enjoyed considerable literary celebrity: (1) Francisco Sanchez (Sanctius) (1523–1601), successively professor of Greek and of rhetoric at Salamanca, whose *Minerva*, first printed at that town in 1587, was long the standard work on Latin grammar. (2) Francisco Sanchez, a Portuguese physician of Jewish parentage, born at Tuy (in the diocese of Braga) in 1550, took a degree in medicine at Montpellier in 1574, became professor of philosophy and physic at Toulouse, where he died in 1623; his ingenious treatise (*Quod nihil scitur*, 1581) marks the high-water of reaction against the dogmatism of his time; he is said to have been distantly related to Montaigne. (3) Tomás Sanchez of Cordova (1551–1610), Jesuit and casuist, whose treatise *De matrimonio* (Genoa, 1592) is more notorious than celebrated.

SĀNCHI, a small village in India, at which there is now a railway station on the Bombay-Baroda line. It is famous as the site of what are almost certainly the oldest buildings in India now standing. They are Buddhist topes (Pali. *thūpa*; Sanskrit, *stūpa*), that is, memorial mounds, standing on the level top of a small sandstone hill about 300 ft. high on the left bank of the river Betwa. The number of topes on this and the adjoining hills is considerable. On the Sānchi hill itself are only ten, but one of these is by far the most important and imposing of all. All these topes were opened and examined by General Alexander Cunningham and Lieut.-Colonel Maisey in 1851; and the great tope has been described and illustrated by them and by James Fergusson. This is a solid dome of stone, about 103 ft. in diameter, and now about 42 ft. high. It must formerly have been much higher, the top of the tope having originally formed a terrace, 34 ft. in diameter, on which stood lofty columns. Cunningham estimates the original height of the building as about 100 ft. Round the base is a flagged pathway surrounded by a stone railing and entered at the four points of the compass by gateways some 18 ft. high. Both gateways and railing are elaborately covered with bas-reliefs and inscriptions. The latter give the names of the donors of particular portions of the architectural ornamentation, and most of them are written in the characters used before and after the time of Asoka in the middle of the 3rd century B.C. The monuments are Buddhist, the bas-reliefs illustrate passages in the Buddhist writings, and the inscriptions make use of Buddhist technical terms. Some of the smaller topes give us names of men who lived in the Buddha's time, and others give names mentioned among the missionaries sent out in the time of Asoka. It is not possible from the available data to fix the exact date of any of these topes, but it may be stated that the smaller topes are probably of different dates both before and after Asoka, and that it is very possible that the largest was one of three which we are told was erected by Asoka himself. The monuments at Sānchi are now under the charge of the archaeological department; they are being well cared for, and valuable photographs have been taken of the bas-reliefs and inscriptions. The drawings in Fergusson's work entitled *Tree and Serpent Worship* are very unsatisfactory, and his suggestion that the carvings illustrate tree and serpent worship is quite erroneous.

Bibliography.—Alex. Cunningham, *Bhilsa Topes* (London, 1854); James Fergusson, *Tree and Serpent Worship* (London, 1873); General F. C. Maisey, *Sanchi and its Remains* (London, 1892); Rhys Davids, *Buddhist India* (London, 1902). (T. W. R. D.)

SANCHUNIATHON (Gr. form of Phoenician *Sakkun-yathon*, "the god Sakkun has given"), an ancient Phoenician sage, who belongs more to legend than to history. He is said to have flourished "even before the Trojan times," "when Semiramis was queen of the Assyrians." Philo Herennius of Byblus claimed to have translated his mythological writings from the Phoenician originals. According to Philo, Sanchuniathon derived the sacred lore from the mystic inscriptions on the 'Αμμουνεῖς (probably *ḥammānim*, "sun pillars," cf. Is. xxvii. 9, &c.) which stood in the Phoenician temples. That any writings of Sanchuniathon ever existed it is impossible to say. Philo drew his traditions from various sources, adapted them to suit his purpose, and conjured with a venerable name to gain credit for his narrative. Porphyry says that Sanchuniathon (here called a native of Byblus) wrote a history of the Jews, based on information derived from Hierombal (*i.e.* Jeruba'al), a priest of the god Jevo (*i.e.* Yahveh, Jehovah), and dedicated it to Abelbal or Abibal, king of Berytus. The story is probably a pure invention; the reference to Berytus shows that it is late.

See Eusebius, *Praep. Ev.* i. 9 (Müller, *Fragm. hist. Graec.* iii. pp. 563 foll.).

SAN CRISTÓBAL (formerly called San Cristóbal de Los Llanos, Ciudad de Las Casas, and Ciudad Real), a town of Mexico, in the state of Chiapas, on a level tableland about 6700 ft. above sea-level and 48 m. E.N.E. of Tuxtla Gutierrez. Pop. (1892 estimate) 16,000. The surrounding country is fertile and healthful and is populated chiefly with Indians. The town possesses a cathedral, hospital and other public institutions. San Cristóbal was founded in 1528 on the site of an Indian village, and afterwards was famous as the residence of Las Casas, Bishop of Chiapas. It was the capital of Chiapas until near the end of the 19th century. There are traces of an early Indian civilization in the vicinity.

SANCROFT, WILLIAM (1616–1693), archbishop of Canterbury, was born at Fressingfield in Suffolk 30th January 1616, and entered Emmanuel College, Cambridge, in July 1634. He became M.A. in 1641 and fellow in 1642, but was ejected in 1649 for refusing to accept the "Engagement." He then remained abroad till the Restoration, after which he was chosen one of the university preachers, and in 1663 was nominated to the deanery of York. In 1664 he was installed dean of St Paul's. In this situation he set himself to repair the cathedral, till the fire of London in 1666 necessitated the rebuilding of it, towards which he gave £1400. He also rebuilt the deanery, and improved its revenue. In 1668 he was admitted archdeacon of Canterbury upon the king's presentation, but he resigned the post in 1670. In 1677, being now prolocutor of the Convocation, he was unexpectedly advanced to the archbishopric of Canterbury. He attended Charles II. upon his deathbed, and "made to him a very weighty exhortation, in which he used a good degree of freedom." He wrote with his own hand the petition presented in 1687 against the reading of the Declaration of Indulgence, which was signed by himself and six of his suffragans. For this they were all committed to the Tower, but were acquitted. Upon the withdrawal of James II. he concurred with the Lords in a declaration to the prince of Orange for a free parliament, and due indulgence to the Protestant dissenters. But, when that prince and his consort were declared king and queen, he refused to take the oath to them, and was accordingly suspended and deprived. From 5th August 1691 till his death on the 24th of November 1693, he lived a very retired life in his native place. He was buried in the churchyard of Fressingfield, where there is a Latin epitaph to his memory. Sancroft was a patron of Henry Wharton (1664–1695), the divine and church historian, to whom on his deathbed he entrusted his manuscripts and the remains of Archbishop Laud (published in 1695).

He published *Fur praedestinatus* (1651), *Modern Politics* (1652), and *Three Sermons* (1694). *Nineteen Familiar Letters to Mr North* (afterwards Sir Henry North) appeared in 1757.

SANCTION (Lat. *sanctio*, from *sancire*, to decree or ordain), in jurisprudence, the means provided for the enforcement of a law. According to T. E. Holland (*Elements of Jurisprudence*, 1906, p. 85), "the real meaning of all law is that, unless acts conform to the course prescribed by it, the state will not only ignore and render no aid to them, but will also, either of its own accord or if called upon, intervene to cancel their effects. This intervention of the state is what is called the 'sanction' of law." So Justinian (*Inst.* ii. 1, 10), "Legum eas partes quibus poenas constituimus adversus eos qui contra leges fecerint, sanctiones vocamus." In general use, the word signifies approval or confirmation.

SANCTIS, FRANCESCO DE (1817–1883), Italian publicist, was born at Morra Irpino, and educated at the institute of the Marchese Basilio Puoti. Becoming a teacher in a private school of his own, he made a name as a profound student of literature; and after the troubles of the '48, when he held office under the revolutionary government and was imprisoned for three years at Naples, his reputation as a lecturer on Dante at Turin brought him the appointment of professor at Zurich in 1856. He returned to Naples as minister of public instruction in 1860, and filled the same post under the Italian monarchy in 1861, 1878 and 1879, having in 1861 become a deputy in the Italian chamber. In 1871 he became professor at Naples University. As a literary critic, De Sanctis took a very high place, notably with his *Storia della letteratura italiana* (2nd ed., 1873) and with his critical studies, published in several volumes, some of them since his death at Naples in 1883.

SANCTI SPIRITUS, an old Cuban city in Santa Clara province, situated on a sandy plain in an angle of the Yayabo river, which winds through the city. Pop. (1907) 17,440. It is connected by railway with Zaza del Medio, on the main railway line of the island, and with its port, Tunas de Zaza, 30 m. (by rail) to the S. The hill called Pan de Azucar (Sugar-loaf) is S.W. of the city. One church is said to be as old as the city, and others date from 1699, 1716, 1717, &c. The surrounding country is devoted principally to grazing. Sancti Spiritus was one of the seven cities founded by Diego Valasquez. Its settlement was ordered in 1514 and accomplished in 1516, and it is the fifth town of the island in age. The present city is about two leagues from the original site (Pueblo Viejo). In 1518, as a result of the war of the Comunidades of Castille, a mimic war broke out in Sancti Spiritus among its two score villagers. The place was sacked by French and English corsairs in 1719. Illicit trade with Jamaica was the basis of local prosperity in the 18th century.

SANCTUARY (from the late Lat. *sanctuarium*, a sacred place), a sacred or consecrated place, particularly one affording refuge, protection or right of asylum; also applied to the privilege itself, the right of safe refuge. In Egyptian, Greek or Roman temples it was applied to the *cella* in which stood the statue of the god, and the Latin word for altar, *ara*, was used for protection as well. In Roman Catholic usage sanctuary is sometimes applied to the whole church, as a consecrated building, but is generally limited to the choir. The idea that such places afforded refuge to criminals or refugees is founded upon the primitive and universal belief in the contagion of holiness. Hence it was sacrilege to remove the man who had gained the holy precincts; he was henceforth invested with a part of the sacredness of the place, and was inviolable so long as he remained there. Some temples had peculiar privileges in this regard. That of Diana at Ephesus extended its inviolability for a perimeter of two stadia, until its right of sanctuary was refused by the Romans. Not all Greek and Roman temples, however, had the right in an equal degree. But where it existed, the action of the Roman civil law was suspended, and in imperial times the statues and pictures of the emperors were a protection against pursuit. Tacitus says that the ancient Germans held woods, even lakes and fountains, sacred; and the Anglo-Saxons seem to have regarded several woods as holy and to have made sanctuaries of them, one of these being at Leek in Staffordshire.

The use of Christian churches as sanctuaries was not based upon the Hebrew cities of refuge, as is sometimes stated. It is part of the general religious fact of the inviolability attaching to things sacred. The Roman law did not recognize the use of Christian sanctuaries until toward the end of the 4th century, but the growing recognition of the office of bishop as intercessor helped much to develop it. By 392 it had been abused to such an extent that Theodosius the Great was obliged to limit its application, refusing it to the *publici debitores*. Further evidence of its progress is given by the provision in 397 forbidding the reception of refugee Jews pretending conversion in order to escape the payment of debts or just punishment. In 398, according to contemporary historians, the right of sanctuary was completely abolished, though the law as we have it is not so sweeping. But next year the right was finally and definitely recognized, and in 419 the privilege was extended in the western empire to fifty paces from the church door. In 431, by an edict of Theodosius and Valentinian it was extended to include the church court-yard and whatever stood therein, in order to provide some other place than the church for the fugitives to eat and sleep. They were to leave all arms outside, and if they refused to give them up they could be seized in the church. Capital punishment was to be meted out to all who violated the right of sanctuary. Justinian's code repeats the regulation of sanctuary by Leo I. in 466, but Justinian himself in a Novel of the year 535 limited the privilege to those not guilty of the grosser crimes. In the new Germanic kingdoms, while violent molestation of the right of sanctuary was forbidden, the fugitive was given up after an oath had been taken not to put him to death (Lex. Rom. Burgund. tit. 2, § 5; Lex. Visigoth vi. tit. 5, c. 16). This legislation was copied by the church at the council of Orleans in 511; the penalty of penance was added, and the whole decree backed by the threat of excommunication. Thus it passed into Gratian's Decretum. It also formed the basis of legislation by the Frankish king Clotaire (511-588), who, however, assigned no penalty for its violation. Historians like Gregory of Tours have many tales to tell showing how frequently it was violated. The Carolingians denied the right of sanctuary to criminals already condemned to death.

The earliest extant mention of the right of sanctuary in England is contained in the code of laws issued by the Anglo-Saxon king Æthelberht in A.D. 600. By these he who infringed the church's privilege was to pay twice the fine attaching to an ordinary breach of the peace. At Beverley and Hexham 1 m. in every direction was sacred territory. The boundaries of the church frith were marked in most cases by stone crosses erected on the highroads leading into the town. Four crosses, each 1 m. from the church, marked the mile limits in every direction of Hexham Sanctuary. Crosses, too, inscribed with the word "Sanctuarium," were common on the highways, serving probably as sign-posts to guide fugitives to neighbouring sanctuaries. One is still to be seen at Armathwaite, Cumberland; and another at St Buryan's, Cornwall, at the corner of a road leading down to some ruins known locally as "the Sanctuary." That such wayside crosses were themselves sanctuaries is in most cases improbable, but there still exist in Scotland the remains of a true sanctuary cross. This is known as MacDuff's Cross, near Lindores, Fifeshire. The legend is that, after the defeat of the usurper, Macbeth, in 1057, and the succession of Malcolm Canmore as Malcolm III. to the Scottish throne, MacDuff, as a reward for his assistance, was granted special sanctuary privileges for his kinsmen. Clansmen within the ninth degree of relationship to the chief of the clan, guilty of unpremeditated homicide, could, on reaching the cross, claim remission of the capital sentence. Probably the privilege has been exaggerated, the fugitive kinsmen were exempt from outside jurisdiction and liable only to the court of the earl of Fife.

The canon law allowed the protection of sanctuary to those guilty of crimes of violence for a limited time only, in order that some compensation (*wergild*) should be made, or to check blood-vengeance. In several English churches there was a stone seat beside the altar which was known as the *frith-stool* (peace-stool), upon which the seeker of sanctuary sat. Examples of such sanctuary-seats still exist at Hexham and Beverley, and of the sanctuary knockers which hung on the church-doors one is still in position at Durham Cathedral. The procedure, upon seeking sanctuary, was regulated in the minutest detail. The fugitive had to make confession of his crime to one of the clergy, to surrender his arms, swear to observe the rules and regulations of the religious houses, pay an admission fee, give, under oath, fullest details of his crime (the instrument used, the name of the victim, &c.), and at Durham he had to toll a special bell as a formal signal that he prayed sanctuary, and put on a gown of black cloth on the left shoulder of which was embroidered a St Cuthbert's cross.

The protection afforded by a sanctuary at common law was this: a person accused of felony might fly for safeguard of his life to sanctuary, and there, within 40 days, go, clothed in sackcloth, before the coroner, confess the felony and take an oath of *abjuration of the realm*, whereby he undertook to quit the kingdom, and not return without the king's leave. Upon confession he was, *ipso facto*, convict of the felony, suffered attainder of blood and forfeited all his goods, but had time allowed him to fulfil his oath. The abjurer started forth on his journey, armed only with a wooden cross, bareheaded and clothed in a long white robe, which made him conspicuous among medieval wayfarers. He had to keep to the king's highway, was not allowed to remain more than two nights in any one place, and must make his way to the coast quickly. The time allowed for his journey was not long. In Edward III.'s reign only nine days were given an abjurer to travel on foot from Yorkshire to Dover.

Under the Norman kings there appear to have been two kinds of sanctuary; one *general*, which belonged to every church, and another *peculiar*, which had its force in a grant by charter from the king. This latter type could not be claimed by prescription, and had to be supported by usage within legal memory. General sanctuaries protected only those guilty of felonies, while those by special grant gave immunity even to those accused of high or petty treason, not for a time only but apparently for life. Of chartered sanctuaries there were at least 22: Abingdon, Armathwaite, Beaulieu, Battle Abbey, Beverley, Colchester, Derby, Durham, Dover, Hexham Lancaster, St Mary le Bow (London), St Martin's le Grand (London), Merton Priory, Northampton, Norwich, Ripon, Ramsey, Wells, Westminster, Winchester, York (Soc. of Antiq. of London, *Archaeologia*, viii. 1-44, London, 1787. *Sketch of the History of the Asylum or Sanctuary*, by Samuel Pegge). Sanctuary being the privilege of the church, it is not surprising to find that it did not extend to the crime of sacrilege; nor does it appear that it was allowed to those who had escaped from the sheriff after they had been delivered to him for execution.

Chartered sanctuaries had existed before the Norman invasion. About thirty churches, from a real or pretended antiquity of the privilege, acquired special reputation as sanctuaries, *e.g.* Westminster Abbey (by grant of Edward the Confessor); Ripon (by grant of Whitlase, king of the Mercians); St Buryans, Cornwall (by grant of Æthelstan); St Martin's le Grand, London, and Beverley Minster. "The precincts of the Abbey," says Dean Stanley, "were a vast cave of Adullam for all the distressed and discontented in the metropolis, who desired, according to the phrase of the time, to 'take Westminster.'" Elizabeth Woodville, queen of Edward IV., took refuge in the Abbey with her younger children from the hostility of Richard III. In the next reign the most celebrated sanctuary-seeker was Perkin Warbeck, who thus twice saved his neck, at Beaulieu and Sheen. John Skelton, tutor and afterwards court poet to Henry VIII., fearing the consequences of his caustic wit as displayed in an attack on Wolsey, took sanctuary at Westminster and died there in 1529.

The law of abjuration and sanctuary was regulated by numerous and intricate statutes (see Coke, *Institutes*, iii. 115); but grave abuses arose, especially in the peculiar sanctuaries. The attack on these seems to have begun towards the close of the 14th century, in the reign of Richard II. During the 15th century violations of sanctuary were not uncommon; the Lollards were forced from churches; and Edward IV. after the battle of Tewkesbury had the duke of Somerset and twenty Lancastrian leaders dragged from sanctuary and beheaded. At the Reformation general and peculiar sanctuaries both suffered drastic curtailment of their privileges, but the great chartered ones suffered most. By the reforming act of 1540 Henry VIII. established seven cities as peculiar sanctuaries. These were Wells, Westminster, Northampton, Manchester, York, Derby and Launceston. Manchester petitioned against being made a sanctuary town, and Chester was substituted. By an act of James I. (1623), sanctuary, as far as crime was concerned, was abolished throughout the kingdom. The privilege lingered on for civil processes in certain districts which had been the site of former religious buildings and which became the haunts of criminals who there resisted arrest—a notable example being that known as Whitefriars between Fleet Street and the Thames, E. of the temple. This locality was nicknamed Alsatia (the name first occurs in Shadwell's plays in Charles II.'s reign), and there criminals were able to a large extent to defy the law (see Sir Walter Scott's *Fortunes of Nigel* and *Peveril of the Peak*), arrests only being possible under writs of the Lord Chief Justice. So flagrant became the abuses here and in the other quasi-sanctuaries that in 1697 an act of William III., known as "The Escape from Prison Act," finally abolished all such alleged privileges. A further amending act of 1723 (George I.) completed the work of destruction. The privileged places named in the two acts were the Minories, Salisbury Court, Whitefriars, Fulwood's Rents, Mitre Court, Baldwin's Gardens, The Savoy, The Clink, Deadman's Place, Montague Close, The Mint and Stepney. (See Stephen, *History of Crim. Law*, i. 113.)

In Scotland excommunication was incurred by any who attempted to arrest thieves within sanctuary. The most famous sanctuaries were those attaching to the Church of Wedale, now Stow, near Galashiels, and that of Lesmahagow, Lanark. All religious sanctuaries were abolished in the Northern Kingdom at the Reformation. But the debtor found sanctuary from "diligence" in Holyrood House and its precincts until late in the 17th century. This sanctuary did not protect criminals, or even all debtors, *e.g.* not crown debtors or fraudulent bankrupts; and it was possible to execute a *meditatio fugae* warrant within the sanctuary. After twenty-four hours' residence the debtor had to enter his name in the record of the Abbey Court in order to entitle him to further protection. Under the Act 1696 c. 5, insolvency concurring with retreat to the sanctuary constituted *notour* bankruptcy (see Bell, *Commentaries*, ii. 461). The abolition of imprisonment for debt in 1881 practically abolished this privilege of sanctuary.

A presumptive right of sanctuary attached to the royal palaces, and arrests could not be made there. In Anglo-Saxon times the king's peace extended to the palace and 3000 paces around it: it extended to the king himself beyond the precincts. At the present day Members of Parliament cannot be served with writs or arrested within the precincts of the Houses of Parliament, which extend to the railings of Palace Yard. During the Irish agitation of the 'eighties Parnell and others of the Irish members avoided arrest for some little while by living in the House and never passing outside the gates of the yard.

The houses of ambassadors were in the past quasi-sanctuaries. This was a natural corollary of their diplomatic immunities (see DIPLOMACY). The privilege was never strictly defined. At one time it was insisted that the immunity accorded an ambassador included his house and those who fled to it. At an earlier date sanctuary had actually been claimed for the quarter of the town in which the house stood. At Rome this privilege was formally abolished by Innocent XI. (Pope 1676–1689), and in 1682 the Spanish ambassador at the Papal Court renounced all right to claim immunity even for his house. His example was followed by the British ambassador in 1686. Portugal, Sweden, Denmark and Venice abolished by express ordinance in 1748 the asylum-rights of ambassadorial residences. In 1726 the Spanish government had forcibly taken the duke of Ripperda out of the hotel of the English ambassador at Madrid, although the Court of St James had sanctioned his reception there. At Venice, too, some Venetians who had betrayed state secrets to the French ambassador and had taken refuge at his house were dragged out by troops sent by the senate.

In Europe, generally, the right of sanctuary survived under restrictions down to the end of the 18th century. In Germany the more serious crimes of violence were always excepted. Highwaymen, robbers, traitors and habitual criminals could not claim church protection. In 1418 sanctuary was further regulated by a bull of Martin V. and in 1504 by another of Julius II. In a modified form the German *Asylrecht* lasted to modern times, not being finally abolished till about 1780. In France *le droit d'asile* existed throughout the middle ages, but was much limited by an edict of Francis I. in 1539, *Ordonnance sur le faut de la justice*. At the Revolution the right of sanctuary was entirely abolished.

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SANCY, NICOLAS DE HARLAY, Seigneur de (1546–1629), French soldier and diplomatist, belonged to the Protestant branch of the family of Harlay but adopted the Catholic religion in 1572 during the massacres of the Huguenots. In 1589 he obtained in Geneva and Berne sums sufficient to raise an army of mercenaries for Henry III., partly by the sale of jewels, among them the "Sancy" diamond which in 1835 found its way to the Russian imperial treasure, and partly by leading the Swiss to suppose that the troops were intended for serious war against Savoy. Henry IV. made him superintendent of his finances in 1594, but in 1599 he was replaced by Sully. Meanwhile he had been a second time converted to Catholicism, but his influence at court waned, and he retired from public life in 1605. He survived until the 13th of October 1629, leaving a *Discours sur l'occurrence des affaires*.

His son, Achille Harlay de Sancy, bishop of Saint Malo (1581–1646), was educated for the church but resigned his vocation for the career of arms on the death of his elder brother in 1601. For seven years, from 1611 to 1618, he was ambassador at the Turkish court, where he amassed a fortune of some £16,000 sterling by doubtful means, and was bastinadoed by order of the sultan for his frauds. Harlay de Sancy was a learned man and a good linguist, who used his opportunities to acquire a valuable collection of oriental MSS., many of which are now in the Bibliothèque Nationale in Paris. On his return to France he joined the Oratorian Fathers, and when Marshal Bassompierre was sent to England in 1627 to regulate the differences between Henrietta Maria and her husband, Harlay de Sancy was attached to the queen's ecclesiastical household, but Charles I. secured his dismissal. He became bishop of St Malo in 1632, and died on the 20th of November 1646.

SAND, GEORGE (1804–1876), the pseudonym of Madame Amandine Lucile Aurore Dudevant, *née* Dupin, the most prolific authoress in the history of literature, and unapproached among the women novelists of France. Her life was as strange and adventurous as any of her novels, which are for the most part idealized versions of the multifarious incidents of her life. In her self-revelations she followed Rousseau, her first master in style, but while Rousseau in his *Confessions* darkened all the shadows, George Sand is the heroine of her story, often frail and faulty, but always a woman more sinned against than sinning. Thanks, however, to her voluminous correspondence that has recently been published and to family documents that her French biographers have unearthed, there are now full materials for tracing the history of her public and private career, and for forming a clear and unbiased estimate of her character and genius.

Her father was Maurice Dupin, a retired lieutenant in the army of the republic; her mother, Sophie Delaborde, the daughter of a Paris bird-fancier. Their ill-assorted marriage took place only a month before the birth of the child (July 1, 1804; at Paris). Her paternal grandfather was M. Dupin de Francueil, a farmer-general of the revenue, who married the widow of Count Horn, a natural son of Louis XV., she in her turn being the natural daughter of Maurice de Saxe, the most famous of the many illegitimate children of Augustus the Strong, by the lovely countess of Königsmarck. George Sand, who was a firm believer in the doctrine of heredity, devotes a whole volume of her autobiography (*Histoire de ma vie*, 1857 seq.) to the elaboration of this strange pedigree. She boasts of the royal blood which ran through her veins, and disregarding the bar sinister she claims affinity with Charles X. and Louis XVII., but she is no less frank in declaring that she is *vilaine et très vilaine*, a daughter of the people, who shares by birth their instincts and sympathies. Her birth itself was romantic. Her father was playing a country dance at the house of a fellow officer, the future husband of Sophie's sister, when he was told that his wife, who had not long left the room, had borne him a daughter. "She will be fortunate," said the aunt, "she was born among the roses to the sound of music."

Passing by her infantine recollections, which go back further than even those of Dickens, we find her at the age of three crossing the Pyrenees to join her father who was on Murat's staff, occupying with her parents a suite of rooms in the royal palace, adopted as the child of the regiment, nursed by rough old sergeants, and dressed in a complete suit of uniform to please the general.

For the next ten years she lived at Nohant, near La Châtre in Berri, the country house of her grandmother. Here her character was shaped; here she imbibed that passionate love of country scenes and country life which neither absence, politics nor dissipation could uproot; here she learnt to understand the ways and thoughts of the peasants, and laid up that rich store of scenes and characters which a marvellously retentive memory enabled her to draw upon at will. The progress of her mind during these early years well deserves to be recorded. Education, in the strict sense of the word, she had none. A few months after her return from Spain her father was killed by a fall from his horse. He was a man of remarkable literary gifts as well as a good soldier. "Character," says George Sand, "is in a great measure hereditary: if my readers wish to know me they must know my father." On his death the mother resigned, though not without a struggle, the care of Aurore to her grandmother, Mme. Dupin de Francueil, a good representative of the *ancien régime*. Though her husband was a patron of Rousseau, she herself had narrowly escaped the guillotine, and had only half imbibed the ideas of the Revolution. In her son's lifetime she had, for his sake, condoned the *mésalliance*, but it was impossible for the stately châtelaine and her low-born daughter-in-law to live in peace under the same roof. She was jealous as a lover of the child's affection, and the struggle between the mother and grandmother was one of the bitterest of Aurore's childish troubles.

Next to the grandmother, the most important person in the household at Nohant was Deschatres. He was an ex-abbé who had shown his devotion to his mistress when her life was threatened, and henceforward was installed at Nohant as factotum. He was maire of the village, tutor to Aurore's half-brother, and, in addition to his other duties, undertook the education of the girl. The tutor was no more eager to teach than the pupil to learn. He, too, was a disciple of Rousseau, believed in the education of nature, and allowed his Sophie to wander at her own sweet will. At odd hours of lessons she picked up a smattering of Latin, music and natural science, but most days were holidays and spent in country rambles and games with village children. Her favourite books were Tasso, *Atala* and *Paul et Virginie*. A simple refrain of a childish song or the monotonous chaunt of the ploughman touched a hidden chord and thrilled her to tears. She invented a deity of her own, a mysterious Corambé, half pagan and half Christian, and like Goethe erected to him a rustic altar of the greenest grass, the softest moss and the brightest pebbles.

From the free out-door life at Nohant she passed at thirteen to the convent of the English Augustinians at Paris, where for the first two years she never went outside the walls. Nothing better shows the plasticity of her character than the ease with which she adapted herself to this sudden change. The volume which describes her conventual life is as graphic as Miss Brontë's *Villette*, but we can only dwell on one passage of it. Tired of mad pranks, in a fit of home-sickness, she found herself one evening in the convent chapel.

> "I had forgotten all; I knew not what was passing in me; with my soul rather than my senses, I breathed an air of ineffable sweetness. All at once a sudden shock passed through my whole being, my eyes swam, and I seemed wrapped in a dazzling white mist. I heard a voice murmur in my ear, '*Tolle, lege.*' I turned round, thinking that it was one of the sisters talking to me—I was alone. I indulged in no vain illusion; I believed in no miracle; I was quite sensible of the sort of hallucination into which I had fallen; I neither sought to intensify it nor to escape from it. Only I felt that faith was laying hold of me—by the heart, as I had wished it. I was so filled with gratitude and joy that the tears rolled down my cheeks. I felt as before that I loved God, that my mind embraced and accepted that ideal of justice, tenderness and holiness which I had never doubted, but with which I had never held direct communion, and now at last I felt that this communion was consummated, as though an invincible barrier had been broken down between the source of infinite light and the smouldering fire of my heart. An endless vista stretched before me, and I panted to start upon my way. There was no more doubt or lukewarmness. That I should repent on the morrow and rally myself on my over-wrought ecstasy never once entered my thoughts. I was like one who never casts a look behind, who hesitates before some Rubicon to be crossed, but having touched the farther bank sees no more the shore he has just left."

Such is the story of her conversion as told by herself. It reads more like a chapter from the life of Ste Thérèse or Madame Guyon than of the author of *Lélia*. Yet no one can doubt the sincerity of her narrative, or even the permanence of her religious feelings under all her many phases of faith and aberrations of conduct. A recent critic has sought in religion the clue to her character and the mainspring of her genius. Only in her case religion must be taken in an even more restricted sense than Matthew Arnold's "morality touched by emotion." For her there was no categorical imperative, no moral code save to follow the promptings of her heart. "Tenderness" she had abundantly, and it revealed itself not only in effusive sentimentality, as with Rousseau and Chateaubriand, but in active benevolence; "justice" too she had in so far as she sincerely wished that all men should share alike her happiness; but of "holiness," that sense of awe and reverence that was felt in divers kinds and degrees by Isaiah, Sophocles, Virgil and St Paul, she had not a rudimenatry conception.

Again in 1820 Aurore exchanged the restraint of a convent for freedom, being recalled to Nohant by Mme de Francueil, who had no intention of letting her granddaughter grow up a *dévote*. She rode across country with her brother, she went out shooting with Deschatres, she sat by the cottage doors on the long summer evenings and heard the flax-dressers tell their tales of witches and warlocks. She was a considerable linguist and knew English, Italian and some Latin, though she never tackled Greek. She read widely though unsystematically, studying philosophy in Aristotle, Leibnitz, Locke and Condillac, and feeding her imagination with *René* and *Childe Harold*. Her confessor lent her the *Genius of Christianity*, and to this book she ascribes the first change in her religious views. She renounced once for all the asceticism and isolation of the *De imitatione* for the more genial and sympathetic Christianity of Chateaubriand. Yet she still clung to old associations, and on her grandmother's death was about to return to her convent, but was dissuaded by her friends, who found her a husband.

Casimir Dudevant, whom she married on the 11th of December 1822, was the natural son of a Baron Dudevant. He had retired at an early age from the army and was living an idle life at home as a gentleman farmer. Her husband, though he afterwards deteriorated, seems at that time to have been neither better nor worse than the Berrichon squires around him, and the first years of her married life, during which her son Maurice and her daughter Solange were born, except for lovers' quarrels, were passed in peace and quietness, though signs were not wanting of the coming storm. Among these must be mentioned her friendship with Aurélien de Sèze, advocate-general at Bourdeau. De Sèze was a middle-aged lawyer with a philosophic turn of mind, and Madame Dudevant for two years kept up with him an intimate correspondence. The friendship was purely platonic, but the husband felt or affected jealousy, and resented an intimacy which he from his total lack of culture was unable to share. The breach quickly widened. He on his part was more and more repelled by a superior woman determined to live her own intellectual life, and she on hers discovered that she was mated, if not to a clown, at least to a *hobereau* whose whole heart was in his cattle and his turnips. So long as the conventionalities were preserved she endured it, but when her husband took to drinking and made love to the maids under her very eyes she resolved to break a yoke that had grown intolerable. The last straw that determined action was the discovery of a paper docketed "Not to be opened till after my death," which was nothing but a railing accusation against herself. She at once quitted Nohant, taking with her Solange, and in 1831 an amicable separation was agreed upon, by which her whole estate was surrendered to the husband with the stipulation that she should receive an allowance of £120 a year. She had regained her liberty, and made no secret of her intention to use it to the full. She endeavoured unsuccessfully to eke out her irregularly paid allowance by those expedients to which reduced gentlewomen are driven—fancy-work and painting fans and snuff-boxes; she lived in a garret and was often unable to allow herself the luxury of a fire. It was only as a last resource that she tried literature. Her first apprenticeship was served under Delatouche, the editor of *Figaro*. He was a native of Berri, like herself, a stern but kindly taskmaster who treated her much as Dr Johnson treated Fanny Burney. George Sand was methodical and had a ready pen, but she lacked the more essential qualities of a Parisian journalist, wit, sparkle and conciseness. At the end of a month, she tells us, her earnings amounted to fifteen francs. On the staff of *Figaro* was another compatriot with whom she was already intimate as a visitor at Nohant. Jules Sandeau was a clever and attractive young lawyer. Articles written in common soon led to a complete literary partnership, and 1831 there appeared in the *Revue de Paris* a joint novel entitled *Prima Donna* and signed Jules Sand. Shortly after this was published in book form with the same signature a second novel, *Rose et Blanche*. The sequel to this literary alliance is best recounted in George Sand's own words: "I resisted him for three months but then yielded; I lived in my own apartment in an unconventional style." Her first independent novel, *Indiana* (1832), was written at the instigation of Delatouche, and the world-famous pseudonym George (originally Georges) Sand was adopted as a compromise between herself and her partner. The "George" connoted a Berrichon as "David" does a Welshman. The one wished to throw *Indiana* into the common stock, the other refused to lend his name, or even part of his name, to a work in which he had had no share. The novel was received with instant acclamation, and Sainte-Beuve only confirmed the judgment of the public when he pronounced in the *Globe* that this new author (then to him unknown) had struck a new and original vein and was destined to go far. Delatouche was the first to throw himself at her feet and bid her forget all the hard things he had said of her. *Indiana* is a direct transcript of the author's personal experiences (the disagreeable husband is M. Dudevant to the life), and an exposition of her theory of sexual relations which is founded thereon. To many critics it seemed that she had said her whole say and that nothing but replicas could follow. *Valentine*, which was published in the same year, indicated that it was but the first chapter in a life of endless adventures, and that the imagination which turned the crude facts into poetry, and the fancy which played about them like a rainbow, were inexhaustible.

As a novel *Valentine* has little to commend it; the plot is feeble and the characters shadowy. Only in the descriptions of scenery, which here resemble too much purple patches, does George Sand reveal her true inspiration, the artistic qualities by which she will live. No one was more conscious than George Sand herself of her strength and of her weakness. In a preface to a later edition she tells us how the novel came to be written, and, though it anticipates events, this revelation of herself may best be given here.

> "After the unexpected literary success of *Indiana* I returned to Berri in 1832 and found a pleasure in painting the scenes with which I had been familiar from a child. Ever since those early days I had felt the impulse to describe them, but as is the case with all profound emotions, whether intellectual or moral, what we most desire to realize to ourselves we are the least inclined to reveal to the world at large. This little nook of Berri, this unknown Vallée Noire, this quiet and unpretentious landscape, which must be sought to find it and loved to be admired, was the sanctuary of my first and latest reveries. For twenty-two years I have lived amongst these pollarded trees, these rutty roads, beside these tangled thickets and streams along whose banks only children and sheep can pass. All this had charms for me alone and did not deserve to be revealed to idle curiosity. Why betray the incognito of this modest country-side without historical association or picturesque sites to commend it to the antiquary or the tourist? The Vallée Noire, so it seemed to me, was part and parcel of myself, the framework in which my life was set, the native costume that I had always worn—what worlds away from the silks and satins that are suited for the public stage. If I could have foreseen what a stir my writings would make, I think I should have jealously guarded the privacy of this sanctuary where, till then, I perhaps was the only soul who had fed the artist's visions and the poet's dreams. But I had no such anticipation; I never gave it a thought. I was compelled to write and I wrote. I let myself be carried away by the secret charm of the air I breathed; my native air, I might almost call it. The descriptive parts of my novel found favour. The plot provoked some lively criticism on the anti-matrimonial doctrines that I was alleged to have broached before in *Indiana*. In both novels I pointed out the dangers and pains of an ill-assorted marriage. I thought I had simply been writing a story, and discovered that I had unwittingly been preaching Saint-Simonianism. I was not then at an age for reflecting on social grievances. I was too young to do more than see and note facts, and thanks to my natural indolence and that passion for the concrete, which is at once the joy and the weakness of artists, I should perhaps always have remained at that stage if my somewhat pedantic critics had not driven me to reflect and painfully search after the ultimate causes of which till then I had only grasped the effects. But I was so shrewdly taxed with posing as a strong-minded woman and a philosopher that one fine day I said to myself, 'What, I wonder, *is* philosophy?'"

Her liaison with Jules Sandeau, which lasted more than a year, was abruptly terminated by the discovery in their apartment on an unexpected return from Nohant of *une blanchisseuse quelconque*. For a short while she was broken hearted:—"My heart is a cemetery!" she wrote to Sainte-Beuve. "A necropolis," was the comment of her discarded lover when years later the remark was repeated to him.

Her third novel, *Lélia* (1833), is in the same vein, a stronger and more outspoken diatribe against society and the marriage law. Lélia is a female Manfred, and Dumas had some reason to complain that George Sand was giving them "du Lord Byron au kilo."

But a new chapter in her life was now to open. In her despair she turned for comfort and counsel to Sainte-Beuve, now constituted her regular father confessor. This ghostly Sir Pandarus recommended new friendships, but she was hard to please. Dumas was "trop commis-voyageur," Jouffroy too serenely virtuous and Musset "trop dandy." Mérimée was tried for a week, but the cool cynic and the perfervid apostle of women's rights proved mutually repulsive. Alfred de Musset was introduced, and the two natures leapt together as by elective affinity. The moral aspect has been given by Mr Swinburne in an epigram:—"Alfred was a terrible flirt and George did not behave as a perfect gentleman."

Towards the end of 1833 George Sand, after winning the reluctant consent of Musset's mother, set out in the poet's company for Italy, and in January 1834 the pair reached Venice, staying first at the Hôtel Danieli and then in lodgings. At first it was a veritable honeymoon; conversation never flagged and either found in the other his soul's complement. But there is a limit to love-making, and George Sand, always practical, set to work to provide the means of living. Musset, though he depended on her exertions, was first bored and then irritated at the sight of this *terrible vache à écrire*, whose pen was going for eight hours a day, and sought diversion in the cafés and other less reputable resorts of pleasure. The consequence was a nervous illness with some of the symptoms of delirium tremens, through which George Sand nursed him with tenderness and care. But with a strange want of delicacy, to use the mildest term, she made love at the same time to a young Venetian doctor whom she had called in, by name Pagello. The pair went off and found their way eventually to Paris, leaving Musset in Italy, deeply wounded in his affections, but, to do him justice, taking all the blame for the rupture on himself. George Sand soon tired of her new love, and even before she had given him his congé was dying to be on again with the old. She cut off her hair and sent it to Musset as a token of penitence, but Musset, though he still flirted with her, never quite forgave her infidelity and refused to admit her to his deathbed. Among the mass of *romans à clef* and pamphlets which the adventure produced, two only have any literary importance, Musset's *Confessions d'un enfant du siècle* and George Sand's *Elle et lui*. In the former woman appears as the serpent whose trail is over all; in the latter, written twenty-five years after the event, she is the guardian angel abused and maltreated by men. *Lui et elle*, the rejoinder of the poet's brother Paul de Musset, was even more a travesty of the facts with no redeeming graces of style.

It remains to trace the influence, direct or indirect, of the poet on the novelist. *Jacques* was the first outcome of the journey to Italy, and in precision and splendour of style it marks a distinct progress. The motive of this and of the succeeding novels of what may be called her second period is free (not to be confounded with promiscuous) love. The hero, who is none other than George Sand in man's disguise, makes confession of faith:—"I have never imposed constancy on myself. When I have felt that love was dead, I have said so without shame or remorse and have obeyed Providence that was leading me elsewhere." And the runaway wife writes to her lover:—"O my dear Octave, we shall never pass a night together without first kneeling down and praying for Jacques." Love is a divine instinct: to love is to be virtuous; follow the dictates of your heart and you cannot go wrong—such is the doctrine that George Sand preached and practised.

In *Les Lettres d'un voyageur*, which ran in the *Revue des deux mondes* between 1834 and 1836, we have not only impressions of travel, but the direct impressions of men and things not distorted by the exigencies of a novel. They reveal to us the true and better side of George Sand, the loyal and devoted friend, the mother who under happier conditions might have been reputed a Roman matron. We could not choose a more perfect specimen of her style than the allegory under which she pictures the "might have been."

> "I care little about growing old; I care far more not to grow old alone, but I have never met the being with whom I could have chosen to live and die, or if I ever met him I knew not how to keep him. Listen to a story and weep. There was a good artist called Watelet, the best aquafortis engraver of his day. He loved Marguerite Lecomte, and taught her to engrave as well as himself. She left husband and home to go and live with him. The world condemned them; then, as they were poor and modest, it forgot them. Forty years afterwards their retreat was discovered. In a cottage in the environs of Paris called *Le Moulin joli*, there sat at the same table an old man engraving and an old woman whom he called his *meunière* also engraving. The last design they were at work upon represented the *Moulin joli*, the house of Marguerite, with the device *Cur valle permutem Sabina divitias operosiores?* It hangs in my room over a portrait the original of which no one here has seen. For a year the person who gave me this portrait sat with me every night at a little table and lived by the same work. At daybreak we consulted together on our work for the day, and at night we supped at the same little table, chatting the while on art, on sentiment, on the future. The future broke faith with us. Pray for me, O Marguerite Lecomte!"

The Everard of the *Lettres* introduces us to a new and for the time a dominant influence on the life and writings. Michel de Bourges was the counsel whose eloquent pleadings brought the suit for a judicial separation to a successful issue in 1836.[1] Unlike her former lovers, he was a man of masterful will, a budge philosopher who carried her intellect by storm before he laid siege to her heart. He preached republicanism to her by the hour, and even locked her up in her bedroom to reflect on his sermons. She was but half converted, and fled before long from a republic in which art and poetry had no place. Other celebrities who figure in the *Lettres* under a transparent disguise are Liszt and Mme d'Agoult (known to literature as Daniel Stern), whom she met in Switzerland and entertained for some months at Nohant. Liszt, in after years when they had drifted apart, wrote of her: "George Sand catches her butterfly and tames it in her cage by feeding it on flowers and nectar—this is the love period. Then she sticks her pin into it when it struggles—that is the congé and it always comes from her. Afterwards she vivisects it, stuffs it, and adds it to her collection of heroes for novels." There is some truth in the satire, but it wholly misrepresents her rupture with Chopin.

To explain this we must open a new chapter of the life in which George Sand appears as the devoted mother. The letters to her daughter Solange, which have recently been published, irresistibly recall the letters of Mme de Sévigné to Mme de Grignan. Solange, who inherited all her mother's wild blood with none of her genius, on the eve of a marriage that had been arranged with a Berrichon gentleman, ran away with Clésinger, a sculptor to whom she had sat for her bust. George Sand not only forgave the elopement and hushed up the scandal by a private marriage, but she settled the young couple in Paris and made over to them nearly one-half of her available property. Clésinger turned out a thankless scapegrace and George Sand was at last compelled to refuse to admit him to Nohant. In the domestic quarrel that ensued Solange, who was a very Vivien, got the ear of Chopin. He upbraided the mother with her hard-heartedness, and when she resented his interference he departed in a huff and they never met again.

The mention of Liszt has led us to anticipate the end of the story, and we must revert to 1836, when the acquaintance began. She was then living in Paris, a few doors from her friend Mme d'Agoult, and the two set up a common *salon* in the Hôtel de France. Here she met two men, one of whom indoctrinated her with religious mysticism, the other with advanced socialism, Lamennais and Pierre Leroux. In the case of Lamennais the disciple outstripped the master. She flung herself into Lamennais's cause and wrote many unpaid articles in his organ, *Le Monde*, but they finally split on the questions of labour and of women's rights, and she complained that Lamennais first dragged her forwards and then abused her for going too fast. The *Lettres à Marcie* (1837) are a testimony to his ennobling and spiritualizing personality. Socialism was a more lasting phase, but her natural good sense revolted at the extravagant mummeries of Père Enfantin and she declined the office of high priestess.

It was doubtless a revulsion of feeling against the doctrinaires and in particular against the puritanic reign of Michel that made her turn to Chopin. She found the *maestro* towards the end of 1837 dispirited by a temporary eclipse of popularity and in the first stage of his fatal malady, and carried him off to winter with her in the south. How she roughed it on an island unknown to tourists is told in *Un hiver à Majorque* (1842), a book of travel that may take rank with Heine's *Reisebilder*. In nearly all George Sand's loves there was a strong strain of motherly feeling. Chopin was first petted by her like a spoilt darling and then nursed for years like a sick child.

During this, her second period, George Sand allowed herself to be the mouthpiece of others—"un écho qui embellissait la voix," as Delatouche expressed it. *Spiridion* (1838) and *Les Sept cordes de la lyre* (1840) are mystic echoes of Lamennais. *Le Compagnon du tour de France* (1841), *Les Maîtres mosaïstes* and *Le Meunier d'Angibault* (1845), *Le Péché de M. Antoine* (1847) are all socialistic novels, though they are much more, and good in spite of the socialism. *Consuelo* (1842–1844) and its sequel *La Comtesse de Rudolstadt* (1843–1845) are *fantaisies à la Chopin*, though the stage on which they are played is the Venice of Musset. Chopin is the Prince Karol of *Lucrezia Floriani* (1847), a self-portraiture unabashed as the *Tagebuch einer Verlorenen* and innocent as *Paul et Virginie*.

An enumeration of George Sand's novels would constitute a Homeric catalogue, and it must suffice to note only the most typical and characteristic. She contracted with Buloz to supply him with a stated amount of copy for the modest retaining fee of £160 a year, and her editor testifies that the tale of script was furnished with the punctuality of a notary. She wrote with the rapidity of Walter Scott and the regularity of Anthony Trollope. For years her custom was to retire to her desk at 10 P.M. and not to rise from it till 5 A.M. She wrote *à la diable*, starting with some central thesis to set forth or some problem to investigate, but with no predetermined plot or plan of action. Round this nucleus her characters (too often mere puppets) grouped themselves, and the story gradually crystallized. This unmethodical method produces in her longer and more ambitious novels, in *Consuelo* for instance and its continuation, a tangled wilderness, the clue to which is lost or forgotten; but in her novelettes, when there is no change of scenery and the characters are few and simple, it results in the perfection of artistic writing, "an art that nature makes."

From novels of revolt and tendency novels George Sand turned at last to simple stories of rustic life, the genuine pastoral. It is here that she shows her true originality and by these she will chiefly live. George Sand by her birth and bringing-up was half a peasant herself, in M. Faguet's phrase, "un paysan qui savait parler." She had got to know the heart of the peasant—his superstitions, his suspiciousness and low cunning, no less than his shrewdness, his sturdy independence and his strong domestic attachments.

Jeanne (1844) begins the series which has been happily called the Bucolics of France. To paint a Joan of Arc who lives and dies inglorious is the theme she sets herself, and through most of the novel it is perfectly executed. The last chapters when Jeanne appears as the Velida of Mont Barbot and the Grande Pastoure are a falling off and a survival of the romanticism of her second manner. *La Mare au diable* (1846) is a clear-cut gem, perfect as a work of Greek art. *François le champi* and *La Petite Fadette* are of no less exquisite workmanship. *Les Maîtres sonneurs* (1853)—the favourite novel of Sir Leslie Stephen—brings the series of village novels to a close, but as closely akin to them must be mentioned the *Contes d'une grande-mère*, delightful fairy tales of the Talking Oak, Wings of Courage and Queen Coax, told to her grandchildren in the last years of her life.

The revolution of 1848 arrested for a while her novelistic activities. She threw herself heart and soul into the cause of the extreme republicans, composed manifestos for her friends, addressed letters to the people, and even started a newspaper. But her political ardour was short-lived; she cared little about forms of government, and, when the days of June dashed to the ground her hopes of social regeneration, she quitted once for all the field of politics and returned to her quiet country ways and her true vocation as an interpreter of nature, a spiritualizer of the commonest sights of earth and the homeliest household affections. In 1849 she writes from Berri to a political friend: "You thought that I was drinking blood from the skulls of aristocrats. No, I am studying Virgil and learning Latin!"

In her latest works she went back to her earlier themes of romantic and unchartered love, but the scene is shifted from Berri, which she felt she had exhausted, to other provinces of France, and instead of passionate manifestos we have a gallery of *genre* pictures treated in the spirit of *François le champi*. "Vous faites," she said to her friend Honoré de Balzac, "la comédie humaine; et moi, c'est l'églogue humaine que j'ai voulu faire."

A word must be said of George Sand as a playwright. She was as fond of acting as Goethe, and like him began with a puppet stage, succeeded by amateur theatricals, the chief entertainment provided for her guests at Nohant. Undaunted by many failures, she dramatized several of her novels with moderate success—*François le champi*, played at the Odéon in 1849, and *Les Beaux Messieurs de Bois-Doré* (1862) were the best; *Claudie*, produced in 1851, is a charming pastoral play, and *Le Marquis de Villemer* (1864) (in which she was helped by Dumas fils) was a genuine triumph. Her statue by Clésinger was placed in the foyer of the Théâtre Français in 1877.

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[1] The final settlement was concluded in 1836. Mme Dudevant was granted sole legal rights over the two children and her Paris home was restored to her. In return she made over to her husband 40,000 fr. vested in the funds.

Of George Sand's style a foreigner can be but an imperfect judge, but French critics, from Sainte-Beuve, Nisard and Caro down to Jules Lemaître and Faguet, have agreed to praise her spontaneity, her correctness of diction, her easy opulence—the *lactea ubertas* that Quintilian attributes to Livy. The language of her country novels is the genuine *patois* of middle France rendered in a literary form. Thus in *La Petite Fadette*, by the happy device of making the hemp dresser the narrator, she speaks (to quote Sainte-Beuve) as though she had on her right the unlettered rustic and on her left a member of the Académie, and made herself the interpreter between the two. She hits the happy mean between the studied archaism of Courier's *Daphnis et Cloë* and the realistic *patois* of the later kailyard novel which for Southerners requires a glossary. Of her style generally the characteristic quality is fluidity. She has all the abandon of an Italian improvisatore, the simplicity of a Bernardin de St Pierre without his mawkishness, the sentimentality of a Rousseau without his egotism, the rhythmic eloquence of a Chateaubriand without his grandiloquence.

As a painter of nature she has much in common with Wordsworth. She keeps her eye on the object, but adds, like Wordsworth, the visionary gleam, and receives from nature but what she herself gives. Like Wordsworth she lays us on the lap of earth and sheds the freshness of the early world. She, too, had found love in huts where poor men dwell, and her miller, her bagpipers, her workers in mosaic are as faithful renderings in prose of peasant life and sentiment as Wordsworth's leech-gatherer and wagoners and gleaners are in verse. Her psychology is not subtle or profound, but her leading characters are clearly conceived and drawn in broad, bold outlines. No one has better understood or more skilfully portrayed the artistic temperament—the musician, the actor, the poet—and no French writer before her had so divined and laid bare the heart of a girl. She works from within outwards, touches first the mainspring and then sets it to play. As Mr Henry James puts it, she interviews herself. Rarely losing touch of earth, and sometimes of the earth earthy, she is still at heart a spiritualist. Her final word on herself rings true, "Toujours tourmentée des choses divines."

Unlike Victor Hugo and Balzac, she founded no school, though Fromentin, Theuriet, Cherbuliez, Fabre and Bazin might be claimed as her collateral descendants. In Russia her influence has been greater. She directly inspired Dostoievski, and Turgenieff owes much to her. In England she has found her warmest admirers. Elizabeth Barrett Browning wrote sonnets to "the large-brained woman and large-hearted man, self-named George Sand." To Thackeray her diction recalled the sound of village bells falling sweetly and softly on the ear, and it sent a shiver through John Stuart Mill, like a symphony of Haydn or Mozart. Leslie Stephen advised Thomas Hardy, then an aspiring contributor to the *Cornhill*, to read George Sand, whose country stories seemed to him perfect. "The harmony and grace, even if strictly inimitable, are good to aim at." He pronounced the *Histoire de ma vie* about the best biography he had ever read. F. W. H. Myers claimed her as *anima naturaliter Christiana* and the inspired exponent of the religion of the future.

George Eliot by her very name invites and challenges comparison with George Sand. But it was as a humble follower, not as a rival, that she took George Sand as sponsor. Both women broke with social conventions, but while George Sand (if the expression may be allowed) kicked over the traces, George Eliot was impelled all the more emphatically, because of her exceptional circumstances, to put duty before inclination and to uphold the reign of law and order. Both passed through phases of faith, but while even Positivism did not cool George Eliot's innate religious fervour, with George Sand religion was a passing experience, no deeper than her republicanism and less lasting than her socialism, and she lived and died a gentle savage. Rousseau's *Confessions* was the favourite book of both (as it was of Emerson), but George Eliot was never converted by the high priest of sentimentalism into a belief in human perfectibility and a return to nature. As a thinker George Eliot is vastly superior; her knowledge is more profound and her psychological analysis subtler and more scientific. But as an artist, in unity of design, in harmony of treatment, in purity and simplicity of language, so felicitous and yet so unstudied, in those qualities which make the best of George Sand's novels masterpieces of art, she is as much her inferior.

Mr Francis Gribble has summed up her character in "a scornful, insular way" as a light woman. A truer estimate is that of Sainte-Beuve, her intimate friend for more than thirty years, but never her lover. "In the great crises of action her intellect, her heart and her temperament are at one. She is a thorough woman, but with none of the pettinesses, subterfuges, and mental reservations of her sex; she loves wide vistas and boundless horizons and instinctively seeks them out; she is concerned for universal happiness and takes thought for the improvement of mankind—the last infirmity and most innocent mania of generous souls. Her works are in very deed the echo of our times. Wherever we were wounded and stricken her heart bled in sympathy, and all our maladies and miseries evoked from her a lyric wail."

George Sand died at Nohant on the 8th of June 1876. To a youth and womanhood of storm and stress had succeeded an old age of serene activity and then of calm decay. Her nights were spent in writing, which seemed in her case a relaxation from the real business of the day, playing with her grandchildren, gardening, conversing with her visitors—it might be Balzac or Dumas, or Octave Feuillet or Matthew Arnold—or writing long letters to Sainte-Beuve and Flaubert. "Calme, toujours plus de calme," was her last prayer, and her dying words, "Ne détruisez pas la verdure."

BIBLIOGRAPHY.—The collected edition of George Sand's works was published in Paris (1862–1883) in 96 volumes, with supplement 109 volumes; the *Histoire de ma vie* appeared in 20 volumes in 1854–1855. The *Étude bibliographique sur les œuvres de George Sand* by "le bibliophile Isaac" (vicomte de Spoelberck) (Brussels, 1868) gives the most complete bibliography. Of Vladimir Karenin's (pseudonym of Mme Komarova) *George Sand*, the most complete life, the first two volumes (1899–1901) carry the life down to 1839. There is much new material in *George Sand et sa fille*, by S. Rocheblave (1905), *Correspondance de G. Sand et d'Alfred de Musset* (Brussels, 1904), *Correspondance entre George Sand et Gustave Flaubert* (1904), and *Lettres à Alfred de Musset et à Sainte-Beuve* (1897). E. M. Caro's *George Sand* (1887) is rather a critique than a life. Lives by Mirecourt (1855) and by Haussonville (1878) may also be consulted. Of the numerous shorter studies may be mentioned those of Sainte-Beuve in the *Causeries du lundi* and in *Portraits contemporains*; Jules Lemaître in *Les Contemporains*, vol. iv.; E. Faguet, *XIX^e Siècle*; F. W. H. Myers, *Essays Ancient and Modern* (1883); Henry James in *North American Review* (April 1902); Matthew Arnold, *Mixed Essays* (1879). See also René Doumic's *George Sand* (1909), which has been translated into English by Alys Hallard as *George Sand: Some Aspects of her Life and Writings* (1910). (F. S.)

SAND. When rocks or minerals are pulverized by any agencies, natural or artificial, the products may be classified as gravels, sands and muds or clays, according to the size of the individual particles. If the grains are so fine as to be impalpable (about $\frac{1}{1000}$ in. in diameter) the deposit may be regarded as a mud or clay; if many of them are as large as peas the rock is a gravel. Sands may be uniform when they have been sorted out by some agency such as a gentle current of water or the wind blowing steadily across smooth arid lands, but usually they vary much both in the coarseness of their grains and in their mineral composition. The great source of natural sands is the action of the atmosphere, frost, rain, plants and other agencies in breaking up the surfaces of rocks and reducing them to the condition of fine powder; in other words sands are ordinarily the product of the agencies of denudation operating on the rocks of the earth's crust. Not all, however, are of this kind, for a few are artificial, like the crushed tailings produced in the extractions of metals from their ores; there are also volcanic sands which have originated by explosions of steam in the craters of active volcanoes.

A great part of the surface of the globe is covered by sand. In fertile regions the soil is very often of a sandy nature; though most soils are mixtures of sand with clay or stones, and may be described as loams rather than as sands. Pure sandy soils are found principally near sea-coasts where the sand has been blown inwards from the shore, or on formations of soft and friable sandstone like the Greensand. The soil of deserts also is often arenaceous, but there the finer particles have been lifted and borne away by the wind. Accumulations of sand are found also in some parts of the courses of our rivers, very often over wide stretches of the seashore, and more particularly on the sea bottom, where the water is not very deep, at no great distance from the land.

Of the rock-making minerals which are common on the earth's crust only a limited number occur at all frequently in sand deposits. For several reasons quartz is by far the commonest ingredient of sands. It is a very abundant mineral in rocks and is comparatively hard, so that it is not readily worn down to a very fine muddy paste. It also possesses practically no cleavage, and does not split up naturally into thin fragments. If we add to this that it is nearly insoluble in water and that it does not decompose, but preserves its freshness unaltered after long ages of exposure to weathering, we can see that it has all the properties necessary for furnishing a large portion of the sandy material produced by the detrition of rock masses. With quartz there is often a small amount of felspar (principally microcline, orthoclase and oligoclase), but this mineral, though almost as common as quartz in rocks, splits up readily on account of its cleavage, and decomposes into fine, soft, scaly aggregates of mica and kaolin, which are removed by the sifting action of water and are deposited as muds or clays. Small plates of white mica, which, though soft and very fissile, decompose very slowly, are often mingled with the quartz and felspar. In addition to these, all sands contain such minerals as garnet, tourmaline, zircon, rutile and anatase, which are common rock-forming minerals, both hard and resistant to decomposition. Among the less common ingredients are topaz, staurolite, kyanite, andalusite, chlorite, iron oxides, biotite, hornblende and augite, while small particles of chert, felsite and other fine-grained rocks appear frequently in the coarser sand deposits.

Shore sands and river sands, which have not been transported for any great distance from their parent rocks, often contain minerals that are too soft or too readily decomposed to persist. In the Lizard district of Cornwall the sands at the base of cliffs of serpentine are rich in olivine, augite, enstatite, tremolite and chromite. Near volcanic islands such minerals as biotite, hornblende, augite and zeolites may form a large portion of the local sand deposits. In marine sands also organic substances are almost universally present, either fragments of plants or the debris of calcareous shells, in fact many sands consist almost entirely of such fragments (shell sands). Around coral islands there are often extensive deposits of comminuted coral (coral sands), mixed with which there is a varying proportion of broken skeletons of calcareous algae, sponge-spicules and other debris of organic origin. The Greensands which are widely distributed over the floor of the oceans, in places where the continental shelf merges into the greater depths, owe their colour to small rounded lumps of glauconite.

Among the accessory ingredients of sands which are of great value and interest are the precious metals, especially gold and platinum. These are found usually in the lower parts of the sand deposits resting on the bed-rock, because of their high specific gravity, and have been derived from the destruction of the rocks in which they originally occurred either in quartzose veins or as disseminated particles. Tinstone occurs also in this way ("stream-tin"), and in Ceylon, Burma, Brazil, South Africa, &c., precious stones such as the diamond, ruby, spinel, chrysoberyl and tourmaline are found in beds of sand and gravel (gem sands).

In general the sand grains have a rounded or oviform shape due to mutual attrition during transport. Those which have been carried farthest are most rounded; sands deposited at no great distance from their parent rock often consist largely of angular grains. The smaller fragments may be carried along in suspension in water, and may travel for many miles without being sensibly worn; but coarse sands and fine gravels are swept along the bottom and are subjected to an intense grinding action. Something depends also on the hardness of the minerals present in the sands, yet even the diamonds and other gems found in sand deposits have often their corners worn and smoothed. Minerals with very perfect cleavage, such as mica, split up into thin plates under the shock of impact with adjacent grains, and are never rounded like quartz or tourmaline. In deserts the transport of the sands is effected by the wind, and owing to the low viscosity of air even the smallest grains are not held in suspension but are rolled along the ground; hence very fine quartzose sands are sometimes met with in arid regions with every particle smoothed and polished. These sands flow almost like a liquid and are used in hour-glasses. Similar "desert sands" occur among the sandstones of the Trias and were doubtless formed in the manner described.

In addition to river sands, shore sands, marine sand deposits and desert sands, there are many other types of sand deposits. Blown sands are usually found near the seashore, but occur also at the margin of some great lakes like those of N. America; desert sands belong in great part to this category. These sands have been blown into their present position by the wind, and unless fixed by vegetation are constantly though slowly in movement, being in consequence a menace to agricultural land on their leeward sides. They may be shell sands, quartz sands or mixed sands, and often show very marked oblique stratification or "current bedding." The surface of blown sand deposits is generally marked by dunes. Glacial sands are common in districts like Britain and those parts of N. America which have been covered by an ice-sheet. They are really water-borne and have been deposited by streams, though they occur in situations where rivers no longer flow. The waters produced by the melting of the ice-sheets flooded extensive tracts of country, laying down sand and mud deposits in temporary lakes. These sands are usually angular, because they have not been transported to any great distance. The old high-level terraces which border the lower courses of many rivers, though usually consisting of gravel, are often accompanied by considerable sand deposits.

Many of the Tertiary and some of the Secondary sandstone rocks are so incompletely consolidated by cementation that they are essentially sand rocks, and especially when weathered may be used as sources of sand. Thus in Britain there are Pliocene sands (St Erth, Cornwall, &c.), Eocene sands (Bagshot sands and Thanet sands); and the Lower and Upper Greensand (Cretaceous) are often dug in pits, though sometimes firmly coherent and more properly described as sandstones (*q.v.*).

The economic uses of sands are very numerous. They are largely employed for polishing and scouring both for domestic and manufacturing purposes. "Bath bricks" are made from the sand of the river Parrett near Bridgwater. Sand for glass-making was formerly obtained at Alum Bay in the Isle of Wight and at Lynn in Norfolk, but must be very pure for the best kinds of glass, and crushed quartz or flint is often preferred on this account. One of the principal uses of sand is for making mortar and cement: for this any good clean quartzose sand free from salts is suitable; it may be washed to remove impurities and sifted to secure uniformity in the size of the individual grains. Moulding sands, adapted for foundry purposes, generally contain a small admixture of clay. Sands are also employed in brick-making, in filtering, and for etching glass and other substances by means of the sand blast. (J. S. F.)

SANDAL (from the Latinized form of Gr. *σανδάλιον* or *σάνδαλον*: this probably represents the Persian *sandal*, slipper; it is not to be referred to Gr. *σανίς*, board), the foot-covering which consists of a sole of leather or other material attached to the sole of the foot by a thong of leather passing between the great and second toe, crossed over the instep and fastened round the ankle (see Shoe and Costume, section *Greek* and *Roman*). Sandals are only worn regularly among the peoples of Western civilization by friars, though forms of them are found among the peasants in Spain and the Balkans. They have in recent times been adopted by the extreme advocates of hygienic dress, especially for young children. In the early part of the 19th century a form of low, light slipper fastened by a ribbon crossed over the instep and round the ankle, and worn by women, was known as a sandal.

SANDALWOOD (from Fr. *sandal*, *santal*, Gr. *σάνταλον*, *σάνδαλον*, Pers. *sandal*, *chandan*, Skt. *chandana*, the sandal tree; the form "sanders" is probably an English corruption), a fragrant wood obtained from various trees of the natural order Santalaceae, and principally from *Santalum album*, a native of India. The use of sandalwood dates as far back at least as the 5th century B.C. It is still extensively used in India and China, wherever Buddhism prevails, being employed in funeral rites and religious ceremonies. Until the middle of the 18th century India was the only source of sandalwood. The discovery of a sandalwood in the islands of the Pacific led to difficulties with the natives, often ending in bloodshed, the celebrated missionary John Williams (1796–1839), amongst others, having fallen a victim to an indiscriminate retaliation by the natives on white men visiting the islands. The loss of life in this trade was at one time even greater than in that of whaling, with which it ranked as one of the most adventurous of callings. In India sandalwood is largely used in the manufacture of boxes, fans and other ornamental articles of inlaid work, and to a limited extent in medicine as a domestic remedy for all kinds of pains and aches.

The oil, obtained by distilling the wood in chips, is largely used as a perfume, few native Indian attars or essential oils being free from admixture with it. In the form of powder or paste the wood is employed in the pigments used by the Brahmans for their distinguishing caste-marks.

Red sandalwood, known also as *red sanders wood*, is the product of a small leguminous tree, *Pterocarpus santalinus*, native of S. India, Ceylon and the Philippine Islands. A fresh surface of the wood has a rich deep red colour, which on exposure, however, assumes a dark brownish tint. In medieval times red sandalwood possessed a high reputation in medicine, and it was valued as a colouring ingredient in many dishes. It is pharmacologically quite inert. Now it is little used as a colouring agent in pharmacy, its principal application being in wool-dyeing. Several other species of *Pterocarpus*, notably *P. indicus*, contain the same dyeing principle and can be used as substitutes for red sandalwood. The barwood and camwood of the Guinea Coast of Africa, from *Baphia nitida* or an allied species, called *santal rouge d'Afrique* by the French, are also in all respects closely allied to the red sandalwood of Oriental countries.

As a substitute for copaiba (*q.v.*), sandalwood oil, distilled from the wood of *Santalum album*, is more expensive and pleasanter to take, but it is less efficient, as it does not contain any analogue to the valuable resin in copaiba.

SANDARACH (Fr. *sandaraque*, Lat. *sandaraca*, Gr. σανδαράκη, realgar or red sulphide of arsenic, cf. Pers. *sandarus*, Skt. *sindura*, realgar), in mineralogy realgar or native arsenic disulphide, but generally (a use found in Dioscorides) a resinous body obtained from the small coniferous tree *Callitris quadrivalvis*, native of the north-west regions of Africa, and especially characteristic of the Atlas mountains. The resin, which is procured as a natural exudation on the stems, and also obtained by making incisions in the bark of the trees, comes into commerce in the form of small round balls or elongated tears, transparent, and having a delicate yellow tinge. It is a little harder than mastic, for which it is sometimes substituted. It is also used as incense, and by the Arabs medicinally as a remedy for diarrhoea. It has no medicinal advantages over many of the resins employed in modern therapeutics. An analogous resin is procured in China from *Callitris sinensis*, and in S. Australia, under the name of pine gum, from *C. Reissii*.

SANDBACH, a market town in the Crewe parliamentary division of Cheshire, England, 5 m. N.E. of Crewe, on the London & North-Western and North Staffordshire railways. Pop. of urban district (1901) 5558. It lies on a headstream of the small river Wheelock, a tributary of the Weaver. The parish church of St Mary is Perpendicular, with a fine carved roof of the 17th century. A few old timbered houses, of the same period, remain. In the market-place are two remarkable crosses covered with rude carvings, and assigned by some to the 7th century, being similar to those at Monasterboice and elsewhere in Ireland. There are boot and shoe factories, chemical works and a manufactory of fustians, with salt-works and iron-works in the adjacent township of Wheelock.

SANDBERGER, KARL LUDWIG FRIDOLIN VON (1826–1898), German palaeontologist and geologist, was born at Dillenburg, Nassau, on the 22nd of November 1826. He was educated at the universities of Bonn, Heidelberg and Giessen, at the last of which he graduated Ph.D. in 1846. He then studied at the university of Marburg, where he wrote his first essay, *Übersicht der geologischen Verhältnisse des Herzogtums Nassau* (1847). In 1849 he became curator of the Natural History Museum at Wiesbaden, and began to study the Tertiary strata of the Mayence Basin, and also the Devonian fossils of the Rhenish provinces, on which he published elaborate memoirs. In 1855 he was appointed professor of mineralogy and geology at the Polytechnic Institute at Karlsruhe, and he took part in the geological survey of Baden. From 1863 to 1896 he was professor of mineralogy and geology at the university of Würzburg. His great work *Die Land- und Süsswasser-Conchylien der Vorwelt* was published in 1870–1875. Later he issued an authoritative work on mineral veins, *Untersuchungen über Erzgänge* (1882–1885). He died at Würzburg on the 11th of April 1898. His brother Guido Sandberger (1821–1869) was an authority on fossil cephalopoda, and together they published *Die Versteinerungen des rheinischen Schichtensystems in Nassau* (1850–1856).

SANDBY, PAUL (1725–1809), English water-colour painter, was born at Nottingham in 1725. In 1746 he was appointed by the duke of Cumberland draughtsman to the survey of the Highlands. In 1752 he quitted this post and retired to Windsor, where he occupied himself with the production of water-colour drawings of scenery and architecture. Sir Joseph Banks commissioned him to bring out in aquatint (a method of engraving then peculiar to Sandby) forty-eight plates drawn during a tour in Wales. Sandby displayed considerable power as a caricaturist in his attempt to ridicule the opposition of Hogarth to the plan for creating a public academy for the arts. In 1768 he was chosen a foundation-member of the Royal Academy and appointed chief drawing-master to the Royal Military Academy at Woolwich. He held this situation till 1799. Sandby is best remembered, however, by his water-colour paintings. They are topographical in character, and, while they want the richness and brilliancy of modern water-colour, he nevertheless impressed upon them the originality of his mind. His etchings, such as the *Cries of London* and the illustrations to Ramsay's *Gentle Shepherd*, and his plates, such as those to Tasso's *Jerusalem Delivered*, are numerous and carefully executed. He died in London on the 9th of November 1809.

SANDEAU, LÉONARD SYLVAIN JULIEN [Jules] (1811–1883), French novelist, was born at Aubusson (Creuse) on the 19th of February 1811. He was sent to Paris to study law, but spent much of his time with unruly students. He met Madame Dudevant (George Sand) at Le Coudray in the house of a friend, and when she came to Paris in 1831 she joined Sandeau. The intimacy did not last long, but it produced *Rose et Blanche* (1831), a novel written in common under the pseudonym Jules Sand, from which George Sand took the idea of her famous *nom de guerre*.

Sandeau continued for nearly fifty years to produce novels and to collaborate in plays. His best works are *Marianna* (1839), in which he draws a portrait of George Sand; *Le Docteur Herbeau* (1841); *Catherine* (1845); *Mademoiselle de la Seiglière* (1848), a successful picture of society under Louis Philippe, dramatized in 1851; *Madeleine* (1848); *La Chasse au roman* (1849); *Sacs et parchemins* (1851); *La Maison de Penarvan* (1858); *La Roche aux mouettes* (1871). The famous play of *Le Gendre de M. Poirier* is one of several which he wrote with Émile Augier—the novelist usually contributing the story and the dramatist the theatrical working up. Meanwhile Sandeau had been made conservateur of the Mazarin library in 1853, elected to the Academy in 1858, and next year appointed librarian of St Cloud. At the suppression of this latter office, after the fall of the empire, he was pensioned. He died on the 24th of April 1883. He was never a very popular novelist, and the quiet grace of his style, and his refusal to pander to the popular taste in the morals and incidents of his novels, may have disqualified him for popularity.

See G. Planche, *Portraits littéraires* (1849), vol. i.; J. Clarétie, *J. Sandeau* (1883); F. Brunetière in the *Revue des deux mondes* (1887).

SAND-EEL, or Sand-Launce. The fishes known under these names form a small family (*Ammodytidae*) now included with the *Scombresocidae* in the sub-order Percesoces. They were formerly placed in the Anacanthini and supposed to be allied to the *Gadidae*, but a fossil form *Cobitopsis* has recently been described in which the pelvic fins are present, and are abdominal in position as in *Belone* and *Scombresox*.

Their body is of an elongate-cylindrical shape, with the head terminating in a long conical snout, the projecting lower jaw forming the pointed end. A low long dorsal fin, in which no distinction between spines and rays can be observed, occupies nearly the whole length of the back, and a long anal, composed of similar short and delicate rays, commences immediately behind the vent, which is placed about midway between the head and caudal fin. The caudal is forked and the pectorals are short. The total absence of ventral fins indicates the burrowing habits of these fishes. The scales, when present, are very small; but generally the development of scales has only proceeded to the formation of oblique folds of the integuments. The eyes are lateral and of moderate size; the dentition is quite rudimentary.

Sand-eels are small littoral marine fishes, only one species attaining a length of 18 in. (*Ammodytes lanceolatus*). They live in shoals at various depths on a sandy bottom, and bury themselves in the sand on the slightest alarm. Other shoals live in deeper water. When they are surprised by fish of prey or porpoises they are frequently driven to the surface in such dense masses that numbers of them can be scooped out of the water with a bucket or hand-net. Sand-eels destroy a great quantity of fry and other small creatures, such as the lancelet (*Amphioxus*), which lives in similar localities. They are excellent eating, and are much sought after for bait. They are captured by small meshed seines, as well as by digging in the sand. The eggs of sand-eels are small, heavier than sea-water and slightly adhesive: they are scattered among the grains of sand in which the fishes live, and the larvae and young at various stages of growth may be taken with the row-net in sandy bays in summer.

Sand-eels are common in the N. Atlantic; a species scarcely distinct from the European common sand-launce occurs on the Pacific side of N. America, another on the E. coast of S. Africa. On the British coasts three species are found: the greater sand-eel (*Ammodytes lanceolatus*), distinguished by a tooth-like bicuspid prominence on the vomer; the common sand-launce (*A. tobianus*), from 5 to 7 in. long, with unarmed vomer, even dorsal fin, and with the integuments folded; and the southern sand-launce (*A. siculus*), with unarmed vomer, smooth skin, and with the margins of the dorsal and anal fins undulated. The last species is common in the Mediterranean, but local farther N. It has been found near the Shetlands at depths from 80 to 100 fathoms.

SANDEFJORD, the oldest and most famous spa in Norway, in Jarlsberg-Laurvik *amt* (county), 86 m. S.S.W. of Christiania by the Skien railway. Pop. (1900) 4847. The springs are sulphurous, saline and chalybeate. Specimens of *jaettegryder* or giant's cauldrons may be seen at Gaardaasen and Vindalsbugt, some upwards of 23 ft. in depth.

SANDEMAN, SIR ROBERT GROVES (1835–1892), Indian officer and administrator, was the son of General Robert Turnbull Sandeman, and was born on the 25th of February 1835. He was educated at Perth and St Andrews University, and joined the 33rd Bengal Infantry in 1856. When that regiment was disarmed at Phillour by General Nicholson during the Mutiny in 1857, he took part in the final capture of Lucknow as adjutant of the 11th Bengal Lancers. After the suppression of the Mutiny he was appointed to the Punjab Commission by Sir John Lawrence. In 1866 he was appointed district officer of Dera Ghazi Khan, and there first showed his capacity in dealing with the Baluch tribes. He was the first to break through the close-border system of Lord Lawrence, by extending British influence to the independent tribes beyond the border. In his hands this policy worked admirably, owing to his tact in managing the tribesmen and his genius for control. In 1876 he negotiated the treaty with the khan of Kalat, which subsequently governed the relations between Kalat and the Indian government; and in 1877 he was made agent to the governor-general in Baluchistan, an office which he held till his death. During the second Afghan War in 1878 his influence over the tribesmen was of the utmost importance, since it enabled him to keep intact the line of communications with Kandahar, and to control the tribes after the British disaster at Maiwand. For these services he was made K.C.S.I. in 1879. In 1889 he occupied the Zhob valley, a strategic advantage which opened the Gomal Pass through the Waziri country to caravan traffic. Sandeman's system was not so well suited to the Pathan as to his Baluch neighbour. But in Baluchistan he was a pioneer, a pacificator and a successful administrator, who converted that country from a state of complete anarchy into a province as orderly as any in British India. He died at Bela, the capital of Las Bela state, on the 29th of January 1892, and there he lies buried under a handsome tomb.

See T. H. Thornton, *Sir Robert Sandeman* (1895); and R. I. Bruce, *The Forward Policy* (1900).

SANDERS, DANIEL (1819–1896), German lexicographer, was born on the 12th of November 1819 at Altstrelitz in Mecklenburg, of Jewish parentage. He was educated at the "Gymnasium Carolinum" in the neighbouring capital Neustrelitz, and the universities of Berlin and Halle, where he took the degree of *doctor philosophiae*. From 1842 to 1852 he conducted with success the school at Altstrelitz.

In 1852 he subjected Grimm's *Deutsches Wörterbuch* to a rigorous examination, and as a result published his dictionary of the German language, *Wörterbuch der deutschen Sprache* (3 vols., 1859–1865). This was followed by his *Ergänzungswörterbuch der deutschen Sprache* (1878–1885). Among others of his works in the same field are *Fremdwörterbuch* (Leipzig, 1871; 2nd ed., 1891), *Wörterbuch der Hauptschwierigkeiten in der deutschen Sprache* (1872; 22nd ed., 1892) and *Lehrbuch der deutschen Sprache für Schulen* (8th ed., 1888). Sanders laid down his views in his *Katechismus der deutschen Orthographie* (1856; 4th ed., 1878), and was an active member of the orthographical conference in Berlin in 1876. He published a translation in verse of the *Song of Songs* (1866), and wrote some poems for the young, *Heitere Kinderwelt* (1868). In 1887 he founded the *Zeitschrift für die deutsche Sprache*, which he conducted almost down to his death at Altstrelitz on the 11th of March 1897.

See Friedrich Düsel, *Daniel Sanders* (1886; 2nd ed., 1890); A. Segert-Stein, *Daniel Sanders, ein Gedenkbuch* (1897).

SANDERS, NICHOLAS (*c.* 1530–1581), Roman Catholic agent and historian, born about 1530 at Charlwood, Surrey, was a son of William Sanders, once sheriff of Surrey, who was descended from the Sanders of Sanderstead. Educated at Winchester and New College, Oxford, he was elected fellow in 1548 and graduated B.C.L. in 1551. The family had strong Catholic leanings, and two of Nicholas's sisters, who must have been much older than he was, became nuns of Sion convent before its dissolution. Nicholas was selected to deliver the oration at the reception of Cardinal Pole's visitors by the university in 1557, and soon after Elizabeth's accession he went to Rome where he was befriended by Pole's confidant, Cardinal Morone; he also owed much to the generosity of Sir Francis Englefield (*q.v.*). He was ordained priest at Rome, and was, even before the end of 1550, mentioned as a likely candidate for the cardinal's hat. For the next few years he was employed by Cardinal Hosius, the learned Polish prelate, in his efforts to check the spread of heresy in Poland, Lithuania and Prussia. In 1565, like many other English exiles, he made his headquarters at Louvain, and after a visit to the Imperial Diet at Augsburg in 1566, in attendance upon Commendone, who had been largely instrumental in the reconciliation of England with Rome in Mary's reign, he threw himself into the literary controversy between Bishop Jewel (*q.v.*) and Harding. His *De visibili Monarchia Ecclesiae*, published in 1571, contains the first narrative of the sufferings of the English Roman Catholics. Its extreme papalism and its strenuous defence of Pius V.'s bull excommunicating and deposing Elizabeth marked out Sanders for the enmity of the English government, and he retaliated with lifelong efforts to procure the deposition of Elizabeth and restoration of Roman Catholicism.

His expectations of the cardinalate were disappointed by Pius V.'s death in 1572, and Sanders spent the next few years at Madrid trying to embroil Philip II., who gave him a pension of 300 ducats, in open war with Elizabeth. "The state of Christendom," he wrote, "dependeth upon the stout assailing of England." His ardent zeal was sorely tried by Philip's cautious temperament; and Sir Thomas Stukeley's projected Irish expedition, which Sanders was to have accompanied with the blessings and assistance of the pope, was diverted to Morocco where Stukeley was killed at the battle of Al Kasr al Kebir in 1578. Sanders, however, found his opportunity in the following year, when a force of Spaniards and Italians was despatched to Smerwick to assist James Fitzmaurice and his Geraldines in stirring up an Irish rebellion. The Spaniards were, however, annihilated by Lord Grey in 1580, and after nearly two years of wandering in Irish woods and bogs Sanders died of cold and starvation in the spring of 1581. The English exiles were disgusted at the waste of such material: "Our Sanders," they exclaimed, "is more to us than the whole of Ireland." His writings have been the basis of all Roman Catholic histories of the English Reformation. The most important was his *De Origine ac Progressu schismatis Anglicani*, which was continued after 1558 by Edward Rishton, and printed at Cologne in 1585; it has been often re-edited and translated, the best English edition being that by David Lewis (London, 1877). Its statements earned Sanders the nickname of Dr Slanders in England; but a considerable number of the "slanders" have been confirmed by corroborative evidence, and others, *e.g.* his story that Ann Boleyn was Henry VIII.'s own daughter, were simply borrowed by Sanders from earlier writers. It is not a more untrustworthy account than a vehement controversialist engaged in a life and death struggle might be expected to write of his theological antagonists.

See Lewis's *Introduction* (1877); *Calendars of Irish, Foreign and Spanish State Papers, and of the Carew MSS.*; Knox's *Letters of Cardinal Allen*; T. F. Kirby's *Winchester Scholars*; R. Bagwell's *Ireland under the Tudors*; A. O. Meyer's *England und die katholische Kirche unter Königin Elisabeth* (1910); and T. G. Law in *Dict. Nat. Biogr.* i. 259-261 where a complete list of Sanders's writings is given. (A. F. P.)

SANDERSON, ROBERT (1587–1663), English divine, was born probably at Sheffield, Yorkshire, in September 1587. He was educated at Rotherham grammar school and at Lincoln College, Oxford, took orders in 1611, and was promoted successively to several benefices. On the recommendation of Laud he was appointed one of the royal chaplains in 1631, and was a favourite preacher with the king, who made him regius professor of divinity at Oxford in 1642. The Civil War kept him from entering the office till 1646; and in 1648 he was ejected by the Parliamentary visitors. He recovered his position at the Restoration, was moderator at the Savoy Conference, 1661, and was promoted to the bishopric of Lincoln. He died two years later on the 29th of January 1663.

His most celebrated work is his *Cases of Conscience*, deliberate judgments upon points of morality submitted to him. They are distinguished by moral integrity, good sense and learning. His practice as a college lecturer in logic is better evidenced by these "cases" than by his *Compendium of Logic*, first published in 1618. A complete edition of Sanderson's works (6 vols.) was edited by William Jacobson in 1854. It includes the *Life* by Izaak Walton, revised and enlarged.

SANDFORD, JOHN DE (d. 1294), archbishop of Dublin, was probably an illegitimate son of the baronial leader, Gilbert Basset (d. 1241), or of his brother Fulk Basset, bishop of London from 1241 until his death in 1259, a prelate who was prominent during the troubles of Henry III.'s reign. John was a nephew of Sir Philip Basset (d. 1271), the justiciar. He first appears as an official of Henry III. in Ireland and of Edward I. in both England and Ireland; he was appointed dean of St Patrick's, Dublin, in 1275. In 1284 he was chosen archbishop of Dublin in succession to John of Darlington; some, however, objected to this choice and Sandford resigned his claim; but was elected a second time while he was in Rome, and returning to Ireland was allowed to take up the office. In 1288, during a time of great confusion, the archbishop acted as governor of Ireland. In 1290 he resigned and returned to England. Sandford served Edward I. in the great case over the succession to the Scottish throne in 1292 and also as an envoy to the German king, Adolph of Nassau, and the princes of the Empire. On his return from Germany he died at Yarmouth on the 2nd of October 1294.

Sandford's elder brother, Fulk (d. 1271), was also archbishop of Dublin. He is called Fulk de Sandford and also Fulk Basset owing to his relationship to the Bassets. Having been archdeacon of Middlesex and treasurer and chancellor of St Paul's Cathedral, London, he was appointed archbishop of Dublin by Pope Alexander IV. in 1256. He took some slight part in the government of Ireland under Henry III. and died at Finglas on the 4th of May 1271.

SANDGATE, a watering-place of Kent, England, on the S.E. coast, 1½ m. W. of Folkestone, on the South-Eastern & Chatham railway. Pop. of urban district (1901) 2023. It is connected with Hythe, 3 m. W., by a tramway belonging to the railway company. It is included in the parliamentary borough of Hythe. Sandgate Castle was built by Henry VIII., but on the formation of a camp here in 1806 it was considerably altered. The camp of Shorncliffe lies N. of the town on a plateau.

SAND-GROUSE, the name[1] by which are commonly known the members of a small group of birds frequenting sandy tracts, and having their feet more or less clothed with feathers after the fashion of grouse (*q.v.*), to which they were originally thought to be closely allied; the species first described were by the earlier systematists invariably referred to the genus *Tetrao*. Their separation therefrom is due to C. J. Temminck, who made for them a distinct genus which he called *Pterocles*.[2] Further investigation of the osteology and pterylosis of the sand-grouse revealed still greater divergence from the normal Gallinae (to which the true grouse belong), as well as several curious resemblances to the pigeons; and in the Zoological Society's *Proceedings* for 1868 (p. 303) T. H. Huxley proposed to regard them, under the name of Pteroclomorphae, as forming a group equivalent to the Alectoromorphae and Peristeromorphae. They are now generally regarded as forming a separate sub-order *Pterocles* of Charadriiform birds, allied to pigeons (see BIRDS).

The Pteroclidae consist of two genera—*Pterocles*, with about fifteen species, and *Syrrhaptes*, with two. Of the former, two species inhabit Europe, *P. arenarius*, the sand-grouse proper, and that which is usually called *P. alchata*, the pin-tailed sand-grouse. The European range of the first is practically limited to Portugal, Spain and S. Russia, while the second inhabits also the S. of France, where it is generally known by its Catalan name of *Ganga*, or locally as *Grandaulo*, or, strange to say, *Perdrix d'Angleterre*. Both species are also abundant in Barbary, and have been believed to extend E. through Asia to India, in most parts of which country they seem to be only winter-visitants; but in 1880 M. Bogdanow pointed out to the Academy of St Petersburg (*Bulletin*, xxvii. 164) a slight difference of coloration between eastern and western examples of what had hitherto passed as *P. alchata*; analogy would suggest that a similar difference might be found in examples of *P. arenarius*. India, moreover, possesses five other species of *Pterocles*, of which, however, only one, *P. fasciatus*, is peculiar to Asia, while the others inhabit Africa as well, and all the remaining species belong to the Ethiopian region—one, *P. personatus*, being peculiar to Madagascar, and four occurring in or on the borders of the Cape Colony.

The genus *Syrrhaptes*, though in general appearance resembling *Pterocles*, has a conformation of foot quite unique among birds, the three anterior toes being encased in a common "podotheca," which is clothed to the claws with hairy feathers, so as to look much like a fingerless glove. The hind toe is wanting. The two species of *Syrrhaptes* are *S. tibetanus*—the largest sand-grouse known—inhabiting the country whence its trivial name is derived, and *S. paradoxus*, ranging from N. China across Central Asia to the confines of Europe, which it occasionally invades. Though its attempts at colonization in the extreme W. have failed, it would seem to have established itself in the neighbourhood of Astrakhan (*Ibis*, 1882, p. 220). It appears to be the "Barguerlac" of Marco Polo (ed. Yule, i. p. 239); and the "Loung-Kio" or "Dragon's Foot," so unscientifically described by the Abbé Huc (*Souvenirs d'un Voyage dans la Tartarie*, i. p. 244), can scarcely be anything else than this bird.

The sand-grouse assimilates in general colour to that of the ground, being above of a dull ochreous hue, more or less barred or mottled by darker shades, while beneath it is frequently varied by belts of deep brown intensifying into black. Lighter tints are, however, exhibited by some species and streaks or edgings of an almost pure white relieve the prevailing sandy or fawn-coloured hues that especially characterize the group. The sexes seem always to differ in plumage, that of the male being the brightest and most diversified. The expression is decidedly dove-like, and so is the form of the body, the long wings contributing also to that effect, so that among Anglo-Indians these birds are commonly known as "rock-pigeons." The long wings, the outermost primary of which in *Syrrhaptes* has its shaft produced into an attenuated filament, are in all the species worked by exceedingly powerful muscles, and in several forms the middle rectrices are likewise protracted and pointed, so as to give to their wearers the name of Pin-tailed Sand-Grouse.[3] The nest is a shallow hole in the sand. Three seems to be the regular complement of eggs, but there are writers who declare that the full number in some species is four. These eggs are almost cylindrical in the middle and nearly alike at each end, and are of a pale earthy colour, spotted, blotched or marbled with darker shades, the markings being of two kinds, one superficial and the other more deeply seated in the shell. The young are hatched fully clothed in down (*P.Z.S.*, 1866, pl. ix. fig. 2), and appear to be capable of locomotion soon after birth. The remains of an extinct species of *Pterocles*, *P. sepultus*, intermediate apparently between *P. alchata* and *P. gutturalis*, have been recognized in the Miocene caves of the Allier by A. Milne-Edwards (*Ois. foss. de la France*, p. 294, pl. clxi., figs. 1-9); and, in addition to the other authorities on this very interesting group of birds already cited, reference may be made to D. G. Elliot's "Study" of the Family (*P.Z.S.*, 1878, pp. 233-264) and H. F. Gadow, "On Certain Points in the Anatomy of *Pterocles*" (*op. cit.*, 1882, pp. 312-332). (A. N.)

SANDHURST, a town in the Wokingham parliamentary division of Berkshire, England, 9 m. N. of Aldershot. Pop. (1901) 2386. Two miles south-east of the town, near the villages of Cambridge Town and York Town, and the railway stations of Blackwater and Camberley on the South-Eastern and Chatham and South-Western lines, is the Sandhurst Royal Military College. It was settled here in 1812, having been already removed by its founder, the duke of York, from High Wycombe, where it was opened in 1799, to Great Marlow in 1802. It stands in beautiful grounds, which contain a large lake. Wellington College station on the South-Eastern branch line to Reading, near Sandhurst itself, serves Wellington College, one of the principal modern public schools of England, founded in memory of the great duke of Wellington, and incorporated in 1853. Its primary object was the education of the sons of deceased army officers. In the vicinity is Broadmoor Prison for criminal lunatics.

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[1] It seems to have been first used by J. Latham in 1783 (*Synopsis*, iv. p. 751) as the direct translation of the name *Tetrao arenarius* given by Pallas.

[2] He states that he published this name in 1809; but hitherto research has failed to find it used until 1815.

[3] These were separated by Bonaparte (*Comptes rendus*, xlii. p. 880) as a distinct genus, *Pteroclurus*, which later authors have justly seen no reason to adopt.

SAN DIEGO, a city, port of entry and the county-seat of San Diego county, in S. California, U.S.A., on the Pacific Ocean, about 10 m. N. of the Mexican border, and about 126 m. (by rail) S.E. of Los Angeles. Pop. (1880) 2637; (1890) 16,159; (1900) 17,700, of whom 3768 were foreign-born; (1910 census) 39,578. It is served by numerous steamship lines and by the Atchison, Topeka & Santa Fé, the Los Angeles & San Diego Beach, the San Diego Southern, and the San Diego, Cuyamaca & Eastern railways. A railway between Yuma, Arizona, and San Diego was under construction in 1910. The harbour, next to that of San Francisco the best in California, has an area of some 22 sq. m. The Federal government has made various improvements in the harbour, building a jetty 7500 ft. long on Zuninga Shoal at the entrance and making a channel 225 ft. wide and 27-28 ft. deep at low tide. The city site, which is a strip of land 25 m. long and 2 to 4 m. wide, is nearly level near the bay. San Diego is the seat of a State Normal School and has a Carnegie library. There is a coaling station of the United States Navy, and the United States government maintains a garrison in Fort Rosecrans. At Coronado (pop. 1900, 935) across the bay are Coronado Beach, and the Hotel del Coronado, with fine botanical and Japanese gardens; on the beach people live in tents except in the stormier season. Within the city, on the top of Point Loma, is the Theosophical Institution of the "Universal Brotherhood." San Diego has one of the most equable climates in the world, and there are several sanatoriums here. The economic interests centre in fruit culture, especially the raising of citrus fruits and of raisin grapes. There are also warehouses, foundries, lumber yards, saw-mills and planing-mills —logs are rafted here from Washington and Oregon. National City (pop. 1900, 1086), adjoining San Diego on the S. and the S. terminus of the Atchison, Topeka & Santa Fé system, has large interests in lemon packing and the manufacture of oil, citric acid and other lemon by-products. In 1905 the total value of the factory products of the city was $1,974,430 (194·8 % more than in 1900).

San Diego is under the commission form of government; in 1905 the city secured as a charter right the power to "recall" by petition any unsatisfactory city official and to elect another in his place, and the initiative and referendum were incorporated in the charter, but were practically inoperative for several years. By a charter amendment of 1909, the city is governed by a commission of a mayor and five councilmen, elected at large.

About 4 m. N. of the business centre of San Diego is the site of the first Spanish settlement in Upper California. It was occupied in April 1769; a Franciscan "mission" (the earliest of twenty-one established in California) was founded on the 16th of July, and a military presidio somewhat later. San Diego began the first revolution against Governor M. Victoria and Mexican authority in 1831, but was intensely loyal in opposition to Governor J. B. Alvarado and the northern towns in 1836. It was made a port of entry in 1828. In 1840 it had a population of 140. It was occupied by the American forces in July 1846, and was reoccupied in November after temporary dispossession by the Californians, no blood being shed in these disturbances. In 1850 it was incorporated as a city, but did not grow, and lost its charter in 1852. In 1867 it had only a dozen inhabitants. A land promoter, A. E. Horton (d. 1909), then laid out a new city about 3 m. S. of the old. Its population increased to 2300 in 1870, and this new San Diego was incorporated in 1872, and was made a port of entry in 1873. The old town still has many ruined adobe houses, and the old "mission" is fairly well preserved. The prosperity of 1867–1873 was followed by a disastrous crash in 1873–1874, and little progress was made until 1884, when San Diego was reached by the Santa Fé railway system. After 1900 the growth of the city was again very rapid.

SANDOMIR, or SEDOMIERZ, a town of Russian Poland, in the government of Radom, 140 m. S.S.E. of Warsaw by river and on the left bank of the Vistula, opposite the confluence of the San. Pop. (1881) 6265, or, including suburbs, 14,710; (1897) 6534. It is one of the oldest towns of Poland, being mentioned as early as 1079; from 1139 to 1332 it was the chief town of the principality of the same name. In 1240, and again in 1259, it was burned by the Mongols. Under Casimir III. it reached a high degree of prosperity. In 1429 it was the seat of a congress for the establishment of peace with Lithuania, and in 1570 the "Consensus Sandomiriensis" was held here for uniting the Lutherans, Calvinists and Moravian Brethren. Subsequent wars, and especially the Swedish (*e.g.* in 1655) ruined the town even more than did numerous conflagrations, and in the second part of the 18th century it had only about 2000 inhabitants. Here in 1702 the Polish supporters of Augustus of Saxony banded together against Charles XII. of Sweden. The beautiful cathedral was built between 1120 and 1191; it was rebuilt in stone in 1360, and is one of the oldest monuments of Polish architecture. Two of the churches are fine relics of the 13th century. The castle, built by Casimir III. (14th century), still exists. The city gives title to an episcopal see (Roman Catholic).

SANDOWAY, a town and district in the Arakan division of Lower Burma. The town (pop. 1901, 12,845) is very ancient, and is said to have been at one time the capital of Arakan. The district has an area of 3784 sq. m.; pop. (1901) 90,927, showing an increase of 16 % in the decade. The country is mountainous, the Arakan range sending out spurs which reach the coast. Some of the peaks in the N. attain 4000 and more ft. The streams are only mountain torrents to within a few miles of the coast; the mouth of the Khwa forms a good anchorage for vessels of from 9 to 10 ft. draught. The rocks in the Arakan range and its spurs are metamorphic, and comprise clay, slates, ironstone and indurated sandstone; towards the S., ironstone, trap and rocks of basaltic character are common; veins of steatite and white fibrous quartz are also found. The rainfall in 1905 was 230·49 in. Except a few acres of tobacco, all the cultivation is rice. Sandoway was ceded to the British, with the rest of Arakan, by the treaty of Yandabo in 1826.

SANDOWN, a watering-place in the Isle of Wight, England, 6½ m. S. of Ryde by rail. Pop. of urban district (1901) 5006. It is beautifully situated on rising ground overlooking Sandown Bay and the English Channel, on the S.E. coast of the island. There is a wide expanse of sandy shore, and bathing is excellent.

SANDPIPER (Ger. *Sandpfeifer*), the name applied to nearly all the smaller kinds of the group Limicolae which are not Plovers (*q.v.*) or Snipes (*q.v.*), but may be said to be intermediate between them. According to F. Willughby in 1676 it was the name given by Yorkshiremen to the bird popularly known in England as the "Summer-Snipe,"—the *Tringa hypoleucos* of Linnaeus and the *Totanus hypoleucus* of later writers,—but probably even in Willughby's time the name was of much wider signification. Placed by most systematists in the family Scolopacidae, the birds commonly called Sandpipers seem to form three sections, which have been often regarded as Subfamilies—Totaninae, Tringinae and Phalaropodinae, the last indeed in some classifications taking the higher rank of a Family—Phalaropodidae. This section comprehends three species only, known as Phalaropes or swimming sandpipers, which are distinguished by the membranes that fringe their toes, in two of the species forming marginal lobes,[1] and by the character of their lower plumage, which is as close as that of a duck. The most obvious distinctions between Totaninae and Tringinae may be said to lie in the acute or blunt form of the tip of the bill (with which is associated a less or greater development of the sensitive nerves running almost if not quite to its extremity, and therefore greatly influencing the mode of feeding) and in the style of plumage—the Tringinae, with blunt and flexible bills, mostly assuming a summer-dress in which some tint of chestnut or reddish-brown is prevalent, while the Totaninae, with acute and stiffer bills, display no such lively colours. Furthermore, the Tringinae, except when breeding, frequent the sea-shore much more than do the Totaninae.[1] To the latter belong the Greenshank (*q.v.*) and Redshank (*q.v.*), as well as the Common Sandpiper, the "Summer-Snipe" above-mentioned, a bird hardly exceeding a skylark in size, and of very general distribution throughout the British Islands, but chiefly frequenting clear streams, especially those with a gravelly or rocky bottom, and most generally breeding on the beds of sand or shingle on their banks. It usually makes its appearance in May. The nest, in which four eggs are laid with their pointed ends meeting in its centre (as is usual among Limicoline birds), is seldom far from the water's edge, and the eggs, as well as the newly-hatched and down-covered young, closely resemble the surrounding pebbles. The Common Sandpiper is found over the greater part of the Old World. In summer it is the most abundant bird of its kind in the extreme N. of Europe, and it extends across Asia to Japan. In winter it makes its way to India, Australia and the Cape of Good Hope. In America its place is taken by a closely kindred species, which is said to have also occurred in England—*T. macularius*, the "Peetweet," or Spotted Sandpiper, so called from its usual cry, or from the almost circular marks which spot its lower plumage. In habits it is very similar to its congener of the Old World, and in winter it migrates to the Antilles and to Central and South America.

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[1] These are *Phalaropus fulicarius* and *P.* (or *Lobipes*) *hyperboreus*, and were thought by some of the older writers to be allied to the Coots (*q.v.*). The third species is *P.* (or *Steganopus*) *wilsoni*. All are natives of the higher parts of the N. hemisphere, and the last is especially American, though perhaps a straggler to Europe.

Of other Totaninae, one of the most remarkable is that to which the inappropriate name of Green Sandpiper has been assigned, the *Totanus* or *Helodromas ochropus* of ornithologists, which differs (so far as is known) from all others of the group both in its osteology[2] and mode of nidification, the hen laying her eggs in the deserted nests of other birds,—Jays, Thrushes or Pigeons,—but nearly always at some height (from 3 to 30 ft.) from the ground (*Proc. Zool. Society*, 1863, pp. 529-532). This species occurs in England the whole year round, and is presumed to have bred there, though the fact has never been satisfactorily proved, and knowledge of its erratic habits comes from naturalists in Pomerania and Sweden. This sandpiper is characterized by its dark upper plumage, which contrasts strongly with the white of the lower part of the back and gives the bird as it flies much the look of a very large house-martin. The so-called wood-sandpiper, *T. glareola*, which, though much less common, is known to have bred in England, has a considerable resemblance to the species last mentioned, but can be distinguished by the feathers of the axillary plume being white barred with greyish-black, while in the green sandpiper they are greyish-black barred with white. It is an abundant bird in most parts of northern Europe, migrating in winter very far to the southward.

Of the section Tringinae the best known are the Knot (*q.v.*) and the Dunlin, *T. alpina*. The latter, often also called Ox-bird, Plover's Page, Purre and Stint,—names which it shares with some other species,—not only breeds commonly on many of the elevated moors of Britain, but in autumn resorts in countless flocks to the shores. In winter of a nearly uniform ash-grey above and white beneath, in summer the feathers of the back are black, with deep rust-coloured edges, and a broad black belt occupies the breast. The Dunlin varies considerably in size, examples from N. America being almost always recognizable from their greater bulk, while in Europe there appears to be a smaller race which has received the name of *T. schinzi*. In the breeding-season the male Dunlin utters a most peculiar and far-sounding whistle, somewhat resembling the continued ringing of a high-toned musical bell.

Next to the Dunlin and Knot the commonest British Tringinae are the Sanderling, *Calidris arenaria* (distinguished from every other bird of the group by wanting a hind toe), the Purple Sandpiper, *T. striata* or *maritima*, the Curlew-Sandpiper, *T. subarquata* and the Little and Temminck's Stints, *T. minuta* and *T. temmincki*. *T. minutilla*, the American stint, is darker, with olive feet, and ranges from the Arctic New World to Brazil. *T. fuscicollis*, Bonaparte's sandpiper, with white upper tail-coverts inhabits Arctic America, but reaches the greater part of South America in winter, whilst *T. bairdi*, with brownish median tail-coverts, extends over nearly all North America, breeding towards the north.

The broad-billed sandpiper, *T. platyrhyncha*, of the Old World, seems to be more snipe-like than any that are usually assigned to this section. The spoon-billed sandpiper, *Eurinorhynchus pygmaeus*, breeds in north-eastern Asia and N.W. America, and ranges to China and Burma in winter. (A. N.)

SANDRART, JOACHIM VON (1606–1688), German art-historian and painter, was born at Frankfort, and after studying in Germany, Holland and England, went in 1627 to Italy, where he became famous as a portrait-painter. He subsequently revisited Holland and then settled in Nuremberg, where he died. His "Peace-Banquet, 1649" is in the town hall there. He is best known as the author of books on art, some of them in Latin, and especially for his historical work, the *Deutsche Akademie* (1675–1679), of which there is a modern edition by Sponsel (1896).

SANDRINGHAM, a village in the N.W. parliamentary division of Norfolk, England, 3 m. from the shore of the Wash, and 2½ from Wolferton station on the Great Eastern railway. Sandringham House was a country seat of King Edward VII., acquired by him when Prince of Wales by purchase in 1861. Ten years later the mansion then existing was replaced by the present picturesque building in brick and stone in Elizabethan style. The estate, of some 7000 acres, includes a park of 200 acres, entered by fine wrought iron gates constructed at Norwich. The church of St Mary Magdalene contains many memorials of the royal family.

SANDSTONE, in petrology, a consolidated sand rock built up of sand grains held together by a cementing substance. The size of the particles varies within wide limits and in the same rock may be uniform or irregular: the coarser sandstones are called grits, and form a transition to conglomerates (*q.v.*), while the finer grained usually contain an admixture of mud or clay and pass over by all stages into arenaceous shales and clay rocks. Greywackes (*q.v.*) are sandstones belonging to the older geological systems, such as the Silurian or Cambrian, usually of brown or grey colour and very impure.

The minerals of sandstones are the same as those of sands. Quartz is the commonest; with it often occurs a considerable amount of felspar, and usually also some white mica. Chlorite, argillaceous matter, calcite and iron oxides, are exceedingly common in sandstones, and in some varieties are important constituents; garnet, tourmaline, zircon, epidote, rutile and anatase are often present though rarely in any quantity. According to their composition we may distinguish siliceous sandstones (some of these are so pure that they contain 99% of silica, *e.g.* Craigleith stone and some gannisters), felspathic sandstones or arkoses (less durable and softer than the siliceous sandstones); micaceous sandstones, with flakes of mica lying along the bedding planes; argillaceous sandstones; ferruginous sandstones, brown or red in colour with the sand grains coated with red haematite or brownish yellow limonite; impure sandstones, usually in the main consisting of quartz with a large addition of other minerals.

The cementing material is often fine chalcedonic silica, and exists in such small quantity that it is difficult to recognize even with the microscope. In some of the cherty sandstones of the Greensand the chalcedonic cement is much more abundant: these rocks also contain rounded grains of glauconite, to which they owe their green colour. Crystalline silica (quartz) is deposited interstitially in some sandstones, often in regular parallel crystalline growth on the original sand grains, and when there are cavities or fissures in the rock may show the development of regular crystalline facets. By this process the rock becomes firmly compacted, and is then described as a quartzite (*q.v.*). A calcareous cement is almost equally common: it may be derived from particles of shells or other calcareous fossils originally mixed with the sand and subsequently dissolved and redeposited in the spaces between the other grains. In Fontainebleau sandstone and some British Secondary rocks the calcite is in large crystalline masses, which when broken show plane cleavages mottled with small rounded sand grains; in the French rock external rhombohedral faces are present and the crystals may be of considerable size. Many of the British Jurassic and Cretaceous sandstones (*e.g.* Kentish Rag, Spilsby Sandstone) are of this calcareous type. In ferruginous sandstones the iron oxides usually form only a thin pellicle coating each grain, but sometimes, in the greensands, are more abundant, especially in concretionary masses or segregations. In argillaceous sandstones the fine clayey material, compacted by pressure, holds the sand grains together, and rocks of this kind are soft and break up easily when exposed to the weather or submitted to crushing tests. Among other cementing materials may be mentioned, dolomite, barytes, fluorite and phosphate of lime, but these are only locally found.

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[1] There are no English words adequate to express these two sections. By some British writers the Tringinae have been indicated as "Stints," a term cognate with Stunt and wholly inapplicable to many of them, while American writers have restricted to them the name of "Sandpiper," and call the Totaninae, to which that name is especially appropriate, "Willets."

[2] It possesses only a single pair of posterior "emarginations" on its sternum, in this respect resembling the Ruff (*q.v.*). Among the Plovers and Snipes other similarly exceptional cases may be found.

Many sandstones contain concretions which may be several feet in diameter, and are sometimes set free by weathering or when the rock is split open by a blow. Most frequently these are siliceous, and then they interfere with the employment of the rock for certain purposes, as for making grindstones or for buildings of fine dressed stone. Argillaceous concretions or clay galls are almost equally common, and nodules of pyrites or marcasite; the latter weather to a brown rusty powder, and are most undesirable in building stones. Phosphatic, ferruginous, barytic and calcareous concretions occur also in some of the rocks of this group. We may also mention the presence of lead ores (the Eifel, Germany), copper ores (Chessy and some British Triassic sandstones) and manganese oxides. In some districts (*e.g.* Alsace) bituminous sandstones occur, while in N. America many Devonian sandstones contain petroleum. Many Coal-Measures sandstones contain remains of plants preserved as black impressions.

The colours of sandstones arise mostly from their impurities; pure siliceous and calcareous sandstones are white, creamy or pale yellow (from small traces of iron oxides). Black colours are due to coal or manganese dioxide; red to haematite (rarely to copper oxide); yellow to limonite, green to glauconite. Those which contain clay, fragments of shale, &c., are often grey (*e.g.* the Pennant Grit of S. Wales).

Sandstones are very extensively worked, mostly by quarries but sometimes by mines, in all districts where they occur and are used for a large variety of purposes. Quarrying is facilitated by the presence of two systems of joints, developed approximately in equal perfection, nearly at right angles to one another and perpendicular to the bedding planes. Sometimes this jointing determines the weathering of the rock into square pillar-like forms or into mural scenery (*e.g.* the Quader Sandstein of Germany). As building stones sandstones are much in favour, especially in the Carboniferous districts of Britain, where they can readily be obtained. They have the advantage of being durable, strong and readily dressed. They are usually laid "on the bed," that is to say, with their bedding surfaces horizontal and their edges exposed. The finer kinds of sandstone are often sawn, not hewn or trimmed with chisels. Pure siliceous sandstones are the most durable, but are often very expensive to dress and are not obtainable in many places. Sandstones are also used for grindstones and for millstones. For engineering purposes, such as dams, piers, docks and bridges, crystalline rocks, such as granite, are often preferred as being obtainable in larger blocks and having a higher crushing strength. Very pure siliceous sandstones (such as the gannisters of the north of England) may be used for lining furnaces, hearths, &c. As sandstones are always porous, they do not take a good polish and are not used as ornamental stones, but this property makes them absorb large quantities of water, and consequently they are often important sources of water supply (*e.g.* the water-stones of the Trias of the English Midlands). Silver is found in beds of sandstone in Utah, lead near Kommern in Prussia, and copper at Chessy near Lyons. (J. S. F.)

SANDUR, or SUNDOOR, a petty state of S. India, surrounded by the Madras district of Bellary. Area, 161 sq. m. Pop. (1901), 11,200; estimated revenue, £3500. The raja is a Mahratta of the Ghorpade family. On the western border is a hill range, which contains the military sanatorium of Ramandrug. Manganese and hematite iron ore have been found, both of unusual purity.

SANDUSKY, a city, port of entry, and the county-seat of Erie county, Ohio, U.S.A., on Sandusky Bay, an arm of Lake Erie, about 56 m. W. by S. of Cleveland. Pop. (1890), 18,471; (1900), 19,664, of whom 4002 were foreign-born and 295 were negroes; (1910 U.S. census) 19,989. Sandusky is served by the Lake Shore & Michigan Southern, the Cleveland, Cincinnati, Chicago & Saint Louis, the Pennsylvania, the Baltimore & Ohio, and the Lake Erie & Western railways, by several interurban electric lines, and by steamboats to the principal ports on the Great Lakes. Among the public buildings are the United States Government Building and the Court House. The city has a Carnegie library (1897), and is the seat of the Lake Laboratory (biological) of the Ohio State University, and of the Ohio Soldiers' and Sailors' Home (26 buildings).

At the entrance to Sandusky Bay is Cedar Point, with a beach for bathing. At the mouth of the harbour is Johnson's Island, where many Confederate prisoners were confined during the Civil War. A few miles farther N. are several fishing resorts, among them Lakeside and Put-in-Bay; at the latter the United States government maintains a fish hatchery, and out of the bay Oliver Hazard Perry and his fleet sailed on the morning of the 10th of September 1813 for the Battle of Lake Erie. Sandusky has a good harbour, which has been greatly improved by the United States government; and its trade in coal, lumber, stone, cement, fish, fruit, ice, wine and beer is extensive; in 1908 the value of its exports, chiefly to Canada, was $580,191 and the value of its imports $57,762. The value of its factory products increased from $2,833,506 in 1900 to $4,878,563 in 1905, or 72.2%.

English traders were at Sandusky as early as 1749, and by 1763 a fort had been erected; but on the 16th of May of that year, during the Pontiac rising, the Wyandot Indians burned the fort. The first permanent settlement was made in 1817, and in 1845 Sandusky was chartered as a city.

SANDWICH, EDWARD MONTAGU, or **MOUNTAGU,** 1ST EARL OF (1625–1672), English admiral, was a son of Sir Sidney Montagu (d. 1644) of Hinchinbrook, who was a brother of Henry Montagu, 1st earl of Manchester, and of Edward Montagu, 1st Lord Montagu of Boughton. He was born on the 27th of July 1625, and although his father was a royalist, he himself joined the parliamentary party at the outbreak of the Civil War. In 1643 he raised a regiment, with which he distinguished himself at the battles of Marston Moor and Naseby and at the siege of Bristol. Though one of Cromwell's intimate friends, he took little part in public affairs until 1653, when he was appointed a member of the council of state. His career as a seaman began in 1656, when he was made a general-at-sea, his colleague being Robert Blake. Having taken some part in the operations against Dunkirk in 1657, he was chosen a member of Cromwell's House of Lords, and in 1659 he was sent by Richard Cromwell with a fleet to arrange a peace between Sweden and Denmark. After the fall of Richard he resigned his command and joined with those who were frightened by the prospect of anarchy in bringing about the restoration of Charles II. Again general-at-sea early in 1660, Montagu carried the fleet over to the side of the exiled king, and was entrusted with the duty of fetching Charles from Holland. He was then made a knight of the Garter, and in July 1660 was created earl of Sandwich. His subsequent naval duties included the conveyance of several royal exiles to England and arranging for the cession of Tangier and for the payment of £300,000, the dowry of Catherine of Braganza.

During the war with the Dutch in 1664–1665 Sandwich commanded a squadron under the duke of York and distinguished himself in the battle off Lowestoft on the 3rd of June 1665. When the duke retired later in the same year he became commander-in-chief, and he directed an unsuccessful attack on some Dutch merchant ships which were sheltering in the Norwegian port of Bergen; however, on his homeward voyage he captured some valuable prizes, about which a great deal of trouble arose on his return. Personal jealousies were intermingled with charges of irregularities in dealing with the captured property, and the upshot was that Sandwich was dismissed from his command, but as a solatium was sent to Madrid as ambassador extraordinary. He arranged a treaty with Spain, and in 1670 was appointed president of the council of trade and plantations. When the war with the Dutch was renewed in 1672 Sandwich again commanded a squadron under the duke of York, and during the fight in Southwold Bay on the 28th of May 1672, his ship, the "Royal George," after having taken a conspicuous part in the action, was set on fire and was blown up. The earl's body was found some days later and was buried in Westminster Abbey. Edward (d. 1688) the eldest of his six sons, succeeded to the titles; another son, John Montagu (*c.* 1655–1728) was dean of Durham.

Lord Sandwich claimed to have a certain knowledge of science, and his translation of a Spanish work on the *Art of Metals* appeared in 1674. Many of his letters and papers are in the British Museum, the Bodleian Library at Oxford, and in the possession of the present earl of Sandwich. He is mentioned very frequently in the *Diary* of his kinsman, Samuel Pepys. See also J. Charnock, *Biographia Navalis*, vol. i. (1794); John Campbell, *Lives of the British Admirals*, vol. ii. (1779); and R. Southey, *Lives of the British Admirals*, vol. v. (1840).

SANDWICH, JOHN MONTAGU, 4TH EARL OF (1718–1792), was born on the 3rd of November 1718 and succeeded his grandfather, Edward, the 3rd earl, in the earldom in 1729. Educated at Eton and at Trinity College, Cambridge, he spent some time in travelling, and on his return to England in 1739 he took his seat in the House of Lords as a follower of the duke of Bedford. He was soon appointed one of the commissioners of the admiralty under Bedford and a colonel in the army. In 1746 he was sent as plenipotentiary to the congress at Breda, and he continued to take part in the negotiations for peace until the treaty of Aix-la-Chapelle was concluded in 1748. In February 1748 he became first lord of the admiralty, retaining this post until he was dismissed by the king in June 1751. In August 1753 Sandwich became one of the principal secretaries of state, and while filling this office he took a leading part in the prosecution of John Wilkes. He had been associated with Wilkes in the notorious fraternity of Medmenham, and his attitude now in turning against the former companion of his pleasures made him very unpopular, and, from a line in the *Beggar's Opera*, he was known henceforward as "Jemmy Twitcher." He was postmaster-general in 1768, secretary of state in 1770, and again first lord of the admiralty from 1771 to 1782. For corruption and incapacity Sandwich's administration is unique in the history of the British navy. Offices were bought, stores were stolen and, worst of all, ships, unseaworthy and inadequately equipped, were sent to fight the battles of their country. The first lord became very unpopular in this connexion also, and his retirement in March 1782 was hailed with joy. Sandwich married Dorothy, daughter of Charles, 1st viscount Fane, by whom he had a son John (1743–1814), who became the 5th earl. He had also several children by the singer Margaret, or Martha, Ray, of whom Basil Montagu (1770–1851), writer, jurist and philanthropist, was one. The murder of Miss Ray by a rejected suitor in April 1779 increased the earl's unpopularity, which was already great, and the stigmas of the prosecution of Wilkes and the corrupt administration of the navy clung to him to the last. He died on the 30th of April 1792.

The Sandwich Islands (see HAWAII) were named after him by Captain Cook. His *Voyage round the Mediterranean in the Years 1738 and 1739* was published posthumously in 1799, with a very flattering memoir by the Rev. J. Cooke; the *Life, Adventures, Intrigues and Amours of the celebrated Jemmy Twitcher* (1770), which is extremely rare, tells a very different tale. See also the various collections of letters, memoirs and papers of the time, including Horace Walpole's *Letters* and *Memoirs* and the *Bedford Correspondence.*

SANDWICH, a market town, municipal borough, and one of the Cinque Ports in the St Augustine's parliamentary division of Kent, England, 12 m. E. of Canterbury, on the South-Eastern & Chatham railway. Pop. (1901), 3170. It is situated 2 m. from the sea, on the river Stour, which is navigable up to the bridge for vessels of 200 tons. The old line of the walls on the land side is marked by a public walk. The Fisher Gate and a gateway called the Barbican are interesting; but the four principal gates were pulled down in the 18th century. St Clement's church has a fine Norman central tower, and St Peter's (restored), said to date from the reign of King John, has interesting medieval monuments. The curfew is still rung at St Peter's. A grammar school was founded by Sir Roger Manwood in 1564, but the existing school buildings are modern. There are three ancient hospitals; St Bartholomew's has a fine Early English chapel of the 12th century. The establishment of the railway and of the St George's golf links (1886) rescued Sandwich from the decay into which it had fallen in the earlier part of the 19th century. The links are among the finest in England.

Richborough Castle, 1¼ m. N. of Sandwich, is one of the finest relics of Roman Britain. It was called *Rutupiae*, and guarded one of the harbours for continental traffic in Roman times, and was in the 4th century a fort of the coast defence along the Saxon shore.

The situation of Sandwich on the Wantsum, once a navigable channel for ships bound for London, made it a famous port in the time of the Saxons, who probably settled here when the sea receded from the Roman port of Richborough. In 973 Edgar granted the harbour and town to the monastery of Christ Church, Canterbury, and at the time of the Domesday Survey Sandwich supplied 40,000 herrings each year to the monks. As one of the Cinque Ports, Sandwich owed a service of five ships to the king, and shared the privileges granted to the Cinque Ports from the reign of Edward the Confessor onwards. At the end of the 13th century the monks granted the borough, with certain reservations, to Queen Eleanor; a further grant of their rights was made to Edward III. in 1364, the crown being thenceforward lord of the borough. A charter of Henry II. confirmed the customs and rights which Sandwich had previously enjoyed, and this charter was confirmed by John in 1205, by Edward II. in 1313 and by Edward III. in 1365. The town was a borough by prescription, and was governed in the 13th century by a mayor and jurats; a mayor was elected as early as 1226. The governing charter until 1835 was that granted by Charles II. in 1684. During the middle ages Sandwich was one of the chief ports for the continent, but as the sea gradually receded and the passage of the Wantsum became choked with sand the port began to decay, and by the time of Elizabeth the harbour was nearly useless. In her reign Walloons settled here and introduced the manufacture of woollen goods and the cultivation of vegetables; this saved the borough from sinking into unimportance. Three fairs to be held at Sandwich were granted to Queen Eleanor in 1290; Henry VII. granted two fairs on the 7th of February and the 5th of June, each to last for thirty days, and in the governing charter two fairs, on the 1st of April and the 1st of October, were granted; these all seem to have died out before the end of the 18th century. A corn market on Wednesday and a cattle market on every alternate Monday are now held. Representatives from the Cinque Ports were first summoned to parliament in 1265; the first returns for Sandwich are for 1366, after which it returned two members until it was disfranchised in 1885. Sandwich is governed by a mayor, 4 aldermen and 12 councillors. Area, 707 acres.

See W. Boys, *Collections for History of Sandwich* (1792); E. Hasted, *History of Kent* (1778–1799); *Victoria County History* (Kent).

SANDYS, SIR EDWIN (1561–1629), British statesman and one of the founders of the colony of Virginia, was the second son of Edwin Sandys, archbishop of York, and his wife Cecily Wilford. He was born in Worcestershire on the 9th of December 1561. He was educated at Merchant Taylors' school, which he entered in 1571, and at Corpus Christi College, Oxford, where he was sent in 1577. He became B.A. in 1579 and B.C.L. in 1589. In 1582 his father gave him the prebend of Witwang in York Minster, but he never took orders. He was entered in the Middle Temple in 1589. At Oxford his tutor had been Hooker, author of the *Ecclesiastical Polity*, whose life-long friend and executor he was. Sandys is said to have had a large share in securing the Mastership of the Temple for Hooker. From 1593 till 1599 he travelled abroad. When in Venice he became closely connected with Fra Paolo Sarpi, who helped him in the composition of the treatise on the religious state of Europe, known as the *Europae speculum*. In 1605 this treatise was printed from a stolen copy under the title, *A Relation of the State of Religion in Europe*. Sandys procured the suppression of this edition, but the book was reprinted at the Hague in 1629. In 1599 he resigned his prebend, and entered active political life. He had already been member for Andover in 1586 and for Plympton in 1589. After 1599, in view of the approaching death of Queen Elizabeth, he paid his court to King James VI., and on James's accession to the throne of England in 1603 Sandys was knighted. He sat in the king's first parliament as member for Stockbridge, and distinguished himself as one of the assailants of the great monopolies. He endeavoured to secure to all prisoners the right of employing counsel, a proposal which was resisted by some lawyers as subversive of the administration of the law. He had been connected with the East India Company before 1614, and took an active part in its affairs till 1629. His most memorable services were, however, rendered to the (London) Virginia Company, to which he became treasurer in 1619. He promoted and supported the policy which enabled the colony to survive the disasters of its early days, and he continued to be a leading influence in the Company till his death. Sir Edwin Sandys sat in the later parliaments of James I. as member for Sandwich in 1621, and for Kent in 1624. His tendencies were towards opposition, and he was suspected of hostility to the court; but he disarmed the anger of the king by professions of obedience. He was member for Penrhyn in the first parliament of Charles I. in 1625. He died in October 1629.

See Alex. Brown's *Genesis of the United States* (London, 1890).

SANDYS, FREDERICK (1832–1904), English painter and draughtsman, was born at Norwich on the 1st of May 1832, and received his earliest lessons in art from his father, who was himself a painter. His early studies show that he had a natural gift for careful and beautiful drawing, and that he sought after absolute sincerity of presentment. Sandys worked along the same lines as Millais, Madox Brown, Holman Hunt and Rossetti. He first met Rossetti in 1857, and carried away with him the impression of the painter-poet's features, which he reproduced so cleverly in "A Nightmare," a caricature of "Sir Isumbras at the Ford," by Millais. Both the picture and the skit upon it by Sandys attracted much attention in 1857. The caricaturist turned the horse of Sir Isumbras into a donkey labelled "J. R., Oxon." (John Ruskin). Upon it were seated Millais himself, in the character of the knight, with Rossetti and Holman Hunt as the two children, one before and one behind. Rossetti and Sandys became intimate friends, and for about a year and a quarter, ending in the summer of 1867, Sandys lived with Rossetti at Tudor House (now called Queen's House) in Cheyne Walk, Chelsea. By this time Sandys was known as a painter of remarkable gifts. He had begun by drawing for *Once a Week*, the *Cornhill Magazine*, *Good Words* and other periodicals. He drew only in the magazines. No books illustrated by him can be traced. So his exquisite draughtsmanship has to be sought for in the old bound-up periodical volumes which are now hunted by collectors, or in publications such as Dalziel's *Bible Gallery* and the *Cornhill Gallery* and books of drawings, with verses attached to them, made to lie upon the drawing-room tables of those who had for the most part no idea of their merits. Every drawing Sandys made was a work of art, and many of them were so faithfully engraved that they are worthy of the collector's portfolio. Early in the 'sixties he began to exhibit the paintings which set the seal upon his fame. The best known of these are "Vivien" (1863), "Morgan le Fay" (1864), "Cassandra" and "Medea." Sandys never became a popular painter. He painted little, and the dominant influence upon his art was the influence exercised by lofty conceptions of tragic power. There was in it a sombre intensity and an almost stern beauty which lifted it far above the ideals of the crowd. The Scandinavian Sagas and the *Morte d'Arthur* gave him subjects after his own heart. "The Valkyrie" and "Morgan le Fay" represent his work at its very best. He made a number of chalk drawings of famous men of letters, including Tennyson, Browning, Matthew Arnold, and James Russell Lowell. Sandys died in Kensington on the 20th of June 1904.

See also Esther Wood, *The Artist* (Winter number, 1896).

SANDYS, GEORGE (1578–1644), English traveller, colonist and poet, the seventh and youngest son of Edwin Sandys, archbishop of York, was born on the 2nd of March 1578. He studied at St Mary Hall, Oxford, but took no degree. On his travels, which began in 1610, he first visited France; from North Italy he passed by way of Venice to Constantinople, and thence to Egypt, Mt. Sinai, Palestine, Cyprus, Sicily, Naples and Rome. His narrative, dedicated, like all his other works, to Charles (either as prince or king), was published in 1615, and formed a substantial contribution to geography and ethnology. He also took great interest in the earliest English colonization in America. In April 1621 he became colonial treasurer of the Virginia Company and sailed to Virginia with his niece's husband, Sir Francis Wyat, the new governor. When Virginia became a crown colony, Sandys was created a member of council in August 1624; he was reappointed to this post in 1626 and 1628. In 1631 he vainly applied for the secretaryship to the new special commission for the better plantation of Virginia; soon after this he returned to England for good. In 1621 he had already published an English translation of part of Ovid's *Metamorphoses*; this he completed in 1626; on this mainly his poetic reputation rested in the 17th and 18th centuries. He also began a version of Virgil's *Aeneid*, but never produced more than the first book. In 1636 he issued his famous *Paraphrase upon the Psalms and Hymns dispersed throughout the Old and New Testaments*; in 1640 he translated *Christ's Passion* from the Latin of Grotius; and in 1641 he brought out his last work, a *Paraphrase of the Song of Songs*. He died, unmarried, at Boxley, near Maidstone, Kent, in 1644. His verse was deservedly praised by Dryden and Pope; Milton was somewhat indebted to Sandys' *Hymn to my Redeemer* (inserted in his travels at the place of his visit to the Holy Sepulchre) in his *Ode on the Passion*.

See Sandys' works as quoted above; the travels appeared as *The Relation of a Journey begun an. Dom. 1610, in four books* (1615); also the Rev. Richard Hooper's edition, with memoir, of *The Poetical Works of George Sandys*; and Alexander Brown's *Genesis of the United States*, pp. 546, 989, 992, 994-995, 1032, 1063; article, "Sandys, George," in *Dictionary of National Biography*.

SAN FERNANDO, a seaport of southern Spain, in the province of Cadiz, on the Isla de León, a rocky island among the salt marshes which line the southern shore of Cadiz Bay. Pop. (1900), 29,635. San Fernando is one of the three principal naval ports of Spain; together with Ferrol and Cartagena it is governed by an admiral who has the distinctive title of captain-general. The town is connected with Cadiz (4½ m. N.W.) by a railway, and there is an electric tramway from the arsenal (in the suburb of La Carraca) to Cadiz. The principal buildings are government workshops for the navy, barracks, a naval academy, observatory, hospital, bull-ring and a handsome town hall. In the neighbourhood salt in largely produced and stone is quarried; the manufactures include spirits, beer, leather, esparto fabrics, soap, hats, sails and ropes; and there is a large iron-foundry.

San Fernando was probably a Carthaginian settlement. On a hill to the S. stood a temple dedicated to the Tyrian Hercules; to the E. is a Roman bridge, rebuilt in the 15th century after partial demolition by the Moors. The arsenal was founded in 1790. During the Peninsular War the cortes met at San Fernando (1810), but the present name of the town dates only from 1813; it was previously known as Isla de León.

SAN FRANCISCO, the chief seaport and the metropolis of California and the Pacific Coast, the tenth city in population (1910) of the United States, and the largest and most important city W. of the Missouri river, situated centrally on the coast of the state in 37° 47′ 22·55″ N. and 122° 25′ 40·76″ W., at the end of a peninsula, with the ocean on one side and the Bay of San Francisco on the other. Pop. (1850), 34,000; (1890), 298,997; (1900), 342,782, of whom 116,885 were foreign-born and 17,404 coloured (mainly Asiatics); (1910) 416,912.

General Description.—The peninsula is from 6 to 8 m. broad within the city limits. The magnificent bay is some 50 m. long in its medial line, and has a shore-line of more than 300 m.; its area is about 450 sq. m., of which 79 are within the three-fathom limit, including San Pablo Bay. This great inland water receives the two principal rivers of California, the Sacramento and the San Joaquin. The islands of the bay are part of the municipal district, as are also the Farallones, a group of rocky islets about 30 m. out in the Pacific. The bay islands are high and picturesque. Several are controlled by the national government and fortified. On Alcatraz Island is the United States Prison, and on Goat Island the United States Naval School of the Pacific. The old Spanish "presidio" is now a United States military reservation, and another smaller one, the Fort Mason Government Reservation, is in the vicinity. The naval station of the Pacific is on Mare Island in San Pablo Bay, opposite Vallejo (*q.v.*). Between 1890 and 1900 the harbour entrance from the Pacific was strongly fortified; it lies through what is called the Golden Gate, a strait about 5 m. long and 1 m. wide at its narrowest point. The outlook from Mt Tamalpais (2592 ft.), a few miles N., gives a magnificent view of the city and bay. The site of the city is very hilly and is completely dominated by a line of high rocky elevations that run like a crescent-formed background from N.E. to S.W. across the peninsula, culminating in the S.W. in the Twin Peaks (Las Papas, "The Breasts"), 925 ft. high. Telegraph Hill in the extreme N.E., the site in 1849 of the criminal settlement called "Sydney Town" and later known as the "Latin Quarter," is 294 ft. high; Nob Hill, where the railway and mining "kings" of the 'sixties and 'seventies of the 19th century built their homes, which only in recent years has lost its exclusiveness, is 300 ft. high; Pacific Heights, which became the site of a fashionable quarter, is still higher; and in Golden Gate Park there is Strawberry Hill, 426 ft. Hilly as it remains to-day, the site was once much more so, and has been greatly changed by man. Great hills were razed and tumbled into the bay for the gain of land; others were pierced with cuts, to conform to street grades and to the checker-board city plan adopted in the early days. An effort to induce the city to adopt, in the rebuilding after the earthquake of 1906, an artistic plan failed, and reconstruction followed practically the old plan of streets, although the buildings which had marked them had been for the most part obliterated. Some minor suggestions for improvement in arrangement only were observed. Cable lines were first practically tested in San Francisco, in 1873; since the earthquake they have given place, with slight exceptions, to electric car lines. A drive of some 20 m. may be taken along the ocean front, through the Presidio, Golden Gate Park, and a series of handsome streets in the west end. Market Street, the principal business street, is more than 3 m. long and 120 ft. broad. For nearly its full extent, excepting the immediate water-front, and running westward to Van Ness Avenue, a distance of 2 m., the buildings lining it on both sides and covering the adjoining area, a total of some 2000 acres, or 514 blocks, equivalent to ⅙ of the city plan, were reduced to ruins in the fire following the earthquake; only a few large buildings of so-called "fire-proof" construction remained standing on the street, and these had their interiors completely "gutted." Repairs on the buildings left standing on this street alone involved an outlay of $5,000,000. Almost the whole of this area was built up again by 1910. As the result of the reconstruction of this section, thousands of wooden buildings, which had been a striking architectural characteristic of the city, were replaced by structures of steel, brick, and, especially, reinforced concrete. Before the earthquake wood had been employed to a large extent, partly because of the accessibility, cheapness and general excellence of redwood, but also because of the belief that it was better suited to withstand earthquake shocks. While the wooden buildings were little damaged by the shocks, the comparative non-inflammability of redwood proved no safeguard and fire swept the affected area irresistibly. In 1900 only one-thirteenth of the buildings in the city were of other material than wood. Of the 28,000 buildings destroyed in the disaster of 1906, valued approximately at $105,000,000, only 5000 were such as had involved steel, stone or brick in their construction. The new buildings, on which an estimated amount of $150,000,000 had been expended up to April 1909, and numbering 25,000 at that date, were built under stringent city ordinances governing the methods of building employed, to reduce the danger from fire to a minimum. The use of reinforced concrete as a building material received a special impetus in consequence. In size and value the new buildings generally exceed their predecessors, buildings eight to eighteen storeys in height being characteristic in the Market Street section. Owing to the complete reconstruction of its business section San Francisco is equalled by few cities in the possession of office and business buildings of the most modern type.

Buildings.—Among the buildings in the burned section restored since 1906, the Union Trust, Mutual Savings, Merchants Exchange, Crocker, Flood and the *Call* (newspaper) buildings are notable. Among business buildings built since the fire are the Phelan building (costing more than $2,000,000), the buildings of the Bank of California, the Alaska Commercial Company, the First National Bank and the San Francisco Savings Union, and the *Chronicle* (newspaper) building. The architecture of the city until the earthquake and fire of 1906 was very heterogeneous. Comparatively few buildings were of striking merit. The old City Hall (finished in 1898), destroyed in 1906, was a great edifice of composite and original style, built of bricks of stucco facing (cost $6,000,000). Provision was made to erect a new building at a cost of $5,000,000. The Hall of Justice, which houses the criminal and police courts and the police department of the city, was another fine structure. Provision was made in 1909 to replace it by a new building. Since the fire of 1906 a new Custom House has been built, costing $1,203,319. The other Federal buildings are not architecturally noteworthy. The Post Office, which withstood the fire and has since undergone repairs, is a massive modern building of granite (original cost $5,000,000). The buildings of the church and college (St Ignatius) of the Jesuits cover more than a city block; those of the Dominicans are equally extensive, and are architecturally imposing. There are several magnificent hotels. The Palace, an enormous structure covering a city block (it had 1200 rooms and cost more than $3,000,000), known as the oldest and most famous hostelry of the city, and architecturally interesting, was completely destroyed by the fire, but has been replaced by a new building. The St Francis, completely reconstructed since the fire, and the Fairmont are new. A revival of the old Spanish-Moorish "mission" (monastery) style has exercised an increasing influence and is altogether the most pleasing development of Californian architecture. Many buildings or localities, not in themselves remarkable, have interesting associations with the history and life of the city. Such are Pioneer Hall, the home of the Society of California Pioneers (1850), endowed by James Lick; Portsmouth Square, where the flag of the United States was raised on the 8th of July 1846, and where the Committee of Vigilance executed criminals in 1851 and 1856; Union Square, a fashionable shopping centre, decorated with a column raised in honour of the achievements of the United States Navy in the Spanish-American War of 1898; also the United States Branch Mint, associated with memories of the early mining days (the present mint dates only from 1874).

Parks.—The parks of the city are extensive and fine. Golden Gate Park (about 1014 acres) was a waste of barren sand dunes when acquired by the municipality in 1870, but skilful planting and cultivation have entirely transformed its character. It is now beautiful with semi-tropic vegetation. The Government presidio or military reservation (1542 acres) is practically another city park, more favourably situated and of better land than Golden Gate Park, and better developed. A beautiful drive follows the shore, giving views of the Golden Gate and the ocean. Near the W. end of Golden Gate Park are the ocean beach, the Cliff House, repeatedly burned down and rebuilt, the last time in 1907—a public resort on a rocky cliff overhanging the sea—the seal rocks, frequented all the year round by hundreds of sea-lions, Sutro Heights, the beautiful private grounds of the late Adolph Sutro, long ago opened to the public, and the Sutro Baths, one of the largest and finest enclosed baths and winter gardens of the world. Nearly in the centre of the city is the old Franciscan mission (San Francisco de Asis, popularly known as Mission Dolores), a landmark of San Francisco's history (1776).

Libraries, Museums, &c.—The Public Library has more than 100,000 volumes (it had more than 165,000 volumes before the fire of 1906, but then lost all but about 25,000). That left to the city by Adolph Sutro had more than 200,000 volumes, but suffered from the fire and earthquake of 1906 and now has about 125,000. It included remarkable incunabula, 16th-century literature, and scientific literature; and among its special collections are Lord Macaulay's library of British Parliamentary papers, a great collection of English Commonwealth pamphlets, one on the history of Mexico, and other rarities. The Mechanics-Mercantile Library (35,000 volumes) was formed before the fire of 1906 (when the entire collection of 200,000 volumes was destroyed) by the merging of the Mechanics Institute Library (116,000 volumes) and the Mercantile Library (founded 1852; 80,000 volumes). The Law Library, the libraries of the San Francisco Medical Society, and the French library of La Ligue Nationale Française (1874), were destroyed in the fire of 1906 and re-established. The building of the California Academy of Sciences (founded 1853, endowed by James Lick with about $600,000) was destroyed in 1906. In Golden Gate Park is a museum owned by the city with exhibits of a wide range, including history, ethnology, natural history, the fine arts, &c. Very fine mineral exhibits by the State Mining Bureau, and California Agricultural and Pacific Coast commercial displays by the California Development Board, are housed in the Ferry Building, and there is a Memorial Museum in Golden Gate Park. The California School of Mechanic Arts was endowed by James Lick with $540,000. The San Francisco Institute of Art, conducted by the San Francisco Art Association (organized 1872), known until the fire of 1906 as the Mark Hopkins Institute of Art, was deeded (1893) to the Regents of the State University in trust for art purposes by a later owner. The building was totally destroyed and the institute was re-established under the new name on the same site. The school conducted by this institute had a fine collection of casts, presented to the city by the government of France. It is said to be the largest university art school of the country. The law, medical, dental, chemical and pharmaceutical departments of the State University are also in the city. Among other educational institutions are the Cogswell Polytechnic College, the Wilmerding School of Industrial Arts, and the California School of Design. In sculpture and painting not much has yet been done to adorn the city.

The self-sufficingness of San Francisco, long forced upon it by the great distance from the older culture of the Eastern States, has thus far shown itself particularly only in the general features of society. Few names belong by exclusive right to San Francisco's literary annals,—the most noteworthy being those of Bret Harte, Joaquin Miller and Henry George; but perhaps a score among the better known of the more recent writers in the country have done enough of their work here to connect them enduringly with the city. The Bohemian Club is a famous centre of literary and artistic life. Among the daily newspapers the *San Francisco Examiner* (Independent-Democratic, 1865), the *Chronicle* (Republican, 1865), the *Call* (Republican, 1856) and the *San Francisco Bulletin* (Independent-Republican, 1855) are chiefly important.

Suburbs.—The city suburbs are partly across the bay and partly to the north and south on the peninsula. Oakland, Berkeley, the home of the State University (damaged by the earthquake), and Alameda, all eastward just across the bay; Burlingame, San Mateo, Menlo Park and Palo Alto, wealthy and fashionable towns southward on the peninsula; Sausalito and San Rafael, summer residence towns on the northern peninsula across the Golden Gate; all lie well within an hour of San Francisco, and are practically suburbs of the metropolis. Many excursions into the surrounding country are very attractive. Mt. Tamalpais has already been referred to. The railroad in making this ascent makes curves equivalent to forty-two whole circles in a distance of 8½ m., at one place paralleling its track five times in a space of about 300 ft.

Climate.—San Franciscan climate is breezy, damp and at times chilling; often depressing to the weakly, but a splendid tonic to others. In a period of 32 years, ending December 1903, the extremes of temperature were 29° and 100° F.; the highest monthly average 65°, the lowest 46°; the average for January, March, June, September and December, respectively 50°, 54°, 59°, 61°, and 51° F. The average rainfall was 22·5 in., falling mostly from November to March. Every afternoon, especially from October to May, a stiff breeze sweeps the city; every afternoon in the summer the fogs roll over it from the ocean. Though geraniums and fuchsias bloom through the year in the open, an overcoat is often needed in summer.

Communications and Commerce.—San Francisco Bay is the most important as well as the largest harbour on the Pacific coast of the United States. There is a difference of a fathom in the mean height of the tides. Deep-water craft can go directly to docks within a short distance of their sources of supply, around the bay. In 1909 extensive improvements to the water front were under way, and land has been purchased west of Fort Mason for the construction of wharves and warehouses for the United States Transport Service. The largest craft can always enter and navigate the bay, and there are ample facilities of dry and floating docks. Steamer connexions are maintained with Australia, Hawaii, Mexico, Central and South America, the Philippines, China and Japan. San Francisco in 1909 had much the largest commerce of any of the Pacific ports. For 1909 the total imports of merchandise for the port were valued at $51,468,597 and the exports at $31,100,309. From 1891 to 1900 San Francisco dropped from the fifth to the eighth rank among the customs districts of the United States in point of aggregate commerce (the ports of Puget Sound rising in the same period from the twentieth to the tenth place). From 1893 to 1903 the yearly imports averaged $37,968,152, exports $33,658,266, and duties collected $6,642,173. The vessel movement for 1909 amounted to 4,959,728 tons arrivals and 4,974,922 tons departures. The foreign trade is chiefly with British Columbia, South America, China and Japan, and there is a considerable trade with Europe, Australia and Mexico. Trade with the Philippine Islands and the Hawaiian Islands and Alaska is important, while the coastwise trade with Pacific ports exceeds all the rest in tonnage. Lumber, grain and flour, fruits and their products, fish, tea and coffee are characteristic staples of commerce. While the export grain business had by 1909 shifted to ports in Oregon and Washington, San Francisco is the great receiving port for cereals on the Pacific Coast. San Francisco's permanence as one of the greatest ports of the country is assured by its magnificent position, the wealth of its "back country," and its command of trans-Pacific and trans-continental commercial routes. It is very nearly the shortest route, great circle sailing, from Panama to Yokohama and Hongkong; the Panama Canal will shorten the sea route from Liverpool and Hamburg by about 5500 m. and from New York by 7800. Three trans-continental railway systems—the Southern Pacific (with two trans-continental lines, the Southern and the old Central Pacific), the Atchison, Topeka & Santa Fé, and the Western Pacific—connect the city with the Eastern States; and besides these, it has traffic connexions with the three trans-continental lines of the north, the Canadian Pacific, Great Northern and Northern Pacific. Lines of the Southern Pacific and its branches connect the whole state with the city, a number of smaller roads—of which the most important is the North-Western Pacific—joining it with the surrounding districts. On the 1st of July 1900 the first train of the Santa Fé left San Francisco for the East; a significant event, as there had before been practically only one railway corporation (the Southern Pacific) controlling trans-continental traffic at San Francisco since 1869. Only one railway, the Southern Pacific's lower coast route, actually enters the city. Some ten other roads, great and small, have their terminals around the bay.

Manufactures.—San Francisco in 1900 held twelfth place among the cities of the Union in value of output; in 1905 it ranked thirteenth. The total value of the factory products of the city in 1905 was $137,788,233 as against $107,023,567 in 1900. The leading products and their value in 1905, where given, were: sugar and molasses refining; printing and publishing, $9,424,494 (of which $5,575,035 was for newspapers and periodicals); slaughtering and meat packing (wholesale), $8,994,992; shipbuilding; foundry and machine-shop products, $8,991,449; clothing, $4,898,095; canning and preserving, $4,151,414; liquors (malt, $4,106,034; vinous, $53,511); coffee and spice roasting and grinding, $3,979,865; flour and gristmill products, $3,422,672; lumber, planing and mill products, including sash, doors and blinds, $2,981,552; leather, tanning and finishing, $2,717,542; bags, $2,473,170; paints, $2,048,250. The development of the petroleum fields of the state has greatly stimulated manufactures, as coal has always been dear, whereas the crude oil is now produced very cheaply. The Union Iron Works on the peninsula is one of the greatest shipbuilding plants of the country.

Government.—Charters were granted to the city in 1850, 1851 and 1856. By the last the city and county, which until then had maintained separate governments, were consolidated. Under this charter San Francisco throve despite much corruption, and it was because the provisions of the State Constitution of 1879 seemed likely to compel the adoption of another charter that the city decisively rejected that constitution. After many years of notorious "boss" rule, the city in 1896 elected a reform mayor. This was the most important movement for good government in its history since the Vigilance Committee of 1856. It was followed by the adoption (1898) of a new charter, which came into effect on the 1st of January 1900. Elections are biennial. The inclusion in the charter of the principle of the "initiative and referendum" enables a percentage of the voters to compel the submission of measures to public approval. The city's control is centralized, great power being given to the mayor. He appoints and removes members of the fire, police, school, election, park, civil service, health and public works commissions of the city; his veto may not be overcome by less than a five-sixths vote of the board of supervisors, and he may veto separate items of the budget. Taxation for ordinary municipal purposes is limited to 1% on property values, extra taxes being allowed for unusual purposes; but the city cannot be bonded without the affirmative vote of two-thirds of the electorate. Civil service is also provided for. There is a highly developed license system. The board of public works, composed of engineers, controls streets, sewers, buildings and public improvements. In 1885 the assessed property valuation of the city, on a basis of 60% of the actual value, was $223,509,560; in 1905, $502,892,459;[1] in 1910 the total was $492,867,037. The net bonded debt on the 30th of June 1909 was $10,130,062·32. The water-supply system was greatly improved after the earthquake of 1906; whereas before the earthquake one main supply pipe brought all the water to the city, there have since been installed five systems which work independently of each other. Provision is made for filling the mains with salt water from the bay if necessary in fighting fire. While the supply had been furnished by a private corporation, the city was in 1910 planning for the ownership of its water-system, the supply to be drawn from the Sierras at a cost of some $45,000,000. Water was at that time in remote parts of the city drawn from artesian wells. In 1903 almost ten-elevenths of the street railways were controlled by one Eastern corporation, which was involved in the charges of municipal corruption that were the most prominent feature of the recent political history of the city. The electric power and light are drawn from the Sierras, 140 m. distant.

Population.—The population of San Francisco increased in successive decades after 1850 by 67·6, 16·3, 56·5, 27·8, 14·6 and 21·6%. The population is very cosmopolitan. Germans and Irish are not so numerous here, relatively, as in various other cities, although in 1900 the former constituted 30·1 and the latter 13·6% of the total population. There is a large Ghetto, a so-called Latin Quarter, where Spanish sounds and signs are dominant, a Little Italy and a Chinese quarter of which no other city has the like. Chinatown, at the foot of Nob Hill, covers some twelve city blocks, and with its temples, rich bazaars, strange life and show of picturesque colours and customs, it is to strangers one of the most interesting portions of the city. It was completely destroyed in the fire of 1906, and its inhabitants removed temporarily across the bay to Oakland, but by 1910 the quarter had been practically rebuilt in an improved manner, yet retaining its markedly oriental characteristics. The new Chinatown gained considerably in sanitation and in the housing of its commercial establishments. San Francisco has naturally been the centre of anti-Chinese agitation. The success of the exclusion laws is seen (though this is not the sole cause) in the decrease of the Chinese population from 24,613 to 13,954 between 1890 and 1900.

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[1] For the fiscal year 1906–1907 the assessed value was $375,932,447, indicating the drop in values immediately after the earthquake and fire, and, by comparison with the 1910 figures, the extent of recovery.

The Japanese numbered 1781 in 1900 and have very rapidly increased. The question of their admission to the public schools, rivalry in labour and trade, and other racial antagonisms attendant on their rapid increase in numbers, created conflicts that at one time seriously involved the relations of the two countries. Two Chinese papers are published. More than half of the daily papers are foreign language.

History.—A Spanish presidio (military post), and the Franciscan mission of San Francisco de Asis, on the Laguna de los Dolores, were founded near the northern end of the peninsula in 1776. San Francisco was not one of the important settlements. Even the very important fact whether it was ever actually a pueblo—*i.e.* a legally recognized and organized town—was long a controverted question. Up to 1835 there were two settlements on the peninsula—one about the presidio, the other about the mission; the former lost importance after the practical abandonment of the presidio in 1836, the latter after the secularization of the mission, beginning in 1834. The year 1835–1836 marked the beginning of a third settlement destined to become the present San Francisco. This was Yerba Buena ("good herb," *i.e.* wild mint), founded on a little cove of the same name S.E. of Telegraph Hill, extending inland to the present line of Montgomery Street. (The cove was largely filled in as early as 1851.)

The site of the city is very different from that of most American towns, and seemed a most unpromising location. The hills were barren and precipitous, and the interspaces were largely shifting sand-dunes; but on the E. the land sloped gently to the bay. In 1835–1839 "San Francisco" had an ayuntamiento (town-council), and the different municipal officers seem to have been located at the same or different times at the mission, the presidio, or at Yerba Buena; the name San Francisco being applied indifferently to all three settlements. The ayuntamiento, apparently recognizing the future of Yerba Buena, granted lots there, and as the older settlements decayed Yerba Buena throve. In 1840 there were only a handful of inhabitants; in 1846, when (on the 9th of July) the flag of the United States was raised over the town, its prosperity already marked it as the future commercial "metropolis" of the coast. In this year a Mormon colony joined the settlement, making it for a time a Mormon town. The population in the year before the gold discovery probably doubled, and amounted to perhaps 900 in May 1848.

The first news of the gold discoveries of January 1848 was received with incredulity at San Francisco (to give Yerba Buena the name it formally assumed in 1847), and there was little excitement until April. In May there was an exodus. By the middle of June the hitherto thriving town had been abandoned by a large majority of its inhabitants. Realty at first fell a half in value, labour rose many times in price. Newspapers ceased publication, the town council suspended sessions, churches and business buildings were alike empty. When the truth became known regarding the mines a wonderful "boom" began. The population is said to have been 2000 in February (in which month the first steamer arrived with immigrants from the East over the Isthmus), 6000 in August, and 20,000 by the end of the year. A city of tents and shanties rose on the sand-dunes. Realty values rose ten-fold in 1849. Early in 1850 more than 500 vessels were lying in the bay, most of them deserted by their crews. Many rotted; others were beached, and were converted into stores and lodging houses. Customs revenues rose from $20,000 in the first half of 1848 to $175,000 in the second half and to $4,430,000 in the year ending in June 1852. There was at first no idea of permanent settlement, and naturally no time whatever to improve the city. Great quantities of expensive merchandise glutted the market and were sunk in the liquid mud of the streets as fillage for the construction of sidewalks. Between December 1849 and June 1851 seven "great" fires, destroying in the aggregate property valued at twenty or twenty-five millions of dollars, swept the business district. Half of this was in the fire of the 4th of May 1851, which almost completely destroyed the city. These misfortunes led to a more general employment of brick and stone in the business quarter. It is characteristic of the vagaries of Californian commerce in the early years that dressed granite for some buildings was imported from China.

In these days the society of San Francisco was extraordinary. It was the most extreme of all democracies. Probably never before nor since in America was there a like test of self-development. Unusual courage and self-reliance were necessary for success. Amusements were coarse and unrestrained. Gambling was the fiercest passion. Property was at first, in San Francisco as in the mines, exceptionally secure; then insecure. Crime became alarmingly common, and the city government was too corrupt and inefficient to repress it. It was estimated (Bancroft) that up to 1854 there were 4200 homicides and 1200 suicides; in 1855 the records show 583 deaths by violence. There were almost no legal convictions and executions. Juries would not punish homicide with severity. In 1851 the first Committee of Vigilance was formed and served from June to September, when it disbanded; it was the nucleus of the second and greater committee, active from May to August of 1856. By these committees criminals were summarily tried, convicted and punished; suspicious characters were deported or intimidated. These vigilantes were the good citizens (the committee of 1851 included some 800 and that of 1856 some 6000–8000 citizens of all classes), who organized outside of law, "not secretly, but in debate, in daylight, with sobriety and decorum," to defend and establish, through defying, its rule. In this they were comparatively successful. Crime was never again so brazen and daring, and 1856 marks also the beginning of political reform. San Francisco's action was widely imitated over the state. In 1877 during the labour troubles a Committee of Safety was again organized, but had a very brief existence.

The United States military authorities in August 1847 authorized a municipal government. Under a municipal ordinance another was chosen in December 1848 to succeed it, but the parent government pronounced the election illegal; nevertheless the new organization continued to act, though another was chosen and recognized as legal. There were for a time at the end of 1848 three (and for a longer time two) civil governments and one military. Neither the military nor municipal organization was competent to give adequate law and peace to the community; and therefore in February 1849 the citizens elected a "Legislative Assembly," which they empowered to make laws not in "conflict with the Constitution of the United States nor the common laws thereof." This was proclaimed revolutionary by the military authorities, but such illegalities continued to spread over the state, until in June 1849 the Convention was called that framed the State Constitution, California being admitted in September 1850 to the Union. Provisional civil officers were elected throughout the state, and the Legislative Assembly came to an end. The charters of 1850, 1851 and 1856 have already been referred to.

The first public school was established in 1849. In 1855–1856 a disastrous commercial panic crippled the city; and in 1858, when at the height of the Fraser river gold-mine excitement it seemed as though Victoria, B.C., was to supplant San Francisco as the metropolis of the Pacific, realty values in the latter city dropped for a time fully a half in value. In 1859 foreign coin was first refused by the banks. Up to this time first gold dust, then private coins, and later money of various countries, had circulated in California. In 1860 mail communication was established with the East by a pony express, the charge being $5.00 for a half-ounce.

Some reference must be made to the Mexican land-grant litigation. The high value of land in and about the city caused the fabrication of two of the most famous claims examined and rejected as fraudulent by the United States courts (the Limantour and Santillan claims). They involved 7 sq. leagues of land and many millions of dollars. Another land question already referred to (that whether San Francisco was entitled as a pueblo to 4 sq. leagues of public land) was settled affirmatively in 1867, but the final land patents were not issued until 1884 by the national government.

When the Civil War came in 1861 the attitude of San Francisco was at first uncertain, for the pro-slavery Democrats had controlled the state and city, although parties were remaking in the late 'fifties. About 75,000 arms are supposed to have been surreptitiously sent to California by the secessionist Secretary of War, J. B. Floyd; and the pro-slavery party seems to have planned to try for union with the Confederacy, or to organize a Pacific Coast republic. Thomas Starr King (1824–1864), a Unitarian minister, was the heroic war-time figure of the city, the leader of her patriotism. Her money contributions to the Sanitary Funds were, it is said, greater than those of any city in the country; and in every other way she abundantly evidenced her love for the Union. The curious Chapman (or Asbury Harpending) case of 1863 was a Confederate scheme involving piracy on Federal vessels in the Pacific and an effort to gain the secession of the state. It had no practical importance.

From 1859–1877 was the "silver era" of San Francisco (see CALIFORNIA). It paralleled the excitement and gambling of 1849, and despite losses was a great stimulus to the city's growth. In September 1869 the Central Pacific line was completed to Oakland, and in the next four years there was a crash in real estate values inflated during the railway speculation. In 1876 railway connexion was made with Los Angeles. The 'seventies were marked by the growth of the anti-Chinese movement, and labour troubles, culminating in 1877–1879 with the "sand-lots" agitation and the formation of the Constitution of 1879 (see CALIFORNIA), in all of which San Francisco was the centre. The feeling against the Chinese found expression sometimes in unjust and mean legislation, such as the famous "queue ordinance" (to compel the cutting of queues—the gravest insult to the Chinese), and an ordinance inequitably taxing laundries. The Chinese were protected against such legislation by the Federal courts. The startling and romantic changes of earlier years long ago gave way to normal municipal problems and ordinary municipal routine. In the winter of 1894 the California Mid-winter International Exposition was held in Golden Gate Park. Since 1898 the governmental changes previously referred to, the location of a new trans-continental railway terminus on the bay, and the new outlook to the Orient, created by the control of the Philippines by the United States, and increased trade in the Pacific and with the Orient, have stimulated the growth and ambitions of the city.

Special mention must be made of the two citizens to whom San Francisco, as it is to-day, owes so much, viz. James Lick (1796–1876), a cold man with few friends, who gave a great fortune to noble ends; and Adolph Sutro (1830–1898), famous for executing the Sutro Tunnel of the Comstock mines of Virginia City, Nevada, and the donor of various gifts to the city.

The partial destruction of San Francisco by earthquake and fire in 1906 was one of the great catastrophes of history. Earthquakes had been common but of little importance in California until 1906. In more than a century there had been three shocks called "destructive" (1839, 1865, 1868) and four "exceptionally severe" at San Francisco, besides very many light shocks or tremors. The worst was that of 1868; it caused five deaths, and cracked a dozen old buildings. Heavy earthquake shocks on the morning of the 18th of April 1906, followed by a fire which lasted three days, and a few slighter shocks, practically destroyed the business section of the city and some adjoining districts. The heaviest shock began at 12 minutes 6 seconds past 5 o'clock a.m., Pacific standard time, and lasted 1 minute 5 seconds. Minor shocks occurred at intervals for several days. The earthquake did serious damage throughout the coast region of California from Humboldt county to the southern end of Fresno county, a belt about 50 m. wide. The damage by earthquake to buildings in San Francisco was, however, small in comparison to that wrought by the fire which began soon after the principal shock on the morning of the 18th. About half the population of the city, it was estimated, spent the nights while the fire was in progress out of doors, with practically no shelter. Some 200,000 camped in Golden Gate Park and 50,000 in the presidio military reservation. The difficulty of checking the fire was increased through the breaking of the water-mains by the earthquake, draining the principal reservoirs. Traffic by street cars was made impossible by the twisting of the tracks.

To stop the fire rows of buildings were dynamited. In this way many fine mansions on Van Ness Avenue were destroyed, and the westward advance of the conflagration was stopped at Franklin Street, one block west. General Frederick Funston, in command at the presidio, with the Federal troops under him, assumed control, and the city was put under military law, the soldiers assisting in the work of salvage and relief. On the 21st the fire was reported under control. A committee of safety was organized by the citizens and by the city authorities acting in conjunction with General Funston, and measures were adopted for the prevention of famine and disease, permanent camps being established for those who had been rendered homeless and not provided for by removal to other cities. Assistance with money and supplies was immediately given by the nation and by foreign countries, a committee of the Red Cross Society being put in charge of its administration. By the 23rd of April about $10,000,000 had been subscribed by the people of the United States; Congress voted $2,500,000 from the national treasury. The committee organized as the Red Cross Relief Corporation completed its work in 1908, having spent for the relief of the hungry, for the sick and injured, and for housing and rehabilitation of individuals and families, in round numbers $9,225,000. As the result of the earthquake and fire about 500 persons lost their lives; of those two were shot as looters. Buildings valued at approximately $105,000,000 were destroyed. The total loss in damage to property has been variously estimated at from $350,000,000 to $500,000,000. To cover the loss there was about $235,000,000 of insurance in some 230 companies. Reconstruction in the burned section began at once, with the result that it was practically rebuilt in the three years following the earthquake. Wages for men employed in building, owing in part to scarcity of labour but chiefly to action of the labour unions, rose enormously, masons being paid $12 a day for a day of 8 hours. High prices of materials and of haulage and freight rates added difficulty to the task of rebuilding, which was accomplished with remarkable energy and speed. In May 1907 there was a street-car strike of large dimensions. Van Ness Avenue, which during the process of rebuilding had assumed the character of a business thoroughfare, did not maintain this status, the business centre returning to the reconstructed Market Street. A new retail business district developed in what is known as the mission district and in Fillmore Street. A new residence district known as Parkside was developed south of Golden Gate Park.

For description and general features, see *Doxey's Guide to San Francisco and the Pleasure Resorts of California* (San Francisco, 1897); and various guides and other publications of the California Development Board (formed by consolidation of the State Board of Trade and California Promotion Committee) in San Francisco. For economic interests and history see the bibliography of the article CALIFORNIA. See also Frank Soule and others, *Annals of San Francisco* (San Francisco, 1858); John S. Hittell, *A History of the City of San Francisco* (San Francisco, 1878); B. E. Lloyd, *Lights and Shades of San Francisco* (San Francisco, 1876); C. W. Stoddard, *In the Footprints of the Padres* (San Francisco, 1900); Bernard Moses, *The Establishment of Municipal Government in San Francisco* (Johns Hopkins University Studies, 1889). Many legal questions of interesting constitutional, treaty and common law import have been decided in the Federal (and state) courts in cases involving Chinese; see the collections of reports. For good accounts of the great earthquake and fire, see D. S. Jordan (ed.), *The California Earthquake of 1906* (1906); F. W. Aitken and E. Hilton, *History of the Earthquake and Fire in San Francisco* (1907); G. K. Gilbert and others, *San Francisco Earthquake and Fire* (Washington, 1907).

SANGALLO, the surname of a Florentine family, several members of which became distinguished in the fine arts.

I. GIULIANO DI SANGALLO (1445–1516) was an architect, sculptor, tarsiatore and military engineer. His father, Francesco di Paolo Giamberti, was also an able architect, much employed by Cosimo de' Medici. During the early part of his life Giuliano worked chiefly for Lorenzo the Magnificent, for whom he built a fine palace at Poggio-a-Cajano, begun in 1485, between Florence and Pistoia, and strengthened the fortifications of Florence, Castellana and other places. Lorenzo also employed him to build a monastery of Austin Friars outside the Florentine gate of San Gallo, a nobly designed structure, which was destroyed during the siege of Florence in 1530. It was from this building that Giuliano received the name of Sangallo, which was afterwards used by so many Italian architects. While still in the pay of Lorenzo, Giuliano visited Naples, and worked there for the king, who sent him back to Florence with many handsome presents of money, plate and antique sculpture, the last of which Giuliano presented to his patron Lorenzo. After Lorenzo's death in 1492, Giuliano visited Loreto, and built the dome of the church of the Madonna, in spite of serious difficulties arising from its defective piers, which were already built. In order to gain strength by means of a strong cement, Giuliano built his dome with pozzolana brought from Rome. Soon after this, at the invitation of Pope Alexander VI., Giuliano went to Rome, and designed the fine panelled ceiling of S. Maria Maggiore. He was also largely employed by Julius II., both for fortification walls round the castle of S. Angelo, and also to build a palace adjoining the church of S. Pietro in Vincoli, of which Julius had been titular cardinal. Giuliano was much disappointed that Bramante was preferred to himself as architect for the new basilica of St Peter, and this led to his returning to Florence, where he did much service as a military engineer and builder of fortressses during the war between Florence and Pisa. Soon after this Giuliano was recalled to Rome by Julius II., who had much need for his military talents both in Rome itself and also during his attack upon Bologna. For about eighteen months in 1514–1515 Giuliano acted as joint-architect to St Peter's together with Raphael, but owing to age and ill-health he resigned this office about two years before his death.

II. Antonio di Sangallo (1455?–1534) was the younger brother of Giuliano, and took from him the name of Sangallo. To a great extent he worked in partnership with his brother, but he also executed a number of independent works. As a military engineer he was as skilful as Giuliano, and carried out important works of walling and building fortresses at Arezzo, Montefiascone, Florence and Rome. His finest existing work as an architect is the church of S. Biagio at Montepulciano, in plan a Greek cross with central dome and two towers, much resembling, on a small scale, Bramante's design for St Peter's. He also built a palace in the same city, various churches and palaces at Monte Sansavino, and at Florence a range of monastic buildings for the Servite monks. Antonio retired early from the practice of his profession, and spent his latter years in farming.

III. Francesco di Sangallo (1493–1570), the son of Giuliano di Sangallo, was a pupil of Andrea Sansovino, and worked chiefly as a sculptor. His works have for the most part but little merit—the finest being his noble effigy of Bishop Leonardo Bonafede, which lies on the pavement of the church of the Certosa, near Florence. It is simply treated, with many traces of the better taste of the 15th century. His other chief existing work is the group of the "Virgin and Child and St Anne," executed in 1526 for the altar of Or San Michele.

IV. Bastiano di Sangallo (1481–1551), sculptor and painter, was a nephew of Giuliano and Antonio. He is usually known as Aristotile, a nickname he received from his air of sententious gravity. He was at first a pupil of Perugino, but afterwards became a follower of Michelangelo.

V. Antonio di Sangallo, the younger (1485?–1546), another nephew of Giuliano, went while very young to Rome, and became a pupil of Bramante, of whose style he was afterwards a close follower. He lived and worked in Rome during the greater part of his life, and was much employed by several of the popes. His most perfect existing work is the brick and travertine church of S. Maria di Loreto, close by Trajan's column, a building remarkable for the great beauty of its proportions, and its noble effect produced with much simplicity. The lower order is square in plan, the next octagonal; and the whole is surmounted by a fine dome and lofty lantern. The lantern is, however, a later addition. The interior is very impressive, considering its very moderate size. Antonio also carried out the lofty and well-designed church of S. Giovanni dei Fiorentini, which had been begun by Jacobo Sansovino. The east end of this church rises in a very stately way out of the bed of the Tiber, near the bridge of S. Angelo; the west end has been ruined by the addition of a later façade, but the interior is a noble example of a somewhat dull style. Great skill was shown in successfully building this large church, partly on the solid ground of the bank and partly on the shifting sand of the river bed. Antonio also built the Cappella Paolina and other parts of the Vatican, together with additions to the walls and forts of the Leonine City. His most ornate work is the lower part of the cortile of the Farnese palace, afterwards completed by Michelangelo, a very rich and well-proportioned specimen of the then favourite design, a series of arches between engaged columns supporting an entablature, an arrangement taken from the outside of the Colosseum. A palace in the Via Giulia built for himself still exists under the name of the Palazzo Sacchetti, much injured by alterations. Antonio also constructed the very deep and ingenious rock-cut well at Orvieto, formed with a double spiral staircase, like the well of Saladin in the citadel of Cairo.

See Raviolo, *Notizie sui lavori . . . dei nove Da San Gallo* (Rome, 1860); G. Clausse, *Les Sangallo* (Paris, 1900–1901). (J. H. M.)

SANGER, JOHN (1816–1889), English circus proprietor, was born at Chew Magna, Somerset, in 1816, the son of an old sailor who had turned showman. In 1845 he started with his brother George a conjuring exhibition at Birmingham. The venture was successful, and the brothers, who had been interested spectators of the equestrian performances at Astley's Amphitheatre, London, then started touring the country with a circus entertainment consisting of a horse and pony and three or four human performers. This enterprise was a success from the beginning, and in due course John and George Sanger became lessees of the Agricultural Hall, London, and there produced a large number of elaborate spectacles. In 1871 the Sangers leased Astley's where they gave an equestrian pantomime every winter, touring in the summer with a large circus. Subsequently the partnership was dissolved, each brother producing his own show. John Sanger died while touring, at Ipswich on the 22nd of August 1889, the business being continued by his son.

SANGERHAUSEN, a town of Germany, in the Prussian province of Saxony, situated on the Gonna, near the south base of the Harz mountains, 30 m. W. of Halle, on the main line of railway Berlin-Nordhausen-Cassel. Pop. (1905) 12,439. Among many medieval buildings, the church of St Ulrich, one of the finest specimens of Romanesque architecture in Germany, and the church of St James, with a magnificent altar screen and interesting tombs and effigies, are particularly noticeable. There are a gymnasium, two hospitals dating from the 14th century and an old town-hall. The industries include the manufacture of sugar, furniture, machinery, boots and buttons. Brewing and brickmaking are also extensively carried on, and there is a considerable agricultural trade.

Sangerhausen is one of the oldest towns in Thuringia, being mentioned in a document of 991 as appertaining to the estates of the emperor. By marriage it passed to the landgrave of Thuringia, and after 1056 it formed for a while an independent country. Having been again part of Thuringia, it fell in 1249 to Meissen, and in 1291 to Brandenburg. In 1372 it passed to Saxony and formed a portion of that territory until 1815, when it was united with Prussia.

See K. Meyer, *Chronik des landrätlichen Kreises Sangerhausen* (Nordhausen, 1892); and F. Schmidt, *Geschichte der Stadt Sangerhausen* (Sangerhausen, 1906).

SAN GERMAN, a city of the department of Mayaguez, Porto Rico, in the south-western part of the island, about 10 m. S.S.E. of the city of Mayaguez. Pop. of the city (1899) 3954; of the municipal district 20,246, of whom 10,715 were of mixed races. The city is served by the American railway of Porto Rico. It is situated near the Guanajibo river, in a fertile agricultural region which produces sugar, coffee, fruit, cacao and tobacco.

In one of the public squares is a Dominican church built in 1538.

San German was founded in 1517, was plundered by the French in 1528, was destroyed by corsairs in 1554, and was unsuccessfully attacked by the English in 1748. Until 1782 it was the seat of government of the western district of the island. It was made a city in 1877.

SAN GIMIGNANO, a town of Tuscany, Italy, in the province of Siena, 24 m. N.W. of Siena, at an elevation of 1089 ft. Pop. (1901) 4060 (town); 10,066 (commune). Being surrounded by its ancient walls, and retaining thirteen out of its original fifty towers, it is, with its predominantly Gothic architecture, a thoroughly medieval town in appearance. In the council chamber of the town-hall (1288–1323) is a fresco by Lippo Memmi of the Madonna enthroned of 1317, copied closely from the similar fresco (the "Majestas") by his master Simone di Martino in the Palazzo Pubblico at Siena; there is also a curious frescoed frieze of 1291, with knights in armour. The museum in the same building contains pictures and other objects of art. The tower is the highest in the town (174 ft.), while the Torre dell' Orologio (167 ft.) close by marks the height beyond which private individuals might not build. In the same piazza is the Collegiata (the former cathedral) of the 12th century, enlarged after 1466 by Giuliano da Maiano, whose brother Benedetto erected the chapel of S. Fina from his plans in 1468, and carved the fine marble altar, the original painting and gilding of which are still preserved. The marble ciborium, a small reproduction of the splendid one in S. Domenico at Siena, is also by Benedetto. The beautiful frescoes with scenes from the life of the saint (a local saint who died at the age of fifteen) are the earliest work of Domenico Ghirlandaio, completed before 1475. There are also some frescoes of his cousin Bastiano Mainardi (d. 1513). The cathedral contains other 14th-century and early Renaissance paintings, the former including some Passion scenes, the only certain work of Barna da Siena, and some fine choir stalls. S. Agostino (1280–1298) contains a famous series of seventeen frescoes by Benozzo Gozzoli, with scenes from the life of St Augustine (1463–1467). They have been to some extent restored. The altar of S. Bartoldus, by Benedetto da Maiano, is not unlike that in the Collegiata (1494). The town was independent in the 13th century, but in 1353, owing to the dissensions of the Salvucci (Ghibellines) and Ardinghelli (Guelphs), it fell into the hands of Florence.

See R. Pantini, *San Gimignano e Certaldo* (Bergamo, 1905).

SANGLI, a native state of India, in Bombay, ranking as one of the Southern Mahratta Jagirs. The territory is widely scattered among other native states and British districts. Area, 1112 sq. m. Pop. (1901) 226,128; estimated revenue, £10,000. The river Kistna waters part of the country, which is exceedingly fertile. Millet, rice, wheat and cotton are the chief crops, and cotton cloth is manufactured. The chief, whose title is Tatya Saheb Patwardhan, is a Brahman by caste. The town of Sangli, on the river Kistna, has a station on the Southern Mahratta railway, 11 m. from Miraj Junction. Pop. (1901) 16,829.

SANJO, SANETOMI, PRINCE (1837–1891), Japanese statesman, was one of the old court nobles (*kuge*) of Japan, and figured prominently among the little band of reformers who accomplished the overthrow of feudalism and the restoration of the administration to the Mikado. He served as the first prime minister (*daijo daijin*) in the newly organized *Meiji* government.

SAN JOSÉ, a city and the county-seat of Santa Clara county, California, U.S.A., situated in the coast ranges, about 46 m. S.E. of San Francisco and 8 m. S.E. of the southern end of San Francisco Bay, in the heart of the beautiful Santa Clara Valley. Pop. (1890) 18,060; (1900) 21,500, of whom 4577 were foreign-born; (1910 census) 28,946; land area (1906), about 6 sq. m. It is served by the Southern Pacific railway, which has car shops and terminal yards here. The city lies mainly on a gently rising plateau (altitude, 90 to 125 ft.) between the Coyote and Guadalupe rivers. It is a popular health resort.

Besides St James and City Hall parks in the city, San José has Alum Rock Canyon Park, a tract of 1000 acres, with sixteen mineral springs, in Penitencia Canyon, 7 m. east. This park is connected by electric railway with the city. San José is the seat of the University of the Pacific (Methodist Episcopal), which was founded at Santa Clara in 1851, removed to its present site just outside the city in 1871, and had 358 students in all departments in 1909–1910; of the College of Notre Dame (1851; Roman Catholic), and of a State Normal School. Among charitable institutions are a Home of Benevolence (1878) for orphans and abandoned children, the Notre Dame Institute (for orphans) under the Sisters of Notre Dame, and the O'Connor Sanatorium. The Lick Observatory, opened in 1888 on the top of Mount Hamilton (4209 ft.) with a legacy of $700,000 left by James Lick (1796–1876) of San Francisco, is 26 m. distant by road, and the New Almaden quicksilver mine (the greatest producer in California and long among the greatest in the world) is about 14 m. south. The Santa Clara Valley has many vegetable and flower-seed farms; it is one of the most fertile of the fruit regions of California, prunes, grapes, peaches and apricots being produced in especial abundance. More than half the prune crop of California comes from Santa Clara county. In 1905 the total value of the factory product of San José was $6,388,445 (94·1 % more than in 1900); nearly one-half ($3,039,803) was the value of canned and preserved fruits and vegetables, $619,532 of planing-mill products, and $518,728 of malt liquors—much barley is grown in the Santa Clara Valley.

San José de Guadalupe (after 1836 for a time "de Alvarado" in honour of Governor J. B. Alvarado) was founded in November 1777, and was the first Spanish pueblo of California. The mission of Santa Clara was founded in the vicinity in January 1777, and the mission of San José, about 12 m. north-east, in 1797. Near the original site of the former, in the town of Santa Clara (pop. 1900, 3650), a suburb of San José, now stands Santa Clara College (Jesuit; founded 1851, chartered 1855). Throughout the Spanish-Mexican period San José was a place of considerable importance. In 1840 its population was about 750. In the last years of Mexican dominion it was the most prominent of the northern settlements in which the Hispano-Californian element predominated over the new American element. The town was occupied by the forces of the United States in July 1846; and a skirmish with the natives occurred in its vicinity in January 1847. San José was the first capital of the state of California (1849–1851), and in 1850 was chartered as a city.

SAN JOSÉ, or SAN JOSÉ DE COSTA RICA, the capital of the republic of Costa Rica, and of the department of San José; in the central plateau of the country, 3868 ft. above sea-level, and on the transcontinental railway from the Pacific port of Puntarenas to the Atlantic port of Limón. Pop. (1908) about 26,500. San José is an episcopal see, the most populous city in Costa Rica, and the centre of a rich agricultural region; its climate is temperate, its water-supply pure and abundant. The city was founded in 1738, and became the capital in 1823 (see COSTA RICA: *History*). It is thoroughly modern in appearance, with macadamized streets lighted by electricity; its houses are one-storeyed so as to minimize the danger from earthquake. The suburbs consist chiefly of cane huts, tenanted by Indians and half-castes. The larger of two public gardens, the Morazan Park, contains a representative collection of the Costa Rican flora. The principal buildings are the cathedral, founded in the 18th century but restored after 1870, the hospital, government offices, institutes of law and medicine and of physical geography, training school for teachers, national bank, museum, library and barracks. The staple trade of San José is in coffee.

SAN JUAN, an Andine province of Argentina, bounded N. and E. by La Rioja, S. by San Luis and Mendoza, and W. by Chile, from which it is separated by the Andean Cordilleras. Area, 33,715 sq. m.; pop. (1904, estimate) 99,955. It is roughly mountainous, and belongs to the closed drainage basin of western Argentina, centring in the province of Mendoza. It is traversed by several rivers, fed by the melting snows of the Andes and discharging into the swamps and lagoons in the S.E. part of the province, the largest of which are the Huanacache lagoons. The largest of these rivers are the Vermejo, Zanjón or Jachal and San Juan. They are all used for irrigation. The climate is extremely hot and dry in summer, but the winter temperature is mild and pleasant. Agriculture is the principal occupation of its inhabitants, though the soil is generally sterile and the rainfall uncertain and very light. Cereals are grown in some localities, and there are large vineyards where irrigation is possible, from which excellent wine is made. The province contains gold, silver, copper, iron, lead, coal and salt, but mining has never been developed to any extent. Pastoral interests are largely in feeding cattle for the Chilean markets, for which large areas of alfalfa are grown in the irrigated valleys of the Andes. The Argentine Great Western railway connects Mendoza with the capital of the province, and with the principal cities of the republic.

The capital of the province is San Juan, once called San Juan de la Frontera (pop. 1904, estimate, 11,500), in a great bend of the San Juan river, 95 m. N. of Mendoza and 730 m. from Buenos Aires by rail. The great bend of the river affords easy irrigation, and the surrounding country is covered by a network of irrigating canals, even the paved streets of the town having streams of cool water running through them. The public buildings include a cathedral, three churches, and several schools, including the "Escuela Sarmiento," a fine edifice with a Greek façade, named after President Domingo Faustino Sarmiento (1811–1886), who was a native of this city. There is also a botanical garden.

San Juan was founded in 1561 by Juan Yufré, a companion of Captain Castillo, the founder of Mendoza. Both came from Chile, to which these outlying colonies were at first subject. From 1776 to 1820 it was governed from Mendoza, and then a popular uprising made the province independent and the town its capital. It has suffered severely from political disorders, and in 1894 was nearly destroyed by an earthquake. The original settlement, now called Pueblo Viejo, 4 m. N., was abandoned on account of frequent inundations. The present town is situated about 2165 ft. above sea-level and is defended from inundations by an embankment above the town, called the Murallon. San Juan exports wine, and has a profitable trade with Chile over the Patos and Uspallata passes.

SAN JUAN (San Juan Bautista de Puerto Rico), the capital and largest city of Porto Rico, on a small and narrow island which lies near the north coast, about 35 m. from the east end of Porto Rico, and is united to the mainland by the bridge of San Antonio. Pop. (1899) 32,048, including 5236 negroes and 11,529 of mixed races; (1910) 48,716. San Juan is served by the American railroad of Porto Rico and by steamboats from New York and other ports. The harbour lies between the city and the mainland. It is capacious and landlocked, except on the north. A portion of it is 30 ft. in depth, and in 1907 Congress passed an Act for enlarging this area by dredging and especially for widening the entrance for large vessels; the work was virtually completed in 1909. San Juan is noteworthy for its fortifications and public buildings, and is the only fortified city of Porto Rico.

On a bluff about 100 ft. high at the west end of the island and commanding the entrance to the harbour rise the battlements of Morro Castle, which was completed about 1584 and in which there is a lighthouse. The Castle of San Cristóbal (begun early in the 17th century, completed in 1771) extends across the island in the rear portion of the city. A wall on each side of the island connects the two castles. The Cañuelo is an abandoned fort on an islet opposite the Morro and less than 1000 yds. from it, the main channel lying between the two; and Forts San Antonio and San Geronimo protect the bridge of San Antonio. Inland rises a range of lofty mountains. Within the walls (which are 50-100 ft. high) the streets are narrow, smoothly paved with glazed brick and well cleaned. Princessa, Covadonga and Puerta de Tierra are lined with shady trees and occasionally widen into refreshing plazas. Between streets the space is packed closely with massive, flat-roofed brick and stone buildings, the walls of which, like the fortifications, are covered with plaster of various colours—green, blue, white, brown, pink, yellow and vermilion; red tile roofs add to the effect. Near Morro Castle is the Casa Blanca, a palace on land which belonged to the family of Ponce de Leon. The tomb of Ponce de Leon is in the Cathedral, and in the Plaza de San José is a bronze statue (said to have been cast from cannon taken from the English in 1797) to his memory. In the Plaza Colon is a marble and granite monument to Columbus. In the church of San Francisco are some good paintings by José Campeche (1752–1809), a local artist. Other churches are the severely beautiful Santo Domingo, the Santa Ana, the Cathedral, with a rich shrine of Nuestra Señora de la Providencia, and the church of San José, which was formerly the Dominican convent. Among the prominent buildings and institutions are the custom-house, the executive mansion (formerly the palace of the governor-general) situated near the Casa Blanca, the archiepiscopal palace, a Seminary College, the City Hall, the Intendencia, the Post Office, the large barracks (Cuartel de Ballajá), the Penitentiary, the Military Hospital, the Presbyterian Hospital, two municipal hospitals (one surgical, one medical), a municipal bath-house and a small public library (the "Cervantes"). At Rio Piedras, not far from San Juan, is the Normal School and Agricultural School of Porto Rico. Other suburbs are Marina, with wharves and piers, Puerta de Tierra and on the mainland, Santurce, with a country club, the Union Club, a beautiful market-place, two charity schools and some attractive villas. Industries are of little importance. The sanitation of the city has been installed since the American occupation; sewers have been laid and a water-supply is piped from Rio Piedras.

From Caparra, established in 1508 by Juan Ponce de Leon and now known as Pueblo Viejo, the Spanish settlement removed in 1520 to San Juan or San Juan Bautista de Puerto Rico, nearer the coast. The new settlement became the capital of the eastern district of the island, to the whole of which the latter part of the name came to be applied. It was sacked by Sir Francis Drake in 1595, and captured by Admiral George Clifford, earl of Cumberland (1558–1605), in 1597, but was abandoned by the conquerors on account of an epidemic. It was unsuccessfully attacked by the English under Sir Ralph Abercromby in April 1797; and it was bombarded by an American fleet under Rear-Admiral William T. Sampson on the 12th of May 1898 during the Spanish-American war, and was blockaded by the auxiliary cruiser "St Paul," which on the 22nd of June drove back into the harbour the Spanish destroyer "Terror" and the gunboat "Isabella II."; but the city was not occupied by the Americans until after the suspension of hostilities.

SAN JUAN (or Haro) **ISLANDS,** an archipelago (San Juan, Orcas, Shaw, Lopez, Blakely, Cypress, &c.) lying between Vancouver Island and the mainland of North America. These islands were for many years the subject of dispute between the British and the United States governments, and were finally assigned to the latter country by the arbitration of the emperor of Germany (on the 21st of October 1872). Geographically the cluster certainly belongs to the mainland, from which it is separated by Rosario Strait, generally much under 50 fathoms in depth, while Haro Strait, separating it from Vancouver Island, has depths ranging from 100 to 190 fathoms. In 1873 the islands, formerly considered part of Whatcom county, Washington, were made the separate county of San Juan. Of the total area of 200 sq. m., about 60 are in San Juan, 60 in Orcas and 30 in Lopez.

See *Papers relating to the Treaty of Washington*, vol. v. (Washington, 1872), and the map in *Petermann's Mitteilungen* (1873).

SANKARA ACHARYA (*c.* 789–820), Hindu theologian, was born about the year 789, probably at the village of Kaladi in Malabar. He belonged to the Nambudri class of Brahmins. He wandered far and wide, and engaged in much philosophical and theological debate. He taught the existence of the Supreme God and founded the sect of the Smarta Brahmins. His great achievement was the perfecting of the Mimansa or Vedanta philosophy. So great were his learning and piety that he was regarded as an incarnation of Siva, and his works (commentaries on the Vedanta Sutras, the Bhagavad Gita and the Upanishads) exercised a permanent influence on Hindu thought. He died at Kedarnata in the Himalayas when only 32 years of age.

See *Sri Sankaracharya*, by C. N. Krishnasurami Aiyar and Pandit Sitanath Tattvabhushan (Madras, 1902).

SANKT JOHANN, a town of Germany, in the Prussian Rhine province, on the right bank of the Saar, opposite Saarbrücken with which it is connected by three bridges. It is 49 m. N.E. from Metz and at the junction of lines from Trier, Bingerbrück and Zweibrücken. Pop. (1905) 24,140. Sankt Johann is the seat of extensive industries, the chief being the manufacture of railway plant and machinery, iron-founding, wire-drawing and brewing; its rapid industrial development is due mainly to the extensive railway system of which it is the centre.

Sankt Johann obtains its name from a chapel erected here. From 1321 to 1859 it formed a single town with Saarbrücken, and then was united to form one municipality with Saarbrücken and Malstatt-Burbach (united population, 90,000).

SANKT PÖLTEN, an old town and episcopal see of Austria, in Lower Austria, 38 m. W. of Vienna by rail. Pop. (1900) 14,510. It is situated on the Traisen, a tributary of the Danube, and contains an interesting old abbey church, founded in 1030 and restored in 1266 and again at the beginning of the 18th century. There are several religious educational institutions in the town, and a military academy for engineers. The industries include cotton spinning and milling, as well as the manufacture of iron and hardware, and small arms. Sankt Pölten was an inhabited place in the Roman period. An abbey dedicated to St Hippolytus was founded here in the 9th century, around which the town developed. It was called *Fanum Sancti Hippolyti*, from which, by corruption, the actual name is derived. It was surrounded with walls and fortifications in the time of Rudolf of Habsburg, but these were demolished in modern times.

See Lampel, *Urkundenbuch des Chorherrenstifts Sankt Pölten* (Wien, 1891–1901, 2 vols.).

SAN LUCAR (or SANLÚCAR DE BARRAMEDA), a fortified seaport of southern Spain, in the province of Cadiz; 27 m. by sea from Cadiz, on the left bank of the Guadalquivir estuary, and on the Puerto de Santa Maria-San Lucar and Jerez de la Frontera-Bonanza railways. Pop. (1900) 23,883. The town is divided into two parts, Alta (" upper ") and Baja (" lower "); for it is built partly on the flat foreshore, partly on the rising ground to the south. The upper part is the older; it culminates in the ruins of a Moorish citadel. On the outskirts are many villas surrounded by pine, palm and orange groves, and often occupied in summer by families from Seville, who come to San Lucar for the excellent sea-bathing. The 14th-century church and the palace of the dukes of Medina Sidonia contain many valuable pictures. The hospital of St George was established by Henry VIII. of England in 1517 for English sailors. The Guadalquivir estuary is deep and sheltered, and lighted by four lighthouses. Bonanza, 2 m. by rail up the river, and on the same bank, is the headquarters of the shipping and fishing trades. It is named after a chapel dedicated here by the South American Company of Seville to the Virgin of Fair Weather (*Virgen de la Bonanza*). The fisheries and agricultural trade of San Lucar are considerable; there are flour mills in the town and a dynamite factory among the surrounding sandhills. Coal is imported from Great Britain, sulphur from France. The imports include sherry, manzanilla and other wines, salt, oats and fruit.

Inscriptions and ruins prove that San Lucar and Bonanza were Roman settlements, though the original names are unknown. San Lucar was captured from the Moors in 1264, after an occupation lasting more than five and a half centuries. After 1492 it became an important centre of trade with America. From this port Columbus sailed across the Atlantic in 1498, and Magellan started in 1519 to circumnavigate the world.

SAN LUIS, a province of Argentina, bounded N. by Rioja, E. by Cordoba, S. by the La Pampa territory and W. by Mendoza. Area, 28,535 sq. m. Pop. (1904, estimated) 97,458. San Luis belongs partly to the semi-arid pampa region, and partly to the mountainous region of the eastern Andes and Cordoba whose ranges terminate between the 33rd and 34th parallels. It is one of the least important of the Argentine provinces because of its aridity and lack of available resources. The rough northern districts, where an occasional stream affords irrigation for a fertile soil, are noted for a remarkably uniform, dry, mild and healthful climate. The Rio Quinto has its sources in these ranges; the Desaguadero, or Salado, forms its western boundary; and the Conlara flows northward among its broken ranges to the great *salinas* of western Cordoba. Only in the mountains are these streams available, as they soon become impregnated with saline matter on the plains. The southern part of the province is a great, arid, saline plain, practically uninhabitable. Agriculture and grazing occupy some attention in the north, but are handicapped by lack of water. The mountains are rich in minerals, however, and a number of gold mines have been opened. The exports include cattle, hides, skins, wool and ostrich feathers. The capital is San Luis (pop. 1904, about 10,500) on the Arroyo Chorillos, a little S. of the *cerro* called Punta de los Venados, 374 m. by rail (the Argentine Great Western) W. of Rosario, and magnificently situated on a plateau 2490 ft. above sea-level. Next in importance is the town of Mercedes or Villa Mercedes (pop. 1904, about 6000) on the Rio Quinto, an important railway junction where the railways from Buenos Aires, Rosario, Mendoza and San José unite.

San Luis, the capital, was founded in 1697 by Martin de Loyola and was for nearly 200 years only a frontier outpost. It suffered much in the civil wars of 1831–1865.

SAN LUIS POTOSÍ, a central state of Mexico, bounded N. by Coahuila, E. by Nuevo Leon, Tamaulipas and Vera Cruz, S. by Hidalgo, Querétaro and Guanajuato, and W. by Zacatecas. Area, 25,316 sq. m. Pop. (1900) 575,432. The state belongs wholly to the high plateau region, with the exception of a small area in the S.E. angle, where the tableland breaks down into the tropical valley of the Panuco. The surface is comparatively level, with some low mountainous wooded ridges. The eastern part borders on the Sierra Madre Oriental, where there are extensive forests. The mean elevation is about 6000 ft., insuring a temperate climate. The state lies partly within the arid zone of the north, the southern half receiving a more liberal rainfall through the influence of the " northers " on the Gulf coast. The rainfall, however, is uncertain and the state is poorly provided with rivers. The soil is fertile and in favourable seasons large crops of wheat, Indian corn, beans and cotton are grown on the uplands. In the low tropical valleys, sugar, coffee, tobacco, peppers and fruit are staple products. Stock-raising is an important industry and hides, tallow and wool are exported. Fine cabinet and construction woods are also exported to a limited extent. At one time San Luis Potosí ranked among the leading mining provinces of Mexico, but the disorders following independence resulted in a great decline in that industry. The Catorce district has some of the richest silver mines in the country. Other well-known silver mining districts are Peñón Blanco, Ramos and Guadalcázar. The development of Guadalcázar dates from 1620 and its ores yield gold, copper, zinc and bismuth, as well as silver. In the Ramos district, the Cocinera lode is said to have a total yield of over $60,000,000. Railway facilities are provided by the Mexican Central and Mexican National lines, the former crossing a corner of the state and having a branch from the capital to Tampico, and the latter passing through the state from N. to S. The capital is San Luis Potosí, and other towns, with their populations, are: Matehuala (13,101 in 1895), a mining town 20 m. E. by W. of Catorce, with which it is connected by a branch railway; Catorce (9547 in 1895), an important mining town 110 m. N. (direct) of San Luis Potosí (capital) and 8 m. from its railway station on the Mexican National; at an elevation of 8780 ft., Santa Maria del Rio (8440 in 1900), 37 m. S.E. of the capital; Venado (5750 in 1895), 45 m. N. of the capital; Rio Verde (5759 in 1900), an agricultural centre with a national agriculture experiment station in its vicinity; Soledad Diez Gutierrez (5730 in 1895), near the capital.

SAN LUIS POTOSÍ, a city of Mexico and capital of a state of the same name, near the head of the valley of the Rio Verde (a tributary of the Panuco), 215 m. by rail N.W. of the city of Mexico. Pop. (1900) 61,019. The city is served by the Mexican Central and the Mexican National railways. It is built on a broad level space, laid out regularly with straight well-paved streets and shady plazas. The altitude of the city, 6168 ft. above sea-level, gives it a cool temperate climate, though the sun temperatures are high. The water-supply was formerly very deficient, but two artesian wells have been drilled to a depth of 450 ft. and furnish 30,000 gallons a day each, in addition to which a large dam 3 m. above the city has been built, having a storage capacity of 7,500,000 cubic meters (1,650,000,000 gallons), or 18 months' supply, which is used for irrigation and domestic purposes. The better class of residences are usually two storeys high, and include many fine specimens of Spanish colonial architecture; but the suburbs consist chiefly of wretched hovels and stretch out over a large area. Among the more notable public buildings are the cathedral and government palace fronting on the Plaza Mayor, the latter conspicuous for its façade of rose-coloured stone; the churches of El Carmen, San Francisco and Guadalupe; the La Paz theatre, mint, penitentiary and the Instituto Científico, in which law, medicine and science are taught. San Luis Potosí is an important railway and distributing centre, with a considerable trade in cattle, tallow, wool, hides and minerals. Its proximity to the port of Tampico, with which it was connected by a branch of the Mexican Central railway in 1885, has greatly increased its commercial importance, though in earlier days it was also one of the principal centres of the diligence and pack-train traffic of this part of Mexico. The city has cotton and woollen factories using modern machinery, and the smelting works of the Metalurgica Mexicana company, an American enterprise.

San Luis Potosí was founded in 1586. It was an important centre of colonial administration and played an important part in the civil wars and political disorders following Mexican independence. It was the seat of the Mexican government of Benito Juárez in 1863, but was soon afterwards captured by the French under Bazaine. It was recovered by Juárez in 1867, after the French had retired.

SAN MARINO, a republic in northern Italy, 14 m. S.W. of Rimini by road. Pop. (1901) about 1600 (town); 9500 (whole territory). It is the smallest republic in the world (32 sq. m. in area). According to tradition, the republic was founded by St Marinus during the persecutions under Diocletian, while his companion, St Leo, founded the village of that name 7 m. to the S.W., with La Rocca its old castle, now a prison, in which the impostor Cagliostro died in 1795. The history of S. Marino begins with the 9th century, the monastery of S. Marino having existed demonstrably since 885. In the 10th century a communal constitution was established. The republic as a rule avoided the faction fights of the middle ages, but joined the Ghibellines and was interdicted by the pope in 1247–1249. After this it was protected by the Montefeltro family, later dukes of Urbino, and the papacy, and successfully resisted the attempts of Sigismondo Malatesta against its liberty. In 1503 it fell into the hands of Caesar Borgia, but soon regained its freedom. Other attacks failed, but civil discords in the meantime increased. Its independence was recognized in 1631 by the papacy. In 1739 Cardinal Alberoni attempted to deprive it of its independence, but this was restored in 1740 and was respected by Napoleon. Garibaldi entered it in 1849, on his retreat from Rome, and there disbanded his army. The town stands on the north end of a precipitous rock (2437 ft.) which bears the name of Monte Titano; each of the three summits is crowned by fortifications—that on the north by a castle, the other two by towers. The arms of the republic are three peaks, each crowned with a tower. There are traces of three different enceintes, of the 14th, 15th and 16th centuries. The chief square, the Pianello, contains the new Palazzo del Governo in the Gothic style (1894) and a statue of Liberty (1876). The principal church (Pieve), in classical style, dates from 1826–1838, and contains the body of St Marinus. The old church, then demolished, is first mentioned in 1113, but was several times restored. S. Francesco has some paintings by Niccolo Alunno of Foligno and other later artists, and a pretty loggia. The museum contains a few pictures of various schools and some Umbrian antiquities. Bartolommeo Borghesi, the epigraphist and numismatist, resided here from 1821 until his death in 1860. The Borgo at the base of the rock is a chiefly commercial village.

The supreme power of the republic resides in the general assembly (*Arringo*) which meets twice a year. It is governed by two *Capitani Reggenti*, selected twice a year from the 60 life-members of the Great Council, which is composed of 20 representatives of the nobility,[1] 20 of the landowners and 20 of the citizens. They are assisted by a small committee of 12 of the Great Council. The available armed forces of the republic form a total of about 1200 men, all citizens able to bear arms being technically obliged to do so from the age of 16 to 60 years. San Marino issues its own postage-stamps, and makes thereby a considerable income. It also issues its own copper coinage, which circulates in Italy also; but Italian money is current for the higher values. Most of the republic falls within the diocese of Montefeltro, a small portion within that of Rimini.

See C. Ricci, *La Repubblica di San Marino* (Bergamo, 1903).

SAN MARTIN, JOSÉ DE (1778–1850), South American soldier and statesman, was born at Yapeyú on the Uruguay river on the 25th of February 1778. His father was a captain in the Spanish army, and young San Martin was taken to Madrid and educated for a military career. He served in the Moorish wars and in the great struggle against Napoleon, and his distinguished conduct at the battle of Baylen brought him the rank of lieutenant-colonel. In 1812 he offered his services to the government of Buenos Aires in the struggle for the independence of Argentina. He was appointed early in 1814 to the command of the revolutionary army operating against the royalists on the borders of Upper Peru. But he soon resigned his command, realizing that for the permanent success of the revolutionary cause it was necessary first to oust the Spaniards from Chile and then to organize an expedition thence against the stronghold of Spanish power on Peru. With this end in view he secured his appointment to the governorship of the province of Cuyo, bordering on the Chilean Andes, and established himself at Mendoza, where he prepared for the invasion of Chile. Assisted by Bernardo O'Higgins, he rallied the Chilean patriots who had fled across the mountains after their defeat at Rancagua; he enlisted the sympathies of the Argentine government, and after two years succeeded in raising a well-trained army of Chileans and Argentines and in collecting the material resources necessary for a crossing of the Andes. In January 1817 he set out on his enterprise. By the swiftness of his movements and by a clever feint he evaded opposition, and he led his army, of about 3000 infantry and 1000 cavalry, together with artillery and large baggage trains, through a barren and difficult region, and over passes 13,000 ft. above sea-level. The victory of Chacabuco (Feb. 12, 1817) over the royalist army led to the re-establishment of a nationalist government at Santiago under Bernardo O'Higgins, as San Martin himself wished to prepare for the invasion of Peru; but in 1818 he took command of the Chilean forces against a fresh royalist army, and by his victory at the river Maipo in April finally secured the independence of Chile. This left him free to organize the expedition against Peru, and assisted by O'Higgins and the Argentine government, he procured the necessary fleet and the army. He set out in August 1820, landed his forces for a short time at Pisco, where he tried to enter into negotiations with the viceroy of Lima, and then transported his army with the help of the fleet to a point on the coast a little way north of Lima. Here he spent several months of inaction, hoping that the demonstration of force and the influence of popular feeling would lead to a peaceful withdrawal of the Spaniards. In July 1821 the Spaniards evacuated Lima, San Martin entered the city, proclaimed the independence of Peru and assumed the reins of government with the title of Protector. His position, however, was far from secure. The royalist party, never having been decisively crushed, organized risings in the interior, and San Martin was embarrassed by the jealousy which his authority roused among the patriots, and by the rivalry of Bolivar, who had arrived with an army on the northern frontier of Peru. San Martin resigned his authority on the 20th of September 1822 and left the country. He spent a short time in Chile and in Argentina, but his many enemies had embittered popular feeling against him, and constant attempts were made to involve him in political intrigues. Unable to live a peaceful private life, he was compelled to exile himself in Europe, where he lived, often in great poverty, till his death at Boulogne on the 17th of August 1850.

San Martin did more than any man for the cause of independence in the Argentine, Chile and Peru. He was not only an able soldier; in the clearness with which he realized that the independence of each state could only be secured by the co-operation of all, and in the perseverance with which he carried his views into execution he showed himself a far-seeing and honest statesman.

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[1] Not a few Italians possess titles of nobility of San Marino.

See W. Pilling, *Emancipation of South America* (London, 1893), a translation of B. Mitre's life of San Martin; P. B. Figueroa, *Diccionario biografico de Chile* (Santiago, 1888) and J. B. Suarez, *Rasgos biograficos de hombres notables de Chile* (Valparaiso, 1886), both giving sketches of prominent characters in Chilean history. See also works on the period mentioned under CHILE: *Bibliography*.

SANMICHELE, MICHELE (1484–1559), Italian architect, was born in San Michele near Verona. He learnt the elements of his profession from his father Giovanni and his uncle Bartolommeo, who both practised as architects at Verona with much success. He went at an early age to Rome to study classic sculpture and architecture. Among his earliest works are the duomo of Montefiascone (an octagonal building surmounted with a cupola), the church of San Domenico at Orvieto, and several palaces at both places. He also executed a fine tomb in S. Domenico. He was no less distinguished as a military architect, and was much employed by the signoria of Venice, not only at home, but also in strengthening the fortifications of Corfu, Cyprus and Candia. One of Sanmichele's most graceful designs is the Cappella de' Peregrini in the church of S. Bernardino at Verona—square outside and circular within, of the Corinthian order. He built a great number of fine palaces at Verona, including those of Canossa, Bevilacqua and Pompei, as well as the graceful Ponte Nuovo. In 1527 Sanmichele began to transform the fortifications of Verona according to the newer system of corner bastions—a system for the advancement of which he did much valuable service. His last work, begun in 1559, was the round church of the Madonna di Campagna, 1½ m. from Verona on the road to Venice. Like most other distinguished architects of his time he wrote a work on classic architecture, *I Cinque Ordini dell' architettura*, printed at Verona in 1735.

See Ronzani and Luciolli, *Fabbriche . . . di M. Sanmichele* (Venice, 1832); and Selva, *Elogio di Sanmichele* (Rome, 1814).

SAN MIGUEL, the capital of the department of San Miguel, Salvador; 80 m. E. by S. of San Salvador, near the right bank of the Rio Grande, and at the foot of the volcano of San Miguel or Jucuapa (7120 ft.). Pop. (1905) about 25,000. San Miguel is an important and attractive city, although the extensive swamps in the Rio Grande Valley render malaria common. It possesses several handsome churches, municipal buildings, law courts and two well-equipped hospitals. Near it are the ruins of an ancient Indian town. San Miguel has a flourishing trade in indigo, grain, rubber and cattle. Its port is La Union (*q.v.*). San Miguel was founded in 1530 by Spanish settlers, and became a city in 1586. Its fairs formerly attracted merchants from all parts of Salvador, Guatemala and Honduras, and it is now third in size among the cities of the republic.

SAN MIGUEL DE MAYUMO, a town of the province of Bulacan, Luzon, Philippine Islands, about 40 m. N. of Manila. Pop. (1903) 14,919. In 1903, after the census had been taken, San Ildefonso (pop. 5326) was annexed to San Miguel. It has a cool and very healthy climate, and commands a beautiful view of the surrounding country. The soil is very fertile, and many of the inhabitants have acquired much wealth from the cultivation of rice. Sugar-cane, Indian corn and cotton are also produced in abundance, and cattle are raised. Near the town are iron mines and quarries of limestone, and on the neighbouring mountains are forests containing valuable hardwood timber. About 8 m. N.E. are the medicinal springs of Sibul, to which large numbers of patients from the neighbouring provinces come. The San Miguel river, which flows near, affords a means of transportation, and the town has considerable commerce. Some beautiful furniture is made out of the hardwood from the mountains, and cotton fabrics are woven in considerable quantities by the women. The principal language is Tagalog. The chief buildings were destroyed in 1901 in a fire started by a band of thieves.

SAN MINIATO, a town and episcopal see of Tuscany, Italy, in the province of Florence, 26 m. W. by S. of Florence by the railway to Pisa, 512 ft. above sea-level, on a hill 2 m. S. of the railway. Pop. (1901) 4421 (town); 20,242 (commune). Its cathedral dates from the 10th century. It was remodelled in 1488, and has a façade decorated with disks of majolica. It manufactures glass, olive oil, leather and hats. It has a castle of the emperor Frederick I., the residence of the imperial governors of Tuscany from 1226 to 1286, and from them bears the name of San Miniato al Tedesco.

SANNAZARO, JACOPO (1458–1530), Italian poet of the Renaissance, was born in 1458 at Naples of a noble family, said to have been of Spanish origin, which had its seat at San Nazaro near Pavia. His father died during the boyhood of Jacopo, who was brought up at Nocera Inferiore. He afterwards studied at Naples under Giovanni Pontanus, when, according to the fashion of the time, he assumed the name Actius Syncerus, by which he is occasionally referred to. After the death of his mother he went abroad—driven, we are told, by the pangs of despised love for a certain Carmosina, whom he has celebrated in his verse under various names; but of the details of his travels nothing is recorded. On his return he speedily achieved fame as a poet and place as a courtier, receiving from Frederick III. as a country residence the Villa Mergillina near Naples. When his patron was compelled to take refuge in France in 1501 he was accompanied by Sannazaro, who did not return to Italy till after his death (1504). The later years of the poet seem to have been spent at Naples. He died on the 27th of April 1530.

The *Arcadia* of Sannazaro, begun in early life and published in 1504, is a somewhat affected and insipid Italian pastoral, in which in alternate prose and verse the scenes and occupations of pastoral life are described. See Scherillo's edition (Turin, 1888). His now seldom read Latin poem *De partu Virginis*, which gained for him the name of the "Christian Virgil," appeared in 1526, and his collected *Sonetti e canzoni* in 1530.

SAN NICOLÁS DE LOS ARROYOS, a town and river port of Argentina, in the province of Buenos Aires, on the W. bank of the Paraná, 150 m. by rail N.W. of the city of Buenos Aires. Pop. (1904, estimate), 18,000. It is a flourishing commercial town, and a port of call both for river and ocean-going steamers of medium tonnage. It is a station on the Buenos Aires & Rosario, and the terminus of a branch from Pergamino of the Central Argentine railway, and exports wheat, flour, wool and frozen mutton. The town is the judicial centre for the northern district of Buenos Aires. San Nicolás was founded in 1749 by José de Aguillar on lands given for that purpose by his wife (*née* Ugarte). Its growth was very slow until near the end of the 19th century.

SAN PABLO, a town of the province of Laguna, Luzon, Philippine Islands, 9½ m. S. of Laguna de Bay and about 35 m. S.S.E. of Manila. Pop. (1903) 22,612. It is an important road centre, and in the vicinity are five small mountain lakes. Coconut palms grow in great abundance in the town and vicinity, and copra is the principal product; hemp and, to a less degree, rice, are grown here. The language is Tagalog.

SANQUHAR, a royal and police burgh of Dumfriesshire, Scotland. Pop. (1901) 1379. It is situated on the Nith, 26 m. N.W. of Dumfries by the Glasgow & South-Western railway. It became a burgh of barony in 1484 and a royal burgh in 1596, and was the scene of the exhibition of the Covenanters' Declaration, attached to the market cross in 1680 by Richard Cameron and in 1685 by James Renwick. The industries include coal-mining and the making of bricks and tiles, spades and shovels. The coal-field, measuring 7 m. long by 2½ m. broad, is the most extensive in the shire and is the main source of supply for Dumfries and other towns. The cattle and sheep fairs are important, and an agricultural show is held every May. Sanquhar Castle, on a hill overlooking the Nith, once belonged to the Crichtons, ancestors of the marquess of Bute, but is now a ruin. Eliock House, in the parish, was the birthplace of James ("the Admirable") Crichton in 1560.

SAN REMO, a seaport of Liguria, Italy, in the province of Porto Maurizio, on the Riviera di Ponente, 9¾ m. E. of Ventimiglia by rail, and 84 m. S.W. of Genoa. Pop. (1901) 17,114 (town); 20,027 (commune). Climbing the slope of a steep hill it looks south over a small bay, and, protected towards the north by hills rising gradually from 500 to 8000 ft., it is in climate one of the most favoured places on the whole coast, a fact which accounts for the great reputation as a winter resort which it has enjoyed since 1861. The older town, with its narrow steep streets and lofty sombre houses protected against earthquakes by arches connecting them, contrasts with the new visitors' town, containing all the public buildings, which has grown up at the foot of the hill. The fort of S. Tecla protects the small harbour, sheltered by its sickle-shaped mole, 1300 ft. long. The promenade of San Remo is the Corso dell' Imperatrice, running from the main street, the Via Vittorio Emanuele, along the coast to the Giardino dell' Imperatrice; it is a broad road shaded by palm-trees, and was, like the garden, constructed at the expense of the empress Maria Alexandrovna of Russia (d. 1880). The Villa Thiem has a valuable picture-gallery, containing for the most part examples of the great 17th-century masters of the Netherlands. Besides the Gothic ex-cathedral of San Siro, the white-domed church of the Madonna della Costa, at the top of the old town, may be mentioned. In front of it is a large hospital. On the east of the harbour, the promenade along the coast is called the Passeggiata Imperatore Federico in memory of the German emperor Frederick, whose visit to the town in 1887–1888 greatly increased its repute as a winter resort. Flowers, especially roses and carnations, are extensively grown for export, and olives, lemons and palms are also cultivated.

San Remo appears to have been dependent on Genoa in its early days, but became independent in 1361. In 1544 the town was attacked by Barbarossa, and in 1625 by the French and Savoyards. The Genoese, against whose encroachments it had long defended its independence, subjugated it in 1753; in 1797 it was incorporated in the Ligurian republic, and in 1814 passed to Piedmont.

SAN SALVADOR, the capital of the republic of Salvador; situated in the valley of Las Hamacas, on the river Asalguate, at an altitude of 2115 ft., and 30 m. inland from the Pacific. Pop. (1905) about 60,000. San Salvador is connected by rail with Santa Ana on the north-west and with the Pacific ports of La Libertad and Acajutla. In addition to the government offices, its buildings include a handsome university, a wooden cathedral, a national theatre, an academy of science and literature, a chamber of commerce, and astronomical observatory and a number of hospitals and charitable institutions. There are two large parks and an excellent botanical garden. In the Plaza Morazan, the largest of many shady squares, is a handsome bronze and marble monument to the last president of united Central America, from whom the plaza takes its name. San Salvador is the only city in the republic which has important manufactures; these include the production of soap, candles, ice, shawls and scarves of silk, cotton cloth, cigars, flour and spirits. The city is admirably policed, has an abundant water supply, and can in many respects compare favourably with the smaller provincial capitals of Europe and America. It was founded by Don Jorge de Alvarado in 1528, at a spot near the present site, to which it was transferred in 1539. Except for the year 1839–1840 it has been the capital of the republic since 1834. It was temporarily ruined by earthquakes in 1854 and 1873.

SANS-CULOTTES (French for "without knee-breeches"), the term originally given during the early years of the French Revolution to the ill-clad and ill-equipped volunteers of the Revolutionary army, and later applied generally to the ultra-democrats of the Revolution. They were for the most part men of the poorer classes, or leaders of the populace, but during the Terror public functionaries and persons of good education styled themselves *citoyens sans-culottes*. The distinctive costume of the typical sans-culotte was the *pantalon* (long trousers)—in place of the *culottes* worn by the upper classes—the *carmagnole* (short-skirted coat), the red cap of liberty and *sabots* (wooden shoes). The influence of the Sans-culottes ceased with the reaction that followed the fall of Robespierre (July 1794), and the name itself was proscribed. In the Republican Calendar the complementary days at the end of the year were at first called *Sans-culottides*; this name was, however, suppressed by the Convention when the constitution of the year III. (1795) was adopted, that of *jours complémentaires* being substituted.

SAN SEBASTIAN (Basque *Iruchulo*), a seaport and the capital of the Spanish province of Guipúzcoa, on the Bay of Biscay, and on the Northern railway from Madrid to France. Pop. (1900) 37,812. In 1886 San Sebastian became the summer residence of the court. The influx of visitors, attracted by the presence of the royal family, by the prolonged local festivities, the bull-fights and the bathing, increases the number of the inhabitants in summer to about 50,000. The city occupies a narrow sandy peninsula, which terminates on the northern or seaward side in a lofty mass of sandstone, Monte Urgull; it is flanked on the east by the estuary of the river Uruméa, on the west by the broad bay of La Concha. The old town, rebuilt after the fire of 1813, lies partly at the foot of Monte Urgull, partly on its lower slopes. Until 1863 it was enclosed by walls and ramparts, and a strong fort, the Castillo de la Mola, still crowns the heights of Urgull. There are also batteries and redoubts facing landward and seaward below this fort; but the other defences have been either razed or dismantled. The Alameda, one of many fine avenues, was laid out on the site of the chief landward wall, and separates the old town from the new—in which the houses are uniformly modern, and built in straight streets or regular series of squares. The bay of La Concha has a broad sandy shore, the Playa de Baños, admirable for bathing and sheltered from sea-winds by the rocky islet of Santa Clara. Its centre is faced by the casino, a handsome building, and the summer palace and park of Miramar occupy the rising ground towards its western extremity. The other noteworthy buildings are the bull-ring, capable of seating 10,000 spectators, the theatre, fine provincial and municipal halls, barracks, a hospital, a Jesuit college, the American International School for girls, and many other schools. There are numerous breweries, saw and flour mills, and manufactures of preserves, soap, candles, glass and paper, especially in the busy suburb that has sprung up on the right bank of the Uruméa. The fisheries are important. The harbour consists of three artificial basins, opening into La Concha Bay, and situated in the midst of the old town; it is chiefly frequented by coasting and fishing vessels, and cannot accommodate large ships. From its position near the frontier San Sebastian was long a first-class fortress, and has sustained many sieges. The last and most memorable was in August 1813, when the allied British, Portuguese and Spanish armies under Lord Wellington captured the city from the French, and then sacked and burned it.

SAN SEPOLCRO, or BORGO S. SEPOLCRO, a town and episcopal see of Tuscany, Italy, in the province of Arezzo, from which it is 28 m. N.E. by rail. Pop. (1901) 4537 (town); 9077 (commune). It is situated 1083 ft. above sea-level, on the Tiber. It was the birthplace of Piero della Francesca (1420–1492) and of Raffaello del Colle (1490–1540), a pupil of Raphael. The Romanesque cathedral and the picture-gallery contain works by both these artists.

SAN SEVERINO (anc. *Septempeda*), a town and episcopal see of the Marches, Italy, in the province of Macerata, from which it is 18 m. W. by S. by rail. Pop. (1901) 3227 (town); 14,932 (commune). The lower town is situated 781 ft. above sea-level, and contains the new cathedral of S. Agostino, with a fine altar-piece by Pinturicchio (1489). The Palazzo Comunale has some interesting pictures by artists of the Marches. Lorenzo and Giacomo Salimbeni da San Severino, who painted an important series of frescoes in the oratory of S. Giovanni Battista at Urbino in 1416, were natives of the town. So was also the later master Lorenzo di Maestro Alessandro, of the end of the 15th century, whose pictures are mainly to be found in the Marches. The old cathedral of S. Severino is in the upper town (1129 ft. above sea-level); it contains frescoes by the two Salimbeni, while an altar-piece by Niccolo Alunno of Foligno (1468) has been removed hence to the picture gallery. The ancient Septempeda lay 1 m. below the modern town, on the branch road which ran from Nuceria Camellaria, on the Via Flaminia: and here the road divided—one branch going to

Ancona and the other through Tolentinum to Urbs Salvia and Firmum. No ruins of the old town exist, but a considerable number of inscriptions have been found, from which it may be gathered that it was a *colonia*.

SAN SEVERO, a city in Apulia, Italy, in the province of Foggia, from which it is 17 m. N.N.W. by rail. Pop. (1901) 28,550. San Severo lies at the foot of the spurs of Monte Gargano, 292 ft. above sea-level. It is the see of a bishop (since 1580), and has some remains of its old fortifications. San Severo dates from the middle ages. It was laid in ruins by Frederick II., and in 1053 was the scene of a victory by Robert Guiscard over the papal troops under Leo IX. In 1799 the town was taken by the French and again almost entirely destroyed. The over-lordship was held in succession by the Benedictines of the abbey of Torre Maggiore, the Knights Templars, the crown of Naples and the Sangro family (commendatories of Torre Maggiore). In 1627, 1828 and 1851 the town suffered from earthquakes.

SAN-SHUI, a treaty port in the province of Kwang-tung, China, on the left bank of the West river, 99 m. from Canton, opened to foreign trade in 1897. Pop. about 5000. Its position is at the junction of the North and West rivers, and it is favourably situated as a distributing centre for foreign goods. Two lines of steamers converge at San-shui, from Canton and Hong-Kong respectively. The town is surrounded by a handsome wall built in the 16th century, but within this rampart the houses are mean. The foreign trade shows little signs of expansion. In 1902 the net foreign imports amounted in value to £474,175, and in 1904 to only £380,000, while the exports during the same two years amounted to £225,000 and £317,000 respectively. The direct foreign trade in 1908 was £507,827. There is a large junk traffic, and the local likin station is one of the richest in the province.

SANSKRIT, the name applied by Hindu scholars to the ancient literary language of India. The word *saṃskṛita* is the past participle of the verb *kar*(*kṛ*), "to make" (cognate with Latin *creo*), with the preposition *sam*, "together" (cog. ἅμα, ὁμός, Eng. "same"), and has probably to be taken here in the sense of "completely formed" or "accurately made, polished, refined"—some noun meaning "speech" (esp. *bhāshā*) being either expressed or understood with it. The term was, doubtless, originally adopted by native grammarians to distinguish the literary language from the uncultivated popular dialects—the forerunners of the modern vernaculars of northern India—which had developed side by side with it, and which were called (from the same root *kar*, but with a different preposition) *Prākṛita*, *i.e.* either "derived" or "natural, common" forms of speech. This designation of the literary idiom, being intended to imply a language regulated by conventional rules, also involves a distinction between the grammatically fixed language of Brāhmanical India and an earlier, less settled, phase of the same language exhibited in the Vedic writings. For convenience the Vedic language is, however, usually included in the term, and scholars generally distinguish between the Vedic and the classical Sanskrit.

I. Sanskrit Language

The Sanskrit language, with its old and modern descendants, represents the easternmost branch of the great Indo-Germanic, or Aryan, stock of speech. Philological research has clearly established the fact that the Indo-Aryans must originally have immigrated into India from the north-west. In the oldest literary documents handed down by them their gradual advance can indeed be traced from the slopes of eastern Kabulistan down to the land of the five rivers (Punjab), and thence to the plains of the Yamunā (Jumna) and Gangā (Ganges). Numerous special coincidences, both of language and mythology, between the Vedic Aryans and the peoples of Iran also show that these two members of the Indo-Germanic family must have remained in close connexion for some considerable period after the others had separated from them.

The origin of comparative philology dates from the time when European scholars became accurately acquainted with the ancient language of India. Before that time classical scholars had been unable to determine the true relations between the then known languages of our stock. This fact alone shows the importance of Sanskrit for comparative research. Though its value in this respect has perhaps at times been overrated, it may still be considered the eldest daughter of the old mother-tongue. Indeed, so far as direct documentary evidence goes, it may be said to be the only surviving daughter; for none of the other six principal members of the family have left any literary monuments, and their original features have to be reproduced, as best they can, from the materials supplied by their own daughter languages: such is the case as regards the Iranic, Hellenic, Italic, Celtic, Teutonic and Letto-Slavic languages. To the Sanskrit the antiquity and extent of its literary documents, the transparency of its grammatical structure, the comparatively primitive state of its accent system, and the thorough grammatical treatment it has early received at the hand of native scholars must ever secure the foremost place in the comparative study of Indo-Germanic speech.

Alphabet.

The Sanskrit alphabet consists of the following sounds:—
  (*a*) Fourteen vowels, viz:
    Ten simple vowels: *a*, *ā*, *i*, *ī*, *u*, *ū*, *ṛ*, *ṝ*, *ḷ* (*ḹ*); and
    Four diphthongs: *ē*, *āi*, *ō*, *āu*.
  (*b*) Thirty-three consonants, viz.:
    Five series of mutes and nasals:
      guttural: *k kh g gh ṅ*
      palatal: *c ch j jh ñ*
      lingual: *ṭ ṭh ḍ ḍh ṇ*
      dental: *t th d dh n*
      labial: *p ph b bh m*;
    Four semivowels: *y r l v* (*w*)
    Three sibilants: palatal *ś* (*ç*), lingual *ṣ* (*sh*), dental *s*; and
    A soft aspirate: *h*.
  (*c*) Three unoriginal sounds, viz.
    visarga (*ḥ*), a hard aspirate, standing mostly for original *s* or *r*; and two nasal sounds of less close contact than the mute-nasals, viz. *anusvāra* (*ṃ*) and *anunāsika* (*ṁ*).

Vowels.

As regards the vowels, a prominent feature of the language is the prevalence of *a*-sounds, these being about twice as frequent as all the others, including diphthongs taken together (Whitney).

The absence of the short vowels *ĕ* and *ŏ* from the Sanskrit alphabet, and the fact that Sanskrit shows the *a*-vowel where other vowels appear in other languages—*e.g.* *bharantam* = φέροντα, *ferentem*; *janas* = γένος, *genus*—were formerly considered as strong evidence in favour of the more primitive state of the Sanskrit vowel system as compared with that of the sister languages. Recent research has, however, shown pretty conclusively from certain indications in the Sanskrit language itself that the latter must at one time have possessed the same, or very nearly the same, three vowel-sounds, and that the differentiation of the original *a*-sound must, therefore, have taken place before the separation of the languages. Thus, Sans. *carati*, he walks, would seem to require an original *kĕrĕti* (Gr. πέλει = *queleti*, Lat. *colit*), as otherwise the guttural *k* could not have changed to the palatal *c* (see below); and similarly Sans. *jānu*, knee, seems to stand for *gēnu* (Lat. *genu*, Gr. γόνυ). Not impossibly, however, this prevalence of pure *a*-sounds in Sanskrit may from the very beginning have been a mere theoretical or graphic feature of the language, the difference of pronunciation having not yet been pronounced enough for the early grammarians to have felt it necessary to clearly distinguish between the different shades of *a*-sounds.

The vowels *ē* and *ō*, though apparently simple sounds, are classed as diphthongs, being contracted from original *ăi* and *ău* respectively, and liable to be treated as such in the phonetic modifications they have to undergo before any vowel except *ă*.

Consonants.

As regards the consonants, two of the five series of mutes, the palatal and lingual series, are of secondary (the one of Indo-Iranian, the other of purely Indian) growth.

The palatals are, as a rule, derived from original gutturals, the modification being generally due to the influence of a neighbouring palatal sound *i* or *y*, or *ĕ* (*ä*). The surd aspirate *ch*, in words of Indo-Germanic origin, almost invariably goes back to original *sk*: *e.g.* *chid-* (*chind-*) = *scindo*, σχίζω: *chāyā* = σκιά (O.E. *scin*, shine); Sans. *gacchati* = βάσκει.

The palatal sibilant *ś* (pronounced *sh*) likewise originated from a guttural mute *k*, but one of somewhat different phonetic value from that represented by Sanskrit *k* or *c*. The latter, usually designated by k^2 (or *q*), is frequently liable to labialization (or dentalization) in Greek, probably owing to an original pronunciation *kw* (*qu*): *e.g.* *katara* = πότερος, *uter*; while the former (k^1) shows invariably κ in Greek, and a sibilant in the Letto-Slavic and the Indo-Iranian languages: *e.g.* *śvan* (*śun*) = κύων (κυν), *canis*, Ger. *Hund*; *daśan* = δέκα, *decem*, Goth. *taihun*.

The non-original nature of the palatals betrays itself even in Sanskrit by their inability to occur at the end of a word—*e.g.* acc. *vācam*=Lat. *vocem*, but nom. *vāk*=*vox*—and by otherwise frequently reverting to the guttural state.

The linguals differ in pronunciation from the dentals in their being uttered with the tip of the tongue turned up to the dome of the palate, while in the utterance of the dentals it is pressed against the upper teeth, not against the upper gums as is done in the English dentals, which to Hindus sound more like their own linguals. The latter, when occurring in words of Aryan origin, are, as a rule, modifications of original dentals, usually accompanied by the loss of an *r* or other adjoining consonant; but more commonly they occur in words of foreign, probably non-Aryan, origin. Of regular occurrence in the language, however, is the change of dental *n* into lingual *ṇ*, and of dental *s* into lingual *ṣ*, when preceded in the same word by certain other letters. The combination *kṣ* seems sometimes to stand for *ks* (? *kst*) as in Sans. *akṣa*, Gr. ἄξων, axle; Sans. *dakshiṇa*, Gr. δέξιος (but Lat. *dexter*); sometimes for *kt*, *e.g.* Sans. *kshiti*, *Gr.* κτίσις (but Sans. *kshiti*=Gr. φθίσις); Sans. *takshan*, Gr. τέκτων.

The sonant aspirate *h* is likewise non-original, being usually derived from original sonant aspirated mutes, especially *gh*, *e.g.* *haṃsa*=χήν (for χανς), *anser*, Ger. *Gans*; *aham*=ἐγών, *ego*, Goth. *ik*.

Phonetic changes.

The contact of final and initial letters of words in the same sentence is often attended in Sanskrit with considerable euphonic modifications; and we have no means of knowing how far the practice of the vernacular language may have corresponded to these phonetic theories. There can be no doubt, however, that a good deal in this respect has to be placed to the account of grammatical reflection; and the very facilities which the primitive structure of the language offered for grammatical analysis and an insight into the principles of internal modification may have given the first impulse to external modifications of a similar kind.

None of the cognate languages exhibits in so transparent a manner as the Sanskrit the cardinal principle of Indo-Germanic word-formation by the addition of inflectional endings—either case-endings or personal terminations (themselves probably original roots)—to stems obtained, mainly by means of suffixes, from monosyllabic roots, with or without internal modifications.

Declension.

There are in Sanskrit declension three numbers and seven cases, not counting the vocative, viz. nominative, accusative, instrumental (or sociative), dative, ablative, genitive and locative. As a matter of fact, all these seven cases appear, however, only in the singular of *a*-stems and of the pronominal declension. Other noun-stems have only one case-form for the ablative and genitive singular. In the plural, the ablative everywhere shares its form with the dative (except in the personal pronoun, where it has the same ending as in the singular), whilst the dual shows only three different case-forms—one for the nominative and accusative, another for the instrumental, dative, and ablative, and a third for the genitive and locative.

The declension of *a*-stems corresponding to the first and second Latin declensions is of especial interest, not so much on account of its being predominant from the earliest time, and becoming more and more so with the development of the language, but because it presents the greatest number of alternative forms, which supply a kind of test for determining the age of literary productions, a test which indeed has already been applied to some extent by Professor Lanman, in his excellent *Statistical Account of Noun Inflexion in the Veda*. These alternative case-forms are :—

1. *āsas* and *ās* for the nominative plural masc. and fem.: *e.g.* *aśvāsas* and *aśvās*=*equi* (*equae*). The forms in *āsas*—explained by Bopp as the sign of the plural *as* applied twice, and by Schleicher as the sign of the plural *as* added to the nominative singular—occur to those in *ās* (*i.e.* the ordinary plural sign *as* added to the *a*-stem) in the Ṛigveda in the proportion of 1 to 2, and in the peculiar parts of the Atharvaveda in that of 1 to 25, whilst the ending *ās* alone remains in the later language.

2. *ā* and *āni* for the nominative and accusative plural of neuters: as *yugā*, *yugāni*=ζυγά, *juga*. The proportion of the former ending to the latter in the Ṛik is 11 to 7, in the Atharvan 2 to 3, whilst the classical Sanskrit knows only the second form.

3. *ēbhis* and *āis* for the instrumental plural masc. and neuter, *e.g.* *devēbhis*, *devāis*. In the Ṛik the former forms are to the latter in the proportion of 5 to 6, in the Atharvan of 1 to 5, while in the later language only the contracted form is used. The same contraction is found in other languages; but it is doubtful whether it did not originate independently in them.

4. *ā* and *āu* for the nominative and accusative dual masc., *e.g.* *ubhā*, *ubhāu*=ἄμφω. In the Ṛik forms in *ā* outnumber those in *āu* more than eight times; whilst in the Atharvan, on the contrary, those in *āu* (the only ending used in the classical language) occur five times as often as those in *ā*.

5. *ā* and *ena* (*enā*) for the instrumental singular masc. and neut., as *dānā*, *dānena*=*dono*. The ending *ena* is the one invariably used in the later language. It is likewise the usual form in the Veda; but in a number of cases it shows a final long vowel which, though it may be entirely due to metrical requirements, is more probably a relic of the normal instrumental ending *ā*, preserved for prosodic reasons. For the simple ending *ā*, as compared with that in *ena*, Professor Lanman makes out a proportion of about 1 to 9 in the Ṛigveda (altogether 114 cases); while in the peculiar parts of the Atharvan he finds only 11 cases.

6. *ām* and *ānām* for the genitive plural, *e.g.* (*aśvām*), *aśvānām* =ἵππων, *equum* (*equorum*). The form with inserted nasal (doubtless for *anām*, as in Zend *aśpanām*), which is exclusively used in the later language, is also the prevailing one in the Ṛik. There are, however, a few genitives of *a*-stems in original *ām* (for *a-ām*), which also appear in Zend, Professor Lanman enumerating a dozen instances, some of which are, however, doubtful, while others are merely conjectural.

Verb system.

The Sanskrit verb system resembles that of the Greek in variety and completeness. While the Greek excels in nicety and definiteness of modal distinction, the Sanskrit surpasses it in primitiveness and transparency of formation. In this part of the grammatical system there is, however, an even greater difference than in the noun inflection between the Vedic and the classical Sanskrit. While the former shows, upon the whole, the full complement of modal forms exhibited by the Greek, the later language has practically discarded the subjunctive mood. The Indo-Aryans never succeeded in working out a clear formative distinction between the subjunctive and indicative moods; and, their syntactic requirements becoming more and more limited, they at last contented themselves, for modal expression, with a present optative and imperative, in addition to the indicative tense-forms, and a little-used aorist optative with a special "precative" or "benedictive" meaning attached to it.

Another part of the verb in which the later language differs widely from Vedic usage is the infinitive. The language of the old hymns shows a considerable variety of case-forms of verbal abstract nouns with the function of infinitives, a certain number of which can still be traced back to the parent language, as, for instance, such dative forms as *jīv-áse*=viv-ere; *sáh-adhyāi*=ἔχεσθαι; *dā'-mane*=δόμεναι; *dā'-vane*=δοῦναι. Further, *ji-shé*, "to conquer," for *ji-sé*, apparently an aorist infinitive with the dative ending (parallel to the radical forms, such as *yudh-é*, "to fight," *dṛs'-é*, "to see"), thus corresponding to the Greek aorist infinitive λῦσαι (but cf. also Latin *da-re*, for *dase*, *es-se*, &c.). The classical Sanskrit, on the other hand, practically uses only one infinitive form, viz. the accusative of a verbal noun in *tu*, *e.g.* *sthātum*, *etum*, corresponding to the Latin supinum *datum*, *itum*. But, as in Latin another case, the ablative (*datū*), of the same abstract noun is utilized for a similar purpose, so the Vedic language makes two other cases do duty as infinitives, viz. the dative in *tave* (*e.g.* *dā́tave*, and the anomalous *étavâi*) and the gen.-abl. in *tos* (*dā́tos*). A prominent feature of the later Sanskrit syntax is the so-called gerund or indeclinable participle in *tvā*, apparently the instrumental of a stem in *tvá* (probably a derivative from that in *tu*), as well as the gerund in *ya* (or *tya* after a final short radical vowel) made from compound verbs. The old language knows not only such gerunds in *tvā*, using them, however, very sparingly, but also corresponding dative forms in *tvāya* (*yuktvāya*) and the curious contracted forms in *tvī'* (*kṛtvī*, "to do"). And, besides those in *ya* and *tya*, it frequently uses forms with a final long vowel, as *bhid-yā*, *i-tyā*, thus showing the former to be shortened instrumentals of abstract nouns in *i* and *ti*.

The Sanskrit verb, like the Greek, has two voices, active and middle, called, after their primary functions, *parasmāi-pada*, "word for another," and *ātmane-pada*, "word for one's self." While in Greek the middle forms have to do duty also for the passive in all tenses except the aorist and future, the Sanskrit, on the other hand, has developed for the passive a special present-stem in *ya*, the other tenses being supplied by the corresponding middle forms, with the exception of the third person singular aorist, for which a special form in *i* is usually assigned to the passive.

The present-stem system is by far the most important part of the whole verb system, both on account of frequency of actual occurrence and of its excellent state of preservation. It is with regard to the different ways of present-stem formation that the entire stock of assumed roots has been grouped by the native grammarians under ten different classes. These classes again naturally fall under two divisions or "conjugations," with this characteristic difference that the one (corresponding to Gr. conj. in ω) retains the same stem (ending in *a*) throughout the present and imperfect, only lengthening the final vowel before terminations beginning with *v* or *m* (not final); while the other (corresponding to that in μι) shows two different forms of the stem, a strong and a weak form, according as the accent falls on the stem-syllable or on the personal ending: *e.g.* 3 sing. *bhára-ti*, φέρει—2 pl. *bhára-tha*, φέρετε: but *é-ti*, εἶσι—*i-thá*, ἴτε (for ἰτέ): 1 sing. *stṛṇó-mi*, στόρνυμι—1 pl. *stṛṇu-más* (στόρνυμες).

As several of the personal endings show a decided similarity to personal or demonstrative pronouns, it is highly probable that, as might indeed be a priori expected, all or most of them are of pronominal origin—though, owing to their exposed position and consequent decay, their original form and identity cannot now be determined with certainty. The active singular terminations, with the exception of the second person of the imperative, are unaccented and of comparatively light appearance; while those of the dual and plural, as well as the middle terminations, have the accent, being apparently too heavy to be supported by the stem-accent either because, as Schleicher supposed, they are composed of two different pronominal elements, or otherwise. The treatment of the personal endings in the modifying, and presumably older, conjugation may thus be said somewhat to resemble that of enclitics in Greek.

In the imperfect the present-stem is increased by the augment, consisting of a prefixed *ă*. Here, as in the other tenses in which it appears, it has invariably the accent, as being the distinctive element (originally probably an independent demonstrative adverb "then") for the expression of past time. This shifting of the word-accent seems to have contributed to the further reduction of the personal endings, and thus to have caused the formation of a new, or secondary, set of terminations which came to be appropriated for secondary tenses and moods generally. As in Greek poetry, the augment is frequently omitted in Sanskrit.

The mood-sign of the subjunctive is *ă*, added to (the strong form of) the tense-stem. If the stem ends already in *ă*, the latter becomes lengthened. As regards the personal terminations, some persons take the primary, others the secondary forms, while others again may take either the one or the other. The first singular active, however, takes *ni* instead of *mi*, to distinguish it from the indicative. But besides these forms, showing the mood-sign *ă*, the subjunctive (both present and aorist) may take another form, without any distinctive modal sign, and with the secondary endings, being thus identical with the augmentless form of the preterite.

The optative invariably takes the secondary endings, with some peculiar variations. In the active of the modifying conjugation its mood-sign is *yā*, affixed to the weak form of the stem: *e.g.* root *as*—*syām* = Lat. *siem*, *sīm* (where Gr., from analogy to ἐστί, &c., shows irregularly the strong form of the stem, εἴην, for ἐσ-ιη-ν; as in 1st sing. of verbs in ω, it also has irregularly the primary ending, λείποιμι = S. *rece-y-am*); while in the *a*-conjugation and throughout the middle the mood-sign is *ī*, probably a contraction of *yā*: *e.g.* *bháres* = φέροις.

Besides the ordinary perfect, made from a reduplicated stem, with distinction between strong (active singular) and weak forms, and a partly peculiar set of endings, the later language makes large use of a periphrastic perfect, consisting of the accusative of a feminine abstract noun in *ā* (*-ām*) with the reduplicated perfect forms of the auxiliary verbs *kar*, "to do," or *as* (and occasionally *bhū*), "to be." Though more particularly resorted to for the derivative forms of conjugation—viz. the causative (including the so-called tenth conjugational class), the desiderative, intensive and denominative—this perfect-form is also commonly used with roots beginning with prosodically long vowels, as well as with a few other isolated roots. In the Ṛigveda this formation is quite unknown, and the Atharvan offers a single instance of it, from a causative verb, with the auxiliary *kar*. In the Vedic prose, on the other hand, it is rather frequent,[1] and it is quite common in the later language.

In addition to the ordinary participles, active and middle, of the reduplicated perfect—*e.g.* *jajan-vấn*, γεγον-ώς: *bubudh-āná*, πεπυσ-μένο—there is a secondary participial formation, obtained by affixing the possessive suffix *vat* (*vant*) to the passive past participle: *e.g.* *kṛta-vant*, lit. "having (that which is) done." A secondary participle of this kind occurs once in the Atharvaveda, and it is occasionally met with in the Brāhmaṇas. In the later language, however, it not only is of rather frequent occurrence, but has assumed quite a new function, viz. that of a finite perfect-form; thus *kṛtavān*, *kṛtavantas*, without any auxiliary verb, mean, not "having done," but "he has done," "they have done."

The original Indo-Germanic future-stem formation in *sya*, with primary endings—*e.g.* *dāsyáti* = δώσει (for δώσετι)—is the ordinary tense-form both in Vedic and classical Sanskrit—a preterite of it, with a conditional force attached to it (*ádāsyat*), being also common to all periods of the language.

Side by side with this future, however, an analytic tense-form makes its appearance in the Brāhmaṇas, obtaining wider currency in the later language. This periphrastic future is made by means of the nominative singular of a *nomen agentis* in *tar* (*dātar*, nom. *dātā* = Lat. *dator*), followed by the corresponding present forms of *as*, "to be" (*dātā-'smi*, as it were, *daturus sum*), with the exception of the third persons, which need no auxiliary, but take the respective nominatives of the noun.

The aorist system is somewhat complicated, including as it does augment-preterites of various formations, viz. a radical aorist, sometimes with reduplicated stem—*e.g.* *ásthām* = ἔστην; *śrudhí* = κλῦθι; *ádudrot*; an *a*-aorist (or thematic aorist) with or without reduplication—*e.g.* *áricas* = ἔλιπες: *ápaptam*, cf. ἔπεφνον; and several different forms of a sibilant-aorist. In the older Vedic language the radical aorist is far more common than the *a*-aorist, which becomes more frequently used later on. Of the different kinds of sibilant-aorists, the most common is the one which makes its stem by the addition of *s* to the root, either with or without a connecting vowel *i* in different roots: *e.g.* root *ji*—1 sing. *ájāisham*, 1 pl. *ájāishma*; *ákramisham*, *ákramishma*. A limited number of roots take a double aorist-sign with inserted connecting vowel (*sish* for *sis*)—*e.g.* *áyāsisham* (cf. *scrip-sis-ti*); whilst others—very rarely in the older but more numerously in the later language—make their aorist-stem by the addition of *sa*—*e.g.* *ádikshas* = ἔδειξας.

As regards the syntactic functions of the three preterites—the imperfect, perfect and aorist—the classical writers make virtually no distinction between them, but use them quite indiscriminately. In the older language, on the other hand, the imperfect is chiefly used as a narrative tense, while the other two generally refer to a past action which is now complete—the aorist, however, more frequently to that which is only just done or completed. The perfect, owing doubtless to its reduplicative form, has also not infrequently the force of an iterative, or intensive, present.

Word-formation.

The Sanskrit, like the Greek, shows at all times a considerable power and facility of noun-composition. But, while in the older language, as well as in the earlier literary products of the classical period, such combinations rarely exceed the limits compatible with the general economy of inflectional speech, during the later, artificial period of the language they gradually become more and more excessive, both in size and frequency of use, till at last they absorb almost the entire range of syntactic construction.

One of the most striking features of Sanskrit word-formation is that regular interchange of light and strong vowel-sounds, usually designated by the native terms of *guṇa* (quality) and *vṛiddhi* (increase). The phonetic process implied in these terms consists in the raising, under certain conditions, of a radical or thematic light vowel *i*, *u*, *ṛ*, *l*, by means of an inserted *a*-sound, to the diphthongal (guṇa) sounds *ăi* (Sans. *ē*), *ău* (Sans. *ō*), and the combination *ar* and *al* respectively, and, by a repetition of the same process, to the (vṛiddhi) sounds *āi*, *āu*, *ār*, and *āl* respectively. Thus from root *vid*, "to know," we have *véda*, "knowledge," and therefrom *vāídika*; from *yuj*, *yóga*, *yāúgika*. While the interchange of the former kind, due mainly to accentual causes, was undoubtedly a common feature of Indo-Germanic speech, the latter, or vṛiddhi-change, which chiefly occurs in secondary stems, is probably a later development. Moreover, there can be no doubt that the vṛiddhi-vowels are really due to what the term implies, viz. to a process of "increment," or vowel-raising. The same used to be universally assumed by comparative philologists as regards the relation between the guṇa-sounds *ăi* (*ē*) and *ău* (*ō*) and the respective simple *i*- and *u*-sounds. According to a more recent theory, however, which has been very generally accepted, we have rather to look upon the heavier vowels as the original, and upon the lighter vowels as the later sounds, produced through the absence of stress and pitch. The grounds on which this theory is recommended are those of logical consistency. In the analogous cases of interchange between *ṛ* and *ar*, as well as *ḷ* and *al*, most scholars have indeed been wont to regard the syllabic *ṛ* and *ḷ* as weakened from original *ar* and *al*, while the native grammarians represent the latter as produced from the former by increment. Similarly the verb *as* (*ĕs*), "to be," loses its vowel wherever the radical syllable is unaccented, *e.g.* *ásti*, Lat. *est*—*smás*, *s(u)mus*; opt. *syām*, Lat. *siēm* (*sīm*). On the strength of these analogous cases of vowel-modification we are, therefore, to accept some such equation as this:—

ásmi: *smás* = δέρκομαι: ἔδρ(α)κον = λείπω: λιπεῖν
= *émi* (εἶμι): *imás* (ἴμεν for ἰμέν)
= φεύγω: φυγεῖν
= *dóhmi* (I milk): *duhmás*.

Acquiescence in this equation would seem to involve at least one important admission, viz. that original root-syllables contained no simple *i*- and *u*-vowels, except as the second element of the diphthongs *ai*, *ei*, *oi*; *au*, *eu*, *ou*. We ought no longer to speak of the roots *vid*, "to know," *dik*, "to show, to bid," *dhugh*, "to milk," *yug*, "to join," but of *veid*, *deik*, *dhaugh* or *dheugh*, *yeug*, &c. Nay, as the same law would apply with equal force to suffixal vowels, the suffix *nu* would have to be called *nau* or *neu*; and, in explaining, for instance, the irregularly formed δείκνυμι, δείκνυμεν, we might say that, by the affixion of νευ to the root δεικ, the present-stem δικνεύ was obtained (δικνεῦμι), which, as the stress was shifted forward, became 1 plur. δικνυμέσ(ι),—the subsequent modifications in the radical and formative syllables being due to the effects of "analogy" (cf. G. Meyer, *Griech. Gramm.*, § 487). Now, if there be any truth in the "agglutination" theory, according to which the radical and formative elements of Indo-Germanic speech were at one time independent words, we would have to be prepared for a pretty liberal allowance, to the parent language, of diphthongal monosyllables such as *deík neú*, while simple combinations such as *dik nu* could only spring up after separate syllable-words had become united by the force of a common accent. But, whether the agglutinationists be right or wrong, a theory involving the priority of the diphthongal over the simple sounds can hardly be said to be one of great prima facie probability; and one may well ask whether the requirements of logical consistency might not be satisfied in some other, less improbable, way.

Now, the analogous cases which have called forth this theory turn upon the loss of a radical or suffixal *a* (*ĕ*), occasioned by the shifting of the word-accent to some other syllable, *e.g.* acc. *mātáram*, instr. *mātrấ*; πέτομαι, ἐπτόμην: δέρκομαι, ἔδρ(α)κον: *ásmi*, *smás*. Might we not then assume that at an early stage of noun and verb inflection, through the giving way, under certain conditions, of the stem-*a* (*ĕ*), the habit of stem-gradation, as an element of inflection, came to establish itself and ultimately to extend its sphere over stems with *i*- and *u*-vowels, but that, on meeting here with more resistance[1] than in the *a* (*ĕ*)-vowel, the stem-gradation then took the shape of a raising of the simple vowel, in the "strong" cases and verb-forms, by that same *a*-element which constituted the distinctive element of those cases in the other variable stems? In this way the above equation would still hold good, and the corresponding vowel-grades, though of somewhat different genesis, would yet be strictly analogous. At all events in the opinion of the present writer, the last word has not yet been said on the important point of Indo-Germanic vowel-gradation.

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[1] It also shows occasionally other tense-forms than the perfect of the same periphrastic formation with *kar*.

The accent of Sanskrit words is marked only in the more important Vedic texts, different systems of notation being used in different works.

Accentuation.

Our knowledge of the later accentuation of words is entirely derived from the statements of grammarians. As in Greek, there are three accents, the *udātta* ("raised," *i.e.* acute), the *anudātta* ("not raised," *i.e.* grave), and the *svarita* ("sounded, modulated," *i.e.* circumflex). The last is a combination of the two others, its proper use being confined almost entirely to a vowel preceded by a semivowel *y* or *v*, representing an original acuted vowel. Hindu scholars, however, also include in this term the accent of a grave syllable preceded by an acuted syllable, and itself followed by a grave.

The Sanskrit and Greek accentuations present numerous coincidences. Although the Greek rule, confining the accent within the last three syllables, has frequently obliterated the original likeness, the old features may often be traced through the later forms. Thus, though augmented verb-forms in Greek cannot always have the accent on the augment as in Sanskrit, they have it invariably as little removed from it as the accentual restrictions will allow; *e.g.* *ábharam*, ἔφερον: *ábharāma*, ἐφέρομεν: *ábharāmahi*, ἐφερόμεθα.

The most striking coincidence in noun declension is the accentual distinction made by both languages between the "strong" and "weak" cases of monosyllabic nouns—the only difference in this respect being that in Sanskrit the accusative plural, as a rule, has the accent on the case-ending, and consequently shows the weak form of the stem; *e.g.* stem *pad*, ποδ: *pā́dam*, πόδα: *padā́s*, ποδός: *padí*, ποδί: *pā́das*, πόδες: *padā́s*, πόδας: *padā́m*, ποδῶν: *patsú*, ποσί. In Sanskrit a few other classes of stems (especially present participles in *ant*, *at*), accented on the last syllable, are apt to yield their accent to heavy vowel (not consonantal) terminations; compare the analogous accentuation of Sanskrit and Greek stems in *tār*: *pitáram*, πατέρα: *pitré*, πατρός: *pitáras*, πατέρες: *pitṛ́shu*, πατρ(ά)σι.

The vocative, when heading a sentence (or verse-division), has invariably the accent on the first syllable; otherwise it is not accented.

Finite verb-forms also, as a rule, lose their accent, except when standing at the beginning of a sentence or verse-division (a vocative not being taken into account), or in dependent (mostly relative) clauses, or in conjunction with certain particles. Of two or more co-ordinate verb-forms, however, only the first is unaccented.

In writing Sanskrit the natives, in different parts of India, generally employ the particular character used for writing their own vernacular.

Written characters.

The character, however, most widely understood and employed by Hindu scholars, and used invariably in European editions of Sanskrit works (unless printed in Roman letters) is the Nāgarī, or "town-script," also commonly called *Devanāgarī*, or *nāgarī* of the gods.

The origin of the Indian alphabets is still enveloped in doubt. The oldest hitherto known specimens of Indian writing are a number of rock-inscriptions, containing religious edicts in Pāli (the Prākrit used in the southern Buddhist scriptures), issued by the emperor Aśoka (Piyadasi) of the Maurya dynasty, in 253–251 B.C., and scattered over the area of northern India from the vicinity of Peshawar, on the north-west frontier, and Girnar in Gujarat, to Jaugada and Dhauli in Katak, on the eastern coast. The most western of these inscriptions—those found near Kapurdagarhi or Shāhbāzgarhi, and Mansora—are executed in a different alphabet from the others. It reads from right to left, and is usually called the Arian Pāli alphabet, it being also used on the coins of the Greek and Indo-Scythian princes of Ariana; while the other, which reads from left to right, is called the Indian Pāli alphabet. The former—also called *Kharoshṭhī* or *Gāndhāra* alphabet (*lipi*)—which is manifestly derived from a Semitic (probably Aramaean) source, has left no traces on the subsequent development of Indian writing. The Indo-Pāli (or *Brāhmī*) alphabet, on the other hand, from which the modern Indian alphabets are derived, is of more uncertain origin. The similarity, however, which several of its letters present to those of the old Phoenician alphabet (itself probably derived from the Egyptian hieroglyphics) suggests for this alphabet also the probability of a Semitic origin, though, already at Aśoka's time, the Indians had worked it up to a high degree of perfection and wonderfully adapted it to their peculiar scientific ends. The question as to the probable time and channel of its introduction can scarcely be expected ever to be placed beyond all doubt. The late Professor Bühler has, however, made it very probable that this alphabet was introduced into India by traders from Mesopotamia about 800 B.C. At all events, considering the high state of perfection it exhibits in the Maurya and Andhra inscriptions, as well as the wide area over which these are scattered, it can hardly be doubted that the art of writing must have been known to and practised by the Indians for various purposes long before the time of Aśoka. The fact that no reference to it is found in the contemporary literature has probably to be accounted for by a strong reluctance on the part of the Brāhmans to commit their sacred works to writing.

As regards the numeral signs used in India, the Kharoshṭhī inscriptions of the early centuries of our era show a numerical system in which the first three numbers are represented by as many vertical strokes, whilst 4 is marked by a slanting cross, and 5–9 by 4(+) 1, &c., to 4(+)4(+)1; then special signs for 10, 20 and 100, the intervening multiples of 10 being marked in the vigesimal fashion, thus 50=20(+)20(+)10. This system has been proved to be of Semitic, probably Aramaic, origin. In the Brāhmī inscriptions up to the end of the 6th century of our era, another system is used in which 1–3 are denoted by as many horizontal strokes, and thereafter by special syllabic signs for 4–9, the decades 10–90, and for 100 and 1000. This system was most likely derived from hieratic sources of Egypt. The decimal system of cipher notation, on the other hand, which is first found used on a Gujarat inscription of A.D. 595, seems to be an invention of Indian astronomers or mathematicians, based on the existing syllabic (or word) signs or equivalents thereof.

The first two Sanskrit grammars published by Europeans were those of the Austrian Jesuit Wesdin, called Paulinus a Sancto Bartholomaeo (Rome, 1790–1804). These were followed by those of H. C. Colebrooke (1805; based on Pāṇini's system), Carey (1806), Wilkins (1808), Forster (1810), F. Bopp (1827), H. H. Wilson, Th. Benfey, &c. These, as well as those of Max Müller, Monier Williams and F. Kielhorn, now most widely used, deal almost exclusively with classical Sanskrit; whilst that of W. D. Whitney treats the whole language historically; as does also J. Wackernagel's not yet completed *Altindische Grammatik*.

The first Sanskrit dictionary was that of H. H. Wilson (1819; 2nd ed., 1832), which was followed by the great Sanskrit-German *Wörterbuch*, published at St Petersburg in 7 vols. by Professors Böhtlingk and Roth. Largely based on this great thesaurus are the Sanskrit-English dictionaries by Sir M. Williams (2nd ed., 1899), Th. Benfey, A. A. Macdonell, &c. On the history of the Indian alphabets, cf. G. Bühler, *Indische Paläographie* (1896); A. C. Burnell, *Elements of South Indian Palaeography* (2nd ed., 1878), R. Cust's résumé in *Jour. Roy. As. Soc.*, N.S. vol. xvi.

II. SANSKRIT LITERATURE

The history of Sanskrit literature labours under the same disadvantage as the political history of ancient India from the total want of anything like a fixed chronology. In that vast range of literary development there is scarcely a work of importance the date of which scholars have fixed with absolute certainty. The original composition of most Sanskrit works can indeed be confidently assigned to certain general periods of literature, but as to many of them, and these among the most important, scholars have but too much reason to doubt whether they have come down to us in their original shape, or whether they have not undergone alterations and additions so serious as to make it impossible to regard them as genuine witnesses of any one phase of the development of the Indian mind. Nor can we expect many important chronological data from new materials brought to light in India. Though by such discoveries a few isolated spots may be lighted up here and there, the real task of clearing away the mist which at present obscures our view, if ever it can be cleared away, will have to be performed by patient research and a more minute critical examination of the multitudinous writings which have been handed down from the remote past. In the following sketch it is intended to take a rapid view of the more important works and writers in the several departments of literature.

In accordance with the two great phases of linguistic development referred to, the history of Sanskrit literature readily divides itself into two principal periods—the Vedic and the classical. These periods partly overlap, and some of the later Vedic work are included in that period on account of the subjects with which they deal, and for their archaic style, rather than for any just claim to a higher antiquity than may have to be assigned to the oldest works of the classical Sanskrit.

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[1] We might compare the different treatment in Sanskrit of *an* and *in* bases (*mūrdháni-mūrdhnā́*; *vādíni-vādínā*); for, though the latter are doubtless of later origin, their inflection might have been expected to be influenced by that of the former. Also a comparison of such forms as (*devá*) *devā́nām* (*agní*) *agnīnā́m*, and (*dhenú*) *dhenūnā́m*, tells in favour of the *i*- and *u*-vowels, as regards power of resistance, inasmuch as it does not require the accent in order to remain intact.

1. The Vedic Period[1]

Saṃhitās.

The term *veda*—*i.e.* “knowledge,” (sacred) “lore”—embraces a body of writings the origin of which is ascribed to divine revelation (*śruti*, literally “hearing”), and which forms the foundation of the Brāhmanical system of religious belief. This sacred canon is divided into three or (according to a later scheme) four co-ordinate collections, likewise called Veda: (1) the *Ṛig-veda*, or lore of praise (or hymns); (2) the *Sāma-veda*, or lore of tunes (or chants); (3) the *Yajur-veda*, or lore of prayer (or sacrificial formulas); and (4) the *Atharva-veda*, or lore of the Atharvans. Each of these four Vedas consists primarily of a collection (*saṃhitā*) of sacred, mostly poetical, texts of a devotional nature, called *mantra*. This entire body of texts (and particularly the first three collections) is also frequently referred to as the *trayī vidyā*, or threefold wisdom, of hymn (*ṛich*[2]), tune or chant (*sāman*), and prayer (*yajus*)—the fourth Veda, if at all included, being in that case classed together with the Ṛik.

Classes of priests.

The Brāhmanical religion finds its practical expression chiefly in sacrificial performances. The Vedic sacrifice requires for its proper performance the attendance of four officiating priests, each of whom is assisted by one or more (usually three) subordinate priests, viz.: (1) the *Hotar* (or *hotṛi*, *i.e.* either “sacrificer,” or “invoker”), whose chief business is to invoke the gods, either in short prayers pronounced over the several oblations, or in liturgical recitations (*śastra*), made up of various hymns and detached verses; (2) the *Udgātar* (udgātṛi), or chorister, who has to perform chants (*stotra*) in connexion with the hotar's recitations; (3) the *Adhvaryu*, or offering priest *par excellence*, who performs all the material duties of the sacrifice, such as the kindling of the fires, the preparation of the sacrificial ground and the offerings, the making of oblations, &c.; (4) the *Brahman*, or chief “priest,” who has to superintend the performance and to rectify any mistakes that may be committed. Now, the first three of these priests stand in special relation to three of the Vedic Saṃhitās in this way: that the Saṃhitās of the Sāmaveda and Yajurveda form special song and prayer books, arranged for the practical use of the udgātar and adhvaryu respectively; whilst the Ṛik-saṃhitā, though not arranged for any such practical purpose, contains the entire body of sacred lyrics whence the hotar draws the material for his recitations. The brahman, however, had no special text-book assigned to him, but was expected to be familiar with all the Saṃhitās as well as with the practical details of the sacrificial performance (see Brahman and Brāhmana). It sometimes happens that verses not found in our version of the Ṛik-saṃhitā, but in the Atharvaveda-saṃhitā, are used by the hotar; but such texts, if they did not actually form part of some other version of the Ṛik—as Sāyaṇa in the introduction to his commentary on the Ṛik-saṃhitā assures us that they did—were probably inserted in the liturgy subsequent to the recognition of the fourth Veda.

Brāhmaṇas.

The several Saṃhitās have attached to them certain theological prose works, called *Brāhmaṇa*, which, though subordinate in authority to the Mantras or Saṃhitās, are like them held to be divinely revealed and to form part of the canon. The chief works of this class are of an exegetic nature,—their purport being to supply a dogmatic exposition of the sacrificial ceremonial and to explain the mystic import of the different rites and utterances included therein (see Brāhmaṇa).

Āraṇyakas and Upanishads.

More or less closely connected with the Brāhmaṇas (and in a few exceptional cases with Saṃhitās) are two classes of treatises, called *Āraṇyaka* and *Upanishad*. The Āraṇyakas, *i.e.* works “relating to the forest,” being intended to be read by those who have retired from the world and lead the life of anchorites, do not greatly differ in character and style from the Brāhmaṇas, but like them are chiefly ritualistic, treating of special ceremonies not dealt with, or dealt with only imperfectly, in the latter works, to which they thus stand in the relation of supplements. The Upanishads, however, are of a purely speculative nature, and must be looked upon as the first attempts at a systematic treatment of metaphysical questions. The number of Upanishads hitherto known is very considerable (about 170); but, though they nearly all profess to belong to the Atharvaveda, they have to be assigned to very different periods of Sanskrit literature—some of them being evidently quite modern productions. The oldest treatises of this kind are doubtless those which form part of the Saṃhitās, Brāhmaṇas and Āraṇyakas of the three older Vedas, though not a few others which have no such special connexion have to be classed with the later products of the Vedic age.[3]

Different recensions.

As the sacred texts were not committed to writing till a much later period, but were handed down orally in the Brāhmaṇical schools, it was inevitable that local differences of reading should spring up, which in course of time gave rise to a number of independent versions. Such different text-recensions, called *śākhā* (*i.e.* branch), were at one time very numerous, but only a limited number have survived. As regards the Saṃhitās, the poetical form of the hymns, as well as the concise style of the sacrificial formulas, would render these texts less liable to change, and the discrepancies of different versions would chiefly consist in various readings of single words or in the different arrangement of the textual matter. But the diffuse ritualistic discussions and loosely connected legendary illustrations of the Brāhmaṇas offered scope for very considerable modifications in the traditional matter, either through the ordinary processes of oral transmission or through the special influence of individual teachers.

Vedāngas.

Besides the purely ceremonial matter, the Brāhmaṇas also contained a considerable amount of matter bearing on the correct interpretation of the Vedic texts; and, indeed, the sacred obligation incumbent on the Brāhmans of handing down correctly the letter and sense of those texts necessarily involved a good deal of serious grammatical and etymological study in the Brāhmaṇical schools. These literary pursuits could not but result in the accumulation of much learned material, which it would become more and more desirable to throw into a systematic form, serving at the same time as a guide for future research. These practical requirements were met by a class of treatises, grouped under six different heads or subjects, called *Vedāngas*, *i.e.* members, or limbs, of the (body of the) Veda. None of the works, however, which have come down to us under this designation can lay any just claim to being considered the original treatises on their several subjects; they evidently represent a more or less advanced stage of scientific development. Though a few of them are composed in metrical form—especially in the ordinary epic couplet, the *anushṭubh śloka*, consisting of two lines of sixteen syllables (or of two octosyllabic pādas) each—the majority belong to a class of writings called *sūtra*, *i.e.* “string,” consisting of strings of rules in the shape of tersely expressed aphorisms, intended to be committed to memory. The Sūtras form a connecting link between the Vedic and the classical periods of literature. But, although these treatises, so far as they deal with Vedic subjects, are included by the native authorities among the Vedic writings, and in point of language may, generally speaking, be considered as the latest products of the Vedic age, they have no share in the sacred title of *śruti* or revelation. They are of human, not of divine, origin. Yet, as the production of men of the highest standing, profoundly versed in Vedic lore, the Sūtras are regarded as works of great authority, second only to that of the revealed Scriptures; and their relation to the latter is expressed in the generic title of *Smṛiti*, or Tradition, usually applied to them.

Sutras.

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[1] J. Muir's *Original Sanskrit Texts* (5 vols., 2nd ed.) forms the most complete general survey of the results of Vedic research.

[2] The combination *ch*, used (in conformity with the usual English practice) in this sketch of the literature, corresponds to the simple *c*—as *ṛi* does to *ṛ*—in the scheme of the alphabet.

[3] Cf. P. Deussen, *The Philosophy of the Upanishads* (Edinburgh, 1906), where these treatises are classified; Jacob, *A Concordance to the Principal Upanishads and Bhagavadgītā* (Bombay S.S., 1891).

The six branches of Vedic science, included under the term Vedānga, are as follows:—

Phonetics.

1. *Śikshā*, or Phonetics.—The privileged position of representing this subject is assigned to a small treatise ascribed to the great grammarian Pāṇini, viz. the *Pāṇinīyā śikshā*, extant in two different (Ṛik and Yajus) recensions. But neither this treatise nor any other of the numerous śikshās which have recently come to light can lay claim to any very high age. Scholars, however, usually include under this head certain works, called *Prātiśākhya*, *i.e.* "belonging to a certain *śākhā* or recension," which deal minutely with the phonetic peculiarities of the several Saṃhitās, and are of great importance for the textual criticism of the Vedic Saṃhitās.

Metre.

2. *Chhandas*, or Metre.—Tradition makes the *Chhandaḥ-sūtra* of Pingala the starting-point of prosody. The Vedic metres, however, occupy but a small part of this treatise, and they are evidently dealt with in a more original manner in the Nidāna-sūtra of the Sāmaveda, and in a chapter of the Ṛik-prātiśākhya. For profane prosody, on the other hand, Pingala's treatise is rather valuable, no less than 160 metres being described by him.

Grammar.

3. *Vyākaraṇa*, or Grammar.—Pāṇini's famous grammar is said to be *the* Vedanga; but it marks the culminating point of grammatical research rather than the beginning, and besides treats chiefly of the post-Vedic language.

Etymology.

4. *Nirukta*, or Etymology.—Yāska's *Nirukta* is the traditional representative of this subject, and this important work certainly deals entirely with Vedic etymology and explanation. It consists, in the first place, of strings of words in three chapters: (1) synonymous words; (2) such as are purely or chiefly Vedic; and (3) names of deities. These lists are followed by Yāska's commentary, interspersed with numerous illustrations. Yāska, again, quotes several predecessors in the same branch of science; and it is probable that the original works on this subject consisted merely of lists of words similar to those handed down by him.

Astronomy.

5. *Jyotisha*, or Astronomy.—Although astronomical calculations are frequently referred to in older works in connexion with the performance of sacrifices, the metrical treatise which has come down to us in two different recensions under the title of Jyotisha, ascribed to one Lagadha, or Lagata, seems indeed to be the oldest existing systematic treatise on astronomical subjects. With the exception of some apparently spurious verses of one of the recensions, it betrays no sign of the Greek influence which shows itself in Hindu astronomical works from about the 3rd century of our era; and its date may therefore be set down as probably not later than the early centuries after Christ.

Ceremonial.

6. *Kalpa*, or Ceremonial.—Tradition does not single out any special work as the Vedānga in this branch of Vedic science; but the sacrificial practice gave rise to a large number of systematic sūtra-manuals for the several classes of priests. The most important of these works have come down to us, and they occupy by far the most prominent place among the literary productions of the sūtra-period. The Kalpa-sūtras, or rules of ceremonial, are of two kinds: (1) the *Srauta-sūtras*, which are based on the śruti, and teach the performance of the great sacrifices, requiring three sacrificial fires; and (2) the *Smārta-sūtras*, or rules based on the smṛiti or tradition. The latter class again includes two kinds of treatises: (1) the *Gṛihya-sūtras*, or domestic rules, treating of ordinary family rites, such as marriage, birth, name-giving, &c., connected with simple offerings in the domestic fire; and (2) the *Sāmayāchārika-* (or *Dharma-*) *sūtras*, which treat of customs and temporal duties, and are supposed to have formed the chief sources of the later law-books. Besides, the Srauta-sūtras of the Yajurveda have usually attached to them a set of so-called *Śulva-sūtras*, *i.e.* "rules of the cord," which treat of the measurement by means of cords, and the construction, of different kinds of altars required for sacrifices. These treatises are of special interest as supplying important information regarding the earliest geometrical operations in India. Along with the Sūtras may be classed a large number of supplementary treatises, usually called *Pariśishṭa* (παραλιπόμενα), on various subjects connected with the sacred texts and Vedic religion generally.

After this brief characterization of the various branches of Vedic literature, we proceed to take a rapid survey of the several Vedic collections.

Ṛigveda samhitā.

A. *Ṛigveda.*[1]—The *Ṛigveda-saṃhitā* has come down to us in the recension of the Śākala school. Mention is made of several other versions; and regarding one of them, that of the Bāshkalas, we have some further information, according to which it seems, however, to have differed but little from the Śākala text. The latter consists of 1028 hymns, including eleven so-called *Vālakhilyas*, which were probably introduced into the collection subsequently to its completion. The hymns are composed in a great variety of metres, and consist, on an average, of rather more than 10 verses each, or about 10,600 verses altogether. This body of sacred lyrics has been subdivided by ancient authorities in a twofold way, viz. either from a purely artificial point of view, into eight *ashṭakas* of about equal length, or, on a more natural principle, based on the origin of the hymns, and invariably adopted by European scholars, into ten books, or *maṇḍalas*, of unequal length. Tradition (not, however, always trustworthy in this respect) has handed down the names of the reputed authors, or rather inspired "seers" (*ṛishi*), of most hymns. These indications have enabled scholars to form some idea as to the probable way in which the Ṛik-saṃhitā originated, though much still remains to be cleared up by future research.

Maṇḍalas ii.-vii. are evidently arranged on a uniform plan. Each of them is ascribed to a different family of ṛishis, whence they are usually called the six "family-books": ii., the Gṛitsamadas; iii., the Viśvāmitras or Kuśikas; iv., the Vāmadevyas; v., the Atris; vi., the Bharadvājas; and vii., the Vasishṭhas. Further, each of these books begins with the hymns addressed to Agni, the god of fire, which are followed by those to Indra, the Jupiter Pluvius, whereupon follow those addressed to minor deities—the Viśve Devāḥ ("all-gods"), the Maruts (storm-gods), &c. Again, the hymns addressed to each deity are arranged in a descending order, according to the number of verses of which they consist.

Maṇḍala i., the longest in the whole Saṃhitā, contains 191 hymns, ascribed, with the exception of a few isolated ones, to sixteen poets of different families, and consisting of one larger (50 hymns) and nine shorter collections. Here again the hymns of each author are arranged on precisely the same principle as the "family-books." Maṇḍalas viii. and ix., on the other hand, have a special character of their own. To the Sāmaveda-saṃhitā, which, as we shall see, consists almost entirely of verses chosen from the Ṛik for chanting purposes, these two maṇḍalas have contributed a much larger proportion of verses than any of the others. Now, the hymns of the eighth book are ascribed to a number of different ṛishis, mostly belonging to the Kāṇva family. The productions of each poet are usually, though not always, grouped together, but no other principle of arrangement has yet been discovered. The chief peculiarity of this maṇḍala, however, consists in its metres. Many of the hymns are composed in the form of stanzas, called *pragātha* (from *gā*, "to sing"), consisting of two verses in the *bṛihatī* and *satobṛihatī* metres; whence this book is usually known under the designation of Pragāthās. The other metres met with in this book are likewise such as were evidently considered peculiarly adapted for singing, viz. the *gāyatrī* (from *gā*, "to sing") and other chiefly octosyllabic metres. It is not yet clear how to account for these peculiarities; but further research may perhaps show either that the Kāṇvas were a family of udgātars, or chanters, or that, before the establishment of a common system of worship for the Brāhmanical community, they were accustomed to carry on their liturgical service exclusively by means of chants, instead of using the later form of mixed recitation and chant. One of the ṛishis of this family is called Pragātha Kāṇva; possibly this surname "pragātha" may be an old, or local, synonym of udgātar, or perhaps of the chief chanter, the so-called *Prastotar*, or precentor. Another poet of this family is Medhātithi Kāṇva, who has likewise assigned to him twelve hymns in the first and largest groups of the first book. The ninth maṇḍala, on the other hand, consists entirely of hymns (114) addressed to *Soma*, the deified juice of the so-called "moon-plant" (*Sarcostemma viminale*, or *Asclepias acida*), and ascribed to poets of different families. They are called *pavamānī*, "purificational," because they were to be recited by the hotar while the juice expressed from the soma plants was clarifying. The first sixty of these hymns are arranged strictly according to their length, ranging from ten down to four verses; but as to the remaining hymns no such principle of arrangement is observable, except perhaps in smaller groups of hymns. One might, therefore, feel inclined to look upon that first section as the body of soma hymns set apart, at the time of the first redaction of the Saṃhitā, for the special purpose of being used as *pavamānyas*,—the remaining hymns having been added at subsequent redactions. It would not, however, by any means follow that all, or even any, of the latter hymns were actually later productions, as they might previously have formed part of the family collections, or might have been overlooked when the hymns were first collected. Other maṇḍalas (viz. i. viii. and x.) still contain four entire hymns addressed to Soma, consisting together of 58 verses, of which only a single one (x. 25, 1) is found in the Sāmaveda-saṃhitā, as also some 28 isolated verses to Soma, and four hymns addressed to Soma in conjunction with some other deity, which are entirely unrepresented in that collection.

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[1] The Ṛigveda has been edited, together with the commentary of Sāyaṇa (of the 14th century), by Max Müller (6 vols., London, 1849–1874; 2nd ed., 4 vols., 1890–1892). The same scholar has published an edition of the hymns, both in the connected (*saṃhitā*) and the disjoined (*pada*) texts, 1873–1877. An edition in Roman transliteration was published by Th. Aufrecht (Berlin, 1861–1863, 2nd ed. 1877). Part of an English translation (chiefly based on Sāyaṇa's interpretation) was brought out by the late Professor H. H. Wilson (vols. i.-iii., 1850–1857) and completed by Professor E. B. Cowell (vols. iv.-vi., 1866–1888). We have also the first volume of a translation, with a running commentary, by M. Müller, containing 12 hymns to the Maruts or storm-gods (1869). These were reprinted, together with the remaining hymns to the Maruts, and those addressed to Rudra, Vāyu and Vāta, Vedic Hymns I. in *S.B.E.*, vol. xxxii. (1891); where (vol. xlvi.) H. Oldenberg has also translated the hymns to Agni, in maṇḍalas 1-5. A metrical English translation was published by R. H. T. Griffith (2 vols., Benares, 1896–1897). Complete German translations have been published, in verse, by H. Grassmann (1876–1877) and, in prose, with comm., A. Ludwig (1876–1888). Cf. also Kaegi, *The Rigveda* (Eng. trans. by Arrowsmith, Boston, 1886).

Maṇḍala x. contains the same number of hymns (191) as the first, which it nearly equals in actual length. The hymns are ascribed to many ṛishis, of various families, some of whom appear already in the preceding maṇḍalas. The traditional record is, however, less to be depended upon as regards this book, many names of gods and fictitious personages appearing in the list of its ṛishis. In the latter half of the book the hymns are clearly arranged according to the number of verses, in decreasing order—occasional exceptions to this rule being easily adjusted by the removal of a few apparently added verses. A similar arrangement seems also to suggest itself in other portions of the book. This maṇḍala stands somewhat apart from the preceding books, both its language and the general character of many of its hymns betraying a more recent origin. In this respect it comes nearer to the level of the Atharvaveda-saṃhitā, with which it is otherwise closely connected. Of some 1350 Ṛik-verses found in the Atharvan, about 550, or rather more than 40%, occur in the tenth maṇḍala. In the latter we meet with the same tendencies as in the Atharvan to metaphysical speculation and abstract conceptions of the deity on the one hand, and to superstitious practices on the other. But, although in its general appearance the tenth maṇḍala is decidedly more modern than the other books, it contains not a few hymns which are little, if at all, inferior, both in respect of age and poetic quality, to the generality of Vedic hymns, being perhaps such as had escaped the attentions of the former collectors.

It has become the custom, after Roth's example, to call the Ṛik-saṃhitā (as well as the Atharvan) an historical collection, as compared with the Saṃhitās put together for purely ritualistic purposes. And indeed, though the several family collections which make up the earlier maṇḍalas may originally have served ritual ends, as the hymnals of certain clans or tribal confederacies, and although the Saṃhitā itself, in its oldest form, may have been intended as a common prayer-book, so to speak, for the whole of the Brāhmaṇical community, it is certain that in the stage in which it has been finally handed down it includes a certain portion of hymn material (and even some secular poetry) which could never have been used for purposes of religious service. It may, therefore, be assumed that the Ṛik-saṃhitā contains all of the nature of popular lyrics that was accessible to the collectors, or seemed to them worthy of being preserved. The question as to the exact period when the hymns were collected cannot be answered with any approach to accuracy. For many reasons, however, which cannot be detailed here, scholars have come to fix on the year 1000 B.C. as an approximate date for the collection of the Vedic hymns. From that time every means that human ingenuity could suggest was adopted to secure the sacred texts against the risks connected with oral transmission. But, as there is abundant evidence to show that even then not only had the text of the hymns suffered corruption, but their language had become antiquated to a considerable extent, and was only partly understood, the period during which the great mass of the hymns were actually composed must have lain considerably farther back, and may very likely have extended over the earlier half of the second millenary, or from about 2000 to 1500 B.C.

As regards the people which raised for itself this imposing monument, the hymns exhibit it as settled in the regions watered by the mighty Sindhu (Indus), with its eastern and western tributaries, the land of the five rivers thus forming the central home of the Vedic people. But, while its advanced guard has already debouched upon the plains of the upper Gangā and Yamunā, those who bring up the rear are still found loitering far behind in the narrow glens of the Kubhā (Cabul) and Gomatī (Gomal). Scattered over this tract of land, in hamlets and villages, the Vedic Āryas are leading chiefly the life of herdsmen and husbandmen. The numerous clans and tribes, ruled over by chiefs and kings, have still constantly to vindicate their right to the land but lately wrung from an inferior race of darker hue; just as in these latter days their Aryan kinsmen in the Far West are ever on their guard against the fierce attacks of the dispossessed red-skin. Not unfrequently, too, the light-coloured Āryas wage internecine war with one another—as when the Bharatas, with allied tribes of the Panjab, goaded on by the royal sage Viśvāmitra, invade the country of the Tṛitsu king Sudās, to be defeated in the "ten kings' battle," through the inspired power of the priestly singer Vasishṭha. The priestly office has already become one of high social importance by the side of the political rulers, and to a large extent an hereditary profession; though it does not yet present the baneful features of an exclusive caste. The Aryan housewife shares with her husband the daily toil and joy, the privilege of worshipping the national gods and even the triumphs of song-craft, some of the finest hymns being attributed to female seers.

The religious belief of the people consists in a system of natural symbolism, a worship of the elementary forces of nature, regarded as beings endowed with reason and power superior to those of man. In giving utterance to this simple belief, the priestly spokesman has, however, frequently worked into it his own speculative and mystic notions. Indra, the stout-hearted ruler of the cloud-region, receives by far the largest share of the devout attentions of the Vedic singer. His ever-renewed battle with the malicious demons of darkness and drought, for the recovery of the heavenly light and the rain-spending cows of the sky, forms an inexhaustible theme of spirited song. Next to him, in the affections of the people, stands Agni (ignis), the god of fire, invoked as the genial inmate of the Aryan household, and as the bearer of oblations, and mediator between gods and men. Indra and Agni are thus, as it were, the divine representatives of the king (or chief) and the priest of the Aryan community; and if, in the arrangement of the Saṃhitā, the Brāhmanical collectors gave precedence to Agni, it was but one of many avowals of their own hierarchical pretensions. Hence also the hymns to Indra are mostly followed, in the family collections, by those addressed to the Viśve Devāḥ (the "all-gods") or to the Maruts, the warlike storm-gods and faithful companions of Indra, as the divine impersonations of the Aryan freemen, the *viś* or clan. But, while Indra and Agni are undoubtedly the favourite figures of the Vedic pantheon, there is reason to believe that these gods had but lately supplanted another group of deities who play a less prominent part in the hymns, viz. Father Heaven (Dyaus Pitar, Ζεὺς πατήρ, Jupiter); Varuṇa (probably οὐρανός), the all-embracing (esp. nocturnal) heavens; Mitra (Zend. Mithra), the genial light of day; and Savitar, the quickener, and Sūrya (ἥλιος), the vivifying sun.

Brāhmaṇas of Rigveda.

Of the Brāhmaṇas that were handed down in the schools of the *Bahvṛichas* (*i.e.* "possessed of many verses"), as the followers of the Ṛigveda are called, two have come down to us, viz. those of the Aitareyins and the Kaushītakins. The *Aitareya-brāhmaṇa*[1] and the *Kaushītaki-*[2] (or *Śānkhāyana-*) *brāhmaṇa* evidently have for their groundwork the same stock of traditional exegetic matter. They differ, however, considerably as regards both the arrangement of this matter and their stylistic handling of it, with the exception of the numerous legends common to both, in which the discrepancy is comparatively slight. There is also a certain amount of material peculiar to each of them. The Kaushītaka is, upon the whole, far more concise in its style and more systematic in its arrangement—features which would lead one to infer that it is probably the more modern work of the two. It consists of thirty chapters (*adhyāya*); while the Aitareya has forty, divided into eight books (or pentads, *panchakā*), of five chapters each. The last ten adhyāyas of the latter work are, however, clearly a later addition—though they must have already formed part of it at the time of Pāṇini (*c.* 400 B.C. ?), if, as seems probable, one of his grammatical sūtras, regulating the formation of the names of Brāhmaṇas, consisting of thirty and forty adhyāyas, refers to these two works. In this last portion occurs the well-known legend (also found in the Śānkhāyana-sūtra, but not in the Kaushītaki-brāhmaṇa) of Śunaḥśepa, whom his father Ajīgarta sells and offers to slay, the recital of which formed part of the inauguration of kings. While the Aitareya deals almost exclusively with the Soma sacrifice, the Kaushītaka, in its first six chapters, treats of the several kinds of *haviryajña*, or offerings of rice, milk, ghee, &c., whereupon follows the Soma sacrifice in this way, that chapters 7-10 contain the practical ceremonial and 11-30 the recitations (*śastra*) of the hotar. Sāyaṇa, in the introduction to his commentary on the work, ascribes the Aitareya to the sage Mahidāsa Aitareya (*i.e.* son of Itarā), also mentioned elsewhere as a philosopher; and it seems likely enough that this person arranged the Brāhmaṇa and founded the school of the Aitareyins. Regarding the authorship of the sister work we have no information, except that the opinion of the sage Kaushītaki is frequently referred to in it as authoritative, and generally in opposition to the Paingya—the Brāhmaṇa, it would seem, of a rival school, the Paingins. Probably, therefore, it is just what one of the manuscripts calls it—the Brāhmaṇa of Sānkhāyana (composed) in accordance with the views of Kaushītaki.

Each of these two Brāhmaṇas is supplemented by a "forest-book," or Āraṇyaka. The *Aitareyāraṇyaka*[3] is not a uniform production. It consists of five books (*āraṇyaka*), three of which, the first and the last two, are of a liturgical nature, treating of the ceremony called *mahāvrata*, or great vow. The last of these books, composed in sūtra form, is, however, doubtless of later origin, and is, indeed, ascribed by native authorities either to Śaunaka or to Āśvalāyana. The second and third books, on the other hand, are purely speculative, and are also styled the *Bahvṛicha-brāhmaṇa-upanishad.* Again, the last four chapters of the second book are usually singled out as *the Aitareyopanishad*,[1] ascribed, like its Brāhmaṇa (and the first book), to Mahidāsa Aitareya; and the third book is also referred to as the *Saṃhitā-upanishad*. As regards the *Kaushītaki-āraṇyaka*,[2] this work consists of fifteen adhyāyas, the first two (treating of the mahāvrata ceremony) and the seventh and eighth of which correspond to the first, fifth, and third books of the Aitareyāraṇyaka respectively, whilst the four adhyāyas usually inserted between them constitute the highly interesting *Kaushītaki-(brāhmaṇa-) upanishad*,[3] of which we possess two different recensions. The remaining portions (9-15) of the Āraṇyaka treat of the vital airs, the internal Agnihotra, &c., ending with the vaṃśa, or succession of teachers. Of *Kalpa-sūtras*, or manuals of sacrificial ceremonial,[4] composed for the use of the hotar priest, two different sets are in existence, the *Āśvalāyana-* and the *Śānkhāyana-sūtra*. Each of these works follows one of the two Brāhmaṇas of the Ṛik as its chief authority, viz. the Aitareya and Kaushītaka respectively. Both consist of a *Srauta-* and a *Gṛihya-sūtra*. Āśvalāyana seems to have lived about the same time as Pāṇini (? *c.* 400 B.C.)—his own teacher, Śaunaka, who completed the Ṛik-prātiśākhya, being probably intermediate between the great grammarian and Yāska, the author of the Nirukta. Śaunaka himself is said to have been the author of a Śrauta-sūtra (which was, however, more of the nature of a Brāhmaṇa) and to have destroyed it on seeing his pupil's work. A Gṛihya-sūtra is still quoted under his name by later writers. The Āśvalāyana Śrauta-sūtra[5] consists of twelve, the Gṛihya of four, adhyāyas.

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[1] Edited, with an English translation, by M. Haug (2 vols., Bombay, 1863). An edition in Roman transliteration, with extracts from the commentary, has been published by Th. Aufrecht (Bonn, 1879).

[2] Edited by B. Lindner (Jena, 1887).

[3] Edited, with Sāyaṇa's commentary, by Rājendralāla Mitra, in the *Bibliotheca Indica* (1875–1876). The first three books have been translated by F. Max Müller in *S.B.Æ.* vol. i. A new edition of the work was published, with translation, by A. B. Keith (Oxford, 1909).

Sūtras of Rigveda.

Regarding Śānkhāyana still less is known; but he, too, was doubtless a comparatively modern writer, who, like Āśvalāyana, founded a new school of ritualists. Hence the Kaushītaki-brāhmaṇa, adopted (and perhaps improved) by him, also goes under his name, just as the Aitareya is sometimes called Āśvalāyana-brāhmaṇa. The Śānkhāyana Śrauta-sūtra consists of eighteen adhyāyas. The last two chapters of the work are, however, a later addition,[6] while the two preceding chapters, on the contrary, present a comparatively archaic, brāhmaṇa-like appearance. The Gṛihya-sūtra[7] consists of six chapters, the last two of which are likewise later appendages. The *Sāmbavya Gṛihya-sūtra*, of which a single MS. is at present known, seems to be closely connected with the preceding work. Professor Bühler also refers to the Ṛigveda the *Vāsishṭha-dharmaśāstra*,[8] composed of mixed sūtras and couplets.

A few works remain to be noticed, bearing chiefly on the textual form and traditionary records of the Ṛik-saṃhitā. In our remarks on the Vedāngas, the Prātiśkhyas have already been referred to as the chief repositories of śikshā or Vedic phonetics. Among these works the *Ṛik-prātiśākhya*[9] occupies the first place. The original composition of this important work is ascribed to the same *Śākalya* from whom the vulgate recension of the (Śākala) Saṃhitā takes its name. He is also said to be the author of the existing *Pada-pāṭha* (*i.e.* the text-form in which each word is given unconnected with those that precede and follow it), which report may well be credited, since the pada-text was doubtless prepared with a view to an examination, such as is presented in the Prātiśākhya, of the phonetic modifications undergone by words in their syntactic combination. In the Prātiśākhya itself, Śākalya's father (or Śākalya the elder) is also several times referred to as an authority on phonetics, though the younger Śākalya is evidently regarded as having improved on his father's theories. Thus both father and son probably had a share in the formulation of the rules of pronunciation and modification of Vedic sounds. The completion or final arrangement of the Ṛik-prātiśākhya, in its present form, is ascribed to Śaunaka, the reputed teacher of Āśvalāyana. Śaunaka, however, is merely a family name ("descendant of Śunaka"), which is given even to the ṛishi Gṛitsamada, to whom nearly the whole of the second maṇḍala of the Ṛik is attributed. How long after Śākalya this particular Śaunaka lived we do not know; but some generations at all events would seem to lie between them, considering that in the meantime the Śākalas, owing doubtless to minor differences on phonetic points in the Saṃhitā text, had split into several branches, to one of which, the Śaiśira (or Śaiśirīya) school, Śaunaka belonged. While Śākalya is referred to both by Yāska and Pāṇini, neither of these writers mentions Śaunaka. It seems, nevertheless, likely, for several reasons, that Pāṇini was acquainted with Śaunaka's work, though the point has by no means been definitely settled. The Ṛik-prātiśākhya is composed in mixed ślokas, or couplets of various metres, a form of composition for which Śaunaka seems to have had a special predilection. Besides the Prātiśākhya, and the Gṛihya-sūtra mentioned above, eight other works are ascribed to Śaunaka, viz. the *Bṛihaddevatā*,[10] an account, in epic ślokas, of the deities of the hymns, which supplies much valuable mythological information; the *Ṛig-vidhāna*,[11] a treatise, likewise in epic metre, on the magic effects of Vedic hymns and verses; the *Pāda-vidhāna*, a similar treatise, apparently no longer in existence; and five different indexes or catalogues (*anukramaṇī*) of the ṛishis, metres, deities, sections (*anuvāka*) and hymns of the Ṛig-veda. It is, however, doubtful whether the existing version of the Bṛihaddevatā is the original one; and the Ṛigvidhāna would seem to be much more modern than Śaunaka's time. As regards the Anukramaṇīs, they seem all to have been composed in mixed ślokas; but, with the exception of the Anuvākānukramaṇī, they are only known from quotations, having been superseded by the *Sarvānukramaṇī*,[12] or complete index, of *Kātyāyana*. Both these indexes have been commented upon by Shaḍguruśishya, towards the end of the 12th century of our era.

Sāma-veda-saṃhita.

B. *Sāma-veda.*—The term *sāman*, of uncertain derivation, denotes a solemn tune or melody to be sung or chanted to a *ṛich* or verse. The set chants (stotra) of the Soma sacrifice are as a rule performed in triplets, either actually consisting of three different verses, or of two verses which, by the repetition of certain parts, are made, as it were, to form three. The three verses are usually chanted to the same tune; but in certain cases two verses sung to the same tune had a different sāman enclosed between them. One and the same sāman or tune may thus be sung to many different verses; but, as in teaching and practising the tunes the same verse was invariably used for a certain tune, the term "sāman," as well as the special technical names of sāmans, are not infrequently applied to the verses themselves with which they were ordinarily connected, just as one would quote the beginning of the text of an English hymn, when the tune usually sung to that hymn is meant. For a specimen of the way in which sāmans are sung, see Burnell, *Ārsheyabrāhmaṇa*, p. xlv. seq.

The Indian chant somewhat resembles the Gregorian or Plain Chant.[13] Each sāman is divided into five parts or phrases (*prastāva*, or prelude, &c.), the first four of which are distributed between the several chanters, while the finale (*nidhana*) is sung in unison by all of them.

In accordance with the distinction between *ṛich* or text and *sāman* or tune, the sāman-hymnal consists of two parts, viz. the *Sāmaveda-saṃhitā*, or collection of texts (ṛich) used for making up sāman-hymns, and the *Gāna*, or tune-books, song-books. The textual matter of the Saṃhitā consists of somewhat under 1600 different verses, selected from the Ṛik-saṃhitā, with the exception of some seventy-five verses, some of which have been taken from Khila hymns, whilst others which also occur in the Atharvan or Yajurveda, as well as such not otherwise found, may perhaps have formed part of some other recension of the Ṛik. The *Sāmaveda-saṃhitā*[14] is divided into two chief parts, the *pūrva-* (first) and the *uttara-* (second) *ārchika*. The second part contains the texts of the sāman-hymns, arranged in the order in which they are actually required for the stotras or chants of the various Soma sacrifices. The first part, on the other hand, contains the body of tune-verses, or verses used for practising the several sāmans or tunes upon—the tunes themselves being given in the *Grāma-geya-gāna* (*i.e.* songs to be sung in the village), the tune-book specially belonging to the Pūrvārchika. Hence the latter includes all the first verses of those triplets of the second part which had special tunes peculiar to them, besides the texts of detached sāmans occasionally used outside the regular ceremonial, as well as such as were perhaps no longer required but had been so used at one time or other. The verses of the Pūrvārchika are arranged on much the same plan as the family-books of the Ṛik-saṃhitā, viz. in three sections containing the verses addressed to Agni, Indra and Soma (*pavamāna*) respectively—each section (consisting of one, three, and one adhyāyas respectively) being again arranged according to the metres. Hence this part is also called *Chhandas-* (metre) *ārchika*. Over and above this natural arrangement of the two ārchikas, there is a purely formal division of the texts into six and nine prapāṭhakas respectively, each of which, in the first part, consists of ten decades (daśat) of verses. We have two recensions of the Saṃhitā, belonging to the Rāṇāyanīya and Kauthuma schools, the latter of which is but imperfectly known, but seems to have differed but slightly from the other. Besides the six prapāṭhakas (or five adhyāyas) of the Pūrvārchika, some schools have an additional "forest" chapter, called the *Āraṇyaka-saṃhitā*, the tunes of which—along with others apparently intended for being chanted by anchorites—are partly contained in the *Araṇya-gāna*. Besides the two tune-books belonging to the Pūrvārchika, there are two others, the *Ūha-gāna* ("modification-songs") and *Uhya-gāna*, which follow the order of the Uttarārchika, giving the several sāman-hymns chanted at the Soma sacrifice, with the modifications the tunes undergo when applied to texts other than those for which they were originally composed. The Sāman hymnal, as it has come down to us, has evidently passed through a long course of development. The practice of chanting probably goes back to very early times; but the question whether any of the tunes, as given in the Gānas, and which of them, can lay claim to an exceptionally high antiquity will perhaps never receive a satisfactory answer.

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[1] Edited and translated by Dr Röer, in the *Bibl. Ind.* The last chapter of the second book, not being commented upon by Sāyaṇa, is probably a later addition.

[2] Translated by A. B. Keith (1908), who has also published (as an appendix to his ed. of the Aitareyāraṇyaka) the text of adhy. 7-15; whilst W. F. Friedländer edited adhy. 1 and 2 (1900). Cf. Keith, *J.R.As.S.* (1908), p. 363 sqq., where the date of the first and more original portion (adhy. 1-8) is tentatively fixed at 600–550 B.C.

[3] Text, commentary and translation published by E. B. Cowell, in the *Bibl. Ind.* Also a translation by F. Max Müller in *S.B.E.* vol. i.

[4] Cf. A. Hillebrandt, "Ritual-Litteratur," in *Bühler's Grundriss* (1897).

[5] Both works have been published with the commentary of Gārgya Nārāyaṇa, by native scholars, in the *Bibl. Ind.* Also the text of the Gṛihya, with a German translation, by A. Stenzler.

[6] See A. Weber's analysis, *Ind. Studien*, ii. 288 seq. The work was edited by Hillebrandt, in *Bibl. Ind.*

[7] Edited, with a German translation, by H. Oldenberg (*Ind. Stud.* vol. xv.), who also gives an account of the Sāmbavya Gṛihya. An English translation in *S.B.E.* vol. xxix. by the same scholar, who would assign the two sūtra works to Sarvajna Śānkhāyana, whilst the Brāhmaṇa (and Āraṇyaka) seem to him to have been imparted by Kahola Kaushītaki to Guṇākhya Śānkhāyana.

[8] Text with Krishnapaṇḍita's commentary, published at Benares; also critically edited by A. A. Führer (Bombay, 1883); translation by G. Bühler in *S.B.E.* vol. xiv.

[9] Edited, with a French translation, by A. Regnier, in the *Journal Asiatique* (1856–1858); also, with a German translation, by M. Müller (1869).

[10] Edited, with translation, by A. A. Macdonell (2 vols.), in the Harvard Or. series (1904).

[11] Edited R. Meyer (Berlin, 1878).

[12] Edited, with commentary, by A. A. Macdonell (Oxford, 1886).

[13] Burnell, *Ārsheyabrāhmaṇa*, p. xli.

[14] Edited and translated by J. Stevenson (1843); a critical edition, with German translation and glossary, was published by Th. Benfey (1848); also an edition, with the Gānas and Sāyaṇa's commentary, by Satyavrata Sāmāśramī, in the *Bibl. Ind.* in 5 vols.; and Eng. trans. by R. H. T. Griffith (Benares, 1893).

Sāma-veda-brāhmaṇas.

The title of *Brāhmaṇa* is bestowed by the Chhandogas, or followers of the Sāmaveda, on a considerable number of treatises. In accordance with the statements of some later writers, their number was usually fixed at eight; but within the last few years one new Brāhmaṇa has been recovered, while at least two others which are found quoted may yet be brought to light in India. The majority of the Sāmaveda-brāhmaṇas present, however, none of the characteristic features of other works of that class; but they are rather of the nature of sūtras and kindred treatises, with which they probably belong to the same period of literature. Moreover, the contents of these works—as might indeed be expected from the nature of the duties of the priests for whom they were intended—are of an extremely arid and technical character, though they all are doubtless of some importance, either for the textual criticism of the Saṃhitā or on account of the legendary and other information they supply. These works are as follows: (1) the *Tāṇḍya-mahā-* (or *Prauḍha-*) *brāhmaṇa*,[1] or "great" Brāhmaṇa—usually called *Panchaviṃśa-brāhmaṇa* from its "consisting of twenty-five" adhyāyas—which treats of the duties of the udgātars generally, and especially of the various kinds of chants; (2) the *Shaḍviṃśa*,[2] or "twenty-sixth," being a supplement to the preceding work—its last chapter, which also bears the title of *Adbhuta-brāhmaṇa*,[3] or "book of marvels," is rather interesting, as it treats of all manner of portents and evil influences, which it teaches how to avert by certain rites and charms; (3) the *Sāmavidhāna*,[4] analogous to the Ṛigvidhāna, descanting on the magic effects of the various sāmans; (4) the *Ārsheya-brāhmaṇa*, a mere catalogue of the technical names of the sāmans in the order of the Pūrvārchika, known in two different recensions; (5) the *Devatādhyāya*, which treats of the deities of the sāmans; (6) the *Chhāndogya-brāhmaṇa*, the last eight adhyāyas (3–10) of which constitute the important Chhāndogyopanishad;[5] (7) the *Saṃhitopanishad-brāhmaṇa*, treating of various subjects connected with chants; (8) the *Vaṃśa-brāhmaṇa*, a mere list of the Sāmaveda teachers. To these works has to be added the *Jaiminīya-* or *Talavakāra-brāhmaṇa*, which, though as yet only known by extracts,[6] seems to stand much on a level with the Brāhmaṇas of the Ṛik and Yajurveda. A portion of it is the well-known *Kena-* (or *Talavakāra-*) *upanishad*,[7] on the nature of Brahma, as the supreme of deities.

Sāma-veda-sūtras.

If the Sāmaveda has thus its ample share of Brāhmaṇa-literature, though in part of a somewhat questionable character, it is not less richly supplied with sūtra-treatises, some of which probably belong to the oldest works of that class. There are three Śrauta-sūtras, which attach themselves more or less closely to the Panchaviṃśa-brāhmaṇa: Maśaka's *Ārsheya-kalpa*, which gives the beginnings of the sāmans in their sacrificial order, thus supplementing the Ārsheya-brāhmaṇa, which enumerates their technical names; and the Śrauta-sūtras of *Lāṭyāyana*[8] and *Drāhyāyaṇa*, of the Kauthuma and Rāṇāyanīya schools respectively, which differ but little from each other, and form complete manuals of the duties of the udgātars. Another sūtra, of an exegetic character, the *Anupada-sūtra*, likewise follows the Panchaviṃśa, the difficult passages of which it explains. Besides these, there are a considerable number of sūtras and kindred technical treatises bearing on the prosody and phonetics of the sāma-texts. The more important of them are—the *Ṛiktantra*,[9] apparently intended to serve as a Prātiśākhya of the Sāmaveda; the *Nidāna-sūtra*,[10] a treatise on prosody; the *Pushpa-* or *Phulla-sūtra*, ascribed either to Gobhila or to Vararuchi, and treating of the phonetic modifications of the ṛich in the sāmans; and the *Sāmatantra*, a treatise on chants of a very technical nature. Further, two *Gṛihya-sūtras*, belonging to the Sāmaveda, are hitherto known, viz. the *Drāhyāyaṇa-gṛihya*, ascribed to Khrādira, and that of Gobhila[11] (who is also said to have composed a śrauta-sūtra), with a supplement, entitled *Karmapradīpa*, by Kātyāyana. To the Sāmaveda seems further to belong the *Gautama-dharmaśāstra*,[12] composed in sūtras, and apparently the oldest existing compendium of Hindu law.

Saṃhitās of Black Yajurveda.

C. *Yajur-veda.*—This, the sacrificial Veda of the Adhvaryu priests, divides itself into an older and a younger branch, or, as they are usually called, the Black (*kṛishṇa*) and the White (*śukla*) Yajurveda. Tradition ascribes the foundation of the Yajurveda to the sage Vaiśampāyana. Of his disciples three are specially named, viz. Kaṭha, Kalāpin and Yāska Paingi, the last of whom again is stated to have communicated the sacrificial science to Tittiri. How far this genealogy of teachers may be authentic cannot now be determined; but certain it is that in accordance therewith we have three old collections of Yajus-texts, viz. the *Kāṭhaka*,[13] the *Kālāpaka* or *Maitrāyaṇī Saṃhitā*,[14] and the *Taittirīya-saṃhitā*.[15] The Kāṭhaka and Kālāpaka are frequently mentioned together; and the author of the "great commentary" on Pāṇini once remarks that these works were taught in every village. The Kaṭhas and Kālāpas are often referred to under the collective name of Charakas, which apparently means "wayfarers" or itinerant scholars; but according to a later writer (Hemachandra) Charaka is no other than Vaiśampāyana himself, after whom his followers would have been thus called. From the Kaṭhas proper two or three schools seem early to have branched off, the Prāchya- (eastern) Kaṭhas and the Kapishṭhala-Kaṭhas, the text-recension of the latter of whom has recently been discovered in the *Kapishṭhala-kaṭha-saṃhitā*, and probably also the Chārāyaṇīya-Kaṭhas. The Kālāpas also soon became subdivided into numerous different schools. Thus from one of Kalāpin's immediate disciples, Haridru, the Hāridravīyas took their origin, whose text-recension, the *Hāridravika*, is quoted together with the Kāṭhaka as early as in Yāska's Nirukta; but we do not know whether it differed much from the original Kālāpa texts. As regards the Taittirīya-saṃhitā, that collection, too, in course of time gave rise to a number of different schools, the text handed down being that of the Āpastambas; while the contents of another recension, that of the Ātreyas, are known from their Anukramaṇi, which has been preserved.

The four collections of old Yajus texts, so far known to us, while differing more or less considerably in arrangement and verbal points, have the main mass of their textual matter in common. This common matter consists of both sacrificial prayers (yajus) in verse and prose, and exegetic or illustrative prose portions (brāhmaṇa). A prominent feature of the old Yajus texts, as compared with the other Vedas, is the constant intermixture of textual and exegetic portions. The Charakas and Taittirīyas thus do not recognize the distinction between Saṃhitā and Brāhmaṇa in the sense of two separate collections of texts, but they have only a Saṃhitā, or collection, which includes likewise the exegetic or Brāhmaṇa portions. The Taittirīyas seem at last to have been impressed with their want of a separate Brāhmaṇa and to have set about supplying the deficiency in rather an awkward fashion: instead of separating from each other the textual and exegetic portions of their Saṃhitā, they merely added to the latter a supplement (in three books), which shows the same mixed condition, and applied to it the title of *Taittirīya-brāhmaṇa*.[16] But, though the main body of this work is manifestly of a supplementary nature, a portion of it may perhaps be old, and may once have formed part of the Saṃhitā, considering that the latter consists of seven ashṭakas, instead of eight, as this term requires, and that certain essential parts of the ceremonial handled in the Brāhmaṇa are entirely wanting in the Saṃhitā. Attached to this work is the *Taittirīya-āraṇyaka*,[1] in ten books, the first six of which are of a ritualistic nature, while of the remaining books the first three (7-9) form the *Taittirīyopanishad*[2] (consisting of three parts, viz. the Sikshāvallī or Saṃhitopanishad, and the Ānandavallī and Bhṛiguvallī, also called together the Vāruṇī-upanishad), and the last book forms the Nārāyaṇīya- (or Yājñikī-) upanishad.

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[1] Edited, with Sāyaṇa's commentary by Ānandachandra Vedāntavāgīśa, in the *Bibl. Ind.* (1869–1874).

[2] Ed. J. Vidyāsāgara (1881); also, with German translation, K. Klemm (1894).

[3] A. Weber, "Omina et Portenta," *Abhandlungen* of Berlin Royal Academy of Sciences (1858).

[4] The works enumerated under (3), (4), (5), (7), (8) have been edited by A. Burnell; (8) also previously by A. Weber; *Ind. St.* vol. iv.; whilst 7 was translated by Sten Konow (Halle, 1893).

[5] Edited and translated by Dr Röer, *Bibl. Ind.*; also translated by M. Müller, *S.B.E.* vol. i., text, with German translation, by O. v. Böhtlingk (1889).

[6] Given by Burnell (1878), and (with translation) by H. Oertel, *J. Am. Or. S.* vol. xvi. See also Whitney's account of the work, *Proceedings of Am. Or. Soc.* (May 1883).

[7] Transl. by F. M. Müller, *S.B.E.* vol. i.

[8] Ārsheyakalpa, ed. W. Caland (1908); Lāṭyāyana-sūtra, with Agnisvamin's commentary and the *vv. ll.* of the Drāhyāyaṇa-sūtra, by Ānandachandra Vedāntavāgīśa, *Bibl. Ind.* (1872).

[9] Ed. and trans., A. Burnell (Mangalore, 1879).

[10] Two chapters published by A. Weber, *Ind. St.* vol. viii.

[11] Edited, with a commentary, by Chandrakānta Tarkālankāra, *Bibl. Ind.* (1880); also ed. and trans. by F. Knauer (1884–1887); Eng. trans. by H. Oldenberg, *S.B.E.* vol. xxx.

[12] Edited by A. Stenzler; translated by G. Bühler, *S.B.E.* vol. ii.

[13] Books I., II., ed. by L. v. Schröder (Leipzig, 1900, 1909).

[14] Ed. by L. v. Schröder (Leipzig, 1881–1886).

[15] With Sāyaṇa's commentary, by E. Röer, E. B. Cowell, &c., in *Bibl. Ind.*; also, in Roman character, by A. Weber, *Ind. Stud.* xi., xii.

[16] Edited, with Sāyaṇa's commentary, by Rājendralāla Mitra, *Bibl. Ind.*; N. Godabole, Ānand. Ser. (1898).

The *Maitrāyaṇī Saṃhitā*, the identity of which with the original Kālāpaka has been proved pretty conclusively by Dr L. v. Schröder, who attributes the change of name of the Kālāpa-Maitrāyaṇīyas to Buddhist influences, consists of four books, attached to which is the *Maitri-* (or *Maitrāyaṇī*) *upanishad*.[3] The *Kāṭhaka*, on the other hand, consists of five parts, the last two of which, however, are perhaps later additions, containing merely the prayers of the hotar priest, and those used at the horse-sacrifice. There is, moreover, the beautiful *Kaṭha-* or *Kāṭhaka-upanishad*,[4] which is also, and more usually, ascribed to the Atharvaveda, and which seems to show a decided leaning towards Sānkhya-Yoga notions.

Saṃhitā of White Yajurveda.

The defective arrangement of the Yajus texts was at last remedied by a different school of Adhvaryus, the Vājasaneyins. The reputed originator of this school and its text-recension is Yājñavalkya Vājasaneya (son of Vājasani). The result of the rearrangement of the texts was a collection of sacrificial mantras, the *Vājasaneyi-saṃhitā*, and a Brāhmaṇa, the *Śatapatha*. On account of the greater lucidity of this arrangement, the Vājasaneyins called their texts the White (or clear) Yajurveda—the name of Black (or obscure) Yajus being for opposite reasons applied to the Charaka texts. Both the Saṃhitā and Brāhmaṇa of the Vājasaneyins have come down to us in two different recensions, viz. those of the *Mādhyandina* and *Kāṇva* schools; and we find besides a considerable number of quotations from a Vājasaneyaka, from which we cannot doubt that there must have been at least one other recension of the Śatapatha-brāhmaṇa. The difference between the two extant recensions is, on the whole, but slight as regards the subject-matter; but in point of diction it is quite sufficient to make a comparison especially interesting from a philological point of view. Which of the two versions may be the more original cannot as yet be determined; but the phonetic and grammatical differences will probably have to be accounted for by a geographical separation of the two schools rather than by a difference of age. In several points of difference the Kāṇva recension agrees with the practice of the Ṛik-saṃhitā, and there probably was some connexion between the Yajus school of Kāṇvas and the famous family of ṛishis of that name to which the eighth maṇḍala of the Ṛik is attributed.

The *Vājasaneyi-saṃhitā*[5] consists of forty adhyāyas, the first eighteen of which contain the formulas of the ordinary sacrifices. The last fifteen adhyāyas are doubtless a later addition—as may also be the case as regards the preceding seven chapters. The last adhyāya is commonly known under the title of Vājasaneyi-saṃhitā (or Īśāvāsya-) upanishad.[6] Its object seems to be to point out the fruitlessness of mere works, and to insist on the necessity of man's acquiring a knowledge of the supreme spirit. The sacrificial texts of the Adhvaryus consist, in about equal parts, of verses (ṛich) and prose formulas (yajus). The majority of the former occur likewise in the Ṛik-saṃhitā, from which they were doubtless extracted. Not infrequently, however, they show considerable discrepancies of reading, which may be explained partly from a difference of recension and partly as the result of the adaptation of these verses to their special sacrificial purpose. As regards the prose formulas, though only a few of them are actually referred to in the Ṛik, it is quite possible that many of them may be of high antiquity.

Brāhmaṇa of White Yajurveda

The *Śatapatha-brāhmaṇa*,[7] or Brāhmaṇa of a hundred paths, derives its name from the fact of its consisting of 100 lectures (adhyāya), which are divided by the Mādhyandinas into fourteen, by the Kāṇvas into seventeen books (kāṇḍa). The first nine books of the former, corresponding to the first eleven of the Kāṇvas, and consisting of sixty adhyāyas, form a kind of running commentary on the first eighteen books of the Vāj.-Saṃhitā; and it has been plausibly suggested by Professor Weber that this portion of the Brāhmaṇa may be referred to in the Mahābhāshya on Pāṇ. iv. 2, 60, where a Śatapatha and a Shashṭi-patha (*i.e.* "consisting of 60 paths") are mentioned together as objects of study, and that consequently it may at one time have formed an independent work. This view is also supported by the circumstance that of the remaining five books (10-14) of the Mādhyandinas the third is called the middle one (madhyama); while the Kāṇvas apply the same epithet to the middlemost of the five books (12-16) preceding their last one. This last book would thus seem to be treated by them as a second supplement, and not without reason, as it is of the Upanishad order, and bears the special title of *Bṛihad-* (great) *āraṇyaka*;[8] the last six chapters of which are the Bṛihadāraṇyaka-upanishad,[9] the most important of all Upanishads. Except in books 6-10 (M.), which treat of the construction of fire-altars, and recognize the sage Sāṇḍilya as their chief authority, Yājñavalkya's opinion is frequently referred to in the Śatapatha as authoritative. This is especially the case in the later books, part of the Bṛihad-āraṇyaka being even called Yājñavalkīya-kāṇḍa. As regards the age of the Śatapatha, the probability is that the main body of the work is considerably older than the time of Pāṇini, but that some of its latter parts were considered by Pāṇini's critic Kātyāyana to be of about the same age as, or not much older than, Pāṇini. Even those portions had probably been long in existence before they obtained recognition as part of the canon of the White Yajus.

The contemptuous manner in which the doctrines of the Charaka-adhvaryus are repeatedly animadverted upon in the Śatapatha betrays not a little of the *odium theologicum* on the part of the divines of the Vājasaneyins towards their brethren of the older schools. Nor was their animosity confined to mere literary warfare, but they seem to have striven by every means to gain ascendancy over their rivals. The consolidation of the Brāhmanical hierarchy and the institution of a common system of ritual worship, which called forth the liturgical Vedic collections, were doubtless consummated in the so-called Madhya-deśa, or "midland," lying between the Sarasvatī and the confluence of the Yamunā and Gangā; and more especially in its western part, the Kuru-kshetra, or land of the Kurus, with the adjoining territory of the Panchālas, between the Yamunā and Gangā. From thence the original schools of Vaidik ritualism gradually extended their sphere over the adjacent parts. The Charakas seem for a long time to have held sway in the western and north-western regions; while the Taittirīyas in course of time spread over the whole of the peninsula south of the Narmadā (Nerbudda), where their ritual has remained pre-eminently the object of study till comparatively recent times. The Vājasaneyins, on the other hand, having first gained a footing in the lands on the lower Ganges, chiefly, it would seem, through the patronage of King Janaka of Videha, thence gradually worked their way westwards, and eventually succeeded in superseding the older schools north of the Vindhya, with the exception of some isolated places where even now families of Brāhmans are met with which profess to follow the old Saṃhitās.

Sutras of Yajurveda.

In *Kalpa-sūtras* the Black Yajurveda is particularly rich; but, owing to the circumstances just indicated, they are almost entirely confined to the Taittirīya school. The only Śrauta-sūtra of a Charaka school which has hitherto been recovered is that of the Mānavas, a subdivision of the Maitrāyaṇīyas. The *Mānava-śrauta-sūtra*[10] seems to consist of eleven books, the first nine of which treat of the sacrificial ritual, while the tenth contains the Śulva-sūtra; and the eleventh is made up of a number of supplements (*pari-śishṭa*). The *Mānava-gṛihya-sūtra*[11] is likewise in existence; but so far nothing is known, save one or two quotations, of a *Mānava-dharma-sūtra*, the discovery of which might be expected to solve some important questions regarding the development of Indian law. Of sūtra-works belonging to the Kaṭhas, a single treatise, the (*Chārāyaṇīya-*) *Kāṭhaka-gṛihya-sūtra*, is known; while Dr Jolly considers the *Vishṇu-smṛiti*,[12] a compendium of law, composed in mixed sūtras and ślokas, to be nothing but a Vaishṇava recast of the Kāṭhaka-dharma-sūtra, which, in its original form, seems no longer to exist. As regards the Taittirīyas, the Kalpa-sūtra most widely accepted among them was that of Āpastamba, to whose school, as we have seen, was also due our existing recension of the Taittirīya-saṃhitā. The *Āpastamba-kalpa-sūtra* consists of thirty *praśna* (questions); the first twenty-five of these constitute the Śrauta-sūtra;[13] 26 and 27 the Gṛihya-sūtra;[14] 28 and 29 the Dharma-sūtra;[15] and the last the Śulva-sūtra. Professor Bühler has tried to fix the date of this work somewhere between the 5th and 3rd centuries B.C.; but it can hardly yet be considered as definitely settled. Considerably more ancient than this work are the

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[1] Ed. R. Mitra, *Bibl. Ind.*; H. N. Apte, Ānand. Ser. (1898).

[2] Trans. by F. M. Müller, *S.B.E.* vol. xv.

[3] Text and translation published by E. B. Cowell, *Bibl. Ind.* Also trans. by F. M. Müller, *S.B.E.* vol. xv.

[4] Text, commentary and translation published by E. Röer, *Bibl. Ind.*; also translation by F. M. Müller, *S.B.E.* vol. xv., and others.

[5] Edited in the Mādhyandina recension, with the commentary of Mahīdhara, and the *vv. ll.* of the Kāṇva text, by A. Weber (1849); trans. by R. H. T. Griffith (Benares, 1899).

[6] Translation by E. Röer, *Bibl. Ind.*; by F. M. Müller, *S.B.E.* vol. i.

[7] Edited by A. Weber, who also translated the first chapter into German. English translation (5 vols.) by J. Eggeling, in *S.B.E.*

[8] The text, with Śankara's commentary, and an English translation, published by E. Röer, *Bibl. Ind.*

[9] Trans. by F. M. Müller, *S.B.E.* vol. xv., and others.

[10] See P. v. Bradke, *Z.D.M.G.* vol. xxxvi. A MS. of a portion of the Śrauta-sūtra, with the commentary of the famous Mīmāmsist Kumārila, has been photo-lithographed by the India Office, under Goldstücker's supervision.

[11] Edited by F. Knauer (Leipzig, 1897).

[12] Edited and translated by J. Jolly.

[13] Edited by R. Garbe, in *Bibl. Ind.*

[14] Ed. M. Winternitz (Vienna, 1887); trans. H. Oldenberg, *S.B.E.* vol. xxx.

[15] G. Bühler has published the text with extracts from Haradatta's commentary, Bombay Sansk. Ser.; also a trans. in *S.B.E.*

Baudhāyana-kalpa-sūtra,[1] which consists of the same principal divisions, and the *Bhāradvāja-sūtra*, of which, however, only a few portions have as yet been discovered. The *Hiranyakeśi-sūtra*,[2] which is more modern than that of Āpastamba, from which it differs but little, is likewise fragmentary, as is also the Vaikhānasa-sūtra;[3] while several other Kalpa-sūtras, especially that of Laugākshi, are found quoted. The recognized compendium of the White Yajus ritual is the *Śrauta-sūtra* of Kātyāyana,[4] in twenty-six adhyāyas. This work is supplemented by a large number of secondary treatises, likewise attributed to Kātyāyana, among which may be mentioned the *Charaṇa-vyūha*,[5] a statistical account of the Vedic schools, which unfortunately has come down to us in a very unsatisfactory state of preservation. A manual of domestic rites, closely connected with Kātyāyana's work, is the *Kātiya-gṛihya-sūtra*,[6] ascribed to Pāraskara. To Kātyāyana we further owe the *Vājasaneyi-prātiśākhya*,[7] and a catalogue (*anukramaṇī*) of the White Yajus texts. As regards the former work, it is still doubtful whether (with Weber) we have to consider it as older than Pāṇini, or whether (with Goldstücker and M. Müller) we are to identify its author with Pāṇini's critic. The only existing Prātiśākhya[8] of the Black Yajus belongs to the Taittirīyas. Its author is unknown, and it confines itself entirely to the Taittirīya-saṃhitā, to the exclusion of the Brāhmaṇa and Āraṇyaka.

Atharva-veda-saṃhitā.

D. *Atharva-veda.*—The Atharvan was the latest of Vedic collections to be recognized as part of the sacred canon. That it is also the youngest Veda is proved by its language, which both from a lexical and a grammatical point of view, marks an intermediate stage between the main body of the Ṛik and the Brāhmaṇa period. In regard also to the nature of its contents, and the spirit which pervades them, this Vedic collection occupies a position apart from the others. Whilst the older Vedas seem clearly to reflect the recognized religious notions and practices of the upper, and so to speak, respectable classes of the Āryan tribes, as jealously watched over by a priesthood deeply interested in the undiminished maintenance of the traditional observances, the fourth Veda, on the other hand, deals mainly with all manner of superstitious practices such as have at all times found a fertile soil in the lower strata of primitive and less advanced peoples, and are even apt, below the surface, to maintain their tenacious hold on the popular mind in comparatively civilized communities. Though the constant intermingling with the aboriginal tribes may well be believed to have exercised a deteriorating influence on the Vedic people in this respect, it can scarcely be doubted that superstitious practices of the kind revealed by the Atharvan and the tenth book of the Ṛik must at all times have obtained amongst the Āryan people, and that they only came to the surface when they received the stamp of recognized forms of popular belief by the admission of these collections of spells and incantations into the sacred canon. If in this phase of superstitious belief the old gods still find a place, their character has visibly changed so as to be more in accordance with those mystic rites and magic performances and the part they are called upon to play in them, as the promoters of the votary's cabalistic practices and the averters of the malicious designs of mortal enemies and the demoniac influences to which he would ascribe his fears and failures as well as his bodily ailments. The fourth Veda may thus be said to supplement in a remarkable manner the picture of the domestic life of the Vedic Āryan as presented in the Gṛihya-sūtras or house-rules; for whilst these deal only with the orderly aspects of the daily duties and periodic observances in the life of the respectable householder, the Atharvaveda allows us a deep insight into "the obscurer relations and emotions of human life"; and, it may with truth be said that "the literary diligence of the Hindus has in this instance preserved a document of priceless value for the institutional history of early India as well as for the ethnological history of the human race" (M. Bloomfield). It is worthy of note that the Atharvaveda is practically unknown in the south of India.[9]

This body of spells and hymns is traditionally associated with two old mythic priestly families, the Atharvans and Angiras, their names, in the plural, serving either singly or combined (Atharvāngirasas) as the oldest appellation of the collection. The two families or classes of priests are by tradition connected with the service of the sacred fire; but whilst the Atharvans seem to have devoted themselves to the auspicious aspects of the fire-cult and the performance of propitiatory rites, the Angiras, on the other hand, are represented as having been mainly engaged in the uncanny practices of sorcery and exorcism. Instead of the Atharvans, another mythic family, the Bhṛigus, are similarly connected with the Angiras (Bhṛigvangirasas) as the depositaries of this mystic science. In course of time the lore of the Atharvans came also to have applied to it the title of *Brahmaveda*; a designation which was apparently meant to be understood both in the sense of the Veda of the Brahman priest or superintendent of the sacrifice, and in that of the lore of the Brahma or sacred (magic) word, and the supreme deity it is supposed to embody. The current text of the *Atharva-saṃhitā*[10]—apparently the recension of the Śaunaka school—consists of some 750 different pieces, about five-sixths of which is in various metres, the remaining portion being in prose. The whole mass is divided into twenty books. The principle of distribution is for the most part a merely formal one, in books i.-xiii. pieces of the same or about the same number of verses being placed together in the same book. The next five books, xiv.-xviii., have each its own special subject: xiv. treats of marriage and sexual union; xv., in prose, of the Vrātya, or religious vagrant; xvi. consists chiefly of prose formulas of conjuration; xvii. of a lengthy mystic hymn; and xviii. contains all that relates to death and funeral rites. Of the last two books no account is taken in the Atharva-prātiśākhya, and they indeed stand clearly in the relation of supplements to the original collection. The nineteenth book evidently was the result of a subsequent gleaning of pieces similar to those of the earlier books, which had probably escaped the collectors' attention; while the last book, consisting almost entirely of hymns to Indra, taken from the Ṛik-saṃhitā, is nothing more than a liturgical manual of recitations and chants required at the Soma sacrifice; its only original portion being the ten so-called *kuntāpa* hymns (127-136), consisting partly of laudatory recitals of generous patrons of sacrificial priests and partly of riddles and didactic subjects.

The Atharvan has come down to us in a much less satisfactory state of preservation than any of the other Saṃhitās, and its interpretation, which offers considerable difficulties on account of numerous popular and out-of-the-way expressions, has so far received comparatively little aid from native sources. Less help, in this respect, than might have been expected, is afforded by a recently published commentary professing to have been composed by Sāyaṇa Āchārya; serious doubts have indeed been thrown on the authenticity of its ascription to the famous Vedic exegetic. Of very considerable importance, on the other hand, was the discovery in Kashmir of a second recension of the Atharva-saṃhitā, contained in a single birch-bark MS., written in the Śāradā character, and lately made available by an excellent chromo-photographic reproduction. This new recension,[11] ascribed in the colophons of the MS. to the Paippalāda school, consists likewise of twenty books (kāṇḍa), but both in textual matter and in its arrangement it differs very much from the current text. A considerable portion of the latter, including the whole of the eighteenth book, is wanting; while the hymns of the nineteenth book are for the most part found also in this text, though not as a separate book, but scattered over the whole collection. The twentieth book is wanting, with the exception of a few of the verses not taken from the Ṛik. As a set-off to these shortcomings the new version offers, however, a good deal of fresh matter, amounting to about one-sixth of the whole. From the Mahābhāshya and other works quoting as the beginning of the Atharva-saṃhitā a verse that coincides with the first verse of the sixth hymn of the current text, it has long been known that at least one other recension must have existed; but the first leaf of the Kashmir MS. having been lost, it cannot be determined whether the new recension (as seems all but certain) corresponds to the one referred to in those works.

Atharva-veda-brāhmaṇa.

The only Brāhmaṇa of the Atharvan, the *Gopatha-brāhmaṇa*,[12] is doubtless one of the most modern and least important works of its class. It consists of two parts, the first of which contains cosmogonic speculations, interspersed with legends, mostly adapted from other Brāhmaṇas, and general instructions on religious duties and observances; while the second part treats, in a very desultory manner, of various points of the sacrificial ceremonial.

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[1] The Śulva-sūtra has been published, with the commentary of Kapardisvāmin, and a translation by G. Thibaut, in the *Benares Pandit* (1875). The Dharma-sūtra has been edited by E. Hultzsch (Leipzig, 1884), and translated by G. Bühler, *S.B.E.* xiv.

[2] The H. Gṛihya-sūtra, ed. J. Kirste (Vienna, 1889); trans. H. Oldenberg, *S.B.E.* vol. xxx.

[3] An account of the Vaikh. Dharmasūtra given by T. Bloch (Vienna, 1896).

[4] Edited by A. Weber, 1858.

[5] Weber, *Ind. Stud.* iii.

[6] Text and German translation by A. Stenzler.

[7] Edited, with Uvaṭa's commentary, and a German translation, by A. Weber, *Ind. Stud.* iv.; another ed. in Benares Sansk. Ser. (1888).

[8] The work has been published by W. D. Whitney, with a translation and a commentary by an unknown author, called Tribhāshyaratna, *i.e.* "jewel of the three commentaries," it being founded on three older commentaries by Vararuchi (? Kātyāyana), Māhisheya and Ātreya.

[9] A. Burnell, *Classif. Index of Tanjore Sansk. MSS.* p. 37.

[10] Edited by Professors Roth and Whitney (1856); with Sāyaṇa's commentary, by Shankar P. Pandit (4 vols., Bombay, 1895–1898). Index verborum, by Whitney, in *J. Am. Or. S.* vol. xii., Eng. trans. by R. H. T. Griffith (in verse) (2 vols., Benares, 1897); by W. D. Whitney (with a critical and exegetical commentary), revised and edited by Ch. R. Lanman (2 vols., Harvard Or. Ser., 1905); and (with some omissions) by M. Bloomfield, *S.B.E.* vol. xlii.; cf. also Bloomfield, "The Atharvaveda," in *Bühler's Encycl.* (1899).

[11] The first account of a copy of it was given by Professor R. v. Roth, in his academic dissertation, "Der Atharvaveda in Kaschmir" (1875). The reproduction on 544 plates, edited by M. Bloomfield and R. Garbe (Baltimore, 1901).

[12] Edited in the *Bibl. Ind.* by Rājendralāla Mitra.

Atharva-veda-sūtras.

The Kalpa-sūtras belonging to this Veda comprise both a manual of śrauta rites, the *Vaitāna-sūtra*,[1] and a manual of domestic rites, the *Kauśika-sūtra*.[2] The latter treatise is not only the more interesting of the two, but also the more ancient, being actually quoted in the other. The teacher Kauśika is repeatedly referred to in the work on points of ceremonial doctrine. Connected with this Sūtra are upwards of seventy *Pariśishtas*,[3] or supplementary treatises, mostly in metrical form, on various subjects bearing on the performance of grihya rites. The last sūtra-work to be noticed in connexion with this Veda is the *Śaunakīyā Chaturādhyāyikā*,[4] being a Prātiśākhya of the Atharva-saṃhitā, so called from its consisting of four lectures (adhyāya). Although Śaunaka can hardly be credited with being the actual author of the work, considering that his opinion is rejected in the only rule where his name appears, there is no reason to doubt that it chiefly embodies the phonetic theories of that teacher, which were afterwards perfected by members of his school. Whether this Śaunaka is identical with the writer of that name to whom the final redaction of the Śākalaprātiśākhya of the Ṛik is ascribed is not known; but it is worthy of note that on at least two points where Śākalya is quoted by Pāṇini, the Chaturādhyāyikā seems to be referred to rather than the Ṛik-prātiśākhya. Śaunaka is quoted once in the Vājasaneyi-prātiśākhya; and it is possible that Kātyāyana had the Chaturādhyāyikā in view, though his reference does not quite tally with the respective rule of that work.

Upanishads.

Another class of writings already alluded to as traditionally connected with the Atharvaveda are the numerous *Upanishads*[5] which do not specially attach themselves to one or other of the Saṃhitās or Brāhmaṇas of the other Vedas. The Ātharvaṇa-upanishads, mostly composed in ślokas, may be roughly divided into two classes, viz. those of a purely speculative or general pantheistic character, treating chiefly of the nature of the supreme spirit, and the means of attaining to union therewith, and those of a sectarian tendency. Of the former category, a limited number—such as the Praśna, Muṇḍaka, and Māṇḍūkya-upanishads—have probably to be assigned to the later period of Vedic literature; whilst the others presuppose more or less distinctly the existence of some fully developed system of philosophy, especially the Vedānta or the Yoga. The sectarian Upanishads, on the other hand—identifying the supreme spirit either with one of the forms of Vishṇu (such as the Nārāyaṇa, Nṛisiṃha-tāpanīya, Rāma-tāpanīya, Gopāla-tāpanīya Upanishads), or with Śiva (*e.g.* the Rudropanishad), or with some other deity—belong to post-Vedic times.

2. The Classical Period

The *Classical Literature of India* is almost entirely a product of artificial growth, in the sense that its vehicle was not the language of the general body of the people, but of a small and educated class. It would scarcely be possible, even approximately, to fix the time when the literary idiom ceased to be understood by the common people. We only know that in the 3rd century B.C. there existed several dialects in different parts of northern India which differed considerably from the Sanskrit; and Buddhist tradition states that Gautama Śākyamuni himself, in the 6th century B.C., used the local dialect of Magadha (Behar) for preaching his new doctrine. Not unlikely, indeed, popular dialects, differing perhaps but slightly from one another, may have existed as early as the time of the Vedic hymns, when the Indo-Aryans, divided into clans and tribes, occupied the Land of the Seven Rivers; but such dialects must have sprung up after the extension of the Aryan sway and language over the whole breadth of northern India. But there is no reason why, even with the existence of local dialects, the literary language should not have kept in touch with the people in India, as elsewhere, save for the fact that from a certain time that language remained altogether stationary, allowing the vernacular dialects more and more to diverge from it. Although linguistic research had been successfully carried on in India for centuries, the actual grammatical fixation of Sanskrit seems to have taken place about contemporaneously with the first spread of Buddhism; and indeed that popular religious movement undoubtedly exercised a powerful influence on the linguistic development of India.

A. *Poetical Literature.*

The national epics.

1. *Epic Poems.*—The Hindus, like the Greeks, possess two great national epics, the *Mahābhārata* and the *Rāmāyaṇa*. The *Mahābhārata*,[6] *i.e.* "the great (poem or tale) of the Bhāratas," is not so much a uniform epic poem as a miscellaneous collection of poetry, consisting of a heterogeneous mass of legendary and didactic matter, worked into and round a central heroic narrative. The authorship of this work is aptly attributed to Vyāsa, "the arranger," the personification of Indian diaskeuasis. Only the bare outline of the leading story can here be given.

In the royal line of Hastināpura (the ancient Delhi)—claiming descent from the moon, and hence called the Lunar race (soma-vaṃśa), and counting among its ancestors King Bharata, after whom India is called Bhārata-varsha (land of the Bhāratas)—the succession lay between two brothers, when Dhṛitarāshṭra, the elder, being blind, had to make way for his brother Pāṇḍu. After a time the latter retired to the forest to pass the remainder of his life in hunting; and Dhṛitarāshṭra assumed the government, assisted by his uncle Bhīshma, the Nestor of the poem. After some years Pāṇḍu died, leaving five sons, viz. Yudhishṭhira, Bhīma and Arjuna by his chief wife Kuntī, and the twins Nakula and Sahadeva by Mādrī. The latter having burnt herself along with her dead husband, Kuntī returned with the five princes to Hastināpura, and was well received by the king, who offered to have his nephews brought up together with his own sons, of whom he had a hundred, Duryodhana being the eldest. From their great-grandfather Kuru both families are called *Kauravas*; but for distinction that name is more usually applied to the sons of Dhṛitarāshṭra, while their cousins, as the younger line, are named, after their father, *Pāṇḍavas*. The rivalry and varying fortunes of these two houses form the main plot of the great epopee. The Pāṇḍu princes soon proved themselves greatly superior to their cousins; and Yudhishṭhira, the eldest of them all, was to be appointed heir-apparent. But, by his son's advice, the king, good-natured but weak, induced his nephews for a time to retire from court and reside at a house where the unscrupulous Duryodhana meant to destroy them. They escaped, however, and passed some time in the forest with their mother. Here Draupadī, daughter of King Drupada of Panchāla, won by Arjuna in open contest, became the wife of the five brothers. On that occasion they also met their cousin, Kuntī's nephew, the famous Yādava prince Kṛishṇa of Dvārakā, who ever afterwards remained their faithful friend and confidential adviser. Dhṛitarāshṭra now resolved to divide the kingdom between the two houses; whereupon the Pāṇḍavas built for themselves the city of Indraprastha (on the site of the modern Delhi). After a time of great prosperity, Yudhishṭhira, in a game of dice, lost everything to Duryodhana, when it was settled that the Pāṇḍavas should retire to the forest for twelve years, but should afterwards be restored to their kingdom if they succeeded in passing an additional year in disguise, without being recognized by any one. During their forest-life they met with many adventures, among which may be mentioned their encounter with King Jayadratha of Chedi, who had carried off Draupadī from their hermitage. After the twelfth year had expired they leave the forest, and, assuming various disguises, take service at the court of King Virāṭa of Matsya. Here all goes well for a time till the queen's brother Kīchaka, a great warrior and commander of the royal forces, falls in love with Draupadī, and is slain by Bhīma. The Kauravas, profiting by Kīchaka's death, now invade the Matsyan kingdom, when the Pāṇḍavas side with King Virāṭa, and there ensues, on the field of Kurukshetra, during eighteen days, a series of fierce battles, ending in the annihilation of the Kauravas. Yudhishṭhira now at last becomes yuva-rāja, and eventually king—Dhṛitarāshṭra having resigned and retired with his wife and Kuntī to the forest, where they soon after perish in a conflagration. Learning also the death of Kṛishṇa, Yudhishṭhira himself at last becomes tired of life and resigns his crown; and the five princes, with their faithful wife, and a dog that joins them, set out for Mount Meru, to seek admission to Indra's heaven. On the way one by one drops off, till Yudhishṭhira alone, with the dog, reaches the gate of heaven; but, the dog being refused admittance, the king declines entering without it, when the dog turns out to be no other than the god of Justice himself, having assumed that form to test Yudhishṭhira's constancy. But, finding neither his wife nor his brothers in heaven, and being told that they are in the nether world to expiate their sins, the king insists on sharing their fate, when this, too, proves a trial, and they are all reunited to enjoy perpetual bliss.

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[1] Text and a German translation published by R. Garbe (1878); German trans. by W. Caland (1910).

[2] This difficult treatise has been published with extracts from commentaries by Professor Bloomfield. Two sections of it had been printed and translated by A. Weber, "Omina et Portenta" (1859).

[3] These tracts have been edited by G. M. Bolling and J. v. Negelein, part i. (1909).

[4] Edited and translated by W. D. Whitney.

[5] For a full list of existing translations of and essays on the Upanishads, see Introd. to Max Müller's "Upanishads," *S.B.E.* i. Cf. also P. Deussen, *Sechzig Upanishads* (1897).

[6] Three complete Indian editions, the handiest in 4 vols., including the Harivaṃśa (Calcutta, 1834–1839); a Bombay edition, with Nīlakaṇṭha's commentary (1863); and a third, in Telugu characters, containing the Southern recension (Madras, 1855–1860). Another Southern edition, in Nāgarī, is now appearing at Bombay, edited by Krishnacharya and Vyasacharya of Kumbakonam. An English translation has been brought out at Calcutta by Pratap Chundra Roy (1883–1894); and another by M. N. Dutt (5 vols., Calcutta, 1896); whilst numerous episodes have been printed and translated by European scholars. For a critical analysis of this epic consult A. Holtzmann, *Das Mahābhārata* (4 vols., Kiel, 1892–1895); W. Hopkins, *The Great Epic of India* (New York, 1902).

The complete work consists of upwards of 100,000 couplets—its contents thus being nearly eight times the bulk of the *Iliad* and *Odyssey* combined. It is divided into eighteen books, and a supplement, entitled Harivaṃśa, or genealogy of the god Hari (Kṛishṇa-Vishṇu). In the introduction, Vyāsa, being about to dictate the poem, is made to say (i. 81) that so far he and some of his disciples knew 8800 couplets; and farther on (i. 101) he is said to have composed the collection relating to the Bhāratas (*bhārata-saṃhitā*), and called the *Bhāratam*, which, not including the episodes, consisted of 24,000 ślokas. Now, as a matter of fact, the portion relating to the feud of the rival houses constitutes somewhere between a fourth and a fifth of the work; and it is by no means improbable that this portion once formed a separate poem, called the *Bhārata*. But, whether the former statement is to be understood as implying the existence, at a still earlier time, of a yet shorter version of about one-third of the present extent of the leading narrative, cannot now be determined. While some of the episodes are so loosely connected with the story as to be readily severed from it, others are so closely interwoven with it that their removal would seriously injure the very texture of the work. This, however, only shows that the original poem must have undergone some kind of revision, or perhaps repeated revisions. That such has indeed taken place, at the hand of Brāhmans, for sectarian and caste purposes, cannot be doubted. According to Lassen's opinion,[1] which has been very generally accepted by scholars, the main story of the poem would be based on historical events, viz. on a destructive war waged between the two neighbouring peoples of the Kurus and Panchālas, who occupied the western and eastern parts of the Madhyadeśa (or "middle land" between the Ganges and Jumna) respectively, and ending in the overthrow of the Kuru dynasty. On the original accounts of these events—perhaps handed down in the form of lays or sagas—the Pāṇḍava element would subsequently have been grafted as calculated to promote the class interests of the Brāhmanical revisers. It is certainly a strange coincidence that the five Pāṇḍava princes should have taken to wife the daughter of the king of the Panchālas, and thus have linked their fortunes to a people which is represented, in accordance with its name, to have consisted of five (pancha) tribes.

The earliest direct information regarding the existence of epic poetry in India is contained in a passage of Dion Chrysostom (*c.* A.D. 80), according to which "even among the Indians, they say, Homer's poetry is sung, having been translated by them into their own dialect and tongue"; and "the Indians are well acquainted with the sufferings of Priam, the lamentations and wails of Andromache and Hecuba, and the prowess of Achilles and Hector." Now, although these allusions would suit either poem, they seem to correspond best to certain incidents in the *Mahābhārata*, especially as no direct mention is made of a warlike expedition to a remote island for the rescue of an abducted woman, the resemblance of which to the Trojan expedition would naturally have struck a Greek becoming acquainted with the general outline of the *Rāmāyaṇa*. Whence Dion derived his information is not known; but as many leading names of the Mahābhārata and even the name of the poem itself[2] are mentioned in Pāṇini's grammatical rules, not only must the Bhārata legend have been current in his time (? *c.* 400 B.C.), but most probably it existed already in poetical form, as undoubtedly it did at the time of Patanjali, the author of the "great commentary" on Pāṇini (*c.* 150 B.C.). The great epic is also mentioned, both as *Bhārata* and *Mahābhārata*, in the *Gṛihya-sūtra* of Āśvalāyana, whom Lassen supposes to have lived about 350 B.C. Nevertheless it must remain uncertain whether the poem was then already in the form in which we now have it, at least as far as the leading story and perhaps some of the episodes are concerned, a large portion of the episodical matter being clearly of later origin. It cannot, however, be doubted that long before that time heroic song had been diligently cultivated in India at the courts of princes and among Kshatriyas, the knightly order, generally. In the *Mahābhārata* itself the transmission of epic legend is in some way connected with the Sūtas, a social class which, in the caste-system, is defined as resulting from the union of Kshatriya men with Brāhmaṇa women, and which supplied the office of charioteers and heralds, as well as (along with the Māgadhas) that of professional minstrels. Be this as it may, there is reason to believe that, as Hellas had her *ἀοιδοί* who sang the *κλέα ἀνδρῶν*, and Iceland her skalds who recited favourite sagas, so India had from olden times her professional bards, who delighted to sing the praises of kings and inspire the knights with warlike feelings. If in this way a stock of heroic poetry had gradually accumulated which reflected an earlier state of society and manners, we can well understand why, after the Brāhmanical order of things had been definitely established, the priests should have deemed it desirable to subject these traditional memorials of Kshatriya chivalry and prestige to their own censorship, and adapt them to their own canons of religious and civil law. Such a revision would doubtless require considerable skill and tact; and if in the present version of the work much remains that seems contrary to the Brāhmanical code and pretensions—*e.g.* the polyandric union of Draupadī and the Pāṇḍu princes—the reason probably is that such features were too firmly rooted in the popular tradition to be readily eliminated; and all the revisers could do was to explain them away as best they could. Thus Draupadī's abnormal position is actually accounted for in five different ways, one of these representing it as an act of duty and filial obedience on the part of Arjuna who, on bringing home his fair prize and announcing it to his mother, is told by her, before seeing what it is, to share it with his brothers. Nay, it has even been seriously argued that the Brāhmanical editors have completely changed the traditional relations of the leading characters of the story. For, although the Pāṇḍavas and their cousin Kṛishṇa are constantly extolled as models of virtue and goodness, while the Kauravas and their friend Karṇa—a son of the sun-god, borne by Kuntī before her marriage with Pāṇḍu, and brought up secretly as the son of a Sūta—are decried as monsters of depravity, these estimates of the heroes' characters are not unfrequently belied by their actions—especially the honest Karṇa and the brave Duryodhana (*i.e.* "the bad fighter," but formerly called Suyodhana, "the good fighter") contrasting not unfavourably with the wily Kṛishṇa and the cautious and somewhat effeminate Yudhishṭhira. These considerations, coupled with certain peculiarities on the part of the Kauravas, apparently suggestive of an original connexion of the latter with Buddhist institutions, have led Dr Holtzmann to devise an ingenious theory, viz. that the traditional stock of legends was first worked up into a connected narrative by some Buddhist poet—most likely at the time of the emperor Aśoka (*c.* 250 B.C.), whom the Kaurava hero Suyodhana might even seem to have been intended to represent—and that this poem, showing a decided predilection for the Kuru party as the representatives of Buddhist principles, was afterwards revised in a contrary sense, at the time of the Brāhmanical reaction, by votaries of Vishṇu, when the Buddhist features were generally modified into Śaivite tendencies, and prominence was given to the divine nature of Kṛishṇa, as an incarnation of Vishṇu. As this theory would, however, seem to involve the Brāhmanical revision of the poem having taken place subsequent to the decline of Buddhist predominance, it would shift the completion of the work to a considerably later date than would be consistent with other evidence. From inscriptions we know that by the end of the 5th century A.D. the Mahābhārata was appealed to as an authority on matters of law, and that its extent was practically what it now is, including its supplement, the Harivaṃśa. Indeed, everything seems to point to the probability of the work having been complete by about A.D. 200. But, whilst Bhārata and Kuru heroic lays may, and probably do, go back to a much earlier age, it seems hardly possible to assume that the Pāṇḍava epic in its present form can have been composed before the Greek invasion of India, or about 300 B.C. Moreover, it is by no means impossible that the epic narrative was originally composed—as some other portions of the works are—in prose, either continuous or mixed with snatches of verse. Nay, in the opinion of some scholars, this poem (as well as the Rāmāyaṇa) may even have been originally composed in some popular dialect, which would certainly best account for the irregular and apparently prākritic or dialectic forms in which these works abound. The leading position occupied in the existing epic by Kṛishṇa (whence it is actually called *kārshṇa veda*, or the veda of Kṛishṇa), and the Vaishṇava spirit pervading it, make it very probable that it assumed its final form under the influence of the Bhāgavata sect with whom Vāsudeva (Kṛishṇa), originally apparently a venerated local hero, came to be regarded as a veritable god, and incarnation of Vishṇu. Its culminating point this sectarian feature attains in the *Bhagavad-gītā* (*i.e.* the upanishad), "sung by the holy one"—the famous theosophic episode, in which Kṛishṇa, in lofty and highly poetic language, expounds the doctrine of faith (bhakti) and claims adoration as the incarnation of the supreme spirit. Of the purely legendary matter incorporated with the leading story of the poem, not a little, doubtless, is at least as old as the latter itself. Some of these episodes—especially the well-known story of Nala and Damayantī, and the touching legend of Sāvitrī—form themselves little epic gems of considerable poetic value.

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[1] Lassen, *Indische Altertumskunde*, i. 733 sqq.

[2] Viz. as an adj., apparently with "war" or "poem" understood.

The *Rāmāyaṇa, i.e.* poem "relating to Rāma," is ascribed to the poet Vālmīki; and, allowance being made for some later additions, the poem indeed presents the appearance of being the work of an individual genius. In its present form it consists of some 24,000 ślokas, or 48,000 lines of sixteen syllables, divided into seven books.

(I.) King Daśaratha of Kośala, reigning at Ayodhyā (Oudh), has four sons borne him by three wives, viz. Rāma, Bharata and the twins Lakshmaṇa and Śatrughna. Rāma, by being able to bend an enormous bow, formerly the dreaded weapon of the god Rudra, wins for a wife Sītā, daughter of Janaka, king of Videha (Tirhut). (II.) On his return to Ayodhyā he is to be appointed heir-apparent (yuva-rāja, *i.e.* juvenis rex); but Bharata's mother persuades the king to banish his eldest son for fourteen years to the wilderness, and appoint her son instead. Separation from his favourite son soon breaks the king's heart; whereupon the ministers call on Bharata to assume the reins of government. He refuses, however, and, betaking himself to Rāma's retreat on the Chitrakūṭa mountain (in Bundelkhund), implores him to return; but, unable to shake Rāma's resolve to complete his term of exile, he consents to take charge of the kingdom in the meantime. (III.) After a ten years' residence in the forest, Rāma attracts the attention of a female demon (rākshasī); and, infuriated by the rejection of her advances, and by the wounds inflicted on her by Lakshmaṇa, who keeps Rāma company, she inspires her brother Rāvaṇa, demon-king of Ceylon, with love for Sītā, in consequence of which the latter is carried off by him to his capital Lankā. While she resolutely rejects the Rākshasa's addresses, Rāma sets out with his brother to her rescue. (IV.) After numerous adventures they enter into an alliance with Sugrīva, king of the monkeys; and, with the assistance of the monkey-general Hanumān, and Rāvaṇa's own brother Vibhīshaṇa, they prepare to assault Lankā. (V.) The monkeys, tearing up rocks and trees, construct a passage across the straits—the so-called Adam's Bridge, still designated Rāma's Bridge in India. (VI.) Having crossed over with his allies, Rāma, after many hot encounters and miraculous deeds, slays the demon and captures the stronghold; whereupon he places Vibhīshaṇa on the throne of Lankā. To allay Rāma's misgivings as to any taint she might have incurred through contact with the demon, Sītā now successfully undergoes an ordeal by fire; after which they return to Ayodhyā, where, after a triumphal entry, Rāma is installed. (VII.) Rāma, however, seeing that the people are not yet satisfied of Sītā's purity, resolves to put her away; whereupon, in the forest, she falls in with Vālmīki himself, and at his hermitage gives birth to two sons. While growing up there, they are taught by the sage the use of the bow, as well as the Vedas, and the Rāmāyaṇa as far as the capture of Lankā and the royal entry into Ayodhyā. Ultimately Rāma discovers and recognizes them by their wonderful deeds and their likeness to himself, and takes his wife and sons back with him.

The last book, as will be noticed from this bare outline, presents a somewhat strange appearance. There can be little doubt that it is a later addition to the work; and the same is apparently the case as regards the first book, with the exception of certain portions which would seem to have formed the beginning of the original poem. In these two books the character of Rāma appears changed: he has become deified and identified with the god Vishṇu, whilst in the body of the poem his character is simply that of a perfect man and model hero. As regards the general idea underlying the leading story, whilst the first part of the narrative can hardly be said to differ materially from other historical and knightly romances, the second part—the expedition to Lankā—on the other hand has called forth different theories, without, however, any general agreement having so far been arrived at. Whilst Lassen and Weber would see in this warlike expedition a poetical representation of the spread of Aryan rule and civilization over southern India, Talboys Wheeler took the demons of Lankā, against whom Rāma's campaign is directed, to be intended for the Buddhists of Ceylon. More recently, again, Professor Jacobi[1] of Bonn has endeavoured to prove that the poem has neither an allegorical nor a religious tendency, but that its background is a purely mythological one—Rāma representing the god Indra, and Sītā—in accordance with the meaning of the name—the personified "Furrow," as which she is already invoked in the Ṛigveda, and hence is a tutelary spirit of the tilled earth, wedded to Indra, the Jupiter Pluvius. Moreover, from a comparison of the narrative of the poem with a popular version of it, contained in one of the Pāli "birth-stories," the Daśaratha-jātaka, which lacks the second part of the story, Professor Weber tried to show that the expedition of Lankā cannot have formed part of the original epic, but was probably based on some general acquaintance with the Troy legend of Greek poetry.

A remarkable feature of this poem is the great variation of its textual condition in different parts of the country, amounting in fact to at least three different recensions. The text most widely prevalent both in the north and south has been printed repeatedly, with commentary, at Bombay, and was taken by Mr R. T. H. Griffith as the basis for his beautiful poetical translation.[2] The so-called Gauḍa or Bengal recension, on the other hand, which differs most of all, has been edited, with an Italian prose translation, by G. Gorresio;[3] whilst the third recension, recognized chiefly in Kashmir and western India, is so far known only from manuscripts. The mutual relation of these versions will appear from the fact that about one-third of the matter of each recension is not found in the other two; whilst in the common portions, too, there are great variations both in regard to the order of verses and to textual readings. To account for this extraordinary textual diversity, it has been suggested that the poem was most likely originally composed in a popular dialect, and was thence turned into Sanskrit by different hands trying to improve on one another; whilst Professor Jacobi would rather ascribe the difference to the fact that the poem was for a long time handed down orally in Sanskrit by rhapsodists, or professional minstrels, when such variations might naturally arise in different parts of the country. Yet another version of the same story, with, however, many important variations of details, forms an episode of the *Mahābhārata*, the *Rāmopākhyāna*, the relation of which to Vālmīki's work is still a matter of uncertainty. In respect of both versification and diction the Rāmāyaṇa is of a distinctly more refined character than the larger poem; and, indeed, Vālmīki is seen already to cultivate some of that artistic style of poetry which was carried to excess in the later artificial Kāvyas, whence the title of *ādi-kavi*, or first poet, is commonly applied to him. Though the political conditions reflected in the older parts of the Rāmāyaṇa seem to correspond best to those of pre-Buddhistic times, this might after all only apply to the poetic material handed down orally and eventually cast into its present form. To characterize the Indian epics in a single word: though often disfigured by grotesque fancies and wild exaggerations, they are yet noble works, abounding in passages of remarkable descriptive power, intense pathos, and high poetic grace and beauty; and while, as works of art, they are far inferior to the Greek epics, in some respects they appeal far more strongly to the romantic mind of Europe, namely, by their loving appreciation of natural beauty, their exquisite delineation of womanly love and devotion, and their tender sentiment of mercy and forgiveness.

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[1] *Das Rāmāyaṇa* (Bonn, 1893).

[2] London, 1870–1874; there is also an English prose translation by M. N. Dutt (Calcutta, 1894); and a condensed version in English verse by Romesh Dutt (London, 1899).

[3] Turin, 1843–1867.

Purāṇas.

2. *Purāṇas and Tantras.*—The *Purāṇas*[1] are partly legendary partly speculative histories of the universe, compiled for the purpose of promoting some special, locally prevalent form of Brāhmanical belief. They are sometimes styled a fifth Veda, and may indeed in a certain sense be looked upon as the scriptures of Brāhmanical India. The term *purāṇa*, signifying "old," applied originally to prehistoric, especially cosmogonic, legends, and then to collections of ancient traditions generally. The existing works of this class, though recognizing the Brāhmanical doctrine of the Trimūrti, or triple manifestation of the deity (in its creative, preservative and destructive activity), are all of a sectarian tendency, being intended to establish, on quasi-historic grounds, the claims of some special god, or holy place, on the devotion of the people. For this purpose the compilers have pressed into their service a mass of extraneous didactic matter on all manner of subjects, whereby these works had become a kind of popular encyclopaedias of useful knowledge. It is evident, however, from a comparatively early definition given of the typical Purāṇa, as well as from numerous coincidences of the existing works, that they are based on, or enlarged from, older works of this kind, more limited in their scope and probably of a more decidedly tritheistic tendency of belief. Thus none of the Purāṇas, as now extant, is probably much above a thousand years old, though a considerable proportion of their materials is doubtless much older, and may perhaps in part go back to several centuries before the Christian era.

In legendary matter the Purāṇas have a good deal in common with the epics, especially the *Mahābhārata*—the compilers or revisers of both classes of works having evidently drawn their materials from the same fluctuating mass of popular traditions. They are almost entirely composed in the epic couplet, and indeed in much the same easy flowing style as the epic poems, to which they are, however, as a rule greatly inferior in poetic value.

According to the traditional classification of these works, there are said to be eighteen (*Mahā-*, or great) *Purāṇas*, and as many *Upa-purāṇas*, or subordinate Purāṇas. The former are by some authorities divided into three groups of six, according as one or other of the three primary qualities of external existence—goodness, darkness (ignorance), and passion—is supposed to prevail in them, viz. the *Vishṇu*, *Nāradīya*, *Bhāgavata*, *Garuḍa*, *Padma*, *Varāha*—*Matsya*, *Kūrma*, *Linga*, *Śiva*, *Skanda*, *Agni*—*Brahmāṇḍa*, *Brahma-vaivarta*, *Mārkaṇḍeya*, *Bhavishya*, *Vāmana* and *Brahma-Purāṇas*. In accordance with the nature of the several forms of the Trimūrti, the first two groups chiefly devote themselves to the commendation of Vishṇu and Siva respectively, whilst the third group, which would properly belong to Brahman, has been largely appropriated for the promotion of the claims of other deities, viz. Vishṇu in his sensuous form of Kṛishṇa, Devī, Gaṇeśa, and Sūrya. As Professor Banerjea has shown in his preface to the *Mārkaṇḍeya*, this seems to have been chiefly effected by later additions and interpolations. The insufficiency of the above classification, however, appears even from the fact that it omits the *Vāyu-purāṇa*, probably one of the oldest of all, though some MSS. substitute it for one or other name of the second group. The eighteen principal Purāṇas are said to consist of together 400,000 couplets. In northern India the Vaishṇava Purāṇas, especially the *Bhāgavata* and *Vishṇu*,[2] are by far the most popular. The Bhāgavata was formerly supposed to have been composed by Vopadeva, the grammarian, who lived in the 13th century. It has, however, been shown [3] that what he wrote was a synopsis of the Purāṇa, and that the latter is already quoted in a work by Ballāla Sena of Bengal, in the 11th century. It is certainly held in the highest estimation, and, especially through the vernacular versions of its tenth book, treating of the story of Kṛishṇa, has powerfully influenced the religious belief of India.

From the little we know regarding the Upa-purāṇas, their character does not seem to differ very much from that of the principal sectarian Purāṇas. Besides these two classes of works there is a large number of so-called *Sthala-purāṇas*, or chronicles recounting the history and merits of some holy "place" or shrine, where their recitation usually forms an important part of the daily service. Of much the same nature are the numerous *Māhātmyas* (literally "relating to the great spirit"), which usually profess to be sections of one or other Purāṇa. Thus the *Devī-māhātmya*, which celebrates the victories of the great "goddess" over the Asuras, and is daily read at the temples of that deity, forms a section, though doubtless an interpolated one, of the Mārkaṇḍeya-purāṇa. Similarly the *Adhyātma-Rāmāyaṇa*, a kind of spiritualized version of Vālmīki's poem, forms part of the *Brahmāṇḍa-purāṇa* which (like the Skanda) seems hardly to exist in an independent form, but to be made up of a large number of Māhātmyas.

The *Tantras*[4] have to be considered as partly a collateral and partly a later development of the sectarian Purāṇas; though, unlike these, they can hardly lay claim to any intrinsic poetic value. These works are looked upon as their sacred writings by the numerous *Śāktas*, or worshippers of the female energy (*śakti*) of some god, especially the wife of Śiva, in one of her many forms (Pārvatī, Devī, Kālī, Bhavānī, Durgā, &c.). This worship of a female representation of the divine power appears already in some of the Purāṇas; but in the Tantras it assumes quite a peculiar character, being largely intermixed with magic performances and mystic rites, partly, indeed, of a grossly immoral nature (see Hinduism). Of this class of writings no specimen would appear to have as yet been in existence at the time of Amarasiṃha (6th century), though they are mentioned in some of the Purāṇas, They are usually in the form of a dialogue between Śiva and his wife. The number of original Tantras is fixed at sixty-four, but they still await a critical examination at the hands of scholars. Among the best known may be mentioned the *Rudrayāmala*, *Kulārṇava*, *Śyāmā-rahasya* and *Kālikā-tantra*.

Modern epics.

3. *Artificial Epics and Romances.*—In the early centuries of the Christian era a new class of epic poems begins to make its appearance, differing widely in character from those that had preceded it. The great national epics, composed though they were in a language different from the ordinary vernaculars, had at least been drawn from the living stream of popular tradition, and were doubtless readily understood and enjoyed by at least the educated classes of the people. The later productions, on the other hand, are of a decidedly artificial character, and must necessarily have been beyond the reach of any but the highly cultivated. They are, on the whole, singularly deficient in incident and invention, their subject matter being almost entirely derived from the old epics. Nevertheless, these works are by no means devoid of merit and interest; and a number of them display considerable descriptive power and a wealth of genuine poetic sentiment, though unfortunately often clothed in language that deprives it of half its value. The simple heroic couplet has mostly been discarded for various more or less elaborate metres; and in accordance with this change of form the diction becomes gradually more complicated—a growing taste for unwieldy compounds, a jingling kind of alliteration, or rather agnomination, and an abuse of similes marking the increasing artificiality of these productions.

The generic appellation of such works is *kāvya*, which, meaning "poem," or the work of an individual poet (*kavi*), is, as we have seen, already applied to the *Rāmāyaṇa*. Six poems of this kind are singled out by native rhetoricians as standard works, under the title of *Mahākāvya*, or great poems. Two of these are ascribed to the famous dramatist Kālidāsa, the most prominent figure of this period of Indian literature and truly a master of the poetic art. In a comparatively modern couplet he is represented as having been one of nine literary "gems" at the court of a king Vikramāditya, who was supposed to have originated the so-called Vikrama era, dating from 56–57 B.C. Recent research has, however, shown that this name was only applied to the era from about A.D. 800, and that the latter was already used in inscriptions of the 5th century under the name of the Mālava era. Hence also Fergusson's theory that it was founded by King Vikramāditya Harsha of Ujjayinī (Ujjain or

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[1] Cf. H. H. Wilson, *Essays on the Religion of the Hindus*, ii. pp. 67 sqq.

[2] There are several Indian editions of these two works. The Bhāgavata has been partly printed, in an *édition de luxe*, with a French translation at Paris, in 3 vols., by E. Burnouf, and a fourth by M. Hauvette-Besnault. Of the Vishṇu, there is a translation by H. H. Wilson, 2nd ed., enriched with valuable notes by F. Hall. This and most other Purāṇas have been printed in India, especially in the *Bibl. Ind.* and the "Ânand. series."

[3] Rājendralāla Mitra, *Notices of Sansk. MSS.* ii. 47.

[4] Cf. H. H. Wilson, *Essays on the Religion of the Hindus*, ii. pp. 77 sqq.

Oujein) in A.D. 544 and ante-dated by 600 years, falls to the ground; and with it Max Müller's theory[1] of an Indian Renaissance inaugurated during the reign of that king. Though Kālidāsa's date thus remains still uncertain, the probability is that he flourished at Ujjayinī about 440–448 A.D. Of the principal poets of this class, whose works have come down to us, he appears to be one of the earliest; but there can be little doubt that he was preceded in this as in other departments of poetic composition by many lesser lights, eclipsed by the sun of his fame, and forgotten. Thus the recently discovered *Buddhacharita*,[2] a Sanskrit poem on the life of the reformer, which was translated into Chinese about A.D. 420, and the author of which, Aśvaghosha, is placed by Buddhist tradition as early as the time of Kanishka (who began to reign in A.D. 78), calls itself, not without reason, a "mahākāvya"; and the panegyrics contained in some of the inscriptions of the 4th century[3] likewise display, both in verse and ornate prose, many of the characteristic features of the kāvya style of composition. Indeed, a number of quotations in the Mahābhāṣhya,[4] the commentary on Pāṇini, go far to show that the kāvya style was already cultivated at the time of Patanjali, whose date can hardly be placed later than the 1st century of the Christian era, though it may, and probably does, go back to the 2nd century B.C.

Of the six universally recognized "great poems" here enumerated the first two, and doubtless the two finest, are those attributed to Kālidāsa. (1) The *Raghuvaṃśa*,[5] or "race of Raghu," celebrates the ancestry and deeds of Rāma. The work, consisting of nineteen cantos, is manifestly incomplete; but hitherto no copy has been discovered of the six additional cantos which are supposed to have completed it. (2) The *Kumāra-sambhava*,[6] or "the birth of (the war-god) Kumāra" (or Skanda), the son of Śiva and Pārvatī, consists of seventeen cantos, the last ten of which were, however, not commented upon by Mallinātha, and are usually omitted in the MSS.; whence they are still looked upon as spurious by many scholars, though they may only have been set aside on account of their amorous character rendering them unsuitable for educational purposes, for which the works of Kālidāsa are extensively used in India; the 8th canto, at any rate, being quoted by Vāmana (*c.* A.D. 700). Another poem of this class, the *Nalodaya*,[7] or "rise of Nala"—describing the restoration of that king, after having lost his kingdom through gambling—is wrongly ascribed to Kālidāsa, being far inferior to the other works, and of a much more artificial character. (3) The *Kirātārjunīya*,[8] or combat between the Pāṇḍava prince Arjuna and the god Śiva, in the guise of a Kirāta or wild mountaineer, is a poem in eighteen cantos, by Bhāravi, who is mentioned together with Kālidāsa in an inscription dated A.D. 634. (4) The *Śiśupāla-badha*, or slaying of Śiśupāla, who, being a prince of Chedi, reviled Kṛishṇa, who had carried off his intended wife, and was killed by him at the inauguration sacrifice of Yudhishṭhira, is a poem consisting of twenty cantos, attributed to Māgha,[9] whence it is also called *Māghakāvya*. (5) The *Rāvaṇabadha*, or "slaying of Rāvaṇa," more commonly called *Bhaṭṭikāvya*, to distinguish it from other poems (especially one by Pravarasena), likewise bearing the former title, was composed for the practical purpose of illustrating the less common grammatical forms and the figures of rhetoric and poetry. In its closing couplet it professes to have been written at Vallabhī, under Śrīdharasena, but, several princes of that name being mentioned in inscriptions as having ruled there in the 6th and 7th centuries, its exact date is still uncertain. Bhaṭṭi, apparently the author's name, is usually identified with the well-known grammarian Bhartṛihari, whose death Professor M. Müller, from a Chinese statement, fixes at A.D. 650, while others make him Bhartṛihari's son. (6) The *Naishadhīya*, or *Naishadha-charita*, the life of Nala, king of Nishadha, is ascribed to Śrī-Harsha (son of Hīra), who is supposed to have lived in the latter part of the 12th century. A small portion of the simple and noble episode of the *Mahābhārata* is here retold in highly elaborate and polished stanzas, and with a degree of lasciviousness which (unless it be chiefly due to the poet's exuberance of fancy) gives a truly appalling picture of social corruption. Another highly esteemed poem, the *Rāghava-pāṇḍavīya*, composed by Kavirāja ("king of poets")—whose date is uncertain, some scholars placing him about A.D. 800, others later than the 10th century—is characteristic of the trifling uses to which the poet's art was put. The well-turned stanzas are so ambiguously worded that the poem may be interpreted as relating to the leading story of either the *Rāmāyaṇa* or the *Mahābhārata*. Less ambitious in composition, though styling itself a mahākāvya, is the *Vikramānka-devacharita*,[10] a panegyric written about A.D. 1085 by the Kashmir poet Bilhaṇa, in honour of his patron the Chālukya king Vikramāditya of Kalyāṇa, regarding the history of whose dynasty it supplies some valuable information.

In this place may also be mentioned, as composed in accordance with the Hindu poetic canon, the *Rājataraṅgiṇī*,[11] or "river of kings," being a chronicle of the kings of Kashmir, and the only important historical work in the Sanskrit language, though even here considerable allowance has to be made for poetic licence and fancy. The work was composed by the Kashmirian poet Kalhaṇa about 1150, and was afterwards continued by three successive supplements, bringing down the history of Kashmir to the time of the emperor Akbar. Worthy of mention, in this place, are also two works on the life of Buddha, which may go back to the 1st century of the Christian era, viz. the *Lalitavistara*[12] and the *Mahāvastu*,[13] written in fairly correct Sanskrit prose mixed with stanzas (gāthā) composed in a hybrid, half Prākrit, half Sanskrit form of language.

Under the general term "kāvya" Indian critics include, however, not only compositions in verse, but also certain kinds of prose works composed in choice diction richly embellished with flowers of rhetoric. The feature generally regarded by writers on poetics as the chief mark of excellence in this ornate prose style is the frequency and length of its compounds; whilst for metrical compositions the use of long compounds is expressly discouraged by some schools of rhetoric. Moreover, the best specimens of this class of prose writing are not devoid of a certain musical cadence adapting itself to the nature of the subject treated. Amongst the works of this class the most interesting are four so-called *kathās* (tales) or *ākhyāyikās* (novels). The oldest of these is the *Daśakumāracharita*,[14] or "adventures of the ten princes"—a vivid, though probably exaggerated, picture of low-class city life—by Daṇḍin, the author of an excellent manual of poetics, the Kāvyādarśa, who most likely lived in the 6th century. Probably early in the 7th century, Subandhu composed his tale *Vāsavadattā*,[15] taking its name from a princess of Ujjayinī (Oujein), who in a dream fell in love with Udayana, king of Vatsa, and, on the latter being decoyed to that city and kept in captivity by her father, was carried off by him from a rival suitor. The remaining two works were composed by Bāṇa, the court poet of King Harshavardhana of Ṭhānesar and Kanauj—who ruled over the whole of northern India, A.D. 606–648, and at whose court the Chinese pilgrim Hiuen Thsang resided for some time during his sojourn in India (630–646)—viz. the Kādambarī,[16] a romantic tale of a princess of that name; and the apparently never completed *Harshacharita*,[17] intended as an historical novel, but practically a panegyric (*praśasti*) in favour of the poet's patron, supplying, however, a valuable picture of the life of the time. Whilst these tales have occasionally stanzas introduced into them, this feature of mixed (miśra) verse and prose is especially prominent in another popular class of romances, the so-called *Champūs*. Of such works, which seem to have been rather numerous, it must suffice to mention two specimens, viz. the *Bhārata-champū*, in twelve cantos, by Ananta Bhaṭṭa; and the *Champū-rāmāyaṇa*, or *Bhoja-champū*, in seven books, the first five of which are attributed, doubtless by way of compliment, to King Bhojarāja of Dhārā.

Drama.

4. *The Drama.*[18]—The early history of the Indian drama is enveloped in obscurity. The Hindus themselves ascribe the origin of dramatic representation to the sage Bharata, who is fabled to have lived in remote antiquity, and to have received this science directly from the god Brahman, by whom it was extracted from the Veda. The term *bharata*—(?) *i.e.* one who is kept, or one who sustains(a part)—also signifies "an actor"; but it is doubtful which of the two is the earlier—

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[1] Propounded in Note G of his *India, What can it Teach Us*?

[2] Ed. by E. B. Cowell (Oxford, 1893); trans. by the same, *S.B.E.*

[3] See G. Bühler, "Die indischen Inschriften und das Alter der indischen Kunstpoesie," in *Sitzungsber. Imp. Ac.* (Vienna, 1890).

[4] Collected by F. Kielhorn, *Ind. Ant.* vol. 16.

[5] Edited with a Latin trans. by F. Stenzler; also text, with commentary, by S. P. Pandit; also repeatedly in India with and without translation.

[6] Text and Latin trans. of cantos 1-7 published by F. Stenzler; an English trans. by R. T. H. Griffith; also several Indian editions, with comm.

[7] Text with comm. and Latin trans., edited by F. Benary; with Eng. trans., in verse, by W. Yates; also repeatedly ed. in India.

[8] Editions of this and the three following poems have been published in India.

[9] Māgha probably lived in the 9th century, though Bháo Dáji, in his paper on Kālidāsa, would make him "a contemporary of the Bhoja of the 11th century."

[10] Edited by G. Bühler.

[11] The Calcutta edition (1835) and that of A. Troyer, with a French trans., based on insufficient material, have been superseded by M. A. Stein's ed. (Bombay, 1892), trans. by Y. C. Datta (Calcutta, 1898).

[12] Ed. and trans. Rāj. Mitra, *Bibl. Ind.*; trans. S. Lefmann.

[13] Ed. E. Senart.

[14] Ed. H. H. Wilson; again (*Bombay Skt. Ser.*) pt. i., G. Bühler; ii., P. Peterson; freely trans. by P. W. Jacob.

[15] Ed. Fitzedw. Hall (*Bibl. Ind.*); with comm. J. Vidyāsāgara (Calcutta, 1874).

[16] Ed. P. Peterson (*Bomb. S.S.*); with comm. M. R. Kale (1896); trans. with some omissions, C. M. Ridding.

[17] Ed. J. Vidyāsāgara (Calcutta, 1883); with comm. (Jammu, 1879; Bombay, 1892); trans. E. B. Cowell and F. W. Thomas (1897).

[18] Cf. H. H. Wilson, *Select Specimens of the Theatre of the Hindus* (3rd ed., 2 vols., 1871); Sylvain Lévi, *Le Théâtre indien* (Paris. 1890).

the appellative use of the word, or the notion of an old teacher of the dramatic art bearing that name. There still exists an extensive work, in epic verse, on rhetoric and dramaturgy, entitled *Nāṭya-śāstra*,[1] and ascribed to Bharata. Though this is probably the oldest theoretic work on the subject that has come down to us, it can hardly be referred to an earlier period than several centuries after the Christian era. Not improbably, however, this work, which presupposes a fully developed scenic art, had an origin similar to that of some of the metrical law-books, which are generally supposed to be popular and improved editions of older sūtra-works. We know that such treatises existed at the time of Pāṇini, as he mentions two authors of *Naṭa-sūtras*, or "rules for actors," viz. Śilālin and Kṛiśāśva. Now, the words *naṭa* and *nāṭya*—as well as *nāṭaka*, the common term for "drama"—being derived (like the modern vernacular "Nautch" = *nṛitya*) from the root *naṭ* (*nṛt*) "to dance," seem to point to a pantomimic or choral origin of the dramatic art. It might appear doubtful, therefore, in the absence of any clearer definition in Pāṇini's grammar, whether the "actors' rules" he mentions did not refer to mere pantomimic performances. Fortunately, however, Patanjali, in his "great commentary," speaks of the actor as singing, and of people going "to hear the actor." Nay, he even mentions two subjects, taken from the cycle of Vishṇu legends—viz. the slaying of Kaṃsa (by Kṛishṇa) and the binding of Bali (by Vishṇu)—which were represented on the stage both by mimic action and declamation. Judging from these allusions, theatrical entertainments in those days seem to have been very much on a level with the old religious spectacles or mysteries of Europe, though there may already have been some simple kinds of secular plays which Patanjali had no occasion to mention. It is not, however, till some five or six centuries later that we meet with the first real dramas, which mark at the same time the very culminating point of Indian dramatic composition. In this, as in other departments of literature, the earlier works have had to make way for later and more perfect productions; and no trace now remains of the intermediate phases of development. Thus we know of at least five predecessors of Kālidāsa from whom nothing but a few quotations have been preserved.

Here, however, the problem presents itself as to whether the existing dramatic literature has naturally grown out of such popular religious performances as are alluded to by Patanjali, or whether some foreign influence has intervened at some time or other and given a different direction to dramatic composition. The question has been argued both for and against the probability of Greek influence; but it must still be considered as *sub judice*; the latest investigator, M. Sylvain Lévi, having given a decided opinion against outside influence. There are doubtless some curious points of resemblance between the Indian drama and the Modern Attic (and Roman) comedy, viz. the prologue, the occasional occurrence of a token of recognition, and a certain correspondence of characteristic stage figures—especially the Vidūshaka, or jocose companion of the hero, presenting a certain analogy to the servus of the Roman stage, as does the Viṭa, the hero's dissolute, though accomplished, boon-companion, of some plays, to the Roman parasite—for which the assumption of some acquaintance with the Greek comedy on the part of the earlier Hindu writers would afford a ready explanation. On the other hand, the differences between the Indian and Greek plays are perhaps even greater than their coincidences, which, moreover, are scarcely close enough to warrant our calling in question the originality of the Hindus in this respect. Certain, however, it is that, if the Indian poets were indebted to Greek playwrights for the first impulse in dramatic composition, in the higher sense, they have known admirably how to adapt the Hellenic muse to the national genius, and have produced a dramatic literature worthy to be ranked side by side with both the classical and our own romantic drama. It is to the latter especially that the general character of the Indian play presents a striking resemblance, much more so than to the classical drama. The Hindu dramatist has little regard for the "unities" of the classical stage, though he is hardly ever guilty of extravagance in his disregard of them. Unlike the Greek dramatic theory, it is an invariable rule of Indian dramaturgy, that every play, however much of the tragic element it may contain, must have a happy ending. The dialogue is invariably carried on in prose, plentifully interspersed with those neatly turned lyrical stanzas in which the Indian poet delights to depict some natural scene, or some temporary physical or mental condition. The most striking feature of the Hindu play, however, is the mixed nature of its language. While the hero and leading male characters speak Sanskrit, women and inferior male characters use various Prākrit dialects. As regards these dialectic varieties, it can hardly be doubted that at the time when they were first employed in this way they were local vernacular dialects; but in the course of the development of the scenic art they became permanently fixed for special dramatic purposes, just as the Sanskrit had, long before that time, become fixed for general literary purposes. Thus it would happen that these Prākrit dialects, having once become stationary, soon diverged from the spoken vernaculars, until the difference between them was as great as between the Sanskrit and the Prākrits. As regards the general character of the dramatic Prākrits, they are somewhat more removed from the Sanskrit type than the Pāli, the language of the Buddhist canon, which again is in a rather more advanced state than the language of the Aśoka inscriptions (*c.* 250 B.C.). And, as the Buddhist sacred books were committed to writing about 80 B.C., the state of their language is attested for that period at latest; while the grammatical fixation of the scenic Prākrits has probably to be referred to the early centuries of the Christian era.

The existing dramatic literature is not very extensive. The number of plays of all kinds of any literary value will scarcely amount to fifty. The reason for this paucity of dramatic productions doubtless is that they appealed to the tastes of only a limited class of highly cultivated persons, and were in consequence but seldom acted. As regards the theatrical entertainments of the common people, their standard seems never to have risen much above the level of the religious spectacles mentioned by Patanjali. Such at least is evidently the case as regards the modern Bengālī *jātrās* (Skt. *yātrās*)—described by Wilson as exhibitions of some incidents in the youthful life of Kṛishṇa, maintained in extempore dialogue, interspersed with popular songs—as well as the similar *rāsas* of the western provinces, and the rough and ready performances of the *bhanrs*, or professional buffoons. Of the religious drama Sanskrit literature offers but one example, viz. the famous *Gītagovinda*,[2] composed by Jayadeva in the 12th century. It is rather a mytho-lyrical poem, which, however, in the opinion of Lassen, may be considered as a modern and refined specimen of the early form of dramatic composition. The subject of the poem is as follows: Kṛishṇa, while leading a cowherd's life in Vṛindāvana, is in love with Rādhā, the milkmaid, but has been faithless to her for a while. Presently, however, he returns to her "whose image has all the while lingered in his breast," and after much earnest entreaty obtains her forgiveness. The emotions appropriate to these situations are expressed by the two lovers and a friend of Rādhā in melodious and passionate, if voluptuous, stanzas of great poetic beauty. Like the Song of Solomon, the Gītagovinda, moreover, is supposed by the Hindu commentators to admit of a mystic interpretation; for, "as Kṛishṇa, faithless for a time, discovers the vanity of all other loves, and returns with sorrow and longing to his own darling Rādhā, so the human soul, after a brief and frantic attachment to objects of sense, burns to return to the God from whence it came" (Griffith).

The *Mṛichchhakaṭikā*,[3] or "little clay cart," has been usually placed at the head of the existing dramas; but, though a certain clumsiness of construction might seem to justify this distinction, the question of its relative antiquity remains far from being definitively settled. Indeed, the fact that neither Kālidāsa, who mentions three predecessors of his, or Bāṇa, in reviewing his literary precursors, makes any allusion to the author of this play, as well as other points, seem rather to tell against the latter's priority. But seeing that Vāmana quotes from the Mṛichchhakaṭikā, this play must at any rate have been in existence in the latter part of the 8th century. According to several stanzas in the prologue, the play was composed by a king Śūdraka, who is there stated to have, through Śiva's

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[1] Ed., in *Kāvyamālā* (Bombay, 1894); by Grosset (Lyons, 1897).

[2] Edited, with a Latin translation, by C. Lassen; English translation by E. Arnold.

[3] Edited by F. Stenzler; with commentary, by K. P. Parab (Bombay), and several times at Calcutta; translated by H. H. Wilson; also into English prose and verse by A. W. Ryder (*Harvard Or. Ser.*, 1905); German by O. v. Böhtlingk and L. Fritze; French by P. Regnaud.

Śūdraka.

favour, recovered his eyesight, and, after seeing his son as king, to have died at the ripe age of a hundred years and ten days. According to the same stanzas, the piece was enacted after the king's death; but it is probable that they were added for a subsequent performance. In Bāṇa's novel *Kādambarī* (*c.* A.D. 630), a king Sūdraka is represented as having resided at Biḍiśā (Bhilsa)—some 130 m. east of Ujjayinī (Ujjain), where the scene of the play is laid. Chārudatta, a Brāhman merchant, reduced to poverty, and Vasantasenā, an accomplished courtezan, meet and fall in love with each other. This forms the main plot, which is interwoven with a political underplot, resulting in a change of dynasty. The connexion between the two plots is effected by means of the king's rascally brother-in-law, who pursues Vasantasenā with his addresses, as well as by the part of the rebellious cowherd Āryaka, who, having escaped from prison, finds shelter in the hero's house. The wicked prince, on being rejected, strangles Vasantasenā, and accuses Chārudatta of having murdered her; but, just as the latter is about to be executed, his lady love appears again on the scene. Meanwhile Āryaka has succeeded in deposing the king, and, having himself mounted the throne of Ujjain, he raises Vasantasenā to the position of an honest woman, to enable her to become the wife of Chārudatta. The play is one of the longest, consisting of not less than ten acts, some of which, however, are very short. The interest of the action is, on the whole, well sustained; and, altogether, the piece presents a vivid picture of the social manners of the time, whilst the author shows himself imbued with a keen sense of humour, and a master in the delineation of character.

Kālidāsa.

In Kālidāsa the dramatic art attained its highest point of perfection. From this accomplished poet we have three well-constructed plays, abounding in stanzas of exquisite tenderness and fine descriptive passages, viz. the two well-known mytho-pastoral dramas, *Śakuntalā* in seven and *Vikramorvaśī*[1] in five acts, and a piece of court intrigue, distinctly inferior to the other two, entitled *Mālavikāgnimitra*[2] in five acts. King Agnimitra, who has two wives, falls in love with Mālavikā, maid to the first queen. His wives endeavour to frustrate their affection for each other, but in the end Mālavikā turns out to be a princess by birth, and is accepted by the queens as their sister.

Śrī-Harshadeva.

Śrī-Harshadeva—identical with the king (Śīlāditya) Harshavardhana of Kānyakubja (Kanauj) mentioned above, who ruled in the first half of the 7th century—has three plays attributed to him; though possibly only dedicated to him by poets patronized by him. This at least commentators state to have been the case as regards the *Ratnāvalī*, the authorship of which they assign to Bāṇa. Indeed, had they been the king's own productions, one might have expected the Chinese pilgrims (especially I-tsing, who saw one of the plays performed) to mention the fact. The *Ratnāvalī*,[3] "the pearl necklace," is a graceful comedy of genteel domestic manners, in four acts, of no great originality of invention; the author having been largely indebted to Kālidāsa's plays. A decided merit of the poet's art is the simplicity and clearness of his style. Ratnāvalī, a Ceylon princess, is sent by her father to the court of King Udayana of Vatsa to become his second wife. She suffers shipwreck, but is rescued and received into Udayana's palace under the name of Sāgarikā, as one of Queen Vāsavadattā's attendants. The king falls in love with her, and the queen tries to keep them apart from each other: but, on learning the maiden's origin, she becomes reconciled, and recognizes her as a "sister." According to H. H. Wilson, "the manners depictured are not influenced by lofty principle or profound reflection, but they are mild, affectionate and elegant. It may be doubted whether the harems of other eastern nations, either in ancient or modern times, would afford materials for as favourable a delineation." Very similar in construction, but distinctly inferior, is the *Priyadarśikā*, in four acts, having for its plot another amour of the same king. The scene of the third play, the *Nāgānanda*,[4] or "joy of the serpents" (in five acts), on the other hand, is laid in semi-divine regions. Jīmūtavāhana, a prince of the Vidyādharas, imbued with Buddhist principles, weds Malayavatī, daughter of the king of the Siddhas, a votary of Gaurī (Śiva's wife). But, learning that Garuḍa, the mythic bird, is in the habit of consuming one snake daily, he resolves to offer himself to the bird as a victim, and finally succeeds in converting Garuḍa to the principle of ahiṃsā, or abstention from doing injury to living beings; but he himself is about to succumb from the wounds he has received, when, through the timely intervention of the goddess Gaurī, he is restored to his former condition. The piece seems to have been intended as a compromise between Brāhmanical (Śaiva) and Buddhist doctrines, being thus in keeping with the religious views of king Harsha, who, as we know from Hiuen Thsang, favoured Buddhism, but was very tolerant to Brāhmans. It begins with a benedictory stanza to Buddha, and concludes with one to Gaurī. The author is generally believed to have been a Buddhist, but it is more likely that he was a Śaiva Brāhman, possibly Bāṇa himself. Nay, one might almost feel inclined to take the hero's self-sacrifice in favour of a Nāga as a travesty of Buddhist principles. In spite of its shortcomings of construction the Nāgānanda is a play of considerable merit, the characters being drawn with a sure hand, and the humorous element introduced into it of a very respectable order.

Bhavabhūti.

Bhavabhūti, surnamed Śrī-kaṇtha, "he in whose throat there is beauty (eloquence),"[5] was a native of Padmapura in the Vidarbha country (the Berars), being the son of the Brāhman Nīlakaṇtha and his wife Jātūkarṇī. He passed his literary life chiefly at the court of Yaśovarman of Kanauj, who must have reigned in the latter part of the 7th century, seeing that, after a successful reign, he suffered defeat at the hands of Lalāditya of Kashmir, who had mounted his throne in A.D. 695. Bhavabhūti was the author of three plays, two of which, the *Mahāvīracharita*[6] ("life of the great hero") and the *Uttararāmacharita*[7] ("later life of Rāma"), in seven acts each, form together a dramatized version of the story of the *Rāmāyaṇa*. The third, the *Mālatīmādhava*,[8] is a domestic drama in ten acts, representing the fortunes of Mādhava and Mālatī, the son and daughter of two ministers of neighbouring kings, who from childhood have been destined for each other, but, by the resolution of the maiden's royal master to marry her to an old and ugly favourite of his, are for a while threatened with permanent separation. The action of the play is full of life, and abounds in stirring, though sometimes improbable, incidents. The poet is considered by native critics to be not only not inferior to Kālidāsa, but even to have surpassed him in his *Uttararāmacharita*, which certainly contains many fine poetic passages instinct with pathos and genuine feeling. But, though he ranks deservedly high as a lyric poet, he is far inferior to Kālidāsa as a dramatic artist. Whilst the latter delights in depicting the gentler feelings and tender emotions of the human heart and the peaceful scenes of rural life, the younger poet finds a peculiar attraction in the sterner and more imposing aspects of nature and the human character. Bhavabhūti's language, though polished and felicitous, is elaborate and artificial compared with that of Kālidāsa, and his genius is sorely shackled by a slavish adherence to the arbitrary rules of dramatic theorists.

Bhaṭṭa Nārāyaṇa.

Bhaṭṭa Nārāyaṇa, surnamed Mṛigarāja or Siṃha, "the lion," the author of the *Veṇīsaṃhāra*[9] ("the binding up of the braid of hair"), is a poet of uncertain date. Tradition makes him one of the five Kanauj Brāhmans whom king Ādisūra of Bengal, desirous of establishing the pure Vaishṇava doctrine, invited to his court, and from whom the modern Bengalī Brāhmans are supposed to be descended. But be this as it may, a copperplate grant was issued to our poet in A.D. 840; and, besides, he is quoted in Ānandavardhana's *Dhvanyāloka*, written in the latter part of the 9th century. The play, consisting of six acts, takes its title from an incident in the story of the *Mahābharāta* when Draupadī, having been lost at dice by Yudhishṭhira, has her braid of hair unloosened, and is dragged by the hair before the assembly by one of the Kauravas; this insult being subsequently avenged by Bhīma slaying the offender, whereupon Draupādī's braid is tied up again, as beseems a married woman. The piece is composed in a style similar to that of Bhavabhūti's plays, but is inferior to them in dramatic construction and poetic merit, though valued by critics for its strict adherence to the rules of the dramatic theory.

The *Hanuman-nāṭaka*[10] is a dramatized version of the story of Rāma, interspersed with numerous purely descriptive poetic passages. It consists of fourteen acts, and on account of its length is also called the *Mahā-nāṭaka*, or great drama. Contrary to the general practice, it has no prologue, and Sanskrit alone is employed in it. Tradition relates that it was composed by Hanumān, the monkey general, and inscribed on rocks; but, Vālmīki, the author of the *Rāmāyaṇa*, being afraid lest it might throw his own poem into the shade, Hanumān allowed him to cast his verses into the sea. Thence fragments were ultimately picked up by a merchant, and brought to King Bhoja, who directed the poet Dāmodara Miśra to put them together and fill up the lacunae; whence the present composition originated. Whatever particle of truth there may be in this story, the "great drama" seems certainly to be the production of different hands. "The language," as Wilson remarks, "is in general very harmonious, but the work is after all a most disjointed and nondescript composition, and the patchwork is very glaringly and clumsily put together." It is nevertheless a work of some interest, as compositions of mixed dramatic and declamatory passages of this kind may have been common in the early stages of the dramatic art. The connexion of the poet with King Bhoja, also confirmed by the *Bhoja-prabandha*, would bring the composition, or final redaction, down to about the 10th or 11th century. A *Mahānāṭaka* is, however, already referred to by Ānandavardhana (9th century); and, besides, there are two different recensions of the work, a shorter one commented upon by Mohanadāsa, and a longer one arranged by Madhusūdana. A Dāmodara Gupta is mentioned as having lived under Jayāpīḍa of Kashmir (755–786); but this can scarcely be the same as the writer connected with this work.

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[1] Both these plays are known in different recensions in different parts of India. The Bengali recension of the *Sakuntalā* was translated by Sir W. Jones, and into French, with the text, by Chézy, and again edited by R. Pischel, who has also advocated its greater antiquity. Editions and translations of the western (Devanāgarī) recension have been published by O. Böhtlingk and Mon. Williams. The *Vikramorvaśī* has been edited critically by S. P. Pandit, and the southern text by R. Pischel. It has been translated by H. H. Wilson and E. B. Cowell.

[2] Edited critically by S. P. Pandit; translated by C. H. Tawney (1875), and into German by A. Weber (1856), and L. Fritze (1881).

[3] Edited by Tārānātha Tarkavāchaspati, and by C. Cappeller in Böhtlingk's *Sanskrit-Chrestomathie*; with commentary (Bombay, 1895); translated by H. H. Wilson.

[4] Edited by Mādhava Chandra Ghosha and translated by P. Boyd, with a preface by E. B. Cowell.

[5] This is the commentator's explanation of the name, whilst M. Lévi would render it by "the divine throat."

[6] Edited by F. H. Trithen (1848); with commentary, A. Barooah (Calcutta, 1877) and Parab (Bombay, 1892); translated by J. Pickford (1871).

[7] Edited with commentary and translation (Nagpur, 1895); with commentary, Aiyar and Parab (1899); translation by H. H. Wilson and C. H. Tawney.

[8] Edited by R. G. Bhandarkar (1876); translated by H. H. Wilson. Whether, as M. S. Lévi suggests, the fact of the play consisting of ten acts points to its having been composed in imitation of the *Mṛichchhakaṭikā* must remain uncertain.

[9] Edited by J. Grill (1871); twice with commentary (Bombay); English translation by S. M. Tagore (Calcutta).

[10] Printed with Mohanadāsa's commentary (Bombay, 1861).

The *Mudrārākshasa*,[1] or "Rākshasa (the minister) with the signet," is a drama of political intrigue, in seven acts, partly based on historical events, the plot turning on the reconciliation of Rākshasa, the minister of the murdered king Nanda, with the hostile party, consisting of Prince Chandragupta (the Greek Sandrocottus, 315–291 B.C.), who succeeded Nanda, and his minister Chāṇakya. The plot is developed with considerable dramatic skill, in vigorous, if not particularly elegant, language. The play was composed by Viśākhadatta, prior, at any rate, to the 11th century, whilst Professor Jacobi infers from astronomical indications that it was written in A.D. 860.

The *Prabodha-chandrodaya*,[2] or "the moon-rise of intelligence," composed by Kṛishṇamiśra about the 12th century, is an allegorical play, in six acts, the *dramatis personae* of which consist entirely of abstract ideas, divided into two conflicting hosts.

Of numerous inferior dramatic compositions we may mention as the best—the *Anarghya-rāghava*, by Murāri; the *Bāla-rāmāyaṇa*, one of six plays (four of which are known) by Rājaśekhara,[3] and the *Prasanna-rāghava*,[4] by Jayadeva, the author of the rhetorical treatise *Chandrāloka*. Abstracts of a number of other pieces are given in H. H. Wilson's *Hindu Theatre*, the standard work on this subject. The dramatic genius of the Hindus may be said to have exhausted itself about the 14th century.

Lyric poetry.

5. *Lyrical, Descriptive and Didactic Poetry.*—Allusion has already been made to the marked predilection of the medieval Indian poet for depicting in a single stanza some peculiar physical or mental situation. The profane lyrical poetry consists chiefly of such little poetic pictures, which form a prominent feature of dramatic compositions. Numerous poets and poetesses are only known to us through such detached stanzas, preserved in native anthologies or manuals of rhetoric, and enshrining a vast amount of descriptive and contemplative poetry. Thus the *Saduktikarṇāmṛita*,[5] or "ear-ambrosia of good sayings," an anthology compiled by Śrīdhara Dāsa in 1205, contains verses by 446 different writers; while the *Śārngadharapaddhati*,[6] of the 14th century, contains some 6000 verses culled from 264 different writers and works; and Vallabhadeva's *Subhāshitāvalī*,[7] another such anthology, consists of some 3500 verses ascribed to some 350 poets. These verses are either of a purely descriptive or of an erotic character; or they have a didactic tendency, being intended to convey, in an attractive and easily remembered form, some moral truth or useful counsel. An excellent specimen of a longer poem, of a partly descriptive, partly erotic character, is Kālidāsa's *Megha-dūta*,[8] or "cloud messenger," in which a banished Yaksha (demi-god) sends a love-message across India to his wife in the Himālaya, and describes, in verse-pictures of the stately mandākrāntā metre the various places and objects over which the messenger, a cloud, will have to sail in his airy voyage. This little masterpiece has called forth a number of more or less successful imitations, such as Lakshmīdāsa's *Śuka-sandeśa*, or "parrot-message," lately edited by the mahārāja of Travancore. Another much-admired descriptive poem by Kālidāsa is the *Ṛitu-saṃhāra*,[9] or "collection of the seasons," in which the attractive features of the six seasons are successively set forth.

As regards religious lyrics, the fruit of sectarian fervour, a large collection of hymns and detached stanzas, extolling some special deity, might be made from Purāṇas and other works. Of independent productions of this kind only a few of the more important can be mentioned here. Śankara Âchārya, the great Vedāntist, who seems to have flourished about A. D. 800, is credited with several devotional poems, especially the *Ānanda-laharī*, or "wave of joy," a hymn of 103 stanzas, in praise of the goddess Pārvatī. The *Sūrya-śataka*, or century of stanzas in praise of Sūrya, the sun, is ascribed to Mayūra, the contemporary (and, according to a tradition, the father-in-law) of Bāṇa (in the early part of the 7th century). The latter poet himself composed the *Chaṇḍikāstotra*, a hymn of 102 stanzas, extolling Śiva's consort. The *Khaṇḍapraśasti*, a poem celebrating the ten avatāras of Vishṇu, is ascribed to no other than Hanumān, the monkey general, himself. Jayadeva's beautiful poem *Gītagovinda*, which, like most productions concerning Kṛishṇa, is of a very sensuous character, has already been referred to.

Didactic poetry.

The particular branch of didactic poetry in which India is especially rich is that of moral maxims, expressed in single stanzas or couplets, and forming the chief vehicle of the *Nīti-śāstra* or ethic science. Excellent collections of such aphorisms have been published—in Sanskrit and German by O. v. Böhtlingk, and in English by John Muir. Probably the oldest original collection of this kind is that ascribed to Chāṇakya,—and entitled *Rājanītisamuchchaya*,[10] "collection on the conduct of kings"—traditionally connected with the Machiavellian minister of Chandragupta, but (in its present form) doubtless much later—of which there are several recensions, especially a shorter one of one hundred couplets, and a larger one of some three hundred. Another old collection is the *Kāmandakīya-Nītisāra*,[11] ascribed to Kāmandaki, who is said to have been the disciple of Chāṇakya. Under the name of Bhartṛihari have been handed down three centuries of sententious couplets,[12] one of which, the *nīta-śataka*, relates to ethics, whilst the other two, the *śṛingāra-* and *vairāgya-śatakas*, consist of amatory and devotional verses respectively. The *Nīti-pradīpa*, or "lamp of conduct," consisting of sixteen stanzas, is ascribed to Vetālabhaṭṭa who is mentioned as one of "nine gems." The *Amarū-śataka*,[13] consisting of a hundred stanzas, ascribed to a King Amaru (sometimes wrongly to Śankara); the *Bhāminī-vilāsa*,[14] or "dalliance of a fair woman," by Jagannātha; and the *Chaura-suratapanchāśikā*,[15] by Bilhaṇa (11th century), are of an entirely erotic character.

Fables and narratives.

6. *Fables and Narratives.*— For purposes of popular instruction stanzas of an ethical import were early worked up with existing prose fables and popular stories, probably in imitation of the Buddhist *jātakas*, or birth-stories. A collection of this kind, intended as a manual for the guidance of princes (*in usum delphini*), was translated into Pahlavī in the reign of the Persian king Chosru Nushirvan, A.D. 531–579;

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[1] Edited (Bombay, 1884, 1893) by K. T. Telang, who discusses the date of the work in his preface; transl. H. H. Wilson; German, L. Fritze; French, Victor Hehn.

[2] Translated by J. Taylor (1810); by T. Goldstücker into German (1842). Edited by H. Brockhaus (1845); also Bombay (1898).

[3] Another play, composed entirely in Prākṛit, by Rājaśekhara (*c.* A.D. 900), the *Karpūramanjarī*, has been critically edited by Sten Konow, with English translation by Ch. R. Lanman, Harvard Or. Ser. (1901).

[4] Ed. Shivarāma Raoji Khopakar (Bombay, 1894).

[5] Rājendralāla Mitra, *Notices*, iii. p. 134.

[6] Ed. P Peterson (Bombay, 1888).

[7] Ed P. Peterson and Durgāprasāda (Bombay, 1886).

[8] Text and translation by H. H. Wilson; with vocabulary by S. Johnson; with German vocabulary by Stenzler (1874); often, with commentary, in India.

[9] The first Sanskrit book published (by Sir W. Jones), 1792. Text and Latin translation by P. v. Bohlen, edited, with notes and translation, by S. Ayyar (Bombay, 1897); partly translated, in verse, by R. T. H. Griffith, *Specimens of Old Indian Poetry*.

[10] Ed. Klatt (1873); German transl. O. Kressler (1906).

[11] Edited by Rājendralāla Mitra, *Bibl. Ind.*; with translation and notes (Madras, 1895).

[12] Translation, in English verse, by C. H. Tawney.

[13] Ed. R. Simon (1893).

[14] Edited, with French translation, by A. Bergaigne (1872); with English translation, by Sheshādri Iyar (Bombay, 1894).

[15] Edited by P. v. Bohlen (1833); with German translation, W. Solf (1886); English translation by Edwin Arnold (1896).

but neither this translation nor the original is any longer extant. A Syriac translation, however, made from the Pahlavī in the same century, under the title of "Qualilag and Dimnag"—from the Sanskrit "Karataka and Damanaka," two jackals who play an important part as the lion's counsellors—has been discovered and published. The Sanskrit original, which probably consisted of fourteen chapters, was afterwards recast—the result being the *Panchatantra*,[1] or "five books" (or headings), of which several recensions exist. A popular summary of this work, in four books, the *Hitopadeśa*,[2] or "Salutary Counsel," has been shown by Peterson to have been composed by one Nārāyaṇa. Other highly popular collections of stories and fairy tales, interspersed with sententious verses, are: the *Vetāla-panchaviṃśati*,[3] or "twenty-five (stories) of the Vetāla" (the original of the Baitāl Pachīsī), ascribed either to Jambhala Datta, or to Śivadāsa (while Professor Weber suggests that Vetāla-bhaṭṭa may have been the author), and at all events older than the 11th century, since both Kshemendra and Somadeva have used it; the *Śuka-saptati*,[4] or "seventy (stories related) by the parrot," the author and age of which are unknown; and the *Siṃhāsana-dvātriṃśikā*,[5] or "thirty-two (tales) of the throne," being laudatory stories regarding Vikramāditya of Avantī, related by thirty-two statues, standing round the old throne of that famous monarch, to King Bhoja of Dhārā to discourage him from sitting down on it. This work is ascribed to Kshemankara, and was probably composed in the time of Bhoja (who died in 1053) from older stories in the Mahārāshṭra dialect. The original text has, however, undergone many modifications, and is now known in several different recensions. Of about the same date are two great-houses of fairy tales, composed entirely in ślokas, viz. the rather wooden and careless *Bṛihat-kathā-manjarī*,[6] or "great cluster of story," by Kshemendra, also called Kshemankara, who wrote, *c.* 1020–1040, under King Ananta of Kashmir; and the far superior and truly poetical *Kathā-sarit-sāgara*,[7] or "ocean of the streams of story," composed in some 21,500 couplets by Somadeva, early in the 12th century, for the recreation of Ananta's widow, Sūryavatī, grandmother of King Harshadeva. Both these works are based on an apparently lost work, viz. Guṇādhya's *Bṛihat-kathā*, or "great story," which was composed in some popular dialect, perhaps as early as the 1st or 2nd century of our era, and which must have rivalled the Mahābhārata in extent, seeing that it is stated to have consisted of 100,000 ślokas (of 32 syllables each).

B. SCIENTIFIC AND TECHNICAL LITERATURE

Law.

I. LAW (*Dharma*).[8]—Among the technical treatises of the later Vedic period, certain portions of the Kalpa-sūtras, or manuals of ceremonial, peculiar to particular schools, were referred to as the earliest attempts at a systematic treatment of law subjects. These are the *Dharma-sūtras*, or "rules of (religious) law," also called *Sāmayāchārika-sūtras*, or "rules of conventional usage (samaya-āchāra)." It is doubtful whether such treatises were at any time quite as numerous as the Gṛihyasūtras, or rules of domestic or family rites, to which they are closely allied, and of which indeed they may originally have been an outgrowth. That the number of those actually extant is comparatively small is, however, chiefly due to the fact that this class of works was supplanted by another of a more popular kind, which covered the same ground. The Dharmasūtras consist chiefly of strings of terse rules, containing the essentials of the science, and intended to be committed to memory, and to be expounded orally by the teacher—thus forming, as it were, epitomes of class lectures. These rules are interspersed with stanzas or "gāthās," in various metres, either composed by the author himself or quoted from elsewhere, which generally give the substance of the preceding rules. One can well understand why such couplets should gradually have become more popular, and should ultimately have led to the appearance of works entirely composed in verse. Such metrical law-books did spring up in large numbers, not all at once, but over a long period of time, extending probably from about the beginning of our era, or even earlier, down to well-nigh the Mahommedan conquest; and, as at the time of their first appearance the epic impulse was particularly strong, other metres were entirely discarded for the epic śloka. These works are the metrical *Dharma-śāstras*, or, as they are usually called, the *Smṛiti*, "recollection, tradition,"—a term which, as we have seen, belonged to the whole body of Sūtras (as opposed to the *Śruti*, or revelation), but which has become the almost exclusive title of the versified institutes of law (and the few Dharmasūtras still extant). Of metrical Smṛitis about forty are hitherto known to exist, but their total number probably amounted to at least double that figure, though some of these, it is true, are but short and insignificant tracts, while others are only different recensions of one and the same work.

Manu.

With the exception of a few of these works—such as the *Agni-*, *Yama-* and *Vishṇu-Smṛitis*—which are ascribed to the respective gods, the authorship of the Smṛitis is attributed to old ṛishis, such as Atri, Kaṇva, Vyāsa, Śāṇdilya, Bharadvāja. It is, however, extremely doubtful whether in most cases this attribution is not altogether fanciful, or whether, as a rule, there really existed a traditional connexion between these works and their alleged authors or schools named after them. The idea, which early suggested itself to Sanskrit scholars, that Smṛitis which passed by the names of old Vedic teachers and their schools might simply be metrical recasts of the Dharma- (or Gṛihya-) sūtras of these schools, was a very natural one, and, indeed, is still a very probable one, though the loss of the original Sūtras, and the modifications and additions which the Smṛitis doubtless underwent in course of time, make it very difficult to prove this point. One could, however, scarcely account for the disappearance of the Dharmasūtras of some of the most important schools except on the ground that they were given up in favour of other works; and it is not very likely that this should have been done, unless there was some guarantee that the new works, upon the whole, embodied the doctrines of the old authorities of the respective schools. Thus, as regards the most important of the Smṛitis, the *Mānava-Dharmaśāstra*,[9] there exist both a Śrauta- and a Gṛihya-sūtra of the Mānava school of the Black Yajus, but no such Dharmasūtra has hitherto been discovered, though the former existence of such a work has been made all but certain by Professor Bühler's discovery of quotations from a Mānavam, consisting partly of prose rules, and partly of couplets, some of which occur literally in the Manusmṛiti, whilst others have been slightly altered there to suit later doctrines, or have been changed from the original trishṭubh into the epic metre. The idea of an old law-giver Manu Svāyambhuva—"sprung from the self-existent (svayam-bhū)" god Brahman (m.)—reaches far back into Vedic antiquity: he is mentioned as such in early texts; and in Yāska's *Nirukta* a śloka occurs giving his opinion on a point of inheritance. But whether or not the Mānava-Dharmasūtra embodied what were supposed to be the authoritative precepts of this sage on questions of sacred law we do not know; nor can it as yet be shown that the Manusmṛiti, which seems itself to have undergone considerable modifications, is the lineal descendant of that Dharmasūtra. It is, however, worthy of note that a very close connexion exists between the Manusmṛiti and the Vishṇuśāstra; and, as the latter is most likely a modern, only partially remodelled, edition of the Sūtras of the Black Yajus school of the Kaṭhas, the close relation between the two works would be easily understood, if it could be shown that the Manusmṛiti is a modern development of the Sūtras of another school of the Charaka division of the Black Yajurveda.

The Mānava Dharmaśāstra consists of twelve books, the first and last of which, treating of creation, transmigration and final beatitude, are, however, generally regarded as later additions. In them the legendary sage Bhṛigu, here called a Mānava, is introduced as Manu's disciple, through whom the great teacher has his work promulgated. Why this intermediate agent should have been considered necessary is by no means clear. Except in these two books the work shows no special relation to Manu, for, though he is occasionally referred to in it, the same is done in other Smṛitis. The question as to the probable date of the final redaction of the work cannot as yet be answered. Dr Burnell has tried to show that it was probably composed under the Chālukya king Pulakeśi, about A.D. 500, but his argumentation is anything but convincing. From several ślokas quoted from Manu by Varāhamihira, in the 6th century, it would appear that the text which the great astronomer had before him differed very considerably from our Manusmṛiti. It is, however, possible that he referred either to the *Bṛihat-Manu* (Great

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[1] Edited by Kosegarten, by G. Bühler and F. Kielhorn; translated by Th. Benfey, E. Lancereau, L. Fritze; edited in Pūrṇabhadra's recension by J. Hertel, in Harv. Or. Ser. (1908).

[2] Ed. and transl. F. Johnson, ed. P. Peterson and others in India.

[3] Ed. H. Uhle (Leipzig, 1881); cf. R. F. Burton, *Vikram and the Vampire* (new ed., 1893).

[4] Edited, with German translation, R. Schmidt (Leipzig, 1893), and translation of some stories of a larger recension (1896).

[5] German translation, with introduction, A. Weber, *Ind. Stud.* xv.

[6] Edited, with translation and notes, by L. v. Mankowski (Leipzig, 1892); chapters 1-8 edited and translated by Sylvain Lévi, *Journ. As.* (1886); cf. F. Lacôte, *Essai sur Guṇādhya et la Bṛihatkathā* (1909), where part of a Nepalese version is given.

[7] Edited by H. Brockhaus (1839–1862); by Durgāpratāpa (Bombay, 1889); translated by C. H. Tawney, *Bibl. Ind.* (1880–1886).

[8] Cf. J. Jolly's exhaustive treatise, *Recht und Sitte*, in Bühler's *Grundriss* (1896).

[9] The standard edition is by G. C. Haughton, with Sir W. Jones's translation (1825); the latest translations by A. Burnell and G. Bühler. There is also a critical essay on the work by F. Johäntgen. On the relation between the Dharmasūtras and Smṛitis see especially West and Bühler, *Digest of Hindu Law* (3rd ed.), i. p. 37 seq.

M.) or the *Vṛiddha-Manu* (Old M.), who are often found quoted, and apparently represent one, if not two, larger recensions of this Smṛiti. The oldest existing commentary on the *Mānava-Dharmaśāstra* is by Medhātithi, who is first quoted in 1200, and is usually supposed to have lived in the 9th or 10th century. He had, however, several predecessors to whom he refers as *pūrve*, "the former ones." The most esteemed of the commentaries is that of Kullūka Bhaṭṭa, composed at Benares in the 15th century.

Yājña-valkya.

Next in importance among Smṛitis ranks the *Yājñavalkya Dharmaśāstra*.[1] Its origin and date are not less uncertain—except that, in the opinion of Professor Stenzler, which has never been questioned, it is based on the Manusmṛiti, and represents a more advanced stage of legal theory and definition than that work. Yājñavalkya, as we have seen, is looked upon as the founder of the Vājasaneyins or White Yajus, and the author of the Śatapatha-brāhmaṇa. In the latter work he is represented as having passed some time at the court of King Janaka of Videha (Tirhut); and in accordance therewith he is stated, in the introductory couplets of the Dharmaśāstra, to have propounded his legal doctrines to the sages, while staying at Mithilā (the capital of Videha). Hence, if the connexion between the metrical Smṛitis and the old Vedic schools be a real one and not one of name merely, we should expect to find in the Yājñavalkya-smṛiti special coincidences of doctrine with the Kātīya-sūtra, the principal Sūtra of the Vājasaneyins. Now, some sufficiently striking coincidences between this Smṛiti and Pāraskara's *Kātīya-Gṛihyasūtra* have indeed been pointed out; and if there ever existed a Dharmasūtra belonging to the same school, of which no trace has hitherto been found, the points of agreement between this and the Dharmaśāstra might be expected to be even more numerous. A connexion between this Smṛiti and the Mānava-gṛihyasūtra seems, however, likewise evident. As in the case of Manu, ślokas are quoted in various works from a *Bṛihat-* and a *Vṛiddha-Yājñavalkya*. The Yājñavalkya-smṛiti consists of three books, corresponding to the three great divisions of the Indian theory of law: *āchāra*, rule of conduct (social and caste duties); *vyavahāra*, civil and criminal law; and *prāyaśchitta*, penance or expiation. There are two important commentaries on the work: the famous *Mitāksharā*,[2] by Vijñāneśvara, who lived under the Chālukya king Vikramāditya of Kalyāṇa (1076–1127); and another by Aparārka or Aparāditya, a petty Śilāra prince of the latter half of the 12th century.

Nārada-smṛiti.

The *Nāradīya-Dharmaśāstra*, or *Nāradasmṛiti*,[3] is a work of a more practical kind; indeed, it is probably the most systematic and business-like of all the Smṛitis. It does not concern itself with religious and moral precepts, but is strictly confined to law. Of this work again there are at least two different recensions. Besides the text translated by Dr Jolly, a portion of a larger recension has come to light in India. This version has been commented upon by Asahāya, "the peerless"—a very esteemed writer on law who is supposed to have lived before Medhātithi (? 9th century)—and it may therefore be considered as the older recension of the two. But, as it has been found to contain the word *dīnāra*, an adaptation of the Roman *denarius*, it cannot, at any rate, be older than the 2nd century; indeed, its date is probably several centuries later.

Parāśara.

The *Parāśara-smṛiti*[4] contains no chapter on jurisprudence, but treats only of religious duties and expiations in 12 adhyāyas. The deficiency was, however, supplied by the famous exegete Mādhava (in the latter half of the 14th century), who made use of Parāśara's text for the compilation of a large digest of religious law, usually called *Parāśara-mādhavīyam*, to which he added a third chapter on vyavahāra, or law proper. Besides the ordinary text of the Parāśara-smṛiti, consisting of rather less than 600 couplets, there is also extant a *Bṛihat-Parāśarasmṛiti*, probably an amplification of the former, containing not less than 2980 (according to others even 3300) ślokas.

Whether any of the Dharmaśāstras were ever used in India as actual "codes of law" for the practical administration of justice is very doubtful; indeed, so far as the most prominent works of this class are concerned, it is highly improbable.[5] No doubt these works were held to be of the highest authority as laying down the principles of religious and civil duty; but it was not so much any single text as the whole body of the Smṛiti that was looked upon as the embodiment of the divine law. Hence, the moment the actual work of codification begins in the 11th century, we find the jurists engaged in practically showing how the Smṛitis confirm and supplement each other, and in reconciling seeming contradictions between them. This new phase of Indian jurisprudence commences with Vijñāneśvara's *Mitāksharā*, which, though primarily a commentary on Yājñavalkya, is so rich in original matter and illustrations from other Smṛitis that it is far more adapted to serve as a code of law than the work it professes to explain. This treatise is held in high esteem all over India, with the exception of the Bengal or Gaurīya school of law, which recognizes as its chief authority the digest of its founder, Jīmūtavāhana, especially the chapter on succession, entitled *Dāyabhāga*.[6] Based on the Mitāksharā are the *Smṛiti-chandrikā*,[7] a work of great common-sense, written by Devāṇḍa Bhaṭṭa, in the 13th century, and highly esteemed in Southern India; and the *Vīramitrodaya*, a compilation consisting of two chapters, on āchāra and vyavahāra, made in the first half of the 17th century by Mitramiśra, for Rājā Vīrasiṃha, or Bīrsinh Deo of Orchhā, who murdered Abul Fazl, the minister of the emperor Akbar, and author of the *Āīn i Akbarī*. There is no need here to enumerate any more of the vast number of treatises on special points of law, of greater or less merit, the more important of which will be found mentioned in English digests of Hindu law.

II. PHILOSOPHY.[8]—The contemplative Indian mind shows at all times a strong disposition for metaphysical speculation. In the old religious lyrics this may be detected from the very first. Not to speak of the abstract nature of some even of the oldest Vedic deities, this propensity betrays itself in a certain mystic symbolism, tending to refine and spiritualize the original purely physical character and activity of some of the more prominent gods, and to impart a deep and subtle import to the rites of the sacrifice. The primitive worship of more or less isolated elemental forces and phenomena had evidently ceased to satisfy the religious wants of the more thoughtful minds. Various syncretist tendencies show the drift of religious thought towards some kind of unity of the divine powers, be it in the direction of the pantheistic idea, or in that of an organized polytheism, or even towards monotheism. In the latter age of the hymns the pantheistic idea is rapidly gaining ground, and finds vent in various cosmogonic speculations; and in the Brāhmaṇa period we see it fully developed. The fundamental conception of this doctrine finds its expression in the two synonymous terms *brahman* (neutr.), probably originally "mystic effusion, devotional utterance,"[9] then "holy impulse," and *ātman*[10] (masc.), "breath, self, soul."

The recognition of the essential sameness of the individual souls, emanating all alike (whether really or imaginarily) from the ultimate spiritual essence (*parama-brahman*) "as sparks issue from the fire," and destined to return thither, involved some important problems. Considering the infinite diversity of individual souls of the animal and vegetable world, exhibiting various degrees of perfection, is it conceivable that each of them is the immediate efflux of the Supreme Being, the All-perfect, and that each, from the lowest to the highest, could re-unite therewith directly at the close of its mundane existence? The difficulty implied in the latter question was at first met by the assumption of an intermediate state of expiation and purification, a kind of purgatory; but the whole problem found at last a more comprehensive solution in the doctrine of transmigration (*saṃsāra*). Some scholars have suggested[11] that metempsychosis may have been the prevalent belief among the aboriginal tribes of India, and may have been taken over from them by the Indo-Aryans. This, no doubt, is possible; but in the absence of any positive proof it would be idle to speculate on its probability; the more so as the pantheistic notion of a universal spiritual essence would probably of itself sufficiently account for the spontaneous growth of such a belief. In any case, however, we can only assume that speculative minds seized upon it as offering the most satisfactory (if not the only possible) explanation of the great problem of phenomenal existence with its unequal distribution of weal and woe. It is certainly a significant fact that, once established in Indian thought, the doctrine of metempsychosis is never again called in question—that, like the fundamental idea on which it rests, viz. the essential sameness of the immaterial element of all sentient beings, the notion of *saṃsāra* has become an axiom, a universally conceded principle of Indian philosophy. Thus the latter has never quite risen to the heights of pure thought; its object is indeed *jijñāsā*, the search for knowledge; but it is an inquiry (*mīmāṃsā*) into the nature of things undertaken not solely for the attainment of the truth, but with a view to a specific object—the discontinuance of saṃsāra, the cessation of mundane existence after the present life. Every sentient being, through ignorance, being liable to sin, and destined after each existence to be born again in some new form, dependent on the actions committed during the immediately preceding life, all mundane existence thus is the source of ever-renewed suffering; and the task of the philosopher is to discover the means of attaining *moksha*, "release" from the bondage of material existence, and union with the Supreme Self—in fact, salvation. It is with a view to this, and to this only, that the Indian metaphysician takes up the great problems of life—the origin of man and the universe, and the relation between mind and matter.

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[1] Edited, with a German translation, by F. Stenzler.

[2] Translated by H. T. Colebrooke.

[3] Ed. (*Bibl. Ind.*, 1885) J. Jolly, trsl. *S.B.E.* xxxiii.

[4] Edited in Bombay Sansk. Ser. (1893); translated *Bibl. Ind.* (1887). The chapter on inheritance (dāya-vibhāga) translated by A. C. Burnell (1868).

[5] See West and Bühler, *Digest*, i. p. 55. A different view is expressed by A. Burnell, *Dāyavibhāga*, p. xiii.

[6] Translated by H. C. Colebrooke (1810).

[7] The section on inheritance has been translated by T. Kristnasawmy Iyer (1866).

[8] Cf. F. Max Müller, *Six Systems of Indian Philosophy* (1899); R. Garbe, *Philosophy of Ancient India* (Chicago, 1897).

[9] The etymological connexion of *brahman* (from root *varh*, *vardh*) with Latin *verbum*, English *word* (corresponding to a Sanskrit *vardha*), assumed by some scholars, though doubtful, is not impossible. The development of its meaning would be somewhat like that of λόγος.

[10] The derivation of *ātman* (Ger. *Atem*) from root *an*, to breathe (or perhaps *av*, to blow) seems still the most likely. A recent attempt to connect it with αὐτός can scarcely commend itself.

[11] See, *e.g.* A. E. Gough, *The Philosophy of the Upanishads*, p. 24; A. A. Macdonell, *Hist. of Sanskrit Lit.* p. 387.

It is not likely that these speculations were viewed with much favour by the great body of Brāhmans engaged in ritualistic practices. Not that the metaphysicians actually discountenanced the ceremonial worship of the old mythological gods as vain and nugatory. On the contrary, they expressly admitted the propriety of sacrifices, and commended them as the most meritorious of human acts, by which man could raise himself to the highest degrees of mundane existence, to the worlds of the Fathers and Devas. But, on the other hand, metaphysical speculation itself had gradually succeeded in profoundly modifying the original character of the sacrificial ritual: an allegorical meaning had come to be attached to every item of the ceremonial, in accordance with the strange monotheistic-pantheistic theory of the Brāhmaṇas which makes the performance of the sacrifice represent the building up of Prajāpati, the Purusha or "world man," and thus the creation of reproduction of the universe. In the *Śatap. Br.* (vii. 3, 4, 41) he is said to be the whole Brahman (n.), and (vii. 1, 2, 7; xi. 1, 6, 17) he is represented as the breath or vital air (prāṇa), and the air being his self (ātman). It needed but the identification of the Ātman, or individual self, with the Brahman or Paramātman (supreme self), to show that the final goal lay far beyond the worlds hitherto striven after through sacrifice, a goal unattainable through aught but a perfect knowledge of the soul's nature and its identity with the Divine Spirit. "Know ye that one Self," exhorts one of those old idealists,[1] "and have done with other words; for that (knowledge) is the bridge to immortality!" Intense self-contemplation being, moreover, the only way of attaining the all-important knowledge, this doctrine left little or no room for those mediatorial offices of the priest, so indispensable in ceremonial worship; and indeed we actually read of Brāhman sages resorting to Kshatriya princes[2] to hear them expound the true doctrine of salvation. But, in spite of their anti-hierarchical tendency, these speculations continued to gain ground; and in the end the body of treatises propounding the pantheistic doctrine, the Upanishads, were admitted into the sacred canon, as appendages to the ceremonial writings, the Brāhmaṇas. The Upanishads[3] thus form literally "the end of the Veda," the *Vedānta*; but their adherents claim this title for their doctrines in a metaphorical rather than in a material sense, as "the ultimate aim and consummation of the Veda." In later times the radical distinction between these speculative appendages and the bulk of the Vedic writings was strongly accentuated in a new classification of the sacred scriptures. According to this scheme they were supposed to consist of two great divisions—the *Karma-kāṇḍa, i.e.* "the work-section," or practical ceremonial (exoteric) part, consisting of the Saṃhitās and Brāhmaṇas (including the ritual portions of the Āraṇyakas), and the *Jñānakāṇḍa*, "the knowledge-section," or speculative (esoteric) part. These two divisions are also called respectively the *Pūrva-* ("former") and *Uttara-* ("latter," or higher[4]) *kāṇḍa*; and when the speculative tenets of the Upanishads came to be formulated into a regular system it was deemed desirable that there should also be a special system corresponding to the older and larger portion of the Vedic writings. Thus arose the two systems—the *Pūrva-* (or *Karma-*) *mīmāṃsā*, or "prior (practical) speculation," and the *Uttara-* (or *Brahma-*) *mīmāṃsā*, or higher inquiry (into the nature of the godhead), usually called the Vedānta philosophy.

Philosophical systems.

It is not yet possible to determine, even approximately, the time when the so-called *Darśanas* (literally "demonstrations"), or systems of philosophy which subsequently arose, were first formulated. And, though they have certainly developed from the tenets enunciated in the Upanishads, there is some doubt as to the exact order in which these systems succeeded each other. Of all the systems the Vedānta has indeed remained most closely in touch with the speculations of the Upanishads, which it has further developed and systematized. The authoritative *exposés* of the systems have, however, apparently passed through several redactions; and, in their present form, these sūtra-works[5] evidently belong to a comparatively recent period, none of them being probably older than the early centuries of our era. By far the ablest general review of the philosophical systems (except the Vedānta) produced by a native scholar is the *Sarva-darśana-sangraha*[6] ("summary of all the Darśanas"), composed in the 14th century, from a Vedāntist point of view, by the great exegete Mādhava Āchārya.

Among the different systems, six are generally recognized as orthodox, as being (either wholly or for the most part) consistent with the Vedic religion—two and two of which are again more closely related to each other than to the rest, viz.:

(1) *Pūrva-mīmāṃsā* (*Mīmāṃsā*), and (2) *Uttara-mīmāṃsā* (*Vedānta*);
(3) *Sānkhya*, and (4) *Yoga*;
(5) *Nyāya*, and (6) *Vaiśeshika*.

Mīmāṃsā.

1. The (*Pūrva-*) *Mīmāṃsā* is not a system of philosophy in the proper sense of the word, but rather a system of dogmatic criticism and scriptural interpretation. It maintains the eternal existence of the Veda, the different parts of which are minutely classified. Its principal object, however, is to ascertain the religious (chiefly ceremonial) duties enjoined in the Veda, and to show how these duties must be performed, and what are the special merits and rewards attaching to them. Hence arises the necessity of determining the principles for rightly interpreting the Vedic texts, as also of what forms its only claim to being classed among speculative systems, viz. a philosophical examination of the means of, and the proper method for, arriving at accurate knowledge. The foundation of this school, as well as the composition of the Sūtras or aphorisms, the *Mīmāṃsā-darśana*,[7] which constitute its chief doctrinal authority, is ascribed to Jaimini. The Sūtras were commented on by Śabara Svāmin; and further annotations (*vārttika*) thereon were supplied by the great theologian Kumārila Bhaṭṭa, who is supposed to have lived about A.D. 700 and to have worked hard for the re-establishment of Brāhmanism. The most approved general introduction to the study of the Mīmāṃsā is the metrical *Jaiminīya-Nyāya-mālā-vistara*,[8] with a prose commentary, both by Mādhava Āchārya. This distinguished writer, who has already been mentioned several times, was formerly supposed, from frequent statements in MSS., to have been the brother of Sāyaṇa, the well-known interpreter of the Vedas. The late Dr Burnell[9] has, however, made it very probable that these two are one and the same person, Sāyaṇa being his Telugu and Mādhavāchārya his Brāhmanical name. In 1331 he became the *jagadguru*, or spiritual head, of the Smārtas (a Vedāntist sect founded by Śankarāchārya) at the Math of Śṛingeri, where, under the patronage of Bukka, king of Vidyānagara, he composed his numerous works. He sometimes passes under a third name, Vidyāraṇya,-svāmin, adopted by him on becoming a *sannyāsin*, or religious mendicant.

Vedānta.

2. The *Vedānta* philosophy, in the comparatively primitive form in which it presents itself in most of the older Upanishads, constitutes the earliest phase of sustained metaphysical speculation. In its essential features it remains to this day the prevalent belief of Indian thinkers, and enters largely into the religious life and convictions of the people. It is an idealistic monism, which derives the universe from an ultimate conscious spiritual principle, the one and only existent from eternity—the *Ātman*, the Self, or the *Purusha*, the Person, the *Brahman*. It is this primordial essence or Self that pervades all things, and gives life and light to them, "without being sullied by the visible outward impurities or the miseries of the world, being itself apart"—and into which all things will, through knowledge, ultimately resolve themselves. "The wise who perceive him as being within their own Self, to them belongs eternal peace, not to others."[10] But, while the commentators never hesitate to interpret the Upanishads as being in perfect agreement with the Vedāntic system, as elaborated in later times, there is often considerable difficulty in accepting their explanations. In these treatises only the leading features of the pantheistic theory find utterance, generally in vague and mystic, though often in singularly powerful and poetical language, from which it is not always possible to extract the author's real idea on fundamental points, such as the relation between the Supreme Spirit and the phenomenal world—whether the latter was actually evolved from the former by a power inherent in him, or whether the process is altogether a fiction, an illusion of the individual self. Thus the Kaṭha-upanishad[11] offers the following summary: "Beyond the senses [there are the objects; beyond the objects] there is the mind (manas); beyond the mind there is the intellect (buddhi); beyond the intellect there is the Great Self. Beyond the Great One there is the Highest Undeveloped (avyaktam); beyond

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[1] Muṇḍaka-upanishad, ii. 2, 5.

[2] From such allusions, or statements, in the Upanishads, some scholars have actually gone the length of claiming the origin of this cardinal doctrine of Vedānta philosophy for the Kshatriyas. It seems to us, however, very much more likely that these anecdotes were introduced by the Brahmanical sages of set purpose to win over their worldly patrons from their materialistic tendencies to their own idealistic views. Kapila, the author of the materialistic Sānkhya, is supposed to have been a Kshatriya, and so, we know, was the Śākya Muni.

[3] Cf. P. Deussen, *The Philosophy of the Upanishads* (Edinburgh, 1906).

[4] Cf. Muṇḍaka-upanishad, i. 4, 5, where these two divisions are called "the lower (*apara*) and the higher (*para*) knowledge."

[5] These works have all been printed with commentaries in India; and they have been partly translated by J. Ballantyne and by K. M. Banerjea. The best general view of the systems is to be obtained from H. C. Colebrooke's account, *Misc. Essays*, i. (2nd ed.), with Professor Cowell's notes. Compare also the brief abstract given in Goldstücker's *Literary Remains*, vol. i. A very useful classified index of philosophical works was published by F. Hall (1859).

[6] Edited in the *Bibl. Ind.*; translated by E. B. Cowell and A. E. Gough (1882).

[7] Text and Commentary, *Bibl. Ind.*

[8] Edited by Th. Goldstücker, completed by E. B. Cowell; also ed. *Ānand-Ser.* (Bombay, 1892).

[9] *Vaṃśa-brāhmaṇa*, Introd.

[10] Kaṭha-upanishad, ii. 5, 12.

[11] Kaṭha-up., i. 3, 10; ii. 6, 7.

the Undeveloped there is the Person (purusha), the all-pervading, characterless (alinga). Whatsoever knows him is liberated, and attains immortality." Here the Vedāntist commentator assures us that the Great Undeveloped, which the Sānkhyas would claim as their own primary material principle (pradhāna, prakṛiti), is in reality *Māyā*, illusion (otherwise called Avidyā, ignorance, or Śakti, power), the fictitious energy which in conjunction with the Highest Self (Ātman, Purusha) produces or constitutes the Īśvara, the Lord, or Cosmic Soul, the first emanation of the Ātman, and himself the (fictitious) cause of all that seems to exist. It must remain doubtful, however, whether the author of the Upanishad really meant this, or whether he regarded the Great Undeveloped as an actual material principle or substratum evolved from out of the Purusha, though not, as the Sānkhyas hold, coexisting with him from eternity. Besides passages such as these which seem to indicate realistic or materialistic tendencies of thought, which may well have developed into the dualistic Sānkhya and kindred systems, there are others which indicate the existence even of nihilist theories, such as the Bauddhas—the *śūnya-vādins*, or affirmers of a void or primordial nothingness—profess. Thus we read in the Chhāndogya-upanishad:[1] "The existent alone, my son, was here in the beginning, one only, without a second. Others say, there was the non-existent alone here in the beginning, one only, without a second—and from the non-existent the existent was born. But how could this be, my son? How could the existent be born from the non-existent? No, my son, only the existent was here in the beginning, one only, without a second."

The foundation of the Vedānta system, as "the completion of the Veda," is naturally ascribed to Vyāsa, the mythic arranger of the Vedas, who is said to be identical with Bādarāyaṇa the reputed author of the *Brahma-* (or *Śārīraka-*) *sūtra*, the authoritative, though highly obscure, summary of the system. **Śankara.** The most distinguished interpreter of these aphorisms is the famous Malabar theologian Śankara Āchārya,[2] who also commented on the principal Upanishads and the Bhagavadgītā, and is said to have spent the greater part of his life in wandering all over India, as far as Kashmir, and engaging in disputations with teachers—whether of the Śaiva, or Vaishṇava, or less orthodox persuasions—with the view of rooting out heresy and re-establishing the doctrine of the Upanishads. His controversial triumphs (doubtless largely mythical) are related in a number of treatises current in South India, the two most important of which are the *Śankara-dig-vijaya* ("Śankara's world-conquest"), ascribed to his own disciple Ānandagiri, and the *Śankara-vijaya*, by Mādhavāchārya. In Śankara's philosophy[3] the theory that the material world has no real existence, but is a mere illusion of the individual soul wrapt in ignorance,—that, therefore, it has only a practical or conventional (*vyāvahārika*) but not a transcendental or true (*pāramārthika*) reality,—is strictly enforced. In accordance with this distinction, a higher (*parā*) and a lower (*aparā*) form of knowledge is recognized; the former being concerned with the Brahman (n.), whilst the latter deals with the personal Brahmā, the Īśvara, or lord and creator, who, however, is a mere illusory form of the divine spirit, resulting from ignorance of the human soul. To the question why the Supreme Self (or rather his fictitious development, the Highest Lord) should have sent forth this phantasmagory this great thinker (with the author of the Sūtras[4]) can return no better answer than that it must have been done for sport (*līlā*), without any special motive—since to ascribe such a motive to the Supreme Lord would be limiting his self-sufficiency—and that the process of creation has been going on from all eternity. Śankara's *Śārīraka-mīmāṃsā-bhāshya*[5] has given rise to a large number of exegetic treatises, of which Vāchaspati-miśra's[6] exposition, entitled *Bhāmatī*,[7] is the most esteemed. **Rāmānuja.** Of numerous other commentaries on the Brahma-sūtras, the *Śrī-bhāshya*, by Rāmānuja, the founder of the Śrī-Vaishṇava sect, is the most noteworthy. This religious teacher, who flourished in the first half of the 12th century, caused a schism in the Vedānta school. Instead of adhering to Śankara's orthodox *advaita*, or non-duality, doctrine, he interpreted the obscure Sūtras in accordance with his theory of *viśishṭādvaita*, *i.e.* non-duality of the (two) distinct (principles), or, as it is more commonly explained, non-duality of that which is qualified (by attributes). According to this theory the Brahman is neither devoid of form and quality, nor is it all things; but it is endowed with all good qualities, and matter is distinct from it; whilst bodies consist of souls (*chit*) and matter (*achit*); and God is the soul. On the religious side, Rāmānuja adopts the tenets of the ancient Vishnuite Pāncharātra sect, and, identifying the Brahman with Vishṇu, combines with his theory the ordinary Vaishṇava doctrine of periodical descents (*avatāra*) of the deity, in various forms, for the benefit of creatures; and allowing considerable play to the doctrine that faith (*bhakti*), not knowledge (*vidyā*), is the means of final emancipation. This phase of Indian religious belief, which has attached itself to the Vedānta theory more closely than to any other, makes its appearance very prominently in the *Bhagavadgītā*, the episode of the *Mahābhārata*, already referred to—where, however, it attaches itself to Sānkhya-yoga rather than to Vedānta tenets—and is even more fully developed in some of the Purāṇas, especially the Bhāgavata. Some scholars would attribute this doctrine of fervid devotion to Christian influence, but it is already alluded to by Pāṇini and in the *Mahābhāshya*. In the *Śāṇḍilya-* (*Bhakti-*) *sūtra*,[8] the author and date of which are unknown, the doctrine is systematically propounded in one hundred aphorisms. According to this doctrine mundane existence is due to want of faith, not to ignorance; and the final liberation of the individual soul can only be effected by faith. Knowledge only contributes to this end by removing the mind's foulness, unbelief. Its highest phase of development this doctrine probably reached in the Vaishṇava sect founded, towards the end of the 15th century, by Chaitanya, whose followers subsequently grafted the Vedānta speculations on his doctrine. In opposition both to Śankara's theory of absolute unity, and to Rāmānuja's doctrine of qualified unity—though leaning more towards the latter—Madhva Āchārya, or Pūrṇaprajna (A. D. 1118–1198), started his *dvaita*, or duality doctrine, according to which there is a difference between God and the human soul (*jīva*), as well as between God and nature; whilst the individual souls, which are innumerable, eternal, and indestructible, are likewise different from one another; but, though distinct, are yet united with God, like tree and sap, in an indissoluble union. This doctrine also identifies the Brahman with Vishṇu, by the side of whom, likewise infinite, is the goddess Lakshmī, as Prakṛiti (nature), from whom inert matter (*jaḍa*) derives its energy. Here also *bhakti*, devotion to God, is the saving element. A popular summary of the Vedānta doctrine is the *Vedānta-sāra* by Sadānanda, which has been frequently printed and translated.[9]

Sānkhya. 3. The *Sānkhya*[10] system seems to derive its name from its systematic enumeration (*sankhyā*) of the twenty-five principles (*tattva*) it recognizes—consisting of twenty-four material and an independent immaterial principle. In opposition to the Vedānta school, which maintains the eternal coexistence of a spiritual principle of reality and an unspiritual principle of unreality, the Sānkhya assumes the eternal coexistence of a material first cause, which it calls either *mūla-Prakṛiti* (fem.), "prime Originant" (Nature), or *Pradhāna*, "the principal" cause, and a plurality of spiritual elements or Selves, *Purusha*. The system recognizes no intelligent creator (such as the *Īśvara*, or demiurgus, of the Vedānta)—whence it is called *nirīśvara*, godless; but it conceives the Material First Cause, itself unintelligent, to have become developed, by a gradual process of evolution, into all the actual forms of the phenomenal universe, excepting the souls. Its first emanation is *buddhi*, intelligence; whence springs *ahaṃkāra*, consciousness (or "conscious mind-matter," Davies); thence the subtle elements of material forms, viz. five elementary particles (*tanmātra*) and eleven organs of sense; and finally, from the elementary particles, five elements. The souls have from all eternity been connected with Nature,—having in the first place become invested with a subtle frame (*linga-*, or *sūkshma-*, *śarīra*), consisting of seventeen principles, viz. intelligence, consciousness, elementary particles, and organs of sense and action, including mind. To account for the spontaneous development of matter, the system assumes the latter to consist of three constituents (*guṇa*) which are possessed of different qualities, viz. *sattva*, of pleasing qualities, such as "goodness," lightness, luminosity; *rajas*, of pain-giving qualities, such as "gloom," passion, activity; and *tamas*, of deadening qualities, such as "darkness," rigidity, dullness, and which, if not in a state of equipoise, cause unrest and development. Through all this course of development, the soul itself remains perfectly indifferent, its sole properties being those of purity and intelligence, and the functions usually regarded as "psychic" being due to the mechanical processes of the internal organs themselves evolved out of inanimate matter. Invested with its subtle frame, which accompanies it through the cycle of transmigration, the soul, for the sake of fruition, connects itself ever anew with Nature, thus, as it were, creating for itself ever new forms of material existence; and it is only on his attaining perfect knowledge, whereby the ever-changing modes of intelligence cease to be reflected on him, that the Purusha is liberated from the miseries of Saṃsāra, and continues to exist in a state of absolute unconsciousness and detachment from matter. The existence of God, on the other hand, is denied by this theory, or rather considered as incapable of proof; the existence of evil and misery, for one thing, being thought incompatible with the notion of a divine origin of the world.

The reputed originator of this school is the sage Kapila, to whom tradition ascribes the composition of the fundamental text-book, the (*Sānkhya-sūtra*, or) *Sānkhya-pravachana*,[1] as well as the *Tattva-samāsa*, a mere catalogue of the principles. But, though the founder would seem to have promulgated his system, in some form or other, at a very early period, these works, in their present form, have been shown to be quite modern productions, going probably not farther back than the 14th century of our era. Probably the oldest existing work is Īśvarakṛishṇa's excellent *Sānkhya-kārikā*,[2] which gives, in the narrow compass of sixty-nine ślokas, a lucid and complete sketch of the system. Though nothing certain is known regarding its author,[3] this work must be of tolerable antiquity, considering that it was commented upon by Gauḍapāda,[4] the preceptor of Govinda, who, on his part, is said to have been the teacher of Śankarāchārya. Of the commentaries on the Sūtras, the most approved are those of Aniruddha[5] and Vijñāna Bhikshu,[6] a writer probably of the latter part of the 16th century, who also wrote an independent treatise, the *Sānkhya-sāra*,[7] consisting of a prose and a verse part, which is probably the most useful compendium of Sānkhya doctrines.

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[1] vi. 2. 1.

[2] *Die Sūtras des Vedānta*, text and commentary translated by P. Deussen (Leipzig, 1887); English translation by G. Thibaut, *S.B.E.*

[3] P. Deussen, *Das System des Vedānta* (1883). A. E. Gough, *The Philosophy of the Upanishads*, also follows chiefly Śankara's interpretation.

[4] *Brahmasūtra*, iii. 1. 32-34.

[5] Translated by G. Thibaut, *S.B.E.*; German, P. Deussen.

[6] Professor Cowell assigns him to about the 10th century.

[7] *Bibl. Ind.*

[8] Text, with Svapneśvara's commentary, edited by J. R. Ballantyne; translated by E. B. Cowell.

[9] Last by G. A. Jacob.

[10] E. Röer, *Lecture on the Sānkhya Philosophy* (Calcutta, 1854); B. St Hilaire, *Mémoire sur le Sānkhya* (1852); R. Garbe, *Sānkhya Philosophie* (Leipzig, 1894); *Sānkhya and Yoga* (Strassburg, 1896).

Yoga.

4. The *Yoga* system is merely a schismatic branch of the preceding school, holding the same opinions on most points treated in common in their Sūtras, with the exception of one important point, the existence of God. To the twenty-five principles (*tattva*) of the Nirīśvara Sānkhya, the last of which was the *Purusha*, the Yoga adds, as the twenty-sixth, the *Nirguṇa Purusha*, or Self devoid of qualities, the Supreme God of the system. Hence the Yoga is called the *Seśvara* (theistical) *Sānkhya*. But over and above the purely speculative part of its doctrine, which it has adopted from the sister school, the theistic Sānkhya has developed a complete system of mortification of the senses—by means of prolonged apathy and abstraction, protracted rigidity of posture, and similar practices,—many of which are already alluded to in the Upanishads,—with the view of attaining to complete concentration (*yoga*) on, and an ecstatic vision of, the Deity, and the acquisition of miraculous powers. It is from this portion of the system that the school derives the name by which it is more generally known. The authoritative Sūtras of the Yoga, bearing the same title as those of the sister school, viz. *Sānkhya-pravachana*, but more commonly called *Yoga-śāstra*, are ascribed to Patañjali, who is perhaps identical with the author of the "great commentary" on Pāṇini. The oldest commentary on the Sūtras, the *Pātañjala-bhāshya*, is attributed to no other than Vyāsa, the mythic arranger of the Veda and founder of the Vedānta. Both works have again been commented upon by Vāchaspati-miśra, Vijñāna-bhikshu, and other writers.

Nyāya and Vaiśeshika.

5, 6. The *Nyāya*[8] and *Vaiśeshika* are but separate branches of one and the same school, which supplement each other and the doctrines of which have virtually become amalgamated into a single system of philosophy. The special part taken by each of the two branches in the elaboration of the system may be briefly stated in Dr Röer's words:—"To the Nyāya belong the logical doctrines of the forms of syllogisms, terms and propositions; to the Vaiśeshikas the systematical explanation of the categories (the simplest metaphysical ideas) of the metaphysical, physical and psychical notions—which notions are hardly touched upon in the Nyāya-sūtras. They differ in their statement of the several modes of proof—the Nyāya asserting four modes of proof (from perception, inference, analogy and verbal communication), the Vaśieshikas admitting only the two first ones." The term Nyāya (*ni-āya*, "in-going," entering), though properly meaning "analytical investigation," as applied to philosophical inquiry generally, has come to be taken more commonly in the narrower sense of "logic," because this school has entered more thoroughly than any other into the laws and processes of thought, and has worked out a formal system of reasoning which forms the Hindu standard of logic.

Logic.

The followers of these schools generally recognize seven categories (*padārtha*): substance (*dravya*), quality (*guṇa*), action (*karma*), generality (*sāmānya*), particularity (*viśesha*), intimate relation (*samavāya*) and non-existence or negation (*abhāva*). Substances, forming the substrata of qualities and actions, are of two kinds: eternal (without a cause), viz. space, time, ether, soul and the atoms of mind, earth, water, fire and air; and non-eternal, comprising all compounds, or the things we perceive, and which must have a cause of their existence. Causality is of three kinds: that of intimate relation (material cause); that of non-intimate relation (between parts of a compound); and instrumental causality (effecting the union of component parts). Material things are thus composed of atoms (*aṇu*), *i.e.* ultimate simple substances, or units of space, eternal, unchangeable and without dimension, characterized only by "particularity (*viśesha*)." It is from this predication of ultimate "particulars" that the Vaiśeshikas, the originators of the atomistic doctrine, derive their name. The Nyāya draws a clear line between matter and spirit, and has worked out a careful and ingenious system of psychology. It distinguishes between individual or living souls (*jīvātman*), which are numerous, infinite and eternal, and the Supreme Soul (*Paramātman*), which is one only, the seat of eternal knowledge, and the maker and ruler (*Īśvara*) of all things. It is by his will and agency that the unconscious living souls (soul-atoms, in fact) enter into union with the (material) atoms of mind, &c., and thus partake of the pleasures and sufferings of mundane existence. On the Hindu syllogism compare Professor Cowell's notes to Colebrooke's *Essays*, 2nd ed., i. p. 314.

The original collection of *Nyāya-sūtras* is ascribed to Gotama, and that of the *Vaiśeshika-sūtras* to Kaṇāda. The etymological meaning of the latter name seems to be "little-eater, particle-eater," whence in works of hostile critics the synonymous terms *Kaṇa-bhuj* or *Kaṇa-bhaksha* are sometimes derisively applied to him, doubtless in allusion to his theory of atoms. He is also occasionally referred to under the name of Kāśyapa. Both sūtra-works have been interpreted and supplemented by a number of writers, the commentary of Viśvanātha on the Nyāya and that of Śankara-miśra on the Vaiśeshika-sūtras being most generally used. There are, moreover, a vast number of separate works on the doctrines of these schools, especially on logic. Of favourite elementary treatises on the subject may be mentioned Keśava-miśra's *Tarka-bhāshā*, the *Tarka-sangraha*[9] and the *Bhāshā-parichchheda*.[10] A large and important book on logic is Gangeśa's *Chintāmani*, which formed the text-book of the celebrated Nuddea school of Bengal, founded by Raghunātha-śiromaṇi about the beginning of the 16th century. An interesting little treatise is the *Kusumāñjali*,[11] in which the author, Udayana Āchārya (about the 12th century, according to Professor Cowell), attempts, in 72 couplets, to prove the existence of a Supreme Being on the principles of the Nyāya system.

Heretical Systems.

As regards the different heretical systems of Hindu philosophy, there is no occasion, in a sketch of Sanskrit literature, to enter into the tenets of the two great anti-Brāhmanical sects, the Jainas and Buddhists. While the original works of the former are written mostly in a popular (the Ardha-māgadhī) dialect, the northern Buddhists, it is true, have produced a considerable body of literature,[12] composed in a kind of hybrid Sanskrit, but only a few of their sacred books have as yet been published;[13] and it is, moreover, admitted on all hands that for the pure and authentic Bauddha doctrines we have rather to look to the Pāli scriptures of the southern branch. Nor can we do more here than briefly allude to the theories of a few of the less prominent heterodox systems, however interesting they may be for a history of human thought.

The *Chārvākas*, an ancient sect of undisguised materialism, who deny the existence of the soul, and consider the human person (*purusha*) to be an organic body endowed with sensibility and with thought, resulting from a modification of the component material elements, ascribe their origin to Bṛihaspati; but their authoritative text-book, the *Bārhaspatya-sūtra*, is only known so far from a few quotations.

The *Pāñcharātras*, or *Bhāgavatas*, are an early Vaishṇava sect, in which the doctrine of faith, already alluded to, is strongly developed. Hence their tenets are defended by Rāmānuja, though they are partly condemned as heretical in the Brahma-sūtras. Their recognized text-book is the *Nārada-Pāñcharātra*,[14] whilst the *Bhagavadgītā* is also supposed to have had some connexion with this sect. According to their theory the Supreme Being (Bhagavat, Vāsudeva, Vishṇu) became four separate persons by successive production. While the Supreme Being himself is indued with the six qualities of knowledge, power, strength, absolute sway, vigour and energy, the three divine persons successively emanating from him and from one another represent the living soul, mind and consciousness respectively.

The *Pāśupatas*, one of several Śaiva (Māheśvara) sects, hold the Supreme Being (*Īśvara*), whom they identify with Śiva (as *paśu-pati*, or "lord of beasts"), to be the creator and ruler of the world, but not its material cause. With the Sānkhyas they admit the notion of a plastic material cause, the *Pradhāna*; while they follow Patañjali in maintaining the existence of a Supreme God.

III. Grammar (*Vyākaraṇa*).—We found this subject enumerated as one of the six "limbs of the Veda," or auxiliary sciences, the study of which was deemed necessary for a correct interpretation of the sacred Mantras, and the proper performance of Vedic rites.

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[1] Translated by J. R. Ballantyne; 2nd ed. by F. Hall.

[2] Edited by C. Lassen (1832). Translations by H. T. Colebrooke and J. Davies.

[3] A writer makes him the pupil of Panchaśikha, whilst another even identifies him with Kālidāsa; cf. F. Hall, *Sānkhyasāra*, p. 29.

[4] Translated by H. H. Wilson. A Chinese translation of a commentary resembling that of Gauḍapāda is said (M. Müller, *India*, p. 360) to have been made during the Ch'en dynasty (A.D. 557–583).

[5] Translated by R. Garbe, *Bibl. Ind.*

[6] Edited by Garbe (Harvard, 1895); translated (Leipzig, 1889).

[7] Edited by F. Hall.

[8] Besides Colebrooke's *Essay*, with Cowell's notes, see Ballantyne's translation of the *Tarka-sangraha* and the introduction to Röer's translation of the *Bhāshāparichheda*, and his article, *Z.D.M.G.* xxi.

[9] Edited and translated by J. R. Ballantyne.

[10] Edited and translated, with commentary, by E. Röer.

[11] Edited and translated, with commentary, by E. B. Cowell.

[12] See B. H. Hodgson, *The Languages, Literature and Religion of Nepal and Tibet.*

[13] *Lalita-vistara*, ed. and partly transl. Rājendralāla Mitra; ed. S. Lefmann (1908); *Mahāvastu*, edited E. Senart; *Vajra-parichchheda*, edited M. Müller; *Saddharma-puṇḍarīka*, translated by E. Burnouf ("Lotus de la bonne loi"); and H. Kern, *Sacred Books of the East.*

[14] It consists of six Saṃhitās, one of which has been edited by K. M. Banerjea, *Bibl. Ind.*

Grammar.

Pāṇini.

Linguistic inquiry, phonetic as well as grammatical, was indeed early resorted to both for the purpose of elucidating the meaning of the Veda and with the view of settling its textual form. The particular work which came ultimately to be looked upon as the "vedānga" representative of grammatical science, and has ever since remained the standard authority on Sanskrit grammar in India, is Pāṇini's *Ashṭādhyāyī*,[1] so called from its "consisting of eight lectures (*adhyāya*)," of four *pādas* each. For a comprehensive grasp of linguistic facts, and a penetrating insight into the structure of the vernacular language, this work stands probably unrivalled in the literature of any nation—though few other languages, it is true, afford such facilities as the Sanskrit for a scientific analysis. Pāṇini's system of arrangement differs entirely from that usually adopted in our grammars, viz. according to the so-called parts of speech. As the work is composed in aphorisms intended to be learnt by heart, economy of memory-matter was the author's paramount consideration. His object was chiefly attained by the grouping together of all cases exhibiting the same phonetic or formative feature, no matter whether or not they belonged to the same part of speech. For this purpose he also makes use of a highly artificial and ingenious system of algebraic symbols, consisting of technical letters (*anubandha*), used chiefly with suffixes, and indicative of the changes which the roots or stems have to undergo in word-formation.

It is self-evident that so complicated and complete a system of linguistic analysis and nomenclature could not have sprung up all at once and in the infancy of grammatical science, but that many generations of scholars must have helped to bring it to that degree of perfection which it exhibits in Pāṇini's work. Accordingly we find Pāṇini himself making reference in various places to ten different grammarians, besides two schools, which he calls the "eastern (*prāñchas*)" and "northern (*udañchas*)" grammarians. Perhaps the most important of his predecessors was Śakaṭāyana,[2] also mentioned by Yāska—the author of the Nirukta, who is likewise supposed to have preceded Pāṇini—as the only grammarian (*vaiyākaraṇa*) who held with the etymologists (*nairukta*) that all nouns are derived from verbal roots. Unfortunately there is little hope of the recovery of his grammar, which would probably have enabled us to determine somewhat more exactly to what extent Pāṇini was indebted to the labours of his predecessors. There exists indeed a grammar in South Indian MSS., entitled *Śabdānuśāsana*, which is ascribed to one Sākaṭāyana;[3] but this has been proved[4] to be the production of a modern Jaina writer, which, however, seems to be partly based on the original work, and partly on Pāṇini and others. Pāṇini is also called Dākshīputra, after his mother Dākshī. As his birthplace the village Śalātura is mentioned, which was situated some few miles north-west of the Indus, in the country of the Gandhāras, whence later writers also call him Śālāturīya, the formation of which name he himself explains in his grammar. Another name sometimes applied to him is Śalanki. In the *Kathā-saritsāgara*, a modern collection of popular tales mentioned above, Pāṇini is said to have been the pupil of Varsha, a teacher at Pāṭaliputra, under the reign of Nanda, the father (?) of Chandragupta (315–291 B.C.). The real date of the great grammarian is, however, still a matter of uncertainty. While Goldstücker[5] attempted to put his date back to ante-Buddhist times (about the 7th century B.C.), Professor Weber held that Pāṇini's grammar cannot have been composed till some time after the invasion of Alexander the Great. This opinion is chiefly based on the occurrence in one of the Sūtras of the word *yavanānī*, in the sense of "the writing of the Yavanas (Ionians)," thus implying, it would seem, such an acquaintance with the Greek alphabet as it would be impossible to assume for any period prior to Alexander's Indian campaign (326 B.C.). But, as it is by no means certain[6] that this term really applies to the Greek alphabet, it is scarcely expedient to make the word the corner-stone of the argument regarding Pāṇini's age. If Patañjali's "great commentary" was written, as seems most likely, about the middle of the 2nd century B.C., it is hardly possible to assign to Pāṇini a later date than about 400 B.C. Though this grammarian registers numerous words and formations as peculiar to the Vedic hymns, his chief concern is with the ordinary speech (*bhāshā*) of his period and its literature; and it is noteworthy, in this respect, that the rules he lays down on some important points of syntax (as pointed out by Professors Bhandarkar and Kielhorn) are in accord with the practice of the Brāhmaṇas rather than with that of the later classical literature.

Kātyāyana.

Patañjali.

Pāṇini's Sūtras continued for ages after to form the centre of grammatical activity. But, as his own work had superseded those of his predecessors, so many of the scholars who devoted themselves to the task of perfecting his system have sunk into oblivion. The earliest of his successors whose work has come down to us (though perhaps not in a separate form) is Kātyāyana, the author of a large collection of concise critical notes, called *Vārttika*, intended to supplement and correct the Sūtras, or give them greater precision. The exact date of this writer is likewise unknown; but there can be little doubt that he lived at least a century after Pāṇini. During the interval a new body of literature seems to have sprung up[7]—accompanied with considerable changes of language—and the geographical knowledge of India extended over large tracts towards the south. Whether this is the same Kātyāyana to whom the Vājasaneyi-prātiśākhya (as well as the Sarvānukrama) is attributed, is still doubted by some scholars.[8] Kātyāyana being properly a family or tribal name, meaning "the descendant of Kātya," later works usually assign a second name Vararuchi to the writers (for there are at least two) who bear it. The Kathāsaritsāgara makes the author of the Vārttikas a fellow-student of Pāṇini, and afterwards the minister of King Nanda; but, though this date might have fitted Kātyāyana well enough, it is impossible to place any reliance on the statements derived from such a source. Kātyāyana was succeeded again, doubtless after a considerable interval, by Patañjali, the author of the (*Vyākaraṇa-*) *Mahā-bhāshya*,[9] or Great Commentary. For the great variety of information it incidentally supplies regarding the literature and manners of the period, this is, from an historical and antiquarian point of view, one of the most important works of the classical Sanskrit literature. Fortunately the author's date has been fairly settled by synchronisms implied in two passages of his work. In one of them the use of the imperfect—as the tense referring to an event, known to people generally, not witnessed by the speaker, and yet capable of being witnessed by him—is illustrated by the statement, "The Yavana besieged Sāketa," which there is reason to believe can only refer to the Indo-Bactrian king Menander (144–*c.* 124 B.C.), who, according to Strabo, extended his rule as far as the Yamunā.[10] In the other passage the use of the present is illustrated by the sentence, "We are sacrificing for Pushpamitra"—this prince (178–*c.* 142 B.C.), the founder of the Śunga dynasty, being known to have fought against the Greeks.[10] We thus get the years 144–142 B.C. as the probable time when the work, or part of it, was composed. Although Patañjali probably gives not a few traditional grammatical examples mechanically repeated from his predecessors, those here mentioned are fortunately such as, from the very nature of the case, must have been made by himself. The Mahābhāshya is not a continuous commentary on Pāṇini's grammar, but deals only with those Sūtras (some 1720 out of a total of nearly 4000) on which Kātyāyana had proposed any Vārttikas, the critical discussion of which, in connexion with the respective Sūtras, and with the views of other grammarians expressed thereon, is the sole object of Patañjali's commentatorial remarks. Though doubts have been raised as to the textual condition of the work, Professor Kielhorn has clearly shown that it has probably been handed down in as good a state of preservation as any other classical Sanskrit work. Patañjali is also called Gonardīya—which name Professor Bhandarkar takes to mean "a native of Gonarda," a place, according to the same scholar, probably identical with Goṇḍa, a town some 20 m. north-west of Oudh—and Goṇikāputra, or son of Goṇikā. Whether there is any connexion between this writer and the reputed author of the Yoga-śāstra is doubtful. The Mahābhāshya has been commented upon by Kaiyaṭa, in his *Bhāshyapradīpa*, and the latter again by Nāgojībhaṭṭa, a distinguished grammarian of the earlier part of the 18th century, in his *Bhāshya-pradīpoddyota*.

Kāśikā Vṛitti.

Of running commentaries on Pāṇini's Sūtras, the oldest extant and most important is the *Kāśikā Vṛitti*,[11] or "comment of Kāśī (Benares)," the joint production of two Jaina writers of probably the first half of the 7th century, viz. Jayāditya and Vāmana, each of whom composed one half (four adhyāyas) of the work. The chief commentaries on this work are Haradatta Miśra's *Padamañjarī*, which also embodies the substance of the Mahābhāshya, and Jinendra-buddhi's *Nyāsa*.[12]

Educational requirements in course of time led to the appearance of grammars, chiefly of an elementary character, constructed

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[1] Printed, with a commentary, at Calcutta; also, with notes, indexes and an instructive introduction, by O. Böhtlingk (1839–1840); and again with a German translation (1887).

[2] *I.e.* son of Śakaṭa, whence he is also called Śakaṭāngaja.

[3] Compare G. Bühler's paper, *Orient und Occident*, p. 691 seq.

[4] A. Burnell, *On the Aindra School of Sanskrit Grammarians.*

[5] *Pāṇini, his Place in Sanskrit Literature* (1861).

[6] See Lassen, *Ind. Alt.* i. p. 723; M. Müller, *Hist. of A.S. Lit.* p. 521; A. Weber, *Ind. Stud.* v. p. 2 seq.

[7] F. Kielhorn, *Kātyāyana und Patañjali* (1876). The *Sangraha*, a huge metrical work on grammar, by Vyāḍi, which is frequently referred to, doubtless belonged to this period.

[8] *E.g.* A. Weber. Goldstücker and M. Müller take the opposite view.

[9] Part of this work was first printed by Ballantyne; followed by a lithographed edition, by two Benares pandits (1871); and a photo-lithographic edition of the text and commentaries, published by the India Office, under Goldstücker's supervision (1874); finally, a critical edition by F. Kielhorn. For a review of the literary and antiquarian data supplied by the work, see A. Weber, *Ind. Stud.* xiii. 293 seq. The author's date has been frequently discussed, most thoroughly and successfully, by R. G. Bhandarkar in several papers. See also A. Weber, *Hist. of I.L.* p. 223.

[10] Lassen, *Ind. Alt.* ii. 341, 362.

[11] Edited by Pandit Bāla Śāstrī (Benares, 1876–1878).

[12] As it is quoted by Vopadeva it cannot be later than the 12th century.

Modern grammars.

Chandra.

on a more practical system of arrangement—the principal heads under which the grammatical matter was distributed usually being: rules of euphony (*sandhi*); inflection of nouns (*nāman*), generally including composition and secondary derivatives; the verb (*ākhyāta*); and primary (*kṛid-anta*) derivatives. In this way a number of grammatical schools[1] sprang up at different times, each recognizing a special set of Sūtras, round which gradually gathered a more or less numerous body of commentatorial and subsidiary treatises. As regards the grammatical material itself, these later grammars supply comparatively little that is not already contained in the older works—the difference being mainly one of method, and partly of terminology, including modifications of the system of technical letters (*anubandha*). Of the grammars of this description hitherto known, the *Chāndra-vyākaraṇa* is probably the oldest—its author Chandra Āchārya having flourished under King Abhimanyu of Kashmir, who is supposed to have lived towards the end of the 2nd century,[2] and in whose reign that grammarian is stated, along with others, to have revived the study of the Mahābhāshya in Kashmir. Only portions of this grammar, with a commentary by Ānandadatta, have, however, as yet been recovered.

Kātantra.

Hema-chandra, &c.

The *Kātantra*,[3] or *Kālāpa*, is ascribed to Kumāra, the god of war, whence this school is also sometimes called *Kaumāra*. The real author probably was Śarva-varman, who also wrote the original commentary (*vṛitti*), which was afterwards recast by Durgasiṃha, and again commented upon by the same writer, and subsequently by Trilochana-dāsa. The date of the Kātantra is unknown, but it will probably have to be assigned to about the 6th or 7th century. It is still used in many parts of India, especially in Bengal and Kashmir. Other grammars are—the *Sārasvatī Prakriyā*, by Anubhūti Svarūpāchārya; the *Sankshipta-sāra*, composed by Kramadīśvara, and corrected by Jumara-nandin, whence it is also called *Jaumara*; the *Haima-vyākaraṇa*,[4] by the Jaina writer Hemachandra (1088–1172, according to Dr Bhāo Dājī); the *Mugdha-bodha*,[5] composed, in the latter part of the 13th century, by Vopadeva, the court paṇḍit of King Mahādeva (Rāmarāja) of Devagiri (or Deoghar); the *Siddhānta-kaumudī*, the favourite text-book of Indian students, by Bhaṭṭoji Dīkshita (17th century); and a clever abridgment of it, the *Laghu-* (*Siddhānta-*) *kaumudī*,[6] by Varadarāja.

Subsidiary grammatical treatises.

Several subsidiary grammatical treatises remain to be noticed. The *Paribhāshās* are general maxims of interpretation presupposed by the Sūtras. Those handed down as applicable to Pāṇini's system have been interpreted most ably by Nāgojībhaṭṭa, in his *Paribāshenduśekhara*.[7] In the case of rules applying to whole groups of words, the complete lists (*gaṇa*) of these words are given in the *Gaṇapāṭha*, and only referred to in the Sūtras. Vardhamāna's *Gaṇaratna-mahodadhi*,[8] a comparatively modern recension of these lists (A.D. 1140), is valuable as offering the only available commentary on the Gaṇas which contain many words of unknown meaning. The *Dhātupāṭhas* are complete lists of the roots (*dhātu*) of the language, with their general meanings. The lists handed down under this title,[9] as apparently arranged by Pāṇini himself, have been commented upon, amongst others, by Mādhava. The *Uṇādi-sūtras* are rules on the formation of irregular derivatives. The oldest work of this kind, commented upon by Ujjvaladatta,[10] is by some writers ascribed to Kātyāyana Vararuchi, by others even to Śākaṭāyana. The oldest known treatise on the philosophy of grammar and syntax is the *Vākya-padiya*,[11] composed in verse, by Bhartṛihari (? 7th century), whence it is also called *Harikārikā*. Of later works on this subject, the *Vaiyākaraṇa-bhūshaṇa*, by Koṇḍabhaṭṭa, and the *Vaiyākaraṇa-siddhānta-mañjūshā*, by Nāgojībhaṭṭa, are the most important.

Dictionaries.

IV. LEXICOGRAPHY.—Sanskrit dictionaries (*kosha*), invariably composed in verse, are either homonymous or synonymous, or partly the one and partly the other. Of those hitherto published, Śāśvata's *Anekārtha-samuchchaya*,[12] or "collection of homonyms," is probably the oldest. While in the later homonymic vocabularies the words are usually arranged according to the alphabetical order of the final (or sometimes the initial) letter, and then according to the number of syllables, Śāśvata's principle of arrangement—viz. the number of meanings assignable to a word—seems to be the more primitive. The work probably next in time is the famous *Amara-kosha*[13] ("immortal treasury") by Amarasiṃha, one of "the nine gems," who probably lived early in the 6th century. This dictionary consists of a synonymous and a short homonymous part; whilst in the former the words are distributed in sections according to subjects, as heaven and the gods, time and seasons, &c., in the latter they are arranged according to their final letter, without regard to the number of syllables. This Kosha has found many commentators, the oldest of those known being Kshirasvāmin.[14] Among the works quoted by commentators as Amara's sources are the *Trikāṇḍa* and *Utpalinī-koshas*, and the glossaries of Rabhasa, Vyāḍi, Kātyāyana, and Vararuchi. A Kosha ascribed to Vararuchi—whom tradition makes likewise one of the nine literary "gems"—consisting of ninety short sections, has been printed at Benares (1865) in a collection of twelve Koshas. The *Abhidhāna-ratnamālā*,[15] by Halāyudha; the *Viśvaprakāśa*, by Maheśvara (1111); and the *Abhidhāna-chintāmaṇi*[16] (or *Haima-kosha*), by the Jaina Hemachandra, seem all three to belong to the 12th century. Somewhat earlier than these probably is Ajaya Pāla, the author of the (homonymous) *Nānārtha-sangraha*, being quoted by Vardhamāna (A.D. 1140). Of more uncertain date is Purushottama Deva, who wrote the *Trikāṇḍa-śesha*, a supplement to the Amarkosha, besides the *Hārāvalī*, a collection of uncommon words, and two other short glossaries. Of numerous other works of this class the most important is the *Medinī*, a dictionary of homonyms, arranged in the first place according to the finals and the syllabic length, and then alphabetically. Two important dictionaries, compiled by native scholars of the last century, are the *Śabdakalpadruma* by Rādhākānta Deva, and the *Vāchaspatya*, by Tārānātha Tarka-vāchaspati. A full account of Sanskrit dictionaries is contained in the preface to the first edition of H. H. Wilson's *Dictionary*, reprinted in his *Essays on Sanskrit Literature*, vol. iii.

Prosody.

V. PROSODY (*Chhandas*).—The oldest treatises on prosody have already been referred to in the account of the technical branches of the later Vedic literature. Among more modern treatises the most important are the *Mṛita-sanjīvanī*, a commentary on Pingala's Sūtra, by Halāyudha (perhaps identical with the author of the glossary above referred to); the *Vṛitta-ratnākara*, or "jewel-mine of metres," in six chapters, composed before the 13th century by Kedāra Bhaṭṭa, with several commentaries; and the *Chhando-mañjarī*, likewise in six chapters, by Gangādāsa. The *Śrutabodha*, ascribed, probably wrongly, to the great Kālidāsa, is a comparatively insignificant treatise which deals only with the more common metres, in such a way that each stanza forms a specimen of the metre it describes. The *Vṛitta-darpaṇa* treats chiefly of Prākṛit metres. Sanskrit prosody, which is probably not surpassed by any other either in variety of metre or in harmoniousness of rhythm, recognizes two classes of metres, viz. such as consist of a certain number of syllables of fixed quantity, and such as are regulated by groups of breves or metrical instants, this latter class being again of two kinds, according as it is or is not bound by a fixed order of feet. A pleasant account of Sanskrit poetics is given in Colebrooke's *Essays*, vol. ii.; a more complete and systematic one by Professor Weber, *Ind. Stud.* vol. viii.

Music.

VI. MUSIC (*Sangīta*).—The musical art has been practised in India from early times. The theoretic treatises on profane music now extant are, however, quite modern productions. The two most highly esteemed works are the *Sangīta-ratnākara* ("jewel-mine of music"), by Śārngadeva, and the *Sangīta-darpaṇa* ("mirror of music"), by Dāmodara. Each of these works consists of seven chapters, treating respectively of—(1) sound and musical notes (*svara*); (2) melodies (*rāga*); (3) music in connexion with the human voice (*prakīrṇaka*); (4) musical compositions (*prabandha*); (5) time and measure (*tāla*); (6) musical instruments and instrumental music (*vādya*); (7) dancing and acting (*nṛitta* or *nṛitya*). The Indian octave consists like our own of seven chief notes (*svara*); but, while with us it is subdivided into twelve semitones, the Hindu theory distinguishes twenty-two intervals (*śruti*, audible sound). There is, however, some doubt as to whether these *śrutis* are quite equal to one another—in which case the intervals between the chief notes would be unequal, since they consist of either two or three or four *śrutis*,—or whether, if the intervals between the chief notes be equal, the *śrutis* themselves vary in duration between quarter-, third-, and semi-tones. There are three scales (*grāma*), differing from each other in the nature of the chief intervals (either as regards actual duration, or the number of śrutis or sub-tones). Indian music consists almost entirely in melody, instrumental accompaniment being performed in unison, and any attempt at harmony being confined to the continuation of the key-note. A number of papers, by various writers, have been reprinted with additional remarks on the subject, in Sourindro Mohun Tagore's *Hindu Music* (Calcutta, 1875). Compare also Bh. A. Pingle, *Indian Music*, 2nd ed. (Bombay 1898).

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[1] Dr Burnell, in his *Aindra School*, proposes to apply this term to all grammars arranged on this plan.

[2] Professor Bhandarkar, *Early History of the Dekhan*, p. 20, proposes to fix him about the end of the 3rd century.

[3] Edited, with commentary, by J. Eggeling.

[4] The Prākṛit part edited and translated by R. Pischel.

[5] Edited by O. Böhtlingk (1847).

[6] Edited and translated by J. R. Ballantyne. For other modern grammars see Colebrooke, *Essays*, ii. p. 44; Rājendralāla Mitra, *Descriptive Catalogue*, i., Grammar.

[7] Edited and translated by F. Kielhorn.

[8] Edited by J. Eggeling.

[9] Edited by N. L. Westergaard; also given in Böhtlingk's edition of Pāṇini.

[10] Text and commentary, edited by Th. Aufrecht.

[11] Edited, with commentaries, at Benares.

[12] Edited by Th. Zachariae.

[13] Edited by H. T. Colebrooke (1808), and by L. Deslongchamps (1839–1845).

[14] A grammarian of this name is mentioned as the tutor of King Jayāpīḍa of Kashmir (A.D. 755–786); but Kshīra, the commentator on Amara, is placed by Professor Aufrecht between the 11th and 12th centuries, because he quotes the Śabdānuśāsana ascribed to Bhojarāja.

[15] Edited by Th. Aufrecht (1861).

[16] Edited by O. Böhtlingk and C. Rieu (1847).

Rhetoric.

VII. RHETORIC (*Alankāra-śāstra*).—Treatises on the theory of literary composition are very numerous. Indeed, a subject of this description—involving such nice distinctions as regards the various kinds of poetic composition, the particular subjects and characters adapted for them, and the different sentiments or mental conditions capable of being both depictured and called forth by them—could not but be congenial to the Indian mind. H. H. Wilson, in his *Theatre of the Hindus*, has given a detailed account of these theoretic distinctions with special reference to the drama, which, as the most perfect and varied kind of poetic production, usually takes an important place in the theory of literary composition. The *Bharata-śāstra* has already been alluded to as probably the oldest extant work in this department of literature. Another comparatively ancient treatise is the *Kāvyādarśa*,[1] or "mirror of poetry," in three chapters, by Daṇḍin, the author of the novel *Daśakumāracharita*, who probably flourished towards the end of the 6th century. The work consists of three chapters, treating—(1) of two different local styles (*rīti*) of poetry, the Gauḍī or eastern and the Vaidarbhī or southern (to which later critics add four others, the Pāñchālī, Māgadhī, Lāṭī, and Āvantikā); (2) of the graces and ornaments of style, as tropes, figures, similes; (3) of alliteration, literary puzzles and twelve kinds of faults to be avoided in composing poems. Another treatise on rhetoric, in Sūtras, with a commentary entitled *Kāvyālankāra-vṛitti*,[2] is ascribed to Vāmana of probably the 8th century. The *Kāvyālankāra*, by the Kashmirian Rudraṭa, was probably composed in the 9th century, a gloss on it (by Nami), which professes to be based on older commentaries, having been written in 1068. Dhananjaya, the author of the *Daśarūpa*,[3] or "ten forms (of plays)," the favourite compendium of dramaturgy, appears to have flourished in the 10th century. In the concluding stanza he is stated to have composed his work at the court of King Muñja, who is probably identical with the well-known Mālava prince, the uncle and predecessor of King Bhoja of Dhārā. The Daśarūpa was early commented upon by Dhanika, possibly the author's own brother, their father's name being the same (Vishṇu). Dhanika quotes Rājaśekhara, who is supposed to have flourished about A.D. 1000,[4] but may after all have to be put somewhat earlier. The *Sarasvatī-kaṇṭhābharaṇa*, "the neck-ornament of Sarasvatī (the goddess of eloquence)," a treatise, in five chapters, on poetics generally, remarkable for its wealth of quotations, is ascribed to King Bhoja himself (11th century), probably as a compliment by some writer patronized by him. The *Kāvya-prakāśa*,[5] "the lustre of poetry," another esteemed work of the same class, in ten sections, was probably composed in the 12th century—the author, Mammaṭa, a Kashmirian, having been the maternal uncle of Śrī-Harsha, the author of the Naishadhīya. The *Sāhitya-darpaṇa*,[6] or "mirror of composition," the standard work on literary criticism, was composed in the 15th century, on the banks of the Brahmaputra, by Viśvanātha Kavirāja. The work consists of ten chapters, treating of the following subjects:—(1) the nature of poetry; (2) the sentence; (3) poetic flavour (*rasa*); (4) the divisions of poetry; (5) the functions of literary suggestion; (6) visible and audible poetry (chiefly on dramatic art); (7) faults of style; (8) merits of style; (9) distinction of styles; (10) ornaments of style.

Medicine.

VIII. MEDICINE (*Āyur-veda, Vaidya-śāstra*).—Though the early cultivation of the healing art is amply attested by frequent allusions in the Vedic writings, it was doubtless not till a much later period that the medical practice advanced beyond a certain degree of empirical skill and pharmaceutic routine. From the simultaneous mention of the three humours (wind, bile, phlegm) in a vārttika to Pāṇini (v. 1, 38), some kind of humoral pathology would, however, seem to have been prevalent among Indian physicians several centuries before our era. The oldest existing work is supposed to be the *Charaka-saṃhitā*,[7] a bulky cyclopaedia in ślokas, mixed with prose sections, which consists of eight chapters, and was probably composed for the most part in the early centuries of our era. Whether the Chinese tradition which makes Charaka the court physician of King Kanishka (*c.* A.D. 100) rests on fact is very doubtful. Of equal authority, but doubtless somewhat more modern, is the *Suśruta* (*-saṃhitā*),[8] which Suśruta is said to have received from Dhanvantari, the Indian Aesculapius, whose name, however, appears also among the "nine gems." It consists of six chapters, and is likewise composed in mixed verse and prose—the greater simplicity of arrangement, as well as some slight attention paid in it to surgery, betokening an advance upon Charaka. Both works are, however, characterized by great prolixity, and contain much matter which has little connexion with medicine. The late Professor E. Haas, in two very suggestive papers,[9] tried to show that the work of Suśruta (identified by him with Socrates, so often confounded in the middle ages with Hippocrates) was probably not composed till after the Mohammedan conquest, and that, so far from the Arabs (as they themselves declare) having derived some of their knowledge of medical science from Indian authorities, the Indian Vaidyaśāstra was nothing but a poor copy of Greek medicine, as transmitted by the Arabs. But even though Greek influence may be traced in this as in other branches of Indian science, there can be no doubt,[10] at any rate, that both Charaka and Suśruta were known to the Arab Rāzī (*c.* A.D. 932), and to the author of the Fihrist (completed A.D. 987), and that their works must therefore have existed, in some form or other, at least as early as the 9th century. Among the numerous later medical works published and greatly esteemed in India, the most important general compendiums are Vāgbhaṭa's *Ashṭānga-hṛidaya*, "the heart of the eight-limbed (body of medical science)," supposed to have been written in the 9th century, or still earlier; and Bhāva Miśra's *Bhāva-prakāśa*, probably of the early part of the 16th century; while of special treatises may be mentioned Mādhava's system of pathology, the *Rugviniśchaya*, or *Mādhava-Nidāna*, of the 8th or 9th century; and Śārngadhara's compendium of therapeutics, the *Śārngadhara-saṃhitā*, composed before 1300, having been commented upon by Vopadeva. Materia medica, with which India is so lavishly endowed by nature, is a favourite subject with Hindu medical writers, the oldest treatise being apparently the *Dhanvantari-nighaṇṭu*, of uncertain, but not very high, age; besides which may be mentioned Madanapāla's *Madanavinoda*, written A.D. 1374; the more modern *Rāja-nighaṇṭu*, by the Kashmirian Narahari; besides other, still more recent esteemed works of this class, to which may be added the valuable medical dictionary *Vaidyakaśabdasindhu* by Umeśachandra Gupta. A useful general view of this branch of Indian science is contained in T. A. Wise's *Commentary on Hindu Medicine* (1845), and in his *History of Medicine*, vol. i. (1867); but the subject has since then been treated in a much fuller and more critical way in Professor J. Jolly's "Medicin" in Bühler's *Grundriss der indo-arischen Philologie*.

Astronomy and Mathematics.

IX. ASTRONOMY AND MATHEMATICS.—Hindu astronomy may be broadly divided into a pre-scientific and a scientific period. While the latter clearly presupposes a knowledge of the researches of Hipparchus and other Greek astronomers, it is still doubtful whether the earlier astronomical and astrological theories of Indian writers were entirely of home growth or partly derived from foreign sources. From very ancient (probably Indo-European) times chronological calculations were based on the synodical revolutions of the moon—the difference between twelve such revolutions (making together 354 days) and the solar year being adjusted by the insertion, at the time of the winter solstice, of twelve additional days. Besides this primitive mode the Ṛigveda also alludes to the method prevalent in post-Vedic times, according to which the year is divided into twelve (*sāvana* or solar) months of thirty days, with a thirteenth month intercalated every fifth year. This quinquennial cycle (*yuga*), is explained in the *Jyotisha*, regarded as the oldest astronomical treatise. An institution which occupies an important part in those early speculations is the theory of the so-called lunar zodiac, or system of lunar mansions, by which the planetary path, in accordance with the duration of the moon's rotation, is divided into twenty-seven or twenty-eight different stations, named after certain constellations (*nakshatra*) which are found alongside of the ecliptic, and with which the moon (masc.) was supposed to dwell successively during his circuit. The same institution is found in China and Arabia; but it is still doubtful[11] whether the Hindus, as some scholars hold, or the Chaldaeans, as Professor Weber thinks, are to be credited with the invention of this theory. Professor G. Thibaut,[12] who has again thoroughly investigated the problem, comes to the conclusion that it is improbable that the nakshatra-theory arose independently in India, but that it is still doubtful whence the Hindus derived it. The principal works of this period are hitherto known from quotations only, viz. the *Gārgī Saṃhitā*, which Professor Kern would fix at *c.* 50 B.C., the *Nāradī Saṃhitā* and others.

The new era, which the same scholar dates from *c.* A.D. 250, is marked by the appearance of the five original Siddhāntas (partly extant in revised redactions and in quotations), the very names of two of which suggest Western influence, viz. the *Paitāmaha-*, *Sūrya-*,[13] *Vasishtha-*, *Romaka-* (*i.e.* Roman) and *Pauliśa-siddhāntas*. Based on these are the works of the most distinguished Indian astronomers, viz. Āryabhaṭa,[1] probably born in 476; Varāha-mihira,[2] probably 505–587; Brahma-gupta, who completed his *Brahma-siddhānta* in 628; Bhaṭṭa Utpala (10th century), distinguished especially as commentator of Varāha-mihira; and Bhāskara Āchārya, who, born in 1114, finished his great course of astronomy, the *Siddhānta-śiromaṇi*, in 1150. In the works of several of these writers, from Āryabhaṭa onwards, special attention is paid to mathematical (especially arithmetical and algebraic) computations; and the respective chapters of Bhāskara's compendium, viz. the *Līlāvatī* and *Vīja-gaṇita*,[3] still form favourite text-books of these subjects. The question whether Āryabhaṭa was acquainted with the researches of the Greek algebraist Diophantus (*c.* A.D. 360) remains still unsettled, but, even if this was the case, algebraic science seems to have been carried by him beyond the point attained by the Greeks.

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[1] Edited, with commentary, by Premachandra Tarkabāgīsa, *Bibl. Ind.*; with German translation by O. v. Böhtlingk (1890).

[2] Edited by Capeller (1875).

[3] Edited by Fitzedw. Hall, *Bibl. Ind.* (1865); with commentary (Bombay, 1897).

[4] R. Pischel, *Gött. Gel. A.* (1883); G. Bühler, *Ind. Ant.* (1884), p. 29.

[5] Edited by Maheśa Chandra Nyāyaratna (1866).

[6] Text and translation in *Bibl. Ind.*; edited by Jibananda Vidyasagara (1897).

[7] Edited by Jibananda Vidyasagara (Calcutta, 1877). Cf. A. F. R. Hoernle, "Studies in Anc. Indian Medicine" (*J. Roy. As. S.* 1906–9).

[8] Edited by Madhusūdana Gupta (1835–1837), and by Jibananda Vidyasagara (1873).

[9] *Z.D.M.G.* (1876), p. 617 seq.; (1877), p. 647 seq.

[10] See Professor Aug. Müller's paper, *Z.D.M.G.* (1880), p. 465.

[11] See especially Professor Whitney's essay on the Lunar Zodiac, in his *Oriental and Linguistic Studies*.

[12] G. Thibaut, "Astronomie, Astrologie und Mathematik," in Bühler's *Grundriss*.

[13] The *Sūrya-siddhānta*, translated by (W. D. Whitney and) E. Burgess (1860).

On Sanskrit literature generally may be consulted Max Müller, *History of Ancient Sanskrit Literature*; A Weber, *History of Indian Literature*; A. A. Macdonell, *History of Sanskrit Literature*. (J. E.)

SANSON, CHARLES HENRI (b. 1739), public executioner of Paris from 1788 to 1795, was the son of Charles Sanson or Longval, who received in 1688 the office of *exécuteur des hautes œuvres de Paris*, which became hereditary in his family. Sanson's brothers exercised the same trade in other towns. In the last days of 1789 Gorsas in the *Courrier de Paris* accused Sanson of harbouring a Royalist press in his house. Sanson was brought to trial, but acquitted, and Gorsas withdrew the accusation. After the execution of Louis XVI., a statement by Sanson was inserted in the *Thermomètre politique* (13th February 1793) in contradiction of the false statements made in respect of the king's behaviour when confronted with death. He surrendered his office in 1795 to his son Henri, who had been his deputy for some time, and held his father's office till his death in 1840. There is no record of the elder Sanson's death. Henri's son Clément Henri was the last of the family to hold the office.

The romantic tales told of C. H. Sanson have their origin in the apocryphal *Mémoires pour servir à l'histoire de la Révolution Française par Sanson* (2 vols., 1829; another ed., 1831), of which a few pages of introduction emanate from Balzac, and some other matter from Lhéritier de l'Ain. Other *Mémoires* of Sanson, edited by A. Grégoire (ps. for V. Lombard) in 1830, and by M. d'Olbreuze (6 vols., 1862–1863) are equally fictitious. The few facts definitely ascertainable are collected by G. Lenôtre in *La Guillotine pendant la Révolution* (1893). Cf. M .Tourneux, *Bibliographie de l'histoire de Paris* . . . (1890, &c.), vol. i. Nos. 3963-3965, and vol. iv., *s.v.* "Sanson."

SANSON, NICOLAS (1600–1667), French cartographer, wrongly termed by some the creator of French geography, was born of an old Picardy family of Scottish descent, at Abbeville, on the 20th (or 31st) of December 1600, and was educated by the Jesuits at Amiens. In 1627 he attracted the attention of Richelieu by a map of Gaul which he had constructed (or at least begun) while only eighteen. He gave lessons in geography both to Louis XIII. and to Louis XIV.; and when Louis XIII., it is said, came to Abbeville, he preferred to be the guest of Sanson (then employed on the fortifications), instead of occupying the lodgings provided by the town. At the conclusion of this visit the king made Sanson a councillor of state. In 1647 Sanson accused the Jesuit Labbe of plagiarizing him in his *Pharus Galliae Antiquae*; in 1648 he lost his eldest son Nicolas, killed during the Fronde. Among the friends of his later years was the great Condé. He died at Paris on the 7th of July 1667. Two younger sons, Adrien (d. 1708) and Guillaume (d. 1703), succeeded him as geographers to the king.

Sanson's principal works are: *Galliae antiquae descriptio geographica* (1627); *Graeciae antiquae descriptio* (1636); *L'Empire romain* (1637); *Britannia, ou recherches de l'antiquité d'Abbeville* (1638), in which he seeks to identify Strabo's *Britannia* with Abbeville; *La France* (1644); *Tables méthodiques pour les divisions des Gaules* . . . (1644); *L'Angleterre, l'Espagne, l'Italie et l'Allemagne* (1644); *Le Cours du Rhin* (1646); *In Pharum Galliae antiquae Philippi Labbe disquisitiones* (1647–1648); *Remarques sur la carte de l'ancienne Gaule de César* (1651); *L'Asie* (1652); *Index geographicus* (1653); *Geographia sacra* (1653); *L'Afrique* (1656). In 1692 Hubert Jaillot collected Sanson's maps in an *Atlas nouveau*. See also Niceron, *Mémoires*, vols. xiii. and xx.; the 18th-century editions of some of Sanson's works on Delamarche under the titles of *Atlas de géographie ancienne* and *Atlas britannique*; and the *Catalogue des cartes et livres de géographie de Sanson* (1702).

SANSOVINO, ANDREA CONTUCCI DEL MONTE (1460–1529), Florentine sculptor, was the son of a shepherd called Niccolo di Domenico Contucci, and was born at Monte Sansavino near Arezzo, whence he took his name, which is usually softened to Sansovino. He was a pupil of Antonio Pollaiuolo, and at first worked in the purer style of 15th-century Florence. Hence his early works are by far the best, such as the terra-cotta altarpiece in Santa Chiara at Monte Sansavino, and the marble reliefs of the "Annunciation," the "Coronation of the Virgin," a "Pietà," the "Last Supper," and various statuettes in the Corbinelli chapel of S. Spirito at Florence, all executed between the years 1488 and 1492. From 1491 to 1500 Andrea worked in Portugal for the king, and some pieces of sculpture by him still exist in the monastic church of Coimbra. (See Raczinski, *Les Arts en Portugal*, Paris, 1846, p. 344.) These early reliefs show strongly the influence of Donatello. The beginning of a more pagan style is shown in the statues of "St John baptizing Christ" over the east door of the Florentine baptistery. This group was, however, finished by the weaker hand of Vincenzo Danti. In 1502 he executed the marble font at Volterra, with good reliefs of the "Four Virtues" and the "Baptism of Christ." In 1505 Sansovino was invited to Rome by Julius II. to make the monuments of Cardinal Ascanio Maria Sforza and Cardinal Girolamo della Rovere for the retro-choir of S. Maria del Popolo. The architectural parts of these monuments and their sculptured foliage are extremely graceful and executed with the most minute delicacy, but the recumbent effigies show the beginning of a serious decline in taste. These tombs became models which for many years were copied by most later sculptors with increasing exaggerations of their defects. In 1512, while still in Rome, Sansovino executed a very beautiful group of the "Madonna and Child with St Anne," now over one of the side altars in the church of S. Agostino. From 1513 to 1528 he was at Loreto, where he cased the outside of the Santa Casa in white marble, covered with reliefs and statuettes in niches between engaged columns; a small part of this sculpture was the work of Andrea, but the greater part was executed by Montelupo, Tribolo and others of his assistants and pupils. Though the general effect is rich and magnificent, the individual pieces of sculpture are both dull and feeble. The earlier reliefs, those by Sansovino himself, are the best.

SANSOVINO, JACOPO (1477–1570), Italian sculptor, was called Sansovino after his master Andrea, his family name being Tatti. He became a pupil of Andrea in 1500, and in 1510 accompanied him to Rome, devoting himself there to the study of antique sculpture. Julius II. employed him to restore damaged statues, and he made a full-sized copy of the Laocoon group, which was afterwards cast in bronze, and is now in the Uffizi at Florence. In 1511 he returned to Florence, and began the statue of St James the Elder, which is now in a niche in one of the great piers of the Duomo. He carved a nude figure of "Bacchus and Pan," now in the Bargello, near the "Bacchus" of Michelangelo, from the contrast with which it suffers much. Soon afterwards Jacopo returned to Rome, and designed for his fellow-citizens the grand church of S. Giovanni dei Fiorentini, which was carried out by Antonio Sangallo the younger. A marble group of the "Madonna and Child," heavy in style, now at the west of S. Agostino, was his next important work. In 1527 Jacopo fled from the sack of Rome to Venice, where he was welcomed by Titian and Pietro Aretino; henceforth till his death he was occupied in adorning Venice with magnificent buildings and many second-rate pieces of sculpture Among the latter Jacopo's poorest works are the colossal statues of "Neptune" and "Mars" on the grand staircase of the ducal palace. His best are the bronze doors of the sacristy of St Mark, cast in 1562; inferior to these are the series of six bronze reliefs round the choir of the same church. In 1565 he completed a small bronze gate with a graceful relief of "Christ surrounded by Angels"; this gate shuts off the altar of the Reserved Host in the choir of St Mark's.

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[1] The *Āryabhaṭīya*, edited by H. Kern (1874).

[2] The *Bṛihat-saṃhitā* and *Yogayātrā*, edited and translated by H. Kern; the *Laghu-jātaka*, edited by A. Weber and H. Jacobi.

[3] A translation of both treatises, as well as of the respective chapters of Brahma-gupta's work, was published (1817) by H. T. Colebrooke, with an important "Dissertation on the Algebra of the Hindus," reprinted in the *Misc. Essays*, ii. pp. 375 seq.

Jacopo's chief claim to distinction rests upon the numerous fine Venetian buildings which he designed, such as the public library, the mint, the Scuola della Misericordia, the Palazzo de' Cornari and the Palazzo Delfino, with its magnificent staircase—the last two both on the grand canal. Among his ecclesiastical works the chief were the church of S. Fantino, that of S. Martino, near the arsenal, the Scuola di S. Giovanni degli Schiavoni and, finest of all, the church, now destroyed (see VENICE), of S. Geminiano, a very good specimen of the Tuscan and Composite orders used with the graceful freedom of the Renaissance.

In 1545 the roof of the public library, which he was then constructing, fell in; on this account he was imprisoned, fined and dismissed from the office of chief architect of the cathedral, to which he had been appointed by a decree of the signoria on the 7th of April 1529. Owing to the intervention of Titian, Pietro Aretino and others, he was soon set at liberty, and in 1549 he was restored to his post. He did good service for St Mark's by encircling its failing domes with bands of iron. Sansovino's architectural works have much beauty of proportion and grace of ornament, a little marred in some cases by an excess of sculptured decoration, though the carving itself is always beautiful, both in design and execution. He used the classic orders with great freedom and tasteful invention. His numerous pupils were mostly men of but little talent.

SANTA ANA, a city and the county-seat of Orange county, southern California, U.S.A., 34 m. S.E. of Los Angeles. Pop. (1900) 4933 (506 foreign-born); (1910) 8429. It is served by the Atchison, Topeka & Santa Fé, the Southern Pacific and the Pacific Electric railways. The city is situated about 10 m. from the ocean, in the lower western foothills of the Santa Ana mountains. There are numerous artesian wells in the surrounding region, and there is a good irrigation system. (For a description of the irrigation canal see AQUEDUCT.) Santa Ana is in the orange, lemon and walnut region of southern California, and in the only important celery-growing district of the state; the celery is grown in great quantities in the large district known as the "Peatlands" (about 9 m. from the city), which is underlaid by a deposit of peat from 1 to 100 ft. deep. Other important products of the county are petroleum, barley, sugar beets, apricots and lima beans. Santa Ana was first platted in 1869 and was incorporated in 1888. Its growth since 1900 has been rapid.

SANTA ANA, the capital of the department of Santa Ana, Salvador, 50 m. by rail N.W. of San Salvador. Pop. (1905) about 48,000. It is situated about 2100 ft. above sea-level, in a valley surrounded by high mountains, which are covered by coffee and sugar plantations and woods. It is the second city of the republic in size, and has broad shady streets and fine open squares. The municipal offices, hospital, literary institute and barracks are noteworthy buildings, and the parish church, Doric in style, is generally regarded as one of the finest in Central America. Cigars, pottery, starch, spirits, sugar and various textiles are manufactured, and the export trade in coffee and sugar has developed rapidly since the opening in 1900 of a railway to San Salvador and the Pacific port of Acajutla.

SANTA-ANNA, ANTONIO LOPEZ DE (1795–1876), Mexican soldier and politician, was born at Jalapa in the province of Vera Cruz on the 21st of February 1795. He was neither a general nor a statesman, nor even an honest man, but he was the most conspicuous and continuously active of the military adventurers who filled Spanish America with violence during the first two generations of its independence. He entered the colonial army of Spain as a cadet in 1810, and served as one of the Creole supporters of the Spanish government till 1821. In that year Mexico fell away from the mother country. Iturbide, who was master of the country for the time, made Santa-Anna brigadier and governor of La Vera Cruz. Till about 1835 he pursued the policy of keeping his hold on his native province of Vera Cruz, and influencing the rest of the country by alternately supporting and upsetting the central government. He first helped to ruin Iturbide, who wished to make himself emperor. He proclaimed the Republic, and was then a supporter of the successful federal party. Federalism suited him very well since it left him in command of Vera Cruz. In 1829 he defeated a foolish attempt of the Spaniards to reassert their authority in Mexico. He kept himself in reserve till events gave him a chance to upset the president of the day, Bustamente, whom he defeated at Casas Blancas on the 12th of November 1832. He could now have become president himself, but preferred to rule through dummies. Now that he saw an opportunity to become master he became reactionary and abolished the federal constitution. This led to the revolt of Texas, which was full of settlers from the United States. Santa-Anna invaded Texas and gained some successes, but was surprised and taken prisoner at San Jacinto on the 21st of April 1836. The Texans had a good excuse for shooting him, as he conducted war in a ferocious way. They preferred to let him save his life by ordering his troops to evacuate the country. He was released in February 1837, and had for a time to "retire to his estates" in Vera Cruz. In 1838 the French government made an attack on the town, and Santa-Anna, by a display of his redeeming virtue of personal courage, lost a leg but regained his influence. He became military dictator in 1841, and governed by violence till he was driven into exile by mutiny in 1845. He fled to Cuba, but was recalled to command against the invading army from the United States in 1846. The Americans beat him, and once more (1848) he went into exile. In 1853 he was recalled and named president for life, with the title of Serene Highness. In less than two years he was again overthrown and had to go abroad in August 1855. For the rest of his life Santa-Anna was hanging on the outskirts of Mexico, endeavouring to find an opening to renew his old adventures. He tried the emperor Maximilian, the French and the United States to see if they would serve his turn. But he had outlived his time. The empty title of grand-marshal given by Maximilian was all he gained. When in 1867 he attempted to head a rising, he was captured and condemned to death, but spared on the ground that he was in his dotage. At last, worn out by age, he accepted an amnesty and returned to the city of Mexico, where he died in obscurity on the 20th of June 1876.

See H. H. Bancroft, *History of the Pacific States of North America*, vols. viii. and ix. (San Francisco, 1882–1890).

SANTA BARBARA, a city and the county-seat of Santa Barbara county, in southern California, U.S.A., on the coast-plain on the southern slope of the Santa Ynez Mountains. Pop. (1900) 6587 (1143 foreign-born); (1910) 11,659. It is served by the Coast Line of the Southern Pacific railway system. With picturesque surroundings, excellent bathing beach and ideal climate, Santa Barbara is one of the most popular of the health and pleasure resorts of California. The monthly average of the mean temperatures for 23 years (1881–1903 inclusive) varied from 53° in January to 67° in August. Nowhere in California is plant life more varied and beautiful; in the vicinity are walnut, olive, lemon and orange groves. North-west of the city are the valuable oil fields of Santa Barbara county, notably the Santa Maria field, 6 m. S. of Santa Maria, and the region between Lompoc and Santa Maria, first developed in 1903. A *presidio* (Spanish military post) was established here in 1782, and a Franciscan mission, by Junipero Serra, about four years later. The mission building is well preserved, and is probably the greatest single attraction of Santa Barbara. It is now the Franciscan headquarters of the Pacific coast, and near it is a Franciscan college. Immediately behind it is the picturesque Mission Canyon. Santa Barbara took part in the revolution of 1829, and in the sectional struggles following leaned to the side of Monterey and the North. It was occupied by the Americans in August 1846, then (without bloodshed) by the Californians in October, and again definitively by the American forces on the 27th of November 1846. In 1850 it was incorporated as a city, though already long a Mexican "ciudad." It remained off the railway route until 1887.

SANTA BARBARA, a town of Iloilo province, island of Panay, Philippine Islands, on the S.E. coast, on the Jalaur river, a few miles N. of Iloilo, the capital of the province. Pop. (1903), after the annexation of Zárraga, Lucena, Pavía and Leganés, 37,621; subsequently Pavía (pop. in 1903, 5700) was annexed to Jaro. There are 87 barrios or villages in the town, only three of these had a population in 1903 exceeding 1000. The language is Visayan. The principal industries are the cultivation of sugar cane, Indian corn, rice, cacao, coco-nut palm and tobacco, and the raising of cattle.

SANTA CATHARINA, a southern maritime state of Brazil, bounded N. by Paraná, E. by the Atlantic, S. by Rio Grande do Sul, and W. by Rio Grande do Sul and the Misiones territory of Argentina. Pop. (1900) 320,289; area 28,633 sq. m. The Serra do Mar rises not far from the coast and leaves only a narrow coast zone, and the plateau above is much broken with irregular ranges of mountains. The coast region, though in the temperate zone, is hot and humid. It is densely forested, is broken by swamps and lagoons, and is crossed by numerous short streams from the wooded slopes of the serras. The plateau is less densely wooded, but has some highly fertile plains, the open *campos* being partly devoted to stock raising. Except in the malarious coast zone, the climate is temperate, bracing and exceptionally healthy. The drainage is westward to the Paraná, the rivers being tributaries of the Iguassú, which forms its northern boundary, and of the Uruguay, which forms its southern boundary. A number of prosperous German colonies—the largest and best known of which are Blumenau, Dona Francisca, Joinville, Itajahy, Brusque, Dom Pedro and São Bento—are devoted chiefly to agriculture. There is no cultivation on a large scale, as in São Paulo and the northern provinces. Coffee is produced to a limited extent. Indian corn, beans, onions, fruit and mandioca are the principal products. A prominent industry is the gathering and preparation of *matê* or Paraguayan tea (*Ilex paraguayensis*), which is an article of export. The mineral resources include coal, iron, silver, gold and petroleum, the first alone is mined. The only railway of the state, the Dona Thereza Christina, runs from Laguna, at the mouth of a lagoon of that name on the southern coast, northward to the port of Imbituba (about 4 m.) and thence westward up the valley of the Rio Tubarão to the coal fields of that name (69 m.). The coal is of inferior quality and the development of the mines, which were discovered in 1841, has not been a success. A later investigation shows that there are beds of better coal at a greater depth extending from Rio Grande do Sul to São Paulo. The capital of the state is Florianopolis (*q.v.*) also called Santa Catharina and Desterro, and its other towns are Blumenau, Lages (9356), Laguna (7282), Joinville (13,996), Itajahy (8875), Brusque (8094), São José (11,820), opposite Florianopolis, Tubarão (5495) and São Francisco (5583), a good port in the northern part of the state in direct communication with a majority of the German colonies.

SANTA CLARA (or VILLA-CLARA), the capital of Santa Clara province, Cuba, about 185 m. (by rail) E.S.E. of Havana. Pop. (1907) 16,702. It is situated near the centre of the island, on a plateau, between two small streams, and is served by the United Railways of Havana and by the Cuba and the Cuba Central railways, the last connecting the east and west lines with the north and south coasts. The streets are straight and wide, and there are many fine buildings. The oldest church is of the last third of the 18th century. The city is surrounded by fertile plains, which are cultivated in cane or devoted to grazing. Santa Clara was founded in 1689 by a band of schismatics from Remedios.

SANTA CRUZ, ÁLVARO DE BAZAN, 1ST MARQUIS OF (1526–1588), Spanish admiral, was born at Granada on the 12th of December 1526, of an ancient family originally settled in the valley of Baztan in Navarre, from which they are said to have taken their name. His grandfather, Álvaro de Bazan, took part in the conquest of Granada from the Moors in 1492, and his father, who had the same Christian name, was distinguished in the service of Charles V., by whom he was made general of the galleys—or commander-in-chief of the naval forces of the crown of Spain in the Mediterranean. The future admiral followed his father in his youth, and was early employed in high commands. He was a member of the military order of St Iago. In 1564 he aided in the capture of Velez de Gomera, commanded the division of galleys employed to blockade Tetuan, and to suppress the piracy carried on from that port. The service is said to have been successfully performed. Bazan certainly earned the confidence of Philip II., by whom he was appointed to command the galleys of Naples in 1568. This post brought him into close relations with Don John of Austria, when the Holy League was formed against the Turks in 1570. During the operations which preceded and followed the battle of Lepanto (7th of October 1571), Bazan was always in favour of the more energetic course. In the battle he commanded the reserve division, and his prompt energy averted a disaster when Uluch Ali, who commanded the left wing of the Turks, outmanœuvred the commander of the Christian right, Giovanni Andrea Doria, and broke the allied line. He accompanied Don John of Austria at the taking of Tunis in the following year. When Philip II. enforced his claim as heir to the crown of Portugal in 1580–1581, Santa Cruz held a naval command. The prior of Crato,[1] an illegitimate representative of the Portuguese royal family, who conducted the popular resistance to the annexation of the country by Philip, continued however, to hold the island possessions of Portugal in the Atlantic. He was supported by a number of French adventurers under Philip Strozzi, a Florentine exile in the service of France. Santa Cruz was sent as admiral of the Ocean to drive the pretender and his friends away in 1583. His victory off Terceira over the Portuguese, and a loose confederation of adventurers and semi-pirates, French and English, decided the struggle in favour of Spain. Santa Cruz, who recognized that England was the most formidable opponent of Spain, became the zealous advocate of war. A letter written by him to King Philip from Angla in Terceira, on the 9th of August 1583, contains the first definite suggestion of the Armada. Santa Cruz himself was to have commanded. His plans, schemes and estimates occupy a conspicuous place in the documents concerning the Armada collected by Don Cesáreo Duro. The hesitating character of the king, and his many embarrassments, political and financial, caused many delays, and left Santa Cruz unable to act with effect. He was at Lisbon without the means of fitting out his fleet, when Drake burnt the Spanish ships at Cadiz in 1587. The independence of judgment shown by Santa Cruz ended by offending the king, and he was held responsible for the failures and delays which were the result of the bad management of his master. His death, which occurred on the 9th of February 1588 at Lisbon, was said to have been hastened by the unjustified reproaches of the king. The marquis de Santa Cruz was the designer of the great galleons which were employed to carry the trade between Cadiz and Vera Cruz in Mexico.

The documents relating to the Armada have been collected by Don Cesáreo Duro in *La Armada Invencible*, and he gives a biography of the marquis in his *Conquista de las Islas Azores*. A separate life has been published by Don Ángel de Altolaguirre. There are various notices of Santa Cruz in Sir W. Stirling Maxwell's *Don John of Austria*. (D. H.)

SANTA CRUZ, an eastern department of Bolivia, bounded N. by El Benί, E. by Brazil, S. by Chuquisaca and W. by Chuquisaca and Cochabamba. Area 141,368 sq. m. Pop. (1900) 209,592; (1906 estimated) 234,743. It is only partly explored. It consists of a great plain extending eastward from the base of the Andes to the frontiers of Brazil, broken by occasional isolated hills, and in the N.E. by a detached group of low sierras known collectively under the name Chiquitos, which belong to the Brazilian highlands rather than to the Andes. On the western side of the department is an upland zone belonging to the eastern slope of the Andes, and here the Bolivian settlements are chiefly concentrated. The Chiquitos contain a number of old missions, now occupied almost exclusively by Indians. The great plains, whose general elevation is about 900 ft. above the sea, are so level that the drainage does not carry off the water in the rainy season, and immense areas are flooded for months at a time. Extensive areas are permanently swampy. There are forests in the N. and W., but the larger part of the department consists of open grassy plains, suitable for grazing. The Llanos de Chiquitos, adjacent to the sierras of that name, have long been used for this purpose. There are two river systems, one belonging to the Amazon and the other to the La Plata basins. The first includes the Guapay or Rio Grande, Piray or Sara, Yapacani and Maracó, upper tributaries of the Mamoré, and the San Miguel, Blanco, Baures and Paragua, tributaries of the Guaporé—both draining the western and northern parts of the department. In the extreme east a number of streams flow eastward into the Paraguay, the largest of which is the Otuquis; their channels are partly hidden in swamps and lagoons. The climate of the plains is hot and malarial, and the rainfall heavy. On the Andean slopes the temperature is more agreeable. Stock-raising is followed to some extent on the plains. Other products of the western districts are sugar, rum, cacao, rice, cotton, coffee and indigo. Rubber and medicinal products are also exported. The Guapay is navigable for small boats in high water, and also the lower courses of the other rivers named, but they are of little service except in the transport of rubber. The principal markets for Santa Cruz products are in the Bolivian cities of the Andes where sugar, rum, cacao and coffee find a ready sale. There is a trade route across the plains from Santa Cruz de la Sierra to Puerto Suarez, on the Paraguay, and the Bolivian government contracted in 1908 for a railway between these two points (about 497 m.) but the traffic is inconsiderable.

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[1] A priory of the Maltese knights of St John of Jerusalem.

The capital and only large town of the department is SANTA CRUZ DE LA SIERRA (pop., in 1900, 15,874; in 1906, estimated, 20,535), on the Piray, a tributary of the Mamoré, 1450 ft. above sea-level, about 160 m. in a straight line N.E. of Sucre. It is situated on a lower terrace of the Andean slope in a highly fertile district, devoted to sugar-cane and stock-raising. It is a dusty, straggling, frontier town with rough habitations and a half-civilized population, chiefly Indians and mestizos. It is the seat of a bishop and has a partly finished cathedral, seminary and mission station for the Indians. It has also a national college. There are flour mills, sugar mills, distilleries, tanneries and leather manufactories. The original site of Santa Cruz de la Sierra was in the uplands, but it was removed to its present site about 1590, the phrase "de la Sierra" being kept. It has been used as a centre for missionary work among the Indians and as a centre of trade. Expeditions to the Brazilian frontier or to the Chiquitos missions are fitted out here, and it is the objective point for expeditions entering Bolivia from Matto Grosso, Brazil, and Paraguay.

SANTA CRUZ, a city and the county-seat of Santa Cruz county, California, U.S.A., on the northern headland of the Bay of Monterey, about 75 m. S. of San Francisco. Pop. (1900) 5659 (1123 foreign-born); (1910) 11,146. It is served by the Southern Pacific railway. Santa Cruz is a popular seaside resort. The site of the city, which spreads back over bluffs and terraces to the foothills of the mountains (2000-3800 ft. in altitude), is very picturesque, and the scenery in the environs beautiful. Hills nearly enclose the city, protecting it from the ocean fogs. Monterey Bay has a remarkable variety of fish; and there is a large fish hatchery near the city. Fruits in great variety are grown in the valley and foothills. The mountains are covered with one of the noblest redwood forests of the state—the only one south of San Francisco; two groves, the Sempervirens Park (4000 acres) and the Fremont Grove of Big Trees, 5 m. from Santa Cruz, have been permanently preserved by the state. A Franciscan mission was established at Santa Cruz in 1791 and secularized in 1834, but was later destroyed. A pueblo or villa called Branciforte, one of the least important of the Spanish settlements (now a suburb of Santa Cruz), was founded in the vicinity in 1797, and before the American conquest was merged with the settlement that had grown up about the mission. The flag of the United States was raised over Santa Cruz in July 1846. The city was chartered in 1876.

SANTA CRUZ, an archipelago of the Pacific Ocean, in the division of Melanesia, belonging to Great Britain. It is a scattered group of small volcanic islands, irregularly disposed from N.W. to S.E. between 8° 31′ and 11° 40′ S., 165° 38′ and 168° E. The total land area is 380 sq. m., and the population is estimated at 5000.

At the north-western extremity, separated by a deep channel from the Solomon Islands, the following islands are clustered: the Duff and Matema or Swallow groups, Analogo, Tinakula or Volcano Island and others; from these a single chain curves S.E. and then E., consisting of Nitendi or Santa Cruz, the largest island, Tupua or Edgecombe, Vanikoro (Recherche), Tucopia, Anuda (Cherry) and Fataka (Mitie). In Vanikoro there are volcanic mountains up to 3030 ft. in height, and Tinakula is a constantly active volcano of 2200 ft. Nitendi is of less elevation (1215 ft. at the highest). Coral reefs are not extensive, excepting those surrounding Vanikoro. The islands are densely wooded, and have a flora akin to that of New Guinea. The land fauna is very scanty; that of the sea extremely rich and valuable to the natives, who are skilled fishermen and navigators. The climate is hot and humid, and storms are frequent. The natives are of Papuan stock, with an intermixture of other blood; but an exception is found in the Duff group, Tucopia and Anuda, which are inhabited by pure Polynesians. The natives live in villages (sometimes fortified). In the past they have proved treacherous, and cannibalism is not extinct. The work of missionaries, however, has borne good fruit. The islands are included in the British protectorate of the Southern Solomons. Some trade in copra is carried on.

The islands were discovered by the Spaniard Alvaro Mendaña in 1595, in which year he attempted to found a colony on Nitendi, but died there on the 18th of October. In 1767 Philip Carteret visited the archipelago, and called it the Queen Charlotte Islands, a name still sometimes used. During the next century, owing to the practice of kidnapping them as labourers, the natives became so much embittered against foreigners that in 1871 they murdered Bishop John Coleridge Patteson on Nukapu, one of the Swallow group. In 1875 James Graham Goodenough, commodore of the Australian station, was shot with a poisoned arrow on Nitendi during a cruise, and died of his wound. Patteson's murder, however, had roused public feeling in England; steps were taken to regulate the labour traffic, and subsequently Bishop John Selwyn was able to establish friendly relations with the natives. He erected the cross which commemorates his predecessor on Nukapu. The British protectorate was declared in 1898.

SANTA CRUZ, chief town and capital of the province of La Laguna, Luzon, Philippine Islands, on the S.E. shore of Laguna de Bay, about 35 m. S.E. of Manila. Pop. of the municipality (1903) 12,747. Santa Cruz has numerous fine buildings and a large trade with Manila by way of the lake and Pasig river. Agriculture and manufacturing are important pursuits, the town being noted for its manufacture of palm wine. The language is Tagalog.

SANTA CRUZ DE TENERIFE, or DE SANTIAGO, a seaport and the capital of Teneriffe and of the Canary Islands; in 28° 28′ N. and 16° 15′ W., on the east coast. Pop. (1900) 38,419. Santa Cruz is the residence of the governor-general of the Canaries, the civil lieutenant-governor of the Teneriffe district, and the military governor of the island. It occupies a small plain bounded by rugged volcanic rocks, and seamed by watercourses which are dry almost throughout the year. Scarcely any vegetation, except cactuses and euphorbias, is to be seen in the neighbourhood. Almost the entire town was rebuilt in the 19th century, when its population more than trebled. The houses are generally low, with flat roofs; those of the better class are large, with a courtyard in the middle, planted with shrubs in the Spanish fashion. There are many good public buildings, including a school of navigation, technical institute, library, natural history museum and hospital. An aqueduct 5 m. long brings pure water from the mountains of the interior. Dromedaries from the adjacent islands of Lanzarote and Fuerteventura are used to convey merchandise and in agricultural operations. The town is defended by modern forts, but its ancient batteries have also been preserved. It was bombarded by the British fleet under Blake in 1657, and by Nelson, who lost his arm during the attack, in 1797. Some British flags lost on that occasion hang in one of the churches. The anchorage is good, and a mole facilitates landing. Santa Cruz is an important coaling station and commercial centre. (See CANARY ISLANDS.)

SANTA FÉ, the capital of New Mexico, U.S.A., and the county-seat of Santa Fé county, about 20 m. E. of the Rio Grande, and 339 m. N. of El Paso, Texas. Pop. (1900) 5603, (256 foreign-born and 466 Indians); (1910) 5072. Santa Fé is served by the Atchison, **Topeka & Santa Fé, the Denver & Rio** Grande, and the New Mexico Central railways. The city lies about 7000 ft. above the sea, at the foot of the southern extremity of the Rocky Mountains, in the Sangre de Cristo range. Its climate is dry, equable and healthy; the mean annual temperature is 49° F., and the mean annual rainfall 14·2 in. The hills surrounding the city on all sides shelter it from the sandstorms which afflict some parts of New Mexico, and its pleasant climate, attractive mountain scenery and historical interest make it a favourite resort.

Santa Fé is built round a plaza or square. Crooked streets, bordered with low adobe houses, are characteristic of the older part of the city and give an impression of antiquity. Around the plaza and elsewhere in the city, however, the Mexican style of architecture has given way to the American. The plaza itself had been converted from a barren, sandy square into a well-shaded park, through the efforts of the Woman's Board of Trade, an unique institution, which also controls the public library, housed in a brick and stone building (1907) in the Mission style of architecture. Within the plaza are a monument to the soldiers who fell in New Mexico during the Civil War and the Indian wars, a stone marking the spot where the first American flag was raised by General Kearny in 1846, and a bronze drinking fountain erected as a memorial to John Baptist Lamy (1814–1888), the first Roman Catholic bishop (1853) and archbishop (1875) of Santa Fé. Facing the plaza is the old Governor's Palace, a low, spreading, adobe structure, erected early in the 17th century, but partially destroyed in the Pueblo revolt of 1680 and later restored. It was occupied continuously by the Spanish, Mexican and American governors of New Mexico until 1909, and houses the historical museum of the Historical Society of New Mexico (founded in 1859, incorporated in 1880), the School of American Archaeology and the New Mexico Museum of Archaeology. In this building General Lew Wallace (governor 1878–1881) wrote the concluding chapters to *Ben Hur.* San Miguel chapel was built probably in the middle of the 17th century, was destroyed in 1680, and was rebuilt in 1710, but has been greatly altered in recent times. The church of Nuestra Señora de Guadalupe (modernized with a shingle roof and a wooden steeple) contains interesting paintings and antique wood-carvings. The cathedral of San Francisco, though not completed, has been used as a place of worship since about 1880. In its walls is incorporated part of a church erected, it is thought, in 1627. Also of interest are the Rosario chapel; the ruined earthworks of Fort Marcy, north of the city, constructed by General Kearny in 1846; the ruins of the Garita, an old Spanish fortification used as a custom house under the Mexican government; the so-called "oldest house," a dilapidated adobe structure claimed to be the oldest building, continuously inhabited, in the United States; the state library; and the national cemetery, in which 1022 American soldiers are buried.

Among the public buildings and institutions are the state capitol, the executive mansion (1909), the Federal building (in front of which is a monument to Kit Carson), the county court house, a National Guard armoury, a Federal industrial boarding school for Indians (with 300 pupils in 1908) and Saint Catherine's Industrial School for Indians (Roman Catholic). About 7 m. east of the city is the Pecos Forest Reserve, across which the Territory undertook the building, with convict labour, of a "scenic highway" from Santa Fé to Las Vegas. In Pajarito Park, 20 m. west of Santa Fé, are many prehistoric cave, cliff and communal dwellings, and near the city are several prehistoric mounds.

The chief manufactures of Santa Fé are brick, pottery (made by Pueblo Indians), and filigree jewelry (made by Mexican artisans). The surrounding country is devoted to agriculture and mining, chiefly for coal.

Santa Fé is considered the oldest city save one (St Augustine, Florida) in the United States. A settlement, known as San Gabriel, was planted at the junction of the Rio Chama and the Rio Grande by Juan de Oñate in 1598, and about 1605,[1] some 30 m. S.E., Santa Fé, officially the Villa Real de Santa Fé de San Francisco, was founded on the site of a deserted Indian pueblo and became the seat of the government of New Mexico. In 1630 it contained a population of 250 Spaniards, 700 Indians and about 50 half-breeds. In August 1680 the Pueblo Indians, embittered by the exactions of the civil and ecclesiastical authorities, revolted (see New Mexico: *History*). Four hundred Spaniards were massacred, and the remainder took refuge in Santa Fé, where they were closely besieged. On the 21st of August, while the Indians were demoralized by a sortie from the garrison, the town was evacuated, and the inhabitants made a six weeks' journey down the Rio Grande to the mission of Guadalupe, near the modern El Paso, Texas. The Indians then took possession, destroyed the crops, churches and archives, and revived their pagan ceremonies. Several unsuccessful attempts were made to regain the town, but finally, in September 1692, Diego de Vargas quietly secured the fresh submission of the Indians. In December 1693 a new Spanish colony of about 800 persons arrived. There were two other Indian revolts, in 1694 and in 1696. During the 18th century a considerable trade in sheep, wool, wine and pelts developed, chiefly with Chihuahua and with the Indians of the plains. After the independence of Mexico Santa Fé became the centre of a growing commerce with the United States, conducted at first by pack animals, and later by wagon trains over the old Santa Fé Trail leading south-west from Independence, Kansas City, and, in earlier years, other places in Missouri, to Santa Fé. On the 18th of August 1846, soon after the outbreak of the war between the United States and Mexico, Santa Fé was occupied by an American force under General S. W. Kearny. The Mexicans revolted a few months later, and the newly appointed governor, Charles Bent, and a number of American sympathizers were assassinated; but the rising was quickly suppressed. In 1847 the first English newspaper in New Mexico was established at Santa Fé, and an English school was founded in 1848. Santa Fé remained the capital when a Territorial government was inaugurated in 1851. The arrival of the first railway train, on the 9th of February 1880, marked a new epoch in the history of Santa Fé, which until then had remained essentially a Mexican town; but with the discontinuance of the wagon caravans over the old trail, it lost its importance as the entrepôt for the commerce of the South-west.

See the sketch by F. W. Hodge in *Historic Towns of the Western States* (New York, 1901), edited by Lyman P. Powell; H. H. Bancroft, *History of Arizona and New Mexico* (San Francisco, 1884); and Henry Inman, *The Old Santa Fé Trail* (New York, 1897).

SANTA FÉ, a central province of Argentina, bounded N. by the Chaco territory, E. by Entre Rios and Corrientes, S. by Buenos Aires, and W. by Cordoba and Santiago del Estero. Area, 50,916 sq. m. Pop. (1895) 397,188, (1904 estimated) 640,755. Santa Fé belongs to the great pampa region of Argentina, and has no wooded districts in the south except on the river courses. In the N. which is borderland to the Gran Chaco region, there are extensive forests, intermingled with grassy campos. The surface is a level alluvial plain, with a saline substratum at no great depth. Salt is found on the surface over large areas, and throughout the province the water is brackish 15 to 20 ft. below the surface. The soil, however, produces wheat, corn, alfalfa, linseed and other crops in abundance. Stock-raising (cattle, horses, sheep and swine) is also an important industry, with the related industries of butter and cheese-making, meat-curing and lard-refining. Many colonies have been made, especially near the provincial capital. It is one of the most productive provinces in the republic, in spite of notorious misgovernment. The Paraná forms its eastern boundary for about 435 m., and provides unfailing transport facilities. The great river is broken into many channels, forming islands and sand bars which are constantly changing their outlines. It receives two large tributaries flowing across the province—the Salado, the upper course of which is called the Pasage and Juramento (the last given to commemorate the circumstance that the oath to wrest their independence from Spain was sworn on its banks in 1816), and which enters the Santa Fé channel of the Paraná near the capital; and the Carcarañá, or Carcarañal, whose sources are in the Cordoba sierras. The northern districts are well watered by numerous tributaries of the Salado. The railway communications of the province are good, comprising the trunk lines of the Buenos Aires and Rosario railway with its extension to Tucuman, which crosses the province from S.E. to N.W.; the Central Argentine from Rosario to Cordoba, and to Buenos Aires; the Cordoba Central; Santa Fé to Tucuman; and the Provincia de Santa Fé; a network of small lines connects all the important towns; and the Buenos Aires and Pacific which crosses near its southern boundary. The river ports having railway connexions are Reconquista, Santa Fé, Colastiné, Coronda, Puerto Gomez, San Lorenzo, Rosario and Villa Constitución. The capital is Santa Fé, and other important towns are Rosario, Esperanza (pop. 1904 estimated 10,000), San Lorenzo (7000), Rafaela, Ocampo, Galvez, Cañada de Gomez and Villa Casilda.

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[1] The exact date of the founding of Santa Fé is not known, but the best opinion has fixed the date between 1604 and 1608, and favours the year 1605.

SANTA FÉ, a city of Argentina and capital of the province of that name, on the Santa Fé channel of the Paraná near the mouth of the Salado, about 299 m. N.W. of Buenos Aires. Pop. (1895) 24,755, (1904 estimated) 33,200. It is built on a sandy plain little above the river level. It is regularly laid out and contains a cathedral, bishop's palace, Jesuits' college and church dating from 1654, the cabildo or town hall facing on the principal square and provincial government buildings. The town is less modern in appearance than Rosario, and has a number of old residences and educational and charitable institutions. It is a port of call for small river steamers and is in ferry communication with Paraná on the opposite bank of the Paraná. Its shipping port for larger steamers is at Colastiné, on a deeper channel, with which it is connected by rail. Santa Fé also has railway communication with Rosario, Cordoba, Tucuman and the frontier of the Chaco.

Santa Fé was founded by Juan de Garay in 1573, and was designed to secure Spanish communications between Asunción and the mouth of the La Plata. It has been the centre of much political intrigue, but its growth has been very slow. In 1852 a constituent congress met there, and in 1860 a national convention for the revision of the constitution.

SANTAL (or SONTHAL) **PARGANAS, THE,** a district of British India, in the Bhagalpur division of Bengal. Area 5470 sq. m. In the east a sharply defined belt of hills stretches for about 100 m. from the Ganges to the river Naubil; west of this a rolling tract of long ridges with intervening depressions covers about 2500 sq. m.; while there is a narrow strip of alluvial country about 170 m. long, lying for the most part along the loop line of the East Indian railway. The Rajmahal hills occupy an area of 1366 sq. m.; they nowhere exceed 2000 ft. There are several other hill ranges which with few exceptions are covered almost to their summits with dense jungle; they are all difficult of access. There are, however, numerous passes through all the ranges. Coal and iron are found in almost all parts, but of inferior quality. The alluvial tract has the damp heat and moist soil characteristic of Bengal, while the undulating and hilly portions are swept by the hot westerly winds of Behar, and are very cool in the winter months. The annual rainfall averages 52 in. In 1901 the population was 1,809,737, showing an increase of 3% in the decade.

The Santals, who give their name to the district, are the most numerous aboriginal tribe in Bengal; they work the coal-mines of Raniganj and Karharbari and migrate to the tea-gardens of Assam. In 1832 officials were deputed to demarcate with solid masonry pillars the present area of the Daman-i-Koh, or "skirts of the hills." The permission to Santals to settle in the valleys and on the lower slopes stimulated Santal immigration to an enormous extent. The Hindu money-lender soon made his appearance among them, and caused the rebellion of 1855–56. The insurrection led to the establishment of a form of administration congenial to the immigrants; and a land settlement has since been carried out on conditions favourable to the occupants of the soil. The Church Missionary Society and the Scandinavian Home Mission have been very successful, especially in promoting education. The district is traversed by both the chord and loop lines of the East Indian railway. It contains the old Mahommedan city of Rajmahal and the modern commercial mart of Sahibganj, both on the Ganges; and also the Hindu place of pilgrimage of Deogarh, which is important enough to have a branch railway. The administrative headquarters are at Dumka, or Naya Dumka: pop. (1901) 5326.

See F. B. Bradley-Birt, *The Story of the Indian Upland* (1905).

SANTALS, an aboriginal tribe of Bengal, who have given their name to the Santal Parganas (*q.v.*). Their early history is unknown; but it is certain that they have not occupied their present home for longer than a century, having migrated from Hazaribagh, and they are still moving on into Northern Bengal. Their total number in all India is nearly two millions. They speak a language of the Munda or Kolarian family.

The Santals as a race care little for permanent homes. They are not true nomads, but they like to be "on the move." In the lowlands they are agriculturists; in the jungles and on the mountains they are skilful hunters, bows and arrows being their chief weapons; on the highlands they are cattle breeders. But if fond of change the Santals like comfort, and their villages are neat, clean and well built, usually in an isolated position. Their social arrangements are patriarchal. In every village is a headman supposed to be a descendant of the founder of the village. A deputy looks after details; a special officer has charge of the children's morals, and there is a watchman. Physically the Santals are not prepossessing. The face is round and blubbery; the cheekbones moderately prominent; eyes full and straight, nose broad and depressed, mouth large and lips full, hair straight, black and coarse. The general appearance approximates to the negroid type. They are somewhat below the average height of the Hindus. They are divided into twelve tribes. In character they are a bright, joy-loving people, hospitable and seizing every chance of a feast. "They have neither the sullen disposition nor the unconquerable laziness of the very old hill-tribes of central India," writes Sir W. W. Hunter in *Annals of Rural Bengal* (1868). "They have carried with them from the plains a love of order, a genial humanity, with a certain degree of civilization and agricultural habits. Their very vices are the vices of an oppressed and driven-out people who have lapsed from a higher state, rather than those of savages who have never known better things." Each village has its priest who has lands assigned to him; out of the profits he must twice a year feast the people. At the Sohrai feast—the "harvest-home"—in December, the headman entertains the villagers, and the cattle are anointed and daubed with vermilion and a share of the rice-beer is given to each animal. The Santals have many gods whose attributes are ill-defined, but whose festivals are strictly observed. Marang Buru, the great spirit, is the deity to whom sacrifices are made at the Sohrai. Among some Santals, *e.g.* in Chota Nagpur, Sing Bonga, the sun, is the supreme deity to whom sacrifices are made. Generally there is no definite idea of a beneficent god, but countless demons and evil spirits are propitiated, and ancestors are worshipped at the Sohrai festival. There is a vague idea of a future life where the spirits of the dead are employed in the ceaseless toil of grinding the bones of past generations into a dust from which the gods may recreate children. In some villages the Santals join with the Hindus in celebrating the Durga Puja festival. In the eastern districts the tiger is worshipped. For a Santal to be sworn on a tiger-skin is the most solemn of oaths. The Santals are omnivorous, but they will not touch rice cooked by a Hindu. Santal parents undergo purification five days after childbirth. Santals have adopted as a rite the tonsure of children. Child marriage is not practised, and the young people make love matches, but the septs are exogamous as a rule. Santals seldom have more than one wife and she is always treated kindly. An open space in front of the headman's house is set apart for dancing, which is very elaborate and excellent. The flute, upon which they play well, is the chief Santal instrument. The Santals burn their dead, and the few charred bones remaining are taken by the next of kin in a basket to the Damodar, the sacred river of the Santals in Hazaribagh district, and left where the current is strongest to be carried to the ocean, the traditional origin and resting place of the Santal race.

See E. Tuite Dalton, *Descriptive Ethnology of Bengal* (Calcutta, 1872); F. B. Bradley-Birt, *The Story of an Indian Upland* (1905).

SANTA MARIA (DA BOCCA DO MONTE), an inland town of Brazil, in Rio Grande do Sul, 162 m. by rail W. of Margem do Taquary, the railway terminus for Porto Alegre (1908), about 80 m. by water N.W. of that city. Pop. (1900) 13,628. Santa Maria, which lies 382 ft. above the sea, is the commercial centre of a rich district on the slopes of short mountain ranges, one of which, the Serra do Pinhal, forms the water parting between the eastern and western river systems of the state. There are prosperous colonies in its vicinity, including one founded by the Jewish Colonisation Association under the provisions of the Hirsch Fund. The industries of this region include the cultivation of wheat, Indian corn, rice, mandioca, beans, grapes (for wine), nuts, olives and tobacco, and stock-raising. The town derives its chief importance, however, from its becoming the junction of the Porto Alegre to Uruguayana, and the Santa Maria to Passo Fundo railways. In 1905 the national and state governments leased to the "Compagnie Auxiliaire de Chemin de Fer au Brésil" the Rio Grande to Bagé, the Porto Alegre to Uruguayana, the Santa Maria to Passo Fundo, and the Porto Alegre to Nova Hamburgo railways, with their branches and connexions, and it was decided to establish the general administration offices for the whole system at Santa Maria. The shops and offices of the Porto Alegre to Uruguayana line had been removed to that place in 1902.

SANTA MARIA DI LICODIA, a village of Sicily, in the province of Catania, 18 m. N.W. of Catania by rail, on the S.W. slopes of Mount Etna. Pop. (1901) 4101. It is believed to occupy the site of the ancient Aetna, a settlement founded by the colonists whom Hiero I. had placed at Catania after their expulsion by the original inhabitants in 461 B.C., which absorbed or incorporated an already existing Sicel town named Inessa. Its subsequent history is uneventful, though it suffered from the exactions of Verres; and its inscriptions are unimportant. A large hoard of coins was found here in 1891. Near it, in a district called Civitá, is a large elliptical area of about 1300 by 380 yds., enclosed by a wall of masses of lava, which is about 28 ft. wide at the base, and 11 ft. high. The ground is covered with fragments of tiles and pottery of the classical period, and it is probably a hastily built encampment of historic times rather than a primitive fortification, as there are no prehistoric traces (Orsi in *Notizie degli scavi*, 1903, 442).

See Casagrandi, *Su due antiche città sicule Vessa ed Inessa* (Acireale, 1892).

SANTA MARTA, a city and port of Colombia and the capital of a department of the same name, on a small bay 40 m. E.N.E. of the mouth of the Magdalena river. Pop. (1908) about 6500. It is built partly on the beach and partly on the slopes of the Sierra Nevada de Santa Marta towards the S.E. Though small, the harbour is one of the best and safest on the coast, as no river flows into it to fill its anchorage with silt. The depth ranges from 18 to 19 fathoms at the entrance to 4½ fathoms along the inner shore line. The city is an episcopal see and has a cathedral. A railway (23 m.) runs southward a little beyond Cienaga (on a large lagoon of the same name), connects with steamers running to Barranquilla (50 m. farther) by way of the lagoon and inland channels, and is to be extended to San Carlos, farther S., as the fruit-growing industry of this region is developed.

Santa Marta was founded by Rodrigo de Bastidas in 1525, and became an important port and centre of trade during the Spanish colonial era. It was also a base of operations in the exploration and conquest of the interior.

SANTA MAURA, or LEUCADIA (Λευκάδα, ancient Λευκάς), one of the Ionian Islands, with an area of 110 sq. m. and a population of about 30,000. It lies off the coast of Acarnania (Greece), immediately south of the entrance to the Gulf of Arta. The shallow strait separating it from the mainland is liable to be blocked by sand-banks; a canal was cut through these in the 7th century B.C. by the Corinthians, and was again after a long period of disuse opened up by the Romans.

During the British occupation a canal for boats of 4 to 5 ft. draught was formed from Fort Santa Maura to the town, but the 16 ft. deep ship canal which it was proposed (1844) to carry right across the lagoon or submerged isthmus to Fort Alexander was only partially excavated. In 1903, however, a canal was completed rendering navigable the channel between the island and the mainland. Its breadth is 50 ft. and its depth 17 ft. Santa Maura, measuring about 20 m. from north to south and 5 to 8 m. in breadth, is a rugged mass of limestone and bituminous shales (partly Tertiary), rising in its principal ridges to heights of 2000 and 3000 ft. and presenting very limited areas of level ground. The grain crop suffices only for a few months' local consumption; but considerable quantities of olive oil of good quality are produced. The vineyards (in the west especially) yield much red wine (bought mainly by Rouen, Cette, Trieste and Venice); the currant, introduced about 1859, has gradually come to be the principal source of wealth (the crop averaging 2,500,000 lb); and small quantities of cotton, flax, tobacco, valonia, &c., are also grown. The salt trade, formerly of importance, has suffered from Greek customs regulations. The chief town (5000 inhabitants), properly called Amaxikhi or Hamaxichi but more usually Santa Maura, after the neighbouring fort, is situated at the N.E. end of the island opposite the lagoon. In the S.W. is the village of Vasiliki, whence the currant crop is exported.

Remains of Cyclopean and polygonal walls exist at Kaligoni (south of Amaxikhi), probably the site of the ancient acropolis of Neritus (or Nericus), and of the later and lower Corinthian settlement of Leucas. From this point a Roman bridge seems to have crossed to the mainland. Between the town and Fort Santa Maura extends a remarkably fine Turkish aqueduct partly destroyed along with the town by the earthquake of 1825. Forts Alexander and Constantine commanding the bridge are relics of the Russian occupation; the other forts are of Turko-Venetian origin. The magnificent cliff, some 2000 ft. high, which forms the southern termination of the modern island still bears the substructions of the temple of Apollo Leucatas (hence the modern name Capo Ducato). At the annual festival of Apollo a criminal was obliged to plunge from the summit into the sea, where, however, an effort was made to pick him up; and it was by the same heroic leap that Sappho and Artemisia, daughter of Lygdamis, are said to have ended their lives.

A theory has been proposed by Professor Dörpfeld that Leucas is the island described in the *Odyssey* under the name of Ithaca; in support of this theory he quotes the fact that the Homeric description of the island and its position, and also the identification of such sites as the palace of Odysseus, the harbour of Phorcys, the grotto of the Nymphs and the island Asteris, where the suitors lay in wait for Telemachus, suit Leucas far better than the island called Ithaca in classical and modern times.

See under CORFU; also P. Goessler, *Leukas-Ithaka* (Stuttgart, 1904).

SANTANDER, a maritime province of northern Spain, bounded N. by the Bay of Biscay, E. by the province of Biscay, S. by Burgos and Palencia, and W. by Leon and Oviedo. Pop. (1900) 276,003; area 2108 sq. m. The province is traversed from east to west by the Cantabrian Mountains (*q.v.*), which in the Peñas de Europa reach a height of over 8600 ft., and send off numerous branches to the sea. On the north side of the range the streams are all short, the principal being the Ason, the Miera, the Pas, the Besaya, the Saja and the Nansa, which flow into the Bay of Biscay; part of the province lies south of the watershed, and is drained by the upper Ebro (*q.v.*). The province is traversed from north to south by the railway and high road from Santander by Palencia to Madrid; the highest point on the railway (Venta de Pazozal) is 3229 ft. above the sea. Other railways connect Santander with Bilbao on the east and with Cabezona de la Sal on the west; there are also many good state, provincial and municipal roads, besides several narrow-gauge mining railways.

Santander was part of the Roman province of Cantabria, which, after passing under the empire of the Goths, became the principality of Asturias (*q.v.*). The portion called Asturia de Santa Juliana, or Santillana, was included in the kingdom of Old Castile, and, on the subdivision of the old provinces of Spain in 1833, became the province of Santander.

SANTANDER (ancient *Portus Blendium* or *Fanum S. Andreae*), the capital of the Spanish province of Santander, the seat of a bishop and one of the chief seaports of Spain; 316 m. by rail N. of Madrid, in 43° 27′ N. and 3° 47′ W., on the Bay of Santander, an inlet of the Bay of Biscay. Pop. (1900) 54,564. It is situated on the inside of a rocky peninsula, Cabo Mayor, which shelters a magnificent harbour from 2 to 3 m. wide and 4 m. long. The entrance is at the eastern extremity of the promontory, and is deep, broad, and illuminated by lighthouses on Cabo Mayor and the rocky islet of Mouro. Santander is the terminus of railways from Valladolid and Bilbao, of a branch line from Cabezona de la Sal, and of several mining railways. It is divided into an upper and a lower town. The cathedral, originally Gothic of the 13th century, has been so altered that little of the old work remains. In the crypt, or Capilla del Cristo de Abajo, is an interesting font of Moorish workmanship. The castle of San Felice contains a prison, which was one of the first examples of the radiating system of construction. The city is essentially modern; its principal buildings are the markets, barracks, theatre, bull-ring, clubs, civil and military governors' residences, custom house, hospitals, nautical school, ecclesiastical seminary, and training school for teachers. Many of the houses on the bay front and public buildings were restored after the catastrophe of the 3rd of November 1893, when the steamer "Cabo Machichaco," laden with 1700 cases of dynamite, blew up near the quay. The harbour was greatly improved during the second half of the 19th century. In the same period the population nearly trebled, and there was a corresponding development of commerce and manufactures.

The port was in 1753 made one of the *puertos habilitados*, or ports privileged to trade with America, and in 1755 it received the title of city. Charles V. landed here in 1522 when he came to take possession of the Spanish crown, and from this port Charles I. of England embarked on his return from his visit in search of a wife (1623). The city was sacked by the French under Soult in 1808.

SANTAREM, the capital of the district of Santarem, Portugal; on the right bank of the river Tagus, 51 m. by rail N.E. of Lisbon. Pop. (1900) 8628. The older part of the city is built on high ground overlooking the Tagus; it contains the ruined castle of Alcaçova, famous in the middle ages as a royal residence, and is partly enclosed by ruined walls. Below is Ribeira de Santarem, a comparatively modern river-port, and on the opposite bank is Almeirim, a village which was also a royal residence until 1755, when it was almost entirely destroyed by earthquake. Santarem has some trade in fish and agricultural produce, including wine and olive oil. Its chief buildings are an ecclesiastical seminary, the largest in Portugal; the late Gothic church of the Convento da Graça, which contains the tomb of Pedro Alvares Cabral, the first Portuguese to visit South America (1502); the Igreja do Milagro, an early Renaissance church; the chapel of Santa Rita, with a painting by Ignatius Xavier, who was born here in 1724; the church of Santa Maria, built in 1244, but with Manoellian additions made early in the 16th century; the secularized 13th-century church of San Francisco; the church of São João, which has a Moorish minaret for a belfry, and has been converted into an archaeological museum; and the church of Santa Iría (St Irene), from which the name of the city is derived. There is a fine bridge across the Tagus.

Santarem is the Roman *Scallabis*, renamed *Praesidium Julium* by Julius Caesar. From its position in the Tagus valley it became an important fortress during the wars between the Moors, Portuguese and Spaniards. Alphonso VI. of Castile first took it from the Moors in 1093, but it was recaptured and occupied by them until 1147, when Alphonso I. of Portugal recovered it. The Almohades endeavoured to win it back in 1184, but were defeated. At Santarem King Diniz died in 1325; the murderers of Inez de Castro (*q.v.*) were executed in 1357; and Prince Alphonso, only son of John II., was drowned in 1491. Here the 15th-century navigator John of Santarem was born, and here the Cardinal-King Henry (1512–1580) was born, abdicated and died. The Miguelites were defeated here in 1834 (see PORTUGAL: *History*). In 1868 Santarem was raised to the rank of a city.

The administrative district of Santarem coincides with the eastern part of the ancient province of Estremadura (*q.v.*); pop. (1900) 283,154; area 2555 sq. m.

SANTAREM, a city of Brazil in the state of Pará, on the right bank of the Tapajos, near its entrance into the Amazon. Pop. (1890) of the town and municipio, 12,062. It is one of the most important towns of the Amazon between Pará and Manáos, and is a port of call for all river steamers, and a station on the Amazon cable line. The national government has made it a station in its system of wireless telegraphy in the Amazon valley. Seen from the river the town is attractive in appearance, and consists of a European (white) and an Indian quarter, the latter of palm-thatched huts. Ruins remain of a fort built in colonial times to protect the population against hostile Indians. Its principal public buildings are a municipal hall and tribunal, a large municipal warehouse, a market (1897), theatre and two churches. The productions of the neighbourhood are cacao, Brazil nuts, rubber, tobacco, sugar-cane and cattle; and the rivers furnish an abundance of fish, which are cured here at the season of low-water, when turtle eggs are gathered up stream for the manufacture of oil and butter. The Tapajos is navigable for steamers to the rapids, 170 m. above Santarem, and for small boats nearly to Diamantino, Matto Grosso, and a considerable trade comes from Matto Grosso and the settlements along its banks. After the American Civil War a colony of Americans settled in the vicinity, but were unsuccessful in founding a permanent colony. Santarem was founded by a Jesuit missionary in 1661 as an Indian *aldeia*, and became a city in 1848.

SANTAROSA, ANNIBALE SANTORRE DI ROSSI DE POMAROLO, COUNT OF (1783–1825), Piedmontese insurgent, and leader in the revival (Resorgimento) of Italy, was born at Savigliano near Coni on the 18th of November 1783. He was the son of a general officer in the Sardinian army who was killed at the battle of Mondovi in 1796. The family had been recently ennobled and was not rich. Santarosa entered the service of Napoleon during the annexation of Piedmont to France, and was sub-prefect of Spezia from 1812 to 1814. He remained, however, loyal in sentiment to the house of Savoy, and, after the restoration of the king of Sardinia in 1814, he continued in the public service. During the brief campaign of the Sardinian army on the south-eastern frontier of France in 1815 he served as captain of grenadiers, and was afterwards employed in the ministry of war. The revolutionary and imperial epoch had seen a great development of Italian patriotism, and Santarosa was aggrieved by the great extension given to the Austrian power in Italy in 1815, which reduced his own country to a position of inferiority. The revolutionary outbreak of 1820, which extended from Spain to Naples, seemed to afford the patriots an opportunity to secure the independence of Italy. When in 1821 the Austrian army was moved south to coerce the Neapolitans, Santarosa entered into a conspiracy to obtain the intervention of the Piedmontese in favour of the Neapolitans by an attack on the Austrian lines of communication. The conspirators endeavoured to obtain the co-operation of the prince of Carignano, afterwards King Charles Albert, who was known to share their patriotic aspirations. On the 6th of March 1821 Santarosa and three associates had an interview with the prince, and on the 10th they carried out the military "pronunciamiento" which proclaimed the Spanish constitution. The movement had no real popular support, and very soon collapsed. During the brief predominance of his party Santarosa showed great decision of character. He was arrested and would have died on the scaffold if sympathisers had not rescued him. He fled to France, and lived for a time in Paris under the name of Conti. Here he wrote in French and published in 1822 his *La révolution piémontaise*, which attracted the notice of Victor Cousin, by whom he was aided and concealed. The French government discovered his hiding-place, and he was imprisoned and expelled from Paris. After a short stay first at Alençon and then in Bourges, he passed over to England, where he found refuge in London with Ugo Foscolo, and made a few English friends. He went to Nottingham, in the hope of being able to support himself by teaching French and Italian. The miseries of exile rather than any hope of advantage led him to accompany his countryman Giacinto Collegno to Greece in November 1824. The Italians were ill-treated by the Greeks and were not well looked on by the Philhellene committees, who thought that their presence would offend the powers. Santarosa was killed, apparently because he was too miserable and desperate to care to save his life, when the Egyptian troops attacked the island of Sphacteria, near Navarino, on the 8th of May 1825.

See Atto Vannucci, *I Martiri della libertà italiana* (Milan, 1877), and vol. ix. of the series called *I Contemporanei italiani* (Turin), in which there is a life by Angelo Degubernatis. Santarosa's correspondence was edited by Signor Bianchi, *Lettere di Santorre Santarosa* (Turin, 1877). A personal description of him by Victor Cousin will be found in the *Revue des deux mondes* for the 1st of March 1840. Cousin dedicated to him the fourth volume of his translation of Plato, and the long dedication is a compressed biography.

SANTA ROSA, a city and the county-seat of Sonoma county, California, U.S.A., situated in a broad valley (altitude about 180 ft.) among the Coast Ranges, about 52 m. N. of San Francisco. Pop. (1900) 6673, (1029 foreign-born); (1910) 7817. It is served by the North-Western Pacific and the Southern Pacific railways. Santa Rosa is in a region admirably adapted to the growing of hops—the city is an important hop market—and of fruit and grain, and the handling of these products is a leading industry. Poultry and dairying interests are also important. It was the home of Luther Burbank (b. 1849), the originator of many new flowers, fruits and vegetables, including the Burbank potato, the pineapple quince, and the stoneless prune. Santa Rosa was first settled about 1838, was laid out and incorporated in 1853, replaced Sonoma as the county-seat in 1854, and was chartered as a city in 1867. In the earthquake of the 18th of April 1906 it suffered severely.

SANTERRE, ANTOINE JOSEPH (1752–1809), French revolutionist, was born in Paris on the 16th of March 1752. Like his father, he was a brewer, and gained great popularity in faubourg St Antoine by his beneficence. In 1789 he was given the command of a battalion of the National Guard, and took part in the storming of the Bastille. After the affair of the Champ de Mars (July 17th, 1791) a warrant was issued for his arrest, and he went into hiding. He emerged again in the following year, and took part in the events of the 20th of June and the 10th of August 1792, when he led the people of the faubourg St Antoine to the assault of the Tuileries. He, however, protected the royal family against the violence of the mob and, on the 7th of August, even attempted to bring about a reconciliation, but his efforts were frustrated by Marie Antoinette. He was made commander-in-chief of the National Guard, and appointed by the Convention warder to the king, in which position he did all in his power to alleviate Louis's captivity. He notified Louis of the sentence of death, and was present at the execution. Accounts differ as to his conduct at the execution, some stating that he ordered a roll of drums to drown the king's voice. The family tradition, however, is that he silenced the drums to enable Louis to speak to the people, and that General J. F. Berruyer, who was in sole command, ordered the drums to beat and thus drowned the last words of the king's speech. Santerre was appointed *maréchal de camp* on the 23rd of October 1792, and subsequently general of division. In May 1793 he was temporarily replaced as commander of the National Guard in Paris, so that he might take command of a force which he had organized to operate in La Vendée. As a military commander he was not a conspicuous success, his début being signalized by the defeat of the republicans at Saumur. He was variously reported to have been wounded and killed in this affair, and the wits of the reactionary party circulated his epitaph:

> *Ci-gît le général Santerre*
> *Qui n'eut de Mars que la bière.*

He was scarcely more popular among the *sans-culottes* of his army. Wounded soldiers, returned to Paris, reported that he was living *là-bas*, "in Oriental luxury," and complained that, since their defeat had been due either to his treason or his incompetence, he should have been either guillotined "like other generals" or superseded. He was, however, not in supreme command, and therefore not responsible for the ill conduct of the war; he distinguished himself in various actions; and when, in October, he returned to Paris his popularity in the faubourg St Antoine was undiminished. But his report on this expedition, in which he drew attention to the evil plight of the republican arms in the Vendée, aroused suspicion. He was accused of "Orleanism" and imprisoned, and was not released until after the fall of Robespierre. He then gave in his resignation as general, and returned to commerce; but his brewery was ruined, and after many vicissitudes of fortune he died in poverty in Paris on the 6th of February 1809.

See A. Carro, *Santerre général de la république française* (Paris, 1847), compiled from Santerre's MS. notes; P. Robiquet, *Le Personnel municipal de Paris pendant la Révolution* (Paris, 1890); C. L. Chassin, *La Vendée et la Chouannerie* (Paris, 1892 seq.); "L'État des services de Santerre dressé par lui-même," in the third volume of *Souvenirs et mémoires* (1899), published by Paul Bonnefon.

SANTERRE, JEAN BAPTISTE (1650–1717), French painter, was born at Magny, near Pontoise, and was a pupil of Bon Boulogne. He began life as a portrait-painter, and enjoyed for half a century a great reputation as a painter of the nude. He died at Paris on the 21st of November 1717. His "Portrait of a Lady in Venetian Costume" (Louvre), and his "Susanna at the Bath" (Louvre, engraved by Porporati), the diploma work executed by him in 1704, when he was received into the Academy, give a good impression of Santerre's taste and of his elaborate and careful method.

SANTIAGO, or SANTIAGO DE CHILE, a city of Chile, capital of the republic and chief town of a province of the same name, on the Mapocho river, a small tributary of the Maipú or Maipo, 115 m. W. of Valparaiso, in 33° 26′ 42″ S., 70° 40′ 36″ W. Pop. (1895) 256,413, (1900) 269,886, (1902, estimated) 322,059. It is built on a wide, beautiful plain about 1860 ft. above sea-level, between the main range of the Andes and the less elevated heights of Cuesta del Prado. In the centre of the city rises the rocky hill of Santa Lucia, once forming its citadel, but now converted into a pleasure-ground, with winding walks, picturesque views, theatres, restaurants and monuments. Immediately N.N.W. and N.E. are other hills, known as Colina, Renca and San Cristóbal, and overshadowing all are the snow-clad Andean peaks of La Chapa and Los Amarillos, visible from all parts of the city. The Mapocho, once the cause of destructive inundations (especially in 1609 and 1783), was enclosed with solid embankments during the administration of Ambrosio O'Higgins, and is now crossed by several handsome bridges; the oldest (1767–1779) of these has eleven arches. Santiago is laid out with great regularity, and its comparatively broad straight streets form parallelograms and enclose several handsome public squares, the Plaza de la Independencia, the Campo de Marte and others. The principal streets have been repaved with asphalt instead of the old cobblestone and Belgian block pavements; water is brought in through an aqueduct (1865) 5 m. long; and there are tramway lines on all the principal streets.

The cathedral, facing on the Plaza de la Independencia, is the oldest of the churches. Originally erected by Pedro de Valdivia, it was rebuilt by García Hurtado de Mendoza, was destroyed by the earthquake of 1647 and was rebuilt on a new plan subsequent to 1748. It is 351 ft. long and 92 ft. wide, has only one tower and is not striking in appearance. Its interior decorations, however, are rich and in good taste. Among the other ecclesiastical buildings are the church of San Augustin, erected in 1595 by Cristóbal de Vera, and in modern times adorned with a pillared portico; the churches of San Francisco, La Merced and Santo Domingo, dating from the 18th century; the church of the Reformed Dominicans, rich in monolithic marble columns; the Carmen Alto, or church of the Carmelite nunnery, an elegant little Gothic structure; the Augustine nunnery, founded by Bishop Medellin in 1576; the episcopal palace; and the chapel erected in 1852 to the memory of Pedro de Valdivia next to the house in which he is reputed to have lived. There are two fine cemeteries—one exclusively Roman Catholic and the other secularized. Mural interment is the custom in Santiago.

Among the secular buildings the more noteworthy are the Capitol. with its rows of massive columns and surrounded with beautiful gardens; the Moneda, or executive residence, which contains the offices of the cabinet ministers also; the municipal palace; the courts, or palace of justice; the post office and telegraph department; the exposition palace in the Quinta Normal, which houses the national museum; the university of Chile, dating from 1842; the national library with over 100,000 volumes; the School of Arts and Trades (Lyceo de Artes y Oficios); the national conservatory of music; the medical school; the astronomical observatory; the national institute; the mint; and a municipal theatre. There are also a military school, a school of agriculture, mining school, normal schools and a number of charitable institutions. The old Universidad de San Felipe, founded in 1747, was closed in 1839, and was succeeded three years later by the present national university. Facing the Capitol, which includes the two halls of Congress, is a small park and commemorative shaft, marking the spot where stood the Jesuits' church, burned down on the night of the 8th of December 1868, and with it "two thousand victims, more or less," chiefly women.

There is railway communication with Valparaiso, with Los Andes and the international tunnel and with the provincial capitals of the south.

Santiago was founded in 1541 by Pedro de Valdivia, who was engaged in the conquest of Chile, and it received the title of Santiago del Nuevo Estremo. It has suffered from earthquakes and from political disorder. After the defeat of the royalists at Chacabuco (Feb. 12th, 1817), it was occupied by the revolutionary forces under General José de San Martin. Though the scene of many revolutionary outbreaks, it has never been subjected to a regular siege.

The province of Santiago, bounded N. by Aconcagua, W. by Mendoza, S. by O'Higgins and Colchagua and W. by Valparaiso and the Pacific, has an area of 5665 sq. m. and a population (1895) of 415,636. It forms part of the "Vale of Chile," celebrated for its fertility and fine climate.

SANTIAGO DE COMPOSTELA, or SANTIAGO (formerly written in English *St Jago de Compostella* and sometimes *Compostello*), a city of N.W. Spain, in the province of Corunna; at the northern terminus of a railway from Tuy, near the confluence of the Sar and Sarela rivers, and 32 m. S. by W. of the city of Corunna. Pop. (1900) 24,120. Santiago is built on the eastern slope of Monte Pedroso, surrounded by the mountains which draw down the incessant rain that gives the granite buildings of its deserted streets an extra tint of melancholy and decay. Its annual rainfall is 66 in., a total rarely exceeded on the mainland of Europe. The city was formerly the capital of Galicia; it gives its name to one of the four military orders of Spain, which rank as follows: Compostela, Calatrava, Alcantara and Montesa; and it is still the seat of a university and of an archbishopric, which long disputed the claim of Toledo to the primacy of all Spain. In the middle ages its shrine, which contained the body of St James the Great, was one of the most famous in Europe; so numerous were the pilgrims that the popular Spanish name for the Milky Way is *El Camiño de Santiago*, or "The Santiago Road." The city became, in fact, the focus of all the art and chivalry of neighbouring Christendom, and a spot where conflicting interests could meet on neutral ground. The Congregation of Rites declared in 1884 that the cathedral still enshrines the veritable body of the apostle, and few places of pilgrimage in Europe are more frequented. The city contains many hospitals and other charitable institutions, which are open to the pilgrims. In 1900 its ecclesiastical buildings numbered forty-six. Its chief industries, apart from agriculture, are brewing, distillation of spirits and the manufacture of linen, paper, soap, chocolate and matches. The city has also been long celebrated for its silversmiths' work.

The belief that St James had preached in Spain was certainly current before A.D. 400. The relics of the saint were said, though the tradition cannot be traced back farther than to the 12th century, to have been discovered in 835 by Theodomir, bishop of Iria, who was guided to the spot by a star. Hence *Compostela* is regarded by some authorities as a corruption of *Campus Stellae*, "Plain of the Star"; others derive it from *San Jacome Apostol*. According to the legend a chapel was forthwith erected, and the bishopric was transferred thither by a special bull of Pope Leo III. A more substantial building was begun in 868, but was totally destroyed in 997 by the Moors, who, however, respected the sacred relics. On the reconquest of the city by Bermudo III. the roads were improved, and pilgrims began to flock to the shrine, which fast grew in reputation.

In 1078 the erection of the present cathedral was begun during the episcopate of Diego Pelaez, and was continued until 1188, when the western doorway was completed. Minor additions prolonged the work until 1211, when the cathedral was consecrated. It is a cruciform Romanesque building, and keeps its original form in the interior, but is disfigured externally by much poor late work. Besides the classic dome and clock-tower, the two western towers have been raised to a height of 220 ft. and crowned with cupolas, and between them has been erected a classic portico, above which is a niche containing a statue of St James. The façade was the work of Fernando Casas y Noboa in 1738, and the statue was by Ventura Rodriguez in 1764. The design is mediocre, and gains its chief effect from forming part of an extended architectural composition on the Plaza Mayor, a grand square surrounded by public buildings. The ground rises to the cathedral, which is reached by a magnificent quadruple flight of steps, flanked by statues of David and Solomon. Access to the staircase is through some fine wrought-iron gates, and in the centre, on the level of the Plaza, is the entrance to a Romanesque chapel, La Iglesia Baja, constructed under the portico and contemporary with the cathedral. To the north and south, and in a line with the west front, are dependent buildings of the 18th century, grouping well with it. Those to the south contain a light and elegant arcade to the upper windows, and serve as a screen to the cloisters, built in 1533 by Fonseca, afterwards archbishop of Toledo. They are said to be the largest in Spain, and are a fair example of the latest Gothic. The delicate sculpture over the heads of the windows and along the wall of the cloister is very noticeable. On the north of the cathedral is the Plazuela S. Juan, where the peasants collect to do their marketing. Here is the convent of S. Martin, built in 1636, which, after serving as a barrack, is now used as an ecclesiastical seminary, restored to the church. It has a tolerable cloister and bell-tower. The north side of the cathedral is much overlaid by the ugly and extravagant ornamentation styled, after its chief Spanish exponent Churriguera (d. 1715), *Churrigueresque* work. The same treatment has been applied to the east end, where is the Puerta Santa; this gate is kept closed, except in jubilee years, when it is opened by the archbishop. The corner of the south transept on the Plaza de los Plateros has been mutilated by the erection of the clock-tower, but the façade is intact. Perhaps the chief beauty of the cathedral, however, is the Portico de la Gloria, behind the western classic portal. It is a work of the 12th century, and probably the utmost development of which round-arched Gothic is capable. The shafts, tympana and archivolts of the three doorways which open on to the nave and aisles are a mass of strong and nervous sculpture. The design is a general representation of the Last Judgment, and the subjects are all treated with a quaint grace which shows the work of a real artist. Faint traces of colour remain and give a tone to the whole work. It is probable that, until the erection of the present grand staircase, the portico could not be reached from the Plaza, but stood open to the air. There are no marks of doors in the jambs, and the entrance to the chapel beneath would have been blocked by any staircase which differed much in plan from the present one. The interior of the church is one of the purest and best examples of Romanesque work to be met with in Spain. The absence of a clerestory throws an impressive gloom over the barrel-vaulted roof, which makes the building seem larger than it is. A passage leads from the north transept to the Parroquia of San Juan, or La Corticela, a small but interesting portion of the original foundation. Many fine examples of metal work are in the cathedral, as, for instance, the two bronze ambos in the choir by Juan B. Celma of 1563, the gilt chandeliers of 1763 and the enamelled shrines of Sts Cucufato and Fructuoso. The great censer which hangs from the cathedral roof, and is swung by an iron chain, is about 6 ft. high. In the Capilla del Relicario are a gold crucifix, dated 874, containing a piece of the true cross, and a silver gilt custodia of 1544.

The Hospicio de los Reyes, on the north of the Plaza Mayor, for the reception of pilgrims, was begun in 1504 by Enrique de Egas under Ferdinand and Isabella. It consists of two Gothic and two classic courtyards with a chapel in the centre. The gateway is fine, and there is some vigorous carving in the courtyards, one of which contains a graceful fountain. The suppressed Colegio de Fonseca and the adjoining convent of S. Gerónimo have good Renaissance doorways. The university, which was created in 1504 by a bull of Pope Julius II., has a library containing 60,000 volumes and several MSS., many valuable and one dating from 788. Those of the Seminario (1777) have no merit. The chapel of the convent of S. Francisco, the cloisters of the half-ruined S. Augustin, the belfry of S. Domingo, the church of S. Feliz de Celorio, modernized 14th century, and the façades of several houses of the 12th and 13th centuries are also good examples of different architectural styles.

SANTIAGO DE CUBA, a city and seaport of Cuba, on the S. coast of the E. end of the island, capital of the province of Oriente, and next to Havana the most important city of the Republic. Pop. (1907) 45,470, of whom 56·7% was coloured and 13·6% was foreign-born. It is connected by the Cuba railway with Havana, 540 m. to the W.N.W.; short railways extend into the interior through gaps in the mountains northward; and there are steamer connexions with other Cuban ports and with New York and Europe.

Santiago is situated about 6 m. inland on a magnificent land-locked bay (6 m. long and 3 m. wide), connected with the Caribbean Sea by a long, narrow, winding channel with rocky escarpment walls, in places less than 200 yds. apart. The largest vessels have ready entrance to the harbour—which has a periphery of 15 m. or more in length—but direct access to the wharves is impossible for those of more than moderate draft (about 14 ft.). Smith Key, an island used as a watering-place, divides it into an outer and an inner basin. To the E. of the sea portal stand the Morro, a picturesque fort (built 1633 seq.), on a jutting point 200 ft. above the water, and the Estrella; and to the W. the Socapa. West of the harbour are low hills, to the E. precipitous cliffs, and N. and N.E., below the superb background of the Sierra Maestra, is an amphitheatre of hills, over which the city straggles in tortuous streets. The houses are almost all of one storey, built in the quaint style of southern Spain, with red-tile roofs, and the better ones with verandas and court gardens. There is a promenade along the harbour and a botanical garden. Facing the Plaza de Cespedes (once Plaza de la Reina and then Plaza de Armas) are hotels and clubs, the large municipal building—formerly the governor's palace (1855 seq.)—and the cathedral. In the cathedral, which is in better taste than the cathedral of Havana, Diego Velazquez (*c.* 1460–1524), conqueror of Cuba, was buried. It has suffered much from earthquakes and has been extensively repaired. Probably the oldest building in Cuba is the convent of San Francisco (a church since the secularization of the religious orders in 1841), which dates in part from the first half of the 16th century. The 18th-century Filarmonia theatre is now dilapidated. The other public buildings are hardly noteworthy. Great improvements have been made in the city since the end of colonial rule, especially as regards the streets, the water-supply and other public works, and sanitation. On a hill overlooking the city is a beautiful school-house of native limestone, erected by the American military government as a model for the rest of the island. Santiago is the hottest city of Cuba (mean temperature in winter about 82° F., in summer about 88°), owing mainly to the mountains that shut off the breezes from the E. There is superb mountain scenery on the roads to El Caney and San Luis (pop. 1907, 3441), in the thickly populated valley of the Cauto. In the barren mountainous country surrounding the city are valuable mines of iron, copper and manganese. On these the prosperity of the province largely depends. There are also foundries, soap-works, tan-yards and cigar factories. The city has an important trade with the interior, with other Cuban ports, and to a less extent with New York and European ports. Mineral ores, tobacco and cigars, coffee, cacao, sugar and rum and cabinet-woods are the main articles of export. Copper ore was once exported in as great quantities as 25,000 tons annually, but the best days of the mines were in the middle of the 19th century. The mines of Cobre, a few miles W. of Santiago, have an interesting history. They were first worked for the government by slaves, which were freed in 1799.

History.—Santiago is less important politically under the Republic than it was when Cuba was a Spanish dependency. The place was founded in 1514 by Diego Velazquez, and the capital of the island was removed thither from Baracoa. Its splendid bay, and easy communication with the capital of Santo Domingo, then the seat of government of the Indies, determined its original importance. From Santiago in 1518–1519 departed the historic expeditions of Juan de Grijalva, Hernan Cortés and Pámfilo de Narvaez—the last of 18 vessels and 1100 men of arms, excluding sailors. So important already was the city that its ayuntamiento had the powers of a Spanish city of the second class. In 1522 it received the arms and title of *ciudad*, and its church was made the cathedral of the island (Baracoa losing the honour). But before 1550 the drain of military expeditions to the continent, the quarrels of civil, military and ecclesiastical powers, and of citizens, and the emigration of colonists to the Main (not in small part due to the abolition of the *encomiendas* of the Indians), produced a fatal decadence. In 1589 Havana became the capital. Santiago was occupied and plundered by French corsairs in 1553, and again by a British military force from Jamaica in 1662. The capture of that island had caused an immigration of Spanish refugees to Santiago that greatly increased its importance; and the illicit trade to the same island—mainly in hides and cattle—that flourished from this time onward was a main prop of prosperity. From 1607 to 1826 the island was divided into two departments, with Santiago as the capital of the E. department—under a governor who until 1801 in political matters received orders direct from the crown. After 1826 Santiago was simply the capital of a province. In July 1741 a British squadron from Jamaica under Admiral Edward Vernon and General Thomas Wentworth landed at Guantánamo (which they named Cumberland Bay) and during four months operated unsuccessfully against Santiago. The climate made great ravages among the British, who lost perhaps 2000 out of 5000 men. The bishopric became an archbishopric in 1788, when a suffragan bishopric was established at Havana. J. B. Vaillant (governor in 1788–1796) and J. N. Quintana (governor in 1796–1799) did much to improve the city and encourage literature. After the cession of Santo Domingo to France, and after the French evacuation of that island, thousands of refugees settled in and about Santiago. They founded coffee and sugar plantations and gave a great impulse to trade. The population in 1827 was about 27,000. There were destructive earthquakes in 1675, 1679, 1766 and 1852. Dr Francesco Antommarchi (1780–1838), the physician who attended Napoleon in his last illness, died in Santiago, and a monument in the cemetery commemorates his benefactions to the poor. In the 19th century some striking historical events are associated with Santiago. One was the "Virginius" affair. The "Virginius" was a blockade-runner in the Civil War; it became a prize of the Federal government, by which it was sold in 1870 to an American, J. F. Patterson, who immediately registered it in the New York Custom House. It later appeared that Patterson was merely acting for a number of Cuban insurgents. On the 31st of October, then commanded by Joseph Fry, a former officer of the Federal and Confederate navies, and having a crew of fifty-two (chiefly Americans and Englishmen) and 103 passengers (mostly Cubans), she was captured off Morant Bay, Jamaica, by the Spanish vessel "Tornado," and was taken to Santiago, where, after a summary court-martial, 53 of the crew and passengers, including Fry and some Americans and Englishmen, were executed on the 4th, 7th and 8th of November. Relations between Spain and the United States became strained, and war seemed imminent; but on the 8th of December the Spanish government agreed to surrender the "Virginius" on the 16th, to deliver the survivors of the crew and passengers to an American war-ship at Santiago, and to salute the American flag at Santiago on the 25th if it should not be proved before that date that the "Virginius" was not entitled to sail under American colours. The "Virginius" foundered off Cape Hatteras as she was being brought to the United States. The Attorney-General of the United States decided before the 25th that the "Virginius" was the property of General Quesada and other Cubans, and had had no right to carry the American flag. Under an agreement of the 27th of February 1875, the Spanish government paid to the United States an indemnity of $80,000 for the execution of the Americans, and an indemnity was also paid to the British government.[1] The most notable military and naval events (in Cuba) of the Spanish-American War (*q.v.*) of 1898 took place at and near Santiago. Monuments commemorate the actions at El Caney and San Juan Hill.

SANTIAGO DE LAS VEGAS, an inland city of Havana province, Cuba, about 12 m. S. of Havana. Pop. (1907) 6462. Tobacco is the principal industry. An agricultural experiment station is maintained here by the Cuban government. The town dates from 1688, when a church was built for a colony of tobacco cultivators of the neighbourhood. In 1721 it received the title and privileges of a *villa*, and in 1824 those of a *ciudad*.

SANTIAGO DEL ESTERO, a province of Argentina, bounded N. by Salta and the Chaco territory, E. by the Chaco and Santa Fé, S. by Cordoba, and W. by Catamarca, Tucuman and Salta. Area 39,764 sq. m.; pop. (1895) 161,502; (1904, estimated) 186,205, chiefly Christianized Indians. The surface of the province is flat and low, chiefly open plains thinly covered with grass. There are forests in the W. and N., extensive swamps along the river courses and large saline areas, especially in the S.W. The Salado (called Pasage, and Juramento in Salta) crosses the province from N.W. to S.E. and empties into the Paraná, and the Dulce, or Saladillo, which has its sources in the Sierra de Aconquija, crosses the province in the same general direction, and is lost in the great saline swamps of Porongos, on the Cordoba frontier. The climate is extremely hot, the maximum temperature being 111° (Mulhall), minimum 32°, and the mean annual 71°, with an annual rainfall of 25 in. Sugar, wheat, alfalfa, Indian corn, tobacco and hides are the principal products, and cotton, which was grown here under the Incas, is still produced. The province is traversed by the Tucuman extension of the Buenos Aires and Rosario railway, by a French line from Santa Fé to Tucuman, and by a branch of the Central Northern (Cordoba section) railway.

The provincial capital, SANTIAGO DEL ESTERO, is on the left bank of the Rio Dulce, 745 m. N.W. of Buenos Aires, with which it is connected by rail. Pop. (1904, estimated) 12,000, chiefly of Indian descent. The city stands on a level open plain, 520 ft. above sea-level, and in the vicinity of large swamps (*esteros*) bordering the Rio Dulce, from which its name is derived. There are a number of interesting old buildings in the city—a government house, several churches, a Jesuit college, a Franciscan convent and a girls' orphanage. The city was founded in 1553 by Francisco de Aguirre and was the first capital of the province of Tucuman, the earliest settled of the La Plata provinces. In 1615 the cathedral was accidentally burnt and the bishop removed to Cordoba. The city has suffered much through inundations from the Rio Dulce, and from frequent local revolutions caused by misgovernment and the struggles of rival factions. In 1663 an inundation carried away half the capital, and the population was so reduced that in 1680 the seat of government was removed to San Miguel, now Tucuman. In 1820 Santiago del Estero became a separate province.

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[1] See F. E. Chadwick, *The Relations between the United States and Spain: Diplomacy* (New York, 1909).

SANTILLANA, IÑIGO LOPEZ DE MENDOZA, Marquis of (1398–1458), Castilian poet, was born at Carrión de los Condes in Old Castile on the 19th of August 1398. His father, Diego Hurtado de Mendoza, grand admiral of Castile, having died in 1405, the boy was educated under the eye of his mother, Doña Leonor de la Vega, a woman of great strength of character. From his eighteenth year onwards he became an increasingly prominent figure at the court of Juan II. of Castile, distinguishing himself in both civil and military service; he was created marqués de Santillana and conde del Real de Manzanares for the part he took in the battle of Olmedo (19th of May 1455). In the struggle of the Castilian nobles against the influence of the constable Álvaro de Luna he showed great moderation, but in 1452 he joined the combination which effected the fall of the favourite in the following year. From the death of Juan II. in 1454 Mendoza took little part in public affairs, devoting himself mainly to the pursuits of literature and to pious meditation. He died at Guadalajara on the 25th of March 1458.

Mendoza shares with Juan de Villalpando the distinction of introducing the sonnet into Castile, but his productions in this class are conventional metrical exercises. He was much more successful in the *serranilla* and *vaqueira*—highland pastorals after the Provençal manner. His rhymed collection of *Proverbios de gloriosa doctrina é fructuosa enseñanza* was prepared for the use of Don Enrique, the heir-apparent. To the same didactic category belong the hundred and eighty stanzas entitled *Diálogo de Bias contra Fortuna*, while the *Doctrinal de Privados* is a bitter denunciation of Álvaro de Luna. The *Comedieta de Ponza* is a Dantesque dream-dialogue, in octave stanzas (*de arte mayor*), founded on the disastrous sea-fight off Ponza in 1425, when the kings of Aragon and Navarre and the Infante Enrique were taken prisoners by the Genoese. The three last-named compositions are the best of Santillana's more ambitious poems, but they are deficient in the elegant simplicity of the *serranillas*. These unpretentious songs are in every Spanish anthology, and are familiar even to uneducated Spaniards.

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SANTINI, GIOVANNI (1787–1877), Italian astronomer, was born on the 30th of January 1787 at Caprese, in the province of Arezzo. He was from 1813 professor of astronomy at the university and director of the observatory at Padua. He wrote *Elementi di astronomia* (2 vols. 1820, 2nd ed. 1830), *Teoria degli stromenti ottici* (2 vols. 1828), and many scientific memoirs and notices, among which are five catalogues of telescopic stars between +10° and −15° declination, from observations made at the Padua observatory. He died on the 26th of June 1877.

See *Astronomische Nachrichten*, No. 90; *Month. Not. Roy. Astr. Soc.*, No. 38.

SANTLEY, SIR CHARLES (1834–   ), English vocalist, son of an organist at Liverpool, was born on the 28th of February 1834. He was given a thorough musical education, and having determined to adopt the career of a singer, he went in 1855 to Milan and studied under Gaetano Nava. He had a fine baritone voice, and while in Italy he began singing small parts in opera. In 1857 he returned to London, and on 16th November made his first appearance in the part of Adam in *The Creation* at St Martin's Hall. In 1858, after appearing in January in *The Creation*, he sang the title-part in *Elijah* in March, both at Exeter Hall. In 1859 he sang at Covent Garden as Hoel in the opera *Dinorah*, and in 1862 he appeared in Italian opera in *Il Trovatore*. He was then engaged by Mapleson for Her Majesty's, and his regular connexion with the English operatic stage only ceased in 1870, when he sang as Vanderdecken in *The Flying Dutchman*. His last appearance in opera was in the same part with the Carl Rosa Company at the Lyceum Theatre in 1876. Meanwhile, in 1861 he sang *Elijah* at the Birmingham Festival, and in 1862 was engaged for the Handel Festival at the Crystal Palace. At the musical festivals and on the concert stage his success was immense. In such songs as "To Anthea," "Simon the Cellarer" or "Maid of Athens," he was unapproachable, and his oratorio singing carried on the finest traditions of his art. He was knighted in 1907. In 1858 Santley married Gertrude Kemble, and their daughter, Edith Santley, had a great success as a concert singer.

SANTO DOMINGO [San Domingo, Dominican Republic, or officially República Dominicana], a state in the West Indies. It occupies two-thirds of the island of Haiti (*q.v.*) and has an area of about 18,045 sq. m. The administration is in the hands of three co-ordinate "powers"—the executive, the legislative and the judicial. Under the constitution of 1844, modified in 1879, 1880, 1881, 1887, 1896, and 1908, the president is the head of the executive. He is chosen by an electoral college and serves for six years, and he is assisted by a cabinet of seven ministers. The legislature, called the National Congress, consists of a Senate of 12 members, and a Chamber of Deputies of 24 members elected for four years by a limited suffrage. The Supreme Court comprises a chief-justice, six justices appointed by the Congress, and one justice appointed by the president. The republic is divided into six provinces and six maritime districts. Each province and district is administered by a governor appointed by the Cabinet. There is a small army, most of which is stationed at the City of Santo Domingo, and military service is compulsory in the event of foreign war. The navy consists of one small gun-boat. Primary education is free and compulsory: elementary schools are supported largely by the local authorities, and the higher, technical and normal schools by the government. There is a professional school with the character and functions of a university. The Roman Catholic is the state religion, but all others are allowed under certain restrictions. The monetary unit is a silver coin of the value of a franc, called the *dominicano*, but in 1897 the United States gold dollar was adopted as the standard of value. The roads in the interior are primitive, but the government encourages the construction of railways. A line runs between Sanchez and La Vega, and another between Santiago and Porto Plata. The republic joined the Postal Union in 1880. The exports include tobacco, coffee, cacao, sugar, mahogany, logwood, cedar, satinwood, hides, honey, gum and wax. The collection of the customs and other revenues specially assigned to the securance of bonds was in the hands of an American company until 1899, when this defaulted in the payment of interest and the government took over the collection. In 1905, to forestall foreign intervention for securing payment of the State debt, President Roosevelt made an agreement with Santo Domingo, under which the United States undertook to adjust the republic's foreign obligations, and to assume charge of the customs houses. A treaty was ratified by the United States Senate in 1907, and an American citizen is temporarily receiver of customs. In June 1907 the debts amounted to $17,000,000.

Santo Domingo has the finest sugar lands in the West Indies; tobacco and cacao flourish; the mountain regions are especially suited to the culture of coffee, and tropical fruits will grow anywhere with a minimum of attention. During the earlier years of the Spanish occupation gold to the value of £90,000 was sent annually to Spain, besides much silver. Platinum, manganese, iron, copper, tin, antimony, opals and chalcedony are also found. In the Neyba valley there are two remarkable hills, composed of pure rock salt. Only an influx of capital and an energetic population are needed to develop these resources.

Santo Domingo, the capital of the republic, is situated on the south coast. At a distance of 45 m. N. lies the town of Azua (pop. 1500) founded in 1504 by Diego Columbus. It stands in a plain, rich in salt and asphalt, which was the scene of the first planting of sugar in the West Indies. Santiago (pop. 12,000), the capital of the Vega Real, stands on the banks of the Yaqui river, 160 m. N.W. of the capital, in the richest agricultural district in the state. It controls the tobacco trade which is chiefly in German and Dutch hands. Its port, Porto Plata (pop. 15,000), is the outlet of the entire Vega Real district. La Vega, perhaps the most beautiful city of Santo Domingo, lies in the midst of a lovely savanna, or plain, surrounded by well-wooded hills, and has a magnificent old cathedral. Six miles away is the Cerro Santo, a hill 787 ft. in height, rising abruptly from the plain, on the summit of which Columbus planted a great cross on his first visit in 1493. Seybo (5000), Monti Cristi (3000) and Samana (1500) are the only other towns of any size. The population of the republic is about 500,000. The people are mainly mulattoes of Spanish descent, but there are a considerable number of negroes and whites of both Creole and European origin. Politically the whites have the predominating influence. The people, on the whole, are quiet, lazy and shiftless, but subject at times to great political excitement. They are Spanish in their mode of life and habits of thought. Spanish too is the common language, though both French and English are spoken in the towns.

History.—After the downfall of Toussaint l'Ouverture (see Haiti) there followed the initiation of the black Haitian Empire under Jean Jacques Dessalines in 1803. Spain, however, established herself anew on the eastern end of the island in 1806, Haiti remaining independent. Santo Domingo continued thus a Spanish possession until 1821, when, under the authority and flag of Colombia, a republic was proclaimed, and the Spaniards withdrew. In the following year the Haitian president Boyer invaded Santo Domingo, joined it to Haiti and ruled the entire island till his fall in 1843. The Spanish part of the island again became independent of Haiti in 1844, when the Dominican Republic was founded, and since that time the two political divisions have been maintained, and their respective inhabitants have grown more and more estranged. The earlier years of the new republic were marked by the struggles between Pedro Santana and Buenaventura Bäez, who with the exception of a few months under Jiminez, occupied the presidency in turn until 1861. In that year Santana, with the consent of the people, proclaimed the annexation of Santo Domingo by Spain. The Spaniards, however, did not long enjoy their sovereignty, for the harshness of their rule provoked a successful revolution under José Maria Cabral in 1864; and in the following year they withdrew all claim to the country. Bäez was again chosen president, but was driven out by Cabral after a year of power.

From 1868 to 1873 Bäez was once again in office, and during this term overtures were made to the United States with a view to annexation. General O. E. Babcock was despatched by President Grant to report on the condition and resources of Santo Domingo, and while there, in 1869, he negotiated a treaty by which the republic was to become part of the United States. Although ratified by the Dominican Senate, this treaty was opposed in the United States Senate, under the leadership of Charles Sumner, and was finally rejected. In 1871 three commissioners were appointed by President Grant to report further, but although their report was favourable to annexation, no action was taken.

Bäez was succeeded by Gonzàlez (1873–1879), under whom the country enjoyed a period of tranquillity. Great political agitation followed, which terminated in 1882 with the election of Ulises Heureaux, a negro, and capable statesman. Under his despotic rule of nearly 17 years, the republic enjoyed greater prosperity and tranquillity than it had ever known. He was assassinated in July 1899, and was succeeded by Jiminez, who was driven out by General Vasquez in 1902. Vasquez, in turn, was deposed by a revolution headed by General Wos y Gil, who became president in 1903, but was overthrown by Jiminez in November of that year. In 1904 Jiminez was expelled and C. F. Morales became president. Ramon Caceres was installed in 1906, and in 1908 a new constitution was proclaimed and Caceres was elected for the term 1908–1914.

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SANTO DOMINGO, the capital of the republic of the same name, in the island of Haiti, West Indies. Pop. about 25,000. It is situated on the S. coast, at the mouth of the river Ozama. Founded in 1496, it is the oldest existing settlement of white men in the New World, and perhaps the most perfect example of a Spanish colonial town of the 16th century. It is surrounded by ancient walls with bastions. The streets are straight, narrow, and intersect at right angles. The massive houses are built of stone with coloured walls pierced with huge doors and windows. The cathedral, in the Spanish Renaissance style, dates from 1512, and contains the reputed tomb of Columbus (*q.v.*). The cell in which he and his brother were confined by order of Bobadilla is still shown in the old fortress. The city is the seat of an archbishop. It has a small and rather poor harbour, but the river is navigable for 4 m. from its mouth. The climate is healthy and cool.

SANTONIN, a drug used in the U.S.P. and B.P., consisting of colourless flat prisms, turning slightly yellow from the action of light and soluble in alcohol, chloroform and boiling water. It is derived from santonica which is the unexpanded flower-heads of *Artemisia maritima.* The dose is 2 to 5 grs. The only B.P. preparation is the *trochiscus santonini*, but the preparation *sodii santoninas* is official in the U.S.P. Santonin is an anthelmintic used to poison the round worm *Ascaris lumbricoides.* It has no influence on tape-worms. It must be administered fasting and be followed by a purgative in order to expel the worm. The most convenient mode of administration is in capsules. For thread worms which infest the anus of young children, a suppository containing 2 to 3 grs. of santonin and used on alternate nights for three nights is effective. The U.S. preparation sodii santoninas is useless as a vermifuge and is used in diseased conditions of the optic nerve. Even small doses of santonin cause disturbances of vision, usually yellow vision or perhaps green (xanthopsia or chromatopsia). The urine also turns yellow and finally purple or red. These effects usually pass off in a few days. Large doses, however, produce toxic effects, aphasia, muscular tremors and epileptiform convulsions, and the disturbances of vision may go on to total blindness.

SANTORIN (corruption of St Irene; anc. Thera), a volcanic island in the Aegean Sea, the southernmost of the Sporades. In shape Santorin forms a crescent, and encloses a bay on the north, east and south, while on the western side lies the smaller island of Therasia. The encircling wall thus formed, which is elliptical in shape and 18 m. round in its inner rim, is broken in two places—towards the north-west by a strait a mile in breadth, where the water is not less than 1100 ft. deep, and towards the south-west by an aperture about 3 m. wide, where the water is shallow, and an island called Aspronisi or White Island lies in the middle. The cliffs rise perpendicularly from the bay, in some places to the height of 1000 ft.; but towards the open sea, both in Santorin and Therasia, the ground slopes gradually away, and has been converted into broad level terraces, everywhere covered with tufaceous agglomerate, which, though bare and ashen, produces the famous Santorin wine. Towards the south-east rises the limestone peak of Mount Elias, the highest point of the island (1910 ft.); this existed before the volcano was formed. In the middle of the basin lie three small islands, which are the centre of volcanic activity, and are called Palaea, Mikra and Nea Kaumene, or the Old, the Little and the New Burnt Island; the highest of these, Nea Kaumene, is 351 ft. above the sea. Owing to the depth of the water there is no anchorage, and vessels have to be moored to the shore, except at one point in the neighbourhood of the modern town, where there is a slight rim of shallow bottom. The cliffs of Santorin and Therasia are marked in horizontal bands by black lava, white porous tufa, and other volcanic strata, some parts of which are coloured dark red. The modern town of Thera (or Phera, as it is more commonly pronounced) is built at the edge of these, overlooking the middle of the bay at a height of 900 ft. above the water, and the foundations of the houses and in some cases their sides also, are excavated in the tufa, so that occasionally they are hardly traceable except by their chimneys. Owing to the absence of timber—for, except the fig, cactus and palm, there are hardly any trees in the island—they are roofed with barrel vaults of stone and cement. Both wood and water have occasionally to be imported from the neighbouring islands, for there are no wells, and the rain water, collected in cisterns, does not always suffice. The largest of the other villages is Apanomeria, near the northern entrance, which is crowded together in a white mass, while the rocks below it are the reddest in the island.

Santorin is closely connected with the earthquake movements to which the countries in the neighbourhood of the Aegean are subject. It is hardly accurate to speak of the basin which forms the harbour as a crater, for most geologists support the view that the whole of this space was once covered by a single volcanic cone, the incline of which is represented by the outward slope of Santorin and Therasia, while the position of the crater was that now occupied by the Kaumene Islands; and that owing to a volcanic explosion and the subsidence of the strata the basin was formed. The Kaumene Islands arose subsequently, and that of Palaea Kaumene is considered to have been prehistoric. The principal eruptions that have taken place within historic times are that of 196 B.C., when, as we learn from Strabo (i. 3, § 16, p. 57), flames rose from the water halfway between Thera and Therasia for four days; that of A.D. 726, during the reign of the Emperor Leo the Isaurian (on both these occasions islands were thrown up, but it is supposed that they afterwards disappeared); that of 1570, when Mikra Kaumene arose; that of 1650, which destroyed many lives by noxious exhalations, and ended in the upheaval of an island in the sea to the north-east of Santorin, which afterwards subsided and became a reef below sea-level; that of 1707, when Nea Kaumene arose; and that of 1866, when Nea Kaumene was extended towards the south and enlarged threefold.

In the southern parts both of Santorin and Therasia prehistoric dwellings have been found at some height above the sea, and there is no doubt that these date from a period antecedent to the formation of the bay. This is proved by their position underneath the layer of tufa which covers the islands, and by these layers of tufa being broken off precipitously, in the same way as the lava-rocks, a fact which can only be explained by the supposition that they all fell in together. The foundations of the dwellings rested, not on the tufa, but on the lava below it; and here and there between the stones branches of wild olive were found, according to a mode of building that still prevails in the island, in order to resist the shocks of earthquakes. Very few implements of metal were found. Some of the vases found were Cretan ware which had been imported; and the correspondence between these and various specimens of the native pottery proves that to some extent this primitive art was derived from Crete.

In Greek legend the island of Thera was connected with the story of the Argonauts, for it was represented as sprung from a clod of earth which was presented to those heroes by Triton (Apollon., *Argonaut.*, iv., 1551 sq., 1731 sq.). According to Herodotus (iv. 147), a Phoenician colony was established there by Cadmus. Subsequently a colony from Sparta, including some of the Minyae, was led thither by Theras, who gave the island his own name, in place of that of Calliste which it had borne before. But the one event which gave importance to Thera in ancient history was the planting of its famous colony of Cyrene on the north coast of Africa by Battus in 631 B.C., in accordance with a command of the Delphic oracle.

The ancient capital, which bore the same name as the island, occupied a site on the eastern coast now called Mesavouno, between Mount Elias and the sea. Since 1895 this place has been excavated by Baron Hiller von Gärtringen and other German explorers. There are extensive ancient cemeteries. A steep ascent leads from a Heroum of Artemidorus to the Agora; in its neighbourhood were the Stoa Basilice, a vast hall with a row of pillars; a temple of Dionysus and the Ptolemies, which at a later period was dedicated to the Caesars; and the barrack of the garrison of the Ptolemies and a gymnasium. The names which occur here remind us that Thera, as a member of the League of the Cyclades, was from B.C. 308 to 145 under the protectorate of the Ptolemies. The main street has narrow lanes diverging from it to right and left; one of these leads to the sanctuary of the Egyptian gods. Near the street there is a small theatre, beneath the seats of which a vast cistern was constructed, arranged so that rain-water should drain into it from the whole of the auditorium. The way then descends south-eastwards first to the temple of Ptolemy Euergetes III., and then to that of Apollo Carneius; finally, at the point where the rocks fall precipitously, there is a gymnasium of the Ephebi. Numerous rock-carvings and inscriptions have been discovered, as well as statues and vases of various periods. Near the western foot of Mount Elias is the temple of Thea Basileia, which, though very small, is perfect throughout even to the roof. It is now dedicated to St Nicolas Marmorites.

Tournefort mentions that in his time nine or ten chapels were dedicated to St Irene, the patron saint of the place; the name Santorin was given to the island after the fourth crusade, when the Byzantine empire was partitioned among the Latins, and the island formed a portion of the duchy of the Archipelago. Santorin is prosperous, for, in addition to the wine trade, there is a large export of *pozzolana*, which, when mixed with lime, forms a hard cement. Santorin (officially Thera) is a province in the department of the Cyclades. It is divided into 9 communes (see CYCLADES), with a total population of 19,597 in 1907.

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(H. F. T.)

SANTOS, a city and seaport of Brazil, in the state of São Paulo, about 230 m. W.S.W. of Rio de Janeiro, and 49 m. by rail S.E. of São Paulo city. Pop. (1890) 13,012; (1902 estimate) 35,000. Santos covers an alluvial plain on the inner side of an island (called São Vicente) formed by an inland tidal channel sometimes called the Santos river. The commercial part of the city is some miles from the mouth of the channel, but the residential sections extend across the plain and line the beach facing the sea. The city is only a few feet above sea-level, the island is swampy, and deep, cement-lined channels drain the city. The Santos river is deep and free from obstructions, and in front of the city widens into a bay deep enough for the largest vessels. The water front, formerly beds of mud and slime, the source of many epidemics of fever, is now faced by a wall of stone and cement. Vessels moor alongside this quay, which is lined with warehouses and provided with railway tracks, &c. Formerly coffee was transported in carts from the railway station to the warehouses, thence loaded into lighters by porters, and from these transferred to vessels anchored in midstream. The improvements were planned by an American engineer, William Milnor Roberts (1810–1881). The thorough drainage of the city has made Santos comparatively healthy. The heavy rainfall (88½ in. per annum), neighbouring swamps, rank vegetation and great heat give rise to malarial and intestinal disorders, rheumatism and other diseases. Beri-beri and smallpox are also common, and bubonic plague has appeared since 1900. The temperature ranges from 41° to 101·3° F. in the shade.

The development of coffee production in the state of São Paulo during the closing years of the 19th century has made Santos the largest coffee shipping port in the world, the exports amounting to 5,849,114 bags, of 132 ℔ each, in 1900, and 8,940,144 bags in 1908. The other exports include sugar, rice, rum, fruit, hides and manufactured goods. Bananas are grown in the vicinity for the River Plate markets. The most popular suburb in the vicinity of Santos is the bathing resort of Guarujá. The São Paulo railway, an English double-track line, provides communication with the interior, ascending the steep wooded slopes of the Serra do Mar by a series of inclines up which the cars are drawn by stationary engines on the old line, and by a series of gradients on the new line.

The first settlement on the São Paulo coast was that of São Vicente in 1532, about 6 m. S. of Santos on the same island. Other settlements soon followed, among them that of Santos in 1543–1546, and later on the small fort at the entrance to its harbour, which was used for protection against Indian raids from the north. São Vicente did not prosper, and was succeeded (1681) by São Paulo as the capital and by Santos as the seaport of the colony. It was captured by the English privateer, Thomas Cavendish, in 1591, when São Vicente was burned. The growth of the town was slow down to the end of the 19th century, because of insanitary conditions and epidemics.

SANUTO (SANUDO), **MARINO,** the elder, of Torcello (*c.* 1260–1338), Venetian statesman, geographer, &c. He is best known for his life-long attempts to revive the crusading spirit and movement; with this object he wrote his great work, the *Secreta* (or *Liber Secretorum*) *Fidelium Crucis*, otherwise called *Historia Hierosolymitana*, *Liber de expeditione Terrae Sanctae*, and *Opus Terrae Sanctae*, the last being perhaps the proper title of the whole treatise as completed in three parts or "books." This work has much to say of trade and trade-routes as well as of political and other history; and through its accompanying maps and plans it occupies an important place in the development of cartography. It was begun in March 1306, and finished (in its earliest form) in January 1307, when it was offered to Pope Clement V. as a manual for true Crusaders who desired the reconquest of the Holy Land. To this original *Liber Secretorum* Sanuto added largely; two other "books" were composed between December 1312 and September 1321, when the entire work was presented by the author to Pope John XXII., together with a map of the world, a map of Palestine, a chart of the Mediterranean, Black Sea and west European coasts, and plans of Jerusalem, Antioch and Acre. A copy was also offered to the king of France, to whom Sanuto desired to commit the military and political leadership of the new crusade. Marino himself tells us that he had spent the best part of his life in Romania, the lands of the Eastern empire; of the Morea he had especially intimate knowledge; he had also visited Cyprus, Rhodes, parts of the Syrian, Cilician and Egyptian coasts, France, Flanders and north Germany, both west and east of Denmark. He had been in Acre, Alexandria, Constantinople, Avignon, Bruges and Sluys, as well as (apparently) in Hamburg, Lübeck, Wismar, Rostock, Stralsund, Greifswald and Stettin. Among his friends and correspondents were Guglielmo Bernardi de Furvo, a Venetian nobleman who had travelled extensively in Moslem and Mongol lands (to Tabriz, Bagdad, Damascus and Cairo), Bishop Jerome of Kaffa, in the Crimea, who in 1312 had been sent to reinforce the Catholic mission in China, and perhaps Peter, the English-born bishop of Sevastopolis or Sukhum Kalé in western Caucasia, who makes an appeal for aid to the prelates of England in 1330. Marino Sanuto's ancestor, Marco, had founded the greatness of his family after the Fourth Crusade as duke of the Archipelago and conqueror of Naxos, Paros, &c. (from 1207); and his descendant wrote with a personal interest in the question of crushing Moslem power in the Levant.

The crusading plans of the *Secreta* are double: first, Egypt and the Moslem world on the side towards Europe (Syria, Asia Minor, the Barbary States, Granada, &c.) are to be ruined by the absolute stoppage of all Christian trade with the same. By such an interdict Sanuto hopes that Egypt, dependent on its European and other imports of metals, provisions, weapons, timber, pitch and slaves, would be fatally weakened, and the way thus prepared for the second part of the campaign—the armed attack of the crusading fleet and army on the Nile delta. With the aid of the Mongol Tatars of Asia, natural allies of western Christendom, and of the Nubian Christians, the conquest of the Delta and of all Egypt was to be followed by that of Palestine, invaded and held from Egypt. Sanuto deprecates any other route for the crusade, and unfolds his plan of campaign, his bases of supply, his sources for the supply of good seamen, with great detail. Not only Mediterranean seaports, but the lakes of North Italy and central Europe, and the Hanseatic ports, are enumerated as nurseries of crusading mariners and marine skill. Finally, after the conquest of Egypt, Marino designs the establishment of a Christian fleet in the Indian Ocean to dominate and subjugate its coasts and islands. He also gives a sketch of the trade-routes crossing Persia and Egypt, as well as of the course of Indian trade from Coromandel and Gujarat to Ormuz and the Persian Gulf, and to Aden and the Nile. The maps and plans which illustrate the *Secreta* are probably (in the main, at least) the work of the great portolano-draughtsman Pietro Vesconte: practically the whole of this map-work corresponds with what Vesconte has left under his own name; much of it is indistinguishable. Among the plans that of Acre is of peculiar interest, being the most complete representation known of the great crusading fortress on the eve of its destruction, with the quarters of all its contingents of defenders (Templars, &c.) indicated. The chart of the Mediterranean and Euxine and of the Atlantic coasts of Europe is composed of five map-sheets, which together form a good example of the earliest scientific design or *portolano*; in the world-map a *portolano* of the Mediterranean world is combined with work of pre-portolan type in remoter regions. Here the shore-lines of the countries well known to Italian mariners, from Flanders to Azov, are well laid down; the Caspian and the north German and Scandinavian coasts appear with an evident, though far slighter, relation to practical knowledge; and some idea is shown of the great continental rivers of the north, such as the Don, Volga, Vistula, Oxus and Syr Daria. Africa, away from the Mediterranean, is conventional, with its south-east projected, after the manner of Idrisi, so as to face Indian Asia, and with a western Nile traversing the continent to the Atlantic. Chinese and Indian Asia show little trace of the new knowledge which had been imparted by European pioneers from the Polos' time, and which appears so strikingly in the *Catalan Atlas* of 1375. Sanuto's Palestine map is remarkable for its space-defining network of lines, which roughly answer to a kind of scheme of latitude and longitude, though properly speaking they are not scientific at all. Of the *Secreta*, twenty-three MSS. exist, of which the chief are: (1) Florence, Riccardian Library, No. 237, 162 fols. (*Secreta* and *Letters*), with maps and plans on fols. 141, v.-144, r.; (2) London, British Museum, Addt. MSS., 27,376, 178 fols. with maps, &c. on fols. 180, v.-190, r.; (3) Paris, National Library, MSS. Lat. 4939, with maps, &c. on fols. 9, r.-11, r. 27, 98-99. All these are of the 14th century. The *Secreta* has only once been printed entire, by Bongars, in *Gesta Dei per Francos*, vol. ii. pp. 1-288 (Hanover, 1611).

See also Friedrich Kunstmann, "Studien über Marino Sanudo den älteren, mit einem Anhange seiner ungedruckten Briefe" in *Abhandlungen der historisch. Classe der Königl. Bayerisch. Akademie der Wissenschaften*, vol. vii. pp. 695-819 (Munich, 1855); Foscarini, *Letteratura Veneziana*; Tiraboschi, *Storia della Letteratura Italiana*, vol. v.; Postansque, *De Marino Sanuto* (Montpellier, 1856); C. R. Beazley, *Dawn of Modern Geography*, iii. 309-319, 391-392, 520-521, 549, 555. (C. R. B.)

SANUTO (or Sanudo), **MARINO,** the younger (1466–1533), Venetian historian, was the son of the senator, Leonardo Sanuto, and was born on the 22nd of May 1466. Left an orphan at the age of eight, he lost his fortune owing to the bad management of his guardian, and was for many years hampered by want of means. In 1483 he accompanied his cousin Mario, who was one of the three *sindici inquisitori* deputed to hear appeals from the decisions of the *rettori*, on a tour through Istria and the mainland provinces, and he wrote a minute account of his experiences in his diary. Wherever he went he sought out learned men, examined libraries, and copied inscriptions. The result of this journey was the publication of his *Itinerario in terra ferma* and a collection of Latin inscriptions. Sanuto was elected a member of the Maggior Consiglio when only twenty years old (the legal age was twenty-five) solely on account of his merit, and he became a senator in 1498; he noted down everything that was said and done in those assemblies and obtained permission to examine the secret archives of the state. He collected a fine library, which was especially rich in MSS. and chronicles both Venetian and foreign, including the famous Altino chronicle, the basis of early Venetian history, and became the friend of all the learned men of the day, Aldo Mannzio dedicating to him his editions of the works of Angelo Poliziano and of the poems of Ovid. It was a great grief to Sanuto when Andrea Navagero was appointed the official historian to continue the history of the republic from the point where Marco Antonio Sabellico left off, and a still greater mortification when, Navagero having died in 1529 without executing his task, Pietro Bembo was appointed to succeed him. Finally in 1531 the value of his work was recognized by the senate, which granted him a pension of 150 gold ducats per annum. He died in 1533.

His chief works are the following: *Itinerario in terra ferma*, published by M. Rawdon Brown in 1847; *I commentarii della guerra di Ferrara*, an account of the war between the Venetians and Ercole d'Este, published in Venice in 1829; *La Spedizione di Carlo VIII.* (MS. in the Louvre); *Le Vite dei Dogi*, published in vol. xxii. of Muratori's *Rerum Italicarum Scriptores* (1733); the *Diarii*, his most important work, which cover the period from the 1st of January 1496 to September 1533, and fill 58 volumes. The publication of these records was begun by Rinaldo Fulin, in collaboration with Federigo Stefani, Guglielmo Berchet, and Niccolò Barozzi; the last volume was published in Venice in 1903. Owing to the relations of the Venetian republic with the whole of Europe and the East it is practically a universal chronicle, and is an invaluable source of information for all writers on that period.

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SAN VICENTE, the capital of the department of San Vicente, Salvador; 30 m. E. of San Salvador, on the river Acahuapa, a left-hand tributary of the Lempa. Pop. (1905) about 18,000.

San Vicente is situated in a volcanic region abounding in hot springs and geysers. The volcano of San Vicente, the highest in the department, reaches an altitude of more than 7000 ft. The city is surrounded by indigo and tobacco plantations, and has considerable commerce, a large portion of which is transacted at the All Saints' fair, held annually on the 1st of November. Shoes, hats, cloth, silk, spirits and cigars are manufactured here. San Vicente was founded in 1634 on the site of Tehuacan, an ancient Indian city. For one year (1839–1840) it was the capital of the republic.

SÃO FRANCISCO, a river of eastern Brazil rising in the S.W. part of the state of Minas Geraes, about 20° 30′ S., 46° 40′ W., near the narrow valley of the Rio Grande, a tributary of the Paraná, and within 240 m. of the coast W. of Rio de Janeiro. It flows in a general N.N.E. direction across the great central plateau of Brazil to about lat. 9° 30′ S., long. 42° W., where it turns N.E. and then S.E. in a great bend, entering the Atlantic in lat. 10° 29′ S. It has a total length of about 1800 m. and a fall of 2700-2800 ft. It is navigable from the Atlantic to Piranhas (148 m.) and is nearly 1 m. wide at Penedo, 22 m. from the sea. Above Piranhas, about 193 m. from its mouth, are the falls of Paulo Affonso where the river plunges through a narrow gorge—in one place only 51 ft. wide—and over three successive falls, all together 265 ft. The obstructed part of the river is about 190 m. long and consists of a series of rapids above the falls and a deep cañon with whirlpools for some distance below. The Brazilian government has built a railway around these falls from Piranhas (151 ft. elevation) to Jatobá (978 ft.) with an extension of 71 m. Above Jatobá there is another series of rapids called the Sobradinho nearly 90 m. above the lower rapids, which are navigable at high water, and above these an unobstructed channel for light-draught river boats up to Pirapora a little above the mouth of the Rio das Velhas, a distance of 984 m. Here the river runs through a barren, semi-arid region, sparsely settled. There are no tributaries of consequence along a large part of this region, and the few people living beside the river are dependent on its annual floods for the fertilization of its sandy shores on which their scanty plantations of Indian corn and beans are made. The rapids of Pirapora are 17 m. above the mouth of the Rio das Velhas, and this point, the head of navigation on the river, and 1742 ft. above sea-level, is the objective point of the Central do Brazil railway, the purpose being to create by rail and river a central route from Rio de Janeiro to the northern ports of Bahia and Recife. The principal tributaries of the São Francisco are: on the right, the Pará, Paraopeba, Velhas, and Verde-Grande; on the left, the Indayá, Abaeté, Paracatú, Urucuya, Carinhanha, Corrente and Grande. Several of these tributaries are navigable for long distances by small boats—the aggregate being a little over 1000 m. Some authorities give the aggregate navigable channels of the São Francisco as 4350 m. The upper valley of the São Francisco is partly forested, has a temperate climate, with a mean annual temperature of 85° and a rainfall of 1637 millimetres. The rainy season is from December to March, but on the lower river the rainfall is light and the season much shorter, sometimes varied by droughts covering several years.

An admirable description of this great river is given by Richard Burton in *The Highlands of Brazil* (2 vols., London), and a more technical description by E. Liais in *Hydrographie du Haut San-Francisco et du Rio das Velhas* (Rio de Janeiro, 1865).

SÃO LEOPOLDO, a city of the state of Rio Grande do Sul, Brazil, on the left bank of the Rio dos Sinos, 20½ m. by rail N. of Porto Alegre. It is the chief town of a *municipio* (commune) of the same name, having an area of about 347 sq. m. and inhabited chiefly by German colonists. Pop. (1900) of the city, 11,015; of the municipio, 32,600. São Leopoldo has river and railway communication with Porto Alegre. It is a prosperous industrial town, with broad straight streets and substantial buildings. It has good schools, and its Jesuits' college ranks high throughout northern Rio Grande. Among its manufactures are matches, hats, boots and shoes, soap, liqueurs and artificial drinks, leather and leather-work and earthenware. In the surrounding districts cattle and hogs are raised, and jerked beef, hides, pork, lard, potatoes, beans, *farinha de mandioca* (cassava flour), Indian corn, tobacco and a great variety of vegetables and fruits are produced.

The city was originally a German colony founded by the emperor Pedro I. in 1824 and established at a place known as the Feitoria Real de Canhamo (Royal flax factory). The first colonists (26 families and 17 unmarried persons, or 126 souls) arrived on the 25th of June 1825, and were followed a few months later by another party of 909 colonists. These were the first German colonists in Rio Grande do Sul. Up to 1830 the arrivals numbered 3701, but the civil war which broke out in 1835 checked further arrivals and nearly ruined the colony, its inhabitants being forced to serve in the contending forces and their property being seized. São Leopoldo was occupied by the revolutionists for some years and was practically ruined at the termination of the war in 1844. The introduction of colonists was immediately resumed, however, and the colony was soon as prosperous as ever. The early colonists were engaged in Germany by a representative of the Brazilian government, and were given free transportation, 130 acres of land each, farming implements, seeds, and a subsidy of 320 reis a day for the first year and half that for the second year. Subsequent settlers received less, but the system of assisting colonists and making contracts with companies and individuals for their introducton became the settled policy of the national and provincial governments.

SÃO LUIZ, or in full, São Luiz de Maranhão (also spelt Maranham), a seaport of northern Brazil, capital of the state of Maranhão, on the W. side of an island of the same name, in 2° 30′ S., 44° 17′ W., about 300 m. E.S.E. of Belem (Pará). Pop. of the whole island (1890) 29,308; (1908, estimate) 32,000. An important part of the population is made up of the planters of the state, who live in town and leave their estates to the care of overseers. The island of Maranhão lies off the mouths of the rivers Mearim and Itapicurú, between the Bay of São Marcos on the W. and the Bay of São José on the E., and is separated from the mainland by a small channel called the Canal do Mosquito. It is irregular in outline, its greatest length from N.E. to S.W. being 34 m., and its greatest breadth 19 m. Its surface is broken by a number of low hills and short valleys. The city is built upon a tongue of land between two small estuaries, Anil and Bacanga, which unite and open upon the Bay of São Marcos. It covers two low hills and the intervening valley, the transverse streets sloping sharply to the estuary on either side. These slopes make it difficult to use vehicles in the streets, but they afford a natural surface drainage which makes São Luiz cleaner and more healthy than the coast towns of tropical Brazil usually are. The city is regularly laid out with comparatively wide longitudinal, and steep, narrow transverse streets, roughly paved and provided with sidewalks. The buildings are of the old Portuguese type, with massive walls of broken stone and mortar, having an outside finish of plaster or glazed tiles and roofs of red tiles. The principal public buildings are the cathedral, a large and severely plain structure, the episcopal palace, the Carmelite church, the government palace, town hall, custom-house, hospital, and a number of asylums, convents and charitable schools. An excellent lyceum and a church seminary are the most important educational institutions, and São Luiz long enjoyed a high reputation in Brazil for the culture of its inhabitants. The trade of São Luiz was once very important, but the commercial activity of Pará and Fortaleza, the decay of agricultural industry in the state, and the silting up of its harbour, have occasioned a decline in its commerce. Its exports comprise cotton, sugar and rice. Communication with the mainland and interior towns is by means of small steamers.

São Luiz was founded in 1612 by La Rivardière, a French officer commissioned by Henri IV. to establish a colony in this vicinity. The French colony was expelled in 1615 by the Portuguese, who, in turn, surrendered to the Dutch in 1641. In 1644 the Dutch abandoned the island, when the Portuguese resumed possession and held the city to the end of their colonial rule in Brazil. The city became the seat of a bishopric in 1679.

SAÔNE, a river of eastern France, rising in the Faucilles mountains (department of Vosges), 15 m. W.S.W. of Épinal at a height of 1300 ft. and uniting with the Rhone at Lyons. Length, 301 m.; drainage area, 11,400 sq. m. The oldest Celtic name of the river was *Arar.* In the 4th century another name appears, *Sauconna,* from which the modern name is derived. The Saône, moving slowly in a sinuous channel, has its course in the wide depression between the Plateau of Langres, the Côte d'Or and the mountains of Charolais and Beaujolais on the west and the western slopes of the Vosges and Jura and the plain of Bresse and the plateau of Dombes on the east. In the department of Saône-et-Loire, the Saône unites with the Doubs, an affluent rivalling the Saône in volume and exceeding it in length at this point. At the important town of Chalon-sur-Saône the river turns south, and passes Mâcon. Below Tréveux its valley, now narrower, winds past the Mont d'Or group and joins the Rhone just below the Perrache quarter of Lyons. The Saône is canalized from Corre to Lyons, a distance of 233 m., the normal depth of water being 6 ft. 6 in. At Corre (confluence with the Coney) it connects with the southern branch of the Eastern Canal, at Heuilley (below Gray) with the Saône-Marne Canal, at St Symphorien (above St Jean-de-Losne) with the Rhone-Rhine Canal, and at St Jean-de-Losne with the Canal de Bourgogne and at Chalon with the Canal du Centre.

SAÔNE-ET-LOIRE, a department of east-central France formed from the districts of Autunois, Brionnais, Chalonnais, Charollais and Mâconnais, previously belonging to Burgundy. It is bounded N. by the department of Côte d'Or, E. by that of Jura, S.E. by Ain, S. by Rhône and Loire, W. by Allier and Nièvre. Pop. (1906) 613,377. Area, 3330 sq. m. Of the two rivers from which the department takes its name the Loire forms its south-western boundary, and the Saône traverses its eastern region from north to south. On the left bank of the Saône the department forms part of the wide plain of Bresse; on its right bank the centre of the department is occupied by the northern Cévennes, here divided by the river Grosne into two parallel ranges—the mountains of Mâconnais to the east, and the mountains of Charollais to the west. The general direction of these ranges is from south, where their altitude is greatest, to north. The north-west region of Saône-et-Loire is occupied by the southern portion of Morvan, which includes the highest point in the department—the Bois du Roi (2959 ft.). South-east of the Morvan lies the hilly region of Autunois, consisting of the basin of the Arroux, a right affluent of the Loire, and divided from the Charollais mountains by the Bourbince, a tributary of the Arroux. Besides those mentioned, the chief rivers of the department are the Doubs, which joins the Saône in the extreme north-east, the Seille, also an affluent of the Saône, and the Arconce, a tributary of the Loire watering the Charollais. The average temperature at Mâcon (52° or 53° F.), the most temperate spot in the department, is slightly higher than at Paris, the winter being colder and the summer hotter. At the same town the yearly rainfall is about 33 in., but both the rigour of the climate and the amount of rain increases in the hilly districts, reaching their maximum in the mountains of Morvan.

Agriculture prospers in Saône-et-Loire. Wheat, oats and maize are the cereals most cultivated; potatoes, clover and other fodder, and mangold-wurzels are important crops, and beetroot, hemp, colza and rape are also grown. Excellent pasture is found in the valleys of the Saône and other rivers. The vine, one of the principal resources of the department, is cultivated chiefly in the neighbourhood of Chalon and Mâcon. Of the wines of Mâconnais, the vintage of Thorins is in high repute. The white Charollais oxen are one of the finest French breeds; horses, pigs and sheep are reared, and poultry farming is a thriving occupation in the Bresse. The industrial importance of the department is great, chiefly owing to its coal and iron mines; the chief coal mines are those in the vicinity of Creusot, Autun and Chapelle-sous-Dun. A pit at Épinac is over 2600 ft. in depth. Iron is mined at Mazenay and Change, and manganese is found at Romanèche and there are quarries of various kinds. There are well-known warm mineral springs containing chloride of sodium and iron at Bourbon-Lancy. The iron and engineering works of Schneider & Company at Le Creusot are the largest in France. The department also has numerous flour-mills and distilleries, together with potteries, porcelain-works (Digoin), tile-works, oil-works and glass factories, and carries on various branches of the textile, chemical, leather and wood-working industries. It exports coal, metals, machinery, wine, Charollais cattle, bricks, pottery, glass. Its commerce is facilitated by navigable streams—the Loire, Saône, Doubs and Seille,—the Canal du Centre, which unites Chalon-sur-Saône with Digoin on the Loire, and the canal from Roanne to Digoin and the lateral Loire Canal, both following the main river valley. The chief railway of the department is the Paris-Lyon-Mediterranée. Saône-et-Loire forms the diocese of Autun; it is part of the district of the VIII. army corps (Bourges); its educational centre is Lyons and its court of appeal that of Dijon. It is divided into 5 arrondissements—Mâcon, Chalon-sur-Saône, Autun, Charolles, Louhans—50 cantons, and 589 communes.

Mâcon, Chalon, Autun, Le Creusot, Cluny, Montceau-Les-Mines, Tournus, Paray-le-Monial, Louhans and Charolles are the most noteworthy towns in the department and receive separate treatment. Other places of interest are St Marcel-lès-Chalon, where there is a Romanesque church, once attached to an abbey where Abélard died; Anzy, which has a Romanesque church and other remains of an important monastery; St Bonnet-de-Joux and Sully, both of which have châteaus of the 16th century; and Semur-en-Brionnais and Varennes-l'Arconce, with fine Romanesque churches. Prehistoric remains of the stone age have been found at Solutré near Mâcon.

SÃO PAULO, a state of Brazil extending from 19° 54′ to 25° 15′ S. lat. and bounded N. by Matto Grosso and Minas Geraes, E. by Minas Geraes, Rio de Janeiro and the Atlantic, S. by the Atlantic and Paraná, and W. by Paraná and Matto Grosso. Pop. (1900) 2,282,279; area, 112,312 sq. m. The state has a coast-line 373 m. long, skirted closely by the Sierra do Mar, below which is a narrow coastal zone broken by lagoons, tidal channels and mountain spurs. Above is an extensive plateau (1500 to 2200 ft. above sea-level) with a mild temperate climate. The southern and eastern borders are broken by mountain chains, and isolated ranges of low elevation break the surface elsewhere, but in general the state may be described as a tableland with an undulating surface sloping westward to the Paraná. The extreme eastern part, however, has an eastward slope and belongs to the Parahyba basin. The state is traversed by a number of large rivers, tributaries of the Paraná, the largest of which are the Rio Grande, a part of the N. boundary, Dourados, Tieté, Aguapehy, Tigre, and, a part of the S. boundary, the Paranapanema. The Paraná forms the W. boundary of the state. The basins of the Pardo and the Tieté include some of the richest coffee estates of Brazil. The state is well wooded, especially on the slopes of the Serra do Mar, but there are extensive grassy *campos* (plains) on the plateau. A large part of western São Paulo is still unsettled. The coastal zone is hot and generally malarial, with heavy rainfall. On the plateau the rainfall is sufficiently abundant, but the air is drier and more bracing, the sun temperature being high and the nights cool. The open country is singularly healthy, but the river courses are generally malarial. Some of the cities have suffered from fever epidemics, due to bad drainage and insanitary conditions.

The great industries are agricultural, and the most conspicuous is coffee production. São Paulo produces more than one-half the total Brazilian crop and its one great port, Santos, is the largest coffee-shipping port in the world. The *terra roxa* (red earth) lands of the central and northern parts of the state, especially in the basins of the Tieté and Pardo, are peculiarly favourable. This soil is ferruginous, pasty, deep red in colour, and free from stone, and it covers the higher surface of the plateau with a thick layer. The best plantations are on the high divides between the river courses, and not in their eroded valleys. The Rio Pardo (Brown river) probably derives its name from this soil. For the crop-year (July to June) of 1895–1896 the production was 3,053,804 bags, and in 1905–1906 it was 6,977,175 bags—these figures being the deliveries at Santos for exportation and not including the reserves on the plantations and the home consumption. The crop for the last year mentioned was not a maximum, however, for the deliveries at Santos in 1901–1902 were 10,165,043 bags and in 1902–1903, 8,349,828 bags. These immense crops were produced in spite of appeals to producers not to increase production, and even of a special tax on new plantations imposed by the state in 1903. Over-production was keeping the price below a remunerative figure and threatened to ruin the industry. In 1906 the state entered into an accord, known as the "Convenio de Taubatá," with the states of Rio de Janeiro and Minas Geraes, to maintain the home selling price of Type No. 7 at 55 to 65 francs gold per bag of 60 kilogrammes (other types in proportion) for the first year, and then to increase this price to 70 francs, according to the state of the market; and to check as far as possible the exportation of coffees inferior to Type

No. 7, which was a grade largely exported to the United States for the roasted coffee package trade, although large quantities of inferior grades were used in the same trade. In addition to the suspension or limitation of the export of grades below Type No. 7, coffee was to be bought and stored until it could be sold through accredited agents abroad at a satisfactory price. To do this, the state of São Paulo was authorized to float a loan of £15,000,000. Failing to accomplish this by itself, the state secured the endorsement of the national congress in December 1908, guaranteeing the above loan, to meet the service of which a surtax of 5 francs per bag was decreed. The guarantee was to endure for ten years, during which time all the transactions of the combination, which undertook to limit the sales abroad to 500,000 bags in 1910, 600,000 bags in 1911, 700,000 bags in 1912, 800,000 bags in 1913 and 700,000 per annum thereafter, were to be subject to the approval of the national government. Another measure was the imposition of an additional tax of 20% on all exports for the year above 9,500,000 bags. At the time this guarantee was obtained the state of São Paulo already held nearly 7,000,000 bags of coffee, the larger part on storage in foreign markets, and had apparently reached the limit of its resources, as the foreign markets had failed to respond to its expectations. At the end of the following year this reserved stock had increased to 8,400,000 bags, and the position had become desperate. The loan of £15,000,000 was floated in 1909, and the pressure was relieved, but the situation was then further complicated by a movement among the coffee planters to have the 9,500,000 bags limit on annual sales removed, and the loan service tax of 5 francs a bag reduced. There had been some improvement in the commercial situation in 1909, but the influence of a reserve of over 8,000,000 bags, increasing crops, and the reckless purpose of planters to realize on their crops regardless of the effect on the government, all conspired to make the situation critical.

The other agricultural products of the state include sugar, cotton, rice, tobacco, Indian corn, beans, mandioca, grapes, bananas and other fruits, and many of the vegetables of the temperate zone. Cereals can be grown, but climatic conditions have been considered unfavourable. Sugar cane was the first exotic to be cultivated in São Paulo, and was its principal product in colonial times. Cotton was largely produced, especially during the American Civil War, but the industry nearly disappeared, and now is again improving because of the demand for fibre by the national cotton factories. The cultivation of rice also is increasing, under the stimulus of protective duties. Although São Paulo is not classed as a pastoral region, the state possesses large herds of cattle, which are being improved by the importation of pure-bred stock from Europe. Butter and cheese are produced to a limited extent, and the supply of fresh milk to the cities is attracting some attention. Attention is also given, to a limited extent, to the breeding of horses and mules. The most general and profitable of the animal industries is the breeding of swine, which thrive remarkably on the plateau. The state has an excellent agricultural school and experiment station at Piracicaba, and there is also a zoötechnic station near the capital.

The principal manufactures are cotton and woollen textiles, jute bagging, *aramina* fabrics, furniture, iron and bronze, coffee machinery and agricultural implements, beer, artificial liquors, mineral waters, biscuits, macaroni, conserves, chocolate and other food products, glass bottles, glassware, earthenware, soap, gloves, boots and shoes, trunks and musical instruments. Steam power is generally used, though both electric and hydraulic power are employed. There are several large cotton factories, which are chiefly employed in the manufacture of the coarser grades of cloth for the working classes. The iron mines and works at Ypanema, near Sorocaba, are one of the oldest industries of the state, dating back to the first quarter of the 19th century. It is a government enterprise and has absorbed an immense sum of money, but has never reached a self-supporting stage.

São Paulo is well provided with railways, which include the pioneer line from Santos to Jundiahy (an English enterprise) which has a double track from Santos to the city of São Paulo, the Paulista lines which are a continuation of the English line into the interior, the Mogyana lines running northward from Campinas through rich coffee districts to Uberaba in Minas Geraes and farther on toward Goyaz, the Sorocabana running south-westward from São Paulo toward the Paraná frontier, the São Paulo branch of the Central do Brazil line which passes through the E. part of the state and provides communication with the national capital, and the São Paulo and Rio Grande which is designed to cross the states of Paraná and Santa Catharina to connect with the railways of Rio Grande do Sul. All these lines except the two last are tributary to the English line and the port of Santos. In addition to these many of the large plantations have private railways, of the Decauville type, for the transportation of produce and material to and from the nearest railway station, and all the large cities have tramway lines, many using electric traction. The ports of the state are Santos, which is visited by large steamers in the foreign trade, and Cananéa, Iguape, São Sebastião and Ubatuba which are engaged in the coasting trade only. Cananéa and Iguape are chiefly known for the rice grown in their vicinity. Ubatuba, near the E. end of the São Paulo coast, has a fine, almost landlocked bay, but is without good communication with the interior.

An important contributory element to the prosperity of the state is the large number of immigrants. Between 1827 and 1900 the arrivals numbered 969,230, of which seven-tenths were Italians. A considerable part of the immigrant movement consists of itinerant labourers who go to São Paulo for the coffee-picking, just as they go to Argentina for the wheat harvest.

The capital of the state is São Paulo (*q.v.*) and its principal port and second city in importance is Santos (*q.v.*). The chief cities and towns, with populations in 1890 where not otherwise stated, are as follows, the enumeration being for municipalities, or parishes, including large rural areas and sometimes including separate villages: Campinas (*q.v.*); Guarantinguetá (30,690; estimate 45,000 in 1906), on the Parahyba, 120 m. E.N.E. of São Paulo; Piracicaba (25,275), 85 m. N.W. of São Paulo; Limeira (21,605), in a fertile thickly-settled district; Rio Claro (20,843), 135 m. N.W. of Santos, on a branch of the Paulista railway, in a fertile coffee-producing region, 2030 ft. above the sea; Taubaté (20,773), one of the oldest cities of the state, on the Parahyba 80 m. E.N.E. of the capital, in a rich agricultural district, with works for refining oil from the petroleum-bearing shales in the vicinity; Braganza, or Bragança (19,787), 50 m. N. of São Paulo in a fertile country partly devoted to sugar production and stock; São José dos Campos (18,884); Tieté (18,878), on the Tieté river N.W. of S. Paulo; Pindamonhangaba (17,542; estimate 25,000 in 1906), on the Parahyba river and Central do Brazil railway 105 m. N.E. of São Paulo in a long settled district, 1770 ft. above the sea, producing coffee, sugar, rice, Indian corn, beans, rum and cattle; Sorocaba (17,068; estimate 30,000 in 1906), a prosperous manufacturing and commercial town on the Rio Sorocaba and Sorocabana railway, 50 m. W. of São Paulo; Itú, or Ytú (13,790) about 70 m. W.N.W. of São Paulo on the Tieté river and Ituana railway, with water power derived from the Salto (falls) de Itú, and with important manufactures; São Carlos do Pinhal (12,651); Casa Branca (13,482), in the N. coffee region; Parahybuna (13,395); Pirassununga (12,494); Batataes (12,438); Franca (12,425); Jacarehy (12,279); Botucatú (12,089); Jundiahy (12,051), 86 m. N. of Santos, an important manufacturing town and railway junction, 2320 ft. above sea-level; Ribeirão Preto (12,033), 197 m. N. of Campinas on the Mogyana railway in a fertile coffee-producing region; Iguape (11,888), a port on the southern coast of the state, on a tidewater channel of sufficient depth for coastwise steamers, with exports of rice and timber; Lorena (10,342), 130 m. N.E. of São Paulo, beautifully situated, 1760 ft. above the sea, a station on the Central do Brazil railway, and the junction of a branch railway to the Campos do Jordão where the national government has established a military sanatorium because of its dry, bracing climate; and Cruzeiro (8883).

São Paulo was settled in 1532 by the Portuguese under Martim Affonso de Souza, who established a colony near Santos, at São Vicente, now an unimportant village. It was originally called the *capitania* of São Vicente (organized 1534) and covered the whole of southern Brazil from Rio de Janeiro south. After the suppression of the captaincy grants, parts of this enormous territory were cut off from time to time to form other captaincies, from which developed the present states of Rio de Janeiro, Minas Geraes, Matto Grosso, Paraná, Santa Catharina and Rio Grande do Sul. In 1681 São Paulo succeeded São Vicente as the capital of the captaincy, and the original name of the latter gradually fell into disuse. The people of the state have always been distinguished for their energy and enterprise, especially during the colonial period. The early population was largely composed of half breeds, known as *Mamelucos*, and the exploration of the greater part of the interior of Brazil is due to them. Their exploring parties, called *bandeiras*, discovered the first gold mines of Minas Geraes and Matto Grosso, drove the Jesuit missions from Paraná, and traversed the interior northward into Piauhy, north-westward almost to Quito, westward into Bolivia and southward into Rio Grande and Paraguay. They were slave-hunters by profession, and were noted for cruelty as well as energy.

SÃO PAULO, a city of Brazil, capital of a state of the same name, and seat of a bishopric, on the Tieté river 49 m. by rail N.W. of the port of Santos and 308 m. by rail W. of Rio de Janeiro. Pop. (1890) 64,934; (1902, estimate) 332,000. São Paulo is connected with Santos, its port, by a double-track railway built, owned and worked by a British company (S. Paulo Railway Co.); with Rio de Janeiro, by the São Paulo branch of the Central do Brazil line; with Campinas and other inland cities by the São Paulo and Paulista railways; with the N.E. part of the state, Minas Geraes, and Goyaz by the Mogyana line starting from Campinas; and with Sorocaba and the southern parts of the state, Paraná, and with Santa Catharina and Rio Grande, by the Sorocabana line and the São Paulo and Rio

Grande line. In great part the city occupies an elevated open stretch of tableland commanding extensive views of the surrounding country; and a small part of it is in the low alluvial land bordering the Tieté. The upper part has several slight elevations forming healthy residential districts. The elevations above sea-level are 2382 ft. at the Central do Brazil railway station in the lower town, 2418 ft. at the São Paulo railway station, 2841 ft. in the Consolação suburb, and 2953 ft. in Villa Mariana. The city is just within the tropics, but its elevation above the sea gives it a temperate climate, bracing in the cool season and yet with high sun temperatures in summer. The broad eroded bed of the Tieté is swampy and is subject to extensive inundations causing malarial and intestinal disorders; otherwise the city is singularly healthy, though its sanitary condition is poor. The picturesqueness of the city is heightened by the ravine of a small stream passing through it and spanned by viaducts and bridges. The city squares are commonly open places with an occasional statue but without ornamental gardens. The Public Garden, near the São Paulo railway station in the Luz section, is a recreation ground embellished with tropical plants and an artificial lake. The streets are well paved and lighted with gas and electricity, and have electric tramways. Although there are still many old structures and residences to be seen in the old town, most of the public and business buildings and private residences are of the modern Italian and French type. Brick is used to some extent, but the building material most used is broken stone and mortar, plastered outside, and covered with stucco mouldings and ornaments. The private residences of the city are the finest in the republic. There is much wealth in the state, especially among the large coffee planters, and the city is their favourite residence. Some of their palatial dwellings are surrounded with beautiful gardens and parks. The water-supply is derived from Cantareira hills, and there is a modern sewerage system, constructed by an English company. The more important public buildings are the new government palace, the palaces of agriculture, finance and justice, the executive residence, the immense Polytechnic School, the Normal School, the School of Agriculture, the public hospital called the Isolamento, the charity hospital, the São Paulo railway station with a beautiful stone tower, and the theatre, rivalling some of the best in Europe. Like other Brazilian cities São Paulo has a number of old religious buildings. There are also several excellent educational and scientific institutions which are in great part supported by the state, among which are the Mackenzie College, created through the gift of an American capitalist, a school of law, a Pasteur Institute, and a bacteriological institute. The police force of the state is a military organization and consists of a brigade of about 5000 men (infantry, cavalry, civic guards, firemen, and a body of hospital attendants for public emergency cases), under a colonel of the regular army. Manufactures include textiles, footwear, clothing, food products, beer, artificial liquors, furniture, domestic utensils, &c. The São Paulo Light and Power Co., whose works are situated at the falls of the Tieté a considerable distance N.W. of the city, supplies about 8000 horse-power to local industries in addition to what is needed for the electric railway (108 m.), the oldest enterprise of this character in Brazil. The city has a large Italian population and many Italian shops and industries.

São Paulo was founded by the Jesuits under Manoel de Nobrega in 1554 and at first bore the name of Piratininga. In 1681 it succeeded São Vicente as the capital of the captaincy. The declaration of Brazilian independence occurred on Sept. 7, 1822, on the plain of Ypiranga, near the city, where a monument commemorates the event.

SAP. (1) Juice, the circulating fluid of plants (see PLANTS, § *Physiology*). The word appears in Teutonic languages, cf. Ger. *Saft*, and may be connected ultimately with the root seen in Lat. *sapere*, taste, hence to know, cf. *sapientia*, wisdom, cf. Gr. σοφός, wise. On the other hand it may, like Fr. *sève*, Span. *saba*, have come direct from Lat. *sapa*, must, new wine, itself also from the same root. The Gr. ὀπός is represented in Lat. by *sucus*. (2) A military term for a trench dug by a besieging force for the purpose of approach to the point of attack when within range, hence "to sap," to undermine, dig away the foundations of a wall, &c. The word is derived through the Old Fr. from the Med. Lat. *sapa*, *sappa*, a spade, entrenching tool, Gr. σκαπάνη, σκάπτειν, to dig. (See FORTIFICATION AND SIEGE-CRAFT.)

SAPAN WOOD (Malay *sapang*), a soluble red dyewood from a tree belonging to the leguminous genus *Caesalpinia*, a native of tropical Asia and the Indian Archipelago. The wood is somewhat lighter in colour than Brazil wood and its other allies, but the same tinctorial principle, brazilin, appears to be common to all.

SAPPHIC METRE, SAPPHICS, an ancient form of quantitative verse, named after the Aeolian poetess Sappho, who is supposed to have invented it, and who certainly used it with unequalled skill. A sapphic line consists of five equal beats, of which the central one alone is of three syllables, while the others consist of two each. The original Greek sapphic was of this type:—

– ⏑ – ⏒ – ⏑ ⏑ – ⏑ – ⏒
ποικι | λόθρον' | ἀθάνατ' | 'Αφρο | δίτα

The sapphic strophe consists of three of these lines followed by an adonic, thus:—

– ⏑ – ⏒ – ⏑ ⏑ – ⏑ – ⏒
– ⏑ – ⏒ – ⏑ ⏑ – ⏑ – ⏒
– ⏑ – ⏑ – ⏑ ⏑ – ⏑ – ⏒
– ⏑ ⏑ – ⏑.

Horace adopted, and slightly adapted, this form of verse, for some of his most engaging metrical effects. The Greek poets had permitted the caesura to come where it would, but Horace, to give solidity to the form, introduced the practice of usually ending a word on the fifth syllable:

jam satis terris nivis atque dirae,

the second half of the sapphic leaping off, as it were, with a long syllable which connects it with the first half. This is a typical example of the Latin sapphic strophe:—

Inte|ger vi|tae sceler|isque | purus
non e|get Maur|is jacu|lis ne|que arcu,
nec ve|nena|tis gravi|da sa|gittis,
Fusce, phar|etra.

Before the days of Horace, Catullus had used this form in Latin, and afterwards sapphics were introduced by the pseudo-Seneca into his tragedies. In the middle ages the sapphic strophe was frequently employed in the Latin hymns, especially by Gregory the Great. Later on, considerable laxity was introduced, and a dactyl was frequently substituted for the first trochee; this quite destroys the true character of the measure. It makes it a more easy metre, however, for those who write modern accentuated verse. We see a loose but effective specimen of it in the famous

Needy knife | grinder! | whither | are you | going?
Rough is the | road, your | wheel is | out of | order.

But nearer to the effect of the antique verse would be:

Needy | grinder! | whither oh! | are you | going?
Rough the | road; your | destitute | wheel is | broken,

although this certainly does not suit English versification so well. English sapphics were written by the Elizabethan poet, Thomas Campion (*q.v.*), and by William Cowper. Mr Swinburne has attempted to create the effect of the ancient Aeolian metre in a daring and brilliant stanza. Sapphics have been written more successfully in German than in any other modern language. The earliest original German poem in the form is said to be an anonymous hymn to St Mary Magdalene, dated 1500. Voss kept strictly to the metrical scheme of the Latin in his famous translation of the *Odes* of Horace (1806), and among German poets who have cultivated sapphics are to be mentioned Klopstock, Platen, Hamerling and Geibel.

SAPPHIRE,[1] a blue transparent variety of corundum, or native alumina, much valued as a gem-stone. It is essentially the same mineral as ruby, from which it differs chiefly in colour. The colour of the normal sapphire varies from the palest blue to deep indigo, the most esteemed tint being that of the blue cornflower. Many of the crystals are parti-coloured, the blue being distributed in patches in a colourless or yellow stone; but by skilful cutting, the deep-coloured portion may be caused to impart colour to the entire gem. As the sapphire crystallizes in the hexagonal system it is dichroic, but in pale stones this character may not be well marked. In a deep-coloured stone the colour may be resolved, by the dichroscope, into an ultramarine blue and a bluish or yellowish green. In blue tourmaline and in iolite—stones sometimes mistaken for sapphire—the dichroism is much more distinct. The blue colour in sapphire has been variously referred to the presence of oxides of chromium, iron or titanium, whilst an organic origin has also been suggested. On exposure to a high temperature, the sapphire usually loses colour, but, unlike ruby, it does not regain it on cooling. A. Verneuil succeeded in imparting a sapphire-blue colour to artificial alumina by addition of 1·5% of magnetic oxide of iron and 0·5% of titanic acid (*Comptes rendus*, Jan. 17, 1910). According to F. Bordas, the blue colour of sapphire exposed to the action of radium changes to green and then to yellow.

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[1] Indirectly from Gr. σάπφειρος, but there seems no doubt that this term, like the Hebrew *sapir* of the Old Testament, was formerly applied to what is now called lapis lazuli; the modern sapphire was probably known as ὑάκινθος (*hyacinthus*).

Under artificial illumination many sapphires appear dark and inky, whilst in some cases the blue changes to a violet, so that the sapphire seems to be transformed to an amethyst. According to lapidaries the hardness of sapphire slightly exceeds that of ruby, and it is also rather denser. Notwithstanding its hardness it has been sometimes engraved as a gem.

Ceylon has for ages been famous for sapphires. They occur, with many other gem-stones, as pebbles or rolled crystals in alluvial deposits of sand and gravel; the gem-gravel being known locally as *illam*. The principal localities are Ratnapura, Rakwana in the province of Sabara-Gamawa and Matara. Some of the slightly-cloudy Ceylon sapphires, usually of greyish-blue colour, display when cut with a convex face a chatoyant luminosity, sometimes forming a luminous star of six rays, whence they are called "star-sapphires" (see ASTERIA). The asterism seems due to the presence of microscopic tubular cavities, or to enclosure of crystalline minerals, arranged in a definite system. In 1875 sapphires were discovered in deposits of clay and sand in Battambang (Siam), where they have been worked on a considerable scale. They occur also with rubies in the provinces of Chantabun and Krat. Many of the Siamese sapphires are of very dark colour, some being so deeply tinted as to appear almost black by reflected light. In Upper Burma sapphires occur in association with rubies, but are much less important (see RUBY). Sapphires are also found in Kashmir, where they occur, associated with tourmaline, in the Zanskar range, especially near the village of Soomjam. Madagascar yields sapphires generally of very deep colour, occurring as rolled crystals. Sapphire is widely distributed through the gold-bearing drifts of Victoria, New South Wales and Queensland, but the blue colour of the Australian stones is usually dark, and it is notable that green tints are not infrequent. The Anakie sapphire-fields of Queensland are situated near Anakie station on the Central railway, to the west of Emerald and east of the Drummond Range. Sapphire occurs also in Tasmania. Coarse sapphire is found in many parts of the United States, and the mineral occurs of gem quality in North Carolina and Montana. The great corundum deposits of Corundum Hill, Macon county, N.C., have yielded good sapphires, and they are found also at Cowee Creek in the same county. In Montana, sapphires were discovered as far back as 1865, and have been worked on a large scale. They were originally found in washing for gold. The rolled crystals of sapphire occur, with garnet and other minerals, in glacial deposits, and have probably been derived from dykes of igneous rocks, like andesite and lamprophyre. They display much variety of colour, and exhibit peculiar brilliancy when cut, but are often of pale tints. The principal localities are at Missouri Bar, Ruby Bar and other places near Helena, where they were first worked, and also at Yogo Gulch, near Utica. The Helena crystals are of tabular habit, being composed of the basal pinacoid with a very short hexagonal prism, whilst at Yogo Gulch many of the crystals affect a rhombohedral habit. The Montana sapphires and the matrix have been described by Dr G. F. Kunz, Professor L. V. Pirsson and Dr J. H. Pratt (*Amer. Jour. Sc.*, ser. 4, vol. iv., 1897). The sapphire occurs also in Europe, being found in the Iserweise of Bohemia and in the basalt of the Rhine valley and of Le-Puy-en-Velay in France, but the European stones have no interest as gems.

Although the term sapphire is primarily applied to blue corundum, it is often used in a general sense so as to include all corundum of gem quality, regardless of colour. Hence clear colourless corundum is known as white sapphire or "leucosapphire." Such stones have been occasionally cut as lenses for microscopes, being recommended for such use by their high refractivity, weak dispersion and great hardness. White topaz is sometimes called "water-sapphire," a name which should, however, be restricted to iolite (*q.v.*). Yellow corundum is not uncommon in Ceylon and is termed yellow sapphire or "oriental topaz," the prefix "oriental" being often applied to corundum. When of pale yellowish-green colour the sapphire is called "oriental chrysolite," when greenish-blue "oriental aquamarine," when of brilliant green colour "oriental emerald," and when violet "oriental amethyst." (For figure of crystal of sapphire see CORUNDUM and for artificial sapphire see GEM, § *Artificial*.)

The so-called "Hope sapphires" of trade have been shown to be artificial blue spinels, coloured by cobalt.

Sapphirine is a rare mineral, not related to sapphire except in colour. It is a silicate, containing aluminium, magnesium and iron, brought originally from Greenland, and since found in a rock from the Vizagapatam district in India. (F. W. R.*)

SAPPHO (7th–6th centuries B.C.), Greek poetess, was a native of Lesbos, contemporary with Alcaeus, Stesichorus and Pittacus, in fact, with the culminating period of Aeolic poetry. One of her brothers, Charaxus, fell in love with a courtesan named Doricha upon whom he squandered his property. Sappho wrote an ode, in which she severely satirized and rebuked him. Another brother, Larichus, was public cup-bearer at Mytilene—a position for which it was necessary to be well born. It is said that she had a daughter, named after her grandmother Cleis, and she had some personal acquaintance with Alcaeus. He addressed her in an ode of which a fragment is preserved: "Violet-weaving (or dark-haired), pure, sweet-smiling Sappho, I wish to say somewhat, but shame hinders me"; and she answered in another ode: "Hadst thou had desire of aught good or fair, shame would not have touched thine eyes, but thou wouldst have spoken thereof openly." The story of her love for the disdainful Phaon, and her leap into the sea from the Leucadian promontory, together with that of her flight from Mytilene to Sicily, has no confirmation; we are not even told whether she died of the leap or not. Critics again are agreed that Suïdas was simply gulled by the comic poets when he tells of her husband, Cercolas of Andros. Both the aspersions which these poets cast on her character and the embellishments with which they garnished her life passed for centuries as undoubted history. Six comedies entitled *Sappho* and two *Phaon*, were produced by the Middle Comedy; but, when we consider, for example, the way in which Socrates was caricatured by Aristophanes, we are justified in putting no faith whatever in such authority. We may conclude that Sappho was not utterly vicious, though by no means a paragon of virtue. All ancient tradition and the character of her extant fragments show that her morality was what has ever since been known as "Lesbian."

At Lesbos she was head of a great poetic school, for poetry in that age and place was cultivated as assiduously and apparently as successfully by women as by men. Her most famous pupils were Erinna of Telos and Damophyla of Pamphylia. In antiquity her fame rivalled that of Homer. She was called "the poetess," he "the poet." Different writers style her "the tenth Muse," "the flower of the Graces," "a miracle," "the beautiful," the last epithet referring to her writings, not her person, which is said to have been small and dark.

Her poems were arranged in nine books, on what principle is uncertain; she is said to have sung them to the Mixo-Lydian mode, which she herself invented. The perfection and finish of every line, the correspondence of sense and sound, the incomparable command over all the most delicate resources of verse, and the exquisite symmetry of the complete odes which are extant, raise her into the very first rank of technical poetry at once, while her painting of passion, which caused Longinus to quote the ode to Anactoria as an example of the sublime, has never been since surpassed, and only approached by Catullus and in the *Vita Nuova*. Her fragments also bear witness to a profound feeling for the beauty of nature. The ancients also attributed to her a considerable power in satire, but in hexameter verse they considered her inferior to her pupil Erinna.

The fragments of Sappho have been preserved by other authors incidentally. Three fragments ascribed to her have been found on Egyptian papyri within recent years. The first two were published by W. Schubart in *Sitzungsberichte d. königl. preuss. Akademie d. Wissenschaften* (1902), i. 195 and re-edited (with bibliography) in the *Berliner Klassikertexte*, v. 2 (1907); the third, discovered in 1879, and attributed to Sappho by Blass, is re-edited in the *Berlin. Klass.* v. For these three fragments see especially J. M. Edmonds, in *Classical Review* (June, 1909), pp. 99-104 (text, trans., comment.) and on the text of the "Ode to the Nereids" in *Classical Quarterly* (October, 1909). The poems were separately edited with translation by Wharton (3rd ed., 1895); also in H. Weir Smyth's *Greek Melic Poets* (1900). See also P. Brandt, *Sappho* (Leipzig, 1905); B. Steiner, *Sappho* (1907). (J. A. PL.)

SAPPORO, the official capital of the island of Yezo, Japan, situated in 43° 4′ N. and 141° 21′ E. Pop. 39,000. It was chosen in 1870, and owed its prosperity at the outset chiefly to the public institutions established by the Japanese government in connexion with the colonization bureau, which had for its object the development of the resources of Yezo. It is now a garrison town and has an agricultural college, a museum, saw-mills, flour-mills, breweries, and hemp and flax factories.

SARABAND (Ital. *Sarabanda*, *Zarabanda*; Fr. *Sarabande*), a slow dance, generally believed to have been imported from Spain in the earlier half of the 16th century, though attempts have been made to trace it to an Eastern origin. The most probable account of the word is that the dance was named after Zarabanda, a celebrated dancer of Seville. During the 16th and 17th centuries the saraband was exceedingly popular in Spain, France, Italy and England. Its music was in triple time—generally with three minims in the bar—and almost always consisted of two strains, each beginning upon the first beat, and most frequently ending on the second or third. Many very fine examples occur in the *Suites* and *Partitas* of Handel and J. S. Bach; by far the finest is that which Handel first composed for his overture to *Almira*, and afterwards adapted to the words "Lascia, ch'io pianga," in *Rinaldo*.

SARACCO, GIUSEPPE (1821–1907), Italian politician and financier, and knight of the Annunziata, was born at Bistagno on the 9th of October 1821, and, after qualifying as an advocate, entered the Piedmontese parliament in 1849. A supporter of Cavour until the latter's death he joined the party of Rattazzi and became under-secretary of state for public works in the Rattazzi cabinet of 1862. In 1864 he was appointed, by Sella, secretary-general of finance, and after being created senator in 1865, acquired considerable fame as a financial authority. In 1879 he succeeded in postponing the total abolition of the grist tax, and was throughout a fierce opponent of Magliani's loose financial administration. Selected as minister of public works by Depretis in 1887, and by Crispi in 1893, he contrived to mitigate the worst consequences of Depretis's corruptly extravagant policy, and introduced a sounder system of government participation in public works. In November 1898 he was elected president of the senate, and in June 1900 succeeded in forming a "Cabinet of pacification" after the Obstructionist crisis which had caused the downfall of General Pelloux. His term of office was clouded by the assassination of King Humbert (29th July 1900), and his administration was brought to an end in February 1901 by a vote of the chamber condemning his weak attitude towards a great dock strike at Genoa. After his fall he resumed his functions as president of the senate; but on the advent of the third Giolitti cabinet, he was not reappointed to that position. He died on the 19th of January 1907. He received the supreme honour of the knighthood of the Annunziata from King Humbert in 1898.

SARACENS, the current designation among the Christians in the middle ages for their Moslem enemies, especially for the Moslems in Europe. In earlier times the name *Saraceni* was applied by Greeks and Romans to the nomad Arabs of the Syro-Arabian desert who harassed the frontier of the empire. *Σαρακηνή*, a district in the Sinaitic peninsula, is mentioned by Ptolemy (v. 16). Its inhabitants, though unknown to Arab tradition, made themselves notorious in the adjacent Roman provinces. Thus all Bedouins in that region came to be called *Saraceni*, in Aramaic *Sarkaje*, usually with no very favourable meaning. The latter form occurs in a dialogue concerning Fate written about A.D. 210 by a pupil of Bardesanes (Cureton, *Spicilegium Syriacum*, 16 ult.). The appellation then became general, and occurs frequently in Ammianus Marcellinus. The name "Saracen" continued to be used in the West in later times, probably rather through the influence of literature than by oral tradition, and was applied to all Arabs, even to all Moslems.

SARAGHARI, a small signalling post on the Samana Range in the North-West Frontier Province of India between Forts Lockhart and Gulistan. It is memorable for the stout defence made by its garrison of 21 sepoys of the 36th Sikhs in 1897. Saraghari, a mere mud block-house with a wooden door and a dead-angle, was held for six and a half hours against seven or eight thousand Orakzais, till the 21 Sikhs were finally overwhelmed and killed to a man. A memorial in commemoration was unveiled at Ferozepore in 1904.

SARAGOSSA (*Zaragoza*), an inland province of northern Spain, one of the three into which Aragon was divided in 1833; bounded on the N. by Logroño and Navarre, N.E. and E. by Huesca, S.E. by Lérida and Tarragona, S. by Teruel and Guadalajara and W. by Soria. Pop. (1900) 421,843; area, 6726 sq. m. Saragossa belongs wholly to the basin of the Ebro (*q.v.*). The main valley is bounded on the south-west by the Sierra de Moncayo (with the highest elevation in the province, 7707 ft.), and is continued in a south-easterly direction by the lower sierras of La Virgen and Vicor; on the north-west are the spurs of the Pyrenees. The principal tributaries of the Ebro within the province are the Jalón (*q.v.*), Huerva and Aguas on the right and the Arba and Gallego on the left; the Aragon also, which flows principally through Navarre, has part of its course in the north of this province. At its lowest point, where the Ebro quits it, Saragossa is only 105 ft. above sea-level. There are large tracts of barren land, but where water is abundant the soil is fertile; its chief productions are wheat, rye, barley, oats, hemp, flax, oil and wine. Silkworms are bred; and on the higher grounds sheep are reared. The manufactures are less important than the agricultural interests. Since 1885, however, the Aragonese have bestirred themselves, especially since the extremely protectionist policy of 1890 gave great impetus to native industries all over Spain. The industries include iron-founding and manufactures of paper, leather, soap, brandies, liqueurs, machinery, carriages of all sorts, railway material, pianos, beds, glass, bronze, chocolate, jams and woollen and linen goods. Much timber is obtained from the Pyrenean forests; the chief exports are live stock, excellent wines, flour, oil and fruit. The province contains important mineral resources, the bulk of which, however, await development.

Saragossa is traversed by the Ebro Valley Railway, which connects Miranda with Lérida, Barcelona and Tarragona, and has a branch to Huesca; it also communicates via Calatayud with Madrid and Sagunto; and there are local lines to Cariñena (south-west from Saragossa) and to Tarazona and Borja (near the right bank of the Ebro). The only towns with upwards of 5000 inhabitants in 1900 were Saragossa (99,118) and Calatayud (11,526) (see separate articles); Tarazona (8790), an episcopal see, with a curious 13th-century cathedral; Caspe (7735); and Borja (5701), the original home of the celebrated family of Borgia (*q.v.*). (For an account of the imperial canal, and of the inhabitants and history of this region, see ARAGON.)

SARAGOSSA (*Zaragoza*), the capital of the Spanish province of Saragossa and formerly of the kingdom of Aragon, seat of an archbishop, of a court of appeal, and of the captain-general of Aragon; on the right bank of the river Ebro, 212 m. by rail N.E. of Madrid. Pop. (1900) 99,118. Saragossa is an important railway junction; it is connected by direct main lines with Valladolid, Madrid and Valencia in the west and south, and by the Ebro Valley Railway with Catalonia and the Basque Provinces; it is also the starting-point of railways to the northern districts of Aragon and to Cariñena on the south-west. The city is built in an oasis of highly cultivated land, irrigated by a multitude of streams which distribute the waters of the Imperial Canal, and surrounded by an arid plain exposed to the violent gales which blow down, hot in summer and icy in winter, from the Castilian plateau. The monthly range of temperature frequently varies by as much as 50° Fahr., and the climate is rarely pleasant for many consecutive days except in spring, when warm easterly winds blow from the Mediterranean. The city is surrounded by gardens, farms and country-houses (locally known as *torres*, "towers"). Seen from a distance it has a fine appearance owing to the number of its domes and towers; on a nearer approach it presents a remarkable contrast between the older streets, narrow, gloomy, ill-paved and lined with the fortress-like palaces of the old Aragonese nobility, and the business and residential quarters, which are as well built as any part of Madrid or Barcelona. Saragossa is thus in appearance at once one of the oldest and one of the newest of Spanish cities.

One of its two stone bridges, the seven-arched Puente de Piedra, dates from 1447; there is also an iron bridge for the railway to Pamplona. Beside the river there are public walks and avenues of poplar; the suburb on the left bank is named Arrabal. The two most important buildings of Saragossa are its cathedrals, to each of which the chapter is attached for six months in the year. La Seo ("The See") is the older of the two, dating chiefly from the 14th century; its prevailing style is Gothic, but the oldest portion, the lower walls of the apse, is Byzantine. The Iglesia Metropolitana del Pilar is the larger building, dating only from the latter half of the 17th century; it was built after designs by Herrera el Mozo, and owes it name to one of the most venerated objects in Spain, the "pillar" of jasper on which the Virgin is said to have alighted when she manifested herself to St James as he passed through Saragossa. It has little architectural merit; externally its most conspicuous features are its cupolas, which are decorated with rows of green, yellow and white glazed tiles. The church of San Pablo dates mainly from the 13th century. The Torre Nueva, an octangular clock tower in diapered brickwork, dating from 1504, was pulled down in 1892; it leaned some 9 or 10 ft. from the perpendicular, owing to faulty foundations, which ultimately rendered it unsafe. Among other conspicuous public buildings are the municipal buildings, the exchange (*Lonja*), and the civil and military hospitals and almshouse (*Hospicio provincial*), which are among the largest in Spain. The university was founded in 1474, but its history has not been brilliant. To the west of the town is the Aljaferia or old citadel, originally built as a palace by the Moors and also used as such by its Christian owners. Late in the 15th century it was assigned by Ferdinand and Isabella to the Inquisition, and has since been used as a military hospital, as a prison and as barracks. Saragossa is the headquarters of a large agricultural trade; its industries include iron-founding, tanning, brewing, distillation of spirits, and manufactures of machinery, candles, soap, glass and porcelain.

History.—Saragossa (Celtiberian, *Salduba*) was made a colony by Augustus at the close of the Celtiberian War (25 B.C.), and renamed *Caesarea Augusta* or *Caesaraugusta*, from which "Saragossa" is derived. Under the Romans it was a highly privileged city, the chief commercial and military station in the Ebro valley, and the seat of one of the four *conventus juridici* (assizes) of Hither Spain. It is now, however, almost destitute of antiquities dating from the Roman occupation. It was captured in 452 by the Suebi, and in 476 by the Visigoths, whose rule lasted until the Moorish conquest in 712, and under whom Saragossa was the first city to abandon the Arian heresy. In 777 its Moorish ruler, the viceroy of Barcelona, appealed to Charlemagne for aid against the powerful caliph of Cordova, Abd-ar-Rahman I. Charlemagne besieged the Cordovan army in *Sarkosta*, as the city was then called; but a rebellion of his Saxon subjects compelled him to withdraw his army, which suffered defeat at Roncesvalles (*q.v.*), while recrossing the Pyrenees. The Moors were finally expelled by Alphonso I. of Aragon in 1118, after a siege lasting nine months in which the defenders were reduced to terrible straits by famine. As the capital of Aragon, Saragossa prospered greatly until the second half of the 15th century, when the marriage between Ferdinand and Isabella (1469) resulted in the transference of the court to Castile. In 1710 the allied British and Austrian armies defeated the forces of Philip V. at Saragossa in the war of the Spanish Succession; but it was in the Peninsular War (*q.v.*) that the city reached the zenith of its fame. An ill-armed body of citizens, led by José de Palafox y Melzi (see PALAFOX), whose chief lieutenants were a priest and two peasants, held the hastily-entrenched city against Marshal Lefebvre from the 15th of June to the 15th of August 1808. The siege was then raised in consequence of the reverse suffered by the French at Bailen (*q.v.*), but it was renewed on the 20th of December, and on the 27th of January the invaders entered the city. Even then they encountered a desperate resistance, and it was not until the 20th of February that the defenders were compelled to capitulate, after more than three weeks of continuous street fighting. About 50,000 persons, the majority non-combatants, perished in the city, largely through famine and disease. Among the defenders was the famous "Maid of Saragossa," Maria Agustin, whose exploits were described by Byron in *Childe Harold* (1, 55 sqq.).

SARAGOSSA, COUNCILS OF (*Concilia Caesaraugustana*). In or about 380 a council of Spanish and Aquitanian bishops adopted at Saragossa eight canons bearing more or less directly on the prevalent heresy of Priscillianism. A second council, held in 592, solved practical problems incident to the recent conversion of the West Goths from Arianism to orthodox Christianity. The third council, in 691, issued five canons on discipline. In 1318 a provincial synod proclaimed the elevation of Saragossa to the rank of an archbishopric; and from September 1565 to February 1566 a similar synod made known the decrees of Trent.

H. T. Bruns, *Canones apostolorum et conciliorum saeculorum iv., v., vi., vii., pars altera* (Berlin, 1839); P. B. Gams, *Die Kirchengeschichte von Spanien* (Regensburg, 1862–1879). (W. W. R.*)

SARAN, a district of British India, in the Tirhut division of Bengal. Area, 2674 sq. m. It is a vast alluvial plain, possessing scarcely any undulations, but with a general inclination towards the south-east, as indicated by the flow of the rivers in that direction. The principal rivers, besides the Ganges, are the Gandak and Gogra, which are navigable throughout the year. The district has long been noted for its high state of cultivation. It yields large crops of rice, besides other cereals, pulses, oil seeds, poppy, indigo and sugar-cane.

The population in 1901 was 2,409,509, showing a decrease of 2·2%, compared with an increase of 7·4% in the previous decade. The average density of population, 901 per square mile, is the highest rate for all India. The indigo industry, formerly of the first importance, has declined, and sugar refining has in great part taken its place. Some saltpetre is produced, and shellac is manufactured. Saran is exposed to drought and flood. It suffered from the famine of 1874, and again in 1896–1899. An irrigation scheme from the river Gandak, started in 1878, proved a failure, after a capital expenditure of Rs. 7,00,000. The Bengal North-Western railway runs through the south of the district. The administrative headquarters are at Chapra.

See *Saran District Gazetteer* (Calcutta, 1908).

SARAPUL, a town of N. Russia, in the government of Vyatka, on the river Kama, 333 m. by river E.N.E. of Kazan and 266 m. S.W. of Perm. Pop. (1855) 12,367; (1897) 21,395. Boots, shoes and gloves are manufactured, the first-named being mostly exported to Siberia, Caucasia and Turkestan. It has also tanneries, flax mills, distilleries, ironworks and rope-works, and is a busy river-port, trafficking in corn and timber. There are a lace-making school and a municipal library.

SARASATE Y NAVASCUES, PABLO MARTIN MELITON DE (1844–1908), Spanish violinist, was born at Pamplona on the 10th of March 1844. From his early years he displayed his aptitude for the violin, and at the age of 12 he began to study under Alard at the Paris Conservatoire. His first public appearance as a concert violinist was in 1860. He played in London in 1861, and in the course of his career he visited all parts of Europe and also both North and South America. His artistic pre-eminence was due principally to the purity of his tone, which was free from any tendency towards sentimentality and rhapsodic mannerism, and to the astonishing facility of execution which made him in the best sense of the word a virtuoso. Although in the Beethoven and Mendelssohn concertos, and in modern French and Belgian works, his playing was unrivalled, his qualities were most clearly revealed in the solos which he himself composed, which were "the spirit of Spanish dance translated into terms of the violin virtuoso." Sarasate died at Biarritz on the 20th of September 1908.

SARASIN, or SARRAZIN, **JEAN FRANÇOIS** (1611?–1654), French author, son of Roger Sarasin, treasurer-general at Caen, was born at Hermanville near Caen. He was educated at Caen, and settled in Paris. As a writer of *vers de société* he rivalled Voiture, but he was never admitted to the inner circle of the hôtel de Rambouillet. He was on terms of intimate friendship with Scarron, with whom he exchanged verses, with Ménage, and with Pellisson. In 1639 he supported Georges de Scudéry in his attack on Corneille with a *Discours de la tragédie*. He accompanied Léon Bouthillier, comte de Chavigny, secretary of state for foreign affairs, on various diplomatic errands. He was to have been sent on an embassy to Rome, but spent the money allotted for the purpose in Paris. This weakened his position with Chavigny, from whom he parted in the winter of 1643–1644. To restore his fallen fortunes he married a rich widow, but the alliance was of short duration. He joined in the pamphlet war against Pierre de Montmaur, against whom he directed his satire, *Bellum parasiticum* (1644). He was accused of writing satires on Mazarin, and for a short time gave up the practice of verse. In 1648, supported by the cardinal de Retz and Madame de Longueville, he entered the household of Armand de Bourbon, prince de Conti, whose marriage with Mazarin's niece he helped to negotiate. He died of fever at Pézénas, in Languedoc on the 5th of December 1654. His biographers have variously stated on inadequate evidence that his death was caused by the prince de Conti in a moment of passion, or that he was poisoned by a jealous husband. The most considerable of his poems were the epic fragments of *Rollon conquérant, la guerre espagnole*, with *Dulot vaincu* and the *Pompe funèbre* in honour of Voiture. As a poet he was overrated, but he was the author of two excellent pieces of prose narration, the *Histoire du siége de Dunkerque* (1649) and the unfinished *Conspiration de Walstein* (1651). The *Walstein* has been compared for elegance and simplicity of style to Voltaire's *Charles XII.*

His *Œuvres* appeared in 1656, *Nouvelles Œuvres* (2 vols.) in 1674. His *Poésies* were edited in 1877 by Octave Uzanne with an introductory note. Much of his correspondence is preserved in the library of the Arsenal, Paris. See Albert Mennung's *Jean François Sarasins Leben und Werke* (2 vols., Halle, 1902–1904).

SARASUATI, in early Hindu mythology, a river-goddess; in later myths the wife of Brahma, goddess of wisdom and science, mother of the Vedas, and inventor of the Devanagari letters. There has been much dispute as to the stream of which she is a personification. Some have identified it with the Avestan river, Haragaiti, in Afghanistan, while others think the term a general one for any great river, and in particular the sacred name for the Indus, Sindhu being the popular one.

Two small but sacred rivers in India are still called Saraswati, one in the Punjab and the other in Gujarat, both of which ultimately lose themselves in the sand. According to one legend, the Punjab river reappears to unite with the Ganges and Jumna at Allahabad. From this river is derived the name of the Sarswat Brahmans, the most numerous and influential of the priestly class in the Punjab, with whom the Gaur Sarswats or Shenvis of the Konkan claim connexion.

SARATOGA, BATTLES OF. The British campaign for the year 1777 in America (see AMERICAN WAR OF INDEPENDENCE) involved the operations of two armies moving from opposite and distant points. The lack of co-operation between the two led to the loss of one of them. This was General Burgoyne's force of 7000 men which marched from Canada in June 1777 with the view of reaching the upper Hudson and combining with British troops from New York to isolate New England from the colonies below. Lord Howe, commander-in-chief of the British in America, who had received no instructions binding him in detail to co-operate with Burgoyne, moved southward and captured Philadelphia. In drawing Washington after him he claimed to be assisting Burgoyne. Burgoyne pushed down by way of Lakes Champlain and George and approached the American army under General Horatio Gates in its fortified camp near Stillwater on the W. bank of the Hudson, about 24 m. N. of Albany. On the 19th Burgoyne attacked the American left under General Benedict Arnold. The battle, fought in densely wooded country till nightfall, was severe but indecisive. The British suffered heavy losses, especially in officers. This is variously known as the First Battle of Saratoga, the Battle of Freeman's Farm, the First Battle of Bemis Heights or the First Battle of Stillwater. Burgoyne fortified himself on the site of the action, and on October 7th made another attempt to turn the American left. An engagement still more severe than that of the 19th, known as the Second Battle of Saratoga, followed, in which the Americans under Benedict Arnold, E. Poor and D. Morgan drove the enemy into their works. Among many British officers killed was Brigadier-General Simon Fraser, who had been the life of the expedition. Crippled to an alarming extent, Burgoyne retreated. He was closely followed and harassed, and on the 16th of October nearly surrounded. On the 17th he surrendered, with about 6000 men, near the present village of Saratoga Springs.

See W. L. Stone, *Campaign of Lieut.-Gen. John Burgoyne* (Albany, 1877).

SARATOGA SPRINGS, a village of Saratoga county, New York, U.S.A., about 38 m. N. of Albany, and about 12 m. W. of the Hudson river. Pop. (1900) 12,409, of whom 1684 were foreign-born and 619 were negroes; (1910) 12,693. Saratoga Springs is served by the Delaware & Hudson and the Boston & Maine railways and by several interurban electric lines. The village is in a region of great historic interest, is famous for its medicinal mineral springs, and has long been one of the most popular watering places in America. Its hotels accommodate more than 20,000 guests. Of the hotels, the best known are the United States, Congress Hall, the Grand Union and the American-Adelphi. The springs, of which there are more than forty, were known in colonial times.

The waters, all having the same ingredients but in varying proportions, are heavily charged with carbonic acid gas, and contain considerable quantities of bicarbonates of lime and magnesium, and chloride of sodium. They rise in a stratum of Potsdam sandstone, underlaid by Laurentian gneiss, &c., and reach the surface after passing through a bed of blue clay. The most noteworthy springs are Congress, Vichy, Arondack, Hathorn, Patterson, High Rock, Putnam, Star, Red, Lincoln, Victoria, Carlsbad and Geyser. Some of the springs originally rose above the surface by their own force, but with the boring of new springs and the pumping for carbonic acid gas south of the village the pressure was greatly lessened; the courts interfered to stop the pumping and it was prohibited by the state legislature. These measures, however, were not effective, and in May 1909 an act was passed establishing a state reservation at Saratoga, creating a commission of three to select the lands to be taken over by the state, and providing for an issue of bonds for $600,000 to buy the springs. Saratoga Lake, a beautiful body of water 6 m. long and 1 m. wide, 3½ m. south-east of the village, is a favourite resort.

The streets are well-shaded and broad, with side stretches of lawn between the sidewalk and the curb. There is a speedway and a famous race-track, where there are annual running races. In the village are Woodlawn Park (1200 acres), a town-hall, a state armoury, a public library, several theatres and a number of private hospitals and sanatoriums. The Convention Hall has been the meeting place of many conventions; near it is a reproduction of the House of Pansa at Pompeii, built by Franklin W. Smith. The principal business is the bottling and shipping of the mineral waters which are sold in large quantities and exported to many foreign countries. Among the manufactures are patent medicines, druggists' preparations and chemicals, silk gloves, textiles, foundry products and boilers and engines. In 1905 the value of the factory product was $1,709,073, an increase of 28·1% since 1900.

The Saratoga country was a favourite summer camping ground of the Iroquois, particularly the Mohawks, who were attracted thither by the medicinal value of the springs long before Europeans visited the region. The Indian name, "Sa-ragh-to-ga" or "Se-rach-ta-gue," is said to have meant "hillside country of the great water" or "place of the swift water." The district became during the colonial wars a theatre of hostilities between the French and English colonists and their Indian allies. In 1693 a French expedition was checked in a sharp conflict near Mt McGregor by an English and colonial force under Governor Benjamin Fletcher and Peter Schuyler. Early in the 18th century the region along the upper Hudson began to be settled, the settlement on the Hudson at the mouth of the Fishkill, directly east of the present Saratoga Springs, being known first as Saratoga (later "Old Saratoga") and finally as Schuylerville (pop. in 1905, 1529), in honour of the Schuyler family. Upon the settlement the French and Indians descended in 1745, and massacred many of the inhabitants. After the close of the Seven Years' War, there was a new influx of settlers. Near Stillwater (pop. in 1905, 973), about 5 m. south-east of the present village, the battles of Saratoga (*q.v.*) were fought during the War of Independence. On the site of the present village a small log lodging house for the reception of visitors was built in 1771. After the close of the War of Independence, the fame of the Springs as a health resort spread abroad, and many sought them annually. In 1791 Gideon Putnam (1764–1812), a nephew of Major-General Israel Putnam, bought a large tract of land here; he built the first inn (on the site of the present Grand Union Hotel). Other hotels were erected within the next few years; between 1820 and 1830, by which time the Springs had become one of the most popular of American resorts, several large barn-like wooden hotels were constructed; and Saratoga Springs was incorporated as a village in 1826.

See G. G. Scott and J. S. L'Amoreaux, *History of Saratoga County* (New York, 1876), N. B. Sylvester, *History of Saratoga County* (Philadelphia, 1878), and G. B. Anderson, *Saratoga County* (New York, 1899).

SARATOV, a government of south-eastern Russia, on the right bank of the lower Volga, having the governments of Penza and Simbirsk on the N., Samara and Astrakhan on the E. and the Don Cossacks territory and the governments of Voronezh and Tambov on the W. The area is 32,614 sq. m. The government has an irregular shape; and a narrow strip 140 m. long and 20 to 45 m. wide, extending along the Volga as far south as its Sarepta bend, separates the river from the territory of the Don Cossacks.

Saratov occupies the eastern part of the great central plateau of Russia, which slopes gently towards the south until it merges imperceptibly into the steppe region; its eastern slope, deeply cut into by ravines, falls abruptly towards the Volga. As the higher parts of the plateau range from 700 to 900 ft. above the sea, while the Volga flows at an elevation of only 20 ft. at Khvalynsk in the north, and is 48 ft. below sea-level at Sarepta, the steep ravine-cut slopes of the plateau give a hilly aspect to the banks of the river In the south, and especially in the narrow strip above mentioned, the country assumes the characteristics of elevated steppes, intersected by waterless ravines.

Every geological formation from the Carboniferous up to the Miocene is represented in Saratov; the older formations are, however, mostly concealed under the Cretaceous, whose fossiliferous marls, flint-bearing clays and iron-bearing sandstones cover extensive areas. The Jurassic deposits seldom crop out from beneath them. Eocene sands, sandstones and marls, abounding in marine fossils and in fossil wood, extend over wide tracts in the east. The boulder-clay of the Finland and Olonets ice-sheet penetrates as far south-east as the valleys of the Medvyeditsa and the Sura; and extensive layers of loess and other deposits of the Lacustrine or Post-Glacial period emerge in the south-east and elsewhere above the Glacial deposits. Iron-ore is abundant; chalk, lime and white pottery clay are extracted to a limited extent. The mineral waters at Sarepta, formerly much visited, have been superseded in public favour by those of Caucasia.

Saratov is well drained, especially in the north. The Volga separates it from the governments of Samara and Astrakhan for a length of 500 m.; its tributaries are but small, except the Sura, which rises in Saratov, and serves for the northward transit of timber. The tributaries of the Don are more important: the upper Medvyeditsa and the Khoper, which both have a southward course parallel to the Volga and drain Saratov each for about 200 m., are navigated notwithstanding their shallows, ready-made boats being brought in separate pieces from the Volga. The Ilovlya, which flows in the same direction into the Don, is separated from the Volga by a strip of land only 15 m. wide; Peter the Great proposed to utilize it as a channel for connecting the Don with the Volga, but the idea has never been carried out, and the two rivers are now connected by the railway (45 m.) from Tsaritsyn to Kalach which crosses the southern extremity of Saratov. The region is rapidly drying up, and the forests diminishing. In the south, about Tsaritsyn, they have almost wholly disappeared. In the north they still occupy more than a third of the surface, the aggregate area under wood being reckoned at nearly 13% of the total. The remainder is distributed as follows: arable land, 58%; prairies and pasture lands, 19%. Such is the scarcity of timber that the peasants' houses are made of clay, the corner posts and door and window frames being largely shipped from the wooded districts of the middle Volga. The climate is severe and continental. The average yearly temperatures are 41·5° at Saratov (January, 12·4°; July, 71·5°) and 44·4° at Tsaritsyn (January, 13·2°; July, 74·6°). The average range of temperature is as much as 119°. The Volga is frozen for an average of 162 days at Saratov and 153 days at Tsaritsyn. The soil is very fertile, especially in the north, where a thick sheet of black-earth covers the plateaus; sandy clay and saline clay appear in the south.

The population numbered 2,113,077 in 1882 and 2,419,884 in 1897. The density in the different districts in 1897 varied from 55 to 107 inhabitants per sq. m., and the urban population amounted to 319,918; the female population numbered 1,230,957. The estimated population in 1906 was 2,862,600. There are a few Germans, a fair number of Mordvinians, Chuvashes and Tatars, but nearly all the rest are Russians; 83% belong to the Orthodox Greek Church, 5% are Nonconformists, 6% Lutherans and 2% Roman Catholics. The government is divided into ten districts, the chief towns of which, with their populations in 1897, are Saratov (*q.v.*), Atkarsk (9750), Balashov (12,160), Kamyshin (16,834), Khvalynsk (15,455), Kuznetsk (21,740), Petrovsk (13,212), Serdobsk (12,721), Tsaritsyn (67,650 in 1900) and Volsk (27,572 in 1900). Education makes some progress: in 1897, 40% of the military recruits were able to read, as against 21% in 1874. The proportion of illiterate women, however, continues very large. Of the total area, 52% belonged to the peasants in 1896, 38% to private landowners, 5% to the crown and 5% to the imperial family and the municipal authorities; the peasants, however, are constantly buying land in considerable quantities. Green crops are being cultivated more widely, both on the private estates and among the peasants. Agriculture suffers, however, very much from droughts, and the attacks of marmots, mice and insects. The principal crops are wheat, rye, oats, barley, potatoes and beetroot, with some tobacco and fruit. Oil-yielding plants are cultivated; linseed in all districts except Tsaritsyn; and mustard, both for grain and oil, extensively about Sarepta and in the Kamyshin district. Gardening is a considerable source of income around Saratov, Volsk, Atkarsk and Kamyshin, the cucumbers, melons and water-melons being specially famous. Fishing and the preparation of caviare are of some importance at Kamyshin and elsewhere. Live-stock breeding is declining. On the other hand, the export trade in poultry, especially geese, has developed greatly. The factories comprise mainly steam flour-mills, oil-works, distilleries, oil-mills, timber-mills, tanneries, fur-dressing works and tobacco factories. Weaving, the fabrication of agricultural machinery and pottery, boot-making, &c., are carried on in the villages. The fairs of the government have lost much of their importance; that at Bekovo, however, in the district of Serdobsk, has held its ground, especially as regards cattle and animal products. The peasants are no better off than those of the other governments of south-east Russia (see SAMARA). Years of scarcity are common, and many peasants leave their homes in search of work on the Volga and elsewhere. An active trade is carried on in corn, hides, tallow, oils, exported; the merchants of Saratov, moreover, are intermediaries in the trade between south-east Russia and the central governments. The chief ports are Saratov, Tsaritsyn, Kamyshin and Khvalynsk. The German colony of Sarepta is a lively little town with 5650 inhabitants, which carries on an active trade in mustard, woollen cloth and manufactured wares.

The district of Saratov has been inhabited since at least the Neolithic period. The inhabitants of a later epoch have left numerous bronze remains in their *kurgans* (burial-mounds), but their ethnological position is still uncertain. In the 8th and 9th centuries the semi-nomad Burtases peopled the territory and recognized the authority of the Khazar princes. Whether the Burtases were the ancestors of the Mordvinians has not yet been determined. At the time of the Mongol invasion in 1239–1242, the Tatars took possession of the territory, and one of their settlements around the khan's palace at Urek, 10 m. from Saratov, seems to have had some importance, as well as those about Tsaritsyn and Dubovka. The Crimean Tatars devastated the country in the 15th century, and after the fall of Kazan and Astrakhan the territory was annexed to Moscow. Saratov and Tsaritsyn, both protected by forts, arose in the second half of the 16th century. Dmitrievsk (now Kamyshin) and Petrovsk were founded about the end of the 17th century, and a palisaded wall was erected between the Volga and the Don. Regular colonization may be said to have begun only at the end of the 18th century, when Catherine II. called back the runaway dissenters, invited German colonists and ordered her courtiers to settle here their serfs, deported from central Russia.

(P. A. K.; J. T. BE.)

SARATOV, a town of Russia, capital of the government of the same name, on the right bank of the Volga, 532 m. by rail S.E. of Moscow. It is one of the most important cities of eastern Russia, and is picturesquely situated on the side of hills which come close down to the Volga. One of these, the Sokolova (560 ft.), is liable to frequent landslips, and is a continual source of danger. The city is divided into three parts by two ravines; the outer two may be considered as suburbs. A large village, Pokrovsk (pop. 20,000), situated on the opposite bank of the Volga, though in the government of Samara, is in reality a suburb of Saratov. Apart from this suburb, Saratov had in 1882 a population of 112,430 (49,660 in 1830, and 69,660 in 1859), and 143,431 in 1900. It is the see of an Orthodox Greek bishop and of a Roman Catholic bishop, and is better built than many towns of central Russia. Its old cathedral (1697) is a very plain structure, but the new one, completed in 1825, is fine, and has a striking campanile. The theatre and the railway station are also fine buildings. The streets are wide and regular, and there are several broad squares. A new fine-art gallery was erected in 1884 by the painter Bogolubov, who bequeathed to the city his collection of modern pictures and objects of art. A school of drawing and the public library are in the same building, the Radishchev Museum.

Agriculture and gardening support a section of the population. The cultivation of the sunflower deserves special mention. Of the manufacturing establishments the distilleries rank first in importance; next come the liqueur factories, flour-mills, oil-works, railway workshops and tobacco-factories. The city has a trade not only in corn, oil, hides, tallow, woollen cloth, wool, fruits and various raw produce exported from Samara, but also in salt from the Crimea and Astrakhan, in iron from the Urals and in wooden wares from the upper Volga governments. Saratov also supplies south-eastern Russia with manufactured articles and grocery wares imported from central Russia. The shallowness of the Volga opposite the town and the immense shoals along its right bank are, however, a great drawback to its usefulness as a river-port.

The town of Saratov was founded at the end of the 16th century, on the left bank of the Volga, some 7 m. above the present site, to which it was removed about 1605. The place it now occupies (Sary-tau or Yellow Mountain) has been inhabited from remote antiquity. Although founded for the maintenance of order in the Volga region, Saratov was several times pillaged in the 17th and 18th centuries. The peasant leader Stenka Razin took it, and his followers kept it until 1671; the insurgent Cossacks of the Don pillaged it in 1708 and the rebel Pugachev in 1774.

SARAVIA, ADRIAN (1531–1613), theologian, was born at Hesdin, Pas-de-Calais, of a Spanish father and Flemish mother, both Protestants. He entered the ministry at Antwerp, had a hand in the Walloon Confession and gathered a Walloon congregation in Brussels. He migrated to the Channel Islands early in the reign of Elizabeth; and, after a period as schoolmaster, officiated (1564–1566) at St Peter's, Guernsey, then under Presbyterian discipline. Subsequently he held the mastership of the grammar school at Southampton, and in 1582 was professor of divinity and minister of the reformed church at Leiden. From Leiden he wrote (9 June 1585) to Lord Burghley advising the assumption of the protectorate of the Low Countries by Elizabeth. He became domiciled in England in 1587–1588, leaving Holland on the discovery of his complicity in a political plot, and was appointed (1588) rector of Tattenhall, Staffordshire. His first work, *De diversis gradibus ministrorum Evangelii* (1590; in English, 1592, and reprinted), was an argument for episcopacy, which led to a controversy with Theodore Beza, and gained him incorporation (9 June 1590) as D.D. at Oxford, and a prebend at Gloucester (22 Oct. 1591). On 6th December 1595 he was admitted to a canonry at Canterbury (which he resigned in 1602), and in the same year to the vicarage of Lewisham, Kent, where he became an intimate friend of Richard Hooker, his near neighbour, whom he absolved on his deathbed. He was made prebendary of Worcester (1601) and of Westminster (5 July 1601). In 1604, or early in 1605, he presented to James I. his Latin treatise on the Eucharist, which remained in the Royal Library unprinted, till in 1885 it was published (with translation and introduction) by Archdeacon G. A. Denison. In 1607 he was nominated one of the translators of the Authorised Version of 1611, his part being Genesis to end of Kings ii. On the 23rd of March 1610 he exchanged Lewisham for the rectory of Great Chart, Kent. He died at Canterbury on the 15th of January 1612, and was buried in the cathedral on the 19th of January.

See the particulars collected in Denison's "Notice of the Author" prefixed to *De sacra eucharistia*. (A. Go.*)

SARAVIA, a town of the province of Negros Occidental, island of Negros, Philippine Islands, on the N.W. coast and the coast road, 16 m. N.N.E. of Bacolod, the capital. Pop. (1903) 13,132. The town is in a rich sugar-producing region, and sugar culture is the only important industry. The language is Panay-Visayan.

SARAWAK, a state situated in the north-west of Borneo; area, 55,000 sq. m.; pop. about 500,600. The coast line extends from Tanjong Datu, a prominent cape in 2° 3′ N., northwards to the mouth of the river Lawas 5° 10′ N. and 115° 30′ W., the whole length of the coast line being about 440 m. in a straight line; but a tract, 80 m. in length, of Brunei territory still remains between the mouths of the Baram and Limbang rivers. The frontier of the southern portion of Sarawak is formed by the Serang, Kelingkang and Batang Lupar ranges of mountains.

The inland or eastern boundary is formed by the broken range of mountains which constitutes the principal watershed of the island. Of these the highest peaks are: Batu Puteh (5400 ft.), Tebang (10,000 ft.), Batu Bulan (7000 ft.), Ubat Siko (4900 ft.), Bela Lawing (7000 ft.) and Batu Leihun (6000 ft.), from which the Rejang and Baram rivers, on the Sarawak side, and the Koti and Balungun rivers, on the Dutch side, take their rise. North of Sarawak is the Pamabo mountain range (8000 ft.), whence flow the rivers Limbang and Trusan, and the mountains Batu Lawei (8000 ft.) and Lawas (6000 ft.). The interior is mountainous, the greatest elevations being Mount Mulu (9000 ft.), of limestone formation, Batu Lawei (8000 ft.), Pamabo (8000 ft.), Kalulong, Dulit, Poeh and Penrisam. The Rejang is the largest river, the Baram ranking second, the Batang Lupar third and the Limbang fourth. The Rejang is navigable for small steamers for about 160 m., the Baram for about 100 m., but there is a formidable bar at the mouth of the Baram. The chief town of Sarawak, Kuching, with a population of about 30,000, is situated on the Sarawak river 20 m. from its mouth, and can be reached by steamers of a thousand tons.

The fauna is rich. The most important mammals are the *maias*, or *orang utan*, the gibbon, the proboscis, semnopithecus and macacus monkeys; lemurs, cats, otters, bears, porcupines, wild pigs, wild cattle, deer and pangolin. Bats, shrews, rats and squirrels are included among the smaller mammals, while sharks, porpoises and dugongs are found along the coast. Of birds, Sarawak has over five hundred species; fish and reptiles are abundant; the jungle swarms with insect life, and is rich in many varieties of fern and orchid.

The mineral wealth gives promise of considerable development. The Borneo Company for some years have successfully worked gold from the quartz reefs at Bau, on the Sarawak river, by the cyanide process, as well as antimony and cinnabar. Antimony occurs in pockets in various localities, notably at Sariki, in the Rejang district, and at Burok Buang and Telapak, in the Baram district and in the river Atun. Cinnabar has also been found in small quantities at Long Liman and in the streams about the base of Mount Mulu. Sapphires of good quality, but too small to be of commercial value, are found in large numbers in the mountain streams of the interior. Coal is worked at Sadong and Brooketon, and shipped to Singapore. The great coal-field of Selantik, along the Kelingkang range in the Batang Lupar district, is being developed. Indications of coal seams have also been found in the river Mukah; at Pelagus in the Rejang; at Similajau and Tutau and on Mount Dulit, in the Baram district.

Timber is one of the most valuable products, but with the exception of bilian (iron wood) from the river Rejang, little is exported. The most important timbers are bilian, merebo, rasak, kruin, tapang, kranji, benaga, bintangor, gerunggang, medang, meranti and kapor. Except near the banks of the rivers, which have been cleared by the natives for farming purposes, the whole country is thickly clothed with timber. The industrial establishments also comprise sago-mills, brick-works, cyanide-works and saw-mills.

In 1904 the total trade of Sarawak (Foreign and Coastwise) reached a value of $16,466,241 as compared with $4,564,200 in 1890. The remarkable increase in trade is shown by the following table:—

	1900.	1904.
Gold	$84,370	$1,819,200
Pepper	125,442	2,611,478
Sago flour	75,026	830,319
Rubber	35,181	351,735
Gutta	78,829	637,348
Gambier	20,060	173,500

The revenue increased from $457,596 in 1894 to $1,321,879 in 1904; and the expenditure increased in the same period from $486,533 to $1,225,384. The Public Debt of Sarawak on the 1st of January 1905 was $25,000.

The population of the state, in addition to a small number of Europeans, government officials and others, a few natives of British India, and a large number of Chinese traders and pepper planters, consists of semi-civilized Malays in the towns and villages of the coast districts and of a number of wild tribes of Indonesian affinities in the interior. Of these the most important are the Dyaks, Milanaus, Kayans, Kenyahs, Kadayans and Muruts. No census has ever been taken. "Without the Chinaman," said the Raja (*Pall Mall Gazette*, 19th September 1883), "we could do nothing. When not allowed to form secret societies he is easily governed, and this he is forbidden to do on pain of death." The Milanaus, who live in the northern districts, have adopted the Malay-dress, and in many cases have become Mahommedans; they are a contented and laborious people. Slavery has been abolished, except among certain of the inland tribes among whom it still obtains in a very mild form:

head-hunting has been entirely suppressed by the government, save for occasional outbreaks among the Dyaks.

The government consists of the raja (the succession is hereditary) who is absolute, assisted by a supreme council of seven, consisting of the three chief European officials and four Malay magistrates, nominated by him. There is also a general council of fifty which meets every three years. It includes, besides European and Malay officials, native chiefs chosen from all the principal tribes of the country. The whole country comprises four administrative divisions, each of these being subdivided into several districts. The first division consists of Sarawak proper, which comprises the districts of the river Sarawak, and those of Lundu and Sadong. The second division is formed by the Batang Lupar, Saribas and Kelakah districts. The third division consists of the Rejang, Mukah, Oya and Bintulu; the fourth of the Baram, Limbang, Trusan and Lawas districts. The military force—some 250 men, Dyaks and Sikhs—is under the control of an English commandant. There is also a small police force, and the government possesses a few small steam vessels. The civil service is regularly organized and pensioned. The superior posts, about 50 in number, are filled by Englishmen. There are both Roman Catholic and Protestant missions in Sarawak, the latter forms part of the see of the bishop of Singapore. Sarawak is easily accessible from Singapore, whence the passage occupies about forty-six hours: steamers run at intervals of seven days. The coast is well lighted, lighthouses having been built and maintained in good order at Tanjong Po, Sirik, Mukah, Oya, Tanjong, Kidurong, Baram Mouth and Brooketon. The climate is equable, the daily temperature ranging on the average between 70° and 90°. The nights are generally cool. The rainfall averages about 200 in. annually, it is heaviest during the north-east monsoon (October–March), but continues through the south-west monsoon, which blows for the rest of the year.

History.—In 1839–1840 Sarawak (which then comprised only the districts now constituting the first and second divisions), the most southern province of the sultanate of Brunei, was in rebellion against the tyranny of the Malay officials, insufficiently controlled by the raja Muda Hassim. The insurgents held out at Blidah fort in the Siniawan district, and there Sir James Brooke first took part in the affairs of the territory. By his assistance the insurrection was suppressed, and on September 24th Muda Hassim resigned in his favour and he became raja of Sarawak. In 1843–1844 Captain (afterwards Admiral Sir Henry) Keppel (*q.v.*) and Raja Brooke expelled the Malay and Dyak pirates from the Saribas and Batang Lupar rivers, and broke up the fleets of Lanun pirates, which, descending from the Sulu Islands and the territory which is now British North Borneo, had long been the scourge of the seas.

In 1857 the Chinese, who for many generations had been working the alluvial deposits of gold in Upper Sarawak, sacked Kuching, killed two or three of the English residents and seized the government; Raja Brooke narrowly escaping with his life. His nephew, afterwards raja, quickly raised a force of Malays and Dyaks in the Batang Lupar district and suppressed the insurrection, driving the main body of the rebels out of the Sarawak territory. Raja Sir Charles Johnson Brooke (b. 1829) succeeded his uncle at his death in 1868; in 1888 he was created G.C.M.G. and Sarawak was made a British Protectorate, and in 1904 the position of his highness as raja of Sarawak was formally recognized by King Edward. His eldest son, the raja Muda (Charles Vyner Brooke, b. 1874), has for some years taken part in the administration of the country.

The extent of the raj of Sarawak, at the time when Sir James Brooke became its ruler, was not more than 7000 sq. m.; since that time the basins of the four rivers, Rejang, Muka, Baram and Trusan, have been added. The sultan of Brunei, who claimed suzerainty over them, ceded them on successive occasions in consideration of annual money payments. A few years after these cessions had been made many of the people of the river Limbang rose in rebellion against the sultan, and their territory was annexed by Sarawak, with the subsequent approval of the British government. In 1905 the basin of yet another river, the Lawas, was added to the northern end of Sarawak, the territory being acquired by purchase from the British North Borneo Company.

See Charles Brooke, *Ten Years in Sarawak* (1866); Gertrude L. Jacob, *The Raja of Sarawak* (1876); Spencer St John, *Life in the Forests of the Far East* (1862), and *Life of Sir James Brooke* (1879); "Notes on Sarawak" in *Proc. Roy. Geogr. Soc.* (1881), by W. M. Crocker; "In the Heart of Borneo," *Proc. Roy. Geogr. Soc.* (July 1900), by Charles Hose; and *The Far Eastern Tropics* (1905), by Alleyne Ireland. (C. H.)

SARCASM, an ironical or sneering remark or taunt, a biting or satirical expression. The word comes through the Latin from the Greek *σαρκάζειν*, literally to tear flesh (*σάρξ*) like a dog; hence, figuratively, to bite the lips in rage, to speak bitterly (cf. Stobaeus, *Eclog.* ii. 222). The etymology of this may be paralleled by the English "sneer," from Dan. *snarre*, to grin like a dog, cognate with "snarl," to make a rattling *r* sound in the throat, Ger. *schnarren*, and possibly also by "sardonic." This latter word appears in Greek in the form *σαρδάνιος*, always in the sense of bitter or scornful laughter, in such phrases as *σαρδάνιον γελᾶν, γέλως σαρδάνιος* and the like. It is probably connected with *σαίρειν*, to draw back, *i.e.* the lips, like a dog, but was usually explained (by the early scholiasts and commentators) as referring to a Sardinian plant (*Ranunculus Sardous*), whose bitter taste screwed up the mouth. Thus, later Greek writers wrote *Σαρδόνιον*, and it was adopted into Latin; cf. Servius on Virg. *Ecl.* vii. 41 "immo ego Sardois videar tibi amarior herbis."

SARCEY, FRANCISQUE (1827–1899), French journalist and dramatic critic, was born at Dourdan (Seine-et-Oise), on the 8th of October 1827. He spent some years as schoolmaster, but his temperament was little fitted to the work. In 1858 he devoted himself to journalism. He contributed to the *Figaro*, *L'Illustration*, *Le Gaulois*, *Le XIXe Siècle* and other periodicals; but his chief bent was towards dramatic criticism, of which he had his first experience in *L'Opinion nationale* in 1859. In 1867 he began to contribute to *Le Temps* the "feuilleton" with which his name was associated till his death. His position as dictator of dramatic criticism was unique. He had the secret of taking the public into his confidence, and his pronouncements upon new plays were accepted as final. He was a masterly judge of acting and of stage effect; his views as to the drama itself were somewhat narrow and indifferent to the march of events. He published several miscellaneous works, of which the most interesting are *Le Siège de Paris*, an account compiled from his diary (1871), *Comédiens et comédiennes* (1878–1884), *Souvenirs de jeunesse* (1884) and *Souvenirs d'âge mûr* (1892; Eng. trans., 1893). *Quarante ans de théâtre* (1900, &c.) is a selection from his dramatic feuilletons edited by A. Brisson. He died in Paris, on the 16th of May 1899.

SARCOCARP (Gr. σάρξ, flesh, καρπός, fruit), a botanical term for the succulent and fleshy part of a fruit.

SARCODINA, a principal group or phylum of Protista, defined by O. Bütschli as those which during their active and motile existence discharge the functions of motion and nutrition by simple flowing movements of their protoplasm or by the extension of simple pseudopods, which merge without trace into the protoplasmic body (Bronn's *Tierreich*, vol. i. pt. i., 1882). Thus defined, it is co-extensive with the older group Rhizopoda (Dujardin), and comprises five classes: Proteomyxa (Lankester), Rhizopoda (Dujardin), Foraminifera (d'Orbigny), Heliozoa (Haeckel) and Radiolaria (Haeckel).

The delimitation of Sarcodina is not unattended with difficulties. A very few of those we include possess in addition to the pseudopods one or more flagella, such as *Dimorpha* and *Myriophrys* (Heliozoa), *Arcuothrix* (Rhizopoda), and might equally be referred to the Flagellata (*q.v.*). The Sporozoa differ in that their active state is usually (not always, *e.g.* Haemosporidia, &c.) a wriggling, sickle-shaped cell, that growth takes place in the whole surface of the body, and not by ingestion of food and consequently without the active deformations that characterize Sarcodina, and that the life-cycle embraces at least two alternating modes of brood formation.

The subdivision of the phylum is no less difficult. The character of the pseudopods (see AMŒBA) is the most obvious one to select, as it appears to be fairly constant. The surface may be a "precipitation-pellicle," not wetted by water, and the cytoplasm immediately within ("ectosarc") free from granules, so that no streaming movement is visible at the surface of the pseudopods, which are blunt or taper sharply to a point (Rhizopoda Lobosa); or the cytoplasm has no such protective outer layer, and the granules extend to the surface where they show a constant streaming, and the pseudopods are fine-pointed, and taper very slowly to the tip, as in all the other groups. For convenience, however, from general similarity of habit, habitat and general structure, we have been obliged to give a minor importance to this character within Rhizopoda. The divisions then stand thus:—

1. PROTEOMYXA.—Pseudopods fine granular, not branching freely; fission usually multiple, in a cyst; no conjugation process known.

2. RHIZOPODA.—Simple forms, sometimes with a simple shell, chitinous, siliceous or of cemented particles, never calcareous; pseudopods lobose, in the tapering and branching never either stiff or reticulate.

3. HELIOZOA.—Pseudopods granular, finely radiate, and gradually tapering, stiff; skeleton variable, never calcareous nor of cemented particles.

4. FORAMINIFERA.—Pseudopods branching freely and anastomosing, flexible except in a few pelagic forms where they are more radiate; shell variable, mostly of cemented sand-grains, calcareous, very rarely siliceous in a few deep-sea forms, not generically separable from

5. RADIOLARIA.—Cytoplasm divided into a central and a peripheral region by a perforated membranous central capsule; pseudopods radiate flexible branching or not; skeleton either of a proteid (?) substance ("acanthin") or siliceous, of spicules or forming an elegant lattice, more rarely continuous.

6. LABYRINTHULIDEA.—Body a reticulate plasmodium, formed by cells more or less coalescent, and connected by a network of anastomosing threadlike pseudopods. Cells aggregated into loose networks without distinct boundaries, the minor aggregates connected by fine threadlike pseudopodia.

7. MYXOMYCETES.—Cells at first free, finally aggregated to form a coalescent fructification, usually preceded by a continuous or fenestrated plasmodium stage in which all cytoplasmic boundaries may be lost.

The reproduction processes of the Sarcodina are (1) Binary fission, equal or nearly so. (2) Multiple fission or "sporulation" (also termed "brood formation"). Conjugation (equal or unequal) usually occurs between cells produced by the latter mode (microgametes); or if not, there are antecedent processes suggesting that brood formation has been lost. Conjugation is entirely unknown in Proteomyxa, Labyrinthulidea and Myxomycetes, even at stages where it occurs in other groups, and it has only been definitely made out in a very limited number of genera in the remaining groups. The zygote or product of cell fusion is usually here, as in the majority of *types* of conjugation, a resting cell. (See the separate articles on the classes.)

The young of the Sarcodina, formed from the outcome of multiple fission, or single resting cells (spores), may be provided with pseudopodia from the first (myxopods or amoebulae), or come into active life for a short time with flagella (mastigopods or flagellulae).

LITERATURE.—*Bütschli* in Bronn's *Tierreich*, vol. i. pt. i. (1882); Y. Delage and E. Hérouard, *Traité de zoologie concrète*, vol. i., *La Cellule et les protozoaires* (1896); A. Lang, *Handb. der Zoologie*, ed. 2, pt. i. "Protozoen" (1902); M. Hartog, *Cambridge Natural History*, vol. i, (1906); in the first four books full bibliographies are given.

(M. HA.)

SARCOPHAGUS (Gr. *σαρκοφάγος*, literally "flesh-eating," from *σάρξ*, flesh, *φαγεῖν*, to eat), the name given to a coffin in stone, which on account of its caustic qualities, according to Pliny (*H.N.* xxxvi. 27), consumed the body in forty days; also by the Greeks to a sepulchral chest, in stone or other material, which was more or less enriched with ornament and sculpture. One of the finest examples known is the sarcophagus of Seti, the second king of the XIX. Egyptian dynasty (1326–1300 B.C.), which is carved out of a block of Aragonite or hard carbonate of lime, now in the Soane Museum; of later date are the green porphyry sarcophagus and the terra-cotta sarcophagus from Clazomenae; both of these date from the early 6th century B.C., and are in the British Museum. The finest Greek examples are those found at Sidon in 1887 by Hamdy Bey, which are now in the Imperial Museum at Constantinople (see GREEK ART). Of Etruscan sarcophagi there are numerous examples in terra-cotta; occasionally they are miniature representations of temples, and sometimes in the form of a couch on which rest figures of the deceased; one of these in the British Museum dates from 500 B.C. The earliest Roman sarcophagus is that of Scipio in the Vatican (3rd century B.C.), carved in peperino stone. Of later Roman sarcophagi, there is an immense series enriched with figures in high relief, of which the chief are the Niobid example in the Lateran, the Lycomedes sarcophagus in the Capitol, the Penthesilea sarcophagus in the Vatican, and the immense sarcophagus representing a battle of the Romans and the barbarians in the Museo delle Terme. In later Roman work there was a great decadence in the sculpture, so that in the following centuries recourse was had to the red Egyptian porphyry, of which the sarcophagi of Constantia (A.D. 355) and of the empress Helena (A.D. 589), both in the Vatican, are fine examples. Of later date, during the Byzantine period, there is a large series either in museums or in the cloisters of the Italian churches. They are generally decorated with a series of niches with figures in them, divided by small attached shafts with semicircular or sloping covers carved with religious emblems, one of the best examples being the sarcophagus of Sta Barbara, dating from the beginning of the 6th century, at Ravenna, where there are many others. The term sarcophagus is sometimes applied also to an altar tomb.

SARD, a reddish-brown chalcedony much used by the ancients as a gem-stone. Pliny states that it was named from Sardis, in Lydia, where it was first discovered; but probably the name came with the stone from Persia (Pers. *sered*, yellowish-red). Sard was used for Assyrian cylinder-seals, Egyptian and Phoenician scarabs, and early Greek and Etruscan gems. The Hebrew *odem* (translated *sardius*), the first stone in the High Priest's breastplate, was a red stone—probably sard, but perhaps carnelian or red jasper (see J. Taylor, "Sardius," in Hastings's *Dict. Bibl.*). Some kinds of sard closely resemble carnelian, but are usually rather harder and tougher, with a duller and more hackly fracture. Mineralogically the two stones pass into each other, and indeed they have often been regarded as identical, both being chalcedonic quartz coloured with oxide of iron. The range of colours in sard is very great, some stones being orange-red, or hyacinthine, and others even golden, whilst some present so dark a brown colour as to appear almost black by reflected light. The hyacinthine sard, resembling certain garnets, was the most valued variety among the ancients for cameos and intaglios. Dark-brown sard is sometimes called "sardoine," or "sardine"; whilst certain sards of yellowish colour were at one time known to collectors of engraved gems as "beryl."

SARDANAPALUS, or SARDANAPALLUS, according to Greek fable, the last king of Assyria, the thirtieth in succession from Ninyas. The name is derived from that of Assur-danin-pal, the rebel son of Shalmaneser II., whose reign ended with the fall of Nineveh in 823 B.C. (or perhaps from that of Assur-dan III., the last king but one of the older Assyrian dynasty); his character is that ascribed to Assur-bani-pal. He was the most effeminate and corrupt of a line of effeminate princes; hence Arbaces, satrap of Media, rebelled and, with the help of Belesys, the Babylonian priest, besieged Nineveh. Sardanapalus now threw off his sloth and for two years the issue was doubtful. Then, the Tigris having undermined part of the city wall, he collected his wives and treasures and burned them with himself in his palace (880 B.C.). His fate is an echo of that of Samas-sum-yukin, the brother of Assur-bani-pal (*q.v.*).

See J. Gilmore, *Fragments of the Persika of Ktesias* (1888).

(A. H. S.)

SARDARPUR, a British station in Central India, within the state of Gwalior, on the Mahi river, 58 m. by road E. of Mhow, pop. (1901) 2783. It is the headquarters of the political agent for the Bhopawar agency, and of the Malwa Bhil corps, originally raised in 1837 and recently converted into a military police battalion.

SARDHANA, a town of British India, in Meerut district of the United Provinces, 12 m. by rail N.W. of Meerut. Pop. (1901), 12,467. Though now a decayed place, Sardhana is historically famous as the residence of the Begum Samru (d. 1836). This extraordinary woman was a Mussulman married to Reinhardt or Sombre (Samru), the perpetrator of the massacre of British prisoners at Patna in 1763. On his death in 1778 she succeeded to the command of his mercenary troops. Ultimately she was baptized into the Roman Catholic Church, and bequeathed an immense fortune to charitable and religious uses. She built in Sardhana a Roman Catholic cathedral, a college for training priests, and a handsome palace.

SARDICA, COUNCIL OF, an ecclesiastical council convened in 343 by the emperors Constantius and Constans, to attempt a settlement of the Arian controversies, which were then at their height. Of the hundred and seventy bishops assembled, about ninety were Homousians—principally from the West—while on the other side were eighty Eusebians from the East. The anticipated agreement, however, was not attained; and the result of the council was simply to embitter the relations between the two great religious parties, and those between the Western and Eastern halves of the Empire. For as Athanasius and Marcellus of Ancyra appeared on the scene, and the Western bishops declined to exclude them, the Eusebian bishops of the East absolutely refused to discuss, and contented themselves with formulating a written protest addressed to numerous foreign prelates. That they instituted a rival congress of their own in Philippopolis is improbable. The bishops, however, who remained in Sardica (mod. *Sofia* in Bulgaria) formed themselves into a synod, and naturally declared in favour of Athanasius and Marcellus, while at the same time they anathematized the leaders of the Eusebian party. The proposal to draw up a new creed was rejected.

Especial importance attaches to this council through the fact that Canons 3-5 invest the Roman bishop with a prerogative which became of great historical importance, as the first legal recognition of his jurisdiction over other sees and the basis for the further development of his primacy. "In order to honour the memory of St Peter," it was enacted that any bishop, if deposed by his provincial synod, should be entitled to appeal to the bishop of Rome, who was then at liberty either to confirm the first decision or to order a new investigation. In the latter case, the tribunal was to consist of bishops from the neighbouring provinces, assisted—if he so chose—by legates of the Roman bishop. The clauses thus made the bishop of Rome president of a revisionary court; and afterwards Zosimus unsuccessfully attempted to employ these canons of Sardica, as decisions of the council of Nice, against the Africans. In the middle ages they were cited to justify the claim of the papacy to be the supreme court of appeal. Attacks on their authenticity have been conclusively repelled.

The canons are printed in C. Mirbt, *Quellen zur Geschichte des Papsttums* (Tübingen, 1901), p. 46 f.; Hefele, *Conciliengeschichte*, ed. 2, i. 533 sqq. See also, J. Friedrich, *Die Unechtheit der Canones von Sardika* (Vienna, 1902); on the other side F. X. Funk, "Die Echtheit der Canones von Sardica," *Historisches Jahrbuch der Görresgesellschaft*, xxiii. (1902), pp. 497-516; *ibid.* xxvi. (1905), pp. 1-18, 255-274; C. H. Turner, "The Genuineness of the Sardican Canons," *The Journal of Theological Studies*, iii. (London, 1902), pp. 370-397. (C. M.)

SARDINIA (Gr. 'Ιχνοῦσα, from a fancied resemblance to a footprint in its shape, Ital. *Sardegna*), an island of the Mediterranean Sea, belonging to the kingdom of Italy. It lies 7½ m. S. of Corsica, from which it is separated by the Strait of Bonifacio, which is some 50 fathoms deep. The harbour of Golfo degli Aranci, in the north-eastern portion of the island, is 138 m. S.W. of Civitavecchia, the nearest point on the mainland of Italy. Sardinia lies between 8° 7′ and 9° 49′ E., and extends from 38° 52′ to 41° 15′ N. The length from Cape Teulada in the S.W. to Punta del Falcone in the N. is about 160 m., the breadth from Cape Comino to Cape Caccia about 68 m. The area of the island is 9187 sq. m.—that of the department (*compartimento*), including the small islands adjacent, being 9294 sq. m. It ranks sixth in point of size (after Sicily) among the islands of Europe, but it is much more sparsely populated.

The island is mountainous in the main, almost continuously so, indeed, along the east coast, and very largely granitic, with a number of lofty upland plains in the east, and volcanic in the west. The highest point in the north-east group of the island (called Gallura) is Monte Limbara (4468 ft.), S.E. of Tempio. This mountain group is bounded on the S.E. and S.W. by valleys, which are followed by the railways from Golfo degli Aranci to Chilivani, and from Chilivani to Sassari. The north-western portion of the island, called the Nurra, lies to the west of Sassari and to the north of Alghero, and is entirely volcanic; so are the mountains to the south of it, near the west coast; the highest point is the Monte Ferru (3448 ft.). East of the railway from Chilivani to Oristano, on the other hand, the granitic mountains continue. The highest points are Monte Rasu (4127 ft.), S. of Ozieri, in the district called Logudoro, on the chain of the Marghine, which runs to Macomer, and, farther S., in the region called Barbargia, the Punta Bianca Spina, the highest summit of the chain of Gennargentu (6016 ft.). These two groups are divided by the deep valley of the Tirso, the only real river in Sardinia, which has a course of 94 m. and falls into the sea in the Gulf of Oristano. South of Gennargentu, in the district of the Sarcidano, is the Monte S. Vittoria (3980 ft.), to the west of which is the deep valley of the Flumendosa, a stream 76 m. long, which rises south of Gennargentu, and runs S.E., falling into the sea a little north of Muravera on the east coast. Still farther W. is the volcanic upland plain of the Giara (1998 ft.) and south of the Sarcidano are the districts known as the Trexenta, with lower, fertile hills, and the Sarrabus, which culminates in the Punta Serpeddi (3507 ft.), and the Monte dei Sette Fratelli (3333 ft.), from the latter of which a ridge descends to the Capo Carbonara, at the S.E. extremity of the island. South of Oristano and west of the districts last described, and traversed by the railway from Oristano to Cagliari, is the Campidano (often divided in ordinary nomenclature into the Campidano of Oristano and the Campidano of Cagliari), a low plain, the watershed of which, near S. Gavino, is only about 100 ft. above sea-level. It is 60 m. long by 7-14 broad, and is the most fertile part of the island, but much exposed to malaria. South-west of it, and entirely separated by it from the rest of the island, are the mountain groups to the north and south of Iglesias, the former culminating in the Punta Perda de Sa Mesa or Monte Linas (4055 ft.), and the latter, in the district known as the Sulcis, reaches 3661 ft. It is in this south-western portion of the island, and more particularly in the group of mountains to the north of Iglesias, that the mining industry of Sardinia is carried on.

The scenery is fine, but wild and desolate in most parts, and of a kind that appeals rather to the northern genius than to the Italian, to whom, as a rule, Sardinia is not attractive. The railway between Mandas and Tortoli traverses some of the boldest scenery in the island, passing close to the Monte S. Vittoria. The mountains near Iglesias are also very fine.

Coast.—The coast of Sardinia contains few seaports, but a good proportion of these are excellent natural harbours. At the north-eastern extremity is a group of islands, upon one of which is the naval station of La Maddalena: farther S.E. is the well-protected Gulf of Terranova, a part of which, Golfo degli Aranci, is the port of arrival for the mail steamers from Civitavecchia, and a port of call of the British Mediterranean squadron. To the south of Terranova there is no harbour of any importance on the east coast (the Gulf of Orosei being exposed to the E., and shut in by a precipitous coast) until Tortoli is reached, and beyond that to the Capo Carbonara at the south-east extremity, and again along the south coast, there is no harbour before Cagliari, the most important on the island. In the south-west portion of Sardinia the island of S. Antioco, joined by a narrow isthmus and a group of bridges to the mainland, forms a good natural harbour to the south of the isthmus, the Golfo di Palmas; while the north portion of the peninsula, with the island of S. Pietro, forms a more or less protected basin, upon the shores of which are several small harbours (the most important being Carloforte), which are centres of the export of minerals and of the tunny fishery. Not far from the middle of the west coast, a little farther S. than the Gulf of Orosei on the east coast, is the Gulf of Oristano, exposed to the west winds, into which, besides the Tirso, several streams fall, forming considerable lagoons. For some way beyond the only seaport is Bosa, which has only an open roadstead; and at the southern extremity of the Nurra come the Gulf of Alghero and the Porto Conte to the W., the latter a fine natural harbour but not easy of ingress or egress. The northern extremity of the Nurra, the Capo del Falcone, is continued to the N.N.E. by the island of Asinara, about 11 m. in length, the highest point of which, the Punta della Scomunica, is 1339 ft. high. This small island serves as a quarantine station. On the mainland, on the south shore of the Golfo dell' Asinara, is the harbour of Porto Torres, the only one of any importance on the north-west coast of Sardinia.

Geology.—Geologically Sardinia consists of two hilly regions of Pre-Tertiary rock, separated by a broad depression filled with Tertiary deposits. This depression runs nearly from north to south, from the Gulf of Asinara to the Gulf of Cagliari. Physically its continuity is broken by Monte Urticu and several smaller hills which rise within it, but these are all composed of volcanic rock and are the remains of Tertiary volcanoes. It is in the south that the depression remains most distinct and it is there known as the Campidano. In the north it forms the plain of Sassari. Both to the east and to the west of this depression the Archean and Palaeozoic rocks which form the greater part of the island are strongly folded, with the exception of the uppermost beds, which belong to the Permian system. In the eastern region this was the last folding which has affected the country, and the Mesozoic and Tertiary beds are almost undisturbed. In the western region, on the other hand, all the Mesozoic beds are involved in a later system of folds; but here also the Tertiary beds lie nearly horizontal. There were, therefore, two principal epochs of folding in the island, one at the close of the Palaeozoic era which affected the whole of the island, and one at the close of the Mesozoic which was felt only in the western region. Corresponding with this difference of structure there is also a difference in the geological succession. In the western region all the Mesozoic systems, including the Trias, are well developed. The Trias does not belong, as might have been expected, to the Alpine or Mediterranean type; but resembles that of Germany and northern Europe. In the eastern region the Trias is entirely absent and the Mesozoic series begins with the Upper Jurassic.

Granite and Archean schists form nearly the whole of the eastern hills from the Strait of Bonifacio southwards to the Flumendosa river, culminating in Monti del Gennargentu. The Palaeozoic rocks form two extensive masses, one in the south-east and the other in the south-west. They occur also on the extreme north-western coast, in the Nurra. Cambrian, Ordovician and Silurian beds have been recognized, the Upper Cambrian consisting of a limestone which is very rich in metalliferous ores (especially galena and calamine). The Permian, which contains workable coal seams, lies unconformably upon the older beds and seems to have been deposited in isolated basins (*e.g.* at Fondu Corrongiu and San Sebastiano), like those of the Central Plateau of France. The Mesozoic beds are limited in extent, the most extensive areas lying around the Gulf of Orosei on the east and west of Sassari in the north. The Tertiary deposits cover the whole of the central depression, where they are associated with extensive flows of lava and beds of volcanic ash. The most widely spread of the sedimentary beds belong to the Miocene period.[1]

Climate.—The climate of Sardinia is more extreme than that of Italy, but varies considerably in different districts. The mean winter temperature for Sassari for 1871–1900 was 48° F., the mean summer temperature 73° F., while the mean of the extremes reached in each direction were 99° F. and 31·5° F. The island is subject to strong winds, which are especially felt at Cagliari owing to its position at the south-east end of the Campidano, and the autumn rains are sometimes of almost tropical violence. The lower districts are hot and often unhealthy in the summer, while the climate of the mountainous portion of the island is less oppressive, and would be still cooler if it possessed more forest. There are comparatively few streams and no inland lakes. Snow hardly ever falls near the coast, but is abundant in the higher parts of the island, though none remains throughout the summer. The rainfall in the south-west portion of the island is considerably greater than in other districts. The mean annual rainfall for Sassari for 1871–1900 was 24·45 in., the average number of days on which rain fell being 109, of which 37 were in winter and only 8 in summer—the latter equal with Palermo, but lower than any other station in Italy.

Malaria.—The island has a bad reputation for malaria, due to the fact that it offers a considerable quantity of breeding places for the *Anopheles claviger*, the mosquito whose bite conveys the infection. Such are the various coast lagoons, formed at the mouths of streams for lack of proper canalization, while much of the harm is also due to the disforestation of the mountains, owing to which the rains collect in the upland valleys, and are brought down by violent torrents, carrying the soil with them, and so impeding the proper drainage and irrigation of these valleys, and encouraging the formation of unhealthy swamps; moreover, the climate has become much more tropical in character. The mortality from malaria in 1902 was higher than for any other part of Italy—1037 persons, or 154 per 100,000 (Basilicata, 141; Apulia, 104; Calabria, 77; Sicily, 76; province of Rome, 27).

Customs and Dress.—The population of Sardinia appears (though further investigation is desirable) to have belonged in ancient times, and to belong at present, to the so-called Mediterranean race (see G. Sergi, *La Sardegna*, Turin, 1907). In the aeneolithic necropolis of Anghelu Ruju, near Alghero, of 63 skulls, 53 belong to the "Mediterranean" dolico-mesocephalic type and 10 to a Eurasian brachycephalic type of Asiatic origin, which has been found in prehistoric tombs of other parts of Europe. The race has probably suffered less here than in most parts of the Mediterranean basin from foreign intermixture, except for a few Catalan and Genoese settlements on the coast (Alghero and Carloforte are respectively the most important of these); and the population in general seems to have deteriorated slightly since prehistoric times, the average cranial capacity of the prehistoric skulls from the Anghelu Ruju being 1490 c.c. for males and 1308 for females, while among the modern population 60% of males and females together fall below 1250 c.c.; and the stature is generally lower than in other parts of Italy, as is shown by the measurements of the recruits (R. Livi, *Antropometria Militare*, Rome 1896). Anthropologists, indeed, have recently observed a large proportion of individuals of exceptionally small stature, not found in Sardinia only, but elsewhere in south Italy also; though in Sardinia they are distributed over the whole island, and especially in the southern half. In the province of Cagliari 29·99% of the recruits born in 1862 were under 5 ft. 1 in., and in that of Sassari 21·99%, the percentage for ten provinces of south Italy being 24·35. These small individuals present apparently no other differences, and Sergi maintains that the difference is racial, these being the descendants of a race of pygmies who had emigrated from central Africa. But the lowness of stature extends to the lower animals—cattle, horses, donkeys, &c.—and this may indicate that climatic causes have some part in the matter also, though Sergi denies this.

The dialects differ very much in different parts of the island, so that those who speak one often cannot understand those who speak another, and use Italian as the medium of communication. They contain a considerable number of Latin words, which have remained unchanged. The two main dialects are that of the Logudoro in the north and that of Cagliari in the south of the island.

The native costumes also vary considerably. In the south-east they have largely gone out of use, but elsewhere, especially in the mountainous districts, they are still habitually worn. In the Barbargia the men have a white shirt, a black or red waistcoat and black or red coat, often with open sleeves; the cut and decorations of these vary considerably in the different districts. They have a kind of short kilt, stiff, made of black wool, with a band from back to front between the legs; under this they wear short linen trousers, which come a little below the knee, and black woollen leggings with boots. They wear a black cap, about 1½ ft. long, the end of which falls down over one side of the head. In other districts the costume varies considerably, but the long cap is almost universal. Thus at Ozieri the men wear ordinary jackets and trousers with a velvet waistcoat; the shepherds of the Sulcis wear short black trousers without kilt and heavy black sheepskin coats, and the two rows of waistcoat buttons are generally silver or copper coins. The costume of the women is different (often entirely so) in each village or district. Bright colours (especially red) are frequent, and the white chemise is an integral part of the dress. The skirts are usually of the native wool (called *orbacia*). For widows or deep mourning the peculiar cut of the local costume is preserved, but carried out entirely in black. The native costume is passing out of use in many places (especially among the women, whose costume is more elaborate than that of the men), partly owing to the spread of modern ideas, partly owing to its cost; and in the Campidano and in the mining districts it is now rarely seen. The curious customs, too, of which older writers tell us, are gradually dying out. But the festivals, especially those of mountain villages or of pilgrimage churches, attract in the summer a great concourse of people, all in their local costumes. There may be seen the native dances and break-neck horse-races—the riders bareback—through the main street of the village. The people are generally courteous and kindly, the island being still comparatively rarely visited by foreigners, while Italians seem to regard it as almost a place of exile. They have the virtues and defects of a somewhat isolated mountain race—a strong sense of honour and respect for women, of hospitality towards the stranger, and a natural gravity and dignity, accompanied by a considerable distrust of change and lack of enterprise. Despite their poverty begging is practically unknown. The houses are often of one storey only. Chimneys are unknown in the older houses; the hearth is in the centre of the chief room, and the smoke escapes through the roof. In the mountain villages the parish priest takes the lead among his people, and is not infrequently the most important person.

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[1] See A. de la Marmora, *Voyage en Sardaigne*, vol. iii. (1857); J. C. Bornemann, "Die Versteinerungen des Cambrischen Schichtensystems der Insel Sardinien," *Nova Acta k. L-C. Akad. Naturf.* vol. li. (1886), pp. 1-148, pls. i.-xxxiii., and *ib.* vol. lvi. (1891), pp. 427-528, pls. xix.-xxviii.; A. Törnquist, "Ergebnisse einer Bereisung der Insel Sardinien," *Sitz. k. preuss. Akad. Wiss.* (1902), pp. 808-829, and "Der Gebirgsbau Sardiniens und seine Beziehungen zu den jungen, circum-mediterranen Faltenzügen," *ib.* (1903), pp. 685-699; A. Dannenberg, "Der Vulkanberg Mte Ferru in Sardinien," *Neues Jahrb. f. Min.* Beil. Bd. xxi. (1906), pp. 1-62, pl. i.

Agriculture.—The rest of the island is mainly devoted to agriculture; according to the statistics of 1901, 151,853 individuals out of a total rural population of 708,034 (*i.e.* deducting the population of Cagliari and Sassari) are occupied in it. Of these 41,661 cultivate their own land, 15,408 are fixed tenants, 24,031 are regular labourers, and no less than 72,753 day labourers; while there are 35,056 shepherds. Emigration is a comparatively new phenomenon in Sardinia, which began only in 1896, but is gaining ground. A considerable proportion of the emigrants are miners who proceed to Tunis, and remain only a few years, but emigration to America is increasing.

Much of the island is stony and unproductive; but cultivation has not been extended nearly as much as would be possible, and the implements are primitive. Where rational cultivation has been introduced, it has almost always been by non-Sardinian capitalists. Two-fifths of the land belongs to the state, and two-fifths more to the various communes; the remaining fifth is minutely subdivided among a large number of small proprietors, many of whom have been expropriated from inability to pay the taxes, which, considering the low value of the land, are too heavy; while the state is unable to let a large proportion of its lands. Comparatively little grain is now produced, whereas under the republic Sardinia was one of the chief granaries of Rome. The Campidano and other fertile spots, such as the so-called Ogliastra on the east side of the island, inland of Tortoli, the neighbourhood of Oliena, Bosa, &c., produce a considerable quantity of wine, the sweet, strong, white variety called Vernaccia, produced near Oristano, being especially noteworthy. Improved methods are being adopted for protecting vines against disease, and the importation of American vines has now ensured immunity against a repetition of former disasters. The cultivation of the vine prevails far more in the province of Cagliari than in that of Sassari, considerable progress having been made both in the extent of land under cultivation and in the ratio of produce to area. The entire island produced 28,613,000 gallons of wine in the year 1899 and 19,809,000 in 1900. In 1902 the production fell to 13,491,517 gallons; in 1903 it was 26,997,680; in 1904 it reached the phenomenal figure of 63,105,577 gallons, of which the province of Cagliari produced 53,995,362 gallons; in 1905 it fell to 36,700,000, of which the province of Cagliari produced 32,500,000 gallons. Though much land previously devoted to grain culture has been planted with vines, the area under wheat, barley, beans and maize is still considerable. Most of the soil, except the rugged mountain regions, is adapted to corn growing. In 1896 the grain area was 380,000 acres, a slight diminution having taken place since 1882. The yield of corn varies from six to ten times the amount sown. In 1902 the total production of wheat in the island was 2,946,070 bushels, but in 1903 it rose to 4,823,800 bushels, in 1904 it fell to 4,015,020, and in 1905 rose again to 4,351,987 bushels, $\frac{1}{34}$ of the whole production of Italy. The cultivation of olives is widespread in the districts of Sassari, Bosa, Iglesias, Alghero and the Gallura. The government, to check the decrease of olive culture in Sassari, has offered prizes for the grafting of wild olive trees, of which vast numbers grow throughout the island. Tobacco, vegetables and other garden produce are much cultivated; cotton could probably be grown with profit.

The houses of the Campidano are mostly built of sun-dried unbaked bricks. The ox-wagons with their solid wheels, and the curious water-wheels of brushwood with earthenware pots tied on to them and turned by a blindfolded donkey, are picturesque. Both European and African fruit trees grow in the island; there are in places considerable orange groves, especially at Milis, to the north of Oristano. The olive oil produced is mainly mixed with that from Genoa or Provence, and placed on the market under the name of the latter. Among the natural flora may be noted the wild olive, the lentisk (from which oil is extracted), the prickly pear, the myrtle, broom, cytisus, the juniper. Large tracts of mountain are clothed with fragrant scrub composed of these and other plants.[1] The higher regions produce cork trees, oaks, pines, chestnuts, &c., but the forests have been largely destroyed by speculators, who burned the trees for charcoal and potash, purchasing them on a large scale from the state. This occurred especially in the last half of the 19th century, largely owing to the abolition of the so-called *beni ademprivili*. These were lands over which, in distinction from the other feudal lands, rights of pasture, cutting of wood, &c. &c., existed. When, in 1837, the baronial fiefs were suppressed by Charles Albert, and the land transferred to the state, the *ademprivio* was maintained on the lands subject to it, and it was thus to the interest of all that the woods should be maintained. In 1865, however, it was suppressed, and one half of the *beni ademprivili* was assigned to the state, the other half being given to the communes, with the obligation of compensating those who claimed rights over these lands. The state, which had already sold not only a considerable part of the domain land, but a large part of the *beni ademprivili*, continued the process, and the forests of Sardinia were sacrificed; and, as has been said, the necessity of reafforestation, of the regulation of streams, and of irrigation[2] is urgent. Laws to secure this object have been passed, but funds are lacking for their execution on a sufficiently large scale. Another difficulty is that Italian and foreign capitalists, have produced a great rise in prices which has not been compensated by a rise in wages. Native capital is lacking, and taxation on unremunerative lands is, as elsewhere in Italy, too heavy in proportion to what they may be expected to produce, and not sufficiently elastic in case of a bad harvest.

Live-Stock.—A considerable portion of Sardinia, especially in the higher regions, is devoted to pasture. The native Sardinian cattle are small, but make good draught oxen. A considerable amount of cheese is manufactured, but largely by Italian capitalists. Sheep's milk cheese (*pecorino*) is largely made, but sold as the Roman product. Horses are bred to some extent, while the native race of donkeys is remarkably small in size. Pigs, sheep and goats are also kept in considerable numbers. Whereas in 1881 Sardinia was estimated to possess only 157,000 head of cattle, 478,000 sheep and 165,000 goats, the numbers in 1896 had increased to 1,159,000 head of cattle, 4,960,000 sheep and 1,780,000 goats. The nomadic system prevails in the island. Breeding is unregulated and natural selection prevails. A more progressive form of pastoral industry is that of the *tanche* (enclosed holdings), in which the owner is both agriculturist and cattle raiser. On these farms the cultivation of the soil and the rearing of stock go hand in hand, to the great advantage of both. Nevertheless the idea of the value of improving breeds is gaining ground. Good cattle for breeding purposes are being imported from Switzerland and Sicily, and efforts are likewise being made to improve the breed of horses, which are bought mainly for the army. The opportunity of utilizing the wool for textile industries has not yet been taken, though Sardinian women are accustomed to weave strong and durable cloth. Everywhere capital and enterprise are lacking. Agricultural products require perfecting and fitting for export.

Of wild animals may be noted the moufflon (*Ovis Ammon*), the stag, and the wild boar, and among birds various species of the vulture and eagle in the mountains, and the pelican and flamingo (the latter coming in August in large flocks from Africa) in the lagoons.

Fisheries.—The tunny fishery is considerable; it is centred principally in the south-west. The sardine fishery, which might also be important, at present serves mainly for local consumption. Lobsters are exported, especially to Paris. The coral fishery—mainly on the west coast—has lost its former importance. Neither the tunny nor the coral fishery is carried on by the Sardinians themselves, who are not sailors by nature; the former is in the hands of Genoese and the latter of Neapolitans. The unhealthy lagoons contain abundance of fish. The mountain streams often contain small but good trout.

In Roman times Sardinia, relatively somewhat more prosperous than at present, though not perhaps greatly different as regards its products, was especially noted as a grain-producing country. It is also spoken of as a pastoral country (Diod. v. 15), but we do not hear anything of its wine. Solinus (4, § 4) speaks of its mines of silver and iron, Suidas (*s.v.*) of its purple and tunny fisheries, Horace (*Ars Poet.* 375) of the bitterness of its honey. Pausanias (x. 17, § 12) mentions its immunity from wolves and poisonous snakes—which it still enjoys,—but Solinus (*l.c.*) mentions a poisonous spider, called *solifuga*, peculiar to the island.

Minerals.—The mining industry in Sardinia is confined in the main to the south-western portion of the island. The mines were known to the Carthaginians, as discoveries of lamps, coins, &c. (now in the museum at Cagliari), testify. The Roman workings too, to judge from similar finds, seem to have been considerable. The centre of the mining district (*Metalla* of the itineraries) was probably about 5 m. south of Fluminimaggiore, in a locality known as Antas, where are the remains of a Roman temple (*Corpus Inscr. Lat.* x. 7539), dedicated to an emperor, probably Commodus—but the inscription is only in part preserved. A pig of lead found near Fluminimaggiore bears the imprint *Imp. Caes. Hadr. Aug.* (*C.I.L.* x. 8073, 1, 2). After the fall of the Roman Empire the workings remained abandoned until the days of the Pisan supremacy,[3] and were again given up under the Spanish government, especially after the discovery of America. When the island passed to Savoy, in 1720, the mines passed to the state. The government let the mines to contractors for forty years and then took them over; but in the period from 1720 to 1840 only 14,620 tons of galena were extracted and 2772 of lead. In 1840 the freedom of mining was introduced, the state giving perpetual concessions in return for 3% of the gross production. In 1904–1905, 14,188 workmen were employed in the mines of the province of Cagliari. The following table (from the consular report of 1905) shows the amount and value of the minerals extracted, the whole amount being exported:

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[1] The *herba Sardoa*, said to cause the *risus Sardonicus* (sardonic laugh), cannot be certainly identified (Pausanias x. 17, 13).

[2] By the law of 1906 the state has not assumed the responsibility of the construction of reservoirs for irrigation.

[3] The Pisan workings are only distinguished from the Roman by the character of the small objects (lamps, coins, &c.) found in them,

	Tons.	Value £.
Zinc—		
Calamine . . .	99,749	466,070
Blende . . .	26,051	135,569
Lead	24,798	140,534
Silver	167	5,012
Manganese . . .	2.362	3,360
Antimony . . .	1,005	4,700
Lignite	15,429	8,778
Anthracite . . .	577	586
Copper	98	445
	170,236	765,054

The chief mines are those of Gennamare and Ingurtosu and others of the group owned by the Pertusola Company, Monteponi and Montevecchio. The mining and washing plant is extremely good and largely constructed at Cagliari. The most important minerals are lead and zinc, obtained in lodes in the forms of galena and calamine respectively. In most cases, owing to the mountainous character of the country, horizontal galleries are possible. The Monteponi Company smelts its own zinc, but the lead is almost all smelted at the furnaces of Pertusola near Spezia. Silver has also been found in the district of Sarrabus, iron at S. Leone to the west of Cagliari, and antimony and other metals near Lanusei, but in smaller quantities than in the Iglesias district, so that comparatively little mining has as yet been done there. Lignite is also mined at Bacu Abis, near Gonnesa, and Anthracite in small quantities near Seui.

The salt-pans at Cagliari and of Carloforte are of considerable importance; they are let by the government to contractors, who have the sole right of manufacture, but are bound to sell the salt necessary for Sardinian consumption at 35 centesimi (3½d.) per cwt.; the government does not exercise the salt monopoly in Sardinia any more than in Sicily, but in the latter island the right of manufacture is unrestricted. The total production in 1905 was 149,431 tons; the average price of salt for the island in 1905 was 2½d. per cwt. (unground), and 1s. per cwt. ground; whereas for Italy, where the government monopoly exists, the price is £1, 12s. the cwt.

Commerce.—The total exports of the province of Cagliari in 1905 attained a value of £1,388,735, of which £550,023 was foreign trade, while the imports amounted to £1,085,514, of which £360,758 was foreign trade. Among the exports may be noticed minerals, wines and spirits, tobacco, hides, live animals; and among the imports, groceries, cotton and cereals. The tonnage of the shipping entering and clearing the ports of the province in 1905 was 1,756,866, of which 352,992 was foreign.

Communications.—The railway system of Sardinia is in the hands of two companies—the Compagnia Reale delle Ferrovie Sarde, and the Compagnia delle Ferrovie Secondarie della Sardegna. The former company's lines (of the ordinary gauge) run from Cagliari, past Macomer, to Chilivani (with a branch at Decimomannu for Iglesias and Monteponi). From Chilivani the line to Sassari and Porto Torres diverges to the N.W., and that to Golfo degli Aranci to the N.E. The latter company owns narrow-gauge lines from Cagliari to Mandas (whence lines diverge N. to Sorgono and E. to Tortoli, the latter having a short branch from Gairo to Ierzu), from Macomer E. to Nuoro and W. to Bosa, from Sassari S.W. to Alghero, from Chilivani S. to Tirso (on the line between Macomer and Nuoro), and from Monti (on the line from Chilivani to Golfo degli Aranci) N.W. to Tempio. In the south-western portion of the island are several private railways belonging to various mining companies, of which the lines from Monteponi to Portoscuso, and from S. Gavino to Montevecchio, are sometimes available for ordinary passengers. There is also a steam tramway from Cagliari to Quartu S. Elena. The trains are few and the speed on all these lines is moderate, but the gradients are often very heavy.

Communication is thus most wanted with the northern and south-eastern extremities of the island, and between Tortoli and Nuoro, and Nuoro and Golfo degli Aranci. The main road system, which dates from 1828, previous to which there were only tracks, is good, and the roads well engineered; many of them are traversed daily by post vehicles. Some road motor services have been instituted. The total length of the railways is 602 m., and of the roads of all classes 3101 m., *i.e.* 596 yds. per sq. m. There is daily steam communication (often interrupted in bad weather) with Civitavecchia from Golfo degli Aranci (the mail route), and weekly steamers run from Cagliari to Naples, Genoa (via the east coast of the island), Palermo and Tunis, and from Porto Torres to Genoa (calling at Bastia in Corsica and Leghorn) and Leghorn direct. A fortnightly line also runs along the west coast of the island from Cagliari to Porto Torres. All these lines (and also the minor lines from Golfo degli Aranci to La Maddalena and from Carloforte to Porto Vesme and Calasetta) are in the hands of the Navigazione Generale Italiana, there being no Sardinian steamship companies. There is also a weekly French service between Porto Torres and Ajaccio in Corsica.

Administration.—Sardinia is divided into two provinces—Cagliari and Sassari; the chief towns of the former (with their communal population in 1901) are: Cagliari (53,057); Iglesias (20,874); Quartu S. Elena (8510), really a large village; Oristano (7107); Fluminimaggiore (9647); Lanusei (3250); and the total population of the province is 486,767: while the chief towns of the latter are Sassari (38,053); Alghero (10,741); Ozieri (9555); Nuoro (7051); Tempio Pausania (14,573); Terranova Pausania (4348); Porto Torres (4225); and the total population of the province 309,026. The density of population is 85·38 per sq. m. (294·55 for the whole of Italy), by far the lowest figure of any part of Italy.

The archiepiscopal sees of the island are: Cagliari (under which are the suffragan sees of Galtelli-Nuoro, Iglesias and Ogliastra), Oristano (with the suffragan see of Ales and Terralba) and Sassari (under which are the suffragan sees of Alghero, Ampurias and Tempio, Bisarchio and Bosa). The number of monastic institutions in the island is very small.

Education.—The number of scholars in the elementary schools for 1901–1902 was 59·09 per 1000 (Calabria 42·27, Tuscany 67·09, Piedmont 118·00); the teachers are 1·34 per 1000, a total of 1084 of both sexes (among whom only one priest) (Calabria 1·18, Tuscany 1·29, Piedmont 2·0), while the rural schools are not buildings adapted for their purpose. In some of the towns, however, and especially at Iglesias, they are good modern buildings. Still, the percentage of those unable to read and write is 72·8, while for the whole of Italy it is 56·0. The male scholars at the secondary schools amounted in 1900 to 2·74 per 1000 inhabitants. The university of Cagliari, which in 1874–1875 had only 60 students, had 260 in 1902–1903. At Sassari in the same year there were 162. There are besides in the island 10 gymnasia, 3 lycées, 6 technical and nautical schools and institutes (including a school of mines at Iglesias), and 9 other institutes for various branches of special education. A tendency is growing up towards the extension of technical and commercial education in place of the exclusively classical instruction hitherto imparted. To the growth of this tendency the excellent results of the agricultural schools have especially contributed.

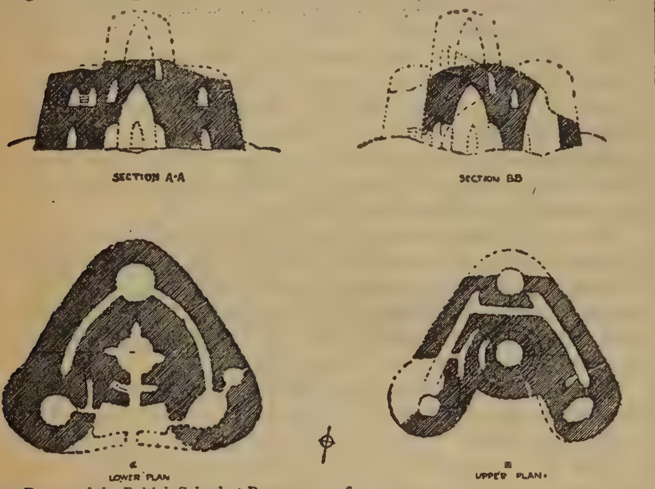
Crime.—For the years 1897–1901 statistics show that Sardinia has more thefts and frauds than any other region of Italy (1068·15 for Sardinia and 210·56 per 100,000 inhabitants per annum for the rest of Italy). This is no doubt accounted for by the extreme poverty which prevails among the lower classes, though beggars, on the other hand, are very few, the convictions being 8·95 per 100,000 against 258·15 per 100,000 for the province of Rome. Sardinia has less convictions for serious crimes than any other *compartimento* of south Italy. Public security is considerably improved, and regular brigandage (as distinct from casual robbery) hardly exists. The vendetta, too, is now hardly ever heard of.

Finance.—In 1887 a severe banking crisis occurred in Sardinia. Though harmful to the economic condition of the island, it left agriculture comparatively unaffected, because the insolvent institutions had never fulfilled the objects of their foundation. Agricultural credit operations in Sardinia are carried on by the Bank of Italy, which, however, displays such caution that its action is almost imperceptible. An agricultural loan and credit company has been formed on the ruins of the former institutions, but hitherto no charter has been granted it. Institutions possessing a special character are the *monti frumentarii*, public grain deposits, founded for the purpose of supplying peasant proprietors with seed corn, debts being paid in kind with interest after harvest. But they, too, lack funds sufficient to assure extensive and efficient working, even after the law of 1906. Meantime much evil arises from usury in the poorer districts. It is estimated that Sardinia pays, in local and general, direct and indirect taxation of all kinds, 23,000,000 lire (£920,000), a sum corresponding to 35·44 lire per head.

History and Archaeology.—The early history of Sardinia is entirely unknown.[1] The various accounts of Greek writers of the early colonizations of the island cannot be accepted, and it appears rather to have been the case that though there were various schemes formed by Greeks for occupying it or parts of it (*e.g.* that recorded by Herodotus i. 170, when it was proposed, after the capture of Phocaea and Teos in 545 B.C., that the remainder of the Ionian Greeks should emigrate to Sardinia) none of them ever came to anything.

Nuraghi.

On the other hand, the island contains a very large number of important prehistoric monuments, belonging to the Bronze Age, during which it must have been comparatively well populated. The most conspicuous and important of these are the *nuraghi* (the word is said to be a corruption of *muraglie, i.e.* large walls, but it is more probably a native word). Of these there are, as has been estimated, as many as 6000 still traceable in the island. The nuraghe in its simplest form is a circular tower about 30 ft. in diameter at the base and decreasing in diameter as it ascends; it is built of rough blocks of stone, as a rule about 2 ft. high (though this varies with the material employed); they are not mortared together, but on the inside, at any rate, the gaps between them were often filled with clay. The entrance almost invariably faces south, and measures, as a rule, 5 or 6 ft. in height by 2 in width. The architrave is flat, and there is a space over it, serving both to admit light and to relieve the pressure on it from above, and the size decreases slightly from the bottom to the top. Within the doorway is, as a rule, a niche on the right, and a staircase ascending in the thickness of the wall to the left; in front is another similar doorway leading to the chamber in the interior, which is circular, and about 15 ft. in diameter; it has two or three niches, and a conical roof formed by the gradual inclination of the walls to the centre. It is lighted by the two doorways already mentioned. The staircase leads either to a platform on the top of the nuraghe or, more frequently, to a second chamber concentric with the first, lighted by a window which faces, as a rule, in the same direction as the main doorway. A third chamber above the second does not often occur. The majority perhaps of the nuraghi of Sardinia present this simple type; but a very large number, and, among them, those best preserved, have considerable additions. The construction varies with the site, obviously with a view to the best use of the ground from a strategic point of view. Thus, there may be a platform round the nuraghe, generally with two, three or four bastions, each often containing a chamber; or the main nuraghe may have additional chambers added to it. In a few cases, indeed, we find very complicated systems of fortification—a wall of circumvallation with towers at the corners, protecting a small settlement of nuraghe-like buildings, as in the case of the Nuraghe Losa near Abbasanta and the Nuraghe Saurecci near Guspini;[2] or, as in the Nuraghe Lugheras near Paulilatino, or the Nuraghe de S'Orcu near Domusnovas, the entrance may be protected by a regular system of courtyards and subsidiary nuraghi. Roughness of construction cannot be regarded as a proof of antiquity, inasmuch as in some cases we find the additions less well built than the original nuraghe; and it is often clear from the careful work at points where it was necessary that the lack of finer construction was often simply economy of labour. That the simpler forms, on the other hand, preceded those of more complicated plan is probable. The manner of their arrangement seems to indicate clearly that they were intended to be fortified habitations, not tombs or temples. The niche at the entrance, which is rarely wanting, served, no doubt, for the sentry on guard and would be on the unprotected side of any one coming in; the door, too, is narrow and low, and closed from within. The approach is, as we have seen, often guarded by additional constructions; the fact that the door and window face south is another argument in favour of this theory, and the access from one part of the interior to another is sometimes purposely rendered difficult by a sudden vertical rise of 5 or 6 ft. in the stairs; while the objects found in them—household pottery, &c.—and near them (in some cases silos containing carbonized grain and dolia) point to the same conclusion. Numerous fragments of obsidian arrow-heads and chips are also found in and near them all over the island. The only place where obsidian is known to be found in Sardinia in a natural state is the Punta Trebina, a mountain south-east of Oristano. The choice of site, too, is decisive. Sometimes they occupy the approaches to tablelands, the narrowest points of gorges, or the fords of rivers; sometimes almost inaccessible mountain tops or important points on ridges; and it may be noticed that, where two important nuraghi are not visible from one another, a small one is interpolated, showing that there was a system of signalling from one to another. Or again, a group of them may occupy a fertile plain, a river valley or a tableland,[3] or they may stand close to the seashore. Generally there is, if possible, a water-supply in the vicinity; sometimes a nuraghe guards a spring, or there may be a well in the nuraghe itself.



From *Papers of the British School at Rome*, v. 92, fig. 1.

FIG. 1.—Nuraghe of Voes (Plans and Sections).

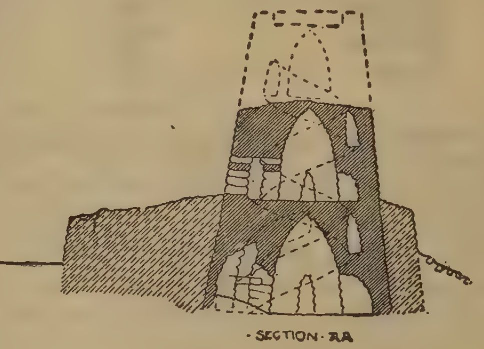
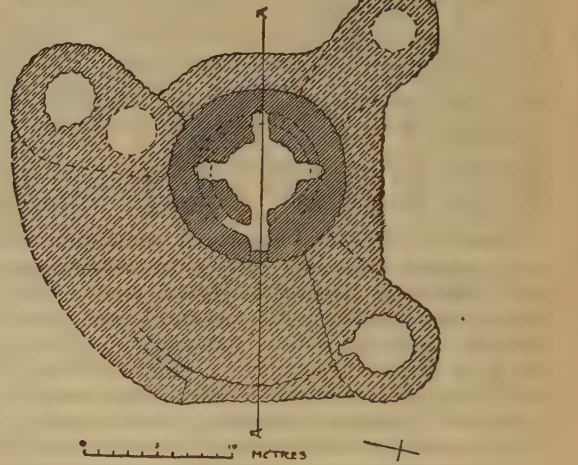


FIG. 2.



From *Papers of the British School at Rome*, v. 97, fig. 3.

FIG. 3.—Nuraghe Aiga (Plan and Section).

A final argument is the existence in some cases of a village of circular stone buildings of similar construction to the nuraghi, but only 15 to 25 ft. in diameter, at the foot of a nuraghe, which, like the baronial castle of a medieval town, towered above the settlement.

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[1] It has been widely believed that the Shardana, who occur as foreign mercenaries in Egypt from the time of Rameses II. downwards, are to be identified with the Sardinians; but the question is uncertain. There were certainly no Egyptian colonies in Sardinia; the Egyptian objects and their imitations found in the island were brought there by the Phoenicians (W. H. Roscher, *Lexikon der griechischen und römischen Mythologie*, ii. 392).

[2] In neither of these cases have the subsidiary buildings been fully traced out. The plan of the former is given by Pinza (*op. cit.*), and that of the latter by La Marmora (*op. cit.*). The latter seen from a distance resembles a medieval castle crowning a hill-top.

[3] Those of the Giara are fully described by A. Taramelli and F. Nissardi in *Monumenti dei Lincei*, vol. xviii.; Nissardi's map of the Nurra, published by G. Pinza, ibid. vol. xi. sqq., may also be consulted.

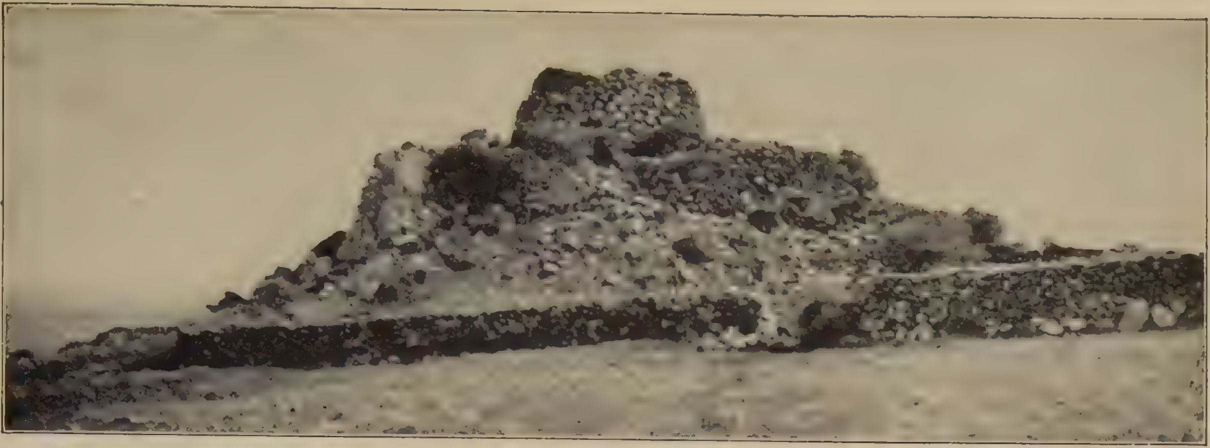


Fig. 1.—NURAGHE MELAS, NEAR GUSPINI.

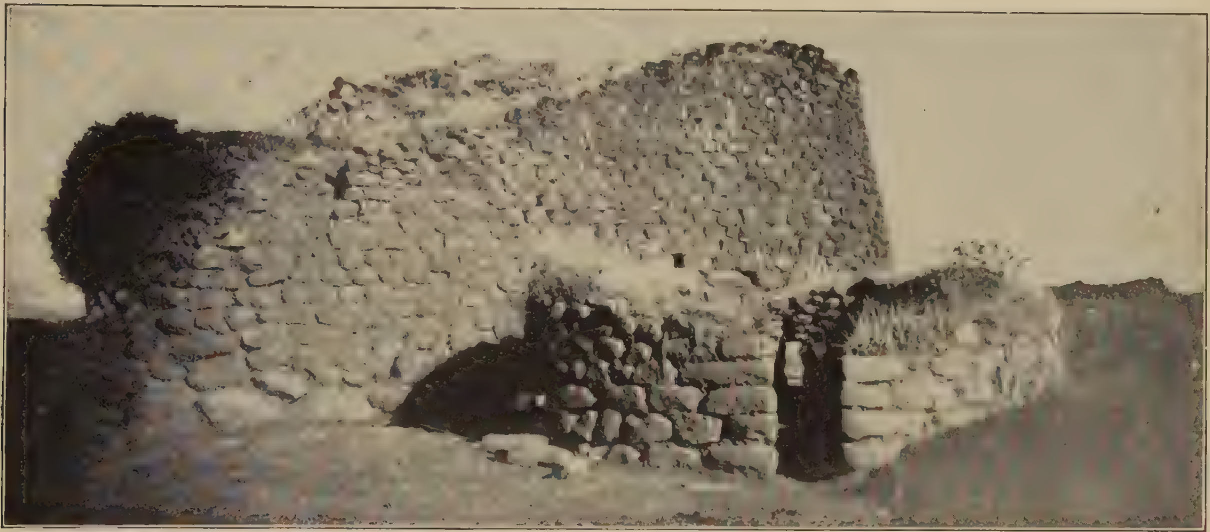


Fig. 2.—NURAGHE LOSA, NEAR ABBASANTA.

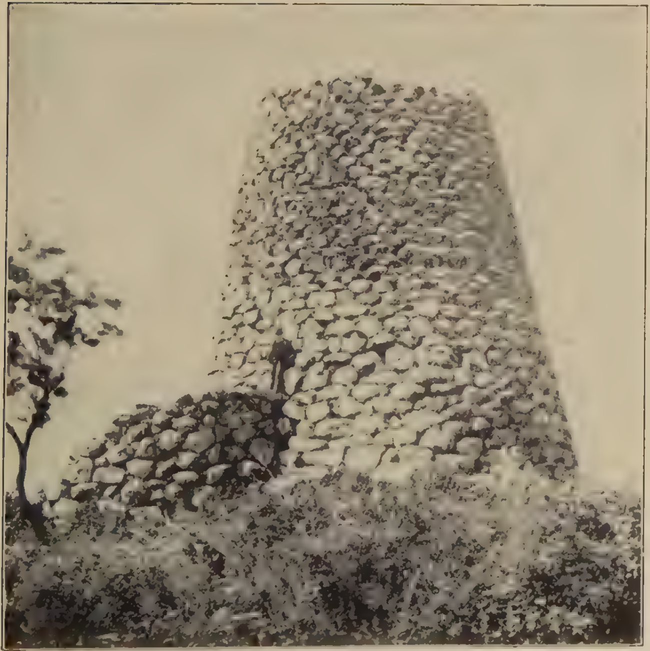


Fig. 3.—NURAGHE MADRONE, NEAR SILANUS.

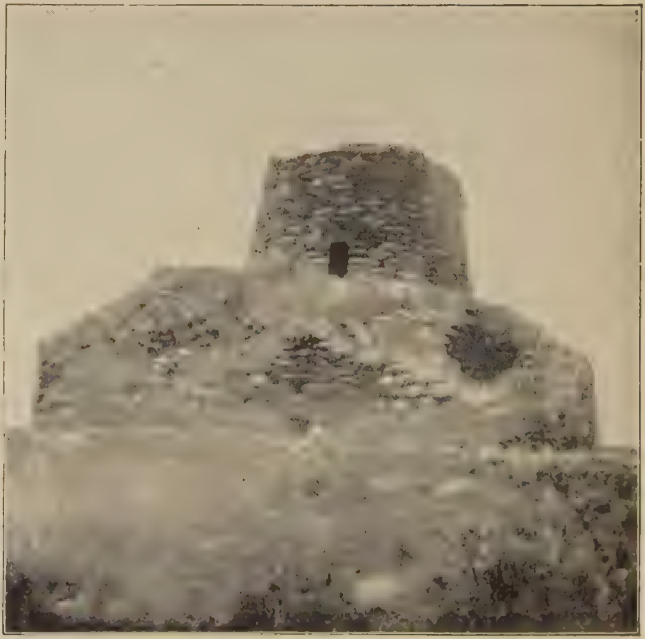
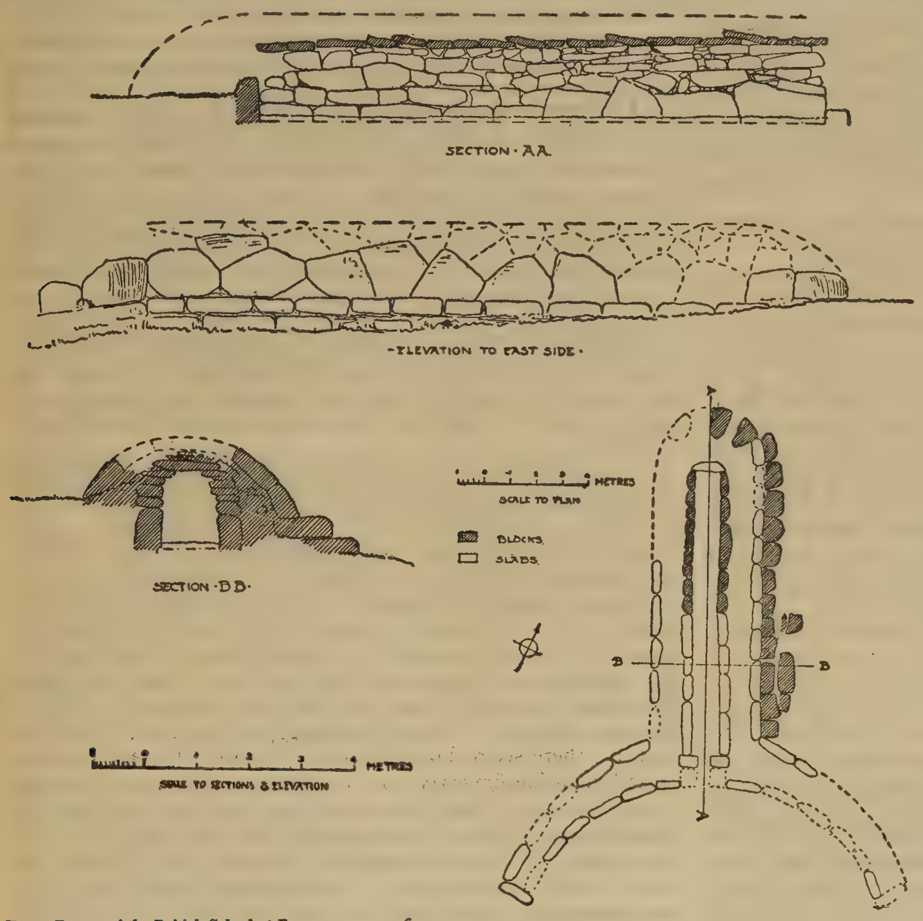


Fig. 4.—NURAGHE OROLO, NEAR BORDIGHALI.

Photos by Dr T. Ashby.

Tombs.

They are distributed over the whole island, but are perhaps most frequent towards the centre and in the Nurra. They seem to be almost entirely lacking in the north-east extremity, near Terranova, and in the mountains immediately to the north of Iglesias, though they are found to the north of the Perda de sa Mesa. In the district of Gennargentu they occur, rarely, as much as 3600 ft. above sea-level. The tombs of their inhabitants are of two classes—the so-called *tombe dei giganti*, or giants' tombs, and the *domus de gianas*, or houses of the spirits. The former are generally found close to, or at least in sight of, the nuraghe to which they belong. They consist of a chamber about 3½ ft. or less in height and width, with the sides slightly inclined towards one another, and from 30 to 40 ft., or even more, in length; the sides are composed sometimes of slabs, sometimes of rough walling, while the roof is composed of flat slabs; and the bodies were probably disposed in a sitting position. At the front is a large slab, sometimes carved, with a small aperture in it, through which offerings might be inserted. On each side of this is a curve formed of two rows of slabs or two small walls; the semicircular space thus formed has a diameter of about 45 ft., and was probably intended for sacrifices. The tomb proper was no doubt covered with a mound of earth, which has in most cases disappeared. Close to these tombs smaller round enclosures, about 4 ft. in diameter, covered with a heap of stones, like a small cairn, may sometimes be seen; these were possibly intended for the burial of slaves or less important members of the tribe. Dolmens (probably to be regarded as a simpler form of the *tomba dei giganti*, inasmuch as specimens with chambers elongated after their first construction have been found) and menhirs are also present in Sardinia, though the former are very rare—that known as Sa Perda e S'altare, near the railway to the south of Macomer is illustrated by A. Taramelli in *Bullettino di Paleoetnologia*, xxxii. (1906), 268, but there are others. The latter, however, are widely distributed over the island, being especially frequent in the central and most inaccessible part. The *domus de gianas*, on the other hand, resemble closely the rock tombs of the prehistoric cemeteries of Sicily. They are small grottos cut in the rock. We thus have two classes of tombs in connexion with the nuraghi, and if these were to be held to be tombs also, habitations would be entirely wanting.[1]



From *Papers of the British School at Rome*, v. p. 119, fig. 11.

Fig. 4.—Giant's Tomb of Srigidanu.

Among the most curious relics of the art of the period is a group of bronze statuettes, some found at Uta near Cagliari and others near Teti, west of Fonni, in the centre of the island, of which many specimens are now preserved in the museum at Cagliari.

Phoenicians.

It is thus clear that in the Bronze Age Sardinia was fairly thickly populated over by far the greater part of its extent; this may explain the lack of Greek colonies, except for Olbia, the modern Terranova, and Neapolis on the west coast, which must from their names have been Greek, though we do not know when or by whom they were founded. Pausanias (x. 17. 5) attributes the foundation of Olbia to the Thespians and Athenians under Iolaus, while Solinus (i. 61) states that he founded other cities also. In any case the Phoenician settlements are the earliest of which we have any accurate knowledge. The date of the conquest by Carthage may perhaps be fixed at about 500–480 B.C., following the chronology of Justin Martyr (xviii. 7), inasmuch as up till that period colonization by the Greeks seems to have been regarded as a possible enterprise. The cities which they founded—Cornus, Tharros, Sulci, Nora, Carales—are all on the coast of the island, and it is doubtful to what extent they penetrated into the interior. Even in the 1st century B.C. there were still traces of Phoenician influence (Cicero, *Pro Scauro*, 15, 42, 45). There are signs of trade with Etruria as early as the 7th century B.C. The Carthaginians made it into an important grain-producing centre; and the Romans set foot in the island more than once during the First Punic War.

Roman period.

In 238 B.C. the Carthaginian mercenaries revolted, and the Romans took advantage of the fact to demand that the island should be given up to them, which was done. The native tribes opposed the Romans, but were conquered after several campaigns; the island became a province under the government of a *praetor* or *propraetor*, to whose jurisdiction Corsica was added soon afterwards. A rebellion in 215 B.C., fostered by the Carthaginians, was quelled by T. Manlius Torquatus (Livy xxiii. 40). After this the island began to furnish considerable supplies of corn; it was treated as a conquered country, not containing a single free city, and the inhabitants were obliged to pay a tithe in corn and a further money contribution. It was classed with Sicily and Africa as one of the main sources of the corn-supply of Rome. There were salt-works in Sardinia too as early as about 150 B.C., as is attested by an inscription assigned to this date in Latin, Greek and Punic, being a dedication by one Cleon salari(us) soc(iorum) s(ervus) (*Corp. Inscr. Lat.* x. 7856). We only hear of two insurrections of the mountain tribes, in 181, when no less than 80,000 Sardinian slaves[2] were brought to Rome by T. Sempronius Gracchus, and in 114 B.C., when M. Caecilius Metellus was proconsul and earned a triumph after two years' fighting: but even in the time of Strabo there was considerable brigandage. Inscriptions record the boundaries of the territories of various tribes with outlandish names otherwise unknown to us (*Corp. Inscr. Lat.* x. 7889. 7930).

Some light is thrown on the condition and administration of the island in the 1st century B.C. by Cicero's speech (of which a part only is preserved) in defence of M. Aemilius Scaurus (*q.v.*), praetor in 53 B.C. Cicero, speaking no doubt to his brief, gives them a very bad character, adding "ignoscent alii viri boni ex Sardinia; credo enim esse quosdam" (§ 43). In the division of provinces made by

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[1] The whole question is well dealt with by F. Nissardi in *Atti del Congresso delle Scienze Storiche* (Rome, 1903), vol. v. (*Archeologia*), 651 sqq.; cf. *Builder*, May 18, 1907 (xcii. 589).

[2] The large number of slaves is said to have given rise to the phrase *Sardi venales* for anything cheap or worthless.

Augustus, Sardinia and Corsica fell to the share of the senate, but in A.D. 6, Augustus, owing to the frequent disturbances, took them over and placed them under a *praefectus*. Tiberius sent 4000 Jewish and Egyptian freedmen to the island to bring the brigands to submission (Tac. *Ann.* ii. 85). Later on two cohorts were quartered there and also detachments of the *Classis Misenas*, as the discharge certificates (*tabulae honestae missionis*) of the former and tombstones of the latter found in the island[1] show (*C.I.L.* x. 777). In A.D. 67 Nero restored Sardinia to the senate (but not Corsica) in exchange for Achaea, and the former was then governed by a *legatus pro praetore*; but Vespasian took it over again before A.D. 78, and placed it under an imperial *procurator* as *praefectus*. It returned to the senate, not before A.D. 83 but certainly before the reign of M. Aurelius, when we find it governed by a proconsul, as it was under Commodus; the latter, or perhaps Septimius Severus, took it over again and placed it under a *procurator* as *praefectus* once more (D. Vaglieri in *Notizie degli scavi*, 1897, 280).

A bronze tablet discovered in 1866 near the village of Esterzili is inscribed with a decree of the time of Otho with regard to the boundaries of three tribes, the Gallienses, Patulienses and Campani, who inhabited the eastern portion of the island. The former tribe had crossed the boundaries of the other two, and was ordered to withdraw immediately under pain of punishment (*Corp. inscr. Lat.* x. 7852). Carales was the only city with Roman civic rights in Sardinia in Pliny's time (when it received the privilege is unknown) and by far the most important place in the island; a Roman colony had been founded at Turris Libisonis (Porto Torres) and others, later on, at Usellis and Cornus.

We hear little of the island under the Empire, except as a granary and as remarkable for its unhealthiness and the audacity of its brigands. It was not infrequently used as a place of exile.

Towns and tribes.

A number of Roman towns are known to us. Besides those already mentioned, including the Phoenician cities (all of which continued to exist in Roman days) the most important were Bosa (*q.v.*), Forum Traiani (mod. Fordungianus) (*q.v.*), Neapolis and Othoca (mod. Oristano, *q.v.*). An interesting group of Roman houses was found in 1878 at Bacu Abis, 5 m. W. of Iglesias, but has been covered up again (F. Vivanet in *Notizie degli scavi*, 1878, 271). The name Barbaria for the mountainous district in the east centre of Sardinia, in the district of Nuoro, which still exists in the form Barbargia, goes back to the Roman period, the *civitates Barbariae* being mentioned in an inscription of the time of Tiberius (*Corp. inscr. Lat.* xiv. 2954). The Barbaricini are mentioned in the 6th century A.D. by Procopius, who wrongly derives the name from several thousand Moors and Numidians who were banished to the island by the Vandal kings, while Gregory the Great speaks of them in a letter (iv. 23) to Hospito, their chief, as a still pagan race, worshipping stocks and stones. The towns were connected by a considerable network of roads, with a total length of 958 Roman miles according to the Itineraries, the most important of which ran from Carales to Turris Libisonis (Porto Torres) through the centre of the island, passing Othoca (Oristano) and Forum Traiani. Its line is followed closely by the modern highroad and railway. A portion of its course, however, between Forum Traiani and the modern Abbasanta, is not so followed, and is still well preserved. Its width is as a rule about 24 ft.; at present its surface is formed of rough cobbling, upon which there was probably a gravel layer, now washed away. Several milestones belonging to it have been discovered, including one of the time of Augustus and one of Claudius near Forum Traiani, and one of Nero near Turris Libisonis, though it was probably not completed right through until a later period (T. Mommsen in *Corp. inscr. Lat.* x. 833; cf. *Eph. epigr.* viii. 181-183). A branch from this road ran to Olbia (followed closely by the modern highroad and railway also), and was perhaps the main line of communication, though the itineraries state that the road from Carales to Olbia ran through the centre of the island by Biora, Valentia, Sorabile (near Fonni) and Caput Thyrsi.

Roads.

Many milestones belonging to the road from Carales to Olbia have been found, but all but one of them (which was seen at Valentia) belong to the portion of the road within 12 m. of the latter place, so that they might belong to either line (see OLBIA). The distance seems to be identical by either route. The itineraries give it as 176 m.—the exact distance in English miles by the modern railway! The difference between English and Roman miles would be compensated for by the more devious course taken by the railway. Turris Libisonis was also connected with Othoca by a road along the west coast, passing through Tharros, Cornus and Bosa; this road went on to Tibula[2] (Capo della Testa) at the north extremity of the island and so by the coast to Olbia. From Tibula another road ran inland to join the road from Carales to Olbia some 16 m. west of the latter. Carales was also connected with Olbia by a road along the east coast. The south-west corner of the island was served by a direct road from Carales westward through Decimomannu (note the name Decimo, a survival, no doubt, of a Roman post-station *ad decimum lapidem*), where there is a fine Roman bridge over 100 yds. long of fourteen arches, still well preserved. The width of the roadway is only 11 ft. There is also a road through Nora and along the coast past Sulci to Metalla and Neapolis, and thence to Othoca.

Byzantine period.

After the time of Constantine, the administration of Sardinia was separated from that of Corsica, each island being governed by a *praeses* dependent on the *vicarius urbis Romae*. In 456 it was seized by Genseric. It was retaken for a short time by Marcellianus, but was not finally recovered until the fall of the Vandal kingdom in Africa in 534, by Cyril. In 551 it was taken by Totila, but reconquered after his death by Narses for the Byzantine Empire. Under Byzantium it remained nominally until the 10th century, when we find the chief magistrate still bearing the title of ἄρχων.[3]

Saracens.

In the 8th century[4] (720) the period of Saracen invasion began; but the Saracens never secured a firm footing in the island. In 725 Luidprand purchased and removed to Pavia the body of St Augustine of Hippo from Cagliari, whither it had been brought in the 6th century by the exiled bishop of Hippo. In 815 Sardinia submitted to Louis the Pious, begging for his protection;[5] but the Saracens were not entirely driven out, and about A.D. 1000 the Saracen chief Musat established himself in Cagliari. Pope John XVIII. preached a crusade in 1004, promising to bestow the island (when or whether it had ever definitely passed into the power of the papacy is not absolutely clear) upon whoever should drive out the Saracens. The Pisans took up the challenge, and Musat was driven out of Cagliari with the help of the Genoese in 1022 for the third time. The Pisans and Genoese now disputed about the ownership of Sardinia, but the pope and the emperor decided in favour of Pisa. Musat returned to the island once more and made himself master of it, but was defeated and taken prisoner under the walls of Cagliari in 1050, when the dominion of Pisa was established.

Pisan period.

The island had (probably since the end of the 9th century) been divided into four districts—Cagliari, Arborea, Torres (or Logudoro) and Gallura—each under a *giudice* or judge, in whom the dignity became hereditary. *Judices* are already mentioned as existing in the account of the mission sent by Nicholas I. in 864 (Duchesne, *Liber pontificalis*, ii. 162), as though the single authority of the Byzantine ἄρχων was already weakened. The three ἄρχοντες who appear in the 10th-century inscriptions just mentioned bear alternately the names Torcotorius and Salusius; and, inasmuch as this is the case with the *judices* of Cagliari from the 11th to the 13th century, there seems no doubt that they were the successors of these Byzantine ἄρχοντες, who were perhaps the actual founders of the dynasty. These names, indeed, continue even after the Pisan family of Lacon-Massa had by marriage succeeded to the judicature. The Greek language occurs in their official seals down to the 13th century. Intermarriage (sometimes illicit) was apparently freely used by the dominant families for the concentration of their power. Thus we find that after the failure of Musat members of the family of Lacon-Unali filled all the four judicatures of the island (Taramelli, *Arch. stor. Sard.*, *cit.* 105). In the continual struggles between Pisa and Genoa some of these princes took the side of the latter. In 1164 Barisone, *giudice* of Arborea, was given the title of king of the whole island by Frederick Barbarossa, but his supremacy was never effective. In 1241 Adelasia, heiress of Gallura and Logudoro, was married as her third husband to Enzio, the natural son of Frederick II., who received the title of king of Sardinia from his father, but fell into the hands of the Bolognese in 1249, and remained a prisoner at Bologna until his death. After this the Pisan supremacy of the island seems to have become more of a reality, but Arborea remained independent, and after the defeat of the Pisans by the Genoese at the naval battle of Meloria in 1284 they were obliged to surrender Sassari and Logudoro to Genoa. In 1297 Boniface VIII. invested James II., the king of Aragon, with Sardinia; but it was not until 1323 that he attempted its conquest, nor until 1326 that the Pisans were finally driven out of Cagliari, which they had fortified in 1305–1307 by the construction of the Torre di S. Pancrazio and the Torre dell' Elefante, and which became the seat of the Aragonese government. To the Pisan period belong a number of fine Romanesque churches, among which may be specially mentioned those of Ardara, S. Giusta near Oristano, La Trinità di Saccargia and Tratalias (see D. Scano, *op. cit. infra*).

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[1] The discharge certificates of sailors from the *Classis Misenas* and *Classis Ravennatis* belonged to Sardinians who had returned home after service in those fleets.

[2] Excavations made in 1880 at Tibula and Sorabile resulted in the discovery at the former of a necropolis of the late Empire, in which the dead were buried in long amphorae, while at the latter Roman baths were explored (F. Vivanet in *Notizie degli scavi*, 1879, 350; 1881, 29 sqq.).

[3] Three inscriptions of the middle of this century, set up by the ἄρχων Σαρδηνίας with the title *protospatarius*, are illustrated by A. Taramelli in *Notizie degli scavi* (1906), 123 sqq.; cf. *Archivio storico Sardo* (1907), 92; and there are a few churches of the Byzantine period and style, a considerable number of Byzantine inscriptions, dedications to Greek saints, and other traces of the influence of the Eastern Empire in the island.

[4] Some authorities attribute to 774, others to 817, a donation of Sardinia to the papacy; we hear of Pope Nicholas I. sending legates in 865 to quell disturbances and check evil practices in the island.

[5] There is no authentic history for the intervening period; the famous "pergamène d'Arborea," published by P. Martini in 1863 at Cagliari, have been shown to be modern forgeries.

Aragonese period.

The Aragonese enjoyed at first the assistance of the *giudici* of Arborea, who had remained in power; but in 1352 war broke out between Mariano IV. and the Aragonese, and was carried on by his daughter Eleonora, wife of Brancaleone Doria of Genoa, until her death in 1403. Peter IV. had meanwhile in 1355 called together the Cortes (parliament) of the three estates (the nobles, the clergy and the representatives of the towns) for the first time after the model of Aragon. After 1403 the Aragonese became masters of Arborea also. The title of *giudice* was abolished and a feudal marquisate substituted. The *carta de logu* (del luogo) or code of laws issued by her was in 1421 extended to the whole island by the cortes under the presidency of Alphonso V., who visited Sardinia in that year. In 1478 the marquisate of Oristano was suppressed, and henceforth the island was governed by Spanish viceroys with the feudal régime of the great nobles under them, the Cortes being convoked once every ten years. Many of the churches show characteristic Spanish Late Gothic architecture which survived until a comparatively recent period. The Renaissance had little or no influence on Sardinian architecture and culture.

Modern history.

The island remained a Spanish province until the War of the Spanish Succession, when in 1708 Cagliari capitulated to an English fleet, and the island became Austrian; the *status quo* was confirmed by the peace of Utrecht in 1713. In 1717, however, Cardinal Alberoni retook Cagliari for Spain; but this state of things was short-lived, for in 1720, by the treaty of London, Sardinia passed in exchange for Sicily to the dukes of Savoy, to whom it brought the royal title. The population was at that time a little over 300,000; public security and education were alike lacking, and there were considerable animosities between different parts of the island. Matters improved considerably under Charles Emmanuel III., in whose reign of forty-three years (1730–1773) the prosperity of the island was much increased. The French attacks of 1792–1793 were repelled by the inhabitants, Cagliari being unsuccessfully bombarded by the French fleet, and the refusal by Victor Amadeus III. to grant them certain privileges promised in consideration of their bravery led to the revolution of 1794–1796. In 1799 Charles Emmanuel IV. of Savoy took refuge in Cagliari after his expulsion by the French, but soon returned to Italy. In 1802 he abdicated in favour of his brother Victor Emmanuel I., who in 1806 returned to Cagliari and remained there until 1814, when he retired, leaving his brother, Carlo Felice, as viceroy. Carlo was successful in repressing brigands, but had to deal with much distress from famine. In 1821 he became king of Savoy by the abdication of his brother, and the construction of the highroad from Cagliari to Porto Torres was begun (not without opposition on the part of the inhabitants) in 1822. Feudalism was abolished in 1836, and in 1848 complete political union with Piedmont was granted, the viceregal government being suppressed, and the island being divided into three divisions of which Cagliari, Sassari and Nuoro were the capitals. General A. La Marmora was appointed royal commissioner to supervise the transformation to the new régime.

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SARDIS, more correctly SARDES (*αἱ Σάρδεις*), the capital of the ancient kingdom of Lydia, the seat of a *conventus* under the Roman Empire, and the metropolis of the province Lydia in later Roman and Byzantine times, was situated in the middle Hermus valley, at the foot of Mt. Tmolus, a steep and lofty spur of which formed the citadel. It was about 2½ m. S. of the Hermus. The earliest reference to Sardis is in the *Persae* of Aeschylus (472 B.C.); in the *Iliad* the name Hydē seems to be given to the city of the Maeonian (*i.e.* Lydian) chiefs, and in later times Hydē was said to be the older name of Sardis, or the name of its citadel. It is, however, more probable that Sardis was not the original capital of the Maeonians, but that it became so amid the changes which produced the powerful Lydian empire of the 8th century B.C. The city was captured by the Cimmerians in the 7th century, by the Persians and by the Athenians in the 6th, and by Antiochus the Great at the end of the 3rd century. Once at least, under the emperor Tiberius, in A.D. 17, it was destroyed by an earthquake; but it was always rebuilt, and was one of the great cities of western Asia Minor till the later Byzantine time. As one of the Seven Churches of Asia, it was addressed by the author of the Apocalypse in terms which seem to imply that its population was notoriously soft and faint-hearted. Its importance was due, first to its military strength, secondly to its situation on an important highway leading from the interior to the Aegean coast, and thirdly to its commanding the wide and fertile plain of the Hermus.

The early Lydian kingdom was far advanced in the industrial arts (see LYDIA), and Sardis was the chief seat of its manufactures. The most important of these trades was the manufacture and dyeing of delicate woollen stuffs and carpets. The statement that the little stream Pactolus which flowed through the market-place rolled over golden sands is probably little more than a metaphor, due to the wealth of the city to which the Greeks of the 6th century B.C. resorted for supplies of gold; but trade and the organization of commerce were the real sources of this wealth. After Constantinople became the capital of the East a new road system grew up connecting the provinces with the capital. Sardis then lay rather apart from the great lines of communication and lost some of its importance. It still, however, retained its titular supremacy and continued to be the seat of the metropolitan bishop of the province of Lydia, formed in A.D. 295. It is enumerated as third, after Ephesus and Smyrna, in the list of cities of the Thracesian *thema* given by Constantine Porphyrogenitus in the 10th century; but in the actual history of the next four centuries it plays a part very inferior to Magnesia ad Sipylum and Philadelphia (see ALA-SHEHR), which have retained their pre-eminence in the district. The Hermus valley began to suffer from the inroads of the Seljuk Turks about the end of the 11th century; but the successes of the Greek general Philocales in 1118 relieved the district for the time, and the ability of the Comneni, together with the gradual decay of the Seljuk power, retained it in the Byzantine dominions. The country round Sardis was frequently ravaged both by Christians and by Turks during the 13th century. Soon after 1301 the Seljuk amirs overran the whole of the Hermus and Cayster valleys, and a fort on the citadel of Sardis was handed over to them by treaty in 1306. Finally in 1390 Philadelphia, which had for some time been an independent Christian city, surrendered to Sultan Bayezid's mixed army of Ottoman Turks and Byzantine Christians, and the Seljuk power in the Hermus valley was merged in the Ottoman empire. The latest reference to the city of Sardis relates its capture (and probable destruction) by Timur in 1402. Its site is now absolutely deserted, except that a tiny village, Sart, merely a few huts inhabited by semi-nomadic Yuruks, exists beside the Pactolus, and that there is a station of the Smyrna & Cassaba railway 1 m. north of the principal ruins.

The ruins of Sardis, so far as they are now visible, are chiefly of the Roman time; but though few ancient sites offered better hope of results, the necessity for heavy initial expenditure was a deterrent (*e.g.* to H. Schliemann). On the banks of the Pactolus two columns of a temple of the Greek period, probably the great temple of Cybele, are still standing. More than one attempt to excavate this temple, the last by G. Dennis in 1882, has been made and prematurely brought to an end by lack of funds. In 1904 a few trial pits were sunk by M. Mendel for the Constantinople Museum, and the site was ultimately conceded to an American syndicate, for whom H. C. Butler of Princeton University undertook the task of excavation. The necropolis of the old Lydian city, a vast series of mounds, some of enormous size, lies on the north side of the Hermus, 4 or 5 m. from Sardis, a little south of the sacred Gygaean Lake, Coloe; here the Maeonian chiefs, sons, according to Homer, of the lake, were brought to sleep beside their mother. The series of mounds is now called Bin Tepe (Thousand Mounds). Several of them have been opened by modern excavators, but in every case it was found that treasure-seekers of an earlier time had removed any articles of value which had been deposited in the sepulchral chambers.

See K. Buresch, *Aus Lydien* (1898); G. Radet, *La Lydie* (1893); *Kybebe* (1908); W. M. Ramsay, *The Letters to the Several Churches* (1904), and article in Hastings' *Dict. of the Bible* (1902). (D. G. H.)

SARDONYX, an ornamental stone much used for seals and cameos. It usually consists of a layer of sard or carnelian with one of milk-white chalcedony, but it may present several alternating layers of these minerals. The sardonyx is therefore simply an onyx in which some of the bands are of sard or carnelian: if, however, the latter is present the stone is more appropriately called a "carnelian onyx." It was considered by ancient authorities that a fine Oriental sardonyx should have at least three strata—a black base, a white intermediate zone and a superficial layer of brown or red; these colours typifying the three cardinal virtues—humility (black), chastity (white) and modesty or martyrdom (red). The ancients obtained sardonyx from India, and the Indian locality, Mount Sardonyx, referred to by Ptolemy, is supposed to have been near Broach, where agates and carnelians are still worked. In the Revised Version of the Old Testament, Ex. xxviii. 18, "sardonyx" is given in the margin as an alternative reading for "diamond," the word by which the Hebrew *yahalom* is usually translated. The stone known to the Romans as *aegyptilla* may have been a kind of sardonyx, or perhaps a *nicolo*, which is an onyx with a thin translucent milky layer on the surface. Imitations of sardonyx have been made by cementing together two or three stones of the required colours, while baser counterfeits have been produced in paste. By coating a sard or carnelian with sodium carbonate and then placing the stone on a red-hot iron a white layer may be produced, so that a kind of sardonyx is obtained (see Carnelian). Most of the modern sardonyx is cut from South American agate, modified in colour by artificial treatment. (See Agate; Gem.)

SARDOU, VICTORIEN (1831–1908), French dramatist, was born in Paris on the 5th of September 1831. The Sardous were settled at Le Cannet, a village near Cannes, where they owned an estate, planted with olive trees. A night's frost killed all the trees and the family was ruined. Victorien's father, Antoine Léandre Sardou, came to Paris in search of employment. He was in succession a book-keeper at a commercial establishment, a professor of book-keeping, the head of a provincial school, then a private tutor and a schoolmaster in Paris, besides editing grammars, dictionaries and treatises on various subjects. With all these occupations, he hardly succeeded in making a livelihood, and when he retired to his native country, Victorien was left on his own resources. He had begun studying medicine, but had to desist for want of funds. He taught French to foreign pupils; he also gave lessons in Latin, history and mathematics to students, and wrote articles for cheap encyclopaedias. At the same time he was trying to make headway in the literary world. His talents had been encouraged by an old *bas-bleu*, Mme de Bawl, who had published novels and enjoyed some reputation in the days of the Restoration. But she could do little for her *protégé*. Victorien Sardou made efforts to attract the attention of Mlle Rachel, and to win her support by submitting to her a drama, *La Reine Ulfra*, founded on an old Swedish chronicle. A play of his, *La Taverne des étudiants*, was produced at the Odéon on the 1st of April 1854, but met with a stormy reception, owing to a rumour that the *débutant* had been instructed and commissioned by the government to insult the students. *La Taverne* was withdrawn after five nights. Another drama by Sardou, *Bernard Palissy*, was accepted at the same theatre, but the arrangement was cancelled in consequence of a change in the management. A Canadian play, *Fleur de Liane*, would have been produced at the Ambigu but for the death of the manager. *Le Bossu*, which he wrote for Charles Albert Fechter, did not satisfy the actor; and when the play was successfully produced, the nominal authorship, by some unfortunate arrangement, had been transferred to other men. M Sardou submitted to Adolphe Montigny (Lemoine-Montigny), manager of the Gymnase, a play entitled *Paris à l'envers*, which contained the love scene, afterwards so famous, in *Nos Intimes*. Montigny thought fit to consult Eugène Scribe, who was revolted by the scene in question.

Sardou felt the pangs of actual want, and his misfortunes culminated in an attack of typhoid fever. He was dying in his garret, surrounded with his rejected manuscripts. A lady who was living in the same house unexpectedly came to his assistance. Her name was Mlle de Brécourt. She had theatrical connexions, and was a special favourite of Mlle Déjazet. She nursed him, cured him, and, when he was well again, introduced him to her friend. Then fortune began to smile on the author. It is true that *Candide*, the first play he wrote for Mlle Déjazet, was stopped by the censor, but *Les Premières Armes de Figaro*, *Monsieur Garat*, and *Les Prés Saint Gervais*, produced almost in succession, had a splendid run, and *Les Pattes de mouche* (1860: afterwards anglicized as *A Scrap of Paper*) obtained a similar success at the Gymnase. *Fédora* (1882) was written expressly for Sarah Bernhardt, as were many of his later plays. He soon ranked with the two undisputed leaders of dramatic art, Augier and Dumas. He lacked the powerful humour, the eloquence and moral vigour of the former, the passionate conviction and pungent wit of the latter, but he was a master of clever and easy flowing dialogue. He adhered to Scribe's constructive methods, which combined the three old kinds of comedy—the comedy of character, of manners and of intrigue—with the *drame bourgeois*, and blended the heterogeneous elements into a compact body and living unity. He was no less dexterous in handling his materials than his master had been before him, and at the same time opened a wider field to social satire. He ridiculed the vulgar and selfish middle-class person in *Nos Intimes* (1861: anglicized as *Peril*), the gay old bachelors in *Les Vieux Garçons* (1865), the modern Tartufes in *Séraphine* (1868), the rural element in *Nos Bons Villageois* (1866), old-fashioned customs and antiquated political beliefs in *Les Ganaches* (1862), the revolutionary spirit and those who thrive on it in *Rabagas* (1872) and *Le Roi Carotte* (1872), the then threatened divorce laws in *Divorçons* (1880).

He struck a new vein by introducing a strong historic element in some of his dramatic romances. Thus he borrowed *Théodora* (1884) from Byzantine annals, *La Haine* (1874) from Italian chronicles, *La Duchesse d'Athènes* from the forgotten records of medieval Greece. *Patrie* (1869) is founded on the rising of the Dutch *gueux* at the end of the 16th century. The scene of *La Sorcière* (1904) was laid in Spain in the 16th century. The French Revolution furnished him with three plays, *Les Merveilleuses*, *Thermidor* (1891) and *Robespierre* (1902). The last named was written expressly for Sir Henry Irving, and produced at the Lyceum theatre, as was *Dante* (1903). The imperial epoch was revived in *La Tosca*[1] (1887) and *Madame Sans Gêne* (1893). Later plays were *La Piste* (1905) and *Le Drame des poisons* (1907). In many of these plays, however, it was too obvious that a thin varnish of historic learning, acquired for the purpose, had been artificially laid on to cover modern thoughts and feelings. But a few—*Patrie* and *La Haine* (1874), for instance—exhibit a true insight into the strong passions of past ages.

M. Sardou married his benefactress, Mlle de Brécourt, but eight years later he became a widower, and soon after the revolution of 1870 was married a second time, to Mlle Soulié, the daughter of the erudite Eudore Soulié, who for many years superintended the Musée de Versailles. He was elected to the French Academy in the room of the poet Joseph Autran (1813–1877), and took his seat on the 22nd of May 1878. He died at Paris on the 8th of November 1908.

See L. Lacour, *Trois théâtres* (1880); Brander Matthews, *French Dramatists* (New York, 1881); R. Doumic, *Écrivains d'aujourd'hui* (Paris, 1895); F. Sarcey, *Quarante ans de théâtre* (vol. vi., 1901).

SARGASSO SEA, a tract of the North Atlantic Ocean, covered with floating seaweed (*Sargassum*, originally named *sargaço* by the Portuguese). This tract is bounded approximately by 25° and 30° N. and by 38° and 60° W., but its extent varies according to winds and ocean currents. By these agencies the weed is carried and massed together, the original source of supply being probably the Caribbean Sea and Gulf of Mexico (see Algae). Similar circumstances lead to the existence of other similar tracts covered with floating weed, *e.g.* in the solitary part of the Pacific Ocean, north of the Hawaiian islands, between 30° and 40° N. and between 150° and 180° W. There is a smaller tract S.E. of New Zealand, and along a belt of the southern ocean extending from the Falkland Islands, south of Africa and south-west of Australia, similar floating banks of weed are encountered. The Sargasso Sea was discovered by Columbus, who on his first voyage was involved in it for about a fortnight. The widely credited possibility of ships becoming embedded in the weed, and being unable to escape, is disproved by the expedition of the "Michael Sars," under the direction of Sir John Murray and the Norwegian government, in 1910, which found the surface covered with weed only in patches, not continuously.

SARGENT, JOHN SINGER (1856–), American artist, son of a distinguished Boston physician, was born at Florence, Italy, on the 12th of January 1856. He was educated in Italy and Germany, and in 1874 entered the atelier of Carolus-Duran in Paris. He received an "honourable mention" in the Salon of 1878 for his "En route pour la pêche," and in 1881 a second class medal for his "Portrait of a Young Lady" (made famous by Henry James's appreciation). In 1886 his "Carnation, Lily, Lily, Rose," exhibited at the Royal Academy, was bought for the Chantrey Bequest. He rapidly became known in London as a brilliant portrait painter, and year by year his Academy portraits were the leading features of its exhibitions. Though of the French school, and American by birth, it is as a British artist that he won fame by his vogue as the most sought-after portrait painter of the day, his sitters including the men and women of greatest distinction in the literary, artistic and social life of Europe and America. While best known, and consequently busily employed, as a portrait painter, he had at the same time a disposition towards other, and especially decorative work; his paintings of Brittany, Venice and Eastern scenes are less known, but his labour of love, the ornate decorations for the Boston public library (completed in 1903), "The Pageant of Religion," shows the other side of his genius. Among his pictures in public galleries not already mentioned are "El Jaleo" (exhibited 1882), in the Boston Art Museum; "La Carmencita," in the Luxembourg; "Coventry Patmore," in the National Portrait Gallery, London; and "Henry Marquand" (1887), in the Metropolitan Museum, New York. He was elected an A.R.A. in 1894, and R.A. in 1897; he was the recipient of various medals of honour, and was made a member of the chief artistic societies of Europe and America.

SARGON, more correctly Sarru-Kinu ("the legitimate king," Sargon being a hybrid formation from the Semitic *sar* and the Sumerian *gina*, "established"), an Assyrian general who, on the death of Shalmaneser IV., during the siege of Samaria, seized the crown on the 12th of Tebet 722 B.C. He claimed to be the descendant of the early kings, and accordingly assumed the name of a famous king of Babylonia who had reigned about 3000 years before him. His first achievement was the capture of Samaria, 27,200 of its inhabitants being carried into captivity. Meanwhile Babylon had revolted under a Chaldaean prince, Merodach-baladan, who maintained his power there for twelve years. In 720 B.C. Yahu-bihdi of Hamath led Arpad, Damascus and Palestine into revolt: this was suppressed, and the Philistines and Egyptians were defeated at Raphia (mod. er-Rafa). In 719 B.C. Sargon defeated the Minni to the east of Armenia, and in 717 overthrew the combined forces of the Hittites and Moschi (Old Testament Meshech). The Hittite city of Carchemish was placed under an Assyrian governor, and its trade passed into Assyrian hands. The following year Sargon was attacked by a great confederacy of the northern nations—Ararat, the Moschi, Tibareni, &c.—and in the course of the campaign marched into the land of the Medes in the direction of the Caspian. In 715 B.C. the Minni were defeated, and one of their chiefs, Dāyuku or Daiukku (Deioces), transported to Hamath. In 714 B.C. the army of Rusas of Ararat was annihilated, and a year later five Median chiefs, including Arbaku (Arbaces) became tributary. Cilicia and the Tibareni also submitted as well as the city of Malatia, eastern Cappadocia being annexed to the Assyrian Empire. A league was now formed between Merodach-baladan and the princes of the west, but before the confederates could move, an Assyrian army was sent against Ashdod, and Edom, Moab and Judah submitted to Sargon, who was thus free to turn his attention to Babylonia, and Merodach-baladan was accordingly driven from Babylon, where Sargon was crowned king. Shortly after this Sargon sent a statue of himself to Cyprus and annexed the kingdom of Commagene. He was murdered in 705 B.C., probably in the palace he had built at Dur-Sargina, now Khorsabad, which was excavated by P. E. Botta. (A. H. S.)

SĀRI, a town of Persia, in the province of Mazandaran, on the left bank of the Tejen river, 80 m. S.W. of Astarabad. Pop. 10,000. It is the seat of the governor of Mazandaran, and has post and telegraph offices. The town is picturesque but very unhealthy, has stone-paved streets and houses built of brick and covered with green and red glazed tiles.

SARIPUL, or Siripul, a town and khanate of Afghan Turkestan. The town lies 100 m. S.W. of Balkh; estimated pop. 18,000. Two-thirds of the people are Uzbegs and the rest Hazaras. The khanate, which lies between Balkh and Maimana, is one of the "four domains" which were in dispute between Bokhara and Kabul, and were allotted to the Afghans by the Anglo-Russian boundary agreement of 1873.

SĀRIPUTTA, one of the two principal disciples of Gotama the Buddha. He was born in the middle of the 6th century B.C. at Nāla, a village in the kingdom of Magadha, the modern Behar, just south of the Ganges and a little east of where Patna now stands. His personal name was Upatissa; the name of his father, who was a brahmin, is unknown; his mother's name was Sārī, and it was by the epithet or nickname of Sāriputta (that is "Sārī's son"), that he was best known. He had three sisters, all of whom subsequently entered the Buddhist Order. When still a young man he devoted himself to the religious life, and followed at first the system taught by Sañjaya of the Belattha clan. A summary of the philosophical position of this teacher has been preserved in the Dialogue called *The Perfect Net*.

According to this account his main tendency was to avoid committing himself to any decided conclusion on any one of the numerous points then discussed so eagerly among the clansmen in the valley of the Ganges. Early in the Buddhist movement Sāriputta had a conversation with one of the men who had just joined it; and the Buddhist quoted to him the now famous stanza, "Of all the things that proceed from a cause, the Buddha the cause hath told; and he tells too how each shall come to an end—such alone is the word of the Sage." The result was that Sāriputta, with his friend Kolita and other disciples of Sañjaya, asked for admission, and were received into the Buddhist Order. He rapidly attained to mastery in the Buddhist system of self-training, and is declared to have been the chief of all the disciples in insight. He was present at a dialogue between the Buddha and a Wanderer named Aggivessana on the nature of sensations; and at the end of that discourse he attained to Arahatship. He is constantly represented as discussing points, usually of ethics or philosophy, either with the Buddha himself, or with one or other of the more prominent disciples. One whole book of the Saṃyutta is therefore called after his name. A number of stanzas inscribed to him are preserved in the *Songs of the Elders* (Thera-gāthā), and one of the poems in the Sutta Nipāta is based on a question he addressed to the Buddha. Asoka the Great, in his Bhabra Edict, enjoins on the Buddhists the study of seven passages in the Scriptures selected for their especial beauty. One of these is called *The Question of Upatissa*, and this poem may be the passage referred to. Feeling his end approaching, he went home, and died just six months before the death of the Buddha, that is, approximately in 480 B.C. He was cremated with great ceremony, and the ashes placed in a tope or burial-mound. An inscribed casket in such a mound at Sāñchi opened by Cunningham in February 1851 contained a portion of these ashes which had been removed to that spot, in General Cunningham's opinion by Asoka.

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[1] Adapted as an opera for the music of Puccini (Rome, 14th Jan. 1900).

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(T. W. R. D.)

SARK, a small island of the Channel Islands, 7 m. E. of Guernsey, much visited on account of its magnificent cliff-scenery and caves. It is 3 m. long from N. to S. and 1½ m. in extreme breadth. Area, 1274 acres; pop. (1901) 504. It is divided into two unequal parts, known as Great Sark (the more northern) and Little Sark, connected by the Coupée, a lofty isthmus so narrow at the summit that it bears only a roadway, artificially built up, and flanked by a precipice on either side. Many islets and detached rocks lie off the coast; Brechou Island to the west is large enough to have a few fields and a house upon it. Some of the rocks are very fine, such as the four lofty flat-topped pillars called the Autelets (altars).

The harbour of Sark lies on the east coast, a tiny cliff-bound bay protected by a breakwater, communicating with the interior only through two tunnels, one of which is modern, while the other dates from 1588. The harbour is called Creux. This is a term of common use in the Channel Islands, applying primarily to natural funnels or pits, but extended also to clefts such as that which forms the harbour. The Creux du Derrible (Old French, a downfall of rocks) is a wide shaft opening from the summit of the cliff and communicating with the sea through a double cave, through which the sea rushes at high water. Of the many majestic caverns in the cliffs the Boutiques and the Gouliots, both on the west coast of Great Sark, may be specially mentioned. The marine fauna is very rich. On Great Sark are the majority of the houses, the church, and the *seigneurie* or manor-house. An ancient mill stands at the summit of the island (375 ft.). Agriculture and fishing are carried on. In Little Sark a disused shaft marks a silver-mine, worked in 1835, but soon abandoned. The island is included in the bailiwick of Guernsey, but has a court of justice of feudal character, the officers being appointed by the *seigneur*.

SARLAT, a town of south-western France, capital of an arrondissement in the department of Dordogne, 44 m. E. by N. of Bergerac on the railway to Aurillac. Pop. (1906) town 4018, commune 6195. The town grew up round a monastery founded in the 8th century and early in the 14th century became the seat of a bishopric which was suppressed in 1790. The former cathedral and abbey-church preserves interesting architecture of the Romanesque and later periods and remarkable wood-carving of the 15th century. There is also a curious pyramidical structure of the 12th century, which was probably used as a burial-place. The house where Étienne de la Boétie (d. 1563), the moralist, was born, and other houses in the Gothic and Renaissance styles are to be seen. La Boétie has a statue in the town. There is a large trade in cattle. Distilling, the manufacture of tin-boxes, and the preparation of truffles, pâtés de foie gras and other delicacies and of nut-oil are carried on; there are coal and iron mines and stone-quarries in the vicinity.

SARMATAE, or SAUROMATAE (the second form is mostly used by the earlier Greek writers, the other by the later Greeks and the Romans), a people whom Herodotus (iv. 21. 117) puts on the eastern boundary of Scythia (*q.v.*) beyond the Tanais (Don). He says expressly that they were not pure Scythians, but, being descended from young Scythian men and Amazons, spoke an impure dialect and allowed their women to take part in war and to enjoy much freedom. Later writers call some of them the "woman-ruled Sarmatae." Hippocrates (*De Aere*, &c., 24) classes them as Scythian. From this we may infer that they spoke a language cognate with the Scythic. The greater part of the barbarian names occurring in the inscriptions of Olbia, Tanais and Panticapaeum are supposed to be Sarmatian, and as they have been well explained from the Iranian language now spoken by the Ossetes of the Caucasus, these are supposed to be the representatives of the Sarmatae and can be shown to have a direct connexion with the Alani (*q.v.*), one of their tribes. By the 3rd century B.C. the Sarmatae appear to have supplanted the Scyths proper in the plains of south Russia, where they remained dominant until the Gothic and Hunnish invasions. Their chief divisions were the Rhoxolani (*q.v.*), the Iazyges (*q.v.*), with whom the Romans had to deal on the Danube and Theiss, and the Alani. The term Sarmatia is applied by later writers to as much as was known of what is now Russia, including all that which the older authorities call Scythia, the latter name being transferred to regions farther east. Ptolemy gives maps of European and Asiatic Sarmatia. (E. H. M.)

SARMENTOSE (Lat. *sarmentum*, twigs), a botanical term for plants producing long runners.

SARNEN, the capital of the western half (or Obwalden) of the Swiss canton of Unterwalden. It stands 1558 ft. above sea-level, at the north end of the lake of Sarnen (3 sq. m. in extent) and on the river Aa. Pop. (1900) 3949. It has a large parish church and two convents. In the archives is preserved the famous MS. known from the colour of its binding as the *White Book of Sarnen*, which contains one of the earliest known versions of the Tell legend (see TELL). Sarnen is a station on the Brünig Railway, being 4½ m. from Alpnachstad, its port on the lake of Lucerne. (W. A. B. C.)

SARNIA, a town and port of entry, Ontario, Canada, capital of Lambton county, 55 m. N.E. of Detroit, on the left bank of the river St Clair. Pop. (1901) 8176. It is on the Grand Trunk and Lake Erie & Detroit River railways, and is a port of call for steamers plying on the Great Lakes. It contains a large oil-refinery which handles the greater part of the product of the Ontario oil region. The Grand Trunk railway crosses the river at this point by the St Clair tunnel, 6025 ft. long or, including the approaches, 2¼ m., which connects the town with the American city of Port Huron (Michigan).

SARNO (anc. *Sarnus*), a town of Campania, Italy, in the province of Salerno, 15 m. N.E. from that city and 30 m. E. of Naples by the main railway. Pop. (1901) 15,130 (town), 19,192 (commune). It lies at the foot of the Apennines, 92 ft. above sea-level, near the sources of the Sarno (anc. *Sarnus*), a stream connected by canal with Pompeii and the sea. Sarno has the ruins of a medieval castle, which belonged to Count Francesco Coppola, who took an important part in the conspiracy of the barons against Ferdinand of Aragon in 1485. Walter of Brienne is buried in the ancient church of S. Maria della Foce rebuilt in 1701. Paper, cotton, silk, linen and hemp are manufactured. The travertine which forms round the springs of the Sarno was used even at Pompeii as building material. Before its incorporation with the domains of the crown of Naples Sarno gave its name to a countship held in succession by the Orsini, Cappola, Suttavilla and Colonna families.

SARONNO, a town of Lombardy, Italy, in the province of Milan, from which city it is distant 13 m. N.N.W. by rail. Pop. (1901) 8729 (town), 9533 (commune). The pilgrimage church of the Madonna dei Miracoli, begun in 1498 by Vincenzo dell' Orto, has a dome of rich architecture externally; the campanile dates from 1516, the rest of the church is later. Internally it is decorated with fine frescoes by Gaudenzio Ferrari, representing a concert of angels, while those in the choir are by Bernardino Luini and are among his finest works (see F. Malaguzzi Valeri in *Rassegna d'arte*, 1904, 69). The place is well known for its gingerbread (*amaretti*) and is also a manufacturing town. It is situated on one of the lines (Ferrovia Nord) from Milan to Como, and has branch lines to Seregno, Busto Arsizio and Varese.

SAROS, in Babylonian numeration, the number 3600, *i.e.* 60 times 60. In astronomy and chronology, a remarkable period of 18 years and 10 or 11 days, at the end of which every eclipse of the sun or moon recurs with little change as regards the time and the character of the eclipse. It is supposed to have afforded in ancient times the principal method of predicting eclipses (see ECLIPSE).

SARPEDŌN, in Greek legend, son of Zeus and Laodameia, Lycian prince and hero of the Trojan war. He fought on the side of the Trojans, and after greatly distinguishing himself by his bravery, was slain by Patroclus. A terrible struggle took place for the possession of his body, until Apollo rescued it from the Greeks, and by the command of Zeus washed and cleansed it, anointed it with ambrosia, and handed it over to Sleep and Death, by whom it was conveyed for burial to Lycia, where a sanctuary (Sarpedoneum) was erected in honour of the fallen hero. Virgil (*Aen.* i. 100) knows nothing of the removal of the body to Lycia. In later tradition, Sarpedon was the son of Zeus and Europa and the brother of Minos. Having been expelled from Crete by the latter, he and his comrades sailed for Asia, where he finally became king of Lycia. Euripides (*Rhesus*, 29) confuses the two Sarpedons.

See Homer, *Iliad*, v. 479, xii. 292, xvi. 419-683; Apollodorus iii. 1, 2; Appian, *Bell. civ.* iv. 78; Herodotus i. 173 with Rawlinson's notes.

SARPI, PAOLO (1552–1623), Venetian patriot, scholar and church reformer, was born at Venice, on the 14th of August 1552, and was the son of a small trader, who left him an orphan at an early age. Notwithstanding the opposition of his relatives, he entered the order of the Servi di Maria, a minor Augustinian congregation of Florentine origin, at the age of thirteen. He assumed the name of Paolo, by which, with the epithet *Servita*, he was always known to his contemporaries. In 1570 he sustained no fewer than three hundred and eighteen theses at a disputation in Mantua, with such applause that the duke made him court theologian. Sarpi spent four years at Mantua, applying himself to mathematics and the Oriental languages. After leaving Mantua, he repaired to Milan, where he enjoyed the protection of Cardinal Borromeo, but was soon transferred by his superiors to Venice, as professor of philosophy at the Servite convent. In 1579 he was sent to Rome on business connected with the reform of his order, which occupied him several years, and brought him into intimate relations with three successive popes, as well as the grand inquisitor and other persons of influence. Having successfully terminated the affairs entrusted to him, he returned to Venice in 1588, and passed the next seventeen years in study, occasionally interrupted by the part he was compelled to take in the internal disputes of his community. In 1601 he was recommended by the Venetian senate for the small bishopric of Caorle, but the papal nuncio, who wished to obtain it for a protégé of his own, informed the pope that Sarpi denied the immortality of the soul, and had controverted the authority of Aristotle. An attempt to procure another small bishopric in the following year also failed, Clement VIII. professing to have taken umbrage at Sarpi's extensive correspondence with learned heretics, but more probably determined to thwart the desires of the liberal rulers of Venice. The sense of injury, no doubt, contributed to exasperate Sarpi's feelings towards the court of Rome. For the time, however, he tranquilly pursued his studies, writing those notes on Vieta which establish his proficiency in mathematics, and a metaphysical treatise now lost, which, if Foscarini's account of it may be relied upon, anticipated the sensationalism of Locke. His anatomical pursuits probably date from a somewhat earlier period. They illustrate his versatility and thirst for knowledge, but are far from possessing the importance ascribed to them by his disciples. His claim to have anticipated Harvey's discovery rests on no better authority than a memorandum, probably copied from Caesalpinus or Harvey himself, with whom, as well as with Bacon and Gilbert, he maintained a correspondence. The only physiological discovery which can be safely attributed to him is that of the contractility of the iris. It must be remembered, however, that his treatises on scientific subjects are lost, and only known from imperfect abstracts.

Clement died in March 1605; and Paul V. assumed the tiara with the resolution to strain papal prerogative to the uttermost. At the same time Venice was adopting measures to restrict it still further. The right of the secular tribunals to take cognizance of the offences of ecclesiastics had been asserted in two remarkable cases; and the scope of two ancient laws of the city of Venice, forbidding the foundation of churches or ecclesiastical congregations without the consent of the state, and the acquisition of property by priests or religious bodies, had been extended over the entire territory of the republic. In January 1606 the papal nuncio delivered a brief demanding the unconditional submission of the Venetians. The senate having promised protection to all ecclesiastics who should in this emergency aid the republic by their counsel, Sarpi presented a memoir, pointing out that the threatened censures might be met in two ways—*de facto*, by prohibiting their publication, and *de jure*, by an appeal to a general council. The document was received with universal applause, and Sarpi was immediately made canonist and theological counsellor to the republic. When in the following April the last hopes of accommodation were dispelled by Paul's excommunication of the Venetians and his attempt to lay their dominions under an interdict, Sarpi entered with the utmost energy into the controversy. He prudently began by republishing the anti-papal opinions of the famous canonist Gerson. In an anonymous tract published shortly afterwards (*Risposta di un Dottore in Teologia*) he laid down principles which struck at the very root of the pope's authority in secular things. This book was promptly put upon the *Index*, and the republication of Gerson was attacked by Bellarmine with a severity which obliged Sarpi to reply in an *Apologia*. The *Considerazioni sulle censure* and the *Trattato dell' interdetto*, the latter partly prepared under his direction by other theologians, speedily followed. Numerous other pamphlets appeared, inspired or controlled by Sarpi, who had received the further appointment of censor over all that should be written at Venice in defence of the republic. Never before in a religious controversy had the appeal been made so exclusively to reason and history; never before had an ecclesiastic of his eminence maintained the subjection of the clergy to the state, and disputed the pope's right to employ spiritual censures, except under restrictions which virtually abrogated it. Material arguments were no longer at the pope's disposal. The Venetian clergy, a few religious orders excepted, disregarded the interdict, and discharged their functions as usual. The Catholic powers refused to be drawn into the quarrel. At length (April 1607) a compromise was arranged through the mediation of the king of France, which, while salving over the pope's dignity, conceded the points at issue. The great victory, however, was not so much the defeat of the papal pretensions as the demonstration that interdicts and excommunications had lost their force. Even this was not wholly satisfactory to Sarpi, who longed for the toleration of Protestant worship in Venice, and had hoped for a separation from Rome and the establishment of a Venetian free church by which the decrees of the council of Trent would have been rejected, and in which the Bible would have been an open book. The republic rewarded her champion with the further distinction of state counsellor in jurisprudence, and, a unique mark of confidence, the liberty of access to the state archives. These honours exasperated his adversaries to the uttermost. On the 5th of October he was attacked by a band of assassins and left for dead, but the wounds were not mortal. The bravos found a refuge in the papal territories. Their chief, Poma, declared that he had been moved to attempt the murder by his zeal for religion, a degree of piety and self-sacrifice which seems incredible in a bankrupt oil-merchant. "Agnosco stylum Curiae Romanae," Sarpi himself pleasantly said, when his surgeon commented upon the ragged and inartistic character of the wounds, and the justice of the observation is as incontestable as its wit. The only question can be as to the degree of complicity of Pope Paul V.

The remainder of Sarpi's life was spent peacefully in his cloister, though plots against him continued to be formed, and he occasionally spoke of taking refuge in England. When not engaged in framing state papers, he devoted himself to scientific studies, and composed several works. A Machiavellian tract on the fundamental maxims of Venetian policy (*Opinione come debba governarsi la repubblica di Venezia*), used by his adversaries to blacken his memory, is undoubtedly not his. It has been attributed to a certain Gradenigo. Nor did he complete a reply which he had been ordered to prepare to the *Squitinio della libertà veneta*, which he perhaps found unanswerable. In 1610 appeared his *History of Ecclesiastical Benefices*, "in which," says Ricci, "he purged the church of the defilement introduced by spurious decretals." In 1611 he assailed another abuse by his treatise on the right of asylum claimed for churches, which was immediately placed on the *Index*. In 1615 a dispute between the Venetian government and the Inquisition respecting the prohibition of a book led him to write on the history and procedure of the Venetian Inquisition; and in 1619 his chief literary work, the *History of the Council of Trent*, was printed at London under the name of Pietro Soave Polano, an anagram of Paolo Sarpi Veneto. The editor, Marco Antonio de Dominis, has been accused of falsifying the text, but a comparison with a MS. corrected by Sarpi himself shows that the alterations are both unnecessary and unimportant. This memorable book, together with the rival and apologetic history by Cardinal Pallavicini, is minutely criticized by Ranke (*History of the Popes*, appendix No. 3), who tests the veracity of both writers by examining the use they have respectively made of their MS. materials. The result is not highly favourable to either; neither can be taxed with deliberate falsification, but both have coloured and suppressed. They write as advocates rather than historians. Ranke rates the literary qualities of Sarpi's work very highly. Sarpi never acknowledged his authorship, and baffled all the efforts of the prince de Condé to extract the secret from him. He survived the publication four years, dying on the 15th of January 1623, labouring for his country to the last. The day before his death he had dictated three replies to questions on affairs of state, and his last words were "Esto perpetua." His posthumous *History of the Interdict* was printed at Venice the year after his death, with the disguised imprint of Lyons.

Great light has been thrown upon Sarpi's real belief and the motives of his conduct by the letters of Christoph von Dohna, envoy of Christian, prince of Anhalt, to Venice, published by Moritz Ritter in the *Briefe und Acten zur Geschichte des dreissigjährigen Krieges*, vol. ii. (Munich, 1874). Sarpi told Dohna that he greatly disliked saying mass, and celebrated it as seldom as possible, but that he was compelled to do so, as he would otherwise seem to admit the validity of the papal prohibition, and thus betray the cause of Venice. This supplies the key to his whole behaviour; he was a patriot first and a religious reformer afterwards. He was "rooted" in what Diodati described to Dohna as "the most dangerous maxim, that God does not regard externals so long as the mind and heart are right before Him." Sarpi had another maxim, which he thus formulated to Dohna: *Le falsità non dico mai mai, ma la verità non a ognuno.* It must further be considered that, though Sarpi admired the English prayer-book, he was neither Anglican, Lutheran nor Calvinist, and might have found it difficult to accommodate himself to any Protestant church. On the whole, the opinion of Le Courayer, "qu'il était Catholique en gros et quelque fois Protestant en détail," seems not altogether groundless, though it can no longer be accepted as a satisfactory summing up of the question. His scientific attainments must have been great. Galileo would not have wasted his time in corresponding with a man from whom he could learn nothing; and, though Sarpi did not, as has been asserted, invent the telescope, he immediately turned it to practical account by constructing a map of the moon.

Sarpi's life was written by his enthusiastic disciple, Father Fulgenzio Micanzio, whose work is meagre and uncritical. Bianchi-Giovini's biography (1836) is greatly marred by digressions, and is inferior in some respects to that by Arabella Georgina Campbell (1869), which is enriched by numerous references to MSS. unknown to Bianchi-Giovini. T. A. Trollope's *Paul the Pope and Paul the Friar* (1861) is in the main a mere abstract of Bianchi-Giovini, but adds a spirited account of the conclave of Paul V. The incidents of the Venetian dispute from day to day are related in the contemporary diaries published by Enrico Cornet (Vienna, 1859). Giusto Fontanini's *Storia arcana della vita di Pietro Sarpi* (1863), a bitter libel, is nevertheless important for the letters of Sarpi it contains, as Griselini's *Memorie e aneddote* (1760) is from the author's access to Sarpi's unpublished writings, afterwards unfortunately destroyed by fire. Foscarini's *History of Venetian Literature* is important on the same account. Sarpi's memoirs on state affairs remain in the Venetian archives. Portions of his correspondence have been printed at various times, and inedited letters from him are of frequent occurrence in public libraries. The King's library in the British Museum has a valuable collection of tracts in the Interdict controversy, formed by Consul Smith.

[In addition to the above works see Balan, *Fra Paolo Sarpi* (Venice, 1887) and Pascolato, *Fra Paolo Sarpi* (Milan, 1893). Some hitherto unpublished letters of Sarpi were edited by Karl Benrath and published, under the title *Paolo Sarpi. Neue Briefe, 1608–1616* (at Leipzig in 1909).] (R. G.)

SARPSBORG, a seaport and manufacturing town of Norway, in Smaalenene *amt* (county), 68 m. S.S.E. of Christiania on the Gothenburg railway. Pop. (1900) 6888. It is the junction for an alternative line to Christiania following the Glommen valley. It sprang into importance through the utilization of the falls in the river Glommen for driving saw-mills and generating electric power. The Sarpsfos, south-east of the town, is a majestic fall, descending 74 ft. with a width of 120 ft. There are wood-pulp factories (one worked by an English company employing over 1000 hands), factories for calcium carbide (used for manufacturing acetylene gas), paper and aluminium; and spinning and weaving mills. There are two large electric supply stations, and power and light are furnished from this point to Frederikstad, 9 m. S.W. The port is at Sannesund, 1 m. S.; its quays can be reached by vessels drawing 20 ft. The town was originally founded in the 11th century, and destroyed by the Swedes in 1567. The existing town dates from 1839.

SARRACENIA, or SIDE-SADDLE FLOWER, a genus of pitcher-plants with seven species native in the eastern states of North America. They are perennial herbaceous marsh-plants with a rosette of leaves from the centre of which springs a tall stalk bearing a large single nodding flower. The leaves are erect and in the form of long slender pitchers, with a longitudinal wing and a terminal hood, to which insects are attracted by the bright colouring of the upper parts and the nectar which is secreted there. The interior of the pitcher is half-filled with water and the wall is lined internally in the lower part with stiff downward pointing hairs, which prevent the escape of insects. The insects which are drowned in the pitcher become decomposed and digested by the fluid, and the products of digestion are ultimately absorbed by the walls of the pitcher and serve as a source of nitrogenous food. (See also PITCHER PLANTS.)

SARRAZIN, JACQUES (1588–1660), French painter, born at Noyon in 1588, went to Rome at an early age and worked there under a Frenchman named Anguille. Starting thus, Sarrazin speedily obtained employment from Cardinal Aldobrandini at Frascati, where he won the friendship of Domenichino, with whom he afterwards worked on the high altar of St Andrea della Valle. His return to Paris, where he married a niece of Simon Vouet, was signalized by a series of successes which attracted the notice of Sublet des Noyers, who entrusted to him the work by which Sarrazin is best known, the decoration of the great portal and the dome of the western façade of the interior court of the Louvre. The famous Caryatides of the attic show the profound study of Michelangelo's art to which Sarrazin had devoted all the time he could spare from bread-winning whilst in Rome. He now executed many commissions from the queen, and was an active promoter of the foundation of the Academy. The mausoleum for the heart of the prince de Condé in the Jesuit church of the Rue Saint Antoine was his last considerable work (see Lenoir, *Musée des monuments français*, v. 5); he died on the 3rd of December 1660, whilst it was in progress, and the crucifix of the altar was actually completed by one of his pupils named Gros.

SARRETTE, BERNARD (1765–1858), founder of the Conservatoire National de Musique et de Déclamation in Paris, was born in Bordeaux on the 27th of November 1765, and died in Paris on the 11th of April 1858. Forty-five musicians from the depôt of the Gardes Françaises were gathered together by him after the 14th of July 1789, and formed the nucleus for the music of the Garde Nationale. In May 1790, the municipality of Paris increased the body to seventy-eight musicians. When the financial embarrassments of the commune necessitated the suppression of the paid guard, Sarrette kept the musicians near him and obtained from the municipality, in June 1792, the establishment of a free school of music. On the 18th of Brumaire in the year II. (Nov. 8, 1793) this school was converted into the Institut National de Musique by decree of the convention, and by the law of the 16th of Thermidor in the year III. (Aug. 3, 1795) it was finally organized under the name of Conservatoire. The motives for the imprisonment of Sarrette from the 25th of March to the 10th of May 1794, have been a source of historical controversy, nor is it possible to ascertain exactly what were his political views throughout this period of the French Revolution. But there is no longer foundation for the theory of Zimmermann, his biographer, that he was imprisoned for singing aloud Crétry's air, *O Richard, ô mon roi!* For the last forty years of his life Sarrette lived in retirement. The protection of Napoleon I. was a source of disaster to him in 1815, when the conservatoire was closed; its subsequent history was watched by its founder as a mere spectator from outside.

See Constant Pierre, *B. Sarrette et les origines du Conservatoire*, (Paris, 1895).

SARSAPARILLA, a popular drug, prepared from the long fibrous roots of several species of the genus *Smilax*, indigenous to Central America, and extending from the southern and western coasts of Mexico to Peru. These plants grow in swampy forests, and, being dioecious and varying much in the form of leaf in different individuals, are imperfectly known to botanists, only two species having been identified with certainty. These are *Smilax officinalis* and *S. medica*, which yield respectively the so-called "Jamaica" and the Mexican varieties. They are large perennial climbers growing from short thick underground stems, from which rise numerous semi-woody flexuous angular stems, bearing large alternate stalked long-persistent and prominently net-veined leaves, from the base of which spring the tendrils which support the plant. The genus is a member of the natural order Smiliaceae, and constitutes the tribe Smilacoidide, characterized by its climbing habit, net-veined leaves and dioecious flowers.

The introduction of sarsaparilla into European medicine dates from the middle of the 16th century. Monardes, a physician of Seville, records that it was brought to that city from New Spain about 1536–1545. Sarsaparilla must have come into extensive use soon afterwards, for John Gerard, about the close of the century, states that it was imported into England from Peru in great abundance.

When boiled in water the root affords a dark extractive matter, the quantity of extract yielded by the root being used as a criterion of its quality. Boiling alcohol extracts from the root a neutral substance in the form of crystalline prisms, which crystallize in scales from boiling water. This body, which is named *parillin*, is allied to the saponin of quillaia bark, from which it differs in not exciting sneezing. The presence in the root of starch, resin and oxalate of lime is revealed by the use of the microscope. Sarsaparilla still has a popular reputation as an "alterative," but it has been examined and tested in every manner known to modern medical science, and is professionally regarded as "pharmacologically inert and therapeutically useless."

The varieties of sarsaparilla met with in commerce are the following: Jamaica, Lima, Honduras, Guatemala, Guayaquil and Mexican. Of these the first-named yields the largest amount of extract, viz. from 33 to 44%; it is the only kind admitted into the British pharmacopoeia. On the Continent, especially in Italy, the varieties having a white starchy bark, like those of Honduras and Guatemala, are preferred. "Jamaica" sarsaparilla derives its name from the fact that Jamaica was at one time the emporium for sarsaparilla, which was brought thither from Honduras, New Spain and Peru. Sarsaparilla is grown to a small extent in Jamaica, and is occasionally exported thence to the London market in small quantities, but its orange colour and starchy bark are so different in appearance from the thin reddish-brown bark of the genuine drug, that it does not meet with a ready sale. The Jamaica sarsaparilla of trade is collected on the Cordilleras of Chiriqui, in Panama, where the plant yielding it grows at an elevation of 4000 to 8000 ft. The root bark is reddish-brown, thin and shrivelled, and there is an abundance of rootlets, which are technically known by the name of "beard." Lima sarsaparilla resembles the Jamaica kind, but the roots are of a paler brown colour. In Honduras sarsaparilla the roots are less wrinkled, and the bark is whiter and more starchy, than in the Jamaica kind. It is exported from Belize. Guatemala sarsaparilla is very similar to that of Honduras, but has a more decided orange hue, and the bark shows a tendency to split off. Guayaquil sarsaparilla is obtained chiefly in the valley of Alausi, on the western side of the equatorial Andes. The bark is thick and furrowed, and of a pale fawn colour internally; the rootlets are few, and the root itself is of larger diameter than in the other kinds. Sometimes there is attached to the rootstock a portion of stem, which is round and not prickly, differing in these respects from that of *Smilax officinalis*, which is square and prickly. Mexican sarsaparilla has slender, shrivelled roots nearly devoid of rootlets. It is collected on the eastern slope of the Mexican Andes throughout the year, and is the produce of *Smilax medica*.

The collection of sarsaparilla root is a very tedious business; a single root takes an Indian half a day or sometimes even a day and a half to unearth. The roots extend horizontally in the ground on all sides for about 9 ft., and from these the earth has to be carefully scraped away and other roots cut through where such come across them. A plant four years old will yield 16 ℔ of fresh root, and a well-grown one from 32 to 64 ℔, but more than half the weight is lost in drying. The more slender roots are generally left, and the stem is cut down near to the ground, the crown of the root being covered with leaves and earth. Thus treated, the plant continues to grow, and roots may again be cut from it after the lapse of two years, but the yield will be smaller and the roots more slender and less starchy. In some varieties, as the Guayaquil and Mexican, the whole plant, including the rootstock, is pulled up.

In several species of *Smilax* the roots become thickened here and there into large tuberous swellings 4 to 6 in. long, and 1 or 2 in. in thickness. These tubers form a considerable article of trade in China, but are used to a limited extent only on the Continent, under the name of China root, although introduced into Europe about the same time as sarsaparilla. China root is obtained from *S. China* and is a native of Cochin China, China and Japan, and extensively imported into India, also from *S. glabra* and *S. lanceaefolia*, natives of India and China, the tubers of which closely resemble those of *S. China*. A similar root is yielded by *S. pseudo-China* and *S. tamnoides* in the United States from New Jersey southwards; by *S. balbisiana*, in the West Indies, and by *S. Japicanga* and *S. syringoides*, and *S. brasiliensis* in South America. The name of Indian sarsaparilla is given to the roots of *Hemidesmus indicus*, an Asclepiadaceous plant indigenous to India. These roots are readily distinguished from those of true sarsaparilla by their loose cracked bark and by their odour and taste, recalling those of melilot.

SARSFIELD, PATRICK (? –1693), titular earl of Lucan, Irish Jacobite and soldier, belonged to an Anglo-Norman family long settled in Ireland. He was born at Lucan, but the date is unknown. His father Patrick Sarsfield married Anne, daughter of Rory (Roger) O'Moore, who organized the Irish rebellion of 1641. The family possessed an estate of £2000 a year. Patrick, who was a younger son, entered Dongan's regiment of foot on the 9th of February 1678. In his early years he is known to have challenged Lord Grey for a supposed reflection on the veracity of the Irish people (September 1681), and in the December of that year he was run through the body in a duel in which he engaged as second. During the last years of the reign of King Charles II. he saw service in the English regiments which were attached to the army of Louis XIV. of France. The accession of King James II. led to his return home.

He took part in the suppression of the Western rebellion at the battle of Sedgemoor on the 6th of July 1685. In the following year he was promoted to a colonelcy. King James had adopted the dangerous policy of remodelling the Irish army so as to turn it from a Protestant to a Roman Catholic force, and Sarsfield, whose family adhered to the church of Rome, was selected to assist in this reorganization. He went to Ireland with Richard Talbot, afterwards earl of Tyrconnel (*q.v.*), who was appointed commander-in-chief by the king. In 1688 the death of his elder brother, who had no son, put him in possession of the family estate, which in those troubled times can have been of small advantage to him. When the king brought over a few Irish soldiers to coerce the English, Sarsfield came in command of them. As the king was deserted by his army there was no serious fighting, but Sarsfield had a brush with some of the Scottish soldiers in the service of the prince of Orange at Wincanton. When King James disbanded his army and fled to France, Sarsfield accompanied him. In 1689 he returned to Ireland with the king. During the earlier part of the war he did good service by securing Connaught for the Jacobites. The king, who is said to have described him as a brave fellow who had no head, promoted him to the rank of brigadier, and then major-general with some reluctance. It was not till after the battle of the Boyne (1st of July 1690), and during the siege of Limerick, that Sarsfield came prominently forward. His capture of a convoy of military stores at one of the two places called Ballyneety between Limerick and Tipperary, delayed the siege of the town till the winter rains forced the English to retire. This achievement, which is said by the duke of Berwick to have turned Sarsfield's head, made him the popular hero of the war with the

Irish. His generosity, his courage and his commanding height, had already commended him to the affection of the Irish. When the cause of King James was ruined in Ireland, Sarsfield arranged the capitulation of Limerick and sailed to France on the 22nd of December 1691 with many of his countrymen who entered the French service. He received a commission as lieutenant-general (maréchal de camp) from King Louis XIV. and fought with distinction in Flanders till he was mortally wounded at the battle of Landen or Neerwinden, on the 19th of August 1693. He died at Huy two or three days after the battle. In 1691 he had been created earl of Lucan by King James. He married Lady Honora de Burgh, by whom he had one son James, who died childless in 1718. His widow married the duke of Berwick.

J. Todhunter, *Life of Patrick Sarsfield* (London, 1895).

SARTAIN, JOHN (1808–1897). American artist, was born in London, England, on the 24th of October 1808. At the age of twenty-two he emigrated to America, and settled in Philadelphia. He was the pioneer of mezzotint engraving in America. Early in his career he painted portraits in oil and made miniatures; he engraved plates in 1841–1848 for *Graham's Magazine*, published by George Rex Graham (1813–1894); became editor and proprietor of *Campbell's Foreign Semi-Monthly Magazine* in 1843; and from 1849–1852 published with Graham *Sartain's Union Magazine*. He had charge of the art department of the Centennial Exhibition, Philadelphia, in 1876; took a prominent part in the work of the committee on the Washington Memorial, by Rudolf Siemering, in Fairmount Park, Philadelphia; designed medallions for the monument to Washington and Lafayette erected in 1869 in Monument Cemetery, Philadelphia; and was a member of the Pennsylvania Academy of the Fine Arts and a cavaliere of the Royal Equestrian Order of the Crown of Italy. He died in Philadelphia on the 25th of October 1897. His *Reminiscences of a Very Old Man* (New York, 1899) are of unusual interest. Of his children WILLIAM SARTAIN (b. 1843), landscape and figure painter, was born at Philadelphia on the 21st of November 1843, studied under his father and under Léon Bonnat, Paris, was one of the founders of the Society of American Artists, and became an associate of the National Academy of Design. Another son, SAMUEL SARTAIN (1830–1906), and a daughter, EMILY SARTAIN (b. 1841), who in 1886 became principal of the Philadelphia School of Design for Women, were also American artists.

SARTHE, a department of north-western France, formed in 1790 out of the eastern part of Maine, and portions of Anjou and of Perche. Pop. (1906) 421,470. Area 2410 sq. m. It is bounded N. by the department of Orne, N.E. by Eure-et-Loir, E. by Loir-et-Cher, S. by Indre-et-Loire and Maine-et-Loire and W. by Mayenne. The Sarthe, a sub-tributary of the Loire, flows in a south-westerly direction through the department; and the Loire, which along with the Sarthe joins the Mayenne to form the Maine above Angers, traverses its southern borders. Broken and elevated country is found in the north and east of the department, which elsewhere is low and undulating. The highest point (on the boundary towards Orne) is 1115 ft. The Sarthe flows past Le Mans and Sablé, receiving the Merdereau and the Vègre from the right, and the Orne Saosnoise and the Huisne from the left. The Loir passes La Flèche, and along its chalky banks caves have been hollowed out which, like those along the Cher and the Loire, serve as dwelling-houses and stores. The mean annual temperature is 51° to 52° Fahr. The rainfall is between 25 and 26 in.

The majority of the inhabitants live by agriculture. There are three distinct districts:—the corn lands to the north of the Sarthe and the Huisne; the region of barren land and moor, partly planted with pine, between those two streams and the Loir; and the wine-growing country to the south of the Loir. Sarthe ranks high among French departments in the production of barley, and more hemp is grown here than in any other department. The raising of cattle and of horses, notably those of the Perche breed, prospers, and fowls and geese are fattened in large numbers for the Paris market. Apples are largely grown for cider. The chief forests are those of Bercé in the south and Perseigne in the north, but the department owes its well-wooded appearance in a great measure to the hedges planted with trees which divide the fields. Coal, marble and free-stone are among the mineral products. The staple industry is the weaving of hemp and flax, and cotton and wool-weaving are also carried on. Paper and cardboard are made in several localities. Iron-foundries, copper and bell foundries, factories for provision-preserving, marble-works at Sablé, potteries, tile-works, glass-works and stained-glass manufactories, currieries, machine factories, wire-gauze factories, flour-mills and distilleries are also prominent industrial establishments, a great variety of which are found at Le Mans. Flour, agricultural products, live stock and poultry form the bulk of the exports. The department is served by the Western, the Orléans and the State railways, and the Sarthe and Loir provide about 100 m. of waterway, though the latter river carries little traffic.

The department forms the diocese of Le Mans and part of the ecclesiastical province of Tours, has its court of appeal at Angers, and its educational centre at Caen, and constitutes part of the territory of the IV. army corps, with its headquarters at Le Mans. The four arrondissements are named from Le Mans, the chief town, La Flèche, Mamers and St Calais. The principal places are Le Mans, La Flèche, La Ferté Bernard, Sablé and Solesmes, which receive separate treatment. Besides these places, those of chief architectural interest are Le Lude, which has a fine château of the Renaissance period, Sillé-le-Guillaume, where there is a Gothic church and a stronghold of the 15th century, and St Calais, the church of which dates from the 14th to the 17th centuries.

SARTI, GIUSEPPE (1729–1802), Italian composer, was born at Faenza on the 28th of December 1729. He was educated by Padre Martini, and appointed organist of the cathedral of Faenza before the completion of his nineteenth year. Resigning his appointment in 1750, Sarti devoted himself to the study of dramatic music, becoming director of the Faenza theatre in 1752. In 1751 he produced his first opera, *Pompeo*, with great success. His next works, *Il Rè Pastore*, *Medonte*, *Demofoonte* and *L'Olimpiade*, assured him so brilliant a reputation that in 1753 King Frederick V. of Denmark invited him to Copenhagen, with the appointments of Hofkapellmeister and director of the opera. Here he produced his *Ciro riconsosciuto*. In 1765 he travelled to Italy to engage some new singers; meanwhile the death of King Frederick put an end for the time to his engagement. In 1769 he went to London, where he could only contrive to exist by giving music lessons. In 1770 he obtained a post in Venice as music master at the Conservatorio dell' Ospedaletto. In 1779 he was elected maestro di cappella at the cathedral of Milan, where he remained until 1784. Here he exercised his true vocation—composing, in addition to at least twenty of his most successful operas, a vast quantity of sacred music for the cathedral, and educating a number of clever pupils, the most distinguished of whom was Cherubini. In 1784 Sarti was invited by the empress Catherine II. to St Petersburg. On his way thither he stopped at Vienna, where the emperor Joseph II. received him with marked favour, and where he made the acquaintance of Mozart. He reached St Petersburg in 1785, and at once took the direction of the opera, for which he composed many new pieces, besides some very striking sacred music, including a *Te Deum* for the victory of Ochakov, in which he introduced the firing of real cannon. He remained in Russia until 1801, when his health was so broken that he solicited permission to return. The emperor Alexander dismissed him in 1802 with a liberal pension; letters of nobility had been granted to him by the empress Catherine. His most successful operas in Russia were *Armida* and *Olega*, for the latter of which the empress herself wrote the libretto. Sarti died at Berlin on the 28th of July 1802.

Sarti's opera *I Due Litiganti* has been immortalized by Mozart, who introduced an air from it into the supper scene in *Don Giovanni*. It should be noted that Mozart's *Nozze di Figaro* owed a great deal to the influence of this opera, which was performed in Vienna in 1784. The admirable libretto by Da Ponte, author of the libretti of *Figaro* and *Don Giovanni*, shows similar situations, and the complicated finale of the first act served as a model to Mozart for the finale of the last act of *Figaro*.

SARZANA, a town and episcopal see of Liguria, Italy, in the province of Genoa, 9 m. E. of Spezia, on the railway to Pisa, at the point where the railway to Parma diverges to the north, 59 ft. above sea-level. Pop. (1901) 6531 (town); 11,850 (commune). The handsome cathedral of white marble in the Gothic style, dating from 1355, was completed in 1474. It contains two elaborately-sculptured altars of the latter period. The former citadel (now gaol), built by the Pisans, was demolished and re-erected by Lorenzo de' Medici. The castle of Sarzanello was built by Castruccio Castracani (d. 1328), whose tomb by the Pisan Giovanni di Balducci is in S. Francesco. The Palazzo del Capitano, by Giuliano da Maiano (1472), has been entirely altered. Sarzana has one of the most important glass-bottle factories in Italy, also brick-works and a patent fuel factory.

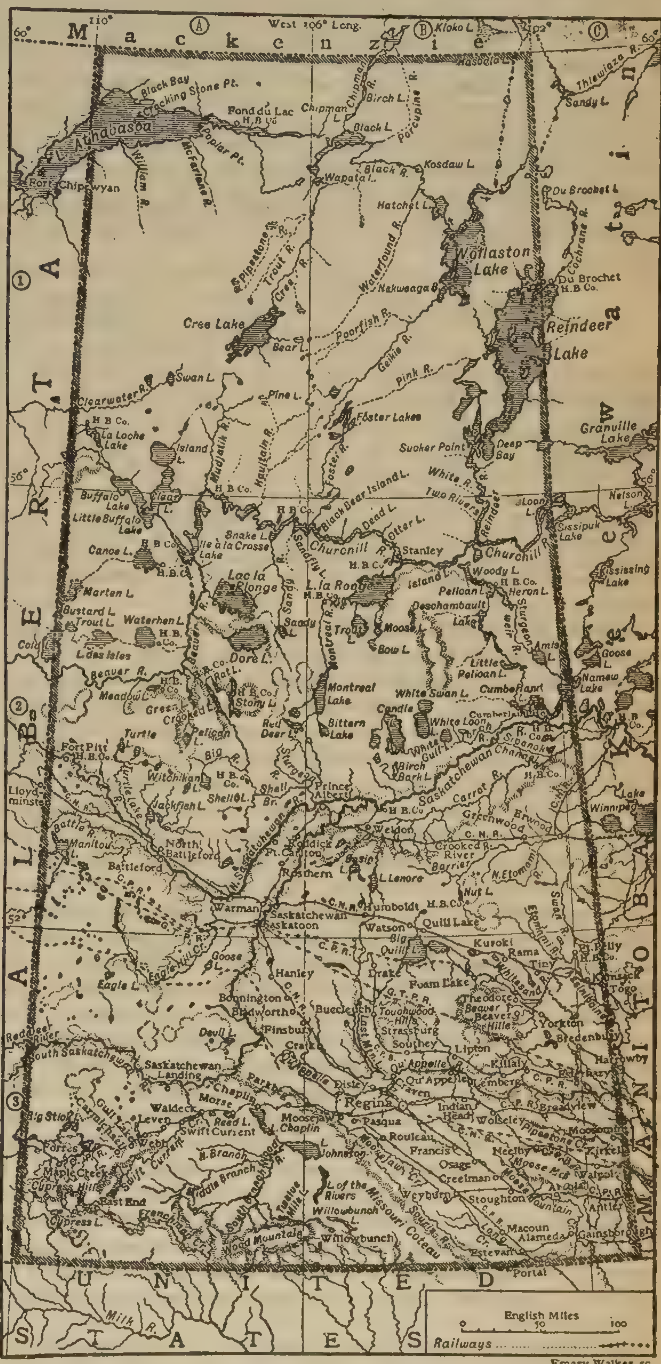
Sarzana was the birthplace of Pope Nicholas V. Its position at the entrance to the valley of the Magra (anc. *Macra*), the boundary between Etruria and Liguria in Roman times, gave it military importance in the middle ages. It arose as the successor of the ancient Luna, 3 m. S.E.; the first mention of it is found in 983, and in 1202 the episcopal see was transferred hither. A branch of the Cadolingi di Borgonuovo family, lords of Fucecchio in Tuscany from the 10th century onwards, which had acquired the name of Bonaparte, had settled near Sarzana before 1264; in 1512 a member of the family took up his residence in Ajaccio, and hence, according to some authorities, was descended the emperor Napoleon I. Sarzana, owing to its position on the frontier, changed masters more than once, belonging first to Pisa, then to Florence, then to the Banco di S. Giorgio of Genoa and from 1572 to Genoa itself. In 1814 it was assigned to the kingdom of Sardinia, the frontier between Liguria and Tuscany being now made to run between it and Carrara.

SĀSANA VAṂSA, a history of the Buddhist order in Burma, which was composed, in that country, by Paññā-sāmi in 1851. It is written in Pali prose; and is based on earlier documents, in Pali or Burmese, still extant, but not yet edited. The earlier part of the work deals with the history of Buddhism outside of Burma. This is based on the Mahāvaṃsa, and other well-known Ceylon works; and has no independent value. The latter part of the work, about three-fifths of the whole, deals with Buddhism in Burma, and contains information not obtainable elsewhere. Down to the 11th century the account is meagre, legendary and incredible. After that date it is sober, intelligible and in all probability mostly accurate. This portion occupies about one hundred pages 8vo in the excellent edition of the text prepared for the Pali Text Society in 1897 by Dr Mabel Bode. It shows a continuous literary effort through the eight and a half centuries, and constantly renewed ecclesiastical controversy. The latter is concerned for the most part with minor questions relating to rules of the order, there being a tendency, as relaxations of the rules crept in with the lapse of time, to hark back to the original simplicity. Of differences in matters of doctrine there is no mention in this manual. Dr Bode has prefixed to her edition a detailed summary of the contents of the book. (T. W. R. D.)

SASARAM, a town of British India, in the Shahabad district of Bengal, with a station on the East Indian railway, 406 m. N.W. from Calcutta. Pop. (1901) 23,644. It is famous as containing the tomb of the Afghan Sher Shah, who defeated Humayun and became emperor of Delhi (1540–1545). The tomb, which is the finest example of Mahommedan architecture in Bengal, stands on an island in the middle of an artificial lake. Close by is the tomb of Sher Shah's father.

SASH. (1) A framework of wood in which glass is fixed for a window, particularly a framework for large panes of glass in two parts which open and shut by sliding up or down. The word is a corruption of the Fr. *châssis*, *châsse*, Lat. *capsa*, box, case, *capere*, to hold. The word is, therefore, a doublet of "case" and "cash" (*qq.v.*). (2) A long band of silk or other fine or ornamented material worn round the waist or over the shoulders as part of a woman's or child's dress, or as a sign or badge of office, or as part of an official costume or uniform. The word is an adaptation of the Arab. *shāsh*, muslin, especially used (of the soft muslin or silken bands used for wrapping round the head in the form of a turban). In its early uses in English it appears as a term used by oriental travellers and writers on the East as an equivalent for a Mahommedan.

SASKATCHEWAN, a province of Western Canada, lying between the two provinces of Alberta and Manitoba. Area, 250,650 sq. m. The south-eastern portion is chiefly prairie, being the continuation of the second prairie steppe found in Manitoba. About 104° W. the Missouri Coteau, an elevation of several hundred feet, probably an old glacial moraine, crosses the southern boundary and runs north-westward, being the eastern escarpment of the third prairie steppe which runs to the Rocky Mountains. Several elevations of note are found in the southern half of the province. On the central part of the southern boundary is Wood Mountain, a succession of clay hills. On the lower level is Moose Mountain, and north of it Beaver Hills and Touchwood Hills. These are elevations of morainal or glacial deposits. The river Saskatchewan (*q.v.*) gives its name to the province. In central Saskatchewan near the south bend of the South Saskatchewan begins the river Qu'Appelle ("Who Calls?"), which runs eastward, and crossing the western boundary of Manitoba falls into the Assiniboine river. Farther to the south rises the Souris river, which flows parallel to the Missouri Coteau, passes southward into N. Dakota, and again entering the province of Manitoba finds its way at length into the Assiniboine river. North of the Saskatchewan river the


Mackenzie
West 106° Long.
60°
110°
102°
Ⓐ
Ⓑ
Ⓒ
①
②
③
ALBERTA
MANITOBA
UNITED STATES
Athabasca
Fort Chipewyan
Black Bay
Stone Pt.
Fond du Lac H.B.Co.
Chipman L.
Birch L.
Black L.
Porcupine R.
Kosdaw L.
Black R.
Wapata L.
Hatchet L.
Wollaston Lake
Nekweaga B.
Du Brochet L.
Du Brochet H.B.Co.
Cochrane R.
Thlewiaza R.
Sandy L.
Reindeer Lake
Cree Lake
Bear L.
Poorfish R.
Geikie R.
Pink R.
Swan L.
Clearwater R.
Pine L.
Foster Lakes
La Loche Lake
Island L.
Mudjatik R.
Haultain R.
Foster R.
Sucker Point
Deep Bay
Granville Lake
Island L.
White R.
Two Rivers
Nelson R.
Loon L.
56°
Buffalo Lake
Little Buffalo Lake
Canoe L.
Snake L.
Île à la Crosse Lake
Churchill R.
Stanley
Otter L.
Churchill
Sissipuk Lake
Sissising Lake
Woody L.
Heron L.
Pelican L.
Deschambault Lake
Lac la Ronge
L. la Ronge
Marten L.
Bustard L.
Trout L.
Waterhen L.
Cold L.
Lac des Isles
Beaver R.
Montreal Lake
Moose L.
Bow L.
Little Pelican L.
Sturgeon R.
Goose L.
Namew Lake
White Swan L.
Cumberland
Candle L.
Bittern Lake
Meadow L.
Green L.
Crooked L.
Pelican L.
Red Deer L.
Turtle L.
Fort Pitt
Witchikan L.
Shell L.
Jackfish L.
Birch Bark L.
Prince Albert
Carrot R.
Saskatchewan
Lake Winnipeg
Lloydminster
Battle R.
Manitou L.
Battleford
North Battleford
Duck Lake
Pt. Carlton
Rosthern
Crooked River
Greenwood
Barrier R.
L. Lenore
Humboldt
Quill Lake
Watson
Big Quill L.
Warman
Saskatoon
Kuroki
Rama
Tiny
Swan R.
Fly
Hanley
Eagle L.
Goose L.
Drake
Foam Lake
Theodore
Beaver
Yorkton
Bredenbury
Touchwood Hills
Strassburg
Southey
Lipton
Qu'Appelle R.
Devil L.
Finsbury
Craik
Bounington
Red Deer R.
South Saskatchewan R.
Saskatchewan Landing
Chaplin L.
Moose Jaw
Regina
Indian Head
Broadview
Wolseley
Moosomin
Pipestone
Kirkella
Waldeck
Leven
Swift Current
Reed L.
Chaplin
Pasqua
Roulcau
Francis
Osage
Creelman
Neelby
Moose Mt.
Walsall
Big Stick L.
Maple Creek
Cypress Hills
East End
Old Wives
L. of the Rivers
Willowbunch
Weyburn
Stoughton
Missouri Coteau
Macoun
Alameda
Gainsborough
Antler
Cypress L.
Frenchman R.
Wood Mountain
Willowbunch L.
Estevan
Portal
Milk R.
English Miles
50
100
Railways

Emery Walker sc.

surface of the province becomes heavily wooded, and this great forest continues through the broken Laurentian and Cambrian region, becoming dwarfed as it goes north. In this portion of the province are found Reindeer Lake, and north-west of this the easterly portion of Lake Athabasca, which is on the provincial boundary line of Alberta.

Climate.—Extending as the province does from north to south for more than 750 m., it may be readily seen that, as in the case of Alberta, there will be a great range of climate and temperature. The south-western part of the province is influenced much by the chinook winds which from the Rocky Mountain valleys come through Alberta. The climate here is dry, and portions of the country need irrigation. In south-eastern Saskatchewan the prairie lies on a lower level, there is more moisture, and the climate in winter is more steady. The whole province of Saskatchewan, except the south-western part, is well watered. As in the case of Alberta, the southern third of Saskatchewan has a moderate and changeable climate; in the central third ranging from Regina to Prince Albert it is steady, while in the northern third, through the Laurentian region to 60° N., it is severe. Compare the following table:—

	Elevation.	Mean Temperature.		Average Precipitation.
		Summer.	Winter.	
Maple Creek .	2495 ft.	62°	15·3°	10·18 in.
Swift Current	2423 „	60°	9·4°	17·04 „
Regina . .	1885 „	50°	0°	9·03 „
Prince Albert	1402 „	54·6°	·09°	14·45 „
Battleford .	1615 „	61·4°	7·1°	13·62 „

The animal life of Saskatchewan resembles that of Alberta (*q.v.*), excepting the mountain lion, mountain sheep and mountain goat, which belong to the Rocky Mountains. The plant life of Saskatchewan is much like that of eastern Alberta. The Douglas fir and several varieties of pine found in the Rocky Mountains do not occur.

Population.—By the census of 1906 the population of Saskatchewan was found to be 257,763. It had grown from 91,279 in 1901 (the area of the province being in 1906 somewhat greater than in 1901). The population is to a large extent Canadian, and the immigration has been largely from (1) the British Isles; (2) the United States; (3) the continent of Europe. Several large bodies of foreigners are found. There is a community of upwards of 8000 Doukhobors—a sect of Russian Quakers. Their tenets are peculiar, involving opposition to form in religion, to marriage and to submission to governmental requirements. They desire to hold their land in common. The Russian writer Tolstoy was a promoter of this immigration. Considerable bodies of Galicians are also found in the province. On the Indian population there were 9049 in 1901; and of Indian half-breeds 7949 in the same year. The Indians of Saskatchewan are chiefly Plain or Wood Crees, with a mixture among them of Saulteaux. Toward the south small bands of Assiniboines are found, and here and there small companies of refugee Sioux from the United States. All the Indians are on government reserves. In these reserves along the Qu'Appelle river are presented many examples of the successful management of the Indians by the Dominion government. These reserves are largely self-supporting; the Indians have comfortable houses, grow considerable crops of grain, make large quantities of hay and possess herds of cattle. At Regina, Qu'Appelle, Crooked Lakes and other industrial schools, young Indians—both male and female—receive a practical education. Many of these are making excellent farmers.

Government, &c.—Throughout the province the municipal system of self-government, especially in the cities, towns and villages, is being introduced. There are two cities in the province, (1) Regina (pop. 9804 in 1907), the capital; (2) Moose Jaw (pop. 6249). The latter is a divisional point on the Canadian Pacific railway, and owes its importance chiefly to its railway connexions. In the northern portion of the province are two considerable towns (1) Prince Albert (pop. 3005), on the banks of the North Saskatchewan river, giving promise of becoming a manufacturing centre, having as it has the great forest on the north side of the Saskatchewan river, adjoining it. (2) Saskatoon (pop. 3011), on the South Saskatchewan river. This, though a new town, bids fair to become a great railway centre. Here the Canadian Pacific, the Canadian Northern and the Grand Trunk Pacific railways all cross the great river of the province, and tributary to this town is a large area of arable and prairie land. The Saskatchewan is to some extent navigated, but a serious obstacle, the Grand Rapids, near the mouth of the river, requires a canal to allow the entrance of steamers into Lake Winnipeg. The southern part of the province is being covered by railways, the Canadian Pacific railway having its main line generally parallel to the international boundary line, at a distance of one hundred to one hundred and fifty miles. This railway has south of its main line two important branches: (1) The "Soo" line from Moose Jaw to Estevan, and connecting with the United States' system of railways. (2) The Arcola branch from the south-eastern corner of the province running to Regina. Another branch leaves the main line for the north at Kirkella, and this will make a direct communication with Edmonton, while another branch line enters the province at Harrowby and runs westward to join the Kirkella branch on its way to Saskatoon and Edmonton. The Canadian Northern railway has a line which enters the province at Togo and following the Saskatchewan leaves the province at Lloydminster and pushes on to Edmonton. The Grand Trunk Pacific railway follows a direct line from Winnipeg to Edmonton, entering the province at 51° 25′ N. and leaving it at 52° 35′ N. for the west.

The chief industries of Saskatchewan are cattle-rearing in the northern part and grain growing in the south of the province. Coal is found on the Saskatchewan, and a light variety of lignite on the Souris river near the international boundary. The province follows in general the plan of government found in the other provinces of the Dominion. The capital of the province is Regina (*q.v.*). A provincial governor lives at Regina and he has a cabinet of four ministers. The legislature consists of twenty-five members. The province has adopted a public schools act, which has a proviso for the establishment of separate schools, but this is so surrounded by restrictions as to be almost non-effective, every such school being required in all particulars to follow the public school model. The system covers both secondary and primary public schools. A normal school is in operation at Regina.

The religions of the people are similar to those in the other western provinces of Canada. The principal denominations were in 1901 as follows:—

Presbyterians . .	17,151	Baptists . .	2618
Roman Catholics .	17,116	Doukhobors .	8700
Church of England .	16,418	Greek Church .	2579
Methodists . . .	11,528	Mennonites .	3683
Lutherans	12,098		

History.—The history of Saskatchewan gathers round the Hudson's Bay Company. The open plains of the south were the home of the buffalo and few posts were established here, but the Saskatchewan river was the great line of communication for the fur-traders. It was first reached by the Montreal fur-traders in 1766, and by the Hudson's Bay Company from Hudson Bay in 1772. By this route the traders reached the great fur country of Mackenzie river, and the forts on the Saskatchewan river were notable. These were Fort Cumberland, Fort Carlton and Edmonton House. Alexander Mackenzie in 1789 left Edmonton and Fort Chipewyan (on Lake Athabasca) and going northward discovered Mackenzie river and reached the Arctic Sea. On his second voyage, leaving Fort Chipewyan, he gained the Peace river, and by means of this crossed the Rocky Mountains and reached the Pacific coast (July 22nd, 1793), being first of white men, north of Mexico, to cross the continent. The Saskatchewan and Mackenzie river basins were the real fur country of the traders. The northern portion of the province of Saskatchewan is still the home of the fur-trader.

SASKATCHEWAN (Cree: "Rapid River"), a river of Alberta and Saskatchewan provinces, Canada. Two large streams known as the North and South Saskatchewan unite near Prince Albert, and thence flow E. into Lake Winnipeg. The North Saskatchewan rises in the Rocky Mountains in 52° 07′ N. and 117° 06′ W., and flows east, though with many windings, receiving several important tributaries, including the Clearwater, Brazeau and Battle. The South Saskatchewan is formed by the union of the Bow and the Belly, the former and larger of which rises in western Alberta in one of the highest districts of the Rockies. Flowing east in an extremely tortuous course, it receives the waters of the Red Deer, and farther on turns abruptly north to its junction with the other branch. The length of the united Saskatchewan is about 300 m.; shallow draught steamers ascend from its mouth to Edmonton on the North Branch, a distance of about 850 m.

SASSANID, or SASSANIAN DYNASTY (or SASANIAN), the ruling dynasty of the neo-Persian empire founded by Ardashir I. in

A.D. 226 and destroyed by the Arabs in 637. The dynasty is named after Sāsān, an ancestor of Ardashir I. For a list of the kings and the history of the empire see PERSIA: *Ancient History*, section viii.; for its fall see also CALIPHATE, section A, § 1.

SASSARI, a town and archiepiscopal see of Sardinia, capital of the province of Sassari, situated in the N.W. corner of the island, 12½ m. by rail S.E. of Porto Torres on the north coast, and 21½ m. N.W. of Alghero on the west coast, 762 ft. above sea-level. Pop. (1906) 34,897 (town); 41,638 (commune). The Aragonese castle and the Genoese walls have been demolished in recent times, and the town has a modern aspect, with spacious streets and squares. The cathedral has a baroque façade; but traces of Romanesque work (12th century) can be seen at the sides and in the campanile. The see was transferred from Porto Torres in 1441. S. Maria di Betlemme has a good façade and Romanesque portal of the end of the 13th (?) century (D. Scano, in *L'Arte*, 1905, 134). In the municipal collection are a few pictures of interest. The museum in the university has an interesting collection of antiquities, largely formed by G. Spano, from all parts of the island, and belonging to the prehistoric, Phoenician and Roman periods. To the east of the town is the Fontana del Rosello, which supplied the town with water before the construction of the aqueduct, the water being brought up in small barrels by donkeys. Sassari is connected by rail by a branch (28½ m. E.S.E. to Chilivani) with the main line from Cagliari to Golfo degli Aranci, and with Porto Torres and Alghero. To the district near Sassari belong some of the most picturesque costumes of the island.

The date of the origin of the town is uncertain; but it was no doubt founded as the result of migrations from Porto Torres. This can hardly have occurred during the 11th century, when we find the *giudici* of Torres or Logudoro residing either at Porto Torres or at Ardara; but it must have occurred before 1217, when a body of Corsicans, driven out of their island by the cruelties of a Visconti of Pisa, took refuge at Sassari, and gave their name to a part of the town. About this time we find one of the *giudici* residing at Sassari for a whole summer, no doubt to escape the malaria. The *giudici* continued to exist at least until 1275, and perhaps till 1284, but about 1260 Sassari seems to have shaken itself free, and in 1275 and 1286 we find Pisa treating Sassari as a free commune. In 1288, four years after the defeat of Meloria, Pisa ceded Sassari to Genoa; but Sassari enjoyed internal autonomy, and in 1316 published its statutes (still extant), which are perhaps in part the reproduction of earlier ones. These, however, did not last long, for in 1323 Sassari submitted to the Aragonese king, and lost its independence. Sassari was sacked by the French in 1527, and disastrous pestilences are recorded in 1528, 1580 and 1652. In 1795 Sassari was the centre of the reaction of the barons against the popular ideas sown by the French Revolution; an insurrection of the people led by one Angioi lasted only a short while, and led to reactionary measures.

See P. Satta-Branca, *Il Comune di Sassari nei secoli XIII e XIV* (Rome, 1885). (T. As.)

SASSINA (or *Sarsina*, the modern form), an ancient town of Umbria, Italy, on the left bank of the river Sapis (Savio), 16 m. S. of Caesena (Cesena). In 266 B.C. both consuls, on different dates, celebrated a triumph over the Sassinates, as is recorded in the *Fasti*, and in the enumeration of the Italian allies of the Romans in 225 B.C. the Umbri and Sassinates are mentioned, on an equal footing, as providing 20,000 men between them. It is possible that the *tribus Sapinia* (the name of which is derived from the river Sapis) mentioned by Livy in the account of the Roman marches against the Boii in 201 and 196 B.C. formed a part of the Sassinates. The poet Plautus was a native of Sassina (b. 254 B.C.). The town was of some importance, as inscriptions show; these are preserved in the local museum. Remains of several buildings, one of which was probably the public baths, have been found (A. Santarelli in *Notizie degli scavi*, 1892, 370; A. Negrioli, *ibid.*, 1900, 392). Its milk is frequently mentioned—no doubt it was the centre of a pasture district—and it provided a number of recruits for the praetorian guard. An episcopal see was founded here in the 3rd century A.D. and still exists. The present town has 2291 inhabitants (commune, 3861).

SASSOON, SIR ALBERT ABDULLAH DAVID, BART. (1818–1896), British Indian philanthropist and merchant, was born at Bagdad on the 25th of July 1818, a member of a Jewish family settled there since the beginning of the 16th century, and previously in Spain. His father, a leading Bagdad merchant, was driven by repeated Anti-Semitic outbreaks to remove from Bagdad to Bushire, Persia, and, in 1832, he settled in Bombay where he founded a large banking and mercantile business. Albert Sassoon was educated in India, and on the death of his father became head of the firm. He was a great benefactor to the city of Bombay, among his gifts being the Sassoon dock, completed in 1875, and a handsome proportion of the cost of the new Elphinstone High School. In 1867 he was made a C.S.I., and in 1872 a Knight of the Bath. In 1873 he visited England and received the freedom of the city of London. Shortly afterwards he settled in England, and was made a baronet in 1890. He died at Brighton on the 24th of October 1896.

SATARA, a town and district of British India, in the Central division of Bombay. The name is derived from the "seventeen" walls, towers and gates which the fort was supposed to possess. The town is 2320 ft. above sea-level, near the confluence of the rivers Kistna and Vena, 56 m. S. of Poona. Pop. (1901) 26,022.

The DISTRICT OF SATARA has an area of 4825 sq. m. It contains two hill systems, the Sahyadri, or main range of the Western Ghats, and the Mahadeo range and its offshoots. The former runs through the district from north to south, while the Mahadeo range starts about 10 m. north of Mahabaleshwar and stretches east and south-east across the whole breadth of the district. The Mahadeo hills are bold, presenting bare scarps of black rock like fortresses. Within Satara are two river systems—the Bhima system in a small part of the north and north-east, and the Kistna system throughout the rest of the district. The hill forests have a large store of timber and firewood. The whole of Satara falls within the Deccan trap area; the hills consist of trap intersected by strata of basalt and topped with laterite, while, of the different soils on the plains, the commonest is the black loamy clay containing carbonate of lime. This when well watered is capable of yielding heavy corps. Satara contains some important irrigation works, including the Kistna canal. In some of the western parts of the district the average annual rainfall exceeds 200 in.; but on the eastern side water is scanty, the rainfall varying from 40 in. in Satara town to less than 12 in. in some places farther east. The population in 1901 was 1,146,559, showing a decrease of 6% in the preceding decade. The principal crops are millet, pulse, oil-seeds and sugar-cane. The only manufactures are cotton cloth, blankets and brass-ware. The district is traversed from north to south by the Southern Mahratta railway, passing 10 m. from Satara town. The Satara agency comprises the two feudatory states of Phaltan and Aundh. Total area 844 sq.m.; pop. (1901) 109,660.

On the overthrow of the Jadhav dynasty in 1312 the district passed to the Mahommedan power, which was consolidated in the reign of the Bahmani kings. On the decline of the Bahmanis towards the end of the 15th century the Bijapur kings finally asserted themselves, and under these kings the Mahrattas arose and laid the foundation of an independent kingdom with Satara as its capital. Intrigues and dissensions in the palace led to the ascendancy of the Peshwas, who removed the capital to Poona in 1749, and degraded the raja of Satara into the position of a political prisoner. The war of 1817 closed the career of the peshwas, and the British then restored the titular raja, and assigned to him the principality of Satara, with an area much larger than the present district. In consequence of political intrigues, he was deposed in 1839, and his brother was placed on the throne. This prince dying without male heirs in 1848, the state was resumed by the British government.

SATELLITE (from the Lat. *satelles*, an attendant), in astronomy, a small opaque body revolving around a planet, as the moon around the earth (see PLANET). In the theory of cubic curves, Arthur Cayley defined the satellite of a given line to be the line joining the three points in which tangents at the intersections of the given (primary) line and curve again meet the curve.

SATIN-SPAR, a name given to certain fibrous minerals which exhibit, especially when polished, a soft satiny or silky lustre, and are therefore sometimes used as ornamental stones. Such fibrous minerals occur usually in the form of veins or bands, having the fibres disposed transversely. The most common kind of satin-spar is a white finely-fibrous gypsum not infrequently found in the Keuper marls of Nottinghamshire and Derbyshire, and used for beads, &c. Other kinds of satin-spar consist of calcium carbonate, in the form of either aragonite or calcite, these being distinguished from the fibrous gypsum by greater hardness, and from each other by specific gravity and optical characters. The satin-spar of Alston, Cumberland, is a finely-fibrous calcite occurring in veins in a black shale of the Carboniferous series. Fibrous calcite is known sometimes to German mineralogists as *Atlasspath*.

SATIN-WOOD, a beautiful light-coloured hard wood, having a rich, silky lustre, sometimes finely mottled or grained, the produce of a moderate-sized tree, *Chloroxylon Swietenia* (natural order *Meliaceae*), native of India and Ceylon. A similar wood, known under the same name, is obtained in the West Indies, the tree being probably a species of *Zanthoxylum* (natural order *Rutaceae*). Satin-wood was in request for rich furniture about the end of the 18th century, the fashion then being to ornament panels of it with painted medallions and floral scrolls and borders. It is used for inlaying and small veneers, in covering the backs of hair and clothes-brushes and in making small articles of turnery.

SATIRE (Lat. *satira*, *satura*; see below). Satire, in its literary aspect, may be defined as the expression in adequate terms of the sense of amusement or disgust excited by the ridiculous or unseemly, provided that humour is a distinctly recognizable element, and that the utterance is invested with literary form. Without humour, satire is invective; without literary form, it is mere clownish jeering. It is indeed exceedingly difficult to define the limits between satire and the regions of literary sentiment into which it shades. The first exercise of satire was no doubt coarse and boisterous. It must have consisted in gibing at personal defects; and Homer's description of Thersites, the earliest example of literary satire that has come down to us, probably conveys an accurate delineation of the first satirists. The character reappears in the heroic romances of Ireland and elsewhere; and it is everywhere implied that the licensed backbiter is a warped and distorted being, readier with his tongue than his hands. To dignify satire by rendering it the instrument of morality or the associate of poetry was a development implying considerable advance in the literary art. The latter is the course adopted in the Old Testament, where the few passages approximating to satire, such as Jotham's parable of the bramble and Job's ironical address to his friends, are embellished either by fancy or by feeling. An intermediate stage between personal ridicule and the correction of faults and follies seems to have been represented in Greece by the *Margites*, attributed to Homer, which, while professedly lampooning an individual, practically rebuked the meddling sciolism impersonated in him. In the accounts that have come down to us of the writings of Archilochus, the first great master of satire, we seem to trace the elevation of the instrument of private animosity to an element in public life. Though a merciless assailant of individuals, Archilochus was also a distinguished statesman, naturally for the most part in opposition, and his writings seem to have fulfilled many of the functions of a newspaper press. Their merit is attested by Quintilian; and Gorgias's comparison of them with Plato's persiflage of the Sophists proves that their virulence must have been tempered by grace and refinement. Archilochus also gave satiric poetry its accepted form by the invention of the iambic trimeter, slightly modified into the scazonic metre by his successors. Simonides of Amorgus and Hipponax were distinguished like Archilochus for the bitterness of their attacks on individuals, with which the former combined a strong ethical feeling and the latter a bright active fancy. All three were restless and turbulent, aspiring and discontented, impatient of abuses and theoretically enamoured of liberty; and the loss of their writings, which would have thrown great light on the politics as well as the manners of Greece, is to be lamented. With Hipponax the direct line of Greek satire is interrupted; but two new forms of literary composition, capable of being the vehicles of satire, almost simultaneously appear. Fable is first heard of in Asiatic Greece about this date; and, although its original intention does not seem to have been satirical its adaptability to satiric purposes was soon discovered. A far more important step was the elevation of the rude fun of rustic merrymakings to a literary status by the evolution of the drama from the Bacchic festival. The means had now been found of allying the satiric spirit with exalted poetry, and their union was consummated in the comedies of Aristophanes.

A rude form of satire had existed in Italy from an early date in the shape of the Fescennine verses, the rough and licentious pleasantry of the vintage and harvest, which, lasting down to the 16th century, inspired Tansillo's *Vendemmiatore*. As in Greece, these eventually, about 364 B.C., were developed into a rude drama, originally introduced as a religious expiation. This was at first, Livy tells us (vii. 2), merely pantomimic, as the dialect of the Tuscan actors imported for the occasion was not understood at Rome. Verse, " like to the Fescennine verses in point of style and manner," was soon added to accompany the mimetic action, and, with reference to the variety of metres employed, these probably improvised composition were entitled *Saturae*, a term denoting *miscellany*, and derived from the *satura lanx*, " a charger filled with the first-fruits of the year's produce, anciently offered to Bacchus and Ceres." The Romans thus had originated the name of satire, and, in so far as the Fescennine drama consisted of raillery and ridicule, possessed the thing also; but it had not yet assumed a literary form among them. Livius Andronicus (240 B.C.), the first regular Latin dramatic poet, appears to have been little more than a translator from the Greek. Satires are mentioned among the literary productions of Ennius (200 B.C.) and Pacuvius (170 B.C.), but the title rather refers to the variety of metres employed than to the genius of the composition. The real inventor of Roman satire is Gaius Lucilius (148–103 B.C.), whose *Satirae* seem to have been mostly satirical in the modern acceptation of the term, while the subjects of some of them prove that the title continued to be applied to miscellaneous collections of poems, as was the case even to the time of Varro, whose " Saturae " included prose as well as verse, and appear to have been only partially satirical. The fragments of Lucilius preserved are scanty, but the verdict of Horace, Cicero and Quintilian demonstrates that he was a considerable poet. It is needless to dwell on compositions so universally known as the *Satires* of Lucilius's successor Horace, in whose hands this class of composition received a new development, becoming genial, playful and persuasive. " Arch Horace strove to mend." The didactic element preponderates still more in the philosophical satires of Persius. Yet another form of satire, the rhetorical, was carried to the utmost limits of excellence by Juvenal, the first example of a great tragic satirist. Nearly at the same time Martial, improving on earlier Roman models now lost, gave that satirical turn to the epigram which it only exceptionally possessed in Greece, but has ever since retained. About the same time another variety of satire came into vogue, destined to become the most important of any. The Milesian tale, a form of entertainment probably of Eastern origin, grew in the hands of Petronius and Apuleius into the satirical romance, immensely widening the satirist's field and exempting him from the restraints of metre. Petronius's " Supper of Trimalchio " is the revelation of a new vein, never fully worked till our days. As the novel arose upon the ruins of the epic, so dialogue sprang up upon the wreck of comedy. In Lucian comedy appears adapted to suit the exigencies of an age in which a living drama had become impossible. With him antique satire expires as a distinct branch of literature,—though mention should be made of the sarcasms and libels with which the population of Egypt were for centuries accustomed to insult the Roman conqueror and his parasites. A denunciation of the apostate poet Hor-Uta—a kind of Egyptian " Lost Leader "—composed under Augustus, has been published by M. Revillout from a demotic papyrus.

After the great deluge of barbarism has begun to retire, one form of satire after another peeps forth from the receding flood, the order of development being determined by the circumstances of time and place. In the Byzantine empire, indeed, the link of continuity is unbroken, and such raillery of abuses as is possible under a despotism finds vent in the pale copies of Lucian published in Adolf Ellissen's *Analekten*. The first really important satire, however, is a product of western Europe, recurring to the primitive form of fable, upon which, nevertheless, it constitutes a decided advance. *Reynard the Fox*, a genuine expression of the shrewd and homely Teutonic mind, is a landmark in literature. It gave the beast-epic a development of which the ancients had not dreamed, and showed how ridicule could be conveyed in a form difficult to resent. About the same time, probably, the popular instinct, perhaps deriving a hint from Rabbinical literature, fashioned Morolf, the prototype of Sancho Panza, the incarnation of sublunar mother-wit contrasted with the starry wisdom of Solomon; and the *Till Eulenspiegel* is a kindred Teutonic creation, but later and less significant. *Piers Ploughman*, the next great work of the class, adapts the apocalyptic machinery of monastic and anchoritic vision to the purposes of satire, as it had often before been adapted to those of ecclesiastical aggrandizement. The clergy were scourged with their own rod by a poet and a Puritan too earnest to be urbane. Satire is a distinct element in Chaucer and Boccaccio, who nevertheless cannot be ranked as satirists. The mock-heroic is successfully revived by Luigi Pulci, and the political songs of the 14th and 15th centuries attest the diffusion of a sense of humour among the people at large. The Renaissance, restoring the knowledge and encouraging the imitation of classic models, sharpened the weapons and enlarged the armoury of the satirist. Partly, perhaps, because Erasmus was no poet, the Lucianic dialogue was the form in the ascendant of his age. Erasmus not merely employed it against superstition and ignorance with infinite and irresistible pleasantry, but fired by his example a bolder writer, untrammelled by the dignity of an arbiter in the republic of letters. The ridicule of Ulric von Hutten's *Epistolae obscurorum virorum* is annihilating, and the art there for the first time fully exemplified though long previously introduced by Plato, of putting the ridicule into the mouth of the victim, is perhaps the most deadly shaft in the quiver of sarcasm. It was afterwards used with even more pointed wit though with less exuberance of humour by Pascal, the first modern example, if Dante may not be so classed of a great tragic satirist. Ethical satire is vigorously represented by Sebastian Brant and his imitator Alexander Barclay; but in general the metrical satirists of the age seem tame in comparison with Erasmus and Hutten, though including the great name of Machiavelli. Sir Thomas More cannot be accounted a satirist, but his idea of an imaginary commonwealth embodied the germ of much subsequent satire.

In the succeeding period politics take the place of literature and religion, producing in France the *Satyre Ménippée*, elsewhere the satirical romance as represented by the *Argenis* of Barclay, which may be defined as the adaptation of the style of Petronius to state affairs. In Spain, where no freedom of criticism existed, the satiric spirit took refuge in the *novela picaresca*, the prototype of Le Sage and the ancestor of Fielding; Quevedo revived the medieval device of the vision as the vehicle of reproof; and Cervantes's immortal work might be classed as a satire were it not so much more. About the same time we notice the appearance of direct imitation of the Roman satirists in English literature in the writings of Donne, Hall and Marston, the further elaboration of the mock-heroic by Tassoni, and the culmination of classical Italian satire in Salvator Rosa. The prodigious development of the drama at this time absorbed much talent that would otherwise have been devoted to satire proper. Most of the great dramatists of the 17th century were more or less satirists, Molière perhaps the most consummate that ever existed; but, with an occasional exception like *Les Précieuses ridicules*, the range of their works is too wide to admit of their being regarded as satires. The next great example of unadulterated satire is Butler's *Hudibras*, and perhaps one more truly representative of satiric aims and methods cannot easily be found. At the same period dignified political satire, bordering on invective, received a great development in Andrew Marvell's *Advices to a Painter*, and was shortly afterwards carried to perfection in Dryden's *Absalom and Achitophel*; while the light literary parody of which Aristophanes had given the pattern in his assaults on Euripides, and which Shakespeare had handled somewhat carelessly in the *Midsummer Night's Dream*, was effectively revived in the duke of Buckingham's *Rehearsal*. In France Boileau was long held to have attained the *ne plus ultra* of the Horatian style in satire and of the mock-heroic, but Pope was soon to show that further progress was possible in both. The polish, point and concentration of Pope remain unsurpassed, as do the amenity of Addison and the daring yet severely logical imagination of Swift; while the *History of John Bull* and the *Pseudologia* place their friend Arbuthnot in the first rank of political satirists.

The 18th century was, indeed, the age of satire. Serious poetry had for the time worn itself out; the most original geniuses of the age, Swift, Defoe and Richardson, are decidedly prosaic, and Pope, though a true poet, is less of a poet than Dryden. In process of time imaginative power revives in Goldsmith and Rousseau; meanwhile Fielding and Smollett have fitted the novel to be the vehicle of satire and much beside, and the literary stage has for a time been almost wholly engrossed by a colossal satirist, a man who has dared the universal application of Shaftesbury's maxim that ridicule is the test of truth. The world had never before seen a satirist on the scale of Voltaire, nor had satire ever played such a part as a factor in impending change. As a master of sarcastic mockery he is unsurpassed; his manner is entirely his own; and he is one of the most intensely national of writers, notwithstanding his vast obligations to English humorists, statesmen and philosophers. English humour also played an important part in the literary regeneration of Germany, where, after Liscow and Rabener, imitators of Swift and the essayists, Lessing, imbued with Pope but not mastered by him, showed how powerful an auxiliary satire can be to criticism—a relation which Pope had somewhat inverted. Another great German writer, Wieland, owes little to the English, but adapts Lucian and Petronius to the 18th century with playful if somewhat mannered grace. Kortum's *Jobsiad*, a most humorous poem, innovates successfully upon established models by making low life, instead of chivalry, the subject of burlesque. Goethe and Schiller, Scott and Wordsworth, are now at hand, and as imagination gains ground satire declines. Byron, who in the 18th century would have been the greatest of satirists, is hurried by the spirit of his age into passion and description, bequeathing, however, a splendid proof of the possibility of allying satire with sublimity in his *Vision of Judgment*. Moore gives the epigram a lyrical turn; Béranger, not for the first time in French literature, makes the gay chanson the instrument of biting jest; and the classic type receives fresh currency from Auguste Barbier. Courier, and subsequently Cormenin, raise the political pamphlet to literary dignity by their poignant wit. Peacock evolves a new type of novel from the study of Athenian comedy. Miss Edgeworth skirts the confines of satire, and Miss Austen seasons her novels with the most exquisite satiric traits. Washington Irving revives the manner of *The Spectator*, and Tieck brings irony and persiflage to the discussion of critical problems. Two great satiric figures remain—one representative of his nation, the other most difficult to class. In all the characteristics of his genius Thackeray is thoroughly English, and the faults and follies he chastises are those especially characteristic of British society. Good sense and the perception of the ridiculous are amalgamated in him; his satire is a thoroughly British article, a little over-solid, a little wanting in finish, but honest, weighty and durable. Posterity must go to him for the humours of the age of Victoria, as they go to Addison for those of Anne's. But Heine hardly belongs to any nation or country, time or place. He ceased to be a German without becoming a Frenchman, and a Jew without becoming a Christian. Only one portrait really suits him, that in Tieck's allegorical tale, where he is represented as a capricious and mischievous elf; but his song is sweeter and his command over the springs of laughter and tears greater than it suited Tieck's purpose to acknowledge. In him the satiric spirit, long confined to established literary forms, seems to obtain unrestrained freedom to wander where it will, nor have the ancient models been followed since by any considerable satirist except the Italian Giusti. The machinery employed by Moore was indeed transplanted to America by James Russell Lowell, whose *Biglow Papers* represent perhaps the highest moral level yet attained by satire.

In no age was the spirit of satire so generally diffused as in the 19th century, but many of its eminent writers, while bordering on the domains of satire, escape the definition of satirist. The term cannot be properly applied to Dickens, the keen observer of the oddities of human life; or to George Eliot, the critic of its emptiness when not inspired by a worthy purpose; or to Balzac, the painter of French society; or to Trollope, the mirror of the middle classes of England. If *Sartor Resartus* could be regarded as a satire, Carlyle would rank among the first of satirists; but the satire, though very obvious, rather accompanies than inspires the composition. The number of minor satirists of merit, on the other hand, is legion. Poole, in his broadly farcical *Little Pedlington*, rang the changes with inexhaustible ingenuity on a single fruitful idea; Jerrold's comedies sparkle with epigrams, and his tales and sketches overflow with quaint humour; Mallock, in his *New Republic*, made the most of personal mimicry, the lowest form of satire; Samuel Butler (*Erewhon*) holds an inverting mirror to the world's face with imperturbable gravity; the humour of Bernard Shaw has always an essential character of satire—the sharpest social lash. One remarkable feature of the modern age is the union of caricature (*q.v.*) with literature. (R. G.)

SATISFACTION (Lat. *satisfacere*, to satisfy), reparation for an injury or offence; payment, pecuniary or otherwise, of a debt or obligation; particularly, in law, and equitable doctrine of much importance. It may operate either as between strangers or as between father and child. As between strangers: it was laid down in *Talbot* v. *Duke of Shrewsbury*, 1714, Pr. Ch. 394, that where a debtor bequeaths to his creditor a legacy as great as, or greater than the debt, the legacy shall be deemed a satisfaction of the debt. This rule, however, has fallen under a considerable amount of discredit, and very small circumstances are required to rebut the presumption of satisfaction. If the debt was incurred after the execution of the will, there is no satisfaction, nor is there where the will giving the legacy contains a direction to pay debts. As between parent and child, the doctrine operates (*a*) in the satisfaction of legacies by portions, and (b) of portions by legacies. In the case of (*a*), it has been laid down that where a parent, or one acting *in loco parentis*, gives a legacy to a child, without stating the purpose for which he gives it, it will be understood as a portion; and if the father afterwards advance a portion on the marriage, or preferment in life, of that child, though of less amount, it is a satisfaction of the whole, or in part. This application of the doctrine is based on the maxim that "equality is equity," as is also the rule (*b*) that where a legacy bequeathed by a parent, or one *in loco parentis*, is as great as, or greater than, a portion or provision previously secured to the child, a presumption arises that the legacy was intended by the parent as a complete satisfaction. In each of the above cases, of course, the presumption may be rebutted by evidence of the testator's intentions.

In theology, the doctrine of satisfaction is the doctrine that the sufferings of Christ are accepted by the divine justice as a substitute for the punishment due for the sins of the world (see ATONEMENT).

SATNA, a British station in Central India, within the state of Rewah, with a station on the East Indian railway, 102 m. S.W. from Allahabad. Pop. (1901) 7471. It is the headquarters of the political agent for Baghelkhand, and an important centre of trade.

SATPURA, a range of hills in the centre of India. Beginning at the lofty plateau of Amarkantak (about 82° E.), the range extends westward almost to the W. coast. From Amarkantak an outer ridge runs S.W. for about 100 m. to a point known as the Saletekri hills in Balaghat district. As it proceeds westward the range narrows from a broad tableland to two parallel ridges enclosing the valley of the Tapti, as far as the famous hill-fortress of Asirgarh. Beyond this point the Khandesh hills, which separate the valley of the Nerbudda from that of the Tapti, complete the chain as far as the Western Ghats. The mean elevation is about 2500 ft.; but the plateaus of Amarkantak and Chauradadar in the east of Mandla district rise to nearly 3500 ft., and many of the peaks and some of the tablelands exceed this altitude. The hill of Khamla in Betul district is 3700 ft., which is also the general height of the Chikalda hills overlooking the Berar plain, while the Pachmarhi hills east of Betul, rising abruptly from the Nerbudda valley, culminate in Dhokgarh at an elevation of 4500 ft. Just east of Asirgarh there is a break in the range, through which passes the railway from Bombay to Jubbulpore, the elevation at this point being about 1240 ft. The extreme length of the range is about 600 m.; the breadth, which is 100 m. at its head across Balaghat and Mandla, diminishes to the narrow ridges of Nimar.

SATRAE, in ancient geography, a Thracian people, inhabiting part of Mount Pangaeus between the rivers Nestus (Mesta) and Strymon (Struma). According to Herodotus, they were independent in his time, and had never been conquered within the memory of man. They dwelt on lofty mountains covered with forests and snow, and on the highest of these was an oracle of Dionysus, whose utterances were delivered by a priestess. They were the chief workers of the gold and silver mines in the district. Herodotus is the only ancient writer who mentions the Satrae, and Tomaschek regards the name not as that of a people but of the warlike nobility among the Thracian Dii and Bessi. J. E. Harrison and others identify them with the Satyri (Satyrs), the attendants and companions of Dionysus in his revels, and also with the Centaurs. The name Satrokentae, a Thracian tribe according to Hecataeus (quoted in Stephanus of Byzantium), seems to support the second identification.

See Herodotus vii. 110-112; J. E. Harrison, *Prolegomena to Greek Religion* (1903), p. 379; W. Tomascheck, *Die alten Thraker* (1893).

SATRAP [Pers. *Khshatrapāvan, i.e.* "protector (superintendent) of the country (or district)," Heb. *sakhshadrapan*, Gr. ἐξαιτράπης (insc. of Miletus, *Sitzungsber. Berl. Ak.* 1900, 112), ἐξαιδραπεύων (insc. of Mylasa, Dittenberger, *Sylloge*, 95), ἐξατράπης (insc. of Mylasa Lebas iii. 388, Theopomp p. 111), shortened into σατράπης], in ancient history, the name given by the Persians to the governors of the provinces. By the earlier Greek authors (Herodotus, Thucydides and often in Xenophon) it is rendered by ὕπαρχος "lieutenant, governor," in the documents from Babylonia and Egypt and in Ezra and Nehemiah by *pakha*, "governor"; and the satrap Mazaeus of Cilicia and Syria in the time of Darius III. and Alexander (Arrian iii. 8) calls himself on his coins "Mazdai, who is [placed] over the country beyond the Euphrates and Cilicia." Cyrus the Great divided his empire into provinces; a definitive organization was given by Darius, who established twenty great satrapies and fixed their tribute (Herodot. iii. 89 sqq.) The satrap was the head of the administration of his province; he collected the taxes, controlled the local officials and the subject tribes and cities, and was the supreme judge of the province to whose "chair" (Nehem. iii. 7) every civil and criminal case could be brought. He was responsible for the safety of the roads (cf. Xenophon, *Anab.* i. 9. 13), and had to put down brigands and rebels. He was assisted by a council of Persians, to which also provincials were admitted; and was controlled by a royal secretary and by emissaries of the king (esp. the "eye of the king"). The regular army of his province and the fortresses were independent of him and commanded by royal officers; but he was allowed to have troops in his own service (in later times mostly Greek mercenaries). The great provinces were divided into many smaller districts, the governors of which are also called satraps and hyparchs. The distribution of the great satrapies was changed occasionally, and often two of them were given to the same man. When the empire decayed, the satraps often enjoyed practical independence, especially as it became customary to appoint them also as generals in chief of their army district, contrary to the original rule. Hence rebellions of satraps became frequent from the middle of the 5th century; under Artaxerxes II. occasionally the greater part of Asia Minor and Syria was in open rebellion. The last great rebellions were put down by Artaxerxes III. The satrapic administration was retained by Alexander and his successors, especially in the Seleucid empire, where the satrap generally is designated as *strategus*; but their provinces were much smaller than under the Persians.

In later times the cult of a god Satrapes occurs in Syrian inscriptions from Palmyra and the Hauran; by Pausanias vi. 25, 6, Satrapes is mentioned as the name of a god who had a statue and a cult in Elis and is identified with Korybas. The origin of this god is obscure; perhaps it arose from a cult connected with a statue or a tomb of some satrap.

See further under PERSIA: *Ancient History*, from the Achaemenid period onwards, and works there quoted (especially section v. § 2). (ED. M.)

SATRICUM (mod. *Conca*), an ancient town of Latium, situated some 30 m. to the S.E. of Rome, in a low-lying region to the S. of the Alban Hills, to the N.W. of the Pomptine Marshes. It was accessible direct from Rome by a road running more or less parallel to the Via Appia, to the S.W. of it. It is said to have been an Alban colony: it was a member of the Latin league of 499 B.C. and became Volscian in 488. It was several times won and lost by the Romans, and twice destroyed by fire. After 346 B.C. we hear of it only in connexion with the temple of Mater Matuta. A. Nibby (*Analisi della carta dei dintorni di Roma*, Rome, 1848, iii. 64) was the first to fix the site upon the low hill, surrounded by tufa cliffs, on which were still scanty remains of walling in rectangular blocks of the same material, which is now occupied by the farm-house of Conca. One mile W.N.W., on the hill above Le Ferriere, remains of an archaic temple, ascribed to Mater Matuta, were discovered by excavation in 1896. The work was begun under the direction of Professor H. Graillot of the University of Bordeaux, member of the French School of Rome, but after two weeks' work was suspended by order of the Italian government, and then resumed under the supervision of their own officials. The objects discovered are in the Museo di Papa Giulio at Rome. Another Satricum lay on the right bank of the Liris, not far from Arpinum.

See H. Graillot in *Mélanges de l'école française de Rome* (1896), 131; and *Notizie degli scavi* (1896), *passim*. (T. As.)

SATSUMA ISLANDS, a group of islands belonging to Japan, lying westward of the province of Satsuma (31° 40′ N. and 129° 40′ E.). The two principal are Kami-Koshiki-shima (24½ m. by 5½) and Shimo-Koshiki-shima (8½ m. by 5¼).

SATTERLEE, WALTER (1844–1908), American figure and genre painter, was born in Brooklyn, New York, on the 18th of January 1844. He graduated at Columbia University in 1863, studied in the National Academy of Design, and with Edwin

White, in New York, and in 1878–1879 under Léon Bonnat in Paris. He first exhibited at the National Academy in 1868, was elected an associate of the Academy in 1879, and received its Thomas B. Clarke prize in 1886. He was a member of the American Water Color Society and of the New York Etching Club, and was an excellent teacher. Satterlee died in Brooklyn on the 28th of May 1908. Among his favourite subjects were Arab life and figures in the costume of the colonial period.

SATURN [SATURNUS], a god of ancient Italy, whom the Romans, and till recently the moderns, identified with the Greek god Cronus.

1. Cronus was the youngest of the Titans, the children of Sky (Uranus) and Earth (Gaea). Besides the Titans, Sky and Earth had other children, the Cyclopes and the Hundred-handers. When the Cyclopes and the Hundred-handers proved troublesome, Sky thrust them back into the bosom of Earth. This vexed Earth, and she called on her sons to avenge her on their father Sky. They all shrank from the deed save Cronus, who waylaid and mutilated his father with a sickle or curved sword. From the drops of blood which fell to the earth sprang the Furies and the Giants. Cronus now reigned in room of Sky. His wife was Rhea, who was also his sister, being a daughter of Sky and Earth. Sky and Earth had foretold to Cronus that he would be deposed by one of his own children, so he swallowed them one after another as soon as they were born. Thus he devoured Hestia, Demeter, Hera, Hades and Poseidon. But when Rhea had brought forth Zeus, the youngest,[1] she wrapped up a stone in swaddling clothes and gave it to Cronus, who swallowed it instead of the babe. When Zeus, who had been hidden in Crete, grew up, he gave his father a dose which compelled him to disgorge first the stone and then the children whom he had swallowed. The stone was preserved at Delphi; every day it was anointed and on festivals it was crowned with wool. Zeus and his brothers now rebelled against Cronus, and after a ten years' struggle they were victorious. Cronus and the Titans were thrust down to Tartarus, where they were guarded by the Hundred-handers. According to others, Cronus was removed to the Islands of the Blest, where he ruled over the departed heroes, judging them in conjunction with Rhadamanthus. Plutarch (*De Def. Orac.* 18) mentions a story that the dethroned monarch of the gods slept on an island of the northern seas guarded by Briareus and surrounded by a train of attendant divinities. The reign of Cronus was supposed to have been the golden age, when men lived like gods, free from toil and grief and the weakness of old age (for death was like sleep); and the earth brought forth abundantly without cultivation. There are few traces of the worship of Cronus in Greece. Pausanias, in his description of Greece, mentions only one temple of Cronus; it stood at the foot of the Acropolis at Athens and was sacred to Cronus and Rhea jointly. The Athenians celebrated an annual festival in his honour on the 12th of Hecatombaeon. A mountain at Olympia was called after him, and on its top annual sacrifices were offered to him at the spring equinox.

The idea that Cronus was the god of time seems to have arisen from a simple confusion between the words Cronus and Chronus ("time"). Curtius derives Cronus from the root *kra*, meaning "to accomplish." Cronus may have been a god of some aboriginal half-savage tribe which the Greeks conquered. Hence the savage traits in his legend, his conquest by Zeus and the scanty traces of his worship in Greece. The myth of the mutilation of Sky by Cronus may be a particular form of the widespread story of the violent separation of Sky and Earth by one of their children. Other forms of this myth are found in New Zealand, India and China. Parallels to the swallowing and disgorging incident are to be found in the folklore of Bushmen, Kaffres, Basutos, Indians of Guiana and Eskimo.

2. Saturn and his wife Ops were amongst the oldest deities of ancient Italy. He is said to have had an altar at the foot of the Capitol before Rome was founded. Saturn was a god of agriculture, his name being derived from *serere*, "to sow."[2] The identification of Saturn with Cronus[3] gave rise to the legend that after his deposition by Zeus (Jupiter) Saturn wandered to Italy, where he ruled as king in the golden age and gave the name Saturnia to the country.[4] Janus, another of the most ancient gods of Italy, is said to have welcomed him to Rome, and here he settled at the foot of the Capitol, which was called after him the Saturnian Hill. His temple stood at the ascent from the Forum to the Capitol and was one of the oldest buildings in Rome, but the eight remaining columns of the temple probably formed a portion of a new temple built in the imperial times. The image of Saturn in this temple had woollen bands fastened round its feet all the year through, except at the festival of the Saturnalia; the object of the bands was probably to detain the deity. Similarly there was a fettered image of Enyalius (the War God) at Sparta, and at Athens the image of Victory had no wings, lest she might fly away. The mode of sacrifice at this temple was so far peculiar that the head of the sacrificer was bare as in the Greek ritual, instead of being covered, as was the usual Roman practice. Legend said that the Greek ritual was introduced by Hercules, who at the same time abolished the human sacrifices previously offered to Saturn. Others said that the rule had been observed by the Pelasgians before. Under or behind the temple was the Roman treasury, in which the archives as well as the treasures of the state were preserved. Dionysius Halicarnassensis (*Ant. Rom.* i. 34) tells that there were many sanctuaries of Saturn in Italy and that many towns and places, especially mountains, were called after him. The oldest national form of verse was known as the Saturnian. Like many other figures in Roman mythology, Saturn is said to have vanished at last from earth. His emblem was a sickle. The substitution of a great scythe for the sickle, and the addition of wings and an hour-glass, are modern.[5] Ops ("plenty"), wife of Saturn, was an earth-goddess, as appears from the custom observed by her suppliants of sitting and carefully touching the earth while they made their vows to her. As goddess of crops and the harvest she was called Consiva, and under this name had a sanctuary at Rome, to which only the Vestals and the priest were admitted. As Saturn was identified in later times with Cronus, so was Ops with Rhea. Another goddess mentioned as wife of Saturn was Lua, a goddess of barrenness. She was one of the deities to whom after a victory the spoils of the enemy were sometimes dedicated and burned.

Saturnalia.—This, the great festival of Saturn, was celebrated on the 19th, but after Caesar's reform of the calendar on the 17th, of December. Augustus decreed that the 17th should be sacred to Saturn and the 19th to Ops.[6] Henceforward it appears that the 17th and 18th were devoted to the Saturnalia, and the 19th and 20th to the Opalia, a festival of Ops.[7] Caligula added a fifth day, "the day of youth" (*dies juvenalis*), devoted no doubt to the sports of the young. But in popular usage the festival lasted seven days. The woollen fetters were taken from the feet of the image of Saturn, and each man offered a pig. During the festival schools were closed; no war was declared or battle fought; no punishment was inflicted. In place of the toga an undress garment (*synthesis*) was worn. Distinctions of rank were laid aside: slaves sat at table with their masters or were waited on by them, and the utmost freedom of speech was allowed them. Gambling with dice, at other times illegal, was now permitted.[8] All classes exchanged gifts, the commonest being wax tapers and clay dolls. These dolls were especially given to children, and the makers of them held a regular fair at this time. Varro thought these dolls represented original sacrifices of human beings to the infernal god. There was, as we have seen, a tradition that human sacrifices were once offered to Saturn, and the Greeks and Romans gave the name of Cronus and Saturn to a cruel Phoenician Baal, to whom, *e.g.* children were sacrificed at Carthage. The Cronus to whom human sacrifices are said to have been offered in Rhodes was probably a Baal, for there are traces of Phoenician worship in Rhodes. It may be conjectured that the Saturnalia was originally a celebration of the winter solstice. Hence the legend that it was instituted by Romulus under the name of the Brumalia (*bruma*=winter solstice). The prominence given to candles at the festival points to the custom of making a new fire at this time. The custom of solemnly kindling fires at the summer solstice (Eve of St John) has prevailed in most parts of Europe, notably in Germany, and there are traces (of which the yule-log is one) of the observance of a similar custom at the winter solstice. In ancient Mexico a new fire was kindled, amid great rejoicings, at the end of every period of fifty-two years.

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[1] So Hesiod. But, according to Homer, Zeus was the eldest of the children of Cronus and Rhea.

[2] He was also known by the epithet of Stercutus or Sterculius, the god of fertilizing manure.

[3] Cronus himself was a harvest god under one of his aspects.

[4] He is said to have taught the inhabitants of Latium agriculture, the art of navigation and the use of stamped pieces of metal for money.

[5] During the first centuries of the Christian era, Saturn was one of the chief popular divinities of northern Africa, representing the Carthaginian Baal under the title of Dominus Saturnus; see Toutain, *De Saturni dei in Africa Romana cultu* (1894).

[6] There was also a special festival, Opeconsiva, on Aug. 25.

[7] The fourth day of the festival was added by some one unknown.

[8] It is curious to find a similar rule with a similar exception in Nepal. See H. A. Oldfield, *Sketches from Nepal*, vol.ii. pp. 353 sq.

The designation of the planets by the names of gods is at least as old as the 4th century B.C. The first certain mention of the star of Cronus (Saturn) is in Aristotle (*Metaphysics*, p. 1073 b. 35). The name also occurs in the *Epinomis* (p. 987 b), a dialogue of uncertain date, wrongly ascribed to Plato. In Latin, Cicero (1st century B.C.) is the first author who speaks of the planet Saturn. The application of the name Saturn to a day of the week (*Saturni dies*, Saturday) is first found in Tibullus (i. 3, 18). (J. G. Fr.; X.)

SATURN, in astronomy, the sixth major planet in the order of distance from the sun, and the most distant one known before the discovery of Uranus in 1781. Its symbol is ♄. Its periodic time is somewhat less than 30 years, and the interval between oppositions is from 12 to 13 days greater than a year. It appears as a star of at least the first magnitude, but varies much in brightness with its orbital position, owing to the varying phases of its rings. It seems to resemble Jupiter in its physical constitution, but the belts and cloud-like features so conspicuous on that planet are so faint on Saturn that they can be seen only in a general way as a slight mottling. In colour the planet has a warmish tint, not dissimilar to that of Arcturus. Its density is the smallest known among the planets, being only 0·13 that of the earth, and therefore less than that of water.

Owing to the difficulty of distinguishing any individual feature, the rotation of the planet has been observed only on a few rare occasions when a temporary bright spot appeared and continued during several days. The first observation of such a spot was made by the elder Herschel, who derived a rotation period of 10 h. 16 m. In December 1876 a bright spot appeared near the equator of the planet, which was observed by Asaph Hall at Washington for more than a month. It gradually spread out in longitude, and finally faded away. The time of rotation found by Hall was 10 h. 14 m. 24 s. A third spot appeared in 1903 on the northern hemisphere, and had a rotation period of about 10 h. 38 m. The deviation of this period from the others indicates that, as in the case of Jupiter and the sun, the time of rotation is least at the equator, and increases toward the poles. Both from this difference and from the appearance presented by the planet it is clear that the visible surface is not a solid, as in the case of Mars, but consists of a layer of cloudy or vaporous matter, which conceals from view the solid body of the planet, if any such exists. Owing to the rapid rotation the figure of the disk is markedly elliptical, but when, owing to the rings being seen edgewise, the entire disk is visible, the latter sometimes seems to have the form of a square with its edges rounded off. This may be an illusion.

The most remarkable feature associated with Saturn is its magnificent system of ring and satellites. The former is unique in the solar system. The ring, the seeming ends of which were first seen by Galileo as handles to the planet, was for some time a mystery. After Galileo had seen it at one or two oppositions, it faded from sight, a result which we now know was due to the advance of the planet in its orbit, bringing our line of sight edgeways to the ring. When it reappeared, Galileo seems to have abandoned telescopic observation, but the "ansae" of Saturn remained a subject of study through a generation of his successors without any solution of their mystery being reached. The truth was at length worked out in 1656 by Huygens, who first circulated his solution in the form of an anagram. When arranged in order the letters read:

> "Annulo cingitur tenui, plano, nusquam cohaerente, ad eclipticam inclinato."

This designation of a plain thin ring surrounding the planet, but disconnected from it, and inclined to the ecliptic, is accurate and as complete as the means of observation permitted.

The varying phases presented by the ring arise from its having an inclination of 27° to the orbit of the planet, while its plane remains invariable in direction as the planet performs its orbital revolution. There are therefore two opposite points of the orbit, at each of which the plane of the ring passes through the sun, and is seen nearly edgeways from the earth. At the two intermediate points the ring is seen as opened out at an angle of 27°. The apparent illuminated surface which it then presents to us exceeds that presented by the planet, so that the brightness of the entire system to the naked eye is more than double.

In 1665 William Ball or Balle, joint-founder and first treasurer of the Royal Society, discovered that the ring was apparently formed of two concentric rings, separated by a fine dark line. This was afterwards independently discovered by G. D. Cassini at the Paris Observatory. As the telescope was improved, yet other shaded lines concentric with the ring itself were found. These were sometimes regarded as divisions, but if they are such they are by no means complete and sharp. The universal rule is that, if we consider any portion of the ring contained between two circles concentric with the ring itself, the general aspect and brightness of this circular portion are alike through its whole circumference. That is to say, if the brightness of different parts of the ring be compared, it is found to be constant when the parts compared are equally distant from the centre, but subject to variation as we pass from the circumference towards the centre. The inner and broader of the two rings is brightest near the outer part and shades off toward the planet, gradually at first, and more rapidly afterwards. Its inner portion is so dark that it was at one time regarded as separate, and called the "crape" or "dusky" ring. This supposed discovery of an inner ring was made independently by W. R. Dawes of England and G. P. Bond of the Harvard Observatory, though J. G. Galle at Berlin noticed the actual appearance at an earlier date. The more powerful telescopes of the present time show this dusky ring to be continuous with the inner portions of the main ring, and transparent, at least near its inner edge.

The physical constitution of the rings is unlike that of any other object in the solar system. They are not formed of a continuous mass of solid or liquid matter, but of discrete particles of unknown minuteness, probably widely separated in proportion to their individual volumes, yet so close as to appear continuous when viewed from the earth. This constitution was first divined by Cassini early in the 18th century. But, although the impossibility that a continuous ring could surround a planet without falling upon it was shown by Laplace, and must have been evident to all investigators in celestial mechanics, Cassini's explanation was forgotten until 1848. In that year James Clerk Maxwell, in an essay which was the first to gain the newly-founded Adams prize of the university of Cambridge, made an exhaustive mathematical investigation of the satellite constitution, showing that it alone could fulfil the conditions of stability. Although this demonstration placed the subject beyond doubt, it was of great interest when J. E. Keeler at the Allegheny Observatory proved this constitution by spectroscopic observation in 1895. He found by measuring the velocity of different parts of the ring to or from the earth that, as we pass from the outer to the inner regions of the ring, the velocity of revolution around the planet increases, each concentric portion of the ring having the speed belonging to a satellite revolving in a circular orbit at the same distance from the planet.

A remarkable feature of the rings is that they are so thin as to elude measurement and nearly disappear from view when seen edgeways even in powerful telescopes. As this can happen only at the rare moments when the plane of the ring passes accurately through the earth, precise observations of the phenomenon with powerful telescopes are few. But before or after the epochs at which the plane passes through the sun, there is sometimes a period of several weeks, during which the sun shines on one face of the ring while the other is presented to the earth. In October 1907 the appearance presented by the rings was studied by W. W. Campbell at the Lick Observatory, and E. E. Barnard at the Yerkes Observatory. The position of the ring as seen against the planet is marked by a dark line stretching across the equator, which is the thin shadow of the ring, on which the sun shines at a very acute angle.

An interesting question still open is the nature of the so-called divisions of the rings. Are these divisions real or are they simply apparent, arising from a darker colour in the matter which composes them? In the case of the sharpest and best-known division, to which the name of Cassini has been given from its first observer, there would seem to be little doubt that the division is real. But there is some doubt in the case of the other divisions. While many excellent observers have sometimes thought they saw a complete separation between the bright and the crape rings, no such phenomenon has been seen in the great telescopes of our times, and it is almost certain that the dark colour of the crape ring arises merely from its tenuity and transparency. From Barnard's observation of the passage of Japetus through the shadow of Saturn and its rings it appears that the transparency gradually diminishes from the centre of this ring to its line of junction with the bright ring. If there should ever be a transit of Saturn centrally past a bright star, many questions as to the constitution of the rings may be settled by noting the times at which the star was seen through the divisions of the ring.

Elements of the Satellites of Saturn.

	Mean Longitude.	Epoch Greenwich Mean Noon.	Mean Daily Motion.	Mean Distance.	Eccentricity.	Long. of Pericentre.	Mass Saturn.
Mimas . . .	127° 19·0′	1889, April	381·9945°	26·814″	Small	Doubtful	16,340,000
Enceladus . .	199 19·8	,,	272·73199	34·401	,,	,,	4,000,000
Tethys . . .	284 31·0	,,	190·69795	42·586	,,	,,	921,500
Dione . . .	253 51·4	,,	131·534975	54·543	,,	,,	536,000
Rhea . . .	358 23·8	,,	79·690087	76·170	,,	,,	250,000
Titan . . .	260 25·1	1890, Jan.	22·5770093	176·578	·02886	276° 15′ + 31·7′t	4,700
Hyperion . .	304 31·8	,,	16·919983	213·92	·1043	255 47 − 18·663°t	unknown
Japetus . . .	75 26·4	1885, Sept. 1	4·537997	514·59	·02836	354 30 + 7·9°t	100,000
Phoebe . . .	343 9·0	1900, Jan.	−0·65398	1871·6	·1659	291 2 − 0·27°t	unknown

Satellites of Saturn.

Saturn is surrounded by a system of nine or (perhaps) ten satellites. The brightest of these was discovered by Huygens in 1665 while pursuing his studies of the ring. The following table shows the names, distances, times of revolution, discoverer and date of discovery of the nine whose orbits are well established:

Name.	Distance.	Periodic Time.		Discoverer.	Date of Discovery.
		d.	h.		
1 Mimas .	3·1	0	23	W. Herschel	1789, Sept. 17
2 Enceladus	4·0	1	9	,,	1789, Aug. 28
3 Tethys .	5·0	1	21	G. D. Cassini	1684, March
4 Dione .	6·3	2	18	,,	1684, March
5 Rhea . .	8·9	4	12	,,	1672, Dec. 23
6 Titan .	20·5	15	23	Huygens	1655, Mar. 25
7 Hyperion .	25·1	21	7	W. C. Bond	1848, Sept. 16
8 Japetus .	59·6	79	8	J. D. Cassini	1671, October
9 Phoebe .	209·3	546	12	W. H. Pickering	1898, August

The five inner satellites seem to form a class by themselves, of which the distinguishing feature is that the orbits are so nearly circular that no eccentricity has been certainly detected in them, and that the planes of their orbits coincide with that of the ring and, it may be inferred, with the plane of the planet's equator. Thus, so far as the position of the planes of rotation and revolution are concerned, the system keeps together as if it were rigid. This results from the mutual attraction of the various bodies. A remarkable feature of this inner system is the near approach to commensurability in the periods of revolution. The period of Tethys is nearly double that of Mimas, and the period of Enceladus nearly double that of Dione. The result of this near approach to commensurability is a wide libration in the longitudes of the satellites, having periods very long compared with the times of revolution.

Each of the four outer satellites has some special feature of interest. Titan is much the brightest of all and has therefore been most accurately observed. Hyperion is so small as to be visible only in a powerful telescope, and has a quite eccentric orbit. Its time of revolution is almost commensurable with that of Titan, the ratio of the period being 3 to 4. The result is that the major axis of the orbit of Hyperion has a retrograde motion of 18° 40′ annually, of such a character that the conjunction of the two satellites always occurs near the apocentre of the orbit, when the distance of the orbit from that of Titan is the greatest. This is among the most interesting phenomena of celestial mechanics. Japetus has the peculiarity of always appearing brighter when seen to the west of the planet than when seen to the east. This is explained by the supposition that, like our moon, this satellite always presents the same face to the central body, and is darker in colour on one side than on the other.

In studying a series of photographs of the sky in the neighbourhood of Saturn, taken at the branch Harvard observatory at Arequipa, Peru, W. H. Pickering found on each of three plates a very faint star which was missing on the other two. He concluded that these were the images of a satellite moving around the planet. The latter was then entering the Milky Way, where minute stars were so numerous that it was not easy to confirm the discovery. When the planet began to emerge from the Milky Way no difficulty was found in relocating the object, and proving that it was a ninth satellite. Its motion was found to be retrograde, a conclusion confirmed by Frank E. Ross. This phenomenon may be regarded as unique in the solar system, for, although the motion of the satellite of Neptune is retrograde, it is the only known satellite of that planet.

Another extremely faint satellite has probably been established by Pickering, but its orbit is still in some doubt.

The conclusions from the spectrum of Saturn, and numerical particulars relating to the planet, are found in the article PLANET.

The planes of the orbits of the inner six satellites are coincident with the plane of the ring system, of which the elements are as follow:

Longitude of ascending node on ecliptic	. .	167° 43′ 29″
Inclination	. .	28° 10′ 22″
Exterior diameter of outer ring, in miles	.	166,920
Interior ,, ,, ,,	. .	147,670
Exterior ,, inner ring ,,	. .	144,310
Interior ,, ,, ,,	. .	109,100
Interior ,, dark ring ,,	. .	91,780
Breadth of outer bright ring ,,	. .	9,625
Breadth of division between the rings, in miles	.	1,680
Breadth of inner bright ring ,,	.	17,605
Breadth of dark ring ,,	.	8,660
Breadth of system of bright rings ,,	.	28,910
Breadth of entire system of rings ,,	.	37,570
Space between planet and dark rings ,,	.	9,760

(S. N.)

SATURNIA (mod. *Saturnia*), an ancient town of Etruria Italy, about 23 m. N.E. of Orbetello and the coast. Dionysius of Halicarnassus enumerates it among the towns first occupied by the Pelasgi and then by the Tuscans. A Roman colony was conducted there in 183 B.C., and it was a *praefectura*, but otherwise little is known about it. Remains of the city walls, in the polygonal style, still exist, to which Roman gates were added. Roman remains have also been discovered within the town, and remains of tombs outside, originally covered by tumuli, which have now disappeared, so that Dennis wrongly took them for megalithic remains. Pitigliano, some 12 m. to the S.W., is another Etruscan site.

See G. Dennis, *Cities and Cemeteries of Etruria* (London, 1883), i. 496; ii. 275; A. Pasqui in *Notizie degli scavi* (1882), 52.

(T. As.)

SATURNIAN METRE (Lat. *Saturnius, i.e.* which relates to Saturn), the name given by the Romans to the crude and irregular measures of the oldest Latin folk-songs. The scansion is generally of the following type:

⏑–́⏑–́⏑–́⏑|–́⏑–́⏑–́⏑

with which Macaulay compares the nursery rhyme, "The Queen was in her parlour, eating bread and honey." There was, however, considerable licence in the scansion, and we can gather only that the verse was generally of this type, and had a light and vivacious movement. It occurs in a few inscriptions (the verses on the tombs of the Scipios: cf. Bücheler, *Anthologia Latina*, 1895) in fragments, Livius Andronicus and the *Bellum Punicum* of Naevius. Subsequently it was ousted by Greek metres. The question as to whether it depended upon accent or upon quantity has been much discussed.

See Keller, *Der saturnische Vers* (Prague, 1883 and 1886); Thurneysen, *Der Saturnier* (Halle, 1885); Havet, *De saturnio Latinorum versu* (Paris, 1880); Müller, *Der saturnische Vers und seine Denkmäler* (1885); Leo, *Der saturnische Vers* (1905); Du Bois, *Stress Accent in Roman Poetry* (New York, 1906); also Mommsen, *Hist. of Rome*, i. chap. xv.

SATURNINUS, LUCIUS APPULEIUS, Roman demagogue. As quaestor (104 B.C.) he superintended the importation of corn at Ostia, but had been removed by the Senate (an unusual proceeding), and replaced by M. Aemilius Scaurus (*q.v.*), one of the chief members of the government party. He does not appear to have been charged with incapacity or mismanagement, and the injustice of his dismissal drove him into the arms of the popular party. In 103 he was elected tribune. He entered into an agreement with C. Marius, and in order to gain the favour of his soldiers proposed that each of his veterans should receive an allotment of 100 jugera of land in Africa. He was also chiefly instrumental in securing the election of Marius to his fourth consulship (102). An opportunity of retaliating on the nobility was afforded him by the arrival (101) of ambassadors from Mithradates VI. of Pontus, with large sums of money for bribing the senate; compromising revelations were made by Saturninus, who insulted the ambassadors. He was brought to trial for violating the law of nations, and only escaped conviction by an *ad misericordiam* appeal to the people. To the first tribunate of Saturninus is probably to be assigned his law on *majestas*, the exact provisions of which are unknown, but its object was probably to strengthen the power of the tribunes and the popular party; it dealt with the *minuta majestas* (diminished authority) of the Roman people, that is, with all acts tending to impair the integrity of the Commonwealth, being thus more comprehensive than the modern word "treason." One of the chief objects of Saturninus's hatred was Q. Caecilius Metellus Numidicus, who, when censor, endeavoured to remove Saturninus from the senate on the ground of immorality, but his colleague refused to assent. In order to ingratiate himself with the people, who still cherished the memory of the Gracchi, Saturninus took about with him Equitius, a paid freedman, who gave himself out to be the son of Tiberius Gracchus. Although the mother of the Gracchi refused to acknowledge him, the people stoned Metellus because he would not admit his claim to citizenship. Equitius was afterwards elected tribune. Marius, on his return to Rome after his victory over the Cimbri, finding himself isolated in the senate, entered into a compact with Saturninus and his ally C. Servilius Glaucia, and the three formed a kind of triumvirate, supported by the veterans of Marius and the needy rabble. By the aid of bribery and assassination Marius was elected (100 consul for the sixth time, Glaucia praetor, and Saturninus tribune for the second time. Saturninus now brought forward an agrarian law, an extension of the African law already alluded to. It was proposed that all the land north of the Padus (Po) lately in possession of the Cimbri, including that of the independent Celtic tribes which had been temporarily occupied by them, should be held available for distribution among the veterans of Marius. This was unjust, since the land was really the property of the provincials who had been dispossessed by the Cimbri. Colonies were to be founded in Sicily, Achaea and Macedonia, on the purchase of which the "Tolosan gold," the temple treasures embezzled by Q. Servilius Caepio (praetor 110), was to be employed. Further, Italians were to be admitted to these colonies, and as they were to be burgess colonies, the right of the Italians to equality with the Romans was thereby partially recognized. This part of the bill was resented by many citizens, who were unwilling to allow others to share their privileges. A clause provided that, within five days after the passing of the law, every senator should take an oath to observe it, under penalty of being expelled from the senate and heavily fined. All the senators subsequently took the oath except Metellus, who went into exile. Saturninus also brought in a bill, the object of which was to gain the support of the rabble by supplying corn at a nominal price. The quaestor Q. Servilius Caepio[1] declared that the treasury could not stand the strain, and Saturninus's own colleagues interposed their veto. Saturninus ordered the voting to continue, and Caepio dispersed the meeting by violence. The senate declared the proceedings null and void, because thunder had been heard; Saturninus replied that the senate had better remain quiet, otherwise the thunder might be followed by hail. The bills (*leges Appuleiae*) were finally passed by the aid of the Marian veterans.

Marius, finding himself overshadowed by his colleagues and compromised by their excesses, thought seriously of breaking with them, and Saturninus and Glaucia saw that their only hope of safety lay in their retention of office. Saturninus was elected tribune for the third time for the year beginning the 10th of December 100, and Glaucia, although at the time praetor and therefore not eligible until after the lapse of two years, was a candidate for the consulship. M. Antonius the orator was elected without opposition; the other government candidate, Gaius Memmius, who seemed to have the better chance of success, was beaten to death by the hired agents of Saturninus and Glaucia, while the voting was actually going on. This produced a complete revulsion of public feeling. The senate met on the following day, declared Saturninus and Glaucia public enemies, and called upon Marius to defend the State. Marius had no alternative but to obey. Saturninus, defeated in a pitched battle in the Forum (Dec. 10), took refuge with his followers in the Capitol, where, the water supply having been cut off, they were forced to capitulate. Marius, having assured them that their lives would be spared, removed them to the Curia Hostilia, intending to proceed against them according to law. But the more impetuous members of the aristocratic party climbed on to the roof, stripped off the tiles, and stoned Saturninus and many others to death. Glaucia, who had escaped into a house, was dragged out and killed.

BIBLIOGRAPHY.—Appian, *Bell. civ.* i. 28-33; Diod. Sic. xxxvi. 12; Plutarch, *Marius*, 28-30; Livy, *Epit.* 69; Florus iii. 16; Vell. Pat. ii. 12; Auctor ad Herennium i. 21; Aurelius Victor, *De viris illustribus*, 73; Orosius v. 17; Cicero, *Pro Balbo*, 21, 48, *Brutus*, 62, *De oratore*, ii. 49, *De haruspicum responsis*, 19, *Pro Sestio*, 47, *Pro Rabirio*, passim; Mommsen, *Hist. of Rome* (Eng. trans.), bk. iv. ch. 6; G. Long, *Decline of the Roman Republic*, ii. ch. 10; E. Klebs in Pauly-Wissowa's *Realencyclopädie*, ii. 1 (1896); see further ROME: *History*, II., "The Republic," Period C.

SATYRS (SATYRI), in Greek mythology, spirits, half-man half-beast, that haunted the woods and mountains, companions of Pan and Dionysus. They are not mentioned in Homer; in a fragment of Hesiod they are called brothers of the mountain nymphs and Curetes, an idle and worthless race. Fancy represented them as strongly built, with flat noses, pointed ears, small horns growing out of the forehead, and the tails of horses or goats. They were a roguish but faint-hearted folk, lovers of wine and women, roaming to the music of pipes and cymbals, castanets and bagpipes, dancing with the nymphs or pursuing them and striking terror into men. They had a special form of dance calles *Sikinnis*. In earlier Greek art they appear as old and ugly, but in later art, especially in works of the Attic school, this savage character is softened into a more youthful and graceful aspect. There is a famous statue supposed to be a copy of a work of Praxiteles, representing a graceful satyr leaning against a tree with a flute in his hand. In Attica there was a species of drama known as the Satyric; it parodied the legends of gods and heroes, and the chorus was composed of satyrs. Euripides's play of the *Cyclops* is the only extant example of this kind of drama. The older satyrs were called Sileni, the younger Satyrisci. By the Roman poets they were often confounded with the Fauns. The symbol of the shy and timid satyr was the hare. In some districts of modern Greece the spirits known as Calicantsars offer points of resemblance to the ancient satyrs; they have goats' ears and the feet of asses or goats, are covered with hair, and love women and the dance. The herdsmen of Parnassus believe in a demon of the mountain who is lord of hares and goats.

In the Authorized Version of Isa. xiii. 21, xxxiv. 14 the word "satyr" is used to render the Hebrew *sĕʿīrīm*, "hairy ones." A kind of demon or supernatural being known to Hebrew folk-lore as inhabiting waste places is meant; a practice of sacrificing to the *sĕʿīrīm* is alluded to in Lev. xvii. 7, where E. V. has "devils." They correspond to the "shaggy demon of the mountain-pass" (*azabb al-ʿakaba*) of old Arab superstition.

Satyr in art important.

SAUCE, flavouring or seasoning for food, usually in a liquid or semi-liquid state, either served separately or mixed with the dish. The preparation of suitable sauces is one of the essentials of good cookery. The word comes through the Fr. from the Lat. *salsa*, salted or pickled food (*salire*, to season or sprinkle with *sal*, salt). The same Latin word has also given "saucer," properly a dish for sauce, now a small flat plate with a depressed centre to hold a cup and so prevent the spilling of liquid, and

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[1] According to some, the son of the Caepio mentioned above. But chronological reasons make the relationship doubtful.

"sausage" (O. Fr. *saulcisse*, Late Lat. *salsicium*), minced seasoned meat, chiefly pork, stuffed into coverings of skin. The colloquial use of "saucy," impertinent, "cheeky" is an obvious transference from the tartness or pungency of a sauce, and has a respectable literary ancestry; thus Latimer (*Misc. Sel.*) "when we see a fellow sturdy, lofty and proud, men say this is a saucy fellow."

SAUERLAND, a mountainous district of Germany, in the Prussian province of Westphalia, between the Sieg and the Ruhr, separated by the former from the Westerwald on the S., and by the latter from the coal formation of Ardey on the N. It is a well-wooded plateau of the Devonian formation, diversified by deep valleys and tracts of heather land. The district is a favourite tourist resort.

See F. W. Grimme, *Das Sauerland und seine Bewohner* (2nd ed., Paderborn, 1886); Fricke, *Der Tourist im Sauerland* (Bielefeld, 1892), and Kneebusch, *Reiseführer durch das Sauerland* (Dortmund, 1899).

SAUGOR, or SAGAR, a town and district of British India, in the Jubbulpore division of the Central Provinces. The town, in a picturesque situation on a spur of the Vindhyan hills, 1758 ft. above sea-level, has a station on the Indian Midland railway. Pop. (1901) 42,330. It has long ceased to be a growing place, though it is still third in importance in the province. It was founded in 1660, but owes its importance to having been made the capital of the Mahratta governor who established himself here in 1735. The cantonments contain a battery of artillery, a detachment of a European regiment, a native cavalry and a native infantry regiment. The town is handsomely built, and is an emporium of trade.

The DISTRICT OF SAUGOR has an area of 3962 sq. m. It is an extensive, elevated and in parts tolerably level plain, broken in places by low hills of the Vindhyan sandstone. It is traversed by numerous streams, chief of which are the Sunar, Beas, Dhasan and Bina, all flowing in a northerly direction towards the valley of the Ganges. In the southern and central parts the soil is black, formed by decaying trap; to the north and east it is a reddish-brown alluvium. Iron ore of excellent quality is found and worked at Hirapur, a small village in the extreme north-east. The district contains several densely wooded tracts, the largest of which is the Ramna teak forest preserve in the north.

The population in 1901 was 469,479, showing a decrease of 20% in the decade, due to the results of famine. The principal crops are wheat, millet, pulse, oil-seeds and a little cotton. The main line of the Indian Midland railway crosses the district, with a branch from Bina to Katni on the East Indian system.

By a treaty concluded with the Mahratta Peshwa in 1818, the greater part of the present district was made over to the British; and the town became the capital of the Saugor and Nerbudda Territories, then attached to the North-western Provinces. During the Mutiny of 1857 the whole district was in the possession of the rebels, excepting the town and fort, in which the Europeans were shut up for eight months, till relieved by Sir Hugh Rose. The rebels were totally defeated and order was again restored by March 1858.

See the *Saugor District Gazetteer* (Allahabad, 1907).

SAUJBULAGH, or SUJBULAK, the principal town of the Mukri district, in the province of Azerbaijan in Persia, in a fertile valley, between 30 and 40 m. S. of Lake Urmia, at an elevation of 4270 ft. It has post and telegraph offices, and a population of about 7000, mostly Kurds of the Mukri tribe, and exports dried fruit, grain and tobacco. There are many more localities with this name (Turkish, meaning "cold stream," or "cold spring") in Persia, the most notable, after the above-mentioned Kurdish city, being a district of the province of Teheran, with many villages. The place was temporarily occupied by Turkish troops in January 1908.

SAUL (Heb. *shā'ūl*, "asked"), in the Old Testament, son of Kish, and king of Israel.[1] His history is closely interwoven with that of the prophet Samuel and the Judaean king David. Two distinct accounts are given of his rise. In one Samuel, after defeating the Philistines, rules as the last "judge" of Israel; the people demand a king, and Saul, a young giant of Benjamin, is chosen by lot; the choice is confirmed when he delivers Jabesh-Gilead from the Ammonites (1 Sam. i.-viii., x. 17-27, xi., xii.). In the other, Saul is raised up by Yahweh to deliver Israel from a sore Philistine oppression. Samuel, a seer of local fame, previously unknown to Saul, gives him the divine commission, and ultimately a complete victory is gained which is celebrated by the erection of an altar (ix. 1-x. 16, xiii. seq.). See further SAMUEL. Once king, Saul achieves conquests over the surrounding states, and the brief summary in 1 Sam. xiv. 47-51 may be supplemented by 2 Sam. i. 19 sqq., where the brave deeds of the loving pair Saul and his son Jonathan, and their untimely death, form the subject of an old poem which vividly describes the feelings of a prostrate nation. Saul and his sons fell in the battle on Mt. Gilboa in the north and the land was thrown into confusion (1 Sam. xxxi.). Jabesh-Gilead, mindful of its debt, secretly carried away the dead bodies (cf. 2 Sam. xxi. 12 seq.), and Abner the commander hurriedly removed the surviving son, Ishbosheth,[2] to Mahanaim and at length succeeded in establishing his power over all Israel north of Jerusalem (2 Sam. ii. 8 seq.). But the sequel is lost in the more popular accounts of the rise of David.

Little old tradition is preserved of the house of Saul. The interest now lies in the prominence of Samuel, and more particularly in the coming supremacy of the Judaean king David (see the introductory verse 1 Sam. xiv. 52); as a result of this Saul is depicted in less sympathetic colours, his pettiness and animosity stand in strong contrast to David's chivalry and resignation, and in the melancholy Benjamite court with its rivalry and jealousy, the romantic attachment between David and Jonathan forms the one redeeming feature. The great Israelite disaster is foreshadowed in a thrilling narrative of Saul's visit to the since famous Witch of Endor (1 Sam. xxviii.). Israel had lost its mainstay through the death of Samuel (cf. xii. 23), and the king, uneasy at the approach of the enemy, invoked the shade of the prophet only to learn that his cause was lost through his own sin. The incident is now connected with David's nearing supremacy, and refers to a previous act of disobedience in his Amalekite campaign. In a detailed account of Saul's expedition we learn that his failure to carry out Yahweh's commands to the letter had brought the prophet's denunciation (cf. Ahab, 1 Kings xx. 42), and that he had lost the divine favour (xv.). This in turn ignores an earlier occasion when Saul is condemned and the loss of his kingdom foretold ere he had accomplished the task to which he had been called (xiii. 8-14).[3]

This later tendency to subordinate the history of Saul to that of David appears especially in a number of detailed and popular narratives encircling Judah and Benjamin, superseding other traditions which give an entirely different representation of David's move from the south to Jerusalem. Consequently it proves impossible to present a consistent outline of the history. Instead of the sequel to Ishbaal's recovery of power, and instead of David's incessant conflicts north of Hebron, ending with the capture of Jerusalem and its district from a strange people (2 Sam. v. xxi. 15-22, xxiii. 8 sqq.), we meet with the stories of the war with Benjamin and Israel, of the intrigue of Abner (*q.v.*) and the vengeance of Joab (*q.v.*). While Saul's death had left Israel in the hands of the Philistines, it is David who accomplishes the deliverance of the people (2 Sam. iii. 18, xix. 9). So, also, in accordance with his generous nature, David takes vengeance upon the Amalekite who had slain Saul (2 Sam. i. 6-10, contrast the details in 1 Sam. xxxi.), and upon the treacherous aliens who had murdered Ishbaal (iv.). When king at Jerusalem (seven years after Saul's death) he seeks out the survivors of Saul in order to fulfil his covenant with Jonathan. Jonathan's son Mephibosheth[4] is found in safe-keeping east of the Jordan and is installed at court (ix.). Another impression is given by the relations between David and Saul's daughter, Michal (vi. 16 sqq., cf. also the "wives" in xii. 8), and we learn from yet another source that he handed over Saul's sons to the Gibeonites who had previously suffered from the king's bloodthirsty zeal (xxi. 1-14). On this occasion (the date is quite uncertain) the remains of Saul and Jonathan were removed from Jabesh-Gilead and solemnly interred in Benjamin. During Absalom's revolt, Mephibosheth entertained some hopes of reviving the fortunes of his house (xvi. 1-4, xix. 24-30), and two Benjamites, Shimei and Sheba, appear (xvi. 5 sqq., xix. 16-23, xx). But there is no concerted action; the three are independent figures whose presence indicates that Judaean supremacy over Israel was not accepted without a protest, and that the spilt blood of the house of Saul was laid upon the shoulders of David. Henceforth Saul's family disappears from the pages of history. But a genealogy of his descendants (1 Chron. viii. 33-40, ix. 39-44) tells of "mighty men of valour, archers," who with their sons number 150 strong, and this interesting post-exilic list is suggestive for the vitality of the traditions of their ancestors.

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[1] On the name Saul, also that of an Edomite king (Gen. xxxvi. 37 seq.), see SAMUEL note 1. Kish seems to be identical with the Arabic personal and god-name Ḳais.

[2] Ishbosheth, *i.e.* Ishbaal, "man of Baal," cf. 1 Chron. viii. 33.

[3] For other explanations see 1 Chron. x. 13 seq. (which refers to 1 Sam. xxviii.), and Josephus, *Ant.* vi. 14, 9 (a reference to Saul's massacre of the priests at Nob, 1 Sam. xxii., a crime which is not brought to his charge in biblical history and probably belongs to one of the latest traditions).

[4] Perhaps Meribaal, "man of Baal," or Meribbaal, "Baal contends"; for the intentional alteration of the name cf. note 2 above, and see BAAL.

In surveying the earlier traditions of Saul's rise, it is clear that the desperate state of Israel leaves little room for the quiet picture of the inexperienced youth wandering around in search of his father's asses, or for the otherwise valuable representation of popular cult at the local sanctuaries (1 Sam. ix.). Since it is Saul who is commissioned to deliver Israel, it is disconcerting to meet his grown-up son who slays the Philistine "garrison" (rather "officer") in Geba (Gibeah, xiii. 3 seq.), and takes the initiative in overthrowing the Philistines (xiv. 1-16); yet the account which follows of Jonathan's violation of Saul's hasty vow and its consequences prepares us for the subsequent stories of the unfriendly relations between the two. Finally the absence of any prelude to the Philistine oppression is perplexing. On the other hand, Judg. x. 6 sqq. (*now* the introduction to the Gileadite Jephthah and the Ammonites) contain references (now obscure) to the distress caused by the Philistines, the straitened circumstances of the people, and their penitent appeal to Yahweh. When at length Yahweh "could bear the misery of Israel no longer," it is evident that in the original connexion some deliverer was raised. But the sequel cannot be found in the Danite Samson, the priest Eli, or the seer Samuel, and it is only in the history of Saul that Yahweh's answer to the people's cry leads to the appointment of the saviour. The traces of the older accounts of Saul's rise and the fragments in the highly composite introduction in Judg. x. (*vv. 7a, 8b*, 10-16) agree so materially that unless both the prelude to the former and the sequel to the latter have been lost it is probable that the two were once closely connected, but have been severed in the course of the literary growth of the traditions. See further Samuel, Books, § 6.

The development of views regarding the pre-monarchical "judges," the rise of the monarchy and its place in the religion of Yahweh have been factors quite as powerful as the growth of national tradition of the first king of Israel and the subordination of the narratives in order to give greater prominence to the first king of the Judaean dynasty. Although a considerable body of native tradition encircled the great Israelite heroes (cf. Ahab, Jehu, the wars of Aramaeans and Ammonites), Saul is pre-eminently a Benjamite figure. From the biblical evidence alone it is far from certain that this is the earliest phase. Saul's deliverance of Jabesh-Gilead from Ammon and his burial may suggest (on the analogy of Jephthah) that Gilead regarded him as its own. Some connexion between Gilead and Benjamin may be inferred from Judg. xxi., and, indeed, the decimation of the latter (see *ibid.* xx. 4, 7, xxi. 13 seq.) seems to link the appearance of the tribe in the earlier history with its new rise under Saul. But the history of the tribe as such in this period is shrouded in obscurity, and the Benjamite cycle appears to represent quite secondary and purely local forms of the great founder of the Israelite monarchy, whose traditions contain features which link him now with another founder of Israel—the warrior Joshua, and now with the still more famous invader and conqueror Jacob.

See S. A. Cook, *Critical Notes on O. T. History* (Index, *s.v.*), and art. Jews, §§ 6-8, Samuel (Books). (S. A. C.)

SAULT SAINTE MARIE, a city and the county-seat of Chippewa county, Michigan, U.S.A., on Saint Mary's river, at the outlet of Lake Superior and at the E. end of the upper peninsula. Pop. (1890) 5760; (1900) 10,538, of whom 5329 were foreign-born; (1910 census), 12,615. It is served by the Canadian Pacific, the Duluth, South Shore & Atlantic, and the Minneapolis, Saint Paul & Sault Sainte Marie railways. A railway bridge (3607 ft. long, completed in 1887) and steam ferries connect it with the Canadian town of Sault Sainte Marie (pop. 1901, 7169) on the opposite side of the river. The principal buildings are the Court House, City Hall, Post Office, Custom House and Carnegie Library (1905). Fort Brady, in the south-western part of the city, is an infantry garrison; the old Ft. Brady (built about 1822) in another part of the city is still standing.

The river is here nearly 1 m. wide and falls 20 ft. in three-fourths of a mile; it has been made navigable by lock canals for vessels drawing 20 ft. of water. The North West Fur Company built a lock here in 1797–1798. A canal 5700 ft. long, navigable for vessels of 11·5 ft. draught, was completed by the state in 1855. Between 1870 and 1881 the Federal government widened the canal to 100 ft., made the draught 16 ft., and built the Weitzel lock, 515 ft. long, 80 ft. wide, 60 ft. at gate openings, with a lift of 18-20 ft.; in 1896 the Poe lock (on the site of the old state locks), having a lift of 18-20 ft., and measuring 800 ft. × 100 ft., was opened, and the canal and its approaches were deepened. In 1908 the government began the widening of the canal above the locks and the construction of a new lock, 1350 ft. long between gates and having a draft of 24·5 ft. at extreme low-water. The estimated cost of this lock and approaches is $6,200,000. In 1907 the commerce passing here during the navigation season of eight months and twenty-three days amounted to 58,217,214 tons of freight, valued at more than $600,000,000; the commerce passing through the canals at this point is larger than that of any other canal in the world. There is a ship canal (1⅛ m. long) on the Canadian side of the river, which was completed in 1895 at a cost of $3,750,000. From the rapids opposite the city two water-power plants (of 50,000 and 10,000 h.p. respectively) derive their power; the larger, a hydraulic water-power canal (costing, with power equipment, $6,500,000) is 1½ m. long, and extends from the lake above to a power-house below the rapids; in this power-house are 320 turbines. The total value of the factory product in 1904 was $2,412,481, an increase of 231·3% over that of 1900. Much hay and fish are packed and shipped here.

The place was long a favourite fishing-ground of the Chippewa Indians. It was visited by the French missionaries Rambault and Jogues in 1641 and by Père René Ménard in 1660. In 1668 Jacques Marquette founded a mission here. In 1671 the governor-general of New France called a great council of the Indians here and in the name of the king of France took formal possession of all the country S. to the Gulf of Mexico and W. to the Pacific. The mission was abandoned in 1689; but as a trading post of minor importance—for a time protected by a palisade fort—the settlement was continued. In 1879 Sault Sainte Marie was incorporated as a village; in 1887 it was chartered as a city.

For an account of the mission see Antoine I. Rezek, *History of the Diocese of Sault Ste Marie and Marquette* (2 vols., Houghton, Mich., 1906–1907); see also A. B. Gilbert's "A Tale of Two Cities" in *Historical Collections*, vol. 29 (Lansing, 1901) of the Michigan Pioneer and Historical Society.

SAUMAREZ, JAMES SAUMAREZ [or Sausmarez], Baron de (1757–1836), English admiral, was descended from an old family, and was born at St Peter Port, Guernsey, 11th of March 1757. Many of his ancestors had distinguished themselves in the naval service, and he entered it as midshipman at the age of thirteen. For his bravery at the attack of Charleston in 1776 on board the "Bristol" he was raised to the rank of lieutenant, and he was promoted commander for his gallant services off the Dogger Bank, 5th of August 1781, when he was wounded. In command of the "Russell," 70, he contributed to Rodney's victory over De Grasse (12th of April 1782). For the capture of "La Réunion," a French frigate, in 1793, he was knighted. While in command of a small squadron he was on the 5th of June 1794 attacked by a superior French force on the way from Plymouth to Guernsey, but succeeded in gaining a safe anchorage in Guernsey harbour. After being promoted to the "Orion," 74, in 1795, he took part in the defeat of the French fleet off Lorient, on the 22nd of June, distinguished himself in the battle of Cape St Vincent in February 1797, and was present at the blockade of Cadiz from February 1797 to April 1798, and at the battle of the Nile, where he was wounded. On his return from Egypt he received the command of the "Caesar," 84, with orders to watch the French fleet off Brest during the winters of 1799 and 1800. In 1801 he was raised to the rank of rear-admiral of the blue, was created a baronet, and received the command of a small squadron which was destined to watch the movements of the Spanish fleet at Cadiz. Between the 6th and 12th of July he performed a brilliant piece of service, in which after a first repulse at Algeciras he routed a much superior combined force of French and Spanish ships. For his services

Saumarez received the order of the Bath and the freedom of the city of London. In 1803 he received a pension of £1200 a year. On the outbreak of the war with Russia in 1809 he was given command of the Baltic fleet. He held it during the wars preceding the fall of Napoleon, and his tact was conspicuously shown towards the government of Sweden at the crisis of the invasion of Russia. Charles XIII. (Bernadotte) bestowed on him the grand cross of the military order of the Sword. At the peace of 1814 he attained the rank of admiral; and in 1819 he was made rear-admiral, in 1821 vice-admiral of Great Britain. He was raised to the peerage as Baron de Saumarez in 1831, and died at Guernsey on the 9th of October 1836.

See *Memoirs of Admiral Lord de Saumarez*, by Sir John Ross (2 vols., 1838).

SAUMUR, a town of western France, capital of an arrondissement in the department of Maine-et-Loire, 28 m. S.E. of Angers on the railway to Tours. Pop. (1906) 14,747. Saumur is well situated on the left bank of the Loire, which here receives the Thouet, and on an island in the river. A large metal bridge connects the Tours-Angers railway with that of Montreuil-Bellay, by which Saumur communicates with Poitiers and Niort. Two stone bridges (764 and 905 ft. long) unite the town on the island with the two banks of the river. Several of the Saumur churches are interesting. St Pierre, of the 12th century, has a 17th-century façade and a Renaissance nave; and Notre-Dame of Nantilly, often visited by Louis XI., who rebuilt portions of it, has a remarkable though greatly damaged façade, a doorway and choir of the 12th century, and a nave of the 11th. Both these churches contain curious tapestries, and in the latter, fixed in the wall, is the copper cross of Gilles de Tyr, keeper of the seals to St Louis. St Jean is a small building in the purest Gothic style of Anjou. St Nicolas-du-Chardonnet, in the Gothic style of the 12th century, has a fine modern spire. Notre-Dame of Ardilliers, of the 16th century, was enlarged in the following century by Richelieu and Madame de Montespan. The hotel de ville, containing a museum and library, is an elegant 16th century edifice; and the whole town is rich in examples of the domestic architecture of the 15th, 16th and 17th centuries. The house known as the Maison de la Reine Cécile (15th century) was built by René, duke of Anjou. The castle, built between the 11th century and the 13th, and remodelled in the 16th, is used as an arsenal and powder magazine. There is also an interesting almshouse, with its chambers in part dug out in the rock. The famous cavalry school of Saumur was founded in 1768 and is used for the special training of young officers appointed to cavalry regiments on leaving the cadet school of St Cyr. Other public institutions are the sub-prefecture, tribunals of first instance and of commerce, a chamber of commerce, a branch of the Bank of France, colleges for both sexes and a horticultural garden, with a school of vines. Saumur prepares and carries on a large trade in the sparkling white wines grown in the neighbourhood, as well as in brandy, grain, flax and hemp; and it manufactures enamels and rosaries and carries on liqueur-distilling.

The Saumur caves along the Loire and on both sides of the valley of the Thouet must have been occupied at a very remote period. The Tour du Tronc (9th century), the old stronghold of Saumur, served as a place of refuge for the inhabitants of the surrounding district during foreign invasions (whence perhaps the name Saumur, from *Salons Murus*) and became the nucleus of a monastery built by monks from St Florent le Vieil. On the same site rose the castle of Saumur two hundred years later. The town fell into the hands of Foulques Nerra, duke of Anjou, in 1025, and passed in the 13th century into the possession of the kings of France. The English failed to capture it during the Hundred Years' War. After the Reformation the town became the metropolis of Protestantism in France and the seat of a theological seminary. The school of Saumur, as opposed to that of Sedan, represented the more liberal side of French Protestantism (Cameron, Amyraut, &c.). In 1623 the fortifications were dismantled; and the revocation of the edict of Nantes reduced the population by more than one half. In June 1793, the town was occupied by the Vendeans, against whom it soon afterwards became a base of operations for the republican army.

SAUNDERSON, EDWARD JAMES (1837–1906), Irish politician, was born at Castle Saunderson, Co. Cavan, on the 1st of October 1837. He was the son of Alexander Saunderson, M.P. for Cavan (d. 1857), his mother being a daughter of the 6th Baron Farnham. The Irish Saundersons were a 17th century branch of an old family, originally of Durham; a Lincolnshire branch, the Saundersons of Saxby, held the titles of Viscount Castleton (Irish: cr. 1628) and Baron Saunderson (British: cr. 1714) up to 1723. Edward Saunderson was educated abroad, and, having succeeded to the Cavan estates, married in 1865 a daughter of the 3rd Baron Ventry, and in the same year was elected M.P. for the county as a Palmerstonian Liberal. He lost his seat in 1874, and by 1885, when he again entered parliament for North Armagh, he had become a prominent Orangeman and a Conservative; the question of Irish home rule had now come to the front, and Saunderson's political career as a representative Irish Unionist had begun. He had entered the Cavan militia (4th battalion Royal Irish Fusiliers) in 1862, and was now major (1875), becoming colonel in 1886 and in command of the battalion from 1891 to 1893. Almost from the first he became leader of the Irish Unionist party in the House of Commons, his uncompromising speeches being full of force and humour. In 1898 his services were recognized by his being made a privy councillor. He died on the 21st of October 1906. In private life Colonel Saunderson was well known as a keen yachtsman; his character was deeply marked by stern religious feeling, and his fine sincerity, while endearing him to his friends, never lost him the respect of his opponents.

See the *Memoir* by Reginald Lucas (1908).

SAUNDERSON, or SANDERSON, **NICHOLAS** (1682–1739), English mathematician, was born at Thurlstone, Yorkshire, in January 1682. When about a year old he lost his sight through smallpox; but this did not prevent him from acquiring a knowledge of Latin and Greek, and studying mathematics. In 1707 he began lecturing at Cambridge on the principles of the Newtonian philosophy, and in November 1711 he succeeded William Whiston, the Lucasian professor of mathematics in Cambridge. He was created doctor of laws in 1728 by command of George II., and in 1736 was admitted a member of the Royal Society. He died of scurvy, on the 19th of April 1739.

Saunderson possessed the friendship of many of the eminent mathematicians of the time, such as Sir Isaac Newton, Edmund Halley, Abraham De Moivre and Roger Cotes. His senses of hearing and touch were extraordinarily acute, and he could carry on mentally long and intricate mathematical calculations. He devised a calculating machine or abacus, by which he could perform arithmetical and algebraical operations by the sense of touch; this method is sometimes termed his *palpable arithmetic*, an account of which is given in his elaborate *Elements of Algebra* (2 vols., Cambridge, 1740). Of his other writings, prepared for the use of his pupils, the only one which has been published is *The Method of Fluxions* (1 vol., London, 1756). At the end of this treatise there is given, in Latin, an explanation of the principal propositions of Sir Isaac Newton's philosophy.

SAUNTER, to loiter, lounge, walk idly or lazily. The derivation of the word has given rise to some curiously far-fetched guesses; thus it has been referred to the Holy Land, *La Sainte Terre*, where pilgrims lingered and loitered, or to the supposed tendency to idle propensities of those who possess no landed property, *sans terre*. The most probable suggestions are (1) that of Wedgwood, who connects it with a word in exactly the English sense which appears in various forms in Scandinavian languages, Icel. *slentr*, Dan. *slentre*, Swed. *slentra*, cf. *slen*, sloth, *slunt*, lout; this derivation assumes the disappearance of the *l*. (2) That supported by Skeat, and first propounded by Blackley (*Word Gossip*, 1869), which connects it with the Middle Eng. *aunter*, adventure; it may represent the Fr. *s'aventurer*, to go out on an adventure, and the sense-development would be from the idle and apparently objectless expeditions of knights-errant in search of adventure.

SAUROPSIDA. This name was introduced by T. H. Huxley in his *Introduction to the Classification of Animals* (1869), to designate a province of the *Vertebrata* formed by the union of the *Aves* with the *Reptilia*. In his *Elements of Comparative Anatomy* (1864) he had used the term "Sauroids" for the same province. The five divisions of the *Vertebrata—Pisces*, *Amphibia*, *Reptilia*, *Aves*, and *Mammalia*—are all distinctly definable, but their relations to one another differ considerably in degree. Whilst it was Huxley's great merit to emphasize by the term *Sauropsida* the close and direct relationship between the classes of reptiles and birds, it was an unfortunate innovation to brigade the Amphibia and fishes as *Ichthyopsida*, thereby separating the Amphibia much more from the reptiles than is justifiable, more than perhaps he himself intended. The great gulf within the recent Vertebrata lies between fishes, absolutely aquatic creatures with internal gills and "fins" on the one side, and on the other side all the other, tetrapodous creatures with lungs and fingers and toes, for which H. Credner has found the excellent term of *Tetrapoda*. Another drawback of Huxley's divisions resulted in the tendency of alienating the Mammalia, the third division, from the reptiles whilst trying to connect their ancestry with the Amphibia, a view which even now has some vigorous advocates.

The characters which distinguish the *Sauropsida*, that is, which are common to birds and reptiles, and not found combined in the other classes, have been thus summarized by Huxley: no branchiae at any period of existence; a well-developed amnion and allantois present in the embryo; a mandible composed of many bones and articulated to the skull by a quadrate bone; nucleated blood-corpuscles; no separate parasphenoid bone in the skull; and a single occipital condyle. In addition to these principal characters others exist which are found in all birds and reptiles, but are not exclusively confined to them. The oviduct is always a Müllerian duct separate from the ovary and opening from the body cavity. The adult kidney is a metanephros with separate ureter; the mesonephros and mesonephric duct become in the adult male the efferent duct of the testis. The intestine and the reproductive and urinary ducts open into a common cloaca. There is usually an exoskeleton in the form of scales; in the birds the scales take the form of feathers. There are two aortic arches in reptiles, in birds only one—the right. The heart is usually trilocular, becoming quadrilocular in crocodiles and birds. In all the eggs are meroblastic and large, possessing a large quantity of yolk; in all the egg is provided in the oviduct with a layer of albumen and outside this with a horny or calcareous shell. In a few cases the egg is hatched in the oviduct, but in these cases there is no intimate connexion between the embryo and the walls of the duct. Fertilization takes place internally, occurring at the upper end of the oviduct previously to the deposition of the albuminous layer and egg shell.

Comparative anatomy clearly shows that birds are closely allied to reptiles; enthusiasts even spoke of them as "glorified reptiles," and this view seemed to receive its proof by the discoveries of Archaeopteryx (*q.v.*), and the numerous bipedal Dinosaurs. But Archaeopteryx was after all a bird, although still somewhat primitive, and the question, what group of reptiles has given rise to the birds? is still unanswered. By irony of fate, mere lack of the fossil material, it has come to pass that the bridges between Amphibia and reptiles and from them to Mammals are in a fairer way of reconstruction than is that between reptiles and birds, the very two classes of which we know that they "belong together." (H. F. G.)

SAUSSURE, HORACE BÉNÉDICT DE (1740–1799), Swiss physicist and Alpine traveller, was born at Geneva on the 17th of February 1740.[1] Under the influence of his father and his maternal uncle, Charles Bonnet, he devoted himself to botany. In 1758 he made the acquaintance of Albrecht von Haller, and in 1762 he published his first work, *Observations sur l'écorce des feuilles et des pétales*. The same year he was chosen professor of philosophy at the academy of Geneva, and retained this chair till 1786. His health began to fail in 1791, when too he suffered great pecuniary losses. But he was able to complete his great work in 1796, before his death on the 22nd of January 1799. He became a F.R.S. after his visit to England (autumn of 1768), and in 1772 founded the Société pour l'Avancement des Arts at Geneva. His early devotion to botanical studies naturally led him to undertake journeys among the Alps, and from 1773 onwards he directed his attention to the geology and physics of that great chain. Incidentally, he did much to clear up the topography of the snowy portions of the Alps, and to attract the attention of pleasure travellers towards spots like Chamonix and Zermatt. In 1760 he first visited Chamonix, and offered a reward to the man who should first succeed in reaching the summit of Mont Blanc (then unscaled). He made an unsuccessful attempt himself in 1785, by the Aiguille du Goûter route. Two Chamonix men attained the summit in 1786, by way of the Grands Mulets, and in 1787 Saussure himself had the delight of gaining the summit (the third ascent). In 1788 he spent 17 days in making observations on the crest of the Col du Géant (11,060 ft.). In 1774 he mounted the Crammont, and again in 1778, in which year he also explored the Valsorey glacier, near the Great St Bernard. In 1776 he had ascended the Buet (10,201 ft.). In 1789 he visited the Pizzo Bianco (near Macugnaga) and made the first traveller's passage of the St Théodule Pass (10,899 ft.) to Zermatt, which he was the first traveller to visit. On that occasion he climbed from the pass up the Klein Matterhorn (12,750 ft.), while in 1792 he spent three days on the same pass (not descending to Zermatt), making observations, and then visited the Theodulhorn (11,392 ft.). In 1780 he climbed the Roche Michel, above the Mont Cenis Pass. The descriptions of seven of his Alpine journeys (by no means all), with his scientific observations gathered *en route*, were published by him in four quarto volumes, under the general title of *Voyages dans les Alpes* (1779–1796; there was an octavo issue in eight volumes, issued 1780–1796, while the non-scientific portions of the work were first published in 1834, and often since, under the title of *Partie pittoresque des ouvrages de M. de Saussure*).

The Alps formed the centre of Saussure's investigations. They forced themselves on his attention as the grand key to the true theory of the earth, and among them he found opportunity for studying geology in a manner never previously attempted. The inclination of the strata, the nature of the rocks, the fossils and the minerals received his closest attention. He acquired a thorough knowledge of the chemistry of the day; and he applied it to the study of minerals, water and air. Saussure's geological observations made him a firm believer in the Neptunian theory: he regarded all rocks and minerals as deposited from aqueous solution or suspension, and in view of this he attached much importance to the study of meteorological conditions. He carried barometers and boiling-point thermometers to the summits of the highest mountains, and estimated the relative humidity of the atmosphere at different heights, its temperature, the strength of solar radiation, the composition of air and its transparency. Then, following the precipitated moisture, he investigated the temperature of the earth at all depths to which he could drive his thermometer staves, the course, conditions and temperature of streams, rivers, glaciers and lakes, even of the sea. The most beautiful and complete of his subsidiary researches is described in the *Essai sur l'hygrométrie*, published in 1783. In it he records experiments made with various forms of hygrometer in all climates and at all temperatures, and supports the claims of his hair-hygrometer against all others. He invented and improved many kinds of apparatus, including the magneto-meter, the cyanometer for estimating the blueness of the sky, the diaphanometer for judging of the clearness of the atmosphere, the anemometer and the mountain eudiometer. His modifications of the thermometer adapted that instrument to many purposes: for ascertaining the temperature of the air he used one with a fine bulb hung in the shade or whirled by a string, the latter form being converted into an evaporometer by inserting its bulb into a piece of wet sponge and making it revolve in a circle of known radius at a known rate; for experiments on the earth and in deep water he employed large thermometers wrapped in non-conducting coatings so as to render them extremely sluggish, and capable of long retaining the temperature once they had attained it. By the use of these instruments he showed that the bottom water of deep lakes is uniformly cold at all seasons, and that the annual heat wave takes six months to penetrate to a depth of 30 ft. in the earth. He recognized the immense advantages to meteorology of high-level observing stations, and whenever it was practicable he arranged for simultaneous observations being made at different altitudes for as long periods as possible. It is perhaps as a geologist (it is said that he was the first to use the term "geology"—see the "Discours préliminaire" to vol. i. of his *Voyages*, publ. in 1779) that Saussure worked most; and although his ideas on matters of theory were in many cases very erroneous he was instrumental in greatly advancing that science.

See Lives by J. Senebier (Geneva, 1801), by Cuvier in the *Biographie universelle*, and by Candolle in *Décade philosophique*, No. xv. (trans. in the *Philosophical Magazine*, iv. p. 96); articles by E. Naville in the *Bibliothèque universelle* (March, April, May 1883), and chaps. v.–viii. of Ch. Durier's *Le Mont-Blanc* (Paris, various editions between 1877 and 1897). (W. A. B. C.)

SAUSSURE, NICOLAS THÉODORE DE (1767–1845), eldest son of Horace Bénédict de Saussure, was born on the 14th of October 1767, at Geneva, and is known chiefly for his work on the chemistry of vegetable physiology. He lived quietly and avoided society; yet like his ancestors he was a member of the

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[1] His father, Nicolas de Saussure (1709–1790), an agriculturist of unusually liberal opinions, resided all his life at his farm of Conches, on the Arve, near Geneva. As a member of the council of Two Hundred he took part in public affairs. Most of his writings bear on the growth and diseases of grain and other farm produce. His last work *Le Feu, principe de la fécondité des plantes et de la fertilité de la terre* (1782), was more speculative in its nature.

Genevan representative council, and gave much attention to public affairs. In the latter part of his life he became more of a recluse than ever, and died at Geneva on the 18th of April 1845.

When a young man Nicolas Théodore accompanied his father in his Alpine journeys and assisted him by the careful determination of many physical constants. He was attracted to chemistry by Lavoisier's brilliant conceptions, but he did not become great as an originator. He took a leading share in improving the processes of ultimate organic analysis; and he determined the composition of ethyl alcohol, ether and some other commonly occurring substances. He also studied fermentation, the conversion of starch into sugar, and many other processes of minor importance. The greater number of his 36 published papers dealt with the chemistry and physiology of plants, the nature of soils, and the conditions of vegetable life, and were republished under the title *Recherches chimiques sur la végétation.*

SAUVAL, HENRI (1623–1676), French historian, son of an advocate in the Parlement, was born in Paris, and baptized on the 5th of March 1623. He devoted most of his life to researches among the archives of his native city, and in 1656 even obtained a licence to print his *Paris ancien et moderne*; but on his death (21st March 1676) the whole work was still in manuscript. A long time afterwards it appeared, thanks to his collaborator, Claude Bernard Rousseau, under the title of *Histoire et recherches des antiquités de la ville de Paris* (1724), but remodelled, with the addition of long and dull dissertations which were not by Sauval. The work was not without merits, and it was re-issued in 1733 and 1750. The original manuscript first belonged to Montmerqué, and then passed into the possession of Le Roux de Lincy, who prepared an annotated edition; unfortunately this material, together with the original MS., was lost in the incendiary fires which took place under the Commune (1871). There remain, however, Le Roux de Lincy's researches, a series of articles on Sauval which appeared in the *Bulletin du bibliophile et du bibliothécaire* in 1862, 1866 and 1868. See also the *Bibliographie de Paris avant 1789*, by the Abbé Valentin Dufour (1882).

SAVAGE, MINOT JUDSON (1841–), American Unitarian minister and author, was born in Norridgewock, Maine, on the 10th of June 1841. He graduated at the Bangor Theological Seminary in 1864, and for nine years was in the Congregational ministry, being a home missionary at San Mateo and Grass Valley, California, until 1867, and holding pastorates at Framingham, Mass. (1867–1869), and Hannibal, Missouri (1869–1873). He then became a Unitarian, and was pastor of the Third Unitarian Church of Chicago in 1873–1874, of the Church of the Unity in Boston in 1874–1896, and of the Church of the Messiah in New York City in 1896–1906.

He wrote many books, including *Christianity, the Science of Manhood* (1873), *The Religion of Evolution* (1876), *The Morals of Evolution* (1880), *The Religious Life* (1885), *My Creed* (1887), *The Evolution of Christianity* (1892), *Our Unitarian Gospel* (1898), *The Passing and the Permanent in Religion* (1901), *Life Beyond Death* (1901), *Can Telepathy Explain?* (1902), *Life's Dark Problems* (1905), and, besides other volumes in verse, *America to England* (1905).

SAVAGE, RICHARD (d. 1743), English poet, was born about 1697, probably of humble parentage. A romantic account of his origin and early life, for which he at any rate supplied the material, appeared in Curll's *Poetical Register* in 1719. On this and other information provided by Savage, Samuel Johnson founded his *Life of Savage*, one of the most elaborate of the *Lives*. It was printed anonymously in 1744, and has made the poet the object of an interest which would be hardly justified by his writings. In 1698 Charles Gerrard, 2nd earl of Macclesfield, obtained a divorce from his wife, Anna, daughter of Sir Richard Mason, who shortly afterwards married Colonel Henry Brett. Lady Macclesfield had two children by Richard Savage, 4th earl Rivers, the second of whom was born at Fox Court, Holborn, on the 16th of January 1697, and christened two days later at St Andrews, Holborn, as Richard Smith. Six months later the child was placed with Anne Portlock in Covent Garden; nothing more is positively known of him. In 1718 Richard Savage claimed to be this child. He stated that he had been cared for by Lady Mason, his grandmother, who had put him to school near St Albans, and by his godmother, Mrs Lloyd. He said he had been pursued by the relentless hostility of his mother, Mrs Brett, who had prevented Lord Rivers from leaving £6000 to him and had tried to have him kidnapped for the West Indies. His statements are not corroborated by the depositions of the witnesses in the Macclesfield divorce case, and Mrs Brett always maintained that he was an impostor. He was wrong in the date of his birth; moreover, the godmother of Lady Macclesfield's son was Dorothea Ousley (afterwards Mrs Delgardno), not Mrs Lloyd. There is nothing to show that Mrs Brett was the cruel and vindictive woman he describes her to be, but abundant evidence that she provided for her illegitimate children. Discrepancies in Savage's story made Boswell suspicious, but the matter was thoroughly investigated for the first time by W. Moy Thomas, who published the results of his researches in *Notes and Queries* (second series, vol. vi., 1858). Savage, impostor or not, blackmailed Mrs Brett and her family with some success, for after the publication of *The Bastard* (1728) her nephew, John Brownlow, Viscount Tyrconnel, purchased his silence by taking him into his house and allowing him a pension of £200 a year. Savage's first certain work was a poem satirizing Bishop Hoadly, entitled *The Convocation, or The Battle of Pamphlets* (1717), which he afterwards tried to suppress. He adapted from the Spanish a comedy, *Love in a Veil* (acted 1718, printed 1719), which gained him the friendship of Sir Richard Steele and of Robert Wilks. With Steele, however, he soon quarrelled. In 1723 he played without success in the title rôle of his tragedy, *Sir Thomas Overbury* (pr. 1724), and his *Miscellaneous Poems* were published by subscription in 1726. In 1727 he was arrested for the murder of James Sinclair in a drunken quarrel, and only escaped the death penalty by the intercession of Frances, countess of Hertford (d. 1754).

Savage was at his best as a satirist, and in *The Author to be Let* he published a quantity of scandal about his fellow-scribblers. Proud as he was, he was servile enough to supply Pope with petty gossip about the authors attacked in the *Dunciad*. His most considerable poem, *The Wanderer* (1729), shows the influence of Thomson's *Seasons*, part of which had already appeared. Savage tried without success to obtain patronage from Walpole, and hoped in vain to be made poet-laureate. Johnson states that he received a small income from Mrs Oldfield, but this seems to be fiction. In 1732 Queen Caroline settled on him a pension of £50 a year. Meanwhile he had quarrelled with Lord Tyrconnel, and at the queen's death was reduced to absolute poverty. Pope had been the most faithful of his friends, and had made him a small regular allowance. With others he now raised money to send him out of reach of his creditors. Savage went to Swansea, but he resented bitterly the conditions imposed by his patrons, and removed to Bristol, where he was imprisoned for debt. All his friends had ceased to help him except Pope, and in 1743 he, too, wrote to break off the connexion. Savage died in prison on the 1st of August 1743.

See Johnson's *Life of Savage*, and *Notes and Queries* as already quoted. He is the subject of a novel, *Richard Savage* (1842), by Charles Whitehead, illustrated by John Leech. *Richard Savage*, a play in four acts by J. M. Barrie and H. B. Marriott-Watson, was presented at an afternoon performance at the Criterion theatre, London, in 1891. The dramatists took considerable liberties with the facts of Savage's career. See also S. V. Makower, *Richard Savage, a Mystery in Biography* (1909).

SAVAGE, a word by derivation meaning belonging to the wilds or forests (O. Fr. *salvage*, mod. *sauvage*, Late Lat. *silvaticus*, *silva*, wood, forest), hence wild, uncultivated, barbarian, and so used of races in an uncivilized or barbarous condition, or of animals or human beings generally, untamed, ferocious.

SAVAH, a small province of central Persia, north of Irak and south-west of Teheran, comprising the districts of Savah, Khalejistan (inhabited by the Turkish Khalej tribe), Zerend and Karaghan. It pays a yearly revenue of about £5000. The capital is the ancient city of Savah, which has a population of about 7000, and is 72 m. S.W. of Teheran, at an elevation of 3380 ft., in 35° 4′ N., 50° 30′ E. The soil is very fertile, is well watered, and produces much wheat, barley and rice. It is occasionally joined to the province of Teheran to facilitate the governor's arrangements for supplying the capital of Persia with grain.

SAVANNA or SAVANNAH (Span. *sávana*, a sheet; Late Lat. *sabanum*, Gr. *σάβανον*, a linen cloth), a term applied either to a plain covered with snow or ice, or, more generally, to a treeless plain. Its use in English, more frequent formerly than now, is most common in application to the great plains of central North America, in which it is practically the equivalent of "prairie" (*q.v.*). In this application it was first used (accented thus—*savána*) by the Spanish historian Gonzalo de Oviedo y Valdés in the 16th century.

SAVANNAH, a city, a port of entry, and the county-seat of Chatham county, Georgia, U.S.A., on the right (south) bank of the Savannah river, about 18 m. from the Atlantic Ocean. Pop. (1890) 43,189; (1900) 54,244, of whom 28,090 were negroes and 3434 were foreign-born; (1910, census) 65,064. It is served by the Atlantic Coast Line, the Central of Georgia, the Southern, and other railways; by river steamers to Augusta; by coastwise steamers to Baltimore, Philadelphia, New York and Boston; and by transatlantic steamers to European ports.

The city is situated on a plateau some 40 ft. above the Savannah river and covers about 6·3 sq. m. Savannah owes its regular form, with streets intersecting each other at right angles, to James Edward Oglethorpe, its founder, but the monotony is slightly relieved by 42 small parks and squares, whose total area is 166·79 acres. The larger parks are the Daffin, the Colonial, on Oglethorpe Avenue (formerly South Broad Street), and Forsyth, on Gaston Street, with fine tropical and semi-tropical flora. The smaller parks or squares are mostly in five series parallel to the Savannah river. On account of the large number of its shade trees Savannah has been called the "Forest City." Bonaventure Cemetery, about 4 m. east of the city, has avenues of fine live-oaks, draped with Spanish moss. In the principal commercial street, Bay Street, are the new City Hall (1906), on the site of the old City Hall built in 1779, the Custom House, completed in 1850, the Cotton Exchange, and a granite seat marking the spot where Oglethorpe first pitched his tent; and in Bull Street, a fashionable promenade, named in honour of William Bull (1683–1755), a military officer who aided Oglethorpe in his survey of the city, are Chatham Academy, a marble post-office building, the county court house, and the Savannah theatre (established in 1818, remodelled in 1895, rebuilt in 1906), one of the oldest playhouses in the United States. In Johnson Square, a little south of the City Hall and Custom House, stands a plain dignified monument, in the design of a Roman sword, erected in 1829 in memory of General Nathanael Greene, to whom a tract of land near Savannah was given by Congress in recognition of his service in the War of American Independence, and who was buried in a vault in the old cemetery in South Broad Street (now Oglethorpe Avenue); his remains were transferred to the monument in 1900. In Monterey Square there is a monument and statue by the German sculptor Robert Eberhard Launitz (1806–1870), in honour of Count Casimir Pulaski, who was mortally wounded during the siege of Savannah in 1779. The corner-stones of these monuments were laid by General La Fayette in 1825. In Madison Square, north of Monterey Square, there is a monument to Sergeant William Jasper (1750–1779), a hero of the War of Independence, who replaced the fallen colours on Fort Moultrie in the face of a galling fire during the battle of Charleston Harbour (June 28th, 1776), rescued a band of American prisoners from British guards at Jasper Spring, 2 m. from Savannah, and was fatally wounded during the siege of the city in 1779. In Chippewa Square there is a bust of Major-General Lafayette McLaws (1821–1897). The Ladies' Memorial Association erected a Confederate Soldiers Monument in the "Parade Ground," which forms an extension to Forsyth Park, in the south central part of the city; and in honour of Tomochichi, an Indian chief who was the staunch friend of the early settlers, a large granite boulder has been placed in Wright Square, where he was buried. At the corner of Anderson and Bull Streets there is a memorial to Major-General Alexander Robert Lawton (1818–1896), state senator in 1854–1861, who seized Fort Pulaski in 1861 upon the governor's orders, served through the Civil War in the Confederate Army, and was U.S. minister to Austria-Hungary in 1887–1889.

Since the founding of Georgia as a bulwark against the Spaniards and French, Savannah has had an ardent martial spirit, and there are five military organizations—the Chatham Artillery, formed in 1786, one of the oldest military companies in the United States; the Savannah Volunteer Guards, organized in 1802 as an infantry corps, now a coast artillery corps of four companies; the Georgia Hussars, formed after the War of 1812 by the consolidation of two other companies; the First Volunteer Regiment of Georgia, composed of five companies, organized respectively in 1808, 1843, 1846, 1860 and 1861, and a division of naval militia organized in 1895. The most prominent clubs are the Oglethorpe, the Guards, the Hussars and the Harmonie. Among the pleasure resorts in the vicinity are Tybee Island, at the mouth of the Savannah river, a popular bathing resort, and Thunderbolt, Isle of Hope, White Bluff and Montgomery, distant 5 m., 6 m., 8 m. and 9 m. respectively.

Among the religious corporations in Savannah, the oldest is Christ Church, whost first building was erected in 1740–1750 and whose present edifice was built in 1838. Its third rector was John Wesley, who is said to have established a Sunday School (still in existence) in Savannah almost half a century before Robert Raikes established such a school in England. The first African Baptist Church, organized in 1788, is the oldest religious society of negroes in the United States. The Convent of St Vincent de Paul was founded in 1842; the Cathedral of St John the Baptist was dedicated in 1876, was destroyed by fire in 1898, but was subsequently rebuilt; and a Jewish synagogue was erected in 1878. Savannah is the see of a Roman Catholic and of a Protestant Episcopal bishop. There are several hospitals and charitable institutions in or near Savannah, including the Bethesda Orphan Asylum, about 8 m. from the city, founded by George Whitefield in 1740 and now owned by the Union Society, and the Savannah Female Asylum (1750). In 1885 the Telfair Academy of Arts and Sciences (near Telfair Square or Telfair Place), endowed by Miss Mary Telfair, was opened; in its collections are Wilhelm von Kaulbach's "Peter Arbues of Epila" and Joseph von Brandt's "Ein Gefecht." The Georgia Historical Society, organized in 1839 and in 1847 united with the Savannah Library Society, has a handsome building (Hodgson Hall) at the intersection of Whitaker and Gaston Streets, and a library of about 35,000 volumes; it published six volumes of *Collections* between 1840 and 1904. The Georgia Industrial College (1890), for negroes, is near the city. The Chatham Academy was chartered and endowed with some of the confiscated property of Loyalists in 1788.

Savannah harbour has permanent seacoast defences, and is the most important Atlantic seaport south of Baltimore. The port is nearer the Panama Canal than either New Orleans or Galveston; and after the completion of harbour improvements by the United States government, begun in 1902, the depth of the river from its mouth to the city was 28 ft. There are great wharves and piers on the water front; more than 4 m. of wharves are occupied by railway terminals. In 1909 Savannah's exports were valued at $66,932,973; its imports at $2,664,079. Of the exports naval stores rank first, Savannah being first among the world markets of naval stores; cotton comes second, but the relative position of the city as a cotton centre has declined because of the greater increase in that of Galveston and New Orleans. Other important exports are fertilizers, rice and lumber. Savannah is the business and shipping centre of the surrounding fruit and truck growing country. The principal manufactures are fertilizers and cars, and, of less importance, lumber and planing-mill products, and foundry and machine-shop products. The city's rice-mills and cotton compresses are commonly visited by tourists. The total value of the city's factory products in 1905 was $6,340,004 (69·1 % more than in 1900).

The city government is vested in a council, consisting of a mayor and twelve aldermen, elected for two years in January of odd-numbered years; the council's committees act as heads of several of the administrative departments; the mayor is head of the police; and the council appoints other city officers. The board of aldermen may pass a measure by a two-thirds vote over the mayor's veto. The city board of education was incorporated in 1866 and took over the powers of the board of education of Chatham county; it is self-perpetuating and practically non-partisan. A free school had been established as early as 1816. In 1909 the assessed value of real estate was $35,147,580 and of personal property $12,828,673, and the bonded debt was $2,701,050 ($218,050 due in 1913 and $2,483,000 due in 1959); the rate of taxation was $1·39 per $100.

The first European settlement in Georgia was made at Savannah in February 1733 by James Edward Oglethorpe. Among the early inhabitants were Charles and John Wesley, who arrived in 1735, but returned to England in 1736 and 1737 respectively, and George Whitefield, who lived in Savannah in 1738 and 1740. Savannah was the seat of government of Georgia until the capture of the city by the British in 1778. Here, on the 1st of January 1755, met the first legislature of Georgia. In the years preceding the War of Independence the political issues excited much partisanship. Riots almost completely prevented the execution of the Stamp Act, and the stamps were reloaded on the ship that brought them to Savannah. In 1769 the merchants agreed not to import any articles mentioned in the Townshend Acts of 1767.

On the 18th of January 1775 the first Provincial Congress was convened here; on the night of the 11th of May the powder magazine was robbed of all its ammunition, part of which was sent to Boston and, according to tradition, was used at Bunker Hill; and on the 22nd of June the people of the city elected a Council of Safety. On the 4th of July the same Provincial Congress again met, and soon the royal administration collapsed. Probably the first naval capture of the War of Independence was made off Tybee Island on the 10th of July, when a schooner, the first vessel chartered by the Continental Congress, seized a British ship and its cargo of 14,000 lb of powder. Yet the Loyalists were strong in Savannah, and many families were divided among themselves.

In October 1776–February 1777 the convention which framed the first constitution of Georgia was held in Savannah, and the first state legislature assembled here in May 1778; but the British captured the city on the 29th of December in that year, and the seat of the state government was then transferred to Augusta. In 1779 Savannah was unsuccessfully besieged by a French fleet under Comte d'Estaing and land forces under General Benjamin Lincoln, but in May 1782 it was evacuated after a short siege by General Anthony Wayne. It once more became the capital, but in 1783 the seat of the state government was again transferred to Augusta. Savannah soon became the commercial rival of Charleston, South Carolina. It was chartered as a city in 1789. As early as 1817 the Savannah Steamboat Company, which ran a steamer to Charleston, was organized, and in 1819 the "Savannah," the first vessel fitted with steam-engines to cross the Atlantic,[1] owned by Savannah capitalists but built in the North, sailed from Savannah to Liverpool in 25 days. In 1861 the state convention which adopted the ordinance of secession met in Savannah. A blockade of the port was instituted by the Federal government in 1861, and on the 12th of December 1862 Fort Pulaski (on Cockspur Island, at the mouth of the Savannah river), which commanded the channel, and had been seized by the state at the outbreak of the war, was forced to surrender. Savannah was the objective of General W. T. Sherman's "march to the sea," and on the 21st of December 1864 surrendered to him after futile opposition by General William J. Hardee (1818–1873) with a force very inferior in numbers. The city limits were extended in 1879, 1883 and 1901.

SAVARY, ANNE JEAN MARIE RENÉ, Duke of Rovigo (1774–1833), French general and diplomatist, was born at Marcq in the Ardennes on the 26th of April 1774. He was educated at the college of St Louis at Metz and entered the royal army in 1790. His first campaign was that waged by General Custine against the retreating forces of the duke of Brunswick in 1792. He next served in succession under Pichegru and Moreau, and distinguished himself during the skilful retreat of the latter from an untenable position in the heart of Swabia. He became *chef d'escadron* in 1797, and in 1798 served under General Desaix, in the Egyptian campaign, of which he left an interesting and valuable account. He also distinguished himself under Desaix at Marengo (14th of June 1800). His fidelity and address while serving under Desaix, who was killed at Marengo, secured him the confidence of Bonaparte, who appointed him to command the special body of gendarmes charged with the duty of guarding the First Consul. In the discovery of the various ramifications of the Cadoudal-Pichegru conspiracy Savary showed great skill and activity. He proceeded to the cliff of Biville in Normandy, where the plotters were in the habit of landing, and sought, by imitating the signals of the royalist plotters, to tempt the comte d'Artois (afterwards Charles X.) to land. In this he was unsuccessful. He was in command of the troops at Vincennes when the duc d'Enghien (*q.v.*) was summarily executed. Hullin, who presided at the court-martial, afterwards accused Savary, though not by name, of having intervened to prevent the despatch to Bonaparte of an appeal for mercy which he (Hullin) was in the act of drawing up. Savary afterwards denied this, but his denial has not generally been accepted. In February 1805 he was raised to the rank of general of division. Shortly before the battle of Austerlitz (2nd of December 1805) he was sent by Napoleon with a message to the emperor Alexander I. with a request for an armistice, a device which caused that monarch all the more eagerly to strike the blow which brought disaster to the Russians. After the battle Savary again took a message to Alexander, which induced him to treat for an armistice. In the campaign of 1806 Savary showed signal daring in the pursuit of the Prussians after the battle of Jena. Early in the next year he received command of a corps, and with it gained an important success at Ostrolenka (16th of February 1807).

After the treaty of Tilsit (7th of July 1807) Savary proceeded to St Petersburg as the French ambassador, but was soon replaced by General Caulaincourt (*q.v.*), another accessory to the execution of the duc d'Enghien. The repugnance of the empress dowager to Savary is said to have been one of the reasons of his recall, but it is more probable that Napoleon felt the need of his gifts for intrigue in the Spanish affairs which he undertook at the close of 1807. With the title of duke of Rovigo (a small town in Venetia), Savary set out for Madrid when Napoleon's plans for gaining the mastery of Spain were nearing completion. With Murat Savary made skilful use of the schisms in the Spanish royal family (March–April 1808), and persuaded Charles IV., who had recently abdicated under *duresse*, and his son Ferdinand VII., the *de facto* king of Spain, to refer their claims to Napoleon. Savary induced Ferdinand to cross the Pyrenees and proceed to Bayonne—a step which cost him his crown and his liberty until 1814. In September 1808 Savary accompanied the emperor to the famous interview at Erfurt with the emperor Alexander. In 1809 he took part, but without distinction, in the campaign against Austria. On the disgrace of Fouché (*q.v.*) in the spring of 1810, Savary received his appointment, the ministry of police. There he showed his wonted skill and devotion to Napoleon; and this office, which the Jacobinical Fouché had shorn of its terrors, now became a veritable inquisition. Among the incidents of this time may be cited the cynical brutality with which Savary carried out the order of Napoleon for the exile of Mme de Staël and the destruction of her work *De l'Allemagne*. Savary's wariness was, however, at fault at the time of the strange conspiracy of General Malet, two of whose confederates seized him in his bed and imprisoned him for a few hours (23rd of October 1812). Savary's reputation never quite recovered from the ridicule caused by this event. He was among the last to desert the emperor at the time of his abdication (11th of April 1814) and among the first to welcome his return in 1815, when he became inspector-general of gendarmerie and a peer of France. After Waterloo he accompanied the emperor to Rochefort and sailed with him to Plymouth on H.M.S. "Bellerophon." He was not allowed to accompany him to St Helena, but underwent several months' "internment" at Malta. Escaping thence, he proceeded to Smyrna, where he settled for a time. Afterwards he travelled about in more or less distress, but finally was allowed to return to France and regained civic rights; later he settled at Rome. The July revolution (1830) brought him into favour and in 1831 he received the command of the French army in Algeria. Ill-health compelled him to return to France, and he died at Paris in June 1833.

See *Mémoires du duc de Rovigo* (4 vols., London, 1828; English edition also in 4 vols., London, 1828); a new French edition annotated by D. Lacroix (5 vols., Paris, 1900); *Extrait des mémoires de M. le duc de Rovigo concernant le catastrophe de M. le duc d'Enghien* (London, 1823); *Le Duc de Rovigo jugé par lui-même et par ses contemporains*, by L. F E.... (Paris, 1823); and A. F. N. Macquart, *Réfutation de l'écrit de M. le duc de Rovigo* (1823). (J. Hl. R.)

SAVE, or Sava (Ger. *Sau*; Hungarian *Száva*; Lat. *Savus*), one of the principal right-bank affluents of the Danube. It runs almost parallel with the other great tributary of the Danube, the Drave, both having about the same length. The Save rises in the Triglav group in Carniola from two sources, the Wurzener Save and the Wocheiner Save, which join at Radmannsdorf. It then takes a south-easterly course, and flows through Carniola and Croatia-Slavonia—forming from Jasenovac the frontier-line between it and Bosnia and Servia—and joins the Danube at Belgrade. The Save has a length of 442 m., the area of its basin being 34,000 sq. m. It is navigable for steamers from Sissek to its mouth, a distance of 360 m., but navigation is greatly hindered by shifting sandbanks and other obstructions. Its principal affluents are, on the right, the Sora, Laibach, Gurk, Kulpa, Una, Vrbas, Bosna and Drina; and on the left, the Kanker, Feistritz, Sann, Sotla, Krapina, Lonja and Orljava.

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[1] The "Savannah" did not make the entire voyage under steam; she was fitted with sails and used them in rough weather, unshipping her paddle-boxes.

SAVI, PAOLO (1798–1871), Italian geologist, was born at Pisa. Assistant-lecturer on zoology at the university of his native city when twenty-two years of age, he was appointed professor in 1823, and lectured also on geology. He devoted great attention to the museum of the university, and formed one of the finest natural history collections in Europe. He was regarded as the father of Italian geology. His first paper related to the Bone-caves of Cassano (1825). He studied the geology of Monte Pisano and the Apuan Alps, explaining the metamorphic origin of the Carrara marble; he also contributed essays on the Miocene strata and fossils of Monte Bambolo, the iron-ores of Elba and other subjects. With Giuseppe Meneghini (1811–1889) he published memoirs on the stratigraphy and geology of Tuscany (1850–1851). He became eminent also as an ornithologist, and was author of a great work on the birds of Italy. He died in May 1871.

SAVIGLIANO, a town of Piedmont, Italy, in the province of Cuneo, 32 m. S. of Turin by rail, 1053 ft. above sea-level. Pop. (1901) 9895 (town), 17,340 (commune). It has important ironworks, foundries, locomotive works and silk manufactures, as well as sugar factories, printing works and cocoon-raising establishments. It retains some traces of its ancient walls, demolished in 1707, and has a fine collegiate church (S. Andrea, in its present form comparatively modern), and a triumphal arch erected in honour of the marriage of Charles Emmanuel I. with Catherine of Austria.

SAVIGNY, FRIEDRICH KARL VON (1779–1861), German jurist, was born at Frankfort-on-Main on the 21st of February 1779. He was descended from an ancient family, which figures in the history of Lorraine, and which derived its name from the castle of Savigny near Charmes in the valley of the Moselle. Left an orphan at the age of 13, he was brought up by his guardian until, in 1795, he entered the university of Marburg, where, though suffering at times severely from ill-health, he studied under Professors Anton Bauer (1772–1843) and Philipp Friedrich Weiss (1766–1808), the former one of the most conspicuous pioneers in the reform of the German criminal law, the latter distinguished for his knowledge of medieval jurisprudence. After the fashion of German students, Savigny visited several universities, notably Jena, Leipzig and Halle; and returning to Marburg, took his doctor's degree in 1800. At Marburg he lectured as *Privatdozent* on criminal law and the Pandects. In 1803 he published his famous treatise, *Das Recht des Besitzes* (the rights of possession). It was at once hailed by the great jurist Thibaut as a masterpiece; and the old uncritical study of Roman law was at an end. It quickly obtained a European reputation, and still remains a prominent landmark in the history of jurisprudence. In 1804 Savigny married Kunigunde Brentano, the sister of Bettina von Arnim and Clemens Brentano the poet, and the same year started on an extensive tour through France and south Germany in search of fresh sources of Roman law. In this quest, particularly in Paris, he was successful.

In 1808 he was appointed by the Bavarian government ordinary professor of Roman law at Landshut, where he remained a year and a half. In 1810 he was called, chiefly at the instance of Wilhelm von Humboldt, to fill the chair of Roman law at the new university of Berlin. Here one of his services was to create, in connexion with the faculty of law, a "Spruch-Collegium," an extraordinary tribunal competent to deliver opinions on cases remitted to it by the ordinary courts; and he took an active part in its labours. This was the busiest time of his life. He was engaged in lecturing, in the government of the university (of which he was the third rector), and as tutor to the crown prince in Roman, criminal and Prussian law. Not the least important consequence of his residence in Berlin was his friendship with Niebuhr and Eichhorn. In 1814 appeared his pamphlet *Vom Beruf unserer Zeit für Gesetzgebung und Rechtswissenschaft* (new edition, 1892). It was a protest against the demand for codification, and was intended as a reply to Thibaut's pamphlet urging the necessity of forming a code for Germany which should be independent of the influence of foreign legal systems. In this famous pamphlet Savigny did not oppose the introduction of new laws, or even a new system of laws, but only objected to the proposed codification on two grounds: (1) that the damage which had been caused by the neglect of former generations of jurists could not be quickly repaired, and that time was required to set the house in order; and (2) that there was great risk of the so-called *natural law*, with its "infinite arrogance" and its "shallow philosophy" ruining such a scheme. Indeed, the enduring value of this pamphlet is that it saved jurisprudence for all time from the hollow abstractions of such a work as the *Institutiones juris naturae et gentium* of Christian Wolff (1679–1754), and conclusively proved that a historical study of the positive law was a condition precedent to the right understanding of the science of all law.

In 1815 he founded, with Karl Friedrich Eichhorn, and Johann Friedrich Ludwig Göschen (1778–1837), the *Zeitschrift für geschichtliche Rechtswissenschaft*, the organ of the new historical school, of which he was the representative. In this periodical (vol. iii. p. 129 seq.) Savigny made known to the world the discovery at Verona, by Niebuhr, of the lost text of Gaius, pronouncing it, on the evidence of that portion of the MS. submitted to him, to be the work of Gaius himself and not, as Niebuhr suggested, of Ulpian. The record of the remainder of Savigny's life consists of little else than a list of the merited honours which he received at the hands of his sovereign, and of the works which he published with indefatigable activity. In 1815 appeared the first volume of his *Geschichte des römischen Rechts im Mittelalter*, the last of which was not published until 1831. This work, to which his early instructor Weiss had first prompted him, was originally intended to be a literary history of Roman law from Irnerius to the present time. His design was in some respect narrowed; in others it was widened. He saw fit not to continue the narrative beyond the 16th century, when the separation of nationalities disturbed the foundations of the science of law. His treatment of the subject was not merely that of a bibliographer; it was philosophical. It raised the veil which had hung over the history of Roman law, from the breaking up of the empire until the beginning of the 12th century, and showed how, though considered dead, the Roman law yet lived on through these dark centuries, in local customs, in towns, in ecclesiastical doctrines and school teachings, until it blossomed out once more in full splendour in Bologna and other Italian cities. This history was the parent of many valuable works in which Savigny published the result of his investigations.[1] In 1817 he was appointed a member of the commission for organizing the Prussian provincial estates, and also a member of the department of justice in the Staatsrath, and in 1819 he became a member of the supreme court of appeal for the Rhine Provinces. In 1820 he was made a member of the commission for revising the Prussian code. In 1822 a serious nervous illness attacked him, and compelled him to seek relief in travel. In 1835 he began his elaborate work on contemporary Roman law, *System des heutigen römischen Rechts* (8 vols., 1840–1849). His activity as professor ceased in March 1842, when he was appointed "Grosskanzler" (High Chancellor), the title given by Frederick II. in 1746 to the official at the head of the juridical system in Prussia, as in this position he carried out several important law reforms in regard to bills of exchange and divorce. He held the office until 1848, when he resigned, not altogether to the regret of his friends, who had seen his energies withdrawn from jurisprudence without being able to flatter themselves that he was a great statesman. In 1850, on the occasion of the jubilee of his obtaining his doctor's degree, appeared in five volumes his *Vermischte Schriften*, consisting of a collection of his minor works published between 1800 and 1844. This event gave rise to much enthusiasm throughout Germany in honour of "the great master" and founder of modern jurisprudence. In 1853 he published his treatise on Contracts (*Das Obligationenrecht*), a supplement to his work on modern Roman law, in which he clearly demonstrates the necessity for the historical treatment of law. Savigny died at Berlin on the 25th of October 1861. His son, Karl Friedrich von Savigny (1814–1875), was Prussian minister of foreign affairs in 1849. He represented Prussia in important diplomatic transactions, especially in 1866.

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[1] See von Mohl's *Staatswissenschaft*, vol. iii. p. 55. For a somewhat less favourable view, see Gans's *Vermischte Schriften*.

Savigny belongs to the so-called historical school of jurists, though he cannot claim to be regarded as its founder, an honour which belongs to Gustav Hugo. In the history of jurisprudence Savigny's great works are the *Recht des Besitzes* and the *Beruf unserer Zeit für Gesetzgebung* above referred to. The former marks an epoch in jurisprudence. Professor Jhering says: "With the *Recht des Besitzes* the juridical method of the Romans was regained, and modern jurisprudence born." It marked a great advance both in results and method, and rendered obsolete a large literature. Savigny sought to prove that in Roman law possession had always reference to "usucapion" or to "interdicts"; that there is not a right to continuance in possession but only to immunity from interference; possession being based on the consciousness of unlimited power. These and other propositions were maintained with great acuteness and unequalled ingenuity in interpreting and harmonizing the Roman jurists. The controversy which has been carried on in Germany by Jhering, Baron, Gans and Bruns shows that many of Savigny's conclusions have not been accepted.[1] The *Beruf unserer Zeit*, in addition to the more specific object the treatise had in view, which has been already treated, expresses the idea, unfamiliar in 1814, that law is part and parcel of national life, and combats the notion, too much assumed by French jurists, especially in the 18th century, and countenanced in practice by Bentham, that law might be arbitrarily imposed on a country irrespective of its state of civilization and past history. Of even greater value than his services in consolidating "the historical school of jurisprudence" is the emphatic recognition in his works of the fact that the practice and theory of jurisprudence cannot be divorced without injury to both.

See Biographies by Stinzing (1862); Rudorff (1867); Bethmann-Holweg (1867); and Landsberg (1890).

SAVILE, SIR GEORGE (1726–1784), English politician, was the only son of Sir George Savile, Bart. (d. 1743), of Rufford, Nottinghamshire, and was born in London on the 18th of July 1726. He entered the House of Commons as member for Yorkshire in 1759. In general he advocated views of a very liberal character, including measures of relief to Roman Catholics and to Protestant dissenters, and he defended the action of the American colonists. He refused to take office and in 1783 he resigned his seat in parliament. He died unmarried in London on the 10th of January 1784. Horace Walpole says Savile had "a large fortune and a larger mind," and Burke had also a very high opinion of him. He bequeathed Rufford and some of his other estates to his nephew, Richard Lumley (1757–1832), a younger son of Richard Lumley Saunderson, 4th earl of Scarborough (1725–1782). Richard took the additional name of Savile, but when on his brother's death in 1807 he became 6th earl of Scarborough the Savile estates passed to his brother John (1760–1835), afterwards the 7th earl. John's son and heir was John Lumley Savile, 8th earl of Scarborough (1788–1856). The 8th earl was never married, but he left four natural sons, the eldest of whom was John Savile (1818–1896), the diplomatist, who was created Baron Savile of Rufford in 1888. He entered the foreign office in 1841, was British envoy at Dresden and at Berne, and from 1883 to 1888 represented his country in Rome. Although the eldest son, he did not inherit Rufford and his father's other estates until after the deaths of two of his younger brothers. He made a fine collection of pictures and died at Rufford on the 28th of November 1896, when his nephew John Savile Lumley Savile (b. 1854) became the 2nd baron.

SAVILE, SIR HENRY (1549–1622), warden of Merton College, Oxford, and provost of Eton, was the son of Henry Savile of Bradley, near Halifax, in Yorkshire, a member of an old county family, the Saviles of Methley, and of his wife Elizabeth, daughter of Robert Ramsden. He was educated at Brasenose College, Oxford, where he matriculated in 1561. He became a fellow of Merton in 1565, proceeded B.A. in 1566, and M.A. in 1570. He established a reputation as a Greek scholar and mathematician by voluntary lectures on the *Almagest*, and in 1575 became junior proctor. In 1578 he travelled on the continent of Europe, where he collected manuscripts and is said to have been employed by Queen Elizabeth as her resident in the Low Countries. On his return he was named Greek tutor to the queen, and in 1535 was established as warden of Merton by a vigorous exercise of the interest of Lord Burghley and Secretary Walsingham. He proved a successful and autocratic head under whom the college flourished. A translation of four Books of the Histories of Tacitus, with a learned *Commentary on Roman Warfare* in 1591, enhanced his reputation. On the 26th of May 1596 he obtained the provostship of Eton, the reward of persistent begging. He was not qualified for the post by the statutes of the college, for he was not in orders, and the queen was reluctant to name him. Savile insisted with considerable ingenuity that the queen had a right to dispense with statutes, and at last he got his way. In February 1601 he was put under arrest on suspicion of having been concerned in the rebellion of the earl of Essex. He was soon released and his friendship with the faction of Essex went far to gain him the favour of James I. So no doubt did the views he had maintained in regard to the statutes of Eton. It may have been to his advantage that his elder brother, Sir John Savile (1545–1607), was a high prerogative lawyer, and was one of the barons of the exchequer who in 1606 affirmed the right of the king to impose import and export duties on his own authority. On the 30th of September 1604 Savile was knighted, and in that year he was named one of the body of scholars appointed to prepare the authorized version of the Bible. He was entrusted with parts of the Gospels, the Acts of the Apostles and the Book of Revelation. In 1604 died the only son born of his marriage in 1592 with Margaret Dacre, and Sir Henry Savile is thought to have been induced by this loss to devote the bulk of his fortune to the promotion of learning, though he had a daughter who survived him and who became the mother of the dramatist Sir Charles Sedley. His edition of Chrysostom in eight folio volumes was published in 1610–1613. It was printed by the king's printer, William Norton, in a private press erected at the expense of Sir Henry, who imported the type. The Chrysostom, which cost him £8000 and did not sell well, was the most considerable work of pure learning undertaken in England in his time. At the same press he published an edition of the *Cyropaedia* in 1618. In 1619 he founded and endowed his professorships of geometry and astronomy at Oxford. He died at Eton on the 19th of February 1622. Sir Henry Savile has been sometimes confounded with another Henry Savile, called "Long Harry" (1570–1617), who gave currency to the forged addition to the Chronicle of Asser which contains the story that King Alfred founded the university of Oxford.

A brother, THOMAS SAVILE (d. 1593), was also a member of Merton College, Oxford, and had some reputation as a scholar.

See W. D. Macray, *Annals of the Bodleian Library* (London, 1868); Sir N. C. Maxwell-Lyte, *History of Eton College* (3rd ed., London, 1899); and John Aubrey, *Lives of Eminent Men* (London, 1898).

SAVINGS BANKS (Fr. *caisses d'épargne*; Ger. *Sparkassen*), institutions for the purpose of receiving small deposits of money and investing them for the benefit of the depositors at compound interest. They originated in the latter part of the 18th century—a period marked by a great advance in the organization of provident habits in general (see FRIENDLY SOCIETIES). They seem, however, to have been first suggested by Daniel Defoe in 1697. The earliest institution of the kind in Europe was one established at Brunswick in 1765; it was followed in 1778 by that of Hamburg, which still exists, in 1786 by one at Oldenburg, in 1790 by one at Loire, in 1792 by that of Basel, in 1794 by one at Geneva, which had but a short existence, and in 1796 by one at Kiel in Holstein. In Great Britain, in 1797, Jeremy Bentham revived Defoe's suggestion under the name of "Frugality Banks," and in 1799 the Rev. Joseph Smith put it in action at Wendover. This was followed in 1801 by the addition of a savings bank to the friendly society which Mrs Priscilla Wakefield had established in 1798. Savings banks were shortly after established in London, Bath, Ruthwell in Dumfriesshire by the Rev. H. Duncan (1774–1846), Edinburgh, Kelso, Hawick, Southampton and many other places. By 1817 they had become numerous enough to claim the attention of the legislature, and many acts of parliament were passed from time to time for the management of these institutions in Great Britain, culminating in the establishment on a very broad basis of the Post Office savings banks (see POST AND POSTAL SERVICE). The promotion of thrift, at the end of the 18th century an experiment by a few far-seeing individuals, was by the 20th century almost universally adopted, and was regarded practically as an adjunct to the institutions of every civilized community. Friendly societies, co-operative societies, trade societies and other agencies are all based on this same principle.

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[1] See Windscheid, *Lehrbuch des Pandektenrechts*, i. 439.

The progress of savings banks and the large amount that the deposits have now reached are evidence of the general fitness of the organization for its purpose. So far as regards trustee savings banks, the provisions of the acts of 1817 are still to a great extent the same as those by which they are now regulated, though the law has been frequently amended in matters of detail. The acts relating to trustee savings banks are referred to as the Trustee Savings Banks Acts 1863 to 1904, a title given by s. 16 (2) of the act of 1904. They comprise the Trustee Savings Banks Act 1863 (26 & 27 Vict. c. 87), the Trustee Savings Banks Act 1887 (50 & 51 Vict. c. 47) and so much of the following acts as applies to trustee savings banks: the Post Office Savings Bank Act 1863, the Savings Banks Act 1880, the Savings Banks Act 1887, the Savings Banks Act 1891, the Savings Banks Act 1893, and the Savings Banks Act 1904.

The main feature is the requirement that the whole of the funds should be invested with the government through the Commissioners for the Reduction of the National Debt. The local management of the banks has been left entirely to the trustees, who are precluded from receiving any remuneration for their services or making any profit. They are, however, required to furnish the commissioners with periodical returns of their transactions. This blending of private management with state control has had many advantages in knitting together class and class. A new savings bank requires for its establishment the consent of the National Debt Commissioners and the certificate of the registrar of friendly societies to its rules.

The legislation of 1817, among other inducements to thrift, offered that of a bounty to the savings bank depositor in the shape of a rate of interest in excess of that given to the ordinary public creditor, or—which is the same thing—in excess of that which could be earned by the investment of the deposits in the purchase of government stock. The interest offered in the first instance was 3d. per day, or £4, 11s. 3d. % per annum; and that rate continued to be granted until the passing of the Act of 1828 (9 Geo. IV. c. 92). That act reduced the rate of interest allowed to the trustees of savings banks to $2\frac{1}{2}$d. per day, or £3, 16s. $0\frac{1}{2}$d. per annum, and prohibited them from allowing more to their depositors than $2\frac{1}{4}$d. per day, or £3, 8s. $5\frac{1}{4}$d. per annum, requiring them to pay the surplus, if any, into a separate fund held by the National Debt Commissioners, but bearing no interest. In 1844 the interest to trustees was further reduced to 2d. per day, or £3, 5s. %, the maximum to be allowed to depositors being fixed at £3, 0s. 10d. In 1880 the interest to trustees was reduced to £3, and that to depositors to £2, 15s. and again in 1888 to £2, 15s. and £2, 10s. respectively.

The result of the bonus on thrift offered by the earlier statutes was a loss to the state, which ought to have been made good by an annual vote. Between 1817 and 1828 the difference between the interest credited and that earned amounted to £744,363; and this led to the reduction in the rate of interest effected by the act of the latter year. The deficiency, instead of being paid off, was allowed still to accumulate, and as the price of stock rose and the deposits increased fresh deficiencies arose, so that by 1844 the deficiency, which would have been $1\frac{1}{2}$ millions by the mere accumulation of interest on the previous £744,363, had become £3,179,930. The reduction of interest in 1844 was about enough to make the fund self-supporting, though savings banks are always liable to loss from the fact that deposits are in excess when the funds are high and withdrawals when they are low; but the past deficiency was still allowed to accumulate, although in 1863 nearly 2 millions was voted by parliament to make good part of the deficiency; from 1876 income deficiency was met annually as it arose, while in 1880 there was created to meet the capital deficiency a terminable annuity to expire in 1908, but which by the act of 1904 was extended to 1917.

The offer of a bonus on thrift was of necessity accompanied by provisions to guard against its being used by others than the classes it was intended to encourage. This was done by limiting the amount that each depositor should be permitted to pay in. The limit has been varied from time to time, but by the Savings Banks Act 1891, s. 11(1), the maximum amount standing in the name of any depositor must not exceed £200, nor must interest be allowed on any sum in excess of that amount. By the act of 1893 the maximum deposit in any one year must not exceed £50, but a depositor may, not more than once, replace the amount of any withdrawal made in one entire sum in the course of a year. The replacement may be effected in one or more sums.

When a person comes with his first deposit to a savings bank he is required to sign a declaration, setting forth his name, address and occupation, that he desires to become a depositor on his own account, and that he has no money in any other savings bank.[1] If this declaration be not true, the deposits are liable to be forfeited; but it is to be feared that few depositors take the trouble to read what they are signing, or think much about the meaning of it. If the depositor cannot write, the actuary of the savings bank will usually ask him a few questions, such as his age, mother's maiden name, &c., which may tend to identify him, or defeat any attempt to personate him for the purpose of withdrawal.

Among the benefits conferred by the legislature upon depositors in savings banks has been that of exemption from the jurisdiction of the ordinary courts of law in cases of dispute with the trustees. By the Acts of 1817 disputes were to be settled by arbitration. By that of 1828 the barrister appointed to certify the rules of the savings banks was made umpire in case of difference of opinion between the arbitrators. By that of 1844 the arbitrators were abolished, and an original and final jurisdiction was conferred upon the barrister. By an Act of 1876 the functions of the barrister in this respect were conferred upon the registrar of friendly societies. This in effect made no change in the law, for the offices of barrister and registrar had been always held by the same persons. As early as 1832 it was determined in the case of *Crisp* v. *Bunbury* (8 Bing. 394) that the effect of these enactments is to oust the jurisdiction of all the superior courts of law and equity (see also *Cardiff S.B.* v. *Aberdare District of Oddfellows*, F. S. Rept., 1887, pt. A., p. 70). This jurisdiction has been highly beneficial to depositors in savings banks. The costs of the award are limited by treasury warrant to a few shillings, never exceeding £1. The procedure is simple and elastic, and the results are satisfactory. The central office, acting as registrar, determines law and fact, and adjusts all the equities of each case. Reference to the index to the registrar's decisions appended to the chief registrar's annual reports will show that many interesting questions of law have had to be determined with regard to so small a matter as the ownership of a savings bank deposit.

Many of the old trustee savings banks which were put on a systematic basis in 1817, have been absorbed by the Post Office, but while the total amount of their deposits increases, the number of their depositors remains about the same. In 1863 there were 622 of these banks carrying on operations with 1,558,000 depositors, and deposits amounting to £40,563,000. In 1889 the number of banks had decreased to 380, with 1,500,000 depositors, and £45,000,000 of deposits; while in 1905 they had still further decreased in number to 224, but the depositors had increased to 1,730,331, and their deposits to £52,723,435. The reason for this is that the smaller trustee savings banks, open often only once a week for a short time, cannot give such facilities as the Post Office, which is open every day Further than this, owing to the break-up of the Cardiff bank in 1886, and other smaller irregularities, a select committee of the House of Commons was appointed to inquire into these banks. By the recommendations of this committee, an independent and permanent inspection committee was appointed, which has carried on its work of inspection ever since, and reports annually to parliament. This action has rather tended to merge the smaller trustee savings banks in the Post Office. At the same time the large banks continue to do a great business, and have become in many ways similar to ordinary joint stock banks, affording to persons of smaller means daily facilities for saving.

Those who have studied the habits of thrift among the people have usually come to the conclusion that its development depends largely on the ready facilities which exist for its exercise. To this fact may perhaps be attributed the efforts that have been made in various directions for establishing some means of saving close to the places where wages are paid. To carry out this idea, some of the large railway corporations have obtained powers in special acts of parliament to establish savings banks for those in their employment. The success of these banks has been great, though it has varied much, and it is difficult to trace any general rule of progress. Thirteen such institutions return their operations to the Registrar of Friendly Societies. The total amount held was, by the return for 1905, £5,513,207 in 60,427 accounts. In these banks the interest paid, as well as the deposits, are really guaranteed by the whole assets of the companies. Further, in order to encourage thrift among their employés, the companies have formally agreed and bound themselves, by the provisions of their special acts, that the rate of interest paid shall be higher than can be obtained in the open market on the same security.

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[1] By the Post Office Savings Bank (Public Trustee) Act 1908, the regulations as to declaration by a depositor and the prohibition of a depositor having more than one account do not apply to the public trustee.

Other efforts have been made to establish savings banks at factories, to be open at the time wages are paid. One great difficulty, however, has been the objection many of those employed have to their employers knowing of their savings, and their fear lest it may affect their rate of pay. To get over this objection the plan has been tried of employing an outside agency to hold the savings bank. This has not been much more successful, as the suspicion that accounts may be looked at by employers is difficult to overcome. It is found that the most successful savings banks are those which are carried on as a business, where the transactions are so numerous that the individual feels that his own private account is not likely to become known.

Penny banks.

Another class of savings bank which of late years has developed considerably, is the penny bank. These banks have a twofold object: one to provide facilities for putting by extremely small sums for those whose means are very limited, and the other to attract children in their earliest years so as to train them to habits of thrift and the realization of the importance and use of even quite small savings. Some form of penny bank now exists in nearly every district, and indeed in nearly every parish. No returns have been collected, but it may be safely said that there are tens of thousands in operation. Many of these penny banks are feeders to the Post Office, which gives them special advantages to invest in that institution. Not only is the gross amount of money thus taken large, but (what is more important) the habit of thrift and of husbanding resources is being taught to the young in all parts of the United Kingdom. This has been one cause of the large extension of the Post Office savings bank itself, and has no doubt led to considerable change in the habits of the people. In a few cases successful efforts have been made to establish permanently these penny banks on a commercial basis, as in the case of the Yorkshire Penny Bank, which has 858 branches, nearly 500,000 depositors and deposits of nearly £16,000,000; and the National Penny Bank, which has 13 branches in London, most of them open from 9 in the morning till 9 at night, with 155,768 depositors, and over £2,000,000 in deposits. The establishment of penny banks in schools has been carried on for many years, and it is difficult to exaggerate the useful work they have done in inculcating habits of thrift in the children, and in adding depositors to the Post Office savings banks when the children start in life. In England and Wales there are over 7000 of these savings banks held in the various elementary schools inspected by the Education Department. The London County Council has done much to promote this movement by instituting penny banks in its various schools. Although the financial result is not large, the educational effect of these banks is considerable. It has been found that many children open accounts at outside penny banks in preference to going to those carried on at their own schools, but it is probable that the idea of so doing is often suggested by the school savings bank.

With a view of bringing the savings bank still nearer the door of the people, efforts have been made to establish collecting savings banks. In these the collector calls at fixed periods for the deposits. This scheme has grown out of the investigations of a committee of the Charity Organization Society, and is based on the idea, which undoubtedly is the fact, that many people will make contributions when the money is called for, who will not take the trouble to walk a few yards themselves to make the same deposit. That this is so is proved most conclusively by the Post Office life insurance experience, a branch of the Post Office which is scarcely used by the people, while at the same time collecting life insurance companies (which of course must charge a considerable extra premium for collecting) do business to the extent of millions. In most of these banks no interest is given, but facilities and encouragements are afforded for the transfer of each individual account to the Post Office as soon as it is large enough to earn interest.

Closely allied, though essentially different, are the very numerous sharing-out clubs which may be called temporary savings banks. These nearly all take a weekly subscription from their members, and, should any member die, his representative receives a certain sum, the balance left being divided at Christmas equally among the survivors, in proportion to the weekly subscriptions. Some of these clubs are registered, and at a rough estimate they number about 900, with some 120,000 members. The unregistered are, however, much more numerous, though no official information is to be had of them, and it is certain that hundreds of thousands of pounds are divided in this way each Christmas.

The attempt to induce sailors and soldiers to exercise habits of thrift by the establishments of naval savings banks under the act of 1866, and military savings banks under the act of 1859, should be mentioned. The amount in the naval savings bank is generally about £300,000. As might be expected the amount does not grow. This is accounted for by the fact that the depositors leave the service and draw out their savings. About £200,000 a year, however, goes in and out of the naval banks, and £80,000 in the army banks. This sum represents a good deal of self-denial, when the margin within which it is possible to save among sailors and soldiers is considered.

Closely allied to savings banks are a number of societies which need only be briefly referred to here. The largest of them are building societies (*q.v.*) under the Act of 1874, which are a very popular form of saving, especially in certain localities. The contributions to the shares of these societies, which are paid by instalments, differ but little from the periodical payments into savings banks; and although the money is not so readily repaid, notice and other forms having to be gone through, large numbers of persons pay in and draw out money, and receive the interest on the shares in much the same way as they do on deposits in savings banks without any idea of building or buying houses. In 1906 the receipts were £43,219,548 in the United Kingdom, and the accumulated capital more than £70,000,000, with a membership of 612,424. The action of industrial and provident societies regulated under the act of parliament of 1893, must also be mentioned with reference to that part of their business which is closely allied to savings banks. These societies are divided into three classes:—(*a*) ordinary co-operative societies; (*b*) societies for carrying on various businesses, including loan and banking; (*c*) land and building societies. Most of these societies, indirectly or directly, act as savings banks, and have had considerable influence in the growth of thrift in the United Kingdom. (See FRIENDLY SOCIETIES.) In the co-operative societies the sales in 1905 amounted to more than £71,000,000, and the profits to over £5,000,000. These profits are divided in different ways among the members, and they form a saving fund of large dimensions. The societies for carrying on various businesses, such as working men's clubs, loan and banking organizations, registered under the 1893 act, numbered 286, with total receipts £2,020,569. These are not rapidly increasing, but they must be included as one exhibition of the savings of the people, and they are practically used as savings banks. The land and building societies under the act of 1893 are not the same as those above referred to, though their action as regards savings is similar. They are not under the act of 1874, but carry on a trade or business, including dealings of any kind in land. Their operations are slightly increasing. They received £336,424 from subscriptions and other sources, according to a return of 1905, and the value of the land and mortgages was £982,900. Two other classes of institutions should be referred to, the friendly and trade societies, which exist for special purposes, namely, to make provision in sickness, for death, for a want of employment, and to a limited extent for old age. They differ essentially from savings banks, as the subscriptions are parted with and cannot be withdrawn. But as the subscriptions are for certain definite needs, almost certain to be required by each member, which but for those societies would have to be provided for by direct savings in banks, they must be mentioned in treating of the subject as a whole. The amount held by the friendly societies is estimated at £50,459,060, subscribed by 13,978,790 members.

It was once stated with truth that the national debt was held by a very small proportion of the population; but this is not so now. The various agencies which may be described as savings banks in different forms hold over £200,000,000, which is a considerable share of the national debt of Great Britain.

British Colonies.—In New South Wales there are both state and trustee institutions for savings purposes The Government Savings Bank was established in 1871 and the Savings Bank of New South Wales in 1832. In both, sums of one shilling and any multiple of that amount may be deposited. The Government Savings Bank does not allow interest on the excess of deposits exceeding £300 except in the case of charitable institutions, friendly societies and trade unions, while the Savings Bank of New South Wales does not allow interest on the excess of deposits over the sum of £200 made by any one individual, but allows the interest on the full deposit in the case of charitable institutions, or a legally established friendly or other society. The rate of interest in the Government Savings Bank is 3%, and in the Savings Bank of New South Wales 3½%. The following table shows the growth of depositors and deposits:—

Year.	Government Savings Bank.		Savings Bank of New South Wales.		Total.		
	Number of Depositors.	Amount of Deposits.	Number of Depositors.	Amount of Deposits.	Number of Depositors.	Amount of Deposits.	Average Amount per Depositor.
		£		£		£	£ s. d.
1885	57,538	1,471,894	49,977	2,016,656	107,515	3,488,550	32 8 11
1895	131,703	4,121,700	71,099	3,951,875	202,802	8,073,575	39 16 2
1900	198,014	6,045,622	84,629	4,855,760	282,643	10,901,382	38 11 5
1905	270,982	8,883,651	101,383	5,545,367	372,365	14,429,018	38 15 0

The Savings Bank of New South Wales was originally administered by nine trustees, one of whom was vice-president, but by an act of 1902 the number may be extended up to eighteen. The funds of the institution, unlike those of the Government Savings Bank, can be applied to investments of a general nature, such as mortgages, government and municipal securities, &c. Victoria and South Australia have not developed the postal system, but show the largest amount per head of population of deposits. In trustee savings banks in Victoria the number of depositors in 1900–1901 was 393,026, in 1905–1906 466,752; the amount of deposits in the same years £9,662,006 and £11,764,179, showing an average amount per depositor of £24, 11s. 8d. and £25, 4s. 1d. In South Australia the total number of depositors in savings banks in 1900–1901 was 126,032, of this number 111,537 were depositors in trustee savings banks, having an amount of deposits standing to their credit of £3,782,575 out of a total of £3,795,631. The average amount per depositor was £30, 2s. 4d. In 1905–1906 there were 152,487 depositors with a total amount of deposits of £4,766,907, giving an average amount per head of £31, 5s. 3d. On the other hand, Queensland and West Australia rely almost exclusively on the post office system. In Queensland there were 81,025 depositors in 1900–1901, and 88,026 in 1905–1906. Deposits amounted to £3,896,170 in 1900–1901 and to £4,142,791 in 1905–1906, giving an average per depositor of £48, 1s. 9d. and £47, 1s. 3d. respectively. In Western Australia in 1900–1901 there were 39,318 depositors and in 1905–1906 63,573. The deposits amounted to £1,618,359 in 1900–1901 and to £2,316,161 in 1905–1906, giving an average per depositor of £41, 3s. 3d. and £36, 8s. 8d. In Tasmania the amount of deposits (including those of two joint stock companies) was in 1900–1901 £1,009,097 and in 1905–1906 £1,332,546. The depositors numbered 42,509 and 50,731, giving an average per depositor of £23, 14s. 9d. and £26, 5s. 4d. The following table shows deposits per head of population:—

State.	1900–1901.	1905–1906.
	£ s. d.	£ s. d.
N. S. Wales	8 0 3	10 0 8
Victoria	8 0 6	10 6 10
Queensland . . .	7 15 2	8 7 6
South Australia . .	10 10 0	13 15 0
West Australia . .	8 11 3	9 19 3
Tasmania	5 16 9	8 8 4

In New Zealand there were in 1900–1901 212,436 post office depositors with an amount standing to their credit of £6,350,013 and in 1905–1906 276,066 depositors with deposits of £8,662,023. There are five savings banks in New Zealand not connected with the post office; in these the total amount standing to the credit of depositors in 1905–1906 was £1,111,931.

Canada.—In Canada post office savings banks were established in 1867, but government savings banks, under the management of the Finance Department, had been established in the maritime provinces some years previously. The Canadian government is pursuing the policy of transferring the accounts from the savings banks under the control of the Finance Department to the Post Office Department, the transfer taking place as the position of superintendent of each place becomes vacant. In both kinds of savings banks a deposit must not be less than $1 or exceed $1000 in any one year; nor must the total amount in deposit exceed $3000. There are 961 branches of the post office savings bank and 23 offices of the government savings bank. The following table shows the number of depositors and amount of deposits:—

Year.	Post Office.		Government (other than Post Office).	
	Depositors.	Amount standing to Credit of Depositors.	Depositors.	Amount standing to Credit of Depositors.
	No.	Dollars.	No.	Dollars.
1895	120,628	26,805,542	54,932	17,644,956
1900	150,987	37,507,456	45,773	15,642,267
1905	165,518	45,367,761	48,165	16,649,136

In addition to the post office and government savings banks there are special savings banks, such as the Caisse d'économie of Quebec and Montreal City and District Savings Banks. The chartered banks also have savings branches, but they do not make a separate return to the government of the amounts on deposit in these branches. In India, the Straits Settlements, Orange River Colony, Transvaal, Gold Coast, Sierra Leone and the Bahamas the savings banks are under the post office; in Mauritius, Seychelles, Basutoland, Falkland Islands, Natal, St Helena, Southern Nigeria, Newfoundland, St Lucia, St Vincent, Turks and Caicos Islands, Jamaica, Barbados, Grenada, St Christopher, Nevis, Antigua, Montserrat, Dominica, Virgin Islands, Bermuda, British Honduras, Cyprus, Trinidad, Tobago, Gibraltar and Malta there are government savings banks; in Gambia, treasury savings banks; in Ceylon and British Guiana there are both government and post office savings banks, while in the Cape of Good Hope, in addition to the post office savings banks, there are private savings banks, but their business is small.

France.—In France the first savings bank was instituted in Paris by royal ordinance in 1818. It was quickly imitated in all the principal departments. Some of those so started were independent undertakings, but several were founded on the initiative of municipal councils, three (Nancy, Metz, Avignon) being attached to monts-de-piété. These communal savings banks are now the rule and private banks the exception. They are regulated by a law of 1835, amended in several particulars by later legislation. They are created by decree of the president on the advice of the council of state, and at the initiative of the municipal council. Their administration is in the hands of a council consisting of the mayor of the commune and its directors, none of whom receive remuneration for their services. The funds of these institutions are, with the exception of a certain amount allowed to be retained for independent investment, handed over to the Caisse des dépôts et consignations (created in 1816 for the administration of the investment of private funds). Interest of 3¼% is allowed by the Caisse des dépôts, but out of that the savings banks retain from ¼ to ½% for administrative expenses and the providing of a reserve fund. Both in the private and the post office savings banks the maximum amount standing in the name of a depositor must not exceed 1500 fr.

The following statement shows the progress of private savings banks[1] since 1835:—

Year.	Number of Banks including Branches.	Number of Depositors.	Amount of Deposits.	Per Head of Population.
			£	s. d.
1840	430	351,308	7,695,337	4 7
1850	565	565,995	5,396,680	3 2
1860	649	1,218,122	15,090,839	8 8
1870	1165	2,079,141	25,289,617	13 10
1880	1405	3,841,104	51,208,107	28 10
1890	1599	5,761,408	116,468,894	63 5
1900	1845	7,116,462	130,559,773	70 7
1905	2042	7,557,133	135,061,740	72 2

Germany.—In Germany the postal savings bank has not been adopted to any extent, but there is an elaborate system of state insurance, which includes life, accident and old-age policies, and to a certain extent even protection against involuntary idleness (see GERMANY).

See the official publications of the various countries, and J. H. Hamilton, *Savings and Savings Institutions* (New York, 1902).

(G. C. T. B.; T. A. I.)

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[1] For statistics of the post office savings banks see POST OFFICE.

UNITED STATES

There are in the United States four kinds of savings banks: (1) Mutual or Trustee Savings Banks; (2) Stock Savings Banks; (3) Postal Savings Banks; (4) School Savings Banks.

1. *Mutual Savings Banks* are organized under state laws, and are under the supervision of an officer usually appointed by the governor. They have no capital, and do a strictly investment business. All their earnings go to the depositors, either as dividends, or to a surplus fund, which, in the event of liquidation, also belongs to the depositors. Their management is vested in a board of trustees, a self-perpetuating body who serve without pay, except for specific service such as appraising property. Executive officers and clerks are paid moderate salaries. The proportion of annual expense to each dollar of assets is sometimes less than ·0025. The rate of interest on deposits usually ranges from 3 to 4%. Depositors have no voice in the management, except as citizens of the state, through their representatives in the state legislature. Nearly all the states limit investments carefully, though a few permit considerable latitude: in New York the deposits in saving banks are considered next to government bonds as safe investments. In that state the deposits in savings banks are exempt from taxation, but a franchise tax of 1% annually is imposed upon the surplus. In most other states the deposits are taxed for state purposes. The amount which each person may deposit in any year or half year is sometimes limited by the by-laws, and the total sum to be received from any one depositor is usually limited by state law. Deposits are in practice generally payable on demand, though the banks reserve the right to require notice, generally from sixty to ninety days, and sometimes enforce this right in times of panic. The first savings bank incorporated in the United States was the Provident Institution for Savings, incorporated in Boston in 1816. The oldest in New York is the Bank for Savings, of New York City, incorporated in 1819. The largest deposit of any bank of this kind in the United States, $108,720,523·82, was in 1910 that of the Bowery Savings Bank of New York. Mutual savings banks are confined chiefly to the states in the eastern portion of the country. The only mutual banks outside the north-eastern states were in 1910 three in Ohio, five in Indiana, fourteen in Minnesota, one in West Virginia, one in California and two in Wisconsin.

Though the laws governing mutual banks vary in the different states, the following abstract of the New York Savings Bank Law of 1875, re-enacted in 1892, and subsequently amended, gives the main principles on which they are organized.

Thirteen or more persons may incorporate a savings bank, two-thirds of whom shall be residents of the county where the proposed bank is to be situated. When the certificate of organization is filed with the superintendent of banks, who exercises supervision over all banks chartered by the state, he is required to ascertain whether the bank is in fact needed in the community where it is to be organized, and to investigate the character and general fitness of the trustees. The present superintendent of banks requires that the incorporators of a savings bank shall defray personally the expenses of the institution until its earnings are sufficient to meet such expenses, and also return dividends at the rate of not less than 3%. The board of trustees have entire control of the management of the bank. They elect the president and other officers. A trustee who borrows any of the bank's funds, or who becomes a surety for any other borrower, forfeits his office. Bankruptcy or an unsatisfied judgment of ninety days' standing will also void his office. Trustees are not allowed to have any interest in the profits, or to borrow the deposits or funds.

The trustees of any savings bank may invest the moneys deposited therein and the income derived therefrom as follows: (1) In the stocks or bonds or interest-bearing notes or obligations of the United States, or those for which the faith of the United States is pledged, including the bonds of the District of Columbia. (2) In the stock or bonds or interest-bearing obligations of this state. (3) In the stocks or bonds or interest-bearing obligations of any of the United States which has not within ten years defaulted in the payment of any part of any debt authorized by its legislature. (4) In the stocks or bonds of any city, county, town or village, school district bonds and union free school district bonds, issued for school purposes, or in the interest-bearing obligations of any city or county of this state. (5) In the stocks or bonds of a number of specified cities without the state, subject to the condition that if at any time the indebtedness of any of said cities, less its water debts and sinking fund, shall exceed 7% of its valuation for purposes of taxation, its bonds and stocks shall cease to be an authorized investment. (6) In bonds and mortgages on unencumbered real property situated in this state, to the extent of 60% of the value of such property. Not more than 65% of the whole amount of deposits shall be so lent or invested. If the loan is on unimproved and unproductive real property, the amount lent thereon shall not be more than 40% of its actual value. No investment in any bond and mortgage shall be made by any savings bank, except upon the report of a committee of its trustees. (7) Also, by virtue of a law passed by the legislature of 1898: In the first mortgage bonds of any railway corporation of this state, or in the mortgage bonds of any such railway corporation of an issue to retire all prior mortgage debt of such railway corporation, provided the bonds satisfy certain precautionary conditions. Not more than 25% of the assets of any savings banks shall be loaned or invested in railroad bonds. There are other limitations of the amounts to be loaned or invested in the securities of any one railway. Street railway corporations shall not be considered railway corporations within the meaning of this section. An act passed in 1900 permits the investment of deposits in the bonds of certain railways situated in other states. These investments must conform to conditions assuring safety.

Savings banks in New York are preferred creditors of insolvent state banks and trust companies. In 1901 a law was passed providing for a tax of 1% on the surplus of savings banks, computed on the par value of their securities. On July 1, 1910, deposits in the savings banks amounted to $1,526,935,581·84, distributed amongst 2,886,910 depositors; interest credited for the preceding year amounted to $53,828,625·03; expenses for the year 1909 were $5,000,053·55 or $2·90 for each $1000 of resources. Loans on real estate, secured by bond and mortgage, amounted to $805,053,044·63, and investments in stocks and bonds, market value, $658,872,348·85.

Other important items in the assets of these banks are: State bonds, $43,719,111·66; city bonds, $305,695,035·71; railroad bonds, $250,346,600. Deposits received for the year 1909 were $390,709,469·44.

According to reports made to the Comptroller of the Currency there were on April 28, 1909, a total of 642 Mutual Savings Banks in the United States, with $3,394,926,005 aggregate resources. The loans and mortgages of these banks amounted to $1,590,181,366·19, and their investments to $1,599,532,371, classified as follows:

United States bonds	$33,353,576·12
State, county and municipal bonds . .	685,099,502·18
Railroad bonds	743,425,893·93
Other stocks and bonds, including railroad and bank stocks	137,653,399·71

These banks had, on the date named, a surplus fund of $202,065,316·85, and $3,144,584,874 individual deposits. The Mutual Savings Banks hold more than 22% of the aggregate individual deposits of all the banks in the country.

2. *Stock Savings Banks* are found in the more purely agricultural parts of the country, the southern, Mississippi Valley and western states, where only a small proportion of people earn wages in manufactures and commerce; suitable investments are not numerous, the benefits of mutual savings banks are not familiar, and the people are unwilling to accept a low rate of interest. In some states having stock banks there are no laws relating to banking, and in others the savings banks carry on their business under the same laws as commercial banks. Several of the states restrict the investments of the stock savings banks. Prior to 1865, when the issue of circulating notes by state banks was suppressed by a prohibitory tax, there was a distinction between state banks and stock savings banks; the former could issue notes, while the latter, as a rule, could not. Stock savings banks are conducted frequently as adjuncts of state and national banks, occupying the same rooms and being under the same management. Many of the national banks chartered by the Federal government maintain "savings departments," though the deposits received in these departments are on the same legal footing as other deposits and are not specially invested. Similar departments are also to be found in many trust companies and state banks of discount.

The law of the state of Iowa is typical of those states where stock banks are under public supervision. A savings bank may be organized by not less than five persons. In towns of ten thousand inhabitants or less it must have a capital of $10,000, and in towns or cities with more than ten thousand inhabitants $50,000. The usual corporate powers are granted. The amount of deposits is limited to twenty times the capital and surplus. The usual provisions for repayments of deposits are made, and in addition the savings banks are given the privilege of requiring sixty days' notice for the withdrawal of savings deposits.

The banks are allowed to invest their funds in the following securities: (1) Stocks, bonds or interest-bearing notes of the United States. (2) Stocks, bonds or evidences of debt-bearing interest of the state of Iowa. (3) Stocks, bonds and warrants of any city, town, village or school district, or drainage district, in the state regularly issued, but the investments of any savings bank should not consist of such bonds or warrants to a greater amount than 25% of the assets. (4) Mortgages or debts on unencumbered real estate within the state worth at least twice the amount lent. (5) It is lawful for such banks to discount, purchase, sell and make loans upon personal or public security, except shares of their own capital stock.

Property acquired by foreclosure of mortgages, &c., may not be held more than ten years. The rate of interest to be paid is left to the discretion of the trustees, and the profits, after the payment of such interest and expenses, go to capital stock. Stockholders are liable to the creditors for double their stock, and such liability continues for six months after the transfer of any stock. Directors receive no compensation. Officers and directors of the bank are required to give the same security for loans that is required of others, and such loans can only be made by the board in the absence of the party applying. The savings banks are prohibited from lending to any individual or firm more than 20% of the capital stock. All savings banks are required to make a quarterly statement to the auditor of the state, giving in detail the statement of condition upon a given day. This statement is made under oath of the officers, and is required to be published. The state auditor is given the power to examine any savings bank at any time, and must make an examination at least once a year; and should the conditions warrant, he is required to report to the attorney-general, who institutes proceedings under the law relating to insolvent corporations. Provision is made for increasing the capital stock by a two-thirds' vote of the existing shares. The corporate existence of the banks is placed at fifty years. Michigan affords a good example of banks doing a commercial and savings bank business under a single organization, but with the savings deposits entirely segregated from other deposits and separately invested. The system has worked successfully and satisfactorily. There has been much discussion among bankers throughout the country in recent years of the propriety of enacting laws specifically providing (*a*) for the creation of savings departments in national banks, with the segregation of savings deposits, and (*b*) for the enactment of similar state laws to be applicable to state banks and trust companies maintaining savings departments. Other proposals have been made for a government (or state) guaranty of deposits, and this plan has been adopted in a few of the states.

On April 28, 1909, there were 1061 stock savings banks reporting, with aggregate resources of $677,784,099·95. Their capital was $59,506,420, and surplus and undivided profits $38,112,716·60. Individual deposits subject to check, $100,708,410·57; savings deposits, or deposits in interest or savings departments, $366,167,901·61; other deposits, including amount due banks and bankers, $109,911,859·91.

Number of Savings Banks in the United States, Number of Depositors, Amount of Savings Deposits, &c., 1900–1909.

Year.	Number of Banks.	Number of Depositors.	Deposits.	Average due each Depositor.	Average per Capita in the United States.
1900	1002	6,107,083	2,449,547,885	$401·10	$31·78
1901	1007	6,358,723	2,597,094,580	408·30	33·45
1902	1036	6,666,672	2,750,177,290	412·53	34·89
1903	1078	7,035,228	2,935,204,845	417·21	36·52
1904	1157	7,305,443	3,060,178,611	418·89	37·52
1905	1237	7,696,229	3,261,236,119	423·74	39·17
1906	1319	8,027,192	3,482,137,198	433·79	41·13
1907	1415	8,588,811	3,690,078,945	429·64	42·87
1908	1453	8,705,848	3,660,553,945	420·47	41·84
1909[1]	1703[2]	8,831,863	3,713,405,710	420·45	41·75

[1] Population estimated at 88,926,000, June 30, 1909.

[2] Not including 339 state banks and trust companies of Illinois with $204,908,505 savings deposits credited to 641,634 savings depositors. Including Illinois savings deposits and depositors the average due each depositor is $413·60 and average per capita $44·06.

On May 3, 1909, a statement was issued by Wm. Hanhart, Secretary of the Savings Bank Section of the American Bankers Association, showing "actual savings deposits in the savings banks, national banks, Trust Companies and private banks in United States," $5,560,837,016.

3. *Postal Savings Banks.*—By an act of the Federal Congress, approved June 25, 1910, Postal Savings Banks were first authorized in the United States. The management of these banks is vested in a board of trustees composed of the postmaster-general, secretary of the treasury, and attorney-general. The board of trustees shall designate such post-offices as it deems proper to be postal savings depository offices. Any person ten years or over may be a depositor; the minimum deposit is one dollar, and not more than $100 may be deposited by any one person in any one month; the maximum balance to the credit of any depositor (exclusive of interest) shall not exceed $500. Interest, 2% annually; deposits payable on demand without notice. The deposits in the postal savings depositories are to be deposited in banks subject to national or state supervision at not less than 2¼% interest; 65% of the deposits may be so redeposited in these banks; 30% invested in United States securities, and 5% held as a reserve in the United States treasury. But the 65% fund on deposit with the banks may be withdrawn for investment in bonds or other securities of the United States, but only by direction of the president, and only when, in his judgment, the general welfare and the interests of the United States so require. At the option of the depositor, deposits may be converted into United States government bonds. In making deposits of the funds in national or state banks, the Federal government requires of those banks security in the form of public bonds or other securities as the board of trustees may prescribe. The faith of the United States is solemnly pledged to the payment of the deposits.

4. *School Savings Banks* were first established in the United States in 1885 by J. H. Thiry, at Long Island City, New York. On January 1, 1910, the system was in use in 1168 schools, distributed throughout 118 cities or villages. Out of 632,665 pupils registered in these schools, 203,458 have saved $5,051,644·60, of which $4,180,948·59 have been withdrawn, leaving a balance of $870,696·01 due depositors. (B. R.*)

SAVOIE, a frontier department of France, formed in 1860 of the old provinces of Haute Savoie, Savoie, the Tarentaise and the Maurienne, which constituted the southern portion of the duchy of Savoy. It is bounded N. by the department of Haute Savoie, E. and S.E. by Italy, S.W. by the department of the Hautes Alpes, and W. by those of the Isère and the Ain. Pop. (1901) 254,781; area 2224 sq. m. It is mainly made up of the basin of the Isère. The upper course of that river flows through the Tarentaise, receiving (right) the Arly and later (left) the Arc, which flows through the Maurienne, which is to a large extent traversed by the Mont Cenis railway. Probably the Isère formerly communicated with the Rhône past Chambéry and the Lac du Bourget. The sources of the Isère and of the Arc are separated by the ridge of the Col du Mont Iseran (9085 ft.). The loftiest points in the department are the Grande Casse (12,668 ft.), the culminating summit of the Vanoise group, the Mont Pourri (12,428 ft.), the Pointe de Charbonel (12,336 ft.), the Aiguille de la Grande Sassière (12,323 ft.), the Dent Parrachée (12,179 ft.), the Levanna (11,943 ft.) and the Aiguilles d'Arves (11,529 ft.). A small portion of the department (including both shores of the Lac du Bourget) is in the part of the duchy of Savoy neutralized in 1815. It is divided into 4 arrondissements (Chambéry, the chief town, Albertville, Moutiers-Tarentaise, and St Jean de Maurienne), 29 cantons and 329 communes. It forms the dioceses of Chambéry (an archbishopric), Moutiers and St Jean de Maurienne. The best place known to foreigners is Aix les Bains (*q.v.*), while other sulphur springs rise at Marlioz and at Challes, those of Salins being saline, and those of Brides (the best known after Aix) alkaline.

See J. J. Vernier, *Dictionnaire topographique du dép. de la Savoie* (Chambéry, 1897). (W. A. B. C.)

SAVONA, a seaport and episcopal see of Liguria, Italy, in the province of Genoa, 27 m. W.S.W. of Genoa by rail, 33 ft. above sea-level, and after Genoa and Nice the most important of the cities of the Riviera. Pop. (1906) 43,836 (town); 46,778 (commune). The greater part of the town is now modern. It is surrounded with green-clad hills and luxuriant orange groves. On the Rock of St George stands the castle built by the Genoese in 1542, on the area of the old cathedral and now used as a military prison. The cathedral (1589–1604) is a late Renaissance building with a modern dome and early Renaissance choir-stalls, puplit, &c. In the Cappella Sistina, to the north, stands the simple, finely carved tomb erected by Sixtus IV. to his parents. Facing the cathedral is the Della Rovere palace erected by

Cardinal Giulio della Rovere (Julius II.) from the plans of Giuliano da Sangallo as a kind of university, and now occupied by the prefecture, the post-office and law-courts. S. Maria di Sastello has a large altarpiece by Foppa and Brea (of 1490). There is a municipal picture-gallery in the hospital of St Paul. The Teatro Chiabrera was erected in 1853 in honour of the lyric poet Chiabrera, who was born and buried in Savona. Four and a half miles W. is a pilgrimage church of the Madonna della Misericordia, founded in 1536. The modern harbour, dating from 1815, has since 1880 been provided with a dock excavated in the rock, 986 ft. long, 460 ft. wide and 23 ft. deep. Savona is one of the chief seats of the Italian iron industry, having iron-works and foundries, shipbuilding, railway workshops, engineering shops, brass foundry, tinplate works, sulphur mills and glass-works. It imports commodities to the value of nearly £2,000,000 yearly, half of which is coal, with petroleum, iron, cereals, &c. In 1906, 777,000 tons of shipping, of which about half was British, and most of the rest Italian, entered. There is a small export trade, chiefly in iron sheets, chemicals, wood and candied fruits. The potteries export their earthenware to all parts of Italy. There is a railway through the mountains from Savona to Turin (91 m. N.N.W.).

Savona is the ancient *Savo*, a town of the Ingauni (see ALBENGA), where, according to Livy, Mago stored his booty in the Second Punic War. A buried Roman bridge lies near the stream, which has now changed its course. The place was never of importance in Roman times, the traffic passing to Vada Sabatia (Vado), 4 m. to the W., which was a harbour, and the point to which the coast road from Rome was reconstructed in 109 B.C., and from which a road diverged across the Apennines to Placentia. In 1191 it bought up the territorial claims of the marquesses Del Carretto. Its whole history is that of a long struggle against the preponderance of Genoa. As early as the 12th century the Savonese built themselves a sufficient harbour; but in the 16th century the Genoese, fearing that Francis I. of France intended to make it a great seat of Mediterranean trade, rendered it useless by sinking at its mouth vessels filled with large stones. In 1746 it was captured by the king of Sardinia, but it was restored to Genoa by the treaty of Aix-la-Chapelle. Columbus, whose ancestors came from Savona, gave the name of the city to one of the first islands he discovered in the Antilles.

SAVONAROLA, GIROLAMO (1452–1498), Italian monk and martyr, was born at Ferrara on the 21st of September 1452, the third child of Michele Savonarola and his wife Elena Bonaccossi of Mantua. His grandfather, Michele Savonarola, a Paduan physician of much repute and learning, had settled in Ferrara, and gained a large fortune there. The younger Michele was a mere courtier and spendthrift, but Elena seems to have been a woman of superior stamp. She was tenderly loved by her famous son, and his letters prove that she retained his fullest confidence through all the vicissitudes of his career.

Early Years.

Girolamo was a precocious child, with an early passion for learning. His first tutor was his grandfather, the physician; and, in the hope of restoring their fallen fortunes, his parents intended him for the same profession. Even as a boy he had intense pleasure in reading St Thomas Aquinas and the Arab commentators of Aristotle, was skilled in the subtleties of the schools, wrote verses, studied music and design, and, avoiding society, loved solitary rambles on the banks of the Po. Ferrara was then a gay and bustling town of 100,000 inhabitants, its prince Borso d'Este a most magnificent potentate. To the mystic young student all festivities were repulsive, and although reared in a courtier-household he early asserted his individuality by his contempt for court life. At the age of nineteen, however, he had no thought of renouncing the world, for he was then passionately in love with the daughter of a neighbour, a Strozzi exiled from Florence. His suit was repulsed with disdain; no Strozzi, he was told, might stoop to wed a Savonarola. This blow probably decided his career; but he endured two years of misery and mental conflict before resolving to abandon his medical studies and become a monk. He was full of doubt and self-distrust; disgust for the world did not seem to him a sufficient qualification for the religious life, and his daily prayer was, "Lord! teach me the way my soul should walk." But in 1474 his doubts were dispelled by a sermon heard at Faenza. He secretly stole away to Bologna, entered the monastery of St Domenico and then acquainted his father with his reasons for the step. The world's wickedness was intolerable, he wrote; throughout Italy he beheld vice triumphant, virtue despised. Among the papers he had left behind at Ferrara was a treatise on "Contempt of the World," inveighing against the prevalent corruption and predicting the speedy vengeance of Heaven. His novitiate was marked by a fervour of humility. He sought the most menial offices, and did penance for his sins by the severest austerities. According to contemporary writers he was worn to a shadow. His gaunt features were beautified by an expression of singular force and benevolence. Luminous dark eyes sparkled and flamed beneath his thick, black brows, and his large mouth and prominent nether lips were as capable of gentle sweetness as of power and set resolve. He was of middling stature and dark complexion. His manners were simple, his speech unadorned and almost homely. His splendid oratorical power was as yet unrevealed; but his intellectual gifts being recognized his superiors charged him with the instruction of the novices. He passed six quiet years in the convent, but his poems written during that period are expressive of burning indignation against the corruptions of the church and profoundest sorrow for the calamities of his country.

Removal to Florence.

In 1482 he reluctantly accepted a mission to Ferrara, and, regarding earthly affections as snares of the evil one, tried to keep aloof from his family. His preachings attracted slight attention there, no one—as he later remarked—being a prophet in his own land. An outbreak of hostilities between Ferrara and Venice, fomented by Pope Sixtus IV., soon caused his recall to Bologna. Thence he was despatched to St Mark's in Florence. Lorenzo the Magnificent was then (1482) at the height of his power and popularity. At first Savonarola was enchanted with Florence. His cloister, sanctified by memories of St Antonine and adorned with the inspired paintings of Frà Angelico, seemed to him a fore-court of heaven. But his content speedily changed to horror. The Florence streets rang with Lorenzo's ribald songs (the "canti carnascialeschi"); the smooth, cultured citizens were dead to all sense of religion or morality; and the spirit of the fashionable heathen philosophy had even infected the brotherhood of St Mark. In 1483 Savonarola was Lenten preacher in the church of St Lorenzo, but his plain, earnest exhortations attracted few hearers, while all the world thronged to Santo Spirito to enjoy the elegant rhetoric of Frà Mariano da Genazzano. Discouraged by this failure in the pulpit, Savonarola now devoted himself to teaching in the convent, but his zeal for the salvation of the apathetic townsfolk was soon to stir him to fresh efforts. Convinced of being divinely inspired, he had begun to see visions, and discovered in the Apocalypse symbols of the heavenly vengeance about to overtake this sin-laden people. In a hymn to the Saviour composed at this time he gave vent to his prophetic dismay. The papal chair was now filled by Innocent VIII., whose rule was even more infamous than that of his predecessor Sixtus IV.

Savonarola's first success as a preacher was gained at St Gemignano (1484–1485), but it was only at Brescia in the following year that his power as an orator was fully revealed. In a sermon on the Apocalypse he shook men's souls by his terrible threats of the wrath to come, and drew tears from their eyes by the tender pathos of his assurances of divine mercy. A Brescian friar relates that a halo of light was seen to flash round his head, and the citizens remembered his awful prophecies when in 1512 their town was put to the sack by Gaston de Foix. Soon, at a Dominican council at Reggio, Savonarola had occasion to display his theological learning and subtlety. The famous Pico della Mirandola was particularly impressed by the friar's attainments, and is said to have urged Lorenzo de' Medici to recall him from Lombardy.

When Savonarola returned to Florence in 1490, his fame as an orator had gone there before him. The cloister garden was too small for the crowds attending his lectures, and on the 1st of August 1490 he gave his first sermon in the church of St Mark. To quote his own words, it was "a terrible sermon," and legend adds that he foretold he should preach for eight years. And now, for the better setting forth of his doctrines, to silence pedants, and confute malignant misinterpretation, he published a collection of his writings. These proved his knowledge of the ancient philosophy he so fiercely condemned, and showed that no ignorance of the fathers caused him to seek inspiration from the Bible alone. *The Triumph of the Cross* is his principal work, but everything he wrote was animated by the ardent spirit of piety evidenced in his life. Savonarola's sole aim was to bring mankind nearer to God.

Prior of St Mark's.

In 1491 he was invited to preach in the cathedral, Sta Maria del Fiore, and his rule over Florence may be said to begin from that date. Lorenzo sent leading citizens to him to urge him to show more respect to the head of the state. Savonarola rejected their advice and foretold the impending deaths of Lorenzo, of the pope and of the king of Naples. In the July of the same year he was elected prior of St Mark's. As the convent had been rebuilt by Cosimo, and enriched by the bounty of the Medici, it was considered the duty of the new superior to present his homage to Lorenzo. Savonarola, however, refused to conform to the usage. His election was due to God, not Lorenzo; to God alone would he promise submission. Upon this the sovereign angrily exclaimed: "This stranger comes to dwell in my house, yet will not stoop to pay me a visit." Nevertheless, disdaining to recognize the enmity of a mere monk, he tried, but in vain, conciliatory measures. The Magnifico then sought to undermine his popularity, and Frà Mariano was employed to attack him from the pulpit. But the preacher's scandalous accusations missed their mark, and disgusted his hearers without hurting his rival. Savonarola took up the challenge; his eloquence prevailed, and Frà Mariano was silenced. But the latter, while feigning indifference, was thenceforth his rancorous and determined foe.

In April 1492 Lorenzo de' Medici was on his death-bed at Careggi. Oppressed by the weight of his crimes, he summoned the unyielding prior to shrive his soul. Savonarola reluctantly came, and offered absolution upon three conditions. Lorenzo asked in what they consisted. First, "You must repent and feel true faith in God's mercy." Lorenzo assented. Secondly, "You must give up your ill-gotten wealth." This, too, Lorenzo promised, after some hesitation; but upon hearing the third clause, "You must restore the liberties of Florence," Lorenzo turned his face to the wall and made no reply. Savonarola waited a few moments and then went away. And shortly after his penitent died unabsolved.

Prophetic Visions.

Savonarola's influence now rapidly increased. Many adherents of the late prince came over to his side, disgusted by the violence and incompetency of Piero de' Medici's rule. The same year witnessed the fulfilment of Savonarola's second prediction in the death of Innocent VIII. (July 1492); men's minds were full of anxiety, an anxiety increased by the scandalous election of Cardinal Borgia to the papal chair. The friar's utterances became more and more fervent and impassioned. It was during the delivery of one of his Advent sermons that he beheld the celebrated vision, recorded in contemporary medals and engravings, that is almost a symbol of his doctrines. A hand appeared to him bearing a flaming sword inscribed with the words: "Gladius Domini supra terram cito et velociter." He heard supernatural voices proclaiming mercy to the faithful, vengeance on the guilty, and mighty cries that the wrath of God was at hand. Then the sword bent towards the earth, the sky darkened, thunder pealed, lightning flashed, and the whole world was wasted by famine, bloodshed and pestilence. It was probably the noise of these sermons that caused the friar's temporary removal from Florence at the instance of Piero de' Medici. He was presently addressing enthusiastic congregations at Prato and Bologna. In the latter city his courage in rebuking the wife of Bentivoglio, the reigning lord, for interrupting divine service by her noisy entrance nearly cost him his life. Assassins were sent to kill him in his cell; but awed, it is said, by Savonarola's words and demeanour they fled dismayed from his presence. At the close of his last sermon the undaunted friar publicly announced ~~the day~~ and hour of his departure from Bologna; and his lonely journey on foot over the Apennines was safely accomplished. He was rapturously welcomed by the community of St Mark's, and at once proceeded to re-establish the discipline of the order and to sweep away abuses. For this purpose he obtained, after much difficulty, a papal brief emancipating the Dominicans of St Mark from the rule of the Lombard vicars of that order. He thus became an independent authority, no longer at the command of distant superiors. He relegated many of the brethren to a quieter retreat outside the city, only retaining in Florence those best fitted to aid in intellectual labour. To render the convent self-supporting, he opened schools for various branches of art, and promoted the study of Oriental languages. His efforts were successful; religion and learning made equal progress; St Mark's became the most popular monastery in Florence, and many citizens of noble birth flocked thither to take the vows.

Meanwhile Savonarola continued to denounce the abuses of the church and the guilt and corruption of mankind, and thundered forth predictions of heavenly wrath. In 1494 the duke of Milan demanded the aid of France, and King Charles VIII. brought an army across the Alps. Piero de' Medici, made alliance with the Neapolitan sovereign whose kingdom was claimed by Charles. Then, repenting this ill-judged step, he hurried in person to the French camp at Pietra Santa and humbled himself before the king. Not content with agreeing to all the latter's demands, he further promised large sums of money and the surrender of the strongholds of Pisa and Leghorn. This news drove Florence to revolt. But even at this crisis Savonarola's influence was all-powerful, and a bloodless revolution was effected. Piero Capponi's declaration that "it was time to put an end to this baby government" was the sole weapon needed to depose Piero de' Medici. The resuscitated republic instantly sent a fresh embassy to the French king, to arrange the terms of his reception in Florence. Savonarola was one of the envoys, Charles being known to entertain the greatest veneration for the friar who had so long predicted his coming and declared it to be divinely ordained. He was most respectfully received at the camp, but could obtain no definite pledges from the king, who was bent on first coming to Florence.

Returning full of hope from Pietra Santa, Savonarola might well have been dismayed by the distracted state of public affairs. Nevertheless, with the aid of Capponi, he guided the bewildered city safely through these critical days. Charles entered Florence on the 17th of November 1494, and the citizens' fears evaporated in jests on the puny exterior of the "threatened scourge." But the exorbitance of his demands soon showed that he came as a foe. Disturbances arose, and serious collision with the French troops seemed inevitable. The signory resolved to be rid of their dangerous guests; and, when Charles threatened to sound his trumpets unless the sums exacted were paid, Capponi tore up the treaty in his face and made the memorable reply: "Then we will ring our bells." The monarch was cowed, accepted moderate terms, and, yielding to Savonarola's remonstrances, left Florence on the 24th of November.

After seventy years' subjection to the Medici Florence had forgotten the art of self-government, and felt the need of a strong guiding hand. So the citizens turned to the patriot monk whose words had freed them of King Charles, and Savonarola became the lawgiver of Florence. The first thing done at his instance was to relieve the starving populace within and without the walls; shops were opened to give work to the unemployed; all taxes, especially those weighing on the lower classes, were reduced; the strictest administration of justice was enforced, and all men were exhorted to place their trust in the Lord. And, after much debate, as to the constitution of the new republic, Savonarola's influence carried the day in favour of Soderini's proposal of a universal or general government, with a great council on the Venetian plan. The great council consisted of 3200 citizens of blameless reputation and over twenty-five years of age, a third of the number sitting for six months in turn in the hall of the Cinquecento expressly built for the purpose. There was also an upper council of eighty, which in conjunction with the signory decided all questions of too important and delicate a nature for discussion in the larger assembly. These institutions were approved by the people, and gave a fair promise of justice. Savonarola's programme of the new government was comprised in the following formula:—(1) fear of God and purification of manners; (2) promotion of the public welfare in preference to private interests; (3) a general amnesty to political offenders; (4) a council on the Venetian model, but with no doge. At first the new machinery acted well; the public mind was tranquil, and the war with Pisa—not as yet of threatening proportions—was enough to occupy the Florentines and prevent internecine feuds.

"Dictator of Florence."

Without holding any official post in the commonwealth he had created, the prior of St Mark's was the real head of the state, the dictator of Florence, and guarded the public weal with extraordinary political wisdom. At his instance the tyrannical system of arbitrary imposts and so-called voluntary loans was abolished, and replaced by a tax of 10% (*la decima*) on all real property. The laws and edicts of this period read like paraphrases of Savonarola's sermons, and indeed his counsels were always given as addenda to the religious exhortations in which he denounced the sins of his country and the pollution of the church, and urged Florence to cast off iniquity and become a truly Christian city, a pattern not only to Rome but to the world at large. His eloquence was now at the flood. Day by day his impassioned words, filled with the spirit of the Old Testament, wrought upon the minds of the Florentines and strung them to a pitch of pious emotion never before—and never since—attained by them. Their fervour was too hot to be lasting, and Savonarola's uncompromising spirit roused the hatred of political adversaries as well as of the degraded court of Rome. Even now, when his authority was at its highest, when his fame filled the land, and the vast cathedral and its precincts lacked space for the crowds flocking to hear him, his enemies were secretly preparing his downfall.

Pleasure-loving Florence was completely changed. Abjuring pomps and vanities, its citizens observed the ascetic régime of the cloister; half the year was devoted to abstinence and few dared to eat meat on the fasts ordained by Savonarola. Hymns and lauds rang in the streets that had so recently echoed with Lorenzo's dissolute songs. Both sexes dressed with Puritan plainness; husbands and wives quitted their homes for convents; marriage became an awful and scarcely permitted rite; mothers suckled their own babes; and persons of all ranks—nobles, scholars and artists—renounced the world to assume the Dominican robe. Still more wonderful was Savonarola's influence over children, and their response to his appeals is a proof of the magnetic power of his goodness and purity. He organized the boys of Florence in a species of sacred militia, an inner republic, with its own magistrates and officials charged with the enforcement of his rules for the holy life. It was with the aid of these youthful enthusiasts that Savonarola arranged the religious carnival of 1496, when the citizens gave their costliest possessions in alms to the poor, and tonsured monks, crowned with flowers, sang lauds and performed wild dances for the glory of God. In the same spirit, and to point the doctrine of renunciation of worldly enjoyments, he celebrated the carnival of 1497 by the famous "burning of the vanities" (*i.e.* masks and other objects pertaining to the carnival festivities, indecent books and pictures, &c.) in the Piazza della Signoria. A Venetian merchant is known to have bid 22,000 gold florins for the doomed vanities, but the scandalized authorities not only rejected his offer but added his portrait to the pile. Nevertheless the artistic value of the objects consumed has been greatly exaggerated by some writers. There is no proof that any book or painting of real merit was sacrificed, and Savonarola was neither foe to art nor to learning. On the contrary, so great was his respect for both that, when there was a question of selling the Medici library to pay that family's debts, he saved the collection at the expense of the convent purse.

Conflict with the Pope.

Meanwhile events were taking a turn hostile to the prior. Alexander VI. had long regretted the enfranchisement of St Mark's from the rule of the Lombard Dominicans, and now, having seen a transcript of one of Savonarola's denunciations of his crimes, resolved to silence this daring preacher. Bribery was the first weapon employed, and a cardinal's hat was held out as a bait. But Savonarola indignantly spurned the offer, replying to it from the pulpit with the prophetic words: "No hat will I have but that of a martyr, reddened with my own blood." So long as King Charles remained in Italy Alexander's concern for his own safety prevented vigorous measures against the friar. But no Borgia ever forgot an enemy. He bided his time, and the transformation of sceptical Florence into an austerely Christian republic claiming the Saviour as its head only increased his resolve to crush the man who had wrought this marvel. The potent duke of Milan, Ludovico Sforza, and other foes were labouring for the same end, and already in July 1495 a papal brief had courteously summoned Savonarola to Rome. In terms of equal courtesy the prior declined the invitation, nor did he obey a second, less softly worded, in September. Then came a third, threatening Florence with an interdict in case of renewed refusal. Savonarola disregarded the command, but went to preach for a while in other Tuscan cities. But in Lent his celebrated sermons upon Amos were delivered in the duomo, and again he urged the necessity of reforming the church, striving by ingenious arguments to reconcile rebellion against Alexander with unalterable fidelity to the Holy See. All Italy recognized that Savonarola's voice was arousing a storm that might shake even the power of Rome. Alive to the danger, the pope knew that his foe must be crushed, and the religious carnival of 1496 afforded a good pretext for stronger proceedings against him. The threatened anathema was deferred, but a brief uniting St Mark's to a new Tuscan branch of the Dominicans now deprived Savonarola of his independent power. However, in the beginning of 1497 the Piagnoni were again in office, with the prior's staunch friend, Francesco Valori, at their head. In March the aspect of affairs changed. The Arrabbiati and the Medicean faction merged political differences in their common hatred to Savonarola. Piero de' Medici's fresh attempt to re-enter Florence failed; nevertheless his followers continued their intrigues, and party spirit increased in virulence. The citizens were growing weary of the monastic austerities imposed on them, and Alexander foresaw that his revenge was at hand.

Excommunicated.

A signory openly hostile to Savonarola took office in May, and on Ascension Day his enemies ventured on active insult. His pulpit in the duomo was defiled, an ass's skin spread over the cushion, and sharp nails fixed in the board on which he would strike his hand. The outrage was discovered and remedied before the service began; and, although the Arrabbiati half filled the church and even sought to attempt his life, Savonarola kept his composure and delivered an impressive sermon. But the signory, in feigned anxiety for the public peace, besought him to suspend his discourses. Shortly afterwards the threatened bull of excommunication was launched against him, and Frà Mariano was in Rome stimulating the pope's wrath. Savonarola remained undaunted. The sentence was null and void, he said. His mission was divinely inspired; and Alexander, elected simoniacally and laden with crimes, was no true pope. Nevertheless the reading of the bull in the duomo with the appropriate, terrifying ceremonial made a deep impression on the Florentines. And now, the Arrabbiati signory putting no check on the Compagnacci, the city returned to the wanton licence of Lorenzo's reign. But in July Savonarola's friends were again in power and did their best to have his excommunication removed. Meanwhile party strife was stilled by an outbreak of the plague. During this time Rome was horror-struck by the mysterious murder of the young duke of Gandia, and the bereaved pope mourned his son with the wildest grief. Savonarola addressed to the pontiff a letter of condolence, boldly urging him to bow to the will of Heaven and repent while there was yet time.

The plague ended, Florence was plunged in fresh troubles from Medicean intrigues, and a conspiracy for the restoration of Piero was discovered. Among the five leading citizens concerned in the plot was Bernardo del Nero, a very aged man of lofty talents and position. The gonfalonier, Francesco Valori, used his strongest influence to obtain their condemnation, and all five were put to death. It is said that at least Bernardo del Nero would have been spared had Savonarola raised his voice, but, although refraining from any active part against the prisoners, the prior would not ask mercy for them. This silence proved fatal to his popularity with moderate men, gave new adherents to the Arrabbiati, and whetted the fury of the pope, Sforza and all potentates well disposed to the Medici faction. He was now interdicted from preaching even in his own convent and again summoned to Rome. As before, the mandate was disobeyed. He refrained from public preaching, but held conferences in St Mark's with large gatherings of his disciples, and defied the interdict on Christmas Day by publicly celebrating mass and heading a procession through the cloisters.

The year 1498, in which Savonarola was to die a martyr's death, opened amid seemingly favourable auspices. The Piagnoni were again at the head of the state, and by their request the prior resumed his sermons in the duomo, while his dearest disciple, Frà Domenico Buonvicini, filled the pulpit of St Lorenzo. For the last time the carnival was again kept with strange religious festivities, and some valuable books and works of art were sacrificed in a second bonfire of "vanities." But menacing briefs poured in from Rome; the pope had read one of Savonarola's recent sermons on Exodus; the city itself was threatened with interdict, and the Florentine ambassador could barely obtain a short delay. Now too the Piagnoni quitted office; the new signory was less friendly, and the prior was persuaded by his adherents to retire to St Mark's. There he continued to preach with unabated zeal; and, since the women of Florence deplored the loss of his teachings, one day in the week was set apart for them. The signory tried to conciliate the pope by relating the wonderful spiritual effects of their preacher's words, but Alexander was obdurate. The Florentines must either silence the man themselves, or send him to be judged by a Roman tribunal.

Undismayed by personal danger, Savonarola resolved to appeal to all Christendom against the unrighteous pontiff, and despatched letters to the rulers of Europe adjuring them to assemble a council to condemn this antipope. The council of Constance, and the deposition of John XXIII., were satisfactory precedents still remembered by the world. One of these letters being intercepted and sent to Rome by the duke of Milan (it is said) proved fatal to the friar. The papal threats were now too urgent to be disregarded, and the cowed signory entreated Savonarola to put an end to his sermons. He reluctantly obeyed, and concluded his last discourse with the tenderest and most touching farewell.

The ordeal of fire.

The government now hoped that Alexander would be appeased and Florence allowed to breathe freely. But although silenced the prophet was doomed, and the folly of his disciples precipitated his fate. A creature of the Arrabbiati, a Franciscan friar named Francesco di Puglia, challenged Savonarola to prove the truth of his doctrines by the ordeal of fire. At first the prior treated the provocation with merited contempt, but his too zealous disciple Frà Domenico accepted the challenge. And, when the Franciscan declared that he would enter the fire with Savonarola alone, Frà Domenico protested his willingness to enter it with any one in defence of his master's cause. As Savonarola resolutely declined the trial, the Franciscan deputed a convert, one Giuliano dei Rondinelli, to go through the ordeal with Frà Domenico. There were long preliminary disputes. Savonarola, perceiving that a trap was being laid for him, discountenanced the "experiment" until his calmer judgment was at last overborne by the fanaticism of his followers. Aided by the signory, which was playing into the hands of Rome, the Arrabbiati and Compagnacci pressed the matter on, and the way was now clear for Savonarola's destruction.

On the 7th of April 1498 an immense throng gathered in the Piazza della Signoria to enjoy the barbarous sight. Two thick banks of combustibles 40 yds. long, with a narrow space between, had been erected in front of the palace, and five hundred soldiers kept a wide circle clear of the crowd. Some writers aver that the piles were charged with gunpowder. The Dominicans from one side, the Franciscans from the other, marched in solemn procession to the Loggia dei Lanzi, which had been divided by a hoarding into two separate compartments. The Dominicans were led by Savonarola carrying the host, which he reverently deposited on an altar prepared in his portion of the loggia. The magistrates signalled to the two champions to advance. Frà Domenico stepped forward, but neither Rondinelli nor Frà Francesco appeared. The Franciscans began to urge fantastic objections, and, when Savonarola insisted that his champion should bear the host, they cried out against the sacrilege of exposing the Redeemer's body to the flames. All was turmoil and confusion, the crowd frantic. And, although Rondinelli had not come, the signory sent angry messages to ask why the Dominicans delayed the trial. It was now late in the day, and a storm shower gave the authorities a pretext for declaring that heaven was against the ordeal. The Franciscans slipped away unobserved, but Savonarola raising the host attempted to lead his monks across the piazza in the same solemn order as before. On this the popular fury burst forth. Defrauded of their bloody diversion, the people were wild with rage. Frà Girolamo's power was suddenly at an end. Neither he nor his brethren would have lived to reach St Mark's but for the devoted help of Salviati and his men. Against the real culprits, the Franciscans, no anger was felt; the zealous prior, the prophet and lawgiver of Florence, was made the popular scapegoat. Notwithstanding the anguish that must have filled his heart, the fallen man preserved his dignity and calm. Mounting his own pulpit in St Mark's he quietly related the events of the day to the faithful assembled in the church, and then withdrew to his cell, while the mob on the square outside was clamouring for his blood.

Arrest and Trial.

The next morning, the signory having decreed the prior's banishment, Francesco Valori and other leading Piagnoni hurried to him to concert measures for his safety. Meanwhile the government decided on his arrest, and no sooner was this made public than the populace rushed to the attack of the convent. The doors of St Mark's were hastily secured, and Savonarola discovered that his adherents had secretly prepared arms and munitions and were ready to stand a siege. The signory sent to order all laymen to quit the cloister, and a special summons to Valori. After some hesitation the latter obeyed, hoping by his influence to rally all the Piagnoni to the rescue. But he was murdered in the street, and his palace sacked by the mob. The monks and their few remaining friends made a most desperate defence. In vain Savonarola besought them to lay down their arms. When the church was finally stormed Savonarola was seen praying at the altar, and Frà Domenico, armed with an enormous candlestick, guarding him from the blows of the mob. A few disciples dragged their beloved master to the inner library and urged him to escape by the window. He hesitated, seemed about to consent, when a cowardly monk, one Malatesta Sacramoro, cried out that the shepherd should lay down his life for his flock. Thereupon Savonarola turned, bade farewell to the brethren, and, accompanied by the faithful Domenico, quietly surrendered to his enemies. Later, betrayed by the same Malatesta, Frà Silvestro was also seized. The prisoners were conveyed to the Palazzo Vecchio, and Savonarola was lodged in the tower cell which had once harboured Cosimo de' Medici.

Now came an exultant brief from the pope. His well-beloved Florentines were true sons of the church, but must crown their good deeds by despatching the criminals to Rome. Sforza was equally rejoiced by the news, and the only potentate who could have perhaps saved Savonarola's life, Charles of France, had died on the day of the ordeal by fire. Thus another of the friar's prophecies was verified, and its fulfilment cost him his sole protector. The signory refused to send their prisoners to Rome, but they did Rome's behests. Savonarola's judges were chosen from his bitterest foes. Day after day he was tortured, and in his agony, with a frame weakened by constant austerity and the mental strain of the past months, he made every admission demanded by his tormentors. But directly he was released from the rack he always withdrew the confessions uttered in the delirium of pain. These being too incoherent to serve for a legal report, a false account of the friar's avowals was drawn up and published.

Though physically unable to resist torture, Savonarola's clearness of mind returned whenever he was at peace in his cell. So long as writing materials were allowed him he employed himself in making a commentary on the Psalms, in which he restated all his doctrines. Alexander was frantically eager to see his enemy die in Rome. But the signory insisted that the false prophet should suffer death before the Florentines whom he had so long led astray. The matter was finally compromised. A second mock trial was held by two apostolic commissioners specially appointed by the pope. One of the new judges was a Venetian general of the Dominicans, the other a Spaniard. Meanwhile the trial of Brothers Domenico and Silvestro was still in progress. The former remained faithful to his master and himself. No extremity of torture could make him recant or extract a syllable to Savonarola's hurt; he steadfastly repeated his belief in the divinity of the prior's mission. Frà Silvestro on the contrary gave way at mere sight of the rack, and this seer of heavenly visions owned himself and his master guilty of every crime laid to their charge.

The two commissioners soon ended their task. They had the pope's orders that Savonarola was to die "even were he a second John the Baptist." On three successive days they "examined" the prior with worse tortures than before. But he now resisted pain better, and, although more than once a promise to recant was extorted from him, he reasserted his innocence when unbound, crying out, "My God, I denied Thee for fear of pain." On the evening of the 22nd of May sentence of death was pronounced on him and his two disciples. Savonarola listened unmoved to the awful words, and then quietly resumed his interrupted devotions. Frà Domenico exulted in the thought of dying by his master's side; Frà Silvestro, on the contrary, raved with despair.

The only favour Savonarola craved before death was a short interview with his fellow victims. This the signory unwillingly granted. The memorable meeting took place in the hall of the Cinquecento. During their forty days of confinement and torture each one had been told that the others had recanted, and the false report of Savonarola's confession had been shown to the two monks. The three were now face to face for the first time. Frà Domenico's loyalty had never wavered, and the weak Silvestro's enthusiasm rekindled at sight of his chief. Savonarola prayed with the two men, gave them his blessing, and exhorted them by the memory of their Saviour's crucifixion to submit meekly to their fate. Midnight was long past when Savonarola was led back to his cell. Jacopo Niccolini, one of a religious fraternity dedicated to consoling the last hours of condemned men, remained with him. Spent with weakness and fatigue he asked leave to rest his head on his companion's lap, and quickly fell into a quiet sleep. As Niccolini tells us, the martyr's face became serene and smiling as a child's. On awaking he addressed kind words to the compassionate brother, and then prophesied that dire calamities would befall Florence during the reign of a pope named Clement. The carefully recorded prediction was verified by the siege of 1529.

Martyrdom.

The execution took place the next morning. A scaffold, connected by a wooden bridge with the magistrates' rostrum, had been erected on the spot where the piles of the ordeal had stood. At one end of the platform was a huge cross with faggots heaped at its base. As the prisoners, clad in penitential haircloth, were led across the bridge, wanton boys thrust sharp sticks between the planks to wound their feet. First came the ceremonial of degradation. Sacerdotal robes were thrown over the victims, and then roughly stripped off by two Dominicans, the bishop of Vasona and the prior of Sta Maria Novella. To the bishop's formula, "I separate thee from the church militant and the church triumphant," Savonarola replied in firm tones, "Not from the church triumphant; that is beyond thy power." By a refinement of cruelty Savonarola was the last to suffer. His disciples' bodies already dangled from the arms of the cross before he was hung on the centre beam. Then the pile was fired. For a moment the wind blew the flames aside, leaving the corpses untouched. "A miracle," cried the weeping Piagnoni; but then the fire leapt up and ferocious yells of triumph rang from the mob. At dusk the martyrs' remains were collected in a cart and thrown into the Arno.

Savonarola's party was apparently annihilated by his death, but, when in 1529–1530 Florence was exposed to the horrors predicted by him, the most heroic defenders of his beloved if ungrateful city were Piagnoni who ruled their lives by his precepts and revered his memory as that of a saint.

Savonarola's writings may be classed in three categories:—(1) numerous sermons, collected mainly by Lorenzo Violi, one of his most enthusiastic hearers; (2) an immense number of devotional and moral essays and some theological works, of which *Il Trionfo della Croce* is the chief; (3) a few short poems and a political treatise on the government of Florence. Although his faith in the dogmas of the Roman Catholic Church never swerved, his strenuous protests against papal corruptions, his reliance on the Bible as his surest guide, and his intense moral earnestness undoubtedly connect Savonarola with the movement that heralded the Reformation.

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SAVORY, SIR WILLIAM SCOVELL, BART. (1826–1895), British surgeon, was born on the 30th of November 1826, in London. He entered St Bartholomew's Hospital in 1844, becoming M.R.C.S. in 1847, and F.R.C.S. in 1852. From 1849 to 1859 he was demonstrator of anatomy and operative surgery at St Bartholomew's, and for many years curator of the museum, where he devoted himself to pathological and physiological work. In 1859 he succeeded Sir James Paget as lecturer on general anatomy and physiology. In 1861 he became assistant surgeon, and in 1867 surgeon, holding the latter post till 1891; and from 1869 to 1889 he was lecturer on surgery. In the College of Surgeons he was a man of the greatest influence, and was president for four successive years, 1885–1888. As Hunterian professor of comparative anatomy and physiology (1859–1861), he lectured on "General Physiology" and the "Physiology of Food." In 1884 he delivered the Bradshaw Lecture on the "Pathology of Cancer." In 1887 he delivered the Hunterian Oration. In 1879, at Cork, he had declared against "Listerism" at the meeting of the British Medical Association, "the last public expression," it has been said, "by a prominent surgeon against the now accepted method of modern surgery." In 1887 he became surgeon-extraordinary to Queen Victoria, and in 1890 he was made a baronet. Savory, who was an able operator, but averse from exhibitions of brilliancy, was a powerful and authoritative man in his profession, his lucidity of expression being almost as valuable as his great knowledge of physiology and anatomy. He died in London on the 4th of March 1895.

SAVOY, HOUSE OF, a dynasty which ruled over the territory of Savoy and Piedmont for nine centuries, and now reigns over the kingdom of Italy. The name of Savoy was known to the Romans during the decline of the empire. In the 5th century the territory was conquered by the Burgundians, and formed part of their kingdom; nearly a hundred years later it was occupied by the Franks. It was included in Charlemagne's empire and was divided by him into counties, which evolved there as elsewhere into hereditary fiefs; but after the break-up of Charlemagne's empire, the Burgundian kingdom revived and Savoy was again absorbed in it. After the collapse of that monarchy its territories passed to the German kings, and Savoy was divided between the counts of Provence, of Albon, of Gex, of Bresse, of the Genevois, of Maurienne, the lords of Habsburg, of Zähringen, &c., and several prelates.

The founder of the house of Savoy is Umberto Biancamano (Humbert the White-handed), a feudal lord of uncertain but probably Teutonic descent, who in 1003 was count of Salmourenc in the Viennois, in 1017 of Nyon on the Lake of Geneva, and in 1024 of the Val d'Aosta on the eastern slope of the Western Alps.

Humbert the White-handed.

In 1034 he obtained part of Maurienne as a reward for helping King Conrad the Salic to make good his claims on Burgundy. He also obtained the counties of Savoy, Belley, part of the Tarantaise, and the Chablais. With these territories Umberto commanded three of the great Alpine passes, viz. the Mont Cenis and the two St Bernards. In the meanwhile his son Oddone married Adelaide, eldest daughter and heiress of Odelrico Manfredi, marquess of Susa, a descendant of Arduino of Ivrea, king of Italy, who ruled over the counties of Turin, Auriate, Asti, Bredulo, Vercelli, &c., corresponding roughly to modern Piedmont and part of Liguria (1045). Umberto died some time after 1056 and was succeeded by his son, Amadeus I., at whose death the country passed to Oddone, the husband of the countess Adelaide.

Oddone.

Oddone thus came to rule over territories on both sides of the Alps, a fact which was to dominate the policy of Savoy until 1860; its situation between powerful neighbours accounting for its vacillating attitude, whence arose the charges of duplicity levelled against many of its rulers, while its dominion over the Alpine passes brought many advantages. Oddone died in 1060, and was succeeded by his widow Adelaide; but before her death in 1091 his son, Peter I., became count, and subsequently the latter's brother, Amadeus II. Under Humbert II. (1080) occurred the first clash with the Piedmontese communes, but he and his successors, Amadeus III. (who died on his way home from the crusades) and Thomas I. (1189), adopted a policy of conciliation towards them.

Thomas I.

Thomas, who reigned until 1222, was a Ghibelline in politics and greatly increased the importance of Savoy, for he was created Imperial Vicar and acquired important extensions of territory in the Bugey, Vaud and Romont to the west of the Alps, and Carignano, Pinerolo, Moncalieri and Vigone to the east; he also exercised sway over Geneva, Albenga, Savona and Saluzzo. At his death these territories were divided among his sons, Thomas II. obtaining Piedmont, Aimone the Chablais, Peter and Philip other fiefs, and Amadeus IV., the eldest, Savoy and a general overlordship over his brothers' estates. Peter visited England several times, one of his nieces, Eleanor of Provence, being the wife of the English king Henry III., and another, Sancha, wife of Richard, earl of Cornwall. Henry conferred great honours on Peter, creating him earl of Richmond, and gave him a palace on the Thames, known as Savoy House. Count Peter also acquired fresh territories in Vaud, and defeated Rudolph of Habsburg at Chillon. Thomas's other sons received fiefs and bishoprics abroad, and one of them, Boniface, was made archbishop of Canterbury. Thomas II., after capturing several cities and castles in Piedmont, lost them again and was made prisoner by the citizens of Turin, but was afterwards liberated. He alone of the sons of Thomas I. left male heirs, and his son Amadeus V. (1285–1323) reunited the scattered dominions of his house. When Amadeus succeeded to the throne these were divided into the county of Savoy (his own territory), the principality of Piedmont ruled by his nephew Philip, prince of Achaea (a title acquired through his wife, Isabella of Villehardouin, heiress of Achaea and the Morea), and Vaud ruled by his brother Louis. But although this division was formally recognized in 1295, Amadeus succeeded in enforcing his own supremacy over the whole country and making of it a more unified state than before, and by war, purchase or treaty he regained other fiefs which his predecessors had lost. He fought in many campaigns against the dauphins of Viennois, the counts of Genevois, the people of Sion and Geneva, the marquesses of Saluzzo and Montferrat, and the barons of Faucigny. He also acted as peacemaker between France and England, accompanied the emperor Henry VII. of Luxemburg on his expedition to Italy, reorganized the finances of the realm and reinforced the Salic law of succession. He was succeeded by his sons, Edward (1323–1329), known as "the Liberal," on account of his extravagance, and Aimone, the Peaceful (1329–1343), who strove to repair the harm done to the state's exchequer by his predecessor and proved one of the best princes of his line.

Amadeus VI.

Amadeus VI. (1343–1383), son of the latter (known as the *Conte Verde* or Green Count because of the costume he habitually wore at tourneys), succeeded at the age of nine. He won a reputation as a bold knight in the fields of chivalry and in the crusades, and he inaugurated a new policy for his house by devoting more attention to his Italian possessions than to those on the French side of the Alps and in Switzerland. In 1366 he led an expedition to the East against the Turks; and he arbitrated between Milan and the house of Montferrat (1379), between the Scaligeri and the Visconti, and between Venice and Genoa after the "War of Chioggia" (1381). Amadeus was the first sovereign to introduce a system of gratuitous legal assistance for the poor. He unfortunately espoused the cause of Louis, duke of Anjou, and while aiding that prince in his attempt to recover the kingdom of Naples he died of the plague, leaving his realm to his son, Amadeus VII., the *Conte Rosso* or "Red Count" (1383–1391); the latter added Nice (1388) and other territories to his domains.

During the reign of Amadeus VIII. (1391–1440), Savoy prospered in every way. The count extended his territories both in Savoy itself and in Italy, and in 1416 was created duke by the emperor Sigismund.

Amadeus VIII.

He was distinguished for his wisdom and justice, and in 1430 he promulgated a general statute of laws for the whole duchy, in spite of the opposition of the nobles and cities whose privileges were thereby curtailed. In 1434 he retired to the hermitage of Ripaille on the Lake of Geneva, but continued to conduct the chief affairs of the state and to mediate between foreign Powers, leaving matters of less importance to his son Louis. Five years later the council of Basel by a strange decision elected Amadeus pope, in spite of his not being a priest, and deposed Eugenius IV. Amadeus accepted the dignity, assuming the style of Felix V., and abdicated the dukedom. For nine years he remained pope, although he never went to Rome and one-half of Christendom regarded him as an anti-pope. On the death of Eugenius (1447) Thomas of Sarzana was elected as Nicholas V., and in 1449 Amadeus abdicated and returned to his hermitage at Ripaille, where he died two years later (see FELIX V.).

Under Louis Savoy began to decline, for he was indolent, incapable, and entirely ruled by his wife, Anne of Lusignan, daughter of the king of Cyprus, an ambitious and intriguing woman; she induced him to fit out an expensive expedition to Cyprus, which brought him no advantage save the barren title of king of Cyprus, Jerusalem and Armenia. He neglected to make good the claims which he might have enforced to the duchy of Milan on the death of Filippo Maria, the last Visconti (1447). His latter years were troubled by conspiracies and dissensions on the part of the nobles and even of his own son, Philip, count of Bresse. He went to France to seek aid of King Louis XI., but died there in 1465. In spite of his incapacity he acquired the city of Freiburg and the homage of the lords of Monaco. He was succeeded by his son, Amadeus IX. (1455–1472), who on account of ill-health left the duchy in the hands of his wife, Yolande, sister of Louis XI. This led to feuds and intrigues on the part of the French king and of Philip of Bresse, and Savoy would probably have been dismembered but for the patriotic action of the States General. On Amadeus's death, his son Philibert I. (1472–1482) succeeded, but as he was a minor the States General appointed his mother Yolande regent. Wars and civil commotions occupied the period of his minority and Savoy lost Freiburg and many other territories. Yolande died in 1472, and the regency was disputed by various claimants; Philip of Bresse having obtained it by force, he carried off Philibert, who died in 1482 at Lyons. He was succeeded by his brother Charles I. (1482–1490), who, freed by Louis XI. from the dangerous protection of Philip of Bresse and by death from that of the French king, crushed the rebellious nobles and seized Saluzzo (1487). He did much to raise the falling fortunes of his house, but died at the age of thirty-one. Under his successor Charles II. (1490–1496), an infant in arms, the duchy was again distracted by civil war and foreign invasions. Charles died at an early age, and, having no male heirs, the aged Philip of Bresse succeeded, but reigned only for one year. Philibert II. (1497–1504) followed, but he was devoted only to pleasure and left the helm of state to his half-brother, Renato, and later to his wife, Margaret of Austria. He died without heirs and was succeeded by his brother, Charles III. During his reign Savoy abandoned its attitude of subserviency to France, adopting a policy of greater independence, and became more friendly to Austria.

Emmanuel Philibert.

Charles Emmanuel I.

Victor Amadeus II.

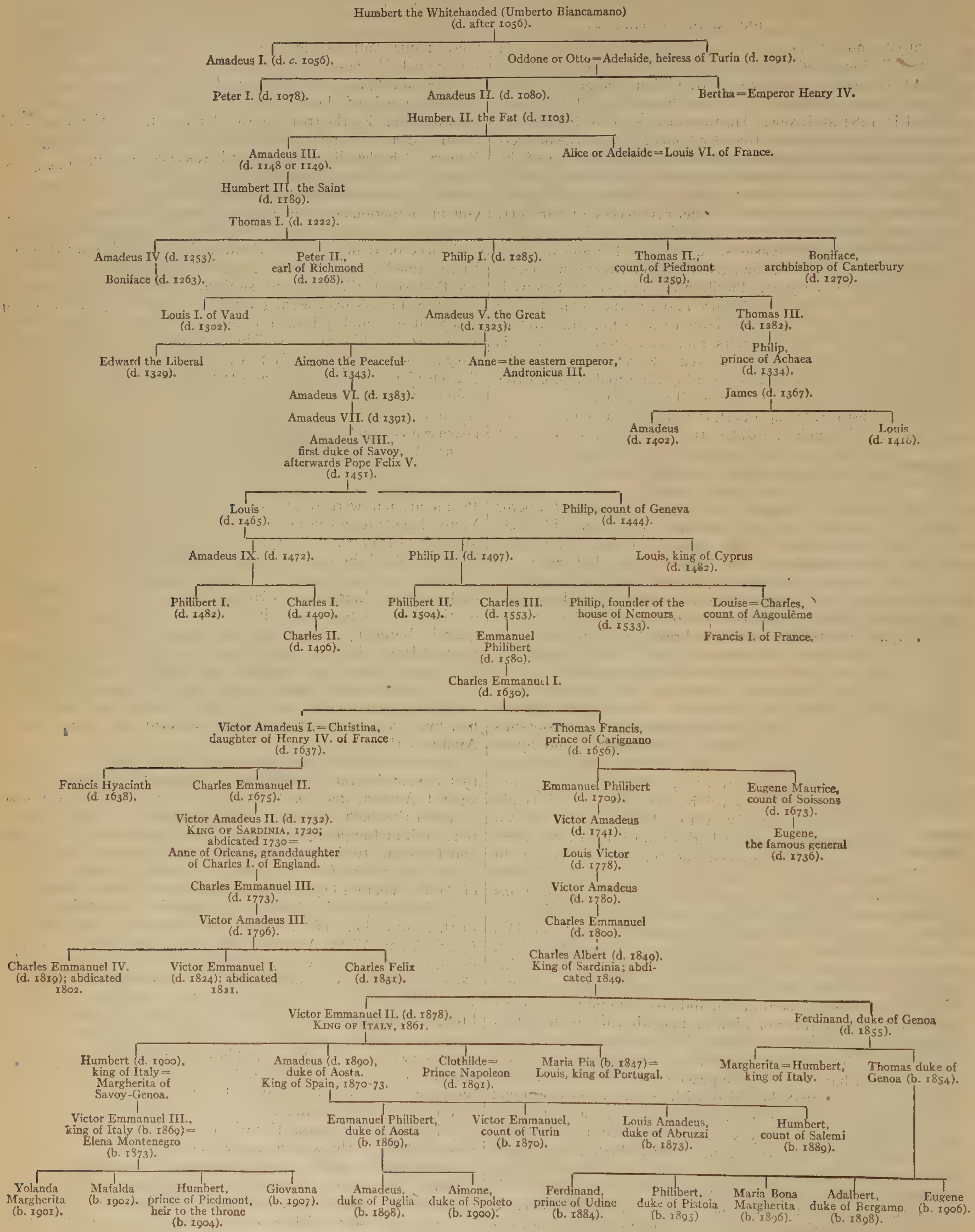
The kingdom of Sardinia.

Under Charles III. (1504–1553), the duchy suffered a series of misfortunes. Although the duke strove after peace at almost any price, he was nearly always involved in war and lost many possessions, including Geneva and Vaud. At his death the whole country was overrun by the hostile armies of Francis I. of France and of the Emperor Charles V., while his son and successor, Emmanuel Philibert (1553–1580), was serving in the Spanish armies. Emmanuel could not take possession of the duchy at once, but continued to serve the emperor as governor-general of the Low Countries. By his victory at St Quentin over the French in 1557 he proved himself one of the first generals of the day, and by the terms of the subsequent treaty of Cateau Cambrésis he was reinstated in most of his hereditary possessions (1559). Under Emmanuel Philibert Savoy lost all traces of constitutional government and became an absolute despotism of the type then predominating throughout the greater part of Europe. At the same time he raised his country from ruin and degradation into a prosperous and powerful monarchy. He induced both France and Spain to evacuate the fortresses which they still held in Piedmont, made a profitable exchange of territory with the Bernese, and acquired an extension of seaboard by the purchase of Tenda and Oneglia (see EMMANUEL PHILIBERT of Savoy). His son and successor, Charles Emmanuel I., surnamed the Great, strengthened the tendency of Savoy to become less of a French and more of an Italian Power. In 1588 he wrested Saluzzo from the French, but his expeditions to Provence and Switzerland were unsuccessful. In the war between France and Spain after the accession of Henry IV., he took the Spanish side, and at the peace of Lyons (1601), although he gave up all his territories beyond the Rhone, his possession of Saluzzo was confirmed. His attempt to capture Geneva by treachery (1602) failed, and although on the death of Francesco Gonzaga, duke of Mantua and Montferrat, he seized the latter city (1612) he was forced by Spain and her allies to relinquish it. The Spaniards invaded the duchy, but after several years of hard fighting the peace of 1618 left his territory almost intact. In 1628 he sided with Spain against France; the armies of the latter overran the duchy, and Charles Emmanuel died in 1630 (see CHARLES EMMANUEL). His son, Victor Amadeus I. (1630–1637), succeeded to little more than a title, but by his alliance with France—his wife Christina being a daughter of Henry IV.—he managed to regain most of his territories. He proved a wise and popular ruler, and his early death was much deplored. His eldest son, Francis Giacinto, a minor, lived only a year, and his second son, Charles Emmanuel II., also a minor, remained under the regency of his mother. That princess, in spite of her French origin, resisted the attempts of France, then dominated by Cardinal Richelieu, to govern Savoy, but her quarrels with her brothers-in-law led to civil war, in which the latter obtained the help of Spain, and Christina that of France. In the end the duchess succeeded in patching up these feuds and saving the dynasty, and in 1648 Charles Emmanuel II. assumed the government. The war between France and Spain continued to rage, and Savoy, on whose territory much of the fighting took place, suffered severely in consequence. By the treaty of the Pyrenees (1669) the war came to an end and Savoy regained most of the towns occupied by France. Charles died in 1675 and was succeeded by his only son, Victor Amadeus II. (1675–1732). The latter's minority was passed under the regency of his able but imperious mother, Jeanne of Savoy-Nemours. He married Anne of Orleans, daughter of Henrietta of England and niece of Louis XIV. of France. The French king treated Victor Amadeus almost as a vassal, and obliged him to persecute his Protestant (Waldensian) subjects. But the young duke, galled by Louis's overbearing arrogance, eventually asserted his independence and joined the league of Austria, Spain and Venice against him in 1690. The campaign was carried on with varying success, but usually to the advantage of Louis, and the French victory at Marsiglia and the selfish conduct of the allies induced Victor to come to terms with France, and to turn against the imperialists (1696). By the treaty of Ryswick a general peace was concluded. In the war of the Spanish Succession (1700) we find Victor at first on the French side, until, dissatisfied with the continued insolence of Louis XIV. and of Philip of Spain, he went over to the Austrians in 1704. The French invaded Piedmont, but were totally defeated at the siege of Turin by Victor Amadeus and Prince Eugene of Savoy (1706), and eventually driven from the country. By the treaty of Utrecht (1713) Victor received the long-coveted Montferrat and was made king of Sicily; but in 1718 the powers obliged him to exchange that kingdom for Sardinia, which conferred on the rulers of Savoy and Piedmont the title subsequently borne by them until they assumed that of kings of Italy. In 1730 he abdicated in favour of his son, Charles Emmanuel, retired to Chambéry, and married the countess of San Sebastiano (afterwards Marchioness of Spigno). His wife's ambitions induced him to try to regain the crown, but his son had him arrested, and he died in prison in 1732 (see VICTOR AMADEUS II.).

The French occupation.

Charles Emmanuel III. (1730–1773) was a born soldier and took part in the war of the Polish Succession on the side of France against Austria, and for his victory at Guastalla (1734) was awarded the duchy of Milan, which, however, he was forced to relinquish at the peace of Vienna (1736), retaining only Novara and Tortona. In the war of the Austrian Succession, which broke out on the death of the Emperor Charles VI., he took the side of Maria Theresa (1742). By the peace of Aix-la-Chapelle in 1748, following on the defeat of the French, Savoy gained some further accessions of territory in Piedmont. The reign of Charles's son, Victor Amadeus III. (1773–1796), was a period of decadence; the king was incapable and extravagant, and he chose equally incapable ministers. On the outbreak of the French Revolution he sided with the royalists and was eventually brought into conflict with the French republic. The army being demoralized and the treasury empty, the kingdom fell an easy prey to the republican forces. Savoy became a French province, and, although the Piedmontese troops resisted bravely for four years in the face of continual defeats, Victor at last gave up the struggle as hopeless, signed the armistice of Cherasco, and died soon afterwards (1796). He was succeeded in turn by his three sons, Charles Emmanuel IV., Victor Emmanuel I., and Charles Felix. Charles Emmanuel (1796–1802), believing in Bonaparte's promises, was induced to enter into a confederation with France and give up the citadel of Turin to the French, which meant the end of his country's independence. Realizing his folly he abdicated on the 6th of December 1796, and retired to Sardinia,

GENEALOGICAL TABLE OF THE HOUSE OF SAVOY.


Humbert the Whitehanded (Umberto Biancamano) (d. after 1056).
Amadeus I. (d. c. 1056).
Oddone or Otto = Adelaide, heiress of Turin (d. 1091).
Peter I. (d. 1078).
Amadeus II. (d. 1080).
Bertha = Emperor Henry IV.
Humbert II. the Fat (d. 1103).
Amadeus III. (d. 1148 or 1149).
Alice or Adelaide = Louis VI. of France.
Humbert III. the Saint (d. 1189).
Thomas I. (d. 1222).
Amadeus IV (d. 1253).
Boniface (d. 1263).
Peter II., earl of Richmond (d. 1268).
Philip I. (d. 1285).
Thomas II., count of Piedmont (d. 1259).
Boniface, archbishop of Canterbury (d. 1270).
Louis I. of Vaud (d. 1302).
Amadeus V. the Great (d. 1323).
Thomas III. (d. 1282).
Edward the Liberal (d. 1329).
Aimone the Peaceful (d. 1343).
Anne = the eastern emperor, Andronicus III.
Philip, prince of Achaea (d. 1334).
Amadeus VI. (d. 1383).
James (d. 1367).
Amadeus VII. (d 1391).
Amadeus (d. 1402).
Louis (d. 1418).
Amadeus VIII., first duke of Savoy, afterwards Pope Felix V. (d. 1451).
Louis (d. 1465).
Philip, count of Geneva (d. 1444).
Amadeus IX. (d. 1472).
Philip II. (d. 1497).
Louis, king of Cyprus (d. 1482).
Philibert I. (d. 1482).
Charles I. (d. 1490).
Charles II. (d. 1496).
Philibert II. (d. 1504).
Charles III. (d. 1553).
Emmanuel Philibert (d. 1580).
Philip, founder of the house of Nemours (d. 1533).
Louise = Charles, count of Angoulême
Francis I. of France.
Charles Emmanuel I. (d. 1630).
Victor Amadeus I. = Christina, daughter of Henry IV. of France (d. 1637).
Thomas Francis, prince of Carignano (d. 1656).
Francis Hyacinth (d. 1638).
Charles Emmanuel II. (d. 1675).
Victor Amadeus II. (d. 1732). King of Sardinia, 1720; abdicated 1730 = Anne of Orleans, granddaughter of Charles I. of England.
Charles Emmanuel III. (d. 1773).
Victor Amadeus III. (d. 1796).
Emmanuel Philibert (d. 1709).
Victor Amadeus (d. 1741).
Louis Victor (d. 1778).
Victor Amadeus (d. 1780).
Charles Emmanuel (d. 1800).
Charles Albert (d. 1849). King of Sardinia; abdicated 1849.
Eugene Maurice, count of Soissons (d. 1673).
Eugene, the famous general (d. 1736).
Charles Emmanuel IV. (d. 1819); abdicated 1802.
Victor Emmanuel I. (d. 1824); abdicated 1821.
Charles Felix (d. 1831).
Victor Emmanuel II. (d. 1878), King of Italy, 1861.
Ferdinand, duke of Genoa (d. 1855).
Humbert (d. 1900), king of Italy = Margherita of Savoy-Genoa.
Amadeus (d. 1890), duke of Aosta. King of Spain, 1870-73.
Clothilde = Prince Napoleon (d. 1891).
Maria Pia (b. 1847) = Louis, king of Portugal.
Margherita = Humbert, king of Italy.
Thomas duke of Genoa (b. 1854).
Victor Emmanuel III., king of Italy (b. 1869) = Elena Montenegro (b. 1873).
Emmanuel Philibert, duke of Aosta (b. 1869).
Victor Emmanuel, count of Turin (b. 1870).
Louis Amadeus, duke of Abruzzi (b. 1873).
Humbert, count of Salemi (b. 1889).
Yolanda Margherita (b. 1901).
Mafalda (b. 1902).
Humbert, prince of Piedmont, heir to the throne (b. 1904).
Giovanna (b. 1907).
Amadeus, duke of Puglia (b. 1898).
Aimone, duke of Spoleto (b. 1900).
Ferdinand, prince of Udine (b. 1884).
Philibert, duke of Pistoia (b. 1895)
Maria Bona Margherita (b. 1896).
Adalbert, duke of Bergamo (b. 1898).
Eugene (b. 1906).

The Restoration.

while the French occupied the whole of Piedmont. After the defeat of the French by the Austro-Russian armies during Bonaparte's absence in Egypt, Charles Emmanuel landed at Leghorn, hoping to regain his kingdom; but Napoleon returned, and by his brilliant victory at Marengo he reaffirmed his position in Italy. The king retired to Naples, abdicated once more (1802), and entered the Society of Jesus; he died in Rome in 1819. Victor Emmanuel I. (1802–1820) remained in Sardinia until by the Final Act of the Congress of Vienna (June 9, 1815) his dominions were restored to him, with the addition of Genoa.

Humbert. ***Victor Emmanuel III.***

From this time the fortunes of the house of Savoy are bound up with those of Italy (see Italy, *History*). Victor Emmanuel I. abdicated in 1821 in favour of his brother Charles Felix (1821–1831). The latter being without a son, the succession devolved upon Charles Albert, of the cadet line of the princes of Carignano, who were descended from Thomas, youngest son of Charles Emmanuel I. Charles Albert abdicated, on the evening of his defeat at Novara (April 20, 1849), in favour of his son Victor Emmanuel II. (1849–1878), who on the 18th of February 1861 was proclaimed king of Italy. Victor Emmanuel had married in 1842 Maria Adelaide, daughter of the archduke Rainer, who bore him several children, viz. Princess Clothilde (b. 1843), who married Prince Napoleon; Humbert, prince of Piedmont (1844); Amadeus, duke of Aosta (b. 1845); Oddone, duke of Montferrat (b. 1846); and Princess Maria Pia (b. 1847). Humbert, who in 1868 had married Princess Margherita of Savoy, daughter of Victor Emmanuel's brother, the duke of Genoa, became king of Italy on his father's death in 1878. In July 1900 he was assassinated by an anarchist at Monza. He was succeeded by his only son, Victor Emmanuel III., born in 1869, who during his father's lifetime had borne the title of prince of Naples. The new king had married Princess Elena of Montenegro in 1896, by whom he has had four children, viz. Princess Yolanda Margherita (b. 1901), Princess Mafalda (b. 1902), Humbert, prince of Piedmont (b. 1904), and Princess Giovanna (b. 1907).

The second son of Victor Emmanuel II., Amadeus, duke of Aosta, was offered the crown of Spain by the Cortes in 1870, which he accepted, but, finding that his rule was not popular, he voluntarily abdicated in 1873 rather than cause civil war. In 1867 he married Princess Maria Vittoria dal Pozzo della Cisterna, who bore him three sons, viz. Emmanuel Philibert, duke of Aosta (b. 1869), commanding an Italian army corps; Victor Emmanuel, count of Turin; and Louis Amadeus, duke of Abruzzi, an Italian naval officer and a distinguished traveller, explorer and man of science. Amadeus's first wife having died in 1876, he married Princess Maria Letizia Bonaparte in 1888, who bore him a son, Humbert, count of Salemi (b. in 1889).

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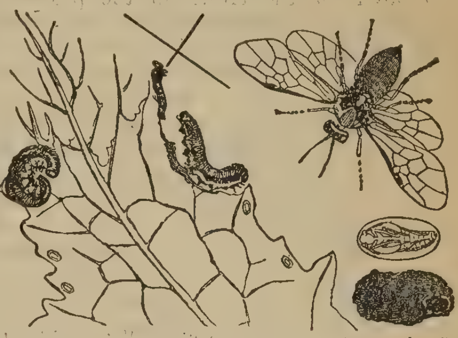
SAW, a tool for cutting wood or other material, consisting of a blade with the edge dentated or toothed and worked either by hand or by steam, water, electric or other power (see Tools). The word in O. Eng. is *saga* and appears, in such forms as Dutch *zaag*, Dan. *sav*, Ger. *Säge*, in Teutonic languages. The root is *sag-*, to cut, which is seen in Lat. *secare*. It is also the base of such English words as scythe, sickle, &c. It must be distinguished from "saw," a maxim, proverb, which is etymologically and in meaning a "saying," from the Teutonic base *sag-*, to say; cf. "Saga," Ger. *sagen*.

SAWANTWARI, or Savantvadi, a native state of Bombay, India. Area, 925 sq. m. Pop. (1901) 217,732, showing an increase of 13% during the preceding decade. The surface is broken and rugged, interspersed with densely-wooded hills; in the valleys are gardens and groves of cocoa-nut and betel-nut palms. Sawantwari has no considerable rivers; the chief streams are the Karli on the north and the Terakhol on the south, both navigable for small craft. The climate is humid and relaxing, with an average annual rainfall of 150 in. The estimated revenue is £28,000. The chief, whose title is sar desai, is a Mahratta of the Bhonsla family, who traces back his descent to the 16th century. There are special manufactures of ornaments carved out of bison-horn, painted and inlaid lacquer-work, and gold and silver embroidery. The town of Sawantwari, or Vadi, is picturesquely situated on the bank of a large lake, 17 m. E. of the seaport of Vengurla. Pop. (1901) 10,213.

Before the establishment of Portuguese power Sawantwari was the highway of a great traffic between the coast and the interior; but during the 16th and 17th centuries trade suffered much from the rivalry of the Portuguese, and in the disturbances of the 18th century it almost entirely disappeared. In consequence of piracy, the whole coast-line (including the port of Vengurla) was ceded to the British in 1812.

SAW-FLY, the name given to the members of a well-known subdivision (Symphyta) of the Hymenoptera characterized by possessing a sessile abdomen which hides the base of the posterior legs. The antennae vary in their structure and in the number of their joints. Two of the processes of the ovipositor are modified to form saws, which when at rest lie in a sheath formed of two other processes which are modified into protective structures or valves. The larvae are usually caterpillars, but may be distinguished from the caterpillars of Lepidoptera (moths and butterflies) by the greater number of their abdominal pro-legs; usually 6 to 8 pairs are present. When alarmed they roll themselves up in a spiral fashion; some also discharge a thin fluid from lateral pores situated above the spiracles. The females place their eggs in small incisions made by means of their saws in the soft parts of leaves. Usually one egg is placed in each slit. Some species merely attach their eggs in strings to the exterior of the leaves. With each incision a drop of fluid is usually excreted, which serves to excite a flow of sap to the wounded part. The egg is said to absorb this sap, and so to increase in size. One genus (*Nematus*) alone forms galls. These occur in the young leaves of the willow, a tree which the true gall-flies do not attack. *Nematus ventricosus* resembles the bees and wasps in the fact that the parthenogenetic ova produce only males; as a rule in the animal kingdom the absence of fertilization results in the production of females.



Turnip Saw-Fly (*Athalia spinarum*). Saw-Fly (magnified, with lines to left showing natural size), caterpillars, pupa and pupa-case.

The injury which the saw-flies inflict upon crops or young trees is almost entirely brought about by the voracious habits of the larvae. These possess well-developed mouth-appendages, by means of which they gnaw their way out of the leaf in which they have been hatched, and then eat it. In this way the turnip saw-fly (*Athalia spinarum*), not to be confused with the turnip "fly," a beetle (*Phyllotreta nemorum*), attacks the leaves of the turnip, often completely consuming the leafage of acres at a time. The pine saw-fly (*Lophyrus pini*) causes great damage to plantations of young Scotch firs, devouring the buds, the leaves and even the bark of the young shoots. Other species infest currant and gooseberry bushes, consuming the soft parts of the leaves, and leaving only the tough veins. The only remedy in most cases is to collect and kill the larvae when they first appear, or to spray the plants with some arsenical wash. The best known family of saw-flies is that of the *Tenthredinidae*, most of whose caterpillars feed on leaves. The larvae of other families—the *Cephidae* and *Siricidae*—are internal feeders, burrowing in succulent or woody stems, and their limbs are in an extremely reduced condition.

SAWTREY, WILLIAM (d. 1401), English Lollard, was a priest at Lynn who was summoned before the bishop of Norwich for heresy in 1399. He does not appear at this time to have been seriously punished, and at the beginning of 1401 he is found in London, where his preaching again attracted the notice of the ecclesiastical authorities. The statute *De haeretico comburendo* had just been introduced for the purpose of stamping out heresy, but it had not become law when Sawtrey was summoned to St Paul's and was charged with denying transubstantiation, with refusing to adore the cross except as a symbol, and with six other heresies. He defended himself ably against Archbishop Thomas Arundel, but in February he was condemned and was degraded from the priesthood. Being the first Lollard to be put to death he was burned at St Paul's Cross in March 1401.

SAWYER, SIR ROBERT (1633–1692), English lawyer, a younger son of Sir Edmund Sawyer, auditor of the city of London, was educated at Magdalene College, Cambridge, where he distinguished himself in classical learning, being the first Craven Scholar in 1648. He acquired a good practice at the bar, and in 1673 he was elected to the House of Commons, where for a short time in 1678 he was speaker. He inclined to the side of the court in politics, but was a strong opponent of concession to the Roman Catholics, and was one of the draftsmen of the Exclusion Bill. About the same time he began to appear as counsel in important state trials; he prosecuted Sir George Wakeman and others accused of complicity in the Popish plot in 1679; in 1681, having been in that year appointed attorney-general, he appeared for the crown in the prosecutions of Stephen College and Lord Shaftesbury; in the following year in the proceedings against the charter of the city of London; and in 1683 against Lord Russell and Algernon Sidney for complicity in the Rye House plot; and he conducted the case against Titus Oates for perjury in 1685. Although James II. retained him as attorney-general, he proved himself by no means a complacent instrument of the royal prerogative; he advised the king against the legality of the dispensing power, and objected to signing the patents appointing Roman Catholics to office from which they were excluded by law. He was dismissed from the attorney-generalship in 1687, and in the following year he appeared as leading counsel for the defence of the seven bishops, whose acquittal he secured. On the flight of James II., Sawyer maintained that the throne had thereby been abdicated, and took a prominent part in the debates on the constitutional questions then brought to the front. Owing to an attack upon him in 1690 in relation to his conduct in the case of Sir Thomas Armstrong in 1684, Sawyer was expelled from the House of Commons, but was returned again for Cambridge University shortly afterwards. He died on the 30th of July 1692. Sawyer's only daughter married Thomas Herbert, 8th earl of Pembroke.

See *State Trials*, vols. vii.-xii.; Laurence Eachard, *History of England* (3 vols., London, 1707–1718), especially for Sawyer's defence of the seven bishops; Narcissus Luttrell, *Brief Relation of State Affairs, 1678–1714* (Oxford, 1857); Gilbert Burnet, *History of His Own Times* (6 vols., Oxford, 1833); and the *Histories of England* by Hallam and Lord Macaulay.

SAX, ANTOINE JOSEPH, known as ADOLPHE (1814–1894), maker of musical instruments, was born at Dinant in Belgium on the 6th of November 1814 and died in Paris in 1894. In 1835 he perfected a bass clarinet superior to any that had preceded it. He came to Paris in 1842 and succeeded in interesting many eminent men, including Berlioz and Halévy. He set up a workshop in the Rue St Georges and studied acoustics, discovering a new principle in the manufacture of wind instruments, viz. that it is the proportions given to a column of air vibrating in a sonorous tube, and these alone, that determine the character of the timbre produced: the material of the walls of the tube is not of the slightest importance so long as it offers enough resistance. Together with his genius for mechanical invention Sax seems to have combined a knowledge of self-advertisement, and his name was often prefixed to successful types of instrument for the invention of which he was not primarily responsible. In 1845 he patented his saxhorn and a family of cylinder instruments called saxotrombas. On the 22nd of June 1846 he registered the saxophone. He also effected various improvements in piston instruments, of which the most important was the substitution of a single ascending piston for a number of descending ones.

See J. P. O. Cornettant, *Histoire d'un inventeur* (1860); C. Pilard, *Les Inventions Sax* (1869).

SAXE, JOHN GODFREY (1816–1887), American poet, was born at Highgate, Vermont, on the 2nd of June 1816. He graduated at Middlebury College in 1839, and was admitted to the bar at St Albans, Vermont, in 1843. From 1850 to 1856 he edited the Burlington (Vermont) *Sentinel*, in 1859 and in 1860 was the candidate of the Democratic party for governor of Vermont, in 1860 removed to New York, and after 1872 edited the *Evening Journal* at Albany, New York, where he died on the 31st of March 1887. He was best known as a writer of humorous verse and a lecturer. His travesties and satires found many readers or listeners, and some of his love lyrics and other poems combine sparkle with real feeling. His "Rhyme of the Rail," "The Proud Miss McBride," "I'm Growing Old" and "Treasures in Heaven" were once very popular. Among his published collections are *Humorous and Satirical Poems* (1850), *The Times, The Telegraph, and other Poems* (1865), and *Leisure Day Rhymes* (1875).

SAXE, MAURICE, COMTE DE (1696–1750), marshal of France, was the natural son of Augustus II. of Saxony and the countess Aurora Königsmark, and was born at Goslar on the 28th of October 1696. In 1698 the countess sent him to Warsaw to his father, who had been elected king of Poland in the previous year, but on account of the unsettled condition of the country the greater part of his youth was spent outside its limits. This separation from his father made him independent of control and had an important effect on his future career. At the age of twelve he was present, with the army of Eugène, at the sieges of Tournay and Mons and the battle of Malplaquet, but the achievements ascribed to him in this campaign are chiefly fabulous. A proposal to send him at the close of it to a Jesuit college at Brussels was relinquished on account of the protests of his mother; and, returning to the camp of the allies in the beginning of 1710, he displayed a courage so impetuous as to call forth from Eugène the friendly admonition not to confound rashness with valour. He next served under Peter the Great against the Swedes. After receiving in 1711 formal recognition from his father, with the rank of count, he accompanied him to Pomerania, and in 1712 he took part in the siege of Stralsund. In manhood he bore a strong resemblance to his father, both in person and character. His grasp was so powerful that he could bend a horse-shoe with his hand, and to the last his energy and endurance were scarcely subdued by the illnesses resulting from his many excesses. In 1714 a marriage was arranged between him and one of the richest of his father's subjects, Johanna Victoria, Countess von Loeben, but he dissipated her fortune so rapidly that he was soon heavily in debt, and, having given her more serious grounds of complaint against him, he consented to an annulment of the marriage in 1721. Meantime, after serving in a campaign against the Turks in 1717, he had in 1719 gone to Paris to study mathematics, and in 1720 obtained a commission as *maréchal de camp*. In 1725 negotiations were entered into for his election as duke of Courland, at the instance of the duchess Anna Ivanovna, who offered him her hand. He was chosen duke in 1726, but declining marriage with the duchess found it impossible to resist her opposition to his claims, although, with the assistance of £30,000 lent him by the French actress Adrienne Lecouvreur, whose story forms the subject of Scribe and Legouvé's tragedy, he raised a force by which he maintained his authority till 1727, when he withdrew and took up his residence in Paris. On the outbreak of the war in 1734 he served under Marshal Berwick, and for a brilliant exploit at the siege at Philippsburg he was in August named lieutenant-general. On the opening of the Austrian Succession War in 1741, he took command of a division of the army sent to invade Austria, and on the 19th November surprised Prague during the night, and took it by assault before the garrison were aware of the presence of an enemy, a *coup de main* which made him famous throughout Europe. After capturing the strong fortress of Eger on the 19th April 1742, he received leave of absence, and went to Russia to push his claims on the duchy of Courland, but obtaining no success he returned to his command. His exploits had been the sole redeeming feature in an unsuccessful campaign, and on 26th March 1743 his merits were recognized by his promotion to be marshal of France. From this time he became one of the first generals of the age. In 1744 he was chosen to command the expedition to England in behalf of the Pretender, which assembled at Dunkirk but did not proceed farther. After its abortive issue he received an independent command in the Netherlands, and by dexterous manœuvring succeeded in continually harassing the superior forces of the enemy without risking a decisive battle. In the following year he besieged Tournai and inflicted a severe defeat on the relieving army of the duke of Cumberland at Fontenoy (*q.v.*), a battle of which the issue was due entirely to his constancy and cool leadership. During the battle he was unable on account of dropsy to sit on horseback except for a few minutes, and was carried about in a wicker chariot. In recognition of his brilliant achievement the king conferred on him the castle of Chambord for life, and in April 1746 he was naturalized as a French subject. Thenceforward to the end of the war he continued to command in the Netherlands, always with success. Besides Fontenoy he added Rocoux (1746) and Lawfeldt or Val (1747) to the list of French victories, and it was under his orders that Marshal Löwendahl captured Bergen-op-Zoom. He himself won the last success of the war in capturing Maestricht in 1748. In 1747 the title formerly held by Turenne, "Marshal general of the King's camps and armies," was revived for him. But on the 30th of November 1750 he died at Chambord "of a putrid fever." In 1748 there had been born to him a daughter, one of several illegitimate children, whose great-granddaughter was George Sand.

Saxe was the author of a remarkable work on the art of war, *Mes Réveries*, which though described by Carlyle as "a strange military farrago, dictated, as I should think, under opium," is in fact a classic. It was published posthumously in 1757 (ed. Paris, 1877). His *Lettres et mémoires choisis* appeared in 1794. His letters to his sister, the princess of Holstein, preserved at Strassburg, were destroyed by the bombardment of that place in 1870; thirty copies had, however, been printed from the original. Many previous errors in former biographies were corrected and additional information supplied in Carl von Weber's *Moritz, Graf von Sachsen, Marschall von Frankreich, nach archivalischen Quellen* (Leipzig, 1863), in St René Taillandier's *Maurice de Saxe, étude historique d'après les documents des archives de Dresde* (1865) and in C. F. Vitzthum's *Maurice de Saxe* (Leipzig, 1861). See also the military histories of the period, especially Carlyle's *Frederick the Great.*

SAXE-ALTENBURG (Ger. *Sachsen-Altenburg*), a duchy in Thuringia, forming an independent member of the German Empire and consisting of two detached and almost equal parts, separated from each other by a portion of Reuss, and bounded on the S. and W. by the grand duchy of Saxe-Weimar-Eisenach, on the N. by Prussia, and on the E. by the kingdom of Saxony. There are in addition twelve small exclaves. The total area is 511 sq. m., of which 254 are in the east, or Altenburg, division, and 257 in the west, or Saal-Eisenberg, division. The eastern district, traversed by the most westerly offshoots of the Erzgebirge and watered by the Pleisse and its tributaries, forms an undulating and fertile region, containing some of the richest agricultural soil in Germany. The western district, through which the Saale flows, is rendered hilly by the foothills of the Thuringian Forest, and in some measure makes up by its fine woods for its comparatively poor soil. The mineral wealth of Saxe-Altenburg is scanty; lignite, the chief mineral, is worked mainly in the eastern district. Nearly 60% of the entire duchy is occupied by arable land, and about 26% by forests, mainly consisting of conifers. Oats, rye, wheat and potatoes are the chief crops. Cattle-raising and horse-breeding are of considerable importance. About 35% of the population are directly supported by agriculture. The manufactures of the duchy are varied, though none is of first-rate importance; woollen goods, gloves, hats, porcelain and earthenware, bricks, sewing-machines, paper, musical instruments, sausages and wooden articles are the chief products. Trade in these, and in horses, cattle and agricultural produce, is brisk. The chief seats of trade and manufacture are Altenburg the capital, Ronneburg, Schmölln, Gössnitz and Meuselwitz in the Altenburg division; and Eisenberg, Roda and Kahla in the Saal-Eisenberg division. Besides these there are the towns of Lucka, Orlamünde and Russdorf in an exclave. The duchy includes one of the most densely inhabited districts in the Thuringian states. The population in 1905 was 206,508, of whom 200,511 were Protestants and 5449 Roman Catholics. In the west division the population is wholly Teutonic, but in the east there is a strong Wendish or Slavonic element, still to be traced in the peculiar manners and costume of the country-people, though these are gradually disappearing. The Altenburg peasants are industrious and prosperous; they are said to be avaricious, but to love pleasure, and to gamble for high stakes, especially at the card game of *Skat* (*q.v.*), which many believe to have been invented here. Their holdings are rarely divided, and a common custom is the inheritance of landed property by the youngest son. They are decreasing in numbers.

Saxe-Altenburg is a limited hereditary monarchy, its constitution resting on a law of 1831, subsequently modified. The diet consists of 32 members, elected for 3 years, of whom 9 are returned by the highest taxpayers, 11 by the towns and 12 by the country districts. The franchise is enjoyed by all males over 25 years of age who pay taxes. The duke has considerable powers of initiative and veto. The executive is divided into four departments, justice, finance, the interior, and foreign and ecclesiastical affairs. The annual revenue and expenditure stand at about £230,000 each. There was a public debt in 1909 of £44,370. Saxe-Altenburg has one vote in the Reichstag and one in the Bundesrat (federal council).

History.—The district now forming the duchy of Saxe-Altenburg came into the possession of the margrave of Meissen about 1329, and later with Meissen formed part of the electorate of Saxony. On the division of the lands of the Wettins in 1485 it was assigned to the Albertine branch of the family, but in 1554 it passed by arrangement to the Ernestine branch. In 1603 Saxe-Altenburg was made into a separate duchy, but this only lasted until 1672, when the ruling family became extinct and the greater part of its lands was inherited by the duke of Saxe-Gotha. In 1825 the family ruling the duchy of Saxe-Gotha-Altenburg became extinct and another division of the Saxon lands was made. Frederick (d. 1834) exchanged the duchy of Saxe-Hildburghausen, which he had ruled since 1780, for Saxe-Altenburg, and was the founder of the present reigning house. In answer to popular demands a constitution was granted to Saxe-Altenburg in 1831, and greater concessions were extorted by the more threatening disturbances of 1848. In November of this year Duke Joseph abdicated and was succeeded by his brother George. Under George's son Ernest (1826–1908), who became duke in 1853, a period of reaction began and the result was that the constitution was made less liberal. In 1874 a long dispute over the public domains was settled, two-thirds of these being assigned to the duke in lieu of a civil list. In 1908 Ernest was succeeded by his nephew Ernest (b. 1871).

See Frommelt, *Sachsen-altenburghische Landeskunde* (Leipzig, 1838–1841); L. von Braun, *Erinnerungsblätter aus der Geschichte Altenburgs 1525–1826* (Altenburg, 1876); Mälzer, *Die Landwirtschaft im Herzogtum Altenburg* (Stuttgart, 1907); Albrecht, *Das Domänenwesen im Herzogtum Saxe-Altenburg* (Jena, 1905); and E. Löhe, *Altenburgica* (Altenburg, 1878).

SAXE-COBURG-GOTHA (Ger. *Sachsen-Koburg-Gotha*), a sovereign duchy of Germany, in Thuringia, and a constituent member of the German empire, consisting of the two formerly separate duchies of Coburg and Gotha, which lie at a distance of 14 m. from each other, and of eight small scattered exclaves, the most northerly of which is 70 m. from the most southerly. The total area is 764 sq. m., of which about 224 are in Coburg and 540 in Gotha. The duchy of Coburg is bounded on the S.E., S., and S.W. by Bavaria, and on the other sides by Saxe-

Meiningen, which, with part of Prussia, separates it from Gotha. The considerable exclave of Königsberg in Bavaria, 10 m. south, belongs to Coburg. Lying on the south slope of the Thuringian Forest, and in the Franconian plain, the duchy of Coburg is an undulating and fertile district, reaching its highest point in the Senichshöhe (1716 ft.) near Mirsdorf. Its streams, the chief of which are the Itz, Biberach, Steinach and Rodach, all find their way into the Main. The duchy of Gotha, more than twice the size of Coburg, stretches from the south borders of Prussia along the northern slopes of the Thuringian Forest, the highest summits of which (Der grosse Beerberg, 3225 ft.; Schneekopf, 3179 ft.; and Inselsberg, 2957 ft.) rise within its borders. The more open and level district on the north is spoken of as the "open country" (*das Land*) in contrast to the wooded hills of the "forest" (*der Wald*). The Gera, Hörsel, Unstrut and other streams of this duchy flow to the Werra, or to the Saale. The climate is that of the other central states of Germany, temperate in the valleys and plains and somewhat inclement in the hilly regions.

Industries and Population.—In both duchies the chief industry is agriculture, which employs about 30% of the entire population. According to the returns for 1905, about 50% of the area was occupied by arable land, 10% by meadow-land and pasture and 30% by forest. In the same year the chief crops were oats, barley, rye, wheat, potatoes and hay. A small quantity of hemp and flax is raised, but a considerable quantity of fruit and vegetables is annually produced, and some wine, in the Coburg district of Königsberg. Cattle-breeding is important, especially in Gotha and the Itz valley in Coburg. Beehives are numerous and produce excellent honey, and poultry is reared in large numbers for export. The mineral wealth of Saxe-Coburg-Gotha is insignificant, small quantities of coal, lignite, ironstone and millstone being annually raised. There are also salt-works, and some deposits of potter's clay.

The manufactures of the duchies, especially in the mountainous parts less favourable for agriculture, are tolerably brisk, but there is no large industrial centre in the country. Iron goods and machinery, glass, earthenware, chemicals and wooden articles, including large quantities of toys, are produced; and various branches of textile industry are carried on. Coburg (pop. 1905, 24,289) and Gotha (36,893) are the chief towns of the duchies, to which they respectively give name; the latter is the capital of the united duchy. There are nine other small towns, and 320 villages and hamlets. Friedrichroda and Ruhla, the Inselsberg and the Schneekopf and other picturesque points, annually attract an increasing number of summer visitors and tourists. The population in 1905 was 242,432 (117,224 males and 125,208 females), or about 290 to the square mile. Of these 71,512 were in Coburg and 170,920 in Gotha; the relative density in either duchy being about equal. In Coburg the people belong to the Franconian and in Gotha to the Thuringian branch of the Teutonic family, and, according to religious confessions, almost the entire population is Lutheran, Roman Catholics only numbering some 3000 and Jews about 700.

Constitution and Administration.—Saxe-Coburg-Gotha is a limited hereditary monarchy, its constitution resting on a law of 1852, modified in 1874. For its own immediate affairs each duchy has a separate diet, but in more important and general matters a common diet, formed of the members of the separate diets and meeting at Coburg and Gotha alternately, exercises authority. The members are elected for four years. The Coburg diet consists of eleven members and the Gotha diet of nineteen. The franchise is extended to all male taxpayers of twenty-five years of age and upwards. The ministry has special departments for each duchy, but is under a common president. There is a sub-department for the control of ecclesiastical affairs, which are locally managed by ephories, twelve in number. The united duchy is represented in the imperial Bundesrat by one member and in the Reichstag by two members, one for each duchy. By treaty with Prussia in 1867 the troops of the duchy are incorporated with the Prussian army. The budget is voted in either duchy for four years, a distinction being made between domain revenue and state revenue. Taking both together the receipts into the exchequer on behalf of Coburg were estimated for 1909–1910 at about £100,000 and those for Gotha at about £200,000, while the common state expenditure amounted to about the same sum. The civil list of the reigning duke is fixed at £15,000 a year, in addition to half the proceeds of the Gotha domains, after £5000 has been deducted and paid into the state exchequer, and half the net revenue of the Coburg domains. Besides the civil list the duke of Saxe-Coburg-Gotha enjoys a very large private fortune, amassed chiefly by Ernest I., who sold the principality of Lichtenberg, which the congress of Vienna had bestowed upon him in recognition of his services in 1813, to Prussia for a large sum of money.

History.—The district of Coburg came into the possession of the family of Wettin in the 14th century, and after the Wettins had become electors of Saxony this part of their lands fell at the partition of 1485 to the Ernestine branch of the house. In 1572 Gotha was given to John Casimir, a son of the Saxon duke John Frederick, but when he died childless in 1633 it passed to another branch of the family. In 1680, as Saxe-Coburg, it was formed into a separate duchy for Albert, one of the seven sons of Ernest I., duke of Saxe-Gotha (d. 1675), but he died childless in 1699, when his possessions were the subject of vehement contentions among the collateral branches of the Saxon house. Eventually it was assigned to Albert's youngest brother, John Ernest (d. 1729), who called himself duke of Saxe-Coburg-Saalfeld, and who left two sons, Christian Ernest and Francis Josiah, who ruled the land together, the principle of primogeniture being introduced by the survivor of the two, Francis Josiah. Under this duke and his son and successor, Ernest Frederick, the land was plunged into bankruptcy and a commission was appointed to manage its finances. The measures adopted to redeem the country's credit were successful, but they imposed much hardship on the people and a rising took place which was only quelled by the aid of troops from electoral Saxony. Duke Francis died in December 1806 and was succeeded by his son Ernest, although the country was occupied by the French from 1807 to 1816.

Also an early possession of the Wettins, Gotha fell at the partition of 1485 to the Albertine branch of the family, but was transferred to the Ernestine branch by the capitulation of Wittenberg of 1547. In 1554 it became a separate duchy, its line of rulers being founded by Duke John Frederick, a son of the dispossessed elector of Saxony, John Frederick, and becoming extinct in 1638. In 1640 Saxe-Gotha came into the possession of Ernest the Pious, and after his death in 1675 its duke was his eldest son Frederick (d. 1691), whose family, having inherited Altenburg, became extinct in February 1825 with the death of Duke Frederick IV. This event was followed in 1826 by a redistribution of the Saxon lands. Ernest, duke of Saxe-Coburg-Saalfeld, exchanged Saalfeld for Gotha, took the title of duke of Saxe-Coburg-Gotha and became the founder of the present ruling house.

Ernest II. (1818–1893) succeeded to the duchy in 1844, and during his long reign various reforms were achieved and the union of the two parts of the duchy was made closer. This duke had no issue, and the succession passed to the children of his brother Albert, the English prince consort. In 1855 his second son, Prince Alfred, had been declared heir to the duchy, and he succeeded his uncle in 1893. When he died without sons in July 1900, the succession having been renounced by his brother, the duke of Connaught and his issue, Saxe-Coburg passed to Charles Edward, duke of Albany (b. 1884), a nephew of the late duke. For many years there had been trouble between the ruler and the people over the ownership of the extensive crown lands, it being evidently feared at one time that an English prince might renounce the throne and yet claim the lands. The matter was settled by a law of 1905, on the lines mentioned in the earlier section of this article.

See Fleischmann, *Zur Geschichte des Herzogtums Sachsen-Coburg* (Hildburghausen, 1880); A. Lotz, *Koburgische Landesgeschichte* (Coburg, 1892).

SAXE-MEININGEN (Ger. *Sachsen-Meiningen*), a duchy in Thuringia, forming an independent member of the German empire and consisting chiefly of an irregular crescent-shaped territory, which, with an average breadth of 10 m., stretches for over 80 m. along the south-west slope of the Thuringian Forest. The convex side rests upon the duchy of Coburg and is in part bounded by Bavaria, while the concave side, turned towards the north, contains portions of four other Thuringian states and Prussia between its horns, which are 46 m. apart. The districts of Kranichfeld, 15 m. N.W., and Kamburg, 22 m. N. of the eastern horn, together with a number of smaller scattered exclaves, comprise 74 of the 953 sq. m. belonging to the duchy. The surface on the whole is hilly and is partly occupied by offshoots of the Thuringian Forest; the highest summits are found in the eastern half, where the Kieferle reaches 2849 ft. and the Blessberg 2835 ft. The chief streams are the Werra, which traverses the south and east of the duchy, and various tributaries of the Main and the Saale, so that Saxe-Meiningen belongs to the basins of the three great rivers Weser, Rhine and Elbe.

The soil is not very productive, although agriculture flourishes in the valleys and on the level ground; grain has to be imported to meet the demand. Only 41% of the total area is devoted to agriculture, while meadow-land and pasture occupy 11%. The chief grain crops are oats, rye and wheat, and the cultivation of potatoes is general. Tobacco, in the Werra district, hops and flax are also raised. The Werra valley and the other fertile valleys produce large quantities of fruit. The raising of cattle, pigs and sheep is a fairly important branch of industry throughout the duchy; horses are bred in Kamburg. The extensive and valuable forests, of which 75% consist of coniferous trees, occupy 42% of the entire area. About 42% of the forests belong to the state and about 33% to public bodies and institutions, leaving only 25% for private owners. The mineral wealth of the duchy is not inconsiderable. Iron, coal and slate are the chief products, and copper and cobalt may be added. There are salt-works at Salzungen and Neusulza, the former the most important in Thuringia; and the mineral water of Friedrichshall is well known. The manufacturing industry of Saxe-Meiningen is active, especially in the districts of Sonneberg, Gräfenthal and Saalfeld. Iron goods of various kinds, glass and pottery, school slates, pencils and marbles are produced; the abundant timber fosters the manufacture of all kinds of wooden articles, especially toys; and the textile industry and the manufacture of leather goods, papier mâché and sewing-machines are also carried on.

The capital of the duchy is Meiningen; the other principal towns are Salzungen, Hildburghausen, Eisfeld, Sonneberg, Saalfeld, Pössneck and Kamburg. In 1905 the population was 268,916, of whom 30% live in communities of more than 2000. As in the other Saxon duchies the population is almost exclusively Protestant; in 1905, 262,243 belonged to the Lutheran confession, 4845 were Roman Catholics and 1256 Jews.

Saxe-Meiningen is a limited monarchy, its constitution resting on a law of 1829, subsequently modified. The diet, elected for six years, consists of 24 members, of whom 4 are elected by the largest landowners, 4 by those who pay tax on incomes of £150 or more, and 16 by the other electors. The franchise is enjoyed by all domiciled males over twenty-five years of age who pay taxes. The government is carried on by a ministry of five, with departments for the ducal house and foreign affairs, home affairs, justice, education and public worship and finance. The revenue, £190,000 of which is drawn from the state domains, stands at about £480,000 a year. The expenditure, including a civil list of £20,000, stands at £445,000. In 1909 the state had a debt of £302,270. Saxe-Meiningen has one vote in the German federal council (Bundesrat) and sends two members to the Reichstag.

History.—The duchy of Saxe-Meiningen, or more correctly Saxe-Meiningen-Hildburghausen, was founded in 1681 by Bernard, the third son of Ernest the Pious, duke of Saxe-Gotha, and consisted originally of the western part of the present duchy, the district around Meiningen. Bernard was succeeded in 1706 by his three sons, Ernest Louis, Frederick William and Anton Ulrich, but after 1746 the only survivor was the youngest, Anton Ulrich, who reigned alone from this date until his death in 1763. By this time the duchy had increased considerably in extent, but petty wars with the other Saxon princes combined with the extravagance of the court and the desolation caused by the Seven Years' War to plunge it into distress and bankruptcy. A happier time, however, was experienced under Charlotte Amalie, Anton's widow, who ruled as regent for her sons, Charles (d. 1782) and George (d. 1806). Under the latter prince the country prospered greatly, and having introduced the principle of primogeniture, he died and was succeeded by his infant son, Bernard Ernest Freund (1800–1882), whose mother, Eleanora of Hohenlohe-Langenburg, governed in his name until 1821. The war with France at the beginning of this reign, with its attendant evils, quartering of troops, conscription and levies of money, joined with cattle disease and scanty harvests in plunging the land again into distress, from which it recovered very slowly.

In 1825 the extinction of the family ruling Saxe-Gotha made a rearrangement of the Saxon duchies necessary, and Saxe-Meiningen benefited greatly by the settlement of 1826, its area being more than doubled by the receipt of 530 sq. m. of territory. The additions consisted of the duchy of Saxe-Hildburghausen, founded in 1680 by Ernest, the sixth son of Ernest the Pious; the duchy of Saxe-Saalfeld, founded by John Ernest, the seventh son of Ernest the Pious, which had been united with Saxe-Coburg in 1735; and the districts of Themar, Kranichfeld and Kamburg. In 1823 Bernard had granted a liberal constitution to his duchy, but these additions made further changes inevitable and a new constitution was granted in 1829. Saxe-Meiningen had entered the confederation of the Rhine in 1807, but had joined the allies in 1813 and became a member of the German confederation in 1815. In 1866, unlike the other Saxon duchies, Saxe-Meiningen declared for Austria in the war with Prussia; at once the land was occupied by Prussian troops, and in September 1866 Duke Bernard abdicated and was succeeded by his son George (b. 1826), who immediately made peace with Prussia and joined the North German Confederation, his land becoming a member of the new German empire in 1871. In 1871 the dispute which had been carried on since 1831 between the duke and the diet about the rights of each to the state domains was settled by a compromise, each party receiving a share of the revenues. The heir-apparent Prince Bernard (b. 1851) has no sons, so by a law of 1896 the succession is settled upon the sons of his half-brother Prince Frederick (b. 1861).

See *Statistik des Herzogtums Sachsen-Meiningen* (Meiningen, 1892 fol.); Brückner, *Landeskunde des Herzogtums Sachsen-Meiningen* (Meiningen, 1853); Goeckel, *Das Staatsrecht des Herzogtums Sachsen-Meiningen* (Jena, 1904); Anschütz, *Industrie, Handel und Verkehr im Herzogtum Sachsen-Meiningen* (Sonneberg, 1904); and the publications of the Verein für sachsen-meiningische Geschichte und Landeskunde (Hildburghausen, 1888 fol.).

SAXE-WEIMAR-EISENACH (Ger. *Sachsen-Weimar-Eisenach*), a grand duchy of Germany and a sovereign and constituent state of the German empire. It is the largest of the Thuringian states, and consists of the three chief detached districts of Weimar, Eisenach and Neustadt, and twenty-four scattered exclaves, of which Allstedt, Oldisleben and Ilmenau belonging to Weimar, and Ostheim belonging to Eisenach, are the chief. The first and last named of these exclaves are 70 m. apart; and the most easterly of the other exclaves is 100 m. from the most westerly. The total area of the grand-duchy is 1397 sq. m., of which 678 are in Weimar, 465 in Eisenach and 254 in Neustadt. The population in 1905 was 388,095 (189,422 males and 198,673 females), on an average 271 to the square mile, of whom the greatest bulk are Lutherans, the Roman Catholics only numbering about 18,000, and Jews and those of other confessions about 1500 in all. Of the population about 47% live in towns or communes exceeding 2000 inhabitants, and about 53% are rural.

The district of Weimar, which is at once the largest division and the geographical and historical kernel of the grand-duchy, is a roughly circular territory, situated on the plateau to the north-east of the Thuringian Forest. It is bounded on the N. and E. by Prussia, and on the S. and W. by Schwarzburg and detached portions of Saxe-Altenburg, and lies 23 m. east of the nearest part of Eisenach, and 7 m. north-west of the nearest part of Neustadt. The exclaves of Allstedt and Oldisleben lie in Prussian territory 10 m. to the north and north-west respectively; Ilmenau as far to the south-west. The surface is undulating and destitute of any striking natural features, although the valleys of the Saale and Ilm are picturesque. The Kickelhahn (2825 ft.) and the Hohe Tanne (2641 ft.) rise in Ilmenau; but the Grosser Kalm (1814 ft.) near Remda, in the extreme south, is the highest point in the main part of Weimar. The Saale flows through the east of the district and is joined by the Ilm, the Elster and the Unstrut. The chief towns are Weimar, the capital, on the Ilm; Jena, with the common university of the Thuringian states, on the Saale; Apolda, the "Manchester of Weimar," to the east; and Ilmenau, lying among the hills on the edge of the Thuringian Forest to the S.W. of Weimar.

Eisenach, the second district in size, and the first in point of natural beauty, stretches in a narrow strip from north to south on the extreme western boundary of Thuringia, and includes parts of the church lands of Fulda, of Hesse and of the former countship of Henneberg. It is bounded on the N. and W. by Prussia, on the S. by Bavaria (which also surrounds the exclave of Ostheim) and on the E. by Saxe-Meiningen and Saxe-Gotha. The north is occupied by the rounded hills of the Thuringian Forest, while the Rhön mountains extend into the southern part. The chief summits of the former group, which is more remarkable for its fine forests and picturesque scenery than for its height, are the Wartburgberg (1355 ft.), the north-western termination of the system, Ottowald (2103 ft.), the Wachstein (1900 ft.) and the Ringberg (2290 ft). The chief river is the Werra, which flows across the centre of the district from east to west, and then bending suddenly northwards, re-enters from Prussia, and traverses the north-eastern parts in an irregular course. Its chief tributaries in Eisenach are the Hörsel and the Ulster. Eisenach is the only town of importance in this division of the grand-duchy.

Neustadt, the third of the larger divisions, is distinguished neither by picturesque scenery nor historical interest. It forms an oblong territory, about 24 m. long by 16 broad, and belongs rather to the hilly district of the Vogtland than to Thuringia. It is bounded on the N. by Reuss (junior line) and Saxe-Altenburg, on the W. by Saxe-Meiningen and a Prussian exclave, on the S. by the two Reuss principalities and on the E. by the kingdom of Saxony. The Kesselberg (1310 ft.), near the town of Neustadt, is the chief eminence. This district lies in the basin of the Saale, its chief streams being the White (*Weisse*) Elster, the Weida and the Orla. Neustadt, Auma and Weida are the principal towns.

Agriculture forms the chief occupation of the inhabitants in all parts of the duchy, though in Eisenach and around Ilmenau a large proportion of the area is covered with forests. According to the return for 1900 about 55% of the entire surface was occupied by arable land, 26% by forest and 9% by pasture and meadow-land. Only about 5% was unproductive soil or moorland. In 1900 the chief crops were oats, barley, rye, wheat, potatoes, hay, beet (for sugar), flax and oil-yielding plants. Fruit grows in abundance, especially around Jena, and vines are cultivated with great success on the banks of the Saale. Of the forests, about 38% are deciduous and 62% coniferous trees, and the greater part of the former belong to the government. Cattle-raising is carried on to a considerable extent, especially in Eisenach and Neustadt, while the sheep-farming centres in Weimar. Poultry is also reared in considerable quantities. Although iron, copper, coal and lignite are worked, the mineral wealth is trifling. There are salt springs at Berka and Stadtsulza.

The manufacturing industries in the grand-duchy are considerable; they employ 41% of the population. The most important is the textile industry, which centres in Apolda. The production of woollen goods (stockings, cloth, underclothing) forms the leading branch of this industry; but cotton and linen weaving and yarn-spinning are also carried on. Large quantities of earthenware and crockery are made, especially at Ilmenau. The optical instruments of Jena and the scientific instruments of Ilmenau are well known. Leather, paper, glass, cork and tobacco are among the less prominent manufactures. There are numerous breweries in the duchy. The volume of trade is not very great, although some of the productions are exported all over Europe, and in some cases to other continents as well.

Constitution.—Saxe-Weimar-Eisenach is a limited hereditary monarchy, and was the first state in Germany to receive a liberal constitution. This was granted in 1816 by Charles Augustus, the patron of Goethe, and was revised in 1850 and again in 1906. The diet consists of one chamber with thirty-eight members, of whom five are chosen by owners of land worth at least £150 a year, five by those who derive a similar income from other sources, five by the university of Jena and other public bodies, and twenty-three by the rest of the inhabitants. The deputies are elected for six years. The franchise is enjoyed by all domiciled citizens over twenty-one years of age. The government is carried on by a ministry of three, holding the portfolios of finance; of home and foreign affairs; and of religion, education and justice, with which is combined the ducal household. The duchy is represented by one vote in the Bundesrat and by two members in the Reichstag.

The Saxe-Weimar family is the oldest branch of the Ernestine line, and hence of the whole Saxon house. By a treaty with Prussia in 1867, which afterwards became the model for similar treaties between Prussia and other Thuringian states, the troops of the grand-duchy were incorporated with the Prussian army.

The budget is voted by the chamber for a period of three years. That from 1908 to 1910 estimated an annual income and an annual expenditure of about £620,000. A large income is derived from the state forests. The public debt amounted to £145,000 in 1908, but it is amply secured by real estate and invested funds. Justice is administered by two high courts (*Landesgerichte*), at Weimar and Eisenach respectively; the district of Neustadt falling under the jurisdiction of the Landesgericht at Gera; while the supreme court of appeal for the four Saxon duchies, Schwarzburg-Rudolstadt and Reuss, together with portions of Prussia, is the Oberlandesgericht at Jena.

History.—In early times Weimar with the surrounding district belonged to the counts of Orlamünde, and from the end of the 10th century until 1067 it was the seat of the counts of Weimar. In the 14th century it passed to the elector of Saxony, falling at the partition of 1485 to the Ernestine branch of the Wettin family. Although John Frederick the Magnanimous was deprived of the electorate in 1547 his sons retained Weimar; and one of them, John William (d. 1573), may be regarded as the founder of the present ruling house, but it was not until 1641 that Saxe-Weimar emerged into an independent historical position. In this year, having just inherited Coburg and Eisenach, the three brothers William, Albert and Ernest founded the three principalities of Saxe-Weimar, Saxe-Eisenach and Saxe-Gotha. Eisenach fell to Saxe-Weimar in 1644, and although the enlarged principality of Saxe-Weimar-Eisenach was temporarily split up into the lines Saxe-Weimar, Saxe-Eisenach and Saxe-Jena, it was again united under Ernest Augustus, who began to reign in 1728, and the adoption of the principle of primogeniture about this time secured it against further divisions. Ernest Augustus II., who succeeded in 1748, died in 1758, and his young widow, Anna Amelia, was appointed regent of the country and guardian of her infant son Charles Augustus. The reign of this prince, who assumed the government in 1775, is the most brilliant epoch in the history of Saxe-Weimar. An intelligent patron of literature and art, he attracted to his court the leading scholars in Germany; Goethe, Schiller and Herder were members of this illustrious band, and the little state, hitherto obscure, attracted the eyes of all Europe.[1]

The war between France and Prussia in 1806 was fraught with danger to the existence of the principality, and after the battle of Jena it was mainly the skilful conduct of the duchess Louise, the wife of Charles Augustus, that dissuaded Napoleon from removing her husband from his place as a reigning prince. In 1807 Saxe-Weimar-Eisenach entered the Confederation of the Rhine and in the subsequent campaigns it suffered greatly. The Congress of Vienna in 1815 added about 660 sq. m. to its area and gave its ruler the title of grand-duke. Just after the conclusion of peace Charles Augustus gave a liberal constitution to his land; freedom of the press was also granted, but after the festival of the Wartburg on the 18th of October 1817 this was seriously curtailed. The next grand-duke, Charles Frederick, who succeeded in 1828, continued his father's work, but his reforms were not thorough enough nor rapid enough to avert disturbances in 1848, when power was given to a popular ministry and numerous reforms were carried through. Reaction set in under Charles Alexander, who became grand-duke in 1853, and the union of the crown lands and the state lands was undone, although both remained under the same public management. In 1866 the grand-duchy joined Prussia against Austria, although its troops were then garrisoning towns in the interests of the latter power; afterwards it entered the North German Confederation and the new German empire. Charles Alexander died in January 1901 and was succeeded by his grandson William Ernest (b. 1876).

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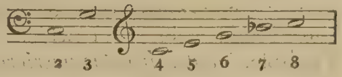
[1] See Goethe's famous lines, *Epigramme* (35):—

> "Klein ist unter den Fürsten Germaniens freilich der meine;
> Kurz und schmal ist sein Land, mässig nur, was er vermag.
> Aber so wende nach innen, so wende nach aussen die Kräfte
> Jeder; da wär' es ein Fest, Deutscher mit Deutschen zu sein."

See C. Kronfeld, *Landeskunde des Grossherzogtums Sachsen-Weimar-Eisenach* (Weimar, 1878–1879); and the official *Staatshandbuch für das Grossherzogtum Sachsen* (Weimar, 1904).

SAXHORN, the generic name of a family of brass wind instruments (not horns but valve-bugles) with cup-shaped mouthpieces, invented by Adolphe Sax and in use chiefly in French and Belgian military bands and in small wind-bands. The saxhorns came into being in 1843, when Sax applied a modification of the valve system invented in Germany in 1815 to the keyed bugle. The saxhorn consists of a conical tube of a calibre greater than that of French horn and trumpet, but smaller than that of the tubas or bombardons, and capable therefore of producing by overblowing the members of the harmonic series from the 2nd to the 8th, in common with the cornets, bugles, valve-trombones and the Wagner tubas. The saxhorns are furnished with three valves, by means of which the compass is rendered chromatic, and which act as in other valve instruments, lowering the pitch of the instrument when depressed, respectively 1 tone, a semitone and 1½ tones; and further, when used in combination, 2 tones, 2½ tones and 3 tones. The Flügelhorns, the euphonium, the bombardon and the tubas are sometimes erroneously classed as saxhorns. The difference between saxhorns and bombardons or tubas consists in the calibre of the bore, which in the latter is sufficiently wide in proportion to the length to produce the fundamental note of the harmonic series an octave below the lowest note of the saxhorns. The consequence of this structural difference is important, for whereas the tube of the tubas is theoretically of the same length as an open organ pipe of the same pitch, the saxhorns require a tube twice that length to produce the same scale. For instance, a euphonium sounding 8 ft. C only needs a tube 8 ft. long, whereas the corresponding bass saxhorn requires one 16 ft. long. In Germany these structural differences have given rise to a classification of brass wind instruments as *whole* or *half* instruments (*Ganze* or *Halbe*),[1] according to whether the whole or only the half of the length of tubing is of practical use. The members of the saxhorn family are the small saxhorn in E♭, the soprano in B♭, the alto in E♭, the tenor in B♭, the bass in B♭ (an octave lower), the low bass in E♭, the contrabass in B♭, three octaves below the soprano. All the saxhorns are treated as transposing instruments.[2] A similar family, constructed with rotary valves and conical tubes of larger calibre than the saxhorns, but having the same harmonic scale, is known in Germany as Flügelhorn. (K. S.)



SAXIFRAGACEAE, in botany, a small natural order of Dicotyledons belonging to the sub-class Polypetalae and containing 27 genera with about 350 species distributed through the Arctic and north temperate zone, often alpine. It is represented in Britain by its largest genus *Saxifrage* (*q.v.*), *Chrysosplenium* (golden saxifrage) and *Parnassia* (grass of Parnassus). The plants are herbs, generally with scattered exstipulate leaves with a broad leaf-base. The small flowers are generally arranged in cymose inflorescences and are bisexual, regular and hypogynous, perigynous or more frequently more or less epigynous, this variation in the relative position of the ovary occurring in one and the same genus *Saxifraga* (fig. 1). The flowers are 5-merous, more rarely 4-merous, having 5 (or 4) sepals, 5 (or 4) free petals, two 5- or 4-merous whorls of free stamens which are obdiplostemonous, *i.e.* those of the outer whorl are opposite to the petals, and two carpels (see fig. 2). The carpels are sometimes free, more generally united at the base, or sometimes completely joined to form a one- or two-chambered ovary with two free styles. The fruit is a many-seeded capsule.

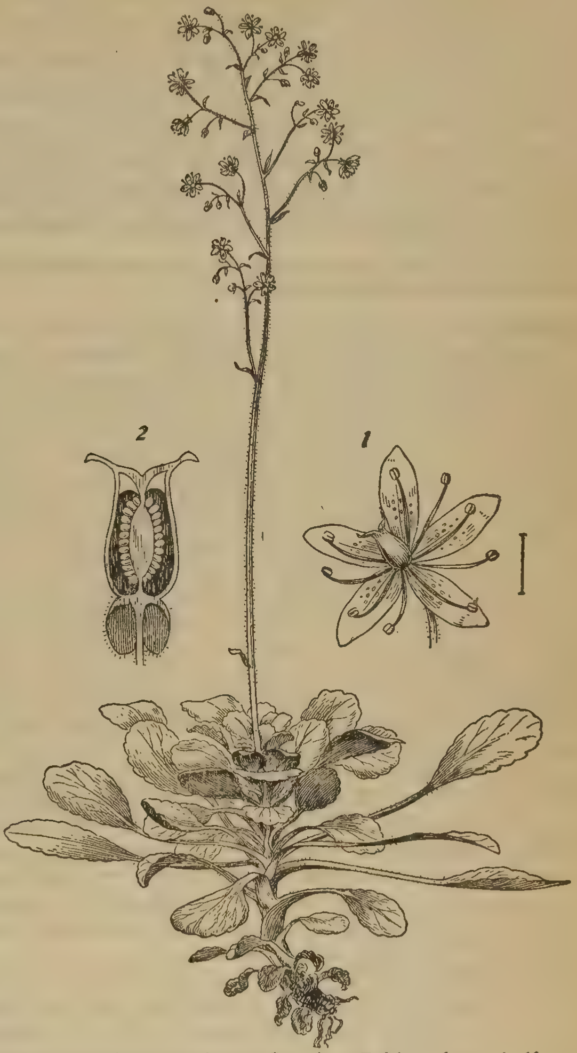


FIG. 1.—*Saxifraga umbrosa*, London Pride, about half natural size. 1, Flower enlarged. 2, Vertical section of ovary with sepals, more enlarged.

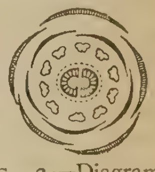


FIG. 2.—Diagram of a saxifrage (*Saxifraga tridactylites*). The calyx and corolla each consist of five parts, there are ten stamens in two series, and a pistil of two carpels.

More than half the species (200) are contained in the genus *Saxifrage* (*q.v.*). *Chrysosplenium*, with 39 species, two of which are British, has a very similar distribution. The North American genus *Heuchera* has sometimes apetalous flowers. *Astilbe* has 6 species in temperate Asia and north-eastern North America; *A. japonica* is commonly grown in the spring as a pot-plant, and often misnamed Spiraea.

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[1] See Dr Emil Schafhäutl's article on musical instruments in sect. iv. of *Bericht der Beurteilungscommission bei der allg. deutschen Industrieausstellung*, 1854 (Munich, 1855), pp. 169–170.

[2] Georges Kastner, in *Manuel général de musique militaire* (Paris, 1848), gives full information on the saxhorns, pp. 230 et seq., 246-247, and Pls. xxii. and xxiii.

The order is frequently much extended to include other groups of genera differing in habit and more or less in general conformation from those to which the order is here confined, and which are then regarded as forming one of several tribes. Among these is the order *Ribesiaceae*, comprising one single genus *Ribes*, to which belong the gooseberry (*R. Grossularia*) and currants of gardens. These are shrubs with racemes of flowers which have only one whorl of stamens (isostemonous), an inferior unilocular ovary with two parietal placentas, and fruit a berry. Another is the Hydrangeaceae, to which belong *Hydrangea* (*q.v.*), *Deutzia* and *Philadelphus*, all well-known garden plants; *P. coronarius* is the so-called Syringa or mock-orange. They are shrubs or trees with simple generally opposite leaves, 5-merous flowers with epigynous stamens and a 3- to 5-locular ovary.

Escallonia, which represents a small group of genera with leathery gland-dotted leaves, is also often included.

SAXIFRAGE (*Saxifraga*), a genus of plants which gives its name to the order of which it is a member. There are nearly 200 species distributed in the temperate and arctic parts of the northern hemisphere, frequently at considerable heights on the mountains, and also found on the Andes. They are mostly herbs with perennial rootstocks and leaves in tufts or scattered on the flower-stalks. The arrangement of the flowers is very various, as also are the size and colour of the flowers themselves. They have a flat or more or less cup-shaped receptacle, from the margin of which spring five sepals, five petals and ten (or rarely five) stamens. The pistil is often partly adherent to the receptacle, and is divided above into two styles; the ovules are numerous, attached to axile placentas; and the seed-vessel is capsular. Fifteen species are natives of Britain, some alpine plants of great beauty (*S. oppositifolia*, *S. nivalis*, *S. aizoides*, &c.), and others, like *S. granulata*, frequenting meadows and low ground, while *S. tridactylites* may be found on almost any dry wall. *S. umbrosa* is London Pride or St Patrick's Cabbage, a common garden plant, a native of the Spanish Peninsula and also of the mountains of W. and S.W. Ireland. Many species are in cultivation, including the *Bergenias* or *Megaseas* with their large fleshy leaves and copious panicles of rosy or pink flowers, the numerous alpine species, such as *S. pyramidalis*, *S. cotyledon*, &c., with tall panicles studded with white flowers, and many others, most of them adapted for rockwork.

SAXO GRAMMATICUS (*c.* 1150–*c.* 1206), Danish historian and poet, belonged to a family of warriors, his father and grandfather having served under Valdemar I., king of Denmark (d. 1182). Brought up for the clerical profession, Saxo entered the service of Archbishop Absalon about 1180, and remained in that capacity until the death of Absalon in 1201. It was at the archbishop's instigation that he began, about 1185, to write the history of the Danish Christian kings from the time of Sweyn Astridson (d. 1076), but later Absalon prevailed on him to write also the history of the earlier heathen times, and to combine both into a great work, *Gesta Danorum*, or *Historia Danica*. The archbishop died before the work was finished, and therefore the preface, written about 1208, dedicates the work to his successor Archbishop Andreas, and to King Valdemar II. Nothing else is known about Saxo's life and person; a chronicle of 1265 calls him "mirae et urbanae eloquentiae clericus"; and an epitome of his work from about 1340 describes him as "egregius grammaticus, origine Sialandicus." That he was a native of Zealand is probably correct, inasmuch as, whereas he often criticizes the Jutlanders and the Scanians, he frequently praises the Zealanders. The surname of "Grammaticus" is probably of later origin, scarcely earlier than 1500, apparently owing to a mistake. The title of "provost of Röskilde," given him in the 16th century, is also probably incorrect, the historian being confounded with an older contemporary, the provost of the same name. Saxo, from his apprenticeship as the archbishop's secretary, had acquired a brilliant but somewhat euphuistic Latin style, and wrote fine Latin verses, but otherwise he does not seem to have had any very great learning or extensive reading. His models of style were Valerius Maximus, Justin and Martianus Capella, especially the last. Occasionally he mentions Bede, Dudo of St Quentin and Paulus Diaconus, but he does not seem to have studied them or any other historical works thoroughly. His sources are partly Danish traditions and songs, partly the statements of Archbishop Absalon, partly the accounts of Icelanders and, lastly, some few earlier sources, lists of Danish kings and short chronicles, which furnished him with some reliable chronological facts. He considered traditions as history, and therefore made it his chief business to recount and arrange these, and his work is a loosely connected series of biographies of Danish kings and heroes.

The first nine books of the *Gesta Danorum* comprise traditions of kings and heroes of the half-mythical time up to about 950. Here we have traditions about Fredfrode, about Amleth (Hamlet) and Fenge, about Hrolfr Kraki, Hadding, the giant Starkather, Harald Hildetann and Ragnarr Lodbrok. In this earlier history Saxo has also embodied myths of national gods who in tradition had become Danish kings, for instance, Balder and Hother, and of foreign heroes, likewise incorporated in Danish history, as the Gothic Jarmunrik (A.S. Eormenríc), the Anglian Vermund (A.S. Gármund) and Uffe (A.S. Offa), the German Hedin and Hild, and others. Frequently the narrative is interrupted by translations of poems, which Saxo has used as authentic sources, although they are often only a few generations older than himself. In the later books (x.-xvi.) of his work he follows to a greater extent historical accounts, and the more he approaches his own time the fuller and the more trustworthy his relation becomes; especially brilliant is his treatment of the history of King Valdemar and of Absalon. But his patriotism often makes him partial to his countrymen, and his want of critical sense often blinds him to the historical truth.

Saxo's work was widely read during the middle ages, and several extracts of it were made for smaller chronicles. It was published for the first time, from a MS. afterwards lost, in Paris, 1514, by the Danish humanist Christiern Pedersen; this edition was reprinted at Basel, 1534, and at Frankfort, 1576. Of later editions may be mentioned that of Stephen Stephanius (Söro, 1644), the second volume of which contains the little-known, but valuable, *Stephanii notae uberiores in historiam Danicam Saxonis Grammatici*, and which was reproduced, though without the notes, by C. A. Klotz (Leipzig, 1771); and that of P. E. Müller completed by J. M. Velschow (Copenhagen, 1839–1858). The last complete edition is that of Alfred Holder (Strassburg, 1886), while a large part was edited by G. Waitz in the *Mon. Germ. historica*, xxix. pp. 43-161 (1892). No complete MS. any longer exists; yet of late small fragments have been found of three MSS. The most remarkable of these is the fragment found at Angers, in France, written in the later part of the 13th century. It is now in the library of Copenhagen.

There are Danish translations by A. G. Vedel (Copenhagen, 1575, and again 1851), and by F. Winkel-Horn (1896–1898). There is an English translation by O. Elton and F. Y. Powell (London, 1894).

See A. Potthast, *Bibliotheca historica medii aevi* (Berlin, 1896), where full references will be found.

SAXONS, a Teutonic people mentioned for the first time by Ptolemy about the middle of the 2nd century. At that time they are said to have inhabited the neck of the Cimbric peninsula, by which we have probably to understand the modern province of Schleswig, together with three islands lying off its western coast. We next hear of them in connexion with piratical expeditions in the North Sea about the year 286. These raids became more frequent during the 4th century, and at the beginning of the 5th century the northern coast of Gaul and the south-east coast of Britain were known as *litora Saxonica*, owing either to their liability to the attacks of the Saxons or, as some think, to the establishment of Saxon colonies there. During the same period the Saxons appear to have conquered a considerable portion of north-west Germany. According to their own traditions they landed at Hadeln in the neighbourhood of Cuxhaven and seized the surrounding districts from the Thuringians. It is clear that by the middle of the 4th century they had advanced westwards into the basin of the Yssel, from whence they drove the Frankish Salii into Batavia. In the following centuries we find them in possession of the whole of the basin of the Ems, except the coast district, while that of the Weser with all its tributaries belonged to them as far south as the Diemel, where they bordered on the Hessian Franks, the ancient Chatti. The conquest of the Boructuari who dwelt between the Lippe and the Ruhr marks the extent of their progress towards the south-west. This took place shortly before the end of the 7th century. They frequently came into conflict with the Franks and on several occasions had to submit to their supremacy, notably after their defeat by Clothaire I. in 553. No thorough conquest was, however, carried out until the time of Charlemagne, who, between the years 772 and 785, annexed the whole region as far as the Elbe, destroying in 772 the Irminsul, their great sanctuary, near Marsberg on the Diemel. Up to this time they had remained entirely heathen. In the 8th century and later we find the Saxons divided into three geographical districts known as Westfalahi (a name preserved in Westphalia), Angrarii and Ostfalahi, each of which had in several respects special customs of its own. They were ruled by a number of independent princes, but it is said that they had a national council which met annually at a place called Marklo on the Weser. At the beginning of the following century Charles also conquered the Saxons known as Nordalbingi in western Holstein, a district which had perhaps been occupied by a southward movement from the original home of the tribe.

It is doubtful how far the Saxons who invaded Britain were really distinct from the Angli, for all their affinities both in language and custom are with the latter and not with the Saxons (Old Saxons) of the continent. During the 5th century we hear also of Saxon settlements on the coasts of Gaul. The most important were those at the mouth of the Loire founded in the time of Childeric, Clovis's father, and at Bayeux, in a district which remained in their possession until towards the close of the 6th century. From the 6th century onwards, however, we hear practically nothing of the Saxons as a seafaring people. Almost all the southern coast of the North Sea had now come into the possession of the Frisians, and one can hardly help concluding that most of the maritime Saxons had either voluntarily or by conquest become incorporated in that kingdom.

See Ptolemy ii. 11; Eutropius ix. 21; Zosimus iii. 6; Ammianus Marcellinus xxvi. 4. 5, xxvii. 8. 5, xxviii. 2. 12, 7. 8, xxx. 5. 1 and 4; *Notitia dignitatum*; Gregory of Tours, *Historia Francorum*, ii. 19, iv. 10. 14, v. 27, x. 9; Bede, *Hist. Eccl.* v. 10 ff.; *Annales Einhardi*; *Translatio S. Alexandri*; Hucbald, *Vita S. Lebuini*; Widukind, *Res Gestae Saxonicae*, i. 1 ff. (F. G. M. B.)

SAXONY, a kingdom of Germany, ranking among the constituent states of the empire, fifth in area, third in population and first in density of population, bounded on the S. by Bohemia, on the W. by Bavaria and the Thuringian states and on the W., N. and E. by Prussia. Its frontiers have a circuit of 760 m. and, with the exception of the two small exclaves of Ziegelheim in Saxe-Altenburg and Liebschwitz on the border of the principality of Reuss, it forms a compact whole of a triangular shape, its base extending from N.E. to S.W., and its apex pointing N.W. Its greatest length is 130 m.; its greatest breadth 93 m., and the total area is 5787 sq. m. Except in the south, towards Bohemia, where the Erzgebirge forms at once the limit of the kingdom and of the empire, the boundaries are entirely political.

Physical Features.—Saxony belongs almost entirely to the central mountain region of Germany, only the districts along the north border and around Leipzig descending into the great north-European plain. The average elevation of the country, however, is not great, and it is more properly described as hilly than as mountainous. The chief mountain range is the Erzgebirge, stretching for 90 m. along the south border, and reaching in the Fichtelbergs (3979 ft. and 3953 ft.) the highest elevation in the kingdom. The west and south-west half of Saxony is more or less occupied by the ramifications and subsidiary groups of this range, one of which is known from its position as the Central Saxon chain, and another lower group still farther north as the Oschatz group. The south-east angle of Saxony is occupied by the mountains of Upper Lusatia (highest summit 2600 ft.), which form the link between the Erzgebirge and Riesengebirge in the great Sudetic chain. North-west from this group, and along both banks of the Elbe, which divides it from the Erzgebirge, extends the picturesque mountain region known as the Saxon Switzerland. The action of water and ice upon the soft sandstone of which the hills here are chiefly composed has produced deep gorges and isolated fantastic peaks, which, however, though both beautiful and interesting, by no means recall the characteristics of Swiss scenery. The highest summit attains a height of 1830 ft.; but the more interesting peaks, as the Lilienstein, Königstein and the Bastei, are lower. With the trifling exception of the south-east of Bautzen, which sends its waters by the Neisse to the Oder, Saxony lies wholly in the basin of the Elbe, which has a navigable course of 72 m. from south-east to north-west through the kingdom. Comparatively few of the numerous smaller streams of Saxony flow directly to the Elbe, and the larger tributaries only join it beyond the Saxon borders. The Mulde, formed of two branches, is the second river of Saxony; others are the Black Elster, the White Elster, the Pleisse and the Spree. There are no lakes of any size, but mineral springs are very abundant. The best known is at Bad Elster in the Vogtland.

Climate.—The climate of Saxony is generally healthy. It is mildest in the valleys of the Elbe, Mulde and Pleisse and severest in the Erzgebirge, where the district near Johanngeorgenstadt is known as Saxon Siberia. The average temperature, like that of central Germany as a whole, varies from 48° to 50° Fahr.; in the Elbe valley the mean in summer is from 62° to 64° and in the winter about 30°; in the Erzgebirge the mean temperature in summer is from 55° to 57°, and in winter 23° to 24°. The Erzgebirge is also the rainiest district, 27½ to 33½ in. falling yearly; the amount decreases as one proceeds northward, and Leipzig, with an average annual rainfall of 17 in., enjoys the driest climate.

Population.—In 1905 the population of Saxony was 4,508,601, or 7·4% of the total population of the German empire, on 2·7% of its area. Except the free towns, Saxony is the most densely peopled member of the empire, and its population is increasing at a more rapid rate than is the case in any of the larger German states. The growth of the population since 1815, when the kingdom received its present limits, has been as follows: (1815) 1,178,802; (1830) 1,402,066; (1840) 1,706,275; (1864) 2,344,094; (1875) 2,760,586; (1895) 3,787,688; (1900) 4,202,216. The preponderating industrial activity of the kingdom fosters the tendency of the population to concentrate in towns, and no German state, with the exception of the Hanseatic towns, has so large a proportion of urban population, this forming 52·97% of the whole. The people of Saxony are chiefly of pure Teutonic stock; a proportion are Germanized Slavs, and to the south of Bautzen there is a large settlement of above 50,000 Wends, who retain their peculiar customs and language.

The following table shows the area and population of the whole kingdom and of each of the five chief governmental districts, or *Kreishauptmannschaften*, into which it is divided:—

Governmental District.	Area in Eng. sq. m.	Pop. 1900.	Pop. 1905.	Density per sq. m., 1905.
Dresden	1674	1,216,489	1,284,397	767·2
Leipzig	1378	1,060,632	1,146,423	832
Bautzen	953	405,173	426,420	447·4
Chemnitz	799	792,393	851,130	1065·2
Zwickau	983	727,529	800,231	814·1
Total	5787	4,202,216	4,508,601	779·1

The chief towns are Dresden (pop. 1905, 514,283), Leipzig (502,570), Chemnitz (244,405), Plauen (105,182), Zwickau (68,225), Zittau (34,679), Meissen (32,175), Freiberg (30,869), Bautzen (29,372), Meerane (24,994), Glauchau (24,556), Reichenbach (24,911), Crimmitzschau (23,340), Werdau (19,476), Pirna (19,200).

Communications.—The roads in Saxony are numerous and good. The first railway between Leipzig and Dresden, due entirely to private enterprise, was opened in part in April 1837, and finished in 1840, with a length of 71 m. In 1850 there were 250; in 1870, 685; in 1880, 1184; and in 1905, 1920 m., together with 25 m. of private line, all worked by the state. There are no canals in the kingdom, and the only navigable river is the Elbe.

Agriculture.—Saxony is one of the most fertile parts of Germany, and is agriculturally among the most advanced nations of the world. The lowest lands are the most productive, and fertility diminishes as we ascend towards the south, until on the bleak crest of the Erzgebirge cultivation ceases altogether. Saxon agriculture, though dating its origin from the Wends, was long impeded by antiquated customs, while the land was subdivided into small parcels and subjected to vexatious rights. But in 1834 a law was passed providing for the union of the scattered lands belonging to each proprietor, and that may be considered the dawn of modern Saxon agriculture. The richest grain districts are near Meissen, Grimma, Bautzen, Döbeln and Pirna. The chief crop is rye, but oats are hardly second to it. Wheat and barley are grown in considerably less quantity. Very large quantities of potatoes are grown, especially in the Vogtland. Beet is chiefly grown as feeding stuff for cattle, and not for sugar. Flax is grown in the Erzgebirge and Lusatian mountains, where the manufacture of linen was at one time a flourishing domestic industry. Saxony owes its unusual wealth in fruit partly to the care of the elector Augustus I., who is said never to have stirred abroad without fruit seeds for distribution among the peasants and farmers. Enormous quantities of cherries, plums and apples are annually borne by the trees round Leipzig, Dresden and Colditz. The cultivation of the vine in Saxony is respectable for its antiquity, though the yield is insignificant. Wine is said to have been grown here in the 11th century; the Saxon vineyards, chiefly on the banks of the Elbe near Meissen and Dresden, have of late years, owing to the ravages of the phylloxera, become almost extinct.

Live Stock.—The breeding of horses is carried on to a very limited extent in Saxony. Cattle rearing, which has been an industry since the advent of the Wends in the 6th century, is important on the extensive pastures of the Erzgebirge and in the Vogtland. In 1765 the regent Prince Xaver imported 300 merino sheep from Spain, and so improved the native breed by this new strain that Saxon sheep were eagerly imported by foreign nations to improve their flocks, and "Saxon electoral wool" became one of the best brands in the market. Sheep farming, however, has considerably declined within the last few decades. Swine furnish a very large proportion of the flesh diet of the people. Geese abound particularly round Leipzig and in Upper Lusatia, poultry about Bautzen. Bee-keeping flourishes on the heaths on the right bank of the Elbe.

Game and Fish.—Game is fairly abundant; hares and partridges are found in the plains to the north-west, capercailzie in the neighbourhood of Tharandt and Schwarzenberg, and deer in the forests near Dresden. The Elbe produces excellent pike, salmon and eels, its tributaries trout in considerable quantities, while the marshy ponds lying on the left bank furnish a good supply of carp, a fish held in great esteem by the inhabitants.

Forests.—The forests of Saxony are extensive and have long been well cared for both by government and by private proprietors. The famous school of forestry at Tharandt was founded in 1811. The Vogtland is the most densely wooded portion of the kingdom, and next comes the Erzgebirge. About 857,000 acres, or 85% of the whole forest land, are planted with conifers; and about 143,000 acres, or 15%, with deciduous trees, among which beeches and birches are the commonest. About 35% of the total belongs to state.

Mining.—Silver was raised in the 12th century, and argentiferous lead is still the most valuable ore mined; tin, iron and cobalt rank next, and coal is one of the chief exports. Copper, zinc and bismuth are also worked. The country is divided into four mining districts: Freiberg, where silver and lead are the chief products; Altenberg, where tin is mainly raised; Schneeberg, yielding cobalt, nickel and ironstone; and Johanngeorgenstadt, with ironstone and silver mines. There were, in 1907, 143 mines, including coal, in operation, employing 31,455 hands. The total value of metal raised in Saxony in 1907 was £7,036,000; in 1870 it was £314,916. The coal is found principally in two fields—one near Zwickau, and the other in the governmental district of Dresden. Brown coal or lignite is found chiefly in the north and north-west, but not in sufficiently large quantities to be exported; the total value of the output in 1907 was nearly £3,500,000. Peat is especially abundant on the Erzgebirge. Immense quantities of bricks are made all over the country. Excellent sandstone for building is found on the hills of the Elbe. Fine porcelain clay occurs near Meissen, and coarser varieties elsewhere. A few precious stones are found among the southern mountains.

Industries.—The central-European position of the kingdom has fostered its commerce; and its manufactures have been encouraged by the abundant water-power throughout the kingdom. Nearly one-half of the motive power used in Saxon factories is supplied by the streams, of which the Mulde, in this respect, is the chief. The early foundation of the Leipzig fairs, and the enlightened policy of the rulers of the country, have also done much to develop its commercial and industrial resources. Next to agriculture which supports about 20% of the population, by far the most important industry is the textile. Saxony carries on 26% of the whole textile industry in Germany, a share far in excess of its proportionate population. Prussia, which has more than nine times as many inhabitants, carries on 45%, and no other state more than 8%. The chief seats of the manufacture are Zwickau, Chemnitz, Glauchau, Meerane, Hohenstein, Kamenz, Pulsnitz and Bischofswerda. The centre of the cotton manufacture (especially of cotton hosiery) is Chemnitz; cotton-muslins are made throughout the Vogtland, ribbons at Pulsnitz and its neighbourhood. Woollen cloth and buckskin are woven at Kamenz, Bischofswerda and Grossenhain, all in the north-east, woollen and half-woollen underclothing at Chemnitz, Glauchau, Meerane and Reichenbach; while Bautzen and Limbach produce woollen stockings. Linen is manufactured chiefly in the mountains of Lusatia, where the looms are still to some extent found in the homes of the weavers. The coarser kinds only are now made, owing to the keen English competition in the finer varieties. Damask is produced at Gross-Schönau and Neu-Schönau. Lace-making, discovered or introduced by Barbara Uttmann in the latter half of the 16th century, and now fostered by government schools, was long an important domestic industry among the villages of the Erzgebirge, and has attained to a great industry in Plauen. Straw-plaiting occupies 6000 hands on the mountain slopes between Gottleuba and Lockwitz. Waxcloth is manufactured at Leipzig, and artificial flowers at Leipzig and Dresden. Stoneware and earthenware are made at Chemnitz, Zwickau, Bautzen and Meissen, porcelain ("Dresden china") at Meissen, chemicals in and near Leipzig. Döbeln, Werdau and Lossnitz are the chief seats of the Saxon leather trade; cigars are very extensively made in the town and district of Leipzig, and hats and pianofortes at Leipzig, Dresden and Chemnitz. Paper is made chiefly in the west of the kingdom, but does not keep pace with the demand. Machinery of all kinds is produced, from the sewing-machines of Dresden to the steam-locomotives and marine-engines of Chemnitz. The last-named place, though the centre of the iron-manufacture of Saxony, has to import every pound of iron by railway. The leading branch is the machinery used in the industries of the country—mining, paper-making and weaving. The very large printing trade of Leipzig encourages the manufacture of printing-presses in that city. In 1902–1903 Saxony contained 601 active breweries and 572 distilleries. The smelting and refining of the metal ores is also an important industry.

The principal exports are wool, woollen, cotton, linen goods, machinery, china, pianofortes, cigarettes, flannels, stockings, curtains and lace, cloth from Reichenbach and Zittau, watches of superlative value from Glashütte and toys from the Vogtland.

Constitution.—Saxony is a constitutional monarchy and a member of the German empire, with four votes in the *Bundesrath* (federal council) and twenty-three in the *Reichstag* (imperial diet). The constitution rests on a law promulgated on the 4th of September 1831, and subsequently amended. The crown is hereditary in the Albertine line of the house of Wettin, with reversion to the Ernestine line, of which the duke of Saxe-Weimar is now the head. The king enjoys a civil list of 3,674,927 marks or about £185,000, while the appanages of the crown, including the payments to the other members of the royal house, amount to £29,544 more.

The legislature (Ständeversammlung) is bicameral—the constitution of the co-ordinate chambers being finally settled by a law of 1868 amending the enactment of 1831. The first chamber consists of the adult princes of the blood, two representatives of the Lutheran and one of the Roman Catholic Church, a representative of Leipzig university, the proprietor (or a deputy) of the *Herrschaft* of Wildenfels, a proprietor of the mediatized domains, two of *Standesherrschaften*, one of those of four estates in fee, the superintendent at Leipzig, a deputy of the collegiate institution at Wurzen, 12 deputies elected by owners of nobiliar estates, ten landed proprietors and five other members nominated by the king and the burgomasters of eight towns. The second chamber consists of 43 members from the towns and 48 from the country, elected for six years. All male citizens twenty-five years old and upwards who pay 3 marks per annum in taxes have the suffrage; and all above thirty years of age who pay 30 marks in annual taxes are eligible as members of the lower house. With the exception of the hereditary and some of the ex-officio members of the first chamber, the members of the diet are entitled to an allowance for their daily expenses, as well as their travelling expenses. The executive consists of a responsible ministry (Gesammt Ministerium), with the six departments of justice, finance, home affairs, war, public worship and education, and foreign affairs. The minister of the royal household does not belong to the cabinet. The constitution also provides for the formation of a kind of privy council (Staatsrat), consisting of the cabinet ministers and other members appointed by the king.

For administrative purposes Saxony is divided into five Kreishauptmannschaften, or governmental departments, subdivided into twenty-seven Amtshauptmannschaften. The cities of Dresden, Leipzig, Chemnitz, Plauen and Zwickau, form departments by themselves. The supreme court of law for both civil and criminal cases is the Oberlandesgericht at Dresden, subordinate to which are seven other courts in the other principal towns. The German imperial code was adopted by Saxony in 1879. Leipzig is the seat of the supreme court of the German empire.

The Saxon army is modelled on that of Prussia. It forms the XII. and XIX. army corps in the imperial German army, with headquarters at Dresden and Leipzig respectively.

Church.—About 94% of the inhabitants of Saxony are Protestants; about 12,500 are Jews, and about 4·7%, including the royal family, are Roman Catholics. The Evangelical-Lutheran, or State, church has as its head the minister *de evangelicis* so long as the king is Roman Catholic; and its management is vested in the Evangelical Consistory at Dresden. Its representative assembly consisting of 35 clergymen and 42 laymen is called a synod (*Synode*). The Reformed Church has consistories in Dresden and Leipzig. The Roman Catholic Church has enjoyed the patronage of the reigning family since 1697, though it was only the peace of Posen in 1806 which placed it on a level with the Lutherans. By the peace of Prague, which transferred Upper Lusatia to Saxony in 1635, stipulations were made in favour of the Roman Catholics of that region, who are ecclesiastically in the jurisdiction of the cathedral chapter of St Peter at Bautzen, the dean of which has ex-officio a seat in the first chamber of the diet. The other districts are managed by an apostolic vicar at Dresden, under the direction of the minister of public worship. Two nunneries in Lusatia are the only conventual establishments in Saxony, and no others may be founded. Among the smaller religious sects the Moravian Brethren, whose chief seat is at Herrnhut, are perhaps the most interesting. In 1868 civil rights were declared to be independent of religious confession.

Education.—Saxony claims to be one of the most highly educated countries in Europe, and its foundations of schools and universities were among the earliest in Germany. Of the four universities founded by the Saxon electors at Leipzig, Jena, Wittenberg, later transferred to Halle, and Erfurt, now extinct, only the first is included in the present kingdom of Saxony. The endowed schools (Fürstenschulen) at Meissen and Grimma have long enjoyed a high reputation. There are over 4000 schools; and education is compulsory. Saxony is particularly well-equipped with technical schools, the textile industries being especially fostered by numerous schools of weaving, embroidery and lace-making; but the mining academy at Freiberg and the school of forestry at Tharandt are probably the most widely known. The conservatory of music at Leipzig enjoys a world-wide reputation; not less the art collections at Dresden.

Finance.—The Saxon financial period embraces a space of two years. For 1908–1909 the "ordinary" budget showed an income of £17,352,833, balanced by the expenditure. The chief sources of income are taxes, state-railways and public forests and domains. The chief expenditure was on the interest and sinking fund of the national debt. The national debt, incurred almost wholly in making and buying railways and telegraphs, and carrying out other public works, amounted at the end of 1909 to £44,841,880.

See the annual *Jahrbuch für Statistik des Königreichs Sachsen* (Dresden); P. E. Richter, *Literatur des Landes und Volkskunde des Königreichs Sachsen* (Dresden, 1903); Zemmrich, *Landeskunde des Königreichs Sachsen* (Leipzig, 1906); and Pelz, *Geologie des Königreichs Sachsen* (Leipzig, 1904).

History.—The name of Saxony has been borne by two distinct blocks of territory. The first was the district in the north-west of Germany, inhabited originally by the Saxons, which became a duchy and attained its greatest size and prosperity under Henry the Lion in the 12th century. In 1180 it was broken up, and the name of Saxony disappeared from the greater part of it, remaining only with the districts around Lauenburg and Wittenberg. Five centuries later Lauenburg was incorporated with Hanover, and Wittenberg is the nucleus of modern Saxony, the name being thus transferred from the west to the east of Germany. In 1423 Meissen and Thuringia were united with Saxe-Wittenberg under Frederick of Meissen, and gradually the name of Saxony spread over all the lands ruled by this prince and his descendants.

The earlier Saxony was the district lying between the Elbe and the Saale on the east, the Eider on the north and the Rhine on the west, with a fluctuating boundary on the south. During the 8th century it was inhabited by the Saxons (*q.v.*), and about this time was first called *Saxonia*, and afterwards Saxony. For many years the Saxons had been troublesome to the Franks, their neighbours to the east and south, and the intermittent campaigns undertaken against them by Charles Martel and Pippin the Short had scarcely impaired their independence. This struggle was renewed by Charlemagne in 772, and a warfare of thirty-two years' duration was marked by the readiness of the Saxons to take advantage of the difficulties of Charles in other parts of Europe, and by the missionary character which the Frankish king imparted to the war. The subjugation of the Saxons, who were divided into four main branches, was rendered more difficult by the absence of any common ruler, and of a central power answerable for the allegiance of the separate tribes. Einhard, the friend and biographer of Charles, sums up this struggle as follows:—"It is hard to say how often the Saxons, conquered and humbled, submitted to the king, promised to fulfil his commands, delivered over the required hostages without delay, received the officials sent to them, and were often rendered so tame and pliable that they gave up the service of their heathen gods and agreed to accept Christianity. But just as quickly as they showed themselves ready to do this, did they also always break their promises, so that one could not really say which of these two courses may truly have been easier to them, and from the beginning of the war scarcely a year passed without bringing such change of mind."

In 772 the war was decided upon, and Charles marched from Worms into the land of the Engrians or Angrians. The frontier fortress of Eresburg which stood on the site of the modern Marburg was taken, the *Irminsul* was destroyed, and the treasures of gold and silver were seized. The *Irminsul* was a wooden pillar erected to represent the world-sustaining ash Yggdrasil, and was the centre of the worship of the whole Saxon people. Having received hostages Charles left the country; but in 774 while he was in Italy the Saxons retook Eresburg, and crossing the frontier attacked the church of St Boniface at Fritzlar and ravaged the land of the Franks. The king retaliated by sending troops of cavalry to devastate Saxony, and declared at Quierzy he would exterminate his foes unless they accepted Christianity. In pursuance of this resolve he marched against them early in 775, captured the fortress of Sigiburg on the Ruhr, regained and rebuilt Eresburg and left Frankish garrisons in the land. The Engrians, together with the Eastphalians and the Westphalians who dwelt on either side of them, made a formal submission and many of them were baptized; but about the same time some Frankish troops met with a serious reverse at Lübbecke near Minden. Charles thereupon again took the field, and after ravaging Saxony returned home under the impression that the war was over. In 776, however, the Saxons were again in arms and retook Eresburg; but they failed to capture Sigiburg, and showed themselves penitent when the king appeared among them. Eresburg was regarrisoned, a new fortress named Carlsburg was erected on the banks of the Lippe, and terms of peace were arranged. In 777 Charles held an assembly at Paderborn, henceforth his headquarters during this war, which was attended by most of the Saxon chiefs. Hostages were given, oaths of fealty renewed, while many accepted Christianity, and the rudiments of an ecclesiastical system were established. The peace did not last long. A certain Widukind, or Wittekind, who had doubtless taken part in the earlier struggle, returned from exile in Denmark, and under his leadership the Saxon revolt broke out afresh in 778. The valley of the Rhine from Coblenz to Deutz was ravaged, and the advance of winter prevented Charles from sending more than a flying column to drive back the Saxons. But in 779 he renewed the attack, and after an important Frankish victory at Bocholt the Westphalians again did homage. The civil and ecclesiastical organization of the country was improved, and in 782 the king held an assembly at the source of the Lippe and took further measures to extend his influence. The land was divided into counties, which, however, were given to Saxon chiefs to administer, and it was probably on this occasion that the *capitulatio de partibus Saxoniae* was issued. This capitulary ordered the celebration of baptism and other Christian rites and ceremonies in addition to the payment of tithes, and forbade the observance of pagan customs on pain of death.

This attack on the religion and property of the Saxons aroused intense indignation, and provoked the rising of 782 which marks the beginning of the second period of the war. The work of devastation was renewed, the priests were driven out, and on the Süntel mountains near Minden, the Frankish forces were almost annihilated. Charles collected a large army, and by his orders 4500 men who had surrendered were beheaded at Verden. This act made the Saxons more furious than ever, but in 783 Charles inflicted two defeats upon them at Detmold and on the river Hase, and ravaged their territory from the Weser to the Elbe. This work was continued during the following year by the king and his eldest son Charles, and the Christmas of 784 was spent by the royal family at Eresburg, whence Charles directed various plundering expeditions. The work of conversion was renewed, and an important event took place in 785 when Widukind, assured of his personal safety, surrendered and was baptized at Attigny together with many of his companions. Saxony at last seemed to be subdued, and Saxon warriors took service in the Frankish armies. But in 792 some Frankish troops were killed at the mouth of the Elbe, and a similar disaster in the following year was the signal for a renewal of the ravages with great violence, when churches were destroyed, priests killed, or driven away, and many of the people returned to heathenism. These events compelled Charles to leave the Avar war and return to Saxony in 794; and until 799 each year had its Saxon campaign. At the same time in 794, as a fresh experiment in policy, every third man was transported; while the king was assisted in his work of conquest by the Abotrites who inhabited a district east of the Elbe. The resistance Charles met with was not serious, and these expeditions took the form of plundering raids. Oaths and hostages were exacted; and many Saxon youths were educated in the land of the Franks as Christians, and sent back into Saxony to spread Christianity and Frankish influence. The southern part of the country was now fairly tranquil, and the later campaigns were directed mainly against the Nordalbingians, the branch of the Saxons living north of the Elbe, who suffered a severe reverse near Bornhöved in 798. Further transportations were carried out, and in 797 Charles issued another *capitulary* which mitigated the severe provisions of the *capitulary* of 782; and about 802 the Saxon law was committed to writing. The Nordalbingians were still restless, and it is recorded that their land was devastated in 802. Two years later a final campaign was undertaken, when a large number of these people were transported into the country of the Franks and their land was given to the Abotrites.

The conversion of the Saxons to Christianity, which during this time had been steadily progressing, was continued in the reign of the emperor Louis I., the Pious, who, however, took very little interest in this part of his empire. Bishoprics were founded at Bremen, Münster, Verden, Minden, Paderborn, Osnabrück, Hildesheim and Hamburg, and one founded at Seligenstadt was removed to Halberstadt. Some of these bishoprics were under the authority of the archiepiscopal see of Cologne, others under that of Mainz, and this arrangement was unaltered when in 834 Hamburg was raised to an archbishopric. In 847 the bishopric of Bremen was united with Hamburg, but the authority of this archbishopric extended mainly over the districts north and east of the Elbe. The abbey of Corvey, where rested the bones of St Vitus, the patron saint of Saxony, soon became a centre of learning for the country, and the Saxons undertook with the eagerness of converts the conversion of their heathen neighbours. After a period of tranquillity a reaction set in against Frankish influences, and in 840 the freemen and *liti* separated themselves from the nobles, formed a league, or *stellinga*, and obtained a promise from the emperor Lothair I. that he would restore their ancient constitution. This rising, which was probably caused by the exaction of tithes and the oppression of Frankish officials, aimed also at restoring the heathen religion, and was put down in 842 by king Louis the German, who claimed authority over this part of the Carolingian empire.

The influences of civilization and the settlement of Frankish colonists in various parts of Saxony facilitated its incorporation with the Carolingian empire, with which its history is for some time identified. By the treaty of Verdun in 843 Saxony fell to Louis the German, but he paid little attention to the northern part of his kingdom which was harassed by the Normans and the Slavs. About 850, however, he appointed a margrave to defend the *Limes Saxoniae*, a narrow strip of land on the eastern frontier, and this office was given to one Liudolf who had large estates in Saxony, and who was probably descended from an Engrian noble named Bruno. Liudolf, who is sometimes called "duke of the East Saxons," carried on a vigorous warfare against the Slavs and extended his influence over other parts of Saxony. He died in 866, and was succeeded by his son Bruno, who was killed fighting the Normans in 880. Liudolf's second son, Otto the Illustrious, was recognized as duke of Saxony by King Conrad I., and on the death of Burkhard, margrave of Thuringia in 908, obtained authority over that country also. He made himself practically independent in Saxony, played an important part in the affairs of the Empire, and is said to have refused the German throne in 911. He died in 912 and was succeeded by his son Henry I., the Fowler. Between this prince and Conrad I., who wished to curb the increasing power of the Saxon duke, a quarrel took place; but Henry not only retained his hold over Saxony and Thuringia, but on Conrad's death in 919 was elected German king. He extended the Saxon frontier almost to the Oder, improved the Saxon forces by training and equipment, established new marks, and erected forts on the frontiers for which he provided regular garrisons. Towns were walled, where it was decreed markets and assemblies should be held, churches and monasteries were founded, civilization was extended and learning encouraged. Henry's son, Otto the Great, was crowned emperor in 962, and his descendants held this dignity until the death of the emperor Otto III. in 1002. Otto retained Saxony in his own hands for a time, though in 938 he had some difficulty in suppressing a revolt led by his half-brother Thankmar. The Slavs were driven back, the domestic policy of Henry the Fowler was continued, the Saxon court became a centre of learning visited by Italian scholars, and in 968 an archbishopric was founded at Magdeburg for the lands east of the Elbe. In 960 Otto gave to a trusted relative Hermann, afterwards called Billung, certain duties and privileges on the eastern frontier, and from time to time appointed him as his representative in Saxony. Hermann gradually extended his authority, and when he died in 973 was followed by his son Bernard I., who was undoubtedly duke of Saxony in 986. When Henry II. was chosen German king in 1002 he met the Saxons at Merseburg, and on promising to observe their laws Bernard gave him the sacred lance, thus entrusting Saxony to his care. Bernard was succeeded by his son Bernard II., who took up a hostile attitude towards the German kings, Conrad II. and Henry III. His son and successor Ordulf, who became duke in 1059, carried on a long and obstinate struggle with Adalbert, archbishop of Bremen, who was compelled to cede one-third of his possessions to Ordulf's son Magnus in 1066. The emperor Henry III. sought to win the allegiance of the Saxons by residing among them, and built a castle at Goslar and the Harzburg; and the emperor Henry IV. also spent much time in Saxony.

In 1070 Otto of Nordheim, duke of Bavaria, who held large estates in this country, being accused of a plot to murder Henry, was placed under the ban, his possessions were declared forfeited and his estates plundered. Otto, in alliance with Magnus, won considerable support in Saxony, but after some fighting both submitted and were imprisoned; and Magnus was still in confinement when on his father's death in 1072 he became titular duke of Saxony. As he refused to give up his duchy he was kept in prison, while Henry confiscated the estates of powerful nobles, demanded the restoration of ducal lands by the bishops, and garrisoned newly-erected forts with Swabians, who provisioned themselves from the surrounding country. These proceedings aroused suspicion and discontent, which were increased when the emperor assembled an army, ostensibly to attack the Slavs. The Saxon nobles refused to join the host until their grievances were redressed, and in 1073 a league was formed at Wormesleben. When the insurgents under Duke Otto were joined by the Thuringians, Henry was compelled in 1074 to release Magnus and to make a number of concessions as the price of the peace of Gerstungen; which, however, was short-lived, as the peasants employed in pursuance of its terms in demolishing the forts, desecrated the churches and violated the ducal tombs. Henry, having obtained help from the princes of the Rhineland, attacked and defeated the Saxons at Hohenburg near Langensalza, rebuilt the forts, and pardoned Otto, whom he appointed administrator of the country. The Saxons, however, were not quite subdued; risings took place from time to time, and the opponents of Henry IV. found considerable support in Saxony. During the century which followed the death of Hermann Billung, there had been constant warfare with the Slavs, but although the emperors had often taken the field, the Saxons had been driven back to the Elbe, which was at this time their eastern boundary. In 1106 Magnus died, and the German king Henry V. bestowed the duchy upon Lothair, count of Supplinburg, whose wife Richenza inherited the Saxon estates of her grandfather Otto of Nordheim, on the death of her brother Otto in 1116. Lothair quickly made himself independent, defeated Henry at Welfesholz in 1115, and prosecuted the war against the Slavs with vigour. In 1125 he became German king, and in 1137 gave Saxony to Henry the Proud, duke of Bavaria, who had married his daughter Gertrude, and whose mother Wulfhild was a daughter of Magnus Billung. The succeeding German king Conrad III. refused to allow Henry to hold two duchies, and gave Saxony to Albert the Bear, margrave of Brandenburg, who like his rival was a grandson of Magnus Billung. Albert's attempts to obtain possession failed, and after Henry's death in 1139 he formally renounced Saxony in favour of Henry's son, Henry the Lion (*q.v.*). The new duke improved its internal condition, increased its political importance, and pushed its eastern frontier towards the Oder. In 1180, however, he was placed under the imperial ban and Saxony was broken up. Henry retained Brunswick and Luneburg; Westphalia, as the western portion of the duchy was called, was given to Philip, archbishop of Cologne, and a large part of the land was divided among nine bishops and a number of counts who thus became immediate vassals of the emperor. The title duke of Saxony was given to Bernard, the sixth son of Albert the Bear, together with the small territories of Lauenburg and Wittenberg, which were thus the only portions of the former duchy which now bore the name of Saxony. Bernard, whose paternal grandmother, Eilicke, was a daughter of Magnus Billung, took a prominent part in German affairs, but lost Lauenburg which was seized by Waldemar II., king of Denmark. Dying in 1212, Bernard was succeeded in Wittenberg by his younger son Albert I., who recovered Lauenburg after the defeat of Waldemar at Bornhöved in 1227. Albert died in 1260, and soon after his death his two sons divided his territories, when the elder son John took Lauenburg which was sometimes called lower Saxony, and the younger, Albert II., took Wittenberg or upper Saxony. Both retained the ducal title and claimed the electoral privilege, a claim which the Lauenburg line refused to abandon when it was awarded to the Wittenberg line by the Golden Bull of 1356.

Saxe-Lauenburg was governed by John until his death in 1285, when it passed to his three sons John II., Albert III. and Eric I. As Albert had no sons the duchy was soon divided into two parts, until on the death of duke Eric III., a grandson of John II., in 1401, it was reunited by Eric IV., a grandson of Eric I. When Eric IV. died in 1412 he was succeeded by his son Eric V., who made strenuous but vain efforts to obtain the electoral duchy of Saxe-Wittenberg, which fell vacant on the death of the elector Albert III. in 1422. Eric died in 1436 and was followed by his brother Bernard IV., whose claim to exercise the electoral vote was quashed by the electors in 1438; and who was succeeded by his son John IV. in 1463. The next duke, John's son Magnus I., spent much time in struggles with the archbishop of Bremen and the bishop of Ratzeburg; he also assisted the progress of the Reformation in Lauenburg. Magnus, who was formally invested with the duchy by the emperor Charles V. in 1530, was the first duke to abandon the claim to the electoral privilege. After his death in 1543 his son Francis I. reigned for the succeeding twenty-eight years, and his grandsons, Magnus II. and Francis II., until 1619. Francis, who did something to improve the administration of his duchy, was succeeded in turn by his two sons and his two grandsons; but on the death of Julius Francis, the younger of his grandsons, in 1689 the family became extinct.

Several claimants to Saxe-Lauenburg thereupon appeared, the most prominent of whom were George William, duke of Lüneburg-Celle, and John George III., elector of Saxony. George William based his claim upon a treaty of mutual succession made in 1369 between his ancestor Magnus II., duke of Brunswick, and the reigning dukes of Saxe-Lauenburg. John George had a double claim. Duke Magnus I. had promised that in case of the extinction of his family Lauenburg should pass to the family of Wettin, an arrangement which had been confirmed by the emperor Maximilian I. in 1507. Secondly, John George himself had concluded a similar treaty with Julius Francis in 1671. In 1689 the elector received the homage of the people of Lauenburg. George William, however, took Ratzeburg, and held it against the troops of a third claimant, Christian V., king of Denmark; and in 1702 he bought off the claim of John George, his successor being invested with the duchy in 1728. Since that date its history has been identified with that of Hanover (*q.v.*).

In Saxe-Wittenberg Albert II. was succeeded in 1298 by his son Rudolph I., who in 1314 gave his vote to Frederick, duke of Austria, in the disputed election for the German throne between that prince and Louis of Bavaria, afterwards the emperor Louis IV.; and when the latter ignored his claims on the margraviate of Brandenburg Rudolph shared in the attempt to depose him, and to elect Charles of Luxemburg, afterwards the emperor Charles IV., as German king. Rudolph was followed in 1356 by his son Rudolph II., who had fought at the battle of Crécy; and who in turn was succeeded in 1370 by his half-brother Wenceslaus. This prince succeeded after some fighting in temporarily obtaining the duchy of Lüneburg for his house; he took part in the election of Wenceslaus as German king in 1376; and was followed in 1388 by his eldest son Rudolph III. Lavish expenditure during the progress of the council of Constance reduced Rudolph to poverty, and on the death in 1422 of his brother Albert III., who succeeded him in 1419, this branch of the Ascanian family became extinct.

A new era in the history of Saxony dates from 1423, the year when the emperor Sigismund bestowed the vacant electoral duchy of Saxe-Wittenberg upon Frederick, margrave of Meissen. Frederick was a member of the family of Wettin, which since his day has played a prominent part in the history of Europe, and he owed his new dignity to the money and other assistance which he had given to the emperor during the Hussite war. The new and more honourable title of elector of Saxony now superseded his other titles, and the name Saxony gradually spread over his other possessions, which included Meissen and Thuringia as well as Saxe-Wittenberg, and thus the earlier history of the electorate and kingdom of Saxony is the early history of the mark of Meissen, the name of which now lingers only in a solitary town on the Elbe.

Frederick's new position as elector, combined with his personal qualities to make him one of the most powerful princes in Germany, and had the principle of primogeniture been established in his country, Saxony and not Prussia might have been the leading power to-day in the German empire. He died in 1428, just before his lands were ravaged by the Hussites in 1429 and 1430. The division of his territory between his two sons, the elector Frederick II. and William, occasioned a destructive internecine war, a kind of strife which had many precedents in the earlier history of Meissen and Thuringia. It was in 1455 during this war that the knight Kunz von Kaufungen carried into execution his daring plan of stealing the two sons of the elector Frederick, Ernest and Albert, but he was only momentarily successful, the princes soon escaping from his hands. These two sons succeeded to their father's possessions in 1464, and for twenty years ruled together peaceably. The land prospered rapidly during this respite from the horrors of war. Encouraged by an improved coinage, trade made great advances, and other benefits also accrued from the discovery of silver on the Schneeberg. Several of the important ecclesiastical principalities of North Germany were about this time held by members of the Saxon ruling house, and the external influence of the electorate corresponded to its internal prosperity. But matters were not allowed to continue thus. The childless death of their uncle William in 1482 brought Thuringia to the two princes, and Albert insisted on a division of their common possessions. The important partition of Leipzig accordingly took place in 1485, and resulted in the foundation of the two main lines of the Saxon house. The lands were never again united. Ernest, the elder brother, obtained Saxe-Wittenberg with the electoral dignity, Thuringia and the Saxon Vogtland; while Albert received Meissen, Osterland being divided between them. Something was still held in common, and the division was probably made intricate to render war difficult and dangerous.

The elector Ernest was succeeded in 1486 by his son, Frederick the Wise, one of the most illustrious princes in German history.

Under him Saxony was perhaps the most influential state in the Empire, and became the cradle of the Reformation. He died in 1525 while the Peasants' War was desolating his land, and was succeeded by his brother John, who was an enthusiastic supporter of the reformed faith and who shared with Philip, landgrave of Hesse, the leadership of the league of Schmalkalden. John's son and successor, John Frederick the Magnanimous, who became elector in 1532, might with equal propriety have been surnamed the Unfortunate. He took part in the war of the league of Schmalkalden, but in 1547 he was captured at Mühlberg by the emperor Charles V. and was forced to sign the capitulation of Wittenberg. This deed transferred the electoral title and a large part of the electoral lands from the Ernestine to the Albertine branch of the house, whose astute representative, Maurice, had taken the imperial side during the war. Only a few scattered territories were reserved for John Frederick's sons, although these were increased by the treaty of Naumburg in 1554, and on them were founded the Ernestine duchies of Saxe-Gotha, Saxe-Weimar, Saxe-Coburg, Saxe-Meiningen and Saxe-Altenburg. For the second time in the history of the Saxon electorate the younger line secured the higher dignity, for the Wittenberg line was junior to the Lauenburg line. The Albertine line is now the royal line of Saxony.

Maurice, who became elector of Saxony in consequence of the capitulation of Wittenberg, was a grandson of Albert, the founder of his line. His predecessors in ruling Albertine Saxony had been his father, Henry, who only reigned for two years, and his uncle George. The latter, a zealous Roman Catholic, had vainly tried to stem the tide of the Reformation in his dominions; Henry, on the other hand, was an equally devoted Protestant. Maurice, who succeeded his father in 1541, was also a Protestant, but he did not allow his religious faith to blind him to his political interests. His ruling motive was ambition to increase both his own power and the importance of his country. He refused to join the other Protestant princes in the league of Schmalkalden, but made a secret treaty with Charles V. Then suddenly invading the Ernestine lands while the elector John Frederick was campaigning against the imperialists on the Danube, he forced that prince to return hastily to Saxony, and thus weakened the forces opposed to the emperor. Although compelled to retreat, his fidelity to Charles V. was rewarded, as we have already seen, by the capitulation of Wittenberg. All the lands torn from John Frederick were not, however, assigned to Maurice; he was forced to acknowledge the superiority of Bohemia over the Vogtland and the Silesian duchy of Sagan. Moreover, Roman Catholic prelates were reinstated in the bishoprics of Meissen, Merseburg and Naumburg-Zeitz. Recognizing now as a Protestant prince that the best alliance for securing his new possessions was not with the emperor, but with the other Protestant princes, Maurice began to withdraw from the former and to conciliate the latter. In 1552, suddenly marching against Charles at Innsbruck, he drove him to flight and then extorted from him the religious peace of Passau. Thus at the close of his life he came to be regarded as the champion of German national and religious freedom.

Amid the distractions of outward affairs, Maurice had not neglected the internal interests of Saxony. To its educational advantages, already conspicuous, he added the three *Fürstenschulen* at Pforta, Grimma and Meissen, and for administrative purposes, especially for the collection of taxes, he divided the country into the four circles of the Electorate, Thuringia, Meissen and Leipzig. During his reign coal-mining began in Saxony. In another direction over two hundred religious houses were suppressed, the funds being partly applied to educational purposes. The country had four universities, those of Leipzig, Wittenberg, Jena and Erfurt; books began to increase rapidly, and, by virtue of Luther's translation of the Bible, the Saxon dialect became the ruling dialect of Germany.

Augustus I., brother and successor of Maurice, was one of the best domestic rulers that Saxony ever had. He increased the area of the country by the "circles" of Neustädt and the Vogtland, and by parts of Henneberg and the silver-yielding Mansfeld, and he devoted his long reign to the development of its resources. He visited all parts of the country himself, and personally encouraged agriculture; he introduced a more economical mode of mining and smelting silver; he favoured the importation of finer breeds of sheep and cattle; and he brought foreign weavers from abroad to teach the Saxons. Under him lace-making began on the Erzgebirge, and cloth-making flourished at Zwickau. With all his virtues, however, Augustus was an intolerant Lutheran, and used very severe means to exterminate the Calvinists; in his electorate he is said to have expelled 111 Calvinist preachers in a single month. Under his son Christian I., who succeeded in 1586, the chief power was wielded by the chancellor Nikolas Crell (*q.v.*), who strongly favoured Calvinism; but, when Christian II. came to the throne in 1591, Crell was sacrificed to the Lutheran nobles. The duke of Saxe-Weimar was made regent, and continued the persecution of crypto-Calvinism. Christian II. was succeeded in 1611 by his brother John George I., under whom the country was devastated by the Thirty Years' War. John George was an amiable but weak prince, totally unfitted to direct the fortunes of a nation in time of danger. He refused the proffered crown of Bohemia, and, when the Bohemian Protestants elected a Calvinist prince, he assisted the emperor against them with men and money. The edict of restitution, however, in 1629, opened his eyes to the emperor's projects, and he joined Gustavus Adolphus. Saxony now became the theatre of war. The first battle on Saxon soil was fought in 1631 at Breitenfeld, where the bravery of the Swedes made up for the flight of the Saxons. Wallenstein entered Saxony in 1632, and his lieutenants plundered, burned and murdered through the length and breadth of the land. After the death of Gustavus Adolphus at the battle of Lützen, not far from Leipzig, in 1632, the elector, who was at heart an imperialist, detached himself from the Swedish alliance, and in 1635 concluded the peace of Prague with the emperor. By this peace he was confirmed in the possession of Upper and Lower Lusatia, a district of 180 sq. m. and half a million inhabitants, which had already been pledged to him as a reward for his services against the Bohemians.

Saxony had now to suffer from the Swedes a repetition of the devastations of Wallenstein. No other country in Germany was so scourged by this terrible war. Immense tracts were rendered desolate, and whole villages vanished from the map; in eight years the population sank from three to one and a half millions. When the war was ended by the peace of Westphalia in 1648, Saxony found that its influence had begun to decline in Germany. Its alliance with the Catholic party deprived it of its place at the head of the Protestant German states, which was now taken by Brandenburg. John George's will made the decline of the electorate even more inevitable by detaching from it the three duchies of Saxe-Weissenfels, Saxe-Merseburg and Saxe-Zeitz as appanages for his younger sons. By 1746, however, these lines were all extinct, and their possessions had returned to the main line. Saxe-Neustädt was a short-lived branch from Saxe-Zeitz, extinct in 1714. The next three electors, who each bore the name of John George, had uneventful reigns. The first made some efforts to heal the wounds of his country; the second wasted the lives of his people in foreign wars against the Turks; and the third was the last Protestant elector of Saxony. John George IV. was succeeded in 1694 by his brother Frederick Augustus I., or Augustus the Strong. This prince was elected king of Poland as Augustus II. in 1697, but any weight which the royal title might have given him in the Empire was more than counterbalanced by the fact that he became a Roman Catholic in order to qualify for the new dignity. The connexion with Poland was disastrous for Saxony. In order to defray the expenses of his wars with Charles XII. Augustus pawned and sold large districts of Saxon territory, while he drained the electorate of both men and money. For a year before the peace of Altranstädt in 1706, when Augustus gave up the crown of Poland, Saxony was occupied by a Swedish army, which had to be supported at an immense expense.

The wars and extravagance of the elector-king, who regained the Polish crown in 1709, are said to have cost Saxony a hundred million thalers. From this reign dates the privy council (*Geheimes Kabinet*), which lasted till 1830. The caste privileges of the estates (*Stände*) were increased by Augustus, a fact which tended to alienate them more from the people, and so to decrease their power. Johann Friedrich Böttger made his famous discovery in 1710, and the manufacture of porcelain was begun at Meissen, and in this reign the Moravian Brethren made their settlement at Herrnhut. Frederick Augustus II., who succeeded his father in the electorate in 1733, and was afterwards elected to the throne of Poland as Augustus III., was an indolent prince, wholly under the influence of Count Heinrich von Brühl (*q.v.*). Under his ill-omened auspices Saxony sided with Prussia in the First Silesian War, and with Austria in the other two. It gained nothing in the first, lost much in the second, and in the third, the Seven Years' War (1756–1763), suffered renewed miseries. The country was deserted by its king and his minister, who retired to Poland. By the end of the war it had lost 90,000 men and a hundred million thalers; its coinage was debased and its trade ruined; and the whole country was in a state of frantic disorder. The elector died seven months after his return from Poland; Brühl died twenty-three days later. The connexion with Poland was now at an end. The elector's son and successor, Frederick Christian, survived his father only two months, dying also in 1763, leaving a son, Frederick Augustus III., a boy of thirteen. Prince Xaver, the elector's uncle, was appointed guardian, and he set himself to the work of healing the wounds of the country. The foundation of the famous school of mining at Freiberg, and the improvement of the Saxon breed of sheep by the importation of merino sheep from Spain, were due to his care.

Frederick assumed the government in 1768, and in his long and eventful reign, which saw the electorate elevated to the dignity of a kingdom, though deprived of more than half its area, he won the surname of the Just. As he was the first king of Saxony, he is usually styled Frederick Augustus I. The first ten years of his active reign passed in peace and quiet; agriculture, manufactures and industries were fostered, economical reforms instituted, and the heavy public debt of forty million thalers was steadily reduced. In 1770 torture was abolished. When the Bavarian succession fell open in 1777, Frederick Augustus joined Prussia in protesting against the absorption of Bavaria by Austria, and Saxon troops took part in the bloodless "potato-war." The elector commuted his claims in right of his mother, the Bavarian princess Maria Antonia, for six million florins, which he spent chiefly in redeeming Saxon territory that had been pawned to other German states. When Saxony joined the *Fürstenbund* in 1785, it had an area of 15,185 sq. m. and a population of nearly 2,000,000, but its various parts had not yet been combined into a homogeneous whole, for the two Lusatias, Querfurt, Henneberg and the ecclesiastical foundations of Naumburg and Merseburg had each a separate diet and government, independent of the diet of the electorate proper. In 1791 Frederick declined the crown of Poland, although it was now offered as hereditary even in the female line. He remembered how unfortunate for Saxony the former Polish connexion had been, and he mistrusted the attitude of Russia towards the proffered kingdom. Next year saw the beginning of the great struggle between France and Germany. Frederick's first policy was one of selfish abstention, and from 1793 until 1796, when he concluded a definite treaty of neutrality with France, he limited his contribution to the war to the bare contingent due from him as a prince of the Empire. When war broke out in 1806 against Napoleon, 22,000 Saxon troops shared the defeat of the Prussians at Jena, but the elector immediately afterwards snatched at Napoleon's offer of neutrality, and abandoned his former ally. At the peace of Posen (11th December 1806) Frederick assumed the title of king of Saxony, and entered the Confederation of the Rhine as an independent sovereign, promising a contingent of 20,000 men to Napoleon.

No change followed in the internal affairs of the new kingdom, except that Roman Catholics were admitted to equal privileges with Protestants. Its foreign policy was dictated by the will of Napoleon, of whose irresistibility the king was too easily convinced. In 1807 his submission was rewarded with the duchy of Warsaw (to which Cracow and part of Galicia were added in 1809) and the district of Cottbus, though he had to surrender some of his former territory to the new kingdom of Westphalia. The king of Saxony's faith in Napoleon was shaken by the disasters of the Russian campaign, in which 21,000 Saxon troops had shared; when, however, the allies invaded Saxony in the spring of 1813, he refused to declare against Napoleon and fled to Prague, though he withdrew his contingent from the French army. Whatever misgivings he may have had were, however, removed by Napoleon's victory at Lützen (May 2, 1813), and the Saxon king and the Saxon army were once more at the disposal of the French. After the battle of Bautzen, Napoleon's headquarters were successively at Dresden and Leipzig. During the battle of Leipzig in October 1813, the popular Saxon feeling was displayed by the desertion of the Saxon troops to the side of the allies. Frederick was taken prisoner in Leipzig, and the government of his kingdom was assumed for a year by the Russians. Saxony was now regarded as a conquered country. Nothing but Austria's vehement desire to keep a powerful neighbour at a distance from her boundaries preserved it from being completely annexed by the Prussians, who had succeeded the Russians in the government. At the congress of Vienna the claim of Prussia to annex the whole kingdom was supported by Russia, and opposed by Austria, France and Great Britain, the question all but leading to a complete break-up of the alliance (see VIENNA, CONGRESS OF). As it was, the congress assigned the northern portion, consisting of 7800 sq. m., with 864,404 inhabitants, to Prussia, leaving 5790 sq. m., with a population of 1,182,744, to Frederick, who was permitted to retain his royal title. On the 8th of June 1815 King Frederick joined the new German Confederation.

From the partition in 1815 to the war of 1866 the history of Saxony is mainly a narrative of the slow growth of constitutionalism and popular liberty within its limits. Its influence on the general history of Europe ceased when the old Empire was dissolved. In the new German Empire it is too completely overshadowed by Prussia to have any objective importance by itself. Frederick lived twelve years after the division of his kingdom. The commercial and industrial interests of the country continued to be fostered, but only a few of the most unavoidable political reforms were granted. Religious equality was extended to the Reformed Church in 1818, and the separate diet of Upper Lusatia was abolished. Frederick Augustus was succeeded in 1827 by his brother Antony, to the great disappointment of the people, who had expected a more liberal era under Prince Frederick Augustus, the king's nephew. Antony announced his intention of following the lines laid down by his predecessor. He accorded at first only a few trifling reforms, which were far from removing the popular discontent, while he retained the unpopular minister, Count Detlew von Einsiedel (1773–1861), and continued the encouragement of the Roman Catholics. The old feudal arrangement of the diet, with its inconvenient divisions, was retained, and the privy council continued to be the depository of power. An active opposition began to make itself evident in the diet and in the press, and in 1830, under the influence of the July revolution in Paris, riots broke out in Leipzig and Dresden. Einsiedel was now dismissed, Prince Frederick Augustus, son of Maximilian, who resigned the succession, became co-regent, and a constitution was promised. After consultation with the diet the king promulgated, on the 4th of September 1831, a new constitution which is the basis of the present government. An offer from Metternich of Austrian arms to repress the discontent by force had been refused. The feudal estates were replaced by two chambers, largely elective, and the privy council by a responsible ministry of six departments. Bernhard von Lindenau was the head of the first responsible cabinet, and the first constitutional assembly sat from the 27th of January 1833 till the 30th of October 1834.

While Saxony's political liberty was thus enlarged, its commerce and credit were stimulated by its adhesion to the Prussian *Zollverein* and by the construction of railways. Antony had died in 1836, and Frederick Augustus II. became sole king. Growing interest in politics produced dissatisfaction with the compromise of 1831, and the Liberal opposition grew in numbers and influence. The burning questions were the publicity of legal proceedings and the freedom of the press; and on these the government sustained its first crushing defeat in the lower chamber in 1842. In 1843 Lindenau was forced by the action of the aristocratic party to resign, and was replaced by Julius Traugotte von Könneritz (1792–1866), a statesman of reactionary views. This increased the opposition of the Liberal middle classes to the government. Religious considerations arising out of the attitude of the government towards the "German Catholics," and a new constitution for the Protestant Church, began to mingle with purely political questions, and Prince John, as the supposed head of the Jesuit party, was insulted at a review of the communal guards at Leipzig in 1845. The military rashly interfered, and several innocent spectators were shot. The bitterness which this occurrence provoked was intensified by a political reaction which was initiated about the same time under Könneritz. Warned by the sympathy excited in Saxony by the revolutionary events at Paris in 1848, the king dismissed his reactionary ministry, and a Liberal cabinet took its place in March 1848. The disputed points were now conceded to the country. The privileges of the nobles were curtailed; the administration of justice was put on a better footing; the press was unshackled; publicity in legal proceedings was granted; trial by jury was introduced for some special cases; and the German Catholics were recognized. The feudal character of the first chamber was abolished, and its members made mainly elective from among the highest tax-payers, while an almost universal suffrage was introduced for the second chamber. The first demand of the overwhelmingly democratic diet returned under this reform bill was that the king should accept the German constitution elaborated by the Frankfort parliament. Frederick, alleging the danger of acting without the concurrence of Prussia, refused, and dissolved the diet. A public demonstration at Dresden in favour of the Frankfort constitution was prohibited as illegal on the 2nd of May 1849. This at once awoke the popular fury. The mob seized the town and barricaded the streets; Dresden was almost destitute of troops; and the king fled to the Königstein. The rebels then proceeded to appoint a provisional government, consisting of Tzschirner, Heubner and Todt, though the true leader of the insurrection was the Russian Bakunin. Meanwhile Prussian troops had arrived to aid the government, and after two days' fierce street fighting the rising was quelled. The bond with Prussia now became closer, and Frederick entered with Prussia and Hanover into the temporary "alliance of the three kings." He was not sincere, however, in desiring to exclude Austria, and in 1850 accepted the invitation of that power to send deputies to the restored federal diet at Frankfort. The first chamber immediately protested against this step, and refused to consider the question of a pressing loan. The king retorted by dissolving the diet and summoning the old estates abolished in 1848. When a quorum, with some difficulty, was obtained, another period of retrograde legislation set in. The king himself was carried away with the reactionary current, and the people remained for the time indifferent. Beust became minister for both home and foreign affairs in 1852, and under his guidance the policy of Saxony became more and more hostile to Prussia and friendly to Austria.

The sudden death of the king, by a fall from his carriage in Tirol in 1854, left the throne to his brother John, a learned and accomplished prince, whose name is known in German literature as a translator and annotator of Dante. His brother's ministers kept their portfolios, but their views gradually became somewhat liberalized with the spirit of the times. Beust, however, still retained his federalistic and philo-Austrian views. When war was declared between Prussia and Austria in 1866, Saxony declined the former's offer of neutrality, and, when a Prussian force crossed the border, the Saxon army under the king and the crown prince joined the Austrians in Bohemia. The entire kingdom, with the solitary exception of the Königstein, was occupied by the Prussians. On the conclusion of peace Saxony lost no territory, but had to pay a war indemnity of ten million thalers, and was compelled to enter the North German Confederation.

During the peace negotiations Beust had resigned and entered the Austrian service, and on the 15th of November the king in his speech from the throne announced his intention of being faithful to the new Confederation as he had been to the old. On the 7th of February 1867 a military convention was signed with Prussia which, while leaving to Saxony a certain control in matters of administration, placed the army under the king of Prussia; from the 1st of July it formed the XII. army corps of the North German Confederation under the command of Crown-Prince Albert. The postal and telegraph systems were also placed under the control of Prussia, and the representation of the Saxon crown at foreign courts was merged in that of the Confederation. A new electoral law of the same year reformed the Saxon diet by abolishing the old distinction between the various "estates" and lowering the qualification for the franchise; the result was a Liberal majority in the Lower House and a period of civil and ecclesiastical reform. John was succeeded in 1873 by his elder son Albert (1832–1902) who had added to his military reputation during the war of 1870. Under this prince the course of politics in Saxony presented little of general interest, except perhaps the spread of the doctrines of Social Democracy, which was especially remarkable in Saxony. The number of Social Democratic delegates in a diet of 80 members rose from 5 in 1885 to 14 in 1895. So alarming did the growth appear, that the other parties combined, and on the 28th of March 1896 a new electoral law was passed, introducing indirect election and a franchise based on a triple division of classes determined by the amount paid in direct taxation. This resulted in 1901 in the complete elimination of the Socialists from the diet. On the 7th of June 1902 King Albert died, and was succeeded by his brother as King George. The most conspicuous event of his reign was the flight in December 1902 of the crown-princess Louise with a M. Giron, who had been French tutor to her children, which resulted in a grave scandal and a divorce. More important, however, was the extraordinary situation created by the electoral law of 1896. This law had in effect secured the misrepresentation of the mass of the people in the diet, the representation of the country population at the expense of that of the towns, of the interests of agriculture as opposed to those of industry. A widespread agitation was the outcome, and the temper of the people, of what became known as the "Red Kingdom," was displayed in the elections of 1903 to the German imperial parliament, when, under the system of universal suffrage, of 23 members returned 22 were Social Democrats. This led to proposals for a slight modification in the franchise for the Saxon diet (1904), which were not accepted. In the elections of 1906, however, only 8 of the Social Democrats succeeded in retaining their seats. In 1907 the government announced their intention of modifying the electoral system in Saxony by the adding of representation for certain professions to that of the three classes of the electorate. This was, however, far from satisfying the parties of the extreme Left, and the strength of Social Democracy in Saxony was even more strikingly displayed in 1909 when, in spite of plural voting, under a complicated franchise, 25 Socialist members were returned to the Saxon diet.

King George died on the 15th of October 1904 and was succeeded by his son as King Frederick Augustus III.

The Saxon Duchies.—The political history of the parts of Saxony left by the capitulation of Wittenberg to the Ernestine line, which occupy the region now generally styled Thuringia (Thüringen), is mainly a recital of partitions, reunions, redivisions and fresh combinations of territory among the various sons of the successive dukes. The principle of primogeniture was not introduced until the end of the 17th century, so that the Protestant Saxon dynasty, instead of building up a single compact kingdom for itself, has split into four petty duchies, of no political influence whatever. In 1547 the ex-elector John Frederick the Magnanimous was allowed to retain Weimar, Jena, Eisenach, Gotha, Henneberg and Saalfeld. Altenburg and a few other districts were added to the Ernestine possessions by the treaty of Naumburg in 1554, and other additions were made from other sources. John Frederick, who had retained and transmitted to his descendants the title of duke of Saxony, forbade his sons to divide their inheritance; but his wishes were respected only until after the death of his eldest son in 1565. The two survivors then founded separate jurisdictions at Weimar and Coburg, though arrangements were made to exchange territories every three years. In 1596 Saxe-Coburg gave off the branch Saxe-Eisenach; and in 1603 Saxe-Weimar gave off Saxe-Altenburg, the elder Weimar line ending and the younger beginning with the latter date. By 1638 Weimar had absorbed both Coburg and Eisenach; Altenburg remained till 1672. John, duke of Saxe-Weimar, who died in 1605, is regarded as the common ancestor of the present Ernestine lines. In 1640 his three surviving sons ruled the duchies of Weimar, Eisenach and Gotha. Eisenach fell in in 1644 and Altenburg in 1672, thus leaving the dukes of Saxe-Weimar and Saxe-Gotha to become the ancestors of the modern ruling houses. Saxe-Weimar was still repeatedly divided; in 1668 a Saxe-Marksuhl appears, and about 1672 a Saxe-Jena and a new Saxe-Eisenach. All these, however, were extinct by 1741, and their possessions returned to the main line, which had adopted the principle of primogeniture in 1719.

Saxe-Gotha was even more subdivided; and the climax was reached about 1680, when Gotha, Coburg, Meiningen, Romhild, Eisenberg, Hildburghausen and Saalfeld were each the capital of a duchy. By the beginning of 1825 only the first three of these and Hildburghausen remained, the lands of the others having been divided after much quarrelling. In that year the Gotha line expired, and a general redistribution of the lands of the "Nexus Gothanus," as this group of duchies was called, was arranged on the 12th of November 1826. The duke of Hildburghausen gave up his lands entirely for Altenburg and became duke of Saxe-Altenburg; the duke of Coburg exchanged Saalfeld for Gotha and became duke of Saxe-Coburg-Gotha; and the duke of Saxe-Meiningen received Hildburghausen, Saalfeld and some other territories, and added Hildburghausen to his title. The existing duchies are separately noticed.

The chief authority for the early history of Saxony is Widukind, whose *Res gestae Saxonicae* is printed, together with the works of other chroniclers, in the *Monumenta Germanica historica, Scriptores.* Modern authorities are C. W. Böttiger, *Geschichte des Kurstaates und Königreichs Sachsen*, new ed. by T. Flathe (1867–1873); Sturmhöfel, *Geschichte der sächsischen Lande und ihrer Herrscher* (Chemnitz, 1897–1898); and Tutzschmann, *Atlas zur Geschichte der sächsischen Länder* (Grimma, 1852). Collections which may be consulted are: *Codex diplomaticus Saxoniae regiae* (Leipzig, 1862–1879); the *Archiv für die sächsische Geschichte*, edited by K. von Weber (Leipzig, 1862–1879); and the *Bibliothek der sächsische Geschichte und Landeskunde*, edited by G. Buchholz (Leipzig, 1903). See also GERMANY: *Bibliography*, and the articles on the various dukes, electors and kings of Saxony.

SAXONY (Ger. *Provinz Sachsen*), one of the central provinces of the kingdom of Prussia, consists mainly of what was formerly the northern part of the kingdom of Saxony, which was ceded to Prussia in 1815, but also comprises part of the duchy of Magdeburg and other districts, the connexion of which with Prussia is of earlier date. The area of the province is 9751 sq. m. It is bounded W. by Hesse-Nassau, Hanover and Brunswick, N. by Hanover and Brandenburg, E. by Brandenburg and Silesia, and S. by the kingdom of Saxony and the small Thuringian states. It is, however, very irregular in form, entirely surrounding parts of Brunswick and the Thuringian states, and itself possessing several exclaves, while the northern portion is almost severed from the southern by the duchy of Anhalt.

The major part belongs to the great North-German plain, but the western and south-western districts include parts of the Harz, with the Brocken, its highest summit, and the Thuringian Forest. About nine-tenths of Prussian Saxony belongs to the basin of the Elbe, the chief feeders of which within the province are the Saale, with its tributary the Unstrut, and the Mulde, but a small district on the west drains into the Weser.

Saxony is on the whole the most fertile province of Prussia and excels all the others in its produce of wheat and beetroot for sugar, but the nature of its soil is very unequal. The best crop-producing districts lie near the base of the Harz Mountains, such as the "Magdeburger Börde" (between Magdeburg and the Saale) and the "Goldene Aue," and rich pasture lands occur in the river valleys, but the sandy plains of the Altmark, in the north part of the province, yield but a scanty return.

Of the total area 61% is occupied by arable land, 8% by meadows and pastures and 21% by forests. Wheat and rye are exported in considerable quantities. The beetroot for sugar is grown chiefly in the district to the north of the Harz, as far as the Ohre, and on the banks of the Saale; and the amount of sugar produced is nearly as much as that of all the rest of Prussia together. Flax, hops and oil-seeds are also cultivated, and large quantities of excellent fruit are grown at the foot of the Harz and in the valleys of the Unstrut and the Saale. The market-gardening of Erfurt and Quedlinburg is well known throughout Germany. The province is comparatively poor in timber, though there are some fine forests in the Harz and other hilly districts. Cattle-rearing is carried on with success in the river valleys, and more goats are met with here than in any other part of Prussia.

The principal underground wealth of Prussian Saxony consists of its salt and its brown coal, of both of which it possesses larger stores than any other part of the German empire. The chief rock-salt mines and brine springs are at Stassfurt, Schönebeck and Halle. The brown coal region extends from Oschersleben by Kalbe to Weissenfels; it is also found in the neighbourhood of Aschersleben, Bitterfeld and Wittenberg. Prussian Saxony also possesses three-fourths of the wealth of Germany in copper. The copper mines are found chiefly in the Harz district. The other mineral resources include silver (one-third of the total German yield), pit-coal, pyrites, alum, plaster of Paris, sulphur, alabaster and several varieties of good building-stone. Numerous mineral springs occur in the Harz.

In addition to the production of sugar the most important industries are the manufactures of cloth, leather, iron and steel wares, chiefly at Erfurt, Suhl and Sömmerda; spirits at Nordhausen, chemicals at Stassfurt and Schönebeck, and starch. Beer is also brewed extensively. Trade is facilitated by the great waterway of the Elbe as well as by a complete system of railways. The chief articles are wool, grain, sugar, salt, lignite and the principal manufactured products named above.

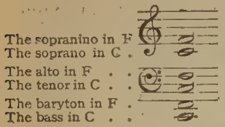
The population of the province of Saxony in 1905 was 2,979,221, an average of 305 persons to the square mile; they were almost equally divided between urban population and rural. There were 2,730,098 Protestants, 230,860 Roman Catholics and 8050 Jews. The bulk of the inhabitants are of unmixed German stock, but many of those in the east part have Wendish blood in their veins.

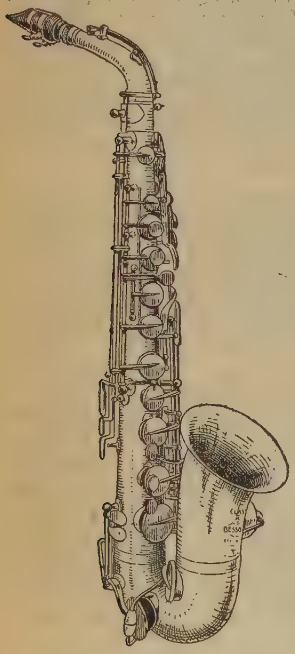
Prussian Saxony is divided into the three government districts of Magdeburg, Merseburg and Erfurt. The principal towns are Magdeburg, Halle, Erfurt, Halberstadt, Nordhausen, Mühlhausen, Aschersleben, Weissenfels and Zeitz. Magdeburg is the headquarters of an army corps. The provincial chambers meet at Merseburg. The province sends twenty members to the Reichstag and thirty-eight to the Prussian Abgeordnetenhaus (house of representatives). Magdeburg is the seat of an Evangelical consistory; the Roman Catholics belong to the diocese of Paderborn. The university of Halle holds high rank among German seats of learning.

See the *Handbuch der Provinz Sachsen* (Magdeburg, 1900); and Jacobs, *Geschichte der in der preussischen Provinz Sachsen vereinigten Gebiete* (Gotha, 1884).

SAXOPHONE (Ger. *Saxophon*, Ital. *sassofone*), a modern hybrid musical instrument invented by Adolphe Sax, having the clarinet mouthpiece with single reed applied to a conical brass tube. In general appearance the saxophone resembles the bass clarinet, but the tube of the latter is cylindrical and of wood; both instruments are doubled up near the bell, which is shaped somewhat like the flower of the gloxinia. The mouthpiece in both is fixed to a serpentine tube at right angles to the main bore. On the saxophone, owing to its conical bore, the production of sound materially differs from that of the clarinet, and resembles that of the oboe. The reed mouthpiece in combination with a conical tube allows the performer to give the ordinary harmonic series unbroken, which means in practice that the octave or second member of the harmonic series is first overblown when the pressure of the breath and the tension of the lips on the reed are proportionally increased. The saxophone is therefore one of the class known as octave instruments. The fundamental note given out by the tube when the lateral holes are closed is that of an open organ pipe of the same length, whereas when, as in the clarinet family, the reed mouthpiece is combined with a cylindrical bore, the tube behaves as though it were closed at one end, and its notes are an octave lower in pitch. Hence the bass clarinet to give the same note as a bass saxophone would need to be only half as long. The closed pipe, moreover, can only overblow the uneven numbers of the harmonic series, and therefore first gives the 12th instead of the octave, which necessitates an entirely different arrangement of holes and keys and a different scheme of fingering.

The bore of the saxophone is large, and there are from 18 to 20 keys covering holes of large diameter to produce the fundamental scale. The first 15 semitones are obtained by opening successive keys, the rest of the compass by means of octave keys enabling the performer to sound the harmonic octave of the fundamental scale. The compass of the various saxophones extends over 2 octaves and a fifth with chromatic intervals, being one octave less than the clarinet. The complete family consists of the accompanying members. The treble clef is used in notation, and all saxophones are transposing instruments, the music being written in a higher key, according to the difference in pitch between the fundamental note of the instrument and the standard C of the notation. The keys given above are of the orchestral saxophones; the instruments used in military bands are a tone lower. The quality of tone of this family of instruments is inferior to that of the clarinets and has affinities with that of the harmonium. According to Berlioz it has vague analogies with the timbre of 'cello, clarinet and cor anglais, with, however, a brazen tinge. To a clockmaker of Lisieux named Desfontenelles, who made a clarinet with a conical bore and an upturned bell in 1807, is due the combination of single reed mouthpiece with a conical tube. In 1840 Adolphe Sax, in trying to produce a clarinet that would overblow an octave like the flute and oboe, invented the saxophone, which at once leapt into popularity in France and Belgium, where the alto, tenor and baryton have superseded the bassoon in almost all the military bands. Many modern French composers, Meyerbeer, Massenet, Ambroise Thomas and others, have scored for it in their operas. Kastner introduced it into the orchestra in Paris in 1844 in *Le Dernier Roi de Juda*. The saxophone has been adopted in England at the Royal Military School of Music at Kneller Hall. (K. S.)





(Besson & Co., Ltd.)

SAY, JEAN BAPTISTE (1767–1832), French economist, was born at Lyons on the 5th of January 1767. His father, Jean Étienne Say, was of a Protestant family which had originally belonged to Nîmes, but had removed to Geneva for some time in consequence of the revocation of the edict of Nantes. Young Say was intended to follow a commercial career, and was sent, with his brother Horace, to England, and lived first at Croydon, in the house of a merchant, to whom he acted as clerk, and afterwards in London, where he was in the service of another employer. When, on the death of the latter, he returned to France, he was employed in the office of a life assurance company directed by E. Clavière, afterwards known in politics. Clavière called his attention to the *Wealth of Nations*, and the study of that work revealed to him his vocation. His first literary attempt was a pamphlet on the liberty of the press, published in 1789. He worked under Mirabeau on the *Courrier de Provence*. In 1792 he took part as a volunteer in the campaign of Champagne; in 1793 he assumed, in conformity with the Revolutionary fashion, the pre-name of *Atticus*, and became secretary to Clavière, then finance minister. He married in 1793 Mlle Deloche, daughter of a former *avocat au conseil*; the young pair were greatly straitened in means in consequence of the depreciation of the assignats. From 1794 to 1800 Say edited a periodical entitled *La Décade philosophique, littéraire, et politique*, in which he expounded the doctrines of Adam Smith. He had by this time established his reputation as a publicist, and, when the consular government was established in the year VIII (1799), he was selected as one of the hundred members of the tribunate, and resigned, in consequence, the direction of the *Décade*. He published in 1800 *Olbie, ou essai sur les moyens de réformer les mœurs d'une nation*.

In 1803 appeared his principal work, the *Traité d'économie politique*. In 1804, having shown his unwillingness to sacrifice his convictions for the purpose of furthering the designs of Napoleon, he was removed from the office of tribune, being at the same time nominated to a lucrative post, which, however, he thought it his duty to resign. He then turned to industrial pursuits, and, having made himself acquainted with the processes of the cotton manufacture, founded at Auchy, in the Pas de Calais, a spinning-mill which employed four or five hundred persons, principally women and children. He devoted his leisure to the improvement of his economic treatise, which had for some time been out of print, but which the censorship did not permit him to republish; and in 1814 he availed himself (to use his own words) of the sort of liberty arising from the entrance of the allied powers into France to bring out a second edition of the work, dedicated to the emperor Alexander, who had professed himself his pupil. In the same year the French government sent him to study the economic condition of Great Britain. The results of his observations during his journey through England and Scotland appeared in a tract *De l'Angleterre et des Anglais*; and his conversations with distinguished men in those countries contributed to greater correctness in the exposition of principles in the third edition of the *Traité*, which appeared in 1817. A chair of industrial economy was founded for him in 1819 at the Conservatoire des Arts et Métiers. In 1831 he was made professor of political economy at the Collège de France. He published in 1828–1830 his *Cours complet d'économie politique pratique*, which is in the main an expansion of the *Traité*, with practical applications. In his later years he became subject to attacks of nervous apoplexy. He lost his wife in January 1830; and from that time his health constantly declined. When the revolution of that year broke out, he was named a member of the council-general of the department of the Seine, but found it necessary to resign. He died at Paris on the 15th of November 1832.

Say was essentially a propagandist, not an originator. His great service to mankind lay in the fact that he disseminated throughout Europe by means of the French language, and popularized by his clear and easy style, the economic doctrines of Adam Smith. It is true that his French panegyrists (and he is not himself free from censure on this score) are unjust in their estimate of Smith as an expositor and extol too highly the merits of Say. On the side of the philosophy of science his observations are usually commonplace or superficial. Thus he accepts the shallow dictum of Condillac that *toute science se réduit à une langue bien faite*. He recognizes political economy and statistics as alike sciences, and represents the distinction between them as having never been made before him, though he quotes what Smith had said of political arithmetic. While deserving the praise of honesty, sincerity and independence, he is inferior to his predecessor in breadth of view on moral and political questions. In his general conception of human affairs there is a tendency to regard too exclusively the material side of things, which made him pre-eminently the economist of the French liberal *bourgeoisie*. He is inspired with the dislike and jealousy of governments so often felt and expressed by thinkers formed in the social atmosphere of the 18th century. Soldiers are for him not merely unproductive labourers, as Smith called them; they are rather "destructive labourers." Taxes are uncompensated payments; they may be described as of the nature of robbery.

Say is considered to have brought out the importance of capital as a factor in production more distinctly than the English economists, who unduly emphasized labour. The special doctrines most commonly mentioned as due to him are—(1) that of "immaterial products," and (2) what is called his "théorie des débouchés." Objecting, as Germain Garnier had, to Smith's distinction between productive and unproductive labour, he maintains that, production consisting in the creation or addition of a utility, all useful labour is productive. He is thus led to recognize immaterial products, whose characteristic quality is that they are consumed immediately and are incapable of accumulation; under this head are to be ranged the *services* rendered either by a person, a capital or a portion of land, as, *e.g.*, the advantages derived from medical attendance, or from a hired house or from a beautiful view. But in working out the consequences of this view Say is not free from obscurities and inconsistencies; and by his comprehension of these immaterial products within the domain of economics he is confirmed in the error of regarding that science as filling the whole sphere which really belongs to sociology. His "théorie des débouchés" amounts to this, that, products being, in last analysis, purchased only with products, the extent of the markets (or outlets) for home products is proportional to the quantity of foreign productions; when the sale of any commodity is dull, it is because there is not a sufficient number, or rather value, of other commodities produced with which it could be purchased. Another proposition on which Say insists is that every value is consumed and is created only to be consumed. Values can therefore be accumulated only by being reproduced in the course or, as often happens, by the very act of consumption; hence his distinction between reproductive and unproductive consumption. We find in him other corrections or new presentations of views previously accepted, and some useful suggestions for the improvement of nomenclature.

Say's writings occupy vols. ix.-xii. of Guillaumin's *Collection des principaux économistes.* Among them are, in addition to those already mentioned, *Catéchisme d'économie politique* (1815); *Petit Volume contenant quelques aperçus des hommes et de la société, lettres à Malthus sur différens sujets d'économie politique* (1820); *Épitomé des principes de l'économie politique* (1831). A volume of *Mélanges et correspondance* was published posthumously by Charles Comte, author of the *Traité de législation*, who was his son-in-law. To the above must be added an edition of Storch's *Cours d'économie politique*, which Say published in 1823 without Storch's authorization, with notes embodying a "critique amère et virulente," a proceeding which Storch justly resented.

The last edition of the *Traité d'économie politique* which appeared during the life of the author was the 5th (1826); the 6th, with the author's final corrections, was edited by the eldest son, Horace Émile Say, himself known as an economist, in 1846. The work was translated into English "from the 4th edition of the French" by C. R. Prinsep (1821), into German by Ludwig Heinrich von Jakob (1807) and by C. Ed. Morstadt (1818 and 1830), and, as Say himself informs us, into Spanish by José Queypo. The *Cours d'économie politique pratique*, from which Morstadt had given extracts, was translated into German by Max Stirner (1845). The *Catéchisme* and the *Petit Volume* have also been translated into several European languages. An English version of the *Lettres à Malthus* appears in vol. xvii. of the *Pamphleteer* (1821). See also *Jean Baptiste Say*, by A. Liesse (Paris, 1901). (J. K. I.)

SAY, [JEAN BAPTISTE] LÉON (1826–1896), French statesman and economist, was born in Paris on the 6th of June 1826. The family was a most remarkable one. His grandfather JEAN BAPTISTE SAY (*q.v.*) was a well-known economist. His brother LOUIS AUGUSTE SAY (1774–1840), director of a sugar refinery at Nantes, wrote several books against his theories. His son HORACE ÉMILE SAY (1794–1860), the father of Léon Say, was educated at Geneva, and had travelled in America before establishing himself in business in Paris, where he became president of the Chamber of Commerce in 1848. His careful investigations into the condition of industry at Paris gained for him a seat in the Academy of political and moral sciences, 1857.

Léon Say thus inherited zeal for economic studies, of which he gave proof by publishing at the age of twenty-two a brief *Histoire de la caisse d'escompte.* He was at first destined for the law, next entered a bank, and finally obtained a post in the administration of the Chemin de fer du Nord. Meanwhile he became a regular contributor to the *Journal des débats*, where he established his reputation by a series of brilliant attacks on the financial administration of the prefect of the Seine, Haussmann. He displayed talent for interesting popular audiences in economic questions. His sympathies, like those of his grandfather, were with the British school of economists; he was, indeed, the hereditary defender of free-trade principles in France. He had, moreover, an intimate acquaintance with the English language and institutions, and translated into French Goschen's *Theory of Foreign Exchanges.* He was one of the pioneers of the co-operative movement in France. Elected to the Assembly of 1871 by the departments of Seine and Seine-et-Oise, he adopted the former, and took his seat among the Moderate Liberals, to whose principles he adhered throughout his life. He was immediately chosen as reporter of the commission on the state of the national finances, and in this capacity prepared two elaborate statements. Thiers, though opposing their publication on grounds of public expediency, was much struck by the ability displayed in them, and on the 5th of June appointed Say prefect of the Seine. The fall of the empire, the siege of Paris, and the Commune had reduced the administration of the capital to chaos, and the task of reconstruction severely tried the new prefect's power of organization. This was, however, a gift with which he was pre-eminently endowed; and he only quitted his post to assume, in December 1872, the ministry of finance—a remarkable tribute to his abilities from Thiers, who himself held strongly protectionist views. In all other respects Say regarded himself as the disciple of Thiers, who, in his last public utterance, designated Say as one of the younger men who would carry on his work. He fell from office with Thiers on the 24th of May 1873, and was elected president of the Left Centre group, as whose candidate he unsuccessfully contested the presidency of the Chamber with Buffet. In spite of their divergence of views, he consented, at the urgent request of President MacMahon, to take office in March 1875 in the Buffet Cabinet; but the reactionary policy of the premier led to a dispute between him and Say both in the press and in the constituencies, and brought about Buffet's resignation. Say continued to hold the ministry of finance under Dufaure and Jules Simon, and again in the Dufaure ministry of December 1877, and its successor, the Waddington ministry, till December 1879. During this long period, in which he was practically the autocratic ruler of the French finances, he had first to complete the payment of the war indemnity—an operation which, thanks largely to his consummate knowledge of foreign exchanges, was effected long before the prescribed time. It was at a conference held between Say, Gambetta and M. de Freycinet in 1878 that the great scheme of public works introduced by the latter was adopted. Say's general financial policy was to ameliorate the incidence of taxation. As a pendant to his free-trade principles, he believed that the surest way of enriching the country, and therefore the Treasury, was to remove all restrictions on internal commerce. He accordingly reduced the rate of postage, repealed the duties on many articles of prime utility, such as paper, and fought strongly, though unsuccessfully, against the system of *octrois.* On the 30th of April 1880 he accepted the post of ambassador in London for the purpose of negotiating a commercial treaty between France and England, but the presidency of the Senate falling vacant, he was elected to it on the 25th of May, having meanwhile secured a preliminary understanding, the most important feature of which was a reduction of the duty on the cheaper class of French wines. In January 1882 he became minister of finance in the Freycinet Cabinet, which was defeated in the following July on the Egyptian question. Say's influence over the rising generation grew less; his "academic Liberalism" was regarded as old-fashioned; Socialism, which he never ceased to attack, obtained even greater power, and free-trade was discarded in favour of M. Méline's policy of protection, against which Say vainly organized the *Ligue contre le renchérissement du pain.* He had, however, a large share in the successful opposition to the income-tax, which he considered likely to discourage individual effort and thrift. In 1889 he quitted the Senate to enter the Chamber as member for Pau, in the belief that his efforts for Liberalism were more urgently needed in the popular Assembly. Throughout his career he was indefatigable both as a writer and as a lecturer on economics, and in both capacities exerted a far wider influence than in parliament. Special mention must be made of his work, as editor and contributor, on the *Dictionnaire des finances* and *Nouveau Dictionnaire d'économie politique.* His style was easy and lucid, and he was often employed in drawing up important official documents, such as the famous presidential message of December 1877. He was for many years the most prominent member of the Académie des Sciences Morales et Politiques, and in 1886 succeeded to Edmond About's seat in the Académie Française. He died in Paris on the 21st of April 1896. A selection of his most important writings and speeches has since been published in four volumes under the title of

Les Finances de la France sous la troisième république (1898–1901).

See Georges Michel, *Léon Say* (Paris, 1899); Georges Picot, *Léon Say, notice historique* (Paris, 1901), with a bibliography.

SAY, a town on the right bank of the river Niger in 13° 4′ N. and 2° 30′ E., in the French colony of Upper Senegal and Niger. In the agreement of 1890 between Great Britain and France for the delimitation of their respective spheres of influence in West Africa, Say was taken as the western end of an imaginary line which ran eastward to Barrua on Lake Chad. To the north the "light soil" of the Sahara—a phrase used by Lord Salisbury in explaining the nature of the agreement in the House of Lords—was recognized as French; to the south the Sokoto empire (northern Nigeria) fell to Great Britain. By the convention of 1898 Say, however, and a considerable tract of territory south and east of the town were ceded to France. (See Africa, § 5.)

SAYAD, a descendant of Ali, the son-in-law of Mahomet, by Fatima, Mahomet's daughter. Many of the Pathan tribes in the North-West Frontier Province of India, such as the Bangash of Kohat and the Mishwanis of the Hazara border, claim Sayad origin. The apostles who completed the conversion of the Pathans to Islam were called Sayads if they came from the west, and Sheikhs if they came from the east; hence doubtless many false claims to Sayad origin. In Afghanistan the Sayads have much of the commerce in their hands, as their holy character allows them to pass unharmed where other Pathans would be murdered.

The Sayads gave a short-lived dynasty to India, which reigned at Delhi during the first half of the 15th century. Their name again figures in Indian history at the break up of the Mogul empire, when two Sayad brothers created and dethroned emperors at their will (1714–1720). In 1901 the total number of Sayads in all India was returned at 1,339,734. They include many well-known and influential families. The first Mahommedan appointed to the Council of India and the first appointed to the Privy Council were both Sayads.

SAYAN MOUNTAINS, a range of Asia, forming the eastern continuation of the Sailughem or Altai range, stretching from 89° E. to 106° E. Orographically they are the N. border-ridge of the plateau of N.W. Mongolia, and separate that region from Siberia. The geology is imperfectly known. While the general elevation is 7000 to 9000 ft., the individual peaks, consisting largely of granites and metamorphic slates, reach altitudes of 10,000 ft. and 11,450 ft., *e.g.* in Munko Sardyk; while the principal passes lie 6000 to 7500 ft. above the sea, *e.g.* Muztagh 7480 ft., Mongol 6500 ft., Tenghyz 7480 ft. and Obo-sarym 6100 ft. In 92° E. the system is pierced by the Bel-kem or upper Yenisei, and in 106°, at its eastern extremity, it terminates above the depression of the Selenga-Orkhon valley. From the Mongolian plateau the ascent is on the whole gentle, but from the plains of Siberia it is much steeper, despite the fact that the range is masked by a broad belt of subsidiary ranges of an Alpine character, *e.g.* the Usinsk, Oya, Tunka, Kitoi and Byelaya ranges. Between the breach of the Yenisei and the Kosso-gol (lake) in 100° 30′ E. the system bears also the name of Yerghik-taiga. The flora is on the whole poor, although the higher regions carry good forests of larch, pitch pine, cedar, birch and alder, with rhododendrons and species of *Berberis* and *Ribes*. Lichens and mosses clothe many of the boulders that are scattered over the upper slopes.

SAYBROOK, a township of Middlesex county, Connecticut, U.S.A., at the mouth and on the W. bank of the Connecticut river, about 100 m. E.N.E. of New York City and about 40 m. S. of Hartford. Pop. (1900) 1634; (1910) 1907. The post office of the township is named Deep River. Mainly confined to Saybrook Point, jutting out into the river, is the township of Old Saybrook (pop. in 1910, 1516), separated from the township of Saybrook in 1852, but actually the mother colony; its post village is called Saybrook. It is served by the New York, New Haven & Hartford railway, the Valley branch of which here separates from the Shore Line branch. It is a beautiful place, with several old buildings, notably the Hart mansion built about 1783 by Captain Elisha Hart, whose seven daughters here entertained Washington Irving, J. R. Drake and Fitz-Greene Halleck. Com. Isaac Hull and his nephew Joseph Bartine Hull married two of the daughters, and the younger of these in 1874 left the house to the township of Old Saybrook, which refused the gift. Fenwick (pop. in 1910, 34), the smallest borough in the state, is a part of Old Saybrook township, in which there are summer residences. The first settlement was made on Saybrook Point late in 1635 by John Winthrop, commissioned governor for one year by the company of which the principal shareholders were Lord Saye and Sele, Lord Brooke, Sir Richard Saltonstall, John Pym and John Hampden, and which had a grant from the earl of Warwick. The English settlers forestalled the Dutch, who attempted to land here in November. A palisade was built across the narrowest part of the neck of the point by Lion Gardiner, who built a fort (burned in 1647) and planned a settlement, to which for a time it was thought Lord Saye and Sele, Lord Brooke, John Hampden, Oliver Cromwell, and other independents would immigrate. Gardiner called the place Saybrook from the names of its principal proprietors. He had practical control until 1639, when he was displaced by George Fenwick (d. 1657), whose wife, called Lady Fenwick (she was the widow of Sir John Botelier), died here in 1646, and who in 1644 sold [1] to Connecticut the proprietors' rights.

In 1646 the First Church of Christ was organized; a church building was erected in 1647, and in 1680–1681 another, in which in September 1708, at the call of the General Assembly, met a Congregational Synod of 16 members which reaffirmed the Savoy Confession of Faith and the Heads of Agreement adopted in England in 1691 by Congregationalists and Presbyterians, and drew up the Saybrook Platform of discipline, providing for the promotion of harmony and order, the regular introduction of candidates into the ministry and the establishment of associations and consociations, the latter being tribunals with final and appellate jurisdiction. This platform was approved by the General Assembly, and churches organized under it were declared to be established by law. This establishment continued in full force until 1784. A granite boulder (1901) marks the site of the first home of Yale University, established here in 1701 as the Collegiate School of Connecticut; until 1716, when it was removed to New Haven, most of the school's commencements were held here and all its exercises after 1707–1708, before which time most of the actual teaching was done in Killingworth, now Clinton, Connecticut. Saybrook was the home of David Bushnell (1742–1824), who devised in 1776 a submarine torpedo and a tortoise-shaped diving boat, the "American Turtle," which were tried without success against the British in the War of American Independence.

The original township of Saybrook contained the present townships of Old Saybrook, Westbrook (1840), Essex (1854, taken from Old Saybrook), Saybrook and Chester (1836), and, on the east side of the river, parts of the present Lyme (1665), Old Lyme (1855, from Lyme), and East Lyme (1839, from Lyme and Waterford).

SAYCE, ARCHIBALD HENRY (1846–), British Orientalist, was born at Shirehampton on the 25th of September 1846, son of the Rev. H. S. Sayce, vicar of Caldicot. He was educated at Bath, and at Queen's College, Oxford, of which he became fellow in 1869. In 1891 he was elected professor of Assyriology at Oxford. He threw his whole energies into the study of biblical and other Oriental subjects, and though his conclusions have in a number of cases been considerably modified (*e.g.* in chronology and transliteration) by the work of other scholars (see, *e.g.* Babylonia and Assyria) it is impossible to overestimate his services to Oriental scholarship. He travelled widely in the East and continued in later life annual trips up the Nile. An interesting example of the importance of his pioneer work is the fact that there has been a strong tendency to revert to the views which he advanced on the question of the Hittites in his early Oxford lectures. He was a member of the Old Testament Revision Company in 1874–1884; deputy professor of comparative philology in Oxford 1876–1890; Hibbert Lecturer 1887; Gifford Lecturer 1900–1902.

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[1] The sale was probably illegal as it was never confirmed; and it does not appear that the earl of Warwick had ever had title to the land to convey to the company of which Fenwick was agent. For a conjectural explanation of the history of the Warwick patent see Forrest Morgan, "The Solution of an Old Historic Mystery," in the *Magazine of History* for July, August, September and October 1909.

Of his numerous publications the following are of special importance:—*Assyrian Grammar for Comparative Purposes* (1872); *Principles of Comparative Philology* (1874); *Babylonian Literature* (1877); *Introduction to the Science of Language* (1879); *Monuments of the Hittites* (1881); *Herodotus i.-iii.* (1883); *Ancient Empires of the East* (1884); *Introduction to Ezra, Nehemiah and Esther* (1885); *Assyria* (1885); *Hibbert Lectures on Babylonian Religion* (1887); *The Hittites* (1889); *Races of the Old Testament* (1891); *Higher Criticism and the Verdict of the Monuments* (1894); *Patriarchal Palestine* (1895); *The Egypt of the Hebrews and Herodotus* (1895); *Early History of the Hebrews* (1897); *Israel and the Surrounding Nations* (1898); *Babylonians and Assyrians* (1900); *Egyptian and Babylonian Religion* (1903); *Archaeology of the Cuneiform Inscr.* (1907). He also contributed important articles to the 9th, 10th and 11th editions of the *Encyclopaedia Britannica* and edited a number of Oriental works.

SAYE AND SELE, WILLIAM FIENNES, 1st Viscount (1582–1662), was the only son of Richard Fiennes, 7th Baron Saye and Sele, and was descended from James Fiennes, Lord Saye and Sele, who was lord chamberlain and lord treasurer under Henry VI. and was beheaded by the rebels under Jack Cade on the 4th of July 1450. Born on the 28th of May 1582 Fiennes, like many of his family, was educated at New College, Oxford; he succeeded to his father's barony in 1613, and in parliament opposed the policy of James I., undergoing a brief imprisonment for objecting to a benevolence in 1662; and he showed great animus towards Lord Bacon. In 1624, owing probably to his temporary friendship with the duke of Buckingham, he was advanced to the rank of a viscount, but notwithstanding this he remained during the early parliaments of Charles I. champion of the popular cause, and was in Clarendon's words "the oracle of those who were called Puritans in the worst sense, and steered all their counsels and designs." Afterwards his energies found a new outlet in helping to colonize Providence Island, and in interesting himself in other and similar enterprises in America. Although Saye resisted the levy of ship-money, he accompanied Charles on his march against the Scots in 1639; but, with only one other peer, he refused to take the oath binding him to fight for the king to "the utmost of my power and hazard of my life." Then Charles I. sought to win his favour by making him a privy councillor and master of the court of wards. When the Civil War broke out, however, Saye was on the committee of safety, was made lord-lieutenant of Gloucestershire, Oxfordshire and Cheshire, and raising a regiment occupied Oxford. He was a member of the committee of both kingdoms; was mainly responsible for passing the self-denying ordinance through the House of Lords; and in 1647 stood up for the army in its struggle with the parliament. In 1648, both at the treaty of Newport and elsewhere, Saye was anxious that Charles should come to terms, and he retired into private life after the execution of the king, becoming a privy councillor again upon the restoration of Charles II. He died at his residence, Broughton Castle near Banbury, on the 14th of April 1662. On several occasions Saye outwitted the advisers of Charles I. by his strict compliance with legal forms. He was a thorough aristocrat, and his ideas for the government of colonies in America included the establishment of an hereditary aristocracy. His eldest son James (*c.* 1603–1674) succeeded him as 2nd viscount; other sons were the parliamentarians Nathaniel Fiennes (*q.v.*) and John Fiennes. The viscounty of Saye and Sele became extinct in 1781, and the barony is now held by the descendants of John Twisleton (d. 1682) and his wife Elizabeth (d. 1674), a daughter of the 2nd viscount. Saybrook (*q.v.*) in Connecticut is named after Viscount Saye and Lord Brooke.

SAYER (or Sayers), **JAMES** (1748–1823), English caricaturist, was a native of Yarmouth, and son of a merchant captain. He began as clerk in an attorney's office, and was for a time a member of the borough council. In 1780 the death of his father put him in possession of a small fortune, and he came to London. As a political caricaturist he was a supporter of William Pitt. His plate of "Carlo Khan's triumphal entry into Leadenhall Street" was allowed by C. J. Fox, against whom it was directed, to have damaged him severely in public opinion. Indeed Sayer was always at his best when attacking Fox, whose strongly marked features he rendered with remarkable power, and always so as to make them convey expressions of defiant impudence or of anger. Pitt, who showed no wish to help literature or art in any other case, provided Sayer with a place as marshal of the Exchequer court. He died in Curzon Street, Mayfair, on the 20th of April 1823.

Sayer's "Carlo Khan" has been frequently reproduced. But he can only be judged with confidence after examining the collection in the British Museum, or other public libraries. His drawings, made originally with pencil on oil paper, were etched for him by the Brethertons. They were then sold in collections of the size of a large octavo copybook, under such titles as *Illustrious Heads* (1794) or *Outlines of the Opposition* (1795). Sayer left a complete gallery of small full-length pictures of the public men of his time, slightly caricatured. In his great plates he is inferior to Gillray, and he never has the grace of Rowlandson, but he is less exaggerated than either, and nearer the truth.

SAYERS, TOM (1826–1865), English pugilist, was born at Brighton on the 25th of May 1826. By trade a bricklayer, he began his career as a prize fighter in 1849 and won battle after battle, his single defeat being at the hands of Nat Langham in October 1853. In 1857 he gained the championship. His fight with the American, John C. Heenan, the Benicia Boy, a much heavier man than himself, is perhaps the most famous in the history of the English prize ring. It took place at Farnborough on the 17th of April 1860 and lasted two hours and six minutes, thirty-seven rounds being fought. After Sayers's right arm had been injured the crowd pressed into the ring and the fight was declared a draw. £3000 was raised by public subscription for Sayers, who withdrew from the ring and died on the 8th of November 1865. The champion was 5 ft. 8½ in. in height and his fighting weight was under 11 stone. An account of the fight between Sayers and Heenan is given by Frederick Locker-Lampson in *My Confidences* (1896).

SAYRE, a borough of Bradford county, Pennsylvania, U.S.A., on the North Branch of the Susquehanna river, about 95 m. (by rail) N.N.W. of Wilkes-Barré, and just S. of the New York state boundary. Pop. (1900) 5243 (337 foreign-born); (1910) 6426. Sayre is served by the main line and by a branch of the Lehigh Valley railway, and is connected by electric railway with Waverly, New York, and with the adjacent borough of Athens, Pennsylvania (pop. in 1910, 3796), which manufactures furniture, carriages and wagons. Sayre, Athens, South Waverly and Waverly form virtually one industrial community. The borough of Sayre is the seat of the Robert Packer Hospital (1885) and has two parks. It is the trade centre of an agricultural and dairying region, and has metal works and other factories; but its industrial importance is due primarily to the locomotive and car shops of the Lehigh Valley railway. It was named in honour of Robert Heysham Sayre (1824–1907), long chief-engineer of this railway. Sayre was settled in 1880 and was incorporated as a borough in 1891.

SAYYID AHMAD KHAN, SIR (1817–1898), Mahommedan educationist and reformer, was born at Delhi, India, in 1817. He belonged to a family which had come to India with the Mahommedan conquest, and had held important offices under the Mogul emperors. Although his imperfect acquaintance with English prevented his attainment of higher office than that of a judge of a small cause court, he earned the title of the recognized leader of the Mahommedan community. To the British he rendered loyal service, and when the mutiny reached Bijnor in Rohilkand in May 1857 the British residents owed their lives to his courage and tact. His faithfulness to his religion was pronounced, and in 1876 he defended the cause of Islam in *A Series of Essays on Mahommed*, written in London. He used these advantages to act as interpreter between the Mahommedans and their rulers, and to rouse his co-religionists to a sense of the benefits of modern education. The task was no light one; for during the first half of the 19th century the Mahommedans had kept themselves aloof from English education, and therefore from taking their proper part in the British administration, being content to study Persian and Arabic in their own mosques. Sayyid Ahmad set himself to alter their resolution. He established a translation society, which became the Scientific Society of Aligarh. He wrote letters from England to draw the hearts of the East to the West. In 1873 he founded the Mahommedan Anglo-Oriental College at Aligarh, and raised funds for the buildings of which Lord Lytton laid the foundation-stone. He stimulated a similar movement elsewhere, and among other cities Karachi, Bombay and Hyderabad caught the infection of his spirit. Thus he effected a revolution in the attitude of Mahommedans towards modern education. He was made K.C.S.I., and became a member of the legislative councils of India and Allahabad, and of the education commission. He died at Aligarh on the 2nd of March 1898.

See Lieut.-Colonel G. F. I. Graham, *The Life and Work of Sir Saiyad Ahmed Khan* (1885). (W. L.-W.)

SBEITLA (anc. *Sufetula*), a ruined city of Tunisia, 66 m. S.W. of Kairawan. Long buried beneath the sand, this is the most beautiful and extensive of the Roman cities in the regency. It stands at the foot of a hill by a river, here perennial, but at a short distance beyond lost in the sands. The chief ruin is a rectangular walled enclosure, 238 ft. by 198 ft., known as the Hieron, having three small and one large entrance. The great gateway is a fine monumental arch in fair preservation, with an inscription to Antoninus Pius. Facing the arch, within the Hieron, their rear walls forming one side of the enclosure, are three temples, connected with one another by arches, and forming one design. The length of the entire façade is 118 ft. The principal chamber of the central temple, which is of the Composite order, is 44 ft. long; those of the side temples, in the Corinthian style, are smaller. The walls of the middle temple are ornamented with engaged columns; those of the other buildings with pilasters. The porticos have fallen, and their broken monolithic columns, with fragments of cornices and other masonry, lie piled within the enclosure, which is still partly paved. (In 1901 a violent storm further damaged the temples and forced the gateway out of the perpendicular.) The other ruins include a triumphal arch of Constantine, a still serviceable bridge and a square keep or tower of late date.

The early history of Sufetula is preserved only in certain inscriptions. Under Antoninus and Marcus Aurelius it appears to have been a flourishing city, the district, now desolate, being then very fertile and covered with forests of olives. It was partly rebuilt during the Byzantine occupation and became a centre of Christianity. At the time of the Arab invasion it was the capital of the exarch Gregorius, and outside its walls the battle was fought in which he was slain; his daughter, who is said by the Arab historians to have fought by the side of her father, became the wife of one of the Arab leaders. The invaders besieged, captured and sacked Sufetula, and it is not afterwards mentioned in history. It was not until the close of the 19th century that the ruins were thoroughly examined by French savants.

See A. Graham, *Roman Africa* (London, 1902); Sir R. L. Playfair, *Travels in the Footsteps of Bruce* (London, 1877).

SCABBARD, the sheath of a sword. The early forms of the word given in the *Promptorium parvulorum* are *scauberk*, *scaubert* or *scauberd*. The termination is certainly from the Teutonic *bergen*, to protect, as seen in "hauberk," "hawberk" (*i.e. halsberg*), literally a protection for the neck and shoulders, hence the "long tunic of mail" of the 12th century (see ARMS AND ARMOUR). The first part is doubtful; Skeat takes it as representing the O. Fr. *escale*, mod. *écaille*, shell, Ger. *Schale*; the word would therefore mean an outer sheath or shell that covers or protects.

SCABBLING, or SCAPPLING, in building, the process of reducing a stone to a rough square by the axe or hammer; in Kent the rag-stone masons call this knobbling (see MASONRY).

SCABIES, or ITCH, a skin disease due to an animal parasite, the *Sarcoptes scabei* (see MITE), which burrows under the epidermis at any part of the body, but hardly ever in the face or scalp of adults; it usually begins at the clefts of the fingers, where its presence may be inferred from several scattered pimples, which will probably have been torn at their summits by the scratching of the patient, or have been otherwise converted into vesicles or pustules. The remedy is soap and water, and sulphur ointment.

SCAEVOLA, the name of a famous family of ancient Rome, the most important members of which were:—

1. GAIUS MUCIUS SCAEVOLA, a legendary hero, who volunteered to assassinate Lars Porsena when he was besieging Rome. Making his way through the enemy's lines to the royal tent, but not knowing Porsena by sight, he slew his secretary by mistake. Before the royal tribunal Mucius declared that he was one of 300 noble youths who had sworn to take the king's life, and that he had been chosen by lot to make the attempt first. Threatened with death or torture, Mucius thrust his right hand into the fire blazing upon an altar, and held it there until it was consumed. The king, deeply impressed and dreading a further attempt upon his life, ordered Mucius to be liberated, made peace with the Romans and withdrew his forces. Mucius was rewarded with a grant of land beyond the Tiber, known as the "Mucia Prata" in the time of Dionysius of Halicarnassus, and received the name of Scaevola ("left-handed"). Dionysius says nothing of the incident of the fire, and attributes Porsena's alarm partly to the loss of a band of marauders in an ambuscade. The story is presumably an attempt to explain the name Scaevola, coloured by national and family vanity (Livy ii. 12; Dion. Halic. v. 27-30). The Mucius of the legend is described as a patrician; the following were undoubtedly plebeians.

2. PUBLIUS MUCIUS SCAEVOLA, Roman orator and jurist, consul 133 B.C. during the time of the Gracchan disturbances. He was not opposed to moderate reforms, and refused to use violence against Tiberius Gracchus, although called upon in the senate "to protect the state and put down the tyrant." After the murder of Gracchus, however, he expressed his approval of the act. He was an opponent of the younger Scipio Africanus, for which he was attacked by the satirist Lucilius (Persius i. 115; Juvenal i. 154). In 130 he succeeded his brother Mucianus as pontifex maximus. During his tenure of office he published a digest in 80 books of the official annals kept by himself and his predecessors, which were afterwards discontinued as unnecessary, their place being taken by the works of private annalists. He was chiefly distinguished for his knowledge of law, which he held to be indispensable to a successful pontifex. Cicero frequently mentions him as a lawyer of repute, and he is cited several times by the jurists whose works were used in the compilation of the Digest. He was also a famous player at ball and the game called Duodecim Scripta; after he had lost a game, he was able to recall the moves and throws in their order.[1]

See A. H. J. Greenidge, *History of Rome*.

3. QUINTUS MUCIUS SCAEVOLA, son of (2), usually called "Pontifex Maximus," to distinguish him from (4), consul in 95 B.C. with his friend L. Licinius Crassus the orator. He and his colleague brought forward the *lex Licinia Mucia de civibus regundis*, whereby any non-burgess who was convicted of having usurped the rights of citizenship was to be expelled from Rome, and any non-burgess was forbidden under pain of a heavy penalty to apply for the citizenship. Its object was undoubtedly to purify the elections and to prevent the undue influence of the Italians in the comitia. The indignation aroused by it was one of the chief causes of the Social War (see Mommsen's *Hist. of Rome*). After his consulship Scaevola was governor of the province of Asia, in which capacity he distinguished himself by his just dealing and his severe measures against the unscrupulous farmers of taxes (*publicani*). The latter, finding themselves unable to touch Mucius, attacked him in the person of his legate, Publius Rutilius Rufus (*q.v.*). In honour of his memory the Greeks of Asia set aside a day for the celebration of festivities and games called Mucia. He was subsequently appointed Pontifex Maximus, and, in accordance with a custom that had prevailed since the first plebeian appointment to that office (about 150 years before), was always ready to give gratuitous legal advice. His antechamber was thronged, and even the chief men of the state and such distinguished orators as Servius Sulpicius consulted him. He kept a firm hand over the priestly colleges and insisted upon the strict observance of definite regulations, although he was by no means bigoted in his views. He held that there were two kinds of religion, philosophical and traditional. The second was to be preferred for the sake of the unreasoning multitude, who ought to be taught to set a higher

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[1] Some authorities hold that Quintilian (*Inst. Orat.* xi. 2, 38) refers to Scaevola (3).

value upon the gods, while people of intellect had no need of religion at all. He was proscribed by the Marian party, and in 82, when the younger Marius, after his defeat by Sulla at Sacriportus, gave orders for the evacuation of Rome and the massacre of the chief men of the opposite party, Scaevola, while attempting to reconcile the opposing factions, was slain at the altar of Vesta and his body thrown into the Tiber. He had already escaped an attempt made upon his life by Gaius Fimbria at the funeral of the elder Marius in 86.

Scaevola was the founder of the scientific study of Roman law and the author of a systematic treatise on the subject, in eighteen books, frequently quoted and followed by subsequent writers. It was a compilation of legislative enactments, judicial precedents and authorities, from older collections, partly also from oral tradition. A small handbook called Ὅροι (*Definitions*) is the oldest work from which any excerpts are made in the *Digest*, and the first example of a special kind of judicial literature (*libri definitionum* or *regularum*). It consisted of short rules of law and explanations of legal terms and phrases. A number of speeches by him, praised by Cicero for their elegance of diction, were in existence in ancient times.

4. Quintus Mucius Scaevola (*c.* 159–88 B.C.), uncle of (3), from whom he is distinguished by the appellation of "Augur." He was instructed in law by his father, and in philosophy by the famous Stoic Panaetius of Rhodes. In 121 he was governor of Asia. Accused of extortion on his return, he defended himself and, though no orator, secured his acquittal by his legal knowledge and common sense. In 117 he was consul. He did not take a prominent part in the Senate, but his brief, unpolished remarks sometimes made a great impression. He was a great authority on law, and at an advanced age he gave instruction to Cicero and Atticus. He had a high appreciation of Marius, and when Sulla assembled the senate, to obtain from it a declaration that Marius was the enemy of his country, Scaevola refused his assent. He married Laelia (the daughter of Gaius Laelius, the friend of the younger Scipio), by whom he had a son and two daughters, one of whom became the wife of Licinius Crassus the orator. Scaevola is one of the interlocutors in Cicero's *De oratore*, *De amicitia* and *De republica*.

For the legal importance of the Scaevolas, see A. Schneider, *Die drei Scaevola Ciceros* (Munich, 1879), with full references to ancient and modern authorities.

SCAFELL (pronounced and sometimes written Scaw Fell), a mountain of Cumberland, England, in the Lake District. The name is specially applied to the southern point (3162 ft. in height) of a certain range or mass, but Scafell Pike, separated from Scafell by the steep narrow ridge of Mickledore, is the highest point in England (3210 ft.). The ridge continues N.E. to Great End (2984 ft.), which falls abruptly to a flat terrace, on which lies Sprinkling Tarn. The terrace is traversed by the path between Sty Head Pass (1600 ft.) and Esk Hause (2490 ft.). The range thus defined may be termed the Scafell mass. North-west from the Pike the lesser height of Lingmell (2649 ft.) is thrown out like a bastion, and the steep flank of the range, scored with the deep gully of Piers Gill, sweeps down to the head of Wasdale. On the east an even steeper wall, with splendid crags, falls to Eskdale. Above Mickledore ridge Scafell rises nearly sheer, the rock scored with bold clefts; here are some of the ascents most in favour with the mountaineers. Some of these tax climbers to the utmost; and the mountain has been the scene of several accidents.

SCAFFOLD, Scaffolding (from the O. Fr. *escafaut*, originally *escafalt*, modern *échafaud*, a corruption of the Italian or Spanish *catafalco*, a platform, especially a canopy over a bier, a catafalque; this word is composed of O. Span. *catar*, O. Ital. *catare*, to view, Lat. *captare*, to watch, observe, and *balco*, balcony), properly a platform or stage, particularly one of a temporary character erected for viewing or displaying some spectacle, and hence applied to the raised structure on which the execution of a criminal or condemned person is carried out. (See Capital Punishment, &c.). The word "scaffold" or "scaffolding" is used in a technical sense of an obstruction formed in a blast furnace by the fitting together of lumps which form a comparatively solid skeleton mass inside the furnace, preventing the charge from descending properly. The most general modern application of the word, however, is, in building, to the temporary structure of platforms erected or suspended at convenient heights to afford workmen easy access to their work. Such scaffolds may be divided into four principal classes—bricklayers' scaffolds, masons' scaffolds, gantries and derrick towers or stages. The first two are constructed with upright and horizontal poles lashed together. Gantries and derricks are built up of squared timber, and the different members are connected by iron bolts and dogs.

Bricklayers' scaffold.

The bricklayers' scaffold is constructed of standards, ledgers and putlogs, and the connexions are made with lashings of rope, though wire ropes or chains are sometimes used. The standards are a series of upright fir poles 30 to 50 ft. in length, either (1) sunk about 2 ft. into the ground, (2) fixed in barrels filled with earth lightly rammed, or (3) placed upon a "sole plate" of timber with a square formed of small fillets of wood round the base to prevent movement. The standards are placed 6 to 9 ft. apart, and about 5 ft. away from the building. At every 5 ft. ledgers are tied to the standards to support the putlogs, which in turn support the platform of planks. The ledgers are poles lashed horizontally to the standards; upon these, putlogs, usually of birch wood 3 in. square in section, are laid about 3 or 4 ft. apart, with one end resting on the ledger and the other in a recess in the wall. The outer end should be lashed to the ledger. Boards are then laid upon these putlogs parallel with the face of the wall. Two thicknesses of boards are laid when the work is heavy. If the scaffold is erected in an exposed position or is more than 30 ft. high, it should be stiffened by cross braces of poles running diagonally across the face of the structure and firmly lashed to all the main timbers touched. Ties should also be taken back from the face of the scaffold through apertures in the walls of the building and firmly secured. These ties should be connected with every fourth standard and start at a height between 20 and 30 ft. from the ground. Instead of, or in addition to, these ties light shores may be taken from the face of the scaffold outwards from the building. As the work is carried up the boarding and many of the putlogs are removed to the stage above, some putlogs, however, being left tied to the lower ledgers to stiffen the scaffold. In the case of thick walls a scaffold is required inside as well as outside the building, and when this is the case the two structures are tied together and stiffened by short connecting poles through the window and door openings.

Masons' scaffold.

The mason requires an independent scaffold. He cannot rest the inner ends of his putlogs in the wall as the bricklayer does, for this would disfigure the stonework, so he erects another and parallel framework of standards and ledgers within a few inches of the wall-face upon which to support them. The two portions are tied together with cross braces, and the whole of the timbering is made capable of taking heavier weights than are required in the case of the bricklayer.

Materials.

Scaffolding poles are of Northern pine obtained chiefly from the Baltic ports. They consist of small trees up to 30 to 40 ft. long and of not more than 9 in. in diameter. They are sold with the bark on, but this should be removed before use. Such material forms the standards and ledgers. The putlogs are usually pieces of birch from 3 to 4 in. square in section, and 5 to 6 ft. long. In order to have the fibres uncut they should be split, not sawn. Scaffold boards are made in 8-to 12-ft. lengths, 7 or 9 in. wide, and 1½ in. or 2 in. thick. They should be of yellow deal, but they are more often cut from spruce. The corners are cut off and the ends bound with stout hoop-iron to prevent splitting. The cords used for lashing are made of jute and hemp fibre. The best and strongest cords are those of white Manilla hemp. The fibres for scaffold cords are often dipped in hot tar before being made up into rope. The ropes generally used by the scaffolder are either "shroud laid," having three strands of fibres wound tightly around a core, or "three strand," which are similar but without a core.

Erection.

The erection of scaffolding demands nerve and physical strength, as well as skill and discretion. The timbers near the ground are fixed by hand labour alone; the higher poles are raised by pulley and rope. The wedges used for tightening cordage are driven in between the pole and the rope. They should be of oak or other hard wood, about 12 in. long and semicircular in cross section, and should taper off from one end to the other. Practically the only tool used by the scaffolder is his hatchet, made with a hammer-head for driving spikes and wedges; the wooden handle he often uses as a lever to tighten knots and cords. Scaffolds should not be too heavily loaded, and the weight of materials should be distributed as much as possible. This applies especially to bricklayers' scaffolds, for heavy concentrated loads, even if not sufficient to cause the scaffold to fail, tend to injure the brickwork.

In Scotland and the north of England much work is done from inside by means of platforms of boards placed upon the floor joists. When the work gets so advanced that it cannot be reached from the floor, trestles and platforms are used. For executing special external features, such as stone carving or plaster moulding, a scaffold will be thrown out on cantilevers projecting through openings in the wall and tied down inside the building. The materials are usually hoisted by derrick cranes.

Gantries.

"Gantry" is the term applied to a staging of squared timber used for the easy transmission of heavy material. The name has, however, come to be used generally for strong stagings of squared timber whether used for moving loads or not. Taking the general meaning of the term, gantries may be divided into three classes: (1) Gantries supporting a traveller; (2) Travelling gantries, in which the whole stage moves along rails placed on the ground; (3) Elevated platforms which serve as a base upon which to erect pole scaffolding.

A gantry to support a traveller (fig. 1) consists of two sets of framing placed at a convenient distance apart, say 8 ft. or more, and standing independently of each other. These frames consist of standards or uprights standing upon a sleeper or sill resting in a continuous line upon the ground. The tops of the standards are levelled to receive the head or runner. Struts are taken from cleats fixed at a convenient point in the sides of the standards, and meet in pairs under the middle of the head; sometimes a straining-piece is introduced between them. Struts are also taken outwards from the uprights and bedded on foot-blocks or bolted to small piles driven into the ground. The space between the two frames must be kept free from struts and ties of any description so as to leave a free passage for the material while being lifted and moved. The different members are connected by iron dogs and bolts; dogs are used wherever possible, as they form a strong connexion and do not spoil the wood for other purposes as bolt-holes do. They should be placed on both sides of the timbers to be connected. The size of the timbers varies according to the height of the structure and the weight intended to be carried. The standards may be from 6 to 12 in. squared in section, and the heads and sills are of similar size; the struts and braces are usually somewhat smaller. The traveller consists usually of two wood girders trussed with iron rods and mounted on flanged wheels so as to run along the rails fixed to the head-piece. Along each girder also, a rail is provided upon which moves the hoisting gear; this is worked either by hand or steam power. The ends of the rails are turned up to form a stop for the traveller or crab.

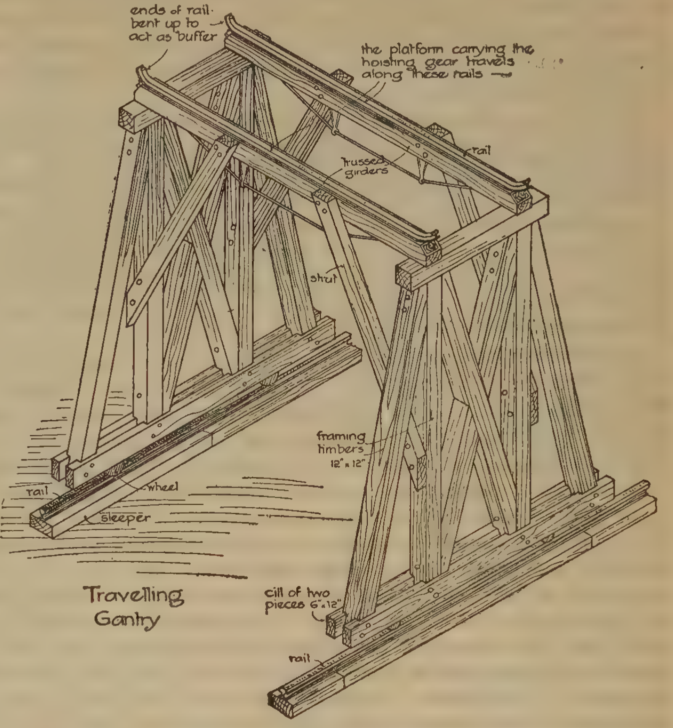
ends of rail bent up to act as buffer
the platform carrying the hoisting gear travels along these rails
rail
trussed girders
strut
framing timbers 12"×12"
rail
wheel
sleeper
Travelling Gantry
cill of two pieces 6"×12"
rail

Fig. 2.

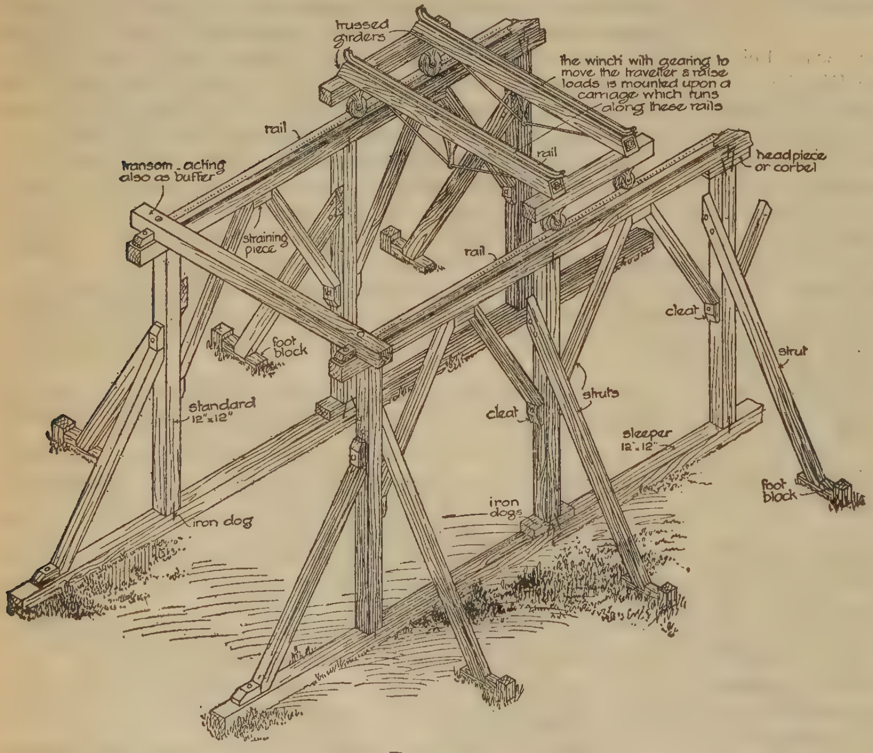

Fig. 1.

A travelling gantry (fig. 2) runs along rails placed on the ground, and consists of two strong trusses braced and bolted together and supporting the two trussed girders which take the crab-winch. The latter is mounted on wheels, and by simple gearing is caused to run along the rails fixed on the upper side of the girders. This is a most useful form of gantry, and requires a very small amount of timber for its construction. The travelling frame is, however, very heavy, and such an apparatus is usually fitted with a steam winch, the power from which, besides lifting the materials, can also be applied to move the traveller. Gantries built on this principle have been used successfully in building or repairing lofty and wide-spanned steel or other roofs. After the collapse of the steel "bowstring" roof of Charing Cross station (London) in December 1905, huge travelling gantries running along rails laid upon the station platforms were employed, and these provided an efficient and economical means of access to the damaged portions; as section by section the work was removed the gantries were shifted along to the next bay. These gantries were 60 ft. in height. One, used to strip and remove the coverings of the roof, was 32 ft. deep, weighed 200 tons and moved upon 24 steel flanged wheels; the other, 40 ft. deep and with 32 wheels, weighed 250 tons and was used to take down the structural steel work of the roof. Four cranes were erected upon the staging to lower the material as it was removed. The amount of timber used in these gantries was 22,400 cubic ft.

In the erection of the Williamsburg Bridge over the East river, New York, for which 19,000 tons of steel were used, "framed timber falsework" was built up of squared timber to a height of 100 ft. and 90 ft. wide at the top. The span was 355 ft. The timbering was in three storeys or stages, and each "bent" had 8 vertical and 4 battering posts. The bents were 20 ft. apart and were connected at the top by 10 lines of 12-in. by 14-in. stringers, and the lower sills were 12 in. square. The cross braces were 8 by 10 in. and 6 by 12 in. The vertical standards or posts rested on sills, and under each one also at its base was a timber foundation 4 ft. square. Two travelling gantry towers, 22 ft. by 25 ft. and 40 ft. high, mounted on double-flanged wheels, ran on rails at the top of the falsework and carried long derrick booms fitted with pulleys for raising the materials necessary for the bridge. Beside the cranes they carried cars with the power plant, gasoline tank, water tanks and air compressor and apparatus for the pneumatic riveting hammers.

"Elevated platforms" are generally used in conducting building operations in towns where the importance of the traffic renders it necessary to keep the footway clear. They consist of two sets of standards, sill and head, one set being erected close to the building and the other about 8 or 10 ft. away. These stages are formed of square timber, framed and braced in a similar manner to gantries designed to support a traveller, but, instead of external shores or braces the uprights are braced across to each other, care being taken to fix the braces at such a height as to allow free passage beneath them. Joists are placed across from head to head, and a double layer of scaffold boards is laid to form the floor, the double thickness being necessary to prevent materials dropping through the joints upon the heads of passers-by. When the gantry abuts on the road, a heavy timber fender splayed at each end should be placed so as to ward off the traffic. Sometimes the scaffold is carried up several stages in this way and is then called "staging," but more often the gantry consists of only one stage and forms the foundation upon which light pole or other scaffolding is erected. At the level of the platform a fanguard is often thrown out for a distance of about 6 ft. or more and closely boarded to protect the public from falling materials and the workmen from accident.

Derrick towers.

Derrick "gantries" or "towers" (fig. 3) are skeleton towers of timber erected in a central position on a site to support a platform at such a height as to enable an electric or steam power derrick crane placed upon it to clear the highest portions of the building. The crane revolves upon a base through nearly three parts of the circumference of a circle, and in addition to this the jib of the crane is capable of an "up and down" motion which enables it to command any spot within a radius of three-quarters of the length of the jib. For a single crane, a derrick tower with three legs is built, and the crane is placed over one of these, stayed back to the other two and then counterbalanced by heavy weights. Each leg is usually from 6 ft. to 10 ft. square on plan, the "king" leg (that is, the leg supporting the crane) being larger than the "queen" legs. The three legs are placed from 20 to 30 ft. apart in the form of an equilateral or isosceles triangle. When two cranes are used, as is the case when important operations are to be conducted over the entire area of a circle, a four-legged square derrick tower is constructed, and a crane set upon a platform over each of two opposite legs. The ground upon which it is proposed to erect the towers must be well chosen for its solidity, and often requires to be well rammed. The foundation usually consists of a platform of 9-in. by 3-in. deals under each leg. The corner posts may be of three 9-in. by 3-in. deals bolted together, but those for the king leg may advantageously be larger. They are connected at every 8 or 10 ft. of their height by means of cross pieces or transoms from 9 by 3 in. to 9 by 6 in. in size, and each bay thus formed is filled in on all four sides with diagonal bracing of the same or slightly smaller timber. Up the centre of the king leg, from the bottom to the top, is carried an extra standard of timber to take the weight of the crane. It may be a balk of whole timber, 12 or 14 in. square, or may consist of deals bolted together up to 16 in. square. This central standard must be well braced and strutted from the four corners to prevent any tendency to bending.

When the towers have reached the desired height the king leg is connected to each of the queen legs by a trussed girder, the two queen legs may be connected with each other either by a similar trussed girder or by a single balk of timber which can be supported by struts if the span is considerable. For the connecting girders a balk of timber reaching from king to queen legs is placed on each of the two topmost transoms, which may be from 4 to 8 ft. apart, the depth of the top bays often being modified to the required depth of the connecting beams. Upright struts are fixed at intervals of about 5 ft. between the two balks, which are also connected by long iron bolts and cross braces filled into each bay. The top balks project 6 or 10 ft. beyond the king leg and form the support for a working platform of deals. Struts are thrown out from the sides of the leg to support the ends of the balks. Upon the platform are laid two "sleepers" of balk timber extending from beneath the bed of the crane and passing over the centre of each queen leg. The "mast," a vertical member composed either of a single timber or two pieces strutted and braced, is erected upon the revolving crane bed, and the "jib," which is similar in construction to the mast, is attached to the base of the latter by a pivoted hinge. The jib is raised and lowered by a rope fixed near the end of the jib and running to the engine by way of a pulley wheel at the top of the mast. The rope or chain used for lifting the materials passes over a pulley at the end of the jib and thence to the winch over a pulley at the top of the mast. In the operation of lifting it is obvious that a great strain is put upon the mast and a considerable overturning force is exerted by the leverage of the weight lifted at the end of the jib. To counterbalance this, two timber "stays" or "guys" are taken from the mast head, one to the centre of each queen leg, and there secured. From these points two heavy chains are taken down the centre of each queen leg and anchored to the platform at their bases, which are each loaded with a quantity of bricks, stone or other heavy material equal in weight to at least twice any load to be lifted by the crane. A coupling screw link should be provided in the length of each anchor chain so that it may be kept at a proper tension, for if allowed to get slack a sudden jerk might cause it to snap. The coupling screws should be placed in an accessible place near the ground, where they may easily be seen and tightened when necessary. The legs of the structure should be cross braced with each other, either by ties of steel bars with tightening screws, or, as is more usual, with scaffold-pole or squared timber-braces crossing each other at right angles and lashed or bolted to the framework.

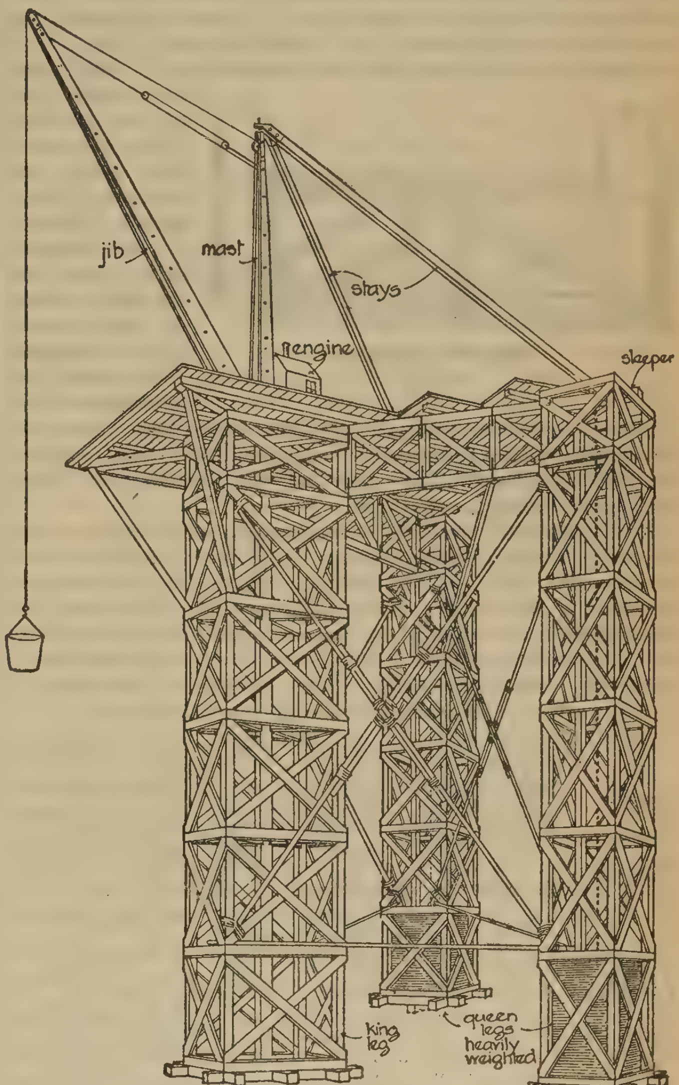

Fig. 3.

In the case of a three-towered gantry it is necessary to ballast only the two queen legs. The weighting of the king leg, as is sometimes done, is quite unnecessary, and even injurious, for in soft or moderately hard ground the added weight combined with that of the crane engine and load may cause a serious settlement. With a square gantry having four legs, all four should be weighted, and in calculating the ballast necessary for the crane towers the weight of the engine should be considered. Access to the platform is obtained by ladders fixed either inside or outside one of the queen legs. With the exception of the boards forming the working platform, which are usually spiked down, the timbers of a tower gantry should all be connected by screw bolts and nuts.

Cradles and swinging scaffolds.

Swinging scaffolds are useful for executing light repairs to a building. Perhaps the simplest form of swinging scaffold is the "boatswain's boat," so called from its being chiefly used for the painting or examination of the sides of ships, but it is dangerous to work from and a light wind will cause it to swing to and fro, and owing to the extremely awkward position occupied by the workman there is difficulty in doing good work from it. A better, safer and more comfortable arrangement, the "painter's boat" (fig. 4), is suspended by blocks and falls from two cantilever "jibs" fixed in the upper part of the building. The positions of the jibs are altered as required. The ends of the suspension ropes are fastened securely to the cradle, and by altering their length the workmen can adjust it to the proper height for working. These boats are usually constructed with a framework of iron and fitted with edge boards and guard rails all round. Like the "boatswain's boat" they sway considerably in the wind.

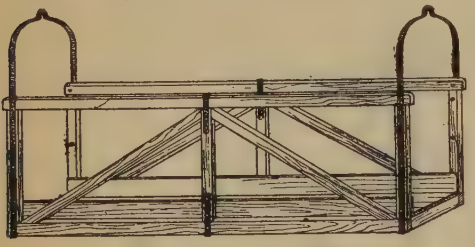

FIG. 4.

An improved form of cradle has been patented which is swung on block runners working along a tight wire cable stretched between two jibs. Block tackle is used to raise or lower the cradle, and horizontal movement also is obtained by light guy lines working over pulleys at the jibs and secured to the tops of the suspension ropes. All adjustments can be made from the cradle with perfect safety. The guy lines steady the boat to some extent and prevent it from swinging in the wind.

Scaffolding for chimneys.

Tall chimney shafts may be erected by internal scaffolding only, or by a combination of external and internal staging. The latter method is often adopted when the lower part of the shaft is designed with ornamental brickwork, string courses, panels, &c., and it is important that this work should be carefully finished. An external scaffold is therefore carried up until plain work not more than 2 or 2½ bricks thick is reached, when the remainder can be completed by "overhand" work from an internal scaffold. The offsets made in the brickwork on the inside are used to support the timbering. For the repair of tall chimneys, light ladders are erected one above the other by a steeplejack and his assistants, each being lashed to the one below it and secured to the brickwork by dog-hooks driven in the joints. When the top of the chimney is reached balk timbers are raised by pulleys and laid across the top. From these are swung cradles from which the defective work is made good. If the work or weather demand a more stable scaffold, a light but strong framework of putlogs held together with iron bolts is fixed on each side of the shaft with iron holdfasts, and a platform of boards is laid upon them. For circular chimneys pieces of timber cut to a curve to fit the brickwork are clamped with iron to the putlogs to prevent them from bending when the bolts connecting the two frames are screwed up.

Accidents.

In England, the Factory and Workshop Act of 1901 empowers the secretary of state to make regulations respecting any dangerous "machinery, plant, process, or description of manual labour." No regulations affecting the building trade have been made, however, but a memorandum was issued in 1902 by the Home Office with the following suggestions for the prevention of scaffold accidents:—

1. All working platforms above the height of 10 ft., taken from the adjacent ground level, should, before employment takes place thereon, be provided throughout their entire length, on the outside and at the ends,
   (*a*) with a guard rail fixed at a height of 3 ft. 6 in. above the scaffold boards. Openings may be left for workmen to land from the ladders and for the landing of materials;
   (*b*) with boards fixed so that their bottom edges are resting on or abutting to the scaffold boards. The boards so fixed should rise above the working platform not less than 7 ins. Openings may be left for the landing of the workmen from the ladders.

2. All "runs" or similar means of communication between different portions of a scaffold or building should be not less than 18 in. wide. If composed of two or more boards they should be fastened together in such a manner as to prevent unequal sagging.

3. Scaffold boards forming part of a working platform should be supported at each end by a putlog, and should not project more than 6 in. beyond it unless lapped by another board, which should rest partly on or over the same putlog and partly upon putlogs other than those upon which the supported board rests.

In such cases where the scaffold boards rest upon brackets, the foregoing suggestion should read as if the word bracket replaced the word putlog.

N.B. Experiments have shown that a board with not more than a 6 in. projection over a putlog can be considered safe from trapping or tilting.

4. All supports to centring should be carried from a solid foundation.

5. In places where the scaffolding has been sublet to a contractor, the employer should satisfy himself, before allowing work to proceed thereon, that the foregoing suggestions have been complied with, and that the material used in the construction of the scaffold is sound.

See J. F. Hurst, *Tredgold's Carpentry*; A. G. H. Thatcher, *Scaffolding*. (J. Bt.)

SCALA NUOVA (Turk. *Kush-Adasi*), also known as New Ephesus, a well-protected harbour on the west coast of Asia Minor in the vilayet of Aidin, opposite Samos. The site of the ancient Marathesium is close by on the S. It is connected with the railway station of Ayassoluk by a diligence service. Before the opening of the Smyrna-Aidin railway its roadstead was frequented by vessels trading with the Anatolian coast, and it has often been proposed to connect it with the railway system by a branch line, and thus enable it to compete with Smyrna. In the absence of this the town is rapidly on the decline. The population is not over 7000. The trade is of merely local interest. (D. G. H.)

SCALD, an ancient Scandinavian bard who recited or sang at feasts compositions in honour of chiefs and famous men and their deeds. This word represents the Icel. *skāld*, Dan. *skald*, Swed. *skjald*, the regular term for a poet. Authorities differ as to its derivation. It seems certain that the word was originally derogatory in sense; some connect it with *skālda*, a pole, on which libels were cut. Others, *e.g.* Skeat, refer it to Swed. *skalla*, Icel. *skjalla*, to make a loud noise or clatter, and take the original sense to have been a "loud talker." This would link the word with "scold," to rail at, find fault with, which is formed from Dutch *schold*, past tense of *scheldan*, cf. Ger. *schelten*, in the same sense.

Of different origin is the verb "scald," to burn or injure the skin or flesh by hot liquid or steam (see BURNS AND SCALDS); also to cleanse an object, or to remove hair, bristles, feathers &c., from an animal, by exposure to moist heat, such as boiling water, steam, &c. This word is derived from the O. Fr. *escalder*, *eschauder*, mod. *échauder*, Lat. *excaldare*, to wash with hot water (*caldus*, *calidus*, hot).

SCALE (1) A small thin flake, plate or shell. The word in O. Eng. is *sceale*, so *bean-sceale*, the husk or pod of a bean; cognate forms are found in Ger. *Schale*, O.H.G. *Scale*, from which the O. Fr. *escale*, modern *écale*, is borrowed. The ultimate root is seen in the closely allied "shell," and also in skull, scalp, shale and skill, and means to peel off, separate, divide. The word is used specifically (1) in botany, of the rudimentary flake-like leaf forming the covering of the leaf-buds of deciduous trees and of the bracts of the cone in conifers; (2) in zoology, of the flat, hard structures of the epidermis or exoskeleton in fishes, reptiles. Thus in ichthyology the various types of scales are classed as *cycloid* (Gr. κύκλος, circle), where the growth is in layers, equally from the anterior and posterior edges; *ctenoid* (Gr. κτήν, comb), where the posterior edge is toothed; *ganoid* (Gr. γάνος, shining), with a hard enamelled surface and usually rhomboidal in shape, and *placoid* (Gr. πλάξ, tablet), as in the ossified papillae of the cutis of the shark. In reptiles the term is applied to the structures which form the covering of the true reptiles, snakes and lizards. In entomology the downy covering of the wings of lepidoptera consists of minute scales, really modifications of hairs, covered with fine lines, giving the bright colours. Another form in O. Eng. *scâle* is found glossing the Lat. *lanx*, flat bowl or dish, and is thus used of the dishes or cups of a balance (*bilanx*), the instrument itself being also called "scales."

2. Properly a ladder, flight of steps, now only used in the derived "scaling ladder." The word is derived from the Lat. *scala* (originally *scandla*, from *scandere* to climb). There are many transferred senses of the word, *e.g.* the distinguishing marks for purposes of measurement on a rule or other measuring instrument; hence a graduated measure or a system of proportional measurement or numeration, and particularly, in music, a series of tones at definite standard intervals (see Harmony, Musical Notation).

SCALE INSECT, a name given to insects belonging to the family *Coccidae* of the homopterous division of the Hemiptera and deriving their name from the formation by the females of a waxy secretion which often hardens into a protective scale beneath which the insects live. Honey-dew, a sweet sticky substance is also secreted by some members of the family. The females are always wingless, but are provided with antennae, legs and well-developed mouth-parts. In some cases these organs are retained, in some they are lost in the encysted condition. The males, on the contrary, although sometimes wingless, are, as a rule, provided with a pair of large forewings and greatly reduced hindwings; their antennae and legs are longer than in the other sex, but the mouth-parts are reduced and functionless (see Economic Entomology).

SCALIGER, the Latinized name of the great Della Scala family (see Verona). It has also been borne by two scholars of extraordinary eminence.

1. Julius Caesar Scaliger (1484–1558), so distinguished by his learning and talents that, according to A. de Thou, no one of the ancients could be placed above him and the age in which he lived could not show his equal, was, according to his own account, a scion of the house of La Scala, for a hundred and fifty years princes of Verona, and was born in 1484 at the castle of La Rocca on the Lago de Garda. At the age of twelve his kinsman the emperor Maximilian placed him among his pages. He remained for seventeen years in the service of the emperor, distinguishing himself as a soldier and as a captain. But he was unmindful neither of letters, in which he had the most eminent scholars of the day as his instructors, nor of art, which he studied with considerable success under Albrecht Dürer. In 1512 at the battle of Ravenna, where his father and elder brother were killed, he displayed prodigies of valour, and received the highest honours of chivalry from his imperial cousin, who conferred upon him with his own hands the spurs, the collar and the eagle of gold. But this was the only reward he obtained. He left the service of Maximilian, and after a brief employment by another kinsman, the duke of Ferrara, he decided to quit the military life, and in 1514 entered as a student at the university of Bologna. He determined to take holy orders, in the expectation that he would become cardinal, and then pope, when he would wrest from the Venetians his principality of Verona, of which the republic had despoiled his ancestors. But, though he soon gave up this design, he remained at the university until 1519. The next six years he passed at the castle of Vico Nuovo, in Piedmont, as a guest of the family of La Rovère, at first dividing his time between military expeditions in the summer, and study, chiefly of medicine and natural history, in the winter, until a severe attack of rheumatic gout brought his military career to a close. Henceforth his life was wholly devoted to study. In 1525 he accompanied M. A. de la Rovère, bishop of Agen, to that city as his physician. Such is the outline of his own account of his early life. It was not until some time after his death that the enemies of his son first alleged that he was not of the family of La Scala, but was the son of Benedetto Bordone, an illuminator or schoolmaster of Verona; that he was educated at Padua, where he took the degree of M.D.; and that his story of his life and adventures before arriving at Agen was a tissue of fables. It certainly is supported by no other evidence than his own statements, some of which are inconsistent with well-ascertained facts (see below *ad fin.*).

The remaining thirty-two years of his life were passed almost wholly at Agen, in the full light of contemporary history. They were without adventure, almost without incident, but it was in them that he achieved so much distinction that at his death in 1558 he had the highest scientific and literary reputation of any man in Europe. A few days after his arrival at Agen he fell in love with a charming orphan of thirteen, Andiette de Roques Lobejac. Her friends objected to her marriage with an unknown adventurer, but in 1528 he had obtained so much success as a physician that the objections of her family were overcome, and at forty-five he married Andiette, who was then sixteen. The marriage proved a complete success; it was followed by twenty-nine years of almost uninterrupted happiness, and by the birth of fifteen children.

A charge of heresy in 1538, of which he was acquitted by his friendly judges, one of whom was his friend Arnoul Le Ferron, was almost the only event of interest during these years, except the publication of his books, and the quarrels and criticisms to which they gave rise. In 1531 he printed his first oration against Erasmus, in defence of Cicero and the Ciceronians. It is a piece of vigorous invective, displaying, like all his subsequent writings, an astonishing command of Latin, and much brilliant rhetoric, but full of vulgar abuse, and completely missing the point of the *Ciceronianus* of Erasmus. The writer's indignation at finding it treated with silent contempt by the great scholar, who thought it was the work of a personal enemy—Aleander—caused him to write a second oration, more violent, more abusive, with more self-glorification, but with less real merit than the first. The orations were followed by a prodigious quantity of Latin verse, which appeared in successive volumes in 1533, 1534, 1539, 1546 and 1547; of these, a friendly critic, Mark Pattison, is obliged to approve the judgment of Huet, who says, "par ses poésies brutes et informes Scaliger a déshonoré le Parnasse"; yet their numerous editions show that they commended themselves not only to his contemporaries, but to succeeding scholars. A brief tract on comic metres (*De comicis dimensionibus*) and a work *De causis linguae Latinae*—the earliest Latin grammar on scientific principles and following a scientific method—were his only other purely literary works published in his lifetime. His *Poetice* appeared in 1561 after his death. With many paradoxes, with many criticisms which are below contempt, and many indecent displays of personal animosity—especially in his reference to Étienne Dolet, over whose death he gloated with brutal malignity—it yet contains acute criticism, and showed for the first time what such a treatise ought to be, and how it ought to be written.

But it is as a philosopher and a man of science that J. C. Scaliger ought to be judged. Classical studies he regarded as an agreeable relaxation from severer pursuits. Whatever the truth or fable of the first forty years of his life, he had certainly been a close and accurate observer, and had made himself acquainted with many curious and little-known phenomena, which he had stored up in a most tenacious memory. His scientific writings are all in the form of commentaries, and it was not until his seventieth year that (with the exception of a brief tract on the *De insomniis* of Hippocrates) he felt that any of them were sufficiently complete to be given to the world. In 1556 he printed his *Dialogue* on the *De plantis* attributed to Aristotle, and in 1557 his *Exercitationes* on the work of Jerome Cardan, *De subtilitate*. His other scientific works, *Commentaries* on Theophrastus' *De causis plantarum* and Aristotle's *History of Animals*, he left in a more or less unfinished state, and they were not printed until after his death. They are all marked by arrogant dogmatism, violence of language, a constant tendency to self-glorification, strangely combined with extensive real knowledge, with acute reasoning, with an observation of facts and details almost unparalleled. But he is only the naturalist of his own time. That he anticipated in any manner the inductive philosophy cannot be contended; his botanical studies did not lead him, like his contemporary Konrad von Gesner, to any idea of a natural system of classification, and he rejected with the utmost arrogance and violence of language the discoveries of Copernicus. In metaphysics and in natural history Aristotle was a law to him, and in medicine Galen, but he was not a slave to the text or the details of either. He has thoroughly mastered their principles, and is able to see when his masters are not true to themselves. He corrects Aristotle by himself. He is in that stage of learning when the attempt is made to harmonize the written word with the actual facts of nature, and the result is that his works have no real scientific value. Their interest is only historical. His *Exercitationes* upon the *De subtilitate* of Cardan (1557) is the book by which Scaliger is best known as a philosopher. Its numerous editions bear witness to its popularity, and until the final fall of Aristotle's physics it continued a popular text-book. We are astonished at the encyclopaedic wealth of knowledge which the *Exercitationes* display, at the vigour of the author's style, at the accuracy of his observations, but are obliged to agree with G. Naudé that he has committed more faults than he has discovered in Cardan, and with Charles Nisard that his object seems to be to deny all that Cardan affirms and to affirm all that Cardan denies. Yet Leibnitz and Sir William Hamilton recognize him as the best modern exponent of the physics and metaphysics of Aristotle. He died at Agen on the 21st of October 1558.

2. JOSEPH JUSTUS SCALIGER (1540–1609), the greatest scholar of modern times, was the tenth child and third son of Julius Caesar Scaliger and Andiette de Roques Lobejac. Born at Agen in 1540, he was sent when twelve years of age, with two younger brothers, to the college of Guienne at Bordeaux, then under the direction of Jean Gelida. An outbreak of the plague in 1555 caused the boys to return home, and for the next few years Joseph was his father's constant companion and amanuensis. The composition of Latin verse was the chief amusement of Julius in his later years, and he daily dictated to his son from eighty to a hundred lines, and sometimes more. Joseph was also required each day to write a Latin theme or declamation, though in other respects he seems to have been left to his own devices. But the companionship of his father was worth more to Joseph than any mere instruction. He learned from him to be not a mere scholar, but something more—an acute observer, never losing sight of the actual world, and aiming not so much at correcting texts as at laying the foundation of a science of historical criticism.

After his father's death, he spent four years at the university of Paris, where he began the study of Greek under Turnebus. But after two months he found he was not in a position to profit by the lectures of the greatest Greek scholar of the time. He determined to teach himself. He read Homer in twenty-one days, and then went through all the other Greek poets, orators and historians, forming a grammar for himself as he went along. From Greek, at the suggestion of G. Postel, he proceeded to attack Hebrew, and then Arabic; of both he acquired a respectable knowledge, though not the critical mastery which he possessed in Latin and Greek. The name of Jean Dorat then stood as high as that of Turnebus as a Greek scholar, and far higher as a professor. As a teacher he was able not only to impart knowledge, but to kindle enthusiasm. It was to Dorat that Scaliger owed the home which he found for the next thirty years of his life. In 1563 the professor recommended him to Louis de Chastaigner, the young lord of La Roche Pozay, as a companion in his travels. A close friendship sprang up between the two young men, which remained unbroken till the death of Louis in 1595. The travellers first went to Rome. Here they found Marc Antoine Muretus, who, when at Bordeaux and Toulouse, had been a great favourite and occasional visitor of Julius Caesar at Agen. Muretus soon recognized Scaliger's merits, and introduced him to all the men that were worth knowing. After visiting a large part of Italy, the travellers passed to England and Scotland, taking as it would seem La Roche Pozay on their way, for Scaliger's preface to his first book, the *Conjectanea in Varronem*, is dated there in December 1564. Scaliger formed an unfavourable opinion of the English. Their inhuman disposition, and inhospitable treatment of foreigners, especially impressed him. He was also disappointed in finding few Greek manuscripts and few learned men. It was not until a much later period that he became intimate with Richard Thompson and other Englishmen. In the course of his travels he had become a Protestant. On his return to France he spent three years with the Chastaigners, accompanying them to their different châteaux in Poitou, as the calls of the civil war required. In 1570 he accepted the invitation of Cujas, and proceeded to Valence to study jurisprudence under the greatest living jurist. Here he remained three years, profiting not only by the lectures but even more by the library of Cujas, which filled no fewer than seven or eight rooms and included five hundred manuscripts.

The massacre of St Bartholomew—occurring as he was about to accompany the bishop of Valence on an embassy to Poland—induced him with other Huguenots to retire to Geneva, where he was received with open arms, and was appointed a professor in the academy. He lectured on the *Organon* of Aristotle and the *De finibus* of Cicero with much satisfaction to the students but with little to himself. He hated lecturing, and was bored with the importunities of the fanatical preachers; and in 1574 he returned to France, and made his home for the next twenty years with Chastaigner. Of his life during this period we have interesting details and notices in the *Lettres françaises inédites de Joseph Scaliger*, edited by M Tamizey de Larroque (Agen, 1881). Constantly moving through Poitou and the Limousin, as the exigencies of the civil war required, occasionally taking his turn as a guard, at least on one occasion trailing a pike on an expedition against the Leaguers, with no access to libraries, and frequently separated even from his own books, his life during this period seems most unsuited to study. He had, however, what so few contemporary scholars possessed—leisure, and freedom from pecuniary cares. It was during this period of his life that he composed and published the books which showed that with him a new school of historical criticism had arisen. His editions of the *Catalecta* (1575), of Festus (1575), of Catullus, Tibullus and Propertius (1577), are the work of a man who not only writes books of instruction for learners, but is determined himself to discover the real meaning and force of his author. He was the first to lay down and apply sound rules of criticism and emendation, and to change textual criticism from a series of haphazard guesses into a "rational procedure subject to fixed laws" (Pattison). But these works, while proving Scaliger's right to the foremost place among his contemporaries as Latin scholar and critic, did not go beyond mere scholarship. It was reserved for his edition of Manilius (1579), and his *De emendatione temporum* (1583), to revolutionize all the received ideas of ancient chronology—to show that ancient history is not confined to that of the Greeks and Romans, but also comprises that of the Persians, the Babylonians and the Egyptians, hitherto neglected as absolutely worthless, and that of the Jews, hitherto treated as a thing apart, and that the historical narratives and fragments of each of these, and their several systems of chronology, must be critically compared, if any true and general conclusions are to be reached. It is this which places Scaliger on so immeasurably higher an eminence than any of his contemporaries. Yet, while the scholars of his time admitted his pre-eminence, neither they nor those who immediately followed seem to have appreciated his real merit, but to have considered his emendatory criticism, and his skill in Greek, as constituting his claim to special greatness. His commentary on Manilius is really a treatise on the astronomy of the ancients, and it forms an introduction to the *De emendatione temporum*, in which he examines by the light of modern and Copernican science the ancient system as applied to epochs, calendars and computations of time, showing upon what principles they were based.

In the remaining twenty-four years of his life he at once corrected and enlarged the basis which he had laid in the *De emendatione*. With incredible patience, sometimes with a happy audacity of conjecture which itself is almost genius, he succeeded in reconstructing the lost *Chronicle* of Eusebius—one of the most precious remains of antiquity, and of the highest value for ancient chronology. This he printed in 1606 in his

Thesaurus temporum, in which he collected, restored and arranged every chronological relic extant in Greek or Latin. When in 1590 Lipsius retired from Leiden, the university and its protectors, the states-general of Holland and the prince of Orange, resolved to obtain Scaliger as his successor. He declined their offer. He hated lecturing, and there were those among his friends who erroneously believed that with the success of Henry IV. learning would flourish, and Protestantism be no bar to advancement. The invitation was renewed in the most flattering manner a year later. Scaliger would not be required to lecture. The university only wished for his presence. He would be in all respects the master of his time. This offer Scaliger provisionally accepted. About the middle of 1593 he started for Holland, where he passed the remaining thirteen years of his life, never returning to France. His reception at Leiden was all that he could wish. A handsome income was assured to him. He was treated with the highest consideration. His rank as a prince of Verona was recognized. Placed midway between The Hague and Amsterdam, he was able to obtain, besides the learned circle of Leiden, the advantages of the best society of both these capitals. For Scaliger was no hermit buried among his books; he was fond of social intercourse and was himself a good talker.

For the first seven years of his residence at Leiden his reputation was at its highest point. His literary dictatorship was unquestioned. From his throne at Leiden he ruled the learned world; a word from him could make or mar a rising reputation; and he was surrounded by young men eager to listen to and profit by his conversation. He encouraged Grotius when only a youth of sixteen to edit Capella; the early death of the younger Douza he wept as that of a beloved son; Daniel Heinsius, from being his favourite pupil, became his most intimate friend. But Scaliger had made numerous enemies. He hated ignorance, but he hated still more half-learning, and most of all dishonesty in argument or in quotation. Himself the soul of honour and truthfulness, he had no toleration for the disingenuous arguments and the mis-statements of facts of those who wrote to support a theory or to defend an unsound cause. His pungent sarcasms were soon carried to the persons of whom they were uttered, and his pen was not less bitter than his tongue. He resembles his father in his arrogant tone towards those whom he despises and those whom he hates, and he despises and hates all who differ from him. He is conscious of his power, and not always sufficiently cautious or sufficiently gentle in its exercise. Nor was he always right. He trusted much to his memory, which was occasionally treacherous. His emendations, if frequently happy, were sometimes absurd. In laying the foundations of a science of ancient chronology he relied sometimes upon groundless, sometimes even upon absurd hypotheses, frequently upon an imperfect induction of facts. Sometimes he misunderstood the astronomical science of the ancients, sometimes that of Copernicus and Tycho Brahe. And he was no mathematician. But his enemies were not merely those whose errors he had exposed and whose hostility he had excited by the violence of his language. The results of his system of historical criticism had been adverse to the Catholic controversialists and to the authenticity of many of the documents upon which they had been accustomed to rely. The Jesuits, who aspired to be the source of all scholarship and criticism, perceived that the writings and authority of Scaliger were the most formidable barrier to their claims. It was the day of conversions. Muretus in the latter part of his life professed the strictest orthodoxy; J. Lipsius had been reconciled to the Church of Rome; Casaubon was supposed to be wavering; but Scaliger was known to be hopeless, and as long as his supremacy was unquestioned the Protestants had the victory in learning and scholarship. A determined attempt must be made, if not to answer his criticisms, or to disprove his statements, yet to attack him as a man, and to destroy his reputation. This was no easy task, for his moral character was absolutely spotless.

After several scurrilous attacks by the Jesuit party, in which coarseness and violence were more conspicuous than ability, in 1607 a new and more successful attempt was made. Scaliger's weak point was his pride. In 1594, in an evil hour for his happiness and his reputation, he published his *Epistola de vetustate et splendore gentis Scaligerae et J. C. Scaligeri vita*. In 1607 Gaspar Scioppius, then in the service of the Jesuits, whom he afterwards so bitterly libelled, published his *Scaliger hypobolimaeus* ("The Supposititious Scaliger"), a quarto volume of more than four hundred pages, written with consummate ability, in an admirable and incisive style, with the entire disregard for truth which Scioppius always displayed, and with all the power of his accomplished sarcasm. Every piece of scandal which could be raked together respecting Scaliger or his family is to be found there. The author professes to point out five hundred lies in the *Epistola de vetustate* of Scaliger, but the main argument of the book is to show the falsity of his pretensions to be of the family of La Scala, and of the narrative of his father's early life. "No stronger proof," says Mark Pattison, "can be given of the inpressions produced by this powerful philippic, dedicated to the defamation of an individual, than that it has been the source from which the biography of Scaliger, as it now stands in our biographical collections, has mainly flowed." To Scaliger the blow was crushing. Whatever the case as to Julius, Joseph had undoubtedly believed himself a prince of Verona, and in his *Epistola* had put forth with the most perfect good faith, and without inquiry, all that he had heard from his father. He immediately wrote a reply to Scioppius, entitled *Confutatio fabulae Burdonum*. It is written, for Scaliger, with unusual moderation and good taste, but perhaps for that very reason had not the success which its author wished and even expected. In the opinion of the highest authority, Mark Pattison, "as a refutation of Scioppius it is most complete"; but there are certainly grounds for dissenting, though with diffidence, from this judgment. Scaliger undoubtedly shows that Scioppius committed more blunders than he corrected, that his book literally bristles with pure lies and baseless calumnies; but he does not succeed in adducing a single proof either of his father's descent from the La Scala family, or of any single event narrated by Julius as happening to himself or any member of this family prior to his arrival at Agen. Nor does he even attempt a refutation of the crucial point, which Scioppius had proved, as far as a negative can be proved—namely, that William, the last prince of Verona, had no son Nicholas, the alleged grandfather of Julius, nor indeed any son who could have been such grandfather. But whether complete or not, the *Confutatio* had no success; the attack of the Jesuits was successful, far more so than they could possibly have hoped. Scioppius was wont to boast that his book had killed Scaliger. It certainly embittered the few remaining months of his life, and it is not improbable that the mortification which he suffered may have shortened his days. The *Confutatio* was his last work. Five months after it appeared, "on the 21st of January 1609, at four in the morning, he fell asleep in Heinsius's arms. The aspiring spirit ascended before the Infinite. The most richly stored intellect which had ever spent itself in acquiring knowledge was in the presence of the Omniscient" (Pattison).

Of Joseph Scaliger the only biography in any way adequate is that of Jacob Bernays (Berlin, 1855). It was reviewed by Mark Pattison in the *Quarterly Review*, vol. cviii. (1860), since reprinted in the *Essays*, i. (1889), 132-195. Pattison had made many manuscript collections for a life of Joseph Scaliger on a much more extensive scale, which he left unfinished. In writing the above article, Professor Christie had access to and made much use of these MSS., which include a life of Julius Caesar Scaliger. The fragments of the life of Joseph Scaliger have been printed in the *Essays*, i. 196-243. For the life of Joseph, besides the letters published by M. Tamizey de Larroque (Agen, 1881), the two old collections of Latin and French letters and the two *Scaligerana* are the most important sources of information. For the life of Julius Caesar the letters edited by his son, those subsequently published in 1620 by the President de Maussac, the *Scaligerana*, and his own writings, which are full of autobiographical matter, are the chief authorities. M. de Bourousse de Laffore's *Étude sur Jules César de Lescale* (Agen, 1860) and M. Magen's *Documents sur Julius Caesar Scaliger et sa famille* (Agen, 1873) add important details for the lives of both father and son. The lives by Charles Nisard—that of Julius in *Les Gladiateurs de la république des lettres*, and that of Joseph in

Le Triumvirat littéraire au seizième siècle—are equally unworthy of their author and their subjects. Julius is simply held up to ridicule, while the life of Joseph is almost wholly based on the book of Scioppius and the *Scaligerana*. A complete list of the works of Joseph will be found in his life by Bernays. See also J. E. Sandys, *History of Classical Scholarship*, ii. (1908), 199-204. (R. C. C.; J. E. S.*)

SCALP (O. Dutch *schelpe*, a shell), in anatomy, the whole covering of the top of the head from the skin to the bone. Five layers are recognized in the scalp, and these, from without inward, are: (1) skin, (2) superficial fascia, (3) aponeurosis or epicranium, (4) lymph space, (5) periosteum or pericranium.

The skin of the scalp is thick and remarkable for the large number of hair follicles contained in it. The superficial fascia consists of dense bundles of fibrous tissue which pass from the skin to the third layer or aponeurosis and bind the two structures together so closely that when one of them is moved the other must needs be moved too. The fibrous bundles are separated by pellets of fat, and it is in this second layer that the vessels and nerves of the scalp are found. Here, as elsewhere, the vessels are arteries, veins and lymphatics, and the arteries are specially remarkable, firstly, for their tortuosity, which is an adaptation to so movable a part; secondly, for their anastomosing across the middle line with their fellows of the opposite side, an arrangement which is not usual in the body; and, thirdly, for the fact that, when cut, their ends are held open by the dense fibrous tissue already spoken of, so that bleeding is more free in the scalp than it is from arteries of the same size elsewhere in the body.

The veins do not follow the twists of the arteries but run a straight course; for this reason there is often a considerable distance between an artery and its companion vein. Accompanying the veins are the larger lymphatic vessels, though there are no lymphatic glands actually in the scalp. From the forehead region the lymphatics accompany the facial vein down the side of the face and usually reach their first gland in the submaxillary region, so that in the case of a poisoned wound of the forehead sympathetic swelling or suppuration would take place below the jaw. From the region of the temple the lymphatics drain into a small gland lying just in front of the ear, while those from the region behind the ear drain into some glands lying close to the mastoid process. In the occipital region a small gland (or glands) is found at the edge of the scalp close to the point at which the occipital artery reaches it, that is to say about a third of the distance from the external occipital protuberance to the tip of the mastoid process (see Skull).

The nerve supply of the scalp in its anterior part is from the fifth cranial or trigeminal nerve (see Nerves, Cranial); in the forehead region the supratrochlear and supraorbital branches come out of the orbit from the first or ophthalmic division of the fifth, while farther back, in the anterior part of the temporal region, the temporal branch of the second or maxillary division of the same nerve is found. Farther back still, in front of the ear, is the area of the auriculo-temporal nerve, a branch of the third or mandibular division of the fifth cranial.

Behind the ear the scalp is supplied with sensation by two branches of the cervical plexus of nerves, the great auricular and the small occipital (see Nerves, Spinal), while behind these, and reaching as far as the mid line posteriorly, the great occipital, derived from the posterior primary division of the second cervical nerve, is distributed. Sometimes the posterior primary division of the third cervical nerve reaches the scalp still nearer the middle line behind.

The third layer of the scalp or *epicranium* is formed by the two fleshy bellies of the occipito-frontalis muscle and the flattened tendon or aponeurosis between them. Of these two bellies the anterior (*frontalis*) is the larger, and, when it acts, throws the skin of the forehead into those transverse puckers which are characteristic of a puzzled frame of mind. The much smaller (*occipitalis* or posterior) belly usually merely fixes the aponeurosis for the frontalis to act, though some people have the power of alternately contracting the two muscles and so wagging their scalps backward and forward as monkeys do. Both fleshy bellies of the occipito-frontalis are innervated by the seventh or facial nerve which supplies all the muscles of expression.

Deep to the occipito-frontalis and its aponeurosis or epicranium is the fourth layer, which consists of very lax areolar tissue constituting what is now known in anatomy as a lymph space. The length and laxity of this tissue allow great freedom of movement to the more superficial layers, and it is this layer which is torn through when a Red Indian scalps his foe. So lax is the tissue here that any collection of blood or pus is quickly distributed throughout its whole area, and, owing to the absence of tension as well as of nerves, very little pain accompanies any such effusion.

The fifth and deepest layer of the scalp is the *pericranium* or the external periosteum of the skull bones. This, until the sutures of the skull close in middle life, is continuous with the dura mater which forms the internal periosteum, and for this reason any subpericranial effusion is localized to the area of the skull bone over which it happens to lie. Moreover, any suppurative process may extend through the sutures to the meninges of the brain. (F. G. P.)

Surgery of the Scalp.—In connexion with the treatment of surgical and other wounds of the scalp, it used to be thought that it was dangerous to treat them by suturing, because of the risk of the intervention of abscess or erysipelas. Now that one knows, however, that these two conditions are dependent upon the presence of septic micro-organisms, the surgeon deals with the scalp as with other parts of the body, cleansing the surface before performing an operation upon it, and doing his best to free the region of all germs when he is called upon to treat a wound already inflicted on it. Unless the surgeon could render the scalp aseptic, it would be almost impossible for him to undertake any operation upon the interior of the skull. Before opening the skull, therefore, the scalp is cleanly shaved and dealt with by turpentine, soap and water and other antiseptics. A large horse-shoe shaped flap is then turned down by an incision right to the bone, and on the conclusion of the operation the flap is replaced in position and secured by stitches.

As the result of septic infection by an accidental wound, abscess is likely to form beneath the scalp, and if it is left to increase in size unchecked it may detach a large area of the scalp. As soon, therefore, as it is thought that matter is forming beneath the scalp, an incision should be made down to the bone, and provision taken for insuring free drainage.

Naevi of the scalp are best treated by electrolysis or by removal by dissection. If they are supplied by large blood-vessels, each artery should be under-pinned or tied before the removal by dissection is undertaken.

Sebaceous cysts of the scalp should be removed by incision under the ether-spray whilst they are still small, the whole of the cyst-wall being torn out, for unless the cyst is entirely removed, the tumour is likely to reform. If the sebaceous cyst is left it may cause a thinning of the overlying skin and, effecting its own discharge, may become the source of chronic suppuration. In some cases the chronic abscess of a sebaceous cyst becomes the starting-point of malignant disease. (E. O.*)

SCALPING, the custom of removing the skin of the skull, with hair attached. Though generally associated with the North American Indians, the practice has been common in Europe, Asia and Africa. The underlying idea, as of similar mutilations of those slain in battle, is the warrior's wish to preserve a portable proof or trophy of his prowess. Scalping was the usual form of mutilation from the earliest times. Herodotus (iv. 64) describes the practice among the Scythians. The Abbé Emmanuel H. D. Domenech (*Seven Years' Residence in the Great Desert of North America*, ch. 39) quotes the *decalvare* of the ancient Germans, the *capillos et cutem detrahere* of the code of the Visigoths, and the *Annals* of Flodoard, to prove that the Anglo-Saxons and the Franks still scalped about A.D. 879. In Africa it was, and doubtless is, as prevalent as are all barbarous mutilations.

Among the North American Indians scalping was always in the nature of a rite. It was common to those tribes east of the Rocky Mountains, in the south-west and upper Columbia; but unknown apparently among the Eskimo, along the north-west coast, and on the Pacific coast west of the Cascade range and the Sierras, except among some few Californian tribes, or here and there in Mexico and southward. Properly the scalp could only be taken after a fair fight; in more recent times there seems to have been no such restriction. To facilitate the operation the braves wore long war-locks or scalping-tufts, as an implied challenge. These locks were braided with bright ribbons or ornamented with a feather. After the successful warrior's return the scalp or scalps captured were dried, mounted and consecrated by a solemn dance. Some tribes hung the scalps to their bridles, others to their shields, while some ornamented with them the outer seams of their leggings. Scalping was sometimes adopted by the whites in their wars with the Redskins, and bounties have been offered for scalps several times in American history.

SCAMILLI IMPARES ("unequal steps," Fr. *escabeaux inégales*; Ger. *Schutzstege*), in architecture, a term quoted by Vitruvius when referring to the rise given to the stylobate in the centre of the front and sides of a Greek temple. His explanation is not clear; he states (iii. 4) that, if set out level, the stylobate would have the appearance of being sunk in the centre, so that it is necessary that there should be an addition by means of small steps (*scamilli impares*). In book v. chap. 9, he again refers to the addition on the stylobate. The interpretation of his meaning by Penrose and other authorities is generally assumed to be the addition which it was necessary to leave on the lower frusta of the Doric column, or on the lower portion of the base of the Ionic column, so as to give them a proper bearing on the curved surface of the stylobate; when levelling ground, however, it is sometimes the custom to fix at intervals small bricks or tiles which are piled up until the upper surfaces of all of them are absolutely level. If, as an alternative, these piles were so arranged as to rise towards the centre, instead of a level a slightly curved surface might be obtained, and the term "unequal steps" would apply to them. This was the opinion of M. Bernouf, a French author, who points out that *scamillus* is a diminutive of *scamnum*, a small step (Fr. *petit banc*), which in some parts of France is employed when levelling the surface of areas or courts. According to Penrose the rise of the curved stylobate of the Parthenon had already been obtained in the stereobate carrying it, long before the problem of bedding the columns on the curve had arisen.

SCAMMONY, a plant, *Convolvulus scammonia* (Gr. σκαμωνία), native to the countries of the eastern part of the Mediterranean basin; it grows in bushy waste places, from Syria in the south to the Crimea in the north, its range extending westward to the Greek islands, but not to northern Africa or Italy. It is a twining perennial, bearing flowers like those of *Convolvulus arvensis*, and having irregularly arrow-shaped leaves and a thick fleshy root. The dried juice, "virgin scammony," obtained by incision of the living root, has been used in medicine as *scammonium*,[1] but the variable quality of the drug has led to the employment of *scammoniae resina*, which is obtained from the dried root by digestion with alcohol.

The active principle is the glucoside scammonin or jalapin, $C_{34}H_{56}O_{16}$. The dose of scammonium is 5 to 10 grains, of scammony resin 3 to 8 grains. Like certain other resins, scammony is inert until it has passed from the stomach into the duodenum, where it meets the bile, a chemical reaction occurring between it and the taurocholate and glycocholate of sodium, whereby it is converted into a powerful purgative. Its action is essentially that of a hydragogue, and is exercised upon practically the entire length of the alimentary canal. The drug is not a cholagogue, nor does it markedly affect the muscular coat of the bowel, but it causes a great increase of secretion from the intestinal glands. It acts in about four hours. In large doses it is, of course, a violent gastro-intestinal irritant. In consonance with the statement that scammony acts only after admixture with the bile, is the fact that hypodermic or intravenous injection of the drug produces no purgation, or indeed any other result. The drug frequently kills both the round-worm and the tape-worm, especially the former, and is therefore an anthelmintic. It is not largely used, but is very effective in the treatment of severe constipation, especially in children.

SCAMP, an idle, worthless rascal; in earlier (18th cent.) usage especially applied as a cant term for a highway robber, a foot-pad, later of one who incurs debts and decamps without paying them. The word appears to be derived from a shortened form of "scamper," to run away, decamp, to move quickly or nimbly; which is generally taken to be a military slang word adapted from Dutch *schampen*, to escape; O.Fr. *escamper*; Ital. *scampare*; Lat. *ex*, out of, *campus*, field of battle, hence a vagabond deserter. This word must be distinguished from "scamp," to do work in a hasty, careless manner, which is apparently a variant of "skimp," "skimpy," and is to be referred to the root seen in O. Nor. *skammr*, short; Eng. "scant."

SCANDAL, disgrace, discredit, shame, caused by the report or knowledge of wrongdoing, hence defamation or gossip, especially malicious or idle; or such action as causes public offence or disrepute. (For the law relating to scandal, more generally termed "defamation" see LIBEL AND SLANDER.) The Greek word σκάνδαλον, stumbling-block, cause of offence or temptation, is used in the Septuagint and the New Testament. Classical Greek had the word σκανδάληθρον only, properly the spring of a baited trap; the origin probably being the root seen in Latin *scandere*, to climb, get up. While the Latin *scandalum* has given such direct derivatives as Spanish and Portuguese *escandalo*, Dutch *schandaal*, Eng. "scandal," &c., it is also the source of the synonymous "slander," Middle Eng. *sclaundre*, O. Fr. *esclandre*, *escandle*.

A particular form of defamation was *scandalum magnatum*, "slander of great men," words, that is, spoken defaming a peer spiritual or temporal, judge or dignitary of the realm. Action lay for such defamation under the statutes of 3 Edw. I. c. 34, 2 Rich. II. c. 5, and 12 Rich. II. c. 11 whereby damages could be recovered, even in cases where no action would lie, if the defamation were of an ordinary subject, and that without proof of special damage. These statutes, though long obsolete, were only abolished in 1887 (Statute Law Revision Act).

SCANDERBEG, or ISKENDER BEY (1403–1467), known also as "the Dragon of Albania," the national hero of the Albanians, was the son of John (Giovanni) Castriota, lord of Kroia and of the Mirdite country in northern Albania, and of a Servian princess named Vaisava. His actual name was George (Giorgio) Castriota, and the name of Iskender Bey (Prince Alexander) was given to him by the Turks in complimentary reference to Alexander the Great. In 1423, when Murad II. invaded Epirus, George Castriota, with his three brothers, was handed over as a hostage to the Turks and sent to be trained in the service of the seraglio. His brilliant qualities of mind and body at once gained him the favour of the sultan; he became a Mussulman, was promoted to high military command and, though barely nineteen years of age, to the government of a sanjak. He remained in the Ottoman service for twenty years, dissembling his resentment when, on the death of his father, his principality was annexed and his brothers poisoned. In 1443, however, his opportunity came with Janos Hunyadi's victory at Nish. He seized Kroia by stratagem, proclaimed himself a Christian, and gathered the wild Albanian clansmen about him. In the inaccessible fastnesses of Albania he maintained a guerilla warfare against the Turks during nearly twenty-five years, easily routing the armies sent against him, and is said to have slain three thousand Turks with his own hand. In 1461 Murad's successor Mahommed II. acknowledged him by a temporary truce as lord of Albania and Epirus. He died in 1467 at Alessio, and his tomb was long the object of a superstitious veneration on the part of the Turks.

Scanderbeg's resistance to the Turkish advance was invaluable to the cause of Christianity, but the union which he had maintained in Albania did not survive him. He was succeeded in Kroia by his son, Giovanni Castriota, who in 1474 sold the principality to the Venetians, by whom four years later it was re-sold to the Turks.

See Georges T. Petrovitch, *Scander-beg (Georges Castriota)*; *Essai de bibliographie raisonnée*; *Ouvrages sur Scander-beg écrits en langues française, anglaise, allemande, latine, italienne, &c.* (Paris, 1881); Pisko, *Skanderbeg, historische Studie* (Vienna, 1895).

SCANDINAVIAN CIVILIZATION. The date of man's first appearance in Scandinavia is still an open question. But for all practical purposes Scandinavian archaeology only begins with the Neolithic or Later Stone Age, since the country must have been covered with ice during the preceding period, the Palaeolithic or Early Stone Age, when parts of Europe were already inhabited. Thus the expressions Earlier and Later Stone Age in Scandinavian archaeology merely refer to subdivisions of the Neolithic Period. Men have left traces of their occupation of Denmark from the time when firs were still the prevailing trees in that country, and a few tools of elk and reindeer horn appear to belong to an even earlier period. Sweden and Norway were probably not inhabited until later, though it seems that men were present in Sweden while the Baltic was still a fresh-water lake. The dates assigned to this period vary very greatly: S. Müller suggests before 3000 B.C., while O. Montelius places it at 8000 years before our era. Besides the elk- and reindeer-horn tools mentioned above, a few rough flint implements seem to be the earliest traces of man in Scandinavia. In Norway and Sweden these are only found in the extreme south. The *kjøkkenmøddinger* or *skaldynger*, variously called in English kitchen-middens, refuse-heaps, or shell-mounds, are characteristic of Denmark in the next period. In these we find remains of primitive meals, consisting chiefly of oyster, mussel and other shells, and the bones of various fish, birds and animals, including deer, wild boar, seals, wolves and aurochs. It appears that the race which left these relics must have lived by hunting and fishing, and that they were probably semi-nomadic. They were evidently unacquainted with agriculture and had no domestic animals other than the dog. These refuse heaps are almost always found by the sea-shore or close to a lake. Some of them extend over an area of as much as 700 yds. by 20 yds. width, but their depth is usually not more than 3 to 10 ft. There are frequent traces of fire and hearth places, so that we may conclude that the food was both prepared and eaten on the spot. The flint implements consist of flakes or knives, awls and axes of various kinds, all made by a process of rough chipping. These are supplemented by articles of bone, horn and clay, including arrow or spear points, axes of horn, and bone combs. Earthenware vessels must have been much used, but only fragments have been found, made, of course, without the use of the wheel. Rare attempts at decoration consist of a few cuts or impressions round the top. The only ornaments found are the pierced teeth of animals and shells. In Norway and Sweden implements similar to those of the Danish shell-mounds have been found, but usually without the organic remains, except at Viste, near Stavanger, excavated in 1907. The first Swedish shell-mound was discovered in the north of Bohuslän in 1905, but is of a later type than the Danish. The remains at Nöstvet in the Christiania fjord show traces of a considerable population. Ground slate implements are found scattered along the coasts of Norway and Sweden, and are attributed to a nomadic people, whose arctic culture persisted much longer in these countries than in the much earlier flint civilization of the Kitchen-middens in Denmark. To this race are attributed a few rock-carvings and other sculptured representations of animals in a highly naturalistic style, almost equal to that of the palaeolithic cave-carvings of France, and showing close affinity with the artistic productions of the regions on the eastern side of the Baltic.

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[1] It was formerly called diagrydion, probably from δάκρυ, a tear, in allusion to the manner in which the juice exudes from the incised root.

Later Stone Age.—The remains of the Later Stone Age show a very much more advanced civilization of a pastoral and later of an agricultural type, with domestic animals, such as cattle, horses, pigs, sheep and goats. As the number of "transition" finds, showing a gradual development from the older forms, is very small, and as, moreover, settlements of the kitchen-midden type are known to have existed right through the later Stone Age, or even longer, there is some ground for assuming that the earlier flint implements of Denmark were the product of an aboriginal race, gradually ousted and driven north by Aryans, immigrating with a superior culture.

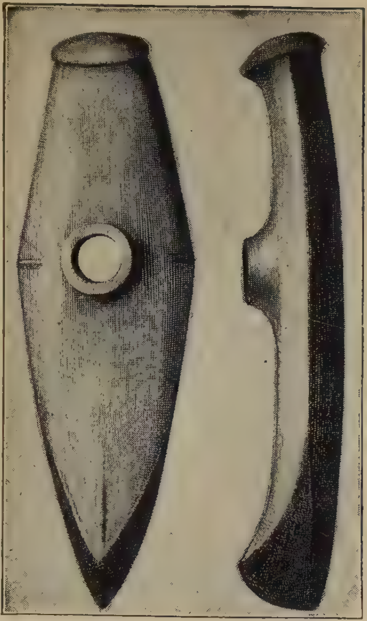
By far the greatest proportion of the remains of the Stone Age are found in Denmark. While there are not more than five to six hundred Stone-Age graves known in Sweden, and only two or three in Norway, there are between three and four thousand on the island of Seeland alone. Besides Seeland, Lolland, Falster and the north-eastern part of Jutland appear to have been thickly inhabited during the Later Stone Age. In Sweden the southernmost part, Skåne and Bohuslän, were probably the first to be inhabited: and then Vestergötland and Dal. Skåne has yielded more than three-fourths of all the Later Stone Age objects found in Sweden. Norway is not, as might be supposed from the absence of graves, entirely deficient in the objects of this period, but they are comparatively few in number, though quite on a par in technique with those of Sweden. As already indicated, the great difference between the culture of the shell-mounds and that of the Later Stone Age is the method of disposing of the dead. The dead of the former period, it is assumed, were placed in simple graves in the earth, while characteristic of the latter period are the megalithic graves found in profusion in Denmark and Sweden.

The earliest form, and that most common in Denmark, is the four-sided dolmen, formed by four or six large upright stones on which rests a huge rock, the whole being partly covered by a mound. These graves usually contain a number of skeletons. The next is the passage grave, a chamber approached by a passage, both built of great blocks of rough-hewn rock. The roof of the largest of these, near Falköping in Sweden, is formed of nine blocks of granite, and the whole attains a length of nearly 60 ft. Later again are stone cists, consisting of a comparatively small space walled in and roofed by thin blocks of stone, surrounded by a low mound. These graves seldom contain more than one skeleton, and mark the end of the Stone Age. Inhumation was practised throughout the period, though the bones found in the great graves are often marked by fire owing to the practice, apparently prevalent, of lighting fires in the grave chambers. The chambers are often full of remains up to within a foot of the roof, and in some cases parts of as many as a hundred skeletons have been found.

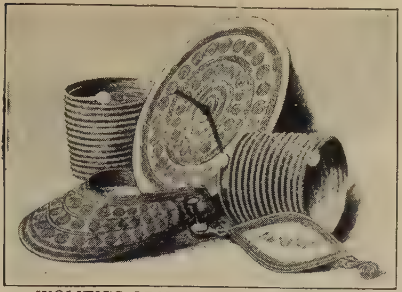
In the mounds surrounding the tombs animal bones and shells are frequently found, indicating feasts and sacrifices. It seems as if many of the graves, especially in Sweden, had at some time been considered as places for sacrifice, to judge by the saucerlike hollows constantly found on the upper side of the covering stones. The finds of tools, weapons, ornaments and pottery contribute greatly to our knowledge of the period, but probably the best specimens were not placed in graves, as we find the finest work elsewhere. The pottery is of good material and form, though still made without the aid of the potter's wheel. The indentations of the pattern are frequently filled in with a white chalklike substance. Many of the vessels are rounded at the bottom, and perforations or handles show that they are meant to hang. Wood was no doubt much used, but it is only by a fortunate chance that wooden vessels and a wooden spoon have been preserved to us in Denmark. It is probable that wool was used as well as skins for clothing, but if so it must be supposed that the spinning and weaving implements were of too perishable a material to have come down to us. Awls are constantly found, but not needles. Bone pins were used for fastening the clothes. The ornaments were chiefly pierced teeth of various wild animals, and objects of amber and bone, many of them in the form of minute axes. Amber was much used during the earlier part of this age, but it is seldom found later on, probably because its value as an article of export had by then been realized. The Swedish archaeologist, O. Montelius, distinguishes four subdivisions in this period, towards the end of which the implements show a mastery over material unequalled in the rest of Europe, but it must not be supposed that this was attained at once. The tools include chisels, borers, knives, saws and axes, but the finest workmanship seems to have been reserved for weapons. Arrow-heads and spear-points of flint have chipped blades of marvellous fineness and symmetry. Daggers with handle and blade all made of one piece of flint are characteristic of the Northern Stone Age, and show how much weight was laid on ornamental appearance, since wooden handles would have been equally effective and far less troublesome to make. The battle-axes are of many forms, perfectly symmetrical and beautifully ground and polished. Those of other stone than flint have holes bored through them for the shaft. Wooden shafts were usually attached at right angles to the flint axes. Of these latter the thin-necked axe is the most characteristic. The distribution of flint implements reveals a considerable trading activity, as flint-bearing strata only occur in certain parts of Denmark and in Skåne, whence it must have been distributed over the whole of Southern Sweden through the channels of commerce. Considerable commercial activity must also have prevailed between the Scandinavians and their southern neighbours.

SCANDINAVIAN CIVILIZATION

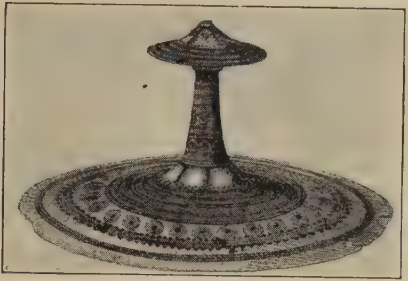
PLATE I.



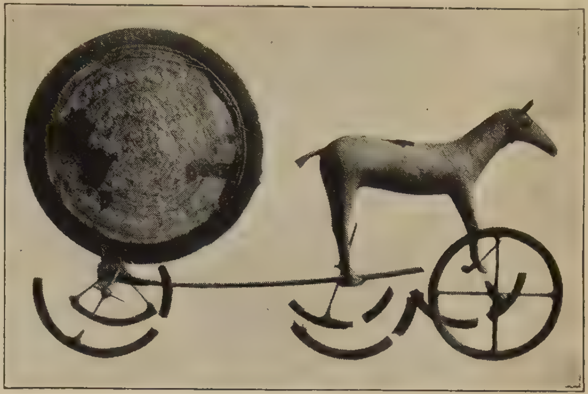
1.—STONE AXE. Later Stone Age, Sweden.



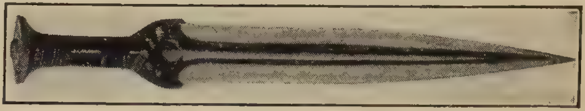
2.—WOMEN'S ORNAMENTS. Early Bronze Age.



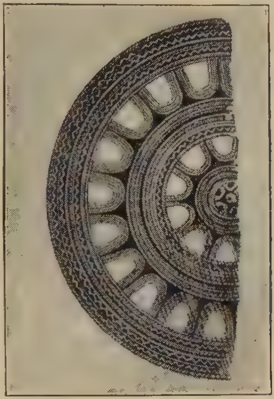
3.—BELT ORNAMENT. Latter part of earlier Bronze Age.



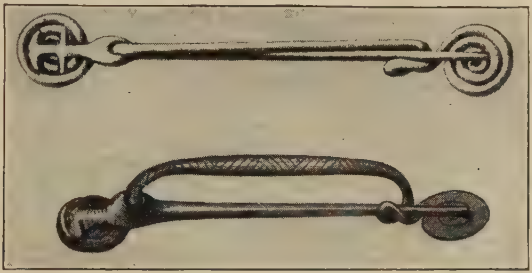
4.—SUN CHARIOT. Older Bronze Age, Denmark.



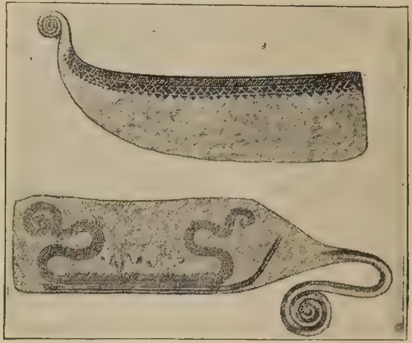
5.—SWORD. Second period of earlier Bronze Age.



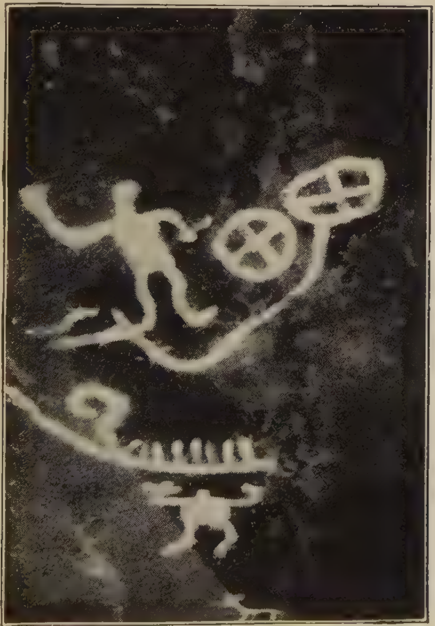
6.—TOP OF A SMALL BRONZE CASKET. Latter part of earlier Bronze Age.



7.—FIBULÆ. Earlier and later forms, Bronze Age, Norway.

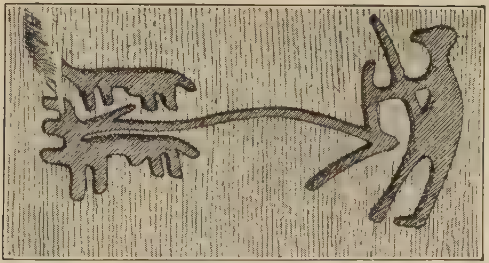


8.—BRONZE KNIVES OR RAZORS. Later Bronze Age, earlier and later forms.

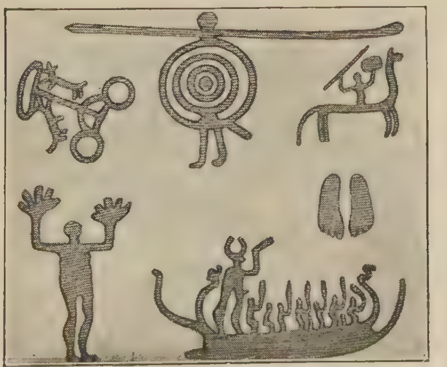


Photo, B. S. Phillpotts.

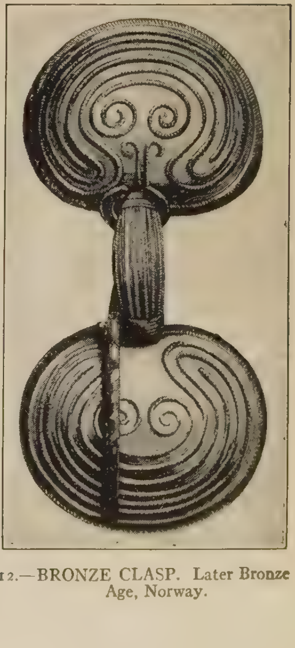
9.—PART OF A ROCK CARVING (the grooves are filled in with chalk). Bronze Age.



10.—PART OF A ROCK CARVING, showing man ploughing.



11.—ROCK CARVINGS. Sweden, Later Bronze Age.

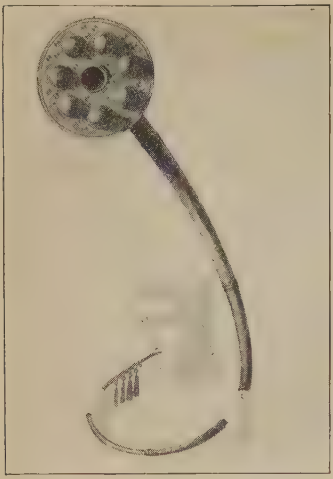


12.—BRONZE CLASP. Later Bronze Age, Norway.

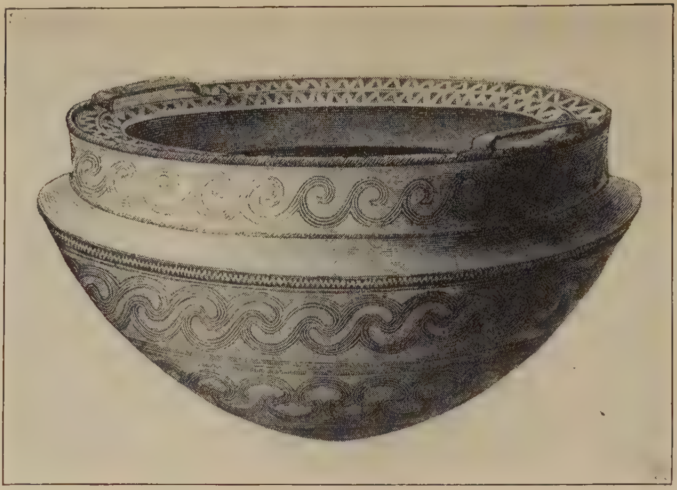
Fig. 1 from O. Montelius, *Civilization of Sweden*; Figs. 2-6, 10, 11 from S. Müller, *Vor Oldtid and Urgeschichte Europas*; Figs. 7, 8, 12 from G. Gustafson, *Norges Oldtid.*

PLATE II.

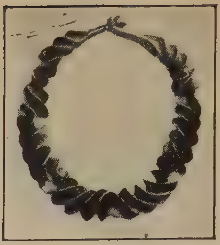
SCANDINAVIAN CIVILIZATION



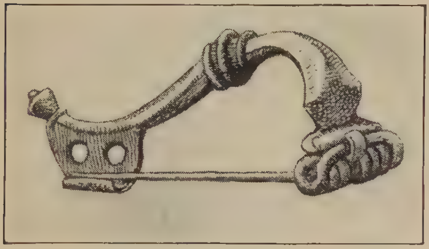
1.—BRONZE TRUMPET. Denmark, Later Bronze Age.



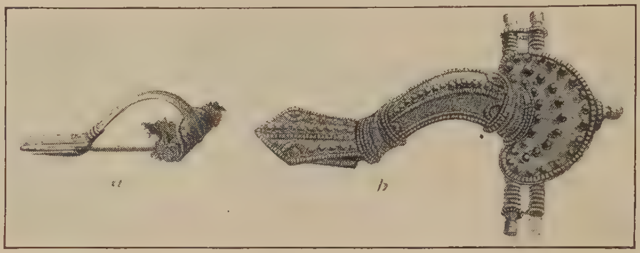
2.—BRONZE HANGING VESSEL. Later Bronze Age.



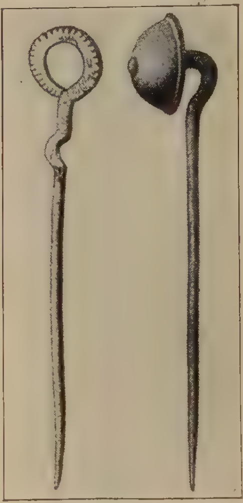
3.—TORQUE. Denmark, Later Bronze Age.



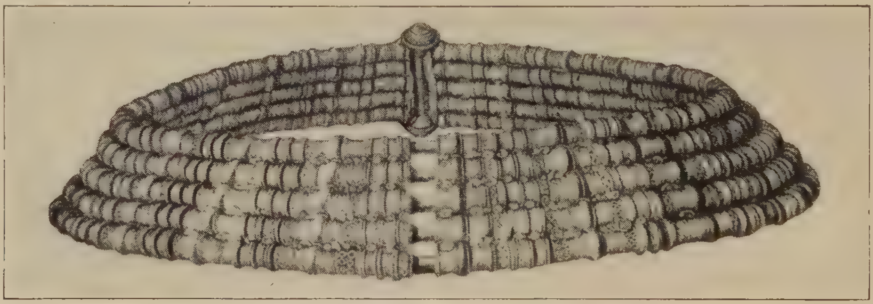
4.—FIBULA. Roman Period.



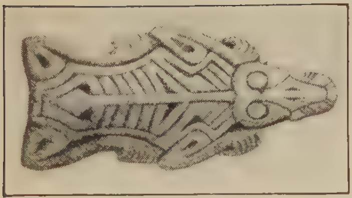
5.—FIBULÆ. Period of National Migrations, Denmark.



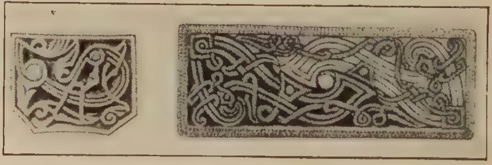
6.—IRON PINS. Pre-Roman Period, Denmark.



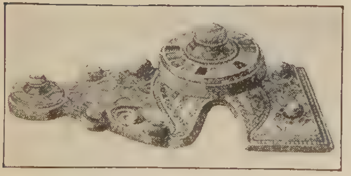
7.—GOLD COLLAR. First period of Later Iron Age.



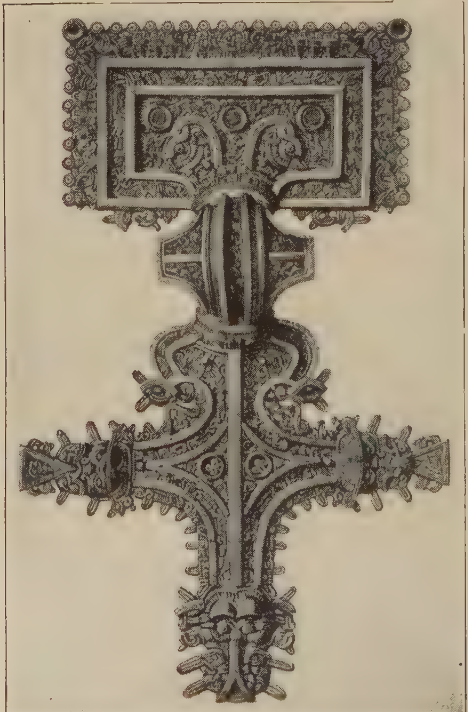
8.—BROOCH. Post-Roman Period, Denmark.



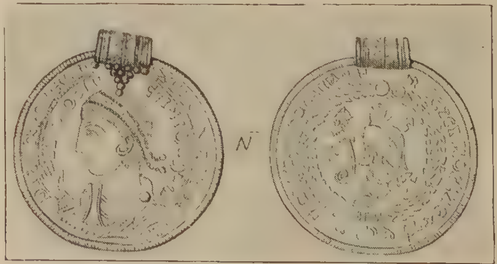
11.—BRONZE PLATE FOR A BELT, showing Animal Figures. Post-Roman Period.



9.—BROOCH SET WITH GARNETS. Post-Roman Period, Denmark.



10.—SILVER GILT BROOCH (length over 9 inches). Period of National Migrations, Norway.



12.—GOLD BRACTEATE, "barbarian" imitation of a Roman Coin. First period of Later Iron Age, Sweden.

Figs. 1, 3-6, 8, 9, 11 from S. Müller, *Vor Oldtid*; Figs. 2, 7, 12 from O. Montelius, *Civ. Sweden*; Fig. 10 from G. Gustafson, *Norges Oldtid.*

Traces of dwelling-houses with hearth-places show that the usual form was a round or slightly oval hut, constructed of wattles, plastered inside and out with clay. The floor was usually partly or entirely paved.

The Bronze Age.—Towards the close of the *Later Stone Age* a few objects of copper are found in the North. Copper is, however, soon superseded by bronze, which was probably imported ready alloyed into Scandinavia, though the special Scandinavian forms, as well as the presence of a number of moulds, conclusively prove that the casting of the metal was done in the North. It is supposed that the Bronze Age, which can be divided into two main periods, began in Scandinavia about 2000-1750 B.C. The earliest implements are clearly copies of the Stone Age work, betraying the ignorance of the makers as to the adaptability of the new material. Some bronze axes are exactly the shape of stone axes, but gradually we see the blade grow wider, the neck narrower, the outer sides of the haft turn back over the wooden shaft, which is still cloven, and finally before the end of the earlier period we have the "socketed celt," in which the tongue has disappeared and the wooden shaft is fixed in a cylinder of bronze, with a metal loop at the side through which the fastening passed. The unsocketed celt has also undergone modifications. By the end of the earlier period swords have been evolved from daggers, and brooches and clasps, besides beautiful vases and hanging vessels, are made of the metal. Gold is also known and used. Fine linear decoration, usually in spirals or zig-zags, is applied. The forms are extremely artistic, and the technique higher than in almost any other European country. Perhaps the most magnificent relic of this earlier period is the bronze "sun-chariot" and horse from Trundholm in Seeland. The disk supposed to represent the sun is overlaid with gold and beautifully decorated with spiral designs. The later period is clearly marked off from the earlier by the method of disposing of the dead, since in the earlier period the dead were still buried unburned, often in stone cists or oak coffins, while in the latter period cremation was practised, and the remains placed in small stone or wooden boxes, or in plain earthenware urns. Some of these urns are clearly imitations of the house of the period, and show that it was still round in form. The graves are covered by a cairn or mound. Miniature weapons are often found in the urns, but the objects placed in or beside the urn reveal little care in their selection: it is obvious that a few gifts were deposited with the dead, rather than the complete outfit of necessaries which are found in earlier periods. During this period decoration becomes more complicated: the spirals are often fringed with tangential lines, and the ends of knives, rings, &c., are frequently rolled up into spiral volutes. Bands of wavy lines are a common form of ornament. Amber and a dark-brown resinous matter are often inlaid. Ornaments show a tendency to exaggeration of size, as is seen in the massive neck and arm-rings, the brooches, pins and clasps.

We are fortunate in knowing more about the Scandinavian Bronze Age than the mere remains, plentiful though they are, could tell us. In some parts of Sweden and Norway rude carvings on bare granite rocks, executed in a stiff and conventional style, have been identified as belonging to this period, and from these, in combination with the finds, we can deduce a considerable fund of information. Horses were used for riding, driving and ploughing. From the impress left on earthenware vessels we find that wheat, barley and oats were cultivated. Large boats, almost invariably without mast or sail, are very frequently depicted. The human figures on the carvings are unfortunately represented in such a primitive manner that little could be known of the details of their clothing but for some unique finds in Denmark, where the oak coffins of the earlier period have preserved hair and clothing for over 3000 years. Thus we know that the garb of the Bronze Age man consisted of a thick glossy cap, replaced by a helmet in time of war, a woollen tunic which left the shoulders bare, a cloak and leather shoes fastened on by strips of cloth crossed up the ankle. A buckle for the belt, pins for the cloak, and one bracelet were his only ornaments. From the small bronze knife and the tweezers found in men's graves it has been deduced that shaving was usual, and a small pointed instrument also found in the graves is regarded as evidence for tattooing. The women wore a fine hair net and comb, a curiously clumsily-cut bodice with sleeves to the elbow, and a long skirt gathered round the waist by a belt with a large ornament in front. A heavy necklace, two bracelets and a dagger appear to have been usual. The people were tall and had light hair. With regard to the distribution of Bronze Age finds, it may be said that Götaland, Skåne and the district round Stockholm yield the richest harvest in Sweden, while in Norway the mass of finds are in the Christiania and the Stavanger districts. A notable feature of the period is the number of finds made in bogs. Many were clearly buried there for safe keeping, but others are usually explained as votive offerings.

Iron Age.—The approximate date for the first beginnings of this period in the North is still a matter of controversy; Montelius placing it at about 500 B.C., while Sophus Müller, of Denmark, would put it at least a century and a half later. It has been divided into four main subdivisions, of which the first, lasting till about the beginning of our era, is usually called the Pre-Roman Period. The beginnings of this age are most clearly traced on the island of Bornholm, where cemeteries are found containing from 10 to 1000 graves. These graves, called *Brandpletter*, are closely similar to the contemporary graves on the Continent, and consist of burnt bones embedded in charcoal and black mould. In this are found iron brooches (of the safety-pin type), buckles and a few fragments of pottery. More typically Northern cemeteries show small mounds covering each grave, in which an urn contains the burnt bones. These graves also yield but few remains, and the wealth of objects from this period come from bog and field finds, as for instance some magnificent chariots, overlaid with decorated bronze plates, from a bog near Ringkjöbing, Denmark. Ornaments were usually of massive bronze or occasionally of iron, and gold seems to have been comparatively scarce, perhaps owing to the disturbed state of central Europe. All but the very beginning of the period shows the influence of the La-Tène (*q.v.*) civilization. The succeeding Roman period begins in the 1st century A.D. and extends, according to Swedish and Norwegian archaeologists, to about 400. In Denmark the latter half of the period is termed that of "National Migrations." A number of Roman objects are found—coins, glass and bronze vessels, &c. From the fact that Skåne, Bornholm, Öland and Gotland are the chief finding-places, it appears that most of the objects must have been brought, through war or trade, from the south-east, by way of the great trade-route along the Vistula. Gotland alone has yielded nearly four thousand Roman coins, while Bornholm equals the whole of the rest of Denmark with 500, and Norway has only yielded three. A certain number of Roman objects seem, however, to have reached Denmark from the Rhine Provinces. The graves show a variety new to Scandinavia: in some parts cremation continues to be practised, in other localities, notably in Jutland and Seeland, inhumation reappears. Characteristic of both forms of burial is the practice of placing a number of vessels containing food and drink in the grave. Weapons are seldom found in graves, but a complete knowledge of them is afforded by such finds as that at Thorsbjerg in Schleswig and Vimose in Fünen, the latter yielding no less than 3500 objects to the National Museum. These are the debris of great battlefields from about the 4th century, and it is usually supposed that the victors dedicated the spoil to some god, as everything was left almost untouched.

From this ample evidence we learn that the spear or lance was the most common weapon, and after that the sword, used now for striking as well as thrusting, and with a short cross-piece. The hilt is often superbly decorated, frequently with silver, which is now much used. Coats of ring-mail are found. Helmets and shields are extraordinarily thin, almost flimsy, possibly in imitation of the inferior Roman goods of the period, possibly in the case of the shields, at any rate, because they were only intended to protect from arrows or spears flung from a distance, or because dependence was mainly placed on the strength of the boss. Numbers of bits and other fragments of harness prove the use of horses in war. A similar find at Nydam in Schleswig yielded two of the oldest boats that have come down to us: one of oak, 75 ft. long, built for 28 rowers, and another of firwood. The timbers were fastened with iron nails, but some early boats from Norway and Sweden show a more primitive method of attaching the timbers with fastenings of baste.

Besides the deserted battlegrounds, the more usual type of votive offering is found, such as the silver cauldron from Gundestrup, or the two magnificent gold horns, one more than 2 ft. in length, discovered at Gallehus in Schleswig. Further indications of religious customs are afforded by a curious find in Jutland, where between 20 and 30 earthenware vessels each contained a slaughtered lamb. With these were found remains of rude altars.

Of domestic arts, weaving and dyeing seem to have been carried to a high degree of perfection. The art of pottery has also advanced, especially in Jutland, where we find a multiplicity of forms, with decoration in bands of slanting lines. It was during this period that the Scandinavians acquired the Runic alphabet from the southern Germanic tribes. The specifically Northern variant of this alphabet does not appear till later. Inscriptions from this period, cut into stone monuments, are found in Norway and Sweden.

The next period (the first of the Later Stone Age), called in Denmark the Post-Roman, and in Sweden and Norway the "Period of National Migrations," brings us from A.D. 400 to about 700. In Denmark these centuries are very obscure, owing to the fact that the graves there are usually difficult to find, being without mounds and unfurnished with goods. Bornholm, where inhumation is greatly on the increase, is again the chief centre for grave-finds. Some few graves contain the personal equipment of the dead: sword, spear, axe, shield, knife and whetstone, and occasionally the skeletons of horse and dog. The vessels for food and drink are no longer found. At Old Upsala, Vendel and Ultuna, all in Upland, great interest attaches to the first ship-graves. These become common in Norway, fairly frequent in Sweden, and even in Finland, but only one grave containing remains of a boat has so far been found in Denmark. The details of the earlier Swedish ship-burials are somewhat obscured for us because the ship and all its contents have been burnt, but we can see that in these the dead man sits at the stern, as if about to set forth on a journey, while in later graves of the Viking Period, both burnt and unburnt, the corpse seems to have been laid on a bed in a chamber built amidships for the purpose. All the larger ship-burials are remarkable for the large number of animal bones found, including those of horses, oxen, pigs, sheep and fowls.

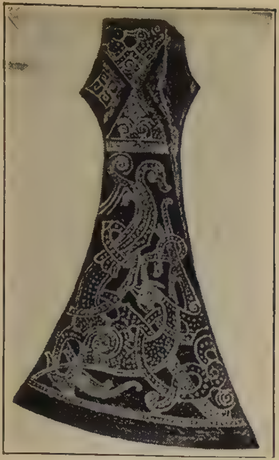
The gold ornaments of the period are its chief glory: indeed the wealth of gold, especially in Sweden, has suggested the title "Gold Age" for these centuries. The favourite ornaments of the period were the so-called bracteates, worn as pendants, and imitated from Roman coins, but often stamped on one side only and decorated in the Northern style. Magnificent brooches of engraved or filigree work, some with a plate at the hinge end at right angles to the pin, others oval, often representing an animal seen from above, are among the finest productions of the time. The decoration of conventionalized animal forms is a marked feature, and, though characteristic of all the Germanic races at this time, is best executed in the north. When worked in filigree the animals' limbs become more and more attenuated and snake-like, or, on the other hand, when engraved, show less and less connexion with each other, but the artist's aim, a good decorative effect, is attained, even though there is a certain barbaric absence of restraint in design.

In the *Viking Age*, from about 800 to the introduction of Christianity in the 10th and 11th centuries, Norway, hitherto the poorest in antiquities, springs into prominence. A wealth of objects is found in the graves, and especially in some of the larger ship-graves, such as those of Gokstad, Tune, Myklebostad and Oseberg (also in the Norwegian ship-grave at Groix, Brittany). Fortunately a number of these ships are unburnt, and in view of the importance of seafaring in the Viking Age, it is worth noting that a mast with square sail of woollen material is common. One ten-oared vessel from this period is of exactly the same build as those used to this day in the district where it was excavated. A number of shield bosses are often found in the vessels, and it is clear that shields were hung round the bulwarks exactly as Icelandic sources describe. The prow and stern-post are often beautifully carved. Sometimes the remains of as many as 12 horses are found in one of these graves, besides those of a number of dogs. The presence of anvils, pincers and other tools, as well as weapons and ornaments, is noteworthy, indicating that the art of metal-work was held in esteem even among chiefs, as indeed is known from literary sources. During this period, moreover, iron ore was extracted, smelted and worked in Scandinavia. The weapons found are swords, knives, sickles, battle-axes, spears and arrows. The sword is two-edged, with a wooden hilt often beautifully decorated with silver. The axe is very broad-bladed, and evidently of great importance, being often the only weapon found in graves. Helmets and coats of mail are not found in Norway, but are comparatively common in Sweden.

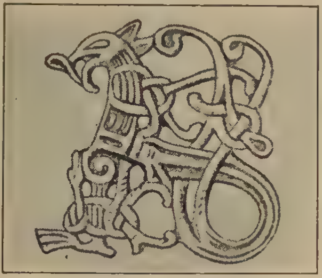
We owe much of our knowledge of this period to the unburnt burials which were fortunately usual. In Denmark grave-chambers of wood, such as those at Jellinge, stand nearest to the ship-graves. In Sweden the great number of graves surrounding the ancient town of Birka (mod. Björkö), should be noticed. Most graves have a round, oblong or triangular howe raised over them. A feature of the period are the tall, rudely-hewn *bauta-stones*, set up over graves containing burnt bones, or sometimes merely to the memory of the dead. Large upright stones are sometimes set round a grave in a circle, or in the shape of a ship, with pointed bow and stern. It is noticeable that the graves are often in close proximity to the modern cemeteries. In this period women are also occasionally buried in a boat or ship, as in the case of one of the finest ship-graves, that at Oseberg. Women's graves often contain splendid ornaments, though gold and silver are rare in grave-finds, and the large oval-headed pins and the oblong or trefoil-shaped clasps found in them are usually of bronze, while in other finds silver ornaments are common. Silver is as characteristic of this period as gold of the preceding one, Denmark alone yielding no less than 25 important silver finds, some of them consisting of necklaces of very fine filigree work, or of dexterously woven silver wires. The style of decoration is the same as the preceding period, but bolder, less refined and often heavy. Ornaments are often set with garnets. The influence of Irish art is discernible, as in the spirals which terminate the limbs of the animal forms, and in the frequent interlacing designs; and we are not surprised to find a number of objects of Irish manufacture in Norway. On the other hand, English leaf decoration is imitated, and Carolingian models appear to have served for certain grotesque forms, such as dragons, winged lions, &c. Sweden shows the same influences at work, though the Swedes still had most dealings with the eastern Baltic countries, and with the Scandinavian kingdom of Novgorod. "Cufic" coins, struck in Persia and Turkestan, are found together with those of Germany and England. It is clear proof of Gorland's commercial importance that it is still the richest treasure-ground in this respect, even for English coins. Evidence for the eastern communications of Sweden is afforded by Runic inscriptions, some of which state that the chief whom the stone commemorates fell in Finland or Esthonia. Runic inscriptions with the later, entirely Northern alphabet are now common all over Scandinavia. The stones, especially the later Swedish ones, are often carved with spiral and animal designs, and some represent mythical scenes such as the adventures of Sigurd Fafnisbane, depicted on a stone from Södermannland. The houses of this period were usually built of wood, and consisted, as we know from literary evidence, of a large hall with various outbuildings. The descriptions in Icelandic sagas of tapestry hangings are borne out by the discovery of traces of hangings in grave-chambers, especially those at Jellinge in Denmark. Some fragments of cloth, showing designs in various colours, testify to a considerable degree of skill in weaving, and figured silk material is found in some of the ship-graves. Traces of feather mattresses and wooden beds are found in some of these graves, and dice and playing-pieces resembling draughtsmen frequently occur. The remains of humbler dwellings have been found, some of them resembling a type of cottage still to be seen in southern Sweden, built of wattles, plastered inside and out.

Another feature of the Viking Age consists in the great earthworks, many of them standing to this day. Such are the famous Danevirke, stretching right across Schleswig, the work of Queen Thyra, who lies in one of the great howes at Jellinge, and the so-called *bygdeborge* in Norway, some of which are assigned to Viking times.

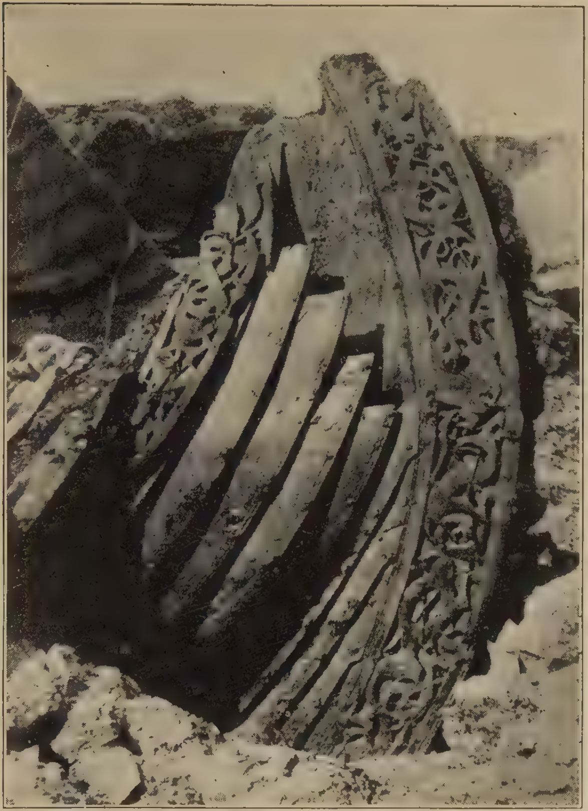
AUTHORITIES.—O. Montelius, *Kulturgeschichte Schwedens von den ältesten Zeiten* (Leipzig, 1906). An earlier Swedish edition of this book has been translated into English by F. H. Woods: *Civilization of Sweden in Heathen Times* (London, 1888); S. Müller, *Nordische Alterthumskunde*; *Deutsche Ausgabe, von O. L. Jiriczek* (Strassburg, 1897), and *Ordnung af Danmarks Oldsager*, *Système Préhistorique du Danemark* (Copenhagen and Paris); J. J. Worsaae, *The Industrial Arts of Denmark* (London, 1882); G. Gustafson, *Norges Oldtid* (Christiania, 1906); O. Rygh, *Norwegian Antiquities* (French and Norwegian text) (London and Christiania, 1880); A. Hansen, *Landnåm i Norge* (Christiania, 1904); E. Vedel, *Bornholms Oldtidsminder* (Copenhagen, 1886); J. Undset, *Das Erste Auftreten des Eisens in Nord-Europa*; J. Mestorf, *Urnenfriedhöfe in Schleswig-Holstein* (Hamburg, 1886) and *Vorgeschichtliche Alterthümer aus Schleswig-Holstein* (Hamburg, 1885); B. Salin, *Die altgermanische Thierornamentik, übersetzt von J. Mestorf* (Stockholm, 1904). Also articles by the above, and by H. Schetelig, H. Hildebrand, H. Stolpe and others, in various periodicals, especially *Bergens Museums Aarbog* (Bergen), *Aarsberetninger fra Foreningen til norske Fortidsmindesmaerkers Bevaring* (Christiania), *Aarböger for nordisk Oldkyndighed* (Copenhagen), *Antiqvarisk Tidskrift för Sverige* (Stockholm), the *Månadsblad* of the *Kgl. Vitterhets Historie och Antiqvitets Akademie* (Stockholm), *Fornvännen*, published since 1906 by the same society, *Svenska Fornminnesforeningens Tidskrift* (Stockholm), *Ymer* (Stockholm). The guides to the various Scandinavian museums are of great value. Some of them can be obtained in English. The importance of the Kiel Museum, with its



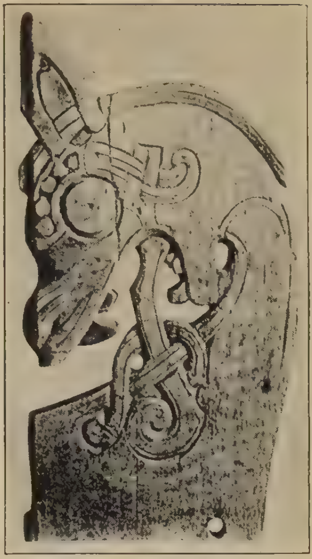
1.—AXE INLAID WITH SILVER.
Viking Age, Denmark.



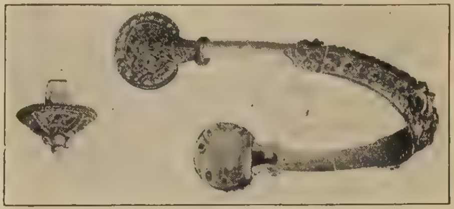
2.—TYPICAL MOTIF, ANIMAL FORM AND SNAKE, from bronze clasp.
Viking Age, Denmark.



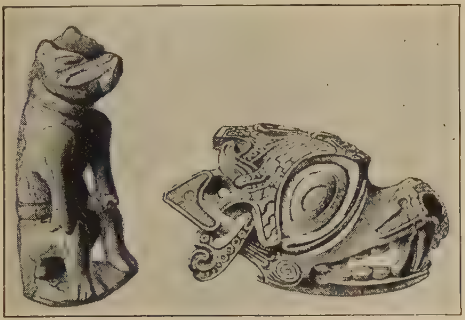
3.—PART OF THE OSEBERG VIKING SHIP. Norway.
Photo lent by Prof. G. H. Gustafson.



4.—OAK CARVING FROM THE GOKSTAD SHIP.
Viking Age, Norway.

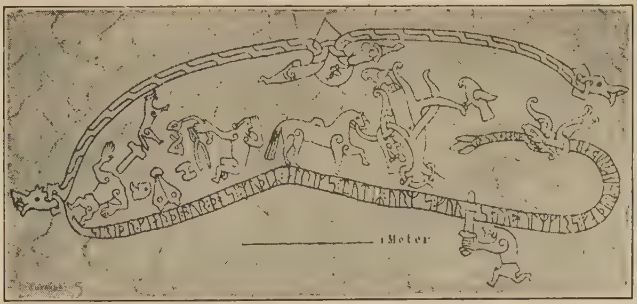


5.—GOLD SPUR. Viking Age, Norway.

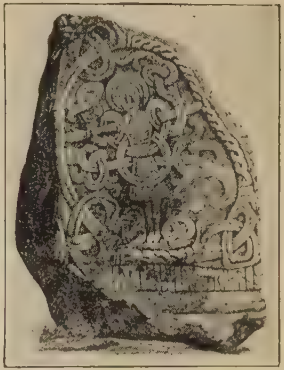


6.—BONE PLAYING PIECE.

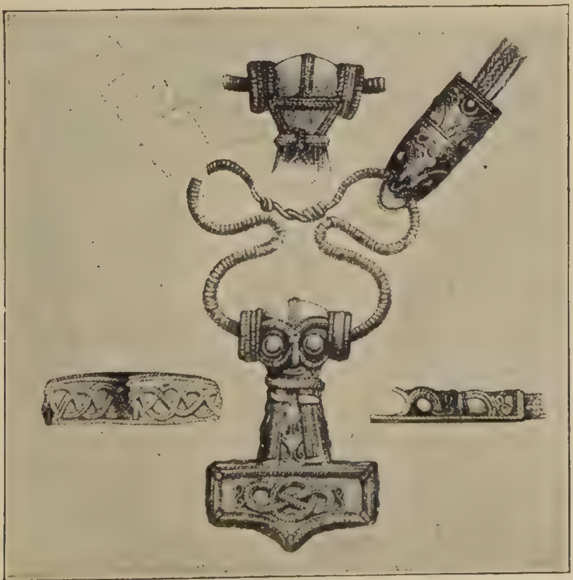
GILT BRONZE KNOB FOR HARNESS. Viking Age, Norway.



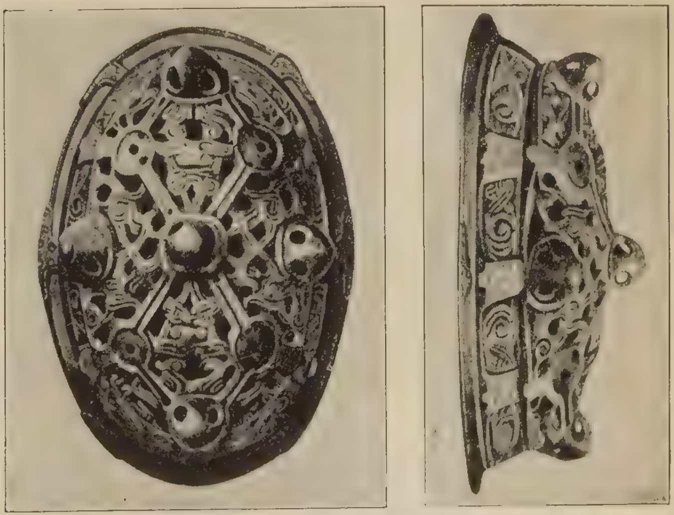
7.—SCENES FROM THE LIFE OF SIGURD AND RUNIC INSCRIPTION.
Viking Age, Sweden.



8.—RUNIC STONE, from Jellinge, Jutland, showing Christian influence.



9.—SILVER "THOR'S HAMMER." Viking Age, Sweden.



10.—BROOCH. Viking Age, Norway.

Figs. 1, 2, 8, from S. Müller, *Vor Oldtid*; Figs. 3, 4, 5, 6, 10 from G. Gustafson, *Norges Oldtid*; Figs. 7, 9 from O. Montelius, *Civ. Swed.*

guide by J. Mestorf, *Vorgeschichtliche Alterthümer aus Schleswig-Holstein*, should not be overlooked. The *Saga Book of the Viking Club* (London) contains excellent articles, chiefly by H. Schetelig and H. Kjær. (B. S. P.)

Territory.

SCANDINAVIAN LANGUAGES.[1] By this expression we understand the closely allied languages which are and have been spoken by the Teutonic population in Scandinavia, and by the inhabitants of the countries that have been wholly or partially peopled from it. The territory of these languages embraces: Sweden, except the most northerly part (chiefly Lapland and inland parts of Vesterbotten, where Finnish and Lappish exclusively or chiefly prevail); certain islands and districts on the coast of western and southern Finland, as well as Åland; a small tract on the coast of Esthonia, where Swedish is spoken, as it is also to some extent in the Esthonian islands of Dagö, Nargö, Nukkö, Odensholm, Ormsö and Rågö; Gammalsvenskby (" Galsvenskbi ") in southern Russia (government of Kherson), a village colonized from Dagö; the Livonian island of Runö, where Swedish is spoken, as it formerly was on the islands of Kynö, Mannö, Moon and Ösel; Norway, except certain regions, especially in the northern part of the country, peopled by Finns and Lapps (mainly in the diocese of Tromsö); Denmark, with the Faeroes, Iceland and Greenland, where, however, Danish is only spoken by a very small part of the population; the northern half of Schleswig; and, finally, several Scandinavian colonies in the United States of North America (especially in Minnesota and Illinois). Scandinavian dialects have besides been spoken for varying periods in the following places: Norwegian in certain parts of Ireland (A.D. 800–1250) and northern Scotland, in the Isle of Man (800–1450), the Hebrides (800–1400), the Shetland Islands (800–1800) and the Orkneys (800–1800); Danish in the whole of Schleswig, in the north-eastern part of England (the Danelagh, *q.v.*, 875–1175), and in Normandy (900–1100, or a little longer); Swedish in Russia (862–1300, or a little longer);[2] Icelandic in Greenland (985–about 1450).

Age.

The Primitive Scandinavian language.

Borrowed words.

Runic inscriptions.

At what epoch the Teutonic population settled in Scandinavia we cannot as yet even approximately decide. It is quite certain, however, that it already existed there before the Christian era—most probably as early as the beginning of the so-called Later Stone Age (5000 B.C., but see SCANDINAVIAN CIVILIZATION), if not still earlier. If this view be correct, the Scandinavian languages have had an existence of seven thousand years at least. But it is only from the beginning of the Christian era that we can get any information concerning the language of the old Scandinavians, which seems by that time not only to have spread over Denmark and great parts of southern and middle Sweden and of Norway, but also to have reached Finland (at least Nyland) and Esthonia. In spite of its extension over this considerable geographical area, the language appears to have been fairly homogeneous throughout the whole territory. Consequently, it may be regarded as a uniform language, the mother of the younger Scandinavian tongues, and accordingly has been named the primitive Scandinavian (*urnordisk*) language. The oldest sources of our knowledge of this tongue are the words which were borrowed during the first centuries of the Christian era by the Lapps from the inhabitants of central Sweden and Norway, and by the Finns from their neighbours in Finland and Esthonia (partly, it is true, also from their Gothic neighbours in Russia and the Baltic provinces), and which have been preserved in Finnish and Lappish down to our own days.[3] These borrowed words, denoting chiefly utensils belonging to a fairly advanced stage of culture, amount to several hundreds, with a phonetic form of a very primitive stamp; as Finn. *terva* (O. Swed. *tiæra*, Ger. *teer*), tar; *airo* (O. Swed. *ar*.), oar; *kansa* (O.H.G. *hansa*), society; *napakaira* (O.H.G. *nabagêr*, O. Swed. *navar*), auger; *ansas* (Got. *ans*, O. Swed. *as*), beam; Lapp *sajet* (Got. *saian*, O. Swed. *sa*); sow; *garves* (O.H.G. *garawêr*, O. Sw. *gör*), finished; *divres* (O. Sax. *diuri*, O. Swed. *dyr*), dear; *saipo* (O.H.G. *seifa*), soap. These words, with those mentioned by contemporary Roman and Greek authors, as well as the most ancient runic inscriptions mentioned below, are the oldest existing traces of any Teutonic language. Wrested from their context, however, they throw but little light on the nature of the original northern tongue. But an equally old series of linguistic monuments has come down to us dating from a little before the end of the so-called Early Iron Age (about A.D. 400)—the knowledge and the use of the oldest runic alphabet (with twenty-four characters) having at that period been propagated among the Scandinavians by the southern Teutonic tribes. In fact we still possess, preserved down to our own times, primitive northern runic inscriptions, the oldest upon the utensils found at Vi in Schleswig and Thorsbjerg in Denmark, dating back to about A.D. 250–300, which, together with the MS. fragments of Ulfilas' Gothic translation of the Bible, about two hundred years later in date, constitute the oldest genuine monuments of any Teutonic tongue.

These runic inscriptions are for the most part found on stone monuments (sometimes on rocks) and bracteates (gold coins stamped on one side and used for ornaments), as well as on metallic and wooden utensils, weapons and ornaments.[4] Up to 1908 there had been discovered more than one hundred, but of these only about one-half give us any information concerning the language, and most of them are only too short. The longest of those satisfactorily interpreted, the stone-monument of Tune, in south-eastern Norway, contains only sixteen words. Their language is perhaps somewhat later in character than that of the oldest words borrowed by the Lapps and Finns, voiced *s*, for example, is changed into a kind of *r* (cf. *dagaR* = Goth *dags*, day; but Finn. *armas* = Goth. *arms*, poor). On the other hand, in all essential matters it is much earlier in character than the language of contemporary Gothic manuscripts, and no doubt approaches more nearly than any Teutonic idiom the primitive form of the Teutonic tongue. For the sake of comparison, we give a Gothic translation of one of the oldest of the primitive Scandinavian inscriptions, that on the golden horn of Gallehus, found on the Danish-German frontier, and dating from about A.D. 300:—

> Scand.: EK HLEWAGASTI*R*. HOLTINGA*R*. HORNA. TAWIDO;
> Goth.: *ik Hliugasts Hultiggs haurn tawida*;
> Engl.: I, HlewagastiR, from Holta, made the horn;

as well as the inscription on the stone monument of Järsberg in western Sweden, which is about 250 years later:—

> Scand.: UBA*R* HITE. HARABANA*R* WIT IAH EK ERILA*R* RUNO*R* WARITU;
> Goth.: *Ubs Hita, Hrabns wit jah ik Airils rûnôs writu*;
> Engl.: UbaR (erected the monument in memory of) HitaR. We both, HarabanaR and I ErilaR, wrote the runes.

Relation to other languages.

Although very brief, and not yet thoroughly interpreted,[5] these primitive Scandinavian inscriptions are nevertheless sufficient to enable us to determine with some certainty the relation which the language in which they are written bears to other languages. Thus it is proved that it belongs to the Teutonic family of the Indo-European stock of languages, of which it constitutes an independent and individual branch. Its nearest relation being the Gothic, these two branches were formerly sometimes taken together under the general denomination *Eastern Teutonic*, as opposed to the other Teutonic idioms (German, English, Dutch, &c.), which were then called *Western Teutonic*.

The most essential point of correspondence between the Gothic and Scandinavian branches is the insertion in certain cases of *gg* before *w* and *j* (*ggj* in Gothic was changed into *ddj*), as in gen. plur. O.H.G. *zweiio*, O. Eng. *tweȝa* (two), compared with O. Icel., O. Norw. *tueggia*, O. Swed., O. Dan. *twæggiae*, Goth. *twaddjê*; and, still, in German *treu*, Eng. *true*, compared with Swed., Norw., Dan. *trygg*, Icel. *tryggr*, Goth.

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[1] For details see A. Noreen, "Geschichte der nordischen Sprachen" (*Grundriss der germanischen Philologie*, 2nd ed., 1897).

[2] V. Thomsen, *The Relations between Ancient Russia and Scandinavia* (1877).

[3] W. Thomsen, *Über den Einfluss der Germ. Sprachen auf die Finnisch-Lappischen* (1870); E. N. Setälä, "Zur Herkunft und Chronologie der älteren germanischen Lehnwörter" in *Journal de la Société Finno-ougrienne*, xviii. (1906).

[4] See the plates in G. Stephens's *Handbook of Old Northern Runic Monuments* (1884), and S. Bugge's *Norges Indskrifter med de ældre Runer* I. (1891–1903).

[5] For the interpretations we are principally indebted to Prof. S. Bugge's ingenious investigations, who in 1865 satisfactorily succeeded in deciphering the inscription of the golden horn, and by this means gained a fixed starting-point for further researches. A short review of their most important results is given by A. Noreen, *Altisländische Grammatik* (3rd ed., 1903), appendix.

triggws. However, even in the primitive Scandinavian age the difference between Gothic and Scandinavian is more clearly marked than the resemblance; thus, for example—just to hint only at some of the oldest and most essential differences—Goth. nom. sing. ending in *-s* corresponds to primitive Scandinavian *-a*ʀ, *-i*ʀ (as Goth. *dags*, day, *gasts*, guest = Scand. *daga*ʀ, *gasti*ʀ); Goth. gen. sing. in *-is* to Scand. *-as* (as Goth. *dagis*, day's = Scand. *dagas*); Goth. dat. sing. in *-a* to Scand. *-e* (as Goth. *kaurna*, corn = Scand. *kurne*); Goth. 1st pers. sing. pret. in *-da* to Scand. *-do* (as Goth. *tawida*, did = Scand. *tawido*).

Transformation.

Already before the beginning of the so-called Viking period (since about A.D. 800) the primitive Scandinavian language had undergone a considerable transformation, as is proved, for example, by the remarkable runic stone at Istaby in the south of Sweden, with the inscription (about A.D. 650):—

> AFĄTR HARIWULĄFĄ HAÞUWULĄF*R* HAERUWULĄFI*R* WĄRAIT RUNA*R* ÞAIA*R*;
>
> Engl.: In memory of Hariwulfʀ, Haþuwulfʀ, son of Heruwulfʀ, wrote these runes.

Here, *e.g.* we find nom. sing. in *-a*ʀ changed into *-r* (cf. *haþuwulaf*ʀ with *holtinga*ʀ on the golden horn), and the plural ending *-o*ʀ into *-a*ʀ (cf. *runa*ʀ with *runo*ʀ on the Järsberg-stone). At the beginning of the Viking period the Scandinavian language seems to have undergone an extraordinarily rapid development, which almost completely transformed its character. This change is especially noticeable in the dropping of unaccented vowels, and in the introduction of a certain vowel harmony of different kinds (*Umlaut*, vowel changes, caused by a following *i* (*j*) or *u* (*w*), as *kwæði* for *kwāði*, poem, and "Brechung," as *healpa* instead of *helpa* to help), different assimilations of consonants (as *ll*, *nn* for *lþ*, *nþ*; *ll*, *nn*, *rr* and *ss* for *l*ʀ, *n*ʀ, *r*ʀ and *s*ʀ), dropping of *w* before *o* and *u* (as *orð*, *ulfr* for *worð*, word, *wulf*ʀ, wolf)(simplified inflection of the verbs, a new passive formed by means of affixing the reflexive pronoun *sik* or *se*ʀ to the active form (as *kalla-sk*, *kalla-ss*, to call one's self, to be called), &c.

Period of transition.

Dialects.

Differences between Eastern and Western Scandinavian.

At this epoch, therefore, the primitive Scandinavian language must be considered as no longer existing. The centuries A.D. 700–1000 form a period of transition as regards the language as well as the alphabet which it employed. We possess some inscriptions belonging to this period in which the old runic alphabet of twenty-four characters is still used, and the language of which closely resembles that of the primitive Scandinavian monuments, as, for example, those on the stones of Stentoften (about 700) and Björketorp (about 750), both from southern Sweden, being the longest inscriptions yet found with the old runic alphabet. On the other hand, inscriptions have come down to us dating from about A.D. 800, in which the later and exclusively Scandinavian alphabet of sixteen characters has almost completely superseded the earlier alphabet from which it was developed, while the language not only differs widely from the original Scandinavian, but also exhibits dialectical peculiarities suggesting the existence of a Danish-Swedish language as opposed to Norwegian, as the form *ruulf* on the stone at *Flemlöse* in Denmark, which in a Norwegian inscription would have been written *hruulf* corresponding to *Hrolf* in Old Norwegian literature. These differences, however, are still unimportant, and the Scandinavians still considered their language as one and the same throughout Scandinavia, and named it *Dǫnsk tunga*, Danish tongue. But when Iceland was colonized (*c.* 900), chiefly from western Norway, a separate (western) Norwegian dialect gradually sprang up, at first of course only differing slightly from the mother-tongue. It was not until the definitive introduction of Christianity (about A.D. 1000) that the language was so far differentiated as to enable us to distinguish, in runic inscriptions and in the literature which was then arising, four different dialects, which have ever since existed as the four literary languages—Icelandic, Norwegian, Swedish and Danish. Of these the latter two, often comprehended within the name of *Eastern Scandinavian*, as well as the former two, *Western Scandinavian*, or, to use the Old Scandinavians' own name, *Norrǿnt mál*, Northern tongue, are very nearly related to each other. The most important differences between the two branches, as seen in the oldest preserved documents, are the following: (1) In. E. Scand. far fewer cases of "Umlaut," as *vāre*, W. Scand. *vǽre*, were; *land*, W. Scand. *lond* (from *landu*), lands; (2) E. Scand. "Brechung" of *y* into *iu* (or *io*) before *ng*(*w*), *nk*(*w*), as *siunga*, W. Scand. *syngua* (from *singwa*), to sing; (3) in E. Scand. *mp*, *nk*, *nt* are in many cases not assimilated into *pp*, *kk*, *tt*, as *krumpin*, W. Scand. *kroppenn*, shrunken; *ænkia*, W. Scand. *ekkìa*, widow; *bant*, W. Scand. *batt*, he bound; (4) in E. Scand. the dative of the definite plural ends in *-umin* instead of W. Scand. *-onom*, as in *handumin*, *hǫndonom*, (to) the hands; (5) in. E. Scand. the simplification of the verbal inflectional endings is far further advanced, and the passive ends in *-s*(*s*) for *-sk*, as in *kallas*(*s*), W. Scand. *kallask*, to be called. In several of these points, and indeed generally speaking, the Western Scandinavian languages have preserved the more primitive forms, which also are found in the oldest Eastern Scandinavian runic inscriptions, dating from a period before the beginning of the literature, as well as in many modern Eastern Scandinavian dialects. For, having regard to the Scandinavian dialects generally, we must adopt quite a different classification from that indicated by the dialects which are represented in the literature. We now pass on to review the latter and their history.

I. ICELANDIC.—In ancient times Icelandic was by far the most important of the Scandinavian languages, in form as well as in literature. To avoid ambiguity, the language before the Reformation (about 1530) is often called Old Icelandic.

Old Icelandic.

1. *Old Icelandic* was spoken not only in Iceland, but also in Greenland, where, as already mentioned, Icelandic colonists lived for a lengthened period. Our knowledge of its character is almost exclusively derived from the remarkably voluminous literature,[1] dating from the first half of the 12th century, and written in the Latin alphabet, adapted to the special requirements of this language. No traces are found of any older runic literature. Indeed, Old Icelandic possesses only very few runic monuments (about forty-five), all of them almost worthless from a philological point of view. The oldest, the inscriptions on the church door of Valþjófstaður, and that of a tombstone at Hjarðarholt, date from the beginning of the 13th century, and they are consequently later than the oldest preserved manuscripts[2] in the Latin alphabet, some of which are as old as the last half of the 12th century. A small fragment (Cod. AM. 237, fol.) of a *Book of Homilies* (of which a short specimen is given below) is considered the oldest of all. About contemporary with this is the oldest part of an inventory entitled *Reykjaholts máldagi.* From the end of the 12th century we possess a fragment (Cod. Reg. old sign. 1812) of the only existing Old Icelandic *glossary*, and from the first years of the 13th century the *Stockholm Book of Homilies* (Cod. Holm. 15, 4to), which from a philological point of view is of the greatest importance, chiefly on account of its very accurate orthography, which is especially noticeable in the indication of quantity; from the early part of the same century comes the fragment (Cod. AM. 325, 2, 4to) entitled *Ágríp* ("abridgment" of the history of Norway), probably a copy of a Norwegian original, also orthographically important. Among later manuscripts we may mention, as philologically interesting, the *Annales Regii* (Cod. Reg. 2087) from the beginning of the 14th century, orthographically of great value; the rich manuscript of miscellanies, *Hauksbók* (Codd. AM. 371, 544, 675, 4to), a great part of which is written with Haukr Erlendsson's (d. 1334) own hand; and, above all, three short essays, in which some Icelanders have tried to write a grammatical and orthographical treatise on their own mother-tongue, all three appearing as an appendix to the manuscripts of the *Prose Edda.* The oldest and most important of these essays (preserved in the Cod. Worm. from the last half of the 14th century) is by an unknown author of about 1140, the second (the oldest known manuscript of which is preserved in the Cod. Ups., *c.* 1300) is by an unknown author of about 1250; the third (the oldest manuscript in Cod. AM. 748, 4to, of the beginning of the 14th century) is by Snorri's nephew Olafr Hvítaskáld (d. 1259), and is no doubt based partly upon a lost work of the first grammarian of Iceland, Þóroddr Rúnameistari (who flourished at the beginning of the 12th century), partly and chiefly upon Priscian and Donatus.[3]

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[1] A complete catalogue of the literature edited hitherto is given by Th. Möbius, *Catalogus Librorum Islandicorum et Norvegicorum Aetatis Mediae* (1856), and *Verzeichniss der . . . altisländischen und altnorwegischen . . . von 1855 bis 1879 erschienenen Schriften* (1880). Cf. ICELAND.

[2] An account of the oldest Icelandic manuscripts (to about 1230) is given by J. Hoffory in the *Gött. Gel. Anz.* (1884), p. 478 sq.

[3] A short review of the most important Old Icelandic manuscripts (and their editions), classed according to subjects, is given by O. Brenner, *Altnordisches Handbuch*, pp. 13 sq. The principal collections of manuscripts are—(1) the Arnamagnaean (AM.) in Copenhagen, founded by Arni Magnússon (d. 1730); (2) the collection of the Royal Library (Reg.) in Copenhagen, founded by T. Torfaeus

Form of the language.

The oldest form of the Icelandic language is, however, not preserved in the above-mentioned earliest manuscripts of the later half of the 12th century, which are written in the language of their own age, but in far later ones of the 13th century, which contain poems by the oldest Icelandic poets, such as the renowned Egill Skallagrímsson (about 950) and the unknown authors of the so-called Edda-songs. In spite of the late date of the manuscripts, the metrical form has been the means of preserving a good deal of the ancient language. But, as already remarked, during the 10th and 11th centuries this dialect differs but little from Norwegian, though in the 12th this is no longer the case.

We may here contrast a specimen of the above-mentioned oldest Icelandic manuscript with an almost contemporary Norwegian one (Cod. AM. 619; see below):—

Icel.—En þat es vitanda, at allt ma andlega merkiasc oc fyllasc í oss, þat es til kirkio bunings eþa þionosto þarf at haua, ef ver liuom sva hreinlega at vér sem verþer at callasc goþs mustere.	*Norw.*—En þat er vitanda, at allt ma andlega merkiasc oc fyllasc i os, þat er til kirkiu bunings eða til þionasto þarf at hafa, ef vér lifum sva ræinlega, at vér sem verðir at kallasc guðs mysteri.	*Engl.*—And that is to be known that all that is needed for the decoration of the church or the service may, spiritually, be found and imitated within us, if we live so cleanly that we are worthy to be called God's temple.

Apart from the fact that the language is, generally speaking, archaic, we find in the Icelandic text two of the oldest and most essential characteristics of Icelandic as opposed to Norwegian, viz. the more complete vowel assimilation (*þionosto*, *þionasto*; cf. also, *e.g.* Icel. *kǫlloþom*, Norw. *kallaðum*, we called) and the retention of initial *h* before *r* (*hreinlega*, *ræinlega*), *l* and *n*. Other differences, some of which occur at this period, others a little later, are—in Icel. lengthening of *a*, *o*, *u* before *lf*, *lg*, *lk*, *lm* and *lp* (as Icel. *hálfr*, Norw. and oldest Icel. *halfr*, half); later still, also of *a*, *i*, *u* and *y* before *ng* and *nk*; Icel. *ǽ* and *ey* for older *ǿ* and *øy* (as in Icel. *dǽma*, *heyra*, Norw. and oldest Icel. *dǿma*, to deem, *høyra*, to hear); Icel. termination of 2nd plur. of verbs in -*ð* (þ) or -*t*, but Norw. often in -*r* (as Icel. *takið*, -*t*, Norw. *takir*, you take). These points may be sufficient to characterize the language of the earlier "classical" period of Icelandic (about 1150–1350). At the middle of the 13th century the written language undergoes material changes, owing in a great measure, perhaps, to the powerful influence of Snorri Sturloson. Thus in unaccented syllables *i* now appears for older *e*, and *u* (at first only when followed by one or more consonants belonging to the same syllable) for *o*; the passive ends in -*z* for -*sk*. The other differences from Norwegian, mentioned above as occurring later, are now completely established. With the beginning of the 14th century there appear several new linguistic phenomena: a *u* is inserted between final *r* and a preceding consonant (as in *ríkur*, mighty); ǫ (pronounced as an open *o*) passes into *ö* (the character *ö* was not introduced till the 16th century), or before *ng*, *nk* into *au* (as *lǫng fiǫll*, pronounced *laung fiöll*); *e* before *ng*, *nk* passes into *ei*; a little later *é* passes into *ie*, and the passive changes its termination from -*z*, oldest -*sk*, into -*zt* (or -*zst*) (as in *kallazt*, to be called). The post-classical period of Old Icelandic (1350–1530), which is, from a literary point of view, of but little importance, already shows marked differences that are characteristic of Modern Icelandic; *kn* has, except in the northern dialects, passed into *hn*, as in *knútr*, knot; as early as the 15th century we find *ddl* for *ll* and *rl* (as *falla*, pronounced *faddla*, to fall), *ddn* for *nn* and *rn* (as *horn*, pron. *hoddn*, horn), and a little later the passive ends in -*st*, *e.g.* *kallast*, to be called.

Dialects.

Although dialectical differences are not altogether wanting, they do not occur to any great extent in the Old Icelandic literary language. Thus, in some manuscripts we find *ft* replaced by *fst* (*oft*, *ofst*, often); in manuscripts from the western part of the island there appears in the 13th and 14th centuries a tendency to change *lf*, *rf* into *lb*, *rb* (*tolf*, *tolb*, twelve; *þǫrf*, *þǫrb*, want), &c. To what extent the language of Greenland differed from that of Iceland we cannot judge from the few runic monuments which have come down to us from that colony.

Grammatical treatment.

Apart from the comparatively inconsiderable attempts at a grammatical treatment of Old Icelandic in the middle ages which we have mentioned above, grammar as a science can only be said to have begun in the 17th century. The first grammar, written by the Icelander Runolphus Jonas (d. 1654), dates from 1651. His contemporary and compatriot Gudmund Andreae (d. 1654) compiled the first dictionary, which was not, however, edited till 1683 (by the Dane Petrus Resenius, d. 1688). The first scholars who studied Old Icelandic systematically were R. K. Rask (1787–1832), whose works[1] laid the foundation to our knowledge of the language, and his great contemporary Jac. Grimm, in whose *Deutsche Grammatik* (1819 seq.) particular attention is paid to Icelandic. Those who since the time of Rask and Grimm have principally deserved well of Icelandic grammar are—among the Norwegians, the ingenious and learned P. A. Munch (d. 1863), to whom we really owe the normalized orthography that has hitherto been most in use in editing Old Icelandic texts, and the solid worker at the syntax, M. Nygaard; the learned Icelander K. Gíslason (d. 1891), whose works are chiefly devoted to phonetic researches;[2] the Danish scholars, K. J. Lyngby (d. 1871), the author of an essay which is of fundamental importance in Icelandic orthography and phonetics, and L. F. A. Wimmer, who has rendered great services to the study of the etymology. The latest and greatest Icelandic grammar is by the Swede A. Noreen.[3] As lexicographers the first rank is held by the Icelanders S. Egilsson (d. 1852),[4] G. Vigfússon (d. 1889),[5] and J. Þorkelsson (d. 1904),[6] the Norwegian J. Fritzner (d. 1893),[7] the Swede L. Larsson,[8] and the German H. Gering.[9]

Modern Icelandic.

2. *Modern Icelandic* is generally dated from the introduction of the Reformation into Iceland; the book first printed, the New Testament of 1540, may be considered as the earliest Modern Icelandic document. Although, on account of the exceedingly conservative tendency of Icelandic orthography, the language of Modern Icelandic literature still seems to be almost identical with the language of the 17th century, it has in reality undergone a constant and active development, and, phonetically regarded, has changed considerably. Indeed, energetic efforts to bring about an orthography more in accordance with phonetics were made during the years 1835–1847 by the magazine entitled *Fjölnir*, where we find such authors as Jónas Hallgrímsson and Konr. Gíslason; but these attempts proved abortive. Of more remarkable etymological changes in Modern Icelandic we may note the following: *y*, *ý* and *ey* at the beginning of the 17th century coincided with *i*, *í* and *ei*; the long vowels *á*, *ǽ* and *ó* have passed into the diphthongs *au* (at least about 1650), *ai* (about 1700), *ou*, *e.g.* *mál*, language, *mǽla*, to speak, *stǿll*, chair; *g* before *i*, *j* is changed into *dj* (after a consonant) or *j* (after a vowel), *e.g.* *liggia*, to lie, *eigi*, not; in certain other cases *g* has passed into *gw* or *w*, *e.g.* *lágur*, low, *ljúga*, to lie; initial *g* before *n* is silent, *e.g.* (*g*)*naga*, to gnaw; *ps*, *pt* have passed into *fs*, *ft*; *bb*, *dd*, *gg* are pronounced as *bp*, *dt*, *gk*, and *ll*, *rl*, *nn*, *rn* now in most positions (not, however, before *d*, *t* and *s*, and in pet names) as *dtl*, *dtn*, as *fjall*, mountain, *björn*, bear; *f* before *n* is now pronounced as *bp*, as *hrafn*, raven, &c. Both in vocabulary and syntax we find early, *e.g.* in the lawbook *Jónsbók*, printed in 1578(–1580), Danish exercising an important influence, as might be expected from political circumstances. In the 18th century, however, we meet with purist tendencies. As one of the leading men of this century may be mentioned the poet Eggert Ólafsson (d. 1768), whose poems were not printed till 1832. Worthy of mention in the history of Modern Icelandic language are the learned societies which appeared in the same century, of which the first, under the name of "Hið ósýnilega," was established in 1760. At this time archaic tendencies, going back to the Old Icelandic of the 13th and 14th centuries, were continually gaining ground. In the 19th century the following won especial renown in Icelandic literature: Bjarne Þórarensen (d. 1841), Iceland's greatest lyric poet, and Jónas Hallgrímsson (d. 1845), perhaps its most prominent prose-author in modern times.

Dialects.

The dialectical differences in Modern Icelandic are comparatively trifling and chiefly phonetic. The Westland dialect has, for example, preserved the Old Icelandic long *a*, while the other dialects have changed it to the diphthong *au*; in the Northland dialect initial *kn* is preserved, in the others changed into *hn*; in the northern and western parts of the island Old Icelandic *hv* appears as *kv*, in a part of south-eastern Iceland as *χ*, in the other dialects as *χw*, *e.g.* *hvolpur*, whelp. As a matter of curiosity it may be noted that on the western and eastern coasts traces are found of a French-Icelandic language, which arose from the long sojourn of French fishermen there.

Grammatical treatment.

Owing to the exclusive interest taken in the ancient language, but little attention is given even now to the grammatical treatment of Modern Icelandic. Some notices of the language of the 17th century may be obtained from the above-mentioned grammar of Runolphus Jonas (1651), and for the language of the 18th from Rask's grammatical works. For the language of our own time there is hardly anything to refer to but F. Jónsson's very short *Islandsk Sproglære* (1905); cf. also B. Magnússon Ólsen's valuable paper "Zur neuisländischen Grammatik" (*Germania*, xxvii., 1882). A dictionary of merit was that of

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(d. 1719) and Brynjólfr Sveinsson (d. 1674); (3) the Delagardian collection (Delag. or Ups.) at Upsala, founded in 1651 by Magnus Gabriel de la Gardie; (4) the Stockholm collection (Holm.), founded by Jón Rugman (in 1662) and Jón Eggertson (in 1682).

[1] *E.g.* *Veiledning til det Islandske sprog* (1811); in a new, much-improved Swedish edition, *Anvisning til Isländskan* (1818).

[2] Especially *Um frumparta islenzkrar túngu i fornöld* (1846).

[3] *Altisländische und altnorwegische Grammatik unter Berücksichtigung des Urnordischen* (1884), 3 *Aufl.* (1903).

[4] *Lexicon poeticum* (1854–1860).

[5] *An Icelandic-English Dictionary*, based on the MS. collections of the late R. Cleasby (1869–1874).

[6] *Supplement til Islandske ordbøger* (1876, 1879–1885 and 1899).

[7] *Ordbog over det Gamle Norske sprog* (1862–1867, new ed. 1883, seq.).

[8] *Ordförrådeti de älsta isländska handskrifterna* (1891).

[9] *Vollständiges Wörterbuch zu den Liedern der Edda* (1903).

Björn Haldorsen (d. 1794), edited in 1814 by Rask. Cleasby-Vigfússon's dictionary mentioned above also pays some attention to the modern language. A really convenient Modern Icelandic dictionary is still wanting, the desideratum being only partly supplied by J. Thorkelsson's excellent *Supplement til islandske ordbøger*, iii. (1890–1894).

Old Norwegian.

II. NORWEGIAN OR NORSE.—The *Old Norwegian* language (till the Reformation) was not, like the modern language, confined to Norway and the Faeroes, but was, as already stated, for some time spoken in parts of Ireland and the north of Scotland, the Isle of Man, the Hebrides, Shetland and Orkney (in the last two groups of islands it continued to survive down to the end of the 18th century), and also in certain parts of western Sweden as at present defined (Bohuslän, Särna in Dalarna, Jämtland and Härjedalen).

Our knowledge of it is due only in a small measure to runic inscriptions, for these are comparatively few in number (about 150), and of trifling importance from a philological point of view, especially as they almost wholly belong to the period between 1050 and 1350,[1] and consequently are contemporary with or at least not much earlier than the earliest literature. The most important are the detailed one of Karlevi on Öland, wherein a Norwegian poet (towards 1000) in so-called "dróttkuǽtt" metre celebrates a Danish chief buried there, and that of Frösö in Jämtland, which (about 1050) mentions the christianizing of the province. The whole literature preserved is written in the Latin alphabet. The earliest manuscripts are not much later than the oldest Old Icelandic ones, and of the greatest interest. On the whole, however, the earliest Norwegian literature is in quality as well as in quantity incomparably inferior to the Icelandic. It amounts merely to about a score of different works, and of these but few are of any literary value. A small fragment (Cod. AM. 655. 4to, Fragm. ix., A, B, C), a collection of legends, no doubt written a little before 1200, is regarded as the earliest extant manuscript. From the very beginning of the 13th century we have the *Norwegian Book of Homilies* (Cod. AM. 619, 4to) and several fragments of law-books (*e.g.* the older *Gulaþingslaw* and the older *Eiðsivaþingslaw*). Of later manuscripts the so-called legendary *Olafssaga* (Cod. Delag. 8, fol.), from about 1250, deserves mention. The chief manuscript (Cod. AM. 243 B., fol.) of the principal work in Old Norwegian literature, the *Speculum regale* or *Konungsskuggsiá* ("Mirror for Kings,") is again a little later. The masses of charters which—occurring throughout the whole middle age of Norway from the beginning of the 13th century—afford much information, especially concerning the dialectical differences of the language, are likewise of great philological importance.

Form of the language.

As in Old Icelandic so in Old Norwegian we do not find the most primitive forms in the oldest MSS. that have come down to us; for that purpose we must recur to somewhat later ones, containing old poems from times as remote as the days of Þorbiorn Hornklofi (end of the 9th century). It has already been stated that the language at this epoch differed so little from other Scandinavian dialects that it could scarcely yet be called by a distinctive name, and also that, as Icelandic separated itself from the Norwegian mother-tongue (about 900), the difference between the two languages was at first infinitely small—as far, of course, as the literary language is concerned. From the 13th century, however, they exhibit more marked differences; for, while Icelandic develops to a great extent independently, Norwegian, owing to geographical and political circumstances, is considerably influenced by the Eastern Scandinavian languages. The most important differences between Icelandic and Norwegian at the epoch of the oldest MSS. (about 1200) have already been noted. The tendency in Norwegian to reduce the use of the so-called *u*-Umlaut has already been mentioned. On the other hand, there appears in Norwegian in the 13th century another kind of vowel-assimilation, almost unknown to Icelandic, the vowel in terminations being in some degree influenced by the vowel of the preceding syllable. Thus, for instance, we find in some manuscripts (as the above-mentioned legendary *Olafssaga*) that the vowels *e*, *o*, *ø* and long *a*, *æ* are followed in terminations by *e*, *o*; *i*, *u*, *y*, and short *a*, *æ*, on the other hand, by *i*, *u*—as in *bøner*, prayers, *konor*, women; but *tiðir*, times, *tungur*, tongues. The same fact occurs in certain Old Swedish manuscripts. When Norway had been united later with Sweden under one crown (1319) we meet pure Suecisms in the Norwegian literary language. In addition to this, the 14th century exhibits several differences from the old language: *rl*, *rn* are sometimes assimilated into *ll*, *nn*—as *kall* (elder *karl*), man, *konn* (*korn*), corn, *prestanner* (*prestarnir*), the priests; *i* passes into *y* before *r*, *l*—as *hyrðir* (*hirðir*), shepherd, *lykyl* (*lykill*), key; final *-r* after a consonant is changed into *-ar*, *-er*, *-ir*, *-or*, *-ur* or *-ær*, sometimes only *-a*, *-e*, *-æ*,—as *hester* (*hestr*), horse, *bøker* (*bøkr*), books, the names *þolleifær* (*þorleifr*), *Guðlæifæ* (*Guðleifr*). About the beginning of the 15th century initial *kv* occurs for old *hv* (not, however, in pronouns, which take *kv* only in western Norway), as the local name *Qviteseið* (*hvitr*, white). During the 15th century, Norway being united with Denmark, and at intervals also with Sweden, a great many Danisms and a few Suecisms are imported into the language. As Suecisms we may mention the termination *-in* of the 2nd pers. plur. instead of *-ir*, *-ið* (as *vilin*, you will). The most important Danisms are the following: *b*, *d* and *g* are substituted for *p*, *t* and *k*—as in the local names *Nabø* (earlier *Napa*), *Tvedæ sogn* (*þveita sókn*); *-a* in terminations passes into *-e*—as *høre* (*høyra*) to hear, *søghe* (*søkia*), to seek; single Danish words are introduced—as *iek* (*ek*), I, *se* (*siá*), to see; *spørge* (*spyria*), to ask, &c. Towards the end of the middle ages the Danish influence shows an immense increase, which marks the gradual decline of Norwegian literature, until at last Norwegian as a literary language is completely supplanted by Danish. During the 15th century Norway has hardly any literature except charters, and as early as the end of that century by far the greatest number of these are written in almost pure Danish. In the 16th century, again, charters written in Norwegian occur only as rare exceptions, and from the Reformation onward, when the Bible and the old laws were translated into Danish, not into Norwegian, Danish was not only the undisputed literary language of Norway, but also the colloquial language of dwellers in towns and of those who had learned to read.

Dialects.

Dialectical differences, as above hinted, occur in great number in the Norwegian charters of the 13th, 14th and 15th centuries. Especially marked is the difference between the language of western Norway, which, in many respects, shows a development parallel to that of Icelandic, and the language of eastern Norway, which exhibits still more striking correspondences with contemporary Old Swedish. The most remarkable characteristics of the eastern dialects of this epoch are the following:—*a* is changed into *æ* in the pronouns *þænn*, this, *þæt*, that, and the particle *þær*, there (the latter as early as the 13th century), and later on (in the 14th century) also in terminations after a long root syllable—as *sendæ*, to send, *høyræ*, to hear (but *gera*, to do, *vita*, to know); *ia* passes (as in Old Swedish and Old Danish) into *iæ*—as *hiærta* (Icel. *hiarta*), heart; *y* sometimes passes into *iu* before *r*, *l*—as *hiurder*, shepherd, *lykiul*, key, instead of *hyrðir*, *lykyl* (older still, *hirðir*, *lykill*; see above); final *-r* after a consonant often passes into *-ar*, *-ær*, sometimes only into *-a*, *-æ*—as *prestar* (*prestr*), priest; *bøkar* (*bøkr*), books; dat. sing. *brøða* (*brøðr*), (to a) brother; *tl* passes into *tsl*, *sl*—as *lisla* (*litla*), (the) little, the name *Atsle*, *Asle* (*Atle*); *rs* gives a "thick" *s*-sound (written *ls*)—as *Bærdols*, genitive of the name *Bergþórr*; *nd*, *ld* are assimilated into *nn*, *ll*—as *bann* (*band*), band, the local name *Vestfoll* (*Vestfold*); and (as far back as the 13th century) traces occur of the vowel assimilation, "tiljævning," that is so highly characteristic of the modern Norwegian dialects—as *vuko*, *vuku*, for *vaku* (Icel. *vǫko*, *-u*), accusative singular of *vaka*, wake, *mykyll* for *mykill*, much. On the other hand, as characteristics of the western dialects may be noted the following: final *-r* after a consonant passes into *-ur*, *-or*, or *-ir*, *-er*—as *vetur* (*vetr*), winter, *rettur* (*réttr*), right, *aftor* (*aftr*), again; *sl* passes into *tl*—as *sytla* (*sýsla*), charge; *hw* is changed into *kw* also in pronouns—as *kuer* (*huerr*), who, *kuassu* (*huersu*), how.

This splitting of the language into dialects seems to have continued to gain ground, probably with greater rapidity as a Norwegian literary language no longer existed. Thus it is very likely that the present dialectical division was in all essentials accomplished about the year 1600; for, judging from the first work on Norwegian dialectology,[2] the Søndfjord (Western Norway) dialect at least possessed at that time most of its present features. A little clog-calendar of the year 1644 seems to prove the same regarding the Valders (Southern Norway) dialect. How far the Old Norwegian dialects on the Faeroes, in Ireland and Scotland, on the Scottish islands, and on the Isle of Man differed from the mother-tongue it is impossible to decide, on account of the few remnants of these dialects which exist apart from local names, viz. some charters (from the beginning of the 15th century onward) from the Faeroes, Shetland and the Orkneys, and a few runic inscriptions from the Orkneys (thirty in number), and the Isle of Man (about thirty in number).[3] These runic inscriptions, however, on account of their imperfect orthography, throw but little light on the subject. Of the Orkney dialect we know at least that initial *hl*, *hn*, *hr* still preserved *h* in the 13th century—that is, at least two hundred years longer than in Norway.

Grammatical treatment.

Old Norwegian grammar has hitherto always been taken up in connexion with Old Icelandic, and confined to notes and appendices inserted in works on Icelandic grammar. A systematic treatise on Old Norwegian grammar is still wanting, with the exception of a short work by the Danish scholar N. M. Petersen (d. 1862), which, although brief and decidedly antiquated, deserves all praise. Among those who in recent days have above all deserved well for the investigation of the Old Norwegian may be mentioned, as to the grammar, the Swede E. Wadstein and the Norwegian M. Hægstad; as to the lexicography, the Norwegian E. Hertzberg, for the law terms, and O. Rygh (d. 1899), for the local names, while the personal names are collected by the Swede E. H. Lind. A most valuable collection of materials for judging of the dialectical varieties exists in the Norwegian charters, carefully and accurately edited by the Norwegian scholars C. Lange (d. 1861), C. R. Unger (d. 1897) and H. J. Huitfeldt-Kaas.[1]

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[1] The latest rune-stones are from the end of the 14th century. Owing to influence of the learned, such stones appear again in the 17th century, *e.g.* in Telemarken.

[2] C. Jensen's *Norsk dictionarium eller glosebog* (1646).

[3] See P. M. C. Kermode, *Manx Crosses* (1907).

III. SWEDISH.—The Pre-Reformation language is called Old Swedish.

Old Swedish.

1. *Old Swedish.*—The territory of the Old Swedish comprehended—(1) Sweden, except the most northerly part, where Lappish (and Finnish?) was spoken, the most southerly (Skåne, Halland and Blekinge) and certain parts of western Sweden; (2) extensive maritime tracts of Finland, Esthonia and Livonia, with their surrounding islands; and (3) certain places in Russia, where Swedish was spoken for a considerable time. The oldest but also the most meagre sources of our knowledge of Old Swedish are those words, almost exclusively personal names (nearly one hundred), which were introduced into the Russian language at the foundation of the Russian realm by Swedes (in 862), and which are for the most part somewhat influenced by Russian phonetic laws, preserved in two Russian documents of the years 911 and 944—as *Igor.* (O. Sw. *Ingvar*), *Rurik* (*Hrørikr*), *Oleg* (*Hialge*, secondary form of *Helge*), *Olga* (*Hialga*, *Helga*). Of about the same date, but of an infinitely greater importance, are the runic inscriptions, amounting in number to about two thousand, which have been found cut on stones (rarely wood, metal or other materials) almost all over Sweden, though they occur most frequently (about half of the total number) in the province of Uppland, next to which come Södermanland, with nearly three hundred inscriptions, then Östergötland, and Gotland, with more than two hundred each. For the most part they occur on tombstones or monuments in memory of deceased relatives; rarely they are public notices. Their form is often metrical, in part at least. Most of them are anonymous, in so far that we do not know the name of the engraver, though, as a rule, the name of the man who ordered them is recorded. Of the engravers named, about seventy in number, the three most productive are Ubir, Bali and Asmundr Karasun, all three principally working in Upland; the first-mentioned name is signed on nearly eighty, the others on about thirty and forty stones respectively. These inscriptions vary very much in age, belonging to all centuries of Old Swedish, but by far the greatest number of them date from the 11th and 12th centuries. From heathen times—as well as from the last two centuries of the middle ages—we have comparatively few. The oldest are perhaps the Ingelstad inscription in Östergötland, the Sparlösa inscription in Västergötland, and the Gursten one found in the north of Småland, all probably from the end of the 9th century. The rune-stone from Rök in Östergötland probably dates from about A.D. 900. Its inscription surpasses all the others both in length (more than 750 runes) and in the importance of its contents, which are equally interesting as regards philology and the history of culture; it is a fragment (partly in metrical form) of an Old Swedish heroic tale. From about the year 1040 we possess the inscriptions of Asmundr Karasun, and the so-called Ingvar monuments (more than twenty in number), erected most of them in Södermanland, in honour of the men who fell in a great war in eastern Europe under the command of a certain Ingvar; the stones cut by Bali belong to the time *c.* 1060. Somewhat later are the inscriptions cut by Ubir, and from the beginning of the 12th century is the remarkable inscription on the door-ring of the church of Forsa in Helsingland, containing the oldest Scandinavian statute now preserved, as well as other inscriptions from the same province, written in a particular variety of the common runic alphabet, the so-called "staflösa" (staffless, without the perpendicular staff) runes, as the long genealogical inscription on the Malstad-stone. The inscriptions of the following centuries are of far less philological interest, because after the 13th century there exists another and more fruitful source for Old Swedish, viz. a literature in the proper sense of the word. Of runic literature nothing has been preserved to our days. The literature in the Latin letters is both in quality and extent incomparably inferior to Old Icelandic, though it, at least in quantity, considerably surpasses Old Norwegian. In age, however, it is inferior to both of them, beginning only in the 13th century. The oldest of the extant manuscripts is a fragment of the Older Västgötalaw, written about the year 1250. A complete codex (Cod. Holm. B 59) of the same law dates from about 1285, and is philologically of the greatest importance. Of other works of value from a philological point of view we only mention a codex of the *Södermannalaw* (Cod. Holm. B 53) of about 1325, a codex of the *Upplandslaw* (Cod. Ups. 12), the two manuscripts containing a collection of legends generally named *Cod. Bureanus* (written a little after 1350) and *Cod. Bildstenianus* (between 1420 and 1450), and the great Oxenstiernian manuscript, which consists chiefly of a collection of legends written for the most part in 1385. The very numerous Old Swedish charters, from 1343 downwards, are also of great importance.[2]

Form of the language.

Old Swedish, during its earliest pre-literary period (800–1225), retains quite as original a character as contemporary Old Icelandic and Old Norwegian. The first part of the inscription of the Rökstone running thus—

AFT UAMUÞ STĄNTA RUNA*R* ÞA*R* . IN UARIN FAÞI
FAÞI*R* AFT FAIKIĄN SUNU,[3]

and probably pronounced—

aft Wāmōð stąnda rūnaʀ þāʀ; en Warinn fāði faðiʀ aft
fæighiąn sunu,

would, no doubt, have had the same form in contemporary Icelandic, except the last word, which would probably have had the less original form *sun*. The formal changes of the Swedish language during this period are, generally speaking, such as appear about the same time in all the members of the group—as the change of soft ʀ into common *r* (the Rök-stone *runa*ʀ, later *runar*, runes; this appeared earliest after dental consonants, later after an accented vowel), and the change of *sþ* into *st* (in the 10th century *raisþi*, later *ræisti*, raised); or they are, at least, common to it with Norwegian—as the dropping of *h* before *l*, *n* and *r* (in the 10th century *hrau*ʀ, younger, *rør*, cairn), and the changing of nasal vowels (the long ones latest) into non-nasalized. But the case is altogether different during what we may call the classical period of Old Swedish (1225–1375), the time of the later runic inscriptions and the oldest literature. During this period the language is already distinctly separate from the (literary) Icelandic-Norwegian (though not yet very much from Danish). The words of the *Older Västgötalaw*—

FALDER KLOCKÆ NIDER I HOVOÞ MANNI, BÖTI SOPCN MARCHUM ÞRIM,
EN HAN FAR BANÆ AF—[4]

would in contemporary Icelandic be—

fellr klukka niðr í hǫfuð manni, bǽti sókn mǫrkum þrim,
ef hann fǽr bana af.

These few words exhibit instances of the following innovations in Swedish:—*d* is inserted between *ll* (*nn*) and a following *r* (as *b* between *m* and *l*, *r*, and *p* between *m* and *t*, *n*—as *hambrar*, Icel. *hamrar*, hammers, *sampt*, Icel. *samt*, together with); an auxiliary vowel is inserted between final *r* and a preceding consonant; *a* in terminations is often changed into *æ*; a *u* in the final syllable causes no change of a preceding *a*; the present tense takes the vowel of the infinitive (and the preterite subjunctive that of preterite indicative plural). Other important changes, appearing at the same time, but probably, partly at least, of a somewhat older date, are the following:—all diphthongs are contracted (as *ø̄gha*, Icel. *auga*, eye; *drø̄ma*, Icel. *dreyma*, to dream; *stēn*, Icel. *steinn*, stone—traces of which we find as early as the 12th century); *é* has passed into *ǣ* (as *knǣ*, Icel. *kné*, knee); *ia* into *iæ*, as in Eastern Norwegian (as *hiærta*, Icel. *hiarta*, heart); *iu* into *ȳ* after *r*, and a consonant +*l* (as *flȳgha*, Icel. *fliúga*, to fly); the forms of the three persons singular of verbs have assimilated (except in the so-called strong preterite); the 2nd person plural ends in *-in* for *-ið*, *-uð*. The transition to the 14th century is marked by important changes:—short *y*, *e.g.*, passed into *ø* in many positions (as *dør* for *dyr*, door, &c.); there appeared a so-called law of vowel balance, according to which the vowels *i* and *u* are always found in terminations after a short root syllable, and—at least when no consonant follows—*e* and *o* after a long one (as *Guþi*, to God, *til salu*, for sale, but *i garþe*, in the court, *for visso*, assuredly), and the forms of the dative and the accusative of pronouns gradually became the same. The number of borrowed words is as yet very limited, and is chiefly confined to ecclesiastical words of Latin and Greek origin, introduced along with Christianity (as *kors*, cross, *brēf*, epistle, *skōle*, school, *præster*, priest, *almōsa*, alms). At the middle of the 14th century the literary language undergoes a remarkable reform, developing at the same time to a "*riksspråk*," a uniform language, common to a certain degree to the whole country. The chief characteristics of this later Old Swedish (1375–1526) are the following:—the long *a* has passed into *å* (that is, an open *o*), and *io* (except before *g*, *k*, *rdh*, *rt*) into *iø* (as *siø*, sea, lake), *g* and *k* (*sk*) before palatal vowels are softened into *dj* and *tj* (*stj*); *k* and *t* in unaccented syllables often pass into *gh*, *dh* (as *Swērighe* for *Swērike*, Sweden, *lītedh* for *lītit*, a little); the articles *thæn* (or *hin*), the, and (a little later) *en*, a, come into use; the dual pronouns vanish; the relative *ær*, that, is changed with *sum*; the present participle takes a secondary form in *-s* (as *gangandis*, beside *gangande*, going). A little later the following changes appear:—a short vowel is lengthened before a single consonant, first when the consonant belongs to the same syllable (as *hat*, hate), afterwards also when it belongs to the following one (as *hata*, to hate); an auxiliary vowel is inserted between *l* or *n* and a preceding consonant (as *gavel*, gable, *øken*, desert); short *i* often passes into *e* (as *leva*, to live); *th* passes into *t*; a new conjugation is formed which has no infinitive termination, but doubles the sign of the preterite (as *bō*, *bōdde*, *bōtt*, to dwell, dwelt, dwelt). Owing to the political and commercial state of the country the language at this period is deluged with borrowed words of Low German origin, mostly social and industrial terms, such as the great number of verbs in *-ēra* (*e.g.* *hantēra*, to handle), the substantives in *-erī* (*røverī*, robbery), *-inna* (*førstinna*, princess), *-hēt* (*fromhēt*, piety), *be-* (*betala*, to pay), and a great many others (*klēn*, weak, *smaka*, to taste, *grōver*, big, *pung*, purse, *tukt*, discipline, *brūka*, to use, *twist*, quarrel, *støvel*, boot, *arbēta*, to work, *frōkoster*, lunch, &c.). Owing to the political circumstances, we find towards the end of the period a very powerful Danish influence, which extends also to phonetics and etymology, so that, for example, nearly all the terminal vowels are supplanted by the uniform Danish *e*, the hard consonants *p*, *t*, *k* by *b*, *d*, *g* as in Danish, the second person plural of the imperative ends in *-er*, besides *-en* (as *tagher*, for *taghen*, older *takin*).

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[1] *Diplomatarium Norvegicum* (1847, sqq.), 16 vols. have appeared.

[2] The Old Swedish monuments are for the most part published in the following collections:—*Svenska fornskriftsällskapets samlingar*, 132 parts (1844–1907); C. J. Schlyter, *Samling af Sveriges gamla lagar*, vols. i.-vii. and x.-xii. (1827–1869); *Svenskt Diplomatarium* (6 vols., 1829–1878, new series, 4 vols., 1875–1904).

[3] In memory of Wámód these runes stand; and Warinn, his father, wrote them in memory of his son (by destiny) condemned to death.

[4] If the bell fall down on anybody's head, the parish pays a fine of three marks should he die from it.

Dialects.

Forngutniska.

Dialectical differences incontestably occur in the runic inscriptions as well as in the literature; in the former, however, most of them are hidden from our eyes by the character of the writing, which is, from a phonetic point of view, highly unsatisfactory, indicating the most different sounds by the same sign (for example, *o*, *u*, *y* and *ö* are denoted by one and the same rune); in the literature again they are reduced to a minimum by the awakening desire to form a uniform literary language for the whole country, and by the literary productivity and consequent predominant influence of certain provinces (as Östergötland). Only one distinct dialect has been handed down to us, that of the island of Gotland, which differs so essentially from the Old Swedish of the mainland that it has with good reason been characterized, under the name *Forngutniska*, as in a certain sense a separate language. Materials for its study are very abundant: on one hand we possess more than two hundred runic inscriptions, among them a very remarkable one from the beginning of the 13th century, counting upwards of four hundred runes, cut on a font (now in Aakirkeby on the island of Bornholm), and representing the life of Christ in a series of pictures and words; on the other hand a literature has been preserved consisting of a runic calendar from 1328, the law of the island (the oldest manuscript is from about 1350), a piece of traditional history and a gild statue. The language is distinguished from the Old Swedish of the mainland especially by the following characteristics:—the old diphthongs are preserved (*e.g. auga*, eye, *droyma*, to dream, *stain*, stone), and a triphthong has arisen by the change of *iu* into *iau* (as *fliauga*, to fly); the long vowels *æ* and *ø* have passed into *ē* and *ȳ* (as *mēla*, to speak, *dȳma*, to deem); short *o* rarely occurs except before *r*, being in other positions changed into *u*; *w* is dropped before *r* (as *raiþi*, wrath); the genitive singular of feminines in *-a* ends in *-ur* for *-u* (as *kirkiur*, of the church). Owing to the entire absence of documentary evidence it is impossible to determine how far the dialects east of the Baltic, which no doubt had a separate individuality, differed from the mother-tongue.

The study of Old Swedish.

The first to pay attention to the study of Old Swedish[1] was the Swedish savant J. Buraeus (d. 1652), who by several works (from 1599 onwards) called attention to and excited a lively interest in the runic monuments, and, by his edition (1634) of the excellent Old Swedish work *Um Styrilse Kununga ok Høfþinga*, in Old Swedish literature also. His no longer extant *Specimen Primariae Linguae Scantzianae* (1636) gave but a very short review of Old Swedish inflections, but is remarkable as the first essay of its kind, and is perhaps the oldest attempt in modern times at a grammatical treatment of any old Germanic language. The study of runes was very popular in the 17th century; M. Celsius (d. 1679) deciphered the "staffless" runes and J. Hadorph (d. 1693), who also did good work in editing Old Swedish texts, copied more than a thousand runic inscriptions, published by J. Göransson as *Bautil* (1750). During the 18th century, again, Old Swedish was almost completely neglected; but in the 19th century the study of runes was well represented by the collection (*Runurkunder*, 1833) of the Swede Liljegren (d. 1837) and by the Norwegian S. Bugge's ingenious interpretation and grammatical treatment of some of the most remarkable inscriptions, especially that of Rök. Old Swedish literature has also been made the object of grammatical researches. A first outline of a history of the Swedish language is to be found in the work of N. M. Petersen (1830), and a scheme of an Old Swedish grammar in P. A. Munch's essay, *Fornswenskans och Fornnorskans språkbyggnad* (1849); but Old Swedish grammar was never treated as an independent branch of science until the appearance of J. E. Rydqvist's (d. 1877) monumental work *Svenska språkets lagar* (in 6 vols., 1850–1883), which was followed in Sweden by a whole literature on the same subject. Thus phonetics, which were comparatively neglected by Rydqvist, have been investigated with great success, especially by L. F. Läffler and A. Kock; while the other parts of grammar have been treated of above all by K. F Söderwall. His principal work, *Ordbok öfver Svenska medeltidsspråket* (1884 sq.), gives the list of words in the later Old Swedish language, and—taken along with the *Ordbok till samlingen af Sveriges gamla lagar* (1877), by C. J. Schlyter, the well-known editor of Old Swedish texts, which contains the vocabulary of the oldest literature—it worthily meets the demand for an Old Swedish dictionary. An Old Swedish grammar, answering the requirements of modern philology, is edited by A. Noreen.[2]

Modern Swedish.

2. *Modern Swedish.*—The first complete translation of the Bible, edited in 1541 by the brothers Olaus and Laurentius Petri, and generally called the Bible of Gustavus I., may be regarded as the earliest important monument of this. Owing to religious and political circumstances, and to the learned influence of humanism, theological and historico-political works preponderate in the Swedish literature of the following period, which therefore affords but scanty material for philological research. It is not until the middle of the 17th century that Swedish literature adequately exemplifies the language, for at that period literature first began to be cultivated as a fine art, and its principal representatives, such as Stiernhielm, Columbus and Spegel, were in reality the first to study it as a means of expression and to develop its resources. Amongst the authors of the 18th century we have to mention in the first place Dalin, who was to some extent the creator of the prose style of that epoch; while of the end of the century Kellgren and Bellman are the most noteworthy examples, representing the higher and the more familiar style of poetry respectively. The language of the 19th century, or at any rate of the middle of it, is best represented in the works of Wallin and Tegnér, which, on account of their enormous circulation, have had a greater influence than those of any other authors.

Form of the language.

As to the language itself the earliest Modern Swedish texts, as Gustavus I.'s Bible, differ considerably from the latest Old Swedish ones.[3] We find a decided tendency to exterminate Danisms and reintroduce native and partially antiquated forms. At the same time there appear several traces of a later state of the language: all genitives (singular and plural), *e.g.*, end in *-s*, which in earlier times was the proper ending of certain declensions only. In spite of the archaistic efforts of many writers, both in forms and in vocabulary, the language nevertheless underwent rapid changes during the 16th and 17th centuries. Thus *sj* and *stj* (original as well as derived from *sk* before a palatal vowel) assimilate into a simple *sh-* sound; *dj* (original as well as derived from *g* before a palatal vowel), at least at the end of the 17th century, dropped its *d*-sound (compare such spellings as *diufwer*, *giättar*, *envogé*, for *jufver*, udder, *jättar*, giants, *envoyé*, envoy); *hj* passes into *j* (such spellings are found as *jort* for *hjort*, hart, and *hjärpe* for *järpe*, hazel grouse); *b* and *p* inserted in such words as *himblar*, heavens, *hambrar*, hammers, *jämpn*, even, *sampt*, together with, are dropped; the first person plural of the verb takes the form of the third person (as *vi fara*, *foro*, for *vi farom*, *forom*, we go, went); by the side of the pronoun *I*, you, there arises a secondary form *Ni*, in full use in the spoken language about 1650; the adjective gradually loses all the case-inflections; in substantives the nominative, dative and accusative take the same form as early as the middle of the 17th century; in the declension with suffixed article the old method of expressing number and case both in the substantive and the article is changed, so that the substantive alone takes the number-inflection and the article alone the case-ending; neuter substantives ending in a vowel, which previously had no plural ending, take the plural ending *-n*, some *-er*—as *bi-n*, bees, *bageri-er*, bakeries. About the year 1700 the Old Swedish inflection may, in general, be considered as almost completely given up, although a work of such importance in the history of the language as Charles XII.'s Bible (so-called) of 1703, by a kind of conscious archaism has preserved a good many of the old forms. To these archaistic tendencies of certain authors at the end of the 17th century we owe the great number of Old Swedish and Icelandic borrowed words then introduced into the language—as *fager*, fair, *härja*, to ravage, *later*, manners, *snille*, genius, *tarna*, girl, *tima*, to happen, &c. In addition to this, owing to humanistic influence, learned expressions were borrowed from Latin during the whole 16th and 17th centuries; and from German, chiefly at the Reformation and during the Thirty Years' War, numberless words were introduced—as *tapper*, brave, *prakt*, magnificence, *hurtig*, brisk, &c.; among these may be noted especially a great number of words beginning in *an-*, *er-*, *för-* and *ge-*. Owing to the constantly increasing political and literary predominance of France, French words were largely borrowed in the 17th century, and to an equally great extent in the 18th; such are *affär*, business, *respekt*, respect, *talang*, talent, *charmant*, charming, &c. In the 19th century, especially about the middle of it, we again meet with conscious and energetic efforts after purism both in the formation of new words and in the adoption of words from the old language (*id*, diligence, *mäla*, to speak, *fylking*, battle-array, &c.), and from the dialects (*bliga*, to gaze, *flis*, flake, *skrabbig*, bad, &c.). Consequently the present vocabulary differs to a very great extent from that of the literature of the 17th century. As for the sounds and grammatical forms, on the other hand, comparatively few important changes have taken place during the last two centuries. In the 18th century, however, the aspirates *dh* and *gh* passed into *d* and *g* (after *l* and *r* into *j*)—as *lag* for *lagh*, law, *bröd* for *brödh*, bread; *hw* passed into *v* (in dialects already about the year 1400)—as *valp* for *hwalper*, whelp; *lj* likewise into *j*—thus *ljuster*, leister, occurs written *juster*. In our time *rd*, *rl*, *rn*, *rs* and *rt* are passing into simple sounds ("supradental"

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[1] See A. Noreen, "Aperçu de l'histoire de la science linguistique suédoise" (*Le Muséon*, ii., 1883).

[2] *Altschwedische Grammatik* (1897–1904).

[3] The printed characters are also considerably changed by the introduction of the new letters *å* (with the translation of the New Testament of 1526), and *ä*, *ö* (both already in the first print in Swedish of 1495) for *aa*, *æ*, *ø*.

d, *l*, *n*, *s* and *t*), while the singular of the verbs is gradually supplanting the plural. A vigorous reform, slowly but firmly carried on almost uniformly during all periods of the Swedish language, is the throwing back of the principal accent to the beginning of the word in cases where previously it stood nearer the end, a tendency that is characteristic of all the Scandinavian languages, but no doubt especially of Swedish. In the primitive Scandinavian age the accent was removed in most simple words; the originally accented syllable, however, preserved a musically high pitch and stress. Thus there arose two essentially different accentuations—the one, with unaccentuated final syllable, as in Icel. *stígr* (Gr. *στείχεις*), thou goest, the comparative *betre* (cf. Gr. *θάσσων* from *ταχύς*), better, the other, with secondary stress and high pitch on the final, as in Icel. pret. plur. *buðo* (Sans. *bubudhús*), we bade, part. pret. *bitenn* (Sans. *bhinnás*), bitten. The same change afterwards took place in those compound words that had the principal accent on the second member, so that such contrasts as German *úrteil* and *erteílen* were gradually brought into conformity with the former accentuation. At the present day it is quite exceptionally (and chiefly in borrowed words of later date) that the principal accent in Swedish is on any other syllable than the first, as in *lekámen*, body, *välsígna*, to bless.

The study of Modern Swedish.

The scientific study of Modern Swedish[1] dates from Sweden's glorious epoch, the last half of the 17th century. The first regular Swedish grammar was written in 1684 (not edited till 1884) in Latin by E. Aurivillius; the first in Swedish is by N. Tiällman (1696). But little, however, of value was produced before the great work of Rydqvist mentioned above, which, although chiefly dealing with the old language, throws a flood of light on the modern also. Among the works of late years we must call special attention to the researches into the history of the language by K. F. Söderwall, F. A. Tamm, A. Kock and E. Hellquist. The grammar of the modern language is, as regards certain parts, treated in a praiseworthy manner by, among others, J. A. Aurén, J. A. Lyttkens and F. A. Wulff (in several common works), E. Tegnér, G. Cederschiöld and F. A. Tamm (d. 1905). A good though short account of phonology and inflections is given in H. Sweet's essay on "Sounds and Forms of Spoken Swedish" (*Trans. Phil. Soc.*, 1877–1879). A comprehensive and detailed grammar (*Vårt språk*) has been edited (since 1903) by A. Noreen. Attempts to construct a dictionary were made in the 16th century, the earliest being the anonymous *Variarum rerum vocabula cum Sueca interpretatione*, in 1538, and the *Synonymorum libellus* by Elaus Petri Helsingius, in 1587, both of which, however, followed German originals. The first regular dictionary is by H. Spegel, 1712; and in 1769 J. Ihre (d. 1780), probably the greatest philological genius of Sweden, published his *Glossarium Suiogoticum*, which still remains one of the most copious Swedish dictionaries in existence. In the 19th century the diligent lexicographer A. F. Dalin published a useful work. The Swedish Academy has been editing (since 1893) a gigantic dictionary on about the same plan as Dr Murray's *New English Dictionary*. Another such large work is *Sverges Ortnamn* (the local names of Sweden) edited since 1906 by the Royal Committee for investigation of the Swedish place-names.

IV. Danish, like Swedish, is divided into the two great Pre- and Post-Reformation epochs of Old and Modern Danish.

Old Danish.

1. *Old Danish.*—The territory of Old Danish included not only the present Denmark, but also the southern Swedish provinces of Halland, Skåne and Blekinge, the whole of Schleswig, and, as stated above, for a short period also a great part of England, and parts of Normandy. The oldest monuments of the language are runic inscriptions, altogether about 225 in number.[2] The oldest of them go as far back as to the beginning of the 9th century, the Snoldelev-stone, for instance, on Sealand, and the Flemløse-stone on Fünen. From about the year 900 date the very long inscriptions of Tryggevaelde (Zealand) and Glavendrup (Fünen); from the 10th century we have the stones of Jaellinge (Jutland), in memory of two of the oldest historical kings of Denmark (Gorm and Harald); while from about 1000 we have a stone at Dannevirke (Schleswig), raised by the conqueror of England, Sven Tjuguskaegg. Relics of about the same age are the words that were introduced by the Danes into English, the oldest of which date from the end of the 9th century, the time of the first Danish settlement in England; most of these are to be found in the early English work *Ormulum*.[3] No Danish literature arose before the 13th century. The oldest manuscript that has come down to us dates from the end of that century, written in runes and containing the law of Skåne. From about the year 1300 we possess a manuscript written in Latin characters and containing the so-called Valdemar's and Erik's laws of Zealand, the Flensborg manuscript of the law of Jutland, and a manuscript of the municipal laws of Flensborg. These three manuscripts represent three different dialects—that, namely, of Skåne, Halland and Blekinge, that of Zealand and the other islands, and that of Jutland and Schleswig. There existed no uniform literary language in the Old Danish period, although some of the most important works of the 15th century, such as the clerk Michael's *Poems* (since 1496) and the *Rhymed Chronicle* (the first book printed in Danish, in 1495), on account of their excellent diction, contributed materially to the final preponderance of their dialect, that of Zealand, towards the Reformation.

Dialects.

Form of the language.

As to the form of the language, it hardly differs at all during the period between A.D. 800 and 1200 from Old Swedish. It is only in the oldest literature that we can trace any marked differences; these are not very important, and are generally attributable to the fact that Danish underwent a little earlier the same changes that afterwards took place in Swedish (*e.g.* *h* in *hw* and *hj* in Danish was mute as early as the end of the 14th century. The laws referred to above only agree in differing from the Swedish laws in the following points: the nominative already takes the form of the accusative (as *kalf*, calf, but Old Sw. nom. *kalver*, acc. *kalf*); the second person plural ends in -*æ* (as *kø̄pæ*, but Old Sw. *kø̄pin*, you buy); in the subjunctive no differences are expressed between persons and numbers. Among themselves, on the contrary, they show considerable differences; the law of Skåne most nearly corresponds with the Swedish laws, those of Zealand keep the middle place, while the law of Jutland exhibits the most distinctive individuality. The Skåne law, *e.g.*, retains the vowels *a*, *i*, *u* in terminations, which otherwise in Danish have become uniformly *æ*; the same law inserts *b* and *d* between certain consonants (like Old Sw.), has preserved the dative, and in the present tense takes the vowel of the infinitive; the law of Jutland, again, does not insert *b* and *d*, and has dropped the dative, while the present tense (undergoing an *Umlaut*) has by no means always accepted the vowel of the infinitive; in all three characteristics the laws of Zealand fluctuate. After 1350 we meet an essentially altered language, in which we must first note the change of *k*, *p*, *t* after a vowel into *g*, *b*, *d* (as *tag*, roof, *lø̄be*, to run, *æde*, to eat); *th* passes into *t* (as *ting*, thing), *gh* into *w* (as *law* for *lagh*, gild) or into *i* (as *vei* for *wægh*, way); *ld*, *nd* are pronounced like *ll*, *nn*; *s* is the general genitive ending in singular and plural, &c. The vocabulary, which in earlier times only borrowed a few, and those mostly ecclesiastical, words, is now—chiefly owing to the predominant influence of the Hanse towns—inundated by German words, such as those beginning with *be-*, *bi-*, *ge-*, *for-* and *und-*, and ending in *-hēd*, and a great number of others, as *blīve*, to become, *skē*, to happen, *frī*, free, *krīg*, war, *buxer*, pantaloons, *ganske*, quite, &c.

Grammatical treatment.

An Old Danish grammar is still wanting, and the preparatory studies which exist are, although excellent, but few in number, being chiefly essays by the Danes K. J. Lyngby and L. F. A. Wimmer. N. M. Petersen's treatise *Det Danske, Norske, og Svenske sprogs historie*, vol. i. (1829), one of the first works that paid any attention to Old Danish, which till then had been completely neglected, is now surpassed by V. Dahlerup's *Geschichte der dänischen Sprache* (1904). A dictionary on a large scale covering the whole of Old Danish literature, except the very oldest, by O. Kalkar, has been in course of publication since 1881; older and smaller is C. Molbech's *Dansk Glossarium* (1857–1866).

Modern Danish sources.

2. *Modern Danish.*—The first important monument of this is the translation of the Bible, by C. Pedersen, Peder Palladius and others, the so-called Christian III.'s Bible (1550), famous for the unique purity and excellence of its language, the dialect of Zealand, then incontestably promoted to be the language of the kingdom. The first secular work deserving of the same praise is Vedel's translation of Saxo (1575). The succeeding period until 1750 offers but few works in really good Danish; as perfectly classical, however, we have to mention the so-called Christian V.'s Law of Denmark (1683). For the rest, humanism has stamped a highly Latin-French character on the literature, striking even in the works of the principal writer of this period, Holberg. But about the year 1750 there begins a new movement, characterized by a reaction against the language of the preceding period and by purist tendencies, or, at least, efforts to enrich the language with new-formed words (not seldom after the German pattern), as *omkreds*, periphery, *selvstændighed*, independence, *valgsprog*, devise, *digter*, poet. The leading representatives of these tendencies were Eilschow and Sneedorf. From their time Danish may be said to have acquired its present essential features, though it cannot be denied that several later authors, as J. Ewald and Öhlenschläger, have exercised a considerable influence on the poetical style. As the most important differences between the grammatical forms of the 18th and 19th centuries on one hand and those of the 16th and 17th centuries on the other, may be noted the following: most neuter substantives take a plural ending; those ending in a vowel form their plural by adding -*r* (as *riger*, for older *rige*, plural of *rige*, kingdom), and many of those ending in a consonant by adding -*e* (as *huse* for *hus*, of *hus*, house); substantives ending in -*ere* drop their final -*e* (as *dommer* for *dommere*, judge); the declension with suffixed article becomes simplified in the same way as in Swedish; the plural of verbs takes the singular form (as *drak* for *drukke*, we drank); and the preterite subjunctive is supplanted by the infinitive (as *var* for *vaare*, were).

Form of the language.

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[1] See A. Noreen, "Aperçu," &c.; *Vårt språk*, i. 181 sqq.

[2] See L. F. A. Wimmer, *De Danske runemindesmærker* (4 vols., 1895–1905).

[3] See E. Brate, "Nordische Lehnwörter im Ormulum" (*Paul Braune's Beiträge*, x., 1884); E. Björkman, *Scandinavian Loanwords in Middle English* (2 vols., 1900, 1902) in "Studien zur englischen Philologie," vii. and xi. Also Orm.

Grammatical treatment.

The first Modern Danish grammar is by E. Pontoppidan, 1668, but in Latin; the first in Danish is by the famous Peder Syv, 1685. The works of the self-taught J. Højsgaard (*e.g. Accentueret og raisonneret grammatica*, 1747) possess great merit, and are of especial importance as regards accent and syntax. The earlier part of the 19th century gave us Rask's grammar (1830). A thoroughly satisfactory Modern Danish grammar does not exist; the most detailed is that by K. Mikkelsen (1894). The vocabulary of the 16th and 17th centuries is collected in Kalkar's *Ordbog*, mentioned above; that of the 18th and 19th centuries in the voluminous dictionary of Videnskabernes Selskab (1793–1905), and in C. Molbech's *Dansk Ordbog* (2nd ed., 1859); that of our days in B. T. Dahl's and H. Hammer's *Dansk Ordbog for folket* (1903 seq.).

Dano-Norwegian.

As already mentioned, Danish at the Reformation became the language of the literary and educated classes of Norway and remained so for three hundred years, although it cannot be denied that many Norwegian authors even during this period wrote a language with a distinct Norwegian colour, as for instance the prominent prose-stylist Peder Claussøn Friis (d. 1614), the popular poet Petter Dass (d. 1708), and, in a certain degree, also the two literary masters of the 18th century, Holberg and Wessel. But it is only since 1814, when Norway gained her independence, that we can clearly perceive the so-called Dano-Norwegian gradually developing as a distinct offshoot of the general Danish language. The first representatives of this new language are the writer of popular life M. Hansen (d. 1842), the poets H. Wergeland (d. 1845) and J. S. C. Welhaven (d. 1873), but above all the tale-writers P. C. Asbjørnsen (d. 1885) and J. Moe (d. 1882). More recently it has been further developed, especially by the great poets Ibsen (d. 1906) and Bjørnson and the novelist Lie; and it has been said, not without reason, to have attained its classical perfection in the works of the first-named author. This language differs from Danish particularly in its vocabulary, having adopted very many Norwegian provincial words (more than 7000), less in its inflections, but to a very great extent in its pronunciation. The most striking differences in this respect are the following: Norwegian *p, t, k* answer to Danish *b, d, g* in cases where they are of later date (see above)—as *løpe*, Danish *løbe*, to run, *liten*, D. *liden*, little, *bak*, D. *bag*, back; to Danish *k, g* before palatal vowels answer Norwegian *tj, j*; *r* (point-trill, not back-trill as in Danish) is assimilated in some way with following *t* (*d*), *l*, *n*, and *s* into so-called supradental sounds; both the primitive Scandinavian systems of accentuation are still kept separate from a musical point of view, in opposition to the monotonous Danish. There are several other characteristics, nearly all of which are points of correspondence with Swedish.[1] Dano-Norwegian is in our days grammatically and lexically treated, especially by H. Falk and A. Torp (*e.g. Etymologisk Ordbog*, 1903, 1906).

Form of the language.

Norwegian-Norwegian.

At the middle of the 19th century, however, far more advanced pretensions were urged to an independent Norwegian language. By the study of the Modern Norwegian dialects and their mother language, Old Norwegian, the eminent philologist J. Aasen (d. 1896) was led to undertake the bold project of constructing, by the study of these two sources, and on the basis of his native dialect (Søndmøre), a Norwegian-Norwegian ("Norsk-Norsk") language, the so-called "Landsmål." In 1853 he exhibited a specimen of it, and, thanks to such excellent writers as Aasen himself, the poets O. Vinje and K. Janson, the novelists A. Garborg and J. Tvedt, as well as a zealous propagandism of the society *Det Norske Samlag* (founded in 1868) there has since arisen a valuable though not very large literature in the "Landsmål." Since 1892 it is also legally authorized to be, alternatively, used in the church and by teachers of the public schools. But still it is nowhere colloquially used. Its grammatical structure and vocabulary are exhibited in Aasen's *Norsk grammatik* (1864) and *Norsk Ordbog* (1873), supplemented by H. Ross's *Norsk Ordbog* (1895; with supplement, 1902). The local names of Norway are treated in the large work *Norske Gaardnavne*, by O. Rygh (1897 seq.).

Dialects.

SCANDINAVIAN DIALECTS.—As above remarked, the Scandinavian dialects are not grouped, so far as their relationship is concerned, as might be expected judging from the literary languages. Leaving out of account the Icelandic dialects and those of the Faeroes, each of which constitutes a separate group, the remainder may be thus classified:—

1. *West Norwegian Dialects*—spoken on the western coast of Norway between Langesund and Molde.
2. *North Scandinavian*—the remaining Norwegian and the Swedish dialects of Uppland, Västmanland, Dalarna, Norrland, Finland and Russia.
3. The dialects on the island of Gotland.
4. *Middle Swedish*—spoken in the rest of Sweden, except the southernmost parts (No. 5).
5. *South Scandinavian*—spoken in the greater part of Småland and Halland, the whole of Skåne, Blekinge and Denmark, and the Danish-speaking part of Schleswig. This group is distinctly divided into three smaller groups—the dialects of southern Sweden (with the island of Bornholm), of the Danish islands and of Jutland (and Schleswig).

The study of the Modern Scandinavian dialects[2] has been very unequally prosecuted. Hardly anything has been done towards the investigation of the Icelandic dialects, while those of the Faeroes have been studied chiefly by V. U. Hammershaimb, J. Jakobsen, and A. C. Evensen. The Norwegian dialects have been thoroughly examined, first by Aasen, whose works give a general account of them; then by J. Storm, who has displayed an unwearying activity, especially in the minute investigation of their phonetic constitution, to which Aasen had paid but scant attention; in our own days by H. Ross and A. B. Larsen.[3] For the study of Danish dialects less has been done. Molbech's *Dialect-Lexicon* of 1841 is very deficient. The Schleswig dialect has been admirably treated of by E. Hagerup (1854), K. J. Lyngby (1858) and others. H. F. Feilberg's great dictionary (1886 seq.) of the dialect of Jutland is in every respect an excellent work. A dialect map on a large scale, and containing the whole territory, is (since 1898) being edited by V. Bennike and M. Kristensen. Finally, several dialect monographs by P. K. Thorsen may be mentioned as being especially valuable. A phonetic alphabet for the purpose of dialectal investigations is worked out by O. Jespersen and published in the journal *Dania*, vol. i. (1890). There is, however, no country in which the dialects have been and are studied with greater zeal and more fruitful results than in Sweden during the last hundred and fifty years. Archbishop E. Benzelius the younger (d. 1743) made collections of dialect words, and on his work is based the dialectical dictionary of Ihre of 1766. An excellent work considering its age is S. Hof's *Dialectus Vestrogothica* (1772). The energy and zeal of C. Säve (d. 1876; essays on the dialects of Gotland and Dalarna) inspired these studies with extraordinary animation at the middle of the 19th century; in 1867 J. E. Rietz (d. 1868) published a voluminous dialect dictionary; the number of special essays, too, increased yearly. From 1872 so-called "landsmålsföreningar" (dialect societies) were founded among the students at the universities of Upsala, Lund and Helsingfors (thirteen at Upsala alone) for a systematic and thorough investigation of dialects. We find remarkable progress in scientific method—especially with regard to phonetics—in the constantly increasing literature; special mention may be made of the detailed descriptions of the dialects of Värmland, Gotland and Dalarna by A. Noreen (1877 seq.), A. F. Freudenthal's and H. Vendell's monographs of the Finnish and Esthonian-Swedish dialects, as well as O. F. Hultman's (1894) and B. Hesselman's (1902 seq.) excellent comparative treatment of certain dialect groups. Since 1879 the Swedish dialect societies have published a magazine on a comprehensive plan, *De Svenska Landsmålen*, edited by J. A. Lundell, who has invented for this purpose an excellent phonetic alphabet (partially based on C. J. Sundevall's work, *Om phonetiska bokstäfver*, 1855). (A. No.)

SCANDIUM [symbol Sc, atomic weight 44·1 (O=16)], one of the rare earth metals. It was isolated in 1879 by L. F. Nilson and was shown by Cleve to be identical with the ekaboron predicted by D. Mendeléeff. The separation of scandium from wolframite (which contains 0·14-0·16% of rare earths) is given by R. J. Meyer (*Zeit. anorg. Chem.* 1908, 60, p. 134), but it seems impossible to obtain a perfectly pure specimen of the oxide. The salts of scandium are all colourless, the chloride and bromide corresponding in composition to $Sc_2X_6\cdot 12H_2O$; the fluoride is anhydrous. The sulphate combines with the alkaline sulphates to form double salts of the type $Sc_2(SO_4)_3\cdot 3K_2SO_4$. A large number of salts, both of inorganic and organic acids, have been described by Sir W. Crookes (*Phil. Trans.* 1908, 209, A. p. 15); those of the fatty acids are in most cases more soluble in cold than in hot water.

SCANTLING, measurement or prescribed size, dimensions, particularly used of timber and stone and also of vessels. In regard to timber the scantling is the thickness and breadth, the sectional dimensions; in the case of stone the dimensions of thickness, breadth and length; in shipbuilding the collective dimensions of the various parts. The word is a variation of "scantillon," a carpenter's or mason's measuring tool, also used of the measurements taken by it, and of a piece of timber of small size cut as a sample. The O. Fr. *escantillon*, mod. *échantillon*, is usually taken to be related to Ital. *scandaglio*, sounding-line (Lat. *scandere*, to climb; cf. *scansio*, the metrical scansion). It was probably influenced by *cantel*, cantle, a small piece, a corner piece. The English form "scantling" was no doubt partly due to a confusion with "scant," stinted, of short measure; this is for *scamt*, cf. "skimpy," "scamp" (*q.v.*), and is related to O.N. *skammr*, short, brief.

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[1] See A. Western, "Kurze Darstellung des norwegischen Lautsystems" in *Phonetische Studien II.*; I. C. Poestion, *Lehrbuch der norwegischen Sprache* (2. Aufl., 1900).

[2] Cf J. A. Lundell, "Skandinavische Mundarten" (*Grundriss der germanischen Philologie*; 2. Aufl. 1901).

[3] The substance of these researches was presented in a magazine, called *Norvegia* (1887), which employed an alphabet invented by Storm.

SCAPHOPODA, the third of the five classes into which the Phylum Mollusca is divided.[1] The Scaphopoda are marine Molluscs with the body, especially the foot, adapted to a burrowing life in sand. The structure is bilaterally symmetrical, the body and shell elongated along the antero-posterior axis and nearly cylindrical. The right and left margins of the mantle are united ventrally, leaving an anterior and posterior aperture to the mantle cavity. The shell has therefore the form of a tube open at both ends. The head is somewhat rudimentary and without eyes, but bears two dorsal appendages produced into numerous long filaments. Buccal mass and radular apparatus are present, but ctenidia are entirely wanting. The foot is cylindrical. At first supposed to be tubicolous Annelids, *Dentalium* and its allies were afterwards placed among the Gastropoda, to which recent authorities consider them to be closely related. In 1857 Lacaze-Duthiers raised them to the rank of a division equal to Lamellibranchia. This view is now generally adopted. The shell is narrower at the posterior end and is slightly curved to the dorsal side. Both the vernacular name, "tooth shell," and the Latin name, *Dentalium*, refer to the resemblance of the shell to a long tooth.

The animal grows at the anterior end, and therefore the shell at the posterior end is older and thicker. The edge of the mantle at the anterior aperture is very thick and muscular; at the posterior aperture also there is a circular muscle, and here the edge is interrupted by a ventral sinus and is provided internally with a dorsal and ventral valve which can be applied to each other so as to close the aperture. The living animal buries itself in the sand with only the posterior extremity projecting into the water, so that the posterior aperture of the mantle cavity is both inhalant and exhalant.

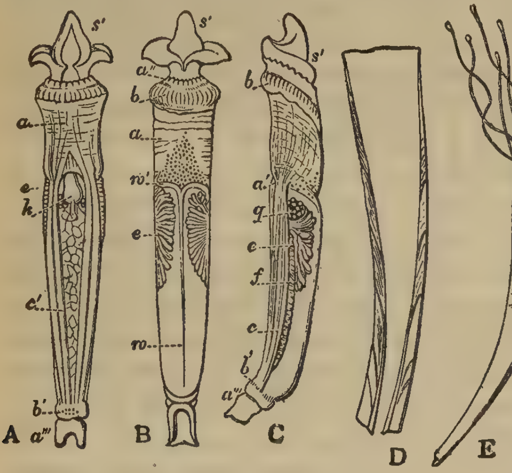
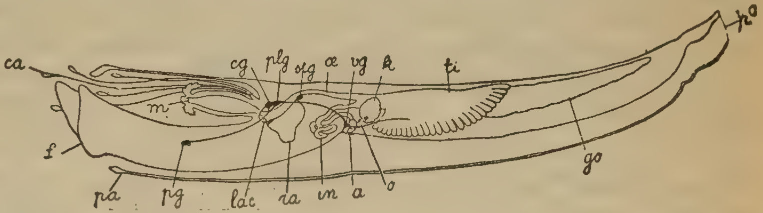


FIG. 1.—*Dentalium vulgare*, Da C. (after Lacaze Duthiers).

A,	Ventral view of the animal removed from its shell.	*b*,	Anterior circular muscle of the mantle.
B,	Dorsal view of the same.	*b'*	Posterior do.
C,	Lateral view of the same.	*c*, *c'*,	Longitudinal muscle of mantle.
D,	The shell in section.	*e*,	Liver.
E,	Surface view of the shell with gill-tentacles exserted as in [life.	*f*,	Gonad.
a,	Mantle.	*k*,	Buccal mass (showing through the mantle).
a',	Longitudinal muscle.	*q*,	Left nephridium.
a'',	Fringe surrounding the anterior opening of the mantle-chamber.	*s'*,	Club-shaped extremity of the foot.
a''',	The posterior appendix of the mantle.	*w*, *w'*,	Longitudinal blood-sinus of the mantle.

The head is situated on the dorsal side of the body anteriorly within the anterior aperture of the mantle, from which it cannot be protruded. It is a small somewhat cylindrical projection with the mouth at its anterior end. In the Dentaliidae the mouth is surrounded by eight small lobes, but these are absent in the Siphonopodiidae. At the base of the head dorsally are a pair of flat tentacular lobes from the edges of which the cephalic filaments or captacula arise. These captacula are of unequal length, highly contractile and extensile, easily thrown off and regenerated. They are ciliated, and their extremities are enlarged and have a small lateral depression in each. The captacula are tactile and prehensile and can be protruded from the anterior aperture of the mantle. The foot is elongated and cylindrical, and can be protruded from the anterior aperture to serve as a burrowing organ. In Dentaliidae it is pointed at the end and has an oblique projecting fold on either side behind the extremity. In Siphonopodiidae it ends in a disk with papillated margins, and in Pulsellum there is a filament in the centre of the disk. Two retractor muscles pass back from the base of the foot to the dorsal side of the shell.

Internal Anatomy.—The cavity within the head leads into a true buccal cavity situated within the body at the base of the foot. This buccal sac is provided with a dorsal mandible and a ventral radula. The latter is short and carries five teeth in each transverse row. The intestine is short and forms several loops all situated close behind the foot. The stomach is small; into it open a small pyloric caecum and the ducts of the liver, paired in Dentaliidae, one on the left only in *Siphonodentalium*. The anus opens just behind the base of the foot. The liver is placed entirely behind the intestine in the middle of the body, and behind it the rest of the body is occupied by the unpaired gonad. The vascular system is very rudimentary. Heart and blood-vessels are entirely absent; the blood is contained in sinuses which have no distinct walls or endothelial lining, and the principal of which are the perianal, the pedal, the visceral and the pallial. It is remarkable that in Scaphopoda only among Mollusca the blood-spaces are in communication with the external medium: a pair of apertures near the renal openings lead from the perianal sinus to the exterior and allow the blood to escape during violent contractions of the body. There are no special respiratory organs, their function is carried on by the internal surface of the mantle.



From Lankester's *Treatise on Zoology.*

FIG. 2.—Diagram of the Organization of *Dentalium*, Left-side View.

a,	Anus.	*la.c*,	Labial commissure.	*p.g*,	Pedal ganglion, with otocyst.
ca,	Captacula.	*li*,	Liver.	*pl.g*,	Pleural ganglion.
c.g,	Cerebral ganglion.	*m*,	Mouth.	*po*,	Posterior orifice of the mantle.
f,	Foot.	*o*,	Orifice leading into the perianal sinus.	*ra*,	Radular sac.
go,	Gonad.	*oe*,	Oesophagus.	*st.g*,	Stomato-gastric ganglion.
in,	Intestine.	*pa*,	Mantle.		
k,	Left kidney.				

The renal organs are a pair of short wide sacs with folded walls lying on either side of the anterior end of the liver. They open to the exterior on either side of the anus. The pericardium being absent, there are no reno-pericardial apertures.

The nervous system resembles that of Gastropoda and Lamellibranchia. A pair of cerebral ganglia lie on the dorsal side of the oesophagus: they innervate the proboscis or head and its tentacular lobes and captacula. Close to each cerebral ganglion is a pleural ganglion, and each is connected by a long nerve with the pedal ganglion of the same side, the two connectives of either side being united in the distal part of their course. The pedal ganglia are situated in the middle of the foot. The pleural ganglia are also united by a long visceral commissure as in Lamellibranchs, and this commissure bears two ganglia lying close beneath the epidermis in front of the anus. There is also a stomatogastric system arising from the cerebral ganglia.

Eyes are absent; attached to the pedal ganglia are a pair of otocysts. They are innervated from the cerebral ganglia. The buccal cavity contains a sense-organ on the ventral side called the sub-radular organ. It consists of ciliated epithelium, beneath which are two ganglia connected with the labial commissure by nerves. The only other sense-organs are the captacula, which are tactile and olfactory. Each contains a terminal ganglion connected with sensory cells in the lateral pit.

The sexes are separate. The gonad, whose position has already been mentioned, is divided into transverse lobes; its duct is anterior and single, and diverges to the right to open into the right kidney as in primitive Gastropods and Lamellibranchs.

Development.—The ova are laid separately and develop in the sea-

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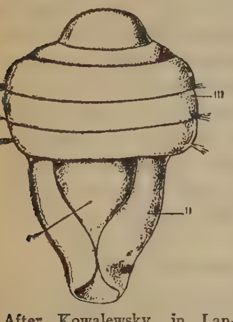
[1] For a discussion of its relationship to the other classes of the Phylum see MOLLUSCA.

water. One large cell, or megamere, remains for some time unsegmented but is finally segmented and forms the endoderm cells which are invaginated. The gastrula thus formed has a large blastopore, which is at first posterior but afterwards gradually moves towards the anterior end of the ventral surface. The velum is peculiar, being reflected backwards over the body and bearing, besides an apical tuft, three or four rings of cilia. The shell-gland is formed on the dorsal surface, and the mantle arises as two lateral lobes which afterwards unite by their ventral edges to form the tubular mantle of the adult. The anus is not formed till a very late period of the development. The foot arises as a prominence on the ventral surface and grows forward, and at the end of five or six days the velum atrophies and the foot becomes the organ of locomotion; the animal then ceases to swim and sinks to the bottom.



After Kowalewsky, in Lankester's *Treatise on Zoology*.

FIG. 3.—Larva of *Dentalium*, aged one and a half days; ventral aspect.
I, Foot.
II, mantle.
III, Velum forming a sort of test.

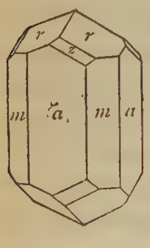
Habits and Distribution.—Scaphopoda feed on the lowest marine organisms such as Diatoms, Protozoa, &c. There are 150 living and about 275 known fossil species. The former occur in all seas from the shore to a depth of 2500 fathoms. Fossil remains are first found in the Silurian, but become most abundant from the Cretaceous onwards.

Classification. — Fam. 1. Dentaliidae. Foot conical with a laterally expanded and dorsally interrupted circular fold. Shell curved with greatest diameter at anterior aperture and diminishing gradually to posterior. *Dentalium*: posterior aperture of shell entire, without incision. *Antalis*: posterior aperture with short incision. *Fissidentalium*: posterior aperture with long fissure on ventral side; abyssal. *Fustiaria*. *Schizodentalium*: ventral border of posterior aperture with a series of small holes in a straight line. *Heterochisma*.

Fam. 2. Siphonopodiidae. Foot expanded distally into a symmetrical disk with a crenate edge or simple and vermiform without well-developed lateral processes; shell often contracted towards the anterior aperture. *Siphonodentalium*: foot ending in a median disk without a median appendage. *Cadulus*. *Dischides*. *Pulsellum*: terminal disk of foot with a median appendage. *Entalina*.

See F. J. H. Lacaze-Duthiers, "Histoire de l'organisation et du développement du Dentale," *Ann. Sci. Nat. Zool.* (4), vi., vii. (1856–1857); A. Kowalewsky, "Étude sur l'embryogénie du Dentale," *Ann. Musée d'Histoire Natur.* (Marseille, Zool. I. 1883); Boissevain, "Beiträge zur Anatomie und Histologie von Dentalium," *Jenaische Zeitschr.* xxxviii. (1904); Paul Pelseneer, *Mollusca*; Lankester's *Treatise on Zoology*, pt. v. (1906). (J. T. C.)

SCAPOLITE (Gr. σκᾶπος, rod, λίθος, stone), a group of rock-forming minerals composed of aluminium, calcium and sodium silicate with chlorine. The variations in composition of the different members of the group may be expressed by the isomorphous mixture of the molecules $Ca_4Al_6Si_6O_{25}$ and $Na_4Al_3Si_9O_{24}Cl$, which are referred to as the meionite (Me) and marialite (Ma) molecules respectively, since they predominate in these two end-members of the series. Wernerite, or common scapolite (Me_3Ma_1 to Me_1Ma_2) and mizzonite (Me_1Ma_2 to Me_1Ma_3) are intermediate members. The tetragonal crystals are hemihedral with parallel faces (like scheelite), and usually have the form of square columns, sometimes of considerable size. There are distinct cleavages parallel to the prism-faces. Crystals are usually white or greyish-white and opaque, though meionite is found as colourless glassy crystals in the ejected limestone blocks of Monte Somma, Vesuvius. The hardness is 5-6, and the specific gravity varies with the chemical composition between 2·74 (meionite) and 2·56 (marialite). The scapolites are especially liable to alteration by weathering processes, with the development of mica, kaolin, &c., and this is the cause of the usual opacity of the crystals. Owing to this alteration, and to the variations in composition, numerous varieties have been distinguished by special names. Scapolite is commonly a mineral of metamorphic origin, occurring usually in crystalline limestones, but also with pyroxene in schists and gneisses. The long slender prisms abundant in the crystalline limestones and schists in the Pyrenees are known as "dipyre" or "couzeranite." Large crystals of common scapolite (wernerite) are found in the apatite deposits in the neighbourhood of Bamle near Brevik in Norway, and have resulted from the alteration of the plagioclase felspar of a gabbro. (L. J. S.)



Scapolite Rocks.

According to their genesis the scapolite rocks fall naturally into four groups.

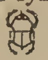
1. The scapolite limestones and contact rocks. As silicates rich in lime, it is to be expected that these minerals will be found where impure limestones have been crystallized by contact with an igneous magma. Even meionite (the variety richest in soda) occurs in this association, being principally obtained in small crystals lining cavities in ejected blocks of crystalline limestone at Vesuvius and the craters of the Eifel in Germany. Scapolite and wernerite are far more common at the contacts of limestone with intrusive masses. The minerals which accompany them are calcite, epidote, vesuvianite, garnet, wollastonite, diopside and amphibole. The scapolites are colourless, flesh-coloured, grey or greenish; occasionally they are nearly black from the presence of very small enclosures of graphitic material. They are not in very perfect crystals, though sometimes incomplete octagonal sections are visible; the tetragonal cleavage, strong double refraction and uniaxial interference figure distinguish them readily from other minerals. Commonly they weather to micaceous aggregates, but sometimes an isotropic substance of unknown nature is seen replacing them. In crystalline limestones and calc-silicate rocks they occur in small and usually inconspicuous grains mingled with the other components of the rock. Large, nearly idiomorphic crystals are sometimes found in argillaceous rocks (altered calcareous shales) which have suffered thermal metamorphism. In the Pyrenees there are extensive outcrops of limestone which are penetrated by igneous rocks described as ophites (varieties of diabase) and lherzolites (peridotites). At the contacts scapolite occurs in a great number of places, both in the limestones and in the calcareous shales which accompany them. In some of these rocks large crystals of one of the scapolite minerals (an inch or two in length) occur, usually as octagonal prisms with imperfect terminations. In others the mineral is found in small irregular grains. It is sometimes clear, but often crowded with minute enclosures of augite, tourmaline, biotite and other minerals, such as constitute the surrounding matrix. From these districts also a black variety is well known, filled with minute graphitic enclosures, often exceedingly small and rendering the mineral nearly opaque. The names couzeranite and dipyre are often given to this kind of scapolite. Apparently the presence of chlorine in small quantities, which may often be detected in limestones, to some extent determines the formation of the mineral.

2. In many basic igneous rocks, such as gabbro and diabase, scapolite replaces felspar by a secondary or metasomatic process. Some Norwegian scapolite-gabbros (or diorites) examined microscopically furnish examples of every stage of the process. The chemical changes involved are really small, one of the most important being the assumption of a small amount of chlorine in the new molecule. Often the scapolite is seen spreading through the felspar, portions being completely replaced, while others are still fresh and unaltered. The felspar does not weather, but remains fresh, and the transformation resembles metamorphism rather than weathering. It is not a superficial process, but apparently takes place at some depth under pressure, and probably through the operation of solutions or vapours containing chlorides. The basic soda-lime felspars (labradorite to anorthite) are those which undergo this type of alteration. Many instances of scapolitization have been described from the ophites (diabases) of the Pyrenees. In the unaltered state these are ophitic and consist of pyroxene enclosing lath-shaped plagioclase felspars; the pyroxene is often changed to uralite. When the felspar is replaced by scapolite the new mineral is fresh and clear, enclosing often small grains of hornblende. Extensive recrystallization often goes on, and the ultimate product is a spotted rock with white rounded patches of scapolite surrounded by granular aggregates of clear green hornblende: in fact the original structure disappears.

3. In Norway scapolite-hornblende rocks have long been known at Oedegården and other localities. They have been called spotted gabbros, but usually do not contain felspar, the white spots being entirely scapolite while the dark matrix enveloping them is an aggregate of green or brownish hornblende. In many features they bear a close resemblance to the scapolitized ophites of the Pyrenees. It has been suggested that the conversion of their original felspar (for there can be no doubt that they were once gabbros, consisting of plagioclase and pyroxene) into scapolite is due to the percolation of chloride solutions along lines of weakness, or planes of solubility, filling cavities etched in the substance of the mineral. Subsequently the chlorides were absorbed, and *pari passu* the felspar was transformed into scapolite. But it is found that in these gabbros there are veins of a chlorine-bearing apatite, which must have been deposited by gases or fluids ascending from below. This suggests that a pneumatolytic process has been at work, similar to that by which, around intrusions of granite, veins rich in tourmaline have been

laid down, and the surrounding rocks at the same time permeated by that mineral. In the composition of the active gases a striking difference is shown, for those which emanate from the granites are mainly fluorine and boron, while those which come from the gabbro are principally chlorine and phosphorus. In one case the felspar is replaced by quartz and white mica (in greisen) or quartz and tourmaline (in schorl rocks); in the other case scapolite is the principal new product. The analogy is a very close one, and this theory receives much support from the fact that in Canada (at various places in Ottawa and Ontario) there are numerous valuable apatite vein-deposits. They lie in basic rocks such as gabbro and pyroxenite, and these in the neighbourhood of the veins have been extensively scapolitized, like the spotted gabbros of Norway.

4. In many parts of the world metamorphic rocks of gneissose character occur containing scapolite as an essential constituent. Their origin is often obscure, but it is probable that they are of two kinds. One series is essentially igneous (orthogneisses); usually they contain pale green pyroxene, a variable amount of felspar, sphene, iron oxides. Quartz, rutile, green hornblende and biotite are often present, while garnet occurs sometimes; hypersthene is rare. They occur along with other types of pyroxene gneiss, hornblende gneiss, amphibolites, &c. In many of them there is no reason to doubt that the scapolite is a primary mineral. Other scapolite gneisses equally metamorphic in aspect and structure appear to be sedimentary rocks. Many of them contain calcite or are very rich in calc-silicates (wollastonite, diopside, &c.), which suggests that they were originally impure limestones. The frequent association of this type with graphitic-schists and andalusite-schists makes this correlation in every way probable. Biotite is a common mineral in these rocks, which often contain also much quartz and alkali felspar. (J. S. F.)

SCARAB (Lat. *scarabaeus*, connected with Gr. κάραβος), literally a beetle, and derivatively an Egyptian symbol in the form of a beetle. The Egyptian hieroglyph  pictures a dung beetle (*scarabaeus sacer*), which lays its egg in a ball of dung, and may be seen on sandy slopes in hot sunshine compacting the pellet by pushing it backward uphill with its hind legs and allowing it to roll down again, eventually reaching a place of deposit. Whatever the Egyptians may have understood by its actions, they compared its pellet to the globe of the sun. The beetle is common on both shores of the Mediterranean; the Egyptian name was *kheperer*, *kheperi*, and the sign spelt the verb *khōpi(r)* meaning "become" and perhaps "create," also the substantive "phenomenon" or "marvel." The insect was sacred to the sun-god in his form *khepēri* at Heliopolis, and has been found mummified. A colossal scarabaeus of granite in the British Museum probably came from the temple of Heliopolis. The scarabaeus was much used in Egyptian religions, appearing sometimes with outstretched wings or with a ram's head and horns as the vivifying soul. It is often seen in this guise on coffins of the New Kingdom and later, when it also became the custom to place in the bandages of the mummy a large stone scarab engraved with a chapter of the Book of the Dead. This chapter, the 64th, identified the object with the heart of the deceased and conjured it not to betray him in the judgment before Osiris. A winged scarab might also be laid on the breast; and later a number of scarabs were placed about the body. These are often of hard stone and of fine workmanship. Another and even more important class of Egyptian antiquities is in the form of scarabs, pierced longitudinally for a swivel or for threading, and having the bases flat and engraved with designs. These were intended principally for seals, but might also be used as beads or ornaments. They are thus found, engraved or plain, strung on necklaces, and amethyst scarabs with plain bases are common articles of Middle Kingdom jewelry. But the employment of scarabs as seals is proved by the impressions found on sealed documents of the Middle and New Kingdom; on several occasions the impressed clay seals alone have been found hardened and preserved by the fire which had destroyed the archives themselves. The seal type of scarabaei is extremely abundant, and the designs engraved beneath them show endless variety. Some have inscriptions carefully executed, but frequently corrupted by illiterate copying until they became meaningless. The inscriptions are sometimes "mottoes" having reference to places, deities, &c., or containing words of good omen or friendly wishes, *e.g.* "Memphis is mighty for ever," "Ammon protecteth," "Mūt give thee long life," "Bubastis grant a good New Year," "May thy name endure and a son be born thee." Such are of the New Kingdom or later. Names and titles of officials appear, most commonly in the Middle Kingdom.

Historically the most valuable class is of those which bear royal arms, ranging from Cheops of the IVth dynasty to the end of the XXVIth dynasty. Certain great kings are commemorated on scarabs of periods long subsequent to them. Thus Cheops (Khufu) may appear on an example of the latest Pharaonic age, and Tethmosis III. is found at all times after the XVIIIth dynasty. But as a rule the royal names are of contemporary workmanship, and the differences of style and pattern make it possible to group unknown kings with those who are known historically; the names of the Hyksos kings have been principally recovered from collections of scarab-seals. Scarab-shaped seals are traceable as far back as about the VIth dynasty. They became abundant under the XIIth and continued until almost the end of the native rule. As seals they took the place of the earlier cylinders. Considering the life-history of the scarabaeus and its meaning as a hieroglyph, it may well be that the scarab impressing the clay had a symbolic significance; however that may be, the oval form was well adapted for seal-stones and for the bezels of finger rings. In this situation the scarabs were often mounted with a rim of gold or silver round the edge. Rings of stone, glass or metal, with engraved bezels of the same material, and eventually Greek gem rings, gradually displaced them.

A series of exceptionally large scarabs was engraved in the reign of Amenophis III., *c.* 1450 B.C., all being inscribed with his name together with that of Queen Taia and her parentage. At present five varieties are known. The simplest commemorates his queen and the north and south limits of his empire; another dated in the first year, a great battue of wild cattle; the third, the arrival of the princess Gilukhipa of Mitanni in the tenth year; the fourth (many specimens), the number of lions slain by the king down to his tenth year; the last, the cutting of the lake of Zarukhe in the eleventh year.

Egyptian scarabs were carried by trade to most of the islands and shores of the eastern Mediterranean and to Mesopotamia. The Greeks, especially in their Egyptian colony of Naucratis (*q.v.*), imitated them in soft paste. The finest Etruscan gems of the 6th and 5th centuries B.C. are in the form of scarabs, perhaps suggested by the Egyptian. The forgers of antiquities have carried on a brisk trade in scarabs for more than a century.

See P. E. Newberry, *Scarabs* (London, 1906); also art. GEM, especially for later scarabaeoid gems. (F. Ll. G.)

SCARAMOUCH, properly a buffoon, used later colloquially for a ne'er-do-well. The name was that of a stock character in 17th-century Italian farce, *Scaramuccia* (*i.e.* literally "skirmish"), who, attired usually in a black Spanish dress, burlesquing a "don," was beaten by Harlequin for his boasting and cowardice. The part was played in London in 1673 by a well-known Italian actor, Tiberic Fiurelli, and became popular. There are many instances of the use of the word in the *New English Dictionary*.

SCARBOROUGH, a municipal and parliamentary borough and fashionable seaside resort in the North Riding of Yorkshire, England, 231 m. N. of London, on the North-Eastern railway. Pop. (1891) 33,776; (1901) 38,161. From the bold and picturesque coast a hammer-like peninsula (285 ft.) projects, separating North Bay from South Bay, and the modern extension of the town fringes both of these. The peninsula is crowned by a 12th-century castle, though this naturally strong position was probably occupied earlier. There is a moat (Castle Dyke) on the landward side, and a wall with towers also protects the castle in this direction. The keep, a lofty ruined tower, is of Norman date. The peninsula is much exposed to encroachment by the sea. In 1190 the plateau forming the castle yard was stated by William of Newburgh to be 60 acres in extent; it is now about 17. The list of the governors of the castle covers the period from 1136 to 1832. Near the landward side of the dike is the church of St Mary, finely situated, occupying the site of a Cistercian monastery of 1198. It is transitional Norman and Early English, with later additions. The choir was occupied by the Roundheads during the Commonwealth, and was wrecked by the castle guns. The tower fell later, and was in part rebuilt in the 17th century.

The development of Scarborough as a watering-place dates from the discovery in 1620 by Mrs Farren, a resident, of mineral springs. These springs, of which there are two, occur near the shore of the South Bay, and a handsome Spa House in pleasant gardens contains them. The south spring is aperient, but contains some iron; while the north or chalybeate spring is more tonic in its properties. They are still in use, though of less importance than formerly in comparison with the other attractions of the town. The sea-bathing is very good, both bays having a sandy foreshore. Well-planted grounds fringe the steep slope down to the North Bay, in which there is a promenade pier; the South Cliff is similarly adorned. It is approached from the north by a lofty bridge over a ravine, to the west of which lies a pleasant park. The southern part of the town is the more fashionable portion. The principal buildings of entertainment are the aquarium (also used as a concert hall); the museum, a rotunda in Doric style, containing excellent antiquarian and natural history collections; two theatres, and the assembly rooms attaching to the Spa House. The promenades and drives are extensive, and there is an inclined tramway leading from summit to foot of the South Cliff. A great marine drive, 4200 ft. long, was opened in 1908. The neighbouring country is exceedingly picturesque, with highlying moors intersected by narrow, well-wooded valleys. The hydrography of the district is remarkable, the Derwent, which flows S.W. to the Ouse and so to the Humber, having one of its sources near Scarborough within 2 m. of the sea. The climate is healthy and temperate; average temperature, 59·2° F. in July, and in January, 37·7.

The chief buildings of Scarborough apart from those already considered are the town hall, market hall and public hall, several modern churches and chapels, and charitable and benevolent institutions. The harbour, enclosed by piers and divided into two basins, lies on the south side of the castle peninsula. It is dry at low tide, but is accessible at spring tides to vessels of 13 ft. draught. It is largely used by fishing boats. The parliamentary borough, falling within the Whitby division of the county, returned two members until 1885, one since that date. The town is governed by a mayor, 6 aldermen and 18 councillors. Area, 2373 acres.

Although there is no mention of Scarborough (*Scardeburc*, *Escardebuc*, *Scardeburg*, *Scardeburk*, *Scartheburg*, *Schardeburg*) in the Domesday Survey the remains of Roman roads leading to the town indicate that it was in early times a place of importance. The castle was built during the 12th century by William le Gros, earl of Albemarle, who chose the site on the top of a steep cliff now called the "Scaur." Henry II. added greatly to its strength. From this time it was in the hands of a line of distinguished nobles appointed by the king. Scarborough is a borough by prescription. Its first charter of 1181 granted that the burgesses should possess all liberties in the same way as the citizens of York. They were also to render to the king yearly 4d. for every house whose gable was turned to the way, and 6d. for those whose sides were turned to the way. This charter was confirmed with various alterations and extensions by most of the succeeding monarchs. Henry III. in 1253 granted that a court of pleas should be held at Scarborough by the justices who went to hold common pleas at York; he also gave the corporation a gild merchant. Edward II. caused the town to be taken away from the burgesses "for certain causes," but it was restored to them by Edward III. in 1327. The charter of Edward III. in 1356 sets forth and confirms the privileges of the borough. Richard III. by his charter of 1485 appointed that the town should be governed by a mayor, sheriff and twelve aldermen, and also granted amongst other extensive privileges that this town with the manor of Whallesgrave should be a county of itself. However, on the death of Richard III. the charter took no effect, and the corporation returned to its ancient mode of government. In 1684 a mayor, 12 aldermen and 31 common councilmen were nominated as governors. Scarborough returned two members to parliament from 1295 to 1885. It is said that Henry II. held a market here which he granted to the burgesses, but of this there is no mention in subsequent charters. In 1253 Henry III. granted a yearly fair lasting from the Assumption of St Mary to the following Michaelmas. This fair was originally held on the sands. Jet was formerly an important manufacture.

See Thomas Hinderwell, *History of Scarborough* (Scarborough, 1832); J. B. Baker, *History of Scarborough* (London, 1882).

SCARF, a narrow wrap for the neck or shoulders; the term is a wide one, ranging from a light band of silk, muslin or other material worn by women as a decorative part of their costume to a warm knitted muffler of wool to protect the throat from cold. The O. Eng. *scearfe* meant a piece or fragment of anything, and is to be referred ultimately to the root *skar-*, to cut, seen in Dutch *scherf*, shred, Ger. *Scherbe*, potsherd, "scrap," a piece or fragment; "scrip," a piece of leather, hence a pouch or wallet. The particular meanings in English are to be referred to Fr. *escharpe*, pilgrim's wallet, also scarf. The ecclesiastical "scarf" was originally a loose wrap or muffler (band) to be worn round the neck out of doors. In the English Church, in post-Reformation times, the minister wore over the surplice the "scarf," which was a broad band of black silk with fringed ends arranged like the stole round the neck, but falling nearly to the feet. Its use has been almost entirely replaced by that of the stole (*q.v.*), with which it has sometimes been wrongly confused.

Ultimately from the same root, but directly adapted from the Scandinavian, cf. Swed. *skarf*, joint, is the use of the word "scarf," in carpentry and joinery, for a joint by which two timbers are fastened together longitudinally so as to form a continuous piece (see JOINERY).

SCARLATTI, ALESSANDRO (1659–1725), Italian musical composer, was born in Sicily, either at Trapani or Palermo, in 1659. He is generally said to have been a pupil of Carissimi in Rome, and there is reason to suppose that he had some connexion with northern Italy, since his early works show the influence of Stradella and Legrenzi. The production at Rome of his opera *Gli Equivoci nell' amore* (1679) gained him the protection of Queen Christina of Sweden, and he became her Maestro di Cappella. In February 1684 he became Maestro di Cappella to the viceroy of Naples, through the intrigues of his sister, an opera singer, who was the mistress of an influential noble in that city. Here he produced a long series of operas, remarkable chiefly for their fluency, as well as other music for state occasions. In 1702 he left Naples and did not return until the Spanish domination had been superseded by that of the Austrians. In the interval he enjoyed the patronage of Ferdinand III. of Tuscany, for whose private theatre near Florence he composed operas, and of Cardinal Ottoboni, who made him his Maestro di Cappella, and procured him a similar post at the church of S Maria Maggiore in Rome (1703). After visiting Venice and Urbino in 1707, he took up his duties at Naples again in 1708, and remained there until 1717. By this time Naples seems to have become tired of his music; the Romans, however, appreciated it better, and it was at the Teatro Capranica in Rome that he produced some of his finest operas (*Telemaco*, 1718; *Marco Attilio Regolo*, 1719; *Griselda*, 1721), as well as some noble specimens of church music, including a mass for chorus and orchestra, composed in honour of St Cecilia for Cardinal Acquaviva in 1721. His last work on a large scale appears to have been the unfinished serenata for the marriage of the prince of Stigliano (1723); he died at Naples on the 24th of October 1725.

Scarlatti's music forms the most important link between the tentative "new music" of the 17th century and the classical school of the 18th, which culminated in Mozart. His early operas (*Gli Equivoci nel sembiante* (1679); *L' Honestà negli amori* (1680); *Pompeo* (1683), containing the well-known airs "O cessate di piagarmi" and "Toglietemi la vita ancor," and others down to about 1685) retain the older cadences in their recitatives, and a considerable variety of neatly constructed forms in their charming little arias, accompanied sometimes by the string quartet, treated with careful elaboration, sometimes by the harpsichord alone. By 1686 he had definitely established the "Italian overture" form (second edition of *Dal male il bene*), and had abandoned the ground bass and the binary air in two stanzas in favour of the ternary or *da capo* type of air. His best operas of this period are *La Rosaura* (1690, printed by the *Gesellschaft für Musikforschung*), and *Pirro e Demetrio* (1694), in which occur the songs "Rugiadose, odorose," "Ben ti sta, traditor." From about 1697 onwards (*La Caduta dei decemviri*), influenced partly perhaps by the style of Bononcini and probably more by the taste of the viceregal court, his opera songs become more conventional and commonplace in rhythm, while his scoring is hasty and crude, yet not without brilliancy (*Eraclea*, 1700), the oboes and trumpets being frequently used, and the violins often playing in unison. The operas composed for Ferdinand de Medici are lost; they would probably have given us a more favourable idea of his style, his correspondence with the prince showing that they were composed with a very sincere sense of inspiration. *Mitridate Eupatore*, composed for Venice in 1707, contains music far in advance of anything that Scarlatti had written for Naples, both in technique and in intellectual power. The later Neapolitan operas (*L'Amor volubile e tiranno* (1709); *La Principessa fedele* (1712); *Tigrane*, 1715, &c.) are showy and effective rather than profoundly emotional; the instrumentation marks a great advance on previous work, since the main duty of accompanying the voice is thrown upon the string quartet, the harpsichord being reserved exclusively for the noisy instrumental *ritornelli.* His last group of operas, composed for Rome, exhibit a deeper poetic feeling, a broad and dignified style of melody, a strong dramatic sense, especially in accompanied recitatives, a device which he himself had been the first to use as early as 1686 (*Olimpia vendicata*) and a much more modern style of orchestration, the horns appearing for the first time, and being treated with striking effect.

Besides the operas, oratorios (*Agar et Ismaele esiliati*, 1684; *Christmas Oratorio*, *c.* 1705; *S. Filippo Neri*, 1714; and others) and serenatas, which all exhibit a similar style, Scarlatti composed upwards of five hundred chamber-cantatas for a solo voice. These represent the most intellectual type of chamber-music of their period, and it is to be regretted that they have remained almost entirely in MS., since a careful study of them is indispensable to any one who wishes to form an adequate idea of Scarlatti's development. His few remaining masses (the story of his having composed two hundred is hardly credible) and church music in general are comparatively unimportant, except the great St Cecilia Mass (1721), which is one of the first attempts at the style which reached its height in the great masses of Bach and Beethoven. His instrumental music, though not without interest, is curiously antiquated as compared with his vocal works.

Scarlatti's greatest claim to remembrance lies in the fact that he practically created the language of classical music. He extended the old forms, and filled them with melody unrivalled for purity and serenity, based on a far-reaching foundation of modern harmony and tonality, combined with a remarkable power of thematic development. That his great qualities have been little recognized is due partly to the wonderful mastery with which he avoided all appearance of difficulty, and partly to the fact that he carried out in his operas and cantatas the structural methods which the present age considers to be suitable to instruments alone, but which were indeed admirably suited to vocal music in an age when the singer was technically and intellectually far in advance of all other musicians.

His eldest son, Domenico Scarlatti (1685–1757), also a composer, was born at Naples on the 26th of October 1685. Presumably he studied first under his father, but he was in all probability also a pupil of Gaetano Greco. In 1704 he remodelled Pollaroli's *Irene* for performance at Naples. Soon after this his father sent him to Venice, where he studied under Gasparini, and became intimate with Thomas Roseingrave. Domenico was already a harpsichord-player of eminence, and at a trial of skill with Handel at the palace of Cardinal Ottoboni in Rome he was adjudged his equal on that instrument, although inferior on the organ. In 1709 Domenico entered the service of Marie Casimire, queen of Poland, then living in Rome, and composed several operas for her private theatre. He was Maestro di Cappella at St Peter's from 1715 to 1719, and in the latter year came to London to direct his opera *Narciso* at the King's Theatre. In 1720 or 1721 he went to Lisbon, where he taught music to the princess Magdalena Theresia. He was at Naples again in 1725, but in 1729 went to Madrid as music master to the princess, who had married into the Spanish royal house. He remained in Spain for some twenty-five years, holding various honourable appointments, and devoting himself entirely to the harpsichord, for which he composed over four hundred pieces. He is supposed to have died in 1757, either at Naples or in Spain.

Like his father, Domenico Scarlatti was a composer of great fertility, intellectual rather than emotional, presenting us with an example of steady development of style up to the end of a long life. His operas and cantatas are of no importance, but his harpsichord pieces are the most original productions of their time. Little known until the beginning of the 19th century, their technical difficulties have caused them to be regarded as mere studies in virtuosity, and modern pianoforte technique owes much to their influence; but considered from a purely musical point of view they display an audacity of harmony and modulation, a freshness and variety of invention, a perfection of workmanship and a vigorous intellectuality in thematic development that places them almost on a level with the sonatas of Beethoven.

Modern Printed Editions.—Clementi's *Practical Harmony*; Czerny's edition; Farrenc, *Le Trésor des pianistes.* Of recent editions the most accurate and complete is by Alessandro Longo (Ricordi, Milan; 6 vols., published 1906). (E. J. D.)

SCARLET, a vivid, bright red colour, somewhat inclined to orange. The word appears in most European languages; cf. Ger. *Scharlach*, Swed. *skarlakan*, Ital. *scarlatto*, &c.; the English form is an adaptation of the O. Fr. *escarlate*, mod. *écarlate.* The origin of these is to be found in the Persian *saqlan*, meaning "broad-cloth." There are various forms, *saqalāt, siqalāt, suqlāt*; this cloth was chiefly used for dresses, flags, large tents and trappings, and was frequently scarlet in colour, and hence its name became applied to the colour.

SCARLET FEVER, or Scarlatina, names applied indifferently to an acute infectious disease, characterized by high fever, accompanied with sore throat and a diffuse red rash upon the skin (see Parasitic Diseases). This fever appears to have been first accurately described by Sydenham in 1676, before which period it had evidently been confounded with smallpox and measles. Klein in 1885 isolated a streptococcus which he termed the streptococcus scarlatinae. The scarlatinal throat is the chief habitat of the organism, though it has been found both by Klein and other observers in the discharges from the ears of scarlet fever patients. Mervyn Gordon also isolated from cases the streptococcus conglomerulatus. It is possible that septic cases of scarlet fever are the result of a mixed infection. The serum of patients has been found to contain agglutins to streptococci from cases of erysipelas, septicaemia and puerperal fever, as well as to the streptococci scarlatinae. F. B. Mallory in 1904 published his discovery of "protozoonlike" bodies in the cells of the epidermis. Other observers have found them in the skin of fatal cases, but failed to find them in the living. The contagion of scarlet fever takes place from a previous case either by the skin during the early stages of the disease or by the nasal or aural discharges of a patient. It may be conveyed by any article of clothing or furniture or by any person that has been in contact with a scarlet fever patient. Infectivity may also take place through a contaminated milk supply, as in the Marylebone epidemic, 1885. Klein here found disorder in cows which he considers analogous to scarlatina and communicable to man.

The period of incubation in scarlet fever may be as short as one or two days, but in most instances it is probably less than a week. The invasion of this fever is generally sudden and sharp, consisting in rigors, vomiting and sore throat, together with a rapid rise of temperature and increase in the pulse. Occasionally, especially in young children, the attack is ushered in by convulsions. These premonitory symptoms usually continue for about twenty-four hours, when the characteristic eruption makes its appearance. It is first seen on the neck, chest, arms and hands, but quickly spreads all over the body, although it is not distinctly marked on the face. This rash consists of minute thickly-set red spots, which coalesce to form a general diffuse redness, in appearance not unlike that produced by the application of mustard to the skin. In some instances the redness is accompanied with small vesicles containing fluid. In ordinary cases the rash comes out completely in about two days, when it begins to fade, and by the end of a week from its first appearance it is usually gone. The severity of a case is in some degree measured by the copiousness and brilliancy of the rash, except in the malignant varieties, where there may be little or no eruption. The tongue, which at first was furred, becomes about the fourth or fifth day denuded of its epithelium and acquires the peculiar "strawberry" appearance characteristic of this fever. The interior of the throat is red and somewhat swollen, especially the uvula, soft palate and tonsils, and a considerable amount of secretion exudes from the inflamed surface. There is also tenderness and slight swelling of the glands under the jaw. In favourable cases the fever departs with the disappearance of the eruption and convalescence sets in with the commencement of the process of "desquamation" or peeling of the cuticle, which first shows itself about the neck, and proceeds slowly over the whole surface of the body. Where the skin is thin the desquamation is in the form of fine branny scales; but where it is thicker, as about the hands and feet, it comes off in large pieces, which sometimes assume the form of casts of the fingers or toes. The duration of this process is variable, but it is rarely complete before the end of six or eight weeks, and not unfrequently goes on for several weeks beyond that period. It is during this stage that complications are apt to appear.

Scarlet fever shows itself in certain well-marked varieties, of which the following are the chief:—

1. *Scarlatina Simplex* is the most common form; in this the symptoms, both local and general, are moderate, and the case usually runs a favourable course. In some rare instances it would seem that the evidences of the disease are so slight, as regards both fever and rash, that they escape observation and only become known by the

patient subsequently suffering from some of the complications associated with it. In such cases the name *latent scarlet fever* (*scarlatina latens*) is applied.

2. *Septic Scarlatina* or *Scarlatina Anginosa* is a more severe form of the fever, particularly as regards the throat symptoms. The rash may be well marked or not, but it is often slow in developing and in subsiding. There is intense inflammation of the throat, the tonsils, uvula and soft palate being swollen and ulcerated, or having upon them membranous patches not unlike those of diphtheria, while externally the gland tissues in the neck are enlarged and indurated and not unfrequently become the seat of abscesses. There is difficulty in opening the mouth; an acrid discharge exudes from the nostrils and excoriates the lips; and the countenance is pale and waxy-looking. This form of the disease is marked by great exhaustion and the gradual development of the symptoms of acute septicaemia, with sweating, albuminuria, delirium and septic rash.

3. *Toxic* or *ataxic scarlatina* (*scarlatina maligna*). In this form the gravity of the condition is due to intense poisoning, and the patient may even die therefrom before the typical symptoms of the disease have had time to manifest themselves.

The typically malignant forms are those in which the attack sets in with great violence and the patient sinks from the very first. In such instances the rash either does not come out at all or is of the slightest amount and of livid rather than scarlet appearance, while the throat symptoms are often not prominent. A further example of a malignant form is occasionally observed in cases where the rash, which had previously been well developed, suddenly recedes, and convulsions or other nervous phenomena and rapid death supervene.

The complications and effects of scarlet fever are among the most important features in this disease, although their occurrence is exceptional. The most common and serious of these is inflammation of the kidneys, which may arise during any period in the course of the fever, but is specially apt to appear in the convalescence, while desquamation is in progress. Its onset is sometimes announced by a return of feverish symptoms, accompanied with vomiting and pain in the loins; but in a large number of instances it occurs without these and comes on insidiously. One of the most prominent symptoms is slight swelling of the face, particularly of the eyelids, which is rarely absent in this complication. If the urine is examined it will probably be observed to be diminished in quantity and of dark smoky or red appearance, due to the presence of blood; while it will also be found to contain a large quantity of albumen. This, together with the microscopic examination which reveals the presence of tube casts containing blood, epithelium, &c., testifies to a condition of acute inflammation of the kidney (glomerular and tubal nephritis). Occasionally this condition does not wholly pass off, and consequently lays the foundation for Bright's disease. Muco-purulent rhinorrhoea and also rheumatism are others of the more common complications or results of scarlet fever, while suppuration of the ears is due to the extension of the inflammatory process from the throat along the Eustachian tube into the middle ear. This not unfrequently leads to permanent ear-discharge, with deafness from the disease affecting the inner ear and temporal bone, a condition implying a degree of risk from its proximity to the brain. Other maladies affecting the heart, lungs, pleura, &c., occasionally arise in connexion with scarlet fever, but they are of less common occurrence than those previously mentioned.

In the treatment of scarlet fever, one of the first requirements is the isolation of the case, with the view of preventing the spread of the disease. In convalescence, with the view of preventing the transmission of the desquamated cuticle, the inunction of the body with carbolized oil (1 in 40) and the frequent use of a bath containing soda, are to be recommended. With respect to the duration of the infective period, it may be stated generally that it is seldom that a patient who has suffered from scarlet fever can safely go about before the expiry of eight weeks, while on the other hand the period may be considerably prolonged beyond this, should any nasal or aural discharge continue. As to general management during the progress of the fever, in favourable cases little is required beyond careful nursing and feeding. The diet all through the fever and convalescence should be of light character, consisting mainly of milk food. Soups and solid animal food should as far as possible be avoided owing to the frequency of nephritis. During the febrile stage a useful drink may be made by a weak solution of chlorate of potash in water (1 drachm to the pint), and of this the patient may partake freely. The fauces should be irrigated every few hours with a mild antiseptic solution, and sucking ice often relieves local discomfort. Should the lymphatic glands be enlarged and tender, they should be fomented. If suppuration threatens they must be opened. In septic cases the nasofaucial passages must be cleansed with a more powerful antiseptic. Insomnia, restlessness and high temperature may be relieved by tepid sponging, and acute hyperpyrexia by cold baths. The treatment of kidney complications is similar to that of acute Bright's disease. A hot-air bath or wet pack is often useful. Otitis may be troublesome, and when otorrhoea is established the canal must be kept as aseptic as possible. The ears should be carefully syringed every four hours with an antiseptic solution and dried, and a little iodoform inserted into the meatus. Complications such as mastoid disease require special treatment. Recently a method of treatment introduced by Dr Robert Milne, and consisting of the inunction of the entire body with eucalyptus oil from the *first* day of the disease, together with swabbing the tonsils with a solution of 1 in 10 of carbolic oil, has been advocated as rendering the patient absolutely non-infectious as well as limiting the severity of the disease. The method is still on its trial, but it is possible it may revolutionize our mode of treatment.

Serumtherapy.—Marmorek's original antistreptococci serum has been on the whole disappointing in its results, but polyvalent serums have been much more successful. Dr Besredka prepared a serum from the blood of fatal cases, and in the serum prepared at the Pasteur Institute no less than twenty separate strains of streptococci are used. In using serums, early and large dosage is necessary. Palmirski and Zebrowski have also prepared a serum from the streptococcus conglomerulatus, which has been used with considerable success in the children's hospital at Warsaw.

SCARLETT, SIR JAMES YORKE (1799–1871), British general, was the second son of the 1st Baron Abinger. Educated at Eton and Trinity College, Cambridge. He entered the army as a cornet in 1818, and in 1830 became major in the 5th Dragoon Guards. From 1836 until 1841 he was Conservative member of Parliament for Guildford. In 1840 he obtained the command of his regiment, which he held for nearly fourteen years. In the Crimean War the 5th Dragoon Guards formed part of the Heavy Cavalry Brigade (of which Scarlett was appointed brigadier); it was sent to the Black Sea in 1854, and suffered very heavily from cholera in the camps of Varna. Scarlett underwent his baptism of fire before Sebastopol. On the 25th of October 1854 occurred the battle of Balaklava, at which the Heavy Brigade achieved a magnificent success against the Russian cavalry, and had the brigadier (who in the previous charge had been in the thickest of the mêlée) been allowed to advance as he wished, might have converted the disastrous charge of the Light Brigade into a substantial success (see Balaklava and Crimean War). For his services on this day Scarlett was promoted major-general, and in 1855 was made K.C.B. After a short absence in England he returned to the Crimea with the local rank of lieutenant-general to command the British cavalry. After the Peace of Paris Sir James Scarlett commanded the cavalry at Aldershot until 1860, and was adjutant-general of the army from 1860 to 1865. In the latter year he became commander of the Aldershot Camp, a post which he held until his retirement in 1870. He died in 1871. In 1869 he had been made G.C.B.

SCARRON, PAUL (1610–1660), French poet, dramatist, novelist and husband of Madame de Maintenon, was baptized on the 4th of July 1610. His father, of the same name, was a member of the *parlement* of Paris. Paul the younger became an *abbé* when he was nineteen, and in 1633 entered the service of Charles de Beaumanoir, bishop of Le Mans, with whom he travelled to Rome in 1635. Finding a patron in Marie de Hautefort, he became a well-known figure in literary and fashionable society. An improbable story is told on the authority of La Beaumelle (*Mémoires . . . de Mme de Maintenon*) that—when in residence at his canonry of Le Mans—he once tarred and feathered himself as a carnival freak and, being obliged to take refuge from popular wrath in a swamp, was crippled from rheumatism. What is certain is that Scarron, after having been in perfect health for nearly thirty years, passed twenty more in a state of miserable deformity and pain. His head and body were twisted, and his legs became useless. He bore up against his sufferings with invincible courage, though his circumstances were further complicated by a series of lawsuits with his stepmother over his father's property, and by the poverty and misconduct of his sisters, whom he supported. Scarron returned to Paris in 1640, and in 1643 appeared a *Recueil de quelques vers burlesques*, and in the next year *Typhon ou la gigantomachie.* At Le Mans he had conceived the idea of the *Roman comique*, the first part of which was printed in 1651. In 1645 was performed the comedy of *Jodelet, ou le maître valet*, the name of which was derived from the actor who took the principal part. *Jodelet* was the first of many French plays in which the humour depends on the valet who takes the part of master, an idea that Scarron borrowed from the Spanish. After a short visit to Le Mans in 1646, he returned to Paris, and worked hard for the bookseller Quinet, calling his works his "*marquisat de Quinet.*" He had also a pension from Fouquet, and one from the queen, which was withdrawn because he was suspected of Frondeur sentiments. When Mazarin received the dedication of *Typhon* coldly, Scarron changed it to a burlesque on the minister. In 1651 he definitely took the side of the Fronde in a *Mazarinade*, a violent pamphlet. He now had no resources but his "*marquisat.*"

In his early years he had been something of a libertine. In 1649 a penniless lady of good family, Céleste Palaiseau, kept his house in the Rue d'Enfer, and tried to reform the gay company which assembled there. But in 1652, sixteen years after he had become almost entirely paralysed, he married a girl of much beauty and no fortune, Françoise d'Aubigné, afterwards famous as Madame de Maintenon (*q.v.*). Scarron had long been able to endure life only by the aid of constant doses of opium, and he died on the 6th of October 1660.

Scarron's work is very abundant and very unequal. The piece most famous in his own day, his *Virgile travesti* (1648–1653), is now thought a somewhat ignoble waste of singular powers for burlesque. But the *Roman comique* (1651–1657) is a work the merit of which is denied by no competent judge. Unfinished, and a little desultory, this history of a troop of strolling actors is almost the first French novel, in point of date, which shows real power of painting manners and character, and is singularly vivid. It is in the style of the Spanish picaresque romance, and furnished Théophile Gautier with the idea and with some of the details of his *Capitaine Fracasse.* Scarron also wrote some shorter novels: *La Précaution inutile*, which inspired Sedaine's *Gageure imprévue*; *Les Hypocrites*, to which *Tartuffe* owes something, and others. Of his plays *Jodelet* (1645) and *Don Japhet d'Arménie* (1653) are the best.

The most complete edition of his works is by La Martinière, 1737 (10 vols., Amsterdam). The *Roman comique* and the *Énéide travestie* were edited by Victor Fournel in 1857 and 1858. Among the contemporary notices of Scarron, that contained in the *Historiettes* of Tallemant des Réaux is the most accurate. The most important modern works on the subject are *Scarron et le genre burlesque* (1888) by Paul Morillot; a biography by J. J. Jusserand in English, prefixed to his edition of *The Comical Romance and other tales by Paul Scarron, done into English by Tom Brown of Shifnal, John Savage and others* (2 vols., 1892); and *Paul Scarron et Françoise d'Aubigné d'après des documents nouveaux* (1894) by A. de Boislisle.

SCAUP, the wild-fowler's ordinary abridgment of SCAUP-DUCK, meaning a duck so called "because she feeds upon *Scaup, i.e.* broken shell-fish," as may be seen in F. Willughby's *Ornithology* (p. 365); but it would be more proper to say that the name comes from the "mussel-scaups," or "mussel-scalps," the beds of rock or sand on which mussels are aggregated. It is the *Anas marila* of Linnaeus and *Fuligula marila* of modern systematic writers, a very abundant bird around the coasts of most parts of the northern hemisphere, repairing inland in spring for the purpose of reproduction, though so far as is positively known hardly but in northern districts, as Iceland, Lapland, Siberia and the fur-countries of America. The scaup-duck has considerable likeness to the pochard (*q.v.*), both in habits and appearance; but it much more generally affects salt-water, and the head of the male is black, glossed with green; hence the name of "Blackhead," by which it is commonly known in North America, where, however, a second species or race, smaller than the ordinary one, is also found, the *Fuligula affinis.* The female scaup-duck can be readily distinguished from the dunbird or female pochard by her broad white face. (A. N.)

SCAURUS, MARCUS AEMILIUS (*c.* 163–88 B.C.), Roman statesman, was a member of a great patrician family which had sunk into obscurity. His father had been a coal-dealer, and he himself had thought of becoming a money-changer, but finally decided in favour of a political career. Having served in the army in Spain and Sardinia, he became curule aedile, praetor and (after an unsuccessful attempt in 117) consul in 115. During his consulship he celebrated a triumph for his victory over certain Alpine tribes. In 112 he was one of the commissioners sent to Africa to arrange the dispute between Jugurtha and Adherbal. When a special committee was appointed to examine the charges of venality in their dealings with Jugurtha brought against the Roman representatives, Scaurus, who was equally guilty with the rest, was especially active in promoting the establishment of the committee, and even managed to get himself put at the head of it. He thus saved himself, but his intercession on behalf of the other offenders was of no avail. In 109 Scaurus was censor, and constructed the Via Aemilia and restored the Mulvian bridge.[1] In 104 he superseded Saturninus (*q.v.*) in the management of the corn supply at Ostia.

During all his life Scaurus was a firm adherent of the moderate aristocratical party, which frequently involved him in quarrels with the representatives of the people and the extremists on his own side. Though not a great orator, his speeches were weighty and impressive. His wife was Caecilia Metella, who after his death married the dictator Sulla. His daughter Aemilia was the wife of Manius Acilius Glabrio, and subsequently of Pompey, the triumvir.

See Sallust, *Jugurtha*; Orelli's *Onomasticon Tullianum*; Asconius, *In Scaurum*; Aurelius Victor, *De viris illustribus*, 72; A. H. J. Greenidge, *Hist. of Rome*, i. 296; and M. G. Bloch, *Mélanges d'histoire ancienne*, i. (1909).

MARCUS AEMILIUS SCAURUS, his son, served during the third Mithradatic War (74–61 B.C.) as quaestor to Pompey, by whom he was sent to Judaea to settle the quarrel between Hyrcanus and Aristobulus. Scaurus decided in favour of the latter, who was able to offer more money. On his arrival in Syria, Pompey reversed the decision, but, ignoring the charge of bribery brought against Scaurus, left him in command of the district. An incidental campaign against Aretas, king of the Nabataeans, was ended by the payment of 300 talents by Aretas to secure his possessions. This agreement is represented on coins of Scaurus—Aretas kneeling by the side of a camel, and holding out an olive branch in an attitude of supplication. As curule aedile in 58, Scaurus celebrated the public games on a scale of magnificence never seen before. Animals, hitherto unknown to the Romans, were exhibited in the circus, and an artificial lake (*euripus*) was made for the reception of crocodiles and hippopotamuses. One of the greatest curiosities was a huge skeleton brought from Joppa, said to be that of the monster to which Andromeda had been exposed. A wooden theatre was erected for the occasion, capable of holding 80,000 spectators. In 56 Scaurus was praetor, and in the following year governor of Sardinia. On his return to Rome (54) he was accused of extortion in his province. Cicero and five others (amongst them the famous Q. Hortensius) undertook his defence, and, although there was no doubt of his guilt, he was acquitted. During the same year, however (according to some, two years later, under Pompey's new law), Scaurus was condemned on a charge of illegal practices when a candidate for the consulship. He went into exile, and nothing further is heard of him.

See Josephus, *Antiq.* xiv. 3-5, *Bell. Jud.* i. 7; Appian, *Syr.* 51, *Bell. civ.* ii. 24; Pliny, *Nat. Hist.* xxxvi. 24; Cicero, *Pro Sestio*, 54, fragments of *Pro Scauro*, numerous references in the *Letters*; Asconius, *Argumentum in Scaurum.* See also, for both the above, AEMILIUS (Nos. 140, 141) in Pauly-Wissowa's *Realencyclopädie der classischen Altertumswissenschaft*, i. pt. 1. (1894), and Smith's *Dictionary of Greek and Roman Biography*, *s.v.* SCAURUS.

SCAURUS, QUINTUS TERENTIUS, Latin grammarian, flourished during the reign of Hadrian (Aulus Gellius xi. 15). He was the author of an *ars grammatica* and commentaries on Plautus, Virgil's *Aeneid* and probably Horace. Under his name two fragments are extant—the longer from his work on orthography (*De orthographia*), the shorter (chiefly on the use of prepositions) from another grammatical work.

SCAVENGER, now one who cleans the streets, removes refuse, generally a workman employed by the local public health authority (see PUBLIC HEALTH). The name is properly "scavager" or "scaveger" (the *n* being intrusive as in "passenger" and "messenger"), an official who was concerned with the receipt of custom duties and the inspection (*scavage*) of imported goods. The "scavagers" are found with such officials of the City of London as aleconners, beadles, &c., in the *Liber Albus* (*Munimenta Gildhallae Londoniensis*, ed. Riley). These officials seem to have been charged also with the cleaning of the streets, and the name superseded the older *rakyer* for those who performed this duty. Skeat takes "scavage" to be a Low French corruption of "showage," spelled variously as *schewage*, *scevage*, &c., and, therefore, to be derived from "show," to exhibit for inspection.

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[1] The view that he was consul again in 108 is disproved by Bloch (see bibliog.).

SCAVENGER'S DAUGHTER (corruption of Skevington's or Skeffington's Daughter), an instrument of torture in use during the 16th century in England. It was invented by Sir W. Skevington, lieutenant of the Tower in the reign of Henry VIII. It consisted of a wide iron hoop which by means of screws was tightened round the victim's body until the blood was forced from the nose and ears, and sometimes even from the hands and feet.

SCENE (Fr. *scène*, Lat. *scaena*, Gr. *σκηνή*, a tent or booth, a stage or scene), a word of which the various applications, figurative or otherwise, are derived from its original meaning of the stage or platform in the Greek or Roman theatre together with the structure that formed the background. Thus "scene" was formerly used, as "stage" is to-day, of the actor's profession or of dramatic art; and of the actual performance or representation on the stage, still surviving in such phrases as "the scene opens" or "closes." It is also applied, actually and figuratively, to the place where the action of a play or any series of events take place, and so of any episode or situation in a novel or other narrative or description of events; from this the transition to an excited or violent exhibition of feeling between two or more persons is easy.

Of the specific applications of the word to the drama the main examples are (1) to a division of the play, marked by the fall of the curtain, the "scene" being a subdivision of an "act," where the play is thus divided, or where there are no acts, of the divisions themselves; (2) to the material which forms the view of the place where the action is supposed to occur, that is, the painted cloths, slides and other apparatus, known as the "scenery," a word which has thus been transferred to a view generally, the appearance of the feature of a natural landscape. Allied words are "scena," used only in music, of a composition consisting mainly of recitative with accompaniment, forming part of an opera or as an individual composition; and "scenario," a full outline of a play or opera, giving details of the acts, scenes, actors, situations, stage-business, &c.

SCENT, an odour or smell, particularly a fragrant liquid distilled from flowers, &c., used as a perfume (see PERFUMERY). The word should be properly spelled "sent," and is derived from the Mid. Eng. verb *senten*, to scent, to perceive by the sense of smell, Fr. *sentir*, Lat. *sentire*, perceive by the senses. The intrusive *c* appears in the 17th century, and is paralleled by the same in "scythe" for *sythe*. For the physical causes of the sensation caused by a scent see SMELL, and for the anatomy of the organs concerned see OLFACTORY SYSTEM.

SCEPTICISM (*σκέπτομαι*, I consider, reflect, hesitate, doubt), a term signifying etymologically a state of doubt or indecision in the face of mutually conflicting statements. It is implied, moreover, that this doubt is not merely a stage in the road to true knowledge, but rather the last result of investigation, the conclusion that truth or real knowledge is unattainable by man. Therefore, in general terms, scepticism may be summarily defined as a thorough-going impeachment of man's power to know—a denial of the possibility of objective knowledge.

Historical appearances.

Trust, not distrust, is the primitive attitude of the mind. 1. What is put before us, whether by the senses or by the statements of others, is instinctively accepted as a veracious report, till experience has proved the possibility of deception. In the history of philosophy affirmation precedes negation; dogmatism goes before scepticism. And this must be so, because the dogmatic systems are, as it were, the food of scepticism. Accordingly, we find that sceptical thought did not make its appearance till a succession of mutually inconsistent theories as to the nature of the real had suggested the possibility that they might all alike be false.

The Sophists.

The Sophistic epoch of Greek philosophy was, in great part, such a negative reaction against the self-confident assertion of the nature-philosophies of the preceding age. Though scepticism as a definite school may be said to date only from the time of Pyrrho (*q.v.*) of Elis, the main currents of Sophistic thought were sceptical in the wider sense of that term. The Sophists (*q.v.*) were the first in Greece to dissolve knowledge into individual and momentary opinion (Protagoras), or dialectically to deny the possibility of knowledge (Gorgias). In these two examples we see how the weapons forged by the dogmatic philosophers to assist in the establishment of their own theses are sceptically turned against philosophy in general. As every attempt to rationalize nature implies a certain process of criticism and interpretation to which the data of sense are subjected, and in which they are, as it were, transcended, the antithesis of reason and sense is formulated early in the history of speculation. The opposition, being taken as absolute, implies the impeachment of the veracity of the senses in the interest of the rational truth proclaimed by the philosophers in question. Among the pre-Socratic nature-philosophers of Greece, Heraclitus and the Eleatics are the chief representatives of this polemic. The diametrical opposition of the grounds on which the veracity of the senses is impugned by the two philosophies (see HERACLITUS, PARMENIDES, ELEATIC SCHOOL) was in itself suggestive of sceptical reflection. Moreover, the arguments by which Heraclitus supported this theory of the universal flux are employed by Protagoras to undermine the possibility of objective truth, by dissolving all knowledge into the momentary sensation or persuasion of the individual. The idea of an objective flux, or law of change constituting the reality of things, is abandoned, and subjective points of sense alone remain—which is tantamount to eliminating the real from human knowledge.

Still more unequivocal was the sceptical nihilism expressed by Gorgias (*q.v.*):—(1) nothing exists; (2) if anything existed, it would be unknowable; (3) if anything existed and were knowable, the knowledge of it could not be communicated. His arguments were drawn from the dialectic which the Eleatics had directed against the existence of the phenomenal world. But they are no longer used as indirect proofs of a universe of pure and unitary Being. The prominence given by most of the Sophists to rhetoric, their cultivation of a subjective readiness as the essential equipment for life, their substitution of persuasion for conviction, all mark the sceptical undertone of their teaching. This attitude of indifference to real knowledge passed in the younger and less reputable generation into a corroding moral scepticism which recognized no good but pleasure and no right but might.

Socrates.

The scientific impulse communicated by Socrates was sufficient to drive scepticism into the background during the great age of Greek philosophy (*i.e.* the hundred years preceding Aristotle's death, 323 B.C.). The captious logic of the Megarian school (*q.v.*) was indeed in some cases closely related to sceptical results. The school has been considered with some truth to form a connecting link with the later scepticism, just as the contemporary Cynicism and Cyrenaicism may be held to be imperfect preludes to Stoicism and Epicureanism. The extreme nominalism of some of the Cynics also, who denied the possibility of any but identical judgments, must be similarly regarded as a solvent of knowledge. But with these insignificant exceptions it holds true that, after the sceptical wave marked by the Sophists, scepticism does not reappear till after the exhaustion of the Socratic impulse in Aristotle.

Pyrrho.

Scepticism, as a distinct school, begins with Pyrrho of Elis, who maintained that knowledge of things is impossible and that we must assume an attitude of reserve (*ἐποχή*). The Pyrrhonists were consistent enough to extend their doubt even to their own principle of doubt. They thus attempted to make their scepticism universal, and to escape the reproach of basing it upon a fresh dogmatism. Mental imperturbability (*ἀταραξία*) was the result to be attained by cultivating such a frame of mind. The happiness or satisfaction of the individual was the end which dominated this scepticism as well as the contemporary systems of Stoicism and Epicureanism, and all three philosophies place it in tranquillity or self-centred indifference. It is men's opinions or unwarranted judgments about things, say the sceptics, which betray them into desire, and painful effort and disappointment. From all this a man is delivered who abstains from judging one state to be preferable to another. But, as complete inactivity would have been synonymous with death, it appears to have been admitted that the sceptic, while retaining his consciousness of the complete uncertainty enveloping every step, might follow custom in the ordinary affairs of life.

The scepticism of the New Academy (more strictly of the Middle Academy, under Arcesilaus and Carneades) differed very little from that of the Pyrrhonists. The differences

The Academy.

asserted by later writers are not borne out on investigation. But the attitude maintained by the Academics was chiefly that of a negative criticism of the views of others, in particular of the somewhat crude and imperious dogmatism of the Stoics. They also, in the absence of certainty, allowed a large scope to probability as a motive to action, and defended their doctrine on this point with greater care and skill. The whole position was stated with more urbanity and culture, and was supported, by Carneades in particular, by argumentation at once more copious and more acute. It seems also true that the Academics were less overborne than the Pyrrhonists by the practical issue of their doubts (imperturbability); their interest was more purely intellectual, and they had something of the old delight in mental exercitation for its own sake (see ARCESILAUS, CARNEADES, AENESIDEMUS, AGRIPPA and SEXTUS EMPIRICUS).

Ancient and modern scepticism.

Both Zeller and Hegel remark upon the difference between the calm of ancient scepticism and the perturbed state of mind evinced by many modern sceptics. Universal doubt was the instrument which the sceptics of antiquity recommended for the attainment of complete peace of mind. By the moderns, on the other hand, doubt is portrayed, for the most part, as a state of unrest and painful yearning. Even Hume, in various passages of his *Treatise*, speaks of himself as recovering cheerfulness and mental tone only by forgetfulness of his own arguments. His state of universal doubt he describes as a "malady" or as "philosophical melancholy and delirium." The difference might easily be interpreted either as a sign of sentimental weakness on the part of the moderns or as a proof of the limitation of the ancient sceptics which rendered them more easily satisfied in the absence of truth. It seems to prove, at all events, that the ancient sceptics were more thoroughly convinced than their modern successors of the reasonableness of their own attitude.

It may be doubted whether the thoroughgoing philosophical scepticism of antiquity has any exact parallel in modern times, with the single exception possibly of Hume's *Treatise on Human Nature*. It is true we find many thinkers who deny the competency of reason when it ventures in any way beyond the sphere of experience, and such men are not unfrequently called sceptics. This is the sense in which Kant often uses the term, and the usage is adopted by others—for example, in the following definition from Ueberweg's *History of Philosophy*: "The principle of scepticism is universal doubt, or at least doubt with regard to the validity of all judgments respecting that which lies beyond the range of experience." The last characteristic, however, is not enough to constitute scepticism, in the ancient sense. Scepticism, to be complete, must hold that even within experience we do not rationally conclude but are irrationally induced to believe. "In all the incidents of life," as Hume puts it, "we ought still to preserve our scepticism.' If we believe that fire warms, or water refreshes, 'tis only because it costs us too much pains to think otherwise" (*Treatise*, bk. i. iv. 7). This tone, which fairly represents the attitude of ancient sceptics, is rare among the moderns, at least among those who are professed philosophers. It is more easily matched in the unsystematic utterances of a man of the world like Montaigne.

Scepticism in the interest of faith.

2. One form of scepticism, however, may be claimed as an exclusively modern growth, namely, philosophical scepticism in the interests of theological faith. These sceptics are primarily Apologists. Their scepticism is simply a means to the attainment of a further end. They find that the dogmas of their church have often been attacked in the name of reason, and it may be that some of the objections urged have proved hard to rebut. Accordingly, in an access of pious rage, as it were, they turn upon reason to rend her. They endeavour to show that she is in contradiction with herself, even on matters non-theological. Thus the "imbecility" of reason becomes their warrant for the reception by another organ—*i.e.* faith—of that to which reason had raised objections. The Greeks had no temptation to divide man in two in this fashion. Their scepticism was an end in itself. But this line of argument was latent in Christian thought from the time when St Paul spoke of the "foolishness" of preaching. So Tertullian: "Crucifixus est Dei filius; non pudet, quia pudendum est. Et mortuus est Dei filius; prorsus credibile est, quia ineptum est. Et sepultus resurrexit; certum est, quia impossibile est." But, as Christianity became firmly established, Christian writers[1] became more tolerant of speculation, and laboured to reduce the doctrines of the church to a rational system. This was the long task essayed by Scholasticism; and, though the great Schoolmen of the 13th century refrained from attempting to rationalize such doctrines as the Trinity and the Incarnation, they were far from considering them as essentially opposed to reason. It was not till towards the close of the middle ages that a sense of conflict between reason and revelation became widely prevalent and took shape in the essentially sceptical theory of the twofold nature of truth. Philosophical truth, as deduced from the teaching of Aristotle, it was said, directly contradicts the teaching of the church, which determines truth in theology; but the contradiction leaves the authority of the latter unimpaired in its own sphere. It is difficult to believe that this doctrine was ever put forward sincerely; in the most of those who professed it, it was certainly no more than a veil by which they sought to cover their heterodoxy and evade its consequences. Rightly divining as much, the church condemned the doctrine as early as 1276. Nevertheless, it was openly professed during the period of the break up of Scholastic Aristotelianism (see POMPONAZZI).

Theory of the twofold nature of truth.

Pascal.

The typical and by far the greatest example of the Christian sceptic is Pascal (1623–1662). The form of the *Pensées* forbids the attempt to evolve from their detached utterances a completely coherent system. For, though he declares at times "Le pyrrhonisme est le vrai," "Se moquer de la philosophie c'est vraiment philosopher," or, again, "Humiliez-vous, raison impuissante, taisez-vous, nature imbécile," other passages might be quoted in which he assumes the validity of reason within its own sphere. But what he everywhere emphatically denies is the possibility of reaching by the unassisted reason a satisfactory theory of things. Man is a hopeless enigma to himself, till he sees himself in the light of revelation as a fallen creature. The fall alone explains at once the nobleness and the meanness of humanity; Jesus Christ is the only solution in which the baffled reason can rest. These are the two points on which Pascal's thought turns. Far from being able to sit in judgment upon the mysteries of the faith, reason is unable to solve its own contradictions without aid from a higher source. In a somewhat similar fashion, Lamennais (in the first stage of his speculations, represented by the *Essai sur l'indifférence en matière religieuse*, 1817–1821) endeavoured to destroy all rational certitude in order to establish the principle of authority; and the same profound distrust of the power of the natural reason to arrive at truth is exemplified (though the allegation has been denied by the author) in Cardinal Newman. In a different direction and on a larger scale, Hamilton's philosophy of the conditioned may be quoted as an example of the same religious scepticism (see HAMILTON, SIR WILLIAM). The theological application and development of Hamilton's arguments in Mansel's Bampton Lectures *On the Limits of Religious Thought* marked a still more determined attack, in the interests of theology, upon the competency of reason.

Sceptics in 16th and 17th centuries.

Passing from this particular vein of sceptical or semi-sceptical thought, we find, as we should expect, that the downfall of Scholasticism, and the conflict of philosophical theories and religious confessions which ensued, gave a decided impetus to sceptical reflection. One of the earliest instances of this spirit is afforded by the book of Agrippa of Nettesheim (1487–1535), *De incertitudine et vanitate scientiarum*,

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[1] This turn of thought is not confined, however, to Christian thinkers; it appears also in the Arabian philosophy of the East. Ghazālī (*q.v.*) in his *Tahāfot al-Filāsifa* ("The Collapse of the Philosophers") is the advocate of complete philosophical scepticism in the interests of orthodox Mahommedanism—an orthodoxy which passed, however, in his own case into a species of mysticism. He did his work of destruction so thoroughly that Arabian philosophy died out after his time in the land of its birth.

Sceptical reflection rather than systematic scepticism is what meets us in Michel de Montaigne (1533–1592), though the elaborate presentation of sceptical and relativistic arguments in his "Apologie de Raimond-Sebond" (*Essais*, ii. 12), and the emblem he recommends—a balance with the legend, "Que scay-je ?"—might allowably be adduced as evidence of a more thoroughgoing Pyrrhonism. In his "tesmoynages de nostre imbécillité" he follows in the main the lines of the ancients, and he sums up with a lucid statement of the two great arguments in which the sceptical thought of every age resumes itself—the impossibility of verifying our faculties, and the relativity of all impressions. In the concluding lines of this essay, Montaigne seems to turn to "nostre foy chrestienne" as man's only succour from his native state of helplessness and uncertainty. But undoubtedly his own habitual frame of mind is better represented in his celebrated saying—"How soft and healthful a pillow are ignorance and incuriousness. . . for a well-ordered head." More inclined than Montaigne to give a religious turn to his reflections was his friend Pierre Charron (1541–1603), who in his book *De la sagesse* systematized in somewhat scholastic fashion the train of thought which we find in the *Essais*. François Sanchez (1562–1632), professor of medicine and philosophy in Toulouse, combated the Aristotelianism of the schools with much bitterness, and was the author of a book with the title *Quod nihil scitur*. Of more or less isolated thinkers may be mentioned François de la Mothe le Vayer (1588–1672), whose *Cinq Dialogues* appeared after his death under the pseudonym of Orosius Tubero; Samuel Sorbière (1615–1670), who translated the *Hypotyposes Pyrrhoneae* of Sextus Empiricus; Simon Foucher (1644–1696), canon of Dijon, who wrote a *History of the Academics*, and combated Descartes and Malebranche from a sceptical standpoint. The work of Hieronymus Hirnhaim of Prague (1637–1679), *De typho generis humani sive scientiarum humanarum inani ac ventoso tumore*, was written in the interests of revelation. This is still more the case with the bitter polemic of Daniel Huet (1630–1721), *Censura philosophiae Cartesianae*, and his later work, *Traité philosophique de la faiblesse de l'esprit humain*. The scepticism of Joseph Glanvill (*q.v.*), which is set forth in his two works *The Vanity of Dogmatizing* (1661) and *Scepsis scientifica* (1665), has more interest for Englishmen. More celebrated than any of the above was Pierre Bayle (1647–1706), whose scepticism lay more in his keen negative criticism of all systems and doctrines which came before him as literary historian than in any theoretic views of his own as to the possibility of knowledge. Bayle also paraded the opposition between reason and revelation; but the argument in his hands is a double-edged weapon, and when he extols the merits of submissive faith his sincerity is at least questionable.

Hume.

3. Hume is the most illustrious and indeed the typical sceptic of modern times. His scepticism is sometimes placed, as we have seen it is by Kant, in his distrust of our ability and right to pass beyond the empirical sphere. But it is essential to the sceptical position that reason be dethroned within experience as well as beyond it, and this is undoubtedly the result at which Hume finally arrives. The *Treatise* is a *reductio ad absurdum* of the principles of Lockianism, inasmuch as these principles, when consistently applied, leave the structure of experience entirely "loosened" (to use Hume's own expression), or cemented together only by the irrational force of custom. Hume's scepticism thus really arises from his thoroughgoing empiricism. Starting with "particular perceptions" or isolated ideas let in by the senses, he never advances beyond these "distinct existences." Each of them exists on its own account; it is what it is, but it contains no reference to anything beyond itself. The very notion of objectivity and truth therefore disappears. Hume's analysis of the conceptions of a permanent world and a permanent self reduces us to the sensationalistic relativism of Protagoras. He expressly puts this forward in various passages as the conclusion to which reason conducts us. The fact that the conclusion is in "direct and total opposition" to the apparent testimony of the senses is a fresh justification of philosophical scepticism. For, indeed, scepticism with regard to the senses is considered in the *Inquiry* to be sufficiently justified by the fact that they lead us to suppose "an external universe which depends not on our perception," whereas "this universal and primary opinion of all men is soon destroyed by the slightest philosophy." Scepticism with regard to reason, on the other hand, depends on an insight into the irrational character of the relation which we chiefly employ, viz. that of cause and effect. It is not a real relation in objects, but rather a mental habit of belief engendered by frequent repetititon or custom. This point of view is applied in the *Treatise* universally. All real connexion or relation, therefore, and with it all possibility of an objective system, disappears; it is, in fact, excluded by Hume *ab initio*, for "the mind never perceives any real connexion among distinct existences." Belief, however, just because it rests, as has been said, on custom and the influence of the imagination, survives such demonstrations. "Nature," as Hume delights to reiterate, "is always too strong for principle." "Nature, by an absolute and uncontrollable necessity, has determined us to judge as well as to breathe and feel." The true philosopher, therefore, is not the Pyrrhonist, trying to maintain an impossible equilibrium or suspense of judgment, but the Academic, yielding gracefully to the impressions or maxims which he finds, as matter of fact, to have most sway over himself.[1]

Sceptical side of Kantianism.

The system of Kant, or rather that part of his system expounded in the *Critique of Pure Reason*, though expressly distinguished by its author from scepticism, has been included by many writers in their survey of sceptical theories. The difference between Kant, with his system of pure reason, and any of the thinkers we have passed in review is obvious; and his limitation of reason to the sphere of experience suggests in itself the title of agnostic or positivist rather than that of sceptic. Yet, if we go a little deeper, there is substantial justification for the view which treats agnosticism of the Kantian type as essentially sceptical in its foundations and in its results. For criticism not only limits our knowledge to a certain sphere, but denies that our knowledge within that sphere is real; we never know things as they actually are, but only as they appear to us. But this doctrine of relativity really involves a condemnation of our knowledge (and of all knowledge), because it fails to realize an impossible and self-contradictory ideal. The man who impeaches the knowing faculties because of the fact of relation which they involve is pursuing the phantom of an apprehension which, as Lotze expresses it, does not apprehend things, but is itself things; he is desiring not to know but to *be* the things themselves. If this dream or prejudice be exploded, then the scepticism originating in it—and a large proportion of recent sceptical thought does so originate—loses its *raison d'être*.[2] The prejudice, however, which meets us in Kant is, in a somewhat different form, the same prejudice which is found in the tropes of antiquity—what Lotze calls the "inadmissible relation of the world of ideas to a foreign world of objects." For, as he rightly points out, whether we suppose idealism or realism to be true, in neither case do the things themselves pass into our knowledge. No standpoint is possible from which we could compare the world of knowledge with such an independent world of things, in order to judge of the conformity of the one to the other. But the abstract doubt "whether after all things may not be quite other in themselves than that which by the laws of our thought they necessarily appear" is a scepticism which, though admittedly irrefutable, is as certainly groundless. No arguments can be brought against it, simply because the scepticism rests on nothing more than the empty possibility of doubting. This holds true, even if we admit the "independent" existence of such a world of things. But the independence of things may with much greater reason be regarded as itself a fiction or prejudice. The real "objective" to which our thoughts must show conformity is not a world of things in themselves, but the system of things as it exists for a perfect intelligence. Scepticism is deprived of its persistent argument if it is seen that, while our individual experiences are to be judged by their coherence with the context of experience in general, experience as a whole does not admit of being judged by reference to anything beyond itself.

Prejudices on which scepticism rests.

To the attack upon the possibility of demonstration, inasmuch as every proof requires itself a fresh proof, it may quite fairly be retorted that the contradiction really lies in the demand for proof of the self-evident, on which all proof must ultimately depend. It is of course always possible that in any particular case we may be deceived; we may be assuming as self-evidently true what is in reality not so. But such incidental lapses are found to correct themselves by the consequences in which they involve us, and they have no power to shake our trust in the general validity of reason. It may, however, be granted that the possibility of lapse throws us open to the objections, ingenuous or disingenuous, of the sceptic; and we must remain exposed to them so long as we deal with our first principles as so many isolated axioms or intuitions. But the process of self-correction referred to points to another proof—the only ultimately satisfactory proof of which first principles admit. Their evidence lies in their mutual interdependence and in the coherence of the system which they jointly constitute.

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[1] Much the same conclusion is reached in what is perhaps the ablest English exposition of pure philosophic scepticism since Hume—A. J. Balfour's *Defence of Philosophic Doubt* (1879).

[2] It may be as well to add that the sceptical side of Kantianism is mainly confined to the *Critique of Pure Reason*, but this side of Kantian thought has been most widely influential. The remarks made above would not apply to the coherent system of idealism which may be evolved from Kant's writings, and which many would consider alone to deserve the name of Kantianism or Criticism.

Function of scepticism.

Of a scepticism which professes to doubt the validity of every reasoning process and every operation of all our faculties it is, of course, as impossible as it would be absurd to offer any refutation. This absolute scepticism, indeed, can hardly be regarded as more than empty words; the position which they would indicate is not one which has ever existed. In any case, such scepticism is at all times sufficiently refuted by the imperishable and justifiable trust of reason in itself. The real function of scepticism in the history of philosophy is relative to the dogmatism which it criticizes. And, as a matter of fact, it has been seen that many so-called sceptics were rather critics of the effete systems which they found cumbering the ground than actual doubters of the possibility of knowledge in general. And even when a thinker puts forward his doubt as absolute it does not follow that his successors are bound to regard it in the same light. The progress of thought may show it to be, in truth, relative, as when the nerve of Hume's scepticism is shown to be his thoroughgoing empiricism, or when the scepticism of the *Critique of Pure Reason* is traced to the unwarrantable assumption of things-in-themselves. When the assumptions on which it rests are proved to be baseless, the particular scepticism is also overcome. In like manner, the apparent antinomies on which such a scepticism builds will be found to resolve themselves for a system based on a deeper insight into the nature of things. The serious thinker will always repeat the words of Kant that, in itself, scepticism is "not a permanent resting-place for human reason." Its justification is relative, and its function transitional.

AUTHORITIES.—Ancient scepticism is fully treated in the relative parts of Zeller's *Philosophie der Griechen*. See also works quoted in the biographical articles; Brochard, *Les Sceptiques grecs* (1887); Ed. Caird, *Evolution of Theology in the Greek Philosophers* (1904); Norman MacColl, *Greek Sceptics from Pyrrho to Sextus* (1869); Haas, *De philosophorum scepticorum successionibus* (1875). Among other works may be mentioned Stäudlin, *Geschichte und Geist d. Scepticismus, vorzüglich in Rücksicht auf Moral u. Religion* (1794); Tafel, *Geschichte d. Scepticismus* (1834); E. Saisset, *Le Scepticisme: Ænésidème, Pascal, Kant* (1875). For a modern view see A. J. Balfour, *Defence of Philosophic Doubt* (1879). All histories of philosophy deal with scepticism, and general accounts will be found in J. M. Robertson's *Short History of Free Thought* and A. W Benn's *History of Modern Rationalism*. See also AGNOSTICISM, RATIONALISM. (A. S. P.-P.; X.)

SCEPTRE. A rod or staff has always been regarded as a token of authority. Among the early Greeks the sceptre (σκῆπτρον) was a long staff used by aged men (*Il.* xviii. 416, Herod. i. 196), and came to be used by judges, military leaders, priests and others. It is represented on painted vases as a long staff tipped with a metal ornament, and is borne by some of the gods. Among the Etruscans sceptres of great magnificence were used by kings and upper orders of the priesthood, and many representations of such sceptres occur on the walls of the painted tombs of Etruria. The British Museum, the Vatican and the Louvre possess Etruscan sceptres of gold, most elaborately and minutely ornamented. The Roman sceptre was probably derived from the Etruscan. Under the Republic an ivory sceptre (*sceptrum eburneum*) was a mark of consular rank It was also used by victorious generals who received the title of *imperator*, and it may be said to survive in the marshal's baton. Under the empire the *sceptrum Augusti* was specially used by the emperors, and was often of ivory tipped with a golden eagle. It is frequently shown on medallions of the later empire, which have on the obverse a half-length figure of the emperor, holding in one hand the *sceptrum Augusti*, and in the other the orb surmounted by a small figure of Victory.

With the advent of Christianity the sceptre was often tipped with a cross instead of the eagle, but during the middle ages the finials on the top of the sceptre varied considerably. In England from a very early period two sceptres have been concurrently used, and from the time of Richard I. they have been distinguished as being tipped with a cross and a dove respectively. In France the royal sceptre was tipped with a fleur de lys, and the other, known as the *main de justice*, had an open hand of benediction on the top. Sceptres with small shrines on the top are sometimes represented on royal seals, as on the great seal of Edward III., where the king, enthroned, bears such a sceptre, but it was an unusual form; and it is of interest to note that one of the sceptres of Scotland, preserved at Edinburgh, has such a shrine at the top, with little images of Our Lady, St Andrew and St James in it. This sceptre was, it is believed, made in France about 1536, for James V. Great seals usually represent the sovereign enthroned, holding a sceptre (often the second in dignity) in the right hand, and the orb and cross in the left. Harold is so depicted on the Bayeux tapestry.

The earliest coronation form of the 9th century mentions a sceptre (*sceptrum*), and a staff (*baculum*). In the so-called coronation form of Ethelred II. a sceptre (*sceptrum*), and a rod (*virga*) are named, and this is also the case with a coronation order of the 12th century. In a contemporary account of Richard I.'s coronation the royal sceptre of gold with a gold cross, and the gold rod (*virga*) with a gold dove on the top, are mentioned for the first time. About 1450 Sporley, a monk of Westminster, compiled a list of the relics there. These included the articles used at the coronation of St Edward the Confessor, and left by him for the coronations of his successors. A golden sceptre, a wooden rod gilt and an iron rod are named. These survived till the Commonwealth, and are minutely described in an inventory of the whole of the regalia drawn up in 1649, when everything was destroyed.

For the coronation of Charles II. new sceptres were made, and though slightly altered, are still in use. They are a sceptre with a cross called St Edward's sceptre, a sceptre with a dove, and a long sceptre or staff with a cross of gold on the top called St Edward's staff. To these, two sceptres for the queen, one with a cross, and the other with a dove, have been subsequently added.

See Cyril Davenport, *The English Regalia*; Leopold Wickham-Legg, *English Coronation Records*; *The Ancestor*, Nos. 1 and 2 (1902); Menin, *The Form, &c., of Coronations* (English translation, 1727).

SCÈVE, MAURICE (*c.* 1500–1564), French poet, was born at Lyons, where his father practised law. Besides following his father's profession he was a painter, architect, musician and poet. He was the centre of the Lyonnese coterie that elaborated the theory of spiritual love, derived partly from Plato and partly from Petrarch, which was enunciated in Antoine Heroet's *Parfaicte Amye*.

Scève's chief works are *Délie, objet de plus haulte vertu* (1544); two eclogues, *Arion* (1536) and *La Saulsaye* (1547); and *Le Microcosme* (1562), an encyclopaedic poem beginning with the fall of man. *Délie* consists of 450 *dizaines* and about 50 other poems in praise of his mistress. These poems, now little read, were even in Scève's own day so obscure that his enthusiastic admirer Étienne Dolet confesses he could not understand them. Scève was a musician as well as a poet, and cared very much for the musical value of the words he used. In this and in his erudition he forms a link between the school of Marot and the Pléiade *Délie* (an anagram for *l'idée*) set the fashion of a series of poems addressed to a mistress real or imaginary, followed by Ronsard in *Cassandre* and by Du Bellay in *Olive*. The Lyonnese school of which Scève was the leader included his friend Claude de Taillemont and many women writers of verse, Jeanne Gaillarde—placed by Marot on an equality with Christine de Pisan—Pernette du Guillet, Clémence de Bourges and the poet's sisters, Claudine and Sibylle Scève. Scève died in 1564. See also LABÉ, LOUISE).

See E. Bourciez, *La Littérature polie et les mœurs de cour sous Henri II* (Paris, 1886); Pernetti, *Recherches pour servir à l'histoire de Lyon* (2 vols., Lyons, 1757), and F. Brunetière, "Un Précurseur de la Pléïade, Maurice Scève," in his *Études critiques*, vol. vi. (1899).

SCHACK, ADOLF FRIEDRICH, GRAF VON (1815–1894), German poet and historian of literature, was born at Brüsewitz near Schwerin on the 2nd of August 1815. Having studied jurisprudence (1834–1838) at the universities of Bonn, Heidelberg and Berlin, he entered the Mecklenburg State service and was subsequently attached to the "Kammergericht" in Berlin. Tiring of official work, he resigned his appointment, and after travelling in Italy, Egypt and Spain, was attached to the court of the grand duke of Oldenburg, whom he accompanied on a journey to the East. On his return he entered the Oldenburg government service, and in 1849 was sent as envoy to Berlin. In 1852 he retired from his diplomatic post, resided for a while on his estates in Mecklenburg and then travelled in Spain, where he studied Moorish history. In 1855, he settled at Munich, where he was made member of the academy of sciences, and here collected a splendid gallery of pictures, containing masterpieces of Genelli, Feuerbach, Schwind, Böcklin, Lenbach, &c., and which, though bequeathed by him to the Emperor William II., still remains at Munich and is one of the noted galleries in that city. He died at Rome on the 14th of April 1894.

Schack was a most productive author; he wrote lyric poems (*Gedichte*, 1867, 6th ed. 1888); novels in verse, *Durch alle Wetter* (1870, 3rd ed. 1875) and *Ebenbürtig* (1876); the dramatic poem *Helidor* (1878); the tragedies *Die Pisaner* (1872) and *Walpurga* and *Der Johanniter* (1887); and the political comedies, *Der Kaiserbote* and *Cancan* (1873). As an historian of literature and art, he published *Geschichte der dramatischen Literatur und Kunst in Spanien* (3 vols. 1845–1846, 2nd ed. 1854), *Poesie und Kunst der Araber in Spanien und Sicilien* (1865, 2nd ed. 1877), which are valuable contributions to literary history. He also produced some excellent translations, *e.g. Spanisches Theater* (1845); *Heldensagen des Firdusi* (1851) and *Stimmen vom Ganges* (1857, 2nd ed. 1877). He also compiled the catalogue and history of his own picture gallery, *Meine Gemäldesammlung* (7th ed., 1894). His collected works, *Gesammelte Werke*, were published in six volumes (1883, 3rd ed. in 10 vols. 1897–1899). *Nachgelassene Dichtungen* were edited by G. Winkler (1896). See his autobiography, *Ein halbes Jahrhundert, Erinnerungen und Aufzeichnungen* (3 vols. 1887, 3rd ed. 1894). Cf. further the accounts of Schack by F. W. Rogge (1883), E. Zabel (1885), E. Brenning (1885), W. J. Mannsen (from the Dutch, 1889), and also L. Berg, *Zwischen zwei Jahrhunderten* (1896).

SCHADOW, a distinguished name in the annals of German art.

I. JOHANN GOTTFRIED SCHADOW (1764–1850), sculptor, was born and died in Berlin, where his father was a poor tailor. His first teacher was an inferior sculptor, Tassaert, patronized by Frederick the Great; the master offered his daughter in marriage, but the pupil preferred to elope with a girl to Vienna, and the father-in-law not only condoned the offence but furnished money wherewith to visit Italy. Three years' study in Rome formed his style, and in 1788 he returned to Berlin to succeed Tassaert as sculptor to the court and secretary to the Academy. Over half a century he produced upwards of two hundred works, varied in style as in subjects.

Among his ambitious efforts are Frederick the Great in Stettin, Blücher in Rostock and Luther in Wittenberg. His portrait statues include Frederick the Great playing the flute, and the crown-princess Louise and her sister. His busts, which reach a total of more than one hundred, comprise seventeen colossal heads in the Walhalla, Ratisbon; from the life were modelled Goethe, Wieland and Fichte. Of church monuments and memorial works thirty are enumerated; yet Schadow hardly ranks among Christian sculptors. He is claimed by classicists and idealists: the quadriga on the Brandenburger Thor and the allegorical frieze on the façade of the Royal Mint, both in Berlin, are judged among the happiest studies from the antique. Schadow, as director of the Berlin Academy, had great influence. He wrote on the proportions of the human figure, on national physiognomy, &c.; and many volumes by himself and others describe and illustrate his method and his work.

II. His eldest son, RUDOLPH SCHADOW (1786–1822), sculptor, was born in Rome, and had his father at Berlin for his first master. In 1810 he went to Rome and received kindly help from Canova and Thorvaldsen. His talents were versatile; his first independent work was a figure of Paris, and it had for its companion a spinning girl.

Embracing the Roman Catholic faith, he produced statues of John the Baptist and of the Virgin and Child. In England he became known by bas-reliefs executed for the duke of Devonshire and for the marquis of Lansdowne. His last composition, commissioned by the king of Prussia, was a colossal group, Achilles with the Body of Penthesilea; the model, universally admired for its antique character and the largeness of its style, had not been carried out in marble when in 1822 the artist died in Rome.

III. FRIEDRICH WILHELM SCHADOW (1789–1862), painter, was the second son of Johann Gottfried Schadow. In 1806–1807 he served as a soldier; in 1810 he went with his elder brother Rudolph to Rome. He became one of the leaders among the German pre-Raphaelites. Following the example of Overbeck and others, he joined the Roman Catholic Church, and held that an artist must believe and live out the truths he essays to paint. The sequel showed that Schadow was qualified to shine less as a painter than as a teacher and director.

The Prussian consul, General Bartholdi, befriended his young compatriots by giving them a commission to decorate with frescoes a room in his house on the Pincian Hill. The artists engaged were Schadow, Cornelius, Overbeck and Veit; the subject selected was the story of Joseph and his brethren, and two scenes, the Bloody Coat and Joseph in Prison, fell to the lot of Schadow. Schadow was in 1819 appointed professor in the Berlin Academy, and his ability and thorough training gained devoted disciples. To this period belong his pictures for churches. In 1826 the professor was made director of the Düsseldorf Academy. The high and sacred art matured in Rome Schadow transplanted to Düsseldorf; he reorganized the Academy, which in a few years grew famous as a centre of Christian art to which pupils flocked from all sides. In 1837 the director selected, at request, those of his scholars best qualified to decorate the chapel of St Apollinaris on the Rhine with frescoes, which when finished were accepted as the fullest and purest manifestation of the Düsseldorf school on its spiritual side. To 1842 belong the "Wise and Foolish Virgins," in the Städel Institute, Frankfort; this large and important picture is carefully considered and wrought, but lacks power. Schadow's fame indeed rests less on his own creations than on the school he formed. In Düsseldorf a reaction set in against the spiritual and sacerdotal style he had established; and in 1859 the party of naturalism, after a severe struggle, drove the director from his chair. Schadow died at Düsseldorf in 1862, and a monument in the platz which bears his name was raised at the jubilee held to commemorate his directorate. (J. B. A.)

SCHAFARIK (Czech, *Šafařík*), **PAVEL JOSEF** (1795–1861), Slavonic philologist, was born of Slovak parents at Kobeljarova, a village of northern Hungary, where his father was a Protestant clergyman. His first production was a volume of poems in Czech entitled *The Muse of Tatra with a Slavonic Lyre* (Levocza, 1814). In 1815 he began a course of study at the university of Jena, and while there translated into Czech the *Clouds* of Aristophanes and the *Maria Stuart* of Schiller. In 1817 he removed to Prague and joined the literary circle of which Dobrovsky, Jungmann and Hanka were members. From 1819 to 1833 he was head master of the high school at Neusatz in the south of Hungary. There he studied Servian literature and antiquities, acquired many rare books and manuscripts, and published a collection of Slovak folk-songs in collaboration with Kollar and others (1823–1827). In 1826 his *Geschichte der slawischen Sprache und Literatur nach allen Mundarten* appeared at Budapest (2nd ed., 1869). This book was the first attempt to give anything like a systematic account of the Slavonic languages as a whole. In 1833 he returned to Prague, where he spent the remainder of his life. There he published his *Serbische Lesekörner oder historisch-kritische Beleuchtung der Serbischen Mundart*, and in 1837 his great work *Slovanské Starožitnosti* ("Slavonic Antiquities"). The "Antiquities" have been translated into Polish, Russian and German; a second edition (1863) was edited by J. Jireček. In 1840 he published in conjunction with Palacký *Die ältesten Denkmäler der böhmischen Sprache*. In 1837 poverty compelled him to accept the uncongenial office of censor of Czech publications, which he abandoned in 1847 on becoming custodian of the Prague public library. In 1842 he published his *Slovanský Národopis*, in which he sought to give a complete account of Slavonic ethnology. He was also for some time conductor of the "Journal" of the Bohemian Museum, and edited the first volume of the *Vybor*, or selections from old Czech writers, which appeared under the auspices of the Prague literary society in 1845. To this he prefixed a grammar of the Old Czech language, *Počátková staročeské mluvnice*. In 1848 he was made professor of Slavonic philology in the university of Prague, but resigned in 1849. He was then made keeper of the university library. In 1857 he published *Glagotitische Fragmente* in collaboration with Höfler; but in the same year, as a result of overwork, ill health and family anxieties, he became insane. He was nevertheless continued in his appointment until his death in 1861.

Schafarik's collected works, *Sebrané Spisy*, were published at Prague 1862–1865; his *Geschichte der südslawischen Literatur* was edited by Jireček in 3 vols. (1864–1865).

SCHAFF, PHILIP (1819–1893), American theologian and church historian, was born in Chur, Switzerland, on the 1st of January 1819. He was educated at the gymnasium of Stuttgart, and at the universities of Tübingen, Halle and Berlin, where he was successively influenced by Baur and Schmid, by Tholuck and Julius Müller, by Strauss and, above all, Neander. In 1842 he was *Privatdozent* in the university of Berlin, and in 1843 he was called to become professor of church history and Biblical literature in the German Reformed Theological Seminary of Mercersburg, Pennsylvania, then the only seminary of that church in America. On his journey he stayed six months in England and met Pusey and other Tractarians. His inaugural address on *The Principle of Protestantism,* delivered in German at Reading, Pennsylvania, in 1844, and published in German with an English version by J. W. Nevin (*q.v.*), by its Neander-like view that Romanism and Protestantism were only stages in the divinely appointed development of the Christian Church, aroused fierce opposition in the Reformed Church and Schaff was characterized as "Puseyistic" and "semi-papistical"; in 1845 he was tried for heresy and found not guilty by the Synod. Opposition to him soon died out within his own denomination: it was more particularly directed against his polemic champion, Nevin, and it had its source more in the Dutch (than in the German) Reformed Church, and even there was confined more to the New Brunswick school (*i.e.* the churchmen of the Dutch Reformed Theological Seminary in New Brunswick, New Jersey) and its English and Scottish members, —as late as 1856 J. J. Janeway of New Brunswick published his *Antidote to the Poison of Popery in the Writings and Conduct of Professors Nevin and Schaff.* Schaff's broad views strongly influenced the German Reformed Church, through his teaching at Mercersburg, through his championship of English in German Reformed churches and schools in America, through his hymnal (1859), through his labours as chairman of the committee which prepared a new liturgy, and by his edition (1863) of the Heidelberg Catechism. His *History of the Apostolic Church* (in German, 1851; in English, 1853) and his *History of the Christian Church* (7 vols., 1858–1890), opened a new period in American study of ecclesiastical history. After 1864 his home was in New York City, where he was until 1869 secretary of the New York Sabbath Committee (which fought the "continental Sunday"), and was corresponding secretary of the American Evangelical Alliance, of which he was in 1866 a founder. In 1865 he founded the first German Sunday School in Stuttgart. In 1862–1867 he lectured on church history at Andover, and after 1869 taught at the Union Theological Seminary—as instructor in church history in 1869–1870, and professor of theological cyclopaedia and Christian symbolism in 1870–1873, of Hebrew and cognate languages in 1873–1874, of sacred literature in 1874–1887, and of church history in 1887–1893. The English Bible Revision Committee in 1870 requested him to form a co-operating American Committee, of which he became president in 1871. He died in New York City on the 20th of October 1893. Working with the Evangelical Alliance and the Chicago (1893) World's Parliament of Religions, and in Germany, through the monthly *Kirchenfreund,* he strove earnestly to promote Christian unity and union; and it was his hope that the pope would abandon the doctrine of infallibility and undertake the reunion of Christianity. He recognized that he was a "mediator between German and Anglo-American theology and Christianity"; his theology was broad rather than definite, though he sharply dissented from Nevin's mystical doctrine of the union in the eucharist of the believer with Christ's glorified body as well as His glorified soul. He edited (1864–1880) the American translation and revision of Lange's *Bibelwerk,* the great Schaff-Herzog *Encyclopaedia of Religious Knowledge* (1884, 3rd ed. 1891); the first seven volumes of the Nicene and Post-Nicene Church Fathers in English (1886–1894); and the *International Illustrated Commentary on the New Testament* (4 vols., 1879–1883) and the *International Revision Commentary* (5 vols. 1881–1884), as far as the Epistle to Romans. His *Bibliotheca symbolica ecclesiae universalis: the Creeds of Christendom* (3 vols. 1877, 6th ed. 1893) was a pioneer work in English in the field of symbolics. His *History of the Christian Church,* already mentioned, resembled Neander's work, though less biographical, and was pictorial rather than philosophical. He wrote, besides, biographies, catechisms and hymnals for children, manuals of religious verse, lectures and essays on Dante, &c.

His son, David Schley Schaff (1852–   ), was professor of church history in Lane Theological Seminary in 1897–1903, and after 1903 in Western Theological Seminary at Allegheny, Pa. He wrote a *Commentary on the Book of Acts* (1882) and a *Life of Philip Schaff* (New York, 1897).

SCHAFFHAUSEN (Fr. *Schaffhouse*), the most northerly of the Swiss cantons, and the only one wholly (excepting the small hamlet of Burg, a suburb of Stein) north of the Rhine. It is divided into three detached portions by the grand-duchy of Baden, which surrounds it on all sides save that of the Rhine, which separates it from the cantons of Thurgau and of Zürich: by far the largest part is the region near the chief town, Schaffhausen, while to the south is the small isolated district of Rüdlingen and Buchberg (purchased in 1520), and to the east the more extensive tract around the old town of Stein on the Rhine (ceded by Zürich in 1798). Within the territory of Schaffhausen are two "enclaves," belonging politically to Baden—the village of Büsingen (just east of the chief town) and the farm of Verenahof, near Büttenhardt. The total area of the canton is 113·5 sq. m., of which 108·4 sq. m. are classed as "productive" (forests covering 46 sq. m., and vineyards 4 sq. m.). The main portion of the canton consists of the gently inclined plateau of the Randen (its highest point, *c.* 3000 ft., is at its north edge) that slopes towards the Rhine, and is intersected by several short glens, separated by rounded ridges. The most important of these glens is that of the Klettgau, to the west of the chief town. There are only intermittent torrents in the canton, apart from the broad stream of the Rhine, which, about 1½ m. below the town, forms the celebrated Falls of the Rhine (first mentioned about 1122), which are rather rapids (only 60 ft. in height) than a cascade proper, though the mass of water is very great.

The direct railway line from Constance to Basel, along the right and (generally) non-Swiss bank of the Rhine, passes through the canton for some 16 m., while there is a branch line (entirely within the canton) from Schaffhausen to Schleitheim (10½ m.), and two lines join the chief town with the Swiss territory to the south, Zürich being thus 29 m. or 35½ m. distant. In 1900 the population was 41,454, of whom 40,290 were German-speaking, while 34,046 were Protestants, 7403 Romanists and 22 Jews. The inhabitants are devoted chiefly to agriculture (particularly fodder stuffs and fruits) and to wine-growing (Hallauer is the best-known red wine). There are tile factories in the Reiath region (N.E. of the capital). The canton is divided into six administrative districts, which comprise thirty-six communes. The cantonal constitution dates in its main features from 1876. The legislature or *Grossrat* is composed of members elected for four years in the proportion of one to every 500 (or fraction over 250) of the population, but only communes with more than 250 inhabitants form separate electoral circles, the smaller being united for electoral purposes with their greater neighbours. The executive or *Regierungsrat* of five members is also elected for four years by a popular vote, as are the two members of the Federal *Ständerat* and of the Federal *Nationalrat.* One thousand citizens have the right of "initiative" as to legislative projects and important financial matters as well as to the revision of the cantonal constitution. Since 1895 the "obligatory referendum" for all legislative projects has prevailed, as well as a curious institution (formerly existing in several cantons) by which the legislature can consult the people on certain questions involving principles and not merely on fully drafted legislative projects. The taxes are very small, while the property of the canton is the most considerable in Switzerland, so that from a financial point of view Schaffhausen is the most favoured in the country, and till recently it had no public debt at all. The numerous forests are well managed and bring in much money.

The canton arose from acquisitions made at various dates from 1461 to 1798 by the town, which at the time of the Reformation obtained possession of the outlying estates of the ecclesiastical foundations then suppressed. The most interesting spot in the canton is the little town of Stein, with its Benedictine monastery (1005–1526), now a sort of medieval museum, and the castle of Hohenklingen towering above it. (W. A. B. C.)

SCHAFFHAUSEN, the capital of the Swiss canton of that name, situated entirely (for its suburb, Feuerthalen, is in the canton of Zürich) on rising ground above the right bank of the Rhine. Its streets are narrow (save in the modern quarters), while it is dominated by the fortress of Unnoth (wrongly called Munoth). It is by rail 31 m. W. of Constance and 59 m. W. of Basel. It is a city of contrasts, medieval architecture of the true Swabian type and modern manufactures mingling curiously together. Three of the sixteen town gates survive, and many old houses, though few have preserved traces of the frescoes which formerly adorned their external walls. The chief ancient building in the town is the *Münster* (now Protestant) of All Saints, formerly a Benedictine monastery. It was consecrated in 1052, and is a good specimen of the "sternest and plainest Romanesque, finished with a single side tower near the east end, that is architecturally connected both with Italian campaniles and the so-called Anglo-Saxon towers of England" (E. A. Freeman). Close to it is deposited the famous 15th-century bell that suggested Schiller's *Song of the Bell* and the opening of Longfellow's *Golden Legend.* The castle of Unnoth, above the town, dates in its present form from the second half of the 16th century. It has enormously thick casemates and a tower, the platform of which (now used as a restaurant) is reached by a spiral ascent. The museum contains antiquarian and natural history collections, as well as the town library, which possesses the MSS. and books of the Swiss historian J. von Müller (*q.v.*). A monument to his memory is on the promenade of the Fäsenstaub, west of the town. Opposite is a building constructed in 1864 by a citizen (G. C. im Thurn) who had made his fortune in London. It is named after him the Imthurneum, and houses a theatre, a picture gallery, concert rooms and the school of music. There are a number of factories in the town, while at Neuhausen, its suburb, are aluminium works, railway rolling stock works and a manufactory of playing cards and railway tickets. Industrial development has been furthered by the hydraulic works for the utilization of the forces in the Rhine; founded 1863–1866 by H. Moser (1805–1874), a wealthy citizen, these are now the property of the town and since 1900 are worked by electricity. In 1900 the town had 15,275 inhabitants (14,684 German-speaking), while there were 11,144 Protestants, 4085 Roman Catholics and 21 Jews.

The spot is first mentioned in 1045, "Villa Scafhusun," while in 1050 we hear of the "ford" there across the Rhine. Hence it is probable that the name is really derived from *scapha*, a skiff, as here goods coming from Constance were disembarked in consequence of the falls of the Rhine a little below. Some writers, however, prefer the derivation from *Schaf* (a sheep), as a ram (now a sheep) formed the ancient arms of the town, derived from those of its founders, the counts of Nellenburg. About 1050 those counts founded here the Benedictine monastery of All Saints, which henceforth became the centre of the town. Perhaps as early as 1190, certainly in 1208, it was an imperial free city, while the first seal dates from 1253. The powers of the abbot were gradually limited and in 1277 the emperor Rudolf gave the town a charter of liberties. It ran considerable risk of becoming a part of the private estates of the Habsburgs, as the emperor Louis of Bavaria pledged it in 1330 to that family, which held it till Duke Frederick with Empty Pockets was placed under the ban of the empire in 1415, its freedom being finally purchased in 1418, while from 1411 the trade gilds ruled the town. But it was much harassed by the neighbouring Austrian nobles, so that in 1454 it made an alliance with six of the Swiss confederates (Uri and Unterwalden coming in in 1479), by whom it was received as an "ally," being finally admitted a full member in 1501. The Reformation was adopted in 1524, finally in 1529. The town suffered much in the Thirty Years' War from the passage of Swedish and Bavarian troops. It was not till the early 19th century that the arrested industrial development of the town took a fresh start.

AUTHORITIES.—F. L. Baumann, *Das Kloster Allerheiligen in Schaffhausen* (vol. iii. of the "Quellen z. Schweizer Geschichte") (Basel, 1881); *Beiträge z. vaterländisch. Geschichte* (5 parts, 1863–1884); E. Im-Thurn, *Der Kanton Schaffhausen* (St Gall and Bern, 1840); A. Pfaff, *Das Staatsrecht d. alten Eidgenossenschaft* (Schaffhausen, 1870) (pp. 89-97 contain a history of Schaffhausen). In 1901 there appeared at Schaffhausen two elaborate historical "Festschriften," one for the canton and one for the town, while in 1906–1907 there were published at Schaffhausen two parts (from 987 to 1530) of an official *Urkundenregister für den Kanton Schaffhausen.* (W. A. B. C.)

SCHÄFFLE, ALBERT EBERHARD FRIEDRICH (1831–1903), German statesman and political economist, was born at Nürtingen in Württemberg on the 24th of February 1831, and in 1848 became a student at the university of Tübingen. From 1850 to 1860 he was attached to the editorial staff of the *Schwäbische Merkur* in Stuttgart, and in the latter year accepted a call to the chair of political economy at Tübingen. From 1862 to 1864 Schäffle was a member of the Württemberg diet, and in 1868 he received a mandate to the German *Zollparlament.* This year he was appointed professor of political science at the university of Vienna, and in 1871 he entered the cabinet of Karl Siegmund Graf von Hohenwart as minister of commerce for Austria. But the government fell in the same year, and Schäffle withdrew to Stuttgart, where he took up his residence, devoting himself entirely to literary work. He died at Stuttgart on the 25th of December 1903. Among his numerous writings must be mentioned *Das Gesellschaftliche System der menschlichen Wirthschaft* (new ed., 1873); *Die Nationalökonomische Theorie der ausschliessenden Absatzverhältnisse* (1867); *Bau und Leben des socialen Körpers* (2nd ed. 1896); *Ein Votum gegen den neuesten Zolltarif* (Tübingen, 1901); *Die agrarische Gefahr* (Berlin, 1902); *Gesammelte Aufsätze* (1885–1887). From 1892 to 1901 Schäffle was the sole editor of the *Zeitschrift für die gesamte Staatswissenschaft.*

See Biermann, *Schäffle und der Agrarismus* (Bonn, 1902) and his autobiography, *Aus meinem Leben* (Berlin, 1905).

SCHALCKEN, GODFRIED (1643–1706), Dutch genre and portrait painter, was born at Dort in 1643, and studied under Hoogstraten, and afterwards under Gerhard Douw, whose works his earlier genre-pictures very closely resemble. He visited England and painted several portraits, of which the half-length of William III., now in the Museum, Amsterdam, is a good example. In this work he shows an effect of candle-light, which he also introduced—frequently with fine effect—in many of his subject-pictures. These may be studied in the collections at Buckingham Palace, the Louvre, Vienna and Dresden. His Scriptural subjects are of very indifferent merit. He died at The Hague in 1706.

SCHALL, JOHANN ADAM VON (1591–1666), Jesuit missionary in China, born of noble parents in Cologne. At the age of twenty he joined the Society of Jesus, and in 1628 went out to China. Apart from successful missionary work, he became the trusted counsellor of the emperor, was created a mandarin, and held an important post in connexion with the mathematical school. His position enabled him to procure from the emperor permission for the Jesuits to build churches and to preach throughout the country. Proselytes to the number of 100,000 are said to have been obtained within fourteen years. The emperor, however, died in 1661, and Schall's circumstances at once changed. He was imprisoned and condemned to death. The sentence was not carried out, but he died after his release owing to the privations he had endured. A collection of his MS. remains was deposited in the Vatican Library.

SCHANDAU, a town of Germany, in the kingdom of Saxony, situated on the right bank of the Elbe, at the mouth of the little valley of the Kirnitsch. It is 4 m. from the Bohemian frontier, 20 m. S.E. of Dresden on the railway to Bodenbach, and has a branch to Niederneukirch, which is carried from the railway station lying on the right bank across the Elbe by an iron bridge. Pop. (1905) 3373. Schandau has an Evangelical parish church, a hydropathic establishment and a school of river navigation. The position of Schandau in the heart of the romantic "Saxon Switzerland" has made it a place of importance, and thousands of tourists make it their headquarters in summer. For their accommodation numerous hotels and villas have been erected. The chief manufactures of the town are artificial flowers and furniture.

See Schäfer, *Führer durch Schandau und seine Umgebung* (Dresden, 1907).

SCHANDORPH [or Skamdrup], **SOPHUS CHRISTIAN FREDERICK** (1836–1901), Danish poet and novelist, was born at Ringsted in Zealand on the 8th of May 1836. In 1855 he entered the university of Copenhagen. In 1862 he published his first volume of poetry, written in the romantic style and giving little indication of the ultimate direction that his talent was to take. Other books followed, but his gifts first found full expression in a volume of rustic tales entitled *Fra Provinsen* (1876), in which he described provincial character and life with much frankness of detail and a great deal of wit. In 1878 his novel, *Uden Midtpunkt* (" Without a Centre "), recast later in dramatic form, attracted great attention by its exposure of contemporary failings. Among the more famous of his later novels are: *Thomas Friis' Historie* (2 vols., 1881), *Det gamle Apothek* (" The Old Apothecary ") (1855) and *Helga* (1900); but his most characteristic work is to be found in his various volumes of short sketches. He published his own *Recollections* (Oplevelser) in 1889. He died after a long illness at Frederiksberg on New Year's Day 1901.

See an article by V. Möller in C. F. Bricka's *Dansk Biografisk Lexikon* (vol. xv., 1901).

SCHARF, SIR GEORGE (1820–1895), British art critic, was born in London on the 16th of December 1820, the son of George Scharf, a Bavarian miniature painter who settled in England in 1816 and died in 1860. He studied in the schools of the Royal Academy. In 1840 he accompanied Sir Charles Fellows to Asia Minor, and in 1843 acted as draughtsman to a government expedition to the same country. After his return he devoted himself with great industry and success to the illustration of books relating to art and antiquity, of which the best known are Macaulay's *Lays of Ancient Rome* (1847); Milman's *Horace*, (1849); Kugler's *Handbook of Italian Painting* (1851); and Dr Smith's classical dictionaries. He also engaged largely in lecturing and teaching, and took part in the formation of the Greek, Roman and Pompeian courts at the Crystal Palace. He acted as art secretary to the great Manchester Art Treasures Exhibition of 1857, and in that year was appointed secretary and director to the newly founded National Portrait Gallery. The remainder of his life was given to the care of that institution. Scharf acquired an unrivalled knowledge of all matters relating to historic portraiture, and was the author of many learned essays on the subject. In 1885, in recognition of his services to the Portrait Gallery, he was made C.B., and on his resignation, early in 1895, K.C.B. and a trustee of the Gallery. He died on the 19th of April of the same year.

SCHARNHORST, GERHARD JOHANN DAVID VON (1755–1813), Prussian general, was born at Bordenau near Hanover, of a farmer stock, on the 12th of November 1755. He succeeded in educating himself and in securing admission to the military academy of Wilhelmstein, and in 1778 received a commission in the Hanoverian service. He employed the intervals of regimental duty in further self-education and literary work. In 1783 he was transferred to the artillery and appointed to the new artillery school in Hanover. He had already founded a military journal which under various names endured till 1805, and in 1788 he designed, and in part published, a *Handbuch für Offiziers in den anwendbaren Theilen der Kriegswissenschaften.* He also published in 1792 his *Militärische Taschenbuch für den Gebrauch im Felde.* The income he derived from his writings was his chief means of support, for he was still a lieutenant, and though the farm of Bordenau produced a small sum annually he had a wife (Clara Schmalz, sister of Theodor Schmalz, first director of Berlin University) and family to maintain. His first campaign was that of 1793 in the Netherlands, in which he served under the duke of York with distinction. In 1794 he took part in the defence of Menin and commemorated the escape of the garrison in his *Vertheidigung der Stadt Menin* (Hanover, 1803), which, next to his paper *Die Ursachen des Glücks der Franzosen im Revolutionskrieg*, is his best-known work. Shortly after this he was promoted major and employed on the staff of the Hanoverian contingent.

In 1795, after the peace of Basel, he returned to Hanover. He was by now so well known to the armies of the various allied states that from several of them he received invitations to transfer his services. This in the end led to his engaging himself to the king of Prussia, who gave him a patent of nobility, the rank of lieutenant-colonel and a pay more than twice as large as that he had received in Hanover (1801). He was employed, almost as a matter of course, in important instructional work at the War Academy of Berlin, he had Clausewitz (*q.v.*) as one of his pupils, and he was the founder of the Berlin Military Society. In the mobilizations and precautionary measures that marked the years 1804 and 1805, and in the war of 1806 that was the natural consequence, Scharnhorst was chief of the general staff (lieutenant-quartermaster) of the duke of Brunswick, received a slight wound at Auerstädt and distinguished himself by his stern resolution during the retreat of the Prussian army. He attached himself to Blücher in the last stages of the disastrous campaign, was taken prisoner with him at the capitulation of Ratkau, and, being shortly exchanged, bore a prominent and almost decisive part in the leading of L'Estocq's Prussian corps which served with the Russians. For his services at Eylau, he received the order *pour le mérite.*

It was now evident that Scharnhorst was more than a brilliant staff officer. Educated in the traditions of the Seven Years' War, he had by degrees, as his experience widened, divested his mind of antiquated forms of war, and it had been borne in upon him that a " national " army and a policy of fighting decisive battles alone responded to the political and strategical situation created by the French Revolution. The steps by which he converted the professional long-service army of Prussia, wrecked at Jena, into the national army as we know it to-day, based on universal service, were slow and laboured. He was promoted major-general a few days after the peace of Tilsit, and placed as the head of a reform commission, to which were appointed the best of the younger officers such as Gneisenau, Grolman and Boyen. Stein himself became a member of the commission and secured Scharnhorst free access to the king by causing him to be appointed aide-de-camp-general. But Napoleon's suspicions were quickly aroused, and the king had repeatedly to suspend or to cancel the reforms recommended. In 1809 the war between France and Austria roused premature hopes in the patriots' party, which the conqueror did not fail to note. By direct application to Napoleon, Scharnhorst evaded the decree of the 26th of September 1810, whereby all foreigners were to leave the Prussian service forthwith, but when in 1811–1812 Prussia was forced into an alliance with France against Russia and despatched an auxiliary army to serve under Napoleon's orders, Scharnhorst left Berlin on unlimited leave of absence. In retirement he wrote and published a work on firearms, *Über die Wirkung des Feuergewehrs* (1813). But the retreat from Moscow at last sounded the call to arms for the new national army of Prussia. Scharnhorst was recalled to the king's headquarters, and after refusing a higher post was made chief of staff to Blücher, in whose vigour, energy and influence with the young soldiers he had complete confidence. The first battle Lützen or Gross-Görschen was a defeat, but a very different defeat from those which Napoleon had hitherto been accustomed to inflict. In it Scharnhorst received a wound in the foot, not in itself grave, but soon made mortal by the fatigues of the retreat to Dresden, and he succumbed to it on the 8th of June at Prague, whither he had been sent to negotiate with Schwarzenberg and Radetzky for the armed intervention of Austria. Shortly before his death he had been promoted to the rank of lieutenant-general. Frederick William III. erected a statue in memory of him, by Rauch, in Berlin.

See C. von Clausewitz, *Über das Leben und den Charakter des General v. Scharnhorst*; H. v. Boyen, *Beiträge zur Kenntnis des General v. Scharnhorst*; lives by Schweder (Berlin, 1865), Klippel (Leipzig, 1869); M. Lehmann (Leipzig, 1886–1888, an important work in two volumes); also Max Jähns, *Gesch. der Kriegswissenschaften*, iii. 2154; Weise, *Scharnhorst und die Durchführung der allgemeinen Wehrpflicht* (1892); A. von Holleben, *Der Frühjahrsfeldzug, 1813* (1905); and F. N. Maude, *The Leipzig Campaign* (1908).

SCHAUMBURG-LIPPE, a principality forming part of the German Empire, consisting of the western half of the old countship of Schaumburg, and surrounded by Westphalia, Hanover and the Prussian part of Schaumburg. Area, 131 sq. m. Its northern extremity is occupied by a lake named the Steinhuder Meer. The southern part is hilly (Wesergebirge), but the remainder consists of a fertile plain. Besides husbandry, the inhabitants practise yarn-spinning and linen-weaving, and the coal-mines of the Bückeberg, on the south-eastern border, are very productive. The great bulk of the population (in 1905, 44,992), are Lutherans. The capital is Bückeburg, and Stadthagen is the only other town. Under the constitution of 1868 there is a legislative diet of 15 members, 10 elected by the towns and rural districts and 1 each by the nobility, clergy and educated classes, the remaining 2 nominated by the prince. Schaumburg-Lippe sends one member to the Bundesrat (federal council) and one deputy to the reichstag. The annual revenue and expenditure amount each to about £41,000. The public debt is about £23,000.

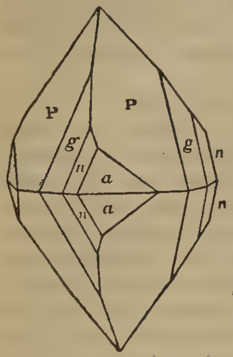
SCHEDULE, originally a written strip or leaf of paper or parchment, a label or ticket, especially when attached to another document, as explaining or adding to its contents, hence any additional detailed statement such as cannot conveniently be embodied in the main statement. The word occurs first (14th century) as *cedule*, or *sedule*, representing the Fr. *cedule* (mod. *cédule*, cf. Ital. *cedola*, Ger. *Zettel*, &c.), which is derived from Late Lat. *scedula* or *schedula*, dim. of *sceda*, a written strip of parchment (late Gr. σχέδη), probably from *scindere*, to cleave, cf. *scindala*, a shingle. The original pronunciation in English was *sedule*, the modern pronunciation is *shedule*; American usage has gone back to the original Latin or Greek, and adopts *skedule*.

SCHEELE, KARL WILHELM (1742–1786), Swedish chemist, was born at Stralsund, the capital of Pomerania, which then belonged to Sweden, on the 19th of December 1742. He was apprenticed at the age of fourteen to an apothecary in Gothenburg, with whom he stayed for eight years. His spare time and great part of his nights were devoted to the experimental examination of the different bodies which he dealt with, and the study of the standard works on chemistry. He thus acquired a large store of knowledge and great practical skill and manipulative dexterity. In 1765 he removed to Malmö, and in 1768 to Stockholm. While there he wrote an account of his experiments with cream of tartar, from which he had isolated tartaric acid, and sent it to T. O. Bergman, the leading chemist in Sweden. Bergman somehow neglected it, and this caused for a time a reluctance on Scheele's part to become acquainted with that savant, but the paper, through the instrumentality of Anders Johann Retzius (1742–1821), was ultimately communicated to the Academy of Sciences at Stockholm. He left Stockholm in 1770 and took up his residence at Upsala, where through the agency of Johann Gottlieb Gahn (1745–1818), assessor of mines at Fahlun, he made the personal acquaintance of Bergman. A friendship, of mutual advantage, soon sprang up between the two men, and it has been said that Scheele was Bergman's greatest discovery. In 1775, the year in which he was elected into the Stockholm Academy of Sciences, he left Stockholm for Köping, a small place on Lake Malar, where he became provisor and subsequently proprietor of a pharmacy. The business, however, was not what he had been led to expect, and it took him several years to put it on a sound footing. Yet in spite of his business cares he found time for an extraordinary amount of original research, and every year he published two or three papers, most of which contained some discovery or observation of importance. His unremitting work, it is said, especially at night, exposing him to cold and draughts, induced a rheumatic attack which brought about his death. He had intended, as soon as his circumstances permitted him, to marry the widow of his predecessor, but his illness increased so rapidly that it was only on his death-bed, on the 19th of May 1786, that he carried out his design. Two days later he died, leaving his wife what property he had acquired.

Scheele's power as an experimental investigator has seldom if ever been surpassed, and his accuracy is most remarkable when his primitive apparatus, his want of assistance, his place of residence, and the undeveloped state of chemical and physical science in his time, are all taken into account. Research was at once his occupation and his relaxation, and his natural endowments were cultivated by unceasing practice and unwearied attention. Study of his original papers shows that his discoveries were not made at haphazard, but were the outcome of experiments carefully planned to verify inferences already drawn, and successfully designed to settle the point at issue in the simplest and most direct manner. He left nothing in doubt if experiment would decide it, and he evidently did not consider that he had fully investigated any compound until he could both unmake and remake it. His record as a discoverer of new substances is probably unequalled. The analysis of manganese dioxide in 1774 led him to the discovery of chlorine and baryta; to the description of various salts of manganese itself, including the manganates and permanganates, and to the explanation of its action in colouring and decolourizing glass. In 1775 he investigated arsenic acid and its reactions, discovering arseniuretted hydrogen and "Scheele's green" (copper arsenite), a process for preparing which on a large scale he published in 1778. Papers published in 1776 were concerned with quartz, alum and clay and with the analysis of *calculus vesicae* from which for the first time he obtained uric acid. In 1778 he proposed a new method of making calomel and powder of algaroth, and he got molybdic acid from mineral *molybdaena nitens* which he carefully distinguished from ordinary molybdena (plumbago or black lead of commerce). In the following year he showed that plumbago consists essentially of carbon, and he published a record of estimations of the proportions of oxygen in the atmosphere, which he had carried on daily during the whole of 1778—three years before Cavendish. In 1780 he proved that the acidity of sour milk is due to what was afterwards called lactic acid; and by boiling milk sugar with nitric acid he obtained mucic acid. His next discovery, in 1781, was the composition of the mineral tungsten, since called scheelite (calcium tungstate), from which he obtained tungstic acid. In 1782 he published some experiments on the formation of ether, and in 1783 examined the properties of glycerine, which he had discovered seven years before. About the same time he showed by a wonderful series of experiments that the colouring matter of Prussian blue could not be produced without the presence of a substance of the nature of an acid, to which the name of prussic acid was ultimately given; and he described the composition, properties and compounds of this body, and even ascertained its smell and taste, quite unaware of its poisonous character. In the last years of his life he returned to the vegetable acids, and investigated citric, malic, oxalic and gallic acids. His only book, on *Air and Fire*, was published in 1777, but was written some years before. The manuscript was in the hands of the printers in 1775, and most of the experimental work for it was done before 1773. Although it starts from the erroneous basis of the phlogistic theory, it contains much matter of permanent value. One of the chief observations recorded in it is that the atmosphere is composed of two gases—one which supports combustion and the other which prevents it. The former, "fire-air," or oxygen, he prepared from "acid of nitre," from saltpetre, from black oxide of manganese, from oxide of mercury and other substances, and there is little doubt but that he obtained it independently a considerable time before Priestley. Incidentally in 1777 Scheele prepared sulphuretted hydrogen, and noted the chemical action of light on silver compounds and other substances.

A list of Scheele's papers is given in Poggendorff's *Biographisch-literarisches Handwörterbuch* (Leipzig, 1863). They were collected and published in French as *Mémoires de chymie* (Paris, 1785–1788); in English as *Chemical Essays*, by Thomas Beddoes (London, 1786); in Latin as *Opuscula*, translated by Schäfer, edited by Hebenstreit (Leipzig, 1788–1789); and in German as *Sämmtliche Werke*, edited by Hermbstadt (Berlin, 1793). The treatise on *Air and Fire* appeared in German, Leipzig and Upsala in 1777, and again in 1782; in English, by J. R. Forster (London, 1780); and in French, by Dietrich (Paris, 1781).

SCHEELITE, a mineral consisting of calcium tungstate, $CaWO_4$. It was early known as "tungsten" (meaning in Swedish, "heavy stone"), and is the mineral in which K. W. Scheele discovered tungstic acid, hence the name scheelite. Well-developed crystals are not infrequent; they usually have the form of acute tetragonal bipyramids (P in fig.); sometimes other pyramid-faces are present, and these (*g* and *n*) being developed on only one side of P indicate the parallel-faced hemihedrism of the crystals. Compact and granular masses also occur. The colour is usually yellowish white or brownish, the crystals sometimes transparent to translucent; the lustre vitreous to adamantine. The hardness is $4\frac{1}{2}$, the specific gravity 6·0. Molybdenum is usually present, replacing an equivalent amount of tungsten; and in a green variety known as "cupro-scheelite" part of the calcium is replaced by copper.



Scheelite usually occurs with topaz, fluor, apatite, wolframite, &c., in tin-bearing veins; and is sometimes found in association with gold. Fine crystals have been obtained from Caldbeck Fells in Cumberland, Zinnwald and Elbogen in Bohemia, Guttannen in Switzerland, the Riesengebirge in Silesia, Dragoon Mountains in Arizona and elsewhere. At Trumbull in Connecticut and Kimpu-san in Japan large crystals of scheelite completely altered to wolframite have been found: those from Japan have been called "reinite."

SCHEEMAKERS, PETER (1691–1770), Flemish sculptor, was born in Antwerp, and learnt his art from his father and from Delvaux. After visiting Denmark and walking thence to Rome for purposes of study, he returned on foot to the port of embarcation for England, but stayed in London but a short while. From 1728 to 1735 he again sojourned in Rome and then settled in England, where he remained from 1735 to 1770, returning in the latter year to his native city where he died a few months afterwards. He worked for a time with Francis Bird, the pupil of Grinling Gibbons. Fifteen of his works—monuments, figures and busts—are in Westminster Abbey, two executed in collaboration with his master Delvaux: the "Hugh Chamberlen" (d. 1728, and therefore perhaps produced during his first visit to London) and "Catherine, duchess of Buckinghamshire." He is best, though not most creditably, known to fame by his monument to Shakespeare (1740), but as this work was designed by Kent the blame for the errors of taste therein displayed must not be laid to Scheemakers' account. In addition to these may be mentioned the monuments to Admiral Sir Charles Wager, Vice-Admiral Watson, Lieut.-General Percy Kirk, George Lord Viscount Howe, General Monck, and Sir Henry Belasye. His busts of John Dryden (1720) and Dr Richard Mead (1754), also in the Abbey, are among the best of his smaller works. The most important of his monuments elsewhere, as mentioned by Walpole, are those to the 1st and 2nd dukes of Ancaster at Edenham, Lincolnshire; Lord Chancellor Hardwicke at Wimpole, Cambridgeshire; the duke of Kent, his wives and daughters, at Fletton, Bedfordshire; the earl of Shelburne, at Wycombe, Bucks; and the figure on the sarcophagus to Montague Sherrard Drake, at Amersham. Although less esteemed as an artist than Rysbrack and Roubiliac, Scheemakers was a very popular and widely-employed sculptor in his day, whose influence was considerable; he was the master of Nollekens, and left a son, Thomas Scheemakers, who produced a considerable amount of work, and exhibited in the Royal Academy from 1782–1804.

See Walpole's *Anecdotes of Painting*, vol. 3 (ed. 1876), and *Dictionary of National Biography*.

SCHEFER, LEOPOLD (1784–1862), German poet and novelist, was born at Muskau in Lower Lusatia on the 30th of July 1784, and educated at the gymnasium of Bautzen. In 1813, he was appointed manager of the estates of Prince Pückler-Muskau (*q.v.*). The prince, recognizing the literary abilities of the young man, encouraged his early poetical efforts and gave him the means to travel. After visiting England, Italy, Greece and Turkey, Schefer returned in 1820 to Muskau, where he lived in easy circumstances and with abundant leisure for his literary pursuits, until his death on the 16th of February 1862. Schefer wrote a large number of short stories which appeared in several series, *Novellen* (5 vols., 1825–1829); *Neue Novellen* (4 vols., 1831–1835); *Lavabecher* (2 vols., 1833); *Kleine Romane* (6 vols., 1836–1837). The historical novel *Die Gräfin Ulfeld* (2 vols., 1834), and the piquant satire, *Die Sibylle von Mantua* (1852), were published separately. But Schefer is less known for his novels which are lacking in plastic power and creative imagination, than for a volume of charming poems, *Laienbrevier* (1834–1835). These, owing to their warmth of feeling and fascinating descriptions of the beauties of nature, at once established his fame as a poet. This vein, in close imitation of his friend the poet Richard Georg Spiller von Hauenschild, known under the pseudonym Max Waldau (1822–1855), he followed in later years with the poems *Vigilien* (1843), *Der Weltpriester* (1846), and *Hausreden* (1869). His *Hafis in Hellas* (Hamburg, 1853) and *Koran der Liebe* (Hamburg, 1855) contain with their glowing descriptions of the East, original poetry of a high order.

A selection of Schefer's works, *Ausgewählte Werke*, in 12 vols., was published in 1845 (2nd ed., 1857). See J. Schmidt, *Geschichte der deutschen Literatur im 19. Jahrhundert*, vol. ii.; E. Brenning *Leopold Schefer* (1884); and L. Geiger in *Dichter und Frauen* (1896).

SCHEFFEL, JOSEPH VIKTOR VON (1826–1886), German poet and novelist, was born at Karlsruhe on the 16th of February 1826. His father, a retired major in the Baden army, was a civil engineer and member of the commission for regulating the course of the Rhine; his mother, *née* Josephine Krederer, the daughter of a prosperous tradesman at Oberndorf on the Neckar, was a woman of great intellectual powers and of a romantic disposition. Young Scheffel was educated at the lyceum at Karlsruhe and afterwards (1843–1847) at the universities of Munich, Heidelberg and Berlin. After passing the state examination for admission to the judicial service, he graduated *doctor juris* and for four years (1848–1852) held an official position at Säckingen. Here he wrote his poem *Der Trompeter von Säckingen* (1853), a romantic and humorous tale which immediately gained extraordinary popularity. It has reached more than 250 editions. Scheffel next undertook a journey to Italy. Returning home in 1853 he found his parents more than ever anxious that he should continue his legal career. But in 1854, defective eyesight incapacitated him; he quitted the government service and took up his residence at Heidelberg, with the intention of preparing himself for a post on the teaching staff of the university. His studies were, however, interrupted by eye-disease, and in search of health he proceeded to Switzerland and took up his abode on the Lake of Constance, and elaborated the plan of his famous historical romance *Ekkehard* (1857); (Eng. trans. by S. Delffs, Leipzig, 1872). The first ideas for this work he got from the *Monumenta Germaniae*. It gained popularity hardly inferior to that of the *Trompeter von Säckingen*. In 1901 it had reached the 179th edition. Scheffel next returned to Heidelberg, and published *Gaudeamus, Lieder aus dem Engeren und Weiteren* (1868), a collection of joyous and humorous songs, the matter for which is taken partly from German legends, partly from historical subjects. In these songs the author shows himself the light-hearted student, a friend of wine and song; and their success is unexampled in German literature and encouraged numerous imitators. For two years (1857–1859) Scheffel was custodian of the library of Prince Egon von Fürstenberg at Donaueschingen, but giving up his appointment in 1859, visited Joseph Freiherr von Lassberg, at Meersburg on the Lake of Constance, stayed for a while with the grand duke Charles Alexander of Saxe-Weimar at the Wartburg in Thuringia, then, settling at Karlsruhe, he married in 1864 Caroline von Malzen, and, in 1872, retired to his Villa Seehalde near Radolfzell on the lower lake of Constance. On the occasion of his jubilee (1876), which was celebrated all over Germany, he was granted a patent of hereditary nobility by the grand duke of Baden. He died at Karlsruhe on the 9th of April 1886.

His works, other than those already mentioned, are *Frau Aventiure. Lieder aus Heinrich von Ofterdingens Zeit* (1863); *Juniperus, Geschichte eines Kreuzfahrers* (1866); *Bergpsalmen* (1870); *Waldeinsamkeit* (1880); *Der Heini von Steier* (1883); and *Hugideo, eine alte Geschichte* (1884). Volumes of *Reisebilder* (1887); *Episteln* (1892); and *Briefe* (1898) were published posthumously. Scheffel's *Gesammelte Werke* have been published in six volumes (1907). Cf. also A. Ruhemann, *Joseph Victor von Scheffel* (1887); G. Zernin, *Erinnerungen an Joseph Victor von Scheffel* (1887); J. Prölss, *Scheffels Leben und Dichten* (1887); L. von Kobell, *Scheffel und seine Frau* (1901); E. Boerschel, *J. V. von Scheffel und Emma Heim* (1906).

SCHEFFER, ARY (1795–1858), French painter of Dutch extraction, was born at Dort on the 10th of February 1795. After the early death of his father, a poor painter, Ary was taken to Paris and placed in the studio of Guérin by his mother, a woman of great energy and character. The moment at which Scheffer left Guérin coincided with the commencement of the Romantic movement. He had little sympathy with the directions given to it by either of its most conspicuous representatives, Sigalon, Delacroix or Géricault, and made various tentative efforts—"Gaston de Foix" (1824), "Suliot Women" (1827)—before he found his own path. Immediately after the exhibition of the last-named work he turned to Byron and Goethe, selecting from *Faust* a long series of subjects which had an extraordinary vogue. Of these, we may mention "Margaret at her Wheel"; "Faust Doubting"; "Margaret at the Sabbat"; "Margaret Leaving Church"; the "Garden Walk"; and lastly, perhaps the most popular of all, "Margaret at the Well." The two "Mignons" appeared in 1836; and "Francesca da Rimini," which is on the whole Scheffer's best work, belongs to the same period. He now turned to religious subjects: "Christus Consolator" (1836) was followed by "Christus Remunerator," "The Shepherds Led by the Star" (1837), "The Magi Laying Down their Crowns," "Christ in the Garden of Olives," "Christ bearing his Cross," "Christ Interred" (1845), "St Augustine and Monica" (1846), after which he ceased to exhibit, but, shut up in his studio, continued to produce much which was first seen by the outer world after his death, which took place at Argenteuil on the 15th of June 1858. At the posthumous exhibition of his works there figured the "Sorrows of the Earth," and the "Angel Announcing the Resurrection," which he had left unfinished. Amongst his numerous portraits those of La Fayette, Béranger, Lamartine and Marie Amélie were the most noteworthy. His reputation, much shaken by this posthumous exhibition, was further undermined by the sale of the Paturle Gallery, which contained many of his most celebrated achievements; the charm and facility of their composition could not save them from the condemnation provoked by their poor and earthy colour and vapid sentiment. Scheffer, who married the widow of General Baudrand, was only made commander of the Legion of Honour in 1848—that is, after he had wholly withdrawn from the Salon. His brother Henri, born at the Hague on the 27th of September 1798, was also a fertile painter.

See Vitet's notice (1861) prefixed to Bingham's publication of works of A. Scheffer; Etex, *Ary Scheffer*; Mrs Grote, *Life of A. Scheffer* (1860).

SCHELANDRE, JEAN DE (*c.* 1585–1635), Seigneur de Saumazènes, French poet, was born about 1585 near Verdun of a Calvinist family. He studied at the university of Paris and then joined Turenne's army in Holland, where he gained rapid advancement. He was the author of a tragedy, *Tyr et Sidon, ou les funestes amours de Belcar et Méliane*, published in 1608 under the anagram-name Daniel d'Anchères, and reprinted with numerous changes in 1628 under the author's own name. In defiance of all rules the action proceeds alternately at Tyre, where Belcar, prince of Sidon, is a prisoner, and at Sidon where Léonte, prince of Tyre, is a prisoner and pursues his gallant adventures. The play, which was divided into two days and ten acts, had a complicated plot and contained 5000 lines. It required an immense stage on which the two towns should be represented, with a field between, where the contests should take place. It is noteworthy as an attempt to introduce the liberty of the Spanish and English drama into France, thus anticipating the romantic revolt of the 19th century. It has been suggested that Schelandre was directly acquainted with Shakespearian drama, but of this there is no direct proof, although he appears to have spent some time in England and to have seen James I. *Tyr et Sidon* is reprinted in the 8th volume of the *Ancien Théâtre français*. Schelandre was also the author of a *Stuartide* (1611), and of *Les Sept Excellents Travaux de la pénitence de Saint Pierre* (1636). He pursued his military career to the end of his life, dying at Saumazènes in 1635 from wounds received in the German campaign of Louis d'Épernon, Cardinal de la Valette.

See Ch. Asselineau, *Jean de Schelandre* (Paris, 1854).

SCHELDT (Fr. *Escaut*, Flem. *Schelde*), a river rising near Catelet in France, entering Belgium near Bleharies in Hainaut, and flowing past Tournai, Oudenarde, Ghent and Termonde till it reaches Antwerp. Some distance below Antwerp, in front of the island Beveland, where the river divides into two channels, respectively north and south of the island, both banks belong to Holland. Of the two channels named, the southern, which reaches the sea at Flushing, is the more important and is used for ocean commerce. The Scheldt has a length of 250 m., of which, by a skilful arrangement of locks, not less than 207 m. are navigable. The principal tributaries are the Lys and the Dender. By the treaty of Munster in 1648 the Dutch obtained the right to close the Scheldt to navigation, and they clung tenaciously to it for over two centuries. In 1839 on the final dissolution of the kingdom of the Netherlands, Holland gave definite form to this right by fixing the toll, and by obtaining the assent of the powers to the arrangement which fettered the trade of Antwerp. In 1863 after long negotiations Belgium bought up this right—each of the powers interested in the trade contributing its quota—and the navigation of the Scheldt was then declared free.

SCHELER, JEAN AUGUSTE ULRIC (1819–1890), Belgian philologist, was born at Ebnat, Switzerland, in 1819. His father, a German, was chaplain to King Leopold I. of Belgium, and Jean Scheler, after studying at Bonn and Munich, became King's librarian and professor at the Brussels Free University. His investigations in Romance philology earned him a wide reputation. He died at Ixelles, Belgium, in 1890.

The most important of his numerous philological works are: *Mémoire sur la conjugaison française considérée sous le rapport étymologique* (Brussels, 1847), *Dictionnaire d'étymologie française d'après les résultats de la science moderne* (Brussels, 1862), *Étude sur la transformation française des mots latins* (Ghent, 1869). He also edited the fourth edition of Diez's *Etymologisches Wörterbuch der romanischen Sprachen* (Bonn, 1878), and completed Grandgagnage's *Dictionnaire étymologique de la langue wallonne* (Louvain, 1880). He also published several critical editions of middle ages texts, including one of *Les Poésies de Froissart* (Brussels, 1870–1872), and a monograph *Sur le séjour de l'apôtre saint Pierre à Rome* (Brussels, 1845), which was translated into German and English.

SCHELLING, FRIEDRICH WILHELM JOSEPH VON (1775–1854), German philosopher, was born on the 27th of January 1775 at Leonberg, a small town of Württemberg. He was educated at the cloister school of Bebenhausen, near Tübingen, where his father, an able Orientalist, was chaplain and professor, and at the theological seminary at Tübingen, which he was specially allowed to enter when he was three years under the prescribed age. Among his (elder) contemporaries were Hegel and Hölderlin. In 1792 he graduated in the philosophical faculty. In 1793 he contributed to Paulus's *Memorabilien* a paper "Über Mythus, historische Sagen, und Philosopheme der ältesten Welt"; and in 1795 his thesis for his theological degree was *De Marcione Paullinarum epistolarum emendatore*. Meanwhile a much more important influence had begun to operate on him, arising out of his study of Kant and Fichte. The *Review of Aenesidemus* and the tractate *On the Notion of Wissenschaftslehre* found in his mind most fruitful soil. With characteristic zeal and impetuosity Schelling had no sooner grasped the leading ideas of Fichte's amended form of the critical philosophy than he put together his impressions of it in his *Über die Möglichkeit* *einer Form der Philosophie überhaupt* (1794). There was nothing original in the treatment, but it showed such power of appreciating the new ideas of the Fichtean method that it was hailed with cordial recognition by Fichte himself, and gave the author immediately a place in popular estimation as in the foremost rank of existing philosophical writers. The more elaborate work, *Vom Ich als Princip der Philosophie, oder über das Unbedingte im menschlichen Wissen* (1795), which, still remaining within the limits of the Fichtean idealism, however, exhibits unmistakable traces of a tendency to give the Fichtean method a more objective application, and to amalgamate with it Spinoza's more realistic view of things.

After two years as tutor to two youths of noble family, Schelling was called as extraordinary professor of philosophy to Jena in midsummer 1798. He had already contributed articles and reviews to the *Journal* of Fichte and Niethammer, and had thrown himself with all his native impetuosity into the study of physical and medical science. From 1796 date the *Briefe über Dogmatismus und Kriticismus*, an admirably written critique of the ultimate issues of the Kantian system; from 1797 the essay entitled *Neue Deduction des Naturrechts*, which to some extent anticipated Fichte's treatment in the *Grundlage des Naturrechts*, published in 1796, but not before Schelling's essay had been received by the editors of the *Journal*.[1] His studies of physical science bore rapid fruit in the *Ideen zu einer Philosophie der Natur* (1797), and the treatise *Von der Weltseele* (1798).

The philosophical renown of Jena reached its culminating point during the years (1798–1803) of Schelling's residence there. His intellectual sympathies united him closely with some of the most active literary tendencies of the time. With Goethe, who viewed with interest and appreciation the poetical fashion of treating fact characteristic of the *Naturphilosophie*, he continued on excellent terms, while on the other hand he was repelled by Schiller's less expansive disposition, and failed altogether to understand the lofty ethical idealism that animated his work. He quickly became the acknowledged leader of the Romantic school whose impetuous litterateurs had begun to tire of the cold abstractions of Fichte. In Schelling, essentially a self-conscious genius, eager and rash, yet with undeniable power, they hailed a personality of the true Romantic type. With August Wilhelm Schlegel and his gifted wife Caroline, herself the embodiment of the Romantic spirit, Schelling's relations were of the most intimate kind, and a marriage between Schelling and Caroline's young daughter, Auguste Böhmer, was vaguely contemplated by both. Auguste's death in 1800 (due partly to Schelling's rash confidence in his medical knowledge) drew Schelling and Caroline together, and Schlegel having removed to Berlin, a divorce was, apparently with his consent, arranged. On the 2nd of June 1803 Schelling and Caroline were married, and with the marriage Schelling's life at Jena came to an end. It was full time, for Schelling's undoubtedly overweening self-confidence had involved him in a series of disputes and quarrels at Jena, the details of which are important only as illustrations of the evil qualities in Schelling's nature which deface much of his philosophic work.

From September 1803 until April 1806 Schelling was professor at the new university of Würzburg. This period was marked by considerable changes in his views and by the final breach on the one hand with Fichte and on the other hand with Hegel. In Würzburg Schelling had had many enemies. He embroiled himself with his colleagues and also with the government. In Munich, to which he removed in 1806, he found a quiet residence. A position as state official, at first as associate of the academy of sciences and secretary of the academy of arts, afterwards as secretary of the philosophical section of the academy of sciences, gave him ease and leisure. Without resigning his official position he lectured for a short time at Stuttgart, and during seven years at Erlangen (1820–1827). In 1809 Caroline died, and three years later Schelling married one of her closest friends, Pauline Gotter, in whom he found a faithful companion.

During the long stay at Munich (1806–1841), Schelling's literary activity seemed gradually to come to a standstill. The "Aphorisms on Naturphilosophie" contained in the *Jahrbücher der Medicin als Wissenschaft* (1806–1808) are for the most part extracts from the Würzburg lectures; and the *Denkmal der Schrift von den göttlichen Dingen des Herrn Jacobi* was drawn forth by the special incident of Jacobi's work. The only writing of significance is the "Philosophische Untersuchungen über das Wesen der menschlichen Freiheit," which appeared in the *Philosophische Schriften*, vol. i. (1809), and which carries out, with increasing tendency to mysticism, the thoughts of the previous work, *Philosophie und Religion*. In 1815 appeared the tract *Über die Gottheiten zu Samothrake*, ostensibly a portion of a great work, *Die Weltalter*, frequently announced as ready for publication, of which no great part was ever written. Probably it was the overpowering strength and influence of the Hegelian system that constrained Schelling to so long a silence, for it was only in 1834, after the death of Hegel, that, in a preface to a translation by H. Beckers of a work by Cousin, he gave public utterance to the antagonism in which he stood to the Hegelian and to his own earlier conceptions of philosophy. The antagonism certainly was not then a new fact; the Erlangen lectures on the history of philosophy (*Sämmt. Werke*, x. 124-125) of 1822 express the same in a pointed fashion, and Schelling had already begun the treatment of mythology and religion which in his view constituted the true positive complement to the negative of logical or speculative philosophy. Public attention was powerfully attracted by these vague hints of a new system which promised something more positive, as regards religion in particular, than the apparent results of Hegel's teaching. For the appearance of the critical writings of Strauss, Feuerbach and Bauer, and the evident disunion in the Hegelian school itself had alienated the sympathies of many from the then dominant philosophy. In Berlin particularly, the headquarters of the Hegelians, the desire found expression to obtain officially from Schelling a treatment of the new system which he was understood to have in reserve. The realization of the desire did not come about till 1841, when the appointment of Schelling as Prussian privy councillor and member of the Berlin Academy, gave him the right, a right he was requested to exercise, to deliver lectures in the university. The opening lecture of his course was listened to by a large and appreciative audience. The enmity of his old foe, H. E. G. Paulus, sharpened by Schelling's apparent success, led to the surreptitious publication of a verbatim report of the lectures on the philosophy of revelation, and, as Schelling did not succeed in obtaining legal condemnation and suppression of this piracy, he in 1845 ceased the delivery of any public courses. No authentic information as to the nature of the new positive philosophy was obtained till after his death (at Bad Rogaz, on the 20th of August 1854), when his sons began the issue of his collected writings with the four volumes of Berlin lectures: vol. i. *Introduction to the Philosophy of Mythology* (1856); ii. *Philosophy of Mythology* (1857); iii. and iv. *Philosophy of Revelation* (1858).

Philosophy.—Whatever judgment one may form of the total worth of Schelling as a philosopher, his place in the history of that important movement called generally German philosophy is unmistakable and assured. It happened to him, as he himself claimed, to turn a page in the history of thought, and one cannot ignore the actual advance upon his predecessor achieved by him or the brilliant fertility of the genius by which that achievement was accomplished. On the other hand he nowhere succeeds in attaining to a complete scientific system. His philosophical writings are the successive manifestations of a restless highly endowed spirit, striving unsuccessfully after a solution of its own problems. Such unity as they possess is a unity of tendency and endeavour; in some respects the final form they assumed is the least satisfactory. Hence it has come about that Schelling remains for the philosophic student but a moment of historical value in the development of thought, and that his works have for the most part ceased now to have more than historic interest.

It is not unfair to connect the apparent failings of Schelling's philosophizing with the very nature of the thinker and with the historical accidents of his career. In his early writings, for example, more particularly those making up *Naturphilosophie*, one finds in painful abundance the evidences of hastily acquired knowledge, impatience of the hard labour of minute thought, over-confidence in the force of individual genius, and desire instantaneously to present even in crudest fashion the newest idea that has dawned upon the thinker. Schelling was prematurely thrust into the position of a foremost productive thinker; and when the lengthened period of quiet meditation was at last forced upon him there unfortunately lay before him a system which achieved what had dimly been involved in his ardent and impetuous desires. It is not possible to acquit Schelling of a certain disingenuousness in regard to the Hegelian philosophy; and if we claim for him perfect disinterestedness of view we must accuse him of deficient insight.

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[1] The reviews of current philosophical literature were afterwards collected, and edited under the title "Abhandlungen zur Erläuterung des Idealismus der Wissenschaftslehre" in Schelling's *Philos. Schriften*, vol. i. (1809).

At all stages of his thought he called to his aid the forms of some other system. Thus Fichte, Spinoza, Jakob Boehme and the Mystics, and finally, the great Greek thinkers with their Neoplatonic, Gnostic, and Scholastic commentators, give respectively colouring to particular works. But Schelling did not merely borrow, he had genuine philosophic spirit and no small measure of philosophic insight, and under all the differences of exposition which seem to constitute so many differing systems, there is one and the same philosophic effort and spirit. But what Schelling did want was power to work out his ideas methodically. Hence he could only find expression for himself in forms of this or that earlier philosophy, and hence too the frequent formlessness of his own thought, the tendency to relapse into mere impatient despair of ever finding an adequate vehicle for transmitting thought. It is fair in dealing with Schelling's development to take into account the indications of his own opinion regarding its more significant momenta. In his own view the turning points seem to have been—(1) the transition from Fichte's method to the more objective conception of nature—the advance, in other words, to *Naturphilosophie*; (2) the definite formulation of that which implicitly, as Schelling claims, was involved in the idea of *Naturphilosophie*, viz. the thought of the identical, indifferent, absolute substratum of both nature and spirit, the advance to *Identitätsphilosophie*; (3) the opposition of negative and positive philosophy, an opposition which is the theme of the Berlin lectures, though its germs may be traced back to 1804. Only what falls under the first and second of the divisions so indicated can be said to have discharged a function in developing philosophy; only so much constitutes Schelling's philosophy proper.

1. *Naturphilosophie*.—The Fichtean method had striven to exhibit the whole structure of reality as the necessary implication of self-consciousness. The fundamental features of knowledge, whether as activity or as sum of apprehended fact, and of conduct had been deduced as elements necessary in the attainment of self-consciousness. Fichtean idealism therefore at once stood out negatively, as abolishing the dogmatic conception of the two real worlds, subject and object, by whose interaction cognition and practice arise, and as amending the critical idea which retained with dangerous caution too many fragments of dogmatism; positively, as insisting on the unity of philosophical interpretation and as supplying a key to the form or method by which a completed philosophic system might be constructed. But the Fichtean teaching appeared on the one hand to identify too closely the ultimate ground of the universe of rational conception with the finite, individual spirit, and on the other hand to endanger the *reality* of the world of nature by regarding it too much after the fashion of subjective idealism, as mere moment, though necessitated, in the existence of the finite thinking mind. It was almost a natural consequence that Fichte never succeeded in amalgamating with his own system the aesthetic view of nature to which the *Kritik of Judgment* had pointed as an essential component in any complete philosophy.

From Fichte's position Schelling started. From Fichte he derived the ideal of a completed whole of philosophic conception and also the formal method to which for the most part he continued true. The earliest writings tended gradually towards the first important advance. Nature must not be conceived as merely abstract limit to the infinite striving of spirit, as a mere series of necessary thoughts for mind. It must be that and more than that. It must have reality for itself, a reality which stands in no conflict with its ideal character, a reality the inner structure of which is ideal, a reality the root and spring of which is spirit. Nature as the sum of that which is objective, intelligence as the complex of all the activities making up self-consciousness, appear thus as equally real, as alike exhibiting ideal structure, as parallel with one another. The philosophy of nature and transcendental philosophy are the two complementary portions of philosophy as a whole.

Animated with this new conception Schelling made his hurried rush to *Naturphilosophie*, and with the aid of Kant and of fragmentary knowledge of contemporary scientific movements, threw off in quick succession the *Ideen*, the *Weltseele*, and the *Erster Entwurf*. *Naturphilosophie* has had scant mercy at the hands of modern science. Schelling had neither the strength of thinking nor the acquired knowledge necessary to hold the balance between the abstract treatment of cosmological notions and the concrete researches of special science. His efforts after a construction of natural reality are bad in themselves, and gave rise to wearisome and useless physical speculation. Yet it would be unjust to ignore the many brilliant and sometimes valuable thoughts that are scattered throughout the writings on *Naturphilosophie*—thoughts to which Schelling himself is but too frequently untrue. Regarded merely as a criticism of the notions with which scientific interpretation proceeds, these writings have still importance and might have achieved more had they been untainted by the tendency to hasty, ill-considered, a priori anticipations of nature.

Nature, as having reality for itself, forms one completed whole. Its manifoldness is not then to be taken as excluding its fundamental unity; the divisions which our ordinary perception and thought introduce into it have not absolute validity, but are to be interpreted as the outcome of the single formative energy or complex of forces which is the inner aspect, the soul of nature. This we are in a position to apprehend and constructively to exhibit to ourselves in the successive forms which its development assumes, for it is the same spirit, though unconscious, of which we become aware in self-consciousness. It is the realization of spirit. Nor is the variety of its forms imposed upon it from without; there is neither external teleology in nature, nor mechanism in the narrower sense. Nature is a whole and forms itself; within its range we are to look for no other than natural explanations. The function of *Naturphilosophie* is to exhibit the ideal as springing from the real, not to deduce the real from the ideal. The incessant change which experience brings before us, taken in conjunction with the thought of unity in productive force of nature, leads to the all-important conception of the duality, the polar opposition through which nature expresses itself in its varied products. The dynamical series of stages in nature, the forms in which the ideal structure of nature is realized, are matter, as the equilibrium of the fundamental expansive and contractive forces; light, with its subordinate processes—magnetism, electricity, and chemical action; organism, with its component phases of reproduction, irritability and sensibility.[1]

Just as nature exhibits to us the series of dynamical stages of processes by which spirit struggles towards consciousness of itself, so the world of intelligence and practice, the world of mind, exhibits the series of stages through which self-consciousness with its inevitable oppositions and reconciliations develops in its ideal form. The theoretical side of inner nature in its successive grades from sensation to the highest form of spirit, the abstracting reason which emphasizes the difference of subjective and objective, leaves an unsolved problem which receives satisfaction only in the practical, the individualizing activity. The practical, again, taken in conjunction with the theoretical, forces on the question of the reconciliation between the free conscious organization of thought and the apparently necessitated and unconscious mechanism of the objective world. In the notion of a teleological connexion and in that which for spirit is its subjective expression, viz. art and genius, the subjective and objective find their point of union.

2. Nature and spirit, *Naturphilosophie* and *Transcendentalphilosophie*, thus stand as two relatively complete, but complementary parts of the whole. It was impossible for Schelling, the animating principle of whose thought was ever the reconciliation of differences, not to take and to take speedily the step towards the conception of the uniting basis of which nature and spirit are manifestations, forms, or consequences. For this common basis, however, he did not succeed at first in finding any other than the merely negative expression of indifference. The identity, the absolute, which underlay all difference, all the relative, is to be characterized simply as *neutrum*, as absolute undifferentiated self-equivalence. It lay in the very nature of this thought that Spinoza should now offer himself to Schelling as the thinker whose form of presentation came nearest to his new problem. The *Darstellung meines Systems*, and the more expanded and more careful treatment contained in the lectures on *System der gesammten Philosophie und der Naturphilosophie insbesondere* given in Würzburg, 1804 (published in the *Sämmtliche Werke*, vol. vi. pp. 131-576), are thoroughly Spinozistic in form, and to a large extent in substance. They are not without value, indeed, as extended commentary on Spinoza. With all his efforts, Schelling does not succeed in bringing his conceptions of nature and spirit into any vital connexion with the primal identity, the absolute indifference of reason. No true solution could be achieved by resort to the mere absence of distinguishing, differencing feature. The absolute was left with no other function than that of removing all the differences on which thought turns. The criticisms of Fichte, and more particularly of Hegel (in the "Vorrede" to the *Phänomenologie des Geistes*), point to the fatal defect in the conception of the absolute as mere featureless identity.

3. Along two distinct lines Schelling is to be found in all his later writings striving to amend the conception, to which he remained true, of absolute reason as the ultimate ground of reality. It was necessary, in the first place, to give to this absolute a *character*, to make of it something more than empty sameness; it was necessary, in the second place, to clear up in some way the relation in which the actuality or apparent actuality of nature and spirit

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[1] The briefest and best account in Schelling himself of *Naturphilosophie* is that contained in the *Einleitung zu dem Ersten Entwurf* (*S.W.* iii.). A full and lucid statement of *Naturphilosophie* is that given by K. Fischer in his *Gesch. d. n. Phil.*, vi. 433-692.

stood to the ultimate real. Schelling had already (in the *System der ges. Phil.*) begun to endeavour after an amalgamation of the Spinozistic conception of substance with the Platonic view of an ideal realm, and to find therein the means of enriching the bareness of absolute reason. In *Bruno*, and in *Philos. u. Religion*, the same thought finds expression. In the realm of ideas the absolute finds itself, has its own nature over against itself as objective over against subjective, and thus is in the way of overcoming its abstractness, of becoming concrete. This conception of a difference, of an internal structure in the absolute, finds other and not less obscure expressions in the mystical contributions of the *Menschliche Freiheit* and in the scholastic speculations of the Berlin lectures on mythology. At the same time it connects itself with the second problem, how to attain in conjunction with the abstractly rational character of the absolute an explanation of actuality. Things—nature and spirit—have an actual being. They exist not merely as logical consequence or development of the absolute, but have a stubbornness of being in them, an antagonistic feature which in all times philosophers have been driven to recognize, and which they have described in varied fashion. The actuality of things is a defection from the absolute, and their existence compels a reconsideration of our conception of God. There must be recognized in God as a completed actuality, a dim, obscure ground or basis, which can only be described as not yet being, but as containing in itself the impulse to externalization, to existence. It is through this ground of Being in God Himself that we must find explanation of that independence which things assert over against God. And it is easy to see how from this position Schelling was led on to the further statements that not in the rational conception of God is an explanation of existence to be found, nay, that all rational conception extends but to the form, and touches not the real—that God is to be conceived as act, as will, as something over and above the rational conception of the divine. Hence the stress laid on will as the realizing factor, in opposition to thought, a view through which Schelling connects himself with Schopenhauer and Von Hartmann, and on the ground of which he has been recognized by the latter as the reconciler of idealism and realism. Finally, then, there emerges the opposition of negative, *i.e.* merely rational philosophy, and positive, of which the content is the real evolution of the divine as it has taken place in fact and in history, and as it is recorded in the varied mythologies and religions of mankind. Not much satisfaction can be felt with the exposition of either as it appears in the volumes of Berlin lectures.

Schelling's works were collected and published by his sons, in 14 vols. (1856–1861). The individual works appeared as follows:—*Über die Möglichkeit einer Form der Philosophie überhaupt* (Tübingen, 1794); *Ideen zu einer Philosophie der Natur* (Leipzig, 1797, ed. 1803); *Von der Weltseele* (Hamburg, 1798, 3rd ed. 1809); *Erster Entwurf eines Systems der Naturphilosophie* (Jena, 1799); *Einleitung zu seinem Entwurf der Naturphilosophie* (ib. 1799); *System des transcendentalen Idealismus* (Tübingen, 1800); *Bruno, oder über das göttliche und natürliche Prinzip der Dinge* (Berlin, 1802, ed. 1843); *Vorlesungen über die Methode des akademischen Studiums* (Tübingen, 1803, ed. Braun, 1907); *Über das Verhältniss der bildenden Künste zu der Natur* (Munich, 1807); *Über die Gottheiten von Samothrake* (Stuttgart, 1815). His Munich lectures were published by A. Drews (Leipzig, 1902). For the life good materials are to be found in the 3 vols., *Aus Schelling's Leben in Briefen* (3 vols., 1869–1870), in which a biographic sketch of the philosopher's early life is given by his son, and in J. Waitz, *Karoline* (2 vols., 1871). An interesting little work is Klaiber, *Hölderlin, Hegel, u. Schelling in ihren schwäbischen Jugendjahren* (1877). The biography in Kuno Fischer's *Gesch. der neueren Philosophie*, vol. vii. (3rd ed., 1902) is complete and admirable. See further *Schelling als Persönlichkeit. Briefe, Reden, Aufsätze*, ed. Otto Braun (1908), who also wrote *Schellings geistige Wandlungen in den Jahren 1800–1810* (1906); Rosenkranz, *Schelling* (1843); L. Noack, *Schelling und die Philosophie der Romantik* (2 vols., 1859); G. A. C. Frantz, *Schelling's Positive Philosophie* (3 vols., 1879–1880); Watson, *Schelling's Transcendental Idealism* (1882); Groos, *Die reine Vernunftwissenschaft. Systematische Darstellung von Schellings . . . Philosophie* (1889); E. von Hartmann, *Schelling's philos. System* (1897); Delbos, *De posteriore Schellingii philosophia quatenus Hegelianae doctrinae adversatur* (1902); Koeber, *Die Grundprinzipien der Schellingschen Naturphilosophie* (1882); G. Mehlis, *Schellings Geschichtsphilosophie in den Jahren 1799–1804* (1907); H. Sueskind, *Der Einfluss Schellings auf die Entwicklung von Schleiermachers System* (1909). (R. Ad.; J. M. M.)

SCHELLING, KAROLINE (1763–1809), one of the most intellectual German women of her age, was born at Göttingen on the 2nd of September 1763, the daughter of the orientalist Michaelis. She married, in 1784, a district medical officer, one Böhmer, in Clausthal in the Harz, and after his death, in 1788, returned to Göttingen. Here she entered into close relations to the poet Gottfried August Bürger and the critic of the Romantic school, August Wilhelm Schlegel. In 1791 she took up her residence in Mainz, joined the famous society of the Clubbists (*Klubbisten*), and suffered a short period of imprisonment on account of her political opinions. In 1796 she married Schlegel, was divorced in 1803, and then became the wife of the philosopher Friedrich Wilhelm Joseph von Schelling. She died at Maulbronn on the 7th of September 1809. Karoline Schelling played a considerable rôle in the intellectual movement of her time, and is especially remarkable for the assistance she afforded Schlegel in his translation of Shakespeare's works. She published nothing, however, in her own name.

See G. Waitz, *Caroline: Briefe an ihre Geschwister*, &c. (2 vols., 1871), and, by the same author, *Caroline und ihre Freunde* (1882); further, J. Janssen, *Eine Kulturdame und ihre Freunde, Zeit- und Lebensbilder* (1885), and Mrs. A. Sidgwick, *Caroline Schlegel and her Friends* (London, 1899).

SCHEME (Lat. *schema*, Gr. σχῆμα, figure, form, from the root σχε, seen in ἔχειν, to have, hold, to be of such shape, form, &c.), in the most general and common sense, a plan or design, especially of action with some definite purpose, often and more particularly in the derivatives "to scheme," "schemer," "scheming," with a hostile or unfavourable notion of a plot or surreptitious plan, or of a selfish project or enterprise. The original meaning, derived from the Med. Lat. translation *figura*, of σχῆμα, is that of a diagram or figure to illustrate a mathematical proposition and the like, a map or plan, &c., thus used of an analysis, a tabular statement; an epitome or synopsis, a table or system of classification. In Kantian philosophy, "Schema" is used of "the product of the exercise of the transcendental imagination in giving generality to sense and particularity to thought," and "schematism of the theory, in the Kantian analysis of knowledge, of the use of the transcendental imagination as mediating between sense and understanding" (Baldwin, *Dictionary of Philosophy and Psychology*, 1902, vol. ii.).

SCHENECTADY, a city and the county-seat of Schenectady county, New York, U.S.A., about 16 m. N.W. of Albany, on the Mohawk river and the Erie Canal. Pop. (1890) 19,902; (1900) 31,682, of whom 7169 were foreign-born; (1910, census) 72,826. Schenectady is served by the New York Central & Hudson River, and the Delaware & Hudson railways, and by interurban electric lines connecting with Albany, Troy, Saratoga, Amsterdam, Johnstown and Gloversville. The city has a fine situation about 230 ft. above the sea. It is a place of much historic interest, and has many examples of quaint Dutch colonial and early American architecture. There is an Indian monument on the site of the "old fort." Schenectady is the seat of Union College (undenominational), which grew out of the Schenectady Academy (1784), was chartered in 1795, and comprises the academic and engineering departments of Union University, the medical (1838), law (1851) and pharmacy (1881) departments of which are at Albany, where also is the Dudley Observatory (1852), which is under the control of the university. Schenectady is a manufacturing centre of growing importance; here are the main works of the General Electric Company, manufacturers of electrical implements, apparatus, motors and supplies, and of the American Locomotive Company. Together they give employment to about 80% of the wage-earners of the city. Among other manufactures are hosiery and knit goods, overalls and suspenders, hardware, lumber, oils and varnishes, gasoline fire engines, mica insulators, agricultural implements, and wagons and carriages. The capital invested in manufacturing industries in 1905 was $22,050,746, and the value of the factory product was $33,084,431, an increase of 87·9% since 1900.

According to tradition Schenectady stands on the site of the chief village of the Mohawk Indians, and its name, of which there are many different spellings in early records, is probably of Indian origin; on an early map (1665) it appears as Scanacthade. Arendt Van Corlaer, or Curler (d. 1667),[1] while manager of the estates of his cousin, the patroon, Killian Van Rensselaer, visited the site in 1642, and in 1662, being dissatisfied with conditions on the Manor, he led a band of settlers here. Their allegiance was directly to the Dutch West India Company, and they enjoyed a greater degree of freedom, especially commercial freedom, than had been possible on the Manor. The land was purchased from the Mohawks. To each of the fifteen original proprietors, except Van Corlaer, who received a double portion, was assigned a village lot 200 ft. sq., a tract of bottom-land for farming purposes, a strip of woodland, and common pasture rights. Many of the early settlers were well-to-do and brought their slaves with them, and for many years the settlement was reputed the richest in the colony. It received a serious set-back in 1690, when on the 9th of February a force of French and Indians surprised and burned the village, massacred sixty of the inhabitants and carried thirty into captivity. The village was rebuilt in the following year, and a military post was established. About 1700 there was a considerable influx of English settlers. In 1748 the French and Indians again descended on the region and killed many of the inhabitants of the outlying settlement at Beukendaal, 3 m. N.W. of Schenectady. Schenectady became a chartered borough in 1765 and a city in 1798. The first newspaper, the *Gazette*, was established in 1799. For some years after the completion of the Erie Canal, Schenectady, which had formerly been an important depot of the Mohawk river boat trade to the westward, suffered a decline. The first two railways in the state made Schenectady their terminus, the Mohawk & Hudson opening to Albany in September 1831 and the Saratoga & Schenectady in July 1832; the original station of the Mohawk & Hudson is still standing. It was not, however, until its new manufacturing era began, about 1880, that Schenectady's modern growth and prosperity began.

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[1] Van Corlaer had emigrated to America about 1630; while manager of Rensselaerwyck he had earned the confidence of the Indians, among whom "Corlaer" became a generic term for the English governors, and especially the governors of New York.

See Jonathan Pearson, *A History of Schenectady Patent in the Dutch and English Times* (Albany, 1883); G. S. Roberts, *Old Schenectady* (Schenectady, 1904); and G. R. Howell and J. H. Munsell, *History of the County of Schenectady* (Albany, 1887).

SCHENKEL, DANIEL (1813–1885), Swiss Protestant theologian, was born at Dägerlen in the canton of Zürich on the 21st of December 1813. After studying at Basel and Göttingen he was successively pastor at Schaffhausen (1841), professor of theology at Basel (1849); and at Heidelberg professor of theology (1851), director of the seminary and university preacher. At first inclined to conservatism, he afterwards became an exponent of the mediating theology (*Vermittelungs-theologie*), and ultimately a liberal theologian and advanced critic. Associating himself with the "German Protestant Union" (*Deutsche Protestanten-verein*), he defended the community's claim to autonomy, the cause of universal suffrage in the church and the rights of the laity. From 1852 to 1859 he edited the *Allgemeine Kirchenzeitung*, and from 1861 to 1872 the *Allgemeine Kirchliche Zeitschrift*, which he had founded in 1859. In 1867, with a view to popularizing the researches and results of the Liberal school, he undertook the editorship of a *Bibel-Lexicon* (5 vols., 1869–1875), a work which was so much in advance of its time that it is still useful. In his *Das Wesen des Protestantismus aus den Quellen des Reformationszeitalters beleuchtet* (3 vols. 1846–1851, 2nd ed. 1862), he declares that Protestantism is a principle which is always living and active, and not something which was realized once and for all in the past. He contends that the task of his age was to struggle against the Catholic principle which had infected Protestant theology and the church. In his *Christliche Dogmatik* (2 vols., 1858–1859) he argues that the record of revelation is human and was historically conditioned: it can never be absolutely perfect; and that inspiration, though originating directly with God, is continued through human instrumentality. His *Charakterbild Jesu* (1864, 4th ed. 1873; Engl. trans. from 3rd ed., 1869), which appeared almost simultaneously with D. Strauss's *Leben Jesu*, met with fierce opposition. The work is considered too subjective and fanciful, the great fault of the author being that he lacks the impartiality of objective historical insight. Yet, as Pfleiderer says, the work "is full of a passionate enthusiasm for the character of Jesus." The author rejects all the miracles except those of healing, and these he explains psychologically. His main purpose was to modernize and reinterpret Christianity; he says in the preface to the third edition of the book: "I have written it solely in the service of evangelical truth, to win to the truth those especially who have been most unhappily alienated from the church and its interests, in a great measure through the fault of a reactionary party, blinded by hierarchical aims." Schenkel died on the 18th of May 1885.

Other works:—*Friedrich Schleiermacher. Ein Lebens- und Charakterbild* (1868); *Christentum und Kirche* (2 vols., 1867–1872); *Die Grundlehren des Christentums aus dem Bewusstsein des Glaubens dargestellt* (1877); and *Das Christusbild der Apostel und der nachapostolischen Zeit* (1879). See Herzog-Hauck, *Realencyklopädie*, Otto Pfleiderer, *Development of Theology* (1890); and F. Lichtenberger, *History of German Theology* (1889). (M. A. C.)

SCHERER, EDMOND HENRI ADOLPHE (1815–1889), French theologian, critic and politician, was born in Paris on the 8th of April 1815. After a course of legal studies he spent several years in theological study at Strassburg, where he graduated doctor in theology in 1843, and was ordained. In 1843 he was appointed to a professorship in the École Évangélique at Geneva, but the development of his opinions in favour of the Liberal movement in Protestant theology led to his resigning the post six years later. He founded the *Anti-Jésuite*, afterwards the *Réformation au XIX^{e} siècle*, in which he advocated the separation of the Church from the State; but he gradually abandoned Protestant doctrine. In thought he became a pronounced Hegelian. Eventually he settled in Paris, where he at once attracted attention by brilliant literary criticisms, at first chiefly on great foreign writers, contributed to the *Revue des deux mondes*. He was elected municipal councillor at Versailles in 1870, deputy to the National Assembly for the department of Seine-et-Oise in 1871 and senator in 1875. He supported the Republican party. Towards the end of his life he devoted himself mainly to literary and general criticism, and was for many years one of the ablest contributors to *Le Temps*. He was a frequent visitor to England, and took a lively interest in English politics and literature. He died at Versailles on the 16th of March 1889.

His chief works are: *Dogmatique de l'Église réformée* (1843), *De l'état actuel de l'Église réformée en France* (1844), *Esquisse d'une théorie de l'Église chrétienne* (1845), *La Critique et la foi* (1850), *Alexandre Vinet* (1853), *Lettres à mon curé* (1853), *Études critiques sur la littérature contemporaine* (1863–1889), *Études critiques de littérature* (1876), *Diderot* (1880), *La Démocratie et la France* (1883), *Études sur la littérature au XVIII^{e} siècle* (1891).

A memoir of him, by V. C. O. Gréard, appeared in 1890. See also an article by Professor E. Dowden in the *Fortnightly Review* (April 1889).

SCHERER, WILHELM (1841–1886), German philologist and historian of literature, was born at Schönborn in Lower Austria on the 26th of April 1841. He was educated at the academic gymnasium at Vienna and afterwards at the university, where he was the favourite pupil of the distinguished Germanist, Karl Viktor Müllenhoff (1818–1884). Having taken the degree of *doctor philosophiae*, he became *Privatdozent* for German language and literature in 1864. In 1868 he was appointed ordinary professor, and in 1872 received a call in a like capacity to Strassburg, and in 1877 to Berlin, where in 1884 he was made member of the Academy of Sciences. He died at Berlin on the 6th of August 1886.

Scherer's literary activity falls into three categories: in Vienna he was the philologist, at Strassburg the professor of literature and in Berlin the author. His earliest work was a biography of the great philologist Jakob Grimm (1865, 2nd ed. 1885); he next, in conjunction with his former teacher Müllenhoff, published *Denkmäler deutscher Poesie und Prosa aus dem 8. bis 12. Jahrhundert* (1864, 3rd ed. 1892). His first great work was, however, *Zur Geschichte der deutschen Sprache* (Berlin, 1868; 3rd ed., 1890), being a history of the German language with especial reference to phonetic laws. He contributed the section on Alsatian literature to O. Lorenz's *Geschichte des Elsasses* (1871, 3rd ed. 1886). Other important works are *Geistliche Poeten der deutschen Kaiserzeit* (Strassburg, 1874–1875); *Geschichte der deutschen Dichtung im 11. und 12. Jahrhundert* (1875); and *Vorträge und Aufsätze zur Geschichte des geistigen Lebens in Deutschland und Österreich* (1874). Scherer's best-known work is his history of German literature, *Geschichte der deutschen Literatur* (Berlin, 1883; 10th ed., 1905; English translation by Mrs F. C. Conybeare, 1883; new ed., 1906). This work is distinguished by the clearness with which details are co-ordinated with a general and comprehensive survey of German literature from the beginning to the death of Goethe. Besides many other philological treatises, Scherer wrote largely on Goethe (*Aus Goethes Frühzeit*

1879; *Aufsätze über Goethe*, 1886), and took an active part in the foundation of the Goethe archives at Weimar. A small treatise on *Poetik*, a biography of Karl Müllenhoff, and two volumes of *Kleine Schriften* were published after his death.

See V. Basch, *Wilhelm Scherer et la philologie allemande* (Paris, 1889), and the article by Eduard Schröder in *Allgemeine deutsche Biographie*.

SCHERR, JOHANNES (1817–1886), German man of letters and novelist, was born at Hohenrechberg in the kingdom of Württemberg on the 3rd of October 1817. After studying philosophy and history at the university of Tübingen (1837–1840), he became master in a school conducted by his brother Thomas in Winterthur. In 1843 he removed to Stuttgart, and, entering the political arena with a pamphlet *Württemberg im Jahr 1843*, was elected in 1848 a member of the Württemberg House of Deputies; became leader of the democratic party in south Germany and, in consequence of his agitation for parliamentary reform in 1849, was obliged to take refuge in Switzerland to avoid arrest. Condemned *in contumaciam* to fifteen years' hard labour, he established himself in Zurich as *Privatdozent* in 1850, but removed in 1852 to Winterthur. In 1860 he was appointed professor of history and Helvetian literature at the Polytechnicum in Zurich, in which city he died on the 21st of November 1886.

Scherr was a voluminous writer in the field of historical investigation into the civilization, literature, and manners and customs of his country. His works have largely a political bias, but are characterized by clearness of exposition and careful research. Noteworthy among his books are the following: *Geschichte der deutschen Kultur und Sitte* (1852–1853, new ed. 1897); *Schiller und seine Zeit* (1859, new ed. 1876); *Geschichte der deutschen Frauenwelt* (1860, 4th ed. 1879); *Allgemeine Geschichte der Literatur* (1851, 9th ed. 1895–1896); *Geschichte der englischen Literatur* (1854, 2nd ed. 1883); *Blücher, seine Zeit und sein Leben* (1862, 4th ed. 1887). Scherr also wrote the humorous *Sommertagebuch des weiland Dr Gastrosophiae, Jeremia Sauerampfer* (1873); as a novelist he published the historical novels, *Schiller* (1856), and *Michel, Geschichte eines Deutschen unserer Zeit* (1858) which have passed through several editions.

With the exception of some of his stories (*Novellenbuch*, 10 vols. 1873–1877) Scherr's works have not appeared in a collected edition.

SCHERZO (Italian for "a joke"), in music, the name given to a quick movement evolved from the minuet and used in the position thereof in the sonata forms. The term is occasionally applied otherwise, as a mere character name. Haydn first used it for a middle movement quicker than a minuet, in the comparatively early set of six quartets known sometimes (for that reason) as *Gli Scherzi*, and sometimes as the *Russian quartets* (Op. 33). He never used the term again, though his later minuets, especially those in the Salomon symphonies, and the last completed quartets (Op. 77), are in a very rapid *tempo* and on a larger scale than any of the earlier scherzos of Beethoven. Haydn wished to see the minuet made more worthy of its position in large sonata works; but he did not live to appreciate (though he might possibly have heard) the great scherzos of his pupil Beethoven, which brought the element of the sublime into what may be generically termed the dance movement of the sonata style.

With rare exceptions Beethoven not only retained the dance character in lively middle movements, but accentuated it to the utmost in terms of what we have elsewhere called "dramatic" as distinguished from "decorative" music. He took those features of minuet form and style which most contrast the minuet with the larger and more highly organized movements, and he devised a form that emphasized them as they have never been emphasized before or since. The distinctive external feature in the minuet and trio is the combination of melodic binary forms with an exact *da capo* of the minuet after the trio; no other movement in the sonata admitting of so purely decorative a symmetry. The form of Beethoven's typical scherzo purposely exaggerates this feature. Mozart had frequently enriched minuets by giving them two or even three trios, with the minuet *da capo* after each. Beethoven does not do this; for, the general structure and texture of his scherzos being more continuous and highly organized, the variety of themes thereby produced would tend to give the form an elaborate *rondo* character which would not have differentiated it sufficiently from finales. But after Beethoven's mature scherzo has run through the stages of scherzo, trio and scherzo *da capo*, it goes through the same trio and *da capo* again; and perhaps even tries to do so a third time, as if it could not find a way out, and is then playfully and abruptly stopped.

This form lends itself to high-spirited humour, and differentiates the scherzo from the more highly organized movements by dramatically emphasizing its formal and dancelike character. The earliest example is the seventh of the pianoforte *Bagatelles* (Op. 33) where its "round-and-round" effect is realized with a mastery which alone suffices to dispose of Thayer's belief that these bagatelles belong, in their finished form, to Beethoven's boyhood.[1] As a rule Beethoven did not find the pianoforte a favourable instrument for his characteristic scherzo style; and his only other typical examples for pianoforte are the second movements of the sonatas Op. 27, No. 1, and Op. 106 (in neither of which is the trio repeated) and the fifth of the Six Bagatelles Op. 126.

The scherzo of the Eroica symphony is too long for Beethoven to allow it to go twice round; and that of the 9th symphony is so enormous that the main body of the scherzo is like a complete first movement of a sonata, from which it differs only in its comparative uniformity of texture and its incessant onrush, which not even the startling measured pauses and the changes from 4-bar to 3-bar rhythm can really interrupt. Beethoven directs as many repetitions of its sub-sections as possible, and his coda consists of a most impressive attempt to begin the trio again, dramatically cut short. In the 4th, 6th and 7th symphonies, the great pianoforte trio in B flat (Op. 97) and the string quartets in E flat (Op. 74), F minor (Op. 95) and C sharp minor (Op. 131), the round-and-round form is developed to the utmost, though in performance the necessary repetitions are too often omitted where Beethoven has only indicated them by a direction instead of writing them in full. The scherzo of the C minor symphony was originally meant to go twice round; and a certain pair of superfluous bars, which caused controversy for thirty years after Beethoven's death, were due simply to traces of the difference between the *prima volta* and *seconda volta* being left in the score.

Beethoven also used other types of quick middle movement in the place of the scherzo. In one case, that of the second allegretto of the E flat trio (Op. 70, No. 2), the round-and-round form is developed to the utmost in an exceedingly luscious and placid movement, very remote from the fiery humours of his typical scherzo style.

Modern custom uses the name of scherzo as a mere technical term for quick middle movements, and in this sense we may speak of the second movement of Beethoven's F major string quartet (Op. 59, No. 1) as a unique example; it being a very highly developed application of binary form with the utmost humour and unexpectedness of detail and style. It is possible that this gigantic movement, occurring in a work which was an especial favourite of Mendelssohn's, may have been the inspiring source of the Mendelssohnian scherzo which is one of the most distinctive new types of sonata movement since Beethoven, and is independent of the notion of an alternating trio, whether in the single or the round-and-round form. The scherzos in Mendelssohn's *Midsummer Night's Dream* music, in the *Scotch Symphony* and in the string quartets in E minor and E flat major (Op. 44, Nos. 2 and 3) are splendid examples. Even Berlioz shows their influence at the height of his power, in the "Queen Mab" scherzo of his *Roméo et Juliette*. The round-and-round form has remained peculiar to Beethoven; perhaps because with the modern scherzo it would be too long, and because it is easier nowadays to manage a scherzo with two trios.

Of Brahms's scherzos there are many distinct types. His largest, such as that of the trio Op. 8, are greatly influenced by Beethoven; but there are several great quick movements in the usual form which are not called scherzos, and are as far from being jokes as is the third movement of Beethoven's F minor quartet. The third movement of Brahms's fourth symphony is perhaps the most gigantic scherzo since Beethoven's time. It lasts hardly seven minutes, but is a fully developed blend of rondo and first-movement forms, with a coda containing one of the greatest climaxes in symphonic art.

Chopin produced a new type of scherzo; independent of the sonata, but still in the quick triple time (one beat in a bar) which is Beethoven's typical scherzo rhythm. Chopin's form is traceable to the classical of scherzo and trio, and the style is dramatically capricious and romantic, but far too impressive to suggest humour. The same may be said of many classical scherzos, though Beethoven uses the title only where the humorous character of the movement lies on the surface. Even then Beethoven's only mature instances of the title (except in the form of *scherzando* as a mark of expression) are those of the Eroica symphony, the B flat trio Op. 97 and the B flat sonata Op. 106. It is, however, correct to call any energetic movement a scherzo when it occupies the position thereof in a sonata scheme. (D. F. T.)

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[1] The autograph date, 1783, tallies neither with the handwriting nor with the style, but it may well refer to the raw material. Beethoven sometimes kept back his ideas for thirty years before executing them.

SCHETKY, JOHN CHRISTIAN (1778–1874), Scottish marine painter, descended from an old Transylvanian family, was born in Edinburgh on the 11th of August 1778. He studied art under Alexander Nasmyth, and after having travelled on the continent he settled in Oxford, and taught for six years as a drawing-master. In 1808 he obtained a post in the military college, Great Marlow, and three years later he was appointed professor of drawing in the naval college, Portsmouth, where he had ample opportunities for the study of his favourite marine subjects. From 1836 to 1855 he held a similar professorship in the military college, Addiscombe. To the Royal Academy exhibitions he contributed at intervals from 1805 to 1872, and he was represented at the Westminster Hall competition of 1847 by a large oil-painting of the Battle of La Hogue. He was marine painter to George IV., William IV. and Queen Victoria. Among his published works are the illustrations to Lord John Manners's *Cruise in Scotch Waters*, and a volume of photographs from his pictures and drawings issued in 1867 under the title of *Veterans of the Sea*. One of his best works, the "Loss of the Royal George," painted in 1840, is in the National Gallery, London, and the United Service Club possesses another important marine subject from his brush. He died in London on the 28th of January 1874. A memoir by his daughter was published in 1877.

His younger brother, JOHN ALEXANDER SCHETKY (1785–1824), studied medicine in Edinburgh university and drawing in the Trustees' Academy. As a military surgeon he served with distinction under Lord Beresford in Portugal. He contributed excellent works to the exhibitions of the Royal Academy and of the Water-Colour Society, and executed some of the illustrations in Sir W. Scott's *Provincial Antiquities*. He died at Cape Coast Castle on the 5th of September 1824, when preparing to follow Mungo Park's route of exploration.

SCHEUCHZER, JOHANN JAKOB (1672–1733), Swiss *savant*, was born at Zürich on the 2nd of August 1672. The son of the senior town physician (or *Archiater*) of Zürich, he received his education in that place, and in 1692 went to the university of Altdorf near Nuremberg, being intended for the medical profession. Early in 1694 he took his degree of doctor in medicine at the university of Utrecht, and then returned to Altdorf to complete his mathematical studies. He went back to Zürich in 1696, and was made junior town physician (or *Poliater*), with the promise of the professorship of mathematics; this he obtained in 1710, being promoted to the chair of physics, with the office of senior town physician, in January 1733, a few months before his death on the 23rd of June.

His published works (apart from numerous articles) were estimated at thirty-four in number. His historical writings are mostly still in MS. The more important of his published writings relate either to his scientific observations (all branches) or to his journeys, in the course of which he collected materials for these scientific works. In the former category are his *Beschreibung der Naturgeschichte des Schweitzerlandes* (3 vols., Zürich, 1706–1708, the 3rd volume containing an account in German of his journey of 1705; a new edition of this book and, with important omissions, of his 1723 work, was issued, in 2 vols., in 1746, by J. G. Sulzer, under the title of *Naturgeschichte des Schweitzerlandes sammt seinen Reisen über die schweitzerischen Gebürge*), and his *Helvetiae historia naturalis oder Naturhistorie des Schweitzerlandes* (published in 3 vols., at Zürich, 1716–1718, and reissued in the same form in 1752, under the German title just given). The first of the three parts of the last-named work deals with the Swiss mountains (summing up all that was then known about them, and serving as a link between Simler's work of 1574 and Gruner's of 1760), the second with the Swiss rivers, lakes and mineral baths, and the third with Swiss meteorology and geology. Scheuchzer's works, as issued in 1746 and in 1752, formed (with Tschudi's *Chronicum Helveticum*) one of the chief sources for Schiller's play of *Wilhelm Tell* (1804). In 1704 Scheuchzer was elected a F.R.S.; he published many scientific notes and papers in the *Philosophical Transactions* for 1706–1707, 1709 and 1727–1728. In the second category are his *Itinera alpina tria* (made in 1702–1704), which was published in London in 1708, and dedicated to the Royal Society, while the plates illustrating it were executed at the expense of various fellows of the society, including the president, Sir Isaac Newton (whose *imprimatur* appears on the title-page), Hans Sloane, Dean Aldrich, Humfrey Wanley, &c. The text is written in Latin, as is that of the definitive work describing his travels (with which is incorporated the 1708 volume) that appeared in 1723 at Leiden, in four quarto volumes, under the title of *Itinera per Helvetiae alpinas regiones facta annis 1702–1711*. These journeys led Scheuchzer to almost every part of Switzerland, particularly its central and eastern districts. Apropos of his visit (1705) to the Rhone glacier, he inserts a full account of the other Swiss glaciers, as far as they were then known, while in 1706, after mentioning certain wonders to be seen in the museum at Lucerne, he adds reports by men of good faith who had seen dragons in Switzerland. He doubts their existence, but illustrates the reports by fanciful representations of dragons, which have led some modern writers to depreciate his merits as a traveller and naturalist, for the belief in dragons was then widely spread. In 1712 he published a map of Switzerland in four sheets (scale 1/290,000), of which the east portion (based on his personal observations) is far the most accurate, though the map as a whole was the best map of Switzerland till the end of the 18th century. At the end of his 1723 book he gives a full list (covering 27 4to pages) of his writings from 1694 to 1721.

See F. X. Hoeherl, *J. J. Scheuchzer, der Begründer d. phys. Geographie d. Hochgebirges* (Munich, 1901), a useful little pamphlet, conveniently summarizing Scheuchzer's scientific views. (W. A. B. C.)

SCHEVENINGEN, a fishing port and watering-place of Holland, on the North Sea, in the province of South Holland, about 2 m. N. of the Hague, with which it is connected by tramways. It is situated in the dunes at the extremity of the woods which separate it from the Hague. The development of Scheveningen as a fashionable seaside resort dates from modern times, but the fishing village is of ancient origin and once stood farther seaward. To prevent coast erosion a stone wall was built along the sea front in 1896–1900, and below this lies the fine sandy beach stretching for miles on either side. The first bathing establishment here dates from 1818, and was also the first in Holland. Overlooking the sea from the top of the dunes on either side are villas, hotels, and the pavilion (1826) belonging to the family of Prince von Wied. The costumes of the fishing community are picturesque, the men having silver buttons and wide trousers, the women wide skirts and brass helmets. There is a large harbour for the fishing fleet at the mouth of the Hague-Scheveningen canal. Among the historical memories associated with Scheveningen are the defeat of the combined French and English fleets by Admiral de Ruyter in 1673, and the flight and subsequent return of William I., king of the Netherlands, in 1813, at the beginning and end of the French occupation. This is commemorated by an obelisk (1865). The town has a rapidly growing population of about 23,000.

SCHIAPARELLI, GIOVANNI VIRGINIO (1835–1910), Italian astronomer and senator of the kingdom of Italy, was born on the 14th of March 1835 at Savigliano in Piedmont. He entered Turin university in 1850, and graduated in 1854. Two years later he went to Berlin to study astronomy under Encke, and in 1859 was appointed assistant observer at Pulkova, a post which he resigned in 1860 for a similar one at Brera, Milan. On the death of Francesco Carlini (b. 1783) in 1862, Schiaparelli succeeded to the directorship, a position which he held until 1900. He died at Milan on the 4th of July 1910.

Schiaparelli was primarily an observer—his first discovery was of the asteroid Hesperia in 1861—but he had also considerable mathematical gifts, as is shown in his treatment of orbital motions, published in 1864, and in other papers. His great contribution to astronomy dates from 1866, when he showed that meteors or shooting stars traverse space in cometary orbits, and, in particular, that the orbits of the Perseids and Comet III., 1862, and of the Leonids and Comet I., 1866, were practically the same. These discoveries, subsequently amplified in his *Le Stelle cadenti* (1873) and in his *Norme per le osservazioni dellestelle cadenti dei bolidi* (1896) gained for him the Lalande prize of the Academy of Sciences, Paris, in 1868, and the gold medal and foreign associateship of the Royal Astronomical Society in 1872. He next worked on the double stars, but his results have only been partially published. This labour was followed in

1877 by observations of the surface of Mars, whereon he detected, among other peculiar characters, certain streaky markings or *canali*, the nature and origin of which is still controversial (see MARS). Mercury and Venus were also studied, and he concluded that these planets rotated on their axes in the same time as they revolved about the sun; but these views are questioned. He also discussed many other problems, such as stellar distribution, the extent of the universe, &c., whilst at Brera. On his retirement he turned to the astronomy of the Hebrews and Babylonians; his earlier results are given in his *L' Astronomia nell' antico Testamento* (1903), a work which has been translated into English and German, whilst later ones are to be found in various journals, the last being in *Scientia* (1908).

SCHIAVONE, the Italian name of the basket-hilted sword of the 17th century, resembling what is erroneously called the "claymore" of modern Highland regiments. The "schiavone" was the sword of the Slavonic guards (*Schiavoni*) of the doges of Venice, whence the name (see SWORD).

SCHIAVONETTI, LUIGI (1765–1810), Italian engraver, was born at Bassano in Venetia on the 1st of April 1765. After having studied art for several years he was employed by Testolini, an engraver of very indifferent abilities, to execute imitations of Bartolozzi's works, which he passed off as his own. In 1790 Testolini was invited by Bartolozzi to join him in England, and, it having been discovered that Schiavonetti, who accompanied him, had executed the plates in question, he was employed by Bartolozzi and became an eminent engraver in both the line and the dot manner. Among his early works are four plates of subjects from the French Revolution, after Benazech. He also produced a "Mater Dolorosa" after Vandyck, and Michelangelo's cartoon of the "Surprise of the Soldiers on the Banks of the Arno." From 1805 to 1808 he was engaged in etching Blake's designs to Blair's *Grave*, which, with a portrait of the artist engraved by Schiavonetti after T. Phillips, R.A., were published in 1808. The etching of Stothard's "Canterbury Pilgrims" was one of his latest works, and on his death on the 7th of June 1810 the plate was taken up by his brother Niccolo, and finally completed by James Heath.

SCHICHAU, FERDINAND (1814–1896), German engineer and shipbuilder, was born at Elbing, where his father was a smith and ironworker, on the 30th of January 1814. He studied engineering at Berlin and then in England, and returning to Elbing in 1837 started works of his own, which from small beginnings eventually developed into an establishment employing some 8000 men. He began by making steam engines, hydraulic presses and industrial machinery, and, by concerning himself with canal work and river or coast improvement, came to the designing and construction of dredgers, in which he was the pioneer (1841), and finally to the building of ships.

His "Borussia," in 1855, was the first screw-vessel constructed in Germany. Schichau began to specialize in building torpedo-boats and destroyers (at first for the Russian government) at an early date. From 1873 he had the co-operation of Carl H. Ziese, who married his daughter. Ziese introduced compound engines into the first vessels built by Schichau for the German navy, the gunboats "Habicht" and "Möwe," launched in 1879, and also designed in 1881 the first triple-expansion machinery constructed on the continent, supplying these engines to the torpedo-boats built by Schichau for the German navy in 1884, the first of some 160 that by the year 1909 were provided for Germany out of the Elbing yards. Torpedo-boats were also built for China, Austria and Italy. Meanwhile Elbing had become insufficient for the increased output demanded. In 1889 Schichau established a floating dock and repairing shops at Pillau, and soon afterwards, by arrangement with the government, started a large shipbuilding yard at Danzig, for the purpose of constructing the largest ships of war and for the mercantile marine. He died on the 23rd of January 1896; but Ziese carried on the work, and not only made the Danzig yard the chief cradle of the new German fleet, rivalling the finest English establishments, but also largely developed the equipment at Elbing. The Schichau works have made the name of their originator to rank with that of Krupp.

SCHIEDAM, a town and river port of Holland, in the province of South Holland, on the Schie, near its confluence with the Maas, and a junction station 3 m. by rail and steam tramway W. of Rotterdam. Pop. (1905) 29,227. The public buildings of interest are the Groote or Janskerk, the old Roman Catholic church, the synagogue, the town-hall, the exchange, the concert-hall and a ruined castle. Schiedam is famous as the seat of a great gin manufacture, which, carried on in more than three hundred distilleries, gives employment besides to malt-factories, cooperages and cork-cutting establishments, and supplies grain refuse enough to feed about 30,000 pigs, as well as sufficient yeast to form an important article of export. Other industries include shipbuilding, glass-blowing and the manufacture of stearine candles.

SCHIEFNER, FRANZ ANTON (1817–1879), Russian linguist, was born at Reval, in Russia, on the 18th of July 1817. His father was a merchant who had emigrated from Bohemia. He was educated first at the Reval grammar school, matriculated at St Petersburg as a law student in 1836, and subsequently devoted himself at Berlin, from 1840 to 1842, exclusively to Eastern languages. On his return to St Petersburg in 1843 he was employed in teaching the classics in the First Grammar School, and soon afterwards received a post in the Imperial Academy, where in 1852 the cultivation of the Tibetan language and literature was assigned to him as his special function. Simultaneously he held from 1860 to 1873 the professorship of classical languages in the Roman Catholic theological seminary. From 1854 till his death he was an extraordinary member of the Imperial Academy. He visited England three times for purposes of research—in 1863, 1867 and 1878. He died on the 16th of November 1879.

Schiefner made his mark in literary research in three directions. First, he contributed to the *Memoirs* and *Bulletin* of the St Petersburg Academy, and brought out independently a number of valuable articles and larger publications on the language and literature of Tibet. He possessed also a remarkable acquaintance with Mongolian, and when death overtook him had just finished a revision of the New Testament in that language with which the British and Foreign Bible Society had entrusted him. Further, he was one of the greatest authorities on the philology and ethnology of the Finnic tribes. He edited and translated the great Finnic epic *Kalevala*; he arranged, completed and brought out in twelve volumes the literary remains of Alexander Castrén, bearing on the languages of the Samoyedic tribes, the Koibal, Karagass, Tungusian, Buryat, Ostiak and Kottic tongues, and prepared several valuable papers on Finnic mythology for the Imperial Academy. In the third place, he made himself the exponent of investigations into the languages of the Caucasus, which his lucid analyses placed within reach of European philologists. Thus he gave a full analysis of the Tush language, and in quick succession, from Baron P. Uslar's investigations, comprehensive papers on the Awar, Ude, Abkhasian, Tchetchenz, Kasi-Kumük, Hürkanian and Kürinian languages. He had also mastered Ossetic, and brought out a number of translations from that language, several of them accompanied by the original text.

SCHILL, FERDINAND BAPTISTA VON (1776–1809), Prussian soldier, was born in Saxony. Entering the Prussian cavalry at the age of twelve, he was still a subaltern of dragoons when he was wounded at the battle of Auerstädt. From that field he escaped to Kolberg, where he played a very prominent part in the celebrated siege of 1807, as the commander of a volunteer force of all arms. After the peace of Tilsit he was promoted major and given the command of a hussar regiment formed from his Kolberg men. In 1809 the political situation in Europe appeared to Schill to favour an attempt to liberate his country from the French domination. Leading out his regiment from Berlin under pretext of manœuvres, he raised the standard of revolt, and, joined by many officers and a company of light infantry, marched for the Elbe. At the village of Dodendorf (5th of May 1809) he had a brush with the Magdeburg garrison, but was soon driven northwards, where he hoped to find British support. The king of Prussia's proclamations prevented the patriots from receiving any appreciable assistance, and with little more than his original force Schill was surrounded by 5000 Danish and Dutch troops in the neighbourhood of Wismar. He escaped by hard fighting (action of Damgarten, 24th of May) to Stralsund, and attempted to put the crumbling fortifications in order. The Danes and Dutch soon hemmed him in, and by sheer numbers overwhelmed the defenders (May 31). Schill himself was killed. Some parties escaped to Prussia, where the officers were tried by court-martial, cashiered and imprisoned. A few escaped to Swinemünde, but the rest were either killed or taken. Handed over to the French, the soldiers were sent to the galleys, and the eleven officers shot at Wesel on the 16th of September. The body of Schill was buried at Stralsund, his head sent to Leiden, where it remained until 1837. Monuments were erected at Brunswick, Stralsund and Wesel, and the 1st Silesian *Leib*-Hussars have borne Schill's name since 1889.

See Haken, *Ferdinand von Schill* (Leipzig, 1824); Bärsch, *Ferdinand von Schill's Zug und Tod* (Leipzig, 1860), and *F. von Schill, ein Charakterbild* (Potsdam, 1860); Petrich, *Pommer'sche Lebensbilder*, vol. ii. (Stettin, 1884); Francke, *Aus Stralsunds Franzosenzeit* (1890).

SCHILLER, JOHANN CHRISTOPH FRIEDRICH VON (1759–1805), German poet, dramatist and philosopher, was born at Marbach on the Neckar, on the 10th of November 1759. His grandfather had been a baker in the village of Bittenfeld, near Waiblingen; his father, Johann Kaspar (1723–1796), was an army-surgeon, who had settled in Marbach and married the daughter of an innkeeper, Elisabeth Dorothea Kodweis (1732–1802). In 1757 Schiller's father again took service in the army and ultimately rose to the rank of captain. The vicissitudes of his profession entailed a constant change of residence; but at Lorch and at Ludwigsburg, where the family was settled for longer periods, the child was able to receive a regular education. In 1773 the duke Karl Eugen of Württemberg claimed young Schiller as a pupil of his military school at the "Solitude" near Ludwigsburg, where, instead of his chosen subject of study, theology, he was obliged to devote himself to law. On the removal of the school in 1775 to Stuttgart, he was, however, allowed to exchange this subject for the more congenial study of medicine. The strict military discipline of the school lay heavily on Schiller, and intensified the spirit of rebellion, which, nurtured on Rousseau and the writers of the *Sturm und Drang*, burst out in the young poet's first tragedy; but such a school-life had for a poet of Schiller's temperament advantages which he might not have known had he followed his own inclinations; and it afforded him glimpses of court life invaluable for his later work as a dramatist. In 1776 some specimens of Schiller's lyric poetry had appeared in a magazine, and in 1777–1778 he completed his drama, *Die Räuber*, which was read surreptitiously to an admiring circle of schoolmates. In 1780 he left the academy qualified to practise as a surgeon, and was at once appointed by the duke to an ill-paid post as doctor to a regiment garrisoned in Stuttgart. His discontent found vent in the passionate, unbalanced lyrics of this period. Meanwhile *Die Räuber*, which Schiller had been obliged to publish at his own expense, appeared in 1781 and made an impression on his contemporaries hardly less deep than Goethe's *Götz von Berlichingen*, eight years before. The strength of this remarkable tragedy lay, not in its inflated tone or exaggerated characterization—the restricted horizon of Schiller's school-life had given him little opportunity of knowing men and women—but in the sure dramatic instinct with which it is constructed and the directness with which it gives voice to the most pregnant ideas of the time. In this respect, Schiller's *Räuber* is one of the most vital German dramas of the 18th century. In January 1782 it was performed in the Court and National Theatre of Mannheim, Schiller himself having stolen secretly away from Stuttgart in order to be present. The success encouraged him to begin a new tragedy, *Die Verschwörung des Fiesco zu Genua*, and he edited a lyric *Anthologie auf das Jahr 1782*, to which he was himself the chief contributor. A second surreptitious visit to Mannheim came, however, to the ears of the duke, who was also irritated by a complaint from Switzerland about an uncomplimentary reference to Graubünden in *Die Räuber*. He had Schiller put under a fortnight's arrest, and forbade him to write any more "comedies" or to hold intercourse with any one outside of Württemberg. Schiller, embittered enough by the uncongenial conditions of his Stuttgart life, resolved on flight, and took advantage of some court festivities in September 1782 to put his plan into execution. He hoped in the first instance for material support from the theatre in Mannheim, and its intendant, W. H. von Dalberg; but nothing but rebuffs and disappointments were in store for him. He did not even feel secure against extradition in Mannheim, and after several weeks spent mainly in the village of Oggersheim, where his third drama, *Luise Millerin*, or, as it was subsequently renamed, *Kabale und Liebe*, was in great part written, he found a refuge at Bauerbach in Thuringia, in the house of Frau von Wolzogen, the mother of one of his former schoolmates. Here *Luise Millerin* was finished and *Don Carlos* begun. In July 1783 Schiller received a definite appointment for a year as "theatre poet" in Mannheim, and here both *Fiesco* and *Kabale und Liebe* were performed in 1784. Neither play is as spontaneous or inspired as *Die Räuber* had been; but both mark a steady advance in characterization and in the technical art of the playwright. *Kabale und Liebe*, especially, is an admirable example of that "tragedy of common life" which Lessing had introduced into Germany from England and which bulked so largely in the German literature of the later 18th century. In this drama Schiller's powers as a realistic portrayer of people and conditions familiar to him are seen to best advantage. Although Schiller failed to win an established position in Mannheim, he added to his literary reputation by his address on *Die Schaubühne als eine moralische Anstalt betrachtet* (1784), and by the publication of the beginning of *Don Carlos* (in blank verse) in his journal, *Die rheinische Thalia* (1785). He had also the opportunity of reading the first act of the new tragedy before the duke of Weimar at Darmstadt in December 1784, and, as a sign of favour, the duke conferred upon him the title of "Rat."

In April 1785 Schiller, whose position in Mannheim had, long before this, become hopeless, accepted the invitation of four unknown friends—C. G. Körner, L. F. Huber, and their *fiancées* Minna and Dora Stock—with whom he had corresponded, to pay a visit to Leipzig. He spent a happy summer mainly at Gohlis, near Leipzig, his jubilant mood being reflected in the *Ode an die Freude*; and in September of the same year he followed his new friend Körner to Dresden. As Körner's guest in Dresden and at Loschwitz on the Elbe, Schiller completed *Don Carlos*, wrote the dramatic tale, *Der Verbrecher aus Infamie* (later entitled *Der Verbrecher aus verlorener Ehre*, 1786) and the unfinished novel, *Der Geisterseher* (1789). The *Rheinische Thalia* was continued as the *Thalia* (1786–1791; in 1792, again renamed *Die neue Thalia*), and in this journal he published most of his writings at this time. Körner's interest in philosophy also induced Schiller to turn his attention to such studies, the first results of which he published in the *Philosophische Briefe* (1786). *Don Carlos*, meanwhile, appeared in book form in 1787, and added to Schiller's reputation as a poet. In adopting verse instead of prose as a medium of expression, Schiller showed that he was prepared to challenge comparison with the great dramatic poets of other times and other lands; but in seeking a model for this higher type of tragedy he unfortunately turned rather to the classic theatre of France than to the English drama which Lessing, a little earlier, had pronounced more congenial to the German temperament. The unwieldiness of the plot and its inconsistencies show, too, that Schiller had not yet mastered the new form of drama; but *Don Carlos* at least provided him with an opportunity of expressing ideas of political and intellectual freedom with which, as the disciple of Rousseau, he was in warm sympathy.

A new chapter in Schiller's life opened with his visit to Weimar in July 1787. Goethe was then in Italy, and the duke of Weimar was absent from Weimar; but the poet was kindly received by Herder and Wieland, by the duchess Amalie and other court notabilities. The chief attraction for Schiller was, however, Frau von Kalb with whom he had been passionately in love in Mannheim; but not very long afterwards he made the acquaintance at Rudolstadt of the family von Lengefeld, the younger daughter of which subsequently became his wife. Meanwhile the preparation for *Don Carlos* had interested Schiller in history, and in 1788 he published the first volume of his chief historical work, *Geschichte des Abfalls der vereinigten Niederlande von der spanischen Regierung*, a book which at once gave him a respected position among the historians of the 18th century. It obtained for him, on the recommendation of Goethe, a professorship in the university of Jena, and in November 1789 he delivered his inaugural lecture, *Was heisst und zu welchem Ende studiert man Universalgeschichte?* In February of the following year he married Charlotte von Lengefeld. Schiller's other historical writings comprise a *Sammlung historischer Memoires*, which he began to publish in 1790, and the *Geschichte des dreissigjährigen Krieges* (1791–1793). The latter work is more perfunctory in execution and written for a wider public than his first history, but the narrative is dramatic and vivid, the portraiture is sympathetic, and the historical events are interpreted by the light of the rationalistic optimism of the later 18th century.

Before, however, the *History of the Thirty Years' War* was finished, Schiller had turned from history to philosophy. A year after his marriage he had been stricken down by severe illness, from the effects of which he was never completely to recover; financial cares followed, which were relieved unexpectedly by the generosity of the hereditary prince of Holstein-Augustenburg and his minister, Graf Schimmelmann, who conferred upon him a pension of 1000 talers a year for three years. Schiller resolved to devote the leisure of these years to the study of philosophy. In the summer of 1790 he had lectured in Jena on the aesthetics of tragedy, and in the following year he studied carefully Kant's treatise on aesthetics, *Kritik der Urteilskraft*, which had just appeared and appealed powerfully to Schiller's mind. The influence of these studies is to be seen in the essays *Über den Grund unseres Vergnügens an tragischen Gegenständen* and *Über tragische Kunst* (1792), as well as in his correspondence with his friend Körner. Here Schiller arrives at his definition of beauty, as *Freiheit in der Erscheinung*, which, although it failed to remove Kant's difficulty that beauty was essentially a subjective conception, marked the beginning of a new stage in the history of German aesthetic theory. *Über Anmut und Würde*, published in 1793, was a further contribution to the elucidation and widening of Kant's theories; and in the eloquent *Briefe über die ästhetische Erziehung des Menschen* (1795), Schiller proceeded to apply his new standpoint to the problems of social and individual life. These remarkable letters were published in *Die Horen*, a new journal, founded in 1794, which was the immediate occasion for that intimate friendship with Goethe which dominated the remainder of Schiller's life. The two poets had first met in 1788, but at that time Goethe, fresh from Italy, felt little inclination towards the author of the turbulent dramas *Die Räuber*, *Kabale und Liebe* and *Don Carlos*. By degrees, however, Schiller's historical publications, and, in a higher degree, the magnificent poems, *Die Götter Griechenlands* (1788) and *Die Künstler* (1789), awakened Goethe's respect, and in 1794, when the younger poet invited Goethe to become a collaborator in the *Horen*, the latter responded with alacrity. In a very few weeks the two men had become friends. In the meantime a holiday in Schiller's Württemberg home had brought renewed health and vigour. An immediate outcome of the new friendship was Schiller's admirable essays, published in the *Horen* (1795–1796) and collected in 1800 under the title *Über naive und sentimentalische Dichtung*. Here Schiller applied his aesthetic theories to that branch of art which was most peculiarly his own, the art of poetry; it is an attempt to classify literature in accordance with an a priori philosophic theory of "ancient" and "modern," "classic" and "romantic," "naive" and "sentimental"; and it sprang from the need Schiller himself felt of justifying his own "sentimental" and "modern" genius with the "naive" and "classic" tranquillity of Goethe's. While Schiller's standpoint was too essentially that of his time to lay claim to finality, it is, on the whole, the most concise statement we possess of the literary theory which lay behind the classical literature of Germany.

For Schiller himself this was the bridge that led back from philosophy to poetry. Under Goethe's stimulus he won fresh laurels in that domain of philosophical lyric which he had opened with *Die Künstler*; and in *Das Ideal und das Leben*, *Die Macht des Gesanges*, *Würde der Frauen*, and *Der Spaziergang*, he produced masterpieces of reflective poetry which have not their equal in German literature. These poems appeared in the *Musenalmanach*, a new publication which Schiller began in 1796, the *Horen*, which had never met with the success it merited, coming to an end in 1797. In the *Musenalmanach* were also published the "Xenien" (1797), a collection of distichs by Goethe and Schiller, in which the two friends avenged themselves on the cavilling critics who were not in sympathy with them. The *Almanach* of the following year, 1798, was even more noteworthy, for it contained a number of Schiller's most popular ballads, "Der Ring des Polykrates," "Der Handschuh," "Ritter Toggenburg," "Der Taucher," "Die Kraniche des Ibykus" and "Der Gang nach dem Eisenhammer;" "Der Kampf mit dem Drachen" following in 1799, and "Das Lied von der Glocke" in 1800. As a ballad poet, Schiller's popularity has been hardly less great than as a dramatist; the bold and simple outline, the terse dramatic characterization appealed directly to the popular mind, which did not let itself be disturbed by the often artificial and rhetorical tone into which the poet falls. But the supreme importance of the last period of Schiller's life lay in the series of master-dramas which he gave to the world between 1799 and 1804. Just as *Don Carlos* had led him to the study of Dutch history, so now his occupation with the history of the Thirty Years' War supplied him with the theme of his trilogy of *Wallenstein* (1798–1799). The plan of *Wallenstein* was of long standing, and it was only towards the end, when Schiller realized the impossibility of saying all he had to say within five acts, that he decided to divide it into three parts, a descriptive prologue, *Wallensteins Lager*, and the two dramas *Die Piccolomini* and *Wallensteins Tod*. Without entirely breaking with the pseudo-classic method he had adopted in *Don Carlos*—the two lovers, Max Piccolomini and Thekla, are an obvious concession to the tradition of the French theatre—*Wallenstein* shows how much Schiller's art had benefited by his study of Greek tragedy; the fatalism of his hero is a masterly application of an antique motive to a modern theme. His whole conception of life and character had deepened since *Don Carlos*, and under the influence of Kant's philosophy the drama became the embodiment of ethical problems that are essentially modern. The success of *Wallenstein*, with which Schiller passed at once into the front rank of European dramatists, was so encouraging that the poet resolved to devote himself with redoubled ardour to dramatic poetry. Towards the end of 1799 he took up his residence permanently in Weimar, not only to be near his friend, but also that he might have the advantage of visiting regularly the theatre of which Goethe was director.

Wallenstein was followed in 1800 by *Maria Stuart*, a tragedy, which, in spite of its great popularity in and outside of Germany, was felt by the critics to follow too closely the methods of the lachrymose "tragedy of common life" to maintain a high position among Schiller's works. It is a serious flaw in the play that the fate of the heroine is virtually decided before the curtain rises, and the poet is obliged to create by theatrical devices the semblance of a tragic conflict which, in reality, does not exist. A finer production in every way is Schiller's "romantic tragedy," *Die Jungfrau von Orleans* (1801). The resplendent medieval colouring of the subject, the essentially heroic character of Joan of Arc, gave Schiller an admirable opportunity for the display of his rich imagination and rhetorical gifts; and by an ingenious alteration of the historical tradition, he was able to make the drama a vehicle for his own imperturbable moral optimism. In unity of style and in the high level of its dramatic diction, *Die Jungfrau von Orleans* is unsurpassed among Schiller's works. Between this drama and its successor, *Die Braut von Messina*, Schiller translated and adapted to his classic ideals Shakespeare's *Macbeth* (1801) and Gozzi's *Turandot* (1802). With *Die Braut von Messina* (1803) he experimented with a tragedy on purely Greek lines, this drama being as close an approximation to ancient tragedy as its medieval and Christian *milieu* permitted of. If the experiment cannot be regarded as successful, the fault lies in the difficulty of reconciling the artificial conventions of the Greek theatre, the chorus and the oracle—here represented by dreams and superstitions—with the point of view of the poet's own time. As far as the diction itself is concerned, the lyric outbursts of the chorus gave Schiller's genius an opportunity of which he was not slow to avail himself. In the poet's last completed drama, *Wilhelm Tell* (1804), he once more, as in *Wallenstein*, chose a historical subject involving wide issues. *Wilhelm Tell* is the drama of the Swiss people; its subject is less the personal fate of its hero than the struggle of a nation to free itself from tyranny. This is the reason for the epic breadth of the work, its picturesque and panoramic character. It also justifies the idealization of the hero, on the one hand, and, on the other, the introduction of episodes which have but little relation to his personal fate, or even put his character in a directly unfavourable light. *Wilhelm Tell* was an attempt to win for the German drama a new field, to widen the domain of dramatic poetry. Besides writing *Tell*, Schiller had found time in 1803 and 1804 to translate two French comedies by Picard, and to prepare a German version of Racine's *Phèdre*; and in the last months of his life he began a new tragedy, *Demetrius*, which gave every promise of being another step forward in his poetic achievement. But *Demetrius* remains a fragment of hardly two acts.

Schiller died at Weimar on the 9th of May 1805. His last years were darkened by constant ill-health; and indeed it is marvellous that he was able to achieve so much. A visit to Leipzig in 1801, and to Berlin—where there was some prospect of his being invited to settle—in 1804, were the chief outward events of his later years. He was ennobled in 1802, and in 1804 the duke of Weimar, unwilling to lose him, doubled his meagre salary of 400 talers. Schiller's art, with its broad, clear lines, its unambiguous moral issues and its enthusiastic optimism, has appealed with peculiar force to the German people, especially in periods of political despondency. But since the re-establishment of the German empire in 1871 there has been, at least in intellectual circles, a certain waning of his popularity, the Germans of to-day realizing that Goethe more fully represents the aspirations of the nation. In point of fact, Schiller's genius lacks that universality which characterizes Goethe's; as a dramatist, a philosopher, an historian, and a lyric poet, he was the exponent of ideas which belong rather to the Europe of the period before the French Revolution than to our time; we look to his high principles of moral conduct, his noble idealism and optimism, rather as the ideal of an age that has passed away than as the expression of the more material ambitions of the modern world.

The first edition of Schiller's *Sämtliche Werke* appeared in 1812–1815 in 12 vols. and was edited by Schiller's most intimate friend, C. G. Körner. Of the countless subsequent editions mention need only be made here of the *historisch-kritische Ausgabe* by K. Goedeke and others (15 vols., 1867–1876); the edition published by Hempel and edited by R. Boxberger and W. von Maltzahn (16 vols., 1868–1874); that in Kürschner's *Deutsche Nationalliteratur*, vols. 118-129 (1882–1890), edited by R. Boxberger and A. Birlinger; and the latest Cotta edition (*Säkularausgabe*), edited by E. von der Hellen and others (17 vols., 1904–1905). A critical edition of Schiller's *Briefe* was published by F. Jonas (7 vols.) in 1892–1896; the chief collections of his correspondence are: *Briefwechsel zwischen Schiller und Goethe* (1828–1829, edited by F. Muncker, 4 vols., 1893); *Briefwechsel zwischen Schiller und W. von Humboldt* (1830, edited by F. Muncker, 1893); *Schillers Briefwechsel mit Körner* (1847, edited by L. Geiger, 1893); *Schiller und Lotte* (1856, 4th ed. 1893); *Briefwechsel zwischen Schiller und Cotta*, ed. by W. Vollmer (1876).

The chief biographies of Schiller are the following: T. Carlyle, *Life of Friedrich Schiller* (1824, German translation with an introduction by Goethe, 1830); Caroline von Wolzogen, *Schillers Leben* (1830, 5th ed. 1876, cheap reprint, 1884); K. Hoffmeister, *Schillers Leben* (1838–1842); G. Schwab, *Schillers Leben* (1840, 2nd ed. 1844); E. Palleske, *Schillers Leben und Werken* (1858–1859, 14th ed. 1894, Eng. trans. 1885); H. Viehoff, *Schillers Leben* (1875, new ed. 1888); H. Düntzer, *Schillers Leben* (1881); J. Sime, *Schiller* (1882); R. Weltrich, *F. Schiller* (vol. i., 1890); O. Brahm, *Schiller* (vols. i.-ii., 1888–1892); J. Minor, *Schiller, sein Leben und seine Werke* (vols. i.-ii., 1890); J. Wychgram, *Schiller* (1895, 3rd ed. 1898, popular ed. 1905); O. Harnack, *Schiller* (1898, 2nd ed. 1905); L. Bellermann, *Schiller* (1901); C. Thomas, *Life and Works of Schiller* (1901); K. Berger, *Schiller* (vol. i., 1905); E. Kühnemann, *Schiller* (1905). See also E. Boas, *Schillers Jugendjahre* (1856); E. Müller, *Schillers Mutter* (1894); by the same, *Schillers Jugenddichtung und Jugendleben* (1896); A. Streicher, *Schillers Flucht von Stuttgart* (1836, reprint, 1905); E. Müller, *Regesten zu Schillers Leben und Werken* (1900); A. Kontz, *Les Drames de la jeunesse de Schiller* (1899); E. Kühnemann, *Kants und Schillers Begründung der Ästhetik* (1895); V. Basch, *La Poétique de Schiller* (1902); K. Tomaschek, *Schiller in seinem Verhältnisse zur Wissenschaft* (1862); F. Überweg, *Schiller als Historiker und Philosoph* (1884); O. Harnack, *Die klassische Ästhetik der Deutschen* (1892); W. Fielitz, *Studien zu Schillers Dramen* (1876); L. Bellermann, *Schillers Dramen: Beiträge zu ihrem Verstandnis* (2 vols., 1888–1891; 2nd ed. 1898); K. Werder, *Vorlesungen über Schillers Wallenstein* (1889); A. Köster, *Schiller als Dramaturg* (1891); L. Belling, *Schillers Metrik* (1883); K. Fischer, *Schiller-Schriften* (1891–1892); J. W. Braun, *Schiller im Urteile seiner Zeitgenossen* (3 vols., 1882); J. G. Robertson, *Schiller after a Century* (1905).

(J. G. R.)

SCHILTBERGER, JOHANN or **HANS** (1381–1440?), German traveller and writer, was born of a noble family in 1381 (May 9th?), probably at Hollern near Lohof, half way between Munich and Freising, on what was then a property of his family. In 1394 he joined the suite of Lienhart Richartinger, and went off to fight under Sigismund, king of Hungary (afterwards emperor), against the Turks on the Hungarian frontier. At the battle of Nicopolis (Sept. 28th, 1396) he was wounded and taken prisoner: when he had recovered the use of his feet, Sultan Bayezid I. (*Ilderim*) took him into his service as a runner (1396–1402). During this time he seems to have accompanied Ottoman troops to certain parts of Asia Minor and to Egypt. On Bayezid's overthrow at Angora (July 20th, 1402), Schiltberger passed into the service of Bayezid's conqueror Timur: he now appears to have followed *Themurlin* to Samarkand, and perhaps also to Armenia and Georgia. After Timur's death (February 17th, 1405) his German runner first became a slave of Shah Rukh, the ablest of Timur's sons; then of Miran Shah, a brother of Shah Rukh; then of Abu Bekr, a son of Miran Shah, whose camp roamed up and down Armenia. He next accompanied Chekre, a Tatar prince living in Abu Bekr's horde, on an excursion to Siberia, of which name Schiltberger gives us the first clear mention in west European literature. He also probably followed his new master in his attack on the Old Bulgaria of the middle Volga, answering to the modern Kazan and its neighbourhood. Wanderings in the steppe lands of south-east Russia; visits to Sarai, the old capital of the Kipchak Khanate on the lower Volga and to Azov or Tana, still a trading centre for Venetian and Genoese merchants; a fresh change of servitude on Chekre's ruin; travels in the Crimea, Circassia, Abkhasia and Mingrelia; and finally escape (from the neighbourhood of Batum) followed. Arriving at Constantinople, he there lay hid for a time; he then returned to his Bavarian home (1427) by way of Kilia, Akkerman, Lemberg, Cracow, Breslau and Meissen. After his return he became a chamberlain of Duke Albert III., probably receiving this appointment in the first instance before the duke's accession in 1438.

Schiltberger's *Reisebuch* contains not only a record of his own experiences and a sketch of various chapters of contemporary Eastern history, but also an account of countries and their manners and customs, especially of those countries which he had himself visited. First come the lands "this side" of Danube, where he had travelled; next follow those between the Danube and the sea, which had now fallen under the Turk; after this, the Ottoman dominions in Asia; last come the more distant regions of Schiltberger's world, from Trebizond to Russia and from Egypt to India. In this regional geography the descriptions of Brusa; of various west Caucasian and Armenian regions; of the regions around the Caspian, and the habits of their peoples (especially the *Red Tatars*); of Siberia; of the Crimea with its great Genoese colony at Kaffa (where he once spent five months); and of Egypt and Arabia, are particularly worth notice. His allusions to the Catholic missions still persisting in Armenia and in other regions beyond the Euxine, and to (non-Roman?) Christian communities even in the Great Tatary of the steppes are also remarkable. Schiltberger is perhaps the first writer of Western Christendom to give the true burial place of Mahomet at Medina: his sketches of Islam and of Eastern Christendom, with all their shortcomings, are of remarkable merit for their time: and he may fairly be reckoned among the authors who contributed to fix Prester John, at the close of the middle ages, in Abyssinia. His work, however, contains many inaccuracies; thus in reckoning the years of his service both with Bayezid and with Timur he unaccountably multiplies by two. His account of Timur and his campaigns is misty, often incorrect, and sometimes fabulous: nor can von Hammer's parallel between Marco Polo and Schiltberger be sustained without large reservations.

Four MSS. of the *Reisebuch* exist: (1) at Donaueschingen in the Fürstenberg Library, No. 481; (2) at Heidelberg, University Library, 216; (3) at Nuremberg, City Library, 34; (4) at St Gall, Monast. Library, 628 (all of 15th century, the last fragmentary). The work was first edited at Augsburg, about 1460; four other editions appeared in the 15th century, and six in the 16th; in the 19th the best were K. F. Neumann's (Munich, 1859), P. Bruun's (Odessa, 1866, with Russian commentary, in the *Records of the Imperial University of New Russia*, vol. i.), and V. Langmantel's (Tübingen, 1885); "Hans Schiltbergers Reisebuch," in the 172nd volume of the *Bibliothek des literarischen Vereins in Stuttgart*. See also the English (Hakluyt Society) version, *The Bondage and Travels of Johann Schiltberger* . . ., trans. by Buchan Telfer with notes by P. Bruun (London, 1879); von Hammer, "Berechtigung d. orientalischen Namen Schiltbergers," in *Denkschriften d. Königl. Akad. d. Wissenschaften* (vol. ix., Munich, 1823–1824); R. Röhricht, *Bibliotheca geographica Palaestinae* (Berlin, 1890, pp. 103-104); C. R. Beazley, *Dawn of Modern Geography*, iii. 356-378, 550, 555.

(C. R. B.)

SCHIMMEL, HENDRIK JAN (1825–   ), Dutch poet and novelist, was born on the 30th of June 1825, at 'S Graveland, in the province of North Holland, where his father was a notary and the burgomaster. From 1836 to 1842 Schimmel served in his father's office, and upon his death he was taken into the office of the agent of the Dutch Treasury in Amsterdam, exchanging in 1849 for a post with the Dutch Trading Company there. In 1863 he became a director of the Amsterdam Credit Association. His first volume of poems appeared in 1852; but it was as a writer of historical dramas in blank verse and one of the regenerators of the Dutch stage that his literary position was made. His finest production was *Struensee* (1868), which was preceded by *Napoleon Bonaparte* (1851) and *Juffrouw Serklaas* ("Mrs Serklaas," 1857). Among his other dramatic works may be mentioned *Joan Woutersz* (a drama, 1847), *Twee*

Tudors ("Two Tudors," 1847), *Gondelbald* (1848), *Schuld en Boete* ("Guilt and Retribution," a drama, 1852), *Het Kind van Staat* ("The State Child," a dramatic fragment, 1859); *Zege na Strijd* ("Struggle and Triumph," a drama, 1878). Schimmel's renderings of Casimir de la Vigne's *Louis XI.*, Geibel's *Sophonisbe*, and Ponsard's *Lucrèce* are also still acted in the Netherlands. His novels are distinguished by their vigorous style and able characterization. The earlier, better-known ones betray the writer's English proclivities. The plots of *Mary Hollis* (1860, 3 vols., English translation, London 1872, under the title of "Mary Hollis, a Romance of the Days of Charles II. and William, Prince of Orange," 3 vols.) and of *Mylady Carlisle* (1864, 4 vols.) are laid in England, whereas those of his *Sinjeur Semeyns* (1875, 3 vols.), a powerful picture of the terrible year 1672, and of *De Kapitein van de Lijfgarde* (1888, 3 vols., English adaptation, 1896, under the title of "The Lifeguardsman," 1 vol.), a continuation of "Master Semeyns," are almost entirely centred in Holland. He had many points of style and manner in common with Madame Bosboom-Toussaint, though both remained highly original in their treatment. Both finally reverted to essentially national subjects. To the earlier romances of Schimmel belong: *Bonaparte en zyn Tyd* ("Bonaparte and his Time," 1853), *De Eerste Dag eens Nieuwen Levens* ("The First Day of a New Life," 2 vols., 1855), *Sproken en Vertellingen* ("Legends and Tales," 1855), *Een Haagsche Joffer* ("A Hague Damsel," 1857), *De Vooravond der Revolutie* ("The Eve of the Revolution," 1866). Schimmel was an early collaborator of Potgieter on the *Gids* staff. His dramatic works appeared in a collected edition in 1885–1886 at Amsterdam (3 vols.), followed by a complete and popular issue of his novels (Schiedam, 1892).

SCHINKEL, KARL FRIEDRICH (1781–1841), German architect and painter, and professor in the academy of fine arts at Berlin from 1820, was born at Neuruppin, in Brandenburg, on the 13th of March 1781. He was a pupil of Friedrich Gilly, the continuation of whose work he undertook when his master died in 1800. In 1803 Schinkel went to Italy, returning to Berlin in 1805. The Napoleonic wars interfered seriously with his work as architect, so that he took up landscape painting, displaying a talent for the romantic delineation of natural scenery. In 1810 he drew a plan for the mausoleum of Queen Louise and in 1819 a brilliant sketch for the Berlin cathedral in Gothic style. From 1808 to 1814 he painted a number of dioramas for Gropins. From 1815 he devoted much time to scene painting, examples of his work being still in use in the royal theatres of Germany. Schinkel's principal buildings are in Berlin and its neighbourhood. His merits are, however, best shown in his unexecuted plans for the transformation of the Acropolis into a royal palace, for the erection of the Orianda Palace in the Crimea and for a monument to Frederick the Great. These and other designs may be studied in his *Sammlung architektonischer Entwürfe* (1820–1837, 3rd ed. 1857–1858) and his *Werke der höheren Baukunst* (1845–1846, new ed. 1874).

See the biographies by Kugler, Böttischer, Quast, H. Grimm, Waagen, Woetmann, Pecht, Dohme, and vol. xxviii. of the *Künstlermonographie*, by Ziller (Leipzig, 1897).

SCHIRMER, FRIEDRICH WILHELM (1802–1866), German landscape artist, was born in Berlin. As a youth he painted flowers in the royal porcelain factory; afterwards he became a pupil of F. W. Schadow in the Berlin Academy, but his art owed most to Italy. He went to Italy in 1827; his sojourn extended over three years; he became a disciple of his countryman Joseph Koch, who built historic landscape on the Poussins, and is said to have caught inspiration from Turner. In 1831 Schirmer established himself in Berlin in a studio with scholars from 1839 to 1865 he was professor of landscape in the academy.

Schirmer's place in the history of art is distinctive: his sketches in Italy were more than transcripts of the spots; he studied nature with the purpose of composing historic and poetic landscapes. On the completion of the Berlin Museum of Antiquities came his opportunity: upon the walls he painted classic sites and temples, and elucidated the collections by the landscape scenery with which they were historically associated. His supreme aim was to make his art the poetic interpretation of nature and he deemed technique secondary to conception. His pictures appeal to the mind by the ideas they embody, by beauty of form, harmony of line, significance of light and colour. In this constructional landscape German critics discover "motive," "inner meaning," "the subjective," "the ideal." And Schirmer thus formed a school.

SCHIRMER, JOHANN WILHELM (1807–1863), German landscape painter, was born at Jülich in Rhenish Prussia. This artist, a namesake of F. W. Schirmer, had a similar aim and career. He first was a student, and subsequently became a professor in the academy of Düsseldorf. In 1854 he was made director of the art school at Carlsruhe, where he died. He travelled and sketched in Italy, and aimed at historic landscape after the manner of the Poussins. His Biblical landscapes with figures are held in good esteem.

SCHISM, a division, especially used of a formal separation from a church or religious body, a sect, or church formed by such separation. The Greek σχίσμα, a cleft, split, from σχίζειν, to cleave, is used in the New Testament of an actual rent in a garment (Matt. ix. 16) and also several times of divisions or differences of opinion as to the teaching and message of Christ (John vii. 43) or of dissension in the church (1 Cor. xi. 18). In the early Christian Church, as defined by the Fathers, and later, the offence of "schism" is distinguished from that of "heresy"; it refers not to differences of belief or doctrine, but to the promotion, or the state, of divisions of organisation, and to the formation of bodies separate from the true church, or to dissensions and separations due to disputes over matters of discipline or authority (see HERESY). The dispute which led to the separation of the Latin and Greek Churches is known as the "Great Schism," and the division over the election to the Papacy of Urban VI. and Clement VII. as the "Great Schism of the West" (1378–1417) (see PAPACY and CHURCH HISTORY).

SCHISTS (Gr. σχίζειν, to split), in petrology, metamorphic rocks which have a fissile character. In all of them there is at least one mineral which crystallizes in platy forms (*e.g.* mica, talc, chlorite, haematite), or in long blades or fibres (anthophyllite, tremolite, actinolite, tourmaline), and, when these have a well marked parallel arrangement in definite bands or folia, the rock will break far more easily along the bands than across them. The platy minerals have also a perfect cleavage parallel to their flat surfaces, while the fibrous species often have two or more cleavages following their long axes; hence a schistose rock may split not only by separation of the mineral plates from one another but also by cleavage of the parallel minerals through their substance.

Schists in the common acceptance of that term are really highly crystalline rocks; fissile slates, shales or sandstones, in which the original sedimentary structures are little modified by recrystallization, are not included in this group by English petrologists, though the French *schistes* and the German *Schiefer* are used to designate also rocks of these types. The difference between schists and gneisses is mainly that the latter have less highly developed foliation; they also, as a rule, are more coarse grained, and contain far more quartz and felspar, two minerals which rarely assume platy or acicular forms, and hence do not lead to the production of a fissile character in the rocks in which they are important constituents. Schists, as a rule, are found in regions composed mainly of metamorphic rocks, such as the Central Alps, Himalayas, and other mountain ranges, Saxony, Scandinavia, the Highlands of Scotland and north-west of Ireland. They are typical products of "regional" metamorphism, and are in nearly all cases older than the fossiliferous sedimentary rocks. Transitions between schists and normal igneous or sedimentary rocks are often found. The Silurian mica-schists of Bergen in Norway are fossiliferous; in the Alps it is believed that even Mesozoic rocks pass laterally into mica-schists and calc-schists. These changes are regarded as having been produced by the operation of heat, pressure and folding. It is often taught that gneisses are the further stages of the crystallization of schists and belong to a deeper zone where the pressures and the temperatures were greater. Igneous rocks also may be converted readily into schists (*e.g.* serpentine into talc-schist, dolerite into hornblende-schist) by the same agencies.

There are two great groups of schists, viz. those derived from sedimentary and those derived from igneous rocks, or, as they have been called, the "paraschists" and the "orthoschists." The first group is the more important and includes some of the commonest metamorphic rocks. In the paraschists, though fossils are exceedingly rare, sedimentary structures such as bedding and the alternation of laminae of fine and coarse deposit may frequently be preserved. The foliation is often parallel to the bedding, but may cross it obliquely or at right angles; or the bedding may be folded and contorted while the foliation maintains a nearly uniform orientation. When the foliation is undulose or sinuous the rocks are said to be crumpled, and have wavy splitting surfaces instead of nearly plane ones. The development of foliation in shaly rocks is undoubtedly closely akin to the production of cleavage in slates.

The sedimentary schists or paraschists have three great subdivisions, the mica-schists and chlorite-schists (which correspond in a general way to shales or clay rocks) the calc-schists (impure limestones) and the quartz-schists (metamorphosed sandstones). In the mica-schists of this group biotite or muscovite may be the principal mineral and often both are present in varying proportions; the mica has developed from the argillaceous matter of the original rock; in addition there is always quartz and sometimes felspar (albite or oligoclase). A large number of minerals may occur as accessories, *e.g.* garnet, tourmaline, staurolite, andalusite, actinolite, chloritoid or ottrelite, epidote, haematite, and if any of these is abundant its presence may be indicated by the name given the rock, *e.g.* staurolite-mica-schist. The phyllites (*q.v.*) form a middle term between this group and the slates; they consist usually of quartz, white mica and chlorite, and have much of the foliation and schistosity of the mica-schists. Those rocks which contain andalusite and staurolite are sometimes found in such associations as show that they are due to contact action by intrusive igneous masses. The chlorite-schists are often of igneous derivation, such as ash-beds or fine lavas which have been metamorphosed. Many of them contain large octahedra of magnetite. Others are probably sedimentary rocks, especially those which contain much muscovite. Calc-schists are usually argillaceous limestones in which a large development of biotite or phlogopite has occasioned foliation. Often they contain quartz and felspar, sometimes pyroxene, amphibole, garnet or epidote. Pure limestones do not frequently take on schistose facies. The quartz-schists consist of quartz and white mica, and are intimately related to quartzites. Many of them have been originally micaceous or felspathic sandstones. We may mention also graphitic-schists containing dark scaly graphite (often altered forms of carbonaceous shales), and haematite-schists which may represent beds of ironstone.

The orthoschists are white mica-schists produced by the shearing of acid rocks, such as felsite and porphyry. Some of the "porphyroids" which have grains of quartz and felspar in a finely schistose micaceous matrix are intermediate between porphyries and mica-schists of this group. Still more numerous are orthoschists of hornblendic character (hornblende-schists) consisting of green hornblende with often felspar, quartz and sphene (also rutile, garnet, epidote or zoisite, biotite and iron oxides). These are modified forms of basic rocks such as basalt, dolerite and diabase. Every transition can be found between perfectly normal ophitic dolerites and typical hornblende-schists, and occasionally the same dike or sill will provide specimens of all the connecting stages. A few hornblende-schists are metamorphosed gabbros; others have developed from dikes or sills of lamprophyre. Under extreme crushing these basic rocks may be converted into dark biotite-schists, or greenish chlorite-schists. Tremolite-schist and anthophyllite-schist are in nearly all cases the representatives of the ultra-basic igneous rocks such as peridotite in regions of high metamorphism. Talc-schists are of the same category. They are soft and lustrous, with a peculiarly smooth feel, and though often confounded with mica-schists may be distinguished by their richness in magnesia; many of them contain tremolite or actinolite; others have residual grains of olivine or augite; and here also every gradation can be found between the unmodified igneous types and the perfectly metamorphic schists. Occasionally serpentines become sheared without yielding talcose minerals; they are then known as serpentine-schist and antigorite-schist, the latter being tough leek-green rocks, more or less transparent.

SCHLAGINTWEIT, the name of five German scientific explorers or students of foreign countries. They were brothers, and were named HERMANN (1826–1882, who became known as Hermann von Schlagintweit Sakünlünski), ADOLF (1829–1857), EDUARD (1831–1866), ROBERT (1833–1885), and EMIL (1835–1904). Hermann was born at Munich on the 13th of May 1826. His first scientific labours were studies in the Alps, carried on between 1846 and 1848 in association with his brother Adolf (born at Munich on the 9th of January 1829). The publication of the *Untersuchungen über die physikalische Geographie der Alpen* in 1850 (Leipzig) founded the scientific reputation of the two brothers, and their reputation was increased by subsequent investigations in the same field, in which Robert (born at Munich on the 27th of October 1837) also took part. Soon after the publication of the *Neue Untersuchungen über die phys. Geog. u. Geol. der Alpen* (Leipzig, 1854), the three brothers received, on the recommendation of Alexander von Humboldt, a commission from the East India Company to travel for scientific purposes in their territory, and more particularly to make observations on terrestrial magnetism. During 1854–1857 they travelled, sometimes in company, sometimes separately, in the Deccan and in the region of the Himalayas, prosecuting their investigations beyond the frontiers of the company's territory into the region of the Karakorum and Kuen-lun mountains. Hermann and Robert were the first Europeans who crossed the Kuen-lun, and in honour of that achievement the former had the title or surname of Sakünlünski bestowed upon him (in 1864). Robert returned to Europe early in 1857; Hermann, after a visit to Nepal, joined him on his homeward journey; but Adolf, who remained to prosecute his explorations in Central Asia, was put to death by the amir of Kashgar on the 26th of August. Hermann and Robert published in four volumes the *Results of a Scientific Mission to India and High Asia* (Leipzig, 1860–1866). They had, moreover, made extensive ethnographical and natural history collections. Hermann spent the last years of his life chiefly in literary and scientific activity, partly at Munich, partly at the castle of Jägernburg near Forchheim. He died at Munich on the 19th of January 1882. Robert was appointed professor of geography at Giessen in 1863. He paid several visits to America, which furnished him with material for such works as *Die Pacific-Eisenbahn* (1870), *Die Mormonen* (1874), *Die Prärien* (1876), &c., all published at Cologne. He died at Giessen on the 6th of June 1885. Eduard, born on the 23rd of March 1831, killed in battle at Kissingen in 1866, made himself known by an account of the Spanish expedition to Morocco in 1859–1860. Emil, born on the 7th of July 1835, wrote several learned works relating to India and Tibet. He died on the 29th of October 1904.

SCHLAN (Czech, *Slaně*), a town of Bohemia, 37 m. N.W. of Prague by rail. Pop. (1900) 9491, mostly Czech. The most notable churches are St Gotthard (14th century, remodelled in 1782) St Mary, attached to the Piarist college (1655–1658), the chapel of St Lawrence (13th century) and the church of the Holy Trinity belonging to the Franciscan friary (1655). There are extensive coal-fields and important iron, metal and machine industries, together with the manufacture of chemicals and corn-milling.

Schlan—probably the name of a castle—occurs in documents of the 10th century. The town was probably founded in the 13th century by Ottakar II. In the Hussite wars it took the utraquist side, was occupied in 1420 by King Sigismund, but retaken the next year by the troops of Prague. These were expelled, in 1425, after a desperate resistance by the Taborites and Orphans. The town now remained faithful to the Taborite cause till its collapse in 1434. The place was re-fortified between 1460 and 1472. After the battle of the White Hill (1620), Schlan was granted to Jaroslaus Bořita of Martinic, lord of Smečno, whose descendants still own the lordship.

SCHLANGENBAD, a watering-place of Germany, in the Prussian province of Hesse-Nassau, pleasantly situated in a deep and well-wooded valley of the Taunus range, 6 m. N.W. of Wiesbaden, 4½ m. S. of Langenschwalbach, and 5 m. E. of Eltville on the Rhine, with which it is connected by a steam tramway. Its eight thermal springs are mostly used for bathing, and are efficacious in nervous complaints and feminine disorders. There is a handsome kursaal connected with the principal bathing establishment. Permanent population (1905) 400, while the number of visitors numbers about 2500 annually.

See Baumann, *Schlangenbad, mit besonderer Berücksichtigung seiner Kur- und Bade-Anstalten* (new ed., Wiesbaden, 1894); and Bertrand, *Schlangenbad und seine Warmquellen* (Heidelberg, 1878).

SCHLEGEL, AUGUST WILHELM VON (1767–1845), German poet, translator and critic, was born on the 8th of September, 1767, at Hanover, where his father, Johann Adolf Schlegel (1721–1793), was a Lutheran pastor. He was educated at the Hanover gymnasium and at the university of Göttingen. Having spent some years as a tutor in the house of a banker at

Amsterdam, he went to Jena, where, in 1796, he married Karoline, the widow of the physician Böhmer (see SCHELLING, KAROLINE) and in 1798 was appointed extraordinary professor. Here he began his translation of Shakespeare, which was ultimately completed, under the superintendence of Ludwig Tieck, by Tieck's daughter Dorothea and Graf W. H. Baudissin. This rendering is one of the best poetical translations in German, or indeed in any language. At Jena Schlegel contributed to Schiller's periodicals the *Horen* and the *Musenalmanach*; and with his brother Friedrich he conducted the *Athenaeum*, the organ of the Romantic school. He also published a volume of poems, and carried on a rather bitter controversy with Kotzebue. At this time the two brothers were remarkable for the vigour and freshness of their ideas, and commanded respect as the leaders of the new Romantic criticism. A volume of their joint essays appeared in 1801 under the title *Charakteristiken und Kritiken*. In 1802 Schlegel went to Berlin, where he delivered lectures on art and literature; and in the following year he published *Ion*, a tragedy in Euripidean style, which gave rise to a suggestive discussion on the principles of dramatic poetry. This was followed by *Spanisches Theater* (2 vols., 1803–1809), in which he presented admirable translations of five of Calderon's plays; and in another volume, *Blumenstraüsse italienischer, spanischer und portuguesischer Poesie* (1804), he gave translations of Spanish, Portuguese and Italian lyrics. In 1807 he attracted much attention in France by an essay in the French language, *Comparaison entre la Phèdre de Racine et celle d'Euripide*, in which he attacked French classicism from the standpoint of the Romantic school. His lectures on dramatic art and literature (*Über dramatische Kunst und Literatur*, 1809–1811), which have been translated into most European languages, were delivered at Vienna in 1808. Meanwhile, after a divorce from his wife Karoline, in 1804, he travelled in France, Germany, Italy and other countries with Madame de Staël, who owed to him many of the ideas which she embodied in her work, *De l'Allemagne*. In 1813 he acted as secretary of the crown prince of Sweden, through whose influence the right of his family to noble rank was revived. Schlegel was made a professor of literature at the university of Bonn in 1818, and during the remainder of his life occupied himself chiefly with oriental studies, although he continued to lecture on art and literature, and in 1828 he issued two volumes of critical writings (*Kritische Schriften*). In 1823–1830 he published the journal *Indische Bibliothek* (3 vols.) and edited (1823) the *Bhagavad-Gīta* with a Latin translation, and (1829) the *Rāmāyana*. These works mark the beginning of Sanskrit scholarship in Germany. After the death of Madame de Staël Schlegel married (1818) a daughter of Professor Paulus of Heidelberg; but this union was dissolved in 1821. He died at Bonn on the 12th of May 1845. As an original poet Schlegel is unimportant, but as a poetical translator he has rarely been excelled, and in criticism he put into practice the Romantic principle that a critic's first duty is not to judge from the standpoint of superiority, but to understand and to "characterize" a work of art.

In 1846–1847 Schlegel's *Sämtliche Werke* were issued in twelve volumes by E. Böcking. There are also editions by the same editor of his *Œuvres écrites en français* (3 vols., 1846), and of his *Opuscula Latine scripta* (1848). Schlegel's Shakespeare translations have been often reprinted; the edition of 1871–1872 was revised with Schlegel's MSS. by M. Bernays. See M. Bernays, *Zur Entstehungsgeschichte des Schlegelschen Shakespeare* (1872); R. Genée, *Schlegel und Shakespeare* (1903). Schlegel's Berlin lectures of 1801–1804 were reprinted from MS. notes by J. Minor (1884). A selection of the writings of both A. W. and Friedrich Schlegel, edited by O. F. Walzel, will be found in Kürschner's *Deutsche Nationalliteratur*, 143 (1892). See especially R. Haym, *Romantische Schule*, and the article in the *Allg. deutsche Biographie* by F. Muncker.

SCHLEGEL, JOHANN ELIAS (1719–1749), German critic and dramatic poet, was born at Meissen on the 28th of January 1719. He was educated at Schulpforta and at the university of Leipzig, where he studied law. In 1743 he became private secretary to his relative, von Spener, the Saxon ambassador at the Danish court. Afterwards he was made professor extraordinary at the academy of Seröe, where he died on the 13th of August 1749. Schlegel was a contributor to the *Bremer Beiträge* and for some time, while he was living in Denmark, edited a weekly periodical, *Der Fremde*. With his dramas as well as with his critical writings he did much to prepare the way for Lessing, by whom his genius was warmly appreciated. He wrote two lively and well-constructed comedies, *Der Triumph der guten Frauen* and *Die stumme Schönheit*, the former in prose, the latter in alexandrines. *Hermann* and *Canut* (in alexandrines) are generally considered his best tragedies.

His works were edited (in 5 vols., 1761–1770) by his brother, J. H. Schlegel (1724–1780), who had a considerable reputation as a writer on Danish history. Another brother, J. Adolf Schlegel (1721–1793), an eminent preacher, and author of some volumes of verse, was the father of August Wilhelm and Friedrich von Schlegel. J. E. Schlegel's *Ästhetische und dramaturgische Schriften* have been edited by J. von Antoniewicz (1887), and a selection of his plays by F. Muncker in *Bremer Beiträge*, vol. ii. (Kürschner's *Deutsche Nationalliteratur*, vol. xliv., 1899). See, besides the biography by his brother in the edition of his works, E. Wolff, *Johann Elias Schlegel* (1889); and J. Rentsch, *Johann Elias Schlegel als Trauerspieldichter* (1890).

SCHLEGEL, KARL WILHELM FRIEDRICH VON (1772–1829), German poet, critic and scholar, was the younger brother of August Wilhelm von Schlegel. He was born at Hanover on the 10th of March 1772. He studied law at Göttingen and Leipzig, but ultimately devoted himself entirely to literary studies. He published in 1797 the important book *Die Griechen und Römer*, which was followed by the suggestive *Geschichte der Poesie der Griechen und Römer* (1798). At Jena, where he lectured as a *Privatdozent* at the university, he contributed to the *Athenaeum* the aphorisms and essays in which the principles of the Romantic school are most definitely stated. Here also he wrote *Lucinde* (1799), an unfinished romance, which is interesting as an attempt to transfer to practical ethics the Romantic demand for complete individual freedom, and *Alarcos*, a tragedy (1802) in which, without much success, he combined romantic and classical elements. In 1802 he went to Paris, where he edited the review *Europa* (1803), lectured on philosophy and carried on Oriental studies, some results of which he embodied in an epoch-making book, *Über die Sprache und Weisheit der Indier* (1808). In the same year in which this work appeared, he and his wife Dorothea (1763–1839), a daughter of Moses Mendelssohn, joined the Roman Catholic Church, and from this time he became more and more opposed to the principles of political and religious freedom. He went to Vienna and in 1809 was appointed imperial court secretary at the headquarters of the archduke Charles. At a later period he was councillor of legation in the Austrian embassy at the Frankfort diet, but in 1818 he returned to Vienna. Meanwhile he had published his collected *Gedichte* (1809) and two series of lectures, *Über die neuere Geschichte* (1811) and *Geschichte der alten und neuen Literatur* (1815). After his return to Vienna from Frankfort he edited *Concordia* (1820–1823), and began the issue of his *Sämtliche Werke*. He also delivered lectures, which were republished in his *Philosophie des Lebens* (1828) and in his *Philosophie der Geschichte* (1829). He died on the 11th of January 1829 at Dresden. A permanent place in the history of German literature belongs to Friedrich Schlegel and his brother August Wilhelm as the critical leaders of the Romantic school, which derived from them most of its governing ideas as to the characteristics of the middle ages, and as to the methods of literary expression. Of the two brothers, Friedrich was unquestionably the more original genius. He was the real founder of the Romantic school; to him more than to any other member of the school we owe the revolutionizing and germinating ideas which influenced so profoundly the development of German literature at the beginning of the 19th century.

Friedrich Schlegel's wife, Dorothea, was the author of an unfinished romance, *Florentin* (1801), a *Sammlung romantischer Dichtungen des Mittelalters* (2 vols., 1804), a version of *Lother und Maller* (1805), and a translation of Madame de Staël's *Corinne* (1807–1808)—all of which were issued under her husband's name. By her first marriage she had a son, Philipp Veit, who became an eminent painter.

Friedrich Schlegel's *Sämtliche Werke* appeared in 10 vols. (1822–1825); a second edition (1846) in 15 vols. His *Prosaische Jugendschriften* (1794–1802) have been edited by J. Minor (1882, 2nd ed. 1906); there are also reprints of *Lucinde*, and F. Schleiermacher's *Vertraute Briefe über Lucinde, 1800* (1907). See R. Haym, *Die romantische Schule* (1870); I. Rouge, *F. Schlegel et la genèse du romantisme allemand* (1904); by the same, *Erläuterungen zu F. Schlegels Lucinde* (1905); M. Joachimi, *Die Weltanschauung der Romantik* (1905); W. Glawe, *Die Religion F. Schlegels* (1906); E. Kircher, *Philosophie der Romantik* (1906). On Dorothea Schlegel see J. M. Raich, *Dorothea von Schlegel und deren Söhne* (1881); F. Diebel, *Dorothea Schlegel als Schriftsteller im Zusammenhang mit der romantischen Schule* (1905).

SCHLEICHER, AUGUST (1821–1868), German philologist, was born at Meiningen on the 19th of February 1821, the son of a medical practitioner. He attended (1835–1840) the gymnasium at Coburg. In the autumn of 1840 he entered the university of Leipzig as a student of theology, but exchanged Leipzig in the spring of 1841 for Tübingen. Here he remained two years, and under the influence of the famous orientalist Ewald, relinquished the study of theology for that of languages. Proceeding to the university of Bonn in 1843, he took his doctor's degree in 1846 and established himself as *Privatdozent* for comparative philology. In 1850 he was appointed extraordinary professor of classical philology at the university of Prague, and in 1853 was advanced as ordinary professor to the chair of German and comparative philology and Sanskrit. While at Prague he commenced the study of Slavonic languages, and with the assistance of the Vienna academy of sciences undertook in 1852 a journey of scientific research into Prussian Lithuania, the fruits of which were the first scientific examination and description of the character of the Lithuanian language. In 1857 he became professor of philology at Jena, where he lived and worked until his death on the 6th of December 1868. Next to Franz Bopp (*q.v.*), the founder on the science of language, no German savant left a more enduring stamp of his personality upon this science than did Schleicher.

His first scientific work, *Zur vergleichenden Sprachgeschichte* (1848), was followed by *Die Sprachen Europas* (1850); but the book by which he is best known is *Kompendium der vergleichenden Grammatik der indogermanischen Sprachen* (2 pts., 1861, 1864; 4th ed., 1876), and a supplementary volume, *Indogermanische Chrestomathie* (1869). Among his minor writings are "Zur Morphologie der Sprache" (in the *Mémoires de l'académie de St. Pétersbourg*, 1859); *Die Darwinsche Theorie und die Sprachwissenschaft* (1863, new ed. 1873), *Über die Bedeutung der Sprache für die Naturgeschichte des Menschen* (1865); while in the department of Slavonic and Lithuanian languages the following may be mentioned: *Formenlehre der kirchenslavischen Sprache* (1852); *Handbuch der litauischen Sprache* (with grammar, reader and glossary, 1856–1857). Besides Lithuanian legends he published an edition of *Christian Donaleitis' Litauische Dichtungen* (1865).

See S. Lefmann, *August Schleicher* (1870) and *Zeitschrift für vergleichende Sprachforschung*, vol. xviii.

SCHLEIDEN, MATTHIAS JAKOB (1804–1881), German botanist, was born at Hamburg on the 5th of April 1804. He studied law at Heidelberg and practised as an advocate in Hamburg till 1831, but not succeeding he studied botany and medicine at Göttingen and Berlin, and in 1839 graduated at Jena, where he was appointed extraordinary professor of botany, becoming honorary professor in 1846 and ordinary professor in 1850. In 1863 he was called to Dorpat, but resigned the following year and returned to Germany, where he lived as a private teacher. He died at Frankfort-on-Main on the 23rd of June 1881. His title to remembrance is twofold. Uniting the labours of two centuries of workers in vegetable histology, he proved that a nucleated cell is the only original constituent of the plant embryo, and that the development of all vegetable tissues must be referred to such cells, thus preparing the way for the epoch-making cell theory of Theodor Schwann (*q.v.*); and his *Principles of Scientific Botany* (1842–1843), which went through several editions, did much to shake the tyranny of the purely systematic Linnean school, whose accumulations he was accustomed irreverently to describe as "hay." Despite a certain inability to criticize and verify his own hypotheses, he gave, both by his speculative activity and by the introduction of improved technical methods, so vivid an impulse to the younger botanists of his time as to have earned from Anton de Bary the title of reformer of scientific botany. His botanical labours practically ceased after 1850, when he entered on various philosophical and historical studies.

SCHLEIERMACHER, FRIEDRICH DANIEL ERNST (1768–1834), theologian and philosopher, was the son of a Prussian army chaplain of the Reformed confession, and was born on the 21st of November 1768 at Breslau. He was educated in a Moravian school at Niesky in upper Lusatia, and at Barby near Halle. Moravian theology, however, soon ceased to satisfy him, and his doubts rapidly took definite shape. Reluctantly his father gave him permission to leave Barby for the university of Halle, which had already (1787) abandoned pietism and adopted the rationalist spirit of Wolf and Semler (see RATIONALISM). As a student he pursued an independent course of reading and neglected to his permanent loss the study of the Old Testament and the Oriental languages. But he frequented the lectures of Semler and of J. A. Eberhard, acquiring from the former the principles of an independent criticism of the New Testament and from the latter his love of Plato and Aristotle. At the same time he studied with great earnestness the writings of Kant and Jacobi. He acquired thus early his characteristic habit of forming his opinions by the process of patiently examining and weighing the positions of all thinkers and parties. But with the receptivity of a great eclectic he combined the reconstructive power of a profoundly original thinker. While yet a student he began to apply ideas gathered from the Greek philosophers in a reconstruction of Kant's system. At the completion of his three years' course at Halle he was for two years private tutor in the family of Count Dohna-Schlobitten, developing in a cultivated and aristocratic household his deep love of family and social life. In 1796 he became chaplain to the Charité Hospital in Berlin. Having no scope for the development of his powers as a preacher, he sought mental and spiritual satisfaction in the cultivated society of Berlin, and in profound philosophical studies. This was the period in which he was constructing the framework of his philosophical and religious system. It was the period, too, when he made himself widely acquainted with art, literature, science and general culture. He was at that time profoundly affected by German Romanticism, as represented by his friend Friedrich Schlegel. Of this his *Confidential Letters* on Schlegel's *Lucinde* (*Vertrauten Briefe über Schlegel's "Lucinde,"* 1801; ed. 1835; by Jonas Fränkel, 1907; R. Frank, 1907), as well as his perilous relation to Eleonore Grunow, the wife of a Berlin clergyman, are proof and illustration. Though his ultimate principles were unchanged he gained much from the struggle. It showed him much of the inner truth of human feeling and emotion, and enriched his imagination and life with ideals ancient and modern, which gave elevation, depth and colour to all his thought. Meantime he studied Spinoza and Plato, and was profoundly influenced by both, though he was never a Spinozist; he made Kant more and more his master, though he departed on fundamental points from him, and finally remodelled his philosophy; with some of Jacobi's positions he was in sympathy, and from Fichte and Schelling he accepted ideas, which in their place in his system, however, received another value and import. The literary fruit of this period of intense fermentation and of rapid development was his "epoch-making" book, *Reden über die Religion* (1799; ed. Göttingen, 1906), and his "new year's gift" to the new century, the *Monologen* (1800; ed. 1902). In the first book he vindicated for religion an eternal place amongst the divine mysteries of human nature, distinguished it from all current caricatures of it and allied phenomena, and described the perennial forms of its manifestation and life in men and society, giving thereby the programme of his subsequent theological system. In the *Monologen* he threw out his ethical manifesto, in which he proclaimed his ideas as to the freedom and independence of the spirit, and as to the relation of the mind to the world of sense and imperfect social organizations, and sketched his ideal of the future of the individual and society.

From 1802 to 1804, Schleiermacher was pastor in the little Pomeranian town of Stolpe. These years were full of literary work, as well as rich in personal and moral progress. He relieved Friedrich Schlegel entirely of his nominal responsibility for the translation of Plato, which they had together undertaken (vols. 1–5, 1804–1810; 3rd ed., 1855–1861; vol. 6, *Repub.* 1828; 2nd ed., 1855–1862). At the same time another work, *Grundlinien einer Kritik der bisherigen Sittenlehre* (1803; 2nd ed. 1834), the first of his strictly critical and philosophical productions, occupied him. This work is a severe criticism of all previous moral systems, especially those of Kant and Fichte, Plato's and Spinoza's finding most favour; its leading principles are that the tests of the soundness of a moral system are the completeness of its view of the laws and ends of human life as a whole and the harmonious arrangement of its subject-matter under one fundamental principle; and, though it is almost exclusively critical and negative, the book announces clearly the division and scope of moral science which Schleiermacher subsequently adopted, attaching prime importance to a "Güterlehre," or doctrine of the ends to be obtained by moral action. But the obscurity of the style of the book as well as its almost purely negative results proved fatal to its immediate success. In 1804 Schleiermacher removed as university preacher and professor of theology to Halle, where he remained until 1807, and where he quickly obtained a reputation as professor and preacher, and exercised a powerful influence in spite of the contradictory charges of his being atheist, Spinozist and pietist. In this period he wrote his dialogue the *Weihnachtsfeier* (1806; 4th ed. 1850), a charming production, which holds a place midway between his *Reden* and his great dogmatic work, *Der christliche Glaube*, and presents in the persons of its speakers phases of his growing appreciation of Christianity as well as the conflicting elements of the theology of the period. After the battle of Jena he returned to Berlin (1807), was soon appointed pastor of the Trinity Church there, and the next year married the widow of his friend Willich. At the foundation of the Berlin university (1810), in which he took a prominent part, he was called to a theological chair, and soon became secretary to the Academy of Sciences. He was thus placed in a position suited to his powers and in domestic and social surroundings adapted to meet the wants of his rich nature. At the same time he approved himself in the pulpit and elsewhere as a large-hearted and fearless patriot in that time of national calamity and humiliation, acquiring a name and place in his country's annals with Arndt, Fichte, Stein and Scharnhorst. He took a prominent part too in the reorganization of the Prussian church, and became the most powerful advocate of the union of the Lutheran and Reformed divisions of German Protestantism. The twenty-four years of his professional career in Berlin were opened with his short but important outline of theological study (*Kurze Darstellung des theologischen Studiums*, 1811; 2nd ed. 1830), in which he sought to do for theology what he had done for religion in his *Reden*. While he preached every Sunday, he also gradually took up in his lectures in the university almost every branch of theology and philosophy—New Testament exegesis, introduction to and interpretation of the New Testament, ethics (both philosophic and Christian), dogmatic and practical theology, church history, history of philosophy, psychology, dialectics (logic and metaphysics), politics, pedagogy and aesthetics. His own materials for these lectures and his students' notes and reports of them are the only form in which the larger proportion of his works exist—a circumstance which has greatly increased the difficulty of getting a clear and harmonious view of fundamental portions of his philosophical and ethical system, while it has effectually deterred all but the most courageous and patient students from reading these posthumous collections. As a preacher he produced a powerful effect, yet not at all by the force of his oratory but by his intellectual strength, his devotional spirit and the philosophical breadth and unity of his thought. In politics he was an earnest friend of liberty and progress, and in the period of reaction which followed the overthrow of Napoleon he was charged by the Prussian government with "demagogic agitation" in conjunction with the great patriot Arndt. At the same time he prepared for the press his chief theological work *Der christliche Glaube nach den Grundsätzen der evangelischen Kirche* (1821–1822; 2nd ed., greatly altered, 1830–1831; 6th ed., 1884). The fundamental principle of this classical work is, that religious feeling, the sense of absolute dependence on God as communicated by Jesus Christ through the church, and not the creeds or the letter of Scripture or the rationalistic understanding, is the source and law of dogmatic theology. The work is therefore simply a description of the facts of religious feeling, or of the inner life of the soul in its relations to God, and these inward facts are looked at in the various stages of their development and presented in their systematic connexion. The aim of the work was to reform Protestant theology by means of the fundamental ideas of the *Reden*, to put an end to the unreason and superficiality of both supernaturalism and rationalism, and to deliver religion and theology from a relation of dependence on perpetually changing systems of philosophy. Though the work added to the reputation of its author, it naturally aroused the increased opposition of the theological schools it was intended to overthrow, and at the same time Schleiermacher's defence of the right of the church to frame its own liturgy in opposition to the arbitrary dictation of the monarch or his ministers brought upon him fresh troubles. He felt himself in Berlin more and more isolated, although his church and his lecture-room continued to be largely attended. But he prosecuted his translation of Plato and prepared a new and greatly altered edition of his *Christliche Glaube*, anticipating the latter in two letters to his friend Lücke (in the *Studien und Kritiken*, 1829), in which he defended with a masterly hand his theological position generally and his book in particular against opponents on the right and the left. The same year he lost his only son—a blow which, he said, "drove the nails into his own coffin." But he continued to defend his theological position against Hengstenberg's party on the one hand and the rationalists von Cölln and D. Schulz on the other, protesting against both subscription to the ancient creeds and the imposition of a new rationalistic formulary. In the midst of such labours, and enjoying still full bodily and mental vigour, he was carried off after a few days' illness by inflammation of the lungs, on the 12th of February 1834.

Philosophical System.—A great antithesis lies at the basis of all thought and life—that of the real and the ideal, of organism, or sense, and intellect. But the antithesis is not absolute, for in life and being both elements are united—though without its presence life and thought would be impossible. In the actual world the antithesis appears as reason and nature, in each of which, however, there is a combination of its two elements—the ideal and the real—the reason having a preponderance of the first and nature a preponderance of the second. At the basis of nature lies universal reason as its organizing principle, and when reason becomes a conscious power in man it finds itself in conflict as well as in harmony with external nature. The whole effort and end of human thought and action is the gradual reduction of the realm and the power of this antithesis in the individual, the race and the world. Though the antithesis is real and deep, the human mind cannot admit its absolute nature; we are compelled to suppose a transcendental reality or entity in which the real and the ideal, being and thought, subject and object, are one. Consciousness itself involves the union of the antithetic elements, and prior to moral action nature is found organized and reason manifested or symbolized therein. We are ourselves proofs of the unity of the real and the ideal, of thought and being, for we are both, our self-consciousness supplying the expression of the fact. As we have in ourselves an instance of the identity of thought and being, we must suppose a universal identity of the ideal and real behind the antithesis which constitutes the world. This supposition is the basis of all knowledge, for thought becomes knowledge only when it corresponds to being. The supposition may be called a belief, but it is so only in the sense in which belief appears in the religious department, where it is the ultimate ground of all action. The supposition is the basis of all ethics, for without the conviction of the correspondence of thought and reality action would be fruitless and in the end impossible. It is above all the substance of religious feeling, which is the immediate consciousness of the unity of the world, of the absolute oneness behind the infinite multiplicity of contrasts; indeed, it is the religious conviction of the unity which is the best guarantee of the truth of the suppositions of philosophy. It is "the religious consciousness of the unity of the intellectual and physical world in God" which is to overcome the scepticism of the critical philosophy. But, though this unity must be laid down as the basis of knowledge, it is absolute and transcendental. In contrast with the "world," as the totality of being in its differentiation, this absolute unity, or God, in whom the real as manifold, and the spirit as one, find their unifying base, by its very nature is unphenomenal, indefinable and inconceivable. The idea is outside the boundary of thought, though its necessary postulate, and it is no less inaccessible to religious feeling, though it is its life and soul. Neither member of the antithesis of the real and the ideal must be conceived as producing the other; they are both equally existent and equally constituent elements of the world; but in God they are one, and therefore the world must not be identified with Him. The world and God are distinct, but correlative, and neither can be conceived without the other. The world without God would be "chaos," and God without the world an empty "phantasm." But though God is transcendent and unknowable He is immanent in the world. In self-consciousness God is present as the basis of the unity of our nature in every transition from an act of knowledge to an act of will, and vice versa. As far as man is the unity of the real and the ideal, God is in him. He is also in all things, inasmuch as in everything the totality of the world and its transcendental basis is presupposed by virtue of their being and correlation. The unity of our personal life amidst the multiplicity of its functions is the symbol of God's immanence in the world, though we may not conceive of the Absolute as a person. The idea of the world as the totality of being is, like the correlative idea of God, only of regulative value; it is transcendent, as we never do more than make approaches to a knowledge of the sum of being. The one idea is the transcendental *terminus a quo* and the other the transcendental *terminus ad quem* of all knowledge. But though the world cannot be exhaustively known it can be known very extensively, and though the positive idea of God must always remain unattainable we are able to reject those ideas which involve a contradiction of the postulate of the Absolute. Thus the pantheistic and the theistic conceptions of God as the supreme power, as the first cause, as a person, are alike unallowable, since they all bring God within the sphere of antithesis and preclude His absolute unity. On the other hand, the world can be known as the realm of antithesis, and it is the correlative of God. Though He may not be conceived as the absolute cause of the world, the idea of absolute causality as symbolized in it may be taken as the best approximate expression of the contents of the religious consciousness. The unbroken connexion of cause and effect throughout the world becomes thus a manifestation of God. God is to be sought only in ourselves and in the world. He is completely immanent in the universe. It is impossible that His causality should have any other sphere than the world, which is the totality of being. "No God without a world, and no world without God." The divine omnipotence is quantitatively represented by the sum of the forces of nature, and qualitatively distinguished from them only as the unity of infinite causality from the multiplicity of its finite phenomena. Throughout the world—not excepting the realm of mind—absolute necessity prevails. As a whole the world is as good and perfect as a world could possibly be, and everything in it, as occupying its necessary place in the whole, is also good, evil being only the necessary limitation of individual being.

Schleiermacher's psychology takes as its basis the phenomenal dualism of the ego and the non-ego, and regards the life of man as the interaction of these elements with their interpenetration as its infinite destination. The dualism is therefore not absolute, and, though present in man's own constitution as composed of body and soul, is relative only even there. The ego is itself both body and soul—the conjunction of both constitutes it; our "organization" or sense nature has its intellectual element, and our "intellect" its organic element. There is no such thing as "pure mind" or "pure body." The one general function of the ego, thought, becomes in relation to the non-ego either receptive or spontaneous action, and in both forms of action its organic, or sense, and its intellectual energies co-operate; and in relation to man, nature and the universe the ego gradually finds its true individuality by becoming a part of them, "every extension of consciousness being higher life." The specific functions of the ego, as determined by the relative predominance of sense or intellect, are either functions of the senses (or organism) or functions of the intellect. The former fall into the two classes of feelings (subjective) and perceptions (objective); the latter, according as the receptive or the spontaneous element predominates, into cognition and volition. In cognition being is the object and in volition it is the purpose of thought: in the first case we receive (in our fashion) the object of thought into ourselves; in the latter we plant it out into the world. Both cognition and volition are functions of thought as well as forms of moral action. It is in those two functions that the real life of the ego is manifested, but behind them is *self-consciousness* permanently present, which is always both subjective and objective—consciousness of ourselves and of the non-ego. This self-consciousness is the third special form or function of thought—which is also called feeling and immediate knowledge. In it we cognize our own inner life as affected by the non-ego. As the non-ego helps or hinders, enlarges or limits, our inner life, we feel pleasure or pain. Aesthetic, moral and religious feelings are respectively produced by the reception into consciousness of large ideas—nature, mankind and the world; those feelings are the sense of being one with these vast objects. Religious feeling therefore is the highest form of thought and of life; in it we are conscious of our unity with the world and God; it is thus the sense of absolute dependence. Schleiermacher's doctrine of knowledge accepts the fundamental principle of Kant that knowledge is bounded by experience, but it seeks to remove Kant's scepticism as to knowledge of the *Ding an sich.* or *Sein*, as Schleiermacher's term is. The idea of knowledge or scientific thought as distinguished from the passive form of thought—of aesthetics and religion—is thought which is produced by all thinkers in the same form and which corresponds to being. All knowledge takes the form of the concept (*Begriff*) or the judgment (*Urtheil*), the former conceiving the variety of being as a definite unity and plurality, and the latter simply connecting the concept with certain individual objects. In the concept therefore the intellectual and in the judgment the organic or sense element predominates. The universal uniformity of the production of judgments presupposes the uniformity of our relations to the outward world, and the uniformity of concepts rests similarly on the likeness of our inward nature. This uniformity is not based on the sameness of either the intellectual or the organic functions alone, but on the correspondence of the forms of thought and sensation with the forms of being. The essential nature of the concept is that it combines the general and the special, and the same combination recurs in being; in being the system of substantial or permanent forms answers to the system of concepts and the relation of cause and effect to the system of judgments, the higher concept answering to "force" and the lower to the phenomena of force, and the judgment to the contingent interaction of things. The sum of being consists of the two systems of substantial forms and interactional relations, and it reappears in the form of concept and judgment, the concept representing being and the judgment being in action. Knowledge has under both forms the same object, the relative difference of the two being that when the conceptual form predominates we have speculative science and when the form of judgment prevails we have empirical or historical science. Throughout the domain of knowledge the two forms are found in constant mutual relations, another proof of the fundamental unity of thought and being or of the objectivity of knowledge. It is obvious that Plato, Spinoza and Kant had contributed characteristic elements of their thought to this system, and directly or indirectly it was largely indebted to Schelling for fundamental conceptions.

Ethics.—Next to religion and theology it was to the moral world, of which, indeed, the phenomena of religion and theology were in his systems only constituent elements, that he specially devoted himself. In his earlier essays he endeavoured to point out the defects of ancient and modern ethical thinkers, particularly of Kant and Fichte, Plato and Spinoza only finding favour in his eyes. He failed to discover in previous moral systems any necessary basis in thought, any completeness as regards the phenomena of moral action, any systematic arrangement of its parts and any clear and distinct treatment of specific moral acts and relations. His own moral system is an attempt to supply these deficiencies. It connects the moral world by a deductive process with the fundamental idea of knowledge and being; it offers a view of the entire world of human action which at all events aims at being exhaustive; it presents an arrangement of the matter of the science which tabulates its constituents after the model of the physical sciences; and it supplies a sharply defined treatment of specific moral phenomena in their relation to the fundamental idea of human life as a whole. Schleiermacher defines ethics as the theory of the nature of the reason, or as the scientific treatment of the effects produced by human reason in the world of nature and man. As a theoretical or speculative science it is purely descriptive and not practical, being correlated on the one hand to physical science and on the other to history. Its method is the same as that of physical science, being distinguished from the latter only by its matter. The ontological basis of ethics is the unity of the real and the ideal, and the psychological and actual basis of the ethical process is the tendency of reason and nature to unite in the form of the complete organization of the latter by the former. The end of the ethical process is that nature (*i.e.* all that is not mind, the human body as well as external nature) may become the perfect symbol and organ of mind. Conscience, as the subjective expression of the presupposed identity of reason and nature in their bases, guarantees the practicability of our moral vocation. Nature is preordained or constituted to become the symbol and organ of mind, just as mind is endowed with the impulse to realize this end. But the moral law must not be conceived under the form of an "imperative" or a "*Sollen*"; it differs from a law of nature only as being descriptive of the fact that it ranks the mind as conscious will, or *zweckdenkend*, above nature. Strictly speaking, the antitheses of good and bad and of free and necessary have no place in an ethical system, but simply in history, which is obliged to compare the actual with the ideal, but as far as the terms "good" and "bad" are used in morals they express the rule or the contrary of reason, or the harmony or the contrary of the particular and the general. The idea of "free" as opposed to necessary expresses simply the fact that the mind can propose to itself ends, though a man cannot alter his own nature. In contrast to Kant and Fichte and modern moral philosophers

Schleiermacher reintroduced and assigned pre-eminent importance to the doctrine of the *summum bonum*, or highest good. It represents in his system the ideal and aim of the entire life of man, supplying the ethical view of the conduct of individuals in relation to society and the universe, and therewith constituting a philosophy of history at the same time. Starting with the idea of the highest good and of its constituent elements (*Güter*), or the chief forms of the union of mind and nature, Schleiermacher's system divides itself into the doctrine of moral ends, the doctrine of virtue and the doctrine of duties; in other words, as a development of the idea of the subjection of nature to reason it becomes a description of the actual forms of the triumphs of reason, of the moral power manifested therein and of the specific methods employed. Every moral good or product has a fourfold character: it is individual and universal; it is an organ and symbol of the reason, that is, it is the product of the individual with relation to the community, and represents or manifests as well as classifies and rules nature. The first two characteristics provide for the functions and rights of the individual as well as those of the community or race. Though a moral action may have these four characteristics at various degrees of strength, it ceases to be moral if one of them is quite absent. All moral products may be classified according to the predominance of one or the other of these characteristics. Universal organizing action produces the forms of intercourse, and universal symbolizing action produces the various forms of science; individual organizing action yields the forms of property and individual symbolizing action the various representations of feeling, all these constituting the relations, the productive spheres, or the social conditions of moral action. Moral functions cannot be performed by the individual in isolation but only in his relation to the family, the state, the school, the church, and society—all forms of human life which ethical science finds to its hand and leaves to the science of natural history to account for. The moral process is accomplished by the various sections of humanity in their individual spheres, and the doctrine of virtue deals with the reason as the moral power in each individual by which the totality of moral products is obtained. Schleiermacher classifies the virtues under the two forms of *Gesinnung* and *Fertigkeit*, the first consisting of the pure ideal element in action and the second the form it assumes in relation to circumstances, each of the two classes falling respectively into the two divisions of wisdom and love and of intelligence and application. In his system the doctrine of duty is the description of the method of the attainment of ethical ends, the conception of duty as an imperative, or obligation, being excluded, as we have seen. No action fulfils the conditions of duty except as it combines the three following antitheses: reference to the moral idea in its whole extent and likewise to a definite moral sphere; connexion with existing conditions and at the same time absolute personal production; the fulfilment of the entire moral vocation every moment though it can only be done in a definite sphere. Duties are divided with reference to the principle that every man make his own the entire moral problem and act at the same time in an existing moral society. This condition gives four general classes of duty: duties of general association or duties with reference to the community (*Rechtspflicht*), and duties of vocation (*Berufspflicht*)—both with a universal reference, duties of the conscience (in which the individual is sole judge), and duties of love or of personal association. It was only the first of the three sections of the science of ethics—the doctrine of moral ends—that Schleiermacher handled with approximate completeness; the other two sections were treated very summarily. In his *Christian Ethics* he dealt with the subject from the basis of the Christian consciousness instead of from that of reason generally; the ethical phenomena dealt with are the same in both systems, and they throw light on each other, while the Christian system treats more at length and less aphoristically the principal ethical realities—church, state, family, art, science and society. Rothe, amongst other moral philosophers, bases his system substantially, with important departures, on Schleiermacher's. In Beneke's moral system his fundamental idea was worked out in its psychological relations.

Religious System.—From Leibnitz, Lessing, Fichte, Jacobi and the Romantic school he had imbibed a profound and mystical view of the inner depths of the human personality. The ego, the person, is an individualization of universal reason; and the primary act of self-consciousness is the first conjunction of universal and individual life, the immediate union or marriage of the universe with incarnated reason. Thus every person becomes a specific and original representation of the universe and a compendium of humanity, a microcosmos in which the world is immediately reflected. While therefore we cannot, as we have seen, attain the idea of the supreme unity of thought and being by either cognition or volition, we can find it in our own personality, in immediate self-consciousness or (which is the same in Schleiermacher's terminology) feeling. Feeling in this higher sense (as distinguished from "organic" sensibility, *Empfindung*), which is the minimum of distinct antithetic consciousness, the cessation of the antithesis of subject and object, constitutes likewise the unity of our being, in which the opposite functions of cognition and volition have their fundamental and permanent background of personality and their transitional link. Having its seat in this central point of our being, or indeed consisting in the essential fact of self-consciousness, religion lies at the basis of all thought and action. At various periods of his life Schleiermacher used different terms to represent the character and relation of religious feeling. In his earlier days he called it a feeling or intuition of the universe, consciousness of the unity of reason and nature, of the infinite and the eternal within the finite and the temporal. In later life he described it as the feeling of absolute dependence, or, as meaning the same thing, the consciousness of being in relation to God. In our consciousness of the world the feelings of relative dependence and relative independence are found; we are acted upon, but we also react. In our religious consciousness the latter element is excluded, and everything within and without us is referred to its absolute cause, that is, God. But, when we call this absolute cause God, the name stands solely as indicating the unknown *source* of our receptive and active existence; on the one hand it means that the world upon which we can react is not the source of the feeling, on the other, that the Absolute is not an object of thought or knowledge. This feeling of absolute dependence can arise only in combination with other forms of consciousness. We derive the idea of a totality by means of its parts, and the transcendental basis of being comes to us through the agency of individual phenomena. As in every affection of our being by individual phenomena we are brought into contact with the whole universe, we are brought into contact with God at the same time as its transcendental cause. This religious feeling is not knowledge in the strict sense, as it is purely subjective or immediate; but it lies at the basis of all knowledge. As immediate knowledge, however, it is no more than the consciousness of the unity of the world, a unity which can never be reached by human inquiry. Religious truths, such as the determination of all things by God, are simply the implications of the feeling of absolute dependence. While that feeling is the characteristic of religion generally, this assumes various forms as the religions of the world. The so-called natural as distinguished from positive religion, or the religion of reason, is a mere abstraction. All religions are positive, or their characteristics and value are mainly determined by the manner in which the world is conceived and imagined. But these varying conceptions with their religious meaning become religiously productive only in the souls of religious heroes, who are the authors of new religions, mediators of the religious life, founders of religious communities. For religion is essentially social. It everywhere forms churches, which are the necessary instruments and organs of its highest life. The specific feature of Christianity is its mediatorial element, its profound feeling of the striving of the finite individual to reach the unity of the infinite whole, and its conception of the way in which Deity deals with this effort by mediatorial agencies, which are both divine and human. It is the religion of mediatorial salvation, and, as Schleiermacher emphatically taught in his riper works, of salvation through the mediation of Christ; that is, its possessors are conscious of having been delivered by Jesus of Nazareth from a condition in which their religious consciousness was overridden by the sense-consciousness of the world and put into one in which it dominates, and everything is subordinated to it. The consciousness of being saved in this sense is now transmitted and mediated by the Christian church, but in the case of Jesus, its originator, it was an entirely new and original factor in the process of religious development, and in so far, like every new and higher stage of being, a supernatural revelation. It was at the same time a natural attainment, in as far as man's nature and the universe were so constituted as to involve its production. The appearance of the Saviour in human history is therefore as a divine revelation neither absolutely supernatural nor absolutely beyond reason, and the controversy of the 18th century between the rationalists and supernaturalists rests on false grounds, leads to wrong issues, and each party is right and wrong (see RATIONALISM). As regards Christian theology, it is not its business to formulate and establish a system of objective truth, but simply to present in a clear and connected form a given body of Christian faith as the contents of the Christian consciousness. Dogmatic theology is a connected and accurate account of the doctrine held at a particular time in a given section of the Christian church. But such doctrines as constitute no integral part of the Christian consciousness—*e.g.* the doctrine of the Trinity—must be excluded from the theological system of the evangelical theologian. As regards the relation of theology and philosophy, it is not one of dependence or of opposition on either side, but of complete independence, equal authority, distinct functions and perfect harmony. Feeling is not a mental function subordinate to cognition or volition, but of equal rank and authority; yet feeling, cognition and volition alike conduct to faith in the unknown Absolute, though by different paths and processes.

The marked feature of Schleiermacher's thought in every department is the effort to combine and reconcile in the unity of a system the antithetic conceptions of other thinkers. He is realistic and idealistic, individualistic and universalistic, monistic and dualistic, sensationalist and intellectualist, naturalist and supernaturalist, rationalist and mystic, gnostic and agnostic. He is the prince of the *Vermittler* in philosophy, ethics, religion and theology. But he does not seek to reconcile the antitheses of thought and being by weakening and hiding the points of difference; on the contrary, he brings them out in their sharpest outlines. His method is to distinctly define the opposing elements and then to seek their harmonious combination by the aid of a deeper conception. Apart from the positive and permanent value of the higher unities which he succeeds in establishing, the light and suggestiveness of his discussions and treatment of the great points at issue in all the principal fields of human thought, unsatisfactory as many of his positions may be considered, make him one of the most helpful and instructive of modern thinkers. And, since the focus of his almost universal thought and inquiry and of his rich culture and varied life was religion and theology, he must be regarded as the classical representative of modern effort to reconcile science and philosophy with religion and theology, and the modern world with the Christian church.

Schleiermacher's collected works were published in three sections: (1) Theological (11 vols.); (2) Sermons (10 vols., ed. 1873–1874, 5 vols.); (3) Philosophical and Miscellaneous (9 vols., Berlin, 1835–1864). His *Pädagogische Schriften* were separately published by Platz (3rd ed., 1902). Of lives of him the best are his own correspondence. *Aus Schleiermachers Leben in Briefen*, published by W. Dilthey (Berlin, 1858–1863, in 4 vols., Eng. trans. by Rowan); *Leben Schleiermachers* by Dilthey (vol. i., 1870, the period from 1768–1804); *Friedrich Schleiermacher, ein Lebens- u. Charakterbild*, by D. Schenkel (Elberfeld, 1868); a selection of the letters by M. Rade (Jena, 1906). See also E. von Willick, *Aus Schleiermachers Hause, Jugenderinnerungen seines Stiefsohnes* (1909). The accounts and critiques of his philosophy, ethics and theology are numerous; some of the most valuable are: J. Schaller, *Vorlesungen über Schleiermacher* (Halle, 1844); G. Weisenborn, *Darstellung und Kritik der Schleiermacher'schen Glaubenslehre* (1849); F. Vorländer, *Schleiermachers Sittenlehre* (Marburg, 1851); W. Bender, *Schleiermachers Theologie mit ihren philosophischen Grundlagen* (1876–1878); O. Ritschl, *Schleiermachers Stellung zum Christentum in seinen Reden über die Religion* (1888); and *Schleiermachers Theorie von der Frömmigkeit* (1897); O. Kirn, *Schleiermacher und die Romantik* (1895); H. Bleek, *Die Grundlagen der Christologie Schleiermachers* (1898); M. Fischer, *Schleiermacher* (1899); Lülmann, *Das Bild des Christentums bei den grossen deutschen Idealisten* (1901), and *Schleiermacher der Kirchenvater der 19. Jahrhunderts* (1907); Stephan, *Die Lehre Schleiermachers von der Erlösung* (1901); Theile, *Schleiermachers Theologie und ihre Bedeutung für die Gegenwart* (1903); G. Thimme, *Die religionsphilosophischen Prämissen der Schleiermacher'schen Glaubenslehre* (1901); H. Sueskind, *Der Einfluss Schellings auf die Entwicklung von Schleiermachers System* (1909): F. Kattenbusch, *Von Schleiermacher zu Ritschl* (1903); E. Cramaussel, *La Philosophie religieuse de Schleiermacher* (1909). See also the histories of philosophy and theology by Zeller, Ueberweg, Chalybäus, Dorner, Gass, Lichtenberger (Eng. trans., 1889), Pfleiderer (Eng. trans., 1890), and the articles in Herzog-Hauck's *Realencyk.* (O. Kirn), and *Allgem. deutsche Biog.* (W. Dilthey). (J. F. S.; X.)

SCHLEIZ, a town of Germany, second capital of the principality of Reuss, Younger Line, situated in a fertile district on the river Wiesenthal, 20 m. by rail N.W. of Plauen. Pop. (1905) 5577. It has a palace, with a chapel and a library, three churches, one of them containing the burial vaults of the princes, several educational establishments, and various small industries such as the manufacture of hosiery, toys, sweetmeats and lamps. It has a market for cattle and pigs.

Schleiz was originally a Slav settlement, but received civic privileges in 1359. There was a settlement of the Teutonic Order here, and for some years previous to 1848 the town was the capital of the small principality of Reuss-Schleiz. In the vicinity a battle was fought, on the 9th of October 1806, between the French and the Prussians.

See Alberti, *Aus vergangenen Tagen des Reussenlandes und der Stadt Schleiz* (Schleiz, 1896).

SCHLESWIG (Dan. *Slesvig*), a town of Germany, capital of the Prussian province of Schleswig-Holstein. It is situated at the west end of the long narrow arm of the sea called the Schlei, 30 m. to the N.W. of Kiel on the railway from Hamburg to Vamdrup, on the Danish frontier. Pop. (1905) 19,032. The town consists mainly of a single street, $3\frac{1}{2}$ m. long, forming a semicircle round the Schlei, and is divided into the old town (Altstadt), Holm, Lollfuss, and Friedrichsberg. The church of St Peter, erected about 1100 and renewed in the Gothic style in the 15th century, has a lofty steeple (365 ft.) and contains a very fine carved oak reredos by Hans Brüggemann, which is regarded as the most valuable work of art in Schleswig-Holstein. Between Friedrichsberg and Lollfuss on an island between the Schlei and Burg See is the old château of Gottorp, now used as barracks. The former commercial importance of the town has disappeared, and the Schlei now affords access to small vessels only. Fishing, tanning, flour-milling and brewing are the chief industries.

Schleswig (ancient forms *Sliesthorp*, *Sliaswic*, *i.e.* the town or bay of the Slia or Schlei) is a town of very remote origin, and seems to have been a trading place of considerable importance as early as the 9th century. It served as a medium of commercial intercourse between the North Sea and the Baltic, and was known to the Arabian geographers. The first Christian church in this district was built here by Ansgarius (d. 865), and it became the seat of a bishop about a century later. The town, which obtained civic rights in 1200, also became the seat of the dukes of Schleswig, but its commerce gradually dwindled owing to the rivalry of Lübeck, the numerous wars in which the district was involved, and the silting up of the Schlei. At the partition of 1544 the old château of Gottorp, originally built in 1160 for the bishop, became the residence of the Gottorp line of the Schleswig-Holstein family, which remained here till expelled by the Danish king Frederick IV. in 1713. From 1731 to 1846 it was the seat of the Danish governor of the duchies. In the wars of 1848 and 1864 Schleswig was an important strategical point on account of its proximity to the Dannewerk (*q.v.*) and was occupied by the different contending parties in turn. It has been the capital of Schleswig-Holstein since its incorporation by Prussia in 1864.

See Sach, *Geschichte der Stadt Schleswig* (Schleswig, 1875); and Jensen, *Schleswig und Umgebung* (Schleswig, 1905).

SCHLESWIG-HOLSTEIN, a province in the north-west of Prussia, formed out of the once Danish duchies of Schleswig, Holstein and Lauenburg, and bounded W. by the North Sea, N. by Denmark (Jutland), E. by the Baltic Sea, Lübeck and Mecklenburg, and S. by the lower course of the Elbe (separating it from Hanover). It thus consists of the southern half of the Cimbric peninsula, and forms the connecting link between Germany and Denmark. (For map, see DENMARK.) In addition to the mainland, which decreases in breadth from south to north, the province includes several islands, the most important being Alsen and Fehmarn in the Baltic, and Röm, Sylt and Föhr of the North Frisian chain in the North Sea. The total area of the province is 7338 sq. m., 450 of which belong to the small duchy of Lauenburg in the S.E. corner, while the rest are divided almost equally between Holstein to the south of the Eider and Schleswig to the north of it. From north to south the province is about 140 m. long, while its breadth varies from 90 m. in Holstein to 35 m. at the narrower parts of Schleswig.

Schleswig-Holstein belongs to the great North-German plain, of the characteristic features of which it affords a faithful reproduction in miniature, down to the continuation of the Baltic ridge or plateau by a range of low wooded hills skirting its eastern coast and culminating in the Bungsberg (538 ft.), a little to the north of Eutin. This hilly district contains the most productive land in the province, the soil consisting of diluvial drift or boulder clay. The central part of the province forms practically a continuation of the great Lüneburg Heath, and its thin sandy soil is of little use for cultivation. Along the west coast extends the "Marshland," a belt of rich alluvial soil formed by the deposits of the North Sea, and varying in breadth from 5 to 15 m. It is seldom more than a few feet above the sea-level, while at places it is below it, and it has consequently to be defended by an extensive system of dykes or embankments resembling those of Holland.

The more ancient geological formations are scarcely met with in Schleswig-Holstein. The contrast between the two coast-lines of the province is marked. The Baltic coast has generally steep well-defined banks and is irregular, being pierced by numerous long and narrow inlets (*Föhrden*) which often afford excellent harbours. The islands of Alsen and Fehmarn are separated from the coast by narrow channels. The North Sea coast is low and flat, and its smooth outline is interrupted only by the estuary of the Eider and the peninsula of Eiderstedt. Dunes or sand-hills, though rare on the protected mainland, occur on Sylt and other islands, while the small flat islands called *Halligen* are being washed away where not defended by dykes. The numerous islands on the west coast probably formed part of the peninsula at no remote period, and the sea between them and the mainland is shallow and full of sandbanks.

The climate of Schleswig-Holstein is mainly determined by the proximity of the sea, and the mean annual temperature, varying from 45° F. in the north to 49° F. in the south, is rather higher than is usual in the same latitude. Rain and fog are frequent, but the climate is on the whole healthy. The Elbe forms the southern boundary of Holstein for 65 m., but the only river of importance within the province is the Eider, which rises in Holstein, and after a course of 120 m. falls into the North Sea, forming an estuary 3 to 12 m. in breadth. It is navigable from its mouth as far as Rendsburg, which is on the Kaiser Wilhelm (Kiel-Elbe) canal, which intersects Holstein. There are numerous lakes in north-east Holstein, the largest of which are the Plöner See (12 sq. m.) and the Selenter See (9 sq. m.).

Of the total area of the province 57% is occupied by tilled land, 22% by meadows and pastures, and barely 7% by forests. The ordinary cereals are all cultivated with success and there is generally a considerable surplus for export. Rape is grown in the marsh lands and flax on the east coast, while large quantities of apples and other fruit are raised near Altona for the Hamburg and English markets. The marsh lands afford admirable pasture, and a greater proportion of cattle (65 per 100 inhabitants) is reared in Schleswig-Holstein, mainly by small owners, than in any other Prussian province. Great numbers of cattle are exported to England. The Holstein horses are also in request, but sheep-farming is comparatively neglected. Bee-keeping is a productive industry. The hills skirting the bays of the Baltic coast are generally pleasantly wooded, but the forests are nowhere of great extent except in Lauenburg. The fishing in the Baltic is productive; Eckernförde is the chief fishing station in Prussia. The oysters from the beds on the west coast of Schleswig are widely known under the misnomer of "Holstein natives." The mineral resources are almost confined to a few layers of rock-salt near Segeberg. The more important industrial establishments, such as iron foundries, machine works, tobacco and cloth factories, are mainly confined to the large towns, such as Altona, Kiel and Flensburg. The shipbuilding of Kiel and other seaports, however, is important; and lace is made by the peasants of north Schleswig. The commerce and shipping of Schleswig-Holstein, stimulated by its position between two seas, as well as by its excellent harbours and waterways, are much more prominent than its manufactures. Kiel is one of the chief seaports of Prussia, while oversea trade is also carried on by Altona and Flensburg. The main exports are grain, cattle, horses, fish and oysters, in return for which come timber, coal, salt, wine and colonial produce.

The population of the province in 1905 was 1,504,248, comprising 1,454,526 Protestants, 41,227 Roman Catholics and 3270 Jews. The urban and rural communities are in the proportion of 4 to 6. The great bulk of the Holsteiners and a large proportion of the Schleswigers are of genuine German stock, but of the 148,000 inhabitants in the north part of Schleswig 139,000 are Danish-speaking. Among the Germans the prevalent tongue is Low German, but the North Frisians on the west coast of Schleswig and the North Sea islands (about 19,000 in all) still speak a Frisian dialect, which, however, is dying out. The peninsula of Angeln, between the Gulf of Flensburg and the Schlei, is supposed to have been the original seat of the English, and observers profess to see a striking resemblance between this district and the counties of Kent and Surrey. The peasants of Dithmarschen in the south-west also retain many of their ancient peculiarities. The boundary between the Danish and German languages is approximately a line running from Flensburg south-west to Joldelund and thence north-west to Tondern and the North Sea coast; not more than 15% of the entire population of the province speak Danish as their mother-tongue, but the proportion is far larger for Schleswig alone, where there is also a considerable bilingual population. The chief educational institution in Schleswig-Holstein is the university of Kiel.

Schleswig is the official capital of the province, but Altona and Kiel are the largest towns, the latter being the chief naval station of Germany. Kiel and Friedrichsort are fortified, but the old lines of Düppel have been dismantled. The province sends 10 members to the Reichstag and 19 to the Prussian Abgeordnetenhaus (house of deputies). The provincial estates meet in Rendsburg.

For the history of the duchies of Schleswig and Holstein see SCHLESWIG-HOLSTEIN QUESTION below.

SCHLESWIG-HOLSTEIN QUESTION, the name given to the whole complex of diplomatic and other issues arising in the 19th century out of the relations of the two "Elbe duchies," Schleswig and Holstein, to the Danish crown on the one hand and the German Confederation on the other, which came to a crisis with the extinction of the male line of the reigning house of Denmark by the death of King Frederick VII. on the 15th of November 1863. The central question was whether the two duchies did or did not constitute an integral part of the dominions of the Danish crown, with which they had been more or less intimately associated for centuries. This involved the purely legal question, raised by the death of the last common male heir to both Denmark and the duchies, as to the proper succession in the latter, and the constitutional questions arising out of the relations of the duchies to the Danish crown, to each other, and of Holstein to the German Confederation. There was also the national question: the ancient racial antagonism between German and Dane, intensified by the tendency, characteristic of the 19th century, to the consolidation of nationalities. Lastly, there was the international question: the rival ambitions of the German powers involved, and beyond them the interests of other European states, notably that of Great Britain in preventing the rise of a German sea-power in the north.

To take the racial question first, from time immemorial the country north of the Elbe had been the battle-ground of Danes and Germans. Danish scholars point to the prevalence of Danish place-names[1] far southward into the German-speaking districts as evidence that at least the whole of Schleswig was at one time Danish; German scholars claim it, on the other hand, as essentially German. That the duchy of Schleswig, or South Jutland (Sönderjylland), had been from time immemorial a Danish fief was, indeed, not in dispute, nor was the fact that Holstein had been from the first a fief of the Germano-Roman Empire. The controversy in the 19th century raged round the ancient "indissoluble" union of the two duchies, and the inferences to be drawn from it; the "Eider Danes"[2] claimed Schleswig as an integral part of the Danish monarchy, which, on the principle of the union, involved the retention of Holstein also; the Germans claimed Holstein as a part of Germany and, therefore, on the same historic principle, Schleswig also. The history of the relations of Schleswig and Holstein thus became of importance in the practical political question.

Early history of the duchies.

Though the designation of Schleswig-Holstein, implying the fusion of the duchies of Schleswig and Holstein in a single Prussian province, only dates from 1866, the history of the duchies has since the 14th century been so closely interwoven that it is impossible to treat them separately. Something must, however, be said about their origins and their separate history up to the time of their first union under the Holstein counts.

Mark of Schleswig.

Countship of Holstein.

When it first appears in history South Jutland was inhabited by mingled Cimbri, Angles, Jutes and Frisians, upon whom the Danes exercised an unceasing pressure from the north. To the south of Schleswig what is now Holstein was inhabited mainly by Saxons, pressed upon from the east by the Wends and other Slavonic races. These Saxons were the last of their nation to submit to Charlemagne (804), who put their country under Frankish counts, the limits of the Empire being pushed in 810 as far as the Schlei in Schleswig. Then began the secular struggle between the Danish kings and the German emperors, and in 934 the German king Henry I. established the Mark of Schleswig (*Limes Danarum*) between the Eider and the Schlei as an outpost of Germany against the Danes. South of this raged the contest between Germans and Slavs. The latter, conquered and Christianized, rose in revolt in 983, after the death of the emperor Otto II., and for a while reverted to paganism and independence. The Saxon dukes, however, continued to rule central Holstein, and when Lothair of Süpplingenburg became duke of Saxony (1106), on the extinction of the Billung line, he invested Adolf I. of Schauenburg with the countship of Holstein. Adolf I.'s son, Adolf II. (1128–1164), succeeded in reconquering the Slavonic Wagri and founded the city and see of Lübeck to hold them in check. Adolf III. (d. 1225), his successor, received Dithmarschen in fee from the emperor Frederick I., but in 1203 the fortunes of war compelled him to surrender Holstein to Valdemar II. of Denmark, the cession being confirmed by the emperor Frederick II. in 1214 and the pope in 1217. Valdemar appointed Albert of Orlamünde his lieutenant in Holstein, and the Schleswig-Holstein question might have been thus early settled but for Valdemar's ill fortune in being taken prisoner in 1223. During his captivity Albert of Orlamünde was beaten at Mölln by Count Adolf III., to whom Valdemar restored his countship as the price of his own release. A papal dispensation from oaths taken under duress excused a new war; but Valdemar himself was beaten at Bornhövede on the 22nd of July 1227, and Holstein was permanently secured to the house of Schauenburg. After the death of Adolf IV.

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[1] *I.e.* place-names according to popular usage, not the official names given in German maps (*e.g.* Haderslev for Hadersleben). See *La Question du Slesvig*, p. 61 seq., "Noms de lieux."

[2] *I.e.* the party at Copenhagen which aimed at making the Eider, the southern boundary of Schleswig, the frontier of the Danish kingdom proper.

in 1261, Holstein was split up into several countships by his sons and grandsons; the lines of Kiel, Plön, Schauenburg-Pinneberg and Rendsburg.

Duchy of Schleswig or South Jutland.

The Constitutio Valdemariana, 1326.

Union of Schleswig and Holstein.

In 1232 King Valdemar II., who had retained the former German Mark north of the Eider, erected South Jutland (Schleswig) into a duchy for his second son, Abel. On the death of the latter's descendant, Duke Eric, in 1319, Christopher II. of Denmark attempted to seize the duchy, the heir of which, Valdemar V., was a minor; but Valdemar's guardian and uncle, Gerhard III. of Holstein-Rendsburg (1304–1340), surnamed "the Great" and a notable warrior, drove back the Danes and, Christopher having been expelled, succeeded in procuring the election of Valdemar to the Danish throne. His reward was the duchy of Schleswig and the famous charter, known as the *Constitutio Valdemariana*, which laid down the principle that the duchy of South Jutland was never to be incorporated in the kingdom of Denmark or ruled by the same sovereign (7 June 1326). Thus Schleswig and Holstein were for the first time united. The union was, indeed, as yet precarious. In 1330 Christopher II. was restored to his throne and Valdemar V. to his duchy, Gerhard having to be content with the reversion in the case of the duke dying without issue. Gerhard, however, was assassinated in 1340 by a Dane, and it was not till 1375, when the male lines both in the kingdom and the duchy became extinct by the deaths of King Valdemar IV. and Duke Valdemar V., that the counts of Holstein seized on their inheritance, assuming at the same time the style of "lords of Jutland." In 1386 Queen Margaret allowed their claim in return for the usual homage and promise of feudal service, and directed that one of their number should be elected duke of Schleswig. The choice fell on Gerhard VI., grandson of Gerhard III. of Rendsburg, who after the extinction of the line of Kiel (1390) obtained in 1403 the whole of the countship of Holstein, except the small Schauenburg territories. With this begins the history of the union of Schleswig and Holstein.

Gerhard VI. died in 1404, and soon afterwards war broke out between his sons and Eric of Pomerania, Margaret's successor on the throne of Denmark, who claimed South Jutland as an integral part of the Danish monarchy, a claim formally recognized by the emperor Sigismund in 1424.[1] It was not till 1440 that the struggle ended with the investiture of Count Adolf VIII., Gerhard's son, with the hereditary duchy of Schleswig by Christopher III. of Denmark. On the death of Christopher eight years later, Adolf's influence secured the election of his nephew Count Christian of Oldenburg to the vacant throne.

King-dukes of the Oldenburg line.

Charter of Ribe, 1460. The "indissoluble union."

Duchy of Holstein, 1472.

On the death of Adolf in 1459 without issue, King Christian I., though he had been forced to swear to the *Constitutio Valdemariana*, succeeded in asserting his claim to Schleswig in right of his mother, Adolf's sister. Instead of incorporating South Jutland with the Danish kingdom, however, he preferred to take advantage of the feeling of the estates in Schleswig and Holstein in favour of union to secure both countries. On Schleswig the Schauenburg counts had no claim; their election in Holstein would have separated the countries; and it was easy therefore for Christian to secure his election both as duke of Schleswig and count of Holstein (5 March 1460). The price he paid was a charter of privileges, issued first at Ribe and afterwards at Kiel, in which he promised to preserve the countries for ever as "one and indivisible," and conceded to the estates the right to refuse to elect as count and duke any Danish prince who should not undertake, on becoming king, to confirm their privileges. By these privileges the union between South Jutland and Holstein, established under the Schauenburg line, was officially recognized. For external affairs the two countries were to be regarded as one, the bishop of Lübeck and five "good men" elected by the estates of each country forming an advisory and executive council under the duke-count. For internal affairs duchy and county were to retain their separate estates and peculiar customs and laws. Above all, Holstein remained a German, Schleswig a Danish fief. The claims of the Schauenburg counts were surrendered for a money payment; it was not till 1640, however, that the extinction of their line brought Schauenburg itself to the Danish crown. Finally, in 1472 the emperor Frederick III. confirmed Christian I.'s overlordship over Dithmarschen, and erected Dithmarschen, Holstein and Stormarn into the duchy of Holstein.

Subdivision of the duchies.

On the death of King Frederick I. (1523–1533), under whom the Reformation had been introduced into the duchies,[2] occurred the first of several partitions of the inheritance of the house of Oldenburg; the elder son, Christian III., succeeding as king of Denmark, the younger, Adolphus (Adolf) I., founding the line of the dukes of Gottorp. In 1581 a further partition was made, by a compact signed at Flensburg, between King Frederick II. and his uncle Duke Adolphus I., under which the rights of overlordship in the various towns and territories of Schleswig were divided between them; the estates, however, remained undivided, and the king and duke ruled the country alternately. To make confusion worse confounded, Frederick II. in 1582 ceded certain lands in Hardersleben to his brother John, who founded the line of Schleswig-Sonderburg, and John's grandsons again partitioned this appanage, Ernest Günther (1609–1689), founding the line of Schleswig-Sonderburg-Augustenburg, and Augustus Philip (1612–1675) that of Schleswig-Beck-Glücksburg (known since 1825 as Holstein-Sonderburg-Glücksburg).

The dukes of Gottorp.

Meanwhile the Gottorp dukes were making themselves a great position in Europe. Frederick III., duke from 1616 to 1659, established the principle of primogeniture for his line, and the full sovereignty of his Schleswig dominions was secured to him by his son-in-law Charles X. of Sweden by the convention of Copenhagen (12 May 1658)[3] and to his son Christian Albert (d. 1694) by the treaty of Oliva, though it was not till after years of warfare that Denmark admitted the claim by the convention of Altona (30 June 1689). Christian Albert's son Frederick IV. (d. 1702) was again attacked by Denmark, but had a powerful champion in Charles XII. of Sweden, who secured his rights by the treaty of Travendal in 1700. Frederick was killed at the battle of Klissow in 1702, and his brother Christian Augustus acted as regent for his son Charles Frederick until 1718. In 1713 the regent broke the stipulated neutrality of the duchy in favour of Sweden and Frederick IV. of Denmark seized the excuse to expel the duke by force of arms. Holstein was restored to him by the peace of Frederiksborg in 1720, but in the following year Frederick IV. was recognized as sovereign of Schleswig by the estates and by the princes of the Augustenburg and Glücksburg lines.

Russia resigns her rights in the duchies, 1767, 1773.

The situation was ultimately simplified by the marriage of Duke Charles Frederick with the tsarevna Anna Pavlovna, and the recognition in 1742 of their son Charles Peter Ulrich as cesarevitch by the empress Elizabeth of Russia. For Peter as duke of Gottorp, Adolphus Frederick, bishop of Lübeck, son of Christian Augustus, acted as regent until 1745; in 1751 he became king of Sweden.[4] But the rulers of Russia had no interest in maintaining their part of Holstein and their confused and disputed common rights in Jutland, and in 1767 the empress Catherine II. resigned them, by the treaty of Copenhagen, in the name of her son Paul, who confirmed this action on coming of age in 1773. Oldenburg and Delmenhorst, surrendered by the Danish king in compensation, were handed over to Frederick Augustus, bishop of Lübeck, the second son of Christian Augustus, who thus founded the younger line of the house of Gottorp. Schleswig and Holstein were thus once more united under the Danish king.

On the abolition of the Holy Roman Empire in 1806, Holstein was practically, though not formally, incorporated in Denmark. Under the administration of the Danish prime minister Count Bernstorff, himself from Schleswig, many reforms were carried out in the duchies, *e.g.* abolition of torture and of serfdom; at the same time Danish laws and coinage were introduced, and Danish was made the official language for communication with Copenhagen. Since, however, the Danish court itself at the time was largely German in language and feeling, this produced no serious expressions of resentment.

Congress of Vienna, 1815.

The Congress of Vienna, instead of settling the questions involved in the relations of the duchies of Denmark once for all,[5] sought to stereotype the old divisions in the interests of Germany. The settlement of 1806 was reversed, and while Schleswig remained as before, Holstein and Lauenburg were included in the new German Confederation. The opening up of the Schleswig-Holstein question thus became sooner or later inevitable. The Germans of Holstein, influenced by the new national enthusiasm evoked by the War of Liberation, resented more than ever the attempts of the government of Copenhagen to treat them as part of the Danish monarchy and, encouraged by the sympathy of the Germans in Schleswig, early tried to reassert in the interests of Germanism the old principle of the unity of the duchies. The political atmosphere, however, had changed at Copenhagen also; and their demands were met by the Danes with a nationalist temper as intractable as their own. Affairs were ripe for a crisis, which the threatened failure of the common male heirs to the kingdom and the duchies precipitated.

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[1] *Question du Slesvig*, p. 78.

[2] The Church (Lutheran) was organized under a *Probst* (provost) and consistory, the king himself assuming the jurisdiction of *summus episcopus*.

[3] The king by a convention of the same date secured the full sovereignty for his own particular appanage in Schleswig. The attempt of the dukes of Gottorp to partition the actual government of the duchy broke on the opposition of the estates.

[4] Adolphus Frederick had renounced his rights in Schleswig by an agreement with the Danish king signed on the 25th of April 1750.

[5] The best solution, which afterwards had the support of Napoleon III., would have been to partition Schleswig on the lines of nationality, assigning the Danish part to Denmark, the German to Holstein. This idea, which subsequently had supporters both among Danes and Germans, proved impracticable later owing to the intractable temper of the majority on both sides. See *La Question de Slesvig*, p. 135 seq., "Historique de l'idée d'un partage du Slesvig."

Question of the succession.

When Christian VIII. succeeded his father Frederick VI. in 1839 the elder male line of the house of Oldenburg was obviously on the point of extinction, the king's only son and heir having no children. Ever since 1834, when joint consultative estates had been re-established for the duchies, the question of the succession had been debated in this assembly. To German opinion the solution seemed clear enough. The crown of Denmark could be inherited by female heirs; in the duchies the Salic law had never been repealed and, in the event of a failure of male heirs to Christian VIII., the succession would pass to the dukes of Augustenburg.[1] Danish opinion, on the other hand, clamoured for a royal pronouncement proclaiming the principle of the indivisibility of the monarchy and its transmission intact to a single heir, in accordance with the royal law. To this Christian VIII. yielded so far as to issue in 1846 letters patent declaring that the royal law in the matter of the succession was in full force so far as Schleswig was concerned, in accordance with the letters patent of August 22, 1721, the oath of fidelity of September 3, 1721, the guarantees given by France and Great Britain in the same year and the treaties of 1767 and 1773 with Russia. As to Holstein, he stated that certain circumstances prevented him from giving, in regard to some parts of the duchy, so clear a decision as in the case of Schleswig. The principle of the independence of Schleswig and of its union with Holstein were expressly reaffirmed. An appeal against this by the estates of Holstein to the German diet received no attention. The revolutionary year 1848 brought matters to a head. On the 28th of January, Christian VIII. issued a rescript proclaiming a new constitution which, while preserving the autonomy of the different parts of the country, incorporated them for common purposes in a single organization. The estates of the duchies replied by demanding the incorporation of Schleswig-Holstein, as a single constitutional state, in the German Confederation. Frederick VII., who had succeeded his father at the end of January, declared (March 4) that he had no right to deal in this way with Schleswig, and, yielding to the importunity of the Eider-Danish party, withdrew the rescript of January (April 4) and announced to the people of Schleswig (March 27) the promulgation of a liberal constitution under which the duchy, while preserving its local autonomy, would become an integral part of Denmark.

Prussian intervention, 1848.

Meanwhile, however, the duchies had broken out into open insurrection; a provisional government had been established at Kiel; and the duke of Augustenburg had hurried to Berlin to secure the assistance of Prussia in asserting his rights. This was at the very crisis of the revolution in Berlin, and the Prussian government saw in the proposed intervention in Denmark in a popular cause an excellent opportunity for restoring its damaged prestige. Prussian troops were accordingly marched into Holstein; and, the diet having on the 12th of April recognized the provisional government of Schleswig and commissioned Prussia to enforce its decrees, General Wrangel was ordered to occupy Schleswig also.

Attitude of the powers.

The principles which Prussia was commissioned to enforce as the mandatory of Germany were: (1) that they were independent states, (2) that their union was indissoluble, (3) that they were hereditary only in the male line. But the Germans had reckoned without the European powers, which were united in opposing any dismemberment of Denmark, even Austria refusing to assist in enforcing the German view. Swedish troops landed to assist the Danes; Nicholas I. of Russia, speaking with authority as representing the elder Gottorp line, pointed out to King Frederick William IV. the risks of a collision; Great Britain, though the Danes rejected her mediation, threatened to send her fleet to assist in preserving the *status quo*. Frederick William now ordered Wrangel to withdraw his troops from the duchies; but the general refused to obey, on the plea that he was under the command not of the king of Prussia but of the regent of Germany, and proposed that, at least, any treaty concluded should be presented for ratification to the Frankfort government. This the Danes refused; and negotiations were broken off. Prussia was now confronted on the one side by the German nation urging her clamorously to action, on the other side by the European powers with one voice threatening the worst consequences should she persist. After painful hesitation, Frederick William chose what seemed the lesser of two evils and, on the 26th of August 1848, Prussia signed at Malmoe a convention which yielded practically all the Danish demands. The Holstein estates appealed to the German parliament, which hotly took up their cause; but it was soon clear that the central government had no means of enforcing its views, and in the end the convention was ratified at Frankfort.

Convention of Malmoe.

The convention was only in the nature of a truce establishing a temporary *modus vivendi*, and the main issues, left unsettled, continued to be hotly debated. At a conference held in London in October, Denmark suggested an arrangement on the basis of a separation of Schleswig from Holstein, which was about to become a member of the new German empire, Schleswig to have a separate constitution under the Danish crown. This was supported by Great Britain and Russia and accepted by Prussia and the German government (27th January 1849). The negotiations broke down, however, on the refusal of Denmark to yield the principle of the indissoluble union with the Danish crown; on the 23rd of February the truce was at an end, and on the 3rd of April the war was renewed. At this point the tsar intervened in favour of peace; and Prussia, conscious of her restored strength and weary of the intractable temper of the Frankfort government, determined to take matters into her own hands. On the 10th of July 1849 another truce was signed; Schleswig, until the peace, was to be administered separately, under a mixed commission, Holstein was to be governed by a vicegerent of the German empire—an arrangement equally offensive to German and Danish sentiment. A settlement seemed as far off as ever; the Danes still clamoured for the principle of succession in the female line and union with Denmark, the Germans for that of succession in the male line and union with Holstein. In utter weariness Prussia proposed, in April 1850, a definitive peace on the basis of the *status quo ante bellum* and the postponement of all questions as to mutual rights. To Palmerston the basis seemed meaningless, the proposed settlement to settle nothing. The emperor Nicholas, openly disgusted with Frederick William's weak-kneed truckling to the Revolution, again intervened. To him the duke of Augustenburg was a rebel; Russia had guaranteed Schleswig to the Danish crown by the treaties of 1767 and 1773; as for Holstein, if the king of Denmark was unable to deal with the rebels there, he himself would intervene as he had done in Hungary. The threat was reinforced by the menace of the European situation. Austria and Prussia were on the verge of war, and the sole hope of preventing Russia from throwing her sword into the scale of Austria lay in settling the Schleswig-Holstein question in the sense desired by her. The only alternative, an alliance with "the devil's nephew," Louis Napoleon, who already dreamed of acquiring the Rhine frontier for France at the price of his aid in establishing German sea-power by the cession of the duchies, was abhorrent to Frederick William. On the 2nd of July 1850 was signed at Berlin a treaty of peace between Prussia and Denmark. Both parties reserved all their antecedent rights; but for Denmark it was enough, since it empowered the king-duke to restore his authority in Holstein with or without the consent of the German Confederation.

Treaty of Berlin, 1850.

Danish troops now marched in to coerce the refractory duchies; but while the fighting went on negotiations among the powers continued, and on the 2nd of August 1850 Great Britain, France, Russia and Norway-Sweden signed a protocol, to which Austria subsequently adhered, approving the principle of restoring the integrity of the Danish monarchy. The Copenhagen government, which in May 1851 made an abortive attempt to come

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[1] This was the argument of Karl Samwer, the German jurist, in his *Die Staatserbfolge der Herzogthümer Schleswig und Holstein*, published in 1844 at the instigation of the duke of Augustenburg.

The Succession Protocol of London, 1852.

Danish Unitary Constitution of 1855.

to an understanding with the inhabitants of the duchies by convening an assembly of notables at Flensburg, issued on the 6th of December 1851 a project for the future organization of the monarchy on the basis of the equality of its constituent states, with a common ministry; and on the 28th of January 1852 a royal letter announced the institution of a unitary state which, while maintaining the fundamental constitution of Denmark, would increase the parliamentary powers of the estates of the two duchies. This proclamation was approved by Prussia and Austria, and by the German federal diet in so far as it affected Holstein and Lauenburg. The question of the succession was next approached. Only the question of the Augustenburg succession made an agreement between the powers impossible, and on the 31st of March 1852 the duke of Augustenburg resigned his claim in return for a money payment. Further adjustments followed. After the renunciation by the emperor of Russia and others of their eventual rights, Charlotte, landgravine of Hesse, sister of Christian VIII., and her son Prince Frederick transferred their rights to the latter's sister Louise, who in her turn transferred them to her husband Prince Christian of Glücksburg. This arrangement received international sanction by the protocol signed in London on the 8th of May 1852 by the five great powers and Norway and Sweden.[1] On the 31st of July 1853 King Frederick VII. gave his assent to a law settling the crown on Prince Christian, "prince of Denmark," and his heirs male. The protocol of London, while consecrating the principle of the integrity of Denmark, stipulated that the rights of the German Confederation in Holstein and Lauenburg should remain unaffected. It was, in fact, a compromise, and left the fundamental issues unsettled. The German federal diet had been unrepresented in London, and the terms of the protocol were regarded in Germany as a humiliation. As for the Danes, they were far from being satisfied with the settlement, which they approved only in so far as it gave them a basis for a more vigorous prosecution of their unionist schemes. On the 15th of February and the 11th of June 1854 the king of Denmark, after consulting the estates, promulgated special constitutions for Schleswig and Holstein respectively, under which the provincial assemblies received certain very limited powers. On the 26th of July 1854 he published a common constitution for the whole monarchy; this, which was little more than a veiled absolutism, was superseded on the 2nd of October 1855 by a parliamentary constitution of a modified type. The legality of this constitution was disputed by the two German great powers, on the ground that the estates of the duchies had not been consulted as promised in the royal letter of the 6th of December 1851; the diet of the Confederation refused to admit its validity so far as Holstein and Lauenburg were concerned (11th February 1858).

The question was now once more the subject of lively international debate; but the European situation was no longer so favourable as it had been to the Danish view. The Crimean War had crippled the power of Russia, and Nicholas I. was dead. France was prepared to sell the interests of Denmark in the duchies to Prussia in return for "compensations" to herself elsewhere. Great Britain alone sided with the Danes; but the action of British ministers, who realized the danger to British supremacy at sea of the growth of German sea-power in the Baltic, was hampered by the natural sympathy of Queen Victoria and the prince consort with the German point of view.[2] The result was that the German diet, on the motion of Bismarck, having threatened federal intervention (July 29), King Frederick VII. issued a proclamation abolishing the general constitution so far as it affected Holstein and Lauenburg, while retaining it for Denmark and Schleswig (November 6).

Denmark repudiates the compacts of 1852.

Though even this concession violated the principle of the "indissoluble union" of the duchies, the German diet, fully occupied at home, determined to refrain from further action till the Danish parliament should make another effort to pass a law or budget affecting the whole kingdom without consulting the estates of the duchies. This contingency arose in July 1860, and in the spring of the following year the estates were once more at open odds with the Danish government. The German diet now prepared for armed intervention; but it was in no condition to carry out its threats, and Denmark decided, on the advice of Great Britain, to ignore it and open negotiations directly with Prussia and Austria as independent powers. These demanded the restoration of the union between the duchies, a question beyond the competence of the Confederation. Denmark replied with a refusal to recognize the right of any foreign power to interfere in her relations with Schleswig; to which Austria, anxious to conciliate the smaller German princes, responded with a vigorous protest against Danish infringements of the compact of 1852. Lord John Russell now intervened, on behalf of Great Britain, with a proposal for a settlement of the whole question on the basis of the independence of the duchies under the Danish crown, with a decennial budget for common expenses to be agreed on by the four assemblies, and a supreme council of state consisting in relative proportion of Danes and Germans.[3] This was accepted by Russia and by the German great powers, and Denmark found herself isolated in Europe. The international situation, however, favoured a bold attitude, and she met the representations of the powers with a flat defiance. The retention of Schleswig as an integral part of the monarchy was to her a matter of life and death; the German Confederation had made the terms of the protocol of 1852, defining the intimate relations between the duchies, the excuse for unwarrantable interference in the internal affairs of Denmark; and on the 30th of March 1863 a royal proclamation was published at Copenhagen repudiating the compacts of 1852, and, by defining the separate position of Holstein in the Danish monarchy, negativing once for all the claims of Germany upon Schleswig.[4]

Danish Constitution of 1863.

The reply of the German diet to this move was to forward a note to Copenhagen (July 9) demanding, on pain of federal execution, the withdrawal of the proclamation and the grant of a fresh constitution, based on the compacts of 1852 or on the British note of the 24th of September 1862. Instead, King Frederick VII. issued on the 28th of September 1863 a new constitution for "our kingdom of Denmark-Slesvig." The diet now resolved on federal execution; but action was delayed, partly through British efforts at mediation, partly because Bismarck judged the time for a satisfactory solution of the whole question had not yet come. Encouraged by this hesitating attitude, the Danish parliament passed the new constitution on the 13th of November. Two days later Frederick VII. died.

Accession of Christian IX., 1863.

The "Protocol-King," Christian IX., who now ascended the throne, was in a position of extraordinary difficulty. The first sovereign act he was called upon to perform was to sign the new constitution. To sign was to violate the terms of the very protocol which was his title to reign; to refuse to sign was to place himself in antagonism to the united sentiment of his Danish subjects. He chose what seemed the remoter evil, and on the 18th of November signed the constitution. The news was received in Germany with violent manifestations of excitement and anger. Frederick, duke of Augustenburg, son of the prince who in 1852 had renounced the succession to the duchies, now claimed his rights on the ground that he had had no share in the renunciation. In Holstein an agitation in his favour had begun from the first, and this was extended to Schleswig on the terms of the new Danish constitution becoming known. His claim was enthusiastically

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[1] Hertslet, *Map of Europe*, ii. 1151.

[2] See Queen Victoria to Lord Malmesbury, 1st of May 1858, in *Letters* (pop. ed., 1908), iii. 280. Compare the letters to Palmerston of 21st of June 1849, ii. 222, and 22nd of June 1850, ii. 279, with Palmerston to Russell, 23rd of June 1850, and Queen Victoria to Russell, ii. 250.

[3] Note of Sept. 24, 1862. For the diplomatic correspondence on the duchies see *Parl. Papers*, lxxiv. (1863).

[4] For this and later correspondence see *Parl. Papers*, lxiv. (1864), p. 40 seq.

Decree of federal execution.

Attitude of Austria and Prussia.

supported by the German princes and people, and in spite of the negative attitude of Austria and Prussia the federal diet decided to occupy Holstein "pending the settlement of the succession." On the 24th of December Saxon and Hanoverian troops marched into the duchy in the name of the German Confederation, and supported by their presence and by the loyalty of the Holsteiners the duke of Augustenburg assumed the government under the style of Duke Frederick VIII. With this "folly"—as Bismarck roundly termed it—Austria and Prussia, in the teeth of violent public opinion, would have nothing to do, for neither wished to risk a European war. It was clear to Bismarck that the two powers, as parties to the protocol of 1852, must uphold the succession as fixed by it, and that any action they might take in consequence of the violation of that compact by Denmark must be so "correct" as to deprive Europe of all excuse for interference. The publication of the new constitution by Christian IX. was in itself sufficient to justify a declaration of war by the two powers as parties to the signature of the protocol. As to the ultimate outcome of their effective intervention, that could be left to the future to decide. Austria had no clear views. King William wavered between his Prussian feeling and a sentimental sympathy with the duke of Augustenburg. Bismarck alone knew exactly what he wanted, and how to attain it. "From the beginning," he said later (*Reflections*, ii. 10), "I kept annexation steadily before my eyes."

The protests of Great Britain and Russia against the action of the German diet, together with the proposal of Count Beust, on behalf of Saxony, that Bavaria should bring forward in that assembly a formal motion for the recognition of Duke Frederick's claims, helped Bismarck to persuade Austria that immediate action must be taken. On the 28th of December a motion was introduced in the diet by Austria and Prussia, calling on the Confederation to occupy Schleswig as a pledge for *the observance by Denmark of the compacts of 1852*. This implied the recognition of the rights of Christian IX., and was indignantly rejected; whereupon the diet was informed that the Austrian and Prussian governments would act in the matter as independent European powers. The agreement between them was signed on the 16th of January 1864. An article drafted by Austria, intended to safeguard the settlement of 1852, was replaced at Bismarck's instance by another which stated that the two powers would decide only in concert on the relations of the duchies, and that they would in no case determine the question of the succession save by mutual consent.

Austria and Prussia occupy the duchies.

At this stage, had the Danes yielded to the necessities of the situation and withdrawn from Schleswig under protest, the European powers would probably have intervened, a congress would have restored Schleswig to the Danish crown, and Austria and Prussia, as European powers, would have had no choice but to prevent any attempt upon it by the duke of Holstein. To prevent this possibility Bismarck made the Copenhagen government believe that Great Britain had threatened Prussia with intervention should hostilities be opened, "though, as a matter of fact, England did nothing of the kind." The cynical stratagem succeeded; Denmark remained defiant; and on the 1st of February 1864 the Austrian and Prussian forces crossed the Eider.

Diplomatic developments during the Danish War.

The Powers and Augustenburg.

An invasion of Denmark itself had not been part of the original programme of the allies; but on the 18th of February some Prussian hussars, in the excitement of a cavalry skirmish, crossed the frontier and occupied the village of Kolding. Bismarck determined to use this circumstance to revise the whole situation. He urged upon Austria the necessity for a strong policy, so as to settle once for all not only the question of the duchies but the wider question of the German Confederation; and Austria reluctantly consented to press the war. On the 5th of March a fresh agreement was signed between the powers, under which the compacts of 1852 were declared to be no longer valid, and the position of the duchies within the Danish monarchy as a whole was to be made the subject of a friendly understanding. Meanwhile, however, Lord John Russell on behalf of Great Britain, supported by Russia, France and Sweden, had intervened with a proposal that the whole question should once more be submitted to a European conference.[1] The German powers agreed on condition that the compacts of 1852 should not be taken as a basis, and that the duchies should be bound to Denmark by a personal tie only. But the proceedings of the conference, which opened at London on the 25th of April, only revealed the inextricable tangle of the issues involved. Beust, on behalf of the Confederation, demanded the recognition of the Augustenburg claimant; Austria leaned to a settlement on the lines of that of 1852; Prussia, it was increasingly clear, aimed at the acquisition of the duchies. The first step towards the realization of this latter ambition was to secure the recognition of the absolute independence of the duchies, and this Austria could only oppose at the risk of forfeiting her whole influence in Germany. The two powers, then, agreed to demand the complete political independence of the duchies bound together by common institutions. The next move was uncertain. As to the question of annexation Prussia would leave that open, but made it clear that any settlement must involve the complete military subordination of Schleswig-Holstein to herself. This alarmed Austria, which had no wish to see a further extension of Prussia's already overgrown power, and she began to champion the claims of the duke of Augustenburg. This contingency, however, Bismarck had foreseen and himself offered to support the claims of the duke at the conference if he would undertake to subordinate himself in all naval and military matters to Prussia, surrender Kiel for the purposes of a Prussian war-harbour, give Prussia the control of the projected North Sea Canal, and enter the Prussian Customs Union. On this basis, with Austria's support, the whole matter might have been arranged without—as Beust pointed out (*Mem.* i. 272)—the increase of Prussia's power beyond the Elbe being any serious menace to Austrian influence in Germany. Fortunately, however, for Bismarck's plans, Austria's distrust and jealousy of Prussia led her to oppose this settlement and at her instigation the duke of Augustenburg rejected it.

Treaty of Vienna, 1864.

On the 25th of June the London conference broke up without having arrived at any conclusion. On the 24th, in view of the end of the truce, Austria and Prussia had arrived at a new agreement, the object of the war being now declared to be the complete separation of the duchies from Denmark. As the result of the short campaign that followed, the preliminaries of a treaty of peace were signed on the 1st of August, the king of Denmark renouncing all his rights in the duchies in favour of the emperor of Austria and the king of Prussia. The definitive treaty was signed at Vienna on the 30th of October 1864. By Article XIX., a period of six years was allowed during which the inhabitants of the duchies might "opt" for Danish nationality and transfer themselves and their goods to Denmark; and the right of "indigenacy" was guaranteed to all, whether in the kingdom or the duchies, who enjoyed it at the time of the exchange of ratifications of the treaty.[2]

The last phase of the question.

The Schleswig-Holstein Question from this time onward became merged in the larger question of the general relations of Austria and Prussia, and its later developments are sketched in the article GERMANY: *History*. So far as Europe was concerned it was settled by the decisive result of the war of 1866. It survived, however, as between Danes and Germans, though narrowed down to the question of the fate of the Danish population of the northern duchy. This question is of great interest to students of international law and as illustrating the practical problems involved in the assertion of the modern principle of "nationality."

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[1] *Parl. Papers* (1864), lxv. 124 seq. Beust (*Mem.* i. 252) says that Queen Victoria personally intervened to prevent British action in favour of Denmark.

[2] The full text of the treaty is in *La Question du Slesvig*, p. 173 et seq.

The Danish "optants."

The position of the Danes in Schleswig after the cession was determined, so far as treaty rights are concerned, by two instruments—the Treaty of Vienna (October 30, 1864) and the Treaty of Prague (August 23, 1866). By Article XIX. of the former treaty subjects domiciled in the ceded territories had the right, within six years of the exchange of ratifications, of opting for the Danish nationality and transferring themselves, their families and their personal property to Denmark, while keeping their landed property in the duchies. The last paragraph of the Article ran: "Le droit d'indigénat, tant dans le royaume de Danemark que dans les Duchés, est conservé à tous les individus qui le possèdent à l'époque de l'échange des ratifications du présent Traité." By Article V. of the Treaty of Prague Schleswig was ceded by Austria to Prussia with the reservation that "the populations of the North of Schleswig shall be again united with Denmark in the event of their expressing a desire so to be by a vote freely exercised." Taking advantage of the terms of these treaties, about 50,000 Danes from North Schleswig (out of a total population of some 150,000) opted for Denmark and migrated over the frontier, pending the *plébiscite* which was to restore their country to them. But the *plébiscite* never came. Its inclusion in the treaty had been no more than a diplomatic device to save the face of the emperor Napoleon III.; Prussia had from the first no intention of surrendering an inch of the territory she had conquered; the outcome of the Franco-German War made it unnecessary for her even to pretend that she might do so; and by the Treaty of Vienna of October 11, 1878, the clause relating to the *plébiscite* was formally abrogated with the assent of Austria.

Meanwhile the Danish "optants," disappointed of their hopes, had begun to stream back over the frontier into Schleswig. By doing so they lost, under the Danish law, their rights as Danish citizens, without acquiring those of Prussian subjects; and this disability was transmitted to their children. By Article XIX. of the Treaty of 1864, indeed, they should have been secured the rights of "indigenacy," which, while falling short of complete citizenship, implied, according to Danish law, all the essential guarantees for civil liberty. But in German law the right of *Indigenat* is not clearly differentiated from the *status* of a subject; and the supreme court at Kiel decided in several cases that those who had opted for Danish nationality had forfeited their rights under the *Indigenat* paragraph of the Treaty of Vienna. There was thus created in the frontier districts a large and increasing class of people who dwelt in a sort of political limbo, having lost their Danish citizenship through ceasing to be domiciled in Denmark, and unable to acquire Prussian citizenship because they had failed to apply for it within the six years stipulated in the Treaty of 1864. Their exclusion from the rights of Prussian subjects was due, however, to causes other than the letter of the treaty. The Danes, in spite of every discouragement, never ceased to strive for the preservation and extension of their national traditions and language; the Germans were equally bent on effectually absorbing these recalcitrant "Teutons" into the general life of the German empire; and to this end the uncertain *status* of the Danish optants was a useful means. Danish agitators of German nationality could not be touched so long as they were careful to keep within the limits of the law; pro-Danish newspapers owned and staffed by German subjects enjoyed immunity in accordance with the constitution, which guarantees the liberty of the press. The case of the "optants" was far other. These unfortunates, who numbered a large proportion of the population, were subject to domiciliary visits, and to arbitrary perquisitions, arrest and expulsion. When the pro-Danish newspapers, after the expulsion of several "optant" editors, were careful to appoint none but German subjects, the vengeance of the authorities fell upon "optant" type-setters, printers and printers' devils. The Prussian police, indeed, developed an almost superhuman capacity for detecting optants: and since these pariahs were mingled indistinguishably with the mass of the people, no household and no business was safe from official inquisition. One instance out of many may serve to illustrate the type of offence that served as excuse for this systematic official persecution. On the 27th of April 1896 the second volume for 1895 of the *Sönderjyske Aarböger* was confiscated for having used the historic term *Sönderjylland* (South Jutland) for Schleswig. To add to the misery, the Danish government refused to allow the Danish optants expelled by Prussia to settle in Denmark, though this rule was modified by the Danish Nationality Law of 1898 in favour of the children of optants born after the passing of the law. It was not till the signature of the treaty between Prussia and Denmark on the 11th of January 1907 that these intolerable conditions were ended. By this treaty the German government undertook to allow all children born of Danish optants before the passing of the new Danish Nationality Law of 1898 to acquire Prussian nationality on the usual conditions and on their own application. This provision was not to affect the ordinary legal rights of expulsion as exercised by either power, but the Danish government undertook not to refuse to the children of Schleswig optants who should not seek to acquire or who could not legally acquire Prussian nationality permission to reside in Denmark. The provisions of the treaty apply not only to the children of Schleswig optants, but to their direct descendants in all degrees.

Treaty of January 11, 1907.

This adjustment, brought about by the friendly intercourse between the courts of Berlin and Copenhagen, seemed to close the last phase of the Schleswig question. Yet, so far from allaying, it apparently only served to embitter the inter-racial feud. The "autochthonous Germans of the Northern Marches" regarded the new treaty as a betrayal, and refused "to give the kiss of peace" to their hereditary enemies. For forty years Germanism, backed by all the weight of the empire and imposed with all the weapons of official persecution, had barely held its own in North Schleswig; in spite of an enormous emigration, in 1905, of the 148,000 inhabitants of North Schleswig 139,000 spoke Danish, while of the German-speaking immigrants it was found that more than a third spoke Danish in the first generation; and this in spite of the fact that, from 1864 onward, German had gradually been substituted for Danish in the churches, the schools, and even in the playground. But the scattered outposts of Germanism could hardly be expected to acquiesce without a struggle in a situation that threatened them with social and economic extinction. Forty years of dominance, secured by official favour, had filled them with a double measure of aggressive pride of race, and the question of the rival nationalities in Schleswig, like that in Poland, remained a source of trouble and weakness within the frontiers of the German empire.

Authorities.—The literature on the subject is vast. From the German point of view the most comprehensive treatment is in C. Jansen and K. Samwer, *Schleswig-Holsteins Befreiung* (Wiesbaden, 1897); see also H. C. L. von Sybel, *Foundation of the German Empire* (Eng. trans., New York, 1890–1891); Bismarck's *Reflections and Reminiscences*, and L. Hahn, *Bismarck* (5 vols., 1878–1891). The Danish point of view is ably and moderately presented in *La Question du Slesvig*, a collection of essays by various writers edited by F. de Jessen (Copenhagen, 1906), with maps and documents. (W. A. P.)

SCHLETTSTADT, a town of Germany, in the imperial province of Alsace-Lorraine, on the Ill; 26 m. S. of Strassburg by the railway to Basel. Pop. (1905) 9700. It possesses two fine Roman Catholic churches, a Protestant church, numerous remains of its old walls and some quaint houses of the 15th and 16th centuries. It has a theatre, a municipal library, a gymnasium, and other educational establishments. The Roman Catholic churches are the cathedral church of St George, a fine Gothic building founded in the 13th century, and the church of St Fides, dating from the 11th century. Its industries comprise wire-drawing, tanning and saw-milling, and there is a considerable trade in wine, fruit and other agricultural produce.

Schlettstadt is a place of very early origin. It was a royal residence in Carolingian times and became a free town of the Empire in the 13th century. In the 15th century it was the seat of a celebrated academy, founded by the humanist Rodolphus Agricola, which contributed not a little to the revival of learning in this part of Germany; Erasmus of Rotterdam was one of its students. In 1634 the town came into the possession of France, and it was afterwards fortified by Vauban. It offered little resistance, however, to the Germans in 1870, and the fortifications have since been razed. The Hoh-Königsburg, a great castle standing at an elevation of 2475 ft., was presented to the emperor William II. by the town of Schlettstadt in 1899, and was completely restored in 1908. The site is first mentioned as bearing a castle in the 8th century.

See Naumann, *Die Eroberung von Schlettstadt* (Berlin, 1876); and J. Gény, *Die Reichstadt Schlettstadt 1490–1536* (Freiburg i. B. 1900).

SCHLEY, WINFIELD SCOTT (1839–**1911**), American naval officer, was born at Richfields, near Frederick, Maryland, on the 9th of October 1839. He graduated at the United States Naval Academy in 1860, and during the Civil War was in active service as a lieutenant until July 1863. In 1867–1869 he was an instructor in the U.S. Naval Academy. He took part in Rear-Admiral John Rodgers's expedition to Korea in 1871, and was adjutant of the American land forces in the attack on the Korean forts on Salee river on the 10th and 11th of June. In 1872–1875 he was head of the department of modern languages in the U.S. Naval Academy. He was promoted commander in June 1874; in 1876–1879 commanded the "Essex," most of the time in the South Atlantic, and then until October 1883 was inspector of the second lighthouse district. In February 1884, after the failure in 1883 of the second expedition (under Lieut. E. A. Garlington) for the relief of the Lady Franklin Bay Expedition commanded by Lieut. A. W. Greely, Schley was appointed to command the third Greely relief expedition; and near Cape Sabine on the 22nd of June rescued Greely and six (of his twenty-four) companions. He was chief of the bureau of equipment and recruiting in 1885–1889; and in April 1888 was promoted captain. He commanded the "Baltimore" in Rear-Admiral George Brown's squadron off the coast of Chile in 1891. Early in 1892 he was again transferred to the lighthouse bureau, and until February 1895 was inspector of the third lighthouse district; and in 1897–1898 he was a member (and chairman) of the Lighthouse Board. He was commissioned commodore on the 6th of February 1898, and on the 24th of March, although lowest on the list of commodores, he was put in command of the "flying squadron," with the "Brooklyn" as his flagship, for service in the war with Spain. The command of the fleet off Santiago de Cuba was taken from Schley by Acting Rear-Admiral W. T. Sampson on the 1st of June. In the battle of Santiago on the 3rd of July Schley, in Sampson's absence, was the senior officer and the "Brooklyn" did especial service, with the "Oregon," in overhauling and disabling the "Cristobal Colón." On the 10th of August Schley was advanced six numbers and was made rear-admiral for "eminent and conspicuous conduct in battle." On the 19th he was appointed a commissioner of the United States to arrange the evacuation of Porto Rico. When the Navy Department recommended that Sampson be promoted eight numbers and over the head of Schley, who had ranked him for forty-two years, there was a bitter controversy, and the Senate did not confirm the promotion. On the 14th of April 1899 Schley was commissioned rear-admiral, ranking as major-general. In November 1899 he was put in command of the South Atlantic Station, and in October 1901 he retired from active service upon reaching the age limit. At his request, because of the charges made against him in E. S. Maclay's *History of the Navy*, a court of inquiry investigated Schley's conduct before and during the battle of Santiago; on the 13th of December 1901 the court pronounced Schley guilty of delay in locating Cervera's squadron, of carelessness in endangering the "Texas" by a peculiar "loop" movement or turn of the "Brooklyn" which blanketed the fire of other American vessels, and of disobedience to a departmental order of the 25th of May, but it recommended that no action be taken. Admiral Schley filed a protest against the court's findings, which, however, were approved by the Secretary of the Navy.

Schley wrote, with James Russell Soley, *The Rescue of Greely* (New York, 1885). See Schley's *Forty-five Years under the Flag* (New York, 1904).

SCHLIEMANN, HEINRICH (1822–1890), German archaeologist, was born on the 6th of January 1822 at Neu Buckow in Mecklenburg-Schwerin, the son of a poor pastor. He has stated in his autobiography that through all his early years of struggle, when he was successively grocer's apprentice at Fürstenberg, cabin-boy on the "Dorothea" bound for Venezuela, and, after her wreck, office attendant and then book-keeper in Amsterdam, he nourished a passion for the Homeric story and an ambition to become a great linguist. In the end, thanks to an unusually powerful memory and determined energy, he acquired a knowledge of seven or eight tongues besides his own, including ancient and modern Greek. The house of B. H. Schröder of Amsterdam sent him in 1846 to St Petersburg, where he established a business of his own and embarked in the indigo trade. He made a fortune at the time of the Crimean War, partly as a military contractor. Happening to be in California when made a state of the Union, in 1850, he became and remained an American citizen. After travels in Greece, Tunisia, India, China and Japan, and writing a short sketch of the last two countries, he took his large fortune to Greece in 1868, and proceeded to visit Homeric sites. In an ensuing book—*Ithaka, der Peloponnes, und Troja*—he propounded two theories which he was destined eventually to test in practice, viz. that Hissarlik, not Bunarbashi, was the site of Troy, and that the Atreid graves, seen by Pausanias at Mycenae, lay within the citadel wall. Two years later he took up Calvert's work on the former site, and, convinced that Troy must be on the lowest level, hewed his way down, regardless of the upper strata, wherein lay unseen the remains of which he was really in search. By 1873 he had laid bare considerable fortifications and other remains of a burnt city of very great antiquity, and discovered a treasure of gold jewelry. We now know this city to have belonged to the middle pre-Mycenaean period, long prior to the generation of Homer's Archaeans, but Schliemann far and wide proclaimed it "Troy," and was backed by Gladstone and a large part of the European public. Trying to resume his work in February 1874, he found himself inhibited by the Ottoman government, whose allotted share of the gold treasure had not been satisfactory, and it was not till April 1876 that he obtained a *firman*. During the delay he issued his *Troy and its Remains* (1875), and betook himself to Mycenae. There in August 1876 he began work in the Dome-tombs and by the Lion Gate, and opened a large pit just within the citadel. The famous double ring of slabs and certain stone reliefs came to light. Schliemann, thinking it was only a platform levelled as a place of Achaean assembly, paused, and did not resume till November. Then, resolved to explore to the rock, he cleared away some three feet more of earth and stones, and lighted on the five shaft graves which have placed him first among fortunate excavators. A sixth grave was found immediately after his departure. The immense treasure of gold, silver, bronze, fine stone and ivory objects, which was buried with the sixteen corpses in this circle, is worth intrinsically more than any treasure-trove known to have been found in any land, and it revealed once for all the character of a great civilization preceding the Hellenic. The find was deposited at Athens, and gradually cleaned and arranged in the Polytechnic; and the discoverer, publishing his *Mycenae* in English in 1877, had his full share of honours and fame. He had now settled in Athens, where he married a Greek lady, and built two splendid houses, which became centres of Athenian society. In 1878 he dug unsuccessfully in Ithaca, and in the same year and the following resumed work at Hissarlik, and summed up his results in a discursive memoir, *Ilios*, upon which a sequel, *Troja*, issued in 1884, after Wilhelm Dörpfeld, associated in 1882, had introduced some archaeological method into the explorations, was a considerable improvement.

In 1880 and 1881 Schliemann cleared out the ruined dome-tomb of Orchomenus, finding little except remains of its beautiful ceiling; and in 1885, with Dörpfeld, he laid bare the upper stratum on the rock of Tiryns, presenting scholars with a complete ground plan of a Mycenaean palace. This was his last fortunate excavation. While Tsountas, for the Greek Archaeological Society, picked up his work at Mycenae in 1886, and gradually cleared the Acropolis, with notable results, Schliemann tried for traces of the Caesareum at Alexandria, of the Palace of Minos at Knossos, in Crete, and of the Aphrodite temple at Cythera (1888); but he was not successful, meeting in the two former enterprises with a local opposition which his wealth was unable to bear down. In 1889 he entertained at Hissarlik a committee of archaeological experts, deputed to examine Bötticher's absurd contention that the ruins represented not a city, but a cremation necropolis; and he was contemplating a new and more extensive campaign on the same site when, in December 1890, he was seized at Naples with an illness which ended fatally on the morning of Christmas Day. His great wealth was left mainly to the two families that he had in Russia and Greece; but a sum was reserved for Hissarlik, where Dörpfeld in 1891 and 1892, by clearing away the debris of the former excavations, exposed the great walls of the sixth stratum which Schliemann had called Lydian, and proved their synchronism with Mycenae, and identity with Mycenaean remains; that is to say, with Homer's Troy, if Troy ever was.

Schliemann was on several occasions in England, in 1883 to receive honours from the great universities, and in 1886 to confute, at a special gathering of the Hellenic Society, the assertion of Stillman and Penrose that the Tirynthian palace was posterior to the Christian era. Nowhere was he better appreciated, and most of his books were first issued in English. (D. G. H.)

SCHLIPPE'S SALT, or sodium thioantimoniate, $Na_3SbS_4 \cdot 9H_2O$, named after K. F. Schlippe (1799–1867), is prepared by dissolving the calculated quantities of antimony trisulphide, sulphur and sodium hydroxide in water, or by fusing sodium sulphate (16 parts), antimony sulphide (13 parts) and charcoal (4·5 parts), dissolving the melt in water and boiling the solution with 2½ parts of sulphur. The liquid is then filtered and evaporated. The salt crystallizes in large tetrahedra, which are easily soluble in water, and have a specific gravity 1·806. The anhydrous salt melts easily on heating, and in the hydrated condition, on exposure to moist air becomes coated with a red film. It combines with sodium thiosulphate to form $Na_3SbS_4 \cdot Na_2S_2O_3 \cdot 20H_2O$.

SCHLOSSER, FRIEDRICH CHRISTOPH (1776–1861), German historian, was born at Jever in East Friesland on the 17th of November 1776. He took up the study of theology, mainly at Göttingen, and began life as a private tutor. Turning to the study of history, he carried with him the tendency to construct his syntheses upon the scanty basis of 18th-century generalizations; yet in spite of the growing scientific school he became and remained for a quarter of a century the most popular German historian. In 1807, inspired by his study of Dante, he published his first work *Abälard und Dulcin*, a defence of scholasticism and medieval thought. Two years later biographical studies of Theodore Beza and Peter Martyr Vermili (*Leben des Theodor de Beza und des Peter Martyr Vermili*, Heidelberg, 1809) revealed more genuine scholarship. In 1812 appeared his *History of the Iconoclastic Emperors of the East* (*Geschichte der bilderstürmenden Kaiser des oströmischen Reichs*), in which he controverted some points in Gibbon and sought to avoid painting the past in present-day colours. His own strong predispositions prevented him from accomplishing this, however, and the history remains open to grave scientific criticism. But it won for him the favour of Archbishop Karl Theodor Dalberg, and secured for him a professorship in the Frankfort Lyceum. He left Frankfort in 1819 to become professor of history at Heidelberg, where he resided until his death on the 23rd of September 1861.

In 1815 appeared the first volume of his *World History* (*Weltgeschichte in zusammenhängender Erzählung*). This work, though never completed, was extended through many volumes, bespeaking an inexhaustible energy and a vast erudition. But it lacks both accuracy of fact and charm of style, and is to-day deservedly quite forgotten. On the other hand a translation of the pedagogical handbook of Vincent of Beauvais and the accompanying monograph are still of value. The next noteworthy work was a history of antiquity and its culture (*Universalhistorische Übersicht der Geschichte der alten Welt und ihrer Kultur*, 1st part, 1826; 2nd part, 1834), which, while revealing little knowledge of the new criticism of sources inaugurated by F. A. Wolf and B. G. Niebuhr, won its way by its unique handling of the subject and its grand style. In 1823 he published in two volumes a *Geschichte des 18ten Jahrhunderts*; then, enlarged and improved, this work appeared in six volumes as *Geschichte des 18ten Jahrhunderts und des 19ten bis zum Sturz des französischen Kaiserreichs* (1836–1848). The history had a most extraordinary success, especially among the common people, owing, not to its scientific qualities, but to the fact that the author boldly and sternly sat in judgment upon men and events, and in his judgments voiced the feelings of the German nation in his day. For this very reason it is no longer read. It has been translated into English by D. Davison (8 vols., 1843–1852). Finally, Schlosser undertook a popular *World History for the German People* (*Weltgeschichte für das deutsche Volk*, 1844–1857), which also enjoyed the favour of those for whom it was written.

Schlosser stands apart from the movement towards scientific history in Germany in the 19th century. Refusing to limit himself to political history, as did Ranke, he never learned to handle his literary sources with the care of the scientific historian. History was to him, as it had been to Cicero, a school for morals; but he had perhaps a juster conception than Ranke of the breadth and scope of the historian's field.

See G. G. Gervinus (Schlosser's pupil), *F. C. Schlosser, ein Nekrolog* (1861); G. Weber, *F. C. Schlosser, der Historiker, Erinnerungsblätter* (Leipzig, 1876); and O. Lorenz, *F. C. Schlosser* (Vienna, 1878).

SCHLOTHEIM, ERNST FRIEDRICH, BARON VON (1764–1832), German palaeontologist, was born in Grafschaft Schwarzburg on the 2nd of April 1764. He was Privy Councillor and President of the Chamber at the court of Gotha. Becoming interested in geology he gathered together a very extensive collection of fossils. In 1804 he published descriptions and illustrations of remarkable remains of (Carboniferous) plants, *Ein Beitrag zur Flora der Vorwelt.* His more important work was entitled *Die Petrefactenkunde* (1820). In this he incorporated the plates used in his previous memoir and supplemented it by a folio atlas (1822), in which he illustrated his collection "of petrified and fossil remains of the animal and vegetable kingdom of a former world." For the first time in Germany the fossils were named according to the binomial system. The specimens are preserved in the Berlin Museum. He died at Gotha on the 28th of March 1832.

SCHLÖZER, AUGUST LUDWIG VON (1735–1809), German historian, was born at Gaggstedt, in the county of Hohenlohe-Kirchberg, on the 5th of July 1735. Having studied theology and oriental languages at the universities of Wittenberg and Göttingen, he went in 1755 as a tutor to Stockholm, and afterwards to Upsala; and while in Sweden he wrote in Swedish an *Essay on the General History of Trade and of Seafaring in the most Ancient Times* (1758). In 1759 he returned to Göttingen, where he began the study of medicine. In 1761 he went to St Petersburg with Gerhardt Friedrich Müller, the Russian historiographer, as Müller's literary assistant and as tutor in his family. Here Schlözer learned Russian and devoted himself to the study of Russian history. In 1762 a quarrel with Müller placed him in a position of some difficulty from which he was delivered by an introduction to Count Rasumovski, who procured his appointment as adjunct to the Academy. In 1765 he was appointed by the empress Catherine an ordinary member of the Academy and professor of Russian history. In 1767 he left Russia on leave and did not return. He settled at Göttingen, where in 1764 he had been made professor extraordinarius, and doctor *honoris causa* in 1766, and in 1769 he was promoted to an ordinary professorship. In 1804 he was ennobled by the emperor Alexander I. of Russia and made a privy councillor. He retired from active work in 1805 and died on the 9th of September 1809.

Schlözer's activity was enormous, and he exercised great influence by his lectures as well as by his books, bringing historical study into touch with political science generally, and using his vast erudition in an attempt to solve practical questions in the state and in society. He was "a journalist before the days of journalism, a traveller before that of travelling, a critic of authorities before that of political oppositions." His most important works were his *Allgemeine nordische Geschichte*, 2 vols. (Halle, 1772) and his translation of the Russian chronicler Nestor to the year 980, 5 vols. (Göttingen, 1802–1809). He awoke much intelligent interest in universal history by his *Weltgeschichte im Auszuge und Zusammenhange*, 2 vols. (2nd ed., Göttingen, 1792–1801); and in several works he helped to lay the foundations of statistical science. He also produced a strong impression by his political writings, the *Briefwechsel*, 10 vols. (1776–1782) and the *Staatsanzeigen*, 18 vols. (1782–1793).

Schlözer, who in 1769 married Caroline Roederer, daughter of Johann Georg Roederer (1726–1763), professor of medicine at Göttingen and body physician to the king of England, left five children. His daughter Dorothea, born on the 10th of August 1770, was one of the most beautiful and learned women of her time, and received in 1787 the degree of doctor. She was recognized as an authority on several subjects, especially on Russian coinage. After her marriage with Rodde, the burgomaster of Lübeck, she devoted herself to domestic duties. She died on the 12th of July 1825 (see Reuter, *Dorothea Schlözer*, Göttingen, 1887). Schlözer's son Christian (1774-1831) was a professor at Bonn, and published *Anfangsgründe der Staatswirthschaft* (1804–1806) and his father's *Öffentliches und Privat-Leben aus Originalurkunden* (1828). The youngest son, Karl von Schlözer, a merchant and Russian consul-general at Lübeck, was the father of Kurd von Schlözer (1822–1894), the historian and diplomatist, who in 1871 was appointed German ambassador to the United States and in 1882 to the Vatican, when he was instrumental in healing the breach between Germany and the papacy caused by the "May Laws."

See Zermelo, *August Ludwig Schlözer* (Berlin, 1875); Wesendonck, *Die Begründung der neuern deutschen Geschichtsschreibung durch Gatterer und Schlözer* (Leipzig, 1876) and F. Frensdorff in *Allgemeine deutsche Biog.* vol. xxxi.

SCHLÜSSELBURG, a town of Russia, in the government of St Petersburg, situated on low ground surrounded by marshes, at the issue of the river Neva from Lake Ladoga, 40 m. by steamer E. of the city of St Petersburg. Pop. (1897) 5285. It was founded in 1323 by the Novgorodians, and though afterwards lost by Russia, was reconquered by Peter the Great in 1702. It has a cathedral and a fortress, built on an island in the Neva, which is now used as a political prison.

SCHLÜTER, ANDREAS (1664–1714), German sculptor and architect, was born in Hamburg. Much of his activity as a sculptor was exercised in Warsaw, but in 1694 he was summoned to Berlin. Two years later he began his designs for the rebuilding of the royal palace. The execution of these occupied him from 1699 to 1706, and the palace became a conspicuous example of barocco style in Germany. In 1713 Schlüter went to St Petersburg, where he did architectural work for Peter the Great. His principal works in Berlin are the monument of the great elector Frederick William and the 21 masks of dying warriors in the courtyard of the arsenal, the tombs of King Frederick I. and his wife, and the marble pulpit in the Marienkirche.

See C. Gurlitt, *Andreas Schlüter* (1891); C. F. von Kloeden, *Andreas Schlüter* (1855).

SCHMALKALDEN, a town of Germany, in the Prussian province of Hesse-Nassau, situated in a narrow valley at the south-western slope of the Thuringian forest, 30 m. S.W. of Erfurt, on the railway Wernshausen-St Blasii. Pop. (1905) 9529. It has a Gothic parish church, a palace—Schloss Wilhelmsburg—with an interesting chapel and a collection of antiquities, and possesses a Gothic town hall in which the important Protestant League of Schmalkalden, or Smalkald, was concluded in 1531, and also the house in which the articles of Schmalkalden were drawn up in 1537 by Luther, Melanchthon and other reformers. It has three other Evangelical churches, a Roman Catholic church and several schools. Its industries are chiefly connected with ironwares, but leather, beer, soap and toys are also manufactured. Karl Wilhelms (1815–1873), the composer of "Die Wacht am Rhein," was born here, and there is a memorial of him in the market-place. Schmalkalden, which was first mentioned in 874, came wholly into the possession of Hesse in 1583, having been a town since 1335.

See Wagner, *Geschichte der Stadt und Herrschaft Schmalkalden* (Marburg, 1849); and Wilisch, *Schmalkalden und seine Umgebungen* (Schmalkalden, 1884).

SCHMERLING, ANTON VON (1805–1893), Austrian statesman, was born on the 23rd of August 1805 at Vienna, where his father held a high position on the judicial side of the civil service. After studying law at Vienna, in 1829 he entered the public service, and during the next eighteen years was constantly occupied, chiefly in Lower Austria. In 1847, as a member of the lesser nobility, he entered the Estates of Lower Austria, and took an active part in the Liberal movement for administrative and constitutional reform of which they were the centre. On the outbreak of the revolution in Vienna in March 1848, when the mob broke into the Assembly, Schmerling was one of the deputation which carried to the palace the demands of the people, and during the next few days he was much occupied in organizing the newly formed National Guard. At the end of the month he was sent by the ministry to Frankfort as one of the men of "public confidence." He soon succeeded Count Colleredo as president of the Diet, and in this capacity officially transferred to the archduke John, who had been elected regent of Germany, the powers of the Diet. For this he was violently attacked in the German parliament by the extreme Radicals; but on this and other occasions (he had himself been elected to the parliament) he defended moderate and constitutional principles, all the more effectively because he depended not on eloquence but on a recognition of what has been called the "irony of facts"—to which the parliament as a whole was so blind. He was the first and the most influential member of the ministry which the regent formed; he held the ministry of the interior and, later, also that of foreign affairs, and it was almost entirely due to him that at least for a short time this phantom government maintained some appearance of power and dignity. A defeat in the parliament when he defended the armistice of Malmö led to his resignation; but he was immediately called to office again, with practically dictatorial power, in order to quell the revolt which broke out in Frankfort on the 18th of September. His courage and resolution averted what nearly became a terrible catastrophe. It was his hope to establish in Germany the supremacy of a Liberal and reformed Austria. This brought him into opposition to the party of Prussian supremacy; and when they attained a majority, he resigned, and was succeeded by Gagern. He remained at Frankfort, holding the post of Austrian envoy, and was the leader of the so-called Great German party until the dissolution of the Austrian parliament showed that the forces of reaction had conquered at Vienna and shattered all hopes of Austria attaining the position he had hoped for her.

After the abortive election of the king of Prussia to be emperor, he, with the other Austrians, left Frankfort. On his return to Vienna he became minister of justice, and the reforms which he carried out added to his reputation. His popularity among all Liberals was increased by his resignation in 1851, as a protest against the failure of the government to establish the constitution they had promised. During the next few years he was judge of the supreme court of appeal. When his forecast was fulfilled, and the system of absolutism broke down, he became minister in January 1862. His first act was the publication of the constitution by which the whole of the empire was to be organized as a single state with a parliamentary government. The experiment failed, chiefly because of the opposition of the Croatians and Magyars, whom he bitterly offended by his celebrated saying that "Hungary could wait." Faults of manner, natural in a man whose life had been spent as an official and a judge, prevented him from keeping together the German Liberals as a strong and united party; he was opposed by a powerful faction at court, and by the Clerical leaders. After the first few months the emperor gave him only a very lukewarm support; and with his retirement in 1865 the attempt to carry out the ideals of Joseph II. to Germanize while he liberalized the whole of the empire, and to compel Hungarians, Poles, Czechs and Croatians to accept a system in which the government of the whole should be carried on by a German-speaking parliament and bureaucracy, failed. The constitution of 1862, though suspended on Schmerling's fall, was still regarded as legally valid for the cis-Leithan territories, and is the basis on which the present constitution for half the empire was framed. On his retirement he returned to his judicial duties; in 1867 he was made life-member of the Upper House in the Reichsrath, of which he became vice-president, and in 1871 president. This post he laid down in 1879, and came forward as leader of the Liberal German opposition to the administration of Count Taaffe. In 1891 he retired from public life, and died at Vienna on the 23rd of May 1893.

Schmerling married, in 1835, Pauline, daughter of Field-Marshal-Lieutenant Baron von Koudelka. Frau von Schmerling, who was distinguished by literary and artistic abilities, at that time rare in the Austrian capital, died in 1840, leaving two daughters.

See Arneth, *Anton v. Schmerling* (Prague, 1895). This contains a full account of Schmerling's life during 1848–1849, but does not deal with his later life. Wurzbach, *Biographisches Lexicon des Kaiserthums Österreich*; Friedjung, *Der Kampf um die Vorherrschaft in Deutschland*; Rogge, *Geschichte Österreichs*. (J. W. He.)

SCHMIDT, HEINRICH JULIAN (1818–1886), German journalist and historian of literature, was born at Marienwerder in East Prussia on the 7th of March 1818, and after studying history and philosophy at the university of Königsberg was appointed, in 1842, to a mastership in the Luisenstadt Realschule in Berlin. In 1847 he joined the editorial staff of the *Grenzboten* in Leipzig, and in the following year became, with Gustav Freytag, joint owner of that periodical. In 1861 he removed to Berlin as editor-in-chief of the *Berliner allgemeine Zeitung*, and in 1878 was rewarded for the journalistic services rendered to the government, by a pension from the emperor William I. He died at Berlin on the 27th of March 1886.

Julian Schmidt's principal contributions to literary history are *Geschichte der Romantik im Zeitalter der Revolution und Restauration* (1848); *Geschichte der deutschen Nationalliteratur im 19. Jahrhundert* (1853); *Geschichte des geistigen Lebens in Deutschland von Leibniz bis auf Lessings Tod* (1861–1863). These works subsequently appeared as *Geschichte der deutschen Literatur von Leibniz bis auf unsere Zeit* (4 vols., 1886–1896); Schmidt also wrote a *Geschichte der französischen Literatur seit der Revolution* (1857), and a biography of Schiller (1859).

SCHMIDT, KARL VON (1817–1875), Prussian cavalry general, was born at Schwedt on the Oder, on the 12th of January 1817, and entered the 4th Ulans as a second lieutenant in 1834. His long regimental service was varied by staff service and instructional work, and in the mobilization of 1859 he had the command of a landwehr cavalry regiment. In 1863 he was made colonel of the 4th Cuirassiers, which he commanded in the, for the cavalry arm, uneventful campaigns of 1864 and 1866. He then commanded a newly raised regiment of Schleswig-Holstein troops, the 16th Hussars, but at the outbreak of the Franco-German War he was still an obscure and perhaps a mistrusted officer, though his grasp of every detail of cavalry work was admitted. But an opportunity for distinction was grasped in the cavalry fighting around Mars-la-Tour (Aug. 16), in which he temporarily led a brigade and was severely wounded. He was soon promoted major-general and succeeded to the temporary command of his division on the disablement of its leader. In this post he did brilliant work in the campaign on the Loire, and even in the winter operations towards Le Mans, and earned a reputation second to none amongst the officers and men of his arm. After the war he took a leading part in the reorganization of the Prussian cavalry, which in ten years raised its efficiency to a point far beyond that of any other cavalry in Europe. In 1875, though his health was failing, he refused to give up the conduct of certain important cavalry manœuvres with which he had been entrusted. But a few days of heavy work in the field brought on a fatal illness, and he died at Danzig on the 25th of August 1875. In 1889 the 4th Ulans, in which his regimental service was almost entirely spent, were given the name "Von Schmidt."

His drill and manœuvre instructions were codified and published after his death by his staff officer, Captain von Vollard Bockelberg, who was authorized by Prince Frederick Charles to do so. An English translation, *Instructions for Cavalry*, has been published by the War Office. Von Schmidt himself wrote a pamphlet, *Auch ein Wort über die Ausbildung der Cavallerie* (1862). The original German edition of the *Instructions for Cavalry* is prefaced by a memoir of Von Schmidt's life and services, written by Major Kaehler.

SCHMIDT, WILHELM ADOLF (1812–1887), German historian, was born in Berlin on the 26th of September 1812. He became in 1851 professor of history at Zürich, and nine years later professor at Jena, where he died on the 10th of April 1887. He was a member of the Frankfort parliament in 1848, and of the German Reichstag from 1874 to 1876. His historical works deal mainly with modern German history, and the most important of them are:—

Preussens deutsche Politik (Berlin, 1850, and other editions); *Geschichte der preussisch-deutschen Unionsbestrebungen* (Berlin, 1851); *Zeitgenössische Geschichten* (Berlin, 1859); *Elsass und Lothringen* (Leipzig, 1859 and 1870); and *Geschichte der deutschen Verfassungsfrage während der Befreiungskriege und des Wiener Kongresses* (Stuttgart, 1890), which was published after his death by A. Stern. Schmidt also wrote: *Tableaux de la Révolution Française publiés sur les papiers inédits du département de la police secrète de Paris* (Leipzig, 1867–1870); *Pariser Zustände während der Revolutionszeit* (Jena, 1874–1876), translated into French by P. Viollet (Paris, 1880–1885); *Das Perikleische Zeitalter* (Jena, 1877–1879); *Handbuch der griechischen Chronologie* (Jena, 1888); and *Abhandlungen zur alten Geschichte* (Leipzig, 1888).

See H. Landwehr, *Zur Erinnerung an Adolf Schmidt* (Berlin, 1887).

SCHMOLLER, GUSTAV (1838–), German political economist, was born at Heilbronn on the 24th of June 1838. He studied political science, philosophy and history at the university of Tübingen from 1857 to 1861, when he obtained an appointment at the Württemberg Statistical Department. In 1864 Schmoller became extraordinary—and in the following year, ordinary—professor of political economy and science at Halle, was transferred in a like capacity to Strasburg in 1872 and finally in 1882 to Berlin. In 1884 he was admitted a member of the Prussian Staatsrath, in 1887 a member of the Prussian Academy of Sciences, and in 1899 was called to the Prussian Herrenhaus (Upper Chamber) as representative of the university of Berlin. Schmoller is famous for his researches in the field of the history of political economy and is one of the founders of the *Verein für Social Politik* (Social Political Society).

Among his numerous scientific works must be specially mentioned: *Der französiche Handelsvertrag und seine Gegner* (1862); *Zur Geschichte des deutschen Kleingewerbes im 19ten Jahrhundert* (1869); *Über einige Grundfragen des Rechts und der Volkswirtschaft* (1875). In late years Schmoller concentrated his attention more upon the history of Prussian administration, and besides editing the *Jahrbuch für preussische Geschichte und Landeskunde*, published the result of his labours in this department in the *Umrisse und Untersuchungen zur Verfassungs-, Verwaltungs- und Wirtschaftsgeschichte, besonders des preussischen Staates, im 17ten und 18ten Jahrhundert* (1898).

For an estimate of Schmoller's work cf. Stampfer, *Gustav Schmoller* (1901).

SCHNEEBERG, a town of Germany, in the kingdom of Saxony, in the Erzgebirge, 14 m. S.E. from Zwickau by rail. Pop. (1905) 9034. It contains a handsome Gothic parish church, one of the largest ecclesiastical buildings in Saxony, dedicated to St Wolfgang, with an altar-piece by Lucas Cranach the elder, and numerous tombs; a gymnasium; a school of lace-making and a hospital. Hand-made lace and silver mining, formerly its two most important industries, have greatly declined. The first has been almost entirely superseded by machine-made goods, while the second appears to have languished owing to exhaustion of the mines. Cobalt, bismuth and nickel are worked and yield satisfactory results, and machine-made lace, embroidery, porcelain, corsets, shoes and colours are among the chief of its other industrial products. Schneeberg is also noted for a snuff made of aromatic herbs, which commands a ready sale in the district.

See Lehmann, *Chronik von Schneeberg* (Schneeberg, 1837–1840).

SCHNEEKOPPE, a mountain of Germany, on the Silesian Bohemian frontier, the highest peak (5100 ft.) of the Riesengebirge, situated immediately above the town of Schmiedeberg, 8 m. S. from Hirschberg. From the crest, which is about 50 yds. sq. and across which runs the frontier line between Silesia and Bohemia, a magnificent view is obtained across the Oder plain to Breslau on the north and over Bohemia to the southwest. Just below the ridge, on the Prussian side, lies the chapel of St Lawrence, which was used as a hospice for travellers from 1824 to 1850, when a new hostel was erected. Since 1900 a meteorological station has been established here.

See Zetzmann, *Panorama von der Schneekoppe* (Berlin, 1903).

SCHNEIDEMÜHL (Polish *Pila*), a town of Germany, in the Prussian province of Posen, situated on the Cüddow, 60 m. N. of Posen and 145 m. N.E. of Berlin on the main line to Königsberg, and at the junction of lines to Stargard and Thorn. Pop. (1905), 21,624. It has five churches, a classical school and a Roman Catholic teachers' seminary. Schneidemühl carries on a trade in wood, grain and potatoes, and possesses an iron foundry, several glass works and machine-shops, and other industrial establishments. Considerable damage was done to the town in 1893 by a violent overflow of water from a deep artesian well.

SCHNEIDER, JOHANN GOTTLOB (1750–1822), German classical scholar and naturalist, was born at Kollmen in Saxony on the 18th of January 1750. In 1774, on the recommendation of Heyne, he became secretary to the famous Strassburg scholar, R. F. Brunck, and in 1811 professor of ancient languages and eloquence at Breslau (chief librarian, 1816) where he died on the 12th of January 1822. Of his numerous works the most important was his *Kritisches griechisch-deutsches Handwörterbuch* (1797–1798), the first independent work of the kind since Stephanus's *Thesaurus*, and the basis of F. Passow's and all succeeding Greek lexicons. A special improvement was the introduction of words and expressions connected with natural history and science. The scientific writings of ancient authors especially attracted him. He published editions of Aelian, *De natura animalium*; Nicander, *Alexipharmaca* and *Theriaca*; the *Scriptores rei rusticae*; Aristotle, *Historia animalium* and *Politica*; Epicurus, *Physica* and *Meteorologica*; Theophrastus, *Eclogae physicae*; Oppian, *Halieutica* and *Cynegetica*; the complete works of Xenophon and Vitruvius; the *Argonautica* of the so-called Orpheus (for which Ruhnken nicknamed him "Orpheomastix"); an essay on the life and writings of Pindar and a collection of his fragments. His *Eclogae physicae* is a selection of extracts of various length from Greek and Latin writers on scientific subjects, containing the original text and commentary, with essays on natural history and science in ancient times.

See F. Passow, *Opuscula academica* (1835); C. Bursian, *Geschichte der classischen Philologie in Deutschland* (1883).

SCHNEIDER, LOUIS (1805–1878), German actor and author, was born at Berlin on the 29th of April 1805, the son of George Abraham Schneider (1770–1839). At an early age he was engaged at the Royal Theatre, Berlin, where he soon rose to play leading comedy parts. His reputation as a comedian grew with his success in such rôles as Zierl in the *Einfahrt vom Lande*, Peter in the *Kapellmeister von Venedig*, Schikaneder in the *Schauspieldirektor* and Basileo in *Figaro's Hochzeit*, and he became the favourite of Berlin. In 1845 he was appointed head of the Royal opera in Berlin. But his bold patriotic couplets and impromptus during the revolutionary year 1848 necessitated his retirement, and thereafter he translated and adapted for the stage Mozart's *Cosi fan tutti*; published, under the pseudonym "L. W. Both," *Das Bühnenrepertoire des Auslandes*; and founded, as a result of his experiences as a soldier in the Danish war of 1849, the periodical *Der Soldatenfreund*. He also wrote *Geschichte der Oper und des Opernhauses in Berlin* (1845–1852). Soon after his retirement he was appointed reader to King Frederick William IV. of Prussia, and subsequently he received the title of Geheimen Hofrat. He continued to enjoy the favour of the court, and, as correspondent of the *Staatsanzeiger*, was attached to the headquarters' staff of the Prussian army during the campaign of 1866; and, by special invitation, accompanied the emperor William during the war of 1870. Schneider also wrote a novel. *Das böse Glück*, and several volumes of reminiscences: *König Wilhelm* (1869), *Kaiser Wilhelm, 1867–1871* (1875). He died at Potsdam on the 16th of December 1878.

See his posthumous memoirs, *Aus meinem Leben* (Berlin, 1879–1880), and *Aus dem Leben Kaiser Wilhelms* (1888), which caused some sensation on their publication.

SCHNEIDEWIN, FRIEDRICH WILHELM (1810–1856), German classical scholar, was born at Helmstedt on the 6th of June 1810. In 1833 he became a teacher at the Brunswick gymnasium, in 1837 extraordinary and in 1842 ordinary professor of classical languages and literature in the university of Göttingen, where he died on the 11th of January 1856. Schneidewin's work on Sophocles and the Greek lyric poets is of permanent value. His most important publications are: *Ibyci Rhegini reliquiae* (1833), severely criticized by G. Hermann; *Simonidis Cei reliquiae* (1835); *Delectus poësis Graecorum elegiacae, iambicae, melicae* (1838–1839), in which the fragments of the lyric poets were for the first time published in a convenient form; *Paroemiographi graeci* (1839, with E. von Leutsch); *Sophocles* (1849–1854, revised after his death by A. Nauck). He also edited the fragments of the speeches of Hypereides on behalf of Euxenippus and Lycophron (already published by Churchill Babington from a papyrus discovered in Egyptian Thebes in 1847) and a Latin poem on rhetorical figures by an unknown author (*Incerti auctoris de figuris vel schematibus versus heroici*, 1841), found by Jules Quicherat in MS. in the Paris library. Schneidewin was also the founder of *Philologus* (1846), a journal devoted to classical learning, and dedicated to the memory of K. O. Müller.

See A. Baumeister in *Allgemeine deutsche Biographie*; E. von Leutsch in *Philologus*, x.; and M. Lechner, *Zur Erinnerung an K. F. Hermann, F. W. Schneidewin* (1864).

SCHNORR VON KAROLSFELD, JULIUS (1794–1872), German painter, was born in 1794 at Leipzig, where he received his earliest instruction from his father Johann Veit Schnorr (1764–1841), a draughtsman, engraver and painter. At seventeen he entered the Academy of Vienna, from which Overbeck and others who rebelled against the old conventional style had been expelled about a year before. In 1818 he followed the founders of the new school of German pre-Raphaelites in the general pilgrimage to Rome. This school of religious and romantic art abjured modern styles and reverted to and revived the principles and practice of earlier periods. At the outset an effort was made to recover fresco painting and "monumental art," and Schnorr found opportunity of proving his powers, when commissioned to decorate with frescoes, illustrative of Ariosto, the entrance hall of the Villa Massimo, near the Lateran. His fellow-labourers were Cornelius, Overbeck and Veit. His second period dates from 1825, when he left Rome, settled in Munich, entered the service of King Ludwig, and transplanted to Germany the art of wall-painting learnt in Italy. He showed himself qualified as a sort of poet-painter to the Bavarian court; he organized a staff of trained executants, and set about clothing five halls in the new palace with frescoes illustrative of the *Nibelungenlied*. Other apartments his prolific pencil decorated with scenes from the histories of Charlemagne, Frederick Barbarossa and Rudolph of Habsburg. These interminable compositions are creative, learned in composition, masterly in drawing, but exaggerated in thought and extravagant in style.

Schnorr's third period is marked by his "Bible Pictures" or Scripture History in 180 designs. The artist was a Lutheran, and took a broad and unsectarian view which won for his Pictorial Bible ready currency throughout Christendom. Frequently the compositions are crowded and confused, wanting in harmony of line and symmetry in the masses; thus they suffer under comparison with Raphael's Bible. The style is severed from the simplicity and severity of early times, and surrendered to the florid redundance of the later Renaissance. Yet throughout are displayed fertility of invention, academic knowledge with facile execution; and modern art has produced nothing better than "Joseph Interpreting Pharaoh's Dream," the "Meeting of Rebecca and Isaac" and the "Return of the Prodigal Son." Biblical drawings and cartoons for frescoes formed a natural prelude to designs for church windows. The painter's renown in Germany secured commissions in Great Britain. Schnorr made designs, carried out in the royal factory, Munich, for windows in Glasgow cathedral and in St Paul's cathedral, London. This Munich glass provoked controversy: medievalists objected to its want of lustre, and stigmatized the windows as coloured blinds and picture transparencies. But the opposing party claimed for these modern revivals "the union of the severe and excellent drawing of early Florentine oil-paintings with the colouring and arrangement of the glass-paintings of the latter half of the 16th century." Schnorr died at Munich in 1872. His brother Ludwig Ferdinand (1789–1853) was also a painter.

SCHOFIELD, JOHN McALLISTER (1831–1906), American soldier, was born at Gerry, Chautauqua county, New York, on the 29th of September 1831. He graduated at West Point in 1853, served for two years in the artillery, was assistant professor of natural and experimental philosophy at West Point in 1855–1860, and while on leave (1860–1861) was professor of physics at Washington university, St Louis. When the Civil War broke out, he became a major in a Missouri volunteer regiment and served as chief of staff to Major-General Nathaniel Lyon until the death of that officer. (In 1892 he received a Congressional medal of honour for "conspicuous gallantry at the battle of Wilson's Creek.") In 1861–1863 he performed various military duties in Missouri. In April 1863 he took command of a division in the Army of the Cumberland, and in 1864, as commander of the Army of the Ohio, he took part in the Atlanta campaign under Major-General W. T. Sherman. In October 1864 Schofield was sent to Tennessee to join Major-General G. H. Thomas in opposing General J. B. Hood, and on the 30th of November he fought with General Hood the desperate and indecisive battle of Franklin. Two weeks later he took part in Thomas's crowning victory at Nashville. For his services at Franklin he was awarded the rank of brigadier-general (November 1864) and the brevet rank of major-general (March 1865) in the regular army. Being ordered to co-operate with Sherman in North Carolina, Schofield moved his corps by rail and sea to Fort Fisher, North Carolina, in seventeen days, occupied Wilmington on the 22nd of February 1865, fought the action at Kinston on the 8–10th of March, and on the 23rd joined Sherman at Goldsboro. After the war he was sent on a special diplomatic mission to France, on account of the presence of French troops in Mexico; and from June 1868 to March 1869 he served as secretary of war under President Andrew Johnson, after the retirement of E. M. Stanton (*q.v.*). From 1876 to 1881 he was superintendent of the Military Academy at West Point, and from 1888 until his retirement in 1895 he was commanding general of the United States army. He had become major-general in March 1869, and in February 1895 he was made lieutenant-general. He died at St Augustine, Florida, on the 4th of March 1906. General Schofield published *Forty-six Years in the Army* (New York, 1897).

SCHOLAR, SCHOLARSHIP. The term "scholar," primarily meaning a "learner," is secondarily applied to one who has thoroughly learnt all that "the school" can teach him, one who by early training and constant self-culture has attained a certain maturity in precise and accurate knowledge. Hence the term "scholarship" in the sense of the knowledge or method of a scholar. Similarly "classical scholarship" may be defined as the sum of the mental attainments of a classical scholar. Scholarship is sometimes identified with classical *learning* or erudition; it is more often contrasted with it. The contrast is thus drawn by Donaldson in his *Classical Scholarship and Classical Learning* (1856), and by Mark Pattison, in his *Essay on Oxford Studies* (1855). "I maintain," says Donaldson, "that not all learned men are accomplished scholars, though any accomplished scholar may, if he chooses to devote the time to the necessary studies, become a learned man" (p. 149). "It is not a knowledge," writes Mark Pattison, "but a discipline, that is required; not science, but the scientific habit; not erudition, but scholarship" (*Essays*, i. 425).

The expression "a scholarship" is also used in England for a money payment made by a school, college or university, as a prize (either for one year or a series of years) to the successful competitors at an examination at which one or more such scholarships are to be awarded; and the successful candidate is called a "scholar," as the holder of a "scholarship." In this sense the word is almost synonymous with "an exhibition," but the latter is usually considered inferior in merit and dignity, if not in amount.

On the general history of classical scholarship, see CLASSICS: *Greek and Latin.*

SCHOLASTICISM, the name usually employed to denote the most typical products of medieval thought. After the centuries of intellectual darkness which followed upon the closing of the philosophical schools in Athens (529), and the death of Boetius, the last of the ancient philosophers, the first symptoms of renewed intellectual activity appear contemporaneously with the consolidation of the empire of the West in the hands of Charlemagne. He endeavoured to attract to his court the best scholars of Britain and Ireland, and by imperial decree (787) commanded the establishment of schools in connexion with every abbey in his realms. Peter of Pisa and Alcuin of York were his advisers, and under their care the opposition long supposed to exist between godliness and secular learning speedily disappeared. Besides the celebrated school of the Palace, where Alcuin had among his hearers the members of the imperial family and the dignitaries of the empire as well as talented youths of humbler origin, we hear of the episcopal schools of Lyons, Orleans and St Denis, the cloister schools of St Martin of Tours, of Fulda, Corbie, Fontenelle and many others, besides the older monasteries of St Gall and Reichenau. These schools became the centres of medieval learning and speculation, and from them the name Scholasticism is derived (cf. Sandys, *Hist. of Class. Schol.*, i. 471, 1906). They were designed to communicate instruction in the seven liberal arts which constituted the educational curriculum of the middle ages (see TRIVIUM). The name *doctor scholasticus* was applied originally to any teacher in such an ecclesiastical gymnasium, but gradually the study of dialectic or logic overshadowed the more elementary disciplines, and the general acceptation of "doctor" came to be one who occupied himself with the teaching of logic. The philosophy of the later Scholastics is more extended in its scope; but to the end of the medieval period philosophy centres in the discussion of the same logical problems which began to agitate the teachers of the 9th and 10th centuries.

Chronological limits.

Scholasticism in the widest sense thus extends from the 9th to the end of the 14th or the beginning of the 15th century—from Erigena to Occam and his followers. The belated Scholastics who lingered beyond the last mentioned date served only as marks for the obloquy heaped upon the schools by the men of the new time. Erigena is really of the spiritual kindred of the Neoplatonists and Christian mystics rather than of the typical Scholastic doctors, and, in fact, the activity of Scholasticism is mainly confined within the limits of the 11th and the 14th centuries. It is divisible into two well-marked periods—the first extending to the end of the 12th century and embracing as its chief names Roscellinus, Anselm, William of Champeaux and Abelard, while the second extended from the beginning of the 13th century to the Renaissance and the general distraction of men's thoughts from the problems and methods of Scholasticism. In this second period the names of Albertus Magnus, Thomas Aquinas and Duns Scotus represent (in the 13th century and the first years of the 14th century) the culmination of Scholastic thought and its consolidation into system.

Logic and theology.

Prantl says that there is no such thing as philosophy in the middle ages; there are only logic and theology. The remark overlooks two facts—firstly that the main objects of theology and philosophy are identical, though the method of treatment is different, and secondly that logical discussion commonly leads up to metaphysical problems, and that this was pre-eminently the case with the logic of the Schoolmen. But the saying draws attention to the two great influences which shaped medieval thought—the tradition of ancient logic and the system of Christian theology. Scholasticism opens with a discussion of certain points in the Aristotelian logic; it speedily begins to apply its logical distinctions to the doctrines of the church; and when it attains its full stature in St Thomas it has, with the exception of certain mysteries, rationalized or Aristotelianized the whole churchly system. Or we might say with equal truth that the philosophy of St Thomas is Aristotle Christianized. The Schoolmen contemplate the universe of nature and man not with their own eyes but in the glass of Aristotelian formulae. Their chief works are in the shape of commentaries upon the writings of "the philosopher."[1] Their problems and solutions alike spring from the master's dicta—from the need of reconciling these with one another and with the conclusions of Christian theology.

Reason and authority.

The fact that the channels of thought during the middle ages were determined in this way is usually expressed by saying that reason in the middle age is subject to authority. It has not the free play which characterizes its activity in Greece and in the philosophy of modern times. Its conclusions are predetermined, and the initiative of the individual thinker is almost confined, therefore, to formal details in the treatment of his thesis. To the church, reason is the handmaid of faith (*ancilla fidei*). But this principle of the subordination of the reason wears a different aspect according to the century and writer referred to. In Scotus Erigena, at the beginning of the Scholastic era, there is no such subordination contemplated, because philosophy and theology in his work are in implicit unity. "Conficitur inde veram esse philosophiam veram religionem, conversimque veram religionem esse veram philosophiam" (*De divina praedestinatione*, Proem). Reason in its own strength and with its own instruments evolves a system of the universe which coincides, according to Erigena, with the teaching of Scripture. For Erigena, therefore, the speculative reason is the supreme arbiter; and in accordance with its results the utterances of Scripture and of the church have not infrequently to be subjected to an allegorical or mystical interpretation. But this is only to say again that Erigena is more of a Neoplatonist than a Scholastic. Hence Cousin suggested in respect of this point a threefold chronological division—at the outset the absolute subordination of philosophy to theology, then the period of their alliance, and finally the beginning of their separation. In other words, we note philosophy gradually extending its claims. Dialectic is, to begin with, a merely secular art, and only by degrees are its terms and distinctions applied to the subject-matter of theology. The early results of the application, in the hands of Berengarius and Roscellinus, did not seem favourable to Christian orthodoxy. Hence the strength with which a champion of the faith like Anselm insists on the subordination of reason. To Bernard of Clairvaux and many other churchmen the application of dialectic to the things of faith appears as dangerous as it is impious. Later, in the systems of the great Schoolmen, the rights of reason are fully established and acknowledged. The relation of reason and faith remains external, and certain doctrines—an increasing number as times goes on—are withdrawn from the sphere of reason. But with these exceptions the two march side by side; they establish by different means the same results. For the conflicts which accompanied the first intrusion of philosophy into the theological domain more profound and cautious thinkers with a far ampler apparatus of knowledge had substituted a harmony. "The constant effort of Scholasticism to be at once philosophy and theology"[1] seemed at last satisfactorily realized. But the further progress of Scholastic thought consisted in a withdrawal of doctrine after doctrine from the possibility of rational proof and their relegation to the sphere of faith. Indeed, no sooner was the harmony apparently established by Aquinas than Duns Scotus began this negative criticism, which is carried much farther by William of Occam. But this is equivalent to a confession that Scholasticism had failed in its task, which was to rationalize the doctrines of the church. The Aristotelian form refused to fit a matter for which it was never intended; the matter of Christian theology refused to be forced into an alien form. The end of the period was thus brought about by the internal decay of its method and principles quite as much as by the variety of external causes which contributed to transfer men's interests to other subjects.

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[1] The common designation of Aristotle in the middle ages.

Scholasticism not unprogressive.

But, although the relation of reason to an external authority thus constitutes the badge of medieval thought, it would be unjust to look upon Scholasticism as philosophically barren, and to speak as if reason, after an interregnum of a thousand years, resumed its rights at the Renaissance. Such language was excusable in the men of the Renaissance, fighting the battle of classic form and beauty and of the manysidedness of life against the barbarous terminology and the monastic ideals of the schools, or in the protagonists of modern science. The new is never just to the old. In the schools and universities of the middle age the intellect of the semi-barbarous European peoples had been trained for the work of the modern world. But we may go further and say that, in spite of their initial acceptance of authority, the Scholastics are not the antagonists of reason; on the contrary they fight its battles. The attempt to establish *by argument* the authority of faith is in reality the unconscious establishment of the authority of reason. Reason, if admitted at all, must ultimately claim the whole man. Anselm's motto, *Credo ut intelligam*, marks well the distance that has been traversed since Tertullian's *Credo quia absurdum est*. The claim of reason has been recognized to manipulate the data of faith, at first blindly and immediately received, and to weld them into a system such as will satisfy its own needs. Scholasticism that has outlived its day may be justly identified with obscurantism, but not so the systems of those who, by their intellectual force alone, once held all the minds of Europe in subjection. The scholastic systems are not the free products of speculation; in the main they are *summae theologiae*, or they are modified versions of Aristotle. But each system is a fresh recognition of the rights of reason, and Scholasticism as a whole may be regarded as the history of the growth and gradual emancipation of reason which was completed in the movements of the Renaissance and the Reformation.

"Universals."

In speaking of the origin of Scholasticism—name and thing—it has been already noted that medieval speculation takes its rise in certain logical problems. To be more precise, it is the nature of "universals" which forms the central theme of Scholastic debate (see NOMINALISM, REALISM). This is the case almost exclusively during the first period, and only to a less extent during the second, where it reappears in a somewhat different form as the difficulty concerning the principle of individuation. The controversy was between Nominalists and Realists; and, exclusively logical as the point may at first sight seem to be, adherence to one side or the other is an accurate indication of philosophic tendency. The two opposing theories express at bottom, in the phraseology of their own time, the radical divergence of pantheism and individualism—the two extremes between which philosophy seems pendulum-wise to oscillate, and which may be said still to await their perfect reconciliation. First, however, we must examine the form which this question assumed to the first medieval thinkers, and the source from which they derived it.

Porphyry's "Isagoge."

A single sentence in Porphyry's *Isagoge* or "introduction" to the *Categories* of Aristotle furnished the text of the discussion. The treatise of Porphyry deals with the notions of genus, species, difference, property and accident (see PREDICABLES); and he mentions, but declines to discuss, the various theories that have been held as to the ontological import of genera and species. In the Latin translation of Boetius, in which alone the *Isagoge* was then known, the sentence runs as follows:—

> "Mox de generibus et speciebus illud quidem sive subsistant, sive in solis nudis intellectibus posita sint, sive subsistentia corporalia sint an incorporalia, et utrum separata a sensibilibus an in sensibilibus posita et circa haec consistentia, dicere recusabo; altissimum enim negotium est hujusmodi et majoris egens inquisitionis."

This passage indicates three possible positions with regard to universals. It may be held that they exist merely as conceptions in our minds; this is Nominalism or Conceptualism (*q.v.*). It may be held that they have a substantial existence of their own, independent of their existence in our thoughts. This is Realism, which may be of two varieties, according as the substantially existent universals are supposed to exist apart from the sensible phenomena or only in and with the objects of sense as their essence. The first form of Realism corresponds to the Platonic theory of the transcendence of the ideas; the second reproduces the Aristotelian doctrine of the essence as inseparable from the individual thing. But, though he implies an ample previous treatment of the questions by philosophers, Porphyry gives no references to the different systems of which such distinctions are the outcome, nor does he give any hint of his own opinion on the subject, definite enough though that was. He simply sets the discussion aside as too difficult for a preliminary discourse, and not strictly relevant to a purely logical inquiry. Porphyry, the Neoplatonist, the disciple of Plotinus, was an unknown personage to those early students of the *Isagoge*. The passage possessed for them a mysterious charm, largely due to its isolation and to their ignorance of the historic speculations which suggested it. And accordingly it gave rise to the three great doctrines which divided the medieval schools: Realism of the Platonic type, embodied in the formula *universalia ante rem*; Realism of the Aristotelian type, *universalia in re*; and Nominalism, including Conceptualism, expressed by the phrase *universalia post rem*, and also claiming to be based upon the Peripatetic doctrine.

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[1] Milman's *Latin Christianity*, ix. 101.

Extent of the early Schoolmen's knowledge.

To form a proper estimate of the first stage of Scholastic discussion it is requisite above all things to have a clear idea of the appliances then at the disposal of the writers. What was the extent of their knowledge of ancient philosophy? To begin with, we know that till the 13th century the middle age was ignorant of Greek, and possessed no philosophical works in their Greek original (see CLASSICS). In translations they had only the *Categories* and the *De interpretatione* of Aristotle in the versions of Boetius, the *Timaeus* of Plato in the version of Chalcidius, and Boetius's translation of Porphyry's *Isagoge*. Some general information as to the Platonic doctrines (chiefly in a Neoplatonic garb) was obtainable from the commentary with which Chalcidius (6th century) accompanied his translation, from the work of Apuleius (2nd century) *De dogmate Platonis*, and indirectly from the commentary of Macrobius (*c.* 400) on the *Somnium Scipionis* of Cicero, and from the writings of St Augustine. As aids to the study of logic, the doctors of this period, beside the commentaries and treatises of Boetius (*q.v.*), possessed two tracts attributed to St Augustine, the first of which, *Principia dialecticae*, is probably his, but is mainly grammatical in its import. The other tract, known as *Categoriae decem*, and taken at first for a translation of Aristotle's treatise, is really a rapid summary of it, and certainly does not belong to Augustine. To this list must be added: (1) the *Satyricon* of Martianus Capella (*q.v.*), the greater part of which is a treatise on the seven liberal arts, the fourth book dealing with logic; (2) the *De artibus ac disciplinis liberalium literarum* of Cassiodorus (*q.v.*); (3) the *Origines* of Isidore of Seville (*ob.* 636), which is little more than a reproduction of (2). The above constitutes the whole material which the earlier middle age had at its disposal.

Erigena.

The grandly conceived system of Erigena (see ERIGENA and MYSTICISM) stands by itself in the 9th century like the product of another age. John the Scot was still acquainted with Greek, seeing that he translated the work of the pseudo-Dionysius; and his speculative genius achieved the fusion of Christian doctrine and Neoplatonic thought in a system of quite remarkable metaphysical completeness. It is the only complete and independent system between the decline of ancient thought and the system of Aquinas in the 13th century, if indeed we ought not to go further, to modern times, to find a parallel. Erigena pronounces no express opinion upon the question which was even then beginning to occupy men's minds; but his Platonico-Christian theory of the Eternal Word as containing in Himself the exemplars of created things is equivalent to the assertion of *universalia ante rem*. His whole system, indeed, is based upon the idea of the divine as the exclusively real, of which the world of individual existence is but the theophany; the special and the individual are immanent, therefore, in the general. And hence at a much later date (in the beginning of the 13th century) his name was invoked to cover the pantheistic heresies of Amalrich of Bena.

Erigena does not separate his Platonic theory of pre-existent exemplars from the Aristotelian doctrine of the universal as *in* the individuals. As Ueberweg points out, his theory is rather a result of the transference of the Aristotelian conception of substance to the Platonic Idea, and of an identification of the relation of accidents to the substance in which they inhere with that of the individuals to the Idea of which, in the Platonic doctrine, they are copies (*Hist. of Philosophy*, i. 363, Eng. trans.). Hence it may be said that the universals are in the individuals, constituting their essential reality (and it is an express part of Erigena's system that the created but creative Word, the second division of Nature, should pass into the third stage of created and non-creating things); or rather, perhaps, we ought to say that the individuals exist in the bosom of their universal. At all events, while Erigena's Realism is pronounced, the Platonic and Aristotelian forms of the doctrine are not distinguished in his writings. Prantl has professed to find the head-stream of Nominalism also in Scotus Erigena; but beyond the fact that he discusses at considerable length the categories of thought and their mutual relations, occasionally using the term *voces* to express his meaning, Prantl appears to adduce no reasons for an assertion which directly contradicts Erigena's most fundamental doctrines. Moreover, Erigena again and again declares that dialectic has to do with the stadia of a real or divine classification: "Intelligitur quod ars illa, quae dividit genera in species et species in genera resolvit, quae διαλεκτική dicitur, non ab humanis machinationibus sit facta, sed in natura rerum ab auctore omnium artium, quae verae artes sunt, condita et a sapientibus inventa" (*De divisione naturae*, iv. 4).

Influence of Boetius.

The immediate influence of Erigena's system cannot have been great, and his works seem soon to have dropped out of notice in the centuries that followed. The real germs of Realism and Nominalism are to be found in the 9th century, in scattered commentaries and glosses upon the statements of Porphyry and Boetius. Boetius in commenting upon Porphyry had already started the discussion as to the nature of universals. He is definitely anti-Platonic, and his language sometimes takes even a nominalistic tone, as when he declares that the species is nothing more than a thought or conception gathered from the substantial similarity of a number of dissimilar individuals. The expression "substantial similarity" is still, however, sufficiently vague to cover a multitude of views. He concludes that the genera and species exist as universals only in thought; but, inasmuch as they are collected from singulars on account of a real resemblance, they have a certain existence independently of the mind, but not an existence disjoined from the singulars of sense. "Subsistunt ergo circa sensibilia, intelliguntur autem praeter corpora." Or, according to the phrase which recurs so often during the middle ages, "universale intelligitur, singulare sentitur." Boetius ends by declining to adjudicate between Plato and Aristotle, remarking in a semi-apologetic style that, if he has expounded Aristotle's opinion by preference, his course is justified by the fact that he is commenting upon an introduction to Aristotle. And, indeed, his discussion cannot claim to be more than semi-popular in character. The point in dispute has not in his hands the all-absorbing importance it afterwards attained, and the keenness of later distinctions is as yet unknown. In this way, however, though the distinctions drawn may still be comparatively vague, there existed in the schools a Peripatetic tradition to set over against the Neoplatonic influence of John the Scot, and amongst the earliest remains of Scholastic thought we find this tradition asserting itself somewhat vigorously. There were Nominalists before Roscellinus among these early thinkers.

Hrabanus Maurus.

Eric.

Alcuin (*q.v.*) does nothing more in his *Dialectic* than abridge Boetius and the other commentators. But in the school of Fulda, presided over by his pupil Hrabanus Maurus (776–856), there are to be found some fresh contributions to the discussion. The collected works of Hrabanus himself contain nothing new, but in some glosses on Aristotle and Porphyry, first exhumed by Cousin, there are several noteworthy expressions of opinion in a Nominalistic sense. The author interprets Boetius's meaning to be "Quod eadem res individuum et species et genus est, et non esse universalia individuis quasi quoddam diversum." He also cites, apparently with approval, the view of those who held Porphyry's treatise to be not *de quinque rebus*, but *de quinque vocibus*. A genus, they said, is essentially something which is predicated of a subject; but a thing cannot be a predicate (*res enim non praedicatur*). These glosses, it should be added, however, have been attributed by Prantl and Kaulich, on the ground of divergence from doctrines contained in the published works of Hrabanus, to some disciple of his rather than to Hrabanus himself. Fulda had become through the teaching of the latter an intellectual centre. Eric or Heiricus, who studied there under Haimon, the successor of Hrabanus, and afterwards taught at Auxerre, wrote glosses on the margin of his copy of the pseudo-Augustinian *Categoriae*, which have been published by Cousin and Hauréau. He there says in words which recall the language of Locke (*Essay*, iii. 3) that because proper names are innumerable, and no intellect or memory would suffice for the knowing of them, they are all as it were comprehended in the species. Taken strictly his words state the position of extreme Nominalism; but even if we were not forbidden to do so by other passages, in which the doctrine of moderate Realism is adopted (under cover of the current distinction between the singular as felt and the pure universal as understood), it would still be unfair to press any passage in the writings of this period. As Cousin says, "Realism and Nominalism were undoubtedly there in germ, but their true principles with their necessary consequences remained profoundly unknown; their connexion with all the great questions of religion and politics was not even suspected. The two systems were nothing more as yet than two different ways of interpreting a phrase of Porphyry, and they remained unnoticed in the obscurity of the schools. . . . It was the 11th century which gave Nominalism to the world."[1]

Remigius.

Remigius of Auxerre, pupil of Eric, became the most celebrated professor of dialectic in the Parisian schools of the 10th century. As he reverted to Realism, his influence, first at Rheims and then in Paris, was doubtless instrumental in bringing about the general acceptance of that doctrine till the advent of Roscellinus as a powerful disturbing influence. "There is one genus more general than the rest," says Remi (J. B. Hauréau, *Histoire de la philosophie scolastique*, i. 146), "beyond which the intellect cannot rise, called by the Greeks *οὐσία*, by the Latins *essentia*. The essence, indeed, comprehends all natures, and everything that exists is a portion of this essence, by participation in which everything that is hath its existence." And similarly with the intermediate genera. "Homo est multorum hominum substantialis unitas." Remigius is thus a Realist, not so much in the sense of Plato as in the spirit of Parmenides, and Hauréau applies to this form of Realism Bayle's description of Realism in general as "le Spinosisme non développé." The 10th century as a whole is especially marked out as a dark age, being partly filled with civil troubles and partly characterized by a reaction of faith against reason. In the monastery of St Gall there was considerable logical activity, but nothing of philosophical interest is recorded. **Gerbert.** The chief name of the century is that of Gerbert (died as Pope Silvester II. in 1003). His treatise *De rationali et ratione uti* is more interesting as a display of the logical acquirements of the age than as possessing any direct philosophical bearing. **School of Chartres.** The school of Chartres, founded in 990 by Fulbert, one of Gerbert's pupils, was distinguished for nearly two centuries not so much for its dialectics and philosophy as for its humanistic culture. The account which John of Salisbury gives of it in the first half of the 12th century, under the presidency of Theodoric and Bernard, affords a very pleasant glimpse into the history of the middle ages. Since then, says their regretful pupil, "less time and less care have been bestowed on grammar, and persons who profess all arts, liberal and mechanical, are ignorant of the primary art, without which a man proceeds in vain to the rest. For albeit the other studies assist literature, yet this has the sole privilege of making one lettered."[2]

Application of logic to theology.

Hitherto, if dialectical studies had been sometimes viewed askance by the stricter churchmen, it was not because logic had dared to stretch forth its hands towards the ark of God, but simply on the ground of the old opposition between the church and the world. But now bolder spirits arose who did not shrink from applying the distinctions of their human wisdom to the mysteries of theology. It was the excitement caused by their attempt, and the heterodox conclusions which were its first result, that lifted these Scholastic disputations into the central position which they henceforth occupied in the life of the middle ages. The next centuries show that peculiar combination of logic and theology which is the mark of Scholasticism, especially in the period before the 13th century.

Berengarius.

One of the first of these attacks was made by Berengarius of Tours (999–1088) upon the doctrine of transubstantiation; he denied the possibility of a change of substance in the bread and wine without some corresponding change in the accidents. M de Rémusat characterizes his view on the Eucharist as a specific application of Nominalism. More intimately connected with the progress of philosophical thought was the tritheistic view of the Trinity propounded by Roscellinus as one of the results of his Nominalistic theory of knowing and being. **Roscellinus.** The sharpness and onesidedness with which he formulated his position were the immediate occasion of the contemporaneous crystallization of Realism in the theories of Anselm and William of Champeaux. Henceforth discussion is carried on with a full consciousness of the differences involved and the issues at stake; and, thanks to the heretical conclusion disclosed by Roscellinus, Realism became established for several centuries as the orthodox philosophical creed. Roscellinus (d. *c.* 1125) was looked upon by later times as the originator of the *sententia vocum*, that is to say, of Nominalism proper. From the scanty and ill-natured notices of his opponents (Anselm and Abelard), we gather that he refused to recognize the reality of anything but the individual; he treated "the universal substance," says Anselm, as no more than "flatum vocis," a verbal breathing or sound; and in a similar strain he denied any reality to the parts of which a whole, such as a house, is commonly said to be composed. The parts in the one case, the general name or common attributes in the other, are only, he seems to have argued, so many subjective points of view from which we choose to regard that which in its own essence is one and indivisible, existing in its own right apart from any connexion with other individuals. This pure individualism, consistently interpreted, involves the denial of all real relation whatsoever; for things are related and classified by means of their general characteristics. Accordingly, if these general characteristics do not possess reality, things are reduced to a number of characterless and mutually indifferent points. It is possible, as Hauréau maintains, that Roscellinus meant no more than to refute the extreme Realism which asserts the substantial and, above all, the independent existence of the universals. Some of the expressions used by Anselm in controverting his position favour this idea. He upbraids Roscellinus, for example, because he was unable to conceive whiteness apart from its existence in something white. But this is precisely an instance of the hypostatization of abstractions in exposing which the chief strength and value of Nominalism lie. Cousin is correct in pointing out, from the Realistic point of view, that it is one thing to deny the hypostatization of an accident like colour or wisdom, and another thing to deny the foundation in reality of those "true and legitimate universals" which we understand by the terms genera and species. It is not to be supposed that the full scope of his doctrine was present to the mind of Roscellinus; but Nominalism would hardly have made the sensation it did had its assertions been as innocent as Hauréau would make them. Like most innovators, Roscellinus stated his position in bold language, which emphasized his opposition to accepted doctrines; and his words, if not his intentions, involved the extreme Nominalism which, by making universality merely subjective, pulverizes existence into detached particulars. And, though we may acquit Roscellinus of consciously propounding a theory so subversive of all knowledge, his criticism of the doctrine of the Trinity is proof at least of the determination with which he was prepared to carry out his individualism. If we are not prepared to say that the three Persons are one thing—in which case the Father and the Holy Ghost must have been incarnate along with the Son—then, did usage permit, he says, we ought to speak of three Gods.

Anselm.

This theological deduction from his doctrine drew upon Roscellinus the polemic of his most celebrated opponent, Anselm of Canterbury (1033–1109). Roscellinus appears at first to have imagined that his tritheistic theory had the sanction of Lanfranc and Anselm, and the latter was led in consequence to compose his treatise *De fide Trinitatis*. From this may be gathered his views on the nature of universals. "How shall he who has not arrived at understanding how several men are in species one man comprehend how in that most mysterious nature several persons, each of which is perfect God, are one God?" The manner in which humanity exists in the individual was soon to be the subject of keen discussion, and to bring to light diverging views within the Realistic camp; but St Anselm does not go into detail on this point, and seems to imply that it is not surrounded by special difficulties. In truth, his Realism was of a somewhat uncritical type. It was simply accepted by him in a broad way as the orthodox philosophic doctrine, and the doctrine which, as a sagacious churchman, he perceived to be most in harmony with Christian theology. Anselm's natural element was theology, and the high metaphysical questions which are as it were the obverse of theology. On the other hand, as the first to formulate the ontological argument (in his *Proslogion*) for the existence of God, he joins hands with some of the profoundest names in modern philosophy. To Anselm specially belongs the motto *Credo ut intelligam*, or, as it is otherwise expressed in the sub-title of his *Proslogion, Fides quaerens intellectum.* He endeavoured to give a philosophical demonstration not only of the existence of God but also of the Trinity and the Incarnation, which were placed by the later Scholastics among the "mysteries." The Christological theory of satisfaction expounded in the *Cur Deus Homo* falls beyond the scope of the present article. But the Platonically conceived proof of the being of God contained in the *Monologion* shows that Anselm's doctrine of the universals as substances in things (*universalia in re*) was closely connected in his mind with the thought of the *universalia ante rem*, the exemplars of perfect goodness and truth and justice, by participation in which all earthly things are judged to possess these qualities. In this way he rises like Plato to the absolute Goodness, Justice and Truth, and then proceeds in Neoplatonic fashion to a deduction of the Trinity as involved in the idea of the divine Word (see further ANSELM).

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[1] Victor Cousin, *Ouvrages inédits d'Abélard*, Introd. p. lxxxv.

[2] *Metalogicus*, i. 27, quoted in Poole's *Illustrations of Medieval Thought*.

William of Champeaux.

Besides its connexion with the speculations of Anselm, the doctrine of Roscellinus was also of decisive influence within the schools in crystallizing the opposite opinion. William of Champeaux (1070–1121), who is reputed the founder of a definitely formulated Realism, much as Roscellinus is regarded as the founder of Nominalism, was instructed by Roscellinus himself in dialectic. Unfortunately none of William's philosophical works have survived, and we depend upon the statements of his opponent Abelard, in the *Historia calamitatum mearum*, and in certain manuscripts discovered by Cousin. From these sources it appears that he professed successively two opinions on the nature of the universals, having been dislodged from his first position by the criticism of Abelard, his quondam pupil. There is no obscurity about William's first position. It is a Realism of the most uncompromising type, which by its reduction of individuals to accidents of one identical substance seems to tremble on the very verge of Spinozism. He taught, says Abelard, that the same thing or substance was present in its entirety and essence in each individual, and that individuals differed no whit in their essence but only in the variety of their accidents. Thus "Socratitas" is merely an accident of the substance "humanitas," or, as it is put by the author of the treatise *De generibus et speciebus*,[1] "Man is a species, a thing essentially one (*res una essentialiter*), which receives certain forms which make it Socrates. This thing, remaining essentially the same, receives in the same way other forms which constitute Plato and the other individuals of the species man; and, with the exception of those forms which mould that matter into the individual Socrates, there is nothing in Socrates that is not the same at the same time under the forms of Plato. . . . According to these men, even though rationality did not exist in any individual, its existence in nature would still remain intact" (Cousin, *Introduction*, &c., p. cxx.). Criticism was speedily at work upon William of Champeaux's position. He had said expressly that the universal essence, by the addition of the individual forms, was individualized and present *secundum totam suam quantitatem* in each individual. But if *homo* is wholly and essentially present in Socrates, then it is, as it were, absorbed in Socrates; where Socrates is not, it cannot be, consequently not in Plato and the other *individua hominis.* This was called the argument of the *homo Socraticus*; and it appears to have been with the view of obviating such time and space difficulties, emphasized in the criticism of Abelard, that William latterly modified his form of expression. But his second position is enveloped in considerable obscurity. Abelard says, "Sic autem correxit sententiam, ut deinceps rem eamdem non essentialiter sed individualiter diceret." In other words, he merely sought to avoid the awkward consequences of his own doctrine by substituting "individualiter" for "essentialiter" in his definition. If we are to put a sense upon this new expression, William may probably have meant to recall any words of his which seemed, by locating the universal in the entirety of its essence in each individual to confer upon the individual an independence which did not belong to it—thus leading in the end to the demand for a separate universal for each individual. In opposition to this Nominalistic view, which implied the reversal of his whole position, William may have meant to say that, instead of the universal being multiplied, it is rather the individuals which are reduced to unity in the universal. The species is essentially one, but it takes on individual varieties or accidents. If, however, we are more ill-natured, we may regard the phrase, with Prantl, as simply a meaningless makeshift in extremities; and if so, Abelard's account of the subsequent decline of William's reputation would be explained. But there is in some of the manuscripts the various reading of "indifferenter" for "individualiter," and this is accepted as giving the true sense of the passage by Cousin and Rémusat (Hauréau and Prantl taking, on different grounds, the opposite view). According to this reading, William sought to rectify his position by asserting, not the numerical identity of the universal in each individual, but rather its sameness in the sense of indistinguishable similarity. Ueberweg cites a passage from his theological works which apparently bears out this view, for William there expressly distinguishes the two senses of the word "same." Peter and Paul, he says, are the same in so far as they are both men, although the humanity of each is, strictly speaking, not identical but similar. In the Persons of the Trinity, on the other hand the relation is one of absolute identity.

Theory of indifference.

Whether this view is to be traced to William or not, it is certain that the theory of "indifference" or "non-difference" (*indifferentia*) was a favourite solution in the Realistic schools soon after his time. The inherent difficulties of Realism led to a variety of attempts to reach a more satisfactory formula. John of Salisbury, in his account of the controversies of these days (*Metalogicus*, ii. 17) reckons up nine different views which were held on the question of the universals, and the list is extended by Prantl (ii. 118) to thirteen. In this list are included of course all shades of opinion, from extreme Nominalism to extreme Realism. The doctrine of indifference as it appears in later writers certainly tends, as Prantl points out, towards Nominalism, inasmuch as it gives up the substantiality of the universals. The universal consists of the non-different elements or attributes in the separate individuals, which alone exist substantially. If we restrict attention to these non-different elements, the individual becomes for us the species, the genus, &c.; everything depends on the point of view from which we regard it. "Nihil omnino est praeter individuum, sed et illud aliter et aliter attentum species et genus et generalissimum est." Adelard of Bath (whose treatise *De eodem et diverso* must have been written between 1105 and 1117) was probably the author or at all events the elaborator of this doctrine, and he sought by its means to effect a reconciliation between Plato and Aristotle:—"Since that which we see is at once genus and species and individual, Aristotle rightly insisted that the universals do not exist except in the things of sense. But, since those universals, so far as they are called genera and species, cannot be perceived by any one in their purity without the admixture of imagination, Plato maintained that they existed and could be beheld beyond the things of sense, to wit, in the divine mind. Thus these men, although in words they seem opposed, yet held in reality the same opinion." Prantl distinguishes from the system of indifference the "status" doctrine attributed by John of Salisbury to Walter of Mortagne (d. 1174), according to which the universal is essentially united to the individual, which may be looked upon, *e.g.* as Plato, man, animal, &c., according to the "status" or point of view which we assume. But this seems only a different expression for the same position, and the same may doubtless be said of the theory which employed the outlandish word "maneries" (Fr. *manière*) to signify that genera and species represented the different ways in which individuals might be regarded. The concessions to Nominalism which such views embody make them representative of what Hauréau calls "the Peripatetic section of the Realistic school."

School of Chartres.

Somewhat apart from current controversies stood the teaching of the school of Chartres, humanistically nourished on the study of the ancients, and important as a revival of Platonism in opposition to the formalism of the Aristotelians. Bernard of Chartres, at the beginning of the 12th century, endeavoured, according to John of Salisbury, to reconcile Plato and Aristotle; but his doctrine is almost wholly derived from the former through St Augustine and the commentary of Chalcidius. The *universalia in re* have little place in his thoughts, which are directed by preference to the eternal exemplars as they exist in the supersensible world of the divine thought. His *Megacosmus* and *Microcosmus* are little more than a poetic gloss upon the *Timaeus.* William of Conches, a pupil of Bernard's, devoting himself to psychological and physiological questions, was of less importance for the specific logico-metaphysical problem. But Gilbert de la Porrée, according to Hauréau, is the most eminent logician of the Realistic school in the 12th century and the most profound metaphysician of either school. The views which he expressed in his commentary on the pseudo-Boetian treatise, *De Trinitate*, are certainly much more important than the mediatizing systems already referred to. The most interesting part of the work is the distinction which Gilbert draws between the manner of existence of genera and species and of substances proper. He distinguishes between the *quod est* and the *quo est*. Genera and species certainly exist, but they do not exist in their own right as substances. What exists as a substance and the basis of qualities or forms (*quod est*) may be said *substare*; the forms on the other hand by which such an individual substance exists qualitatively (*quo est*) *subsistunt*, though it cannot be said that they *substant*. The intellect collects the universal, which exists but not as a substance (*est sed non substat*), from the particular things which not merely are (*sunt*) but also, as subjects of accidents, have substantial existence (*substant*), by considering only their substantial similarity or conformity. The universals are thus forms inherent in things—" native forms," according to the expression by which Gilbert's doctrine is concisely known. The individual consists of an assemblage of such forms; and it is individual because nowhere else is exactly such an assemblage to be met with. The form exists concretely in the individual things (*sensibilis in re sensibili*), for in sensible things form and matter are always united. But they may be conceived abstractly or non-sensuously by the mind (*sed mente concipitur insensibilis*), and they then refer themselves as copies to the Ideas their divine exemplars. In God, who is pure form without matter, the archetypes of material things exist as eternal immaterial forms. In this way Gilbert was at once Aristotelian and Platonist. The distinctions made by him above amount to a formal criticism of categories, and in the same spirit he teaches that no one of the categories can be applied in its literal sense to God (see further GILBERT DE LA PORRÉE).

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[1] This treatise, first published by Cousin in his *Ouvrages inédits d'Abélard*, was attributed by him to Abelard, and he was followed in this opinion by Hauréau; but Prantl adduces reasons which seem satisfactory for believing it to be the work of an unknown writer of somewhat later date (see Prantl. *Geschichte d. Logik*, ii. 143).

Abelard.

But the outstanding figure in the controversies of the first half of the 12th century is Abelard. There is considerable difference of opinion as to his system, some, like Ritter and Erdmann, regarding it as a moderate form of Realism—a return indeed to the position of Aristotle—while others, like Cousin, Rémusat, Hauréau and Ueberweg, consider it to be essentially Nominalistic, only more prudently and perhaps less consistently expressed than was the case with Roscellinus. His position is ordinarily designated by the name Conceptualism (*q.v.*), though there is very little talk of concepts in Abelard's own writings. There can be no doubt, at all events, that Abelard himself intended to find a compromise. As against Realism he maintains consistently *Res de re non praedicatur*; genera and species, therefore, which are predicated of the individual subject, cannot be treated as things or substances. This is manifestly true, however real the facts may be which are designated by the generic and specific names; and the position is fully accepted, as has been seen, by a Realist like Gilbert, who perhaps adopted it first from Abelard. Abelard also perceived that Realism, by separating the universal substance from the forms which individualize it, makes the universal indifferent to these forms, and leads directly to the doctrine of the identity of all beings in one universal substance or matter—a pantheism which might take either an Averroistic or a Spinozistic form. Against the system of non-difference Abelard has a number of logical and traditional arguments to bring, but it is sufficiently condemned by his fundamental doctrine that only the individual exists in its own right. For that system still seems to recognize a generic substance as the core of the individual, whereas, according to Cousin's rendering of Abelard's doctrine, " only individuals exist, and in the individual nothing but the individual." Holding fast then on the one hand to the individual as the only true substance, and on the other to the traditional definition of the genus as that which is predicated of a number of individuals (*quod praedicatur de pluribus*), Abelard declared that this definition of itself condemns the Realistic theory; only a name, not a thing, can be so predicated—not the name, however, as a *flatus vocis* or a collection of letters, but the name as used in discourse, the name as a sign, as having a meaning—in a word, not *vox* but *sermo*. *Sermo est praedicabilis.*

By these distinctions Abelard hoped to escape the consequences of extreme Nominalism, from which, as a matter of history, his doctrine has been distinguished under the name of Conceptualism, seeing that it lays stress not on the word as such but on the thought which the word is intended to convey. Moreover, Abelard evidently did not mean to imply that the distinctions of genera and species are of arbitrary or merely human imposition. His favourite expression for the universal is " quod de pluribus natum est praedicari " (a translation of Aristotle, *De interpretatione*, 7), which would seem to point to a real or objective counterpart of the products of our thought; and the traditional definitions of Boetius, whom he frequently quotes, support the same view of the concept as gathered from a number of individuals in virtue of a real resemblance. What Abelard combats is the substantiation of these resembling qualities, which leads to their being regarded as identical in all the separate individuals, and thus paves the way for the gradual undermining of the individual, the only true and indivisible substance. But he modifies his Nominalism so as to approach, though somewhat vaguely, to the position of Aristotle himself. At the same time he has nothing to say against the Platonic theory of *universalia ante rem* (see IDEALISM). Abelard's discussion of the problem (which it is right to say is on the whole incidental rather than systematic) is thus marked by an eclecticism which was perhaps the source at once of its strength and its weakness. But his brilliant ability and restless activity made him the central figure in the dialectical as in the other discussions of his time. To him was indirectly due, in the main, that troubling of the Realistic waters which resulted in so many modifications of the original thesis; and his own somewhat eclectic ruling on the question in debate came to be tacitly accepted in the schools, as the ardour of the disputants began to abate after the middle of the century.

Bernard of Clairvaux.

Abelard's application of dialectic to theology betrayed the Nominalistic basis of his doctrine. He zealously combated the Tritheism of Roscellinus, but his own views on the Trinity were condemned by two councils (at Soissons in 1121 and at Sens in 1140). Of the alternatives—three Gods or *una res*—which his Nominalistic logic presented to Roscellinus, Roscellinus had chosen the first; Abelard recoiled to the other extreme, reducing the three Persons to three aspects or attributes of the Divine Being (Power, Wisdom and Love). For this he was called to account by Bernard of Clairvaux (1091–1153), the recognized guardian of orthodoxy in France. Nor can it be said that the instinct of the saint was altogether at fault. The germs of Rationalism were unquestionably present in several of Abelard's opinions, and still more so, the traditionalists must have thought, in his general attitude towards theological questions. " A doctrine is believed," he said, " not because God has said it, but because we are convinced by reason that it is so." "Doubt is the road to inquiry, and by inquiry we perceive the truth." The application of dialectic to theology was not new. Anselm had made an elaborate employment of reason in the interest of faith, but the spirit of pious subordination which had marked the demonstrations of Anselm seemed wanting in the argumentations of this bolder and more restless spirit; and the church, or at least an influential section of it, took alarm at the encroachments of Rationalism. Abelard's remarkable compilation *Sic et Non* was not calculated to allay their suspicions. In bringing together the conflicting opinions of the fathers on all the chief points of Christian dogmatics, it may be admitted that Abelard's aim was simply to make these contradictions the starting point of an inquiry which should determine in each case the true position and *via media* of Christian theology. Only such a determination could enable the doctrines to be summarily presented as a system of thought. The book was undoubtedly the precursor of the famous *Books of Sentences* of Abelard's own pupil Peter Lombard and others, and of all the *Summae theologiae* with which the church was presently to abound. But the antinomies, as they appeared in Abelard's treatise, without their solutions, could not but seem to insinuate a deep-laid scepticism with regard to authority. And even the proposal to apply the unaided reason to solve questions which had divided the fathers must have been resented by the more rigid churchmen as the rash intrusion of an over-confident Rationalism.

Realism was in the beginning of the 12th century the dominant doctrine and the doctrine of the church; the Nominalists were the innovators and the especial representatives of the Rationalistic

Hugo of St Victor and the Summists.

tendency. In order to see the difference in this respect between the schools we have only to compare the peaceful and fortunate life of William of Champeaux (who enjoyed the friendship of St Bernard) with the agitated and persecuted existence of Roscellinus and, in a somewhat less degree, of Abelard. But now the greater boldness of the dialecticians awakened a spirit of general distrust in the exercise of reason on sacred subjects, and we find even a Realist like Gilbert de la Porrée arraigned by Bernard and his friends before a general council on a charge of heresy (at Rheims, 1148). Though Gilbert was acquitted, the fact of his being brought to trial illustrates the growing spirit of suspicion. Those heresy-hunts show us the worst side of St Bernard, yet they are in a way just the obverse of his deep mystical piety. The same attitude is maintained by the mystical school of St Victor. Hugo of St Victor (1097–1141) declares that “the uncorrupted truth of things cannot be discovered by reasoning.” The perils of dialectic are manifold, especially in the overbold spirit it engenders. Nevertheless Hugo, by the composition of his *Summa sententiarum*, endeavoured to give a methodical or rational presentation of the content of faith, and was thus the first of the so-called Summists. Richard of St Victor, prior of the monastery from 1162 to 1173, is still more absorbed in mysticism, and his successor Walter loses his temper altogether in abuse of the dialecticians and the Summists alike. The Summists have as much to say against the existence of God as for it, and the dialecticians, having gone to school to the pagans, have forgotten over Aristotle the way of salvation. Abelard, Peter Lombard, Gilbert de la Porrée and Peter of Poitiers he calls the “four labyrinths of France.”

Decline of logic.

John of Salisbury.

This anger and contempt may have been partly justified by the discreditable state into which the study of logic had fallen. The speculative impulse was exhausted which marks the end of the 11th and the first half of the 12th century—a period more original and more interesting in many ways than the great age of Scholasticism in the 13th century. By the middle of the century, logical studies had lost to a great extent their real interest and application, and had degenerated into trivial displays of ingenuity. On the other hand, the Summists[1] occupied themselves merely in the systematizing of authorities. The mystics held aloof from both, and devoted themselves to the practical work of preaching and edification. The intellect of the age thus no longer exhibited itself as a unity. And it is significant of this that the ablest and most cultured representative of the second half of the century was rather an historian of opinion than himself a philosopher or a theologian. John of Salisbury (Johannes Sarisberiensis) was educated in France in the years 1136–1148. The autobiographical account of these years contained in his *Metalogicus* is of the utmost value as a picture of the schools of the time; it is also one of the historian's chief sources as a record of the many-coloured logical views of the period. John recoiled from the idle casuistry which occupied his own logical contemporaries; and, mindful probably of their aimless ingenuity, he adds the caution that dialectic, valuable and necessary as it is, is “like the sword of Hercules in a pigmy's hand” unless there be added to it the accoutrement of the other sciences. Catholic in spirit rather than dogmatic, John ranks himself at times among the Academics, “since, in those things about which a wise man may doubt, I depart not from their footsteps.” It is not fitting to subtilize overmuch, and in the end John of Salisbury's solution is the practical one, his charitable spirit pointing him in particular to that love which is the fulfilling of the law.

Extension of knowledge of the works of Aristotle.

The first period of Scholasticism being thus ~~at~~ an end, there is an interval of nearly half a century without any noteworthy philosophical productions. The cause of the new development of Scholasticism in the 13th century was the acquisition for the first time of the complete works of Aristotle (see CLASSICS and ARABIAN PHILOSOPHY). The doctrines and the works of Aristotle had been transmitted by the Nestorians to the Arabs, and among those kept alive by a succession of philosophers, first in the East and afterwards in the West. The chief of these, at least so far as regards the influence which they exerted on medieval philosophy, were Avicenna, Avempace and Averroes. The unification by the last-mentioned of Aristotle's active intellect in all men, and his consequent denial of individual immortality are well known. The universal human intellect is made by him to proceed from the divine by a series of Neoplatonic emanations. In the course of the 12th century the writings of these men were introduced into France by the Jews of Andalusia, of Marseilles and Montpellier. “These writings contained,” says Hauréau, “the text of the *Organon*, the *Physics*, the *Metaphysics*, the *Ethics*, the *De anima*, the *Parva naturalia* and a large number of other treatises of Aristotle, accompanied by continuous commentaries. There arrived besides by the same channel the glosses of Theophrastus, of Simplicius, of Alexander of Aphrodisias, of Philoponus, annotated in the same sense by the same hands. This was the rich but dangerous present made by the Mussulman school to the Christian” (i. 382). To these must be added the Neoplatonically inspired *Fons Vitae* of the Jewish philosopher and poet Ibn Gabirol (*q.v.*), or Avicebron.

By special command of Raimund, archbishop of Toledo, the chief of these works were translated from the Arabic through the Castilian into Latin by the archdeacon Dominicus Gonzalvi with the aid of Johannes Avendeath (=ben David), a converted Jew, about 1150. About the same time, or not long after, the *Liber de causis* became known—a work destined to have a powerful influence on Scholastic thought, especially in the period immediately succeeding. Accepted at first as Aristotle's, and actually printed in the first Latin editions of his works, the book is in reality an Arabian compilation of Neoplatonic theses. Of a similar character was the pseudo-Aristotelian *Theologia* which was in circulation at least as early as 1200.

First effects of the new knowledge.

The first effects of this immense acquisition of new material were markedly unsettling on the doctrinal orthodoxy of the time. The apocryphal Neoplatonic treatises and the views of the Arabian commentators obscured for the first students the genuine doctrine of Aristotle, and the 13th century opens with quite a crop of mystical heresies. The mystical pantheism taught at Paris by Amalrich of Bena (d. 1207; see AMALRIC and MYSTICISM), though based by him upon a revival of Scotus Erigena, was doubtless connected in its origin with the Neoplatonic treatises which now become current. The immanence of God in all things and His incarnation as the Holy Spirit in themselves appear to have been the chief doctrines of the Amalricans. They are reported to have said, “Omnia unum, quia quicquid est est Deus.” About the same time David of Dinant, in a book *De tomis* (rendered by Albertus *De divisionibus*), taught the identity of God with matter (or the indivisible principle of bodies) and nous (or the indivisible principle of intelligences)—an extreme Realism culminating in a materialistic pantheism. If they were diverse, he argued, there must exist above them some higher or common element or being, in which case this would be God, nous, or the original matter. The spread of the Amalrican doctrine led to fierce persecutions, and the provincial council which met at Paris in 1209 expressly decreed “that neither the books of Aristotle on natural philosophy, nor commentaries on the same, should be read, whether publicly or privately, at Paris.” In 1215 this prohibition is renewed in the statutes of the university of Paris, as sanctioned by the papal legate. Permission was given to lecture on the logical books, both those which had been known all along and those introduced since 1128, but the veto upon the *Physics* is extended to the *Metaphysics* and the summaries of the Arabian commentators. By 1231, however, the fears of the church were beginning to be allayed. A bull of Gregory IX. in that year makes no mention of any Aristotelian works except the *Physics*. Finally, in 1254, we find the university officially prescribing how many hours are to be devoted to the explanation of the *Metaphysics* and the principal physical treatises of Aristotle. These dates enable us to measure accurately the stages by which the church accommodated itself to, and as it were took possession of, the Aristotelian philosophy. Growing knowledge of Aristotle's works and the multiplication of translations enabled students to distinguish the genuine Aristotle from the questionable accompaniments with which he had made his first appearance in Western Europe. Fresh translations of Aristotle and Averroes had already been made from the Arabic (Περὶ τὰ ζῷα ἱστορίαι from the Hebrew) by Michael Scot, and Hermannus Alamannus, at the instance of the emperor Frederick II.; so that the whole body of Aristotle's works was at hand in Latin translations from about 1210 to 1225. Soon afterwards efforts began to be made to secure more literal translations direct from the Greek. Robert Grosseteste (d. 1253) was one of the first to stir in this matter, and he was followed by Albertus Magnus and Thomas Aquinas. Half a century thus sufficed to remove the ban of the church, and soon Aristotle was recognized on all hands as "the philosopher" *par excellence*, the master of those that know. It even became customary to draw a parallel between him as the *praecursor Christi in naturalibus* and John the Baptist, the *praecursor Christi in gratuitis.*

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[1] Among these may be mentioned Robert Pulleyn (d. 1150), Peter Lombard (d. 1164), called the *Magister sententiarum*, whose work became the text-book of the schools, and remained so for centuries. Hundreds of commentaries were written upon it. Peter of Poitiers, the pupil of Peter the Lombard, flourished about 1160–1170. Other names are Robert of Melun, Hugo of Amiens, Stephen Langton and William of Auxerre. More important is Alain de Lille (Alanus de Insulis), who died at an advanced age in 1203. His *De arte seu de articulis catholicae fidei* is a *Summa* of Christian theology, but with a greater infusion than usual of philosophical reasoning. Alanus was acquainted with the celebrated *Liber de causis*.

This unquestioned supremacy was not yielded, however, at the very beginning of the period. The earlier doctors who avail themselves of Aristotle's works, while bowing to his authority implicitly in matters of logic, are generally found defending a Christianized Platonism against the doctrine of the *Metaphysics.*

So it is with Alexander of Hales (d. 1245), the first Scholastic who was acquainted with the whole of the Aristotelian works and the Arabian commentaries upon them. ***Alexander of Hales.*** He was more of a theologian than a philosopher; and in his chief work, *Summa universae theologiae*, he simply employs his increased philosophical knowledge in the demonstration of theological doctrines. So great, however, did his achievement seem that he was honoured with the titles of *Doctor irrefragabilis* and *Theologorum monarcha.* Alexander of Hales belonged to the Franciscan order, and it is worth remarking that it was the mendicant orders which now came forward as the protagonists of Christian learning and faith and, as it were, reconquered Aristotle for the church. ***Mendicant friars.*** During the first half of the 13th century, when the university of Paris was plunged in angry feuds with the municipality, feuds which even led at one time (1229) to the flight of the students in a body, the friars established teachers in their convents in Paris. After the university had settled its quarrels these continued to teach, and soon became formidable rivals of the secular lecturers. After a severe struggle for academical recognition they were finally admitted to all the privileges of the university by a bull of Alexander IV. in 1253. The Franciscans took the lead in this intellectual movement with Alexander of Hales and Bonaventura, but the Dominicans were soon able to boast of two greater names in Albert the Great and Thomas Aquinas. Still later Duns Scotus and Occam were both Franciscans. ***John of Rochelle.*** Alexander of Hales was succeeded in his chair of instruction by his pupil John of Rochelle, who died in 1271 but taught only till 1253. His treatise *De anima*, on which Hauréau lays particular stress, is interesting as showing the greater scope now given to psychological discussions. This was a natural result of acquaintance with Aristotle's *De anima* and the numerous Greek and Arabian commentaries upon it, and it is observable in most of the writers that have still to be mentioned. Even the nature of the universals is no longer discussed from a purely logical or metaphysical point of view, but becomes connected with psychological questions. And, on the whole, the widening of intellectual interests is the chief feature by which the second period of Scholasticism may be distinguished from the first. ***General characteristics of second period.*** In some respects there is more freshness and interest in the speculations which burst forth so ardently in the end of the 11th and the first half of the 12th century. Albert and Aquinas no doubt stood on a higher level than Anselm and Abelard, not merely by their wider range of knowledge but also by the intellectual massiveness of their achievements; but it may be questioned whether the earlier writers did not possess a greater force of originality and a keener talent. Originality was at no time the strong point of the middle ages, but in the later period it was almost of necessity buried under the mass of material suddenly thrust upon the age, to be assimilated. On the other hand, the influence of this new material is everywhere evident in the wider range of questions which are discussed by the doctors of the period. Interest is no longer to the same extent concentrated on the one question of the universals. Other questions, says Hauréau, are "placed on the order of the day—the question of the elements of substance, that of the principle of individuation, that of the origin of the ideas, of the manner of their existence in the human understanding and in the divine thought, as well as various others of equal interest" (i. 420). Some of these, it may be said, are simply the old Scholastic problem in a different garb; but the extended horizon of which Hauréau speaks is amply proved by mere reference to the treatises of Albert and St Thomas. They there seek to reproduce for their own time all the departments of the Aristotelian system.

Bonaventura. John of Rochelle was succeeded in 1253 by John Fidanza, better known as Bonaventura (*q.v.*), who also had been a pupil of Alexander of Hales. But the fame of "the Seraphic Doctor" is connected more closely with the history of mysticism (see MYSTICISM) than with the main stream of Scholastic thought. Like his master, he defended Plato—or what he considered to be the Platonic theory—against the attacks of Aristotle. Thus he defended the *universalia ante rem* as exemplars existent in the divine intelligence, and censured Aristotle's doctrine of the eternity of the world. ***William of Auvergne.*** Among the earlier teachers and writers of this century we have also to name William of Auvergne (d. 1249), whose treatises *De universo* and *De anima* make extensive use of Aristotle and the Arabians, but display a similar Platonic leaning. The existence of intellections in our minds is, he maintains, a sufficient demonstration of the existence of an intelligible world, just as the ideas of sense are sufficient evidence of a sensible world. This archetypal world is the Son of God and true God. ***Grosseteste.*** Robert Grosseteste, important in the sphere of ecclesiastical politics, has been already mentioned as active in procuring translations of Aristotle from the Greek. He also wrote commentaries on logical and physical works of Aristotle. ***Michael Scot.*** Michael Scot, the renowned wizard of popular tradition, earned his reputation by numerous works on astrology and alchemy. His connexion with philosophy was chiefly in the capacity of a translator. ***Vincent of Beauvais.*** Vincent of Beauvais (d. 1264) was the author of an encyclopaedic work called *Speculum majus*, in which, without much independent ability, he collected the opinions of ancient and medieval writers on the most diverse points, transcribing the fragments of their works which he deemed most interesting.

Albertus Magnus introduces us at once to the great age of Scholasticism (1193–1280). The limits of his long life include that of his still greater pupil, Thomas Aquinas (1227–1274). ***Albert and Aquinas.*** For this reason and because the system of Thomas is simply that of Albert rounded to a greater completeness and elaborated in parts by the subtle intellect of the younger man, it will be convenient not to separate the views of master and scholar, except where their differences make it necessary. Albert was "the first Scholastic who reproduced the whole philosophy of Aristotle in systematic order with constant reference to the Arabic commentators, and who remodelled it to meet the requirements of ecclesiastical dogma" (Ueberweg, i. 436). On this account he was called "the Universal Doctor." But in Albert it may be said that the matter was still too new and too multifarious to be thoroughly mastered. In St Thomas this is no longer so. The pupil, entering into his master's labours, was able from the first to take a more comprehensive survey of the whole field; and in addition he was doubtless endowed with an intellect which was finer, though it might not be more powerful, than his master's.

"Mysteries" excluded from philosophy. The monotheistic influence of Aristotle and his Arabian commentators shows itself in Albert and Aquinas, at the outset, in the definitive fashion in which the "mysteries" of the Trinity and the Incarnation are henceforth detached from the sphere of rational or philosophical theology. So long as the Neoplatonic influence remained strong, attempts were still made to demonstrate the doctrine of the Trinity, chiefly in a mystical sense as in Erigena, but also by orthodox churchmen like Anselm. Orthodoxy, whether Catholic or Protestant, has since generally adopted Thomas's distinction. The existence of God is maintained by Albert and Aquinas to be domonstrable by reason; but here again they reject the ontological argument of Anselm, and restrict themselves to the *a posteriori* proof, rising after the manner of Aristotle from that which is prior for us to that which is prior by nature or in itself. God is not fully comprehensible by us, says Albert, because the finite is not able to grasp the infinite, yet he is not altogether beyond our knowledge; our intellects are touched by a ray of his light, and through this contact we are brought into communion with him. God, as the only self-subsistent and necessary being, is the creator of all things. Here the Scholastic philosophy comes into conflict with Aristotle's doctrine of the eternity of the world. Albert and Aquinas alike maintain the beginning of the world in time; time itself only exists since the moment of this miraculous creation. But Aquinas, though he holds the fact of creation to be rationally demonstrable, regards the beginning of the world *in time* as only an article of faith, the philosophical arguments for and against being inconclusive.

The principle of individuation.

The question of universals, though fully discussed, no longer forms the centre of speculation. The great age of Scholasticism presents, indeed, a substantial unanimity upon this vexed point, maintaining at once, in different senses, the existence of the universals *ante rem*, *in re* and *post rem*. Albert and Aquinas both profess the moderate Aristotelian Realism which treats genera and species only as *substantiae secundae*, yet as really inherent in the individuals, and constituting their form or essence. The universals, therefore, have no existence, as universals, *in rerum natura*; and Thomas endorses, in this sense, the polemic of Aristotle against Plato's hypostatized abstractions. But, in the Augustinian sense of ideas immanent in the divine mind, the universal *ante rem* may well be admitted as possessing real existence. Finally, by abstraction from the individual things of sense, the mind is able to contemplate the universal apart from its accompaniments (*animal sine homine, asino, et aliis speciebus*); these subjective existences are the *universalia post rem* of the Nominalists and Conceptualists. But the difficulties which embarrassed a former age in trying to conceive the mode in which the universal exists in the individual reappear in the systems of the present period as the problem of the *principium individuationis*. The universal, as the form or essence of the individual, is called its *quidditas* (its "what-ness" or nature); but, besides possessing a general nature and answering to a general definition (*i.e.* being a "what"), every man, for example, is this particular man, here and now. It is the question of the particularity or "this-ness" (*haecceitas*, as Duns Scotus afterwards named it) that embarrasses the Scholastics. Albert and Aquinas agree in declaring that the principle of individuation is to be found in matter, not, however, in matter as a formless substrate but in determinate matter (*materia signata*), which is explained to mean matter quantitatively determined in certain respects. "The variety of individuals," says Albert, "depends entirely upon the division of matter," and Aquinas says "the principle of the diversity of individuals of the same species is the quantitative division of matter," which his followers render by the abbreviated phrase *materia quanta*. A tolerably evident shortcoming of such a doctrine is that, while declaring the quantitative determination of matter to be the individual element in the individual, it gives no account of how such quantitative determination arises. Yet the problem of the individual is really contained in this prior question; for determinate matter already involves particularity or this-ness. This difficulty was presently raised by Duns Scotus and the realistically-inclined opponents of the Thomist doctrine. But, as Ueberweg points out, it might fairly be urged by Aquinas that he does not pretend to explain how the individual is actually created, but merely states what he finds to be an invariable condition of the existence of individuals. Apart from this general question, a difficulty arises on the Thomist theory in regard to the existence of spirits or disembodied personalities. This affects first of all the existence of angels, in regard to whom Aquinas admits that they are immaterial or separate forms (*formae separatae*). They possess the principle of individuation in themselves, he teaches, but plurality of individuals is in such a case equivalent to plurality of species (*in eis tot sunt species quot sunt individua*). The same difficulty, however, affects the existence of the disembodied human spirit. If individuality depends in matter, must we not conclude with Averroes that individuality is extinguished at death, and that only the universal form survives? This conclusion, it is needless to say, is strenuously opposed both by Albert and by Aquinas. It is still admissible, however, to doubt whether the hateful consequence does not follow consistently from the theory laid down. Aquinas regards the souls of men, like the angels, as immaterial forms; and he includes in the soul-unit, so to speak, not merely the *anima rationalis* of Aristotle, but also the vegetative, sensitive, appetitive and motive functions. The latter depend, it is true, on bodily organs during our earthly sojourn, but the dependence is not necessary. The soul is created by God when the body of which it is the entelechy is prepared for it. It is the natural state of the soul to be united to a body, but being immaterial it is not affected by the dissolution of the body. The soul must be immaterial since it has the power of cognizing the universal; and its immortality is further based by St Thomas on the natural longing for unending existence which belongs to a being whose thoughts are not confined to the "here" and "now," but are able to abstract from every limitation.

Duns Scotus.

Freedom of the will.

Thomism, which was destined to become the official philosophy of the Roman Catholic Church, became in the first instance the accepted doctrine of the Dominican order, who were presently joined in this allegiance by the Augustinians. The Franciscan order, on the other hand, early showed their rivalry in attacks upon the doctrines of Albert and Aquinas. One of the first of these was the *Reprehensorium seu correctorium fratris Thomae*, published in 1285 by William Lamarre, in which the Averroistic consequences of the Thomist doctrine of individuation are already pressed home. More important was Richard of Middletown (d. *c.* 1300), who anticipated many of the objections urged soon after him by Duns Scotus (*q.v.*). His system is conditioned throughout by its relation to that of Aquinas, of which it is in effect an elaborate criticism. The chief characteristic of this criticism is well expressed in the name bestowed on Duns by his contemporaries—*Doctor subtilis*. It will be sufficient therefore to note the chief points in which the two antagonists differ. In general it may be said that Duns shows less confidence in the power of reason than Aquinas, and to that extent Erdmann and others are right in looking upon his system as the beginning of the decline of Scholasticism. For Scholasticism, as perfected by Aquinas, implies the harmony of reason and faith, in the sense that they both teach the same truths. To this general position Aquinas, it has been seen, makes several important exceptions; but the exceptions are few in number and precisely defined. Scotus extends the number of theological doctrines which are not, according to him, susceptible of philosophical proof, including in this class the creation of the world out of nothing, the immortality of the human soul, and even the existence of an almighty divine cause of the universe (though he admits the possibility of proving an ultimate cause superior to all else). His destructive criticism thus tended to reintroduce the dualism between faith and reason which Scholasticism had laboured through centuries to overcome, though Scotus himself, of course, had no such sceptical intention. But the way in which he founded the leading Christian doctrines (after confessing his inability to rationalize them) on the arbitrary will of God was undoubtedly calculated to help in the work of disintegration. And it is significant that this primacy of the undetermined will (*voluntas superior intellectu*) was the central contention of the Scotists against the Thomist doctrine. Voluntary action, Aquinas had said, is action originating in self or in an internal principle. The freedom here spoken of is a freedom from the immediacy of impulse—a freedom based upon our possession of reason as a power of comparison, memory and forethought. Nothing is said of an absolute freedom of the will; the will is, on the contrary, subordinated to the reason in so far as it is supposed to choose what reason pronounces good. Accordingly, the Thomist doctrine may be described as a moderate determinism. To this Scotus opposed an indeterminism of the extremest type, describing the will as the possibility of determining itself motivelessly in either of two opposite senses. Transferred to the divine activity, Aquinas's doctrine led him to insist upon the *perseitas boni*. The divine will is, equally with the human, subject to a rational determination; God commands what is good because it is good. Scotus, on the other hand, following out his doctrine of the will, declared the good to be so only by arbitrary imposition. It is good because God willed it, and for no other reason; had He commanded precisely the opposite course of conduct, that course would have been right by the mere fact of His commanding it. Far removed from actuality as such speculations regarding the priority of intellect or will in the Divine Being may seem to be, the side taken is yet a sure index of the general tendency of a philosophy. Aquinas is on the side of rationalism, Scotus on the side of scepticism.

While agreeing with Albert and Thomas in maintaining the threefold existence of the universals, Duns Scotus attacked the Thomist doctrine of individuation. The distinction of the universal essence and the individualizing determinations in the individual does not coincide, he maintained, with the distinction between form and matter. The additional determinations are as truly "form" as the universal essence. If the latter be spoken of as *quidditas*, the former may be called *haecceitas*. Just as the genus becomes the species by the addition of formal determinations called the difference, so the species becomes the individual by the addition of fresh forms of difference. As *animal* becomes *homo* by the addition of *humanitas*, so *homo* becomes Socrates by the addition of the qualities signified by *Socratitas*. It is false, therefore, to speak of matter as the principle of individuation; and if this is so there is no longer any foundation for the Thomist view that in angelic natures every individual constitutes a species apart. Notwithstanding the above doctrine, however, Scotus holds that all created things possess both matter and form—the soul, for example, possessing a matter of its own before its union with the body. But the matter of spiritual beings is widely different from the matter of corporeal things. In his treatment of the conception of matter, Duns shows that he inclined much more to the Realism which makes for pantheism than was the case with the Aristotelianism of Thomas. A perfectly formless matter (*materia prima*) was regarded by him as the universal substratum and common element of all finite existences. He expressly intimates in this connexion his acceptance of Avicebron's position.

Thomists and Scotists.

In the end of the 13th century and the beginning of the 14th the Thomists and Scotists divided the philosophical and theological world between them. Among the Thomists may be named John of Paris, Aegidius of Lessines (wrote in 1278), Bernard of Trilia (1240–1292) and Peter of Auvergne. More important was Aegidius of Colonna (1247–1316), general of the Augustinian order, surnamed *Doctor Fundatissimus* or *Fundamentarius.* Hervaeus Natalis (d. 1323) and Thomas Bradwardine (d. 1349) were determined opponents of Scotism. Siger of Brabant and Gottfried of Fontaines, chancellor of the university of Paris, taught Thomism at the Sorbonne; and through Humbert, abbot of Prulli, the doctrine won admission to the Cistercian order. Among the disciples of Duns Scotus are mentioned John of Bassolis, Francis of Mayrone (*q.v.*), Antonius Andreae (d. *c.* 1320), John Dumbleton and Walter Burleigh (Burley) (b. 1275) of Oxford, Nicolaus (*q.v.*) of Lyra, Peter of Aquila and others. Henry Goethals or Henry of Ghent (Henricus Gandavensis, 1217–1293), surnamed *Doctor solennis*, occupied on the whole an independent and pre-Thomist position, leaning to an Augustinian Platonism (see HENRY OF GHENT). Gerard of Bologna (d. 1317) and Raoul of Brittany are rather to be ranked with the Thomists. So also is Petrus Hispanus (Pope John XXI.), who is chiefly important, however, as the author of the much-used manual *Summulae logicales*, in which the logic of the schools was expanded by the incorporation of fresh matter of a semi-grammatical character. Petrus Hispanus had predecessors, however, in William of Shyreswood (died 1249 as chancellor of Lincoln) and Lambert of Auxerre, and it has been hotly disputed whether the whole of the additions are not originally due to the Byzantine *Synopsis* of Psellus. By far the greatest disciple of Aquinas is Dante Alighieri, in whose *Divina Commedia* the theology and philosophy of the middle ages, as fixed by Saint Thomas, have received the immortality which poetry alone can bestow. Two names stand apart from the others of the century—Raimon Lull (1234–1315) and Roger Bacon (1214–1294). The *Ars magna* of the former professed by means of a species of logical machine to give a rigid demonstration of all the fundamental Christian doctrines, and was intended by its author as an unfailing instrument for the conversion of the Saracens and heathen. Roger Bacon was rather a pioneer of modern science than a Scholastic, and persecution and imprisonment were the penalty of his opposition to the spirit of his time.

William of Occam.

The last stage of Scholasticism preceding its dissolution is marked by the revival of Nominalism in a militant form. This doctrine is already to be found in Petrus Aureolus (*q.v.*), a Franciscan trained in the Scotist doctrine, and in William Durand of St Pourçain (d. 1332), a Dominican who passed over from Thomism to his later position. But the name with which the Nominalism of the 14th century is historically associated is that of the "Invincible Doctor," William of Occam (*q.v.*), who, as the author of a doctrine which came to be almost universally accepted, received from his followers the title *Venerabilis inceptor.* The hypostatizing of abstractions is the error against which Occam is continually fighting. The Realists, he considers, have greatly sinned against this maxim in their theory of a real universal or common element in all the individuals of a class. From one abstraction they are led to another, to solve the difficulties which are created by the realization of the first. Thus the great problem for the Realists is how to derive the individual from the universal. But the whole inquiry moves in a world of unrealities. Everything that exists, by the mere fact of its existence, is individual (*Quaelibet res, eo ipso quod est, est haec res*). It it absurd, therefore, to seek for a cause of the individuality of the thing other than the cause of the thing itself. The individual is the only reality, whether the question be of an individual thing in the external world or an individual state in the world of mind. It is not the individual which needs explanation but the universal. Occam reproaches the "modern Platonists" for perverting the Aristotelian doctrine by these speculations, and claims the authority of Aristotle for his own Nominalistic doctrine. The universal is not anything really existing; it is a *terminus* or predicable (whence the followers of Occam were at first called Terminists). It is no more than a "mental concept signifying univocally several singulars." It is a natural sign representing these singulars, but it has no reality beyond that of the mental act by which it is produced and that of the singulars of which it is predicated. As regards the existence (if we may so speak) of the universal *in mente*, Occam indicates his preference, on the ground of simplicity, for the view which identifies the concept with the *actus intelligendi*, rather than for that which treats ideas as distinct entities within the mind. And in a similar spirit he explains the *universalia ante rem* as being, not substantial existences in God, but simply God's knowledge of things—a knowledge which is not of universals but of singulars, since these alone exist *realiter.* Such a doctrine, in the stress it lays upon the singular, the object of immediate perception, is evidently inspired by a spirit differing widely even from the moderate Realism of Thomas. It is a spirit which distrusts abstractions, which makes for direct observation, for inductive research. Occam, who is still a Scholastic, gives us the Scholastic justification of the spirit which had already taken hold upon Roger Bacon, and which was to enter upon its rights in the 15th and 16th centuries. Moreover, there is no denying that the new Nominalism not only represents the love of reality and the spirit of induction, but also contains in itself the germs of that empiricism and sensualism so frequently associated with the former tendencies. Aquinas had regarded the knowledge of the universal as an intellectual activity which might even be advanced in proof of the immortality of the soul. Occam, on the other hand, maintains in the spirit of Hobbes that the act of abstraction does not presuppose any activity of the understanding or will, but is a spontaneous secondary process by which the first act (perception) or the state it leaves behind (*habitus derelictus ex primo actu*=Hobbes's "decaying sense") is naturally followed, as soon as two or more similar representations are present.

The Twofold Truth.

In another way also Occam heralds the dissolution of Scholasticism. The union of philosophy and theology is the mark of the middle ages, but in Occam their severance is complete. A pupil of Scotus, he carried his master's criticism farther, and denied that any theological doctrines were rationally demonstrable. Even the existence and unity of God were to be accepted as articles of faith. The *Centilogium theologicum* has often been cited as an example of thoroughgoing scepticism under a mask of solemn irony. But if that were so, it would still remain doubtful, as Erdmann remarks, whether the irony is directed against the church or against reason. The most interesting example of this method is seen in the *Tractatus de sacramento altaris* where Occam accepts the doctrine of Real Presence as a matter of Faith, and sets forth a rational theory of the Eucharist (afterwards adopted by Luther) known as "Consubstantiation." On the whole, there is no reason to doubt Occam's honest adhesion to each of the two guides whose contrariety he laboured to display. None the less is the position in itself an untenable one and the parent of scepticism. The principle of the twofold nature of truth[1] thus embodied in Occam's system was unquestionably adopted by many merely to cloak their theological unbelief; and it is significant of the internal dissolution of Scholasticism. Occam denied the title of a science to theology, emphasizing, like Scotus, its practical character. He also followed his master in laying stress on the arbitrary will of God as the foundation of morality.

Nominalism was at first met by the opposition of the church and the constituted authorities. In 1339 Occam's treatises were put under a ban by the university of Paris, and in the following year Nominalism was solemnly condemned. Nevertheless the new doctrine spread on all hands. Dominicans like

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[1] This principle appeared occasionally at an earlier date, for example in Simon of Tournay about 1200. It was expressly censured by Pope John XXI. in 1276. But only in the period following Occam did it become a current doctrine.

Spread of Nominalism.

The "last of the Scholastics."

Armand de Beauvoir (d. 1334) and Gregory of Rimini accepted it. It was taught in Paris by Albert of Saxony (about 1350–1360) and Marsilius of Inghen (about 1364–1377, afterwards at Heidelberg), as well as by Johannes Buridanus, rector of the university as early as 1327. We find, however, as late as 1473 the attempt made to bind all teachers in the university of Paris by oath to teach the doctrines of Realism; but this expiring effort was naturally ineffectual, and from 1481 onward even the show of obedience was no longer exacted. Pierre d'Ailly (1350–1425) and John Gerson (Jean Charlier de Gerson, 1363–1429), both chancellors of the university of Paris, and the former a cardinal of the church, are the chief figures among the later Nominalists. Both of them, however, besides their philosophical writings, are the authors of works of religious edification and mystical piety. They thus combine temporarily in their own persons what was no longer combined in the spirit of the time, or rather they safisfy by turns the claims of reason and faith. Both are agreed in placing repentance and faith far above philosophical knowledge. They belong indeed (Gerson in particular) to the history of mysticism rather than of Scholasticism, and the same may be said of another cardinal, Nicolaus of Cusa (1401–1464), who is sometimes reckoned among the last of the Scholastics, but who has more affinity with Erigena than with any intervening teacher. The title "last of the Scholastics" is commonly given to Gabriel Biel (*q.v.*), the summarizer of Occam's doctrine. The title is not actually correct, and might be more fitly borne by Francisco Suarez (*q.v.*), who died in 1617. But after the beginning of the 15th century Scholasticism was divorced from the spirit of the time, and it is useless to follow its history further. As has been indicated in the introductory remarks, the end came both from within and from without. The harmony of reason and faith had given place to the doctrine of the dual nature of truth. While this sceptical thesis was embraced by philosophers who had lost their interest in religion, the spiritually minded sought their satisfaction more and more in a mysticism which frequently cast itself loose from ecclesiastical trammels. The 14th and 15th centuries were the great age of German mysticism, and it was not only in Germany that the tide set this way. Scholasticism had been the expression of a universal church and a common learned language. The university of Paris, with its scholars of all nations numbered by thousands, was a symbol of the intellectual unity of Christendom; and in the university of Paris, it may almost be said, Scholasticism was reared and flourished and died. But the different nations and tongues of modern Europe were now beginning to assert their individuality, and men's interests ceased to be predominatingly ecclesiastical. Scholasticism, therefore, which was in its essence ecclesiastical, had no longer a proper field for its activity. It was in a manner deprived of its accustomed subject-matter and died of inanition. Philosophy, as Hauréau finely says, was the passion of the 13th century; but in the 15th humanism, art and the beginnings of science and of practical discovery were busy creating a new world, which was destined in due time to give birth to a new philosophy.

Authorities.—Besides the numerous works quoted in articles on the individual philosophers, see Hauréau, *Histoire de la philosophie scolastique* (2 vols., 1850; revised and expanded in 1870 as *Histoire de la phil. scol.*), Kaulich, *Geschichte d. schol. Philosophie*; Stöckl, *Gesch. der Phil. des Mittelalters*; Karl Werner, *Die Scholastik des späteren Mittelalters*; and, on a smaller scale, de Wulf's *Histoire de la phil. médiévale* (1900). Supplementary details are given in Hauréau's *Singularités historiques et littéraires* (1861) and in R. L. Poole's *Illustrations of the History of Mediaeval Thought* (1884), while much light is thrown upon the minuter history of the period by the *Chartularium Universitatis Parisiensis* edited by Denifle and Chatelain in 1894, by Hauréau's *Notices et extraits de quelques MS. latins de la Bibliothèque Nationale* (6 vols., 1890–1895) and by the *Beiträge zur Geschichte d. Phil. d. Mittelalters*, in course of publication since 1891 by Baeumker and others. A critical survey of recent literature on Scholasticism is given by Baeumker in the *Archiv für Geschichte der Philosophie*, vols. v. and x. The accounts of medieval thought given by Ritter, Erdmann and Ueberweg in their general histories of philosophy are exceedingly good. That of Windelband, though going less into detail, is a remarkably fresh treatment of the problems involved. There are also notices of the leading systems in Milman's *History of Latin Christianity*; and the same writers are considered from the theological side in many works devoted to theology, and the history of dogma. The psychology of the Scholastic writers is ably dealt with in Siebeck's *Die Psychologie von Aristoteles bis zu Thomas von Aquino* (1885). Jourdain's *Recherches critiques sur l'âge et l'origine des traductions latines d'Aristote* (Paris, 1819; 2nd ed. 1843); Rousselot's *Études sur la philosophie dans le moyen âge* (1840–1842), Cousin's Introduction to his *Ouvrages inédits d'Abélard* (1836), and Prantl's *Geschichte der Logik im Abendlande* (4 vols., 1855–1870) are invaluable aids in studying the history of medieval thought. (A. S. P.-P.; X.)

SCHOLEFIELD, JAMES (1789–1853), English classical scholar, was born at Henley-on-Thames on the 15th of November 1789. He was educated at Christ's Hospital and Trinity College, Cambridge, and was in 1825 appointed professor of Greek in the university and canon of Ely (1849). He was for some time curate to Charles Simeon, the evangelical churchman, and his low church views involved him in disputes with his own parishioners at St Michael's, Cambridge, of which he was perpetual curate from 1823 till his death at Hastings on the 4th of April 1853. Scholefield was an excellent teacher. His most useful work was his edition of the *Adversaria* of P. P. Dobree (*q.v.*), his predecessor in the chair of Greek. He also published editions of Aeschylus (1828), in which he dealt very conservatively with the text, and of Porson's four plays of Euripides. His *Hints for an improved Translation of the New Testament* met with considerable success. He was one of the examiners in the first Classical Tripos (1824). The Scholefield Theological Prize at Cambridge was established in commemoration of him in 1856.

See *Memoirs of James Scholefield* (1855), by his wife, Harriet Scholefield; *Gentleman's Magazine* (June 1853, p. 644).

SCHOLIUM[1] (σχόλιον), the name given to grammatical, critical and explanatory notes, extracted from existing commentaries and inserted on the margin of the MS. of an ancient author. These notes were altered by successive copyists and owners of the MS. and in some cases increased to such an extent that there was no longer room for them in the margin, and it became necessary to make them into a separate work. At first they were taken from one commentary only, subsequently from several. This is indicated by the repetition of the *lemma* ("catchword"), or by the use of such phrases as "or thus," "or otherwise," "according to some," to introduce different explanations. The name of "the first scholiast" has been given to Didymus of Alexandria (*q.v.*), and the practice of compiling scholia continued till the 15th or 16th century A.D. The word *σχόλιον* itself is first met with in Cicero (*Ad Att.* xvi. 7). The Greek scholia we possess are for the most part anonymous, the commentaries of Eustathius on Homer and Tzetzes on Lycophron being prominent exceptions. Although frequently trifling, they contain much information not found elsewhere, and are of considerable value for the correction and interpretation of the text. The most important are those on Homer (especially the Venetian scholia on the *Iliad*, discovered by Villoison in 1781 in the library of St Mark), Hesiod, Pindar, Sophocles, Aristophanes and Apollonius Rhodius; and, in Latin, those of Servius on Virgil, of Acro and Porphyrio on Horace, and of Donatus on Terence.

See E. F. Gräfenhan, *Geschichte der classischen Philologie*, iii. (1843–1850); W. H. Suringar, *Historia critica scholiastarum Latinorum* (1835).

SCHOLL, AURELIEN (1833–   ), French author and journalist, was born at Bordeaux on the 13th of July 1833. He was successively editor of the *Voltaire* and of the *Écho de Paris*. He wrote largely for the theatre, and also a number of novels dealing with Parisian life.

SCHOLTEN, JAN HENDRIK (1811–1885), Dutch Protestant theologian, was born at Vleuter near Utrecht on the 17th of August 1811. After studying at Utrecht University, he was appointed professor of theology at Franeker. From Franeker in 1843 he went to Leiden as professor extraordinarius, and in 1845 was promoted to the rank of ordinarius. Through Scholten, A. Kuenen became interested in theology; Scholten was not then the radical theologian he became later. The two scholars in course of time created a movement resembling that of the

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[1] To be distinguished from *scolium* (σκόλιον), an after-dinner song.

Tübingen School in Germany. Pursuing first the study of dogmatic theology and the philosophy of religion, Scholten published a work on the *Principles of the Theology of the Reformed Church* (2 vols., 1848–1850, 4th ed. 1861–1862). He then gave special attention to the New Testament, and wrote *A Critical Study of the Gospel of John* (1864, in German 1867). He died on the 10th of April 1885.

Scholten's other works include: *Historical and Critical Introduction to the New Testament* (1853–1856); *The Oldest Witnesses to the Writings of the New Testament* (1866); *The Oldest Gospel* (1868); and *The Pauline Gospel* (1870). An account of his theological development is given in *Afscheidsrede bij het Neerleggen van het Hoogleeraarsambt* (1881), and in the biography written by A. Kuenen, *Levensbericht van J. Henricus Scholten* (1885).

SCHÖMANN, GEORG FRIEDRICH (1793–1879), German classical scholar, was born at Stralsund in Pomerania on the 28th of June 1793. In 1827 he was appointed professor of ancient literature and eloquence in the university of Greifswald, where he died on the 25th of March 1879. Schömann's attention was chiefly devoted to the constitutional and religious antiquities of Greece. His first works on the subject were *De comitiis Atheniensium* (1819), the first independent account of the forms of Athenian political life, and a treatise *De sortitione judicum apud Athenienses* (1820). In conjunction with M. H. E. Meier, Schömann wrote *Der attische Process* (1824, revised ed. by J. H. Lipsius, 1883–1887), which, although in some respects out of date, still has considerable value.

Among his other works are:—editions of Isaeus (1831) and Plutarch's *Agis and Cleomenes* (1839, important for the Attic law of inheritance and the history of the Spartan constitution); *Antiquitates juris publici Graecorum* (1838); a critical examination of Grote's account of the Athenian constitution (1854, Eng. trans. by B. Bosanquet, 1878) from a conservative point of view; and lastly, *Griechische Alterthümer* (1855–1859; 4th ed. by J. H. Lipsius, 1897–1902; Eng. trans. of vol. i. by E. G. Hardy and J. S. Mann, 1880), treating of the general historical development of the Greek states, followed by a detailed account of the constitutions of Sparta, Crete and Athens, the cults and international relations of the Greek tribes. The question of the religious institutions of the Greeks, which he considered an essential part of their public life, had early engaged his attention, and he held the opinion that everything really religious was akin to Christianity, and that the greatest intellects of Greece produced intuitively Christian, dogmatic ideas. From this point of view he edited the *Theogony* of Hesiod (1868), with a commentary, chiefly mythological, and Cicero's *De natura deorum* (1850, 4th ed. 1876); translated with introduction and notes Aeschylus's *Prometheus Bound*, and wrote a *Prometheus Unbound* (1844), in which Prometheus is brought to see the greatness of his offence and is pardoned by Zeus. Of his contributions on grammatical subjects special mention may be made of *Die Lehre von den Redetheilen nach den Alten dargestellt* (1862), an introduction to the elements of the science of grammar. His many-sidedness is shown in his *Opuscula academica* (4 vols., 1856–1871).

See F. S(usemihl) in C. Bursian's *Biog. Jahrbuch für Altertumskunde* (1879); A. Baumeister in *Allgemeine deutsche Biographie*, xxxii.; C. Bursian, *Gesch. der class. Philologie in Deutschland* (1883), and J. E. Sandys, *Hist. of Classical Scholarship*, iii. (1908), p. 165.

SCHOMBERG (originally SCHONBERG), **FRIEDRICH HERMANN** (or FREDERIC ARMAND), DUKE OF (*c.* 1615–1690), marshal of France and English general, was descended from an old family of the Palatinate, and was born in December 1615 or January 1616, at Heidelberg, the son of Hans Meinard von Schönberg (1582–1616) and Anne Sutton, daughter of the 9th Lord Dudley. An orphan within a few months of his birth, he was educated by various friends, among whom was the "Winter King," Frederick V. of the Palatinate, in whose service his father had been. He began his military career under Frederick Henry, prince of Orange, and passed about 1634 into the Swedish service, whence he entered that of France in 1635. His family, and the allied house of the Saxon Schönbergs had already attained eminence in France.[1] After a time he retired to his family estate at Geisenheim on the Rhine, but in 1639 he re-entered the Dutch army, in which, apparently, with a few intervals spent at Geisenheim, he remained until about 1650. He then rejoined the French army as a general officer (*maréchal de camp*), served under Turenne in the campaigns against Condé, and became a lieutenant-general in 1665, receiving this rapid promotion perhaps partly owing to his relationship with the duc d'Halluin, but mainly because he was looked upon as the eventual successor of the great generals then at the height of their fame.

After the peace of the Pyrenees (1659) the independence of Portugal being again menaced by Spain, Schomberg was sent as military adviser to Lisbon with the secret approval of Charles II. of England (who knew him personally and about this time created him baron of Tetford) and Louis XIV., who in order not to infringe the treaty just made with Spain, deprived Schomberg of his French offices. After meeting in the three first campaigns many difficulties from the insubordination of many of the Portuguese officers, Schomberg won the victory of Montes Claros on the 17th of June 1665 over the Spaniards under the prince of Parma. After participating with his army in the revolution which deposed the reigning king in favour of his brother dom Pedro, and ending the war with Spain, Schomberg returned to France, became a naturalized Frenchman and bought the lordship of Coubert near Paris. He had been rewarded by the king of Portugal, in 1663, with the rank of Grandee, the title of count of Mertola and a pension of £5000 a year. In 1673 he was invited by Charles to England, with the view of taking command of the army, but sentiment was so strong against the appointment, as savouring of French influence, that it was not carried into effect. He therefore again entered the service of France. His first operations in Catalonia were unsuccessful owing to the disobedience of subordinates and the rawness of his troops, but he retrieved the failure of 1674 by retaking Bellegarde in 1675. For this he was made a marshal, being included in the promotion that followed the death of Turenne. The tide had now set against the Huguenots, and Schomberg's merits had been long ignored on account of his adherence to the Protestant religion. The revocation of the edict of Nantes (1685) compelled him to quit his adopted country. Ultimately he became general-in-chief of the forces of the elector of Brandenburg, and at Berlin he was the acknowledged leader of the thousands of Huguenot refugees there. Soon afterwards, with the elector's consent, he joined the prince of Orange on his expedition to England in 1688, as second in command to the prince. The following year he was made a knight of the Garter, was created successively baron, marquis and duke, was appointed master-general of the ordnance, and received from the House of Commons a vote of £100,000 to compensate him for the loss of his French estates, of which Louis had deprived him. In August he was appointed commander-in-chief of the expedition to Ireland against James II. After capturing Carrickfergus he marched unopposed through a country desolated before him to Dundalk, but, as the bulk of his forces were raw and undisciplined as well as inferior in numbers to the enemy, he deemed it imprudent to risk a battle, and entrenching himself at Dundalk declined to be drawn beyond the circle of his defences. Shortly afterwards pestilence broke out, and when he retired to winter quarters in Ulster his forces were more shattered than if they had sustained a severe defeat. His conduct was criticized in ill-informed quarters, but the facts justified his inactivity, and he gave a striking example of his generous spirit in placing at William's disposal for military purposes the £100,000 recently voted him. In the spring he began the campaign with the capture of Charlemont, but no advance southward was made until the arrival of William. At the Boyne (July 1, 1690) Schomberg gave his opinion against the determination of William to cross the river in face of the opposing army. In the battle he commanded the centre, and while riding through the river without his cuirass to rally his men, was surrounded by Irish horsemen and instantly killed. He was buried in St Patrick's cathedral, Dublin, where there is a monument to him, erected in 1731, with a Latin inscription by Dean Swift.

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[1] Of the Misnian Schönbergs in French history may be named Gaspard de Schomberg, count of Nanteuil (d. 1599), French soldier and statesman, his son, Henri, count of Nanteuil and Duretal, marquis d'Espinoy (1575–1632) grandmaster of the artillery, marshal of France, and Henri's son Charles (d. 1656), who by marriage became duc d'Halluin, and was marshal of France and also, during the war with Spain, viceroy of Catalonia. Of the Palatinate family, Theodoric (d. 1590) was killed at Ivry in the service of Henry IV.

His eldest son Charles, the second duke in the English peerage, died in the year 1693 of wounds received at the battle of Marsaglia.

The most important work on Schomberg's life and career is Kazner's *Leben Friedrichs von Schomberg oder Schönberg* (Mannheim, 1789). The military histories and memoirs of the time should also be consulted.

SCHOMBURGK, SIR ROBERT HERMANN (1804–1865), British traveller, was born at Freiburg, Prussian Saxony, on the 5th of June 1804, the son of a Protestant minister. In 1829 he went to the United States, but in 1830 left for Anegada, one of the Virgin Isles. He surveyed the island at his own expense, and sent to the Royal Geographical Society, London, a report which created such an impression that, in 1835, he was entrusted by that body with the conduct of an exploring expedition to British Guiana. He fulfilled his mission with great success, incidentally discovering the Victoria Regia lily. In 1841 he returned to Guiana to survey the colony and fix the boundary for the British Government. The result was the provisional boundary between British Guiana and Venezuela known as the "Schomburgk Line," for which see the articles on those two countries. On his return to England he was knighted. In 1848 he was appointed British consul to St Domingo, and, in 1857, British consul to Bangkok. While holding these posts he continued his geographical surveys. He retired from the public service in 1864, and died at Berlin on the 11th of March 1865. He was the author of a *Description of British Guiana* and a *History of Barbadoes*.

SCHÖNBEIN, CHRISTIAN FRIEDRICH (1799–1868), chemist, was born at Metzingen, Swabia, on the 18th of October 1799, and died at Sauersberg, near Baden Baden, on the 29th of August 1868. After studying at Tübingen and Erlangen, he taught chemistry and physics, first at Keilhau, Thuringia, and then at Epsom, England, but most of his life was spent at Basel, where he undertook the duties of the chair of chemistry and physics in 1828 and was appointed full professor in 1835. His name is chiefly known in connexion with ozone, which he began to investigate in 1839, and with guncotton, which he prepared and applied as a propellant in fire-arms early in 1846. He was a most prolific writer, 364 papers appearing under his name in the Royal Society's *Catalogue*, and he carried on a large correspondence with other men of science, such as Berzelius, Faraday, Liebig and Wöhler.

Many of his letters together with a life will be found in G. W. A. Kahlbaum's *Monographien aus der Geschichte der Chemie*, vols. iv. and vi. (1899 and 1901).

SCHÖNEBECK, a town of Germany, in the province of Prussian Saxony, on the left bank of the Elbe, 9 m. S. of Magdeburg by the railway to Halle and Leipzig. Pop. (1905) 17,786. It contains manufactories of chemicals, machinery, starch, white lead and various other articles, but is chiefly noted for its extensive salt springs and works, which produce about 75,000 tons of salt per annum. Large beds of rock-salt also occur in the neighbourhood, in which shafts have been sunk to a depth of more than 1200 ft. There is a harbour on the Elbe here, and a brisk trade is carried on in coal, grain and timber.

See Magnus, *Geschichte der Stadt Schönebeck* (Berlin, 1880).

SCHÖNEBERG, a town of Germany, in the Prussian province of Brandenburg, forming a suburb of Berlin, which it adjoins on the south-west. Pop. (1905) 141,010. It has four churches, a statue of the emperor William I. and several educational establishments. It contains the railway station of the military line to Zossen and is connected with the metropolis by electric trams and omnibuses. Its chief manufactures are railway plant, cigars, soap, paper and chemicals. The foundation of Alt-Schöneberg is ascribed to Albert the Bear, margrave of Brandenburg, in the 12th century, while Neu-Schöneberg was founded by Frederick the Great in 1750 to accommodate some Bohemian weavers exiled for their religion. It was made a town in 1898.

SCHÖNFELD, EDUARD (1828–1891), German astronomer, was born at Hildburghausen, in the duchy of Meiningen, on the 22nd of December 1828. He had a distinguished career at the gymnasium of his native town, and on leaving desired to devote himself to astronomy, but abandoned the idea in deference to his father's wishes. He went first to Hanover, and afterwards to Cassel to study architecture, for which he seems to have had little inclination. In 1849 we find him studying chemistry under Bunsen at Marburg, where his love for astronomy was revived by Gerling's lectures. In 1851 he visited the Bonn Observatory, and studied astronomy under Argelander. In 1853 he was appointed assistant, and in the following year won a doctor's degree with his treatise *Nova elementa Thetidis.* At Bonn he took an important part in preparing the *Durchmusterung* of the northern heavens. He took up the investigation of the light-changes in variable stars, devoting to this work nights which, on account of moonlight, were unsuitable for zone observations. The results of these researches are published in the *Sitz. Berich. Wien. Akad.* vol. xlii. For a short time he was a *Privatdozent* at Bonn, but in 1859 he was appointed director of the Mannheim Observatory. The instrumental equipment of that observatory was somewhat antiquated, his largest telescope being a small refractor of 73 lines aperture, but he selected a line of work to suit the instruments at his disposal, observing nebulae and variable stars and keeping a watch on comets and new planets. The results of his observations of nebulae are contained in two catalogues published in the *Astronomische Beobachtungen der Grossherzoglichen Sternwarte zu Mannheim*, 1st and 2nd parts (1862 and 1875), and those of his variable star observations appeared in the *Jahresberichte des Mannheimer Vereins für Naturkunde*, Nos. 32 and 39 (1866 and 1875). On the death of Argelander, which occurred on February 17th 1875, Schönfeld was appointed to succeed him as director of the Bonn Observatory, and soon after his appointment he began his last and greatest piece of work, the extension, on Argelander's plan, of the survey of the heavens down to 23° of south declination. The experience gained on the northern survey under Argelander's direction enabled Schönfeld to introduce some improvements in the methods employed, which increased the accuracy of this work, which was practically accomplished in March 1881, some revision only remaining to be done. These zone observations afforded 363,932 separate places of stars, and form the groundwork of the catalogue of 133,659 stars between 2° and 23° south declination, which was published in 1886 as the eighth volume of the Bonn observations.

Schönfeld was a member of the Astronomische Gesellschaft from its foundation in 1863, being a member of Council up to 1869, and in 1875 becoming editor of its publications and secretary in conjunction with Winnecke. In 1878 he was elected a Foreign Associate of the Royal Astronomical Society. He died on the 1st of May 1891. (A. A. R.*)

SCHONGAUER (or SHÖN), **MARTIN** (*c.* 1445–*c.* 1488), the most able engraver and painter of the early German school. His father was a goldsmith named Casper, a native of Augsburg, who had settled at Colmar, where the chief part of Martin's life was spent.[1] Schongauer established at Colmar a very important school of engraving, out of which grew the "little masters" of the succeeding generation, and a large group of Nuremberg artists. As a painter, Schongauer was a pupil of the Flemish Roger van der Weyden the Elder, and his rare existing pictures closely resemble, both in splendour of colour and exquisite minuteness of execution, the best works of contemporary art in Flanders. Among the very few paintings which can with certainty be attributed to him, the chief is a magnificent altar-piece in the church of St Martin at Colmar. The Colmar Museum possesses eleven panels by him, and a small panel of "David with Goliath's Head" in the Munich Gallery is attributed to him. The miniature painting of the "Death of the Virgin" in the English National Gallery is probably the work of some pupil.[1] In 1488 Schongauer died at Colmar, according to the register of St Martin's church. Other authorities state that his death occurred in 1491.

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[1] The date of Schongauer's birth is usually given wrongly as *c.* 1420; he was really born twenty-five or thirty years later, and is mentioned by A. Dürer as being a young apprentice in 1470. His portrait in the Munich Pinakothek is now known to be a copy by Burgkmair, painted after 1510, from an original of 1483—not 1453 as has been supposed. The date (1499) for Schongauer's death, written on the back of the panel by Burgkmair, is obviously a blunder; see Hensler in *Naumann's Archiv* (1867), p. 129, and Wurzbach, *M. Schongauer* (Vienna, 1880). These contradict the view of Goutzwiller, in his *Martin Schongauer et son école* (Paris, 1875). Cf. Schnaase, "Gesch. M. Schongauers," in the *Mittheil. der K. K. Commission* (1863), No. 7.

The main work of Schongauer's life was the production of a large number of beautiful engravings, which were largely sold, not only in Germany, but also in Italy and even in England. Vasari says that Michelangelo copied one of his engravings—the "Trial of St Anthony."[2] Schongauer was known in Italy by the names "Bel Martino" and "Martino d'Anversa." His subjects are always religious; more than 130 prints from copper by his hand are known, and about 100 more are the production of his *bottega.*[3] Most of his pupils' plates as well as his own are signed M+S. Among the most beautiful of Schongauer's engravings are the series of the "Passion" and the "Death and Coronation of the Virgin," and the series of the "Wise and Foolish Virgins." All are remarkable for their miniature-like treatment, their brilliant touch, and their chromatic force. Some, such as the "Death of the Virgin" and the "Adoration of the Magi" are richly-filled compositions of many figures, treated with much largeness of style in spite of their minute scale.

The British Museum possesses a fine collection of Schongauer's prints. Fine facsimiles of his engravings have been produced by Armand-Durand with text by Duplessis (Paris, 1881).

SCHÖNINGEN, a town of Germany, in the duchy of Brunswick, 29 m. by rail W. of Magdeburg. Pop. (1905) 9298. It has three churches, and manufactures of chemicals, machinery and sausages. The place is mentioned as early as 747 and received municipal rights in 1370. It has the remains of a ducal residence and some interesting wooden houses.

SCHOOLCRAFT, HENRY ROWE (1793–1864), American traveller, ethnologist and author, was born on the 28th of March 1793 at what is now Guilderland, New York, and died at Washington on the 10th of December 1864. After studying chemistry and mineralogy in Union College he had several years' experience of their application, especially at a glass-factory of which his father was manager, and in 1817 published his *Vitreology*. In the following year he collected geological and mineralogical specimens in Missouri and Arkansas, and in 1819 he published his *View of the Lead Mines of Missouri*. In 1820 he accompanied General Lewis Cass as geologist in his expedition to the Upper Mississippi and the Lake Superior copper region, and in 1823 he was appointed Indian agent for the Lake Superior country. More than sixteen millions of acres were ceded by the Indians to the United States in treaties which he negotiated. He married the granddaughter of an Indian chief; and during several years' official work near Lake Superior, and later under authorisation of an Act of Congress of 1847, he acquired much information as to institutions, &c., of the American natives. From 1828 to 1831 Schoolcraft was an active member of the Michigan legislature. In 1832, when on an embassy to some Indians, he ascertained the real source of the Mississippi to be Lake Itasca.

In 1825 he published *Travels in the Central Portions of the Mississippi Valley*, and in 1839 appeared his *Algic Researches*, containing Indian legends, notably, "The Myth of Hiawatha and other Oral Legends." He composed a considerable quantity of poetry and several minor prose works, especially *Notes on the Iroquois* (1846); *Scenes and Adventures in the Ozark Mountains* (1853). His principal book, *Historical and Statistical Information respecting the Indian Tribes of the United States*, illustrated with 336 plates from original drawings, in part a compilation, was issued under the patronage of Congress in six quarto volumes, from 1851 to 1857.

SCHOOLS. As is the case with so many of the institutions of modern civilization, so with schools; the name, the thing, the matter, the method have been derived from Greece through Rome. A strange fortune has converted the Greek word σχολή, which originally meant leisure, particularly the "retired leisure that in trim gardens takes his pleasure" of men, into the proper term for the modern school.

Greek Schools.—The term and the institution date, not from the great or what may be called the Hellenic age of Greece, but from the later Macedonian or Hellenistic period. The account given by K. I. Freeman in his *Schools of Hellas* (1907) may be summed up in the statement, "There were no schools in Hellas." That is, there were no schools in our sense, where, during boyhood and youth, boys spent their whole time in a continuous course of instruction. There were professional teachers of three kinds: (1) the *grammatistes*, who taught reading, with writing and perhaps arithmetic, in the *grammateion*; (2) the *citharistes*, who taught music, *i.e.* playing and singing to the cithara—it is significant that there was no word for the music school; (3) the *paedotribes*, who taught gymnastic, wrestling, boxing, running, jumping, throwing the javelin, &c., in the *palaistra*. To these teachers the boys were taken by slaves, called boy-leaders (παιδαγωγοί, whence our pedagogues), as single pupils, and they were taught not in classes but singly.

That all boys did not go through all three schools is clear. For we hear of Socrates, when he was grown up, repairing to a lyre-school to learn music, because he thought his education was not complete without it. Roughly, the age for the grammar-school and song-school was 7 to 14, for the gymnastic school 12 to 18. A certain amount of literature was imparted, as, especially in the song-school, Homer and other early poets, the very Bibles of Hellas, were learnt by heart. In later days, under the Sophists, and Socrates, "the greatest of the Sophists," 450–400 B.C., something approaching to secondary education was developed. But it was wholly unorganized, though a similar division of labour between separate private tutors took place as in primary education. The orators or rhetoricians taught oratory, and the learning that was considered necessary to the political orator, a smattering of Greek history, constitutional law and elementary logic. The philosophers, such as Protagoras, discoursed vaguely on natural science, "things in the heavens above and the earth beneath," and divinity, "whether there are gods or not," mathematics and ethics, or any subject which attracted them, while the lawyers, in the same unsystematic way, taught what law was necessary in a state where the constitution was at the mercy of chance majorities in a sovereign assembly of 30,000 people, and trials at law were settled by 600 jurymen-judges. The orators and sophists were popular lecturers, here to-day and gone to-morrow. There was no co-ordination between them, no regular curriculum, and the youths wandered from one to another as their own or their parents' prejudices and purses dictated.

In the next generation, the orators and the philosophers, by settling down in fixed places, began to establish something more like schools. Plato, though like his master Socrates he taught without asking fees, was the first to give a regular educational course extending over three or four years, and in a fixed place, the Academy. The gymnasium was originally a parade or practice ground for the militia or conscript army of the state, which derived its name from the exercises being in that climate performed naked (γυμνός). At the age of 15 or 16 the boys left the palaestra, or private gymnasium, for this public training school, maintained at the public expense, preparatory to their admission as youths (ἔφηβοι), to take the oath of citizenship and undergo two years' compulsory training in regiments on the frontier. After those two years were over, they still required continuous exercise to keep themselves in training; consequently men of all ages, from 16 to 60, were to be found in the gymnasium. Though the gymnasium was free, the teachers and trainers in gymnastics were paid, and as the poorer citizens had to earn their own living, the Athenian gymnasium, like the modern university, was for educational purposes chiefly frequented by the well-to-do. So the Academy became a fashionable lounge, and here developed the walking and talking clubs, which became the Platonic or Academic Schools. Logic and ethics, built on a foundation of geometry and mathematics, seem to have been the staple subjects. An inner circle met, and dined together in Plato's private house and garden, close to the Academy. Plato devised the house and garden to his successor Speusippus, who passed them on to Xenocrates. They thus became the first endowment of the first endowed college, which grew very rich and lasted till the disestablishment and disendowment of the old learning by Justinian in A.D. 529. Aristotle, a pupil of Plato for twenty years, set up a school of his own in the Lyceum, another public gymnasium, where he lectured twice a day, in the morning esoterically to the inner circle of regular attendants, in the afternoon to the public. From these two institutions three nations of Europe have derived three different terms for a school, the Germans their gymnasium, the French their lycée, and the Scotch their academy. Yet neither of the originals was a school in any real sense of the word. In the days of their founders they were like discussion forums; at the most, courses of lectures. In later years, the gilded youth who flocked to Athens from the whole Greco-Roman world were enrolled among the ephebi, and the so-called "university of Athens" was evolved (Dumont, *L'Éphêbie attique*).

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[1] Another painting of the same subject in the Doria Palace in Rome (usually attributed to Dürer) is given to Schongauer by Crowe and Cavalcaselle, *Flemish Painters* (London, 1872), p. 359; but the execution is not equal to Schongauer's wonderful touch.

[2] An interesting example of Schongauer's popularity in Italy is given by the lovely Faenza plate in the British Museum, on which is painted a copy of Martin's beautiful engraving of the "Death of the Virgin."

[3] See Bartsch, *Peintre Graveur*, and Willshire, *Ancient Prints*, best edition of 1877. According to a German tradition Schongauer was the inventor of printing from metal plates; he certainly was one of the first who brought the art to perfection. See an interesting article by Sidney Colvin in the *Jahrbuch der k. preussischen Kunstsammlung*, vi. p. 69 (Berlin, 1885).

Meanwhile the intellectual hegemony of Greece had for a time passed with the political hegemony from Athens to Alexandria. It is to the Alexandrines, either to Antiodorus or to Eratosthenes, *c.* 250 (J. E. Sandys, *Hist. of Classical Scholarship*, 7), that grammar, as a term and a science, which included literary criticism and scholarship, and the grammar school are due. The earliest extant treatise on grammar is by Dionysius of Thrace (born *c.* 146), a pupil of the Homeric critic, Aristarchus. It defines grammar as "the practical knowledge of the usage of writers of poetry and prose" and includes exegesis or explanation of the author in the widest sense as well as mere verbal or syntactical grammar. It was from the term thus understood that the grammar school (*scōla grammaticalis*), the term which described the typical secondary school from that day to 1869, derived its denotation and its connotation. For a true conception of the history of secondary schools it cannot be repeated too often and too emphatically that to this day the true title of the greatest English "public schools" is grammar school. Winchester and Eton are the grammar schools of the colleges of the Blessed Mary of Winchester and of Eton respectively, and Westminster is the grammar school of the collegiate church of St Peter, Westminster. Throughout the thirteen centuries which intervened between Dionysius Thrax and Dr Kennedy, Dionysius's grammar was the standard work and the foundation, directly or indirectly, of all other grammars, while the grammar school has always meant, and, in the hands of the better class of teachers, has always been, not a gerund-grinding machine, but a place for the training and exercise of the mind by the study of literature. The word "school," as well as the word "grammar," seems to be due to Alexandria. Plato in the *Laws* had spoken of a learned discussion or teaching, the product of leisure, as a *scholē*. But it does not appear that the word was transferred to the place where such discussion took place before the Alexandrian epoch. The first known use of it in that sense seems to be in Dionysius Halicarnassus' Letter to Ammaeus, *c.* 30 B.C. But as Plautus (*c.* 210) uses the corresponding Latin term, *ludus literarius*, some two centuries earlier, we may safely infer that he used it, not on the principle of *ludus a non ludendo*, but as a translation of grammar school.

Roman Schools.—At Rome schools began with intercourse with Greeks. According to Suetonius, the emperor Hadrian's secretary, who wrote *The School Masters* (*De grammaticis*) about A.D. 140, literary teaching and the science of grammar began with Livius Andronicus, a Greek from Magna Graecia in the south of Italy, who, being brought to Rome as a slave in 272 B.C., became a freed man, translated the *Odyssey* into Latin, and taught both Greek and Latin. Ennius, the first Latin poet, was also half-Greek, and came to Rome in 209 B.C., where he also taught both languages. According to Plutarch (*Quaest. Rom.* 59) the first grammar school (*grammatodidaskaleion*) was opened by Spurius Carvilius, a freedman of Carvilius, who was the first Roman to divorce his wife. Like master, like man. These two innovations in morals and manners took place about 230 B.C. According to Suetonius, Crates of Mallus in Cilicia, who about 169 B.C. came to Rome as ambassador from Attalus, king of Pergamum, a great centre of learning, and was kept there by a broken leg, occupied himself in giving lectures. His example was soon followed by Romans. Schools of grammar, in which, even as late as Cicero's time, the Laws of the Twelve Tables were the chief text-book and were learnt by heart, were kept by Greeks or freedmen. These seem to have been of the nature of elementary schools. But at Rome, as at Athens, the working-classes were for the most part slaves; and elementary schools were like English preparatory schools rather than public elementary schools. The teachers were called *litteratores*, a translation of the Greek *γραμματισταί*. Schools of rhetoric, which were more like secondary schools, were also opened after the model of that of Isocrates at Athens. Their teachers were called *litterati*, corresponding to the Greek *γραμματικοί*. Suetonius says that "the early litteratores also taught rhetoric, and we have many of their treatises which include both sciences." In 92 B.C. schools of Latin rhetoric were put down as an innovation. Yet among the treatises written by Cato, the praiser of the past at the expense of the present, was one on public speaking, the chief rule in which was "take care of the sense, and the sounds will take care of themselves." Cicero learned to declaim both in Greek and Latin, and the Gracchi had studied rhetoric under Greek teachers. Neither the gymnasium or palaestra, nor the music school, flourished at Rome. As at Athens, so at Rome the boys were sent to school in charge of a slave, a *pedagogus*, *comes* or *custos*. But it would seem that at Rome the pedagogus, generally a Greek slave, often himself gave elementary instruction. In Varro's much-debated phrase, "Educat nutrix, instituit pedagogus, docet magister," "the nurse brings up, the pedagogue instils the elements, the master teaches." *Magister*, which in English became "maister" and then "master," remained the term for the teacher of the public school from that day to this, though attempts were made at the time of the Reformation to introduce the Greek word *didascalus* in its place.

The Roman school was very much like the modern school. All the methods of torture which have made the service of the Muses for most boys a veritable slavery were in full vogue. Instruction was now in a foreign language, and grammar became prominent. Early rising, loud speaking and hard flogging were in the ascendant. Martial curses the master of a neighbouring school whose shouts and blows woke him up at cock crow. Horace assures us that he admires the old Latin poets in spite of their having been flogged into him by the *pedagogus*, Orbilius, whose name has become proverbial. The staple of instruction in the Roman schools was the works of the poets, Greek and Latin, Homer and Virgil, Hesiod and Aesop, Menander and Terence. Horace says (*Ep.* i. 19. 40) "that he was not thought worthy of going the round of the schoolmasters' desks"; but it was a fate not long delayed, and the writings of the poets of the silver age, Lucan and Statius, became school-books in their own lifetimes.

Our knowledge of the Roman curricula is mainly due to Quintilian's *Institutio oratoria*, *c.* A.D. 91. Fabius Quintilianus, born on the banks of the Ebro, was not only the son of a man who kept a rhetoric school, but himself kept one, and is said by St Jerome to have been the first who kept a public school, in the sense that he was the first who received a stipend from the emperor. In endeavouring to create the perfect orator, Quintilian discusses the whole of education from the cradle upwards. It is clear from him that the grammar school had trenched on the rhetoric school. The latter was then restricted to actual oratory, the rules and practice of public speaking, while the grammar school gave much the same teaching as English grammar schools did until 1850.

The first definitely endowed school we hear of is one founded by Pliny the younger, a pupil of Quintilian, at his native place Como. In a letter to the historian Tacitus (iv. 12) he informs him that he found a Como boy was at school at Milan, because there were no teachers at Como, whereupon he lectured the parents on the "small additional expense" a day-school at Como would be, compared to the cost of boarding boys at Milan. He therefore offered to find a third of the cost, and would have found the whole, did he not "fear that such an endowment might be corrupted . . . to private interests, which he saw happen in many places where teachers are hired by the public" (*preceptores publice conducuntur*). The choice of the master he left to the parents. Later historians say that the emperor Antoninus Pius (138–161) assigned offices and salaries (*honores et salaria*) for rhetoricians throughout the provinces; and that Alexander Severus did the same, and also established exhibitions for poor boys, with the limitation, curiously repeated a thousand years later in the statutes of All Souls College and of Eton, *modo ingenuos*, *i.e.* provided only that they should be free-born.

There were complaints that the masters were ill-paid. The only definite statement as to tuition fees appears to be a line of Horace (*Sat.* i. 6. 76), who says his father took him to school at Rome as he did not care to send him where the sons of his country neighbours went, at 8 asses a month, said to represent 4d. a month, equivalent to "about a shilling"; even this is founded on a disputed reading. Quintilian made a fortune by his school, but Juvenal calls him in this respect a white crow. As in modern times the winning jockey, so then the victorious charioteer, received more pay for a single race than the master for a whole year's labours.

Grammar and rhetoric schools spread throughout the Roman world and continued substantially unchanged in method and subject to the days of Gregory the Great and Augustine the apostle of the English. The *Confessions* of St Augustine of Hippo, a schoolmaster at Carthage, Rome and Milan, before his baptism in the year 387, and the poems of his contemporary Ausonius, educated in the grammar school at Toulouse, and himself a schoolmaster at Bordeaux before becoming prefect of Illyria and of Gaul, show that the schools were much the same in the 4th century as in the first. Ausonius celebrated in verse all the Bordeaux schoolmasters, some coming from schools at Athens, Constantinople, Syracuse and Corinth, one the son of a Druid at Bayeux, others schoolmasters from Poitou, Narbonne, Toulouse, who went to Lerida and other places in Spain. Ausonius had for his pupil the emperor Gratian, who in 376 established a legal tariff for schoolmasters' salaries. "In every town which is called a metropolis, a noble professor shall be elected." The rhetoric master (rhetor) was to have at least 24 annonae (an annona being a year's wages of a working man); while the grammar masters were to receive half that. But at Trier, then the capital of the Western empire, the rhetor was to have 30, the Latin grammarian 20, and the Greek grammarian, if one can be found, 12 annonae (*Cod. Theod.* xiii. 3. 11). The works of Ennodius, bishop of Pavia, 513–521, preserve many school declamations delivered in Milan school. The same century saw Priscian, a schoolmaster at Constantinople, compose the Latin grammar, which, itself for the most part a mere translation from Greek, reigned without a rival till the Reformation, and is represented by over 1000 MSS. Venantius Fortunatus, educated in the grammar school at Treviso, wrote in 570 a life of St Martin of Tours in three books of hexameter verse, and lives of saints and bishops. His era was one of transition, and marks the passing of the schools from secular to ecclesiastical control. His contemporary Pope Gregory rates Desiderius, "bishop of Gaul," at Vienne (*Ep.* xi. 54), because "as we cannot relate without shame, it has come to our knowledge that your brotherhood teaches grammar to certain persons: which we take all the worse as it converts what we formerly said in your favour to lamentation and mourning, since the praise of Christ cannot lie in one mouth with the praise of Jupiter. Consider yourself what a crime it is for bishops to recite what would be improper for religiously minded laymen"—words which are an adaptation of a sentiment of Jerome at his worst.

This letter is the more remarkable, because it ends with commending to Desiderius the monks whom Gregory was sending with Laurence the priest and Mellitus the abbot to Augustine of Canterbury, thus bringing the grammar-school-teaching bishop into direct connexion with the conversion of the English, and the foundation of the first English school.

English Schools.—St Augustine of Canterbury landed in Kent in 596, and the king of Kent, Ethelbert, was christened two years later. He "did not defer giving his teachere a settled residence in his metropolis of Canterbury, with such possessions as were necessary for their subsistence," says Bede. We may therefore attribute the establishment of the Church of England and the first English school to the year 598. For as nowadays the first thing modern missionaries do is to establish a school, so did Augustine. Indeed a school was even more necessary then. Now the Scriptures are always translated into the native tongue, and services conducted in it. But in those days the converted heathen, to understand the church service and to read the Scriptures, had to learn Latin and begin with Latin grammar; and indeed as the *kyrie*, the creed and the *gloria* were still rendered in Greek, if he was thoroughly to comprehend it he had to learn some Greek.

The first actual mention of Canterbury school is in 631. Sigebert of Essex, Bede tells us (*Eccl. Hist.* iii. 18, ed. Plummer, p. 162), while in exile in Gaul, was baptized. "On his return, as soon as he obtained the kingdom (of the East Saxons), wishing to imitate what he had seen well done in Gaul, he founded a grammar school (*scolam in qua pueri litteris erudirentur*), with the assistance of Bishop Felix, whom he had received from Kent, who provided them with ushers and masters (*pedagogos et magistros*) after the manner of the Canterburians (*more Cantuariorum*)." If the last words are translated Kentish folk the meaning is the same, as naturally the first and chief school of the Kentish folk was at Canterbury. Felix was a Burgundian, who had come over to Honorius, one of the last survivors of the original band of Augustine, who became archbishop in 627. The East Saxon see was placed at Dunnoc, now Dunwich, and the school there has been claimed by patriotic Suffolk historians as the first school in England. Though long before the Conquest Dunwich had ceased to be an episcopal see, being deposed in favour of Thetford, while half of it was swallowed up by the sea, yet, when between 1076 and 1083 the priory of Eye was founded by Robert Malet, he appropriated to it all the churches of Dunwich "the tithes of the whole town both of money and herrings . . . the school also of the same town." So the school of Sigebert and Felix was still existing 400 years afterwards. It afterwards perished at the dissolution of the priory, to which it had been handed over.

As the model must be older than the copy, Canterbury school must be allowed the primacy over Dunwich. Being spoken of as an existing institution, with no suggestion that it was then newly established, we need not doubt that it was founded by St Augustine as part of the cathedral establishment of Christ Church, Canterbury. This church was not then monastic, but like all other cathedrals, a college of priests, the monks being placed apart, outside the city walls in the abbey, first called St Paul's, afterwards known as St Augustine's. Enthusiastic "Grecians" have attributed Canterbury school rather to the Greek archbishop, the monk Theodore, who reached Canterbury on the 27th of May 669. "Soon after," he "travelled through the whole English parts of the island," and first established a united church of England, being "the first archbishop whom the whole English church consented to obey." He travelled with Hadrian, a Latin-African monk, who had been first offered the archbishopric, and was sent by the pope to look after Theodore "lest after the fashion of Greeks he should introduce something against the true faith." "Because both were abundantly learned in sacred and profane literature, they collected crowds of disciples, and streams of saving knowledge daily flowed from them, as together with holy writ they gave their hearers instruction both in the arts of metre and astronomy and ecclesiastical arithmetic," or, as the Anglo-Saxon translation has it, "metercraft, tungolcraft and grammaticraft" (Bede, *Eccl. Hist.* iv. 2). "The proof is," says Bede, "that even to this day," *c.* 735, "some of their pupils survive who know Latin and Greek as well as their own language in which they were born." It is a strange misconception of this passage which has narrowed a triumphant record of the first metropolitical visitation of England, the very point of which is that the archbishop left Canterbury to travel to the farthest parts of the heptarchy, into the foundation of a school at Canterbury. Though it is clear that Theodore did not found, there is evidence that he did actually teach in the school at Canterbury, since Albinus, who succeeded Hadrian as abbot of St Paul's, is said to have been "the most learned man of his time in everything, having been educated in the church of Canterbury" (not, it may be noted, in the monastery of St Paul's) by Theodore and Hadrian. Tobias, who died bishop of Rochester in 726, is also described as "a most learned man, for he was a pupil of Theodore and Hadrian, and so, together with a knowledge of literature ecclesiastical and general, Greek and Latin were as familiar to him as his native tongue." We may therefore credit Rochester with its school at least as early as Toby's episcopate.

Of schools still existing, we must give the precedence after Canterbury and Rochester to St Peter's school, the cathedral grammar school at York. If it was originally started by Paulinus, the Roman missionary, in 630 or 633, and there was no church or bishop there till the time of Wilfrid, *c.* 700, it cannot claim to be older than his day. Whoever may be the originator of York school, it is at all events earlier than Archbishop Egbert (Ecgberht), to whom it has been credited by many writers (cf. *Dict. Christian Biog.*). But their authority is a life of Alcuin by a French monk, in a MS. said to have existed at Reims in 1617, but never seen since, a mere piece of hagiology, and certainly not contemporary. It makes a mystic monastic chain of Greek learning from Theodore to Bede, Bede to Egbert, Egbert to Alcuin, Alcuin to Hrabanus Maurus, the monks of St Gall and so on. It is flattering to insular pride, as it makes England the mother of all continental schools. But the chain breaks at the second link. Egbert was neither a pupil of Bede's, nor Alcuin's master. Nor was Egbert ever a monk, and Alcuin only became one late in life. Had Bede been Egbert's master, he could not have failed to mention it in the well-known letter he wrote to him on becoming archbishop, in which he addresses him, not as a master might have written to a pupil, but as a rather humble but lecturing friend. Moreover, Alcuin himself, in the poem on the bishops and saints of the church of York (*Hist. Ch. York.*, Rolls ser. i. 390), written when schoolmaster at York, only says of Egbert that he was of royal blood, an illustrious ruler of the church and an admirable teacher (*egregius doctor*) He finds no space for more about him, because his "muse hastens to the end of his song and the doings of his own master, who, after Egbert, received the insignia of the venerable see, Albert, called the wise." On Albert's merits, Alcuin descants in many verses. Nearly related to Egbert, Albert "was sent to the Minster to school in his boyish years and became a priest quite young, and by Egbert was made advocate of the clergy and preferred as master in the city of York." This phrase exactly describes the duties of the later chancellor of the Minster, who was the chief lawyer of the college of canons and also head of the school; while it shows that the school was the school, not only of the church, but of the city, of the laity as well as of the clergy. Albert taught grammar, rhetoric, law, singing, playing on the flute and lyre, natural history and the church calendar: above all, theology. There were boarders. For "whatever youths he saw of eminent intelligence, these he joined to himself, taught, fed and loved, and so he had many pupils, advanced in various arts." Albert travelled abroad, went to Rome and was received "as the prince of doctors, and kings and princes invited him to irrigate their lands with learning." But he preferred to return home. Even when he became archbishop, he still continued to teach. Two years before his death he retired, and, of his two chief pupils, Eanbald succeeded him in the archbishopric. But "he gave the dearer treasures of his books to the other son, who was always close to his father's side, thirsting to drink the floods of learning. To the one the rule of the church, its treasures and lands; to the other the school (*studium*), the chair, the books." This other son was Alcuin himself. A catalogue of the books is given. Besides the "Fathers," including Boethius and Cassiodorus, Popes Leo and Gregory, there were Aldhelm of Sherborne and Bede the wise. There were Pliny and Pompeius Trogus, Aristotle and Cicero (*De oratore*). Among poets, there were Virgil, Statius and Lucan. But of four lines full of the names of poets, these are the only ones whom the ordinary classical scholar has heard of. The rest were Christian poets, who versified various parts of the Bible; Juvencus (*c.* 330), Paulinus (353–431), Prosper of Aquitaine (379–431), Sedulius (*c.* 460), Venantius Fortunatus (535–600), Arator (*c.* 550). Among grammarians were Valerius Probus, Donatus, Priscian, Servius (the great Virgilian commentator). Phocas (who wrote a life of Virgil in verse), Comminianus (probably Commodianus), of the 5th century. There were "many other masters eminent in the schools, in art, in oratory, who have written many a volume of sound sense, but whose names it seemed too long to write in verse." Alcuin himself wrote dialogues on grammar, rhetoric and dialectic. In the first, the speakers were an English boy of 15 and a Frank boy of 14; in the latter, Charlemagne and Alcuin himself. For Alcuin yielded to the temptation which his master, Albert, had resisted, and meeting Charlemagne, on a visit to Rome, accepted the headship of an itinerant school attached to his court, the so-called Palace School. Except for a short visit in 792–793, Alcuin deserted England for Frankland. But he continued to take an interest in the school of York, and in one of his poems expresses the hope that the youth of York will handle Virgil's bow and fill the Frisian ships with poems. When Eanbald II. was appointed archbishop of York in 796 Alcuin wrote to congratulate him, and recommended him to divide the school and have different masters for grammar, for song and for writing; and also to establish hospitals, which he calls by their Greek name (xenodochia), one of the many proofs that he had a tincture of Greek learning. The advice seems to have been taken, as in later times we find here, as elsewhere, the song school under the precentor quite separate from the grammar school under the chancellor, and St Peter's hospital just outside the cathedral precinct, which was endowed by King Athelstan, and afterwards known as St Leonard's hospital. In another letter Alcuin sends one of his pupils to King Offa of Mercia to act as master in the school Offa was establishing, and expresses his pleasure at Offa's intention to study and make the light of wisdom, which was extinct in so many places, shine in his kingdom. Whether this refers to the establishment of a school at Lichfield, or elsewhere, does not appear. It is to be noticed that Alcuin, all the time he was master at York and master of the so-called palace school of Charlemagne, was not a monk but a secular clerk. He always describes himself as Alcuin the levite, or deacon, until in his old age he retired to an abbacy by way of retiring pension. So too Augustine himself, though a monk, when he became a bishop and set up a school, had been advised by Pope Gregory to abandon the monastic seclusion and live with his clergy like an ordinary bishop.

The recognition of this fact is vital to an understanding of the history of schools in England and other modern countries. The history of medieval and modern schools has, thanks to the superior industry and research of the French and Germans, started with Charlemagne and Alcuin. Though the schools of France came straight from the Roman grammar and rhetoric schools, and the English schools, by new importation, direct from Italy, it has always been assumed that their origin was monastic and that monks were the chief educators. This is because Charlemagne, largely it would seem under Alcuin's influence, did make a distinct effort to convert the monasteries practically into colleges and public schools. How far he succeeded in this is very doubtful, but if the monasteries ever did become the seats of public schools, or if the monks did anything for general education, it was only during his reign. Save for that short period, alike in England and on the continent general education and public schools were the exclusive duty and privilege of the secular clergy from the days of Augustine to the days of Laud. The monks from first to last were never public schoolmasters or educators, they never acted as teachers, and the monasteries never kept schools, except for their own novices, and they never, except incidentally as lords of manors or trustees, or transferees of the spiritual rights of secular colleges, even controlled schools.

The early monasteries and monks, as may be seen by the example of even Jerome, not only did not cultivate learning other than that of the scriptures, but even repudiated it as heathenish. It was not till Cassiodorus, about 550, composed his *Institutions* for the two monasteries he founded in Calabria, that the copying of MSS. and reading came to be regarded as a monkish duty. The original Benedictine rule a few years earlier set apart only two hours a day for reading, except in Lent. Then, lack of food making the monks less able to labour with their hands, they had three hours' reading in the morning, and had to read one book through in the course of the 40 days. Even this rule was not absolute, special provision being made for work for those who were too lazy to read. There is not a word in the rule to suggest that education was one of the duties of monks or of the objects of a monastery. The only reference to boys is apropos of the reception of new brethren, boy novices "offered" (*oblati*) at the altar. The Celtic monasteries, according to Dr Skene (*Celtic Scotland*, ii. 75), became "great educational seminaries, in which the youth of the tribe were sent, not only to be trained to monastic life, but also for the purpose of receiving secular education." But the quotations given from the ancient laws of Ireland and the life of St Brendan in support of this statement by no means bear it out. It may be questioned whether even in Ireland, or its daughter settlement in Wales, at Iona in Scotland and at Lindisfarne in England, anyone other than sucking monks imbibed the milk of learning in the nurseries of the monasteries. Where, however, as in these communities, the church and secular clergy were practically swallowed up in the monastery and monks, where even the bishops became kept officials under an abbot, it is perhaps not possible to draw a distinction between the regular and the secular clergy. The mission of St Columban in 590 took the Celtic monastery to the borders of Alsace, while indirectly through Lindisfarne it may have been known to Alcuin, as it certainly was at Fulda (Skene, 43).

Charlemagne was perhaps consciously acting under Celtic influence when in the council of Aachen (Aix-la-Chapelle), on the 23rd of March 789–790, he entreated the congregations of monks as well as those of the secular canons "not only to get together children of slaves but also the sons of freemen, and take them into their societies," and directed that "schools of reading boys should be established in every monastery and cathedral, where psalms, music (*notas*), arithmetic and grammar, and the writing of good editions of books should be taught; not allowing the boys, however, to corrupt the gospels, psalters or mass books by reading or writing, but employing men of full age for that purpose." It must have been in pursuance of this design of turning the monasteries to account as schools, that the extant plan of the monastery of St Gall (see ABBEY) was prepared. This plan shows an "inner" school of the novices, and an "outer" school for the young gentlemen. The novices' school is shown as a replica on a smaller scale of the monastery, complete in itself with chapel, dormitory, refectory and infirmary. On the plan of it is written, "In this cloister the oblates are associated with the postulants," *i.e.* the boys offered to God, set apart for the monastic life from infancy, were brought up with the ordinary novices of riper years seeking for admission. This school was at the east end of the church, next to the infirmary of the monks. But the other school, the public school, stood on the north side of the church, as far as possible from the monks' quarters, which, at St Gall, as elsewhere when topography permitted, were on the south. This school was close to the guest hall for gentlemen, near the public entrance to the church from the street. It shows provision for about 150 boarders. The plan is credited to Charlemagne's son-in-law, Eginhard. But it is known not to have been carried out in its entirety; and whether any "outer" school was ever actually erected or carried on we do not know. But, if in Charlemagne's time the monasteries in general admitted lay or clerical boys even in a separate outer school, it is certain that the next generation saw them excluded again. A council at Aachen on the 9th of July 817 (Baluze, Capit. i. 581), attended by abbots and a large number of monks, decreed "No school shall be kept in a monastery except for oblates." That this was considered as binding, or at least was followed, in England, is clear from the decrees of this council being included with the rules of Benedict, Dunstan and Ethelwold in the great Saxon monastic collection now in the British Museum (Cott. Tib. A, iii.). In England, at all events from this time, we always find public schools taught not by the monks, but by the secular clergy.

The notion that schools were monastic and monasteries schools is partly due to a verbal confusion, ecclesiastical and monastic having been ignorantly treated as convertible terms. Education and schools were the province of the church, they were subject to the canon law, and every one connected with them was reckoned as a clerk with the privilege of clergy. The secular courts could take no cognizance of pleas concerning the conduct of schools or schoolmasters, as was emphatically reaffirmed in the Gloucester School Case in 1410, any more than they could as to churches or the conduct of rectors and vicars. Just as they could entertain suits about the patronage of livings, so they could about the appointment of schoolmasters, patronage being regarded as property, and a temporal not a spiritual right, as was settled in a case against the Abbot of Battle in 1343. Both these cases have unfortunately been misrepresented as establishing that the common law of England not only "allowed all to be taught but also controlled the administration of educational foundations" (J. E. G. de Montmorency, *State Intervention in English Education*, 1902, p. 16). In truth, that was solely the business of the clergy, and especially of the bishops as the ecclesiastical judges of first instance, with appeal to the court of Canterbury and thence to the supreme court of the pope at Rome. There is a decree of Pope Eugenius II. in a synod held in 826 (Dec. prima pars. Dist. xxxvii. c. 12): "From certain places complaint is made to us that neither are masters found nor care taken for a school of letters (*i.e.* grammar school), wherefore let all care and diligence be taken by all bishops and their subjects, and in other places where necessary, that masters and teachers should be established to teach continually grammar schools (*studia litterarum*) and the principles of the liberal arts, as in them chiefly are the divine commands set forth and declared." This canon only crystallized into statute what had for two centuries at least been the customary law of the church, that schools should be kept in every cathedral city, as we have seen they were at Canterbury, Dunwich and York.

After York the next place in England in which we have actual evidence of a school is at Winchester, to which intellectual superiority seems to have passed with the political suzerainty. In the history of education in the 9th century the name of Alfred takes the place of Alcuin in the 8th. Of Alfred's own education we have no real knowledge, as the tales of the so-called Asser are mere fairy stories ("The Real Alfred," *The Times*, London, 17 March 1898). But Asser's account of the education of Alfred's children may be accepted as applying to Winchester, and as at all events evidence that there was a public school there in the days when "Asser" wrote, about a hundred years after Alfred's death. Edward the eldest son and Ælfthryth the eldest daughter were bred in the king's court, "nor among their other pursuits appertaining to this life were they suffered to pass their time idly and unprofitably without liberal learning. For they carefully learn the Psalms and Saxon books, especially Saxon poems, and are continually in the habit of making use of books." But "Ethelward the youngest, by the divine counsels and the admirable prudence of the king, was sent to the Grammar School (*ludis litterariae disciplinae*), where with the children of almost all the nobility of the country, and many also who were not noble, he prospered under the diligent care of his masters. Books in both languages, namely Latin and Saxon, were diligently read in the school. They also learned to write, so that before they were of an age to practise manly arts, namely hunting and such pursuits as befit gentlemen (*nobilibus*), they became studious and clever in the liberal arts." This passage so entirely coincides with the description of York school given by Alcuin in its evidence that the grammar school was frequented by laymen as well as clerics, and it is so improbable that "Asser" borrowed from Alcuin, that we may take it to be the normal thing that young Englishmen of good birth were brought up in the public grammar schools then as now.

Anglo-Saxon schools were not confined to bishops' sees. Apart from Malmesbury, the story of which has been so obscured by monastic writers as to make it impossible to ascertain whether it had a public school or not, there were public schools in all the principal centres of population, generally marked by being also the sites of collegiate churches. At least, wherever Ethelfleda, the Lady of the Mercians, and her brother, Edward the Elder, are recorded as building "burhs" through the Midlands to consolidate their conquests from the Danes, there we find also collegiate churches of pre-Conquest origin and early grammar schools; *e.g.* at Stafford and Derby, Huntingdon, Bedford and Leicester, at Bridgenorth, Tamworth and Warwick.

It is perhaps only at the last place that the direct evidence of the continuance of the school from pre-Conquest to post-Conquest times is preserved. There, in 1123 (Leach, *Hist. Warwick School*, 1908), the earl of Warwick, having granted to the canons of St Mary's collegiate church in the town "the school of the church, that the service of God in the same may be improved by the attendance of scholars," the older church of All Saints in the castle appealed to the crown, and Henry I. issued a writ to "command that the church of All Saints have all its customs and ordeals . . . as fully as it used to have them in the time of King Edward and my father and brother and the school (*scolas*) in like manner." In the result the two collegiate churches were united, the canons of All Saints being transferred to St Mary's and "the school of Warwick" confirmed to the united church, which was to enjoy the same liberties as London, Lincoln, Salisbury and York churches, *i.e.* be like a cathedral church of secular canons. That this included the maintenance of a school is clear from a reply to one of a number of questions as to their liberties and customs put by the Warwick chapter to the dean and chapter of Salisbury in 1155, viz. "the scholars to their own master stand and fall," *i.e.* the master not the chapter was to look after the boys.

Even the Danes became founders of churches and schools. Thus Herman, the historian of Bury, writing in 1098 (*Mem. Bury St Edmunds*, Rolls ser. i. 46), and speaking of Canute little more than a generation after his death, recalls his charities, how "when he came to a minster or fortified town, he handed over, to be taught at his own expense, for the clerical or the monastic order, not any chance boy of good birth, but the more select of the poor." Abbot Sampson, writing about a century later, *c.* 1180 (*ibid.* 126), credits Canute with "instituting public schools (*publicas scolas*; the earliest use probably of the term public school in any English writer) in the cities and towns, and, establishing masters at the state expense, sent to them boys of good promise to be taught grammar, including even freed sons of slaves." Canute is praised because he turned out the canons from Bury to put in monks. But the school, though it thus fell under the sway of the abbot, continued in the town, outside the precinct of the abbey, and was served by secular masters. So when Earl, afterwards King, Harold founded the college of Holy Cross at Waltham, the chief officer next the dean was the schoolmaster, Master Athelard, imported from Liége, whose "lessons in grammar and verses and composition did not prevent equal knowledge of singing and divine service. The boys knew the psalter by heart, and entered the choir in procession from school, and on leaving choir returned to school with all the gravity of the regular canons" who in 1177 supplanted the seculars. The secular canon, one of the expelled, who wrote the history about 1180, was himself the pupil of Master Peter, son of Athelard; for secular canons married and had children.

In the half century which followed the Conquest, the cathedral and many of the collegiate churches were reconstituted and enlarged, the normal number of seven canons being increased, and reaching in some cases as many as fifty. In this reconstitution schools were not forgotten. The statutes called "The Institution of St Osmund," said to have been made at the foundation of Salisbury Cathedral in 1091, are in almost identically the same words as the statutes of Lincoln, York and Wells, and they established, instead of two principal persons, provost or dean and schoolmaster, four, viz. dean, singer (*cantor*), schoolmaster or chancellor (*cancellarius*) and treasurer. Of these, "the cantor ought to rule the choir as to singing; the treasurer in keeping the ornaments, the chancellor in teaching school (*scolis regendis*), correcting the books; the *archiscola* ought to hear the lessons and determine, carry the church seal, and compose letters and deeds, note the readers on the table as the cantor does the singers." The York statutes codified in 1307 expressly state that the chancellor was "anciently called the schoolmaster" (*magister scolarum*, a variant of which was *scolasticus*). At St Paul's a series of documents relating to the chancellor are endorsed "of the schoolmaster, now the chancellor." When he dropped the title of schoolmaster, the chancellor ceased himself to teach any school except the theological school, in which he continued to lecture until the Reformation, but he always remained the educational officer of the chapter. Thus at York in 1307 he was bound to be a master in theology, *i.e.* D.D., and "to him belongs the collation to grammar schools; but the school of York, he ought to give to a regent in arts" (*i.e.* an M.A. who has not taken his degree more than two years) "to hold for three years, and not longer, except by grace for four years." The grammar schools outside York to which he was to appoint were probably those in York diocese, outside special liberties, such as Beverley (itself a collegiate church), but except for an appointment by the chapter, when the chancellorship was vacant, to Doncaster grammar school in 1351 (A. F. Leach, *Early Yorks. Schools*, i. 22), we do not know what they were. At Lincoln "no one can teach in the city of Lincoln without his (the chancellor's) licence and all the schools in Lincolnshire he confers at his own pleasure" (*Vict. County Hist.: Lincs.* ii.).

In London the chancellor was called schoolmaster until 1205. The original writ is still extant (*Mem. St Paul's*, A. ii. 25), in which, in 1138, Henry of Blois, bishop of Winchester, acting as bishop of London, holding the see *in commendam* during a vacancy, enforced the exclusive privilege of Henry the Schoolmaster (*scolarum magistro*) of St Paul's, ordering the dean and archdeacon "to excommunicate those who without a licence from schoolmaster Henry presume to teach in the city of London, except those teaching the schools of St Mary le Bow and St Martin's le Grand." St Martin's le Grand was itself a collegiate church with a dean and chapter and the duty and right of keeping a grammar school, and St Mary le Bow was a "peculiar" of the archbishop of Canterbury and extra diocesan to London.

Precisely similar provisions prevailed at the great collegiate churches like Beverley and Ripon in Yorkshire, and Southwell in Nottinghamshire (A. F. Leach, *Mem. of Southwell Minster*, xli. ii. 13, 205), all pre-Conquest churches and secondary cathedrals to the vast diocese of York. At the former, where we hear (*Hist. Ch. of York*, Rolls ser., i. 281) a curious tale about the schoolmaster (*scolasticus*), *c.* 1100, falling in love with a girl he saw in church, the schoolmaster also became chancellor. In 1304–1306 we find a series of reported cases in which he enforced by excommunication the monopoly of the grammar schoolmaster he appointed against unlicensed rivals teaching in the chapter liberty (A. F. Leach, *Beverley Chap. Act Book*, i. 42, 48, 55, 102, 108, 114). Similarly the collegiate churches in the castles of Pontefract and Hastings (*Vict. County Hist.: Sussex*, ii.) had their grammar schoolmasters about 1100. They were spread all over the kingdom.

The grammar school was a public school open to every one. It has been indeed repeatedly asserted that the cathedral schools were choristers' schools and taught nothing but the psalter and a little elementary Latin grammar. The assertion is founded on a complete misunderstanding. It is a question whether there were any choristers in the 12th century or whether they are not a later introduction, the canons and their vicars choral or choir deputies at first doing the singing themselves. Choristers at Salisbury are not mentioned in the Institution of St Osmund, and they first appear in the 1220 edition of that document. At Lincoln we first find choristers mentioned in a statute of 1236, "To the Precentor belongs the instruction and discipline of the boys and their admission and ordering in choir." At York the 1307 edition of the statutes says "the collection (*i.e.* appointment of masters) to song schools belongs to the singer," now called precentor, "and cases affecting them ought to be heard and decided by him, though execution belongs to the chapter" (Leach, *Early Yorks. Schools*, i. 12). At St Paul's there was no precentor till the 13th century and there is no mention of choristers till 1263, though school-boys (*pueri scolarum*) appear as witnessing a deed between 1142 and 1148 and receiving 4d. for cherries for doing so. It must be remembered also how very small the number of choristers was and how incapable of constituting a school. At St Paul's they were only eight until the 15th century, at York only seven in the 14th. So far from the grammar school being a school solely or even chiefly for choristers, there are several cases in which contests arose whether they had any right of admission to the grammar school. Thus the 14th century register of the almoner or almsgiver of St Paul's, who about 1180 was given a house for the poor, in which later the choristers were boarded, records that the grammar schoolmaster claimed five shillings a year for teaching them grammar. At Beverley in 1312 a contest between the grammar schoolmaster and the song schoolmaster took place as to whether the grammar schoolmaster was bound to admit all choristers free, or only the original number of seven. It was held after evidence as to old custom that all must be admitted free. But there could have been no doubt if the grammar school had been for their sole or chief benefit. A contest at Warwick between the grammar schoolmaster and the music schoolmaster, about 1215 (or 1315), owing to the latter intruding on the domain of the former, was settled by the chapter on the basis that the latter was to teach no grammar, but only "those learning their letters, the psalter, music and song" (A. F. Leach, *Hist. Warwick School*, 62-66). Everywhere from the 13th century onwards the song or choristers' school was of the nature of an elementary school, like that attended by Chaucer's "litel clergeon" in the Prioress' Tale, in which the boy "sat in the scole at his prymer" but could not construe the *Alma Redemptoris* because "I lerne song, I can (*i.e.* know) but smal grammere." Even in quite small places, as at Northallerton, Yorkshire, the distinction between the grammar school and the song school was at first strictly drawn, but tended to disappear in the dearth of M.A.s after the Black Death (*Early Yorks. Schools*, ii. 60-62). In the larger places the distinction was strictly maintained until the Reformation, when the song schools disappeared, except in the cathedrals and the few collegiate churches, including Winchester and Eton, which survived it, and at Newark and Coventry.

The cathedral and collegiate church grammar schools under the control of the secular clergy in the person of the chancellor of the church furnished the chief, and perhaps in the 12th century the sole, supply of schools. There is, however, some excuse for the notion that monasteries kept them, in the fact that in England, differing from the rest of the world, the cathedral churches had, in many of the chief places, notably Canterbury, Winchester and Worcester, during the monastic outburst connected with the names of Ethelwold bishop of Winchester and Dunstan of Canterbury, been taken from the secular clergy, and monks placed in their room. In those places there was no chancellor. But so essentially was education regarded as the business, not of monks, but of the secular clergy, that even in these places the grammar schools were not placed under the monks but remained under the immediate care of the bishop, either personally or through his archdeacon, a secular. Thus we find at Winchester about 1154 Master Jordan Fantosme and John Joichel (Jekyll), "clerks of the bishop of Winchester," carrying an appeal from the bishop about the right to teach the school at Winchester first to the Court of Arches and then to the pope, and as late as 1488 Bishop William Waynflete appointing a master to the grammar school "called in the vulgar tongue, the High School" (A. F. Leach, *Hist. Win. Coll.*). This school was in Symonds Street outside the monastic precinct. So at Canterbury the grammar schoolmaster appears among lay witnesses in 1259; his right to excommunicate anyone assaulting his scholars or carrying on a rival school was allowed on appeal to the Court of Arches, on production of a confirmation by the archbishop of the right as already ancient in 1292, and appointments by the archbishops of the master in 1306, 1311, 1375 and 1443 are preserved (*The Times*, Sept. 1897). Here also the school was outside the monastic precinct, by the parish church of St Alphege in the town (*Guardian*, 12 and 19 Jan. 1898). Similar evidence is forthcoming at Worcester, Norwich, Carlisle and elsewhere.

At the end of the 11th and beginning of the 12th century a renewed movement began for the further extrusion of the secular clergy, on the ground of their wicked lives, the wickedness being that they insisted on the liberty to marry, and for the conversion of collegiate churches into monasteries of the new orders, first of Cluniac monks, then of Augustinian, Black or regular canons, who eschewed matrimony. Thus Dunwich School passed under the rule of Eye Priory (Cluniacs) between 1076 and 1083; and Thetford School to Thetford Priory (Cluniacs) in 1094, though it was released again to the secular dean of Thetford in 1114. Similarly the government of Gloucester School was handed over to Llanthony Abbey (Augustinians) in 1137; Reading School was given to the newly-founded

Reading Abbey (Cluniacs) in 1139; Dunstable School to Dunstable Priory in 1130; Derby School to Darley Priory (Augustinian) about 1150. Bedford collegiate church was converted into a priory and moved to Newnham, and its right to the school acknowledged by the archdeacon of Bedford in 1155. A similar acknowledgment is found at Christ Church, Hants, in 1161; while Bristol School was taken from the Kalenders Gild and handed to Keynsham Abbey in 1171; and Arundel School to Arundel Priory at some date unknown (see articles on "Schools" in *Victoria County History* for the several counties in which these places occur). But these transfers did not make the schools monastic in the sense that the schools were kept in the monasteries or taught, much less frequented, by monks. The schools remained secular, outside the monastic precincts, frequented by lay boys and secular clerks, and taught by secular clerks, sometimes in holy orders—and at that time even sub-deacons were reckoned as holy orders—but more often only in minor orders, and not seldom married men. Thus in 1420 the Patent Rolls show us one Ralph Strode, master of the scholars of the city of Winchester, bringing an action with Dionysia his wife. All that was transferred to the monks was the right of appointing the schoolmaster and the power and duty of protecting the authorized schoolmaster's monopoly. At Bury St Edmunds indeed the extrusion of seculars had gone so far that even the archdeaconry of Bury was vested in the monastery and exercised by the sacrist of it, subject to appeal to the abbot (*Vict. County Hist.*: *Suffolk Schools*, ii.). The substitution of regulars for seculars ceased in the latter part of the 12th century, owing chiefly to the secular clergy at length, under papal pressure, accepting the rule of celibacy, and to the growth of universities.

The universities were developed out of the cathedral and collegiate church schools. In the days of Alcuin, as we saw, the one schoolmaster taught all subjects from the elements of grammar to theology and philosophy. In Italy the faculties of law and medicine had early in the 12th century developed schools of their own. In France theology similarly segregated itself, and, owing to the fortunate independence which the collegiate church of St Geneviève enjoyed from the jurisdiction of the *scolasticus* or chancellor of Notre Dame, much as in London the master of St Martin's le Grand did from that of the chancellor of St Paul's, rival schools of theology became possible, and the university of Paris, essentially a theological university, was born. The first university teaching in England came, not from France, but Italy, and was not in theology but law, and at Oxford the two collegiate churches of St Frideswide and St George's in the castle occupied much the same relative position as Notre Dame and St Geneviève at Paris. It is rather in their development and rivalry, not in a purely imaginary colony from Paris, that the origin of Oxford University must be sought. But the story of universities (*q.v.*) is told elsewhere. The important thing for the schools was that the university movement made the cathedral schoolmasters devote themselves to theology and to grown-up students, to the exclusion of grammar and arts, and left the grammar school entirely for boys and youths to be instructed in classical literature, rhetoric and the elements of logic, preparatory for the university. Moreover, the movement for university colleges perhaps caused a new crop of collegiate churches to spring up, of which grammar schools formed an integral and important part. In the quinquennium 1260 to 1265, the collegiate church of Howden was founded on the Yorkshire estates of the bishop and priory of Durham at one end of the kingdom, and that of Glasney in Cornwall on the estate of the bishop of Exeter at the other. These were ordinary colleges of secular canons with grammar schools attached, and the schools outlived the colleges at the Reformation. They were contemporary with the first university colleges. The college of St Nicholas, with 20 university students, was founded by Bishop Giles Bridport of Salisbury at Salisbury in 1261, Merton College by Walter of Merton at Malden in Surrey in 1265, and St Edmund's College at Salisbury by Bishop Wyly in 1270, and Merton College was moved to Oxford in 1275. The difference between these colleges and the ordinary collegiate churches was simply that the former were *ad orandum et studendum*, the latter *ad studendum et orandum*. So closely did Merton College follow the ordinary collegiate church model, that its chapel was an impropriated parish church and it contained the usual appendage of a grammar school, though it was limited to 13 boys, who were to be of the founder's kin. The master who taught them was called the "master of glomery," an odd corruption found also at Salisbury, Cambridge and Orleans. A similar grammar school was found at Queen's College in 1340, but this from lack of endowment was never developed according to its founder's intentions. These two colleges formed a starting point for yet another new development, when William of Wykeham, in founding New College on a scale more than twice as large as Merton, separated the grammar students from the theological and legal students, and placed the former as the main object of a separate, though connected and more or less subordinate college, at Winchester in 1382. Though Winchester was the first boys' school-college, Oxford itself had been apparently the first place in medieval England at which grammar schools were maintained as separate entities, not attached to cathedrals or colleges, and practically as private adventure schools. The university apparently placed no limit on their number and rivalry, though retaining control and supervision over their efficiency, through two grammar school surveyors elected by convocation.

In the first quarter of the 14th century even the monasteries contributed to the spread of education by almonry schools, which were now built as quasi-separate institutions by, or just outside, their outer gates, under the management of the almoner or almsgiver of the house. The almonry boys were apparently introduced as choristers to sing in the Lady chapels, which had become almost necessary appendages to great churches. At Canterbury a staff of six secular priests with clerks and scholars was established in the Lady chapel to sing for the soul of Edward I. in 1319. The scholars were admitted at ten years old and might stay to twenty-five, but were expected to be ordained sub-deacons and retire at twenty. They were lodged in a separate hall (*Aula Puerorum*), but waited on the sick and infirm monks who lived in the infirmary. At first they were taught wholly in the city or archbishop's grammar school. But by 1362 they had a separate grammar master, probably only as a house master, as the one mentioned in that year found Kingston school a better post, to which he had gone off without notice. The master was always a secular, and in 1451 was a married man. There is no evidence as to how many boys there were. At Westminster boys first appear in the almonry in 1354, and they first had a master in 1367, who from 1387 onwards, but not before, is called schoolmaster. The boys numbered thirteen in 1373, twenty-eight in 1385, twenty-two in 1387. The normal number seems to have been twenty-four (A. F. Leach in *Journal of Education*, Jan. 1905). This almonry school for charity boys is the only school, other than the novices' school, which existed at Westminster Abbey before, on its conversion into a cathedral by Henry VIII., the present school with forty scholars and unlimited town boys was established on the model of the old cathedral grammar schools. At Durham the almonry school first occurs in 1352; their master is first called schoolmaster in 1362 (*Ibid.* Oct. 1905). At the dissolution there were thirty boys, who waited on the monks in the infirmary, prayed all night round dead monks, sang in the Lady chapel, were fed on the broken meats from the novices' table and lodged in a hospital or infirmary opposite but outside the great gate of the monastery. At Reading almonry boys first appear in 1346, and were ten in number. They seem to have attended the town grammar school. At St Albans statutes were made for apparently thirteen almonry boys in 1399, who lodged by the great gate but attended the grammar school in the town. At Coventry there were fourteen boys in the almonry school, and the town quarrelled with the prior in 1439 for trying to interfere with the town grammar school for the benefit of the almonry school. The Carthusian monastery at Coventry had twelve boys in its almonry. At St Mary's Abbey, York, the almonry had fifty boys who attended St Peter's, *i.e.* the city and cathedral grammar school (*Early Yorks. Schools*, i.).

Taken altogether these almonry schools provided for the education of, or gave exhibitions to, a large number of boys, probably not less than 1000 in all. But they were not "monastic"; the boys themselves were not novices or oblates, and were looked after and taught by seculars. Various efforts were made in the 14th century and onwards to make the monks themselves learned. By papal statute in 1337 the Benedictine monasteries were each to send 5 % of their number to the universities. Though Gloucester College had been established at Oxford in 1283 (reorganized in 1291) to receive them, not ¼ % of the monks went there, for there is reason to think it never had more than sixty, and in 1537 had only thirty-two students (*Vict. Co. Hist.: Gloucester*, ii. 342). Also the monasteries were ordered to provide a grammar master who might be, and in fact nearly always was, to teach the young monks and novices. Yet in 1387 the Winchester cathedral monks were found by William of Wykeham to be “ wholly ignorant of grammar ” and to make the lessons in church unintelligible by wild false quantities. In the visitations of Norwich monasteries in the late 15th century (Dr Jessopp, Camd. Soc. 1892) hardly one had its grammar master as it ought to have had. In 1495 Osney Abbey provided for the monks a grammar master who was a secular (Boase, *Oxford*, *Historic Towns*). At Canterbury itself Archbishop Warham in 1511 found the monks totally ignorant of the meaning of the mass and of the lessons which they read, and ordered them to have a grammar master to teach the young monks. In 1531 Bishop Longland of Lincoln issued injunctions to Messenden Priory in English “ for that ye be ignorant and have small understanding of Latin.” At the Dissolution a grammar master was teaching the monks at Winchester grammar, but he was not a monk but ex-second-master of Winchester College (*Hist. Winchester Coll.* 26), and other Wykehamists were to be found teaching grammar at the London Charterhouse and Netley Abbey, Hants. It is clear that the monks were by no means a learned body.

It is chiefly from the London and Oxford schools that we learn what grammar schools actually taught in the 12th to the 15th centuries. The *local classicus* is Fitzstephen's Description of London (*Mat. Hist. Becket*, Rolls series, iii. 4), as it was in the youth of Thomas à Becket when about 1127 he attended St Paul's school, “ the city school,” before going to Paris university. Fitzstephen describes the contests of the scholars from it and the other two schools on saints' days, when the elders contended in logic and rhetoric, and the boys “ vie with each other in verses, or in the principles of the art of grammar or the rules of preterites and supines, others in epigrams, rhymes and metres ”; while on Shrove Tuesday, after a cock-fight in the morning, they had a great game of (foot?) ball in Smithfield. About a century later, 1267, Oxford University statutes show us that B.A.s had to read for their degree Priscian *On Constructions* twice, and Donatus's *Barbarismus* once; books which imply an advanced knowledge of Latin syntax. The Oxford grammar school statutes, not dated but of the 13th century, provide for grammar masters being examined in verse-making and prose composition and knowledge of Latin authors before being licensed to teach. The only authors actually mentioned, and that for the sake of being forbidden as improper, are Ovid's *Art of Love* and Pamphilus who wrote *De Amore*. Every fortnight the masters were to set a copy of verses and letters to write, which the boys were to do the next holiday, and show up on the following whole school-day. Special attention was to be paid to the smaller boys in hearing and examining them on their rules as to parts of speech and accidence. It was particularly ordered that they were to observe the rule in Latin and Roman (*Romanis*), *i.e.* translations were to be done not into English but Romance, *i.e.* French. For after the Conquest French was the vernacular language of the upper classes, and while the pre-Conquest school glossary of Ælfric translated Latin into English, the post-Conquest glossaries, such as Neckam of St Albans school, give the translation in French. Though by the 13th century English was supplanting French, the schools as usual lagged behind, and the fiction was kept up that French was still the vernacular of England till after the victories of Edward III. John of Trevisa, translating the *Polychronicon* of Higden, who, writing in 1327, commented on the corruption of English due to the strange custom of boys in school being compelled to construe in French, tells us that this custom of construing into French “ was changed after the first murrain (the Black Death of 1349) by John Cornwal, a ‘ mayster of gramere,’ ” followed by Richard Pencrych, so that “ now, A.D. 1385, in al the gramer scoles of Engelond children leaveth Frensch and construeth and lurneth an Englysch,” the advantage of which was that they learnt Latin quicker, but the disadvantage was that they knew “ no more French than their left heel.” Master John Cornwall was an Oxford grammar schoolmaster, being paid 10d. in 1347 for “ salary ” of his school for the six founder's-kin boys at Merton; and Pencrych was not, as supposed by Mr de Montmorency (*State Intervention*, 22) through a strange misunderstanding, a schoolmaster at Penkridge in Staffordshire (though he no doubt took his name from that place), but was another Oxford man, living in 1367 in a hall by Merton, afterwards called Pencrych Hall. Though this very rational innovation thus began in Oxford, yet a new edition of the Oxford Grammar School Statutes in the late 14th or early 15th century provided that the masters should in construing teach the meaning of words by turns in English and French, “ lest the French tongue should be utterly lost,” as it came to be.

It is extremely difficult to ascertain what books were actually read in English schools before the 16th century. Whether the Christian poets such as Sedulius and Juvencus, the staple of Alcuin and recommended by Colet for St Paul's in 1518, were much read in the intermediate times, is doubtful. Vincent of Beauvais, who wrote about 1245 “ on the education of noblemen ” for the queen of France, quotes Horace, Ovid, Apuleius and Valerius Maximus, but would like to substitute the Christians for the classics. But he was a Dominican friar. It is certain that classical authors were not expelled. In 1356 Bishop Grandison of Exeter abused the schoolmasters of his diocese for taking the boys, “ as soon as they could read the Lord's Prayer, the creed or matins and the hours of the Virgin, and before they could construe or parse them,” to “ other school books and poets as if they were heathens instead of Christians.” Books of manners in verse were read in schools from the days of John de Garlandia, *c.* 1220, to the *Quos decet in mensa* of Sulpicius, a Roman schoolmaster of 1498, which was read in the lower forms of Winchester and Eton in 1535. The metrical grammar of Alexander of De villa Dei (Dol) was almost as popular as Donatus. In rhetoric Cicero *De oratore* was the staple work. In dialectic or logic successive manuals were founded on Boëthius and Isidore of Seville. The 15th century saw a reaction against the logic, which, valuable as it was, was begun much too early and was strongly reprobated by Wayneflete, who at Magdalen School insisted that his “ demyes,” or scholars, should not go on to logic till perfect in grammar. The wide knowledge of the classics shown by Chaucer, who no doubt, like Becket before him and Milton after him, went to St Paul's school, indicates what the average laymen and cleric learnt in the average grammar school.

A question has been raised as to who attended the grammar schools. The answer appears to be, all classes. Theoretically, sons of slaves and villeins were excluded. But it seems certain that picked specimens even of this class were admitted. The bulk of early schools were then, as now, in cities and boroughs, where all were free. Ælfric's Anglo-Saxon colloquies represent sons of smiths, huntsmen, cowherds, shepherds attending school and learning Latin. That villeins' sons did go to school is clear from two instances alone. In 1312 Walter of Merton, fellow of Merton College, Oxford, a villein, was manumitted by the prior of Durham. In 1344 the manor rolls at Great Waltham, Essex, show a villein fined 3d. for sending his son to school without licence from the lady of the manor (*Hist. Rev.*, July 1905). In 1391, after the Peasants' Revolt, the Commons sent up a bill to Richard II. “ that no neif ” (said to mean a female villein) “ or villein may henceforth send their children to school (*a escoles*) for their advancement by clergy, and that for the maintenance and salvation of the honour of all the freemen of the realm.” The petition was rejected. In 1406 the statute of artisans, while putting numerous restrictions on their freedom, adds, “ provided always that every man or woman of whatever estate or condition shall be free to send their son or daughter to learn grammar (*litterature*) at any school in our kingdom.” Henry VI., in the statutes of Eton, bears witness to the admission of the unfree to schools by inserting a reactionary prohibition against villeins (*nativi*) or illegitimate children being admitted scholars. Illegitimates were theoretically excluded from the priesthood, but the papal registers are crammed with indulgences to scholars who were illegitimate for admission to holy orders. As to the upper class, an erroneous inference that gentlemen's sons were not sent to school has been drawn from the passage of Higden above quoted, because, after saying that children in grammar schools learnt no French now, he adds that neither did gentlemen teach their sons French. But the two classes are not mutually exclusive. Elder sons, who were going to be knights or squires, did not as a rule go to school, but the younger sons did. The vast majority of bishops, and the higher clergy, were the younger sons of noblemen and gentlemen, and had certainly been to school. It is made a reproach against Bishop Grosseteste of Lincoln in his contest with his chapter that he was not a gentleman. We find Giffard, archbishop of York, son of a great Gloucestershire magnate, sending three wards to Beverley grammar school in 1276, and another archbishop of York, William Melton, ex-privy seal and lord chancellor, sending two nephews to Newark school in 1338. The only known mention of the school of Taunton before the days of its wrongly-reputed founder, Bishop Fox, is preserved in an inquisition in 1310 to prove the age of a royal ward, Hugh, son and heir of Thomas de la Tour. John of Kent, 60 years old, knows Hugh's age because he had a son at the school of Taunton with him seventeen years before (*The Genealogist*, iii. 211). This cannot have been an isolated instance. William of Wykeham would not have provided for “ 10 sons of noblemen and gentlemen, special friends of the college,” being admitted as commensales or boarders with the scholars, nor have forbidden the scholars of Winchester and New College to quarrel as to whether their birth was noble or otherwise, nor would the earliest lists of scholars and commoners there contain the names of sons of judges and masters in chancery and country gentlemen, like the Pophams of Dorset and the ffaringtons of Lancashire, if the gentle classes were not already in the habit of going to school. At Eton the number of noblemen and gentlemen commoners was doubled. The first or second headmaster and third provost of Eton, William Westbury, a Winchester and New College scholar, was almost certainly the son of the chief justice of that name. In 1464 Mr Thomas Bourchier, son of the earl of Essex and of Eu, nephew of the archbishop of Canterbury, was a commoner outside college at Winchester, and in 1479 the son of William Paston, the judge and Norfolk landowner, was writing verses at Eton in his letters home. In 1502 Sir John Percyvale founded Macclesfield grammar school expressly for "gentlemen's and other good men's sons thereabout."

Tuition fees were normally paid in grammar schools. In 1277 the fee paid to the "master of glomery" at Oxford for five Merton founder's-kin boys was 20d., or 4d. a head a term; in 1306 the "scolagium" of eight boys in the winter term was 3s., of seven boys in the Lent term 2s. 11d. and in the summer term 2s. 4d., a variation from 4d. to 4½d. and 5d. a term, probably owing to variation in the length of the term, and representing ½d. a week. In that year the *dica* of the usher was ½d. a term, and in 1310 the usher was paid 4d. for three terms for eight boys, or ½d. a term. The usher must have been paid something by the master, as even in that age, when the majority of livings were under £3 a year, a halfpenny could hardly have been a living wage for eight weeks. Perhaps the usher got a share of the levy of 2d. a head for offerings to the light of St Nicholas, the school boys' patron saint. For at Worcester in 1291 the bishop was called in to settle a quarrel between the schoolmaster and the rector of St Nicholas church as to the right to the wax which guttered from St Nicholas' light, which the boys maintained. An undated Oxford statute of the 15th century fixes the upward limit of grammar school fees at 8d. a term (*Reg. Giffard*, f. 341). The tariff settled by the bishop of Norwich, for Ipswich grammar school in 1476–1477 was 10d. for grammarians, 8d. for psalterians, or those learning to read the psalter in Latin, and 6d. for primerians, or those learning the primer or accidence (*Vict. Co. Hist.*, *Suffolk*, ii.). But the corporation rebelled against the fee of 10d. for grammarians, and in 1482 cut it down to 8d. a term. This was certainly the normal fee. In the return of chantries at their dissolution in 1548, the school at Newland is reported (Leach, *English Schools at the Reformation*, 78) to have been founded in 1446, to be "half-free, that is to say, taking of scholars learning grammar 8d. the quarter, and of others learning to read 4d. a quarter."

At successive epochs there have been attempts to make education free (*Journ. of Educ.*, June and July 1908). Hitherto after every attempt fees have crept back under some guise or other, as the endowments provided to ensure freedom were often inadequate to start with, and anyhow became inadequate by change in the value of money, while the inveterate habit of the rich in giving "tips" to secure special attention forced contributions on others. The movement began under the Roman Empire, Pliny founding a practically free school at Como, while successive emperors from Vespasian onwards extended the area and pay of public schools at the state expense, both of rhetoric and grammar. There can be little doubt that the cathedral schools were intended to be free just as much as the church services. Yet it had become necessary by the Lateran Council in 1179 for the canon law definitely to provide that, "to prevent the poor who could not be helped by their parents' means from being deprived of the opportunity of learning and advancement," every cathedral church should provide a competent benefice for a master to teach the clerks of the church and poor scholars gratis: and that in other churches if any endowment had been assigned for the purpose it should be restored, while no fees were to be exacted for licences to teach. At the next Lateran council in 1215 this canon was recited and its non-observance in many places lamented. The canon was confirmed and extended from cathedrals to all churches of sufficient means, while the cathedrals were also directed to provide a theological lecturer. That the first canon was not everywhere a dead letter is proved by the grant about 1180 of Archbishop Roger to the chapter of York of £5 a year "to the fee of your school," charged on the synodals of three archdeaconries, confirmed by Archbishop Geoffrey (1191–1212), and arrears demanded in a violent letter by the chancellor to Archbishop Giffard in 1271 (A. F. Leach, *Early Yorkshire Schools*, c. 12-16). So at Bury St Edmunds in 1180 Abbot Sampson, who had himself when a boy and a secular clerk been admitted to the grammar school free as a special personal favour, first made the grammar school free of fees for "school-hire" by giving it a school house outside the abbey in the town, and a few years later endowed it with half of a living worth £5 a year, for which the master was to teach 40 boys free, relations of the monks being preferred. There were also many exhibition endowments, which made schools free or partially free for poor boys, such as the provision at St Cross Hospital, Winchester, founded in 1130, of free meals daily for twelve boys from the High School, Winchester; and an endowment given to the Durham Abbey almoner about 1180 for board and lodging of three boys from Durham grammar school, while at St Nicholas' Hospital, Pontefract, the custom was ancient in 1267 to provide 40 loaves a week "except in vacations" for the scholars of Pontefract school, which is mentioned about 1100 as granted to the collegiate church in the castle there. It is significant that while the inquisition which established this custom was taken in French in 1267 it was confirmed in a mixture of Latin and English in 1464. In connexion with Stapledon Hall, now Exeter College, Oxford, Bishop Stapledon about 1327 provided for twelve scholars of Exeter Cathedral grammar school being boarded and clothed gratis in St John's Hospital by one of the gates of the city. In 1441 St Anthony's school was established in St Anthony's Hospital, London. Later, as in the famous case of Banbury Hospital, under Stanbridge in 1501, hospitals were bodily converted into schools, a precedent frequently followed since. Henry VI., in 1441, under the guidance of Chicheley and Wayneflete, copied Winchester down to the minutest particulars, and the wording of its statutes, but with the important difference that its school was declared, what Winchester was not, a free grammar school open to all from all parts of England. Another class of school, which if not free at first generally became so, was that of the grammar schools established by joint stock effort of the numerous gilds, or trades unions, which studded the towns. As the London City gilds still keep chaplains, so nearly every gild maintained one or more priests to perform the gild masses, say grace at the gild feasts, and bury the gild brethren and sisters and pray for their souls. Some of the larger ones converted parish churches, as at Boston, into little less than cathedrals in size and splendour, with a staff of priests and singing clerks as large as that of the greatest collegiate churches. Some of these priests or clerks kept schools of grammar and of song. There are unfortunately no accounts of such gilds preserved earlier than the 15th or 16th centuries. But there can be no doubt that they kept schools much earlier than that. The grammar schools at Louth and Boston, which appear, the former in the 15th century and the latter in the 14th, in gild documents, occur in other documents in 1276 and 1329 respectively. The school of the gild of Wisbech in Cambridgeshire is similarly mentioned in 1446. At Stratford-on-Avon the school appears in the earliest extant gild accounts, in 1402, but existed more than a century earlier, when, in 1295, its master or "rector" was ordained a subdeacon side by side with the rector of the parish church, William Grenfield, a future archbishop of York. It was converted into a free school by endowments given by one of the gild priests in 1482, and has continued without intermission to the present day (*Vict. Co. Hist.*, *Warwick*, ii. 329).

Probably the most numerous schools were those kept by chantry priests, endowed by single benefactors to pray for their souls, who sometimes by express terms of the foundation, more often perhaps to occupy their time or eke out not too substantial endowments, kept schools. These were sometimes free, more often at first not. But we know scarcely anything of these schools before the 14th century, the foundation deeds of those isolated institutions not having been preserved like those of colleges. We find, however, Oswestry endowed as a free school by David Holbeach, a lawyer, about 1406; Middleton, Lancashire, by Bishop Langley of Durham, in 1412; Durham itself by the same in 1414; Sevenoaks by William Sennock (Sevenock), a London grocer, the schoolmaster of which was "by no means to be in holy orders," in 1432; Newport, Shropshire, by Thomas Draper, 1442; Newland, Gloucestershire, by Robert Gryndour esquire, 1446; Alnwick, Northumberland, by William Alnwick, bishop of Lincoln, 1448; Deritend, now in Birmingham, 1448; Towcester by Archdeacon Sponne in 1449. There was somewhat of a stoppage of such foundations during the Wars of the Roses, but it was resumed with renewed vigour during the later years of Edward IV., and under Henry VII., and continued to the dissolution of monasteries. Among colleges may be noticed Acaster College for three schools of grammar, song and scrivener craft, *i.e.* writing and accounts, by ex-chancellor Bishop Stillingfleet about 1472; Rotherham College with three similar schools by ex-chancellor Archbishop Rotherham, 1484; Ipswich by the chancellor Cardinal Wolsey, 1528; and among chantry schools, Hull, 1482; Long Melford, 1484; Chipping Camden and Stow on the Wold, 1487; Stockport, by ex-Lord Mayor Sir Edmund Shaa, 1487; Macclesfield, by ex-Lord Mayor Sir John Percival, 1502; Cromer, by ex-Lord Mayor Read, 1505; Week St Mary, by the ex-Lady Mayoress Percival, 1508; and so on. The re-endowment of the old St Paul's school, London, by Dean Colet in 1510–1512, with the property he inherited from Lord Mayor Colet, and its transfer under papal, episcopal, capitular and royal licence from the dean and chapter of St Paul's to the Mercers' Company, and its conversion into a school free for 153 boys, created no small stir. Especially was this so, because it is the first instance in which the teaching of Greek is mentioned in school statutes, though only in the tentative form of a direction that the high master should be learned in Latin "and also in Greek yf suyche may be gotten." Though Greek was probably taught at Eton and Winchester under William Horman, headmaster of Eton (1485) and Winchester (1494), whose *Vulgaria*, composed when headmaster, contains frequent references to Greek, and even to a Greek play seemingly prepared by the boys, it did not become a regular school subject till the reign of Elizabeth. School exercises in Greek at Winchester under Edward VI. are preserved, but Sir Thomas Pope says it had been dropped at Eton under Mary. There is no evidence of it at St Paul's before Elizabeth's reign. At the time of the meeting of the Reformation parliament in 1535 there were between 300 and 400 grammar schools in England, the majority of which were free schools, charging no fees for teaching.

Free schools received a notable accession, on the dissolution of monasteries, in the schools attached to all the cathedrals "of the new foundation," except Winchester, by Henry VIII. in 1540, including Gloucester, Bristol, Peterborough, Chester and Westminster, which had not been cathedrals before. On the other hand, the list of free schools and endowed schools was much reduced by the doctrine which treated the endowments of schools under the control of monasteries not only through the 12th century transfers but even by much later and known foundations as trustees, as included in the confiscation of the monastery itself. Coventry, St Albans, Eye, Reading, Bury St Edmunds, Abingdon, Faversham are some out of many which suffered from this doctrine, and if they did not in fact cease, were for a time deprived of their endowments and only revived with new ones. Reading school was actually granted to its master, an Eton and King's scholar. St Albans was restored by the munificence of its last and well-pensioned abbot; Bury St Edmunds, like a good many more, by grant of Edward VI.; Abingdon by a private donor; Faversham by restoration of the trust-property on cause shown. But many, like Dunwich, perished irretrievably.

Spite of the dissolution of monasteries, the creation of chantry schools and other grammar schools went on. In this very year, 1540, John Harmon (who is generally known by his assumed name Veysey or Voysey), bishop of Exeter, endowed Sutton Coldfield grammar school, and in 1544 made its gild the governors. One of the latest of great schools, that of Berkhamsted, was founded by John Incent, dean of St Paul's, in 1541; while archbishop Holgate of York founded three free grammar schools, though without any chantry provisions, at York, Malton and Hemsworth in 1546. In 1548 all the endowed schools in England, other than the cathedral schools, were threatened and the vast majority destroyed by the act for the dissolution of colleges and chantries. Only Winchester, Eton and Magdalen College school were exempted, and they owed their exemption to being regarded as part of the universities with which (through New College, King's and Magdalen) they were connected; and even they had been included in the similar act passed in 1546, which was, however, permissive and lasted for Henry VIII.'s life only. The Chantries Act, while providing for the abolition of colleges, gilds and chantries, contained indeed provision for the continuance by special order of all schools attached to them, which were grammar schools by foundation, and for their increase and enlargement out of the confiscated lands. Unfortunately there was neither time nor money to spare for the purpose. A commission consisting of Sir Walter Mildmay, afterwards chancellor of the exchequer, and Robert Keylway, or Kelway, afterwards serjeant-at-law and author of *Kelway's Reports*, continued by warrant of the 20th of June 1548 "until further order" such schools as were clearly shown to be grammar schools by foundation, at the net income specifically enjoyed by the schoolmasters at the time. The "further order," which was to re-endow them with lands, never came. Only in a comparatively few places, where the inhabitants or powerful persons bestirred themselves to beg, or more often to buy, chantry lands from the Crown, were the schools restored and re-endowed. The few that were restored, and even by an irony of fate some of those which were deprived of their lands by Edward VI. but managed to struggle on, got the name of Free Grammar Schools of King Edward VI. So Edward VI. has been credited with being not only the founder of schools, estimated by various writers at 22, 30 and 44 in number, of which in the most favourable cases he increased the endowment, but also with being the promoter instead of the spoiler of a grammar school system. The earliest school actually restored by him was Berkhamsted, which was refounded by act of parliament in 1549; St Albans, Stamford and Pocklington being also refounded by acts of the same year. Acts of parliament were found too cumbrous. Some, as at Morpeth, Northumberland, and Saffron Walden in Essex, were refounded by grant to a town corporation of gild property with a grammar school attached. Most of the later refoundations were by letters patent. The first refoundation by patent for a school *per se* under a governing body created *ad hoc* was that of Sherborne, 13th of May 1550, Bury St Edmunds often, but wrongly, claimed as the first, not being till the 3rd of August 1550. The bulk were refounded in 1551–1553.

The notion that there was any great advance or change in the curriculum of schools at the Reformation is erroneous. There is hardly any difference between the authors prescribed at Bury in 1550 and those at Ipswich in 1528; Cato's *Moralia*, Aesop, Terence, Ovid, Erasmus, Sallust, Caesar, Virgil and Horace appearing in the statutes of both. If anything Ipswich was the more advanced, as Wolsey directed his boys to be taught précis writing in English, and essays and themes, also apparently in English, which are not mentioned at Bury. But Ipswich was a school of the first grade with eight forms, whereas at Bury only five were contemplated. The reign of Mary did not affect the schools as such one way or the other. Several, like Basingstoke grammar school and St Peter's school, York, were re-endowed in her reign, the former by restoration of gild lands, the latter by appropriation of the endowment of a hospital for poor priests. "Heretic" masters were extruded, and occasionally, like the master of Reading school, Julian Palmer, burnt. Similar extrusions of Romanists followed on the accession of Elizabeth. In 1580 and subsequent years the bishops were ordered to inquire as to schoolmasters who did not attend church or had not licences from the ordinaries to teach. The visitations of the chapter of Southwell as ordinaries in their liberty show schoolmasters in many small towns and villages, some of them "popish recusants," and others inhibited until they had been duly licensed. How far they taught grammar schools and not elementary schools is not very clear. But one unfortunate result of the suppression of the song schools was that attempts were now made, as at Wellingborough in Northamptonshire, to make the grammar schools serve the two incompatible purposes of grammar and elementary schools, with the result too often that the grammar school was degraded and the elementary school inefficient.

The number of school foundations credited to Queen Elizabeth or her era is very much larger than the facts justify. The greatest of all, Westminster, which during the 18th century was *facile princeps* in the numbers, social rank and academic and literary achievement of its scholars, had in fact never ceased after its foundation, or refoundation, as a cathedral school under Henry VIII. Though Mary had restored the monks, the school went on throughout her reign[1] and until Elizabeth formally refounded it with the restored canons. It is more extraordinary to find St Albans, founded under act of parliament of Edward VI., with Coventry, restored under patent of Henry VIII., and Lincoln, which had existed uninterruptedly from the 11th century, credited to her time. Similarly Bristol, Mansfield, Worcester, Darlington, Leicester, Eye, Bromyard, Richmond, Bodmin, Penryn, Fotheringay and others long previously existing and deriving no benefit from her or augmentation in her time, are erroneously dubbed Elizabethan.

In the curriculum of the schools, the change made by the Reformation has been much exaggerated. Already in 1446, in founding at Cambridge the college of God's House, now included in Christ's College, which was the first training college for grammar or secondary schoolmasters, Bingham had put forward the necessity of Latin, not only for translating the scriptures and carrying on the law and business of the realm, but also for communication with strangers and foreigners. In the Elizabethan schools the preparation for public life was slightly more emphasized. But methods and authors were little changed. The growth of Greek in all the great schools, and the attempt, as theological discussion grew keener towards the end of the reign, to acclimatize Hebrew, are the chief features. Under James I. and the Commonwealth the mention of Hebrew in statutes and the teaching of it in schools became quite common. It was advocated even by John Comenius, the Czech-German, who created a stir a few years before the Civil War by denouncing Latin as a subject of instruction except for boys going to the universities, and advocating the substitution of teaching in the vernacular language of each country instead.

There is one not wholly novel but notable feature which may be remarked in Elizabethan school foundations, mostly no doubt replacing old ones, and that is that many were the product of joint effort, partly in annual subscriptions and partly in donations of land or money down, not from one benefactor but from many persons. This is the case in many which have been attributed to the queen herself or to individual founders. Wakefield and Halifax in Yorkshire; Ashbourne, Derbyshire; Sandwich, Kent; Hexham, Northumberland; and St Saviour's and St Olave's, Southwark, are cases in which the evidence of joint stock enterprise has been fortunately preserved, as it has in that of Nottingham, which, after an existence of at least 300 years as a fee school, was refounded as a free school in 1512. Another and less fortunate feature may be observed in the frequent attempt to make the grammar schools do double work, and supply the loss caused by the suppression of the song schools, by doing duty also as elementary schools to teach the three R's. It is an attempt which is being continually renewed and always results in failure; generally ending in degrading the secondary school while not making the elementary school efficient. Wellingborough in Northamptonshire is a remarkable example of this. It is a school which, founded by joint effort and out of common town estate, always languished until in recent years it shook off the elementary school and became one of the most flourishing secondary schools in the county (*Vict. Co. Hist.*, *Northants.*, ii.).

During the Civil War and the Commonwealth, when new ideas on every subject were broached, education received new impetus, and under the fostering care of parliament schools were increased in numbers. Many new schools were created, many old schools obtained an increase of endowment and efficiency. Among the great schools it was during this time that Westminster, with a parliamentary committee of lords and commons substituted for the dean and chapter, under Busby, definitely placed itself in that position of pre-eminence which it retained till the first decade of the 19th century. It is significant that the two oldest extant school-lists are of this period, that for Winchester, which flourished under a Puritan warden and headmaster, for 1653, and that for Westminster for 1655. The care that parliament showed for schools was most conspicuous, where it might have least been expected, in regard to the cathedral schools. On the 14th of October 1642 the estates of deans and chapters were ordered to be sequestered, subject to a direction that "allowances assigned for scholars, almsmen and other charitable uses might not be interrupted." On the 9th of October 1643 parliament extended to schoolmasters the functions of the Committee for Plundered Ministers, to remove those scandalous in life or doctrine or who had deserted their cures.

As the property of deans and chapters was gradually sequestrated in 1643–1646, power was given this committee to relieve poor ministers and schoolmasters out of the proceeds. By act of parliament, on the 30th of April 1649, deans and chapters were abolished, but the schools were expressly saved by a clause that all payments from their revenues which before the 1st of December 1641 had been or ought to have been paid to the maintenance of any grammar school or scholars should continue to be paid. The temporal estates were ordered to be sold, but the spiritual property, *i.e.* livings and tithes, devolved on thirteen trustees, and afterwards on the University Reform Committee, for salaries and augmentations for preaching ministers and schoolmasters, of which £2000 a year was to go to the increase of the universities. Under these two provisions not only were all the cathedral grammar schools preserved intact, the existing masters being left in undisturbed possession where they attended to their business and did not bear arms against parliament, but in many cases they received large increases of stipend. The chapters had kept the schoolmasters at the fixed amounts prescribed by Henry VIII.'s statutes or older custom, though their own incomes they had increased to many times the statutable amounts by dividing fines amongst themselves. They had not even properly maintained the school buildings. At Canterbury, parliament had at once to spend the large sum of £50 in repairing the school and masters' houses; and at Rochester similar amounts. The committee augmented salaries at Chester, the master from £22 to £36 and the usher from £10 to £19; at Salisbury the master from £10 to £20 and the usher from £5 to £15; at Chichester the masters from £20 to £30; at Rochester they doubled the former stipend of £13, 6s. 8d.; at Durham the allowance of £20 was doubled. So at St Anthony's school, London, which by a grievous error the local historians killed under Elizabeth though it survived till the Fire of London, the salary, paid by St George's, Windsor, settled in 1442, at the rate of £16, was now increased to £36 a year. Other schools paid from chapter or crown revenues received similar increases, Grimston £30; Newcastle under Lyme £20; Bridport, Dorset, £15, 10s. Two of the most backward districts had each obtained a special "act for the propagation of the gospel and the maintenance of godly and able ministers and schoolmasters there,"—Wales on the 22nd of February, and the four northern counties on the 1st of March 1650. Under these acts, the school at Llanrwst was increased by £8 and at Abergavenny by £10 a year, while new schools were established at some twenty-four places, including Carnarvon, Cardiff, Cardigan, Montgomery and Denbigh, with salaries ranging from £10 a year at Glenberiog to £40 for the master and £25 for the usher at Wrexham. In fact, the act was an anticipation of the Welsh Intermediate Education Act 1888. So in the northern counties the stipends of the Durham Cathedral grammar schoolmasters were doubled; and the masters of Darlington grammar school and of Bishop Auckland grammar school each received an augmentation of £20 or more than double, and the master of Heighington of £10 a year; while new grammar schools were established at Barnard Castle and Ferry Hill. New schools, perhaps elementary, were erected at Stanhope, Staindrop, Brancepeth, Aycliffe and Whickham, while a new departure was taken in the erection of navigation schools at Sunderland and Nether Heworth. The greatest effort was the establishment of the university college of Durham, anticipating by near 200 years the present university, while an elaborate plan was published in 1647 for the establishment of a university of London. But none of the good work of parliament was allowed to stand at the Restoration, and the revenues appropriated to education went back to the prebendaries whom Archbishop Cranmer wished to turn out of the hive as drones 100 years before. The master of Durham grammar school alone, on an express letter from the king, was allowed to receive an augmentation of £20 a year.

A more permanent result of the abolition of bishops and chapters and their licensing powers was the immense development given to private schools all over the country, and not least in London. Among them, John Farnaby, a royalist, who had been employed to produce a revised Lilly's grammar in anticipation of Kennedy's *Latin Primer* of two centuries later, was the most famous and successful at the time; and John

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[1] Nicholas Udal (*q.v.*) was master in 1555–1556.

Milton, though he was perhaps rather a private tutor than a schoolmaster, is the most famous now. Another of them, Charles Hoole, royalist and ex-master of Rotherham, who taught first close to Milton in Aldersgate Street and then in Tokenhouse Garden in Lothbury, produced a most novel and useful school book in his *New Discovery of the Old Art of Teaching School*, written in 1637 and published "after 14 years' diligent trial in practice in London" in 1660. There is no more illuminating work for demonstrating the absurdity of the notion that thought and theorizing were not brought to bear on education in those days. Milton's *Tractate on Education* (1643) is but a series of vague generalities compared with Hoole's book, and is chiefly noticeable for its denunciation, not of education being wholly classical, which is assumed as a matter of course, but of the absurd method which devoted ten years to not learning a smattering of Latin when Italian or French were learnt in a year. But Milton's own idea of cramming the unfortunate boys with Varro and Columella, with agriculture and fishing, tactics and strategics in Greek and Latin authors, so that the pupils might learn things instead of words, was as visionary a one as could be conceived.

The Restoration parliament not only cut off the supply of new schools and new endowments, but by the Act of Uniformity in 1662 and the Five Mile Act in 1665, imposing prohibitory penalties on all teaching in public or private schools, except by rigid Church of England men, did its best to stop all advance. The very ferocity of the attempt in the long run defeated itself. By a series of decisions of the courts all the schools but the endowed grammar schools were (in defiance, it must be admitted, of the law and historical right) freed from the control of the bishops, and even some grammar schools. Thus in Bates's case, 1670, it was held that where a master was put in by lay patrons he could not be turned out for teaching without the licence of the ordinary, but only censured, and that the statutory penalty was a bar to proceedings in the ecclesiastical courts. Next year in Cox's case it was settled that the bishop's licence was only required in grammar schools. Private schools nominally to teach writing, arithmetic, French, geography and navigation were outside ecclesiastical cognizance and gradually monopolized the education of the middle classes. Singleton, expelled from the headmastership of Eton at the Restoration, is said to have had 300 boys in a school in St Mary Axe. Foubert, banished from France for Protestantism, had an academy in the Haymarket under royal patronage. No dissenter, however, could be a member of a governing body or master of an endowed school, and if a dissenter went as a scholar he had to go to church and learn the church catechism. The church was therefore left in sole control of the endowed schools, with the result that at the end of the 18th century the schools were in a more decrepit condition than they were at any time in their long history. Only those which had great possessions and attracted the aristocracy flourished.

The post-Restoration period is distinguished, however, by one great innovation, the development of girls' schools. There were girls' schools at Hackney and at Chelsea, at Oxford and at Bicester, boarding-schools where "young gentlewomen learnt to play, dance and sing," and where needlework was usually taught. In 1673 Mrs Makin, who had a ladies' school at Tottenham High Cross, and had been governess to the Princess Elizabeth, published an "Essay to Revive the Antient Education of Gentlewomen," dedicated to the princess, afterwards queen, Mary. She advocates the education of girls in the same subjects as men, including Latin, though not by learning Lily's grammar by heart, but by learning grammar in English.

In the 18th century, with the progress of the means of communication, a few great schools, of which Westminster, Eton, Winchester, Harrow were the greatest, throve at the expense of the country grammar schools to which the local nobility and gentry used to resort. They were conducted, however, like private schools—the town boys at Westminster, the dames' houses at Eton, the Commoners' houses at Winchester, being in fact private ventures. The process was imitated at Harrow from 1725, and Rugby from 1765, which emulated and sometimes surpassed the three old schools: while Charterhouse and Shrewsbury (which in the latter days of Elizabeth had been one of the largest schools in the country) also developed on the same lines. But there was little change even in their matter or method. In those schools in which French was taught and English poetry and prose were cultivated it was in a sort of amateur way and as a by-study. The serious work of scholarship was still confined to classics, though they were made the medium of excursions into history, geography and political science. The grammar schools in the country towns, with on the whole inferior teachers, clung more closely to the ancient ways. As the growth of commerce and manufactures brought into the ranks of the local aristocracy men mostly dissenters, the grammar schools, which refused to admit them either as governors or scholars, and which despised, if they did not, as they often did, wholly reject modern languages and modern subjects, were relegated to the free boys, who went there not for love of learning but because learning was free. Where some enterprising man got together a boarding-school his "young gentlemen," who paid relatively high fees, were carefully secluded even in work, still more in play, from the common herd of free boys.

Never probably since the 9th century was the condition of the public schools of England worse than in the years 1750 to 1840. In the *Victoria County Histories*, in Carlisle's *Endowed Grammar Schools*, in the reports of Lord Brougham's Commission of Inquiry concerning Charities (1818–1837), it may be read in the case of county after county and school after school how the grammar schools, where they still struggled to preserve a semblance of higher education, were often taught by the nearest vicar or curate, and were reduced to ten or even to no boys. Thus at Stamford in 1729 there were five boys; at Birmingham in 1734 none; at Moulton in 1744 none; at Wainfleet in 1753 none; at Oundle in 1762 one entry, in 1779 four in the school, in 1785 none. At Repton between 1779 and 1800 fifteen boys were admitted; at Abingdon from 1792 to 1803 there were from three to ten boys; at Derby in 1826 four boys; at Chesterfield in 1827 four boys, and from 1832 to 1836 one boy constituted the whole school. Often for half a century no more than half a dozen boys had been known to attend the school; sometimes this was the case for a century, while a large proportion of the schools had been definitely converted into elementary schools, and bad ones at that. Great, if partial, improvement followed after the publication of the reports of Lord Brougham's commission and the suits in Chancery and private acts of parliament for the restitution of endowments of schools which followed them. But the Public Schools Commission Report of 1863 and the Schools Inquiry Report of 1868 revealed still a deplorable state of things. This has largely been remedied by the removal of religious disabilities, the introduction of the principle of representative government in the governing bodies of schools, and the widening of the curriculum through special commissions with drastic powers, in the case of the great public schools under the Public Schools Commission, and in the case of the lesser public schools by the Endowed Schools Commissioners and the Charity Commissioners under the Endowed Schools Act 1869, and the carving of endowed grammar or high schools for girls out of the old schools for boys.

It is satisfactory to end this review of the history of schools with the conclusion that however much might still require to be done, the conditions in 1910 showed a complete alteration. English schools of all grades had never been so full of pupils, so well equipped with buildings and appliances, or staffed with such devoted and active bands of teachers.

Elementary Schools.—Elementary teaching prevailed in medieval England to an infinitely wider extent than has been commonly supposed. It was at first the duty of every parish priest. Its origin has been credited, even as lately as 1908 (Foster Watson, *English Grammar Schools to 1660*), to a decree of Theodulf, bishop of Orleans in France, in 787, and to a law of King Ethelbert in England in 994 (De Montmorency, *State Intervention in English Education*, 1902): "mass priests ought always to have in their houses a school of disciples, and if any good man desires to commit his little ones to them for instruction they ought gladly to receive and kindly teach them." These decrees were, in fact, merely re-issues of the 5th canon of the 6th council of Constantinople: "Let priests throughout the towns and villages have schools, and if any of the faithful wish to commend their little ones to them to learn their letters, let them not refuse to receive them, exacting however no price nor taking anything from them, except what the parents voluntarily offer," a phrase repeated again and again in the foundation documents of free schools, grammar or other, to the middle of the 18th century. The mass priests, however, neglected their duty. In 1295, John of Pontissera, bishop of Winchester, tried to recall those of his diocese to it by a synodal statute: "Let rectors, vicars and parish priests see that the sons of their parishioners know the Lord's Prayer, Creed and Salutation of the Virgin . . . and the parents should be induced to let their boys, when they know how to read the psalter, learn singing also." It may be observed that now the rectors are not required to teach boys themselves, but to see them taught. The duty of the parson had in fact been devolved on the clerk. In a decretal of Gregory IX., *c.* 1234, every parish priest was ordered to have a clerk to sing with him, read the epistle and lesson, and be able to keep school and warn the parishioners to send their sons to the church to learn the faith, whom he is to teach with all chastity (Decret. lib. iii., tit. i., c. iii.). This seems to be only an amplification of Leo IV., *c.* 850, *omnis presbyter clericum habeat scholarem qui epistolam*, &c. Many parish clerks duly did their duty in teaching. So we find in 1481 at St Nicholas, Bristol, "The clerks ought not to take no boke oute of the quere for childeryne to lerne in with owte licence of the procurators," *i.e.* the churchwardens. At Faversham in 1506, "Item the said clarkis or one of theym as moche as in theym is shall endeavour theymself to teche children to rede and synge . . . as of olde tyme hath be accustomed." But probably most neglected their duty, as we find in many places other provision for elementary instruction; sometimes by reading and writing schools, more often, as already stated, by the song schools. At Barnack, Northamptonshire, the rector had licence in 1359 from the bishop of Lincoln to establish a master to teach reading, song and grammar. A reading school is mentioned at Howden, Yorkshire, in 1394, but it had then become united to the song school, and a chaplain, *i.e.* a priest, was appointed to it (*scholas tam lectuales quam cantuales*). In 1401 William Coke "alias clerk," probably because he was the parish clerk, not apparently in orders, was appointed to this joint song and reading school, a reservation, however, being made to one John Lowyke of the right to teach a reading school only (*studium lectuale*) for 18 boys. Next year, 1402, William Lowyke, probably John's son, was appointed to the reading and song school, an appointment repeated in 1412, while another person was appointed to the two schools in 1426. But in 1456 the reading school was combined with the grammar school under John Armandson, B.A. At Northallerton in 1426 the reading and song school are combined; the grammar school separate; but in 1440 reading, grammar and song schools were combined in the hands of John Leuesham, chaplain.

We owe our knowledge of these schools to the casual preservation in the British Museum of a letter book of the prior of Durham cathedral monastery, who was the "Ordinary" for the Yorkshire possessions of St Cuthbert, among which were the two places named. But they can hardly have been as exceptional in fact as they are in records. Separate reading schools must have existed elsewhere. Nor can the two Yorkshire colleges of Acaster and Rotherham, founded about 1472 and 1484, be as unique as they appear to be in having, besides a grammar and song school, a writing school. At Acaster a "third [master] to teche to write and all such thing as belonged to scrivener craft," and at Rotherham "because that country produces many youths endowed with the light and acuteness of ability, but all do not wish to attain the dignity and height of the priesthood, that they may be the better fitted for the mechanical arts and other worldly concerns, a third fellow, knowing and skilled in the art of writing and accounts," was added to the grammar and song masters (A. F. Leach, *Early Yorkshire Schools*, ii. 62, 84-87, 89. 110, 151). At Aldwinkle, Northants, the chantry priest was by foundation ordinance of 1489 to teach six of the poorest boys spelling and reading (*syllabilacione et lectura*). At Barking, in Essex, a chantry priest was founded in 1392 to "teache the childerne to wrytte and read," while the chantry priest at Bromyard, Herefordshire, was founded in 1394 to "brynge upe the childerne borne in the parish in reading, wrytynge and gramar." At Normanton, Yorkshire, the chantry of Our Lady was "for good educatcion as well in grammar as wrytinge," and at Burgh under Stainmore, Westmorland, the stipendiary priest was "to kepe a Free Grammar Schole and also to teche scholers to wryte." At Kingsley, Staffordshire, the chantry priest was also "to kepe scole and teche pore men's children of the said parishe grammar and to rede and singe." At Montgomery, on the other hand, it is made matter of complaint, in 1548, that the fraternity of Our Lady hired a "prest or lerned man to kepe scole" for thirty years past, but he now "taught but yonge begynners onelye to write and syng and to reade soo far as the accidens rules and noo grammer." At Farthinghoe, Northants, was apparently a purely elementary school, the chantry priest being directed by foundation in 1443 by a London mercer to teach the little ones (*parvulos*), later translated *petits*, freely. At Ipswich in 1477 the little ones called Apeseyes (ABC's) and Songe were not under the grammar schoolmaster but an independent teacher. The most elementary school was the ABC school. At Christ's College, Brecon, founded, or refounded, by Henry VIII., besides a grammar master at £13, 6s. 8d. a year and an usher at half that, there was a chaplain to sing mass and "to teache the yonge children resorting to the said scoole there ABC" at the same pay as the usher. This seems to have been really a song school. At the college of Glasney, Cornwall, founded, or refounded, in 1264, the bell-ringer had £2 a year "as well for teachyng of pore mens children their ABC as for ringing"; while at Launceston the grammar master had £16 a year, and 13s. 4d. was "yerly distributed to an aged man chosen by the mayre to teache younge chylderne the ABC." At Saffron Walden, Essex, in 1423, it was settled after legal proceedings, that the chantry priests at the parish church might teach children the alphabet and graces, but not further. Anything more was the privilege of the grammar schoolmaster.

In 1542 an injunction of Bonner as bishop of London shows an attempt on Henry VIII.'s part to recall the clergy to the duty of teaching "every of you that be parsons, vicars, curates and also chantry priests and stipendiaries to . . . teach and bring up in learning the best ye can all such children of your parishioners as shall come to you, or at the least teach them to read English." The advisers of Edward VI. at first appear to have contemplated a similar development by an injunction in 1547 that "all chauntry priests shall exercise themselves in teaching youth to read and write and bring them up in good manners and other virtuous exercises." But the Chantries Act next year swept all the chantries away by Easter 1548; and while professing to apply their endowments to education, struck a deadly blow at elementary education by omitting any saving clause for elementary schools, whether song, reading, writing or ABC schools. The first duty of a song or of a reading school being "to teach a child to help a priest to sing mass," they were regarded as superstitious; and the rest were presumably looked on as tainted with the same poison. So of all the hundreds of song schools in the country, only two, outside the cathedrals and the university colleges and those of Winchester and Eton, Westminster and Windsor colleges, survived. These were the song school of the archdeacon Magnus foundation of a grammar school and song school at Newark in 1532; and that forming part of the grammar school in St John's Hospital, Coventry, established by John Hales under royal licence in 1545, though not legally settled till 1572. The gap left by these schools took long to fill, and probably the ignorance of the masses and of the lower middle classes in Elizabethan and Jacobean times was greater than before the Reformation. In the big towns, like London, during the reign of Elizabeth, voluntary rates, or application of the rates, were made to partly fill the gap. Christ's Hospital in 1553 with its 280 foundling children had, besides its grammar schoolmaster and usher, "a teacher of pricksonge, a teacher to wrighte and two schoole masters for the Petties ABC." But in Mary's reign, Grafton the printer was "clapt in the Flete for two daies because he suffered the children to learne the Englishe prymer" for "the Lattin abseies." In Southwark, while St Saviour's parish set up a grammar school in 1559, St Olave's parish in 1560 directed the churchwardens to ask the inhabitants "watte they will gyve towards the settyng up of a free skolle," which was started next year to "teche the cheldarne to write and rede and cast accompthe." At St Lawrence Jewry in 1568 a school was kept over the vestry. At St Ethelwyn's in 1589 Smythe "the schoolmaster" paid 10s. "for kepinge scole in the belfry." At Stevenage in 1561–1562 the old Brotherhood house and some endowment was bought by subscription for a school "to teach scholars called pettits to read English, write, cast accounts and learn the accidence."

Some of these and other like schools were rather junior or preparatory departments of the grammar school than independent elementary schools. The foundation of purely elementary schools was rare in Elizabeth's reign. In Warwickshire, Alcester in 1582, Henley-in-Arden in 1586, in Salop, Onibury in 1593, in Essex, Littlebury in 1595, appear to be pretty well all those known. Those mentioned in Mr de Montmorency's "State Intervention," taken from the *Digest of Schools* of 1842, are mostly of charities afterwards applied to elementary education, not founded for the purpose. In most counties the earliest elementary endowed schools are of James I.'s reign, such as Appleton, Berkshire, in 1604, Northiam, Sussex, in 1614, Sir William Borlase's school at Great Marlow in Buckinghamshire (now a secondary school) in 1624. At great impetus was given to them by the Commonwealth, and many were founded by state action, only to be destroyed at the Restoration. Conspicuous among Commonwealth schools was that of Polesworth, Warwickshire, founded by deed of 10th March 1655, the first endowed school which provided for girls as well as boys, the boys under a master to learn to write and read English, the girls in a separate schoolroom under a mistress to learn to read and work with the needle. In Wales Thomas Gouge, an ejected minister, in 1672, started voluntary schools.

After 1670 there was a large increase in elementary school foundations. The reign of Queen Anne saw a new development take place of the charity schools. The movement was started in 1698 by the Society for Promoting Christian Knowledge, and taken up by the bishops with an organized propaganda for getting subscriptions. The schools founded were commonly called blue or blue-coat schools, though there were red maids', green and even yellow schools. Many were boarding-schools on the model of Christ's Hospital, where slum children, girls and boys, in separate schools of course, were taken in and prepared for service and work. But there were many day schools. All, however, provided a uniform of the Christ's Hospital type. They were chiefly in the large towns, and still comprise some of the richest endowed elementary schools. Over 100 of them were established between 1698 and 1715 in London and Westminster, and in 1729 there were 1658 schools with 34,000 children. In that year the curious development of "circulating schools" was started in Wales, the masters residing for a certain time in one district and then passing on to another. (This was a device known in medieval times, and notable examples of it were Sir Robert Hitcham's rotatory school for Earl's Colne and two other places in Essex during the Commonwealth.) Griffith Jones was the principal promoter, and at his death in 1761 there were 10,000 children in the schools. In 1801 the Lancasterian system of schools, not of a few boys or girls, but of several hundreds taught in classes of 60 or 80, chiefly by pupil teachers, was inaugurated in the Borough Road by Joseph Lancaster. Out of it grew the British and Foreign School Society. This was undenominational. In 1811 the National Society adopted the similar, but rival, Bell or "Madras system" for Church of England teaching. The effect of these two organizations was to cover the country with elementary schools, partly endowed, chiefly supported by voluntary contributions and low fees. These completed the system, if system it could be called, of sporadic elementary schools. After the Reform Act of 1832 the state stepped in with grants and has gradually made elementary education universal. (A. F. L.)

See further under EDUCATION.

SCHOONER, a vessel rigged with fore and aft sails, properly with two masts, but now often with three, four and sometimes more masts; they are much used in the coasting trade, and require a smaller crew in proportion to their size than square-rigged vessels (see RIGGING and SHIP). According to the story, which is probably true, the name arose from a chance spectator's exclamation "there she scoons," *i.e.* glides, slips free, at the launch of the first vessel of this type at Gloucester, Massachusetts, in 1713, her builder being one Andrew Robinson. The spelling "schooner" is due to a supposed derivation from the Dutch *schooner*, but that and the other European equivalents, Ger. *Schoner*, Dan. *skonnert*, Span. and Portuguese *escuna*, &c., are all from English. "To scoon," according to Skeat, is a Scottish (Clydesdale) dialect word, meaning to skip over water like a flat stone, and is ultimately connected with the root, implying quick motion, seen in shoot, scud, &c. In American colloquial usage "schooner" is applied to the covered prairie-wagons used by the emigrants moving westward before the construction of railways, and to a tall, narrow, lager-beer glass.

SCHOPENHAUER, ARTHUR (1788–1860), German philosopher, was born in Danzig on the 22nd of February 1788. His parents belonged to the mercantile aristocracy—the bankers and traders of Danzig. His father, Heinrich Floris Schopenhauer, the youngest of a family to which the mother had brought the germs of mental malady, was a man of strong will and originality, and so proud of the independence of his native town that when Danzig in 1793 surrendered to the Prussians he and his whole establishment withdrew to Hamburg. At the age of forty he married Johanna Henrietta Trosiener, then only twenty, but the marriage owing to difference of temperament was unhappy. Their two children, Arthur and Adele (born 1796), bore the penalty of their parents' incompatibilities. They were burdened by an abnormal urgency of desire and capacity for suffering, which no doubt took different phases in the man and the woman, but linked them together in a common susceptibility to ideal pain.[1]

In the summer of 1787, a year after the marriage, the elder Schopenhauer, whom commercial experiences had made a cosmopolitan in heart, took his wife on a tour to western Europe. It had been his plan that the expected child should see the light in England, but the intention was frustrated by the state of his wife's health. The name Arthur was chosen because it remains the same in English, French and German.

During the twelve years which followed the removal of the family to Hamburg (1793–1805) the Schopenhauers made frequent excursions. From 1797 to 1799 Arthur was a boarder with M. Gregoire, a merchant of Havre, and friend of the Hamburg house, with whose son Anthime he formed a fast friendship. Returning to Hamburg, for the next four years he had but indifferent training. When he reached the age of fifteen the scholarly and literary instincts began to awaken. But his father, steeped in the spirit of commerce, was unwilling that a son of his should worship knowledge and truth. Accordingly he offered his son the choice between the classical school and an excursion to England. A boy of fifteen could scarcely hesitate. In 1803 the Schopenhauers and their son set out on a lengthened tour, of which Johanna has given an account, to Holland, England, France and Austria. Six months were spent in England. He found English ways dull and precise and the religious observances exacting; and his mother had—not for the last time—to talk seriously with him on his unsocial and wilful character. At Hamburg in the beginning of 1805 he was placed in a merchant's office. He had only been there for three months when his father, who had shown symptoms of mental alienation, fell or threw himself into the canal. After his death the young widow (still under forty), leaving Arthur at Hamburg, proceeded with her daughter Adele in the middle of 1806 to Weimar, where she arrived only a fortnight before the tribulation which followed the victory of Napoleon at Jena. At Weimar her talents, hitherto held in check, found an atmosphere to stimulate and foster them; her aesthetic and literary tastes formed themselves under the influence of Goethe and his circle, and her little salon gained a certain celebrity. Arthur, meanwhile, became more and more restless, and his mother allowed him to leave his employment. He began his education again at Gotha, but a satire on one of the teachers led to his dismissal. He was then placed with the Greek scholar Franz Passow, who superintended his classical studies. This time he made so much progress that in two years he read Greek and Latin with fluency and interest.

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[1] Johanna Schopenhauer (1766–1838) was in her day an author of some reputation. Besides editing the memoirs of Fernow, she published *Notes on Travels in England, Scotland and Southern France* (1813–1817); *Johann van Eyck and his Successors* (1823); three romances, *Gabriele* (1819–1820), *Die Tante* (1823) and *Sidonia* (1828), besides some shorter tales. These novels teach the moral of renunciation (*Entsagung*). Her daughter Adele (1796–1849) seems to have had a brave, tender and unsatisfied heart, and lavished on her brother an affection he sorely tried. She also was an authoress, publishing in 1844 a volume of *Haus-, Wald-, und Feld-Märchen*, full of quaint poetical conceits, and in 1845 *Anna*, a novel, in two vols. See Laura Frost, *Johanna Schopenhauer: ein Frauenleben* (1905).

In 1809 his mother handed over to him (aged twenty-one) the third part of the paternal estate, which gave him an income of £150, and in October 1809 he entered the university of Göttingen. The direction of his philosophical reading was fixed by the advice of G. E. Schulze to study, especially, Plato and Kant. For the former he soon found himself full of reverence, and from the latter he acquired the standpoint of modern philosophy. The names of " Plato the divine and the marvellous Kant " are conjunctly invoked at the beginning of his earliest work. But even at this stage of his career the pessimism of his later writings began to manifest itself, together with a susceptibility to morbid fears which led him to keep loaded weapons always at his bedside. He was a man of few acquaintances, amongst the few being Bunsen, the subsequent scholar-diplomatist, and Bunsen's pupil, W. B. Astor, the son of Washington Irving's millionaire hero. Even then he found his trustiest mate in a poodle, and its bearskin was an institution in his lodging. Yet, precisely because he met the world so seldom in easy dialogue, he was unnecessarily dogmatic in controversy; and many a bottle of wine went to pay for lost wagers. But he had made up his mind to be not an actor but an onlooker and critic in the battle of life; and when Wieland, whom he met on one of his excursions, suggested doubts as to the wisdom of his choice, Schopenhauer replied, " Life is a ticklish business; I have resolved to spend it in reflecting upon it."

After two years at Göttingen he took two years at Berlin. Here also he dipped into divers stores of learning, notably classics under Wolf. In philosophy he heard Fichte and Schleiermacher. Between 1811 and 1813 the lectures of Fichte (subsequently published from his notes in his *Nachgelassene Werke*) dealt with what he called the " facts of consciousness " and the " theory of science," and struggled to present his final conception of philosophy. These lectures Schopenhauer attended—at first, it is allowed, with interest, but afterwards with a spirit of opposition which is said to have degenerated into contempt, and which in after years never permitted him to refer to Fichte without contumely. Yet the words Schopenhauer then listened to, often with baffled curiosity, certainly influenced his speculation.

In Berlin Schopenhauer was lonely and unhappy. One of his interests was to visit the hospital La Charité and study the evidence it afforded of the interdependence of the moral and the physical in man. In the early days of 1813 sympathy with the national enthusiasm against the French carried him so far as to buy a set of arms; but he stopped short of volunteering for active service, reflecting that Napoleon gave after all only concentrated and untrammelled utterance to that self-assertion and lust for more life which weaker mortals feel but must perforce disguise. Leaving the nation and its statesmen to fight out their freedom, he hurried away to Weimar, and thence to the quiet Thuringian town of Rudolstadt, where in the inn " Zum Ritter," out of sight of soldier and sound of drum, he wrote, helped by books from the Weimar library, his essay for the degree of doctor in philosophy. On the 2nd of October 1813 he received his diploma from Jena; and in the same year from the press at Rudolstadt there was published—without winning notice or readers—his first book, *Über die vierfache Wurzel des Satzes vom zureichenden Grunde*, trans. in Bohn's Philological Library (1889).

In November 1813 Schopenhauer returned to Weimar, and for a few months boarded with his mother. But the strain of daily association was too much for their antagonistic natures. His splenetic temper and her volatility culminated in an open rupture in May 1814. From that time till her death in 1838 Schopenhauer never saw his mother again. During these few months at Weimar, however, he made some acquaintances destined to influence the subsequent course of his thought. Conversations with the Orientalist F. Mayer directed his studies to the philosophical speculations of ancient India. In 1808 Friedrich Schlegel had in his *Language and Wisdom of the Old Hindus* brought Brahmanical philosophy within the range of European literature. Still more instructive for Schopenhauer was the imperfect and obscure Latin translation of the *Upanishads* which in 1801–1802 Anquetil Duperron had published from a Persian version of the Sanskrit original. Another friendship of the same period had more palpable immediate effect, but not so permanent. This was with Goethe, who succeeded in securing his interest for those investigations on colours on which he was himself engaged. Schopenhauer took up the subject in earnest, and the result of his reflexions (and a few elementary observations) soon after appeared (Easter 1816) as a monograph, *Über das Sehen und die Farben* (ed. Leipzig, 1854). The essay, which must be treated as an episode or digression from the direct path of Schopenhauer's development, due to the potent force of Goethe, was written at Dresden, to which he had transferred his abode after the rupture with his mother. It had been sent in MS. to Goethe in the autumn of 1815, who, finding in it a transformation rather than an expansion of his own ideas, inclined to regard the author as an opponent rather than an adherent.

Essay on sight and colours.

The pamphlet begins by re-stating with reference to sight the general theory that perception of an objective world rests upon an instinctive causal postulation, which even when it misleads still remains to haunt us (instead of being, like errors of reason, open to extirpation by evidence), and proceeds to deal with physiological colour, *i.e.* with colours as felt (not perceived) modifications of the action of the retina. First of all, the distinction of white and black, with their mean point in grey, is referred to the activity or inactivity of the total retina in the graduated presence or absence of full light. Further, the eye is endowed with polarity, by which its activity is divided into two parts qualitatively distinct. It is this circumstance which gives rise to the phenomenon of colour. All colours are complementary, or go in pairs; each pair makes up the whole activity of the retina, and so is equivalent to white; and the two partial activities are so connected that when the first is exhausted the other spontaneously succeeds. Such pairs of colour may be regarded as infinite in number; but there are three pairs which stand out prominently, and admit of easy expression for the ratio in which each contributes to the total action. These are red and green (each = ½), orange and blue (2 : 1), and yellow and violet (3 : 1).[1] This theory of complementary colours as due to the polarity in the qualitative action of the retina is followed by some criticism of Newton and the seven colours, by an attempt to explain some facts noted by Goethe, and by some reference to the external stimuli which cause colour.

The grand interest of his life at Dresden was the composition of a work which should give expression in all its aspects to the idea of man's nature and destiny which had been gradually forming within him. Without cutting himself altogether either from social pleasures or from art, he read and took notes with regularity. More and more he learned from Cabanis and Helvetius to see in the will and the passions the determinants of intellectual life, and in the character and the temper the source of theories and beliefs. The conviction was borne in upon him that scientific explanation could never do more than systematize and classify the mass of appearances which to our habit-blinded eyes seem to be the reality. To get at this reality and thus to reach a standpoint higher than that of aetiology was the problem of his as of all philosophy. It is only by such a tower of speculation that an escape is possible from the spectre of materialism, theoretical and practical; and so, says Schopenhauer, "the just and good must all have this creed: I believe in a metaphysic." The mere reasonings of theoretical science leave no room for art, and practical prudence usurps the place of morality. The higher life of aesthetic and ethical activity—the beautiful and the good—can only be based upon an intuition which penetrates the heart of reality. Towards the spring of 1818 the work was nearing its end, and Brockhaus of Leipzig had agreed to publish it and pay the author one ducat for every sheet of printed matter. But, as the press loitered, Schopenhauer, suspecting treachery, wrote so rudely and haughtily to the publisher that the latter broke off correspondence with his client. In the end of 1818, however, the book appeared (with the date 1819) as *Die Welt als Wille und Vorstellung*, in four books, with an appendix containing a criticism of the Kantian philosophy (Eng. trans. by R. B. Haldane and J. Kemp, 1883). Long before the work had come to the hands of the public Schopenhauer had rushed off to Italy. He stayed for a time in Venice, where Byron was then living; but the two did not meet. At Rome he visited the art galleries, the opera, the theatre, and gladly seized every chance of conversing in English with Englishmen. In March 1819 he went as far as Naples and Paestum. About this time the fortunes of his mother and sister and himself were threatened by the failure of the firm in Danzig. His sister accepted a compromise of 70%, but Schopenhauer angrily refused this, and eventually recovered 9400 thalers.

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[1] In this doctrine, so far as the facts go, Schopenhauer is indebted to a paper by R. Waring Darwin in vol. lxxvi. of the *Transactions of the Philosophical Society.*

After some stay at Dresden, hesitating between fixing himself as university teacher at Göttingen, Heidelberg or Berlin, he finally chose the last-mentioned. He was, however, not a good lecturer, and his work soon came to an end. His failure he attributed to Hegelian intrigues. Thus, except for some attention to physiology, the first two years at Berlin were wasted. In May 1822 he set out by way of Switzerland for Italy. After spending the winter at Florence and Rome, he left in the spring of 1823 for Munich, where he stayed for nearly a year, the prey of illness and isolation. When at the end of this wretched time he left for Gastein, in May 1824, he had almost entirely lost the hearing of his right ear. Dresden, which he reached in August, no longer presented the same hospitable aspect as of old, and he was reluctantly drawn onwards to Berlin in May 1825.

The six years at Berlin were a dismal period in the life of Schopenhauer. In vain did he watch for any sign of recognition of his philosophic genius. Hegelianism reigned in the schools and in literature and basked in the sunshine of authority. Thus driven back upon himself, Schopenhauer fell into morbid meditations, and the world which he saw, if it was stripped naked of its disguises, lost its proportions in the distorting light. The sexual passion had a strong attraction for him at all times, and, according to his biographers, the notes he set down in English, when he was turned thirty, on marriage and kindred topics are unfit for publication. Yet in the loneliness of life at Berlin the idea of a wife as the comfort of gathering age sometimes rose before his mind—only to be driven away by cautious hesitations as to the capacity of his means, and by the shrinking from the loss of familiar liberties. He wrote nothing material. In 1828 he made inquiries about a chair at Heidelberg; and in 1830 he got a shortened Latin version of his physiological theory of colours inserted in the third volume of the *Scriptores ophthalmologici minores* (edited by Radius).

Another pathway to reputation was suggested by some remarks he saw in the seventh number of the *Foreign Review*, in an article on Damiron's *French Philosophy in the 19th Century*. With reference to some statements in the article on the importance of Kant, he sent in very fair English a letter to the writer, offering to translate Kant's principal works into English. He named his wages and enclosed a specimen of his work. His correspondent, Francis Haywood, made a counter-proposal which so disgusted Schopenhauer that he addressed his next letter to the publishers of the review. When they again referred him to Haywood, he applied to Thomas Campbell, then chairman of a company formed for buying up the copyright of meritorious but rejected works. Nothing came of this application.[1] A translation of selections from the works of Balthazar Gracian, which was published by Frauenstädt in 1862, seems to have been made about this time.[2]

In 1833 he settled finally at Frankfort, gloomily waiting for the recognition of his work, and terrified by fears of assassination and robbery. As the years passed he noted down every confirmation he found of his own opinions in the writings of others, and every instance in which his views appeared to be illustrated by new researches. Full of the conviction of his idea, he saw everything in the light of it, and gave each *aperçu* a place in his alphabetically arranged note-book. Everything he published in later life may be called a commentary, an excursus or a scholium to his main book; and many of them are decidedly of the nature of commonplace books or collectanea of notes. But along with the accumulation of his illustrative and corroborative materials grew the bitterness of heart which found its utterances neglected and other names the oracles of the reading world. The gathered ill-humour of many years, aggravated by the confident assurance of the Hegelians, found vent at length in the introduction to his next book, where Hegel's works are described as three-quarters utter absurdity and one-quarter mere paradox—a specimen of the language in which during his subsequent career he used to advert to his three predecessors Fichte, Schelling, but above all Hegel. This work, with its wild outcry against the philosophy of the professoriate, was entitled *Über den Willen in der Natur*, and was published in 1836 (revised and enlarged, 1854; Eng. trans., 1889).

In 1837 Schopenhauer sent to the committee entrusted with the execution of the proposed monument to Goethe at Frankfort a long and deliberate expression of his views, in general and particular, on the best mode of carrying out the design. But his fellow-citizens passed by the remarks of the mere writer of books. More weight was naturally attached to the opinion he had advocated in his early criticism of Kant as to the importance, if not the superiority, of the first edition of the *Kritik*; in the collected issue of Kant's works by Rosenkranz and Schubert in 1838 that edition was put as the substantive text, with supplementary exhibition of the differences of the second.

In 1841 he published under the title *Die beiden Grundprobleme der Ethik* two essays which he had sent in 1838–1839 in competition for prizes offered. The first was in answer to the question "Whether man's free will can be proved from self-consciousness," proposed by the Norwegian Academy of Sciences at Drontheim. His essay was awarded the prize, and the author elected a member of the society. But proportionate to his exultation in this first recognition of his merit was the depth of his mortification and the height of his indignation at the result of the second competition. He had sent to the Danish Academy at Copenhagen in 1839 an essay "On the Foundations of Morality" in answer to a vaguely worded subject of discussion to which they had invited candidates. His essay, though it was the only one in competition, was refused the prize on the grounds that he had failed to examine the chief problem (*i.e.* whether the basis of morality was to be sought in an intuitive idea of right), that his explanation was inadequate, and that he had been wanting in due respect to the *summi philosophi* of the age that was just passing. This last reason, while probably most effective with the judges, only stirred up more furiously the fury in Schopenhauer's breast, and his preface is one long fulmination against the ineptitudes and the charlatanry of his *bête noire*, Hegel.

In 1844 appeared the second edition of *The World as Will and Idea*, in two volumes. The first volume was a slightly altered reprint of the earlier issue; the second consisted of a series of chapters forming a commentary parallel to those into which the original work was now first divided. The longest of these new chapters deal with the primacy of the will, with death and with the metaphysics of sexual love. But, though only a small edition was struck off (500 copies of vol. i. and 750 of vol. ii.), the report of sales which Brockhaus rendered in 1846 was unfavourable, and the price had afterwards to be reduced. Yet there were faint indications of coming fame, and the eagerness with which each new tribute from critic and admirer was welcomed is both touching and amusing. From 1843 onwards a jurist named F. Dorguth had trumpeted abroad Schopenhauer's name. In 1844 a letter from a Darmstadt lawyer, Joh. August Becker, asking for explanation of some difficulties, began an intimate correspondence which went on for some time (and which was published by Becker's son in 1883). But the chief evangelist (so Schopenhauer styled his literary followers as distinct from the apostles who published not) was Frauenstädt, who made his personal acquaintance in 1846. It was Frauenstädt who succeeded in finding a publisher for the *Parerga und Paralipomena*, which appeared at Berlin in 1851 (2 vols., pp. 465, 531; sel. trans. by J. B. Saunders, 1889; French by A. Dietrich, 1909). Yet for this bulky collection of essays, philosophical and others, Schopenhauer received as honorarium only ten free copies of the work. Soon afterwards, Dr E. O. Lindner, assistant editor of the *Vossische Zeitung*, began a series of Schopenhauerite articles. Amongst them may be reckoned a translation by Mrs Lindner of an article by John Oxenford which appeared in the *Westminster Review* for April 1853, entitled "Iconoclasm in German Philosophy," being an outline of Schopenhauer's system. In 1854 Frauenstädt's *Letters on the Schopenhauerean Philosophy* showed that the new doctrines were become a subject of discussion—a state of things made still more obvious by the university of Leipzig offering a prize for the best exposition and examination of the principles of Schopenhauer's system. Besides this, the response his ideas gave to popular needs and feelings was evinced by the numerous correspondents who sought his advice in their difficulties. And for the same reason new editions of his works were called for—a second edition of his degree dissertation in 1847, of his *Essay on Colours* and of *The Will in Nature* in 1854, a third edition of *The World as Will and Idea* in 1859, and in 1860 a second edition of *The Main Problems of Ethics*.

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[1] It was not till 1841 that a translation of Kant's *Kritik* in English appeared.

[2] He also projected a translation of Hume's *Essays* and wrote a preface for it.

In 1854 Richard Wagner sent him a copy of the *Ring of the Nibelung*, with some words of thanks for a theory of music which had fallen in with his own conceptions. Three years later he received a visit from his old college friend Bunsen, who was then staying in Heidelberg. On his seventieth birthday congratulations flowed in from many quarters. In April 1860 he began to be affected by occasional difficulty in breathing and by palpitation of the heart. Another attack came on in autumn (9th September), and again a week later. On the evening of the 18th his friend and subsequent biographer, Dr Gwinner, sat with him and conversed. On the morning of the 21st September he rose and sat down alone to breakfast; shortly afterwards his doctor called and found him dead in his chair. By his will, made in 1852, with a codicil dated February 1859, his property, with the exception of some small bequests, was devised to the above-mentioned institution at Berlin. Gwinner was named executor, and Frauenstädt was entrusted with the care of his manuscripts and other literary remains.

It is often said that a philosophic system cannot be rightly understood without reference to the character and circumstances of the philosopher. The remark finds ample application in the case of Schopenhauer. The conditions of his training, which brought him in contact with the realities of life before he learned the phrases of scholastic language, give to his words the stamp of self-seen truth and the clearness of original conviction. They explain at the same time the naïveté which set a high price on the products his own energies had turned out, and could not see that what was so original to himself might seem less unique to other judges. Preoccupied with his own ideas, he chafed under the indifference of thinkers who had grown *blasé* in speculation and fancied himself persecuted by a conspiracy of professors of philosophy. It is not so easy to demonstrate the connexion between a man's life and doctrine. But it is at least plain that in the case of any philosopher, what makes him such is the faculty he has, more than other men, to get a clear idea of what he himself is and does. More than others he leads a second life in the spirit or intellect alongside of his life in the flesh—the life of knowledge beside the life of will. It is inevitable that he should be especially struck by the points in which the sensible and temporal life comes in conflict with the intellectual and eternal. It was thus that Schopenhauer by his own experience saw in the primacy of the will the fundamental fact of his philosophy, and found in the engrossing interests of the selfish ἔρως the perennial hindrances of the higher life. For his absolute individualism, which recognizes in the state, the church, the family only so many superficial and incidental provisions of human craft, the means of relief was absorption in the intellectual and purely ideal aims which prepare the way for the cessation of temporal individuality altogether. But theory is one thing and practice another; and he will often lay most stress on the theory who is most conscious of defects in the practice. It need not, therefore, surprise us that the man who formulated the sum of virtue in justice and benevolence was unable to be just to his own kinsfolk and reserved his compassion largely for the brutes, and that the delineator of asceticism was more than moderately sensible of the comforts and enjoyments of life.

Philosophy from Kant to Schopenhauer.

The philosophy of Schopenhauer, like almost every system of the 19th century, can hardly be understood without reference to the ideas of Kant. Anterior to Kant the gradual advance of idealism had been the most conspicuous feature in philosophic speculation. That the direct objects of knowledge, the realities of experience, were after all only our ideas or perceptions was the lesson of every thinker from Descartes to Hume. And this doctrine was generally understood to mean that human thought, limited as it was by its own weakness and acquired habits, could hardly hope to cope successfully with the problem of apprehending the real things. The idealist position Kant seemed at first sight to retain with an even stronger force than ever. But it is darkest just before the dawn; and Kant, the Copernicus of philosophy, had really altered the aspects of the doctrine of ideas. It was his purpose to show that the forms of thought (which he sought to isolate from the peculiarities incident to the organic body) were not merely customary means for licking into convenient shape the data of perception, but entered as underlying elements into the constitution of objects, making experience possible and determining the fundamental structure of nature. In other words, the forms of knowledge were the main factor in making objects. By Kant, however, these forms are generally treated psychologically as the action of the several faculties of a mind. Behind thinking there is the thinker. But in his successors, from Fichte to Hegel, this axiom of the plain man is set aside as antiquated. Thought or conception without a subject-agent appears as the principle—thought or thinking in its universality without any individual substrata in which it is embodied: *τὸ νοεῖν* or *νόησις* is to be substituted for *νοῦς*. This is the step of advance which is required alike by Fichte when he asks his reader to rise from the empirical ego to the ego which is subject-object (*i.e.* neither and both), and by Hegel when he tries to substitute the *Begriff* or notion for the *Vorstellung* or pictorial conception. As spiritism asks us to accept such suspension of ordinary mechanics as permits human bodies to float through the air and part without injury to their members, so the new philosophy of Kant's immediate successors requires from the postulant for initiation willingness to reverse his customary beliefs in quasi-material subjects of thought.

But, besides removing the psychological slag which clung to Kant's ideas from their matrix and presenting reason as the active principle in the formation of a universe, his successors carried out with far more detail, and far more enthusiasm and historical scope, his principle that in reason lay the a priori or the anticipation of the world, moral and physical. Not content with the barren assertion that the understanding makes nature, and that we can construct science only on the hypothesis that there is reason in the world, they proceeded to show how the thing was actually done. But to do so they had first to brush away a stone of stumbling which Kant had left in the way. This was the thing as it is by itself and apart from our knowledge of it—the something which we know, when and as we know it not. This somewhat is what Kant calls a limit-concept. It marks only that we feel our knowledge to be inadequate, and for the reason that there may be another species of sensation than ours, that other beings may not be tied by the special laws of our constitution, and may apprehend, as Plato says, by the soul itself apart from the senses. But this limitation, say the successors of Kant, rests upon a misconception. The sense of inadequacy is only a condition of growing knowledge in a being subject to the laws of space and time; and the very feeling is a proof of its implicit removal. Look at reason not in its single temporal manifestations but in its eternal operation, and then this universal thought, which may be called God, as the sense-conditioned reason is called man, becomes the very breath and structure of the world. Thus in the true idea of things there is no irreducible residuum of matter: mind is the Alpha and Omega, at once the initial postulate and the final truth of reality.

In various ways a reaction arose against this absorption of everything in reason. In Fichte himself the source of being is primeval activity, the groundless and incomprehensible deed-action (*That-Handlung*) of the absolute ego. The innermost character of that ego is an infinitude in act and effort. "The will is the living principle of reason," he says again. "In the last resort," says Schelling (1809), in his *Inquiries into the Nature of Human Freedom*, "there is no other being but will. *Wollen ist Ursein* (will is primal being); and to this alone apply the predicates fathomless, eternal, independent of time, self-affirming." It is unnecessary to multiply instances to prove that idealism was never without a protest that there is a heart of existence, life, will, action, which is presupposed by all knowledge and is not itself amenable to explanation. We may, if we like, call this element, which is assumed as the basis of all scientific method, irrational—will instead of reason, feeling rather than knowledge.

It is under the banner of this protest against rationalizing idealism that Schopenhauer advances. But what marks out his armament is its pronounced realism. He fights with the weapons of physical doctrine and on the basis of the material earth. He knows no reason but the human, no intelligence save what is exhibited by the animals. He knows that both animals and men have come into existence within assignable limits of time, and that there was an anterior age when no eye or ear gathered the life of the universe into perceptions. Knowledge, therefore, with its vehicle, the intellect, is dependent upon the existence of certain nerve-organs located in an animal system; and its function is originally only to present an image of the interconnexions of the manifestations external to the individual organism, and so to give to the individual in a partial and reflected form that feeling with other things, or innate sympathy, which it loses as organization becomes more complex and characteristic. Knowledge or intellect, therefore, is only the surrogate of that more intimate unity of feeling or will which is the underlying reality—the principle of all existence, the essence of all manifestations, inorganic and organic. And the perfection of reason is attained when man has transcended those limits of individuation in which his knowledge at first presents him to himself, when by art he has risen from single objects to universal types, and by suffering and sacrifice has penetrated to that innermost sanctuary where the euthanasia of consciousness is reached—the blessedness of eternal repose.

Schopenhauer and Herbert Spencer.

In substantials the theory of Schopenhauer may be compared with a more prosaic statement of Herbert Spencer (modernizing Hume). All psychical states may, according to him, be treated as incidents of the correspondence between the organism and its environment. In this adjustment the lowest stage is taken by reflex action and instinct, where the change of the organs is purely automatic. As the external complexity increases, this automatic regularity fails; there is only an incipient excitation of the nerves. This feeble echo of the full response to stimulus is an idea, which is thus only another word for imperfect organization or adjustment. But gradually this imperfect correspondence is improved, and the idea passes over again into the state of unconscious or organic memory. Intellect, in short, is only the consequence of insufficient response between stimulus and action. Where action is entirely automatic, feeling does not exist. It is when the excitation is partial only, when it does not inevitably and immediately appear as action, that we have the appearance of intellect in the gap. The chief and fundamental difference between Schopenhauer and Spencer lies in the refusal of the latter to give this "adjustment" or "automatic action" the name of will. Will, according to Mr Spencer, is only another aspect of what is reason, memory or feeling—the difference lying in the fact that as will the nascent excitation (ideal motion) is conceived as passing into complete or full motion. But he agrees with Schopenhauer in basing consciousness, in all its forms of reason, feeling or will, upon "automatic movement—psychical change," from which consciousness emerges and in which it disappears.

Main tendencies of his system.

What Schopenhauer professed, therefore, is to have dispelled the claims of reason to priority and to demonstrate the relativity and limitation of science. Science, he reminds us, is based on final inexplicabilities; and its attempts by theories of evolution to find an historical origin for humanity in rudimentary matter show a misconception of the problem. In the successions of material states there can nowhere be an absolute first. The true origin of man, as of all else, is to be sought in an action which is everlasting and which is ever present: *nec te quaesiveris extra*. There is a source of knowledge within us by which we know, and more intimately than we can ever know anything external, that we will and feel. That is the first and the highest knowledge, the only knowledge that can strictly be called immediate; and to ourselves we as the subject of will are truly the "immediate object." It is in this sense of will—of will without motives, but not without consciousness of some sort—that reality is revealed. Analogy and experience make us assume it to be omnipresent. It is a mistake to say will means for Schopenhauer only force. It means a great deal more; and it is his contention that what the scientist calls force is really will. In so doing he is only following the line predicted by Kant[1] and anticipated by Leibnitz. If we wish, said Kant, to give a real existence to the thing in itself or the noumenon we can only do so by investing it with the attributes found in our own internal sense, viz. with thinking or something analogous thereto. It is thus that Fechner in his "day-view" of things sees in plants and planets the same fundamental "soul" as in us—that is, "one simple being which appears to none but itself, in us as elsewhere wherever it occurs self-luminous, dark for every other eye, at the least connecting sensations in itself, upon which, as the grade of soul mounts higher and higher, there is constructed the consciousness of higher and still higher relations."[2] It is thus that Lotze declares[3] that "behind the tranquil surface of matter, behind its rigid and regular habits of behaviour, we are forced to seek the glow of a hidden spiritual activity." So Schopenhauer, but in a way all his own, finds the truth of things in a will which is indeed unaffected by conscious motives and yet cannot be separated from some faint analogue of non-intellectual consciousness.

In two ways Schopenhauer has influenced the world. He has shown with unusual lucidity of expression how feeble is the spontaneity of that intellect which is so highly lauded, and how overpowering the sway of original will in all our action. He thus reasserted realism, whose gospel reads, "In the beginning was appetite, passion, will," and has discredited the doctrinaire belief that ideas have original force of their own. This creed of naturalism is dangerous, and it may be true that the pessimism it implies often degenerates into cynicism and a cold-blooded denial that there is any virtue and any truth. But in the crash of established creeds and the spread of political indifferentism and social disintegration it is probably wise, if not always agreeable, to lay bare the wounds under which humanity suffers, though pride would prompt their concealment. But Schopenhauer's theory has another side. If it is daringly realistic, it is no less audacious in its idealism. The second aspect of his influence is the doctrine of redemption of the soul from its sensual bonds, first by the medium of art and second by the path of renunciation and ascetic life. It may be difficult in each case to draw the line between social duty and individual perfection. But Schopenhauer reminds us that the welfare of society is a temporal and subordinate aim, never to be allowed to dwarf the full realization of our ideal being. Man's duty is undoubtedly to join in the common service of sentient beings; but his final goal is to rise above the toils and comforts of the visible creature into the vast bosom of a peaceful Nirvana.

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(W. W.; X.)

SCHOPPE, CASPAR (1576–1649), German controversialist and scholar, was born at Neumarkt in the upper Palatinate on the 27th of May 1576 and studied at several German universities. Having become a convert to Roman Catholicism about 1599, he obtained the favour of Pope Clement VIII., and, even in an age of violent polemics, distinguished himself by the virulence of his writings against the Protestants. He became involved in a controversy with Joseph Justus Scaliger, formerly his intimate friend, and others, wrote *Ecclesiasticus auctoritati Jacobi regis oppositus* (1611), an attack upon James I. of England; and in *Classicum belli sacri* (1619) urged the Catholic princes to wage war upon the Protestants. About 1607 Schoppe entered the service of Ferdinand, archduke of Styria, afterwards the emperor Ferdinand II., who found him very useful in rebutting the arguments of the Protestants, and who sent him on several diplomatic errands. According to Pierre Bayle, he was almost killed by some Englishmen at Madrid in 1614, and again fearing for his life he left Germany for Italy in 1617, afterwards taking part in an attack upon the Jesuits. Schoppe, as the long list of his writings shows, knew also something of grammar and philosophy, and had an excellent acquaintance with Latin. His chief work is, perhaps, his *Grammatica philosophica* (Milan, 1628). Schoppe died at Padua on the 19th of November 1649. In his *Life of Sir Henry Wotton* Izaac Walton, calling him Jasper Scioppius, refers to Schoppe as "a man of a restless spirit and a malicious pen."

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[1] *Kritik* (Trans. Anal.), bk. ii. Appendix.

[2] *Über die Seelenfrage*, p. 9 (Leipzig, 1861).

[3] *Mikrokosmus*, i. 408 (2nd ed.).

Besides the works already noticed, he wrote *De arte critica* (1597); *De Antichristo* (1605); *Pro auctoritate ecclesiae in decidendis fidei controversiis libellus*; *Scaliger hypobolymaeus* (1607), a virulent attack on Scaliger; and latterly the anti-jesuitical works, *Flagellum Jesuiticum* (1632); *Mysteria patrum jesuitorum* (1633); and *Arcana societatis Jesu* (1635). For a fuller list of his writings see J. P. Nicéron *Mémoires*, (1727–1745). See also C. Nisard, *Les Gladiateurs de la république des lettres* (Paris, 1860).

SCHORL, in mineralogy, the name given to coarse black varieties of tourmaline (*q.v.*). The *schorl rocks* are crystalline aggregates of quartz and tourmaline. They are granular and massive, not banded or foliated as a rule, grey of various shades, the darkest coloured being most rich in schorl. Some are very fine grained, but in most cases the individual crystals are easily discernible with the unaided eye. They are hard, splintery, and very resistant to weathering. Veined, brecciated, porous and banded varieties occur, but are less common than the granular massive rocks.

Schorl rocks occur practically always in association with tourmaline-bearing granites. Most of them are of igneous origin and, though there may be a few which are direct products of consolidation from a plutonic magma, in the vast majority of cases they originate by the action of gases and vapours on granites, porphyries and other rocks. All magmas contain vapours in solution and give them off more or less readily as they crystallize. Water, carbonic acid and hydrochloric acid (or chlorides) are the commonest dissolved substances, but fluorine, boron, lithium and phosphoric acid occur also, and as they pass outwards these last may act on the surrounding rocks, probably still at a high temperature and produce minerals of a special kind. This action is said to be pneumatolytic. Tourmaline contains boron and flourine, hence the presence of these elements in the emanations from the granite may be assumed. Schorl rocks often also contain varieties of white mica which are rich in fluorine and lithium; in addition apatite is usually present. Lastly, many of the rocks of this group contain tinstone or are associated with tin-bearing veins, and it is probable that the ores of this metal were brought up in solution as fluorides or chlorides and deposited in the situations where now they are found.

Along the sides of fissures, through which, no doubt, the gases ascended, the granite is converted into schorl rock for a distance ranging from a fraction of an inch to several feet, and vein-like masses of grey schorl rock branching and uniting are thus produced. In other places considerable areas of granite are changed in this way, principally near the margin of the granite, and an interrupted belt of this kind of rock encircles some of the larger outcrops of granite in Cornwall. A similar origin must be ascribed to *greisen* (*q.v.*), the aggregate of quartz and white mica commonly found in association with tin-bearing granites; there are complete gradations between schorl rock and greisen, according to the varying proportions of white mica and tourmaline which may be present in each specimen. Another mineral which is produced by the pneumatolytic alteration of granite is topaz (a silicate and fluoride of aluminium); an aggregate of quartz and topaz is called topaz-fels or topaz rock, and is largely developed in some of the tin-mining districts of Germany, though not found in Cornwall.

As might be expected every stage of the conversion of granite into schorl rock can be found. Tourmaline may have been to some extent an original constituent of the granite, but most of it is of new formation and must have resulted from the alteration of the biotite and the felspar of the original rock, both of these minerals having disappeared when the metamorphosis was complete. It is commonly found that the schorl is of a brown colour in the interior of the crystals but blue at the edges; probably the brown is primary or has been derived from biotite, but the blue principally from the replacement of felspar. The rock known as luxullianite, obtained near Luxullian village in Cornwall and used as an ornamental stone for the sarcophagus of the duke of Wellington's monument in St Paul's Cathedral, is a tourmaline granite in which the replacement of biotite and felspar by quartz and tourmaline can be seen in progress. The new tourmaline is in fine pointed needles which have a stellate or divergent arrangement, and is embedded in quartz: often these needles are planted on the surface of corroded crystals of primary brown schorl. This rock still contains a good deal of flesh-coloured felspar in large porphyritic crystals which contrast well with the dark matrix and give polished specimens a very handsome appearance. In the completely altered schorl rocks there are rarely needles of tourmaline, but this mineral occurs as irregular grains mingled in varying proportions with small crystals of quartz. In nearly all cases the structure of the granite has vanished, but at Trevalgan, St Austell, and other places in Cornwall there are schorl rocks which contain white pseudomorphs of quartz after porphyritic crystals of orthoclase.

In porphyries of "elvans" tourmalinization also is frequent, though not so common as greisening. Veins of quartz with stellate schorl needles may be seen spreading through the groundmass or when this has been previously converted into an aggregate of quartz and fine scaly white mica, the porphyritic crystals of felspar alone may be replaced by bunches of tourmaline embedded in quartz. Tinstone often makes its appearance in these rocks either in small crystals enclosed in quartz or lining fissures and cavities left by the removal of a portion of the rock in solution.

The same process goes on also in sedimentary rocks; a felspathic sandstone may yield a schorl rock which can hardly be distinguished from one derived from a fine-grained granite. In shales brown tourmaline is often deposited in the vicinity of fissures, and the whole mass may be converted into a hard splintery aggregate of quartz and schorl (often containing also rutile and tinstone). But these rocks are always banded, like the original slate; their original structures (bedding and cleavage) are probably never completely effaced and the ultimate product has been called schorl-schist (tourmaline hornfels, cornubianite).

The stanniferous veins which in large numbers intersect the granites of Devon and Cornwall and the slates around them, and have yielded a large part of the world's supply of tin consist mostly of quartz, tourmaline and chlorite (with varying proportions of cassiterite). The veinstones are typically very fine grained, hard and dark blue or dark green in colour. The green varieties contain much chlorite, the blue are richer in tourmaline, and both kinds are known to the miners as "peach." Essentially aqueous deposits in lines of fissure, these rocks show that quartz and tourmaline were carried up in hot solutions at a late period in the cooling of the granite, and the changes above described are due to the operation of these solutions as they spread outwards through the surrounding rocks. Their tourmaline crystals are very small and usually of dark-blue shades, but owing to repeated movements of the walls of the veins the ore deposits have sometimes an intricate history, as microscopic studies show that the first infillings of the fissures have been broken up and cemented together again by a later material of slightly different character. (J. S. F.)

SCHOTTISCHE, the German for "Scottish," a name given to a dance, *der schottische Tanz*, introduced into England about 1850. It was a form of polka, with two figures. The "Highland Schottische" is a lively dance resembling a fling. What is known as the "barn dance" was first known in America as the "Military Schottische."

SCHOULER, JAMES (1839–), American lawyer and historian, was born in West Cambridge (now Arlington), Massachusetts, on the 20th of March 1839, the son of William Schouler (1814–1872), who from 1847 to 1853 edited the *Boston Atlas*, one of the leading Whig journals of New England. The son graduated at Harvard in 1859, studied law in Boston and was admitted to the bar there in 1862. In 1869 he removed to Washington, where for three years he published the *United States Jurist*. After his return to Boston, in 1874, he devoted himself to office practice and to literary pursuits. He was a lecturer in the law school of Boston University between 1885 and 1903, a non-resident professor and lecturer in the National

University Law School, Washington, D.C., in 1887–1909, and a lecturer on American history and constitutional law at Johns Hopkins University in 1891–1908. In 1896–1897 he was president of the American Historical Association. His legal treatises are *The Law of Domestic Relations* (1870), *The Law of Personal Property* (1872–1876; new ed., 1907), *The Law of Bailments* (1880), *The Law of Executors and Administrators* (1883), *The Law of Husband and Wife* (1882) and *The Law of Wills* (1910). He is best known, however, as an historian; his most important work being a *History of the United States under the Constitution, 1789–1865* (6 vols., 1880–1899). Among his other publications are *A Life of Thomas Jefferson* (1893); *Historical Briefs* (1896), containing a biography of Mr Schouler; *Constitutional Studies, State and Federal* (1897); a brief *Life of Alexander Hamilton* (1901); *Americans of 1776* (1906); and *Ideals of the Republic* (1908).

SCHRADER, EBERHARD (1836–1908), German orientalist, was born at Brunswick on the 7th of January 1836, and educated at Göttingen under Ewald. In 1858 he took a university prize for a treatise on the Ethiopian languages, and in 1863 became professor of theology at Zürich. Subsequently he occupied chairs at Giessen (1870) and Jena (1873), and finally became professor of oriental languages at Berlin. Though he turned first to biblical research, his chief achievements were in the field of Assyriology, in which he was a pioneer in Germany and acquired an international reputation. He died on the 4th of July 1908.

His publications include: *Studien zur Kritik und Erklärung der biblischen Urgeschichte* (1863); the 8th edition of De Wette's *Einleitung in das Alte Testament* (1869); *Die assyr.-babyl. Keilinschriften* (1872); *Die Keilinschriften und das Alt. Test.* (1872; 3rd ed. by Zimmern and Winckler, 1901–1902); *Keilinschriften und Geschichtsforschung* (1878); *Die Höllenfahrt der Istar* (text, trans., notes, 1874); *Zur Frage nach dem Ursprung der altbabylonischen Kultur* (1884); in conjunction with other scholars, *Keilinschriftliche Bibliothek* (1877).

SCHREIBER, LADY CHARLOTTE ELIZABETH (1812–1895), better known as Lady Charlotte Guest, Welsh scholar and connoisseur of china, daughter of Albemarle Bertie, 9th earl of Lindsey, was born at Uffington House, Lincolnshire, on the 19th of May 1812. She married in 1833 Sir Josiah John Guest, manager and afterwards owner of the Dowlais ironworks near Merthyr Tydvil. Lady Charlotte Guest studied the Welsh language and literature, and published (3 vols., 1838–1849) *The Mabinogion, from the Llyfr Coch o Hergest, and other ancient Welsh Manuscripts, with an English translation and notes.* A second edition without the Welsh text appeared in 1877, and in 1881 *The Boy's Mabinogion; being the earliest Welsh tales of King Arthur in the famous Red Book of Hergest, edited with an introduction by S. Lanier.* Sir Josiah Guest died in 1852, and Lady Charlotte married in 1855 Charles Schreiber, M.P. for Cheltenham and Poole. She made a valuable collection of English porcelain and china, now in the South Kensington Museum, another of fans and fan leaves, presented to the British Museum, and a third of playing cards, part of which is in the British Museum. On all three subjects she left elaborate treatises. She died on the 15th of January 1895 at Canford Manor, Dorset, at the house of her eldest son Ivor Guest, Baron Wimborne.

Editions of Lady Charlotte Guest's translation of the Mabinogion are in *The Temple Classics* (1902), *The Welsh Library* (1902), &c.

SCHREIBERHAU, a village and climatic health resort of Germany, in the Prussian province of Silesia, situated in the valley of the Zacken in the Riesengebirge, 1900 ft. above the sea, 16 m. S.W. from Hirschberg by the railway to Grünthal. Pop. (1905) 4994. It has two Roman Catholic and two Evangelical churches, and works for the making and polishing of glass. It is a popular resort, being visited by about 10,000 visitors annually.

See Kloidt, *Schreiberhau im Riesengebirge* (Breslau, 1893).

SCHREYER, ADOLF (1828–1899), German painter, was born at Frankfort-on-Main, and studied art first at the Staedel Institute in his native town, and then at Stuttgart, Munich, and Düsseldorf; but he formed his style in Paris, whilst he found his favourite subjects in his travels in the East. He first accompanied Prince Thurn and Taxis through Hungary, Wallachia, Russia and Turkey; then, in 1854, he followed the Austrian army across the Wallachian frontier. In 1856 he went to Egypt and Syria, and in 1861 to Algiers. In 1862 he settled in Paris, but returned to Germany in 1870; and settled at Cronberg near Frankfort, where he died in 1899. Schreyer was, and is still, especially esteemed as a painter of horses, of peasant life in Wallachia and Moldavia, and of battle incidents. His work is remarkable for its excellent equine draughtsmanship, and for the artist's power of observation and forceful statement; and has found particular favour among French and American collectors. Of his battle-pictures there are two at the Schwerin Gallery, and others in the collection of Count Mensdorff-Pouilly and in the Ravené Gallery, Berlin. His painting of a "Charge of Artillery of Imperial Guard" was formerly at the Luxembourg Museum. The Metropolitan Museum, New York, owns three of Schreyer's oriental paintings: "Abandoned," "Arabs on the March" and "Arabs making a détour"; and many of his best pictures are in the Rockefeller, Vanderbilt, J. J. Astor, W. Astor, A. Belmont, and W. Walters collections. At the Kunsthalle in Hamburg is his "Wallachian Transport Train," and at the Staedel Institute, Frankfort, are two of his Wallachian scenes.

SCHRIJVER, PETER (1576–1660), Dutch author, better known as SCRIVERIUS, was born at Haarlem on the 12th of January 1576. He was educated at the university of Leiden, where he formed a close intimacy with Daniel Heinsius. He belonged to the party of Oldenbarneveldt and Grotius, and brought down the displeasure of the government by a copy of Latin verses in honour of their friend Hoogerbeets. Most of his life was passed in Leiden, but in 1650 he became blind, and the last years of his life were spent in his son's house at Oudewater, where he died on the 30th of April 1660.

He is best known as a scholar by his notes on Martial, Ausonius, the *Pervigilium Veneris*; editions of the poems of Scaliger (Leiden, 1615), of the *De re militari* of Vegetius Renatus, the tragedies of Seneca (*P. Scriverii collectanea veterum tragicorum*, 1621), &c. His *Opera anecdota, philologica, et poëtica* (Utrecht, 1738) were edited by A. H. Westerhovius, and his *Nederduitsche Gedichten* (1738) by S. Dockes. He made many valuable contributions to the history of Holland: *Batavia Illustrata* (4 parts, Leiden, 1609); *Corte historische Beschryvinghe der Nederlandscher Oorlogen* (1612); *Inferioris Germaniae . . . historia* (1611, 4 parts); *Beschryvinghe van Out Batavien* (Arnheim, 1612); *Het oude gontsche Chronycxken van Hollandt*, edited by him, and printed at Amsterdam in 1663; *Principes Hollandiae Zelandiae et Frisiae* (Haarlem, 1650), translated (1678) into Dutch by Pieter Brugman.

See Peerlkamp, *Vitae Belgarum qui latina carmina scripserunt* (Brussels, 1822), and J. H. Hoeufft, *Parnassus latino-belgicus* (Amsterdam, 1819).

SCHRÖDER, FRIEDRICH LUDWIG (1744–1816), German actor, manager and dramatist, was born in Schwerin on the 3rd of November 1744. Shortly after his birth, his mother, Sophie Charlotte Schröder (1714–1792), separated from her husband, and joining a theatrical company toured with success in Poland and Russia. Subsequently she married Konrad Ernst Ackermann and appeared with his company in many German cities, finally settling in Hamburg. Young Schröder early showed considerable talent, but his childhood was rendered so unhappy by his stepfather that he ran away from home and learnt the trade of a shoemaker. He rejoined his parents, however, in 1759, and became an actor. In 1764 he appeared with the Ackermann company in Hamburg, playing leading comedy parts; but these he soon exchanged for the tragic rôles in which he became famous. These included Hamlet, Lear and Philip in Schiller's *Don Carlos*. After Ackermann's death in 1771 Schröder and his mother took over the management of the Hamburg theatre, and he began to write plays—largely adaptations from the English, making his first success with the comedy *Die Arglistige*. In 1780 he left Hamburg, and after a tour with his wife, Anna Christina Hart, a former pupil, accepted an engagement at the Court theatre in Vienna. In 1785 Schröder again took over his Hamburg management and conducted the theatre with marked ability until his retirement in 1798. The Hamburg theatre again falling into decay, the master was once more summoned to assist in its rehabilitation, and in 1811 he returned to it for one year. He died on the 3rd of September 1816. As an actor Schröder was the first to depart from the stilted style of former tragedians; as a manager he raised the standard of plays presented and first brought Shakespeare before the German public. Schröder's *Dramatische Werke*, with an introduction by Tieck, were published in four volumes (Berlin, 1831).

See B. Litzmann, *Friedrich Ludwig Schröder* (Hamburg, 1890–1894); R. Blum in the *Allgemeines Theater-Lexikon* (1842); and Brunier, *Friedrich Ludwig Schröder* (Leipzig, 1864).

SCHRÖDER, SOPHIE (1781–1868), German actress, was born at Paderborn on the 23rd of February 1781, the daughter of an actor, Gottfried Bürger. She made her first appearance in opera at St Petersburg, in 1793. On Kotzebue's recommendation she was engaged for the Vienna Court theatre in 1798, and here and in Munich and Hamburg she won great successes in tragic rôles like Marie Stuart, Phèdre, Merope, Lady Macbeth, and Isabella in *The Bride of Messina*, which gave her the reputation of being "the German Siddons." She retired in 1840 and lived in Augsburg and Munich until her death on the 25th of February 1868. She had married, in 1795, an actor, Stollmers (properly Smets), from whom she separated in 1799. In 1804 she married the tenor Friedrich Schröder, and on his death in 1825, an actor, Kunst. Mme Schröder's eldest daughter was the opera singer, Wilhelmine Devrient-Schröder (*q.v.*).

See Ph. Schmidt, *Sophie Schröder* (Vienna, 1870); also *Das Lexikon der deutscher Bühnen-Angehörigen.*

SCHRÖDER - DEVRIENT, WILHELMINE (1804–1860), German operatic singer, was born on the 6th of December 1804, in Hamburg, being the daughter of the actress, Sophie Schröder (1781–1868). Her first impersonation was at the age of fifteen as Aricia in Schiller's translation of Racine's *Phèdre*, and in 1821 she was received with so much enthusiasm as Pamina in Mozart's *Zauberflöte* that her future career in opera was assured. In 1823 she married Karl Devrient, but was separated from him in 1828, afterwards making two other marriages. Meanwhile she had maintained her popularity at Dresden and elsewhere. She made her first Paris appearance in 1830, and she sang in London in 1833 and 1837. As a singer she combined a rare quality of tone with dramatic intensity of expression, which was as remarkable on the concert platform as in opera. She died in Coburg on the 26th of January 1860.

See E. von Glümer, *Erinnerungen an Wilhelmine Schröder-Devrient* (Leipzig, 1862); and A. von Wolzogen, *Wilhelmine Schröder-Devrient* (Leipzig, 1863).

SCHRÖTER, JOHANN HIERONYMUS (1745–1816), German astronomer, was born at Erfurt on the 30th of August 1745. Having studied law at Göttingen, he became chief magistrate at Lilienthal, near Bremen, in 1788. Here he built an observatory, and, equipped in 1785 by a 7-ft. reflector by Herschel, and later by a 13-ft. reflector by Johann Gottlieb Friedrich Schrader of Kiel, he made his famous observations on the surface features of the moon and planets. His work was ruined in 1813 by the French under Vandamme, who destroyed his books, writings and observatory; he never recovered from the catastrophe, and died on the 29th of August 1816.

SCHUBART, CHRISTIAN FRIEDRICH DANIEL (1739–1791), German poet, was born at Obersontheim in Swabia (now the kingdom of Württemberg) on the 24th of March 1739, and entered the university of Erlangen in 1758 as a student of theology. He led a dissolute life, and after two years' stay was summoned home by his parents. After attempting to earn a livelihood as private tutor and as assistant preacher, his musical talents gained him the appointment of organist in Geislingen, and subsequently in Ludwigsburg; but in consequence of his wild life and blasphemy, which found expression in a parody of the litany, he was expelled the country. He then visited in turn Heilbronn, Mannheim, Munich and Augsburg. In the last-named town he made a considerable stay, began his *Deutsche Chronik* (1774–1778) and eked out a subsistence by reciting from the latest works of prominent poets. Owing to a bitter attack upon the Jesuits, he was expelled from Augsburg and fled to Ulm, where he was arrested in 1777 and confined in the fortress of Hohenasperg. Here he met with lenient treatment, and he beguiled the time by a study of mystical works and in composing poetry. His *Sämtliche Gedichte* appeared in two volumes at Stuttgart in 1785–1786 (new edition by G. Hauff, Leipzig, 1884, in Reclam's *Universal-Bibliothek*); in this collection most of the pieces are characterized by the bombast of the "Sturm und Drang" period. He was set at liberty in 1787, at the instance of Frederick the Great, king of Prussia, and expressed his gratitude in *Hymnus auf Friedrich den Grossen*. Schubart was now appointed musical director and manager of the theatre at Stuttgart, where he continued his *Deutsche Chronik* and began his autobiography, *Schubarts Leben und Gesinnungen* (2 vols., 1791–1793), but before its completion he died at Stuttgart on the 10th of October 1791. His *Gesammelte Schriften und Schicksale* appeared in 8 vols. (Stuttgart, 1839–1840).

See D. F. Strauss, *Schubarts Leben in seinen Briefen* (2 vols., 1849; 2nd ed., 1878); G. Hauff, *Christian Daniel Schubart* (1885); and E. Nägele, *Aus Schubarts Leben und Wirken* (1888).

SCHUBERT, FRANZ PETER (1797–1828), German composer, was born on the 31st of January 1797, in the Himmelpfortgrund, a small suburb of Vienna. His father, Franz, son of a Moravian peasant, was a parish schoolmaster; his mother, Elizabeth Fitz, had before her marriage been cook in a Viennese family. Of their fourteen children nine died in infancy; the others were Ignaz (b. 1784), Ferdinand (b. 1794), Karl (b. 1796), Franz and a daughter Theresia (b. 1801). The father, a man of worth and integrity, possessed some reputation as a teacher, and his school, in the Lichtenthal, was well attended. He was also a fair amateur musician, and transmitted his own measure of skill to his two elder sons, Ignaz and Ferdinand.

At the age of five Schubert began to receive regular instruction from his father. At six he entered the Lichtenthal school where he spent some of the happiest years of his life. About the same time his musical education began. His father taught him the rudiments of the violin, his brother Ignaz the rudiments of the pianoforte. At seven, having outstripped these simple teachers, he was placed under the charge of Michael Holzer, the Kapellmeister of the Lichtenthal Church. Holzer's lessons seem to have consisted mainly in expressions of admiration, and the boy gained more from a friendly joiner's apprentice, who used to take him to a neighbouring pianoforte warehouse and give him the opportunity of practising on a better instrument than the poor home could afford. The unsatisfactory character of his early training was the more serious as, at that time, a composer had little chance of success unless he could appeal to the public as a performer, and for this the meagre education was never sufficient.

In October 1808 he was received as a scholar at the Convict, which, under Salieri's direction, had become the chief music-school of Vienna, and which had the special office of training the choristers for the Court Chapel. Here he remained until nearly seventeen, profiting little by the direct instruction, which was almost as careless as that given to Haydn at St Stephen's, but much by the practices of the school orchestra, and by association with congenial comrades. Many of the most devoted friends of his after life were among his schoolfellows: Spaun and Stadler and Holzapfel, and a score of others who helped him out of their slender pocket-money, bought him music-paper which he could not buy for himself, and gave him loyal support and encouragement. It was at the Convict, too, that he first made acquaintance with the overtures and symphonies of Mozart—there is as yet no mention of Beethoven—and between them and lighter pieces, and occasional visits to the opera, he began to lay for himself some foundation of musical knowledge.

Meanwhile his genius was already showing itself in composition. A pianoforte fantasia, thirty-two close-written pages, is dated April 8–May 1, 1810; then followed, in 1811, three long vocal pieces written upon a plan which Zumsteeg had popularized, together with a "quintet-overture," a string quartet, a second pianoforte fantasia and a number of songs. His essay in chamber-music is noticeable, since we learn that at the time a regular quartet-party was established at his home "on Sundays and holidays," in which his two brothers played the violin, his father the 'cello and Franz himself the viola. It was the first germ of that amateur orchestra for which, in later years, many of his compositions were written. During the remainder of his stay at the Convict he wrote a good deal more chamber-music, several songs, some miscellaneous pieces for the pianoforte and, among his more ambitious efforts, a *Kyrie* and *Salve Regina*, an octet for wind instruments—said to commemorate the death of his mother, which took place in 1812—a cantata, words and music, for his father's name-day in 1813, and the closing work of his school-life, his first symphony.

At the end of 1813 he left the Convict, and, to avoid military service, entered his father's school as teacher of the lowest class. For over two years he endured the drudgery of the work, which, we are told, he performed with very indifferent success. There were, however, other interests to compensate. He took private lessons from Salieri, who annoyed him with accusations of plagiarism from Haydn and Mozart, but who did more for his training than any of his other teachers; he formed a close friendship with a family named Grob, whose daughter Therese was a good singer and a good comrade; he occupied every moment of leisure with rapid and voluminous composition. His first opera—*Des Teufels Lustschloss*—and his first Mass—in F major—were both written in 1814, and to the same year belong three string quartets, many smaller instrumental pieces, the first movement of the symphony in B♭ and seventeen songs, which include such masterpieces as *Der Taucher* and *Gretchen am Spinnrade.* But even this activity is far outpaced by that of the *annus mirabilis* 1815. In this year, despite his school-work, his lessons with Salieri and the many distractions of Viennese life, he produced an amount of music the record of which is almost incredible. The symphony in B♭ was finished, and a third, in D major, added soon afterwards. Of church music there appeared two Masses, in G and B♭, the former written within six days, a new *Dona nobis* for the Mass in F, a *Stabat Mater* and a *Salve Regina.* Opera was represented by no less than five works, of which three were completed—*Der Vierjährige Posten*, *Fernando* and *Claudine von Villabella*—and two, *Adrast* and *Die beiden Freunde von Salamanca*, apparently left unfinished. Besides these the list includes a string quartet in G minor, four sonatas and several smaller compositions for piano, and, by way of climax, 146 songs, some of which are of considerable length, and of which eight are dated Oct. 15, and seven Oct. 19. "Here," we may say with Dryden, "is God's plenty." Music has always been the most generous of the arts, but it has never, before or since, poured out its treasure with so lavish a hand.

In the winter of 1814–1815 Schubert made acquaintance with the poet Mayrhofer: an acquaintance which, according to his usual habit, soon ripened into a warm and intimate friendship. They were singularly unlike in temperament: Schubert frank, open and sunny, with brief fits of depression, and sudden outbursts of boisterous high spirits; Mayrhofer grim and saturnine, a silent man who regarded life chiefly as a test of endurance; but there is good authority for holding that "the best harmony is the resolution of discord," and of this aphorism the ill-assorted pair offer an illustration. The friendship, as will be seen later, was of service to Schubert in more than one way.

As 1815 was the most prolific period of Schubert's life, so 1816 saw the first real change in his fortunes. Somewhere about the turn of the year Spaun surprised him in the composition of *Erlkönig*—Goethe's poem propped among a heap of exercise-books, and the boy at white-heat of inspiration "hurling" the notes on the music-paper. A few weeks later Von Schober, a law-student of good family and some means, who had heard some of Schubert's songs at Spaun's house, came to pay a visit to the composer and proposed to carry him off from school-life and give him freedom to practice his art in peace. The proposal was particularly opportune, for Schubert had just made an unsuccessful application for the post of Kapellmeister at Laibach, and was feeling more acutely than ever the slavery of the class-room. His father's consent was readily given, and before the end of the spring he was installed as a guest in Von Schober's lodgings. For a time he attempted to increase the household resources by giving music lessons, but they were soon abandoned, and he devoted himself to composition. "I write all day," he said later to an inquiring visitor, "and when I have finished one piece I begin another."

The works of 1816 include three ceremonial cantatas, one written for Salieri's Jubilee on June 16; one, eight days later, for a certain Herr Watteroth who paid the composer an honorarium of £4 ("the first time," said the journal, "that I have composed for money"), and one, on a foolish philanthropic libretto, for Herr Joseph Spendou "Founder and Principal of the Schoolmasters' Widows' Fund." Of more importance are two new symphonies, No. 4 in C minor, called the *Tragic*, with a striking andante, No. 5 in B♭, as bright and fresh as a symphony of Mozart: some numbers of church music, fuller and more mature than any of their predecessors, and over a hundred songs, among which are comprised some of his finest settings of Goethe and Schiller. There is also an opera, *Die Burgschaft*, spoiled by an illiterate book, but of interest as showing how continually his mind was turned towards the theatre.

All this time his circle of friends was steadily widening. Mayrhofer introduced him to Vogl, the famous baritone, who did him good service by performing his songs in the salons of Vienna; Anselm Hüttenbrenner and his brother Joseph ranged themselves among his most devoted admirers; Gahy, an excellent pianist, played his sonatas and fantasias; the Sonnleithners, a rich burgher family whose eldest son had been at the Convict, gave him free access to their home, and organized in his honour musical parties which soon assumed the name of Schubertiaden. The material needs of life were supplied without much difficulty. No doubt Schubert was entirely penniless, for he had given up teaching, he could earn nothing by public performance, and, as yet, no publisher would take his music at a gift; but his friends came to his aid with true Bohemian generosity—one found him lodging, another found him appliances, they took their meals together and the man who had any money paid the score. Schubert was always the leader of the party, and was known by half-a-dozen affectionate nicknames, of which the most characteristic is "kann er 'was?" his usual question when a new acquaintance was proposed.

1818, though, like its predecessor, comparatively unfertile in composition, was in two respects a memorable year. It saw the first public performance of any work of Schubert's—an overture in the Italian style written as an avowed burlesque of Rossini, and played in all seriousness at a Jäll concert on March 1. It also saw the beginning of his only official appointment, the post of music-master to the family of Count Johann Esterhazy at Zelesz, where he spent the summer amid pleasant and congenial surroundings. The compositions of the year include a Mass and a symphony, both in C major, a certain amount of four-hand pianoforte music for his pupils at Zelesz and a few songs, among which are *Einsamkeit*, *Marienbild* and the *Litaney*. On his return to Vienna in the autumn he found that Von Schober had no room for him, and took up his residence with Mayrhofer. There his life continued on its accustomed lines. Every morning he began composing as soon as he was out of bed, wrote till two o'clock, then dined and took a country walk, then returned to composition or, if the mood forsook him, to visits among his friends. He made his first public appearance as a song-writer on February 28, 1819, when the *Schäfers Klagelied* was sung by Jäger at a Jäll concert. In the summer of the same year he took a holiday and travelled with Vogl through Upper Austria. At Steyr he wrote his brilliant piano quintet in A, and astonished his friends by transcribing the parts without a score. In the autumn he sent three of his songs to Goethe, but, so far as we know, received no acknowledgment.

The compositions of 1820 are remarkable, and show a marked advance in development and maturity of style. The unfinished oratorio *Lazarus* was begun in February; later followed, amid a number of smaller works, the 23rd Psalm, the *Gesang der Geister*, the Quartettsatz in C minor and the great pianoforte fantasia on *Der Wanderer.* But of almost more biographical interest is the fact that in this year two of Schubert's operas appeared at the Kärnthnerthor theatre, *Die Zwillingsbrüder* on June 14, and *Die Zauberharfe* on August 19. Hitherto his larger compositions (apart from Masses) had been restricted to the amateur orchestra at the Gundelhof, a society which grew out of the quartet-parties at his home. Now he began to assume a more prominent position and address a wider public. Still, however, publishers held obstinately aloof, and it was not until his friend Vogl had sung *Erlkönig* at a concert in the Kärnthnerthor (Feb. 8, 1821) that Diabelli hesitatingly agreed to print some of his works on commission. The first seven opus-numbers (all songs) appeared on these terms; then the commission ceased, and he began to receive the meagre pittances which were all that the great publishing houses ever accorded to him. Much has been written about the neglect from which he suffered during his lifetime. It was not the fault of his friends, it was only indirectly the fault of the Viennese public; the persons most to blame were the cautious intermediaries who stinted and hindered him from publication.

The production of his two dramatic pieces turned Schubert's attention more firmly than ever in the direction of the stage; and towards the end of 1821 he set himself on a course which for nearly three years brought him continuous mortification and disappointment. *Alfonso und Estrella* was refused, so was *Fierrabras*; *Die Verschworenen* was prohibited by the censor (apparently on the ground of its title); *Rosamunde* was withdrawn after two nights, owing to the badness of its libretto. Of these works the two former are written on a scale which would make their performances exceedingly difficult (*Fierrabras*, for instance, contains over 1000 pages of manuscript score), but *Die Verschworenen* is a bright attractive comedy, and *Rosamunde* contains some of the most charming music that Schubert ever composed. In 1822 he made the acquaintance both of Weber and of Beethoven, but little came of it in either case, though Beethoven cordially acknowledged his genius. Von Schober was away from Vienna; new friends appeared of a less desirable character; on the whole these were the darkest years of his life.

In the spring of 1824 he wrote the magnificent octet, "A Sketch for a Grand Symphony"; and in the summer went back to Zelesz, when he became attracted by Hungarian idiom, and wrote the *Divertissement à l'Hongroise* and the string quartet in A minor. Most of his biographers insert here a story of his hopeless passion for his pupil Countess Caroline Esterhazy; but whatever may be said as to the general likelihood of the romance, the details by which it is illustrated are apocryphal, and the song *l'Addio*, placed at its climax, is undoubtedly spurious. A more debatable problem is raised by the grand duo in C major (op. 140) which is dated from Zelesz in the summer of this year. It bears no relation to the style of Schubert's pianoforte music, it is wholly orchestral in character, and it may well be a transcript or sketch of the "grand symphony" for which the octet was a preparation. If so, it settles the question, raised by Sir George Grove, of a "Symphony in C major" which is not to be found among Schubert's orchestral scores.

Despite his preoccupation with the stage and later with his official duties he found time during these years for a good deal of miscellaneous composition. The Mass in A♭ was completed and the exquisite "Unfinished Symphony" begun in 1822. The *Müllerlieder*, and several other of his best songs, were written in 1825; to 1824, beside the works mentioned above, belong the variations on *Trockne Blumen* and the two string quartets in E and E♭. There is also a sonata for piano and "Arpeggione," an interesting attempt to encourage a cumbersome and now obsolete instrument.

The mishaps of the recent years were compensated by the prosperity and happiness of 1825. Publication had been moving more rapidly; the stress of poverty was for a time lightened; in the summer there was a pleasant holiday in Upper Austria, where Schubert was welcomed with enthusiasm. It was during this tour that he produced his "Songs from Sir Walter Scott," and his piano sonata in A minor (op. 42), the former of which he sold to Artaria for £20, the largest sum which he had yet received for any composition. Sir George Grove, on the authority of Randhartinger, attributes to this summer a lost "Gastein" symphony which is possibly the same work as that already mentioned under the record of the preceding year.

From 1826 to 1828 Schubert resided continuously in Vienna, except for a brief visit to Graz in 1827. The history of his life during these three years is little more than a record of his compositions. The only events worth notice are that in 1826 he dedicated a symphony to the Gesellschaft der Musikfreunde, which voted him in return an honorarium of £10, that in the same year he applied for a conductorship at the opera, and lost it by refusing to alter one of his songs at rehearsal, and that in the spring of 1828 he gave, for the first and only time in his career, a public concert of his own works. But the compositions themselves are a sufficient biography. The string quartet in D minor, with the variations on "Death and the Maiden," was written during the winter of 1825–1826, and first played on Jan. 25. Later in the year came the string quartet in G major, the "Rondeau brilliant," for piano and violin, and the fine sonata in G which, by some pedantry of the publisher's, is printed without its proper title. To these should be added the three Shakespearian songs, of which "Hark! Hark! the Lark" and "Who is Sylvia?" were written on the same day, the former at a tavern where he broke his afternoon's walk, the latter on his return to his lodging in the evening. In 1827 he wrote the *Winterreise*, the fantasia for piano and violin, and the two piano trios: in 1828 the *Song of Miriam*, the C major symphony, the Mass in E♭, and the exceedingly beautiful *Tantum Ergo* in the same key, the string quintet, the second Benedictus to the Mass in C, the last three piano sonatas, and the collection of songs known as *Schwanengesang*. Six of these are to words by Heine, whose *Buch der Lieder* appeared in the autumn. Everything pointed to the renewal of an activity which should equal that of his greatest abundance, when he was suddenly attacked by typhus fever, and after a fortnight's illness died on Nov. 19 at the house of his brother Ferdinand. He had not completed his thirty-second year.

Some of his smaller pieces were printed shortly after his death, but the more valuable seem to have been regarded by the publishers as waste paper. In 1838 Schumann, on a visit to Vienna, found the dusty manuscript of the C major symphony and took it back to Leipzig, where it was performed by Mendelssohn and celebrated in the *Neue Zeitschrift*. The most important step towards the recovery of the neglected works was the journey to Vienna which Sir George Grove and Sir Arthur Sullivan made in the autumn of 1867. The account of it is given in Grove's appendix to the English translation of Kreissle von Hellborn; the travellers rescued from oblivion seven symphonies, the *Rosamunde* music, some of the Masses and operas, some of the chamber works, and a vast quantity of miscellaneous pieces and songs. Their success gave impetus to a widespread public interest and finally resulted in the definitive edition of Breitkopf and Härtel.

Schubert is best summed up in the well-known phrase of Liszt, that he was "le musicien le plus poète qui fut jamais." In clarity of style he was inferior to Mozart, in power of musical construction he was far inferior to Beethoven, but in poetic impulse and suggestion he is unsurpassed. He wrote always at headlong speed, he seldom blotted a line, and the greater part of his work bears, in consequence, the essential mark of improvisation: it is fresh, vivid, spontaneous, impatient of restraint, full of rich colour and of warm imaginative feeling. He was the greatest songwriter who ever lived, and almost everything in his hand turned to song. In his Masses, for instance, he seems to chafe at the contrapuntal numbers and pours out his whole soul on those which he found suitable for lyrical treatment. In his symphonies the lyric and elegiac passages are usually the best, and the most beautiful of them all is, throughout its two movements, lyric in character. The standpoint from which to judge him is that of a singer who ranged over the whole field of musical composition and everywhere carried with him the artistic form which he loved best.

Like Mozart, whose influence over him was always considerable, he wrote nearly all the finest of his compositions in the last ten years of his life. His early symphonies, his early quartets, even his early masses, are too much affected by a traditional style to establish an enduring reputation. It is unfair to call them imitative, but at the time when he wrote them he was saturated with Mozart, and early Beethoven, and he spoke what was in his mind with a boy's frankness. The Andante of the Tragic Symphony (No. 4) strikes a more distinctive note, but the fifth is but a charming adaptation of a past idiom, and the sixth, on which Schubert himself placed little value, shows hardly any appreciable advance. It is a very different matter when we come to the later works. The piano quintet in A major (1819) may here be taken as the turning-point; then come the Unfinished Symphony, which is pure Schubert in every bar; the three quartets in A minor, D minor, and G major, full of romantic colour; the delightful piano trios; the great string quintet; and the C major symphony which, though diffuse, contains many passages of surprising beauty. Every one of them is a masterpiece, and a masterpiece such as Schubert alone could have written. The days of brilliant promise were over and were succeeded by the days of full and mature achievement.

His larger operas are marred both by their inordinate length and by their want of dramatic power. The slighter comedies are pretty and tuneful, but, except as curiosities, are not likely to be revived. We may, however, deplore the fate which has deprived the stage of the Rosamunde music. It is in Schubert's best vein; the entractes, the Romance, and the ballets are alike excellent, and it is much to be hoped that a poet will some day arise and fit the music to a new play.

Of his pianoforte compositions, the sonatas, as might be expected, are the least enduring, though there is not one of them which does not contain some first-rate work. On the other hand his smaller pieces, in which the lyric character is more apparent, are throughout interesting to play and extremely pleasant to hear. He developed a special pianoforte technique of his own—not always "orthodox," but always characteristic. A special word should be added on his fondness for piano duets, a form which before his time had been rarely attempted. Of these he wrote a great many—fantasias, marches, polonaises, variations—all bright and melodious with sound texture and a remarkable command of rhythm.

His concerted pieces for the voice are often extremely difficult, but they are of a rare beauty which would well repay the labour of rehearsal. The 23rd psalm (for female voices) is exquisite; so are the *Gesang der Geister*, the *Nachthalle*, the *Nachtgesang im Walde* (for male voices and horns), and that "dewdrop of celestial melody" which Novello has published with English words under the title of "Where Thou Reignest." Among all Schubert's mature works there are none more undeservedly neglected than these.

Of the songs it is impossible, within the present limits, to give even a sketch. They number over 600, excluding scenas and operatic pieces, and they contain masterpieces from the beginning of his career to the end. *Gretchen am Spinnrade* was written when he was seventeen, *Erlkönig* when he was eighteen; then there follows a continuous stream which never checks or runs dry, and which broadens as it flows to the *Müllerlieder*, the Scott songs, the Shakesperian songs, the *Winterreise*, and the *Schwanengesang*. He is said to have been undiscriminating in his choice of words. Schumann declared that "he could set a handbill to music," and there is no doubt that he was inspired by any lyric which contained, though even in imperfect expression, the germ of a poetic idea. But his finest songs are almost all to fine poems. He set over 70 of Goethe's, over 60 of Schiller's; among the others are the names of Shakespeare and Scott, of Schlegel and Rückert, of Novalis and Wilhelm Müller—a list more than sufficient to compensate for the triviality of occasional pieces or the inferior workmanship of personal friends. It was a tragedy that he only lived for a few weeks after the appearance of the *Buch der Lieder*. We may conjecture what the world would have gained if he had found the full complement of his art in Heine.

In his earlier songs he is more affected by the external and pictorial aspect of the poem; in the later ones he penetrates to the centre and seizes the poetic conception from within. But in both alike he shows a gift of absolute melody which, even apart from its meaning, would be inestimable. Neither Handel nor Mozart—his two great predecessors in lyric tune—have surpassed or even approached him in fertility and variety of resource. The songs in *Acis* are wonderful; so are those in *Zauberflöte*, but they are not so wonderful as *Litaney*, and "Who is Sylvia?" and the *Ständchen*. To Schubert we owe the introduction into music of a particular quality of romance, a particular "addition of strangeness to beauty"; and so long as the art remains his place among its supreme masters is undoubtedly assured. (W. H. Ha.)

SCHÜCKING, LEVIN (1814–1883), German novelist, was born on the estate of Klemenswerth, near Meppen, in Westphalia, on the 6th of September 1814. After studying law at Munich, Heidelberg and Göttingen, he wished to enter the government judicial service, but, confronted by serious difficulties, abandoned the legal career, and settling at Münster in 1837, devoted himself to literary work. In 1841 he removed to Schloss Meersburg on the Lake of Constance, joined in 1843 the editorial staff of the *Allgemeine Zeitung* in Augsburg, and in 1845 that of the *Kölnische Zeitung* in Cologne. In 1852 he retired to his estate, Sassenberg near Münster, and died at Pyrmont on the 31st of August 1883. Among his numerous romances, which are distinguished by good taste and patriotic feeling, largely reflecting the sound, sturdy character of the Westphalians, must be especially mentioned: *Ein Schloss am Meer* (1843); *Ein Sohn des Volkes* (1849); *Ein Staatsgeheimnis* (1854); *Verschlungene Wege* (1867); *Die Herberge der Gerechtigkeit* (1879). Schücking wrote a number of short stories: *Aus den Tagen der grossen Kaiserin* (1858) and *Neue Novellen* (1877). In *Annette von Droste-Hülshoff* (*q.v.*) (1862) he gives a sketch of this poet and acknowledges his indebtedness to her beneficial influence upon his mind. There appeared posthumously, *Lebenserinnerungen* (1886) and *Briefe von Annette von Droste-Hülshoff und Levin Schücking* (1893). His wife, Luise (1815–1855), daughter of the General Freiherr von Gall, in the Hessian service, published some novels and romances of considerable merit. Among the latter may be mentioned *Gegen den Strom* (1851) and *Der neue Kreuzritter* (1853).

Schücking's *Gesammelte Erzählungen und Novellen* appeared in 6 vols. (1859–1866); *Ausgewählte Romane* (12 vols., 1864; 2nd series, also 12 vols., 1874–1876).

SCHULTENS, the name of three Dutch Orientalists. The first and most important, ALBERT SCHULTENS (1686–1750), was born at Groningen. He studied for the church at Groningen and Leiden, applying himself specially to Hebrew and the cognate tongues. His dissertation on *The Use of Arabic in the Interpretation of Scripture* appeared in 1706. After a visit to Reland in Utrecht he returned to Groningen (1708); then, having taken his degree in theology (1709), he again went to Leiden, and devoted himself to the study of the MS. collections there till in 1711 he became pastor at Wassenaer. Disliking parochial work, in 1713 he took the Hebrew chair at Franeker, which he held till 1729, when he was transferred to Leiden as rector of the *collegium theologicum*, or seminary for poor students. From 1732 till his death (at Leiden on the 26th of January 1750) he was professor of Oriental languages at Leiden. Schultens was the chief Arabic teacher of his time, and in some sense a restorer of Arabic studies, but he differed from J. J. Reiske and A. I. De Sacy in mainly regarding Arabic as a handmaid to Hebrew. He vindicated the value of comparative study of the Semitic tongues against those who, like Gousset, regarded Hebrew as a sacred tongue with which comparative philology has nothing to do. His principal works were *Origines Hebraeae* (2 vols., 1724, 1738), a second edition of which, with the *De defectibus linguae Hebraeae* (1731), appeared in 1761; *Job* (1737); *Proverbs* (1748); *Vetus et regia via hebraezandi* (1738); *Monumenta vetustiora Arabum* (1740), &c.

His son, JOHN JAMES SCHULTENS (1716–1778), became professor at Herborn in 1742, and afterwards succeeded to his father's chair. He was in turn succeeded by his son, HENRY ALBERT SCHULTENS (1749–1793), who, however, left comparatively little behind him, having succumbed to excessive work while preparing an edition of Meidani, of which only a part appeared posthumously (1795).

SCHULTZ, HERMANN (1836–), German Protestant theologian, was born at Lüchow in Hanover on the 30th of December 1836. He studied at Göttingen and Erlangen, became professor at Basel in 1864, and eventually (1876) *professor ordinarius* at Göttingen. Here he has also held the appointments of chief university preacher, councillor to the consistory (from 1881) and abbot of Bursfelde (1890). Professor Schultz's theological standpoint was that of a moderate liberal. "It is thought by many that he has succeeded in discovering the *via media* between the positions of Biblical scholars like Delitzsch on the one hand and Stade on the other" (Prof. J. A. Paterson). He is well known to British and American students as the author of an excellent work on *Old Testament Theology* (2 vols., 1869, 5th ed., 1896; Eng. trans., 2nd ed., 1895).

In his work on the doctrine of the Divinity of Christ (*Die Lehre von der Gottheit Christi*, 1881) he follows the method of Ritschl, and contends that the deity of Christ ought to be understood as the expression of the experience of the Christian community. In his own person and work Christ represents to the community a personal revelation of God. Faith in the divinity of Christ does not rest upon a miracle in nature, but upon a miracle in the moral world.

Schultz's other works include: *Die Stellung des christl. Glaubens zur heiligen Schrift* (1876; 2nd ed., 1877), *Lehre vom heiligen Abendmahl* (1886); *Grundriss der evang. Dogmatik* (1890; 2nd ed., 1892), *Grundriss der evang. Ethik* (2nd ed., 1897), and *Grundriss der christl. Apologetik* (2nd ed., 1902).

SCHULTZE, MAX JOHANN SIGISMUND (1825–1874), German microscopic anatomist, was born at Freiburg in Breisgau (Baden) on the 25th of March 1825. He studied medicine at Greifswald and Berlin, and was appointed extraordinary professor at Halle in 1854 and five years later ordinary professor of anatomy and histology and director of the Anatomical Institute at Bonn. He died at Bonn on the 16th of January 1874. He founded, in 1865, and edited the important *Archiv für mikroskopische Anatomie*, to which he contributed many papers, and he advanced the subject generally, by refining on its technical methods. His works included *Beiträge zur Naturgeschichte der Turbellarien* (1851), *Über den Organismus der Polythalamien* (1854), *Beiträge zur Kenntnis der Landplanarien* (1857), *Zur Kenntnis der elektrischen Organe der Fische* (1858) and *Zur Anatomie und Physiologie der Retina* (1866). His name is especially known for his work on the cell theory. Uniting F. Dujardin's conception of animal sarcode with H. von Mohl's of vegetable protoplasma, he pointed out their identity, and included them under the common name of protoplasm, defining the cell as "a nucleated mass of protoplasm with or without a cell-wall" (*Das Protoplasma der Rhizopoden und der Pflanzenzellen; ein Beitrag zur Theorie der Zelle*, 1863).

SCHULZE-DELITZSCH, FRANZ HERMANN (1808–1883), German economist, was born at Delitzsch, in Prussian Saxony, on the 29th of August 1808. The place-name Delitzsch was added in 1848 to distinguish him from other Schulzes in the National Assembly. He studied law at Leipzig and Halle universities and, when thirty, he became an assessor in the court of justice at Berlin, and three years later was appointed *patrimonialrichter* at Delitzsch. Entering the parliament of 1848, he joined the Left Centre, and, acting as president of the commission of inquiry into the condition of the labourers and artisans, became impressed with the necessity of co-operation to enable the smaller tradespeople to hold their own against the capitalists. He was a member of the Second Chamber in 1848–1849; but as matters ceased to run smoothly between himself and the high legal officials, he threw up his public appointments in October 1851, and withdrew to Delitzsch. Here he devoted himself to the organization and development of co-operation in Germany, and to the foundation of Vorschussvereine (people's banks), of which he had established the first at Delitzsch in 1850. These developed so rapidly that Schulze-Delitzsch in 1858, in *Die arbeitenden Klassen und das Assoziationswesen in Deutschland*, enumerated twenty-five as already in existence. In 1859 he promoted the first *Genossenschaftstag*, or co-operative meeting, in Weimar, and founded a central bureau of co-operative societies. In 1861 he again entered the Prussian Chamber, and became a prominent member of the Progressist party. In 1863 he devoted the chief portion of a testimonial, amounting to £7500, to the maintenance of his co-operative institutions and offices. This, however, was only to meet an exceptional outlay, for he always insisted that they must be self-supporting. The next three or four years were given to the formation of local centres, and the establishment of the Deutsche Genossenschafts-Bank, 1865.

The spread of these organizations naturally led to legislation on the subject, and this too was chiefly the work of Schulze-Delitzsch. As a member of the Chamber in 1867 he was mainly instrumental in passing the Prussian law of association, which was extended to the North German Confederation in 1868, and later to the empire. Schulze-Delitzsch also contributed to uniformity of legislation throughout the states of Germany, in 1869, by the publication of *Die Gesetzgebung über die privatrechtliche Stellung der Erwerbs- und Wirthschaftsgenossenschaften*, &c. His life-work was now complete; he had placed the advantages of capital and co-operation within the reach of struggling tradesmen throughout Germany. His remaining years were spent in consolidating this work. Both as a writer and a member of the Reichstag his industry was incessant, and he died in harness on the 29th of April 1883 at Potsdam, leaving the reputation of a benefactor to the smaller tradesmen and artisans, in which light he must be regarded rather than as the founder of true co-operative principles in Germany. (See also CO-OPERATION.)

SCHUMACHER, HEINRICH CHRISTIAN (1780–1850), German astronomer, was born at Bramstedt in Holstein on the 3rd of September 1780. He was director of the Mannheim observatory from 1813 to 1815, and then became professor of astronomy in Copenhagen. From 1817 he directed the triangulation of Holstein, to which a few years later was added a complete geodetic survey of Denmark (finished after his death). For the sake of the survey an observatory was established at Altona, and Schumacher resided there permanently, chiefly occupied with the publication of *Ephemerides* (11 parts, 1822–1832) and of the journal *Astronomische Nachrichten*, of which he edited thirty-one volumes. He died at Altona on the 28th of December 1850.

His son, RICHARD SCHUMACHER (1827–1902), was his assistant from 1844 to 1850 at the conservatory at Altona. Having become assistant to Carlos Guillelmo Moesta (1825–1884), director of the observatory at Santiago, in 1859, he was associated with the Chilean geodetic survey in 1864. Returning in 1869, he was appointed assistant astronomer at Altona in 1873, and afterwards at Kiel.

H. C. Schumacher's nephew, CHRISTIAN ANDREAS SCHUMACHER (1810–1854), was associated with the geodetic survey of Denmark from 1833 to 1838, and afterwards (1844–1845) improved the observatory at Pulkowa.

SCHUMANN, ROBERT ALEXANDER (1810–1856), German musical composer, was born on the 8th of June 1810 in Zwickau in Saxony. His father was a publisher, and it was in the cultivation of literature quite as much as in that of music that his boyhood was spent. He himself tells us that he began to compose before his seventh year. At fourteen he wrote an essay on the aesthetics of music and also contributed to a volume edited by his father and entitled *Portraits of Famous Men*. While still at school in Zwickau he read, besides Schiller and Goethe, Byron (whose *Beppo* and *Childe Harold* had been translated by his father) and the Greek tragedians. But the most powerful as well as the most permanent of the literary influences exercised upon him, however, was undoubtedly that of Jean Paul Richter. This influence may clearly be seen in his youthful novels *Juniusabende* and *Selene*, of which the first only was completed (1826). In 1828 he left school, and after a tour, during which he met Heine at Munich, he went to Leipzig to study law. His interest in music had been stimulated when he was a child by hearing Moscheles play at Carlsbad, and in 1827 his enthusiasm had been further excited by the works of Schubert and Mendelssohn. But his father, who had encouraged the boy's musical aspirations, had died in 1826, and neither his mother nor his guardian approved of a musical career for him. The question seemed to be set at rest by Schumann's expressed intention to study law, but both at Leipzig and at Heidelberg, whither he went in 1829, he neglected the law for the philosophers, and though—to use his own words—"but Nature's pupil pure and simple" began composing songs. The restless spirit by which he was pursued is disclosed in his letters of the period. At Easter 1830 he heard Paganini at Frankfurt. In July in this year he wrote to his mother, "My whole life has been a struggle between Poetry and Prose, or call it Music and Law," and by Christmas he was once more in Leipzig, taking piano lessons with his old master, Friedrich Wieck. In his anxiety to accelerate the process by which he could acquire a perfect execution he permanently injured his right hand. His ambitions as a pianist being thus suddenly ruined, he determined to devote himself entirely to composition, and began a course of theory under Heinrich Dorn, conductor of the Leipzig opera. About this time he contemplated an opera on the subject of *Hamlet*.

The fusion of the literary idea with its musical illustration, which may be said to have first taken shape in *Papillons* (op. 2), is foreshadowed to some extent in the first criticism by Schumann, an essay on Chopin's variations on a theme from *Don Juan*, which appeared in the *Allgemeine musikalische Zeitung* in 1831. Here the work is discussed by the imaginary characters Florestan and Eusebius (the counterparts of Vult and Walt in Jean Paul's novel *Flegeljahre*), and Meister Raro (representing either the composer himself or Wieck) is called upon for his opinion. By the time, however, that Schumann had written *Papillons* (1831) he had gone a step farther. The scenes and characters of his favourite novelist had now passed definitely and consciously into the written music, and in a letter from Leipzig (April 1832) he bids his brothers "read the last scene in Jean Paul's *Flegeljahre* as soon as possible, because the *Papillons* are intended as a musical representation of that masquerade." In the winter of 1832 Schumann visited his relations at Zwickau and Schneeberg, in both of which places was performed the first movement of his symphony in G minor, which remains unpublished. In Zwickau the music was played at a concert given by Wieck's daughter Clara, who was then only thirteen. The death of his brother Julius as well as that of his sister-in-law Rosalie in 1833 seems to have affected Schumann with a profound melancholy. By the spring of 1834, however, he had sufficiently recovered to be able to start *Die neue Zeitschrift für Musik*, the paper in which appeared the greater part of his critical writings. The first number was published on the 3rd of April 1834. It effected a revolution in the taste of the time, when Mozart, Beethoven and Weber were being neglected for the shallow works of men whose names are now forgotten. To bestow praise on Chopin and Berlioz in those days was to court the charge of eccentricity in taste, yet the genius of both these masters was appreciated and openly proclaimed in the new journal.

Schumann's editorial duties, which kept him closely occupied during the summer of 1834, were interrupted by his relations with Ernestine von Fricken, a girl of sixteen, to whom he became engaged. She was the adopted daughter of a rich Bohemian, from whose variations on a theme in C♯ minor Schumann constructed his own *Études symphoniques*. The engagement was broken off by Schumann, for reasons which have always remained obscure. In the *Carnaval* (op. 9=1834), one of his most genial and most characteristic pianoforte works, Schumann commenced nearly all the sections of which it is composed with the musical notes signified in German by the letters that spell Asch, the town in which Ernestine was born, which also are the musical letters in Schumann's own name. By the sub-title "Estrella" to one of the sections in the *Carnaval*, Ernestine is meant, and by the sub-title "Chiarina" Clara Wieck. Eusebius and Florestan, the imaginary figures appearing so often in his critical writings, also occur, besides brilliant imitations of Chopin and Paganini, and the work comes to a close with a march of the men of David against the Philistines in which may be heard the clear accents of truth in contest with the dull clamour of falsehood. In the *Carnaval* Schumann went farther than in *Papillons*, for in it he himself conceived the story of which it was the musical illustration. On the 3rd of October 1835 Schumann met Mendelssohn at Wieck's house in Leipzig, and his appreciation of his great contemporary was shown with the same generous freedom that distinguished him in all his relations to other musicians, and which later enabled him to recognize the genius of Brahms when he was still obscure.

In 1836 Schumann's acquaintance with Clara Wieck, already famous as a pianist, ripened into love, and a year later he asked her father's consent to their marriage, but was met with a refusal. In the series *Phantasiestücke* for the piano (op. 12) he once more gives a sublime illustration of the fusion of literary and musical ideas as embodied conceptions in such pieces as "Warum" and "In der Nacht." After he had written the latter of these two he detected in the music the fanciful suggestion of a series of episodes from the story of Hero and Leander. The *Kreisleriana*, which he regarded as one of his most successful works, was written in 1838, and in this the composer's realism is again carried a step farther. Kreisler, the romantic poet brought into contact with the real world, was a character drawn from life by the poet E. T. A. Hoffmann (*q.v.*), and Schumann utilized him as an imaginary mouthpiece for the recital in music of his own personal experiences. The *Phantasie* (op. 17), written in the summer of 1836, is a work of the highest quality of passion. With the *Faschingschwank aus Wien*, his most pictorial work for the piano, written in 1839, after a visit to Vienna, this period of his life comes to an end. As Wieck still withheld his consent to their marriage, Robert and Clara at last dispensed with it, and were married on the 12th of September at Schönefeld near Leipzig.

The year 1840 may be said to have yielded the most extraordinary results in Schumann's career. Until now he had written almost solely for the pianoforte, but in this one year he wrote about a hundred and fifty songs. Schumann's biographers represent him as caught in a tempest of song, the sweetness, the doubt and the despair of which are all to be attributed to varying emotions aroused by his love for Clara. Yet it would be idle to ascribe to this influence alone the lyrical perfection of such songs as "Frühlingsnacht," "Im wunderschönen Monat Mai" and "Schöne Wiege meiner Leiden." His chief song-cycles of this period were his settings of the *Liederkreis* of J. von Eichendorff (op. 39), the *Frauenliebe und Leben* of Chamisso (op. 42), the *Dichterliebe* of Heine (op. 48) and *Myrthen*, a collection of songs, including poems by Goethe, Rückert, Heine, Byron, Burns and Moore. The songs "Belsatzar" (op. 57) and "Die beiden Grenadiere" (op. 49), each to Heine's words, show Schumann at his best as a ballad writer, though the dramatic ballad is less congenial to him than the introspective lyric. As Grillparzer said, "He has made himself a new ideal world in which he moves almost as he wills." Yet it was not until long afterwards that he met with adequate recognition. In his lifetime the sole tokens of honour bestowed upon Schumann were the degree of Doctor by the University of Jena in 1840, and in 1843 a professorship in the Conservatorium of Leipzig. Probably no composer ever rivalled Schumann in concentrating his energies on one form of music at a time. At first all his creative impulses were translated into pianoforte music, then followed the miraculous year of the songs. In 1841 he wrote two of his four symphonies. The year 1842 was devoted to the composition of chamber music, and includes the pianoforte quintet (op. 44), now one of his best known and most admired works. In 1843 he wrote *Paradise and the Peri*, his first essay at concerted vocal music. He had now mastered the separate forms, and from this time forward his compositions are not confined during any particular period to any one of them. In Schumann, above all musicians, the acquisition of technical knowledge was closely bound up with the growth of his own experience and the impulse to express it. The stage in his life when he was deeply engaged in his music to Goethe's *Faust* (1844–1853) was a critical one for his health. The first half of the year 1844 had been spent with his wife in Russia. On returning to Germany he had abandoned his editorial work, and left Leipzig for Dresden, where he suffered from persistent nervous prostration. As soon as he began to work he was seized with fits of shivering, and an apprehension of death which was exhibited in an abhorrence for high places, for all metal instruments (even keys) and for drugs. He suffered perpetually also from imagining that he had the note A sounding in his ears. In 1846 he had recovered and in the winter revisited Vienna, travelling to Prague and Berlin in the spring of 1847 and in the summer to Zwickau, where he was received with enthusiasm, gratifying because Dresden and Leipzig were the only large cities in which his fame was at this time appreciated.

To 1848 belongs his only opera, *Genoveva*, a work containing much beautiful music, but lacking dramatic force. It is interesting for its attempt to abolish the recitative, which Schumann regarded as an interruption to the musical flow. The subject of *Genoveva*, based on Tieck and Hebbel, was in itself not a particularly happy choice; but it is worth remembering that as early as 1842 the possibilities of German opera had been keenly realized by Schumann, who wrote, "Do you know my prayer as an artist, night and morning? It is called 'German Opera.' Here is a real field for enterprise . . . something simple, profound, German." And in his notebook of suggestions for the text of operas are found amongst others: *Nibelungen*, *Lohengrin* and *Till Eulenspiegel*. The music to Byron's *Manfred* is pre-eminent in a year (1849) in which he wrote more than in any other. The insurrection of Dresden caused Schumann to move to Kreischa, a little village a few miles outside the city. In the August of this year, on the occasion of the hundredth anniversary of Goethe's birth, such scenes of Schumann's *Faust* as were already completed were performed in Dresden, Leipzig and Weimar, Liszt as always giving unwearied assistance and encouragement. The rest of the work was written in the latter part of the year, and the overture in 1853. From 1850 to 1854 the text of Schumann's works is extremely varied. In 1850 he succeeded Ferdinand Hiller as musical director at Düsseldorf; in 1851–1853 he visited Switzerland and Belgium as well as Leipzig. In January 1854 Schumann went to Hanover, where he heard a performance of his *Paradise and the Peri*. Soon after his return to Düsseldorf, where he was engaged in editing his complete works and making an anthology on the subject of music, a renewal of the symptoms that had threatened him before showed itself. Besides the single note he now imagined that voices sounded in his ear. One night he suddenly left his bed, saying that Schubert and Mendelssohn had sent him a theme which he must write down, and on this theme he wrote five variations for the pianoforte, his last work. On the 27th of February he threw himself into the Rhine. He was rescued by some boatmen, but when brought to land was found to be quite insane. He was taken to a private asylum in Endenich near Bonn, and remained there until his death on the 29th of July 1856. He was buried at Bonn and in 1880 a statue by A. Donndorf was erected on his tomb.

His wife, CLARA SCHUMANN (1819–1896), trained from an early age by Wieck, had a brilliant career as a pianist from the age of thirteen up to her marriage. In the various tours on which she accompanied her husband, she extended her own reputation beyond the borders of Germany, and it was thanks to her efforts that his compositions became generally known in Europe. From the time of her husband's death she devoted herself principally to the interpretation of her husband's works, but when in 1856 she first visited England the critics received Schumann's music with a chorus of disapprobation. She returned to London in 1865 and continued her visits annually, with the exception of four seasons, until 1882; and from 1885 to 1888 she appeared each year. In 1878 she was appointed teacher of the piano at the Hoch Conservatorium at Frankfurt, a post which she held until 1892, and in which she contributed greatly to the modern improvement in technique. As an artist she will be remembered, together with Joseph Joachim, as one of the first executants who really played like composers. Besides being remembered for her eminence as a performer of nearly all kinds of pianoforte music, at a time when such technical ability was considerably rarer than in the present day, she was herself the composer of a few songs and of some charming music, mainly for the piano, and the authoritative editor of her husband's works for Breitkopf and Härtel.

The following are the chief compositions of Robert Schumann.

Pianoforte Works.

Papillons (op. 2)	1829–1831
Études symphoniques (op. 13)	1834
Carnaval (op. 9)	1834–1835
Sonata in F sharp minor (op. 11)	1835
Sonata in G minor (op. 22)	1833–1835
Kinderszenen (op. 15)	1836
Fantasia in C (op. 17)	1836
Fantasiestücke (op. 12)	1837
Kreisleriana (op. 16)	1838
Novelletten (op. 21)	1838
Faschingschwank aus Wien (op. 26)	1839

Songs and Choral Works.

Songs:—"Liederkreis" (Heine), nine songs (op. 24)	1840
"Myrthen," twenty-six songs (4 books) (op. 25)	
"Liederkreis" (Eichendorff), twelve songs (op. 39)	
"Frauenliebe und Leben" (Chamisso), eight songs (op. 42)	
"Dichterliebe," sixteen songs from Heine's *Buch der Lieder* (op. 48)	
"Belsatzar," ballad (Heine) (op. 57)	
Song, "Tragödie" (Heine) from op. 64	1841
Ballad, "Der Handschuh" (Schiller)	probably 1851
Songs from Wilhelm Meister and Requiem for Mignon for chorus (op. 98)	1849
Spanische Liebeslieder (op. 138)	1849
Choral and Dramatic Works:—"Paradise and the Peri," for solos, chorus and orchestra (op. 50)	1843
Faust music	1844–1853
"Genoveva," opera	1848
Manfred music	1849
"Der Rose Pilgerfahrt" (Moritz Horn), for solos, chorus and orchestra (op. 112)	1851
"Der Königssohn" (Uhland), for solos, chorus and orchestra (op. 103)	
"Des Sängers Fluch" (Uhland) for solos, chorus and orchestra (op. 139)	1852
Mass for four part chorus and orchestra (op. 148)	
"Vom Pagen und der Königstochter," four ballads (Geibel) for solos, chorus and orchestra (op. 135)	
"Das Glück von Edenhall," ballad (Uhland), for solos, chorus and orchestra (op. 143)	1853
Festival overture on the *Rheinweinlied* for orchestra and chorus (op. 123)	

Chamber Music.

Three quartets for strings in A minor, F and A (op. 41)	1842
Quintet for pianoforte and strings in E flat (op. 44)	
Quartet for pianoforte and strings in E flat (op. 47)	
Fantasiestücke for pianoforte, violin and violoncello (op. 88)	
Andante and variations for two pianofortes (op. 46)[1]	1843
Trio for pianoforte and strings in D minor (op. 63)	1847
Trio for pianoforte and strings in F (op. 80)	
Fantasiestücke for clarinet and pianoforte (op. 73)	1849
Five "Stücke im Volkston" for piano and violoncello (op. 102)	
Three Romances for oboe and piano (op. 94)	
"Märchenbilder" for pianoforte and viola (op. 113)	1851
Sonata for pianoforte and violin in A minor (op. 105)	
Trio for pianoforte and strings in G minor (op. 110)	
Sonata for pianoforte and violin in D minor (op. 121)	
"Märchenerzählungen," four pieces for clarinet, viola and pianoforte, probably written in	1853

Orchestral Works.

B flat Symphony (op. 38)	1841
Fourth Symphony in D minor (op. 120)[2]	
Overture, Scherzo and Finale	
Second Symphony in C (op. 61)	1846
Third or "Rhenish" Symphony in E flat (op. 97)	1850

Concertos and Concert-Stücke.

For Pianoforte in A minor (op. 54)	1841–1845
Concert-stück for four horns (op. 86)	1849
Introduction and Allegro-appassionato for Pianoforte (op. 92)	
Concerto for Violoncello (op. 126)	1852

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[1] Originally for two pianofortes, two violoncellos and horn. The original version (which contains four additional variations) was published in 1893.

[2] Revised 1851; original version published 1891.

SCHÜRER, EMIL (1844–1910), German Protestant theologian, was born at Augsburg on the 2nd of May 1844. After studying at Erlangen, Berlin and Heidelberg from 1862 to 1866, he became in 1873 professor extraordinarius at Leipzig and eventually (1895) professor ordinarius at Göttingen. In 1876 he founded and edited the *Theologische Literaturzeitung*, and from 1881 to 1910 he edited it with Adolf Harnack. His elaborate work on the history of the Jews in the time of Christ (*Geschichte des jüdischen Volks im Zeitalter Jesu Christi*, 2 vols., 1886–1890; new ed. in 3 vols., 1901–1902; Eng. trans., 1890 ff.) made him in Great Britain and America one of the best known of modern German scholars. He died after a long illness on the 30th of April 1910.

His other works include: *Schleiermacher's Religionsbegriff* (1868); *Lehrbuch der neutestamentlichen Zeitgeschichte* (1874; an earlier form of *Gesch. des jüd. Volks*), and *Die Gemeindeverfassung der Juden in Rom* (1879). See A. Harnack in the *Theologische Literaturzeitung* for May 14, 1910.

SCHURMAN, JACOB GOULD (1854–), American educationist, was born at Freetown, Prince Edward Island, on the 22nd of May 1854, of Dutch descent, his Loyalist ancestors having left New York in 1784. While a student at Acadia College, Wolfville, Nova Scotia, in 1875, he won the Canadian Gilchrist scholarship in the University of London, from which he received the degree of B.A. in 1877 and that of M.A. in 1878, and in 1877–1880 studied in Paris, Edinburgh and (as Hibbert Fellow) in Heidelberg, Berlin and Göttingen. He was professor of English literature, political economy and psychology at Acadia College in 1880–1882, of metaphysics and English literature at Dalhousie College, Halifax, N.S., in 1882–1886, and of philosophy (Sage professor) at Cornell University in 1886–1892, being Dean of the Sage School of Philosophy in 1891–1892. In 1892 he became president of Cornell University. He was chairman of the First United States Philippine Commission in 1899, and wrote (besides a part of the official report to Congress) *Philippine Affairs—A Retrospect and an Outlook* (1902). With J. E. Creighton and James Seth he founded in 1892 *The Philosophical Review*. He also wrote *Kantian Ethics and the Ethics of Evolution* (1881); *The Ethical Import of Darwinism* (1888); *Belief in God* (1890), and *Agnosticism and Religion* (1896).

SCHURZ, CARL (1829–1906), German American statesman and reformer, was born in Liblar, near Cologne, on the 2nd of March 1829, the son of a school-teacher. He studied in the Jesuit Gymnasium of Cologne in 1840–1846, and then entered the University of Bonn, where he became a revolutionary, partly through his friendship with Gottfried Kinkel, professor of literature and art-history. He assisted Kinkel in editing the *Bonner Zeitung*, and on the outbreak of the Revolution of 1848 took the field, but when Rastatt surrendered he escaped to Zurich. In 1850 he returned secretly to Germany, rescued Kinkel from the prison at Spandau and helped him to escape to Scotland. Schurz went to Paris, but the police forced him to leave France on the eve of the *coup d'état*, and until August 1852 he lived in London, making his living by teaching German. He married in July 1852 and removed to America, living for a time in Philadelphia.

In 1856 after a year in Europe he settled in Watertown, Wisconsin, and immediately became prominent in the Republican party of that state. In 1857 he was an unsuccessful candidate for lieutenant-governor on the Republican ticket. In the Illinois campaign of the next year between Abraham Lincoln and Stephen A. Douglas he took part as a speaker; and later in 1858 he was admitted to the Wisconsin bar and began to practise law in Milwaukee. In the state campaign of 1859 he made a speech attacking the Fugitive Slave Law and arguing for state's rights and thus injured his political standing in Wisconsin; and in April he delivered in Faneuil Hall, Boston, an oration on "True Americanism," which coming from an alien was intended to clear the Republican party of the charge of "nativism." The Germans of Wisconsin unsuccessfully urged his nomination for governor by the Republican party in 1859. In the Republican National Convention of 1860 Schurz was chairman of the delegation from Wisconsin, which voted for W. H. Seward; he was on the committee which drew up the platform and served on the committee which announced his nomination to Abraham Lincoln. In spite of Secretary Seward's objection, grounded on Schurz's European record as a revolutionary, Lincoln sent him in 1861 as minister to Spain. He returned to America in January 1862, resigned his post, was commissioned brigadier-general of volunteers in April, and in June took command of a division under Frémont, and then in Sigel's corps, with which he took part in the second battle of Bull Run. He was promoted major-general of volunteers on the 14th of March and was a division commander at Chancellorsville of the Eleventh Corps, under General O. O. Howard, with whom he later had a bitter controversy over this battle. He was at Gettysburg and at Chattanooga. After the Eleventh and Twelfth Corps were united as the Twentieth he was put in command of a Corps of Instruction at Nashville, and saw no more active service except in the last months of the war when he was with Sherman's army in North Carolina. He resigned from the army immediately after the close of hostilities. In the summer of 1865 President Johnson sent him through the South to study conditions; the President quarrelled with Schurz because the latter approved General H. W. Slocum's order forbidding the organization of militia in Mississippi, and Schurz's valuable report (afterwards published as an executive document), suggesting the readmission of the states with complete rights and the investigation of the need of further legislation by a Congressional committee, was not heeded by the President. In 1866–1867 he was chief editor of the Detroit *Post* and then became editor and joint proprietor with Emil Praetorius (1827–1905) of the *Westliche Post* of St Louis. In the winter of 1867–1868 he travelled in Germany—the account of his interview with Bismarck is one of the most interesting chapters of his *Reminiscences*. He spoke against "repudiation" and for "honest money" during the Presidential campaign of 1868.

In 1869–1875 he was United States senator from Missouri, and made a great reputation (especially in 1873–1874) by his speeches on financial subjects. During this period he broke with the administration: he started the Liberal Republican movement in Missouri in 1870 which elected B. Gratz Brown governor; and in 1872 he presided over the Liberal Republican convention which nominated Horace Greeley for the presidency (Schurz's own choice was Charles Francis Adams or Lyman Trumbull) and which did not in its platform represent Schurz's views on the tariff, or Greeley's. He opposed Grant's Santo Domingo policy—after Fessenden's death Schurz was a member of the Committee on Foreign Affairs,—his Southern policy, and the government's selling arms and making cartridges for the French army in the Franco-Prussian War. But in 1875 he campaigned for Hayes, as the representative of sound money, in the Ohio gubernatorial campaign. In 1876 he supported Hayes in the contest for the presidency, and Hayes made him in 1877 his secretary of the interior, and followed much of his advice in other cabinet appointments and in his inaugural address. In this department Schurz put in force his theories in regard to merit in the Civil Service, permitting no removals except for cause, and requiring competitive examinations for candidates for clerkships; he reformed the Indian Bureau and successfully opposed a bill transferring it to the War Department; and he prosecuted land thieves and attracted public attention to the necessity of forest preservation. Upon his retirement in 1881 he removed to New York City, and from the summer of 1881 to the autumn of 1883 was editor-in-chief and one of the proprietors of the New York *Evening Post*. In 1884 he was a leader in the Independent (or Mugwump) movement against the nomination of James G. Blaine for the presidency and for the election of Grover Cleveland. From 1888 to 1892 he was general American representative of the Hamburg American Steamship Company. In 1892 he succeeded George William Curtis as president of the National Civil Service Reform League and held this office until 1901. He succeeded Curtis as editorial writer for *Harper's Weekly* in 1892–1898, in which he did much for civil service reform and for Cleveland's nomination and election in 1892. In 1895 he spoke for the Fusion anti-Tammany ticket in New York City. He opposed W. J. Bryan for the presidency in 1896, speaking for sound money and not under the auspices of the Republican party; in 1900 on the anti-imperialism issue he supported Bryan; and in 1904 he supported A. B. Parker, the Democratic candidate. He died in New York City on the 14th of May 1906.

Schurz published a volume of *Speeches* (1885); *Henry Clay* (1887) in the "American Statesmen" series, a standard biography; *Abraham Lincoln* (1889), a remarkable essay; and *Reminiscences* (New York, 3 vols., 1907–1908), in the third volume of which is a sketch of his life and public services from 1869 to 1906 by Frederic Bancroft and William A. Dunning. During the last twenty years of his life Schurz was perhaps the most prominent Independent in American politics, and even more notable than his great abilities was his devotion to his high principles. He was the first German-born American to enter the United States Senate, and was an able debater; and his command of the English language, written and spoken, was remarkable. A sense of humour added much to his campaign speeches.

SCHÜTZENBERGER, PAUL (1829–1897), French chemist, was born on the 23rd of December 1829 at Strassburg, where his father Georges Frédéric Schützenberger (1779–1859) was professor of law, and his uncle Charles Schützenberger (1809–1881) professor of chemical medicine. He was intended for a medical career and graduated M.D. at Strassburg in 1855, but his interests lay in physical and chemical science. In 1853 he went to Paris as *préparateur* to J. F. Persoz (1805–1868), professor of chemistry at the Conservatoire des Arts et Métiers. A year later he was entrusted with a course of chemical instruction at Mülhausen, and he remained in that town till 1865 as professor at the École Supérieure des Sciences. He then returned to Paris as assistant to A. V. Balard at the Collège de France, in 1876 he succeeded that chemist in the chair of chemistry, and in 1882 he became directing professor at the municipal École de Physique et de Chimie. The two latter chairs he held together until his death, which happened on the 26th of June 1897 at Mézy, Seine et Oise. During the period he spent at Mülhausen, Schützenberger paid special attention to industrial chemistry, particularly in connexion with colouring matters, but he also worked at general and biological chemistry which subsequently occupied the greater part of his time. He is known for a long series of researches on the constitution of alkaloids and of the albuminoid bodies, and for the preparation of several new series of platinum compounds and of hyposulphurous acid, $H_2S_2O_4$. Towards the end of his life he adopted the view that the elements have been formed by some process of condensation from one primordial substance of extremely small atomic weight, and he expressed the conviction that atomic weights within narrow limits are variable and modified according to the physical conditions in which a compound is formed.

His publications include *Chimie appliquée à la physiologie et à la pathologie animale* (1863); *Traité des matières colorantes* (1867); *Les Fermentations* (1875), which was translated into German, Italian and English; and an excellent *Traité de chimie générale* in seven volumes (1880–1894).

SCHUYLER, PHILIP JOHN (1733–1804), American soldier, was born at Albany, New York, on the 11th of November 1733. The Schuyler family was established in the New World by Philip Pieterse Schuyler (d. 1683), who migrated from Amsterdam in 1650, and whose son, Peter (1657–1724), was the first mayor of Albany and chairman of the board of Indian commissioners of the province. The family was one of the wealthiest and most influential in the colony and was closely related by marriage to the Van Rensselaers, Van Cortlandts and other representatives of the old Dutch aristocracy. Philip Schuyler served in the Provincial Army during the Seven Years' War, first as captain and later as deputy-commissary with the rank of major, taking part in the battles of Lake George (1755), Oswego River (1756), Ticonderoga (1758) and Fort Frontenac (1758). From 1768 to 1775 he represented Albany in the New York Assembly, and he was closely associated with the Livingston family in the leadership of the Presbyterian or Whig party. He was a delegate to the second Continental Congress in May 1775, and on the 19th of June was chosen one of the four major-generals in the Continental service. Placed in command of the northern department of New York, he established headquarters at Albany, and made preparations for an invasion of Canada. Soon after the expedition started he was prostrated by rheumatic gout, and the actual command devolved upon General Richard Montgomery. Schuyler returned to Ticonderoga and later to Albany, where he spent the winter of 1775–1776 in collecting and forwarding supplies to Canada and in suppressing the Loyalists and their Indian allies in the Mohawk Valley. On the death of Montgomery and the failure to take Quebec the army retreated to Crown Point, and its commander, General John Sullivan, was superseded by General Horatio Gates. Gates claimed precedence over Schuyler and, on failing to secure recognition, intrigued to bring about Schuyler's dismissal. The controversy was taken into Congress. The necessary withdrawal of the army from Crown Point in 1776 and the evacuation of Ticonderoga in 1777 were magnified by Schuyler's enemies into a retrograde movement, and, on the 19th of August 1777, he was superseded. A court martial appointed in 1778 acquitted him on every charge. He resigned from the army in April 1779. He was a delegate from New York to the Continental Congress in 1779–1781, and state senator in 1781–1784, 1786–1790 and 1792–1797. In 1788 he joined his son-in-law Alexander Hamilton, John Jay and others in leading the movement for the ratification by New York of the Federal constitution. He served in the United States Senate as a Federalist from 1790 to 1791 and was again elected in 1797, but resigned in January 1798 on account of ill-health. He was also active for many years as Indian commissioner and surveyor-general and helped to settle the New York boundary disputes with Massachusetts and Pennsylvania. He prepared plans for the construction of a canal between the Hudson river and Lake Champlain before 1776, and, in 1792–1796, carried to a successful conclusion a more pretentious scheme for connecting the Hudson with Lake Ontario by way of the Mohawk, Oneida Lake and the Onondaga river. He died in Albany on the 18th of November 1804.

See Bayard Tuckerman, *Life of General Philip Schuyler* (New York, 1903).

Other prominent members of the family were: Montgomery Schuyler (1814–1896) and his cousin Anthony (1816–1896), Protestant Episcopal clergymen; George Washington (1810–1888), treasurer of New York State in 1863–1865 and of Cornell University in 1868–1874 and author of *Colonial New York: Philip Schuyler and his Family* (2 vols., 1885); his son Eugene (1840–1890), who was long in the consular and diplomatic service of the United States, and who translated some of the novels of Tourgeniev and Tolstoi and wrote *Peter the Great* (1884) and *American Diplomacy and the Furtherance of Commerce* (1886); and Montgomery (b. 1843), a son of Anthony, and a journalist and writer on architecture.

SCHWABACH, a town of Germany, in the kingdom of Bavaria, 9 m. by rail S. of Nuremberg. Pop. (1905) 10,342. It has the interesting Evangelical church of St John, built in the 15th century, with carvings by Veit Stoss, paintings by Wohlgemut, Martin Schön and others, and a ciborium by Adam Krafft; a fountain, the Schöne Brunnen, and several schools. Schwabach is the chief seat of the needle manufacture in Bavaria; its other industries include gold and silver wire work, brewing and the making of soap and earthenware. Schwabach was purchased in 1364 by the burgrave of Nuremberg.

See Petzoldt, *Chronik der Stadt Schwabach* (Schwabach, 1854).

SCHWABE, SAMUEL HEINRICH (1789–1875), German astronomer, was born on the 25th of October 1789 at Dessau, where he died on the 11th of April 1875. At first an apothecary, he turned his attention to astronomy, and in 1826 commenced his observations on sun-spots. In 1843 he made the suggestion of a probable ten year period (*i.e.* that at every tenth year the number of spots reached a maximum), but it met with scant approval, and he continued his observations, which were afterwards utilized in 1851 by Humboldt in the third volume of his *Kosmos*. The periodicity of sun-spots is now fully recognized (see SUN); and to Schwabe is thus due the credit of one of the most important discoveries in astronomy.

See H. H. Turner, *Astronomical Discovery* (1904).

SCHWALBACH, or LANGENSCHWALBACH, a favourite German health resort, in the Prussian province of Hesse-Nassau, pleasantly situated in a deep valley, near the junction of the Schwalbach with the Aar, 12 m. N.W. from Wiesbaden, on the railway Dotzheim-Dietz. Permanent population (1905) 2836. Besides a large kursaal, the town has four churches, two Evangelical, a Roman Catholic and an English, a synagogue and several schools. There are eight springs, which are largely impregnated in varying proportions with iron and carbonic acid, and are used both for drinking and bathing. They are especially efficacious in feminine disorders, and the greater number of visitors (about 6000 annually) are ladies. The public grounds are prettily laid out and there are numerous fashionable hotels.

See Frickhöffer, *Die Eisenquellen zu Schwalbach* (2nd ed., Schwalbach, 1888), and A. Genth, *Geschichte des Kurortes Schwalbach* (3rd ed., Wiesbaden, 1884).

SCHWANN, THEODOR (1810–1882), German physiologist, was born at Neuss in Rhenish Prussia on the 7th of December 1810. His father was a man of great mechanical talent; at first a goldsmith, he afterwards founded an important printing establishment. Schwann inherited his father's tastes, and the leisure of his boyhood was largely spent in constructing little machines of all kinds. He studied at the Jesuits' college in Cologne and afterwards at Bonn, where he met Johannes Müller, in whose physiological experiments he soon came to assist. He next went to Würzburg to continue his medical studies, and thence to Berlin to graduate in 1834. Here he again met Müller, who had been meanwhile translated to Berlin, and who finally persuaded him to enter on a scientific career and appointed him assistant at the anatomical museum. Schwann in 1838 was called to the chair of anatomy at the Roman Catholic university of Louvain, where he remained nine years. In 1847 he went as professor to Liége, where he remained till his death on the 11th of January 1882. He was of a peculiarly gentle and amiable character, and remained a devout Catholic throughout his life. It was during the four years spent under the influence of Müller at Berlin that all Schwann's really valuable work was done. Müller was at this time preparing his great book on physiology, and Schwann assisted him in the experimental work required. His attention being thus directed to the nervous and muscular tissues, besides making such histological discoveries as that of the envelope of the nerve-fibres which now bears his name, he initiated those researches in muscular contractility since so elaborately worked out by Du Bois Reymond and others. He was thus the first of Müller's pupils who broke with the traditional vitalism and worked towards a physico-chemical explanation of life. Müller also directed his attention to the process of digestion, which Schwann showed to depend essentially on the presence of a ferment called by him pepsin. Schwann also examined the question of spontaneous generation, which he greatly aided to disprove, and in the course of his experiments discovered the organic nature of yeast. In fact the whole germ theory of Pasteur, as well as its antiseptic applications by Lister, is traceable to his influence. Once when he was dining with Schleiden in 1837, the conversation turned on the nuclei of vegetable cells. Schwann remembered having seen similar structures in the cells of the notochord (as had been shown by Müller) and instantly realized the importance of connecting the two phenomena. The resemblance was confirmed without delay by both observers, and the results soon appeared in his famous *Microscopic Investigations on the Accordance in the Structure and Growth of Plants and Animals* (Berlin, 1839; trans. Sydenham Society, 1847). The cell theory was thus definitely constituted. In the course of his verifications of the cell theory, in which he traversed the whole field of histology, he proved the cellular origin and development of the most highly differentiated tissues, nails, feathers, enamels, &c. His generalization became the foundation of modern histology, and in the hands of Rudolf Virchow (whose cellular pathology was an inevitable deduction from Schwann) afforded the means of placing modern pathology on a truly scientific basis.

An excellent account of Schwann's life and work is that by Léon Frédéricq (Liége, 1884).

SCHWANTHALER, LUDWIG MICHAEL (1802–1848), German sculptor, was born in Munich on the 26th of August 1802. His family had been sculptors in Tirol for three centuries; young Ludwig received his earliest lessons from his father, and the father had been instructed by the grandfather. The last to bear the name was Xaver, who worked in his cousin Ludwig's studio and survived till 1854. For successive generations the family lived by the carving of busts and sepulchral monuments, and from the condition of mechanics rose to that of artists. From the Munich gymnasium Schwanthaler passed as a student to the Munich academy; at first he purposed to be a painter, but afterwards reverted to the plastic arts of his ancestors. His talents received timely encouragement by a commission for an elaborate silver service for the king's table. Cornelius also befriended him; the great painter was occupied on designs for the decoration in fresco of the newly erected Glyptothek, and at his suggestion Schwanthaler was employed on the sculpture within the halls. Thus arose between painting, sculpture, and architecture that union and mutual support which characterized the revival of the arts in Bavaria. Schwanthaler in 1826 went to Italy as a pensioner of the king, and on a second visit in 1832 Thorwaldsen gave him kindly help. His skill was so developed that on his return he was able to meet the extraordinary demand for sculpture consequent on King Ludwig's passion for building new palaces, churches, galleries and museums, and he became the fellow-worker of the architects Klenze, Gärtner and Ohlmüller, and of the painters Cornelius, Schnorr and Hess. Owing to the magnitude and multitude of the plastic products they turned out, over-pressure and haste in design and workmanship brought down the quality of the art. The works of Schwanthaler in Munich are so many and miscellaneous that they can only be briefly indicated. The new palace is peopled with his statues: the throne-room has twelve imposing gilt bronze figures 10 ft. high; the same palace is also enriched with a frieze and with sundry other decorations modelled and painted from his drawings. The sculptor, like his contemporary painters, received help from trained pupils. The same prolific artist also furnished the old Pinakothek with twenty-five marbles, commemorative of as many great painters; likewise he supplied a composition for the pediment of the exhibition building facing the Glyptothek, and executed sundry figures for the public library and the hall of the marshals. Sacred art lay outside his ordinary routine, yet in the churches of St Ludwig and St Mariahilf he gave proof of the widest versatility. The Ruhmeshalle afforded further gauge of unexampled power of production; here alone is work which, if adequately studied, might have occupied a lifetime; ninety-two metopes, and, conspicuously, the colossal but feeble figure of Bavaria, 60 ft. high, rank among the boldest experiments. A short life of forty-six years did not permit serious undertakings beyond the Bavarian capital, yet time was found for the groups within the north pediment of the Walhalla, Ratisbon, and also for numerous portrait statues, including those of Mozart, Jean Paul Richter, Goethe and Shakespeare. Schwanthaler died at Munich in 1848, and left by will to the Munich academy all his models and studies, which now form the Schwanthaler Museum.

SCHWARTZE, TERESA (1852–), Dutch portrait painter, was born at Amsterdam, the daughter of Johan Georg Schwartze (1814–1874), from whom she received her first training, before studying for a year under Gabriel Max and Franz von Lenbach in Munich. In 1879 she went to Paris to continue her studies under Jean Jacques Henner. Her portraits are remarkable for excellent character drawing, breadth and vigour of handling and rich quality of pigment. She is one of the few women painters who have been honoured by an invitation to contribute their own portraits to the hall of the painters at the Uffizi Gallery in Florence. Some of her best pictures, notably a portrait of Piet J. Joubert, and "Three Inmates of the Orphanage at Amsterdam," are at the Ryks Museum, and one entitled "The Orphan" at the Boyman Museum in Rotterdam.

SCHWARZ (or SCHWARTZ), **CHRISTIAN FRIEDRICH** (1726–1798), German Protestant missionary to India, was born on the 8th of October 1726 at Sonnenburg, in the electorate of Brandenburg, Prussia. Having learned Tamil to assist in a translation of the Bible into that language, he was led to form the intention of becoming a missionary to India. He received ordination at Copenhagen on the 8th of August 1749, and, after spending some time in England to acquire the English language, embarked early in 1750 for India, and arrived at Trichinopoly on the 30th of July. Tranquebar was for some time his headquarters, but he paid frequent visits to Tanjore and Trichinopoly, and in 1766 removed to the latter place. Here he acted as chaplain to the garrison, who erected a church for his general use. In 1769 he secured the friendship of the raja of Tanjore, who, although he never embraced Christianity, afforded him every countenance in his missionary labours. Shortly before his death he committed to Schwarz the education of his adopted son and successor. In 1779 Schwarz undertook, at the request of the Madras government, a private embassy to Hyder Ali, the ruler of Mysore. When Hyder invaded the Carnatic, Schwarz was allowed to pass through the enemy's camp without molestation. After twelve years in Trichinopoly he removed to Tanjore, where he spent the remainder of his life. He died on the 13th of February 1798. Schwarz's direct success in making converts exceeded that of any other Protestant missionary in India, in addition to which he succeeded in winning the esteem of Mahommedans and Hindus. The raja of Tanjore erected a monument, executed by Flaxman, in the mission church, in which he is represented as grasping the hand of the dying missionary and receiving his benediction. A splendid monument to Schwarz by Bacon was placed by the East India Company in St Mary's church at Madras.

See *Remains* of Schwarz, with a sketch of his life (1826); *Memoirs of Life and Correspondence*, by H. N. Pearson (1834, 3rd ed. 1839); *Life*, by H. N. Pearson (1855).

SCHWARZ, KARL (1812–1885), German Protestant theologian, was born at Wiek on the Isle of Rügen on the 19th of November 1812. His father, Theodor Schwarz, pastor at Wiek, was well known as a preacher, and as the writer of a number of popular works (parables, romances, &c.) under the pseudonym "Theodor Melas." Karl Schwarz pursued the study of theology and philosophy at Halle, and afterwards at Bonn (1831) and Berlin (1832–1834). At Berlin he came under the influence of Schleiermacher and Hegel, whose influences are seen in his work *Das Wesen der Religion* (1847). In 1837 he was imprisoned for six months on account of his advanced political opinions. After his release he helped (from 1838) with the *Hallische Jahrbücher*. From 1843–1845 he lectured at Halle, and was then suspended by the government. In 1849, however, he was appointed professor extraordinarius, and later received a number of distinctions (in 1858 chief court preacher, &c.). Schwarz took an important part in the founding and directing of the German Protestantenverein, and became an eminent exponent of liberal theology. His work *Zur Geschichte der neuesten Theologie* (1856, 4th ed. 1869) is a valuable source for the history of theology in Germany. His other works include *Lessing als Theologe* (1854) and *Grundriss der christl. Lehre* (1873, 5th ed. 1876). He died on the 25th of March 1885. In his memory a *Karl-Schwarz-stiftung* was founded in connexion with the theological faculty at Jena.

See G. Rudloff, *Karl Schwarz* (1887); F. Hummel, *Die Bedeutung der Schrift von Karl Schwarz: Über das Wesen der Religion* (1890); and Herzog-Hauck, *Realencyklopädie*.

SCHWARZBURG-RUDOLSTADT, a principality of Germany, an independent member of the German empire, and one of the Thuringian states (see THURINGIA). It shares with Schwarzburg-Sondershausen the possessions of the old house of Schwarzburg, consisting of the upper barony (*Oberherrschaft*) in Thuringia, on the Gera, Ilm and Saale, and the lower barony (*Unterherrschaft*), an isolated district on the Wipper and Helbe, about 25 m. to the north, surrounded by the Prussian province of Saxony. As the dignity of prince is held in virtue of the Oberherrschaft alone, a share of both baronies was given to each sub-line of the main house. The total area of Schwarzburg-Rudolstadt is 363 sq. m., of which 283 are in the upper and 80 in the lower barony; the chief towns in the former district are Rudolstadt (pop. 12,500 in 1905), the capital, and Blankenburg (2000), and in the latter Frankenhausen (6374). Both baronies are hilly, the highest elevation being attained in the Grossfarmdenkopf, 2900 ft. The scenery of the Thuringian portion of Schwarzburg-Rudolstadt attracts many visitors annually, the most beautiful spots being the gorge of the Schwarza and the lovely circular valley in which the village of Schwarzburg nestles at the foot of a curiously isolated hill, crowned by the ancient castle of the princely line. Cattle-rearing and fruit-growing flourish in the lower barony, while the upper barony is finely wooded. Of the whole country 44% is under forest (mainly coniferous trees), and 50% is devoted to agriculture and pasture. The chief grain crops are rye, oats, barley and potatoes. Great attention is paid to poultry farming and bee-keeping, and the exports from these sources are considerable. About 14% of the population are engaged in agriculture and forestry, 21% in mining and cognate industries. Trade and manufactures are insignificant; iron, lignite, cobalt, alum and vitriol are among the mineral productions. In 1905 the population was 96,835 or about 265 to the square mile. Nearly all these were Protestants.

Schwarzburg-Rudolstadt is a limited hereditary monarchy, its constitution resting on laws of 1854 and 1870. A diet has met at intervals since 1816, and is now entitled to be summoned every three years. The present diet consists of sixteen members elected for three years, four chosen by the highest assessed taxpayers, the others by general election. The troops of Schwarzburg-Rudolstadt have been incorporated with the Prussian army since the convention of 1867. The principality has one vote in the Reichstag and one in the federal council.

Schwarzburg-Rudolstadt is the cadet branch of the house of Schwarzburg, descended from Albrecht VII. (1605). In 1710 the count was made a prince, in spite of the remonstrances of the elector of Saxony, although he was prevented from taking his seat in the imperial college at Regensburg until 1754. The principality entered the Confederation of the Rhine in 1807 and the German League in 1815. In 1819 it redeemed the Prussian claims of superiority by surrendering portions of its territory.

See Sigismund, *Landeskunde des Fürstentums Schwarzburg-Rudolstadt* (2 vols., Rudolstadt, 1862–1863).

SCHWARZBURG-SONDERSHAUSEN, a principality of Germany, and constituent state of the German empire. It shares the old Schwarzburg lands with Schwarzburg-Rudolstadt. In general it may be said that while Schwarzburg-Rudolstadt forms the southern, Schwarzburg-Sondershausen occupies the northern portion of the lands once divided between them. The total area of the principality is 333 sq. m., of which 133 are in the upper and 200 in the lower barony. The chief towns are Arnstadt (pop. 16,275 in 1905), which at one time gave name to a line of counts, in the southern, and Sondershausen (7425), the capital, in the northern (or upper) barony. The general description of the nature and resources of Schwarzburg-Rudolstadt applies also to this principality, except that 62% of the whole is devoted to agriculture and pasture and 30% to forests, only about two-fifths of which are coniferous trees. The chief crops are oats, barley, wheat and rye, but by far the most land is planted with potatoes. About 15% of the population are supported by agriculture and forestry, and about 18% by mining and cognate industries. The industries are varied, and in some branches, notably gloves (at Arnstadt), glass, sausages and sugar-refining, considerable. In 1905 the population was 85,152, or about 245 to the square mile. Almost all of these were Protestants.

Schwarzburg-Sondershausen is a limited hereditary monarchy, its constitution resting on a law of 1857. The diet consists of five representatives elected by the highest taxpayers, five by general election, and five nominated for life by the prince. The first ten members are elected for four years, which is also the financial period. There is a ministry with five departments—for the prince's household, domestic affairs, finance, churches and schools, and justice. The budget for the years 1908–1911 estimates the income at £164,440 and the expenditure at the same. The state debt in 1909 was £167,970. The troops of Schwarzburg-Sondershausen have been incorporated with the Prussian army by convention since 1867. The principality has one vote in the Reichstag and one in the federal council.

The house of Schwarzburg is one of the oldest and noblest in Germany; and tradition traces its descent from Widukind and the kings of the Franks. Its historical ancestors were the counts of Käfernburg, from whom the counts of Schwarzburg sprang about the beginning of the 13th century. The name Günther became the distinctive name for the members of this house (corresponding to Heinrich in the Reuss family), the various Günthers being at first distinguished by numbers and afterwards by prefixed names. Various subdivisions and collateral lines were formed, but by 1599 all were extinct but the present two. Count Günther XL., who died in 1552, was the last common ancestor of both lines. Schwarzburg-Sondershausen is the senior line, although its possessions are the smaller. In 1697 the count was raised to the dignity of imperial prince by the emperor Leopold I. The prince had to pay 7000 thalers to the elector of Saxony and 3500 to the duke of Saxe-Weimar, and numerous disputes arose in connexion with the superiorities thus indicated. In 1807 Schwarzburg-Sondershausen entered the Confederation of the Rhine and became a sovereign state. In 1816 it joined the German League, and redeemed with portions of its territory all rights of superiority claimed by Prussia. Its domestic government has gradually, though not very quickly, improved since that time—the oppressive game-laws in particular having been abolished. A treaty of mutual succession was made between the two families in 1713. Prince Charles Günther succeeded on the 17th of July 1880, his father having on account of eye disease renounced the throne in favour of his son. By a law, promulgated in 1896, Sizzo, prince of Leutenberg, was recognized as the heir-presumptive to this principality and, by treaty with Schwarzburg-Rudolstadt, to that principality also.

See Apfelstedt, *Heimatskunde des Fürstentums Schwarzburg-Sondershausen* (Sondersh., 1854–1857); Irmisch, *Beiträge zur schwarzburgischen Heimatskunde* (Sondersh., 1905–1906).

SCHWARZENBERG, a princely family of Franconian origin, established in Bavaria and Austria, and carrying its present name since 1437. It was raised to princely rank in 1670. Besides Karl Philipp (see below) and Johann (1463–1528), a moralist and reformer who, as judge of the episcopal court at Bamberg, introduced a new code of evidence which amended the procedure then prevalent in Europe by securing for the accused a more impartial hearing, its best-known representative is Felix (1800–1852), Karl Philipp's nephew, an important Austrian statesman.

After six years' service in the Austrian army Felix espoused a diplomatic career at the instance of Metternich, and underwent a period of probation (1824–1848) at various European courts, in the course of which he confirmed his aristocratic aversion to popular government, but was led to acknowledge that absolutism needs to be justified by efficiency of administration. In 1848 he took an active part in the war against Piedmont and the insurgents in Vienna. On Nov. 21st of the same year he was appointed head of a reactionary ministry. Himself a soldier, he aimed at the ultimate restoration of the absolute monarchy by means of the army. At first he temporized, and on the 27th of November a proclamation was issued stating the intention of the government to uphold constitutional principles, but at the same time maintaining its intention to keep the empire intact even at the cost of a separation from Germany. The removal of the Austrian parliament to Kremsier followed the abdication of the emperor Ferdinand, and on March 7th 1849 the proclamation of a centralized constitution for the whole Austro-Hungarian monarchy, after the Austrian victory at Kopolna had seemed to Schwarzenberg to have crushed the Magyar power of resistance. This was followed by the declaration of Hungarian independence; and Schwarzenberg did not hesitate ultimately to call in the aid of Russia to put an end to the insurrection (November). This done, he was free to turn his whole attention to Germany. His refusal to incorporate only the German provinces of the monarchy in the proposed new German Empire had thrown the German parliament into the arms of Prussia. His object now was to restore the *status quo ante* of the Confederation, with the old predominance of Austria. His success in this respect was partly due to exterior circumstances, notably the mistimed exaggerations of the German revolutionists, but largely to his diplomatic skill, unscrupulousness and iron tenacity of purpose with which the weakness of Frederick William IV. and his ministers was unable to cope. His triumph came with the restoration of the old federal diet in May 1850 and the signature of the convention of Olmütz on the 29th of November of the same year (see GERMANY: *History*).

See Berger, *Felix, Fürst zu Schwarzenberg* (Leipzig, 1853); A. Beer, *Fürst Schwarzenberg's Deutsche Politik bis zu den Dresdener Konferenzen* (Historisches Taschenbuch, Leipzig, 1891). For Johann see W. Scheel, *Johann, Freiherr von S.* (Berlin, 1905).

SCHWARZENBERG, KARL PHILIPP, PRINCE ZU (1771–1820), Austrian field marshal, was born on the 15th of April 1771 at Vienna.[1] He entered the imperial cavalry in 1788, fought in 1789 under Lacy and Loudon against the Turks, distinguished himself by his bravery, and became major in 1792. In the French campaign of 1793 he served in the advanced guard of the army commanded by Prince Josias of Coburg, and at Cateau Cambresis in 1794 his impetuous charge at the head of his regiment, vigorously supported by twleve British squadrons, broke a whole corps of the French, killed and wounded 3000 men, and brought off 32 of the enemy's guns. He was immediately decorated with the cross of the Maria Theresa order. After taking part in the battles of Amberg and Würzburg in 1796 he was raised to the rank of major-general, and in 1799 he was promoted lieutenant field marshal. At the defeat of Hohenlinden in 1800 his promptitude and courage saved the right wing of the Austrian army from destruction, and he was afterwards entrusted by the archduke Charles with the command of the rearguard. In the war of 1805 he held command of a division under Mack, and when Ulm was surrounded by Napoleon in October he was one of the brave band of cavalry, under the archduke Ferdinand, which cut its way through the hostile lines. In the same year he was made a commander of the order of Maria Theresa and in 1809 he received the Golden Fleece. When in 1808, in view of a new war with France, Austria decided to send a special envoy to Russia, Schwarzenberg, who was *persona grata* at the court of St Petersburg, was selected. He returned, however, in time to take part in the battle of Wagram, and was soon afterwards promoted general of cavalry. After the peace of Vienna he was sent to Paris to negotiate the marriage between Napoleon and the archduchess Maria Louisa. The prince gave a ball in honour of the bride on the 1st of July 1810, which ended in the tragic death of many of the guests, including his own sister-in-law, in a fire. Napoleon held Schwarzenberg in great esteem, and it was at his request that the prince took command of the Austrian auxiliary corps in the Russian campaign of 1812. The part of the Austrians was well understood to be politically rather than morally hostile, and Schwarzenberg gained some minor successes by skilful manœuvres without a great battle; afterwards, under instructions from Napoleon, he remained for some months inactive at Pultusk. In 1813, when Austria, after many hesitations, took the side of the allies against Napoleon, Schwarzenberg, recently promoted to be field marshal, was appointed commander-in-chief of the allied Grand Army of Bohemia. As such he was the senior of the allied generals who conducted the campaign of 1813–1814 to the final victory before Paris and the overthrow of Napoleon. It is the fashion to accuse Schwarzenberg of timidity and over-caution, and his operations can easily be made to appear in that colour when contrasted with those of his principal subordinate, the fiery Blücher, but critics often forget that Schwarzenberg was an Austrian general first of all, that his army was practically the whole force that Austria could put into the field in Central Europe, and was therefore not lightly to be risked, and that the motives of his pusillanimity should be sought in the political archives of Vienna rather than in the text-books of strategical theory. In any case his victory, however achieved, was as complete as Austria desired, and his rewards were many, the grand crosses of the Maria Theresa and of many foreign orders, an estate, the position of president of the Hofkriegsrath, and, as a specially remarkable honour, the right to bear the arms of Austria as an escutcheon of pretence. But shortly afterwards, having lost his sister Caroline, to whom he was deeply attached, he fell ill. A stroke of paralysis disabled him in 1817, and in 1820, when revisiting Leipzig, the scene of the *Völkerschlacht* that he had directed seven years before, he was attacked by a second stroke. He died there on the 15th of October.

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[1] The family of Schwarzenberg, of which many members are known to history, was derived from Erkinger von Seinsheim (b. 1362), a distinguished soldier under the emperor Sigismund, who bought the lordship of Schwarzenberg in Franconia in 1420. Count Adolf von Schwarzenberg (1547–1600) was a renowned general of the empire, whose sword, along with that of his descendant Prince Karl Philipp, is preserved in the arsenal of Vienna. He fought in the wars of religion, but was chiefly distinguished in the wars on the Eastern frontier against the Turks. He was killed in a mutiny of the soldiers at Papa in Hungary in 1600. GEORG LUDWIG, COUNT VON SCHWARZENBERG (1586–1646), was an Austrian statesman in the Thirty Years' War. JOHANN, FREIHERR VON SCHWARZENBERG UND HOHENLANDSBERG (1463–1528), was a celebrated jurist and a friend of Luther.

His eldest son, Friedrich, Prince zu Schwarzenberg (1800–1870), had an adventurous career as a soldier, and described his wanderings and campaigns in several interesting works, of which the best known is his *Wanderungen eines Lanzknechtes* (1844–1845). He took part as an Austrian officer in the campaigns of Galicia 1846, Italy 1848 and Hungary 1848, and as an amateur in the French conquest of Algeria, the Carlist wars in Spain and the Swiss civil war of the Sonderbund. He became a major-general in the Austrian army in 1849, and died after many years of well-filled leisure in 1870. The second son, Karl Philipp (d. 1858), was a Feldzeugmeister; the third, Edmund Leopold Friedrich (1803–1873), a field marshal in the Austrian army. Of Schwarzenberg's nephews, Felix, the statesman, is separately noticed, and Friedrich Johann Josef Coelestin (1809–1885) was a cardinal and a prominent figure in papal and Austrian history.

See Prokesch-Osten, *Denkwürdigkeiten aus dem Leben des Feldmarschall's Fürsten Schwarzenberg* (Vienna, 1823); Berger, *Das Fürstenhaus Schwarzenberg* (Vienna, 1866), and a memoir by the same hand in *Streffleur's Öst. Militärzeitschrift, 1863*.

SCHWARZENBERG, a town of Germany, in the kingdom of Saxony, situated on the Schwarzwasser, 16 m. W. from Annaberg by rail. Pop. (1905) 4629. It has a handsome parish church, an old palace and some schools. It has some small industries and there are large iron-works in the vicinity.

SCHWECHAT, a market-town of Austria, in Lower Austria, 5 m. S.E. of Vienna by rail. Pop. (1900) 8241. Here is situated the Dreher brewery, the largest in the monarchy; and there are also important smelting and iron works, cotton-spinning, factories of electrical plant, &c. The meeting at Schwechat of the emperor Leopold I. with Sobieski in 1683, after the liberation of Vienna, is commemorated by an obelisk. The imperial troops defeated the Hungarian insurgents in a battle fought here in October 1848.

SCHWEDT, a town of Germany, in the Prussian province of Brandenburg, on the left bank of the Oder, 13 m. N.E. from Angermünde by rail. Pop. (1905) 9530. It is a pleasant, well-built town, with broad streets and shady avenues. There are three Evangelical churches, a Roman Catholic church, a palace, built in 1580, and a gymnasium. The royal riding school was removed hence to Hanover in 1867. The industries include the manufacture of tobacco, cigars, machinery, vinegar, soap and bricks, and there is a considerable trade by water in agricultural produce.

Schwedt is mentioned in chronicles as early as 1138, and became a town in 1265. Towards the end of the 15th century it passed to Brandenburg, and, in 1684, after a great conflagration which laid it in ruins, was handsomely rebuilt by the electress Dorothea. The lordship of Schwedt was in the possession of the counts of Hohenstein from 1481 to 1609, when it passed to Brandenburg. In 1689 it was given to Philip William, a younger son of the elector of Brandenburg, Frederick William, and he and his successors called themselves margrave of Brandenburg-Schwedt. When this line became extinct in 1784 the lordship reverted to Prussia, being claimed both by the king as personal property and by the state. The matter was not settled until 1872, when it was assigned to the state.

See Thomä, *Geschichte der Stadt und Herrschaft Schwedt* (Berlin, 1873).

SCHWEGLER, ALBERT (1819–1857), German philosopher and theologian, was born at Michelbach in Württemberg on the 10th of February 1819, the son of a country pastor. He entered the university of Tübingen in 1836, and was one of the earliest pupils of F. C. Baur, under whose influence he devoted himself to church history. His first work was *Der Montanismus u. die christliche Kirche des 2ten Jahrhunderts* (1841), in which he pointed out for the first time that Montanism was much more than an isolated outbreak of eccentric fanaticism in the early church, though he himself introduced fresh misconceptions by connecting it with Ebionitism as he conceived the latter. This work, with other essays, brought him into conflict with the authorities of the church, in consequence of which he gave up theology as his professional study and chose that of philosophy. In 1843 he founded the *Jahrbücher der Gegenwart*, and became *Privatdozent* of philosophy and classical philology in Tübingen university. In 1848 he was made professor extraordinarius of Roman literature and archaeology, and soon afterwards professor ordinarius of history. He died on the 5th of January 1857.

His principal theological work was *Das nachapostolische Zeitalter* (2 vols., 1846). It was this book which first put before the world, with Schwegler's characteristic boldness and clearness, the results of the critical labours of the earlier representatives of the new Tübingen school in relation to the first development of Christianity. Schwegler published also an edition of the *Clementine Homilies* (1847), and of Eusebius's *Ecclesiastical History* (1852); in philosophy *Übersetzung und Erläuterung der aristot. Metaphysik* (4 vols., 1847–1848), his excellent *Geschichte der Philosophie im Umriss* (1848, 14th ed. 1887; 10th edition of Eng. trans. by J. Hutchison Stirling, 1888), and a posthumous *Geschichte der Griech. Philosophie* (1859). In history he began a *Römische Geschichte* (vols. i.-iii., 1853–1858, 2nd ed. 1867–1872), which he brought down only to the laws of Licinius.

See Edward Zeller, *Vorträge*, vol. ii. (1878), pp. 329-363; and the *Allgemeine deutsche Biographie*.

SCHWEIDNITZ, a town of Germany, in the Prussian province of Silesia, picturesquely situated on the left bank of the Weistritz, 28 m. S.W. of Breslau by rail. Pop. (1905) 30,540. The town has wide streets and contains several old churches, one of which, a Roman Catholic church, built in the 14th century, has a tower 330 ft. high. It has an old town hall, a theatre and several statues of eminent men. The surrounding country is fertile and highly cultivated, and the large quantities of flax and hemp there raised encourage an active weaving industry in the town. Beetroot for sugar, grain and fruit are also grown. The manufacture of woollens, linens, hosiery, furniture, gloves, paper, machinery and tools, carriages, nuts and screws, needles and other hardware goods is carried on. The beer of Schweidnitz has long been famous under the name of "Schwarze Schöps," and in the 16th century it was exported as far as Italy. Schweidnitz is the chief grain market of the district.

Schweidnitz, dating from about the 11th century, received civic rights in 1250. About 1278 it became the capital of a principality, with an area of about 1000 sq. m., which belonged to Bohemia from 1353 till 1741, when it passed into the possession of Prussia. The "Pölerei of Schweidnitz" is the name given to the riotous revolt of the town, in 1520–1522, against a royal edict depriving it of the right of coining its own money. One of the strongest towns in Silesia it was besieged several times during the 17th and 18th centuries. In 1807 it was captured by the French, who demolished the fortifications. Restored to Prussia in 1816 it was again fortified, but in 1862 the fortifications were converted into a public park.

See F. J. Schmidt, *Geschichte der Stadt Schweidnitz* (2 vols., Schweidnitz, 1846–1848).

SCHWEIGHÄUSER, JOHANN (1742–1830), German classical scholar, was born at Strassburg on the 25th of June 1742. From an early age his favourite subjects were philosophy (especially Scottish moral philosophy as represented by Hutchinson and Ferguson) and Oriental languages; Greek and Latin he took up later, and although he owes his reputation to his editions of Greek authors, he was always diffident as to his classical attainments. After visiting Paris, London and the principal cities of Germany, he became assistant professor of philosophy (1770) at Strassburg. When the French Revolution broke out, he was banished; in 1794 he returned, and after the reorganization of the Academy in 1809 was appointed professor of Greek. He resigned his post in 1824, and died on the 19th of January 1830.

His son, JOHANN GOTTFRIED (1776–1844), was also a distinguished scholar and archaeologist, joint-author with M. Golbéry of *Antiquités de l'Alsace* (1828).

Schweighäuser's first important work was his edition of Appian (1785), with Latin translation and commentary, and an account of the MSS. On Brunck's recommendation, he had collated an Augsburg MS. of Appian for Samuel Musgrave, who was preparing an edition of that author, and after Musgrave's death he felt it a duty to complete it. His Polybius, with translation, notes and special lexicon, appeared in 1789–1795. But his chief work is his edition of Athenaeus (1801–1807), in fourteen volumes, one of the Bipont editions. His Herodotus (1816; lexicon, 1824) is less successful; he depends too much on earlier editions and inferior MSS., and lacks the finer scholarship necessary in dealing with such an author. Mention may also be made of his *Encheiridion* of Epictetus and *Tabula* of Cebes (1798), which appeared at the time when the doctrines of the Stoics were fashionable; the letters of Seneca to Lucilius (1809); corrections and notes to Suïdas (1789); some moral philosophy essays. His minor works are collected in his *Opuscula academica* (1806).

See monographs by J. G. Dahler, C. L. Cuvier, F. J. Stiévenart (all 1830), L. Spach (1868), Ch. Rabany (1884), the two last containing an account of both father and son.

SCHWEINFURT, a town of Germany, in the kingdom of Bavaria, situated on the right bank of the Main, which is here spanned by several bridges, 27 m. N.E. of Würzburg by rail, and at the junction of lines to Kissingen, Bamberg and Gemünden. Pop. (1905) 18,416. The Renaissance town-hall in the spacious market-place dates from 1570; it contains a library and a collection of antiquities. St John's church is a Gothic edifice with a lofty tower; St Salvator's was built about 1720. Schweinfurt is well furnished with benevolent and educational institutions, including a gymnasium originally founded by Gustavus Adolphus in 1631, and rebuilt in 1881. The chief manufacture is paint ("Schweinfurt green" is a well-known brand in Germany), introduced in 1809; but beer, sugar, machinery, soap and other drysalteries, straw-paper and vinegar are also produced. Cotton-spinning and bell-founding are carried on, and the Main supplies water-power for numerous saw, flour and other mills. Schweinfurt carries on an active trade in the grain, fruit and wine produced in its neighbourhood, and it is the seat of an important sheep and cattle market. A monument was erected in 1900 to Friedrich Rückert the poet (1788–1866).

Schweinfurt is mentioned in 790, and in the 10th century was the seat of a margrave. It fell later to the counts of Henneberg; but, receiving civic rights in the 13th century, it maintained its independence as a free imperial city with few interruptions until 1803, when it passed to Bavaria. Assigned to the grand duke of Würzburg in 1810, it was restored to Bavaria in 1814. In the Thirty Years' War it was occupied by Gustavus Adolphus, who erected fortifications, remains of which are still extant.

See Beck, *Chronik der Stadt Schweinfurt* (2 vols., Schweinfurt, 1836–1841); and Stein, *Geschichte der Reichstadt Schweinfurt* (2 vols., Schweinfurt, 1900).

SCHWEINFURTH, GEORG AUGUST (1836–), German traveller in East Central Africa and ethnologist, was born at Riga on the 29th of December 1836. He was educated at the universities of Heidelberg, Munich and Berlin (1856–1862), where he particularly devoted himself to botany and palaeontology. Commissioned to arrange the collections brought from the Sudan by Freiherr von Barnim and Dr Hartmann, his attention was directed to that region; and in 1863 he travelled round the shores of the Red Sea, repeatedly traversed the district between that sea and the Nile, passed on to Khartum, and returned to Europe in 1866. His researches attracted so much attention that in 1868 the Humboldt-Stiftung of Berlin entrusted him with an important scientific mission to the interior of East Africa. Starting from Khartum in January 1869, he went up the White Nile to Bahr-el-Ghazal, and then, with a party of ivory dealers, through the regions inhabited by the Diur (Dyoor), Dinka, Bongo and Niam-Niam; crossing the Nile watershed he entered the country of the Mangbettu (Monbuttu) and discovered the river Welle (19th of March 1870), which by its westward flow he knew was independent of the Nile. Schweinfurth formed the conclusion that it belonged to the Chad system, and it was several years before its connexion with the Congo was demonstrated. The discovery of the Welle was Schweinfurth's greatest geographical achievement, though he did much to elucidate the hydrography of the Bahr-el-Ghazal system. Of greater importance were the very considerable additions he made to the knowledge of the inhabitants and of the flora and fauna of Central Africa. He described in detail the cannibalistic practices of the Mangbettu, and his discovery of the pygmy Akka settled conclusively the question as to the existence of dwarf races in tropical Africa. Unfortunately nearly all his collections made up to that date were destroyed by a fire in his camp in December 1870. He returned to Khartum in July 1871 and published an account of the expedition, under the title of *Im Herzen von Afrika* (Leipzig, 1874; English edition, *The Heart of Africa*, 1873, new ed. 1878). In 1873–1874 he accompanied Gerhard Rohlfs in his expedition into the Libyan Desert. Settling at Cairo in 1875, he founded a geographical society, under the auspices of the khedive Ismail, and devoted himself almost exclusively to African studies, historical and ethnographical. In 1876 he penetrated into the Arabian Desert with Paul Güssfeldt, and continued his explorations therein at intervals until 1888, and during the same period made geological and botanical investigations in the Fayum, in the valley of the Nile, &c. In 1889 he removed to Berlin; but he visited the Italian colony of Eritrea in 1891, 1892 and 1894.

The accounts of all his travels and researches have appeared either in book or pamphlet form or in periodicals, such as *Petermanns Mitteilungen*, the *Zeitschrift für Erdkunde*, &c. Among his works may be mentioned *Artes Africanae*; *Illustrations and Descriptions of Productions of the Industrial Arts of Central African Tribes* (1875).

SCHWEITZER, JEAN BAPTISTA VON (1833–1875), German politician and dramatic poet, was born at Frankfort-on-the-Main on the 12th of July 1833, of an old aristocratic Catholic family. He studied law at Berlin and Heidelberg, and afterwards practised in his native city. He was, however, from the first more interested in politics and literature than in law. He was attracted by the social democratic labour movement, and after the death of Ferdinand Lassalle in 1864, he became president of the "General Working-men's Union of Germany," and in this capacity edited the *Sozialdemokrat*, which brought him into frequent trouble with the Prussian government. In 1867 he was elected to the parliament of the North German Federation, and on his failure to secure election to the German Reichstag in 1871, he resigned the presidency of the Labour Union, and retired from political life. Schweitzer composed a number of dramas and comedies, of which several for a while had considerable success. Among them may be mentioned *Alcibiades* (Frankfort, 1858); *Friedrich Barbarossa* (Frankfort, 1858); *Canossa* (Berlin, 1872); *Die Darwinianer* (Frankfort, 1875); *Die Eidechse* (Frankfort, 1876); and *Epidemisch* (Frankfort, 1876). He also wrote one political novel, *Lucinde oder Kapital und Arbeit* (Frankfort, 1864).

SCHWELM, a town of Germany, in the Prussian province of Westphalia, situated on the river of the same name, 4 m. E. of Barmen, with which it is connected by an electric tramway, and on the main line of railway, Düsseldorf-Hagen. Pop. (1905) 18,469. It has three churches and various schools and public institutions. Lying close to the Harkort iron and sulphur mines, and within the populous and rich mineral district on the lower Rhine, it carries on iron-founding, wire-drawing and the manufacture of machinery of various kinds, besides an active trade in iron, steel and brass goods. Scarcely less important are its manufactures of ribbons, damask, cord, pianos and paper. In the neighbourhood is a hydropathic establishment. Schwelm is said to have existed as early as 1085, though it did not receive civic rights until 1590.

See Tobien, *Bilder aus der Geschichte von Schwelm* (Schwelm, 1890).

SCHWENKFELD, KASPAR (1490–1561), of Ossing, German theologian, was born in 1490, and after studying at Cologne and other universities served in various minor courts of Silesia, finally entering the service of the duke of Liegnitz, over whom he had great influence. The writings of Tauler and Luther so impressed him, that in 1522 he visited Wittenberg, where he made the acquaintance of Andreas Carlstadt and Thomas Münzer. On his return to Liegnitz he helped to spread the principles of the Reformation in the principality and in Silesia, while warning his colleagues against the abuse of the doctrine of justification by faith. The Protestant controversy on the Eucharist (1524) revealed his disagreement with Luther on that critical point. He sought to establish a *via media* between the doctrines of Luther and Zwingli, and vainly hoped to obtain for it Luther's acceptance. He as vainly sought to secure Luther's adoption of a strict rule of church discipline, after the manner of the Moravian Brethren. Meanwhile the Anabaptists obtained a footing in Silesia, and suspicions of Schwenkfeld's sympathy with them were aroused. Letters and writings of his own (1527–1528) proved him to hold strongly anti-Lutheran heresies, and both Catholics and Lutherans urged the duke of Liegnitz to dismiss him. He voluntarily left Liegnitz in 1529, and lived at Strasburg for five years amongst the Reformed clergy there. In 1533, in an important synod, he defended against Martin Bucer the principles of religious freedom as well as his own doctrine and life. But the heads of the church carried the day, and, more stringent measures being adopted against dissenters, Schwenkfeld left Strasburg for a time, residing in various cities of south Germany and corresponding with many nobles. In 1535 a sort of compromise was brought about between himself and the Reformers, he promising not to disturb the peace of the church and they not to treat him as a disturber. The compromise was of only short duration. His theology took a more distinctly heterodox form, and the publication (1539) of a book in proof of his most characteristic doctrine—the deification of the humanity of Christ—led to his active persecution by the Lutherans and his expulsion from the city of Ulm. The next year (1540) he published a refutation of the attacks upon his doctrine with a more elaborate exposition of it, under the title *Grosse Confession.* The book was very inconvenient to the Protestants, as it served to emphasize the Eucharistic differences between the Lutherans and Zwinglians at a moment when efforts were being made to reconcile them. An anathema was accordingly issued from Schmalkald against Schwenkfeld (together with Sebastian Franck); his books were placed on the Protestant "index"; and he himself was made a religious outlaw. From that time he was hunted from place to place, though his wide connexions with the nobility and the friendship of his numerous followers provided for him secure hiding-places and for his books a large circulation. An attempt in 1543 to approach Luther only increased the Reformer's hostility and rendered Schwenkfeld's situation still more precarious. He and his followers withdrew from the Lutheran Church, declined its sacraments, and formed small societies of kindred views. He and they were frequently condemned by Protestant ecclesiastical and political authorities, especially by the government of Württemberg. His personal safety was more and more imperilled, and he was unable to stay in any place for more than a short time. At last, in his seventy-second year, he died at Ulm, on the 10th of December 1561, surrounded by attached friends and declaring undiminished faith in his views.

Schwenkfeld, whose gentle birth and courtly manners won him many friends in high circles, left behind him a sect (who were called subsequently by others Schwenkfeldians, but who called themselves "Confessors of the Glory of Christ") and numerous writings to perpetuate his ideas. His writings were partially collected in four folio volumes, the first of which was published in the year 1564, containing his principal theological works. Erbkam states that his unprinted writings would make more than another four folios. His adherents were to be found at his death scattered throughout Germany. In Silesia they formed a distinct sect, which has lasted until the present time. In the 17th century they were associated with the followers of Jacob Böhme, and were undisturbed until 1708, when an inquiry was made as to their doctrines. In 1720 a commission of Jesuits was despatched to Silesia to convert them by force. Most of them fled from Silesia into Saxony, and thence to Holland, England and North America. Frederick the Great of Prussia, when he seized Silesia, extended his protection to those who remained in that province. Those who had fled to Philadelphia in Pennsylvania (1734) formed a small community under the name of Schwenkfelders; and Zinzendorf and Spangenberg, when they visited the United States, endeavoured, but with little success, to convert them to their views. This community still exists in Pennsylvania and their views appear to be substantially those of the Quakers.

Schwenkfeld's mysticism was the cause of his divergence from Protestant orthodoxy and the root of his peculiar religious and theological position. It led him to oppose the Lutheran view of the value of the outward means of grace, such as the ministry of the word and the sacraments. He regarded as essential a direct and immediate participation in the grace of the glorified Christ, and looked on religious ordinances as immaterial. He distinguished between an outward word of God and an inward, the former being the Scriptures and perishable, the latter the divine spirit and eternal. In his Christology he departed from the Lutheran and Zwinglian doctrine of the two natures by insisting on what he called the *Vergötterung des Fleisches Christi*, the deification or the glorification of the flesh of Christ. The doctrine was his protest against a separation of the human and the divine in Christ, and was intimately connected with his mystical view of the work of Christ. He held that, though Christ was God and man from his birth from the Virgin, he only attained his complete deification and glorification by his ascension, and that it is in the estate of his celestial *Vergötterung* or glorification that he is the dispenser of his divine life to those who by faith become one with him. This fellowship with the glorified Christ rather than a less spiritual trust in his death and atonement is with him the essential thing. His peculiar Christology was based upon profound theological and anthropological ideas, which contain the germs of some recent theological and Christological speculations.

See Arnoldt, *Kirchen- und Ketzer-Historie* (Frankfort, ed. 1700); Salig, *Historie der Augsburg. Confession*; W. H. Erbkam, *Gesch. der prot. Sekten* (1848); Dorner, *Gesch. d. prot. Theol.* (1867); also R. H. Grützmacher's article in Hauck-Herzog's *Realencyklopädie*; Robert Barclay's *Inner Life of the Religious Societies of the Commonwealth* (1876), and C. Beard's *Hibbert Lectures* (1883), ch. vi.

SCHWERIN, KURT CHRISTOPH, COUNT VON (1684–1757), Prussian general field marshal, was born at Löwitz in Pomerania, and at an early age entered the Dutch army, with which he served at the Schellenberg and at Blenheim. In 1707 he became a lieutenant-colonel in the army of the duke of Mecklenburg-Schwerin, and was present at Ramillies and Malplaquet, and with the Swedish commander Stenbock at Gadebusch. In 1713 he was with Charles XII. of Sweden in his captivity at Bender, and in 1718 was made major-general. In 1719 he opposed the Hanoverian army which invaded Mecklenburg (in the course of which he fought a brilliant action at Walsmühlen on the 6th of March 1719), and in the following year entered the service of the king of Prussia. At first he was employed in diplomatic missions, but in January 1722/3 he received the command of an infantry regiment. In 1730, as a major-general, he was a member of the court martial which tried the crown prince of Prussia (afterwards Frederick the Great) for desertion, and in 1733, at the head of a Prussian army, conducted with great skill the delicate and difficult task of settling the Mecklenburg question. In the following year he became lieutenant-general and in 1739 general of infantry. During the life-time of King Frederick William, Schwerin was also employed in much administrative work. Frederick the Great, on his accession, promoted Schwerin to the rank of general field marshal and made him a count. At the battle of Mollwitz (April 10th, 1741) he justified his sovereign's choice by his brilliant leading, which, when the king had disappeared from the field, converted a doubtful battle into a victory which decided for the time being the fate of Silesia. After the conclusion of the war he was governor of the important fortresses of Brieg and Neisse. In the Second Silesian War (1744–1745) Schwerin commanded the army which, marching from Glatz, met the king's army under the walls of Prague, and in the siege and capture of that place he played a distinguished part (September 10th, 1644). Some time afterwards, the king being compelled to retreat from Bohemia, Schwerin again distinguished himself, but, resenting a real or fancied slight, retired to his estate, to which, and its inhabitants, he devoted his energies during the years of peace. He reappeared on the field at the outbreak of the Seven Years' War (1756), and during the first campaign conducted the war on the Silesian side of Bohemia; and in 1757, following the same route as in 1744, again joined Frederick at Prague. On the 6th of May followed the battle of Prague. Leading on a regiment of the left wing to the attack with its colour in his hand, the old field marshal was shot dead. Frederick erected a statue on the Wilhelmsplatz to his foremost soldier, and a monument on the field of Prague commemorates the place where he fell. Since 1889 the 14th (3rd Pomeranians) Infantry of the German army has borne his name.

See Varnhagen von Ense, *Biographische Denkmale*, vol. vi. (3rd ed., Leipzig, 1873), and *Leben Schwerins* (Berlin, 1841); Wöllner, *Ein Christ und ein Held. oder Nachrichten von Schwerin* (Frankfurt a. O., 1758); Pauli, *Leben Grosser Helden*, i. (Halle, 1759); Gollmert, *Gesch. des Geschlechts von Schwerin* (Berlin, 1878); Schwebel, *Die Herren und Grafen von Schwerin* (Berlin, 1885).

SCHWERIN, a town of Germany, in the Prussian province of Posen, at the confluence of the Obra and the Warthe, 28 m. by rail E. of Cüstrin Pop. (1905) 6768. Its principal manufactures are cigars, furniture, bricks and starch. By river a brisk trade is carried on in agricultural produce.

SCHWERIN, a town of Germany, the capital of the grand duchy of Mecklenburg-Schwerin, prettily situated at the S.W. corner of the lake of Schwerin (14 m. long and 3½ m. broad), 129 m. by rail N.W. of Berlin, and 20 m. S. of the Baltic. Pop. (1905) 41,638. The town is closely surrounded and hemmed in by a number of lakelets, with high and well-wooded banks, and the hilly environs are occupied by meadows, woods and pretty villas. The old and new towns of Schwerin were only united as one city in 1832; and since that date the suburb of St Paul and another outer suburb, known as the Vorstadt, have grown up. Though Schwerin is the oldest town in Mecklenburg, its aspect is comparatively modern, a fact due to destructive fires, which have swept away most of the ancient houses. The most conspicuous of the many fine buildings is the ducal palace, a huge irregularly pentagonal structure with numerous towers, built in 1844–1857 in the French Renaissance style. It stands on a small round island between Castle Lake and the lake of Schwerin, formerly the site of a Wendish fortress and of a later medieval castle, portions of which have been skilfully incorporated with the present building. The older and much simpler palace; the opera house, rebuilt after a fire in 1882; the government buildings, erected in 1825–1834 and restored in 1865 after a fire; and the museum, in the Greek style, finished in 1882, comprising a fine collection of paintings of the 17th century Dutch school; all stand in the "old garden," an open space at the end of the bridge leading to the new palace. Among the other secular buildings are the palace of the heir-apparent, built in 1779 and restored in 1878, the large arsenal, the ducal mews, the ducal library containing 180,000 volumes, the town hall, the artillery barracks and the military hospital. The cathedral was originally consecrated in 1248, though the present building—a brick structure in the Baltic Gothic style, with an unfinished tower—dates for the most part from the 15th century. Among other religious edifices are St Paul's church, a Roman Catholic church and a synagogue. Schwerin is rich in educational institutions, which include a classical school, a veterinary college and a technical school. Since 1837 Schwerin has been once more the residence of the grand duke, and the seat of government, a fact which has had considerable influence on the character of the town and the tone of its society. The chief industry is the making of furniture, and there are also some manufactures of dyes and soap.

Schwerin is mentioned as a Wendish stronghold in 1018, its name (Zwarin or Swarin) being a Slavonic word equivalent to "game-preserve." The Obotrite prince Niclot, whose statue is placed above the portal of the palace as the ancestor of the present reigning family, had his residence here. The town, found in 1161 by Henry the Lion in opposition to this pagan fortress, received civic rights in 1166. From 1170 to 1624 it gave name to a bishopric; and it was also the capital of the duchy of Schwerin, which forms the western part of the grand-duchy of Mecklenburg-Schwerin. Destructive fires, the hardships of the Thirty Years' War, and the removal of the court to Ludwigslust in 1756 seriously depressed the town. It owes its revival and many of its chief buildings to the grand-duke Paul Frederick, to whom a statue by Rauch was erected in 1859.

See Fromm, *Chronik der Haupt- und Residenzstadt Schwerin* (Schwerin, 1863, revised and continued by G. Quade, 1892); G. Quade, *Vaterlandskunde* (Wismar, 1894); and Wörl, *Führer durch Schwerin* (1905).

SCHWERTE, a town of Germany, in the Prussian province of Westphalia, 9 m. by rail N.E. of Hagen, at the junction of the lines Aix-la-Chapelle-Holzminden and Schwerte-Cassel. Pop. (1905) 13,015. It has a Romanesque church, with a carved altar of 1523, and stained glass of the 14th and 15th centuries; and there is a 16th century town hall. The industries are practically confined to the manufacture of iron and steel goods. Schwerte received civic rights in the 12th century.

SCHWETZ, a town of Germany, in the Prussian province of West Prussia, on the left bank of the Vistula, 29 m. by rail N.E. of Bromberg. Pop. (1905) 7747. It has an Evangelical church, two Roman Catholic churches, a synagogue and an old convent, now used as a lunatic asylum, and also the remains of a castle built in the 14th century by the Teutonic Order. The chief industries are the making of sugar and shoes, and there are also electrical works and saw-mills.

See Kötz, *Geschichte der Stadt Schwetz seit 1772* (Marienwerder, 1904).

SCHWETZINGEN, a town of Germany, in the grand duchy of Baden, situated in a plain 9 m. by rail S.E. of Mannheim at the junction of lines to Carlsruhe, Heidelberg and Spires. Pop. (1905) 6858. It has a castle, formerly the residence of the electors palatine of the Rhine, built in 1656, destroyed by the French in 1689, but afterwards rebuilt. Its gardens, which occupy 117 acres, were laid out in the middle of the 18th century in imitation of those of Versailles. Cigars, vinegar, beer, yeast and jam are manufactured, while tobacco and hops are cultivated. Schwetzingen became a town in 1833.

SCHWIEBUS, a town of Germany, in the Prussian province of Brandenburg, situated in a fertile plain, 47 m. E. of Frankfort-on-Oder by the railway to Posen. Pop. (1905) 9321. It is still in part surrounded by its medieval wall, and has an old market-place, a castle and many old houses. Velvet, cloth, machinery, bricks and candles are manufactured, and there are flour-mills, breweries, distilleries and lignite mines. The territory of Schwiebus originally belonged to the principality of Glogau, and in the 16th and 17th centuries was a bone of contention between the electors of Brandenburg and the emperors. A compromise was arrived at in 1686, by which the elector received the lordship of Schwiebus on renouncing his claims to the principalities of Liegnitz, Brieg and Wohlau. The electoral prince Frederick, afterwards the elector Frederick III., had, however, in a private compact pledged himself to restore Schwiebus to the emperor Leopold I. when he became elector, and he did so in 1695, receiving £40,000 in exchange. By the peace of 1742, Frederick the Great regained Schwiebus with the rest of Silesia, and it was incorporated with the department of Glogau.

SCHWIND, MORITZ VON (1804–1871), German painter, was born in Vienna in 1804. He received rudimentary training and led a joyous careless life in that gay capital: among his companions was the composer Schubert, whose songs he illustrated. In 1828 he removed to Munich, and had the advantage of the friendship of the painter Schnorr and the guidance of Cornelius, then director of the academy. In 1834 he received the commission to decorate King Ludwig's new palace with wall paintings illustrative of the poet Tieck. He also found in the same place congenial sport for his fancy in a "Kinderfries"; his ready hand was likewise busy on almanacs, &c., and by his illustrations to Goethe and other writers he gained applause and much employment. In the revival of art in Germany Schwind held as his own the sphere of poetic fancy. To him was entrusted in 1839, in the new Carlsruhe academy, the embodiment in fresco of ideas thrown out by Goethe; he decorated a villa at Leipzig with the story of Cupid and Psyche, and further justified his title of poet-painter by designs from the *Niebelungenlied* and Tasso's *Gerusalemme* for the walls of the castle of Hohenschwangau in Bavarian Tirol. From the year 1844 dates his residence in Frankfort; to this period belong some of the best easel pictures, pre-eminently the Singers' Contest in the Wartburg (1846), also designs for the Goethe celebration, likewise numerous book illustrations. The conceptions for the most part are better than the execution. In 1847 Schwind returned to Munich on being appointed professor in the academy. Eight years later his fame was at its height on the completion in the castle of the Wartburg of wall pictures illustrative of the Singers' Contest and of the history of Elizabeth of Hungary. The compositions received universal praise, and at a grand musical festival in their honour Schwind himself played among the violins. In 1857 appeared his exceptionally mature "cyclus" of the Seven Ravens from Grimm's fairy stories. In the same year he visited England to report officially to King Ludwig on the Manchester art treasures. And so diversified were his gifts that he turned his hand to church windows and joined his old friend Schnorr in designs for the painted glass in Glasgow cathedral. Towards the close of his career, with broken health and powers on the wane, he revisited Vienna. To this time belong the "cyclus" from the legend of Melusine and the designs commemorative of chief musicians which decorate the foyer of the new opera house. Cornelius writes, "You have here translated the joyousness of music into pictorial art." Schwind's genius was lyrical; he drew inspiration from chivalry, folk-lore, and the songs of the people; his art was decorative, but lacked scholastic training and technical skill. Schwind died at Munich in 1871, and was buried in the old Friedhof of the same town.

SCHWYZ (modern spelling *Schwiz*), one of the forest cantons of central Switzerland. Its total area is 350·5 sq. m., of which 293·6 sq. m. are reckoned as "productive" (forests covering 64·9 sq. m. and vineyards ·17 sq. m.), while of the rest 21¼ sq. m. are occupied by lakes (nearly 9 sq. m. of that of Zürich, 8¾ sq. m. of that of Lucerne, 3¾ sq. m. of that of Zug, and the whole of the lake of Lowerz), and ·5 sq. m. is covered by glaciers. Its loftiest point is the Böser Faulen (9200 ft.), while the two highest summits of the Rigi (the Kulm, 5906 ft., and the Scheidegg, 5463 ft.) rise within its borders. The canton extends from the upper end of the lake of Zürich on the north to the middle reach of the lake of Lucerne on the south; on the west it touches at Küssnacht, the northern arm of the same lake, and in the same direction the lake of Zug at Arth, mountain ridges dividing it from Glarus on the east and from Uri on the south. It is made up of two main valleys, those of the Muota, flowing through the older portion of the canton to the lake of Lucerne, and of the Sihl that passes near Einsiedeln on its way to Zürich. Less important are the Aa, that waters the Wäggi glen before joining the lake of Zürich, and the Biber, which receives the Alpbach that flows past Einsiedeln. It is thus a hilly rather than a mountainous region, and is all but wholly devoted to pastoral pursuits. It has not many railways, the principal being that portion of the main St Gotthard line between Küssnacht and Sisikon (about 20 m.), while from Arth-Goldau a line runs past Biberbrücke (where falls in the branch from Einsiedeln, 3 m.) towards Wädenswil. From Arth-Goldau a mountain line runs up to the Rigi Kulm, with a branch to the Rigi Scheidegg, while from Arth-Goldau the line towards Zug runs for 5½ m. within the canton. There is also a mountain line from Brunnen to Axenstein. In 1900 the population was 55,385, of whom 53,834 were German-speaking, 1108 Italian-speaking, and 296 French-speaking, while 53,537 were Romanists, 1836 Protestants and 9 Jews. The most populous town is Einsiedeln, with its famous Benedictine monastery, but Schwyz (the port of which is Brunnen) is the political capital.

There is a certain amount of industrial activity in the canton, particularly in the portion bordering on the lake of Zürich, while silk-weaving at home is widespread. There are many fruit trees, particularly cherry trees. But on the whole the region is essentially a pastoral one, and the local brown race of cattle is much esteemed and largely exported, mainly to north Italy. There are 417 mountain pastures or "alps" in the canton, capable of supporting 17,492 cows, and of an estimated capital value of 1,128,000 frs. Till 1814 the canton was included in the diocese of Constance, but it is now nominally part of that of Coire. There are six administrative districts in the canton, which comprise thirty communes. The cantonal constitution dates mainly from 1876, but was revised in 1898. The legislature (*Kantonsrat*) is composed of members elected in the proportion of one for every six hundred (or fraction over two hundred) inhabitants and holds office for four years—the elections in twelve (the larger) of the thirty electoral circles take place according to the principles of proportional representation. The executive (*Regierungsrat*) of seven members is elected by a popular vote, and holds office for four years. The two members of the federal *Ständerat* and the three of the federal *Nationalrat* are also chosen by a popular vote. The "obligatory referendum" prevails in the case of all laws approved by the legislature and important financial measures, while two thousand citizens may claim a popular vote as to any decrees or resolutions of the legislature, and have also the right of "initiative" as to the revision of the cantonal constitution or as to legislative projects.

The valley of Schwyz is first mentioned in 972 under the form of "Suittes." Later, a community of freemen is found settled at the foot of the Mythen, possessing common lands, and subject only to the count of the Zürichgau, as representing the German king. Its early history consists mainly of disputes with the great monastery of Einsiedeln about rights of pasture. In 1240 the community obtained from the Emperor Frederick II. the privilege of being subject immediately to the empire. Its territory then included only the district round the village of Schwyz and the valley of the Muota. But in 1269 it bought from Count Eberhard of Habsburg-Laufenburg (who in 1273 sold all his other rights to the head of the elder line of the Habsburgs), Steinen and Rothenthurm. Schwyz took the lead in making the famous everlasting league of the 1st of August 1291, with the neighbouring districts of Uri and of Unterwalden, its position and political independence specially fitting it for this prominence. An attack by Schwyz on Einsiedeln was the excuse for the Austrian invasion that was gloriously beaten back in the battle of Morgarten (November 15th, 1315). In the history of the league Schwyz was always to the front, so that its name in a dialectal form (Schweiz) was from the early 14th century onwards applied by foreigners to the league as a whole, though it formed part of its formal style only from 1803 onwards. Between 1319 and 1354 Schwyz secured possession of Arth. But it was only after the victory of Sempach (1386) that it greatly extended its borders. An "alliance" with Einsiedeln in 1397 ended in 1434 with the assumption of the position of "protector" of that great house, between 1386 and 1436 the whole of the "March" (the region near the upper lake of Zürich) was acquired, in 1402 Küssnacht was bought, and in 1440 the "Höfe," the parishes of Wollerau, Feusisberg and Freienbach, situated on the main lake of Zürich. All these districts were governed by Schwyz as "subject lands," the supreme power resting with the *Landsgemeinde* (or assembly of all male citizens of full age), which is first distinctly mentioned in 1294, though it seems to have already existed in 1281, when mention is also made of a common seal. Schwyz joined the other forest cantons in opposing the Reformation and took part in the battle of Kappel (1531), in which Zwingli fell. In 1586 it became a member of the Golden or Borromean League, formed to continue the work of St Charles Borromeo in carrying out the counter reformation in Switzerland. In 1798 Schwyz, including Gersau (free from 1390), formed part of the République Telliane (or Tellgau) set up by the French, which a week later gave way to the Helvetic republic. The men of Schwyz, under Aloys Reding, offered a valiant resistance to the French, but they were forced to yield. Their land formed part of the vast canton of the Waldstätten, though the March and the Höfe were lost to that of the Linth. In 1799 a French occupation was successfully resisted, while later in the same year part of the canton was the scene of the disastrous retreat from Altdorf to Glarus over the Kinzigkulm and Pragel passes by the Russians under Suvarov in face of the French army. In 1803 the separate canton of Schwyz was again set up, the March and the Höfe being recovered, while Gersau now became part of it. In 1806 the great landslip from the Rossberg buried Goldau, causing great loss of life and of property. Later, Schwyz resisted steadily all proposals for the revision of the pact of 1815, joined in 1832 the league of Sarnen, and in 1845 the Sonderbund, which was put down by a short war in 1847. In 1832 the outer districts (Einsiedeln, the March, Küssnacht and Pfäffikon) formed themselves into a separate canton, an act which brought about a federal occupation of the old canton in 1833, this ending in the dissolution of the new canton, the constituent parts of which were put on an equal political footing with the rest. In 1838 a strife broke out in the older portion of the canton between the richer peasant proprietors (nicknamed the "Horns," as they owned so many cows) and the poorer men (dubbed the "Hoofs," as they possessed only goats and sheep) as to the use of the common pastures, which the "Horn" party utilized far more than the others. The "Horn" party finally carried the day at the Landsgemeinde held at Rothenthurm. The cantonal constitution of 1848 put an end to the ancient Landsgemeinde; it was revised in 1876 (when membership of one of the 29 communes became the political qualification), and in 1898.

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SCHWYZ, the capital of the Swiss canton of that name, a picturesque little town, admirably situated, amid fruit trees, on a mountain terrace (at a height of 1706 ft.), commanding a glorious view, at the north-west foot of the conical peak of the Gross Mythen (6240 ft.), and at a considerable height above the valley of the Muota. Besides a stately 18th century parish church and several convents, it contains a 16th century town hall (housing various precious MSS. and banners captured in various wars), as well as several curious old patrician houses, such as that of the Reding family, a member of which, Aloys (1765–1818), headed the patriotic resistance to the French in 1798–1799. Including the neighbouring hamlets of Ibach, Rickenbach, &c., the parish had 7398 inhabitants in 1900, practically all German-speaking and Romanists. The town is connected by an electric tramway with the Schwyz-Seewen station on the St Gotthard railway, about 3 m. from Brunnen, the port of Schwyz on the lake of Lucerne.

SCIACCA, a town and episcopal see of Sicily, on the S. coast, in the province of Girgenti, 45 m. N.W. of Girgenti by road, and about 30 m. direct. Pop. (1906) 24,645. It is surrounded by walls erected in 1400, and has two ruined castles, belonging to the Luna and Perollo families, whose hereditary feuds lasted from 1410 to 1529, some fine medieval palaces, and several interesting churches. The cathedral, founded in 1090, was largely reconstructed in 1686. The convent of Sta. Maria delle Giummare, with its battlemented walls, occupies the former palace of the Saracen governors, and contains a painting of the foundation of the convent by Count Roger. The town has only an open roadstead. It has an important trade in coral.

Three miles E. of the town is the Monte San Calogero (the ancient Mons Cronius) with sulphurous and saline springs and vapour baths, which are still frequented and were known in Roman times as Aquae Larodes or Thermae Selinuntiae (Sciacca is about 15 m. direct S.E. of Selinus). The name Sciacca is Arabic, but of uncertain meaning. The town is the birthplace of Tommaso Fazello (1498–1570), the father of Sicilian history.

SCIATICA (from a late Lat. corruption, *sciaticus*, of Gr. *ἰσχιαδιακός*, from *ἴσχιον*, the hip-joint), a form of neuralgia localized in the sciatic nerve, or its cords of origin; see NEURALGIA.

SCIENCE (Lat. *scientia*, from *scire*, to learn, know), a word which, in its broadest sense, is synonymous with learning and knowledge. Accordingly it can be used in connexion with any qualifying adjective, which shows what branch of learning is meant. But in general usage a more restricted meaning has been adopted, which differentiates "science" from other branches of accurate knowledge. For our purpose, science may be defined as ordered knowledge of natural phenomena and of the relations between them; thus it is a short term for "natural science," and as such is used here technically in conformity with a general modern convention.

The origin of science.

The beginnings of physical science are to be sought in the slow and unconscious observation by primitive races of men of natural occurrences, such as the apparent movements of the heavenly bodies, and in the gradually acquired mastery over the rude implements by the aid of which such men strove to increase the security and comfort of their lives. Biological science similarly must have begun with observation of the plants and animals useful to man, and with empirical medicine and surgery. It was only when a considerable progress had been made with ordered knowledge that men began to ask questions about the meaning and causes of the phenomena, and to discern the connexions between them.

In the earliest stage of development it seems that an anthropomorphic or mythological explanation is always assigned to the phenomena of nature. With no clue to trace the regularity of sequence and connexion between those phenomena, an untutored mind inevitably refers the apparently capricious events which succeed each other to the direct and immediate intervention of some unseen being of a nature essentially similar to his own. The sun is the flaming chariot of the sun-god, driven day by day across the heavens; the clouds are cows from which milk descends as nourishing rain on the fruitful earth. We may regard such myths as childlike fancies, but they were doubtless an advance on the want of all explanation which preceded them; they supplied hypotheses which, besides giving rise to themes of beauty and suggestiveness for poetry and art, played the first and chief part of a scientific hypothesis in pointing the way for further inquiry. Much useful knowledge was acquired and much skill gained in logical analysis before these primitive explanations were proved insufficient. A false theory which can be compared with facts may be more useful at a given stage of development than a true one beyond the comprehension of the time, and incapable of examination by observation or experiment by any means then known. The Newtonian theory of gravitation might be useless to a savage, to whose mind the animistic view of nature brought conviction and helpful ideas, which he could test by experience.

The phenomena of the heavens are at once the most striking, the most easily observed and the most regular of those which are impressed inevitably on the minds of thinking men. Thus it is to astronomy we must look for the first development of scientific ideas. The orientation of many prehistoric monuments shows that a certain amount of astronomical observation had been acquired at a very early age, and the Chaldeans seem to have gone so far as to recognize a law of periodicity even in eclipses. From the land of Asia the Greeks took their earliest ideas of science, and it is to the Ionian philosophers, of whom Thales of Miletus (580 B.C.) is regarded as the first, that we must turn for the earliest known example of an advance on the mythological view of nature. Anaximenes recognized the rotation of the heavens round the pole star, and saw that the dome overhead was but the half of a complete sphere. The earth was thus deprived of the base stretching to unfathomed depths imagined by the mythologists, and left free to float as a flattened cylinder at the centre of the celestial sphere. Anaximenes, too, seems to have grasped the doctrine of the uniformity of nature, teaching that all material transformations must have a true cause.

Early astronomy.

Next came the Pythagoreans, who simplified these conceptions by the suggestion that instead of a rotation of the vast sphere of the heavens the earth itself might be a sphere and revolve about a central fixed point, like a stone at the end of a string. The uninhabited side of the earth always faced the fixed point, and its inhabited side faced successively the different parts of the heavens. At the central fixed point they placed a "universal fire," which, like the fire on an altar, served as a centre for the circling of the worshipping earth. Mythology was losing its hold of science, but mystical symbolism still held sway. When, however, in the 4th century B.C. the growth of geographical discovery failed to disclose any trace of this central fire, the idea of its existence faded away, and was replaced by the conception of the revolution of the earth on its own axis. Finally, Aristarchus (280 B.C.), believing that the sun was larger than the earth, thought it unlikely that it should revolve round the earth, and developed a heliocentric theory. But the time was not ripe; no indisputable evidence could be adduced, no general conviction followed, and to mankind the earth remained the centre of creation till many centuries later. Even to Lucretius, the visible universe consisted of the central earth with its attendant water, air and aether founded by the sphere of the heavens, which formed the flaming walls of the world—*flammantia moenia mundi.*

The problem of matter.

Simultaneously with the birth of astronomy the problem of matter came into being. The old Ionian nature philosophers, observing the sequence of changes from earth and water into the structure of plants and the bodies of animals, and through them again into the original constituents, began to grasp the conception of the indestructibility of matter, and to put forward the idea that all forms of matter might ultimately consist of a single "element." But the conception of a single ultimate basis of matter was far in advance of the age. It is only now becoming a fertile working hypothesis in the light of all the gigantic increase in knowledge of the intervening two thousand years. At the time when it was put forward, the conception was of little use, and the immediate path of advance was found in the idea of Empedocles (450 B.C.) that the primary elements were four: earth, water, air and fire—a solid, a liquid, a gas and the flame which seemed to the ancients a type of matter of still rarer structure. This hypothesis served to interpret the phenomena of nature for many centuries, till, in modern days, the growth of chemistry disclosed the seventy or eighty elements of our text-books. Signs are not wanting that they too have served their turn as a conception of the ultimate nature of matter, while still maintaining their place as the proximate units of chemical action.

The theory of atoms.

In the four elements of Empedocles we trace the germ of the ideas of the Atomists. Empedocles saw that, by combining his separate elements in different proportions, he could explain all the endless differences in matter as known to the senses. Leucippus and Democritus developed the conception and gave to the world the theory of atoms, described at a later date by the Roman poet Lucretius. As matter is subdivided does it keep its characteristic properties throughout? Is iron always iron, however finely we divide it; is water always water? Are the properties of any kind of matter ultimate facts of which no explanation—no description in simpler terms—is possible? To avoid answering this last question in the affirmative, and resigning all hope of an advance in knowledge, the atomic theory of the Greeks was framed.

To recognize the significance of the doctrines of the Greek Atomists, we must remove from our minds all sense of comparison with the atomic theory of to-day. The Greeks had none of the detailed physical and chemical knowledge on which that theory is founded, and which it was framed to explain. The object of Leucippus and Democritus was quite different from that of Dalton and Avogadro. To the latter, the conception of atoms and molecules served as a means of explaining certain definite and detailed facts of chemical combination and gaseous volume in a more definite and exact way than any other hypothesis available at the time. To the Greek philosophers, the atomic theory was an attempt to make the universe intelligible. The particular explanation offered was not of so much importance as the idea that an explanation of some kind was possible. When we see the beliefs that held sway before their day, we realize the advance their ideas produced. The qualities of substances were thought to be of their essence—the sweetness of sugar was as much a reality as sugar itself, the black colour of water must survive all changes in its form, so that, to one who knew this doctrine, snow could never look white again. It was such confusion as this—such denial of facts if they failed to support a theory—that Democritus assailed:— "According to convention there is a sweet and a bitter, a hot and a cold, and according to convention there is colour. In truth there are atoms and a void." Atoms were many in size and shape, but identical in substance. All qualitative differences in substances were to be assigned to differences in size, shape, situation and movement of particles of the same ultimate nature. No attempt was made to examine into the nature of this ultimate substance; but one set of phenomena was expressed in terms of something simpler, and no "explanation" even of the most recondite observation by the most modern physicist can do more.

The atomic theory of the Greeks as transmitted to us by the poem of Lucretius presented a wonderfully consistent picture of nature within the limits of the knowledge of their day. It is easy to show where it fails in the light of the knowledge of phenomena we now possess; it is easy to point to places where, as in its application to psychological problems, its authors passed in imagination over logical chasms without even seeing that a difficulty existed. But the attempt to frame an intelligible picture was a great step in advance, and a study of the flaws which we can now detect may serve to suggest the provisional nature of some of the theories by the aid of which knowledge is advancing so fast in our own day.

But the great difference between the position of the Greeks and that of ourselves in regard to natural knowledge consists in the small number of phenomena known to them contrasted with the enormous wealth of accumulated observation which is available for us, as the result of years of experiment with the aid of apparatus unknown to the ancients. When a new theory is put forward, it is now almost always possible to test its concordance with facts by the use of material already accumulated, or to suggest, in the light of such material, experiments which will serve to refute it, or to lend it greater probability. Thus a theory which survives the trials that follow its birth has nowadays a fairly long expectation of life—probably the theory will serve to interpret phenomena discovered either by its means or in other ways for some time to come. But in the ancient world this was not so. To test a new theory, other phenomena were very rarely available than those which suggested it, or to explain which it was put forward. Thus thought was much more speculative, and, as is still the case with metaphysics, no general consensus of opinion was reached. Each philosopher had a system of his own in science, just as he still has in metaphysics—a system which, beginning from first principles anew, raises on them a superstructure, which, even if it logically follows from them, can have no more validity than the premises on which it is based. When the premises are not accepted by other philosophers, the whole scheme becomes merely the doctrine of one man, and, if it lives at all, may oppress by the dead weight of authority the struggle of living thought beneath it.

Aristotle.

The history of the atomic theory of Leucippus and Democritus illustrates the difficulties of a position where speculation has outstripped observation. The theory was nearer what is now accepted as truth than any other of the ancient schemes of physics. Yet the grounds on which it was based were so insecure that Aristotle (*c.* 340 B.C.), who started with other preconceptions, was able to bring to bear such destructive criticism that the theory ceased to occupy the foremost place in Greek thought. Although, with the knowledge then available, we can but admit that some of Aristotle's criticism was just, much of it consists of metaphysical arguments against the atomists, while in parts he rejects true conclusions owing to what he considers their impossibility. Democritus, for instance, had held that all things would fall with equal speed in a vacuum, and that the fact that heavy bodies were observed to fall faster than very light ones was due to the resistance of the air. Democritus's belief was true, though he was of course quite unconscious of the grounds on which it can alone be demonstrated—the universal attraction of gravity, and the remarkable and curious experimental fact that the weights of bodies are proportional to their masses. Aristotle agrees that in a vacuum all bodies would fall at an equal rate, but the conclusion appears to him so inconceivable that he rejects the idea of the existence of any empty space at all, and with the "void" rejects the rest of the allied concepts of the atomic theory. If all bodies were composed of the same ultimate matter, he argues, they must all be heavy, and nothing would be light in itself and disposed to rise. A large mass of air or fire would then necessarily be heavier than a small mass of earth or water. This result he thinks impossible, for certain bodies always tend upwards and rise faster as their bulk increases. It will be seen that Aristotle has no idea of the conceptions we now call density and specific gravity, though clear views about the question why some things rise through water or air might have been obtained without the aid of physical apparatus. Aristotle's doctrine that bodies are essentially heavy or light in themselves persisted all through the middle ages, and did much to delay the attainment of more exact knowledge. It was not till Galileo Galilei (1564–1642) discovered by actual experiment that, in cases where the resistance of the air is negligible, heavy things fall at the same speed as light ones, that the Aristotelian dogma was overthrown.

Early biology.

Turning to the biological sciences, we may trace a somewhat similar course of development. Owing to its practical importance, medicine has left many records by which its progress can be traced. Just as primitive man personified the sun and the moon, the wind and the sea, so he regarded disease as due to the action of some malignant demon or to the spells of some human enemy. Once more Greek literature enables us to trace the gradual decrease in the importance assigned to charms and magic, and the growth of more rational ideas among physicians. But here, as in the physical sciences, the philosophic range of the intellect of the Greeks led them astray. Assumptions as to the nature of man or the origin of organic life were too often made the starting point of a train of deductive reasoning, the consequences of which were not always compared with the results of observation and experiment, even where such comparison was possible. The Greek philosophers tried to make bricks without straw, usually in sublime unconsciousness that straw was necessary. Many centuries of humble observation and tentative fitting together of small parts of the great puzzle were needed before enough material was collected to make possible useful generalizations about the questions, answers to which the Greeks assumed as the very basis of their inquiries.

Among the multitude of their guesses, a few somewhat resembled the views that are now again rising into prominence from the basis of definite and exact experiment. A good example of the strength and weakness of ancient speculation is found in the cosmogony of the atomists, both on its physical and on its biological side. Lucretius describes how the world was formed by the conjunction of streams of atoms, which condensed into the earth, with its attendant water, air and aether, to form a self-contained whole. Unconscious of the mighty gap between inorganic matter and living beings, he proceeds to tell how, in the chances of infinite time, all possible forms of life appeared, while only those fittest to survive persisted and reared offspring. Here, surrounded by unsupported statements and false conclusions, we see dimly the germs of the ideas of the nebular hypothesis and the theory of natural selection, though Lucretius had the profoundest ignorance of the difficulties of the problem, and the vast stretches of time necessary for cosmical and biological development.

In those branches of biological science in which less ambitious theorizing and more detailed observation were forced on the Greeks, considerable progress was made. Aristotle compiled a laborious account of the animals known in his day, with many accurate details of their anatomical structure. Beginning from an earlier date, steady advance was made with geographical discovery. Maps of the known world, developed from the local maps invented by the Egyptians for the purposes of land-surveying, gave definiteness to the knowledge thus acquired, and showed its bearing on wider problems.

Geometry.

One of the most striking successes of Greek thought is seen in the development of geometry. Geometry has a twofold importance, as being itself the study of the properties of the space known to our senses, and as teaching us methods and means of studying nature by unfolding the full logical consequences of any hypothesis: geometry is the best type of deductive reasoning. Based on axioms, the result of simple experience, it traces from the ideas of solids, surfaces, lines and points the properties of other figures defined in terms of those ideas. As an example to other sciences, the deductive geometry of Euclid (*c.* 300 B.C.) had, perhaps, an unfortunate influence in emphasizing the deductive method, and teaching men to neglect the need of verifying by experiment the theories put forward to explain the more complex phenomena of nature at the conclusion, and at each possible step, of the deduction. But, in itself, the science of Euclidian geometry was brought to such a state of perfection that no advance was made till modern times: no change even in form attempted till quite recently. Unlike some other branches of inquiry we have mentioned, Euclid's geometry carried universal conviction, and represented a permanent step in advance which never had to be retraced.

Theories of knowledge.

Alongside the study of individual sciences, the Greeks paid even more attention to the laws of thought, and to the examination of the essence of the methods by which knowledge in general is acquired. In opposition to Plato's theory that all knowledge is but the unfolding and development of forgotten memories of a previous state of existence, Aristotle taught that we learn to reach the generalizations, which alone the Greeks regarded as knowledge, by remembering, comparing and co-ordinating numerous particular acts or judgments of sense, which are thus used as a means of gaining knowledge by the action of the innate and infallible nous or intellect. Neither Plato nor Aristotle could be satisfied without finding infallibility somewhere. Aristotle, it is true, investigated the logical processes by which we pass from particular instances to general propositions, and laid stress on the importance of observing the facts before generalizing about them, but he had little appreciation of the conditions in which observation and the induction based on it must be conducted in practice in order to obtain results where the probability of error is a minimum. Aristotle regarded induction merely as a necessary preliminary to true science of the deductive type best seen in geometry, and, in applying his principles, he never reached the "positive" stage, in which metaphysical problems are evaded, if not excluded, and a scheme of natural knowledge built up in a consistent manner, so that metaphysical ideas, though they may underlie the foundation of the ultimate conceptions, do not intrude between the parts of the building. Hence Aristotle's explanations often turn directly on metaphysical ideas such as form, cause, substance, terms which do not occur (in the Aristotelian sense) in modern scientific terminology.

The origin of mechanics.

A century later than the time of Aristotle, Archimedes of Syracuse (287 to 212 B.C.) formulated the fundamental conceptions of hydrostatics and took what may be regarded as the first step in the exact science of mechanics. The use of the lever must have been discovered at a very early date, and Archimedes set to work to investigate its quantitative laws by the application of principles learnt from the geometers. He begins by laying down two axioms: (1) Equal weights placed at equal distances from the point of support of a bar will balance: (2) Equal weights placed at unequal distances do not balance, but that which hangs at the greater distance descends. The ancient philosophers based such axioms as the first of these two on the "principle of sufficient reason." No motion can take place, because, from the symmetry of the system, there is no reason why the balance should descend on one side more than the other. Even if we grant the theoretical validity of this principle, it is impossible to make sure without trial that the system in any given case is really symmetrical. Electrification of the bar, for instance, though imperceptible to our senses, would cause one end to descend if an oppositely electrified body were placed near that end; we cannot assume without trial that the position of the sun, or the colour of the arms, will not affect the result. Archimedes based the second axiom on the sounder ground of direct experience. On these two axioms he proceeded to construct an elaborate deductive proof of the numerical law of the lever, but, in the course of it, he assumed as known the principle of the centre of gravity. In reality, this principle is identical with that of the lever, and assuming one, implicitly we assume the other. Nevertheless, Archimedes' proof is of use and interest. On the assumptions made, it shows the connexion between the general case of the lever with unequal arms, and the special and more familiar case when the arms are equal. Indeed, if we also treat the principle of the centre of gravity as an axiom known by experience, Archimedes' proof is a true type of all scientific "explanations"; it reduces an unfamiliar phenomenon to others already well known to our minds, which, creatures of habit as they are, regard the familiar cases as in no need of explanation. Nowadays we should treat the law of the lever of unequal arms as one that is verified by direct and familiar experiment, and use it, in its turn, as the starting point for further deduction.

The dark ages.

Thus before the intellectual activity of Greece was absorbed by the utilitarianism of Rome, which, in its turn, was lost in the dark ages following the barbarian conquests, the seeds were sown which, germinating after the lapse of centuries, developed in the more fruitful soil of the age of experiment. But for a time they were buried, and only remembered by compendiums written just before the ancient light was wholly lost. During the dark ages, the contents of secular learning, based on those compendiums, settled down into the elementary "trivium," consisting of grammar, rhetoric and dialectic, and the more advanced "quadrivium" music, arithmetic, geometry and astronomy. Music included a half-mystical doctrine of numbers and the rules of plainsong; geometry consisted of a selection of the propositions of Euclid without the demonstrations; while arithmetic and astronomy were cultivated chiefly because they taught the means of finding Easter. Meanwhile, the early alchemists of Alexandria, by the aid of mystical analogies with the conceptions of astrology, were making primitive experiments on the transformations of various substances. It was probably from them that the "sacred science" passed to the Arabs, among whom Geber (*c.* A.D. 750) discovered many new chemical reactions and compounds.

Medieval learning.

With the intellectual revival which began in the 11th century, and the gradual recovery of some of the lost works of the ancient writers, we turn a new page. The controversy between Plato and Aristotle upon the doctrine of ideas fascinated the minds of the middle ages, saturated as they were with the logical subtleties of dialectic. This controversy originated the long debate on the reality of universals, which absorbed the intellectual energies of many generations of men. Did reality belong only to the idea or universal—to the class rather than to the individual—to the common humanity of mankind, for instance, rather than to each isolated being? Or were the individuals the reality, and the universals mere names? In this question, trivial, almost meaningless, as it seems at first sight, logical analysis disclosed to the medieval mind the whole theory of the universe. Either answer contained danger to theological orthodoxy as then understood; hence the fervour with which it was debated. But, as communication with the East was reopened early in the 13th century, Latin translations of Aristotle's works gradually were recovered; the whole of Aristotle's philosophy was reimported into the schools of Europe, and reconciled and adopted by Christian theology. For three hundred years Aristotle reigned supreme in European thought, and exponents of the scholastic philosophy, ignoring their master's teaching on the need of experiment, settled questions of fact as well as those of opinion by an appeal to his books. But outside the academic schools of the newly founded universities, experiment was kept alive by the labours of the alchemists, who, early in the 13th century, caught their ideas from the Arabs, and began to search for an *elixir vitae* and for a means of transmuting baser metals into gold. But alchemy never quite squared its account with orthodox theology, and the "sacred science" of the Alexandrians became associated in the medieval mind with the "black art" of witchcraft. Even a man like Roger Bacon, who, with some astrological mysticism, had a more modern idea of experiment both in chemical and physical problems, did not escape condemnation.

The Renaissance.

We now reach the period in the history of the world known as the Renaissance, when many converging streams of thought were given room to join by the increased material prosperity and improved political stability of the 15th and 16th centuries. The Renaissance was not, as it is sometimes represented, a sudden break with medievalism and a birth of the modern world. But a number of conditions favourable to rapid development happened to coincide, and, in the course of a century, men's outlook on themselves and on nature became profoundly modified. The recovery of the Greek language, the voyages of Columbus, the decay of the Western and the passing of the Eastern empire, the temporary diminution in power of the papacy, the invention of printing, all tended to produce new ideas and to prepare men's minds to accept the more human and naturalistic view of the universe which had been current among the Greeks, in place of the mystical aspect which it wore to the medieval schoolmen and ecclesiastics. At first the tendency was to substitute the authority of the ancients for the authority of the schoolmen, but gradually more independence of thought was secured; men like Leonardo da Vinci (1452–1519) began to experiment and to record their results; Nicolaus Copernicus (1473–1543) revived the heliocentric theory, and showed how the accumulated mass of astronomical observations could be interpreted by its means; and anatomy began again to be studied in the schools of medicine, gradually making its way in face of the prejudice against mutilating the human body.

Francis Bacon.

The philosophy of the new experimental methods was first studied deeply by Francis Bacon (1561–1626). Sensible of the confused and disjointed information which then constituted the only scientific knowledge, Bacon set himself to describe a new method by which definite knowledge might be acquired with certainty. Warned by the failure of the scholastic methods, Bacon laid exclusive stress on experimental research, and it was perhaps natural that he should incline to the other extreme and ignore almost entirely the use of hypothesis and the deductive method. To arrive at the underlying causes, said Bacon, we must study the natural history of the phenomena, collect and tabulate all observations which bear on them, notice which phenomena are related in such a way as to vary together, and then, by a merely mechanical process of exclusion, we discover the cause of any given phenomenon. As a corrective of the medieval philosophy Bacon's work was of the greatest value in the history of thought, and, from this point of view, it is perhaps but a small drawback that scientific discovery is seldom or never made by the pure Baconian method. The multitude of phenomena are too great for any subject to be attacked with success without the aid of hypothesis framed by the use of the scientific imagination. Facts are collected to prove or disprove the consequences deduced from the hypothesis, and thus the number of facts to be examined becomes manageable.

Galileo.

Even while Bacon was philosophizing, the true method was being used by Galileo Galilei (1564–1642) to found the science of dynamics. We have seen how the Aristotelians held the belief that every body sought its natural place, the place of heavy bodies being below and that of light ones above. Innate qualities of heaviness and lightness were thus invoked to explain why some things fell, and others, in similar circumstances, rose. Galileo, rightly rejecting the whole current point of view, set himself to examine not why, but how, things fell. This change of attitude was in itself one of his great achievements. Now a falling body starts from rest and falls with a speed which is increasing constantly. Galileo sought to find the law of increase. To isolate the real law out of all possible laws he made a guess at a simple law which seemed likely to be true. He assumed that the speed acquired is proportional to the distance fallen through. But, working out the consequences of this hypothesis, he soon convinced himself that it involved a contradiction. He abandoned the hypothesis and made another. He supposed that the speed was proportional to the time of fall. Again he deduced mathematically the consequences of this new hypothesis, and, finding no inconsistencies, put some of his deductions to the test of experiment, and verified their accuracy. Thus Galileo proved mathematically that, if the speed of fall is proportional to the time from the moment of starting, the space traversed by a falling body must be proportional to the square of the time of fall. To verify this result experimentally, Galileo convinced himself that a body falling down an inclined plane acquired a speed which is the same as that it would have attained in falling through the same vertical height. He was able therefore to use a slow fall down a plane for his experiments instead of the unmanageably rapid course of a body falling freely. Nor was this all. From this stage to the investigation another consequence of his results was found to spring. A ball after running down an inclined plane of a certain height will run up another plane of the same height irrespective of its inclination—that is, if friction be small. The second plane may be made very long, but still, if its final height be the same, the ball will reach its end. Hence it is the height that matters; none of the speed of the ball is destroyed unless it rises. If the second plane be made horizontal, the ball will thus run on for ever unless stopped by friction or some other applied force. This fundamental result, put into definite words by Newton, is known as the first law of motion, and is the foundation of the whole science of dynamics. In Galileo's day it was an entirely new conception. It has been assumed that every motion required some cause or force to maintain it. Hence arose the need of hypothetical vortices to maintain planetary movements, and similar complications in astronomy and mechanics. But it now became evident that it was not the continuous motion of the planets which needed explanation, but the constant deflection of that motion from the straight path it would hold if no applied force were in action. The way was open for Newton.

Newton.

Sir Isaac Newton (1642–1727) proved mathematically that the observed motion of the planets about the sun could be explained, and explained only, by the supposition that the sun exerted a force on each planet proportional inversely to the square of its distance from the planet. But the earth, at any rate, does attract bodies on ~~or~~ near its surface, the phenomenon being the familiar but mysterious gravity. Is this force competent to account for the motion of the moon round the earth? On the assumption of the law of inverse squares, Newton calculated what the known force of gravity would become at the distance of the moon. Owing to faulty data, his first result indicated that the force would be too great, and Newton put aside his calculations. Six years later a new determination of the size of the earth gave him a new basis for calculation, and, in an excitement so great that he could hardly see his figures, Newton found that the fall of a stone to the earth and the sweep of the moon in her orbit were due to the same cause. The mechanism by means of which the force is exerted remained unrevealed to Newton, and has baffled all inquirers since his day, but the discovery that all the movements of the heavens could be described by one simple physical law, represents the greatest achievement in the history of science.

Laplace.

Newton brought the existing state of the solar system within the cognizance of known dynamical principles, and the logical extension of such principles to explain the origin of that system was made by the speculations of Pierre Simon, marquis de Laplace (1749–1827), and developed by those who followed him. They imagined a primitive state of nebulosity from which, by the action of known dynamical processes, the sun and planets would be evolved.

Geology.

These speculations, isolated at first, coalesced with the more detailed conclusions of geology during the 19th century. The earlier conceptions of the origin of the rocks of the earth imagined catastrophes of fire or water, processes alien to those of everyday experience. But the "uniformitarian" school, founded by James Hutton (1726–1797) and expounded by Sir Charles Lyell (1797–1875), produced evidence to show that much, at any rate, of the structure of the surface of the globe was produced by the action of causes and processes still going on under our eyes. The deposition of material by the action of seas and rivers and other natural agencies, *e.g.* volcanoes, &c., was seen to need only time enough to produce beds of rock like those which make up our mountains. Comparison of the fossil remains of plants and animals found in different kinds of rock then enabled geologists to classify the rocks, and place them in a chronological sequence. Moreover, it became evident that a series of animal and plant types was associated with the gradual formation of the rocks, and that the age both of the earth itself and of the organic life found on it was much greater than had been suspected. The few thousand years of received cosmogonies stretched out into untold millions, during which the same familiar laws described the phenomena of development. The remains and traces of man, found, it is true, only in the later sedimentary deposits of the earth, still were enough to prove his existence through ages beside which the dawn of history was but as yesterday. As Newton had extended known principles throughout the gigantic spaces of the heavens, so the later geologists pushed them back over enormous epochs of time. The extent of the kingdom of ordered knowledge expanded both in space and time to a degree truly marvellous.

The spectroscope.

The discovery by Sir George G. Stokes (1819–1903), R. W. Bunsen (1811–1898) and G. R. Kirchhoff (1824–1887), that the spectroscope gave a means of investigating the chemical composition of the sun and the stars, brought another set of phenomena under the control of terrestrial experiment. Moreover, the differences in stellar spectra once more suggested the idea of cosmical development, familiar from the nebular hypothesis of Laplace.

Darwin.

Besides the direct extension of the dominion of science produced by geology and spectroscopy the new results emphasized the idea of development, and prepared the way for the biological work of Charles Darwin (1809–1882). The origin of living beings from a few ancestral types was an old conception, but Darwin first found an adequate intelligible cause in the slow action of sexual selection, joined to the pressure of the struggle for life, which allowed only those individuals most suited by favourable variation to the environment to survive and rear their offspring. The advantage thus given to beings with useful variations may develop into permanent modifications in the course of ages, and, when the parent types have disappeared, their common posterity may exhibit the marked differences characteristic of the separate and distinct species now existent. From the point of view of scientific thought, the significance of Darwin's theory lies in the new and vast extension it gives to the field in which causes intelligible to the human mind can be sought as explanations of phenomena. Thus evolution is co-ordinated in the history of thought with the Newtonian theory of gravitation, and with the uniformitarian theory of geology.

Variation.

Both before and after the appearance of Darwin's work, biologists devoted their attention to the study of how the useful variations arise. Three views have been held. (1) Jean Baptiste, chevalier de Lamarck (1744–1829), regarded variation as due to the accumulated and inherited effect of use. Thus the giraffe acquires his long neck by the successive efforts of countless generations to browse on leaves just beyond their reach. (2) Darwin, while accepting changes in accordance with Lamarck's ideas as exceptional aids to variation, revolutionized biology by showing the primary importance of the struggle for life, when extended over long periods of time, in selecting useful variations which arise accidentally or in other ways. (3) Darwin also recognized the possible occasional effect of discontinuous variations or "sports," when a plant or an animal diverges from its parents in a marked manner. But of late years the study by Hugo de Vries, William Bateson and others, of discontinuous variations which arise spontaneously has pointed to the conclusion that in nature such sudden leaps are the normal cause of development. If a "sport" has advantages over the parental type, it tends to survive, while, if it is not as fitted for its life struggle, it is destroyed by natural selection and never establishes itself. Such a theory avoids the difficulty of pure "Darwinism," that organs useful, when fully developed, to an animal or plant are of no advantage in incipient stages. Statistical methods, too, suggest that a definite limit may exist to the amount of a given variation which proceeds by small steps, each insignificant in itself.

Inheritance.

Closely connected with such problems is the question of inheritance. Lamarck's theory required the inheritance of characteristics acquired during the life of a parent. But difficulties, such as that of seeing how such a change could affect the simple germ cells, has led some more recent biologists to pass to the other extreme, and to deny the possibility of any acquired characteristic being transmitted to offspring.

Mendel.

A new light has been thrown on the problem of inheritance by the recent re-discovery of the work of G. J. Mendel, abbot of Brunn (1822–1884). Certain characters in both plants and animals have been found to be separable, and some of these characters exist in pairs, so that the presence of one involves the absence of the other. To take a simple example. Blue Andalusian fowls do not breed "true." On the average, half the offspring of two blue parents are blue, while the remaining half are divided equally between black and white birds. Both black and white when mated with a consort of the same colour breed "true" and yield only offspring similar to the parents. A white bird mated with a black, however, produces invariably all blue chicks. White mated with blue gives half blue and half white, while black mated with blue gives half blue and half black. Such phenomena are explained if we suppose that of the germ cells of the blue birds half bear the black character and half the white. If, in reproduction, a "black" cell meets a "black" the resulting chick is black; if "white" meets "white" the chick is white; while if "white" meets "black" the chick possesses a mixture of the two characters which in this case yield blue colour. But the reproductive cells of this intermediate form are not intermediate in character; they possess the pure parental characters in equal numbers. Knowing these facts, it is evident that we can reproduce any of the results at will, and from the mixed blue type produce a pure true breed of either black or white birds. Experiments of this kind must lead to a power of breeding new varieties of plants and animals hitherto undreamed of, and already have changed altogether our views of the problems of heredity. Instead of a vague mixture of all our ancestors, we possess definite characteristics of some of them only, though, like the blue Andalusian fowl, we may transmit to our children ancestral characters we do not ourselves exhibit. The family or race is more important in heredity than the individual parent. Thus the aristocratic theory of politics receives support from the experience of biology.

The theory of energy.

Simultaneously with the growth of geology, and the birth of the Darwinian hypothesis, a new development took place in physical science—the development of the conception of energy as a quantity invariable in amount throughout a series of physical changes. The genesis of the idea in its modern form may be traced in the work of Newton and C. Huygens (1629–1695), who applied it to the problems of pure dynamics. But, in the middle of the 19th century, by the work of James Prescott Joule (1818–1889), Lord Kelvin (1824–1907), H. L. F. von Helmholtz (1821–1894), J. Willard Gibbs (1839–1903), R. J. E. Clausius (1822–1888) and others, it was extended to physical processes. The amount of heat produced by friction was found to bear a constant proportion to the work expended, and this experimental result led to the conception of an invariable quantity of something, to which the name of energy was given, manifesting itself in various forms such as heat or mechanical work. Energy thus took its place beside mass as a real quantity, conserved throughout a series of physical changes. Of late years, as we shall see below, evidence has appeared to show that mass is not absolutely constant, but may depend on the velocity when the velocity approaches that of light. Since the only essential quality of matter is its mass, this result seems to strike at the root of the metaphysical conception of matter as a real, invariable quantity. It remains to be seen whether the conception of energy as an invariable quantity will hold its place or give way to some similar modification as science develops. But, in the present state of knowledge, we may accept the principle of the conservation of energy as one of the most firmly established of physical laws.

The amount of energy in an isolated system remains invariable, but, if changes are going on in the system, the energy tends continually to become less and less available for the performance of useful work. All heat engines require a difference of temperature—a boiler and refrigerator, or their equivalents. We cannot continue to transform heat into mechanical work if all available objects are at a uniform temperature. But, if temperature differences exist, they tend to equalize themselves by irreversible processes of thermal conduction, and it becomes increasingly difficult to get useful work out of the supplies of heat. In an isolated system, then, equilibrium will be reached when this process of "dissipation of energy" is complete, and, from this single principle, the whole theory of the equilibrium of physical and chemical systems was worked out by Willard Gibbs. Such a method avoids altogether the use of atomic and molecular conceptions. In fact, some supporters of the theory of "energetics" expressly disclaim the conceptions of natural atoms and molecules as unnecessary and misleading, and prefer to found all science on the idea of energy. Matter, they argue, is known to us only as a vehicle for energy, and may itself be but a manifestation of that energy.

The theory of electric ions.

But the other great line of advance in recent physics, although it may lead us in the end to somewhat similar conclusions, has been traced by a method which used atomic and molecular conceptions in an extreme form. The passage of electricity through liquids had been explained by Michael Faraday (1791–1867) and others as a transference of a succession of electric charges carried by moving particles of matter or ions. At the end of the 19th century these ideas were extended, chiefly by the labours of J. J. Thomson, to elucidate also the conduction of electricity through gases. In 1897 Thomson discovered that, in certain cases, the moving particles which carried the electric current were of much smaller mass than the smallest chemical atom, that of hydrogen, and that these minute particles, to which he gave the name of corpuscles, were identical from whatever substance they were obtained. They enter into the structure of all matter, and form a common constituent of all chemical atoms. The only known properties of these corpuscles are their mass and their electric charge. Now, a charged body when set in motion spreads electromagnetic energy into the surrounding medium. Thus, more force is needed to produce a given acceleration than if the body were uncharged. The body acts as though its mass were greater than when it is uncharged. Now there is reason to believe that the whole apparent mass of the minute corpuscles to which we have referred is an effect of their electric charge. The idea of a material particle thus disappears with that of material mass, and the corpuscle becomes an isolated unit of electricity—an electron. It is impossible to resist making the speculation that the whole of an atom is made up of electrons, and that mass is to be explained in terms of electricity, though it must be pointed out that there is no conclusive evidence in favour of this hypothesis.

Another train of reasoning, starting from a different point, reinforces this result. The phenomena of the interference of beams of light in certain circumstances, to produce darkness or colour, indicate that light is some form of wave motion, and, to carry these waves, a hypothetical luminiferous aether was invented. The theoretical work of J. Clerk Maxwell (1831–1879) and the experiments of H. R. Hertz (1857–1894) showed that the properties and velocity of propagation of light and of electromagnetic waves were identical and that their other properties differed only in degree. Thus light became an electromagnetic phenomenon. But light is started by some form of atomic vibration, and to start an electromagnetic wave requires a moving electric charge. Thus electric charges must exist within the atom, and we are led again to the theory of electrons by the road opened up by H. A. Lorentz and Joseph Larmor. Such a theory suggests the occasional instability of the atom, and the phenomena of radioactivity, shown in a remarkable form by the substance radium, discovered by M. and Mme. Curie, have been explained satisfactorily by the theory of E. Rutherford and F. Soddy, who regard the energy liberated as due to the disintegration of the atom. The evolutionary view of nature, established in the biological and sociological sciences, is thus extended to physical science, not only in the development of planets and suns, but even in the chemical atoms, hitherto believed indestructible and eternal.

The methods of science.

As we have seen, Francis Bacon described a new method of discovery in which exclusive attention was paid to the collection and tabulation of facts, with a view to the detection of relations between them, and the consequent reference of "effects" to their proper "causes." Impressed by the barrenness of the a priori methods of the Schoolmen, Bacon in his philosophy went to the other extreme. The use of the Baconian method in its purity would be too laborious for success. Some guide is necessary in the collection of facts at an early stage of our investigations. Here the scientific imagination is brought into play, and some hypothesis is framed to explain the phenomena under investigation. The hypothesis may be suggested by the theories which are accepted at the time in cognate branches of knowledge, or it may be suggested by the few isolated facts already known or just discovered in the phenomena to be considered. From this new hypothesis, consequences are deduced by processes of logical reasoning—consequences which may be put to the test by comparison with the results of observation or experiment. If agreement is found, the hypothesis is, so far, confirmed, and gains in authority with every fresh concordance discovered. If the deductions from the hypothesis do not agree with the accepted interpretation of facts, the hypothesis may need modification, it may have to be abandoned altogether, or the want of concordance may point to some error or inconsistency in the fundamental concepts on which the hypothesis is based—the whole framework of that branch of science may need revision, as the idea of heat as a caloric substance had to be abandoned under the pressure of the experiments of Joule on the equivalence between work done and heat developed. But the ultimate test of the validity of our knowledge can only be the consistency with each other of the parts of the whole scheme. If the received interpretation of one set of phenomena is not consistent with that of another, one or other or both of the interpretations must be wrong if we make the assumption necessary for all knowledge, namely, that the universe is intelligible to a mind capable of dealing with its complexity.

The classification of the sciences.

In early times, when the knowledge of nature was small, little attempt was made to divide science into parts, and men of science did not specialize. Aristotle was a master of all science known in his day, and wrote indifferently treatises on physics or animals. As increasing knowledge made it impossible for any one man to grasp all scientific subjects, lines of division were drawn for convenience of study and of teaching. Besides the broad distinction into physical and biological science, minute subdivisions arose, and, at a certain stage of development, much attention was given to methods of classification, and much emphasis laid on the results, which were thought to have a significance beyond that of the mere convenience of mankind.

But we have reached the stage when the different streams of knowledge, followed by the different sciences, are coalescing, and the artificial barriers raised by calling those sciences by different names are breaking down. Geology uses the methods and data of physics, chemistry and biology; no one can say whether the science of radioactivity is to be classed as chemistry or physics, or whether sociology is properly grouped with biology or economics. Indeed, it is often just where this coalescence of two subjects occurs, when some connecting channel between them is opened suddenly, that the most striking advances in knowledge take place. The accumulated experience of one department of science, and the special methods which have been developed to deal with its problems, become suddenly available in the domain of another department, and many questions insoluble before may find answers in the new light cast upon them. Such considerations show us that science is in reality one, though we may agree to look on it now from one side and now from another as we approach it from the standpoint of physics, physiology or psychology.

The philosophical basis of science.

Having traced the development of the most important of the fundamental conceptions of science, and followed the subdivision of natural knowledge into the various sections which for convenience mankind has made, let us now examine the meaning of the knowledge thus acquired, and its relation to other branches of learning.

By the slow and laborious methods of observation, hypothesis, deduction, and experimental verification, a scheme has been constructed which for the most part is consistent with itself, and bears the test of the comparison of one part with another. As a chart is drawn by the explorer of unknown seas to represent his discoveries in a conventional manner, so the scientific investigator constructs a mental model of the phenomena he observes, and tests its consistency with itself and its concordance with the results of further experiment. The chart does not give a lifelike picture of the coast as does a painting, but it represents one aspect of it conventionally in a manner best adapted for the immediate purpose. So the conceptions of one branch of science—mechanics let us say—represent the phenomena of nature in the conventional aspect best suited for one particular line of inquiry. It does not follow necessarily that "nature" in reality resembles the particular mental chart which mechanical science enables us to construct. It does not even follow that there is any "reality" underlying phenomena and corresponding with any of our conceptions. The whole problem which mankind has to face undoubtedly includes an inquiry into the ultimate nature of reality. But that inquiry lies in the province of metaphysics, and is not necessarily involved in the pursuit of natural science. Metaphysics uses the results of natural science, as of all other branches of learning, as evidence bearing on her own deeper and more difficult questions. But it does not follow that natural science must solve metaphysical problems before being of use to man and enlarging the sphere of his knowledge. We need not ask whether the reality is represented accurately by our conventional model, whether indeed there be any reality at all, before using that model to introduce order into what would otherwise be mental confusion, and to enable us to make systematic and progressive use of natural resources. It is true that the possibility of constructing consistent schemes of scientific concepts is an argument in favour of the existence of a definite reality underlying phenomena resembling in some respects the pictures of it we draw. But metaphysicians are not agreed that it is a conclusive argument. The difficulty of making a scientific picture of the ultimate nature of reality may be illustrated by an example. Our first conception of a wooden stick involves the ideas of a certain long-shaped form, of smoothness, of hardness, of weight, of a certain brown colour, perhaps of some amount of elasticity. A microscope reveals a structure much more detailed than we imagined, and our mental model of the stick ceases to be smooth. It becomes co-ordinated with those of a number of other bodies which we know to be parts of trees, and study, as regards growth and structure, by the help of botany. From the results of observation and experiment, physics teaches us that the properties of the stick can only be represented satisfactorily by imagining that the substance of it is not infinitely divisible, that it consists of discontinuous particles or molecules. Again, chemistry assures us that the molecules of the stick are made up of still smaller parts or atoms, which separate from each other when, for instance, the stick is burned, and afterwards can arrange themselves into new molecules. When we pursue our inquiries into the nature of these atoms, we find that they can be resolved, partly at any rate, into much smaller particles or corpuscles in continual motion within the atom. These corpuscles themselves have been identified with isolated units of negative electricity or electrons, the vibrations of which within the atom sort out the electromagnetic radiation which falls on them and allow to reach our eyes those waves only which give us the sensation of brown colour. At present pioneers are attempting to explain electrons in terms of centres of elastic strain in a hypothetical aether. But we have travelled far from our original conception of the nature of the stick, and, should the problem last stated be solved, we should only find ourselves faced by the next one, the nature of the aether. But what constitutes reality? Where, in the endless chain of explanations discovered or to be discovered, can we stop and say: "Here is the true picture of what the stick *is*"? But this impossibility does not prevent us from getting the full use of each conception in turn when used for its particular purpose. To the schoolboy, the effective and deterrent conception of the stick is that of a hard, elastic, long-shaped solid. The botanist regards it as built up by the action of vegetable cells, which he refers to a particular kind of tree. To the chemist the stick is made up of atoms of carbon, hydrogen and oxygen, each with definite properties and arranged in certain combinations. The physicist sees these atoms composed of whirling electrons, each an ultimate electric unit not capable of further explanation, or possibly a centre of strain in an all-pervading aether of unknown nature. Each idea is useful in turn, and each corresponds truly with certain properties of the stick, corresponds with the stick itself in certain of its aspects.

Such considerations show us the meaning of the subdivisions into which science has been arranged for convenience of study and research. They represent different aspects of nature, different sections, as it were, cut through the solid model which stands for the sum of all our scientific knowledge of the universe.

A nerve-impulse may be regarded from a psychological aspect when we deal with the thought which accompanied it; from a physiological aspect when we examine its relation to other changes in the body. But modern methods have co-ordinated it also with definite chemical and electrical changes, and are said sometimes to have "explained" the nerve-impulse in physical terms.

But, as always, an "explanation" proves to be simply a restatement of a phenomenon in terms of other phenomena which previously are familiar to the mind, and therefore appear to be better understood. Nevertheless, from our present point of view, no one of these possible aspects of the phenomenon—of the nerve-impulse—is essentially more fundamental than any other. To the psychologist the nerve-impulse is expressed in terms of thought, to the physicist by physical changes. The fact that a thought is accompanied by movement of matter or electricity does not make the thought less a fundamental conception.

But perhaps the best illustration is to be sought in the relation between the physical concepts of matter and electricity. As we have seen, J. J. Thomson discovered corpuscles which were common constituents of all matter, with masses smaller than those of any known atoms. One of these corpuscles represents a unit of negative electricity. An atom with a corpuscle in excess is an atom negatively electrified, an atom with one corpuscle less than the normal number is an atom positively electrified. In this scheme electricity is described in terms of matter. But these corpuscles have been identified with the hypothetical electrons of Lorentz and Larmor, who consider matter to be composed of such isolated units of electricity. Such electrons, it has been shown, would possess mass by virtue of their electromagnetic properties. In this theory the idea of mechanical mass is eliminated altogether, and mass, and therefore matter, explained in terms of electricity. The view has been held by some that a mechanical explanation of a phenomenon is fundamental, and that a phenomenon so explained in terms of mechanical conceptions is fully understood. This idea may be traced to the familiarity with mechanical conceptions of our everyday experience. The mind obtains its concept of matter from the resistance which that matter manifests to forces tending to set it in motion when at rest, or to change its state of motion when travelling. This fundamental property of inertia is the measure of mass, and we reach the concept of mass by our muscular sense of the force needed to set mass in motion. Force seems to be a direct sense perception, though mathematically it is better to define force in terms of acceleration and mass—since mass is found normally to keep constant throughout a series of physical changes. The familiarity we feel, then, with the conception of matter is based on our familiarity with the conception of force. Our minds form this conception from their experience of a direct sense perception of muscular effort. This seems to be the basis of the whole feeling that mechanical conceptions are more fundamental than any others, and that, for instance, it is more intelligible to explain electricity in terms of mechanics than vice versa. But the fact that we have a special muscular sense is an accident of our bodies. It is possible that the electric fish, or torpedo, has a special electric sense, and that to such a fish-philosopher the perception of electromotive force is more real than that of mechanical force. Such a being might well argue that it is intelligible and satisfactory to explain the mysterious concept of mass, which he only reaches through the other equally mysterious concept of mechanical force, in terms of the familiar concept of electricity, well known to every torpedo from his direct sense perception of electromotive force. This instance may serve to show that it is quite as correct philosophically to explain matter in terms of electricity, as to explain electricity in terms of mass. The object of science is to find connexions between phenomena and thus to correlate them. At present a greater simplification may be reached by reducing all possible phenomena to mechanical conceptions than in any other way, but that only shows that the mechanical aspect of nature gives us a fuller view than any other at present known, not that mechanics is philosophically the most fundamental science.

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SCILLITAN MARTYRS, a company of early North African Christians who suffered under Marcus Aurelius in A.D. 180, and whose *Acta* are at once the earliest documents of the Church of Africa and the earliest specimen of Christian Latin. The martyrs take their name from Scilla (or Scillium), a town in Numidia. Their trial and execution took place in Carthage under the Pro-consul Vigellius Saturninus, whom Tertullian declares to have been the first persecutor of the Christians in Africa. The date of their martyrdom is the 17th of July A.D. 180. It is thus the concluding scene of the persecution under Marcus Aurelius, which is best known from the sufferings of the churches of Vienne and Lyons in South Gaul. Marcus Aurelius died on the 17th of March of the year in question, and persecution ceased almost immediately upon the accession of Commodus. A group of sufferers called the Madaurian martyrs seems to belong to the same period: for in the correspondence of St Augustine, Namphamo, one of their number, is spoken of as "archimartyr," which appears to mean protomartyr of Africa. We have in this martyrdom an excellent example of "Acts of Martyrs" properly so called. The document is in brief legal form, beginning with the date and the names of the accused, and giving the actual dialogue between them and their judge. It closes with the sentence, based on "obstinate" persistency in an illicit cult, and with the proclamation by the herald of the names of the offenders and the penalty. All this may quite well be a transcript of the *Acta*, or official report of the proceedings. A Christian appends the words: "And so they all together were crowned with martyrdom; and they reign with the Father and the Son and the Holy Ghost, for ever and ever. Amen."

The Scillitan sufferers were twelve in all—seven men and five women. Two of these bear Punic names (Nartzalus, Cintinus), but the rest Latin names. Six had already been tried: of the remainder, to whom these *Acta* primarily relate, Speratus is the principal spokesman. He claims for himself and his companions that they have lived a quiet and moral life, paying their dues and doing no wrong to their neighbours. But when called upon to swear by the genius of the emperor, he replies: "I recognize not the empire of this world; but rather do I serve that God whom no man hath seen, nor with these eyes can see." Here he uses the language of 1 Tim. vi. 16; and it is interesting also to note that in reply to the question, "What are the things in your satchel?" he says, "Books and letters of Paul, a just man." The martyrs are offered a delay of thirty days to reconsider their decision, but this they all alike refuse. These Acts have been long known in an expanded form, or rather in a variety of later recensions. The fame of the martyrs led to the building of a basilica in their honour at Carthage; and their annual commemoration required that the brevity and obscurity of their Acts should be supplemented and explained, to make them suitable for public recitation.

The historical questions connected with these martyrs are treated by Lightfoot, *Ignatius* (1889, 2nd ed.), i. 524 ff. The Latin text, together with later recensions and a Greek version, is published in *Texts and Studies*, i. 2 (Passion of Perpetua, 1890); see also *Analecta Bollandiana* (1889), viii. 5; H. M. Gwatkin, *Selections from Early Christian Writers*, where, as in *Ante-Nicene Fathers*, ix. 285, there is an English translation. (J. A. R.)

SCILLY ISLES, a group of small islands, belonging to Cornwall, England, 25 m. W. by S. of Land's End. (For map, see ENGLAND, Section VI.) They form an outlying portion of the granite highlands of Cornwall, and contain a few metalliferous veins or lodes, which could never have yielded much ore. An old theory that the Scilly Isles could be identified with the "Cassiterides" or "Tin Islands" of Herodotus is abandoned, and the origin of their name has never been authoritatively settled. The islands are wild and picturesque, with sheer cliffs and many large caves hollowed out by the Atlantic. Owing to the reefs and shoals by which these shores are surrounded, navigation becomes perilous in rough weather, and many disasters have occurred. In 1707 Sir Cloudesley Shovel perished in the shipwreck of his flagship and two other men-of-war, while two fireships of his squadron were driven aground, and the remainder only narrowly escaped. The graveyard of an old Puritan church on St Mary's contains the bodies of 311 persons, drowned in the wreck of the "Schiller" in 1875; and a local proverb tells that for every man who dies a natural death on the islands the sea takes nine. Much, however, has been done to minimise the danger, especially by lighting the coast. On St Agnes there is a lighthouse, and on an outlying rock to the south-west is the lonely Bishop Light, constructed with infinite difficulty in 1858, and rebuilt thirty years later.

The islands are composed wholly of granite—outliers of the granite highlands of Cornwall. Most of the granite is coarse and porphyritic, but towards the centre of the original igneous mass it is finer and non-porphyritic. The finer granite occurs on the north-west side of St Mary's, the southern part of Tresco, Bryher and Samson and the north-west side of Annet. Elvans of quartz-porphyry are found in the granite. On the north-east end of White Island a fragment of the altered killas, which once covered the whole area, is still visible. A gravel deposit with chalk flints and Greensand cherts which caps some of the higher ground on St Mary's may possibly be of Eocene age. Raised beach, blown sand, fragmental granitic waste or "head" and an iron-cemented glacial deposit are found resting upon the granite.

The climate of the islands is unusually mild, snow being rarely seen, and the temperature varying from about 46° F. in winter to 58° in summer. As a result, vegetation is luxuriant; fuchsias, geraniums and myrtles attain an immense size, and aloes, cactus and prickly pear flourish in the open. All these, together with palms, may be seen in the gardens of the governor on Tresco Island, which are quite subtropical in character, and, therefore, unique in the British Isles. Great flocks of sea-birds haunt the remoter parts, and on some of the islands there are deer. On Tean there is a warren of white rabbits; and some of the rarer land-birds occasionally visit the islands, such as the golden oriole, which has been known to breed here.

The islands are served by steamers from Penzance, and telephone and telegraph communication is established with the mainland. The raising of early asparagus and other spring vegetables, and of flowers, has taken the place of potato culture as the principal industry. In spring the fields of narcissus and other flowers add greatly to the beauty of the islands. There is also a small coasting trade; and fishing is carried on to some extent, its most important branch being the taking of lobsters for the London market.

The islands which may be distinguished from mere rocks number about 40, and the group has a total area of 4041 acres; but only five islands are inhabited—St Mary's, Tresco, St Martin's, St Agnes and Bryher. The total population in 1901 was 2092. Hugh Town in St Mary's is the capital, occupying a sandy peninsula crowned by the height known as the Garrison, with Star Castle, dating from the days of Elizabeth. The town possesses a harbour, which is used by the Penzance steamers, and a roadstead where large vessels can lie at anchor. The government of the islands is vested in a county council created in 1890, consisting of a chairman, vice-chairman, 4 aldermen, and 18 councillors. For parliamentary purposes the isles are included in the St Ives division of Cornwall.

On Tresco there are the ruins of an abbey, and of two fortifications called Oliver Cromwell's Tower and King Charles's Tower; and here also is a church built in 1882 and dedicated to St Nicholas. Numerous rude pillars and circles of stones, resembling those of Cornwall, are to be noticed; and barrows are common, the most remarkable of these prehistoric remains being a barrow on the Isle of Samson, 58 ft. in girth, and containing amongst other relics, the only perfect "kistvaen," or sepulchral chamber of stone, which has been disinterred from any Cornish tomb.

Although the Scilly Isles have been regarded as the remains of Lyonessé, as identical with the Cassiterides, and as the object of an expedition and of conquest on the part of Athelstan in pursuance of a vow made at the shrine of St Burian, it is not until the reign of Henry I. that we have indisputable evidence concerning them. The king gave all the churches of Scilly and the land, as the hermits held it in the days of the Confessor, to the abbot and church of Tavistock. A confirmation of this grant and a further grant to the monks of all wrecks except whole ships and whales was made by Reginald, earl of Cornwall. In 1180 the bishop of Exeter confirmed a grant by Richard de Wicha of tithes, hitherto withheld, and of rabbits. Secular priests were temporally substituted for regulars by the abbot of Tavistock in 1345. Sharing the dignity of lords of Scilly with the abbot, holding apparently the better half of St Mary's Island, which was already furnished with a castle and a prison, and like the abbot practically beyond the jurisdiction of the hundred courts, the family of Blanchminster (de Albo Monasterio), at the beginning of the 14th century, held of the earldom of Cornwall lands in Scilly at a yearly service of 6s. 8d. or 600 puffins. The Year Books tell us that in cases of felony the punishment under this family was for the convicted person to be taken to a certain rock in the sea with two barley loaves and one pitcher of water and to be left on the rock until drowned by the tide. The Blanchminsters resisted and imprisoned the coroner of Cornwall and in 1319 were granted a coroner of their own. In 1345 they are found petitioning the king for a remedy owing to an invasion by 600 of the king's Welsh troops, who, being becalmed at Scilly, had carried away everything, and so impoverished the tenants that they were unable to pay their yearly rent of £40. In 1547 Silvester Danvers, as representing the Blanchminsters, being one of the coheirs, sold his moiety of Scilly to Sir Thomas Seymour, by whose attainder in 1549 this and probably the other moiety fell to the crown. The suppression of the religious houses had already placed the church's land and revenues at the king's disposal. During the Civil Wars, Hugh Town stood for the king, and in 1645 afforded a temporary shelter to Prince Charles, until his escape to Jersey. In 1649 the islands were occupied by a royalist, Sir Richard Grenville, and formed the base from which he swept the surrounding seas for two years, before a fleet under Admiral Blake and Sir John Ayscue forced him to surrender. In ancient times a haunt of pirates, the islands were afterwards notorious for smuggling. In 1687 the whole of Scilly was granted to Sidney Godolphin for eighty-nine years from the expiration of the lease for fifty years granted to Francis Godolphin in 1636 by Charles I. In 1831 Augustus Smith succeeded the Godolphins as lessee or lord-proprietor, and under his and his nephew's wise autocracy the islands prospered.

SCIMITAR, the term generally used of all oriental single-edged curved or crescent-shaped swords (see SWORD). The word has appeared in a variety of forms in English, due to Fr. *cimetare*, It. *scimitarra* or Span. *cimitarra*; it has even been corrupted into "smyter," as if connected with "smite." Most probably it represents an early Western corruption of the Persian word for a sabre, *shamshir* or *shimshir*, which means literally "lion's claw" (*sher*, lion, in Hindustani "tiger," and *sham*, nail, claw).

SCIOLIST, one who, with only a superficial knowledge or a smattering of knowledge on any particular subject, claims or pretends to a complete or profound learning. The Lat. *sciolus*, a diminutive of *scius*, learned, from *scire*, to know, is only found in post-classical times, *e.g.* Hieronymus, A.D. 420, *Epist.* 48. 18. It first appears in English at the beginning of the 17th century.

SCIOMANCY (Gr. σκιά, shade, shadow, and μαντεία, soothsaying, divination), a form of divination by means of supposed communication with the shades or spirits of the dead. The calling up of the spirit of Samuel by the Witch at Endor when consulted by Saul is the classical example (1 Sam. xxviii.).

SCION, a slip or cutting of a tree or plant used for grafting, hence a young shoot or twig. In a transferred sense the word is used of the heir or any young member of a family, a descendant. The word in O. Fr. was *cion* or *syon*, mod. *scion*, and the early forms in English are *syon*, *cion* or *cyon*. These forms seem to disprove the usual etymology, which connects it with Fr. *scier*, to cut, Lat. *secare*.

SCIPIO[1] ("staff"), the name of a patrician branch of the Cornelian gens, of which the following are the principal historical representatives:—

1. PUBLIUS CORNELIUS SCIPIO, father of the elder Africanus. He was consul in 218 B.C., the first year of the Second Punic War, and sailed with an army from Pisa to Massilia, with the view of arresting Hannibal's advance on Italy. Failing, however, to meet his enemy, he hastened to return by sea to Cisalpine Gaul, having sent back his army to Spain under the command of his brother Gnaeus, with instructions to hold the Carthaginian forces there in check. On his return to Italy he at once advanced to meet Hannibal. In a sharp cavalry engagement in the upper valley of the Po, on the Ticinus, he was defeated and severely wounded. Again, in December of the same year, he witnessed the complete defeat of the Roman army on the Trebia, his colleague T. Sempronius Longus having insisted on fighting contrary to his advice. But he still retained the confidence of the Roman people; his term of command was extended, and we find him with his brother in Spain in the following year, winning victories over the Carthaginians and strengthening Rome's hold on that country, till 212 (or 211). The details of these campaigns are not accurately known, but it would seem that the ultimate defeat and death of the Scipios were due to the desertion of the Celtiberi, bribed by Hasdrubal, Hannibal's brother.

See Polybius iii. 40; Livy xxi.-xxv.; Appian, *Hannib.* 5-8, *Hisp.* 14-16.

2. PUBLIUS CORNELIUS SCIPIO AFRICANUS, the elder (237[2]–183 B.C.), son of the above. He was present at the disastrous battles of the Ticinus (where, according to one tradition, he saved his father's life), the Trebia and Cannae. Even after the last of these he resolutely protested against several Roman nobles who advocated giving up the struggle and quitting Italy in despair (see METELLUS, 2). The year after his father's death, he offered himself for the command of the new army which the Romans resolved to send to Spain. In spite of his youth, his noble demeanour and enthusiastic language had made so great an impression that he was unanimously elected. All Spain south of the Ebro in the year of his arrival (210 or 209) was under Carthaginian control, but fortunately for him the three Carthaginian generals, Hasdrubal and Mago (Hannibal's brothers), and Hasdrubal the son of Gisgo, were not disposed to act in concert and were preoccupied with revolts in Africa. Scipio, on landing at the mouth of the Ebro, was thus enabled to surprise and capture New Carthage, the headquarters of the Carthaginian power in Spain. He thus obtained a rich booty of war stores and supplies, and an excellent harbour. His kindly treatment of the Spanish hostages and prisoners brought many over to his side. In 209 he drove back Hasdrubal, from his position at Baecula, on the upper Guadalquivir, but was unable to hinder his march to Italy. After winning over a number of Spanish chiefs he achieved in 206 a decisive victory over the full Carthaginian levy at Ilipa (near Corduba), which resulted in the evacuation of Spain by the Punic commanders. With the idea of striking a blow at Carthage in Africa, he paid a short visit to the Numidian princes, Syphax and Massinissa, but at the court of Syphax he was foiled by the presence of Hasdrubal, the son of Gisgo, whose daughter Sophonisba was married to the Numidian chief. On his return to Spain Scipio had to quell a mutiny which had broken out among his troops. Hannibal's brother Mago had meanwhile sailed for Italy, and in 206 Scipio himself, having secured the Roman occupation of Spain by the capture of Gades, gave up his command and returned to Rome. In the following year he was unanimously

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[1] The first *i* is long—Scīpio.

[2] So Polybius: 235 according to Livy.

elected to the consulship, the province of Sicily being assigned to him. By this time Hannibal's movements were restricted to the south-western extremity of Italy, and the war was now to be transferred to Africa. Scipio was himself intent on this, and his great name drew to him a number of volunteers from all parts of Italy, but the old-fashioned aristocracy of Rome, who disliked his luxurious tastes and his Greek culture, and still entertained a wholesome dread of Hannibal, opposed the idea; all Scipio could obtain was permission to cross over from Sicily to Africa, if it appeared to be in the interests of Rome. The introduction (205) of the Phrygian worship of Cybele and the transference of the image of the goddess herself from Pessinus to Rome (see GREAT MOTHER OF THE GODS) to bless the expedition no doubt had its effect on public opinion. A commission of inquiry was sent over to Sicily, and it found that Scipio was at the head of a well-equipped fleet and army. At the commissioners' bidding he sailed in 204 and landed near Utica. Carthage meanwhile had secured the friendship of the Numidian Syphax, whose advance compelled Scipio to raise the siege of Utica and to entrench himself on the shore between that place and Carthage. Next year he destroyed two combined armies of the Carthaginians and Numidians. After the failure of peace negotiations in which Scipio displayed great moderation, he defeated Hannibal in a decisive battle near Zama (Oct. 19, 202; see PUNIC WARS). In the subsequent settlement with Carthage he upheld with success his comparatively lenient terms against the immoderate demands of many Roman aristocrats. Scipio was welcomed back to Rome with the surname of Africanus, and had the good sense to refuse the many honours which the people would have thrust upon him. For some years he lived quietly and took no part in politics. In 193 he was one of the commissioners sent to Africa to settle a dispute between Massinissa and the Carthaginians. In 190, when the Romans declared war against Antiochus III. of Syria, Publius was attached as legate to his brother Lucius, to whom the chief command had been entrusted. The two brothers brought the war to a conclusion by a decisive victory at Magnesia in the same year. Meanwhile Scipio's political enemies had gained ground, and on their return to Rome a prosecution was started (187) by two tribunes against Lucius on the ground of misappropriation of moneys received from Antiochus. As Lucius was in the act of producing his account-books his brother wrested them from his hands, tore them in pieces, and flung them on the floor of the senate-house. This created a bad impression; Lucius was brought to trial, condemned and heavily fined. Africanus himself was subsequently (185) accused of having been bribed by Antiochus, but by reminding the people that it was the anniversary of his victory at Zama he caused an outburst of enthusiasm in his favour. The people crowded round him and followed him to the Capitol to offer thanks to the gods and beg them to give Rome more citizens like himself. He then retired to his native country seat at Liternum on the coast of Campania, where he died. By his wife Aemilia, daughter of the Aemilius Paullus who fell at Cannae, he had a daughter Cornelia, who became the mother of the two famous Gracchi.

Scipio was one of Rome's greatest generals. Skilful alike in strategy and in tactics, he had also the faculty of inspiring his soldiers with confidence. According to the story, Hannibal, who regarded Alexander as the first and Pyrrhus as the second among military commanders, confessed that had he beaten Scipio he should have put himself before either of them. He was a man of great intellectual culture and could speak and write Greek perfectly. He wrote his own memoirs in Greek. He also enjoyed the reputation of being a graceful orator. There was a belief that he was a special favourite of heaven and held actual communication with the gods. It is quite possible that he himself honestly shared this belief; to his political opponents he was often harsh and arrogant, but towards others singularly gracious and sympathetic. According to Gellius, his life was written by Oppius and Hyginus, and also, it was said, by Plutarch.

See Livy xxi.-xxxviii. and Polybius; Aulus Gellius iv. 18; Val. Max. iii. 7; biography by F. D. Gerlach (1868); E. Berwick (1817), with notes and illustrations; also PUNIC WARS.

3. **PUBLIUS CORNELIUS SCIPIO AEMILIANUS AFRICANUS**, the younger (185–129 B.C.), was the younger son of L. Aemilius Paullus, the conqueror of Macedonia. He fought when a youth of seventeen by his father's side at the battle of Pydna (168), which decided the fate of Macedonia and made northern Greece subject to Rome. He was adopted by P. Cornelius Scipio Africanus, the eldest son of Scipio Africanus the elder, and from him took the name Scipio with the surname Africanus. In 151, a time of defeat and disaster for the Romans in Spain, he voluntarily offered his services in that country and obtained an influence over the native tribes similar to that which the elder Scipio, his grandfather by adoption, had acquired nearly sixty years before. In the next year an appeal was made to him by the Carthaginians to act as arbiter between them and the Numidian prince Massinissa, who, backed up by a party at Rome, was incessantly encroaching on Carthaginian territory. In 149 war was declared by Rome, and a force sent to besiege Carthage. In the early operations of the war, which went altogether against the Romans, Scipio, though a subordinate officer, distinguished himself repeatedly, and in 147 he was elected consul, while yet under the legal age, in order that he might hold the supreme command. After a year of desperate fighting and splendid heroism on the part of the defenders he carried the fortress, and at the senate's bidding levelled it to the ground. On his return to Rome he celebrated a splendid triumph, having also established a personal claim to his adoptive surname of Africanus. In 142, during his censorship, he endeavoured to check the growing luxury and immorality of the period. In 139 he was unsuccessfully accused of high treason by Tiberius Claudius Asellus, whom he had degraded when censor. The speeches delivered by him on that occasion (now lost) were considered brilliant. In 134 he was again consul, with the province of Spain, where a demoralized Roman army was vainly attempting the conquest of Numantia on the Durius (Douro). After devoting several months to restoring the discipline of his troops, he reduced the city by blockade. The fall of Numantia in 133 established the Roman dominion in the province of Hither Spain. For his services Scipio received the additional surname of Numantinus.

Scipio himself, though not in sympathy with the extreme conservative party, was decidedly opposed to the schemes of the Gracchi (whose sister Sempronia was his wife). When he heard of the death of Tiberius Gracchus, he is said to have quoted the line from the *Odyssey* (i. 47), "So perish all who do the like again"; after his return to Rome he was publicly asked by the tribune C. Papirius Carbo what he thought of the fate of Gracchus, and replied that he was justly slain. This gave dire offence to the popular party, which was now led by his bitterest foes. Soon afterwards, in 129, on the morning of the day on which he had intended to make a speech in reference to the agrarian proposals of the Gracchi, he was found dead in bed. The mystery of his death was never cleared up, and there were political reasons for letting the matter drop, but there is little doubt that he was assassinated by one of the supporters of the Gracchi, probably Carbo, whose guilt is expressly stated by Cicero (see GRACCHUS).

The younger Scipio, great general and great man as he was, is for ever associated with the destruction of Carthage. The horror he expressed at its fate was a tardy repentance. Yet he was a man of culture and refinement; he gathered round him such men as the Greek historian Polybius, the philosopher Panaetius, and the poets Lucilius and Terence. At the same time he had all the virtues of an old-fashioned Roman, according to Polybius and Cicero, the latter of whom gives an appreciation of him in his *De republica*, in which Scipio is the chief speaker. As a speaker he seems to have been no less distinguished than as a soldier. He spoke remarkably good and pure Latin, and he particularly enjoyed serious and intellectual conversation. After the capture of Carthage he gave back to the Greek cities of Sicily the works of art of which Carthage had robbed them. He did not avail himself of the many opportunities he must have had of amassing a fortune. Though politically opposed to the Gracchi, he cannot be said to have been a foe to the interests of the people. He was, in fact, a moderate man, in favour of conciliation, and he was felt by the best men to be a safe political adviser, while he unfortunately contrived to offend both parties.

See Polybius xxxv. 4, xxxix.; Vell. Pat. i. 12; Florus ii. 15, 17, 18; Appian, *Punica*, 72, 98, 113-131, *Hisp.* 48-95, *Bell. Civ.* i. 19; Plutarch, *Aemilius Paullus*, 22, *Tib. Gracchus*, 21, *C. Gracchus*, 10; Gellius iv. 20, v. 19; Cicero, *De orat.* ii. 40; exhaustive life by E. Person (Paris, 1877); monograph by Lincke (Dresden, 1898).

4. Publius Cornelius Scipio Nasica Serapio, consul 138 B.C., took a prominent part in the murder of Tiberius Gracchus. To save him from the vengeance of the people, he was sent by the senate on a pretended mission to Asia, where he died. The nickname Serapio was given him by the tribune C. Curiatius from his likeness to one Serapio, a dealer in sacrificial victims.

See Appian, *Punica*, 80 B.C., i. 16; Val. Max. ix. 14; Plutarch, *Tib. Gracchus*, 21.

SCIRE FACIAS, in English law, a judicial writ founded upon some record directing the sheriff to make it known (*scire facias*) to the party against whom it is brought, and requiring the latter to show cause why the party bringing the writ should not have the advantage of such record, or why (in the case of letters patent and grants) the record should not be annulled and vacated. Proceedings in *scire facias* are regarded as an action, and the defendant may plead his defense as in an action. The writ is now of little practical importance; its principal uses are to compel the appearance of corporations aggregate in revenue suits, and to enforce judgments against shareholders in such companies as are regulated by the Companies Clauses Act 1845, or similar private acts, and against garnishees in proceedings in foreign attachment in the lord mayor's court. Proceedings by *scire facias* to repeal letters patent for inventions were abolished by the Patents, Designs and Trademarks Act 1883, and a petition to the court substituted. It is not used in Scottish procedure.

SCISSORS, a cutting instrument, consisting of two crossed blades with the inner edges sharpened, pivoted at the crossing, and terminating with two looped handles for the insertion of the fingers of the person using them. The term is usually confined to small cutting implements, the larger being known as "shears" (*q.v.*). The modern form of the word points to a derivation from Lat. *scindere*, to cleave or cut, and is no doubt due to Lat. *scissor*, a cutter, which was used only of a carver, a butcher and a class of gladiators, never of a cutting instrument; but the earlier forms, *cysowres*, *sisoures*, *cisors*, *cissers*, *sizars*, &c., show the origin to be found in O. Fr. *cisoires*, shears, mod. *ciseaux*, plural of *ciseau*, earlier *cisel*, a chisel, and therefore to be referred to Lat. *caedere*, to cut, *cisorium*, a cutting instrument.

SCLOPIS DI SALERANO, FEDERIGO (1798–1878), Italian statesman and jurist. While still comparatively young he was appointed attorney-general to the Sardinian senate, and took part in the compilation of the new codes. An advocate of liberal ideas and reform, he proclaimed the necessity for a constitution, and was himself one of the authors of the *Statuto*, or Sardinian charter of 1848, which is to this day the constitution of the Italian kingdom; the introduction is entirely his work. Sclopis also wrote the proclamation in which Charles Albert announced to the people of Lombardy and Venetia his war against Austria. He was minister in the first Sardinian constitutional ministry under the presidency of Count Balbo, and afterwards president of the senate. In 1871 he was sent to Geneva as Victor Emmanuel's representative on the "Alabama" arbitration, and was chosen president of that tribunal; on his return to Italy the king conferred on him the Order of the Annunziata. The last years of his life were mainly occupied with municipal affairs and charitable administration at Turin. Between 1819 and 1878 he published over seventy works on history, jurisprudence, politics and literature, in Italian, Latin and French. At the age of thirty he was elected member of the Turin Academy of Sciences, of which he became life president in 1864; he was also foreign member of the Institut de France. His most important work is his *Storia della legislaziona Italiana dalle origini fino al 1847* (Turin, 1840), issued as a sequel to his *Storia dell' antica legislazione del Piemonte*, published in 1833.

Among his other writings we may mention the following: *Ricerche sui Longobardi in Italia* (1827), *Delle relazioni politiche fra la dinastia di Savoia e il governo Britannico dal 1240 al 1815* (1853), *Rimembranze sul Conte di Cavour* (1876), and *Considerazioni storiche sulle antiche assemblee rappresentative del Piemonte e della Savoia* (1878).

See E. Ricotti, *Notizia biografica di F. Sclopis*; A. Manno, *Bibliografia degli scritti di F. Sclopis*; M. Ricci, *Necrologia di F. Sclopis* (in the *Archivio storico Italiano*, ser. iv. tom. ii. p. 331 seq.).

SCOLD, one who scolds, *i.e.* chides, finds fault with or rebukes with violence or persistence or vituperation. It is usually a term applied to women, and a "common scold" (in Low Lat. *communis rixatrix*) was indictable in England at common law as a public nuisance, special instruments of punishment being devised in the "branks" or "scold's bridle," and the "cucking stool." The word is apparently an adaptation of the Norse *skald*, skald or scald, a poet, and according to the *New English Dictionary* the intermediate meaning through which the sense develops is "libeller" or "lampooner." Skeat derives from Du. *schold*, *schellen*, and takes the word as originally meaning a loud talker, cf. Icel. *skjalla*, to clash, Ger. *schallen*. The Norse word is also to be connected in this case, the "skald" being one who talks loudly.

SCOLECITE, a mineral belonging to the zeolite group; a hydrated calcium silicate, $CaAl_2Si_3O_{10}+3H_2O$. It is a lime-zeolite, and like the soda-zeolite natrolite and the soda-lime-zeolite mesolite, usually occurs as acicular and fibrous aggregations. Although having nearly the same interfacial angles as the orthorhombic natrolite, it crystallizes in the monoclinic system, and, as shown by the etched figures and the pyro-electric character, in the hemihedral class of this system, there being a plane, but no axis, of symmetry. Scolecite can therefore be distinguished from natrolite by an optical examination, since the acicular crystals do not extinguish parallel to their length between crossed nicols. Twinning on the ortho-pinacoid is usually evident. The mineral is colourless or white, transparent, and vitreous in lustre: the hardness is 5½, and the specific gravity 2·2. It is a mineral of secondary origin, and occurs with other zeolites in the amygdaloidal cavities of weathered volcanic rocks of basic composition. Fine divergent groups of prismatic crystals are found in the basalt of Berufjord near Djupivogr in Iceland and in the Deccan traps near Poona in India; hence the synonym poonahlite for this species. The name scolecite is derived from Gr. σκώληξ, a worm, because the crystals sometimes curl up like worms when heated before the blowpipe. (L. J. S.)

SCONCE (Lat. *absconsus*, Fr. *esconce*), a word of many meanings, mostly signifying a covering or protection, or, by extension, that which is covered or protected. Its most familiar significance is that of a wall light, consisting of a metal bracket, with two or more socketed branches for candles. The word is also used for the orifice of a candlestick into which the candle is fixed, and for the rim of metal, glass or china, placed round a candle to intercept grease droppings. Among its obsolete meanings is that of head or skull. At the English universities "to sconce" is still used as the term for imposing a penalty at dinner in the shape of a quart-pot of beer or cider.

SCONE (pron. *Skoon*; Gaelic, *skene*, "a cutting"), a parish of Perthshire, Scotland, containing Old Scone, the site of an historic abbey and palace, and New Scone, a modern village (pop. 1585), 2 m. N. of Perth, near the left bank of the Tay. Pop. of parish (1901) 2362. It became the capital of Pictavia, the kingdom of northern Picts, in succession to Forteviot. Parliaments occasionally assembled on the Moot Hill, where the first national council of which we possess records was held (906). The Moot Hill was known also as the Hill of Belief from the fact that here the Pictish king promulgated the edict regulating the Christian church. The abbey was founded in 1115 by Alexander I., but long before this date Scone had been a centre of ecclesiastical activity and the seat of a monastery. Kenneth is alleged to have brought the Stone of Destiny, on which the Celtic kings were crowned, from Dunstaffnage Castle on Loch Etive, and to have deposited it in Scone, whence it was conveyed to Westminster Abbey (where it lies beneath the Coronation Chair) by Edward I. in 1296. Most of the Scottish kings were crowned at Scone, the last function being held on the 1st of January 1651, when Charles II. received the crown. Apparently there was never any royal residence in the town, owing to the proximity of Perth. Probably the ancient House of Scone, which stood near the abbey, provided the kings with temporary accommodation. Both the abbey and the house were burned down by the Reformers in 1559, and next year the estates were granted to the Ruthvens. On the attainder of the family after the Gowrie conspiracy in 1600, the land passed to Sir David Murray of the Tullibardine line, who became 1st viscount Stormont (1621) and was the ancestor of the earl of Mansfield, to whom the existing house belongs. Sir David completed in 1606 the palace which the earl of Gowrie had begun. The 5th viscount—father of the 1st earl of Mansfield, the lord chief justice of England (b. at Scone 1705)—entertained the Old Pretender for three weeks in 1716, and his son received Prince Charles Edward in 1746. The present palace, which dates from 1803, stands in a beautiful park. It contains several historic relics, the most interesting being a bed adorned with embroidery worked by Mary Queen of Scots during her imprisonment in Lochleven Castle. The gallery in which Charles II. was crowned, a hall 160 ft. long, has been included in the palace. Two hundred yards east of the mansion is an ancient gateway, supposed to have led to the old House of Scone, and near it stands the cross of Scone, removed hither from its original site in the town.

SCONE, the Scots name of a species of cake made of wheat or barley meal and baked on a griddle. The cakes are round and are usually cut into four pieces, thus giving the familiar shape of a wedge with circular edge. The broad lowland bonnet was called a "scone" or "scone-cap" from its shape. The word appears to have been a shortened form of a Low Ger. *Schonbrot, i.e.* fine bread, explained in the Bremen Glossary (1771), quoted in the *New English Dictionary,* as a sort of white loaf with two acute and two obtuse angles. The Hamburg dialect word *schönroggen,* fine rye, was adopted into Swedish and Icelandic in the sense of biscuit.

SCOOP (from M. L. Ger. or M. Du. *schope,* cf. Du. *schoep,* a bailing vessel, Ger. *schöpfen,* and, from M. Du. *schoppe,* Ger. *Schüppe,* shovel), properly a utensil or implement for ladling or bailing out water or liquid from a vessel, and so used of the bucket of a water-wheel or of a dredger; in its most usual sense the word is applied to a small kind of shovel with a short handle and a sharply curved blade, often covered in towards the handle end, and used for the moving and lifting of loose materials or for cutting out a rounded piece from any substance. In journalistic slang, originally American, a "scoop" is an exclusive piece of information obtained by a newspaper.

SCOPAS, probably of Parian origin, the son of Aristander, a great Greek sculptor of the 4th century B.C. Although classed as an Athenian, and similar in tendency to Praxiteles, he was really a cosmopolitan artist, working largely in Asia and Peloponnesus. The extant works with which he is associated are the Mausoleum of Halicarnassus, and the temple of Athena Alea at Tegea. In the case of the Mausoleum, though no doubt the sculpture generally belongs to his school, we are unable to single out any special part of it as his own. But we have good reason to think that the pedimental figures from Tegea, some of which are at Athens, while some are kept in the local museum, are Scopas' own work. The subjects of the pedimental compositions were the hunting of the Calydonian boar and the battle between Achilles and Telephus. Four heads remain, that of Hercules, that of Atalanta and two of warriors: also part of the body of Atalanta and the head of the boar. Unfortunately all these are in very poor preservation; but it is allowed that they are our best evidence for the style of Scopas. The head of a helmeted warrior (see GREEK ART, Plate III. fig. 63) is especially valuable to us. It is very powerful, with massive bony framework; the forehead is projecting, the eyes deep-set and heavily shaded, the mouth slightly open and full of passion. It shows us that while in general style Scopas approached Praxiteles, he differed from him in preferring strong expression and vigorous action to repose and sentiment. The temple at Tegea was erected after 395 B.C.; and the advanced character of the sculpture seems to indicate a date at least twenty years later than this.

Attempts have been made, through comparison of these heads, to assign to Scopas many sculptures now in museums, heads of Heracles, Hermes, Aphrodite, Meleager and others. It is, however, very risky thus to attribute works executed in Roman times, and often thoroughly eclectic in character. Ancient writers give us a good deal of information as to works of Scopas. He made for the people of Elis a bronze Aphrodite, riding on a goat (copied on the coins of Elis); a Maenad at Athens, running with head thrown back, and a torn kid in her hands was ascribed to him; of this Dr Treu has published a probable copy in the Albertinum at Dresden (*Mélanges Perrot,* p. 317). Another type of his was Apollo as leader of the Muses, singing to the lyre. The most elaborate of his works was a great group representing Achilles being conveyed over the sea to the island of Leuce by his mother Thetis, accompanied by Nereids riding on dolphins and sea-horses, Tritons and other beings of the sea, "a group," says Pliny (36. 25), "which would have been remarkable had it been the sole work of his life." He made also an Aphrodite which rivalled the creation of Praxiteles, a group of winged love-gods whom he distinguished by naming them Love, Longing and Desire, and many other works.

Jointly with his contemporaries Praxiteles and Lysippus, Scopas may be considered as having completely changed the character of Greek sculpture. It was they who initiated the lines of development which culminated in the schools of Pergamum, Rhodes and other great cities of later Greece. In most of the modern museums of ancient art their influence may be seen in three-fourths of the works exhibited. At the Renaissance it was especially their influence which dominated Italian painting and through it modern art. (P. G.)

SCOPE (through Ital. *scopo,* aim, purpose, intent, from Gr. *σκοπός,* mark to shoot at, aim, *σκοπεῖν,* to see, whence the termination in telescope, microscope, &c.), properly that which is aimed at, purpose, intention; hence outlook, view, range of observation or action; more generally, the sphere or field over which an activity extends, room or opportunity for play or action.

SCORDISCI, in ancient geography, a Celtic tribe inhabiting the southern part of lower Pannonia between the Savus, Dravus and Danuvius. Some Roman authorities consider them a Thracian stock, because of their admixture with an older Thraco-Illyrian population. As early as 175 B.C. they came into collision with the Romans by assisting Perseus, king of Macedonia; and after Macedonia became a Roman province they were for many years engaged in hostilities with them. In 135 they were defeated by M. Cosconius in Thrace (Livy, *epit.* 56); in 118, according to a memorial stone discovered near Thessalonica (W. Dittenberger, *Sylloge inscriptionum Graecarum,* i. No. 247, 1883 edition), Sextus Pompeius, probably the grandfather of the triumvir, was slain fighting against them near Stobi. In 114 they surprised and destroyed the army of Gaius Porcius Cato in the Servian mountains, but were defeated by Q. Minucius Rufus in 107. Nevertheless, they still from time to time gave trouble to the Roman governors of Macedonia, whose territory they invaded in combination with the Maedi and Dardani. They even advanced as far as Delphi and plundered the temple; but Lucius Cornelius Scipio Asiaticus finally overcame them in 88 and drove them across the Danube. In Strabo's time they had been expelled from the valley of the Danube by the Dacians (Strabo vii. pp. 293,313).

See Mommsen, *Hist. of Rome* (Eng. trans.), bk. iv. ch. 5, who puts the final conquest of the Scordisci by the Romans not later than 91. Also H. Pomtow, "Die drei Brände des Tempels zu Delphi" in *Rheinisches Museum,* li. p. 369 (1896); A. Holder, *Altceltischer Sprachschatz,* ii. (1904).

SCORE (O.E. *scor*, from *sceran*, to cut, notch, cf. "shear"), properly a notch or groove cut in a piece of wood, called a "tally" (*q.v.*), as a method of counting; hence an account or reckoning made in this way. Either from a custom of keeping each series of twenty numbers or notches on a separate tally, or of marking the twentieth number by a longer or deeper mark, the word was early used to denote the number twenty; it is still used as a measure of weight, equivalent to 20 lb, computing the weight of animals sold for slaughtering for food. In music, a score is the written or printed copy of a composition on two or more staves, barred and braced together. For instrumental and vocal music a "full score" has the parts for each class of voice and instrument on a separate staff.

SCORESBY, WILLIAM (1789–1857), English Arctic explorer, scientist and divine, was born near Whitby, Yorkshire, on the 5th of October 1789. His father, William Scoresby (1760–1829), made a fortune in the Arctic whale fishery. The son made his first voyage with his father when he was eleven years of age, but on his return he was sent back to school, where he remained till 1803. After this he was his father's constant companion, and was with him on the 25th of May 1806, as chief officer of the whaler "Resolution," when he succeeded in reaching 81° 30′ N. lat. (19° E. long.), for twenty-one years the highest northern latitude attained in the eastern hemisphere. During the following winter, Scoresby attended the natural philosophy and chemistry classes at Edinburgh university, and again in 1809. In his voyage of 1807 he began the study of the meteorology and natural history of the polar regions, among the earlier results of which are his original observations on snow and crystals; and in 1809 Robert Jameson brought certain Arctic papers of his before the Wernerian Society of Edinburgh, of which he was at once elected a member. In 1811 his father resigned to him the command of the "Resolution," and in the same year he married the daughter of a Whitby shipbroker. In his voyage of 1813 he established for the first time the fact that the temperature of the polar ocean is warmer at considerable depths than it is on the surface, and each subsequent voyage in search of whales found him no less eager of fresh additions to scientific knowledge. His letters of this period to Sir Joseph Banks, whose acquaintance he had made a few years earlier, no doubt gave the first impulse to the search for the North-West Passage which followed. In 1819 he was elected a fellow of the Royal Society of Edinburgh, and about the same time communicated a paper to the Royal Society of London "On the Anomaly in the Variation of the Magnetic Needle." In 1820 he published *An Account of the Arctic Regions and Northern Whale Fishery*, in which he gathers up the results of his own observations, as well as those of previous navigators. In his voyage of 1822 to Greenland he surveyed and charted with remarkable accuracy 400 m. of the east coast, between 69° 30′ and 72° 30′, thus contributing to the first real and important geographic knowledge of East Greenland. This, however, was the last of his Arctic voyages. On his return he was met by the news of his wife's death, and this event, with other influences acting upon his naturally pious spirit, decided him to enter the church. After two years of residence in Cambridge he took his degree (1825) and was appointed to the curacy of Bassingby, Yorkshire. Meantime had appeared at Edinburgh his *Journal of a Voyage to the Northern Whale Fishery, including Researches and Discoveries on the Eastern Coast of Greenland* (1823). The discharge of his clerical duties at Bassingby, and later at Liverpool, at Exeter and at Bradford, did not prevent him from continuing his interest in science. In 1824 the Royal Society elected him a fellow, and in 1827 he was elected an honorary corresponding member of the Paris Academy of Sciences, while in 1839 he took the degree of D.D. From the first he was an active member and official of the British Association, and he contributed especially to the knowledge of terrestrial magnetism. Of his sixty papers in the Royal Society list many are more or less connected with this department of research. But his observations extended into many other departments, including certain branches of optics. In order to obtain additional data for his theories on magnetism he made a voyage to Australia in 1856, the results of which were published in a posthumous work—*Journal of a Voyage to Australia for Magnetical Research*, edited by Archibald Smith (1859). He made two visits to America, in 1844 and 1848; on his return home from the latter visit he made some valuable observations on the height of Atlantic waves, the results of which were given to the British Association. He interested himself much in social questions, especially the improvement of the condition of factory operatives. He also published numerous works and papers of a religious character. In 1850 he published a work urging the prosecution of the search for the Franklin expedition and giving the results of his own experience in Arctic navigation. He was twice married after the death of his first wife. After his third marriage (1849) he built a villa at Torquay, where he died on the 21st of March 1857.

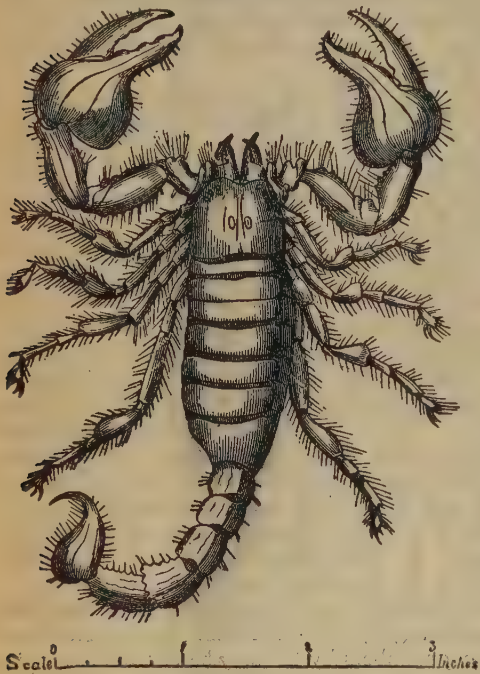
See the *Life* by his nephew, Dr R. E. Scoresby-Jackson (1861).

SCORIA (Lat. *scoria*, slag), in geology, a name applied to lava when moderately vesicular and having a structure like that of a clinker. Ejected masses of scoriaceous lava are often called "cinders," a term conveniently used for all lumps of vesicular lava (see VOLCANO).

SCORPIO ("THE SCORPION"), in astronomy, the 8th sign of the zodiac (*q.v.*), denoted by the symbol ♏. It is also a constellation, mentioned by Eudoxus (4th century B.C.) and Aratus (3rd century B.C.), and catalogued by Ptolemy (24 stars), Tycho Brahe (10), Hevelius (20). The Greeks fabled that Orion having boasted to Diana and Latona that he would kill every animal on the earth, these goddesses sent a poisonous reptile—a scorpion—which stung him so that he died. Jupiter raised the scorpion to heaven, and afterwards, at Diana's request, did the same for Orion. The chief star in this constellation is α *Scorpii* or Antares, a reddish star of the first magnitude, accompanied by a green companion of the seventh magnitude. μ *Scorpii* is a spectroscopic binary; T *Nova Scorpii* is a "new" star discovered in 1860 by G. F. Auwers in the cluster Messier 80.

SCORPION (Lat. *scorpio*), the common name for members of the class Arachnida (*q.v.*), distinguishable at a glance from all the other existing members by having the last five segments of the body modified to form a highly flexible tail, armed at the end with a sting consisting of a vesicle holding a pair of poison glands, and of a sharp spine behind the tip of which the ducts of the glands open. Like spiders they have four pairs of walking legs; but the limbs of the second pair form a couple of powerful pincers, and those of the first pair two much smaller nippers. They feed entirely upon animal food, principally upon insects such as beetles or other ground species, although the larger kinds have been known to kill small lizards and mice. The large pincers are studded with highly sensitive tactile hairs, and the moment an insect touches these he is promptly seized by the pincers and stung to death, the scorpion's tail being swiftly brought over his back and the sting thrust into the struggling prey. Paralysis rapidly follows, and, when dead, the insect is pulled to pieces by the small nippers and its soft tissues sucked into the scorpion's mouth. Scorpions vary in size from about 1 in. to 8 in.; and the amount of poison instilled into a wound depends principally upon the size of the animal. But the poison is more virulent in some of the smaller than in the larger species. Upon mankind the effects of the poison are seldom fatal, though death has been known to follow in the case of patients in a poor state of health at the time. In small scorpions, like those belonging to the genus *Euscorpius*, which occurs in Italy and other countries of South Europe, the sting is said to be as bad as that of a wasp; but in many tropical species acute pain, accompanied by inflammation and throbbing of the wounded part, follows. But unless molested, scorpions are perfectly harmless, and only make use of the sting for the purpose of killing prey.

The belief that scorpions commit suicide by stinging themselves to death when tortured by fire is of considerable antiquity and is prevalent wherever these animals occur. It is nevertheless quite without foundation in fact; for it has been proved experimentally of late years that the venom has no effect upon the individual itself, nor yet upon a member of the same species. Scorpions, however, are extraordinarily susceptible to heat, and succumb very rapidly when exposed either to the warmth of a fire or to that of the tropical sun. Moreover, when they feel the heat beating upon them they brandish their tails and strike right and left as if to drive off or destroy the unseen enemy; and there can be no doubt that the belief above alluded to is traceable primarily to observation of the sequence of events just described, the final event being the death of the animal, not, however, from a self-inflicted wound but from the heat which provoked the behaviour suggestive of suicidal purpose. It may be that under such circumstances a random stroke has now and again wounded the animal itself; but a wound so inflicted would be accidental, not intentional, and at most would contribute in a small measure to the creature's death. Scorpions are very easily rendered innocuous by scraping off the sharp point of the sting; and specimens, which are handled with impunity by Arabs and Dervishes to impress the uninitiated with their superhuman attributes, have generally been treated in this way. At the same time it has been shown that insensibility to the pain of the sting and immunity to the ill effects can be acquired by any one who has the courage to permit himself to be repeatedly stung.



African Scorpion (*Pandinus heros*).

Like many poisonous animals, scorpions are for the most part rendered conspicuous by distinctive coloration of jet-black or black and yellow; and many of them are gifted with stridulating organs, developed in various parts of the body which are functionally comparable to the rattles of rattlesnakes, porcupines and other noxious animals. In habits scorpions are cryptozoic and nocturnal, spending the daytime concealed under stones or fallen tree trunks or in burrows, and only venturing out after sunset in search of food. Amongst the burrowing kinds are the large African species belonging to the genera *Pandinus* and *Opisthophthalmus* and to the eastern genus *Palamnaeus*. The yellow scorpions of the genus *Buthus*, which are common in Egypt and the Sahara, lurk on the watch for prey in shallow depressions which they excavate with their legs in the sand.

Unlike the majority of Arachnida, scorpions are viviparous. The young are born two at a time, and the brood, which consists of a dozen or more individuals, is carried about on its mother's back until the young are large and strong enough to shift for themselves. The young in a general way resemble their parents and undergo no metamorphosis with growth, which is accompanied by periodical casting of the entire integument. Moulting is effected by means of a split in the integument which takes place just below the edge of the carapace all round, exactly as in king-crabs, spiders and Pedipalpi. Through the split the young scorpion gradually makes its way, leaving the old integument behind.

Scorpions are of great antiquity. In coal deposits of the Carboniferous Period their remains are not uncommonly found, and no essential structural difference has been discovered between these fossils and existing forms—a fact proving that the group has existed without material structural modification for untold thousands of years. These Carboniferous scorpions, however, were preceded by others, now occurring in marine Silurian deposits, which evidently lived in the sea and exhibit some anatomical differences marking them off as a group distinct from their Carboniferous and recent descendants and attesting affinity with the still earlier marine Arachnida referred to the group Gigantostraca. Their legs were short, thick, tapering, and ended in a single strong claw, and were well adapted, it seems, like the legs of shore-crabs, for maintaining a secure hold upon rocks or seaweed against the wash of waves. The method of breathing of these ancient types is not certainly known; but probably respiration was effected by means of gills attached to the ventral plates of the body. At all events no trace of respiratory stigmata has been detected even in well-preserved material. These Silurian scorpions, of which the best-known genus is *Palaeophonus*, were of small size, only 1 in. or 2 in. in length.

At the present time scorpions are almost universally distributed south of about the 40th or 45th parallels of north latitude; and their geographical distribution shows in many particulars a close and interesting correspondence with that of the mammalia, their entire absence from New Zealand being not the least interesting point of agreement. The facts of their distribution are in keeping with the hypothesis that the order originated in the northern hemisphere and migrated southwards into the southern continent at various epochs, their absence from the countries to the north of the above-mentioned latitudes being due, no doubt, to the comparatively recent glaciation of those areas. When they reached Africa, Madagascar was part of that continent; but their arrival in Australia was subsequent to the separation of New Zealand from the Austro-Malayan area to the north of it. Moreover, the occurrence of closely related forms in Australia and South America on the one hand, and in tropical Africa and the northern parts of South America on the other, suggests very forcibly that South America was at an early date connected with Australia by a transpacific bridge and with Africa by a more northern transatlantic tract of land.

In conformity with their wide dispersal, scorpions have become adapted to diverse conditions of existence, some thriving in tropical forests, others on open plains, others in sandy deserts, and a few even at high altitudes where the ground is covered with snow throughout the winter. In the tropics they aestivate at times of drought; and in the Alps they pass the cold months of the year in a state of hibernation. (R. I. P.)

SCORPION-FLY, the popular name given to insects of the family *Panorpidae*, deriving the name from the fact that in the typical genus, *Panorpa*, the last two or three segments of the abdomen are narrow and can be flexed over the back like a scorpion's tail. The scorpion-flies are remarkable for the elongation of the oral region of the head into a prominent beak. The larva is grub-like, beset with spines and generally furnished with eight pairs of abdominal pro-legs in addition to the legs on the thorax, which are short. They live in the soil or in rotten wood and are carnivorous. The species of the genus *Bittacus* are superficially strikingly similar to the *Tipulidae* or "daddy-long-legs"; while those referred to, *Boreus*, are anomalous in being apterous and like small grasshoppers. They have usually been included in the order Neuroptera, but it is now generally considered that they should form a distinct order, which is termed Panorpata or Mecaptera.

SCORZONERA (*Scorzonera hispanica*), a hardy perennial, native to central and southern Europe, and cultivated in gardens as a vegetable for its fleshy cylindrical roots, which resemble those of salsafy except in being black outside. They should be treated in every respect like salsafy. The genus is a member of the natural order Compositae, and nearly allied to *Tragopogon*, to which salsafy belongs.

SCOT, MICHAEL (? 1175–1232), Scottish mathematician and astrologer. The dates of his birth and death are quite uncertain, the most probable being those here given. The efforts of Sir

Walter Scott and others to identify him with the Sir Michael Scot of Balwearie, who in 1290 was sent on a special embassy to Norway, must be considered unsuccessful, though he may have been a member of the family. Scot studied at Oxford and Paris, devoting himself to philosophy and mathematics. It appears that he had also studied theology, and was ordained a priest, as Pope Honorius III. wrote to Stephen Langton on the 16th of January 1223/4, urging him to confer an English benefice on Scot, and actually himself nominated him archbishop of Cashel in Ireland. This appointment Scot refused to take up, but he seems to have held benefices in Italy from time to time. From Paris he went to Bologna, and thence, after a stay at Palermo, to Toledo. There he acquired a knowledge of Arabic. This opened up to him the Arabic versions of Aristotle and the multitudinous commentaries of the Arabians upon them, and also brought him into contact with the original works of Avicenna and Averroes. His own first work was done as a translator. He was one of the savants whom Frederick II. attracted to his brilliant court, and at the instigation of the emperor he superintended (along with Hermannus Alemannus) a fresh translation of Aristotle and the Arabian commentaries from Arabic into Latin. There exist translations by Scot himself of the *Historia animalium*, the *De anima* and *De coelo*, along with the commentaries of Averroes upon them. This connexion with Frederick and Averroes—both of evil reputation in the middle ages—doubtless contributed to the formation of the legend which soon enveloped Michael Scot's name. His own books, however, dealing as they do almost exclusively with astrology, alchemy and the occult sciences generally, are mainly responsible for his popular reputation. Chief among these are *Super auctorem spherae*, printed at Bologna in 1495 and at Venice in 1631; *De sole et luna*, printed at Strassburg (1622), in the *Theatrum chimicum*, and containing more alchemy than astronomy, the sun and moon being taken as the images of gold and silver; *De chiromantia*, an opuscule often published in the 15th century; *De physiognomia et de hominis procreatione*, which saw no fewer than eighteen editions between 1477 and 1660. The *Physiognomia* (which also exists in an Italian translation) and the *Super auctorem spherae* expressly state that they were undertaken at the request of the emperor Frederick. Michael is said to have foretold (after the double-tongued manner of the ancient oracles) the place of Frederick's death, which took place in 1250. Around his own death many legends gathered. He was supposed to have foretold that he would end by a blow from a stone of not more than two ounces in weight, and that to protect himself he wore an iron helmet, and that, raising this in church at the elevation of the host, the fatal stone fell on him from the roof. Italian tradition says he died in that country, while another legend is that he returned to his native land to die, and according to one account was buried at Holme Cultram in Cumberland; according to another, which Sir Walter Scott has followed in the *Lay of the Last Minstrel*, in Melrose Abbey. In the notes to that poem, of which the opening of the wizard's tomb forms the most striking episode, Scott gives an interesting account of the various exploits attributed by popular belief to the great magician. "In the south of Scotland any work of great labour and antiquity is ascribed either to the agency of Auld Michael, of Sir William Wallace or the devil." He used to feast his friends with dishes brought by spirits from the royal kitchens of France and Spain and other lands. His embassy to France alone on the back of a coal-black demon steed is also celebrated, in which he brought the French monarch to his knees by the results of the stamping of his horse's hoof: the first ringing the bells of Notre Dame and the second causing the towers of the palace to fall. Other powers and exploits are narrated in Folengo's Macaronic poem of *Merlin Coccaius* (1595). But Michael's reputation as a magician was already fixed in the age immediately following his own. He appears in the *Inferno* of Dante (canto xx. 115-117) among the magicians and soothsayers. He is represented in the same character by Boccaccio, and is severely arraigned by Giovanni Pico della Mirandola in his work against astrology, while Gabriel Naudé finds it necessary to defend his good name in his *Apologie pour les grands personnages faussement accusés de magie.*

For full details and analysis of all the legends attaching to Scot, see Rev. J. Wood Brown, *Life and Legend of Michael Scot* (1897).

SCOT AND LOT (O. Fr. *escot*, A.S. *sceot*, a payment; *lot*, a portion or share), a phrase common in the records of English medieval boroughs, applied to those householders who were assessed to any payment (such as tallage, aid, &c.) made by the borough for local or national purposes. They were usually members of a gild merchant. Previous to the Reform Act 1832 those who paid scot and bore lot were entitled to the franchise in virtue of this payment, and the rights of those living in 1832 were preserved by the act. The phrase is preserved in the Disorderly Houses Act 1751, which empowers inhabitants of a parish or place paying scot and bearing lot therein (*i.e.* ratepayers) to require the constable of the parish to prosecute disorderly houses.

See D. P. Fry, "On the Phrase Scot and Lot," in *Trans. Philological Society* (1867), pp. 167-197; C. Gross, *Gild Merchant*, i. c. iv.; Pollock and Maitland, *Hist. Eng. Law*, p. 647.

SCOTER, a word of doubtful origin, perhaps a variant of "Scout," one of the many local names shared in common by the guillemot (*q.v.*) and the razorbill (*q.v.*), or perhaps primarily connected with coot (*q.v.*),[1] the English name of the *Anas nigra* of Linnaeus, a bird which with some allied species has been justifiably placed in a distinct genus, *Oedemia* (often misspelt *Oidemia*)—a name coined in reference to the swollen appearance of the base of the bill. The scoter is also very generally known around the British coasts as the "black duck" from the male being, with the exception of a stripe of orange that runs down the ridge of the bill, wholly of that colour. In the representative American form, *Oe. americana*, the protuberance at the base of the bill, black in the European bird, is orange as well. Of all ducks the scoter has the most marine habits, keeping the sea in all weathers, and rarely resorting to land except for the purpose of breeding. Even in summer small flocks of scoters may generally be seen in the tideway at the mouth of any of the larger British rivers or in mid-channel, while in autumn and winter these flocks are so increased as to number thousands of individuals, and the water often looks black with them. A second species, the velvet-duck, *Oe. fusca*, of much larger size, distinguished by a white spot under each eye and a white bar on each wing, is far less abundant than the former, but examples of it are occasionally to be seen in company with the commoner one, and it too has its American counterpart, *Oe. velvetina*; while a third, only known as a straggler to Europe, the surf-duck, *Oe. perspicillata*, with a white patch on the crown and another on the nape, and a curiously particoloured bill, is a not uncommon bird in North American waters. All the species of *Oedemia*, like most other sea-ducks, have their true home in arctic or subarctic countries, but the scoter itself is said to breed occasionally in Scotland (*Zoologist*, s.s. p. 1867). The females display little of the deep sable hue that characterizes their partners, but are attired in soot-colour, varied, especially beneath, with brownish white. The flesh of all these birds has an exceedingly strong taste, and, after much controversy, was allowed by the authorities to rank as fish in the ecclesiastical dietary (cf. Graindorge, *Traité de l'origine des macreuses*, Caen, 1680; and *Correspondence of John Ray*, Ray Soc. ed., p. 148). (A. N.)

SCOTIA (Gr. σκοτιά, shadow or darkness), in architecture, a concave moulding most commonly used in bases, which projects a deep shadow on itself, and is thereby a most effective moulding under the eye, as in a base. (See MOULDING.)

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[1] In the former case the derivation seems to be from the O. Fr. *Escoute*, and that from the Latin *auscultare*, but in the latter from the Dutch *Koet*, which is said to be of Celtic extraction—*cwtiar*. The Fr. *macreuse*, possibly from Lat. *macer*, indicating a bird that may be eaten in Lent or on the fast days of the Roman Church, is of double signification, meaning in the south of France a coot and in the north a scoter. By the wild-fowlers of parts of North America scoters are commonly called coots.

SCOTLAND, the name given in modern times to that portion of Great Britain which lies north of the English boundary; it also comprises the Outer and Inner Hebrides and other islands off the west coast, and the Orkney and Shetland islands off the north coast. With England lying to the south, it is thus bounded on the N. and W. by the Atlantic Ocean, and on the E. by the North Sea. It is separated from England by the Solway Firth, the Sark, Scotsdyke (an old embankment in 55° 3′ N., connecting the Sark with the Esk), the Esk (for one mile), the Liddel, the Kershope, the Cheviot Hills, the Tweed and a small area known as the "liberties" of Berwick. The mainland lies between 58° 40′ 30″ (at Dunnet Head in Caithness) and 54° 38′ N. (Mull of Galloway in Wigtownshire), and 1° 45′ 32″ (Buchan Ness in Aberdeenshire) and 6° 14′ W. (Ardnamurchan Point in Argyllshire). Including the islands, however, the extreme latitude north is 60° 51′ 30″ (Out Stack in the Shetlands) and the extreme longitude west 8° 35′ 30″ (St Kilda). The greatest length from Cape Wrath in Sutherland to the Mull of Galloway is 274 m., and the greatest breadth from Buchan Ness to Applecross in the shire of Ross and Cromarty 154 m., but from Bonar Bridge at the head of Dornoch Firth to the head of Loch Broom it is only 26 m. wide, and 30 m. from Grangemouth on the Forth to Bowling on the Clyde. The coast-line is estimated at 2300 m., the arms of the sea being so numerous and in several cases penetrating so far inland that few places are beyond 40 m. from salt water. The total area is 19,069,500 acres or 29,796 sq. m., exclusive of inland waters (about 608 sq. m.), the foreshore (about 498 sq. m.) and tidal water (about 608 sq. m.).

The name Scotland for this geographical area of northern Britain (the *Caledonia* of the ancients—a name still poetically used for Scotland) originated in the 11th century, when (from the tribe of Scots) part of it was called Scotia (a name previously applied to what is now Ireland); and the name of Scotland became established in the 12th and 13th centuries. The name of Britain or North Britain is still firmly associated with Scotland; thus English letters are generally addressed, *e.g.* "Edinburgh, N.B.," *i.e.* North Britain; and Scottish people have long objected to the conventional use south of the Tweed of the word "English," when it really means (as they correctly, but sometimes rather pedantically, insist) "British."

I. GEOGRAPHY

Physically, Scotland is divided into three geographical regions—the "Highlands" (subdivided by Glen More into the North-Western and South-Eastern Highlands); the Central Plain or "Lowlands" (a tract of south-westerly to north-easterly trend, between a line drawn roughly from Girvan to Dunbar and a line drawn from Dumbarton to Stonehaven); and the Southern Uplands.

The Highlands.—Nearly all this region is lofty ground, deeply trenched with valleys and sea lochs. The only considerable low-lying area embraces the eastern part of Aberdeenshire and the northern parts of Banff, Elgin and Nairn—tracts which, ethnologically, do not fall within Highland territory. Along both sides of the Moray Firth a strip of level land lies between the foot of the hills and the sea, while the county of Caithness, occupying a wide plain, does not, strictly speaking, belong to the Highlands. Seen from Strathmore or the Firth of Clyde the Highlands present well-defined masses of hills abruptly rising from the Lowland plains, and from any of the western islands their sea front resembles a vast rampart indented by lochs and rising to a uniform level, which sinking here and there allows glimpses of still higher summits in the interior. The Highland hills differ from a mountain chain such as the Alps not merely in their inferior elevation but in configuration and structure. They are made up of a succession of more or less parallel confluent ridges, having in the main a trend from north-east to south-west. These ridges are separated by longitudinal and furrowed by transverse valleys. The portions of the ridge thus isolated rise into what are regarded as mountains, though they are really only loftier parts of the ridge, along which indeed the geological structure is continued. It is remarkable how the average level of the summits is maintained. Viewed from near at hand a mountain may seem to tower above the surrounding country, but from a distance it will be seen not to rise much above the general uniformity of elevation. There are no gigantic dominant masses obviously due to special terrestrial disturbance. A few apparent exceptions occur along the western seaboard of Sutherland, in Skye and elsewhere, but examination of their structure at once explains the reason of their prominence and confirms the rule. The surface of the Highlands is rugged. The rocks project in innumerable bosses and crags, which roughen the sides and crests of the ridges. The shape and colour of these roughnesses depend on the nature of the underlying rock. Where it is hard and jointed, weathering into large quadrangular blocks, the hills are more especially distinguished for the gnarled bossy character of their declivities, as may be seen in Ben Ledi and the heights to the north-east of it. Where, on the other hand, the rock decays with smaller debris, the hills assume smoother contours, as in the slate hills running from the Kyles of Bute to Loch Lomond. But, regarded broadly, the Highland mountains are monuments of erosion, the relic of an old tableland, the upper surface and former inclinations of which are shown approximately by the summits of the existing masses and the direction of the chief water-flows.

The Highlands are separated into two completely disconnected and in some respects contrasted regions by the depression of the Great Glen, extending from Loch Linnhe to Inverness, by which the ancient plateau was severed. In the north-western section the highest ground is found along the Atlantic coast, mounting steeply from the sea to an average height of 2000 to 3000 ft. The watershed consequently keeps close to the western seaboard, and indeed in some places is not above a mile and a half from the shore. From these hills which catch the first downpour of the rains from the ocean, the ground falls eastward. Numerous eminences, however, prolong the mountainous features to the North Sea and south-eastward to Glen More. The difference of the general level on the two sides of the water-parting is reflected in the length of their streams. On the west the drainage empties itself into the Atlantic after flowing only a very few miles, on the east it has to run 30 or 40 m. At the head of Loch Nevis the western stream is but 3 m. long, while the eastern has a course of some 18 m. to the Great Glen. Throughout the north-western region uniformity of features characterizes the scenery, betokening even at a distance the general monotony of structure. But the sameness is relieved along the western coast of the shires of Sutherland and Ross and Cromarty by groups of cones and stacks, and farther south by the terraced plateaus and abrupt conical hills of Skye, Rum and Mull.

The south-eastern region of the Highlands, having a more diversified geological structure, offers greater variety of scenery. Most of the valleys, lakes and sea lochs run in a south-westerly and north-easterly direction, a feature strikingly exhibited in west Argyllshire. But there are also several important transverse valleys, those of the Garry and Tay being the most conspicuous examples. The watershed, too, is somewhat different. It first strikes eastwards round the head of Loch Laggan and then swings southwards, pursuing a sinuous course till it leaves the Highlands on the east side of Loch Lomond. The streams flowing westward, however, are still short, while those running to the north-east, east and south-east have long courses and drain wide areas. There is a marked contrast between the configuration of the north-eastern district and the other parts of this region. In that area the Grampians rise into wide flat-topped heights or moors often more than 3000, and in a few places exceeding 4000 ft. in height, and bounded by steep declivities and sometimes by precipices. Seen from an eminence on their surface, the inference is irresistible that these plateaus are fragments of the original tableland, trenched into segments by the formation of the longitudinal and transverse valleys. Farther to the south-west, in the shires of Perth, Inverness and Argyll, they give place to the ordinary hummocky crested ridges of Highland scenery, which, however, in Ben Nevis and Aonach Beg reach a height of over 4000 ft.

Besides the principal tracts of low-lying ground in the Highlands already alluded to, there occur long narrow strips of flat land in the more important valleys. Most of the straths and glens have a floor of detritus which, spread out between the bases of the boundary hills, has been levelled into meadow land by the rivers and provides almost the sole arable ground in each district.

The Lowlands of Mid-Scotland, or the Central Plain, constitute a broad depression with south-westerly to north-easterly trend lying between the Highland line that runs from the head of the Firth of Clyde to Stonehaven and the pastoral uplands that stretch from Girvan to Dunbar. They may be regarded as a long trough of younger rocks let down by parallel dislocations between the older masses to the south and north. The lowest of these younger rocks are the various sedimentary and volcanic members of the Old Red Sandstone. These are covered by the successive formations of the Carboniferous system. The total thickness of both these groups of rock cannot be less than 30,000 ft., and, as most of them bear evidence of having been deposited in shallow water, they could only have been accumulated during a prolonged period of depression. The question arises whether this depression affected only the area of the midland valley, or extended also to the regions to the north and south; and so far as the evidence goes there is ground for the inference that, while the depression had its maximum along the line of the lowlands, it also involved some portion at least of the high grounds on either side. In other words, the Old Red Sandstone and Carboniferous rocks, though chiefly accumulated in the broad lowland valley, crept also over some part of the hills on either side, where a few outliers tell of their former extension. The central Lowlands are thus of great geological antiquity. During and since the deposition of the rocks that underlie them the tract has been the scene of repeated terrestrial disturbances. Long dislocations have sharply defined its northern and southern margins. By other fractures and unequal movements of upheaval or depression portions of the older rocks have been brought up within the bounds of the younger, and areas of the younger have been enclosed by the older. On the whole, these disturbances have followed the prevalent north-easterly trend, and hence a general tendency may be observed among the main ridges and valleys to run in that direction. The chains of the Ochil, Sidlaw, Pentland, Renfrew, Campsie and Fintry Hills, and the valleys of the Strathmore, Firth of Tay, and the basin of Midlothian may be cited as examples. But the dominant cause in the determination of the topographical prominences and depressions of the district has been the relative hardness and softness of the rocks. Almost all the eminences in the Lowlands consist of hard igneous rocks, forming not only chains of hills such as those just mentioned and others in Ayrshire and Lanarkshire, but isolated crags and hills like those on which stand the castles of Edinburgh and Stirling, and others conspicuous in the scenery of Fife and the Lothians.

Of the three chief valleys in the central Lowlands two, those of the Tay and the Forth, descend from the Highlands, and one, that of the Clyde, from the Southern Uplands. Though on the whole transverse, these depressions furnish another notable example of that independence of geological structure already referred to.

The Southern Uplands extend from the North Channel in the south-west to St Abb's Head in the north-east and form a well-defined belt of hilly ground, and though much less elevated (their highest point is 2764 ft. above the sea) than the Highlands, rise with scarcely less abruptness above the lower tracts that bound them. Their north-western margin for the most part springs boldly above the fields and moorlands of the Central Plain, and its boundary for long distances continues remarkably straight. On the south and south-east their limits in general are less prominently defined, but are better seen west and south-west of the Nith from which they extend to the sea and Loch Ryan, terminating in the extreme south-west in a plateau of which the loftiest point is little over 1000 ft. above the sea. The Cheviots do not properly belong to the Uplands, from which they are separated by Liddesdale and other hollows and on which they abut abruptly. But though geologically the one set of mountains must be separated from the other, geographically it is convenient to include within the Southern Uplands the whole area between the Central Plain and the Border. A survey of the Uplands, therefore, presents in succession from south-west to north-east the Kirkcudbrightshire and Ayrshire mountain moors, the Lowthers, the Moffat hills, the Moorfoots and the Lammermuirs. Distinguished especially by the smoothness of their surface, they may be regarded as a rolling tableland or moorland, traversed by many valleys conducting the drainage to the sea. This character is well observed from the heights of Tweedsmuir. Wide, mossy moors, 2000 ft. or more above the sea, and sometimes level as a racecourse, spread out on all sides. Their continuity, however, is interrupted by numerous valleys separating them into detached flat-topped hills, which are comparatively seldom marked by precipices of naked rock. Where the rock projects it more usually appears in low crags and knolls, from which long trails of grey or purple debris descend till they are lost among the grass. Hence, besides being smooth, the uplands are remarkably verdant. They form indeed excellent pasture-land, while the alluvial flats in the valleys and even some of the lower slopes are fitted for grain and green crops.

This uniformity of aspect is doubtless traceable to the prevalence of the same kind of rocks and the same geological structure. The Silurian greywackes and shales that underlie almost the whole of the Uplands weather generally into small angular debris, and at a tolerably uniform rate of disintegration. But slight differences may readily be detected even where no feature interferes noticeably with the monotony. The bands of massive grit and coarse greywacke, for example, break up into larger blocks and from their greater hardness are apt to project above the general surface of the other softer rocks. Hence their line of trend, which like that of all the other strata is in a north-easterly direction, may be traced from hill to hill by their more craggy contours. Only in the higher tracts are there rugged features recalling the more savage character of Highland scenery. In the heights of Hartfell (2651 ft.) and Whitecoomb (2695), whence the Clyde, Tweed, Annan, and Moffat Water descend, the high moorlands have been scarped into gloomy corries, with crags and talus-slopes, which form a series of landscapes all the more striking from the abrupt and unexpected contrast which they offer to everything around them. In Galloway, also, the highest portions of the Uplands have acquired a ruggedness and wildness more like those of the Highlands than any other district in the south of Scotland. For this, however, there is an obvious geological reason. In that region the Silurian rocks have been invaded by large bosses of granite and have undergone a variable amount of metamorphism which has in some places altered them into hard crystalline schists. These various rocky masses, presenting great differences in their powers of resisting decay, have yielded unequally to disintegration: the harder portions project in rocky knolls, crags and cliffs, while the softer parts have been worn down into more flowing outlines. The highest summit in the south of Scotland—Merrick (2764 ft.)—consists of Silurian strata much altered by proximity to the granite, while the rest of the more prominent heights (all in Kirkcudbrightshire)—Rinns of Kells (2668 ft.), Cairnsmuir of Carsphairn (2612), and Cairnsmore of Fleet (2331)—are formed of granite.

The watershed of the Southern Uplands is of much interest in relation to their geological history. It runs from the mouth of Loch Ryan in a sinuous north-easterly direction, keeping near the northern limit of the region till it reaches the basin of the Nith, where it quits the Uplands altogether, descends into the lowlands of Ayrshire, and, after circling round the headwaters of the Nith, strikes south-eastwards across half the breadth of the Uplands, then sweeps north and eastwards between the basins of the Clyde, Tweed and Annan, and then through the moors that surround the sources of the Ettrick, Teviot and Jed, into the Cheviot Hills. Here again the longest slope is on the east side, where the Tweed bears the whole drainage of that side into the sea. Although the rocks throughout the Southern Uplands have a persistent north-easterly and south-westerly strike, and though this trend is apparent in the bands of more rugged hills that mark the outcrop of hard grits and greywackes, nevertheless geological structure has been much less effective in determining the lines of ridge and valley than in the Highlands. On the southern side of the watershed, in Dumfriesshire and Galloway, the valleys run generally transversely from north-west to south-east. But in the eastern half of the Uplands the valleys do not appear to have any relation to the geological structure of the ground underneath.

Valleys.

Characteristic Features.—Though Scotland is pre-eminently a "land of mountain and of flood," yet its leading physical features are not the lofty ridges carved out of the primeval plateau—apparently the dominant characteristic—but the valleys which have been opened through them by the agencies of water and weather, and which are therefore its fundamental topographical element. The longitudinal valleys, which run in the same general direction as the ridges—that is, north-east and south-west—have had their trend defined by geological structure, such as a line of dislocation (the Great Glen), or the plications of the rocks (Lochs Ericht, Tay and Awe, and most of the sea lochs of Argyllshire). The transverse valleys run north-west or south-east and are for the most part independent of geological structure. The valley of the Garry and Tay crosses the strike of all the Highland rocks, traverses the great fault on the Highland border, and finally breaks through the chain of the Sidlaw Hills at Perth. The valley of the Clyde crosses the strike of the Silurian folds in the Southern Uplands, the boundary fault, and the ridges of the Old Red Sandstone, and pursues its north-westerly course across the abundant and often powerful dislocations of the Carboniferous system.

The crumpling of the earth's crust which folded the rocks of the Highlands and Southern Uplands probably upraised above the sea a series of longitudinal ridges having a general north-easterly direction. The earliest rain that fell upon these ridges would run off them, first in transverse watercourses down each short slope, and then in longitudinal depressions wherever such had been formed during the terrestrial disturbance. Afterwards the pathways of the streams would be gradually deepened and widened into valleys. Hence the valleys are of higher antiquity than the mountains that flank them. The mountains in fact have been hewn out of the original bulk of the land in proportion as the valleys have been excavated. The denudation would continue so long as the ground stood above the level of the sea; but there have been prolonged periods of depression, when the ground, instead of being eroded, lay below the sea-level and was buried sometimes under thousands of feet of accumulated sediment, which completely filled up and obliterated the previous drainage-lines. When the land reappeared a new series of valleys would at once begin to be eroded; and the subsequent degradation of these overlying sediments might reveal portions of the older topography, as in the case of the Great Glen, Lauderdale, and other ancient valleys. But the new drainage-lines have usually little or no reference to the old ones. Determined by the inequalities of surface of the overlying mantle of sedimentary material, they would be wholly independent of the geological structure of the rocks lying below that mantle. Slowly sinking deeper and deeper into the land, they might eventually reach the older rocks, but they would keep in these the lines of valley that they had followed in the overlying deposits. In process of time the whole of these deposits might be denuded from the area, and there might even remain no trace of the younger formations on which the valleys began and which guided their excavation. This is probably the explanation of the striking independence of geological structure exhibited by the Tweed and the Nith.

Among the valleys certain prevailing characteristics have been recognized in their popular names. *Straths* are broad expanses of low ground between bounding hills and are usually traversed by one main stream and its tributaries—*e.g.* Strath Tay, Strath Spey, Strath Conon. This name, however, has also been applied to wide tracts of lowland which embrace portions of several valleys, but are defined by lines of heights on each side; the best example is afforded by Strathmore—the "Great Strath"—between the southern margin of the Highlands and the line of the Sidlaw Hills. This long and wide depression, though it looks like one great valley, strictly speaking includes portions of the valleys of the Tay, Isla, North Esk and South Esk, all of which cross it. Elsewhere in central Scotland such a wide depression is known as a *howe*, as in the Howe of Fife between the Ochil and Lomond Hills. A *glen* is a narrower and steeper-sided valley than a strath, though the names have not always been applied with discrimination. Most of the Highland valleys are true glens, Glencoe being the best-known example. The hills rise rapidly on each side, sometimes in grassy slopes, sometimes in rocky bosses and precipitous cliffs, while the bottom is occupied by a lake. In the south of Scotland the larger streams flow in wide open valleys called *dales*, as in Clydesdale, Tweeddale, Teviotdale, Liddesdale, Eskdale, Nithsdale. The strips of alluvial land bordering a river are known as *haughs*, and where in estuaries they expand into wide plains they are termed *carses*. The carses of the Forth extend seawards as far as Bo'ness and consist chiefly of raised beaches. The Carse of Gowrie is the strip of low ground intervening between the Firth of Tay and the Sidlaw Hills. *Brae* signifies the steep bank of a river, and so any slope or hill-side.

River-gorges.

River-gorges are characteristic features in many of the valleys. In the Old Red Sandstone they are particularly prominent where that formation has lain in the pathway of the streams sweeping down from the Highlands. In the basin of the Moray Firth some fine examples may be seen on the Nairn and Findhorn, while on the west side of the Cromarty Firth some of the small streams descending from the high grounds of the east of the shire of Ross and Cromarty have cut out defiles in the Conglomerates, remarkable for their depth and narrowness. Towards the south margin of the Highlands notable instances of true *canyons* in the Old Red Sandstone are to be seen where the Isla and North Esk enter that formation. The well-known gorge in which the Falls of Clyde are situated is the best example in the Lowlands. (For the chief rivers see the separate articles on them, and also the section on the physical features in the article on the different shires of Scotland.)

Types of mountain and hill.

The topography of the country being the result of prolonged denudation, it is reasonable to infer that the oldest surfaces likely to be preserved are portions of some of the platforms of erosion successively established by the wearing down of the land to the sea-level. Relics of these platforms occur both in the Highlands and among the Southern Uplands. Allusion has already been made to the flat-topped moorlands which in the eastern Grampians reach heights of 3000 to 4000 ft. above the sea. The most familiar example perhaps is the top of Lochnagar, where, at the level of 3500 ft., the traveller finds himself on a broad undulating moor, more than a mile and a half long, sloping gently towards Glen Muick and terminating on the north in a range of granite precipices. The top of Ben Macdhui stands upon nearly a square mile of moor exceeding 4000 ft. in elevation. These mountains lie within granite areas; but not less striking examples may be found among the schists. The mountains at the head of Glen Clova and Glen Isla, for instance, sweep upwards into a broad moor some 3000 ft. above the sea, the more prominent parts of which have received special names—Driesh, Mayar, Tom Buidhe, Tolmount, Cairn na Glasha. It would hardly be an exaggeration to say that there is more level ground on the tops of these mountains than in areas of corresponding size in the valleys below. That these high plateaus are planes of erosion is shown by their independence of geological structure, the upturned edges of the vertical and contorted schists having been abruptly shorn off and the granite having been wasted and levelled along its exposed surface. Among the Southern Uplands exist traces of a similar tableland of erosion. The top of Broad Law on the confines of Peeblesshire and Selkirkshire, for example, is a level moor comprising between 300 and 400 acres above the contour line of 2500 ft. and lying upon the upturned edges of the greatly denuded Silurian grits and shales. An instructive example of the similar destruction of a much younger platform is to be found in the terraced plateaus of Skye, Eigg, Canna, Muck, Mull and Morven, which are portions of what was probably originally a continuous plain of basalt. Though dating back only to older Tertiary time, this plain has been so deeply trenched by the forces of denudation that it has been reduced to mere scattered fragments. Thousands of feet of basalt have been worn away from many parts of its surface; deep and wide valleys have been carved out of it; and so enormously has it been wasted, that it has been almost entirely stripped from wide tracts which it formerly covered and where only scattered outliers remain to prove that it once existed.

It is curious that broad flat-topped mountains are chiefly to be found in the eastern parts of the country. Traced westwards, these forms gradually give place to narrow ridges and crests. No contrast, for instance, can be greater than that between the wide elevated moors of the eastern Grampians, and the crested ridges of western Inverness-shire and Argyllshire—Loch Hourn, Glen Nevis, Glencoe—or that between the broad uplands of Peeblesshire and the precipitous heights of Galloway. Geological structure alone will not account for these contrasts. Perhaps the cause is to be sought mainly in differences of rainfall. The western mountains, exposed to the fierce lash of the Atlantic rains, sustain the heaviest and most constant precipitation. Their sides are seamed with torrents which tear down the solid rock and sweep its detritus into the glens and sea lochs. The eastern heights, on the other hand, experience a smaller rainfall and consequently a diminished rate of erosion. No doubt, too, the preponderance of rainfall in the west has persisted for an enormous period.

Regarding the existing flat-topped heights among the eastern Grampians as remnants of what was once the general character of the surface, we can trace every step in the gradual obliteration of the tableland and in the formation of the most rugged and most individualized forms of isolated mountain. In fact, in journeying westwards across the tops of the Highland mountains we pass, as it were, over successive stages in the history of the origin of Highland scenery. The oldest types of form lie on the east side and the newest on the west. From the larger fragments of the denuded tableland we advance to ridges with narrow tops, which pass by degrees into sharp rugged crests. The ridges, too, are more and more trenched until they become groups of detached hills or mountains. In the progress of this erosion full scope has been afforded for the modification of form by variation in geological structure. Each ridge and mountain has been cut into its shape by denudation, but its outlines have been determined by the nature of the rocks and the manner in which they have yielded to decay. Every distinct variety of rock has impressed its own character upon the landscape. Hence, amid the monotonous succession of ridge beyond ridge and valley after valley, diversity of detail has resulted from the varying composition and grouping of the rocks.

The process by which the ancient tablelands have been trenched into valleys and confluent ridges is most instructively displayed among the higher mountains, where erosion proceeds at an accelerated pace. The long screes or talus-slopes at the foot of every crag and cliff bear witness to the continual waste. The headwaters of a river cut into the slopes of the parent hill. Each valley is consequently lengthened at the expense of the mountain from which it descends. Where a number of small torrents converge in a steep mountain recess, they cut out a crescent-shaped hollow or half-cauldron, which in the Scottish Highlands is known as a *corrie*. It is doubtful whether the convergent action of the streams has been the sole agency in the erosion of these striking cavities, or whether snow and glacier-ice have had a share in the work. No feature in Highland scenery is more characteristic than the corries, and in none can the influence of geological structure be better understood. Usually the upper part of a corrie is formed by a crescent of naked rock, from which long trails of debris descend to the bottom of the hollow. Every distinct variety of rock has its own type of corrie, the peculiarities being marked both in the details of the upper cliffs and crags, and in the amount, form and colour of the screes. The Scottish corries have been occupied by glaciers. Hence their bottoms are generally ice-worn or strewn over with moraine stuff. Sometimes a small tarn fills up the bottom, ponded back by a moraine. It is in such localities that we can best observe the last relics of the glaciers that once overspread the country. Among these high grounds also the gradual narrowing of ridges into sharp, narrow, knife-edged crests and the lowering of these into *cols* or passes can be admirably studied. Where two glens begin opposite to each other on the same ridge, their corries are gradually cut back until only a sharp crest separates them. This crest, attacked on each front and along the summit, is lowered with comparative rapidity, until merely a low col or pass may separate the heads of the two glens. The various stages in this kind of demolition are best seen where the underlying rock is of granite or similarly tough material, which at the same time is apt to be split and splintered by means of its numerous transverse joints. The granite mountains of Arran furnish excellent illustrations.

Where a rock yields to weather with considerable uniformity in all directions it is likely to assume *conical forms* in the progress of denudation. Sometimes this uniformity is attained by a general disintegration of the rock into fine debris, which rolls down the slopes in long screes. In other cases it is secured by the intersection of joints, whereby a rock, in itself hard and durable, is divided into small angular blocks, which are separated by the action of the elements and slide down the declivities. In many instances the beginning of the formation of a cone may be detected on ridges which have been deeply trenched by valleys. The smaller isolated portions, attacked on all sides, have broken up under weather. Layer after layer has been stripped from their sides, and the flat or rounded top has been narrowed until it has now become the apex of a cone. The mountain Schiehallion (3547 ft.) is an instance of a cone not yet freed from its parent ridge. Occasionally a ridge has been carved into a series of cones united at their bases, as in the chain of the Pentland Hills. A further stage in denudation brings us to isolated groups of cones completely separated from the rest of the rocks among which they once lay buried. Such groups may be carved out of a continuous band of rock extending into the regions beyond. The Paps of Jura, for instance, rise out of a long belt of quartzite which stretches through the islands of Islay, Jura and Scarba. In many cases, however, the groups point to the existence of some boss of rock of greater durability than those in the immediate neighbourhood, as in the Cuchullins and Red Hills of Skye and the group of granite cones of Ben Loyal, Sutherland. The most impressive form of solitary cone is that wherein after vast denudation a thick overlying formation has been reduced to a single outlier, such as Morven in Caithness, the two Bens Griam in Sutherland, and still more strikingly, the pyramids of red sandstone on the western margin of the shires of Sutherland and Ross and Cromarty. The horizontal stratification of some of these masses gives them a curiously architectural aspect, further increased by the effect of the numerous vertical joints by which the rock is cleft into buttresses and recesses along the fronts of the precipices and into pinnacles and finials along the summits. Solitary or grouped pyramids of red sandstone between 3000 and 4000 ft.

above the sea are mere remnants of a continuous sheet of red sandstone that once spread far and wide over the western Highlands.

Stratified rocks when they have not been much disturbed from their original approximate horizontality weather into escarpments. Such cliffs may run for many miles across a country, rising one above another into lofty terraced hills. In Scotland the rocks have been so dislocated and disturbed as to prevent the formation of continuous escarpments, and this form of rock-scenery is consequently almost entirely absent, except locally and for the most part on a comparatively small scale. The most extensive Scottish escarpments are found among the igneous rocks. Where lava has been piled up in successive nearly horizontal sheets, with occasional layers of tuff or other softer rock between them, it offers conditions peculiarly favourable for the formation of escarpments, as in the wide basalt plateaus of the Inner Hebrides. The Carboniferous lavas of the Campsie and Fintry Hills and of the south of Dumfriesshire and Roxburghshire likewise rise in lines of bold escarpment.

Lakes. The lakes and water-basins may be classified in four groups, each with its own peculiar scenery and distinct mode of origin—(1) glen lakes, (2) rock-tarns, (3) moraine-tarns, (4) lakes of the plains.

1. *Glen lakes* are those which occupy portions of glens. They are depressions in the valleys, not due to local heaping up of detritus, but true rock-basins, often of great depth. Much discussion has arisen as to their mode of origin, but it is probable they were caused by the erosive action of ice, since glaciers occupied the glens where they occur and wore down the rocks along the sides and bottom; but it is a point of difficulty in this theory whether ice could have eroded the deepest of the hollows. In any circumstances the lakes must be of recent geological date. Any such basins belonging to the time of the folding of the crystalline schists would have been filled up and effaced long ago. Indeed, so rapid is the infilling by the torrents which sweep down detritus from the surrounding heights that even the existing lakes are visibly diminishing. Glen lakes are almost wholly confined to the western half of the Highlands, where they form the largest sheets of fresh water. Hardly any lakes are to be seen east of a line drawn from Inverness to Perth. West of that line, however, they abound in both the longitudinal and the transverse valleys. The most remarkable line of them is that which fills up much of the Great Glen, Loch Ness being the largest. Other important longitudinal lakes are Lochs Tay, Awe, Ericht and Shiel. The most picturesque glen lakes, however, lie in transverse valleys, which being cut across the strike of the rocks present greater variety and, usually, abruptness of outline. Lochs Lomond, Katrine and Lubnaig in the southern Highlands, and Lochs Maree and More in the north, are conspicuous examples.

2. *Rock-tarns* are small lakes lying in rock-basins on the sides of mountains or the summits of ridges, and on rocky plateaus or plains. Unlike glen lakes, they have no necessary dependence upon lines of valley, but are scattered as it were broadcast, and are by far the most abundant of the Scottish lakes. Dispersed over all parts of the western Highlands, they are most numerous in the north-west, especially in the Outer Hebrides and in the west of the shires of Ross and Cromarty and Sutherland, where the surface of the Archean gneiss is so thickly sprinkled with them that many tracts consist nearly as much of water as of land. They almost invariably lie on strongly ice-worn platforms of rock, and are obviously hollows produced by the gouging action of the sheets of land-ice by which the general glaciation of the country was affected. In the Southern Uplands, owing to the greater softness and uniformity of texture of the rocks, rock-tarns are comparatively infrequent, except in Galloway, where the protrusion of granite and its associated metamorphism have reproduced Highland conditions of rock-structure. In the rocky hill-ranges of the Central Plain rock-tarns occasionally make their appearance.

3. *Moraine-tarns*—small sheets of water ponded back by some of the last moraines shed by the retreating glaciers—are confined to the more mountainous tracts. Among the Southern Uplands the best-known and one of the most picturesque is the wild and lonely Loch Skene, lying in a recess of Whitecoomb at the head of Moffat Water. Others are sprinkled over the higher parts of the valleys in Galloway. None occurs in the Central Plain. In the Highlands they may be counted by hundreds, nestling in the bottoms of the corries. In the north-western counties, where the glaciers continued longest to descend to the sea-level, lakes retained by moraine-barriers may be found very little above the sea.

4. The *Lakes of the Plains* lie in hollows of the glacial detritus which is strewn so thickly over the lower grounds. As these hollows were caused by original irregular deposition rather than by erosion, they have no intimate relation to the present drainage-lines. The lakes vary in size from mere pools to sheets of water several square miles in area. As a rule they are shallow in proportion to their extent and surface. They were once more numerous than they are now, but some have disappeared through natural causes and others have been drained. The largest sheets of fresh water in the Lowlands are lakes of the plains as Loch Leven and the Lake of Menteith.

Coast-line. The eastern and western seaboards present a singular contrast. The eastern is indented by a series of broad arms of the sea—the firths of Forth and Tay, Moray and Dornoch firths—but is otherwise relatively unbroken. The land slopes gently to the sea or to the edge of cliffs that have been cut back by the waves. The shores are for the most part low, with few islands in front of them, and cultivation comes down almost to the tide-line. The western side, on the contrary, is from end to end intersected with long narrow sea lochs or fjords. The land shelves down rapidly into the sea and is fronted by chains and groups of islands. The explanation of this contrast must be sought in geological structure. The west side, as we have seen, has been more deeply eroded than the eastern. The glens are more numerous there and on the whole deeper and narrower. Many of them are prolonged under the sea; in other words, the narrow deep fjords are seaward continuations of the glens. The presence of the sea in these fjords is an accident. If they could be raised out of the sea they would become glens, with lakes filling their deeper portions. That this has been their history hardly admits of question. They are submerged land-valleys, and as they run down the whole western coast they show that this side has subsided to a considerable depth beneath its former level. The Scottish sea lochs must be considered in connexion with those of western Ireland and Norway. The whole of this north-western coast-line of Europe bears witness to recent submergence. The bed of the North Sea, which at no distant date in geological history was a land surface across which plants and animals migrated freely into Great Britain, sank beneath the sea-level, while the Atlantic advanced upon the western margin of the continent and filled the seaward ends of what had previously been valleys open to the sun. In this view the Outer and Inner Hebrides were formerly one with themselves and the mainland, and the western isles therefore are truly grouped with the Highland province of Scotland. Nearly the whole coast-line is rocky. On the east indeed, the shores of the estuaries are generally low, but the land between the mouths of these inlets is more or less precipitous. On the west the coast is mostly either a steep rocky declivity or a sea-wall, though strips of lower ground are found in the bays. The cliffs vary in character according to the nature of the rock. At Cape Wrath, precipices 300 ft. high have been cut out of the Archean gneiss. The varying texture of this rock, its irregular foliation and jointing, and its ramifying veins of pegmatite give it very unequal powers of resistance. Here it projects in irregular bastions and buttresses, there retires into deep recesses and tunnels, but shows everywhere a ruggedness of aspect eminently characteristic. In striking contrast to these precipices are those of the Cambrian red sandstone a few miles to the east. Vast vertical walls of rock shoot up to a height of 600 ft., cut by their perpendicular joints into quadrangular piers and projections, some of which stand out alone as cathedral-like islets in front of the main cliff. The sombre colouring is relieved by vegetation along the edges of the nearly flat beds which project like great cornices and serve as nesting-places for sea-fowl. On the west the most notable cliffs south of those of Cape Wrath and the Cambrian sandstones of Sutherland are to be found among the basaltic islands, particularly in Skye, where a magnificent range of precipices rising to 1000 ft. bounds the western coast-line. However, the highest cliffs are found among the Shetland and Orkney Islands. The sea-wall of Foula, in Shetland, and the western front of Hoy, in Orkney, rise like walls to heights of 1100 or 1200 ft. Caithness is one wide moor, terminating almost everywhere seaward in a range of precipices of Old Red Sandstone. Along the eastern coast most of the cliffs are formed of rocks belonging to this formation. Beginning at Stonehaven, an almost unbroken line of precipice varying up to 200 ft. in height runs to the mouth of the estuary of the Tay. On the east the Southern Uplands plunge abruptly into the sea near St Abb's Head in a noble range of precipices 300 to 500 ft. in height, and on the west terminate in a long broken line of sea-wall, which begins at the mouth of Loch Ryan, extends to the Mull of Galloway, and reappears again in the southern headlands of Wigtown and Kirkcudbright. Among the most picturesque features of Scottish sea-cliffs are the numerous *stacks* or columns of rock which during the demolition and cutting-back of the precipices have been isolated and left standing amidst the waves. These remnants attain their most colossal size and height on the cliffs of Old Red Sandstone. Thus the Old Man of Hoy in Orkney is a huge column of yellow sandstone between 400 and 500 ft. high, forming a conspicuous landmark in the north. The coast of Caithness abounds in outstanding pillars and obelisks of flagstone.

The low shores on the west coast are frequently occupied by *sand-dunes*, as on the western margin of North and South Uist, and in many bays from the north of Sutherland to the coast of Ayrshire. They are more abundant on the east coast, however, especially on the shores of Aberdeenshire, between the mouths of the two Esks in Forfarshire, on both sides of the mouth of the Firth of Tay, and at various places on the Firth of Forth. Raised sea-beaches likewise play a part in the coast scenery. These alluvial terraces form a strip of low fertile land between the edge of the sea and the rising ground of the interior, and among the western fjords sometimes supply the only arable soil in their neighbourhood, their flat green surfaces presenting a strong contrast to the brown and barren moors that rise from them. Most of the seaport towns stand upon platforms of raised beach. Considerable deposits of mud, silt and sand are accumulating in many of the estuaries. In the Tay, Forth and Clyde, where important harbours are situated, great expense is involved in constantly dredging to remove the sediment continually brought down from the land and carried backwards and forwards by the tides.

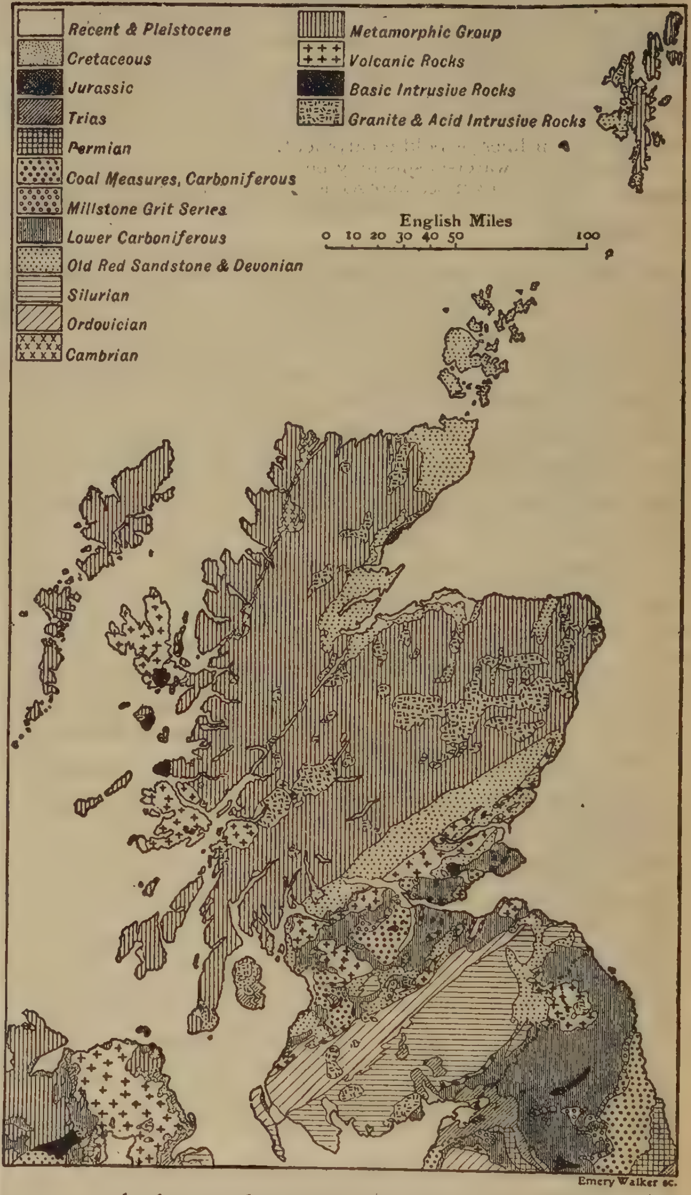
While no *islands* except mere solitary rocks like May Island, the Bass Rock and Inchkeith diversify the eastern seaboard, the western presents a vast number, varying from such extensive tracts as Skye to the smallest stack or skerry. Looked at in the broadest way, these numerous islands may be regarded as belonging to two groups or series, the Outer and the Inner Hebrides. In the Outer Hebrides most of the ground is low, rocky and plentifully dotted over with lakes; but it rises into mountainous heights in Harris, some of the summits attaining elevations of 2600 ft. The general trend of this long belt of islands is north-north-east. The Inner Hebrides form a much less definite group. They may be regarded as beginning with the Shiant Isles in the Minch and stretching to the southern headlands of Islay, and their irregularity has no doubt been chiefly brought about by the remarkable diversity of geological structure. Archean gneiss, Cambrian sandstone, Silurian quartzite, limestone and schist, Jurassic sandstone and limestone. Cretaceous sandstone, and Tertiary basalts, gabbros, and granitic rocks all enter into the composition of the islands.

Influence of Topography.—The influence of the topography of the country on the history of its inhabitants has been all-important. How powerfully the configuration affects the climate is shown in the remarkable difference between the rainfall of the mountainous west and of the lowland east. This difference has necessarily modified the character and employment of the people, leading to the cultivation of the soil on the one side and the raising of sheep and cattle on the other. The fertile low grounds on the east have offered facilities for the invasions of Romans, Norsemen and English, while the mountain fastnesses of the interior and the west have served as secure retreats for the older Celtic population. While, therefore, Teutonic people have spread over the one area, the earlier race has to this day maintained its ground in the other. Not only external configuration but geological structure also has profoundly influenced the progress of the inhabitants. In the Highlands no mineral wealth has been discovered to stimulate the industry of the natives or to attract labour and capital. These tracts remain still, as of old, sparsely inhabited and given over to the breeding of stock and the pursuit of game. In the Lowlands, on the other hand, rich stores of coal, iron, lime and other minerals have been found. The coal-fields have gradually drawn to them an ever-increasing share of the population. Villages and towns have suddenly developed and rapidly increased in size. Manufactures and shipbuilding have grown and commerce has advanced with accelerated pace. Other influences have of course contributed largely to the development of the country, but among them all the chief place must be assigned to that fortunate geological structure which, amid the revolutions of the past, has preserved in the centre of Scotland those fields of coal and ironstone which are the foundations of the national industry.

Geology.

Archean Rocks.—The oldest rocks of Scotland and of the British Isles are known, from their antiquity, as Archean, and consist chiefly of gneiss (called Fundamental, as lying at the foundation of the geological structure of the country, and Lewisian and Hebridean, because it is well developed in the island of Harris and the Outer Hebrides), which varies from a coarsely crystalline granitoid mass to fine schist. The coarse varieties are most abundant, intermingled with bands of hornblende-rock, hornblende-schist, pegmatite, eucrite, mica-schist, sericite-schist and other schistose accompaniments. In a few places limestone has been observed. No trace of any organism has ever been detected in any of these rocks. Over wide areas, particularly on the mainland, the bands of gneiss have a general north-west trend and undulate in frequent plications with variable inclination to north-east and south-west. The largest tract of Archean rock is that which forms almost the whole of the Outer Hebrides, from Barra Head to the Butt of Lewis. Other areas more or less widely separated from each other run down the western parts of the shires of Sutherland and Ross and Cromarty, and are probably continued at least as far as the island of Rum.

Eastern or Younger Schists.—The central, southern and eastern Highlands are occupied by metamorphosed sedimentary and igneous rocks, to which has been provisionally assigned the name of Dalradian, from the old Celtic kingdom of Dalriada. Their true stratigraphical position has not yet been ascertained, and it may appear that more than one group of rocks is included in the series. Eastward of the Archean gneiss in the west of Sutherland the effect of enormous underground pressure has been to upraise masses of the ancient gneiss and Torridonian sandstone and thrust them westward over the younger rocks. It is not possible to say what was the original character of many of the disrupted materials, for they have been rearranged and re-crystallized into granulitic, flaggy gneisses and schists (Moine schists). They extend from the north-east of Sutherland as far south as the Sound of Mull. To the east of the dislocation of the Great Glen these puzzling rocks may also be met with, though in that tract most of the surface comprises sedimentary and igneous rocks, the metamorphism of which has varied much. Immense sheets of dolerite, gabbro, or allied basic rocks indicate eruptive materials intruded as sills or poured out as lavas contemporaneously with the sedimentary formations among which they lie. On the other hand, there occur bands of conglomerate, pebbly grit, quartzite, graphitic shale and limestone in a certain ordered sequence and over a wide area. Traces of annelids have been detected in some of the quartzites, and some of the less changed parts of the limestones may be searched for fossils. This great series of metamorphic rocks, the geological age of which is still unsettled, has had a powerful effect on the scenery, especially along the Highland line. Where a thick group of coarse hard grits intercalated in the sedimentary rocks crops out it rises into a chain of lofty rugged hills, of which Ben Ledi and Ben Vorlich are examples. The slate hills, weathering more readily, assume gentle slopes and rounded ridges, as in the high land from Holy Loch to the Kyles of Bute. The quartzites rise in conical hills, such as those of Jura and Islay. And to the soil created by the decay of the limestones is due a greener verdure than that of the surrounding moors.



Emery Walker sc.

Torridonian Sandstone.—Above the Archean gneiss lies a series of red and chocolate-coloured sandstone (Torridon sandstone), which form a number of detached areas from Cape Wrath down the seaboard of the shires of Sutherland and Ross and Cromarty, across Skye, and as far as the island of Rum. They rise into prominent pyramidal mountains, which, as the stratification is usually almost horizontal, present in their terraced sides a singular contrast to the neighbouring heights, composed of highly plicated crystalline schists. In the Torridon district they can be seen towering bed above bed to a height of about 4000 ft., but they must be at least 10,000 ft. thick. They are not met with anywhere else in Scotland. Traces of annelids and probably other organisms have been found in the bands of shale occurring in the south-west of the shire of Ross and Cromarty, in the isle of Raasay, and at Cailleach Head, and are the oldest relics of animal life yet found in Great Britain.

Cambrian.—In the north-western Highlands masses of white quartzite, resting unconformably in Torridonian sandstone, run from Loch Eriboll to Skye, forming in places great conical hills and sometimes capping isolated mountains of red Torridon sandstone. They constitute the lowest group of the most interesting series of strata in the Highlands, and yield a large number of fossils. In descending order they embrace the following subdivisions, whose thickness in the district of Durness is estimated at about 2000 ft.: (*e*) limestones, dolomites and cherts, with numerous organic remains; (*d*) grit and quartzite, with *Saltarella* and *Olenellus* (Serpulite Grit); (*c*) calcareous shales and dolomites, with many annelid casts and sometimes *Olenellus* (Fucoid Beds); (*b*) Upper Quartzite, often crowded with annelid pipes (Pipe Rock Quartzite); (*a*) Lower Quartzite—their original upper limit can nowhere be seen, for they have been overridden by the Eastern Schists in those gigantic underground disturbances already referred to, by which these rocks, the Archean gneiss and Torridonian sandstone, were crumpled, inverted, dislocated and thrust over each other. The quartzites themselves have also been subjected to extraordinary horizontal displacement, amounting in places to not less than 10 m. The rocks overlying them to the east of the line of disturbance in the shires of Sutherland and Ross and Cromarty are fine flaggy schists. The Cambrian system—including the Upper (Durness-Eriboll Limestone) and the Lower (Serpulite grit, Fucoid Beds, Quartzite)—forms a narrow band which can be traced for 100 m. from the north coast of Sutherland to Skye. Rocks of Cambrian age have not been identified elsewhere in Scotland, though it may ultimately be shown that the quartzites and limestones of the Central Highlands are equivalents of those of the north-west coast.

Ordovician and Silurian.—In the Southern Uplands a great development of Ordovician and Silurian rocks is found. In that belt they consist mostly of greywacke, grit, shale and other sedimentary rocks, but in the southwest of Ayrshire they include some thick lenticular bands of limestone. They have been thrown into many folds, the long axes of which run in a general north-easterly direction. It is this structure which has determined the trend of the southern Uplands. The plications of the Highlands and the chief dislocations of the country have followed the same general direction, and hence the parallelism and north-easterly trend of the main topographical features. Abundant fossils (grapholites principally) in certain parts of these rocks have shown that representatives of both the Ordovician and Upper divisions are present. By far the larger part of the Uplands belongs to the former. The Upper Silurian shales and sandstones appear only along the northern and southern margins. The coast on both sides of the country shows good sections of the rocks, the Berwickshire cliffs being particularly fine. Those of Ayrshire and Galloway are lower and more accessible, and permit of study of the plication of the strata. Among the best localities for fossils are Moffat Water, in Dumfriesshire, for graptolites, and the Pentlands, in Midlothian. Balmae, on the southern shore of Kirkcudbrightshire, the coast south of Girvan and the limestone quarries of the Stinchar and Girvan valleys, in Ayrshire, for shells, trilobites, corals, &c.

Old Red Sandstone.—Scotland is the typical European region for the deposits classed as Old Red Sandstone. These rocks are grouped in two divisions, Lower and Upper, both of which appear to have been deposited in lakes. The Lower, with its abundant intercalated lavas and tuffs, extends continuously as a broad belt along the northern margin of the Central Plain, reappears in detached tracts along the southern border, is found again on the south side of the Uplands in Berwickshire and the Cheviot Hills, occupies a tract of Lorne (Oban and the vicinity) in Argyllshire, and on the north side of the Highlands underlies most of the low ground on both sides of the Moray Firth, stretches across Caithness and through nearly the whole of the Orkney Islands, and is prolonged into Shetland. The Upper Old Red Sandstone covers a more restricted space in most of the areas just mentioned, its chief development being on the flanks of the north-eastern part of the Southern Uplands, where it spreads out over the Lammermuir Hills and the valleys of Berwickshire and Roxburghshire. The Lower Old Red Sandstone is rich in remains of plants and fishes, notably in the flagstones of Caithness, Orkney and Forfarshire. The volcanic rocks of this division form ranges of hills in the Lowlands, such as the Pentlands, Ochils and Sidlaws. They have in some places a thickness of 7000 ft. The lavas are usually porphyrites, which occur in sheets, with intercalated bands of volcanic tuff that are sometimes strongly felsitic. One of the vents by which such materials were ejected occurs in the Braid Hills on the south side of Edinburgh. Fossils are less common in the Upper Old Red Sandstone, though they are found—particularly fishes—in large numbers in certain spots, as at Dura Den, near Cupar-Fife. Traces of contemporaneous volcanic action exist in the Orcadian island of Hoy.

Carboniferous.—The areas occupied by Carboniferous rocks are almost entirely restricted to the Central Plain or Lowlands, but they are also found skirting the Southern Uplands from the mouth of the Tweed to that of the Nith. In the basins of the Forth and Clyde the following subdivisions are well marked: (5) Upper Red Sandstone series (red and grey sandstones, fireclays, shales, marls); (4) Coal Measures (white and grey sandstones, dark shales, fireclays, coal seams, ironstones); (3) Millstone Grit (massive sandstones and grits, with fireclays, thin limestones and coal); (2) Carboniferous Limestone series—(*c*) sandstones and shales, with three or more seams of limestone; (*b*) sandstones, shales, coals and ironstones, but with no limestone bands; (*a*) sandstones, shales, fireclays, coals and ironstones, with thin limestones towards the top and the Hurlet (Renfrewshire) limestone at the bottom; (1) Calciferous Sandstone series—(*b*) Upper or Cement Stone group, consisting of white and grey sandstones (of which the city of Edinburgh was built), black shales, thin limestones (Burdiehouse, near Edinburgh), and occasional coal seams; (*a*) Lower Red Sandstone group, with reddish and greenish marls and shales, passing down with the Upper Old Red Sandstone. The coal-fields contain two main groups of seams, the lower in the middle section of the Carboniferous Limestone, and the upper in the Coal Measures. The thin seams of the Calciferous Sandstone are not workable, but the bituminous shales in the Firth of Forth basin are largely worked for the manufacture of mineral oil. The plant-life of the Carboniferous was exceedingly luxuriant and varied, and the system is rich also in fossils of fishes, crustaceans, mollusca, insects and other forms of animal life. There was great volcanic activity during the deposition of the Calciferous Sandstone, Carboniferous Limestone and Millstone Grit series. The two leading types of volcanic areas are the *plateaus*, in which sheets of porphyrites, basalts and even trachytes were emitted, sometimes with wide discharge of volcanic ashes, and the *puys*, or isolated vents, or scattered groups of vents, which discharged comparatively a small amount of lava and ashes. The Campsie, Kilpatrick and Dumbarton hills, the high ground from Greenock to Ardrossan, and the Carleton Hills in East Lothian are examples of the plateaus, while Arthur's Seat in Edinburgh and the Binn of Burntisland illustrate the puys. Most of the hills and crags in the Carboniferous area are volcanic, and many of them—such as the castle rocks of Edinburgh and Stirling, Binny Craig in Linlithgowshire, North Berwick Law and the Bass Rock—mark the sites of actual events of eruption.

Permian.—Rocks assignable to the Permian system occupy only a few small areas in Scotland. They fill up the valley of the Nith for a few miles north of Dumfries, and, reappearing again in the same valley a little farther north, run up the narrow valley of the Carron to the Lowther Hills. Other detached tracts cover a considerable space in Annandale, one of them ascending the deep defile, known as the Devil's Beef Tub, at the head of that valley. Another isolated patch occurs among the Lead Hills; and lastly, a considerable space in the heart of the Ayrshire coal-field is occupied by Permian rocks. Throughout these separate basins the prevailing rock is a red sandstone, varied in the narrow valleys with intercalated masses of breccia. There can be no doubt that the valleys in which these patches of red rocks lie already existed in Permian time. They seem then to have been occupied by small lakes or inlets, not unlike fjords. Numerous amphibian tracks have been found in the red sandstone of Annandale and also near Dumfries, but no other traces of the life of the time. One of the most interesting features of the Scottish development of the Permian system is the occurrence of intercalated bands of contemporaneously erupted volcanic rocks in the Carron, Nithsdale and Ayrshire. The actual vents which were the sites of the small volcanoes still remain distinct, and the erupted lavas form high ground in the middle of Ayrshire.

Triassic.—The Triassic system is only feebly represented. The largest tract occurs in the south of Dumfriesshire between Annan and the head of the Solway Firth. To this division are assigned the yellow sandstones of Elgin, which have yielded crocodilian and other reptilian remains, the discovery of which led to the rocks being separated from the Upper Old Red Sandstone, to which they had previously been thought to belong. There occur also below the Lias on some parts of the west coast unfossiliferous red sandstones, conglomerates and breccias, presenting lithological resemblance to the Rhaetic group of England. Such strata are well seen in the isle of Raasay and near Heast in Skye. Red sandstones and conglomerates, probably of the same age, attain a thickness of several hundred feet at Gruinard Bay on the west coast of the county of Ross and Cromarty. On the east side of Scotland, where so many fragments of the Secondary rocks occur as boulders in the glacial deposits, a large mass of strata was formerly exposed at Linksfield to the north of Elgin, containing fossils which appear to show it to belong to the Rhaetic beds at the top of the Trias. But it was not in place, and was probably a mass transported by ice. Rhaetic strata no doubt exist *in situ* at no great distance under the North Sea.

Jurassic.—The Jurassic system—comprising, in descending order, the subdivisions of Upper Oolites (Portlandian Kimmeridge Clay), Middle Oolites (coal limestones; Oxford clay), Lower Oolites (Great Oolite series; Inferior Oolite series), Lias (Upper, Middle, Lower)—is well represented on both sides of the Highlands. Along the east coast of Sutherland good sections are exposed showing the succession of strata. Among these the Lower and Middle Lias can be identified by their fossils. The Lower Oolite is distinguished by the occurrence in it of some coal-seams, one of which, 3½ ft. in thickness, has been worked at Brora. The Middle Oolite consists mostly of sandstones with bands of shale and limestones, and includes fossils which indicate the English horizons from the Kellaways Rock up to the Coral Rag. The lower part of the Kimmeridge Clay is probably represented by sandstones and conglomerates, forming the highest beds of the series in Sutherland. On the west side of the Highlands Jurassic rocks are found in many detached areas from the Shiant Isles to the southern shores of Mull. Over much of this region they owe their preservation largely to the mass of lavas poured over them in Tertiary time. They have been uncovered, indeed, only at a comparatively recent geological date. They comprise a consecutive series of deposits from the bottom of the Lias up to the Oxford Clay. The Lower, Middle and Upper Lias consist chiefly of shales and shelly limestones, with some sandstones, well seen along the shores of Broadford Bay in Skye and in some of the adjacent islands. The Lower Oolites are made up of sandstones and shales with some limestones, and are overlaid by several hundred feet of an estuarine series of deposits consisting chiefly of thick white sandstones, below and above which lie shales and shelly limestones. These rocks form a prominent feature underneath the basalt terraces of the east side of Skye, Raasay and Eigg. They form the highest members of the Jurassic series, representing probably some part of the Oxford Clay. The next Secondary rocks (Cretaceous) succeed them unconformably.

Cretaceous.—Rocks belonging to the Cretaceous system at one time covered considerable areas on both sides of the Highlands, but they have been entirely stripped off the eastern side, while on the western they have been reduced to a few fragmentary patches, which have survived because of the overlying sheets of basalt that have protected them. Some greenish sandstones containing recognizable and characteristic fossils are the equivalents of the Upper Greensand of the south of England. These rocks are found on the south and west coasts of Mull and on the west coast of Argyllshire. They are covered by white sandstones and these by white chalk and marly beds, which represent the Upper Chalk of England. Their existence under the basalt outlier of Ben Iadain in Morven, at a height of 1600 ft. above the sea, shows notably how extensively they have been denuded, but also over how large a portion of the Western Highland seaboard they may have spread. They are a prolongation of the Cretaceous deposits of Antrim (Ireland). Enormous numbers of flints and also less abundant fragments of chalk are found in glacial deposits bordering the Moray Firth. These transported relics show that the Chalk must once have been in place at no great distance, if indeed it did not actually occupy part of Aberdeenshire and the neighbouring counties.

Older Tertiary.—Above the highest Secondary rocks on the west coast come terraced plateaus of basalt, which spread out over wide areas in Skye, Eigg, Mull and Morven, and form most of the smaller islets of the chain of the Inner Hebrides. These plateaus are composed of nearly horizontal sheets of basalt—columnar, amorphous or amygdaloidal—which, in Ben More, in Mull, attain a thickness of more than 3000 ft. They are prolonged southwards into Antrim, where similar basalts overlying Secondary strata cover a large territory. Occasional beds of tuff are intercalated among these lavas, and likewise seams of fine clay or shale which have preserved the remains of numerous land-plants. The presence of these fossils indicates that the eruptions were subaërial, and a comparison of them with those elsewhere found among Older Tertiary strata shows that they probably belong to the Oligocene stage of the Tertiary series of formations, and therefore that the basalt eruptions took place in early Tertiary time. The volcanic episode to which these plateaus owe their origin was one of the most important in the geological history of Great Britain. It appears to have resembled in its main features those remarkable outpourings of basalt which have deluged so many thousand square miles of the western area of the United States. The eruptions were connected with innumerable fissures up which the basalt rose and from numerous points on which it flowed out at the surface. These fissures with the basalt that solidified in them now form the vast assemblage of dykes which cross Scotland, the north of England and the north of Ireland. That the volcanic period was a prolonged one is shown by the great denudation of the plateaus before the last eruptions took place. In the Isle of Eigg, for example, the basalts had already been deeply eroded by river-action and into the river-course a current of glassy lava (pitch-stone) flowed. Denudation has continued active ever since, and now, owing to greater hardness and consequent power of resistance, the glassy lava stands up as the prominent and picturesque ridge of the Scuir, while the basalts which formerly rose high above it have been worn down into terraced declivities that slope away from it to the sea. A remarkable feature in the volcanic phenomena was the disruption of the basaltic plateaus by large bosses of gabbro and of various granitoid rocks. These intrusive masses now tower into conspicuous groups of hills—the Cuillins in Skye, the mountains of Rum and Mull, and the rugged heights of Ardnamurchan.

Post-Tertiary.—Under the Post-Tertiary division come the records of the Ice Age, when Scotland was buried under sheets of ice which ground down, striated and polished the harder rocks over the whole country, and left behind them the widespread accumulation of clay, gravel and sand known as Glacial Deposits. The Till or Boulder Clay, the most universal kind of Drift—which covers much of the Lowlands to a depth sometimes of 100 ft., and along the flanks of hills reaches a height of 2000 ft. or more—was pushed along by ice radiating from different centres, evidence of which is to be seen in the direction of the striae on the rocky surface of the country as well as in the dispersion of boulders and stones from recognizable districts. Thus remains of Highland schists have been borne across the Central Plain and deposited on the northern margin of the Southern Uplands. Above the Boulder Clay are found sands and gravels, along with perched boulders which, by their source and position, indicate the direction and thickness of the ice that carried them. Moraines of the last of the glaciers are numerous throughout the Highlands.

Recent.—The youngest formations are the raised beaches—consisting sometimes of ledges cut in the rock, as on Lismore and other parts of Loch Linnhe, and sometimes of heaped-up beds of sand and gravel—river terraces, lake deposits, peat-mosses, tracts of blown sand—notably seen in the dunes of Culbin, Rattray Head, Aberdeen, Montrose and Tents Muir on the east coast, and at Stevenston, Troon, Ayr, Glenluce and along North and South Uist on the west. These are related to the present configuration of the land and contain remains of plants and animals still living on its surface. (A. Ge.; J. A. M.)

Climate

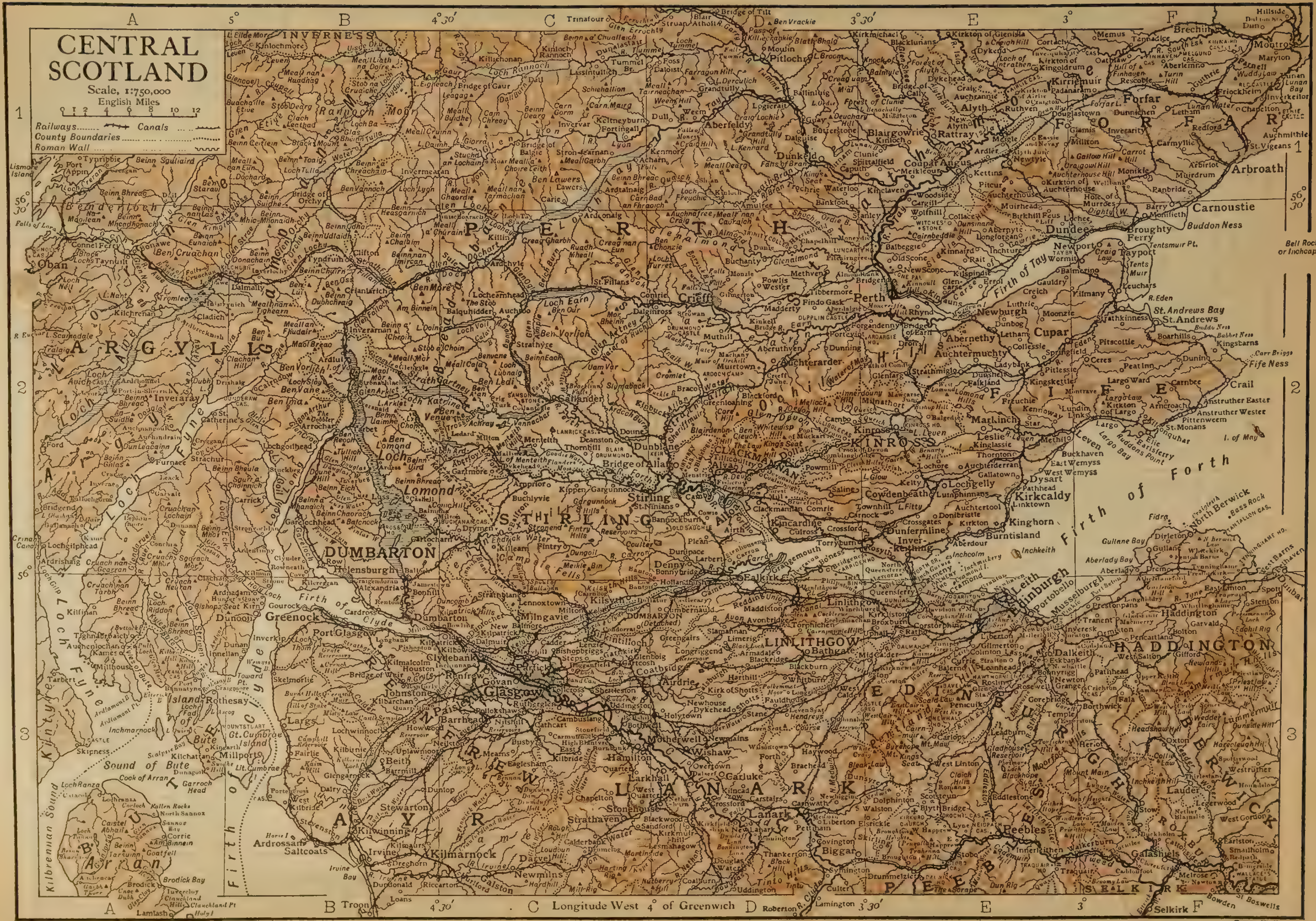
In considering the climate of Scotland the first place must be assigned to the temperature of various districts during the months of the year, since this, and not the mean temperature of the whole year, gives the chief characteristics of climate. Thus, while the annual temperatures of the west and east coasts are nearly equal, the summer and winter temperatures are very different. At Portree (on the east coast of Skye) the mean temperatures of January and July are 39° and 56·8° F., whereas at Perth they are 37·5° and 59·0°. The prominent feature of the isotherms of the winter months is their north and south direction, thus pointing not to the sun but to the warm waters of the Atlantic as the more powerful influence in determining the climate at this season through the agency of the prevailing westerly winds. In exceptionally cold seasons the ocean protects all places in its more immediate neighbourhood against the severe frosts which occur in inland situations. While this influence of the ocean is felt at all seasons, it is most strikingly seen in winter and is more decided in proportion as the locality is surrounded by the warm waters of the Atlantic. The influence of the North Sea is similarly apparent, but in a less degree. Along the whole of the eastern coast, from the Pentland Firth southwards, temperature is higher than what is found a little inland. In summer, everywhere, latitude for latitude, temperature is lower in the west than in the east and inland situations, but in winter the inland climates are the colder. The course of the isothermal lines in summer is very instructive. Thus the line of 59° passes from the Solway directly northwards to the north of Perthshire and thence curves round eastward to near Stonehaven. From Teviotdale to the Grampians temperature falls only one degree; but for the same distance farther northwards it falls three degrees. The isothermal of 56° marks off the districts where the finer cereals can be successfully raised. This distribution of the temperature shows that the influence of the Atlantic in moderating the heat of summer is very great and is felt a long way into the interior of the country. On the other hand, the high lands of western districts by robbing the westerly winds of their moisture, and thus clearing the skies of eastern districts, exercise an equally striking effect in the opposite direction—in raising the temperature.

There is nearly twice as much wind from the south-west as from the north-east, but the proportions vary greatly in different months. The south-west prevails from July to October, and again from December to February; accordingly in these months the rainfall is heaviest. These are the summer and winter portions of the year, and an important result of the prevalence of these winds, with their accompanying rains, which are coincident with the annual extremes of temperature, is to imprint a more strictly insular character on the climate, by moderating the heat of summer and the cold of winter. The north-east winds acquire their greatest frequency from March to June and in November, which are accordingly the driest portions of the year.

The mountainous regions are mostly massed in the west and lie generally north and south, or approximately facing the rain-bringing winds from the Atlantic. Thus the climates of the west are essentially wet. On the other hand, the climates of the east are dry, because the surface is lower and more level; and the breezes borne thither from the west, being robbed of most of their superabundant moisture in crossing the western hills, are drier and precipitate a greatly diminished rainfall. It thus happens that the driest climates in the east are those which have to south-westwards the broadest extent of mountainous ground, and that the wettest eastern climates are those which are least protected by high lands on the west. The breakdown of the watershed between the Firths of Clyde and Forth exposes southern Perthshire, the counties of Clackmannan and Kinross, and nearly the whole of Fife to the clouds and rains of the west, and their climates are consequently wetter than those of any others of the eastern slopes of the country. The driest climates of the east are in Tweeddale about Kelso and Jedburgh, the low grounds of East Lothian, and those on the Moray Firth from Elgin round to Dornoch. In these districts the annual rainfall averages 26 in., whereas over extensive breadths in the west it exceeds 100 in., in Glencroe being nearly 130 in., and on the top of Ben Nevis it may reach 150 in.

II. ECONOMIC CONDITIONS, &c.

Population.—At the end of the 15th century it is conjectured that the population of Scotland did not exceed 500,000—Edinburgh having about 20,000 inhabitants, Perth about 9000, and Aberdeen, Dundee and St Andrews about 4000 each. By the Union with England (1707) the population is supposed to


CENTRAL SCOTLAND
Scale, 1:750,000
English Miles
0 1 2 4 6 8 10 12
Railways
Canals
County Boundaries
Roman Wall
A
B
C
D
E
F
1
2
3
5°
4°30'
3°30'
3°
56° 30'
56°
Longitude West 4° of Greenwich
INVERNESS
ARGYLL
PERTH
FORFAR
FIFE
KINROSS
CLACKMANNAN
STIRLING
DUMBARTON
LINLITHGOW
EDINBURGH
HADDINGTON
BERWICK
PEEBLES
SELKIRK
ROXBURGH
LANARK
RENFREW
AYR
BUTE
Arran
Firth of Forth
Firth of Tay
Firth of Clyde
Loch Fyne
Sound of Bute
Kilbrennan Sound
Glasgow
Edinburgh
Perth
Dundee
Stirling
Oban
Arbroath
Bell Rock or Inchcape

Information embodied from the Ordnance Survey, by

Emery Walker sc.

have grown to 1,000,000. In 1755, according to the returns furnished by the clergy to the Rev. Dr Alexander Webster (1707–1784), minister of the Tron Kirk, Edinburgh—who had been commissioned by Lord President Dundas to prepare a census for government,—it was 1,265,380. At the first government census (1801) it had reached 1,608,420. The increase at succeeding decades has been continuous though fluctuating in amount, and in 1901 the population amounted to 4,472,103 (females, 2,298,348). In 1902 the Registrar-General for Scotland calculated that if the rate of increase (11·09%) manifest during 1891–1901 were uniformly maintained, the population would double itself in the course of about 66 years.

TABLE I.—*Area and Population of Civil Counties in 1891 and 1901.*

Civil Counties.	Area in Acres.	Population.		Pop. per sq. m. 1901.
		1891.	1901.	
I. *Northern.*				
1. Shetland	352,889	28,711	28,166	51
2. Orkney	240,476	30,453	28,699	76
3. Caithness	438,878	37,177	33,870	49
4. Sutherland	1,297,849	21,896	21,440	11
	2,330,092	118,237	112,175	31
II. *North-Western.*				
5. Ross and Cromarty	1,976,707	78,727	76,450	25
6. Inverness	2,695,037	90,121	90,104	21
	4,671,744	168,848	166,554	23
III. *North-Eastern.*				
7. Nairn	103,429	9,155	9,291	57
8. Elgin (or Moray)	305,119	43,471	44,800	94
9. Banff	403,364	61,684	61,488	98
10. Aberdeen	1,261,887	284,036	304,439	154
11. Kincardine	243,974	35,492	40,923	107
	2,317,773	433,838	460,941	127
IV. *East Midland.*				
12. Forfar	559,171	277,735	284,082	325
13. Perth	1,595,774	122,185	123,283	49
14. Fife	322,844	190,365	218,840	434
15. Kinross	52,410	6,673	6,981	85
16. Clackmannan	34,927	33,140	32,029	587
	2,565,126	630,098	665,215	166
V. *West Midland.*				
17. Stirling	288,842	118,021	142,291	315
18. Dumbarton	157,433	98,014	113,865	463
19. Argyll	1,990,471	74,085	73,642	24
20. Bute	139,658	18,404	18,787	86
	2,576,404	308,524	348,585	87
VI. *South-Western.*				
21. Renfrew	153,332	230,812	268,980	1123
22. Ayr	724,523	226,386	254,468	225
23. Lanark	562,821	1,105,899	1,339,327	1523
	1,440,676	1,563,097	1,862,775	827
VII. *South-Eastern.*				
24. Linlithgow	76,861	52,808	65,708	547
25. Edinburgh	234,339	434,276	488,796	1335
26. Haddington	171,011	37,377	38,665	145
27. Berwick	292,577	32,290	30,824	67
28. Peebles	222,599	14,750	15,066	43
29. Selkirk	170,762	27,712	23,356	88
	1,168,149	599,213	662,415	363
VIII. *Southern.*				
30. Roxburgh	426,060	53,500	48,804	73
31. Dumfries	686,302	74,245	72,571	68
32. Kirkcudbright	575,565	39,985	39,383	44
33. Wigtown	311,609	36,062	32,685	67
Grand Total	1,999,536	203,792	193,443	62
SCOTLAND	19,069,500	4,025,647	4,472,103	150

In 1901 there were 150 persons to each square mile, and 4·3 acres (excluding inland waters, tidal rivers and foreshore) to each person. The distribution of population is illustrated in the preceding table, which gives the names and areas of the counties and other particulars.

In the northern, north-western and southern divisions the population declined during the decade, the fifteen counties thus affected being, in the order of decrease, beginning with the shire in which it was smallest, Inverness, Banff, Argyll, Kirkcudbright, Shetland, Sutherland, Dumfries, Ross and Cromarty, Clackmannan, Berwick, Orkney, Roxburgh, Caithness, Wigtown and Selkirk. It will thus be seen that the far north and far south alike decreased in population, the decline being largely due to physical conditions, though it need not be supposed that the limit of population was reached in either area. The most sparsely inhabited county was Sutherland, the most densely Lanark. The counties in which there was the largest increase in the decennial period—with Linlithgow first, followed by Lanark, Stirling, Renfrew, Dumbarton and thirteen others—principally belonged to the Central Plain, or Lowlands, in which, broadly stated, industries and manufactures, trade, commerce and agriculture and educational facilities have attained their highest development. In every county the population increased between 1801 and 1841, the increase being more than 10% in each county with the exception of Argyll, Perth and Sutherland. After 1841, however, the population in several Highland shires—in which the clearance of crofters to make way for deer was one of the most strongly-felt grievances among the Celtic part of the people—in the islands, and in some of the southern counties, diminished. The next table affords a comparison of the numbers of the population as grouped in towns, villages and rural districts, and in the mainland and islands.

TABLE II.—*Population in Towns, Villages and Rural Districts, Mainland and Islands, 1891 and 1901.*

Groups.	Population.		Percentage of Pop. in each to total Pop.	
	1891.	1901.	1891.	1901.
Towns[1]	2,631,298	3,120,241	65·37	69·77
Villages[1]	465,836	466,053	11·57	10·42
Rural districts	928,513	885,809	23·06	19·81
Total	4,025,647	4,472,103	100·00	100·00
Mainland	3,865,748	4,316,551	96·03	96·52
Islands	159,899	155,552	3·97	3·48
Total	4,025,647	4,472,103	100·00	100·00

[1] Villages have populations of from 300 to 2000; towns from 2000 upwards.

Table III. gives the population of towns with more than 30,000 inhabitants.

TABLE III.—*Population in chief Towns in 1881, 1891 and 1901.*

Town.	1881.	1891.	1901.
Glasgow	551,415	565,839 (of enlarged area, 658,198)	760,468
Edinburgh	228,357	261,225 (of enlarged area)	316,523
Dundee	140,239	153,330	160,878
Aberdeen	105,189	121,623	153,503
Paisley	55,638	166,425	79,354
Leith	59,485	67,700	76,668
Govan	50,492	63,625	76,350
Greenock	66,704	63,423	67,672
Partick	27,410	36,538	54,281
Coatbridge	24,812	30,034	36,991
Kilmarnock	23,901	28,447	34,165
Kirkcaldy	23,632	27,151	34,063
Perth	28,980	29,899	32,886
Hamilton	18,517	24,859	32,775
Motherwell	12,904	18,726	30,418

The burghs in which the largest proportion of Scottish-born persons lived in 1901 were Kirkcaldy (with 95·997 in every 100 of its inhabitants), Aberdeen (with 94·997), Perth (with 94·442) and Kilmarnock (with 94·046). The largest proportion of English-born were found in Edinburgh (with 5·438%) and Leith (with 4·481). Irish-born were most in evidence in Coatbridge (with 15·158 in every 100), Partick (with 12·05) and Govan (with 11·51). Welsh nationality was most marked in Motherwell (with 0·250%). Those of British-Colonial birth were most numerous in Edinburgh (with 0·933%), and foreigners in Glasgow (with 0·890), Leith (with 0·741) and Hamilton (with 0·720). In addition to the 17,654 resident foreigners there were 4973 foreigners casually in Scotland at the taking of the census in 1901 (1839 men and women on board foreign and British vessels), raising the total of foreigners actually enumerated to 22,627 (males 14,448), of whom 10,373 were of Russian nationality, 4051 of Italian, and 3232 of German.

Table IV. shows the nationalities of the people in 1891 and 1901.

TABLE IV.—*Illustrating Nationalities in 1891 and 1901.*

Where Born.	Scotland, 1891.		Scotland, 1901.	
	Number.	Percentage of Pop.	Number.	Percentage of Pop.
Scotland . . .	3,698,700	91·63	4,085,755	91·361
Ireland . . .	184,807	4·84	205,064	4·585
England . . .	108,736	2·70	131,350	2·937
Wales . . .	2,309	0·06	2,673	0·060
Isle of Man and the Channel Islands	927	0·02	1,058	0·024
British Colonies .	13,607	0·39	15,907	0·355
British born abroad, by naturalization and at sea	8,051	0·20	12,642	0·283
Foreigners . .	8,510	0·21	17,654	0·395
Total	4,025,647	100	4,472,103	100

Table V. gives the number of persons, exclusive of children under three years of age, who spoke Gaelic only, and Gaelic and English, with their percentages to the population in 1901. The counties in which the highest percentages obtained of persons speaking Gaelic only were Ross and Cromarty with 15·92 % (12,171 persons) and Inverness with 13·01 % (11,722 persons). But in no fewer than eighteen counties the proportion of Gaelic-speaking persons was under 1 %.

TABLE V.—*Showing Number of Persons aged three years and upwards speaking Gaelic only and Gaelic and English in 1901.*

Area.	Population.	Gaelic only.	Percentage.	Gaelic and English.	Percentage.
Scotland	4,472,103	28,106	0·63	202·700	4·53
Northern portion .	1,753,470	27,854	1·59	160,915	9·18
Southern portion .	2,718,633	252	0·01	41,785	1·54
Northern division .	112,175	489	0·43	17,084	15·23
North-western ,,	166,554	23,893	14·34	82,573	49·58
North-eastern ,,	460,941	20	0·01	5,125	1·11
East-midland ,,	665,215	95	0·01	13,818	2·06
West-midland ,,	348,585	3,357	0·96	42,315	12·14
South-western ,,	1,862,775	162	0·01	34,289	1·84
South-eastern ,,	662,415	89	0·01	7,002	1·06
Southern ,,	193,443	1	0·00	494	0·26

Vital Statistics.—In Table VI. is shown the number of births, deaths, marriages and illegitimate births for the decades ending 1870, 1880, 1890 and 1900.

Table VII. gives the percentages to the population of the births, deaths and marriages in the four decades specified, along with the ratio of illegitimacy to the total number of births in the same periods.

TABLE VI.—*Births, Deaths, Marriages and Illegitimate Births, 1861–1900.*

	1861–1870 (inclusive).	1871–1880 (inclusive).	1881–1890 (inclusive).	1891–1900 (inclusive).
Births . .	1,120,791	1,232,311	1,251,930	1,280,044
Deaths . .	706,195	763,948	743,582	781,860
Marriages .	224,222	253,550	259,388	298,664
Illegitimate births . .	110,061	108,260	102,128	90,981

The counties in which the highest percentages of illegitimate births were found were Wigtown, Dumfries, Kirkcudbright and Peebles in the south; Elgin, Banff and Aberdeen in the north-east, and Caithness in the north; the shires showing the lowest percentages were Clackmannan, Dumbarton and Shetland.

TABLE VII.—*Birth, Death and Marriage Ratio, 1861–1900, and Percentages of Illegitimacy to total Births.*

Rate.	1861–1870 (inclusive).	1871–1880 (inclusive).	1881–1890 (inclusive).	1891–1900 (inclusive).
Birth . .	3·48	3·47	3·22	3·01
Death . .	0·19	2·15	1·91	1·84
Marriage . .	0·69	0·71	0·66	0·70
Percentages of illegitimate births to total births	9·81	8·79	8·15	7·11

Occupations of the People.—Table VIII. divides the people according to occupations. The most noteworthy feature in this connexion is the great diminution that took place within the intercensal period (1891–1901) in the unproductive class, which to some extent accounts for the increase in the number of the industrial and commercial classes.

Poor Relief.—Before the Reformation, relief of the poor had been the duty of the Church, for early legislation aimed at suppressing rather than aiding poverty. Those, indeed, who were absolutely dependent on alms might receive a licence to beg within the bounds of their own parish, but the able-bodied poor were severely dealt with. The act of 1579 directed the magistrates in towns and the justices in rural parishes to propose a register of the aged and impotent poor and to levy a tax on the inhabitants of every parish for their support. One consequence of the denial of relief to the able-bodied was that the workhouse, so familiar in the English poor-law system, was not established in Scotland, though almshouses are found in many

TABLE VIII.—*Occupation of the People in 1891 and 1901.*

Occupations.	Number engaged in each Class of Occupation.						Percentage engaged in each Class of Occupation.			
	1891.			1901.			1891.		1901.	
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Males.	Females.
Total occupied and unoccupied (aged 10 years and upwards)	1,446,209	1,599,453	3,045,662	1,656,081	1,790,242	3,446,323	100·00	100·00	100·00	100·00
Engaged in occupations	1,203,909	543,828	1,747,737	1,391,188	591,624	1,982,812	83·25	34·00	84·00	33·05
Retired or unoccupied	242,300	1,055,625	1,297,925	264,893	1,198,618	1,463,511	16·75	66·00	16·00	66·95
Classes.										
1. Professional . .	59,053	23,051	82,104	67,827	33,234	101,061	4·08	1·44	4·10	1·86
2. Domestic . .	29,163	190,057	219,220	26,755	174,475	201,230	2·02	11·88	1·61	9·75
3. Commercial . .	174,558	10,276	184,834	221,579	24,136	245,715	12·07	0·64	13·38	1·35
4. Agriculture and Fishing	205,827	30,018	235,845	196,581	40,730	237,311	14·23	1·88	11·87	2·27
5. Industrial . .	735,308	290,426	1,025,734	878,446	319,049	1,197,495	50·85	18·16	53·04	17·82
6. Unoccupied and non-productive	242,300	1,055,625	1,297,925	264,893	1,198,618	1,463,511	16·75	66·00	16·00	66·95

towns, and poorhouses, where those indigent who are alone in the world without any one to care for them find food and shelter, began to be general in the 19th century. Hence arises the prevalence of out-relief, one of the distinctive features of the Scottish poor law. The act of 1579, however, proved largely inoperative. The provision of relief passed from the justices to the ministers and kirk-sessions, who by an edict of the Privy Council, in 1692, were required to draw up a list of the poor twice a year, and rates were levied only when collections in the church "plates" were insufficient. For 150 years nothing was done to systematize poor relief, and even in 1842 about half of the parishes were yet unassessed to the poor. The total inadequacy of the voluntary system to cope with genuine distress, in respect both of contributions and the dispensing of alms, led in 1845 to the passing of an act which made the parish the poor-relief area, substituted the parochial board for the kirk-session where recourse was had to a rate, made the appointment of inspectors of the poor and medical officers compulsory, and set up a system of central administrative control known as the Board of Supervision for the Relief of the Poor, with headquarters in Edinburgh. The act did not provide for compulsory assessment, but this was virtually accomplished by the vigilance of the Board, which demanded of local authorities increased care and more liberal relief, with the result that in 1894 only 46 out of 848 parishes remained unassessed. In this year a change in the governing body was affected, the Local Government Board for Scotland being constituted and replacing the Board of Supervision, while the parochial boards made way for parish councils. As the authorities cannot give relief to those able to work, there are no casual wards in Scotland, vagrants having to pay for their night's lodging, or find it in the police station or elsewhere. Every parish has to support its own poor, that is, natives or those who have acquired a settlement by living in it for five years, but relief is given in the parish in which it is applied for, the cost being recovered from the parish of birth or settlement afterwards. For the sick poor the larger towns provide hospitals and dispensaries, besides medical attendance at the homes of the poor, while in rural districts there are cottage hospitals, village sick-rooms, and sick wards in the poorhouses. The mentally afflicted are sent to the asylum if they are dangerous, or kept in the licensed wards of poorhouses, or, if they are harmless or imbecile, boarded out. The expense of pauper lunacy is only partially borne by the parish. The district lunacy board (practically a joint-committee of the county and burgh councils), aided by a parliamentary grant, is charged with the provision and upkeep of the asylums, the poor-law authorities only defraying the maintenance of their own patients. Orphan or deserted children, or the children of paupers, are boarded out and reared like ordinary children, attending the public schools and growing up without the "pauper taint."

Police.—It was not till the middle of the 19th century that a regular police force was established in Scotland. Till then dwellers in rural districts had practically to provide for their own safety as best they could, while some towns maintained a paid watch and others enrolled volunteer constables, every citizen being expected to take his turn in patrolling the streets to protect person and property. At first an adoptive act was introduced, under which the Commissioners of Supply, who then managed county business—resident landowners in possession of landed estate to the annual value of £100—were empowered to raise a police force in the counties; but the want of common policy and initiative led in 1857 to the compulsory institution of a police force throughout the country. Burghs having a population of more than 7000 might furnish their own police, and smaller burghs were policed as part of the county to which they belonged by the standing joint-committee (composed equally of Commissioners of Supply and members of the county council), but no new police burgh the population of which was under 20,000 was to be free to police itself. All the constabulary forces, excepting the Orkney and Shetland police, are annually inspected as to efficiency and reported on to the Secretary of State for Scotland.

Education. (*a*) *Elementary Schools.*—The system of schools which prevailed till the Education Act of 1872 dated from 1696, when the Act for Settling of Schools was passed—one of the last but not the least of the achievements of the Scots Parliament—providing for the maintenance of a school in every parish by the kirk-session and heritors, with power to the Commissioners of Supply to appoint a schoolmaster in case the primary authorities made default. The schoolmaster held his office for life, co-education was the rule from the first, and the school was undenominational. The various religious secessions in Scotland led to the founding of a large number of sectarian and subscription schools, and at the Disruption in 1843 the Free Church made provision for the secular as well as the religious instruction of the children of its members. The Education Act of 1872 abolished the old management of the parish schools and provided for the creation of districts (burgh, parish or group of parishes) under the control of school boards, of which there are 972 in Scotland, elected every three years by the ratepayers, male and female. Since that date the most important changes effected in the elementary education system were the abolition, in 1886, of individual inspection of the lower standards—afterwards extended to the whole of the standards, the inspectors applying a collective test, the "block-grant" system, to the efficiency of a school—and the abolition of school fees (1889) for the compulsory standards, the loss being made up principally by a parliamentary grant, and partly by a proportion, earmarked for the purpose, of the proceeds of the Local Taxation (Customs and Excise) Act 1890, and the Education and Local Taxation Account (Scotland) Act 1892. The capitation grant in relief of fees is at the rate of 12s., of which 10s. is furnished by the parliamentary grant and 2s. by the other sources. King's Scholars, trained at one of the training colleges, and King's Students who attend one of the universities, form the chief source of supply of certificated teachers.

(*b*) *Secondary Schools.*—Records of the existence of schools in the chief towns occur as early as the 13th century. They were under the supervision of the chancellor of each diocese, and were mainly devoted to studies preparatory for the Church. Before the Reformation schools for general education were attached to many religious houses, and in 1496 the first Scottish act was passed requiring substantial householders to send their eldest sons to school from the time they were eight or nine years old until they were "competentlie founded and have perfite Latin." In 1560 John Knox propounded in his *First Book of Discipline* a comprehensive scheme of education from elementary to university, but neither this proposal nor an act passed by the privy council in 1616 for the establishment of a school in every parish was carried into effect. In several burghs grammar schools have existed from a very early date, and some of them, such as the Royal High School of Edinburgh and the High School of Glasgow, reached a high standard of proficiency. They were largely supported by the town councils, who erected the buildings, kept them in repair, and usually paid the rector's salary. By the act of 1872 their management was transferred to the school boards, and they may be conveniently classified into higher-class public schools, such as the old grammar schools and the liberally endowed schools of the Merchant Company in Edinburgh, and higher grade schools, with a few years' preparatory course for the universities, while some of the ordinary schools have earned the grant for higher education. In 1885 the Scottish Education Department, of which the secretary for Scotland is the virtual head, was reorganized. It was separated from the English Department, and undertook the inspection of higher class schools (public, endowed and voluntary), and two years later instituted a leaving certificate examination, the pass of which is accepted for most of the university and professional authorities in lieu of their preliminary examinations. In 1898 the functions of the Science and Art Department, as far as Scotland is concerned, were transferred to the Department, which makes substantial grants for instruction in those subjects for which science and art grants were formerly paid. A Technical Schools Act, passed in 1887, was applied by a few local authorities; but in 1890 funds were by chance made available from an unexpected source, and devoted to the purposes of technical and secondary education. Parliament had introduced a measure of public-house reform along with a scheme for compensating such houses as lost their licence. This feature was so stoutly opposed that the bill did not pass, although the chancellor of the exchequer had provided the necessary funds. Government proposed to distribute this money among local authorities and expend the balance in relief rates, but a clause was inserted in this bill giving burgh and county councils the option of spending the balance on technical education as well as in relief of rates. Advantage was largely taken of this power, and the grant came to be succinctly described as the "Residue" grant (£97,000 a year). The Department established in each county a body known as the secondary education committee, chosen by the county council and the chairmen of the school boards, which is charged with the expenditure of its share of the grant. The committee exists also in a few of the largest burghs, the members being in this case appointed by the town council, school board, and sometimes the trustees of educational endowments. In virtue of a Continuation Class code, technical and specialized education is given in day and, chiefly, evening classes in various centres, the principal being the Heriot-Watt College, Edinburgh; the Edinburgh and East of Scotland College of Agriculture; the Glasgow and West of Scotland Technical College; the Glasgow School of Art; the Glasgow Athenaeum Commercial College; the West of Scotland Agricultural College; the Dundee Technical Institute; Gray's School of Art, Aberdeen; the Edinburgh Royal Institution School of Art, and the Edinburgh School of Applied Art; but well-equipped classes are held in most of the large towns, and several county councils maintain organizers of technical instruction. As regards agricultural education, the county is found to be in most cases too small an area for efficient organization, and consequently several counties combine to support, for instance, the East of Scotland Agricultural College—a corporation consisting of the agricultural department in the University, the Heriot-Watt College and the Veterinary College in Edinburgh,—the West of Scotland Agricultural College, Glasgow, and the agricultural department in Aberdeen University. The leading public schools on the English model are Trinity College, Glenalmond, Perthshire; Loretto School, Musselburgh, and Fettes College, Merchiston Castle and the Academy in Edinburgh.

(*c*) *Universities and Colleges.*—There are four universities in Scotland, namely (in the order of foundation), St Andrews (1411), Glasgow (1450), Aberdeen (1494) and Edinburgh (1582), in which are the customary faculties of arts, divinity, law, medicine and science. In 1901 Mr Andrew Carnegie gave £2,000,000 to the universities. The administration of the fund was handed over to a body of trustees, who devote the annual income (£100,000) partly to the payment of students' fees and partly to buildings, apparatus, professorships and research. The court of each university is the supreme authority in regard to finance, discipline, and the regulation of the duties of professors and lecturers. The universities are empowered to affiliate other academical institutions, and women students are admitted on an equal footing with men. Under the act of 1899 the University College of Dundee was incorporated with St Andrews University, and Queen Margaret College became a part of the university of Glasgow, the buildings and endowments, used for women students exclusively, being handed over to the University Court. St Mungo's College, Glasgow, incorporated in 1889 under a Board of Trade licence, has medicinal and law faculties, and Anderson's College Medical School, Glasgow, was instituted in 1887. These are on the same basis as the extra-mural medical schools in Edinburgh, their medical curricula qualifying for licence only and not for Scottish university degrees. The United Free Church maintains colleges at Aberdeen, Edinburgh and Glasgow, and there is a Roman Catholic college at Blairs near Aberdeen, besides a monastery and college at Fort Augustus. The Church of Scotland and the United Free Church each possess their training colleges for teachers, the Episcopal Church supports one and the Roman Catholic Church one. The Edinburgh Museum of Science and Art has been transferred to the Scottish Education Department.

Agriculture.—Though Scotland is a country of great estates, this circumstance possesses less significance from the agricultural than from the historical standpoint. The excessive size of the properties may to some extent be accounted for by the fact that most of the surface is so mountainous and unproductive as to be unsuitable for division into smaller estates, but two other causes have also co-operated, namely, first, the wide territorial authority of such Lowland families as the Scotts and Douglases, and such Highland clans as the Campbells of Argyll and Breadalbane, and the Murrays of Athol and the duke of Sutherland; and secondly, the stricter law of entail introduced in 1685. Thus the largest estates remain in the hands of the old hereditary families. The almost absolute power formerly wielded by the landlords, who within their own territories were lords of regality, hindered independent agricultural enterprise, and it was not till after the abolition of hereditable jurisdictions in 1748 that agriculture made real progress. The Society of Improvers in the Knowledge of Agriculture, founded in 1723, ceased to exist after the rebellion of 1745, and the introduction of new and improved methods, where not the result of private energy and sagacity, was chiefly due to the Highland and Agricultural Society, established in 1784. Further stimulus was also supplied by the high prices that obtained during the Napoleonic wars, and, in spite of periods of severe depression since then, the science of agriculture has continued to advance. The system of nineteen years' leases had proved distinctly superior to the system of yearly tenancy so general in England, although prejudicially affected by customs and conditions which, for a considerable time, seriously strained the relations between landlord and tenant. But the abolition of the law of hypothec in 1879—under which the landlord had a lien for rent upon the produce of the land, the cattle and sheep fed on it, and the live stock and implements used in husbandry—the Ground Game Act of 1880, the several Agricultural Holdings Acts, and the construction of light railways improved matters and established a better understanding. The period of general depression which set in before 1885 was surmounted in Scotland with comparatively little trouble. A large amount of capital was lost by tenants, and a few farms were thrown here and there upon the landlords' hands, but in no district was rent extinguished or were holdings abandoned. The sub-commissioners who reported to the Royal Commission on Agriculture in 1895 found nearly everywhere a demand, sometimes competition for farms, persisting throughout the crisis. In Banff, Nairn, Elgin and several southern counties rent reductions varied from 25 to 30%. In Perth, Fife, Forfar and Aberdeen the average was 30%; but in nearly all the counties, towards the end at least of the period of depression, the coexistent demand and competition for farms were observable. In some districts in the west rents fell very little; in others, especially sheep-farming districts, the fall was very severe. In Ayrshire the figure varied from 5 to 20%; for Dumfriesshire 16% was given as a fair average, but here too the distressed farmer was compelled to admit that if he gave up his holding there were others ready to take it. Afterwards, owing to the increased attention given to stock-fattening and dairying, and to a rise in prices, farming reached a condition of equilibrium, and the most noticeable residuum of the period of depression was the large intrusion of the butcher and grazier class into the farmer class proper. Caithness-shire was declared to be the greatest sufferer by the period of depression; rents fell in that county by 30 to 50% on large farms, 20 to 30% on medium, and 10 to 60% on small farms. Nevertheless, the decline in the value of land was serious. According to the reports of the Inland Revenue Commissioners, the gross income derived from the ownership of lands in Scotland was returned in 1879–1880 at £7,769,303. After that year a continuous fall set in, and in 1901–1902 the amount returned was only £5,911,836, a drop in twenty-five years of £1,857,467. These figures refer to land, whether cultivated or not, including ornamental grounds, gardens attached to houses when exceeding one acre in extent, teinds or tithe-rent charge commuted under the Lands Commutation Acts, farm-houses and farm-buildings.

The crofters of the Highlands and islands had their grievances also. During the first half of the 19th century wholesale clearances had been effected in many districts, and the crofters were compelled either to emigrate or to crowd into areas already congested, where, eking out a precarious living by following the fisheries, they led a hard and miserable existence. At last after agitation and discontent had become rife, government appointed a royal commission to inquire into the whole question in 1883. It reported next year, and in 1886 the Crofters' Holdings Act was passed. Amending statutes of succeeding years added to the commissioners' powers of fixing fair rents and cancelling arrears, the power of enlarging crofts and common grazings. Since then political agitation has practically died out, though the material condition of the class has not markedly improved, except where, with government aid, crofter fishermen have been enabled to buy better boats; but in some districts, even in the island of Lewis, substantial houses have been built. After the passing of the act (1886) the Crofters' Commission in 15 years considered applications for rent and revaluation of holdings which amounted to £82,790, and fixed the fair rent at £61,233, or an annual reduction of £21,557; of arrears of rent amounting to £184,962 they cancelled £124,180, and also assigned 48,949 acres in enlargement of holdings. Under the Congested Districts (Scotland) Act of 1897, £35,000 a year was devoted within certain districts of Argyll, Inverness, Ross and Cromarty, Sutherland, Caithness, Orkney and Shetland, to assisting migration, improving the breeds of live stock, building piers and boat-slips, making roads and bridges, developing home industries, &c.

TABLE IX.—*Classification of Holdings above 1 Acre.*

Years.	1 to 5 Acres.		5 to 50 Acres.		50 to 300 Acres.		Above 300 Acres.	
	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.
1895	20,150	65,891	33,921	608,390	22,802	2,935,184	2766	1,284,461
1903	19,560	63,961	34,018	610,669	23,075	2,970,325	2730	1,268,843
1905	18,685	...	34,673	...	23,055	...	2718	...

In Table IX. will be found a classification of the holdings in 1895, 1903 and 1905. The figures show that the holdings under 50 acres constituted fully two-thirds of the total holdings and that, though no very decided alteration in the size of farms was in progress, the larger portion of the cultivated land was held in farms of between 50 and 300 acres. The average holding in 1905 was 61·7 acres.

Table X. shows the total area, the cultivated area and the area under grain crops, green crops, grasses and miscellaneous crops. Comparison between 1905 and the average for 1871–1875 clearly demonstrates the change which Scottish agriculture had undergone. Though practically the same amount of land was brought under the plough, there was a considerable fall in the acreage under grain and green crops, but this was rather more than balanced by the increased area under grass, showing that the tendency towards the raising of live stock has become more widespread and more pronounced. Only a little more than one-fourth of the area of Scotland is cultivated, while in England only one-fourth is left uncultivated; but it should be borne in mind that "permanent pasture" does not include the mountainous districts, which not only form so large a proportion of the surface but also, in their heaths and natural grasses, supply a scanty herbage for sheep and cattle, 9,104,388 acres being used for grazing in 1905. Oats remain the staple grain crop, and barley, though fluctuating from year to year, is steadied by the demands of the distillers. Wheat showed a marked decline in most years from 1893 to 1904. Table XI., however, shows that in most cases, even when the acreage occupied by crops is smaller, the estimated yield to the acre shows a distinct improvement, the result of enhanced skill and industry, and the adoption of more scientific methods. In 1905 the yield of hay from clover, sainfoin and rotation grasses amounted to 666,985 tons, or 31·19 cwts. to the acre, and from permanent pasture 209,908 tons, or 28·46 cwts. to the acre, or 876,893 tons of all kinds of hay from 575,220 acres.

TABLE X.—*Acreage under Cultivation.*

Total Area, including Inland Water, but excluding Foreshore and Tidal Water, 19,458,728 Acres.

Crops.	Average 1871–1875.	1905.
	Acres.	Acres.
Total area under Crops and Grasses.*	4,560,825	4,880,985
Permanent Pasture—		
For Hay	..	148,342
Not for Hay	..	1,302,384
Total	1,084,983	1,450,726
Arable Land	3,475,842	3,430,259
Grain Crops—		
Wheat	122,513	48,641
Barley or Bere	252,105	212,134
Oats	1,007,339	962,972
Rye	10,480	5,598
Beans	26,746	10,346
Peas	2,332	910
Total	1,421,515	1,240,601
Potatoes	167,880	144,265
Turnips and Swedes	503,709	445,306
Mangold	1,748	2,389
Cabbage, Kohl-Rabi and Rape	4,656	14,725
Vetches or Tares	15,828	8,557
Other Crops		2,699
Total	693,821	617,941
Clover, Sainfoin and Grasses under Rotation—		
For Hay	..	427,686
Not for Hay	..	1,130,591
Total	1,338,106	1,558,277
Flax	731	4
Small Fruit	†	6,493
Bare Fallow	21,669	6,943

* Not including mountain and heath land.

† Not separately distinguished.

TABLE XI.—*Showing Yield of Chief Crops to the Acre.*

Crops.	Estimate Total Produce.		Average Yield to the Acre.	Average Yield to the Acre.
	1885.	1905.	1885.	1905.
Wheat—Bushels	1,893,501	2,065,381	34·33	42·46
Barley ,,	8,245,820	8,004,446	34·72	37·73
Oats ,,	33,407,127	35,277,807	31·93	36·63
Beans ,,	709,577	364,818	30·67	36·76
Peas ,,	37,464	17,108	21·41	27·16
Potatoes—Tons	803,523	979,541	5·39	6·97
Turnips and Swedes—Tons	6,496,189	7,162,794	15·39	16·08

Table XII. shows the number of live stock in 1905, with the average for the period 1871–1875, and illustrates the extent to which farmers have turned their attention to stock in preference to crops. The cattle stock has risen steadily, and a regular increase in the number under 2 years points to the healthy state of the breeding industry. The breeds include the Ayrshire, noted milkers and specially adapted for dairy farms (which prevail in the south-west), which in this respect have largely supplanted the Galloway in their native district; the polled Angus or Aberdeen, fair milkers, but valuable for their beef-making qualities, and on this account, as well as their hardihood, in great favour in the north-east, where cattle-feeding has been carried to perfection; and the West Highland or Kyloe breed, a picturesque breed with long horns, shaggy coats and decided colours—black, red, dun, cream and brindle—that thrives well on wild and healthy pasture. The special breeds of sheep are the fine-woolled of Shetland, the blackfaced of the Highlands, the Cheviots, natives of the hills from which they are named, a favourite breed in the south, though Border Leicesters and other English breeds, as well as a variety of crosses, are kept for winter feeding on lowland farms. The principal breeds of horses are the Shetland and Highland ponies, and the Clydesdale draught.

TABLE XII.—*Illustrating Increase of Live Stock.*

Stock.	Average 1871–1875.	1905.
Horses—		
Used for agricultural purposes, including mares kept for breeding	..	156,520
Unbroken	..	49,668
Total	178,652	206,188
Cattle—		
Cows and heifers in milk or in calf	392,252	437,138
Other cattle, 2 years and above	267,920	276,330
Other cattle, under 2 years	467,165	513,827
Total	1,127,337	1,227,295
Sheep—		
Ewes kept for breeding	..	2,918,544
Other sheep, 1 year and above	4,735,008	1,383,200
Other sheep, under 1 year	2,426,114	2,722,467
Total	7,161,122	7,024,211
Pigs	166,148	130,214

Orchards and Forests.—The acreage devoted to orchards rose from 1562 in 1880 to 2482 in 1905. The chief areas for tree and small fruit are Clydesdale and the Carse of Gowrie, but there are also productive orchards in the shires of Haddington, Stirling, Ayr and Roxburgh, while market-gardening has developed in the neighbourhood of the larger towns. In 1812 woods and plantations occupied 907,695 acres, of which 501,469 acres were natural woods and 406,226 planted. Within sixty years this area had declined to 734,490 acres, but with renewed attention to forestry and encouragement of planting the area had grown in 1895 to 878,675 acres; by 1905, however, the acreage was practically unchanged. Inverness, Aberdeen and Perth are naturally the best wooded shires. The modern plantations consist mostly of Scots fir with a sprinkling of larch.

Deer Forests and Game, &c.—Deer forests in 1900 covered 2,287,297 acres, an increase of 575,405 acres since 1883. The red deer is peculiar to the Highlands, but the fallow deer is not uncommon in the hill country of the south-western Lowlands. The grouse moors occupy an extensive area and are widely distributed. Ptarmigan and black-cock are found in many districts, partridges and pheasants are carefully preserved, and the capercailzie, once extirpated, has been restored to some of the Highland forests. Hares and rabbits, the latter especially, are abundant. Fox-hunting is fashionable in most of the southern shires, but otter-hunting is practically extinct. The bear, wolf and beaver, once common, have long ceased to be, the last wolf having been killed, it is said, in 1680 by Sir Ewen Cameron of Lochiel. The wild cat may yet be found in the Highlands, and the polecat, ermine and pine marten still exist, the golden eagle and the white-tailed eagle haunt the wilder and more remote mountainous districts, while the other large birds of prey, like the osprey and kite, are becoming scarce. The islands, rocks and cliffs and some inland lochs are frequented in multitudes by a great variety of water-fowl.

Fisheries.—The Scottish seaboard is divided for administrative purposes into twenty-seven fishery districts, namely, on the east coast, Eyemouth, Leith, Anstruther, Montrose, Stonehaven, Aberdeen, Peterhead, Fraserburgh, Banff, Buckie, Findhorn, Cromarty, Helmsdale, Lybster, Wick (15); on the north, Orkney, Shetland (2); on the west, Stornoway, Barra, Loch Broom, Loch Carron and Skye, Fort William, Campbeltown, Inverary, Rothesay, Greenock, Ballantrae (10). The whole of the fisheries are controlled by the Fishery Board for Scotland, which was established in 1882 in succession to the former Board of White Herring Fishery. In 1903 the number of fishermen directly employed in fishing was 36,162, there were 17,496 engaged in curing and preserving the fish landed, while 32,201 were employed in subsidiary industries on shore, making a total of 85,859 persons engaged in the fisheries and dependent industries. In 1905 the herring fishery yielded 5,342,777 cwts. (£1,343,080); in 1909, 4,541,297 cwts. The most prolific districts are Shetland in the north, Fraserburgh, Peterhead, Wick, Aberdeen and Anstruther in the east, and Stornoway in the west. The principal herring market is continental Europe, Germany and Russia being the largest consumers, and there has been a growing exportation to the United States. In 1905 the total catch of fish of all kinds (excepting shell-fish) amounted to 7,856,310 cwts., and in 1907 (the highest recorded to 1910), 9,018,154 cwts. (£3,149,127). The annual value of the shell-fish (lobsters, crabs, oysters, mussels, clams, periwinkles, cockles, shrimps) is about £73,000. The weight of salmon carried by Scottish railways and steamers in 1894 was 2437 tons, and in 1903 it was 2047 tons. In 1894 the number of boxes of Scottish salmon delivered at Billingsgate market in London was 15,489, and in 1903 it was 15,103, being more than half of the salmon received then from all parts of Europe, including Irish and English consignments. In 1903 the Tay rentals came to £22,902, the highest then recorded. The other considerable rentals were the Dee £18,392, Tweed £15,389 and Spey £8146.

Roads.—In the 12th century an act was passed providing that the highways between market-towns should be at least 20 ft. broad. Over the principal rivers at this early period there were bridges near the most populous places, as over the Dee near Aberdeen, the Esk at Brechin, the Tay at Perth and the Forth near Stirling. Until the 16th century, however, traffic between distant places was carried on chiefly by pack-horses. The first stage-coach in Scotland was that which ran between Edinburgh and Leith in 1610. In 1658 there was a fortnightly stage-coach between Edinburgh and London, but afterwards it would appear to have been discontinued for many years. Separate acts enjoining the justices of the peace, and afterwards along with them the commissioners of supply, to take measures for the maintenance of roads were passed in 1617, 1669, 1676 and 1686. These provisions had reference chiefly to what afterwards came to be known as "statute labour roads," intended primarily to supply a means of communication within the several parishes. They were kept in repair by the tenants and cotters, and, when their labour was not sufficient, by the landlords, who were required to "stent" (assess) themselves, customs also being sometimes levied at bridges, ferries and causeways. By separate local acts the "statute labour" was in many cases replaced by a payment called "conversion money," and the General Roads Act of 1845 made the alteration universal. The Roads and Bridges (Scotland) Act of 1878 entrusted the control of the roads to royal and police burghs and in the counties to road trustees, from whom it was transferred by the Local Government Act of 1889 to county councils, the management, however, being in the hands of district committees. The Highlands had good military roads earlier than the rest of the country. The project, begun in 1725 under the direction of General George Wade, took ten years to complete, and the roads were afterwards kept in repair by an annual parliamentary grant. In the Lowlands the main roads were constructed under the Turnpike Acts, the earliest of which was obtained in 1750. Originally they were maintained by tolls, but this method, after several counties had obtained separate acts for its abolition, was superseded in 1883 by the act of 1878.

Canals.—There are four canals in Scotland, the Caledonian, the Crinan, the Forth and Clyde and the Union, of which the Caledonian and Crinan are national property (see CALEDONIAN CANAL). The Forth and Clyde Navigation runs from Bowling on the Clyde, through the north-western part of Glasgow and through Kirkintilloch and Falkirk to Grangemouth on the Forth, a distance of 35 m. There is also a branch, 2¾ m. long, from Stockingfield to Port Dundas in the city of Glasgow, which is continued for the distance of 1 m. to form a junction with the Monkland canal. This last has a length of 12¼ m., and runs from the north-east of Glasgow through Coatbridge to Woodhall in the parish of Old Monkland. It was begun in 1761 and opened for traffic in 1792. The Forth and Clyde canal was authorized in 1767 and opened from sea to sea in 1790. In 1846 its proprietors bought the Monkland canal, and in 1867 the combined undertaking passed into the hands of the Caledonian Railway Company. The Union canal, 31½ m. long, starts from Port Downie, on the Forth and Clyde canal near Falkirk, and runs to Port Hopetoun in Edinburgh. Begun in 1818 it was completed in 1822, and in 1849 was vested in the Edinburgh and Glasgow Railway Company, which in turn was absorbed by the North British Railway Company in 1865. The Forth and Clyde canal has a revenue of about £120,000 a year, including receipts from the docks at Grangemouth, and the expenditure on management and maintenance is about £40,000. The Union canal earns between £2000 and £3000, and its expenditure is but little less than its revenue. Three other canals formerly existed in Scotland. The Aberdeen canal, 18¼ m. long, running up the Don valley from Aberdeen to Inverurie was opened in 1807, but did not prove profitable and was ultimately sold to the Great North of Scotland Railway Company, by which it was abandoned. The Glasgow, Paisley and Johnstone canal, 11 m. long, was opened in 1811 and was bought in 1869 by the Glasgow and South-Western railway, which in 1881 obtained statutory powers to abandon it as a canal and use its site, so far as necessary, for a railway line. The Forth and Cart Junction canal was only half a mile long. It ran from the Forth and Clyde canal to the Clyde, opposite the river Cart, and was intended to allow vessels to pass direct from the east coast up that river to Paisley. The Caledonian railway, which acquired it together with the Forth and Clyde canal in 1867, obtained powers to abandon it in 1893.

Railways.—The first railway in Scotland for which an act of parliament was obtained was that between Kilmarnock and Troon (9¾ m.), opened in 1812, and worked by horses. A similar railway, of which the chief source of profit was the passenger traffic, was opened between Edinburgh and Dalkeith in 1831, branches being afterwards extended to Leith and Musselburgh. By 1840 the length of the railway lines for which bills were passed was 191¼ m., the capital being £3,122,133. The chief companies are the Caledonian, formed in 1845; the North British, of the same date; the Glasgow and South-Western, formed by amalgamation in 1850; the Highland, formed by amalgamation in 1865; and the Great North of Scotland, 1846.

Table XIII. shows the advance in mileage, goods and passenger traffic and receipts, from both sources, since 1857.

TABLE XIII.—*Illustrating Growth of Railway Business.*

Year.	Mileage.	Passengers.	Passenger Traffic Receipts.	Goods Traffic Receipts.	Total.
1857	1243	14,733,503	£916,697	£1,584.781	£2,501,478
1874	2700	38,220,892	2,350,593	3,884,424	6,235,017
1884	2999	54,305,074	2,931,737	4,426,023	7,357,760
1888	3097	68,413,349	3,163,195	4,564,627	7,727,822
1900	3485	122,201,102	4,715,592	6,431,693	11,147,285
1905	3804	115,580,000	5,014,452	6,803,286	11,817,738

The total capital of all the Scots companies in 1888 was £114,120,119; by 1910 it exceeded £185,000,000. Since the passing of the Light Railways Act 1896, the Board of Trade has sanctioned several light railways. By 1910 the total railway mileage was 3844.

Mining Industry.—Coal and iron, generally found in convenient proximity to each other, are the chief sources of the mineral wealth of Scotland. The principal coalfields are Lanarkshire, which yields nearly half of the total output, Fifeshire, Ayrshire, Stirlingshire and Midlothian, but coal is also mined in the counties (usually reckoned as forming part of one or other of the main fields) of Linlithgow, Haddington, Dumbarton, Clackmannan, Kinross, Dumfries, Renfrew, Argyll and Peebles, while a small quantity is obtained from the Oolite at Brora in Sutherlandshire. The earliest records concerning coalpits appear to be the charters granted, towards the end of the 12th century, to William Oldbridge of Carriden in Linlithgowshire, and in 1291 to the abbot and convent of Dunfermline conferring the privilege of digging coal in the lands of Pittencrieff. The monks of Newbattle Abbey also dug coal at an early date from surface pits on the banks of the Esk. Aeneas Sylvius (Pope Pius II.), who visited Scotland in the 15th century, refers to the fact that the poor received at church doors a species of stone which they burned instead of wood; and although the value of coal for smith's and artificer's work was early recognized it was not used for domestic purposes till about the close of the 16th century. In 1606 an act was passed binding colliers to perpetual service at the works where they were employed, and they were not fully emancipated till 1799. An act was passed in 1843 forbidding the employment of children of tender years and women in underground mines. In 1905 there were 492 coal and iron mines in operation, employing 109,939 hands (89,516 below ground and 20,423 above). The total output in that year amounted to 35,839,297 tons, valued at £10,369,433. The total quantity worked up to the end of 1898 was 1,514,062 tons, the quantity then remaining to work being estimated at 4,634,785,000 tons. The quantity of coal exported in 1905 from the principal Scottish ports was 7,863,511 tons, and the quantity shipped coastwise to ports of the United Kingdom amounts annually to about 2½ million tons in addition.

The rise of the iron industry dates from the establishment of the Carron ironworks near Falkirk in 1760, but it was the introduction of railways that gave the production of pig-iron its greatest impetus. In 1796 the quantity produced was 18,640 tons, which had only doubled in thirty-four years (37,500 tons in 1830). In 1840 this had grown to 241,000 tons, in 1845 to 475,000 tons and in 1865 to 1,164,000 tons, almost the height of its prosperity, for in 1905 the product of 101 blast furnaces only amounted to 1,375,125 tons, and in the interval there were years when the output was below one million tons. More than one-third of the iron ore (that chiefly worked being Black Band Ironstone) comes from mines which also yield coal. The iron-producing counties in the order of their output are Ayr, Lanark, Renfrew, Linlithgow, Dumbarton, Fife, Midlothian and Stirling, the first three being the most productive. In 1905 the quantity of ore raised was 832,388 tons, valued at £320,875 and yielding 249,716 tons of metal. The imports of ore in that year amounted to 1,862,444 tons of the value of £1,420,379.

The oil shale industry is wholly modern and has attained to considerable magnitude since it was established (in 1851 and following years). Linlithgowshire yields nearly three-fourths of the total output, Midlothian produces nearly one-fourth, a small quantity is obtained from Lanarkshire, and there is an infinitesimal supply from Sutherland. The mineral is chiefly obtained from seams in the Calciferous Sandstone at the base of the Carboniferous rocks.

Fire-clay is produced in Lanarkshire, which yields nearly half of the total output, and Ayrshire and, less extensively, in Stirlingshire, Fifeshire, Renfrewshire, Midlothian and a few other shires. With the exception of the counties of Orkney, Shetland, Caithness, Sutherland and Inverness, granite is quarried in every shire in Scotland, but the industry predominates in Aberdeenshire, and is of considerable importance in Kirkcudbrightshire; limestone is quarried in half of the counties, but especially in Midlothian and Fife; large quantities of paving-stones are exported from Caithness and Forfarshire, and there are extensive slate quarries at Ballachulish and other places in Argyllshire, which furnishes three-fourths of the total supply. Sandstone, of which the total production in 1905 was 1,142,135 tons valued at £320,761, is quarried in nearly every county, but the industry flourishes particularly in the shires of Lanark, Dumfries, Ayr and Forfar. Lead ore occurs at Wanlockhead in Dumfriesshire and Leadhills in Lanarkshire. In 1905 there were produced 2774 tons of dressed lead ore, of the value of £25,823, yielding 2167 tons of lead in smelting and 11,409 oz. of silver. Gold has been found in the county of Ross and Cromarty. A small quantity of zinc is mined in Dumfriesshire and of barytes at Lochwinnoch in Renfrewshire. The precious metals were once worked at Abington in Lanarkshire and in the Ochils, and lead was mined at Tyndrum in Perthshire. In 1905 there were 66 mines apart from coal and iron, employing altogether 5329 hands, and 1127 quarries employing 7390 persons inside the quarries and 4797 persons outside, or 12,187 in all. Alumina is treated at works near Foyers in the shire of Inverness, where abundant water power enables electricity to be generated cheaply. The Foyers installation is the largest water-power plant in the United Kingdom.

Iron and Steel.—In 1901 the number of persons engaged in working of the raw material was 23,263, of whom 8258 were employed in steel smelting and founding, 7781 at blast furnaces in the manufacture of pig-iron, and 7224 at puddling furnaces and rolling mills. All the great iron foundries and engineering works are situated in the Central Plain or Lowlands, in close proximity to the shipbuilding yards and coalfields, especially in the lower and part of the middle wards of Lanarkshire, in certain districts of Ayrshire and Renfrewshire, at and near Dumbarton, in south Stirlingshire and in some parts of East and Mid Lothian and Fife. In 1901 the number of persons employed in engineering and machine-making—including 24,122 ironfounders, 24,944 blacksmiths, 26,567 fitters, turners and erectors, 9767 boiler-makers and 18,618 undefined—amounted to 118,736. In miscellaneous metal trades, embracing tinplate goods, wire workers, makers of stoves, grates, ranges and fire-arms, makers of bolts, nuts, rivets, screws and staples, and those occupied in several subsidiary trades, the number of operatives in 1901 amounted to 13,209. In the same year there were 7279 persons employed in the making of cycles, motor cars, railway coaches and waggons and carriages and other vehicles. In the whole group of industries connected with the working in metals and the manufacture of machinery, implements and conveyances the total number of persons employed amounted in 1901 to 205,830.

Manufactures. (*a*) *Wool and Worsted.*—Although a company of wool weavers was incorporated by the town council of Edinburgh in 1475, the cloth worn by the wealthier classes down to the beginning of the 17th century was of English or French manufacture, the lower classes wearing "coarse cloth made at home," a custom still prevalent in the remoter districts of the Highlands. In 1601 seven Flemings were brought to Edinburgh to teach the manufacture of serges and broadcloth, and eight years later a company of Flemings was established in the Canongate (Edinburgh) for the manufacture of cloth under the protection of the king; but, notwithstanding also the establishment in 1681 of an English company for the manufacture of woollen fabrics near Haddington, the industry for long made little progress. In fact its importance dates from the introduction of machinery in the 19th century. The most important branch of the trade, that of tweeds, first began to attract attention shortly after 1830; though still having its principal seat in the district from which it takes its name, including Galashiels, Hawick, Innerleithen and Selkirk, it has extended to other towns, especially Aberdeen, Elgin, Inverness, Stirling, Bannockburn, Dumfries and Paisley. Carpet manufacture has had its principal seat in Kilmarnock since 1817, but is also carried on in Aberdeen, Ayr, Bannockburn, Glasgow, Paisley and elsewhere. Tartans are largely manufactured in Tillicoultry, Bannockburn and Kilmarnock, and shawls and plaids in several towns. Fingering and many other kinds of woollen yarns are manufactured at Alloa, the headquarters of the industry. In 1901 the number of operatives in the woollen industry (including combers and sorters, spinners, weavers and workers in other processes) amounted to 24,906. In 1850 the employed numbered 10,210.

(*b*) *Flax, Hemp and Jute.*—The manufacture of cloth from flax is of very ancient date, and towards the close of the 16th century Scottish linen cloths were largely exported to foreign countries, as well as to England. Regulations in regard to the manufacture were passed in 1641 and 1661. In a petition presented to the privy council in 1684, complaining of the severe treatment of Scotsmen selling linen in England, it was stated that 12,000 persons were engaged in the manufacture. Through the intercession of the secretary of state with the king these restrictions were removed. Further to encourage the trade it was enacted in 1686 that the bodies of all persons, excepting poor tenants and cotters, should be buried in plain linen only, spun and made within the kingdom. The act was renewed in 1693 and 1695, and in the former year another act was passed prohibiting the export of lint and permitting its import free of duty. At the time of the Union the annual amount of linen cloth manufactured in Scotland is supposed to have been about 1,500,000 yards. The Union gave a considerable impetus to the manufacture, as did also the establishment of the Board of Manufactures in 1727, which applied an annual sum of £2650 to its encouragement, and in 1729 established a colony of French Protestants in Edinburgh, on the site of the present Picardy Place, to teach the spinning and weaving of cambric. From the 1st of November 1727 to the 1st of November 1728 the amount of linen cloth stamped was 2,183,978 yds., valued at £103,312, but for the year ending the 1st of November 1822, when the regulations as to the inspection and stamping of linen ceased, it had increased to 36,268,530 yds., valued at £1,396,296. The counties in which the manufacture is now most largely carried on are Forfar, Perth, Fife and Aberdeen, but Renfrew, Lanark, Edinburgh and Ayr are also extensively associated with it. Dundee is the principal seat of the coarser fabrics, Dunfermline of the table and other finer linens, while Paisley is widely known for its sewing threads. The allied industry of jute is the staple industry of Dundee. In 1890 the number employed in the linen industry was 34,222, which had declined in 1901 to 23,570. In 1890 the operatives in the jute and hemp industry numbered 39,885, and in 1901 they were (including workers in canvas, sacking, sailcloth, rope, twine, mats, cocoa fibre) 46,550.

(*c*) *Cotton.*—The first cotton mill was built at Rothesay by an English company in 1779, though Penicuik also lays claim to priority. The Rothesay mill was soon afterwards acquired by David Dale, who was the agent for Sir Richard Arkwright, and had the invaluable aid of his counsel and advice. Dale also established cotton factories in 1785 at New Lanark, afterwards so closely associated with the socialistic schemes of his son-in-law, Robert Owen. The counties of Lanark and Renfrew are now the principal seats of the industry. The great majority of the cotton factories are concentrated in Glasgow, Paisley and the neighbouring towns, but the industry extends in other districts of the west and is also represented in the counties of Aberdeen, Perth and Stirling. As compared with England, however, the manufacture has stagnated. The number of hands employed in 1850 was 34,325, in 1875 it was 35,652 and in 1901 (including bleachers, dyers, printers, calenderers, &c.) it was 34,057.

(*d*) *Silk and other Textiles.*—The principal seats of the silk manufacture are Paisley and Glasgow. In 1885 the number employed amounted to 600 and in 1901 to 2424. The weaving of lace curtains has made considerable progress, in 1878 only 45 hands being employed against 2875 in 1901. Hosiery manufactures, a characteristic Border industry, with its chief seat at Hawick, employed 11,957 hands in 1901. The total number of persons working in textile fabrics in 1901, exclusive of 21,849 drapers, mercers and other dealers, but including 43,040 employed in mixed or unspecified materials (hosiery, lace, carpets, rugs, fancy goods, &c., besides a large number of "undefined" factory hands and weavers), amounted to 174,547 persons.

(*e*) *Whisky and Beer.*—Scotland claims a distinctive manufacture in whisky. Though distillation was originally introduced from England, by 1771 large quantities of spirits were already being consigned to the English market. The legal manufacture of whisky was greatly checked in the earlier part of the 19th century by occasional advances in the duty, but after the reduction of 2s. 4¾d. per proof gallon in 1823—the duty amounted in 1904 to 11s. per proof gallon—the number of licensed distillers rapidly increased, to the discouragement of smuggling and illicit distillation. In 1824 the number of gallons made amounted to 5,108,373; by 1855 this had more than doubled; in 1884 it was 20,164,962; in 1900 it reached 31,798,465; and in 1904 it had receded to 27,110,977. More than four-fifths of the distilleries at work in the United Kingdom are situated in Scotland. The leading distilling counties are Argyll, Banff, Elgin, Inverness and Aberdeen, Perth and Ross and Cromarty, while the industry is found in seventeen other shires. In 1893–1894 the total net duty received for home-made spirits amounted to £5,461,198 and in 1903–1904 to £7,276,125. The production has attained to colossal dimensions. In 1893–1894 the quantity of proof gallons in bond was 61,275,754, and in 1903–1904 it amounted to 121,397,951, the production having practically doubled itself within ten years. Ale was a common beverage as early as the 12th century, one or more breweries being attached to every religious house and barony. So general was its use even in the beginning of the 18th century that the threatened imposition of a tax on malt in 1725 provoked serious riots in Glasgow and clamour for repeal of the Union; and sixty years afterwards Robert Burns in certain poems voiced the popular sentiment concerning the "curst restrictions" proposed by the Excise on beer and whisky. Though ale has been superseded by whisky as the national beverage, brewing is extensively carried on in Edinburgh, whose ales are in high repute, Leith, Alloa and elsewhere. In 1885 the number of barrels of beer, duty-paid, amounted to 1,237,323; in 1893–1894 to 1,733,407; and in 1903–1904 to 1,877,978. In 1893–1894 the duty (6s. 3d. the barrel) yielded £473,311 and in 1903–1904 (7s. 9d. the barrel) £649,080. After 1893–1894, when the number of brewers licensed to brew for sale numbered 149, there was a steady fall to 117 in 1903–1904, alleged by the Inland Revenue Commissioners to be due to the disappearance of the small brewer. The practice of private brewing exhibits a still greater decline—from 272 to 84 in the years named. Notwithstanding the enormous turnover and output and the large capital invested, neither distilling nor brewing gives employment to many hands, the figures for 1901 being 1330 maltsters, 2052 brewers and 1970 distillers.

(*f*) *Miscellaneous.*—Paper, stationery and printing are industries in which Scotland has always occupied a foremost position. A paper mill was erected in 1675 at Dalry on the Water of Leith in which French operatives were employed to give instruction, with the result, in the words of the proprietors, that "grey and blue paper was produced much finer than ever was done before in the kingdom." Midlothian has never lost the lead then secured. The paper mills at Penicuik and elsewhere in the vale of the Esk and around Edinburgh are flourishing concerns, and the industry is also vigorously conducted near Aberdeen. Stationery is largely manufactured at Glasgow, Aberdeen and Edinburgh. In 1901 the number of persons employed in the paper and stationery industries amounted to 19,602. Ever since it was established by Andrew Myllar and Walter Chepman, early in the 16th century, the Edinburgh press has been renowned for the beauty and excellence of its typography, a large proportion of the books issued by London publishers emanating from the printing works of the Scottish capital. Printing is also extensively carried on in Glasgow and Aberdeen, and Cupar once enjoyed considerable repute for its press. The number of persons engaged in the production of books and other printed matter (including lithographers, copper, steel plate and "process" printers, bookbinders, publishers, booksellers and distributors) amounted in 1901 to 24,139. The first sugar refinery was erected in 1765 at Greenock, which, despite periodical vicissitudes, has remained the principal seat of the industry, which is also carried on at Leith, Glasgow and Dundee. The making of preserves and confectionery flourishes in Dundee, Aberdeen, Paisley and Edinburgh. Kirkcaldy is the seat of the oil floor-cloth and linoleum industries, the latter introduced in 1877. The headquarters of the chemicals manufacture are situated in Glasgow and the vicinity, while explosives are chiefly manufactured at Stevenston and elsewhere in Ayrshire, and at certain places on the Argyll coast. Among occupations providing employment for large numbers were trades in connexion with building and works of construction (136,639 persons in 1901), and furniture and timber (39,000), while the conveyance of passengers, parcels and messages employed 163,102 (railway, 43,037; roads, 53,813; sea, rivers and canals, 20,451; docks, harbours and lighthouses, 10,659; and storage, porterage and messages, 35,142).

Commerce and Shipping.—That Scotland had a considerable trade with foreign countries at a very early period may be inferred from the importation of rich dresses by Malcolm III. (d. 1093), and the enjoyment of Oriental luxuries by Alexander I. (d. 1124). His successor, David I., receives the special praise of Fordun for enriching "the ports of his kingdom with foreign merchandise." In the 13th century the Scots had acquired a considerable celebrity in shipbuilding; and a powerful French baron had a ship specially built at Inverness in 1249 to convey him and his vassals to the Holy Land. The principal shipowners at this period were the clergy, who embarked the wealth of their religious houses in commercial enterprises. Definite statements regarding the number and tonnage of shipping are, however, lacking till the 18th century. From two reports printed by the Scottish Burgh Record Society in 1881, it appears that the number of vessels belonging to the principal ports—Leith, Dundee, Glasgow, Kirkcaldy and Montrose—in 1656 was 58, the tonnage being 3140, and that by 1692 they had increased to 97 of 5905 tons. These figures only represent a portion of the total shipping of the kingdom. At the time of the Union in 1707 the number of vessels was 215 of 14,485 tons.

Table XIV. gives the figures of the registered tonnage in port in 1850 and later specified years, which are interesting as showing how, while sailing vessels declined during the half century to one-third of their number in 1850, steam vessels increased thirteenfold. It is true that the tonnage of the 918 sailing vessels of 1905 was considerably in excess of that of the 3432 sailing vessels of 1850, but even so it was a declining figure from a higher tonnage of the middle of the period. On the other hand, during fifty-five years the tonnage of steamers had grown to be a hundred times as large as it was in 1850. Table XV. illustrates the development that took place in the shipping trade with foreign countries and British possessions, as well as the expansion of the coasting trade, in 1855–1905, certain years being taken as types.

TABLE XIV.—*Showing Registered Tonnage in Port in Specified Years.*

	1850.		1860.		1870.		1884.		1900.		1905.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Sailing vessels	3432	491,395	3172	552,212	2715	727,942	2065	827,295	1104	709,430	918	578,340
Steam vessels .	169	30,827	314	71,579	582	209,142	1403	866,780	1980	1,528,032	2330	3,139,558
Total . .	3601	522,222	3486	623,791	3297	937,084	3468	1,694,075	3084	2,237,462	3248	3,717,898

TABLE XV.—*Foreign and Colonial and Coastwise Trade: Tonnage of Vessels.*

Year.	Coastwise.		Colonial and Foreign.		Total.	
	Entered.	Cleared.	Entered.	Cleared.	Entered.	Cleared.
1855	1,963,552	2,057,936	668,078	840,150	2,631,630	2,898,086
1880	6,628,853	5,691,136	2,700,915	3,001,897	9,329,768	8,693,033
1889	7,188,763	6,998,516	3,931,010	4,412,607	11,119,773	11,411,123
1898	9,256,233	8,937,481	5,510,927	6,296,555	14,767,160	15,234,036
1900	7,213,574	6,791,959	5,657,200	6,602,545	12,870,774	13,394,504
1905	9,928,674	9,500,160	6,268,745	7,478,579	16,197,419	16,978,739

Table XVI. exhibits the growth of the foreign and colonial trade at specified dates since 1755, showing how it advanced by leaps and bounds during the latter part of the 19th century. Though the value of imports into Scotland is less than one-eleventh of that into England, this does not represent the due proportion of foreign wares used and consumed in Scotland, for the obvious reason that large quantities of goods are brought into the country by rail, nearly all the tea, for example, consumed in Great Britain being imported into London, while several ports have almost a monopoly of certain other imports. Foreign and colonial merchandise transhipped was valued at £989,289 in 1889 and at £746,246 in 1903. The customs revenue rose from £1,965,080 in 1894 to £3,399,141 in 1903. Judged by the combined value of their imports and exports the chief ports are as shown in the first section of Table XVII. Their status is modified by the movements of shipping, and for purposes of comparison the entrance and clearance tonnage of the trade with British colonies and foreign countries and of the coastwise traffic are exhibited in the second and third sections of the same table. The favourable position occupied by Greenock in the third section is due to its preponderating share of the traffic with the west coast and the islands. Its share of the Irish and coasting trade likewise accounts for the position of Ardrossan in the same section. It should be added that on the figures of import and export value in 1909, Aberdeen had changed places with Methil, and Burntisland with Granton. The figure for Glasgow in that year was £41,238,867.

TABLE XVI.—*Showing Growth of Foreign and Colonial Trade since 1755.*

Year.	Imports.	Exports.	Year.	Imports.	Exports.
	£	£		£	£
1755	464,411	535,576	1874	31,012,750	17,912,932
1790	1,688,337	1,235,405	1880	34,997,652	18,243,078
1795	1,268,520	976,791	1884	30,600,258	20,322,355
1800	2,212,790	2,340,069	1889	36,771,016	22,310,006
1815	3,447,853	6,997,709	1898	36,224,982	23,643,143
1825	4,994,304	5,842,296	1900	38,691,245	32,166,561
1851	8,921,108	5,016,116	1903	40,396,280	32,301,198

TABLE XVII.—*Chief Ports (1905).*

Port.	Order.	Imports and Exports. £	Order.	Colonial and Foreign Tonnage In and Out.	Order.	Coastwise Tonnage In and Out.
Glasgow . .	1	38,291,762	1	4,472,071	1	4,257,957
Leith . . .	2	17,975,978	2	2,210,015	4	1,410,160
Grangemouth .	3	6,273,317	4	1,425,978	6	859,177
Dundee . . .	4	5,657,583	7	320,103	7	807,159
Greenock . .	5	2,046,457	10	202,336	2	3,348,928
Methil . . .	6	1,127,931	3	1,716,355	8	542,244
Aberdeen . .	7	1,035,233	8	217,410	3	1,613,966
Granton . .	8	933,480	9	202,901	10	230,458
Burntisland . .	9	846,741	5	1,305,945	9	294,261
Ardrossan . .	10	651,124	6	326,356	5	1,094,439

Shipbuilding.—Many of the most important improvements in the construction of ships, especially steam vessels, are due to the enterprise and skill of the Clyde shipbuilders, who, from the time of Robert Napier of Shandon (1791–1876), who built and engined the first steamers for the Cunard Company, formed in 1840, have enjoyed an unrivalled reputation for the construction of leviathan liners, both as regards mechanical appliances and the beauty and convenience of the internal arrangements. The principal Clyde yards are situated in the Glasgow district (Govan, Partick, Fairfield, Clydebank, Renfrew), Dumbarton, Port Glasgow and Greenock. At several of the ports on the lower firth, as at Ardrossan and Fairlie, famous for its yachts, the industry is also carried on. On the east coast the leading yards are at Leith, Kirkcaldy, Grangemouth, Dundee, Peterhead and Aberdeen, which, in the days of sailing ships, was renowned for its clippers built for the tea trade. There are yards also at Inverness.

Postal Service.—Towards the end of the 16th century the practice arose of regular communication by letter between the magistrates of the larger towns and the seat of government in Edinburgh. After the accession of James VI. to the throne of England the necessity for an ordered method of intercourse between the Scottish capital and London became urgent, but the plans adopted involved extraordinary delay, for it not infrequently happened that there was an interval of two months between the despatch of a letter and the receipt of a reply. Such a leisurely fashion of transacting business soon grew intolerable, and in 1635 a system of relays was instituted which enabled the journey between the two cities to be accomplished in three days, the charge for a letter being 8d. The service was reorganized in 1662, and in 1711 the postal establishments of the United Kingdom, hitherto conducted independently in each country, were consolidated into one. When this reform was effected the cost of a letter to London was reduced to 6d. Three years before this date a local penny post had been provided in Edinburgh by private enterprise, carried on by a staff of seven persons, and after the success of this effort had been demonstrated the concern was taken over by the post office. Subsequently postal business stagnated, mainly owing to the greatly increased charges (the postage of a letter from London to Edinburgh is stated to have cost 1s. 4½d.), until the system of uniform penny postage came into operation. The telephones are mainly conducted by the post office and the National Telephone Company, but the corporation of Glasgow has a municipal service.

Religion.—The bulk of the population is Presbyterian, this form of Church government having generally obtained, in spite of persecution and other vicissitudes, since the Reformation. It is accepted equally by the Established Church, the United Free, the Free and other smaller Presbyterian bodies, the principal point distinguishing the first-named from the rest being that it accepts the headship of the sovereign. The Episcopal Church of Scotland, which is in communion with the Church of England, claims to represent the ancient Catholic Church of the country.

See SCOTLAND, CHURCH OF; also FREE CHURCH OF SCOTLAND; UNITED PRESBYTERIAN CHURCH; PRESBYTERIANISM; and SCOTLAND, EPISCOPAL CHURCH OF.

Parliamentary Government.—By the Act of Union in 1707 Scotland ceased to have a separate parliament, and its government was assimilated to that of England. In the parliament of Great Britain its representation was fixed at sixteen peers elected in Holyrood Palace by the peers of Scotland at each new parliament in the House of Lords, and at forty-five members in the House of Commons, the counties returning thirty and the burghs fifteen. The power of the sovereign to create new Scottish peerages lapsed at the Union, and consequently their number is a diminishing quantity. By the Reform Act of 1832 the number of Scottish representatives in the Commons was raised to fifty-three, the counties under a slightly altered arrangement returning thirty members as before, and the burghs, reinforced by the erection of various towns into parliamentary burghs, twenty-three; the second Reform Act (1867) increased the number to sixty, the universities obtaining representation by two members, while two additional members were assigned to the counties and three to the burghs; by the Redistribution of Seats Act in 1885 an addition of seven members was made to the representation of the counties and five to that of the burghs, the total representation being raised to seventy-two. The management of Scottish business in parliament has since 1885 been under the charge of the secretary for Scotland.[1]

Law.—At the Union Scotland retained its old system of law and legal administration, a system modelled on that of France; but since the Union the laws of England and Scotland have been on many points assimilated, the criminal law of the two countries being now practically identical, although the methods of procedure are in many respects different. The Court of Session, as the supreme court in civil causes is called, which is held at Edinburgh, dates from 1532, and was formed on the model of the *parlement* of Paris. Since the Union it has undergone certain modifications. It consists of thirteen judges, acting in an Inner and an Outer House. The Inner House has two divisions, with four judges each, the first being presided over by the lord president of the whole court, and the second by the lord justice clerk. In the Outer House five judges, called lords ordinary, sit in separate courts. Appeals may be made from the lords ordinary to either of the divisions of the Inner House, and, if the occasion demands, the opinion of all the judges of the Court of Session may be called for; but whether this be done or not the decision is regarded as a decision of the Court of Session. Appeals may be made from the Court of Session to the House of Lords. The lord justice general (lord president), the lord justice clerk and the other judges of the Court of Session form the High Court of Justiciary, instituted in 1672, for criminal cases, which sits at Edinburgh for the trial of cases from the three Lothians and of cases referred from the circuit courts. The latter meet for the south at Jedburgh, Dumfries and Ayr; for the west at Glasgow, Inveraray and Stirling; and for the north at Perth, Aberdeen, Dundee and Inverness. The law agents who undertake cases to be decided before the supreme courts are either solicitors before the supreme courts (S.S.C.) or writers to the signet (W.S.), the latter of whom possess certain special privileges. The lawyer authorized to plead before the supreme courts is termed an advocate. The principal law officer of the crown is the lord advocate, who is assisted by the solicitor-general and by advocates-depute. The practical administration of the law in a county is under the control of the sheriff-depute, who combines with his judicial duties certain administrative functions. The office, which once implied a much less restricted authority than at present, is as old as the reign of Alexander I. (d. 1124), when the greater part of the kingdom was divided into twenty-five sheriffdoms. In the latter part of the 13th century they numbered thirty-four, but now there are only fifteen sheriffs in all, who, excepting the sheriff for Lanarkshire, need not reside in the counties to which they are appointed and are not prohibited from private practice. They are assisted by sheriffs-substitute upon whom the bulk of the work falls, who must be residential and are debarred from private practice. At one time the functions of the sheriff-principal were confined to one county, but by an act passed in 1855 it was arranged that as sheriffdoms fell vacant certain counties should be grouped under the control of one sheriff-principal. Thus Aberdeen, Kincardine and Banff form one group, and the three Lothians with Peebles another. The public prosecutor for counties is the procurator-fiscal, who takes the initiative in regard to suspected cases of sudden death, although in this respect the law of Scotland is less strict than that of England. Justices of the peace, who are unpaid and require no special qualification, but as they are recommended by the lord-lieutenant, are generally persons of position in the county, once exercised a wider subordinate jurisdiction than now devolves upon them, their chief administrative function being to act along with certain members of the county councils, as the licensing authority for public-houses in the county and in police burghs, and as a court of appeal from the decisions of the bailies in royal and parliamentary burghs.

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[1] A separate secretary of state for Scotland was in existence after the Union, but this office was abolished in 1746. From 1782 to 1885 the secretary of state for the home department was responsible for the conduct of Scottish business, being advised in these matters by the lord advocate. The secretary for Scotland is not one of the principal secretaries of state.

Local Government.—The largest administrative unit is that of the county, but the areas of counties may be adapted to meet various public or political requirements. They may be altered for the purposes of the registrar-general, and for police purposes part of the area of one county may be brought into the area of another. For parliamentary purposes some counties have been united, as Clackmannan and Kinross, Elgin and Nairn, Orkney and Shetland, and Peebles and Selkirk, and others divided, as Aberdeen, Ayr, Lanark, Perth and Renfrew, while others retain in certain respects their old subdivision, Lanarkshire for assessment purposes being still partitioned into the upper, middle and lower wards. Originally the counties were synonymous either with sheriffdoms or stewartries. Stewartries ceased with the abolition of hereditary jurisdictions in 1748, though Kirkcudbrightshire still bears the designation. The counties are thirty-three in number, Ross and Cromarty constituting one, while Edinburgh, Glasgow, Aberdeen and Dundee are each a county of a city. The highest county dignitary is the lord-lieutenant, the office dating from 1782. Nominated by the crown, he holds office *aut vitam aut culpam*, represents the crown in military matters, recommends for commissions of the peace, holds the position of high sheriff, and is a member of the standing joint committee. The office, however, is little more than honorary. In olden times there were three classes of burgh. Those created by charter directly from the crown were styled royal burghs: they number seventy in all, of which no fewer than seventeen belong to Fifeshire. Those holding their charters from a feudal superior and not from the crown were called burghs of regality, their magistrates and council being usually appointed by the overlord or his representative. Being small and unimportant, these burghs were not affected by the act of 1833, but in 1892 were required to adopt the constitution of police burghs. Towns that received their charters from bishops were burghs of barony, their magistrates and council being appointed by the superior. When the bishop's jurisdiction was abolished, the burghs as a rule assumed the position of royal burghs. Police burghs are wholly modern, dating from the middle of the 19th century. They were called into existence by the rapid growth of certain districts caused by the development of the coal and iron fields. The principle on which they are established may be briefly stated thus: towns with a minimum population of 800 can, on a poll demanded by the ratepayers showing a majority in favour of it, acquire the status of a police burgh subject to representations from neighbouring burghs, a proviso devised to check the growth of "parasitic" burghs in the immediate vicinity of a great centre of population and industry, enjoying all the public improvements initiated by their powerful neighbour and yet contributing nothing towards the cost and upkeep of them. It should be noted that, according to Scottish usage, "police" includes drainage, the suppression of nuisances, paving, lighting and cleansing, in addition to the provision of a constabulary force, and that in point of fact, paradoxical as it appears, the bulk of the police burghs do not manage their police. Royal burghs derive part of their income from ancient corporate property known as "the Common Good" and consisting mostly of land and houses. It is devoted to objects for which the rates are not applicable. Glasgow, for example, might found a chair in the University from the Common Good but not from the rates, and Edinburgh maintains from the same source the city observatory and defrays part of the cost of the time-gun. Only Edinburgh, Glasgow, Dundee, Greenock, Aberdeen and Paisley have private and local acts, conferring powers exceeding the general law, to deal with, *e.g.* overcrowding, the obnoxious display of advertisements, the compulsory acquisition of land for gas, water or electric-power enterprises, all the other burghs being governed by Public General Acts. This is in marked contrast with the practice in England, where almost every large borough has its own private act. The corporation of the burghs consists of the provost (or lord provost, in the cases of Edinburgh, Glasgow, Aberdeen and Dundee), bailies and councillors, with certain permanent officials, of whom the town clerk is the most important. The course of reform may now be concisely summarized. In 1833 Scottish burghs were for the first time entitled to be governed by directly-elected bodies, and at various times since that date fuller powers of legal self-government were granted in different directions. In 1845 parochial boards were created for relief of the poor, their powers being afterwards extended to deal with the statutes concerning burial-grounds, the registration of births, deaths and marriages, vaccination, public health, public libraries and other matters. In 1872 school boards were set up throughout the country; county councils followed in 1889 and parish councils in 1894. These reforms profoundly modified and in some cases abolished older organizations which had grown inadequate to modern wants. The Commissioners of Supply, originally appointed to apportion and collect the national revenue and afterwards entrusted with the regulation of the land tax, the control of the county police, the raising of the militia, and the levying of rates for county expenditure, were practically superseded by the county councils, which are also the local authority under the Contagious Diseases (Animals) and the Public Health Acts in all parishes (burghs and police burghs excepted), perform the administrative duties formerly entrusted to the justices of the peace, and may also enforce the Rivers Pollution Act each within its own jurisdiction. The county councils are strengthened by certain special committees, such as the secondary education committee, whose duties have already been defined, and the standing joint committee—one half appointed by the county council, the other half by the Commissioners of Supply—which manages the county police and whose consent in writing must be obtained before the county council can undertake any work involving capital outlay. All but the smallest counties are subdivided into districts, and the Road Acts and Public Health Acts are administered in these areas by district committees, composed of members of the county council for the district and one representative of each parish council within the area. The act of 1894, as we have seen, not only established the Local Government Board, consisting of the secretary for Scotland, the solicitor-general, the under-secretary and three appointed members—a vice-president, a lawyer and a medical officer of public health—but also replaced the parochial boards by parish councils, empowered to deal among other things with poor relief, lunacy, vaccination, libraries, baths, recreation grounds, disused churchyards, rights of way, parochial endowments, and the formation of special lighting and scavenging districts. (J. A. M.)

III. Political History.

Scotland, to political observers of the middle of the 16th century, seemed destined by nature to form one homogeneous kingdom with England. The outward frontiers of both were the sea; no difficult physical barriers divided the two territories; the majority of Scots spoke an intelligible form of English, differing from northern English more in spelling and pronunciation than in idiom and vocabulary; and after the Reformation the State religion in both countries was Protestant. Yet, in spite of these causes making for union, and in spite of the manifest advantages of union, it was by a mere dynastic accident that, in the defect of nearer heirs to the English throne, the crowns of both kingdoms were worn by James VI. (1603), while more than a century of unrest and war had to elapse before the union of England and Scotland into one kingdom in 1707. Even later there broke forth civil wars that, apart from dynastic sentiment, had no political aim except "to break the Union." Thus for seven hundred years the division of the isle of Britain was a constant cause of weakness and public distress. Nothing did more to bring the two peoples together than religion, after the Reformation, yet, by an unhappy turn of affairs, and mainly thanks to one man, John Knox, few causes were more potent than religious differences in delaying that complete union which nature herself seemed to desire.

Early conditions.

The historical causes which kept the nations separate were mainly racial, though, from a very early period, the majority of the people of Scotland were, if not purely English by blood, anglicized in language and, to a great extent, in institutions. All questions of race are dim, for such a thing as a European people of pure unmixed blood is probably unknown in experience. In A.D. 78–82 Agricola, carrying the Eagles of Rome beyond the line of the historical border, encountered tribes and confederations of tribes which, probably, spoke, some in Gaelic, some in Brythonic varieties of the Celtic language. That the language had been imposed, in a remote age, by Celtic-speaking invaders, on a prior non-Celtic-speaking population, is probable enough, but is not demonstrated. There exist in Scotland a few inscriptions on stones, in Ogam, which yield no sense in any known Indo-European language. There are also traces of the persistence of descent in the female line, especially in the case of the Pictish royal family, but such survivals of savage institutions, or such a modification of male descent for the purpose of ensuring the purity of the royal blood, yield no firm ground for a decision as to whether the Picts were "Aryans" or "non-Aryans."

It is unnecessary here to discuss the Pictish problem (see Celt). That their rivals, the Scots, were a Gaelic-speaking people is certain. That the Picts were Teutons (Pinkerton) is no longer believed. That they were non-Aryan, the theory of

Sir John Rhys, seems improbable; for the non-English place-names of Scotland are either Gaelic or Brythonic (more or less Welsh), and the names of Pictish kings are either common to Gaelic and Welsh (or Cymric, or Brythonic), or are Welsh in their phonetics. Mr Skene held that the Picts were a Gaelic-speaking people, but the weight of philological authority is with Mr Whitley Stokes, who says that Pictish phonetics, "so far as we can ascertain them, resemble those of Welsh rather than of Irish" (see Zimmer, *Das Mutterrecht der Pikten*; Rhys, *Royal Commission's Report on Land in Wales*, *Celtic Britain*, *Rhind Lectures*; Skene's *Celtic Scotland*; J. G. Frazer, *Lectures on the Early History of the Kingship*, p. 247; Macbain's edition, 1902, of Skene's *Highlanders of Scotland*).

The Roman occupation has left not many material relics in Scotland, and save for letting a glimmer of Christianity into the south-west, did nothing which permanently affected the institutions of the partially subjugated peoples. In A.D. 81–82 Agricola garrisoned the Roman frontier between Forth and Clyde, and in 84 he fought and won a great battle farther north, probably on the line of the Tay. His enemies were men of the early iron age, and used the chariot in war. They fought with courage, but were no match for Roman discipline; it was, however, impossible to follow them into their mountain fortresses, nor were the difficulties of pursuit thoroughly overcome till after the battle of Culloden in 1746. The most important Roman stations which have hitherto been excavated are those of Birrenswark, on the north side of Solway Firth; Ardoch, near the historical battlefield of Sheriffmuir (1715); and Newstead, a site first occupied by Agricola, under the Eildon hills. Roman roads extended, with camps, as far as the Moray Firth. It is not till A.D. 300 that we read of "the Caledonians and other Picts"; in the 4th century they frequently harried the Romans up to the wall of Hadrian, between Tyne and Solway. About the end of the century the southern Picts of Galloway, and tribes farther north, were partially converted by St Ninian, from the *candida casa* of Whithern. The Scots, from Ireland, also now come into view, the name of Scotland being derived from that of a people really Irish in origin, who spoke a Gaelic (see CELTIC) akin to that of the Caledonians, and were in a similar stage of higher barbarism. The Scots made raids, but, as yet, no national settlement.

The withdrawal of the Romans from Britain (410) left the northern part of the island as a prey to be fought for by warlike tribes, of whom the most notable were the Picts in the north, the Scots or Dalriads from Ireland in the west (Argyll), the Cymric or Welsh peoples in the south-west and between Forth and Tay, and the Teutonic invaders, Angles or English, in the south-east.

If the Picts had been able to win and hold Scotland as far south as the historic border, the fortunes of the country would probably have been more or less like those of Ireland. After the Norman Conquest, England would have subjugated the Celts and held Scotland by a tenure less precarious and disputed than they possessed in the western island. Scotland would have been, at most, a larger Wales. But in the struggle for existence it chanced that the early English invaders secured a kingdom, Bernicia, which stretched from the Humber into Lothian, or farther north, as the fortune of battle might at various times determine; and thus, from the centre to the south-east of what is now Scotland, the people had come to be anglicized in speech before the Norman Conquest, though Gaelic survived much later in Galloway. The English domain comprised, roughly speaking, the modern counties of Selkirkshire, Peeblesshire, Berwickshire, Roxburghshire and most of the Lothians, while south of Tweed it contained Northumberland, Durham and Yorkshire to the Humber. In later days the Celtic kings of northern and western Scotland succeeded in holding, on vague conditions of homage to the English crown, the English-speaking region of historic Scotland. That region was the most fertile, had the best husbandry, and possessed the most civilized population, a people essentially English in language and institutions, but indomitably attached to the Celtic dynasties of the western and northern part of the island. It was the English-speaking south-east part of Scotland, gradually extended so as to comprise Fife and the south-west (Lanarkshire, Dumfriesshire, Stirlingshire, Dumbartonshire, Ayrshire and Renfrewshire), which learned to adopt the ideas of western Europe in matters political, municipal and ecclesiastical, while it never would submit to the domination of the English crown. This English element, in a nation ruled by a Celtic dynasty, prevented Scotland from becoming, like Wales, a province of England.

On the west of the northern part of the English kingdom of Bernicia, severed from that by the Forest of Ettrick, and perhaps by the mysterious work of which traces remain in the "Catrail," was the Brython or Welsh kingdom of Strathclyde, which then included the territory and population, later anglicized, of Renfrewshire, Ayrshire, Lanarkshire, Dumfriesshire, and, south of the historic border, Cumberland and Westmoreland to the Derwent. Strathclyde was essentially Welsh, and it may be noted that this region, centuries later, was the centre of the recalcitrant Covenanters, a people enthusiastically religious in their own way. Later, this region was the hotbed or "revivals" and the cradle of Irvingism. Whether the influence of Cymric blood may be traced in these characteristics is a dubious question.

While southern Scotland was thus English and Cymric, the north, from Cape Wrath to Lochaber, in the west, and to the Firth of Tay, on the east, was Pictland; and the vernacular spoken there was the Gaelic. The west, south of Lochaber to the Mull of Kintyre, with the isles of Bute, Islay, Arran and Jura, was the realm of the Dalriadic kings, Scots from Ireland (503): here, too, Gaelic was spoken, as among the "Southern Picts" of the kingdom of Galloway. Such, roughly speaking, were the divisions of the country which arose as results of the obscure wars of the 5th, 6th and 7th centuries.

Christianity.

As regards Christianity in these regions, Protestantism, Presbyterianism and patriotism find here a battle-ground. The mission of St Ninian (397) was that of a native of the Roman province of Britain, and the church which he founded would bear the same relation to Rome as did the church in Britain. There are material relics of his church, bearing the Christian monogram, and there are stones with Latin epitaphs; these objects are wholly unlike the Irish crosses and inscriptions of the Gaelic church. If Bede is right in saying that Ninian was trained in Rome, then the early Christianity of Scotland was Roman.

In 431 the contemporary *Chronica* of Prosper of Aquitaine record that Palladius was ordained by Pope Celestine as the first bishop "to the believing Scots," that is, to the Irish. If there were "believing Scots" in Ireland before the first bishop was ordained, their ecclesiastical constitution cannot have been episcopal. Fordun, in the 14th century, supposed that the clergy, before Palladius, were presbyters or monks. As Hector Boece, "that pillar of falsehood," dubbed these presbyters "Culdees," "the pure Culdee," a blameless presbyterian, almost prehistoric, has been claimed as the ancestor of Scottish presbyterianism; and episcopacy has been regarded as a deplorable innovation. The Irish church has paid more reverence to St Patricius than to Palladius (373–463), and the church of St Patricius, himself a figure as important as obscure, certainly abounded in bishops; according to Angus the Culdee there were 1071, but these cannot have been bishops with territorial sees, and the heads of monasteries were more potent personages.

The Dalriadic settlers in Argyll and the Isles, the (Irish) Scots, were Christians in the Irish manner. Their defeat by the Picts, in 560, induced the Irish St Columba to endeavour to convert the conquering Picts. In 563–565 he founded his mission and monastery in the isle of Iona, and journeying to Inverness he converted the king of the Picts. About the same date (573), the king of Cymric Strathclyde summoned, from exile in Wales, St Kentigern, the patron saint of Glasgow, who restored a Christianity almost or quite submerged in paganism, Celtic and English. The pagan English of Deira (603) routed under Æthelfrith the Christian Scots of Argyll between Liddesdale and North Tyne; and pagan English for more than a century held unopposed the region from Forth to Humber. In 617 Æthelfrith fell in battle with the English of East Anglia, and his sons, Eanfrid and Oswald, fled to the North. Eanfrid, by his marriage with a Pictish princess, became the father of the Pictish king Talorcan, while Oswald was baptized into the Columban church at Iona. In a season of war and turmoil Oswald won the crown of the north-east English kingdom, stretching to the Forth, with its capital at Eadwinsburgh (? Edinburgh, a dubious etymology), and in that kingdom St Aidan, from Iona, erected the Columban churches under the auspices of Oswald, whose brother Oswin dominated Strathclyde and Pictland up to the Grampians; the English element, for the time, extending itself and anglicizing more and more of the Scotland that was to be.

Thus the Dalriadic Scots had handed on the gift of Irish Christianity, with such literature as accompanied it in the shape of Latin, and reading and writing, to the northern English from Forth to Humber. The ecclesiastical constitution thus introduced was one of missionary monastic stations, settled in fortified villages. The Celtic church, unluckily, differed from the Roman on the question of the method of calculating the date of Easter, the form of the tonsure, and other usages, one of them apparently relating to a detail in the celebration of the Holy Communion. From a letter to Pope Boniface IV. of an Irish saint Columbanus, who led twelve Irish monks into Gaul and Burgundy, the Celtic church appears to have denied that the papal jurisdiction extended beyond the limits of the Roman empire. Consequently Rome would have no jurisdiction in the affairs of the Irish church established in Scotland and the north of England. The results would be the severance of these regions from the main current of western ecclesiastical ideas. Conceivably these sentiments of Columbanus never wholly died out in the Scottish kingdom of later history, whose kings were always apt to treat Rome in a cavalier manner, laughing at interdicts and excommunications. A papal legate, in Bruce's time, was no more safe, if his errand was undesirable, than under John Knox, when Mary Stuart wore the crown. "All the world errs, Rome and Jerusalem err, only the Scoti and the Britones are in the right" is quoted as the opinion of the Scoti and Britones in 634. It appears that Scotland was naturally Protestant against Rome as soon as she was Christian.

Meanwhile Rome was too strong, and in 664, in a synod held at Whitby, St Wilfrid procured the acceptance of Roman as against Celtic doctrine in the questions then at issue. The English Christians overcame the Celtic divines of Iona, and in 710 even in Pictland they came into the customs of western Christianity. The church of the Celtic tribe thus yielded to the church of the Roman empire.

Wars of Picts and Scots.

There followed an age of war in which the northern English were routed at Nectan's mere, in Forfarshire, and driven south of Forth. In the quarrels of Picts and of Scots of Argyll, the Pictish king, Angus MacFergus (ob. 761), was victorious while in his prime, and then consolidated Pictland; but (802–839) the Scandinavian sea-rovers began to hold large territories in Scotland, weakened the Picts, and made easy their conquest by Kenneth MacAlpine of Kintyre, the king of the Dalriad Scots of Argyll. In 860 this Scot became king of the Picts. Old legends represent him as having exterminated the Picts to the last man; and the Picts become, in popular tradition, a mythical folk, hardly human, to whom great feats, including the building of Glasgow cathedral, are attributed, as the walls of Tiryns and Mycenae in Greece were traditionally assigned to the energy of the Cyclopes. In 1814 Sir Walter Scott met a dwarfish traveller in the Orkneys, whom the natives regarded as a "Pecht" or Pict.

There was, of course, in fact, no extermination of the Picts, there was merely a change of dynasty, and alliance between Picts and Scots, and that change was probably made in accordance with Pictish customs of succession. Kenneth MacAlpine, though son of a Scottish father, was probably, though not certainly, a Pict on the mother's side, and in Pictland the crown was inherited in the female line. The consequence was that what had been Pictland came to be styled Scotland. The king of Alban was a Scot in the paternal line. His conquest was not achieved at a blow, but his language, Gaelic, prevailed. Henceforth, despite the incursions of the Scandinavians, and partly because of them, the ecclesiastical and royal centres of life are moved to the south and the east, though the king of Alban (*Ardrigh*) is not always master of his *Ri*, or subordinate princes of the seven provinces (*Mortuath*). His position is rather that of an overlord, or Bretwalda, like Agamemnon's among the Achaean *anaktes*. He allies himself with Cymric Strathclyde, and by constant raids, and thanks to English weakness caused by Danish invasions, he extends his power over English Lothian. A marriage of the daughter of Kenneth MacAlpine with the Welsh prince of Strathclyde gives Scotland a footing in that region; in short, Scotland slowly advances towards and even across the historic border.

Connexions with England.

Through this contact with and actual tenure of English lands arose the various so-called "submissions" of kings of Scotland to the English crown. Thus (924) the *English Chronicle* asserts that Constantine, king of Scotland, "chose Edward King to father and lord." It is impossible here to analyse the disputes as to whether, in Freeman's words, "from this time to the 14th century" (he means, to Bannockburn) "the vassalage of Scotland was an essential part of the public law of the Isle of Britain." In fact this vassalage was claimed at intervals by the English kings, and was admitted by Scottish kings for their lands in England; but as regards Scotland, was resisted in arms whenever opportunity arose. Each submission "held not long," and the practical result was that (945) Malcolm acquired northern Strathclyde, "Cumberland, Galloway (?) and other districts," while another Malcolm (1018) took Lothian, the northern part of Northumbria, after winning a great battle at Carham on the Tweed.

The Celts, Scoto-Picts, of Alban, had thus annexed a great English-speaking region, which remained loyal to their dynasty, the more loyal from abhorrence of the Norman conquerors. The English or anglicized element in Scotland was never subjugated by England, save during the few years of the Cromwellian Commonwealth, and was supported (with occasional defections, and troubles caused by dynastic Celtic risings) by the Celtic element in the kingdom during the long struggle for national independence. Scotland, in short, was too English to be conquered by England. Poor, distracted, threatened on occasion by the Celts on her flank and rear, anglicized Scotland preferred her poverty with independence, to the prosperity and peace which England would have given, if unresisted, but never could impose by war. Her independence, her resistance, curbed the conquering ambitions of England abroad; and it went for something in securing the independence of France, and the success of Protestantism, where it succeeded.

A sturdy and stoical temper was developed in the nation, which later helped parliamentary England in the struggle against the crown (1643–1648). Habits of foreign adventure and of thrift were evolved, which were of advantage to the empire when, too long after the union of 1707, Scottish men were admitted to participate in its privileges and in its administration. Such were the consequences, in the sequel, of what seemed a disastrous event, the absorption, by a Celtic kingdom, of a large and fertile region of northern England.

Dynasty of Malcolm II.

The English element in the realm of Malcolm II. (1005–1034) was the conducting medium of western ideas which naturally appealed to the interests and the ambitions of that prince. On looking at the genealogical tree of the dynasty of Kenneth MacAlpine, we see that from the date of his death (859) to the accession of Duncan on the death of Malcolm II. (1034) no monarch is succeeded by his own son or grandson. The same peculiarity appears in the list of the ancient kings of Rome, but these are entangled in mythology. In the dynasty of Kenneth the succession to the crown alternated thus: he was succeeded by his brother Donald, who was followed by his nephew, Kenneth's son, Constantine; Constantine's brother, Aodh, followed; and henceforth till 957, the kings were alternately chosen from the houses of Constantine and Aodh. It was the custom to appoint the successor to the king, his "Tanist," at the same time as the king himself. Malcolm II. succeeded his own cousin, and, in accordance with the native system of royal inheritance, should have been followed by the unnamed grandson of his own predecessor, Kenneth III. But Malcolm is accused of putting his legitimate successor out of the way, and thus securing the succession of his own grandson, Duncan, a son of his daughter, Bethoc, and her husband Crinan, protector of the abbey (or lay abbot) of Dunkeld. Malcolm thus set the example of advance to the western system of royal successions, while in Crinan's lay tenure of the abbacy of Dunkeld we see the habit of appropriating ecclesiastical revenues which again became so common about a century before the Reformation.

The innovation of Malcolm II. brought no peace but a sword. Boedhe, son of Kenneth III., left a daughter, Gruach, who inherited the claims of the unnamed son of Boedhe slain by order of Malcolm. Gruach married Gilcomgain, and had issue male, Lulach. After the death of Gilcomgain, Gruach wedded Macbeth, Mormaor (or earl in later style) of the province or sub-kingdom of Moray; Macbeth slew Duncan, and ruled as protector of the legitimate claims of Lulach. From Lulach descended a line of Celtic *prétendants*, and for a century the dynasty violently founded by Malcolm II. was opposed by claimants of the blood of Lulach, representing the Celtic customs adverse to the English and Norman ideas of the family in possession of the throne. Thus Celtic principles, as opposed to the western principles of chartered feudalism, did not perish in Scotland without a long and severe struggle.

Malcolm Canmore.

Meanwhile the dynasty of Malcolm II. was brought into close connexion with the English crown, and relied on English support, both before and after the Norman Conquest. The genius of Shakespeare, in his *Macbeth*, based on legendary materials borrowed by Hollinshed from Hector Boece, and on the dynastic myth of the descent of the Stuart kings from Banquo, has clouded the actual facts of history. To the Celts of Scotland, or at least to those of the great sub-kingship or province of Moray, Duncan, not Macbeth, was the usurper. Duncan left sons, Malcolm, called Canmore (great head), and Donald Ban; and in 1054 Siward, earl of Northumbria, defeated Macbeth, whether acting under the order of Edward the Confessor in favour of the claims of Malcolm Canmore, or merely to punish Macbeth for sheltering Norman fugitives from the Confessor's court. The latter *casus belli* is the more probable, though the chronicler, Florence of Worcester, asserts the protection of the sons of Duncan by England. Siward did not dethrone Macbeth, who was defeated and slain by Malcolm in 1057; Lulach fell obscurely in 1058, leaving claimants to his rights, though these did not trouble much the crowned king, Malcolm Canmore. His long reign (1058–1093), and his second marriage (1068) with Margaret, sister of Edgar Ætheling, of the ancient English royal blood—dispossessed by the Norman Conqueror—intensified the sway of English ideas in Scotland, and increased the prepotency of the English element in political, social and ecclesiastical affairs. The anarchic state of Northumberland and Cumberland after the Norman Conquest, which did not soon assimilate them, was Malcolm's opportunity. He held Cumberland (1070), and supported the claims of his brother-in-law, the Ætheling, while his relationship with Gospatric, earl of Northumbria, who retired into Scotland, gave him pretexts for invading the north-east of England. William the Conqueror's earl of Northumberland, Robert de Comines, was slain at Durham in 1069, and the houses of Gospatric (earls of Dunbar and March) and of de Comines (the Comyns of Badenoch) were long puissant in Scottish history.

In 1072 William marched north and took a disputed homage of Malcolm at Abernethy, receiving as hostage the king's eldest son (by his first wife, Ingebiorge), named Duncan. As to the nature of Malcolm's homage, whether for Scotland (Freeman), or for manors and a subsidy in England (Robertson), historians disagree. Malcolm subdued "the King of Moray," son of Lulach, who died in far Lochaber, though his family's claims to the crown of Scotland did not lapse. In 1091 William Rufus renewed the treaty of Abernethy with Malcolm and fortified Carlisle, thereby cutting Malcolm off from Cumberland; Malcolm was summoned to meet Rufus at Gloucester; he went, but declined to accept the jurisdiction of the Anglo-Norman peers, or to "do right" to Rufus, except on the frontier of the two realms, wherever he may have supposed that frontier to be. He was an independent king, no vassal of England; as such (1093) he invaded Northumberland, and was slain at Alnwick. His wife, St Margaret, did not survive her sorrow; she died in the castle of Edinburgh. Her reforms in church matters had apparently made her unpopular with the Celts, but under cover of a mist her body was conveyed to and buried at Dunfermline.

Margaret, in fact, completed the reduction of the Celtic church in Scotland to conformity with western Christendom, and some recent presbyterian writers have not forgiven her. Beautiful, charitable and pious, she mollified the fierce manners of her husband, who, according to her director and biographer, Turgot, acted as interpreter between her and the Gaelic-speaking ecclesiastics at their conferences. Certain obscure religious usages, as regards Lent, the Communion, the non-observance of Sunday, non-communicating at Easter, and the Forbidden Degrees in marriage, were brought into conformity with western Christendom. The last Celtic "bishop of Alban" died at this time; and when the dynasty of Malcolm Canmore was established after an interval of turmoil, English ecclesiastics began to oust the Celtic Culdees from St Andrews.

Malcolm would have been succeeded by his eldest son by Margaret, Edward, but he fell beside his father at Alnwick, and the succession was disputed between Duncan, son of Malcolm by his first wife; Edmund, eldest surviving son of Malcolm and Margaret; and Donald Ban, brother of Malcolm. The Celts (apart from the claimant of the blood of Lulach and the house of Moray) placed Donald Ban on the throne; England supported Duncan (by primogeniture Malcolm's heir, and a hostage in England); there was division of the kingdom till Duncan was slain, and Edgar, son of Malcolm and Margaret, was restored by Edgar Ætheling. He put out the eyes of his uncle, Donald Ban, and in unsaintly ways established the dynasty of the English St Margaret and of the Celtic Malcolm. In 1103 Edgar's sister, Eadgyth (Matilda), married Henry I.; the dynasty of Scotland now shows, by the names of its members, that the English element in it was predominant. After Donald Ban no Scottish sovereign bears a Gaelic Christian name save Malcolm the Maiden; and perhaps no later king knew Gaelic.

Alexander I.

Edgar, before his death, established his brother, Alexander I., as king of Scotland, north of Forth and Clyde, with Edinburgh, which looks as if he considered Forth and Clyde the frontier of what was legally Scotland; while his younger brother, David, as earl, ruled Lothian and Cumbria. The reign of Alexander I. is marked by war with the northern Celts, and by the introduction of English bishops of St Andrews, while the claims of the see of York to superiority over the Scottish church were cleverly evaded at Glasgow (David's bishopric), as well as at St Andrews, where English Augustinian canons were now established, to the prejudice of the Celtic Culdees. We observe that the chief peers of Alexander, who signed the charter of his monastery at Scone, are Celts—Heth, earl of Moray (husband of the daughter of Lulach), Malise of Strathearn, Dufagan of Fife, and Rory. After the death of Alexander I. (1124) his successor, David I., is attended by men of Norman names, Moreville, Umfraville, Somerville, Bruce, FitzAlan (the ancestor of the Stewards of Scotland, and himself of an ancient Breton house), and so on.

David I.

David, educated in England by Normans, was the maker of a Scotland whereof the anglicized part at least was now ruled by Anglo-Norman feudalism and Anglo-Norman municipal laws in the burghs. Marrying Matilda, widow of Simon de St Liz and heiress of Waltheof, David received the earldom of Huntingdon and supposed himself to have claims over Northumberland, a cause of war for three generations. With Anglo-Norman aid he repelled a Celtic rising—the right of the claimants to represent the blood of Lulach is exquisitely complex and obscure in this case—but in the end David annexed to the crown the great old sub-kingdom or province of Moray, and made grants therein to English, Norman and Scottish followers.

Some of the most eminent of his southern allies could not stand by David when, in the reign of Stephen and in fidelity to the cause of his niece, the empress Matilda, daughter of Henry I., he invaded England. The towns of Northumberland and Cumberland opened their gates, but he and Stephen met in conference at Durham, and David's son Henry, prince of Scotland, received the Honour of Huntingdon, Carlisle, Doncaster "and all that pertains to them" (1135). Stephen's relations with Henry became unfriendly, and in January 1138, in pursuance of Henry's claim to Northumberland, David again invaded. A holy war against him was proclaimed by the archbishop of York, and on the 22nd of August 1138 Bruce, Baliol, and others of David's southern allies renounced fealty to him, and he was defeated at the battle of the Standard, near Northallerton. David regained the shelter of Carlisle, a legate from Rome made peace, and Prince Henry received the investiture of Northumberland, without the strong fortresses of Bamborough and Newcastle.

The anarchic weakness of the reign of Stephen enabled David to secure his hold of northern England to the Till, but the death of his gallant and gentle son Henry, in June 1152, left the succession to his son, Malcolm the Maiden, then a child of ten, and David's death (24th of May 1153) exposed Scotland to the dangers of a royal minority.

Social and political growth.

David was, if any man was, the maker of Scotland. The bishoprics erected by him, and his many Lowland abbeys, Holyrood, Melrose, Dryburgh, Kelso, Jedburgh and others, confirmed the freedom of the Scottish church from the claims of the see of York, encouraged the improvement of agriculture and endowed the country with beautiful examples of architecture. His charters to landowners and burghs (charters not being novel in Scotland, but now more lavishly conferred) substituted written documents for the unwritten customs of Celtic tenure, and converted the under kings of provinces into earls of the king, while *vice-comites*, or sheriffs, administered local justice in the king's name, though Celtic custom still prevailed, under a thin veneer of law, in the Celtic regions, as in Galloway. Where Anglo-Normans obtained lands in Moray and Renfrewshire, there seems to have been no displacement of the population: though a FitzAlan was dominant in Renfrewshire, the "good men," or gentry, still bore Gaelic names, till territorial names—"of" this or that place—came into use. In Lothian the place-names recorded in charters were already, for the most part, English. Beneath the freeholders and *noblesse* were free tenants, farmers paying rents, mainly in kind, and in services of labour and of war. Below these were the *nativi*, attached to the land, and changing masters when the land changed hands. These *nativi* were gradually emancipated, partly through the influence of the church, partly for economic reasons, partly through the rule that any *vilein* became free after a year's residence in a burgh.

Thus Scotland never saw a *jacquerie* or servile rising. The burghs were not actually the creations of David and William the Lion, but the rights, duties and privileges which had gradually developed in the towns were in the time of these kings codified and confirmed by charters; the towns had magistrates of their own election, courts, and legalized open markets. The greater burghers had a union, and made laws and regulations for municipal affairs. In addition to royal burghs, there were burghs of nobles and of bishops, and the provostship was apt to become, by custom, almost hereditary in a local noble family, which protected the burgesses.

The germ of a parliament existed in the crown vassals and the royal officials—chancellor, steward, constable, marischal and the rest—with bishops, priors, earls, barons and other *probi homines*. The term *tota communitas*, "the whole community," appears to denote all freeholders of gentle birth, who might be present at any important assembly for the discussion of national affairs. Burgesses do not yet receive mention as present on such occasions. Scotland was as yet, and in fact remained, destitute of constitutional history as it appears in England. There was, technically speaking, no taxation. The king "lived on his own," on rent of crown lands, feudal fines and aids, wardships, marriages, and the revenues of vacant bishoprics. Opposition used the mechanism of conspiracies; and changes of administration were effected by the seizure of the king's person, especially during the many royal minorities.

In the matter of justice, royal succeeded to tribal authority. Offences were no longer against the individual and his kin, but against the king's peace, or against the peace of subordinate holders of courts—earls, thanes, barons, bishops and abbots. Compurgation, the ordeal, and trial by battle began to yield to *Visnet*, *Jugement del Pais*, the "good men of the country," giving their verdict, while sentence was passed by the judge, sheriff, alderman or bailiff. "The Four Pleas of the Crown," murder, arson, rape and robbery, were relegated to the king's court, under Alexander II. ruled by four grand justiciaries. While Roman law became the foundation of justice, a learned clerk was needed as assessor and developed into the Lord Justice Clerk. The *vice-comes*, or sheriff, as the king's direct representative, was the centre of justice for shires, and his judicature tended to encroach on that of noble holders of courts. Royal authority, sheriffs, juries and witnesses gradually superseded ordeal, compurgation, and trial by battle, though even barons long retained the right of "pit and gallows."

In the matter of education, the monasteries had their schools, as had the parish churches, and there were high schools in the burghs, and "song-schools." From the time of David to the death of Alexander III. Scotland was relatively peaceful, prosperous, and, in the south, anglicized, and was now in the general movement of western civilization.

Malcolm the Maiden, before his early death in 1165, had put down the menacing power of Somerled, lord of the Isles, a chief apparently of mixed Celtic and Scandinavian blood, the founder of the great clan of Macdonald, whose chiefs, the lords of the Isles, were almost royal; Malcolm also subdued the Celts of Galloway, sometimes called Picts, but at this time Gaelic in speech.

William the Lion.

Malcolm's brother, William the Lion (1165–1214), initiated the French alliance, fondly ascribed to the time of Charlemagne. William's desire was to seize Northumberland; in 1173 he was allied with Henry, the rebellious son of Henry II., himself in alliance with France. The capture of William at Alnwick, in July 1174, permitted a Celtic revolt in Galloway, and necessitated the Treaty of Falaise, by which for fifteen years Scotland was absolutely a fief of England, though the clergy maintained their independence of the see of York, which was recognized by Pope Clement III. in 1188. In a quarrel of church and state the legate had been authorized to lay an interdict on Scotland; William and the country merely disregarded it; and in 1191 a new pope absolved the Scottish king. The Celtic risings now were made in defence of the royal claims of a descendant of Duncan, son of Malcolm Canmore; there were also MacHeth claimants to the old rights of Lulach; Galloway and the Celtic north were ceaselessly agitated.

After the death of Henry II. in 1189, Richard I. sold back to Scotland all that his father had gained by the Treaty of Falaise, and William only became Richard's man—for all the lands for which his predecessors had been liegemen to the English kings, a vague phrase but implying that the king of Scotland was not liegeman for Scotland. To John, William did homage (1200) *salvo jure suo*. In 1209 he promised to purchase John's goodwill with 15,000 merks, and gave hostages. Peace was preserved till William died in 1214.

Alexander III.

In the reign of his successor, Alexander II., the risings of Celtic claimants died out; he converted Argyll into a sheriffdom, and (1237) resigned the claims to Northumberland, in exchange for lands in the northern English counties with a rental of £200 yearly. His death in 1249 left the crown to his son, Alexander III., a child of eight, in whose minority began the practice by which parties among the nobility seized the person of the sovereign. At the age of ten, Alexander, at York, wedded a child bride, Margaret, daughter of Henry III. His boyhood was distracted by vague party strifes, but Henry did not attempt to administer his country. In 1261 his queen bore, at Windsor, a daughter, Margaret, who later, marrying Eric, king of Norway, became the mother of "The Maid of Norway," heiress of Alexander III.; the girl whose early death left the succession disputed, and opened the flood-gates of strife. Alexander (1260) won the western isles and the Isle of Man from Norway, paying 4000 merks, and promising a yearly rent of 100 merks. In 1279 Alexander did homage to Edward I. at Westminster, *salvo jure suo*, and through the lips of Bruce, earl of Carrick. The homage was vague, "for the lands which he holds of the king of England," or according to the Scottish version, "saving my own kingdom." On the death of Alexander's daughter, Margaret of Norway (1283), and of his son, the prince of Scotland, without issue, the estates, at Scone, recognized Margaret's infant daughter as rightful successor. At this assembly were Bruce, earl of Annandale; Robert de Brus, earl of Carrick (later king), his son; Comyn, earl of Buchan; John Baliol; and James the Steward of Scotland, of the house of FitzAlan. On the 19th of March 1286 Alexander died, in consequence of a slip made by his horse on a cliff near Kinghorn during a night ride. His death was the great calamity of Scotland, and is lamented in a famous fragment of early Scottish verse. The golden age of "The Kings of Peace" was ended.

Bruce and Baliol parties.

The first step of the Scottish noblesse (mainly men of Norman names), after Alexander's death, was to send a secret verbal message to Edward of England. Six custodians of the realm were then appointed, including the bishop of Glasgow (Wishart) and the bishop of St Andrews (Frazer). Presently the nobles formed two hostile parties, that of the Bruces and that of Baliol. The Bruce party took up arms, and from the terms of their "band," or agreement, obviously contemplated resistance to the rights of the Maid of Norway, while declaring their fealty to Edward. In 1286–1289 Scotland was on the verge of civil war. Edward procured a papal dispensation for the marriage of the Maid of Norway to his son Edward; the Scots were glad to consent, and preliminaries were adjusted by the Treaty of Birgham (18th of July 1290). All possible care was taken by the Scots to guard their national independence, but Edward succeeded in inserting his favourite clause, "saving always the rights of the King of England, which belonged, or ought to belong, to him." As the Bruce faction had asserted their fealty to Edward, the carefully patriotic attitude of the Scots may be ascribed to the two bishops, who did not consistently live on this level. In August Edward ventured a claim to the castles of Scotland, which was not admitted. By the 19th of August it was known that the child queen had arrived in the Orkneys. An assembly was being held at Scone; the Bruces did not appear, but, by the 7th of October, they arrived in arms, on a rumour of the queen's death. The bishop of St Andrews tells Edward of these events, and urges him to come to the border, to preserve peace. The bishop of St Andrews was for Baliol, he of Glasgow was for Bruce; and the Baliol party, the seven earls complain, was ravaging Moray. These seven earls appear to represent the old rulers of the seven provinces of Pictland, and asserted ancient claims to elect a king. The Bruces placed themselves under Edward's protection. In March 1291 he ordered search to be made for documents bearing on his claims in the English clerical libraries, and summoned his northern feudal levies to meet him at Norham on Tweed, fully armed, in June. Hither he called the representatives of Scotland for the 10th of May; on the 2nd of June the eight claimants of the crown acknowledged him as Lord Paramount, despite a written protest of the *communitas* of Scotland; obscurely mentioned, and not easily to be understood. Edward took homage from all, including burgesses even, at Perth; his decision on the claims was deferred to the 2nd of June 1292 at Berwick.

The choice lay between descendants in the female line of David of Huntingdon, younger brother of William the Lion. John Baliol was great-grandson of this David, through his eldest daughter; Bruce the old was grandson of David through his second daughter, and pleaded that, by Scottish custom, he was David's heir. He also pleaded a selection of himself as successor by Alexander II., before the birth of Alexander III., but of this he had no documentary evidence. On the 17th of November 1292 Edward decided, against Scottish custom (if such custom really existed), in favour of Baliol, who did fealty, and, amidst cries of dissent, was crowned at Scone on the 26th of December.

John Baliol crowned.

Intervention by England.

Edward instantly began to summon John to his courts, even on such puny matters as a wine-merchant's disputed bill. He appeared to aim at driving Baliol into rebellion and annexing his kingdom. In 1293 Edward refused to obey a similar summons from the king of France, and in 1294 was fighting in Gascony. Baliol declined to follow his standard and negotiated for a French alliance. Edward ordered Baliol's English property to be confiscated; Baliol renounced his fealty, and English merchants were massacred at Berwick. The Comyns failed in an attack on Carlisle, and (30th of March 1296) Edward took Berwick, seized William Douglas (father of the Good Lord James), and massacred the male populace. A disorderly levy of Scots, appearing on the hills above Dunbar, left their strong position (like Leslie later) and were defeated with heavy loss. Robert Bruce was now of Edward's party; the nobles in a mass surrendered and Edward was unopposed. He seized the Black Rood, the coronation stone of Scone, St Margaret's fragment of the True Cross, and many documents; then he marched north as far as Elgin. The Ragman's Roll contains sworn submissions of all *probi homines* outside of the western thoroughly Celtic region; and, in October 1296, Edward returned to England, with Baliol his prisoner, leaving Scotland in the hands of the earl of Surrey as guardian, Cressingham as treasurer, and Ormsby as justiciary.

Wallace.

Agitation at once broke out, and, when Edward went abroad in June 1297, he left orders for suppression of assemblies (*conventiculae*). Now Sir William Wallace came to the front, a younger son of Sir Malcolm Wallace of Elderslie, near Paisley. The family probably came from England with the FitzAlans, the hereditary Stewards of Scotland. The English chroniclers call Wallace *latro*, "a brigand," and he probably was a leader of broken men, discontented with English rule. Sir Thomas Gray, son of an English gentleman wounded in a rising at Lanark in May 1297, says that Wallace was chosen leader "by the *commune* of Scotland," and began operations by slaying Heselrig, sheriff of Clydesdale, at Lanark. The Lanercost contemporary chronicler writes that the bishop of Glasgow and the Steward began the broil, and called in Wallace as the leading brigand in the country-side. Wallace, in fact, was a gentleman of good education. Percy and Clifford led the English forces to suppress him, and (7th July) made terms with the bishop, the Steward and Robert Bruce, who submitted; but Wallace held out in Ettrick Forest. Sir William Douglas was kept a prisoner for life, but Andrew Murray was out in Moray, with a large following. The nobles who had submitted made delays in providing hostages, and Warenne marched from Berwick against Wallace, who, by September 1297, was north of Tay.

On hearing of Warenne's advance, Wallace occupied the Abbey Craig at Stirling, commanding the narrow bridge over the Forth; the Steward and Lennox attempted pacific negotiations; a brawl occurred; and next day (11th of September) the English crossed Stirling bridge, marched back again, recrossed, and were attacked in deploying from the bridge. The general, Warenne, was old and feeble, Cressingham was hasty and confident; counsels were confused, the manner of attack was rash, and the rout was sanguinary. Cressingham was slain, and Warenne fled to Berwick. Pursuing his victory, Wallace ravaged Cumberland, most English writers say with savage ferocity; but Hemingburgh represents Wallace as courteous on one occasion, and as confessing that his men were out of hand.

By the 29th of March 1298 Wallace appears, in a charter granted by himself, as guardian of the kingdom, and, with

Andrew Murray, as army leader in the name of King John—that is, the captive Baliol. By June 1298 Robert Bruce is active in the service of Edward, in Galloway. Edward was moving on Scotland, and on the 22nd of July he found Wallace in force, and in a strong position, guarded by a morass, at Falkirk. The Scottish horsemen fled from the English cavalry, but the archers of Ettrick fought and died round Sir John Stewart of Bonhill, brother of the Steward. The *schiltrons*, or squares of Scottish spearmen, were unbroken by Edward's cavalry, till their ranks were thinned by the English bowmen and could no longer keep out the charging horse. Wallace had made the error of risking a general engagement in place of retiring into the hills; to do this had, it is said, been his purpose, but Edward surprised him, and Wallace disappears from the leadership, while the wavering Robert Bruce appears in command, with the new bishop of St Andrews, Lamberton; Lord Soulis; and the younger Comyn, "the Red Comyn" of Badenoch. For want of supplies, Edward returned to England through Annandale, burning Bruce's castle of Lochmaben. Stirling still held out for England. There is certain evidence of fierce dissensions in some way connected with Wallace, among the Scottish leaders (August 1299). Wallace was going to France; the Scottish leaders were reconciled to each other, and took the castle of Stirling, which they entrusted to Sir William Oliphant. The Scottish cause seemed stronger than ever, under Bruce, the Steward, the Red Comyn and Lamberton, but in June 1300 Edward mustered a splendid array, and took Carlaverock castle, but, on the arrival of the archbishop of Canterbury with a letter from the pope approving of the Scottish cause, he granted a truce till Whitsuntide 1301. The barons of England angrily refused to submit to the papal interference, but nothing decisive was attempted by Edward, though Bruce had again entered his service. By 1303 France (which doubtless had moved the pope to his action) deserted the Scots in the Treaty of Amiens, and Edward, with little opposition, overran Scotland in 1303.

On the 9th of February 1304 Comyn with his companions submitted; they hunted Wallace, who had returned from the continent, and on the 24th of July the brave Oliphant surrendered Stirling on terms of a degrading nature. Among his officers we see the names of Napier, Ramsay, Haliburton and Polwarth.

The noblest names of Scotland now took part in the pursuit of Wallace, who, as great in diplomacy as in war, had visited Rome (he had a safe-conduct of Philip of France to that end), and had at least secured a respite for his country. It seems probable that Wallace remained consistently loyal to Baliol, and hostile to the party of the wavering Bruce. He was taken near Glasgow, in his own country, and handed over to England by Sir John Menteith, sheriff of Dumbartonshire. Menteith certainly received the blood-money, £100 yearly in land, and Wallace, like Montrose, was hanged, disembowelled and quartered (at London, August 1305). Tradition attributes to Wallace strength equal to his courage. His diplomacy in France proves him to have been a man of education, and his honour is unimpeached; he never wavered, he never was liegeman of Edward, while bishops, nobles, and, above all, Bruce, perjured themselves and turned their coats again and again. The martyr of an impossible loyalty, Wallace shares the illustrious immortality of the great Montrose, and is by far the most popular hero of his country's history. His victory at Stirling lit a fire which was never quenched, and began the long and cruel wars of independence on which Scotland now entered.

Bruce.

For an hour there seemed as if there might be no raising of the fallen standard of St Andrew. Edward had not yet alienated the country by cruelty, save in the case of Wallace and the massacre of Berwick. He aimed at a union of the two countries, and Scottish representatives were chosen to sit in the English parliament. The laws of David I. were to be revised. Eight justices were appointed, the sheriffs were mainly Scots of the kingdom; the bishop of St Andrews was one of the Scottish representatives. The country was being reorganized, ruined churches and bridges were being rebuilt. The "commons," the populace, were eager for peace; nobles like Bruce were Edward's men. Bruce had been actively engaged in the siege of Stirling, and had succeeded his father as earl of Annandale. Yet, during the siege of Stirling (11th of June 1304), Bruce had entered into a secret band with Lamberton, bishop of St Andrews, for mutual aid. Early in February 1306 he stabbed the Red Comyn before the high altar, in the church of the Franciscans at Dumfries: Comyn's uncle was also slain, and Bruce, from his castle of Lochmaben, summoned his party to arms; he was supported by the bishops of St Andrews and Glasgow, and by Sir James of Douglas, and was promptly crowned by the countess of Buchan, representing the clan MacDuff, at Scone.

The cause of the slaying of Comyn is unknown; the two men had long been at odds, but the evidence does not confirm the story that Comyn had betrayed Bruce to Edward. It is more probable that Comyn merely refused to be drawn by Bruce into a rising, and that the deed was unpremeditated. Be that as it may, Bruce had now no place of repentance for a sacrilegious homicide; he could not turn his tabard again; he was outlawed, forfeited and excommunicated. He had against him, not merely England, but the kith and kin of Comyn, including the potent clan of MacDowall or MacDougall in Galloway and Lorne; on his own side he had his kinship, broken men, and the clergy of Scotland. Heedless of the excommunication they backed him, and the preaching friars proclaimed his to be a holy war.

Bruce was warring in Galloway when, in May 1306, Aymer de Valence led an English force to Perth. Bruce followed, and was defeated in Methven wood; the prisoners of rank, his brother Nigel, and Atholl, with others, were hanged, and his two bishops were presently secured. "All the Commons went him fra," says Barbour, the poet chronicler. His queen, with Lady Buchan and his sister, were imprisoned; and his castles were held against him. He took to the heather, making for the western seas, hewing his way through the MacDougals at Tyndrum and marching over the mountains to Loch Lomond, which he crossed in a canoe. Sir Nial Campbell of Lochow, founder of the house of Argyll, secured shipping for him, and he reached a castle of Macdonald of Islay (Angus Og), his ally, at Dunaverty in Kintyre. He was driven to an isle off the Irish coast; he thence joined Douglas in Arran, and by a sudden camisade he butchered the English cantoned under his own castle of Turnberry in Carrick. Two of his brothers were taken in Galloway and hanged at Carlisle, while King Edward, a dying man, lay with a great army at Carlisle, or at the neighbouring abbey of Lanercost. Aymer de Valence, Butetourte, Clifford, and Mowbray were sent to net and "drive" the inner wilds of Galloway, where Bruce lurked in the forests and caves of Loch Trool and Loch Dungeon. Now he evaded them, now he and his valiant brother Edward surprised and cut them up in detail, doing *miracula*, says a contemporary English chronicler. Douglas, an excellent guerilla leader, captured his own castle and butchered the English garrison. By the 15th of May 1307 a writer of a letter from Forfar says that if Edward dies his cause in Scotland is lost. Bruce slipped into Ayrshire and defeated de Valence at Loudon Hill; so Edward, a dying man, began to move against him with his whole force. He died (7th of July 1307) at Burgh-on-Sands, leaving his incompetent son to ruin himself by his own follies, while ferocious hangings and dragging of men to death at horses' heels roused the Scottish Commons, and the men of Ettrick and Tweeddale, renouncing their new lord, de Valence, came over to the wandering knight who stood for Scotland.

In the winter of 1307 and in 1308 Bruce ruined Buchan, a Comyn territory, and won the castles of Aberdeen and Forfar, while Edward Bruce cleared the English out of Galloway. In the summer of 1309 Bruce fell on the MacDougals, on the right side of the Awe, where it rushes from Loch Awe at the pass of Brander, and, aided by a rear attack led by Douglas, seized the bridge and massacred the enemy. He then took the old royal castle of Dunstaffnage and drove the chief, John of Lorne, into England; Menteith, the captor of Wallace, changed sides, and

Edward, after a feeble invasion in 1310, retreated from a land laid desolate by the Scots.

In 1311 Bruce carried the war into England, seconded by the most audacious if the least skilled of his captains, his daring brother Edward. For two years the north of England, as far south as Durham and Chester, was the prey of the Scots, and some English counties secured themselves by paying an indemnity. The castles of Carlisle and Berwick, however, repelled the assailants, but Perth was surprised, in January 1313, Bruce himself leading the advance. Randolph, earl of Murray, took the chief hold in the country, Edinburgh castle, by scaling the precipitous rock to the north, while a feigned attack was being made on the accessible southern front. In short almost every castle held by the English was captured, and the fortifications were destroyed.

In the spring of 1313 Edward Bruce invested Stirling castle, the key of Scotland; on midsummer day he accepted a pact for the surrender of the place if not relieved within a year. This was a heedless piece of chivalry on Edward's part. It gave the English king, less opposed by his nobles since his favourite, Gaveston, was slain, time to muster a large army, which Bruce must meet, if at all, in the open field. Edward II. not only summoned English but Irish levies, and knights of Hainault, Bretagne, Gascony and Aquitaine crowded to his standard. The estimates of numbers by the old writers are usually much exaggerated; modern authorities reckon King Edward's army at 50,000 of whom 10,000 were cavalry. Old accounts put the infantry at 100,000, the horsemen at 40,000. Bruce had but five hundred horse, under Keith the Marischal; Douglas led the levies of his own district and Ettrick Forest; Randolph commanded the men of Moray; Walter Steward, those of the south-western shires; and Angus Og brought to the Scottish standard the light-footed men of the Isles, and, probably, of Lochaber, Moidart, and the western coast in general. Bruce commanded the people of Carrick and probably of his old earldom, Annandale.

Bannockburn.

Moving out from the Torwood forest, Bruce arrayed his force so as to guard either the Roman road through St Ninians, or the way through the Carse, which was then studded with marshes and small lakes. The former route appeared to be chosen by the English, and Bruce stationed his army in a position where it was defended by a cleugh, or ravine of the Bannockburn, and by two morasses between which was a practicable but narrow neck of firm land. Randolph, on Bruce's left, was to guard against a rush of English cavalry to relieve Stirling castle. The Macdonald tradition is that their clan was on the right wing, under Angus Og; the old accounts place them with Bruce's reserves. Three hundred English horsemen appear to have stolen round Randolph's flank unseen by him, and Bruce is said to have warned him that "a rose had fallen from his chaplet." Randolph advanced with his footmen against the English horse, who unwarily accepted his challenge and were defeated by his spearmen. While Edward's army paused, Bruce, mounted on a palfrey, was attacked by Sir Henry Bohun. Bruce evaded his spear and slew him with an axe stroke; the axe shaft broke in his hand. The omens were evil for England; and her forces bivouacked, reserving the general attack for the following day. Bruce is said to have proposed retreat and a guerilla war, but his council were for fighting.

In the general engagement, next day, the English cavalry could not break the "impenetrable wood" of the Scottish spearmen, who, however, were galled by the arrows of the English bowmen, which had broken their formation at Falkirk. Bruce bade Keith, with his five hundred horse, charge the archers in flank: apparently they were unprotected by pikes; they were broken, and the great peril passed away. The Scottish archers charged with axe in hand, and the Scottish right front was protected by a mass of fallen English horses and fighting men; the rear ranks of the English, clogged and crowded, could not reach the foe, and the line of Scottish spears pressed steadily and slowly forward. Now a panic was caused by a rush of camp followers from the "gillie's hill": the English wavered; Bruce commanded an advance of his whole line: the English rout was general, and, had Bruce possessed cavalry, few would have escaped. The Bannockburn was choked with the fallen, and it was only by hard spurring that Edward and his guards reached Dunbar, whence he sailed to Berwick. An immense booty and many ransoms rewarded the Scots, whose victory was one of the decisive battles of the world. It was won by the generalship of Bruce and his captains; by the excellence of his position, by the steadiness of his men, and, obviously, by the reckless fury of the English cavalry, and by the folly which left their archers open to defeat by the Marischal's handful of horse (24th of June 1314).

Bruce now swept the country, but Carlisle he could not take. He married his daughter, Marjory, to the Steward, and from this union came the Stewart (Stuart) dynasty. The invasion of Ireland by Edward Bruce failed (1315–1318), and Edward fell in battle: after which (1318) parliament settled the crown in the Steward's line, failing male descendants of Robert Bruce. He disdained the pope's efforts to make peace with England, except on terms of absolute independence for his country. He took and held Berwick, and (14th of October 1322) defeated Edward with heavy loss near Byland Abbey in Yorkshire, where the highlanders scaled a cliff and drove the English from a formidable position. A thirteen years' truce was arranged in 1323: the pope removed his excommunication from Bruce, and acknowledged him as king: a son, David, was born to him in 1324.

Bruce's death and work.

The murder of Edward II. (1327) was followed by successful Scottish raids in the north, and in May 1328 the Treaty of Northampton sealed the triumph of Scotland. David Bruce was to marry Joanna of England: Bruce was recognized as king: former owners of forfeited lands, with three exceptions, were not to be restored. This led, after Bruce's death, to an invasion by the disinherited English ci-devant lords of lands in Scotland, and to a long war from which Scotland was only "saved as by fire." Bruce died, outworn by war and hardships, on the 7th of June 1329: his body was buried in Dunfermline abbey; his heart, which Douglas was bearing to the Holy Land, was brought home again, after Douglas's chivalrous death in battle with the Moors in Spain.

Bruce, previously so shifty, had never wavered or turned back since he smote the Red Comyn at Dumfries. In face of obstacles apparently insurmountable he had made a nation, consolidating all the forces which Wallace had stirred into life. There is, perhaps, nothing in the history of medieval Europe which so closely resembles a voice from ancient Greece as the reply of the nobles and the whole *communitas* of Scotland to the pope (parliament of Aberbrothock, 6th of April 1320). They will be liegemen of Bruce only so long as he resists England. As long as a hundred Scots are left alive, they will continue the war for freedom, "which no good man loses save with his life." They show that the barbarities of Edward I. (which *he* regarded as reprisals) have made it eternally impossible for Scotland to yield to an English king. Their excommunication by Rome does not trouble them at all. They are free from Rome, from England, from all alien powers. Henceforth, through good and evil fortune, this was the spirit of the nation.

The most important point in constitutional history was the action of a parliament at Cambuskenneth, near Stirling, in 1326. The representatives of the burghs were present: they made a grant of all tenths to the king during his life; while they covenanted with him that he should collect no other taxes and should exercise the privileges of *prisiae et cariagia* with moderation. The long wars had been adverse to commerce, for which ransoms and the booty of Bannockburn made inadequate compensation. But the great abbey church of St Andrews was, none the less, completed, to stand for some two hundred and forty years, and was dedicated in the presence of Bruce.

The brilliant and sustained effort which made Scotland independent was almost paralysed by the deaths of Bruce and

David II. Struggle with Edward Baliol.

the Good Sir James of Douglas, during the minority of David II. (crowned, 24th of November 1331). The disinherited lords, deprived of their lands by Bruce, were headed by Edward Baliol, claiming the crown of Scotland as heir of John Baliol, and secretly backed by England. Randolph died in July 1332, and in August Edward Baliol, with the disinherited lord of Liddesdale, and Beaumont, the disinherited earl of Buchan, and the English claimant of the earldom of Atholl, landed a filibustering force in Forfarshire. They were opposed by the new regent of Scotland, the earl of Mar, who was routed with heavy loss and was slain, at Dupplin, on the 12th of August 1332. The English owed the victory to their archers, whose shafts rolled up a courageous charge by the Scots. Edward Baliol was enabled to seize and fortify Perth and was crowned at Scone, as Edward I. of Scotland (24th of September). On the 23rd of November, at Roxburgh, Baliol acknowledged Edward III. as his liege lord and promised to surrender Berwick and large lands in southern Scotland. The hands on the clock were then put back to the time of the reign of John Baliol. But the earl of Murray, son of Randolph, and Archibald, youngest brother of the Good Lord James of Douglas, surprised Baliol at Annan and drove him, half clad, into England.

Relations with Edward III.

The struggle was now (1333) for Berwick, which was besieged by Edward III. Archibald Douglas tried to relieve it, just as Edward II. strove to relieve Stirling, and found his Bannockburn on Halidon hill (19th of July 1333), where he was routed and slain, with many of the leaders of the Scots. Scotland was never again to hold Berwick for any length of time: meanwhile a few castles stood out, but the child king was sent over to France for safe keeping. A parliament held by Baliol at Edinburgh (February 1334) ratified the promises made by him to England at Roxburgh: the disinherited lords were in power and many patriots turned their coats. At Newcastle on the 12th of July Baliol surrendered to Edward III. the southern shires of Scotland with their castles: he had already done homage for the whole of Scotland; and Edward III. would have succeeded where Edward I. failed, had not the partisans of Baliol come to deadly feud over matters of their private interests and ambitions. Some took part with Sir Andrew Murray, son of a companion of Wallace, and with the Steward, who contrived to occupy the castle of Dunbarton, the key of western Scotland. These two men, with Campbell of Loch Awe, and Randolph's son, the earl of Moray, held up the national standard and were joined by the English claimant of the earldom of Atholl.

Randolph's daughter, too, the famous Black Agnes of Dunbar, brought over her wavering husband, the earl of March, to the side of the patriots, and there was a war of partisans, while Edward III. again and again invaded and desolated southern Scotland. In 1335–1336 the English party prevailed, and patriots began to come into the English peace: Atholl again changed his side, but the sister of Bruce held out in Kildrummie castle. Andrew Murray, March and a Douglas, the Black Knight of Liddesdale, went to her relief and slew Atholl: Edward III. (1336) again waged a victorious summer campaign, from Perth as his base, and again found Scottish resistance revive in winter. His rupture with France in October 1337, caused by his claims to the French crown, tended to withdraw his attention from Scotland, where, though the staunch Sir Andrew Murray died, Black Agnes drove the English besiegers from Dunbar (1338), while the Knight of Liddesdale recovered Perth. By 1342 Roxburgh, Stirling and Edinburgh castles were again in Scottish hands, though the Knight of Liddesdale captured and starved to death, in Hermitage castle, his gallant companion in arms, Sir Alexander Ramsay, who had relieved the garrison of Dunbar. With this Douglas, Knight of Liddesdale, a ruffian and a traitor, may be said to begin the long struggle between his too powerful house and the crown.

David's captivity.

King David, a lad of eighteen, had returned from France and had removed this Douglas from the sheriffdom of Teviotdale, superseding him by Alexander Ramsay. Douglas revenged himself on Ramsay, as we have seen, and though David was obliged to overlook the crime, the Knight of Liddesdale henceforth was not to be trusted as loyal against England. It is probable that he was intriguing for Baliol's restoration, and he certainly was securing the favour of Edward III. An ill-kept truce of three years ended in October 1346, when David attempted to lead the whole force of his realm, including the levies of John, Lord of the Isles, and of the western Celts in general, against England. As the Celts marched south the earl of Ross slew Ronald Macdonald, whose inheritance was claimed by John of the Isles. As a result, the Islesmen went home: David, however, crossed the border, plundering and burning the marches. Near Durham he came into touch with English levies under Henry Percy and the archbishop of York. David was a knight of the French school of late chivalry: he was not a general like Bruce or Randolph. In this affair of Neville's Cross (17th of October 1346) he copied the mistakes of Edward II. at Bannockburn; his crowded division was broken by the English archers, and the king himself was wounded and captured. Moray, the last male representative of Randolph, with the Constable and Earl Marischal of Scotland, was slain; the Steward made his escape: and, henceforth, the childless David regarded his heir, the Steward, with jealousy and suspicion. The Steward, during the king's captivity, was regent, and the Douglas of Liddesdale (the son of Archibald and nephew of the Good Lord James) drove the English out of Douglasdale, Teviotdale and the forest of Ettrick. A truce till 1354 was arranged between England, France and Scotland, while the country strove to raise the royal ransom, and David, who preferred English ways to those of his own kingdom, acknowledged Edward III. as his paramount. It became David's policy to secure his own life interest on Scotland, while the crown, on his decease, should go to one of the English royal family. The more loyal William Douglas, in 1353, slew his kinsman, the shifty Knight of Liddesdale, on the braes of Yarrow, and a fragment of one of the oldest Scottish ballads deplores his fall.

David's agreement with Edward.

In July 1354 an arrangement as to David's ransom was made: his price was 90,000 merks *sterling* (for the coinage of Scotland was already beginning to be debased). Negotiations were interrupted by the arrival of French reinforcements in men and gold: Berwick was recaptured, only to be recovered by England in 1356. In the same year Edward Baliol, after handing over his crown and the royalty of Scotland to Edward III., retired from active life, and Edward wasted the south in the raid of "The Burned Candlemas." In October 1357 David was permitted to return to Scotland, giving hostages and promising 100,000 merks in ten yearly payments. The country, crushed by inevitable taxation, was discontented, and not reconciled by Edward's grant of commercial privileges. In May 1363 David put down a rising headed by the Steward, and then, in October, went to London, where he and the earl of Douglas made arrangements by which the countries were to be united under Edward III. if David died childless. Scotland was to be forgiven the ransom, receive the Stone of Scone and retain its independent title as a kingdom: her parliaments were to be held within her own borders; her governors and magistrates were to be Scots, freedom of trade was guaranteed, and the earl of Douglas was to be restored to his English estates, or to an equivalent.

The union rejected by Scotland.

This scheme would have saved Scotland from centuries of war and from a Stewart dynasty: there would have been a union of the crowns, as under James VI.; or (by an alternative plan of November, December 1363) a son of the king of England, not Edward III. himself, would succeed to David. In March 1364 David laid the projects before a parliament at Scone, which firmly refused its assent. Possibly David had, as one motive for his scheme, the very dubious legitimacy of the children of the Steward, a probable cause of civil war and a disputed succession. He had also private reasons for disliking the Steward, who was on bad terms with the widow, Margaret Logie (by birth a Drummond), whom David had married on the death of his first wife. The country, resolved to stand by the Steward and the blood of Bruce, preferred the heavy taxation and the turbulence inevitable under such a king as David to union under an English prince. On the 20th of June 1365 Edward granted a four years' truce, with the ransom to be paid in yearly instalments of £4000. But the necessary taxation was resisted by various nobles, including John of the Isles (1368), who had married a daughter of the Steward. John was in arms, divisions and distress were everywhere, a famine prevailed, and Scotland had to face the prospect of yielding to Edward, when, in 1369, that prince proclaimed himself king of France, and, having his hands full of war, made a fourteen years' truce with his northern neighbour.

David was now free to subdue John of the Isles, to repudiate all his own debts contracted before 1368, and to make preparations for a crusade. From this crowning folly death delivered him on the 22nd of February 1371. The whole of his ransom was never paid, and his absurdities and misfortunes gave the Estates opportunity to strengthen their constitutional position. They established the rule that no official should put in execution any royal warrant "against the statutes and common form of law." The reign also saw the introduction of the committees, "elected by the Commons and the other Estates," which did the actual business of parliament, thus saving time and expense to the members. But these committees, later known as the Lords of the Articles, were to exercise almost the full powers of parliament in accordance with the desires of the crown, or of the dominant faction, and they were among the grievances abolished after the revolution of 1688–1689. The whole reign was a period of wasteful turmoil, of party strife, of treachery, of reaction. But the promise of peace and prosperity in exchange for absolute independence was rejected with all the old resolution; and the freedom which a Bruce desired to sell was retained by the first of the Stewart line, Robert II.; for Mr Froude erred in alleging that James I. was the first Stewart king of Scotland.

Stuart line: Robert II.

Robert II., the grandson of Robert Bruce, had lived hard, and when he came to the throne, was weary of fighting and of politics. Nothing proves more clearly the firm adherence of the nation to the blood of Bruce, and the parliamentary settlement of the crown in his female line, than the undisputed acceptance of the Steward's children as heirs to the throne. Several of them had been born to Robert's mistress, Elizabeth Mure of Rowallan, before a papal dispensation permitted, in 1349, a marriage which the canon law seemed to render impossible. The pope might have said, like a later pontiff on another day, "remittimus irremissibile." By a second marriage, undeniably legal, Robert had a family whose claims were not permitted to give trouble at his accession, though the earl of Douglas, the fellow conspirator of David II., would have caused difficulties if he had possessed the power. His eldest son, the earl who fell at Otterburn, was married to Robert's daughter, Isabella, but by her had no issue. The new prince of Scotland, John (an unlucky name, later changed to Robert), was a *fainéant*: the king's second son, Robert, earl of Fife (later first duke of Albany), was a man of energy and ambition, while the character of the third, Alexander, is expressed in his sobriquet, "The Wolf of Badenoch."

When the new reign opened, Edward III. made no secret of his claims to be king of Scotland, and the southern regions were still in English hands. From 1372 to 1383 Scotland was in truce with England; and Robert II. had no desire to aid France and accept from Rome a dispensation from the oaths of truce. The southern nobles, under the Douglases and March, kept up a semi-public feud with the Percy on the border, after the accession of Richard II., still a child, and piece by piece Scottish territory was recovered, mainly in Teviotdale and Liddesdale. In 1380 and 1381, Lancaster, uncle of Richard II., arranged truces, but difficulties were caused by the late proclamation, in Scotland, of a truce made with her ally, France, on the 26th of January 1384. With the tidings of this truce arrived, in April, a body of French knights who desired to enjoy fighting, and though dates are obscure they seem to have caused, by a raid in April, a retaliatory foray by the Percies in May or June. The king smoothed matters over, but in 1385 a great band of French knights landed in Scotland, forced the king's hand, and penetrated England as far as Morpeth. Here they might have had fighting enough, as Lancaster led a force against them, while Richard II. followed with a large army. But Douglas, to the disgust of the French, refused battle, and allowed the English to do what mischief could be done in a thrice stripped country. The French deemed the Scots shabby, poor and avaricious: their grooms were killed by the peasantry when they went foraging: the nobles were churlish and inhospitable.

In August 1388 Douglas led the famous raid as far as Alnwick castle, which culminated in the battle of Otterburn, fought by moonlight. Here Douglas fell in the thickest of the melée, but his death was concealed and Henry Percy, with many other English knights, were captured and held to heavy ransom (15th of August 1388). These battles were fought in the spirit of chivalry, and were followed, in 1389, by a three years' truce.

Robert III.

The second son of King Robert, Albany, was appointed governor, his father being in ill-health and dying in 1390. He was succeeded (14th of August 1390) by his son Robert III., whose own health was so bad that, in the previous year, his brother Albany had been preferred before him as governor. The reign of a weakling was full of anarchy, complicated by the feud between his eldest son, the wayward duke of Rothesay, and his ambitious brother, now duke of Albany. These two are the first dukes in Scotland. There was peace with England till the death of Richard II. in 1399, and till the parliament of January 1399 Albany still undertook the duties of the king.

Regency rule.

Here commenced the tragedy of the Stuarts and of Scotland. For nearly two centuries each reign began with a long royal minority, increasing the power and multiplying the feuds of the nobles. The remainder of each reign was, therefore, a struggle to re-establish the central power, a struggle in which cruel deeds were done on all sides. Meanwhile, now England, now France, secured the alliance of the men in power, or out of power, and threatened the independence of the kingdom. The cause of the miseries of these two unhappy centuries was beyond human control: no Stuart sovereign, after Robert II., escaped from the inevitable evils of a long minority, while Robert II. himself was as weak as any child. Under his nominal rule, the Celts of the north and west, in 1385, became troublesome, while Robert's son, the Wolf of Badenoch, who was justiciary, with his own wild sons, rather fanned than extinguished the flames. They slew the sheriff of Angus (1391–1392) in a battle, and then two clan-confederacies, quarrelling among themselves, put their cause to the ordeal of fight, in the famous combat of thirty against thirty, on the Inch of Perth (see Scott's *Fair Maid of Perth*). Though we know the cost of fencing the lists, from entries in the treasury accounts, we are ignorant of the cause of the quarrel, and even of the clans engaged. The names are diversely given, but probably the combat was only one incident in the long wars of the Camerons with the great Clan Chattan confederacy. In 1397, at Stirling, the Estates denounced the anarchy "through all the kingdom," and, in 1398–1399, were full of grievances arising from universal misgovernment. By this parliament, David, prince of Scotland and duke of Rothesay, was made regent for three years; with his uncle, duke of Albany, as his coadjutor. Peace between Albany and the wayward Rothesay was impossible, and Rothesay, by breaking troth with the daughter of the earl of March, and marrying a daughter of the third earl of Douglas, added a fresh feud to the general confusion.

Meanwhile Scotland, to vex Henry IV., adopted the cause of the "Mammet," the pretender to be Richard II. This enigmatic personage appeared in Islay, and rather had his pretences thrust on him than assumed them; he was half-witted. Meanwhile the insult to March caused him to seek alliance with Henry IV., who crossed the border—the last English king to do so—and appeared before Edinburgh castle. Rothesay held it in his contempt, and, as Albany declined a battle in the open, Henry returned with nothing gained.

In 1400 Albany, and the 4th earl of Douglas (brother-in-law of the duke of Rothesay), confessed before the Estates that they had arrested the prince, and were cleared of the guilt of his subsequent death. They kept him, first in the castle of St Andrews, and then at Falkland, where he perished; some said of dysentery, others, of starvation.

Restored to the regency, Albany permitted his son, Murdoch, with Douglas, to retort on a successful raid by Percy and the traitor March. They were defeated by English archery, as usual, at Homildon hill: Murdoch and Douglas were captured. Percy, dissatisfied with Henry's treatment of him in the matter of ransoms, led an army into Scotland which was to have trysted at Cocklaw with Albany and the whole forces of the realm, and invaded England. But Douglas and Percy left Cocklaw before Albany came up, and hurried to join hands with the Welsh rebel, Glendower. The hostile forces met at Shrewsbury, and Shakespeare has made the result immortal. Percy was slain; Douglas was the prisoner of England.

James I.

The young prince of Scotland, the first James, was on his way to seek safety in France, during an interval of truce, but was captured on the high seas by English cruisers. (The dates are obscure, but James was in the Tower by February-March 1405–1406.) His father's death followed (4th of April 1406). Albany sent, within a year, envoys to plead for his release; and again, in 1409, but vainly. An interval of peace occurred, among a series of border battles, and the heresy of Lollardy was attacked by the clergy; Resby, who had been a priest in England, was burned in 1407 at Perth. The embers of Lollardy, not extinguished by the new central fountain of learning, the university of St Andrews, smouldered in the west till the Reformation.

"The wicked blood of the Isles," the Macdonalds, descendants of island kings, now made alliance with England; Donald, eldest son of the Lord of the Isles, having an unsatisfied claim on the earldom of Ross, which Albany strove to keep in his own family. The greatest of highland hosts met at Ardtornish castle, now a ruin on the sound of Mull: they marched inland and north, defeated the Mackays of Sutherland and were promised the plunder of Aberdeen. The earl of Mar, with a small force of heavily-armoured lowland cavaliers, stopped and scattered the plaided Gael at Harlaw (1411). The knights lost heavily, but Donald did not plunder Aberdeen (see Elspeth's ballad of Harlaw, in *The Antiquary*). Next year Albany received the submission of Donald at Lochgilp in Knapdale, and the Celts were, for the moment, useless to their allies of England.

Time went on: Albany's son, Murdoch, was set free, but in 1410 the captive King James much resented Albany's neglect of himself. His letter is written in Scots. Albany died in 1420; his regency, with that of his son Murdoch, produced the anarchy which James, when free, combated at the cost of his life. Meanwhile France demanded and received auxiliaries from Scotland, who fought gloriously for French freedom. Their great victory, where the duke of Clarence fell, was at Baugé Bridge (1421), where the Stewarts and Kennedys, under Sir Hugh, were specially distinguished. In 1424 the Scots, with the earl of Buchan and the earl of Douglas, were almost exterminated at Verneuil, some five months after King James, already affianced to the Lady Jane Beaufort, was released. He never paid his ransom, and his noble hostages lived and died south of Tweed: one cause of his unpopularity.

Tradition tells that James vowed "to make the key keep the castle, and the bush keep the cow," even though he "lived a dog's life" in the endeavour. His reign was a struggle against anarchy and in the cause of the poor and weak. He instantly arrested Murdoch, son of Albany, and Fleming of Cumbernauld, met parliament, dismissed it, retaining a committee ("the Lords of the Articles"), and took measures with landlords, who must display their charters; appointed an inquest into lay and clerical property; and imposed taxes to defray his ransom. The money could not be collected, and the edicts against private wars and the maintenance of armed retainers were hard to enforce. James next arrested Lennox and that Sir Robert Graham whose feud proved fatal to the king. In March 1425 he met his second parliament, relying on a council of barons with no great earl but Mar. He next arrested Albany's secretary and the Lord Montgomery: the story, accepted by our historians, that he also seized twenty-six notables, has been finally disproved by Sir James Ramsay. No Scottish king ever embarked on such a *coup d'état* as the arrest of "the whole Scottish House of Lords," and Knox, who attributes a much larger design to James V., must have been deceived by rumour. Albany (Murdoch), his son, and Lennox, were tried and executed: Albany's son, James, in revenge burned Dumbarton. The king appears to have been avenging his private wrongs, or destroying the three nobles *pour encourager les autres*. Parliament now insisted on inquisition for heretics: an act was passed (which never took effect) against "bands" or private leagues among the nobles: the Covenant was called "the great band," by cavaliers in days to come. More important was the establishment of a new court of justice, the court of Session, to sit thrice in the year. Yeomen were bidden to practise archery, to which they much preferred football and golf.

The highlanders were next handled as the lowlanders had been; a parliament was held at Inverness and a number of chiefs who attended were seized, imprisoned or executed. The Lord of the Isles, when released, burned Inverness (1429), but, being pursued, he was deserted by Clan Chattan and Clan Cameron (probably the clans represented on the ordeal of battle on the Inch of Perth). The Lord of the Isles made submission, but Donald Balloch, his cousin, defeated Mar near Inverlochy, later fled to Ireland, and was reported dead, though he lived to give trouble. James was unjustly repressing highland anarchy: from the highlands came his bane.

James now granted his daughter, a child, to the Dauphin, later Louis XI.; but, as Jeanne d'Arc said, "the daughter of the king of Scotland could not save Orleans," then (1428–1429) besieged in a desultory manner by the English. In February 1429 the Scots under the oriflamme were cut to pieces in "The Battle of the Herrings" at Rouvray. The surviving Scots fought under Jeanne d'Arc till her last success, at Lagny, under Sir Hugh Kennedy of Ardstinchar in Ayrshire, but James (May, June 1429) made a treaty of peace with Cardinal Beaufort, which enabled Beaufort to send large reinforcements into Paris, where the Maid, deserted by Charles VII., failed a few months later.

In October 1430 was born the prince destined to be James II. The king and the Estates were curtailing the judicial privileges and jurisdiction of the clergy; and the anti-pope, Peter de Luna, quarrelled with the country on this ground. Scotland then deserted his cause for that of Martin V., but quarrels between church and state did not cease, and a legate arrived to settle the dispute a few days before the king's murder. James had already threatened the Benedictines and Augustines for "impudently abandoning religious conduct," and had founded the Carthusian monastery in Perth, that the Carthusians might offer a better example. A reformation by the state seemed at hand, but the religious orders fell deeper in odium and contempt during the next hundred and thirty years. Doctrine, too, was endangered by heretics, one of whom, a Hussite named Paul Crawar, was burned at Perth in 1433.

In 1427 James seized, as a male fee, the earldom of Strathearn, gave the earl by female descent the title of Menteith, and sent him to England as a hostage for his ransom. He was nephew of the Sir Robert Graham whom James had arrested at the beginning of his reign: Graham's anger was thus rekindled. The earls of Mar and March also lost their lands, on one pretext or another: James's policy was plainly to break the power of the nobles.

Death of James I.

The English translation (1440) of a lost contemporary Latin history of the events avers that Sir Robert Graham rose in parliament, denounced James as a tyrant and called on the barons to seize their king: Graham was taken, was banished from court, was confiscated and fled to the Atholl hills. He thence intrigued with the old earl of Atholl (heir to the crown if the ancestors of James by Robert II.

and Elizabeth Muir were illegitimate), and he drew into the conspiracy the king's chamberlain, Atholl's grandson. By his aid 300 highlanders were brought into the monastery of the Black Friars in Perth, where the king was keeping the Christmas of 1436, and there they slew James, who had fled into a vault. The conspirators were seized and tortured to death with unheard-of cruelties, but lawlessness had won the battle. James had failed, practically, even in his effort (1427–1428) to anglicize parliament, by introducing the representative system; two "wise men" were to be chosen by each sheriffdom, and two Houses were to take the place of the one House in which all Estates were wont to meet. But constituents were averse to paying their members, no Speaker was elected, the reform never came into being. Till the Union, all estates sat in one room during parliament. The court of session was the most valuable and permanent of James's innovations, and his poem "The King's Quhair" attests his real genius. He had attempted to reform the country too hurriedly; and treachery, by all accounts, was one of his methods. He left a child as king, and the old round of anarchy began again; oppression, murder, feud, faction and private war. History repeats itself, and the evil practices were checked, not by the Reformation, but by the increased resources and entire safety enjoyed by James VI. when he succeeded to the crown of England.

James II.

Space forbids a record of the faction fights in the reign of James II. Coming to the crown at the age of seven, he was used like the Great Seal, as a sanction of authority and passed from one party to another of the nobles, as each chanced to be the more dexterous or powerful (crowned 25th of March 1437). The Crichtons and Livingstones held the king till the earl of Douglas died, being succeeded by his son, a boy. The queen-mother married Sir James Stewart of Lorne, and their sons, Buchan and Atholl, mixed in the confused intrigues of the reign of James III., but the queen was treated with scant courtesy by the rival parties. From them the young earl Douglas and duc de Touraine, the most powerful man in Scotland, stood apart, sullenly watching an unprecedented state of anarchy. Livingstone and Crichton, previously foes, invited him and his brother to dine with the child king in Edinburgh castle, and there served to him "the black dinner" bewailed in a fragment of an early ballad. The two young nobles, after a mock trial, were decapitated (November 1440).

Douglas was succeeded in his earldom by his grandfather, Sir James the Gross, an unwieldy veteran. On his death in 1443, his son, William, a lad of eighteen, became earl, and waged private war on Crichton, while he allied himself with Livingstone. Crichton lost the chancellorship: and the keys were given to Kennedy, bishop of St Andrews and founder of St Salvator's college in that university. Involved in secular feuds with Douglas, Livingstone and the earl of Crawford, Kennedy destroyed Crawford with a spiritual weapon, his Curse (23rd of January 1445–1446).

On the 3rd of July 1449 James married Marie of Gueldres, seized and imprisoned the Livingstones, and generally asserted royal power. He relied on Douglas, who (1450) was his constant companion, till the earl visited Rome (November 1450–April 1451). In June 1451 he resigned his lands, in which he was at once reinstated. It appears, however, that he was, or was suspected of being, in treasonable alliance with the new earl of Crawford and the ever-turbulent Celtic lord of the Isles. It is certain, from documents, that Douglas was always in the royal *entourage* from June 1451 to January 1452, so that stories of insults and crimes committed by him at this period seem legendary. Nevertheless, on the 22nd of February 1452, James, who had invited Douglas, under safe-conduct, to visit him at Stirling, there dirked his guest with his own hand. The king was exonerated by parliament, on the score of Douglas's contemptuous treatment of his safe-conduct, and because of his oppressions, conspiracies and refusal to aid the king against rebels, such as the new "Tiger Earl" of Crawford.

The brother of the slain Douglas defied his king, then made his submission, and visited London, where he probably intrigued with the English government against his sovereign and country. In 1455 James made serious war against the "Black Douglases" of the south; his army being led by the "Red Douglas," the earl of Angus. The royal cause was successful, and the Black Douglas was attainted (10th of June 1455). He fled south and became the pensioner and ally of Edward IV., who reasserted the traditional claim to sovereignty over Scotland—"his rebels of Scotland!"

From 1457 to 1459 a truce was made between Scotland and the Lancastrian party, then in power, but in July 1460, Henry VI. was defeated and taken, and his wife and son sought James's hospitality. Roxburgh castle was in English hands; James besieged it, and on the 3rd of August 1460 was slain by the bursting of one of his own huge siege guns. The castle was taken, but the second James died at the age of thirty, leaving a child to succeed him in his heritage of woe. James II. had overcome his nobles, but left a legacy of feuds to the coming reign.

James III.

The period of James III. is filled with the recurrent strife of the nobles among themselves and against law and order. Slowly and obscurely the Renaissance comes to Scotland; its presence is indicated by the artistic tastes of the king, and, later, by the sweet and mournful poetry of Henryson. But the Renaissance, like the religious revivals initiated in Italy, arrived in Scotland weak and weary; hence the church did not share in the new enthusiasms of the faith of St Francis, and art was trampled on by the magnates who hated poetry and painting.

In politics, the queen-mother, who had the private guardianship of her boys, the king and the dukes of Albany and Ross, turned from the Lancastrian to the Yorkist side, while Kennedy and his party (Lancastrians) were accused of endangering Scotland to please France. This was the beginning of that movement away from the Ancient League to partisanship with England, which culminated in the success of the Protestant allies of England at the Reformation. This, then, is an important moment in the long and weary march to union with England.

In 1461 Henry VI. was driven to take sad shelter with Kennedy at St Andrews. In June 1461 Edward IV. was crowned, and at once made pact and alliance with the banished Douglas and the Celts of the west Highlands and the isles. From Ardtornish castle, John, lord of the Isles, sent ambassadors to Westminster, where (1462) a treaty was made for an English alliance and the partition of Scotland between Douglas and the Celts. A marriage between the mother of James III. and Edward IV. was spoken of, but Kennedy would not meet the English, and in March 1463 the English treaty with Douglas and the Celts was ratified. Douglas invaded Scotland, in advance of an English army, but was defeated by an army under Bishop Kennedy. When France went over to the Yorkists, Kennedy, accepting an English pension, made a long truce between Scotland and England (October 1464). Peace might have been assured, but Kennedy died in 1466. His tomb in his college chapel of St Salvator's at St Andrews, his college and his bridge over the river Eden, have survived as monuments of a good and great man; they passed unscathed through the ruin wrought by the reformers.

On his death the nobles, notably Fleming, Livingstone, Crawford, Hamilton and Boyd, made a band for securing power and place. Boyd, with some borderers, Hepburn and Ker of Cessford, seized the boy king, and Boyd had himself made governor, his son marrying the princess Mary, sister of James.

In July 1469 James, then about eighteen, married Margaret, daughter of King Christian of Norway, who pledged the Orkney and Shetland Isles for her dowry, which remains unpaid. The enemies of the Boyds instantly overthrew them, and the Hamiltons, a race of English origin, arose on their ruins to their perilous place of possible heirs to the crown. The princess Mary was divorced from her Boyd husband and married Lord Hamilton. Their descendants were again and again kept from the royal succession only by the existence of a Stuart child, Mary, queen of Scots, or James VI. This fact, with the consequent feud of the Stewarts of Lennox, themselves claimants, governs the dynastic intrigues during more than two centuries and gave impetus to the Reformation. Never was marriage so fruitful in tragedies as the wedding of Lord Hamilton and the princess Mary.

There followed ecclesiastical feuds, centring round Patrick Graham, the new bishop of St Andrews. These, to the present day, have been misunderstood (see *The Archbishops of St Andrews*, by Herkless and Hannay, for details). It is not possible here to unravel the problem, but documents at St Andrews, now printed, demonstrate the error of the historians who regard Graham as a holy man, persecuted because he was half a premature Protestant. At Rome he procured, without royal or national assent, the archbishopric for St Andrews; he became insane and was succeeded by the learned Schevez. Glasgow also became an archbishopric.

James now followed a policy in which Louis XI. succeeded, but he himself failed utterly. He surrounded himself with men of low birth, such as Ireland, a scholar and diplomatist; Rogers, a great musician; and Cochrane, apparently an architect or sculptor—he is styled a mason or stone-cutter. This aroused the wrath of the nobles and the two princes of the blood, Albany and Mar. Mar was arrested on a charge of magic, and died, whether murdered or from natural causes is uncertain, while his accomplices are said to have been the protomartyrs of witchcraft, scarcely heard of in Scotland till the reformers began to burn old women. Albany was arrested for treason, escaped to France, and was under sentence of forfeiture.

Relations with England were now unfriendly, and parliament, in March 1482, denounced Edward IV. as " the reiver, Edward." By May the Douglases brought Albany from France to England, where he swore fealty to Edward, and was to be given the Scottish crown. The duke of Gloucester (later Richard III.) marched north and took Berwick, while the earl of Angus, with other nobles, hanged Cochrane and other favourites of James over Lauder bridge. The domestic mutiny and the English war ended in a compromise, Albany being restored to office and estates. He took Edinburgh castle, in which James was interned, and he was made lieutenant-general. Yet, aided by Angus, he continued to intrigue with Edward for the gift of the Scottish crown. By March 1483 he was reduced, we know not how; he laid down his office, and was forbidden to approach the court. On the death of Edward IV. he lost his chief supporter (9th of April 1483), and was forfeited while absent in England. He and Douglas entered Scotland with a small force (22nd of July 1484), and were defeated at Lochmaben: Albany escaped, went to France, and was slain in a tournament, leaving issue, but Douglas was captured and interned till his death in the monastery of Lindores.

Our information for this period is so scanty that we do not know how James reached his new position, how he overcame Albany and his other rebels. At peace with England, and allied with France, he quarrelled with the church, and it was decreed that the clergy who obtained benefices from Rome were guilty of treason. He planned a set of royal marriages with England, and this was the ground of his subjects' charge against him of servility to England. " James IV. and James V. are constantly upbraided for not doing the very things which James III. is execrated for having done," namely, securing peace and amity with their powerful neighbour. James III. " died in his enemies' day," and such accounts as we have of him are written by the partisans of his unruly nobles, Argyll, Lennox and Angus.

They secured the crown prince, James, now aged fifteen, their motive being that under James III. the guilt of their murders and rebellion still hung over their heads. The Estates refused to give them an amnesty for seven years; and the arch rebel, Angus Bell the Cat, with Argyll, the young prince, Lennox and other malcontents, declared that he was deposed, and proclaimed his son as his successor and Argyll as chancellor. Doing what they falsely accused James of having done, they sent, or obtained from England leave to send, members of their party to intrigue with Henry VII. (1st of May 1488). After a half reconciliation, James marched in force to Stirling, the key of the north, but the treacherous commander of the castle, Shaw of Sauchie, held the castle against him. James and his leaders, Atholl and Huntly, with their Stewarts and Gordons, and the levies of burgesses, and the mounted gentry of Fife, encountered the wild border spearmen of Hepburn and Home and the Galloway men, the whole being led by Angus and the rebel prince at Sauchie burn, near Bannockburn. How it chanced we know not; James's horse seems to have run away and thrown him (he was a bad horseman), and the story goes that he was taken into a cottage and stabbed by a priest. In fact, as his rebels put it, " he happinit to be slain " at Beaton's mill. He was accused of having accumulated great treasures. They were never found, or, if found, never accounted for by the finders.

His real history remains unknown; we have only Ferrerius, who is vague, and the late and slanderous gossip of the writers of the Reformation. We know that James was clement; that the middle and lower classes stood by him; that he was a great amateur in the arts; that he was betrayed again and again by those of his own house, finally by his own son. A hideous tale is told by Buchanan against his private morals, but it is certainly inaccurate in detail, and is uncorroborated, while it appears to turn on a confusion between an alleged royal mistress, " the Daisy," and Margaret (Daisy), the king's own sister. It is clear to any reader of Ferrerius, Lesley and Buchanan that they all drew from a common source, now unknown, and this source may well have been a chronicle inspired by James's enemies. James III. of Scotland has been almost as much the butt of slanderous charges as the Jacobite James III. of England and VIII. of Scotland, " The Old Pretender."

James IV.

With James IV. we enter on the modern history of Scotland. The king escaped the evils of a long minority, was a " free king " and managed his own policy. He was tall, handsome, strong and recklessly brave. He inherited his father's love of art and of nascent science; but this fault was forgiven him, as his manners were popular, his horsemanship good, and his bearing frank and free. The early Tudor policy of Henry VII. was not to make open war on Scotland, but to intrigue secretly, especially with the treacherous Douglas, earl of Angus, and with Ramsay, earl of Bothwell under James III., but soon dispossessed. They schemed to kidnap the king as vainly as Henry VIII. later planned to kidnap many of his foreign opponents. Under James IV. the houses of Hepburn of Hailes, ancestor of Queen Mary's Bothwell; of the Huntly Gordons; and of the Kers of Ferniehirst and Cessford, rose into new importance; while the Huntlys and Argylls were entrusted with the maintenance of order among the fighting clans of the west and north. They aggrandized themselves at the expense of the Macleans, Macdonalds, Camerons and Clan Chattan, but their sway was far from being peaceful and orderly.

The king, reckless as he was, had more than his share of the Stuart melancholy. His parricidal rebellion lay heavy on his conscience; he practised asceticism at intervals, and dreamed of eastern pilgrimages. But he also fostered a navy, under Sir Andrew Wood, who swept the seas of the English pirates. James threw Scotland into the whirlpool of European politics, dealing with Spanish envoys and with the duchess of Burgundy, the patroness of the mysterious Perkin Warbeck, who claimed to be Richard, duke of York, son of Edward IV. Meanwhile, to balance the power of the primate, James purchased from Innocent VIII. an archbishopric for the bishop of Glasgow (1492), who laid information against the heretics of Kyle in Ayrshire. They had evolved or inherited anti-papal heresies much like those of the reformers of 1559, but James turned their trial into a jest. He made a secret treaty to defend France if she were attacked by England, but meanwhile a five years' truce was concluded (1491). In the following year James was in correspondence with Perkin, then in Ireland; in 1495 he received that *prétendant*, married him to a daughter of Huntly, and in 1496 raided northern England in his company,—all this in contempt of the offered hand of a Tudor princess. In the autumn of 1497 an attempted raid by James ended in a seven years' truce fostered by the Spanish envoy, Ayala, who has left a flourishing description of the king and his country. Meanwhile Perkin had failed in Cornwall and been captured. Henry VII. kept offering the hand of his daughter Margaret, who was married to James at Holyrood in August 1503. From this wedding, disturbed by quarrels over the queen's jewels and dowry, was to result the union of the crowns on the head of Margaret's great-grandson, James VI., after a century of tragedies and turmoil.

In 1507 the pope failed to draw James into the league formed to check French aggression in Italy. A murder on the borders poisoned Scottish relations with England, and the death of Henry VII. (1509) left James face to face with his blustering brother-in-law, Henry VIII. The Holy League of 1511, against France, found James committed to the cause of the old French alliance. He strengthened his fleet, but his admiral, Sir Andrew Barton, fell in a fight with English privateers equipped by the earl of Surrey and commanded by his sons (1511). Border homicides added their element of international irritation, and James renewed the ancient league with France. In 1513 Dr West, an envoy of Henry VIII., found James in the state of "a fey man," doomed, distracted, agitated and boastful. In May came the letter and ring of the French queen ordering James, as her knight, to strike a blow on English ground. He wrote to Henry none the less (24th May) with peaceful proposals, but on the 30th of June Henry invaded France.

Battle of Flodden.

Strange portents and warning phantasms did not check James: he sent forth a fleet of thirteen ships and 3000 men, which faded into nothingness: he declared war on Henry; and on the 22nd of August he crossed the border with all his force, including the highlanders and islesmen. After securing his flank and rear by taking Norham, Wark and Eitel castles, he awaited the approach of Surrey's army at Ford castle, behind which lies Flodden Edge, a strong position, which he presently occupied. Surrey, who was ill-provisioned, challenged him to fight on the open field of Wooler Haugh. James declined to commit this chivalrous folly; but, for lack of scouts, permitted Surrey to out-manœuvre him and pass, concealed by a range of hills, across his front, to a position north of Flodden, on his lines of communication.

Next day, 9th of September, Surrey crossed the Till, unobserved, by Twizel bridge and Millford, and moved south against Branxton hill, the middle of three ridges on the Flodden slope. The ground was difficult from heavy rains, the English troops were weary and hungry, but James had lost touch of Surrey and knew nothing of his movements till his troops appeared on his rear towards evening. In place of remaining in his position, James burned his camp and hurried his men down hill to the plateau of Branxton ridge. Home and Huntly, on the Scottish left, charged Edmund Howard's force; the Tynemouth men, under Dacre, did not support Howard, at first, but Dacre checked Home (whose later conduct is obscure) and drove off the Gordons. The Percys broke Errol's force; Rothes and Crawford fell, and the king led the centre, through heavy artillery fire, against Surrey. With Herries and Maxwell he shook the English centre, but while Stanley and the men of Cheshire drove the highlanders of Lennox and Argyll in flight (their leaders had already fallen), the admiral and Dacre fell on the flank of James's command, which Surrey, too wise to pursue the fleet highlanders, surrounded with his whole force. The Scottish centre fought like Paladins, and James, breaking out in their front, hewed his way to within a lance's length of Surrey, as that leader himself avers. There fell the king, riddled with arrows, his left hand hanging helpless, his neck deeply gashed by a bill-stroke. His peers surrounded his body, and night fell on "the dark impenetrable wood" of the Scottish spears. At dawn the survivors had retreated, only the light Border horse of Home hung about the field. The bishop of Durham accuses them of plundering both sides. (That Home's Borderers had but slight loss is argued by Colonel the Hon. FitzWilliam Elliot, in *The Trustworthiness of Border Ballads*, pp. 136-138.) Among the dead were thirteen earls, and James's son, the archbishop of St Andrews. The king's death assured the victory, which Surrey had not the strength to pursue, though the townsmen of Edinburgh built their famous Flodden Wall to resist him if he approached.

England never won a victory more creditable to the fighting and marching powers of her sons than at the battle of Flodden. The headlong recklessness of James, remarked on by Ayala, gave the opportunity, but he nobly expiated his fault. The Scots had so handled their enemies that they could not or dared not pursue their advantage; on the other hand, it was long indeed before the memory of Flodden ceased to haunt the Scots and deter them from invading England in force.

Social progress.

Though Ayala's well-known letter certainly flatters the material progress of Scotland, the country had assuredly made great advances. While England was tuneless, with Dunbar and the other "Makers" Scotland was "a nest of singing birds." The good Bishop Elphinstone founded the university of Aberdeen in 1495; and in 1496 parliament decreed compulsory education, and Latin, for sons of barons and freeholders. Prior Hepburn founded a new college, that of St Leonard's, in the university of St Andrews, and Scotland owes only one university, that of Edinburgh, to the learned enthusiasm of her reformed sons. Printing was introduced in 1507, and the march of education among the laity increased the general contempt for the too common ignorance that prevailed among the clergy. The greater benefices were being conferred on young men of high birth but of little learning. The college of Surgeons was founded by the municipality of Edinburgh (1505), and in 1506 obtained the title of "Royal." The stimulus given to shipbuilding encouraged commerce, and freedom from war fostered the middle class, which was soon to make its influence felt in the Reformation. The burgesses, of course, had long been a relatively rich and powerful body: it is a fond delusion to suppose that they sprang into being under John Knox, though their attachment to his principles made them prominent among his disciples, while Flodden probably began to deter them from the ancient attachment to France. Protestantism, and the disasters of James V., with the regency of his widow, were to convert the majority of Scots to the English party.

James V.

The long minority of James V. was fatal to the Stuart dynasty. The intrigues of Henry VIII., the ambition of Angus, who married the king's mother (Margaret, sister of Henry VIII.); the counter intrigues of Albany, a resident in France, and son of the rebellious Albany, brother of James III.; the constantly veering policy and affections of the queen-mother; and the gold of England, filled fourteen years with distractions, murders, treasons and conspiracies. Already Henry VIII. was trying to kidnap the child king, who found, as he grew up, that his stepfather, Angus, was his master and was the paid servant of Henry. The nobles were now of the English, now of the French party; none could be trusted to be loyal except the clergy, and they were factious and warlike. The result was that James threw off the yoke of his stepfather, Angus; drove him and his astute and treacherous brother, Sir George Douglas, into England (thereby raising up, like Bruce, a fatal party of lords disinherited), and while he was alienated from Henry and his Reformation, threw himself into the arms of France, of the clergy and of Rome.

Meanwhile the many noble and dissatisfied pensioners of England adopted Protestantism, which also made its way among the barons, burgesses and clergy, so that, for political reasons, James at last could not but be hostile to the new creed; he bequeathed this anti-protestantism, with the French alliance, through his wife, Mary of Guise, and the influence of the house of Lorraine, to his unhappy daughter, Mary Stuart. The country, ever jealous of its independence, found at last that France threatened her freedom even more than did England, the apparent enemy; and thus, partly from Protestantism, partly from patriotism, the English party in Scotland proved victorious, and the Reformation was accomplished. Had Henry been honourable and gentle, had his sister not shared his vehement passions, James and Henry, nephew and uncle, might have been united in peace; and the Scottish Reformation might have harmoniously blended with that of England.

It is impossible here fully to unfold the tortuous intrigues which darkened the minority of James. Who was to govern the young prince and the country? His wavering, intriguing mother, Margaret Tudor, or her sometimes friend, sometimes foe, Albany, arrived from France; or her discarded husband, Angus, the paid tool of Henry VIII.? By June 1528 the young king settled the question. He had complained to Henry of the captivity in which he was held by his hated stepfather, Angus. In June Angus had prepared forces to punish the Border raiders, and James, rightly or wrongly, seems to have suspected that he was to be handed over bodily to his royal uncle. On the 27th of May he was with Angus in the castle of Edinburgh; on the 30th of May, by a bold and dexterous ride, he was with his mother in the castle of Stirling, with Archbishop Beaton, Argyll and Maxwell. In July he mastered Edinburgh, and bade Angus and his brother, Sir George Douglas, place themselves in ward north of Tay. This he announced to Henry, the paymaster of the Douglases, and the breach between the two kings was never healed. A war broke out between the Douglases and James, but a five years' peace, not including the restoration of Angus, was concluded in December 1528. Angus prolonged his outrages on the Scottish border till 1529, when he entered England as a subsidized mischief-maker against Scotland. Not till James's death did the Douglases return to their own country. Meanwhile James visited the Border, hanged some brigand lairds, and reduced such English partisans as the Kers, Rutherfords, Stewarts of Traquair, Veitches and Turnbulls. Johnny Armstrong of Gilnockie, famed in ballad and legend, was hanged, with forty of his clan, at Carlanrigg, in Teviotdale. The tale of royal treachery in his capture is popular; the best authorities for it seem to be the synoptic versions of a ballad and of the fabulous chronicler, Pitscottie.

When James V. became "a free King" the main problems before him were his relations with Henry VIII. and with the nascent Reformation. From 1535 Henry was anxious that James should meet him in England. Henry was notoriously treacherous; to kidnap was his ideal in diplomacy. His pensioner Angus (1531) was to have aided Bothwell in crowning Henry in Edinburgh. In 1535 Henry sent Dr Barlowe to convert James to his own religious ideas, Erastian, anti-papal, the seizure of the wealth of the church. James (1536) was willing enough to meet Henry in England, but his council, especially the clerical members, were opposed to the tryst. James desired to wed none but his mistress, Margaret Erskine, the mother of the Regent Moray. As Henry had once declared that he could only meet a Scottish king, in England, as a vassal, James's council had good reason for their attitude. Had they consented, had James married Henry's daughter, Mary (called "The Bloody"), it is not plain that advantage would have come of the alliance.

In 1536 James sailed to France, and (1st of Jan. 1537) married Madeleine, daughter of Francis I. The die was cast; he was committed to France and to the ancient faith. This was the cardinal misfortune of the Stuarts, but who could trust Henry, and who could join in the fiery persecutions of the new pope-king? In James's absence, Scottish heretics fled to England, while Henry's heretics fled to Scotland. Madeleine died on the 7th of July 1537. "Lady Glamis," as she was called, a Douglas lady, widow of Lord Glamis, was burned for abetting her brother Angus and devising the king's death by poison. The truth of this matter is obscure; our early historians of this age, Protestants like Knox and Pitscottie, with Buchanan and the Catholic Lesley, are seldom to be trusted without documentary corroboration.

In 1538 James married a lady whom Henry desired to add to his list of wives, Mary of Guise, at this moment a young widow, Madame de Longueville. Mary shines like a good deed in a naughty world; but she was a Catholic, was of the house of Lorraine, and in diplomacy was almost as other diplomatists.

In 1539 David Beaton, the Cardinal, now aged forty-five, succeeded his uncle, James Beaton, as primate of Scotland. He had been educated in Scotland and Paris, held the rich abbey of Arbroath, and for some twenty years at least lived openly with Mariotte Ogilvy, of the house of Airlie. He was a practised diplomatist, and necessarily of the French and Catholic party. His wealth, astuteness, experience and tenacity of purpose, were to baffle Henry's attacks on Scottish independence, till the daggers of pietistic cut-throats closed the long debate. Beaton was cruel: he had no more scruples than Henry about burning men for their beliefs. But the martyrs were few, compared with the numbers of people whom the reformed kirk burned for witchcraft. Some twelve martyrs at least perished in 1539–1540, and George Buchanan, whose satires on the Franciscans delighted the king, escaped to France, in circumstances which he described diversely on different occasions, as was his habit.

In May 1540 James visited the highlands, and later reduced the Macdonalds and annexed the lordship of the Isles to the crown. In 1541 he lost two infant sons, and the mysterious affair of the death of that aesthetic ruffian, Sir James Hamilton of Finnart, was supposed to lie heavy on his mind. There were disputes with Henry, who demanded the extradition of fugitive friars, which James refused. In 1541 he disappointed Henry, not meeting him at York, and this course, advised by his council and Francis I., rankled deeply, while Angus was making a large English raid on the Border in time of peace. The English fared ill, and Henry horrified his council by his usual proposal to kidnap the king of Scotland. Henry's men marauded on the Border, but a force which James summoned to Fala Moor (31st of October 1542) contained but one lord who would march with him—Napier of Merchistoun. About this date occurs the legend of a list of hundreds of heretics, whom the clergy asked James to proscribe. No king of Scotland could dream of executing such a *coup d'état*; the authority for it is that mythopoeic earl of Arran who later became regent, and told the fable to Henry's agent, Sir Ralph Sadleyr.

Presently ensued the Scottish raid of Solway Moss and the capture of many of the Scottish nobles. The facts may be found in contemporary English despatches printed in the Hamilton papers. The fables are to be read in Knox's *History of the Reformation in Scotland*, and in Froude. The secret of the raid was sold by the brother of Angus, Sir George Douglas, and by other traitors. England was prepared, and on the 23rd of November routed and drove into Solway Moss a demoralized multitude of farm-burning Scots. The guns and some 1200 men were taken; many men were drowned. James retired heartbroken from the Border to Edinburgh, where he executed business. He then dwelt for a week at Linlithgow with the queen, who was about to give birth to a child. Next he bore "the pageant of his bleeding heart" to Falkland, where he heard of the birth (8th of December) of his daughter, Mary Stuart. Uncomforted, he died on the 14th (15th?) of December. Accounts differ as to the date. Sheer grief and shame, and, it is said, sorrow for the failure in war of his favourite, Oliver Sinclair, were the apparent causes of his death. Knox appears to insinuate that a rumour declared Mary of Guise and the cardinal guilty of poisoning James, but an attempt had been made to put another sense on the words of this historian, who frequently hints that Mary was the mistress of the cardinal (Knox, vol. i. p. 92).

Mary, queen of Scots.

Again Scotland had to endure a long royal minority. The distraction of Scotland promised to Henry VIII. a good chance of annexing the kingdom, whether by the marriage of Edward, prince of Wales, to the infant queen, Mary, or by acquiring, through treachery, her person and the castles of the country. Sir George Douglas at once crossed the border. Angus soon followed, with the lords captured at Solway Moss, all bound more or less to work Henry's will. In Scotland the cardinal; Arran, who was next heir to the throne; Huntly and Murray were proclaimed regents. Knox and others speak of a will of James V., forged by the cardinal, but the stories are inconsistent, and rest mainly on the untrustworthy evidence of Arran. His legitimacy was rather worse than dubious, and henceforth he sided with the party most powerful at each crisis. Now the restored Douglases were most powerful; by the 28th of January 1543 they imprisoned the cardinal, but their party was already breaking up. In March a full parliament was held, the Bible in English was allowed to circulate, and envoys were sent to treat with Henry. But by the 22nd of March Beaton was a free man, liberated by Sir George Douglas. Arran's brother, later archbishop of St Andrews, arrived from France and worked on the wavering regent, while his rival, Lennox, came also from France, and failing to oust Arran, became Henry's pensioner in England. If Arran were illegitimate, Lennox was next heir to the throne, and the consequent Stewart-Hamilton feud was to ruin Mary Stuart. Sir George Douglas went to London and negotiated with Henry for the marriage of Mary and Prince Edward. But the people were still so averse to England that Beaton's was the more popular party: they carried Mary to Stirling: the treaty with Henry was ratified, indeed, but a quarrel was picked over the arrest by England of six Scottish ships; and Arran, who had just given orders for the sack of monasteries in Edinburgh, suddenly (3rd of September) fled to Beaton and was reconciled to the church, just after he had (28th of August) proclaimed Beaton an outlaw.

At once the sacking of religious houses in Dundee, Lindores and Arbroath had begun; the hour of religious revolution had struck; but the godly were put down when the regent and the cardinal were so suddenly reconciled. Arran must have perceived that Henry had infuriated the Scots and that the cardinal might adopt the claims of Lennox and proclaim Arran illegitimate. But Beaton could not keep both Arran, whom he had now secured, and Lennox, who betrayed him, and made for England. The cardinal, however, punished the church-sackers and imprisoned George Douglas, while Hertford in 1544 moved with a large army against Scotland, and Henry negotiated with a crew of discontented lairds and a man named Wishart for the murder or capture of Beaton. Hertford struck at Edinburgh in May, and in the leader's own words "made a jolly fire" and did much mischief. The suffering Commons now began to blame Beaton. Lennox presently married Margaret, Henry's niece, daughter of his sister, Margaret Tudor, by her husband, Angus. Their eldest son was the miserable Henry Darnley, second husband of Mary Stuart. In Scotland arose party divisions and reunions, the queen mother being in the hands of the Douglas faction, while Beaton's future murderers backed him and Arran. Then the Douglases allied themselves with the cardinal, and Henry VIII. tried to kidnap Angus and his brother, Sir George. For once true to their country, they helped Buccleuch to defeat a large English force at Ancram Moor in February 1545, and Henry, seeking help from Cassilis, revived the plot to murder Beaton. Cassilis was a Protestant and the patron of Knox's friend and teacher, George Wishart; Cassilis would not commit himself formally, and the threads of the plot are lost, owing to a great gap in the records.

The Douglases continued to play the part of double traitors; Hertford, in autumn, again devastated the border and burned religious houses (whether he always burned the abbey *churches* is disputed), but Beaton never lost heart and had some successes. We lose trace of the plot to slay him from the 20th of October 1545 till the end of May 1546, the documents being missing; but on the 29th of May 1546 Beaton was cruelly murdered in his castle of St Andrews. On the 1st of March he had caused George Wishart, a man of austere life and a Protestant propagandist, to be strangled and then burned. To what extent revenge for Wishart was the motive of the Kirkcaldys and Leslies and Melvilles who led the assassins, and how far they were paid agents of England, is unknown. These men had been alternately bitter enemies and allies of Beaton; in 1543 Kirkcaldy of Grange and the master of Rothes were offering their venal daggers to England, through a Scot named Wishart. The details of the final and successful plot were uncertain—the martyr Wishart cannot be identified with Wishart the would-be murderer—but with Beaton practically expired the chances of the French and Catholic party in Scotland.

The death of Beaton brought the Douglases into resistance to Henry VIII., who aided the murderers, now besieged in Beaton's castle of St Andrews. An armistice was arranged; the besieged begging for a remission from the pope, and also asking Henry to request the emperor to move the pope to refuse. The remission, however, arrived before the 2nd of April 1547, and was refused by the murderers.

Henry VIII. and Francis II. were now dead. In mid July French armed galleons approached St Andrews, and the castle surrendered as soon as artillery was brought to bear on it. With other captives, John Knox was put aboard a French galley. In September the Protector Somerset (Hertford) invaded and utterly routed the Scots at Pinkie near Musselburgh. No result ensued, except Scottish demands for French aid, and a resolve to send Mary to France. Ferocious fighting, aided by French auxiliaries, followed: in 1550 the English abandoned all castles occupied by them in Scotland. Mary was now in France, the destined bride of the Dauphin; while Knox, released from the galleys, preached his doctrines in Berwick and Newcastle, and was a chaplain of Edward VI., till the crowning of Mary Tudor drove him to France and Switzerland. Here he adopted, with political modifications of his own, the extremest form of Calvinism.

Religious revolution.

A visit of Mary of Guise to France (1550) ended in her acquiring the regency, which she administered mainly under French advice. The result was irritation, the nobles looking towards England as soon as Mary Tudor was succeeded by Elizabeth, while Protestantism daily gained ground, inflamed by a visit from Knox (1555–1556). Invited again, in 1557, he shrank from the scene of turmoil, but a "band" of a Protestant tendency was made by nobles, among them Mary's natural brother James Stewart, later the Regent Murray (3rd of Dec. 1557). On the 24th of April, Mary wedded the Dauphin, and about the same date Walter Milne, an aged ex-priest, was burned as a heretic, the last Protestant martyr in Scotland. There was image-burning by godly mobs in autumn; a threat of the social revolution, to begin at Whitsuntide, was issued on the 1st of January 1559,—"the Beggars' Warning." Mary of Guise issued proclamations against preachers and church-wreckers, backed by a statute of March 1559. The preachers, mainly ex-friars and tradesmen, persevered, and they were summoned to stand their trial in April, but Knox arrived in Perth, where an armed multitude supported their cause. On the 10th of May they were outlawed for non-appearance at Stirling. Knox accuses Mary of Guise of treachery: the charge rests mainly on his word.

On the 10th of May the brethren wrecked the monasteries of Perth, after a sermon by Knox, and the revolution was launched, the six or seven preachers already threatening the backward members of their party with excommunication. The movement spread to St Andrews, to Stirling, to Edinburgh, which the brethren entered, while Mary of Guise withdrew. She was still too strong for them, and on the 24th of July they signed a compact. They misrepresented its terms, broke them, and accused the regent of breaking them. Knox and William Kirkcaldy of Grange had been intriguing with England for aid, and for the marriage of the earl of Arran (son of the earl of Arran, now also duc de Chatelherault, ex-regent) with Queen Elizabeth. He escaped from threatened prison in France, by way of Switzerland, and though Elizabeth never intended to marry him, the Hamiltons now deserted Mary of Guise for the Anglo-Protestant party. Maitland of Lethington, the Achitophel of his day, also deserted the regent; but in November the reformers were driven by the regent and her small band of French soldiers from Edinburgh to Stirling. They were almost in despair, but, heartened by Knox and Lethington, they resumed negotiations with Elizabeth, who had already supplied them with money. An English fleet suddenly appeared, and drove the French to retreat into Leith from an expedition to the west. In February 1560 a league was made at Berwick between Elizabeth and "the Congregation." France was helpless, the tumult of Ambroise alarmed the Guises for their own lives and power, and the regent, long in bad health, was dying in Edinburgh castle. On the 10th of June she expired, and hunger forced her French garrison in Leith, after a gallant and sanguinary defence, to surrender.

After an armistice, treaties of peace were concluded on the 6th of July: the treaty, as far as it touched the rights of Mary Stuart, was not accepted by her, nor did she give her assent to the ensuing parliament or convention of Estates. Knox and the other preachers began to organize the new kirk, under "superintendents" (not bishops), whose rule was very brief. The Convention began business in August, crowded by persons not used to be present, and accepted a Knoxian "Confession of Faith." On the 24th of August three statutes abolished papal and prelatical authority and jurisdiction; repealed the old laws in favour of the church, and punished celebrants and attendants of the Mass—for the first offence by confiscation, for the second by exile, for the third by death. The preachers could get the statute passed, but the sense of the laity prevented the death penalty from being inflicted, except, as far as we know, in one or two instances. The *Book of Discipline* and the *Book of Common Order* express Knox's ideals, which, as far as they were noble, as in the matter of education and of provision for the poor, remained, in part or in whole, "devout imaginations." Not so the Knoxian claims for the power of ministers to excommunicate, with civil penalties, and generally to "rule the roast" in secular matters. The nobles and gentry clung to the wealth of the old church; the preachers, but for congregational offerings, must have starved.

Neglect as well as mob violence left the ecclesiastical buildings in a ruinous condition, but the authority of the preachers, with their power of boycotting (excommunication), became a theocracy. The supernatural claims of these pulpiteers to dominance in matters public or private were the main cause of a century of war and tumult. The preachers became, what the nobles had been, the opponents of authority; the Stuarts were to break them and be broken on them till 1688. In the hands of the ministers a Calvinism more Calvinistic than Calvin's was the bitter foe of freedom of life, of conscience, and of religious tolerance. On the other hand, unlike the corrupt clergy whom they dispossessed, they were almost invariably men of pure and holy life; stainless in honour; incorruptible by money; poor and self-sacrificing; and were not infrequently learned in the original languages of the scriptures. Many were thought to be possessed of powers of healing and of prediction; in fact a belief in their supernormal gifts, like those of Catholic saints, was part of the basis of their prestige. The lower classes, bullied by sabbatarianism and deprived of the old revels, were restive and hostile; but the educated middle class was with the preachers; so were many lesser country gentry; and the nobles, securing the spoils of the church, were acquiescent.

Mary's return to Scotland.

The religious revolution in Scotland, after the work of destruction had been done, was the most peaceful that occurred in any European country. On the Catholic side there was as yet no power of resistance. Huntly, the Catholic "Cock of the North," had himself been compromised in the actions of the Congregation. How the Catholics of the west highlands took the change of creed we do not know, but they were not fanatically devout and attempted no Pilgrimage of Grace. Life went on much as usual, and the country, with a merely provisional government, was peaceful enough under the guidance of Moray, Maitland of Lethington, and the other lay Protestant leaders. They wished, as we saw, to secure the hand of Elizabeth for the earl of Arran, a match which would practically have taken away the Scottish crown from Mary Stuart, unless she were backed by the whole force of France. But Elizabeth had seen Arran in London and had probably detected his hysterical folly. He actually became a suitor for Mary's hand, when the death of her husband the French king (5th of December 1560) left her a friendless exile. Her kinsmen, the Guises, fell from power, and were no longer to be feared by England, so that Elizabeth need not abandon her favourite, Lord Robert Dudley, in the hope of securing Scotland by her marriage with Arran. In the spring of 1561, Mary's brother, Lord James Stewart, lay prior of St Andrews, visited her in the interest of the Scottish Protestant party, while Lesley, later bishop of Ross, brought the promises of Huntly. He would restore the Mass in the North and welcome the queen at Aberdeen if she would land there, but Mary knew the worth of Huntly's word, and preferred such trust as might be ventured on the good faith of her brother. She foiled the attempts of the English ambassador to make her ratify the treaty of Edinburgh, and, while Lethington, no worse a prophet than Knox, predicted "strange tragedies," Mary came home.

Young as she was, she came as no innocent novice to a country seething with all the perfidious ambitions that a religious revolution brings to the surface. She was wise with the wisdom of the Guises, but sincere friends she had none, and with all her trained fascinations she made few, except in the circle of the Flemings, Beatons, Livingstones and Seatons. Lethington, who had deserted her mother, dreaded her arrival; she forgave him, and for a time, relying on him and her brother, contrived to secure a measure of tranquillity.

Scotland was, doubtless, in Mary's mind, a mere stepping-stone to England. There the Catholic party was strong but for its lack of a leader, and to the English Catholics Mary seemed their rightful queen. By one way or other—by a Spanish marriage, by the consent of Elizabeth to recognize Mary as her heir, by the ambitions of her own nobles and the wit of Lethington, ever anxious to unite the island under one sovereign—Mary hoped to wear the three crowns. Catholicism she would restore if she could, but that was not her first object. It was commonly thought that, though she would never turn Calvinist, she might adopt the Anglican doctrine as understood by Elizabeth, if only she could be recognized as Elizabeth's successor. Till she became Elizabeth's captive there was always the possible hope of her conversion, and despite her professions to the pope there was at least one moment when the pope perceived this possibility. Meanwhile she only asked freedom of conscience for herself, and her mass in her own chapel. The bitter fanaticism of Knox on this point encountered the wiser policy of Lord James and of Lethington.

Mary had her mass, but the constant and cowardly attacks on her faith and on her priests embittered her early years of queenhood in her own country. The politicians hoped that Elizabeth might convert Mary to her own invisible shade of Protestantism if the sister sovereigns could but meet, and for two years the promise of a meeting was held up before Mary.

Meanwhile the needy and reckless Bothwell, a partisan of Mary of Guise, a Protestant and the foe of England, was accused by Arran of proposing to him a conspiracy to seize the queen, but the ensuing madness of Arran left this plot a mystery, though Bothwell was imprisoned till he escaped in August 1562. Mary then undertook a journey to the north, which ended in a battle with the Gordons, the death of Huntly and the execution of one of his sons. This attack by a Catholic queen on the leader of the Catholic party has been explained in various ways. But Mary's heart was in the expedition and in the overthrow of Huntly; she was in the hands of her brother, to whom she had secretly given the earldom of Murray, coveted by Huntly, whose good faith she had never believed in, and whose power was apt to trouble the state and disturb her friendly relations with England. She was deliberately "running the English course," and she crushed a probable alliance between the great clans of the Gordons and Hamiltons.

The question of her marriage was all important, and her chances were not improved by the scandal of Chastelard, whether he acted as an emissary of the Huguenots, sent to smirch her character, or merely played the fatuous fool in his own conceit. He was executed on the 22nd of February 1563 at St Andrews. Lethington then went to London to watch over Mary's interests, and either to arrange her marriage with Don Carlos, or to put pressure on Elizabeth by the fear of that alliance. Now, in March 1563, Elizabeth first drew before the Scottish queen the lure of a marriage with her favourite, Lord Robert Dudley, Mary to be acknowledged as her successor if Elizabeth died without issue. Later in the year, and after Lethington's diplomatic mission to France, Elizabeth announced that a marriage of Mary with a Spanish, Imperial or French prince would mean war, while she still hinted at the Leicester marriage, or perhaps at a union with young Henry Darnley, son of Lennox. Elizabeth's real intention was merely "to drive time," to distract Scotland and to leave her rival isolated. The idea of a Spanish marriage excited the wrath of Knox, whose interviews with Mary did nothing but irritate both parties and alienate the politicians from the more enthusiastic Protestants. The negotiations for the Leicester marriage were prolonged till March 1565, when Elizabeth had let slip on Mary Henry Darnley (the young son of Lennox, who himself had been allowed to return to Scotland), and at the same time made it clear that she had never been honest in offering Leicester.

Marriage with Darnley.

Till the spring of 1565, Mary, despite the insults to her religion and the provocations to herself, had remained attached to "the English course" and to the counsels of Moray and Lethington. Her naturally high temper, wearied of treacheries and brow-beatings, now at last overcame her. Darnley was esteemed handsome, though his portraits give an opposite impression; his native qualities of cowardice, perfidy, profligacy and overweening arrogance were at first concealed, and in mid April 1565 Lethington was sent to London, not to renew the negotiations with Leicester (as had been designed till the 31st of March), but to announce Mary's intended wedding with her cousin. Thus the cunning of Elizabeth and Cecil had its reward. Darnley being a Catholic, as far as he was anything, the jealous fears of the Brethren under Knox reached a passionate height. The Hamiltons saw their Stuart enemies in power and favour. Murray knew that his day of influence was over, and encouraged by the promises of Elizabeth, who was remonstrating violently against the match into which she had partly beguiled and partly forced Mary, he assumed a hostile attitude and was outlawed (6th of August 1565). A week earlier Mary, without waiting for the necessary papal dispensation (Pollen, *Papal Negotiations with Mary Stuart*), had publicly married Darnley, who bore the title of king, but never received the crown matrimonial.

Mary now promised restoration to Huntly's son, Lord George; she recalled Bothwell, who had a considerable military reputation, from exile in France; and she pursued Murray with his allies through the south of Scotland to Dumfries, whence she drove him over the English border in October. Here Elizabeth rebuked and disavowed him, and Mary's triumph seemed complete. Her valour, energy and victory over Elizabeth were undeniable, but she was now in the worst of hands, and her career took its fatal ply. Lethington had not left her, but he was overlooked; Lennox and the impracticable Darnley were neglected; and the dangerous earl of Morton, a Douglas, had to tremble for his lands and office as chancellor, while Mary rested on her foreign secretary, the upstart David Riccio; on Sir James Balfour, noted for falseness even in that age; and on Bothwell.

As early as September 1565 gossips were busy over the indiscretion of Riccio's favour: Darnley had forfeited the good opinion of his wife; was angry because the Hamiltons were not wholly sacrificed to the ancient feud of Lennox and his clan; and Knox's party looked forward with horror to the parliament of March 1566, when Mary certainly meant "to do something tending to some good anent restoring the ancient religion." She was also supposed to have signed a Catholic league, which only existed in devout imaginations, but in February 1560 she sent the bishop of Dunblane to crave a large subsidy from the pope. Quite ignorant as to the real state of affairs, he raised the money and sent a nuncio, who never risked himself in Scotland, but made the extraordinary proposal later, that Mary should execute or at least "discourt" her chief advisers.

Meanwhile the clouds of hatred gathered over the queen. Lethington (5th of February 1566), wrote to Cecil saying that "we must chop at the very root," and Randolph, Elizabeth's ambassador, heard that measures against Mary's own person were being taken. Randolph was dismissed for supplying Murray with English gold; from Berwick he and Bedford reported to Cecil the progress of the conspiracy. While Mary was arranging a marriage between Bothwell and the late Huntly's daughter, Lady Jane Gordon, Darnley intrigued with Lord Ruthven and George Douglas, a bastard kinsman of Morton, for the murder of Riccio, and for his own acquisition of the crown matrimonial. Morton and Lindsay were brought into the plot, while Murray, in England, also signed. He was to return to Edinburgh as soon as the deed of slaughter was done, and before parliament could proceed to his forfeiture.

Riccio's murder.

Mary, according to Ruthven's published account, had herself unconstitutionally named the executive committee of parliament, the Lords of the Articles, who were usually elected in various ways by the Estates themselves. While Mary was at supper, on the 9th of March, Darnley, with Ruthven, George Douglas and others, entered the boudoir in Holyrood, by his private stair, while Morton and his accomplices, mainly Douglases, burst in by way of the great staircase. There had been an intention of holding some mock trial of Riccio, but the fury of the crowd overcame them: Riccio was dragged from Mary's table and fell under more than fifty dagger wounds. While Mary, Darnley and Ruthven exchanged threats and taunts, Bothwell and Huntly escaped from the palace, but next day, Mary contrived to send letters to them and Atholl. On the following evening Murray arrived, and now even Murray was welcome to his sister. Darnley had taken on him (his one act of kingly power) to dismiss the parliament, but he now found himself the mere tool of his accomplices. He denied—he never ceased to deny—his share in the guilt, and Mary worked on his vanity and his fears, and moulded his "heart of wax" to her will. On his assurances the lords, expecting an amnesty, withdrew their guards from the palace and next day found that the bird had flown to the strong castle of Dunbar. Hence Mary summoned the forces of the country, under Bothwell and Huntly; she forgave Murray; the murderers had no aid from the Protestants of Edinburgh, who as before failed them in their need. Knox himself fled to Kyle, though there is no evidence that he was privy to a deed which he calls "worthy of all praise," and Morton and Ruthven spurred to Berwick, while Lethington skulked in Atholl. His possessions were handed over to Bothwell. Darnley betrayed some obscure accomplices. He was now equally detested by Murray, by the new exiles and by the queen, while she reconciled Murray and Bothwell. She tried to assuage all feuds; in an inventory of her jewels she left many of them to Darnley, in case she and her child did not survive its birth. The infant, James, was born in the castle on the 19th of June.

On Mary's recovery, her aversion to Darnley, and her confidence in Bothwell, were unconcealed; and, early in September, she admitted Lethington to her presence. She had learned that Darnley meant to leave the country: she met him before her Privy Council, who sided with her; he withdrew, and the lords, including Murray, early in October signed a "band" disclaiming all obedience to him. On the 7th or 9th of October, Mary went to Jedburgh on the affairs of Border justice, and a week later she rode with Murray to Hermitage castle, where for several days Bothwell had lain, wounded nearly to death by Eliot, a border reiver. On her return she fell into an almost fatal illness and prepared for her end with great courage and piety; Darnley now visited her, but was ill-received, while Bothwell was borne to Jedburgh from Hermitage in a litter. While Buchanan represents the pair as indulging in a guilty passion, the French ambassador, du Croc, avers that Mary was never in better repute with her subjects. On the 24th of November Mary was at Craigmillar castle, near Edinburgh, where undoubtedly she held a conference with her chief advisers that boded no good to Darnley; and there were rumours of Darnley's design to seize the infant prince and rule in his name. The evidence on these points is disputable, but now, or not long after, Huntly, Bothwell, Lethington and Argyll signed a "band" for Darnley's murder.

Meanwhile, in December, Mary held the feasts for the baptism of her son by Catholic rites at Stirling (17th of December), while

Darnley's murder.

Darnley stood aloof, in fear and anger. A week later, moved by Bedford, representing Elizabeth, and by Bothwell and her other advisers, Mary pardoned Morton and his accomplices. She also restored Archbishop Hamilton to his consistorial jurisdiction, but withdrew her act, in face of presbyterian opposition. Darnley had retired to his father's house at Glasgow, where he fell ill of small-pox, and, on the 14th of January 1567 Mary, from Holyrood, offered to visit him, though he had replied by a verbal insult to a former offer of a visit from Stirling. About this week must have occurred the interview in the garden at the Douglas's house of Whittingehame, between Morton, Bothwell and Lethington, when Morton refused to be active in Darnley's murder, unless he had a written warrant from the queen. This he did not obtain. On the 20th of January 1567 Mary left Edinburgh for Glasgow, her purpose being to bring Darnley back to Craigmillar. At this time (the 22nd–25th of January), she must have written the two first Casket Letters to Bothwell. Letter II. (really Letter I.) leaves no doubt, if we accept it, as to her murderous design (see Casket Letters). What followed must be read in Mary's biography: the end was the murder of Darnley in the house at Kirk o' Field, after the midnight of Sunday, the 9th of February.

Marriage with Bothwell.

Public and conspicuous as was the crime, the house being blown up with gunpowder, no secret has been better kept than the details. The facts of Mary's lawless marriage with Bothwell, her capture at Carberry Hill, her confinement in Loch Leven Castle, her escape, her defeat at Langside, and her fatal flight to an English prison, with the proceedings of the English Commissions, which uttered no verdict, must be read in her biography (see Mary Stuart).

James VI.: Internal Contentions.

Scotland was now ruled by her brother, the Regent Murray, in the name of her infant son, James VI. Murray arrested Lethington, as accused of Darnley's murder, and Lethington was now lodged under ward in Edinburgh, but Kirkcaldy of Grange released him and gave him shelter in Edinburgh castle, which he commanded (23rd of October). Lethington was to be tried, but his armed friends mustered in great numbers, and, secure in the castle, he and Kirkcaldy upheld the cause of Mary. Lethington's motive is obvious; in Mary's success lay his chance of safety: how he won over Kirkcaldy is unknown. The rebellion in the north of England failed, Northumberland was driven across the border, and it was Murray's idea to barter him for Mary, in the beginning of January 1570. But on the 23rd of January, Murray was shot dead, in the street of Linlithgow, by a Hamilton, with the approval and aid of Archbishop Hamilton and other heads of the house.

The contending parties, queen's men and king's men, now made approaches to each other; neither had a share in the Hamiltons' crime. But Randolph, sent to Edinburgh for the purpose, kept them apart; Elizabeth despatched Sussex to ravage the Scottish border, in revenge for a raid by Buccleuch, and in May Lennox entered Scotland with an English force and soon was appointed regent (17th of July). This meant a war of Stuarts against Hamiltons, and, generally, of "Queen's men" against "King's men." Truces and empty negotiations merely protracted disorder. On the 2nd of April 1571 Mary's party lost Dumbarton castle, which Crawford of Jordanhill took by a daring night surprise; and Archbishop Hamilton, a prisoner, was hanged without trial. In May the Hamiltons entered Edinburgh, and later Lennox, in a parliament held at Leith, secured the forfeiture of Lethington. As the year passed by, Argyll, Cassilis, Eglintoun and Boyd went over to Lennox's party, and in an otherwise futile raid of Kirkcaldy's men on Stirling, Lennox was captured and was shot by a man named Calder. In England the Ridolphi-Norfolk plot was discovered, and at the end of 1571 Buchanan's "Detection" of Mary, with translations of the Casket Letters, was published. Though Mar was now regent, Morton was the man of action. In February 1572 he forced on the kirk an order of bishops, "Tulchan bishops," filters through which the remaining wealth of the church trickled into the coffers of the state, or of the regent.

Crown and Kirk.

This was the beginning of the sorrows of more than a century. The kirk Presbyterian was founded on the Genevan model, and was intended to be a theocracy. She had claimed, since the riots at Perth in 1559, the Power of the Keys, with the power of excommunicating even the king, a sentence practically equivalent to outlawry. These pretensions were incompatible with the freedom of the state and of individuals. It became the policy of the crown to check the preachers by means of the order of bishops, first reintroduced by Morton, and worthy of their origin. The kirk was robbed afresh, benefices were given to such villainous cadets of great families as Archibald Douglas, an agent in Darnley's murder; and though, under the scholarly but fierce Andrew Melville, the kirk purified herself afresh and successfully opposed the bishops, James VI. dominated her again, when he came to the English crown, and the result was the long war between claims equally exorbitant and intolerable, those of the crown and the kirk.

The death of Mar (28th of October 1572) left power in the stronger hands of Morton, and the death of Knox (24th of November) put the kirk for a while at the mercy of the new regent. Meanwhile Mary's party dwindled away; at a meeting in Perth (23rd of February 1573) her thanes fled from her, and Elizabeth at last reinforced Mary's enemies with men and artillery. On the 28th of May Edinburgh castle surrendered at discretion. Lethington, the heart of the long resistance, died, a paralytic, in prison, and Morton resisted the generous efforts made to save the gallant Kirkcaldy. Knox had prophesied that he would be hanged, and hanged he was.

Despite the ferocity of partisans in "the Douglas wars," an English envoy reported that the power of the country gentry and the boroughs had increased, while that of the great wavering nobles, Hamilton, Huntly and others, was diminishing. The "navy was so augmented as it is a thing almost incredible," but none the less £100 sterling was worth as much, Drury wrote from Berwick, as £1000 Scots.

In 1575, at the General Assembly, Andrew Melville, now a man of thirty, and, with Buchanan, the foremost scholar of Scotland, especially in Greek, caused the lawfulness of bishops to be mooted. Thenceforward Scotland was engaged in a kind of "bishops' war." Meanwhile Morton found the old Marian party-feud reviving, and in 1577, knowing his own guilt in Darnley's murder, he attempted to win the alliance of Mary for his own security. In March 1578, a coalition of his public and private foes caused Morton to resign the regency, while the young earl of Mar became custodian of the boy king. On the 28th of May, Morton allied himself with Mar, who commanded Stirling castle, and after negotiations recovered power. Atholl was his chief opponent, but in April 1579 he died suddenly, after dining with Morton; poison was suspected. Morton, with Angus, attacked the Hamiltons, whose chiefs fled the country, accompanied by the worst of traitors, Sir James Balfour. Knowing all the secrets of Darnley's murder, Balfour revenged himself by raking up Morton's foreknowledge of the deed; and here he was helped by the influence exercised over the young king by his cousin Esmé Stuart d'Aubigny (a son of Darnley's paternal uncle, John), who came to Scotland from France in September 1579. D'Aubigny allied himself with Knox's brother-in-law, James Stewart of the house of Ochiltree, captain of the King's Guards, an able, handsome, learned, but rapacious man. The Hamiltons, now in English exile, were forfeited; d'Aubigny received the earldom of Lennox; and, as after Darnley's death, placards, were posted urging the trial of Morton for that crime. As against the new Lennox, Morton was deemed a friend by the preachers, though Lennox professed to be reconciled to the kirk. Throughout 1580 Elizabeth encouraged Morton, with her wonted fickle treachery. In October she recalled her ambassador, and left Morton to his fate. Sir James Balfour secretly returned from France with his information, and Morton was accused and arrested on the last day of 1580. Elizabeth sent old Randolph to threaten and plead, but Lennox and James Stewart were too powerful. Morton was tried on the 1st of June 1581, was found guilty, and, with one Binning, who had accompanied Archibald Douglas to the scene of Darnley's murder, was executed. His title went to the Douglases of Lochleven. James Stewart received the Hamilton earldom of Arran, and under him and Lennox the young king began his long strife with the kirk and his half-hearted dealings with the Catholics and his mother.

It is impossible here to follow the course of the strife, in which the godly were led by the earls of Gowrie and Angus. Gowrie seized James, and power, at Ruthven (August 1582), a step approved of by the preachers. In June 1583, James escaped to St Andrews and was surrounded by his party. In November he made the son of Lennox, who had died in France, a duke; Arran was again in power, and Melville with other preachers fled to England in 1584, after the execution of Gowrie for high treason. The king and council were proclaimed judges in all cases; preachers were to submit to their judicature when accused of political offences, a standing cause of strife.

No longer needing Catholic assistance, James threw over his mother, with whom he had been intriguing, and sent the beautiful Master of Gray to betray Mary's secrets to Elizabeth. At the end of 1585, all James's exiled foes, Douglases, Hamiltons and others, returned across the border in force, caught the king at Stirling, drove Arran into hiding, restored the Gowrie family, and became the new administration. In 1586, the Babington plot was arranged, and discovered by those who had allowed it to be arranged. James practically did nothing to rescue his mother: one of his representatives in England was that Archibald Douglas who helped to slay his father.

Death of Mary.

The execution of Mary on the 8th of February left James "a free king" as far as his mother's claim to the throne was concerned, and he had his pension of £3000 or £4000 from Elizabeth. Thus war between the two countries was avoided. Thenceforth, till James came to the throne of England, the history of Scotland was but a series of inchoate revolutions, intrigues that led to nothing definite and skirmishes in the war of kirk and state. The king had to do with preachers who practically held the doctrines of Becket as to priestly pretensions. James was "Christ's silly vassal," so Andrew Melville told him, and "Christ" in practice meant the preachers who possessed the power of the keys, the power to bind and loose on earth and in heaven. The strange thing is that while Elizabeth warned James against the pretensions of men who "would have no king but a presbytery," whenever he was at odds with the ministers and with the nobles who kept trying to seize his person with the approval of the ministers, Elizabeth secretly or openly backed the kirk.

The kirk was strong enough to compel James to march, more than once, against the Catholic earls, Huntly, Errol, Angus and others. They, again, constantly intrigued with Spain, and there were moments when James, driven desperate by the preachers, listened to their projects. He was anti-papal by conviction, yet hoped for help from Rome, and was so far implicated in the adventures of his Catholic subjects that, in the interest of his own character, he had to advance against them and drive them into exile. In 1590 he married Anne of Denmark: in 1592 his character suffered through the murder, by Huntly, of "the bonny earl o' Murray," suspected of favouring the madcap Francis Stewart, earl of Bothwell (nephew of Queen Mary's Bothwell), a man who made it his business to kidnap the king, and who presently, by the help of Gowrie's widow, seized him in Holyrood. In 1592 parliament "ratified the liberty of the true kirk," leaving little liberty for king and state, since, in the phrase of one preacher, "the king might be excommunicated in case of contumacy and disobedience to the will of God," as interpreted by the ministers. In the following year (23rd of July 1593) Bothwell, much favoured by the preachers, made his capture of James, but had not the power to hold him long, and a later revolutionary attempt in the same year, by Atholl and the young earl of Gowrie, was a failure.

Gowrie went abroad and passed some time at the university of Padua; to him the eyes of the preachers were hopefully turned after 1596. As Bothwell had become a Catholic, they excommunicated him in 1595: in 1596 James resolved to recall the exiled Catholic peers; the commissioners of the General Assembly, alarmed and infuriated, met in Edinburgh, ordered a day of humiliation, decided to excommunicate the Catholic earls and established a kind of revolutionary committee of public safety. James insisted on his own authority; insisted that a secular court had a right to try a virulent preacher who declined the secular jurisdiction when accused of having denounced Queen Elizabeth as an atheist. The quarrel waxed: the gatherings summoned by the preachers were declared to be seditious; a meeting in a church ended in a threatening riot that raged round the Tolbooth, where James was sitting, and on the following day he with his Court withdrew to Linlithgow (18th of December 1596). The Court of Session was also to be removed, and the burgesses, fearing loss of trade, laid down their arms. The leader of the clerical agitation, Mr Bruce, with a wild preacher named Balcanquhal, fled to England, and James returned in triumph to his capital on the 1st of January 1597. He followed up his victory; a General Assembly at Perth was obedient to his will: the preachers were forbidden to criticize, from the pulpit, acts of parliament or of the privy council; they were forbidden to call conventions without the royal person or authority and to attack individuals in their sermons.

In the great towns, moreover, ministers might not be appointed to charges without the king's consent, and in this course James advanced, with but slight opposition, till he put the preachers under his feet. In a long series of crafty movements James managed to reintroduce episcopacy (1598–1600) by the aid of packed General Assemblies, later declared void by the Covenanters (1638). He increased Presbyterian emotion by the suspicion that he was intriguing with Catholic powers, and by his book on the rights and duties of a king (*Basilicon Doron*), which fell into the hands of Andrew Melville. Some cryptic correspondence with the pope, whether actually by James or by Elphinstone, one of his ministers, came apparently to the knowledge of the English court; his secret relations with the earl of Essex were, if not known, suspected; the young earl of Gowrie, returned from a residence on the continent, was too effusively welcomed by Elizabeth in May 1600; and James made a tactless speech when asking parliament for money towards his "honourable entering to the crown of England after the death of the queen." He was in deep poverty, the Estates were chary of supplies, plotters in Scotland had been offering to Cecil to kidnap the king (1598), and his relations both with the English government and with his own subdued but struggling preachers were bitterly unfriendly.

Gowrie conspiracy.

It is not known whether the mysterious events that culminated in the slaying of the earl of Gowrie and his brother, by John Ramsay, in their own house in Perth, on the 5th of August 1600, had any connexion with James's attitude to England and the kirk. The most probable explanation is that Gowrie laid, with the utmost secrecy, a plot to lure James to Perth, kidnap him there, transport him to Fastcastle, a fortress of the profligate and intriguing Logan of Restalrig, on the Berwickshire coast, and then raise the Presbyterian party. If we could accept the evidence of a letter attributed to Logan and produced in 1608, this theory would be valid. But the letter has been proved beyond question to be a forgery, though it may very well be a forged copy of a genuine original (see *The Gowrie Conspiracy Confessions of George Sprot*, by A. Lang, Roxburghe Club, London, 1902). Certainly no plot was laid by James to entrap the Ruthvens, and the only question is, was the brawl in which they fell accidental, or had a plot hatched in deep secrecy been frustrated by unexpected circumstances? (In *James VI. and the Gowrie Conspiracy* the writer argues in favour of the latter solution.) In any case the scepticism of the Edinburgh ministers, especially of Bruce, encouraged the tendency of the people to think the worst, and led to the banishment, followed by other restrictions and sufferings, of Bruce himself. The house of Gowrie, so long hostile to Mary Stuart and James, was forfeited and ruined. Charles I. was born just after the trial of the dead Ruthvens (19th of November 1600), and his mother was, as ususal, opposed to the king's recent proceedings.

James becomes king of England.

In 1602 Cecil was engaged in dark plots against James; the rising of Essex (of which James probably was expectant) had failed; but by the end of the year Cecil had entered into a secret understanding with James to favour his claims to the English succession. Elizabeth's last letter to the king was of the 5th of January 1603; she died in the earliest hour of the 1st of April, and James, late on the 3rd of April, had the news from Carey. He entered London on the 6th of May, whence he henceforth, as he said, governed Scotland "by the pen." Entirely safe from the usual turbulent movements of Scottish opposition, and but ill acquainted with Scottish opinion, he could dictate measures which were oppressive to the preachers and unwelcome to the majority of the laity. He kept the kirk for two or three years without a General Assembly, to which they had a legal right, and (with at least a shadow of legal right) he proclaimed unlawful the assembly of Aberdeen (1605). Though the recalcitrants who held it were punished, James's own officials saw that he had gone too far. His bishops were already becoming odious to his nobles; his prorogation of General Assemblies continued, and the brothers Melville, called to England, were treated with unconstitutional harshness. Andrew, who behaved with injudicious violence, was banished to France, James to Newcastle; other preachers were confined to their parishes; and by a mixture of chicanery (as at the pseudo assembly of Linlithgow) and of violence, the king established his tottering episcopacy, and sowed the dragon's teeth of civil war. Catholics were equally or more severely persecuted; and though the Borderers were brought into tranquillity, it was by measures of indiscriminate severity.

A scheme for complete union of England and Scotland, promoted by James and by Francis Bacon, was unwelcome to and rejected by the two jealous countries (1604–1606). But *Postnati*, subjects born in Scotland after James's accession to the English throne, were allowed to purchase and hold real property, and "to bring real actions for the same," in England (1608).

In 1610 James had three Scottish bishops consecrated by three English bishops, ensuring for the northern country apostolic succession; and justices of the peace were created in Scotland. The "plantation" of Ulster by Scottish colonists was begun and flourished. Catholics were more and more persecuted, and in 1615 Father Ogilvie was executed, after abominably cruel treatment in which Spotiswoode, archbishop of Glasgow, took an unworthy share. In the same year the king's "Courts of High Commission" were consolidated, and an organ was actually placed in the royal chapel at Holyrood.

In 1617 James visited his native land: ecclesiastical brawls at once broke out, and James vigorously pushed, in face of the disfavour even of his bishops, the acceptance of his famous Five Articles. They were accepted at Perth, in 1618, but were evaded wherever evasion was possible. Communicants were to kneel, not to sit, a thing that had, of all others, been odious to John Knox; Easter was to be observed, also Christmas, contrary to earnest consciences; confirmation was introduced; the Communion might be administered to the dying in their houses; and baptism must be on the first Sunday after the child's birth. These articles, harmless as they may seem to us, were the last straw that Scottish loyalty could bear. In 1621, they were carried in parliament by a fair majority; to the horror and bitter indignation of all men and women of the old leaven. Worse, the English liturgy was used in a college chapel of St Andrews on the 15th of January 1623. James tried to suppress the general irritation by a proclamation against conventicles, and a threat to take away the courts of law from Edinburgh, if people did not go to church on Christmas day. He postponed the threat till Easter 1625, but, says Calderwood, "The Lord removed him out of the way fourteen days before the Easter Communion." He died on the 27th of March. Encouraged by safety and adulation in England; grasping at the Tudor ideal of kingship, determined to reduce to order the kirk from which he had suffered so many injuries and insults, he sowed the wind and his son reaped the whirlwind.

Charles I.

Only the chief moments in the struggle between Charles I. and the Scots can be touched on in this summary. James VI. had succeeded in his struggle with the preachers partly by satisfying the nobles with gifts out of old church lands. Charles I. reunited the kirk and the nobles by threatening, or seeming to threaten, to resume or impair these gifts, and also by his favour towards the universally detested bishops (1625–1629). Mr S. R. Gardiner speaks of the final shape of Charles's measure as "a wise and beneficent reform"; and he did aim at recovering the "teinds" or tithes, and securing something like a satisfactory sustenance for ministers. But he had caused alarm, and he refused all demands for the withdrawal of the loathed articles of Perth. The younger bishops too were not "sound" in Calvinism; many were looked on as Arminians. Protests were uttered in 1633, when Charles entered Edinburgh and held a parliament. Above all, and most legitimately, the revival of General Assemblies, now long discussed, was demanded vainly.

By 1636, Charles and Laud had decided to introduce a liturgy, a slightly, but in Scottish apprehensions "idolatrously," modified version of the Anglican prayer-book. Anglicanism was a limb of Antichrist; extempore prayers were regarded as inspired: a liturgy was "a Mass-book." The procedure was purely despotic, and at the first attempt to use the liturgy in St Giles's there broke out the famous "Jenny Geddes" riot in the church (23rd of July 1637). The nobles of the country, the ministers and lairds, met in Edinburgh and sent a petition against the liturgy to Charles. In November were formed "The Tables," a standing revolutionary committee of all Estates.

The Covenanters.

Constant meetings hurled protestations against the bishops; no man was more active than the young Montrose. In February 1638 the Covenant, practically a "band" of the whole country, enforced on reluctant signers, was launched. It made Scotland, like Israel, "a covenanted people" for the defence and propagation of the old Presbyterianism of Andrew Melville, and many devotees held that it was for ever binding on the nation. Legists differ as to whether the band was legal or not, but revolutions make their own laws, and the Covenant could not be more illegal than the imposure of the liturgy. Charles drove on the bishops, who better understood the situation, and he sent the half-hearted Hamilton to negotiate and threaten in Edinburgh, where the Covenanters were blockading the castle. But Charles did grant a General Assembly in Glasgow (21st of November), where, among unseemly uproar, the ecclesiastical legislation of James I. was rescinded, the law and custom of forty years were abolished, conformist clerics were expelled, and the earl of Argyll appeared as leader of the extreme party, while Montrose was the general of the armed Covenanters. In 1639 he was as active in arms in the north as Hamilton, on the king's side, was dilatory and helpless in the south. By May the chief clerical leader, Henderson of Leuchars, was denouncing Royalists as "Amalekites," and by biblical precedent Amalekites receive no quarter. Prelacy was "Baal worship," and the kirk thus turned the strife in the direction of religious ferocity.

While Charles hung irresolute on the eastern border, the Covenanters, under Alexander Leslie, took heart, occupied Duns Law, and terrified Charles into negotiations (11th–18th June). A hollow pacification was made: the assembly of August 1639 imposed the signing of the Covenant on all Scotsmen. A parliament (31st of August) demanded the loss of votes (fourteen) by bishops, and freedom of debate on bills formed by the Lords of the Articles, who had practically held all power; while Argyll carried a bill demanding for each estate the right to select its own representatives among these lords. Traquhair, as royal commissioner, prorogued parliament; negotiations with the king in London had no result; and in 1640 the prorogation was contemned, and though opposed by Montrose, the parliament constituted itself, with no royal warrant. War was at hand, but Montrose formed a party by "the band of Cumbernauld," to suppress the practical dictatorship of his rival and enemy, Argyll, who, he understood, was to be one of a triumvirate, and absolute north of Forth. Argyll allowed the committee of Estates to rule, as before, and bided his time. On the 20th of August Montrose was the first of the Covenanting army to cross the Tweed; Newcastle was seized, and Charles, unsupported by England, entered on the course of the Long Parliament and the slaying of Strafford. In Scotland the secret of the Cumbernauld band came out; Montrose, Napier and other friends were imprisoned on the strength of certain ambiguous messages to Charles, and on the 27th of July, being called before parliament, Montrose said—" My resolution is to carry with me honour and fidelity to the grave." Montrose kept his word, while Hamilton stooped to sign the Covenant. Montrose lay in prison while Charles I. visited Scotland and met the parliament, perturbed by the dim and unintelligible plot called " The Incident " (October 1641), which seems to have aimed at seizing the persons of Argyll, Hamilton and his brother Lanark. All that is known of Montrose, in this matter, is that from prison he had written thrice to Charles, and that Charles had intended to show his third letter to Argyll, Hamilton and Lanark, on the very day when they, suspecting a plot, retired into the country (12th of October). An agitated inquiry which only found contradictory evidence was disturbed by the news of the Irish rebellion (28th of October). Charles heaped honours on his opponents (Argyll was the one marquis of his name), and hastened to England. The country was governed by fifty-six members of the Estate and by the dreaded commission of the General Assembly, for now the kirk dominated Scotland, denying even the right of petition to the lieges.

The "Incident."

The Great Rebellion.

The English parliament, at war with the king, demanded aid from Scotland; it was granted under the conditions of the Solemn League and Covenant (1643), by which the Covenanters expected to secure the establishment of Presbyterianism in England, though the terms of agreement are dubious. Scotland, however, regarded herself as bound to war against " Sectaries," and so came into collision with Cromwell, to her undoing. In January 1644, a Scottish army crossed Tweed, to aid the parliament, with preachers to attend the synod of Westminster. Already some 2000 men from Ireland, mainly of Macdonalds and other clans driven into Ireland by the Argylls, were being despatched to the west Highland coast. Lanark, from Oxford, fled to join the Covenanters; Charles imprisoned Hamilton in Cornwall; Montrose was made a marquis; Leslie, with a large Scottish force and 4000 horse, besieged Newcastle. Montrose arrived a day too late for Marston Moor (2nd of July 1644); Rupert took his contingent; he entered Scotland in disguise, met the ill-armed Irish levies under Colkitto, raised the Gordons and Ogilvies, who supplied his cavalry, raised the fighting Macdonalds, Camerons and Macleans; in six pitched battles he routed Argyll and all the Covenanting warriors of Scotland, and then, deserted by Colkitto and the Gordons, and surprised by Leslie's cavalry withdrawn from England, was defeated at Philiphaugh near Selkirk, while men and women of his Irish contingent were shot or hanged months after the battle.

The clamour of the preachers was now for blood, and gentlemen taken under promise of quarter were executed by command of the Estates at St Andrews, for to give quarter was " to violate the oath of the Covenant "—as interpreted by the clergy. It would have been wiser to put the revenges as reprisals for the undeniable horrors committed by Montrose's Irish levies. The surrender of Charles to the Scots, the surrender by the Scots of Charles to the English, for £200,000 of arrears of pay, with hopes of another £200,000 (February 1647), were among the consequences of Montrose's defeat. But the surrender of the king festered in Scottish consciences; for the country was far from acquiescing in the transaction.

Leslie, by the advice of one Nevoy, a preacher, massacred, on his return to Scotland, the Macdonalds in Dunaverty castle. A strife arose between Hamilton, who wished to disband the Covenanting army, and Argyll, and gradually the struggle was between Hamilton and the sympathizers with the imprisoned king and Argyll at the head of (or under the heels of) the more fanatical preachers and Presbyterians. The Scottish commissioners in England, with Lauderdale, and with the approval of Hamilton's faction, signed, at the end of 1647, " The Engagement " with Charles, and broke away from the tyranny of the preachers. The Engagers had the majority in parliament, but were frantically cursed from the pulpits; they and their army mustered for the deliverance of their king. In August 1648, they crossed the border, leaving the fanatics to arm in their rear, but Cromwell, by a rapid march across the fells, caught and utterly routed them at Preston and on the line of the Ribble, taking captive the infantry and Hamilton, who was sent to the block.

Execution of Charles I.

This was the kirk's proudest triumph; the countrymen of the preachers had been ruined on " St Covenant's Day." The preachers, with Lords Loudoun and Eglintoun, Argyll and Cassilis, armed and raised the godly, and occupied Edinburgh. The parliamentary committee capitulated with the extremists, who sent friendly messages to Cromwell, and Argyll met him on the Tweed. Thence Cromwell sent Lambert with seven regiments to Edinburgh, where he himself stayed for some time. A parliament in Argyll's and the preachers' interest met there in January 1649; only sixteen nobles were present, as against fifty-six in the previous year. The execution of Charles I. (30th of January 1649) left the extreme party in a quandary. How could they keep terms with " bloody Sectaries " that had slain their king, in face of the protests of their envoys? They did pass the Act of the Classes, disabling all " Engagers " from all manner of offices, military and civil, and dividing the distracted country into two hostile camps. On the 5th of February Charles II. was proclaimed king in Edinburgh, if he took the two Covenants. This meant war against England, and war in which the Engagers and Royalists could not take part. The situation developed into ruin under the strife of the wilder and the gentler preachers.

Death of Montrose.

Communications with Charles II. at the Hague were opened, and the Scots accused the English of breach of the Solemn League and Covenant. Huntly, as a Royalist, was decapitated at Edinburgh; and the envoys of Charles, thanks to the advice of Montrose, failed to induce him to stamp himself a recreant and a hypocrite by signing any covenants. But Montrose (January 1650) was sent by Charles to " search his death," as he said, in an expedition to the north of Scotland, while, in the absence of his stainless servant, Charles actually signed the treaty of Breda (1st of May). In April Montrose was abandoned by his royal master, and was defeated at Carbiesdale, on the south side of the kyle, or estuary, of Shin and Oykel; he was betrayed, insulted, bullied by the preachers, and, going to his death like a bridegroom to the altar, was hanged at Edinburgh, on the 20th of May. " Great in life, Montrose was yet greater in his death." He had kept his word, he had " carried fidelity and honour to the grave " (Gardiner). His head was set on a spike and his quartered limbs were exposed in various places.

Royalist cause in Scotland.

Charles came to Scotland; he signed the Covenants, while his tormentors well and duly knew that the action was a base hypocrisy, that they had tempted him to perjury. Cromwell, who now crossed the border, impressed this truth, as far as he might, on the preachers, who made Charles sign declarations yet more degrading, to the discredit of his father and mother. Meanwhile David Leslie, with singularly excellent strategy, foiled and evaded Cromwell in the neighbourhood of Edinburgh, till the great cavalry leader was forced to retreat towards England. At Dunbar Leslie held Cromwell in the hollow of his hand, but his army had been repeatedly " purged " of all Royalist men of the sword by the preachers; they are said, and Cromwell believed it, to have constrained Leslie to leave his impregnable position and attack on the lower levels. Leslie appears to have intended a surprise, as at Philiphaugh, but " through our own laziness," he confesses, the surprise came from Cromwell's side, and few of the Scots except the mounted gentry escaped from the crushing defeat at

Dunbar (3rd of September). Of the prisoners an unknown number died of hunger in Durham cathedral, others were sold to slavery in the colonies.

Cromwell had occupied the country south of the Forth, while Argyll was Charles's master, extorting hard terms from the prisoner, who once ran away. The committee of Estates, on hard terms, gave an indemnity to Royalists whose swords they needed; many ministers acquiesced ("The Resolutioners"), the more fanatical dissidents were called "Remonstrants," and now the kirk was rent in twain by the disputes of these two factions. The Remonstrants, clerical and military (Guthrie and Strachan), would not support Charles while he was not "under conviction," and Strachan was excommunicated by the Resolutioners. On the 20th of July 1651 Lambert defeated the Royalists at Inverkeithing; Forth no longer bridled Cromwell; Leslie was sure to be outflanked, and, with Charles, he evaded Cromwell, marched into the heart of England (unaccompanied by Argyll), and was defeated and taken, while Charles made a marvellous escape at Worcester (3rd of September 1651).

The Restoration.

The conquest of Scotland was soon completed; at last she lay at an English victor's feet; the General Assembly was turned out into the street by "some rats of Musketeers and a troup of horse," and the risings of Glencairn, Lorne (eldest son of Argyll) and others in the highlands were easily crushed. Argyll, deserted and detested, compromised himself by letters to Monk, containing intelligence as to the movements of the Royalists. While the rival bands of preachers squabbled, Cromwell, like Edward I., arranged that Scottish members should sit in Westminster, and, commercially, as in the administration of fair justice, and the peace of the country, Scotland prospered under English rule. But Monk withdrew his force to London in January 1660, and hurrying events brought the joyous Restoration of the 29th of May.

The festivities in Scotland were exuberant, but it was impossible that tranquillity should be restored. The Remonstrants, that is, the clerical fanatics to whom toleration was more especially abominable, are reckoned (Hume Brown) as the majority of the preachers, but exact statistics cannot be obtained. In their eyes, as Charles had taken both Covenants, he was bound to remain a Presbyterian and to establish Presbyterianism in England, a thing impossible and entailing civil war in the attempt. Even the representatives of the Resolutioners urged Charles not to use the Anglican service, though they confided to Sharp, their agent in London, their opinion that, if the Remonstrants (or Protesters) had any hand in affairs, "it cannot but breed continual distemper and disorders." Suppose that the kirk was restored by Charles to her position in 1592, with General Assemblies. With the violent party in a majority, refusing the jurisdiction of the state, insisting on the establishment of Presbyterianism in England, excommunicating and scolding, Scotland would be as much disturbed as in the days of Andrew Melville. "Neither fair nor other means are likely to do with them" (the fanatics), says Baillie, principal of Glasgow University, himself a Covenanter from the beginning. He wished to banish the Remonstrants to Orkney.

Historians do not usually seem to perceive that Charles was faced by the old quarrel of church and state, in which "fair means" were seen to be unavailing, while "unfair means" only succeeded, after some thirty years, in breaking down the old Presbyterian spirit so much that, after 1688, the state could hold her own. Charles, without first summoning the Estates, named his own privy council and ministers, of whom Lauderdale, long a Covenanter, came presently to be governor of Scotland. As Argyll, in face of all warnings, went to court, he was arrested, and during the session of parliament of January 1661 was tried for treason, and, on the ground of his letters to Monk, was convicted and executed, as was the leading Remonstrant preacher, James Guthrie, accused of holding an illegal conventicle, "tending to disturbance, . . . and, if possible, rekindling a civil war."

The history of the country during the Restoration falls naturally into four periods.

Four periods during the Restoration.

I. In the first (1660–1663) the royal commissioner to parliament was the earl of Middleton, a soldier of fortune who had been in arms for the Crown as late as 1655, who had been excommunicated by the kirk, and was determined to keep down the preachers. With him were the Cavalier party, anxious to recover their losses during the civil war. All were impoverished, and greed was the dominant motive of the members of the privy council, the rulers of the country. Meanwhile, in London, the earl of Lauderdale, once a fervent Covenanter, was secretary for Scotland, had the king's ear, and would have restored presbytery, at least by way of experiment. The "creature" of Charles, as he called himself, this burly, violent scholar, buffoon and bully, was reckoned a patriot. As an "Engager" he had seen his country conquered by English arms. His policy was to keep Scotland in good humour by restoring presbytery; to raise in the country a militia strong enough to support Charles against the English parliament, and thus, in both countries, to make the royal prerogative absolute. The first parliament (1661–1663), under Middleton, was obsequious enough to grant the king £40,000 annually, to abolish the covenants and to rescind all but the private legislation of the revolutionary years (1638–1660). The Lords of the Articles were restored, mere nominees of government. Middleton, Tarbat and Clarendon overcame Charles's reluctance to restore episcopacy; Lauderdale fell into the background; The Rev. James Sharp, hitherto the agent of the Resolutioners, or milder party among the preachers, turned his coat, and took the archbishopric of St Andrews. Episcopacy being restored, some three or four hundred preachers were driven from their parishes (1663). "We made a waste," said Archbishop Leighton, "and stocked it with owls and satyrs," the detested "curates." The Shorter Catechism was taught; the liturgy was not brought in; the sole change was in kirk government.

Meanwhile the Cavalier party invented a system of heavily fining men who had been their opponents in the troubles. Middleton coveted the estates of the earl of Argyll, son of the late marquis, and on a trumped-up charge of "leasing making" (he had spoken in a private letter of "the tricks of parliament") had him condemned to death. He was saved by the exertions of Lauderdale, and Tarbat suggested, while Middleton adopted, a scheme for ostracizing, and making incapable of office, twelve of their opponents, including Lauderdale. But Lauderdale had the skill to turn the cards on Middleton, accusing him of tricking both parliament and king, and of usurping royal prerogative. Middleton and Tarbat were cashiered, and the able but profligate earl of Rothes united four or five of the highest offices in his own person, Lauderdale remaining at court as secretary for Scotland.

II. We come now to the years from 1664 to 1667. Middleton, with Archbishop Sharp, misgoverned the country, established a high court of commission, exiled the fiercest preachers to Holland, whence they worked endless mischief by agitation and a war of pamphlets; irritated the Covenanting shires, Fife and the south-west, by quartering troops on them to exact fines for Nonconformity, and so caused, during a war with Holland, the Pentland Rising (November 1666). This unconcerted movement arose out of an act of cruelty by soldiers in the remote Glenkens, and was unsupported by Holland, with which the Covenanters had been intriguing. Crushed at Rullion Green in the Pentlands, by General Dalziel, this movement left the Presbyterians the more angry, by reason of the cruelty of its suppression, and the use of torture to extract information from Mackail, a preacher, and Neilson of Corsack, a laird.

III. Lauderdale again saw his chance; Rothes was deprived of all offices save the chancellorship; Sharp was "snibbed" and disgraced, attempts at concession were begun, and the indulgence of 1669 licensed a number of Presbyterian ministers, under restrictions. The indulgence accentuated the division between those who accepted and those who rejected it. Outrages on conformist ministers were frequent, and conventicles were accompanied by armed men. A popular book, *Jus Populi*

Vindicatum (1669), demanded the restoration of the covenants, which meant civil war, the hanging of the bishops, and even applauded assassination by men who had "a call," like Phinehas. In a parliament with Lauderdale as commissioner (1669–1673) "clanking acts" were passed against nonconformity, but the laws were too severe to be executed, save spasmodically, and were followed by a second indulgence (1672). Lauderdale having married the rapacious countess of Dysart, corruption was rife; his brother, Haltoun, was an example of reckless greed; opposition arose to a scheme of union, presently dropped, and by 1673 the duke of Hamilton and Sir George Mackenzie led an organized political opposition. Lauderdale's Militia Act gave Charles a force of 22,000 men, who would "go anywhere" (that is, would invade England), at the king's command, and in 1673–1675 Lauderdale was attacked in the English House of Commons. Charles stood by him, but his best allies, Kincardine and Sir Robert Murray, deserted him, while Sir George Mackenzie of Rosehaugh came over to his party, became king's advocate (1677), and till 1686 was the Achitophel and public prosecutor of the government. After an alleged attempt to negotiate through Argyll (1678) with the preachers, in view of the threatening increase of armed conventicles, Lauderdale resolved on suppression. Without money, and without anything like an adequate regular force, he called out the clansmen of Atholl, Perth and other nobles, and quartered "the Highland host" on the disturbed districts. He would either put them down, or, what he preferred, bring rebellion to a head. The gentry, who had proclaimed their inability to suppress conventicles, were ordered to sign a bond making them responsible for their tenants, and were bound over to keep the king's peace by "law burrows," a method common in private life but unheard of between monarch and people. After six weeks the plundering clansmen were withdrawn, and in the spring of 1678, also of 1679, Hamilton with his allies carried their complaints to Charles. Mackenzie, in a controversy at Windsor (1679), proved to Charles that in Scotland he was as absolute as the kings of France and Spain, over church, state and all his subjects, and indeed, by various acts of James VI. and of his own reign, Charles really was a despot (British Museum, Additional MSS. 23,244, pp. 20-28).

Meanwhile, armed conventicles abounded, and the extreme faction openly denounced and separated themselves from the rapidly growing mass of the Indulged. Early in May 1679 Sharp was hacked to death on Magus Moor near St Andrews. The murderers rode to the west, joined the company of Robert Hamilton, defeated Graham of Claverhouse with a small force of horse at Drumclog, occupied Glasgow, and proved the total inability of the regular forces to cope with a rising. Charles might have been unable, in the frenzy of the popish plot of Titus Oates, to send forces from England, but as he chose the popular Protestant, the duke of Monmouth, to command them, he was allowed to despatch some regiments. The rebels, who were in two hostile parties, Indulged and Separatists, failed to hold Bothwell Bridge, and were easily routed. The duke of York was sent, in honourable banishment, to Scotland, and in the parliament of 1681 was royal commissioner.

IV. Here begins the fourth period (1680–1688), the domination of the duke, Queensberry, Perth, and his brother, Drummond of Lundin (earl of Melfort). Lauderdale was out of favour, and died. Now "by concession" (a third indulgence) "and repression, the once mighty force of Scottish Presbyterianism had at length been broken" (Hume Brown). By "Presbyterianism" we are here to understand, not the Presbyterian form of church government—the kirk whose motto is *Nec tamen consumebatur*—but the pretensions of preachers to dominate the state by the mythical "power of the keys," by excommunication with civil penalties and by the fiercest religious intolerance. Presbyterianism can exist and flourish without these survivals of the proudest pretensions of Romanism. To quote Dr Hume Brown again, "When the absolutism of the Stuarts was succeeded by a more rational government (1689), the example of the Indulged ministers, who composed the great mass of the Presbyterian clergy, was of the most potent effect in substituting the idea of toleration for that of the religious absolutism of Knox and Melville." Save for the fact that the ministers were as intolerant as ever of Nonconformists, Catholics and heretics, this is a just view, but Charles II. had to deal with a kirk in which the Remonstrants, the more fanatical ministers, were potent, whether the majority or not, while, after 1689, government found "the once mighty force of Presbyterianism broken." It was broken by the two last Stuart kings, who employed methods the most brutal and repulsive for the crushing of consciences trained in the theocratic ideas of Knox and Melville. The memory of the courage and devotion with which men, women and even children faced torture, death and ruin for an ideal impossible and undesirable is dear to the Scottish people.

On the side of the extremists, Cameron was happy enough to die in fair fight at Airs Moss (22nd of July 1680), after publicly disowning the king for his breach of the Covenant. Cargill next excommunicated the king, Dalziel and Mackenzie, and his followers separated themselves from "the ordinances dispensed by any Presbyterian minister." The followers of these two men, and of their successor, Renwick, who later was hanged, became the armed and organized "Societies," a large force of yeomen and farmers in south-western Scotland, usually styled Cameronians. After the Revolution, the government left them alone, and could afford to do so.

In 1681, parliament, under the duke of York as commissioner, passed a test act so drafted that no human being could honestly and logically take the test. The earl of Argyll, son of the marquis, added a qualifying clause; he would take the test, "as far as it was consistent with itself." By the influence of his countless creditors, who desired to be paid out of his estates, and in revenge for his seizure, on claims for debts, of the whole estates of clan Maclean (1674–1680), he was tried and was actually found guilty of treason. He escaped, but was condemned on the old charge after his later invasion of Scotland (1685).

In 1684, while Perth, and his brother, Melfort, who went over to Rome, were in power, Renwick emitted an "Apologetical Declaration," in which the active enemies of his sect were threatened with secret trials and with assassination (October), and a "curate," with some soldiers, was murdered. This, coming on the head of the Rye House murder plot (of which the Rev. Mr Carstairs, the agent of Argyll, and probably Argyll himself, then in Holland, were not ignorant), caused the government to demand, at the hands of the military, from all and sundry, an "Abjuration" of Renwick's anarchist utterances. Recusants were shot. The test was carefully framed so as to include no disavowal of religious principles, and was "universally unscrupled, even by the generality of great professors and ministers too," says Sheilds, an advanced extremist. However, the peasantry found, in the abjuration, matter contrary to their consciences, and while some recusants were shot out of hand, a girl named Margaret Wilson, with an old woman, Margaret MacLauchlan, were tied to stakes and drowned by the incoming tide, near Wigtown (13th of May 1685). How the penalty came to be inflicted, as the pair had what Wodrow calls "a material pardon," while there is no record of the withdrawal of the reprieve, remains a mystery. The guilt appears to attach to the local authorities at Wigtown.

In this cruel affair, Claverhouse, who caused to be shot the celebrated John Brown, "the Christian carrier," had no hand. To quote Dr Hume Brown, Claverhouse "kept strictly within the limits of his commission, and he carried out his orders with the distinct aim of saving blood in the end. To those who he thought had been led astray, it was his policy not to be unmerciful; for, in his own words, 'it renders three desperate where it gains one.' On the other hand, in the case of the obdurate, he showed a relentless precision, which gained for him his evil name, 'The Bloody Clavers,' the commissioned servant of the powers of darkness." As constable of Dundee he secured the commutation of the death penalty on minor offenders under his jurisdiction, and his expressed maxim was "in the greatest crimes it is thought wisest to pardon the multitude and punish the ringleaders." It is no exaggeration to say that, of the governors of Scotland under the Restoration, Claverhouse was the ablest, the most honourable, the least rapacious and even the most clement. But "Bluidy Claverhouse" will continue to enjoy his traditional reputation in popular tracts and popular histories.

Charles II. had died on the 2nd of February 1685, and there were in Scotland some who wept for him. The year of his death was, *par excellence*, "The Killing Time," thanks to Renwick and his associates and the Rye House plotters. Now, too, came the attempts of Monmouth and of Argyll, who, owing to divided counsels in his camp, and want of support either from his clan or from the southern malcontents, failed in his invasion of Scotland, was taken, and was executed, suffering like his father with great courage and dignity. Many recusants were penned up, starved and cruelly treated, even tortured when they attempted escape, in the vaults of Dunottar Castle.

Revolution of 1688.

In 1686 James claimed and used the dispensing power as to penal laws against Catholics, in face of the opposition of two of the Scottish bishops (who were ejected from their sees) and of parliament. Mackenzie, for his opposition, lost office. The privy council was opened to Catholics, but on the landing of William III. the populace, in 1688, wrecked the chapel of Holyrood and began to "rabble" conformist ministers, or "curates." Of the guard that defended Holyrood "the gentlemen and the rabble, when they saw all danger over, killed some and put the rest in prison, where many of them died of their wounds and hunger," a parallel to the Dunottar cruelties not usually mentioned by historians ("Balcarres Memoirs"). A Convention of Estates, without a royal commissioner, met at Edinburgh on the 14th of March 1689, and it is curious that Williamites and Jacobites were not unequally represented. For president, Hamilton, who had been in opposition from 1673 to 1682, was preferred to Atholl by a small majority, but it soon appeared that William's friends were in the ascendant.

Killiecrankie.

Claverhouse, now Viscount Dundee, despairing of his party, and under apprehension of an attack in arms, rode northward with a handful of horse, and began to play the part of Montrose, while the Convention offered the crown to William and Mary, adding the claim of right to dethrone a king who had infringed the laws. In May, William, in London, took the coronation oath, but firmly refused to accept, except in some sense of his own not easily understood, the clause, "to be careful to root out all heretics." The castle of Edinburgh was surrendered by Gordon, and Balcarres was put in that prison where, according to legend, he was visited by the wraith of Dundee, on the night of the battle of Killiecrankie. While Dundee was raising the clans and outmanœuvring Mackay, a party in parliament was agitating for constitutional reforms, and especially for freedom from the Lords of the Articles. William opposed, and party war was furious, when news came of Dundee's complete victory at Killiecrankie. The terror of the Whigs turned to joy when they heard that Dundee himself had fallen in the arms of victory. Two murderers had been sent by the earl of Nottingham to "seize," that is to despatch, Dundee. They left London for Mackay's camp on the 19th of July. On the 27th of July Dundee was shot, and on the 21st of October Nottingham wrote that his emissaries "had done very good service to the King" (*State Papers*, "Domestic," July 17th, 18th, 19th, October 21st, 1689). Henceforth, for lack of a commander of Dundee's genius, there was no real danger from the clans, and absolutely no chance of a rising of the lowland Jacobites in their support. At Dunkeld the newly raised Cameronian regiment successfully repulsed the highlanders, ill led by General Cannon as they were. They were never again dangerous at this period, were scattered by Livingstone in a surprise at Cromdale haughs, and government began to attempt to buy from chiefs the peace of the clans.

Massacre of Glencoe.

Meanwhile complex intrigues occurred, and were betrayed, between "the Club" (the advanced constitutionalists) and the Jacobites. In 1690 an act restored the kirk to the legal position of 1592, under sixty of the surviving ministers deprived in 1661. An act abolished civil penalties upon sentences of excommunication, and thus broke the terrible weapon which the preachers had wielded so long. Nothing was said about the eternally binding Covenant, which continued to be the fetish of the Cameronians and of later seceders. The General Assemblies, henceforth, under the influence of the diplomatic Carstairs (who had been cruelly tortured in 1684, to extract information about the Rye House Plot), did little to thwart government, though many "placed ministers" were, at heart, attached to the ancient claims of Knox and Melville. Laws as to patronage, an inflammatory question, were made, abolished and remade, causing, from about 1730 onwards, passions which exploded in the great Disruption of 1842. The dealings with the clans culminated in the massacre of the MacIans of Glencoe (13th February 1692). Through military inefficiency the hill passes were not stopped, and the murders of a peaceful and hospitable population were relatively few. That Dalrymple arranged for actual extermination of the males of the clan is certain, but there is no proof that he knew of the *modus operandi*, the betrayal of hospitality, "murder under trust." It is conceivable that William signed the orders under the impression that a "punitive expedition" of the ordinary sort was alone intended, but remonstrance from the Estates brought no punishment on any man except the dismissal, later, of Dalrymple (Viscount Stair) from office.

In 1693–1694 the kirk was much irritated by William's demands for oaths of allegiance to himself, without the consent of the ecclesiastical courts. William gave way, but similar Hanoverian demands later caused great searchings of heart and divisions among the preachers. The Episcopal party among the ministers was excluded from a share in church government and tended to dwindle; the bishops had no territorial sees; and gradually Episcopalians came to be Jacobites, professing a strange loyalty to James, who had treated them so unjustly, and later to his son, "James VIII.," the Chevalier de St George (b. June 10, 1688).

Darien Scheme.

Since the Cromwellian occupation the interest of Scottish men had slowly shifted from religion to commerce; but a tariff war between England and Scotland had checked manufacturing and other enterprises. One William Paterson, instrumental in founding the Bank of England, conceived the plan of a Scottish East India Company, which, in 1695, obtained a patent by act of parliament. William complained, later, that he had no notice of the terms of that patent till after it was passed (he was fighting under Namur at the time), and the act not unnaturally aroused the jealousy of the rival English companies. It committed William to conditions which might readily produce a great naval war with Spain, for Paterson's real design was to establish an entrepôt in Panama, at Darien, within the undeniable sphere of Spanish influence. The Scots invested very largely, for them, but their expeditions were ill-found and worse managed; the Spaniards seized one of their vessels with its crew; the colonists deserted the colony; a fresh expedition was expelled by Spain, and William refused to take up the Scottish quarrel (1695–1700). The losses and the apparent injustice caused a frenzy of excitement in Scotland, and William could only express his regret and his desire for an incorporating Union of the two kingdoms. He died on the 7th of March, when the project of Union was to be debated by the English parliament. Under William, Scotland was a constitutional country; the absolute despotism enjoyed by Charles II. ceased to be; a free debating parliament existed, and torture was inflicted only by decree of king and parliament. It was abolished two years after the Union of 1707.

The Union.

Anne, from the beginning of her reign, advocated union, which, with the question of the succession, was the subject of constant and furious debates in the Scots parliament, till, on the 4th of March 1707, the act received the royal assent. Scotland was to have forty-five members and sixteen elected peers at Westminster; the holders of Darien stock were compensated; as a balance to equality of taxation a pecuniary equivalent was to be paid, the kirk and Scottish courts of justice were safeguarded (final appeal being to the British House of Lords), and Scots shared English facilities and privileges of trade, in name, for many years passed before Scotland really began to enjoy the benefits. Mar, Queensberry, Stair (of Glencoe) and Argyll (Red John of the Battles) were the leading statesmen of the Unionist party; being opposed by Hamilton, Atholl and Lockhart of Carnwath as Jacobites; by Fletcher of Saltoun as an independent patriot; by popular sentiment, by mob violence, and by many of the preachers, though not by the General Assembly. Every sentimental consideration was against a union with a prelatic kingdom, "an auld enemy," which drove a hard bargain by threats of excluding Scottish commodities. The negotiations were constantly disturbed by Jacobite intrigues with France in favour of James VIII.; by Scottish adherence to the Act of Security, which might give Scotland a king other than a Hanoverian in succession to Anne; and by the hanging of an Englishman, Captain Green, for piracy on a lost Scottish vessel (1705). The final debates of 1706 were conducted under apprehensions of an invasion of Edinburgh by highlanders and wild western fanatics of the Covenant; but the astuteness of Harley's agent in Edinburgh, de Foe, the resolution of Argyll and the tact of Queensberry, who easily terrified the duke of Hamilton, carried the measure into haven. The Union was at first rich in causes of friction, and in nothing else; even as late as 1745 it was most unpopular, but Scotland had no choice. The nation would never accept a Catholic king, a Stuart, nor revert, as against England, to the ancient French alliance. The religious objection was insuperable; opportunities of commercial development were indispensable; war with England was not to be contemplated by the common sense of the country; and thus, as de Foe wrote, "The Union was merely formed by the nature of things." In Lockhart's words, the 30th of April 1707 "was the last day that Scotland was Scotland. I may lament and weep," he adds, "but truly I have had admirable sport," with his greyhounds.

Jacobite failures.

Friction about matters of trade was the instant sequel of the Union: so much ill-feeling was provoked that, in the general opinion, had King James VIII. landed alone when brought to the Scottish coast by Forbin's fleet in March 1708, he would have carried Scotland with him. But Forbin was chased away from the Firth of Forth by a fleet under Sir George Byng; he refused to allow the young adventurer to land farther north, and the Jacobites doubted that France was never serious in the enterprise. The Jacobites also, through mistrust of each other—none could trust Hamilton—and finally through the intoxication of a pilot who failed to reach Forbin, led to the imbecile fiasco. In the English parliament the Jacobites managed to secure a measure of toleration for the Episcopal clergy, after one of them, Mr Greenshields, had long lain in prison for his use of the liturgy (1711). The kirk was incensed by the growth of Episcopalianism and of Popery, the restoration of patronage, and the pressure to accept an oath abjuring James, which divided a church that was absolutely anti-Jacobite. Repeal of the Union was actually mooted in 1712, and even Argyll was restive. The fatal duel in which Hamilton was slain by Mohun, when on the eve of going as ambassador to France, with the interests of James in his eye, was a blow to the Jacobites; as were the death of Anne, the fall of Bolingbroke and the unopposed succession of George I. (August 1714). Their king over the water had, in a manly and magnanimous letter to his adherents, refused to change his creed, and when Bolingbroke fled from England his evangelical efforts at proselytizing James were fruitless. Berwick and Bolingbroke were his ministers, but Berwick would not accompany him to Scotland, and Bolingbroke did not provide the necessary munitions of war. Through a series of confusions and blunders, Mar prematurely raised on the 16th of September 1715 the standard of King James, and though in command of a much larger army than ever followed Montrose, was baffled by Argyll, who held Stirling with a very small force. Mar never crossed the Forth, and the command of Mackintosh, who did, was captured, with his Northumbrian cavaliers, at Preston, on the very day (12th of November) when Argyll foiled Mar in the confused battle of Sheriffmuir. Mar's highlanders began to desert; his council was a confusion of opinions and discontents, and when, after many dangers and in the worst of health, James joined the Jacobites at Perth, it was only to discourage his friends by his gloom, and to share their wintry flight before Argyll to Montrose. Thence he furtively sailed with Mar to France, a broken man, leaving his army to shift for themselves. Many of his noble supporters escaped, he did his best to provide them with ships, others were executed, while the great Whig, Forbes of Culloden, protested against the bad policy of the repressive measures. Argyll, who had saved the country, was regarded as lukewarm, and lost the royal favour, while James, at Avignon, intrigued with Charles XII. of Sweden and with Argyll and his brother, the earl of Islay, till he was driven from France to take refuge in Italy. Spain backed him in 1719, but the death of Charles XII., and the utter failure of a Spanish expedition to Scotland in 1719, when the Jacobites were scattered, and the Spaniards taken, in a fight at Glensheil, ruined what had seemed a fair chance of success. Returning from Spain, James married Maria Clementina Sobieska, daughter of Prince James Sobieski, a pretty bride whom Charles Wogan rescued from durance in Innsbruck, an adventure of romantic gallantry. The marriage was unhappy; James was eternally occupied with the business of his cause and the feuds of his adherents; Clementina lost her gaiety and became causelessly jealous; and her retreat to a convent in 1725 was a greater blow to the cause than the failure of Atterbury's plot (1720), the alleged treason of Mar and the splits in the Jacobite party. Clementina, however, was the mother of two sons, Charles Edward, the hope of his party, and Henry. The cause slumbered, till in 1742–1743 the outbreak of wars with France and Spain gave Prince Charles a chance of showing his mettle. The Jacobites surrounding James in Rome never ceased to weave at the endless tissue of their plot, but in Scotland nothing more substantial than the drinking of loyal healths was done, between the flight of Lockhart of Carnwath, the manager of the party, and the years of 1737–1744. The old Jacobites were dying out; James never had a minister who was not baited by three-fourths of the party, and denounced as a favourite at best, at worst a traitor; and the Cause would have sunk into ashes but for the promise of his eldest son, Prince Charles.

Parties in the kirk.

In Scotland the kirk, as ever, was militant, but it could no longer wage war on kings and their ministers, nor attempt to direct foreign and domestic policy. The preachers thus fell into parties, which attacked each other in a brotherly way. The grounds of strife were the spread of "liberal" religious ideas; on one side heretical and anti-Calvinistic doctrines, and on the other a tendency to stretch Calvinistic principles till they were scarcely to be distinguished from Antinomianism. A Glasgow professor, the Rev. Mr Simson, was attacked for Arminianism and Socinianism as early as 1717; and the battle raged between the more severe Presbyterians—who still hankered after the Covenant, approved of an old work *The Marrow of Modern Divinity* (1646), and were especially convinced that preachers must be elected by the people—and the Moderates, who saw that the Covenant was an anachronism, thought conduct more important than Calvinistic convictions, and supported in the General Assembly the candidates selected by patrons, as against those chosen by the popular voice. *The Marrow* was discouraged as verging on Antinomianism (1720); and in 1722 its protesting admirers were rebuked by the Assembly. *The Marrow* men put in protests, and were clearly on the way to secession from the kirk. The oath of abjuration of James was another cause of division, at least till it was watered down in 1719; and by 1726 a revival of the charges of heresy against Simson, with the increase of agitation against the majority of the Assembly who supported patrons, lighted a flame which burned the slight bonds that kept the extremists in union with the kirk.

In 1732 their leaders were the brothers Erskine, one of whom, Ebenezer, preached a sermon accusing professed Presbyterians as guilty of "an attempt to jostle Christ out of his church." For this and other severe censures of his brethren, Mr Erskine would not apologize: he had "delivered the utterance given to him by the Lord": his was the very attitude of the preachers who thundered against James VI. Mr Erskine was rebuked in the Assembly of 1733; he protested with three friends: they were deprived of their charges; they vowed that they were "the True Presbyterian Covenanted Church of Scotland," and had the power of the keys. They constituted themselves a presbytery, and maintained that the covenants were perpetually binding. The Assembly went as far as was possible in offers of reconciliation, but the seceders were irreconcilable, and were deposed in 1740. In 1744 they made the "Taking of the Covenants" a term of ministerial and Christian communion. It is impossible here to follow the schisms which split the seceding body within itself: the Erskines themselves were handed over to Satan; their very families adopted opposite factions: there were "Burghers" and "Anti-Burghers," "New Lights" and "Old Lights"; besides the sects which in the 19th century merged in United Presbyterians, and merged themselves later with the Free Church of the Disruption, itself the parent of a small protesting body, popularly styled "The Wee Frees" (see SCOTLAND, CHURCH OF). The whole movement, intended as a return to the kirk of Knox and Melville and the Covenanters, was a not unneeded protest against the sleepy "moderation," and want of spiritual enthusiasm, which invaded the established kirk in the latter part of the 18th century, a period in which she possessed such distinguished writers as John Home, author of the drama of *Douglas*, Robertson, the historian, and Dr Carlyle, whose amusing autobiography draws a perfect portrait of an amiable and highly educated "Moderate" and man of the world. Naturally the opposite party, whether seceders, or "High Flyers," as they were called, within the church, had most influence with the populace, so that "the Trew Universal Kirk" of Scotland was broken into several communions, differing but slightly in accepted doctrines, and not at all in mode of worship. Their tendency has been centripetal, and all the "Free Churches" are agreed in their views concerning the prolonged existence of "the Auld Kirk." The Episcopalians, in this period, were nearly as much perturbed as the Presbyterians, by questions as to the election of bishops in relation to their exiled king, and by the introduction of ritualism in the shape of "the usages." They passed through much persecution, in consequence of the rising of 1745, but, after the death of their King Charles, they became as loyal as any other religious body, managing their own affairs with no more turmoil than is caused by the co-existence of the Anglican and the Laudian prayer-books, with their different forms of the communion service.

The highland clans.

As to civil matters, the country was troubled by riots against the Malt Tax, but the clans submitted to a very superficial disarmament; companies of highlanders were employed to preserve order and check cattle-raiding; and one of these, "The Black Watch" (the Forty-Second), greatly distinguished itself at the battle of Fontenoy. Wade drove his military roads through the highlands, and, poor as the country still was, the city of Glasgow throve on the tobacco and sugar trade with America and the West Indies. Yet Duncan Forbes of Culloden, president of the Court of Session, after the outbreak of the war with Spain, reported amazing scarcity of money in the country, and strenuously advised legislative checks on the taste for tea, which naturally diminished the profits of the excise on more generous beverages. The fact is that as English companies for foreign trade had long been in chartered existence, Scotsmen and Scottish capital had no profitable outlets, while agriculture was conducted on slovenly medieval or prehistoric methods; and only the linen trade of the country was really flourishing. Thus, except in the case of the west coast trade with the colonies, Scotland had reaped little commercial benefit from the Union, and the loss of business caused by the abolition of the parliament, and the rush of noble families to London, was severely felt in Edinburgh. Yet there existed no dangerous political dissatisfaction. Though the chief religions of the highlanders, the Episcopalian and Catholic forms, were depressed by persecution, and priests were few, the clans had long been accustomed to lack of religious functions and did not feel the want. But the hereditable jurisdictions and feudal powers, as of calling out tenants by the fiery cross and punishing the peaceful by burning their cottages, had never been abolished; the chief's will was law, and if the chiefs headed a rising, their clansmen would follow them, willingly or "forced out." They formed a remarkable militia, trained to the use of arms; wonderfully mobile and rapid on the march and dauntlessly courageous.

Bonny Prince Charlie.

The years 1737–1739 saw the germs of civil war beginning to take active life. Simon Fraser, Lord Lovat, an aged intriguer, conceived discontent against the government for the loss of his independent company, and began to intrigue with France and with James in Rome. In the same year a young Tweedside laird, Murray of Broughton, visited Rome, fell in love with Prince Charles, then a handsome, wayward, stalwart and ambitious lad, with "a body made for war," and, returning home, Murray practically succeeded to the duties once performed by Lockhart of Carnwath, as Jacobite agent and organizer.

In 1738 the waning power of Walpole and the approaching war with Spain caused Forbes of Culloden to propose the raising of four or five highland regiments for foreign service. Walpole, urged by Lord Islay, brother of Argyll, is said to have approved, but nothing was done. The declaration of war with Spain and the certainty of war with France promised to the Jacobites good fishing in turbid waters; and they entertained futile hopes of enlisting Argyll with his potent clan. Walpole entered into communication with James, who saw through the manœuvre, and in 1741 a Jacobite association was formed, which included Lovat and Lochiel. Their agent was Drummond (Macgregor really) of Balhaldie, who in 1741–1743 dealt with the English Jacobites, and persuaded France that they were powerful and eager. In fact the Scots were feebly organized, and the English Jacobites were not organized at all. Says Murray, "there was not the least ground for encouragement," but, thanks to Balhaldie, Louis XV. began to mobilize an invading force in November 1743. Balhaldie carried to James in Rome an invitation for Prince Charles to go to France, a *verbal* invitation, which James reluctantly accepted. Cardinal Tencin was not in the secret, and by the time Charles made his way to Paris in January 1744, James clearly perceived the duplicity of France. The Scottish Jacobites were left in ignorance of the French attempt to land in the mouth of the Thames (February–March 1744), an effort frustrated by a disastrous tempest, and by the slackness of the English conspirators.

Prince Charles was left in neglect and obscurity; till, unchecked by Murray, relying on hasty Jacobite promises brought by him, and encouraged by the French victory of Fontenoy, he started with seven companions for the west highland coast on the 21st of July 1745. His landing at Borradale on the 5th of August brought a few enthusiastic Macdonalds about him; from a sense of honour Lochiel joined with the Camerons. Keppoch and Clanranald would not desert a prince with a reward of £30,000 on his head, but Macleod and Sleat held aloof; and Lovat wrecked the adventure by his doubts and delays. None the less a small ill-armed force of some 2000 men marched south; Cope did not oppose them, but evaded them and went to Inverness, leaving open the road to Edinburgh. At Perth Charles was joined by a skilled soldier, Lord George Murray, brother of the Whig duke of Atholl, a pardoned veteran who had been out in 1715 and 1719.

But Lord George's previous dealings with Cope inspired in Charles a distrust which was to prove fatal. Charles entered Edinburgh unopposed on the 16th of September, made his quarters in Holyrood, and on the 21st of September routed Cope at Prestonpans. But he had not the force to invade England, or to take the castle, and waited, collecting recruits and money, and encouraged by empty promises from France, till, as he wrote to James (26th of October), "I shall have one decisive stroke for 't, but unless the French land, perhaps none. As matters stand, I must either conquer or perish in a little." His English adherents did not come in, and, after marching to Derby, his council insisted that enough had been done for honour, that Wade was on their flank and rear, the duke of Cumberland in their front, and an army was gathered to defend London. A broken-hearted man, Charles was compelled to acquiesce in retreat (5th of December). If the chiefs had possessed information now accessible to us, they might not have made "the great refusal," but with only the intelligence which they possessed they could not have followed their audacious prince to the south. Their force was not more than 5000 men; and they were wholly unskilled in the use of the guns which they had captured at Prestonpans. The retreat was admirably conducted; Lord George and Cluny fought a gallant and successful rear guard at Clifton; they escaped from Cumberland across the border, but Charles, against advice, left a doomed garrison in Carlisle. After a stay to re-fit at Glasgow, Charles moved to besiege Stirling castle, and to join a force from the north, almost as numerous as that with which he had invaded the heart of England.

Culloden.

Cumberland had returned to London, but Hawley marched from Edinburgh with an army which Charles drove to the winds on Falkirk Moor. Hawley's guns were never in action, the Macdonalds charged and scattered his cavalry on the right wing, but pursued too far, and as the pipers had gone in sword in hand, they could not be recalled. On the left the prince's men could not load their pieces, their powder being ruined by the tempestuous rain. They were checked by two steady regiments; many fled, all was darkness and confusion, but, on returning into Falkirk, Charles found that Hawley had decamped in a disgraceful rout. He could not pursue; the whereabouts of his right was unknown, and after the battle his best officers felt rather dismayed than encouraged by the conspicuous lack of discipline. In place of advancing on Edinburgh, they dallied round Stirling castle in futile siege, and, on the news of Cumberland's advance, alarmed by desertions which they appear to have greatly exaggerated, the chiefs compelled Charles to a fresh retreat. His expostulations perhaps prove him to have been "the best general in his army," but he was dragged northwards to Inverness, and with depleted ranks of starving men, outworn by the fatigue of a long night's march to surprise Cumberland at Nairn, he stood on Culloden Moor in defence of Inverness, his base and only source of supplies (16th of April 1746). Charles had some 5000 men, Cumberland had nearly 9000 and eighteen well-served guns. Here for the first time the highlanders were under heavy fire of grape and roundshot, to which they could not reply, and though the right wing and centre, Camerons, Atholl men, Macleans, Clan Chattan, Appin Stewarts, under Lord George and Lochiel, fought with even more than their usual gallantry and resolution, the Macdonalds on the left, discouraged by the death of Keppoch, Scotus and other officers in the advance, never came to the shock. Though outflanked, enfiladed and met by heavy musketry fire in front, the right wing broke Barrel's regiment and passed the guns, but the attack was checked by the bayonets of the second line and a rapid retreat became general. Charles did not leave the field till all was lost; so much seems clear from Yorke's evidence; but the price on his head, and probably suspicions urged by some of his Irish officers, induced him to desert his army and hurry secretly to the west coast and the western isles. He was rewarded by five or six months of dangerous and distressful wanderings, and would certainly have been taken at one juncture but for the courageous and wise assistance of Flora Macdonald, while on all hands the highlanders displayed the most devoted loyalty.

Into the ferocious conduct displayed by Cumberland after the victory, and in the suppression of the clans, we need not enter; nor is the list of executions of rebels alluring. The spirit of the clans remained true indeed, but their prince became "a broken man": his clemency, and courage, and all that had endeared him to his people, perished under the disgusts and vices engendered by many years of a secret fugitive existence, after he was driven from France in 1749 (see A. Lang's *Pickle, the Spy*, and *Life of Prince Charles*).

Modern Scotland.

As far as the rising had a political aim and reason for existence, apart from mere dynastic sentiment, that aim was "to break the Union"; in the prince's words, "to make Scotland once more a free and happy people." But the vast majority of Scots, though not in love with the Union, preferred it to the rule of a Catholic king—Charles probably, for James had every desire to abdicate. The failure of Charles had, in fact, the result of assimilating Scotland much more closely to England. A disarming act, and the prohibition of the highland dress, did not indeed break, but it transferred to other fields the military spirit of the clans. The chiefs first raised the highland regiments which have covered themselves with glory from Ticonderoga to Dargai and Elandslaagte. The reward which many of the clansmen of the Peninsula and Waterloo received may be appreciated by those who read the introduction to Scott's *Legend of Montrose*. They returned to glens desolate of men, deserted, first, by the voluntary emigrations of the clans, and later by forced emigrations in the interests of sheep farms and deer forests. The abolition of hereditable jurisdictions and of the claims of feudal superiors to military service, after Culloden, broke the bond between chiefs and clans, and introduced new social and economical conditions, bequeathing the Land Question to the 20th century. The "planting" of ministers in the highlands, which had since the Reformation been almost destitute of religious instruction, bred a populace singularly strict in the matter of "Sabbath observance," and, except in districts still Catholic or Episcopalian, eager supporters of the Free churches. In outlying places the old popular beliefs linger; second sight is common in some glens; and the interesting poetical traditions, like Jacobite sentiment, survive in the memories of the people, despite cheap newspapers and modern education.

With the failure of the last armed attempt to "break the Union," Scottish history is merged in that of Great Britain; it was a British force that routed the Jacobites at Culloden. After 1745 the men of letters of the country continued with intense eagerness the movement initiated by John Knox, when he wrote in English, not in the old Scots that he learned at his mother's knee. Hutchinson, David Hume, Home and Robertson were assiduous in avoiding Scotticisms as far as they might; even Burns, who summed up the popular past of Scotland in his vernacular poetry, as a rule wrote English in his letters, and when he wrote English verse he often followed the artificial style of the 18th century. The later famous men of letters, Scott, Carlyle and R. L. Stevenson, appealed as much to English readers as to their countrymen, patriotic as each of them was in his own way. As early as 1730–1740, the great English public schools and universities began to attract the Scottish youths of the wealthier classes, and now good Scots is seldom heard in conversation and is not always written in popular Scottish novels. Scotland and England, however, will always remain pleasantly distinct by virtue of their historical past and inherited traditions.

Bibliography.—The best general History of Scotland is that by Patrick Fraser-Tytler (1841–1843). It ends, however, with the Union of the crowns in 1603, and though it is based on thorough research in MSS., many documents now available, such as the despatches of Spanish ambassadors to England, were not accessible to the learned author. The History by John Hill Burton (Edinburgh, 1867–1870) ends with the Jacobite Rising of 1746. It is of unequal merit, being best in places where the author was most imterested, especially in points of the development of law. Here the works of Cosmo Innes are valuable, *Lectures on Scotch legal antiquities* (Edinburgh, 1872); and *Scotland in the middle ages* (Edinburgh, 1860). Burton's anti-Celticism, and scepticism as to archaeology, make his work inadequate in the earlier parts. On the Celtic beginnings the best books are E. W. Robertson's *Scotland under her Early Kings* (Edinburgh, 1862) and W. F. Skene's *Celtic Scotland* (Edinburgh, 1876–1880), with his *Highlanders of Scotland* in the edition edited by A. Macbain (Stirling, 1902); other views are maintained in Rhys's *Celtic Britain* (1884). David Stewart of Garth's *Sketches of the Highlanders* (Edinburgh, 1822) is interesting, though the author leans too much on tradition; and Dr Gregory's *History of the Highlands* (1881) is excellent, but closes with the Union of the crowns. Scott's *Tales of a Grandfather* is, of course, full of interest, but is inevitably somewhat behind the mark of later years of research. The Foreign Calendars of State Papers, especially J. Bain's *Calendars* (Edinburgh, 1881–1888), are useful indices, but not infrequently need to be checked by the manuscripts.

There is much new information among the documents published by the Historical Manuscripts Commission, by the Scottish History Society, and the Register of the Privy Council, edited by Professors Masson and Hume Brown. The volumes of the book clubs, Bannatyne, Maitland, Abbotsford and Spalding, are full of matter; also those of the Early Scottish Texts Society and the Wodrow Society, with the works of Knox, Calderwood and the *History of the Sufferings* by Wodrow (edited by the Rev. Robert Burns, 1837–1838). Knox, like Bishop Burnet, needs to be read critically and in the light of contemporary documents; especially those in the Hamilton Papers, The Border Papers and English State Papers (Foreign). The most recent general Histories of Scotland are those of P. Hume Brown (Cambridge, 1899), and on a larger scale, but ending at 1746, of A. Lang (Edinburgh, 1900–1907). Mathieson's works deal with the period of the Covenant and Civil War, and, like Mackinnon's, with the Union; while Sir H. Craik's *A Century of Scottish History* (Edinburgh, 1901) gives a full account of the disruption of the Kirk. Many important manuscripts in muniment rooms are still uncalendared; those of the French Foreign Office are imperfect in places, and have been little consulted; and a complete calendar of the treasures of the Advocate's Library was only recently begun.

Among monographs, *Six Saints of the Covenant* and *The Life of Mary Stuart* (up to 1568), by D. Hay Fleming; the *Life of Knox*, by P. Hume Brown, and *John Knox and the Reformation*, by A. Lang; Miss Shield's *King over the Water* and Martin Haile's *James Francis Stuart* (the old Chevalier); Omond's *Lord Advocates of Scotland*; Willcock's *The Great Marquess* (of Argyll); Napier's *Lives of Montrose and Dundee*; Clarke and Foxcroft's *Life of Bishop Burnet*; Sir Herbert Maxwell's *Robert Bruce* and *Book of Douglas*, with all Sir W. Fraser's family histories, and Patrick's *Statutes of the Scottish Church*, may on various points prove serviceable. For Scottish constitutional history, what there is of it, Sanford Terry's *Scottish Parliaments* may be recommended. (A. L.)

IV. Scottish Literature

"Scottish Literature" is taken here in the familiar sense of the Teutonic vernacular of Scotland, not in the more comprehensive sense of the literature of Scotland or of writings by men of Scottish birth, whether in Gaelic (see Celt) or Latin or Northern English. The difference between the two definitions, however, is of small practical concern. The Scottish-Gaelic literature, which is separately dealt with (see Celt: *Literature*) is, by comparison, of minor importance; and the Latin, though it has a range and influence in Scotland to which it is difficult to find a parallel in the history of the literatures of Europe, is (perhaps for the very reason of its persistency and extent) so bound up with the vernacular that it may be conveniently treated with that literature. It is true that down to the 15th century there were many Teutonic Scots who had difficulty in expressing themselves in "Ynglis," and that, at a later date, the literary vocabulary was strongly influenced by the Latin habit of Scottish culture; but the difficulty was generally academic, arising from a scholarly sensitiveness to style in the use of a medium which had no literary traditions; perhaps also from medieval and humanistic contempt of the vulgar tongue; in some cases from the cosmopolitan circumstance of the Scot and the special nature of his appeal to the learned world. The widespread use of Latin was, however, seldom or never antagonistic to the preservation of national sentiment. That it was used for other than literary purposes strengthened that sentiment in a way which mere scholarly or literary interest could not have done. The Scottish *timbre* is rarely wanting, even in places where scholastic or classical custom might have claimed, as in other literatures, an exclusive privilege. And to say this implies no disrespect to the quality of early Scottish Latinity.

In a survey of the vernacular literature of Scotland it is advantageous to keep in mind that there are two main streams or threads running throughout, the one *literary* in the higher sense, expressing itself in "schools" of a more artificial or academic type; the other *popular*, also in the better sense of that term, more native, more rooted in national tradition, more persistent and conversely less bookish in fashion. The former is represented by the group known as the Scottish Chaucerians, by the 17th-century Court poets, by the "English" writings of literary Edinburgh of the 18th century; the latter by the domestic and "rustic" muse from *Christis Kirk on the Grene* to the work of the 18th century revival begun in Ramsay. There is, of course, frequent interaction between these two movements, but recognition of their separate development is necessary to the understanding of such contemporary contrasts as the *Thrissil and the Rois* and *Peblis to the Play*, Drummond and Montgomerie, Ramsay and Hume. In our own day, when the literary medium of Scotland is identical with that of England, the term Scottish literature has been reserved for certain dialectal revivals, more or less bookish in origin, and often as artificial and as unrelated to existing conditions as the most "aureate" and Chaucerian "Ynglis" of the 15th century was to the popular speech of that time.

This sketch is concerned only with the general process of Scottish literature. An estimate of the writings of individual authors will be found in separate articles, to which the reader is, in each case, referred.

I. *Early Period* (from the beginnings to the earlier decades of the 15th century). The literary remains of this period written in the vernacular, which is in its main characteristics "Northern English," are in the familiar medieval kinds of romance and rhymed chronicle. After the Wars of Independence a national or Scottish sentiment is discernible, but it does not colour the literature of this age as it does that of later periods when political and social conditions had suffered serious change.

The earliest extant verse has been associated with Thomas of Erciłdoune (*q.v.*), called The Rhymer, but the problem of the Scot's share in reworking the Tristrem saga is in some important points undetermined. Uncertainty also hangs round the later Huchown (*q.v.*), who continues in the 14th century the traditions of medieval romance. Contemporary with the work of the latter are a few anonymous fragments such as the verses on the death of Alexander II., first quoted by Wyntoun in the 15th century, and the snatches on the "Maydens of Englelonde" and "Long beerdys," quoted by Fabyan. The type of alliterative romance shown in the work ascribed to Huchown continued to be popular throughout the period (*e.g. The Knightly Tale of Golagros and Gawane*), and lingered on in the next in *The Buke of the Howlat* by Holland (*q.v.*), the anonymous *Rauf Coilȝear* of the third quarter of the 15th century, and in occasional pieces of burlesque by the "Chaucerian" makars.

Independent of this group of alliterative romances is the not less important body of historical verse associated with the names of John Barbour (*q.v.*), Andrew of Wyntoun (*q.v.*), and, in the middle period, Harry the Minstrel (*q.v.*). Barbour has been called the Father of Scottish Poetry, apparently for no other reason than that he is the oldest writer who has held place in popular esteem. Though his work shows some of the qualities of a poet, which are entirely lacking in the annalistic verse of Wyntoun, he is without literary influence. Later political fervour has grouped him with the author of the *Wallace*, and treated the unequal pair as the singers of a militant patriotism. That association is not only unjust to Barbour's literary claims, but a misinterpretation of the general terms of his political appeal. The "Scottish prejudice" which Burns tells us was "poured" into his veins from the *Wallace* is not obvious to the dispassionate reader of the *Brus*.

II. *Middle Period* (extending, roughly, throughout the 15th and 16th centuries). To this period belongs the important group of Middle Scots "makars" or poets who, in the traditional phrase of the literary historians, made their age "the Golden Age of Scottish Poetry"; it is in the writings of this time that we find the practice of the artificial literary dialect known as Middle Scots; but there is also in this period the first clear indications of other literary types of great prospective interest in the historical development of the literature of Scotland.

The prevailing influence in the writers of greater account is Chaucerian. These writers, to whom the name of "The Scottish Chaucerians" has been given, broke with the manner of 14th-century verse, and carried over from the south much of the verbal habit and not a little of the literary sentiment of the master-poet. In both respects they are always superior to Lydgate, Occleve and other southern contemporaries; and not rarely they approach Chaucer in sheer accomplishment. The first example of this new style is the *Kingis Quair* of James I. (*q.v.*), a dream-poem written in Troilus verse, and reminiscent of Chaucer's translation of the *Romance of the Rose*. The indebtedness to Chaucer, even when full allowance is made for the young poet's individuality, is direct and clear. The language, like that of the later *Lancelot of the Laik* and the *Quare of Jelousy*, represents no spoken dialect. Whether it is to be explained by the deliberate adoption of southern literary forms by the author, which his enthusiasm for Chaucer and the circumstances of his sojourn in England made inevitable, or whether the single text which is extant is a Scottish scribe's rendering of a text purely southern in character, is a nice academic question. The balance of evidence, and the presumption is strongly in favour of the former, which is the traditional view. When the linguistic forms of the other pieces in the Selden MS., presumably by the same scribe, have been carefully examined and compared, it should not be difficult to reach a final settlement.

The later Scots Chaucerian type is less directly derivative in its treatment of allegory and in its tricks of style, and less southern in its linguistic forms; but, though it is more original and natural, it nevertheless retains much of the Chaucerian habit. The greater poets who represent this type are Robert Henryson, William Dunbar, Gavin Douglas, and, to a large extent, Sir David Lyndsay—whose united genius has given high literary reputation to the so-called Golden Age. General opinion has exaggerated the importance of the minor writers who shared in this poetical outburst. There is, of course, some historical significance in the drawing up of such lists as we have in Dunbar's *Lament for the Makaris*, or in Douglas's *Palice of Honour*, or in Lyndsay's *Testament of the Papyngo*, but it is at the same time clear that their critical importance has been exaggerated. Several of the writers named belong to an earlier period; of many of the others we know little or nothing; and of the best known, such as Walter Kennedy (*q.v.*) and Quintyn Schaw, it would be hard to say that they are not as uniformly dull as any of Occleve's southern contemporaries.

The greater portion of this Middle Scots "Chaucerian" literature is courtly in character, in the literary sense, that it continues and echoes the sentiment and method of the verse of the *cours d'amour* type; and in the personal sense, that it was directly associated with the Scottish court and conditioned by it. All the greater writers, with the exception of Robert Henryson, were well born and connected with the Household, or in high office. Hence what is not strictly allegorical after the fashion of the *Romaunt of the Rose* or Chaucer's exercises in that kind, is for the most part occasional, dealing with courtiers' sorrow and fun, with the conventional plaints on the vanity of the world and with pious ejaculation. Even Henryson, perhaps the most original of these poets, is in his most original pieces strongly "Chaucerian" in method, notably in his remarkable series of *Fables*, and his *Testament of Cresseid*, a continuation of the story left untold by Chaucer. In his *Robene and Makyne*, on the other hand, he breaks away, and follows, if he follows anything, the tradition of the *pastourelles*. Dunbar often, and at times deliberately, recalls the older verse-habit, even in his vigorous shorter poems; and Douglas, in his *Palice of Honour* and *King Hart*, and even in his translation of Virgil, is unequivocally medieval. Still later, amid the satire and Reformation heat of Lyndsay we have the old manner persisting in the *Testaments* and in the tale of *Squyer Meldrum*.

There are, as might be expected, points of contact between the work of the greater makars and the more native and "popular" material. It is remarkable that each of these poets has left one example of the old manner, shown in the alliterative romance-poem; but the fact that in each case their purpose is strongly burlesque is significant of the change in literary outlook.

The non-Chaucerian verse of this period is represented by (*a*) alliterative romance-poems and (*b*) verse of a rustic, domestic and "popular" character Of the historical romance-poem there is little or nothing beyond Henry the Minstrel's *Wallace* (*supra*). The outstanding type is shown in such pieces as Holland's (*q.v.*) *Buke of the Howlat*, and in the anonymous poems *Golagros and Gawane*, *The Awntyrs of Arthur at the Terne Wathelyne*, *Rauf Coilȝear* and *The Pistill of Susan*. These, however, were already outworn forms, lingering on in a period which had chosen other ideals.

Strong as the Chaucerian influence was, it was too artificial to change the native habit of Scots verse; and though it helps to explain much in the later history of Scots literature, it offers no key to the main process of that literature in succeeding centuries. Our knowledge of this non-Chaucerian material, as of the Chaucerian, is chiefly derived from the MS. collections of Asloan, Bannatyne (*q.v.*) and Maitland (*q.v.*), supplemented by the references to "fugitive" and "popular" literature in Dunbar, Douglas, Lyndsay and, in especial, the prose *Complaynt of Scotlande*. Classification of this literature by traditional subdivision into *genres* is difficult, and, at the best, unprofitable. The historical student will be mainly interested in discovering anticipations of the later style and purpose of Ramsay, Fergusson and Burns, and in finding therein early evidence of what has been too often treated as the characteristics of later Scotticism. It would not be difficult to show that the reaction in the 18th century against literary and class affectation —however editorial and bookish it was in the choice of subjects and forms—was in reality a re-expression of the old themes in the old ways, which had never been forgotten, even when Middle Scots, Jacobean and early 18th-century verse-fashions were strongest. It is impossible here to do more than to point out the leading elements and to name the leading examples. These elements are, briefly stated, (1) a strong partiality for subjects dealing with humble life, in country and town, with the fun of taverns and village greens, with that domestic life in the rough which goes to the making of the earlier farces in English and French; (2) a whimsical, elfin kind of wit, delighting in extravagance and topsy-turviness; (3) a frank interest in the pleasures of good company and good drink. The reading of 15th- and 16th-century verse in the light of these will bring home the critical error of treating such poems as Burns's *Cottar's Saturday Night*, the *Address to the Deil*, and *Scotch Drink* as entirely expressions of the later poet's personal predilection. Of the more serious, or "ethical" or "theological" mood which counts for so much in the modern estimate of Scottish literature, there is but little evidence in the popular verse of the middle period. Even in the deliberately religious and moral work of the more academic poets this seriousness is never more exclusive or oppressive than it is in any other literature of the time. If it becomes an obsession of many of the post-Reformation writers, it becomes so by the *force majeure* of special circumstances rather than in the exercise of an old-established habit.

Outstanding examples of this rustic style are *Peblis to the Play* and *Christis Kirk on the Grene*, ascribed by some to James V. (*q.v.*), *Sym and his Brudir*, a satirical tale of two palmers, *The Wyf of Auchtirmuchty*, and the *Wowing of Jok and Jynny*. The more imaginative, elfin quality, familiar in Dunbar's *Ballad of Kynd Kittok* and his *Interlude of the Droichis Part* appears in such pieces as *Gyre Carling* (the mother-witch), *King Berdok*, and *Lichtounis Dreme*. The convivial verse, at its best in Dunbar's *Testament of Mr Andrew Kennedy*, may be studied in *Quhy sould nocht Allane honorit be*, one of the many eulogies of John Barleycorn anticipatory of Burns's well-known piece.

In the collections there are few examples of the simple fabliau, the best being the *Thrie Priestis of Peblis* and *The Dumb Wyf*, or of the social variety of the same as shown in *Rauf Coilȝear* and *John the Reeve*. For the latter Sir David Lyndsay remains the chief exponent. Of historical and patriotic verse there are few specimens, but some of the lyrics and love-songs, more or less medieval in *timbre* and form, are of importance. Of these, *Tayis Bank* and *The Murning Maiden* are perhaps the best.

Vernacular prose was, as might be expected, and especially in Scotland, late in its appearance. The main work continued to be done in Latin, and to better purpose by Hector Boece (*q.v.*), John Major (*q.v.*) and George Buchanan (*q.v.*) than by the earlier annalists Fordun (*q.v.*) and Bower (*q.v.*). It is not till the middle of the 15th century that we encounter any works seriously undertaken in the vulgar: before that time there is nothing but an occasional letter (*e.g.* that of the earl of March to Henry IV.), a few laws, and one or two scraps in the Asloan and other MSS., all of the plainest and without any effort towards style. Nor can it be said that the first works of a more extensive and deliberate character show any consciousness of pure art as we find it in contemporary writings in England, though the fact that they are translations has some prospective significance. The earliest books are Sir Gilbert Haye's *Buke of the Law of Arms*, *Buke of the Order of Knighthood*, and *Government of Princes*, preserved in a single MS. at Abbotsford. The dull treatise of John of Ireland (*q.v.*) lays claim to originality of a kind. The author's confession that, being "thretty ȝeris nurist in Fraunce, and in the noble study of Paris in Latin toung," he "knew nocht the gret eloquens of Chauceir," and again that he had written another work in Latin, "the tounge that I knaw better," is valuable testimony to the difficulties in the way of a struggling Scots prose. Other preliminary efforts are the *Portuus of Nobilnes* in the Asloan MS.; the *Spectakle of Luf*, translated by G. Mill (1492); and the *Schort Memoriale of the Scottis Corniklis*, an account of the reign of James II. In the early 16th century the use of the vernacular is extended, chiefly in the treatment of historical and polemical subjects, as in Murdoch Nisbet's version of Purvey (in MS. till 1901), a compromise between northern and southern usage; Gau's (*q.v.*) *Richt Vay*, translated from Christiern Pedersen; Bellenden's (*q.v.*) translation of Livy and *Scottish History*; the *Complaynt of Scotlande*, largely a mosaic of translation from the French; Ninian Winzet's (*q.v.*) *Tractates*; Lesley's (*q.v.*) *History of Scotland*; Knox's (*q.v.*) *History*; Buchanan's (*q.v.*) *Chamaeleon*; Lindesay of Pitscottie's (*q.v.*) *History*; and the tracts of Nicol Burne and other exiled Catholics. In these works, and especially in Knox, the language is strongly southern. The Scriptures, which had an important bearing on the literary style, as on other matters, were, with the exception of Nisbet's version, which does not appear to have widely circulated, accepted in the southern text. It was not till the publication of Bassandyne's Bible in 1576–1579 that a Scottish version was used officially. Lyndsay in the midst of passages in Scots quotes directly from the Genevan version. The literary influence of the Bassandyne was unimportant. Of the prose books named the *Complaynt of Scotlande* is the most remarkable example of aureate Middle Scots, the prose analogue of the verse of the "Chaucerians." This characteristic is by no means strong in Scots prose, even at this time: the last, and most extravagant, example is the *Rolment of Courtis* by Abacuck Bysset, as late as 1622.

So far in our treatment of the Middle Period we have taken account of the "Chaucerian" and more popular verse and of the prose. There appear towards the close of the period certain verse-writers, who, despite points of difference with their Middle Scots predecessors, belong as much to this period as to the next. In language they are still Scottish; if they show any southern affectations, it is (all echoes of the older aureate style notwithstanding) the affectation of Tudor and Elizabethan English. This poetry, like that of the early half of the period, is courtly; its differences are the differences between the atmosphere of the reigns of the first and fourth Jameses and that of the sixth. When the sixth James becomes the first of England, a more thorough transformation is discernible. In the centre of this group is King James (*q.v.*) himself, poet and writer of prose; but he yields in literary competence to Alexander Scott (*q.v.*) and Alexander Montgomerie (*q.v.*). Their interest on the formal side is retrospective, but it is possible to find even in the persistent reiteration of medieval sentiment and methods, a fresh feeling for nature, and a lyrical quality of later *timbre*. With these may be named the minors, William Fowler (*q.v.*), Alexander Arbuthnot (*q.v.*) and John Rolland (*q.v.*), the last most strongly influenced by Douglas and the earlier "makars."

III. The third period begins with the 17th century, with the union of the English and Scottish crowns, if we seek the aid of political history for our literary finger-posts. Strict accuracy would place the date of change earlier than 1600 or 1603, for there is evidence in the 16th century, even outside the region of diplomatic and official correspondence, of the intermingling of the north and south. It is, however, when James is established on his new throne that we have the clearest signs of the changes which had been at work and were ultimately to transform the entire literary habit of his ancient kingdom. The recital of the names of the Anglo-Scots poets will make this clear: Robert Ker, earl of Ancram, best known for his *Sonnet in Praise of a Solitary Life*; Sir David Murray of Gorthy, who wrote *The tragicall Death of Sophonisba*; Sir William Alexander (*q.v.*), afterwards earl of Stirling; William Drummond, laird of Hawthornden (*q.v.*); Sir Robert Aytoun (*q.v.*); James Grahame, marquess of Montrose; Patrick Hannay; and the covenanting Sir William Mure of Rowallan (*q.v.*); a group whose "courtly" style might be assumed, had the literary evidence been less ample than it is. So, too, in prose. There we have Drummond again, and that strange genius Sir Thomas Urquhart (*q.v.*); a crowd of polemical writers, mostly ecclesiastics; all the historians, including Spotswood and Calderwood. There is small room for the old vernacular here; and less when we take into account the still active Latinity, shown in the publication by the poet Arthur Johnston (*q.v.*) of the two volumes of *Delitiae poëtarum Scotorum hujus aevi illustrium* (1637), and in the writings of John Barclay (*q.v.*) author of the *Argenis*, Sir Robert Aytoun (*v.s.*), Thomas Dempster (*q.v.*), the historian, David Hume of Godscroft, Sir John Scot of Scotstarvet, best known for his prose *Staggering State*, Sir Thomas Craig, author of the *Jus Feudale*, Andrew Melville and others represented in Johnston's volumes.

There is nothing in Scots to balance this English and Latin list. The play *Philotus*, a poor example in a *genre* rarely attempted in the north, is indebted to the south for more than its subject. The interesting philological tractate *Of the Orthographie and Congruitie of the Britan Tongue* by Alexander Hume (not the verse writer, *u.s.*) is in its language a medley; and William Lithgow had travelled too widely to retain his native speech in purity, even in his indifferent verse. Scraps may be unearthed as mediocre as the *Answer to Curat Caddel's Satyre upon the Whigs*, which attempts to revive the mere vulgarity of the Scots "flyting." The only contributions which redeem these hundred years and more from the charge of disrespect to the native muse come from the pen of the Sempills (*q.v.*). And even here individual merit must yield to historical interest. We are attracted to Beltrees and his kinsmen less by their craftsmanship than by the fact that they supplied the leaders of the vernacular revival of the 18th century with many subjects and verse-models, and that by their treatment of these subjects and models, based on the practice of an earlier day, they complete the evidence of the continuity of the domestic popular type of Scots verse.

In the 18th century the literary union of the North and South is complete. The Scot, whatever dialectal habits marked his speech, wrote the English of Englishmen. The story of his triumphs belongs to the story of English literature: to it we leave James Thomson, Adam Smith, David Hume, James Boswell and Sir Walter Scott. If the work begun by Allan Ramsay, continued by Fergusson and completed by Burns, were matter for separate treatment, it would be necessary to show not only that the editorial zeal which turned these writers to the forgotten vernacular and to "popular" themes was inspired by the general conditions of reaction against the artificiality of the century; but that it was because these poets were Scots, and in Scotland, that they chose this line of return to nature and naturalness, and did honour, partly by protest, to the slighted efforts of the "vulgar" muse. Yet even they did not abjure the "southern manner," and their work in it is matter of some critical significance, whatever may be said of its inferiority in spirit and craftsmanship.

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SCOTLAND, CHURCH OF. The purpose of this article is to trace the growth of the Scottish "Kirk" as a whole, defining the views on which it was based and the organization in which they took form. The controversies within the Church of Scotland have not arisen out of matters of faith but out of practical questions of church government and of the relation of church and state. Holding a church theory to which the rulers of the country were for a century strongly opposed, Scotland became the leading exponent of Presbyterianism (*q.v.*); and this note has been the dominant one in her religious history even in recent times.

Scottish Reformation.

The Scottish Reformation came out of a covenant in which the barons, inspired by John Knox, then abroad, bound themselves in 1557 to oppose the Roman Catholic religion and to promote the cause of the Reformation. When parliament, on the 24th of August 1560, passed the acts abolishing the papal jurisdiction and the mass in Scotland, it was able, as Knox had been preparing for this crisis, to sanction a new confession of faith for the Reformed church. Other documents of the new system were quickly forthcoming. The First Book of Discipline set forth the whole of the proposed religious and educational constitution, and this book speaks of "the order of Geneva which is now in use in some of our churches." This order, afterwards with some modifications known as John Knox's Liturgy, and used in the church down to the reign of Charles I., is a complete directory of worship, with forms of all the services to be held in the church.

First Book of Discipline.

The type of religion found in these documents is that of Geneva, the unit being the self-governing congregation, and the great aim of the system the pure preaching of the Word. The congregation elect the minister; in no other way can he enter on his functions; but once elected and admitted he is recognized as a free organ of the divine spirit, not subject in spiritual things to any earthly authority but that of his fellow-ministers; the word of God is the supreme authority, and the spoken word of God the vital element of every religious act. The word of God is to prevail in all matters, in conduct as well as doctrine, and in the affairs of government as well as in the church. The terrible power of excommunication is claimed for the church; but the council of the realm also is called to use the power given them by God to put down all religion but the reformed, and to further the aims and carry out the sentences of the church. It was a matter of course that saints' days and church festivals were abolished as having no warrant in Scripture; Sunday alone remained, as the principal day of preaching. In towns a week-day was to be set apart for the "exercise" or public interpretation of Scripture, in which all qualified persons in the neighbourhood were to take part, as if the whole country were a school of the Bible.

The First Book of Discipline does not set forth any complete scheme of church government. Its arrangements are in part provisional. In addition to the minister, who is its most definite figure and proved to be the most permanent, it recognizes the superintendent, the lay elder and the reader. Ten or twelve superintendents were to be appointed, "a thing most expedient at this time." They were parish ministers and subject like their brethren to church courts; their added function was to plant churches, and place ministers, elders and deacons where required. This was also the duty of "commissioners" who were superintendents over smaller territories and for a shorter term. Whether the superintendents were meant to be permanent in the church is not clear. The lay elder was very much what he is still. The reader was to conduct service when no minister was available, reading the Scriptures and the Common Prayer. When there was preaching, it was accompanied by free prayer; the liturgy was not then called for. Of church courts the assembly is taken for granted, having existed from the first; the minor church courts are not yet defined, though the elements of each of them are present. A noble scheme of education was sketched for the whole country, but neither this nor the provision made for ministers' stipends was carried out, the revenues of the old church, from which the expenses of both were to be paid, being in the hands of the barons.

The system naturally took time to get into working order. The old clergy, bishops, abbots and priests were still on the ground, and were slow to take service in the new church. In 1574 there were 289 ministers and 715 readers; in the district of the presbytery of Auchterarder, which now has fifteen parishes, there were then four ministers and sixteen readers. As the ranks of the clergy slowly filled, questions arose which the Reformation had not settled, and it was natural that the old system with which the country was familiar should creep in again. Presbytery was never much in favour with the crown—this was the case in other countries as well as in Scotland—and when the crown, so weak at the Reformation, gained strength, encroachments were made on the popular character of the kirk; while the barons also had obvious reasons for not wishing the kirk to be too strong. The first parliament of the Regent Murray (1567), while confirming the establishment of the Reformed church as the only true church of Christ, settling the Protestant succession, and doing something to secure the right of stipend to ministers, reintroduced lay patronage, the superintendent being charged to induct the patron's nominee—an infringement of the reformed system against which the church never ceased to protest. In 1572 a kind of Episcopacy was set up in the interest of the nobles, who in order to draw the income of the episcopal sees had to arrange with men possessing a legal title to them. These "tulchan"[1] bishops did not make the episcopal office respected in the country; but their appointment was not opposed by the church leaders. They had no episcopal ordination, nor did they exercise any authority over their brother ministers. Knox was called to preach the sermon at the admission of one of them, John Douglas, to the archbishopric of St Andrews, and while he denounced both patron and presentee for the corrupt bargain they had made, he did not protest against the office of bishop as contrary to the constitution of the church.

Second Book of Discipline.

To this declaration, however, the church soon came. Andrew Melville (*q.v.*) came to Scotland at this time, and became the leader of the church in place of Knox, who died in 1572. He brought with him from Geneva, where he had been the colleague of Beza, a fervent hatred of ecclesiastical tyranny and a clear grasp of the Presbyterian church system. The Scottish church, hitherto without a definite constitution, soon espoused under his able leadership a logical and thorough Presbyterianism, which was expressed in the Second Book of Discipline, adopted by the assembly in 1577, and was never afterwards set aside by the church when acting freely. The assembly of 1575 decided that all ministers were bishops; that of 1578 abolished the name of bishop as denoting an office in the church, and that of 1580 in spite of a royal remonstrance abolished Episcopacy, a decree to which all the bishops except five submitted. The Second Book of Discipline recognizes four kinds of office in the church, and no one can lawfully be placed in any of them except by being called to it by the members. Pastor, bishop and minister are all titles of the same office, that of those who preach the word and administer the sacraments, each to a particular congregation. The doctor is a teacher in school or university; he is an elder and assists in the work of government. Elders are rulers; their function also is spiritual, though practical and disciplinary. The fourth office is that of the deacons, who have to do with matters of property and are not members of church courts. Neither superintendent nor reader now appears; all the functions of bishops and superintendents are vested in the elderships, or church courts, and it is urged that the parts which still remain in Scotland of the old system should be cleared away and the sole jurisdiction of the kirk, as then constituted, recognized. The assembly is to have the right to fix its own time of meeting, and its decision in matters ecclesiastical is not to be subject to any review. Kirk-sessions and presbyteries are not named, but the principles are clearly laid down on which these institutions were to rest.

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[1] "Tulchan," a calf-skin filled with straw, supposed to induce the cow to give milk freely; hence a term of contempt for one who is used as a dummy for the advantage of another.

Presbyterian principle.

By committing herself to this system the Church of Scotland established between herself and the Church of England a division which became more and more apparent and was the cause of much of her subsequent sufferings. It is no doubt strange that she should have endured so much not for any great Christian principle, but for a question of church government. On the other hand, Presbyterianism stood in Scottish history for freedom, and for the rights of the middle and lower classes against the crown and the aristocracy; and it might not have been held with such tenacity or proved so incapable of compromise but for the opposition and persecution of the three Stuart kings. The history of the Scottish church for a century after the date of the Book of Discipline is that of a religious struggle between the people and the crown.

For some years after its inception Presbyterianism carried all before it. The presbyteries came quickly into existence; that of Edinburgh dates from 1580. In that year it was found that there were 924 parishes in Scotland, but not nearly all supplied with ministers; it was proposed that there should be 50 presbyteries (in 1910 there are 84) and 400 ministers. A great part of the country, especially in the north and west, had not yet been reached by the Reformation. At this time began the long series of attempts made by James VI. in the direction of curbing Presbyterian liberty and of the restoration of Episcopacy. In 1584 were passed the acts called the Black Acts, which made it treason to speak ill of the bishops, declared the king to be supreme in all causes and over all persons, thus subverting the jurisdiction of the church, and made all conventions illegal except those sanctioned by the king. The bishops were to do what had hitherto been done by the assembly and presbyteries, and no attacks were to be made at religious meetings on the king or council. Other acts followed by which the episcopate was strengthened, though the act of 1587 annexing the temporalities of the bishops to the crown, while fatal to the old episcopate, made the prospects of the new more doubtful. In 1588 a change took place. A Roman Catholic rising threw James into the arms of the kirk; in 1592 the acts of 1584 were abrogated, the Second Book of Discipline legalized and Presbytery established. The church was at the time very powerful, the people generally sympathizing with her system, and her assemblies being attended by many of the nobles and the foremost men. Discipline was strict; the temper of the church was in accordance with the Old rather than the New Testament.

Another sudden change took place a few years later, James falling out of humour with the church on the question of the restoration of the Roman Catholic lords and angered by the free criticism of some of the ministers. His *Basilicon Doron*, published in 1599, shows a determination to make the church episcopal. With this end assemblies, from which Melville was excluded, and which were otherwise tampered with and terrorized, were got to agree that a number of ministers should sit in parliament, and to surrender the assembly's right of meeting. On his accession to the throne of England in 1603 James entered on a new set of attempts to assimilate the Scottish church to that of England. Melville was brought to London, imprisoned and sent abroad; other ministers who had acted or spoken too freely were banished. The powers of the bishops were increased, and their brethren brought in various ways under subjection to them, and in 1609 two courts of high commission were set up by the royal authority with plenary powers to enforce conformity to the new arrangements. In 1610 three ministers were called to London to be consecrated as bishops, as if there had till now been no bishops in Scotland; these on their return consecrated ten others. In 1612 the act of 1592 which established Presbytery was rescinded, and Episcopacy became the legal church system of Scotland.

Articles of Perth.

In all this it was the position and rights of the clergy that were assailed; and James showed kindness to the church in seeking to secure that stipends should be paid and that new churches should be provided where required. The people had been less interfered with; the change of church government involved no change in the conduct of worship. But the articles passed by the packed assembly of Perth in 1618 touched on the religious habits and postures of the people, and in this it soon appeared that a crisis had been reached. These famous articles were: (1) That the communion should be received kneeling; (2) That it might be administered in private; (3) That baptism might be in the home; (4) That children of eight should be taken to the bishop for examination and his blessing; (5) That Christmas, Good Friday, Easter and Whitsunday should be observed. These articles were opposed in parliament and were strongly resented throughout the country. When Charles became king in 1625 he at once let it be known that the Articles of Perth were not to be abrogated, and that no meeting of the assembly was to be allowed. During the first years of his reign he was occupied in other directions; but when he came to Scotland in 1633 to be crowned, Laud came with him, and though like his father he showed himself kind to the clergy in matters of stipend, and adopted measures which caused many schools to be built, he also showed that in the matter of worship the policy of forcing Scotland into uniformity with England was to be carried through with a high hand. A book of canons and constitutions of the church which appeared in 1636, instead of being a digest of acts of assembly, was English in its ideas, dealt with matters of church furniture, exalted the bishops and ignored the kirk-session and elders. The liturgy was ordered to be used, which had not yet appeared, but which proved to be a version, with somewhat higher doctrine, of the Anglican Common Prayer. The introduction of this service book in St Giles's Church, Edinburgh, on the 16th of July 1637, occasioned the tumult of which Jenny Geddes will always figure as the heroine.

National covenant.

The sentiment was echoed throughout Scotland. Petitions against the service book and the book of canons poured in from every quarter; the tables or committee formed to forward the petition rapidly became a powerful government at the head of a national movement, the action of the crown was temporizing, and on the 28th of February the National Covenant was signed in the famous scene in Greyfriars church and churchyard. This document consisted of three parts: (1) A covenant signed by King James and his household in 1580, to uphold Presbyterianism and to defend the state against Romanism; (2) A recital of all the acts of parliament passed in the reigns of James and Charles in pursuance of the same objects; and (3) The covenant of nobles, barons, gentlemen, burgesses, ministers and commons to continue in the reformed religion, to defend it and resist all contrary errors and corruptions. The Covenant was no doubt an act of revolt against legal authority, and can only be justified on the ground that the crown had for many years acted oppressively and illegally in its attempt to coerce Scotland into a religious system alien to the country, and that the subjects were entitled to free themselves from tyranny. The crown was unable either to check the popular movement or to come to any compromise with it, and the Glasgow assembly of 1638, the first free assembly that had met for thirty years, proceeded to make the church what the Covenant required. A clean sweep was made of the legislation of the preceding period; the five articles of Perth, the service book and book of canons and the court of high commission were all condemned. The bishops were tried not for being bishops but on exaggerated charges of false doctrine and loose living; and all were deposed from the ministry. Many ministers were also deposed on the charge of Arminianism. It was by an assembly that the second reformation was effected; but the assembly contained the most influential of the nobility and gentry, and was carried on the crest of a great national movement. The Covenant was accepted by parliament in 1639.

The succeeding decennium is the culminating period of Scottish Presbyterianism, when, having successfully resisted the crown, it not only was supreme in Scotland but exercised a decisive influence over England. The causes which brought about this state of affairs are to be sought to a large extent in the civil history of England. Presbytery was rapidly growing in that country, and the English parliament sought the alliance of the assembly, while the Independents, though in the event Presbytery was as little to their liking as Episcopacy, joined in the wish to get rid of the episcopal system. In its period of triumph the Presbyterianism of Scotland displayed its character. After the injustice and persecution it had suffered it could scarcely prove moderate or tolerant; it showed a vehement determination to carry out the truth it had vindicated with such enthusiasm, to the full extent and wherever possible. The Covenant, at first a standard of freedom, was immediately converted into a test and made the instrument of oppression and persecution. All policy was to be determined by the Covenant; the king and every official was to be obliged to take it. The mind of the nation being so preoccupied with the Covenant, it naturally followed that those who carried their fanaticism farthest were ready to denounce and to unchurch those who showed any inclination to moderation and political sanity, and that the beginnings of schism soon appeared in the ranks of the Covenanters.

Westminster confession.

In 1643, when the full legal establishment of Presbytery had just been consummated, the assembly, asked by the English parliament to arrange a league to be signed in both countries for the furtherance of reformed religion, agreed, but asked that the league should be a religious one. The result was the Solemn League and Covenant. The league did not mention Presbyterianism; but the assembly had refused to hear of any recognition of independency; if religion were thoroughly reformed, they considered the result must be Presbyterianism in England as in Scotland. In the Westminster Standards also, which were the fruit of the Scottish desire for a religious uniformity, Scotland did not obtain by any means all it desired in its church documents. The Scottish divines in the Westminster Assembly were only five in number, while the assembly contained effective parties of Erastians and Independents. The Confession of Faith contains no approval of any system of church government, and when she adopted it in 1647 the kirk gave up her old confession in which the principles at least of true church order are laid down. In accepting in 1645 the Westminster Directory of Public Worship she tacitly gave up her own liturgy which had been in use till recently, and committed herself to a bald and uninviting order of worship, in which no forms of prayer were allowed to be used. So much did Scotland for the sake of uniformity accept from England. The metrical psalms also, which are still sung in Scottish churches, were adopted at this time; they are based mainly on the version, which had been approved by the Westminster Assembly, of Francis Rouse (1579–1659), a member of the English House of Commons.

The engagement made with Charles, then a prisoner in the Isle of Wight in 1647, which promised him support on condition of his sanctioning the Solemn League and Covenant and pledging himself to set up after three years a church according to the Confession of Faith, was protested against by the assembly; and from this came the famous "Act of Classes" by which the Covenanters disqualified for public office and even for military service all who had been parties to the engagement. The rescinding of this act in 1651 led to a serious breach in the ranks of the Scottish clergy. The Resolutioners, or supporters of the resolution to rescind that act, were opposed by the Protesters, the rigid adherents to the strictest interpretation of the Covenant. The period of the Commonwealth was filled with the strife between these two parties, its bitterness not lessened by the fact that the assembly dissolved in 1653 by Cromwell's soldiers was not allowed to meet again in his protectorate. The Protesters, who were in favour with the common people, are chargeable with having brought into Scottish church life the observance of fast-days, and of the long and excited Communion services which were kept up for two and a half centuries and may still be witnessed in the Highlands.

Struggle against Episcopacy.

If the mismanagement of Scottish religious affairs under James and Charles I. is a melancholy story, what took place under Charles II. is infinitely sadder. A series of blunders was committed in the attempt to compel Scotland to submit to the religion the government prescribed, and the failure of each measure was followed by more inhuman severities. Detail is impossible here. From the first Charles showed himself determined to force Episcopalianism on Scotland, and not too scrupulous in the choice of methods for securing his ends. The attempt was nearly successful. In the greater part of the country little change took place in the religious services. The service book was not read nor kneeling at communion required, and it made no immediate difference to the people that the clergy should be under bishops. The inferior church courts still sat, though not the assembly. At the Restoration it was a question whether the bulk of the population was in favour of Presbytery or of Episcopacy. But the matter was handled in such a way in the west of Scotland that an extreme Covenanting spirit arose, nourished on intolerable grievances, and that the nation as a whole decided against the system which had been promoted by such means.

The Rescissory Act of 1661 swept away the legislation of the preceding twenty years, and so disposed of the Presbyterian polity of the church. Episcopacy was restored by a letter from the king on the 5th of September 1661. James Sharp (*q.v.*), Fairfoul, James Hamilton (1610–1674) and Robert Leighton (*q.v.*) were the new bishops; Sharp and Leighton having to be ordained as deacons, then as priests, before the consecration, and the party travelling to Scotland in state, though Leighton left them before crossing the border. An act requiring all ministers appointed during the period when patronage was abolished to get presentation from their patrons and institution from their bishops was applied in the west of Scotland in such a way that 300 ministers left their manses. Their places were filled with less competent men whom the people did not wish to hear, and so conventicles began to be held. The attempts to suppress these, the harsh measures taken against those who attended them or connived at them, or refused to give information against them, the military violence and the judicial severities, the confiscations, imprisonments, tortures, expatriations, all make up a dreadful narrative. Indulgences were tried, and were successful in bringing back about 100 ministers to their parishes and introducing a new cause of division among the clergy. On the other hand, the Covenanting spirit rose higher and higher among the persecuted till the armed risings took place and the formal rebellion of a handful of desperate men against the ruler of three kingdoms. The story of Richard Cameron (*q.v.*) is one of the highest romantic heroism; his name was perpetuated in that of the Cameronian body ("first-born of the Scottish sects"), which, as the Reformed Presbyterian Church, kept up a separate existence till 1876, when it united with the Free Church, and in that of the Cameronian regiment, originally formed from his followers after his death and distinguished since in every part of the world. The proclamation of toleration in 1685 was intended mainly for Roman Catholics and excluded field preachers.

Revolution of 1688.

When William landed in England in 1688, the scene changed in Scotland. The soldiery was withdrawn from the west, and the people at once showed their feelings by the "rabbling" or ejection of the curates who occupied the manses of the ousted ministers, in which, however, no lives were lost. William would have decided for Episcopacy in Scotland, as the great body of the nobles and gentry adhered to it, but only on condition that the Episcopalians agreed to support him and that they had the people with them. Neither of these conditions was fulfilled. On the 22nd of July

1689 the Convention which declared the throne vacant and called William and Mary to fill it, declared in its Claim of Right that prelacy and the superiority of any office in the church above ministers had been a great and insupportable grievance to Scotland. Effect was given to this; and in April 1690 the act was passed on which the establishment of the Church of Scotland rests, the Westminster Confession being recognized, the laws in favour of Episcopacy repealed, though the Rescissory Act remained on the statute book, and the assembly appointed to meet. The Covenants were not mentioned; at his coronation William had refused to be a persecutor, and he desired that the church should embrace all who were willing to be in it. The Revolution church contained from the first men of different views. Its first assembly in 1690 received into the church the three remaining ministers of the Cameronians, though their followers refused to come with them. With regard to Episcopalian ministers, by whom the majority of parishes were served, there was more difficulty. The Presbyterians were not ready for union with them, and many of them were put out of their livings, ostensibly by way of discipline. The king and his representatives at the assembly pressed hard for their reception, and in 1693 the "Act for settling the quiet and peace of the Church" was passed, which provided for their admission on taking the oaths of allegiance and assurance, subscribing the Confession of Faith and acknowledging Presbyterian government. This act fixed the formula of subscription to be signed by all ministers.

From this time forward the church, while jealously asserting her spiritual independence, was on the side of the crown against the Jacobites, and became more and more an orderly and useful ally of the state. In 1697 the Barrier Act was passed, which provides that any act which is to be binding on the church is to come before the assembly as an overture and to be transmitted to presbyteries for their approval. The difficulties which threatened to arise about the union were skilfully avoided; the Act of Security provided that the Confession of Faith and the Presbyterian government should "continue without any alteration to the people of this land in all succeeding ages," and the first oath taken by Queen Anne at her accession was to preserve it. The Act of Toleration of 1712 allowed Episcopalian dissenters to use the English liturgy. This had not hitherto been done, and the claim of the Episcopalians for this liberty had been the occasion of a bitter controversy. The same parliament restored lay patronage in Scotland, an act against which the church always protested and which was the origin of great troubles.

Patronage difficulties.

Presbytery, being loyal to the house of Hanover, while Episcopacy was Jacobite, was now in enjoyment of the royal favour and was treated as a firm ally of the government. But while the church as a whole was more peaceful, more courtly, more inclined to the friendship of the world than at any former time, it contained two well-marked parties. The Moderate party, which maintained its ascendancy till the beginning of the 19th century, sought to make the working of the church in its different parts as systematic and regular as possible, to make the assembly supreme, to enforce on presbyteries respect for its decisions, and to render the judicial procedure of the church as exact and formal as that of the civil courts. The Popular party, regarding the church less from the side of the government, had less sympathy with the progressive movements of the age, and desired greater strictness in discipline. The main subject of dispute arose at first from the exercise of patronage. Presbyteries in various parts of the country were still disposed to disregard the presentations of lay patrons, and to settle the men desired by the people; but legal decisions had shown that if they acted in this way their nominee, while legally minister of the parish, could not claim the stipend. To the risk of such sacrifices the church, led by the Moderate party, refused to expose herself. By the new policy inaugurated by Dr William Robertson (1721–1793), which led to the second secession, the assembly compelled presbyteries to give effect to presentations, and in a long series of disputed settlements the "call," though still held essential to a settlement, was less and less regarded, until it was declared that it was not necessary, and that the church courts were bound to induct any qualified presentee. The substitution of the word "concurrence" for "call" about 1764 indicates the subsidiary and ornamental light in which the assent of the parishioners was now to be regarded. The church could have given more weight to the wishes of the people; she professed to regard patronage as a grievance, and the annual instructions of the assembly to the commission (the committee representing the assembly till its next meeting) enjoined that body to take advantage of any opportunity which might arise for getting rid of the grievance of patronage, an injunction which was not discontinued till 1784. It is not likely that any change in the law could have been obtained at this period, and disregard of the law might have led to an exhausting struggle with the state, as was actually the case at a later period. Still it was in the power of the church to give more weight than she did to the feelings of the people; and her working of the patronage system drove large numbers from the Establishment. A melancholy catalogue of forced settlements marks the annals of the church from 1749 to 1780, and wherever an unpopular presentee was settled the people quietly left the Establishment and erected a meeting-house.

Growth of dissent.

In 1763 there was a great debate in the assembly on the progress of schism, in which the Popular party laid the whole blame at the door of the Moderates, while the Moderates rejoined that patronage and Moderatism had made the church the dignified and powerful institution she had come to be. In 1764 the number of meeting-houses was 120, and in 1773 it had risen to 190. Nor was a conciliatory attitude taken up towards the seceders. The ministers of the Relief desired to remain connected with the Establishment, but were not suffered to do so. Those ministers who resigned their parishes to accept calls to Relief congregations, in places where forced settlements had taken place, and who might have been and claimed to be recognized as still ministers of the church, were deposed and forbidden to look for any ministerial communion with the clergy of the Establishment. Such was the policy of the Moderate ascendancy, or of Principal Robertson's administration, on this vital subject. It had the merit of success in so far as it completely established itself in the church. The presbyteries ceased to disregard presentations, and lay patronage came to be regarded as part of the order of things. But the growth of dissent steadily continued and excited alarm from time to time; and it may be questioned whether the peace of the church was not purchased at too high a price. The Moderate period is justly regarded as in some respects the most brilliant in the history of the church. Her clergy included many distinguished Scotsmen, among them Thomas Reid, George Campbell, Adam Ferguson, John Home, Hugh Blair, William Robertson and John Erskine. The labours of these men were not mainly in theology; in religion the age was one not of advance but of rest; they gained for the church a great and widespread respect and influence.

Another salient feature of the Moderate policy was the consolidation of discipline. It is frequently asserted that discipline was lax at this period and that ministers of scandalous lives were allowed to continue in their charges. It cannot, however, be shown that the leaders of the church at this time sought to procure the miscarriage of justice in dealing with such cases. That some offenders were acquitted on technical grounds is true; it was insisted that in dealing with the character and status of their members the church courts should proceed in as formal and punctilious a manner as civil tribunals, and should recognize the same laws of evidence; in fact, that the same securities should exist in the church as in the state for individual rights and liberties.

The religious state of the Highlands, to which at the period of the Union the Reformation had only very partially penetrated, occupied the attention of the church during the whole of the 18th century. In 1725 the gift called the "royal bounty" was first granted—a subsidy amounting at first to £1000

Religious condition of Highlands.

per annum, increased in George IV.'s reign to £2000, and continued to the present day; its original object was to assist the reclamation of the Highlands from Roman Catholicism by means of catechists and teachers. The Society for Propagating Christian Knowledge, incorporated in 1709, with a view partly to the wants of the Highlands, worked in concert with the Church of Scotland, setting up schools in remote and destitute localities, while the church promoted various schemes for the dissemination of the Scriptures in Gaelic and the encouragement of Gaelic students. In these labours as well as in other directions the church was sadly hampered by poverty. The need of an increase in the number of parishes was urgently felt, and, though chapels began to be built about 1796, they were provided only in wealthy places by local voluntary liberality; for the supply of the necessities of poor outlying districts no one as yet looked to any agency but the state. In every part of the country many of the ministers were miserably poor; there were many stipends, even of important parishes, not exceeding £40 a year; and it was not till after many debates in the assembly and appeals to the government that an act was obtained in 1810 which made up the poorer livings to £150 a year by a grant from the public exchequer. The churches and manses were frequently of the most miserable description, if not falling to decay.

The Haldanes.

With the close of the 18th century a great change passed over the spirit of the church. The new activity which sprang up everywhere after the French Revolution produced in Scotland a revival of Evangelicalism which has not yet spent its force. Moderatism had cultivated the ministers too fast for the people, and the church had become to a large extent more of a dignified ruler than a spiritual mother. About this time the brothers Robert and James Haldane devoted themselves to the work of promoting Evangelical Christianity, James making missionary journeys throughout Scotland and founding Sunday schools; and in 1798 the eccentric preacher Rowland Hill visited Scotland at their request. In the journals of these evangelists dark pictures are drawn of the religious state of the country, though their censorious tone detracts greatly from their value; but there is no doubt that the efforts of the Haldanes brought about or coincided with a quickening of the religious spirit of Scotland. The assembly of 1799 passed an act forbidding the admission to the pulpits of laymen or of ministers of other churches, and issued a manifesto on Sunday schools. These acts helped greatly to discredit the Moderate party, of whose spirit they were the outcome; and that party further injured their standing in the country by attacking Leslie, afterwards Sir John Leslie, on frivolous grounds—a phrase he had used about Hume's view of causation—when he applied for the chair of mathematics in Edinburgh. In this dispute, which made a great sensation in the country, the popular party successfully defended Leslie, and thus obtained the sympathy of the enlightened portion of the community. In 1810 the *Christian Instructor* began to appear under the editorship of Dr Andrew Thomson, a churchman of vigorous intellect and noble character. It was an ably written review, in which the theology of the Haldanes asserted itself in a somewhat dogmatic and confident tone against all unsoundness and Moderatism, clearly proclaiming that the former things had passed away. The question of pluralities began to be agitated in 1813, and gave rise to a long struggle, in which Dr Thomas Chalmers (*q.v.*) took a notable part, and which terminated in the regulation that a university chair or principalship should not be held along with a parish which was not close to the university seat.

Church extension.

The growth of Evangelical sentiment in the church, along with the example of the great missionary societies founded in the end of the 18th and the beginning of the 19th century, led to the institution of the various missionary schemes still carried on, and their history forms the chief part of the history of the church for a number of years. The education scheme, having for its object the planting of schools in destitute Highland districts, came into existence in 1824. The foreign mission committee was formed in 1825, at the instance of Dr John Inglis (1763–1834), a leader of the Moderate party; and Dr Alexander Duff (*q.v.*) went to India in 1829 as the first missionary of the Church of Scotland. The church extension committee was first appointed in 1828, and in 1834 it was made permanent. The colonial scheme was inaugurated in 1836 and the Jewish mission in 1838, Robert Murray M'Cheyne (1813–1843) and Andrew Alexander Bonar (1810–1892) setting out in the following year as a deputation to inquire into the condition of the Jews in Palestine and Turkey and on the continent of Europe. Of these schemes that of church extension has most historical importance. It was originally formed to collect information regarding the spiritual wants of the country, and to apply to the government to build the churches found to be necessary. As the population of Scotland had doubled since the Reformation, and its distribution had been completely altered in many counties, while the number of parish churches remained unchanged, and meeting-houses had only been erected where seceding congregations required them, the need for new churches was very great. The application to government for aid, however, proved the occasion of a "Voluntary controversy," which raged with great fierceness for many years and has never completely subsided. The union of the Burgher and the Antiburgher bodies in 1820 in the United Secession—both having previously come to hold Voluntary principles—added to the influence of these principles in the country, while the political excitement of the period disposed men's minds to such discussions. The government built forty-two churches in the Highlands, providing them with a slender endowment; and these are still known as parliamentary churches. Under Thomas Chalmers, however, the church extension committee struck out a new line of action. That great philanthropist had come to see that the church could only reach the masses of the people effectively by greatly increasing the number of her places of worship and abolishing or minimizing seat-rents in the poorer districts. In his powerful defence of establishments against the voluntaries in both Scotland and England, in which his ablest assistants were those who afterwards became, along with him, the leaders of the Free Church, he pleaded that an established church to be effective must divide the country territorially into a large number of small parishes, so that every corner of the land and every person, of whatever class, shall actually enjoy the benefits of the parochial machinery. This "territorial principle" the church has steadily kept in view ever since. With the view of realizing this idea he appealed to the church to provide funds to build a large number of new churches, and personally carried his appeal throughout the country. By 1835 he had collected £65,626 and reported the building of sixty-two churches in connexion with the Establishment. The keenness of the conflict as it approached the crisis of 1843 checked the liberality of the people for this object, but by 1841 £305,747 had been collected and 222 churches built.

The zealous orthodoxy of the church found at this period several occasions to assert itself. John M'Leod Campbell (*q.v.*), minister of Row, was deposed by the assembly of 1830 for teaching that assurance is of the essence of faith and that Christ died for all men. He has since been recognized as one of the profoundest Scottish theologians of the 19th century, although his deposition was never removed. The same assembly condemned the doctrine put forth by Edward Irving, that Christ took upon Him the sinful nature of man and was not impeccable, and Irving was deposed five years later by the presbytery of Annan, when the outburst of supposed miraculous gifts in his church in London had rendered him still more obnoxious to the strict censures of the period. In 1841 Thomas Wright of Borthwick (1785–1855) was deposed for a series of heretical opinions, which he denied that he held, but which were said to be contained in a series of devotional works of a somewhat mystical order which he had published.

The influence of dissent also acted along with the rapidly rising religious fervour of the age in quickening in the church that sense of a divine mission, and of the right and power to carry out that mission without obstruction from any worldly

Disruption of 1843.

authority, which belongs to the essential consciousness of the Christian church. An agitation against patronage, the ancient root of evil, and the formation of an anti-patronage society, helped in the same direction. The Ten Years' Conflict, which began in 1833 with the passing by the assembly of the Veto and the Chapel Acts, is treated in the articles Free Church of Scotland, and it is not necessary to dwell further in this place on the consequences of those acts. The assembly of 1843, from which the exodus took place, proceeded to undo the acts of the church during the preceding nine years. The Veto was not repealed but ignored, as having never had the force of law; the Strathbogie ministers were recognized as if no sentence of deposition had gone forth against them. The protest which the moderator had read before leaving the assembly had been left on the table; and an act of separation and deed of demission were received from the ministers of the newly formed Free Church, who were now declared to have severed their connexion with the Church of Scotland. The assembly addressed a pastoral letter to the people of the country, in which, while declining to "admit that the course taken by the seceders was justified by irresistible necessity," they counselled peace and goodwill towards them, and called for the loyal support of the remaining members of the church.

Two acts at once passed through the legislature in answer to the claims put forward by the church. The Scottish Benefices Act of Lord Aberdeen, 1843, gave the people power to state objections personal to a presentee, and bearing on his fitness for the particular charge to which he was presented, and also authorized the presbytery in dealing with the objections to look to the number and character of the objectors. Sir James Graham's Act, 1844, provided for the erection of new parishes, and thus created the legal basis for a scheme under which chapel ministers might become members of church courts.

Development of the church since 1843.

The Disruption left the Church of Scotland in a sadly maimed condition. Of 1203 ministers 451 left her, and among these were many of her foremost men. A third of her membership is computed to have gone with them. In Edinburgh many of her churches were nearly empty. The Gaelic-speaking population of the northern counties completely deserted her. All her missionaries left her but one. She had no gale of popular enthusiasm to carry her forward, representing as she did not a newly arisen principle but the opposition to a principle which she maintained to be dangerous and exaggerated. For many years she had much obloquy to endure. But she at once set herself to the task of filling up vacancies and recruiting the missionary staff. A lay association was formed, which raised large sums of money for the missionary schemes, so that their income was not allowed seriously to decline. The good works of the church, indeed, were in a few years not only continued but extended. All hope being lost that parliament would endow the new churches built by the church extension scheme of Dr Chalmers, it was felt that this also must be the work of voluntary liberality. Under Dr James Robertson, professor of church history in Edinburgh, one of the leading champions of the Moderate policy in the Ten Years' Conflict, the extension scheme was transformed into the endowment scheme, and the church accepted it as her duty and her task to provide the machinery of new parishes where they were required.[1] By 1854, 30 new parishes had been added at a cost of £130,000, and from this time forward the work of endowment proceeded still more rapidly. In 1843 the number of parishes had been 924; in 1909 it was 1437. By the Poor Law Act of 1845 parishes were enabled to remove the care of the poor from the minister and the kirk-session, in whom it was formerly vested, and to appoint a parochial board with power to assess the ratepayers. The Education Act of 1872 severed the ancient tie connecting church and school together, and created a school board having charge of the education of each parish. At that date the Church of Scotland had 300 schools, mostly in the Highlands. The church continued till lately to carry on normal schools for the training of teachers in Edinburgh, Glasgow and Aberdeen; but these, along with the normal schools of the United Free Church, were recently made over to the state.

Abolition of patronage.

In 1874 patronage was abolished. The working of Lord Aberdeen's Act had given rise to many unedifying scenes and to lengthy struggles over disputed settlements, and it was early felt that some change at least was necessary in the law. The agitation on the subject went on in the assembly from 1857 to 1869, when the assembly by a large majority condemned patronage as restored by the Act of Queen Anne, and resolved to petition parliament for its removal. The request was granted, and the right of electing parish ministers was conferred by the Patronage Act 1874 on the congregation; thus a grievance of old standing, from which all the ecclesiastical troubles of a century and a half had sprung, was removed and the church placed on a thoroughly democratic basis. This act, combined with various efforts made within the church for her improvement, secured for the Scottish Establishment a large measure of popular favour, and in the last half of the 19th century she grew rapidly both in numbers and in influence. This revival was largely due on the one hand to the improvement of her worship which began with the efforts of Dr Robert Lee (1804–1868), minister of Old Greyfriars, Edinburgh, and professor of Biblical criticism in Edinburgh university. By introducing into his church a printed book of prayers and also an organ, Dr Lee stirred up vehement controversies in the church courts, which resulted in the recognition of the liberty of congregations to improve their worship. The Church Service Society, having for its object the study of ancient and modern liturgies, with a view to the preparation of forms of prayer for public worship, was founded in 1865; it has published eight editions of its "Book of Common Order," which, though at first regarded with suspicion, has been largely used by the clergy. Church music has been cultivated and improved in a marked degree; and hymns have been introduced to supplement the psalms and paraphrases; in 1898 a committee appointed by the Church of Scotland, the Free Church, the United Presbyterian Church and the Presbyterian Church in Ireland issued *The Church Hymnary*, which is authorized for use in all these churches alike. Architecture has restored many of the larger churches from their disfigurement by partition walls and galleries—though much still remains to be done in this way—and has erected new churches of a style favourable to devotion. The cathedral churches of St Giles, Edinburgh, and of Brechin and Dunblane, the abbey church of Paisley and the Church of the Holy Trinity, St Andrews, have been restored; and the abbey of Iona, handed over to the Church of Scotland by the duke of Argyll, is now once more fitted up for worship.

Improvements in public worship.

Committee on Christian Life and Work.

The fervour of the church found a channel in the operations of a "Committee on Christian Life and Work," appointed in 1869 with the aim of exercising some supervision of the work of the church throughout the country, stimulating evangelistic efforts and organizing the labours of lay agents. This committee publishes a magazine of "Life and Work," which has a circulation of over 100,000, and has organized young men's gilds in connexion with congregations and revived the ancient order of deaconesses. It was to reinforce this element of the church's activity, as well as to strengthen her generally, that James Baird (1802–1876) in 1873 made the munificent gift of £500,000. This fund is administered by a trust which is not under the control of the church, and the revenue is used mainly in aid of church building and endowment throughout the country.

The church has greatly increased of late years in width of view and liberality of sentiment, and shelters various tendencies of thought. A volume of *Scotch Sermons*, published in 1880 by ministers holding liberal views, brought out the fact that the church would not willingly be led into prosecutions for heresy. After this, however, there was a revival on the part of some of the clergy of High Church and orthodox sentiment. The Scottish Church Society was founded in 1892 with Dr John Macleod of Govan as president, "to defend and advance catholic doctrine as set forth in the ancient creeds and embodied in the standards of the Church of Scotland." In 1897, however, Alexander Robinson of Kilmun was deposed by the presbytery of Dunoon acting under the orders of the Assembly on account of the views contained in his book *The Saviour in the Newer Light*, in which the results of modern criticism of the Gospels were set forth with some ability. The National Church Union, of which Professor A. Menzies was president, was formed after this event by ministers and elders who feared that the cause of free theological inquiry was in peril in the church. This body at once raised the question of the relaxation of subscription, which was in a few years seriously taken up by the church, and the National Church Union, feeling that in this, as well as in the growth of liberal opinion in the church its object had been attained, discontinued its operations. The Scottish Church Society still carries on its work.

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[1] Those branches of the church extension scheme which dealt with church building, and with the opening of new missions to meet the wants of increasing populations, were taken up by a new department, called the Home Mission scheme. The home mission as the pioneer in opening up new fields of labour, and the endowment scheme which renders permanent the religious centres that the mission has founded, are both traceable to Dr Chalmers.

Questions of heresy.

The question of subscription has been more or less before the church for many years. The formula adopted by the assembly of 1711 had still to be signed by ministers, and was felt to be much too strict. After debates extending over many years, the assembly of 1889 fell back on the words of the act of parliament 1693, passed to enable the Episcopalian clergy to join the establishment, in which the candidate declared the Confession of Faith to be the confession of his faith, owned the doctrine therein contained to be the true doctrine and promised faithfully to adhere to it. This was accompanied by a Declaratory Act in which the church expressed its desire to enlarge rather than curtail the liberty hitherto enjoyed. Ten years later the assembly was again debating the question of subscription. A committee appointed in 1899 to inquire into the powers of the church in the matter reported that the power of the church was merely administrative—it was in her power as cases arose to prosecute or to refrain from prosecuting, but that she had no power to modify the confession in any way. Here the matter might have remained, but that the approach to parliament of the United and the Free Churches after the decision of the House of Lords in 1904 (see Free Church and United Free Church) offered an opportunity for asking parliament to remove a grievance the church herself had no power to deal with. The Scottish Churches Bill of 1905 afforded relief to all the Presbyterian churches. It did not do what the Church of Scotland asked, viz. allow the words of the act of 1690 to be used as the formula; but it removed that of 1693 and left it to the church to frame a new formula for her ministers and professors, an undertaking to which she is seriously addressing herself.

Attacks on the establishment.

The agitation for disestablishment sprang up afresh after the passing of the Church Patronage Act (Scotland); each assembly of the Free Church passed a resolution in favour of it, and the United Free Church continued this testimony. In 1890 Mr Gladstone declared for disestablishment, and under his government of 1892 a Disestablishment Bill was introduced in the House of Commons by Sir Charles Cameron, in two successive sessions, 1893–1894. After the defeat of the Liberal government in 1895, the church was for ten years relieved from this anxiety, nor had the attack been renewed up to 1911. A counter-movement was represented by a bill introduced into parliament in 1886 in order to declare the spiritual independence of the Church of Scotland, in the hope that the way might be opened to a reunion of the Presbyterian bodies. The act of 1905 has altered the circumstances of the churches in this regard. During the agitation the church was much occupied with the question of her own defence, and after it died down, various schemes were entertained for the improvement of her position without and within. She more than once expressed her willingness to confer with the daughter Presbyterian churches, with a view to their sharing with her the benefits of her position.

Since 1908 the subject of the union of the churches has been much spoken of. The quarter-centenary of the birth of Calvin occurring at the time of the Church assemblies of 1909 brought the Church of Scotland and the United Free Church assembly together for a memorial service in St Giles's; and a committee on union, consisting of 105 representatives from each assembly, was appointed.

Scottish theologians.

The Church of Scotland has made few contributions of importance to the movement of Biblical Criticism which has entered so deeply into the religious life of Scotland, but she has had distinguished writers on theology. Robert Lee (1804–1868), minister of Old Greyfriars and professor of Biblical criticism in Edinburgh University, fought a long battle for the liberty and the improvement of worship, of which the churches generally now reap the advantage. He held clear views as to the necessity of reform in the doctrine of the church as well; but these he died without publishing. Norman Macleod (*q.v.*), minister of the Barony Parish, Glasgow, a man of great natural eloquence and an ardent philanthropist, enjoyed the warm friendship of Queen Victoria and was beloved by his nation. John Caird (*q.v.*), professor of divinity and then principal of Glasgow University, wrote *An Introduction to the Philosophy of Religion*, exercised a deep influence as a teacher on Scottish thought, and was the most distinguished British preacher, of the intellectual order, of his day. John Tulloch (*q.v.*), principal of St Mary's College, St Andrews, wrote *Theism*, *Leaders of the Reformation*, *Rational Theology and Christian Philosophy in England in the 17th century*, and many other works, and was an effective champion of doctrinal liberty. He was succeeded at St Andrews and as Liberal leader in the assembly by John Cunningham (1819–1893), who wrote a very successful *History of the Church of Scotland*. Robert Herbert Story (1835–1906), principal after Caird of Glasgow University, stood by the side of Lee and Tulloch in their assembly contendings and was an outspoken defender of the National Church against her spoliators from without. Of his works may be mentioned lives of his father Dr Story, of Carstairs, and of Robert Lee. His life was written by his daughters. Andrew K. H. Boyd (1825–1899), minister of St Andrews, was widely known by the numerous volumes of essays, especially the "Recreations of a Country Parson." His "Twenty-five Years of St Andrews" contains a good deal of information. Robert Flint (*q.v.*) published *The Philosophy of History in Europe*, *Historical Philosophy in France*; his volumes on *Theism and Antitheistic Theories* have passed through many editions.

Statistics.

The Church of Scotland in 1909 had 1437 parishes and 251 chapels and preaching stations. The General Assembly consisted of 741 members. The professors of divinity at the four Scottish universities must be ministers of the church, but a proposal has been made to throw the chairs open to ministers of any of the Presbyterian bodies. The foreign mission employs fifty-two ordained and about as many unordained, medical, industrial and other missionaries, with a large number of native agents, in India, East Africa and China. Jewish missions are kept up at five stations in the East, and the colonial committee supplies ordinances to emigrants from Scotland in many of the dependencies of the empire. The small-livings fund aims at bringing up to £200 a year all stipends which fall short of that sum, of which there are nearly 400. About £4000 a year was still required in 1910 to carry out the object of this scheme.

The parliamentary return of 1888 showed the value of the teinds of 876 parishes to be £375,678 and the stipends paid to amount (exclusive of manses and glebes) to £242,330. The value of augmentations obtained since that date is more than balanced by the decline of fiars prices, so that the total revenue of the church from this source is about £220,000. The unexhausted teinds, according to the return in 1907, amounted to about £133,000. The exchequer pays to 190 poor parishes and 42 Highland churches, from church property in the hands of the crown, £17,040. From burgh and other local funds the church derives a revenue of £23,501. The church has herself added to her endowments, for the equipment of 453 new parishes, £1,681,330, yielding over £54,000 a year. The entire endowments of the church, including manses and glebes but not church buildings, is about £300,000.

For detailed accounts of the separate bodies—the United Presbyterian Church, the Free Church and the United Free Church—see the articles on each of these. The table on the following page shows the material progress of the respective organizations in recent years.

In the absence of a religious census it is not possible to deduce from statistics supplied by the churches themselves any trustworthy conclusion as to the percentage of the population adhering to each church. The Communion rolls of the parish churches require to be kept with care, as in vacancies they form the register of those entitled to vote for the new minister. In the able statistical discussions in the reports of the United Free Church it is pointed out that in the figures furnished by the churches the numbers of members and the numbers of deaths are not in the same proportion as the population of the country and the general death-rate, and the conclusion is drawn that the number of members is in each case too great.

	1879.	1899.	1909.
Congregations:—			
Church of Scotland .	1,337	1,447	1,687
Free Church . . .	1,033	1,101	
United Presbyterian .	533	577	
United Free Church .			1,620
Membership:—			
Church of Scotland .	518,146	648,476	706,653
Free Church . . .	246,250	293,684	
United Presbyterian .	172,150	195,498	
United Free Church .			506,573
Income:—			
Church of Scotland .	£311,378	£492,816	£554,145
Free Church . . .	594,050	706,546	
United Presbyterian .	367,915	392,116	
United Free Church .			1,089,101 (for 1908)

The Free Church in 1909 had 150 congregations and 77 ministers; its members and adherents are stated to number 60,000, and its income, apart from investments, is £22,542. The membership of the larger churches is that of communicants only; in the Highlands especially the adherents of these churches who do not communicate form a large proportion of those connected with the church.

According to the figures given above the communicants of the Church of Scotland represent 14·7 of the population and those of the United Free 10·6. A study of the figures for many years past shows that the proportion of the people attached to these churches is not decreasing.

The Scottish Episcopal Church in 1909 numbered 388 charges with 52,029 communicants. Its charges are numerous in proportion to its membership, having an average of 134 members, while the Church of Scotland averages 497 and the United Free Church 313 members for each congregation. The adherents of each of these churches outnumber their communicants in a ratio which is variously estimated. The Roman Catholic hierarchy[1] was restored in Scotland in 1878. There are six dioceses (two archbishops, one of Edinburgh and St Andrews and the other of Glasgow; and four suffragans, Aberdeen, Argyll and the Isles, Dunkeld and Galloway), with, in 1909, 550 priests; 398 churches, chapels and stations; and a Roman Catholic population estimated at about 519,000.

The original Secession Church has 5 presbyteries and 26 congregations; and the remnant of the Reformed Presbyterian Church which did not join the Free Church in 1876, 2 presbyteries and 11 congregations. The Congregational and Evangelical Union (formed by the amalgamation of the Congregational and Evangelical Churches in 1896), has 183 churches; and the remnant of the Evangelical Union, 7 churches. The Baptist Union has 128 congregations and the Wesleyan Methodists 40 churches.

LITERATURE.—For the earlier history of the kirk the outstanding authorities are the histories of Knox, Calderwood, Baillie's *Letters*, and Wodrow's *History*: Knox's liturgy has been edited by Dr Sprott, and on the Westminster Standards the reader may consult Dr Mitchell's *Minutes of the Westminster Assembly*, and Baird lectures on the same subject. Modern histories of the church have been written by Cook, Hetherington and Principal Cunningham; Dr Story's *Church of Scotland* in 5 vols. contains information on every side of the subject. Among books professedly dealing with the Free Church question, the most valuable are Sydow's *Die Schottische Kirchenfrage* (Potsdam, 1845), and *The Scottish Church Question* (London, 1845); Buchanan's *Ten Years' Conflict* (1849); Hanna's *Life of Chalmers* (1852); and Taylor Innes on *The Law of Creeds in Scotland* (1867). See also Cockburn, *Memorials of His Time* (Continuation, 1874); Walker, *Dr Robert Buchanan: an Ecclesiastical Biography* (1877); *Annals of the Disruption* (published by authority of a committee of the Free Church (1876–1877). On the United Presbyterian Church see McKerrow, *History of the United Secession Church* (1841); Struthers, *History of the Relief Church* (1843); McKelvie, *Annals and Statistics of the United Presbyterian Church* (1873). For a concise account of all the Secessions and Unions, Logan, *The United Free Church* (1681–1906). (A. M.*)

SCOTLAND, EPISCOPAL CHURCH OF, a Scottish church (see above) in communion with, but historically distinct from, the Church of England, and composed of seven dioceses: Aberdeen and Orkney; Argyll and the Isles; Brechin; Edinburgh; Glasgow and Galloway; Moray, Ross and Caithness; and St Andrews, Dunkeld and Dunblane. All, except Edinburgh, founded by Charles I., are pre-Reformation sees. The bishops constitute the episcopal synod, the supreme court of appeal, whose president, elected by the members from among themselves, has the style, not the functions, of a metropolitan, being called primus. The legislature is the provincial synod, consisting of the bishops, at whose discretion it is summoned, and a lower chamber of presbyters. The canons have the authority of this synod. The representative church council, including laymen, administers finance. Each diocese has its synod of the clergy. Its dean is appointed by the bishop, and, on the voidance of the see, summons the clerical and lay electors, at the instance of the primus, to choose a bishop, who is presented to the episcopal synod for confirmation and to the primus for consecration. There are cathedrals at Perth, Inverness, Edinburgh and Cumbrae; the sees of Aberdeen, Brechin and Glasgow have no cathedrals. The Theological College was founded in 1810, incorporated with Trinity College, Glenalmond, in 1848, and re-established at Edinburgh in 1876. There were 356 congregations, with a total membership of 124,335, and 324 working clergy in 1900. No existing ministry can claim regular historic continuity with the ancient hierarchy of Scotland, but the bishops of the Episcopal Church are direct successors of the prelates consecrated to Scottish sees at the Restoration. On the refusal of the bishops to recognize William III. (1689), the presbyterian polity was established in the kirk, the effect of which on its ecclesiastical status is a matter of theological opinion, but the Comprehension Act of 1690 allowed episcopalian incumbents, on taking the Oath of Allegiance, to retain their benefices, though excluding them from any share in the government without a further declaration of presbyterian principles. Many non-jurors also succeeded for a time in retaining the use of the parish churches. The extruded bishops were slow to organize the episcopalian remnant under a jurisdiction independent of the state, regarding the then arrangements as provisional, and looking forward to a reconstituted national kirk under a "legitimate" sovereign. A few prelates, known as college bishops, were consecrated without sees, to preserve the succession rather than to exercise a defined authority. But at length the hopelessness of the Stewart cause and the growth of congregations outside the establishment forced the bishops to dissociate canonical jurisdiction from royal prerogative and to reconstitute for themselves a territorial episcopate. The act of Queen Anne (1712), which protects the "Episcopal Communion," marks its virtual incorporation as a distinct society. But matters were still complicated by a considerable, though declining, number of episcopalian incumbents holding the parish churches. Moreover, the Jacobitism of the non-jurors provoked a state policy of repression in 1715 and 1745, and fostered the growth of new Hanoverian congregations, served by clergy episcopally ordained but amenable to no bishop, who qualified themselves under the act of 1712. This act was further modified in 1746 and 1748 to exclude clergymen ordained in Scotland. These causes reduced the Episcopalians, who included at the Revolution a large section of the people, to what is now, save in a few corners of the west and north-east of Scotland, a small minority. The official recognition of George III. on the death of Charles Edward in 1788, removed the chief bar to progress. The "qualified" congregations were gradually absorbed, though traces of this ecclesiastical solecism still linger. In 1792 the penal laws were repealed, but clerical disabilities were only finally removed in 1864. In 1784 Seabury, the first American bishop, was consecrated at Aberdeen. The Book of Common Prayer, which came into general use at the Revolution, is now the authorized service book. The Scottish Communion Office, compiled by the non-jurors in accordance with primitive models, has had a varying co-ordinate authority, and the modifications of the English liturgy adopted by the American Church were mainly determined by its influence. Among the clergy of post-Revolution days the most eminent are Bishop Sage, a well-known patristic scholar; Bishop Rattray, liturgiologist; John Skinner, of Longside, author of *Tullochgorum*; Bishop Gleig, editor of the 3rd edition of the *Encyclopaedia Britannica*; Dean Ramsay, author of *Reminiscences of Scottish Life and Character*; Bishop A. P. Forbes; G. H. Forbes, liturgiologist; and Bishop Charles Wordsworth.

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[1] During the long period of proscription, the Roman Catholic Church in Scotland survived in scattered groups; after the Reformation it was at first under the jurisdiction of the English arch-priest, but from 1653 to 1694 it was governed by prefects apostolic and from 1694 to 1878 by vicars apostolic appointed by the pope.

AUTHORITIES.—Carstares, *State Papers*; Keith, *Historical Catalogue of the Scottish Bishops* (Russel's edition, 1824); Lawson, *History of the Scottish Episcopal Church from the Revolution to the Present Time* (1843); Stephen, *History of the Church of Scotland from the Reformation to the Present Time* (4 vols., 1843); Lathbury, *History of the Nonjurors* (1845); Grub, *Ecclesiastical History of Scotland* (4 vols., 1861); Dowden, *Annotated Scottish Communion Office* (1884). (J. G. SI.)

SCOTT, ALEXANDER (fl. 1550), Scottish poet, was probably a Lothian man, but particulars of his origin and of his life are entirely wanting. It is only by gathering together a few scraps of internal evidence that we learn that his poems were written between 1545 and 1568 (the date of the Bannatyne MS., the only MS. authority for the text). Allan Ramsay was the first to bring Scott's work to the notice of modern readers, by printing some of the poems in his *Ever Green*. In a copy of verses ("Some Few of the Contents") on the Bannatyne MS., he thus refers to Scott:

"Licht skirtit lasses, and the girnand wyfe,
Fleming and Scot haif painted to the lyfe.
Scot, sweit tunged Scot, quha sings the welcum hame
To Mary, our maist bony soverane dame;
How lyflie he and amorous Stuart sing!
Quhen lufe and bewtie bid them spred the wing."

The sketch is just, for Scott's poems deal chiefly with female character and with passion of a strongly erotic type. He is "sweit tunged," for his technique is always good, and his lyrical measures show remarkable accomplishment. In this respect he holds his own with the best of the "makars" represented in the Bannatyne MS. In what may appear excessive coarseness to present-day taste, he makes good claim to rival Dunbar and his contemporaries. The poems referred to by Ramsay are "Ane Ballat maid to the Derisioun and Scorne of Wantoun Wemen," "Ane New Yeir Gift to the Queen Mary quhen scho come first Hame, 1562," and some or all of his amorous songs (about 30 in number). Of these "To luve unluvit," "Ladeis, be war," and "Lo, quhat it is to lufe" are favourable examples of his style. No early Scots poet comes nearer the quality of the Caroline love-lyric. His *Justing and Debait vp at the Drum betwix W*[*illiam*] *Adamsone and Johine Sym* follows the literary tradition of *Peblis to the Play* and *Christis Kirk on the Grene*. He has left verse-renderings of the 1st and 50th Psalms.

The first collected edition was printed by D. Laing in 1821; a second was issued privately at Glasgow in 1882. The latest edition is that by James Cranstoun (Scottish Text Society, 1 vol., 1896). (G. G. S.)

SCOTT, DAVID (1806–1849), Scottish historical painter, brother of William Bell Scott, was born at Edinburgh in October 1806, and studied art under his father, Robert Scott, the engraver. In 1828 he exhibited his first oil picture, the "Hopes of Early Genius dispelled by Death," which was followed by "Cain, Nimrod, Adam and Eve singing their Morning Hymn," "Sarpedon carried by Sleep and Death," and other subjects of a poetic and imaginative character. In 1829 he became a member of the Scottish Academy, and in 1832 visited Italy, where he spent more than a year in study. At Rome he executed a large symbolical painting, entitled the "Agony of Discord, or the Household Gods Destroyed." The works of his later years include "Vasco da Gama encountering the Spirit of the Storm," a picture—immense in size and most powerful in conception—finished in 1842, and now preserved in the Trinity House, Leith; the "Duke of Gloucester entering the Water Gate of Calais" (1841); the "Alchemist" (1838), "Queen Elizabeth at the Globe Theatre" (1840) and "Peter the Hermit" (1845), remarkable for varied and elaborate character-painting; and "Ariel and Caliban" (1837) and the "Triumph of Love" (1846), distinguished by beauty of colouring and depth of poetic feeling. The most important of his religious subjects are the "Descent from the Cross" (1835) and the "Crucifixion—the Dead Rising" (1844). Scott also executed several remarkable series of designs. Two of these—the Monograms of Man and the illustrations to Coleridge's *Ancient Mariner*—were etched by his own hand, and published in 1831 and 1837 respectively, while his subjects from the *Pilgrim's Progress* and Nichol's *Architecture of the Heavens* were issued after his death. He died in Edinburgh on the 5th of March 1849.

See W. Bell Scott, *Memoir of David Scott, R.S.A.* (1850), and J. M. Gray, *David Scott, R.S.A., and his Works* (1884).

SCOTT, SIR GEORGE GILBERT (1811–1878), English architect, was born in 1811 at Gawcott near Buckingham, where his father was rector; his grandfather, Thomas Scott (1747–1821), was a well-known commentator on the Bible. In 1827 young Scott was apprenticed for four years to an architect in London named Edmeston, and at the end of his pupildom acted as clerk of the works at the new Fishmongers' Hall and other buildings. In Edmeston's office he became acquainted with W. B. Moffat, a fellow-pupil, who possessed considerable talents for the purely business part of an architect's work, and the two entered into partnership. In 1834 they were appointed architects to the union workhouses of Buckinghamshire, and for four years were busily occupied in building a number of cheap and ugly unions, both there and in Northamptonshire and Lincolnshire. In 1838 Scott built at Lincoln his first church, the design for which won the prize in an open competition, and this was quickly followed by six others, all very poor buildings without chancels; church building in England had then reached its very lowest point both in style and in poverty of construction. About 1839 his enthusiasm was aroused by some of the eloquent writings of Pugin on medieval architecture, and by the various papers on ecclesiastical subjects published by the Camden Society. These opened a new world to Scott, and he thenceforth studied and imitated the architectural styles and principles of the middle ages with the utmost zeal and patient care. The first result of this new study was his design for the Martyrs' Memorial at Oxford, erected in 1840, a clever adaptation of the late 13th-century crosses in honour of Queen Eleanor. From that time Scott became the chief ecclesiastical architect in England, and in the next twenty-eight years completed a large number of new churches and "restorations," the fever for which was fomented by the Ecclesiological Society and the growth of ecclesiastical feeling in England.

In 1844 Scott won the first premium in the competition for the new Lutheran church at Hamburg, a noble building with a very lofty spire, designed strictly in the style of the 13th century. In the following year his partnership with Moffat was dissolved, and in 1847 he was employed to renovate and refit Ely cathedral, the first of a long series of English cathedral and abbey churches which passed through his hands. In 1851 he visited and studied the architecture of the chief towns in northern Italy, and in 1855 won the competition for the town-house at Hamburg, designed after the model of similar buildings in north Germany. In spite of his having won the first prize, another architect was selected to construct the building, after a very inferior design. In 1856 a competition was held for designs of the new government offices in London; Scott obtained the third place in this, but the work was afterwards given to him on the condition (insisted on by Lord Palmerston) that he should make a new design, not Gothic, but Classic or Renaissance in style. To this Scott very reluctantly consented, as he had little sympathy with any styles but those of England or France from the 13th to the 15th century. In 1862–1863 he was employed to design and construct the Albert Memorial, a costly and elaborate work, in the style of a magnified 13th-century reliquary or ciborium, adorned with many statues and reliefs in bronze and marble. On the partial completion of this he was knighted. In 1866 he competed for the new London law-courts, but the prize was adjudged to his old pupil, G. E. Street. In 1873, owing to illness caused by overwork, Scott spent some time in Rome and other parts of Italy. The mosaic pavement which he designed for Durham cathedral soon afterwards was the result of his study of the 13th-century mosaics in the old basilicas of Rome. On his return to England he resumed his professional labours, and continued to work almost without intermission till his short illness and death on the 27th of March 1878. He was buried in the nave of Westminster Abbey, and an engraved brass, designed by G. E. Street, was placed over his grave. In 1838 Scott married his cousin, Caroline Oldrid, who died in 1870; they had five sons, two of whom adopted their father's profession.

An incomplete list of his works from 1847 in the *Builder* for 1878 (p. 360) ascribes to Scott 732 buildings with which he was connected as architect, restorer or the author of a report. These include 29 cathedrals, British or colonial, 10 minsters, 476 churches, 25 schools, 23 parsonages, 58 monumental works, 25 colleges or college chapels, 26 public buildings, 43 mansions and a number of small ecclesiastical accessories. While a member of the Royal Academy, Scott held for many years the post of professor of architecture, and gave a long series of able lectures on medieval styles, which were published in 1879. He wrote a work on *Domestic Architecture*, and a volume of *Personal and Professional Recollections*, which, edited by his eldest son, was published in 1879, and also a large number of articles and reports on many of the ancient buildings with which he had to deal.

SCOTT, MICHAEL (1789–1835), British author, was born at Cowlairs, near Glasgow, on the 30th of October 1789, the son of a Glasgow merchant. In 1806 he went to Jamaica, first managing some estates, and afterwards joining a business firm in Kingston. The latter post necessitated his making frequent journeys, on the incidents of which he based his best known book, *Tom Cringle's Log*. In 1822 he left Jamaica and settled in Glasgow, where he engaged in business. *Tom Cringle's Log* began to appear serially in *Blackwood's Magazine* in 1829. Scott's second story, *The Cruise of the Midge*, was also first published serially in *Blackwood's* in 1834–1835. The first appearance in book-form of each story was in Paris in 1834. Both stories were originally published anonymously, and their authorship was not known till after Scott's death at Glasgow, on the 7th of November 1835.

SCOTT, ROBERT (1811–1887), English divine and lexicographer, was born on the 26th of January 1811, at Bondleigh in Devonshire, where his father was rector. Educated at Shrewsbury School and Christ Church, Oxford, after a brilliant university career he was elected fellow of Balliol, where he was tutor from 1835 to 1840. After holding successively the college livings of Duloe and South Luffenham, in 1854 he was elected master of Balliol. This office he held, together (from 1861) with that of the professorship of the exegesis of Holy Scriptures, down to 1870, when he accepted the deanery of Rochester. As master of Balliol he kept the college up to the high level it had attained under his predecessor Dr Jenkyns. As a Greek scholar, he had few equals among his contemporaries. His great literary achievement, which may be said to constitute his life's work, was his collaboration with Dean Liddell in the Greek lexicon which bears their names. He died at Rochester on the 2nd of December 1887.

SCOTT, SIR WALTER, Bart. (1771–1832), Scottish poet and novelist, was born at Edinburgh on the 15th of August 1771. His pedigree, in which he took a pride that strongly influenced the course of his life, may be given in the words of his own fragment of autobiography. "My birth was neither distinguished nor sordid. According to the prejudices of my country it was esteemed *gentle*, as I was connected, though remotely, with ancient families both by my father's and mother's side. My father's grandfather was Walter Scott, well known by the name of *Beardie*. He was the second son of Walter Scott, first laird of Raeburn, who was third son of Sir William Scott, and the grandson of Walter Scott, commonly called in tradition *Auld Watt* of Harden. I am therefore lineally descended from that ancient chieftain, whose name I have made to ring in many a ditty, and from his fair dame, the Flower of Yarrow—no bad genealogy for a Border minstrel."

In a notice of John Home, Scott speaks of pride of family as "natural to a man of imagination," remarking that, "in this motley world, the family pride of the north country has its effects of good and of evil." Whether the good or the evil preponderated in Scott's own case would not be easy to determine. It tempted him into courses that ended in commercial ruin; but throughout his life it was a constant spur to exertion, and in his last years it proved itself as a working principle capable of inspiring and maintaining a most chivalrous conception of duty. If the ancient chieftain Auld Watt was, according to the anecdote told by his illustrious descendant, once reduced in the matter of live stock to a single cow, and recovered his dignity by stealing the cows of his English neighbours, Scott's Border ancestry were sheep-farmers, who varied their occupation by "lifting" sheep and cattle, and whatever else was "neither too heavy nor too hot." The Border lairds were really a race of shepherds in so far as they were not a race of robbers. Scott may have derived from this pastoral ancestry an hereditary bias towards the observation of nature and the enjoyment of open-air life. He certainly inherited from them the robust strength of constitution that carried him successfully through so many exhausting labours. And it was his pride in their real or supposed feudal dignity and their rough marauding exploits that first directed him to the study of Border history and poetry, the basis of his fame as a poet and romancer. His father, Walter Scott, a writer to the signet (or attorney) in Edinburgh—the original of the elder Fairford in *Redgauntlet*—was the first of the family to adopt a town life or a learned profession. His mother was the daughter of Dr John Rutherford, a medical professor in the university of Edinburgh, who also traced descent from the chiefs of famous Border clans. The ceilings of Abbotsford display the arms of about a dozen Border families with which Scott claimed kindred through one side or the other. His father was conspicuous for methodical and thorough industry; his mother was a woman of imagination and culture. The son seems to have inherited the best qualities of the one and acquired the best qualities of the other.

The details of his early education are given with great precision in his autobiography. John Stuart Mill was not more minute in recording the various circumstances that shaped his habits of mind and work. We learn from himself the secret —as much at least as could be ascribed to definite extraneous accident—of the "extempore speed" in romantic composition against which Carlyle protested in his famous review of Lockhart's *Life of Scott*. The indignant critic assumed that Scott wrote "without preparation"; Scott himself, as if he had foreseen this cavil, is at pains to show that the preparation began with his boyhood, almost with his infancy. The current legend when Carlyle wrote his essay was that as a boy Scott had been a dunce and an idler. With a characteristically conscientious desire not to set a bad example, the autobiographer solemnly declares that he was neither a dunce nor an idler, and explains how the misunderstanding arose. His health in boyhood was uncertain;[1] he was consequently irregular in his attendance at school, never became exact in his knowledge of Latin syntax, and was so belated in beginning Greek that out of bravado he resolved not to learn it at all.

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[1] Dr Charles Creighton contributes the following medical note on Scott's early illness:—"Scott's lameness was owing to an arrest of growth in the right leg in infancy. When he was eighteen months old he had a feverish attack lasting three days, at the end of which time it was found that he 'had lost the power of his right leg'—*i.e.* the child instinctively declined to move the ailing member. The malady was a swelling at the ankle, and either consisted in or gave rise to arrest of the bone-forming function along the growing line of cartilage which connects the lower epiphysis of each of the two leg-bones with its shaft. In his fourth year, when he had otherwise recovered, the leg remained 'much shrunk and contracted.' The limb would have been blighted very much more if the arrest of growth had taken place at the upper epiphysis of the tibia or the lower epiphysis of the femur. The narrowness and peculiar depth of Scott's head point to some more general congenital error of bone-making allied to rickets but certainly not the same as that malady. The vault of the skull is the typical 'scaphoid' or boat-shaped formation, due to premature union of the two parietal bones along the sagittal suture. When the bones of the cranium are universally affected with that arrest of growth along their formative edges, the sutures become prematurely fixed and effaced, so that the brain-case cannot expand in any direction to accommodate the growing brain. This universal synostosis of the cranial bones is what occurs in the case of microcephalous idiots. It happened to me to show to an eminent French anthropologist a specimen of a miniature or microcephalic skull preserved in the Cambridge museum of anatomy; the French *savant*, holding up the skull and pointing to the 'scaphoid' vault of the crown and the effaced sagittal suture, exclaimed 'Voilà Walter Scott!' Scott had fortunately escaped the early closure or arrest of growth at other cranial sutures than the sagittal, so that the growing brain could make room for itself by forcing up the vault of the skull bodily. When his head was opened after death, it was observed that 'the brain was not large, and the cranium thinner than it is usually found to be.' In favour of the theory of congenital liability it has to be said that he was the ninth of a family of whom the first six died in 'very early youth.'"

Left very much to himself throughout his boyhood in the matter of reading, so quick, lively, excitable and uncertain in health that it was considered dangerous to press him and prudent rather to keep him back, Scott began at a very early age to accumulate the romantic lore of which he afterwards made such splendid use. As a child he seems to have been an eager and interested listener and a great favourite with his elders, apparently having even then the same engaging charm that made him so much beloved as a man. Chance threw him in the way of many who were willing to indulge his delight in stories and ballads. Not only his own relatives—the old women at his grandfather's farm at Sandyknowe, his aunt, under whose charge he was sent to Bath for a year, his mother—took an interest in the precocious boy's questions, told him tales of Jacobites and Border worthies of his own and other clans, but casual friends of the family—such as the military veteran at Prestonpans, old Dr Blacklock the blind poet, Home the author of *Douglas*, Adam Ferguson the martial historian of the Roman republic—helped forward his education in the direction in which the bent of his genius lay. At the age of six he was able to define himself as "a virtuoso," "one who wishes to and will know everything." At ten his collection of chap-books and ballads had reached several volumes, and he was a connoisseur in various readings. Thus he took to the High School, Edinburgh, when he was strong enough to be put in regular attendance, an unusual store of miscellaneous knowledge and an unusually quickened intelligence, so that his master "pronounced that, though many of his schoolfellows understood the Latin better, *Gualterus Scott* was behind few in following and enjoying the author's meaning."

Throughout his school days and afterwards when he was apprenticed to his father, attended university classes, read for the bar, took part in academical and professional debating societies, Scott steadily and ardently pursued his own favourite studies. His reading in romance and history was really study, and not merely the indulgence of an ordinary schoolboy's promiscuous appetite for exciting literature. In fact, even as a schoolboy he specialized. He followed the line of overpowering inclination; and even then, as he frankly tells us, "fame was the spur." He acquired a reputation among his schoolfellows for out-of-the-way knowledge, and also for story-telling, and he worked hard to maintain this character, which compensated to his ambitious spirit his indifferent distinction in ordinary school-work. The youthful "virtuoso," though he read ten times the usual allowance of novels from the circulating library, was carried by his enthusiasm into fields much less generally attractive. He was still a schoolboy when he mastered French sufficiently well to read through collections of old French romances, and not more than fifteen when, attracted by translations to Italian romantic literature, he learnt the language in order to read Dante and Ariosto in the original. This willingness to face dry work in the pursuit of romantic reading affords a measure of the strength of Scott's passion. In one of the literary parties brought together to lionize Burns, when the peasant poet visited Edinburgh, the boy of fifteen was the only member of the company who could tell the source of some lines affixed to a picture that had attracted the poet's attention—a slight but significant evidence both of the width of his reading and of the tenacity of his memory. The same thoroughness appears in another little circumstance. He took an interest in Scottish family history and genealogy, but, not content with the ordinary sources, he ransacked the MSS. preserved in the Advocates' Library. By the time he was one and twenty he had acquired such a reputation for his skill in deciphering old manuscripts that his assistance was sought by professional antiquaries.

This early, assiduous, unintermittent study was the main secret, over and above his natural gifts, of Scott's extempore speed and fertility when at last he found forms into which to pour his vast accumulation of historical and romantic lore. He was, as he said himself, "like an ignorant gamester who keeps up a good hand till he knows how to play it." That he had vague thoughts from a much earlier period than is commonly supposed of playing the hand some day is extremely probable, if, as he tells us, the idea of writing romances first occurred to him when he read Cervantes in the original. This was long before he was out of his teens; and, if we add that his leading idea in his first novel was to depict a Jacobitic Don Quixote, we can see that there was probably a long interval between the first conception of *Waverley* and the ultimate completion.

Scott's preparation for painting the life of past times was probably much less unconsciously such than his equally thorough preparation for acting as the painter of Scottish manners and character in all grades of society. With all the extent of his reading as a schoolboy and a young man he was far from being a cloistered student, absorbed in his books. In spite of his lameness and his serious illnesses in youth, his constitution was naturally robust, his disposition genial, his spirits high: he was always well to the front in the fights and frolics of the High School, and a boon companion in the "high jinks" of the junior bar. The future novelist's experience of life was singularly rich and varied. While he liked the life of imagination and scholarship in sympathy with a few choice friends, he was brought into intimate daily contact with many varieties of real life. At home he had to behave as became a member of a Puritanic, somewhat ascetic, well-ordered Scottish household, subduing his own inclinations towards a more graceful and comfortable scheme of living into outward conformity with his father's strict rule. Through his mother's family he obtained access to the literary society of Edinburgh, at that time electrified by the advent of Burns, full of vigour and ambition, rejoicing in the possession of not a few widely known men of letters, philosophers, historians, novelists and critics, from racy and eccentric Monboddo to refined and scholarly Mackenzie. In that society also he may have found the materials for the manners and characters of *St Ronan's Well*. From any tendency to the pedantry of over-culture he was effectually saved by the rougher and manlier spirit of his professional comrades, who, though they respected *belles lettres*, would not tolerate anything in the shape of affectation or sentimentalism. The atmosphere of the Parliament House (the law-courts of Edinburgh) had considerable influence on the tone of Scott's novels. His peculiar humour as a story-teller and painter of character was first developed among the young men of his own standing at the bar. They were the first mature audience on which he experimented, and seem often to have been in his mind's eye when he enlarged his public. From their mirthful companionship by the stove, where the briefless congregated to discuss knotty points in law and help one another to enjoy the humours of judges and litigants, "Duns Scotus" often stole away to pore over old books and manuscripts in the library beneath; but as long as he was with them he was first among his peers in the art of providing entertainment. It was to this market that Scott brought the harvest of the vacation rambles which it was his custom to make every autumn for seven years after his call to the bar and before his marriage. He scoured the country in search of ballads and other relics of antiquity; but he found also and treasured many traits of living manners, many a lively sketch and story with which to amuse the brothers of "the mountain" on his return. His staid father did not much like these escapades, and told him bitterly that he seemed fit for nothing but to be a "gangrel scrape-gut." But, as the companion of "his Liddesdale raids" happily put it, "he was *makin' himsell* a' the time, but he didna ken maybe what he was about till years had passed: at first he thought o' little, I dare say, but the queerness and the fun."

His father intended him originally to follow his own business, and he was apprenticed in his sixteenth year; but he preferred the upper walk of the legal profession, and was admitted a member of the faculty of advocates in 1792. He seems to have read hard at law for four years at least, but almost from the first to have limited his ambition to obtaining some comfortable appointment such as would leave him a good deal of leisure for literary pursuits. In this he was not disappointed. In 1799 he obtained the office of sheriff-depute of Selkirkshire, with a salary of £300 and very light duties. In 1806 he obtained the reversion of the office of clerk of session. It is sometimes supposed, from the immense amount of other work that Scott accomplished, that this office was a sinecure. But the duties, which are fully described by Lockhart, were really serious, and kept him hard at fatiguing work, his biographer estimates, for at least three or four hours daily during six months out of the twelve, while the court was in session. He discharged these duties faithfully for twenty-five years, during the height of his activity as an author. He did not enter on the emoluments of the office till 1812, but from that time he received from the clerkship and the sheriffdom combined an income of £1600 a year, being thus enabled to act in his literary undertakings on his often-quoted maxim that "literature should be a staff and not a crutch." Scott's profession, in addition to supplying him with a competent livelihood, supplied him also with abundance of opportunties for the study of men and manners.

It was as a poet that he was first to make a literary reputation. According to his own account, he was led to adopt the medium of verse by a series of accidents. The story is told by himself at length and with his customary frankness and modesty in the *Essay on Imitations of the Ancient Ballad*, prefixed to the 1830 edition of his *Border Minstrelsy*, and in the 1830 introduction to the *Lay of the Last Minstrel*. The first link in the chain was a lecture by Henry Mackenzie on German literature, delivered in 1788. This apprized Scott, who was then a legal apprentice and an enthusiastic student of French and Italian romance, that there was a fresh development of romantic literature in German. As soon as he had the burden of preparation for the bar off his mind he learnt German, and was profoundly excited to find a new school founded on the serious study of a kind of literature his own devotion to which was regarded by most of his companions with wonder and ridicule. We must remember always that Scott quite as much as Wordsworth created the taste by which he was enjoyed, and that in his early days he was half-ashamed of his romantic studies, and pursued them more or less in secret with a few intimates. While he was in the height of his enthusiasm for the new German romance, Mrs Barbauld visited Edinburgh, and recited an English translation of Bürger's *Lenore*. Scott heard of it from a friend, who was able to repeat two lines—

"Tramp, tramp, across the land they speed;
Splash, splash, across the sea!"

The two lines were enough to give Scott a new ambition. He could write such poetry himself! The impulse was strengthened by his reading Lewis's *Monk* and the ballads in the German manner interspersed through the work. He hastened to procure a copy of Bürger, at once executed translations of several of his ballads, published *The Chase*, and *William and Helen*, in a thin quarto in 1796 (his ambition being perhaps quickened by the unfortunate issue of a love affair), and was much encouraged by the applause of his friends. Soon after he met Lewis personally, and his ambition was confirmed. "Finding Lewis," he says, "in possession of so much reputation, and conceiving that if I fell behind him in poetical powers, I considerably exceeded him in general information, I suddenly took it into my head to attempt the style of poetry by which he had raised himself to fame." Accordingly, he composed *Glenfinlas*, *The Eve of St John*, and the *Gray Brother*, which were published in Lewis's collection of *Tales of Wonder* (2 vols., 1801). But he soon became convinced that "the practice of ballad-writing was out of fashion, and that any attempt to revive it or to found a poetical character on it would certainly fail of success." His study of Goethe's *Götz von Berlichingen*, of which he published a translation in 1799, gave him wider ideas. Why should he not do for ancient Border manners what Goethe had done for the ancient feudalism of the Rhine? He had been busy since his boyhood collecting Scottish Border ballads and studying the minutest details of Border history. He began to cast about for a form which should have the advantage of novelty, and a subject which should secure unity of composition. He was engaged at the time preparing a collection of the *Minstrelsy of the Scottish Border*. The first instalment was published in two volumes in 1802; it was followed by a third next year, and by an edition and continuation of the old romance of *Sir Tristram*; and Scott was still hesitating about subject and form for a large original work. Chance at last threw in his way both a suitable subject and a suitable metrical vehicle. He had engaged all his friends in the hunt for Border ballads and legends. Among others, the countess of Dalkeith, wife of the heir-apparent to the dukedom of Buccleuch, interested herself in the work. Happening to hear the legend of a tricksy hobgoblin named Gilpin Horner, she asked Scott to write a ballad about it. He agreed with delight, and, out of compliment to the lady who had given this command to the bard, resolved to connect it with the house of Buccleuch. The subject grew in his fertile imagination, till incidents enough had gathered round the goblin to furnish a framework for his long-designed picture of Border manners. Chance also furnished him with a hint for a novel scheme of verse. Coleridge's fragment of *Christabel*, though begun in 1797—when he and Wordsworth were discussing on the Quantock Hills the principles of such ballads as Scott at the same time was reciting to himself in his gallops on Musselburgh sands—was not published till 1816. But a friend of Scott's, Sir John Stoddart, had met Coleridge in Malta, and had carried home in his memory enough of the unfinished poem to convey to Scott that its metre was the very metre of which he had been in search. Scott introduced still greater variety into the four-beat couplet; but it was to *Christabel* that he owed the suggestion, as one line borrowed whole and many imitated rhythms testify.

The *Lay of the Last Minstrel* appeared in January 1805, and at once became widely popular. It sold more rapidly than poem had ever sold before. Scott was astonished at his own success, although he expected that "the attempt to return to a more simple and natural style of poetry was likely to be welcomed." Many things contributed to the extraordinary demand for the *Lay*. First and foremost, no doubt, we must reckon its simplicity. After the abstract themes and abstruse, elaborately allusive style of the 18th century, the public were glad of verse that could be read with ease and even with exhilaration, verse in which a simple interesting story was told with brilliant energy, and simple feelings were treated not as isolated themes but as incidents in the lives of individual men and women. The thought was not so profound, the lines were not so polished, as in *The Pleasures of Memory* or *The Pleasures of Hope*, but the "light-horseman sort of stanza" carried the reader briskly over a much more diversified country, through boldly outlined and strongly coloured scenes. No stanza required a second reading; you had not to keep attention on the stretch or pause and construe laboriously before you could grasp the writer's meaning or enter into his artfully condensed sentiment. To remember the pedigrees of all the Scotts, or the names of all the famous chiefs and hardy retainers "whose gathering word was Bellenden," might have required some effort, but only the conscientious reader need care to make it. The only puzzle in the *Lay* was the goblin page, and the general reader was absolved from all trouble about him by the unanimous declaration of the critics, led by Jeffrey in the *Edinburgh Review*, that he was a grotesque excrescence, in no way essential to the story. It is commonly taken for granted that Scott acquiesced in this judgment, his politely ironic letter to Miss Seward being quoted as conclusive. This is hardly fair to the poor goblin, seeing that his story was the germ of the poem and determines its whole structure; but it is a tribute to the lively simplicity of the *Lay* that few people should be willing to take the very moderate amount of pains necessary to see the goblin's true position in the action. The supernatural element was Scott's most risky innovation. For the rest, he was a cautious and conservative reformer, careful not to offend established traditions. He was far from raising the standard of rebellion, as Wordsworth had done, against the great artistic canon of the classical school—

"True art is nature to advantage dressed."

To "engraft modern refinement on ancient simplicity," to preserve the energy of the old ballad without its rudeness and bareness of poetic ornament, was Scott's avowed aim. He adhered to the poetic diction against which Wordsworth protested. His rough Borderers are "dressed to advantage" in the costume of romantic chivalry. The baronial magnificence of Branksome, Deloraine's "shield and jack and acton," the elaborate ceremony of the combat between the pseudo-Deloraine and Musgrave, are concessions to the taste of the 18th century. Further, he disarmed criticism by putting his poem into the mouth of an ancient minstrel, thus pictorially emphasizing the fact that it was an imitation of antiquity, and providing a scapegoat on whose back might be laid any remaining sins of rudeness or excessive simplicity. And, while imitating the antique romance, he was careful not to imitate its faults of rambling, discursive, disconnected structure. He was scrupulously attentive to the classical unities of time, place and action. The scene never changes from Branksome and its neighbourhood; the time occupied by the action (as he pointed out in his preface) is three nights and three days; and, in spite of all that critics have said about the superfluity of the goblin page, it is not difficult to trace unity of intention and regular progressive development in the incidents.

The success of the *Lay* decided finally, if it was not decided already, that literature was to be the main business of Scott's life, and he proceeded to arrange his affairs accordingly. It would have been well for his comfort, if not for his fame, had he adhered to his first plan, which was to buy a small mountain-farm near Bowhill, with the proceeds of some property left to him by an uncle, and divide his year between this and Edinburgh, where he had good hopes, soon afterwards realized, of a salaried appointment in the Court of Session. This would have given him ample leisure and seclusion for literature, while his private means and official emoluments secured him against dependence on his pen. He would have been laird as well as sheriff of the cairn and the scaur, and as a man of letters his own master. Since his marriage in 1797 with Charlotte Charpentier, daughter of a French refugee, his chief residence had been at Lasswade, about six miles from Edinburgh. But on a hint from the lord-lieutenant that the sheriff must live at least four months in the year within his county, and that he was attending more closely to his duties as quartermaster of a mounted company of volunteers than was consistent with the proper discharge of his duties as sheriff, he had moved his household in 1804 to Ashestiel. When his uncle's bequest fell in, he determined to buy a small property on the banks of the Tweed within the limits of his sheriffdom. There, within sight of Newark Castle and Bowhill, he proposed to live like his ancient minstrel, as became the bard of the clan, under the shadow of the great ducal head of the Scotts. But this plan was deranged by an accident. It so happened that an old schoolfellow, James Ballantyne (1772–1833), a printer in Kelso, whom he had already befriended, transplanted to Edinburgh, and furnished with both work and money, applied to him for a further loan. Scott declined to lend, but offered to join him as sleeping partner. Thus the intended purchase money of Broadmeadows became the capital of a printing concern, of which by degrees the man of letters became the overwrought slave, milch-cow and victim.

When the *Lay* was off his hands, Scott's next literary enterprise was a prose romance—a confirmation of the argument that he did not take to prose after Byron had "*bet* him," as he put it, in verse, but that romance writing was a long-cherished purpose. He began *Waverley*, but a friend to whom he showed the first chapters—which do not take Waverley out of England, and describe an education in romantic literature very much like Scott's own—not unnaturally decided that the work was deficient in interest and unworthy of the author of the *Lay*. Scott accordingly laid *Waverley* aside. We may fairly conjecture that he would not have been so easily diverted had he not been occupied at the time with other heavy publishing enterprises calculated to bring grist to the printing establishment. His active brain was full of projects for big editions, which he undertook to carry through on condition that the printing was done by Ballantyne & Co., the "Co." being kept a profound secret, because it might have injured the lawyer and poet professionally and socially to be known as partner in a commercial concern.

In 1806 he collected from different publications his *Ballads and Lyrical Pieces*. Between 1806 and 1812, mainly to serve the interests of the firm, though of course the work was not in itself unattractive to him, Scott produced his elaborate editions of Dryden (18 vols., 1808), Swift (19 vols., 1818), the Somers Tracts (13 vols., 1809–1815), and the *State Papers and Letters of Sir Ralph Sadler* (2 vols., 1809). Incidentally these laborious tasks contributed to his preparation for the main work of his life by extending his knowledge of English and Scottish history.

Marmion, begun in November 1806 and published in February 1808, was written as a relief to "graver cares," though in this also he aimed at combining with a romantic story a solid picture of an historical period. It was even more popular than the *Lay*. Scott's resuscitation of the four-beat measure of the old "gestours" afforded a signal proof of the justness of their instinct in choosing this vehicle for their recitations. The four-beat lines of *Marmion* took possession of the public like a kind of madness: they not only clung to the memory but they would not keep off the tongue: people could not help spouting them in solitary places and muttering them as they walked about the streets. The critics, except Jeffrey, who may have been offended by the pronounced politics of the poet, were on the whole better pleased than with the *Lay*. Their chief complaint was with the "introductions" to the various cantos, which were objected to as vexatiously breaking the current of the story.

The triumphant success of *Marmion*, establishing him as *facile princeps* among living poets, gave Scott such a *heeze*, to use his own words, "as almost lifted him off his feet." He touched then the highest point of prosperity and happiness. Presently after, he was irritated and tempted by a combination of little circumstances into the great blunder of his life, the establishment of the publishing house of John Ballantyne & Co. A coolness arose between him and Jeffrey, chiefly on political but partly also on personal grounds. They were old friends, and Scott had written many articles for the *Review*, but its political attitude at this time was intensely unsatisfactory to Scott. To complete the breach, Jeffrey reviewed *Marmion* in a hostile spirit. A quarrel occurred also between Scott's printing firm and Constable, the publisher, who had been the principal feeder of its press. Then the tempter appeared in the shape of Murray, the London publisher, anxious to secure the services of the most popular *littérateur* of the day. The result of negotiations was that Scott set up, in opposition to Constable, "the crafty," "the grand Napoleon of the realms of print," the publishing house of John Ballantyne & Co., to be managed by John Ballantyne (d. 1821), James's younger brother, whom Scott nicknamed "Rigdumfunnidos," for his talents as a mimic and low comedian. Scott interested himself warmly in starting the *Quarterly Review*, and in return Murray constituted Ballantyne & Co. his Edinburgh agents. Scott's trust in Rigdumfunnidos and his brother, "Aldiborontiphoscophornio," and in his own power to supply all their deficiencies, is as strange a piece of infatuation as any that ever formed a theme for romance or tragedy. Their devoted attachment to the architect of their fortunes and proud confidence in his powers helped forward to the catastrophe, for whatever Scott recommended they agreed to, and he was too immersed in multifarious literary work and professional and social engagements to have time for cool examination of the numerous rash speculative ventures into which he launched the firm.

The *Lady of the Lake* (May 1810) was the first great publication by the new house, and next year the *Vision of Don Roderick* followed. The *Lady of the Lake* was received with enthusiasm, even Jeffrey joining in the chorus of applause. It made the Perthshire Highlands fashionable for tourists, and raised the post-horse duty in Scotland. But it did not make up to

Ballantyne & Co. for their heavy investments in unsound ventures. The *Edinburgh Annual Register*, meant as a rival to the *Edinburgh Review*, though Scott engaged Southey to write for it and wrote for it largely himself, proved a failure. In a very short time the warehouses of the firm were filled with unsaleable stock. By the end of three years Scott began to write to his partners about the propriety of "reefing sails." But apparently he was too much occupied to look into the accounts of the firm, and, so far from understanding the real state of their affairs, he considered himself rich enough to make his first purchase of land at Abbotsford. But he had hardly settled there in the spring of 1812, and begun his schemes for building and planting and converting a bare moor into a richly wooded *pleasaunce*, than his business troubles began, and he found himself harassed by fears of bankruptcy. Rigdumfunnidos concealed the situation as long as he could, but as bill after bill came due he was obliged to make urgent application to Scott, and the truth was thus forced from him item by item. He had by no means revealed all when Scott, who behaved with admirable good-nature, was provoked into remonstrating, "For heaven's sake, treat me as a man and not as a milch-cow." The proceeds of *Rokeby* (January 1813) and of other labours of Scott's pen were swallowed up, and bankruptcy was inevitable, when Constable, still eager at any price to secure Scott's services, came to the rescue. With his help three crises were tided over in 1813.

It was in the midst of these embarrassments that Scott opened up the rich new vein of the Waverley novels. He chanced upon the manuscript of the opening chapters of *Waverley* which he had written in 1805, and resolved to complete the story. Four weeks in the summer of 1814 sufficed for the work, and *Waverley* was published by Constable without the author's name in July. The notes and introductions first appeared in the edition of 1829. Many plausible reasons might be given and have been given for Scott's resolution to publish anonymously. The reason given by Lockhart is that he considered the writing of novels beneath the dignity of a grave clerk of the Court of Session. Why he kept up the mystification, though the secret, which was formally divulged in 1827, was an open one to all his Edinburgh acquaintances, is easily understood. He enjoyed it, and his formally initiated coadjutors enjoyed it; it relieved him from the annoyances of foolish compliment; and it was not unprofitable—curiosity about "the Great Unknown" keeping alive the interest in his works. The secret was so well kept by all to whom it was definitely entrusted, and so many devices were used to throw conjecture off the scent, that even Scott's friends, who were certain of the authorship from internal evidence, were occasionally puzzled. He kept on producing in his own name as much work as seemed humanly possible for an official who was to be seen every day at his post and as often in society as the most fashionable of his professional brethren. His treatises on chivalry, romance and the drama, besides an elaborate work in two volumes on Border antiquities, appeared in the same year with *Waverley*, and his edition of Swift in nineteen volumes in the same week. In 1813 he published the romantic tale of *The Bridal of Triermain* in three cantos, enlarged from an earlier poem, printed in the *Edinburgh Annual Register* of 1809. The *Lord of the Isles* was published in January 1815; *Guy Mannering*, written in "six weeks about Christmas," in February; and *The Field of Waterloo* in the same year. *Paul's Letters to his Kinsfolk* and *The Antiquary* appeared in 1816; the first series of the *Tales of My Landlord*, edited by "Jedediah Cleishbotham"—*The Black Dwarf* and *Old Mortality*—in the same year; *Harold the Dauntless*[1] in 1817; the two volumes of *The Border Antiquities of England and Scotland* in 1814 and 1817. No wonder that the most positive interpreters of internal evidence were mystified. It was not as if he had buried himself in the country for the summer half of the year. On the contrary, he kept open house at Abbotsford in the fine old feudal fashion and was seldom without visitors. His own friends and many strangers from a distance, with or without introductions, sought him there, and found a hearty hospitable country laird, entirely occupied to all outward appearance with local and domestic business and sport, building and planting, adding wing to wing, acre to acre, plantation to plantation, with just leisure enough for the free-hearted entertainment of his guests and the cultivation of friendly relations with his humble neighbours. How could such a man find time to write two or three novels a year, besides what was published in his own name? Even the few intimates who knew how early he got up to prepare his packet for the printer, and had some idea of the extraordinary power that he had acquired of commanding his faculties for the utilization of odd moments, must have wondered at times whether he had not inherited the arts of his ancestral relation Michael Scot, and kept a goblin in some retired attic or vault.

Scott's fertility is not absolutely unparalleled; Anthony Trollope claimed to have surpassed him in rate as well as total amount of production, having also business duties to attend to. But in speed of production combined with variety and depth of interest and weight and accuracy of historical substance Scott is unrivalled. On his claims as a serious historian, which Carlyle ignored in his curiously narrow and splenetic criticism, he was always, with all his magnanimity, peculiarly sensitive. A certain feeling that his antiquarian studies were undervalued seems to have haunted him from his youth. It was probably this that gave the sting to Jeffrey's criticism of *Marmion*, and that tempted him to the somewhat questionable proceeding of reviewing his own novels in the *Quarterly* upon the appearance of *Old Mortality*. He was nettled besides at the accusation of having treated the Covenanters unfairly, and wanted to justify himself by the production of historical documents. In this criticism of himself Scott replied lightly to some of the familiar objections to his work, such as the feebleness of his heroes, Waverley, Bertram, Lovel, and the melodramatic character of some of his scenes and characters. But he argued more seriously against the idea that historical romances are the enemies of history, and he rebutted by anticipation Carlyle's objection that he wrote only to amuse idle persons who like to lie on their backs and read novels. His *apologia* is worth quoting. Historical romances, he admits, have always been failures, but the failure has been due to the imperfect knowledge of the writers and not to the species of composition. If, he says, anachronisms in manners can be avoided, and "the features of an age gone by can be recalled in a spirit of delineation at once faithful and striking, . . . the composition itself is in every point of view dignified and improved; and the author, leaving the light and frivolous associates with whom a careless observer would be disposed to ally him, takes his seat on the bench of the historians of his time and country. In this proud assembly, and in no mean place of it, we are disposed to rank the author of these works. At once a master of the great events and minute incidents of history, and of the manners of the times he celebrates, as distinguished from those which now prevail, the intimate thus of the living and of the dead, his judgment enables him to separate those traits which are characteristic from those that are generic; and his imagination, not less accurate and discriminating than vigorous and vivid, presents to the mind of the reader the manners of the times, and introduces to his familiar acquaintance the individuals of the drama as they thought and spoke and acted." This defence of himself shows us the ideal at which Scott aimed, and which he realized. He was not in the least unconscious of his own excellence. He did not hesitate in this review to compare himself with Shakespeare in respect of truth to nature. "The volume which this author has studied is the great book of nature. He has gone abroad into the world in quest of what the world will certainly and abundantly supply, but what a man of great discrimination alone will find, and a man of the very highest genius will alone depict after he has discovered it. The characters of Shakespeare are not more exclusively human, not more perfectly men and women as they live and move, than those of this mysterious author."

The immense strain of Scott's double or quadruple life as sheriff and clerk, hospitable laird, poet, novelist, and miscellaneous man of letters, publisher and printer, though the prosperous excitement sustained him for a time, soon told upon his health. Early in 1817 began a series of attacks of agonizing cramp of the stomach, which recurred at short intervals during more than two years. But his appetite and capacity for work remained unbroken. He made his first attempt at play-writing [1] as he was recovering from the first attack; before the year was out he had completed *Rob Roy*, and within six months it was followed by *The Heart of Midlothian*, which filled the four volumes of the second series of *Tales of My Landlord*, and has remained one of the most popular among his novels. *The Bride of Lammermoor*, *The Legend of Montrose*, forming the third series by "Jedediah Cleishbotham," and *Ivanhoe* (1820) were dictated to amanuenses, through fits of suffering so acute that he could not suppress cries of agony. Still he would not give up. When Laidlaw begged him to stop dictating he only answered, "Nay, Willie, only see that the doors are fast. I would fain keep all the cry as well as the wool to ourselves; but as to giving over work, that can only be when I am in woollen."

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[1] This poem, like the *Bridal of Triermain*, did not bear his name on the title-page, but the authorship was an open secret, although he tried to encourage the idea that the author was his friend Erskine.

Throughout those two years of intermittent ill-health, which was at one time so serious that his life was despaired of and he took formal leave of his family, Scott's semi-public life at Abbotsford continued as usual—swarms of visitors coming and going, and the rate of production, on the whole, suffering no outward and visible check, all the world wondering at the novelist's prodigious fertility. The first of the series concerning which there were murmurs of dissatisfaction was *The Monastery* (1820), which was the first completed after the re-establishment of the author's bodily vigour. The failure, such as it was, was possibly due to the introduction of the supernatural in the person of the White Lady of Avenel; and its sequel, *The Abbot* (1820), in which Mary, Queen of Scots, is introduced, was generally hailed as fully sustaining the reputation of "the Great Unknown." *Kenilworth* (1821), *The Pirate* (1822), *The Fortunes of Nigel* (1822), *Peveril of the Peak* (1822), *Quentin Durward* (1823), *St Ronan's Well* (1824), *Redgauntlet* (1824) followed in quick succession in the course of three years, and it was not till the last two were reached that the cry that the author was writing too fast began to gather volume. *St Ronan's Well* was very severely criticized and condemned. And yet Leslie Stephen tells a story of a dozen modern connoisseurs in the Waverley novels who agreed that each should write down separately the name of his favourite novel, when it appeared that each had without concert named *St Ronan's Well*. There is this certainly to be said for *St Ronan's*, that, in spite of the heaviness of some of the scenes at the "hottle" and the artificial melodramatic character of some of the personages, none of Scott's stories is of more absorbing or more brilliantly diversified interest. Contradictions between contemporary popular opinion and mature critical judgment, as well as diversities of view among critics themselves, rather shake confidence in individual judgment on the vexed but not particularly wise question which is the best of Scott's novels. There must, of course, always be inequalities in a series so prolonged. The author cannot always be equally happy in his choice of subject, situation and character. Naturally also he dealt first with the subjects of which his mind was fullest. But any theory of falling off or exhaustion based upon plausible general considerations has to be qualified so much when brought into contact with the facts that very little confidence can be reposed in its accuracy. *The Fortunes of Nigel* comes comparatively late in the series and has often been blamed for its looseness of construction. Scott himself always spoke slightingly of his plots, and humorously said that he proceeded on Bayes's maxim, "What the deuce is a plot good for but to bring in good things?" Yet some competent critics prefer *The Fortunes of Nigel* to any other of Scott's novels. An attempt might be made to value the novels according to the sources of their materials, according as they are based on personal observation, documentary history or previous imaginative literature. On this principle *Ivanhoe* and *The Tales of the Crusaders* (1825, containing *The Betrothed* and *The Talisman*) might be adjudged inferior as being based necessarily on previous romance. But as a matter of fact Scott's romantic characters are vitalized, clothed with a verisimilitude of life, out of the author's deep, wide and discriminating knowledge of realities, and his observation of actual life was coloured by ideals derived from romance. He wrote all his novels out of a mind richly stored with learning of all kinds, and in the heat of composition seems to have drawn from whatever his tenacious memory supplied to feed the fire of imagination, without pausing to reflect upon the source. He did not exhaust his accumulations from one source first and then turn to another, but from first to last drew from all as the needs of the occasion happened to suggest.

During the years 1821–1825 he edited Richard Franck's *Northern Memoirs* (1821), *Chronological Notes of Scottish Affairs from the Diary of Lord Fountainhall* (1822), *Military Memoirs of the Great Civil War* (1822), and *The Novelists' Library* (10 vols., London, 1821–1824), the prefatory memoirs to which were separately published in 1828.

Towards the close of 1825, after eleven years of brilliant and prosperous labour, encouraged by constant tributes of admiration, homage and affection such as no other literary potentate has ever enjoyed, realizing his dreams of baronial splendour and hospitality on a scale suited to his large literary revenues, Scott suddenly discovered that the foundations of his fortune were unsubstantial. He had imagined himself clear of all embarrassments in 1818, when all the unsaleable stock of John Ballantyne & Co. was bargained off by Rigdum to Constable for Waverley copyrights, and the publishing concern was wound up. Apparently he never informed himself accurately of the new relations of mutual accommodation on which the printing firm then entered with the great but rashly speculative publisher, and drew liberally for his own expenditure against the undeniable profits of his novels without asking any questions, trusting blindly in the solvency of his commercial henchmen. Unfortunately, "lifted off their feet" by the wonderful triumphs of their chief, they thought themselves exempted like himself from the troublesome duty of inspecting ledgers and balancing accounts, till the crash came. From a diary which Scott began a few days before the first rumours of financial difficulty reached him we know how he bore from day to day the rapidly unfolded prospect of unsuspected liabilities. "Thank God," was his first reflection, "I have enough to pay more than 20s. in the pound, taking matters at the worst." But a few weeks revealed the unpleasant truth that, owing to the way in which Ballantyne & Co. were mixed up with Constable & Co., and Constable with Hurst & Robinson, the failure of the London house threw upon him personal responsibility for £130,000.

How Scott's pride rebelled against the dishonour of bankruptcy, how he toiled for the rest of his life to clear off this enormous debt, declining all offers of assistance and asking no consideration from his creditors except time, and how nearly he succeeded, is one of the most familiar chapters in literary history, and would be one of the saddest were it not for the heroism of the enterprise. His wife died soon after the struggle began, and he suffered other painful bereavements; but, though sick at heart, he toiled on indomitably, and, writing for honour, exceeded even his happiest days in industrious speed. If he could have maintained the rate of the first three years, during which he completed *Woodstock* (1826); *Chronicles of the Canongate* (1827), which included three tales—"The Highland Widow," "The Two Drovers" and "The Surgeon's Daughter"; *The Fair Maid of Perth* (1828, in the second series of *Chronicles of the Canongate*); *Anne of Geierstein* (1829); the *Life of Napoleon* (9 vols., 1827); part of his *History of Scotland* (2 vols., 1829–1830, for *Lardner's Cabinet Cyclopaedia*); the Scottish series of *Tales of a Grandfather* (four series, 1828–1829–1830–1831; inscribed to "Hugh Littlejohn," *i.e.* John Hugh Lockhart), besides several magazine articles, some of them among the most brilliant of his miscellaneous writings, and prefaces and notes to a collected edition of his novels—if he could have continued at this rate he might soon have freed himself from all his encumbrances. The result of his exertions from January 1826 to January 1828 was nearly £40,000 for his creditors. But the terrific labour proved too much even for his endurance. Ugly symptoms began to alarm his family in 1829, and in February of 1830 he had his first stroke of paralysis. Still he was undaunted, and not all the persuasions of friends and physicians could induce him to take rest. "During 1830," Lockhart says, "he covered almost as many sheets with his MS. as in 1829," the new introductions to a collected edition of his poetry and the *Letters on Demonology and Witchcraft* being amongst the labours of the year. He had a slight touch of apoplexy in November and a distinct stroke of paralysis in the following April; but, in spite of these warnings and of other bodily ailments, he had two more novels, *Count Robert of Paris* and *Castle Dangerous* (constituting the fourth series of *Tales of My Landlord*), ready for the press by the autumn of 1831. He would not yield to the solicitations of his friends and consent to try rest and a change of scene, till fortunately, as his mental powers failed, he became possessed of the idea that all his debts were at last paid and that he was once more a free man. In this belief he happily remained till his death. When it was known that his physicians recommended a sea voyage for his health, a government vessel was put at his disposal, and he cruised about in the Mediterranean and visited places of interest for the greater part of a year before his death. But, when he felt that the end was near, he insisted on being carried across Europe that he might die on his beloved Tweedside at Abbotsford, where he expired on the 21st of September 1832. He was buried at Dryburgh Abbey.

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[1] *The Doom of Devorgoil*. This and his other dramatic sketches, *Macduff's Cross*, *Halidon Hill* (1822) and *Auchindrane, or The Ayrshire Tragedy*, printed with *Devorgoil* in 1830, were slight compositions, dashed off in a few days, and afford no measure of what Scott might have done as a dramatist if he had studied the conditions of stage representation.

Scott's wife had died in 1826. His eldest son, Walter, succeeded to the baronetcy which had been conferred on his father in 1820, and the title became extinct on his death in 1847; the second son, Charles, died at Teheran in 1841, and the second daughter, Anne, died unmarried in 1833. Scott's elder daughter Charlotte Sophia (d. 1837) was the wife of his biographer, J. G. Lockhart (*q.v.*); and their daughter Charlotte (d. 1858) married J. R. Hope-Scott (*q.v.*), and was the mother of Mary Monica, wife of the Hon. J. C. Maxwell, who in 1874 took the additional name of Scott on his marriage with the heiress of Abbotsford. Mrs Maxwell Scott inherited some of the family literary talent, and among other books wrote two volumes about Abbotsford (1893 and 1897).

Two busts of Scott were executed by Sir Francis Chantrey: one in 1820, which was presented to Scott by the sculptor in 1828; a second in 1828, which was sent by Chantrey to Sir Robert Peel about 1837, and is now in the National Portrait Gallery, London. The 1820 bust was duplicated by Chantrey for the duke of Wellington in 1827, and there is a copy in Westminster Abbey, erected in 1897. Henry Raeburn painted Scott's portrait for Archibald Constable in 1808; Scott sat to the same artist in 1809 for the portrait now at Abbotsford, and two or three times subsequently. Other notable portraits were executed by Sir Thomas Lawrence in 1820 for George IV.; by John Graham Gilbert in 1829 for the Royal Society of Edinburgh; by Francis Grant for Lady Ruthven in 1831; and a posthumous portrait of Scott with his dogs in the Rhymer's Glen by Sir Edwin Landseer. The Scott monument in Princes Street, Edinburgh, erected in 1846, was designed by George Kemp, the statue being the work of John Steell.

BIBLIOGRAPHY.—*The Miscellaneous Prose Works of Sir Walter Scott* (6 vols., Edinburgh, 1827) were subsequently printed in 30 vols. (London, 1834–1871) and in 3 vols. (1841–1847). The collected editions of the novels and tales are very numerous. Among them are that known as the "author's favourite edition" (48 vols., Edinburgh, 1829–1833), for which Scott wrote new prefaces and notes; an édition de luxe of the Waverley novels, illustrated by A. Lalauze, E. Riou and others (25 vols., London, 1882–1898); the "Border" edition (48 vols., 1892–1894), with introductory essays and notes by A. Lang; and many modern cheap reprints. His *Poetical Works* were printed in 12 vols. (Edinburgh, 1820); they were edited by J. G. Lockhart (12 vols., Edinburgh, 1833–1834), with 24 steel engravings from illustrative drawings by Turner; by F. T. Palgrave for the "Globe" edition (1866); by W. Minto (2 vols., Edinburgh, 1888); by J. Logie Robertson (Oxford complete edition, 1904). Many of the novels have been adapted for the stage, the most famous of these dramatizations being the libretto of Donizetti's *Lucia di Lammermoor* and the *Ivanhoe* of Sir Arthur Sullivan and J. R. Sturgis. His *Minstrelsy of the Scottish Border* (3 vols., 1802–1803) was edited (4 vols., 1902) by T. F. Henderson.

The standard life by his son-in-law, J. G. Lockhart, *Memoirs of the Life of Sir Walter Scott* (7 vols., Edinburgh, 1837–1838), left little new material for later biographers. It was supplemented by the publication (2 vols., 1890) of Scott's *Journal*, covering the years from 1825 to 1832, and of his *Familiar Letters* (2 vols., 1894), both edited by David Douglas. Some unpublished letters from Scott to the marchioness of Abercorn were sold at Sotheby's in 1909. Shorter lives, chiefly based on Lockhart, are by R. H. Hutton ("English Men of Letters," London, 1898); by C. D. Yonge ("Great Writers," London, 1888), with bibliography by J. P. Anderson; by Robert Chambers (Edinburgh, 1871); by K. Elze (2 vols., Dresden, 1864); by G. E. B. Saintsbury ("Famous Scots" Series, 1897); by Andrew Lang ("Literary Lives," London, 1906), and by G. le Grys Norgate (London, 1906). For the Ballantyne controversy see also *The Ballantyne Press and its Founders* (1909), which should be taken into account in considering Lockhart's attitude on the subject.

In the long list of critical essays on Scott and his works may be mentioned:—W. Bagehot, "The Waverley Novels," in *Literary Studies* (1879, vol. ii.); W. Hazlitt, in his *Spirit of the Age* (1825); James Hogg, *The Domestic Manners and Private Life of Sir Walter Scott* (Glasgow, 1834); A. Lang, in *Letters to Dead Authors* (1886); Catalogue of the Scott Exhibition held at Edinburgh in 1871, preface by Sir W. Stirling-Maxwell (Edinburgh, 1872); Sir Leslie Stephen, *Hours in a Library* (London, 1874); J. Veitch, *The History and Poetry of the Scottish Border* (Glasgow, 1878); L. Maigron, *Le Roman historique à l'époque romantique, Essai sur l'influence de Walter Scott* (Paris, 1898). An account of the portraits of Scott, and a bibliography of his works, are given in Sir W. Stirling-Maxwell's *Catalogue of the Scott Exhibition*, commemorating Scott's centenary at Edinburgh in July–August 1871. (W. M.; X.)

SCOTT, WILLIAM BELL (1811–1890), British poet and artist, son of Robert Scott (1777–1841), the engraver, and brother of David Scott, the painter, was born in Edinburgh on the 12th of September 1811. While a young man he studied art and assisted his father, and he published verses in the Scottish magazines. In 1837 he went to London, where he became sufficiently well known as an artist to be appointed in 1844 master of the government school of design at Newcastle-on-Tyne. He held the post for twenty years, and did good work in organizing art-teaching and examining under the Science and Art Department. He did much fine decorative work, too, on his own account, notably at Wallington Hall, in the shape of eight large pictures illustrating Border history, with life-size figures, supplemented by eighteen pictures illustrating the ballad of *Chevy Chase* in the spandrels of the arches of the hall. For Penhill Castle, Perthshire, he executed a similar series, illustrating *The King's Quhair*. After 1870 he was much in London, where he bought a house in Chelsea, and he was an intimate friend of Rossetti and in high repute as an artist and an author. His poetry, which he published at intervals (notably *Poems*, 1875, illustrated by etchings by himself and Alma-Tadema), recalled Blake and Shelley, and was considerably influenced by Rossetti; he also wrote several volumes of artistic and literary criticism, and edited Keats, "L.E.L.," Byron, Coleridge, Shelley, Shakespeare and Scott. He resigned his appointment under the Science and Art Department in 1885, and from then till his death (22nd November 1890) he was mainly occupied in writing his reminiscences, which were published posthumously in 1892, with a memoir by Professor Minto. It is for his connexion with Rossetti's circle that Bell Scott will be chiefly remembered.

SCOTT, WINFIELD (1786–1866), American general, was born near Petersburg, Virginia, on the 13th of June 1786. In 1805 he entered the College of William and Mary, where he studied law, and he continued his studies in the law office of David Robertson in Petersburg. In 1807 he removed to Charleston, South Carolina, but as war with England seemed imminent he soon left for Washington and offered his services. In 1808 he was commissioned as a captain of artillery, recruited a company in Richmond and Petersburg, and was ordered to New Orleans. His criticism of his superior officer, General James Wilkinson, led to his being suspended for a year, but the term was eventually reduced to three months. In July 1812, as a lieutenant-colonel of artillery, he was sent to the Niagara frontier and fought at Queenston, where he was taken prisoner. He was exchanged in January 1813, became colonel in the following March, in March 1814 was promoted to the rank of brigadier-general, and in July received the brevet of major-general. In the battles of Chippewa (5th July 1814) and Lundy's Lane (25th July) he took a conspicuous part, being twice wounded in the latter engagement. For his services he was presented with a gold medal by Congress and with a sword by the state of Virginia. Among the difficult tasks that he was called upon to perform between 1815 and 1861, for the last twenty years of which period he was the commanding general of the U.S. army, were: an expedition to the Middle West in 1832, where, after the end of the Black Hawk War, he negotiated treaties of peace with the Sauk, Fox, Winnebago, Sioux, and Menominee Indians; a journey to Charleston in the same year to watch the progress of the nullification movement, and to strengthen the garrisons of the forts in the harbour; an expedition in 1836 against the Seminole Indians in Florida; the supervision of the removal in 1838 of the Cherokee Indians from Georgia, North Carolina, Alabama and Tennessee to the reservation set apart for them by treaty W. of the Mississippi river; a visit to the Niagara river in the autumn and winter of 1838 to put an end to the acts by Canadian insurgents in violation of American neutrality; a similar mission to Maine in 1839 to restore tranquillity between the citizens of Maine and New Brunswick, who were disputing the possession of a tract of land along the Aroostook river; and a journey to the north-west in 1859 to adjust a dispute between American and British officers concerning the joint occupation of San Juan Island in Puget Sound. His greatest achievement was the brilliant Mexican campaign of 1847. As the senior officer of the army, he was placed in command of the invading expedition, and after capturing Vera Cruz (March 29th, 1847), and winning victories at Cerro Gordo (April 18th), Contreras-Churubusco (August 19th-25th), Molino del Rey (September 8th), and Chapultepec (September 13th), he crowned his campaign by the capture, on the 14th of September, of the Mexican capital. In March 1848 he received a vote of thanks from Congress, which ordered a gold medal to be struck in commemoration of his services. Scott appeared to have an excellent opportunity for a political career; his nomination for the presidency by the Whigs had been suggested in 1839 and in 1848, and in 1852 he received it; but his candidacy was doomed to failure. The Whigs, divided on the slavery question, gave only half-hearted support to their compromise platform; and Scott made several extemporaneous addresses which did him harm. He received the electoral votes of only four states—Kentucky, Virginia, Massachusetts and Vermont. This defeat, however, detracted nothing from the esteem in which he was held, and in 1852 the brevet rank of lieutenant-general was created specially for him. Among the other honours conferred upon him were the degree of Master of Arts by Princeton in 1814, and the degree of Doctor of Laws by Columbia in 1850 and by Harvard in 1861. At the outbreak of the Civil War, though a Virginian, he remained at the head of the United States armies and directed operations from Washington until November 1861. He then visited Europe for a short time, and after returning wrote his *Memoirs*, published in 1864. He died at West Point, New York, on the 29th of May 1866.

See *Memoirs of Lieutenant-General Scott, LL.D.* (2 vols., New York, 1864); Raphael Semmes, *The Campaign of General Scott in the Valley of Mexico* (Cincinnati, 3rd ed., 1852); Edward D. Mansfield, *Life and Military Services of General Scott* (New York, 1862); and Marcus J. Wright, *General Scott* (New York, 1894), in the "Great Commanders" series.

SCOUNDREL, a rogue, a rascal. Etymologists have referred the word to various sources; but Skeat (*Etym. Dict.*) refers it to the provincial or Scottish *scunner* (O. Eng. *scunian*, to shun), to shrink back in fear or loathing.

SCOURGE (Ital. *scoriada*, from Lat. *excoriare*, to flay, *corium*, skin), a whip or lash, especially one used for the infliction of punishment. The typical scourge (Lat. *flagellum*) has several thongs or lashes attached to a single handle, as in the modern "cat-o'-nine-tails." The scourge or flail, and the crook, are the two symbols of power and domination depicted in the hands of Osiris in ancient Egyptian monuments; these show the unchanging form of the instrument throughout the ages.

SCOUT (from O. Fr. *escouter*, mod. *écouter*, Lat. *auscultare*, to listen), a soldier sent out to watch the enemy and bring information of his numbers, movements, whereabouts, &c. The name has also been applied to a particular class of light speedy cruisers in the British navy. After the South African War of 1899–1902, the importance of military scouting received much attention in England in consequence of the prominence given to it by Major-General Baden-Powell, of Mafeking fame. Under the latter's auspices an unofficial attempt to foster the qualities required was made by the institution of the Boy Scouts, a voluntary organization which, starting in 1908, had by 1910 enrolled many hundreds of thousands of boys throughout the United Kingdom, with branches overseas.

Various birds of the auk family, such as the guillemot and the puffin, are known as "scouts." The name is also given colloquially to college servants at Oxford and Harvard Universities. It then answers to the "gyp" of Cambridge, Trinity College, Dublin, and Durham, which has been variously explained as short for "gipsy," as taken from γύψ, vulture, from a supposed reference to a grasping character, or as representing an old word "gippo" (Fr. *jupeau*, tunic), used of a scullion or kitchen servant.

In the above senses, "scout" must be distinguished from the word meaning to flout, or reject with ridicule and scorn, which is derived from the Icel. *skúta*, taunt, jeer.

In the military sense, see Sir R. S. Baden-Powell, *Scouting*, and *Scouting for Boys*. The Boy Scouts' movement in England has official papers in the weekly *Scout* and monthly *Headquarters Gazette*.

SCRANTON, a city and the county-seat of Lackawanna county, Pennsylvania, U.S.A., at the confluence of the Lackawanna river and Roaring Brook, about 162 m. by rail N. by W. of Philadelphia and about 146 m. W.N.W. of New York. Pop. (1890) 75,215; (1900) 102,026, of whom 28,973 were foreign-born (including 7193 Irish, 4704 Germans, 4621 Welsh and 3692 English) and 521 were negroes; (1910, census) 129,867. Scranton is served by the Erie, the Delaware, Lackawanna & Western, the Central of New Jersey, the New York, Ontario & Western, the Delaware & Hudson, and the Lackawanna & Wyoming Valley railways. It occupies an area of about 20 sq. m. Among the principal public buildings are the United States Government building, the County Court House, the City Hall, the Albright Memorial building, housing the public library (55,800 vols. in 1908), the armoury of the 13th Regiment, State National Guard, the Board of Trade building, some fine churches and school-houses, a Young Men's Christian Association building and a Young Women's Christian Association building. Scranton is the see of a Roman Catholic bishop, has a good public school system, and is the seat of the International Correspondence Schools (1891), which give instruction by mail in the trades and professions to large numbers of students; Mt. St Mary's Seminary (1902) for girls, and the W. T. Smith (Memorial) Manual Training School (1905), a part of the public school system. The city has an Institute of History and Science, and the Everhart Museum of natural history, science and art (dedicated 1908), founded and endowed by Dr I. F. Everhart (b. 1840) of Scranton, a Soldiers' and Sailors' Monument, and monuments to the memory of Columbus and Washington. Scranton is the largest city in the great anthracite-coal region of the United States; and 17,525,995 long tons of coal were produced within the county in 1905. The chief manufactures are silk goods (21·6% of all in value) and other textiles, but large quantities of foundry and machine-shop products, malt liquors, flour, and planing mill products are also manufactured. The total value of the city's factory products in 1905 was $20,453,285. The Delaware, Lackawanna & Western railway has since built large machine and car shops.

A permanent settlement was established within the present limits of Scranton in 1788, and a primitive grist-mill, a saw-mill and a charcoal iron-furnace were erected during the next few years; but there was little further development until 1840, when the Lackawanna Iron Company was formed for the manufacture of iron here. The limestone and iron ore of the vicinity proved to be of inferior quality, and the failure of the enterprise was prevented only by the persistent efforts of George Whitefield Scranton (1811–1861), aided by his brother Selden T. Scranton and his cousin Joseph Hand Scranton. Under the leadership of George W. Scranton better grades of iron ore and of limestone were procured, and within a decade a rolling mill, a nail factory and a manufactory of steel rails were established, and adequate facilities for railway transportation were provided. Scranton was incorporated as a borough in 1854, was chartered as a city of the third class in 1866, and became a city of the second class in 1901.

See B. H. Throop, *A Half-Century in Scranton* (Scranton, 1895).

SCREAMER, a bird inhabiting Guiana and the Amazon valley, so called in 1781 by T. Pennant (*Gen. Birds*, p. 37) "from the violent noise it makes"—the *Palamedea cornuta* of Linnaeus. First made known in 1648 by G. de L. Marcgrav under the name of "Anhima," it was more fully described and better figured by Buffon under that of *Kamichi*, still applied to it by French writers. Of about the size of a turkey, it is remarkable for the curious "horn" or slender caruncle, more than three inches long, it bears on its crown, the two sharp spurs with which each wing is armed, and its elongated toes. Its plumage is plain in colour, being of an almost uniform greyish black above, the space round the eyes and a ring round the neck being variegated with white, and a patch of pale rufous appearing above the carpal joint, while the lower parts of the body are white. Closely related to this bird is another first described by Linnaeus as a species of *Parra* (see Jaçanā), to which group it certainly does not belong, but separated therefrom by Illiger to form the genus *Chauna*, and now known as *C. chavaria*, very generally in English as the "Crested Screamer," a name which was first bestowed on the Seriema (*q.v.*). This bird inhabits the lagoons and swamps of Paraguay and Southern Brazil, where it is called "Chajá" or "Chaka," and is smaller than the preceding, wanting its "horn," but having its head furnished with a dependent crest of feathers; while the plumage is grey. Its nest is a light construction of dry rushes, having its foundation in the water, and contains as many as six eggs, which are white tinged with buff. The young are covered with down of a yellowish-brown colour. A most singular habit possessed by this bird is that of rising in the air and soaring there in circles at an immense altitude, uttering at intervals the very loud cry of which its local name is an imitation. From a dozen to a score may be seen at once so occupying themselves. The young are often taken from the nest and reared by the people to attend upon and defend their poultry, a duty which is faithfully[1] and, owing to the spurs with which the chaka's wings are armed, successfully discharged. Another very curious property of this bird, which was observed by Jacquin, who brought it to the notice of Linnaeus,[2] is its emphysematous condition—there being a layer of air-cells between the skin and the muscles, so that on any part of the body being pressed a crackling sound is heard. In Central America occurs another species, *C. derbiana*, chiefly distinguished by the darker colour of its plumage. For this a distinct genus, *Ischyrornis*, was proposed, but apparently without necessity, by A. B. Reichenbach (*Syst. Avium.* p. xxi.).

The taxonomic position of the Palamedeidae, for all will allow to the screamers the rank of a family at least, has been much debated. Their anserine relations were pointed out by W. K. Parker in the Zoological *Proceedings* for 1863 (pp. 511-518, and in the same work for 1867 T. H. Huxley placed the family among his *Chenomorphae*; but this view was contravened in 1876 by A. H. Garrod, who said, "The screamers must have sprung from the primary avian stock as an independent offshoot at much the same time as did most of the other important families." P. L. Sclater in 1880 placed them in a distinct order, *Palamedeae*, which he, however, placed next to the true *Anseres*, and they are now generally regarded as forming a sub-order of anseriform *birds*.

SCREEN (usually, but very doubtfully, connected with Lat. *scrinium*, a box for holding books, from *scribere*, to write; a connexion with Ger. *Schranke*, barrier, has been suggested), in architecture, any construction subdividing one part of a building from another—as a choir, chantry, chapel, &c. The earliest screens are the low marble *podia*, shutting off the *chorus cantantium* in the Roman basilicas, and the perforated *cancelli* enclosing the bema, altar, and seats of the bishops and presbyters. The chief screens in a church are those which enclose the choir or the place where the breviary services are recited. This is done on the continent of Europe, not only by doors and screen-work, but also, when these are of open work, by curtains, the laity having no part in these services. In England screens were of two kinds: one of open woodwork; the other, massive enclosures of stonework enriched with niches, tabernacles, canopies, pinnacles, statues, crestings, &c., as at Canterbury, York, Gloucester, and many other places both in England and abroad (see Rood and Jubé).

As an article of furniture, the screen is an ornamental frame, usually of wood, but sometimes of metal, for protection from observation, draught, or the heat of a fire. Screens are made of all shapes and sizes, and may consist of leather, paper or textile materials fastened to the framework; they may have several leaves or only one—thus a fourfold screen has four leaves. Fire-screens are usually small, with a single leaf—indeed in the Georgian period of English furniture they often took the form of a circular, oval, heart-shaped or oblong piece of framed embroidery fixed to a wooden pole or upright, upon which they could be raised or lowered. This variety, which was called a pole-screen, was more effective as an ornament than as a protection. The hand-screen was light and portable, as the name implies. At the present time fire-screens are often of glass set in metal frames. The larger type of screen, with several leaves, is of uncertain origin, but probably first came into use towards the end of the 16th century. The earlier examples were of stamped or painted Spanish leather or of some rich stuff such as tapestry; at a later date lacquer was extensively used. They were tall enough to conceal the person sitting behind them, and were frequently exceedingly handsome and stately.

SCREW (O.E. *scrue*, from O. Fr. *escroue*, mod. *écrou*; ultimate origin uncertain; the word, or a similar one, appears in Teutonic languages, cf. Ger. *Schraube*, Dan. *skrue*, but Skeat, following Diaz, finds the origin in Lat. *scrobs*, a ditch, hole, particularly used in Low Latin for the holes made by pigs boring in the ground with their snouts), a cylindrical or conical piece of wood or metal having a groove running spirally round it. The surface thus formed constitutes an external or male screw, while a similar groove cut round the interior of a cylindrical hole, as in a nut, constitutes an internal or female screw. The ridge between successive turns of the groove is the "thread," and the distance between successive turns of the thread is the "pitch." The present article will deal with the standard pitches in common use and with modern methods of manufacture, the earlier history of which, down to the time of Sir Joseph Whitworth, may be read in Holtzapffel's *Turning and Mechanical Manipulation*. For the screw as a mechanical power see Mechanics; for the screw used to propel steamships see Shipbuilding.

Standardization of Screws.—All screws made to-day are copies of pre-existing or master screws, which are familiarly known as "guide screws," "hobs" or "leaders," "chasers" or "comb tools," "taps," and "dies" in numerous forms. These are so standardized that a thread cut to a given standard in England fits its fellow thread cut to the same standard in America, Germany or elsewhere. At one time screws cut by one firm would not match those cut by another. Formerly there was no "tackle," but large screws were cut with chisel and file, and a nut was cast around them and used for correction, until gradually the coarser errors were eliminated. Another method was that of the mathematical instrument makers, who used a screw and tangent wheel by which a cutter was moved along synchronously with the revolution of the screw blank, a method only suitable for short screws. The first attempt at securing uniformity in screw threads was made by Sir Joseph Whitworth, who communicated a paper on the subject to the Institution of Civil Engineers in 1841. In the course of about twenty years the Whitworth system generally displaced the previous heterogeneous designs of threads, by the existence of which engineers' repairs had been rendered most inconvenient and costly, almost every establishment having its own "standard" set of screwing tackle. In fact it was suspected that firms thought their interest lay in this separation of practice in order to capture repairs, each of its own work.

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[1] Hence J. Latham's name for this species is "Faithful Jacana"—he supposing it to belong to the genus in which Linnaeus placed it.

[2] "Tacta manu cutis, sub pennis etiam lanosa, crepat ubique fortiter" (*Syst. Nat.* ed. 12, i. p. 260).

When Whitworth began his work he made an extensive collection of screw bolts from the principal English workshops, and an average observed for diameters of $\frac{1}{4}$ in., $\frac{1}{2}$ in., 1 in., and $1\frac{1}{2}$ in. chiefly was taken and tabulated in exact numbers and equal fractional parts of threads per inch, the scale being afterwards extended to 6-in. diameter. In cases above an inch the same pitch is maintained for two sizes, the object being to avoid small fractions, and to simplify the construction of screwing apparatus. The system is therefore a practical compromise based on previous practice. The proportion between pitch and diameter varies throughout the series, and at the extremes the amount of power required to turn a nut is either in excess or insufficient.

When the Whitworth threads were accepted in England, Germany and the United States, it appeared as though they were established for ever in an impregnable position, as a unification evolved from chaos. Moreover, Great Britain at that time occupied a position of pre-eminence in manufacturing engineering, which was favourable to the establishment of an English system. But two things were wanting to permanence—the facts that the Whitworth threads were not based on the metric system, and that the United States was destined to come into rivalry with Great Britain. Metric systems became standardized on the continent of Europe and the Sellers thread in America overshadowed the Whitworth, though it is impossible to doubt that the Sellers like the Whitworth must in time be swallowed up by some one metric system.

It is easier to devise new standards than to induce manufacturers to accept them. Change means the purchase of a very costly new equipment of screwing tackle, both hand and machine, besides the retention of the old for effecting repairs. There is no question of accommodating or bringing in the threads of one system to others nearly like them. They either fit or do not fit, they are right or wrong, so that a clean sweep has to be made of the entire screwing tackle in favour of the new. The two great attacks that have been made on the Whitworth thread came, one from the Franklin Institute in 1864, when the Sellers thread was adopted and recommended to American engineers, and the other in 1873, when Delisle of Carlsruhe initiated a metric system. As a result, after several years of effort, the Society of German Engineers took the matter up, and the appointment of a committee gave birth to the International Screw Thread Congress, which has met from time to time for the discussion of the matter. We have thus two broad lines of departure from the Whitworth standard.

The history of the battle of the screw threads in England, America, Germany, Switzerland and France would occupy a volume. The subject is highly technical, involving practical points concerned with manufacture as well as with questions of strength and durability. We can merely state the fact that the threads now recognized as standard are included in about eight great systems, out of about sixty that have been advocated and systematized. Their elements are shown by the diagram, fig. 1; but tables of dimensions are omitted, since they would demand too much space.

Methods of Cutting Screws.—There are four methods employed for the cutting of screw threads: one by means of a single-edged tool held in the saddle of the screw-cutting lathe, and traversed horizontally only, the cylinder which is to receive the thread revolving the while; another by means of short master screws, hobs or leaders, controlling chasers or comb tools; the third by means of screw taps and dies, either the work or the tool being absolutely still. The fourth is by means of a milling cutter presented to the work in a special screw-milling machine, both the work and the cutter revolving.

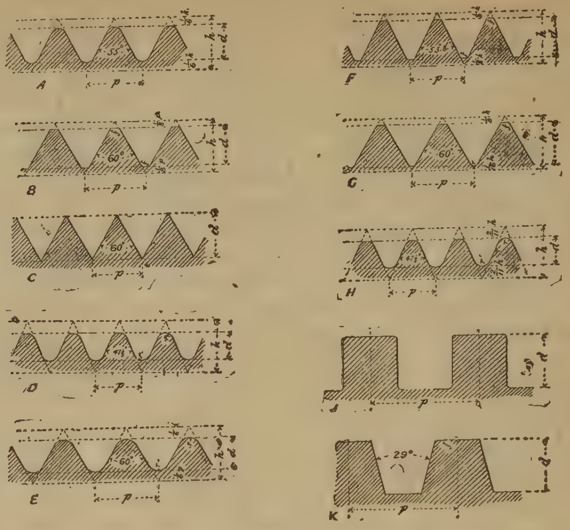


FIG. 1.—Sections of principal Screw Threads.

Formulae: p=pitch, or distance between centres of contiguous threads; d=depth of thread; h=total height of thread construction; r=radius; f=flat.

A. Whitworth thread. $h=0{\cdot}9605\ p$; $d=0{\cdot}6403\ p$; leaving $\frac{1}{6}$th h to be rounded at top and bottom.

B. Sellers, or Franklin Institute, or U.S. standard thread. $h=0{\cdot}866\ p$; $d=0{\cdot}6495\ p$; $f=\frac{1}{8}$th p.

C. Sharp Vee thread. $d=0{\cdot}8660\ p$.

D. British Association standard thread. $d=0{\cdot}6\ p$; $r=\frac{2}{11}$th p.

E. C.E.I. or Cycle Engineers' Institute standard thread. $h=0{\cdot}866\ p$; $d=0{\cdot}5327\ p$; $r=\frac{1}{6}$th p.

F. Löwenherz or Delisle thread (metric, used largely on the continent of Europe). $h=p$; $d=0{\cdot}75\ h$; $f=\frac{1}{8}$th h.

G. International standard thread (metric). $d=0{\cdot}6495\ p$; $f=\frac{1}{8}$th h; $r=\frac{1}{16}$th h.

H. Thury thread (metric). $d=\frac{3}{5}$th p; $r=\frac{1}{5}$th p; $r'=\frac{1}{6}$th p.

J. Square thread. $d=\frac{1}{2}\ p$.

K. Acme thread. $d=\frac{1}{2}\ p+0{\cdot}010$; $f=0{\cdot}3707\ p$.

In the lathe.

The problem of screw-cutting in the lathe in the simplest form resolves itself into the relative number of revolutions of the lathe spindle and of the lead screw (fig. 2). If the two rotate at the same speed, the thread cut on the spindle axis will be equal in pitch to that of the lead screw. If the spindle revolves more slowly than the lead screw, a thread coarser than that in the latter will result; if it revolves more rapidly, one of finer pitch will be produced. The spindle is the first factor, being the *driver*, and the lead screw is *driven* therefrom through the change wheels—the variables—which determine the number of revolutions of the latter whether the same, or slower, or faster than the spindle. Screw-cutting in all its details is an extensive subject, including the cutting of what are termed odd or unequal pitches, that is, those which involve fractions, the catching of threads for successive traverses of the tool, the cutting of multiple threads and of right- and left-hand threads, which involve much practical detail. The principle of screw-cutting may be stated briefly thus: the pitch of the guide screw is to that of the screw to be cut as the number of teeth on the mandrel or (headstock) wheel is to the number of teeth on the lead screw wheel. It is therefore simply a question of ratio. Hence for cutting threads finer than that of the lead screw, the guide screw must rotate more slowly than the lathe mandrel; and for cutting threads coarser than those of the guide screw, the lead screw must rotate faster than the lathe mandrel (fig. 2, C and D). When the ratios are ascertained, these facts indicate when the larger or the smaller wheels must be placed as drivers, or be driven. "Simple trains" are those which contain only one pair of change wheels; "compound trains" have two, three, four or more pairs (fig. 2), and are necessary when the ratio between the guide screw and the screw to be cut exceeds about six to one.

A device which has become very popular under the name of Hendey-Norton gears comprises a nest of twelve change wheels, mounted and keyed on the end of the lead screw. A stud wheel is made to engage through an intermediate wheel with any one of the twelve change gears, on the simple movement of a lever, giving twelve different ratios for screw-cutting. These again are doubled or trebled by altering the ratios of other gears connected therewith, so that for each position of engagement of the stud wheel, two, or in some cases three, pitches can be cut. This avoids the waste of time involved in setting up fresh wheels on the swing-plate as often as a screw of different pitch has to be cut.

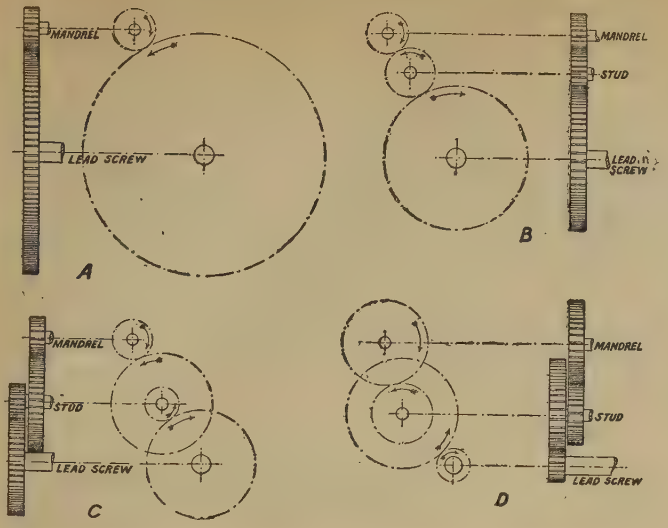


FIG. 2.

A, Simple train which rotates lead screw in opposite direction to mandrel, and makes slide-rest feed away from the headstock.
B, Simple train with intermediate wheel on stud, which rotates lead screw in same direction as mandrel, making slide-rest feed towards the headstock. Intermediate on "stud" does not alter ratio.
C, Typical compound train arranged for cutting a screw finer than that of the lead screw.
D, Ditto for screw coarser than that of the lead screw.

Another step in the direction of economy depends on the removal of all screw-cutting, except those screws which are of several feet in length, from the ordinary lathe to the special chasing and screwing machines. The screw-cutting arrangement of an engineer's lathe is a cumbrous apparatus to fit up and set in motion for the cutting of screws of small dimensions. When there was no other method available except that of common dies operated by hand or carried in a screwing machine, there was good reason why a true cutting tool should be operated in the lathe through change wheels. But the reason no longer exists, since for the single cutting tool of the lathe the two or three cutters of the chasing and screwing machines (figs. 3 and 4) are substituted, and the hollow mandrel embodied in the latter permits of screws being cut and parted from the solid bars of several feet in length. Except for the cutting of long screws and screws of odd pitches, the ordinary lathe is now a wasteful machine.

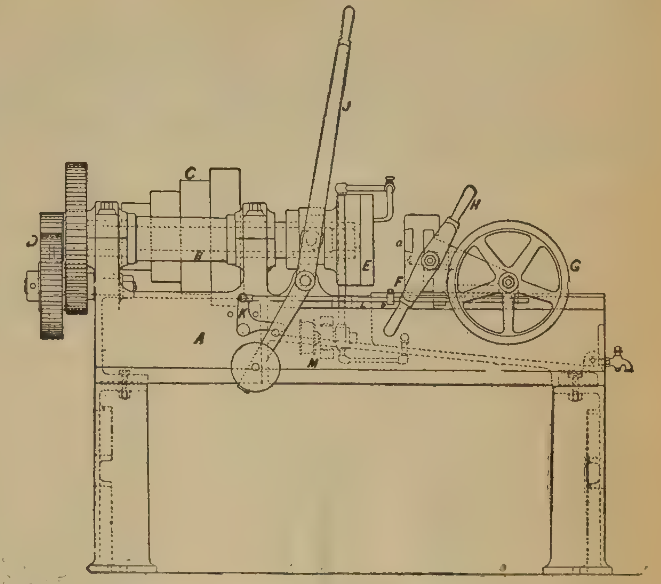


FIG. 3.—Bolt-Screwing Machine (John Stirk & Sons, Ltd., Halifax).

A, Bed. B, Spindle.
C, Four-step belt pulley, driving through triple spur gears D, to B.
E, Opening die head.
F, Bolt carriage racked to or fro along the bed by rotation of hand-wheel G.
H, Handle for opening and closing vee-jaws at *a* for gripping and releasing bolts by means of a right- and left-hand screw.
J, Handle for opening the dies.
K, Lever for automatically opening the dies, operating through J.
L, Rod having adjustable dog *b*, struck by carriage at a definite position of its travel, thus throwing the dies off the work.
M, Pump drawing lubricant from reservoir in bed.

The second method of cutting screws is that by means of hobs or leaders, and either comb or single-edged tools. That is, a short

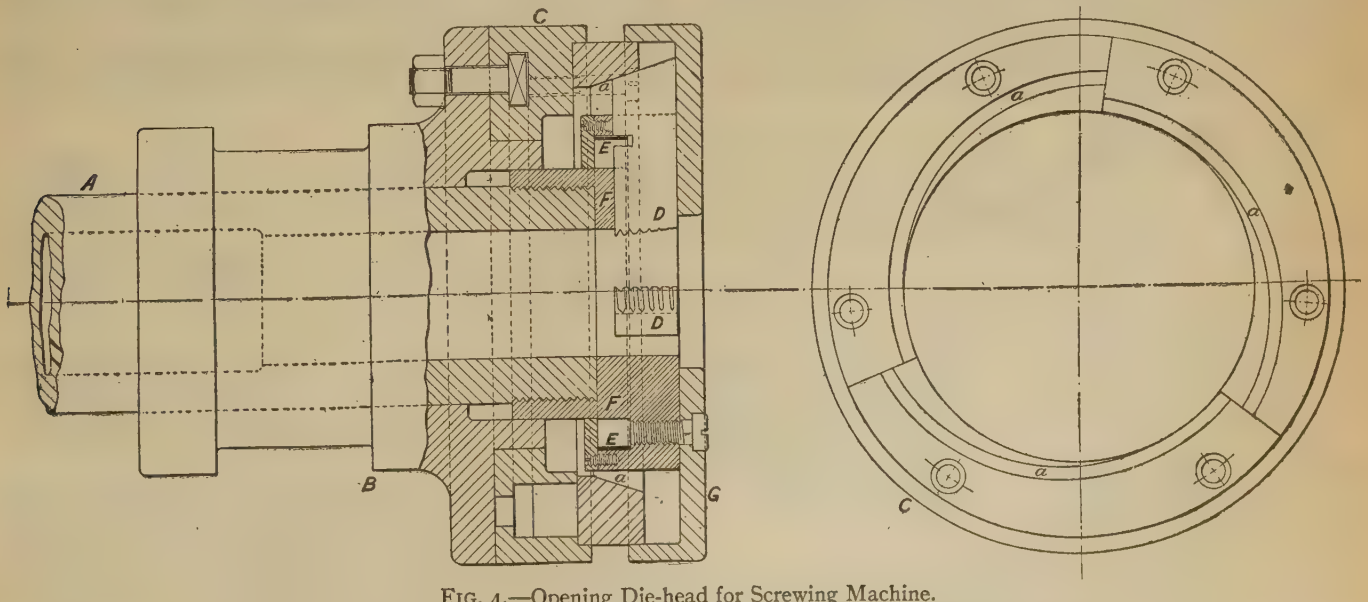


FIG. 4.—Opening Die-head for Screwing Machine.

A, Spindle end.
B, Sliding collar.
C, Ring bolted to B, and enclosing ring having three coned grooves *a*, *a*, *a*, set eccentrically to close in or let out the chasers D.
E, Curled spring keeping chasers outwards in contact with *a*.
F, Piece screwed to end of A, and provided with three grooves to carry the chasers.
G, Cover plate confining the chasers, and unscrewed from F when changing chasers for other sizes.

By hobs.

standard screw is mounted somewhere on the lathe, at the rear, or in front, and a nut partly embracing this becomes a guide to a bar which is attached to the tool slide directly. These are termed chasing lathes. Their value lies in the cutting of screws of but a few inches in length, of which large numbers are required, a familiar example being the screwed stays for the fire-boxes of steam boilers, hundreds of which are used in a single boiler.

By taps and dies.

The third method embodies the use of taps and dies in their numerous designs. The simpler forms used are those operated by hand at the bench, from which all the machine taps and dies have been elaborated. The tap is the solid screwed cylindrical tool which cuts an internal thread (fig. 5); the die is the hollow tool which cuts a thread on the outside of a cylinder (fig. 6).

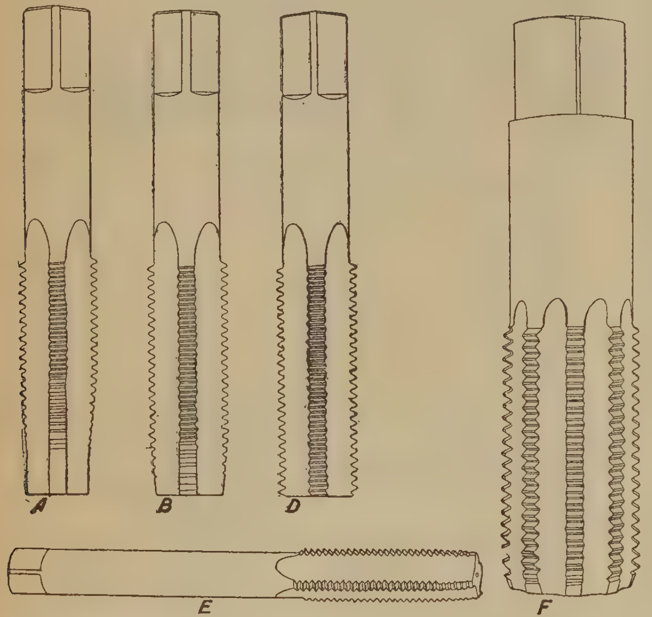


FIG. 5.—Taps. A, Entering or taper tap; B, middle or second tap; D, bottoming or plug tap; E, machine tap; F, hob or master tap.

These taps and dies are, or should be, true cutting tools, and if we examine any of those of approved form we shall see that they are so in fact. But none of the early taps was in any sense a cutting tool. They ground, and scraped, and squeezed, but never cut. They were usually made of round steel rod, screwed, and having three or four flats filed down upon them. The angles therefore which abraded the work were always obtuse, and as proper backing off was often neglected, or insufficiently done, the labour not only of running them down, but also of running them back out of their holes, was very great. This, combined with the inefficient form of solid screw plates used at the same time, made the work of fitting nuts and bolts one of constant trial and error, of easing and doctoring; and when this had been done, nuts and bolts were not interchangeable, but each nut was marked for its own bolt. The earliest screw plates were probably of the same forms which are used now for screws below $\frac{3}{16}$ in. diameter—mere hardened plates of steel, having holes of graduated diameters, screwed to the various sizes required.

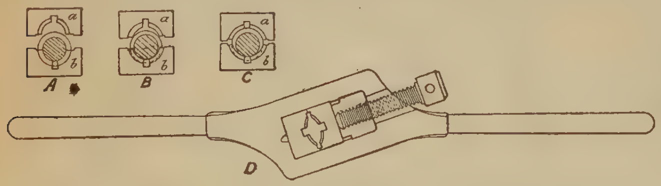


FIG. 6.—Dies.

A, Dies cut over hob of same size as screw to be cut; the lead is bad, there is coincidence only at the completion of the thread, and they are seldom used except in solid screw plates.

B, Dies cut over hob one thread deeper than the screw to be cut, the standard form; the lead is good and there is coincidence at about the middle of action.

C, Dies cut over hob two threads deeper than screw to be cut, frequently used; the lead is good and there is coincidence at the beginning of action. *a*, dies at beginning of action, *b*, at completion.

D, Screw stock.

In all taps and dies the problem is to cut a screw, of which the angle of thread changes from point to root, with tools whose angle must remain constant. In taps there is no choice of angle, since they must be the exact counterparts of the tapped threads when finished. But in dies a compromise is made by cutting them with hobs, or master taps (fig. 5), one thread larger than the thread to be cut by the dies. Briefly, the practical effect is that the dies are only counterparts of the thread to be cut at about the middle part of their action (fig. 6, B).

Though the action of taps resembles in some respects that of common dies, the results achieved are better, partly because the backing off is generally superior, partly because taper taps are commonly used to start a screw hole. Tapered solid dies are also used in some kinds of turret work with the same object, namely, to facilitate the work of an inherently badly formed tool. With a tapered tap, or a tapered solid die, the full threads do not come into operation until after the tapered threads have started the cut. A properly made throughfare tap, or a tapered die, will cut an average-sized screw at one traverse, provided lubrication is ample. Taps are now made with very narrow edges and wider clearances than formerly, very different from the common taps with broad edges and narrow grooves. There is thus little friction, and there is plenty of clearance for the chips, essential conditions for cutting screws rapidly at a single traverse.

Dies are held in stocks. In the common die stocks one adjustable die is moved forward with a screw, which forms one of the handles of the stock, or a separate tightening screw is used at right angles with the handles, or the tightening screw is set diagonally in relation to the handle (fig. 6, D). Sir Joseph Whitworth's well known "guide" screw stock (fig. 7) is an example of the embodiment of the principle just stated, the dies being cut over a hob two depths of thread larger than the screw; one, a broad die, is used for guidance only, and two narrow dies do all the cutting. The guide-screw stock derives its name from the fact that it embodies a guide *a* distinct from the cutters *b*,*b*, the guide doing very little actual cutting; it is one of the best tools for screw-cutting outside the lathe, but some of the American types of dies, such as in fig. 8, A and B, give very accurate results, especially when they are combined with a guide in advance of the dies, to keep them truly parallel on the work. The common dies are inferior in operation to those used in the guide-screw stock. Nevertheless, the common die stocks are used most extensively. The reason is that, although they are of faulty construction regarded strictly from the mechanician's point of view, yet they do their work in a very satisfactory manner if moderate care be exercised in their construction and working.

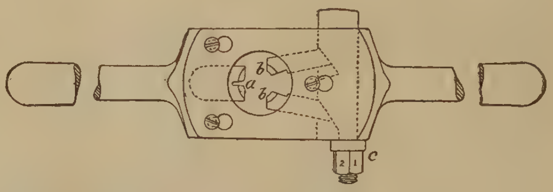


FIG. 7.—Whitworth Guide-Screw Stock. *a*, Guide; *b*,*b*, cutters; *c*, adjusting bolt.

Machine Work.—Hand tapping and screwing has long been confined to occasional pieces of work done by the fitter at the bench, the erecter and repairer. Screws and tapped holes required in quantities are done on machines which include numerous types, at a rate of production which would seem incredible were it not so common. For cutting common screws of no very great length the lathe has long been superseded by the various screwing machines. The earlier forms were provided with clutch mechanism for running the solid dies back off the thread, in imitation of the action of the hands, and the dies could not cut a complete thread at one traverse, two or three traverses being necessary in the production of a full thread. In the modern screwing machines (fig. 3) the cutters are closed and released by cam mechanism, and all threads except those of large diameter are cut at a single traverse. Common bolts and nuts are cut in

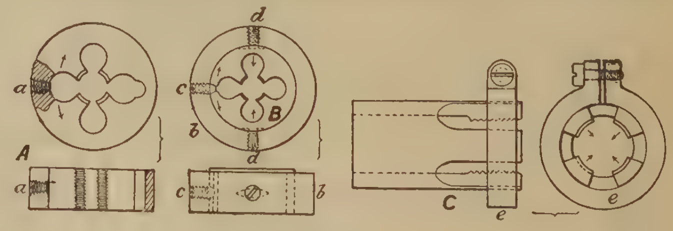


FIG. 8.

A, Common split spring die, adjusted by taper screw, *a*.

B, Split die held in collet, *b*, and expanded or contracted by turning in the taper-pointed screw, *c*, and slackening the screws *d*,*d*, or vice versa.

C, Spring die for lathes, adjusted to cut larger or smaller by means of the split ring *e*.

machines of this kind, machine taps, which are longer than hand operated taps, being employed in the same machines.

But the smaller screws made in large quantities, and screws which have to be cut on pieces of work on which other operations, as turning, boring, facing, knurling, have to be performed, are made in the numerous capstan or turret lathes, the dies or taps being held in the turrets. Often a cam-operated screwing plate is pulled into line with the work operating independently of the turret head. But in most cases the dies (fig. 8) are held in a chuck which is inserted in one of the holes in the turret and which is better for the cutting of the finer screws. More valuable than any other single improvement is the automatic opening of many dies used in turret lathes, by which the running back of the die over the work is avoided. These opening die heads are of several designs. They are so beautifully contrived that contact with a stop, the position of which can be regulated, arrests the cutting action and causes the dies to fly open away from the screw, so that the turret can be slid away instantly, while the dies close in readiness for the next screw.

Sizing Taps are used for the finishing of threads which are required to be finished so uniformly as to be interchangeable one with the other. These are ordinary plug or second taps, generally short in length, and as they remove but a mere trifle of material they retain their size for a very long time. The case of sizing taps is more difficult than that of dies, because a die can be readily compressed to compensate for wear (fig. 8), but a tap has to be expanded. The result is that while plenty of adjustable dies are made, there are few expanding taps. Many have been designed, but they are used to a much less extent than the dies. A sizing tap is kept true as long as possible by careful use, and when it falls below the limit dimensions it is replaced by a new one.

Screw milling.

Screw milling, the latest development in screw-cutting, involves the use of a special machine, something like the lathe in outline, the piece of work to be threaded being rotated in the axis of the machine. The cutter is carried in a head, with swivelling arrangements, to provide for variations in screw angles, and is rotated at speeds suitable for the metal or alloy being cut. The necessary traverse is imparted either to the work or to the cutter, according to the design of machine, by lead screw and change gears. This method is employed to a considerable extent, chiefly for cutting coarsely threaded screws and worms. The great advantage which the revolving cutter possesses over the single-edged tool is its rapidity of action, by which threads may be produced more quickly than in the lathe.

Testing Screws.—The screws cut in engineers' shops are sufficiently true for all practical purposes. But the fact remains that no guide screw yet made is true, and no true screw can be made apart from the use of devices which are unknown in the machine shop. Actually no screw ever has been, or probably ever will be, made perfect, but the variation from truth has been in some cases only $\frac{1}{25,000}$ or $\frac{1}{30,000}$ part of an inch. The microscope is brought into requisition for testing standard screws, but commercial screws simply have to pass the test of gauges. A screw 21 ft. long was made by the Pratt & Whitney Co., and tested by Professor W. A. Rogers. A scale, the corrections of which were known to within $\frac{1}{25,000}$ in., was mounted parallel with the axis of the screw. A microscope containing a cross bar was mounted on the carriage actuated by the screw. The cross bar was furnished with a micrometer by which the deviations for any revolution of the screw could be measured. A reading was taken for each half inch in length of the screw. Special tests were made at various points by turning the screw through 45° at a time. The maximum error in the entire length of the screw was found to be less than $\frac{1}{100}$ in.

The problem of producing a true screw has occupied investigators since the days of Henry Maudslay (1771–1831). The great difficulty is that of attaining accurate pitch, so that the distances between all the threads shall be uniform, and consequently that a nut on the screw shall move equably during the rotation. The importance of this point is felt in the dividing engines of various classes employed for ruling, and in measuring machines used for testing standards of length. The ordinary screw, cut by dies or in the screw-cutting lathe, is found, on applying comparatively coarse tests, to be far from accurate in pitch, while the thread may be wavy or "drunken" and the diameter may not be uniform at all points. There are several methods of correcting the errors in screws; the principal one is that of retarding or accelerating the traverse motion of the screw-cutting tool by means of a compensating lever bearing on a compensating bar, which is formed after observations have been made on the degree of accuracy of the leading screw used to propel the tool carriage. The original errors in the leading screw are therefore eliminated as far as possible. The inspection of the screw is done by means of the microscope working in conjunction with a line measure fastened down parallel with the axis of the screw, so that the coincidence or otherwise of the screw pitches with the subdivisions of the measure may be compared. (J. G. H.)

Errors of Screws.—For scientific purposes the screw must be so regular that it moves forward in its nut exactly the same distance for each given angular rotation around its axis. As the mountings of a screw introduce many errors, the final and exact test of its accuracy can only be made when it is finished and set up for use. A large screw can, however, be roughly examined in the following manner:—(1) See whether the surface of the threads has a perfect polish. The more it departs from this, and approaches the rough torn surface as cut by the lathe tool, the worse it is. A perfect screw has a perfect polish. (2) Mount it between the centres of a lathe and then slip upon it a short nut which fits perfectly. If the nut moves from end to end with equal friction, the screw is uniform in diameter. If the nut is long, unequal resistance may be due to either an error of run or a bend in the screw. (3) Fix a microscope on the lathe carriage and focus its single cross-hair on the edge of the screw and parallel to its axis. If the screw runs true at every point its axis is straight. (4) Observe whether the short nut runs from end to end of the screw without a wabbling motion when the screw is turned and the nut kept from revolving. If it wabbles the screw is said to be drunk. One can see this error better by fixing a long pointer to the nut, or by attaching it to a mirror and observing an image in it with a telescope. The following experiment will also detect this error. (5) Put upon the screw two well-fitting and rather short nuts, which are kept from revolving by arms bearing against a straight-edge parallel to the axis of the screw. Let one nut carry an arm which supports a microscope focused on a line ruled on the other nut. Screw this combination to different parts of the screw. If during one revolution the microscope remains in focus, the screw is not drunk; and, if the cross-hairs bisect the line in every position, there is no error of run. Where the highest accuracy is needed, we must resort in the case of screws, as in all other cases, to grinding. A long solid nut, tightly fitting the screw in one position, cannot be moved freely to another position unless the screw is very accurate. If grinding material is applied and the nut is constantly tightened, it will grind out all errors of run, drunkenness, crookedness and irregularity of size. The condition is that the nut must be long, rigid and capable of being tightened as the grinding proceeds; also the screw must be ground longer than it will finally be needed, so that the imperfect ends may be removed.

The following process will produce a screw suitable for ruling gratings for optical purposes. Suppose it is our purpose to produce a screw which is finally to be 9 in. long, not including bearings, and 1⅛ in. in diameter. Select a bar of soft Bessemer steel, which has not the hard spots usually found in case steel, about 1⅜ in. in diameter and 30 in. long. Put it between lathe centres and turn it down to 1 in. diameter everywhere, except about 12 in. in the centre, where it is left a little over 1⅛ in. in diameter for cutting the screw. Now cut the screw with a triangular thread a little sharper than 60°. Above all, avoid a fine screw, using about 20 threads to the inch.

The grinding nut, about 11 in. long, has now to be made. Fig. 9 represents a section of the nut, which is made of brass, or better of Bessemer steel. It consists of four segments, *a,a*, which can be drawn about the screw by two collars, *b,b*, and the screw *c*. Wedges between the segments prevent too great pressure on the screw. The final clamping is effected by the rings and screws, *d,d*, which enclose the flanges, *e*, of the segments. The screw is now placed in a lathe and surrounded by water whose temperature can be kept constant to 1° C., and the nut placed on it. In order that the weight of the nut may not make the ends too small, it must either be counterbalanced by weights hung from a rope passing over pulleys in the ceiling, or the screw must be vertical during the whole process. Emery and oil seem to be the only available grinding materials, though a softer silica powder might be used towards the end of the operation to clean off the emery and prevent future wear. Now grind the screw in the nut, making the nut pass backwards and forwards over the screw, its whole range being nearly 20 in. at first. Turn the nut end for end every ten minutes and continue for two weeks, finally making the range of the nut only about 10 in., using finer washed emery and moving the lathe slower to avoid heating. Finish with a fine silica powder or rouge. During the process, if the thread becomes too blunt, recut the nut by a *short* tap, so as not to change the pitch at any point. This must of course not be done less than five days before the finish. Now cut to the proper length; centre again in the lathe under a microscope; and turn the bearings. A screw so ground has fewer errors than from any other system of mounting. The periodic error especially will be too small to be discovered, though the mountings and graduation and centering of the head will introduce it; it must therefore finally be corrected.

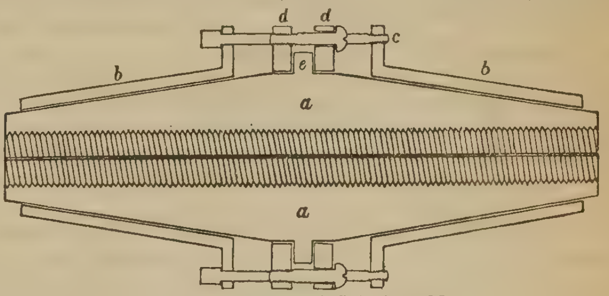


FIG. 9.—Section of Grinding Nut.

Mounting of Screws.—The mounting must be devised most carefully, and is indeed more difficult to make without error than the screw itself. The principle which should be adopted is that no workmanship is perfect; the design must make up for its imperfections. Thus the screw can never be made to run true on its bearings, and hence the device of resting one end of the carriage on the nut must be rejected. Also all rigid connexion between the nut and the carriage must be avoided, as the screw can never be adjusted parallel to the ways on which the carriage rests. For many purposes, such as ruling optical gratings, the carriage must move accurately forward in a straight line as far as the horizontal plane is concerned, while a little curvature in the vertical plane produces very little effect. These conditions can be satisfied by making the ways V-shaped and grinding with a grinder somewhat shorter than the ways. By constant reversals, and by lengthening or shortening the stroke, they will finally become nearly perfect. The vertical curvature can be sufficiently tested by a short carriage carrying a delicate spirit-level. Another and very efficient form of ways is V-shaped with a flat top and nearly vertical sides. The carriage rests on the flat top and is held by springs against one of the nearly vertical sides. To determine with accuracy whether the ways are straight, fix a flat piece of glass on the carriage and rule a line on it by moving it under a diamond; reverse and rule another line near the first, and measure the distance apart at the centre and at the two ends by a micrometer. If the centre measurement is equal to the mean of the two end ones, the line is straight. This is better than the method with a mirror mounted on the carriage and a telescope. The screw itself must rest in bearings, and the end motion be prevented by a point bearing against its flat end, which is protected by hardened steel or a flat diamond. Collar bearings introduce periodic errors. The secret of success is so to design the nut and its connexions as to eliminate all adjustments of the screw and indeed all imperfect workmanship. The connexion must also be such as to give means of correcting any residual periodic errors or errors of run which may be introduced in the mountings or by the wear of the machine.

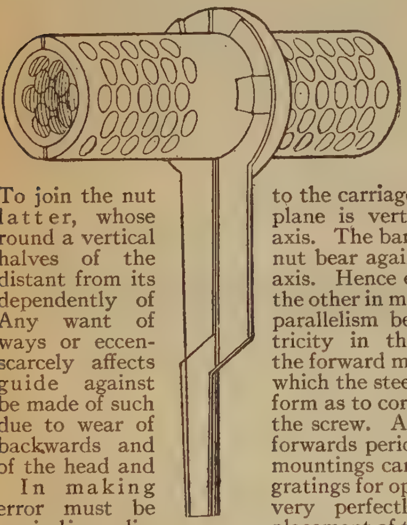


Fig. 10.

The nut is shown in fig. 10. It is made in two halves, of wrought iron filled with boxwood or lignum vitae plugs, on which the screw is cut. To each half a long piece of sheet steel is fixed which bears against a guiding edge, to be described presently. The two halves are held to the screw by springs, so that each moves forward almost independently of the other. To join the nut to the carriage, a ring is attached to the latter, whose plane is vertical and which can turn round a vertical axis. The bars fixed midway on the two halves of the nut bear against this ring at points 90° distant from its axis. Hence each half does its share independently of the other in moving the carriage forward. Any want of parallelism between the screw and the ways or eccentricity in the screw mountings thus scarcely affects the forward motion of the carriage. The guide against which the steel pieces of the nut rest can be made of such form as to correct any small error of run due to wear of the screw. Also, by causing it to move backwards and forwards periodically, the periodic error of the head and mountings can be corrected. In making gratings for optical purposes the periodic error must be very perfectly eliminated, since the periodic displacement of the lines only one-millionth of an inch from their mean position will produce "ghosts" in the spectrum. (See Diffraction.) Indeed this is the most sensitive method of detecting the existence of this error, and it is practically impossible to mount the most perfect of screws without introducing it. A very practical method of determining this error is to rule a short grating with very long lines on a piece of common thin plate glass; cut it in two with a diamond and superimpose the two halves with the rulings together and displaced sideways over each other one-half the pitch of the screw. On now looking at the plates in a proper light so as to have the spectral colours show through it, dark lines will appear, which are wavy if there is a periodic error and straight if there is none. By measuring the comparative amplitude of the waves and the distance apart of two lines, the amount of the periodic error can be determined. The phase of the periodic error is best found by a series of trials after setting the corrector at the proper amplitude as determined above.

A machine properly made as above and kept at a constant temperature should be able to make a scale of 6 in. in length, with errors at no point exceeding $\frac{1}{100,000}$ of an inch. When, however, a grating of that length is attempted at the rate of 14,000 lines to the inch, four days and nights are required and the result is seldom perfect, possibly on account of the wear of the machine or changes of temperature. Gratings, however, less than 3 in. long are easy to make. (H. A. R.)

SCREW-PINE, the popular name for plants of the genus *Pandanus*, which are shrubs or trees of peculiar habit, having a main stem and a few branches at the ends of which is a tuft of long, stiff, narrow leaves closely arranged in three strongly twisted lines. The stem forms stout roots, which grow obliquely downwards to the soil, and owing to the decay of the lower part of the stem the plant is often supported merely by these strong prop-like roots. The ripe fruits are borne in often very large spherical or cylindrical heads, which are often extremely hard. The genus is the principal one of the family Pandanaceae, a small order of Monocotyledons, which is widely distributed through the tropics of the Old World, especially in the islands of the Malay Archipelago and of the Indian and Pacific Oceans.

SCRIBE, AUGUSTIN EUGÈNE (1791–1861), French dramatist, was born in Paris on the 24th of December 1791. His father was a silk merchant, and he was well educated, being destined for the bar. But, having a real gift for the theatre, a gift which unfortunately was not allied with a corresponding literary power, he very soon began to write for the stage. His first piece, *Le Prêtendu sans le savoir*, was produced without his name at the Variétés in 1810, and was a failure. Numerous other plays, written in collaboration with various authors, followed; but Scribe achieved no distinct success till 1815, when *Une Nuit de la garde nationale*, written in collaboration with Delestre-Poirson, made him famous. Thenceforward his fertility was unceasing and its results prodigious. He wrote every kind of drama—vaudevilles, comedies, tragedies, opera-libretti. To the Gymnase theatre alone he is said to have furnished a hundred and fifty pieces before 1830. This extraordinary fecundity is explained by the systematic methods of collaboration which he established. He had a number of co-workers, one of whom supplied the story, another the dialogue, a third the jokes and so on. He is said in some cases to have sent sums of money for "copyright in ideas" to men who were unaware that he had taken suggestions from their work. Among his collaborators were Jean Henri Dupin (1787–1887), Germain Delavigne, Delestre-Poirson, Mélesville (A. H. J. Duveyrier), Marc-Antoine Desaugiers, Xavier Saintine and Gabriel Legouvé. His début in serious comedy was made at the Théâtre Français in 1822 with *Valérie*, the first of many successful pieces of the same kind. His industry was untiring and his knowledge both of the mechanism of the stage and of the tastes of the audience was wonderful. For purely theatrical ability he is unrivalled, and his plays are still regarded as models of dramatic construction. Moreover he was for fifty years the best exponent of the ideas of the French middle classes, so that he deserves respectful attention, even though his style be vulgar and his characters commonplace. He wrote a few novels, but none of any mark. The best-known of Scribe's pieces after his first successful one are *Une Chaîne* (1842); *Le Verre d'eau* (1842); *Adrienne Lecouvreur* (1849), in conjunction with Legouvé; *Bertrand et Raton, ou l'art de conspirer*; and the libretti of many of the most famous operas of the middle of the century, especially those of Auber and Meyerbeer. The books of *La Muette de Portici, Fra Diavolo, Robert le Diable*, and of *Les Huguenots* are wholly or in part by him. Scribe died in Paris on the 20th of February 1861.

His *Œuvres complètes* appeared in seventy-six volumes in 1874–1885. See Legouvé, *Eugène Scribe* (1874).

SCRIBES. The word "scribe" (from Lat. *scribere*, to write) means generally a writer; but it has a more special application as the English term for the Jewish class called in Hebrew *Sopherim* (Gr. γραμματεῖς). Both the Hebrew and the Greek word are used to denote something equivalent to secretary of state or town-clerk in general; and through the influence of the law, revealed through Moses, upon the Jewish nation conceived as a theocracy, both words denote in particular one learned in Scripture. Jeremiah (for example) knew of Scribes who made the law of the Lord falsehood (viii. 8), just as he knew of false prophets and profane priests (xxiii.). The function of writing belongs rather to the scribe or secretary in general than to the specifically Jewish scribe, whose primary business was to read and interpret the existing revelation of God's will, just as the town-clerk at Athens read public documents to the assembly (Thuc. vii. 10). So Ezra, the most famous of the early

Scribes, is referred to as "the scribe of the commandments of the Lord and of his statutes to Israel" (Ezra vii. 11), and again as "a ready scribe in the law of Moses which the Lord, the God of Israel, had given." As a Scribe he read the Law to the congregation of the children of Israel and the Levites recited a paraphrase to enable them to understand it (Nehemiah viii.). But even Jewish scribes were not only readers (as the old Greek version of 1 Esdras calls Ezra) but writers. Jeremiah (viii. 8) had a feud with the Scribes of his day, who wrote what they thought necessary as a compendium or supplement of the Law; but ben Sira, a Scribe himself, left such a book (Ecclesiasticus), which is reckoned Apocryphal, indeed, but is on its merits worthy to be "read for example of life and instruction of manners" (Thirty-Nine Articles of Religion, vi.; following Jerome). The book contains the Scribes' ideal (xxxviii. 24–xxxix. 11) as well as a typical performance. To be a Scribe requires a man's whole life; a ploughman (for example) has not leisure enough to acquire such wisdom—and here it is well to notice that experience taught the Jews the necessity of teaching all their children some handicraft, even if they were to be Scribes. But a Scribe must devote himself to the study of the law, the wisdom of the fathers and the prophets, *i.e.* the written law, and he must receive the oral tradition which will teach him to unlock its secrets. He must wander through the lands of the nations and explore things good and evil among men. So trained he will stand beside the rulers of his people because the law covers all the departments of their life. And he may be inspired to speak or write the wisdom he has gained. Ben Sira's grandson (natural or spiritual) in the prologue to the Greek version of this collection of such wisdom speaks of him as having been led forward to write it as an aid to the progressive fulfilment of God's law.

Such were the Scribes of the Jews, an order of learned theologians who practised applied theology, a succession of religious teachers and thinkers controlled in their speculations by their oral tradition to some extent and always by the principles of the law and the other scriptures so far as they accepted them and regarded them as consistent with the teaching of Moses. Their general aim was progress in knowledge of God's will, but apart from fundamental principles there were no tests or formularies to which their teaching must conform. Necessarily they differed from one another even in the same generation according to their different temperaments and their different experiences, especially of foreign lands. And different generations had to adapt themselves to different needs. In the time of Antiochus Epiphanes (for example) they had to face the problem, Was the law of the Sabbath to be broken, or was the whole nation to perish and leave none to keep the rest of the law and that part in happier days? A company of them decided with a unanimity rare in the history of the order that the Sabbath must be broken (1 Macc. ii. 40-42). Later these Hasidaeans deserted the Maccabean rebels, when some relief had been effected on the coming of a priest of the seed of Aaron (1 Macc. vii. 12-16). Their massacre, like the massacres which led to the suspension of the Sabbath law, was another fact to be assimilated for the guidance of posterity, and, as Scribes always did, they found and cited the prophecy which was thus fulfilled (Ps. lxxix. 2, 3; 1 Macc. vii. 17).

Later they are represented as falling generally into two classes, the Pharisees and the Sadducees, for it is obvious that the Sadducees needed doctors of the law to answer the Scribes of the Pharisees as long as they could, and as long as they dared to hold out against the Pharisaic tradition, backed as it was by the popularity of the Pharisees. But it must not be supposed that the Pharisees all held identical views or insisted upon all points in the tradition which accumulated and tended to crystallize as of equal importance. The Sadducean position was probably more definite and more commonly held by individual Sadducees because it was mainly based on negations. The rivals may be compared roughly to theists and atheists of the present day so far as their relative solidarity is concerned. As an example of the broad and conspicuous divergences among the Pharisees it is enough to point to the Zealots; they had isolated precursors before the final coalition of Pharisees, who thought that the time had come for the sword of Gideon as well as the sword of the Lord, with others who seemed to Josephus to love the bloodshed for its own sake. And the Talmud speaks of the Pairs of Scribes—*e.g.* Hillel and Shammai—as contending with one another.

In the Gospel according to St John, which is wholly, and the Gospel of St Luke, which is partially in touch with the life of the time of our Lord, the different receptions which different Scribes accorded to the new teachers is clearly recognized. St Paul was of course a Scribe, and helped St Luke, it may fairly be supposed, to resist Christian prejudice against the whole order—the mere name of Scribe—without any discrimination in favour of such men as Nathaniel, Nicodemus and Gamaliel. The Gospel associated with the name of St Matthew has at any rate something of the intolerance with which a tax-gatherer might well regard those of the Pharisees (*i.e.* the Zealots, to use the term handed down) who condemned them as breakers of God's law. But in respect of its wholesale denunciations of "Scribes and Pharisees, hypocrites," it must be said that there were many Scribes and Pharisees who were not hypocrites, and were therefore entitled to say, "Let the galled jade wince, our withers are unwrung." It appears that the parable of the Pharisee and the Publican ended originally with a question, "Which went home justified"—the Pharisee who thanked God because he had been saved from the grosser sins, or the Publican who recognized that his calling was in itself sinful, and without venturing to pass beyond the Court of the Gentiles whom he served—without even promising to abandon their service—prayed for mercy to the God whom he feared? The official text of St Luke has answered the question in one way: Christian practice is, on the whole, in favour of the Pharisee.

Other views of the ancient Scribes are too notorious to need statement here. Broadly speaking they have no connexion with the real evidence, because they rest upon the denunciations of the First Gospel. If it is necessary to begin historical investigation at the wrong end, it is advisable to take into account the whole evidence available. The Scribes of the 1st century A.D. preserved Judaism in spite of the destruction of the Temple, and this fact is enough to refute the view too commonly taken of them by Christians in spite of St Luke and St John. The common view is as reasonable and just as an account of the Prophets based on Jeremiah's denunciations would be—or an estimate of the Church of England which consisted of summary accounts of its criminous clerks.

See Schürer's *History of the Jewish People*, with full authorities.

(J. H. A. H.)

SCRIM, a light open texture, usually made of cotton or flax. It is used in bookbinding, upholstery and other industries. It is also used as a backing to strengthen paper, as in maps and packing paper. Sometimes jute scrims are made for the latter purpose, and the whole made impervious to moisture by the addition of some waterproof solution. Certain varieties of jute scrims or nets are used for supporting the branches of fruit trees, and for preventing birds from damaging the fruit.

SCRIP, properly any written document; the word is a corruption of "script" (Lat. *scribere*, to write), possibly from an assimilation with "scrip," a pilgrim's bag or wallet, which is borrowed from the Scandinavian (cf. Nor. *skreppa*, knapsack), and is ultimately cognate with "scrap," shred. In commercial usage, "scrip" is a document or certificate issued by a public company when instalments upon its shares are payable at different dates, or the whole amount to be paid has not been called up. Such a document entitles the person named to be treated as the allottee of the shares mentioned; it is transferable, and entitles the allottee on payment of all the calls to a share certificate. Scrip requires a penny stamp impressed upon it. The word is frequently loosely used for the share certificates or shares collectively.

SCROFULA (Lat. for "little sow"), or STRUMA, the general names formerly given to the disease now termed tuberculosis (*q.v.*)—"scrofulous," "strumous" and "tuberculous" being nearly interchangeable. The particular characters associated with "scrofula" have, therefore, varied at different periods.

when the real nature of the disease was misunderstood; but essentially what was meant was tuberculosis of the bones and lymphatic glands, with its attendant symptoms, and it is in this sense that the word survives. The old English popular name was "king's evil," so called from the belief that the sovereign's touch could effect a cure. This superstition can be traced back to the time of Edward the Confessor in England, and to a much earlier period in France. Samuel Johnson was touched by Queen Anne in 1712, and the same prerogative of royalty was exercised by Prince Charles Edward in 1745.

SCROGGS, SIR WILLIAM (*c.* 1623–1683), lord chief justice of England, was the son of a butcher of sufficient means to give his son a university education. Scroggs went to Oriel College, and later to Pembroke College, Oxford, where he graduated in 1640, having acquired a fair knowledge of the classics. There is some evidence that he fought on the royalist side during the Civil War. In 1653 he was called to the bar, and soon gained a good practice in the courts. He was appointed a judge of the common pleas in 1676, and two years later was promoted to be lord chief justice, his advancement being due to his unfailing readiness to degrade the administration of justice to serve the purposes of the court. He was a man of debauched life and coarse and violent manners; and these qualities were conspicuous in his demeanour on the bench. As lord chief justice Scroggs presided at the trial of the persons denounced by Titus Oates for complicity in the "popish plot," and he treated these prisoners with characteristic violence and brutality, overwhelming them with indecent sarcasm and abuse while on their trial, and taunting them with savage mockery when sentencing them to death. He may at first have been a sincere believer in the existence of a plot; if so he showed himself not less gullible than the ignorant multitude out of doors; at all events he did nothing to test the credibility of such perjured witnesses as Oates, Bedloe and Dangerfield. At the trial in February 1679 of the prisoners accused of the murder of Sir Edmund Godfrey he gave a characteristic exhibition of his methods, indulging in a vituperative tirade against the Roman Catholic religion, and loudly proclaiming his satisfaction in the guilt of the accused. It was only when, in July of the same year, Oates's accusation against the queen's physician, Sir George Wakeman, appeared likely to involve the queen herself in the ramifications of the plot, that Scroggs began to think matters were going too far; he was probably also influenced by the discovery that the court regarded the plot with discredit and disfavour, and that the country party led by Shaftesbury had less influence than he had supposed with the king. The chief justice on this occasion threw doubt on the trustworthiness of Bedloe and Oates, and warned the jury to be careful in accepting their evidence. This change of front inflamed public opinion against Scroggs, for the popular belief in the plot was still undiminished. Scroggs, however, was no less violent than before against Catholic priests who came before him for trial, as he showed when he sentenced Andrew Bromwich to death at Stafford in the summer of 1679; but his proposing the duke of York's health at the lord mayor's dinner a few months later in the presence of Shaftesbury indicated his determination not to support the Exclusionists against the known wishes of the king. Acting in the assurance of popular sympathy, Oates and Bedloe now arraigned the chief justice before the privy council for having discredited their evidence and misdirected the jury in the Wakeman case, accusing him at the same time of several other misdemeanours on the bench, including a habit of excessive drinking and bad language. In January 1680 the case was argued before the council and Scroggs was acquitted. At the trials of Elizabeth Cellier and of Lord Castlemaine in June of the same year, both of whom were acquitted, he discredited Dangerfield's evidence, and on the former occasion committed the witness to prison. In the same month he discharged the grand jury of Middlesex before the end of term in order to save the duke of York from indictment as a popish recusant, a proceeding which the House of Commons declared to be illegal, and which was made an article in the impeachment of Scroggs in January 1681. The dissolution of parliament put an end to the impeachment, but in April Scroggs was removed from the bench with a pension; he died in London on the 25th of October 1683.

Scroggs was perhaps the worst of the judges who disgraced the English bench at a period when it had sunk to the lowest degradation; and although his infamy is less notorious than that of Jeffreys, his character exhibited fewer redeeming features. Scroggs was the author of a work on the *Practice of Courts-Leet and Courts-Baron* (London, 1701), and he edited reports of the state trials over which he presided. He was the subject of many contemporary satires.

See W. Cobbett, *Complete Collection of State Trials* (vols. i.-x. of *State Trials*, 33 vols., London, 1809); Roger North, *Life of Lord Guilford, &c.*, edited by A. Jessopp (3 vols., London, 1890), and *Examen* (London, 1740); Narcissus Luttrell, *A Brief Relation of State Affairs, 1678–1714* (6 vols., Oxford, 1857); Anthony à Wood, *Athenae Oxonienses*, edited by P. Bliss (4 vols., London, 1813–1820); *Correspondence of the Family of Hatton*, edited by E. M. Thompson (2 vols., Camden Soc. 22, 23, London, 1878); Lord Campbell, *Lives of the Chief Justices of England* (3 vols., London, 1849–1857); Edward Foss, *The Judges of England* (9 vols., London, 1848–1864); Sir J. F. Stephen, *History of the Criminal Law of England* (3 vols., London, 1883); Henry B. Irving, *Life of Judge Jeffreys* (London, 1898). (R. J. M.)

SCROLL, a strip or roll of paper, parchment, &c. The word in Mid. Eng. was *scrow*, and came from Fr. *escrou*, modern *écrou*; the French form is preserved in the legal term "escrow" (see DEED); the French diminutive *escrouel* gave the English form "scroll." The Fr. *escrou* is of Teutonic origin and is connected with "shred," "shard" and "sherd"; and meant a "shred" of paper. The term is sometimes given in architecture to the volute of the Ionic capital, to the termination of the handrail of a staircase, and also to the wave-like decorations of Roman red glazed pottery, and more particularly in Samian ware.

SCROPE, the name of an old English family of Norman origin. Sir William le Scrope, of Bolton, in Wensleydale, Yorkshire, had two sons, HENRY (d. 1336) and GEOFFREY (d. 1340), both of whom were in succession chief justice of the king's bench and prominent supporters of the court in the reign of Edward II. Henry was father of RICHARD LE SCROPE, 1st Baron Scrope of Bolton (*c.* 1327–1403), chancellor of England, an active adherent of John of Gaunt. Having been knight of the shire of Yorkshire in the parliament of 1364, he was summoned to the upper house as a baron by writ in 1371, when he was made treasurer and keeper of the great seal. In 1378 Lord Scrope became chancellor, in which office he attempted to curb the extravagance of Richard II., an offence for which he was deprived of office in 1382. Scrope engaged in several disputes with regard to his armorial bearings, the most celebrated of which was with Sir Richard Grosvenor as to his right to the shield blazoned "Azure, a bend or," which a court of chivalry decided in his favour after a controversy extending over four years. Both as a soldier and a statesman Lord Scrope was a man of high attainments, his integrity and prudence being conspicuous. His eldest son WILLIAM (*c.* 1350–1399) was created earl of Wiltshire in 1397 by Richard II., of whose evil government he was an active supporter. Wiltshire bought the sovereignty of the Isle of Man from the earl of Salisbury. In 1398 he became treasurer of England. His execution at Bristol was one of the first acts of Henry IV., and the irregular sentence of an improvised court was confirmed by that monarch's first parliament. Wiltshire's father, Lord Scrope, and his other sons were not included in the attainder, but received full pardon from Henry. Scrope, who was the builder of Bolton Castle, his principal residence, died in 1403. He was succeeded in the barony by his second son, Roger, whose descendants held it till 1630. HENRY, 9th Baron Scrope of Bolton (1534–1592), was governor of Carlisle in the time of Elizabeth, and as such took charge of Mary Queen of Scots when she crossed the border in 1568; and he took her to Bolton Castle, where she remained till January 1569. He was grandfather of Emmanuel Scrope, 11th baron (1584–1630), who was created earl of Sunderland in 1627; on his death without legitimate issue in 1630 the earldom became extinct, and the immense estates of the Scropes of Bolton were divided among his illegitimate children, the chief portion passing by marriage to the marquis of Winchester, who was created duke of Bolton in 1689; to the Earl Rivers; and to John Grubham Howe, ancestor of the earls of Howe. The barony of Scrope of Bolton seems then to have become dormant; but the title might, it would appear, be claimed through the female line by the representative of Charles Jones (d. 1840) of Caton, Lancashire. From Stephen, third son of the 1st Baron Scrope of Bolton, were descended the Scropes of Castle Combe, Wiltshire, the last of whom was William Scrope (1772–1852), an artist and author, who was an intimate friend of Sir Walter Scott. His daughter married George Poulett Thompson (1797–1876), an eminent geologist and prolific political writer, who took the name of Scrope, and who after his wife's death sold Castle Combe, of which he wrote a history. Probably from the same branch of the family was descended Adrian Scrope, or Scroope (1601–1660), who was prominent on the parliamentarian side in the Civil War, and one of the signatories of Charles I.'s death warrant.

Sir Geoffrey le Scrope (d. 1340), chief justice of the king's bench as mentioned above, uncle of the first Baron Scrope of Bolton, had a son Henry (1315–1391), who in 1350 was summoned to parliament by writ as Baron Scrope, the designation "of Masham" being added in the time of his grandson to distinguish the title from that held by the elder branch of the family. Henry's fourth son was Richard le Scrope (*c.* 1350–1405), archbishop of York, who took part with the Percies in opposition to Henry IV., and was beheaded for treason in June 1405. Henry le Scrope, 3rd Baron Scrope of Masham (*c.* 1376–1415), was a favourite of Henry V., by whom he was made treasurer in 1410 and employed on diplomatic missions abroad. But in 1415 he was concerned in a conspiracy to dethrone Henry and was executed at Southampton, when his title was forfeited. It was, however, restored to his brother John in 1455; and it fell into abeyance on the death, in 1517, of Geoffrey, 11th Baron Scrope of Masham, without male heirs.

See Sir N. H. Nicolas, *The Scrope and Grosvenor Controversy* (2 vols., London, 1832), containing much detailed information about the various branches of the Scrope family; J. H. Wylie, *History of England under Henry IV.* (4 vols., London, 1884–1898); Edward Foss, *The Judges of England* (9 vols., London, 1848–1864); G. P. Scrope, *History of the Manor and Ancient Barony of Castle Combe, Wilts* (London, 1852); G. E. C., *Complete Peerage*, vol. vii. (London, 1896). (R. J. M.)

SCROPE, GEORGE JULIUS POULETT (1797–1876), English geologist and political economist, was born on the 10th of March 1797, the second son of J. Poulett Thompson of Waverley Abbey, Surrey. He was educated at Harrow, and for a short time at Pembroke College, Oxford, but in 1816 he entered St John's College, Cambridge, graduated B.A. in 1821, and through the influence of E. D. Clarke and Sedgwick became interested in mineralogy and geology. During the winter of 1816–1817 he was at Naples, and was so keenly interested in Vesuvius that he renewed his studies of the volcano in 1818; and in the following year visited Etna and the Lipari Islands. In 1821 he married the daughter and heiress of William Scrope of Castle Combe, Wiltshire, and assumed her name; and he entered parliament in 1833 as M.P. for Stroud, retaining his seat until 1868. Meanwhile he began to study the volcanic regions of Central France in 1821, and visited the Eifel district in 1823. In 1825 he published *Considerations on Volcanos, leading to the establishment of a new theory of the Earth*, and in the following year was elected F.R.S. This earlier work was subsequently amplified and issued under the title of *Volcanos* (1862): an authoritative text-book of which a second edition was published ten years later. In 1827 he issued his classic *Memoir on the Geology of Central France, including the Volcanic formations of Auvergne, the Velay and the Vivarais*, a quarto volume illustrated by maps and plates. The substance of this was reproduced in a revised and somewhat more popular form in *The Geology and extinct Volcanos of Central France* (1858). Scrope was awarded the Wollaston Medal by the Geological Society in 1867. Among his other works was the *History of the Manor and Ancient Barony of Castle Combe* (printed for private circulation, 1852). He died at Fairlawn near Cobham in Surrey on the 19th of January 1876.

Biography (with portrait) in *Geol. Mag.* for May 1870.

SCROPHULARIACEAE, in botany, a natural order of seed-plants belonging to the sympetalous section of Dicotyledons, and a member of the series Tubiflorae. It is a cosmopolitan order containing about 180 genera with about 2000 species; the majority occur in temperate regions, the numbers diminishing rapidly towards the tropics and colder regions. About 30% of the species are annual herbs, such as eyebright (*Euphrasia officinalis*), cow-wheat (*Melampyrum*), and species of *Veronica*; more than 60% are biennial or generally perennial herbs and undershrubs, such as species of *Veronica*, mullein (*Verbascum*), foxglove (*Digitalis*; fig. 1), &c., while shrubs and trees are rare; *Paulownia*, a native of the mountains of Japan, a tree with large leaves and handsome panicles of violet flowers, is grown in European gardens.

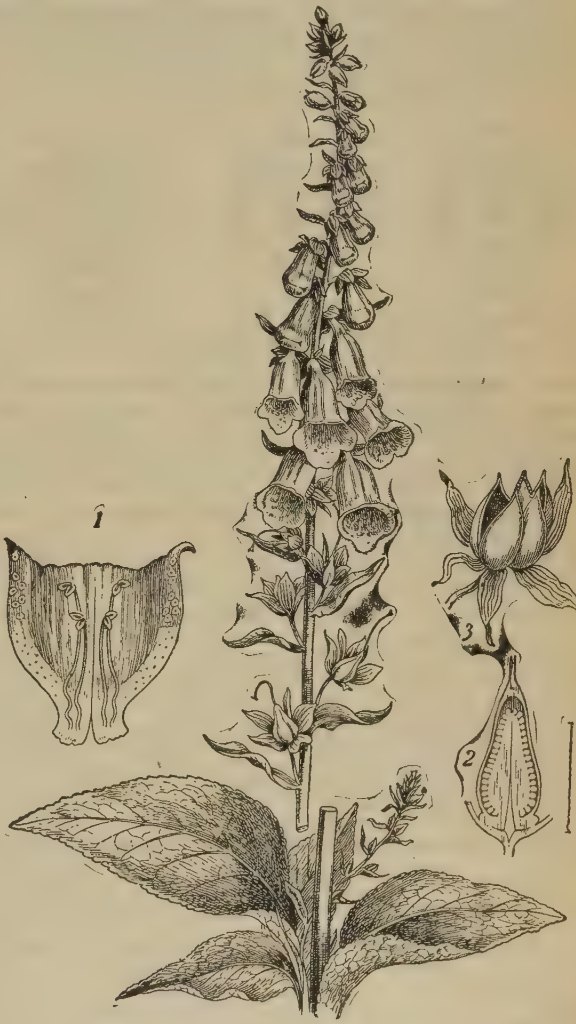


Fig. 1.—Foxglove (*Digitalis purpurea*).

1, Corolla cut open showing the four stamens, rather more than ½ nat. size.
2, Unripe fruit cut lengthwise, showing the thick axial placenta bearing numerous small seeds.
3, Ripe capsule split open.

The stem is sometimes prostrate and creeping, as in ivy-leaved toad-flax (*Linaria Cymbalaria*) and some of the native British Veronicas, but generally erect as in foxglove, figwort, mullein, &c.; a few are climbers as *Rhodochiton* and *Maurandia*. The South African genera *Hyobanche* and *Harveya* are parasites almost devoid of chlorophyll with scale-like leaves; and many genera are semiparasitic, having green leaves, but attaching themselves by root-suckers to roots of grass, &c., from which they derive part of their nourishment; such are *Euphrasia*, *Rhinanthus*, *Pedicularis*, &c. A few genera are aquatic, *e.g. Ambulia* (old world tropics), and have much divided submerged leaves and entire aerial leaves. The leaf-arrangement varies; the leaves are alternate as in *Verbascum*, or the lower leaves are opposite and the upper alternate as in *Antirrhinum* (snapdragon), or all are opposite (*Mimulus*), or whorled (some Veronicas). All varieties of leaf-arrangement are found in the one genus *Veronica* (*q.v.*), in some New Zealand species of which the leaves are small and appressed to the stem. The flowers are solitary in the leaf-axils, as in *Mimulus*, species of *Linaria*, &c., or form spikes or racemes which are terminal as in foxglove, species of *Veronica*, &c., or axillary as in *Veronica* (*Chamaedrys* section). Cymose inflorescences also occur, as in *Verbascum*, consisting of dichasia arranged in spikes, racemes or panicles. The flowers are hermaphrodite, hypogynous and zygomorphic in the median plane, being often more or less two-lipped, and having five sepals joined below and persisting in the fruiting stage, five petals uniting to form a corolla of very various shape, generally four stamens, the fifth (posterior) being suppressed or represented by a rudiment, while the anterior pair are longer than the posterior, and two generally equal carpels in the median plane forming a two-celled ovary containing numerous anatropous ovules on a thick axile placenta, and bearing a simple or bilobed style (fig. 2).

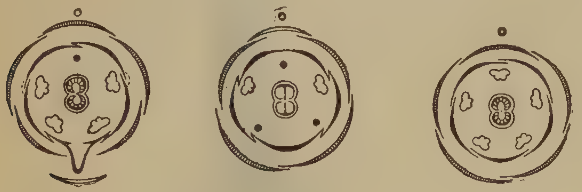


FIG. 2*a*. FIG. 2*b*. FIG. 2*c*.

FIG. 2.—Floral Diagrams of Scrophulariaceae. *a*, Linaria. *b*, Veronica. *c*, Verbascum.

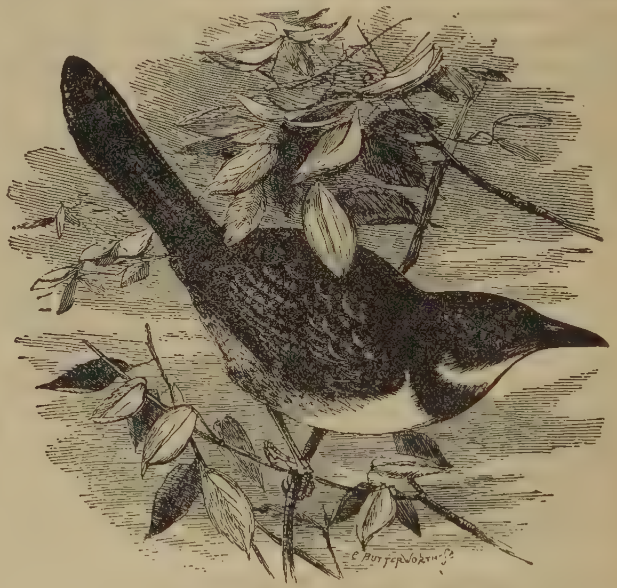
When a terminal flower is present it becomes regular as in toadflax, where radial symmetry is produced by development of a spur to each petal—such flowers are termed peloric; all the flowers in a spike are sometimes peloric. In *Euphrasia* and many species of *Veronica* the posterior sepal is suppressed, and in *Calceolaria* the anterior petals are completely united. The form of the corolla shows great variety, depending on the length and breadth of the tube—which in *Veronica* is almost obsolete, while in foxglove it is large and almost bell-shaped—and the development of the limbs, which are spreading in *Veronica*, small and almost erect in figwort, or form a pair of closed lips as in *Linaria* and *Antirrhinum*. In *Linaria* the anterior petal is spurred; in *Calceolaria* a very short tube is succeeded by a two-lipped limb, a smaller upper lip representing the two posterior petals and a larger, often very large, lower lip representing the three anterior petals. In *Verbascum* the five segments are almost equal, forming a nearly regular corolla; in *Veronica* the two posterior petals have united and the corolla is four-lobed. The approach to regularity in the corolla in *Verbascum* is associated with the presence of five fertile stamens, but the three posterior are generally larger than the two anterior. In *Veronica*, *Calceolaria* and other genera only two stamens are present. The anthers generally open introrsely by a longitudinal slit; their form shows great variety. These differences in the form of the corolla, the position and length of the stamens and the form of the anthers, are associated with their pollination by insects which probe the flower for honey, which is secreted by a disk surrounding the base of the ovary or by special nectaries below it. *Verbascum* and *Veronica* with a short-tubed corolla represent an open type of flower with more exposed nectar; in foxglove the honey is at the base of the long tube, and a bee crawling to reach it will rub with its back the anthers or stigmas which are placed on the upper side of the bell. The closed flowers of *Linaria* and *Antirrhinum* can be visited only by insects which are strong enough to separate the lips. In *Euphrasia* and others the pollen is loose and powdery, and the anthers have appendages which when touched by the head of the insect-visitor cause the pollen to be scattered.

The fruit is generally a capsule surrounded at the base, or sometimes as in yellow-rattle (*Rhinanthus*) enveloped in the persistent calyx; it opens by two or four valves, or, as in *Antirrhinum*, by pores. Occasionally it is a berry. The seeds are generally small and numerous, rarely few and large as in *Veronica*. In *Linaria Cymbalaria* the fruit becomes buried by the stalks bending downwards when ripe.

The order is divided into tribes by characters derived from the number of fertile stamens present and the form of the corolla. It is well represented in Britain by 13 genera, viz. *Verbascum* (mullein), *Linaria* (toad-flax), *Antirrhinum* (snapdragon), *Scrophularia* (figwort), *Limosella*—a small creeping annual found on edges of ponds, *Sibthorpia*, a small herb with creeping thread-like stems, *Digitalis* (foxglove), *Veronica* (speedwell), *Bartsia*, *Euphrasia* (eyebright), *Rhinanthus* (yellow-rattle), *Pedicularis* (louse-wort) and *Melampyrum* (cow-wheat). An American species of *Mimulus* (*M. Langsdorfii*) has become naturalized by river-sides in many places. Several genera are well known in gardens; such are *Calceolaria*, an important genus in temperate South America, *Collinsia*, *Pentstemon* and *Mimulus* (musk), also American genera.

Scrophulariaceae are closely allied to Solanaceae (*q.v.*), from which they are distinguished by the median position of the carpels, and generally by the zygomorphic flower; *Verbascum* and its allies, in which the flower approaches regularity, form a connecting link. An anatomical distinction is found in the arrangement of the wood and bast in the stem, which is collateral, not bicollateral as in Solanaceae.

SCRUB-BIRD, the name of an Australian genus, one of the most curious ornithological types of the many furnished by that country. The first examples were procured between Perth and Augusta in West Australia, and were described by J. Gould in the Zoological Society's *Proceedings* for 1844 (pp. 1, 2) as forming a new genus and species under the name of *Atrichia clamosa*, the great peculiarity observed by that naturalist being the absence of any bristles around the gape, in which respect alone it seemed to differ from the already known genus *Sphenura*. Later, however, it was given its modern name *Atrichornis clamosa*, and on account of the discovery of its peculiar sternum (made by A. Newton) it was removed from Oscine division of the Passeres, and the family *Atrichornithidae* in the sub-oscine division of Passeres was made for the genus, the nearest ally being the lyre-bird (*q.v.*), now placed in the family Menuridae. Both the known species of scrub-bird are about the size of a small thrush—*A. clamosa* being the larger of the two. This species is brown above, each feather barred with a darker shade; the throat and belly are reddish white, and there is a large black patch on the breast; while the flanks are brown and the lower tail-coverts rufous. *A. rufescens* of New South Wales has the white and black of the fore-parts replaced by brown, barred much as is the upper plumage. Both species inhabit the thickest "scrub" or brushwood forest; but little has been ascertained as to their mode of life except that the males are noisy, imitative of the notes of other birds, and given to violent gesticulations. The nest and eggs seem never to have been found, and indeed no example of the female of either species is known to have been procured, whence that sex may be inferred to escape observation by its inconspicuous appearance and retiring habits. (A. N.)


West-Australian Scrub-bird (*Atrichornis clamosa*).

SCRUPLE, a term used in the two senses of (1) perplexity, doubt, reluctance or hesitation, especially the moral doubt arising from the difficulties of conscience; (2) a unit of weight, $\frac{1}{24}$ part of the ounce in apothecaries' weight, $=\frac{1}{3}$ of a dram, 20 grains (1·296 grammes). The word is an adaptation of Fr. *scrupule*, Lat. *scrupulus*, *scrupulum*, primarily a small sharp stone, also used in both the English meanings, dim. of *scrupus*, a rough stone, figuratively uneasiness of mind, probably to be connected with the root *skar*, to cut, cf. Gr. σκῦρον, stone-chippings, ζυρόν, a razor.

SCRUTIN DE LISTE (Fr. *scrutin*, voting by ballot, and *liste*, a list), a system of election of national representatives by which the electors of a department vote for all the deputies to be elected in that department (compare the "general ticket" in the United States). It is distinguished from the *scrutin d'arrondissement*, under which the electors in each arrondissement vote only for the deputy to be elected in it. See REPRESENTATION.

SCRUTINY (Fr. *scrutin*, Late Lat. *scrutinium*, from *scrutari*, to search or examine thoroughly), careful examination or inquiry. The word is specifically applied in the early church to the examination of the catechumens or those under instruction in the faith. They were taught the creed and the Lord's Prayer, examined therein, and exorcized prior to baptism. The days of scrutiny varied at different periods from three to seven. From about the beginning of the 12th century, when it became usual to baptize infants soon after their birth instead of at stated times (Easter and Pentecost), the ceremony of scrutiny was incorporated with that of the actual baptism. Scrutiny is also a term applied to a method of electing a pope in the Roman Catholic church, in contradistinction to two other methods, acclamation and accession. (See CONCLAVE.) In the law of elections, scrutiny is the careful examination of votes cast after the unsuccessful candidate has lodged a petition claiming the seat, and alleging that he has the majority of legal votes. Each vote is dealt with separately, notice being given beforehand by one party to the other of the votes objected to and the grounds of objection.

SCUDERY, the name of a family said to have been of noble Italian origin and to have transferred itself to Provence, but only known by the singular brother and sister who represented it during the 17th century.

GEORGES DE SCUDÉRY (1601–1667), the elder of the pair, was born at Havre, whither his father had moved from Provence, on the 22nd of August 1601. He served in the army for some time, and, though in the vein of gasconading which was almost peculiar to him he no doubt exaggerated his services, there seems little doubt that he was a stout soldier. But he conceived a fancy for literature before he was thirty, and during the whole of the middle of the century he was one of the most characteristic figures of Paris. He gained the favour of Richelieu by his opposition to Corneille. He wrote a letter to the Academy criticizing the *Cid*, and his play, *L'Amour tyrannique* (1640), was patronized by the cardinal in opposition to Corneille. Possibly these circumstances had something to do with his appointment as governor of the fortress of Notre-Dame de la Garde, near Marseilles in 1643, and in 1650 he was elected to the Academy. During the troubles of the Fronde he was exiled to Normandy, where he made his fortune by a rich marriage. He was an industrious dramatist, but *L'Amour tyrannique* is practically the only piece among his numerous tragi-comedies and pastorals that has escaped oblivion. His other most famous work was the epic of *Alaric* (1655). He lent his name to his sister's first romances, but did little beyond correcting the proofs. He died at Paris on the 14th of May 1667. Scudéry's swashbuckler affectations have been rather exaggerated by literary gossip and tradition. Although possibly not quite sane, he had some poetical power, a fervent love of literature, a high sense of honour and of friendship.

His sister MADELEINE (1607–1701), born also at Havre on the 15th of November 1607, was a writer of much more ability and of a much better regulated character. She was very plain and had no fortune, but her abilities were great and she was very well educated. Establishing herself at Paris with her brother, she was at once admitted to the Rambouillet coterie, afterwards established a *salon* of her own under the title of the *Société du samedi*, and for the last half of the 17th century, under the pseudonym of "Sapho" or her own name, was acknowledged as the first blue-stocking of France and of the world. She formed with Pellisson a close friendship only terminated by his death in 1693. Her lengthy novels, such as *Artamène, ou le Grand Cyrus* (10 vols. 1648–1653), *Clélie* (10 vols. 1654–1661), *Ibrahim, ou l'illustre Bassa* (4 vols. 1641), *Almahide, ou l'esclave reine* (8 vols. 1661–1663) were the delight of all Europe, including persons of the wit and sense of Madame de Sévigné. But neither in conception nor in execution will they bear criticism as wholes. With classical or Oriental personages for nominal heroes and heroines, the whole language and action are taken from the fashionable ideas of the time, and the personages can be identified either really or colourably with Mademoiselle de Scudéry's contemporaries. In *Clélie*, Herminius represents Paul Pellisson; Scaurus and Lyriane were Paul Scarron and his wife (afterwards Mme de Maintenon); and in the description of Sapho in vol. x. of *Le Grand Cyrus* the author paints herself. It is in *Clélie* that the famous Carte de Tendre appeared, a description of an Arcadia, where the river of Inclination waters the villages of Billet Doux, Petits Soins and so forth. The interminable length of the stories is made out by endless conversations and, as far as incidents go, chiefly by successive abductions of the heroines, conceived and related in the most decorous spirit, for Mademoiselle de Scudéry is nothing if not decorous. Nevertheless, although the books can hardly now be read through, it is still possible to perceive their attraction for a period which certainly did not lack wit. In that early day of the novel prolixity did not repel. "Sapho" had really studied mankind in her contemporaries and knew how to analyse and describe their characters with fidelity and point. Moreover her novels had the interest always attaching to the *roman à clef*. She was a real mistress of conversation, a thing quite new to the age as far as literature was concerned, and proportionately welcome. She had a distinct vocation as a pedagogue, and is compared by Sainte-Beuve to Mme de Genlis. She could moralize—a favourite employment of the time—with sense and propriety. Though she was incapable of the exquisite prose of Mme de Sévigné and some other of her contemporaries, her purely literary merits were considerable. Madeleine survived her brother more than thirty years, and in her later days published numerous volumes of conversations, to a great extent extracted from her novels, thus forming a kind of anthology of her work. She outlived her vogue to some extent, but retained a circle of friends to whom she was always the "incomparable Sapho." She died in Paris on the 2nd of June 1701.

Her *Life and Correspondence* were published at Paris by MM. Rathery and Boutron in 1873. An amusing sketch of her is to be found in vol. iv. of Sainte-Beuve's *Causeries du lundi*. Georges de Scudéry is sketched by Théophile Gautier in his *Grotesques*. See also V. Cousin, *La Société française au XVII^e siècle*, vol. ii.

SCULL (the same word as "skull," cf. Swed. *skål*, basin, *hufvud-skål*, skull of the head), a light oar with blade more concave than the ordinary racing oar and with shorter helm, thus allowing the user to hold one in each hand. "Sculling" is therefore the propulsion of a boat by one person with a pair of sculls. The word is also applied to the propulsion of a boat by one scull worked over the stern, the blade being swept through the water from side to side, turning diagonally at each stroke; the sculler usually stands. The principles of sculling with a pair of sculls are the same as those of rowing (*q.v.*). For the type of boat used in racing see BOAT. The Wingfield Sculls, a race which forms the English Amateur championship, was instituted in 1830. It is rowed from Putney to Mortlake. The Diamond Challenge Sculls, instituted in 1844, are rowed for at Henley Regatta. The earliest professional championship sculling race was rowed on the Thames in 1831. Since 1876, when an Australian (E. Trickett, of Sydney) beat J. H. Sadler, the professional championship of the world has been held by Australians or Canadians; the principal champions have been E. Hanlan (Toronto), 1880–1884, W. Beach (New South Wales), 1884–1887; other names are H. E. Searle, J. Stanbury, G. Towns and R. Arnst (New Zealand). Most of the races have been rowed on the Paramatta river. In August 1910 the race was rowed on the Zambezi between E. Barry of England and Arnst, the latter winning.

SCULLERY, a back-kitchen, the place where dishes, plates, kettles, &c., are washed and cleaned, and the rough work connected with the domestic service of a house is performed. The Med.

Lat. *scutellarius*, keeper of dishes and plates (*scutella*), became in O. Fr. *escueillier* or *sculier*, whence in English *sculler*, *squiler*, &c. A "sergeaunt-squylloure" is found amongst the officials of the royal household; and the *Promptorium parvulorum*, dating about 1400, glosses *lixa*, a sutler or camp-cook, by "squyllare, dysche-wescheare." "Scullion," a kitchen-wench, has been naturally connected with scullery, but is derived from O. Fr. *escouillon*, dish-cloth, cf. Span. *escobillon*, spring for a gun, ultimately from Lat. *scopa*, birch tree, *scopae*, broom of birch twigs.

SCULPTURE (Lat. *sculptura*, from *sculpere*, to carve, cognate with Gr. γλύφειν), a general term for the plastic art of carving, especially in stone and marble, but also in such materials as wood (see Wood-carving), ivory (see Ivory), metal (see Metal-work) and gems (see Gem).

Technical methods of the sculptor.

The production of bronze statues by the *cire perdue* (*anglice*, "lost wax") process is described in the article Metal-work; until (since its revival) recent times but little practised in Europe outside of Paris, it has now invaded most countries where fine casting is appreciated, and where naturalistic rendering is desired. There are signs, however, of its being ousted for a certain class of handling by the "galvanoplastic" method—a system of copper deposit by an electrical process—whereby "going over" the work after it has been reproduced in metal is avoided.

Clay model.

For the execution of a marble statue the sculptor first models a finished preliminary sketch on a small scale in clay or wax. He then, in the case of a life-size or colossal statue, has a sort of iron skeleton set up, with stout bars for the arms and legs, fixed in the pose of the future figure. This is called the "armature." It is placed on a stand, called a *chassis*, with a revolving top, so that the sculptor can easily turn the whole model round and thus work with the light on any side of it. Over this iron skeleton well-tempered modelling-clay is laid and is modelled into shape by the help of wood and bone tools; without the sustaining assistance of the ironwork a soft clay figure, if more than a few inches high, would collapse with its own weight and squeeze the lower part out of shape. While the modelling is in progress it is necessary to keep the clay moist and plastic by squirting water on to it with a sort of garden syringe capped with a finely perforated rose. When the sculptor is not at work the whole figure is kept wrapped up in damp cloths. A modern improvement is to mix the modelling-clay, not with water, but with stearin and glycerin; this, while keeping the clay soft and plastic, has the great advantage of not being wet, and so the sculptor avoids the chill and consequent risk of rheumatism which follow from a constant manipulation of wet clay. This method, however, has not been very extensively adopted. When the clay model is finished it is cast in plaster. A "piece-mould"[1] is formed by applying patches of wet plaster of Paris all over the clay statue in such a way that they can be removed piecemeal from the model, and then be fitted together again, forming a complete hollow mould. The inside is then rinsed out with plaster and water mixed to the consistency of cream till a skin of plaster is formed all over the inner surface of the mould, and thus a hollow cast is made of the whole figure. The "piece-mould" is then taken to pieces and the casting set free. If skilfully done by a good *formatore* or moulder the plaster cast is a perfect facsimile of the original clay, very slightly disfigured by a series of lines showing the joints in the piece-mould, the sections of which cannot be made to fit together with absolute precision. Many sculptors have their clay model cast in plaster before the modelling is quite finished, as they prefer to put the finishing touches on the plaster cast—good plaster being a very easy and pleasant substance to work on.

Pointing the marble.

The next stage is to copy the plaster model in marble. The model is set on a large block called a "scale stone," while the marble for the future statue is set upon another similar block. The plaster model is then covered with a series of marks, placed on all the most salient parts of the body, and the front of each "scale stone" is covered with another series of points, exactly the same on both stones. An ingenious instrument called a pointing machine, which has arms ending in metal points or "needles" that move in ball-socket joints, is placed between the model and the marble block. Two of its arms are then applied to the model, one touching a point on the scale stone while the other touches a mark on the figure. The arms are fixed by screws in this position, and the machine is then revolved to the marble block, and set with its lower needle touching the corresponding point on the scale stone. The upper needle, which is arranged to slide back on its own axis, cannot reach the corresponding point on the statue because the marble block is in the way; a hole is then drilled into the block at the place and in the direction indicated by the needle, till the latter can slide forward so as to reach a point sunk in the marble block exactly corresponding to the point it touched on the plaster mould. This process is repeated both on the model and on the marble block till the latter is drilled with a number of holes, the bottoms of which correspond in position to the number of marks made on the surface of the model. A comparatively unskilled *scarpellino* or "chisel-man" then sets to work and cuts away the marble till he has reached the bottoms of all the holes, beyond which he must not cut. The statue is thus roughly blocked out, and a more skilled *scarpellino* begins to work. Partly by eye and partly with the constant help of the pointing machine, which is used to give any required measurements, the workman almost completes the marble statue, leaving only the finishing touches to be done by the sculptor. In the opinion of many artists the use of the mechanical pointing-machine is responsible in a great measure for the loss of life and fire in much of modern sculpture.

The scarpellino.

Polish on marble.

Among the ancient Greeks and Romans and in the medieval period it was the custom to give the nude parts of a marble statue a considerable degree of polish, which really suggests the somewhat glossy surface of the human skin very much better than the full loaf-sugar-like surface which is left on the marble by most modern sculptors. This high polish still remains in parts of the pedimental figures from the Parthenon, where, at the back, they have been specially protected from the weather. The Hermes of the Vatican Belvidere is a remarkable instance of the preservation of this polish. Michelangelo carried the practice further still, and gave certain parts of some of his statues, such as the Moses, the highest possible polish in order to produce high lights just where he wanted them; the artistic legitimacy of this may perhaps be doubted, and in weak hands it might degenerate into mere trickery. It is, however, much to be desired that modern sculptors should to some extent at least adopt the classical practice, and by a slight but uniform polish remove the disagreeable crystalline grain from all the nude parts of the marble.

A rougher method of obtaining fixed points to measure from was occasionally employed by Michelangelo and earlier sculptors. They immersed the model in a tank of water, the water being gradually allowed to run out, and thus by its sinking level it gave a series of contour lines on any required number of planes. In some cases Michelangelo appears to have cut his statue out of the marble without previously making a model—a marvellous feat of skill.

Relief sculpture.

In modelling bas-reliefs the modern sculptor usually applies the clay to a slab of slate on which the design is sketched; the slate forms the background of the figures, and thus keeps the relief absolutely true to one plane. This method is one of the causes of the dulness and want of spirit so conspicuous in most modern sculptured reliefs. In the best Greek examples there is no absolutely fixed plane surface for the backgrounds. In one place, to gain an effective shadow, the Greek sculptor would cut below the average surface; in another he would leave the ground at a higher plane, exactly as happened to suit each portion of his design. Other differences from the modern mechanical rules can easily be seen by a careful examination of the Parthenon frieze and other Greek reliefs. Though the word "bas-relief" is now often applied to reliefs of all degrees of projection from the ground, it should, of course, only be used for those in which the projection is slight; "basso," "mezzo" and "alto rilievo" express three different degrees of salience. Very low relief is but little used by modern sculptors, mainly because it is much easier to obtain striking effects with the help of more projection. Donatello and other 15th-century Italian artists showed the most wonderful skill in their treatment of very low relief. One not altogether legitimate method of gaining effect was practised by some medieval sculptors: the relief itself was kept very low, but was "stilted" or projected from the ground, and then undercut all round the outline. A 15th-century tabernacle for the host in the Brera at Milan is a very beautiful example of this method, which as a rule is not pleasing in effect, since it looks rather as if the figures were cut out in cardboard and then stuck on (see RELIEF).

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[1] Moulds made in one or few pieces, from which the cast can only be extracted by destroying the mould, are called "spoil-moulds." A large number of casts can be made from a "piece-mould," but only one from a "spoil-mould."

Sculptor's assistants.

The practice of most modern sculptors is to do very little to the marble with their own hands; some, in fact, have never really learnt how to carve, and thus the finished statue is often very dull and lifeless in comparison with the clay model. Most of the great sculptors of the middle ages left little or nothing to be done by an assistant; Michelangelo especially did the whole of the carving with his own hands, and when beginning on a block of marble attacked it with such vigorous strokes of the hammer that large pieces of marble flew about in every direction. But skill as a carver, though very desirable, is not absolutely necessary for a sculptor. If he casts in bronze by the *cire perdue* process he may produce the most perfect plastic works without touching anything harder than the modelling-wax. The sculptor in marble, however, must be able to carve a hard substance if he is to be master of his art. Unhappily some modern sculptors not only leave all manipulation of the marble to their workmen, but they also employ men to do their modelling, colloquially termed "ghosts," the supposed sculptor supplying little or nothing but his sketch and his name to the work. The practice, however, is less common nowadays than formerly, owing mainly to one or two exposures which brought the matter sharply before the public. In some cases sculptors of ability who suffer under an excess of popularity are induced to employ aid of this kind on account of their undertaking more work than any one man could possibly accomplish—a state of things which is necessarily very hostile to the interests of true art. As a rule, however, the sculptor's *scarpellino*, though he may and often does attain the highest skill as a carver and can copy almost anything with wonderful fidelity, seldom develops into an original artist. The popular admiration for pieces of clever trickery in sculpture, such as the carving of the open meshes of a fisherman's net, or a chain with each link free and movable, or a veil over and half revealing the features of the face, would perhaps be diminished if it were known that such work as this is invariably done, not by the sculptor, but by the *scarpellino*. Unhappily at the present day there is, especially in England, little appreciation of what is valuable in plastic art; there is probably no other civilized country where the State does so little to give practical support to the advancement of monumental and decorative sculpture on a large scale—the most important branch of the art—which it is hardly in the power of private persons to further.

Medieval methods and materials.

It may here be well to say a few words on the technical methods employed in the execution of medieval sculpture, which in the main were very similar in England, France and Germany. When bronze was used—in England as a rule only for the effigies of royal persons or the richer nobles—the metal was cast by the delicate *cire perdue* process, and the whole surface of the figure was then thickly gilded. At Limoges in France a large number of sepulchral effigies were produced, especially between 1300 and 1400, and exported to distant places. These were not cast, but were made of hammered (*repoussé*—*q.v.*) plates of copper, nailed on a wooden core and richly decorated with champlevé enamels in various bright colours. Westminster Abbey possesses a fine example, executed about 1300, in the effigy of William of Valence (d. 1296).[1] The ground on which the figure lies, the shield, the border of the tunic, the pillow, and other parts are decorated with these enamels very minutely treated. The rest of the copper was gilt, and the helmet was surrounded with a coronet set with jewels, which are now missing. One royal effigy of later date at Westminster, that of Henry V. (d. 1422), was formed of beaten silver fixed to an oak core, with the exception of the head, which appears to have been cast. The whole of the silver disappeared in the time of Henry VIII., and nothing now remains but the rough wooden core; hence it is doubtful whether the silver was decorated with enamel or not; it was probably of English workmanship.

In most cases stone was used for all sorts of sculpture, being decorated in a very minute and elaborate way with gold, silver and colours applied over the whole surface. In order to give additional richness to this colouring the surface of the stone, often even in the case of external sculpture, was covered with a thin skin of *gesso* or fine plaster mixed with size; on this, while still soft, and over the drapery and other accessories, very delicate and minute patterns were stamped with wooden dies, and upon this the gold and colours were applied; thus the gaudiness and monotony of flat smooth surfaces covered with gilding or bright colours were avoided.[2] In addition to this the borders of drapery and other parts of stone statues were frequently ornamented with crystals and false jewels, or, in a more laborious way, with holes and sinkings filled with polished metallic foil, on which very minute patterns were painted in transparent varnish colours; the whole was then protected from the air by small pieces of transparent glass, carefully shaped to the right size and fixed over the foil in the cavity cut in the stone. It is difficult now to realize the extreme splendour of this gilt, painted and jewelled sculpture, as no perfect example exists, though in many cases traces remain of all these processes, and show that they were once very widely applied.[3] The architectural surroundings of the figures were treated in the same elaborate way. In the 14th century in England alabaster came into frequent use for monumental sculpture; it too was decorated with gold and colour, though in some cases the whole surface does not appear to have been so treated. In his wide use of coloured decoration, as in other respects, the medieval sculptor came far nearer to the ancient Greek than do any modern artists. Even the use of inlay of coloured glass was common at Athens during the 5th century B.C.—as, for example, in the plait-band of some of the marble bases of the Erechtheum—and five or six centuries earlier at Tiryns and Mycenae.

Another material much used by medieval sculptors was wood, though, from its perishable nature, comparatively few early examples survive;[4] the best specimen is the figure of George de Cantelupe (d. 1273) in Abergavenny church. This was decorated with *gesso* reliefs, gilt and coloured in the same way as the stone. The tomb of Prince John of Eltham (d. 1334) at Westminster is a very fine example of the early use of alabaster, both for the recumbent effigy and also for a number of small figures of mourners all round the arcading of the tomb. These little figures, well preserved on the side which is protected by the screen, are of very great beauty and are executed with the most delicate minuteness; some of the heads are equal to the best contemporary work of the son and pupils of Niccola Pisano. The tomb once had a high stone canopy of open work—arches, canopies and pinnacles—a class of architectural sculpture of which many extremely rich examples exist, as, for instance, the tomb of Edward II. at Gloucester, the de Spencer tomb at Tewkesbury, and, of rather later style, the tomb of Lady Eleanor Fitzalan de Percy at Beverley. This last is remarkable for the great richness and beauty of its sculptured foliage, which is of the finest Decorated period and stands unrivalled by any Continental example. The condition of this shrine (erected about 1335 to 1340) is almost perfect.

On technical methods, see (specially for the explanation of modelling, &c.) Edward Lantéri, *Modelling* (London, vol. 1, 1903, vol. 2, 1904, vol. 3, 1910), and Albert Toft, *Modelling and Sculpture* (London, 1910). These volumes give in detail every process and method of the sculptor's craft with a fulness to be found in no other works of their class in the English language.

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[1] Other effigies from Limoges were imported into England, but no other example now exists in the country.

[2] In the modern attempts to reproduce the medieval polychromy these delicate surface reliefs have been omitted; hence the painful results of such colouring as that in Notre-Dame and the Sainte Chapelle in Paris and many other "restored" churches, especially in France and Germany.

[3] On the tomb of Aymer de Valence (d. 1326) at Westminster a good deal of the stamped *gesso* and coloured decoration is visible on close inspection. One of the cavities of the base retains a fragment of glass covering the painted foil, still brilliant and jewel-like in effect.

[4] The Victoria and Albert Museum possesses a magnificent colossal wood figure of an angel, not English, but Italian work of the 14th century. A large stone statue of about the same date, of French workmanship, in the same museum is a most valuable example of the use of stamped *gesso* and inlay of painted and glazed foil.

History

The following general sketch of the history of sculpture is confined mainly to that of the middle ages and modern times. The philosophy and aesthetics of the subject—the relation of sculpture to the other arts and the nature of its appeal to the emotions—are treated in the article Fine Arts. What is known as "classical" sculpture is dealt with under Greek Art and Roman Art; see also, for other allied aspects, China, *Art*; Japan, *Art*; Egypt, *Art*; Byzantine Art; and articles on Metal-work, Ivory, Wood-carving, &c.; the article Architecture and allied articles (*e.g.* Capital); and the articles on the several individual artists.

Early Christian.

In the 4th century A.D., under the rule of Constantine's successors, the plastic arts in the Roman world reached the lowest point of degradation to which they ever fell. Coarse in workmanship, intensely feeble in design, and utterly without expression or life, the pagan sculpture of that time is merely a dull and ignorant imitation of the work of previous centuries. The old faith was dead, and the art which had sprung from it died with it. In the same century a large amount of sculpture was produced by Christian workmen, which, though it reached no very high standard of merit, was at least far superior to the pagan work. Although it shows no increase of technical skill or knowledge of the human form, yet the mere fact that it was inspired and its subjects supplied by a real living faith was quite sufficient to give it a vigour and a dramatic force, which raise it aesthetically far above the expiring efforts of paganism. Apart from ivories (see Ivory), a number of large marble sarcophagi are the chief existing specimens of this early Christian sculpture. In general design they are close copies of pagan tombs, and are richly decorated outside with reliefs. The subjects of these are usually scenes from the Old and New Testaments. From the former those subjects were selected which were supposed to have some typical reference to the life of Christ: the Meeting of Abraham and Melchisedec, the Sacrifice of Isaac, Daniel among the Lions, Jonah and the Whale, are those which most frequently occur. Among the New Testament scenes no representations occur of Christ's sufferings;[1] the subjects chosen illustrate his power and beneficence: the Sermon on the Mount, the Triumphal Entry into Jerusalem, and many of his miracles are frequently repeated. The Vatican and Lateran museums are rich in examples of this sort. One of the finest in the former collection was taken from the crypt of the old basilica of St Peter; it contained the body of a certain Junius Bassus, and dates from the year 359.[2] Many other similar sarcophagi were made in the provinces of Rome, especially Gaul; and fine specimens exist in the museums of Arles, Marseilles and Aix; those found in Britain are of very inferior workmanship.

Sculpture in the round, with its suggestion of idol worship which was offensive to the Christian spirit, was practically non-existent during this and the succeeding centuries, although there are a few notable exceptions, like the large bronze statue of St Peter[3] in the nave of St Peter's in Rome, which is probably of 5th-century workmanship and has much of the repose, dignity and force of antique sculpture.

Italian plastic art in the 5th century continued to create in the spirit of the 4th century, especially reliefs in ivory (to a certain extent imitations of the later consular diptychs), which were used to decorate episcopal thrones or the bindings of MSS. of the Gospels. The so-called chair of St Peter, still preserved (though hidden from sight) in his great basilica, is the finest example of the former class; of less purely classical style, dating from about 550, is the ivory throne of Bishop Maximianus in Ravenna cathedral. Another very remarkable work of the 5th century is the series of small panel reliefs on the doors of S. Sabina on the Aventine Hill at Rome. There are scenes from Bible history carved in wood, and in them much of the old classic style survives.[4]

In the 6th century, under the Byzantine influence of Justinian, a new class of decorative sculpture was produced, especially at Ravenna. Subject reliefs do not often occur, but large slabs of marble, forming screens, altars, pulpits and the like, were ornamented in a very skilful and original way with low reliefs of graceful vine-plants, with peacocks and other birds drinking out of chalices, all treated in a very able and highly decorative manner. Byzantium, however, in the main, became the birthplace and seat of all the medieval arts soon after the transference thither of the headquarters of the empire (see Byzantine Art). It was natural that love of splendour and sumptuousness in the Eastern capital found expression in colour and richness of material rather than in monumental impressiveness. The school of sculpture which arose at Byzantium in the 5th or 6th century was therefore essentially decorative, and not monumental; and the skill of the sculptors was most successfully applied to work in metals and ivory, and the carving of foliage on capitals and bands of ornament, possessed of the very highest decorative power and executed with unrivalled spirit and vigour. The early Byzantine treatment of the acanthus or thistle, as seen in the capitals of S. Sophia at Constantinople, the Golden Gate at Jerusalem, and many other buildings in the East, has never since been surpassed in any purely decorative sculpture; and it is interesting to note how it grew out of the dull and lifeless ornamentation which covers the degraded Corinthian capital used so largely in Roman buildings of the time of Constantine and his sons.

Influence of Byzantine art.

Till about the 12th century, and in some places much later, the art of Byzantium dominated that of the whole Christian world in a very remarkable way. The spread of this art was to a great extent due to the iconoclast riots which not only led to the destruction of images and works of art, but threatened the very life of the artists and craftsmen, who thereupon sought refuge in foreign countries, especially at the court of Charlemagne, and for several centuries determined the course of European art. From Russia to Ireland and from Norway to Spain any given work of art in one of the countries of Europe might almost equally well have been designed in any other. Few or no local characteristics or peculiarities can be detected, except of course in the methods of execution, and even these were wonderfully similar everywhere. The dogmatic unity of the Catholic Church and its great monastic system, with constant interchange of monkish craftsmen between one country and another, were the chief causes of this widespread monotony of style. An additional reason was the unrivalled technical skill of the early Byzantines, which made their city widely resorted to by the artist-craftsmen of all Europe—the great school for learning any branch of the arts.

The extensive use of the precious metals for the chief works of plastic art in this early period is one of the reasons why so few examples still remain—their great intrinsic value naturally causing their destruction. One of the most important existing examples, dating from the 8th century, is a series of colossal wall reliefs executed in hard stucco in the church of Cividale (Friuli) not far from Trieste. These represent rows of female saints bearing jewelled crosses, crowns and wreaths, and closely resembling in costume, attitude and arrangement the gift-bearing mosaic figures of Theodora and her ladies in S. Vitale at Ravenna. It is a striking instance of the almost petrified state of Byzantine art that so close a similarity should be possible between works executed at an interval of fully two hundred years. Some very interesting small plaques of ivory in the library of St Gall show a still later survival of early forms. The central relief is a figure of Christ in Majesty, closely resembling those in the colossal apse mosaic of S. Apollinare in Classe and other churches of Ravenna; while the figures below the Christ are survivals of a still older time, dating back from the best eras of classic art. A river-god is represented as an old man holding an urn, from which a stream issues, and a reclining female figure with an infant and a cornucopia is the old Roman Tellus or Earth-goddess with her ancient attributes.[1]

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[1] A partial exception to this rule is the scene of Christ before Pilate, which sometimes occurs.

[2] See Dionysius, *Sac. Vat. Bas. Cryp.*, and Bunsen, *Besch. d. Stadt Rom* (1840).

[3] There is no ground for the popular impression that this is an antique statue of Jupiter transformed into that of St Peter by the addition of the keys.

[4] Various dates have been assigned to these interesting reliefs by different archaeologists, but the costumes of the figures are strong evidence that they are not later than the 5th century.

Norse and Celtic influences in England.

While the countries of the north could not altogether resist the rising tide of Byzantinism, in Scandinavia, and to a great extent in England, the autochthonous art was not altogether obliterated during the early middle ages. In England, during the Saxon period, when stone buildings were rare and even large cathedrals were built of wood, the plastic arts were mostly confined to the use of gold, silver, and gilt copper. The earliest existing specimens of sculpture in stone are a number of tall churchyard crosses, mostly in the northern provinces and apparently the work of Scandinavian sculptors. One very remarkable example is a tall monolithic cross, cut in sandstone, in the churchyard of Gosforth in Cumberland. It is covered with rudely carved reliefs, small in scale, which are of special interest as showing a transitional state from the worship of Odin to that of Christ. Some of the old Norse symbols and myths sculptured on it occur modified and altered into a semi-Christian form. Though rich in decorative effect and with a graceful outline, this sculptured cross shows a very primitive state of artistic development, as do the other crosses of this class in Cornwall, Ireland and Scotland, which are mainly ornamented with those ingeniously intricate patterns of interlacing knotwork designed so skilfully by both the early Norse and the Celtic races.[2] They belong to a class of art which is not Christian in its origin, though it was afterwards largely used for Christian purposes, and so is thoroughly national in style, quite free from the usual widespread Byzantine influence. Of special interest from their early date—probably the 11th century—are two large stone reliefs now in Chichester cathedral, which are traditionally said to have come from the pre-Norman church at Selsey. They are thoroughly Byzantine in style, but evidently the work of some very ignorant sculptor; they represent two scenes in the Raising of Lazarus; the figures are stiff, attenuated and ugly, the pose very awkward, and the drapery of exaggerated Byzantine character, with long thin folds. To represent the eyes pieces of glass or coloured enamel were inserted; the treatment of the hair in long ropelike twists suggests a metal rather than a stone design.

Romanesque sculpture.

The Romanesque period in art was essentially one of architectural activity. The spirit of the time did not encourage that individual thought which alone can produce a great development of sculpture and painting. Thus the plastic art of the 11th and 12th centuries, which was still entirely at the service and under the rule of the Church, was strictly confined to conventional symbols, ideas and forms. It is based, not on the study of nature, but on the late Roman reliefs. The treatment of the figures, though often rude and clumsy, and sometimes influenced by Byzantine stiffness, is on the whole dignified, solemn and serious, and bent upon the expression of the typical, and not of the individual. The tympana of the porches, the capitals of columns and the pulpits and choir-screens of the Romanesque churches, and, on a smaller scale, the ivory carvings for book-covers and portable miniature altars, provided the field for the Romanesque sculptors' activity.

Italy.

In Italy the strong current of hierarchal Byzantinism had never altogether supplanted the antique tradition, though the works based upon the latter, before Niccola Pisano revived for a short while the true spirit of the antique, are of almost barbaric rudeness, like the bronze gates of S. Zeno at Verona, and the stone-carving of The Last Supper on the pulpit of S. Ambrogio, in Milan. The real home of Romanesque sculpture was beyond the Alps, in Germany and France, and much of the work done in Italy during the 12th century was actually due to northern sculptors—as, for example, the very rude sculpture on the façade of S. Andrea at Pistoia, executed about 1186 by Gruamons and his brother Adeodatus,[3] or the relief by Benedetto Antelami for the pulpit of Parma cathedral of the year 1178. Unlike the sculpture of the Pisani and later artists, these early figures are thoroughly secondary to the architecture they are designed to decorate; they are evidently the work of men who were architects first and sculptors in a secondary degree. After the 13th century the reverse was usually the case, and, as at the west end of Orvieto cathedral, the sculptured decorations are treated as being of primary importance —not that the Italian sculptor-architect ever allowed his statues or reliefs to weaken or damage their architectural surroundings, as is unfortunately the case with much modern sculpture. In southern Italy, during the 13th century, there existed a school of sculpture resembling that of France, owing probably to the Norman occupation. The pulpit in the cathedral of Ravello, executed by Nicolo di Bartolommeo di Foggia in 1272, is an important work of this class; it is enriched with very noble sculpture, especially a large female head crowned with a richly foliated coronet, and combining lifelike vigour with largeness of style in a very remarkable way. The bronze doors at Monreale (by Barisanus of Trani), Pisa and elsewhere are among the chief works of plastic art in Italy during the 12th century. The history of Italian sculpture of the best period is given to a great extent in the separate articles on the Pisani and other Italian artists. Here it suffices to say that sculpture never became as completely subservient to architecture, as it did in the north, and that with Giovanni Pisano the almost classic repose and dignity of his father Niccola's style gave way—probably owing to northern influences—to an increased sense of life and freedom and dramatic expression. Niccola stands at the close of the Romanesque, and Giovanni on the threshold of the Gothic period. During the 13th century Rome and the central provinces of Italy produced very few sculptors of ability, almost the only men of note being the Cosmati.

German bronze work.

The power acquired by Germany under the Saxon emperors, upon whom had descended the mantle of the Roman Caesars, was the chief reason that led to the great development of Romanesque art in Germany. It is true that, in the 11th century, Byzantine influences stifled the spontaneous *naïveté* of the earlier work; but about the end of the 12th century a new free and vital art arose, based upon a better understanding of the antique, and fostered by the rise of feudalism and the prosperity of the cities. Next in importance to the numerous examples of German Romanesque ivory carvings are the works in bronze, in the technique of which the German craftsmen of the pre-Gothic period stand unrivalled. This is seen in the bronze pillar reliefs and other works, notably the bronze gates of Hildesheim Cathedral, produced by Bishop Bernward (d. 1022) after his visit to Rome. Hildesheim, Cologne and the whole of the Rhine provinces were the most active seats of German sculpture, especially in metal, till the 12th century. Many remarkable pieces of bronze sculpture were produced at the end of that period, of which several specimens exist. The bronze font at Liége, with figure-subjects in relief of various baptismal scenes from the New Testament, by Lambert Patras of Dinant, cast about 1112, is a work of most wonderful beauty and perfection for its time; other fonts in Osnabrück, by Master Gerhard, and Hildesheim cathedrals are surrounded by spirited reliefs, fine in conception, but inferior in beauty to those on the Liége font. Fine bronze candelabra exist in the abbey church of Combourg and at Aix-la-Chapelle, the latter of about 1165. Merseburg cathedral has a strange realistic sepulchral figure of Rudolf of Swabia, executed about 1100; and at Magdeburg is a fine effigy, also in bronze, of Bishop Frederick (d. 1152), treated in a more graceful way. The last figure has a peculiarity which is not uncommon in the older bronze reliefs of Germany: the body is treated as a relief, while the head sticks out and is quite detached from the ground in a very awkward way. One of the finest plastic works of this century is the choir screen of Hildesheim cathedral, executed in hard stucco, one rich with gold and colours; on its lower part is a series of large reliefs of saints modelled with almost classical breadth and nobility, with drapery of especial excellence. In the 13th century German sculpture had made considerable artistic progress, but it did not reach the high standard of France. One of the best examples of the transition period from German Romanesque to Gothic is the "golden gate" of Freiburg cathedral, with sculptured figures on the jambs after the French fashion. The statues of the apostles on the nave pillars, and especially one of the Madonna at the east end (1260–1270), possess great beauty and sculpturesque breadth. Of the same period, and kindred in style and feeling, are the reliefs on the eastern choir-screen in Bamberg cathedral.

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[1] On early and medieval sculpture in ivory consult Gori, *Thesaurus veterum diptychorum* (Florence, 1759); Westwood, *Diptychs of Consuls* (London, 1862); Didron, *Images ouvrantes du Louvre* (Paris, 1871); William Maskell, *Ivories in the South Kensington Museum* (London, 1872 & 1875); Wieseler, *Diptychon Quirinianum zu Brescia* (Göttingen, 1868); Wyatt and Oldfield, *Sculpture in Ivory* (London, 1856); Alfred Maskell, *Ivories* (London, 1905), one of the best treatises in the English language; E. Molinier, *Les Ivoires*; *Die Elfenbeinbilder* (Berlin Museum, 1903).

[2] See O'Neill, *Sculptured Crosses of Ireland* (London, 1857).

[3] The other finest examples of this early class of sculpture exist at Pisa, Parma, Modena and Verona; in most of them the old Byzantine influence is very strong.

France.

France is comparatively poor in characteristic examples of Romanesque sculpture, as the time of the greatest activity coincides with the beginnings of the Gothic style, so that in many cases, as for instance on the porches of Bourges and Chartres cathedrals, Romanesque and Gothic features occur side by side and make it impossible to establish a clear demarcation between the two. Among the most important Romanesque monuments of the early 12th century are the sculptures on the porch of the abbey church of Conques, representing the Last Judgment; the somewhat barbaric tympanum of Autun cathedral (*c.* 1130); and that of the church of Moissac.

During the 12th and 13th centuries the prodigious activity of the cathedral builders of France and their rivalry to outshine each other in the richness of the sculptured decorations, led to the glorious development that culminated in the full flower of Gothic art. The façades of large cathedrals were completely covered with sculptured reliefs and thick-set rows of statues in niches. The whole of the front was frequently one huge composition of statuary, with only sufficient purely architectural work to form a background and frame for the sculptured figures. A west end treated like that of Wells cathedral, which is almost unique in England, is not uncommon in France. Even the shafts of the doorways and other architectural accessories were covered with minute sculptured decoration,—the motives of which were often, especially during the 12th century, obviously derived from the metal-work of shrines and reliquaries studded with rows of jewels. The west façade of Poitiers cathedral is one of the richest examples; it has large surfaces covered with foliated carving and rows of colossal statues, both seated and standing, reaching high up the front of the church. Of the same century (the 12th), but rather later in date, is the very noble sculpture on the three western doors of Chartres cathedral, with fine tympanum reliefs and colossal statues (all once covered with painting and gold) attached to the jamb-shafts of the openings. These latter figures, with their exaggerated height and the long straight folds of their drapery, are designed with great skill to assist and not to break the main upward lines of the doorways. The sculptors have willingly sacrificed the beauty and proportion of each separate statue for the sake of the architectonic effect of the whole façade. The heads, however, are full of nobility, beauty, and even grace, especially those that are softened by the addition of long wavy curls, which give relief to the general stiffness of the form. The sculptured doors of the north and south aisles of Bourges cathedral are fine examples of the end of the 12th century, and so were the west doors of Notre Dame in Paris till they were hopelessly injured by "restoration." The early sculpture at Bourges is specially interesting from the existence in many parts of its original coloured decoration.

Norman period in England.

Romanesque sculpture in England, during the Norman period, was of a very rude sort and generally used for the tympanum reliefs over the doors of churches. Christ in Majesty, the Harrowing of Hell and St George and the Dragon occur very frequently. Reliefs of the zodiacal signs were a common decoration of the richly sculptured arches of the 12th century, and are frequently carved with much power. The later Norman sculptured ornaments are very rich and spirited, though the treatment of the human figure is still very weak.[1]

The best-preserved examples of monumental sculpture of the 12th century are a number of effigies of knights-templars in the round Temple church in London.[2] They are laboriously cut in hard Purbeck marble, and much resemble bronze in their treatment; the faces are clumsy, and the whole figures stiff and heavy in modelling; but they are valuable examples of the military costume of the time, the armour being purely chain-mail. Another effigy in the same church cut in stone, once decorated with painting, is a much finer piece of sculpture of about a century later. The head, treated in an ideal way with wavy curls, has much simple beauty, showing a great artistic advance. Another of the most remarkable effigies of this period is that of Robert, duke of Normandy (d. 1134), in Gloucester cathedral, carved with much spirit in oak, and decorated with painting. The realistic trait of the crossed legs, which occurs in many of these effigies, heralds the near advent of Gothic art. Most rapid progress in all the arts, especially that of sculpture, was made in England in the second half of the 13th and the beginning of the 14th century, largely under the patronage of Henry III., who employed and handsomely rewarded a large number of English artists, and also imported others from Italy and Spain, though these foreigners took only a secondary position among the painters and sculptors of England. The end of the 13th century was in fact the culminating period of English art, and at this time a very high degree of excellence was reached by purely national means, quite equalling and even surpassing the general average of art on the Continent, except perhaps in France. Even Niccola Pisano could not have surpassed the beauty and technical excellence of the two bronze effigies in Westminster Abbey modelled and cast by William Torell, a goldsmith and citizen of London, shortly before the year 1300. These are on the tombs of Henry III. and Queen Eleanor (wife of Edward I.), and, though the tomb itself of the former is an Italian work of the Cosmati school, there is no trace of foreign influence in the figures. At this time portrait effigies had not come into general use, and both figures are treated in an ideal way.[3] The crowned head of Henry III., with noble well-modelled features and crisp wavy curls, resembles the conventional royal head on English coins of this and the following century, while the head of Eleanor is of remarkable, almost classic, beauty, and of great interest as showing the ideal type of the 13th century. In both cases the drapery is well conceived in broad sculpturesque folds, graceful and yet simple in treatment. The casting of these figures, which was effected by the *cire perdue* process, is technically very perfect. The gold employed for the gilding was got from Lucca in the shape of the current florins of that time, which were famed for their purity. Torell was highly paid for this, as well as for two other bronze statues of Queen Eleanor, probably of the same design.

Although the difference between fully developed Gothic sculpture and Romanesque sculpture is almost as clearly marked as the difference between Gothic and Romanesque architecture—

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[1] In Norway and Denmark during the 11th and 12th centuries carved ornament of the very highest merit was produced, especially the framework round the doors of the wooden churches; these are formed of large pine planks, sculptured in slight relief with dragons and interlacing foliage in grand sweeping curves,—perfect masterpieces of decorative art, full of the keenest inventive spirit and originality.

[2] See Richardson, *Monumental Effigies of the Temple Church* (London, 1843).

[3] The effigy of King John in Worcester cathedral of about 1216 is an exception to this rule; though rudely executed, the head appears to be a portrait.

indeed, the evolution of the two arts proceeded in parallel stages—the change from the earlier to the later style is so gradual and almost imperceptible, that it is all but impossible to follow it step by step, and to illustrate it by examples. What distinguishes the Gothic from the Romanesque in sculpture is the striving to achieve individual in the place of typical expression. This striving is as apparent in the more flexible and emotional treatment of the human figure,as it is in the substitution of naturalistic plant and animal forms for the more conventional ornamentation of the earlier centuries. Statuesque architectonic dignity and calmness are replaced by slender grace and soulful expression. The drapery, instead of being arranged in heavy folds, clings to the body and accentuates rather than conceals the form. At the same time, the subjects treated by the Gothic sculptor do not depart to any marked degree from those which fell to the task of the Romanesque workers, though they are brought more within the range of human emotions.

Gothic sculpture in France.

It is only natural that in France, which was the birthplace of Gothic architecture, the sister art of sculpture should have attained its earliest and most striking development. During the 13th century, the *imagiers*, or stone sculptors, worked hand in hand with the great cathedral builders. This century may indeed be called the golden age of Gothic sculpture.

While still keeping its early dignity and subordination to its architectural setting, the sculpture reached a very high degree of graceful finish and even sensuous beauty. Nothing could surpass the loveliness of the angel statues round the Sainte Chapelle in Paris, and even the earlier work on the façade of Laon cathedral is full of grace and delicacy. Amiens cathedral is especially rich in sculpture of this date,—as, for example, the noble and majestic statues of Christ and the Apostles at the west end; the sculpture on the south transept of about 1260–1270, of more developed style, is remarkable for dignity combined with soft beauty.[1] The noble row of kings on the west end of Notre Dame at Paris has, like the earlier sculpture, been ruined by "restoration," which has robbed the statues of both their spirit and their vigour. To the latter years of the 13th century belong the magnificent series of statues and reliefs round the three great western doorways of the same church, among which are no fewer than thirty-four life-sized figures. On the whole, the single statues throughout this period are finer than the reliefs with many figures. Some of the statues of the Virgin and Child are of extraordinary beauty, in spite of their being often treated with a certain mannerism—a curved pose of the body, which appears to have been copied from ivory statuettes, in which the figure followed the curve of the elephant's tusk. The north transept at Rheims is no less rich: the central statue of Christ is a work of much grace and nobility of form; and some nude figures—for example, that of St Sebastian—show a knowledge of the human body which was very unusual at that early date. Many of these Reims statues, like those by Torell at Westminster, are quite equal to the best work of Niccola Pisano. The abbey church of St Denis possesses the largest collection of French 13th-century monumental effigies, a large number of which, with supposed portraits of the early kings, were made during the rebuilding of the church in 1264; some of them appear to be "archaistic" copies of older contemporary statues.[2]

In the 14th century French sculpture began to decline, though much beautiful plastic work was still produced. Some of the reliefs on the choir screen of Notre Dame at Paris belong to this period, as does also much fine sculpture on the transepts of Rouen cathedral and the west end of Lyons. At the end of this century an able sculptor from the Netherlands, Claus Sluter (who followed the tradition of the 14th-century school of Tournai, which is marked by the exquisite study of the details of nature and led to the brilliant development of Flemish realism), executed much fine work, especially at Dijon, under the patronage of Philip the Bold, for whose newly founded Carthusian monastery in 1399 he sculptured the great "Moses fountain" in the cloister, with six life-sized statues of prophets in stone, painted and gilt in the usual medieval fashion. Not long before his death in 1411 Sluter completed a very magnificent altar tomb for Philip the Bold, now in the museum at Dijon. It is of white marble, surrounded with arcading, which contains about forty small alabaster figures representing mourners of all classes, executed with much dramatic power. The recumbent portrait effigy of Philip in his ducal mantle with folded hands is a work of great power and delicacy of treatment.[3]

German 13th-century sculpture.

Whilst in France there was a distinct slackening in building activity in the 14th century, which led to a corresponding decline in sculpture, Germany experienced a reawakening of artistic creative energy and power. That the Gothic style had taken root on German soil in the preceding century, is proved by the fresh, mobile treatment of the statues on the south porch of the east façade of Bamberg cathedral, and even more by the equestrian statue of Conrad III. in the market-place at Bamberg, which supported by a foliated corbel, exhibits startling vigour and originality, and is designed with wonderful largeness of effect, though small in scale. The statues of Henry the Lion and Queen Matilda at Brunswick, of about the same period, are of the highest beauty and dignity of expression. Strassburg cathedral, though sadly damaged by restoration, still possesses a large quantity of the finest sculpture of the 13th century. One tympanum relief of the Death of the Virgin, surrounded by the sorrowing Apostles, is a work of the very highest beauty, worthy to rank with the best Italian sculpture of even a later period. Of its class nothing can surpass the purely decorative carving at Strassburg, with varied realistic foliage studied from nature, evidently with the keenest interest and enjoyment.

But such works were only isolated manifestations of German artistic genius, until, in the next century, sculpture rose to new and splendid life, though it found expression not so much in the composition of extensive groups, as in the neighbouring France, but in the carving of isolated figures of rare and subtle beauty.

Nuremberg is rich in good sculpture of the 14th century. The church of St Sebald, the Frauenkirche, and the west façade of St Lawrence are lavishly decorated with reliefs and statues, very rich in effect, but showing the germs of that mannerism which grew so strong in Germany during the 15th century. Of special beauty are the statuettes which adorn the "beautiful fountain," which was formerly erroneously attributed to the probably mythical sculptor Sebald Schonhofer, and is decorated with gold and colour by the painter Rudolf.[4] Of considerable importance are the statues of Christ, the Virgin, and the Apostles on the piers in the choir of Cologne cathedral, which were completed after 1350. They are particularly notable for their admirable polychromatic treatment. The reliefs on the high altar, which are of later date, are wrought in white marble on a background of black marble. Augsburg produced several sculptors of ability about this time; the museum possesses some very noble wooden statues of this school, large in scale and dignified in treatment. On the exterior of the choir of the church of Marienburg castle is a very remarkable colossal figure of the Virgin of about 1340–1350. Like the Hildesheim choir screen, it is made of hard stucco and is decorated with glass mosaics. The equestrian bronze group of St George and the Dragon in the market-place at Prague is excellent in workmanship and full of vigour, though much wanting dignity of style. Another fine work in bronze of about the same date is the effigy of Archbishop Conrad (d. 1261) in Cologne cathedral, executed many years after his death. The portrait appears truthful and the whole figure is noble in style. The military effigies of this time in Germany as elsewhere were almost unavoidably stiff and lifeless from the necessity of representing them in plate armour. The ecclesiastical chasuble, in which priestly effigies nearly always appear, is also a thoroughly unsculpturesque form of drapery, both from its awkward shape and its absence of folds. The Günther of Schwarzburg (d. 1349) in Frankfort cathedral is a characteristic example of these sepulchral effigies in slight relief.

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[1] See Ruskin, *The Bible of Amiens* (1878).

[2] See Félibien, *Histoire de l'Abbaye de Saint-Denys* (Paris, 1706).

[3] See A. Kleinclausz, *Claus Sluter* (Paris, 1908).

[4] See Baader, *Beiträge zur Kunstgesch. Nürnbergs*; Rettberg, *Nürnberger Kunstleben* (Stuttgart, 1854), and P. J. Rée, *Nuremberg and its Art to the end of the 18th Century* (London, 1905).

Architectural sculpture in England.

In England, much of the fine 13th-century sculpture was used to decorate the façades of churches, though, on the whole, English cathedral architecture did not offer such great opportunities to the *imagier* as did that of France. A notable exception is Wells cathedral, the west end of which, dating from about the middle of the century, is covered with more than 600 figures in the round or in relief, arranged in tiers, and of varying sizes. The tympana of the doorways are filled with reliefs, and above them stand rows of colossal statues of kings and queens, bishops and knights, and saints both male and female, all treated very skilfully with nobly arranged drapery, and graceful heads designed in a thoroughly architectonic way, with due regard to the main lines of the building they are meant to decorate. In this respect the early medieval sculptor inherited one of the great merits of the Greeks of the best period: his figures or reliefs form an essential part of the design of the building to which they are affixed, and are treated in a subordinate manner to their architectural surroundings—very different from most of the sculpture on modern buildings, which frequently looks as if it had been stuck up as an afterthought, and frequently by its violent and incongruous lines is rather an impertinent excrescence than an ornament.[1] Peterborough, Lichfield and Salisbury cathedrals have fine examples of the sculpture of the 13th century: in the chapter-house of the last the spandrels of the wall-arcade are filled with sixty reliefs of subjects from Bible history, all treated with much grace and refinement. To the end of the same century belong the celebrated reliefs of angels in the spandrels of the choir arches at Lincoln, carved in a large massive way with great strength of decorative effect. Other fine reliefs of angels, executed about 1260, exist in the transepts of Westminster Abbey; being high from the ground, they are broadly treated without any high finish in the details.[2]

Purely decorative carving in stone reached its highest point of excellence about the middle of the 14th century—rather later, that is, than the best period of figure sculpture. Wood-carving (*q.v.*), on the other hand, reached its artistic climax a full century later under the influence of the fully developed Perpendicular style.

The most important effigies of the 14th century are those in gilt bronze of Edward III. (d. 1377) and of Richard II. and his queen (made in 1395), all at Westminster. They are all portraits, but are decidedly inferior to the earlier work of William Torell. The effigies of Richard II. and Anne of Bohemia were the work of Nicolas Broker and Godfred Prest, goldsmith citizens of London. Another fine bronze effigy is at Canterbury on the tomb of the Black Prince (d. 1376); though well cast and with carefully modelled armour, it is treated in a somewhat dull and conventional way. The recumbent stone figure of Lady Arundel, with two angels at her head, in Chichester cathedral is remarkable for its calm peaceful pose and the beauty of the drapery. Among the most perfect works of this description is the alabaster tomb of Ralph Nevill, first earl of Westmorland, with figures of himself and his two wives, in Staindrop church, county Durham (1426), removed, 1908, from a dark corner of the church into full light, a few feet away, where its beauty may now be examined. A very fine but more realistic work is the tomb figure of William of Wykeham (d. 1404) in the cathedral at Winchester. The cathedrals at Rochester, Lichfield, York, Lincoln, Exeter and many other ecclesiastical buildings in England are rich in examples of 14th-century sculpture, used occasionally with great profusion and richness of effect, but treated in strict subordination to the architectural background.

The finest piece of bronze sculpture of the 15th-century is the effigy of Richard Beauchamp (d. 1439) in his family chapel at Warwick—a noble portrait figure, richly decorated with engraved ornaments. The modelling and casting were done by William Austen of London, and the gilding and engraving by a Netherlands goldsmith who had settled in London, named Bartholomew Lambespring, assisted by several other skilful artists.

Spain.

The first Spanish sculptor of real eminence who need be considered is Aparicio, who lived and worked in the 11th century. His shrine of St Millan, executed to the order of Don Sancho the Great is in the monastery of Yuso, and is a composition excellent, in its way, in design, grace and proportion. In the early medieval period the sculpture of northern Spain was much influenced by contemporary art in France. From the 12th to the 14th century many French architects and sculptors visited and worked in Spain. The cathedral of Santiago de Compostella possesses one of the grandest existing specimens in the world of late 12th-century architectonic sculpture; this, though the work of a native artist, Mastei Mateo,[3] is thoroughly French in style; as recorded by an inscription on the front, it was completed in 1188. The whole of the western portal with its three doorways is covered with statues and reliefs, all richly decorated with colour, part of which still remains. Round the central arch are figures of the twenty-four elders, and in the tympanum a very noble relief of Christ in Majesty between Saints and Angels. As at Chartres, the jamb-shafts of the doorways are decorated with standing statues of saints—St James the elder, the patron of the church, being attached to the central pillar. These noble figures, though treated in a somewhat rigid manner, are thoroughly subordinate to the main lines of the building. Their heads, with pointed beards and a fixed mechanical smile, together with the stiff drapery arranged in long narrow folds, recall the Aeginetan pediment sculpture of about 500 B.C. This appears strange at first sight, but the fact is that the works of the early Greek and the medieval Spaniard were both produced at a somewhat similar stage in two far distant periods of artistic development. In both cases plastic art was freeing itself from the bonds of a hieratic archaism, and had reached one of the last steps in a development which in the one case culminated in the perfection of the Phidian age, and in the other led to the exquisitely beautiful yet simple and reserved art of the end of the 13th and early part of the 14th century—the golden age of sculpture in France and England. In the cathedral of Tarragona are nine statues, in stone, executed by Bartolomé in 1278 for the gate.

In the 14th century the silversmiths of Spain produced many works of sculpture of great size and technical power. One of the finest, by a Valencian called Peter Bernec, is the great silver retable at Gerona cathedral. It is divided into three tiers of statuettes and reliefs, richly framed in canopied niches, all of silver, partly cast and partly hammered.

In the 15th century an infusion of German influence was mixed with that of France, as may be seen in the very rich sculptural decorations which adorn the main door of Salamanca cathedral, the façade of S. Juan at Valladolid, and the church and cloisters of S. Juan de los Reyes at Toledo, perhaps the most gorgeous examples of architectural sculpture in the world. These were executed between 1418 and 1425 by a group of clever sculptors, among whom A. and F. Diaz, A. F. de Sahagun, A. Rodriguez and A. Gonzales were perhaps the chief. The marble altar-piece of the grand altar at Tarragona was begun

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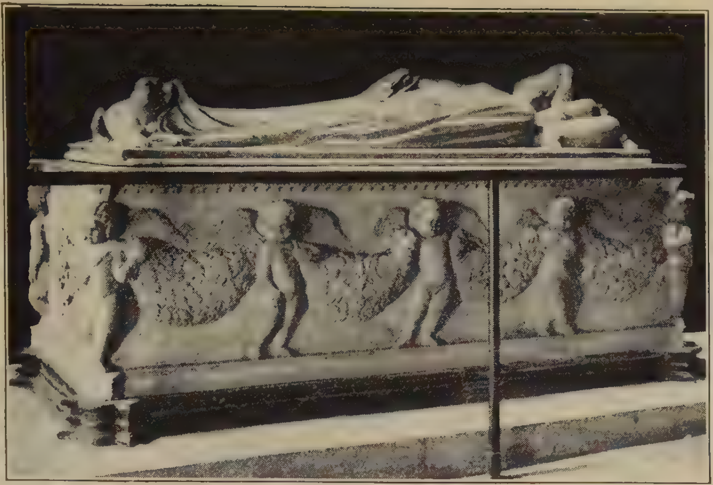
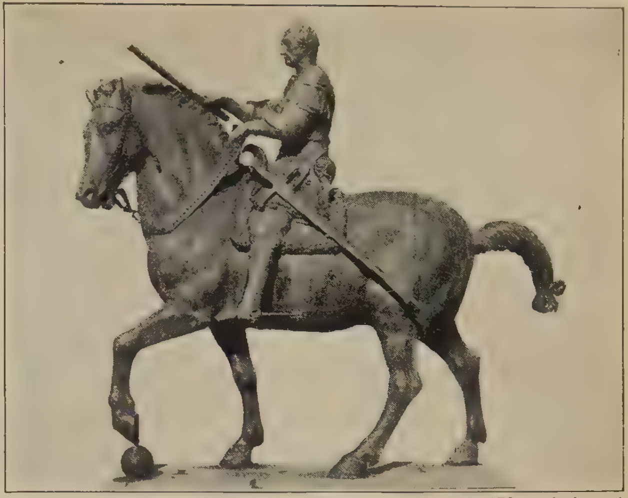
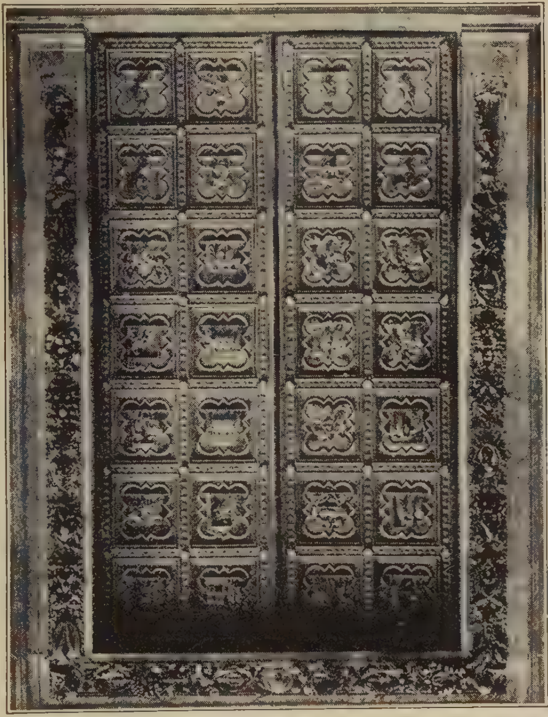
[1] The sculpture on the Paris opera house is a striking instance of this; and so, in a small way, are the statues in the reredos at Westminster Abbey and that at Gloucester cathedral. Another is afforded by the figures of modern soldiers inserted in the beautifully-designed Gothic Boer War Memorial (by G. F. Bodley, R.A.) set up in the cathedral close in York.

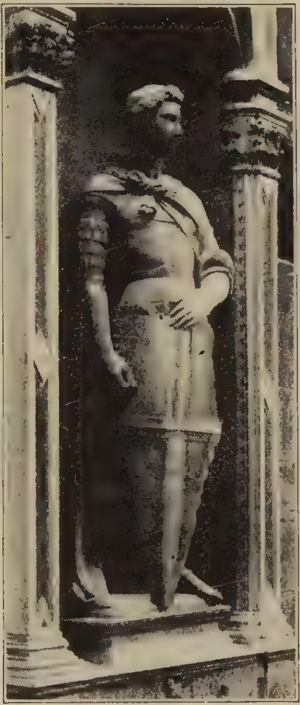
[2] On the whole, Westminster possesses the most completely representative collection of English medieval sculpture in an unbroken succession from the 13th to the 16th century.

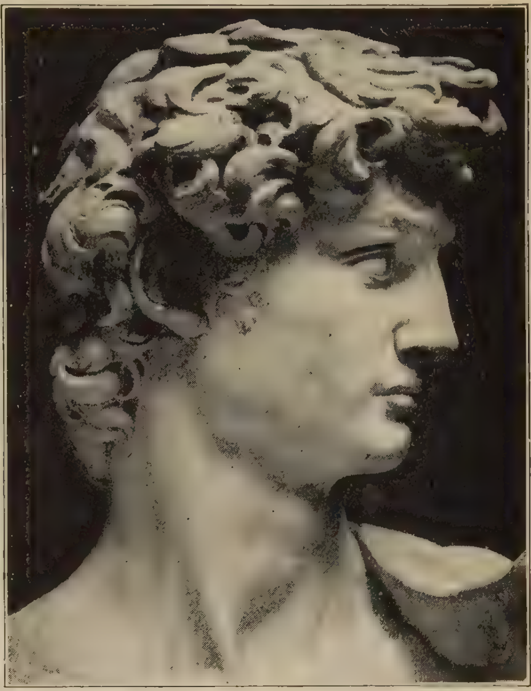
[3] A kneeling portrait-statue of Mateo is introduced at the back of the central pier. This figure is now much revered by the Spanish peasants, and the head is partly worn away with kisses.

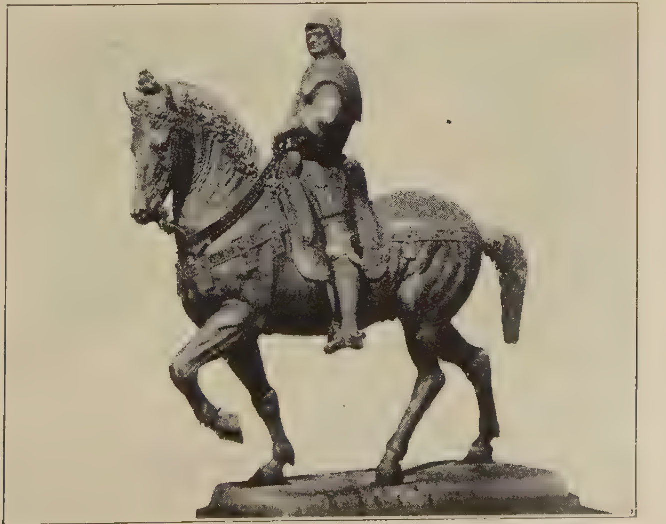

(*Photo, Brogi.*)
JACOPO DELLA QUERCIA—Tomb, Ilaria del Carretto, Lucca.

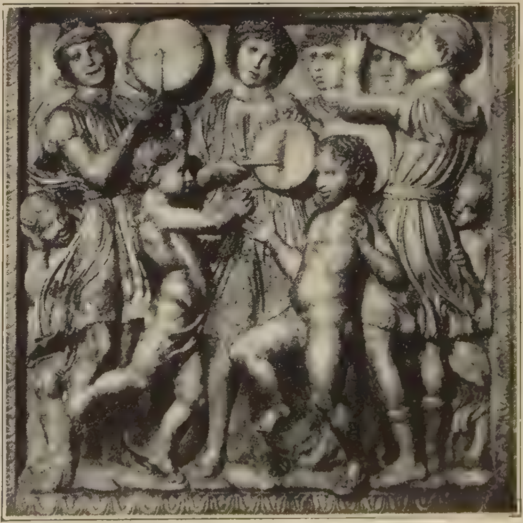

(*Photo, Anderson.*)
DONATELLO—Equestrian Statue, General Gattamelata, Padua.


(*Photo, Alinari.*)
ANDREA PISANO—The first bronze door of the Baptistery, Florence.

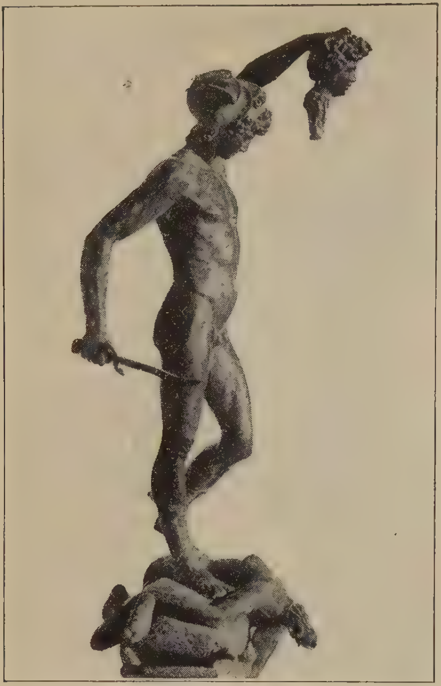

(*Photo, Alinari.*)
DONATELLO—Statue of St George, Florence.


(*Photo, Anderson.*)
MICHELANGELO—Head of Colossal David, Florence.

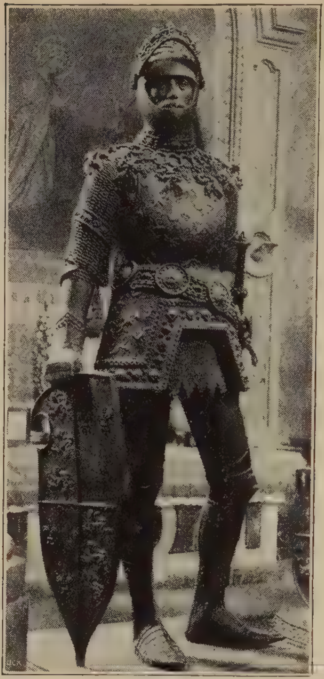

(*Photo, Anderson.*)
VERROCCHIO & LEOPARDI—Bronze Colossal Statue of Bartolommeo Colleoni, Venice.


(*Photo, Anderson.*)
LUCA DELLA ROBBIA—Girls and boys playing on musical instruments and dancing (Museo dell' Opera, Florence).

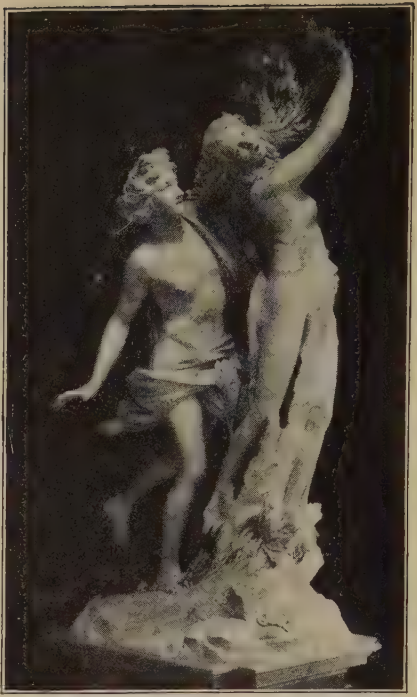
SCULPTURE



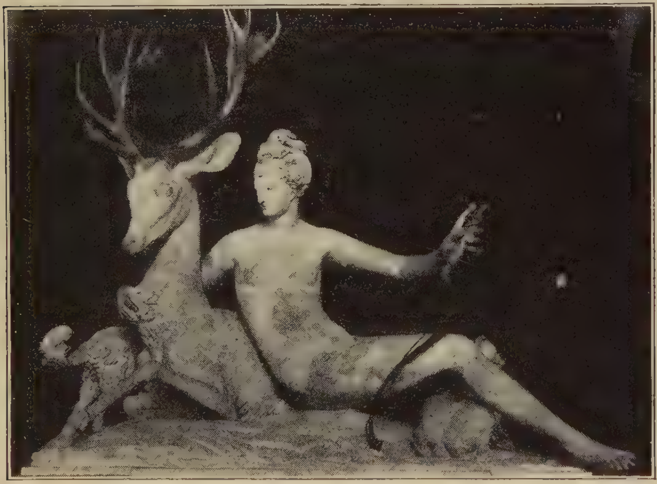
(*Photo, Alinari.*)
BENVENUTO CELLINI—Bronze Statue of Perseus and Medusa, in the Loggia dei Lanzi, Florence.



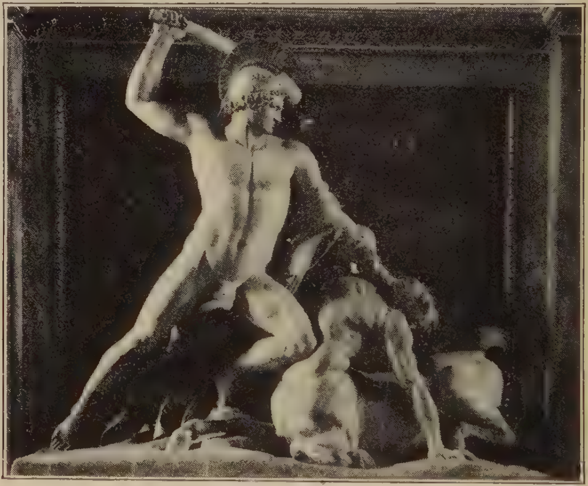
(*Photo, Wurthle & Sohn.*)
PETER VISCHER—Gilt Bronze Statue of King Arthur, Innsbruck.



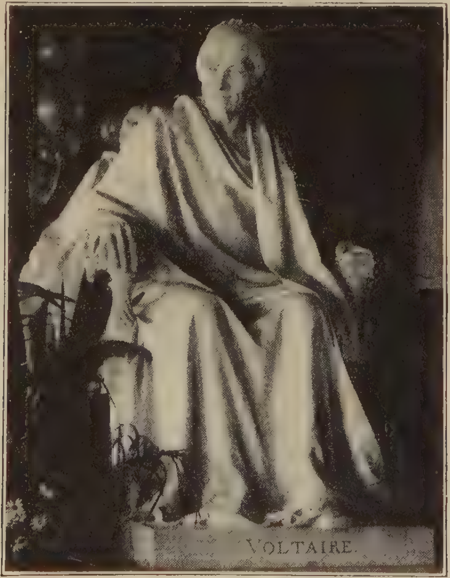
(*Photo, Anderson.*)
BERNINI—Apollo and Daphne (Borghese Gallery).



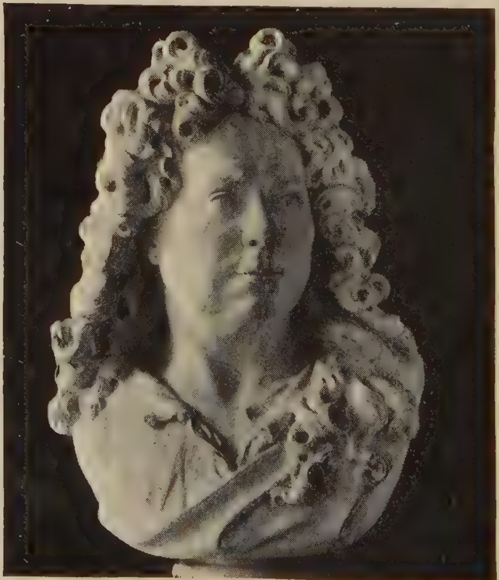
(*Photo, Giraudon.*)
JEAN GOUJON—Diane de Poitiers (as Huntress), in the Louvre.



(*Photo, Löwy.*)
CANOVA—Colossal Marble Group of Theseus and Centaur, Vienna.



(*Photo, Giraudon.*)
HOUDON—Voltaire (Théâtre Français, Paris).



(*Photo, Giraudon.*)
COYSEVOX—Bust of himself, in the Louvre.

by P. Juan in 1426 and completed by G. De La Mota. The carved foliage of this period is of especial beauty and spirited execution; realistic forms of plant-growth are mingled with other more conventional foliage in the most masterly manner. The very noble bronze monument of Archdeacon Pelayo (d. 1490) in Burgos cathedral was probably the work of Simon of Cologne, who was also architect of the Certosa at Miraflores, 2 m. from Burgos. The church of this monastery contains two of the most magnificently rich monuments in the world, especially the altar-tomb of King John II. and his queen by Gil de Siloe—a perfect marvel of rich alabaster canopy-work and intricate under-cutting. The effigies have little merit. From the 16th century onwards wood was a favourite material with Spanish sculptors, who employed it for devotional and historical groups realistically treated, such as the "Scene from Taking of Granada" by El Maestre Rodrigo, and even for portraiture, as in the Bust of Turiano by Alonzo Berruguete (1480–1561).

Gothic sculpture in Italy.

During the 14th century Florence and the neighbouring cities were the chief centres of Italian sculpture, and there numerous sculptors of successively increasing artistic power lived and worked, till in the 15th century the city had become the aesthetic capital of the world. But the Gothic sculptor's activity was by no means confined to Tuscany, for in northern Italy various schools of sculpture existed in the 14th century, especially at Verona and Venice, whose art differed widely from the contemporary art of Tuscany; but Milan and Pavia, on the other hand, possessed sculptors who followed closely the style of the Pisani. The chief examples of the latter class are the magnificent shrine of St Augustine in the cathedral of Pavia, dated 1362, and the somewhat similar shrine of Peter the Martyr (1339), by Balduccio of Pisa, in the church of S. Eustorgio at Milan, both of white marble, decorated in the most lavish way with statuettes and subject reliefs. Many other fine pieces of the Pisan school exist in Milan. The well-known tombs of the Scaliger family at Verona show a more native style of design, and in general form, though not in detail, suggest the influence of transalpine Gothic. In Venice the northern and almost French character of much of the early 15th-century sculpture is more strongly marked, especially in the noble figures in high relief which decorate the lower story and angles of the doge's palace;[1] these are mostly the work of a Venetian named Bartolomeo Bon. A magnificent marble tympanum relief by Bon can be seen at the Victoria and Albert Museum; it has a noble colossal figure of the Madonna, who shelters under her mantle a number of kneeling worshippers; the background is enriched with foliage and heads, forming a "Jesse tree," designed with great decorative skill. The cathedral of Como, built at the very end of the 15th century, is decorated with good sculpture of almost Gothic style, but on the whole rather dull and mechanical in detail, like much of the sculpture in the extreme north of Italy. A large quantity of rich sculpture was produced in Naples during the 14th century, but of no great merit either in design or in execution. The lofty monument of King Robert (1350), behind the high altar of S. Chiara, and other tombs in the same church are the most conspicuous works of this period. The extraordinary poverty in the production of sculpture in Rome during the 14th century was remarkable. The clumsy effigies at the north-east of S. Maria in Trastevere are striking examples of the degradation of the plastic art there about the year 1400; and it was not till nearly the middle of the century that the arrival of able Florentine sculptors, such as Filarete, Mino da Fiesole, and the Pollaiuoli, initiated a brilliant era of artistic activity, which, however, for about a century continued to depend on the presence of sculptors from Tuscany and other northern provinces. It was not, in fact, till the period of full decadence had begun that Rome itself produced any notable artists.

In Florence, the centre of artistic activity during the 15th as well as the 14th century, Giotto not only inaugurated the modern era of painting, but in his relief sculpture, and more particularly by the influence he exercised upon Andrea Pisano, carried the art of sculpture beyond the point where it had been left by Giovanni Pisano. In Andrea we find something of Niccola's classic dignity grafted on to Giovanni's close observation of nature. His greatest works are the bronze south gate of the Baptistery, and some of the reliefs on Giotto's Campanile. The last great master of the Gothic period is Andrea di Cione, better known as Orcagna (1308? to 1368), who, like Giotto, achieved fame in the three sister arts of painting, sculpture and architecture. His wonderful tabernacle at Or San Michele is a noble testimony to his efficiency in the three arts and to his early training as a goldsmith. Very beautiful sepulchral effigies in low relief were produced in many parts of Italy, especially at Florence. The tomb of Lorenzo Acciaioli, in the Certosa near Florence, is a fine example of about the year 1400, which has absurdly been attributed to Donatello. The similarity between the plastic arts of Athens in the 5th or 4th century B.C. and of Florence in the 15th century is not one of analogy only. Though free from any touch of copyism, there are many points in the works of such men as Donatello, Luca della Robbia, and Antonio Pisano which strongly recall the sculpture of ancient Greece, and suggest that, if a sculptor of the later Phidian school had been surrounded by the same types of face and costume as those among which the Italians lived, he would have produced plastic works closely resembling those of the great Florentine masters. Lorenzo Ghiberti may be called the first of the great sculptors of the Renaissance. But between him and Orcagna stands another master, the Sienese, Jacopo della Quercia[2] (1371–1438) who, although in some minor traits connected with the Gothic school, heralds at this early date the boldest and most vigorous and original achievements of two generations hence. Indeed, Jacopo, whose chief works are the Fonte Gaja at Siena (now reconstructed) and the reliefs on the gate of S. Petronio at Bologna, stands in his strong muscular treatment of the human figure nearer to Michelangelo than to his Gothic precursors and contemporaries. Contemporaneously with Ghiberti, the sculptor of the world-famed baptistery gates, and with Donatello, and to a certain extent influenced by them, worked some men who, like Ciuffagni, were still essentially Gothic in their style, or, like Nanni di Banco, retained unmistakable traces of the earlier manner. Luca della Robbia, the founder of a whole dynasty of sculptors in glazed terra-cotta, with his classic purity of style and sweetness of expression, came next in order. Unsensual beauty elevated by religious spirit was attained in the highest degree by Mino da Fiesole, the two Rossellini, Benedetto da Maiano, Desiderio da Settignano and other sculptors more or less directly influenced by Donatello. Through them the tomb monument received the definite form which it retained throughout the Renaissance period. Two of the noblest equestrian statues the world has probably ever seen are the Gattamelata statue at Padua by Donatello and the statue of Colleoni at Venice by Verrocchio and Leopardi. A third, which was probably of equal beauty, was modelled in clay by Leonardo da Vinci, but it no longer exists. Among other sculptors who flourished in Italy about the middle of the 15th century, are the Lucchese Matteo Civitali; Agostino di Duccio (1418–*c.* 1481), whose principal works are to be found at Rimini and Perugia; the bronze-worker Bertoldo di Giovanni (1420–1491); Antonio del Pollaiuolo, the author of the tombs of popes Sixtus IV. and Innocent VIII. at St Peter's in Rome; and Francesco Laurana (1424–1501?), a Dalmatian who worked under Brunelleschi and left many traces of his activity in Naples (Triumphal Arch), Sicily and southern France. Finally came Michelangelo, who raised the sculpture of the modern world to its highest pitch of magnificence, and at the same time sowed the seeds of its rapidly approaching decline; the head of his David at Florence is a work of unrivalled force and dignity. His rivals and imitators, Baccio Bandinelli, Giacomo della Porta, Montelupo, Ammanati and Vincenzo de' Rossi (pupils of Bandinelli) and others, copied and exaggerated his faults without possessing a touch of his gigantic genius. In other parts of Italy, such as Pavia, the traditions of the 15th century lasted longer, though gradually fading. The statuary and reliefs which make the Certosa near Pavia one of the most gorgeous buildings in the world are free from the influence of Michelangelo, which at Florence and Rome was overwhelming. Though much of the sculpture was begun in the second half of the 15th century, the greater part was not executed till much later. The magnificent tomb of the founder, Giovanni Galeazzo Visconti, was not completed till about 1560, and is a gorgeous example of the style of the Renaissance grown weak from excess of richness and from loss of the simple purity of the art of the 15th century. Everywhere in this wonderful building the fault is the same; and the growing love of luxury and display, which was the curse of the time, is reflected in the plastic decorations of the whole church. The old religious spirit had died out and was succeeded by unbelief or by an affected revival of paganism. Monuments to ancient Romans, such as those to the two Plinys on the façade of Como cathedral, or "heroa" to unsaintly mortals, such as that erected at Rimini by Sigismondo Pandolfo in honour of Isotta,[1] grew up side by side with shrines and churches dedicated to the saints. We have seen how the youthful vigour of the Christian faith vivified for a time the dry bones of expiring classic art, and now the decay of this same belief brought with it the destruction of all that was most valuable in medieval sculpture. Sculpture, like the other arts, became the bond-slave of the rich, and ceased to be the natural expression of a whole people. Though for a long time in Italy great technical skill continued to exist, the vivifying spirit was dead, and at last a dull scholasticism or a riotous extravagance of design became the leading characteristics.

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[1] See Ruskin, *Stones of Venice*; and Mothes, *Gesch. der Bauk. u. Bildh. Venedigs* (Leipzig, 1859); also H. v. d. Gabelentz, *Mittelaltert. Plastik in Venedig* (Leipzig, 1902).

[2] See Carl Cornelius, *Jacopo della Quercia* (Halle a. S., 1896).

The 16th century was one of transition to this state of degradation, but nevertheless produced many sculptors of great ability who were not wholly crushed by the declining taste of their time. John of Douai (1524–1608), usually known as Giovanni da Bologna, one of the ablest, lived and worked almost entirely in Italy. His bronze statue of Mercury flying upwards, in the Uffizi, one of his finest works, is full of life and movement. By him also is the "Carrying off of a Sabine Woman" in the Loggia de' Lanzi. His great fountain at Bologna, with two tiers of boys and mermaids, surmounted by a colossal statue of Neptune, a very noble work, is composed of architectural features combined with sculpture, and is remarkable for beauty of proportion. He also cast the fine bronze equestrian statue of Cosimo de' Medici at Florence and the very richly decorated west door of Pisa cathedral, the latter notable for the overcrowding of its ornaments and the want of sculpturesque dignity in the figures; it is a feeble imitation of Ghiberti's noble production. One of Giovanni's best works, a group of two nude figures fighting, is now lost. A fine copy in lead existed till recently in the front quadrangle of Brasenose College, Oxford, of which it was the chief ornament. In 1881 it was sold for old lead by the principal and fellows of the college, and was immediately melted down by the plumber who bought it—an irreparable loss, as the only other existing copy is very inferior; the destruction was an utterly inexcusable act of vandalism. The sculpture on the western façade of the church at Loreto and the elaborate bronze gates of the Santa Casa are works of great technical merit by Girolamo Lombardo and his sons, about the middle of the 16th century. Benvenuto Cellini (1500–1569), though in the main greater as goldsmith than as sculptor, produced one work of great beauty and dignity—the bronze Perseus in the Loggia de' Lanzi at Florence. His large bust of Cosimo de' Medici in the Bargello is mean and petty in style. A number of very clever statues and groups in terra-cotta were modelled by Antonio Begarelli of Modena (d. 1565), and were enthusiastically admired by Michelangelo; the finest are a "Pietà" in S. Maria Pomposa and a large "Descent from the Cross" in S. Francesco, both at Modena. The colossal bronze seated statue of Julius III. at Perugia, cast in 1555 by Vincenzio Danti, is one of the best portrait-figures of the time.

The Renaissance in France.

The latter part of the 15th century in France was a time of transition from the medieval style, which had gradually been deteriorating, to the more florid and realistic taste of the Renaissance. To this period belong a number of rich reliefs and statues on the choir-screen of Chartres cathedral. Those on the screen at Amiens are later still, and exhibit the rapid advance of the new style.

The transition from the Gothic to the Renaissance is to be noted in many tomb monuments of the second half of the 15th and the beginning of the 16th centuries, notably in Rouland de Roux's magnificent tomb of the cardinals of Amboise at Rouen cathedral. Italian motifs are paramount in the great tomb of Louis XII. and his wife Anne of Bretagne, at St Denis, by Jean Juste of Tours.

The Italian influence.

The influx of Italian artists into France in the reign of Francis I., who, with Leonardo da Vinci, Andrea del Sarto, Rosso, and Primaticcio, had summoned Benvenuto Cellini and other Italian sculptors to his court, naturally led to the practical extinction of the Gothic style, though isolated examples of medievalism still occur about the middle of the 16th century. Such are the "Entombment" in the crypt of Bourges cathedral, and the tomb of René of Chalons in the church of St Etienne at Bar-le-Duc. But the main current of artistic thought followed the direction indicated by the founding of the italianizing school of Fontainebleau. Jean Goujon, (d. 1572) was the ablest French sculptor of the time; he combined great technical skill and refinement of modelling with the florid and affected style of the age. His nude figure of "Diana reclining by a Stag," now in the Louvre, is a graceful and vigorous piece of work, superior in sculpturesque breadth to the somewhat similar bronze relief of a nymph by Cellini. Between 1540 and 1552 Goujon executed the fine monument at Rouen to Duke Louis de Brézé, and from 1555 to 1562 was mainly occupied in decorating the Louvre with sculpture. One of the most pleasing and graceful works of this period, thoroughly Italian in style, is the marble group of the "Three Graces" bearing on their heads an urn containing the heart of Henry II., executed in 1560 by Germain Pilon for Catherine de Médicis. The monument of Catherine and Henry II. at St Denis, by the same sculptor, is an inferior and coarser work. Maître Ponce, probably the same as the Italian Ponzio Jacquio, chiselled the noble monument of Albert of Carpi (1535), now in the Louvre. Another very fine portrait effigy of about 1570, a recumbent figure in full armour of the duke of Montmorency, preserved in the Louvre, is the work of Barthélemy Prieur. François Duquesnoy of Brussels (1594–1644), usually known as Il Fiammingo, was a clever sculptor, thoroughly French in style, though he mostly worked in Italy. His large statues are very poor, but his reliefs in ivory of boys and cupids are modelled with wonderfully soft realistic power and graceful fancy.

To these sculptors should be added Jacques Sarrazin, well known for the colossal yet elegant caryatides for the grand pavilion of the Louvre; and François Augier, the sculptor of the splendid mausoleum of the duc de Montmorency.

The Netherlands.

In the Netherlands the great development of painting was not accompanied by a parallel movement in plastic art. Of the few monuments that claim attention, we must mention the bronze tomb of Mary of Burgundy at Notre-Dame, Bruges, executed about 1495 by Jan de Baker, and the less remarkable though technically more complete companion tomb of Charles the Bold (1558).

Beginning of the Renaissance in Germany.

The course of the Renaissance movement in German sculpture differs from that of most other countries in so far as it appears to grow gradually out of the Gothic style in the direction of individual, realistic treatment of the figure which in late Gothic days had become somewhat conventional and schematic and idealized. Marked physiognomic expression, careful rendering of movement, costume and details, and the suggestion of different textures, together with almost tragic emotional intensity, are the chief aims of the 15th-century sculptors who, on the whole, adhere to medieval thought and arrangement. The Italian influence, which did not make itself felt until the early days of the 16th century, led to brilliant results, whilst the workers retained their fresh northern individuality and keen observation of nature. But in the latter half of this century it began to choke these national characteristics, and led to somewhat theatrical and conventional classicism and mannerism.

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[1] See Yriarte, *Rimini au XV^e siècle* (Paris, 1880).

One speciality of the 15th century was the production of an immense number of wooden altars and reredoses, painted and gilt in the most gorgeous way and covered with subject-reliefs and statues, the former often treated in a very pictorial style.[1] Wooden screens, stalls, tabernacles and other church-fittings of the greatest elaboration and clever workmanship were largely produced in Germany at the same time, and on into the 16th century.[2] Jörg Syrlin, one of the most able of these sculptors in wood, executed the gorgeous choir-stalls in Ulm cathedral, richly decorated with statuettes and canopied work, between 1469 and 1474; his son and namesake sculptured the elaborate stalls in Blaubeuren church of 1496 and the great pulpit in Ulm cathedral. Another exceptionally important work of this type is the magnificent altar at St Wolfgang in Upper Austria, carved by the Tirolese, Michael Pacher, in 1481. Veit Stoss of Cracow, who later settled in Nuremberg, a man of bad character, was a most skilful sculptor in wood; he carved the high altar, the tabernacle and the stalls of the Frauenkirche at Cracow, between 1472 and 1494. One of his finest works is a large piece of wooden panelling, nearly 6 ft. square, carved in 1495, with central reliefs of the Doom and the Heavenly Host, framed by minute reliefs of scenes from Bible history. It is now in the Nuremberg town-hall. Wohlgemuth (1434–1519), the master of A. Dürer, was not only a painter but also a clever wood-carver, as was also Dürer himself (1471–1528), who executed a tabernacle for the Host with an exquisitely carved relief of Christ in Majesty between the Virgin and St John, which still exists in the chapel of the monastery of Landau. Dürer also produced miniature reliefs cut in boxwood and hone-stone, of which the British Museum (print-room) possesses one of the finest examples. Adam Krafft (*c.* 1455–1507) was another of this class of sculptors, but he worked also in stone; he produced the great Schreyer monument (1492) for St Sebald's at Nuremberg,—a very skilful though mannered piece of sculpture, with very realistic figures in the costume of the time, carved in a way more suited to wood than stone, and too pictorial in effect. He also made the great tabernacle for the Host, 80 ft. high, covered with statuettes, in Ulm cathedral, and the very spirited "Stations of the Cross" on the road to the Nuremberg cemetery.

The Vischer family of Nuremberg for three generations were among the ablest sculptors in bronze during the 15th and 16th centuries. Hermann Vischer the elder worked mostly between 1450 and 1505, following the earlier medieval traditions, but without the originality of his son, Peter Vischer.

Next to Nuremberg, the chief centres of bronze sculpture were Augsburg and Lübeck. Innsbruck possesses one of the finest series of bronze statues of the first half of the 16th century, namely twenty-eight colossal figures round the tomb of the emperor Maximilian, which stands in the centre of the nave, representing a succession of heroes and ancestors of the emperor. The first of the statues which was completed cost 3000 florins, and so Maximilian invited the help of Peter Vischer, whose skill was greater and whose work less expensive than that of the local craftsmen. Most of them, however, were executed by sculptors of whom little is now known. They differ much in style, though all are of great technical merit. The finest is an ideal statue of King Arthur of Britain, in plate armour of the 14th or early 15th century, very remarkable for the nobility of the face and pose. That of Theodoric is also a very fine conception. Both are wrongly said to be the work of Peter Vischer himself. Of the others, the best, nine in number, are by Master Gilg. The others, which range from stiffness to exaggerated realism, are executed by inferior workers.

In the latter part of the 16th century the influence of the later Italian Renaissance becomes very apparent, and many elaborate works in bronze were produced, especially at Augsburg, where Hubert Gerhard cast the fine "Augustus fountain" in 1593, and Adrian de Vries made the "Hercules fountain" in 1599; both were influenced by the style of Giovanni di Bologna, as shown in his magnificent fountain at Bologna.

The Renaissance in England.

At the beginning of the 16th century sculpture in England was entering upon a period of rapid decadence, and to some extent had lost its native individuality. The finest series of statues of this period are those of life-size high up on the walls of Henry VII.'s chapel at Westminster and others over the various minor altars. These ninety-five figures, which represent saints and doctors of the church, vary very much in merit: some show German influence, others that of Italy, while a third class are, as it were, "archaistic" imitations of older English sculpture.[3] In some cases the heads and general pose are graceful, and the drapery dignified, but in the main they are coarse both in design and in workmanship compared with the better plastic art of the 13th and 14th centuries. This decadence of English sculpture caused Henry VII. to invite the Florentine Torrigiano (1472?–1522) to visit England to model and cast the bronze figures for his own magnificent tomb, which still exist in almost perfect preservation. The recumbent effigies of Henry VII. and his queen are fine specimens of Florentine art, well modelled with lifelike portrait heads and of very fine technique in the casting. The altar-tomb on which the effigies lie is of black marble, decorated with large medallion reliefs in gilt bronze, each with a pair of saints—the patrons of Henry and Elizabeth of York—of very graceful design. The altar and its large baldacchino and reredos were the work of Torrigiano, but were destroyed during the 17th century. The reredos had a large relief of the Resurrection of Christ executed in painted terra-cotta, as were also a life-size figure of the dead Christ under the altar-slab and four angels on the top angles of the baldacchino; a number of fragments of these figures have recently been found in the "pockets" of the nave vaulting, where they had been thrown after the destruction of the reredos. Torrigiano's bronze effigy of Margaret of Richmond in the south aisle of the same chapel is a very skilful but too realistic portrait, apparently taken from a cast of the dead face and hands. Another terra-cotta effigy in the Rolls chapel is also, from internal evidence, attributed to the same able Florentine. Another talented Florentine sculptor, Benedetto da Maiano, was invited to England by Cardinal Wolsey to make his tomb; of this only the marble sarcophagus now exists and has been used to hold the body of Admiral Nelson in St Paul's Cathedral. Another member of the same family, named Giovanni, was the sculptor of the colossal terra-cotta heads of the Caesars affixed to the walls of the older part of Hampton Court Palace.

Spanish Renaissance Sculpture.

In Spain, in the early part of the 16th century, a strong Italian influence superseded that of France and Germany, partly owing to the presence there of the Florentine Torrigiano and other Italian artists. The magnificent tomb of Ferdinand and Isabella in Granada cathedral is a fine specimen of Italian Renaissance sculpture, somewhat similar in general form to the tomb of Sixtus IV. by Ant. Pollaiuolo in St Peter's, but half a century later in the style of its detail. It looks as if it had been executed by Torrigiano, but the design which he made for it is said to have been rejected. The statue of St Jerome, which he executed for the convent of Buenavista, near Seville, was declared by Goya to be superior to Michelangelo's "Moses." Some of the work of this period, though purely Italian in style, was produced by Spanish sculptors,

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[1] This class of large wooden retable was much imitated in Spain and Scandinavia. The metropolitan cathedral of Röskilde in Denmark possesses a very large and magnificent example covered with subject reliefs enriched with gold and colours.

[2] See Waagen, *Kunst und Künstler in Deutschl.* (Leipzig, 1843–1845).

[3] There were once no fewer than 107 statues in the interior of this chapel, besides a large number on the exterior; see J. T. Micklethwaite in *Archaeologia*, vol. xlvii. pl. x.-xii.

—for example, the choir reliefs at Toledo cathedral, and those in the Colegio Mayor at Salamanca by Alonzo Berruguete, sculptor, painter and architect, trained in Rome and Florence, and the greatest designer of Spain up to that time. He worked under Michelangelo and Vasari, and on his return to Spain in 1520 was appointed court painter and sculptor to Charles V. The same position was occupied under Philip II. by Gaspar Becerra (1520–1570), whose masterpiece is a figure of Our Lady of the Solitude, in Madrid. Esteban Jordan, Gregorio Hernandez and other Spanish sculptors produced a large number of elaborate retables, carved in wood with subjects in relief and richly decorated in gold and colours. These sumptuous masses of polychromatic sculpture resemble the 15th-century retables of Germany more than any Italian examples, and were a sort of survival of an older medieval style. J. Morlanes was the first of Spanish sculptors to adopt the style of Albert Dürer, which afterwards became general. Philip de Vigarni, Christopher of Salamanca, and Paul de Cespedes, who was native of Cordova, are names of great prominence up to the end of the century. Alonzo Cano (1600–1667), the painter, was remarkable for clever realistic sculpture, very highly coloured and religious in style. Montañes, who died in 1614, was one of the ablest Spanish sculptors of his time. His finest works are the reliefs of the Madonna and Saints on an altar in the university church of Seville, and in the cathedral, in the chapel of St Augustine, a very nobly designed Conception, modelled with great skill.

In the 17th century sculpture in wood still prevailed. The statue of St Bruno of Montañez seems to have inspired others to repeat the subject in the same material: Juan de Juin (d. 1614) is a case in point. Pedro de Mena and Zarcillo achieved great success in this class of sculpture. A. Pujol of Catalonia and Peter Roldan carried on the Spanish tradition. The chief names in the 18th century are those of Don P. Duque Cornesso of Seville, Don J. de Hinestrosa, A. Salvador (known as "the Roman," d. 1766), Philip de Castro of Galicia, one of the most eminent sculptors of his time (d. 1775), and F. Gutierrez (d. 1782).[1]

Baroque sculpture in Italy.

If the immediate followers of Michelangelo showed a tendency to turn the characteristics of the master's style into exaggerated mannerism, the beginning of the 17th century finds Italian sculpture in a state of complete decadence, statuesque dignity having given way to violent fluttering movement and florid excesses, such as was revived in a later century. From Italy this "baroque" style spread over the whole continent of Europe and retained its hold for nearly two centuries. The chief sculptor and architect of this period was the Neapolitan, J. L. Bernini (1598–1680), who, with the aid of a large school of assistants, produced an almost incredible quantity of sculpture of the most varying degrees of merit and hideousness. His chief early group, the Apollo and Daphne in the Villa Borghese, is a work of wonderful technical skill and delicate high finish, combined with soft beauty and grace, though too pictorial in style. In later life Bernini turned out work of brutal coarseness,[2] designed in a thoroughly unsculpturesque spirit. The churches of Rome, the colonnade of St Peter's, and the bridge of S. Angelo are crowded with his clumsy colossal figures, half draped in wildly fluttering garments,—perfect models of what is worst in the plastic art. And yet his works received perhaps more praise than those of any other sculptor of any age, and after his death a scaffolding was erected outside the bridge of S. Angelo in order that people might walk round and admire his rows of feeble half-naked angels. For all that, Bernini was a man of undoubted talent, and in a better period of art would have been a sculptor of the first rank; many of his portrait-busts are works of great vigour and dignity, quite free from the mannered extravagance of his larger sculpture. Stefano Maderna (1571–1636) was the ablest of his contemporaries; his clever and much-admired statue, the figure of the dead S. Cecilia under the high altar of her basilica, is chiefly remarkable for its deathlike pose and the realistic treatment of the drapery. Another clever sculptor was Alessandro Algardi of Bologna (1598?–1654), who formed a school, which included G. Brunelli, D. Guidi and C. Mazza of Bologna.

The classicist revival in Italy.

In the next century at Naples Queirolo, Corradini and Sammartino produced a number of statues, now in the chapel of S. Maria de' Sangri, which are extraordinary examples of wasted labour and neglect of the simplest canons of plastic art. These are marble statues enmeshed in nets or covered with thin veils, executed with almost deceptive realism, perhaps the lowest stage of tricky degradation into which the sculptor's art could possibly fall.[3] In the 18th century Italy was naturally the headquarters of the classical revival, which spread thence throughout most of Europe. Canova (1757–1822), a Venetian by birth, who spent most of his life in Rome, was perhaps the leading spirit of this movement, and became the most popular sculptor of his time. His work is very unequal in merit, mostly dull and uninteresting in style, and is occasionally marred by a meretricious spirit very contrary to the true classic feeling. His group of the "Three Graces," the "Hebe," and the very popular "Dancing-Girls," copies of which in plaster disfigure the stairs of countless modern hotels and other buildings on the Continent, are typical examples of Canova's worst work. Some of his sculpture is designed with far more of the purity that distinguished antique art; his finest work is the colossal group of Theseus slaying a Centaur, at Vienna. Canova's attempts at Christian sculpture are singularly unsuccessful, as, for example, his pretentious monument to Pope Clement XIII. in St Peter's at Rome, that of Titian at Venice, and Alfieri's tomb in the Florentine church of S. Croce. Fiesole in the 19th century produced one sculptor of great talent, named Bastianini. He worked in the style of the great 15th-century Florentine sculptors, and followed especially the methods of his distinguished fellow-townsman Mino da Fiesole. Many of Bastianini's works are hardly to be distinguished from genuine sculpture of the 15th century, and in some cases great prices have been paid for them under the supposition that they were medieval productions. These frauds were, however, perpetrated without Bastianini's consent, or at least without his power to prevent them. Several of his best terra-cotta works may be seen in the Victoria and Albert Museum.

In France.

Whilst monumental sculpture in France during the 17th century continued to be influenced by Italy, the national tradition was carried on to a certain extent by such portraitists as the two Coustous and their master Coysevox (1640–1720), whose works are marked by a great sense of life and considerable technical skill. The exaggerated elegance in the treatment of the female figure, which became so marked a characteristic of French sculpture during this period, is the chief trait of François Girardon (1630–1715), who was chiefly employed on the sculptural decorations at Versailles, and on the famous equestrian statue of Louis XIV., which was destroyed during the Revolution and for which hundreds of exquisite drawings and studies were made, now in the French national collection. Far more strength and grandeur mark the work of Pierre Puget (1622–1694), who is best known by his "Milo of Crotona" for Versailles. His training was entirely Italian, and in style considerably influenced by Bernini. He worked for some considerable time in Italy, particularly in Genoa. The same opposed movements which run side by side in French 18th-century painting, academic allegory and frivolous sensuality, can be traced in the sculpture of this period. Of the first, the chief representatives are Lemoyne and his pupil Falconet, who executed the equestrian statue of Peter the Great at St Petersburg; of the other, Clodion, whose real name was Claude Michel (*c.* 1745–1814). The latter worked largely in terra-cotta, and modelled with great spirit and invention, but in the sensual unsculpturesque manner prevalent in his time.

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[1] For the earlier history of Spanish sculpture, see Don Juan Augustin Cean Bermudez, *Diccionario historico de los mas illustres professores de las bellas artes en Espagna* (Madrid, 1800, 6 vols.). For the later sculptors, see B. Händke, *Studien zur Geschichte der spanischen Plastik* (Strasburg, 1900).

[2] The Ludovisi group of Pluto carrying off Proserpine, now in the Borghese Gallery, is a striking example, and shows Bernini's deterioration of style in later life. It has nothing in common with the Cain and Abel or the Apollo and Daphne of his earlier years.

[3] In the 19th century an Italian sculptor named Monti won much popular repute by similar unworthy tricks; some veiled statues by him in the London Exhibition of 1851 were greatly admired; since then copies or imitations of them have enraptured the visitors who have crowded round the Italian sculpture stalls at every subsequent international exhibition.

Eighteenth century.

In the later part of the 18th century France produced two sculptors of great eminence in Jean-Baptiste Pigalle (1714–1785) and Jean Antoine Houdon (1740–1828). Houdon may be regarded as the precursor of the modern school of French sculpture of the better sort. Towards the end of the 18th century a revolution was brought about in the style of sculpture by the suddenly revived taste for antique art. A period of dull pseudo-classicism succeeded, which in most cases stifled all original talent and reduced the plastic arts to a lifeless form of archaeology. Regarded even as imitations the works of this period are very unsuccessful: the sculptors got hold merely of the dry bones, not of the spirit of classic art; and their study of the subject was so shallow and unintelligent that they mostly picked out what was third-rate for special admiration and ignored the glorious beauty of the best works of true Hellenic art. Thus in sculpture, as in painting and architecture, a study which might have been stimulating and useful in the highest degree became a serious hindrance to the development of modern art; this misconception and misdirection occurred not only in France but in the other countries of Europe. In France, however, the victories of Napoleon I. and his arrogant pretension to create a Gaulish empire on the model of that of ancient Rome caused the taste for pseudo-Roman art to be more pronounced than elsewhere.

Early 19th century.

Among the first sculptors of this school were Antoine Chaudet (1763–1810) and Joseph Bosio (1769–1845). The latter was much employed by Napoleon I.; he executed with some ability the bronze spiral reliefs round the column of the Place Vendôme and the statue of Napoleon on the top, and also modelled the classical quadriga on the triumphal arch in the Place du Carrousel. Jacques Pradier of Geneva (1792–1862), produced the "Chained Prometheus" of the Louvre and the Niobe group (1822). He possessed great technical ability, but aimed in most of his works at a soft sensuous beauty which is usually considered to be specially unsuited to sculpture. François Rude (1784–1855), worked in a style modelled on Graeco-Roman sculpture treated with some freedom. His bronze Mercury in the Louvre, is a clever work and the enormous high-relief on the Arc de l'Etoile in Paris, representing "The Song of Departure to Battle," is full of vigour and movement, but his statues of Marshal Ney in the Luxembourg Gardens and of General Cavaignac (1847) in the cemetery of Montmartre are conspicuously poor. The reliefs on the pediment of the Panthéon are by Pierre Jean David of Angers (1789–1856); his early works are of dull classic style, but later in life he became a realist and produced very unsculpturesque results. A bronze statue of a Dancing Fisher-lad modelled by François Joseph Duvet, now in the Luxembourg collection, is an able work of the *genre* class. Other French sculptors who were highly esteemed in their time were Ottin, Courtet, Simart, Etex and Carpeaux. The last was an artist of great ability, and produced an immense number of clever but often, sculpturesquely considered, offensive statues. He obtained the highest renown in France, and, hailed as a great innovator by those who welcomed a greater measure of naturalism, he was denounced by the "pure" and classic school as a typical example of the sad degradation of taste which prevailed under the rule of Napoleon III.

The modern schools of French sculpture are the most important in the world; they are dealt with in a separate section later. Technical skill and intimate knowledge of the human form are possessed by French artists to a degree which has probably never been surpassed. Many of their works have a similar fault to that of one class of French painters: they are much injured by an excess of sensual realism; in many cases nude statues are simply life-studies with all the faults and individual peculiarities of one model. Very unsculpturesque results are produced by treating a statue as a representation of a *naked* person,—one, that is, who is obviously in the habit of wearing clothes,—a very different thing from the purity of the ancient Greek treatment of the nude. Thus the great ability of many French sculptors has been degraded to suit, or rather to illustrate, the taste of the voluptuary. An extravagance of attitude and an undignified arrangement of the figures do much to injure some of the large groups which are full of technical merit, and executed with marvellous anatomical knowledge. This is specially the case with much of the sculpture that decorates the buildings of Paris. The group of nude dancers by Carpeaux outside the opera-house is a work of astonishing skill and sensual imagination, unsculpturesque in style and especially unfitted to decorate the comparatively rigid lines of a building. The egotism of modern French sculptors, with rare exceptions, has not allowed them, when professedly aiming at providing plastic decoration for buildings, to accept the necessarily subordinate reserve which is so necessary for architectonic sculpture. Other French works, on the other hand, have frequently erred in the direction of a sickly sentimentalism, or a petty realism, which is fatal to sculpturesque beauty; or they seek to render modern life, sometimes on the scale of life-size, even to the point of securing atmospheric effect. This exaggerated misconception of the function of sculpture can only be a passing phase; yet as any movement issuing from Paris finds adherents throughout other countries, the effect upon sculptors and upon public taste can hardly be otherwise than mischievous. The real power and merits of the modern French school make these faults all the more conspicuous.

Netherlandish sculptors.

Whatever work of importance was produced by Netherlandish sculptors in the 17th and 18th centuries, was due entirely to Italian training and influence. François Duquesnoy (usually called "The Fleming") (1594–1644) has already been mentioned; he worked principally in Rome, in rivalry with Bernini, and most of his works have remained in Italy, but, inasmuch as his style is conspicuously French, he is here included in the French school. His pupil Arthur Quellinus is best known by his allegorical groups on the pediments of Amsterdam town-hall, and has also left some traces of his activity in Berlin. P. Buyster, native of Brussels (b. 1595), passed into France and is also often classed as a French sculptor.

Scandinavian sculptors.

By far the greatest sculptor of the classical revival was Bertel Thorwaldsen (1770–1844), an Icelander by race, whose boyhood was spent at Copenhagen, and who settled in Rome in 1797, when Canova's fame was at its highest. The Swedish sculptors Tobias Sergell and Johann Byström belonged to the classic school; the latter followed in Thorwaldsen's footsteps. Another Swede named Fogelberg was famed chiefly for his sculptured subjects taken from Norse mythology. H. W. Bissen and Jerichau of Denmark produced some able works,—the former a fine equestrian statue of Frederick VII. at Copenhagen, and the latter a very spirited and widely known group of a Man attacked by a Panther.

Seventeenth century in England.

During the troublous times of the Reformation, sculpture, like the other arts, continued to decline. Of 17th-century monumental effigies that of Sir Francis Vere (d. 1607) in the north transept at Westminster is one of the best, though its design—a recumbent effigy overshadowed by a slab covered with armour, upborne by four kneeling figures of men-at-arms—is almost an exact copy of the tomb of Engelbert II. of Vianden-Nassau.[1] The finest bronze statues of this century are those of George Villiers, duke of Buckingham (d. 1628), and his wife at the north-east of Henry VII.'s chapel. The effigy of the duke, in rich armour of the time of Charles I., lies with folded hands in the usual medieval pose. The face is fine and well modelled and the casting very good. The allegorical figures at the foot are caricatures of the style of Michelangelo, and are quite devoid of merit, but the kneeling statues of the duke's children are designed with grace and pathos. A large number of very handsome marble and alabaster tombs were erected throughout England during the 17th century. The effigies are poor and coarse, but the rich architectural ornaments are effective and often of beautiful materials, alabaster being mixed with various richly coloured marbles in a very skilful way. Nicholas Stone (1586–1647), who worked under the supervision of Inigo Jones and was master-mason to King Charles I., was the chief English sculptor of his time. The De Vere and Villiers monuments are usually attributed to him.[1] One of the best public monuments of London is the bronze equestrian statue of Charles I. at Charing Cross, which was overthrown and hidden during the protectorate of Cromwell, but replaced at the Restoration in 1660; it is very nobly modelled and was produced under Italian influence by the French sculptor Hubert Le Sœur (d. 1670). The standing bronze statue of James II., formerly behind the Whitehall banqueting room, very poorly designed but well executed, was the work of Grinling Gibbons (1648–1721), a native of Holland, who was chiefly famed for his extraordinary skill in carving realistic fruit and flowers in pear and other white woods. Many rich and elaborate works of his exist at Trinity College, Oxford, at Cambridge, Chatsworth, and several other places in England. In the early part of the 18th century he worked for Sir Christopher Wren, and carved the elaborate friezes of the stalls and screens in St Paul's Cathedral and in other London churches.

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[1] See Arendt, *Chateau de Vianden* (Paris, 1884).

Eighteenth century in England.

During the 18th century English sculpture was mostly in the hands of Flemish and other foreign artists, of whom Roubiliac (1695–1762), Peter Scheemakers (1691–1773), and J. M. Rysbrack (1694–1770) were the chief. The ridiculous custom of representing Englishmen of the 18th and 19th centuries in the toga or in the armour of an ancient Roman was fatal alike to artistic merit and eikonic truth; and when, as was often the case, the periwig of the Georgian period was added to the costume of a Roman general the effect is supremely ludicrous. Nollekens (1737–1823), a pupil of Scheemakers, though one of the most popular sculptors of the 18th century, was a man of very little real ability. John Bacon (1740–1799) was in some respects an abler sculptor. John Flaxman (1755–1826) was in England the chief initiator of the classical revival. For many years he worked for Josiah Wedgwood, the potter, and designed for him an immense number of vases covered with delicate cameo-like reliefs. Many of these, taken from antique gems and sculpture, are of great beauty, though hardly suited to the special necessities of fictile ware. Flaxman's large pieces of sculpture are of less merit, but some of his marble reliefs are designed with much spirit and classic purity. He modelled busts as well as small portrait medallions for production in Wedgwood's pottery. His illustrations in outline to the poems of Homer, Aeschylus and Dante, based on drawings on Greek vases, have been greatly admired, but they are unfortunately much injured by the use of a thicker outline on one side of the figures—an unsuccessful attempt to give a suggestion of shadow. Flaxman's best pupil was Baily (1788–1867), chiefly celebrated for his nude marble figure of Eve.

Modern German sculpture.

On the whole the 17th and 18th centuries in Germany, as in England, were periods of great decadence in the plastic art; little of merit was produced, except some portrait figures. Among the rare exceptions mention must be made of Andreas Schlüter, of Hamburg (*c.* 1662–1714), who produced many decorative bronze reliefs for the royal castle in Berlin, and the famous colossal equestrian statue of the Great Elector on the bridge in Berlin. Another artist who approached greatness in a period of utter degradation was Rafael Donner, whose principal work is the large fountain with lead figures of Providence and the four rivers of Austria (the Enns, Ybbs, Traun and March), in Vienna, a very remarkable example of baroque sculpture which to this day is known as the Donner fountain. In the second half of the 18th century there was a strong revival in sculpture, especially in the classic style; and since then Germany has produced an immense quantity of large and pretentious sculpture, mostly dull in design and second-rate in execution. Gottfried Schadow of Berlin (1764–1850) finished a number of portrait figures, not in the customary antique guise, but in the costume of the period. Some of his works are ably modelled. He was followed by Christian Rauch (1777–1857), whose works are, however, mostly weak and sentimental in style, as, for example, his recumbent statue of Queen Louisa at Charlottenburg (1813), and his statues of generals Bülow and Scharnhorst at Berlin. Rauch became the leader of an important school in Berlin, but will be most honourably remembered by his splendid monument of Frederick the Great, in Berlin—an elaborate work, modern in feeling and of great technical accomplishment. Friedrich Drake was the ablest of Rauch's pupils, but he lived at a very unhappy period for the sculptor's art. His chief work is perhaps the colossal bronze equestrian statue of King William of Prussia at Cologne. Albert Wolff was a sculptor of more ability; he executed the equestrian portrait of King Ernest Augustus at Hanover, and a "Horseman attacked by a Lion" now in the Berlin Museum. Augustus Kiss (1802–1865) produced the companion group to this, the celebrated Amazon and Panther in bronze, as well as the fine group of St George and the Dragon in a courtyard of the royal palace at Berlin. The St George and his horse are of bronze; the dragon is formed of gilt plates of hammered iron. Kiss worked only in metal. The bad taste of the first half of the present century is strongly shown by many of the works of Theodore Kalidè, whose "Bacchanal sprawling on a Panther's Back" is a marvel of awkwardness of pose and absence of any feeling for beauty. Ernst Rietschel (1804–1861) was perhaps the best German sculptor of this period, and produced work superior to that of his contemporaries, such as Haagen, Wichmann, Fischer and Hiedel. Rietschel's career was marked by steady progress from a meaningless classicism to serious realism. It was his task to erect monuments in memory of some of the greatest intellectual heroes of Germany, such as his Lessing monument in Braunschweig, the monument to Goethe and Schiller in Weimar, and that to Martin Luther at Worms. Some revival of a better style is shown in certain sculpture, especially reliefs, by Hähnel, whose chief works are at Dresden. Schwanthaler (1802–1848), who was largely patronized by King Louis of Bavaria, studied at Rome and was at first a feeble imitator of antique classic art, but later in life he developed a more romantic and pseudo-medieval style. By him are a large number of reliefs and statues in the Glyptothek at Munich and in the Walhalla, also the colossal but feeble bronze statue of Bavaria, in point of size one of the most ambitious works of modern times.[2] Johannes Schilling (b. 1826) is the author of the colossal national monument on the Niederwald near Rüdesheim, and Ernst Bandel of the imposing monument of Hermann Arminius in the Teutoburg Forest near Detmold.

It was Reinhold Begas (b. 1831) who definitely broke away from the all-pervading classicist tradition. His art has more in common with that of the Rococo period than with that of Canova and his followers. Not only did he excel in the rendering of textures, and in giving life and animation to his figures, but his earlier work was marked by unconventionality and great boldness of disposition. Unfortunately his rapid success, and the official favour that was shown to him, led him subsequently to hasty and what might almost be described as factory-like production. His work became pretentious, and though some of the reliefs and single figures on his monuments are remarkable for his keen gift of observation, the whole effect is frequently spoilt by the unnecessary introduction of disturbing decorative features, ill-disposed and singularly lacking in sculptural dignity. The monument of the emperor William I. with the two beautiful reliefs of Peace and War, and the Neptune fountain, both in front of the imperial palace, and the Schiller monument before the royal theatre, all in Berlin, are perhaps his most successful works. The Bismarck in front of the Reichstag building suffers from the excessive use of allegorical motifs and from other errors of taste.

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[1] The Villiers monument is evidently the work of two sculptors working in very opposite styles. These monuments, however, are not included in the list of his works drawn up by Stone himself and printed in Walpole's *Anecdotes of Painting*, i. 239-243. This sculptor's receipts, recorded by his kinsman, Charles Stoakes, amounted to £10,889—an enormous sum for an English sculptor and "tomb-maker" of those days.

[2] In size, but not in merit, this enormous statue was surpassed by the figure of Liberty made in Paris by Bartholdi and erected as a beacon in the harbour of New York city.

Of Begas's many pupils, who participated in the execution of the numerous statues that flank the Siegesallee in the Berlin Thiergarten, the most distinguished is Joseph Uphues (b. 1850), who is the creator of the Moltke monument in Berlin, and of the Frederick the Great in the Siegesallee, a replica of which is to be found in Washington. Adolf Brütt (b. 1855) and Gustav Eberlein should be mentioned among the most successful Berlin sculptors; Robert Dietz, as the founder of an important school in Dresden; and Wilhelm Ruemann (d. 1906) and Rudolf Maison among the modern sculptors of Munich.

The closing years of the 19th century were marked by an enormous advance, not only in public appreciation of sculpture but in productive activity. The younger generation of Berlin sculptors includes such distinguished artists as Fritz Klimsch, who is best known by "The Triumph of Woman" and "The Kiss"; Hugo Lederer, the designer of the Bismarck monument in Hamburg; August Gaul, who excelled in statuettes of animals; Max Kruse, a woodcarver of great ability; and Louis Touaillon, who spent his early years in Rome, and became famous for the excellent anatomy and action of his equine studies. Karl Seffner, of Leipzig; August Hudler, of Dresden; Georg Weba, Fritz Christ, Erwin Kurz, Hermann Hahn, Theodor von Gosen and Hugo Kaufmann, all of Munich, should also here be mentioned. Adolf Hildebrand (b. 1847) is best known by his Wittelsbach fountain in Munich and his Reinhard fountain in Strassburg. He has also executed some excellent medals and plaquettes. Franz Stuck, who has ranked among the leading painters of modern Germany, has also produced some powerful pieces of sculpture, such as the Beethoven, and the "Athlete holding a heavy Ball." Max Klinger (b. 1857), famous as painter and etcher, revived polychromatic sculpture in Germany. His Beethoven monument, at the Leipzig Museum, is the best known example of his work in this direction. The great composer is conceived as Jupiter enthroned, with the eagle at his feet. The work caused an enormous sensation on its first appearance before the public and became a veritable apple of discord around which a wordy war was waged by the different factions. The Leipzig Museum also owns his Cassandra and a rough-hewn portrait bust of Liszt. One of his most striking works is the Nietzsche bust at Weimar. At the Albertinum, in Dresden, is an important late work of his, a marble group of three beautifully modelled life-size figures, "The Drama." (J.H.M.; M.H.S.; P.G.K.)

Modern British sculpture.

During the first half of the 19th century the prevalence of a cold, lifeless pseudo-classic style was fatal to individual talent, and robbed the sculpture of England of all real vigour and spirit. Francis Chantrey (1782–1841) produced a great quantity of sculpture, especially sepulchral monuments, which were much admired in spite of their limited merits. Allan Cunningham and Henry Weekes, who excelled in busts of men, worked in some cases in conjunction with Chantrey, who was distinguished by considerable technical skill. John Gibson (1790–1866) was perhaps after Flaxman the most successful of the English classic school, and produced some works of real merit. He strove eagerly to revive the polychromatic decoration of sculpture in imitation of the *circumlitio* of classical times. His "Venus Victrix," shown at the exhibition in London of 1862 (a work of about six years earlier), was the first of his coloured statues which attracted much attention. The prejudice, however, in favour of white marble was too strong, and both the popular verdict and that of other sculptors were strongly adverse to the "tinted Venus." The fact is that Gibson's colouring was timidly applied: it was a sort of compromise between the two systems, and thus his sculpture lost the special qualities of a pure marble surface, without gaining the richly decorative effect of the polychromy either of the Greeks or of the medieval period. The other chief sculptors of the same inartistic period were Banks, the elder Westmacott (who modelled the Achilles in Hyde Park), R. Wyatt (who cast the equestrian statue of Wellington, removed from London to Aldershot), Macdowell, Campbell, Calder Marshall, and Bell. Samuel Joseph (d. 1850), working in a naturalistic spirit, produced some excellent work, notably (in 1840) the remarkable statue of Samuel Wilberforce now in Westminster Abbey. The brilliant exception of its period is the Wellington monument in St Paul's cathedral, probably the finest plastic work of modern times. It was the work of Alfred Stevens (1817–1875), a sculptor of the highest talent, who lived and died almost unrecognized by the British public. The value of Stevens's work is all the more conspicuous from the feebleness of most of the sculpture of his contemporaries.

During the last quarter of the century a great change came over British sculpture—a change so revolutionary that it gave a new direction to the aims and ambitions of the artist, and raised the British school to a level wholly unexpected. It cannot be pretended that the school yet equals either in technical accomplishment, in richness or elasticity of imagination, or in creative freedom, the schools of France and Belgium, for these have been built up upon the example of national works of many generations of sculptors during several centuries. British sculptors, whose training was far less thorough and intelligent than that which is given abroad, found themselves practically without a past of their own to inspire them, for there existed no truly national tradition; with them it was a case of beginning at the beginning.

The awakening came from without, brought to England mainly by a Frenchman—Jules Dalou—as well as by Lord Leighton, Alfred Gilbert and, in a lesser degree, by Onslow Ford. To Carpeaux, no doubt—despised of the classicists—the new inspiration was in a great measure due; for Carpeaux, who infused life and flesh and blood into his marble (too much of them, as has been here shown, to please the lovers of purism), was to his classic predecessors and contemporaries much what in painting Delacroix was to David and the cold professors of his formal school. But it was to Jules Dalou that was chiefly due the remarkable development in Great Britain. A political refugee at the time of the Commune, he received a cordial welcome from the artists of England, and was invited to assume the mastership of the modelling classes at South Kensington. This post he retained for some years, until the amnesty for political offenders enabled him to return to his native land; but before he left he had succeeded in making it clear that severe training is an essential foundation of good sculpture. This had been but partly understood—is not even now wholly realized; yet by the impression he made, Dalou improved the work in the schools beyond all recognition. The whole conception of sculpture seemed to be modified, and intelligent enthusiasm was aroused in the students. When he departed, he left in his stead Professor Lantéri, who became a naturalized Englishman, and who exercised a beneficent influence over the students equal to that of his predecessor. Meanwhile, the Lambeth Art Schools—where Mr W. S. Frith, a pupil of M. Dalou, was conducting his modelling class under the directorship of John Sparkes (d. 1907)—were being maintained with great success. At the Royal Academy, where in 1901 the professorship of sculpture was revived after many years, the inspiring genius of Alfred Gilbert aroused the students to an enthusiasm curiously contrasting with the comparative apathy, which passed as dignified restraint, of earlier days. British sculpture, therefore, when it is not coloured directly from the Italian Renaissance, is certainly influenced from France. But it is remarkable that in spite of this turning of British sculptors to romantic realism as taught by Frenchmen and Italians, and in spite of the fact that the spirit of colour and decoration and greater realism in modelling had been brought from abroad, the actual character of British sculpture, even in its most decorative forms, is not in the main other than British.

Nevertheless, there has been shown a tendency towards reviving the application of colour in sculpture which has not met with universal approval. Although the polychromatic work of the Renaissance, for example, may keep its place, it is held to clash with the idea of sculptural art; for though there is no absolute approach to imitation, there is a very strong suggestion of it. The use of a variety of marbles and metals, or other materials, such as has been increasingly adopted, does not offend in the same measure, as the result is purely formal. Yet, in the final result, the work becomes not so much sculpture broadly seen, as an "object of art," amiably imagined and delicately wrought.

Indeed, the sculptor has been greatly reinforced by the artificer in metal, enamel, and the like. But the revival of metal-work, cut, beaten, and twisted, however fine in itself, does not help sculpture forward very much. It may even keep it back; for, popular and beautiful as it is, it really tends to divert the attention from form to design, and from light and shade, with planes, to ingenuity, in pleasing lines—a very beautiful and elevated art, but not sculpture. As an adjunct, it may be extremely valuable in the hands of a fine artist who does not mistake the mere wriggles and doublings which are the mark of the more extravagant phase of the so-called "New Art" for harmonious "line." But it must always suggest the man with the anvil, shears, and pincers, rather than the man with the clay and the chisel. It is mainly to Alfred Gilbert that is due the delightful revival of metal-work in its finest form wedded to sculpture, with the introduction of marbles, gems, and so forth, felicitous and elegant in invention and ornament, and so excellent in design and taste that in his hands, at least, it is subservient to the monumental character of his sculpture.

The first effectual rebellion against the Classic, and the birth of Individualism, dates back to Alfred Stevens. The picturesque fancy of the Frenchman Roubiliac (who practised for many years in England), with his theatrical arrangement and skilful technique, inherited from his master Coustou, had left little mark on the Englishmen of his day. They went on, for the most part, with their pseudo-classic tradition, which Flaxman carried to the highest point. But until Stevens, few in England thought of instilling real life and blood and English thought and feeling into the clay and marble. It was not only life that Stevens realized, but dignity, nobility of form, and movement, previously unknown in English work. Follower though he was of Michelangelo and the Italian Renaissance, he was entirely personal. He was no copyist, although he had the Italian traditions at his fingers' ends, and his feeling for architecture helped him to treat sculpture with fine decorative effect. Yet even Stevens and his brilliant example were powerless to weaken the passion for the Greek and Roman tradition that had engrossed English sculptors—with their cold imitations and lifeless art, pursued in the name of their fetish, "the Antique."

Until towards the close of the 19th century this pseudo-classic art was blindly pursued by a non-Latin race, and a public favourite like W. Calder Marshall (1813–1894; A.R.A., 1844; R.A., 1852) never attempted, except perhaps in the "Prodigal Son," now at the Tate Gallery, to break away towards originality of thought.

Thomas Woolner (1825–1892; A.R.A., 1871; R.A., 1874), who had represented a modern heroine as a Roman matron, and had shown in his monument to Bishop Jackson in St Paul's cathedral an archaic severity and dryness altogether excessive, sought elevation of conception such as brought him applause for his "Tennyson" in portraiture and for his classically-inspired relief "Virgilia lamenting the Banishment of Coriolanus"—probably his most admirable and most exquisitely touching work.

Meanwhile, Baron Carlo Marochetti (1809–1867; A.R.A., 1861; R.A., 1866), an Italian of French parentage, had tried to introduce a more modern feeling, and his "Richard Cœur de Lion" at Westminster evoked great enthusiasm. It is difficult, now, to admire without reserve the incongruity of the 12th-century king, mounted on a modern thoroughbred, and raising arm and weapon with an action lacking in vigour. The intention was excellent and fruitful, notwithstanding, and the statue is not without merit. It was he who cast for Landseer the lions of the Nelson monument in Trafalgar Square, London.

Later on Charles Bell Birch (1832–1893; A.R.A., 1880), with his German training, introduced a new picturesque element in his "Wood Nymph," "Retaliation," "The Last Call," and the "Memorial to Lieut. Hamilton, V.C., dying before Kabul"; but neither the vigour nor the individuality of his work influenced his contemporaries to any extent, doubtless on account of the strong Teutonic feeling it displayed.

Sir Joseph Edgar Boehm, R.A. (1834–1890), an Austrian by birth, was more successful, and his influence, helped by the talent of able studio-assistants (Professor Lantéri, Alfred Gilbert, and others), contributed somewhat to thaw the chill which the cold marble still seemed to shed around. There was not much inspiration in his monument of "General Gordon" in St Paul's cathedral, and his "Wellington Memorial" is cold and empty, though correct enough; but the "Herdsman and Bull," among his ideal subjects, the "Carlyle" on Chelsea Embankment, among his portrait-statues, had the right feeling in them. His busts were usually excellent.

J. H. Foley (1818–1874; A.R.A., 1849; R.A., 1858), who at first was all for "the unities" and a "pure style," seemed in his later years to throw his previous convictions to the winds, when he produced the finely spirited equestrian statue of "General Sir James Outram," now erected in India, and the statue of Sir Joshua Reynolds in the Tate Gallery. This statue was welcomed with enthusiasm in the art world, and helped to remind the public that monuments need not be staid to dulness, nor stiff and dead in their imperturbability.

Meanwhile Henry Hugh Armstead (1828–1905; A.R.A., 1875; R.A., 1880), who had begun by devoting himself to the art of the silversmith, fashioning the "St George's Vase," "The Packington Shield," and "The Outram Shield," was working in the spirit of the younger school; he made his first appearance in the exhibitions in 1851. He was carrying out commissions of considerable magnitude—in the Palace of Westminster, and in the Abbey itself, for which he executed the marble reredos with its many figures, the whole of the external sculptural decorations for the Colonial Office in Whitehall, as well as the eighty-four life-sized figures on two sides of the podium of the Albert Memorial, with the four bronze statues, "Chemistry," "Astronomy," "Medicine," and "Rhetoric." Portrait-figures of all ages are here classed together, and the work is a better-sustained piece of designing and carving than is commonly understood. The statue set up at Chatham of "Lieutenant Waghorn" is a good example of Armstead's sculpture, impressive by its breezy strength and picturesqueness; but a more remarkable work, technically speaking, is the memorial to a son of the earl of Wemyss, "David and the Lion," now fixed in the Guards' Chapel. It is in very flat relief; Ninevite in character of treatment, and carved wholly by the artist directly from the living model, it is, in point of technique, one of his best productions. His marble statuette of "Remorse," bought for the Chantrey Collection, is a remarkable example of combined intensity of expression and elevated purity of style. The work of Armstead is monumental in character—the quality which has been so rare among British sculptors, yet the finest quality of all; and in almost everything he did there is a "bigness" of style which assures him his place in the British school.

Following the chronological order of the artists' first public appearance, as being the most convenient and the only consistent method that will prevent overlapping, we come to F. J. Williamson (b. 1853), who executed many works for Queen Victoria; John Hutchison, R.S.A. (b. 1856), a Scottish sculptor of the Classic school; and George A. Lawson, H.R.S.A. (1832–1904). Lawson was a pupil of Alexander Ritchie, of the Royal Scottish Academy, and in a measure of Rome. He went to London in 1867, and soon proved himself one of the best sculptors Scotland has produced. "In the Arena" was his first striking group; "Daphnis" is an excellent example of his Classic life-size work; and "Motherless" one of his greater successes in a more modern and pictorial spirit, a group full of pathetic pathos and free and sympathetic handling. "Callicles," "The Weary Danaïd," "Old Marjorie," and the statue of "Robert Burns," erected at Ayr, are all in their way noticeable. Lawson's work, which only requires a little more animation to be fine, has the quality of "style," and is strong, manly, and full of distinction.

Sir Edwin Landseer (1802–1873) had exhibited in 1866 a "Stag at Bay," but his four colossal lions for the Nelson monument in Trafalgar Square, London, constitute his principal plastic works. They engaged him from 1859 to 1867, the year in which they were set up. The casting of them, as already stated, was carried out by Baron Marochetti. Each is 20 ft. in length and weighs 7 tons. They have great nobility and dignity of pose, and although they are not altogether sculptural in treatment, they are finely impressive with a good sense of style.

George Simonds (b. 1844) is a product of the foreign schools. He is the author of many monumental works and not a little decorative sculpture, but he is best recognized by ideal subjects, such as "Dionysus astride his Leopard" (his finest work), "The Goddess Gerd," "The Falconer" (in the Central Park, New York), "Cupid and Campaspe" and "Anemone, the Wind Flower." His treatment of the undraped female figure is refined and delicate, and there is an intellectual reality about his best work, as well as imagination in conception. A. Bruce-Joy (b. Dublin, 1842) has produced ideal work and statues of public men for public spaces, and many busts.

Thomas Brock (b. 1847; A.R.A., 1883; R.A., 1891), whose work is prodigious in amount as well as solid and scholarly, came to London from Worcester in 1866 and fell early under the influence of the sculptor Foley, who was soon to rebel against the formalism that prevailed. When his chief died, in 1874, Brock was appointed to carry out the great unfinished works in the studio—the "O'Connell Monument" in Dublin, the "Lord Canning" in Calcutta, and several others. But he felt the foreign current; and even when his style was formed, his career being already assured, he was perceptive enough to modify it, and, so developed, he left his master very far behind. The ideal work that marked this transition was "The

Moment of Peril," a fine, scholarly work representing a mounted Red Indian repelling the attack of a great serpent which has thrown his horse to earth. How greatly he improved in technical quality and in refinement of taste is to be seen in the life-sized marble statue called "The Genius of Poetry"—graceful where the "Moment of Peril" was violent in action, reposeful and harmonious where that was vigorous, and sculpturesque where that was anecdotal. A higher intellectual point was reached in "Song" and in the "Eve," now in the Tate Gallery in London. A similar advance is to be observed in Brock's portraiture. The statues of "Robert Raikes" (on the Thames Embankment) and "Sir Richard Temple" (in Bombay Town Hall), for example, are finely treated, unconventional figures; but "The Rt. Rev. Henry Philpott, D.D., Bishop of Worcester," in which the inherent difficulty of a seated figure is happily surmounted, marks the progress. The skill with which the artist has given the drapery, especially of the sleeves, a lightness not commonly seen, is striking. There are no black holes of shadow: the depressions are shallow and of the right shape to hold light even while securing shadow; yet weakness is avoided and crispness is secured by the sharpening of the edge of the folds—the principle which is established in the Pheidian group of "The Fates," for example, among the Elgin Marbles. Other works of importance in the same class are the effigy of "Dr Benson, archbishop of Canterbury," and the admirable statue of "Sir Richard Owen" in the Natural History Museum, South Kensington, and especially the "Thomas Gainsborough" in the Tate Gallery, are all of a high order whether as to character or handling. With these may be grouped the statue of "Sir Henry Irving," the tribute of British actors to the memory of the great dramatic artist (1910), and the seated marble statue of Lord Russell (1904). The bust of Queen Victoria is one of the noblest and most dignified works of its class executed in England; full of tenderness and of character, lovingly rendered; and with a delicate feeling for form, rightly realized. This head heralded the noble work by which the memory of Lord Leighton is to be kept green in the aisle of St Paul's cathedral. In proportion and in harmony of design and of line, alike in conception and in reticence, it is the sculptural expression of a well-ordered mind and taste. The effigy shows Leighton asleep, while figures personifying his arts, painting and sculpture, guard his sarcophagus at head and foot. There is a note of triumph in the great design for the "Queen Victoria Memorial," which provides London with its most elaborate sculptural effort, rising 70 ft. high on a plateau 200 ft. across, with numerous emblematical figures of great size and imposing arrangement. It is based on an elevated style, dignified, refined and monumental; for Brock is a sculptor in the full sense of the term, and his lines are always good.

D. W. Stevenson, R.S.A. (1842–1904), in his general work showed but little sympathy with modern developments. The "Bronze Lectern" (in St Cuthbert's Church, Edinburgh) is perhaps the most decoratively effective; but his most ambitious work, called "The Pompeian Mother," is a modern adaptation of the "Niobe and her Daughter" by a follower of the school of Scopas in the Uffizi Gallery.

Although Horace Montford, modelling master at the Royal Academy, passed much time in the studio of Matthew Noble (1818–1876), he did not thereby lose his sculptural taste. Not that he displayed it much in the share he had, as assistant to C. B. Birch, A.R.A., in the modelling of the notorious "City Griffin" at Temple Bar—a weird but spirited beast, the design for which had been supplied by the city architect, Sir Horace Jones. "A Hymn to Demeter," a life-size statue full of movement, and the statue of "Psyche and the Casket of Venus," may be named as typical of the style of Montford, whose work is usually broad and sculpturesque, distinguished by firmness and grace.

Sir Charles B. Lawes-Wittewronge (b. 1843) has produced three large works which have attracted attention: an elaborate and spirited equestrian group of a female Mazeppa—"They Bound me on" (1888); "The United States of America" (1890), decorative and not without elegance, and "The Death of Dirce." The last-named, of heroic size, in variously coloured bronze, was first exhibited at the Royal Academy in 1908, and again, in coloured marbles (yet not truly polychromatic in character) in colossal size, at the Franco-British Exhibition (1908). The complexity of the design, the skilful composition and arrangement of the elaborate group, the vigour of the modelling, and the impressiveness with which the work imposes itself upon the spectator, combine to render this perhaps the most important sculptured group of its kind exhibited in England. Sir Charles's work is always strong and robust, though occasionally somewhat lacking in repose.

W. Hamo Thornycroft (b. 1850; A.R.A., 1881; R.A., 1888) became a great influence for good in the British school. His tendency towards the Greek has been a wholesome reminder of the danger of the over-enthusiasm for naturalism, and yet was never forced to conventionalism. Alike in ideal work, in monumental sculpture and in portraiture, his art is marked by refined taste and scholarship and a noble sense of beauty. It is strong, yet without undue display of power. In him we have to appreciate an unaffected sympathy with grandeur and style, and in all, a big, broad rendering of the human form, with something of the movement of the Greek sculptors and not a little of their repose, yet individual and unmistakably belonging to the British order of mind. In his largest monumental group, however, the "National Memorial to W. E. Gladstone," erected in the Strand, London, there is little trace of the classic. In this work, as in the bronze statue of Bishop Creighton in St Paul's Cathedral, there is a modern feeling entirely responsive to the feeling of the people. Mr Thornycroft's seated marble statue of Lord Tennyson (1909) in Trinity College, Cambridge, is one of his finest portrait figures, full of dignity and excellent in likeness—a worthy memorial of the poet.

J. Havard Thomas began in 1872 to exhibit portrait sculpture, and soon turned his attention to ideal work, but he did not attract widespread attention until 1886, when he produced "The Slave Girl." This marble nude was a curious contrast to most Slave Girls by other sculptors—that by Hiram Powers, for example. Somewhat stunted in form, she is nevertheless full of very human grace and well-felt realism, and is a good example of the artist's carving. Mr Thomas, indeed, is one of the few to carve his own marbles, often without taking the intermediate step of making a clay model. This of course cannot be the case with his large sculpture, such as his great statue of "The Rt. Hon. W. E. Forster" at Bradford, and his "Samuel Morley, M.P.," and "Edmund Burke, M.P.," both at Bristol; but the beautiful small heads of peasants and children—such as the Donatellesque "Pepinella"—of Capri, where he lived for years from 1889 onwards, are mostly carved direct from life. The beauty of his chisel work can be seen to perfection in the exquisite bust of Mrs Wertheimer in the Tate Gallery; the marble seems to turn to flesh under his chisel and to palpitate with life: it is, perhaps, too much like flesh. This is very far from the "Classic," with over-attention to which Mr Thomas has curiously and quite inaccurately been reproached. It is true that his much discussed statue "Lycidas" appears to be a distant echo of Myron; it is in truth archaistic, but with an aim altogether different from that of the Greek. It is Classic in a sense, full of life and wonderfully modelled, but the attainment of perfection of human beauty was not the intention of the sculptor, and yet it appears to the unobserving as but a *rifacimento.* There is a vivid sense of style in Mr Thomas's work, and sometimes a search for beauty in subjects which to the common eye may suggest the ugly. But Mr Thomas must be recognized as an artist of great power and originality and to the last degree conscientious. Sculptural subtleties he loves, and he works in a low key, quiet and unobtrusive, and severe though he is, he is a poet in sentiment with extreme refinement of taste. His reliefs are fine in rhythm, and by their accentuated definition, allied with delicacy, extremely telling.

From the year 1873 Edwin Roscoe Mullins (d. 1905) produced numerous busts and statues, and his work was in the main ideal and decorative. His best figure is probably that of "Cain—My Punishment is Greater than I can Bear," executed in 1896; his latest work, "The Sisters" (1905), shows considerable grace. Mullins' work in architectural embellishment was good in style, appropriate and effective.

Joseph Swynnerton (d. 1910) was a sculptor who spent a good deal of his time in Rome and worked under her influence. His colossal fountain of flowers, zephyrs and splashing nymphs is, on the contrary, rather rococo in style, with charming passages. On the other hand, "Love's Chalice" is Classic in feeling. Generally speaking, Swynnerton's work has an appearance of strength, without commonness or lack of effect.

E. Onslow Ford (1852–1901; A.R.A., 1888; R.A., 1895) was lost to British art before he had passed middle age. His seated statue of "Henry Irving as Hamlet" is a well-conceived piece of realism, with expression subtly marked, and verging upon the theatrical—which is precisely what an actor's character-portrait should be. Compared with this work, the later seated statue, that of "Huxley," keen and refined, is more strictly sculpturesque—for in it there is no "subject," and there are no ornaments to divert the attention and suggest a false appearance of decoration. The statue of "Gordon" mounted on a camel—reminding us too vividly of the "Arab Chief" by Barye—is more open to criticism on the score of the elaborateness of the ornamental details, which almost reach the boundary of what is allowable in sculpture. It is erected at Chatham, and a replica has been set up (1902) in Khartum. A finer memorial is that to the honour of "Shelley." It is, however, better in its parts than in its entirety, because the decorative scheme injures, rather than helps, the sculptural dignity of the drowned poet's exquisitely-rendered figure. Of Onslow Ford's other memorials, that of Queen Victoria at Manchester is perhaps the most discussed and the least to be admired, for although the conception is dignified and characteristic, it does not rank by any means with the best of which the artist was capable. As a truthful portraitist Onslow Ford had few rivals. The sitter is before the spectator, without undue flattery, yet without ever showing the commoner side of the model. Flesh, bone, hair, clothing, are all in their true relation, and the whole is admirably realized. Idealism, or at least poetic realism, Onslow Ford cultivated in a series of small works. Of his last figure, "Glory to the Dead," it may be said that, although statuesque, it carries realism rather far in treatment. It may be objected that in funerary art, so to call it, the nude was never resorted to by the Greeks in such a relation; but Onslow Ford felt that he was working, not for ancient Greeks, but for modern Englishmen, and that sentiment, and not archaeology, must in such matters be the guide. There are, besides, the "Marlowe Memorial," set up in Canterbury—graceful and refined, but rather trifling in manner—and the "Jowett Memorial," a wall decoration, in the style of the Italian Renaissance. The work of Onslow Ford always charms, for he had a strong sense of the picturesque and a true feeling for beauty, but with insufficient power. But for his delight in decorative detail, he would have been greater than he was; for over-enrichment is in inevitable opposition to the greater qualities of the monumental and the dignified in glyptic art, and abundance of small details involves poorness of effect. But against Ford's taste, especially against his admirable dexterity, little can be said. The high degree of refinement, the charm of modelling, grace of line and composition, sweetness of feeling, which are the note of his work, are in a great measure a set-off against occasional weakness of design and character, and lack of monumental effect.

H. R. Hope Pinker is primarily a portrait-sculptor. Of all his works the seated statue of "Dr Martineau" is perhaps the best, for interest, refinement, and for technical qualities. His reliefs are as numerous as his statues, of which the most popular is the "Henry Fawcett" in the Market Place of Salisbury, but his most important work is the colossal statue of Queen Victoria executed for the government of British Guiana.

The most remarkable work executed by any British amateur-sculptor is the "Shakespeare Memorial," presented to the nation by Lord Ronald Sutherland Gower, and set up by him outside the Shakespeare Theatre at Stratford-on-Avon (1888). This monument, carried out in Paris, represents the poet on the summit, attended below by the four great characters—"Hamlet," "Henry V.," "Lady Macbeth" and "Falstaff," designed with singular ability and a happy display of symbolic inventiveness. Lord Ronald also modelled statues of "Marie Antoinette," "The Dying Guardsman," and other works which have secured wide attention.

In 1877 there burst upon the world a new sculptor, in the person of Sir Frederick (afterwards Lord) Leighton (1830–1896; A.R.A., 1864; R.A., 1868), who, in the following year, was to be the president of the Royal Academy. His first work was "An Athlete Struggling with the Python." No piece of sculpture of modern times made a greater stir on its appearance; for here was a work, by a painter, a work, it was declared, which would have done honour to the ancients, fine in style, noble in type and in form, learned in the knowledge of the figure it displayed, original and strong in pose, in action and movement; scholarly in execution and instinct, with the manner of the painter himself. The group was hailed as a masterpiece by one who was thought to be not yet even a student in sculpture, and it was declared by the most exacting critics to be worthy to rank with the best examples of all but the finest periods. Yet it is somewhat lacking in expression—in that kind of humanity which every really great masterpiece of art should exhibit; and connoisseurs applauded the technique, the surface qualities and the like, when they should have been caught by the sentiment. But as Leighton was seeking only the beauty and expression of form, to the neglect of sentiment, he was well content with the reception and world-wide recognition of his work. One day the model for the "Athlete," tired out, rose and stretched himself, and the sculptor was so enraptured by the pose that he forthwith began the model for the "Sluggard." This work is in its way of still higher accomplishment than the "Athlete." It is just as Greek as the other in its devotion to form and its worship of the beauty of the human frame. But it is a condition, a sensation, an idea, rather than an action, that is here recorded; and so it is the higher conception. And it has some of the mystery which is distinctive of the finest art of ancient times, in which modern sculpture is almost entirely deficient. Yet while the "Athlete" may be compared, in idea, with the relatively debased "Laocoon," which it seems in some degree to follow if not to challenge, the "Sluggard" belongs to a more elevated expression of a distinctly pagan art, and, as it were, to a better period. Great as was the sensation made by these works, and by the charming little statue of "Needless Alarms" (cast by the "lost-wax" process), Leighton seems to have left no direct follower or imitator among the younger men.

T. Stirling Lee, by natural ability as well as by cultivation, is an artist of unusual elevation of mind and excellence of execution, and in his composition he aims at securing beauty by the arrangement of his figures in the panel, rather than at enriching them with details, as a designer would do. He is an ascetic in choice of materials, so that his works generally remain beautiful studies of the human form, draped or undraped. It is for his power of telling a story beautifully in marble—as in his panels for St George's Hall, Liverpool, which are among the finest work of their kind in England—that Mr Lee will continue to be admired: he is, beyond almost all others, a sculptor's sculptor. His statue of "Cain," extremely simple in conception, is a masterpiece of expression.

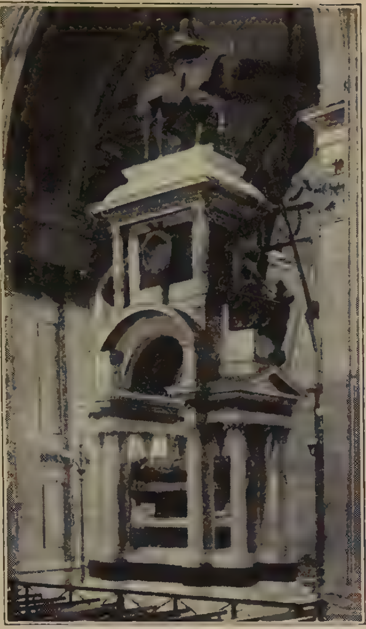
John M. Swan (1847–1910; A.R.A., 1894; R.A., 1905); a pupil of the Royal Academy and of Gérôme and Frémiet, specialized as a sculptor of a particular class of subject. He is a stylist in a high degree, whose work is full of beauty and importance. For the most part, but by no means exclusively, his sculptures are studies of animals, mainly of the *felidae*; but he would pass from the accentuation of action to the covering of skin and hair, without seeking much to emphasize the bone and flesh, because they alone display, with the fascinating expressiveness of their sinuous bodies, the whole range of the passions in the most concentrated form. In the "Leopard Playing with a Tortoise," "Leopard Running," "Puma and Macaw," and similar works, we have the note of his art—sinuosity, with tense muscles, stretched and folded skin, suppressed frenzy of enjoyment. The note of Barye, the great Frenchman, from whom in some measure Swan drew inspiration, is power and strength and decorative form, but his aim is rather at fine, grim, naturalistic studies of a great cat's crawl, with amazing vivacity and vitality. In certain groups, such as "Orpheus" and "Boy and Bear Cubs," the sculptor combines the human figure with animal forms. In the composition of these there is always the note of originality.

Another student of animal life is Harry Dixon, whose bronze "Wild Boar" is in the Tate Gallery. "A Bear Running," excellent alike in character, form and construction, and especially in movement, "Otters and Salmon," and the figure-subject called "The Slain Enemy"—a prehistoric man with a dead wolf—are among his chief works.

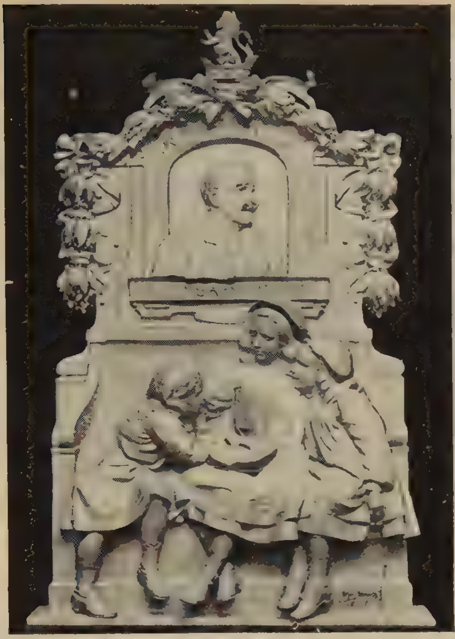
Andrea C. Lucchesi is one of the few who, in spite of all discouragement, has not only persisted in concentrating his attention on ideal work, but has devoted most of it to the rendering of the female form. Prominent among his figures are those called "Destiny," "The Flight of Fancy," "The Mountain of Fame," "The Myrtle's Altar," "Carthage, 149 B.C.," and "Verity and Illusion." Mr Lucchesi's main excellence is in the treatment of nude forms, in which he has succeeded, through agreeable working out of idea and excellent execution, in interesting a public usually indifferent to this branch of sculpture.

Alfred Gilbert (b. 1854; A.R.A., 1887; R.A., 1892; resigned, 1909) is to be regarded as one of the greatest figures in British sculpture, not only as being a master of his art, but as having preached in his work a great movement, and in less than a decade effected more than any other man for the salvation of the British school, and inspired almost as much as Carpeaux or Dalou, the young sculptors of the country. Among his earlier works are two fine heads of a man and a girl, pure in style and incisive in character, which were cast by the *cire perdue*, or "lost-wax," process, which he had learned in Naples. Its introduction into Great Britain—or, it may be more correct to say, its revival—had considerable influence on the treatment of bronze sculpture by British artists. In Gilbert's portraiture we have not merely likenesses in the round, but little biographies full of character, with a spiritual and decorative as well as a physical side, and the mental quality displayed with manly sympathy. Flesh and textures are perfectly realized, yet broad, simple, and modest. Many of these qualities are as obvious in his portrait-statues, such as the fine effigy set up to "John Howard" in the market-place of Bedford. The monument with which Gilbert's name will ever be associated is the "Statue of Queen Victoria" set up at Winchester, which, since its erection and re-erection in that city, has been irretrievably injured by depredations, and remains incomplete in its decorative details. The queen is shown with extraordinary dignity. Large in its masses, graceful in its lines, the person of the queen enveloped by all the symbolical figures and fanciful ornaments with which the artist has chosen to enrich it, the monument marks the highest level in this class to which any sculptor and metal-worker has reached for generations. The profusion of an ardent and poetic imagination is seen throughout in the arrangement of the figure itself, in the exquisite "Victory" that used to surmount the orb, in the stately throne. Invention, originality, and inspiration are manifest in every part, and every detail is worked out with infinite care, and birth is given to a score of dainty conceits, not all of them, perhaps, entirely defensible from the purely sculptural point of view. In a measure it suggests goldsmithry, to which the genius of Gilbert has so often yielded, as in the exquisite epergne presented to Queen Victoria on her jubilee in 1887, typifying Britannia's realm and sea power in endless poetic and dainty suggestions of beautiful devices. Among Gilbert's memorials, not mentioned elsewhere, are those to "Frank Holl, R.A.," and to "Randolph Caldecott," both in the crypt of St Paul's cathedral, London; the "Henry Fawcett" memorial in Westminster Abbey, which, with its row of expressive little symbolical figures, has been styled "a little garden of sculpture." The finest work of its kind in England is the "Tomb of the Duke of Clarence" in St George's chapel, which in 1910 still awaited final completion. Perhaps his best composition expressive of emotion is the half-length group "Mors Janua Vitae," a terra-cotta group designed to be executed in bronze for the hall of the Royal College of Surgeons. Few artists in any age have shown greater genius as at once artificer and sculptor. Gilbert is fond of dealing with a subject which allows his fancy full play. His work is full of colour; it is playful and broad. The smallest details are big in treatment, and every part is carefully thought out and most ingenious in design. His playfulness has caused him at times to be somewhat too florid in manner; but his taste is so just, and his fancy so inexhaustible, that he has safely given rein to his imagination where another man would have run riot and come to grief.

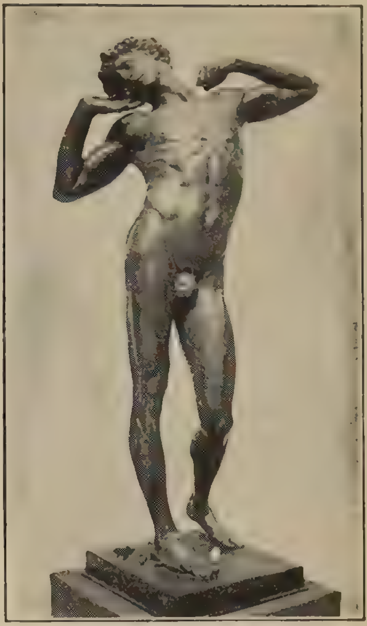
Robert Stark is an animal sculptor who has usually attracted the notice of connoisseurs rather than of the greater public, and his fine bronze statuette of an "Indian Rhinoceros" is to be seen in the Chantrey Collection. Mr Stark has a profound knowledge of



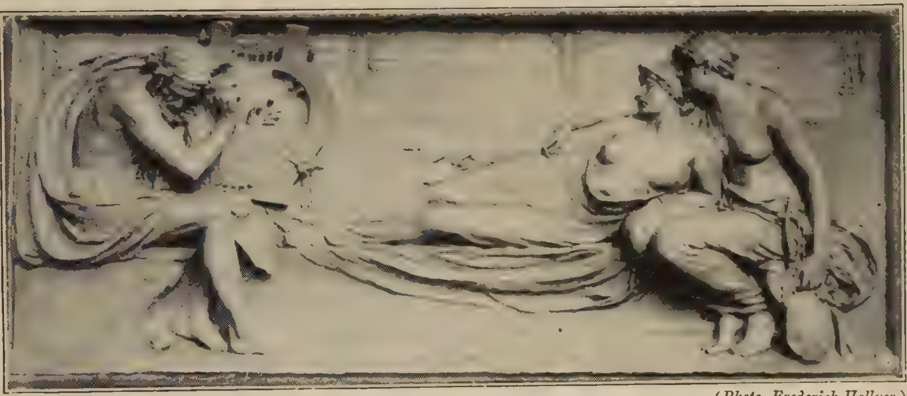
(*Photo, London Stereoscopic Co.*)
ALFRED STEVENS—The Wellington Monument, St Paul's Cathedral, London.



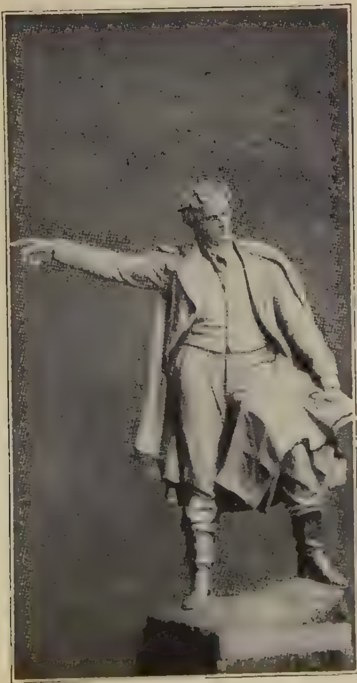
SIR GEORGE FRAMPTON, R.A.—The Dr Barnardo Memorial.



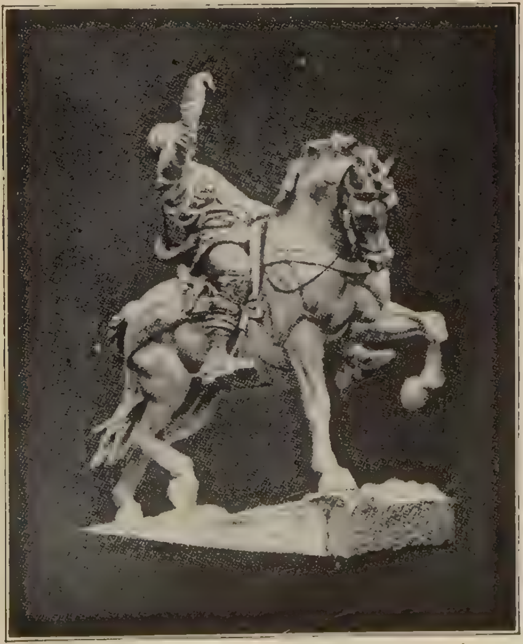
(*Photo, Mansell & Co.*)
LORD LEIGHTON, P.R.A.—The Sluggard.



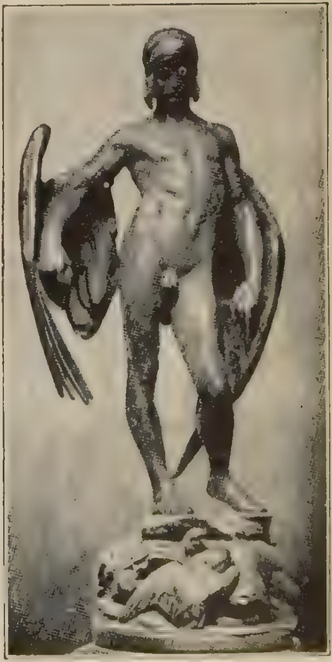
(*Photo, Frederick Hollyer.*)
HARRY BATES, A.R.A.—Homer.



H. H. ARMSTEAD, R.A.—Lieutenant Waghorn.



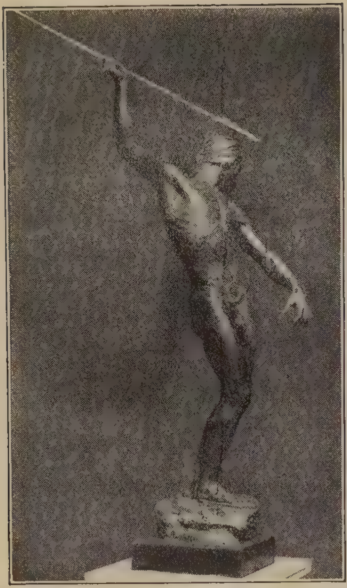
G. F. WATTS, R.A.—Hugh Lupus.



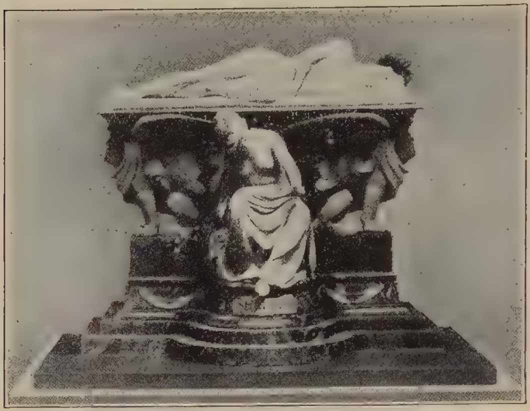
A. GILBERT, M.V.O.—Icarus.

Plate IV.

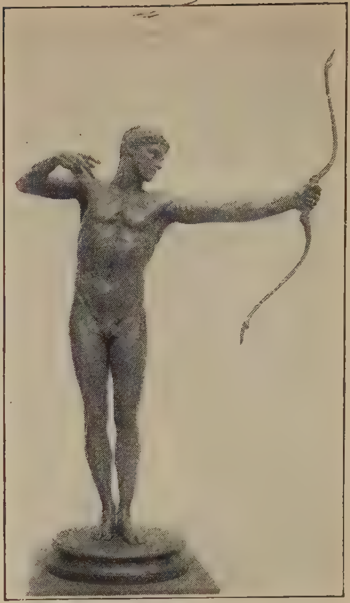
SCULPTURE—British *(b)*



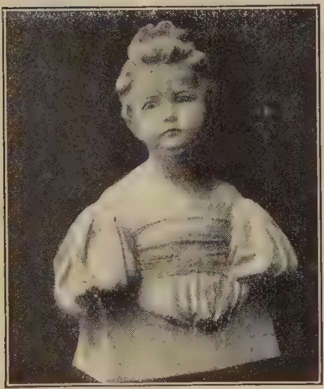
F. W. POMEROY, A.R.A.—The Spearman.



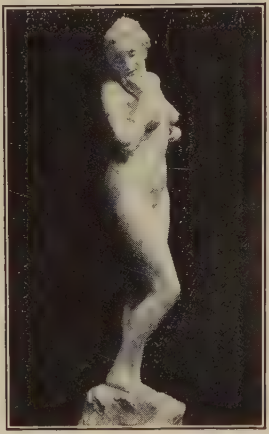
E. ONSLOW FORD, R.A.—Shelley Memorial.



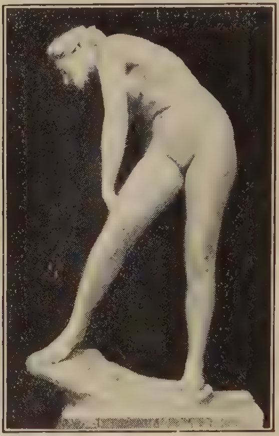
W. HAMO THORNYCROFT, R.A.—
Teucer.



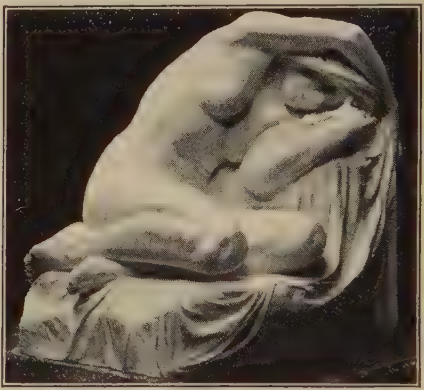
ALFRED DRURY, A.R.A.—
Innocence.



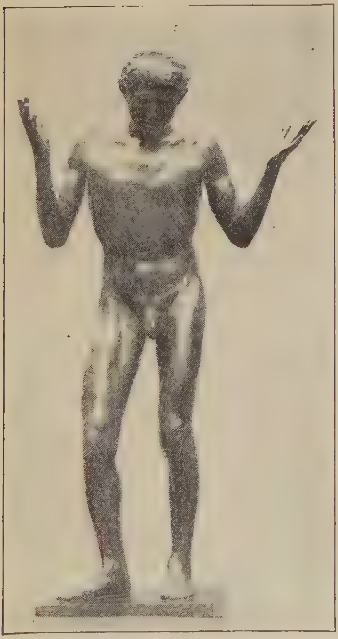
F. DERWENT WOOD, A.R.A.—
Psyche.



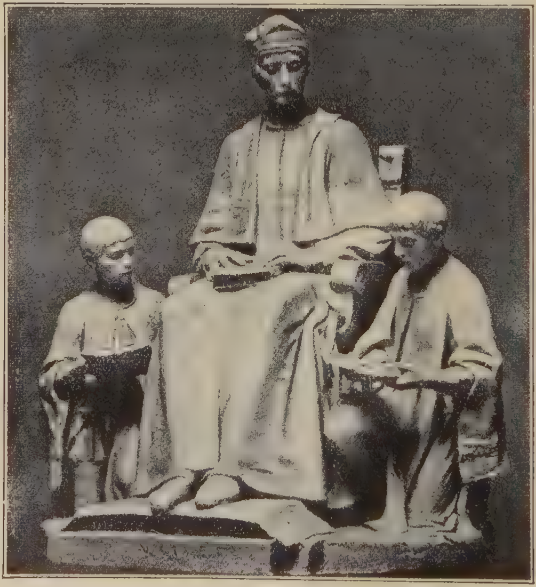
BERTRAM MACKENNAL, A.R.A.—
Diana Wounded.



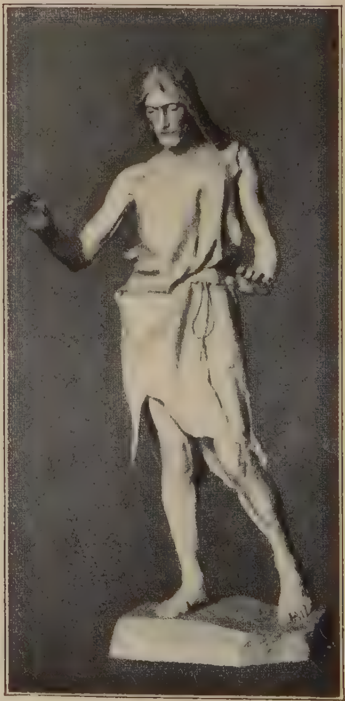
ALBERT TOFT—
Antigone.



HAVARD THOMAS—Lycidas.



W. HAMO THORNYCROFT, R.A.—Dean Colet.



W. GOSCOMBE JOHN, R.A.—
St John the Baptist.

animal anatomy; his range is considerable, and he is as easy with a rhinoceros as with a cart-horse or a hunter.

Conrad Dressler is best known for his busts of distinguished men, but his statue of "A Girl Tying up her Sandal," and his two large marble panels for St George's Hall, Liverpool, assured him his position. There is a cleverness, a daring, in his marked style, vigour of treatment, and a tendency towards emphasis, especially in his decorative work, much of which is designed for execution in Della Robbia ware. Since his return to pure sculpture he has executed some important work, including a bronze "Bacchante."

In the work of Harry Bates (1850–1899; A.R.A., 1892), especially in the reliefs, with its balance and dignity, its rhythmical line and fine expression, is to be seen a flexibility which few Englishmen had shown up to that time. Style and a genuinely modern treatment of classic form, which is not weakened by touches of naturalism, were also to be recognized. Nor—in his "Homer," for example—does the background detract from the main subject: Homer and Humanity in front; and behind, a vision of the Parthenon and Pallas Athene, and the great Sun of Art rising with the dawn of Poetry. "Psyche" is more delicate in thought and treatment, but it has little of the originality or force of the "Homer," or of the classic style seen in the head called "Rhodope." The serene and reposeful statue of "Pandora," about to open her ivory casket, successfully achieves the purity of style at which the sculptor aimed. "Hounds in Leash" (the bronze of which belongs to the earl of Wemyss) is a vigorous group which was undertaken by Bates in response to the criticism that he could design no figures but such as are at rest. The plastic group is in the Tate Gallery, where it figures along with the "Pandora." In "Endymion" the sculptor seems to have united in some degree the sculptural ideas expressed in the "Homer" and the central relief of "Psyche": there is in it a good deal of the grace of the one and of the decorative force of the other, together with a lofty sense of beauty. The portrait-busts of Harry Bates are good pieces of realism—strong, yet delicate in technique, and excellent in character.

Sir George Frampton (b. 1860; A.R.A., 1894; R.A., 1902; knighted, 1908), pupil of the Royal Academy, the Lambeth Schools, and Mercié in Paris, is a particularly versatile and original artist, thoroughly in the "new movement" which he has done so much to direct. Highly accomplished, he is at home in every branch of his art, and covers the whole field. He first exhibited "Socrates Teaching" (1884), and followed this with "The Songster" (1887), "An Act of Mercy" (1888), "In Silence Prayeth She," "The Angel of Death" (1889), "Caprice" (1891), and in 1892 "The Children of the Wolf"—his last ideal statue of the kind. It was followed by "Mysteriarch," heralding a class of work with which the artist has since identified himself; for being in open rebellion against "white sculpture," he thenceforward devoted himself to colour. "Mother and Child" is an experiment in polychromatic figure-work. The half-length figure called "Lamia," with ivory face, head, and neck, and in a quaint head-and-neck dress of bronze jewelled, is a further departure from the true reserve of sculpture, but beautiful and delightful in feeling. The statue of "Dame Alice Owen," in bronze and marble, and "King Edward VI." are original, notwithstanding the pseudo-medieval taste of their conception. Frampton is happiest in distinctly decorative sculpture. His prolific and inventive fancy has expressed itself in such works as the bronze "The Steamship" and "The Sailing Ship" for Lloyd's Registry in London, and in the memorial "Monument to Charles Mitchell," at Newcastle-on-Tyne. Herein a new note is sounded, and we have some of the most striking features of Frampton's design. That is to say, he seeks to escape from the purely architectural forms, pediments and mouldings, introducing his own inventions of curved lines, and frequently substituting tree-forms for columns or pilasters, with roots for bases, trunks for pillars, and branches and foliage for capitals. Besides these should be mentioned "The Vision," the seven heroines from the *Morte d'Arthur*, "My Thoughts are my Children," "Music" and "Dancing," and memorials and busts of "Charles Keene," "R. Stuart Poole," "Leigh Hunt," "Passmore Edwards," "Dr Garnett," a colossal statue of "Queen Victoria" erected in Calcutta, and another, an extremely successful work, for Leeds. His group of "Maternity" (1905) and the full-length seated statue of the marquess of Salisbury (1907) have added to his reputation. There are always charm of arrangement, delicacy of workmanship, and daintiness of feeling, as well as considerable power of design, simplicity, and breadth in his work. Sir George Frampton has also produced a number of fine medals.

W. S. Frith, one of the most successful teachers of sculptors in England, is chiefly remarkable for the decorative quality of his work. As in the monument to "Wheatstone, Inventor of the Telegraph," or again, the standard lamps at the Astor Estate Office on the Thames Embankment, the sculptor shows charm of thought and spirit of design, vigour, and richness of effect. His ideal statuary and portraiture are not his chief work, however; his decorative sculpture for ecclesiastical and secular buildings is vast in extent and has had good influence on the younger school. One of his chief works is the "Bishop Ellicott's Memorial," a tomb with recumbent figure, a design of considerable imagination.

Henry A. Pegram (b. 1862; A.R.A., 1904), a pupil of Hamo Thornycroft and of the Royal Academy, attracted early attention with "Death Liberating a Prisoner," and by the two high reliefs "Ignis Fatuus" (acquired for the Chantrey Collection) and "The Doom of Medusa." These were followed by "Eve," "Sibylla Fatidica," "The Last Song," "The Bather," "Labour," and "Fortune," by decorative work for the exterior of the Imperial Institute, and later by the great candelabra which flank the interior western end of St Paul's cathedral. "Into the Silent Land" (1905) is a group typical of the funerary sculpture on which his chisel was engaged in later years. His portraiture is also noteworthy, and his work generally is usually sculpturesque, with movement and life.

A. G. Walker has produced notable work in the class of pure sculpture, including the relief representing "The Last Plague: The Death of the Firstborn," "Adam and Eve: And They were Afraid" and "The Thorn" (exhibited in bronze in 1910), graceful and quaintly charming, with elegance in the pose and in the action. His chief decorative work includes the sculptural figures in Stamford Hill Church.

The name of Captain Adrian Jones was for many years chiefly associated with the spirited work called "Duncan's Horses," a group displaying great knowledge of equine anatomy, form and action; since then his equestrian statue of "The Duke of Cambridge," erected in Whitehall, London, outside the War Office, has been recognized as a vigorous performance. His most important work is the monumental quadriga designed to crown Burton's great Arch at Hyde Park Corner, London.

W. Reynolds-Stephens (b. 1862), more devoted to goldsmith's figure-work than to larger and more searching sculpture, must be considered less as a statuary than as "a poet who sings in metal." A relief, after Sir L. Alma-Tadema's "Women of Amphissa" (1889), was followed by a "Wall Fountain," "Truth and Justice," and the "Sleeping Beauty," a bas-relief, full of thought, invention, and dainty conceits. In the highly decorated "Launcelot and the Nestling," "Guinevere and the Nestling," and similar works, the artist makes use of various coloured metals, ivory, gems and the like, with pretty symbolism. Apart from his choice of material, there is a delicate languor about the lines of his figures and reliefs, which display a charming feeling and refined taste. By two striking works he has re-entered the field of pure sculpture—the dramatic and somewhat too anecdotal "A Royal Game" and "The Scout in War," exhibited in 1908, an equestrian group of great refinement and excellence.

Alfred Drury (b. 1857; A.R.A., 1900) was a pupil of Dalou, whose assistant for a time he became. The first result was the curious echo of the master's style, "The Triumph of Silenus" (1885). "The Genius of Sculpture" and "The First Reflection" (bought by the queen of Saxony) and "The Evening Prayer" (1890, Manchester Corporation Gallery) were followed by the statue of "Circe" (1893), which, through its grace, elegance of line, and symbolical realization of the subject, achieved a great popular success and was acquired by Leeds. The bronze head of "St Agnes" (1894) is one of the first examples of Mr Drury's later style, belonging to the higher order of conception which, generally speaking, he has since maintained. This may be seen also in "Griselda" (bought for the Chantrey Collection), "The Age of Innocence," and other busts symbolical of childhood, and in the series of "The Months," at Barrow Court. For the decoration of the City Square at Leeds Drury executed the statue of Dr Priestly, consisting of the colossal figure entitled "Even." His colossal groups for the decoration of the War Office, the monumental panels in high relief for the piers of Lambeth Bridge, and the decorative sculpture for the façade of the new Victoria and Albert Museum, all in London, are works of considerable importance. Among the latter are the figures of "Inspiration" and "Knowledge," executed in 1907. Drury's quiet, suave, and contemplative art lends itself well as decorative sculpture to architectural embellishment. His portraiture is also good, reticent, and full of character, and as a manipulator of clay he represents the highest contemporary standard of English sculptors.

Frederick W. Pomeroy (A.R.A., 1906), pupil of the Lambeth and Royal Academy Schools, and of Mercié, is of equal taste and ability. After 1888, when he exhibited the bronze statuette "Giotto," he produced many ideal works—"Love, the Conqueror" (Walker Art Gallery, Liverpool), "Pleasures are like Poppies Spread," "Boy Piping," "Dionysos," and "The Nymph of Loch Awe" (both in the Tate Gallery), "A Nymph Finding the Head of Orpheus," "Undine," "Pensée," and the clever study of the nude called "The Potter." "Perseus" is an inspiration from Benvenuto Cellini, but "The Spearman" is an original and powerful work. "Feroniae" (1909) is a nude statue, in bronze, remarkable for grace and sculptural animation. In ideal portraiture he has produced the statues of "Admiral Blake," "Dean Hook" (a colossal work for Leeds), "Oliver Cromwell" (also colossal, for St Ives, Huntingdonshire), "Robert Burns" for Paisley, as well as "R. P. Bonington" (1910), "Monsignor Nugent of Liverpool" (1905), an impressive group, and similar work, together with the life-size panel of "Archbishop Temple," in bronze, for St Paul's cathedral. In true portraiture, Pomeroy executed the Liberal Memorial Statue of Mr Gladstone, in the lobby of the Houses of Parliament, and the recumbent effigy of the Duke of Westminster, for Chester cathedral. His work is strong and sculpturesque, and his statues "stand" well. He sees nature in a big broad way, and his decoration is effective and well designed.

Albert Toft became known by his statue of "Lilith" (1889), and emphasized the impression then created by "Fate-Led" (1892, Walker Art Gallery), "Age and the Angel of Death," "In the Sere and Yellow Leaf" (a remarkable study of old age), "The Goblet of Life," and "Hagar." "The Spirit of Contemplation" and "The Cup of Immortality" are more complete and display dignity and refinement. His memorials of the Boer War, at Cardiff and Birmingham, in design and silhouette, are among the most striking in the country. In "Mother and Child" (1903) and "Maternity" (1905) he has greatly raised the high-water mark of his achievement. Toft's busts, such as those of W. E. Gladstone and Philip Bailey, as well as his statue of Sir Charles Mark Palmer, at Jarrow, and similar works, have force and breadth of character; and in his ideal work there is an effort, well sustained and successful, after dignity, harmony, evenness of balance, and relation of the whole.

Professor Édouard Lantéri, a naturalized Englishman, to whom British sculpture owes much, employed his own striking gifts to teach rather than to produce. But "The Fencing Master," "The Duet," and "A Garden Decoration" have exercised influence on the younger school through their fine sculptural qualities of vitality, richness, joyousness, sensuousness, and movement. His portrait busts are full of life and have that refinement and elegance pushed to the utmost length, which are characteristic of all his work; in his nude figure called "Pax" we have much of the severity, dignity, and placid repose of the Greek.

W. Birnie Rhind, R.S.A., has produced little work so important as the elaborate decorations for the doorway of the Scottish National Portrait Gallery, but some of his statues and busts—"King James V. of Scotland," "Lord Salisbury," and others—show the influence of the modern school.

W. Goscombe John (b. 1860; A.R.A., 1899, R.A., 1909) achieved an early reputation with a figure of "St John the Baptist," an austere creation of real importance. His other chief works are "Morpheus," "A Girl Binding her Hair," "A Boy at Play" (Tate Gallery), "The Glamour of the Rose," and "The Elf"—a weird creation of true comedy. In these are shown a love of the purity and refinement of nature, realized with delicacy and a feeling for beauty. In portraiture Mr John is not less successful. The colossal seated statue of "The Duke of Devonshire" at Eastbourne has been acknowledged by the best critics in France and England to be one of the finest things of its kind, good in design and quiet suggestion of power. Among his chief memorials are the tomb of the marquess of Salisbury in Westminster Abbey, the "Memorial of the King's Regiment" at Liverpool, the equestrian statue of "Viscount Tredegar" at Cardiff, the "Maharajah of Balrampur" at Lucknow, and the monument to Sir Arthur Sullivan in the Embankment Gardens, London. These all sustain the reputation of the sculptor who has from the first been loyally encouraged by his fellow-countrymen of Wales. The striking frieze "The Battle of Trafalgar," for the pedestal of the statue of Viscount Tredegar (1910), is a remarkable performance.

Bertram Mackennal (A.R.A., 1909), the son of a Scottish sculptor settled in Australia, acknowledges no school, but was chiefly influenced by study in Paris. In his early ideal works, such as "Circe" and "For She Sitteth on a Seat in the High Places of the City," there are boldness and a sense of drama, with a keen appreciation of elegance of form, not without severity and power of design. But they give little hint of the excellence that was to follow and to bring him to the very front rank of British sculptors, so that in 1910 he was selected to design the coinage of the new reign. His great pediment in the Local Government Offices in Whitehall is perhaps the finest work of its kind in the Kingdom. "Diana," 1908, bought for the Chantrey Collection in the same year, is a marble nude of extraordinary grace, beauty and refinement; and his small "Earth and the Elements," similarly acquired in the preceding year for the Chantrey Collection, reveals a poetic beauty rare in these days. "The Mother" (1910) belongs to this group. The bronze statue of "The Dancer" (1904) is a work not less subtle, in which the learnedness of the sculptor is evident to every discerning eye, and "War," a colossal female bust, reveals a power, amounting almost to ferocity, not disclosed in the other works. Among Mackennal's other important statuary are the War Memorial at Islington and statues of Queen Victoria for India, Australia, and Blackburn; in all of these the sculpture is marked by good style, with movement, vigour, grace and nervousness of treatment.

G. Herbert Hampton made his first appearance in the Paris Salon with "The Mother of Evil," and then the statues of "David" and Apollo" and "The Broken Vow," "A Mother and Child," "Narcissus," "Orpheus" and other works were seen in the London galleries. Portraiture of merit has come from Mr Hampton, but his greatest success, perhaps, has been achieved in decorative sculpture.

F. E. Schenck (d. 1908) was similarly and more emphatically an architect's sculptor—one of those who have done much to embellish many of the numerous great buildings which during the last twenty years of the 19th and the opening decade of the present century sprang up all over Great Britain. The municipal buildings at Stafford and Oxford, the public library at Shoreditch, and the *Scotsman* offices in Edinburgh—involving groups of colossal figures bearing close relation to their architectural setting—are among the works which made his reputation. His defect was a "curliness" in his ornamental forms, which frequently detracts from the dignity and seriousness of his work.

J. Wenlock Robbins is another architectural sculptor of real power and individuality, whose work for the New General Hospital in Birmingham and for the Town Hall of Croydon is of a high order. His portraiture is also good, the colossal statue of "Queen Victoria" for Belfast being the most important of his achievements. Of ideal work, the statue called "Nydia" is the best known.

Henry C. Fehr (pupil at the Royal Academy and of T. Brock) contributed the group of "Perseus and Andromeda" to the Academy in 1893, when it was purchased for the Chantrey Collection (Tate Gallery). His subsequent ideal works, "Hypnos Bestowing Sleep upon the Earth," "The Spirit of the Waves," "St George and the Rescued Maiden," and "Ambition's Crown Fraught with Pain," confirmed the high opinion of his cleverness; but in some of them his exuberance tells somewhat against their general effect, in spite of their inherent grace and strength. On the other hand, the statue of "James Watt" for the City Square of Leeds exhibits those qualities needful for open-air portraiture; and his busts and statues have character and life. "Isabella and the Pot of Basil" is free from this defect, and is an original treatment of the subject; and "The Briton" (1908), though full of vigour and imagination, shows restraint.

George Wade is essentially a sculptor of busts and statues; the most noteworthy of his works are the memorial to Sir John Macdonald in Montreal, the seated figure for Madras of the native judge, Sir T. Aiyar Muthuswamy, and a number of ambitious monumental works.

Gilbert Bayes, at first a modeller in the flat of horses treated in a decorative manner, produced "Vanity," "A Knight-Errant," and similar picturesque *bibelôts* on a large scale; and later still, such work as "The Fountain of the Zodiac," showing a talent at once more serious, ordered and graceful. "The Coming of Spring" (1904) and "The Gallopers" (1905) are reliefs noteworthy for the intelligence and the sculptural appropriateness they display. The equestrian "Sigurd" (1909 and 1910) is full of fancy and illustrates the personal talent of the sculptor: the latter group was acquired for the Chantrey Collection. He is the designer of the great seal (1910).

W. R. Colton (b. 1867; A.R.A., 1903) is a sculptor of strong individuality, capable equally of deep feeling and dainty fancy. "The Girdle," "The Image-Finder," "The Crown of Love," "The Wavelet" and the "The Spring-tide of Life" revealed a sculptor of exceptional ability, whose love of truth and life has sometimes inspired him to place a touch of rather awkward realism in a graceful and charming composition; the result is something unusual, yet quite natural, and because it imparts to the work a flavour of quaintness and originality, it is not only unobjectionable but welcome. Later, Colton struck out another path especially in the monumental and statuary work executed in England and India. Among his principal efforts are the South African memorial to the Royal Artillery erected in the Mall, London, during the summer of 1910, the statue of the Maharajah of Mysore (1906) and a monumental "Tiger" (1909) in bronze—a work of considerable power. His vigour of design and sense of style made him a force in the younger school of sculptors. He has acted as professor of sculpture at the Royal Academy.

David McGill first attracted attention with the relief of "Hero and Leander," following it with a series of figures, of which the most striking is "The Bather," a work at once of vigour and of humour. His work is good in pose and line, refined in drawing and feeling, and excellent in style.

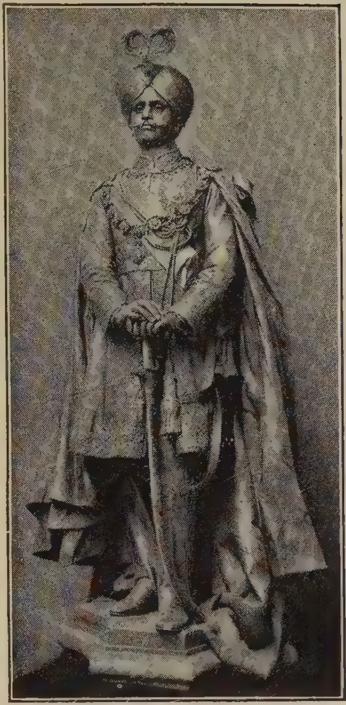
Charles J. Allen belongs to the same group. "Love and the Mermaid" (Walker Art Gallery, Liverpool), "A Dream of Love," "Rescued" and "Love's Tangles" (1908) are works of high merit, in every case good in treatment, free in modelling and pleasing in design. His important Queen Victoria memorial in Liverpool was unveiled in 1906, and the monument to "Rt. Hon. Samuel Smith, M.P.," and numerous busts have followed. "The Woman whom Thou gavest to be with me" is probably his completest ideal work.

F. M. Taubman, who had both French and Belgian teaching, has produced a series of works which display his power of design and strength of technique. "The Angel of Sad Flowers," "Orpheus and Eurydice" and "Adam and Eve" reveal his strength in ideal work; and the statue of "Sir Sidney Waterlow" at Highgate is a good example of his monumental portraiture. In "The Sandal," a small nude kneeling figure, he has turned frankly to classic coldness, and even the purity of design and modelling cannot warm it into life.

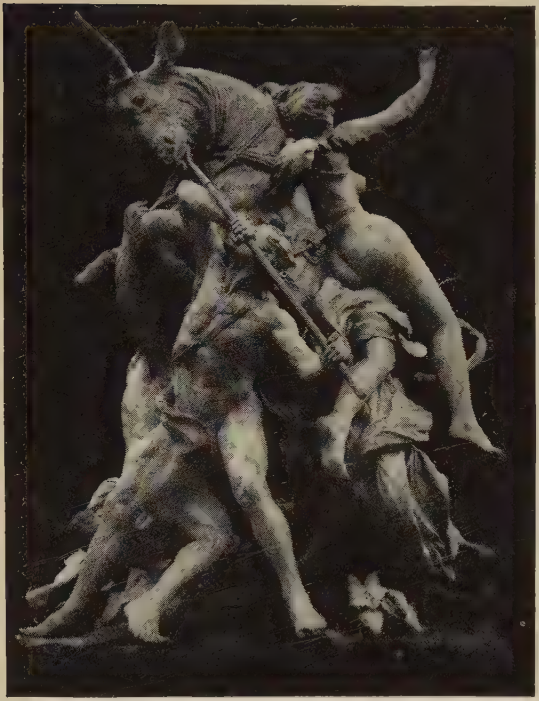
J. Pittendrigh Macgillvray, R.S.A., belongs to the rather meagre Scottish group, of whom he is generally regarded as the chief. His chief work consists mainly of monuments and colossal memorials. The "Peter Low Memorial" in Glasgow cathedral, the "Robert Burns," the "Allan Family Memorial," the fine relief of "Rhythm" and the "National Gladstone Memorial" for Scotland are his leading works. With these should be considered the "Dean Montgomery Memorial" in St Mary's cathedral, Edinburgh, and the "John Knox Memorial" in St Giles's cathedral.

F. Derwent Wood (A.R.A., 1910) is a sculptor of exceptional ability. His varied training—at the Royal College of Art, the Slade School, the Royal Academy schools, and under M. Rodin and Mr Brock—gave him a wide outlook without impairing his individuality. His merit was recognized as soon as he quitted his masters, and he forthwith won the competition for a series of statues

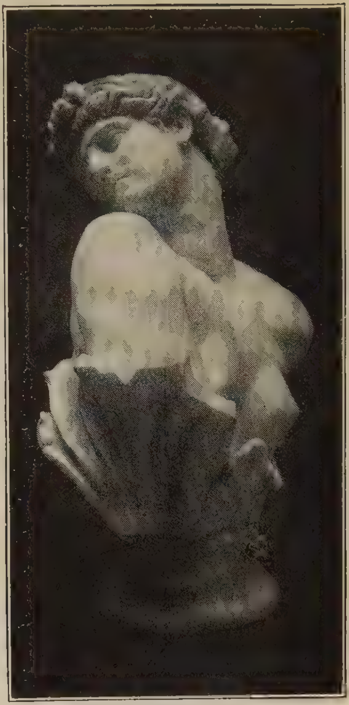
SCULPTURE—British (*c*)



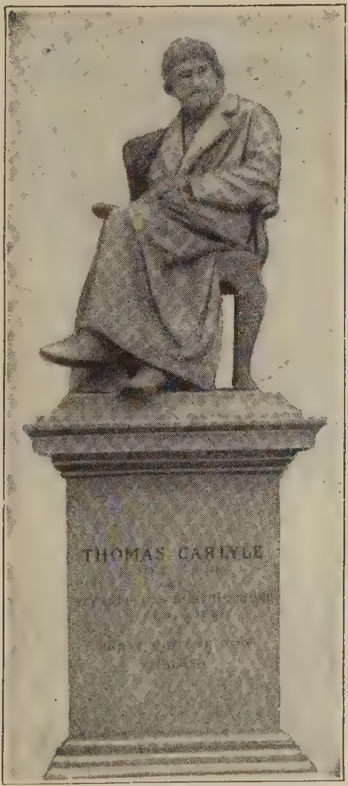
W. R. COLTON, A.R.A.—Maharajah of Mysore.



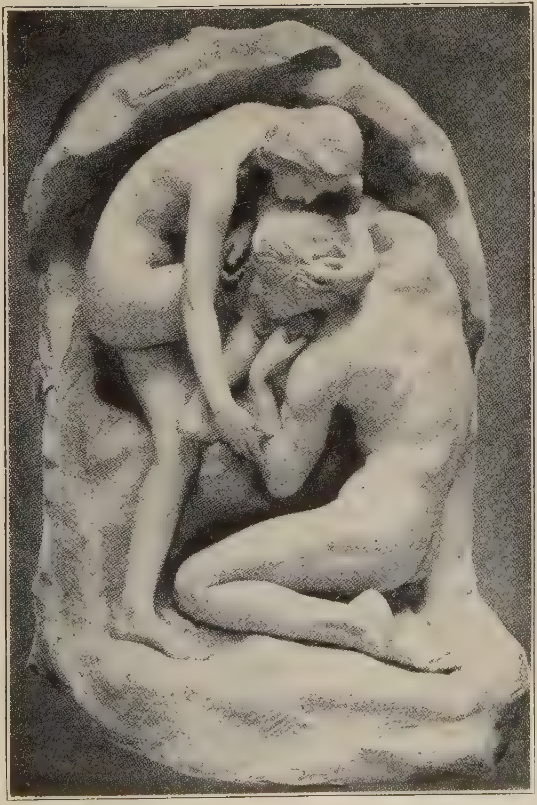
SIR CHARLES LAWES-WITTEWRONGE—The Punishment of Dirce.



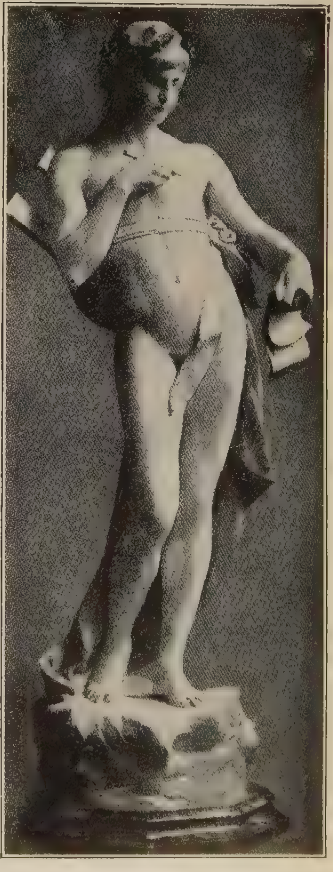
G. F. WATTS, R.A.—Clytie



SIR J. EDGAR BOEHM, R.A.—Carlyle.

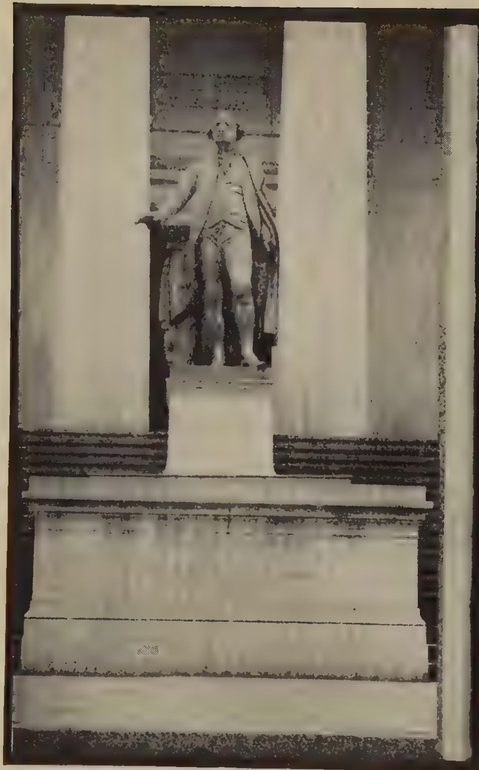


W. R. COLTON, A.R.A.—The Crown of Love.

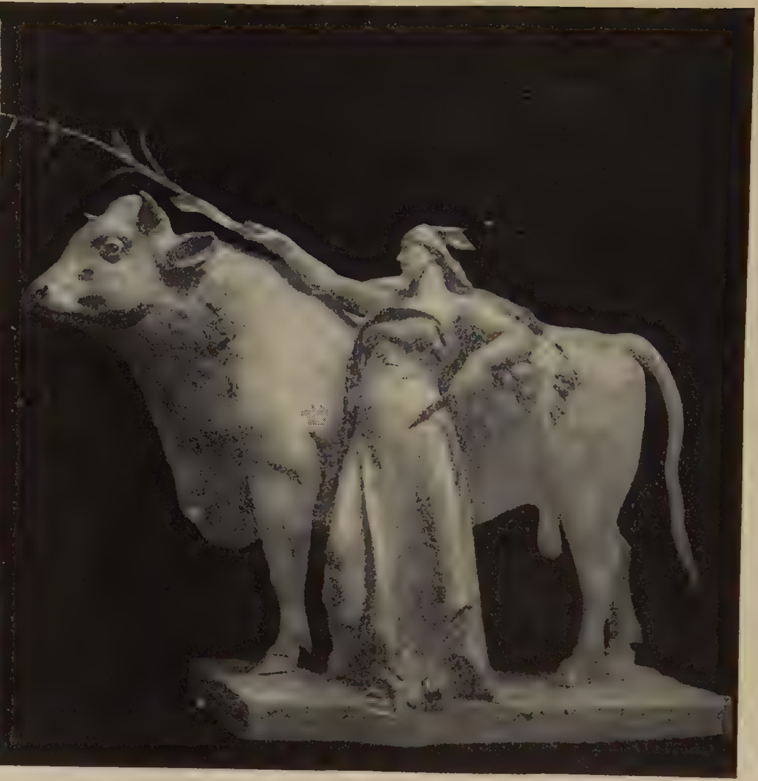


THOMAS BROCK, R.A.—The Genius of Poetry.

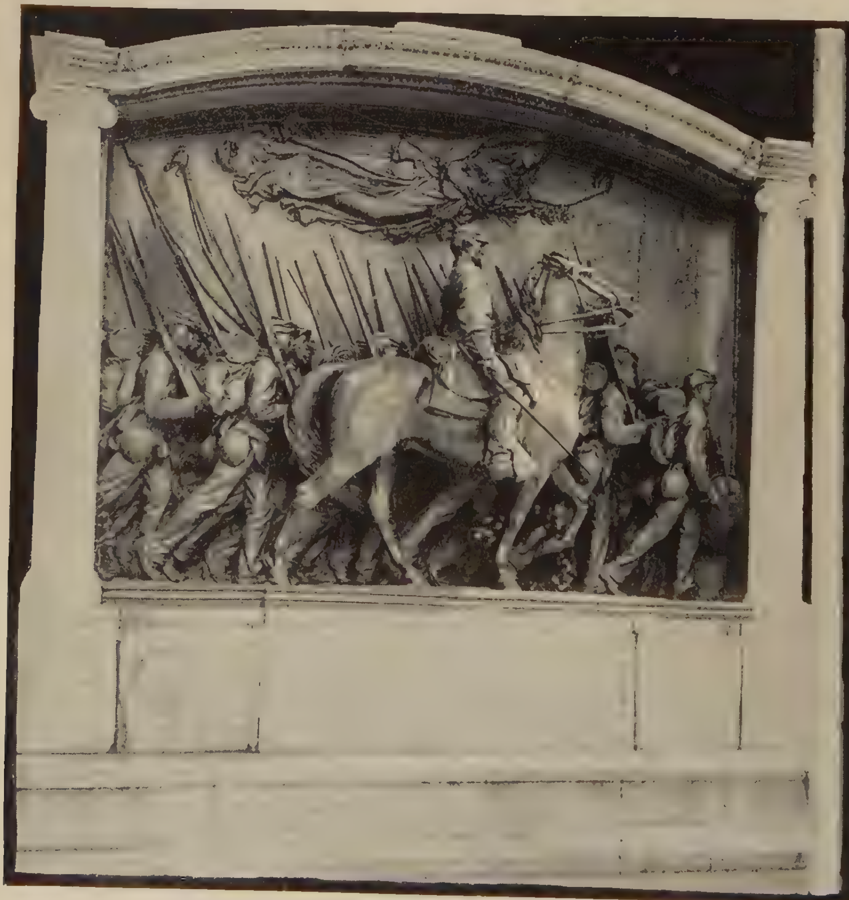
SCULPTURE—AMERICAN



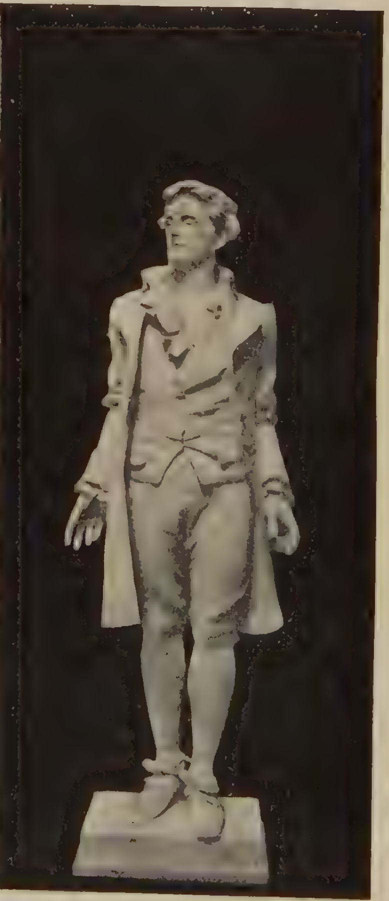
J. Q. A. WARD—George Washington.



D. C. FRENCH—Indian Corn; Bull by E. C. POTTER.



AUGUSTUS ST GAUDENS—Memorial to Robert Gould Shaw.



FREDERICK MacMONNIES—Nathan Hale.
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representing the arts for the Kelvingrove art gallery at Glasgow. A great mural tomb followed, with "Love Sacred and Profane" as its *motif*, together with a series of other works of growing artistic importance. "Cain" (1905), a vigorous, dramatic, yet wholly sculpturesque figure, is in powerful contrast to the three works that appeared in successive years: "Abundance" (a group of a woman and two children) and the marble statues "Atalanta" and "Psyche"—all of them the type of grace in pose and of beauty of face and form. At the same time Derwent Wood produced the two boy figures on the piers to the southward of the Queen Victoria Memorial in front of Buckingham Palace. There is marked individuality in all he does, sculpturesque character, firmness and delicacy of handling, with a richness of style and appreciation of breadth and simplicity.

Paul Montford, the son of Horace Montford, after a brilliant academic career made his mark in decorative sculpture. It is not by such work as "Court Favourites" (1906) that he sustains his reputation, but rather by the sculptural embellishments wherewith the archway connecting the Local Government offices with the Home Office in Whitehall is enriched. "The Spinning Girl" is one of his best ideal figures, and the 18th century "Viscount Bolingbroke" and "The Storm Waves" are characteristic of his vigorous style and personal conception and execution.

John Tweed, who studied under Falguière and Rodin, was influenced more by the latter than by the former, and inclines rather to the impressionistic school than to the academic. His statue of Cecil Rhodes has power and emphasis—it impresses rather than attracts. The statues of Queen Victoria at Aden, of van Riebeck at Cape Town, and the Wilson Memorial in Rhodesia are among his chief works. He was selected to "complete" Alfred Stevens's Wellington Memorial in St Paul's cathedral. Basil Gotto has not less force, and he is more exuberant in his realization of life—an exuberance which does not always make for refinement. "Brother Ruffino" has dignity and strength, and the "Bacchus" of 1907 is realistic enough to repel those who ask for elegance even in an unrefined subject. The work, however, is ably treated.

Henry Poole belongs to the same vigorous school, and has a true sense of the monumental, as is evident in his colossal group of "The Mermaids"; while his "Naiad" (1909) shows an innate refinement.

S. Nicholson Babb, for some years an assistant of Mr Brock, has produced an ambitious "War Memorial" and many able groups and figures, among which "The Coming of Spring" (1910) reveals the modern French influence.

Albert H. Hodge stands by himself. As a sculptor-decorator with special views on relief-work in which he adheres to the sentiment and character of the architecture it is to embellish, he adopts a convention which gives the appearance of high relief to what is really low, by sharpness of edges and by a learned use of light and shade. His panels of "Science and Art" (1904) and "Commerce" (1906) are good illustrations of this original kind of architectonic work, while his large equestrian group of "Prosperity" applies the same principles to the round. These three works were modelled for the town of Hull.

A man of similar force is Joseph Epstein, who replaces refinement by vigour, archaic simplicity, and primitiveness of outlook, as though casting his vote in favour of the Garden of Eden as against the garden of the Tuileries. His work, in which he leans towards the modern German view, is mainly decoration for buildings; his most discussed productions are the statues (1907) on the topmost storey of the British Medical Association offices.

Richard Garbe, a sculptor of equal strength, was a pupil of the London County Council School of Arts and Crafts and began to exhibit in 1898. Rugged power both in subject and execution mark his productions. His ideal works, such as "The Egoist" (1906), "Man and the Ideal" (1907), "The Idealist" (1908) and "Undine" (1909), illustrate his range of thought and reveal his uncommon vigour which amounts, it might be said, to well-controlled, idealistic brutality; they are broad and impressive, and are conceived in a monumental spirit.

Charles L. Hartwell has grace and strength combined. The nude figure representing "The Rising Tide" (1906), reminding us a little of Leighton's work, and "The Bathers" (1907), are both works of refinement and elegance, and "Dawn" (1909) displays unusual charm and, like the others, offers a silhouette of much interest. While much poetry of expression and grace of composition distinguish his "Sirens" (1910), vigour is the note of the small group "A Foul in the Giants' Race," which was acquired by the Chantrey trustees in 1908.

Benjamin Clemens, pupil of Professor Lantéri and the Royal College of Art, is another member of this talented group. His life-size ideal figures, "Sappho" (1902), "Cain" (1904), "Eurydice" (1906), "Andromeda" (1907) and "Aurora" (1908), all made their mark when exhibited in the Royal Academy, and showed the sculptor to be possessed of the qualities of sensitiveness, elegance, and strength. The group of "Kephalos and Prokris" (1910) is his most important and most striking work.

Harold Parker came to England from Australia in 1896 at the age of twenty-three, and after studying under W. S. Frith, made many Academic successes, and in 1904 exhibited his plaster life-size statue of "Ariadne," which, translated into marble and re-exhibited in 1908, was bought by the trustees of the Chantrey Collection and is now in the Tate Gallery. His other more important works include "The Long, Long Dreams of Youth" (1905), "Narcissus" (1906), and "Prometheus" (1909). Without revealing any striking originality, Parker displays very considerable accomplishment and a good sense of the sculpturesque, and his busts are refined and good.

Oliver Wheatley, formerly assistant to Brock, and pupil of Aman-Jean, has done much decorative work. His life-size recumbent statue "Awakening" is among the best of his figures.

T. Tyrrell, who first attracted attention by his decorative figures on Professor Pite's house in Mortimer Street, London, has shown much graceful fancy in his "The Ideal," such as "The Whisper" (1906).

Reuben Sheppard has shown himself poetic and pleasing in symbolic suggestion in his striking half-length group "The Music of Death" (1907); and Oliver Sheppard, in his "Eve" of the same year, produced a graceful work.

The Irish sculptor, John Hughes, achieved a great success by his monument to Queen Victoria erected in Dublin. It is a fine combination of sculptural and architectural effect and richness of grouping, and although it reveals too great a love of ornament it is impressive alike in mass, design, silhouette, and general arrangement.

There should also be mentioned, among the younger sculptors, Mortimer Brown ("St John the Baptist"), David B. Brown ("The Spirit of Ivy"), Bertram Pegram ("Down to the Sea"), the Scotsmen, McFarlane Shannan ("The Arcadian Shepherd's Dream"), Kellock Brown, and J. Crosland McLure ("Leicester War Memorial"); Herbert Ward (bronzes of South African savages, "The Idol Maker" and the like), Alfred Turner, Charles Pibworth, and F. Arnold Wright.

The women sculptors include such accomplished amateurs as H.R.H. the duchess of Argyll ("A Crucifix"—the Colonial Memorial in St Paul's cathedral) and Countess Gleichen. The principal recent names are those of Mary Pownall (Mrs Bromet), ("A Harpy"), E. M. Rope ("Springtime," relief), Ruby Levick ("Fishermen hauling a Net"), Margaret Winser ("Mourners," a relief), Esther Moore ("At the Gates of the Past"), Edith Maryon ("The Poet of Umbria"), and Gwendolen Williams ("The Lorelei," 1907, and charming groups of children).

The sculptor-decorators make a group of workers of striking fancy and ability. Lynn Jenkins, whose frieze in bronze, ivory and mother-of-pearl at Lloyd's Registry is a remarkable achievement, is one of the leaders. He has latterly devoted himself to pure sculpture, such as the life-size bronze figure on a sarcophagus, "Destiny" (1909 and 1910) and bust portraits remarkable for exquisite feeling and delicacy of carving. Walter Crane designed for Manchester a mace that is remarkable for beauty of conception and felicity of symbolism. Alexander Fisher and Nelson Dawson should be included in the group. Other sculptors already mentioned, including Thornycroft, Gilbert, Frampton, Pomeroy, Colton and Toft, have all devoted themselves to sculptural decoration pure and simple, whether in metal, stone, or marble.

The painter-sculptors claim among them Alfred Stevens, Sir Edwin Landseer, Lord Leighton, J. M. Swan, W. Reynolds-Stephens, George Richmond, and G. F. Watts. George Richmond's real talent may be gauged by his "Monument to Bishop Blomfield" in St Paul's cathedral. His son, Sir William Richmond, K.C.B., has also practised in sculpture—the memorial tomb of Mr and Mrs Gladstone is his. Watts educated himself artistically on the Elgin Marbles, and he produced half a dozen pieces of sculpture which place him high among the world's finest sculptors of the 19th century. The recumbent effigy of "Bishop Lonsdale" in Lichfield cathedral was an epoch-marking work, not only in the technical matter of the bold treatment of the drapery, but in largeness and breadth and its noble sense of style, and the "Lord Lothian" in Bickling church is also very remarkable. The artist then produced the colossal equestrian group of "Hugh Lupus" for the duke of Westminster (Eaton Hall), a composition as imaginative and original as it is grand and sculpturesque. Then followed "Physical Energy," another equestrian group, which, after being about twenty years in progress, was cast in 1902; it was executed in duplicate; one copy has been set up in South Africa, to the memory of Cecil Rhodes, whose character it may be held to symbolize, and the other has been erected in Kensington Gardens, London, at the expense of the British government. In 1902 also, the statue of "Lord Tennyson" was completed. But the bust of "Clytie" is surpassed in bigness and classic purity of style and feeling by nothing ever produced in England; it is a complete and noble thing. There is no sculptor who has come nearer to obtaining the grandeur of form which is so wonderful in the Greek masterpieces. Simple in line, immense in character, full and rich in modelling, Watts's work is instinct with vigour, breadth and movement. It sets the true standard, and is a constant and a noble warning to sculptors of the younger school not to be led away by the dainty and fanciful, however alluring. Especially it warns them against what has become a feature with a certain section—the devotion to metal-working, enamelling, and the like, and the free introduction of these accessories into serious sculptural work. Irresistible in the hands of a great artist like Alfred Gilbert, such work, at all times attractive, is the goldsmith's and ironsmith's business rather than the sculptor's; and although it has coloured the work of some of the younger sculptors of the day, it is not likely to obtain any very wide hold, or to exercise permanent influence for evil. The variety and independence of the British School are such that it is impossible to define any particular tendency in its practice other than towards an ever-increasing rise in the level of technical excellence and the power of design. There is, broadly speaking, a general stand against the "modernity" imported into sculpture by the younger members of the foreign schools, and a disinclination to bend the art to the illustration of everyday life and to the rendering of effects not hitherto considered to be the function of the plastic arts. (M. H. S.)

Modern French sculpture.

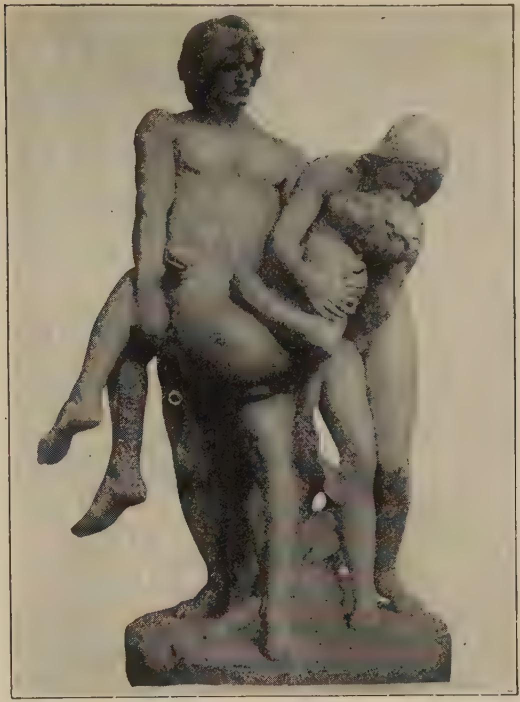
After 1870, when a great artistic movement marked the resuscitation of France after the Franco-German War, sculpture especially revived with exceptional vigour, and the last thirty years of the 19th century were a memorable epoch in its history. Not that many new and unexpected men of genius suddenly arose, for most of the artists who then came to the front had already distinguished themselves by equally noble work; but sculpture, like the other arts, benefited by the pause for thought, and by the ripe and manly tone stamped on the national mind by the discipline of events. Intense ardour animated the admirable group of French sculptors: the oldest still found some lofty expression; the men in their prime showed their powers with unwonted force and fire; and the younger generations grew up in rapid succession, a close phalanx of sculptors whose number is still increasing, for if we include only living artists, and those who have taken honours in the Salons, we find a list of seven hundred exhibitors. The first generation of survivors of the war, who led the way in the new period, still boasted of such men as Dumont (1801–1884), Cavelier (1814–1894), Bonnassieux (1810–1892), Jouffroy (1806–1882), Schoenewerck (1820–1885), Carrier-Belleuze (1824–1887), Aimé Millet (1819–1891) and Clésinger (1814–1883). These artists, born in the first quarter of the 19th century, were for the most part each the head of a studio, their teaching being carried on till the end of the century. Next to them followed their immediate pupils, already their rivals, and some indeed famous before the new era; such were Guillaume, Dubois and Frémiet; others, fresh from the Academy at Rome, at once rose to distinction, and all combined to form the remarkable group of artists to which the modern school of French sculpture owes its world-wide fame. At this time Eugène Guillaume (1822–1905) was exhibiting his "Roman Marriage," his "Bust of Mgr Darboy," his "Orpheus," and "Andromache," works of learned skill and severe distinction. Paul Dubois (1829–1905) executed his "Narcissus," and the "Tomb of General Lamoricière," on which the decorative figures of Charity, Faith, and Military Courage are popular favourites, full of grave and pathetic feeling. Chapu (1833–1891) executed his exquisite figure of "Youth" for the tomb of Henri Regnault, and that of "Thought" for the tomb of Daniel Stern, his monuments to Berryer and to Mgr Dupanloup. Barrias' (1841–1905) "First Interment" won him the medal of honour in 1878; besides his patriotic group of the "Defence of Paris." Falguière (1831–1900) produced a remarkable series of statues, characterized by their life-like power; some dignified or pathetic, as "St Vincent de Paul," "La Rochejacquelein," and "Cardinal Lavigerie"; some full of bold and dashing spirit, as his "Diana," his "Nereids," and "Hunting Nymphs." Mercié gave us "Gloria Victis," "Quand Même," and his monuments, among which that called "Memory" must be mentioned; his pediment for the Tuileries; his "Genius of Art," &c. Delaplanche (1836–1890) produced his "Mother's Teaching," "Music," "The Virgin with a Lily," and "Aurora"; and Allar "The Death of Alcestis." To these names must be added those of Degeorge, who, with Chapu, gave so powerful an impetus to the art of the medallist; of Gautherin, Hiolle, Thomas, Crauck, Lafrance, Maniglier and Moreau-Vauthier—one of the men who, with Gérôme (the painter) and Frémiet, revived the taste for coloured sculpture, a style first attempted long before by Simart; besides many more. These artists created a supremely healthy and vital school of sculpture, dignified and elegant, learned and varied, fresh and charming, and, above all, as single-hearted and as well trained as in any period of history.

To understand, however, the position of contemporary sculpture in France, it will be necessary to look back even further than 1870. It must be remembered that the whole history of French sculpture, as far back as the 17th century, is connected with the invasion of Italian influence in the 16th century, which remained paramount over French art for more than three hundred years. Statue-making, until then an art of expression—national, popular, human and Christian—lost its primitive character under the dilettante refinement of an aristocratic society closely gathered round a king who made art subservient to his splendour or his pleasure; it sank into superficial and conventional beauty, and became almost exclusively the interpreter of trivial ingenuity or flattering allegories derived from the dead fables of heathen mythology. The best that would be expected from this was choice elegance of line, a harmonious treatment of mass and composition, a loving study of the nude—in short, a purely plastic type of art. And sculpture had become the art of the nobility and of the court, having no hold, as it had in the past, on the great human family—the nation. Still, even at the high tide of Louis XIV.'s reign, some dissatisfaction became evident, even some rebellion, in the great though solitary spirit of Puget, who strove to animate the marble with the passions of humanity. In the next century he found followers—Falconet, Pigalle and Houdon, who also asserted their right to infuse life and passion and movement into their statues, seeking them in the despised province of stern reality. The great cataclysm of the Revolution, which might have been expected to break the bonds of thought, turned men's minds to contemplate the Antique, and though it certainly modified the style of sculpture, was far from changing the source of its inspiration, since it sent it once more to the Antique. Indeed, at the beginning of the 19th century, when the teaching of David was paramount in spite of Gros, who, then in the master's studio, was unconsciously sowing the seed of romanticism in painting, a robust individuality was developing among French sculptors—a spirit somewhat rugged, independent, and partly trained, beyond the academic pale, prepared to carry on the tradition of Puget, and quite simply, without any revolutionary airs of innovation, to shake off torpid conventionality. By the mere force of a strong plebeian temperament Rude quite naturally happened on a style of art—high art—at once expressive and popular. He was the first to raise the cry of liberty in sculpture, and he left successors who bravely worked out what he had begun. Barye and Carpeaux were both in 1875 on the threshold of an era to which they bequeathed a fruitful influence. Barye carried on Rude's tradition of expression, and transformed what had previously been mere decorative carving into a new style and branch of art now adopted by a whole phalanx of admirable artists: the sculpture, namely, of animals, the first glance that sculpture had till then bestowed on nature apart from man. Carpeaux, who was much younger, was in his day—as Puget had been—an exceptional personality; he carried on the slow revolt of two centuries which was to break the narrow mould of school-training and infuse a soul of more ardent vitality into sculptured forms.

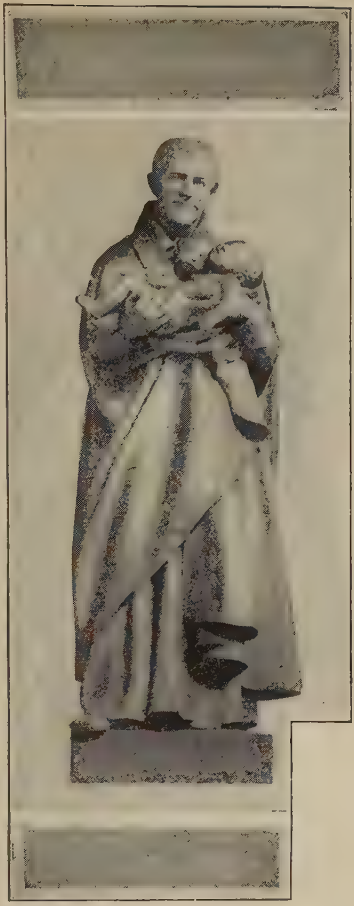
The importance of these two great artists in relation to contemporary art was not fully seen till after their death. In point of fact Painting had until now amply filled the new part assigned to Art; its vehement efforts had strongly influenced public opinion; and as, in the early years of the 19th century, it had largely extended the field of human vision over the remote past and the domains of feeling, with the promise of surveying all nature, space and time, the spirit of the age asked no more, and did not expect sculpture, too, to abandon old-world myths. It must also be said that those sculptors who at that time carried on the classical tradition had renewed its youth by their learned and enthusiastic love of it; they had reverted to the past, but it was the past of the really great masters, either of antiquity or of the early Florentine school, no less enamoured of life, beauty and nature. Guillaume and Paul Dubois, Chapu and Falguière, Mercié, and Delaplanche were the rivals in sculpture of the great idealist painters—Puvis de Chavannes, Gustave Moreau, Ricard, Delaunay, Baudry, and Henner—who were working at the same time.

SCULPTURE—French (*a*)

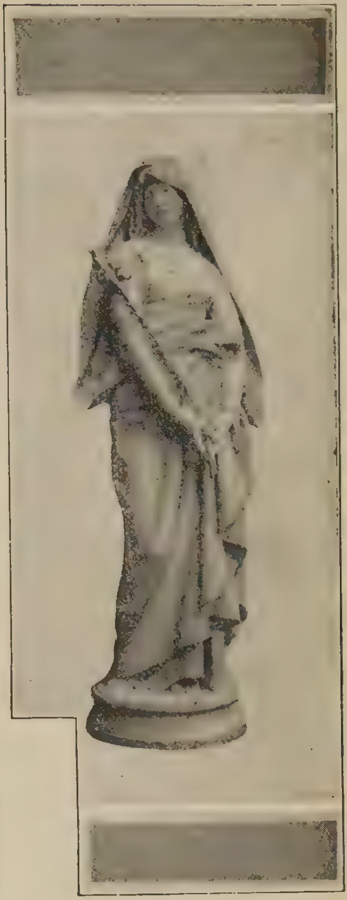
Plate VII.



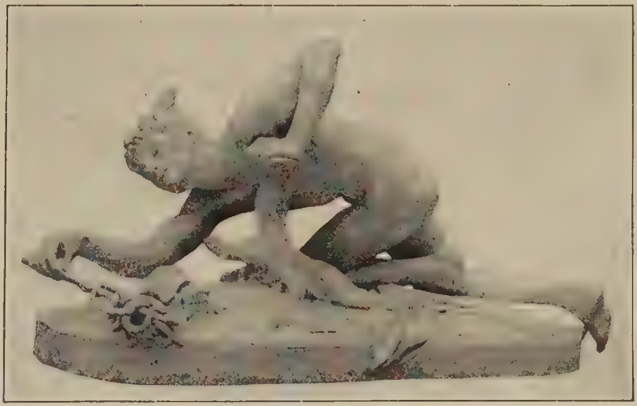
E. BARRIAS—The First Funeral.



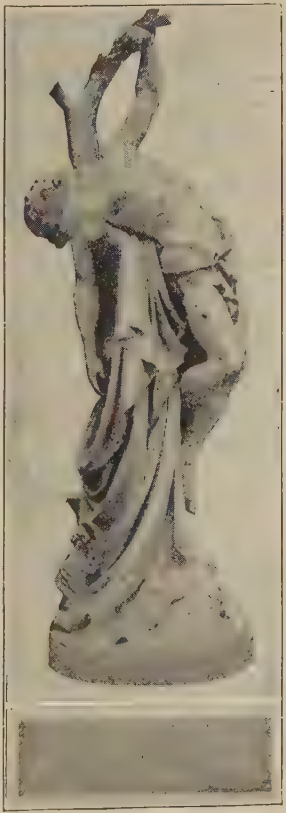
A. FALGUIÈRE—St Vincent de Paul.



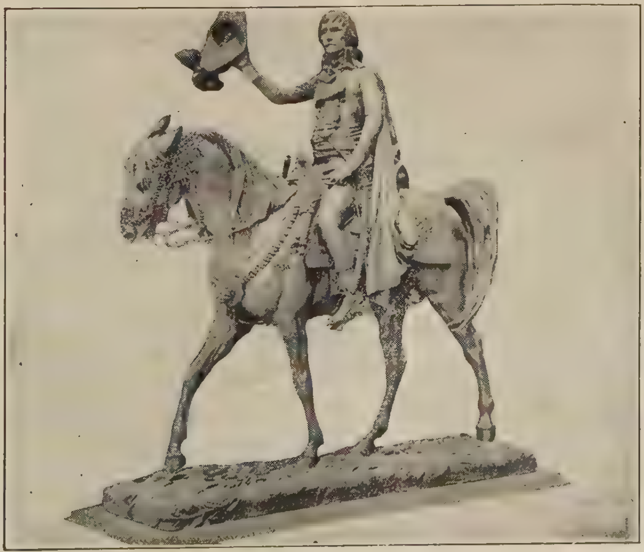
E. DELAPLANCHE—The Virgin with the Lily.



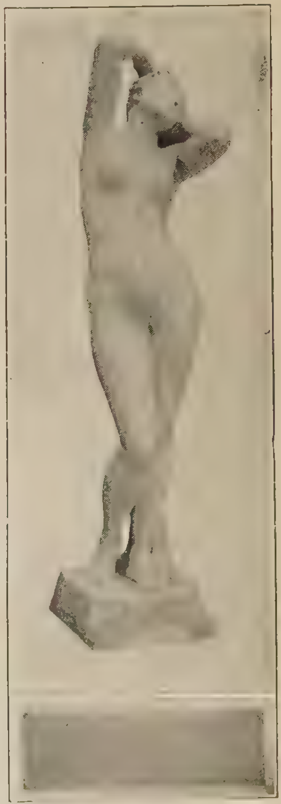
A. IDRAC—Mercury inventing the Caduceus.



JUSTE BECQUER—St Sebastian.



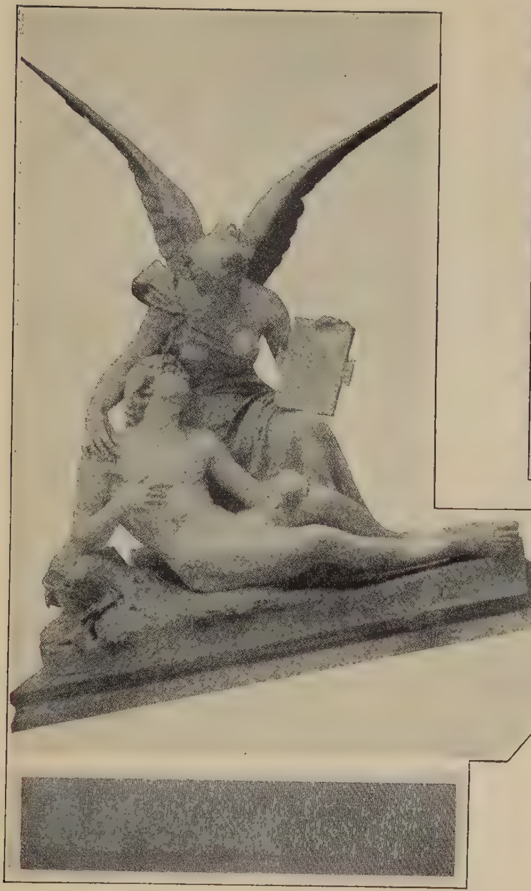
L. GÉRÔME—Bonaparte at Cairo.



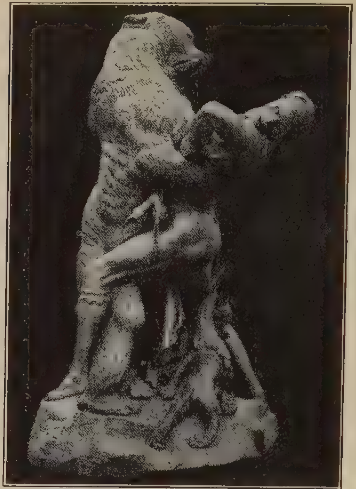
L. MARQUESTE—Galatea.

PLATE VIII.

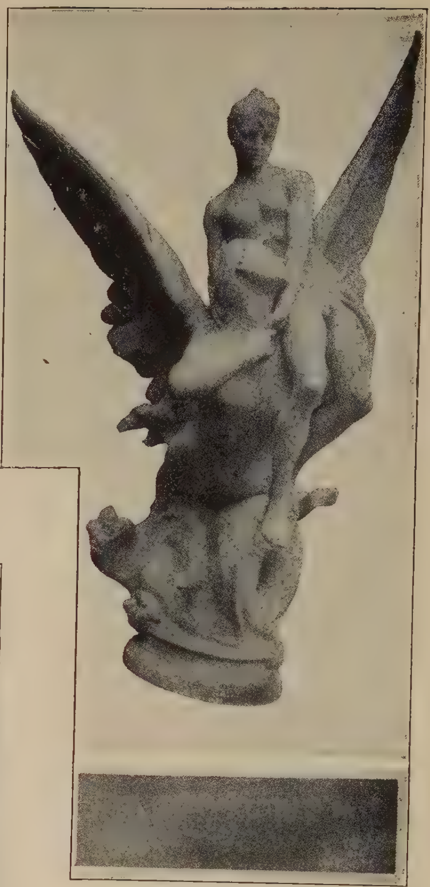
SCULPTURE—FRENCH (*b*)



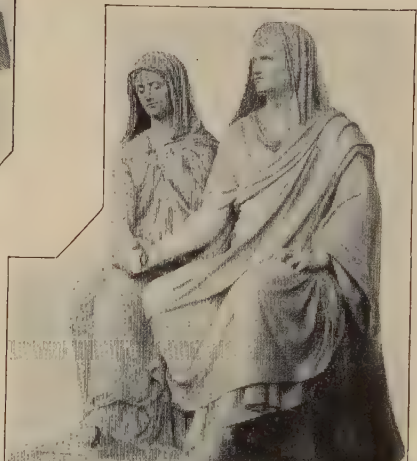
L. LONGEPIED—Immortality.



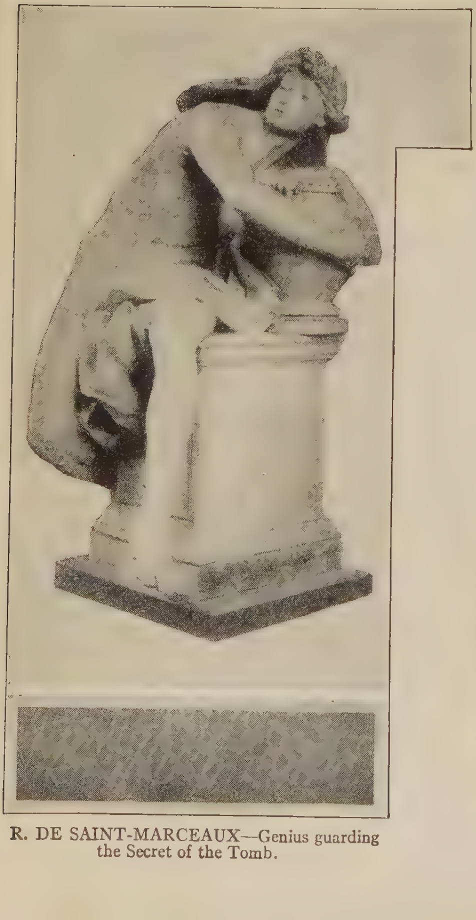
FRÉMIET—The Bear Hunter.



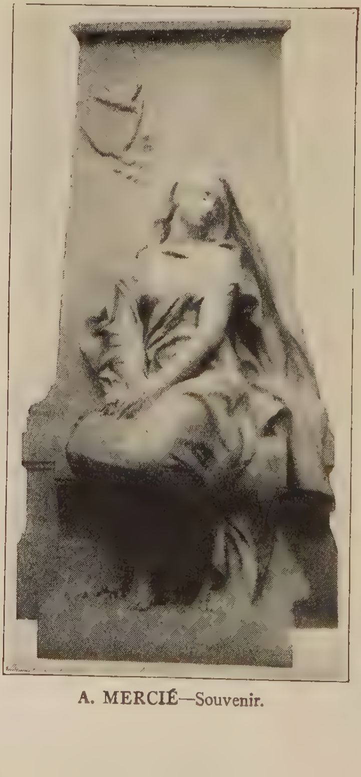
D. PUECH—The Siren.



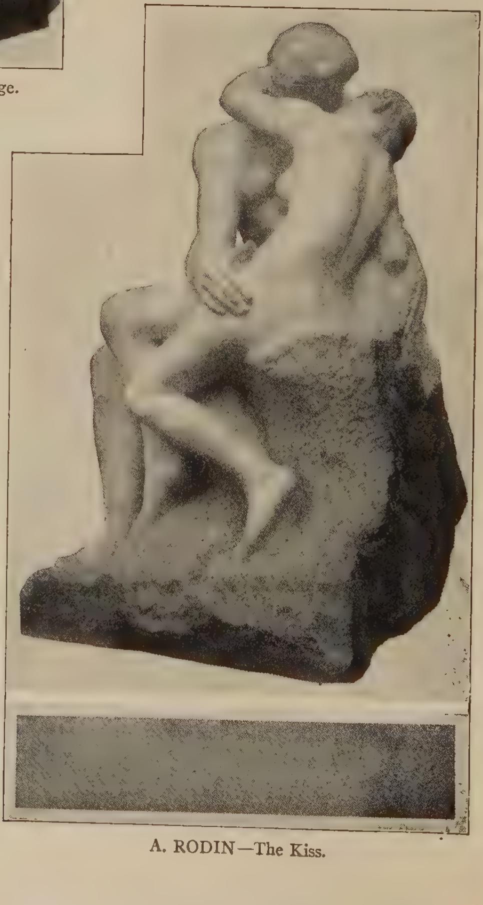
E. GUILLAUME—The Roman Marriage.



R. DE SAINT-MARCEAUX—Genius guarding the Secret of the Tomb.



A. MERCIÉ—Souvenir.



A. RODIN—The Kiss.

This it is which accounts for the fact that romanticism then found so little acceptance among sculptors. But in the next generation the sowers of the seed might see their harvest. The pupils of Rude, of Barye and of Carpeaux, allied by school sympathies—the little drawing-school conducted by Lecoq de Boisbaudran, which, in despite of the studios of the Beaux Arts, created a group of independent and highly original artists—formed the centre of a distinct force which increased day by day. Young men, fresh from Rome, persistently kept up the spirit of the Antique. A galaxy of learned and refined artists was represented by such men as Hiolle (1833–1887) ("Arion," "Orpheus"), Idrac (1840–1884) ("Mercury inventing the Caduceus," "Salammbô"), Marqueste ("Galatea," "Eros," "Perseus beheading the Gorgon," "The Rape of Europa"), and Coutan ("Eros," "A Woman carrying Loaves," "A Sergeant-at-Arms," &c.), Lanson ("The Iron Age"), Longepied (1849–1888) ("Immortality"), Peinte ("Orpheus charming Cerberus to Sleep"), Gustave Michel ("In a Dream," "Meditation"), Carlès ("Innocence," "Abel"), A. Boucher ("Earth," "Au but"), besides Carlier, Léonard and Turcan (1846–1895)—soon to be followed by another generation: Puech ("The Siren," "The Muse of André Chénier"), Verlet ("The Monument to Maupassant," "Orpheus"), Larche ("The Brook and the Meadow," "Violets"), Sicard ("Hagar and Ishmael"), and Daillon, Escoula, St Lami, and many more. In opposition to these there stood a group of sculptors, young and old, who sought their subjects in mythology, legend, history or poetry, or merely in the scenes of daily life, and aimed at presenting the ideal of their time under its external aspects, but more especially the deepest emotions of the modern mind. It was Frémiet, with his striking and vivid conceptions, who led the advance with new and dramatic subjects: primeval man and the fierce beasts with which he disputed his rule ("A She-Bear and a Man of the Stone Age," "An Oran-utan and a Savage," "Gorillas"), or embodiments of the heroes of the past ("Joan of Arc," "Saint Louis," "Saint George," "Louis of Orleans," &c.); then followed Just Becquet (1829–1907), the excellent artist who represented the stricken figures of "Ishmael" and "Saint Sebastian"; Christophe (1827–1892), with his symbolical presentments of "The Human Comedy," "Fortune" and "The Supreme Kiss"; Aubé ("Monument to Gambetta," "Dante," "Bailly," &c.); A. Legros, the naturalized English painter and sculptor, who executed some fine fountains for the duke of Portland; Injalbert, returned from Rome ("Hippomène," "Christ on the Cross," "The Herald"); and, younger than these, Desbois ("Leda"), Dampt ("A Grandmother's Kiss," "Melusine"), Alexandre Charpentier, Carriès, Baffier, Pierre Roche, Madame Marie Cazin and many more.

The disruption of the Salons in 1890 showed very plainly the bent of this group, who seceded to the Champ de Mars, where the leaders were Dalou and Rodin, and where Bartholomé made an unexpected and original appearance. Foreigners added a contingent of the highest merit, such as the American St Gaudens, and, more especially, the Belgian Constantin Meunier, affiliated to France by their early training, to say nothing of descent. Meunier especially, with his statues and statuettes of labouring figures—miners, puddlers, hammerers, glass-blowers, and the like—gave to his art a keynote new to France, which found a response even in academic circles. A broad democratic current was swaying public feeling. The questions which turn on the status of the working man had become the programme of every party, even of the most conservative. Art being the mirror of society, the novel, the drama and painting devoted themselves to the glorification of a new factor in modern life, namely, Labour. Sculpture now, in rivalry with painting, through which Millet had immortalized the peasant, and Courbet the working man, also sought inspiration from such themes; and at the same time the demands of the democratic movement called for monuments to the memory and deeds of great or useful men.

Sculpture, under this modern tendency, assumed an unexpected aspect; its highest expression is seen in the work of three men very dissimilar: Dalou, Rodin, and Bartholomé. In Belgium, as has been said, where modern social questions are strongly felt, Constantin Meunier had interpreted the democratic impulse in a very striking manner, under the influence, no doubt, of J. F. Millet. In France, Jules Dalou (1838–1902), with a broader view, aimed at creating an art which should represent the aspirations and dreams of this phase of society while adhering to the fine old traditions of the art of Louis XIV., stamped with magnificence and grandeur, but applied with graver, simpler and severer feeling to the glorification of the people. He revived the older style of sculpture, giving it greater power and truer dignity by a close study of life, supported by a scholarly and serious technique. In his "Triumph of the Republic," and the monuments to "Alphand," to "Delacroix," to "Floquet," to "Victor Hugo," and others, he strove to create a style apart from life, to which he is alien and indifferent, but based on life, the outcome of the needs of society, the impersonation of its characteristics, the expression in eloquent form of its nature, spirit, and moral idiosyncrasy.

Treading the same path, though in a different step, is Auguste Rodin. He disregards every contingent fact; even when he takes his subject from legend or history, whether "Eve" or "St John the Baptist," "The Age of Bronze" or "The Burgesses of Calais," "Victor Hugo" or "Balzac," he avoids all the conventional details and attributes of his personages to embody the very essence of humanity as expressed in the quivering flesh. He, like Carpeaux, has gone back, to Dante and to Michelangelo to force the "Gates of Hell"—the subject chosen for the entrance to the Musée des Arts Décoratifs—and to read the deepest mysteries of the human soul. His is the art of suffering, anguish and terror, of cruel and despairing pleasure—a wild cycle of proud and bitter melancholy. All the efforts made in the past to infuse life into Art, all that Puget, Falconet, Pigalle and Houdon tried to effect, and that Rude, Barye and Carpeaux strove for in their turn—all this was part of the endeavour of these their successors, but with a clearer purpose and more conscious aim. By good hap or providence they were greeted on their way by the voice of the most devoted apostle who was to preach the new doctrine, namely, Louis Courajod, the founder of the French sculpture gallery in the Louvre. From his professor's chair in the schools he cursed the Italian intruders of the 16th century for having debased French art with "noble attitudes," extravagant gestures and allegorical antics; and he carried his pupils and his hearers back to the great national period of French sculpture, which, in the dark medieval ages, had created the splendid stone images of the noble French cathedrals.

A marked individuality now appeared in protest against academic traditions—Albert Bartholomé. He, after beginning as a painter, was tempted by sculpture, more particularly, in the first instance, by a wish to execute a monument to a comrade he had loved. From this first effort, carried out in his studio, without any school training, but with a firm determination to master technical difficulties and fulfil his dream, followed a broader purpose to execute a great expressive and vitally human work which should appeal to the heart of the populace. From this arose the idea of a "Monument to the Dead" in Père Lachaise. Bartholomé had started without a guide, but he instinctively turned to the great tradition of Northern Christianity, which his mind subsequently associated with that of the antique race who had ever done most honour to Death, the people of Egypt.

Thus two currents contended, as it were, for the guidance of French sculpture, each claiming a descent from the historic past; one inheriting the classic tradition of the Renaissance, of Latin and Hellenic origin, to which the French school, since the time of Jean Goujon, has owed three centuries of glory. This is the pagan art of the South; its marks are balance, reasonableness and lucidity; it was the composer of apotheoses, the preserver of the ideal of beauty. The other, reverting, after centuries of resignation or of impotent rebellion, to the genuine French past which produced the noble works of the 11th, 12th and 13th centuries—to the tradition of Flanders and of Burgundy, which was smothered in the 16th century by Italian art—to the Christian and naturalistic art of the North, which renounced the canons of antiquity, and expressed itself by methods essentially human and mutable, living and suffering—appeals to all mankind. The immediate result of this antagonism was no doubt a period of agitation. The outcome, on the whole, is confusion. Still, however vexatious the chaos of form and movement may be, it is Life, a true reflection of the tumult of modern thought in its complexity and bewilderment; it is the reawakening of sculpture.

Monumental and decorative statuary found an extended sphere through the founding or restoration of public buildings after the events of 1870. Memorial sculpture obtained constant employment on patriotic or republican monuments erected in various parts of France, and not yet complete. Illustrious masters have done themselves honour in such work. Dalou, Mercié, Barrias, Falguière, and many others less famous executed monuments to the glory of the Republic or in memory of the national defence, and figures of Joan of Arc as a symbol of patriotism, &c., as well as numberless statues erected in the market-places of humble towns, or even of villages, in commemoration of national or local celebrities: politicians, soldiers, savants and artists—Thiers, Gambetta, Jules Ferry, Carnot, Pasteur, Claude Bernard, Delacroix, Ingres, Corot, Millet, Victor Hugo, Lamartine and many more. The garden of the Luxembourg alone has become a sort of Elysian Fields, where almost every day some fresh statue rises up in memory of contemporary French poets. The funereal style of monument, in which French art was at all times conspicuously distinguished, was also revived in sympathy with that general sentiment which regards reverence for the dead as a religion, and gave rise, as we have seen, to some splendid work by Chapu (the monuments to Regnault, to Daniel Stern, of Mgr Dupanloup); by Paul Dubois (the monument to General Lamoricière); by Mercié (the tombs of Baudry, of Cabanel, of King Louis Philippe and his queen Marie Amélie); by Dalou (the monuments to Victor Noir, to Floquet and Blanqui); and by many more, with Bartholomé at their head. The cemetery of Père Lachaise is indeed one of the best spots to visit for a review of contemporary sculpture.

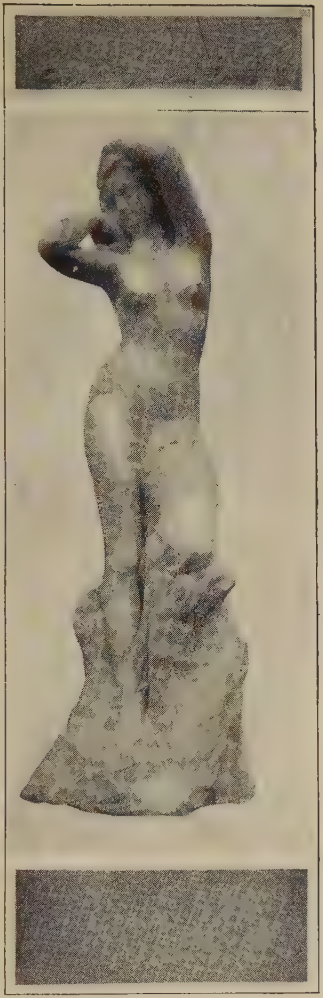
While man has been diligently studied in every class of sculpture, more particularly in portrait sculpture, which finds a more practical adaptation to daily uses by a bust or small statue, such as Théodore Rivière was the first to produce, by medallions, or by medals, closely related to statuary, nature now holds a place in the sculpture of animals—a place created, so to say, by Barye and carried on by Frémiet, Mêne, Cain, and, with even greater vigour and a closer study of character, by Gardet ("Panthers," in the Luxembourg, "Lions" and "Dogs," at Chantilly, &c.); Peter, Valton, Le Duc, Isidore Bonheur, Peyrol, Cordier, Surand, Virion, Mérite and others. Finally, the class of *la petite sculpture*—the statuette and small group—after long hesitation in the hands of the two men who first cultivated it, Frémiet and the painter Gérôme, made a sudden start into life, due in no small measure to the success attending the charming and pathetic statuettes of Théodore Rivière ("Salammbô and Malthô," "Ultimum feriens," "Charles VI. and Odette," "The Vow," "Fra Angelico," "The Shunammite Woman," &c.). Rivière was wont to use—as Gérôme did in his "Bellona," and subsequently in his small "Tamerlane"—materials of various colours, and even precious stones and metals, which he employed with great effect. A whole class of art was not, indeed, originated, but strongly vivified by this method of treatment. Claudius Marioton and Dampt, who always affected small and precious work, Agathon Léonard (*e.g.* a table decoration of "Dancers" in Sèvres china), Laporte Blairsy, Ferrary, Levasseur, Belloc, E. Lafont, &c., utilized every process and every kind of material—marble and metal, wood and ivory, enchanced by the most costly goldsmiths' work and gems.

It would seem now that sculpture, thus endowed with new ideas and the most various means of expression, and adapted to every comprehension and every situation, ~~was~~ fully on a level with the other graphic arts. What it had chiefly to fear was, in fact, the wealth of means at its disposal, and its competition or collaboration with other arts. And this the later generations seem to have understood—the men who were the outcome of the two conflicting traditions: order and moderation on one side; character, life, and emotion on the other. Though very variously inspired by the facts or ideals of contemporary life, such young artists as Jean Boucher ("Evening," "The Antique and the Modern"), Roger Bloche ("Childhood," "Cold"), Derré, Boverie, Hippolyte Lefebvre, Desruelles, Gaston Schnegg, Pierre Roche, Fix-Masseau, Couteilhas, and others seem to show that French sculpture is about to assume a solid position on a sound foundation, while not ceasing to keep in touch with the tastes, aspects and needs—in short, the ideal—of the day. Thus, while painting engaged the attention of the public by its new departures, its daring, and its very extravagance, sculpture, which by the conditions of its technique is less exposed to transient influences, has, since the close of the 19th century, developed normally but with renewed vigour. If the brilliancy of the school was not so conspicuous and its works gave rise to little discussion or speculation, it is not the less certain that at the beginning of the 20th century the younger generation offered the encouraging prospect of a compact group of sculptors who would probably leave works of permanent merit. Yet sculpture too had gone through a crisis, and been deeply stirred by the currents which so violently agitated all modern thought. We have already spoken of its "state of mind," torn between the noble traditions of a glorious past which link it to the antique, and the craving to render in its own medium, with greater freedom and fuller force of expression, all those unuttered meanings of the universe and of contemporary thought which the other arts—painting, literature, the drama, and even music—have striven to identify and to record. But the acute stage of tentative and incoherent effort seemed in 1910 to be past; inspiration had returned to its normal channel and purely plastic expression.

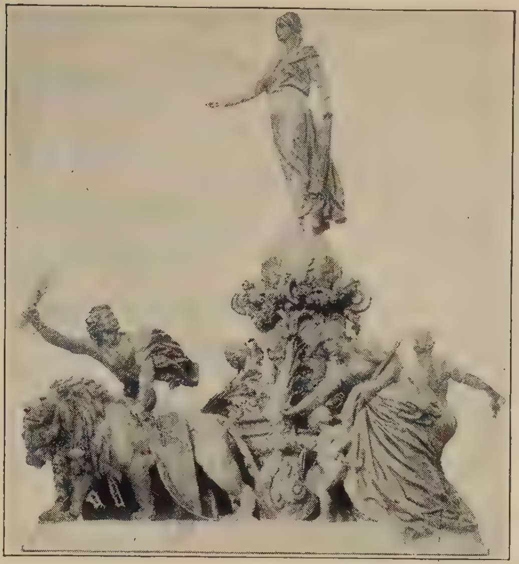
The powerful individuality which had the most vital influence on modern sculpture in France, and, it may be added, on many foreign schools, is that of Rodin. During the ten years which followed the Great Exhibition in Paris (1900) and the special display of his works, his reputation spread throughout the countries of the world and his fame was fully established. The state liberally contributed to his triumph by commissions and purchases, and in the Luxembourg Gallery may be seen about five and twenty of his finest works. His productiveness was unbroken, but it was chiefly evolved in relation to his first great conception, "The Gate of Hell"; its leading features were taken up again, modified, expanded, and added to by their creator. But besides the numberless embodiments of voluptuous, impassioned, or pathetic ideas—of which there is need to name only "Les ombres" (the Shades) and "Le penseur" (the Thinker), now placed in front of the steps of the Panthéon; several monuments, as for instance to Victor Hugo, to Whistler, and to Puvis de Chavannes; besides a large number of portrait-busts. Enthusiastic literary men, and the critics of the day who upheld Rodin in his struggles, more from an instinct of pugnacity and a love of paradox than from conviction and real comprehension of his prodigious and fertile genius, have tended to give him a poetic and prophetic aspect, and make him appear as a sort of Dante in sculpture. Though his art is vehement in expression, and he has revelled in the presentment of agonized suffering and the poignant melancholy of passion, it is by the methods of Michelangelo and essentially plastic treatment than power of modelling. His modelling is indeed the most wonderful that modern sculpture has to show, the most purely plastic technique, and this characteristic is always evident in his work, combined with reverence for the antique. Rodin made his home in the midst of Greek statues, a museum of the antique which he collected at Meudon; and some of his own late work, such as the male torsos which he exhibited at the Salon, has a direct relationship to the marbles of the Parthenon—the Ilyssus and the Theseus. It is the fuller understanding of these

SCULPTURE—French (c)

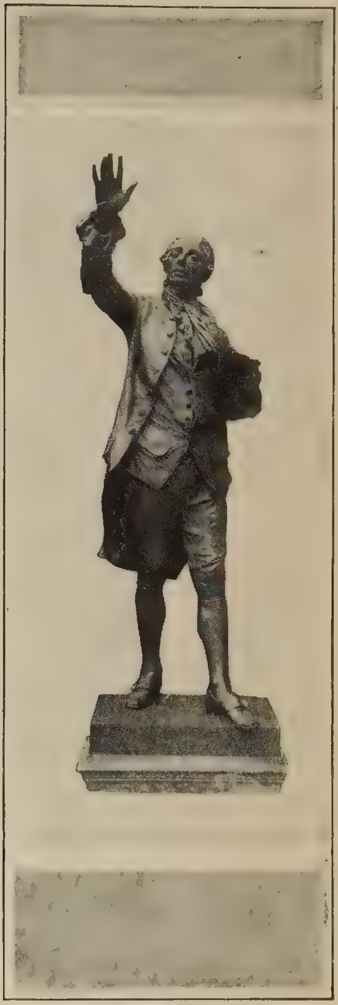
Plate IX.



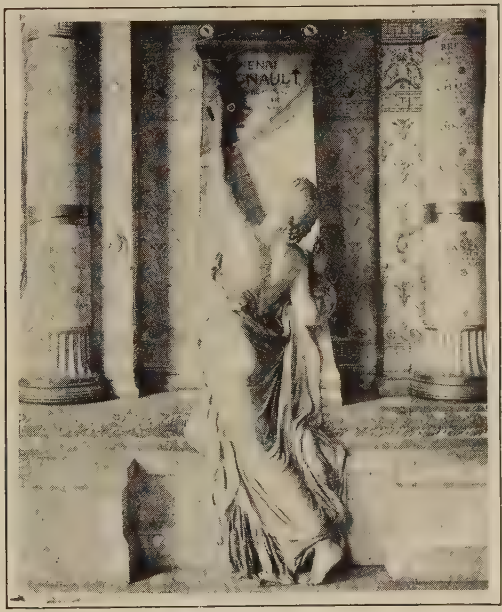
G. MICHEL—Dreaming.



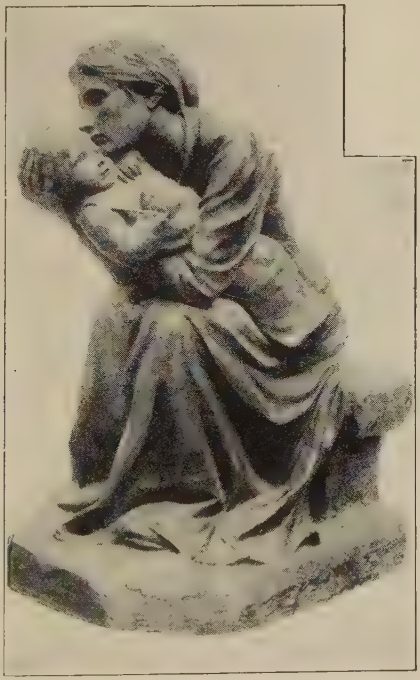
J. DALOU—The Triumph of the Republic.



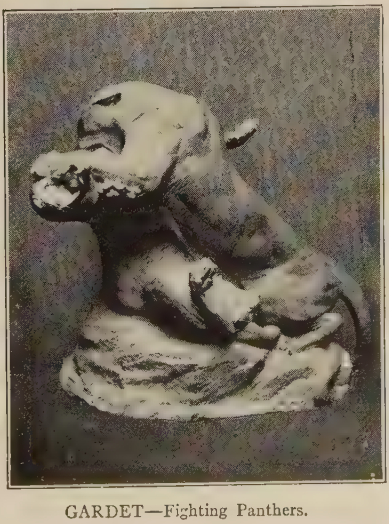
P. AUBÉ—Bailly.



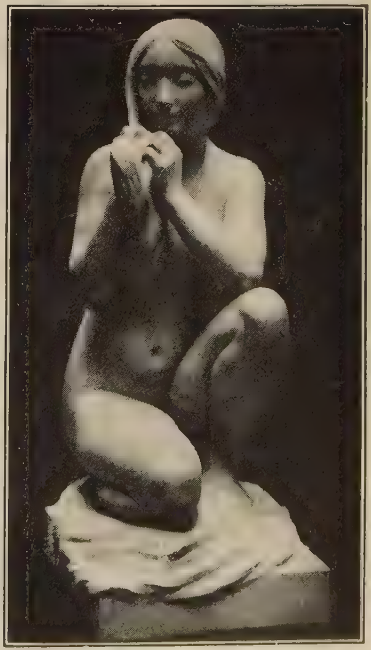
H. CHAPU—Youth (Monument to Henri Regnault).



ROGER BLOCHE—The Child.



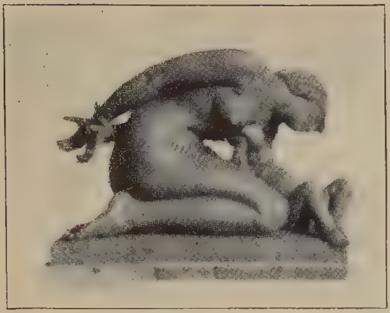
GARDET—Fighting Panthers.



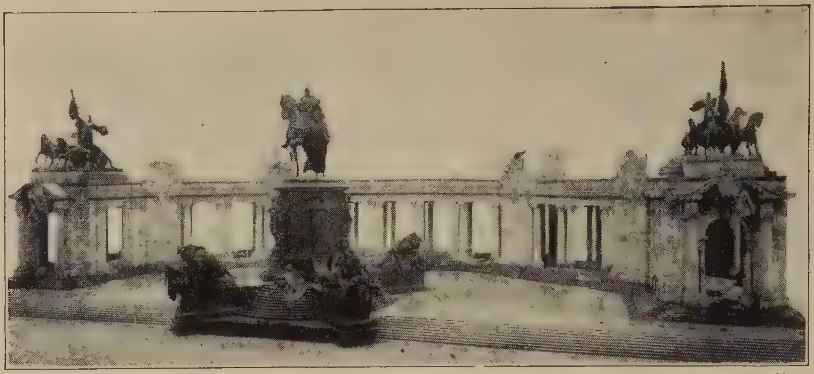
BARTHOLOMÉ—Young Girl dressing her Hair.

PLATE X.

SCULPTURE—OTHER FOREIGN COUNTRIES

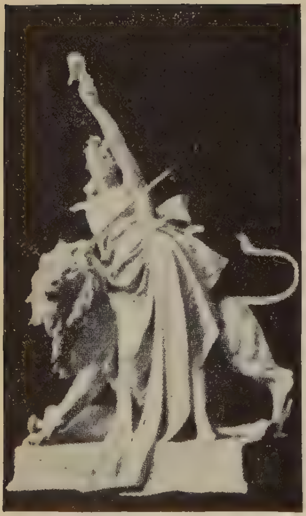


S. SINDING—The Captive Mother.
(Danish.)

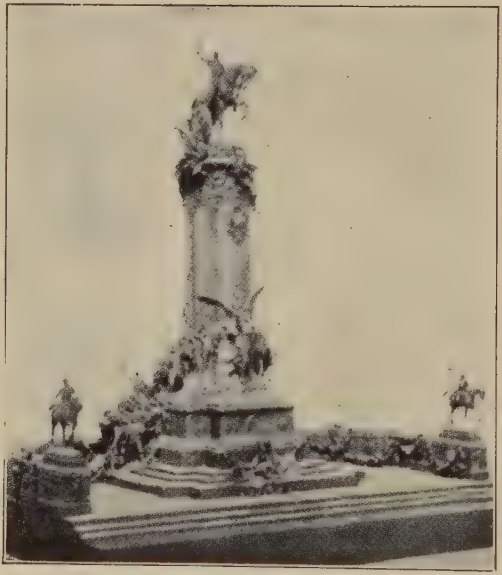


(Photo, W. Titzenthaler, Berlin.)

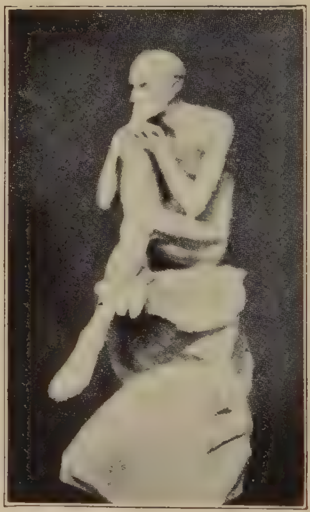
REINHOLD BEGAS—Statue and Memorial of Emperor William I.
(German.)



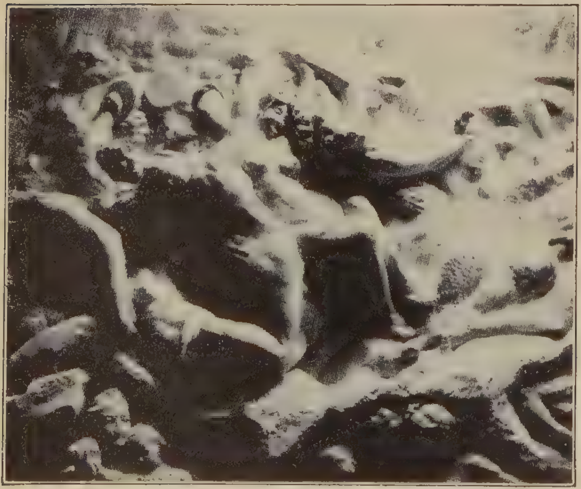
ETTORE XIMENES—Revolution.
(Italian.)



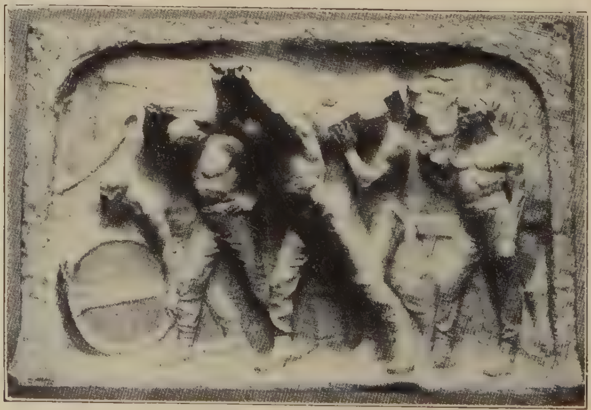
A. QUEROL—Memorial to Alphonso XII. *(From the Model.)*
(Spanish.)



M. ANTOKOLSKI—Satan.
(Russian.)



JEF LAMBEAUX—The Human Passions.
(Belgian.)



C. MEUNIER—Unloading.
(Belgian.)

characteristics of Rodin's work, apart from some exaggeration of expression to which they have given rise, that has had the most valuable influence on the younger generation.

Nothing need be particularly noted as to the development of masters long since recognized, whatever branch of the school they belong to; such as Frémiet, Mercié, Marqueste, Injalbert, Saint-Marceaux and others already spoken of. The very distinct individuality of Bartholomé, after asserting itself in his crowning effort the "Monument of the Dead," found very delicate expression in numerous works on a more modest scale, nude figures, monumental groups, and portraits. His monument to Jean-Jacques Rousseau for the Panthéon (1909) is a fine example of his art.

We must not omit, after the elder generation, the name of Alfred Lenoir, who particularly distinguished himself in portrait-statues by dealing successfully with the difficult problem of modern dress, as in the monuments of Berlioz, to César Franck, to Marshal Canrobert, in the bust of M. Moreau, &c.; nor that of Gustave Michel, a spirit loftily inspired in his decorative compositions and figures for galleries, "Le rêve" (the Dream), "La pensée" (Thought)—both in the Luxembourg Gallery,—"Au soir de la vie" (in the Evening of Life), and "Automne." H. Gréber, after some realistic works, such as "Le Grisou" (Fire-damp) and portrait-statuettes, as the tiny full-length figures of "Frémiet" and of "Gévine," distinguished himself in the Salon of 1909 by a statue of "Narcissus" at the edge of a fountain-pool, very elegant and Italian in feeling. And among the younger men of the school we must name Verlet, Gasq Vermare, Ernest Dubois, and Larche, all employed on important works.

It must indeed be said that in France, apart from the select committees which have, with more or less success, peopled provincial towns with monumental statues, the government has always taken an interest in encouraging the art of sculpture. Any considerable work of that class could hardly be undertaken without its support. The former Council of Fine Arts in Paris foresaw the application of sculpture to the decoration of the park of Saint Cloud; the present council has encouraged a strong competition among our sculptors by decorating the squares of the Carrousel and of the Champ de Mars, by carrying on the decorative work in the Panthéon, &c. They have thus given commissions to a group of rising artists, who quickly made a distinguished reputation. The names of these younger sculptors have already been recorded here; in the ten years 1901–1910 they came into the front rank of their contemporaries by their conspicuous talent and the firm expression of their ideals. The first fact to be noted about them is their determination to be men of their time. Many artists before them were indeed possessed by this idea: Legros, Dalou, the Belgian sculptor Constantin Meunier, the American St Gaudens, and among their immediate precursors Alfred Lenoir. But now this purposeful bias is more strongly marked; the new men do not restrict themselves to the merely monumental or commemorative aspect, to the picturesque treatment of the miners or the tillers of the soil. Every type of the people, even of the middle-class citizen, is included in the programme. Alexandre Charpentier (d. 1909) was one of the earliest of these younger realists, and he gave it expression not only in sculpture proper, but in medal work, and bas-reliefs introduced into architecture, in decorative furniture and in every form of ornamental sculpture. Thus he produced the "Woman suckling her Infant" (1883) and a large bas-relief of "Bakers," executed in stone and placed in the square of St Germain des Prés, Paris; and, following in his footsteps, other artists gave expression to the same ideas. An instructive fact is that one of these men was a pupil of the École des Beaux Arts and of the academy at Rome. Hippolyte Lefebvre devoted himself to proving that the common aspects of modern life are not an insuperable problem for the sculptor's art; nay, that they actually afford him new subjects most suitable to his methods. He persisted in this purpose, and finally won the adhesion of his fellow-artists and the medal of honour for his "Jeunes aveugles" (Blind Boys), in the Luxembourg Gallery. We have also by him in this manner of the day, handled with truly synthetic breadth, "Summer," a youthful female figure in an ordinary walking dress carrying a parasol, her straw hat tilted over her eyes; "Winter," an old lady wrapped in furs, coming down snow-covered steps; "Spring," more accurately the "Age of Love," a group of six figures, and others. His comrade Roger Bloche has gone even further, asserting with no little pugnacity the same ideas in figures derived from the people, and in episodes of daily life, as in the "Accident," a recumbent figure surrounded by about twenty bystanders, drawn from every rank of society and rendered with that firm decision and breadth of treatment which alone constitute a work of art. This work earned him a first prize in the Salon of 1909. These awards are an unmistakable sign of official recognition of these tendencies, so long ignored and disapproved. Such encouragement has borne fruit. François Sicard and Henri Bouchard, who both had won the *prix de Rome*, started boldly on the new road, one in his monumental sculpture (a "Monument of the War of 1870" at Tours; "Monument to Barbey"; "Monument to Bertagna"; a pediment for a college for girls at Tours), the other in works recalling the feeling of Constantin Meunier by subjects of labour, in town or country, small figures in bronze, or large and important decorative groups, as "La Carrière" (the Quarry) and "Le Défrichement" (Turning the Sod), a group of six oxen led by two men. This was intended to decorate the Champ de Mars.

Meantime the study of beauty in the nude, far from being neglected, seemed to start on a new flight. Some students of the Roman school revived this tradition. Victor Ségoffin and Maximilien Landowski, each in his own nervous, vivid and characteristic manner, and, borne on an independent current, Louis Convers and Aimé Octobre show a feeling for grace and charm.

This is the normal and traditional heritage of the school; we see how strikingly it has renewed itself. In opposition to the followers of Rodin we find another group which represents an antagonistic school. Mademoiselle Camille Claudel, José de Charmoy and Henri Matisse typify the extremes of this manner; Emile Bourdelle, Aristide Maillot and Lucien Schnegg might be regarded as some of the artists who best deserved attention. With various characteristics and vehement or equable temperament they all reveal in the highest degree a fine sense of purely plastic qualities; in them we find no lapse into the pictorial, no purpose or *arrière-pensée* that is not of the essence of sculpture. Emile Bourdelle has given us busts of Beethoven, Carpeaux, Heracles (in the Luxembourg Gallery), Pallas Athena, and the large group of "Wrestlers of Tarn et Garonne" for completion in bronze. Maillot for his part prefers to work in marble and stone with large surfaces, after the tradition of the ancients; he exhibited in the autumn Salons several heads of girls and of old women, a figure of a youth in bronze (1909) and a stooping nude female figure in plaster. Lucien Schnegg's (d. 1909) reputation would have been assured by one bust only from his hand, that, namely, of his pupil "Mademoiselle Jane Poupelet." This in marble is now in the Luxembourg Gallery, and is a masterpiece for grace and dignity in the best spirit of the antique.

Besides these there should be named Jean Boucher, who has executed a monument to Renan, the "Evening of Life" and "Ancient and Modern"; E. Derré, an inventive decorator, with social tendencies and grateful emotional feeling; Max Blondat, lively and witty, as is seen in a fountain with frogs entitled "Jeunesse" (exhibited in the Royal Academy, 1910) and "Love" (in the Luxembourg Gallery); Abbal, Pierre Roche, who loves to handle very various materials—marble, stone and lead; Moreau-Vauthier, D. Poisson, Fix-Masseau, Gaudissard, David, Jacquot, Despiau, known by some fine busts, Drivier, Niclausse and Michel Cazin.

Sculpture on a small scale was effectively carried on by L. Dejean, Vallgren, Carabin, who carves in wood, Cavaillon and Féomont-Meurice. The sculpture of animals, since G. Gardet and P. Péter, has been brilliantly executed by Paul Jouve, Christophe, Navellier, Bigot, Perrault-Harry, Marie Gautier, Berthier and others. (L. Bé.)

Modern Belgian sculpture.

The inevitable reaction in Belgium following upon the long period of dry and lifeless academic sculpture is difficult to trace to any particular pioneer or leader. Nevertheless the three men who certainly mark this period of revolt are Guillaume Geefs, De Bay and Simonis. There is, however, very little to be remembered of these men except that they were the best of their time. Geef's work was marred greatly by his frivolous and unessential details and poverty of thought, together with a frigid coldness of expression in his modelling. In his statue of General Belliard at Brussels, however, he shows the tendency to search for a broader and truer interpretation that warrants his being mentioned as belonging to the movement against the academic school. De Bay was a sculptor of a more artistic temperament, and though some of his works are charming and sympathetic when judged by the standard of his own day, few show evidence of advanced ideas. The work of Simonis is very different. Beyond the mere endeavour to grasp something more true, his work is fresher and perhaps more honest, more bold and gifted with more life. Such qualities are shown in his "Young Girl," in the museum at Brussels, and "Godefroid de Bouillon," in the Place Royale. Besides these three sculptors there was no man of note to strengthen the revival of sculptural art until Paul de Vigne (1843–1901). His early work bears the unmistakable influence of the Italian Renaissance, but after studying in Paris and in Rome he became a follower of the true classic ideal, not of the so-called classicism of Canova and his followers. He was a prolific artist, and from his numerous works it is difficult to pronounce one as his masterpiece. Perhaps that most generally considered his best is the sepulchral marble figure of "Immortality" in the museum at Brussels. Almost its equal in beauty and truthful rendering are his two bronze groups, "The Triumph of Art," on the façade of the Palais des Beaux Arts at Brussels, and the monument to Breydel and De Koninck at Bruges. Among his other works are "Fra Angelico of Fiesole," the bust of Professor Moke, at Antwerp, "Heliotrope" in the museum at Ghent, "Portrait of M. Charles van Hutten," the Wilson monument in the Musée Communal, Brussels, the statue of "Marnix de Sainte Aldegonde" in Brussels, the monument erected at Courtrai to Mgr de Hearne, the monument of Meddepenningen at Ghent, and the monument of the Gevaert family in the Communal Cemetery at Evere.

The art of Charles van der Stappen (b. 1843) is decorative in character, mostly applied to architecture, though he proved himself a versatile sculptor, producing many statues, reliefs, groups, monumental works, and statuettes. His works include a silver centrepiece executed for the town of Brussels, the statue of William the Silent in the Square du Petit Sablon, Brussels, a bust for the monument of Edouard Agneesens in the cemetery of St Josse-ten-noode, St Michael in the Gothic hall of the Hôtel de Ville, Brussels, the monument to Baron Coppens near Sheel, the Alexandre Gendebien monument at Brussels, statues for the Alhambra theatre and Caryatids for the architect De Curtis' house in the same city, and the group of tired workmen, called "The Builders of Cities."

The work of Thomas Vinçotte is characterized chiefly by its vigour and vitality. Vinçotte is classed by some authorities as belonging to the classic group, but his work is less graceful than that of de Vigne and more vigorous and life-like than Van der Stappen's. There is perhaps more movement in his work than in that of any of his contemporaries. The many portraits he executed reveal the ability of grasping the essentials of portraiture as well as the discrimination necessary to discard everything that does not render the work alike and characteristic. Among his works are a statue of Giotto in the Brussels Museum, "Music," on the façade of the Palais des Beaux Arts, the Godecharles monument in the Park, the bronze group of the "Horsebreaker" in the Avenue Louise, and the statue "Agneessens" in the Boulevard du Midi, all of them in Brussels. There is also a bronze group of horses and Tritons for the park of the Château d'Ardenne.

Few men have exercised such influence upon Belgian sculpture as Jef Lambeaux (1852–1908), the Flemish artist. He was born at Antwerp of poor and obscure parents. At an early age he showed great aptitude for drawing, and after a very meagre education he was apprenticed to a wood carver. While there he studied at the academy schools. At sixteen he completed his course and undertook his first important commission, that for two reliefs for the tympana of the French theatre. He was successful for a time in producing statuettes, but after a while his success waned and he was obliged to abandon sculpture and to take any work he could get. After a period devoted to odd employments—sometimes painting, sometimes modelling—he again saved money to enable him to produce some good works. The first of these, "The Kiss," was finished in 1880. It had a great success and was bought by the Antwerp Museum. This discovery of a sculptor of talent led the town of Antwerp to find the means for sending Lambeaux to Italy. After studying in Florence he returned to produce "La Folle Chanson," which by some is considered his masterpiece. The group of "Intoxication" produced later is less satisfactory. The figures show a curious and unpleasant development which the sculptor's previous work scarcely hinted at. A work which may be placed with his "Folle Chanson" is the "Fountain of Brabo" in front of the Hôtel de Ville at Antwerp. This in fact is declared by many critics to be Lambeaux's *chef-d'œuvre*; it is certainly his most imposing monument. Other works of his are "The Robber of the Eagle's Nest," the wonderful colossal relief, "The Passions of Humanity," "The Wrestlers" and "The Orgy."

Less bold and energetic than Lambeaux's is the work of Julien Dillens (b. 1849). Though it does not possess that sense of life and the directness which is found in his brother sculptor, his standard of excellence was steadier. He will be remembered as one of Belgium's finest decorative sculptors, for his best work has been done in architectural enrichment. His pediment for the Hospice des Trois Alliés at Uccle is a successful treatment of the difficult dress of modern times. Dillen's masterpiece is without doubt the group of "Justice" in the Palais de Justice at Brussels. He is responsible for many other important works, the chief of which are the busts of De Pède and Rubens in the Brussels Museum, a statue of Van Orley in one of the squares of Brussels, "The Lansquenets," on the summit of the Royal Palace (before its reconstruction), a statue of Jean de Nivelles on the front of the Palais de Justice at Nivelles, and the marble statues of St Victor and St Louis at Epernay.

There is yet another artist who ranks as one of the greatest sculptors of Flanders. This is Jules Lagaë (b. 1862). He was a pupil of Jef Lambeaux. His work does not call for further distinction from that of Dillens and Lambeaux, than that it is what may be termed "delicate" and possessed a distinctive charm of spontaneous freshness. His "Mother and Child," shown at Florence in 1891, is a good example of the first quality, while "The Kiss," a terra-cotta bust, shows his spontaneity.

In the Walloon provinces two sculptors have done much for the renaissance of the art, Achille Chainaye and Jean Marie Gaspar. Achille Chainaye (b. 1862) is not a prolific sculptor, but all his work is inspired, it would seem, by similar motives and ideas to those which inspired the early sculptors of Florence. The scarcity of his works may be accounted for by the fact that his productions were received with ridicule and derision. Meeting with scant success, he abandoned sculpture and devoted himself to journalism.

The work of Jean Marie Gaspar (b. 1864) shows the inspiration of a whole gamut of emotions, but hardly the continuity of purpose necessary to carry to completion half of his conceptions. He studied under Lambeaux, and, while still in his master's studio, he produced a wonderful group, "The Abduction," two men on furious, plunging horses wrestling for the possession of a struggling woman. This group was shown at the Paris Exposition of 1889, and brought immediate fame to the then unknown sculptor. Of his other finished works may be cited "The Brave," an Indian on horseback; "Adolescents," a charming group of two nude children embracing; "The Young Girl on a Rock," and the "Panther," destined for the botanical gardens at Brussels.

From the death in 1904 of Constantin Meunier (b. 1831) up to the year 1910 no man had advanced beyond the standard set up by that great sculptor. At the outset of his career Meunier had, like all pioneers, to contend with the hostility and derision of the public and of the press. His work touched a hitherto unawakened note. His sympathies lay all with the people who, obscure and unsung, work for the enrichment of the nation. Thus we find his energies and love of work wrapped around the iron foundry, the mine, the field and the factory. His art is not the art of the pseudo-classic, nor is he influenced by the masters of the Renaissance. His work is free and straightforward, true almost to brutality, but withal inspired by a love of doing homage to the workers of the people. He studied in the studio of Fraikin. But it is unlikely that he was much influenced by him, and he soon forsook sculpture for painting. He was for some years one of the group of independent painters, which included De Groux, Dubois, Boulanger, and Baron. When these artists fell apart, Meunier stood alone, painting where no painter had before ventured or given a thought, working amongst the machinery, the pits, and the great factory yards. He continued for twenty-five years to paint in this manner, ignoring public ridicule and neglect. Then Meunier suddenly returned to his old love and produced some small statuettes. One of these—a puddler seated in an attitude of weariness, hard and rough and muscular, clad in little beyond his leathern apron—attracted much attention at the exhibition of the "Society of the XX." at Brussels. The subject and the treatment, so different to the recognized precepts of the schools, created a vast amount of discussion. From that time Meunier continued on the road he had taken, and produced works which gained to him new believers and new friends. Among his chief productions are "Fire-damp," in the Brussels Museum, "The Mower," in the Jardin Botanique at Brussels, "The Glebe," and "Puddlers at the Furnace," both in the Luxembourg Museum, "The Hammerman," the statues on the façade of Notre Dame de la Chapelle, and the monument to Father Damien at Louvain.

Jacques de Lalaing is the author of the masterly monument erected at Evere to the English officers and men who fell at Waterloo, an elaborate work full of imagination and sculptural force and originality. His statue to Robert Cavelier de la Salle, at Chicago, is also a noteworthy performance, and important decorative works by him are to be seen embellishing public gardens in Brussels. Among the leading sculptors of to-day is to be reckoned Charles Samuel, who leans towards the traditions of yesterday.

Modern Italian sculpture.

Canova so dominated the world of sculpture at the beginning of the 19th century that the pseudo-classic style which he introduced remained typical of all the Italian sculpture of note until Bartolini led the movement which ultimately crushed it. In Rome Canova completely overshadowed all other sculptors except perhaps Thorwaldsen, the Danish sculptor, who resided for some time in that city. It is true that Pompeo Marchesi (1789–1858) at the outset of his career enjoyed great popularity, but at the time of his death he was well-nigh forgotten. The interval between the death of Canova and the rise of Bartolini and the new school was filled in by men of mediocre talent, in whose work the influence of the leader of classicism is strongly marked. Francesco Carradori (1747–1824), Camillo Pacetti (1758–1826), Rinaldo Rinaldi (b. 1793) and Giuseppe Fabris (b. 1800) were all followers of Canova, the last three being pupils of that master.

Lorenzo Bartolini (1777–1850) became the leader of the movement towards naturalism. This was nothing more nor less than the servile copying of form—both in natural forms and in dress. Nevertheless Bartolini must be remembered as the pioneer of a different kind of naturalism which was of far greater importance than the manner of treating forms and texture. His true originality lay in his representations of character. In place of the classic subjects invariably treated in his time, he applied himself to the study of actual life. Instead of the expressionless faces of the pseudo-classic, he gave vitality and energy.

A sculptor who was much talked of in his day was Pietro Tenerani (1789–1869), a native of Torano near Carrara. He worked for some time as assistant to Thorwaldsen. Later these two sculptors jointly accepted a commission for the monument of Eugène Beauharnais, and as Thorwaldsen wished to suppress the younger man's name, they quarrelled and finally separated. Tenerani visited Munich and Berlin, where he enjoyed the patronage of Frederick William IV. During the disturbances of 1848 and 1849 he was obliged to leave Rome with his family, in consequence of his sympathy with the Papists and his friendship for Count Pellegrino Rossi, who was assassinated in 1848. Amongst Tenerani's works are a statue of Count Rossi, a monument to Pius VIII. in the sacristy of St Peter's, "The Angel of Resurrection" in the Friedenskirche at Potsdam, a low relief in the church at Castle-Ashby, Northamptonshire, and "The Descent from the Cross," in the Torlonia chapel in St John Lateran. The last-named reveals the close study of nature so characteristic of his work.

The most distinguished Piedmontese sculptor of this period was Marochetti, who is referred to above in connexion with the British school.

Although Vincenzio Vela (1820–1891) was Swiss by birth, he was Italian both by adoption and in his sympathies. In 1838 he won the prize offered by the government to the students of the Lombard-Venetian provinces of Austria, and became known by his statue of Spartacus. His chief works are a statue of Bishop Luini at Lugano; Desolation, at the Villa Gabrina, Lugano; William Tell, at Lugano; the Alfieri and statues of Dr Gallo at the university, and of Cesare Balbo, all at Turin; the statues of Tommaso Grossi and Gabrio Piola at the Brera, Milan; Dante and Giotto at Padua; Joachim Murat at the Certosa, Bologna; and Cavour at Genoa. His masterpiece is the seated figure of Napoleon at Versailles.

After Bartolini, sculpture in Italy slowly developed along the lines of "naturalism" suggested by that leader. Perhaps the greatest activity and advance are to be recorded around Naples, a city till then of subordinate importance in art. Tommaso Solari (b. 1820), who may be regarded as one of the group belonging to Naples, produced work which is hardly distinguishable from that of Vela. His statue of Carlo Poerio, which occupies an important position in Naples, is characteristic of his work. He was followed by several sculptors whose works betray but little originality except in some cases in the forcing of qualities they wished to accentuate, and the selection of daring or dramatic subjects—qualities which reveal the true character of the Neapolitan. The work of Raffaele Belliazzi, another Neapolitan (b. 1835), like that of Solari, is full of conscientious study, but his naturalism shows no genius. Among his works are "The Sleeping Boy," in the Gallery of Modern Art, Rome; "A Woman and Child," and two terra-cotta busts at Capodimonte. Emilio Franceschi (1839–1890) and Achille D'Orsi (b. 1845) both belonged to the Neapolitan group of sculptors. Though the former was not a native of Naples, he resided there from 1869 until his death. But while Franceschi was influenced to a very large extent by the Neapolitan school, D'Orsi broke away from it and created a distinctive style of his own. He studied in Rome, and in 1876 returned to Naples, where he produced "Il Cabalista," followed by "The Parasites," the latter establishing his fame by its singularity both of subject and treatment. It represents two gluttons in a state of extreme intoxication. The group is remarkable as showing D'Orsi's powers of characterization.

A man of perhaps greater original thought was Francesco Jerace, who seems to have been entirely free from the "academic" smallness which characterized the followers of the naturalistic movement. He was born at Polistena in Calabria in 1853. His work bears the impress of his personality and his rather marked aloofness from his contemporaries. He is the author of the monument to Mary Somerville, the English mathematician, which is in the Protestant cemetery at Naples; Vittoria Colonna, exhibited at the Brera, Milan, in 1894; and the Beethoven exhibited at Venice, 1895. At Bergamo there is a statue of the musician Donizetti, which was placed there in 1897.

Vincenzo Gemito was born at Naples in 1852 of parents in a very humble position. He picked up a living in various occupations until, at the age of fourteen, he entered the studio of Emanuele Caggiano (1866). He worked hard and to some purpose, for two years after he modelled "The Gamester," which is at Capodimonte. This work shows evidence of astounding precocity. His work is realistic, but forcible and more alive than that of many sculptors of his day. Gemito was supremely confident of his powers, and in a manner this was justified by his early recognition both amongst critics and the public. He designed a statue of Charles V. for the façade of the Royal Palace at Naples. A small figure of a water-carrier upon a fountain is now in the Gallery of Modern Art at Rome; in the same gallery are his statuette of Meissonier and a terra-cotta figure of Brutus.

A sculptor of quite a different class of subject is Costantino Barbella, born at Chieti in 1853, who gave his entire attention to pastoral subjects, dealing with the costumes, types and occupations of the folk among whom his early life was spent. In the Royal Villa at Monza is a replica of his three peasant girls—a group in terra-cotta. In the national gallery at Rome there are a group of "The Departure of the Conscript," "The Conscript's Return," and another called "April."

For some years the activity amongst what may be called the Sicilian group of sculptors was headed by Benedetto Civiletti (b. Palermo, 1846). Civiletti was a pupil of Dupré, but his work bears little impress of his master's influence; it is characterized mostly by its force and meaning of gesture and facial expression. His statue of "The Youth Dante" at the moment of the first meeting with Beatrice, and his seated figure of "The Young Caesar" are both works which successfully show his power of pose and facial expression. He is the author also of the famous Canaris group, "Christ in Gethsemane," "The Dead Christ," a group of the siege of Missolonghi, and a group of seventeen life-size figures representing the last stand of the Italians at the massacre of Dogali.

The family of Ximenes of Palermo is noted on account of the three of its members who each became well known in the world of art: Empedocle, the painter, Eduardo, the writer, and Ettore, the sculptor. Ettore was a pupil of Morelli. His earliest work of note was a boy balancing himself upon a ball which he called "Equilibrium." He also produced "La Rixe," "Le marmiton," "Cuore del Re," "The Death of Ciceruacchio," "Achilles," and many others. His statue of "Revolution" is one of his best works.

Giulio Monteverde's work is conspicuous for its gaiety and sparkle, but though he has had some influence upon the recent sculptors of Italy, his work follows the naturalistic precepts laid down by his predecessors. A group of his own children, full of vivacious merriment, is in the Palazzo Bianco at Genoa; a "Madonna and Child" is in the Camposanto, and a statue of Victor Emmanuel stands in the square in the centre of Bologna.

Ettore Ferrari of Rome (b. 1849) is another sculptor whose work shows remarkable care and love of what is called finish. He has produced the statues "Porcari," the medieval revolutionist, "Ovid," "Jacopo Ortis," "A Roman Slave," "Giordano Bruno," in the Campo di Fiori, and "Abraham Lincoln," in the New York Museum.

To the Roman group of sculptors also belongs Ercole Rosa (b. 1846). That he was a man of considerable talent is shown by his group of the Cairoli at Rome and his monument of Victor Emmanuel near the cathedral at Milan. Emilio Gallori, who studied at the Florence academy, is the author of the colossal statue of St Peter on the façade of the cathedral at Florence. He won the competition for, and executed, the Garibaldi monument at Rome.

A sculptor who is looked upon as the leader of the Venetian school is Antonio dal Zotto (b. 1841), a follower of Ferrari, at whose hands he received much of his training. He won the *prix de Rome* offered by the academy, and in Rome he met and became a friend of Tenerani. Being a man of independent views, however, he was but little affected by Tenerani's work. He was then twenty-five years old, and after spending two years in Rome and in other centres of artistic interest, he returned to Venice, where he produced a statue of St Anthony of Padua, one of Petrarch and another of Galileo. In 1880 he completed his statue of Titian for the master's birthplace, Pieve di Cadore, and in 1883 he finished the figure of Goldoni in Venice. He is author also of a statue of Victor Emmanuel and a monument of Tartini the violinist, the former in the memorial tower on the battlefield of S. Martino near Brescia, the latter in a public square at Pirano.

Turin boasts many sculptors who are known throughout the country. Chief of these is Odoardo Tabacchi (b. 1831). He is the joint author with Antonio Tantardini of the Cavour monument at Milan. He has modelled several subjects of a lighter type, such as "The Bather," exhibited in Milan in 1894. Lorenzo Bistolfi, a younger man, conquered recognition chiefly by his composition of "Grief Comforted by Memory." Amongst other Turin sculptors must be mentioned Luigi Belli, author of the Raphael monument at Urbino, and Davide Calandra, whose "L'Aratro" is in the national gallery at Rome.

Modern Austrian sculpture.

As everywhere in western and central Europe, national sculpture in Austria during the first half of the 19th century was altogether influenced by the classicism of the Italian Canova—in Austria perhaps more than in other countries, since two of Canova's most important works came to Vienna in the early years of the century: the famous tomb of Marie Christine in the Augustinerkirche, which was ordered by Duke Albrecht of Saxony, in 1805, at the price of 20,000 ducats; and the Theseus group, bought by the emperor Francis, in Rome, which is now in the Vienna Museum. Canova's pupil, Pompeo Marchesi, was the author of the emperor Francis monument, unveiled in 1846, in the inner court of the Hofburg.

The first national sculptor of note was the Tirolese Franz Zauner (1746–1822), who was knighted in 1807 (the year in which his Kaiser-Joseph monument was unveiled) and became director of the Vienna gallery and academy. Among his works are the tomb of Leopold II. in the Augustinerkirche; the tomb of General Laudon at Hadersdorf; the tomb of the poet Heinrich von Collin in the Karlskirche in Vienna; and a number of busts in the Empire style, which are by no means remarkable as expressions of artistic individuality. Leopold Kiesling (1770–1827), another Tirolese, whose first work on a large scale is the Mars, Venus and Cupid, in the Imperial gallery, was sent by his patron, Count Cobenzl, to Rome, where he was more attracted by Canova than by the antique or the late Renaissance. Joseph Klieber (1773–1850), also Tirolese, enjoyed the protection of Prince Johann Liechtenstein, who employed him in the plastic decoration of his town residence and country seats. His reputation as sculptor of colossal figures for imperial triumphal arches and lofty tombs was so widespread that he was given the commission for the catafalque of Louis XVIII. in Paris. Many middle-class houses of the Empire period in Vienna were decorated by him with reliefs of children. The elaborate relief figures on the Andreas Hofer monument in Innsbruck are the work of his hand. His followers were less favoured by powerful protection and were forced into a definite direction: among them must be mentioned Johann Martin Fischer (1740–1820), who succeeded Zauner as head of the academy. His best-known work is "The Muscle-man," which still serves as model to students.

Of the greatest importance for the development of Austrian sculpture in the second half of the 19th century was the influence of Joseph Daniel Boehm (1794–1865), director of the academy of coin-engravers, and discriminating collector of art treasures. He was the father of Sir Joseph Edgar Boehm, R.A. Emanuel von Max (1810–1900), who in conjunction with his brother Joseph modelled the Radetzky monument in Prague, wrote in his autobiography, concerning the year 1833 in Vienna: "Art, particularly sculpture, was at the lowest ebb. The appearance of a statuette or bust at an exhibition was considered an event." But a strong movement began towards the end of the 'fifties. Professor Franz Bauer, of the Vienna academy (1797–1872), exercised a most stimulating influence upon the rising generation. Among the earlier artists, whose life overlaps into the new era, were Anton Dietrich (1799–1872), who is best known by "The Three Magi," on the porch of the church of St John, and by a very beautiful ivory crucifix; and Johann Preleuthner (b. 1810).

The architectural rejuvenation of Vienna led to the rise of an original local school of sculpture. J. D. Boehm devoted himself almost entirely to goldsmith-work and medals, but with the aid of his great collections he taught the new generation and helped to develop original talent. Hans Gasser (1817–1868) owed him his introduction to society, for whom he produced many busts. He modelled the empress Elisabeth monument at the western railway station in Vienna, the Wieland monument in Weimar, and the famous "Donauweibchen" in the Vienna town park. His brother, Joseph Gasser von Wallhorn (b. 1816), was a sculptor of figures of saints, many of which decorate St Stephen's Cathedral and the Votive Church in Vienna. Anton Fernkorn (1813–1878), born at Erfurt, was Austrian by his art. He started as a metal worker, and studied in Munich, but not at the academy. His talent was only fully developed after he settled in Vienna, which city owes to him the bold equestrian bronze monuments of Archduke Charles (1859) and Prince Eugene of Savoy (1865). He became director of the imperial bronze foundry, in which post he was followed by his pupil Franz Poenninger. Johann Meixner (b. 1819 in Bohemia) is the creator of the marble figures on the Albrecht Fountain, one of the most famous and imposing monuments in Vienna. Vienna received a few of her most important monuments from the strong personality of the Westphalian Kaspar von Zumbusch (b. 1830), the Beethoven monument, and that of Maria Theresa, an imposing and skilfully designed work, which solves in admirable fashion the problem of placing a monument effectively between the heavy masses of the two imperial museums. Munich owns his monument of King Maximilian II. Zumbusch's fame did not quite overshadow that of Karl Kundmann (b. 1838), to whose vigorous art Vienna owes the Tegetthoff monument (based on the Duilius column), the Schubert statue, the seated figure of Grillparzer, and the awkwardly placed "Minerva" in front of the houses of parliament. Joseph V. Myslbeck (b. 1848) worked under Thomas Seidaus (1830–1890), and is the author of the equestrian figure of St Vaelav, of "The Crucified Saviour," and of the Sladkowsky tomb in Prague. The most successful of the younger school was Edmund Hellmer (b. 1850), who executed the group on the pediment of the houses of parliament; "Francis Joseph granting the Constitution"; the Turkish monument at St Stephen's; one of the wall fountains on the façade of the new Hofburg (Austria's land power)—the companion figure ("Sea Power") is by Rudolf Weyr (b. 1847);—the animated Bacchus frieze of the Court Theatre; the statue of Francis Joseph in the polytechnic institute; and the reliefs of the Grillparzer monument.

Like Hellmer and Weyr, Victor Tilgner (1844–1896) was a pupil of F. Bauer; but he owed his training rather to Joseph von Gasser and Daniel Boehm. He produced a vast number of portrait busts of his most prominent contemporaries in Vienna. Among his most notable monuments are those to Mozart and Makart in Vienna, the Werndl figure at Steyr, Bürgermeister Petersen in Hamburg, and a war memorial at Königgrätz, in addition to numerous monumental fountains. Artistically on a higher plane than Tilgner stands Arthur Strasser (b. 1854), who excelled in polychromatic work on a small scale. In the 'seventies his Japanese figures excited considerable interest and attracted Makart's attention. He excelled in Egyptian and Indian genre figures, such as a praying Hindu between two elephants. An Arab leaning against a Sphinx and a classic female figure with a funeral torch were strikingly decorative. His green patined bronze of "The Triumph of Antinous" with a team of lions was awarded a first medal at the Paris Exhibition of 1900.

Vincenz Pilz (b. 1816) was the sculptor of the quadrigas and caryatids on the Vienna houses of parliament, and of the Kolnitz and Türck monuments. Contemporary with him were Karl Costenoble (b. 1837), Alois Düll (b. 1843), Otto König (b. 1838), Anton Schmidgruber (b. 1837), the craftsman Franz Schönthaler, Johann Silbernagel (b. 1839)—the author of the Liebenberg monument in Vienna, and Anton Wagner (1834–1900), whose "Goose Girl" is one of the monumental features of the streets of Vienna. Classic form was represented by Johannes Benk, who did good work in groups for pediments. One of his latest productions is the Amerling monument in the Vienna town park. Theodor Friedel (1842–1899) excelled in decorative work on a large scale. His are "The Horse Tamers" in front of the Hof-Stallgebäude.

Edmund Hofmann von Aspernburg (b. 1847) is the sculptor of the Friedrich Schmidt monument, of the bronze centaurs in front of the Vienna Academy of Fine Arts, and of the monument of Archduke Karl Ludwig. The works of Stefan Schwartz (b. 1851) are remarkable for their vigour. He excelled in a new technique of embossing portrait plaques in silver direct from life. He counts also among the best Viennese medallists, almost equalling Heinrich Natter (1844–1892). Hermann Klotz (b. 1850) became professor of sculpture in wood. The very talented statuette-maker Ludwig Dürnbauer (1860–1895) died almost at the beginning of what promised to be a brilliant career. Other distinguished sculptors of statuettes and works on a small scale were Hans Rathausky (b. 1858) and Johann Scherpe (b. 1855), who was entrusted with the execution of the Anzengruber monument. They all were pupils of Kundmann, as was also the animal sculptor Lax. Karl Schwerzek is the author of the Lenau and Anastasias Grün busts in Vienna, and Franz Vogl (b. 1861) of the poet Raimund's monument. Among Zumbusch's pupils were Anton Brenck, the creator of the emperor Joseph II. monuments in Brünn and Reichenberg; Emanuel Pendl, whose colossal marble statue of "Justice" is placed in the law courts in Vienna; and Hans Bitterlich (b. 1860), whose bust of Exner in the Vienna university is one of the most remarkable pieces of realistic portraiture in that city. Another work of his is the Gutenberg monument. Othmar Schimkowitz is remarkable for a strikingly original style.

In the other provinces under the Austrian emperor's rule, the best-known sculptors are the Carniole Marcell Guiçki (1830–1894), Lewandowski, Buracz, and the Tirolese Gurschner, who follows the modern French style of statuette sculptors.

In the art of the medallist, Professor Karl Radnitzky the elder (b. 1818) led the way after J. D. Boehm; but he was surpassed by his pupil Joseph Tautenhayn (b. 1837), whose large shield "Struggle between the Centaurs and Lapithae" was the cause of his appointment as professor. More important still is Anton Scharff (b. 1845), a real master of the delicate art of the medallist.

Spanish 19th-century sculptors.

At the beginning of the 19th century the art of sculpture was practically dead in Spain—or at least was mainly confined to the mechanical production of images of saints. But towards the middle of the century the two brothers Agapito and Venancio Vallmitjana, of Barcelona, encouraged by the enthusiasm with which some of their works had been received by local connoisseurs, took part in the Paris *Figaro* competition for the figure which decorates the entrance to the offices of that journal, and carried off the second prize. They afterwards obtained the first prize in other competitions at Madrid and other Spanish centres. Their chief works are: "Beauty dominating Strength," "St Vincent de Paul," the large statue erected at Valencia to Don Jaime Conquistador, and groups of Queen Isabella with the Prince of the Asturias, and Queen Marie Christine with Alfonso XIII.

Another sculptor of distinction is Andres Aleu, professor of the Barcelona School of Fine Arts, whose principal works are the "St George and the Dragon" on the façade of the Barcelona Chamber of Deputies, and Marshal Concha, the equestrian statue in Madrid. Kosendo Novas, of Catalan birth, like most modern Spanish sculptors of eminence, is best known by his masterpiece, "The dead Torero." Manuel Oms, another Barcelona sculptor who leans to the naturalistic school, is the author of the monument to Isabella the Catholic, erected at the end of the Paseo de la Castellana in Madrid in 1883. Antonio Fabrés, who at the beginning of his career was an eminent sculptor, devoted himself subsequently to painting. Agustin Querol, and Mariano Benlliure, of Valencia, were for many years the official favourites of the Spanish government, who entrusted them with numerous important commissions, though their work was neither lofty in conception nor particularly remarkable as regards execution, and occasionally, as in Querol's monument of Alfonso XII.—especially in the completed sketch of it—baroque in the extreme. Indeed, the genius of the Spanish race at all times, and particularly in the 19th century, found its expression in painting rather than in sculpture. Querol's group called "Tradition" is well imagined and expressive, and a good example of the best work achieved by a school in which freedom is the chief note.

Towards the end of the 19th and in the early years of the 20th centuries, Joseph Llimona y Brugena ("The Communion") and Blay, both of Catalan birth, were the most distinguished sculptors of Spain. The fame of Blay, who was a pupil of Chapu in Paris, has extended beyond the frontiers of his native country. His style has at the same time strength and delicacy. His chief works are the Miners' monument at Bilbao, and a group of an old man seated on a bench protecting a little girl from the cold. He also produced a great number of delicately wrought marble busts before his career was prematurely cut short. Joseph Llimona is the most personal and distinguished of all modern Spanish sculptors. His art ranges from the greatest delicacy to real power. At the International Exhibition at Barcelona in 1907 he was awarded the grand prize of honour for a group intended for the monument to Dr Robert in that city; and for a small marble figure of Pain, a work in which he has been thought to rival the Florentines of the best period. José Alcoverro, Pages y Serratora, José Gragera, Fuxa y Leal, Miguel Embil, and the brothers Osle are prominent members of the younger school and aim at giving "the personal note." The vigour displayed by them illustrates the revivification and rejuvenation of Spanish sculpture.

Russian sculpture.

Russian sculpture has practically no past to record. In its beginnings Russian art was entirely ruled by the Church, whose laws were inspired by Byzantinism, and who forced all artists to submit to strictly fixed rules as regards form and formula. Before the 18th century, Russian sculpture was practically non-existent, except in the form of peasant wood-carving. The early stone idols (Kamenyia baby) and primitive bas-reliefs belong to the sphere of archaeology rather than of art. Real sculpture only appears at the end of the 18th century, when Peter the Great, to use his own expression, "opened a window upon Europe" and ordered, together with a radical change in Russian society, the introduction of western art in Russia.

From all European countries artists streamed into Russia and helped to educate native talent, and at the same time the tsar sent young artists abroad to study in foreign art centres. Among the foreign artists of this period were Conrad Hausner, Egelgrener and Schpekle; among the Russians Koulomjin, Issaeiv and Woynow. About 1776 Falconet and his wife arrived in Russia; then Gillet, whose pupil Schubin ranks among Russia's most gifted artists. Among his best-known works is the monument of Catherine II. His fame was rivalled by that of Schedrine. Kozlovski is known by his Souvorine monument. Other early sculptors of distinction were Demouth-Malinowski, the sculptor of the Soussaniev monument; Pimenow, Martos, and the medallist Count Theodore Tolstoï, who is also known as an able illustrator. Orlovsky, Vitali and the whole preceding group represent the pseudo-classic character acquired at foreign academies. Among animal sculptors Baron Klodt is known by his horses which decorate the Anitschkine bridge at St Petersburg.

About the beginning of the 19th century the sculptor Kamenski inaugurated a more realistic tendency by his work which was inspired by contemporary life. He entered the academy after having exhibited a series of sculptures among which the most interesting were "The First Step" and "Children in the Rain." His contemporary Tschigoloff began his career in brilliant fashion, but devoted himself subsequently to the execution of commissions which did not give full scope to his gifts.

The greatest talent of all was unquestionably Marc Antokolsky (1845–1902), a Jewish sculptor permitted to work outside the Pale, of whom the Paris correspondent of *The Times* wrote, about 1888, that French sculptors would benefit by studying under Antokolsky, and by learning from him the power of the inspiration drawn from the study of nature. The artist himself held his statue of Spinoza to be his finest achievement. "I have put into this statue," he wrote, "all that is best in me. In the hard moments of life I can find peace only before this work." Equally beautiful is "The Christian Martyr," in the creation of which Antokolsky definitely broke all the fetters of tradition and strove no longer to express linear beauty, but intense truth. The martyr is an ugly, deformed woman, tortured and suffering, but of such beautiful sentiment that under the influence of religious extasis her very soul seems to rise to the surface. Among his other works few are better known than "Mephistopheles" (which he wanted to call "The 19th Century") and the powerful "Ivan the Terrible," which the Russian critic Starsoff called "The Torturer Tortured." The whole strange psychology of this ruler, whose compeer in history can only be found perhaps in the person of Louis XI., is strikingly expressed by Antokolsky. Very beautiful is the statue of Peter the Great, which breathes strength, intelligence, genius and devouring activity. To the works already mentioned must be added the statues of Ermak and of Nestor. Antokolsky has left to the world a gallery of the most striking figures in Russian history, giving to each one among them his proper psychology. His technique is always marked by perfect sureness and frequently by dazzling bravura.

Antokolsky was twenty-one years of age when he left St Petersburg. The academy at that time was in a state of complete decadence, under the rule of worthy old professors who remained strangers to their pupils, just as their pupils remained strangers to them. When Professors Piminoff and Raimers died, soon after, the academy seemed quite deserted; but just at that time a number of very gifted students began to work with energy, learning all they could from one another, fired by the same purpose and spirit. Antokolsky was in close touch with his friend, the painter Repin, with whom he worked much, and so failed to come under the influence of the idealist M. V. Praklow, who soon began to deliver certain lectures on art which excited keen interest among the young workers. Antokolsky tried the Berlin Academy of Fine Arts, but finding it ruled by the same routine, he returned before long to St Petersburg, where within a short time he executed the statue of "Ivan the Terrible" to which he owed his fame. This epoch became the starting-point of Russian sculpture, so that Antokolsky deserves an eminent position in the history of Russian art.

Among his pupils was his faithful follower and friend Ilia Ginsbourg (b. 1859), who devoted himself to genre scenes and portraits in the spirit of his master, but with a degree of sincerity and enthusiasm which save him from the reproach of plagiarism. Lancéré (1848–1887) is known by his military statuettes. Libérich (1828–1883) has left few remarkable works. Léopold Bernstamm always practised in Paris; among his works are a great number of portraits and a few monuments that are not without merit. Among contemporary sculptors, whose number is still restricted in Russia, and whose artistic merit remains stationary, without marked progress and with little evidence of evolution, are Beklemicheff, Bach, Brodsky, Mikechine, Tourgeneff, Auber and Bernstein. Prince Troubetzkoï, who is counted among the sculptors of Russia, though he was educated and worked in Italy, acquired some reputation by

his skill in the rapid execution of cleverly-wrought impressionist statuettes of figures and horses as well as busts. Their value lies in the vivid representation they give of Russian life and types. Among the most original modern Russian sculptors is Naoum Aronson (b. 1872), whose best-known work is his Beethoven monument at Bonn. At Godesberg is his Narcissus fountain, whilst other works of his are at the Berlin, St Petersburg and Dublin Museums.
(M. H. S.; P. G. K.)

United States.

The early names in American sculpture—Shem Drowne, the maker of weather-vanes; Patience Wright (1725–1785); William Rush (1765–1833), carver of portraits and of figure-heads for ships; John Frazer (1790–1850), the stonecutter; and Hezekiah Augur (1791–1858)—have the interest of chronicle at least. Hiram Powers (1805–1873) had a certain technical skill, and his statues of the "Greek Slave" (carved in 1843 in Rome and now at Raby castle, Darlington, the seat of Lord Barnard, with a replica at the Corcoran Gallery, Washington, and others elsewhere) and "Eve before the Fall" were important agents in overcoming the Puritanic abhorrence of the nude. Horatio Greenough (1805–1852), Joel T. Hart (1810–1877), S. V. Clevenger (1812–1843) and Clark Mills (1815–1883) all received many commissions but made no additions to the advancement of a true art-spirit. Thomas Crawford (1814–1857) began the bas-reliefs for the bronze doors of the Capitol, and they were finished by William H. Rinehart (1825–1874), whose "Latona" has considerable grace. Henry Kirke Brown (1814–1886) achieved, among less noteworthy works, the heroic "Washington" in Union Square, New York City. It is one of the noblest of equestrian statues in America, both in breadth and certainty of handling and in actual majesty, and reflects unwonted credit on its period. Erastus D. Palmer (1817–1904) was the first to introduce the lyrical note into American sculpture; his statue, "The White Captive," and still more his relief, "Peace in Bondage," may be named in proof. There is undeniable skill, which yet lacks the highest qualities, in the work of Thomas Ball (b. 1819). William Wetmore Story (1819–1896), whose "Cleopatra," though cold, shows power; Randolph Rogers (1825–1892), best known for his blind "Nydia," and for his bronze doors of the Capitol at Washington; John Rogers (1829–1904), who struck out a new line in actuality, mainly of an anecdotal military kind; Harriet Hosmer (1830–1908), a classicist, whose recumbent "Beatrice Cenci" is perhaps her most graceful work; J. S. Hartley (b. 1845); Launt Thompson (1833–1894) are among the leaders of their day. The works of Olin L. Warner (1844–1896) and J. Q. A. Ward (1830–1910) reveal at times far greater originality than any of these. Warner's two graceful classical figures for a fountain in Portland, Oregon, and his admirable portrait statue of William Lloyd Garrison, reveal a nice discernment of the fitness of manner to matter. He was also successful in modelling medallions. Ward has a sturdiness, dignity, and individuality quite his own, and may be considered at the head of his own generation. In addition to these should be mentioned Larkin G. Mead (b. 1835), George Bissell (b. 1839), Franklin Simmons (b. 1839), Martin Milmore (1844–1883), Howard Roberts (1843–1900), Moses Ezekiel (b. 1844), all of whom are prominent in the history and development of sculpture in America. By their time the sculptors of America had wakened completely, artistically speaking, to a sense of their own nationality.

It was however later that came that inspired modernity, that sympathy with the present, which are in some senses vital to genuinely emotional art. American sculpture, like American painting, was awakened by French example. The leading spirit in the new movement was Augustus St Gaudens (*q.v.*), a great sculptor whose work is sufficiently dealt with in the separate article devoted to him. Two other Americans stand out, with St Gaudens, among their contemporaries, Daniel Chester French (*q.v.*) and Frederick Macmonnies (*q.v.*). French's "Gallaudet teaching a Deaf Mute" is an example of how a difficult subject can be turned into a triumph of grace. His "Death and the Young Sculptor" is a singularly beautiful rendering of the idea of the intervention of death. In collaboration with E. C. Potter he modelled various important groups, particularly "Indian Corn" and the equestrian "Washington," in Paris. The "Bacchante" of Macmonnies, instinct with Renaissance feeling, is a triumph of modelling and of joyous humour; while his statue of "Nathan Hale" in City Hall Park, New York, his "Horse Tamers," and his triumphal arch decorations for the Soldiers' and Sailors' Memorial at Brooklyn, show the artist's power in the treatment of a serious theme.

The strenuous achievements of George Grey Barnard have both high skill and deep sincerity. His "Two Natures," his "Brotherly Love," his "Pan" and the design for a monumental Norwegian stove are among the strongest efforts of modern American statuary. Ranking with him, though different in thought and method, stands Paul Wayland Bartlett. Success, too, artistically has been accorded to the fine works of John J. Boyle, William Couper, twenty years of whose life were passed in Florence, William O. Partridge, Hermon MacNeil and Lorado Taft. The beautiful busts of Herbert Adams; the thoroughly artistic miniature figures of Mrs Clio Hinton Bracken; the graceful figurines of Mrs Potter Vonnoh; Edwin F. Elwell's "Egypt" and "Orchid"; and the work of F. Wellington Ruckstuhl should also be mentioned; also J. Massey Rhind, a Scotsman by birth and artistic education, John Donoghue, Charles H. Niehaus, Roland H. Perry ("Fountain of Neptune"), Andrew O'Connor, Jerome Conner, John H. Roudebush, and Louis Potter. Equally noteworthy are Bela L. Pratt ("General Benjamin F. Butler" memorial), Cyrus E. Dallin (with Wild West subjects), Richard E. Brooks, Charles Grafly ("Fountain of Life"), Alexander S. Calder, Edmund A. Stewardson ("The Bather") and Douglas Tilden ("Mechanics' Fountain," San Francisco). The leading "animaliers" include Edward Kemeys (representing the Southern states), Edward C. Potter, Phimister Proctor, Solon H. Borglum, Frederick G. Roth, and Frederick Remington. Among the women sculptors are Mrs Kitson, Mrs Hermon A. MacNeil, Miss Helen Mears, Miss Evelyn Longman, Miss Elise Ward, Miss Yandell and Miss Katherine Cohen. (M. H. S.)

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On Belgian sculpture, see Olivier Georges Destrée, *The Renaissance of Sculpture in Belgium* (London, 1895).

On Spanish sculpture, see Paul Laforid, *La Sculpture espagnole* (Paris, 1908).

On English sculpture, see Carter, *Specimens of Ancient Sculpture* (London, 1780); Aldis, *Sculpture of Worcester Cathedral* (London, 1874); Cockerell, *Iconography of Wells Cathedral* (Oxford, 1851); Stothard, *Monumental Effigies of Britain* (London, 1817); Westmacott, "Sculpture in Westminster Abbey," in *Old London* (pub. by Archaeological Institute, 1866), p. 159 seq.; G. G. Scott, *Gleanings from Westminster* (London, 1862); W. Bell Scott, *British School of Sculpture* (London, 1872); W. M. Rossetti, "British Sculpture," in *Fraser's Mag.* (April 1861). The subject of recent British sculpture has been curiously neglected, except in newspaper notices and occasional articles in the periodical press, such as Edmund Gosse's "Living English Sculptors" in the *Century Magazine* for July 1883. The only volume published is M. H. Spielmann's *British Sculpture and Sculptors of To-day* (London, 1901).

For American sculpture, see Henry T. Tuckerman, *Book of the Artists: American Artist Life* (New York, 1870, and later editions); Lorado Taft, *American Sculpture* (New York and London, 1903); William J. Clark, Jnr., *Great American Sculptures* (Philadelphia, 1877); Charles H. Caffin, *American Masters of Sculpture* (New York, 1903); Sadikichi Hartmann, *Modern American Sculpture* (New York).

SCURVY (*Scorbutus*), a constitutional disease, characterized by debility, morbid conditions of the blood, spongy gums, impairment of the nutritive functions, and the occurrence of haemorrhagic extravasations in the tissues of the body. In former times this disease was extremely common among sailors, and gave rise to a frightful amount of mortality. It is now, however, of rare occurrence at sea, the simple means of prevention being well understood. Scurvy has also frequently broken out among soldiers on campaign, in beleaguered cities, as well as among communities in times of scarcity, and in prisons, workhouses and other public institutions. In all such instances it has been found to depend closely upon the character of the food. The precise etiology is obscure, and the modern tendency is to suspect an unknown micro-organism; on the other hand, even among the more chemical school of pathologists, it is disputed whether the cause (or *conditio sine qua non*) is the *absence* of certain constituents in the food, or the *presence* of some actual poison. Sir Almroth Wright in 1895 published his conclusions that scurvy was due to an acid intoxication, while Torup of Christiania believes it to be a direct poisoning from damaged and badly preserved meat. Dr Jackson and Dr Harley support this latter view, contending that scurvy occurs when meat is eaten in this condition, even when lime juice and vegetables are given in conjunction with it. The palmy days of the disease were those when sailors and soldiers had to fare on salt meat and "hard tack," or were deprived of fresh vegetables; and the fact that scurvy has been practically abolished by the supply of these latter has led to the association of this factor with the disease as a *vera causa*. But how the defect in vegetable diet produces scurvy is not quite clear; nor how far other conditions may be involved.

The symptoms of scurvy come on gradually, and its onset is not marked by any special indications beyond a certain failure of strength, most manifest on making effort. Breathlessness and exhaustion are thus easily induced, and there exists a corresponding mental depression. The countenance acquires a sallow or dusky hue; the eyes are sunken; while pains in the muscles of the body and limbs are constantly present. The appetite and digestion may be unimpaired in the earlier stages and the tongue comparatively clean, but the gums are tender and the breath offensive almost from the first. These preliminary symptoms may continue for weeks, and in isolated cases may readily escape notice, but can scarcely fail to attract attention where they affect large numbers of men. In the further stages of the disease all these phenomena are aggravated in a high degree and the physical and mental prostration soon becomes extreme. The face looks haggard; the gums are livid, spongy, ulcerating and bleeding; the teeth are loosened and drop out; and the breath is excessively foetid. Extravasations of blood now take place in the skin and other textures. These may be small like the petechial spots of purpura (*q.v.*), but are often of large amount and cause swellings of the muscles in which they occur, having the appearance of extensive bruises and tending to become hard and brawny. These extravasations are most common in the muscles of the lower extremities; but they may be formed anywhere, and may easily be produced by very slight pressure upon the skin or by injuries to it. In addition, there are bleedings from mucous membranes, such as those of the nose, eyes and alimentary or respiratory tracts, while effusions of blood-stained fluid take place into the pleural, pericardial or peritoneal cavities. Painful, extensive and destructive ulcers are also apt to break out in the limbs. Peculiar disorders of vision have been noticed, particularly night-blindness (nyctalopia), but they are not invariably present, nor specially characteristic of the disease. The further progress of the malady is marked by profound exhaustion, with a tendency to syncope, and with various complications, such as diarrhoea and pulmonary or kidney troubles, any or all of which may bring about a fatal result. On the other hand, even in desperate cases, recovery may be hopefully anticipated when the appropriate remedy can be obtained. The composition of the blood is materially altered in scurvy, particularly as regards its albumen and its red corpuscles, which are diminished, while the fibrine is increased.

No disease is more amenable to treatment both as regards prevention and cure than scurvy, the single remedy of fresh vegetables or some equivalent securing both these ends. Potatoes, cabbages, onions, carrots, turnips, &c., and most fresh fruits, will be found of the greatest service for this purpose. Lime juice and lemon juice are recognized as equally efficacious, and even vinegar in the absence of these will be of some assistance. The regulated administration of lime juice in the British navy, which has been practised since 1795, has had the effect of virtually extinguishing scurvy in the service, while similar regulations introduced by the British Board of Trade in 1865 have had a like beneficial result as regards the mercantile marine. It is only when these regulations have not been fully carried out, or when the supply of lime juice has become exhausted, that scurvy among sailors has been noticed in recent times. Wright has proposed giving what he terms anti-scorbutic elements (Rochelle salt, calcium chloride or lactate of sodium) instead of raw materials such as lime juice and vegetables, as being more convenient to carry on voyages. Besides the administration of lime or lemon juice and the use of fresh meat, milk, cider, &c., which are valuable adjuvants, the local and constitutional conditions require the attention of the physician. The ulcers of the gums and limbs can be best treated by stimulating astringent applications; the hard swellings, which are apt to continue long, may be alleviated by fomentations and frictions; while the anaemia and debility are best overcome by the continued administration of iron tonics, aided by fresh air and other measures calculated to promote the general health.

Infantile Scurvy (*Scurvy Rickets, Barlow's disease*), a disease of childhood due to a morbid condition of the blood and tissues from defects of diet, was first observed in England in 1876 by Sir T. Smith, and later fully investigated by Sir Thomas Barlow. The chief symptoms are great and progressive anaemia, mental apathy, spongy gums, haemorrhages into various structures, particularly under the periosteum and muscles, with suggestive thickenings round the shafts of the long bones, producing a state of pseudo-paralysis.

SCUTAGE or ESCUAGE, the pecuniary commutation, under the feudal system, of the military service due from the holder of a knight's fee. Its name is derived from his shield (*scutum*). The term is sometimes loosely applied to other pecuniary levies on the basis of the knight's fee. It was supposed till recently that scutage was first introduced in 1156 or on the occasion of Henry II.'s expedition against Toulouse in 1159; but it is now recognized that the institution existed already under Henry I. and Stephen, when it occurs as *scutagium*, *scuagium* or *escuagium*. Its introduction was probably hastened by the creation of fractions of knights' fees, the holders of which could only discharge their obligation in this fashion. The increasing use of mercenaries in the 12th century would also make a money payment of greater use to the crown. Levies of scutage were distinguished by the names of the campaigns for which they were raised, as "the scutage of Toulouse" (or "great scutage"), "the scutage of Ireland" and so forth. The amount demanded from the fee was a marc (13s. 4d.), a pound or two marcs, but anything above a pound was deemed abnormal till John's reign, when levies of two marcs were made in most years without even the excuse of a war. The irritation caused by these exactions reached a climax in 1214, when three marcs were demanded, and this was prominent among the causes that led the barons to insist on the Great Charter (1215). By its provisions the crown was prohibited from levying any scutage save by "the common counsel of our realm." In the reissue of the Charter in 1217 it was provided, instead of this, that scutages should be levied as they had been under Henry II. In practice, however, under Henry III., scutages were usually of three marcs, but the assent of the barons was deemed requisite, and they were only levied on adequate occasions.

Meanwhile, a practice had arisen, possibly as early as Richard I.'s reign, of accepting from great barons special "fines" for permission not to serve in a campaign. This practice appears to have been based on the crown's right to decide whether personal service should be exacted or scutage accepted in lieu of it. A system of special composition thus arose which largely replaced the old one of scutage. As between the tenants-in-chief, however, and their under-tenants, the payment of scutage continued and was often stereotyped by the terms of charters of subinfeudation, which specified the quota of scutage due rather than the proportion of a knight's fee granted. For the purpose of recouping themselves by levying from their under-tenants the tenant-in-chief received from the crown writs *de scutagio habendo*. Under Edward I. the new system was so completely developed that the six levies of the reign, each as high as two pounds on the fee, applied only in practice to the under-tenants, their lords compounding with the crown by the payment of large sums, though their nominal assessment, somewhat mysteriously became much lower (see KNIGHT SERVICE). Scutage was rapidly becoming obsolescent as a source of revenue, Edward II. and Edward III. only imposing one levy each and relying on other modes of taxation, more uniform and direct. Its rapid decay was also hastened by the lengths to which subinfeudation had been carried, which led to constant dispute and litigation as to which of the holders in the descending chain of tenure was liable for the payment. Apart from its financial aspect it had possessed a legal importance as the test, according to Bracton, of tenure by knight-service, its payment, on however small a scale, proving the tenure to be "military" with all the consequences involved.

The best monograph on the subject (though not wholly free from error) is J. F. Baldwin's *The Scutage and Knight Service in England* (1897), a dissertation printed at the University of Chicago Press. Madox's *History of the Exchequer* was the standard authority formerly, and is still of use. The view now held was first set forth by J. H. Round in *Feudal England* (1895). In 1896 appeared the *Red Book of the Exchequer* (Rolls series), which, with the *Testa de Nevill* (Record Commission) and the Pipe Rolls (published by the Record Commission and the Pipe Roll Society), is the chief record authority on the subject; but many of the scutages are wrongly dated by the editor, whose conclusions have been severely criticized by J. H. Round in his *Studies on the Red Book of the Exchequer* (privately issued) and his *Commune of London and other Studies* (1899). Pollock and Maitland's *History of English Law* (1895) should be consulted. M'Kechnie's *Magna Carta* (1905) is of value; and Scargill Bird's "Scutage and Marshal's Rolls" in *Genealogist* (1884), vol. i., is important for the later records. (J. H. R.)

SCUTARI (Turkish, *Uskudar*, anc. *Chrysopolis*), a town of Turkey in Asia, on the E. shore of the Bosporus, opposite Constantinople of which it forms the 9th Cercle-Municipale. Its painted wooden houses and white minarets piled upon the slopes of the shore and backed by the cypresses of the great cemetery farther inland present a very picturesque appearance from the sea. The town contains eight mosques, one of them, the Valideh Jami, built in 1547, of considerable beauty. Other remarkable buildings are the vast barracks of Selim III. and a hospital used during the Crimean War (see NIGHTINGALE, FLORENCE). The chief industry of Scutari is the manufacture of silk, muslin and cotton stuffs. The population is estimated at 105,500, of which two-thirds are Mahommedan. The most striking feature of Scutari is its immense cemetery, the largest and most beautiful of all the cemeteries in and around Constantinople; it extends over more than 3 m. of undulating plain behind the town. Between Scutari and Haidar Pasha the English army lay encamped during the Crimean War, and in a cemetery on the Bosporus are buried the 8000 English who died in hospital. At Haidar Pasha is the terminus of the Angora, Konia and Smyrna railways. Chrysopolis ("Golden City"), the ancient name of Scutari, most probably has reference to the fact that there the Persian tribute was collected, as at a later date the Athenians levied there a tenth on the ships passing from the Euxine. Scutari was formerly the post station for Asiatic couriers (Uskudar=courier), as also down to the introduction of steam the terminus of the caravan routes from Syria and Asia.

SCUTARI (anc. *Scodra*, Slav. *Skadar*, Albanian *Shkóder*, or with the definite article *Shkódr-a*), the capital of the vilayet of Scutari and principal city of Albania, European Turkey; on the south-eastern shore of Lake Scutari, near the confluence of the Drin and Boyana rivers, and 14 m. inland from the Adriatic Sea. Pop. (1905) about 32,000. The plain in which Scutari is built extends southwards to Alessio and northwards to the Montenegrin frontier. It is enclosed by lofty mountains on every side except where it adjoins the lake. It is very liable to be flooded, and this liability was greatly increased towards the close of the 19th century by the deflection of the Drin and its junction with the Boyana. Its bazaar and mosques give Scutari an oriental appearance, but the finest of its buildings are Italian—an old Venetian citadel on a high crag, and a Roman Catholic cathedral. The city is the seat of a Roman Catholic archbishop and a Jesuit college and seminary, which are subsidized by the Austrian government. The trade of Scutari tends to decline and to be diverted to Salonica and other ports connected with the main European railways. Grain, wool, hides and skins, tobacco and sumach are exported; arms and cotton stuffs are manufactured; and textiles, metals, provisions and hardware are imported. Large quantities of a kind of sardine, called *scoranze* by the Italians and *seraga* by the Albanians, are caught in the Boyana and cured for export or home consumption. The Boyana is navigable by small seagoing vessels as far as Oboti, 12 m. from its mouth; cargoes for Scutari are then transhipped into light river craft. The steamers of the Anglo-Montenegrin trading company ply on the lake.

Livy relates that Scodra was chosen as capital by the Illyrian king Gentius, who was here besieged in 168 B.C., and carried captive to Rome. In the 7th century Scutari fell into the hands of the Servians, from whom it was wrested by the Venetians, and finally, in 1479, the Turks acquired it by treaty.

LAKE SCUTARI is almost bisected by the line of the Montenegrin frontier. It occupies one of the depressions, known as *polyes*, which are common throughout the Illyrian Karst region. Its generally even margin is broken by the estuary of the river Moratcha, and by a long, narrow inlet which stretches towards the North Albanian Alps. The lake measures 135 sq. m.; its maximum depth was long considered to be no more than 23 ft. But a series of soundings taken in 1901 by Dr Jovan Cvijić revealed the existence of a series of deep holes near the south-western shore, one of which attains a depth of 144 ft. The surface is 20 ft. above sea-level. The principal affluent of Lake Scutari is the Moratcha, which enters it, after forming two small lakes, near the Montenegrin port of Plavnitza. It is drained by the Boyana, which issues from its south-eastern extremity and flows to the Adriatic. Lake Scutari abounds in aquatic birds and fish; its brilliantly clear water, its archipelago of wooded islets, and its setting of rugged mountains, some of which are covered with snow during the greater part of the year, render it one of the most beautiful lakes in Europe.

SCUTTLE, a term formerly applied to a broad flat dish or platter; it represents the O. Eng. *scutel,* cognate with Ger. *Schüssel*, dish, derived from Lat. *scutella*, a square salver or tray, dim. of *scutra*, a platter, probably allied to *scutum*, the large oblong shield, as distinguished from the *clypeus*, the small round shield. The name survives in the coal-scuttle, styled "purdonium" in English auctioneers' catalogues, which now assumes various forms. "Scuttle" in this sense must be distinguished from the word meaning a **small** opening in the deck or side of a ship, either forming a hatchway or cut through the covering of the hatchway; from which to "scuttle" a ship means to cut a hole in the bottom so that she sinks. This word is an adaptation of O. Fr. *escoutille*, mod. *écoutille*, from Span. *escotilla*, dim. of *escoti*, a sloping cut in a garment about the neck. The Spanish word is cognate with Du. *schoot*, Ger. *Schoss*, lap, bosom, properly the flap or projecting edge of a garment about the neck, O. Eng. *sceat*, whence "sheet." The colloquial "scuttle," in the sense of hurrying away, is another form of "scuddle," frequentative of "scud," to run, which, like its variant "scoot," is another form of "shoot."

SCYLAX OF CARYANDA (in Caria), Greek historian, lived in the time of Darius Hystaspis (521–485 B.C.), who commissioned him to explore the course of the Indus. He started from Caspatyrus (Caspapyrus in Hecataeus; the site cannot be identified: see V. A. Smith, *Early Hist. of India*, 2nd ed., 1908, 34 note), and is said by Herodotus (iv. 44) to have reached the sea, whence he sailed west through the Indian Ocean to the Red Sea. Scylax wrote an account of his explorations, referred to by Aristotle (*Politics*, vii. 14), and probably also a history of the Carian hero Heracleides,[1] prince of Mylasae, who distinguished himself in the revolt against Darius (Herodotus v. 121). This work is the earliest known Greek history which centred round the achievements of a single individual. Suïdas (*s.v.*), who mentions the second work, confounds the older Scylax with a much later author, who wrote a refutation of the history of Polybius, and is presumably identical with Scylax of Halicarnassus, a statesman and astrologer, the friend of Panaetius spoken of by Cicero (*De div.* ii. 42). Neither of these, however, can be the author of the *Periplus* of the Mediterranean, which has come down to us under the name of Scylax of Caryanda. This work is little more than a sailor's handbook of places and distances all round the coast of the Mediterranean and its branches, and then along the outer Libyan coast as far as the Carthaginians traded. Internal evidence shows that it must have been written long after the time of Herodotus, about 350 B.C.

Editions by B. Fabricius (1878) and C. Müller in *Geographici Graeci minores*, i., where the subject is fully discussed; see also G. F. Unger, *Philologus*, xxxiii. (1874); B. G. Niebuhr, *Kleine Schriften*, i. (1828); and E. H. Bunbury, *History of Ancient Geography*, i.

SCYLLA AND CHARYBDIS. In Homer (*Od.* xii. 73, 235, 430) Scylla is a dreadful sea-monster, daughter of Crataeis, with six heads, twelve feet and a voice like the yelp of a puppy. She dwelt in a sea-cave looking to the west, far up the face of a huge cliff. Out of her cave she stuck her heads, fishing for marine creatures and snatching the seamen out of passing ships. Within a bowshot of this cliff was another lower cliff with a great fig-tree growing on it. Under this second rock dwelt Charybdis, who thrice a day sucked in and thrice spouted out the sea water. Between these rocks Odysseus sailed, and Scylla snatched six men out of his ship. In later classical times Scylla and Charybdis, whose position is not defined by Homer, were localized in the Straits of Messina—Scylla on the Italian, Charybdis on the Sicilian side (Strabo i. p. 24; vi. p. 268). The well-known line, *Incidis in Scyllam cupiens vitare Charybdim*, occurs in the *Alexandreis* of Gautier de Lille, a poet of the 12th century. In Ovid (*Metam.* xiv. 1-74) Scylla appears as a beautiful maiden beloved by the sea-god Glaucus and other deities, and changed by the jealous Circe (or other rival) into a sea-monster; afterwards she was transformed into a rock shunned by fishermen. According to a late legend (Servius on *Aeneid*, iii. 420), Charybdis was a voracious woman who robbed Heracles of his cattle and was therefore cast into the sea by Zeus, where she retained her old voracious nature. In later poetry and art Scylla was conceived of as a maiden above, with dogs' or wolves' heads growing out of her body, and the tail of a fish.

Another Scylla, confounded by Virgil (*Ecl.* vi. 74) with the sea-monster, was a daughter of Nisus (*q.v.*), king of Megara.

See O. Waser, *Skylla und Charybdis in der Literatur und Kunst der Griechen und Römer* (1894); and D. Jobst, *Skylla und Charybdis* (Würzburg, 1902), who endeavours to show that the Homeric description really referred, as the ancients assumed, to the Sicilian straits.

SCYMNUS of Chios, the name assigned to a Greek geographer of uncertain date, commonly taken to be the author of a fragmentary anonymous *Paraphrasis* in verse describing the northern coasts of the Mediterranean and the shores of the Black Sea, a work which in the first edition (Augsburg, 1600) was ascribed to Marcianus of Heraclea. Meineke showed that this piece cannot be by Scymnus. It is dedicated to a King Nicomedes, probably Nicomedes III. of Bithynia (91–76 B.C.), and so would date from the beginning of the 1st century B.C. Its most valuable portions relate to the Euxine regions and to the Hellenic colonies of those shores as well as of the coasts of Spain, Gaul and Italy.

See Meineke's edition (Berlin, 1846); C. Müller, *Geographi Graeci minores*, vol. i., where the poem is edited with sufficient prolegomena, (pp. lxxiv.–lxxvii.); E. H. Bunbury, *Ancient Geography*, i. 99, 100, 102, 128, 183; ii. 26, 69–74.

SCYPHOMEDUSAE or ACALEPHAE, one of the two subdivisions of the Hydrozoa (*q.v.*), the other being the Hydromedusae (*q.v.*). The subclass Scyphomedusae contains a number of animals which in the adult condition are medusae or jellyfishes (see MEDUSA), exclusively marine in habitat and found in all seas. They are chiefly pelagic organisms, floating at or near the surface of the water, but occur also at great depths, and are sometimes fixed and sessile in habit. Many species attain a large size and by their brilliant coloration are very conspicuous objects to the mariner or traveller. In spite of the soft nature of their bodies, a number of Scyphomedusae have been found fossil; see especially Maas (7 and 12).

A scyphomedusa is distinguished from a hydromedusa chiefly by the following points. The umbrella has a lobed, indented margin, a character only seen amongst Hydromedusae in the order Narcomedusae, and it is without the characteristic velum of the Hydromedusae; hence the Scyphomedusae are sometimes termed Hydrozoa Acraspeda. The sense-organs are covered over by flaps of the umbrellar margin (hence "Steganophthalmata"), and are always tentaculocysts, that is to say, reduced and modified tentacles, which bear usually both ocelli and otocysts, and are hollow. The gonads are formed in the endoderm (hence "Entocarpeae"), and the generative products are shed into the gastric cavity and pass to the exterior by way of the mouth. The development from the egg may be direct, or may take place with an alternation of generations (metagenesis), in which a non-sexual individual, the so-called scyphistoma or scyphopolyp, produces by budding the sexual medusae.

Morphology of the Scyphomedusa.—As already stated, a medusa of this order may be free-swimming or sessile in habit. Intermediate between these two types are species which have the power of temporal fixation by the exumbral surface. Such forms when undisturbed fix themselves to the bottom and rest with their mouths and tentacles uppermost. If disturbed they swim about like other medusae until a favourable opportunity presents itself for resuming the sedentary habit. A well-known example of a permanently sessile form is *Lucernaria*, common on the Atlantic coasts of Europe, especially in *Zostera*-beds, attached to the weed. It resembles in general appearance a polyp, lacking even the characteristic medusan sense-organs, which are present, however, in the allied genus *Haliclystus* (fig. 1), proving its medusan nature beyond all doubt.

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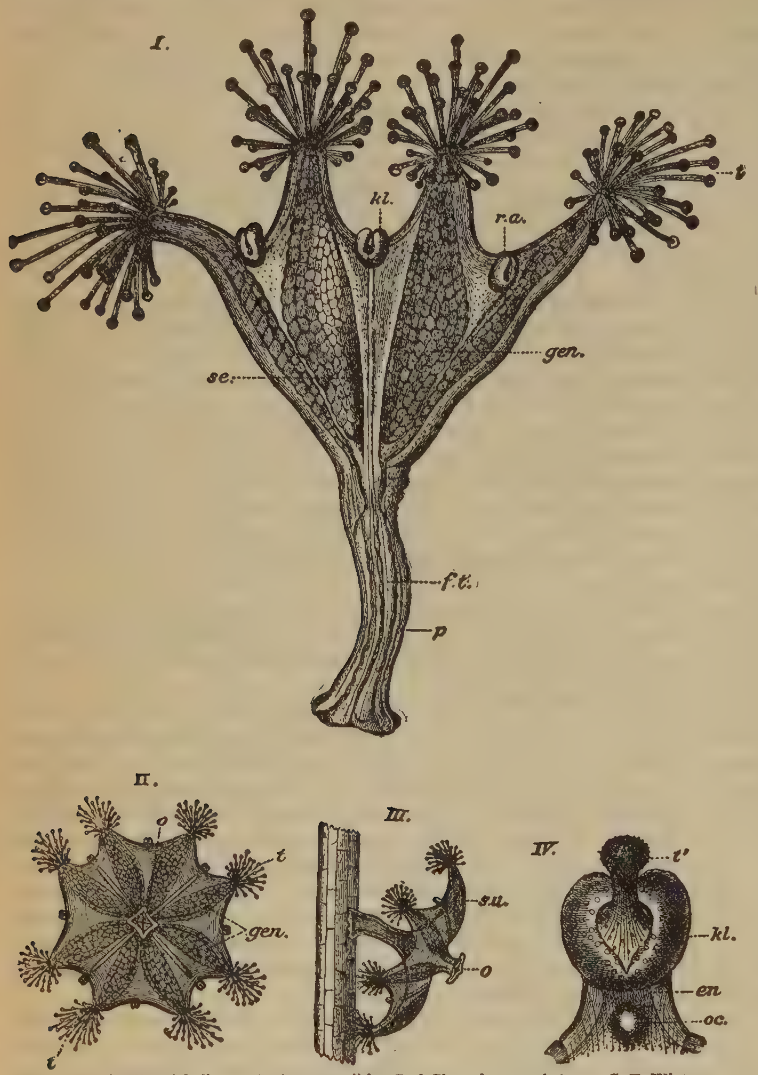
[1] This Heracleides is noticed in an Egyptian papyrus containing a fragment of the historian Sosylus, which alludes, by way of comparison, to the tactical ability displayed by him at the battle of Artemisium (Wilcken in *Hermes*, xli., 1906, pp. 103 seq.).

The body-form of the Scyphomedusae varies from that of a conical or roughly cubical cap (fig. 4), to that of a shallow saucer or disk (fig. 2*a*). The tentacles vary in number from four, the primitive number, to a very large number, but in one suborder, the Rhizostomeae, tentacles are absent altogether (fig. 3, *a*). Typically the tentacles have the form of long flexible filaments, hollow or solid, implanted singly on the margin of the umbrella (fig. 3, *b*), but in some species they occur in groups or tufts (fig. 15), and in *Lucernaria* and its allies a bunch of small capitate tentacles is found on each of the eight adradial lappets of the margin (fig. 1). A true velum is absent, as already stated, but in *Charybdaea* (fig. 4) a structure is found termed a *velarium* (*Ve*), which is a flap hanging down from the margin of the umbrella, and which consists of a fold of the subumbral ectoderm containing endodermal canals. A true velum, such as is found in Hydromedusae, never contains endoderm.



From Bronn's *Tierreich*, ii. 2, "Coelenterata," by Carl Chun, by permission of C. F. Winter.

FIG. 1.—*Haliclystus auricula*. (After H. J. Clark.)

I.	From the side.
II.	From above.
III.	From the side, with the umbrella drawn back and the mouth thrust out.
IV.	A tentaculocyst ("colleto-cystophore" or "marginal anchor") seen from the subumbral side.
p,	Stalk.
su,	Subumbrella.
t,	Knobbed tentacles in eight clusters.
ra,	Tentaculocysts, four perradial, four interradial.
t',	Rudimentary tentacle of the tentaculocyst.
kl,	Glandular cushion.
oc,	Ocellus, and *en*, internal canal of the tentaculocyst.
o,	Mouth.
se,	Interradial septal ridges, passing into the taeniolae (*f.t*) in the stalk.
gen,	The eight adradial gonads on the subumbral walls of the four radial pouches, representing primitively four horse-shoe-shaped gonads each divided into two by an interradial septum.

The mouth may be a simple structure at the extremity of the manubrium, or may be four-cornered, with the corners drawn out into so-called oral arms, each of which bears on the inner side a groove continuing the angle of the mouth (fig. 2*a*). In some genera the oral arms are of great length, and in the suborder Rhizostomeae they undergo concrescence to form a proboscis (fig. 3, *a*), in such a way that the mouth becomes nearly obliterated, and is reduced to a system of fine canals opening to the exterior by small pores.

The mouth leads into the spacious stomach, which is typically four lobed (fig. 2*b*, *v*). On the floor of the stomach are borne the conspicuous gonads (*ov*), and also tentacle-like processes termed gastric filaments or *phacellae*, projecting into the cavity of the stomach. The gonads are folds of the endoderm containing generative cells, and are primitively four in number, situated interradially, but each gonad may be divided into two by the partition which separates two adjacent lobes of the stomach, that is to say, by one of the areas of concrescence between exumbral and subumbral endoderm, whence arises a condition with eight gonads which is by no means uncommon. As a rule these medusae are of separate sexes, but hermaphrodite forms are known, for example, the conspicuous British (east-Atlantic) medusa *Chrysaora* (fig. 3, *b*).

Immediately below each gonad the subumbral ectoderm is pushed in, as it were, to form a pit or deep cavity (fig. 2*a*, *x*, *y*) opening by a wide aperture (*GP*). These cavities are known as the *infundibular* or *subgenital* cavities. They serve probably for the aëration of the gonads by admitting to their vicinity water with its dissolved oxygen; they never serve as genital ducts, since the generative products are always dehisced into the stomach and pass out by the mouth. In some genera, for instance, *Cyanea* and its allies the gonad as a whole protrudes through the subgenital cavity as if it had undergone a hernia, and hangs down in the subumbral space as if suspended by a mesentery (fig. 15). Usually the four subgenital cavities are distinct from each other (so-called tetrademnic condition), but in many Rhizostomeae, for example, *Crambessa*, the subgenital cavities join together under the subumbral floor of the stomach (so-called monodemnic condition) and coalesce to form a so-called subgenital portico placed on the oral side of the stomach, opening by four interradial apertures between the oral arms, that is to say, by the four primitive apertures of the subgenital pits. In *Nausithoë* subgenital pits are absent altogether, and the same condition may be found in *Charybdaeidae*.

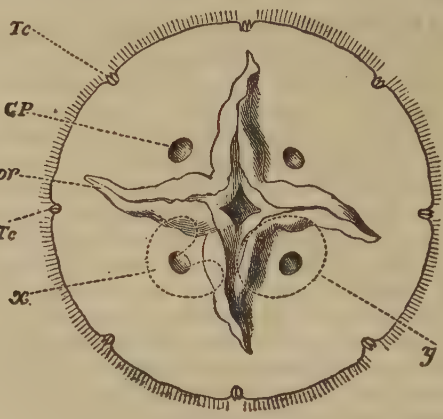


FIG. 2*a*.—Surface view of the Subumbrella or oral aspect of *Aurelia aurita*, to show the position of the openings of the subgenital pits, *GP*. In the centre is the mouth, with four perradial arms corresponding to its angles (compare fig. 11). The four sub-genital pits are seen to be interradial. *x* indicates the outline of the roof (aboral limit) of a subgenital pit; *y*, the outline of its floor or oral limit, in which is the opening.

The gastrovascular system shows every degree of complexity from a very primitive to a highly elaborate type of structure. Taking as a starting-point the wide archenteric cavity which the medusa inherits primitively from the antecedent actinula-stage (see article MEDUSA), we find, in such a form as *Tessera*, four interradial areas of concrescence between the exumbral and subumbral layers of endoderm, four so-called septal nodes or "cathammata," subdividing the stomach into four wide, radially situated pouches which communicate with each other beyond the septal nodes by wide apertures constituting what is termed by courtesy a ring-canal. In other cases the areas of concrescence may extend as far as the margin of the umbrella, so that the lobes of the stomach are completely separated from one another, as in *Charybdaea* (fig. 4), where there are four gastric pouches communicating with the central stomach by four so-called gastric ostia (fig. 4). A similar condition is seen in *Pelagia*, where the number of gastric pouches is increased to sixteen. In forms such as *Lucernaria* and *Charybdaea*, in which the umbrella is of deep form and the stomach-cavity consequently of great extent in the vertical direction, the concrescence-areas or septal nodes are drawn out into vertical partitions or *taeniolae* (fig. 4, *L.o.c.*), resembling in their anatomical relations the mesenteries of the Anthopolyp. The phacellae are carried on the edges of the taeniolae (fig. 4, *Gh*). Finally in the majority of Scyphomedusae the primitively simple concrescence-areas become increased in number and in extent, so that radial canals, ring-canals, &c., can be distinguished in addition to stomach-pouches. Thus in *Aurelia* (figs. 2*a* and 2*b*), to take a familiar example, the digestive tract begins with the mouth, of which the four corners are prolonged into the four long oral arms, perradial in position. The mouth leads into the spacious stomach containing the four conspicuous horse-shoe-shaped gonads (*ov*) marking four stomach-pouches, which, however, are interradial in position. From the stomach or its pouches arise sixteen radial canals, four perradial, four interradial and eight adradial (fig. 2*b*). The perradial and interradial canals consist of a main stem giving off branches, and both stem and branches reach to the marginal ring-canal, the main stem ending in one of the eight tentaculocysts, which are lodged in the notches between the lobes of the umbrellar margin. The adradial canals are unbranched and run to the middle point of one of the marginal lobes. The system of canals shows great variation even in the same species.

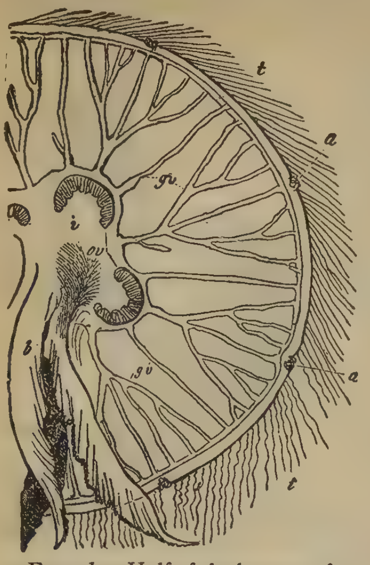


FIG. 2*b*.—Half of the lower surface of *Aurelia aurita*. The transparent tissues allow the enteric cavities and canals to be seen through them. (From Gegenbaur.)

a, Marginal lappets hiding tentaculocysts.
b, Oral arms.
t, tentacles.
v, Axial or gastric portion of the enteric cavity.
gv, Radiating and anastomosing canals of the enteric system.
ov, Ovaries. The gastral filaments near to these are not drawn.

The muscular system of the Scyphomedusae is developed on the subumbral surface as a system of circularly disposed fibres which by their contraction make the umbrella more concave and diminish its cavity. The circular muscles usually form two chief portions, a peripheral wreath-muscle (*Kranzmuskel*), subdivided into four, eight or sixteen areas, and an oral ring-muscle round the mouth. Endodermal muscles are found in the phacellae, and in such forms as *Lucernaria*, longitudinal (vertical) muscular tracts or bands are found in the taeniolae, which, according to some authorities, are of endodermal origin, but which, according to recent observations, are formed in the walls of the infundibular cavities, and are therefore of ectodermal origin.

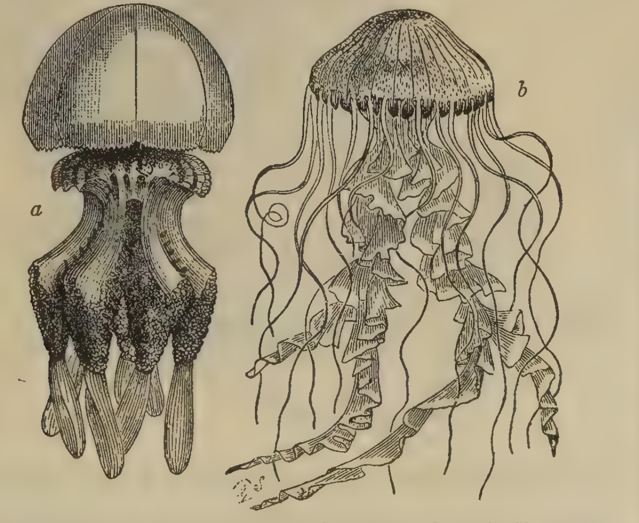


FIG. 3.—*Scyphomedusae*. *a*, *Rhizostoma pulmo*; *b*, *Chrysaora hysoscella*.

The nervous system consists as in Hydromedusae of a diffuse plexus beneath the ectoderm, concentrated in certain places to form a central nervous system. In these medusae, however, the central nervous system does not form continuous rings, but occurs as four or eight separate concentrations at the margin of the umbrella, centred each round one of the sense-organs (tentaculocysts). Each nerve-centre controls its own antimere or segment of the body, receiving sensory impressions from the tentaculocyst and innervating its special subdivision of the muscular system. The separate nerve-centres are, as a rule, placed in communication only by the general nerve-plexus, but in *Charybdaea* there is a zigzag marginal nerve connecting them up.

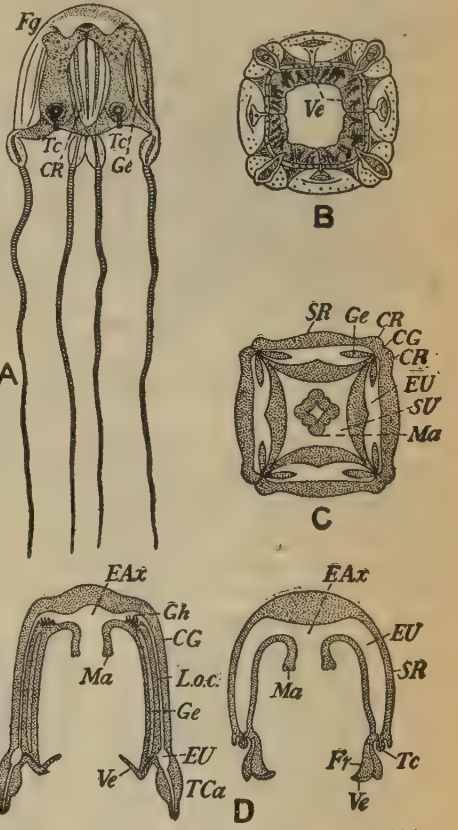


FIG. 4.—*Charybdaea marsupialis*. (After Claus.)

A, Natural size.
B, View of the margin of the umbrella, natural size.
C, Horizontal section through the umbrella and manubrium.
D, Vertical sections, to the left in the plane of an interradius, to the right in the plane of a perradius.
SU, Subumbrella.
Ma, Manubrium.
EAx, Axial enteron.
Gh and *Fg*, Gastral filaments (*phacellae*).
CG, Corner groove.
CR, Corner ridge.
SR, Side ridge.
L.o.c., Endoderm lamella (line of concrescence of the walls of the enteric cavity of the umbrella, whereby its single chamber is broken up into four pouches).
Ge, Line of attachment of a genital band and band in section.
EU, Enteric pouch of the umbrella, in the left-hand figure, points to the cavity uniting neighbouring pouches near the margin of the umbrella and giving origin to *TCa*, the tentacular canal.
Ve, Velarium.
Fr, Frenum of the velarium.
Tc, Tentaculocyst.

The sense-organs of the Scyphomedusae are on the whole of a very uniform type. They are always tentaculocysts, as already stated, and they always have a hollow axis, unlike the tentaculocysts of Hydromedusae, in which group these organs, when they do occur (as in Trachylinae) are always solid. Two types of tentaculocyst must be distinguished, the one occurring only in the order Stauromedusae, the other in all orders of the group. The second and commoner type is known as a *rhopalium* (fig. 6) and consists of a short, hollow rod, the wall of which is composed of the two body-layers, ectoderm and endoderm, enclosing a cavity continuous with that of the gastrovascular system. At the apex of the rhopalium the endoderm is greatly thickened and consists of concrement-cells secreting otoliths (*Con*). The more proximal portion of the rhopalium usually bears one or more ocelli (*oc*). The rhopalia are lodged in the notches between the marginal lobes of the umbrella, and each rhopalium is covered over by a little protecting flap or lappet. On the external (*i.e.* exumbral) face of the lappet there is frequently a patch of sensory ciliated epithelium regarded as olfactory in function and termed the olfactory pit (fig. 6, *A*). Each rhopalium is a centre round which, as already stated, nervous tissue is concentrated.

The *otoliths* vary considerably in number and size. In *Aurelia* there are found numerous otoliths arranged irregularly. In *Charybdaea* (fig. 7, *otol*) the otoliths are larger but fewer in number and have a definite arrangement. In *Nausithoë* a single large otolith is found.

The ocelli vary greatly both as regards number and complexity of structure. In some genera they are absent, as, for instance, in *Pelagia*, *Cyanea* and *Rhizostoma*. In *Aurelia* there are two on each rhopalium, a simple ocellus on the exumbral side, and a cupped ocellus on the subumbral side (not present in young individuals). In *Charybdaea* there are no less than six ocelli on each of the four rhopalia (fig. 7); on the exumbral aspect there are two median ocelli (oc^1, oc^2), a distal and a proximal, each of them a vesiculate ocellus with a lens, and on the sides of the rhopalium are two pairs of ocelli without lenses (*oc.l*); sometimes also an additional seventh ocellus occurs, a pit-like structure without a lens, either between the two median ocelli, or placed asymmetrically near the median proximal ocellus. The ocelli consist, as in Hydromedusae, of two kinds of elements: (1) visual cells, sensory ectodermal cells, which may develop terminal visual cones; (2) pigment-cells, usually ectodermal, but in one known instance endodermal. The simplest type of ocellus is exemplified by the exumbral ocellus of *Aurelia*, a simple patch of pigment-cells interspersed with visual cells, the whole on a level with the remaining ectodermal epithelium. In the next stage of complication, seen in the supernumerary (seventh) ocellus of *Charybdaea*, the patch of pigmented and sensory epithelium is pushed in to form a little pit, in the interior of which the pigment-cells secrete a gelatinous substance forming a rudimentary vitreous body. As a further advance, the pit becomes widened out into a cup, as in the lateral ocelli of *Charybdaea*. The culminating stage of evolution is seen in the median ocelli of *Charybdaea* (fig. 8); the primitively open cup has now closed over to form a vesicle lying beneath the ectoderm; the outer wall of the vesicle becomes thickened to form a cellular lens (*l*), while the proximal wall consists of sensory and pigmented cells and forms a retina. In this way the ocellus becomes a true eye, very similar in plan to the eyes of Gastropods and other molluscs. The ectoderm continued over the optic vesicle forms a transparent cornea (fig. 8, *c*) (better perhaps termed a conjunctiva), below which the spherical lens projects into the optic vesicle, imbedded in the vitreous humour (*v.b*) which fills it; the retina (*r*) consists of visual cells with long cones (fig. 9) alternating with pigment-cells. The high development of the eyes of *Charybdaea* is very remarkable, and so is their close resemblance to the eyes found in other groups of the animal kingdom, with which they can have no genetic relation. Highly developed eyes, with ectodermal pigment and lens, are found also on the rhopalia of *Paraphyllina* (Maas [8]).

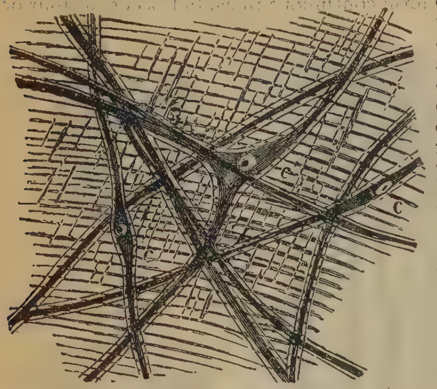


Fig. 5.—Scattered Nerve Ganglion Cells. *c*, From the subumbrella of *Aurelia aurita*. (After Schäfer.)

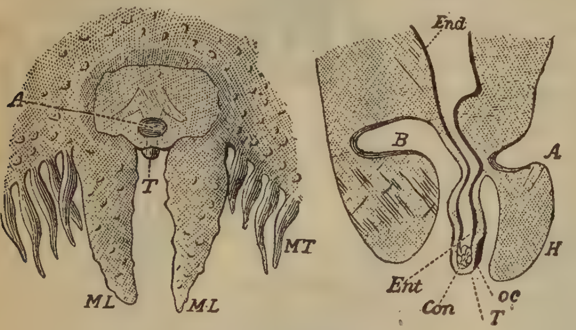


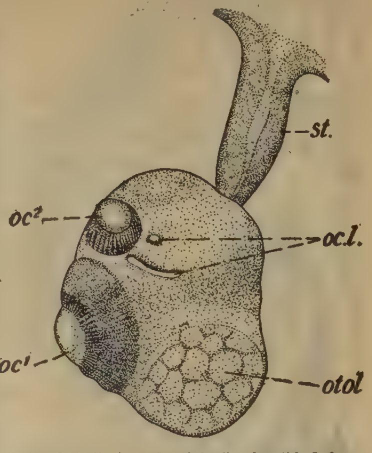
Fig. 6.—Tentaculocyst and Marginal Lappets of *Aurelia aurita*. (After Eimer.)

In the left-hand figure—
ML, Marginal lappets.
T, Tentaculocyst.
A, Superior or aboral olfactory pit.
MT, Marginal tentacles of the disc. The view is from the aboral surface, magnified about 50 diameters.

In the right-hand figure—
A, Superior or aboral olfactory pit.
B, Inferior or adoral olfactory pit.
H, Bridge between the two marginal lappets forming the hood.
T, Tentaculocyst.
End, Endoderm.
Ent, Canal of the enteric system continued into the tentaculocyst.
Con, Endodermal concretion (auditory).
oc, Ectodermal pigment (ocellus). The drawing represents a section, taken in a radial vertical plane so as to pass through the long axis of the tentaculocyst.

The subumbral ocellus of *Aurelia* is found to be of the inverted type, with the visual cones turned away from the light, as in *Tiaropsis* amongst Hydromedusae, and here also the pigment is furnished by the endoderm, forming a cup into which the ectodermal visual cells project (Schewiakoff [13]).

In the Stauromedusae tentaculocysts are either absent altogether, as in *Lucernaria*, or represented by peculiar structures termed "colletocystophores" or "marginal anchors" (fig. 1, IV.). Each such body has a basal hollow portion (*en*) surmounted by a glandular cushion (*kl*), from the centre of which projects a small, solid, club-shaped process or tentacle (*t′*). The basal portion bears an ocellus (*oc*) of simple structure. The distal club corresponds to the crystal-sac of an ordinary rhopalium, but bears a battery of nematocysts in place of the otoliths. These organs are said to be used for purposes of adherence rather than to have the function of sense-organs.

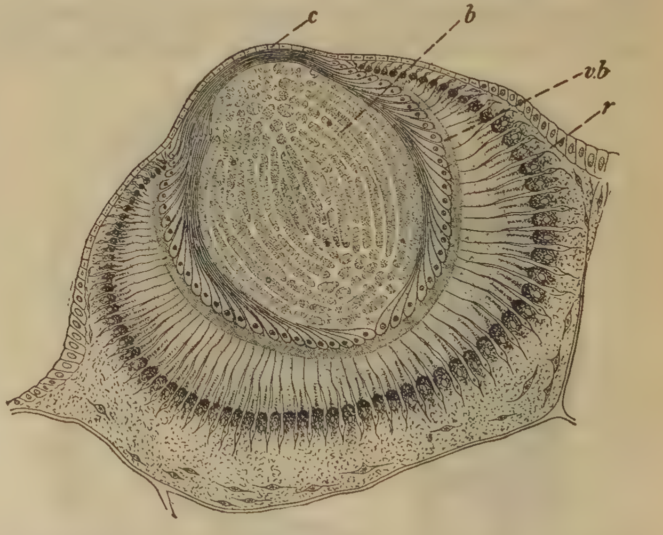


After Wladimir Schewiakoff, simplified from a coloured plate in *Morphologisches Jahrbuch*, xv., 1889, by permission of Wilhelm Engelmann.

Fig. 7.—Tentaculocyst of *Charybdaea marsupialis*, seen from the right side.
st, Stalk.
oc^1, oc^2, Distal and proximal median ocelli.
oc.l, Lateral ocelli.
otol, Otoliths ("crystal-sac").

The histological structure of the Scyphomedusae is in the main similar to that of the Hydromedusae (*q.v.*), but the mesogloea is more abundantly developed in the free-swimming forms, and contains special mesogloeal corpuscles, derived by immigration from the ectoderm, and generally occurring in the form of stellate or bipolar cells.

Development of the Scyphomedusae.—No adult Scyphomedusae are known to reproduce themselves by budding or by any method other than the sexual one. The course of the development in this group is best made clear by taking as a type *Aurelia*, which, together with certain other common genera, such as *Chrysaora* and *Cotylorhiza*, has been studied in detail. Unfortunately the statements concerning some points are very contradictory.

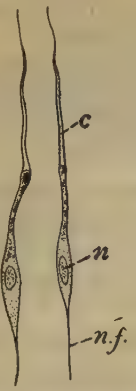


Combined from three figures by Wladimir Schewiakoff in *Morphologisches Jahrbuch*, xv., 1889, by permission of Wilhelm Engelmann.

Fig. 8.—Vertical section of the Median Distal Ocellus (oc^1 of the preceding figure) of *Charybdaea*. *c*, Cornea; *l*, lens; *v.b.*, vitreous body; *r*, retina.

The ova pass out of the mouth and are fertilized externally. In some cases the ova, after leaving the mouth, are lodged in the oral arms, and undergo the earliest phases of their development in this situation, accumulating in the grooves that continue the angles of the mouth, and bulging the wall of the groove into sacs or pockets.

The ovum undergoes total cleavage, giving rise to a bastula which forms a gastrula (fig. 10, A) by invagination (see article HYDROZOA). This is a type of germ-layer formation never found in the Hydromedusae, though of universal occurrence in all groups of animals above the Coelentera. We may regard it as a form of unipolar immigration in which the immigrating cells pass into the interior in a connected epithelial layer, instead of going in singly and independently. The embryo is set free as a planula larva (fig. 10, B) in the gastrula stage, and the orifice of invagination or blastopore, which persists, is situated at the hinder pole. After a time the planula fixes itself by the anterior pole, with the blastopore uppermost. The larva after fixation changes into a polyp-like organism termed a scyphistoma or scyphopolyp (fig. 10, C, D). The body becomes in shape like a vase or urn attached by a narrow stalk, round which a chitinous membrane is secreted. From the edges of the vase the four primary tentacles grow out, each a slender filament with a solid endodermal axis. The tentacles border a broad, flattened peristome, from the centre of which arises the hypostome with the mouth at its extremity; the hypostome is at first low, but soon becomes a projecting, chimney-like tube. It has been sought to prove that the interior of the hypostome is lined by ectoderm, so as to form a stomodaeum or ectodermal oesophagus similar to that of the Anthozoa, but this has been disproved by the most recent investigations of Hein (4) and Friedemann (3), who have shown that the mouth at the extremity of the hypostome represents the persistent blastopore of the gastrula stage.



After W. Schewiakoff, simplified from a coloured plate in *Morphologisches Jahrbuch*, xv., 1889, by permission of Wilhelm Engelmann.

FIG. 9.—Sensory cells from the retina of *Charybdaea*, highly magnified. *c*, Visual cone; *n*, nucleus; *n.f*, nerve fibril.

The internal gastric cavity of the scyphistoma is not a simple space as in the hydropolyp, but is subdivided by four ridges or taeniolae, arising one in each interradius (fig. 11, B). Each taeniola is similar in its anatomical relations to the similarly named structures in *Haliclystus* (fig. 1), and becomes perforated in the same way at its outer side by a "septal ostium," forming as it were the rudiment of a ring-canal. Each taeniola bears a strongly developed longitudinal muscle-band, stated by Claus and Chun to be developed from the endoderm, like the retractor muscles of the anthopolyp, but by other investigators it is affirmed that each retractor muscle of the scyphistoma arises from the lining of a funnel-shaped ectodermal ingrowth ("Septaltrichter") growing down from the peristome inside each taeniola, in a manner similar to the infundibular cavities of *Lucernaria*, which in their turn are homologous with the subgenital cavities of other Scyphomedusae. It is asserted, however, by Friedemann (3), a recent investigator of the subject, that the infundibular cavities appear late in the scyphistoma and have no relation either to the septal muscles or to the subgenital cavities of the adult. The muscle-bands are very contractile, rendering the scyphistoma one of the most difficult of all organisms to preserve in an expanded condition. By their contraction the muscles of the taeniolae drag the hypostome down and so produce the appearances which have been interpreted as a stomodaeal invagination.

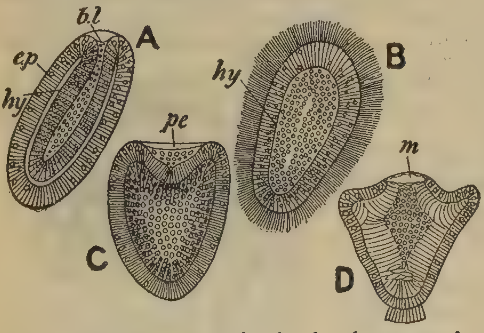


FIG. 10.—Four stages in the development of *Chrysaora*. From Balfour, after Claus.

A, Diblastula stage.
B, Stage after closure of blastopore.
C, Fixed larva.
D, Later stage with mouth, short tentacles, &c.
ep, Ectoderm.
hy, Endoderm.
pe, Stomodaeum.
m, Mouth.
bl, Blastopore.

As the scyphistoma grows the tentacles increase in number, four interradial and eight adradial being formed in addition to the four primary perradial tentacles (fig. 11, A, B, C). The animal may produce its like by lateral budding, or by budding from a basal stolon. The scyphistoma of *Nausithoë* forms a branching network which grows in the sponge *Esperella* and forms the colonial polypoid organism named by Schulze *Spongicola fistularis*, by Allman *Stephanoscyphus mirabilis*. Sooner or later, however, the scyphistoma produces free medusae by a process of transverse fission termed strobilization. In the simplest case one medusa, or at least one at a time, is produced in this way (monodisk strobilization); a circular furrow cuts off the upper, tentacle-bearing portion from the lower half of the scyphistoma (fig. 11, D, and fig. 12), and the upper part becomes detached and swims away, while the base regenerates a new crown. In most cases, however, many such furrows are formed (polydisk strobilization), so that the animal comes to resemble a pile of saucers one above the other (fig. 12). The uppermost saucers of the pile become detached successively and swim off. In this state the scyphistoma is termed a *strobila*.

The medusae produced by strobilization of the scyphistoma are of a peculiar type termed Ephyrae (fig. 11, E, F). As preparations for their formation the margin of the peristome of the scyphistoma grows out into eight lobes, four perradial, four interradial. The sixteen tentacles of the scyphistoma disappear, and in the place of the four perradial and four interradial tentacles, the eight tentaculocysts of the adult are formed as outgrowths of the subumbral margin, independently of the tentacles of the scyphistoma (Friedemann). The septal ostia become widened and the gastral cavity flattened, whereby the taeniolae become comparatively shallow columns, similar to the septal nodes or cathammata of other forms.[1]

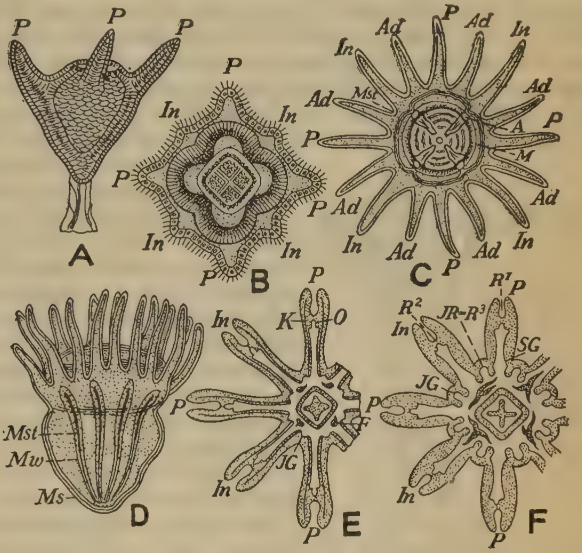


FIG. 11.—Later development of *Chrysaora* and *Aurelia*. (After Claus.)

A, Scyphistoma of *Chrysaora*, with four perradial tentacles and horny basal perisarc.
B, Oral surface of later stage of scyphistoma of *Aurelia*, with commencement of four interradial tentacles. The quadrangular mouth is seen in the centre; the outline of the stomach wall, seen by transparency around it, is nipped in four places interradially to form the four gastric ridges.
C, Oral surface of a sixteen-tentacled scyphistoma of *Aurelia*. The four gastric interradial ridges are seen through the mouth.
D, First constriction of the *Aurelia* scyphistoma to form the pile of ephyrae or young medusae. The single ephyra carries the sixteen scyphistoma tentacles, which will atrophy and disappear. The four longitudinal gastric ridges are seen by transparency.
E, Young ephyra just liberated, showing the eight bifurcate arms of the disk and the interradial single gastral filaments.
F, Ephyra developing into a medusa by the growth of the adradial regions. The gastral filaments have increased to three in each of the four sets.
A, Margin of the mouth.
Ad, Adradial radius.
F, Gastral filament.
In, Interradial radius.
JG, Adradial gastral canal.
JR=R^3, Adradial lobe of the disk.
K, Lappet of a perradial arm.
M, Stomach wall.
Mst, Muscle of the gastral ridge.
Mw, Gastral ridge.
Ms, Mesogloea.
O, Tentaculocyst.
P, Perradial radius.
R^2, Interradial radius.
R^3, Adradial radius.
SG, Commencement of lateral vessel.

The ephyra has a flat, disk-shaped body, with eight marginal lobes (four perradial, four interradial); a tentaculocyst is lodged in a deep notch at the apex of each lobe. Four groups of phacellae indicate the four interradii. The stomach has sixteen marginal pouches and the general anatomical structure recalls that of *Pelagia*. As the ephyra grows in size it gradually takes on the form and structure of the young medusa. The adradial regions grow (fig. 11, F) so as to change the star-like contour into one more evenly circular, the tentacles grow out, and the various parts become complicated and take on the structure of the adult medusa.

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[1] The four primitive interradial cathammata disappear in the fully formed ephyra and become replaced by sixteen subradial concrescence-areas without any ostia or ring-canal at the margin.

The course of development sketched out above is that which is typical of the higher forms of Scyphomedusae, and is by no means to be regarded as the most primitive type of development. The complicated alternation of generations seen in such a form as *Aurelia* does not occur in the more primitive genera. Thus in *Pelagia* the scyphistoma-stage is free-swimming and changes directly into the ephyra, which in its turn grows into the adult form. On the other hand, such a form as *Lucernaria* or *Haliclystus* may be regarded simply as a scyphistoma which has become adult and mature. The comparison of the metagenetic type of development, such as that of *Aurelia*, with the more primitive genera of Scyphomedusae, indicates clearly that the scyphistoma and ephyra are recapitulative larval stages which are represented by the adult forms of primitive genera, making such allowances as are necessary when comparing adult and larval forms. The metagenesis has arisen through the scyphistoma-larva acquiring the power of larval proliferation by budding. A similar origin for metagenesis has been discussed under the Hydromedusae (*q.v.*).

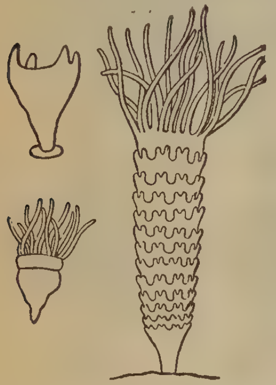


FIG. 12.—Development of *Aurelia*. Above to left, young scyphistoma with four perradial tentacles. Below to left, scyphistoma with sixteen tentacles and first constriction. To the right, strobila condition of the scyphistoma, consisting of thirteen metameric segments; the uppermost still possesses the sixteen tentacles of the scyphistoma; the remainder have no tentacles, but are ephyrae, each with eight bifid arms (processes of the disc). Each segment when detached becomes an ephyra, such as that drawn in fig. 11, E, F. (From Gegenbaur.)

The above comparison further indicates that the scyphistoma should not be regarded as a polyp but rather as a medusoid organism. The only certain criterion of a medusa-individual is the presence of definite sense-organs, but in cases where the organism is much reduced, this criterion may fail us, as it does in the genus *Lucernaria*. Nevertheless a comparison between *Lucernaria* and its close ally *Haliclystus* shows clearly that the absence of sense-organs in the former is the result of secondary reduction, so that a true medusa may lose its most characteristic feature. Hence the absence of sense-organs in the scyphistoma does not necessarily disprove its medusoid character, while its anatomical structure resembles that of a simple scyphomedusa, such as *Lucernaria*, rather than that of a polyp.

Affinities of the Scyphomedusae.—By some authorities the Scyphomedusae have been removed from the Hydrozoa and united with the Anthozoa in a common group termed Scyphozoa. The diagnostic features of the class Scyphozoa thus constituted are supposed to be (1) an ectodermal oesophagus or stomodaeum, (2) a gastric cavity subdivided by mesenteries, (3) gonads formed in the endoderm. It appears, however, that the first of these characters is non-existent, and that the so-called mesenteries are simply the concrescence-areas found in all medusae. There remains only the third feature, the endodermal gonads, as an argument for uniting the Scyphomedusae with the Anthozoa, against which must be set all the peculiarities of medusan organization in which the Scyphomedusae resemble the Hydromedusae. The fact that the Scyphomedusae have a number of well-marked peculiarities of form and structure is not incompatible with placing them in the Hydrozoa as a distinct sub-class, contrasting sharply in many ways with the Hydromedusae.

CLASSIFICATION OF THE SCYPHOMEDUSAE

ORDER I. Cubomedusae or Charybdaeida.—Medusae more or less cubical in form, with four perradial rhopalia alternating with four interradial tentacles or groups of tentacles; oral arms short; stomach a wide cavity bearing four interradial groups of phacellae and giving off four broad perradial pouches completely separated from each other by four interradial septa (*i.e.* ring-canal absent); gonads divided each into two by the septa, hence eight in number; subgenital pits small or absent.

This order stands very much apart from the other orders of the Scyphomedusae. It has been proposed by Maas to divide the entire subclass Acraspeda into A, Charybdaeida and B, Acraspeda typica. The Charybdaeida comprise three families:—

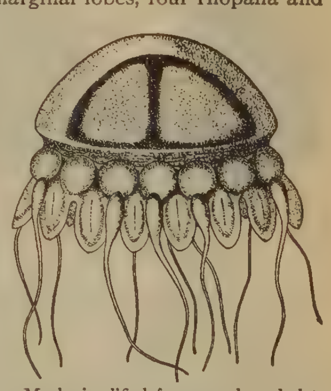
1. *Charybdaeidae.*—With four interradial tentacles. *Charybdaea marsupialis* (fig. 4) is a familiar Mediterranean medusa; the wonderful development of the sense-organs in this genus has already been described (figs. 7-9). The species of *Charybdaea* are stated to be quick and active in their movements and to be voracious feeders.
2. *Chirodropidae.*—With four interradial groups of tentacles. *Chirodropus.*
3. *Tripedaliidae.*—With four interradial groups of tentacles, three in each group. *Tripedalia.*

ORDER II. Stauromedusae or Lucernarida.—Medusae of deep pyramidal form, often sessile, attached by a stalk developed from the centre of the exumbral surface; rhopalia absent or represented by colletocystophores. Four families:—

1. *Lucernaridae.*—Sessile, stalked, with capitate tentacles arranged in groups on eight projecting marginal lobes. Eight gonads. *Lucernaria*, without, and *Haliclystus* (fig. 1) with colletocystophores, are two well-known genera.
2. *Tesseridae.*—Free, with eight or more tentacles, without tentaculocysts. *Tessera*, &c.
3. *Depastridae.*—Sessile, stalked, with eight shallow marginal lobes bearing one or more rows of tentacles; without tentaculocysts; with four gonads. *Depastrum* is a British genus.
4. *Stenoscyphidae.*—Sessile, with the margin undivided; with eight colletocystophores and eight adradial groups of capitate tentacles. *Stenoscyphus inabai*, from Japan.

ORDER III. Coronata.—Free medusae with rhopalia of the normal type; the exumbrella is divided by a circular, so-called *coronal groove*, into two parts, a central portion, which is conical, thimble-shaped, or domed in form, and a peripheral portion, the *pedal zone*, which bears the marginal lobes, tentacles and rhopalia; the pedal zone is subdivided into areas termed *pedalia*, from each of which arises a tentacle or rhopalium in the interspace between two adjacent lobes of the margin. The order contains the following families:—

1. *Periphyllidae.*—With sixteen marginal lobes, four rhopalia and twelve tentacles; the rhopalia are interradial. *Periphylla* (fig. 13), a widely distributed deep-sea genus.
2. *Paraphyllinidae.*—With sixteen marginal lobes, four rhopalia and twelve tentacles; the rhopalia are perradial in position, corresponding to the angles of the stomach. *Paraphyllina* recent; *Paraphyllites* fossil [see Maas (8 and 12)].
3. *Atorellidae.* — With twelve marginal lobes, six rhopalia and six tentacles. *Atorella.*
4. *Pericolpidae.* — With eight marginal lobes, four rhopalia and four tentacles. *Pericolpa.*
5. *Collaspidae* (*Atollidae*).—With sixteen or thirty-two rhopalia, marginal lobes and tentacles often very numerous. *Atolla* (fig. 14) is a well-known deep-sea genus.
6. *Ephyropsidae.*—With sixteen marginal lobes, eight rhopalia and eight tentacles. *Nausithoë*, a small medusa of world-wide distribution, is the type of the subfamily *Nausithoidae*; the subfamily *Linergidae* includes the genera *Linerges*, &c., medusae confined to tropical seas. By Maas and others the *Nausithoidae* and *Linergidae* are ranked as independent families.



Much simplified from a coloured plate in *Results of the "Albatross" Expedition*, Museum of Comparative Zoology, Cambridge, Mass., U.S.A.

FIG. 13.—*Periphylla regina* from life, after O. Maas, about half life-size.

ORDER IV. Discophora.—Medusae with umbrella flattened or disk-like, without coronal groove; lips always prolonged into long oral arms. The most prolific and dominant group of the Scyphomedusae, containing two suborders; the Semaeostomae, in which the oral arms remain separate, and the Rhizostomeae, in which the oral arms become fused together to form a proboscis. Nine families, three of Semaeostomeae, six of Rhizostomeae:—

1. *Pelagiidae.*—Semaeostomeae with wide gastric pouches not united by a ring-canal. *Pelagia*, an oceanic genus with direct development. *Chrysaora* (fig. 3*b*), a common British medusa, with a scyphistoma stage and alternation of generations. *Dactylometra*, a common American medusa of the Atlantic shores, differs from *Chrysaora* in small points.

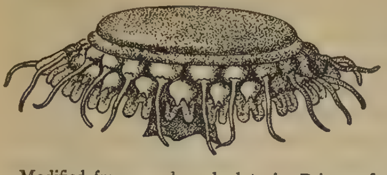

Modified from a coloured plate in Prince of Monaco's series.

FIG. 14.—*Atolla bairdi.* After O. Maas.

2. *Cyaneidae.* — Semaeostomeae with sixteen gastric pouches sending off canals to the margin not united by a ring-canal; tentacles in bunches on the margin. *Cyanea* (fig. 15), represented in the British fauna by two species.

3. *Ulmaridae.*—Semaeostomeae with gastric pouches relatively small, sending off branching canals to the margin, where they are united by a ring-canal. *Ulmaris*, from the South Atlantic, has only eight adradial tentacles. *Aurelia* (fig. 2), with numerous marginal tentacles, is one of the commonest and most familiar of jelly-fishes.

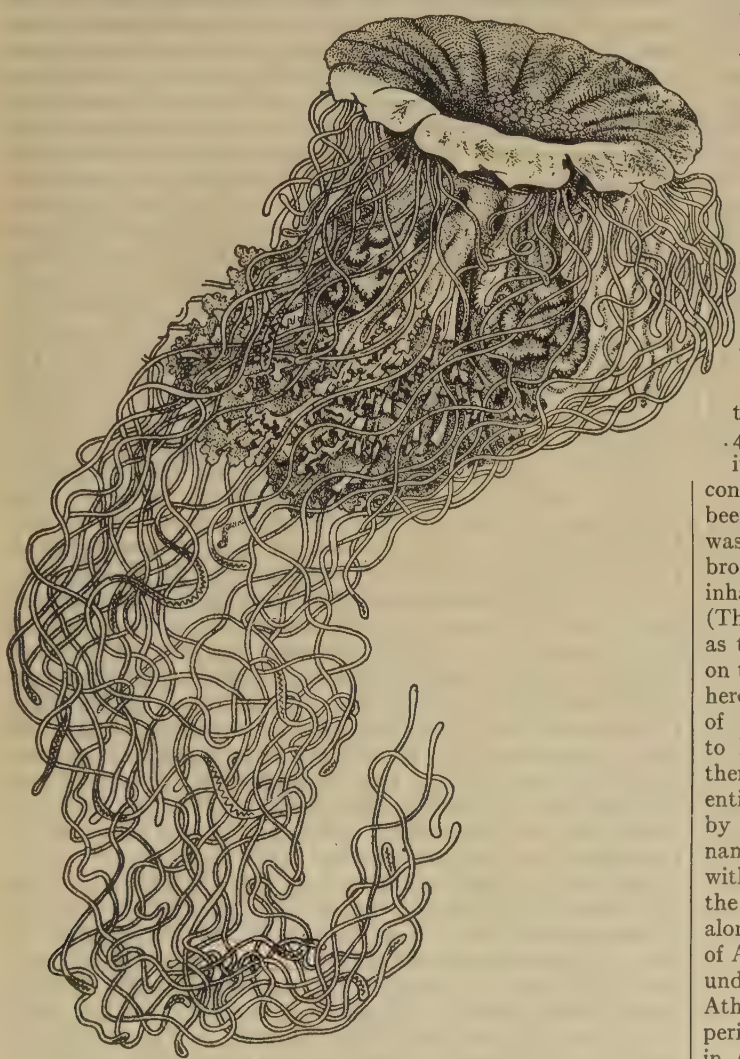

After E. Haeckel, from *System der Medusen*, by permission of Gustav Fischer.

FIG. 15.—*Cyanea* (*Desmonema*) *anasethe*, about two-thirds life-size.

4. *Cassiopeidae.*—Rhizostomeae with subumbral musculature arranged in feather-like arcades (Arcadomyaria, Maas); oral arms pinnate. *Cassiopeia.*

5. *Cepheidae.*—Rhizostomeae with subumbral musculature in radial tracts (Radiomyaria, Maas); oral arms bifid. *Cephea*, *Cotylorhiza.*

6. *Rhizostomatidae* (*Pilemidae*).—Rhizostomeae with subumbral musculature in circular bands (Cyclomyaria); oral arms bifid or very complicated; sixteen radial canals. *Rhizostoma* (*Pilema*) is a very common genus (fig. 3*a*).

7, 8, 9. The families *Lychnorhizidae*, *Leptobrachidae* and *Catostylidae* resemble the preceding in the arrangement of the musculature. In *Lychnorhizidae* only eight of the sixteen radial canals reach the ring-canal; the genus *Crambessa* is the best-known representative of the family. In the other two families there are eight radial canals, and between them a network of canals with many openings into the ring-canal.

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SCYROS, a small rocky barren island in the Aegean Sea, off the coast of Thessaly, containing a town of the same name. In 469 B.C. it was conquered by the Athenians under Cimon, and it was probably about this time that the legends arose which connect it with the Attic hero Theseus, who was said to have been treacherously slain and buried there. A mythic claim was thus formed to justify the Athenian attack, and Cimon brought back the bones of Theseus to Athens in triumph. The inhabitants of Scyros before the Athenian conquest were Dolopes (Thuc. i. 98); but other accounts speak of Pelasgians or Carians as the earliest inhabitants. There was a sanctuary of Achilles on the island, and numerous traditions connect Scyros with that hero. He was concealed, disguised as a woman, in the palace of Lycomedes, king of the island, when his mother wished to keep him back from the Trojan War; he was discovered there by Odysseus, and gladly accompanied him to Troy. An entirely different cycle of legends relate the conquest of Scyros by Achilles. The actual worship on the island of a hero or god named Achilles, and the probable kinship of its inhabitants with a Thessalian people, whose hero Achilles also was, form the historical foundation of the legends. Scyros was left, along with Lemnos and Imbros, to the Athenians by the peace of Antalcides (387 B.C.). It was taken by Philip, and continued under Macedonian rule till 196, when the Romans restored it to Athens, in whose possession it remained throughout the Roman period. It was sacked by an army of Goths, Heruli and Peucini, in A.D. 269. The ancient city was situated on a lofty rocky peak, on the north-eastern coast, where the modern town of St George now stands. A temple of Athena, the chief goddess of Scyros, was on the shore near the town. The island has a small stream, called in ancient times Cephissus.

SCYTHAE (Gr. Σκύθαι), in Herodotus (iv. 1-142) and Hippocrates (*De aere*, 24 sqq.), a definite nation giving its name to Scythia (*q.v.*); in later writers a general term for the inhabitants of that country without distinction of race.

SCYTHE, an implement for mowing grass or reaping corn or grain, consisting of a curved steel blade fastened to a long wooden handle with a slight double curve from which project two small pieces by which the handle is held. The handle is technically known as the "snathe," "sned" or "snead" (*snædan* to cut, cf. Ger. *schneiden*). The word in O.E. is *siðe* or *siþe* M.E. *sithe*; the mis-spelling "scythe" is paralleled by "scent," and is possibly due to the Fr. *scier*, saw; the word means "an instrument for cutting," and is derived from the root *sak*-, seen in Lat. *secare*, to cut, "saw" and "sickle," the oldest of reaping implements, with deep curved blade and short handle. The same root is seen in the "sedge," *i.e.* cutting or sword-grass, strictly applied to plants of the genus *Carex*, but loosely used of flags, rushes and other grasses growing in marshy places (see Reaping).

SCYTHIA (Gr. Σκυθία), originally (*e.g* in Herodotus iv. 1-142), the country of the Scythae or the country over which the nomad Scythae were lords, that is, the steppe from the Carpathians to the Don. With the disappearance of the Scythae as an ethnic and political entity, the name of Scythia gives place in its original seat to that of Sarmatia, and is artificially applied by geographers, on the one hand, to the Dobrudzha, the lesser Scythia of Strabo, where it remained in official use until Byzantine times; on the other, to the unknown regions of northern Asia, the Eastern Scythia of Strabo, the "Scythia intra et extra Imaum" of Ptolemy; but throughout classical literature Scythia generally meant all regions to the north and north-east of the Black Sea, and a Scythian (*Scythes*) any barbarian coming from those parts. Herodotus (*l.c.*), to whom with Hippocrates (*De aere*, &c. 24, sqq.) we owe our earliest knowledge (Homer, *Il.* xiii. 5, speaks of "mare-milkers," and Hesiod, *ap.* Strabo vii. 3 (7) mentions Scythae) of the land and its inhabitants, tries to restrict this merely geographical usage and to confine the word Scyth to a certain race or at any rate to that race and its subjects, but even he seems to slip back into the wider use. Hence there is much doubt as to his exact meaning.

His account of the geography falls into two irreconcilable parts; one (iv. 99 sqq.), in connexion with the tale of the invasion of Darius, makes of Scythia a kind of chessboard 4000 stades square on which the combatants can make their moves quite unhindered by the great rivers: the other (16-20), founded on what he learned from Greeks of Olbia and supplemented by the tales of the 7th century traveller Aristeas of Proconnesus, is not very far removed from first-hand information and can be made more or less to tally with the lie of the land. In accordance with this we can give the relative positions of the various tribes, and an excursus on the rivers (47–57) lets us define their actual seats. In western Scythia, starting from Olbia and going northwards, we have Callippidae on the lower Hypanis (Bug), Alazones where the Tyras (Dniester) and Hypanis come near each other in their middle courses, and Aroteres ("Ploughmen") above them. These tribes raised wheat, presumably in the river valleys, and sold it for export; in the eastern half from west to east were Georgi (perhaps the same as Aroteres) between the Ingul and the Borysthenes (Dnieper), nomad Scyths and Royal Scyths between the Borysthenes and the Tanais (Don). Above all these stretched a row of non-Scythian tribes from west to east: on the Maris (Maros) in Transylvania the Agathyrsi; Neuri in Podolia and Kiev, Androphagi and Melanchlaeni in Poltava, (Ryazan) and Tambov. On the lower Don and Volga we have the Sauromatae, and on the middle course of the Volga the Budini with the great wooden town of Gelonus and its semi-Greek inhabitants. From this region started an important trade route eastward by the Thyssagetae among the southern Urals, the Iyrcae on the Tobol and Irtysh to the Kirgiz steppe, where dwelt other Scyths, regarded as colonists of those in Europe: then by the Argippaei in the Altai and the Issedones in the Tarym basin, to the one-eyed Arimaspi on the borders of China, who stole their gold from the watchful griffins, and who marched with goat-footed men and Hyperboreans reaching to the sea. To the south of Scythia the Crimean mountains were inhabited by a non-Sythic race, the Tauri. (See also articles on these tribes.)

Ethnology.—Herodotus expressly divides the Scythians into the Agriculturists, Callipidae, Alazones, Aroteres and Georgi in the western part of the country, and the Nomads with the Royal Scyths to the east. The latter claimed dominion over all the rest. The question arises whether we have to do with the various tribes of one race in different stages of civilization, or with a mixed population called by foreigners after the ruling tribe. The latter seems by far the more probable. The affinities of this tribe have been sought in various directions, and the evidence suggests that it was itself of mixed blood. We know that in the 2nd century A.D., when the steppes were dominated by the Sarmatae (*q.v.*), the majority of the barbarian names in the inscriptions of Olbia, Tanais, and Panticapaeum were Iranian, and can infer that the Sarmatae spoke an Iranian language. Pliny speaks of their descent from the Medes. Now the Sarmatae are represented as half-caste Scyths speaking a corrupt variety of Scythian. Presumably, therefore, the Scyths also spoke an Iranian dialect. But of the Scythic words preserved by Herodotus some are Iranian, others, especially the names of deities, have found no satisfactory explanation in any Indo-European language. Indeed they rather suggest a Ugrian origin. Nevertheless, the general opinion has been that the Scyths were Iranian. The present writer believes that they were a horde which came down from upper Asia, conquered an Iranian-speaking people, and in time adopted the speech of its subjects. The settled Scythians would be the remains of this Iranian population, or the different tribes of them may have been connected with their neighbours beyond Scythian dominion—Thracian Getae and Arimaspi, Slavonic Neuri, Finnish Androphagi and such like. The Cimmerians who preceded the Scythians used Iranian proper names, and probably represented this Iranian element in greater purity. Herodotus gives three legends of the origin of the Scyths (iv. 5-12); these, though they contradict each other, can be reconciled with the view stated above. Two of them seem to be the same story; one is very strongly Hellenized, the other, in more or less native shape, is shortly this. The tribe is autochthonous, claiming descent from a son of the river Borysthenes Targitaos, who lived a thousand years before. Of his three sons the youngest Colaxais is preferred by an ordeal of picking up certain objects which fell from heaven,—a plough, a yoke, an axe and a cup,—and becomes the ancestor of the ruling clan of Paralatae; from the other sons, Lipoxais and Harpoxais, are descended minor clans, and the name of the whole people is Scoloti, not Scythae, which is used by the Greeks alone. In this story the names make sense in Iranian, the tribes are not again mentioned except when this passage is copied, the objects are hardly such as would be held sacred by nomads, the form of ordeal is to be paralleled in Iranian legends, and the people say themselves that they are not really Scythae. Surely this is the national legend of the agricultural Scythians about Olbia, and the name Scoloti, by which careful modern writers designate the Royal Scyths, is the true designation of the subject race. The royal line of these is quite distinct from the true Royal Scyths, who, like most nomad conquerors, allowed their subjects to preserve their own organizations.

The third account fails chiefly in being too plausible, but there seems no reason to reject it as an artificial combination of unconnected facts. According to it the Scyths dwell in Asia, and were forced by the Massagetae over the Araxes (Volga ?) into the land of the Cimmerians. Aristeas says that the first impulse came from the Arimaspi, who displaced the Issedones, who in turn fell upon the Scyths. This comes to much the same thing, as the Massagetae seem to have contained an element which had come in from the land of the Issedones. The Scyths having fallen upon them from the north-east, the Cimmerians appear to have given way in two directions, towards the south-west, where the tombs of their kings were shown on the Tyras (Dniester) and one body joined with the Treres of Thrace in invading Asia Minor by the Hellespont; and towards the south-east where another body threatened the Assyrians, who called them Gimirrai (Hebrew Gomer; Gen. xi.). They were followed by the Scyths (Ashguzai, Heb. Ashkenaz) whom the Assyrians welcomed as allies and used against the Cimmerians, against the Medes and even against Egypt. Hence the references to the Scyths in the Hebrew prophets (Jer. iv. 3, vi. 7). This is all put in the latter half of the 7th century B.C. Herodotus says that the Scyths ruled Media for twenty-eight years, and were then massacred or expelled. The Assyrian evidence is in the main a confirmation of Herodotus, though most writers think that the Scythians who troubled Asia were Sacae from the east of the Caspian (H. Winckler, *Altorientalische Forschungen*, p. 484 sqq.). If the Scyths came out of upper Asia, the Scythian colonists beyond the Iyrcae might be a division which had remained nearer the homeland, but in dealing with nomads we can suppose such a return as that of the Calmucks (Kalmuks) in the 18th century.

The physical features of the Scyths are not described by Herodotus, but Hippocrates (*l.c.*) draws a picture of them which makes them very similar to the Mongols as they appeared to the Franciscan missionaries in the 13th century. He says they are quite unlike any other race of men, and very like each other. The main point seems to be a tendency to slackness, fatness and excess of humours. The men are said to be in appearance very like eunuchs, and both sexes have a tendency to sexual indifference amounting in the men to impotence. When a man finds himself in this condition he assumes the women's dress and habits. Herodotus mentions the existence of this class, called Enarees, and says that they suffer from a sacred disease owing to the wrath of the goddess of Ascalon whose shrine they had plundered. Reinegg describes a similar state of things in the Nogai in the 18th century. The whole account suggests a Tatar clan in the last stage of degeneracy. Hippocrates says that this only applies to the ruling class, not to the slaves, but gives as the reason the want of exercise among the former. The skulls dug up in Scythic graves throw no light on the question, some being round and some long. The representations of nomads on objects of Greek art show people with full beards and shaggy hair, such as cannot be reconciled with Hippocrates; but the only reliefs which seem to be accurate belong to a late date when the ruling clan was Sarmatian rather than Scythic.

Customs.—Herodotus gives a good survey of the customs of the Scyths: it seems mostly to apply to the ruling race. Again the closest analogy is the state of the Mongols in the 13th century, but too much weight must not be put on this, as the natural conditions of steppe-ranging nomads dictated the greater part of them. Still the correspondence of religion and of funeral rites is very close. The Scyths lived upon the produce of their herds of cattle and horses, their main food being the flesh of the latter, either cooked in a cauldron or made into a kind of haggis, and the milk of mares from which they made cheese and kumiss (a fermented drink resembling buttermilk). This necessitated their constantly moving in search of fresh pasture, spending the spring and autumn upon the open steppe, the winter and summer by the rivers for the sake of moisture and shelter. The men journeyed on horseback, the women in wagons with felt tilts. These were drawn by their cattle, and were the homes of each family. Hence the Greek names, Abii, Hippemolgi, Hamaxobii. The women were kept in subjection, and were far from enjoying the liberty granted them among the Sarmatae, among whom they rode on horseback and engaged in war. Polygamy was practised, the son inheriting his father's wives. Both men and women avoided washing, but there was something of the nature of a vapour bath, with which Herodotus has confused a custom of using the smoke of hemp as a narcotic. The women daubed themselves with a kind of cosmetic paste. The dress of the men is well shown upon the Kul Oba and Chertomlyk vases, and upon other Greek works of art made for Scythic use. It must not be confused with the fanciful barbarian costumes that are so common upon the Attic pots. They wore coats confined by belts, trousers tucked into soft boots, and hoods or tall pointed caps. The women had flowing robes, tall pointed caps, and veils descending over most of the figure. Both sexes wore many stamped gold plates sewn upon their clothes in lines or *semés*. Their horses had severe bits, and were adorned with nose pieces, cheek pieces and saddle cloths. True stirrups were unknown. In war the nation was divided into three sub-kingdoms, and these into companies, each with its commander. The companies had yearly feasts, at which the commander honoured warriors who had slain one or more of the enemy. As evidence of such prowess, and as a token of his right to a share of any spoil, the warrior was accustomed to scalp his enemy and adorn his bridle with the trophy. In the case of a special enemy or an adversary overcome in a private dispute before the king, he would make a cup of the skull, mounting it in bull's hide or in gold. The tactics in war were the traditional nomad tactics of harassing the enemy on the march, constantly retreating before him and avoiding a general engagement. Their weapons consisted of bow and arrows, short swords, spears and axes. The government was a despotism, but a king who aroused the extreme dissatisfaction of his subjects was liable to be murdered.

Religion.—The religion of the Scyths was nature worship. Herodotus (iv. 59) gives a list of their gods, with the Greek deities corresponding, but we cannot tell what aspect of the Greek deity is in question. He says they chiefly reverence Tabiti (Hestia), next Papaeus and his wife Apia (Zeus and Ge), then Oitosyros (Apollo) and Argimpasa (Aphrodite Urania). These are common to all the Scythians, but Thamimasadas (Poseidon) is peculiar to the Royal Scyths.[1] They set up no images or altars or temples save to Ares only. To Ares they make a heap of faggots three stades square, with three sides steep and one inclined, and bring to it a hundred and fifty fresh loads of faggots every year. Upon the top is set up a sword which is the image of Ares; to this they sacrifice captives, pouring their blood over it. The account of the cult of Ares, for whom no Scythian name is given, appears to be an addition, and the mention of such masses of faggots suggests the wooded district of the agricultural Scythians, not the treeless steppe of the Royal tribe. The Scythian pantheon is not distinctive, and can be paralleled among the Tatars and among the Iranians. The Scyths had a method of divination with sticks, and the Enarees, who claimed to be soothsayers by grant of the goddess who had afflicted them, used another method by splitting bast fibres. They intervened in case of the king's falling sick, when it was assumed that some man had sworn by the king's hearth and broken his oath. If a man accused of this denies it, other diviners are called, and if these concur, he is beheaded and his sons slain and his goods given to the diviners. But if a majority of diviners decide against the accusers, the latter are set upon a wagon-load of brushwood and burned to death. The burial rites are the most fully described. Private persons were merely carried about among their friends, who held wakes in their honour, and then buried forty days after death. But the funerals of the kings were much more elaborate. They exhibit the extreme development of the principle of surrounding the dead man with everything in which he found pleasure during his life. The tombs of the kings were in the land of Gerrhus near the great bend of the Dnieper where the chief tumuli have been excavated. The body was embalmed and filled with aromatic herbs, and then brought to this region, passing through the lands of various tribes. The Royal Scyths who followed the body were accustomed to cut about their faces and arms, and each tribe that the cortège met upon its way had to join it and conform to this expression of grief. Arrived at the place of burial, the body was set in a square pit with spears marking out its sides and a roof of matting. Then one of the king's concubines and his cup-bearer, cook, groom, messenger and horses were strangled and laid by him, and round about offerings of all his goods and cups of gold—no silver or bronze. After this they raised a great mound, striving to make it as high as possible. A year later they strangled fifty youths of the dead man's servants (all Scyths born) and fifty of the best horses, stuffed them and mounted them in a circle about the tomb.

Tombs.—The description is generally borne out by the evidence of the tombs opened in the Scythic area. None agrees in every point, but almost every detail finds a close parallel in some tomb or other. The chief divergence is in the presence of silver and copper objects, but the great quantity of gold is the most striking fact, and to say that there was nothing but gold seems merely an exaggeration. Tombs to which the name Scythic is generally applied form a well-defined class. They are preceded over the whole area by a much simpler form of burial marked by the practice of staining the bones with red ochre, and the presence of one or two rude pots and nothing more: yet that some were tombs of great chiefs is shown by the great size of the barrows heaped over them. They have been referred to the Cimmerians, but for this there is no clear evidence. The Scythic tombs can be roughly dated by the objects of Greek art that they contain. They seem to begin about the 6th century B.C., and to continue till the 2nd century A.D.; that is, they cover the period of the Scythic domination according to the account accepted above, and that of the Sarmatian, and so suggest that, as far as the archaeological evidence goes, there was little more than a change of name and perhaps the substitution of one ruling clan for another—not a real change of population. The finest of the class were opened about the bend of the Dnieper, where we should put the land Gerrhus. Others are found to the south-west of the central area, and in the governments of Kiev and Poltava we have many tombs with Scythic characteristics, but a difference (*e.g.* the fewness of the horses) which makes us think of the settled tribes under Scythic domination. Others occur in the flat northern half of the Crimea, and even close to Kerch, where the famous Kul Oba seems to have held a Scythic chieftain who had adopted a veneer of Greek tastes, but remained a barbarian at heart. East of the Maeotis, especially along the river Kuban, are many groups of barrows showing the same culture as those of Gerrhus but in a purer form. Farther to the north and east the series seems to extend into Siberia, but in this region excavations have been few. Unfortunately very few of these barrows have come down to us unplundered, and we cannot find one complete example and take it as a type. Soon after they were heaped up, before the beams supporting the central chamber had rotted, thieves made a practice of driving a mine into the mound straight to where the valuables were deposited, and it is only by the collapse of this mine and the crushing of the robber after he had thrown everything into confusion that the treasures of the Chertomlyk barrow, on the whole the most typical, were preserved to us. This was 60 ft. high and 1100 ft. round; about it was a stone plinth, and it was approached by a kind of stone alley. A central shaft descended 35 ft. 6 in. below the surface of the earth, and from each corner of it at the bottom opened out side chambers. The north-west chamber communicated with a large irregular chamber into which the plunderer's mine opened. In the central pit all was in confusion, but here the king seems to have lain on a bier. His belongings, found piled up near the mine, seem to have included a combined bow-case and quiver and a sword sheath, each covered with plates of gold of Greek work, three swords with gold hafts, a hone with gold mounting, a whip, many other gold plates and a heap of arrow-heads. In the north-west chamber was a woman's skeleton, and she had her jewels, mostly of Greek work. She was attended by a man, and three other men were buried in the other chambers. They were supplied with simpler weapons and adornments, but even so their clothes had hundreds of stamped gold plates and strips of various shapes sewn on to them. By every skeleton were drinking vessels. Store of wine was contained in six amphorae, and in two bronze cauldrons were mutton-bones. The most wonderful object of all was a great two-handled vase standing 3 ft. high and made to hold kumiss. The greater part of its body is covered by a pattern of acanthus leaves, but on the shoulder is a frieze showing nomads breaking in wild mares, our chief authority for Scythian costume. To the west of the main shaft were three square pits with horses and their harness, and by them two pits with men's skeletons. In the heap itself was found an immense quantity of pieces of harness and what may be remains of a funeral car. The Greek work would seem to date the burial as of the 3rd century B.C.

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[1] The names are read in various ways; it is impossible to establish the correct forms.

At Alexandropol in the same district was an even more elaborate tomb, but its contents were in even greater confusion. Another tomb in this region, Melgunov's barrow, found as long ago as 1760, contained a dagger-sheath and pommel of Assyrian work and Greek things of the 6th century. In the Kul Oba tomb mentioned above the chamber was of stone and the contents, with one or two exceptions, of purely Greek workmanship, but the ideas underlying are the same—the king has his wife, his servant and his horse, his amphorae with wine, his cauldron with mutton-bones, his drinking vessels and his weapons, the latter being almost the only objects of barbarian style. One of the cups has a frieze with reliefs of natives supplementing that on the Chertomlyk vase.

East of the Maeotis on the Kuban we have many barrows; the most interesting are the groups called the Seven Brothers, and those of Karagodeuashkh, Kostromskaya, Ul and Kelermes, the latter remarkable for objects of Assyrian style, the others for the enormous slaughter of horses; on the Ul were four hundred in one grave.

Art.—Certain of the objects which occur in these Scythic graves are of special forms typical for the Scythic area. Most interesting of these is the dagger or sword, always very short, save in the latest graves, and distinguished by a heart-shaped guard marking the juncture of hilt and blade; its sheath is also characteristic, having a triangular projection on one side and usually a separate chape: these peculiar forms were necessitated by a special way of hanging the dagger from two straps that it might not interfere with a rider's movements. Just the same form of short sword was used in Persia and is shown on the sculptures at Persepolis. Another special type is the bow-case, made to take a short curved bow and to accommodate arrows as well. Further, there is the peculiar cauldron on one conical foot, round which the fire was built, the cylindrical hone pierced for suspension, and the cup with a rounded bottom. Assyrian and afterwards Greek craftsmen working for Scythic employers were compelled to decorate these outlandish forms, which they did according to their own fashion: but there was also a native style with conventionalized beast decoration, which was almost always employed for the adornment of bits and horses' gear, and very often for weapons. This style and the types of dagger, cauldron, bit and two-looped socketed axehead run right across from Hungary to the upper Yenisei, where a special Bronze Age culture seems to have developed them. But even here it seems impossible to deny some influence coming from the Aegean area, and Scythic beasts are very like certain products of Mycenaean and early Ionic art. Again, the Scythic style is interesting as being one element in the art of the barbarians who conquered the Roman Empire and the zoomorphic decoration of the early middle ages.

The dominance from the Yenisei to the Carpathians of a distinct style of art which, whatever its original elements may have been, seems to have taken shape as far east as the Yenisei basin is an additional argument in favour of a certain movement of population from the far north-east towards the south Russian steppes. It would correspond in time with the movement of the Scyths of which Herodotus speaks, and it may be inferred that immigrants coming from those regions were rather allied to the Tatar family of nations than to the Iranian. Similar movements from the same regions appear also to have penetrated Iran itself; hence the resemblance between the dress and daggers of certain classes of warriors on the sculptures of Persepolis and those shown on the Kul Oba vase. An Iranian origin would not account for the presence of analogous types on the Yenisei.

History.—To sum up the history of Scythia, the oldest inhabitants of whom we hear in Scythia were the Cimmerii; the nature of the country makes it probable that some of them were nomads, while others no doubt tilled some land in the river valleys and in the Crimea, where they left their name to ferries, earthworks and the Cimmerian Bosporus. They were probably of Iranian race: among the Persians Herodotus describes a similar mixture of nomadic and settled tribes. In the 7th century B.C. these Cimmerians were attacked and partly driven out by a horde of newcomers from upper Asia called Scythae; these imposed their name and their yoke upon all that were left in the Euxine steppes, but probably their coming did not really change the basis of the population, which remained Iranian. The newcomers adopted the language of the conquered, but brought with them new customs and a new artistic taste probably largely borrowed from the metal-working tribes of Siberia. About the same time similar peoples harassed the northern frontier of Iran, where they were called Saka (Sacae), and in later times Saka and Scyths, whether they were originally the same or not, were regarded as synonymous. It is difficult always to judge whether given information applies to the Sacae or the Scyths.

About 512 B.C. Darius, having conquered Thrace, made an invasion of Scythia, which, according to the account of Herodotus, he crossed as far as the Oarus, a river identified with the Volga, burned the town of Gelonus and returned in sixty days. In this march he was much harassed by the nomads, with whom he could not come to close quarters, but no mention is made of his having any difficulty with the rivers (he gets his water from wells), and no reason for his proceedings is advanced except a desire to avenge legendary attacks of Scyths upon Asia. After losing many men the Great King comes back to the place where he crossed the Danube, finds the Ionians still guarding the bridge in spite of the attempts of the Scyths to make them desert, and safely re-enters his own dominions. Ctesias says that the whole campaign only took fifteen days and that Darius did not get beyond the Tyras (Dniester). This is also the view of the reasonable Strabo; but it does not account for the genesis of the other story. It seems best to believe that Darius made an incursion in order to secure the frontier of the Danube, suffered serious reverses and retired with loss, and that this offered too good a chance to be missed for a moral tale about the discomfiture of the Great King by a few poor savages. The Greeks had been trading with the Scyths ever since their coming, and at Olbia there were other tales of their history. We can make a list of Scythian kings—Spargapeithes, Lycus, Gnurus, Saulius (whose brother, the famous Anacharsis (*q.v.*), travelled over all the world in search of wisdom, was reckoned a sage among the Greeks and was slain among his own people because they did not like his foreign ways), and Idanthyrsus, the head king at the time of Darius, probably the father of Ariapeithes. This latter had three wives, a Greek woman from Istrus, Opoea a Scythian, and a Thracian daughter to the great chief Teres. Scyles, his son by the Greek mother, affected Greek ways, had a house in Olbia, and even took part in Bacchic rites. When this came to the knowledge of his subjects he was murdered, and Octamasadas, his son by the third wife, reigned in his stead. Herodotus adduces this to show how much the Scyths hated foreign customs, but with the things found in the graves it rather proves how strong was the attraction exercised upon the nomads by the higher culture of their neighbours. Octamasadas died shortly before the time of Herodotus. We cannot place Ariantas, who made a kind of census of the nation by exacting an arrow-head from each warrior and cast a great cauldron out of the bronze, nor Taxacis and Scopasis, the under-kings in the time of Idanthyrsus. After the retreat of Darius the Scythians made a raid as far as Abydos, and even sent envoys to King Cleomenes III. of Sparta to arrange that they should attack the Persian Empire from the Phasis while the Spartans should march up from Ephesus. The chief result of the embassy was that Cleomenes took to the Scythian habit of drinking his wine neat and went mad therefrom (Herodotus vi. 84). Henceforward the Scyths appear as a declining power: by the middle of the 4th century their eastern neighbours the Sarmatae have crossed the Tanais (Don) and the pressure of the Scyths is felt on the Danube. Here Philip II. of Macedon defeated and slew their king Ateas in 339 B.C., and from this time on the representatives of the old Scythic power are petty chieftains in the western part of the country about Olbia, where they could still be dangerous, and about Tomi. Towards the second half of the 2nd century B.C. this kingdom seems to have become the nucleus of a great state under Scilurus, whose name appears on coins of Olbia, and who at the same time threatened Chersonese in the Crimea. Here, however, he was opposed by the might of Mithradates VI. of Pontus and his power was broken. Henceforward the name "Scythian" is purely geographical. Meanwhile Scythia had become the land of the Sarmatae (*q.v.*). These, as has been seen, spoke a cognate dialect, and the tombs which belong to their period show exactly the same culture with Greek and Siberian elements. It is probable that the Iranian element was stronger among the Sarmatae, whose power extended as the ruling clan of the Scyths became extinct; but it is quite likely that they in their turn were officered by some new horde from upper Asia. Like the Scyths they were pressed towards the west by yet newer swarms, and with the coming of the Huns Scythia enters upon a new cycle, though still keeping its old name in the Byzantine historians.

AUTHORITIES.—(1) Ancient: Herodotus iv. 1-142 (editions of Blakesley, Rawlinson, Macan); Hippocrates, *De Aere*, &c., c. 24 sqq.; for geography alone: Strabo vii. cc. 3, 4; xi. cc. 1, 2, 6; Pliny iv. 75 sqq.; Ptolemy, *Sarmatia*; Diodorus Sic. ii. 2, 43-47; and Justin i. cc. 1, 8; ii. 1, 4, do not seem to add anything of which we can be certain. (2) Modern: E. H. Minns, *Scythians and Greeks* (Cambridge, 1909), gives a summary of various opinions and a survey of the subject from all points of view. See also for ethnological questions, Mongolian hypothesis: K. Neumann, *Die Hellenen im Skythenlande* (Berlin, 1855). Iranian hypothesis: K. Müllenhoff, "Über Herkunft und Sprache der Pontischen Skythen und Sarmaten," in *Monatsber. d. Berl. Ak.* (1866), reprinted in *Deutsche Altertumskunde*, vol. iii. For the archaeology: Kondakoff, Tolstoi and Reinach, *Antiquités de la Russie Méridionale* (Paris, 1892); more fully in *Antiquités de la Russie d'Hérodote* and *Compte rendu de la commission archéologique de St-Pétersbourg, passim.* (E. H. M.)

SEA (in O. Eng. *sae*, a common Teutonic word; cf. Ger. *See*, Dutch *Zee*, &c.; the ultimate source is uncertain), in its widest sense that part of the surface of the globe which consists of salt water, in distinction from dry land. The greater divisions of "the sea," in this sense, are called oceans, and are dealt with under the heading OCEAN AND OCEANOGRAPHY, the latter being the term now generally applied to the scientific study of the sea. The word "sea," however, is also used, in a restricted sense, in application to specific parts of the great oceans, more or less clearly defined by a partial land-boundary. Such are the Mediterranean Sea and the Caribbean Sea, connected with the Atlantic Ocean; the Arabian Sea, a division of the Indian Ocean, and the China and Japan Seas of the western Pacific Ocean. Subdivisions of great seas are similarly defined (*e.g.* the Adriatic Sea), and a few large bodies of salt water entirely land-locked are also called seas—*e.g.* the Caspian Sea, the Sea of Aral, the Dead Sea. *Sea-level* is the assumed mean level of the sea, serving as a datum from which to calculate the elevation of land in surveying (*q.v.*).

Different from sovereignty or dominion, &c.

SEA, COMMAND OF THE, a technical term of naval warfare, which indicates a definite strategical condition. (For its difference from "sea-power," see the separate article on that subject.) The term has been substituted sometimes for the much older "Dominion of the sea" or "Sovereignty of the sea," a legal term expressing a claim, if not a right. It has also been sometimes treated as though it were identical with the rhetorical expression, "Empire of the sea." Captain A. T. Mahan, instead of it, uses the term "Control of the sea," which has the merit of precision, and is not likely to be misunderstood or mixed up with a form of words meaning something different. The expression "Command of the sea," however, in its proper and strategic sense, is so firmly fixed in the language that it would be a hopeless task to try to expel it; and as, no doubt, writers will continue to use it, it must be explained and illustrated. Not only does it differ in meaning from "Dominion or Sovereignty of the Sea," it is not even truly derived therefrom, as can be briefly shown. "It has become an uncontested principle of modern international law that the sea, as a general rule, cannot be subjected to appropriation" (W. E. Hall, *Treatise on International Law*, 4th ed., 1895, p. 146). This, however, is quite modern. Great Britain did not admit the principle till 1805; the Russians did not admit it till 1824; and the Americans, and then only tacitly, not till 1894. Most European nations at some time or other have claimed and have exercised rights over some part of the sea, though far outside the now well-recognized "three miles' limit." Venice claimed the Adriatic, and exacted a heavy toll from vessels navigating its northern waters. Genoa and France each claimed portions of the western Mediterranean. Denmark and Sweden claimed to share the Baltic between them. Spain claimed dominion over the Pacific and the Gulf of Mexico, and Portugal over the Indian Ocean and all the Atlantic south of Morocco (Hall, pp. 148–9). The claim which has made the greatest noise in the world is that once maintained by the kings of England to the seas surrounding the British Isles. Like other institutions, the English sovereignty of the sea was, and was admitted to be, beneficent for a long period. Then came the time when it ought to have been abandoned as obsolete; but it was not, and so it led to war. The general conviction of the maritime nations was that the Lord of the Sea would provide for the police of the waters over which he exercised dominion. In rude ages when men, like the ancients, readily "turned themselves to piracy," this was of immense importance to trade; and, far from the right of dominion being disputed by foreigners, it was insisted upon by them and declared to carry with it certain duties. In 1299, not only English merchants, but also "the maritime people of Genoa, Catalonia, Spain, Germany, Zealand, Holland, Frisia, Denmark, Norway and several other places of the empire" declared that the kings of England had from time immemorial been in "peaceable possession of the sovereign lordship of the seas of England," and had done what was "needful for the maintenance of peace, right and equity between people of all sorts, whether subjects of another kingdom or not, who pass through those seas" (J. K. Laughton, "Sovereignty of the Sea," *Fortnightly Review*, August 1866). The English sovereignty was not exercised as giving authority to exact toll. All that was demanded in return for keeping the sea safe for peaceful traffic was a salute, enforced no doubt as a formal admission of the right which permitted the (on the whole, at any rate) effective police of the waters to be maintained. The Dutch in the 17th century objected to the demand for this salute. It was insisted upon. War ensued; but in the end the Dutch acknowledged by solemn treaties their obligation to render the salute. The time for exacting it, however, was really past. S. R. Gardiner ("The First Dutch War," *Navy Records*, vol. xiii., 1899) maintains that though the "question of the flag" was the occasion, it was not the cause of the war. There was not much, if any, piracy in the English Channel which the king of England was specially called upon to suppress, and if there had been the merchant vessels of the age were generally able to defend themselves, while if they were not their governments possessed force enough to give them the necessary protection. Great Britain gave up her claim to exact the salute in 1805.

Attempts to gain command.

The necessity of the foregoing short account of the "Sovereignty or Dominion of the Seas" will be apparent as soon as we come to the consideration of the first struggle, or rather series of struggles, for the command of the sea. Gaining this was the result of England's wars with the Dutch in the 17th century. At the time of the first Dutch war, 1652–54, and probably of the later wars also, many people, and especially seamen, believed that the conflict was due to a determination on her part to retain, and on that of the Dutch to put an end to, the English sovereignty or dominion. The obstinacy of the

Dutch in objecting to pay the old-established mark of respect to the English flag was quite reason enough in the eyes of most Englishmen, and probably of most Dutchmen also, to justify hostilities which other reasons may have rendered inevitable. The remarkable thing about the Dutch wars is that in reality what England gained was the possibility of securing an absolute command of the sea. She came out of the struggle a great, and in a fair way of becoming the greatest, naval power. It is this which prompted Vice-Admiral P. H. Colomb to hold that there are various kinds of command, such as "absolute or assured," "temporary," "with definite ulterior purpose," &c. An explanation that would make all these terms intelligible would be voluminous and is unnecessary here. It will be enough to say that the absolute command—of which, as Colomb tells us, the Anglo-Dutch wars were the most complete example—is nothing but an attribute of the nation whose power on the sea is paramount. It exists and may be visible in time of peace. The command which, as said above, expresses a definite strategical condition is existent only in time of war. It can be easily seen that the former is essential to an empire like the British, the parts of which are bound together by maritime communications. Inability to keep these communications open can have only one result, viz. the loss of the parts with which communication cannot be maintained. Experience of war as well as reason will have made it evident that inability to keep open sea-communications cannot be limited to any single line, because the inability must be due either to incapacity in the direction of hostilities or insufficiency of force. If Great Britain has not force enough to keep open all the communications of her widely extended empire, or if—having force enough—she is too foolish to employ it properly, she does not hold the command of the sea, and the empire must fall if seriously attacked.

Strategic command.

The strategic command of the sea in a particular war of campaign has equal concern for all maritime belligerents. Before seeing what it is, it will be well to learn on high authority what it is not. Mahan says that command, or, to use his own term, "control of the sea, however real, does not imply that an enemy's single ships or small squadrons cannot steal out of port, cannot cross more or less frequented tracts of ocean, make harassing descents upon unprotected points of a long coast-line, or enter blockaded harbours. On the contrary, history has shown that such evasions are always possible, to some extent, to the weaker party, however great the inequality of naval strength" (*Influence of Sea-Power on History*, London, 1890, p. 14). The Anglo-French command of the sea in 1854–1856, complete as it was, did not enable the Allies to intercept the Russian ships in the north-western Pacific, nor did that held by the Federals in the American Civil War put an early stop to the cruises of the Confederate vessels. What the term really does imply is the power possessed from the first, or gained during hostilities, by one belligerent of carrying out considerable over-sea expeditions at will. In the Russian war just mentioned the Allies had such overwhelmingly superior sea-power that the Russians abandoned to them without a struggle the command of the sea; and the landing in South Africa (1899–1902), more than six thousand miles away, of a large British army without even a threat of interruption on the voyage is another instance of unchallenged command. In wars between great powers and also between secondary powers, if nearly equally matched, this absence of challenge is rare. The rule is that the command of the sea has to be won after hostilities begin. To win it the enemy's naval force must be neutralized. It may be driven into his ports and there blockaded or "masked," and thus rendered virtually innocuous; or it must be defeated and destroyed. The latter is the preferable, because the more effective plan. As was perceptible in the Spanish-American War of 1898, as long as one belligerent's fleet is intact or at large the other is reluctant to carry out any considerable expedition over-sea. In fact, the command of the sea has not been secured whilst the enemy continues to have a "fleet in being" (see Sea-Power).

Various instances.

In 1782 a greatly superior Franco-Spanish fleet was covering the siege of Gibraltar. Had this fleet succeeded in preventing the revictualling of the fortress the garrison would have been starved into surrender. A British fleet under Lord Howe, though much weaker in numbers, had not been defeated and was still at large. Howe, in spite of the odds against him, managed to get his supply-ships in to the anchorage and to fight a partial action, in which he did the allies as much damage as he received. There has never been a display of higher tactical skill than this operation of Howe's, though, curiously enough, he owes his fame much more to his less meritorious performance on the 1st of June. The revictualling of Gibraltar surpassed even Suffren's feat of the capture of Trincomalee in the same year. In 1798 the French, assuming that a temporary superiority in the Mediterranean had given them a free hand on the water, sent a great expedition to Egypt. Though the army which was carried succeeded in landing there, the covering fleet was destroyed by Nelson at the Nile, and the army itself was eventually forced to surrender. The French had not perceived that, except for a short time and for minor operations, you cannot separate the command of the Mediterranean or of any particular area of water from that of the sea in general. Local command of the sea may enable a belligerent to make a hasty raid, seize a relatively insignificant post or cut out a vessel; but it will not ensure his being able to effect anything requiring considerable time for its execution, or, in other words, anything likely to have an important influence on the course of the war. If Great Britain has not naval force enough to retain command of the Mediterranean she will certainly not have force enough to retain command of the English Channel. It can be easily shown why it should be so. In war danger comes less from conditions of locality than from the enemy's power to hurt. Taking up a weak position when confronting an enemy may help him in the exercise of his power, but it does not constitute it. A maritime enemy's power to hurt resides in his fleet. If that can be neutralized his power disappears. It is in the highest degree inprobable that Great Britain could attain this end by splitting up her fleet into fragments so as to have a part of it in nearly every quarter in which the enemy may try to do her mischief. The most promising plan—as experience has often proved—is to meet the enemy when he shows himself with a force sufficiently strong to defeat him. The proper station of the British fleet in war should, accordingly, be the nearest possible point to the enemy's force. This was the fundamental principle of Nelson's strategy, and it is as valid now as ever it was. If Great Britain succeeds in getting into close proximity to the hostile fleet with an adequate force of her own, her foe cannot obtain command of the sea, or of any part of it, whether that part be the Mediterranean or the English Channel, at any rate until he has defeated her. If he is strong enough to defeat her fleet he obtains the command of the sea in general; and it is for him to decide whether he shall show the effectiveness of that command in the Mediterranean or in the English Channel.

Seeking the enemy's fleet.

In smaller operations.

In the smaller operations of war temporary command of a particular area of water may suffice for the success of an expedition, or at least will permit the execution of the preliminary movements. When the main fleet of a country is at a distance—which it ought not to be except with the object of nearing the opposing fleet—a small hostile expedition may slip across, say the English Channel, throw shells into a coast town or burn a village, and get home again unmolested. Its action would have no sort of influence on the course of the campaign, and would, therefore, be useless. It would also most likely lead to reprisals; and, if this process were repeated, the war would probably degenerate into the antiquated system of "cross-raiding," discarded centuries ago, not at all for reasons of humanity, but because it became certain that war could be more effectually waged in other ways. The power in command of the sea may resort to raiding to expedite the formal submission of an already defeated enemy, as Russia did when at war with Sweden in 1719; but in such a case the other side cannot retaliate. Temporary command of local waters will also permit of operations rather more considerable than mere raiding attacks; but the duration of these operations must be adjusted to the time available. If the duration of the temporary command is insufficient the operation must fail. It must fail even if the earlier steps have been taken successfully. The command of the English Channel, which Napoleon wished to obtain when maturing his invasion project, was only temporary. It is possible that a reminiscence of what had happened in Egypt caused him to falter at the last; and that, quite independently of the proceedings of Villeneuve, he hesitated to risk a second battle of the Nile and the loss of a second army. It may have been this which justified his later statement that he did not really mean to invade England. In any case, the British practice of fixing the station of their fleet wherever that of the enemy was, would have seriously shortened the duration of his command of the English Channel, even if it had allowed it to be won at all. Moreover, attempts to carry out a great operation of war against time as well as against the efforts of the enemy to prevent it are in the highest degree perilous.

In war the British navy has three prominent duties to discharge. It has to protect the maritime trade, to keep open the communications between the different parts of the empire and to prevent invasion. If Great Britain commands the sea these duties will be discharged effectually. As long as she does that, the career of cruisers sent to prey on her commerce will be precarious, because command of the sea carries with it the necessity of possessing an ample cruiser force. As long as the condition mentioned is satisfied her ocean communications will be kept open, because an inferior enemy, who cannot obtain the command required, will be too much occupied in seeing to his own safety to be able to interfere seriously with that of any part of the British empire. This being so, it is evident that the greater operation of invasion cannot be attempted, much less carried to a successful termination, by the side which cannot make head against the opposing fleet. Command of the sea is the indispensable preliminary condition of a successful military expedition sent across the water. It enables the nation which possesses it to attack its foes where it pleases and where they seem to be most vulnerable. At the same time it gives to its possessor security against serious counter-attacks, and affords to his maritime commerce the most efficient protection that can be devised. It is, in fact, the main object of naval warfare.

Authorities for the above may be given as naval histories in general, placing in the first rank the well-known works of Captain A. T. Mahan, U.S.N. The book which must be specially referred to is Vice-Admiral P. H. Colomb's *Naval Warfare* (3rd ed., London, 1900). See also the article NAVY. (C. A. G. B.)

SEABURY, SAMUEL (1729–1796), American Protestant Episcopal bishop, was born on the 30th of November 1729, in Ledyard, Groton, Connecticut. His father, Samuel Seabury (1706–1764), originally a Congregationalist minister in Groton, was ordained deacon and priest in the Church of England in 1731, and was a rector in New London, Conn., from 1732 to 1743, and in Hempstead, Long Island, from 1743 until his death. The son graduated at Yale in 1748; studied theology with his father; studied medicine at Edinburgh in 1752–1753; was ordained deacon by the bishop of Lincoln and priest by the bishop of Carlisle in 1753; was missionary in New Brunswick, New Jersey, in 1754–1757, and was rector in Jamaica, New York, in 1757–1766, and of St. Peter's, Westchester, New York, in 1766–1775. He was one of the signers of the White Plains protest of April 1775 against "all unlawful congresses and committees," in many other ways proved himself a devoted loyalist, and wrote the *Free Thoughts on the Proceedings of the Continental Congress* (1774) by "A. W. Farmer" (*i.e.* a Westchester farmer), which was followed by a second "Farmer's Letter," *The Congress Canvassed* (1774), answered by Alexander Hamilton in *A Full Vindication of the Measures of the Congress, from the Calumnies of their Enemies*. A third "Farmer's Letter" replied to Hamilton's *View of the Controversy between Great Britain and her Colonies*, in a broader and abler treatment than in the previous pamphlets. To this third pamphlet Hamilton replied with *The Farmer Refuted* (1775). These three "Farmer's Letters"—a fourth was advertised but apparently was never published—were forcible presentations of the pro-British claim, written in a plain, hard-headed style; their authorship was long in question, but it is certain that Seabury claimed them in England in 1783 when he was seeking episcopal consecration. At the same time he claimed the authorship of a letter, not signed by the Westchester farmer, which under the title *An Alarm to the Legislature of the Province of New York* (1775) discussed the power of this the only legal political body in the colony. He was arrested in November 1775 by a mob of lawless Whigs, and was kept in prison in Connecticut for six weeks; his parochial labours were broken up, and after some time in Long Island he took refuge in New York City, where he was appointed in 1778 chaplain to the king's American regiment. On the 25th of March 1783 he was chosen their bishop by ten episcopal clergymen of Connecticut, meeting in Woodbury; as he could not take the British oath of allegiance, Seabury was shut out from consecration by the English bishops, and he was consecrated by Scotch bishops at Aberdeen on the 14th of November 1784. He returned to Connecticut in 1785 and made New Haven his home, becoming rector of St James's Church there. The validity of his consecration was at first questioned by many, but was recognized by the General Convention of his church in 1789. In 1790 he took charge of the diocese of Rhode Island also. In 1792 he joined with Bishops William White and Samuel Provoost, who had received English consecration in 1787, and James Madison (1749–1812), who had received English consecration in 1790, in the consecration of Bishop Thomas J. Claggett of Maryland in 1792, thus uniting the Scotch and the English successions. He died in New London on the 25th of February 1796. He was a great organizer and a strict churchman: it is noteworthy that after his consecration he used the signature "Samuel Bp. Connect." Seabury's "Farmer's Letters" rank him as the most vigorous American loyalist controversialist and as one of the greatest masters of style of his period.

His son Charles (1770–1844) was rector in various Long Island churches; and Charles's son Samuel (1801–1872), who graduated at Columbia in 1823, was rector of the Church of the Annunciation in New York in 1838–1868, and from 1862 professor of Biblical learning and the Interpretation of Scriptures in the General Theological Seminary. William Jones Seabury (b. 1837), son of the last named, was rector of the Church of the Annunciation from 1868 to 1898, professor of ecclesiastical polity and law in the General Theological Seminary from 1873, and published a *Manual for Choristers* (1878), *Lectures on Apostolic Succession* (1893) and *An Introduction to the Study of Ecclesiastical Polity* (1894).

See E. Edwards Beardsley, *Life and Correspondence of the Rt. Rev. Samuel Seabury* (Boston, 1881).

SEADIAH (or SAADIA; in Arabic Saʿid) **BEN JOSEPH** (892–942) was born in A.D. 892 at Dilaz in the Fayyum, whence he is often called al-Fayyūmī. Although he is justly regarded as the greatest figure in the literary and political history of medieval Judaism, nothing certain is known of his father or of his early life. Even the names of his teachers, generally recorded in the case of Jewish scholars, are unknown, with the exception of a certain Abū Kathīr, who is himself obscure, and left no writings. Saadia's literary work is in fact the more remarkable since it suddenly appears at a time when learning seemed to be dead both in East and West. Since the completion of the Talmud very little of any literary importance, if we except certain midrashim, had been produced among the orthodox (Rabbanite) Jews, although the Babylonian schools at Sura and Pumbeditha continued to enjoy a somewhat intermittent prosperity. On the other hand, learning was cultivated among the Qaraites (*q.v.*; see also HEBREW LITERATURE), a sect of Jews who rejected the oral tradition, restricting their practice to the ordinances of scripture (*miqrā*). It even seemed for a time as if conservative heresy would prevail against progressive orthodoxy. In Saadia, however, the Rabbanites found a powerful champion. Almost his first work, written at the age of twenty-three, was an attack on the teaching of ʿAnan, the founder of Qaraism, who lived in the 8th century. This, like most of Saadia's polemical writings, is no longer extant, but we can gather something of its contents from references in the author's other works, and from the statements of his opponents. The controversy turned largely on the calendar, which of course involved the dates of festivals, and, since the Rabbanite calendar had come down from ancient times, opened up the whole question of oral tradition and the authority of the Talmud. The conflict raged for many years, the chief representative of the other side being Solomon ben Yeruḥam, a virulent if not successful opponent. It was not, however, the only controversy in which Saadia was engaged. In 922 Ben Meir, a person of importance in Palestine, attempted to make alterations in the calendar, against the authority of the Babylonian schools. Saadia, who was then at Baghdad, warned him of his errors, refuted him in a work called *Sefer ha-Mōʿadīm* (the Book of the Festivals), and finally procured his excommunication by David ben Zakkai, the exilarch or head of the Jewish community in Babylonia. The vigorous action of Saadia seems to have brought him more prominently to the notice of the exilarch, and that at a time of more than usual difficulty. The honourable rivalry of the two schools of Sura and Pumbeditha, as the recognized authorities in matters of religion, had degenerated into jealousy and contention. The Gaon (*q.v.*) or President of Pumbeditha, taking advantage of his own position and of a vacancy in the Gaonate of Sura, wished to abolish the rival school. The exilarch, however, no doubt in recognition of his recent services, appointed Saadia as Gaon of Sura, although it was against the usual custom to appoint a person who was not a member of the school. Unfortunately this step did not lead to peace. Pumbeditha was jealous: the exilarch was weak and not very scrupulous. Money had to be raised not only for the support of the schools, but also to buy immunity from the government, and Saadia was not the man to connive at the corruption and oppression practised by the exilarch to raise it. Within two years matters had come to a crisis, and the exilarch dismissed Saadia, while Saadia retorted by declaring the exilarch deposed (930). After three years of contention David succeeded in sufficiently bribing the new and needy Caliph (Qāhir, 932–934; see CALIPHATE, § 19), who definitely forbade Saadia to act as Gaon. The next four years, spent in retirement at Baghdad, were devoted to literary labours, which had no doubt been impossible during the previous years of trouble, and in fact it was at this time that most of Saadia's work was produced. Eventually a reconciliation was effected with David, favoured probably by the new Caliph Radi (934–940; see CALIPHATE, § 20), and Saadia was reinstated as Gaon of Sura in 938. Under his rule the school attained the highest reputation among the Jewish communities of East and West—but it was not of long duration. His health had been impaired by the strenuous life he had led, and in his later years he suffered from melancholia. In 942 he died, two years after the exilarch.

That some of the many works of Saadia, in spite of their merits, have been neglected, and others partly or entirely lost, is not as surprising as it appears at first sight. They were for the most part written in Arabic, the vernacular of the Jews in the East, so that after the break-up of the Babylonian schools in the middle of the 11th century, they would only be studied in Spain, the new centre of Jewish learning, and in Egypt. After the expulsion of the Jews from Spain, Arabic practically ceased to be used by them for literary purposes, and in the rest of Europe (except perhaps in S. Italy) it was never understood. Even some Hebrew works, of great interest to us now, must have been regarded at the time as of purely temporary value, such as *e.g.* the *Sefer ha-Mōʿadīm*, fragments of which have only recently been recovered in the Geniza at Cairo. The anti-Qaraite works[1] against ʿAnan, Ibn Sāḳawaihī and Ben Zūṭā, the *Kitāb at-tamyīz*, *Kitāb al-Sharaʿī*, *Kitāb al-ʿIbbur* (calendar) and a book on anthropomorphisms, all in Arabic, are now lost and only known from quotations. So also are the refutation of the sceptic Ḥīvī of Balkh, and the *Sefer ʿOrayōth* (on prohibited marriage, against Qaraites). Of the *Sefer ha-Mōʿadīm* and *Sefer ha-Galūī* (against David ben Zakkai), both in Hebrew, some fragments have been recovered recently.

Closely allied to his polemical writings are his *exegetical* works. He translated most of the Bible into Arabic, and commented on at least some of the books. The memorial edition[2] contains (1) the version of the Pentateuch (1893), (3) of Isaiah (1896), (5) of Job (1899), (6) of Proverbs (1894), the last three with commentary. The translation of the 5 Meghilloth, and of Daniel (with commentary), usually ascribed to Saadia, is not really by him, but a genuine translation of Daniel, with commentary, exists in manuscript. There is also ascribed to him a midrashic work on the Decalogue. These all, no doubt, exhibit the defects necessary to the time in which their author lived. But it must be remembered that Saadia was a pioneer. Ḥayyūj, the father of Hebrew grammar, was not yet born, nor had the scientific and comparative study of the language begun. In this respect Saadia contributed little to the subject. Moreover, he shows a tendency, common at all times and perhaps due to a particular theory of inspiration, to get more out of the text than it contains, and to interpret it in accordance with preconceived philosophical opinions. At the same time both translations and commentaries are remarkable for their great learning, sound sense and an honest endeavour to arrive at the true meaning of the original. They were thus admirably suited for their purpose, which was, like the earlier Targums and the later work of Moses Mendelssohn, to render the sacred text more intelligible to the faithful generally and to check the growth of error.

The *grammatical* work called *Agron*, a sort of dictionary, is now lost, as are also the *Kutub al-Lughah* and perhaps other treatises on Hebrew grammar. The explanation of the 70 (really 90) hapaxlegomena in the Bible is still extant, and a poem on the number of letters in the Bible.

On *Talmudic* subjects again little is preserved beyond the *Kitāb al-Mawārīth*, which was published as vol. ix. of the *Œuvres complètes*, together with the short treatise in Hebrew on the 13 *Middōth* or canons of exegesis of R. Ishmael and some *Responsa* mostly in Hebrew. The translation of the Mishna, the introduction to the Talmud and other works of the kind are known only by repute.

Of the *Siddur* or arrangement of the liturgy by Saadia, a large part exists in a single manuscript at Oxford, and several fragments have been recovered from the Cairo Geniza. Numerous other liturgical poems, or parts of them, have been obtained from the same source, and several have been published in periodicals. His *Azharōth*, a poetical enumeration of the 613 precepts, in Hebrew, is included in vol. ix. of the *Œuvres complètes*.

His *philosophical* works are (1) a commentary on the *Sefer Yeẓīra*, a mystical treatise ascribed to the patriarch Abraham, which, as the foundation of the Kabbala, had great influence on Jewish thought, and was the subject of numerous commentaries; (2) the *Kitāb al-Amānāt wʿal-Iʿtiqādāt* (*Book of Beliefs and Convictions*), written in 933, called, in the Hebrew translation by Judah ibn Tibbon, *Emūnōth we-Dēʿōth*. Its system is based on reason in conjunction with revelation, the two being not opposed, but mutually complementary. It is thus concerned, as the title implies, with the rational foundation of the faith, and deals with creation, the nature of God, revelation, free will, the soul, the future life and the doctrine of the Messiah. It shows a thorough knowledge of Aristotle, on whom much of the argument is based, and incidentally refutes the views of Christians, Moslems, Brahmins and sceptics such as Ḥīvī. From its nature, however, the work, although of great interest and value, never had the same wider influence as that of Ibn Gabirol (*q.v.*). The Arabic text was published by S. Landauer (Leiden, 1880), the Hebrew version at Constantinople in 1562 and frequently since.

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[1] An excellent account of these is given by Poznański in the *Jewish Quarterly Review*, x. 238 ff.

[2] *Œuvres complètes de R. Saadia*, ed. by J. Derenbourg (Paris, 1893 ff.).

religionsphilosophische Lehre Saadja Gaons," in Baeumker's *Beiträge*, iv. 4 (Münster, 1903) (containing a German translation of part iii. of the *Kitāb al-Amānāt*); A. Harkavy, *Studien*, v. (St Petersburg, 1891) (in Hebrew); S. Schechter, *Saadyana* (Cambridge, 1903) (texts from the Geniza, repr. from the *Jewish Quarterly Review*). (A. Cy.)

SEAFIELD, EARLS OF. The 1st earl of Seafield, in the Scottish peerage, was James Ogilvy (1663–1730), son and heir of James Ogilvy, 3rd earl of Findlater. Although in the convention parliament of 1689 he had spoken for James II., he took the oath of allegiance to William and Mary, and after filling some minor official positions he was made secretary of state in 1696, and lord chancellor in 1702. In 1707 he was made chief baron in the court of exchequer. In 1701 he was created earl of Seafield, and in 1711 succeeded to his father's earldom of Findlater. When his great grandson, James, 7th earl of Findlater and 4th earl of Seafield died in October 1811 the earldom of Findlater became dormant or extinct, while the earldom of Seafield passed to a cousin, Lewis Alexander Grant (1767–1840), who was descended from Margaret, a daughter of the 2nd earl. He took the name of Grant-Ogilvy and was succeeded as 6th earl by his brother, Francis William Ogilvy-Grant (1778–1853), whose descendant, James Ogilvie-Grant (b. 1876) became the 11th earl in 1888. The earl of Seafield is a peer of the United Kingdom as Baron Strathspey.

SEAFORD, an urban district and watering-place in the Eastbourne parliamentary division of Sussex, England, 58 m. S. by E. from London by the London, Brighton & South Coast railway. Pop. (1901) 3355. In recent years there has been a considerable increase in the number of visitors. The climate is bracing, and the town is sheltered by high cliffs. There are golf links on the neighbouring downs. The church of St Leonard is Norman of various dates, but received large additions in the Perpendicular period. In former days the river Ouse entered the English Channel here, and the natural harbour so formed accounts for the origin of Seaford (Sefford, Safford, Seford), probably in Roman times. In the "Domesday of Cinque Ports" (which existed in the reign of Edward III., but was lost before 1728), it stood first among the members of Hastings, and was doubtless of considerable importance until about the end of the 14th century, when its rapid decline began owing to the constant alteration of the sea-coast and the decay of the harbour. In the 16th century the town was finally deserted by the Ouse, which now runs into the sea at Newhaven, 2 m. westward, and no revival of its prosperity occurred until the early 19th century, when it began to be frequented as a watering-place. Fishing has always been the chief industry.

Seaford is not mentioned in Domesday Book, but evidently pertained to the lordship of the 1st Earl Warenne and his descendants, who were succeeded in 1347 by the earls of Arundel. It was probably a mesne borough in the 12th century, growing up under the protection of the earls of Warenne, and was certainly called a borough in 1236. Bailiffs are mentioned in the 14th century, but the town was not incorporated until 1544, when notwithstanding its decayed condition Henry VIII. annexed it to Hastings by charter, and incorporated it under the title of bailiff and commonalty, presumably as a reward for assisting the head port to provide its proportion of ships to the crown. The corporation was dissolved by an act of 1883. The town returned two representatives to parliament from 1298 to 1399, and again from 1640 until 1832, when it was disfranchised. In the 13th century the earls of Warenne held a market or fair, or both, apparently by prescriptive right. In 1792 the fair-days were Whit-Monday and the 10th of August, and the market-days Wednesdays and Saturdays, but no market or fair now exists.

SEAFORTH, Earl of, a Scottish title held by the family of Mackenzie from 1623 to 1716, and again from 1771 to 1781. The Mackenzies trace their descent to one Colin of Kintail (d. 1278), and their name is a variant of Mackenneth. Kenneth, the twelfth head of the clan, was made Lord Mackenzie of Kintail in 1609, and his son Colin, who succeeded his father as 2nd Lord Mackenzie in March 1611, was created earl of Seaforth in 1623. Colin's successor was his half-brother George (d. 1651), who became the 2nd earl in 1633. George was alternately a royalist and a covenanter between 1636 and 1646, and was afterwards in Holland with Charles II., who made him secretary of state for Scotland. His grandson, Kenneth, the 4th earl, followed James II. to France and was with the dethroned king in Ireland. Sent by James in 1690 to head a rising in Scotland, he was captured and imprisoned, but in 1697 he was released and he died in Paris in January 1701. His successor was his son William, who joined the Jacobite standard at Braemar in 1715, and then, having raised 3000 men, was present at the battle of Sheriffmuir and was appointed lieutenant-general of the northern counties. He also took part in the Jacobite enterprise of 1719, being wounded at Glenshiel. In 1716 he was attainted and his titles and estates forfeited; before his death in January 1740, he had been relieved of some of the penalties of his treason, although his titles were not restored. His son Kenneth (*c.* 1718–1761), who but for the attainder would have been the 6th earl, helped the English government during the rising of 1745, and was a member of parliament for some years. His son Kenneth (*c.* 1744–1781) was created earl of Seaforth in 1771, but his peerage became extinct when he died in August 1781, although there were still heirs to the older earldom, which was under attainder. This earl raised the regiment of Highlanders, the 78th, known later as the 2nd battalion of the Seaforth Highlanders.

SEAHAM HARBOUR, a seaport and urban district, in the South-eastern parliamentary division of Durham, England, 6 m. S. of Sunderland by a branch of the North-Eastern railway. Pop. (1901) 10,163. The harbour was built (1828) by the third marquis of Londonderry to facilitate the export of coal from the mines on his adjacent property. Besides the coal trade there are extensive bottle and chemical works.

SEA-HORSE. Sea-horses (*Hippocampina*) are small marine fishes which, with pipe-fishes (*Syngnathina*), form the Lophobranchiate division of the suborder Thoracostei. The gills of the members of this group are not arranged in leaf-like series as in other fishes, but form a convex mass composed of small rounded lobes attached to the branchial arches, as shown in the accompanying figure (fig. 1) of the head of a sea-horse, in which the gill-cover has been pushed aside to show the interior of the gill-cavity. Sea-horses differ from pipe-fishes by having a prehensile and invariably finless tail; it is long, slender, tapering, quadrangular in a transverse section, and, like the rest of the body, encased in a dermal skeleton, which consists of horny segments, allowing of ventral, and in a less degree of lateral, but not of dorsal, flexion. The typical sea-horse (*Hippocampus*) can coil up a great portion of its tail, and firmly attach itself by it to the stems of sea-weeds or similar objects. The body is compressed and more or less elevated, and the head terminates in a long tubiform snout, at the end of which is the small mouth. The configuration of the fore part of the body, as well as the peculiar manner in which the head is joined to the neck-like part of the trunk, bears a striking resemblance to a horse's head. Sea-horses are bad swimmers and are unable to resist currents. With the aid of their single dorsal fin, which is placed about the middle of the fish's body, and can be put into a rapid undulatory motion, they shift from time to time to some object near them, remaining stationary among vegetation or coral where they find the requisite amount of food and sufficient cover. Their coloration and the tubercles or spines on the head and body, sometimes with the addition of skinny flaps and filaments, closely resemble their surroundings, and constitute the means by which these defenceless creatures escape detection by their enemies. These protective

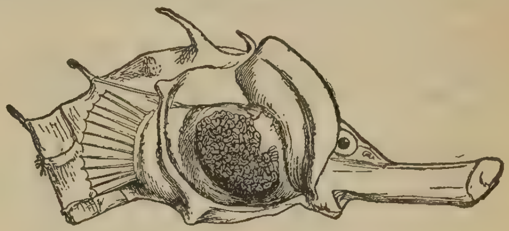

Fig. 1.—Gills of *Hippocampus abdominalis.*

structures are most developed in the Australian genus *Phyllopteryx*, one of the most singular types of littoral fishes.

Sea-horses belong to the tropics and do not extend so far north as pipe-fishes. They are abundant at suitable localities, chiefly on the coral-banks of the Indo-Pacific Ocean. Some forty species are known, of which the majority belong to the genus *Hippocampus* proper. They vary from 2 to 12 in. in length; but in China and Australia a genus (*Solenognathus*) occurs, the species of which attain to a length of nearly 2 ft.; they, however, in form resemble pipe-fishes rather than sea-horses. The species which may be sometimes seen in European aquaria is *Hippocampus antiquorum*, common in the Mediterranean and on the coasts of Portugal and France. It is rare on the south coast of England, but it has often been captured on the Essex coast. About 1885, according to Dr J. Murie, two Leigh fishermen when shrimping at Harwich during the summer season succeeded in procuring altogether between 100 and 120 specimens. The food of the sea-horses consists probably of very small invertebrates and the fry of other fishes. Like the other Lophobranchiates, they take great care of their progeny. The male *Hippocampus* carries the ova in a sac on the lower side of the tail, in which they are hatched; in the other genera no closed pouch is developed, and the ova are embedded in the soft and thickened integument of either the abdomen or the tail.

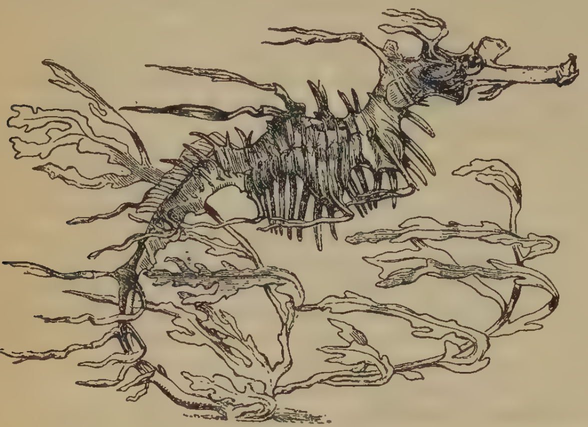
FIG. 2.—*Phyllopteryx eques.*

All that is known of the habits of these interesting fishes will be found summarized in a valuable paper by T. Gill, "The Life History of the Sea-Horses (Hippocampids)," in *Proc. U.S. Nat. Mus.* xxviii. (1905), p. 805.

SEA-KALE, *Crambe maritima*, a hardy perennial, a member of the natural order Cruciferae, which grows wild along the coasts of England, of Ireland and of the Scottish lowlands, along the western coasts of Europe, and on the Baltic, reappearing on the Black Sea.

In cultivation sea-kale prefers a light dry soil, and when manure is necessary it should consist of sea-weed or well-rotted dung; or a dressing of salt or of nitrate of soda may be given. When raised from seeds, they should be sown in March or April in rows 1 ft. asunder, the plants being thinned to 6 in. apart. In the following March these should be planted out in trenched well-prepared ground, 2 ft. asunder, in rows 2½ to 3 ft. apart. The top with the crown buds should be cut off before planting to prevent them from running to seed. In the spring of the second year the young shoots if blanched will be fit for use, and therefore the summer growth should be promoted by the use of water and liquid manure. Tolerably blanched stalks may be produced by plants only nine months old from the seed, and after two summers seedling plants will have acquired sufficient strength for general cropping. The seeds, instead of being sown in rows and transplanted, may be deposited in patches of three or four together, where they are to remain. In the autumn, after the leaves have been cleared off, the ground should be forked up, and 6 or 8 inches' depth of leaves or of light sandy soil laid over the plants, by either of which means they will be blanched, though not forced. The blanched sprouts should be cut for use whilst they are crisp, compact and from 3 to 6 in. in length, the stem being cut quite down to the base.

Sea-kale beds may be made from cuttings of the roots of very healthy plants, the extremities of the roots, technically called "thongs," being best adapted for this purpose. They should be taken up in autumn, cut into lengths of about 4 in., and laid in a heap of sand or earth till spring, when they should be planted out like the seedlings.

Forcing.—Sea-kale may be forced in the open beds by the aid of sea-kale pots or covers, which are contracted a little at top, with a movable lid. One of the earthenware covers, or an inverted flower-pot, is placed over each plant, or each patch of plants, and leaves of trees are closely packed round the pots, and raised to about 1 ft. above them. When fermentation commences, the temperature within should not exceed 60° F. If the crowns are thus covered up by about the end of October, the crop may be cut by about the third week of December, and by starting a batch at various times a supply may be kept up till the middle of May.

Strong plants may also be taken up and planted on hotbeds, the sashes being kept covered close; or they may be set thickly in boxes as recommended for rhubarb, and placed in any heated structure, or in the mushroom house; but, to have the shoots crisp and tender as well as blanched, light must be completely excluded. Besides the common purple-leaved, there is a green-leaved sort, which is said to blanch better.

SEAL, strictly speaking the name of the common European representative of that group of marine carnivorous mammals constituting the suborder Pinnipedia of the order Carnivora, but in a wider sense used to designate all the members of that group, except the walrus. The common seal (*Phoca vitulina*) is the typical representative not only of that group (see CARNIVORA), but also of the family *Phocidae* and the subfamily *Phocinae*, and it is to this latter group that the present article is restricted.

Although seals swim and dive with the greatest ease, often remaining as much as a quarter of an hour or more below the surface, and are dependent for their sustenance entirely on living prey captured in the water, all the species frequently resort to sandy beaches, rocks or ice-floes, either to sleep or to bask in the sun, and especially for the purpose of bringing forth their young. The latter appears to be the universal habit, and the young seals—of some species at least—take to the water at first very reluctantly, and have to be taught to swim by their parents. The number of young produced is usually one annually, though occasionally two. They are at first covered with a coat of very thick, soft, nearly white fur, and until this falls off they do not usually enter the water. This occurs in the Greenland seal (*Phoca groenlandica*)and the grey seal (*Halichoerus grypus*) when from two to three weeks old, but in the common seal the change takes place either *in utero* or at birth. The movements of the true seals upon the ground or ice are very different from those of the eared seals, or *Otariidae*, which walk and run upon all four feet, the body being raised as in the case of ordinary quadrupeds. The hind limbs (by which seals mainly propel themselves through the water) are on land perfectly passive, stretched backwards, with the soles of the feet applied to each other, and often raised to avoid contact with the ground. Sometimes the fore-limbs are equally passive, being placed close to the sides of the body; motion being then effected by a shuffling or wriggling action produced by the muscles of the trunk. When, however, there is necessity for more rapid progress, the animals

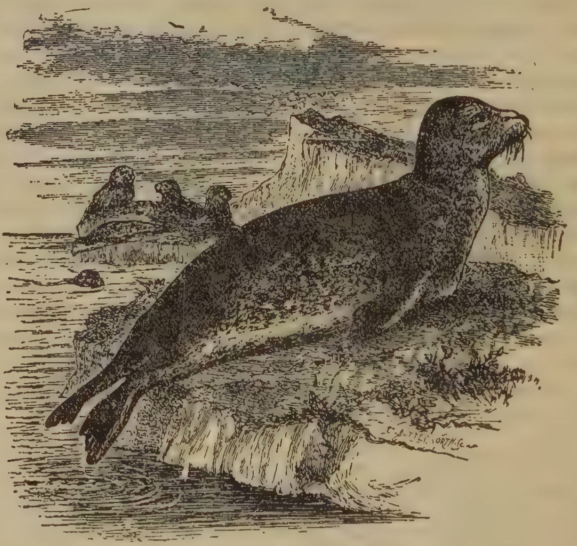
FIG. 1.—Common Seal (*Phoca vitulina*).

use the fore-paws, either alternately or simultaneously, pressing the palmar surface on the ground and lifting and dragging the body forwards in a succession of short jumps. In this way they can move so fast that a man has to step out beyond a walk to keep up with them; but such rapid action costs considerable effort, and they soon become exhausted. These various modes of progression appear to be common to all species so far as has been observed.

Most kinds of seals are gregarious and congregate, especially at the breeding season, in immense herds. Such is the habit of the Greenland seal, which resorts in the spring to the ice-floes of the North Sea, around Jan Mayen Island. Others, like the common seal of the British Islands, though having a wide geographical range, are never met with in such large numbers or far away from land. This species is stationary all the year round, but some have a regular season of migration, moving south in winter and north in summer. They are usually harmless, timid, inoffensive animals, though, being polygamous, the old males often fight desperately with each other, their skins being frequently found covered with wounds and scars. They are greatly attached to their young, and remarkably docile and easily trained when in captivity; indeed there is perhaps no wild animal which attaches itself so readily to the person by whom it is cared for and fed. They have much curiosity, and are strongly attracted by musical sounds. Their sense of smell is acute, and their voice varies from a harsh bark or grunt to a plaintive bleat. Seals feed chiefly on fish, of which they consume enormous quantities; some, however, subsist largely on crustaceans, especially species of *Gammarus*, which swarm in the northern seas, also on molluscs, sea-urchins and even occasionally sea-birds, which they seize when swimming or floating on the water.

Although the true seals do not possess the beautiful under-fur ("seal-skin" of the furriers) which makes the skin of the sea-bears or fur-seals so precious, their hides are still valuable as articles of commerce, and together with the oil yielded by their fat, subject them to a devastating persecution.

Two species of seal are met with regularly on the British coasts, the common seal and the grey seal. The former is a constant resident in all suitable localities round the Scottish, Irish and English coasts, from which it has not been driven away by man. Although the most secluded and out-of-the-way spots are selected as their habitual dwelling-places, there are few localities where these seals may not occasionally be seen. They frequent bays, inlets and estuaries, and are seen on sandbanks or mud-flats left dry at low tide. Unlike some of their congeners, they are not found on the ice-floes of the open sea, nor, though gregarious, are very large numbers ever seen in one spot. The young are born at the end of May or beginning of June. They feed chiefly on fish, and the destruction they occasion among salmon is well known to Scottish fishermen. The common seal is found not only on the European and American coasts bordering the Atlantic, but also in the North Pacific. It is from 4 to 5 ft. in length, and variable in colour, though usually yellowish grey, with irregular spots of dark brown or black above and yellowish white beneath. According to Dr J. A. Allen, there is a marked difference between the dentition of the male and female of the common seal. In the latter sex the teeth are much smaller than those of the male, and are inserted more obliquely in the jaw; they also differ by the reduction in the size and number of the accessory cusps, which are almost invariably absent on the inner side.

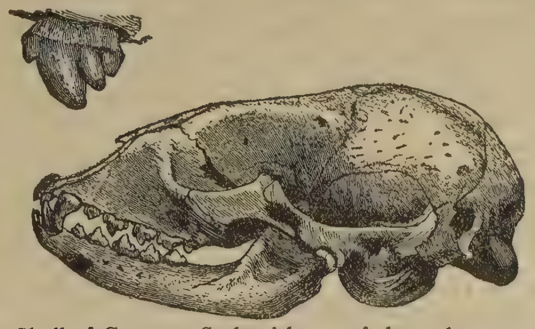

FIG. 2.—Skull of Common Seal, with one of the molars on a larger scale.

The grey seal (*Halichoerus grypus*) is of considerably larger size, the males attaining when fully adult a length of 8 ft. from the nose to the end of the hind feet. The form of the skull and the simple characters of the molar teeth distinguish it generically from the common seal. It is of a yellowish grey colour, lighter beneath, and with dark grey spots or blotches, but, like most other seals, is liable to great variations of colour according to age. The grey seal appears to be restricted to the North Atlantic, having been rarely seen on the American coasts, but not farther south than Nova Scotia; it is chiefly met with on the coasts of Ireland, England, Scotland, Norway and Sweden, including the Baltic and Gulf of Bothnia, and Iceland, though it does not appear to range farther north. It is not migratory, and its favourite breeding-places are rocky islands, the young being born in the end of September or beginning of October.

As the grey seal is sometimes confused with the bearded seal (*Phoca barbata*), the following account, by T. Southwell, of the distinctions between the two may be quoted:—

"As to the external features by which the grey seal may at any age be distinguished from the bearded seal, which it most resembles, in the first place the abnormal season of reproduction in this species is unique; it is the only seal which has its young in the late autumn. The large size is not a very trustworthy distinction, as it varies considerably in individuals; but a marked feature is the great length of the claws in the fore-flipper, the first two digits of which are nearly of equal length and extend beyond the others; those on the hind-flippers are small and weak, the margin of the skin extending beyond them, and the outer toes on each foot the longest. The long, scimitar-shaped, flattened and crenulated lip-bristles do not differ greatly from those of other species, except from those of the bearded seal, the only species in which this curious impressed pattern is absent. The muzzle is broad and fleshy, and the upper lip and nose extend considerably beyond the lower jaw. Dr Edmondston calls special attention to this peculiarity, and states that in seizing its prey he has often seen it 'make a slight turn in the manner of a shark.' A captive young grey seal in taking fluid food always turned its head on one side and sucked it in through the side of the mouth. Another feature, which, so far as I know, is peculiar to this species, is the dog-like way in which, when on the alert, it carries its fore-flippers to the front.

"Dr Edmondston also mentions a curious disposal of the hair on the neck of the adult animals, which he attributes to there being four or five rings of hair a little longer than on the rest of the body, which, he says, give it the appearance when rearing its head somewhat out of the water, as if several small ropes encircled its neck. This is a sedentary species, seldom straying far from its chosen locality and rarely met with far from land.

"In the British seas the grey seal resorts to tide-washed rocks and lonely beaches, from Shetland and the Orkney Isles in the north to a few scattered localities along the east and south coasts, as far as Cornwall and even the Channel Islands; northward on the west coast to Wales, the outlying rocks in the Irish Sea and the Hebrides—a sufficiently comprehensive range, and in a few favoured spots it is still fairly numerous. It is seldom found far from land, and seems to be much attached to particular spots, to which it regularly returns as the state of the tide permits. In the breeding-season, which is the late autumn or early winter, its favourite resort is the inner recess of an ocean-cavern, often only to be approached under water; here, in October or November, it deposits its single young one on the small beach at the far end of the cave, beyond the reach of the tide, attending it assiduously for several weeks, until it has shed its infant-coat, which is at first beautifully long, soft and white, offering a great contrast to the young of the common seal. The young are suckled for six weeks before they take to the water, and during that time they are practically land animals. From this time till maturity several successive changes of pelage in each sex take place."

Other species of seals inhabiting the nothern seas, of which stragglers have occasionally visited the British coasts, are the small ringed seal or "floe-rat" of the sealers (*Phoca hispida*), the Greenland or harp-seal (*Phoca groenlandica*), the hooded or bladder-nosed seal (*Cystophora cristata*) and the bearded seal (*Phoca barbata*).

See also SEAL-FISHERIES. (W.H.F.; R.L.*)

SEA LAWS, a title which came into use among writers on maritime law in the 16th century, and was applied by them to certain medieval collections of usages of the sea recognized as having the force of customary law, either by the judgments of a maritime court or by the resolutions of a congress of merchants and shipmasters. To the former class belong the sea laws of Oléron, embodying the usages of the mariners of the Atlantic; under the latter come the sea laws of Visby (Wisby), reflecting the customs of the mariners of the North Sea and of the Baltic.

The earliest collection of such usages received in England is described in the *Black Book of the Admiralty* as the "Laws of Oléron," whilst the earliest known text is contained in the *Liber memorandorum* of the corporation of the City of London, preserved in the archives of their Guildhall. These laws are in an early handwriting of the 14th century, and the title prefixed to them is *La Charte d'Oleroun des juggementz de la mier.* How and in what manner these "Judgments of the Sea" came to be collected is not altogether certain. Cleirac, a learned advocate in the parlement of Bordeaux, in the introduction to his work on *Les Us et coustumes de la mer* (Bordeaux, 1647), states that Eleanor of Aquitaine (*q.v.*), having observed during her visit to the Holy Land that the collection of customs of the sea contained in *The Book of the Consulate of the Sea* (see CONSULATE OF THE SEA) was held in high repute in the Levant, directed on her return that a record should be made of the judgments of the maritime court of the island of Oléron (at that time a peculiar court of the duchy of Guienne), in order that they might serve as law amongst the mariners of the Western Sea. He states further that Richard I. of England, on his return from the Holy Land, brought back with him a roll of those judgments, which he published in England and ordained to be observed as law. Though R. G. Marsden doubts the story of Richard I. having brought back *La Leye Olyroun* to England, the general outline of Cleirac's account accords with a memorandum on the famous roll of 12 Edw. III., "De Superioritate Maris Angliae" (for many years preserved in the archives of the Tower of London, now deposited in the Public Record Office). According to this memorandum, the king's justiciaries were instructed to declare and uphold the laws and statutes made by the kings of England, in order to maintain peace and justice amongst the people of every nation passing through the sea of England.

The earliest version of these Oléron sea laws comprised certain customs of the sea which were observed in the wine and the oil trade, as carried on between the ports of Guienne and those of Brittany, Normandy, England and Flanders. No English translation seems to have been made before the *Rutter of the Sea*, printed in London by Thomas Petyt in 1536, in which they are styled "the Lawes of ye Yle of Auleron and ye Judgementes of ye See." French was, in fact, a tongue familiar to the English high court of admiralty down to the reign of Henry VI. A Flemish text, however, appears to have been made in the latter part of the 14th century, the *Purple Book of Bruges*, preserved in the archives of Bruges, in a handwriting somewhat later than that of the *Liber Memorandorum*. Prefixed to this Flemish version is the title, "Dit es de Coppie van den Rollen van Oleron van den Vonnesse van der Zee." Certain changes, however, have been made in the *Purple Book of Bruges* in the names of the ports mentioned in the original Gascon text. For instance, Sluys is in several places substituted for Bordeaux, just as in the *Rutter of the Sea* London replaces Bordeaux. That these sea laws were administered in the Flemish maritime courts may be inferred from two facts. First, a Flemish translation of them was made for the use of the maritime tribunal of Damme, which was the chief Flemish entrepôt of the wine trade in the 13th century. The text of this translation has been published by Adriaen Verwer under the title of the *Judgments of Damme*. In the second place, there is preserved in the archives of the senate of Danzig, where there was a maritime court of old, an early manuscript of the 15th century, containing a Flemish reproduction of the Judgments of Oléron headed "Dit is Twater Recht in Vlaenderen." So far there can be no doubt that the Judgments of Oléron were received as sea laws in Flanders as well as in England in the 14th century. Further inquiry can trace them as they followed the course of the wine trade in the North Sea and the Baltic Sea. Boxhorn, in his *Chronyk van Zeelande*, has published a Dutch version of them, which van Leeuwen has reproduced in his *Batavia Illustrata*, under the title of the *Laws of West-Capell* in Zealand. Verwer has also published a Dutch text of them in his *Nederlant's See-Rechten*, accompanied by certain customs of Amsterdam, of which other MSS. exist, in which those customs are described as usages of Stavoren, or as usages of Enkhuizen, both ports of active commerce in the 15th century. Of these customs of Amsterdam, or, as they were more generally styled, "Ordinances of Amsterdam," further mention is made below.

A new and enlarged collection of sea laws, purporting to be an extract of the ancient laws of Oléron, made its appearance in the latter part of the 15th century in *Le Grant routier de la mer*, printed at Poitiers in France by Jan de Marnef, at the sign of the Pelican. The title-page is without a date, but the dedication, which purports to be addressed by its author, Pierre Garcie, *alias* Ferrande, to his godson, is dated from St Gilles on the last day of May 1483. It contains forty-seven articles, of which the first twenty-two are identical with articles of the "Judgments of the Sea," in the *Liber Memorandorum*, the remaining articles being evidently of more recent origin. A black-letter edition of this work in French, without a date, is preserved in the Bodleian Library at Oxford, and to the last article this colophon is appended: "Ces choses précédentes sont extraictes du très utille et profittable Roolle Doloyron par le dict Pierre Garcie alias Ferrande." An English translation is printed in the appendix to *A View of the Admiral Jurisdiction*, published in 1661 by Dr John Godolphin, in which the laws are described as "an Extract of the Ancient Laws of Oléron rendered into English out of Garsias alias Ferrand." Although this new text had the recommendation of an advocate who had filled the office of judge of the Admiralty Court during the Commonwealth and been appointed king's advocate-general by Charles II., it seems to have been superseded in a short time by Cleirac's *Us et coustumes de la mer*, to which was appended the following clause of authentication: "Tesmoin le Seel de l'Isle d'Oléron, estably aux contracts de la dite Isle, le jour du Mardy apres la Feste Sainct André l'an mille deux cens soixant-six." Cleirac does not inform us from what source or under what circumstances he procured his text, nor on what authority he has adopted in certain articles readings at variance with those of Garcie, whilst he retains the same number of articles, to wit, forty-seven. The clause of authentication cannot be accepted as a warranty above suspicion, as the identical clause of authentication with the same date is appended to the early Norman and Breton versions of the rolls, which contain only twenty-six articles. Cleirac's version, however, owing probably to the superior style in which it was edited, and to the importance of the other treatises on maritime matters which Cleirac had brought together for the first time in a single volume, seems to have obtained a preference in England over Garcie's text, as it was received in the High Court of Admiralty during the judgeship of Sir Leoline Jenkyns, and an English translation of it was introduced into the English translation of the *Black Book of the Admiralty* made by John Bedford, the deputy registrar of the High Court. It seems to have been Bedford's intention to print this translation under the title of "Sea Laws"; but the manuscript passed into the hands of Sir Leoline Jenkyns, who gave it to the College of Advocates in 1685. The *Black Book* itself, which was missing for a long time from the Admiralty registry, was discovered in the 19th century and replaced in the archives of the Admiralty Court. Of these two versions of the sea laws of Oléron the earlier obtained a world-wide reception, for it was translated into Castilian (*Fuero de Layron*) by order of King Alphonso X., and a Gascon text of it is still preserved in the archives of Leghorn, apparently in a handwriting of the 15th century, entitled "Asso es la copia deus Rolles de Leron de jucgemens de mar."

The parent stock of the Visby sea laws would appear to have been a code preserved in the chancery of Lübeck, drawn up in the Old Saxon tongue, and dated 1240. This code contains amongst many others certain articles on maritime law which are identical with articles in the Gotland sea laws. This collection comprises sixty-six articles, and it is now placed beyond a doubt by modern researches, especially of Professor Schlyter of Lund, that these Gotland sea laws are a compilation derived from three distinct sources—a Lübeck, an Oléron and an Amsterdam source. A Saxon or Low German text of this collection was printed for the first time in 1505 at Copenhagen by Godfrey de Gemen, a native of Gouda in Holland, who is reputed to have set up the earliest printing-press in Copenhagen. This print has no title-page, and in this respect resembles the earliest known print of *The Consulate of the Sea*; but upon a blank leaf, which occupies the place of a frontispiece in one of two copies of Godfrey de Gemen's text, both preserved in the royal library at Copenhagen, there has been inserted with a pen in alternate lines of black and red ink the title "Dat hogheste Gotlansche Water-Recht gedrucket to Koppenhaven Anno Domini M.D.V.," and there has also been inserted on the first page of the text the introductory title "Her beghynt dat hogheste Water-Recht" (here begins the supreme sea law). Professor Schlyter discovered a MS. (No. 3123) in the royal library at Copenhagen, which is written on parchment in a hand of the 15th century, and from which it seems probable that Godfrey de Gemen mainly derived his text, as it comprises the same number of articles, containing the same matter arranged in the same order, with this minor difference, that, whilst both the MS. and the print have the simple title "Water-Recht" prefixed to the first article, the MS. has also a similar title prefixed to the fifteenth. Further, as this article, together with those that follow it in the MS. appears to be in a handwriting different from that of the articles that precede, the fifteenth article may justly be considered as the first of a distinct series, more particularly as they are numbered in Roman characters, beginning with § I, and such characters are continued with a single interruption down to the end of the MS. Although, however, the numeration of the articles of this second series is continuous and the handwriting of the MS. from the fifteenth to the sixty-sixth article is unchanged, the text of the series is not continuous, as the fortieth article commences with an introductory clause—"This is the ordinance which the skippers and merchants have resolved amongst themselves as ship law." There is no difficulty in recognizing the first division of this second series of sea laws as a Low German version of the Judgments of Oléron, transmitted most probably through a Flemish text. This hypothesis would account for the substitution in several articles of Sluys for Bordeaux. On the other hand, the introductory clause which ushers in the fortieth article is identical with the title that is generally prefixed to MSS. of the maritime Ordinances of Amsterdam, and the text of this and of the following articles down to the sixty-fifth inclusive is evidently of Dutch origin and more or less identical with Verwer's text of the usages of Amsterdam. M. Pardessus, in his valuable *Collection de lois maritimes*, published in Paris before Professor Schlyter made known the result of his researches, justly remarked that the provisions of several articles of this last division of the sea laws are inconsistent with the theory that they originated at Visby. It may be observed that the sixty-sixth article of the MS. is a Lübeck law identical with the first article of the first series, which is of Lübeck origin. No colophon is appended to this final article in the MS. Nevertheless, Godfrey de Gemen's edition of 1505, which breaks off in the middle of the sixty-sixth article of the MS., has the following colophon: "Here end the Gotland sea laws, which the community of merchants and skippers have ordained and made at Visby, that all men may regulate themselves by them. Printed at Copenhagen, A.D. M.D.V." The question naturally suggests itself, To what MS. was Godfrey de Gemen indebted for this colophon, or is the alternative more probable that he devised it? There is no known MS. of this collection of an earlier date to which an appeal can be made as an authority for this colophon; on the contrary, the only known MSS. of which the date is earlier than Godfrey de Gemen's print, both of which are in the library of the university of Copenhagen, are without this colophon, and one of them, which purports to have been completed at Nyköping on the Eve of the Visitation of the Virgin in 1494, concludes with a colophon which precludes all idea that anything has been omitted by the scribe, viz., "Here ends this book, and may God send us His grace, Amen." We are disposed to think that Gemen himself devised this colophon. He was engaged in printing for the first time other collections of laws for the Danish government, and, as Gotland was at that time a possession of Denmark, he may have thus distinguished the sea laws from another collection, namely, of land laws. Professor Schlyter, however, believes Gemen may have borrowed it from a MS. which is lost, or at all events is not known. There is some support to this view in the fact that in the archives of the guildhall of Lübeck there is preserved a MS. of 1533 which contains a Low German version of the same collection of sea laws, with a rubric prefixed to the first article announcing them to be "the water law or sea law, which is the oldest and highest law of Visby," and there are good reasons for supposing that the scribe of this MS. copied his text from a MS. other than the Copenhagen MS. The same observation will apply to a second MS. of a similar character preserved in the library of the gymnasium of Lübeck, which purports to have been written in 1537. But as regards the Visby sea laws little reliance can be placed on such rubrics or colophons as proofs of the facts recited in them, though they may be valuable as evidence of the reputed origin of the sea laws at the time when the scribe completed the MS. In illustration of this view it may be stated that in the same year in which the more recent of these two MSS. purports to have been completed—namely 1537—there was printed at Lübeck an enlarged edition of the sea laws consisting of seventy-two articles, being a Low German translation of a Dutch text, in which six additional Dutch laws had been inserted which are not found in the Copenhagen MS., nor have a place in Gemen's text, yet to this edition is prefixed the title, "This is the highest and oldest sea law, which the community of merchants and shipmasters have ordained and made at Visby, that all persons who would be secure may regulate themselves by it." Further, it has an introductory clause to its thirty-seventh article—"This is the ordinance which the community of skippers and merchants have resolved upon amongst themselves as ship law, which the men of Zeeland, Holland, Flanders hold, and with the law of Visby, which is the oldest ship law." At the end of the seventy-second article there follows this colophon: "Here ends the Gotland sea law, which the community of merchants and mariners have ordained and made at Visby, that each may regulate himself by it. All honour be to God, MDXXXVII." Each article of this edition has prefixed to it after its particular number the word "belevinge" (judgment). It would thus appear that the Visby sea laws have fared like the Oléron sea laws: they have gathered bulk with increasing years.

The question remains to be answered, How did this collection of sea laws acquire the title of the "Visby sea laws" outside the Baltic? for under such title they were received in Scotland in the 16th century, as may be inferred from extracts from them cited in Sir James Balfour's *System of the more Ancient Laws of Scotland*, which, although not printed till 1754, was completed before his death in 1583. The text of the Visby sea laws generally current in England is an English translation of a French text which Cleirac published in 1641 in his *Us et coustumes de la mer*, and is an abbreviated, and in many respects mutilated, version of the original sea laws. This inquiry, however, would open a new chapter on the subject of the northern sea laws, and the civilizing influence which the merchants of Visby exercised in the 13th century through their factories at Novgorod, linking thereby the trade of the Baltic to that of the Black Sea. (T. T.)

See Pardessus, *Collection de lois maritimes antérieures au XVIII^e siècle* (6 vols., Paris, 1828–1845); Schlyter, *Wisby Stadslag och Sjörätt*, being vol. viii. of the *Corpus Juris Sueco-Gotorum Antiqui* (Lund, 1853); and *The Black Book of the Admiralty*, ed. by Sir Travers Twiss (4 vols., London, 1871–1876). An exhaustively critical edition of the Rhodian sea law (given in vol. i. of Pardessus) by W. Ashburner, appeared in 1909 (Oxford, University Press). It contains valuable material not only on the Rhodian sea law, but on the various other sea laws in force on the Mediterranean coast.

SEAL-FISHERIES. Seals of all descriptions (see SEAL)—whether belonging to the typical family *Phocidae*, or true seals, or to the *Otariidae*, or sea-lions and sea-bears—are of great commercial value. Whereas, however, the true seals and the sea-lions are hunted only for the sake of their hides and blubber, the sea-bears are sought on account of their valuable "seal skin" (see CARNIVORA; also FUR). Walruses (*Odobaenidae*) are hunted not only for their hides and blubber but also for the ivory of their tusks, which is, however, far less valuable than elephant-ivory. Among the more important species of sea-bears or fur-seals, which yield commercial "seal-skin," may be mentioned *Otaria* (*Arctocephalus*) *australis* of South America and the adjacent islands, including the Galapagos group and Tierra-del-Fuego; *O.* (*A.*) *antarctica* or *pusilla* of South Africa and the Crozets; *O.* (*A.*) *gazella* of Kerguelen Island; and *O.* (*A.*) *Forsteri* of the coasts of New Zealand and South-Western Australia. This group was widely distributed over the pelagic islands of the southern hemisphere, but is now practically extinct in the greater part of its habitat, although remnants of importance exist on Lobos Island in the mouth of the river Plata in Uruguay, and on the islands off Cape Horn, both of which now receive protection from government. A second group is represented by *Otaria* (*Callorhinus*) *ursina* of the Commander Islands and Pribiloff Islands in Bering Sea, Robben Island and the Kurile Islands, Sea of Okhotsk, and other parts of the North Pacific; the forms from the different islands having received distinct specific names.

Of the southern herds little authentic information exists, but the records for the northern herds are fairly complete. At the period of its maximum development, 1870 to 1880, the herd of the Pribiloff Islands numbered about 2½ million animals; that of the Commander Islands about one-half as many. The herd in the Sea of Okhotsk is one of minor importance, numbering in 1897 less than 1000 animals on Robben Island. All these herds became greatly reduced, and in 1896–1897 numbered in all not more than 600,000 animals. The typical adult male or bull (*sikatch*) of the second group attains maturity about the seventh year, and weighs from 400 to 500 ℔. It is 6 ft. in length, with a girth of 4½ ft. The fur is blackish or dark brown, with long yellowish-white hairs, especially long and firm on the back of the neck, forming the so-called "wig" or mane. The animal stands erect and runs or "lollops" along the ground when on land. The adult female, or cow (*matka*), is much smaller, averaging about 80 ℔ in weight, with length and girth in proportion. The fur is of varying shades of brown; she bears her first young at the age of three years.

The breeding-grounds are boulder-strewn beaches or rocky hill slopes near the shore. On these the sea-bears congregate in close-set masses called "rookeries." The unit of rookery life is the family group, or "harem," each bull collecting as many females as he can control. The number ranges from 1 to 100 or more, averaging about 30. The bulls reach the islands early in May and take up their places. The cows begin to arrive the first week in June. The number on the rookeries from day to day grows steadily to a climax about the middle of July, when about one-half are present, the number actually on the ground diminishing to about one-fourth at and after the close of the breeding season with the end of July. The single young, or pup (*kotik*), weighing 10 to 12 ℔ and jet black in colour, is born within six to forty-eight hours after the arrival of the cow. Within a week the latter is served by the bull, and by the end of another week she goes to sea to feed, returning at gradually lengthening intervals through the summer to nourish her young, left in the meantime to care for itself on the rookeries. The bulls, having fasted since their arrival in May, go away in August to feed. The pups learn to swim at the age of a month or six weeks, and in November, with the approach of winter, swim away with their mothers to the south. The winter migration of the

Pribiloff seals extends as far south as the latitude of southern California, the return course following the coast. The Commander seals reach the latitude of southern Japan and return on their course. The fur-seals find their food, chiefly squid, Alaska pollack, and especially a small smelt-like fish (*Therobromus callorhini*), in deep water, and their feeding-grounds in Bering Sea and on the migrations lie mainly along the 100-fathom curve.

The Commander Islands were discovered by Vitus Bering in 1741, and our first knowledge of the northern fur-seal herds comes from the notes of Georg Wilhelm Steller, a German naturalist accompanying Bering's expedition. The Pribiloff Islands were discovered in 1786 and transferred with the territory of Alaska to the United States in 1867. Up to 1867 the catch taken by the Russian Company holding the Alaska monopoly was about 75,000 yearly. Between 1868 and 1897 the reported catch of seals from the Pribiloff herd on land was 2,440,213, and 651,282 were reported as taken by pelagic sealing; but the latter is certainly greatly under the truth. From 1867 to 1902 the fur-seal catch was worth, it has been estimated, about $35,000,000. From 1870 to 1890 the United States government leased the islands to the Alaska Commercial Company, and in 1890 the monopoly passed to the North American Commercial Company; this lease expired on the 1st of May 1910, and was not to be renewed. The catch was limited to 60,000 in 1890 and 1891; 7500 in 1892 and 1893; 20,000 in 1894; 15,000 in 1895, 20,000 in 1897; 30,000 in 1896, 1898–1903; and 15,000 in 1904, 1905 and 1906. The total number of skins shipped by the lessees from 1870 to 1906 was 2,135,248. From 1868 to 1906 the receipts from royalties on skins was $9,311,054·77, and the expenses of the United States were $1,353,015·53 (including $349,464·88 for agents, $254,051·49 for supplies to natives, $483,842·65 for Bering Sea awards and commission, and $41,000·31 for investigation of the fur-seal fisheries in 1898–1899); besides this, from 1890 to 1895 the government expended $1,410,722 for the policing of Bering Sea and the prevention of illegal pelagic hunting.

Land-killing and pelagic sealing.

The Russians worked out the principle, based on the polygamous habit of the animals, of affording absolute protection to the breeding female herd, and confining the killing to the superfluous males. The young males, or bachelors, "haul out" to rest and sleep on beaches adjacent to, but distinct from, the breeding-grounds. Here they are surrounded at night by the sealing gangs, rounded up in droves of from 1000 to 3000, and driven inland to the killing-grounds. The large droves are broken up into successive "pods," or groups, of from 20 to 50, of which the "killable" seals (animals of three years of age or approximating to such in size) are knocked down with clubs, those too large or too small being allowed to escape. The skins are removed, salted in kenches and, when cured, are exported. The two important processes in dressing the skins are the removal of the long hairs which grow out through the short thick fur, and the dyeing of the fur itself black.

The decline in the fur-seal herds of Bering Sea is due to the growth of a rival sealing industry—the hunting of the animals at sea with spear or shot-gun, known as pelagic sealing.[1] Stragglers from the migrating herd had from the earliest times been taken by the Indians of Cape Flattery and Vancouver Island, going out from the shore in their canoes, but the number so captured was small. In 1879, however, sailing vessels began to be used to carry the hunters and their canoes out to the main body of the herd, and to enable them to follow its movements. The industry developed rapidly, by 1892 employing a fleet of 122 sailing vessels, each with from five to twenty hunting crews. The catch at sea grew to a maximum in 1894 of 140,000 skins. The operations of the fleet gradually extended to cover the entire migration route of the herd, and in 1883 the sealers entered its summer feeding-grounds in Bering Sea. Pelagic hunting, necessarily indiscriminate, affected most seriously the herd of breeding females. Investigations carried on in Bering Sea in 1895 and 1896 show that from 62 to 84% of the pelagic catch were of this class, the death of the female involving the death of her unborn offspring, as well as that of the unweaned young. From 1870 to 1902 the "pelagic" catch has been estimated (Jordan) as 1,000,000, nearly half the corresponding total for the land-catch.

The abuse of pelagic sealing naturally created much indignation in America. Under sanction of a claim made by Russia in 1821 to exclusive jurisdiction in Bering Sea (a claim decided by the Paris Tribunal of 1893 to be untenable), the United States in 1886 seized sealing vessels operating in that sea—among them Canadian vessels. This brought on a diplomatic discussion with the British government, which culminated in 1892 in a treaty by which it was agreed to submit to arbitration the claims of the United States to jurisdiction in Bering Sea in the interests of her fur-seal herd when beyond the ordinary territorial limits. The Tribunal of Arbitration met in Paris in 1893 (see BERING SEA ARBITRATION). Its decision was adverse to the contentions of the United States, and equally adverse to the life of the fur-seal herds. As agreed upon in such event, the tribunal formulated a set of rules for the regulation of pelagic sealing, with a view to the protection of the seals. These regulations provided for a close season in May, June and July, and a protected zone of 60 m. radius about the breeding islands. The regulations failed of their object, because the breeding females do not feed within the protected area, but far outside, and are therefore taken without restriction on the feeding-grounds in August and September, their young being left to starve.

In 1896 it was agreed between the United States and Great Britain that a new investigation of the facts of seal life should be made. At the close of this inquiry in 1897 the two Commissions met in Washington as a Joint Conference of Fur Seal Experts, and after a discussion of the results of their labours, a substantial agreement was reached on all essential facts. On the basis of this agreement the fur-seal question passed into the hands of a Joint High Commission, representing Great Britain, the United States and Canada, called at Quebec in September 1898 to consider a number of questions at issue between the United States and Canada. There the matter rested. Meanwhile the herds continued to decline, and the pelagic catch itself fell rapidly with the depleted herds.

The following is a summary of the fur skins from various sources over the period 1743 to 1897:—

From all sources prior to 1868	3,197,154
Land sealing, 1868–1897, Pribiloff herd	2,440,213
„ „ Commander herd	942,736
Pelagic sealing, 1868–1897, Pribiloff herd	651,282
„ „ Commander herd	312,247
Lobos Island skins	316,746
Cape Horn skins	122,390
Grand Total	7,982,768

For a full account of the fur-seals and the fur-seal industries, reference should be made to the reports of D'Arcy W. Thompson, Commissioner for Great Britain, and his associates, for 1896 and 1897 (*Parliamentary Papers*, "United States," No. 3 [1897], and No. 1 [1898]), and especially to the final report of David S. Jordan, Commissioner for the United States, and his associates, for the same years (Treasury Department Document No. 2017, *Fur Seals and Fur Seal Islands of North Pacific Ocean*, 4 vols. and atlas, Washington, 1898). Other papers of importance are: H. W. Elliott's "Monograph of the Seal Islands of Alaska," Bull. 147, *U.S. Fish Commission* (1882), and the report of C. H. Merriam and T. C. Mendenhall, the American Commissioners for 1891, *Proc. Paris Arbitration*, ii. 311-396.

SEALING WAX. In medieval times, when the principal use of sealing wax was for attaching the impression of seals to official documents, the composition used consisted of a mixture of Venice turpentine, beeswax and colouring matter, usually vermilion. The preparation now employed contains no wax. Fine red stationery sealing wax is composed of about seven parts by weight of shellac, four of Venice turpentine, and three to four of vermilion. The resins are melted together in an earthenware pot over a moderate fire, and the colouring matter is added slowly with careful stirring. The mass when taken from the fire is poured into oiled tin moulds the form of the sticks required, and when hard the sticks are polished by passing them rapidly over a charcoal fire, or through a spirit flame, which melts the superficial film. For the brightest qualities of sealing wax bleached lac is employed, and a proportion of perfuming matter—storax or balsam of Peru—is added. In the commoner qualities considerable admixtures of chalk, carbonate of magnesia, baryta white or other earthy matters are employed, and for the various colours appropriate mineral pigments. In inferior waxes ordinary resin takes the place of lac, and the dragon gum of Australia (from *Xanthorrhoea hastilis*) and other resins are similarly substituted. Such waxes, used for bottling, parcelling and other coarser applications, run thin when heated, and are comparatively brittle, whereas fine wax should soften slowly and is tenacious and adhesive.

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[1] A temporary cause for the shrinkage of the herd was the ravages of the *Uncinaria*, a worm which attacked the infant seals; in 1906 it seemed no longer to be present.

SEALS. The idea of testifying the personal presence or the agency of an individual on some particular occasion, by affixing the impression of his seal (Lat. *sigillum,* O. Fr. *scel*) to the record or object connected with the transaction of the moment, can be traced back among the nations of the old world when advanced only a comparatively short way on the path of civilization. In the East the custom which has prevailed for centuries, and which is a practice at the present day, of using the seal as a stamp wherewith to print its device in ink or pigment in authentication of a document is parallel to our western habit of inscribing a signature for the same purpose. In the West, too, the impression of the seal has, at certain periods, had the same value as the signature; and at all times the connexion between the signature and the seal has been intimate in European practice (see AUTOGRAPHS and DIPLOMATIC). But the western method of obtaining the impression has differed from the eastern method. With us, the notion of a seal is an impression in relief, obtained from an incised design, either on a soft material such as wax or clay, or on a harder material such as lead, gold or silver. By common usage the word "seal" is employed as a term to describe both the implement for making the impression, and the impression itself; but properly it should be confined to the latter, the graven implement being technically called the matrix.

Egyptian seals.

The earliest examples of seals, both matrices and impressions, are found among the antiquities of Egypt, Babylonia and Assyria. On the clay stoppers of wine jars of the remote age which goes by the name of the pre-dynastic period, and which preceded the historic period of the first Pharaohs, there are seal impressions which must have been produced from matrices, like those of Babylonia and Assyria, of the cylinder type, the impress of the design having been repeated as the cylinder was rolled along the surface of the moist clay. Two such engraved cylinders of this archaic period are in the British Museum collections. The cylinder, however, seems to have been generally superseded in Egypt by the engraved scarab, or beetle-shaped object, which, it may be assumed, was used at an early time, as it certainly was in later Egyptian history, for sealing purposes, although its proper function was that of an amulet. Still, the fashion for cylinders appears to have revived at intervals, for they are found in the 6th, the 12th and the 18th dynasties. Even in the 1st dynasty, about 4500 B.C., the Egyptian Pharaohs had their official sealers, or, to use a modern expression, keepers of the Royal Seal. Egyptian signet-rings, which were used for sealing, date back to the 12th dynasty.

Babylonian and Assyrian seals.

As already stated, the matrices of ancient Babylonian and Assyrian seals, usually cut on precious stones, are in cylinder form. The fine collection in the British Museum presents us with Babylonian specimens of even archaic times, followed by an historical series, the earliest of which is of nearly 4500 years B.C. The Assyrian series is not so full. The engraved subjects are chiefly mythological. Impressions are to be found on many of the cuneiform clay tablets. Early in the 7th century B.C. the cylinder seal gave place to the cone, the impression being henceforth obtained after the fashion followed to the present day.

Phoenician seals.

The Phoenicians, as was only to be expected of those traders and artisans of the ancient world, appear to have adopted both the cylinder of Assyria and the scarab of Egypt as patterns for their seals. Examples indeed are rare, but that these people were acquainted with both forms is certain. Phoenician names are found cut both on cylinder matrices and on scarabs by the Phoenician engravers employed in Assyria and Egypt; and, when the cone-shaped matrix superseded the cylinder in Western Asia, the Phoenicians conformed to the change.

Greek seals.

In Europe, the use of seals among the early Greeks is well known. Of the Mycenaean period numerous seal-impressions in clay have been found. Also from ancient times have survived the numerous engraved stones or pebbles, technically called gems, which served as matrices and in most instances were undoubtedly mounted as finger-rings or were furnished with swivels. At first being used in their natural forms, these pebbles or gems have been grouped as lenticular or bean-shaped, and glandular or of the sling-bolt pattern; later, from the 6th to the 4th century B.C., they were fashioned as scaraboids, that is, in the general form of the Egyptian scarab, but without the sculptured details of the beetle's body. To these, by a natural process, succeeded the matrix formed of only a thin slice of stone, which was more conveniently adapted for the bezel of the ring; and in this shape the engraved matrix passed on from the Greeks to the Romans. Signet-rings also with fixed metal bezels were in common use among the Greeks from about 600 B.C.

Etruscan seals.

But while the scarab met with little favour in Greece, where, as just stated, the scaraboid was preferred, among the Etruscans its adoption was complete, and with them it became the commonest form of the seal-matrix, dating from the latter part of the 6th century B.C., engraved chiefly with subjects derived from Greek art.

Impressions of late Greek or Roman gems in clay have survived in a few instances. A series of impressions from Greek seals was found at Selinus in Sicily, dating before 249 B.C.; a small collection of sealed Greek documents on papyrus of the 4th and 3rd centuries B.C. has been discovered at Elephantine in Egypt. An interesting and very rare example of a Roman law deed sealed with gem impressions in clay is in the British Museum, recording the sale of a slave boy in A.D. 166.

It is not the object of this article to deal further with the history of antique seals (see NUMISMATICS; also GEMS, JEWELRY and RING), but to give some account of European seals of the middle ages, when the revival of their use for the authentication of documents resulted in their universal employment among all classes of society. Hence it is that we are in possession of the vast number of impressions still to be found in public museums and archives, and in private muniment rooms and antiquarian collections, either attached to the original charters or other deeds which they authenticated, or as independent specimens. Hence, too, have survived a fairly large number of matrices.

Early medieval seals.

The connecting link between the general use of the signet, which was required by the Roman law for legal purposes, but which had died out by the 7th century, and the revival of seals in the middle ages is to be found in the chanceries of the Merovingian and Carolingian sovereigns, where the practice of affixing the royal seal to diplomas appears to have been generally maintained (see DIPLOMATIC). Naturally, surviving examples of such seals are rare, but they are sufficient in number to indicate the style adopted at different periods. The seal-ring of Childeric II. (d. 673) was found in his tomb, bearing a full-face bust and his name; and impressions of seals of later monarchs of the Merovingian line, engraved with their busts and names, have survived. Pippin the Short and the early Carolings made use of intaglios, both actual antiques and copies from them; their successors had seals of ordinary types usually showing their busts. One of the oldest matrices is an intaglio in rock crystal, now preserved at Aix-la-Chapelle, bearing a portrait head of Lothair II., king of Lorraine (A.D. 855–869), and the legend "Xp̄e [*Christe*] Adivva Hlotharium Reg." As time advanced there was a growing tendency to enlarge the royal seal. Under Hugh Capet there was (A.D. 989) a further development, the king being represented half-length with the royal insignia; and at last under Henry I. (A.D. 1031–1060) the royal seal of France was complete as the seal of majesty, bearing the full effigy of the king enthroned. In Germany, however, this full type had already been attained somewhat earlier in the seal of the emperor Henry II. (A.D. 1002–1024); and it had been used even earlier by Arnulf, count of Flanders, in 942. The royal seal thus developed as a seal of majesty became the type for subsequent seals of dignity of the monarchs of the middle ages and later, the inscription or legend giving the name and titles of the sovereign concerned.

All the early royal seals which have been referred to were affixed to the face of the documents, that is, *en placard*; but in the 11th century the practice of appending the seal from thongs or cords came into vogue; by the 12th century it was universal.

Naturally, the introduction of the pendant seal invited an impression on the back as well as on the face of the disk of wax or other material employed. Hence arose the use of the counterseal, which might be an impression from a matrix actually so called (*contrasigillum*), or that of a signet or private seal (*secretum*), such countersealing implying a personal corroboration of the sealing. The earliest seal of a sovereign of France to which a counterseal was added was that of Louis VII. (A.D. 1141), an equestrian effigy of the king as duke of Aquitaine being impressed on the reverse. When, in 1154, Aquitaine passed to the English crown, this counterseal disappeared, and eventually in subsequent reigns a fleur-de-lis or the shield of arms of France took its place. In the German royal seals the imperial eagle or the imperial shield of arms was the ordinary counterseal.

Anglo-Saxon royal seals.

Great seals.

To turn to England: it appears that the kings of the Anglo-Saxon race, or at least some of them, imitated their Frankish neighbours in using signets or other seals. There are still extant an impression of the seal of Offa of Mercia (A.D. 790) bearing a portrait head; and one of the seal of Edgar (A.D. 960), an intaglio gem. The first royal seal of England which ranks as a "great seal" is that of Edward the Confessor, impressions of which are extant. This seal was furnished with a counterseal, the design being nearly identical with that of the obverse (fig. 1). William the Conqueror, as duke of Normandy, used an equestrian seal, representing him mounted and armed for battle. After the conquest of England, he added a seal of majesty, copied from the seal of Henry I. of France, as a counterseal. In subsequent reigns the order of the two seals was reversed, the seal of majesty becoming the obverse, and the reverse being the equestrian seal: a pattern which has been followed, almost uniformly, down to the present day.

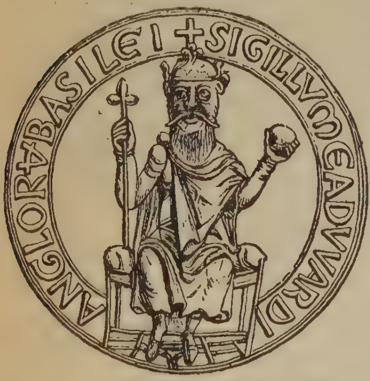

FIG. 1.—Seal of Edward the Confessor.

Anglo-Saxon private seals.

Besides the two royal seals of Anglo-Saxon kings noticed above there are extant a few other seals, and there is documentary evidence of yet others, which were used in England before the Norman Conquest; but the rarity of such examples is an indication that the employment of seals could not have been very common among our Anglo-Saxon forefathers. Berhtwald the thane, in 788, and Æthelwulf of Mercia, in 857, affixed their seals to certain documents. In the British Museum are the bronze matrices of seals of Æthilwald, bishop of Dunwich, about 800; of Ælfric, alderman of Hampshire, about 985; and the finely carved ivory double matrix of Godwin the thane (on the obverse) and of the nun Godcythe (on the reverse), of the beginning of the 11th century. In the Chapter Library of Durham there is the matrix of the monastic seal of about the year 970; and in the British Museum, appended to a later charter (Harl. 45 A. 36), is the impression of the seal of Wilton Abbey of about 974.

Medieval seals.

The official practice of the Frankish kings, which, as we have seen, was the means of handing down the Roman tradition of the use of the signet, was gradually imitated by high officers of state. In the 8th century the mayors of the palace are found affixing their personal seals to royal diplomas; and, once the idea was started, the multiplication of seals naturally followed. From the end of the 10th century there was a growing tendency to their general use. From the 12th to the 15th century inclusive, sealing was the ordinary process of authenticating legal documents; and during that period an infinite variety of seals was in existence. The royal seals of dignity or great seals we have already noticed. The sovereign also had his personal seals: his privy seal, his signet. The provinces, the public departments, the royal and public officers, the courts of law: all had their special seals. The numerous class of ecclesiastical seals comprised episcopal seals of all kinds, official and personal; seals of cathedrals and chapters; of courts and officials, &c. The monastic series is one of the largest, and, from an artistic point of view, one of the most important. The topographical or local series comprises the seals of cities, of towns and boroughs and of corporate bodies. Then come the vast collections of personal seals. Equestrian seals of barons and knights; the seals of ladies of rank; the armorial seals of the gentry; and the endless examples, chiefly of private seals, with devices of all kinds, sacred and profane, ranging from the finely engraved work of art down to the roughly cut merchant's mark of the trader and the simple initial letter of the yeoman, typical of the time when everybody had his seal.

Shapes.

The ordinary shape of the medieval seal is round; but there are certain exceptions. Ladies' seals and some classes of ecclesiastical and monastic seals are of pointed oval form, which is best adapted to receive the standing figure of lady, bishop, abbot or saint: the common types in such classes. Fancifully shaped seals also occur, but they are comparatively rare.

Matrices.

In the middle ages the metal chiefly employed in the manufacture of matrices was bronze. Among the wealthy, silver was not uncommon; among the poor, lead was in general use. Matrices of steel and iron were made at a later time in the 16th and 17th centuries. In the 11th century a fairly large number of matrices were cut in ivory. The use of engraved gems in the early middle ages has already been noticed; but the taste for antique intaglios was not confined to any one period. In the later centuries also, particularly in the 14th century, they were set in seal matrices and finger rings. A fine Graeco-Roman gem, bearing a female head, full face and set in a medieval setting, does duty for the head of Mary Magdalen, as seen in the accompanying cut (fig. 2).

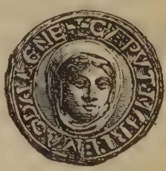

FIG. 2.—Antique gem used as a private seal.

The ordinary matrix of the middle ages was provided with a ridge on the back (or, in some instances, with a vertical handle), by which it could be held while being used for sealing, and which might be pierced for suspension. Sockets for the insertion of handles are of comparatively late make. The matrix was in most instances simple, the design giving a direct impression once and for all. But there are examples of elaborate matrices composed of several pieces, from the impressions of which the seal was built up in an ingenious fashion, both obverse and reverse being carved in hollow work, through which figures and subjects impressed on an inner layer of wax are to be seen. Such examples are the seal matrix of the Benedictine priory of St Mary and St Blaise of Boxgrave in Sussex, of the 13th century, now in the British Museum (fig. 3); and the matrix of Southwick Priory in Hampshire, of the same period (*Archaeologia*, xxiii. 374). The matrix of one of the seals of Canterbury Cathedral was also constructed in the same manner.

It has usually been the custom to break up or deface the matrices of official seals when they have ceased to be valid, as, for example, at the commencement of a new reign. The seals of deceased bishops or abbots were solemnly broken in presence of the chapter or before the altar. But the legal maxim that corporations never die is well illustrated by the survival of the fine series, not complete, indeed, but very full, of the matrices of English corporations, beginning with the close of the 12th century. A fine example is the corporate seal of Rochester, of the 13th century, showing the keep and battlements of the castle (fig. 4) in high relief.

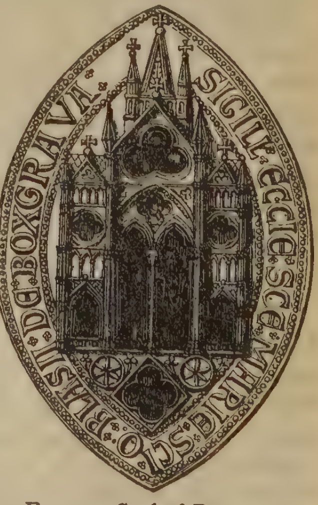
SIGILL' ECCLE' SCE MARIE ET SCI BLASII DE BOXGRAVA

FIG. 3.—Seal of Boxgrave Priory: obverse.

Waxen impressions.

The common material for receiving the impressions from the matrices was beeswax, generally strengthened and hardened by admixture with other substances, such as resin, pitch and even hemp and hair. The employment of chalk as an ingredient in many seals of the 12th century has caused them to become extremely friable. It was a common practice to apply to such seals a coating of brown varnish. Besides the transparent yellowish-brown of the wax when used in its natural state, as it very frequently was used in the earlier middle ages, many other colours, especially red, dark green and dark brown, and even black, are found in medieval seals. Any attempt to classify examples by their colours fails, for, while at some periods the particular tints employed in certain chanceries may have been selected with a view to marking the character of the documents so sealed, such practice was not consistently followed.

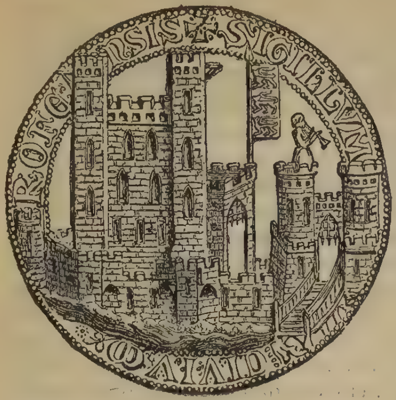

FIG. 4.—Corporate Seal of Rochester.

For the protection of the impression, in the 12th and 13th centuries, when it was an ordinary custom to impress the seals on thick cakes of wax, the surrounding margin rising well above the field usually formed a suitable fender; at other times, as in the 14th and 15th centuries, a so-called wreath, or twisted shred of parchment, or plaited grass or reed, was imbedded in the wax round the impression. But the most common process was to sew up the seal in a bag or piece of cloth or canvas, with the mistaken notion that this would ensure the seal's integrity; the ordinary result being that, on the assumption that seals thus protected needed no further care, they have been in most instances either broken or crushed to powder. In later times, seals, especially great seals, have been frequently fitted in metal or wooden boxes.

Type and legend.

The medieval seal may be said, in general, to be composed of two essential parts: the device, or type as it is sometimes called, and the inscription or legend. It is the existence of the legend, surrounding the device as with a border, that distinguishes it from the antique engraved gem, which rarely bore an inscription and then only its field. Such antique gems as were adopted for matrices in the middle ages were usually set in metal mounts, on which the legends were engraved. The first and obvious reason for an inscription on a seal was to ensure identification of the owner; and therefore the names of such owners appear in the earliest examples. Afterwards, when the use of seals became common, and when they were as often toys as signets, fanciful legends or mottoes appropriate to the devices naturally came into vogue. Examples of such mottoes will be given below.

A few words may be said regarding the different kinds of types or devices appropriate to particular classes or groups of medieval seals; and, although these remarks have special reference to English seals, it may be noted that there is a common affinity between the several classes of seals of all countries of western Europe, and that what is said of the seal-devices of one country may be applied in general terms to those of the rest. The types of the great seals of sovereigns have already been mentioned: a seal of majesty on the obverse, an equestrian seal on the reverse. Other royal official seals usually bear on the obverse the king enthroned or mounted, and the royal arms on the reverse. Among other official seals a very interesting type is that of the Lord High Admiral in the 15th century, several matrices of the seals of holders of the dignity having survived and being exhibited in the British Museum. That of John Holland, earl of Huntingdon, Admiral of England, Ireland and Aquitaine, 1435–1442, is here given (fig. 5), having the usual device of a ship, on the mainsail of which are the earl's armorial bearings. In ecclesiastical seals generally, in the seals of religious foundations, cathedrals, monasteries, colleges and the like, sacred subjects naturally find a place among other designs. Such subjects as the Deity, the Trinity, the Annunciation, the Nativity, the Crucifixion, the Coronation of the Virgin, are not uncommon. Episcopal seals more generally show the prelate prominently as a standing figure, or, less conspicuously, as kneeling in prayer before the Deity or patron saint; the counterseal also frequently represents him in the same posture of adoration. Chapter seals may bear the patron saint, or a representation, more or less conventional, of the cathedral; monastic seals may have figures of the Virgin Mary, or other patron saint, or of the founder, or of abbot or abbess; or the conventual building. If there be a counterseal, the figure of patron saint or founder may stand there, while the building occupies the obverse. Each abbot, too, would have his own seal of dignity, generally showing him standing. Local seals of town or borough may have the image of a patron saint, or armorial device, or castle or bridge or other building (see fig. 4), or the town itself. A seaport will be indicated by a ship on the waves. The baronial seal bears the armed and mounted knight. On ladies' seals the owner is often gracefully depicted standing and holding flower or bird, or with shields of arms. After the 14th century, the figures of ladies, other than queens, vanish from seals. Armorial devices of the gentry first appear on seals at the close of the 12th century; and from that time there is a gradual development of the heraldic seal, which in the 14th century was often a work of fine decorative sculpture. And, lastly, the devices on fancy seals are without end in their variety.

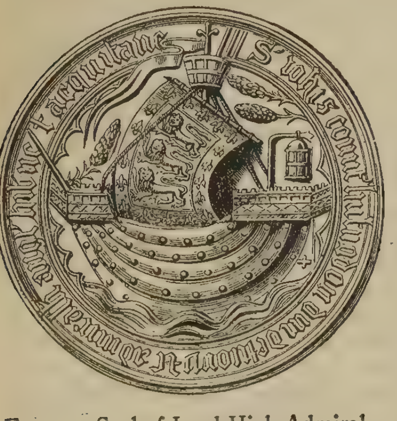

FIG. 5.—Seal of Lord High Admiral Huntingdon.

Art.

As in all other departments of medieval art, the engraving of seals in the middle ages passed through certain well-marked developments and changes characteristic of different periods. Fine seal engraving is to be found in the productions of many of the continental nations; but in the best periods nothing can excel the work of English cutters. Beginning with the examples of the 11th and 12th centuries, we find the subjects generally of an archaic style, which is evidence of an early stage of the art. In the 13th century this undeveloped stage has passed, and a fine, but still restrained, quality of engraving ensues, which, like all the allied arts of that century, charms with its simple and unpretending precision. For example, in the great seals of Henry III., something of the antique stiffness remains, but the general effect and the finish of the details are admirable. We may refer also again to the Boxgrave seal (fig. 3) as a fine specimen of 13th century architectural carving. But the most beautiful seal of this period, and in many respects the most beautiful medieval seal in existence, is the monastic seal of Merton Priory, in Surrey, of the year 1241. An engraving of the obverse, the Virgin and Child, is here given (fig. 6). The Merton seal is the work of a master hand treating his subject with wonderful breadth and freedom. As the century advances, a more graceful movement in the figures is discernible. For instance, the great seal of Edward I. shows a departure from the severe simplicity of his predecessor in the addition of decorative architectural details, and in the easier action of the equestrian figure, which in this instance is of a strikingly fine type. Comparable with it is the remarkable baronial equestrian seal of Robert Fitz-Walter (fig. 7), 1298–1304, the silver matrix of which is in the British Museum collections.

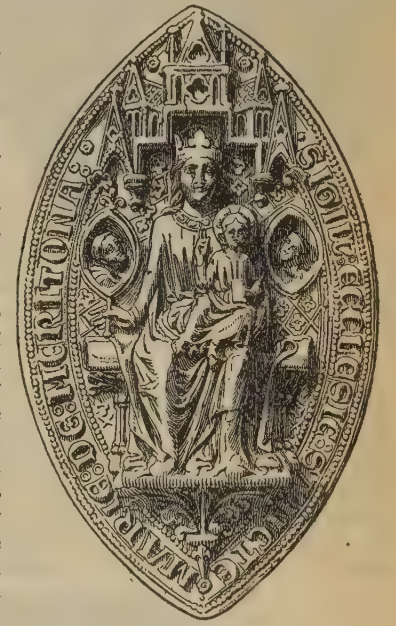

FIG. 6.—Merton Priory Seal.

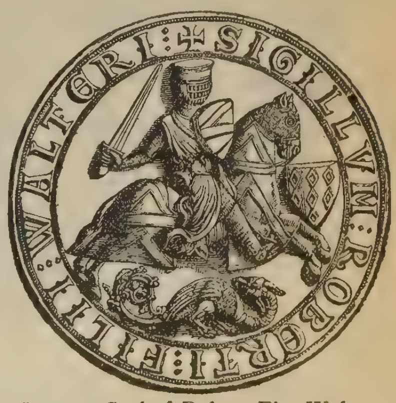

FIG. 7.—Seal of Robert Fitz-Walter.

The work of the 14th century is marked by a great development in decoration. Where the artist of the former century would have secured his effect by simple, firm lines, the new school trusted to a more superficial style, in which ornament rather than form is the leading motive. The new style is conspicuous in the great seals and other official seals of Edward III., as well as in other classes. The 14th century is also the period of enriched canopies, of niches and pinnacles and of other details of monumental sculpture reproduced in its seals. A very beautiful and typical example of the best work of this period is to be seen in the seal of Richard de Bury, bishop of Durham from 1333 to 1345 (fig. 8). It is to be remarked that the standing figure of the bishop in episcopal seals, of the abbot in monastic seals and of the lady in ladies' seals, which was so persistent from the 12th century onwards, proved to be the happy cause of the maintenance of the elegant oval shape in examples of these classes, wherein some of the best balanced designs are to be found.

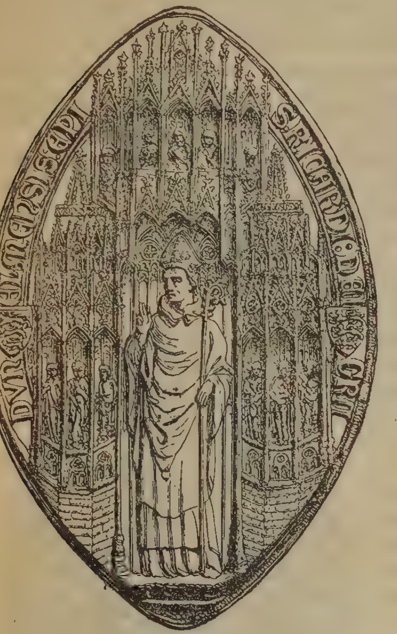

Fig. 8.—Seal of Richard de Bury, late 14th century.

The 15th century brought with it to seal-engraving, as it did to other departments of medieval art, the elements of decadence. The execution becomes of a more mechanical type; the strength of the 13th century and the gracefulness of the 14th century have passed; and, while examples of great elaboration were still produced, the tendency grows to overload the decoration. This defect is noticeable, for example, in the elaborate great seals of the Henries of the 15th century, as compared with the finer types of their predecessors. As a good example of the middle of the century, the seal of King's College, Cambridge, of about the year 1443, is here given (fig. 9), showing the Virgin in glory in the centre, between St Nicholas and King Henry VI.

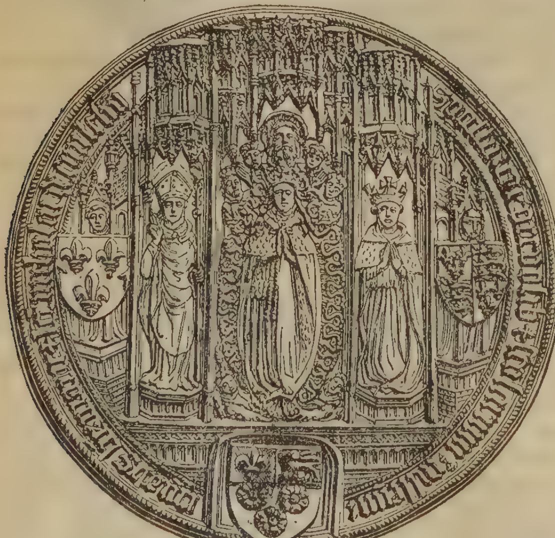

Fig. 9.—Seal of King's College, Cambridge.

With the rise of the period of the Renaissance, like other medieval arts, seal-engraving passed out of the range of the traditions of the middle ages and came under the influence of the derived classical or pseudo-classical sentiment. There is, therefore, no need to pursue the subject further.

Mottoes.

We close this portion of the present article with specimens of the legends or mottoes which are to be found on the innumerable personal seals of the 13th, 14th and 15th centuries. They are of great variety, and many of them are very interesting, both on account of the devices which they accompany and the sentiments which they express. In English seals they are found composed in Latin, in French, and in the vernacular. First there are legends describing the quality of the seal or conveying a message to the recipient of the missive, as :—Privé su (suis); privé su et poi conu (peu connu); sigillum secreti; secreti nuntius; je su mute; lel (loial) ami muet; je su sel bon e leel; veici parti lel; clausa secreta tego; signo secreta signo; secreta gero; si frangis, revelo; frange, lege, tege; brusset, liset, et celet; accipe, frange, lege; claude, repone, tege; missa lege, lecta tege; tecta lege, lecta tege; briset, vaez, lisez, craez; tene fidem; tenet la foy; softe and fayre. Seals with love mottoes are numerous:—sigillum pacis et amoris; je suy damurs; je su seel damur lel; seel de saluz e damur; de li penset par ki me avet; jeo su ci en lu dami; penset de li par ki su ci; ase for the treweste; ami amet, car lel ami avét; amye amet, mon quer avet; mun quer avet, ben le gardé; mun cuer avet, ne le deceve; penset de moi, e je de vus; mon quer jolye a vos doin, amye; je suy flur de lel amur; love me and I the; if the liket, mi love holde; poi vaut vivre sans lel ami. The lion is a not uncommon device:—Je su lion bon par avisoun; sum leo, quovis eo, non nisi uera veho; je su rey des bestes; leo tegit secretum. A lion dormant:—Ci repose le lion; ici dort le lion fort; wake me no man. A lion dormant on a rose, the symbol of secrecy:—Ben pur celer, gis sur roser; ici repose liun en la rose; de su la rose le lion repose. Rustic life is represented by a squirrel:—I crake notis; I krak nots; I bite notes: by a hare, or a hare riding a dog:—Sohou, sohou; sohou, mutel; sohou, Robin; sohou, je le voi; sohou, je lai trouvé; je vois a bois; by a hare in a tree:—Sohou, scut, ware I cut: by a monkey riding a dog or goat:—Allone I ride, I hunt; allone I ride, have I no swayn: by a stag:—Alas, Bowles: by a dog:—hobbe, dogge, hobbe; garez ben le petit chen: by a hawk seizing a bird:—Alas, je su pris. And more than one example bears the motto:—By the rood, women ar wood (mad).

Bullae.—As stated above, metal seals, as well as seals in soft materials, have been employed in European countries under certain conditions. These are technically called "bullae" (Lat. *bulla*, a boss, or circular metal ornament), and necessarily they were in all cases suspended from the documents, and they bore a design on both obverse and reverse. In the southern countries of Europe, where wax would be affected by the warmth of the climate, it was natural that a harder material should also be used. Hence the leaden bulla was a recognized form of seal during the middle ages in the Peninsula, in southern France, in Italy, and in the Latin East. The best-known series is the papal series of leaden seals which have lent their name to the documents of the papal chancery which they authenticate, popularly known as papal "bulls." The earliest extant example of this series is of the year 746 (see Diplomatic). Leaden seals were also used by the archbishops of Ravenna and other prelates of Italy; also to some extent by officials of a lower rank, and by certain communes. The official seals of the doges of Venice and of Genoa and of other dignitaries of those states were also of lead. The sovereigns of Spain, too, made use of the same material; and in the Byzantine empire leaden bullae seem to have been universally employed, not only by emperors and state officials but also by private persons. Even in the north, metal bullae were also occasionally in use. Certain Carolingian monarchs, probably copying the practice of the papal chancery, issued diplomas authenticated by leaden seals, examples of the reign of Charles the Bald being still extant. The fashion even spread to Britain, as is proved by the existence in the British Museum of a leaden bulla of Cœnwulf of Mercia, A.D. 800–810. In Germany, too, bishops occasionally made use of leaden seals. But, while lead was the ordinary material for the metal seal, a more precious substance was occasionally used. On special occasions golden bullae were issued by the Byzantine emperors, by the popes, by the Carolings, although no actual examples of the last have survived, by the emperors of Germany, and by other sovereigns and rulers. Such specimens as have descended to us show that the golden bulla of the middle ages was usually hollow, being formed of two thin plates of metal stamped with the designs of obverse and reverse, soldered together at the edges and padded with wax or plaster. On rare occasions it was of solid gold. The popes attached golden bullae to their confirmations of the elections of the emperors in the 12th and 13th centuries; and they issued them on such occasions as when Leo X. conferred on Henry VIII. the title of Defender of the Faith, in 1521; on the coronation of Charles V., 1530; on the erection of the archbishopric of Lisbon into a patriarchate in 1716, &c.; and quite recently papal golden bullae have been conferred on royal personages. Comparatively few examples of golden bullae have survived. The value of the metal sufficiently accounts for their scarcity. Some examples are in the British Museum, viz. of Baldwin II. de Courtenay, formerly emperor of Constantinople, attached to a charter of 1269; of Edmund, king of Sicily, son of Henry III. of England; and of the emperor Frederick III., 1452–1493. In the Public Record Office, of Alfonso X. of Castile, ceding Gascony to Edward, son of Henry III. of England, 1254; of Clement VII. confirming to Henry VIII. the title of Defender of the Faith, 1524 (this example being the work of Benvenuto Cellini); and of Francis I. of France, ratifying the treaty with Henry VIII., 1527 (the counterpart with Henry's bulla being in Paris).

AUTHORITIES.—W. de G. Birch, *Catalogue of Seals in the British Museum* (6 vols., 1887–1900); A. Wyon, *The Great Seals of England* (1887); G. Pedrick, *Borough Seals of the Gothic Period* (1904); H. Laing, *Catalogue of Ancient Scottish Seals* (1858, 1866); Douet d'Arcq, *Collection de sceaux* (*Inventaires et documents des archives de l'Empire*) (3 vols., 1863–1868); G. Demay, *Inventaire des sceaux de la Flandre* (2 vols., 1873), *de l'Artois et de la Picardie* (1877), *de la Normandie* (1881); G. Schlumberger, *Sigillographie de l'empire byzantin* (1884); J. von Pflugk-Hartung, *Specimina selecta chartarum pontificum Romanorum* (for papal bullae) (1885–1887); *Catalogue of Engraved Gems in the Dept. of Greek and Roman Antiquities* (British Museum, 1888); F. H. Marshall, *Catalogue of the Finger-Rings, Greek, Etruscan, and Roman, in the British Museum* (1907); E. Babelon, *Histoire de la gravure sur gemmes en France* (1902). There are also numerous papers on seals in *Archaeologia* and in the *Proceedings* of the Society of Antiquaries, and in the archaeological journals. Handbooks on diplomatic devote some attention to seals, *e.g.* A. Giry, *Manuel de diplomatique* (1894); H. Bresslau, *Handbuch der Urkundenlehre für Deutschland und Italien* (1889). (E. M. T.)

SEALSFIELD, CHARLES, the pseudonym of KARL ANTON POSTL (1793–1864), German novelist, who was born on the 3rd of March 1793 at Poppitz near Znaim in Moravia. His schooling completed, he entered the Kreuzherrenorden in Prague, where he became a priest, but in the autumn of 1822 he fled to America, where he assumed the name of Charles Sealsfield. In 1826 he returned to Germany and published a book on America (*Die Vereinigten Staaten von Nordamerika*), which was followed by an outspoken criticism of Austria, written in English (*Austria as it is*, 1828) and published anonymously in London. Meanwhile he had returned to America, where he published his first novel, also in English, *Tokeah, or the White Rose* (1828). He now turned journalist, first in New York and subsequently in Paris and London, as correspondent for various journals. In 1832 he settled in Switzerland, and in 1860 purchased a small estate near Solothurn. Here he died on the 26th of May 1864. His will first revealed the fact that he was the former monk, Postl.

It is as a German novelist that he is best known. His *Tokeah* appeared in German under the title *Der Legitime und die Republikaner* (1838), and was followed by *Der Virey und die Aristokraten* (1835). *Lebensbilder aus beiden Hemisphären* (1835–1837), *Sturm-, Land- und Seebilder* (1838), *Das Kajütenbuch, oder Nationale Charakteristiken* (1842). Sealsfield occupies an important position in the development of the German historical novel at a period when Scott's influence was beginning to wane. He endeavoured to widen the scope of historical fiction, to describe great national and political movements, without forfeiting the sympathy of his readers for the individual characters of the story.

Sealsfield's *Gesammelte Werke* appeared in 18 vols. (1843–1846); his chief novels are also to be obtained in modern reprints. See Kertbény, *Erinnerungen an Sealsfield* (1864); L. Schmolle, *Charles Sealsfield* (1875); L. Hamburger, *Sealsfield-Postl, bisher unveröffentlichte Briefe* (1879); A. B. Faust, *Charles Sealsfield, der Dichter beider Hemisphären* (1896).

SEAMAN, OWEN (1861–), English humorist and author, was educated at Shrewsbury school and Clare College, Cambridge, where he took a first-class in the classical tripos in 1883; in the next year he became a master at Rossall school; and in 1890 he was appointed professor of literature at the Durham College of Science, Newcastle-on-Tyne. He was called to the bar at the Inner Temple in 1897. He was introduced to *Punch* in 1894, with his "Rhyme of the Kipperling," a parody of Rudyard Kipling's "Rhyme of the Three Sealers." He also wrote for *The National Observer* and *The World*. In 1894 he published a volume of parodies which is a classic of its kind, *Horace at Cambridge*, followed by *The Battle of the Bays* (1896), *In Cap and Bells* (1899), *Borrowed Plumes* (1902), *A Harvest of Chaff* (1904). He joined the staff of *Punch* in 1897, and shortly afterwards became assistant-editor, succeeding Sir F. C. Burnand as editor in 1906.

SEAMANSHIP, the general term for the art by which vessels of all classes and sizes are handled in all conditions of weather. It is commonly distinguished from "boatmanship," but the distinction is arbitrary. In ordinary speech it is frequently used as meaning the same thing as navigation (*q.v.*). But the two subjects are essentially different. Navigation is a science based on observation of the sun and stars in their apparent movements, on their bearings to one another, and the earth, and on time. It may be acquired from the study of books, and by a student who has never been in sight of the sea. Seamanship is an art. Its principles may be stated in literary form, but a mastery of it can only be acquired by actual practice on the sea. The art is far older than the science, but because of its practical character its history is much more difficult to trace. Navigation, being one form of the study of mathematics and astronomy, has been written about from the beginning. Seamanship has been practised in perfection by men who were perfectly illiterate for thousands of years before any treatise on it appeared. Seamen have at all times been, as Clarendon noted, a people apart. Till recently they have believed in practice only, and being jealous of, and hostile to, landsmen, have generally endeavoured to preserve their knowledge as an "art and mystery" to be handed down by oral instruction from master to apprentice. Sir Henry Manwayring, whose *Seaman's Dictionary* appeared in 1644, claimed that it was the first treatise on seamanship ever written. After explaining that a writer who had not acquired the art by practice could not expound it, he goes on: "And as for the professed Seamen, they either want ability and dexterity to express themselves, or (as they do generally) will, to instruct any Gentleman. If any will tell me why the vulgar sort of Seamen hate landmen so much, either he or I may give the reason why they are so unwilling to instruct them in their art, whence it is that so many gentlemen go long voyages, and return (in a manner) as ignorant and as unable to do their country service as when they went out." Though the *Seaman's Dictionary* did not appear in print till 1644, it is described on the title-page as having been presented to George Villiers, duke of Buckingham, the lord high admiral of Charles I., who was murdered in 1628. Manwayring's book is therefore probably, if not the first treatise on seamanship written in English, at least as old as its only rival the *Accidences, or the pathway to experience necessary for all young seamen*, published in 1626, by the famous Captain John Smith, of Virginia. On the continent of Europe, as in England, while works on navigation and gunnery were common, treatises on practical seamanship date from the 17th century. The books of Manwayring and Smith are rather glossaries of terms than expositions of principles.

We are therefore left with very few documents from which to learn what the seamanship of antiquity and the middle ages was. But such testimony as we have confirms the conclusion to be drawn from our general knowledge of the construction of their ships, and of the scientific learning of their times. The old seamen were coasters, who acted on the fisherman's adage—

"If you cannot steer by the compass, steer by the land," because they had no choice. War ship and merchant ship alike clung to the coast—or if they ventured out to sea, they did so for a voyage to be counted by the hour, as, for instance, from the south-west of Sicily to the opposite coast of Africa—or they relied on regular trade winds, like the seamen who sailed from the Red Sea to the coast of Malabar going and coming with the monsoons. In spite of exceptions, more apparent perhaps than real, such as the voyages of Irish anchorites to Iceland, and of the Norsemen to that island, and to Greenland, seamanship continued to be the art of the coaster till the close of the middle ages. Chaucer's sailor has hardly lost sight of the coast. Such treatises as were written for seamen were books of pilotage. Examples will be found at the end of the Hakluyt Society's edition of *Hues Tractatus de globis*. The warships, Phoenician, Greek, Roman, Norse, Byzantine and Italian throughout the middle ages, used sails only when not in action. They were rowed in battle, and the mast was lowered, or left on shore. Whenever they could they avoided passing the night at sea. Their galleys were beached or anchored close to the shore and the men landed. We know from Thucydides' narrative of the expedition to Syracuse, that the crews were landed even for their meals; from the chronicle of Ramon de Muntaner, we know that this was also the case with the best Mediterranean squadrons at the end of the 13th century. The Athenians, clinging to the coast, spent two months in going from Athens to Syracuse. Roger di Lauria, the admiral of Aragon, when coming from Sicily in circumstances of great urgency to Catalonia, went round by the coast of Africa and Spain. When under sail the ships of war and of commerce alike had, at the outside, very few sails, and generally only one great course (see SAILS) square and slung by the middle of the yard. It could be trained fore and aft by bowlines, so as to enable the vessel to sail on the wind. Under these restrictions seamanship was necessarily a limited art. From Marco Polo we learn that the seamen of the China Sea and of the Indian Ocean were coasters like their European contemporaries.

Though the art of seamanship is distinct both from the art of shipbuilding and the science of navigation, it has naturally developed with them. The discovery of the mariner's compass, the advance of astronomical knowledge, the invention of the rude early instruments of navigation, the astrolabe, the back staff, the quarter staff, loosened the dependence of the sailor on the shore. Thence came the need for larger ships, and they demanded a more developed rigging (*q.v.*). Modern seamanship begins with the voyage of Columbus. The previous and contemporary voyages of the Portuguese were coasting voyages round Africa. But Columbus struck across the ocean, and within thirty years Sebastian de Elcano, who accompanied Magellan, had sailed round the world.

Many of the seamen wrote treatises for the benefit of their fellow-seamen, but, like the *Brief Compendium* of the Spaniard Martin Cortes, or the *Seaman's Secrets* of the Englishman John Davis, and the so-called "Waggoners" (a corruption of the name of the Dutch author Waggenaer), they were devoted to navigation, or were "rutters," *i.e.* route books and sailing directions. A curious little volume named *Six Dialogues about Sea Service between a High Admiral and a Captain at Sea*, published in London in 1685, and written by Nathaniel Boteler, contains interesting details of the seamanship of the time, but is mainly concerned with naval organization. Such a well-known text-book as *The Mariners' Magazine*, of Captain Samuel Sturmy, reprinted in the 17th century, from which Swift took the sea phrases used in *Gulliver's Travels*, is devoted to "the doctrine of Triangles," "Navigation," "Dialling," "Gunnery," &c. Little attention is paid to pure seamanship, and the author practically confesses that his brother seamen regarded all book knowledge as superfluous if not actually injurious. The art continued in short to be purely empirical till the middle of the 18th century, and it suffered from adherence to rule of thumb and want of study of principles.

The first writer on seamanship who went beyond a glossary, and who looked at the way of a ship on the sea scientifically, was a Frenchman who was not a seaman—Pierre Bouguer, royal hydrographer for the ports of La Croisic and of Havre, member of the Academie Royale des Sciences, and of the British Royal Society. In 1757 he published his book *De la manœuvre des vaisseaux, ou traité de méchanique et de dynamique, dans lequel on réduit à des solutions très simples les problèmes de marine les plus difficiles qui ont pour objet le mouvement du navire.* It is to be observed that Bouguer, even at this late date, notes the lack of treatises on seamanship as compared to the abundance of books on navigation. His treatment of the theme was too scientific to be intelligible by the average seafaring man, but his influence was gradually spread by his pupils, French and foreign. He is quoted as the dominant authority in the edition of *Falconer's Dictionary* issued by Dr Burney in 1830. Bouguer had an English follower—William Hutchinson—a merchant skipper and privateer captain, who was for some time dock-master of Liverpool. In 1777 he printed, probably at Liverpool, *A Treatise on Practical Seamanship; with Hints and Remarks relating thereto: designed to contribute something towards fixing Rules upon Philosophical and Rational Principles; to make ships, and the Management of them; and also Navigation in general more perfect, and consequently less dangerous and destructive to Health, Lives, and Property.* Darcy Lever, whose *Young Officers' Sheet Anchor, or a Key to the leading of Rigging and to Practical Seamanship* appeared in 1835, says that Hutchinson's was then the best treatise which had appeared in English; but it suffers from a defect to which the writer confesses with perfect candour—his want of education. His early training as "cook, cabin boy, and beer drawer for the men" had not prepared him to write clearly. Darcy Lever was the standard authority of the middle of the 19th century, when the art of seamanship in sailing ships had reached its fullest development.

What that art was can now be learnt only by the study of books. Before Darcy Lever's book appeared, steam and the use of metal for the construction of ships had already been introduced. Since 1835 a revolution has been carried out in shipbuilding and seamanship greater than had taken place in all the previous centuries. Even as regards the sailing ship the change from wood and hemp to soft-steel and wire, together with the employment of small engines to help in hauling the yards in the larger vessels, has made a vast difference. As between the steamer and the sailing ship, the difference can hardly be said to be one of degree at all. A comparison of two incidents in the history of the British navy in the 19th century will serve to illustrate the unlikeness better than any generalities. They are the similar perils, and the very dissimilar escapes of the 74-gun ship "Magnificent" on the 16th of December 1812 in the Basque roads on the French coast, and of the cruiser "Calliope" at Apia in Samoa on the 16th of March 1888. Both were in danger of being driven on shore by storms of extreme violence. The "Magnificent" was saved by the resource of her captain, John Hayes, who, by making an unprecedented use of his masts and sails, tacked the ship when within her own breadth of a reef. Everything was done by his order and under his eye (see *Naval Chronicle*, vol. xxix. p. 19). Captain Kane of the "Calliope" steamed to sea by the power of the machines of his ship, which were out of his sight, below the water-line, and were handled by the engineers. The old seamanship was concerned not only with directing the course of the vessel, but with the actual control of the machinery of her motive power, for masts and sails are, after all, machines. The new seamanship directs the course. The motive power is exercised below, out of sight, and by men whose function is radically different from that of the members of the crew who are on deck.

The old seamanship did not retire before the new without a long resistance. Until very recently it continued to be an article of faith both in navies and in the merchant service, that the sailor could only be trained in a sailing vessel. Special vessels were maintained in navies to give the desired training to young seamen and officers. But the navies of the world have found that the brief period which can be spent by young men in a special masted ship did not give an equivalent for the old training. This was inevitable, if only because these ships were also provided with engines, and recourse was had to the machinery at all times of difficulty or peril—when entering and leaving harbour, when rounding awkward headlands or working off a lee-shore. The name of "seamanship" still continues to be applied to the art of handling ships under sail, and has never been made the subject of a treatise in so far as it means the management of a steamer. Perhaps it never can be. The art of constructing and managing machines is really "engineering." It is by "navigation" that the course of a ship is laid. The modern seaman who steers and guides a steamer from the upper deck, or the bridge, must be able to navigate, and must have such a knowledge of engineering as will tell him what he may expect from the machinery and what he must not ask it to do. But he cannot see his engines, and must perforce leave to the engineers the responsibility of handling them and the initiative in the face of sudden peril. There remain to the captain, and the officers who direct the course, the superior command and the functions of the pilot.

In addition to the books already mentioned see R. H. Dana, *Seaman's Manual; containing a treatise on Practical Seamanship* (London, 1841); B. J. Totten, Lieut. U.S.N., *Naval Text-Book* (Boston, 1841); N. Tinmouth, *Inquiry relative to various important points of Seamanship* (London, 1845); A. H. Alston, Lieut. R.N., *Seamanship and its associated duties in the Royal Navy, with a treatise on Nautical Surveying* (London, 1860); R. Maxwell, *Seamanship and Navigation required for the examination of the Local Marine Board* (London, 1869). (D. H.)

SEAMEN, LAWS RELATING TO. In most legal systems legislation has interfered to protect the seaman from the consequences of that imprudence which is generally supposed to be one of his distinguishing characteristics. In the United Kingdom legislation has dealt with the interests of seamen with unusual fulness of detail, proving the care bestowed by a maritime power upon those to whom its commercial success is so largely due. How far this legislation has had the efficiency which was expected may be doubtful.

For legislative purposes seamen may be divided into three classes—seamen in the royal navy, merchant seamen, and fishermen.

Seamen in the Royal Navy.—It is still lawful to impress men for the naval service (see IMPRESSMENT), subject to certain exemptions (13 Geo. II. c. 17, 1740). Among persons exempt are seamen in the merchant service. In cases of emergency officers and men of the coastguard and revenue cruisers, seamen riggers and pensioners may be required to serve in the navy (Naval Volunteers Act 1853). There appears to be no other instance (now that balloting for the militia is suspended) where a subject may be forced into the service of the crown against his will. The navy is, however, at the present day wholly recruited by voluntary enlistment (see the Naval Enlistment Acts, 1835 to 1884). Special advantages are afforded by the Merchant Shipping Act 1894 to merchant seamen enlisting in the navy. They are enabled to leave their ship without punishment or forfeiture in order to join the naval service. The discipline of the navy is, unlike that of the army, for which an annual act is necessary, regulated by a permanent act of parliament, that now in force being the Naval Discipline Act 1866. In addition to numerous hospitals and infirmaries in the United Kingdom and abroad, the great charity of Greenwich Hospital is a mode of provision for old and disabled seamen in the navy. At present such seamen are out-pensioners only; the hospital has been for some years used as the Royal Naval College for officer students. The enactments of the Merchant Shipping Act 1854 as to savings banks are extended to seamen in the navy by the Merchant Shipping Act 1894, s. 148. Enlistment without the licence of the crown in the naval service of a foreign state at war with another foreign state that is at peace with the United Kingdom is an offence punishable under the Foreign Enlistment Act 1870. Any person buying from a seaman or enticing a seaman to sell government property is liable to penalties under the Seamen's Clothing Act 1869 (see NAVY).

Merchant Seamen.—Most of the acts dealing with this subject, commencing with 8 Eliz. c. 13, were repealed in 1854 and have since been consolidated and extended by the Merchant Shipping Acts 1894 and 1906,[1] the act of 1894 being the longest act on the statute roll. The main part of the legislation affecting seamen in the merchant service occurs in the second part of the act of 1894 and the fourth part of the act of 1906. The act of 1894 defines a seaman to be "every person (except masters, pilots, and apprentices duly indentured and registered) employed or engaged in any capacity on board any ship" (s. 742).

Engagement and discharge of Seamen.

The act of 1894 is largely a re-enactment of the previous acts of 1854, 1862 and 1876. The law as to the engagement and discharge of seamen has not been altered. These must take place before a superintendent only when the employment is on a foreign-going ship. If the ship is a home-trade ship, the signing on and discharge take place before a superintendent only if the master so desire. But if the signing on does not take place before a superintendent, the master must cause the agreement to be read and explained to the seaman, and the seaman must sign it in the presence of a witness; copies of all such agreements must be transmitted to the Board of Trade. A copy of every agreement with the crew must be posted in some part of the ship accessible to the crew. In any British possession abroad other than that in which the ship is registered, a seaman must be engaged before a superintendent or officer of customs, and at any port abroad where there is a British consular officer, before such officer. Before a seaman can be discharged at any place abroad, the master must obtain the sanction, endorsed on the agreement with the crew, of the like officials or, in their absence, of merchants there resident. A seaman discharged in a foreign country is entitled to be provided with adequate employment on some other British ship bound to the port in His Majesty's dominions at which he was originally shipped, or to a port in the United Kingdom agreed to by the seaman, or to be furnished with the means of returning to such port or of a passage home. The consul is charged with the duty of attending to the seamen's interests. It is a misdemeanour wrongfully to force a seaman on shore, or otherwise wrongfully leave him in any place before the completion of the voyage for which he was engaged, or the return of the ship to the United Kingdom. The only persons by whom seamen may be engaged or supplied in the United Kingdom are a superintendent, the master, the mate, a servant bona fide in the constant employ of the owner, and any person holding a licence from the Board of Trade.

At common law there was no obligation of the owner to provide a seaworthy ship, but by the act of 1876, now superseded by the act of 1894, part v., every person who sends or attempts to send, or is party to sending or attempting to send, a British ship to sea in such unseaworthy state that the life of any person is likely to be thereby endangered is guilty of a misdemeanour, unless he proves that he used all reasonable means to ensure her being sent to sea in a seaworthy state, or that her going to sea in such unseaworthy state was under the circumstances reasonable and justifiable. A master knowingly taking a British ship to sea in such unseaworthy state that the life of any person is likely to be thereby endangered is guilty of a misdemeanour. In every contract of service between the owner and the master or any seaman, and in every indenture of sea apprenticeship, an obligation is implied that the owner, master and agent shall use all reasonable means to ensure the seaworthiness of the ship. By the act of 1906 many of the provisions as to seaworthiness was applied to foreign ships, and they may be detained in a proper case. A return of certain particulars, such as lists of crews and of distressed seamen sent home from abroad, reports on discharge, births and deaths at sea, must be made to the registrar-general of shipping and seamen, an officer of the Board of Trade. The seaman is privileged in the matter of wills (see WILL), and is exempt from serving in the militia (42 Geo. III. c. 90, s. 43). Assaults upon seamen with intent to prevent their working at their occupation are punishable summarily by the Offences against the Person Act 1861, s. 40. There are special enactments in favour of Lascars and foreign seamen on British ships, *e.g.* s. 125 of the act of 1894.

Duties of Masters and Seamen.

In addition to this legislation directly in his interest, the seaman is indirectly protected by the provisions of the Merchant Shipping Acts requiring the possession of certificates of competence by ships' officers, the periodical survey of ships by the Board of Trade, and the enactments against deck cargoes and overloading, as well as by other acts, such as the Chain Cables and Anchors Acts, enforcing a minimum strength of cables and anchors, and the Passenger Acts, under which a proper supply of life-boats and life-buoys must be provided. The duties of the seaman appear to be to obey the master in all lawful matters relating to the navigation of the ship and to resist enemies, to encourage him in which he may become entitled to prize money under 22 and 23 Car. II c. 11 (see PRIZE). Any services beyond these would fall under the head of salvage service and be recompensed accordingly. There are certain offences for which the seaman is liable to be summarily punished under the act of 1894. They comprise desertion, neglect or refusal to join his ship or absence without leave, quitting the ship without leave before she is placed in security, wilful disobedience to a lawful command, either on one occasion or continued, assault upon a master or mate, combining to disobey lawful commands or to neglect duty, or to impede the navigation of the ship or the progress of the voyage, wilful damage to the ship, or embezzlement of or wilful damage to her stores or cargo and smuggling. The punishment varies from forfeiture of all or part of his wages to twelve weeks' imprisonment. Any offence committed on board is entered in the official log-book. Personation or forgery of a certificate of service or discharge is an offence punishable by summary jurisdiction by the Seamen's and Soldiers' False Characters Act 1906.

A master, seaman or apprentice, who by wilful breach of duty, or by neglect of duty, or by reason of drunkenness, does any act tending to the immediate loss, destruction or serious damage of the ship, or to immediately endanger the life or limb of any person belonging to or on board of the ship, or who by wilful breach of duty, &c., refuses or omits to do any lawful act proper and requisite to be done by him for preserving the ship from immediate loss, destruction, &c., is guilty of a misdemeanour. A seaman is also punishable at common law for piracy and by statute for piracy and offences against the Slave Trade Acts. A riotous assembly of seamen to prevent the loading or unloading of any ship or to prevent others from working is an offence under 33 Geo. III. c. 67. Deserters from Portuguese ships are punishable by 12 and 13 Vict. c. 25, and from any foreign ship by 15 and 16 Vict. c. 26, by virtue of conventions with Portugal and other foreign powers. The rating of seamen is now regulated by the Merchant Shipping Act 1894, s. 126. By that act a seaman is not entitled to the rating of "A.B." unless he has served four years before the mast, or three years or more in a registered decked fishing vessel and one year at sea in a trading vessel.

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[1] There are numerous Orders in Council dealing with seamen, especially as to the registration of fishing boats and the lights to be shown by them.

The act of 1894 enables contributions to seamen's refuges and hospitals to be charged upon the mercantile marine fund. There appears, however, to be no grant in support of seamen's hospitals out of any public funds. The principal seamen's hospital is that at Greenwich, established in 1821 and incorporated by 3 and 4 Will. IV. c. 9 under the name of "The Seaman's Hospital Society." Up to 1870 this hospital occupied the old "Dreadnought" at Greenwich, but in that year it obtained the infirmary of Greenwich Hospital from the Admiralty at a nominal rent, in return for which a certain number of beds is to be at the disposal of the Admiralty. This hospital with others is supported by voluntary contributions, including those of many foreign governments. At one time there was an enforced contribution of sixpence a month from the pay of masters and seamen towards the funds of Greenwich Hospital, levied under the powers of some of the Greenwich Hospital Acts. The payment of these contributions enabled them to receive annuities from the funds of the hospital. These "Greenwich Hospital sixpences," however, became the source of very considerable irritation and were discontinued. In their place a purely voluntary seamen's provident fund was established, its object being to persuade seamen to subscribe sixpence a month towards the seamen's hospital.

Remedies for wages.

The remedies of the seaman for wages are an ordinary action in the king's bench division or plaint in a county court, an action *in rem* or *in personam* in the admiralty division of the High Court (in Scotland in the Court of Session), a colonial court of admiralty, or a county court having admiralty jurisdiction, or summary proceedings before justices, naval courts, or superintendents of mercantile marine offices. The master has now the same remedies as the seaman for his wages, under which are included all disbursements made on account of the ship. At common law he had only a personal action against the owner. He has the additional advantage of being able to ensure his wages, which a seaman cannot do. A county court having admiralty jurisdiction may entertain claims for wages where the amount claimed does not exceed £150 [County Courts (Admiralty Jurisdiction) Act 1868, s. 3]. Wages cannot be attached. They may be forfeited or reduced by desertion, smuggling, and other kinds of misconduct. In *O'Neil* v. *Armstrong*, 1895, 2 K.B. 418, it was held by the court of appeal that a seaman, though he had not completed the voyage, could recover his full wages where war breaking out added a risk to the employment which was not in his contemplation at the time of his engagement. In actions in all courts of admiralty jurisdiction the seaman has a maritime lien on the ship and freight, ranking next after claims for salvage and damage. The amount recoverable summarily before justices is limited to £50. Orders may be enforced by distress of the ship and her tackle. Proceedings must be taken within six months. A naval court on a foreign station may determine questions as to wages without limit of amount.[1] As a rule a seaman cannot sue abroad for wages due for a voyage to terminate in the United Kingdom. The superintendent of a mercantile marine office has power to decide any question whatever between a master or owner and any of his crew which both parties in writing agree to submit to him. These summary remedies are all preserved by the act of 1894. The act further provides that, where a question as to wages is raised before a superintendent, if the amount in question does not exceed £5, the superintendent may adjudicate finally, unless he is of opinion that a court of law ought to decide it. The Merchant Seamen Act 1880, by a section not repealed by the act of 1894, and the Workmen's Compensation Act 1906, put seamen on a level with other workmen. A county court or court of summary jurisdiction (the latter limited to claims not exceeding £10) may under the act of 1875 determine all disputes between an employer and workman arising out of their relation as such. The jurisdiction of courts of summary jurisdiction is protected by the enactment of the act of 1894, that no proceeding for the recovery of wages under £50 is to be instituted in a superior court unless either the owner of the ship is bankrupt, or the ship is under arrest or sold by the authority of such court, or the justices refer the case to such court, or neither owner nor master is or resides within 20 m. of the place where the seaman is put ashore. Claims upon allotment notes may be brought in all county courts and before justices without any limit as to amount. In Scotland the sheriff court has concurrent jurisdiction with justices in claims for wages and upon allotment notes. The representatives of a deceased seaman may claim damages for his death in cases within the Fatal Accidents Acts 1846 and 1864. It has been held that the action lies where the deceased is a foreign seaman on a foreign ship (*Davidsson* v. *Hill*, 1901, 2 K.B. 606).

Where a seaman is discharged before a superintendent in the United Kingdom, his wages must be paid through or in the presence of the superintendent, and in the case of home-trade ships may be so paid if the master or owner so desire. The master must in every case deliver either to the superintendent or to the seaman a full account, in a form approved by the Board of Trade, of the wages and of all deductions therefrom; such deductions will only be allowed if they have been entered by the master during the voyage in a book kept for that purpose, together with a statement of the matters in respect of which they are made. Where a seaman is left abroad on the ground of his unfitness or inability to proceed on the voyage, the account of wages must be delivered to the superintendent, chief officer of customs, consular officer, or merchants, from whom the master obtains the certificate without which he may not leave the seaman behind. To protect seamen from crimps, advance notes, or documents authorizing or promising the future payment of money on account of a seaman's wages conditionally on his going to sea from any port of the United Kingdom, and made before those wages had been earned, were from 1880 to 1889 wholly void. No money paid in respect of any such document could be deducted from a seaman's wages. Since 1889 this restriction has been removed to the extent of one month's wages, provided that the agreement with the crew contains a stipulation for such advance, but this does not extend to cases where the seaman is going to sea from any port not in the United Kingdom. In such cases there is no limitation upon the right to make any agreement for advances or to make advances to any amount.

As under the former law, the scale of provisions as amended by the act of 1906 must be entered in the agreement with the crew, and compensation made for short or bad provisions, and means are provided whereby the crew can raise complaints. In addition, in the case of ships trading or going from any port in the United Kingdom through the Suez Canal or round the Cape of Good Hope or Cape Horn, the provisions and water are put under inspection by the Board of Trade, and if they are deficient, the ship may be detained until the defects are remedied. By the act of 1906 a certificated cook must be provided for foreign-bound ships. If a seaman receives hurt or injury in the service of the ship, the expense of medical attendance and maintenance, together with the cost of bringing him home, is to be borne by the owner of the ship, and cannot be deducted from wages.

Load line.

The safety of the crew is aimed at by provisions which are designed to prevent overloading and undermanning, and generally to prevent ships from being sent to sea in an unseaworthy state. The stringency of these provisions has been much increased. Life-saving appliances, according to a scale and rules prescribed by the Board of Trade, must be carried by every British ship. Except where the ship is under 80 tons register, employed solely in the coasting trade, or is employed solely in fishing, or is a pleasure yacht, the position of each deck above water must be marked by conspicuous lines, and the maximum load line in salt water, to which it shall be lawful to load the ship, must be marked at such level as may be approved by the Board of Trade below the deck line, and in accordance with tables and regulations prescribed by the Board of Trade. It is this load line which is commonly known as the Plimsoll mark. It is an offence to load a ship so as to submerge the load line, and a ship so loaded may be detained as unsafe. Dangerous goods, *e.g.* explosives, must not be shipped or carried without being distinctly marked as such. Timber must not be carried on deck in the winter months. In the carriage of grain cargoes, rules prescribed by the Board of Trade to prevent shifting must be complied with. The officers of the Board of Trade (subject to appeal to a court of survey from an order of final detention) have power to detain a ship which is, by reason of the defective condition of the hull, equipments or machinery, or of undermanning, overloading or improper loading, unfit to proceed to sea without serious danger to human life. Provision is made for the investigation of complaints by seamen that a ship is unfit to proceed to sea. The Public Health Act 1904 enables regulations to be made for carrying into effect international conventions as to insanitary vessels and conveyance of infection by vessels. By s. 11 of the Workmen's Compensation Act 1906, a ship may be detained by order of a court of record on allegation that a foreign owner is liable to pay compensation under the act.

Manning of British ships.

The manning of British merchant ships has received much consideration, but has hitherto been little affected by statute law. The effect of the acts is thus given in the report, issued in 1896, by a Board of Trade committee on the manning of merchant ships: "Since the final repeal of the Navigation Laws, which required that the master and three-fourths of the crew of every British ship should be British subjects, and reserved the coasting trade entirely to

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[1] In the absence of appeal the order of a naval court is conclusive. *Hutton* v. *Ras S.S. Co.*, 1907, 1 K.B. 834. By s. 68 of the act of 1906 an appeal lies to the High Court of Justice.

British ships and British seamen, the whole world has been open as a recruiting ground to British shipowners, who have not been hampered in their selection by any restriction as to colour, language, qualification, age or strength. Except with regard to certificates, which must be held by masters, officers, and engineers in certain cases, and which, moreover, may be obtained by men of any nationality, there is at present practically no bar to the employment of any person of any nationality in any capacity whatsoever on board any British ship." The Merchant Shipping Act 1897 gave power to the Board of Trade to detain ships unseaworthy by reason of undermanning, but prescribed no rules for determining when a ship is to be deemed to be undermanned. Apart from that act the law does not interfere with the number of qualifications of the crew. Nearly one-fourth the seamen employed on British ships are foreigners. Another fourth are Lascars. The figures in 1904, as given by Mr Lloyd-George in introducing the bill of 1906 in the House of Commons, were 176,000 British subjects, 39,000 aliens, 42,000 Lascars. Aliens serving on British ships may by a regulation of the home secretary (29th of April 1904) be naturalized without fee. The act of 1906 (s. 12) provided that after the 31st of December 1907 no seaman may be shipped who does not possess a sufficient knowledge of the English language to understand necessary orders, with an exception in favour of Lascars and inhabitants of a British protectorate. Pilotage certificates are not to be granted unless to British masters and mates (s. 73).

Certificates of masters, mates and engineers.

Certificates of competency as masters, mates, and engineers are granted by the Board of Trade. Such certificates are for the following grades, viz. master or first mate, or second mate, or only mate of a foreign-going ship, master or mate of a home-trade passenger ship, first or second class engineer. By virtue of Orders in Council under section 102 of the act of 1894, certificates granted in many of the British colonies have the same force as if granted by the Board of Trade. The following are the requirements of the act as to the officers to be carried by ships:—*Masters*: A properly certificated master must be carried by every foreign-going ship and every home-trade passenger ship, whatever their tonnage. *Mates*: A mate, with the certificate of the grade of first or only mate, or master, must, in addition to the certificated master, be carried by every foreign-going ship of 100 tons or upwards, unless more than one mate is carried, in which case the first and second mates must have valid certificates appropriate to their several stations on such ship or of a higher grade; and a mate, with a certificate of the grade of first or only mate or master, must, in addition to the certificated master, be carried by every home-trade passenger ship of 100 tons or upwards. *Engineers*: Every foreign-going steamship of 100 nominal horse power or upwards must have two certificated engineers—the first possessing a first-class engineer's certificate, and the second possessing a second-class engineer's certificate, or a certificate of the higher grade. Every other foreign-going steamship, and every sea-going home-trade passenger steamship, is required to carry as the first or only engineer an engineer having a second-class certificate, or a certificate of the higher grade. Vessels in the home trade (*i.e.* United Kingdom and continent of Europe between the Elbe and Brest) are not required to carry certificated masters or officers unless they are passenger ships of 100 tons or upwards; and vessels in the foreign trade of less than 100 tons are not required to carry any mate.

Apprenticeship.

In 1898 a slight attempt was made to encourage shipowners to carry apprentices. The Merchant Shipping Act of that year, which dealt with light dues, provided that "on proof to the satisfaction of the Board of Trade that a British ship has during any financial year carried, in accordance with the scale and regulations to be made by the Board of Trade, with the concurrence of the Treasury, boys between the ages of 15 and 19, there shall be paid to the owner of the ship, out of moneys to be provided by parliament, an allowance not exceeding one-fifth of the light dues paid during that year in respect of that ship. Provided that no such payment shall be made in respect of anybody unless he has enrolled himself in the Royal Naval Reserve, and entered into an obligation to present himself for service when called upon in accordance with rules to be issued by the Admiralty." This enactment was to continue until 1905 and does not seem to have been renewed. Some more efficient means will have to be devised if apprenticeship to the sea service is to be revived; at present it has practically ceased to exist, except in the case of boys who intend to become officers.

British ships not registered in the U.K.

Some only of the provisions of the acts apply to ships belonging to the general lighthouse authorities and pleasure yachts. But, with these exceptions, the whole of Part II. (Masters and Seamen) applies, unless the contract or subject-matter requires a different application, to all sea-going ships registered in the United Kingdom. Where a ship is a British ship, but not registered in the United Kingdom, the provisions of Part II. apply as follows:

The provisions relating to the shipping and discharge of seamen in the United Kingdom and to volunteering into the navy apply in every case. The provisions relating to lists of the crew and to the property of deceased seamen and apprentices apply where the crew are discharged or the final port of destination of the ship is in the United Kingdom. All the provisions apply where the ship is employed in trading or going between any port in the United Kingdom and any port not situate in the British possession or country in which the ship is registered. The provisions relating to the rights of seamen in respect of wages, to the shipping and discharge of seamen in ports abroad, to leaving seamen abroad, and the relief of seamen in distress in ports abroad, to the provisions, health, and accommodation of seamen, to the power of seamen to make complaints, to the protection of seamen from imposition, and to discipline, apply in every case except where the ship is within the jurisdiction of the government of the British possession in which the ship is registered.

Fishermen.—The regulations respecting fishermen are contained chiefly in the Sea Fisheries Acts 1868 and 1883, and in the Merchant Shipping Act 1894, part iv. The Sea Fisheries Act of 1868 constituted a registry of fishing-boats, and that of 1883 gave powers of enforcing the provisions of the acts to sea fishery officers. The Merchant Shipping (Fishing-Boats) Act 1883 was passed in consequence of the occurrence of some cases of barbarous treatment of boys by the skippers of North Sea trawlers. It is now incorporated in the act of 1894.

This act provides, *inter alia*, that indentures of apprenticeship are to be in a certain form and entered into before a superintendent of a mercantile marine office, that no boy under thirteen is to be employed in sea-fishery, that agreements with seamen on a fishing-boat are to contain the same particulars as those with merchant seamen, that running agreements may be made in the case of short voyages, that reports of the names of the crew are to be sent to a superintendent of a mercantile marine office, and that accounts of wages and certificates of discharge are to be given to seamen. No fishing-boat is to go to sea without a duly certified skipper. Provision is also made for special reports of cases of death, injury, ill-treatment or punishment of any of the crew, and for inquiry into the cause of such death, &c. Disputes between skippers or owners and seamen are to be determined at request of any of the parties concerned by a superintendent. Fishermen are exempt from Trinity House dues. There are numerous police provisions contained in various acts of parliament dealing with the breach of fishery regulations. These provisions act as an indirect protection to honest fishermen in their employment. The rights of British fishermen in foreign waters and foreign fishermen in British waters are in many cases regulated by treaty, generally confirmed in the United Kingdom by act of parliament. A royal fund for widows and orphans of fishermen has been formed, the nucleus of the fund being part of the profits of the Fisheries Exhibition held in London in 1883. Special provisions as to fishermen in Scotland are contained in s. 389 of the act of 1894 and s. 83 of the act of 1906.

India and Colonies.—In India and in most British colonies there are laws affecting merchant seamen. In some cases such legislation is identical with the imperial act, but in most there are differences of more or less importance, and the colonial statutes should be consulted.

United States.—The law of the United States is in general accordance with that of England. The law relating to seamen in the navy will be found in the articles for the government of the navy (*Revised Statutes*, s. 1624). Legislation in the interests of merchant seamen dates from 1790. A list of the crew must be delivered to a collector of customs. The shipping articles are the same as those in use in the United Kingdom. For vessels in the coasting trade they are, with certain exceptions, to be in writing or in print. They must in the case of foreign-bound ships be signed before a shipping commissioner appointed by the circuit court or a collector of customs, or (if entered into abroad) a consular officer, where practicable, and must be acknowledged by his signature in a prescribed form. One-third of a seaman's wages earned up to that time is due at every port where the ship unlades and delivers her cargo before the voyage is ended. They must be fully paid in gold or its equivalent within twenty days of the discharge of the cargo. Advance notes can be made only in favour of the seaman himself or his wife or mother. There is a summary remedy for wages before a district court, a justice of the peace, or a commissioner of a district court. A shipping commissioner may act as arbitrator by written consent of the parties. Seaworthiness is an implied condition of the hiring. There may be an examination of the ship on the complaint of the mate and a majority of the crew. The expenses of an unnecessary investigation are a charge upon the wages of those who complain. A seaman may not leave his ship without the consent of the master. For foreign-bound voyages a medicine-chest and antiscorbutics must be carried, also 60 gallons of water, 100 ℔ of salted meat, and 100 ℔ of wholesome bread for every person on board, and for every seaman at least one suit of woollen clothing, and fuel for the fire of the seaman's room. An assessment of forty cents per month per seaman is levied on every vessel arriving from a foreign port and on every registered coasting vessel in aid of the fund for the relief of sick and disabled seamen. In the navy a deduction of twenty cents per month from each man's pay is made for the same purpose. The offences and punishments are similar to those in the United Kingdom. There is also the additional offence of wearing a sheath knife on shipboard. As in England, consuls are required to provide for the passage home of destitute seamen (see Revised Statutes, §§ 4554–4591). A seamen's fund was constituted by the act of the 16th of July 1798, amended by subsequent legislation.

Continental European Countries.—The commercial codes contain provisions of a more or less detailed character. For France see §§ 250–272; Italy, §§ 343–380; Netherlands, §§ 394–452; Germany, Wendt, *Maritime Legislation* (1888). These enactments are in general accordance with British legislation. In Germany the law goes a little further than in the United Kingdom in enacting that copies of the part of the law affecting him must be handed to each seaman on his engagement at a seamen's office.

AUTHORITIES.—The works on merchant shippings, such as those of Abbott, Boyd, Kay, Maclachlan, Maude and Pollock, Temperley, and on admiralty law and practice, such as those of Roscoe and Williams and Bruce. Also E. S. Roscoe *Modern Legislation for Seamen and for Safety at Sea* (1885). (J. W.)

History of the term.

SEA-POWER. This term is used to indicate two distinct, though cognate, things. The affinity of these two and the indiscriminate manner in which the term has been applied to each have tended to obscure its real significance. The obscurity has been deepened by the frequency with which the term has been confounded with the old phrase, "Sovereignty of the sea," and the still current expression, "Command of the sea" (*vide* SEA, COMMAND OF). A discussion—etymological, or even archaeological in character—of the term must be undertaken as an introduction to the explanation of its now generally accepted meaning. It is one of those compound words in which a Teutonic and a Latin (or Romance) element are combined, and which are easily formed and become widely current when the sea is concerned. Of such are "sea-coast," "sea-forces" (the "land- and sea-forces" used to be a common designation of what we now call the "Army and Navy"); "sea-service," "sea-serpent" and "sea-officer" (now superseded by "naval officer"). The term in one form is as old as the 15th century. Edward III., in commemoration of the naval victory of Sluys, coined gold "nobles" which bore on one side his effigy "crowned, standing in a large ship, holding in one hand a sword and in the other a shield." An anonymous poet, who wrote in the reign of Henry VI., says of this coin:—

> "For four things our noble showeth to me,
> King, ship and sword, and *power of the sea.*"

Even in its present form the term is not of very recent date. Grote (*Hist. of Greece*, v. 67, published in 1849, but with preface dated 1848) speaks of "the conversion of Athens from a land-power into a sea-power." In a lecture published in 1883, but probably delivered earlier, the late Sir J. R. Seeley says that "commerce was swept out of the Mediterranean by the besom of the Turkish sea-power" (*Expansion of England*, p. 89). The term also occurred in the 9th edition of this *Encyclopaedia*, vol. xviii. p. 574, in the article "PERSIA," where we are told that Themistocles was "the founder of the Attic sea-power." The sense in which the term is used differs in these extracts. In the first it means what we generally call a "naval power"—that is to say, a state having a considerable navy in contradistinction to a "military power," a state with a considerable army but only a relatively small navy. In this sense there are many old uses of the phrase. In the last two extracts it means all the elements of the naval strength of the state referred to; and this is the meaning that is now generally, and is likely to be exclusively, attached to the term owing to the brilliant way in which it has been elucidated by Captain A. T. Mahan of the United States Navy.

The double use of the term is common in German, though in that language both parts of the compound now in use are Teutonic. One instance out of many may be cited from the historian Adolf Holm (*Griechische Geschichte*, Berlin, 1889). He says (ii. p. 37) that Athens, being in possession of a good naval port, could become "*eine bedeutende Seemacht*," *i.e.* an important naval power. He also says (ii. p. 91) that Gelon of Syracuse, besides a large army (*Heer*), had "*eine bedeutende Seemacht*," meaning a considerable navy. The term, in the first of the two senses, is old in German, as appears from the following, extracted from Zedler's *Grosses Universal Lexicon*, vol. xxxvi. (Leipzig and Halle, 1743); "Seemachten, Seepotenzen; Latin, *summae potestates mari potentes*." "Seepotenzen" is probably quite obsolete now. It is interesting as showing that German no more abhors Teuto-Latin or Teuto-Romance compounds than English. We may note, as a proof of the indeterminate meaning of the expression until his own epoch-marking works had appeared, that Mahan himself in his earliest book, *Influence of Sea-power on History* (1890), used it in both senses. He says (p. 35), "The Spanish Netherlands ceased to be a sea-power." He alludes (p. 42) to the development of a nation as a "sea-power," and (p. 43) to the inferiority of the Confederate States "as a sea-power." Also (p. 225) he remarks of the war of the Spanish Succession that "before it England was one of the sea-powers, after it she was *the* sea-power without any second." In all these passages, as appears from the use of the indefinite article, what is meant is a naval power, or a state in possession of a strong navy. The other meaning of the term forms the general subject of Mahan's writings. In his earlier works Mahan writes "sea power" as two words; but in a published letter of the 19th February 1897 he joins them with a hyphen, and defends this formation of the term and the sense in which he uses it. We may regard him as the virtual inventor of the term in its more diffused meaning, for—even if it had been employed by earlier writers in that sense—it is he beyond all question who has given it general currency. He has made it impossible for any one to treat of sea-power without frequent reference to his writings and conclusions.

Appreciation of sea-power by the ancients.

There is something more than mere literary interest in the fact that the term in another language was used more than two thousand years ago. Before Mahan no historian—not even one of those who specially devoted themselves to the narration of naval occurrences—had evinced a more correct appreciation of the general principles of naval warfare than Thucydides. He alludes several times to the importance of getting command of the sea. Great Britain would have been saved some disasters and been less often in peril had British writers—taken as guides by the public—possessed the same grasp of the true principles of defence as Thucydides exhibited. One passage in his history is worth quoting. Brief as it is, it shows that on the subject of sea-power he was a predecessor of Mahan. In a speech in favour of prosecuting the war, which he puts in the mouth of Pericles, these words occur: *οἱ μὲν γὰρ οὐχ ἕξουσιν ἄλλην ἀντιλαβεῖν ἀμαχεί, ἡμῖν δέ ἐστι γῆ πολλὴ καὶ ἐν νήσοις καὶ κατ' ἤπειρον· μέγα γὰρ τὸ τῆς θαλάσσης κράτος.* The last part of this extract, though often translated "command of the sea," or "dominion of the sea," really has the wider meaning of sea-power, the "power of the sea" of the old English poet above quoted. This wider meaning should be attached to certain passages in Herodotus (iii. 122 in two places; v. 83), which have been generally interpreted "commanding the sea," or by the mere titular and honorific "having the dominion of the sea." One editor of Herodotus, Ch. F. Baehr, did, however, see exactly what was meant, for, with reference to the allusion to Polycrates, he says, *classe maximum valuit.* This is perhaps as exact a definition of sea-power as could be given in a sentence.

Can only be explained historically.

It is, however, impossible to give a definition which would be at the same time succinct and satisfactory. To say that "sea-power" means the sum total of the various elements that go to make up the naval strength of a state would be in reality to beg the question. Mahan lays down the "principal conditions affecting the sea-power of nations," but he does not attempt to give a concise definition of it. Yet no one who has studied his works will find it difficult to understand what it indicates. Our present task is, within the necessarily restricted limits of an article in an encyclopaedia, to put readers in possession of the means of doing this. The best, indeed—as Mahan has shown us—the only effective way of attaining this object is to treat the matter historically. Whatever date we may agree to assign to the formation of the term itself, the idea—as we have seen—is as old as history. It is not intended to give a condensed history of sea-power, but rather an analysis of the idea and what it contains, illustrating this analysis with examples from history ancient and modern. It is important to know that it is not something which originated in the middle of the 17th century, and having seriously affected history in the 18th, ceased to have weight till Captain Mahan appeared to comment on it in the last decade of the 19th. With a few masterly touches Mahan, in his brief allusion to the second Punic war, has illustrated its importance in the struggle between Rome and Carthage. What has to be shown is that the principles which he has laid down in that case, and in cases much more modern, are true and have been true always and everywhere. Until this is perceived there is much history which cannot be understood, and yet it is essential to the welfare of Great Britain as a maritime power that she should understand it thoroughly. Her failure to understand it has more than once brought her, if not to the verge of destruction, at any rate within a short distance of serious disaster.

Early manifestations of sea-power.

The high antiquity of decisive naval campaigns is among the most interesting features of international conflicts. Nothwithstanding the much greater frequency of land wars, the course of history has been profoundly changed more often by contests on the water. That this has not received the notice it deserved is true, and Mahan tells us why. "Historians generally," he says, "have been unfamiliar with the conditions of the sea, having as to it neither special interest nor special knowledge; and the profound determining influence of maritime strength on great issues has consequently been overlooked." Moralizing on that which might have been is admittedly a sterile process; but it is sometimes necessary to point, if only by way of illustration, to a possible alternative. As in modern times the fate of India and the fate of North America were determined by sea-power, so also at a very remote epoch sea-power decided whether or not Hellenic colonization was to take root in, and Hellenic culture to dominate, central and northern Italy as it dominated southern Italy, where traces of it are extant to this day. A moment's consideration will enable us to see how different the history of the world would have been had a Hellenized city grown and prospered on the Seven Hills. Before the Tarquins were driven out of Rome a Phocaean fleet was encountered (537 B.C.) off Corsica by a combined force of Etruscans and Phoenicians, and was so handled that the Phocaeans abandoned the island and settled on the coast of Lucania (Mommsen, *Hist. Rome*, English trans. i. p. 153). The enterprise of their navigators had built up for the Phoenician cities and their great off-shoot Carthage, a sea-power which enabled them to gain the practical sovereignty of the sea to the west of Sardinia and Sicily. The control of these waters was the object of prolonged and memorable struggles, for on it—as the result showed—depended the empire of the world. From very remote times the consolidation and expansion, from within outwards, of great continental states have had serious consequences for mankind when they were accompanied by the acquisition of a coast-line and the absorption of a maritime population. We shall find that the process loses none of its importance in recent years. "The ancient empires," says the historian of Greece, Ernst Curtius, "as long as no foreign elements had intruded into them, had an invincible horror of the water." When the condition, which Curtius notices in parentheses, arose the "horror" disappeared. There is something highly significant in the uniformity of the efforts of Assyria, Egypt, Babylon and Persia to get possession of the maritime resources of Phoenicia. Our own immediate posterity will perhaps have to reckon with the results of similar efforts in our own day. It is this which gives a living interest to even the very ancient history of sea-power, and makes the study of it of great practical importance to us now. We shall see, as we go on, how the phenomena connected with it reappear with striking regularity in successive periods. Looked at in this light the great conflicts of former ages are full of useful, indeed necessary, instruction.

Wars of the Greeks and Persians.

In the first and greatest of the contests waged by the nations of the East against Europe—the Persian wars—sea-power was the governing factor. Until Persia had expanded to the shores of the Levant the European Greeks had little to fear from the ambition of the great king. The conquest of Egypt by Cambyses had shown how formidable that ambition could be when supported by an efficient navy. With the aid of the naval forces of the Phoenician cities the Persian invasion of Greece was rendered comparatively easy. It was the naval contingents from Phoenicia which crushed the Ionian revolt. The expedition of Mardonius, and still more that of Datis and Artaphernes, had indicated the danger threatening Greece when the master of a great army was likewise the master of a great navy. Their defeat at Marathon was not likely to, and as a matter of fact did not, discourage the Persians from further attempts at aggression. As the advance of Cambyses into Egypt had been flanked by a fleet, so also was that of Xerxes into Greece. By the good fortune sometimes vouchsafed to a people, which, owing to its obstinate opposition to, or neglect of, a wise policy, scarcely deserves it, there appeared at Athens an influential citizen who understood all that was meant by the term sea-power. Themistocles saw more clearly than any of his contemporaries that, to enable Athens to play a leading part in the Hellenic world, she needed above all things a strong navy. "He had already in his eye the battle-field of the future." He felt sure that the Persians would come back, and come with such forces that resistance in the open field would be out of the question. One scene of action remained—the sea. Persuaded by him the Athenians increased their navy, so that of the 271 vessels comprising the Greek fleet at Artemisium, 147 had been provided by Athens, which also sent a large reinforcement after the first action. Though no one has ever surpassed Themistocles in the faculty of correctly estimating the importance of sea-power, it was understood by Xerxes as clearly as by him that the issue of the war depended upon naval operations. The arrangements made under the Persian monarch's direction, and his very personal movements, show that this was his view. He felt, and probably expressed the feeling, exactly as—in the war of American Independence—Washington did in the words, "Whatever efforts are made by the land armies, the navy must have the casting vote in the present contest." The decisive event was the naval action of Salamis. To have made certain of success, the Persians should have first obtained a command of the Aegean, as complete for all practical purposes as the French and English had of the sea generally in the war against Russia of 1854–56. The Persian sea-power was not equal to the task. The fleet of the great king was numerically stronger than that of the Greek allies; but it has been proved many times that naval efficiency does not depend on numerical superiority alone. The choice sections of the Persian fleet were the contingents of the Ionians and Phoenicians. The former were half-hearted or disaffected; while the latter were, at best, not superior in skill, experience, and valour to the Greek sailors. At Salamis Greece was saved not only from the ambition and vengeance of Xerxes, but also and for many centuries from oppression by an Oriental conqueror. Persia did not succeed against the Greeks, not because she had no sea-power, but because her sea-power, artificially built up, was inferior to that which was a natural element of the vitality of her foes. Ionia was lost and Greece in the end enslaved, because the quarrels of Greeks with Greeks led to the ruin of their naval states.

Peloponnesian war.

The Peloponnesian was largely a naval war. The confidence of the Athenians in their sea-power had a great deal to do with its outbreak. The immediate occasion of the hostilities, which in time involved so many states, was the opportunity offered by the conflict between Corinth and Corcyra of increasing the sea-power of Athens. Hitherto the Athenian naval predominance had been virtually confined to the Aegean Sea. The Corcyraean envoy, who pleaded for help at Athens, dwelt upon the advantage to be derived by the

Athenians from alliance with a naval state occupying an important situation "with respect to the western regions towards which the views of the Athenians had for some time been directed" (Thirlwall, *Hist. Greece,* iii. 96). It was the "weapon of her sea-power," to adopt Mahan's phrase, that enabled Athens to maintain the great conflict in which she was engaged. Repeated invasions of her territory, the ravages of disease among her people and the rising disaffection of her allies had been more than made up for by her predominance on the water. The scale of the subsequent Syracusan expedition showed how vigorous Athens still was down to the interruption of the war by the peace of Nicias. The great expedition just mentioned overtaxed her strength. Its failure brought about the ruin of the state. It was held by contemporaries, and has been held in our own day, that the Athenian defeat at Syracuse was due to the omission of the government at home to keep the force in Sicily properly supplied and reinforced. This explanation of failure is given in all ages, and should always be suspected. The friends of unsuccessful generals and admirals always offer it, being sure of the support of the political opponents of the administration. After the despatch of the supporting expedition under Demosthenes and Eurymedon no further great reinforcement, as Nicias admitted, was possible. The weakness of Athens was in the character of the men who swayed the popular assemblies and held high commands. A people which remembered the administration of a Pericles, and yet allowed a Cleon or an Alcibiades to direct its naval and military policy, courted defeat. Nicias, notwithstanding the possession of high qualities, lacked the supreme virtue of a commander—firm resolution. He dared not face the obloquy consequent on withdrawal from an enterprise on which the popular hopes had been fixed; and therefore he allowed a reverse to be converted into an overwhelming disaster. "The complete ruin of Athens had appeared, both to her enemies and to herself, impending and irreparable. But so astonishing, so rapid and so energetic had been her rally, that (a year after Syracuse) she was found again carrying on a terrible struggle" (Grote, *Hist. Greece,* v. p. 354). Nevertheless her sea-power had indeed been ruined at Syracuse. Now she could wage war only "with impaired resources and on a purely defensive system." Even before Arginusae, it was seen that "superiority of nautical skill had passed to the Peloponnesians and their allies" (*ibid.* p. 503).

Struggle between Rome and Carthage.

The great, occasionally interrupted, and prolonged contest between Rome and Carthage was a sustained effort on the part of one to gain and of the other to keep the control of the western Mediterranean. So completely had that control been exercised by Carthage, that she had anticipated the Spanish commercial policy in America. The Romans were precluded by treaties from trading with the Carthaginian territories in Hispania, Africa and Sardinia. Rome, as Mommsen tells us, "was from the first a maritime city and, in the period of its vigour, never was so foolish or so untrue to its ancient traditions as wholly to neglect its war marine and to desire to be a mere continental power." It may be that it was lust of wealth rather than lust of dominion that first promoted a trial of strength with Carthage. The vision of universal empire could hardly as yet have formed itself in the imagination of a single Roman. The area of Phoenician maritime commerce was vast enough both to excite jealousy and to offer vulnerable points to the cupidity of rivals. It is probable that the modern estimate of the sea-power of Carthage is much exaggerated. It was great by comparison, and of course overwhelmingly great when there were none but insignificant competitors to challenge it. Mommsen holds that, in the 4th and 5th centuries after the foundation of Rome, "the two main competitors for the dominion of the Western waters" were Carthage and Syracuse. "Carthage," he says, "had the preponderance, and Syracuse sank more and more into a second-rate naval power. The maritime importance of the Etruscans was wholly gone. . . . Rome itself was not exempt from the same fate; its own waters were likewise commanded by foreign fleets." The Romans were for a long time too much occupied at home to take much interest in Mediterranean matters. The position of the Carthaginians in the western basin of the Mediterranean was very like that of the Portuguese long afterwards in India. The latter kept within reach of the sea; "nor did their rule ever extend a day's march from their ships" (R. S. Whiteway, *Rise of the Portuguese Power in India.* Westminster, 1889, p. 12). "The Carthaginians in Spain," says Mommsen, "made no effort to acquire the interior from the warlike native nations; they were content with the possession of the mines and of stations for traffic and for shell and other fisheries." Allowance being made for the numbers of the classes engaged in administration, commerce and supervision, it is nearly certain that Carthage could not furnish the crews required by both a great war-navy and a great mercantile marine. No one is surprised on finding that the land-forces of Carthage were composed largely of alien mercenaries. We have several examples from which we can infer a parallel, if not an identical, condition of her maritime resources. How, then, was the great Carthaginian carrying-trade provided for? The experience of more than one country will enable us to answer this question. The ocean trade of those off-shoots or dependencies of the United Kingdom, viz. the United States, Australasia and India, is largely or chiefly conducted by shipping of the "old country." So that of Carthage was largely conducted by old Phoenicians. These may have obtained a "Carthaginian Register," or the contemporary equivalent; but they could not all have been purely Carthaginian or Liby-Phoenician. This must have been the case even more with the war-navy. British India for a considerable time possessed a real, and indeed highly efficient navy; but it was officered entirely and manned almost entirely by men from the old country. Moreover, it was small. The wealth of India would have sufficed to furnish a larger material element; but, as the country could not supply the *personnel,* it would have been absurd to speak of the sea-power of India apart from that of England. As soon as the Romans chose to make the most of their natural resources the maritime predominance of Carthage was doomed. The artificial basis of the latter's sea-power would not enable it to hold out against serious and persistent assaults. Unless this is perceived, it is impossible to understand the story of the Punic Wars. Judged by every visible sign of strength, Carthage, the richer, the more enterprising, ethnically the more predominant among her neighbours, and apparently the more nautical, seemed sure to win in the great struggle with Rome which, by the conditions of the case, was to be waged largely on the water. Yet those who had watched the struggles of the Punic city with the Sicilian Greeks, and especially that with Agathocles, must have seen reason to cherish doubts concerning her naval strength. It was an anticipation of the case of Spain in the age of Philip II. As the great Elizabethan seamen discerned the defects of the Spanish naval establishment, so men at Rome discerned those of the Carthaginian. Dates in connexion with this are of great significance. A comprehensive measure, with the object of "rescuing their marine from its condition of impotence" was taken by the Romans in the year 267 B.C. Four *quaestores classici*—in modern naval English we may perhaps call them port-admirals—were nominated, and one was stationed at each of four ports. The objects of the Roman Senate, so Mommsen tells us, were very obvious. They were "to recover their independence by sea, to cut off the maritime communications of Tarentum, to close the Adriatic against fleets coming from Epirus, and to emancipate themselves from Carthaginian supremacy." Four years afterwards the first Punic War began. It was, and had to be, largely a naval contest. The Romans waged it with varying fortune, but in the end triumphed by means of their sea-power. The victory of Catulus over the Carthaginian fleet off the Aegadian Islands decided the war and left to the Romans the possession of Sicily and the power of possessing themselves of Sardinia and Corsica. It would be an interesting and perhaps not barren investigation to inquire to what extent the decline of the mother states of Phoenicia, consequent on the campaigns of Alexander the Great, had helped to enfeeble the naval efficiency of the Carthaginian defences. One thing was certain. Carthage had now met with a rival endowed with natural maritime resources greater than her own. That rival also contained citizens who understood the true importance of sea-power. "With a statesmanlike sagacity from which succeeding generations might have drawn a lesson, the leading men of the Roman Commonwealth perceived that all their coast fortifications and coast garrisons would prove inadequate unless the war-marine of the state were again placed on a footing that should command respect" (Mommsen, i. 427). It is a gloomy reflection that the leading men of the United Kingdom could not see this in 1860. A thorough comprehension of the events of the first Punic War enables us to solve what, until Mahan wrote, had been one of the standing enigmas of history, viz. Hannibal's invasion of Italy by land instead of by sea in the second Punic War. Mahan's masterly examination of this question has set at rest all doubts as to the reason of Hannibal's action (*Influence on Hist.* pp. 13-21). The naval predominance in the western basin of the Mediterranean acquired by Rome had never been lost. Though modern historians, even those belonging to a maritime country, may have failed to perceive it, the Carthaginians knew well enough that the Romans were too strong for them on the sea. Though other forces co-operated to bring about the defeat of Carthage in the second Punic War, the Roman navy, as Mahan demonstrates, was the most important. As a navy, he tells us in words like those already quoted, "acts on an element strange to most writers, as its members have been from time immemorial a strange race apart, without prophets of their own, neither themselves nor their calling understood, its immense determining influence on the history of that era, and consequently upon the history of the world, has been overlooked."

Expansion of Roman dominion furthered by sea-power.

The attainment of all but universal dominion by Rome was now only a question of time. "The annihilation of the Carthaginian fleet had made the Romans masters of the sea" (Schmitz, *Hist. Rome*, p. 256). A lodgment had already been gained in Illyricum, and countries farther east were before long to be reduced to submission. A glance at the map will show that to effect this the command of the eastern basin of the Mediterranean, like that of the western, must be secured by the Romans. The old historic navies of the Greek and Phoenician states had declined. One considerable naval force there was which, though it could not have prevented, was strong enough to have delayed the Roman progress eastwards. This force belonged to Rhodes, which in the years immediately following the close of the second Punic War reached its highest point as a naval power (C. Torr, *Rhodes in Ancient Times*, p. 40). Far from trying to obstruct the advance of the Romans the Rhodian fleet helped it. Hannibal, in his exile, saw the necessity of being strong on the sea if the East was to be saved from the grasp of his hereditary foe; but the resources of Antiochus, even with the mighty co-operation of Hannibal, were insufficient. In a later and more often quoted struggle between East and West—that which was decided at Actium—sea-power was again seen to "have the casting vote." When the whole of the Mediterranean coasts became part of a single state the importance of the navy was naturally diminished; but in the struggles within the declining empire it rose again at times. The contest of the Vandal Genseric with Majorian and the African expedition of Belisarius—not to mention others—were largely influenced by the naval operations (Gibbon, *Decline and Fall*, chaps. xxxvi., xli.).

Extension westward of Mahommedan conquest.

A decisive event, the Mahommedan conquest of northern Africa from Egypt westwards, is unintelligible until it is seen how great a part sea-power played in effecting it. Purely land expeditions, or expeditions but slightly supported from the sea, had ended in failure. The emperor at Constantinople still had at his disposal a fleet capable of keeping open the communications with his African province. It took the Saracens half a century (A.D. 647–698) to win "their way along the coast of Africa as far as the Pillars of Hercules" (Hallam, *Mid. Ages*, chap. vi.); and, as Gibbon tells us, it was not till the Commander of the Faithful had prepared a great expedition, this time by sea as well as by land, that the Saracenic dominion was definitely established. It has been generally assumed that the Arabian conquerors who, within a few years of his death, spread the faith of Mahomet over vast regions, belonged to an essentially non-maritime race; and little or no stress has been laid on the extent to which they relied on naval support in prosecuting their conquests. In parts of Arabia, however, maritime enterprise was far from non-existent; and when the Mahommedan empire had extended outwards from Mecca and Medina till it embraced the coasts of various seas, the consequences to the neighbouring states were as serious as the rule above mentioned would lead us to expect that they would be. "With the conquest of Syria and Egypt a long stretch of sea-board had come into the Saracenic power; and the creation and maintenance of a navy for the protection of the maritime ports as well as for meeting the enemy became a matter of vital importance. Great attention was paid to the manning and equipment of the fleet" (Amir Ali, Syed, *Short Hist. Saracens*, p. 442). At first the fleet was manned by sailors drawn from the Phoenician towns, where nautical energy was not yet quite extinct; and later the crews were recruited from Syria, Egypt and the coasts of Asia Minor. Ships were built at most of the Syrian and Egyptian ports, and "also at Obolla and Bushire on the Persian Gulf," whilst the mercantile marine and maritime trade were fostered and encouraged. The sea-power thus created was largely artificial. It drooped—as in similar cases—when the special encouragement was withdrawn. "In the days of Arabian energy," says Hallam, "Constantinople was twice, in 668 and 716, attacked by great naval armaments." The same authority believes that the abandonment of such maritime enterprises by the Saracens may be attributed to the removal of the capital from Damascus to Bagdad. The removal indicated a lessened interest in the affairs of the Mediterranean Sea, which was now left by the administration far behind. "The Greeks in their turn determined to dispute the command of the sea," with the result that in the middle of the 10th century their empire was far more secure from its enemies than under the first successors of Heraclius." Not only was the fall of the empire, by a rational reliance on sea-power, postponed for centuries, but also much that had been lost was regained. "At the close of the 10th century the emperors of Constantinople possessed the best and greatest part" of southern Italy, part of Sicily, the whole of what is now called the Balkan Peninsula, Asia Minor, with some parts of Syria and Armenia (Hallam, chap. vi.; Gibbon, chap. li.).

Sea-power and the Crusades.

Neglect of sea-power by those who can be reached by sea brings its own punishment. Whether neglected or not, if it is an artificial creation it is nearly sure to disappoint those who wield it when it encounters a rival power of natural growth. How was it possible for the Crusaders, in their various expeditions, to achieve even the transient success that occasionally crowned their efforts? How did the Christian kingdom of Jerusalem contrive to exist for more than three-quarters of a century? Why did the Crusades more and more become maritime expeditions? The answer to these questions is to be found in the decline of the Mahommedan naval defences and the rising enterprise of the seafaring people of the West. Venetians, Pisans and Genoese transported crusading forces, kept open the communications of the places held by the Christians and hampered the operations of the infidels. Even the great Saladin failed to discern the important alteration of conditions. This is evident when we look at the efforts of the Christians to regain the lost kingdom. Saladin "forgot that the safety of Phoenicia lay in immunity from naval incursions, and that no victory on land could ensure him against an influx from beyond the sea" (Amir Ali, Syed, pp. 359-360). Not only were the Crusaders helped by the fleets of the maritime republics of Italy, they also received reinforcements by sea from western Europe and England, on the "arrival of *Malik Ankiltar* [Richard Cœur de Lion] with twenty shiploads of fighting men and munitions of war."

Participation in the Crusades was not a solitary proof of the

Sea-power of Italian republics.

importance of the naval states of Italy. That they had been able to act effectively in the Levant, may have been in some measure due to the weakening of the Mohammedans by the disintegration of the Seljukian power, the movements of the Moguls and the confusion consequent on the rise of the Ottomans. However that may have been, the naval strength of those Italian states was great absolutely as well as relatively. Sismondi, speaking of Venice, Pisa and Genoa, towards the end of the 11th century, says "these three cities had more vessels on the Mediterranean than the whole of Christendom besides" (*Ital. Republics*, English ed. p. 29). Dealing with a period two centuries later, he declares it "difficult to comprehend how two simple cities could put to sea such prodigious fleets as those of Pisa and Genoa." The difficulty disappears when we have Mahan's explanation. The maritime republics of Italy—like Athens and Rhodes in ancient, Catalonia in medieval and England and the Netherlands in more modern times—were "peculiarly well fitted, by situation and resources, for the control of the sea by both war and commerce." As far as the western Mediterranean was concerned, Genoa and Pisa had given early proofs of their maritime energy, and fixed themselves in succession to the Saracens, in the Balearic Isles, Sardinia and Corsica. Sea-power was the Themistoclean instrument with which they made a small state into a great one.

A fertile source of dispute between states is the acquisition of territory beyond sea. As others have done before and since, the maritime republics of Italy quarrelled over this. Sea-power seemed, like Saturn, to devour its own children. In 1284, in a great sea-fight off Meloria, the Pisans were defeated by the Genoese with heavy loss, which, as Sismondi states, "ruined the maritime power" of the former. From that time Genoa, transferring her activity to the Levant, became the rival of Venice. The fleets of the two cities in 1298 met near Cyprus in an encounter, said to be accidental, that began "a terrible war which for seven years stained the Mediterranean with blood and consumed immense wealth." In the next century the two republics, "irritated by commercial quarrels"—like the English and Dutch afterwards—were again at war in the Levant. Sometimes one side, sometimes the other was victorious; but the contest was exhausting to both, and especially to Venice. Within a quarter of a century they were at war again. Hostilities lasted till the Genoese met with the crushing defeat of Chioggia. "From this time," says Hallam, "Genoa never commanded the ocean with such navies as before; her commerce gradually went into decay; and the 15th century, the most splendid in the annals of Venice, is till recent times the most ignominious in those of Genoa." Venice seemed now to have no naval rival, and had no fear that any one could forbid the ceremony in which the Doge, standing in the bows of the *Bucentaur*, cast a ring into the Adriatic with the words, "*Desponsamus te, mare, in signum veri perpetuique dominii.*" The result of the combats at Chioggia, though fatal to it in the long run, did not at once destroy the naval importance of Genoa. A remarkable characteristic of sea-power is the delusive manner in which it appears to revive after a great defeat. The Persian navy occasionally made a brave show afterwards; but in reality it had received at Salamis a mortal wound. Athens seemed strong enough on the sea after the catastrophe of Syracuse; but, as already stated, her naval power had been given there a check from which it never completely recovered. The navy of Carthage had had similar experience; and, in later ages, the power of the Turks was broken at Lepanto and that of Spain at Gravelines notwithstanding the deceptive appearances afterwards. Venice was soon confronted on the sea by a new rival. The Turkish naval historian, Haji Khalifeh (*Maritime wars of the Turks*, Mitchell's trans. p. 12), tells us that, "After the taking of Constantinople, when they [the Ottomans] spread their conquests over land and sea, it became necessary to build ships and make armaments in order to subdue the fortresses and castles on the Rumelian and Anatolian shores, and in the islands of the Mediterranean." Mahommed II. established a great naval arsenal at Constantinople. In 1470 the Turks, "for the first time, equipped a fleet, with which they drove that of the Venetians out of the Grecian seas" (Sismondi, p. 256). The Turkish wars of Venice lasted a long time. In that which ended in 1503 the decline of the Venetian naval power was obvious. "The Mussulmans had made progress in naval discipline; The Venetian fleet could no longer cope with theirs." Henceforward it was as an allied contingent of other navies that that of Venice was regarded as important. Dyer (*Hist. Europe*, i. p. 85) quotes a striking passage from a letter of Aeneas Sylvius, afterwards Pope Pius II., in which the writer affirms that, "if the Venetians are defeated, Christendom will not control the sea any longer; for neither the Catalans nor the Genoese, without the Venetians, are equal to the Turks."

Sea-power and progress of the Turks.

The last-named people, indeed, exemplified once more the rule that a military state expanding to the sea and absorbing older maritime populations becomes a serious menace to its neighbours. Even in the 15th century Mahommed II. had made an attack on Southern Italy; but his sea-power was not equal to the undertaking. Suleymān the Magnificent directed the Ottoman forces towards the west. With admirable strategic insight he conquered Rhodes, and thus freed himself from the danger of a hostile force on his flank. "The centenary of the conquest of Constantinople was past, and the Turk had developed a great naval power besides annexing Egypt and Syria" (Seeley, *British Policy*, i. 143). The Turkish fleets, under such leaders as Khair-ad-din Barbarossa), Piale and Dragut, seemed to command the Mediterranean, including its western basin; but the repulse at Malta in 1565 was a serious check, and the defeat at Lepanto in 1571 virtually put an end to the prospect of Turkish maritime dominion. The predominance of Portugal in the Indian Ocean in the early part of the 16th century had seriously diminished the Ottoman resources. The wealth derived from the trade in that ocean, the Persian Gulf and the Red Sea had supplied the Mahommedans with the sinews of war, and had enabled them to contend with success against the Christians in Europe. "The main artery had been cut when the Portuguese took up the challenge of the Mahommedan merchants of Calicut, and swept their ships from the ocean" (Whiteway, p. 2). The sea-power of Portugal wisely employed had exercised a great, though unperceived influence. Though enfeebled and diminishing, the Turkish navy was still able to act with some effect in the 17th century. Nevertheless, the sea-power of the Turks ceased to count as a factor of importance in the relations between great states.

Spanish sea-power, Catalonia, &c.

In the meantime the state which had a leading share in winning the victory of Lepanto had been growing up in the West. Before the union of its crown with that of Castile and the formation of the Spanish monarchy, Aragon had been expanding till it reached the sea. It was united with Catalonia in the 12th century, and it conquered Valencia in the 13th. Its long line of coast opened the way to an extensive and flourishing commerce; and an enterprising navy indemnified the nation for the scantiness of its territory at home by the important foreign conquests of Sardinia, Sicily, Naples and the Balearic Isles. Among the maritime states of the Mediterranean Catalonia had been conspicuous. She was to the Iberian Peninsula much what Phoenicia had been to Syria. The Catalan navy had disputed the empire of the Mediterranean with the fleets of Pisa and Genoa. The incorporation of Catalonia with Aragon added greatly to the strength of that kingdom. The Aragonese kings were wise enough to understand and liberal enough to foster the maritime interests of their new possessions (Prescott, *Ferdinand and Isabella*, Introd. sects. i., ii.). Their French and Italian neighbours were to feel, before long, the effect of this policy; and, when the Spanish monarchy had been consolidated, it was felt not only by them, but by others also. The more Spanish dominion was extended in Italy the more were the naval resources at the command of Spain augmented. Genoa became "Spain's water-gate to Italy. . . . Henceforth the Spanish crown found in the Dorias its admirals;

their squadron was permanently hired to the kings of Spain." Spanish supremacy at sea was established at the expense of France (G. W. Prothero, in M. Hume's *Spain 1479–1788*, p. 65). The acquisition of a vast domain in the New World had greatly developed the maritime activity of Castile, and Spain was as formidable on the ocean as in the Mediterranean. After Portugal had been annexed the naval forces of that country were added to the Spanish, and the great port of Lisbon became available as a place of equipment and as an additional base of operations for oceanic campaigns. The fusion of Spain and Portugal, says Seeley, "produced a single State of unlimited maritime dominion. . . . Henceforth the whole New World belonged exclusively to Spain." The story of the tremendous catastrophe—the defeat of the Armada—by which the decline of this dominion was heralded is well known. It is memorable, not only because of the harm it did to Spain, but also because it revealed the rise of another claimant to maritime pre-eminence —the English nation. The effects of the catastrophe were not at once visible. Spain still continued to look like the greatest power in the world; and, though the English seamen were seen to be something better than adventurous pirates—a character suggested by some of their contemporary exploits—few could have comprehended that they were engaged in building up what was to be a sea-power greater than any known to history.

Early manifestations of British sea-power.

They were carrying forward, not beginning, the building of this. "England," says Sir J. K. Laughton, "had always believed in her naval power, had always claimed the sovereignty of the Narrow Seas; and more than two hundred years before Elizabeth came to the throne, Edward III. had testified to his sense of its importance by ordering a gold coinage bearing a device showing the armed strength and sovereignty of England based on the sea" (*Armada*, Introd.). It is impossible to make intelligible the course of the many wars which the English waged with the French in the middle ages unless the true naval position of the former is rightly appreciated. Why were Créçy, Poitiers, Agincourt—not to mention other combats—fought, not on English, but on continental soil? Why, during the so-called "Hundred Years' War," was England in reality the invader and not the invaded? We of the present generation are at last aware of the significance of naval defence, and know that, if properly utilized, it is the best security against invasion that a sea-surrounded state can enjoy. It is not, however, commonly remembered that the same condition of security existed and was properly valued in medieval times. The battle of Sluys in 1340 rendered invasion of England as impracticable as did that of La Hogue in 1692, that of Quibéron Bay in 1759 and that of Trafalgar in 1805; and it permitted, as did those battles, the transport of troops to the continent to support Great Britain's allies in wars which, had she not been strong at sea, would have been waged on the soil of her country. Her early continental wars, therefore, are proofs of the long-established efficiency of her naval defences. Notwithstanding the greater attention now paid to naval affairs, it is doubtful if Great Britain even yet recognizes the extent to which her security depends upon a good fleet as fully as her ancestors did seven centuries ago. The narrative of pre-Elizabethan campaigns is interesting merely as a story; and, when told—as, for instance, D. Hannay has told it in the introductory chapters of his *Short History of the Royal Navy*—it will be found instructive and worthy of careful study at the present day. Each of the principal events in England's early naval campaigns may be taken as an illustration of the idea conveyed by the term "sea-power," and of the accuracy with which its meaning was apprehended at the time. To take a very early case, we may cite the defeat of Eustace the Monk (see DOVER: *Battle of*) by Hubert de Burgh in 1217. Reinforcements and supplies had been collected at Calais for conveyance to the army of Prince Louis of France and the rebel barons who had been defeated at Lincoln. The reinforcements tried to cross the Channel under the escort of a fleet commanded by Eustace. Hubert de Burgh, who had stoutly held Dover for King John, and was faithful to the young Henry III., heard of the enemy's movements. "If these people land," said he, "England is lost; let us therefore boldly meet them." He reasoned in almost the same words as Raleigh about four centuries afterwards, and undoubtedly "had grasped the true principles of the defence of England." He put to sea and defeated his opponent. The fleet on which Prince Louis and the rebellious barons had counted was destroyed; and with it their enterprise. "No more admirably planned, no more fruitful battle has been fought by Englishmen on water" (Hannay, p. 7). As introductory to a long series of naval operations undertaken with a like object it has deserved detailed mention here.

Extending sphere of sea-power.

The 16th century was marked by a decided advance in both the development and the application of sea-power. Previously its operation had been confined to the Mediterranean or to coast waters outside it. Spanish or Basque seamen—by their proceedings in the English Channel—had proved the practicability of, rather than been engaged in, ocean warfare. The English, who withstood them, were accustomed to seas so rough, to seasons so uncertain and to weather so boisterous, that the ocean had few terrors for them. All that was wanting was a sufficient inducement to seek distant fields of action and a development of the naval art that would permit them to be reached. The discovery of the New World supplied the first; and consequently increased length of voyages and of absence from the coast led to the second. The world had been moving onwards in other things as well as in navigation. Intercommunication was becoming more and more frequent. What was done by one people was soon known to others. It is a mistake to suppose that, because the English had been behindhand in the exploration of remote regions, they were wanting in maritime enterprise. The career of the Cabots would of itself suffice to render such a supposition doubtful. The English had two good reasons for postponing voyages to and settlement in far-off lands. They had their hands full nearer home; and they thoroughly, and as it were by instinct, understood the conditions on which permanent expansion must rest. They wanted to make sure of the line of communications first. To effect this a sea-going marine of both war and commerce, and, for further expansion, stations on the way were essential. The chart of the world furnishes evidence of the wisdom and the thoroughness of their procedure. Taught by the experience of the Spaniards and the Portuguese, when unimpeded by the political circumstances of the time, and provided with suitable equipment, the English displayed their energy in distant seas. It now became simply a question of the efficiency of sea-power. If efficiency was not a quality of the English sea-power, then their efforts were bound to fail; and, more than this, the position of their country, challenging as it did what was believed to be the greatest of maritime states, would have been altogether precarious. The principal expeditions now undertaken were distinguished by a characteristic peculiar to the people, and not to be found in connexion with the exploring or colonizing activity of most other great nations even down to our own time. They were really unofficial speculations in which, if the government took part at all, it was for the sake of the profit expected, and almost, if not exactly, like any private adventurer. The participation of the government, nevertheless, had an aspect which it is worth while to note. It conveyed a hint—and quite consciously—to all whom it might concern that the speculations were "under-written" by the whole sea-power of England. The forces of more than one state had been used to protect its maritime trade from the assaults of enemies in the Mediterranean or in the Narrow Seas. They had been used to ward off invasion and to keep open communications across not very extensive areas of water. In the 16th century they were first relied upon to support distant commerce, whether carried on in a peaceful fashion or under aggressive forms. This, naturally enough, led to collisions. The contention waxed hot, and was virtually decided when the Armada shaped course to the northward after the fight off Gravelines.

The expeditions against the Spanish Indies and, still more, those against Philip II.'s peninsular territory had helped to define

Limitations of sea-power.

the limitations of sea-power. It became evident, and it was made still more evident in the next century, that for a great country to be strong it must not rely upon a navy alone. It must also have an adequate and properly organized mobile army. Notwithstanding the number of times that this lesson has been repeated Great Britain has been slow to learn it. It is doubtful if she has learned it even yet. English seamen in all ages seem to have mastered it fully; for they have always demanded—at any rate for upwards of three centuries—that expeditions against foreign territory oversea should be accompanied by a proper number of land-troops. On the other hand, the necessity of organizing the army of a maritime insular state and of training it with the object of rendering effective aid in operations of the kind in question, has rarely been perceived and acted upon by others. The result has been a long series of inglorious or disastrous affairs, like the West Indies voyage of 1595–1596, the Cadiz expedition of 1625 and that to the Île de Ré of 1627. Additions might be made to the list. The failures of joint expeditions have often been explained by alleging differences or quarrels between the naval and the military commanders. This way of explaining them, however, is nothing but the inveterate critical method of the streets by which cause is taken for effect and effect for cause. The differences and quarrels arose, no doubt; but they generally sprang out of the recriminations consequent on, not producing, the want of success. Another manifestation of the way in which sea-power works was first observed in the 17th century. It suggested the adoption of, and furnished the instrument for, carrying out a distinct maritime policy. What was practically a standing navy had come into existence. As regards England this phenomenon was now of respectable age. Long voyages and cruises of several ships in company had been frequent during the latter half of the 16th century and the early part of the 17th. Even the grandfathers of the men who sailed with Blake and Penn in 1652 could not have known a time when ships had never crossed the ocean, and squadrons kept together for months had never cruised. However imperfect it may have been, a system of provisioning ships and supplying them with stores, and of preserving discipline among their crews, had been developed, and had proved fairly satisfactory. The parliament and the Protector in turn found it necessary to keep a considerable number of ships in commission, and make them cruise and operate in company. It was not till well on in the reign of Queen Victoria that the man-of-war's man was finally differentiated from the merchant seaman; but, two centuries before, some of the distinctive marks of the former had already begun to be noticeable. There were seamen in the time of the Commonwealth who rarely, perhaps some who never, served afloat except in a man-of-war. Some of the interesting naval families which were settled at Portsmouth and the eastern ports, and which—from father to son—helped to recruit the ranks of bluejackets till a date later than that of the launch of the first ironclad, could carry back their professional genealogy to at least the days of Charles II., when, in all probability, it did not first start. Though landsmen continued even after the Civil War to be given naval appointments, and though a permanent corps, through the ranks of which every one must pass, had not been formally established, a body of real naval officers—men who could handle their ships, supervise the working of the armament and exercise military command—had been formed. A navy, accordingly, was now a weapon of undoubted keenness, capable of very effective use by any one who knew how to wield it. Having tasted the sweets of intercourse with the Indies, whether in the occupation of Portugal or of Spain, both English and Dutch were desirous of getting a larger share of them. English maritime commerce had increased and needed naval protection. If England was to maintain the international position to which, as no one denied, she was entitled, that commerce must be permitted to expand. The minds of men in western Europe, moreover, were set upon obtaining for their country territories in the New World, the amenities of which were now known. From the reign of James I. the Dutch had shown great jealousy of English maritime enterprise. Where it was possible, as in the East Indian Archipelago, they had destroyed it. Their naval resources were great enough to let them hold English shipping at their mercy, unless a grand effort were made to protect it. The Dutch conducted the carrying trade of most of the world, and the monopoly of this they were resolved to keep, while the English were resolved to share in it. The exclusion of the English from every trade-route, except such as ran by their own coast or crossed the Narrow Seas, seemed a by no means impossible contingency. There seemed also to be but one way of preventing it, viz. by war. The supposed unfriendliness of the Dutch, or at least of an important party amongst them, to the regicide government in England helped to force the conflict. The Navigation Act of 1651 was passed and regarded as a covert declaration of hostilities. So the first Dutch war began. It established England's claim to compete for the position of a great maritime commercial power.

Appearance of standing navies.

Sea-power and territorial expansion in the "New World."

Sea-power of the Dutch.

The rise of the sea-power of the Dutch, and the magnitude which it attained in a short time, and in the most adverse circumstances, have no parallel in history. The case of Athens was different, because the Athenian power had not so much been unconsciously developed out of a great maritime trade, as based on a military marine deliberately and persistently fostered during many years. Thirlwall believes that it was Solon who "laid the foundations of the Attic navy" (*Hist. Greece*, ii. p. 52), century before Salamis. The great achievement of Themistocles was to convince his fellow-citizens that their navy ought to be increased. Perhaps the nearest parallel with the power of the Dutch was presented by that of Rhodes, which rested largely on a carrying trade. The Rhodian undertakings, however, were by comparison small and restricted in extent. Motley declares of the Seven United Provinces that they "commanded the ocean" (*United Netherlands*, ii. 132), and that it would be difficult to exaggerate the naval power of the young Commonwealth. Even in the days of Spain's greatness English seamen positively declined to admit that she was stronger than England on the sea; and the story of the Armada justified their view. The first two Dutch wars were, therefore, contests between the two foremost naval states of the world for what was primarily a maritime object. The identity of the cause of the first and of the second war will be discerned by any one who compares what has been said about the circumstances leading to the former, with Monk's remark as to the latter. He said that the English wanted a larger share of the trade enjoyed by the Dutch. It was quite in accordance with the spirit of the age that the Dutch should try to prevent, by force, this want from being satisfied. Anything like free and open competition was repugnant to the general feeling. The highroad to both individual wealth and national prosperity was believed to lie in securing a monopoly. Merchants or manufacturers who called for the abolition of monopolies granted to particular courtiers and favourites had not the smallest intention, on gaining their object, of throwing open to the enterprise of all what had been monopolized. It was to be kept for the exclusive benefit of some privileged or chartered company. It was the same in greater affairs. As Mahan says, "To secure to one's own people a disproportionate share of the benefits of sea commerce every effort was made to exclude others, either by the peaceful legislative methods of monopoly or prohibitory regulations, or, when these failed, by direct violence." The apparent wealth of Spain was believed to be due to the rigorous manner in which foreigners were excluded from trading with the Spanish oversea territories. The skill and enterprise of the Dutch having enabled them to force themselves into this trade, they were determined to keep it to themselves. The Dutch East India Company was a powerful body, and largely dictated the maritime policy of the country. We have thus come to an interesting point in the historical consideration of sea-power. The Elizabethan conflict with Spain had practically settled the question whether or not the

Effect on ocean trade.

expanding nations were to be allowed to extend their activities to territories in the New World. The first two Dutch Wars were to settle the question whether or not the ocean trade of the world was to be open to any people qualified to engage in it. We can see how largely these were maritime questions, how much depended on the solution found for them, and how plain it was that they must be settled by naval means.

Mahan's survey.

Mahan's great survey of sea-power opens in 1660, midway between the first and second Dutch Wars. " The sailing-ship era, with its distinctive features, " he tells us, " had fairly begun. " The art of war by sea, in its more important details, had been settled by the first war. From the beginning of the second the general features of ship design, the classification of ships, the armament of ships, and the handling of fleets, were to remain without essential alteration until the date of Navarino. Even the tactical methods, except where improved on occasions by individual genius, altered little. The great thing was to bring the whole broadside force to bear on an enemy. Whether this was to be impartially distributed throughout the hostile line or concentrated on one part of it depended on the character of particular admirals. It would have been strange if a period so long and so rich in incidents had afforded no materials for forming a judgment on the real significance of sea-power. The text, so to speak, chosen by Mahan is that, notwithstanding the changes wrought in naval *matériel* since about 1850, we can find in the history of the past instructive illustrations of the general principles of maritime war. These illustrations will prove of value not only " in those wider operations which embrace a whole theatre of war," but also, if rightly applied, " in the tactical use of the ships and weapons " of our own day. By a remarkable coincidence the same doctrine was being preached at the same time and quite independently by Vice-Admiral Philip Colomb in his work on *Naval Warfare.* As a prelude to the second Dutch War we find a repetition of a process which had been adopted somewhat earlier. That was the permanent conquest of trans-oceanic territory. Until the 17th century had well begun, naval, or combined naval and military, operations against the distant possessions of an enemy had been practically restricted to raiding or plundering attacks on commercial centres. The Portuguese territory in South America having come under Spanish dominion in consequence of the annexation of Portugal to Spain, the Dutch—as the power of the latter country declined—attempted to reduce part of that territory into permanent possession. This improvement on the practice of Drake and others was soon seen to be a game at which more than one could play. An expedition sent by Cromwell to the West Indies seized the Spanish island of Jamaica, which has remained in the hands of its conquerors to this day. In 1664 an English force occupied the Dutch North American settlements on the Hudson. Though the dispossessed rulers were not quite in a position to throw stones at sinners, this was rather a raid than an operation recognized warfare, because it preceded the formal outbreak of hostilities. The conquered territory remained in English hands for more than a century, and thus testified to the efficacy of a sea-power which Europe had scarcely begun to recognize. Neither the second nor the third Dutch War can be counted amongst the occurrences to which Englishmen may look back with unalloyed satisfaction; but they, unquestionably, disclosed some interesting manifestations of sea-power. Much indignation has been expressed concerning the corruption and inefficiency of the English government of the day, and its failure to take proper measures for keeping up the navy as it should have been kept up. Some, perhaps a good deal, of this indignation was deserved; but it would have been nearly as well deserved by every other government of the day. Even in those homes of political virtue where the administrative machinery was worked by, or in the interest of speculating capitalists and privileged companies, the accumulating evidence of late years has proved that everything was not considered to be, and as a matter of fact was not, exactly as it ought to have been. Charles II. and his brother, the duke of York, have been held up to obloquy because they thought that the coast of England could be defended against a naval enemy better by fortifications than by a good fleet and, as Pepys noted, were " not ashamed of it. " The truth is that neither the king nor the duke believed in the power of a navy to ward off attack from an island. This may have been due to want of intellectual capacity; but it would be going a long way to put it down to personal wickedness. They have had many imitators, some in our own day. The huge forts which stud the coast of the United Kingdom, and have been erected within living memory, are monuments, likely to last for many years, of the inability of people, whom no one could accuse of being vicious, to rate sea-power at its proper value. It is much more likely that it was owing to a reluctance to study questions of naval defence as industriously as they deserved, and to that moral timidity which so often tempts even men of proved physical courage to undertake the impossible task of making themselves absolutely safe against hostile efforts at every point.

Misapplication.

Charles II. has also been charged with indifference to the interests of his country, or worse, because during a great naval war he adopted the plan of trying to weaken the enemy by destroying his commerce. The king " took a fatal resolution of laying up his great ships and keeping only a few frigates on the cruise." It is expressly related that this was not Charles's own idea, but that it was urged upon him by advisers whose opinion probably seemed at the time as well worth listening to as that of others. Anyhow if the king erred, as he undoubtedly did, he erred in good company. Eighteen hundred years earlier the statesmen who conducted the great war against Carthage, and whose astuteness has been the theme of innumerable panegyrics since, took the same " fatal resolution." In the midst of the great struggle they " did away with the fleet. At the most they encouraged privateering; and with that view placed the war-vessels of the state at the disposal of captains who were ready to undertake a corsair warfare on their own account " (Mommsen, 1894, ii. 191). In much later times this method has had many respectable defenders. Mahan's works are, in a sense, a formal warning to his fellow-citizens not to adopt it. In France, within the last years of the 19th century, it found, and appears still to find, adherents enough to form a school. The reappearance of belief in demonstrated impossibilities is a recognized incident in human history; but it is usually confined to the emotional or the vulgar. It is serious and filled with menaces of disaster when it is held by men thought fit to administer the affairs of a nation or advise concerning its defence. The third Dutch War may not have settled directly the position of England in the maritime world; but it helped to place that country above all other maritime states—in the position, in fact, which Great Britain, the United Kingdom, the British Empire, whichever name may be given it, has retained up to the present. It also manifested in a very striking form the efficacy of sea-power. The United Provinces, though attacked by two of the greatest monarchies in the world, France and England, were not destroyed. Indeed, they preserved much of their political importance in the state system of Europe. The Republic " owed this astonishing result partly to the skill of one or two men, but mainly to its sea-power. " The effort, however, had undermined its strength and helped forward its decline.

The war, which was ended by the Peace of Ryswick in 1697, presents two features of exceptional interest: one was the havoc wrought on English commerce by the enemy; the other was Torrington's conduct at and after the engagement off Beachy Head. Mahan discusses the former with his usual lucidity. At no time has war against commerce been conducted on a larger scale and with greater results than during this period. England suffered " infinitely more than in any former war." Many of her merchants were ruined; and it is affirmed that the English shipping was reduced to the necessity of sailing under the Swedish and Danish flags. The explanation is that Louis XIV. made great efforts to keep up powerful fleets. The English navy was so fully occupied in watching these that no ships could be spared to protect England's maritime trade. This is only another way of saying that her commerce had increased so largely that the navy was not strong enough to look after it as well as oppose the enemy's main force. Notwithstanding her losses she was on the winning side in the conflict. Much misery and ruin had been caused, but not enough to affect the issue of the war.

The "Fleet in being."

Torrington's proceedings in July 1690 were at the time the subject of much angry discussion. The debate, still meriting the epithet angry, has been renewed within the last few years. The matter has to be noticed here, because it involves the consideration of a question of naval strategy which must be understood by those who wish to know the real meaning of the term sea-power, and who ought to learn that it is not a thing to be idly risked or thrown away at the bidding of the ignorant and the irresponsible. Arthur Herbert, earl of Torrington—the later peerage is a viscountcy held by the Byng family—was in command of the allied English and Dutch fleet in the English Channel. "The disparity of force," says Mahan, "was still in favour of France in 1690, but it was not so great as the year before." We can measure the ability of the then English government for conducting a great war, when we know that, in its wisdom, it had still further weakened the fleet by dividing it. Vice-Admiral Killigrew had been sent to the Mediterranean with a squadron, and had neglected, and indeed refused when urged, to take the necessary steps to repair this error. The government having omitted, as governments sometimes do, to gain any trustworthy intelligence of the strength or movements of the enemy, Torrington suddenly found himself confronted by a considerably superior French fleet under Tourville, one of the greatest of French sea-officers. Since then the intentions of the French have been questioned; but it is beyond dispute that, in England at the time, Tourville's movements were believed to be preliminary to invasion. Whether Tourville deliberately meant his movement to cover an invasion or not, invasion would almost certainly have followed complete success on his part; otherwise, his victory would have been without any valuable result. Torrington saw that as long as he could keep his own fleet intact, he could, though much weaker than his opponent, prevent him from doing serious harm. Though personally not a believer in the imminence of invasion, the English admiral knew that "most men were in fear that the French would invade." His own view was "that whilst we had a fleet in being they would not dare to make an attempt." Of late years controversy has raged round this phrase, "a fleet in being," and the strategic principle which it expresses. Most seamen were at the time, have been since, and still are in agreement with Torrington. This might be supposed enough to settle the question. It has not been allowed, however, to remain one of purely naval strategy. It was made at the time a matter of party politics. This is why it is so necessary that in a notice of sea-power it should be discussed. Both as a strategist and as a tactician Torrington was immeasurably ahead of his contemporaries. The only English admirals who can be placed above him are Hawke and Nelson. He paid the penalty of his preeminence: he could not make ignorant men and dull men see the meaning or the advantages of his proceedings. Mahan, who is specially qualified to do him full justice, does not devote much space in his work to a consideration of Torrington's case, evidently because he had not sufficient materials before him on which to form a judgment. The admiral's character had been taken away already by Macaulay, who did have ample evidence before him; William III., with all his fine qualities, did not possess a military genius quite equal to that of Napoleon; and Napoleon, in naval strategy, was often wrong. William III. understood that subject even less than the French emperor did; and his favourites were still less capable of understanding it. Consequently Torrington's action has been put down to jealousy of the Dutch. There have been people who accused Nelson of being jealous of the naval reputation of Caracciolo! The explanation of Torrington's conduct is this: He had a fleet so much weaker than Tourville's that he could not fight a general action with the latter without a practical certainty of a crushing defeat. Such a result would have laid the kingdom open: a defeat of the allied fleet, says Mahan, "if sufficiently severe, might involve the fall of William's throne in England." Given certain movements of the French fleet, Torrington might have manœuvred to slip past it to the westward and join his force with that under Killigrew, which would make him strong enough to hazard a battle. This proved impracticable. There was then one course left—to retire before the French, but not to keep far from them. He knew that, though not strong enough to engage their whole otherwise unemployed fleet with any hope of success, he would be quite strong enough to fight and most likely beat it, when a part of it was trying either to deal with our ships to the westward or to cover the disembarkation of an invading army. He, therefore, proposed to keep his "fleet in being" in order to fall on the enemy when the latter would have two affairs at the same time on his hands. Vice-Admiral Colomb rose to a greater height than was usual even with him in his criticism of this campaign. What Torrington did was merely to reproduce on the sea what has been noticed dozens of times on shore, viz. the menace of the flanking enemy. In land warfare this is held to give exceptional opportunities for the display of good generalship, but, to quote Mahan over again, a navy "acts on an element strange to most writers, its members have been from time immemorial a strange race apart, without prophets of their own, neither themselves nor their calling understood." Whilst Torrington has had the support of the seamen, his opponents have been landsmen. For the crime of being a good strategist he was brought before a court-martial, but acquitted. His sovereign, who had been given the crowns of three kingdoms to defend our laws, showed his respect for them by flouting a legally constituted tribunal and disregarding its solemn finding. The admiral who had saved his country was dismissed from the service. Still, the principle of the "fleet in being" lies at the bottom of all sound strategy.

Change in naval operations.

Admiral Colomb has pointed out a great change of plan in the later naval campaigns of the 17th century. Improvements in naval architecture, in the methods of preserving food, and in the arrangements for keeping the crews healthy, permitted fleets to be employed at a distance from their home ports for long continuous periods. The Dutch, as allies of the Spaniards, kept a fleet in the Mediterranean for many months. The great de Ruyter was mortally wounded in one of the battles there fought. In the War of the Spanish Succession the Anglo-Dutch fleet found its principal scene of action eastward of Gibraltar. This, as it were, set the fashion for future wars. It became a kind of tacitly accepted rule that the operation of British sea-power was to be felt in the enemy's, rather than in British waters. The hostile coast was regarded strategically as the British frontier, and the sea was looked upon as territory which the enemy must be prevented from invading. Acceptance of this principle led in time to the so-called "blockades" of Brest and Toulon. The name was misleading. As Nelson took care to explain, there was no desire to keep the enemy's fleet in; what was desired was to be near enough to attack it if it came out. The wisdom of the plan is undoubted. The hostile navy could be more easily watched and more easily followed if it put to sea. To carry out this plan a navy stronger in number of ships or in general efficiency than that of the enemy was necessary. With the exception of that of American Independence, which will, therefore, require special notice, England's subsequent great wars were conducted in accordance with the rule.

Rise of Russia's sea-power.

In the early part of the 18th century there was a remarkable manifestation of sea-power in the Baltic. Peter the Great, having created an efficient army, drove the Swedes from the coast provinces south of the Gulf of Finland. Like the earlier monarchies of which we have spoken, Russia, in the Baltic at least, now became a naval state. A large fleet was built, and, indeed, a considerable navy established. It was a purely artificial creation, and showed the merits and defects of its character. At first, and when under the eye of its creator, it was strong; when Peter was no more it dwindled away and, when needed again, had to be created afresh. It enabled Peter the Great to conquer the neighbouring portion of Finland, to secure his coast territories and to dominate the Baltic. In this he was assisted by the exhaustion of Sweden consequent on her endeavours to retain, what was no longer possible, the position of a *quasi*-great power which she had held since the days of Gustavus Adolphus. Sweden had been further weakened, especially as a naval state, by almost incessant wars with Denmark, which prevented all hope of Scandinavian predominance in the Baltic, the control of which sea has in these days passed into the hands of another state possessing a quickly created navy—the modern German empire.

Seven Years' War.

The War of the Spanish Succession left Great Britain a Mediterranean power, a position which, in spite of twice losing Minorca, she still holds. In the War of the Austrian Succession, "France was forced to give up her conquests for want of a navy, and England saved her position by her sea-power, though she had failed to use it to the best advantage" (Mahan, *Influence on Hist.* p. 280). This shows, as we shall find that a later war showed more plainly, that even the government of a thoroughly maritime country is not always sure of conducting its naval affairs wisely. The Seven Years' War included some brilliant displays of the efficacy of sea-power. It was this which put the British in possession of Canada, decided which European race was to rule in India, and led to a British occupation of Havana in one hemisphere and of Manila in the other. In the same war Great Britain learnt how, by a feeble use of sea-power, a valuable possession like Minorca may be lost. At the same time, the maritime trade and the general prosperity of the kingdom increased enormously. The result of the conflict made plain to all the paramount importance of having in the principal posts in the government men capable of understanding what war is and how it ought to be conducted.

First American War.

This lesson, as the sequel demonstrated, had not been learned when Great Britain became involved in a war with the insurgent colonies in North America. Mahan's comment is striking: "The magnificence of sea-power and its value had perhaps been more clearly shown by the uncontrolled sway and consequent exaltation of one belligerent; but the lesson thus given, if more striking, is less vividly interesting than the spectacle of that sea-power meeting a foe worthy of its steel, and excited to exertion by a strife which endangered not only its most valuable colonies, but even its own shores" (*Influence on Hist.* p. 338). Great Britain was, in fact, drawing too largely on the *prestige* acquired during the Seven Years' War, and was governed by men who did not understand the first principles of naval warfare, and would not listen to those who did. They quite ignored the teaching of the then comparatively recent wars which has been alluded to already—that the enemy's coast should be looked upon as the frontier. A century and a half earlier the Dutchman Grotius had written—

> "Quae meta Britannis
> Litora sunt aliis."

Though ordinary prudence would have suggested ample preparation, British ministers allowed their country to remain unprepared. Instead of concentrating their efforts on the main objective, they frittered away force in attempts to relieve two beleaguered garrisons under the pretext of yielding to popular pressure, which is the official term for acting on the advice of irresponsible and uninstructed busybodies. "Depuis le début de la crise," says Captain Chevalier, "les ministres de la Grande-Bretagne s'étaient montrés inférieurs à leur tâche." An impressive result of this was the repeated appearance of powerful and indeed numerically superior hostile fleets in the English Channel. The war—notwithstanding that land operations constituted an important part of it, and in the end settled the issue—was essentially oceanic. Captain Mahan says it was "purely maritime." It may be true that, whatever the belligerent result, the political result, as regards the *status* of the insurgent colonies, would have been the same. It is in the highest degree probable, indeed it closely approaches to certainty, that a proper use of the British sea-power would have prevented independence from being conquered, as it were, at the point of the bayonet. There can be no surprise in store for the student acquainted with the vagaries of strategists who are influenced in war by political in preference to military requirements. Still, it is difficult to repress an emotion of astonishment on finding that a British government intentionally permitted de Grasse's fleet and the French army in its convoy to cross the Atlantic unmolested, for fear of postponing for a time the revictualling of the garrison beleaguered at Gibraltar. Washington's opinion as to the importance of the naval factor has been quoted already; and Mahan does not put the case too strongly when he declares that the success of the Americans was due to "sea-power being in the hands of the French and its improper distribution by the English authorities." England's navy, misdirected as it was, made a good fight of it, never allowed itself to be decisively beaten in a considerable battle, and won at least one great victory. At the point of contact with the enemy, however, it was not in general so conspicuously successful as it was in the Seven Years' War, or as it was to be in the great conflict with the French republic and empire. The truth is that its opponent, the French navy, was never so thoroughly a sea-going force as it was in the War of American Independence; and never so closely approached the British in sea experience as it did during that period. Great Britain met antagonists who were very nearly, but fortunately not quite, as familiar with the sea as she was; and she never found it so hard to beat them, or even to avoid being beaten by them. An Englishman would, naturally enough, start at the conclusion confronting him, if he were to speculate as to the result of more than one battle had the great Suffren's captains and crews been quite up to the level of those commanded by stout old Sir Edward Hughes. Suffren, it should be said, before going to the East Indies, had "thirty-eight years of almost uninterrupted sea-service" (Laughton, *Studies in Naval Hist.* p. 103). A glance at a chart of the world, with the scenes of the general actions of the war dotted on it, will show how notably oceanic the campaigns were. The hostile fleets met over and over again on the far side of the Atlantic and in distant Indian seas. The French navy had penetrated into the ocean as readily and as far as the British could do. Besides this, it should be remembered that it was not until the 12th of April 1782, when Rodney in one hemisphere and Suffren in the other showed them the way, that British officers were able to escape from the fetters imposed on them by the *Fighting Instructions*—a fact worth remembering in days in which it is sometimes proposed, by establishing schools of naval tactics on shore, to revive the pedantry which made a decisive success in battle nearly impossible.

Wars of the French Revolution and Empire.

The mighty conflict which raged between Great Britain on one side and France and her allies on the other, with little intermission, for more than twenty years, presents a different aspect from that of the war last mentioned. The victories which the British fleet was to gain were generally to be overwhelming; if not, they were looked upon as almost defeats. Whether the fleet opposed to the British was or was not the more numerous, the result was generally the same—the enemy was beaten. That there was a discoverable reason for this is certain. A great deal has been made of the disorganization in the French navy consequent on the confusion of the Revolution. That there was disorganization is undoubted; that it did impair discipline and, consequently, general efficiency will not be disputed; but that it was considerable enough to account by itself for the French naval defeats is altogether inadmissible. Revolutionary disorder had invaded the land-forces to a greater degree than it had invaded the sea-forces. The supersession, flight or guillotining of army officers had been beyond measure more frequent than was the case with the naval officers. In spite of all this the French armies were on the whole—even in the early days of the Revolution—extraordinarily successful. In 1792 "the most formidable invasion that ever threatened France," as Alison calls it, was repelled, though the invaders were the highly disciplined and veteran armies of Prussia and Austria. It was nearly two years later that the French and British fleets came into serious conflict. The first great battle, "The Glorious First of June," though a tactical victory for Great Britain, was a strategical defeat. Villaret Joyeuse manœuvred so as to cover the arrival in France of a fleet of merchant vessels carrying sorely needed supplies of food, and in this he was completely successful. His plan involved the probability, almost the necessity of fighting a general action which he was not at all sure of winning. He was beaten, it is true; but the French made so good a fight of it that their defeat was not nearly so disastrous as the later defeats of the Nile or Trafalgar, and—at the most—not more disastrous than that of Dominica. Yet no one even alleges that there was disorder or disorganization in the French fleet at the date of any one of those affairs. Indeed, if the French navy was really disorganized in 1794, it would have been better for France—judging from the events of 1798 and 1805—if the disorganization had been allowed to continue. In point of organization the British navy was inferior, and in point of discipline not much superior to the French at the earliest date; at the later dates, and especially at the latest, owing to the all-pervading energy of Napoleon, the British was far behind its rival in organization, in "science," and in every branch of training that can be imparted without going to sea. Great Britain had the immense advantage of counting among her officers some very able men. Nelson, of course, stands so high that he holds a place entirely by himself. The other British chiefs, good as they were, were not conspicuously superior to the Hawkes and Rodneys of an earlier day. Howe was a great commander, but he did little more than just appear on the scene in the Revolutionary War. Almost the same may be said of Hood, of whom Nelson wrote, "He is the greatest sea-officer I ever knew" (Laughton, *Nelson's Lett. and Desp.* p. 71). There must have been something, therefore, beyond the meritorious qualities of the principal British officers which helped the navy so consistently to victory. The many triumphs won could not have been due in every case to the individual superiority of the British admiral or captain to his opponent. There must have been bad as well as good among the hundreds on the lists; and we cannot suppose that Providence had so arranged it that in every action in which a British officer of inferior ability commanded, a still more inferior French commander was opposed to him. The explanation of the nearly unbroken success is, that the British was a thoroughly sea-going navy, and became more and more so every month; while the French, since the close of the American War, had lost to a great extent its sea-going character and, because it had been shut up in its ports, became less and less sea-going as hostilities continued. The war had been for the British, in the words of Theodore Roosevelt, "a continuous course of victory won mainly by seamanship." The British navy, as regards sea experience, especially of the officers, was immensely superior to the French. This enabled the British government to carry into execution sound strategic plans, in accordance with which the coasts of France and its allied countries were regarded as the British frontier to be watched or patrolled by British fleets.

Importance of sea experience.

Second American War.

Before the long European war had been brought to a formal ending we received some rude rebuffs from another opponent of unsuspected vigour. In the quarrel with the United States, the so-called "War of 1812," the great sea-power of the British in the end asserted its influence, and the Americans suffered much more severely, even absolutely, than their enemy. At the same time the British might have learned, for the Americans did their best to teach it, that over-confidence in numerical strength and narrow professional self-satisfaction are nearly sure to lead to reverses in war, and not unlikely to end in grave disasters. The British had now to meet the *élite* of one of the finest communities of seamen ever known. Even in 1776 the Americans had a great maritime commerce, which, as Mahan says, "had come to be the wonder of the statesmen of the mother country." In the six-and-thirty years which had elapsed since then this commerce had further increased. There was no finer nursery of seamen than the then states of the American Union. Roosevelt says that "there was no better seaman in the world" than the American, who "had been bred in his work from infancy." A large proportion of the population "was engaged in sea-going pursuits of a nature strongly tending to develop a resolute and hardy character in the men that followed them" (*Naval War of 1812*, 3rd ed., pp. 29, 30). Having little or no naval protection, the American seaman had to defend himself in many circumstances, and was compelled to familiarize himself with the use of arms. The men who passed through this practical, and therefore supremely excellent, training school were numerous. Very many had been trained in English men-of-war, and some in French ships. The state navy which they were called on to man was small; and therefore its *personnel*, though without any regular or avowed selection, was virtually and in the highest sense a picked body. The lesson of the War of 1812 should be learned by Englishmen of the present day, when a long naval peace has generated a confidence in numerical superiority, in the mere possession of heavier *matériel*, and in the merits of a rigidly uniform system of training, such confidence, as experience has shown, being often the forerunner of misfortune. It is neither patriotic nor intelligent to minimize the American successes. Certainly they have been exaggerated by Americans and even by the British. To take the frigate actions alone, as being those which properly attracted most attention, the captures in action amounted to three on each side, the proportionate loss to the Americans, considering the smallness of their fleet, being immensely greater than to the British. We also see that no British frigate was taken after the first seven months of a war which lasted two and a half years. Attempts have been made to spread a belief that British reverses were due to nothing but the greater size and heavier guns of the enemy's ships. It is now established that the superiority in these details, which the Americans certainly enjoyed, was not great, and not of itself enough to account for their victories. Of course, if superiority in mere *matériel*, beyond a certain well-understood amount, is possessed by one of two combatants, his antagonist can hardly escape defeat; but it was never alleged that size of ship or calibre of guns—greater within reasonable limits than the British had—necessarily led to the defeat of British ships by the French or Spaniards. In the words of Admiral Jurien de la Gravière: "The ships of the United States constantly fought with the chances in their favour." All this is indisputable. Nevertheless in any future war British sea-power, great as it may be, should not receive shocks like those that it unquestionably did suffer in 1812.

We have now come to the end of the days of the naval wars of old time. The subsequent period has been illustrated repeatedly by manifestations of sea-power, often of great interest and importance, though rarely understood or even discerned by the nations whom they more particularly concerned. The British sea-power, notwithstanding the first year of the War of 1812, had come out of the great European conflict unshaken and indeed more pre-eminent than ever. The words used half a century before by a writer in the great French *Encyclopédie* seemed more exact than when first written. "*L'Empire des mers,*" he says, is "le plus avantageux de tous les empires; les Phœniciens le possédoient autre fois et c'est aux Anglois que cette gloire appartient aujourd'hui sur toutes les puissances maritimes" (*Encyclopédie*, 7th January 1765, art. "Thalassarchie"). Vast outlying territories had been acquired or were more firmly held, and the communications of all the oversea dominions of the British crown were secured against all possibility of serious menace for many years to come. Her sea-power was so ubiquitous and all-pervading that, like the atmosphere, Great Britain rarely thought of it and rarely remembered its necessity or its existence. It was not till a late date that the greater part of the nation—for there still are some exceptions—perceived that it was the medium apart from which the British empire could no more live than it could have grown up. Forty years after the fall of Napoleon she found herself again at war with a great power. She had as her ally the owner of the greatest

Russian War, 1854-56.

navy in the world except her own. Her foe, as regards naval forces, came the next in order. Yet so overwhelming was the strength of Great Britain and France on the sea that Russia never attempted to employ her navy against them. Not to mention other expeditions, considerable enough in themselves, military operations on the largest scale were undertaken, carried on for many months, and brought to a successful termination on a scene so remote that it was two thousand miles from the country of one, and three thousand from that of the other partner in the alliance. "The stream of supplies and reinforcements, which in terms of modern war is called 'communications,'" was kept free from even the threat of molestation, not by visible measures, but by the undisputed efficacy of a real, though imperceptible sea-power. At the close of the Russian War there were, even in influential positions, men who, undismayed by the consequences of mimicking in free England the cast-iron methods of Frederick the Great, began to measure British requirements by standards borrowed from abroad and altogether inapplicable to British conditions. Because other countries wisely abstained from relying on that which they did not possess, or had only imperfectly and with elaborate art created, the mistress of the seas was led to proclaim her disbelief in the very force that had made and kept her dominion, and was urged to defend herself with fortifications by advisers who, like Charles II. and the duke of York two centuries before, were "not ashamed of it." It was long before the peril into which this brought the empire was perceived; but at last, and in no small degree owing to the teachings of Mahan, the people themselves took the matter in hand and insisted that a great maritime empire should have adequate means of defending all that made its existence possible.

Later manifestations of sea-power.

In forms differing in appearance, but identical in essentials, the efficacy of sea-power was proved again in the American Civil War. If ever there were hostilities in which, to the unobservant or short-sighted, naval operations might at first seem destined to count for little they were these. The sequel, however, made it clear that they constituted one of the leading factors of the success of the victorious side. The belligerents, the Northern or Federal states and the Southern or Confederate states, had a common land frontier of great length. The capital of each section was within easy distance of this frontier, and the two were not far apart. In wealth, population and resources the Federals were enormously superior. They alone possessed a navy, though at first it was a small one. The one advantage on the Confederate side was the large proportion of military officers which belonged to it and their rare excellence as soldiers. In *physique* as well as in *moral* the army of one side differed little from that of the other; perhaps the Federal army was slightly superior in the first, and the Confederate, as being recruited from a dominant white race, in the second. Outnumbered, less well equipped, and more scantily supplied, the Confederates nevertheless kept up the war, with many brilliant successes on land, for four years. Had they been able to maintain their trade with neutral states they could have carried on the war longer, and—not improbably—have succeeded in the end. The Federal navy, which was largely increased, took away all chance of this. It established effective blockades of the Confederate ports, and severed their communications with the outside world. Indispensable articles of equipment could not be obtained, and the armies, consequently, became less and less able to cope with their abundantly furnished antagonists. By dominating the rivers the Federals cut the Confederacy asunder; and, by the power they possessed of moving troops by sea at will, perplexed and harassed the defence, and facilitated the occupation of important points. Meanwhile the Confederates could make no reply on the water except by capturing merchant vessels, by which the contest was embittered, but the course of the war remained absolutely unaffected. The great numbers of men under arms on shore, the terrific slaughter in many battles of a war in which tactical ability, even in a moderate degree, was curiously uncommon on both sides, and the varying fortunes of the belligerents, made the land campaigns far more interesting to the ordinary observer than the naval. It is not surprising, therefore, that peace had been re-established for several years before the American people could be made to see the great part taken by the navy in the restoration of the Union; and what the Americans had not seen was hidden from the sight of other nations.

Russo-Turkish War, 1877-78.

In several momentous wars in Europe waged since France and Great Britain made peace with Russia sea-power manifested itself but little. In the Russo-Turkish War the naval superiority of the Turks in the Black Sea, where the Russians at the time had no fleet, governed the plans, if not the course, of the campaign. The water being denied to them, the Russians were compelled to execute their plan of invading Turkey by land. An advance to the Bosporus through the northern part of Asia Minor was impracticable without help from a navy on the right flank. Consequently the only route was a land one across the Danube and the Balkans. The advantages, though not fully utilized, which the enforcement of this line of advance put into the hands of the Turks, and the difficulties and losses which it caused the Russians, exhibited in a striking manner what sea-power can effect even when its operation is scarcely observable.

Chilean Civil War, 1891.

This was more conspicuous in a later series of hostilities. The civil war in Chile between Congressists and Balmacedists was specially interesting, because it threw into sharp relief the predominant influence, when a non-maritime enemy was to be attacked, of a navy followed up by an adequate land-force. At the beginning of the dispute the Balmacedists, or President's party, had practically all the army, and the Congressists, or Opposition party, nearly all the Chilean navy. Unable to remain in the principal province of the republic, and expelled from the waters of Valparaiso by the Balmacedist garrisons of the forts—the only and doubtful service which those works rendered to their own side—the Congressists went off with the ships to the northern provinces, where they counted many adherents. There they formed an army, and having money at command, and open sea communications, they were able to import equipment from abroad, and eventually to transport their land-force, secured from molestation on the voyage by the sea-power at their disposal, to the neighbourhood of Valparaiso, where it was landed and triumphantly ended the campaign.

War between China and Japan, 1894-95.

It will have been noticed that, in its main outlines, this story repeated that of many earlier struggles. It was itself repeated, as regards its general features, by the story of the war between China and Japan in 1894–95. Every aspect of the war, says Colomb, is interesting to Great Britain, "as Japan is to China in a position similar to that which the British Islands occupy to the European continent" (*Naval Warfare*, 3rd ed. p. 436). It was additionally interesting because the sea-power of Japan was a novelty. Though a novelty, it was well known by British naval men to be superior in all essentials to that of China, a novelty itself. As is the rule when two belligerents are contending for something beyond a purely maritime object, the final decision was to be on land. Korea was the principal theatre of the land war; and, as far as access to it by sea was concerned, the chief bases of the two sides were about the same distance from it. It was possible for the Chinese to march there by land. The Japanese, coming from an island state, were obliged to cross the water. It will be seen at once that not only the success of the Japanese in the struggle, but also the possibility of its being carried on by them at all, depended on sea-power. The Japanese proved themselves decisively superior at sea. Their navy effectually cleared the way for one army which was landed in Korea, and for another which was landed in the Chinese province of Shantung. The Chinese land-forces were defeated. The navy of Japan being superior on the sea, was able to keep its sister service supplied or reinforced as required. It was not, however, the navy, but the army, which finally frustrated the Chinese efforts at defence, and really terminated the war. What the navy did was what, in accordance with the limitations of sea-power, may be expected of a navy. It made the transport of the army across the sea possible, and enabled it to do what of itself the army could not have done, viz. overcome the last resistance of the enemy.

Spanish-American War, 1898.

The issue of the Spanish-American War, at least as regards the defeat of Spain, was a foregone conclusion. That Spain, even without a serious insurrection on her hands, was unequal to the task of meeting so powerful an antagonist as the United States must have been evident even to Spaniards. However that may be, an early collapse of the Spanish defence was not anticipated, and however one-sided the war may have been seen to be, it furnished examples illustrating rules as old as naval warfare. Mahan says of it that, " while possessing, as every war does, characteristics of its own differentiating it from others, nevertheless in its broad analogies it falls into line with its predecessors, evidencing that unity of teaching which pervades the art from its beginnings unto this day " (*Lessons of the War with Spain*, p. 16). The Spaniards were defeated by the superiority of the American sea-power. " A million of the best soldiers," says Mahan, " would have been powerless in face of hostile control of the sea." That control was obtained and kept by the United States navy, thus permitting the unobstructed despatch of troops—and their subsequent reinforcement and supply—to Spanish territory, which was finally conquered, not by the navy, but by the army on shore. That it was the navy which made this final conquest possible happened, in this case, to be made specially evident by the action of the United States government, which stopped a military expedition on the point of starting for Cuba until the sea was cleared of all Spanish naval force worth attention.

It is unnecessary here to dwell on the results of sea-power in the war between Great Britain and the Boers, in which troops had to be transported by sea from England to South Africa, or in that between Russia and Japan, in which the culminating blow given by Japan was the defeat of the Russian fleet at the battle of Tsushima.

The events of the long period which we have been considering will have shown how sea-power operates, and what it effects. What it involves will have appeared from this narrative more clearly than would have been possible from any mere definition. Like many other things, sea-power is composed of several elements. To reach the highest degree of efficacy it should be based upon a population naturally maritime, and on an ocean commerce naturally developed rather than artificially enticed to extend itself. Its outward and visible sign is a navy, strong in the discipline, skill and courage of a numerous *personnel* habituated to the sea, in the number and quality of its ships, in the excellence of its *matériel*, and in the efficiency, scale, security and geographical position of its arsenals and bases. History has demonstrated that sea-power thus conditioned can gain any purely maritime object, can protect the trade and the communications of a widely extended empire, and while so doing can ward off from its shores a formidable invader. There are, however, limitations to be noted. Left to itself its operation is confined to the water, or at any rate to the inner edge of a narrow zone of coast. It prepares the way for the advance of an army, the work of which it is not intended and is unable to perform. Behind it, in the territory of which it guards the shores, there must be a land-force adjusted in organization, equipment and numbers to the circumstances of the country. The possession of a navy does not permit a sea-surrounded state to dispense with all fixed defences or fortification; but it does render it unnecessary and indeed absurd that they should be abundant or gigantic. The danger which always impends over the sea-power of any country is that, after being long unused, it may lose touch of the sea. The revolution in the constructive arts during the latter half of the 19th century, which has also been a period of but little-interrupted naval peace, and the universal adoption of mechanical appliances, both for ship-propulsion and for many minor services—mere *matériel* being thereby raised in the general estimation far above really more important matters—make the danger mentioned more menacing in the present age than it has ever been before.

The classic works on Sea-power are those of Captain A. T. Mahan: *Influence of Sea-power on History* (1890); *Influence of Sea-power on the French Revolution and Empire* (1892); *Nelson: the Embodiment of the Sea-power of Great Britain* (1897), &c. See also the bibliography of the article NAVY. (C. A. G. B.)

SEARCH, or VISIT AND SEARCH, a term used in international law and apparently derived in some confused way from the French word *visite*, which means search, combined with the English translation of the word *visite*. An attempt made by some writers to distinguish between visit and search only leads to misunderstanding. Search is the exact English equivalent of *visite*, and in the translation of the Declaration of London (Feb. 26, 1909) the translator has rightly rendered it as such (art. 63).

The right of search belongs to belligerents alone. Its object is to verify the nationality of the vessel and if neutral to ascertain whether it carries contraband. The consequence of resistance to search is capture and trial in a Prize Court. " Forcible resistance to the legitimate exercise of the right of stoppage, search and capture," says art. 63 of the Declaration of London, 1909, " involves in all cases the condemnation of the vessel. The cargo is liable to the same treatment as the cargo of an enemy vessel. Goods belonging to the master or owner of the vessel are treated as enemy goods." At the Hague Conference of 1907 the question of the liability to search of mail-ships gave rise to much discussion based on incidents arising out of the South African and Russo-Japanese Wars. It was ultimately decided that postal correspondence of neutrals and even of belligerents, and whether official or private, found on board a neutral or even an enemy ship should be " inviolable," and that though the ship should be detained, this correspondence had to be forwarded to its destination by the captor " with the least possible delay."[1] The only exception to this exemption is correspondence destined for or proceeding from a blockaded port. As regards the mail-ships themselves, apart from this inviolability of the correspondence, no exemption or privilege is extended beyond the injunction that they should not be searched, except when absolutely necessary, and then only " with as much consideration and expedition as possible," which might just as well be said of all ships stopped or searched on the high seas. (T. BA.)

SEA-SERPENT. The belief in enormous serpents, both terrestrial and marine, dates from very early times. Pliny (*H.N.* viii. 14), following Livy (*Epit.* xviii.), tells us of a land-serpent 120 ft. long, which Regulus and his army besieged with balistae, as though it had been a city, and this story is repeated by several other writers (Florus ii. 2; Val. Max. i. 8; Gellius vi. 3). The most prolific in accounts of the sea-serpent, however, are the early Norse writers, to whom the " Sö-Orm " was a subject both for prose and verse. Olaus Magnus (*Hist. gent. sept.* xxi. 24) describes it as 200 ft. long and 20 ft. round, and states that it not only ate calves, sheep and swine, but also " disturbs ships, rising up like a mast, and sometimes snaps some of the men from the deck," illustrating his account with a vivid representation of the animal in the very act. Pontoppidan, in his *Natural History* (Eng. trans., 1755, pp. 195 seq.), says that its existence was generally believed in by the sailors and fishermen of his time, and he recounts the means they adopted to escape it, as well as many details regarding its habits. The more circumstantial records of comparatively modern times may be conveniently grouped according to the causes which presumably gave rise to the phenomena described. (1) A number of porpoises swimming one behind another may, by their characteristic mode of half emerging from and then re-entering the water during respiration, produce the appearance of a single animal showing a succession of snake-like undulations. The figure given by Pontoppidan was very likely suggested by such an appearance, and a sketch of an animal seen off Llandudno by several observers[1] looks as though it might have had a similar origin, notwithstanding that this hypothesis was rejected by them. (2) A flight of sea-fowl on one occasion recorded by Professor Aldis[2] produced the appearance of a snake swimming at the surface of the water. (3) A large mass of seaweed has on more than one occasion been cautiously approached and even harpooned under the impression that it was such a monster.[3] (4) A pair of basking sharks (*Selache maxima*) furnish an explanation of some of the recorded observations, as was first pointed out by Frank Buckland. These fish have a habit of swimming in pairs, one following the other with the dorsal fin and the upper lobe of the tail just appearing above the water, and, as each animal is fully 30 ft. long, the effect of a body of 60 or more ft. long moving through the water is readily produced. To this category belongs the famous serpent cast up on Stronsay, one of the Orkneys, of which an account was read to the Wernerian Society of Edinburgh;[4] some of its vertebrae were preserved in the Royal College of Surgeons of London, and identified as those of *Selache maxima* by both Home and Owen.[5] There is also evidence to show that specimens of *Carcharodon* must have existed more than 100 ft. long.[6] (5) Ribbon-fish (*Regalecus*), from their snake-like form and great length (sometimes as much as 20 ft.), have been suggested as the origin of so-called "sea-serpents," amongst others by Dr Andrew Wilson[7]; but Dr Günther,[8] from what is known regarding the habits of these fish, does not regard the theory as tenable. (6) A gigantic squid (*Architeuthis*) was most likely the foundation of the old Norse accounts,[9] and also of those which in the early part of the 19th century came so frequently from the United States as to gain for the animal the sobriquet of "American sea-serpent."[10] These stories were so circumstantial, so consistent, and vouched for by persons of such eminence, that no doubt was possible (notwithstanding the cavilling of Mitchell)[11] as to the existence of a strange marine monster of very definite character in those regions. The description commonly given of it has been summed up by Gosse[12] somewhat thus:—(i.) general form that of a serpent; (ii.) length averaging 60 ft.; (iii.) head flattened, eye generally not mentioned, some distinctly stating that it was not seen; (iv.) neck 12 to 16 in. in diameter; (v.) appendages on the head, neck or back (accounts here variable); (vi.) colour dark, lighter below; (vii.) swims at the surface, head thrown forward and slightly elevated; (viii.) progression steady and uniform, body straight but capable of being bent; (ix.) water spouting from it; (x.) in shape like a "nun buoy." The annexed figure (fig. 1) represents one which was seen from H.M.S. "Daedalus."[13] To show the reasonableness of this hypothesis, it may be added that gigantic Cephalopods are not unfrequent on the shores of Newfoundland.[14] and are occasionally met with on the coasts of Scandinavia,[15] Denmark and the British Isles,[16] and their extreme size seems to be above 60 ft., and, furthermore, that their mode of progression is by means of a jet of water forcibly expelled from the siphon, which would impart that equable motion to which several observers allude as being evidently not produced by any serpentine bending of the body. A very interesting account of a monster almost certainly originating in one of these squids is that of Hans Egede,[17] the well-known missionary to Greenland; the drawing by Bing, given in his work, is reproduced here (fig. 2), with a sketch of a squid in the act of rearing itself out from the water (fig. 3), an action which they have been observed in aquaria habitually to perform. Numerous other accounts seem to be explicable by this hypothesis,[18] among them may be mentioned that of a huge "snake" seen by certain of the crew of the "Pauline" in the South Atlantic Ocean, which was said to be coiled twice round a large sperm whale, and then towered up many feet into the air and finally dragged the whale to the bottom. It is now well-known that the sperm whale kills and devours *Architeuthis* and other large oceanic Cephalopods, and no one who has read Bullen's vivid description, in *The Cruise of the Cachalot*, of the struggle between a cachalot and a giant squid, can doubt that it was a combat of this kind which was thus erroneously described. The immensely long arms of *Architeuthis* would not unnaturally be mistaken for a snake by sailors, and instead of being dragged to the bottom the whale doubtless sounded of its own accord as whales usually do (see CUTTLE-FISH). (7) A sea-lion, or "Anson's seal" (*Morunga elephantina*), was suggested by Owen[19] as a possible explanation of the serpent seen from H.M.S. "Daedalus"; but as this was afterwards rejected by Captain M'Quahae,[20] who stated that it could not have been any animal of the seal kind, it seems better to refer the appearance to a squid. (8) A plesiosaurus, or some other of the huge marine reptiles usually believed to be extinct, might certainly have produced the

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[1] Convention relative to certain restrictions on the exercise of the right of capture in maritime war (art. 1).

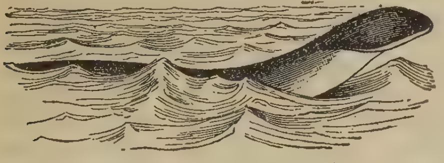
FIG. 1.—Sea-serpent, as seen from H.M.S. "Daedalus."

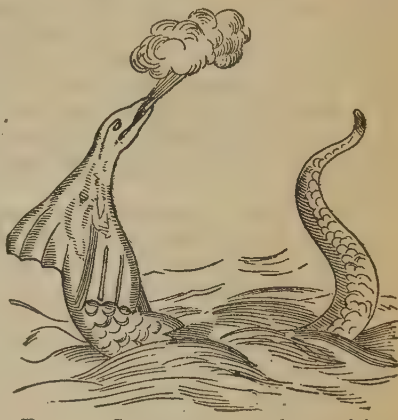
FIG. 2.—Sea-serpent, as observed by Hans Egede.

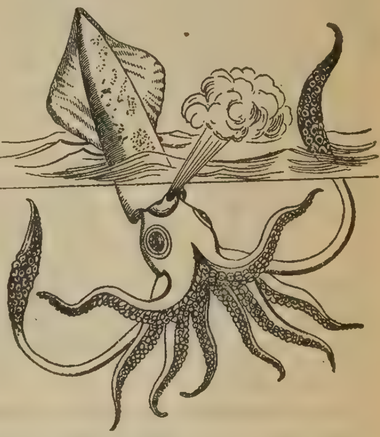
FIG. 3.—Squid, rearing itself out of the water.

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[1] Mott, *Nature*, xxvii. pp. 293, 315, 338; also *Land and Water* (September 1872).

[2] *Nature*, ibid.; also Drew, in vol. xviii. p. 489; Bird, *tom. cit.* p. 519; Ingleby, *tom. cit* p. 541.

[3] F. Smith, *Times* (February 1858); Herriman, quoted by Gosse, *op. cit. postea*, p. 338; Pringle, *Nature*, xviii. p. 519 (1878).

[4] *Mem. Wern. Soc. Edin.* vol. i. pp. 418-444, pls. ix.-xi. (1811).

[5] *Ann. Mag. Nat. Hist.* ser. 2, vol. ii. p. 461 (1848); for a criticism of these views, see Traill, *Proc. Roy. Soc. Edin.* vol. iii. p. 208 (1857).

[6] Owen, *Odontography*, p. 30.

[7] *Leisure Time Studies*, p. 115 (London, 1879), containing a readable essay on the subject; *Scotsman* (6th September 1878); *Nature, loc. cit.*

[8] *Study of Fishes*, p. 521 (Edinburgh, 1880).

[9] See note 2; also Deinbolt, quoted in *Zoologist*, p. 1604 (1847).

[10] Bigelow, *Amer. Journ. Sci.* vol. ii. pp. 147-165 (1820); Warburton, *ibid.* vol. xii. p. 375 (1823); *Zoologist*, p. 1714 (1847).

[11] *Amer. Journ. Sci.* vol. xv. p. 351 (1829).

[12] *Romance of Natural History*, p. 345 (London, 1859).

[13] M'Quahae, *Times* (October 1848); *Ill. Lond. News* (October 1848).

[14] A. E. Verrill, *Trans. Connect. Acad.* vol. v. part i. (1880), containing an account of all authenticated specimens of gigantic squids.

[15] Steenstrup, *Forhandl. Skand. Naturf., 7de Möde*, pp. 182-185 (Christiania, 1857).

[16] Saville Kent, *Proc. Zool. Soc. Lond.* p. 178 (1874); More, *Zoologist*, p. 4526 (1875); also *Ann. Mag. Nat. Hist.* ser. 4, vol. vi. p. 123.

[17] *Det gamle Grönlands nye Perlustration* (Copenhagen, 1741; Eng. trans., *A Description of Greenland*, London, 1745, pp. 86-89); also Paul Egede, *Efterretninger om Grönland*, Copenhagen, n.d., pp. 45, 46.

[18] L. de Ferry, quoted by Pontoppidan, *op. cit.*; Davidson and Sandford, quoted in *Zoologist*, p. 2459 (1849); Senior, *Graphic* (19th April 1879); Barnett, *Nature*, vol. xx. p. 289 (1879); Penny, *Ill. Lond. News*, vol. lxvii. p. 515 (20th November 1875).

[19] *Ann. Mag. Nat. Hist.* ser. 2, vol. ii. p. 461 (1848).

[20] *Times* (21st November 1848).

phenomena described, granting the possibility of one having survived to the present time. Newman[1] and Gosse[2] have both supported this theory, the former citing as evidence in its favour the report of a creature with the body of an alligator, a long neck and four paddles having been seen by Captain Hope of H.M.S. “ Fly ” in the Gulf of California.[3] (9) No satisfactory explanation has yet been given of certain descriptions of the sea-serpent. Perhaps the most remarkable of these is Lieutenant Hayne's[4] account of a creature seen from H.M. yacht “Osborne.” Two different aspects were recorded—the first being a ridge, 30 ft. in length, of triangular fins, each rising 5 to 6 ft. above the water, while the second view showed a large round head 6 ft. in diameter, with huge flappers, which moved like those of a turtle.

A more recent record of the appearance of a mysterious sea-monster is that of Messrs Meade-Waldo and Nicoll, both fellows of the Zoological Society, in the *Proceedings* of that Society for 1906, p. 719. These two gentlemen on the 7th of December 1905 were on board the yacht “ Valhalla ” off the coast of Brazil when at 10·15 A.M. they saw, 100 yds. from the ship, a large fin projecting above the water to a height of 18 in. or 2 ft., and 6 ft. in length. Under the water to the rear of the fin was the shade of a considerable body. When Mr Meade-Waldo directed his field-glasses upon the object he saw a great head and neck rise out of the water in front of the fin. The neck appeared about the thickness of a man's body, and 7 to 8 ft. in length. The head was of the same thickness and had a very turtle-like appearance, eye and mouth being distinctly seen. The object was going very slowly and shortly disappeared from view. In this case as in others the objects seen were not sufficient to identify the nature of the animal. It is difficult to attribute such a head and neck to any known fish, and turtles have no dorsal fin. It would thus appear that, while, with very few exceptions, all the so-called “ sea-serpents ” can be explained by reference to some well-known animal or other natural object, there is still a residuum sufficient to prevent modern zoologists from denying the possibility that some such creature may after all exist.

Distinct in origin from the stories already touched on is the legend of the sea-serpent or *tinnīn* among the Arabs (Mas'ūdī i. 266 seq.; Kazwīnī i. 132 seq.; Damiri i. 186 seq.), which is described in such a way as to leave no doubt that the waterspout is the phenomenon on which the fable rests. The *tinnīn* is the Hebrew *tannīn* (E.V. “ whale,” “ dragon ”), which in Ps. cxlviii. 7 might in the context be appropriately rendered “ waterspout.”

In addition to the sources already cited, the reader may consult *Blackwood's Magazine*, vol. iii. (1818); Lee, *Sea Monsters Unmasked* (International Fisheries Exhibition *Handbook*, London, 1883); Cogswell, *Zoologist*, pp. 1841, 1911 (1847); and Hoyle, *Proc. Roy. Phys. Soc. Edin.* vol. ix. (W. E. Ho.; J. T. C.)

SEA-SICKNESS, the symptoms experienced by many persons when subjected to the pitching and rolling motion of a vessel at sea, of which depression, giddiness, nausea and vomiting are the most prominent. They generally show themselves soon after the vessel has begun to roll by the onset of giddiness and discomfort in the head, together with a sense of nausea and sinking at the stomach, which soon develops into intense sickness and vomiting. At first the contents of the stomach only are ejected; but thereafter bilious matter, and occasionally even blood, are brought up by the violence of the retching. The vomiting is liable to exacerbations according to the amount of oscillation of the ship; but seasons of rest, sometimes admitting of sleep, occasionally intervene. With the sickness there is great physical prostration, as shown in the pallor of the skin, cold sweats and feeble pulse, accompanied with mental depression and wretchedness. In almost all instances the attack has a favourable termination, except in the case of persons weakened by other diseases.

The conditions concerned in the production of the malady are apparently of complex character. In the first place, the rolling or heaving of the vessel disturbs that feeling of the relation of the body to surrounding objects upon which the sense of security rests. The nervous system being thus subjected to a succession of shocks fails to effect the necessary adjustments for equilibrium. Giddiness and with it nausea and vomiting follow, aided probably by the profound vaso-motor disturbance which produces such manifest depression of the circulation. The displacement of the abdominal viscera, especially the stomach, by the rolling of the vessel may possibly operate to some extent, but it can only be as an accessory cause. The same may be said of the influence of the changing impressions made upon the vision, since attacks of sea-sickness occur also in the dark, and in the case of blind persons. Other contributory causes may be mentioned, such as the feeling that sickness is certain to come, which may bring on the attack in some persons even before the vessel has begun to move; the sense of the body being in a yielding medium, the varied odours met with on board ship, and circumstances of a like nature tend also to precipitate or aggravate an attack.

No means has yet been discovered which can altogether prevent the occurrence of sea-sickness, nor is it likely any will be found, until the pitching movements of the vessel are done away with. Swinging couches or chambers have not proved of any practical utility. No doubt there is less risk of sickness in a large and well-ballasted vessel than in a small one; but, even though the rolling may be considerably modified, the ascending and descending movements which so readily produce nausea continue. None of the medicinal agents proposed possess infallible properties: a remedy which suits one person will often wholly fail with another. Nerve sedatives are among the most potent drugs which can be employed; and doses of bromide of potassium, bromural or chloral, appear to act usefully in the case of many persons. On the other hand, some high authorities have recommended the employment of nerve stimulants, such as a small cupful of very strong coffee, to be taken about two hours before sailing, which will frequently prevent or mitigate the sickness. When the vessel is in motion, or even before starting, the recumbent position with the head low and the eyes closed should be assumed by those at all likely to suffer, and, should the weather admit, on deck rather than below—the body, especially the extremities, being well covered. Many persons, however, find comfort and relief from lying down in their berths with a hot bottle to the feet, by which means sleep may be obtained, and with it a temporary abatement of the giddiness and nausea. Should sickness supervene small quantities of some light food, such as thin arrowroot, gruel or soup, ought to be swallowed if possible, to lessen the sense of exhaustion. The vomiting may be mitigated by saline effervescing drinks, ice, chloroform, hydrocyanic acid or opium. Alcohol, although occasionally useful in great prostration, generally tends rather to aggravate the sickness. Dr Chapman, in accordance with his view that the cause of the sickness is an undue afflux of blood to the spinal cord, introduced a spinal ice-bag; but, like every other plan of treatment, it has only occasional success. Such remedies as nitrite of amyl and cocaine do not seem to yield any better results.

SEASON (O. Fr. *seson*, *seison*, mod. *saison*, Lat. *satio*, sowing time, the spring, from *serere*, to sow; in Late Lat. the word is found with its present meaning, the spring being considered as particularly *the* season of the year), a period of time, in particular, that of the four periods into which the year is divided by the changing of the temperature, rainfall, and growth and decay of vegetation due to the annual motion of the sun in declination. Divided strictly according to this motion the year falls into four nearly equal seasons, “ spring ” (*i.e.* the springing time, when vegetation rises or shoots), “ summer ” (O. Eng. *sumer*, cf. Dutch *zomer*, Ger. *Sommer*, probably connected with Skt. *sama*, year), “ autumn ” (Lat. *autumnus*, *auctumnus*, from *augere*, to increase, the period of ripening or fruiting) and “ winter ” (common Teutonic, possibly a nasalized form of root seen in “ wet ”). (See further CLIMATE, METEOROLOGY.)

SEATON, SIR JOHN COLBORNE, 1ST BARON (1778–1863), British field marshal, was born at Lyndhurst, Hants, on the 16th of February 1778 and entered the 20th (Lancashire Fusiliers) in 1794, winning thereafter every step in his regimental promotion without purchase. He first saw service in the Helder expedition of 1799, and as a captain he took part in Sir Ralph Abercromby's expedition to Egypt in 1801. He distinguished himself at Maida, and soon afterwards was brought under the notice of Sir John Moore, who obtained a majority for him and made him his military secretary. In this capacity he served through the Corunna campaign, and Sir John Moore's dying request that he should be given a lieutenant-colonelcy was at once complied with. In the summer of 1809 Lieut.-Colonel Colborne was again in the Peninsula, and before taking command of the 66th regiment, he witnessed the defeat of the Spaniards at Ocaña. With the 66th he was present at Busaco and shared in the defence of the lines of Torres Vedras, and next year, after temporarily commanding a brigade with distinction at the battle of Albuera, he was gazetted to command the famous 52nd Light Infantry (Oxfordshire and Bucks L.I.) with which corps he is most closely identified. He led it and was very severely wounded at Ciudad Rodrigo (1812), and only rejoined in July 1814. Shortly afterwards he was placed in temporary charge of a brigade of the Light Division which he commanded in the Pyrenees engagements and the battles of Orthes and Toulouse. At the peace he was made colonel, aide-de-camp to the Prince Regent and K.C.B. In 1815 Colborne and the 52nd at Waterloo played a brilliant part in the repulse of the Old Guard at the close of the day. Promoted major-general in 1825, Colborne was soon afterwards made lieutenant-governor of Guernsey. In 1830 he served as lieutenant-governor of Upper Canada. In 1838 at the moment of his vacating the post on promotion to lieutenant-general, the rebellion broke out, and he was ordered to assume the functions of governor-general and commander-in-chief. He quickly repressed the revolt, and in 1839, returning home, he was raised to the peerage as Baron Seaton of Seaton in Devonshire. From 1843 to 1849 he was high commissioner of the Ionian islands. In 1854 he was promoted full general, and from 1855 to 1860 he was commander-in-chief in Ireland. He died at Torquay on the 17th of April 1863.

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[1] *Zoologist*, p. 2395.

[2] *Op. cit.* p. 358.

[3] *Op. cit.*, p. 2356 (1849).

[4] *Graphic* (30th June 1877).

See the *Life* by G. C. Moore Smith (1906).

SEATTLE, the county-seat of King county, Washington, U.S.A., and the largest city in the state, situated on a neck of land between Elliott Bay (an eastern arm of Admiralty Bay, Puget Sound) and the fresh-water Lake Washington; about 865 m. by water N. of San Francisco, about 185 m. by rail N. of Portland, Oregon, and about 28 m. N. of Tacoma. Pop. (1870) 1107; (1880) 3533; (1890) 42,837; (1900) 80,671; (1910 U.S. census) 237,194. Of the population in 1900, 41,483 were of foreign parentage and 22,003 were foreign-born. The area of the city in 1910 was about 83·45 sq. m., of which 29·42 sq. m. were water surface, 23 sq. m. being salt water. Seattle is the terminus of the Northern Pacific, the Canadian Pacific (using the tracks of the Northern Pacific), the Great Northern, the Chicago, Milwaukee & Puget Sound (1909), the Oregon & Washington (1910; a joint extension to Puget Sound of the Southern Pacific and Union Pacific), the Chicago, Burlington & Quincy (using the tracks of the Northern Pacific), and the Columbia & Puget Sound railways. It is served by inter-urban electric lines to Tacoma and Everett; is the starting-point for steamers to Alaska and to Prince Rupert, British Columbia (Grand Trunk Pacific line), and for lines to Japan, China, Siberia, Hawaii, the Philippines, Australia, Mexico, South America and Pacific coast ports of the United States; and is a port of call for coasting vessels. The city has the excellent salt-water harbour of Elliott Bay to the W.; and to the E. there is a fresh-water harbour, Lake Washington, connected with Puget Sound by the Lake Washington Canal, an artificial improvement of the natural waterway by Lake Union, a great V-shaped body of water in the north-central part of the city, and by Salmon Bay, a narrow channel setting in from Puget Sound on the N.W. Crossing the S.W. part of the city is Duwamish river, which empties into Elliott Bay. At Bremerton, Kitsap county, about 15 m. W. by S. of Seattle, is the Puget Sound Navy Yard, protected by Fort Ward, with one dry dock (1910) 836 ft. long and 110 ft. wide, another 627 ft. long, and two docks 650 ft. long.

The surface of the city is hilly, the greatest height being 500 ft. above sea-level. The higher hills, the better residential parts of the city, are reached by cable railways or by electric railways following winding routes. Many of the higher hills, especially in the business district, have been removed by hydraulic power and large parts regraded. Lake Washington, to the E., is 22 m. long, and 1 to 4 m. wide, with an area of 50 sq. m., a shore line of 80 m. and a maximum depth of 225 ft; its waters are deep and clear and never freeze. In the north-central part of the city is Green Lake, about 1 m. long and ½ m. wide. On Puget Sound and Lake Union and about these two lakes, both with well-wooded shores and both furnishing excellent boating and canoeing, are the principal parks of the city. In 1910 the total park acreage under the park commissioners was 1058 acres. Immediately S. of Green Lake is Woodland Park (179 acres) with athletic fields and a zoological collection. On the southern shore of Union Bay (a circular, nearly landlocked arm of Lake Washington) in the east-central part of the city is Washington Park (163 acres). Farther S. near Lake Washington are Madrona Park (9 acres), Frink Park (20 acres), which adjoins Leschi Park (4 acres), and Mount Baker Park (12 acres). Near Lake Union is Volunteer Park (48 acres) on Capitol Hill, containing a public observatory (460 ft. above sea-level) and a statue of W. H. Seward by Richard Brooks. Schmitz Park (30 acres) is woodland on the West Seattle peninsula, overlooking the Sound; and between Volunteer Park and Washington Park is Interlaken (46 acres). Kinnear Park (14 acres) is near the entrance to the harbour. Nearly all these parks command views of the Cascade and Olympic ranges. The city owns large areas which are to be improved as parks, including Ravenna Park, which has a noble native fir and cedar forest and sulphur springs. Private parks include the White City (on Lake Washington), Golden Gardens (50 acres) and, in West Seattle (annexed in 1907), Luna Park, an amusement place with a natatorium. North of the city on Lake Washington are the links of the Seattle Golf and Country Club. Practically a part of the city's park system and to be crossed by its boulevards are the campus of the university of Washington, and the fine grounds (605 acres given to the Federal government by the city) of Fort Lawton. On the campus of the university are a statue of Washington by Lorado Taft and a bust of J. J. Hill by Ben Frolick.

The principal public buildings are the county court house (on a commanding site), the county almshouse, the municipal building, a federal building, the Y.M.C.A. building, a Labor Temple, a Carnegie library (1905), with several branches throughout the city and about 128,000 volumes in 1910, and the buildings of the university of Washington. In Georgetown, immediately S. of the main part of Seattle and nearly hemmed in by parts of the city, is the county hospital. The city has many churches, including Chinese, Japanese, Finnish, Scandinavian, German and Russian. Seattle is the see of a Roman Catholic bishop, and St James Cathedral is the finest church in the city. The First Presbyterian Church has a large auditorium.

Of the many educational institutions, the most important is the university of Washington (see WASHINGTON), which was established here by the legislature of 1854–1855. Among the others are: the Washington Preparatory School for Girls; the Holy Names Academy and Normal School (under the Sisters of the Holy Names of Jesus and Mary); the College of Our Lady of Lourdes; Adelphia College; the Brothers' School; the Seattle College; three business colleges; the Seattle Art School, in connexion with which the Art Students' League of Seattle was formed in 1909; and a good public school system including six high schools in 1910, one of which has an excellent collection of the fauna and flora of the Pacific Coast. On Mercer Island in Lake Washington is the parental school of the municipal public school system. The city has a cosmopolitan press, including two Japanese dailies.

There are an associated charities organization and a "charities endorsement committee" (1903), which is under the auspices of three commercial associations. For children there are a receiving home (1896, under the Washington Children's Home Society); the Seattle Children's Home (1884, under the Ladies' Relief Society of Washington); and a children's orthopaedic hospital (1907). The Seattle Federation of Women's Clubs supports a Girls' Home and Training School (1909). Under Roman Catholic control are a Deaconess Home, the Mount Carmel Home (under the Missionary Sisters of the Sacred Heart of Jesus), and the House of the Good Shepherd (under the Sisters of the Good Shepherd). The Ladies' Hebrew Benevolent Society, the Ladies' Montefiore Aid Society and the Hebrew Benevolent Association are Jewish charities. Other charities are the Seattle Seamen's Friend Society, the Florence Crittenton Home, the Lebanon Rescue Mission, the Japanese Women's Home, the Seattle Fruit and Flower Mission, and the Kenny Home for Old Ladies (Presbyterian). The principal hospitals are the Pacific (1899), the Seattle General (1894, under the Deaconess Home Association), the Providence (1877, under the Sisters of Charity), the Minor, the Wayside Emergency (1900), the Municipal and the County.

The situation of Seattle makes it important commercially and industrially. For its manufactories electric power is derived from Snoqualmie Falls (N.E. of Seattle) from Puyallup river (S.W.) and from Cedar river.

The total value of the factory product in 1905 (excluding Ballard) was $25,406,574 (nearly one-fifth of that of the state), or 65·8 % more than in 1900. The increase was particularly marked in the value of flour, $4,593,566, or 253·9 % more than in 1900. Other important manufactures in 1905 were: packed meats and slaughter house products ($3,419,085); malt liquors ($2,121,631); foundry and machine shop products ($1,771,571)—there is a large manufactory of nuts and bolts; lumber and timber ($1,519,247); confectionery ($821,123); canned and preserved fish ($610,356); and ships and boats. In what was formerly Ballard, now the 13th ward, on Salmon Bay, there are large mills for the manufacture of red cedar shingles.

Seattle is the most important seaport of the state, being the commercial and industrial centre for the customs district of Puget Sound. In 1909 the net tonnage of vessels entering the harbour (local figures) was 2,467,351 tons. The foreign exports in 1908 (Harbour Master's Report) were valued at $18,413,735, the foreign imports at $23,805,727. Its exports and imports make up the greater part of the commerce of the district, which has Port Townsend as its port of entry, and the city is rivalled only by San Francisco among the cities of the Pacific coast in the amount of its water-borne traffic. The chief exports are wheat, flour, timber, hay, potatoes, live stock, fruit, fish (salmon), oats, coal (from the mines E. of Lake Washington), hops, cotton (from the Southern States), dairy products and general merchandise; and the imports include silk, rice, coffee, tea, sugar, spices, indigo and other Oriental products. Practically all the gold from Alaska and the Yukon territory is received here, and nearly 80 % of the Alaskan trade is done through Seattle. The foreign trade is with China, Japan, Siberia, Hawaii, the Philippines, Australia, Mexico, South America and Europe. The Chamber of Commerce has an excellent commercial museum.

The city was chartered in 1880, and under the charter of 1896 (as amended since) elections are biennial. By an amendment of 1908 the initiative and referendum were introduced; an initiative petition must be signed by 10 % of the voters at the preceding municipal election; a petition for a referendum on any ordinance passed by the city council must be signed by 8 % of the voters at the preceding municipal election. The city council is composed of one councilman elected for a two-year term from each ward (in 1910 there were 14 wards), and two councilmen elected at large and serving for four years. The municipality owns the water-supply system with its source at Cedar Lake and Cedar river, 28 m. S.E., and an electric lighting plant (for which power is derived from the falls of the Cedar river), but most of the lighting is supplied by private companies. The city has undertaken the regrading necessitated by the hilly site of Seattle. In 1909 the assessed valuation of the city was $185,317,470 and the city's debt was $8,570,380 (bonded) and $8,933,973 (net debt for local improvements).

The first permanent settlement here was made in 1852 by settlers who a year before had established New York, a village at Alki Point, on the W. side of Elliott Bay and in the present city limits. The name Seattle was given to the settlement in honour of a Dwamish chief of that name, who died in 1866 and who was friendly to the whites. In 1853 a town plat was filed, King county was erected, and Seattle became the county seat. In 1855 Seattle had a population of 300. In January 1856 in an attempt to exterminate the whites the neighbouring Indians unsuccessfully attacked Seattle, which was defended by the U.S. sloop-of-war "Decatur." The first railway reached Seattle in 1884. In 1885–1886, when there were anti-Chinese riots here led by the Knights of Labour, martial law was declared by the governor and the Chinese were defended by local vigilance committees. A destructive fire in 1889 and the financial depression of 1893 checked the city's growth, which, however, received a new impulse from the discovery of gold in Alaska and the Yukon territory in 1897, as Seattle became the outfitting place for prospectors and the port to which gold was shipped. The town of South Seattle was annexed in 1905; and the city of South-east Seattle, the town of Ravenna, the town of South Park, the city of Columbia, the city of Ballard, the city of West Seattle, and Dunlap, Rainier Beach and Atlantic City were annexed in 1907. From the 1st of June to the 15th of October 1909 the Alaska-Yukon-Pacific Exposition was held in Seattle on grounds which now form part of the university campus, between Lake Union and Lake Washington; of the twelve central Exposition buildings some were afterwards turned over to the university. The purpose of the Exposition was to exploit Washington, the Yukon and the entire north-west on the Pacific slope.

SEA-URCHIN. These animals belong to the great group of Echinoderms (see ECHINODERMA) and to its class Echinoidea. Both the scientific and the English names denote their resemblance to the urchin or hedgehog, the resemblance lying in the prickles with which the skin is covered. The skin itself is stiffened by a deposit of calcite (crystalline carbonate of lime) in the form of plates. If the prickles be scraped away, these plates will be seen to form a hard shell or test, in which are two openings, for the mouth and the anus. According to the position of these openings the urchins are described as Regular or Irregular. In the Regular urchins, of which *Echinus esculentus*, the edible egg-urchin (fig. 1), and *Dorocidaris papillata*, the piper (fig. 2), are familiar examples, the test is spheroidal with the mouth at the lower pole and the anus at the upper. In the Irregular urchins, of which *Spatangus purpureus*, the purple heart-urchin (fig. 3), is a common type, the test has been drawn out into an oval or heart shape, with the mouth shifted towards the front end and the anus towards the hinder end.

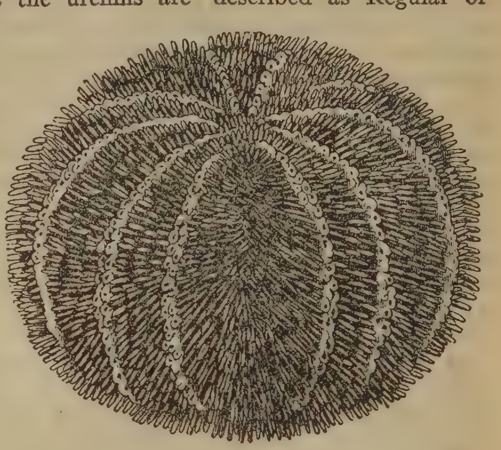


FIG. 1.—A Regular Sea-urchin, *Echinus esculentus*. The test is still covered with spines, between which the suckers of the podia are seen in ten rows.

The greater part of the test of a Regular urchin is divided, as a globe by meridians of longitude, into ten areas, each composed of two columns of plates. In five of these areas the plates are pierced by pairs of pores (fig. 2, *Ambulacrum*), and in life there issues from each pair a tubular process with a sucking disk at its end (fig. 1). Within the test these processes or podia are connected with five tubes arising from a tubular ring round the mouth and running upwards to the apex, where each passes out as a single process through a special plate at the end of the area to which it belongs. Since this terminal process is sometimes surrounded by pigment, as are organs susceptible to light, it has been regarded as an eye and the plate through which it passes called an ocular (fig. 2). From the ring-canal round the mouth a single tube passes straight through the body-cavity to the apex, where it opens through a sieve-like plate—the madreporite (fig. 2). Thus all this system of tubes is placed in connexion with the outer sea-water, and is filled with it. Within the test the bottom of each podium is swollen into a little bag—ampulla—likewise full of water, and when the muscles with which it is provided pull the sides of the bag together, the water is squeezed into the podium and dilates it, so that it is stretched far out (see ECHINODERMA, fig. 12 D). The podium can then wave about and attach its sucker to any smooth object within reach. Each of these five areas, with the podia on each side of it extended and waving, looks like a garden avenue—Latin *ambulacrum*—and the areas are therefore called ambulacral areas, the plates composing them ambulacrals, and the whole system of water-vessels the ambulacral system. This system forms perhaps the most characteristic feature of all living Echinoderms, but it reaches its highest development in the urchins. The five areas alternating with the ambulacral areas are called interambulacral (fig. 2, *Interambulacrum*); their plates are not pierced by pores but are generally ornamented by large tubercles bearing big prickles (spines or radioles), between and around which are smaller prickles (fig. 2). The madreporite is one of five plates that surround the anal opening and alternate in position with the oculars. Each of these plates is pierced by a pore, connected on the inside with one of the five generative glands, and giving passage to the eggs or milt when they are ripe; hence these plates are called genitals (fig. 2). The five genitals and five oculars together form the apical system of plates (see ECHINODERMA, fig. 3, A.B.). From the mouth to the anus the gut follows a coiled course, first going round the cavity of the test in one direction and then turning back on itself, while the two limbs of the loop thus formed are themselves thrown into festoons attached by strands to the wall of the test. The lower coil, next the mouth, is the stomach in which food accumulates, while the upper coil is the intestine proper. In *Echinus*, but not in the Cidarids, a narrow tube branches from the gut at the beginning of the first coil, runs alongside the stomach, and re-enters the gut at the end of the coil; this, which is called the siphon, permits a flow of water through the gut however full of food the stomach may be. Round the gullet is a jaw-apparatus, consisting essentially of five hard, pointed teeth, the ten jaw-pieces in which they are held, five struts between the pairs of jaws, and five cambered stays for the attachment of ligaments to keep the whole apparatus in position. The jaws are worked by muscles in such a way as to draw the teeth together or apart, inwards or outwards. This apparatus is often called "Aristotle's lantern," though it is extremely doubtful whether Aristotle (*Hist. Anim.* iv. 5) was alluding to this structure. The whole of it is covered by the membrane lining the body-cavity, and from the space thus enclosed there pass to the exterior five pairs of hollow branched appendages, the external gills; the five notches through which the gills passed can be seen in the dried test of an Echinus from which the mouth-membrane has been removed, but not in the test of the piper-urchin or other Cidarid, because there the gills are not developed.

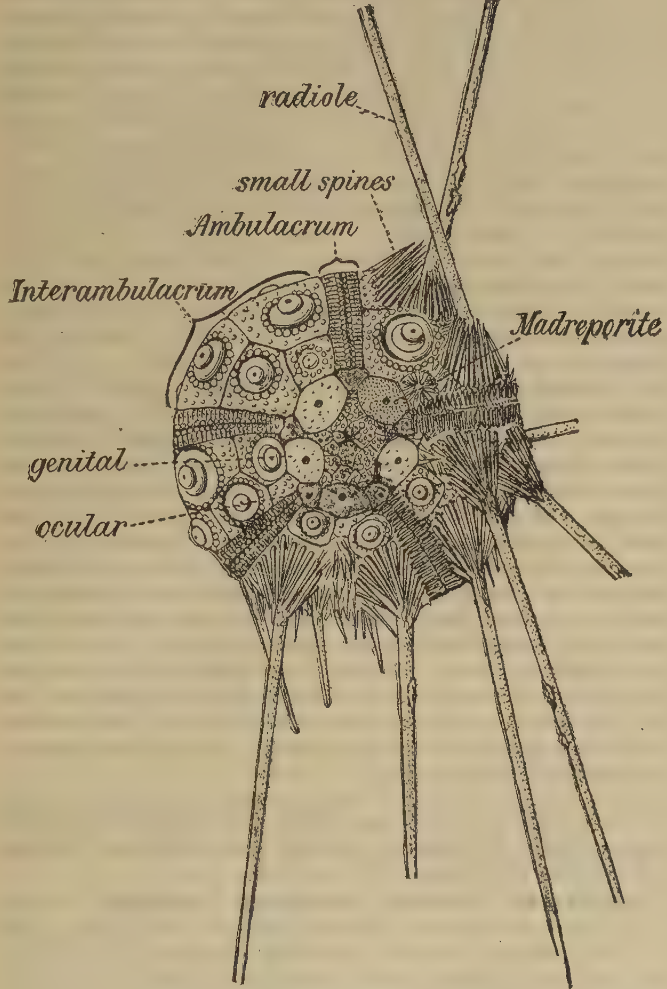


FIG. 2.—A Regular Sea-urchin, *Dorocidaris papillata*. The test seen from above, with most of the spines removed. Natural size.

The prickles that cover the test are better studied in the piper-urchin (fig. 2), where some of them are very large and, from their resemblance to the drones of a bagpipe, have suggested the name of the animal. Each of these large spines or radioles is attached to a rounded tubercle by an enclosing ligament and outer coat of muscles, the base of the radiole being hollowed to fit on the tubercle. Thus the radiole can be moved in any direction. The attachment of the larger radioles is protected by a ring of smaller ones. These and the other small spines protect the sea-urchin, as its prickles protect a hedgehog; the larger ones may also help the animal to move or to fix itself firmly against the shock of waves. Some urchins, especially the purple egg-urchin, bore holes even in very hard rocks, and by stretching out their radioles they can hold themselves immovably in their holes; how they bore the holes is not known with certainty. Besides radioles, small pincer-like appendages called pedicellariae are attached to the test by similar ball-and-socket joints. Each consists of a long stalk bearing three blades which can meet at their points; on the inner surface of each blade is a cushion of sensitive skin, and often a gland which secretes a poison. The pedicellariae were once supposed to be parasites, but they are really organs of the urchin of the same nature as the radioles; they are of four different forms, three of which undoubtedly serve for defence, while the shortest ones clean the test from impurities and sand-grains that fall between the radioles. Sea-urchins other than Cidarids also bear on the test minute sensory organs called sphaeridia, each consisting of a small hard knob, supported by a stalk which may be partly calcified but always contains many nerve-fibres. It is generally supposed that they are sensitive to vibrations in the water, and to any change from the normal position which the animal may assume or be forced into. Such a regular urchin as has here been described lives with the mouth downwards, preferring a hard floor, on which it creeps by its podia and its radioles, constantly scraping the algae and seaweeds from the rock with its teeth and so feeding itself. If it does not bore a hole, or is not protected by long needle-like radioles, it may grasp bits of sea-weed or other objects with its pedicellariae and hide beneath them from the fish that seek it for food.

The Irregular urchins (fig. 3) have been modified for another way of life. Some of them live in mud or ooze, through which they creep. The mouth has moved forward, has lost its jaws and often has a lip, projecting so as to scoop up the mud. The prickles have become smaller, often almost silky, and are generally directed backwards so as not to oppose the passage of the body. The podia of the under surface still aid locomotion, but those of the upper surface, which are concentrated in five petal-shaped areas, act mainly as gills. These urchins often assume a heart shape, owing to the greater development and sinking in of the front petal. The sand-dollars and their allies, which live half-buried in sand without moving through it, retain a more or less circular outline, as well as the central position of the mouth, which has not lost its jaws; the anus, however, has moved to the side, while the podia of the upper surface are concentrated in petals and many of them modified into branched gills. The sand-dollars proper are very thin and flat, but the shield-urchins (*Clypeaster*, &c.) have the central region of the upper surface raised in a boss, which reaches above the sand, so that the animal can still breathe though the whole body is hidden. In many Irregular urchins the petals of the ambulacra are deeply sunk, and serve as a nursery for the young, which are covered by the spines of the parent.

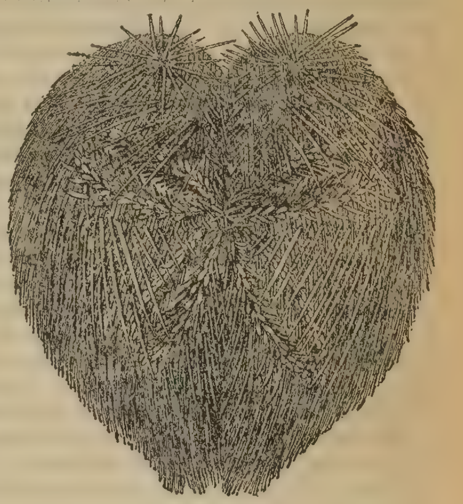
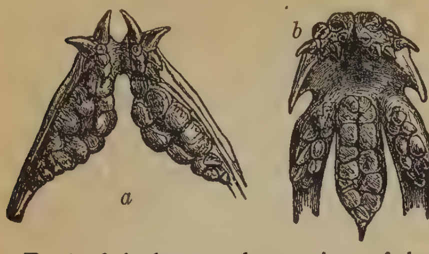


FIG. 3.—An Irregular Sea-urchin, *Spatangus purpureus*.

Sea-urchins live only in the sea, from between tide-marks down to all but the greatest depths. The abyssal forms have very thin tests, which are often flexible. Urchins eat all kinds of animal and vegetable food, and are themselves attacked by fish, by star-fish, and even by other urchins. The ripe egg-bunches are a favourite article of diet with dwellers round the Mediterranean; in other respects sea-urchins are of small importance to man, being neither useful nor harmful. In olden times the larger radioles were recommended to be powdered and taken as a remedy for the stone.

For details of classification, see under *Echinoidea*, in the article ECHINODERMA.

SEA-WOLF, also SEA-CAT and WOLF-FISH (*Anarrhichas lupus*), a marine fish, the largest of the family *Blenniidae* or blennies. In spite of its large size, it has retained the bodily form and general external characteristics of the small blennies. Its body is long, subcylindrical in front, compressed in the caudal portion, smooth and slippery, the rudimentary scales being embedded and almost hidden in the skin. An even dorsal fin extends the whole length of the back, and a similar fin from the vent to the caudal fin, as in blennies. The pectorals are large and rounded, the pelvic fins entirely absent. Its dentition distinguishes the sea-wolf from all the other members of the family. Both jaws are armed in front with strong conical teeth, and on the sides with two series of large tubercular molars, a biserial band of similar molars occupying the middle of the palate. By these teeth the sea-wolf is able to crush the hard carapaces or shells of the crustaceans and molluscs on which it feeds; that it uses the teeth as a weapon of defence and deserves the character of ferocity generally attributed to it would appear to be rather questionable. Sea-wolves are inhabitants of the northern seas of both hemispheres, one (*A. lupus*) being common on the coasts of Scandinavia and North Britain, and two in the seas round Iceland and Greenland. Two others occur in the corresponding latitudes of the North Pacific. They attain to a length exceeding 6 ft., and in the north are esteemed as food, both fresh and preserved. The oil extracted from the liver is said to be in quality equal to the best cod-liver oil.



Teeth of the lower and upper jaws of the Sea-wolf.

To the fishermen of the North Sea this fish is generally known as the cat-fish, and for some years past numbers of this species have been marketed. As it would be impossible to sell the fish in its natural state on account of its forbidding appearance, it is skinned and beheaded, and the flesh retailed under the name of rock-salmon.

SEAWRACK, the detached seaweeds thrown up, often in great quantities, by the sea and used for manure, also formerly for making kelp. It consists largely of species of *Fucus*—brown seaweeds with flat branched ribbon-like fronds, characterized in *F. serratus* by a saw-toothed margin and in *F. vesiculosus*, another common species, by bearing air-bladders. Also of *Zostera marina*, so-called sea-grass, a marine flowering plant with bright green long narrow grass-like leaves.

SEBASTIAN, ST, a Christian martyr whose festival is celebrated on the 20th of January. According to St Ambrose (in Psalm 118, oct. 20) Sebastian was a native of Milan, went to Rome at the height of Diocletian's persecution, and there suffered martyrdom. The *Acta* of St Sebastian, falsely attributed to the same St Ambrose, are far less sparing of details. They make him a citizen of Narbonne and captain of the first cohort under the emperors Diocletian and Maximian. Having secretly become a Christian, Sebastian was wont to encourage those of his brethren who in the hour of trial seemed wavering in their profession. This was conspicuously the case with the brothers Marcus and Marcellinus. He made many converts, several of whom suffered martyrdom. Diocletian, having been informed of this conduct, sent for him and earnestly remonstrated with him, but, finding him inflexible, ordered him to be bound to a stake and shot to death. After the archers had left him for dead, a devout woman, Irene, came by night to take his body away for burial, but, finding him still alive, carried him to her house, where his wounds were dressed. No sooner had he wholly recovered than he hastened to confront the emperor, reproaching him with his impiety; Diocletian ordered him to be instantly carried off and beaten to death with rods. The sentence was forthwith executed, his body being thrown into the *cloaca*, where, however, it was found by another pious matron, Lucina, whom Sebastian visited in a dream, directing her to bury him *ad Catacombas juxta vestigia apostolorum*. It was on this spot, on the Appian way, that was built the basilica of St Sebastian, which was a popular place of pilgrimage in the middle ages. The translation of his relics to Soissons in 826 made that town a new centre of his cult. St Sebastian is specially invoked against the plague. As a young and beautiful soldier, he is a favourite subject of sacred art, being most generally represented undraped, and severely though not mortally wounded with arrows.

See *Acta Sanctorum*, January, ii. 257-296; *Bibliotheca hagiographica Latina* (Brussels, 1899), n. 7543-7549; A. Bell, *Lives and Legends of the Evangelists, Apostles and other early Saints* (London, 1901), pp. 238-240. (H. De.)

SEBASTIAN, king of Portugal (Port. *Sebastião*) (1554–1578), the posthumous son of Prince John of Portugal and of his wife Joanna, daughter of the emperor Charles, ~~was~~ born in 1554, and became king in 1557, on the death of his grandfather John III. of Portugal. During his minority (1557–1568), his grandmother Queen Catherine and his great uncle the Cardinal Prince Henry acted jointly as regents. Sebastian's education was entrusted to a Jesuit, D. Luiz Conçalves da Camara and to D. Aleixo de Menezes, a veteran who had served under Albuquerque. He grew up resolved to emulate the medieval knights who had reconquered Portugal from the Moors. He was a mystic and a fanatic, whose sole ambition was to lead a crusade against the Mahommedans in north-west Africa. He entrusted the government to the Jesuits; refused either to summon the Cortes or to marry, although the Portuguese crown would otherwise pass to a foreigner, and devoted himself wholly to hunting, martial exercises and the severest forms of asceticism. His first expedition to Morocco, in 1574, was little more than a reconnaissance; in a second expedition Sebastian was killed and his army annihilated at Al Kasr al Kebir (4th of August 1578). Although his body was identified before burial at Al Kasr, reinterred at Ceuta, and thence (1582) removed by Philip II. of Spain to the Convento dos Jeronymos in Lisbon, many Portuguese refused to credit his death. "Sebastianism" became a religion. Its votaries believed that the *rei encuberto*, or "hidden king," was either absent on a pilgrimage, or, like King Arthur in Avalon, was awaiting the hour of his second advent in some enchanted island. Four pretenders to the throne successively impersonated Sebastian; the first two, known from their places of birth as the "King of Penamacor" and the "King of Ericeira," were of peasant origin; they were captured in 1584 and 1585 respectively. The third, Gabriel Espinosa, was a man of some education, whose adherents included members of the Austrian and Spanish courts and of the Society of Jesus in Portugal. He was executed in 1594. The fourth was a Calabrian named Marco Tullio, who knew no Portuguese; he impersonated the "hidden king" at Venice in 1603 and gained many supporters, but was ultimately captured and executed. The Sebastianists had an important share in the Portuguese insurrection of 1640, and were again prominent during the Miguelite wars (1828–34). At an even later period Sir R. F. Burton stated that he had met with Sebastianists in remote parts of Brazil (Burton, *Camoens*, vol. i.p. 363, London, 1881), and the cult appears to have survived until the beginning of the 20th century, although it ceased to be a political force after 1834.

See PORTUGAL, *History*; J. Barbosa Machado, *Memorias para . . . . . o governo del rey D. Sebastião* (4 vols., Lisbon, 1736–1741); Miguel d'Antas, *Les Faux Don Sébastien* (Paris, 1866); São Mamede, *Don Sébastien et Philippe II* (Paris, 1884).

SÉBASTIANI, HORACE FRANÇOIS BASTIEN, COUNT (1772–1851) French marshal and diplomatist. Of Corsican birth, he was in his early years banished from his native island during the civil disturbances, and in 1789 he entered the French army. In 1793, as a French lieutenant, he took part in the war in his native island, after which he served in the Army of the Alps. He became *chef de brigade* in 1799. Attached by birth and service to the future Emperor Napoleon, he took part in the *Coup d'État* of 18th Brumaire (9th November 1799). He was present at Marengo in 1800. Sébastiani next appears in his first diplomatic post, in Turkey and Egypt (1802). Promoted general of brigade in 1803, he served in 1805 in the first of the great campaigns of the Empire. His conduct at Austerlitz (2nd December), where he was wounded, won him promotion to the rank of general of division. Sébastiani soon returned to Constantinople as French Ambassador. As ambassador he induced the Porte to declare war on Russia, as a soldier he directed with success the defence of Constantinople against the British squadron of Admiral (Sir) J. T. Duckworth. But the deposition of the Sultan Selim III. put an end to French diplomatic success in this quarter, and Sébastiani was recalled in April 1807 (see *La Politique orientale de Napoléon: Sébastiani et Gardane*, by E. Driault, Paris, 1905). He was at this time made Count of the Empire. As the commander of a corps he served in the Peninsular War, but his cavalry genius did not shine in the laborious and painful operations against the careful English and the ubiquitous *guerrilleros*. In the more congenial *grande guerre* of Russia and Germany he was in his element, and at Smolensk, Borodino and Leipzig he did brilliant service. He accepted the Restoration government in 1814, but rejoined his old leader on his return from Elba. After Waterloo he retired into England for a time, but soon returned, and was placed on half-pay. From 1819 onwards he was a prominent member of the Chamber of Deputies. He held the posts of Minister of Marine, and, later, of Foreign Affairs. In this latter capacity he was the author of the historic saying "Order reigns at Warsaw." In 1832 he was a Minister of State without portfolio, next year ambassador at Naples, and from 1835 to 1840 was ambassador to Great Britain. On his retirement from this post he was made Marshal of France. He was a brilliant social figure in Paris. His last years were clouded by the death of his daughter at the hands of her husband, the duc de Praslin. He died at Paris on the 21st of July 1851.

His brother, JEAN ANDRÉ TIBURCE SÉBASTIANI (1786–1871), entered the army in 1806, served in the Peninsula from 1809 to 1811, and in the great campaigns of Russia, Germany, France and Belgium. He took part in the war of Greek independence under General Maison. In 1842, now lieutenant-general and peer of France, he was appointed to command the military division of Paris. But he proved incapable of dealing with the Revolution of 1848, and the remainder of his life was spent in retirement in Corsica.

SEBASTIANO DEL PIOMBO (1485–1547), Italian painter, was born at Venice in 1485. His family name was Luciani. He belongs to the Venetian school, exceptionally modified by the Florentine or Roman. At first a musician, chiefly a solo-player on the lute, he was in great request among the Venetian nobility. He soon showed a turn for painting, and became a pupil of Giovanni Bellini and afterwards of Giorgione. His first painting of note was done for the church of San Giovanni Crisostŏmo in Venice, and is so closely modelled on the style of Giorgione that in its author's time it often passed for the work of that master. It represents Chrysostom reading aloud at a desk, a grand Magdalene in front, and two other female and three male saints. Towards 1512 Sebastiano was invited to Rome by the wealthy Sienese merchant Agostino Chigi, who occupied a villa by the Tiber, since named the Farnesina; he executed some frescoes here, other leading artists being employed at the same time. The Venetian mode of colour was then a startling novelty in Rome. Michelangelo saw and approved the work of Luciani, became his personal friend, and entered into a peculiar arrangement with him. At this period the pictorial ability of Michelangelo was somewhat decried in Rome, the rival faculty of Raphael being invidiously exalted in comparison; in especial it was contended that Buonarroti fell short as a colourist. He therefore thought that he might try whether, by furnishing designs for pictures and leaving to Sebastiano the execution of them in colour, he could not maintain at its highest level his own general supremacy in the art. In this there seems to have been nothing particularly unfair, always assuming that the compact was not fraudulently concealed; and the facts are so openly stated by Michelangelo's friend Vasari (besides other writers) that there appears to have been little or no disguise in the matter. The pictures are there to speak for themselves; and connoisseurs have always acknowledged that the quality of Michelangelo's unmatched design is patent on the face of them. Some writers, however, jealous for Buonarroti's personal rectitude, have denied that his handiwork is to be traced in the pictures bearing the name of Sebastiano.

Four leading pictures which Sebastiano painted in pursuance of his league with Buonarroti are the "Pietà" (earliest of the four), in the church of the Conventuali, Viterbo; the "Transfiguration" and the "Flagellation," in the church of S. Pietro in Montorio, Rome; and, most celebrated of all, the "Raising of Lazarus," now in the National Gallery, London. This grand work—more remarkable for general strength of pictorial perception than for qualities of detailed intellectual or emotional expression—is more than 12 by 9 ft. in dimensions, with the principal figures of the natural size; it is inscribed "Sebastianus Venetus faciebat," and was transferred from wood to canvas in 1771. It was painted in 1517–1519 for Giulio de' Medici, then bishop of Narbonne, afterwards Pope Clement VII.; and it remained in Narbonne cathedral until purchased by the duke of Orleans early in the 18th century—coming to England with the Orleans gallery in 1792. It used to be generally admitted (yet it is now increasingly contested) that the design of Michelangelo appears in the figure of Lazarus and of those who are busied about him (the British Museum contains two sketches of the Lazarus regarded as Michelangelo's handiwork); but whether he actually touched the panel, as has often been said, appears more than doubtful, as he left Rome about the time when the picture was commenced. Raphael's "Transfiguration" was painted for the same patron and the same destination. The two works were exhibited together, and some admirers did not scruple to give the preference to Sebastiano's. The "Flagellation of Christ," though ordinarily termed a fresco, is, according to Vasari, painted in oil upon the wall. This was a method first practised by Domenico Veneziano, and afterwards by other artists; but Sebastiano alone succeeded in preventing the blackening of the colours. The contour of the figure of Christ in this picture is supposed by many to have been supplied by Buonarroti's own hand. Sebastiano, always a tardy worker, was occupied about six years upon this work, along with its companion the "Transfiguration," and the allied figures of saints.

After the elevation of Giulio de' Medici to the pontificate, the office of the "piombo" or leaden seal—that is, the office of sealer of briefs of the apostolic chamber—became vacant; two painters competed for it, Sebastiano Luciani, hitherto a comparatively poor man, and Giovanni da Udine. Sebastiano, assuming the habit of a friar, secured the very lucrative appointment—with the proviso that he should pay out of his emoluments 300 scudi per annum to Giovanni. If he had heretofore been slow in painting, he became now supine in a marked degree. One of the few subject-pictures which he executed after taking office was "Christ carrying the Cross" for the patriarch of Aquileia, also a "Madonna with the body of Christ." The former painting is done on stone, a method invented by Sebastiano himself. He likewise painted at times on slate—as in the instance of "Christ on the Cross," now in the Berlin gallery, where the slate constitutes the background. In the same method, and also in the same gallery, is the "Dead Christ supported by Joseph of Arimathea, with a weeping Magdalene"—colossal half-length figures. Late in life Sebastiano had a serious disagreement with Michelangelo with reference to the Florentine's great picture of the "Last Judgment." Sebastiano encouraged the pope to insist that this picture should be executed in oil. Michelangelo, determined from the first upon nothing but fresco, tartly replied to his holiness that oil was only fit for women and for sluggards like Friar Sebastian; and the coolness between the two painters lasted almost up to the friar's death. This event, consequent upon a violent fever acting rapidly upon a very sanguine temperament, took place in Rome in 1547. Sebastiano directed that his burial, in the church of S Maria del Popolo, should be conducted without ceremony of priests, friars or lights, and that the cost thus saved should go to the poor; in this he was obeyed.

Numerous pupils sought training from Sebastiano del Piombo; but, owing to his dilatory and self-indulgent habits, they learned little from him, with the exception of Tommaso Laureti. Sebastiano, conscious of his deficiency in the higher sphere of invention, made himself especially celebrated as a portrait painter: the likeness of Andrea Doria, in the Doria Palace, Rome, is one of the most renowned. In the National Gallery, London, are two fine specimens; one canvas represents the friar himself, along with Cardinal Ippolito de' Medici; the other, a portrait of a lady in the character of St Agatha, used to be identified with one of Sebastiano's prime works, the likeness of Julia Gonzaga (painted for her lover, the aforenamed cardinal), but this assumption is now discredited. There were also portraits of Marcantonio Colonna, Vittoria Colonna, Ferdinand marquis of Pescara, Popes Adrian VI., Clement VII. (Studj Gallery, Naples) and Paul III., Sanmicheli, Anton Francesco degli Albizzi and Pietro Aretino. One likeness of the last-named sitter is in Arezzo and another in the Berlin gallery.

See his general histories of art; and, with regard to his designs, Bernhard Berenson, *The Drawings of Florentine Painters* (1904). The decision as to the authorship of various pictures which may or may not be attributable to Sebastiano del Piombo is necessarily a matter of contemporary connoisseurship, and it need only be noted that Mr Berenson is inclined to give increased importance to this master. (W. M. R.)

SEBENICO (Serbo-Croatian, *Šibenik*), an episcopal city, and the centre of an administrative district in Dalmatia, Austria; at the end of a branch railway from Knin. Pop. (1900) of city and commune, 24,751. Sebenico is built on a hill overlooking the river Kerka, which here forms a broad basin, connected by a winding channel with the Adriatic Sea, 3 m. S.W. The city is partly walled, and guarded on the seaward side by the 16th-century castle of St Anna and two dismantled forts. Venetian influence is everywhere manifest; the Lion of St Mark is carved over the main gateway and on many public buildings; and among the narrow and steep lanes of the city there are numerous examples of Venetian Gothic or early Renaissance architecture. Sebenico has been the seat of a Roman Catholic bishop since 1298. It has also an orthodox bishop. The Roman Catholics, who constitute the majority of citizens, possess a lofty and beautiful cruciform cathedral, built entirely of stone and metal. Probably no other church of equal size in Europe is similarly constructed. Even the waggon vaults over the nave, choir and transepts are of stone unprotected by lead or tiles. The older part of the cathedral, dating from 1430 to 1441, and including the fine north doorway, is Italian Gothic. Giorgio Orsini of Zara, who had studied architecture in Venice and been strongly influenced by the Italian Renascence, carried on the work of construction until his death in 1475. It was finished early in the 16th century; and thus the cathedral belongs to two distinct periods and represents two distinct styles.

Sebenico is lighted by electric light; the power being supplied by the celebrated falls of the Kerka, near Scardona, on the north. Sebenico is a steamship station, with an excellent harbour. Wine, oil, corn and honey are produced in the neighbourhood; many of the inhabitants are fishermen and seamen. The Latin name of *Sicum* is adopted in public inscriptions; but the city cannot be identified with the Roman colony of Sicum, which was probably situated farther south. Sebenico first became prominent in the 12th century as a favourite residence of the Croatian kings. From 1358 to 1412 it was ruled by Hungary; it subsequently formed part of the Venetian dominions. In 1647 it was unsuccessfully besieged by the Turks.

SEBORRHOEA, a medical term applied to describe an accumulation on the skin of the normal sebaceous secretion mixed with dirt and forming scales or a distinct incrustation. On the head, where it is commonly seen, it may interfere with the nutrition of the hair and cause partial baldness. A form of this disease occurs in young infants. The main treatment consists in thoroughly cleansing the parts. The crusts may be softened with oil and the affected skin regularly washed with soft soap and rectified spirit. The sebum frequently accumulates in the sebaceous ducts, giving rise to the minute black points often noticed on the face, back and chest in young adults, to which the term *comedones* is applied. A form of this disorder, of larger size and white appearance, is termed *milium*. These affections may to a large extent be prevented by strict attention to ablution and brisk friction of the skin, which will also often remove them when they begin to appear. The retained secretion may be squeezed out or evacuated by incision and the skin treated with some simple sulphur application.

SECCHI, ANGELO (1818–1878), Italian astronomer, was born on the 29th of June 1818 at Reggio in Lombardy, and entered the Society of Jesus at an early age. In 1849 he was appointed director of the observatory of the Collegio Romano, which was rebuilt in 1853; there he devoted himself with great perseverance to researches in physical astronomy and meteorology till his death at Rome on the 26th of February 1878.

The results of Secchi's observations are contained in a great number of papers and memoirs. From about 1864 he occupied himself almost exclusively with spectrum analysis, both of stars (*Catalogo delle stelle di cui si è determinato lo spettro luminoso*, Paris, 1867, 8vo; "Sugli spettri prismatici delle stelle fisse," two parts, 1868, in the *Atti della Soc. Ital.*) and of the sun (*Le Soleil*, Paris, 1870, 8vo; 2nd ed., 1877).

For a list of his publications see Poggendorff, *Biographisch-Literarische*; also see *Monthly Notices R.A.S.*, No. 39, and Carlo Bricarelli, "Vita e opere di A. Secchi," *Nuovi Linc. Mem.* (1888), vol. 4.

SECESSION, a term used in political science to signify the withdrawal of a state from a confederacy or composite state, of which it had previously been a part; and the resumption of all powers formerly delegated by it to the federal government, and of its status as an independent state. To secede is a sovereign right; secession, therefore, is based on the theory that the sovereignty of the individual states forming a confederacy or federal union has not been absorbed into a single new sovereignty. Secession is a right claimed or exercised by weaker states of a union whose rights are threatened by the stronger states, which seldom acknowledge such a principle. War generally follows the secession of a member of a union, and the seceding state, being weaker, is usually conquered and the union more firmly consolidated. The history of Europe furnishes several examples of secession or attempts to secede: in 1309 the Swiss cantons withdrew from the Empire and formed a confederacy from which, in 1843–1847, the Catholic cantons seceded and formed a new confederacy called the *Sonderbund*, which was crushed in the war that followed; in 1523 Sweden seceded from the *Kalmarian* Union formed in 1397 of Denmark, Sweden and Norway; and in 1814 Norway seceded and entered into a union with Sweden, from which, in the same year, it attempted to secede but was forcibly prevented; Norway, however, accomplished a peaceful secession from the Union in 1905 and resumed her independent status; in 1848–1849 Hungary attempted to withdraw from the union with Austria but the attempt was defeated; Prussia and other north German states withdrew in 1866–1868 from the German Confederation and formed a new one; a late instance of successful secession is that of Panama, which seceded in 1903 from the Republic of Colombia. But secession in theory and practice is best exhibited in the history of the United States. Most of the original states, and many of the later ones, at some period when rights were in jeopardy proclaimed that their sovereignty might be exercised in secession. The right to secede was based, the secessionists claimed, upon the fact that each state was sovereign, becoming so by successful revolution against England; there had been no political connexion between the colonies; the treaty of 1783 recognized them "as free, sovereign and independent states"; this sovereignty was recognized in the Articles of Confederation, and not surrendered, they asserted, under the Constitution; the Union of 1787 was really formed by a secession from the Union of 1776–1787. New states claimed all the rights of the old ones, having been admitted to equal standing. Assertions of the right and necessity of secession were frequent from the beginning; separatist conspiracies were rife in the West until 1812; various leaders in New England made threats of secession in 1790–1796 and 1800–1815—especially in 1803 on account of the purchase of Louisiana, in 1811 on account of the proposed admission of Louisiana as a state, and during the troubles ending in the War of 1812. Voluntary separation was frequently talked of before 1815. Two early commentators on the Constitution, St George Tucker in 1803 and William Rawle in 1825, declared that the sovereign states might secede at will. In 1832–1833 the "Union" party of South Carolina was composed of those who rejected nullification, holding to secession as the only remedy; and from 1830 to 1860 certain radical abolitionists advocated a division of the Union. But as the North grew stronger and the South in comparison grew weaker, as slavery came to be more and more the dominant political issue, and as the South made demands concerning that "peculiar institution" to which the North was unwilling to accede, less was heard of secession in the North and more in the South. Between 1845 and 1860 secession came to be generally accepted by the South as the only means of preserving her institutions from the interference of the North. The first general movement toward secession was in 1850. In 1860–1861, when the federal government passed into the control of the stronger section, the Southern states, individually, seceded and then formed the Confederate states, and in the war that followed they were conquered and forced back into the Union. So, in the United States, secession along with state sovereignty is of the past. From the historical point of view it may be suggested that neither North nor South was correct in theory in 1861: the United States were not a nation; neither were the states sovereign; but from the embryo political communities of 1776–1787, in which no proper sovereignty existed anywhere, two nationalities were slowly being evolved and two sovereignties were in the making; the North and the South each fulfilled most of the requirements for a nation and they were mutually unlike and hostile.

See Jefferson Davis, *Rise and Fall of the Confederate Government* (New York, 1881); A. H. Stephens, *Constitutional View of the War between the States* (Philadelphia, 1868-1870); J. L. M. Curry, *Civil History of the Confederate States* (Richmond, 1900); J. W. Du Bois, *William L. Yancey* (Birmingham, 1892); J. Hodgson, *Cradle of the Confederacy* (Mobile, 1876); B. J. Sage, *Republic of Republics* (Boston, 1876); W. Wilson, *The State* (Boston, 1900); A. L. Lowell, *Government and Parties in Continental Europe* (Boston, 1896); J. W. Burgess, *Political Science and Comparative Constitutional Law* (New York, 1895), and C. E. Merriam, *American Political Theories* (New York, 1902). See also STATE RIGHTS, NULLIFICATION, and CONFEDERATE STATES. (W. L. F.)

SECKENDORF, FRIEDRICH HEINRICH, COUNT VON (1673–1763), German soldier, nephew of Veit Ludwig von Seckendorf (*q.v.*), was born at Königsberg in Franconia. His father was an official of Saxe-Gotha. In 1693 he served in the allied army commanded by William III. of England, and in 1694 became a cornet in a Gotha cavalry regiment in Austrian pay. Leaving the cavalry he became an infantry officer in the service of Venice, and (1697) in that of the margrave of Anspach, who in 1698 transferred the regiment in which Seckendorf was serving to the imperial army. In 1699 he married and returned to Anspach as a court officer, but the outbreak of the War of the Spanish Succession called him into the field again as lieutenant-colonel of an Anspach regiment, which was taken into the Dutch service. He distinguished himself at Oudenarde (1708), and was severely wounded at the siege of Ryssel. Disappointed of promotion in Holland and Austria, he entered the Polish-Saxon army as a major-general, and fought as a volunteer at the siege of Tournai and the battle of Malplaquet. He continued to serve in Flanders to the end of the war, acted in a diplomatic capacity in the peace negotiations, and in 1713 suppressed an insurrection in Poland. In 1715, as a lieutenant-general, he commanded the Saxon contingent at the siege of Stralsund, defended by Charles XII. of Sweden. In 1717 Seckendorf once more entered the service of the emperor, with the rank of lieutenant field marshal, and he was present at the siege of Belgrade by Prince Eugène. In 1718 and 1719 he fought in Italy, and in the latter year he was made a count of the empire. In 1726, at the instance of Prince Eugène, he was made the Austrian representative at the court of Prussia. He remained at Berlin, with short intervals, up to 1735, and for the greater part of this time exercised a strong influence over Frederick William II. He was deeply involved in the family quarrels which embittered the lives of Frederick William, his queen and the crown prince (Frederick the Great), which culminated in the prince's condemnation to death by court martial, and is presented by Carlyle (*Frederick the Great*, vol. ii.) as a cold, passionless intriguer, taciturn, almost stolid, and absolutely unscrupulous in the furtherance of Austrian political aims. In 1726 Seckendorf was appointed general of cavalry of the army of the Holy Roman Empire, and served with such distinction as was to be gained in a war of positions in the Rhine campaigns of the War of the Polish Succession (1734–35). His dissensions with Prince Leopold of Anhalt-Dessau (*q.v.*)—the "old Dessauer" was Seckendorf's declared enemy at the Prussian court—made the conduct of operations impossible, and, after placing the Austrian and German armies in favourable positions, Seckendorf departed to Hungary to report on the state of the Austrian army there—a task which brought him fresh enemies. In 1737 the emperor Charles VI., however, made Seckendorf commander-in-chief in Hungary, at the same time giving him the bâton of field marshal. The new commander began well, but failed at the end, and his numerous enemies at Vienna brought about his recall, trial and imprisonment. He remained a prisoner till 1740, and was then reinstated by order of Maria Theresa, but being denied his arrears of pay he laid down all his Austrian and imperial offices and accepted from the emperor Charles VII., elector of Bavaria, the rank of field marshal in the Bavarian service. His last campaigns were those of 1743 and 1744 in the Austrian Succession War (*q.v.*), and, after the death of Charles VII. and the election of Maria Theresa's husband to the imperial dignity, he became reconciled with the Austrian court. From 1745 his life was spent more or less in retirement at Meuselwitz, near Altenburg. In 1757 the death of his wife, for whom, harsh and unamiable as he was, he had a deep and abiding affection, broke down his already failing health. He fell into the hands of a Prussian hussar party in December 1758, and was for five months held prisoner by Frederick the Great, who had little love for him either as his former court enemy or as his unsatisfactory ally in the first Silesian war. He died at Meuselwitz on the 23rd of November 1763.

See Wurzbach's *Biogr. Lexikon*, pt. 33, "Versuch einer Lebensbeschreibung des F. M. Seckendorf" (Leipzig, 1792–1794); Seelander, *Graf Seckendorf und der Friede v. Passau* (Gotha, 1883); Carlyle, *Frederick the Great*, vols. i.-v. *passim*; and memoir in *Allgemeine deutsche Biographie*.

SECKENDORF, VEIT LUDWIG VON (1626–1692), German statesman and scholar, was a member of a German noble family, which took its name from the village of Seckendorf between Nuremberg and Langenzenn. The family was divided into eleven distinct lines, but only three survive, widely distributed throughout Prussia, Württemberg and Bavaria.[1] Veit Ludwig von Seckendorf, son of Joachim Ludwig von Seckendorf, was born at Herzogenaurach, near Erlangen, on the 20th of December 1626. In 1639 the reigning duke of Saxe-Coburg-Gotha, Ernest the Pious, made him his protégé. Entering the university of Strassburg in 1642, he devoted himself to history and jurisprudence. The means for his higher education came from Swedish officers, former comrades of his father who had been actively engaged in the Thirty Years' War and who was executed at Salzwedel on the 3rd of February 1642 for his dealings with the Imperialists. After he finished his university course Duke Ernest gave him an appointment in his court at Gotha, where he laid the foundation of his great collection of historical materials and mastered the principal modern languages. In 1652 he was appointed to important judicial positions and sent on weighty embassages. In 1656 he was made judge in the ducal court at Jena, and took the leading part in the numerous beneficent reforms of the duke. In 1664 he resigned office under Duke Ernest, who had just made him chancellor and with whom he continued on excellent terms, and entered the service of Duke Maurice of Zeitz (Altenburg), with the view of lightening his official duties. After the death of Maurice in 1681 he retired to his estate, Meuselwitz in Altenburg, resigning nearly all his public offices. Although living in retirement, he kept up a correspondence with the principal learned men of the day. He was especially interested in the endeavours of the pietist Philipp Jakob Spener to effect a practical reform of the German church, although he was hardly himself a pietist. In 1692 he was appointed chancellor of the new university of Halle, but he died a few weeks afterwards, on the 18th of December.

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[1] Besides Friedrich Heinrich, count von Seckendorf, separately noticed, other members of the family were Adolf Franz Karl (1742–1818), who was made a count by Frederick William III. of Prussia; Eduard Christoph Ludwig Karl v. Seckendorf-Gudent (1813–1875), a Württemberg official; Karl Sigmund (1744–1785), writer; Franz Karl Leopold v. Seckendorf-Aberdar (1775–1809), poet, literary man and soldier; the brothers Christian Adolf (1767–1833) and Gustav Anton ("Patrik Peale") (1775–1823), both literary men of some note, and Arthur v. Seckendorf-Gudent (1845–1886), student of forestry.

Seckendorf's principal works were the following:—*Teutscher Fürstenstaat* (1656 and 1678), a handbook of German public law; *Der Christenstaat* (1685), partly an apology for Christianity and partly suggestions for the reformation of the church, founded on Pascal's *Pensées* and embodying the fundamental ideas of Spener; *Commentarius historicus et apologeticus de Lutheranismo sive de Reformatione* (3 vols., Leipzig, 1692), occasioned by the Jesuit Maimbourg's *Histoire du Luthéranisme* (Paris, 1680), his most important work, and still indispensable to the historian of the Reformation as a rich storehouse of authentic materials.

See Richard Pahner, *Veit Ludwig von Seckendorff und seine Gedanken über Erziehung und Unterricht* (Leipzig, 1892), the best sketch of Seckendorf's life, based upon original sources. See also Theodor Kolde, "Seckendorf," in Herzog-Hauck's *Realencyklopädie* (1906).

SECKER, THOMAS (1693–1768), archbishop of Canterbury, was born at Sibthorpe, Nottinghamshire. He studied medicine in London, Paris and Leiden, receiving his M.D. degree at Leiden in 1721. Having decided to take orders he graduated, by special letters from the chancellor, at Exeter College, Oxford, and was ordained in 1722. In 1724 he became rector of Houghton-le-Spring, Durham, resigning in 1727 on his appointment to the rectory of Ryton, Durham, and to a canonry of Durham. He became rector of St James's, Westminster, in 1733, and bishop of Bristol in 1735. About this time George II. commissioned him to arrange a reconciliation between the prince of Wales and himself, but the attempt was unsuccessful. In 1737 he was translated to Oxford, and he received the deanery of St Paul's in 1750. In 1758 he became archbishop of Canterbury. His advocacy of an American episcopate, in connexion with which he wrote the *Answer to Dr Mayhew's Observations on the Charter and Conduct of the Society for the Propagation of the Gospel in Foreign Parts* (London 1764), raised considerable opposition in England and America.

His principal work was *Lectures on the Catechism of the Church of England* (London, 1769).

SECOND (through Fr. from Lat. *secundus*, following, *sequi*, to follow), next after the first in order, time, rank, &c., more particularly the ordinal number corresponding to two. It is the only French ordinal in English; the older word was "other," Ger. *ander*, Goth. *anthar*, Skt. *antara*. The use of the word for the sixtieth part of a minute of time and of degree is from Med. Lat. *secunda*, abbreviation of *minuta secunda*, the second small division of the hour, *minuta prima* or *minuta* being the first division. Another particular meaning is for one who supports or assists another, especially the friend at a duel, who arranges for his principal the terms of the encounter and sees that all rules of the duel are carried out. In the British army an officer is said to be "seconded" (with the accent on the second syllable) when he is employed on special service outside his regiment, his name being retained on the regimental list, but his place being filled by promotion of other officers. He may rejoin his regiment when his special employment is at an end.

SECOND SIGHT, a term denoting the opposite of its apparent significance, meaning in reality the seeing, in vision, of events *before* they occur. "Foresight" expresses the meaning of second sight, which perhaps was originally so called because normal vision was regarded as coming first, while supernormal vision is a secondary thing, confined to certain individuals.

Though we hear most of the "second sight" among the Celts of the Scottish Highlands (it is much less familiar to the Celts of Ireland), this species of involuntary prophetic vision, whether direct or symbolical, is peculiar to no people. Perhaps our earliest notice of symbolical second sight is found in the *Odyssey*, where Theoclymenus sees a shroud of mist about the bodies of the doomed Wooers, and drops of blood distilling from the walls of the hall of Odysseus. The Pythia at Delphi saw the blood on the walls during the Persian War; and, in the *Argonautica* of Apollonius Rhodius, blood and fire appear to Circe in her chamber on the night before the arrival of the fratricidal Jason and Medea. Similar examples of symbolical visions occur in the Icelandic sagas, especially in *Njala*, before the burning of Njal and his family. In the Highlands, and in Wales, the chief symbols beheld are the shroud, and the corpse candle or other spectral illumination. The Rev. Dr Stewart, of Nether Lochaber, informed the present writer that one of his parishioners, a woman, called him to his door, and pointed out to him a rock by the sea, which shone in a kind of phosphorescent brilliance. The doctor attributed the phenomenon to decaying sea-weed, but the woman said, "No, a corpse will be laid there to-morrow." This, in fact, occurred; a dead body was brought in a boat for burial, and was laid at the foot of the rock, where, as Dr Stewart found, there was no decaying vegetable matter.

Second sight flourished among the Lapps and the Red Indians, the Zulus and Maoris, to the surprise of travellers, who have recorded the puzzling facts. But in these cases the visions were usually "induced," not "spontaneous," and should be considered as "clairvoyance" (*q.v.*). Ranulf Higdon's *Polychronicon* (14th century) describes Scottish second sight, adding that strangers "setten their feet upon the feet of the men of that londe for to see such syghtes as the men of that londe doon." This method of communicating the vision is still practised, with success, according to the late Dr Stewart. The present writer once had the opportunity to make an experiment, but to him the vision was not imparted. (For the method see Kirk's *Secret Commonwealth of Elves, Fauns and Fairies*, 1691, 1815, 1893.) It is, by some, believed that if a person tells what he has seen before the event occurs he will lose the faculty, and recently a second-sighted man, for this reason, did not warn his brother against taking part in a regatta, though he had foreseen the accident by which his brother was drowned. Where this opinion prevails it is, of course, impossible to prove that the vision ever occurred. There are many seers, as Lord Tarbat wrote to Robert Boyle, to whom the faculty is a trouble, "and they would be rid of it at any rate, if they could."

Perhaps the visions most frequently reported are those of funerals, which later occur in accordance with "the sight," of corpses, and of "arrivals" of persons, remote at the moment, who later do arrive, with some distinctive mark of dress or equipment which the seer could not normally expect, but observed in the vision. Good examples in their own experience have been given to the present writer by well-educated persons. Some of the anecdotes are too surprising to be published without the names of the seers. A fair example of second sight is the following from Balachulish. An aged man of the last generation was troubled by visions of armed men in uniform, drilling in a particular field near the sea. The uniform was not "England's cruel red," and he foresaw an invasion. "It must be of Americans," he decided, "for the soldiers do not look like foreigners." The Volunteer movement later came into being, and the men drilled on the ground where the seer had seen them. Another case was that of a man who happened to be sitting with a boy on the edge of a path in the quarry. Suddenly he caught the boy and leaped aside with him. He had seen a runaway trolly, with men in it, dash down the path; but there were no traces of them below. "The spirits of the living are powerful to-day," said the percipient in Gaelic, and next day the fatal accident occurred at the spot. These are examples of what is, at present, alleged in the matter of second sight.

"The sight" may, or may not, be preceded or accompanied by epileptic symptoms, but this appears now to be unusual. A learned minister lately made a few inquiries on this point in his parish, at the request of the present writer. His beadle had "the sight" in rich measure: "it was always preceded by a sense of discomfort and anxiety," but was not attended by convulsions. Out of seven or eight seers in the parish, only one was not perfectly healthy and temperate. A well-known seer, now dead, whom the writer consulted, was weak of body, the result of an accident, but seemed candid, and ready to confess that his visions were occasionally failures. He said that "the sight" first came on him in the village street when he was a boy. He saw a dead woman walk down the street and enter the house that had been hers. He gave a few examples of his foresight of events, and one of his failure to discover the corpse of a man drowned in the loch.

The phenomena, as described, may be classed under "clairvoyance," "premonition," and "telepathy" (*q.v.*), with a residuum of symbolical visions. In these, "corpse candles" and spectral lights play a great part, but, in the region best known to the writer, the "lights" are visible to all, even to English tourists, and are not hallucinatory. The conduct of the lights is brilliantly eccentric, but, as they have not been studied by scientific specialists, their natural causes remain unascertained. It is plain that there is nothing peculiar to the Celts in second sight; but the Gaelic words for it and the prevailing opinion indicate telepathy, the action of "the spirits of the living" as the main agents. Yet, in cases of premonition, this explanation is difficult. Conceivably an engineer, in 1881, was thinking out a line of railway from Oban to Balachulish, at the moment when four or five witnesses were alarmed by the whizz and thunder of a passing train on what was then the road, but was later (1903) usurped by the railway track. (For this amazing anecdote the writer has the first-hand evidence of a highly educated percipient.) If the speculation of the engineer was "wired on," telepathically, to the witnesses, then telepathy may account for the premonition, which, in any case, is a good example of collective second sight. That second sight has died out, under the influence of education and newspapers, is an averment of popular superstition in the south.

The examples given, merely a selection from those known to the present writer, prove that the faculty is believed to be as common as in any previous age.

The literature of second sight is not insignificant. *The Secret Commonwealth* of the Rev. Mr Kirk (1691), edited by Sir Walter Scott in 1815 (a hundred copies), and by Andrew Lang in 1893, is in line with cases given in Trials for Witchcraft (cf. Dalyell's *Darker Superstitions of Scotland*, and Wodrow's *Analecta*). Aubrey has several cases in his *Miscellanies*, and the correspondence of Robert Boyle, Henry More, Glanvil and Pepys, shows an early attempt at scientific examination of the alleged faculty. The great treatise on Second Sight by Theophilus Insulanus (a Macleod) may be recommended; with Martin's *Description of the Western Isles* (1703–1716), and the work of the Rev. Mr Fraser, Dean of the Isles (1707, 1820). Fraser was familiar with the contemporary scientific theories of hallucination, and justly remarked that "the sight" was not peculiar to the Highlanders; but that, in the south, people dared not confess their experiences, for fear of ridicule. (A. L.)

SECRET (Lat. *secretum*, hidden, concealed), that which is concealed from general knowledge. In special senses the word is applied to (*a*) a prayer in the Roman and other liturgies, said during mass by the priest in so low a voice that it does not reach the congregation, and (*b*) a covering or skull-cap made of steel fitting close to the head.

In law, the question of secrecy is an important one. Generally, English law does not require a solicitor or barrister to disclose secrets entrusted to them by a client, and the same probably holds good in the case of medical men. In the case of ministers of religion, it has never been definitely settled how far they can be compelled to disclose in evidence what has been confided in the secrecy of the confessional. But according to the 113th Canon, a priest of the Church of England would commit an ecclesiastical offence in revealing a secret disclosed to him in confession "except it be such as by the laws of this realm his own life may be called into question for concealing the same." As to what are called "trade secrets," it had been decided (*Merryweather* v. *Moore*, 1892, 2 Ch. 518) that it is a breach of contract to reveal trade secrets acquired during service.

Official Secrets.—By the Official Secrets Act 1889 it was made a misdemeanour for an official to communicate any information or documents concerning the military or naval affairs of Her Majesty, to any person to whom it ought not to be communicated. If the information be communicated to a foreign state it is a felony. In Germany the betrayal of military secrets is punishable under an imperial law of 1893.

Secret Service.—In practically every civilized country, there is always a department of the government charged with the duty of espionage, either diplomatic or domestic. Its officials work in secret, and certain sums of money are placed at the disposal of the head of the department, and expended as he may think fit, without having to render any specific account of them. Various departments of governments have also their own departmental secret service, for the better guarding against frauds, such as in the United States, the Treasury Department and the Post Office.

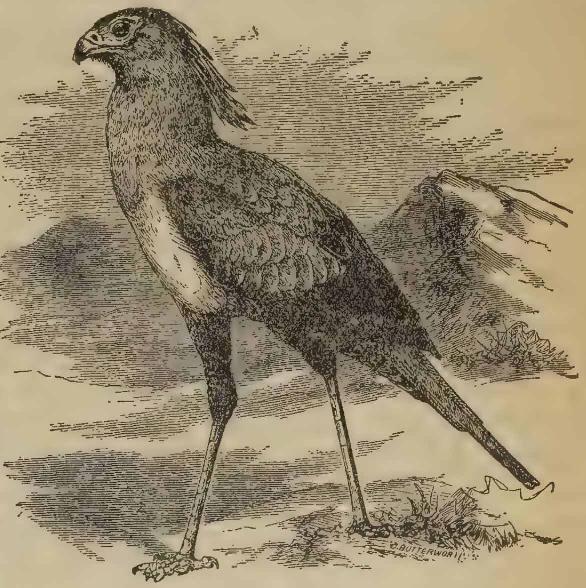
The various European codes generally have dealt with breach of secrecy, *e.g.* s. 300 of the German Penal Code imposes a fine up to 1500 marks and imprisonment up to three months on doctors, attorneys and other professional persons who reveal a secret entrusted to them in their professional capacity. For this offence also the French code, art. 378, imposes imprisonment of from one to six months and a fine of from 100 to 500 francs.

See Brouardel, *Le Secret médical* (Paris, 1893); Hallays, *Le Secret professionnel* (Paris, 1890).

SECRÉTAN, CHARLES (1815–1895), Swiss philosopher, was born on the 19th of January 1815, at Lausanne, where he died on the 21st of January 1895. Educated in his native town and later under Schelling at Munich, he became professor of philosophy at Lausanne (1838 to 1846), and at Neuchâtel (1850 to 1866). In 1866 he returned to his old position at Lausanne. In 1837 he founded, and for a time edited, the *Revue suisse*. His principal works were *La Philosophie de la liberté* (1848); *La Raison et le Christianisme* (1863); *La Civilisation et les croyances* (1887); *Mon Utopie* (1892). The object of his writing was to build up a rational, philosophical religion, to reconcile the ultimate bases of Christianity with the principles of metaphysical philosophy.

For a detailed examination of his philosophy, see Pillon, *La Philosophie de Charles Secrétan.*

SECRETARY-BIRD, a very singular African bird, first accurately made known, from an example living in the menagerie of the prince of Orange, in 1769 by A. Vosmaer,[1] in a treatise published simultaneously in Dutch and French, and afterwards included in his collected works issued, under the title of *Regnum Animale*, in 1804. He was told that at the Cape of Good Hope this bird was known as the "Sagittarius" or Archer, from its striding gait being thought to resemble that of a bowman advancing to shoot, but that this name had been corrupted into that of "Secretarius." In August 1770 G. Edwards saw an example (apparently alive, and the survivor of a pair which had been brought to England) in the possession of a Mr Raymond near Ilford in Essex; and, being unacquainted with Vosmaer's work, he figured and described it as "of a new genus" in the *Philosophical Transactions* for the following year (lxi. pp. 55, 56, pl. ii.). In 1776 P. Sonnerat (*Voy. Nouv. Guinée*, p. 87, pl. 50) again described and figured, but not at all correctly, the species, saying (but no doubt wrongly) that he found it in 1771 in the Philippine Islands. A better representation was given by D'Aubenton in



Secretary-Bird.

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[1] Le Vaillant (*Sec. Voy. Afrique*, ii. p. 273) truly states that Kolben in 1719 (*Caput Bonae Spei hodiernum*, p. 182, French version, ii. p. 198) had mentioned this bird under its local name of "Snake-eater" (*Slangenvreeter*, Dutch translation, i. p. 214); but that author, who was a bad naturalist, thought it was a Pelican and also confounded it with the Spoonbill, which is figured to illustrate his account of it.

the *Planches enluminées* (721); in 1780 Buffon (*Oiseaux*, vii. p. 330) published some additional information derived from Querhoent, saying also that it was to be seen in some English menageries; and the following year J. Latham (*Synopsis*, i. p. 20, pl. 2) described and figured it from three examples which he had seen alive in England. None of these authors, however, gave the bird a scientific name, and the first conferred upon it seems to have been that of *Falco serpentarius*, inscribed on a plate bearing date 1779, by John Frederick Miller (*Ill. Nat. History*, xxviii.), which plate appears also in Shaw's *Cimelia Physica* (No. 28) and is a misleading caricature. In 1786 Scopoli called it *Otis secretarius*—thus referring it to the Bustards,[1] and Cuvier in 1798 designated the genus to which it belonged, and of which it still remains the sole representative, *Serpentarius*. Succeeding systematists have, however, encumbered it with many other names, among which the generic terms *Gypogeranus* and *Ophiotheres*, and the specific epithets *reptilivorus* and *cristatus*, require mention here.[2] The Secretary-bird is of remarkable appearance, standing nearly 4 ft. in height, the great length of its legs giving it a resemblance to a Crane or a Heron; but unlike those birds its tibiae are feathered all the way down. From the back of the head and the nape hangs, loosely and in pairs, a series of black elongated feathers, capable of erection and dilation in periods of excitement.[3] The skin round the eyes is bare and of an orange colour. The head, neck and upper parts of the body and wing-coverts are bluish grey; but the carpal feathers, including the primaries, are black, as also are the feathers of the vent and tibiae—the last being in some examples tipped with white. The tail-quills are grey for the greater part of their length, then barred with black and tipped with white; but the two middle feathers are more than twice as long as those next to them, and drooping downwards present a very unique appearance.

Its chief prey consists of insects and reptiles, and as a foe to snakes it is held in high esteem; although it is undoubtedly also destructive to young game. It seems to possess a strange partiality for the destruction of snakes, and successfully attacks the most venomous species, striking them with its knobbed wings and kicking forwards at them with its feet, until they are rendered incapable of offence, when it swallows them. The nest is a huge structure, placed in a bush or tree, and in it two white eggs, spotted with rust-colour, are laid. The young remain in the nest for a long while, and even when four months old are unable to stand upright. They are very frequently brought up tame. The Secretary-bird is found, but not very abundantly and only in some localities, over the greater part of Africa, especially in the south, extending northwards on the west to the Gambia and in the interior to Khartum.

The systematic position of the genus *Serpentarius* has long been a matter of discussion, and is still one of much interest, though of late classifiers have been pretty well agreed in placing it in the order *Accipitres*. Most of them, however, have shown great want of perception by putting it in the family *Falconidae*. No anatomist can doubt its forming a peculiar family, *Serpentariidae*, differing more from the *Falconidae* than do the *Vulturidae*; and the fact of A. Milne-Edwards having recognized in the Miocene of the Allier the fossil bone of a species of this genus, *S. robustus* (*Ois. foss. France*, ii. pp. 465-468, pl. 186, figs. 1-6), proves that it is an ancient form, one possibly carrying on a direct and not much modified descent from a generalized form, whence may have sprung not only the *Falconidae* but perhaps the progenitors of the *Ardeidae* and *Ciconiidae*, as well as the puzzling *Cariamidae* (Seriema, *q.v.*). (A. N.)

SECRETARY OF STATE, in England, the designation of certain important members of the administration. The ancient English monarchs were always attended by a learned ecclesiastic, known at first as their clerk, and afterwards as secretary, who conducted the royal correspondence; but it was not until the end of the reign of Queen Elizabeth that these functionaries were called secretaries of state. Upon the direction of public affairs passing from the privy council to the cabinet after 1688 the secretaries of state began to assume those high duties which now render their office one of the most influential of an administration.

Until the reign of Henry VIII. there was generally only one secretary of state, but at the end of his reign a second principal secretary was appointed. Owing to the increase of business consequent upon the union of Scotland, a third secretary, in 1708, was created, but a vacancy occurring in this office in 1746 the third secretaryship was dispensed with until 1768, when it was again instituted to take charge of the increasing colonial business. However, in 1782 the office was again abolished, and the charge of the colonies transferred to the home secretary; but owing to the war with France in 1794 a third secretary was once more appointed to superintend the business of the war department, and seven years later the colonial business was attached to his department. In 1854 a fourth secretary of state for the exclusive charge of the war department and in 1858 a fifth secretaryship for India were created. There are therefore now five principal secretaries of state, four of whom, with their political under-secretaries, occupy seats in the House of Commons. One of these secretaries of state is always a member of the House of Lords. The secretaries of state are the only authorized channels through which the royal pleasure is signified to any part of the body politic, and the counter-signature of one of them is necessary to give validity to the sign manual. The secretaries of state constitute but one office, and are coordinate in rank and equal in authority. Each is competent in general to execute any part of the duties of the secretary of state, the division of duties being a mere matter of arrangement. For the existing division of duties, see under separate headings, COLONIAL OFFICE, FOREIGN OFFICE, &c.

In the United States the "secretary of state" is a member of the executive, who deals with foreign affairs, and who, in the event of a vacancy in the office of president, is next in succession after the vice-president. The title of "secretary"—"of the treasury," "of war," &c.—is used for some other members of the executive. In various states there is an executive officer called "secretary of state."

SECT, a body of persons holding distinctive or separate doctrines or opinions, especially in matters of religion; thus there are various sects among the Jews, the Mahommedans, and the Buddhists, &c. In the Christian Church it has usually a hostile or depreciatory sense and is applied, like "sectary," to all religious bodies outside the one to which the user of the term belongs.

The latter use has been influenced by the false etymology which makes the word mean "cut off" (Lat. *secare*, to cut). The derivation has been long a matter of dispute. The Latin *secta* was used in classical Latin first of a way, a trodden or beaten path; it seems to be derived from *secare*, to cut, cf. the phrase *secare viam*, to travel, take one's way, Gr. τέμνειν ὁδόν. From the phrase *sectam sequi*, to follow in the footsteps of any one, the word came to mean a party, following, faction. Another transferred sense is a manner or mode of life, so *hanc sectam rationemque vitae . . . secuti sumus* (Cic. *Cael.* 17, 40). It was also the regular word for a school of philosophy and so translates αἵρεσις, lit. choice (αἱρεῖσθαι, to choose), from which is derived "heresy" (*q.v.*). The Vulgate (N.T.) translates αἵρεσις sometimes by *secta*, sometimes by *haeresis*. In Med. Lat., besides these uses we find *secta* meaning a suit at law, a suit of clothes, and a following or suite. These meanings point to the derivation of *secta* adopted by Skeat (*Etym. Dict.*, 1910); which connects the word with *sequi*, to follow. Whichever derivation is accepted a "sect" does not mean a part "cut off" from the church.

SECTION (Lat. *sectio*, cutting, *secare*, to cut), the act of cutting or a part cut off, thus used of any division of a subject, as the paragraph of a book, article, statute, &c., of a division of land, of a town, &c., or a separate class of a community or race; the term is more particularly applied to a thin slice of any substance prepared for examination by the microscope (see MICROTOMY) or to a diagram of any structure showing the internal plan as if exposed by the cutting off of an external surface; thus, in architecture, a section is a drawing of a building cut in half, so as to show the relative height of the floors, the depth of the foundation and its footings, the framing of the roof, if in timber or iron, or the construction of the vault or dome, if in masonry. The term is also applied to the details of the structure, such as the cornice and the various mouldings showing their profile.

SECULAR (Lat. *saecularis*, of or belonging to an age or generation, *saeculum*), a word with two main branches of meaning (1) lasting or occurring for a long indefinite period of time, and (2) non-spiritual, having no concern with religious or spiritual matters. The first sense, which is directly taken from the classical

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[1] Curiously enough, Boddaert in 1783 omitted to give it a scientific name.

[2] The scientific synonymy of the species is given at great length by Drs Finsch and Hartlaub (*Vögel Ost-Afrikas*, p. 93) and by R. B. Sharpe (*Cat. B. Brit. Museum*, i. p. 45).

[3] It is from the fancied resemblance of these feathers to the pens which a clerk is supposed to stick above his ear that the bird's name of Secretary is really derived.

Latin, is chiefly found in scientific applications, of processes or phenomena which are continued through the ages and are not regularly recurrent or periodical, *e.g.* the secular cooling of the earth, secular change of the mean annual change of the temperature. The word is thus used widely of that which is lasting or permanent. In medieval and Late Latin, *saecularis* was particularly used of that which belongs to this world, hence non-spiritual, lay. It is thus used, first to distinguish the "regular" or monastic clergy from those who were not bound by the rule (*regula*) of a religious order, the parish priests, the "seculars," who were living in the world, and secondly in the wide sense of anything which is distinct, opposed to or not connected with religion or ecclesiastical things, temporal as opposed to spiritual or ecclesiastical. Thus property transferred or alienated from spiritual to temporal hands is said to be "secularized"; "secularism" (*q.v.*) is the term applied in general to the separation of state politics or administration from religious or church matters; "secular education" is a system of training in which definite religious teaching is excluded.

SECULAR GAMES (*Ludi Saeculares*, originally *Terentini*). These were celebrated at Rome for three days and nights to mark the commencement of a new *saeculum* or generation. It is important to note that there was a *saeculum civile*, the length of which was definitely fixed at 100 years, and a *saeculum naturale*, which, under Greek and Etruscan influence, came to be accepted by the quindecimviri as 110 years. According to tradition, the secular games had their origin in certain sacrificial rites of the gens Valeria, which were performed at the Terentum, a volcanic cleft in the Campus Martius. According to the Roman antiquarians themselves, they were derived from the Etruscans, who, at the end of a mean period of 100 years (as representing the longest human life in a generation), presented to the chthonian deities an expiatory offering on behalf of the coming generation. The first definitely attested celebration of the games took place in 249 B.C., on which occasion a vow was made that they should be repeated every hundredth year (their name being also changed to *Saeculares*), a regulation which seems to have been immediately disregarded, for they were next held in 146 (not 149, although the authorities are not unanimous); in 49 the civil wars prevented any celebration. They would probably have fallen entirely into oblivion, had not Augustus revived them in 17 B.C., for which occasion the *Carmen Saeculare* was composed by Horace. In explanation of the selection of this year it is supposed that the quindecimviri invented celebrations for the years 456, 346, 236, 126, the *saeculum* being taken as lasting 110 years.

In later times various modes of reckoning were adopted. The dates were: A.D. 47 (under Claudius), celebrating the 800th year of the foundation of the city; 88 (under Domitian), an interval of only 105 instead of 110 years; 147 (under Antoninus Pius), the 900th year of the city; 204 (under Septimius Severus), exactly two *saecula* (220 years) after the Augustan celebration; 248 (under Philip the Arabian), the 1000th year of the city; 262 (under Gallienus), probably a special ceremony in time of calamity; in 304 (which should have been 314) Maximian intended to hold a celebration, but does not appear to have done so. From this time nothing more is heard of the secular games, until they were revived in the year 1300 as the popish jubilees instituted by Boniface VIII.

At the beginning of the harvest, heralds went round and summoned the people to the festival. The quindecimviri distributed to all free citizens on the Capitol and in the temple of Apollo on the Palatine various means of expiation—torches, sulphur and bitumen. Here and in the temple of Diana on the Aventine, wheat, barley, and beans were distributed, to serve as an offering of firstfruits. The festival then began, at which offerings were made to various deities. On the first night the emperor sacrificed three rams to the Parcae at an underground altar on the banks of the Tiber, while the people lighted torches and sang a special hymn. On the same or following nights a black hog and a black pig were sacrificed to Tellus, and dark victims to Dis (Pluto) and Proserpine. On the first day white bulls and a white cow were offered to Jupiter and Juno on the Capitol, after which scenic games were held in honour of Apollo. On the second day noble matrons sang supplicatory hymns to Juno on the Capitol; on the third, white oxen were sacrificed to Apollo and twenty-seven boys and maidens sang the "secular hymn" in Greek and Latin.

The above particulars are from Zosimus (ii. 5, and 6, which contain the Sibylline oracle), who, with Censorinus (*De Die Natali*, 17), Valerius Maximus, ii. 4, and Horace (*Carmen Saeculare*) is the chief ancient authority on the subject; see also Mommsen, *Römische Chronologie* (1858); C. L. Roth, "Über die römischen Säcularspiele" in the *Rheinisches Museum*, viii. (1853); and Marquardt, *Römische Staatsverwaltung*, iii. (1885), p. 386. The inscription commemorating the *ludi* of 17 B.C. was discovered in 1890 and is printed in the *Ephemeris epigraphica*, vol. viii. The best account of the whole subject is in H. Diels, *Sibyllinische Blätter* (1890), p. 109 foll.

SECULARISM, a term applied specially (see SECULAR) to the system of social ethics associated with the name of G. J. Holyoake (*q.v.*). As the word implies, secularism is based solely on considerations of practical morality with a view to the physical, social and moral improvement of society. It neither affirms nor denies the theistic premises of religion, and is thus a particular variety of utilitarianism. Holyoake founded a society in London which subsequently under the leadership of Charles Bradlaugh advocated the disestablishment of the Church, the abolition of the Second Chamber and other political and economic reforms.

See Holyoake's *Principles of Secularism* (1885).

SECUND (Lat. *secundus*, following), a botanical term used of plants when similar parts are directed to one side only, as flowers on an axis.

SECUNDERABAD, one of the chief British military stations in India, situated in the state of Hyderabad or the Nizam's Dominions, 1830 ft. above sea-level, and 6 m. N.E. of Hyderabad city. Pop. (1901) 83,550. It is now the headquarters of the 9th division of the southern army. Secunderabad includes Bolaram, the former cantonment of the Hyderabad contingent (now merged in the Indian army), and also Trimulgherry, the artillery cantonment, covering a total area of 22 sq. m. These two places have an additional population of 12,888.

SECUNDUS, JOHANNES, whose real name was JOHANN EVERTS (1511–1536), Latin poet, was born at The Hague on the 10th of November 1511. He was descended from an ancient family in the Netherlands; his father, Nicholas Everts, or Everard, seems to have been high in the favour of the emperor Charles V. On what account the son was called Secundus is not known. His father intended him for the law; but though he took his degree at Bourges it does not appear that he devoted much time to legal pursuits. Poetry, painting and sculpture engaged his mind at a very early period. In 1533 he went to Spain, and soon afterwards became secretary to the cardinal-archbishop of Toledo, in a department of business which required no other qualification than that of writing Latin with elegance. During this period he composed his most famous work, the *Basia*, a series of amatory poems, of which the fifth, seventh, and ninth *Carmina* of Catullus seem to have given the hint. In 1534 he accompanied Charles V. to the siege of Tunis. After quitting the service of the archbishop, Secundus was employed as secretary by the bishop of Utrecht; and so much did he distinguish himself by his compositions that he was called upon to fill the important post of private Latin secretary to the emperor, who was then in Italy. But, having arrived at St Amand, near Tournay, he died of fever on the 8th of October 1536.

SECUNDUS, PUBLIUS POMPONIUS, Roman general and tragic poet, lived during the reigns of Tiberius, Caligula and Claudius. He was on intimate terms with the elder Pliny, who wrote a biography of him (now lost). The chief authority for his life is Tacitus, according to whom Secundus was a man of refinement and brilliant intellect. His friendship with Sejanus and his brother made him politically suspect, and he only escaped death by remaining practically a prisoner in his own brother's house until the accession of Caligula. During his enforced retirement he composed tragedies, which were put on the stage during the reign of Claudius. In A.D. 50 he distinguished himself against the Chatti and obtained the honour of the triumphal insignia. Quintilian asserts that he was far superior to any writer of tragedies he had known, and Tacitus expresses a high opinion of his literary abilities. Secundus devoted much attention to the niceties of grammar and style, on which he was recognized as an authority. Only a few lines of his work remain, some of which belong to the tragedy *Aeneas*.

See O. Ribbeck, *Geschichte der römischen Dichtung*, iii. (1892).

and *Tragicorum Romanorum fragmenta* (1897); Tacitus, *Annals*, v. 8, xi. 13, xii. 28; Quintilian, *Inst. Orat.* x. 1. 98; Pliny, *Nat. Hist.* xiv. 5; M. Schanz, *Geschichte der römischen Literatur*, ii. 2 (1900); Teuffel, *Hist. of Roman Literature* (Eng. trans., 1900), 284, 7.

SECURITY (Lat. *securus*, free from care, safe), in general, the condition of being secure. In law, a security is a document evidencing the right to money, goods or other property, *e.g.* stocks, shares, bills of exchange, mortgages, &c. A security is termed *collateral* when it is given merely as a guarantee for the repayment of money; *personal*, when it gives a right of action against a person for the recovery of money. A convertible security is one which can be readily converted into money (*e.g.* consols), as contrasted with land or buildings, sometimes termed "dead" security. A person who holds himself responsible for the fulfilment of another's obligations or goes surety for him is called a security.

SEDAINE, MICHEL JEAN (1719–1797), French dramatist, was born at Paris on the 4th of July 1719. His father, who was an architect, died when Sedaine was quite young, leaving no fortune, and the boy began life as a mason's labourer. He was at last taken as pupil by an architect whose kindness he eventually repaid by the help he was able to give to his benefactor's grandson, the painter David. Meanwhile he had done his best to repair his deficiencies of education, and in 1750 he published a *Recueil de pièces fugitives*, which included fables, songs and pastorals. His especial talent was, however, for light opera. He produced *Le Diable à quatre* (1756), the music being by several composers; *Blaise le Savetier* (1759), for the music of Danican Philidor; *On ne s'avise jamais de tout* (1761) and others with Pierre Alexandre de Monsigny; *Aucassin et Nicolette* (1780), *Richard Cœur de Lion* (1784), and *Amphitryon* (1788) with André Grétry. Sedaine's vaudevilles and operettas attracted the attention of Diderot, and two plays of his were accepted and performed at the *Théâtre Français*. The first and longest, the *Philosophe sans le savoir*, was acted in 1765; the second, a lively one-act piece, *La Gageure imprévue* in 1768. These two at once took their place as stock pieces and are still ranked among the best French plays, each of its class. Except these two pieces little or nothing of his has kept the stage or the shelves, but Sedaine may be regarded as the literary ancestor of Scribe and Dumas. He had the practical knowledge of the theatre, which enabled him to carry out the ideas of Diderot and give him claims to be regarded as the real founder of the domestic drama in France. Sedaine, who became a member of the Academy (1786), and secretary for architecture of the fine arts division, died at Paris on the 17th of May 1797. He wrote two historical dramas, *Raymond V. comte de Toulouse*, and *Maillard, ou Paris sauvé*.

His *Œuvres* (1826) contain a notice of his life by Ducis.

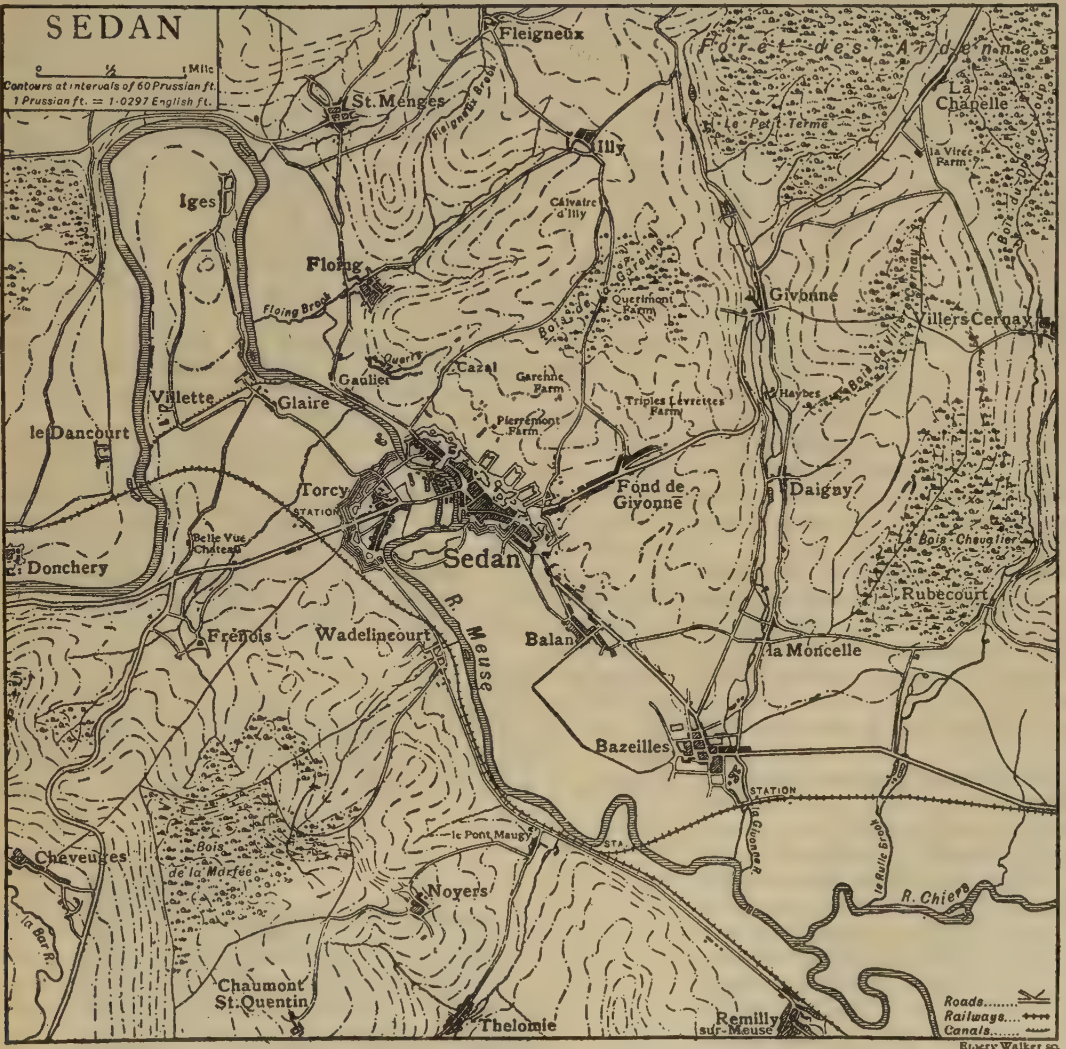
SEDALIA, a city and the county-seat of Pettis county, Missouri, U.S.A., a little W. of the centre of the state. Pop. (1900) 15,231; (1725 negroes; 972 foreign-born); (1910) 17,822. Sedalia is served by the Missouri Pacific and the Missouri, Kansas & Texas railway systems, and is a transportation centre with good facilities. The city has a high and pleasant site (about 990 ft. above sea-level) on a rolling prairie, and is laid out as an exact square. Among the public buildings much the handsomest are the court house, built of Warrensburg blue sandstone (1884), and the Public Library (1900), given by Andrew Carnegie. Sedalia is the seat of the George R. Smith College (M. E., founded in 1894) for negroes. Liberty Park (60 acres), in the W. part of the city, is owned by the municipality. Broadway, the principal residence street, is 120 ft. wide, and is parked on either side. The State Board of Agriculture established fair grounds (now 210 acres) adjoining the city on the S.W. in 1900, and the annual state fair attracts many visitors. The water supply is derived from a storage lake on Flat Creek, 3 m. from the city, settling basins being used to clarify the water. There are a city hospital and the Maywood, a private hospital; and the Missouri, Kansas & Texas railway maintains here a hospital for all parts of its system. The surrounding country is a magnificent livestock and farming region, and in the immediate vicinity are valuable deposits of coal, of limestone, of shale suitable for sewer pipe and of fire clays. The city has important horse and mule yards. The Missouri Pacific, three of whose operating divisions end at Sedalia and thus make the city its central division point, in 1904 established large shops (129 acres) in a suburb E. of the city. These shops and those of the Missouri, Kansas & Texas railway, of which Sedalia is the central division point on the N. end of its system, add greatly to the industrial importance of the city. The total value of the factory product in 1905 was $1,691,727, showing an increase of 31·8% since 1900.

Sedalia was established as a station on the Missouri Pacific railroad in 1857. In 1864 it was chartered as a town and was made the county-seat, succeeding Georgetown (then a flourishing town, which speedily fell into decay), the transfer of the offices taking place in 1865. Sedalia was a Union military post throughout the Civil War; on the 15th of October 1864 a detachment from Sterling Price's raiding column dislodged a small Union force that was occupying the town, but the Confederate occupation lasted only one day. Sedalia was chartered as a city in 1889. In 1896 a constitutional amendment to remove the state capital from Jefferson City to Sedalia was defeated by popular vote.

SEDAN, a town of northern France, capital of an arrondissement in the department of Ardennes, on the right bank of the Meuse, 12 m. E.S.E. of Mézières by rail. Pop. (1906) town 16,014; commune 19,599. Sedan is built on the right bank of the Meuse round a bend in the river forming a peninsula. On the left bank stands the suburb of Torcy, situated partly within the bend, partly beyond the canal which cuts across the neck of the peninsula. There is a statue of Turenne (born at Sedan in 1611), remains of a castle of the 15th century and a Protestant temple dating from 1593. Sedan is the seat of a sub-prefect and has a municipal school of weaving. The manufacture of fine black cloth established in the middle of the 17th century by Cardinal Mazarin, held its place as the staple industry of the town till towards the end of the 19th century. A large variety of woollen fabrics are produced, and there are flour mills and factories for industrial machinery, boilers and heavy iron goods, chocolate, &c.

Sedan was in the 14th century a dependency of the abbey of Mouzon, the possession of which was disputed by the bishops of Liége and Reims. United to the crown of France by Charles V., it was ceded by Charles VI. to Guillaume de Braquemont, whose son sold it to his brother-in-law Evrard de la Marck. For two centuries this family continued masters of the place in spite of the bishops of Liége and the dukes of Burgundy and Lorraine; and Henri Robert adopted the title "prince of Sedan." In the 16th century the town was an asylum for many Protestant refugees, who laid the basis of its industrial prosperity, and it became the seat of a Protestant seminary. Robert I. de la Marck (d. 1489) was lord of Sedan when he acquired Bouillon. His grandson, Robert III., seigneur of Fleurange and Sedan (d. 1537), was marshal of France and left interesting memoirs. Robert IV. de la Marck (d. 1556), also marshal of France, erected Sedan on his own authority into an independent principality. By the marriage of his granddaughter Charlotte with Henry I. de la Tour d'Auvergne, the duchy of Bouillon and the principality of Sedan passed to the house of Turenne. When the new duke attempted to maintain his independence, Henry IV. captured Sedan in three days; and the second duke Frédéric Maurice de la Tour d'Auvergne, eldest brother of the great marshal, who had several times revolted against Louis XIII., was, after his share in the conspiracy of Cinq-Mars, obliged to surrender his principality. Sedan thus became part of the royal domain in 1642. On the 1st of September 1870 the fortress was the centre of the most disastrous conflict of the Franco-German War (see below). The village of Bazeilles, 3 m. S.E. of Sedan, contains the great ossuary. The house, rendered famous by Neuville's paintings, "Les Dernières Cartouches," now contains objects found on the battlefield. At Donchery, 3½ m. to the west of Sedan, is the château of Bellevue, where Napoleon III. surrendered his sword and where the terms of capitulation of Sedan were agreed upon.

Battle of Sedan (September 1st, 1870).—During the course of the 31st of August (see FRANCO-GERMAN WAR) the retreating French army (1st, 5th, 7th and 12th corps) under Marshal MacMahon assembled in and around Sedan, watched throughout the day by the German cavalry but not severely pushed by them. Sedan is a small old-fashioned fortress, lying in a depression between two ridges which converge in the plateau of Illy about 2½ m. north-east of the town. The only part which its defences played, or might have played, in the ensuing battle lay in the strategic possibilities contained in the fine and roomy bridge-head of Torcy, covering an elbow bend of the Meuse whence the whole French army might have been hurled into the gap between the German III. and Meuse armies, had there been a Napoleon to conceive and to execute this plan. But MacMahon seems to have been too despondent to contemplate anything further than a battle for the honour of the army, and though communications with Mezières, where Vinoy's corps (13th) was gathering, lay open throughout the day, he neither sent orders to it nor made any arrangements to meet the coming danger.


SEDAN
0
½
1 Mile
Contours at intervals of 60 Prussian ft.
1 Prussian ft. = 1·0297 English ft.
Fleigneux
St. Menges
Fleigneux Brook
Illy
Calvaire d'Illy
Iges
Floing
Floing Brook
Querimont Farm
Bois
Forêt des Ardennes
La Chapelle
Le Petit Terme
la Virée Farm
Givonne
Villers Cernay
Gaulier
Cazal
Garenne Farm
Triples Levrettes Farm
Pierremont Farm
Haybes
Bois
Villette
Glaire
le Dancourt
Torcy
STATION
Fond de Givonne
Daigny
Belle Vue Chateau
Donchery
Sedan
Bois Chevalier
Rubecourt
R. Meuse
Balan
la Moncelle
Frénois
Wadelincourt
Bazeilles
STATION
le Pont Maugy
STA.
Givonne R.
la Rulle Brook
R. Chiers
Cheveuges
Bois de la Marfée
Noyers
la Bar R.
Chaumont St. Quentin
Thelonne
Remilly sur-Meuse
Roads
Railways
Canals
Emery Walker sc.

The troops received food and ammunition, the disorders consequent on the successive days' fighting in retreat were remedied, and the men themselves got what they needed most of all, an almost unbroken day's rest. Locally their positions were strong, particularly to the east, where the stream flowing through the Fond du Givonne, though fordable, presented a serious obstacle to the tactical handling of the German infantry. But as a whole it was far too cramped for the numbers crowded into it; it could be completely overlooked from the heights of Frénois, where the king of Prussia's headquarters took their stand, and whence in the afternoon the German artillery fire began to cross over the town itself. At nightfall on the 31st the leading German infantry were approaching. The Army of the Meuse on the right bank of the river, with the II. Bavarians moving towards Bazeilles to reinforce it, and the III. Army, consisting of the V. and XI. corps with the Württemberg division, was heading for Donchéry to cut off the French from Mezières, and only a weak cavalry screen closed the gap between them.

During the night of the 31st of August the Bavarians threw a pontoon bridge across the Meuse below Rémilly, and soon after daybreak, in a fog which lay thickly over the whole country, they began their advance towards Bazeilles, held by Vassoigne's division of the 12th corps and fairly prepared for defence. The firing called all troops within reach of the sound to arms, and before 5 A.M. the Meuse Army was marching to the battle-field, the Guards on the northern road via Villers-Arnay, the Saxons and IVth corps to the south along the river.

Vassoigne's division contained a number of Marine battalions, and their stubborn resistance completely disconcerted the Bavarians. Deprived of all artillery co-operation owing to the fog, the latter spent themselves in fruitless and disconnected efforts in the gardens and streets of the village, and reinforcements were soon urgently needed. About 6 A.M. the fog lifted, and the German batteries at once took part in the struggle. One of the first shells wounded Marshal MacMahon. The next senior officer, General Ducrot, at once assumed command (7 A.M.). But it happened that General Wimpffen, who had only joined the army from Algiers on the night of the 30th, brought with him a secret commission to assume command in the event of the death or disablement of MacMahon. Of this power he did not at first avail himself, since he was a stranger both to the army and the country, whilst Ducrot possessed the confidence of the one and the knowledge of the other in the highest degree. But when about 9 A.M. he learnt that Ducrot proposed to move the whole army under cover of rearguards to the west towards Mezières, he produced his commission and countermanded the movement, being himself convinced that eastward towards Bazaine at Metz lay the road to salvation. Orders once issued on a battle-field are not easily recalled, and the result of this change of command was dire confusion. The French troops northward of Bazeilles, along the Fond du Givonne, were already commencing their withdrawal, when the leading troops of the Saxon XII. corps began to arrive about Daigny, and being only opposed by a weak rearguard, easily carried the ridge south of the Givonne-Sedan road, thus threatening the retreat of Vassoigne's division in and about Bazeilles, which then fell into the hands of the Bavarians between 10 and 11 A.M. At the same moment the Guard corps had begun to form up between Daigny and Givonne, and there being no serious force of the enemy in front of them, the artillery was deploying along the western heights above the valley of Givonne, covered only by weak advanced guards of infantry, when suddenly a great column of French infantry, some 6000 strong, moving west in pursuance of Wimpffen's orders, came over the eastern border of the valley and charged down at full speed towards the guns. Then followed one of the most dramatic spectacles of the entire war. The whole of the corps artillery of the Guard turned upon these devoted men, and tore the column in half, shrouding it in dense clouds of dust and smoke from the bursting shells, above which could be seen the trunks and limbs of men flung upwards by their explosion. The head of the column, perhaps 2000 strong, nevertheless kept on its way, but under the combined fire of the Guard rifle battalion and the flanking fire from other guns its impetus died out and its débris disappeared by degrees under convenient cover. The German Guards were now free to stretch out their right towards the Belgian frontier (where the scouts of the III. Army were already moving) and prepare with all deliberation for the attack on the Bois de la Garenne.

The III. Army had moved off as early as 2.30 A.M., and by 4 A.M. was already crossing the Meuse at Donchéry, aided by several pontoon and trestle bridges thrown over during the night. Their right was covered from sight by the peninsula formed by a bend of the river, and the march of the several columns was unopposed till, clearing its northern extremity, they began to deploy to their right between St Menges and Floing. Here they encountered French outposts, which fell back on their main position on the ridge, to the south of the Floing-Illy road. Against this position the German artillery now pressed forward, and seeing their exposed position, General Gallifet brought forward his brigade of Chasseurs d'Afrique and delivered a most dashing charge. But being unsupported he was compelled to withdraw again behind the cover of the Cazal-Illy ridge.

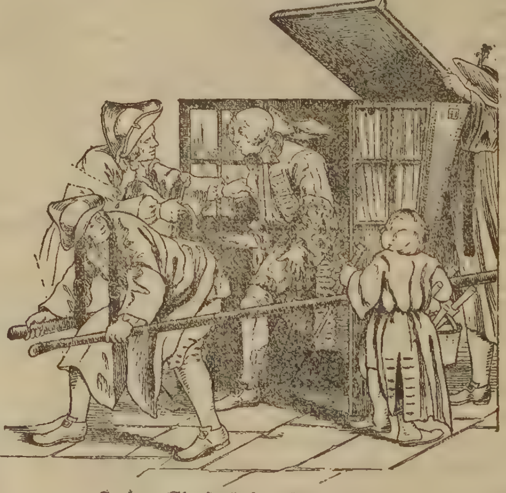
It was now about 11 A.M., and, whether moved by the belated impulse of Ducrot's orders or attracted by the apparent weakness of the Prussians within sight, the French infantry now made a brilliant counter-attack out of their position in their usual manner. But German reinforcements coming suddenly into view, and their *élan* having spent itself, they fell back again, holding only to Floing, whence it required nearly two hours more to expel them.

About noon Wimpffen rode up to General Douay and asked him whether he could hold on to his position. The latter, possibly elated by the success of his recent attack, replied in the affirmative, pointing out only the importance of maintaining the Calvaire d'Illy to the north. De Wimpffen promised him support from the 1st corps on the right rear, part of which, hidden in the Bois de la Garenne, had as yet been little engaged, and then rode south to Balan, where he found the 12th corps fighting desperately. He then sent back to Douay for reinforcements, and the latter despatched all he could spare. These, marching south, crossed the troops of the 1st corps sent to Douay's assistance. The Prussian shells were already crashing into the woods from all sides, and countless stragglers and riderless horses caused most serious delay. To gain time, Margueritte's division was ordered to charge. Margueritte was killed as he rode forward to reconnoitre, and Gallifet took command. "For the next half-hour," says the Prussian official account, "the scene defies description. Gallifet and his squadrons covered themselves with glory, but he had not 2000 sabres at his disposal. Under the storm of shell and over the broken ground manœuvring was impossible. But a series of isolated charges were delivered with results which convinced well-nigh every survivor that the day of cavalry, in sufficient numbers and properly handled on the battle-field, was by no means spent." About an hour after the cavalry charges, between 3 and 4 P.M., the Germans at length gathered weight enough to attempt the assault of the French main position, and moved by a common instinct, lines of men almost 2 m. in extent, pressed on, gaining cover from the convex slope of the hill, till at length they were able to storm the stubbornly-defended ridge. Meanwhile, Wimpffen had initiated a fresh counter-stroke from the Fond du Givonne against Balan and Bazeilles. Carried out with magnificent courage, it swept the Bavarians out of both villages, and for a moment the road seemed open for escape, but Wimpffen did not know that the IV. Prussian corps stood waiting behind the gap.

Riding back to the town to seek the emperor and implore him to place himself at the head of all available reinforcements, he saw a white flag break out from the steeple of the church tower, but almost instantaneously disappear. He did indeed reach the emperor, but, delayed by the appalling confusion, was too late. The flag had gone up again and he knew that further resistance was hopeless. The fighting did not cease at once. The troops he had directed to make the final effort, their eyes fixed on the enemy in front of them, never saw the flag; and until 6 P.M. a series of isolated attempts were made to break the iron circle with which the Germans had surrounded them. The emperor, who during the early hours of the day had fearlessly courted death, at length overcome by extreme physical pain and exhaustion, had ridden back to the town, and about 4 P.M., seeing no hope of success, had sent a parlementaire conveying his personal surrender to the king of Prussia, at the same time ordering the white flag to be hoisted. It was torn down by a Colonel Fauve, but was hoisted again half an hour later, when Prussian troops from Cazal were almost at the western gates of Sedan. It only remained for Wimpffen to make terms for the army, and after a long and gallant effort to avert the inevitable, he at length signed an unconditional surrender, with the sole alleviation (introduced as a tribute of respect for the gallantry shown by his men) that all officers were to retain their swords.

Thus passed into captivity 82,000 men, 558 guns and stores to an immense amount. The price to the victors for this result was in round numbers 9000. The French killed and wounded numbered about 17,000. It is indicative of the demoralization in the French army that this figure is 1000 less than the cost of the victory to the Germans at Wörth, although on that occasion the French troops actually engaged numbered one half those available at Sedan. The duration of the fighting was the same in both cases. (F. N. M.)

SEDAN-CHAIR, a portable chair or covered vehicle, with side windows, and entrance through a hinged doorway at the front, the roof also opening to allow the occupant to stand. It is carried on poles by two "chairmen." Alike in Paris and in London the sedan-chair man was an institution—in the one city he was usually an Auvergnat, in the other an Irishman. The sedan-chair was a fashionable mode of transport in towns up to a century or so ago. It took its name from the town of Sedan, in France, where it was first used, and was introduced into England by Sir S. Duncombe in 1634. Although a typically 18th-century vehicle it was used in the 17th, and had been known much earlier. Indeed, the ancient *sedia gestatoria* of the popes is really a rudimentary form of sedan-chair. These vehicles were


Sedan-Chair (after Hogarth).

often beautifully painted, even the greatest French pastoralists not disdaining to embellish their panels. It is still in use at the public baths at Ischl, in Austria, and also in the city of Bath, England, as a mode of transit in connexion with the medical baths. The sedan-chair can be taken into the bedroom, and the invalid conveyed without exposure to the outer air to and from the mineral-water bath. The poles are so arranged that the chair may be carried up and down stairs and still preserve its horizontal position.

SEDBERGH, a market town in the Skipton parliamentary division of the West Riding of Yorkshire, England, 28½ m. S.S.E. of Penrith by a branch of the London & North-Western railway. Pop. (1901) 2430. It is pleasantly situated at the junction of several small streams forming the river Lune, in a deep valley surrounded by high-lying moors. The church of St Andrew is principally late Norman. The grammar school was founded by Dr Roger Lupton, provost of Eton College, in 1528, but as it was connected with a chantry it was suppressed by Henry VIII., to be refounded in 1551 by Edward VI.; it now takes rank among the important public schools.

SEDDON, RICHARD JOHN (1845–1906), New Zealand statesman, was born at Eccleston, Lancashire, England, in 1845, his father being a schoolmaster at Eccleston Hill school. He was brought up to the engineering trade, and when eighteen went to Australia and entered the railway workshops at Melbourne. He was caught by the "gold fever" and went to Bendigo, where he spent some time in the diggings; but in 1866 he joined an uncle on the west coast of New Zealand, starting work as a miner. In 1869 he married Miss Louisa Jane Spotswood, of Melbourne. In the same year he was elected to a seat on his local Road Board, and he was soon returned to the Westland Provincial Council for the Arahura district, becoming its first chairman of committees. In 1879 he was returned to the New Zealand parliament for Kumara, and sat for that constituency for twenty-six years, though its name was changed to Westland. He was a member of the Ballance ministry (1891), holding the portfolios for public works, defence and mines; and on Ballance's death (1893) became premier, a position he retained till his sudden death on the 10th of June 1906. During these years Seddon held a unique place in the public life of New Zealand, and in its relations with the empire. He combined his premiership with various offices—as colonial treasurer, minister for education, postmaster-general, telegraph commissioner, minister of marine, minister for land purchase, and minister for labour,—but his strenuous personality, and the confidence inspired by his determination to make New Zealand a living force among the British dominions, were the dominating features in all his course of action. His large physique, his profound earnestness, his gift of popular oratory, his expansive kindliness and his power of dealing with men, made him supreme among his own people. He became known in a wider sphere after his attending the colonial conference in London in 1897, and thenceforth he was regarded as one of the pillars of British imperialism. During the Boer War, and afterwards in the movement for preferential trade with the colonies, he was an enthusiastic supporter of Mr Chamberlain, though he was characteristically outspoken in opposition to the introduction of Chinese labour into South Africa. His rough and ready views were frequently open to criticism, but his vigorous patriotism and intensity of character give him a permanent place among those who have worked for the consolidation of the British dominions.

A *Life*, by J. Drummond, was published in 1907.

SEDDON, THOMAS (1821–1856), English landscape painter, was born in London on the 28th of August 1821. His father was a cabinetmaker, and the son for some time followed the same occupation; but in 1842 he was sent to Paris to study ornamental art. On his return he executed designs for furniture for his father. In 1849 he made sketching expeditions in Wales and France, and in 1852 began to exhibit in the Royal Academy, sending a figure-piece, Penelope, and afterwards landscapes, deriving their subjects from Brittany. In the end of 1853 he joined Holman Hunt at Cairo. He worked for a year in Egypt and Palestine, executing views which Ruskin pronounced to be "the first landscapes uniting perfect artistical skill with topographical accuracy; being directed, with stern self-restraint, to no other purpose than that of giving to persons who cannot travel trustworthy knowledge of the scenes which ought to be most interesting to them." Seddon's Eastern subjects were exhibited in Berners Street, London, in 1855, and in Conduit Street in 1856. In October 1856 Seddon again visited Cairo, where he died on the 23rd of November. In 1857 his works were exhibited in the rooms of the Society of Arts, and his important and elaborately finished picture, "Jerusalem and the Valley of Jehoshaphat," was purchased by subscription and presented to the National Gallery.

A memoir of Seddon, by his brother, was published in 1859.

SEDERUNT, ACT OF, in Scots law, an ordinance for regulating the forms of judicial procedure before the Court of Session, passed by the judges under authority of a power originally conferred by an act of the Scottish parliament, 1540, c. 93. A quorum of nine judges is required to pass an act of Sederunt.

SEDGLEY, an urban district of Staffordshire, England, between Dudley and Wolverhampton, in the parliamentary borough of Wolverhampton. Pop. (1901) 15,951. The district abounds in coal, lime and ironstone. Nails, rivets, chains, fire-irons, locks and safes are produced. The parish includes the large manufacturing districts of Upper and Lower Gornal, Coseley and Deepfields, the last having a station on the London & North-Western railway, 10 m. W.N.W. from Birmingham.

SEDGWICK, ADAM (1785–1873), English geologist, was born on the 22nd of March 1785 at Dent in Yorkshire, the second son of Richard Sedgwick, vicar of the parish. He was educated at the Grammar Schools of Dent and Sedbergh, and at Trinity College, Cambridge, where he graduated B.A. as fifth wrangler in 1808, and two years later was elected a Fellow of his college. For several years he was occupied as private tutor and afterwards as assistant mathematical tutor at Trinity College. In 1818 he was admitted to priests' orders. He had at this time paid no serious attention to geology. As a lad he had collected fossils from the Mountain Limestone near Dent, and in 1813 he had visited the mines near Furness and Coniston. Nevertheless, when the Rev. John Hailstone retired in 1818 from the post of Woodwardian professor of geology, Sedgwick applied for the vacancy, and was so strongly supported by his college as a man of talent that he was elected by a large majority. He now took up the study of geology with intense zeal, traversed large areas in the south of England, and, becoming acquainted with W. D. Conybeare, regarded him as his master in geology. It is astonishing with what rapidity he grasped the principles of stratigraphical geology and the relationships of rocks in the field. In papers read before the Cambridge Philosophical Society, 1820–1821, on the structure of parts of Devonshire and Cornwall, he made observations of exceptional interest and value. Of this society in 1819 he had been one of the founders with J. S. Henslow. Every year for a long period now brought its season of field-work. Sedgwick dealt with the geology of the Isle of Wight, and with the strata of the Yorkshire coast (in papers published in the *Annals of Philosophy*, 1822, 1826); and he examined the rocks of the north of Scotland with Murchison in 1827. He contributed an important essay *On the Geological Relations and Internal Structure of the Magnesian Limestone* to the Geological Society of London (1828). As early as 1822 he had begun to make a detailed geological map of the older rocks of the Lake District; he continued these researches whereby the main structure of this mountain region was first unravelled, in succeeding years; and the principal results were brought before the Geological Society (1831–1836). Meanwhile he was elected president of the Geological Society in 1829–1830, and in 1831 he commenced field-work in North Wales. His chief attention was now concentrated on the older rocks of England and Wales. Murchison began the task of unravelling the structure of the older rocks on the Welsh borders in the same year. They had intended to start together, but the arrangements fell through, and thus they began their labours independently and from opposite sides of the principality. Eventually Sedgwick founded the Cambrian system for the oldest group of fossiliferous strata, and Murchison the Silurian system for the great group immediately below the Old Red Sandstone. Their systems were found to overlap—Sedgwick's Upper Cambrian and Murchison's Lower Silurian being practically equivalent. Hence arose a painful controversy that has only of late years been terminated by the adoption of Professor C. Lapworth's term Ordovician in place of the Upper Cambrian of Sedgwick and the Lower Silurian of Murchison.

Sedgwick was ever actively interested in the work of his university. His famous *Discourse on the Studies of the University of Cambridge*, delivered in 1832, was published in expanded form in 1833; it reached a fifth edition in 1850. The studies were reviewed under the headings of (1) The laws of nature, (2) Ancient literature and language, and (3) Ethics and metaphysics; and the volume had so grown that it ultimately consisted of 442 pages of preface, or preliminary dissertation on the history of creation, with arguments against the transmutation of species, and an essay on the evidences of Christianity; the discourse occupied 94 pages; and there was an appendix of notes, &c., that filled 228 pages.

In 1833 Sedgwick was president of the British Association at the first Cambridge meeting, and in 1834 he was appointed a canon of Norwich. In 1836 with Murchison he made a special study of the Culm-measures of Devonshire, which until that time had been grouped with the greywacke, and together they demonstrated that the main mass of the strata belonged to the age of the true Coal Measures. Continuing their researches into the bordering strata they were able to show in 1839, from the determinations of William Lonsdale, that the fossils of the South Devon limestones and those of Ilfracombe and other parts of North Devon were of an intermediate type between those of the Silurian and Carboniferous systems. They therefore introduced the term Devonian for the great group of slates, grits and limestones, now known under that name in West Somerset, Devon and Cornwall. These results were published in the great memoir by Sedgwick and Murchison, "On the Physical Structure of Devonshire" (*Trans. Geol. Soc.*, 1839). Of later published works it will be sufficient to mention *A Synopsis of the Classification of the British Palaeozoic Rocks* (1855), which contained a systematic description of the fossils by F. McCoy. Also the preface by Sedgwick to *A Catalogue of the collection of Cambrian and Silurian Fossils contained in the Geological Museum of the University of Cambridge*, by J. W. Salter (1873).

The Wollaston Medal of the Geological Society was awarded to Sedgwick in 1851, and the Copley Medal of the Royal Society in 1863. He continued to lecture until 1872, when ill-health rendered necessary the appointment of a deputy (Professor J. Morris). He died at Cambridge on the 27th of January 1873.

In 1865 the senate of the university received from A. A. Van Sittart the sum of £500 "for the purpose of encouraging the study of geology among the resident members of the university, and in honour of the Rev. Adam Sedgwick." Thus was founded the Sedgwick prize to be given every third year for the best essay on some geological subject. The first Sedgwick prize was awarded in 1873. On the death of Sedgwick it was decided that his memorial should take the form of a new and larger museum. Hitherto the geological collections had been placed in the Woodwardian Museum in Cockerell's Building. Through the energy of Professor T. McK. Hughes (successor to Sedgwick) the new building termed the Sedgwick Museum was completed and opened in 1903.

See the *Life and Letters*, by John Willis Clark and Thomas McKenny Hughes (1890).

SEDGWICK, JOHN (1813–1864), American general, was born at Cornwall, Connecticut, on the 13th of September 1813, and graduated at West Point in 1837. Amongst his classmates were Joseph Hooker, Braxton Bragg and J. A. Early. He saw active service against the Seminoles in Florida, and took part as an artillery officer in the Mexican War, winning the brevets of captain and major for his conduct at Contreras-Churubusco and Chapultepec. In command first of a brigade and later of a division in the Army of the Potomac, he took part in the Seven Days' and Maryland campaigns. At the battle of Antietam he was twice wounded, but remained on the field. Soon afterwards he was given command of the VI. corps, in which position he took an important part in the battle of Chancellorsville, capturing the famous lines of Fredericksburg and fighting the severe battle of Bank's Ford. The VI. corps bore a share in the battle of Gettysburg, having made a fine forced march to the field. Sedgwick had been offered the chief command of the army upon Hooker's resignation; but he declined, and retained his command of the VI. corps during the Virginian campaign of the autumn of 1863, being on several occasions placed by Meade in charge of a wing of the army. He was also given the command of the whole army in Meade's absence. At the action of Rappahannock station Sedgwick by a brilliant night attack destroyed two brigades of Early's division (November 7th). When Grant became commanding-general and the Army of the Potomac was reorganized in three corps, the VI. was one of these, and Sedgwick thus led his old corps, now greatly augmented, at the battle of the Wilderness. At the opening of the battle of Spottsylvania Court House, Sedgwick was killed (9th of May 1864) by a shot from a Confederate skirmisher. A monument to his memory, cast from the guns taken in action by the VI. corps, was erected at West Point in 1868.

SEDILIA (the plural of Lat. *sedile*, seat), in ecclesiastical architecture, the term given to the seats on the south side of the chancel near the altar for the use of the officiating priests. They are generally three in number, for the priest, deacon and sub-deacon. The custom of recessing them in the thickness of the wall began about the end of the 12th century; some early examples consist only of stone benches, and there is one instance of a single seat or arm-chair in stone at Lenham in Kent, thought by some to be a confessional. The niches or recesses in which they are sunk are often richly decorated with canopies and subdivided with moulded shafts, pinnacles and tabernacle work; the seats are sometimes at different levels, the eastern being always the highest, and sometimes an additional niche is provided in which the piscina is placed.

SEDITION (Lat. *se* or *sed*, apart, and *ire*, to go, a going apart, dissension), in law, an attempt to disturb the tranquillity of the state. In Roman law sedition was considered as *majestas* or treason. In English law it is a very elastic term, including offences ranging from libel to treason (*q.v.*). It is rarely used except in its adjectival form, *e.g.* seditious libel, seditious meeting or seditious conspiracy. "As to sedition itself," says Mr Justice Stephen, "I do not think that any such offence is known to English law" (*Hist. Crim. Law*, vol. ii. chap. xxiv.).[1] The principal enactments now in force dealing with seditious offences were all passed during the last twenty-five years of the reign of George III. They are the Unlawful Oaths Act 1797, prohibiting the administering or taking of unlawful oaths (see OATH) or the belonging to an unlawful confederacy; the Unlawful Drilling Act 1819–1820 prohibited unlawful drilling and military exercises; and the acts for the suppression of corresponding societies, the Unlawful Societies Act 1799 and the Seditious Meetings Act 1817. No proceedings can be instituted under these last two acts without the authority of the law officers of the crown (Corresponding Societies, &c., Act, 1846). Under the head of statutes aimed at seditious offences may also be classed statutes of Richard II. (1378, 1388) against *scandalum magnatum* or slander of great men, such as peers, judges or great officers of state, whereby discord may arise within the realm, and a statute of Charles II. (1661) against tumultuous petitioning (see PETITION). There has been no prosecution for many years for seditious words as distinguished from seditious libel, but such words have been admitted as evidence in proceedings for seditious conspiracy (*q.v.*), as in the prosecution of O'Connell in 1844 and of C. S. Parnell and others in 1880 (see *Reg.* v. *Parnell*, Cox's *Criminal Cases*, vol. xiv. 508). By the Prison Act 1877, any prisoner under sentence for sedition or seditious libel is to be treated as a misdemeanant of the first division.

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[1] The word "sedition" occurs, however, in the Prison Act 1877, s. 40.

Scotland.—"All acts by which the minds of the people may be incited to defeat the government or control legislation by violent or unconstitutional means are seditious" (Macdonald, *Criminal Law*, 229). Sedition is punishable by fine or imprisonment or both (Punishment of Leasing-making, &c., 1825). A very large number of acts of the Scottish parliament dealt with sedition, beginning as early as 1184 with the assize of William the Lion, c. 29. Leasing-making is to be distinguished from sedition, as it attacked only the sovereign individually, not the government.

United States.—In the acts of Congress the word "sedition" appears to occur only in the army and navy articles. A soldier joining any sedition or who, being present at any sedition, does not use his utmost endeavour to suppress the same, is punishable with death or such other punishment as a court-martial shall direct (U.S. Rev. Stats. § 1342, arts. 22, 23). A sailor uttering seditious words is punishable at the discretion of a court-martial. In 1798 an act of Congress called the Sedition Act was passed, which expired by effluxion of time in 1801. Its constitutionality was violently assailed at the time and it "was beyond all question condemned by public sentiment" as "susceptible of being used for purposes of oppression and terrorism." (See Story on the constitution of the United States, §§ 1293–1294.) Several prosecutions under the act will be found in Wharton's *State Trials*. Sedition is also dealt with by the state laws mostly in a very liberal spirit. Thus the Louisiana Code, § 394, enacted that "there is no such offence known to our law as defamation of the government or either of its branches, either under the name of libel, slander, seditious writing or other appellation." By § 111, to constitute the offence of sedition "there must be not only a design to dismember the state, or to subvert or change its constitution, but an attempt must be made to do it by force. It has been held that publications which tend to degrade and vilify the constitution, to promote insurrection and circulate discontent through its members, to asperse its justice and anywise impair the exercise of its functions are *seditious* and are visited with the peculiar rigour of the law (1805, *Respub. v. Dennie*, 4 Yeates (Penna), 267). The defendant was indicted "as a factitious and seditious person of a wicked mind and unquiet and turbulent disposition and conversation, seditiously, maliciously and wilfully intending as much as in him lay to bring into contempt and hatred the independence of the United States, the constitution of this commonwealth and of the United States, to excite popular discontent and dissatisfaction against the scheme of polity instituted and upon trial in the said United States and in the said commonwealth, to molest, disturb and destroy the peace and public tranquillity of the said United States . . . to condemn the principles of revolution and revile, depreciate and scandalize the characters of the revolutionary patriots and statesmen, to endanger, subvert and totally destroy the republican constitutions and free governments of the United States . . . to involve (it) . . . in civil war, desolation and anarchy and to procure by art and force a radical change and alteration in the principles and forms of the said constitutions and governments without the free will and concurrence of the people of the United States, and to fulfil, perfect and bring to effect his wicked, seditious and detestable intentions aforesaid he the said Joseph Dennie on the 23rd of April 1803 at the city of Philadelphia falsely, maliciously, factiously and seditiously did make, compose, write and publish the following libel, to wit, 'a *democracy* is scarcely tolerable at any period of national history. Its omens are always *sinister* and its powers are *unpropitious*; it was weak and wicked at *Athens*, it was bad in Sparta and worse in *Rome*. . . . It was tried in England and rejected with the utmost *loathing and abhorrence*. *It is on its trial* here and its issue will be *civil war, desolation and anarchy*. . . . No honest man but proclaims its *fraud*, and no brave man but draws his *sword against its force*,' &c., &c." The defendant was found not guilty.

Continent of Europe.—The continental codes as a rule are little more definite than English law in their treatment of sedition. In Germany a distinction is drawn between *Auflauf*, the remaining together of a mob after the authorities have thrice bid it disperse, and *Aufruhr* or *Aufstand*, an organized resistance to the authorities; but no definition is given of the terms. The Hungarian penal code defines *Aufstand* to be an armed assembly which has the intention of attacking a class of citizens, a nationality or a religious body. The French penal code recognizes a difference between *sédition* and *réunion séditieuse*. If carried out with sufficient numbers and sufficient force *sédition* becomes *rébellion*. Section 100 exempts from the penalties of sedition those who have merely been present at a seditious meeting without taking any active part therein, and have dispersed at the first warning of the military or civil authorities.

SEDLEY, SIR CHARLES (*c.* 1639–1701), English wit and dramatist, was born about 1639, and was the son of Sir John Sedley of Aylesford in Kent. He was educated at Wadham College, Oxford, but left without taking a degree. Sedley is famous as a patron of literature in the Restoration period, and was the "Lisideius" of Dryden's *Essay of Dramatic Poesy*. His most famous song, "Phyllis is my only joy," is much more widely known now than the author's name. His first comedy, *The Mulberry Garden* (1668), hardly sustains Sedley's contemporary reputation for wit in conversation. The best, but most licentious, of his comedies is *Bellamira; or The Mistress* (1687), an imitation of the *Eunuchus* of Terence, in which the heroine is supposed to represent the duchess of Cleveland, the mistress of Charles II. His two tragedies, *Antony and Cleopatra* (1667) and *The Tyrant King of Crete* (1702), an adaptation of Henry Killigrew's *Pallantus and Eudora*, have little merit. He also produced *The Grumbler* (1702), an adaptation of *Le Grondeur* of Brueys and Palaprat. An indecent frolic in Bow Street, for which he was heavily fined, made Sedley notorious. He was member of parliament for New Romney in Kent, and took an active and useful part in politics. A speech of his on the civil list after the Revolution is cited by Macaulay as a proof that his reputation as a man of wit and ability was deserved. His *bon mot* at the expense of James II. is well known. The king had seduced his daughter and created her countess of Dorchester, whereupon Sedley remarked that he hated ingratitude, and, as the king had made his daughter a countess, he would endeavour to make the king's daughter a queen. He died on the 20th of August 1701.

His only child, CATHERINE, countess of Dorchester (*c.* 1657–1717), was the mistress of James II. both before and after he came to the throne, and was created a countess in 1686, an elevation which aroused much indignation and compelled Catherine to reside for a time in Ireland. In 1696 she married Sir David Colyear, Bart. (d. 1730), who was created earl of Portmore in 1703, and she was thus the mother of Charles Colyear, 2nd earl of Portmore (1700–1785). She died at Bath on the 26th of October 1717, when her life peerage became extinct. By James II. Lady Dorchester had a daughter Catherine (d. 1743), who married James Annesley, earl of Anglesey (d. 1702), and after his death married John Sheffield, duke of Buckingham. Through Catherine, her daughter by her first husband, she was the ancestress of the Barons Mulgrave.

See *The Works of Sir Charles Sedley in Prose and Verse* (1778), with a slight notice of the author.

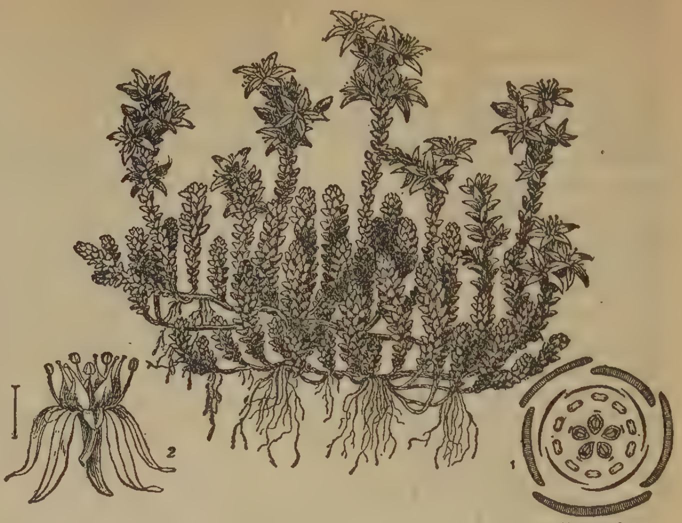
SEDUCTION (from Lat. *seducere*, to lead astray), a term generally used in the special sense of wrongfully inducing a woman to consent to sexual intercourse. The action for seduction of an unmarried woman in England stands in a somewhat anomalous position. The theory of English law is that the woman herself has suffered no wrong; the wrong has been suffered by the parent or person *in loco parentis*, who must sue for the damage arising from the loss of service caused by the seduction of the woman. Some evidence of service must be given, but very slight evidence will be sufficient, even making of tea, milking cows, minding children or any small household work. It is no bar if a daughter is out at work during the day time, provided she assists in the household when she comes home in the evening. The relationship of master and servant must, however, exist, and the action must be brought by the person with whom the seduced girl was residing at the time, whether in the capacity of daughter and servant, ward and servant, or servant only. It is so seldom indeed that an action is brought against a seducer when the seduced girl is a servant only, that what Serjeant Manning wrote many years ago is still painfully true: "The *quasi* fiction of *servitium amisit* affords protection to the rich man whose daughter occasionally makes his tea, but leaves without redress the poor man whose child is sent unprotected to earn her bread amongst strangers" (note to *Grinnell v. Wells*, 1844, 7 M. & G. 1044). This capricious working of the action for seduction is somewhat obviated in Scots law, under which the seduced woman may sue on her own account, but only if deceit has been used, and most often there is a difficulty in showing that the deceit alone was the cause of the injury. Although the action is nominally for loss of service, still exemplary damages are given for the dishonour of the plaintiff's family beyond recompense for the mere loss of service. An action for seduction cannot be brought in the county court except by agreement of the parties. As to seduction of a married woman, the old action for criminal conversation was abolished by the Divorce Act 1857 which substituted for it a claim for damages against the co-respondent in a divorce suit; but if a married woman were living apart from her husband in her father's house, and giving her services to her father in the slightest degree, an action for seduction would lie. Seduction in England is not as a rule a criminal offence. But a conspiracy to seduce is indictable at common law. And the Criminal Law Amendment Act 1885 (which extends to the United Kingdom) makes it felony to seduce a girl under the the age of thirteen, and misdemeanour to seduce a girl between thirteen and sixteen (§§ 4,5). The same act also deals severely with the cognate offences of procuration, abduction and unlawful detention with the intent to seduce a woman of any age. The Children Act 1908 gave a further protection to young people, enacting that if any person having the custody, charge or care of a girl under the age of sixteen causes or encourages the seduction of that girl he shall be guilty of a misdemeanour, and be liable to imprisonment, with or without hard labour, for a term not exceeding two years.

United States.—In the United States state legislation has generally modified the common law. In some states the father brings the action as the representative of the family whose purity has been invaded; in others the woman herself may bring the action. In many states there is a criminal as well as a civil remedy. The penal codes of New York, New Jersey, Louisiana and other states make it a crime to seduce under promise of marriage an unmarried woman of good reputation. Subsequent intermarriage of the parties is in most cases a bar to criminal proceedings. The state legislation of the United States is in remarkable opposition to the rule of the canon law, by which the seduction of a woman by her betrothed was not punishable on account of the inchoate right over her person given by the betrothal.

SEDULIUS, Coelius or Caelius (a praenomen of doubtful authenticity), a Christian poet of the first half of the 5th century, is termed a presbyter by Isidore of Seville and in the Gelasian decree. He must not be confused with Sedulius the Irish-Scot grammarian of the 9th century. His fame rests mainly upon a long poem, *Carmen paschale*, based on the four gospels. In style a bombastic imitator of Virgil, he shows, nevertheless, a certain freedom in the handling of the Biblical story, and the poem soon became a quarry for the minor poets. A hymn by Sedulius in honour of Christ, consisting of twenty-three quatrains of iambic dimeters, has partly passed into the liturgy, the first seven quatrains forming the Christmas hymn *A solis ortus cardine*, and some later ones the Epiphany hymn, *Hostis Herodes impie*. A *Veteris et novi Testamenti collatio* in elegiac couplets has also come down, but we have no grounds for ascribing to him the Virgilian cento, *De verbi incarnatione*.

Sedulius's works were edited by F. Arevalo (Rome, 1794), reprinted in J. P. Migne's *Patrol. Lat.* vol. xix.; and finally by J. Huemer (Vienna, 1885). See J. Huemer, *De Sedulii poëtae vita et scriptis commentatio* (Vienna, 1878); M. Manitius, *Geschichte der christlich-lateinischen Poesie* (Stuttgart, 1891); Teuffel-Schwabe, *Hist. of Roman Lit.* (Eng. trans.), 473; Herzog-Hauck, *Realencyklopädie für protestantische Theologie*, xviii. (Leipzig, 1906); Smith and Wace, *Dictionary of Christian Biography* (1887).

SEDUM, in botany, a genus of the natural order Crassulaceae, containing about 120 species, natives chiefly of the north temperate and frigid regions, and mostly perennial herbs with succulent leaves of varied form, but never compound. The white or yellow, rarely pink or blue, flowers are usually small and grouped in cymes. They have a calyx of fine sepals, as many petals, usually ten stamens and five distinct carpels, which have as many glands at their base and ripen into as many dry seed-pods. Several species are British, including some with tuberous roots and large leaves (*Telephium*), and others of smaller size, chiefly found on rocks, walls and dry banks; *S. acre* is stonecrop (see fig. 1), well known also in gardens, a variety of which, *aureum*, is in cultivation with golden-yellow tips to the leaves and shoots. Many others are cultivated for the beauty of their foliage or flowers, and many are remarkable for their vitality under adverse circumstances. They succeed on rockwork, old walls or as border plants; some, *e.g. S. Lydium*, a native of Asia Minor, are excellent for carpet bedding. *S. spectabile*, 1 to 1½ ft., with pink flowers in great cymose heads, is a fine plant for the borders, and worthy also of pot-culture for greenhouse decoration. *S. Sieboldi* and its variegated form, from Japan, are often grown in hanging pots or baskets in cottage windows. *Sedums* are very closely allied to *Sempervivums* (see Houseleek).



Sedum acre (Stonecrop). (After Curtis.) Flora Lindinensis.
1, Diagram of flower; 2, flower enlarged.

SEE (Lat. *sedes*, a seat), a seat or throne, particularly the throne of a bishop, the *cathedra*, the symbol of his office and dignity, the placing of which in a church makes it a cathedral (*q.v.*). The term is thus applied to the place where the bishop's cathedral is situated and from which he properly takes his title, and so is to be distinguished from diocese (*q.v.*), the territorial province over which his jurisdiction extends (see Bishop).

SEEBACH, MARIE (1830–1897), German actress, was born at Riga, in Russia, on the 24th of February 1830, being the daughter of an actor, Wilhelm Friedrich Seebach (1798–1863). After appearing first at Nuremberg as Julie in *Kean*, she played soubrette parts at Lübeck, Danzig and Cassel. In 1852 she achieved her first great success at the Thaliatheater in Hamburg as Gretchen in Goethe's *Faust*, and she remained there until 1854, when she appeared in Vienna. She then played in Munich, establishing her reputation as a tragic actress with the rôles of Jane Eyre and Adrienne Lecouvreur. From 1855 to 1866 she was engaged at the court theatre at Hanover, and there in 1859 she married the tenor Albert Niemann. In 1866 she followed her husband to Berlin, but separated from him after two years. In 1870–1871 she visited the United States, and gave in seventeen cities no less than 160 performances—mostly of *Faust*; and in 1886 she accepted a permanent engagement at the Schauspielhaus in Berlin. She retired from the stage in 1897, and died on the 3rd of August of that year. In 1895 she endowed a home for poor actors and actresses at Weimar, called the Marie Seebach Stiftung.

See Gensichen, *Aus Marie Seebachs Leben* (Berlin, 1900).

SEED (from the root seen in Lat. *serere*, to sow), the fertilized ovule of plants. The seeds of the cryptogams or flowerless plants are not true seeds and are properly designated "spores" (see Fruit). For the sowing of seed see Sowing.

SEELEY, SIR JOHN ROBERT (1834–1895), English essayist and historian, was born in London in 1834. His father, R. B. Seeley, was a publisher, and author of several religious books and of *The Life and Times of Edward I.*, which was highly esteemed by historians. From his father Seeley doubtless derived his taste for religious and historical subjects. He was educated at the City of London School and at Christ's College, Cambridge, where he was head of the classical tripos and senior chancellor's medallist, was elected fellow and became classical tutor of his college. For a time he was a master at his old school, and in 1863 was appointed professor of Latin at University College, London. His essay *Ecce Homo*, published anonymously in 1866, and afterwards owned by him, was widely read, and called forth many replies, being held to be an attack on Christianity. Dealing only with Christ's humanity, it dwells on his work as the founder and king of a theocratic state, and points out the effect which this society, his church, has had upon the standard and active practice of morality among men. Some who comdemned the book seem to have forgotten that it was avowedly "a fragment," and that the author does not deny the truth of doctrines which he does not discuss. Its literary merit is unquestionable; it is written with vigour and dignity; its short and pointed sentences are never jerky, and there is a certain stateliness in the admirable order of their sequence. His later essay on *Natural Religion*, which, premising that supernaturalism is not essential to religion, maintains that the negations of science tend to purify rather than destroy Christianity, satisfied neither the Christian nor the scientist, and though well written excited far less interest than his earlier work. In 1869 he was appointed professor of modern history at Cambridge. His influence as a teacher was stimulating; he prepared his lectures carefully and they were largely attended. In historical work he is distinguished as a thinker rather than a scholar. Avoiding research and disliking all attempts at a picturesque representation of the past, he valued history solely in its relation to politics, as the science of the state. He maintained that it should be studied scientifically and for a practical purpose, that its function was the solution of existing political questions. Hence he naturally devoted himself mainly to recent history, and specially to the relations between England and other states. His *Life and Times of Stein*, a valuable narrative of the anti-Napoleonic revolt, led by Prussia mainly at Stein's instigation, was written under German influence, and shows little of the style of his short essays. Its length, its colourlessness, and the space it devotes to subsidiary matters render it unattractive. Far otherwise is it with his *Expansion of England* (1883). Written in his best manner, this essay answers to his theory that history should be used for a practical purpose; it points out how and why Great Britain gained her colonies and India, the character of her empire, and the light in which it should be regarded. As an historical essay the book is a fine composition, and as a defence of the empire is unanswerable and inspiring. It appeared at an opportune time, and did much to make Englishmen regard the colonies, not as mere appendages, but as an expansion of the British state as well as of British nationality, and to remind them of the value of Great Britain's empire in the East. Seeley was rewarded for this public service by being made K.C.M.G., on the recommendation of Lord Rosebery. His last book, *The Growth of British Policy*, written as an essay and intended to be an introduction to a full account of the expansion of Great Britain, was published posthumously. Seeley died on the 13th of January 1895. He married in 1869 Miss Mary Agnes Phillott, who survived him.

See G. W. Prothero, *Memoir* prefixed to *Growth of British Policy* (London, 1895). (W. Hu.)

SÉES, a town of north-western France, in the department of Orne, on the river Orne 3 m. from its source and 13 m. N.N.E. of Alençon by rail. Pop. (1906) town, 2612; commune, 3982. The town is a bishop's see and has a Gothic cathedral remarkable for the boldness of its architecture. The church dates from the 13th and 14th centuries and occupies the site of three earlier churches. The west front, which is disfigured by the buttresses projecting beyond it, has two stately spires of open work 230 ft. high. The nave was built towards the end of the 13th century. The choir, built soon afterwards, is remarkable for the lightness of its construction. In the choir are four bas-reliefs of great beauty representing scenes in the life of the Virgin; and the altar is adorned with another depicting the removal of the relics of St Gervais and St Protais. The church has constantly been the object of restoration and reconstruction. Other noteworthy buildings are the episcopal palace (1778), with a pretty chapel; the higher seminary, located in the old abbey of St Martin (supposed to be one of the fourteen or fifteen monasteries founded in the 6th century by St Evroult); and the sumptuous modern chapel of the Immaculate Conception, a resort of pilgrims.

The first bishop of Sées (*Saium, Sagium*) was St Lain, who lived about the 4th century. In the 9th century Sées was a fortified town and fell a prey to the Normans. At that period Sées consisted of two distinct parts, separated by the Orne—the bishop's burgh, and to the south, the new or count's burgh (*Bourg le Comte*). From 1356 the counts of Alençon were its possessors. It was captured and recaptured in the wars between Henry II. of England and his sons. In the Hundred Years' War it was one of the first towns of Normandy to fall into the hands of the English (1418). Pillaged by the Protestants during the Wars of Religion, Sées attached itself to the League in 1589, but voluntarily surrendered to Henry IV. in 1590.

SEETZEN, ULRICH JASPER (1767–1811), German explorer of Arabia and Palestine, was born, the son of a yeoman, in the little lordship of Jever in German Frisia on the 30th of January 1767. His father, who was a man of substance, sent him to the university of Göttingen, where he graduated in medicine. His chief interests, however, were in natural history and technology; he wrote papers on both these subjects which gained him some reputation, and had both in view in making a series of journeys through Holland and Germany. He also engaged in various small manufactures, and in 1802 obtained a government post in Jever. In 1801, however, the interest which he had long felt in geographical exploration culminated in a resolution to travel. In the summer of 1802 he started down the Danube with a companion Jacobsen, who broke down at Smyrna a year later. His journey was by Constantinople, where he stayed six months, thence through Asia Minor to Smyrna, then again through the heart of Asia Minor to Aleppo, where he remained from November 1803 to April 1805, and made himself sufficiently at home with Arabic speech and ways to travel as a native. Now began the part of his travels of which a full journal has been published (April 1805 to March 1809), a series of most instructive journeys in eastern and western Palestine and the wilderness of Sinai, and so on to Cairo and the Fayum. His chief exploit was a tour round the Dead Sea, which he made without a companion and in the disguise of a beggar. From Egypt he went by sea to Jidda and reached Mecca as a pilgrim in October 1809. In Arabia he made extensive journeys, ranging from Medina to Lahak and returning to Mocha, from which place his last letters to Europe were written in November 1810. In September of the following year he left Mocha with the hope of reaching Muscat, and was found dead two days later, having, it is believed, been poisoned by the command of the imām of Sana.

For the parts of Seetzen's journeys not covered by the published journal (*Reisen*, ed. Kruse, 4 vols., Berlin, 1854), the only printed records are a series of letters and papers in Zach's *Monatliche Correspondenz* and Hammer's *Fundgruben*. Many papers and collections were lost through his death or never reached Europe. The collections that were saved form the Oriental museum and the chief part of the Oriental MSS. of the ducal library in Gotha.

SEGANTINI, GIOVANNI (1858–1899), Italian painter, was born at Arco in the Trentino on the 15th of June 1858. His mother, who died in 1863, belonged to an old family of the mountain country. His father, who was a man of the people, went to Milan, whence he set forth with another son to seek his fortune, leaving Giovanni behind. At the age of seven the child ran away; he was found perishing of cold and hunger, and was obliged to earn his bread by keeping the flocks on the hills. He spent his long hours of solitude in drawing. Owing to his fame having reached the ears of a syndic, he was sent back to Milan; but, unable to endure domestic life, he soon escaped again, and led a wandering life till he met at Arco with his half-brother, who offered him the place of cashier in his provision shop. After more flights and more returns, Segantini remained at Milan to attend classes at the Brera, earning a living meanwhile by giving lessons and painting portraits. His first picture, "The Choir of Sant Antonio," was noticed for its powerful quality. After painting this, however, he shook himself free by degrees of academical teaching, as in his picture "The Ship." He subsequently painted "The Falconer" and "The Dead Hero," and then settled in Brianza, near Como. There he gave himself up to the study of mountain life, and became in truth the painter of the Alps. At this time he painted the "Ave Maria," which took a gold medal at the Amsterdam Exhibition (1883), "Mothers," "After a Storm in the Alps," "A Kiss," and "Moonlight Effect." Deeply impressed by Millet, the artist nevertheless quickly strove to reassert his individuality, as may be seen in "The Drinking-place," which gained a gold medal in Paris (1889), "In the Sheep-fold," "By the Spinning-wheel," and "Ploughing in the Engadine," for which he was awarded a gold medal at the Turin Exhibition (1892). Besides those works in which he studied simple effects of light and Alpine scenery, such as "Midday on the Alps" and "Winter at Savognino," he also painted symbolical subjects: "The Punishment of Luxury," and the "Unnatural Mothers" (in the Walker Art Gallery, Liverpool). Segantini died at Maloja in October 1899. An exhibition of his works was held in London, and afterwards at Brussels in 1899, and at Milan in 1900.

AUTHORITIES.—H. Zimmern, *Magazine of Art* (London, 1897); W. Ritter, *Gazette des beaux-arts* (Paris, 1898); Robert de la Sizeranne, *Revue de l'art* (Paris, 1899); and *Revue des deux mondes* (Paris, 1900).

SEGESTA (Gr. Ἔγεστα), an ancient city of Sicily, 8 m. W.S.W. of the modern Alcamo and about 15 m. E.S.E. of Eryx. It was a city of the Elymi, but, though the Elymi were regarded as *barbari*, Segesta, in its relations with its neighbours, was almost like a Greek city. Disputes with Selinus over questions of boundary seem to have been frequent from 580 B.C. onwards. In 454 B.C. we hear of dealings—possibly even an alliance—with Athens (the authority is a fragmentary inscription, see E. A. Freeman, *History of Sicily*, ii. 554), and in 426 an alliance was concluded by Laches. One of the ostensible objects of the Athenian expedition to Sicily in 415 was to aid Segesta against Selinus in a dispute, not only as to questions of boundary, but as to rights of marriage. After the Athenian *débâcle*, the Segestans turned to Carthage; but when Hannibal in 409 B.C. firmly established the Carthaginian power in western Sicily, Segesta sank to the position of a dependent ally, and was indeed besieged by Dionysius in 397, being at last relieved by Himilco. In 307 Agathocles marched on the city, massacred 10,000 men, sold the rest of the inhabitants into slavery and changed its name to Dicaeopolis; but it soon recovered its old name and returned to the Carthaginians. Early in the First Punic War, however, the inhabitants, having massacred the Carthaginian garrison and allied themselves with Rome, had to stand a severe siege from the Carthaginians. Segesta was treated with favour by the Romans, retaining its freedom and immunity from tithe; indeed it seems probable that the municipal constitution of Eryx was suppressed and its territory assigned to Segesta. It received Latin rights before Caesar's concession of them to the rest of Sicily.

The site is now absolutely deserted. The town lay upon the Monte Varvaro (1345 ft.); considerable remains of its external walls, of houses and of a temple of Demeter are to be seen. The theatre is well preserved: its diameter is 205 ft. It is partly hewn in the rock, the rest (especially the back wall of the stage) being of very roughly hewn, long, thin blocks of hard limestone, approximately rectangular, with smaller pieces filling up the interstices. To the W.N.W., 350 ft. below the theatre, is a temple, 200½ ft. long and 86¼ wide, including the steps: it is a hexastyle peripteros, and has 36 columns, 29 ft. in height, 6½ ft. in lower diameter. The building was, however, not completed; the *cella* was never built, and the columns, not having been fluted, have a heavy appearance. It is, however, extremely well preserved. Its style places the date of its construction between 430 and 420, so that the interruption of the work must be due to the events of 416 or of 409 B.C. The *Thermae Segestanae* were situated about 5 m. to the north on the road to Castellammare: the hot springs are still in use. (T. As.)

SEGESVÁR (Ger. *Schässburg*), a town of Hungary, in Transylvania, the capital of the county of Nagy-Küküllö, 126 m. S.E. of Koloszvár by rail. Pop. (1900) 10,857. Amongst the principal buildings are a Gothic church of the 15th century, the town and county hall, a German gymnasium with a good collection of antiquities, and the municipal museum. In front of the county hall is a bronze statue of the Hungarian poet Alexander Petöfi (1823–1849), erected in 1897. Segesvár has a good woollen and linen trade, as well as exports of wine and fruit.

Segesvár was founded by Saxon colonists at the end of the 12th century; its Latin name was *Castrum Sex*. Here, on the 31st of July 1849, the Hungarian army under Bem was defeated by the overwhelming numbers of the Russian General Lüders. Petöfi is generally believed to have met his end in this battle.

SEGOVIA, a province of central Spain, formerly part of Old Castile, bounded on the N. and N.E. by the provinces of Burgos and Soria, S.E. by Guadalajara and Madrid, S.W. by Avila, and N.W. by Valladolid. Pop. (1900) 159,243; area, 2635 sq. m. The greater portion of the country consists of an arable tableland, some 2500 ft. above the sea, monotonous enough in appearance, and burnt to a dull brown during summer, but yet producing some of the finest corn in the Peninsula. Along the whole south-eastern boundary the Sierra de Guadarrama rises up suddenly, like a huge barrier, separating Old from New Castile and the basin of the Duero from that of the Tagus. The province is well watered by the streams which rise in the Guadarrama range and flow northwards to the Duero, and by careful irrigation. The Eresma, Cega, Duraton and Riaza are the principal watercourses. Except the capital, Segovia, there is no town of more than 5000 inhabitants; but Sepulveda and other small towns contain monuments of some historical and ecclesiastical interest. At the foot of the Navacerrada pass lies the royal demesne and summer residence of La Granja (*q.v.*). After the completion (1883) of the railway from Medina del Campo to the city of Segovia, and its subsequent extensions to Madrid and Aranda de Duero, the towns adjoining these lines showed signs of increased prosperity and animation. There are manufactures on a small scale of coarse pottery, dyes, paper, alcohol, rosin, hats, pins and needles, flour, oil and beer. Such prosperity, however, as Segovia retains is dependent upon its agricultural produce—wheat, rye, barley, peas, hemp, flax, &c.—together with the rearing of sheep, cattle, mules and pigs. There are extensive forests in the sierras, which yield excellent granite, marble and limestone; but the difficulty of transport has prevented any systematic development of these resources.

SEGOVIA, the capital of the Spanish province of Segovia; on the railway from Madrid to Valladolid and Zamora. Pop. (1900) 14,547. Segovia is built upon a narrow ridge of rock which rises in the valley of the Eresma, where this river is joined by its turbulent tributary the Clamores. It is an episcopal see in the archbishopric of Valladolid. Founded originally as a Roman pleasure resort, it became in the middle ages a great religious centre and seat of the Castilian court; it was surrounded by Alphonso VI. with the walls and towers which still give to it, even in their dilapidation, the air of a military stronghold. The streets are steep, irregular and narrow, and are lined with quaint old-fashioned houses, built for the most part of granite from the neighbouring Sierra Guadarrama. The place teems with records and monuments of the many vicissitudes of fortune and art through which it has passed, foremost among the latter being the ancient alcázar or citadel, the cathedral, the aqueduct of Trajan, and a notable array of churches and other ecclesiastical edifices.

The alcázar is perched upon the western tip of the long tongue of rock upon which the city is built. Of the original medieval fortress but little remains save the noble façade—the building having been wantonly fired in 1862 by the students of the artillery school then domiciled within its walls, and all but destroyed. The work is Gotho-Moorish, with an admixture of Renaissance in the decoration. The 16th-century cathedral (1521–1577), the work of Juan Gil de Ontañon and his son Rodrigo, occupies the site of a former church of the 11th century, of which the present cloisters, rebuilt in 1524, formed part. It is a well-proportioned and delicate piece of Late Gothic—the latest of its kind in Spain—and contains some very fine stained glass. The most remarkable of the many other churches are those of La Vera Cruz (Knights Templar, Romanesque of the early 13th century), San Millan and San Juan (both Romanesque of second half of 13th century), El Parral (Gothic of early 16th century), and Corpus Christi, an ancient Jewish sanctuary and an interesting specimen of Moorish work. The towers and external cloistering, or *corredores*, of several of the later churches—especially those of San Estéban and San Martin—are fine. The great aqueduct, however, called El Puente del Diablo, usually ranks as the glory of Segovia, and is remarkable alike for its colossal proportions, its history, its picturesqueness, and the art with which it is put together. Erected or rebuilt, according to fairly trustworthy tradition, in the time of the emperor Trajan (*c.* A.D. 53–117), and several times barely escaping destruction, it is now in perfect working order, bringing the waters of the Rio Frio down from the Sierra Fuenfria, 10 m. S. The bridge portion striding across the valley into the city is 847 yds. long, and consists of a double tier of superimposed arches, built of rough-hewn granite blocks, laid without lime or cement. (For illustration, see AQUEDUCT.) Segovia lost its ancient prosperity when it was taken and sacked by the French in 1808. Since then, however, suburbs have sprung up on all sides, outside the walls. The woollen industry decayed, but its place was taken by dyeing, iron-founding, and manufactures of paper, flour, earthenware, and coarse porcelain. Segovia has a botanical garden, a museum and picture gallery, a savings bank, two public libraries, and two remarkable collections of archives. Public education is provided by an institute, a dozen primary schools, a school for teachers, and schools of art and handicrafts. The royal artillery school of Spain is also established here.

SEGRAVE, the name of an English baronial family. Stephen de Segrave, or Sedgrave (d. 1241), the son of a certain Gilbert de Segrave of Segrave in Leicestershire, became a knight and was made constable of the Tower of London in 1203. He obtained lands and held various positions under Henry III., and in 1232 he succeeded Hubert de Burgh as chief justiciar of England. As an active coadjutor of Peter des Roches, bishop of Winchester, Segrave incurred some share of the opprobrium which was lavished on the royal favourites, and in 1234 he was deprived of his office. Soon, however, he was again occupying an influential position at Henry's court, and he retained this until his death on the 9th of November 1241. His son and heir, Gilbert de Segrave (d. 1254), who was also a judge, died in prison at Pons in France, whither he had gone to fight for Henry III.

Gilbert was the father of NICHOLAS DE SEGRAVE, 1st Baron Segrave (*c.* 1238–1295), who was one of the partisans of Simon de Montfort; he led the Londoners at the battle of Lewes, and was a member of Earl Simon's famous parliament of 1265. He was wounded at the battle of Evesham, and was afterwards among those who defied the royal authority in the isle of Ely. Soon, however, he obtained terms of peace, and went to the Holy Land with his future sovereign, Edward I. In 1283 he was summoned to parliament as a baron, and he served the king in various ways. He had six sons, three of whom, John (who succeeded him), Nicholas and Gilbert (bishop of London from 1313 until his death in December 1316), were men of note. Nicholas the younger (*c.* 1260–1322) was summoned to parliament in 1295, and was present at the battle of Falkirk and at the siege of Carlaverock Castle. In 1305 he was found worthy of death for deserting the English army in Scotland and for crossing over to France in order to fight a duel with Sir John de Cromwell; he was, however, pardoned, and again served Edward I. in Scotland. Under Edward II., Nicholas, who was one of Piers Gaveston's few friends, was made marshal of England, but lost this office definitely in 1316. Later he associated himself with Thomas, earl of Lancaster. Through marriage he obtained the manor of Stowe in Northamptonshire, and he is generally called lord of Stowe.

JOHN DE SEGRAVE, 2nd Baron Segrave (*c.* 1256–1325), was one of those who supported the earls of Norfolk and of Hereford in their refusal to serve Edward I. in Gascony in 1297. He took part in campaigns in Scotland, and like his brother Nicholas he signed the letter which was sent in 1301 by the barons at Lincoln to Pope Boniface VIII. repudiating the papal claim to the suzerainty of Scotland. Having been appointed warden of Scotland, Segrave was defeated at Roslin in February 1303; after the capture of Stirling he was again left in charge of this country and was responsible for the capture of Sir William Wallace, whom he conveyed to London. He was also warden of Scotland under Edward II., and was taken prisoner at Bannockburn, being quickly released, and dying whilst on active service in Aquitaine. His grandson and heir, another John (*c.* 1295–1353), married Margaret, daughter and heiress of Thomas of Brotherton, earl of Norfolk, a son of Edward I. Their daughter Elizabeth married John de Mowbray, and the barony of Segrave was united with, and shared the fate of, that of Mowbray (*q.v.*).

Other celebrated members of the Segrave family are Sir Hugh Segrave (d. *c.* 1386), treasurer of England from 1381 until his death, and Stephen de Segrave (d. 1333), a noted pluralist, who was archbishop of Armagh from 1323 until his death on the 27th of October 1333.

SÉGUIER, PIERRE (1588–1672), chancellor of France, was born in Paris on the 28th of May 1588, of a famous legal family originating in Quercy. His grandfather, Pierre Séguier (1504–1580), was *président à mortier* in the parlement of Paris from 1554 to 1576, and the chancellor's father, Jean Séguier, a seigneur d'Autry, was civil lieutenant of Paris at the time of his death in 1596. Pierre was brought up by his uncle, Antoine Séguier, *président à mortier* in the parlement, and became master of requests in 1620. From 1621 to 1624 he was intendant of Guienne, where he became closely allied with the duc d'Épernon. In 1624 he succeeded to his uncle's charge in the parlement, which he filled for nine years. In this capacity he showed great independence with regard to the royal authority; but when in 1633 he became keeper of the seals under Richelieu, he proceeded to bully and humiliate the parlement in his turn. He became allied with the cardinal's family by the marriage of his daughter Marie with Richelieu's nephew, César du Cambout, marquis de Coislin,[1] and in December 1635 he became chancellor of France. In 1637 Séguier was sent to examine the papers of the queen, Anne of Austria, at Val de Grâce. According to Anquetil, the chancellor saved her by warning her of the projected inquisition. In 1639 Séguier was sent to punish the Normans for the insurrection of the Nu-Pieds, the military chief of the expedition, Gassion, being placed under his orders. He put down pillage with a strong hand, and was sufficiently disinterested to refuse a gift of confiscated Norman lands. He was the submissive tool of Richelieu in the prosecutions of Cinq-Mars and François Auguste de Thou in 1642. His authority survived the changes following on the successive deaths of Richelieu and Louis XIII., and he was the faithful servant of Anne of Austria and of Mazarin. His resolute attitude towards the parlement of Paris made the chancellor one of the chief objects of the hatred of the Frondeurs. On the 25th of August 1648, Séguier was sent to the parlement to regulate its proceedings. On the way he was assailed by rioters on the Pont-Neuf, and sought refuge in the house of Louis Charles d'Albert, duc de Luynes. In the course of the concessions made to the Fronde in 1650, Séguier was dismissed from his office of keeper of the seals. He spent part of his retirement at Rosny, with his second daughter Charlotte and her husband, the duke of Sully.[2] He was recalled in April 1651, but six months later, on the king's attaining his majority, Séguier was again disgraced, and the seals were given to President Mathieu Molé, who held them with a short interval till his death in 1656, when they were returned to Séguier. Séguier lived for some time in extreme retirement in Paris, devoting himself to the affairs of the academy. When Paris was occupied by the princes in 1652, he was for a short time a member of their council, but he joined the king at Pontoise in August, and became president of the royal council. After Mazarin's death in 1661 Séguier retained but a shadow of his former authority. He showed a great violence in his conduct of the case against Fouquet (*q.v.*), voting for the death of the prisoner. In 1666 he was placed at the head of a commission called to simplify the police organization, especially that of Paris; and the consequent ordinances of 1667 and 1670 for the better administration of justice were drawn up by him. He died at St Germain on the 28th of January 1672.

Séguier was a man of great learning, and throughout his life a patron of literature. In December 1642 he succeeded Richelieu as official "protector" of the Academy, which from that time until his death held its sessions in his house. His library was one of the most valuable of his time, only second, perhaps, to the royal collection. It contained no less than 4000 MSS. in various languages, the most important section of them being the Greek MSS. A catalogue was drawn up in Latin and in French (1685–1686) by the duc de Coislin. The chancellor's great-grandson, Henri Charles du Cambout de Coislin, bishop of Metz, commissioned Bernard de Montfaucon, a learned Benedictine of St Maur, to prepare a catalogue of the Greek MSS. with commentaries. This work was published in folio 1715, as *Bibliotheca Coisliniana, olim Segueriana. . . .* The greater part of the printed books were destroyed by fire, in the abbey of St Germain-des-Prés, in 1794.

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[1] Mme de Coislin became a widow, and in 1644 married clandestinely Guy de Laval, chevalier de Bois-dauphin, afterwards marquis of Laval.

[2] She afterwards contracted a second marriage with Henri de Bourbon, duke of Verneuil, a grandson of Henry IV.

See F. Duchesne, *Hist. des chanceliers de France* (fol. 1680); for the affair of Val de Grâce, *Catalogue de documents historiques . . . relatifs au règne de Louis XIII* (Paris, 1847); also R. Kerviler, *Le Chancelier P. Séguier* (Paris, 1874). Great part of his correspondence is preserved in the Bibliothèque Nationale, Paris.

SÉGUR, the name of a French family, the first member of which to attain distinction was François de Ségur, better known as the seigneur de Sainte-Aulaye (d. *c.* 1605), who professed the reformed religion, and was closely associated with Henry IV., becoming in 1576 president of his council. Jean-Isaac, marquis de Ségur (d. 1707), fought in most of the campaigns of the France of his time, and remained loyal throughout the troubles of the Fronde. His son, Henri Joseph, marquis de Ségur (1661–1737), was lieutenant-general of Champagne and Brie, governor of Foix. In his youth he was the hero of an episode of gallantry with Anne of Beauvilliers, abbess of La Joye, which led to the suggestion that she was none other than the Portuguese nun of the famous Letters. His son, Henri François, comte de Ségur (1689–1751), was colonel at seventeen, when he succeeded to the command of the Ségur regiment which his father had raised. In 1718 he began a thirty years' tenure of the lieutenant-generalship of Champagne and Brie. He had married in that year Angélique de Froissy, a natural daughter of the regent, Philip of Orleans, but the death of his father-in-law a few years later prevented his reaping special advancement from his marriage, though Mme de Ségur belonged to the inner circle of Louis XV.'s intimates. Ségur served in Italy during the war of the Polish Succession under Marshal Villars, and became, in 1736, inspector-general of cavalry. In 1738 he was sent to Nancy as lieutenant-general under Marshal Belle-Isle, and to Bohemia in 1741 with the French troops allied with the Bavarians. But in September 1741 he was compelled by the imperial troops to surrender at Linz. In 1744 he was again sent to Bavaria, and defeated the Austrians at Lichtenau on the 28th of January 1745. He served throughout the Flemish campaigns of 1746 and 1747, and was commandant of Metz at the time of his death (18th of June 1751). His son, Philippe Henri, marquis de Ségur (1724–1801), marshal of France, his grandson, Louis Philippe, comte de Ségur (1753–1830), and Louis Philippe's son Philippe Paul, comte de Ségur (1780–1873), are separately noticed.

Joseph Alexandre Pierre, vicomte de Ségur (1756–1805), second son of the marshal, quitted the army at the outbreak of the Revolution to devote himself to literature. He edited the *Mémoires* of Besenval in 1795 from the MS. which, originally in his possession, had been surreptitiously placed with the printer during Ségur's imprisonment under the Terror. These were printed in 1804–1805. Between 1790 and 1800 he produced a number of pieces at the Comédie Française and the Opéra Comique. He published in 1802 a selection from his works entitled *Comédies, chansons et proverbes*, and in 1801 appeared *Les Femmes, leurs mœurs . . .* (3 vols.), which has often been reprinted, but is of doubtful authorship.

Octave-Henri Gabriel de Ségur (1778–1818), elder son of Louis Philippe de Ségur, served in the later Napoleonic campaigns, and remained in the army under the Restoration. He threw himself into the Seine on the 15th of August 1818. The domestic unhappiness that led to his suicide is retailed by the comtesse de Boigne in her *Mémoires* (vol. i., 1907). His elder son, Eugène, comte de Ségur, succeeded his grandfather in the peerage in 1830. He married Sophie Rostopchine (1799–1894), daughter of Count Feodor Rostopchine, governor of Moscow. The countess of Ségur wrote some famous books for children, the most familiar of which are perhaps the *Malheurs de Sophie* and the *Mémoires d'un âne*, and many tales in the *Bibliothèque rose.* Her letters to her daughter and son-in-law, the count and countess de Simard de Petray, were published in 1891, and those to her grandson in 1898.

Raymond Joseph Paul, comte de Ségur d'Aguesseau (1803–1889), third son of Octave de Ségur, took his mother's family name in addition to his own. He studied law at Aix and Paris. As *procureur général* of Amiens he gave in March 1830 a decision on the question of the electoral lists which pleased the liberal party, but late in the year, as substitute in the royal court of Paris, he ordered the suppression of certain liberal journals, and in other civil appointments was accused of reactionary administration. He gave his adhesion to Prince Louis Napoleon, and became a member of the consultative commission in 1851, and of the senate in 1852. After the fall of the empire he retired into private life.

Louis Gaston Adrien de Ségur (1820–1881), son of Eugène de Ségur and Sophie Rostopchine, became a prelate of the papal court, and canon-bishop of Saint-Denis. He was a champion of the ultra-montane party and wrote a number of Catholic works, collected in ten volumes (Paris, 1876–1877). His life was written by his brother Anatole, who edited two collections of his letters in 1882 and 1899.

Anatole Henri Philippe de Ségur (1823–1902), Gaston's brother, became councillor of state in 1872, serving until 1879. His works include the life of his grandfather Count Rostopchine (1872), *Fables* (1879), *Un Épisode de la Terreur* (1864), *Paul Marie Charles Bernard* (1875).

His son, Pierre Marie Maurice Henri, marquis de Ségur (b. 1853), wrote a life (1895) of the marshal de Ségur, which was crowned by the French Academy. His book on Madame Geoffrin, *Le Royaume de la rue Saint-Honoré* (1897), also received a prize. His principal work is the three volumes devoted to Marshal Luxemburg—*La Jeunesse du maréchal de Luxembourg, 1628–1668* (1900); *Le Maréchal de Luxembourg et le prince d'Orange, 1668–1678* (1902); *Le Tapissier de Notre-Dame. Dernières années du maréchal de Luxembourg, 1678–1695* (1904); *Julie de Lespinasse* (1905); English Transl., 1907; and *Au couchant de la monarchie Louis XVI et Turgot, 1774–1776* (Paris, 1910). He was elected to the French Academy in 1907.

There is much general information on the family of Ségur in A. de Ségur's *Le Maréchal de Ségur, 1724–1801* (Paris, 1895), and in L. P. de Ségur's *Recueil de famille* (1826).

SÉGUR, LOUIS PHILIPPE, Comte de (1753–1830), French diplomatist and historian, son of Philippe Henri, marquis de Ségur, was born in Paris on the 10th of December 1753. He entered the army in 1769, served in the American War of Independence in 1781 as a colonel under Rochambeau. In 1784 he was sent as minister plenipotentiary to St Petersburg, where he was received into the intimacy of the empress Catherine II. and wrote some comedies for her theatre. At St Petersburg he concluded (11 January 1787) a commercial treaty which was exceedingly advantageous to France, and returned to Paris in 1789. He took up a sympathetic attitude towards the Revolution at its outset and in 1791 was sent on a mission to Berlin, where he was badly received. After fighting a duel he was forced to leave Berlin, and went into retirement until 1801 when, at Bonaparte's instance, he was nominated by the senate to the *Corps législatif.* Subsequently he became a member of the council of state, grand master of the ceremonies, and senator, 1813. In 1814 Ségur voted for the deposition of Napoleon and entered Louis XVIII.'s Chamber of Peers. Deprived of his offices and functions in 1815 for joining Napoleon during the Hundred Days, he was reinstated in 1819, supported the revolution of 1830, but died shortly afterwards in Paris on the 27th August 1830. By his wife, Antoinette d'Aguesseau, he had two sons, of whom Count Philippe Paul is separately noticed. Among his writings may be mentioned *Histoire des principaux événements du règne de Frédéric-Guillaume II* (1800); *Pensées politiques* (Paris, 1795); *Histoire de France* (11 vols., 1824–1834); *Histoire des juifs* (1827); *Mémoires* (3 vols., 1824); and *Contes* (1809). His *Œuvres complètes* were published in 34 volumes in 1824 et seq.

See duc de Broglie, "Deux Français aux États-Unis" in *Mélanges publiés par la Société des Bibliophiles français* (2nd part, 1903); A. Cornereau, "La Mission du comte de Ségur dans la xviii^{e} division militaire," in the *Mémoires de la Société bourguignonne de géographie et d'histoire* (vol. 17, 1901).

SÉGUR, PHILIPPE HENRI, Marquis de (1724–1801), marshal of France, son of Henri François, comte de Ségur, and his wife Angélique de Froissy, was appointed to the command of an infantry regiment at eighteen, and served under his father in Italy and Bohemia. He was wounded at Roucoux in Flanders in October 1746, and lost an arm at Lauffeld in 1747. In 1748 he succeeded his father as lieutenant-general of Champagne and Brie; he also received in 1753 the governorship of the county of Foix. During the Seven Years' War he fought at Hastenbeck (1757), Crefeld (1758) and Minden (1759). In 1760 he was taken prisoner at Kloster-campen. The ability which he showed in the government of Franche-Comté in 1775 led in 1780 to his appointment as minister of war under Necker. He created in 1783 the permanent general staff, and made admirable regulations with regard to barracks and military hospitals; and though he was officially responsible for the reactionary decree requiring four quarterings of nobility as a condition for the appointment of officers, the scheme is said not to have originated with him and to have been adopted under protest. In 1783 he became a marshal of France. He resigned from the ministry of war in 1787. During the Terror he was imprisoned in La Force, and after his release was reduced to considerable straits until in 1800 he received a pension from Napoleon. He died in Paris on the 3rd of October of the next year.

See A. de Ségur, *Le Maréchal de Ségur, 1724–1801* (Paris, 1895).

SÉGUR, PHILIPPE PAUL, Comte de (1780–1873), French general and historian, son of Louis Philippe, comte de Ségur, was born in Paris on the 4th of November 1780. He enlisted in the cavalry in 1800, and forthwith obtained a commission. He served with General Macdonald in the Grisons in 1800–1801, and published an account of the campaign in 1802. By the influence of Colonel Duroc (afterwards duc de Frioul) he was attached to the personal staff of Napoleon. He served through most of the important campaigns of the first empire, and was frequently employed on diplomatic missions. During the campaign in Poland in 1807 he was taken prisoner by the Russians, but was exchanged at the peace of Tilsit. His brilliant conduct in the cavalry charge at Somo Sierra on the 30th of November 1808 (see Peninsular War) won him the grade of colonel, but his wounds compelled him to return to France. As general of brigade he took part in the Russian campaign of 1812, and in the campaigns of 1813 and 1814 he repeatedly distinguished himself, notably at Hanau (October 1813), and in a brilliant affair at Reims (March 1814). He remained in the army at the Restoration, but, having accepted a command from Napoleon during the Hundred Days, he was retired until 1818, and took no further active part in affairs until the revolution of 1830. During his retirement he wrote his *Histoire de Napoléon et de la grande armée pendant l'année 1812* (Paris, 2 vols., 1824), which ran through numerous editions, and was translated into several languages. The unfavourable portrait of Napoleon given in this book provoked representations from General Gourgaud, and eventually a duel, in which Ségur was wounded. On the establishment of the July monarchy he received, in 1831, the grade of lieutenant-general and a peerage. In 1830 he was admitted to the French Academy, and he became grand cross of the Legion of Honour in 1847. After the revolution of 1848 he lived in retirement. He died in Paris on the 25th of February 1873. His works include: *Histoire de Russie et de Pierre le Grand* (1829); *Histoire de Charles VIII.* (2 vols., 1834–1842), in continuation of the history of France begun by his father; and the posthumous *Histoire et mémoires* (8 vols., 1873).

See *Un Aide-de-camp de Napoléon (1800–1812), mémoires du général cômte de Ségur*, new edition by his grandson Louis de Ségur (3 vols., 1894–1895), of which an abridged English version was published in 1895.

SEGURA (anc. *Tader*), a river of south-eastern Spain about 150 m. long. It is formed by the confluence of three head-streams, one of which rises on the northern versant of La Sagra (7875 ft.), a mountain in Granada, while the other two spring from the Sierra de Segura, in Jaen. From the junction of these three streams below Yeste the river winds in an easterly and south-easterly direction past the towns of Cieza and Archena to Murcia. Thence it trends N.E. and passing Orihuela falls into the Mediterranean 19 m. S.W. of Alicante. Its chief tributaries are the Mundo and Arroyo del Jua on the left, and the Caravaca, Quipar and Sangonera on the right. It is only navigable by small sailing-vessels, even in its estuary, but its waters are extensively utilized for irrigation.

SEGUSIO (mod. *Susa*, *q.v.*), an ancient town in north Liguria, the capital of the Cottii (see Cottii Regnum). Here the son of King Donnus, Cottius—who held the rank of imperial praefect over the fourteen tribes over which his father had ruled as king, so that in the inscription he calls himself "M. Iulius regis Donni f(ilius) Cottius praefectus civitatium quae subscriptae sunt"—erected a triumphal arch in honour of Augustus in 9–8 B.C., which is still standing. The style of the sculptures on the frieze is quite barbaric, with archaic elements, and is probably derived from Gaul. His tomb, situated near the city walls, mentioned by Ammianus Marcellinus, has long since disappeared. Claudius restored the royal titles to the family; but, after the death of its last member, Nero made the district into a province, and the town into a *municipium*. It was strongly fortified and garrisoned, and remains of its walls, including those of a double-arched gate, exist, while inscriptions testify to its importance, one of them mentioning baths erected by Gratian. Constantine captured the town, which offered some resistance to him, on his march against Maxentius.

See F. Genin, *Susa Antica* (Saluzzo, 1886); E. Ferrero, *L'Arc d'Auguste à Suse* (Turin, 1901); F. Studniczka, *Jahrbuch des K. D. archäologischen Instituts*, xviii. (1903), 1 sqq. (T. As.)

SEHESTED, HANNIBAL (1609–1666), Danish statesman, born at Arensborg Castle on Ösel. After completing his education abroad, he returned to Denmark in 1632 and was attached to the court of Christian IV. Two or three years later he was sent to Wismar to negotiate a treaty with the Swedish chancellor, Axel Oxenstjerna, and, if possible, bring about a match between Christian's son Frederick and Gustavus Adolphus's daughter Christina. Though failing in both particulars, he retained the favour of the king, who had marked him out as one of his seven sons-in-law, by whose influence he hoped to increase the influence of the crown; and in 1636 he was betrothed to one of the daughters, the countess Christine, then in her tenth year, whom he married in 1642. In May 1640 Sehested became a member of the august *Rigsraad*. He imagined, with some reason, that the proper field for the exercise of his talents was diplomacy, and he openly aspired to be minister of foreign affairs. Despite a successful embassy to Spain in 1640–1641 he did not obtain the coveted post, but was appointed viceroy of Norway (April 1642). He had now the opportunity of displaying an administrative and organizing ability, united with a zeal for reform, as remarkable as unexpected, which raises him high above his compeers. He made it his first object thoroughly to develop Norway's material resources, and reorganize her armaments and fiscal system; and he aimed at giving her a more independent position as regards Denmark. During Christian IV.'s second war with Sweden (1643–1645), Sehested, as viceroy of Norway, assisted his father-in-law materially. He invaded Sweden four times; successfully defended Norway from attack; and, though without any particular military talent, won an engagement at Nysaker in 1644. After the war he renewed his reforming efforts, and during the years 1646–1647 strove to withdraw his viceroyalty from the benumbing influence of the central administration at Copenhagen, and succeeded with the help of Christian IV. in creating a separate defensive fleet for Norway and giving her partial control of her own finances. He was considerably assisted in his endeavours by the fact that Norway was regarded as the hereditary possession of the kings of Denmark. At the same time Sehested freely used his immense wealth and official position to accumulate for himself property and privileges of all sorts. His successes finally excited the envy and disapprobation of the Danish *Rigsraad*, especially of his rival Korfits Ulfeldt (*q.v.*), also one of the king's sons-in-law. The quarrel became acute when Sehested's semi-independent administration of the finances of Norway infringed upon Ulfeldt's functions as lord treasurer of the whole realm; in November 1647 Ulfeldt carried his point, and a decree was issued that henceforth the Norwegian provincial governors should send their rents and taxes direct to Copenhagen. On the accession of Frederick III. (1648), Sehested strove hard to win his favour; but an investigation into his accounts as viceroy, conducted by his enemies, brought to light such wholesale embezzlement and peculation that he was summoned to appear before a *herredag*, or assembly of notables, in May 1551, and give an account of his whole administration. Unable to meet the charges brought against him, he compromised matters by resigning his viceroyalty and his senatorship, and surrendering all his private property in Norway to the crown. Throughout his trial Sehested had shown consummate prudence. He surrendered voluntarily thrice as much as he had ever embezzled, and, calculating on the secret fondness of Frederick III. for a man of his monarchical tendencies, carefully abstained from the wild and treasonable projects of revenge which were the ruin of Korfits Ulfeldt. From 1651 to 1660 he lived abroad. At the end of 1655 he met the exiled Charles II. of England at Cologne, and lived a part of the following year with him in the Spanish Netherlands. In the summer of 1657 he returned to Denmark, but Frederick III. refused to receive him, and he hastily quitted Copenhagen. During the crisis of the war of 1658 he was at the headquarters of Charles X. of Sweden. In seeking the help and protection of the worst enemy of his country, Sehested approached the very verge of treason, but he never quite went beyond it. When, at last, it seemed probable that the war would not result in the annihilation of Denmark, Sehested strained every nerve to secure his own future by working in the interests of his native land while still residing in Sweden. In April 1660 he obtained permission from Frederick III. to come to Copenhagen, and was finally instructed by him as plenipotentiary to negotiate with the Swedes. The treaty of Copenhagen, which saved the honour of Denmark and brought her repose, was very largely Sehested's work. He was one of the willing abettors of Frederick III. at the revolution of 1660, when he re-entered the Danish service as lord treasurer and councillor of state. Both at home and on his frequent foreign missions he displayed all his old ability. As a diplomatist he, in some respects, anticipated the views of Griffenfeldt, supporting the policy of friendship with Sweden and a French alliance. He died suddenly on the 23rd of September 1666 at Paris, where he was conducting important negotiations. His "political testament" is perhaps the best testimony to his liberal and statesmanlike views.

See Thyra Sehested, *Hannibal Sehested* (Copenhagen, 1886); Julius Albert Fridericia, *Adelsvaeldens sidste Dage* (Copenhagen, 1894). (R. N. B.)

SEHORE, a British station in Central India, within the state of Bhopal, with a station on the Bhopal-Ujjain section of the Indian Midland railway, 24 m. E. from Bhopal. Pop. (1901) 16,864. It is the headquarters of the political agent for Bhopal, and a British military cantonment. For many years it was also the headquarters of the Bhopal contingent, raised in 1818, which was in 1903 incorporated in the Indian army. It is an important centre of trade.

SEICHE (Fr. *sèche*, fem. of *sec*, dry), in limnology, an irregular fluctuation of the water-level of lakes, first observed and so named in Switzerland. (See LAKE, and GENEVA.)

SEIDL, ANTON (1850–1898), Hungarian operatic conductor, was born at Budapest on the 7th of May 1850. He entered the Leipzig Conservatorium in October 1870, and remained there until 1872, when he was summoned to Bayreuth as one of Wagner's copyists. There he assisted to make the first fair copy of *Der Ring des Nibelungen.* Thoroughly imbued with the Wagnerian spirit, it was natural that he should take a part in the first Bayreuth Festival in 1876. His chance as a conductor came when, on Wagner's recommendation, he was appointed to the Leipzig Stadt-Theater, where he remained until, in 1882, he went on tour with Angelo Neumann's *Nibelungen Ring* company. To his conducting the critics attributed much of such artistic success as attended the production of ~~the~~ Trilogy at Her Majesty's Theatre in London in June of that year. In 1883 Seidl went with Neumann to Bremen, but two years later was appointed successor to Leopold Damrosch as conductor of the German Opera in New York, and in the same year he married Fräulein Kraus, the distinguished singer. In America Seidl's orchestra became famous. In 1886 he was one of the conductors at Bayreuth, and in 1897 at Covent Garden, London. He died in New York on the 28th of March 1898.

See the memorial volume prepared by H. T. Finck, H. E. Krehbiel and others (New York, 1899).

SEIGNIORAGE, the due levied by the authority that possesses the right of coining on the metal that it manufactures into coin. The term "brassage" has been used to describe this due, when confined to the mere cost of the process; the wider term "seigniorage" being employed when the charge is so raised as to become a profit to the imposer. The exercise of the right of seigniorage has been the instrument by which most of the debasements of currency have been carried out. Under feudalism, especially in France, the chief nobles had this prerogative. In the modern state it is reserved for the sovereign authority. Most countries adopt a moderate seigniorage charge. Thus the fundamental currency law of France (1803) provides that "only the expense of coining" shall be charged. At present this due is 6 fr. 70 c. per kilo. of gold $\frac{9}{10}$ fine, or 0·24%. The charge by the same law on silver was 3 fr. per kilo. or 1·66%. The limitation on the coinage of silver in practically all countries has made the seigniorage on that metal very heavy. The policy of England in respect to gold has been peculiar. Since 1664 it has been freed from any charge, though the delay in return amounts to a small due. In consequence of this gratuitous coinage, English gold has been regarded as equivalent to bullion, and exchange fluctuations have been reduced. The policy was severely criticized by Adam Smith, and it does in fact amount to a bounty on the coinage of gold. The amount is, however, too insignificant to deserve attention, especially as there are compensating gains. The employment of a seigniorage of about 1% on the "sovereign" was suggested by the proceedings of the Paris Monetary Conference of 1867, in order to bring about an assimilation of English and French money. By reducing the amount of gold in the sovereign to that in the proposed 25-franc piece an exact *par* would have been created, and, so it was hoped, the English currency and accounts need have undergone no change. The scheme was, however, rejected by a Royal Commission on the ground that an adjustment of obligations would be required.

The theory of the effects that a seigniorage produces have been discussed at length. The definitive results obtained may be briefly stated as follows:—(1) A seigniorage charge is the same as a debasement, but its evil effect may be avoided by limiting the amount of coin issued. (2) Seigniorage operates as a tax on the metal subject to it, and this tax tends ultimately to fall on the producers, or rather on the rent obtained through the production. A heavy seigniorage on gold would tend to lower the profits derived from the gold mines of the world, and might even compel the abandonment of the least productive ones.

See MONEY, MONETARY CONFERENCES, and TOKEN MONEY. (C. F. B.)

SEIGNORY, or SEIGNIORY (Fr. *seigneur*, lord; Lat. *senior*, elder), in English law, the lordship remaining to a grantor after the grant of an estate in fee-simple. There is no land in England without its lord: "Nulle terre sans seigneur" is the old feudal maxim. Where no other lord can be discovered the crown is lord as lord paramount. The principal incidents of a seignory were an oath of fealty; a "quit" or "chief" rent; a "relief" of one year's quit rent, and the right of escheat. In return for these privileges the lord was liable to forfeit his rights if he neglected to protect and defend the tenant or did anything injurious to the feudal relation. Every seignory now existing must have been created before the Statute of *Quia Emptores* (1290), which forbade the future creation of estates in fee-simple by subinfeudation. The only seignories of any importance at present are the lordships of manors. They are regarded as incorporeal hereditaments, and are either appendant or in gross. A seignory appendant passes with the grant of the manor; a seignory in gross—that is, a seignory which has been severed from the demesne lands of the manor to which it was originally appendant—must be specially conveyed by deed of grant.

Freehold land may be enfranchised by a conveyance of the seignory to the freehold tenant, but it does not extinguish the tenant's right of common (*Baring* v. *Abingdon*, 1892, 2 Ch. 374). By s. 3 (ii.) of the Settled Land Act 1882, the tenant for life of a manor is empowered to sell the seignory of any freehold land within the manor, and by s. 21 (v.) the purchase of the seignory of any part of settled land being freehold land, is an authorized application of capital money arising under the act.

SEINE (Lat. *Sequana*), one of the chief rivers of France, rising on the eastern slope of the plateau of Langres, about 5 m. N.W. of St Seine-l'Abbaye and 18 m. N.W. of Dijon. It keeps the same general direction (north-westwards) throughout its entire course, but has numerous windings: between its source and its mouth in the English Channel the direct distance is only 250 m., but that actually traversed by the river (through the departments of Cote-d'Or, Aube, Marne, Seine-et-Marne, Seine-et-Oise, Seine, Eure and Seine-Inférieure) is 482 m. Though shorter than the Loire and Rhone, and inferior in volume to the Loire, Rhone and Gironde, the Seine derives an exceptional importance from the regularity of its flow. This feature is due to the geological character of its basin, an area of 30,000 sq. m., entirely belonging to France (with the exception of a few communes in Belgium), and formed in three-fourths of its extent of permeable strata, which absorb the atmospheric precipitation to restore it gently to the river by perennial springs. At Paris the average volume of the river per second is 5300 cub. ft.; after it has received all its tributaries the volume is about 10,600 cub. ft. At Paris it falls as low as 1550 cub. ft., and in exceptional droughts the figure of 1200 is reached. During the flood of 1658 the volume between the quays at Paris is believed to have risen to 88,000 cub. ft. per second. The height of the river above the normal at Paris was probably on that occasion about 21 ft., whereas in the disastrous floods of January 1910 it was over 24 ft. Other notable floods are recorded in 1740, 1799, 1802, 1876 and 1883.

Rising at a height of 1545 ft. above sea-level, at the base of the statue of a nymph erected on the spot by the city of Paris, the Seine is at first such an insignificant streamlet that it is often dry in summer as far as Châtillon (705 ft.) some 31 m. from its source. At Bar its waters feed the Haute-Seine Canal, though navigation thereon only begins at Troyes. It next passes Méry, and at Marcilly receives the Aube (right), at which point the canal terminates and the river itself is canalized; here it is deflected from its hitherto north-north-westerly to a south-westerly direction by the heights of the Brie, the base of which it skirts past Nogent and Montereau. At the latter point it receives the Yonne, its most important left-hand tributary, and is deepened from 5 ft. 3 in. to 6 ft. 6 in. It then resumes its general north-westerly direction, receiving the Loing (left) at Moret; having passed Melun it is joined at Corbeil by the Essonne (left), and after its junction with the Marne (right), a tributary longer than itself by 31 m. at the confluence, reaches Paris. From this point to the sea its channel has been so deepened that vessels of 9 to 10 ft. draught can reach the capital. The river then winds through a pleasant champaign country past St Cloud, St Denis, Argenteuil, St Germain, Conflans (where it is joined from the right by the Oise, 56 ft. above the sea), Poissy, Mantes, Les Andelys, between which and the sea the river is remarkable for its détours, as also in the vicinity of Paris. At Poses the tide first begins to be perceptible. It next receives the Eure (left), and passes Pont de l'Arche, Elbeuf and Rouen, where the sea navigation commences. The river is dyked below Rouen so as to admit vessels of 20 ft. draught, and large areas have thus been reclaimed for cultivation. At every tide there is a "bore" (*barre* or *mascaret*), ranging usually from 8 to 9 ft., and attaining its maximum from Quillebeuf to Caudebec. Below Quillebeuf (where the Risle is received from the left) the estuary begins, set with extensive sand-banks, between which flows a narrow navigable channel. Tancarville (right) is the starting-point of a canal to enable river boats for Havre to avoid the sea passage. The river enters the English Channel between Honfleur on the left and Havre on the right. The Marne brings to the Seine the waters of the Ornain, the Ourcq, and the Morin; the Oise those of the Aisne; the Yonne those of the Armançon. The low elevation of the bounding hills has rendered it comparatively easy to connect the Seine and its affluents with adjoining river basins by means of canals. The Oise and Somme are connected to the Picardy or Crozat Canal, which in turn is continued to the Scheldt by means of the St Quentin Canal and the Oise, and to the Sambre by that of Oise and Sambre. Between the Aisne and the Meuse is the Ardennes Canal, and the Aisne and the Marne are united by a canal which passes Reims. The Marne has similar communication with the Meuse and the Rhine, the Yonne with the Saône (by the Burgundy Canal) and with the Loire by the Loing Canal dividing at Montargis into two branches—those of Orleans and Briare

SEINE, the department of northern France which has Paris as its chief town, formed in 1790 of part of the province of Ile-de-France. It is entirely surrounded by the department of Seine-et-Oise, from which it is separated at certain parts by the Seine, the Marne and the Bièvre. The area of the department is only 185 sq. m., and of this surface about a sixth is occupied by Paris; the suburban towns also are close together and very populous. In actual population (3,848,618 in 1906) as well as in density (23·7 persons per acre) it holds the first place. Flowing from south-east to north-west through the department, the Seine forms three loops: on the right it receives above Paris the Marne, and below Paris the Rouillon, and on the left hand the Bièvre within the precincts of the city. The left bank of the Seine is in general higher than the right, and consists of the Villejuif and Châtillon plateaus separated by the Bièvre; the highest point (560 ft.) is above Châtillon and the lowest (105) at the exit of the Seine. Below Paris the river flows between the plain of Gennevilliers and Nanterre (commanded by Mont Valérien) on the left and the plain of St Denis on the right. On the right side, to the east of Paris, are the heights of Avron and Vincennes commanding the course of the Marne. Communication is further facilitated by canals.

Market gardening is the chief agricultural industry, and by means of irrigation and manuring the soil is made to yield from ten to eleven crops per annum. Some districts are specially celebrated,—Montreuil for its peaches, Fontenay-aux-Roses for its strawberries and roses, and other places for flowers and nurseries. The plain of Gennevilliers fertilized by the sewage water of Paris yields large quantities of vegetables. Milch-cows are reared in large numbers. The principal woods (Boulogne and Vincennes) belong to Paris. It is partly owing to the number of quarries in the district that Paris owes its origin: Châtillon and Montrouge in the south yield freestone, and Bagneux and Clamart in the south and Montreuil and Romainville in the east possess the richest plaster quarries in France. Within the circuit of Paris are certain old quarries now forming the catacombs. Most of the industrial establishments in the department are situated in Paris or at St Denis (*qq.v.*). The department is traversed by all the railway lines which converge in Paris, and also contains the inner circuit railway (Chemin de Fer de Ceinture) and part of the outer circuit. There are 3 arrondissements (Paris, St Denis, and Sceaux), 41 cantons and 78 communes. The department forms the archiepiscopal diocese of Paris, falls within the jurisdiction of the Paris court of appeal and the académie (educational division) of Paris, and is divided between the II., III., IV., V. and VI *corps d'armée*. The chief places besides Paris are St Denis, Asnières, Aubervilliers, Boulogne-sur-Seine, Clichy-sur-Seine, Courbevoie, Levallois-Perret, Neuilly-sur-Seine, Pantin, St Ouen, Colombes, Charenton, Ivry-sur-Seine, Montreuil-sous-Bois, Nanterre, Nogent-sur-Marne, Vincennes and Arcueil.

SEINE, or SEAN (O. Fr. *seigne*, mod. *seine*, Lat. *sagena*, Gr. σαγήνη, a draw-net), a type of fishing net, consisting of an expanse of netting weighted at the bottom and floated at the top edge by corks, cast from a boat or ship to enclose a space of water and then drawn into the vessel or to shore.

SEINE-ET-MARNE, a department of northern France, formed in 1790 of almost the entire district of Brie (half of which belonged to Champagne and half to Ile-de-France) and a portion of Gâtinais (from Ile-de-France and Orléanais). Pop. (1906) 361,939. Area, 2289 sq. m. Seine-et-Marne is bounded N. by the department of Oise, N.E. by that of Aisne, E. by Marne and Aube, S.E. by Yonne, S. by Loiret and W. by Seine-et-Oise. The whole department belongs to the basin of the Seine, and is drained partly by that river and partly by its tributaries the Yonne and the Loing from the left, and from the right the Voulzie, the Yères and the Marne, with its affluents the Ourcq, the Petit Morin and the Grand Morin. With the exception of the Loing, flowing from south to north, all these streams cross the department from east to west, following the general slope of the surface, which is broken up into several plateaus from 300 to 500 ft. in height (highest point, in the north-east, 705 ft., lowest 105), and separated from each other by deep valleys. Most of the plateaus belong to the Brie, a fertile well-wooded district of a clayey character. In the south lie the dry sandy district of the Fontainebleau sandstones and part of the region known as the Gâtinais. The climate is rather more "continental" than that of Paris—the summers warmer, the winters colder; the annual rainfall does not exceed 16 in. There is a striking difference in temperature between the south of the department, where the famous white grape (*chasselas*) of Fontainebleau ripens, and the country to the north of the Marne,—this river marking pretty exactly the northern limit of the vine.

The wheat and oats of Brie are especially esteemed; potatoes, sugar beet, mangel-wurzel and green forage are also important crops, and market gardening flourishes. Provins and other places are well-known for their roses. The cider and honey of the department are of good quality. Thousands of the well-known Brie cheeses are manufactured, and large numbers of calves, sheep and poultry are reared. The forests (covering a fifth of the surface) are planted with oak, beech, chestnut, hornbeam, birch, wild cherry, linden, willow, poplar and conifers. Best known and most important is the forest of Fontainebleau. Large areas are devoted to game-preserves. Excellent freestone is quarried in the department, notably at Château-Landon in the valley of the Loing, mill-stones at La Ferté-sous-Jouarre; the Fontainebleau sandstone is used for pavements, and the white sand which is found along with it is in great request for the manufacture of glass. Along the Marne are numerous gypsum quarries; lime-kilns occur throughout the department; and peat is found in the valleys of the Ourcq and the Voulzie. Beds of common clay and porcelain clay supply the potteries of Fontainebleau and Montereau. Other industrial establishments are numerous large flour-mills, notably those of Meaux, the chocolate works of Noisiel, sugar factories, alcohol distilleries, paper-mills (the Jouarre paper-mill manufactures bank-notes, &c., both for France and for foreign markets), saw-mills, printing works (Coulommiers, &c.) and tanneries. Much of the motive-power used is supplied by the streams. Paris is the chief outlet for the industrial and agricultural products of the department. Coal and raw material for the manufactures are the chief imports. The Seine, the Yonne, the Marne, and the Grand Morin are navigable, and, with the canals of the Loing and the Ourcq and those of Chalifert, Cornillon and Chelles, which cut off the windings of the Marne, form a total waterway of over 200 m. Seine-et-Marne has 5 arrondissements (Melun, Coulommiers, Fontainebleau, Meaux, Provins), 29 cantons and 533 communes. It forms the diocese of Meaux (archiepiscopal province of Paris), and part of the region of the V army corps and of the *académie* (educational circumscription) of Paris. Its court of appeal is at Paris. Melun, the capital, Meaux, Fontainebleau, Coulommiers, Provins, Nemours and Montereau (*qq.v.*), are the more important towns in the department. Among other interesting places are Lagny (pop. 5302), with an abbey-church of the 13th century; Brie-Comte Robert, with a church of the early 13th century; Ferrières, with a fine château built in 1860 by Baron Alphonse Rothschild; Moret-sur-Loing, which preserves fortifications dating from the 15th century including two remarkable gateways; St Loup-de-Naud, with a church of the first half of the 12th century; Jouarre, where there is a church of the 15th century, built over a crypt containing workmanship of the Merovingian period; and Vaux-le-Vicomte with the famous château built by Fouquet, minister of Louis XIV.

SEINE-ET-OISE, a department of northern France, formed in 1790 of part of the old province of Île-de-France, and traversed from south-east to north-west by the Seine, which is joined by the Oise. Pop. (1906) 749,753. Area, 2184 sq. m. It is bounded by the departments of Seine-et-Marne on the E., Loiret on the S., Eure-et-Loir on the W., Eure on the N.W. and Oise on the N. It encloses the department of Seine. The Epte on the north-west is almost the only natural boundary on the department. The streams (all belonging to the basin of the Seine) are: on the right the Yères, the Marne, the Oise and the Epte, and on the left the Essonne (joined by the Juine, which passes Étampes), the Orge, the Bièvre and the Mauldre. Seine-et-Oise belongs in part of the tableland of Beauce in the south and to that of Brie in the east. In the centre are the high wooded hills which make the charm of Versailles, Marly and St Germain. But it is in the north-west, in the Vexin, that the culminating point (690 ft.) is reached, while the lowest point, where the Seine leaves the department, is little more than 40 ft. above the sea. The mean temperature is 51° F.

Seine-et-Oise is a flourishing agricultural and horticultural department. Wheat, oats, potatoes and sugar-beet are important crops. Versailles, Rambouillet, Argenteuil are among the numerous market-gardening and horticultural centres, and wine is grown at Argenteuil and in other localities on the right bank of the Seine. Milch-cows and draught-oxen are the chief livestock, and poultry farming is prosperous, the town of Houdan giving its name to a well-known breed of fowls. Forests occupy about 190,000 acres, the largest being that of Rambouillet (about 32,000 acres). Oak, hornbeam, birch and chestnut are the commonest trees. Building, paving and mill stones, gypsum, cement, &c., are produced by the department which is very rich in quarries. There are mineral springs at Enghien and Forges-les-Bains. The most important industrial establishments are the national porcelain factory at Sèvres; the government powder-mills of Sevran and Bouchet; paper-mills, especially those of Essonnes and its vicinity, which are among the most important in Europe; textile works, flour-mills, foundries and engineering, metallurgical or railway works at Evry-Petit-Bourg, Villeneuve-St Georges (pop. 9508) and elsewhere; agricultural implement factories at Dourdan and elsewhere; sugar-refineries and distilleries; crystal works (Meudon), laundries, large printing establishments, close to Paris; factories for chemical products, candles, hosiery, perfumery, shoes and buttons; zinc-works, saw-mills. Seine-et-Oise exports chiefly the products of its farms and quarries. Its imports include coal, raw material for its industries, wine, kaolin and wood.

The railways of all the great companies of France (except the Southern) traverse the department, but most of the lines belong to those of the Western and Northern systems. The Seine and the Oise, and the canals of Ourcq and Chelles provide about 120 m. of waterway. Seine-et-Oise is divided into six arrondissements (Versailles, Corbeil, Étampes, Mantes, Pontoise, Rambouillet) with 37 cantons and 691 communes. It forms the diocese of Versailles and part of the educational circumscription (académie) of Paris and of the regions of the II., III., IV. and V. army corps, the troops in its territory being under the command of the military government of Paris. Its court of appeal is also at Paris.

The most notable towns in the department are Versailles, the capital, Corbeil, Sèvres, Étampes, Mantes, Pontoise, Rambouillet, Argenteuil, Poissy, St Cloud, St Cyr, St Germain-en-Laye, Meudon, Montmorency, Rueil and Marly-le-Roi (see separate articles). Other places of interest are Montfort-l'Amaury, which has a Renaissance church with fine stained glass, a gateway of the 16th century and a ruined château once the seat of the powerful family of Montfort; Montlhéry, which preserves the keep (13th century) and other ruins of a celebrated fortress which commanded the road from Paris to Orléans; Roche-Guyon, seat of the family of that name, which has two châteaus, one a feudal stronghold, the other also medieval but altered in the 18th century; Vigny, with a Gothic château of the 15th century; Ecouen, where there is a château of the 16th century once the property of the Condé family, now a school for daughters of members of the Legion of Honour; Dampierre, which has a château of the 17th century once the property of Charles, Cardinal of Lorraine; Maisons-Laffitte (pop. 8117), with a château of the same period once belonging to the family of Longueil. The château of Malmaison (18th century) is famous as the residence of the Empress Joséphine.

Of the churches of the department, which are very numerous mention may be made of those of Jouy-le Moutier (11th and 12th centuries); Beaumont-sur-Oise (13th century); Taverny (12th and 13th centuries); Longpont (remains of an abbey-church dating from the 11th to the 13th centuries). Near Cernay-la-Ville are interesting remains of a Cistercian abbey and near Lévy-St-Nom those of the abbey of Notre-Dame de la Roche, including a church (13th century) with stalls which are among the oldest in France and the tombs of the Lévis-Mirepoix family.

SEINE-INFÉRIEURE, a department of the north of France, formed in 1790 of four districts (Norman Vexin, Bray, Caux and Roumois) belonging to the province of Normandy Pop. (1906) 863,879. Area 2448 sq. m Seine-Inférieure is bounded N.W. and N. by the English Channel for a distance of 80 m., N.E by Somme, from which it is separated by the Bresle, E. by Oise, S. by Eure and the estuary of the Seine, which separates it from Calvados. It is divided almost equally between the basin of the Seine in the south and the basins of certain coast streams in the north. The Seine receives from the right hand before it reaches the department the Epte and the Andelle from the Bray district, and then the Darnétal, the Cailly, the Austreberthe, the Bolbec and the Lézarde. The main coast streams are the Bresle (which forms the ports of Eu and Tréport), the Yères, the Arques or Dieppe stream (formed by the junction of the Varennes, the Béthune and the Eaulne), the Scie, the Saane, the Durdent. The Pays de Caux, the most extensive natural division, is a system of plateaus separated by small valleys, terminating along the Seine in high bluffs and towards the sea in steep chalk cliffs 300 to 400 ft. high, which are continually being eaten away and transformed into beds of shingle. The Bray district in the south-east is a broad valley of denudation formed by the sea as it retired, and traversed by valleys covered with excellent pasture. The highest point (about 800 ft.) is on the eastern border of the department. In the comparatively regular outline of the coast there are a few breaks, as at Le Tréport, Dieppe, St Valery-en-Caux, Fécamp and Havre, the Cap de la Hève, which commands this last port, and Cape Antifer, 12 or 13 m. farther north. Le Tréport, Dieppe, Veules, St Valery, Veulettes, Fécamp, Yport, Étretat and Ste Adresse (to mention only the more important) are fashionable watering-places. Forges-les-Eaux (in the east of the department) has cold chalybeate springs of some note. The winter is not quite so cold nor the summer so hot as in Paris, but the average temperature of the year is higher. The rainfall at Rouen is 28 in. per annum, increasing towards Dieppe.

In general the department is fertile and well cultivated. Along the Seine fine meadow-land has been reclaimed by dyking; and sandy and barren districts have been planted with trees, mostly with oaks and beeches, and they often attain magnificent dimensions, especially in the forest of Arques and along the railway from Rouen to Dieppe; *Pinus sylvestris* is the principal component of the forest of Rouvray opposite Rouen. The forest of Eu covers 36 sq. m. in the north-east. Of the arable crops wheat and oats are the principal, rye, flax, colza, sugar beet and potatoes being also of importance. Milch cows are kept in great numbers especially in the Bray district, and Gournay butter and Gournay and Neufchâtel cheese are in repute. The farms of the Caux plateau are each surrounded by an earthen dyke, on which are planted forest trees, generally beech and oak. Within the shelter thus provided apple and pear trees grow, which produce the cider generally drunk by the inhabitants. With the exception of a little peat and a number of quarries, Seine-Inférieure has no mineral source of wealth; but manufacturing and especially the textile industry is well developed. Rouen is the chief centre of the cotton trade, which comprises spinning and the weaving of *rouenneries*, *indiennes* (cotton prints), cretonnes and other cotton goods. Elbeuf is the centre of woollen manufacture. Flax-spinning, the dyeing and printing of fabrics and other accessory industries also employ many hands. Engineering works, foundries and iron ship-building yards are found at Havre and Rouen. Wooden ships are also built at Havre, Rouen, Dieppe and Fécamp. Other establishments of importance are the national tobacco-factories at Dieppe and Havre, sugar-refineries, distilleries, glass-works, potteries, paper works, soap-works, chemical works, flour-mills, oil-factories, leather works, &c. The fisheries are the great resource for the inhabitants of the seaboard. Fécamp, which plays a very important part at the Newfoundland fisheries, sends large quantities of cod, herrings, mackerel, &c., into the market; Dieppe supplies Paris with fresh fish; St Valery sends boats as far as Iceland. The principal ports for foreign trade are Havre, Rouen and Dieppe.

The chief imports of the department are cotton, wool, cereals, hides, coffee, timber and dye-woods, indigo and other tropical products, coal, petroleum, &c. The exports include industrial and dairy products. Seine-Inférieure is served principally by the Western railway, but the Northern railway also has several lines there. The Seine and other rivers provide 85 m. of navigable waterway. The canal of Tancarville from Quillebeuf to Havre is about 15 m. long, that from Eu to Tréport about 2 m. The department is divided into five arrondissements (Rouen, Dieppe, Havre, Neufchâtel and Yvetot) 55 cantons and 760 communes. It forms the diocese of the archbishopric of Rouen and part of the region of the III. army corps and of the *académie* (educational division) of Caen. Its court of appeal is at Rouen, the capital.

Rouen, Havre and Dieppe and in a lesser degree, Elbeuf, Fécamp, Harfleur, Lillebonne, Yvetot, Eu, Le Tréport, Aumale, Étretat, Bolbec, Barentin and Caudebec-en-Caux (see separate articles) are noteworthy towns for commercial, architectural or other reasons. The following places are also of architectural interest. St Martin-de Boscherville, where there are remains of an important abbey including a fine church in the Romanesque style of the early 12th century and a Gothic chapter-house of the latter half of the 12th century; Valmont, which has fine ruins (16th century) of the choir of a Cistercian abbey-church; Varengeville, well known for the manor (16th century) of Jacques Ango (see DIEPPE); Graville-Ste Honorine, with a Romanesque church and other remains of an ancient abbey; Montivilliers, which has a fine abbey-church of the 11th, 12th and 16th centuries; and Arques, Boos, Martainville, Mesnières and Tancarville which have old châteaus of various periods.

SEISIN (from M. Eng. *saysen*, *seysen*, in the legal sense of to put in possession of, or to take possession of, hence, to grasp, to seize; the O. Fr. *seisir*, *saisir*, is from Low Lat. *sacire*, generally referred to the same source as Goth. *satjan*, O. Eng. *settan*, to put in place, set), the possession of such an estate in land as was anciently thought worthy to be held by a free man (Williams, *On Seisin*, p. 2). Seisin is of two kinds, in law and in deed. Seisin in law is where lands descend and the heir has not actually entered upon them; by entry he converts his seisin in law into seisin in deed. Seisin is now confined to possession of the freehold, though at one time it appears to have been used for simple possession without regard to the estate of the possessor.[1] Its importance is considerably less than it was at one time, owing to the old form of conveyance by feoffment with livery of seisin having been superseded by a deed of grant (see FEOFFMENT), and the old rule of descent from the person last seised having been abolished in favour of descent from the purchaser. At one time the right of the wife to dower and of the husband to an estate by curtesy depended upon the doctrine of seisin. The Dower Act (1833–1834), however, rendered the fact of the seisin of the husband of no importance, and the Married Women's Property Act 1882 practically abolished the old law of curtesy.

Primer seisin was a feudal burden at one time incident to the king's tenants *in capite*, whether by knight service or in socage. It was the right of the crown to receive of the heir, after the death of a tenant *in capite*, one year's profits of lands in possession and half a year's profits of lands in reversion. The right was abandoned by the act abolishing feudal tenures (12 Car. II. c. 24, 1660).

In Scots law the corresponding term is "sasine." Like seisin in England, sasine has become of little legal importance owing to modern legislation. By an act of 1845 actual sasine on the lands was made unnecessary. By an act of 1858 the instrument of sasine was superseded by the recording of the conveyance with a warrant of registration thereon.

SEISMOMETER (from Gr. σεισμός, earthquake, and μέτρον, a measure). This name was originally given to instruments designed to measure the movement of the ground during earthquakes (*q.v.*). Observations have shown that, in addition to the comparatively great and sudden displacements which occur in earthquakes, the ground is subject to other movements. Some of these, which may be called "earth-tremors," resemble earthquakes in the rapidity with which they occur, but differ from earthquakes in being imperceptible (owing to the smallness of the motion) until instrumental means are used to detect them. Others, which may be called "earth-tiltings," show themselves by a slow bending and unbending of the surface, so that a post stuck in the ground, vertical to begin with, does not remain vertical, but inclines now to one side and now to another, the plane of the ground in which it stands shifting relatively to the horizon. No sharp distinction can be drawn between these classes of movements. Earthquakes and earth-tremors grade into one another, and in almost every earthquake there is some tilting of the surface. The term "seismometer" may conveniently be extended (and will here be understood) to cover all instruments which are designed to measure movements of the ground.

Seismoscope.

Popularly it is supposed that earthquake recorders are instruments so sensitive to slight vibrations that great care is necessary in selecting a site for their installation. Although this supposition is correct for a certain class of apparatus, as for example that which will record rapid elastic vibrations produced by the movement of a train a mile distant, it is far from being so for the ordinary apparatus employed by the seismologist. What he usually aims at is either to record the more or less rapid movements of the ground which we can feel, or the slow but large disturbances which do not appeal to our unaided senses. Generally speaking, the instruments used for these purposes are not disturbed by the vibrations resulting from ordinary traffic. In almost every household something may be found which will respond to a gentle shaking of the ground. Sometimes it is a loosely-fitting shutter or window-frame, a hanging drawer-handle, or a lamp-shade which will rattle; the timbers in a roof may creak, or a group of wine-glasses with their rims in contact may chatter. Any of these sounds may call attention to movements which otherwise would pass unnoticed. Specially arranged contrivances which tell us that the ground has been shaken are called *seismoscopes* or earthquake indicators. A small column, as for example a lead pencil standing on end, or a row of pins propped up against suitable supports, or other bodies which are easily overturned, may be used as seismoscopes. Experience, however, has shown that contrivances of this order are wanting in sensibility, and often remain standing during movements that are distinctly perceptible. A more satisfactory arrangement is one where the body to be overturned is placed upon a platform which exaggerates the movements of the ground. For example, the platform *h* (see fig. 1) may be on the top of a small rod *r*, fixed at its lower end by plaster of Paris in a watch-glass *w*, and carrying a disk or sphere of lead at *l*. When the stand on which *w* rests is shaken, a multiplied representation of this movement takes place at *h*, and any small body resting on that point, as for example a small screw *s* standing on its head, may be caused to topple over. If the loaded rod is elastic its lower end may be fixed in a stand, and the spherically curved base *w* is no longer required. In this case the motion at *h* is that of elastic switching. Apparatus of this kind may be employed for several purposes beyond merely indicating that an earthquake has taken place. For example, if the falling body *s* is attached by a thread to the pendulum of a timepiece, it may be used to stop it and indicate the approximate time at which the tremor occurred. In its most sensitive form *r* is a steel wire, the upper end of which passes freely through a small hole in a metal plate. By the movement of the wire or the movement of the plate, especially if the latter projects from the top of a second and similar piece of apparatus, an electrical contact can be established by means of which an electromagnet may ring a bell, stop a clock, or set free machinery connected with a cylinder or other surface upon which an earthquake machine may record the movement of the ground.

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[1] Up to the middle of the 15th century "seisin" was applied to chattels equally with freeholds, the word "possessed" being rarely used. In course of time the words acquired their modern meaning. See F. W. Maitland, "Seisin of Chattels," *Law Quarterly Review*, vol. l. p. 324 and "The Mystery of Seisin," *Law Q. R.* ii. 481. Pollock and Maitland, *Hist. Eng. Law*, vol. ii. 29 seq.; Fry, L. J., in *Cochrane* v. *Moore* (1890), 25 Q.B.D. 57.

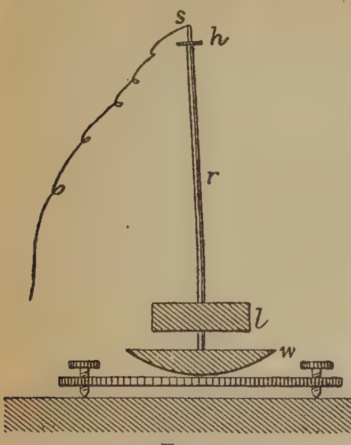

FIG. 1.

Seismometer. Seismograph.

The next class of instruments to be considered are seismometers or earthquake measurers, and seismographs or instruments which give diagrams of earthquake motion. Although a seismograph may be designed that will not only respond to fairly rapid elastic vibrations, but will also record very slow and slight undulatory movements of the ground, experience has shown that the most satisfactory results are obtained when special instruments are employed for special purposes.

First we will consider the types of apparatus which are used to record the rapid back-and-forth movements of earthquakes which can be distinctly felt and at times are even destructive. The essential feature in these seismographs is a fairly heavy mass of metal, so suspended that although its supports are moved, some point in the mass remains practically at rest. For small earthquakes, in which the movement is rapid, the bob of a very long and heavy pendulum will practically comply with these conditions. If a style projecting from this pendulum rests upon say the smoked surface of a glass plate fixed to the ground, the vibratory motion of the ground will be recorded on the glass plate as a set of superimposed vibrations. To obtain an open diagram of these movements the plate must be moved, say by clockwork.

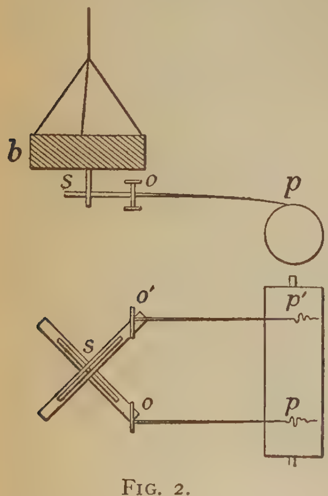

FIG. 2.

Experience, however, has shown that even when the movements of the ground are alarming the actual range of motion is so small that a satisfactory record can be obtained only by some mechanical (or optical) method of multiplication. This is usually accomplished as shown in fig. 2. *b* is the bob of a pendulum, with its style *s* passing through a slot in the short arm of a light lever, *sop*, pivoted at *o*, and with its outer end resting upon a revolving cylinder covered with smoked paper. As shown in the figure, it is evident that the motion of *o* in the line *sop* would not be recorded, and to obtain a complete record of horizontal movements it is necessary to have two levers at right angles to each other. A complete arrangement of this kind is shown in the plan of fig. 2. Here the style *s* of the pendulum rests in slots in the short arms of two writing levers pivoted at *o* and *o′*. Motion of the ground in the direction *os* actuates only the lever *so′p′*, motion in the direction *o′s* actuates only *sop*, whilst motion in intermediate directions actuates both. The length of the short arms of the levers is usually $\frac{1}{6}$ or $\frac{1}{12}$ of the long arms.

Duplex pendulums.

This type of apparatus has been replaced in Japan by what are called duplex pendulum seismographs. The change was made because it frequently happened that in consequence of the movement of the ground agreeing with the period of the pendulum, the latter no longer acted as a steady point, but was caused to swing, and the record became little better than that given by a seismoscope. Very long pendulums (30 to 40 ft.) are less subject to this disadvantage, but on the other hand their installation is a matter of some difficulty. A duplex pendulum (fig. 3) consists of an ordinary pendulum diagrammatically represented by *ab*, connected by a universal joint to an inverted pendulum *dc*. The latter, which is a rod pointed at its lower end and loaded at *c*, would be unstable if it were not connected with *b*. Now imagine this system to be suddenly displaced so that *a* moves to *a′* and *d* moves to *d′*. In the new position *b* would tend to follow the direction of its point of support, whilst *c* would tend to fall in the opposite direction, and the bob of one pendulum would exercise a restraint upon the motion of the other. If, as in practice, the moment of *b* is made slightly greater than that of *c*, the system will come *slowly* to a vertical position beneath *a′d′*. In this way, by coupling together an ordinary pendulum about 3 ft. in length with an inverted pendulum 2 ft. 6 in. long, it is easy to obtain the equivalent of a slowly-moving very long pendulum which is too sluggish to follow the back-and-forth movements of its supports.

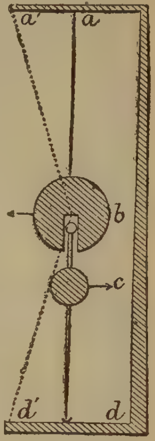

FIG. 3.

To complete an instrument of this description (see fig. 4) a point in the steady mass *b* is used as the fulcrum for the short arm of a light-writing index. This has a ball joint at *s*, a universal joint at *o* and a writing point at *p*, resting upon a piece of smoked glass. Attention was first directed to the possibility of rendering ordinary pendulums more truly astatic by Professor Thomas Gray, who suggested methods by which this might be accomplished. The method shown in fig. 4 is that devised by Professor J. A. Ewing. Records obtained from instruments of this description give information respecting the range and principal direction of motion, and show us that in a given earthquake the ground may move in many azimuths.

Horizontal pendulums.

For obtaining an open diagram of an earthquake the best type of apparatus consists of a pair of horizontal pendulums writing their movements upon a moving surface. A simple form of horizontal pendulum as shown in fig. 5, consists of a rod, *op*, free to swing like a gate round a vertical or nearly vertical axis, *oo′*, and loaded at some point *b*. In practice the weight *b* is pivoted on the rod whilst its outer end, *bp*, which writes on a smoked surface, is made extremely light. When the frame of this arrangement is rapidly displaced through a small horizontal range to the right and left of the direction in which the rod points, the weight *b* by its inertia tends to remain at rest, and the motion of the frame, which is that of the earth, is magnified in the ration *op* to *bp*. This apparatus, of which there are many types, was first introduced into seismometry by Professor Ewing.

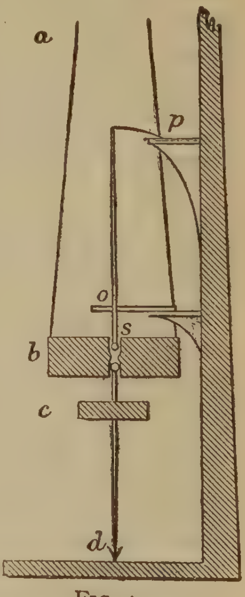

FIG. 4.

To obtain a complete record of horizontal motion, two of these pendulums are placed at right angles; and by cranking one of the writing levers, *o′p′*, as shown in the plan of fig. 5, two rectangular components of the earth's movements are written side by side. Since the movements of the ground are frequently accompanied by a slight tilting, which would cause *b* or *b′* to swing or wander away from its normal position, a sufficient stability is given to the weights by inclining the axis of the instrument slightly forwards. Although by compounding corresponding portions of the diagrams given by instruments of this type, it is possible to determine the range and direction of the movement of which they are the resolved parts, their chief value is that they enable us to measure with ease the extent of any vibration, half of which is called its amplitude, and the time taken to make any complete back-and-forth movement, or its period. Now if *a* be the amplitude expressed in millimetres, and *t* the period expressed in seconds, then the maximum velocity of an earth particle as it vibrates to and fro equals $2\pi a/t$, whilst the maximum acceleration equals $4\pi^2 a/t^2$. The former quantity determines the distance to which a body, as for example the capping of a pillar, may be projected, whilst the latter measures the effort exerted by an earthquake to overturn or shatter various bodies. If after a heavy earthquake we find bodies that have been projected or overturned, then by observing the distance of projection, and the height through which they have fallen, or their dimensions, we can by means of simple formulae calculate quantities closely agreeing with those obtained from the seismogram. For example, if a body, say a coping-stone, has been thrown horizontally through a distance a, and fallen from a height b, the maximum horizontal velocity with which it was projected equals $\sqrt{(ga^2/2b)}$; or if the height of the centre of gravity of a column like a gravestone above the base on which it rests is y, and x is the horizontal distance of this centre from the *edge* over which it has turned, then the acceleration or suddenness of motion which caused its overthrow is measured, as pointed out by C. D. West, with fair accuracy by gx/y.

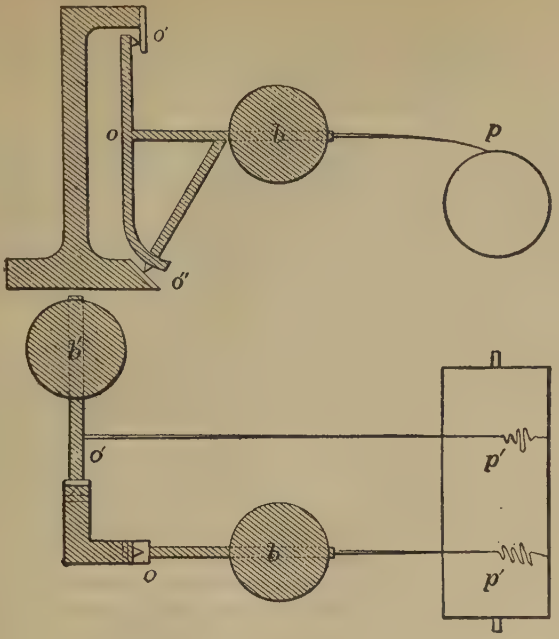

Fig. 5.

Gray's seismograph.

To measure vertical motion, which with the greater number of earthquakes is not appreciable, a fairly steady mass to which a multiplying light-writing index can be attached is obtained from a weight carried on a lever held by any form of spring in a horizontal position. Such an arrangement, for which seismologists are indebted to Professor T. Gray, is shown in fig. 6, in which B is the mass used as the steady point. This, when supported as shown, can be arranged to have an extremely slow period of vertical motion, and in this respect be equivalent to a weight attached to a very long spring, an alternative which is, however, impracticable. The value of these records, as is the case with other forms of seismographs, is impaired by pronounced tiltings of the ground.

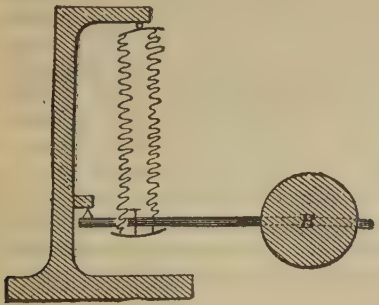

Fig. 6.

Instruments to record distant earthquakes.

We next turn to types of instruments employed to record earthquakes which have radiated from their origins, where they may have been violent, to such distances that their movements are no longer perceptible. In these instruments the same principles are followed as in the construction of horizontal pendulums, the chief difference being that the so-called steady mass is arranged to have a much longer period than that required when recording perceptible earthquakes. Instruments largely employed for this purpose in Italy are ordinary pendulum seismographs as in fig. 2. One at Catania consists of a weight of 300 kilos suspended by a wire 25 metres in length, the movements of which by means of writing indexes are multiplied 12·5 times. With pendulums of shorter length, say 2 metres, it is necessary to have a multiplication 80 to 100 fold by a double system of very light levers, in order to render the extremely slight tilting of their support perceptible. This arrangement, as devised by Professor G. Vicentini of Padua, will yield excellent diagrams of the gentle undulations of earthquakes which have originated at great distances, but for local disturbances, even if the bob of the pendulum acts as a steady point, the highly multiplied displacements are usually too great to be recorded.

In Japan, Germany, Austria, England and Russia horizontal pendulums of the von Rebeur-Paschwitz type are employed, which by means of levelling screws are usually adjusted to have a natural period or double swing of from 15 to 30 seconds. These pendulums are usually small. The swinging arm or boom is from 4 to 8 in. long horizontally, and carries at its extremity a weight of a few ounces. A simple form, which is sometimes referred to as a conical pendulum, may be constructed with a large sewing needle carrying a galvanometer mirror, suspended by means of a silk or quartz fibre as shown in fig. 7. To avoid the possibility of displacements due to magnetic influences, the needle may be replaced by a brass or glass rod. The adjustment of the instrument is effected by means of screws in the bed-plate, by turning which the axis $o'o''$ may be brought into a position nearly vertical. As this position is approached the period of swing becomes greater and greater, and sensibility to slight tilting at right angles to the plane of $o'o''m$ is increased. The movements of the apparatus, which when complete should consist of two similar pendulums in planes at right angles to each other, are recorded by means of a beam of light, which, after reflection from the mirror or mirrors, passes through a cylindrical lens and is focussed upon a moving surface of photographic paper. The more distant this is from the pendulum the greater is the magnification of the angular movements of the mirror. With a period of 18 seconds, and the record-receiving paper at a distance of about 15 ft., a deflection of 1 millimetre of the light spot may indicate a tilting of $\frac{1}{100}$ part of a second of arc, or 1 in. in 326 miles. Although this high degree of sensibility, and even a sensibility still higher, may be required in connexion with investigations respecting changes in the vertical, it is not necessary in ordinary seismometry. A very sensitive modified von Rebeur instrument was employed by O. Hecker in his measurement of the variation in the vertical and of tidal earth tremors.

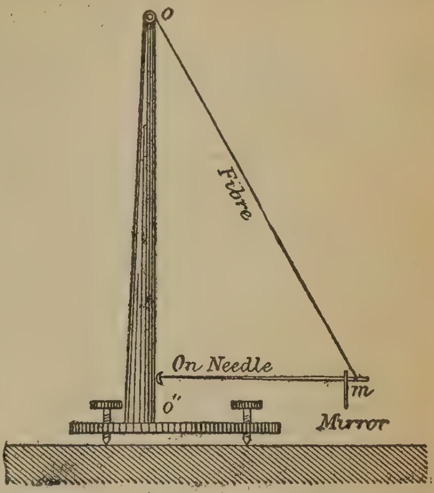

Fig. 7.

A type of instrument which has sufficient sensibility to record the various phases of unfelt earthquake motion, and which, at the suggestion of a committee of the British Association, has been adopted at many observatories throughout the world, is shown in fig. 8. With an adjustment to give a 15-second period, a deflection of 1 mm. at the outer end of the boom corresponds to a tilting of the bed-plate of $0''{\cdot}5$, or 1 in. in 6·4 m. The record is obtained by the light from a small lamp reflected downwards by a mirror so as to pass through a slit in a small plate attached to the outer end of the boom. The short streak of light thus obtained moves with

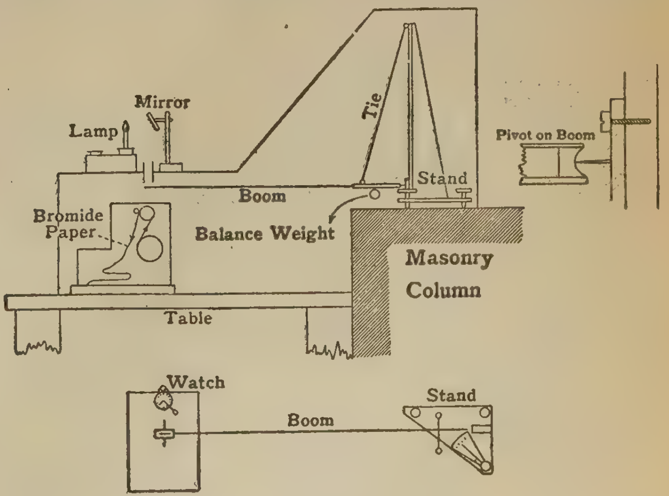

Fig. 8.

the movement of the boom over a second slit perpendicular to the first and made in the lid of a box containing clockwork driving a band of bromide paper. With this arrangement of crossed slits a spot of light impinges on the photographic surface and, when the boom is steady, gives a sharp fine line. The passage of the long hand of a watch across the end of the slit every hour cuts off the light, and gives hour marks enabling the observer to learn the time at which a disturbance has taken place. The chief function of the instrument is to measure slow displacements due to distant earthquakes. For local earthquakes it will move relatively to the pivoted balance weight like an ordinary bracket seismograph, and for very rapid motion it gives seismoscopic indications of slight tremors due to the switching of the outer end of the boom, which is necessarily somewhat flexible. If we wish to obtain mechanical registration from a horizontal pendulum of the above type, we may minimize the effect of the friction of the writing index—say a glass fibre touching the smoked surface of moderately smooth paper—by using a considerable weight and placing it near to the outer end of the boom. In the Isle of Wight there is a pair of pendulums arranged as in fig. 5. The stand is 3 ft. in height. Weights of 10 ℔ each are carried at a distance of 10 in. from the pivots of booms which have a total length of 34 in. With these, or even with booms half the above length, actuating indices arranged as shown in fig. 2, but multiplying the motion six or seven times, good results may be obtained. At Rocca di Papa near Rome there is a pair of horizontal pendulums with booms 8 ft. 9 in. in length, 17 ft. in vertical height, which carry near their outer ends weights exceeding half a hundredweight. Although such apparatus is far too cumbersome to be used by ordinary observers, it yields valuable results.

An apparatus of great value in measuring slight changes in the vertical which have a bearing upon seismometrical observation is the Darwin bifilar pendulum. This consists of a mirror about half an inch in diameter, which, when it is suspended as shown in fig. 9, rotates by tilting at right angles to the paper. By this rotation a beam of light reflected from the surface suffers displacement. It is possible to adjust the apparatus so that a tilt of $\frac{1}{1000}$ sec. of arc, or a change of slope of 1 in. in 1000 miles, can be detected. (See Sir G. H. Darwin, *Scientific Papers*, vol. i. (1907).)

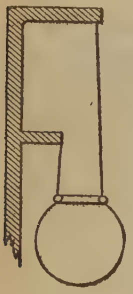

Fig. 9.

The principle of the Vicentini instrument described above has been adopted by G. Agamennone, director of the observatory at Rocca di Papa, near Rome, and also by E. Wiechert of Göttingen. In the Agamennone seismometrograph the pendulum is cheese-shaped, and weighs 500 kilos in one form and 2000 kilos, or over two tons, in the largest. This cylinder, which is suspended from a stand rigidly attached to the earth, has a vertical hole in its centre extending from its upper surface to its centre of gravity, and to the bottom of this well a light rod is fixed. The motion of the frame is communicated to this rod by an extension of the frame which makes contact with it just above its point of attachment to the well. The motion is first magnified by the lever, and, on its communication to a complex lever system above the stationary mass, is still further magnified before registration, which is effected by a pen supplied with ink writing on white paper. Mechanism is provided whereby the speed of the paper is doubled on receipt of a shock, an electric bell ringing at the same time to summon an attendant. In the Wiechert astatic pendulum seismometer the stationary mass is also cheese-shaped, but it is supported by a conical extension from its base, which balances it on the floor of its case. There is also an extension from the upper surface of the pendulum, in contact with a system of levers and rods attached to the case; an air-damping cylinder is fitted to annul the free vibrations of the pendulum. The motion of the rod consequent to a motion of the case is modified by the projecting axle of the stationary mass, and after much magnification is recorded on a sheet of smoked paper. This instrument was made with a pendulum weight of 1100 kilos or over a ton; and with a modified construction the weight was increased to 17,000 kilos or nearly 19 tons, portability being obtained by replacing the solid pendulum of the smaller instrument by a shell which can be filled with barytes, a heavy mineral readily obtainable in most places. This instrument, which has a magnification of 2200, detects the slightest tremors, and is consequently most useful in recording earthquakes of distant origin; its high sensitiveness and complications, however, militate against its common use. Wiechert has also constructed a seismometer on the same principle, but in which the stationary mass is smaller, being adjustable between 80 and 200 kilos (180 and 440 ℔).

The Strassburg or Bosch seismograph differs from those just described in resembling the Milne instrument, *i.e.* it is a horizontal and not a vertical pendulum. The steady mass, however, is much larger, being 100 kilos (or 220 ℔); the magnification is from 80 to 100; and the registration is effected on a roll of smoked paper. An air-damping apparatus is attached in order to annul the natural oscillations of the pendulum. Two of these instruments are set up, one in the N.-S. direction and the other in the E.-W. so as to record the two horizontal components. A more popular Strassburg instrument has a stationary mass of 25 kilos. The Galitzin seismograph, devised by Prince Galitzin, is of the same type, but it essentially differs from the Milne instrument in having its pendulum dead-beat; this is brought about by an electromagnetic device. Magnification and registration of the motion is effected in the following way. Attached to the pendulum is a coil of fine wire which moves in the field of a pair of magnets. The currents induced in the coil are led to a dead-beat D'Arsonval galvanometer having the same natural period of vibration as the pendulum. It is found that the motion of the galvanometer mirror faithfully records, except in a few special cases, the motion of the pendulum; the actual record is made on sensitized paper. Two instruments are set up, and the two components are recorded on one strip.

Authorities.—For older forms see R. Mallet's *Report of the British Association* (1858). For modern forms see J. Milne, *Seismology* (London, 1898); *Transactions of the Seismological Society of Japan*, vols. i.-xvi.; *Seismological Journal*, vols. i.-v. (Yokohama, 1880–1895); *Bollettino della Società Sismologica Italiana*, vols. i.-v. (Rome, 1895); J. A. Ewing, *Memoir on Earthquake Measurement* (Tokyo, 1883); *Reports of the British Association* (1887–1902); E. von Rebeur-Paschwitz, *Das Horizontalpendel* (Halle, 1892); A. Sieberg, *Handbuch der Erdbebenkunde* (Braunschweig, 1904).

SEISTAN, or Sistan (Sejistan), the ancient *Sacastane* ("land of the Sacae") and the *Nimruz* or "Meridies" of the *Vendidad*, a district of Persia and Afghanistan, situated generally between 30° 0′ and 31° 35′ N., and between 61° 0′ and (including Rudbar) 62° 40′ E. Its extreme length is about 100 and its breadth varies from 70 to over 100 m., but the exact limits are vague, and the modern signification of the name practically comprehends the peninsula formed by the lower Helmund and its embouchure on the one side and the Hamun (lake) on the other. Its area is 7006 sq. m.; 2847 sq. m. are Persian territory, while 4159 sq. m. belong to Afghanistan. When British arbitration was brought to bear upon the disputed claims of Persia over this country in 1872, it was found necessary to suppose two territories—one compact and concentrated, which was called "Seistan Proper," the other detached and irregular, called "Outer Seistan."

1. Seistan Proper is bounded on the north by the Naizar, or reed-bed which fringes the Hamun; west by the Hamun itself, of which the hill called Kuh-i-Khwajah marks the central point; south by a line shutting in Sikuha and all villages and lands watered by the main Seistan canal; and east by the old bed of the Helmund, from 1 m. above the dam at Kohak to the mouth. Kalʿah-i-nau and Rindan are among the more northerly inhabited villages. The Kuh-i-Khwajah is a sufficient indication of the western side. Burj-i-ʿAlam Khan should be included within the southern boundary as well as Sikuha. Khwajah Ahmad and Jahanabad, villages on the left bank, or west of the true bed of the Helmund, denote the eastern line. The whole area is estimated at 947 sq. m. The fixed population may be roughly stated at 35,000—some 20,000 Seistanis and 15,000 settlers—the greater part of whom are Parsiwans, or rather, perhaps, a Persian-speaking people. To the above numbers may be added 10,000 Baluch nomads. Taking the aggregate at 45,000, we find nearly 48 persons to the square mile. These figures are eight times in excess of the proportional result found for the whole of Persia. It should be explained that the designation Seistan Proper is not arbitrarily given. The territory comprehended in it is spoken of as Seistan by the dwellers on the right bank of the Helmund, in contradistinction to their own lands. At the same time it could only be but a fractional part—as indeed the whole country under consideration could only be—of the Seistan of Persian history.

Seistan Proper is an extensive tract of sand and clay alluvium, generally flat, but irregular in detail. It has heaps, but no hills; bushes, but no trees, unless indeed three or four tamarisks of aspiring height deserve the name; many old ruins and vestiges of civilization, but few monuments or relics of antiquity. It is well watered by rivers and canals, and its soil is of proved fertility. Wheat or barley is perhaps the staple cultivation; but pease, beans, oil-seeds and cotton are also grown. Among fruits, grapes and mulberries are rare, but melons and water-melons, especially the latter, are abundant. Grazing and fodder are not wanting, and besides the reeds peculiar to Seistan there are two grasses which merit notice—that called *bannu*, with which the bed of the Hamun abounds on the south and the taller and less salt *kirta* on the higher ground.

2. Outer Seistan, the country on the right bank of the Helmund, and east of its embouchure in the Hamun, extends more than 100 m. in length, or from a point between the Charboli and Khuspas rivers north to Rudbar south. In breadth the district of Chakhansur, measuring from the old bed of the Helmund, inclusive of Nad Ali, to Kadah, may be estimated at some 30 m. It produces wheat and barley, melons, and perhaps a few vegetables and oil seeds. Beyond the Chakhansur limits, southward or up to the Helmund, there is probably no cultivation save that obtained on the river bank, and ordinarily illustrated by patches of wheat and barley with melon beds. On the opposite side of the river, in addition to the cultivated portions of the bank, there is a large tract extending from south of Kuhak, or the Seistan dam (*band*), to the gravelly soil below the mountain ranges which separate Seistan from Baluchistan and Narmashir. The distance from north to south of this plain may be computed at 40 m., and from east to west at 80 or 90 m. Lands north of the Naizar not belonging to the Afghan district of Lash Juwain may also be included in Outer Seistan; but it is unnecessary to make any distinction of the kind for the tract marked Hamun on the west, where it merges into the Persian frontier. The inhabitants are Seistanis or Parsiwans, Baluch nomads and Afghans. Between the Kuhak *band* and Rudbar they are mainly Baluch. Most of the less nomad tribesmen are Sanjurani and Toki, the sardars jealously claiming the former appellation.

The most remarkable geographical feature of Seistan generally, in the modern acceptation of the term, is the Hamun, which stretches far and wide on the north, west and south, but is for a great part of the year dry or a mere swamp. It is a curious feature in the physical conformation of northern and western Afghanistan that none of the rivers flow to the sea, but that the Helmund and all the other rivers of western Afghanistan empty themselves into these lagoons, which spread over thousands of square miles. A noteworthy feature of the Seistan lagoon is that in times of excessive flood it overspreads a vast area of country, both to the north and south, shutting off the capital of Seistan (Nusretabad) from surrounding districts, and spreading through a channel southwards, known as Shelag, to another great depression, called the Gaud-i-Zirreh. This great salt swamp is about 1000 ft. lower in elevation and is situated so close to the Helmund as to leave but a few miles of broken ridge between. By that ridge all communication with Seistan must pass in time of flood. Seistan becomes a promontory connected with the desert south of the Helmund by that isthmus alone. In the early spring the existence of a lake could only be certified by pools or hollows of water formed at the mouths of the principal feeders, such as the Khash Rud on the north-east, the Farah Rud on the north-west, and the Helmund, where its old bed terminates at no great distance from the Khash Rud. Bellew describes the aspect of that portion of Seistan limited to the actual basin of the Helmund as indicating the former existence of a lake which covered with its waters a considerable area. On the north this tract has been raised to a higher level than the remainder by the deposit at the mouths of rivers of the solid matter brought down. It is still, however, from 200 to 500 ft. below the level of the desert cliffs that bound it, and at some former period formed the shores of the lake; and it is from 50 or 60 to 200 ft. above the level of the beds of the rivers now flowing into the existing Hamun.

The water-supply of Seistan is about as uncertain as that of Sind, though the general inclination to one bank, the left, is more marked in the Helmund than in the Indus. Therefore the boundary lines given must be received with slight reservation. It is easy to see that a good year of inundation extends the borders of the so-called lake to within the Naizar; and there are well-defined beds of dry canals intersecting the country, which prove the existence formerly of an extensive water-system no longer prevailing. The main canal of Seistan, confounded by some writers with the parent river, bears the waters of the Helmund westward into the heart of the country. They are diverted by means of a large *band* or dam, known indifferently as the "Amir's," the "Seistan" or the "Kuhak" *band*. It is constructed of horizontally laid tamarisk branches, earth and perpendicular stakes, and protected from damage by a fort on the left and a tower on the right bank of the river. Although this diversion of the stream may be an artificial development of a natural channel, and undoubtedly dates from a period long prior to recent Persian occupation, it appears that the later arrangements have been more maturely and better organized than those carried on by the predecessors of the amir of Kaian. The towns of Deshtak, Chelling, Burj-i-ʿAlam Khan, Bahramabad, Kimmak and others of less note are actually on the banks of this main canal. Moreover, it is the indirect means of supplying water to almost every town and village in Seistan Proper, feeding as it does a network of minor canals, by which a system of profuse irrigation is put in force. The yearly rainfall is only 2 to 3 in. The Seistan depression receives the drainage of a tract of country over 125,000 sq. m. in area.

Provisions in Seistan are as a rule sufficient, though sheep and oxen are somewhat poor. Bread is cheap and good, being procurable to natives at less than a halfpenny the pound. Vegetables are scarce, and rice is chiefly obtained from Herat. The inundated lands abound with water-fowl. Partridges and sand-grouse are occasionally seen. River fish are plentiful enough, but confined to one species, the barbel.

The population is about 205,000, but the country, even with the lazy methods of the present day, furnishes a very large amount of grain and food-supplies in excess of local requirements, and it could, of course, be made to furnish very much more. Under improved government Seistan could with but little trouble be made into a second Egypt.

The inhabitants of Seistan are mainly composed of Kaianis, descendants of the ancient rulers of the land; Sarbandis and Shahrakis, tribes supposed to have consisted originally of immigrants from western Persia; and Baluchis of the Nharui and Sanjurani (Toki) clans. Bellew separates the "Seistanis"; but it is a question whether this term is not in a large measure applied to fixed inhabitants of the country, whatever their descent and nationality. The dense reed-beds (Naizar) skirting the Hamun, often several miles in width and composed of reeds 10 ft. or more in height, look impenetrable, but narrow winding lanes exist in them, known only to the Sayāds (Arab. for "hunter"), a strange aboriginal race of Seistan, who live by netting fish and water-fowl. These people live all the year round at the water's edge, in huts made of reeds, and change their abodes as the waters advance or recede. They have a language of their own, and are an unsociable people, suspicious of strangers, ever ready to decamp if they think a tax-collector is near.

History.—The ancient Drangiana (Zaraya, Darañka, "lake land") received the name of "land of the Sacae" after this country was permanently occupied by the "Scythians" or Sacae, who overran Iran in 128 B.C. It was included in the Sassanian empire, and then in the empire of the caliphs. About A.D. 860, when it had undergone many changes of government under lieutenants of the Bagdad caliphs, or bold adventurers acting on their own account, Yakub b. Laith al-Saffar made it the seat of his power. In 901 it fell under the power of the Samanids, and a century later into that of the Ghaznevids. An invasion of Jagatais and the irruption of Timur are salient points in the history of Seistan prior to the Sefavid conquest (1508). Up to 1722 Seistan remained more or less a Persian dependency. At the time of the Afghan invasion of Mir Mahmud (1722), Malik Mahommed Kaiani was the resident ruler in Seistan, and by league with the invader or other intrigue he secured for himself that particular principality and a great part of Khorasan also. He was slain by Nadir Kuli Khan, the general of Shah Tahmasp, who afterwards, as Nadir Shah, became possessor of Seistan as part of his Persian dominions. Shortly after the death of Nadir (1751) Seistan passed, together with other provinces, into the hands of Ahmad Shah Abdali, the first sovereign in a united Afghanistan. On the death of Ahmad Shah in 1773 the country became a recognized bone of contention, not so much between Persians and Afghans as between Herat and Kandahar; but eventually the internal dissensions of Afghanistan gave Persia the desired opportunity; and by a steady course of intrigue and encroachment she managed to get within her grasp the better lands on the left bank of the lower Helmund and something on the right bank besides. When the British arbitrator appeared on the scene in the beginning of 1872, though compelled to admit the shah's possession of what has been called "Seistan Proper," he could in fairness insist on the evacuation of Nad Ali, Kala Fath, and all places occupied on the right bank by Persian troops; and furthermore he left to the Afghans both sides of the river Helmund from the dam of Kuhak to its elbow west of Rudbar. A part of the work of General Sir Frederic J. Goldsmid, K.C.S.I., who conducted the first Seistan demarcation commission in 1872, was left undone and completed only in 1903–1905 by Col Sir Henry McMahon, K.C.I.E.

See *Eastern Persia*, vol. i.; Bellew's "Record of Seistan Mission," *Journal of R. Geog. Society*, vol. xliii. (1873); Col Sir H. McMahon's paper in *Geographical Journal* (September to October, 1906); also PERSIA. (F. J. G.; A. H.-S.)

SEJANUS, LUCIUS AELIUS, favourite and minister of the Emperor Tiberius. He was the son of Seïus Strabo, prefect of the praetorians, and was adopted into the Aelian gens. After his father's departure from Rome to take up the governorship of Egypt, Sejanus was made prefect in his stead. He gained the confidence of Tiberius, and, supported by the praetorians, whom he concentrated in a camp on the Viminal Hill, became virtually ruler of Rome. But he aimed still higher, and determined to put all the members of the royal house out of his way. Having removed Drusus (the son of Tiberius) by poison, he persuaded the emperor to retire to the island of Capreae. The death of Drusus was followed some years later by those of Agrippina (the wife of Germanicus) and her sons Drusus and Nero. Tiberius at last saw through his designs, and caused Sejanus to be put to death (A.D. 31).

Tacitus, *Annals*, iv. 1, 2, 3, 8, 39-59, 74, v. 6-9; Suetonius, *Tiberius*, 62; Dio Cassius lvii. lviii.; Juvenal x. 65-86; J. Jülg, *Vita Aelii Sejani* (1882), with notes giving full references to authorities; J. C. Tarver, *Tiberius the Tyrant* (London, 1902), chap. xvii.

SEKONDI, a port on the Gold Coast in 4° 57′ N., 1° 42′ W., and 167 m. by rail S. by W. of Kumasi. Pop. (1908) about 5000, of whom some 200 were whites. Sekondi is one of the old trading stations on the Guinea coast, and Fort Orange was built here by the Dutch about 1640, the English later on building another fort near by. In 1694 the Dutch fort was plundered by the Ahanta, who in 1698 burnt the English fort. It was not rebuilt, and it was not until 1872 that the place became definitely British. The town was of comparatively little importance until it was chosen as the sea terminus of the railway serving the gold-mining districts and Ashanti. The railway reached the Tarkwa goldfields in 1901 and the Obuassi mines in 1902. From that date Sekondi became the chief port of the Gold Coast colony, gold, rubber and timber being the principal exports. In 1908 the total trade of the port was £2,121,420. There is no sheltered harbour, but at the landing place are piers provided with cranes. Landing is effected in lighters, ships anchoring in the roadstead half a mile from the shore. The public buildings include Fort Orange, a church, court-house, government offices and hospital. The mean temperature is about 79° F.; the rainfall about 40 in. a year. The climate is unhealthy for Europeans, but by the reclamation of the neighbouring lagoons its sanitary condition has been improved. Sekondi is governed by a municipality, created in 1905. It is in telegraphic communication with Europe by submarine cable, and is served by British, German and Belgian lines of steamers.

SELACHIANS, or ELASMOBRANCHII, a subclass of fishes, including the various kinds of Sharks and Rays.

Structural Features.—The general shape is somewhat spindle-like in the Sharks, while in the Rays—in correlation with the ground-feeding habits—the body has become greatly depressed. Departures from the normal are seen in the Hammerheads (*Sphyrna*), where the sides of the head are so produced as to give a hammer shape, and in the Saw-fishes (*Pristis*), where the head is prolonged forwards as a greatly elongated flattened rostrum. In regard to the fins, the tail is heterocercal in the adults of living forms, except in *Chlamydoselachus*, where the protocercal condition persists; the pectoral fins are greatly enlarged in the Rays, in which movement is effected mainly by the passage backwards of waves of flexure along the pectoral fins; the pelvic fins in the last-named fishes have their hinder portions modified in the male to form special copulatory organs, the *myxipterygia* or "claspers."

The mouth opening is a ventrally placed crescentic slit except in *Chlamydoselachus*, where it is nearly terminal. The olfactory organs, lying in front of the mouth, are widely open to the exterior, and in some cases are connected with the mouth by oronasal grooves. The spiracular opening frequently retains in the adult an opening to the exterior behind or below the eye. In the Rays it is used mainly for inspiration. The post-spiracular clefts open freely to the exterior, each guarded by a flap-like extension of its anterior margin which serves as a valve to allow water to pass only in one direction, viz. outwards. In the Holocephali the anterior flap, that arising from the hyoid arch, is greatly enlarged so as to form an *operculum* covering over all the clefts lying posterior to it.

The postspiracular clefts are usually five in number, but six in *Chlamydoselachus* and *Notidanus griseus*, and seven in *N. cinereus*. The gill lamellae are strap-like and attached by their edges to the gill septa. Fully developed lamellae are present on the anterior wall of the hyobranchial clefts and vestigial lamellae on the anterior wall of the spiracle where they form the "pseudobranch."

In the Basking Shark *Cetorhinus* the pharyngeal openings of the gill clefts are guarded by series of long slender rods—the greatly elongated representatives of the small conical "gill rakers" found in this position in other fishes. These structures form a sieve-like arrangement for preventing the minute creatures (plankton) upon which this shark feeds from passing out through the gill clefts.

There appears to be no representative of the lung or swimbladder, and there are no pyloric caeca. The intestine is provided with a spiral valve in its interior which varies in character in different forms (1). A glandular caecum—the *rectal caecum*—opens into the dorsal side of the rectum. In regard to the coelomic spaces the Selachians exhibit the interesting feature that the pericardiac cavity is in the adult in communication with the general splanchnocoele by an open channel sometimes forked at its posterior end. This communication apparently arises secondarily and is not due to a persistence of the embryonic communication (2). In the case of *Torpedo* and in the ordinary Rays certain portions of the muscular system are converted into electrical organs. In the Skates and Rays the electrical disturbance is relatively small—imperceptible by human beings—but in *Torpedo* it is very considerable. No doubt the electric organs subserve a defensive function.

The kidney of the adult is a mesonephros. The pronephros is never functional, though it appears in a vestigial form in the embryo. The mesonephros shows a division into a broader posterior portion which alone is renal in function, and a slender anterior portion which in the male subserves a genital function. The female genital duct is a typical Müllerian duct having at its anterior end a wide coelomic funnel and lined by glandular epithelium whose secretion forms adventitious coats round the egg during its downward passage. The spermatozoa find their way to the cloaca by way of the mesonephric duct, the hinder portion of which is dilated to form a vesicula seminalis. The urino-genital sinus—formed by the fusion of the mesonephric ducts at their hinder ends—projects forward as a pair of pockets (the so-called sperm sacs).

The skeleton of the Selachian shows remarkably archaic features, inasmuch as the internal skeleton is entirely cartilaginous, the bony or placoid skeleton retaining its primitive superficial position and not showing in any part a tendency to sink or spread inwards for the reinforcement of the cartilaginous skeleton. The vertebral column is of the chordacentrous type, although in some of the more archaic of known fossil forms (Pleuropterygii, Ichthyotomi, Acanthodei, *Hybodus*) the chondrified secondary sheath of the notochord apparently retained in the adult the unsegmented condition. The same holds for the Holocephali and for the hinder part of the vertebral column of the existing *Chlamydoselachus*. The centra are usually, if not always, strengthened in the adult by the deposition of lime salts in the intercellular matrix: such calcified cartilage must be carefully distinguished from true bone. The arrangement of the calcified tracts shows differences which are of taxonomic importance.

In the *cyclospondylous* type (fig. 1, A) the calcified tract has the form of a double cone—of the wall of a dice-box—and in the transverse section appears as a simple circle (*Palaeospinax*, *Acanthias*, *Scymnus*). In the *tectospondylous* (fig. 1, B) type, additional calcified tracts are developed outside and concentric with the original double cone (Batoidei), while in the *asterospondylous* (fig. 1, C) type the additional calcification takes the form of longitudinally arranged plates radiating outwards from the original double cone, so as to produce a star-like appearance in cross section (*Scyllium*, *Lamna*). Eventually in the adult the calcification may extend from the special tracts above mentioned throughout the whole centrum. In certain cases (Carchariidae, &c.) the transverse section of the centrum is modified by its surface becoming indented by the ingrowth of cartilage tracts (calcified or not) situated *external* to the primary sheath, thus producing an appearance something like a Maltese cross.

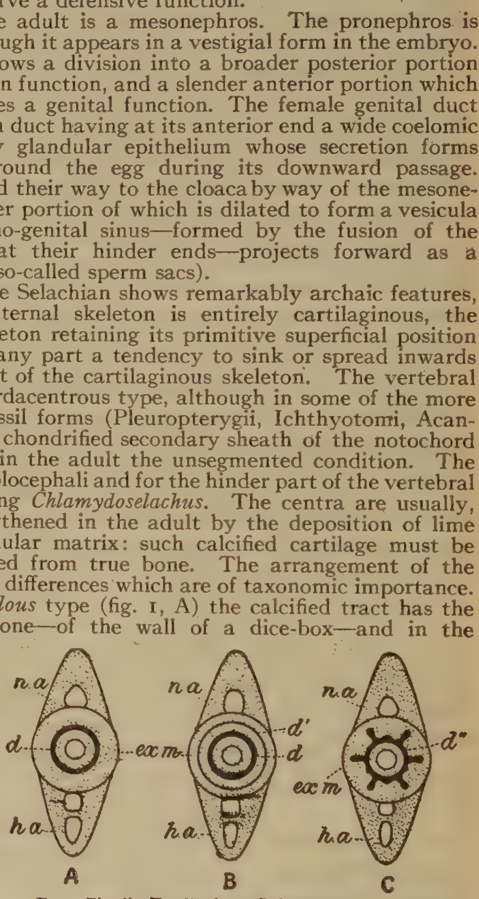

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FIG. 1.—Diagrammatic transverse sections to illustrate the Cyclospondylous (A), the Tectospondylous (B) and the Asterospondylous (C) type of vertebra.

d, *d′*, *d″*, Calcified tracts. *h.a*, Haemal arch.
ex.m, Primary sheath. *n.a*, Neural arch.

The arch elements of the vertebral column have lost in variable degrees the numerical correspondence with the centra which they possibly once possessed. The same applies to the relations of the centra with the fundamental body metamerism, as shown by the neuro-muscular segments; *e.g.* there are frequently in the caudal region in sharks (3) two centra to each neuro-muscular segment, while in part of the trunk in Notidanidae one centrum corresponds to two neuro-muscular segments.

The chondrocranium retains through life its primitive character. The ethmoidal region is prolonged forwards into a *rostrum*—which may be of enormous size (*Pristis*), or may be of insignificant dimensions as in most sharks.

The jaw apparatus is also remarkably archaic: the functional jaws being the *palatopterygoquadrate* cartilage and Meckel's cartilage respectively. The suspension from the skull is typically *hyostylic*, except in *Notidanus* where it is *amphistylic*, in the *Holocephali* where it is *autostylic*, and in *Heterodontus* where it approaches the autostylic condition.

The skeleton of the postmandibular visceral arches consists of a half hoop of cartilage on each side divided into a number of segments: the two half hoops are connected ventrally by a median *copula* (*basihyal*, or *basibranchial*). The hyoid arch most usually shows a division into a dorsal (*hyomandibular*) and a ventral (*ceratohyal*) element, and except in the Notidanidae the dorsal segment is of large size in correlation with its function in the suspension of the jaws. This enlargement of the hyomandibular is particularly marked in the case of the Rays (*Raia*) where it may become freed from the ventral segmented part of the arch which articulates directly with the skull. The branchial arches usually are segmented on each side into four pieces (*pharyngobranchial*, *epibranchial*, *ceratobranchial* and *hypobranchial*) in addition to the median copula.

All these visceral arch skeletons bear on their outer surface a number of cartilaginous rays which radiate outwards and support the gill septa. Those attached to the hyoid arch (*branchiostegal* rays) show by their specially large size a foreshadowing of the development of the operculum of the higher group of fishes.

In addition to the elements already mentioned slender cartilaginous rods of doubtful significance are found superficial to the jaw cartilage (*labials*) and to certain of the branchial arches (*extra branchials*).

The limb girdles of the Selachians are very simple—a hoop of cartilage incomplete dorsally in the case of the pectoral, a transverse bar of cartilage in the case of the pelvic girdle.

In the ancient Pleuracanthids the two halves of the pectoral girdle remained distinct in the adult, and each was segmented into three pieces, thus showing a remarkable correspondence with the visceral arches lying in front of them. (For the bearing of this on theories of the origin of limbs see ICHTHYOLOGY: *Anatomy*.) In some existing sharks (*e.g. Acanthias*) a relic of this condition is found—the dorsal extremity of the girdle being segmented off from the rest.

The cartilaginous skeleton of the pectoral limb consists of numerous cartilaginous rays which typically are connected with the girdle through the intermediary of three basal pieces known as *propterygium*, *mesopterygium* and *metapterygium*. In the Rays, in correlation with the gigantic development of the pectoral fins, the propterygium and metapterygium become greatly enlarged in an anteroposterior direction—the former becoming attached to the side of the cranium or even meeting and fusing with its fellow in front (*Trygon*). In the pelvic limb the rays are—except a few in front—borne on the outer side of a single backwardly projecting basal piece (*metapterygium*). In the male this is continued backwards to form the skeleton of the clasper.

The limb skeleton shows remarkably interesting features in the ancient extinct sharks *Cladoselache* and *Pleuracanthus*.

The placoid or bony skeleton is seen in its most archaic form in Selachians in the form of superficially placed placoid scales. These may be uniform in size forming the characteristic shragreen of the various sharks, or scattered scales may be greatly enlarged as in the thornbacks, or finally the scales may have completely atrophied as in the electric ray (*Torpedo*).

Local placoid elements or aggregations of placoid elements may become specially enlarged to form defensive or offensive weapons. In the sawfish (*Pristis*) a row of greatly enlarged placoid spines along each side of the rostrum form the "teeth" of the saw, and a similar condition occurs in the sharks of the genus *Pristiophorus*. In the sting-rays the tail is armed with a large serrated spine taking the place of the dorsal fin and having behind it smaller spines, the front one of which increases in size and becomes functional if the previously functional spine is broken off.

The portion of skin involuted to line the buccal cavity carries with it its armature of placoid scales (*Chlamydoselachus*). Normally these undergo atrophy except near the margin of the cavity where they are greatly enlarged to form the teeth. These vary greatly, as might be expected, in accordance with the nature of the food—they may be sharp prehensile spines, or triangular cutting blades with serrated edges (*e.g. carcharodon* and other sharks) or flattened plates adapted to crushing Molluscan shells (*e.g.* various rays).

Vascular System.—The heart possesses a single atrium and a single ventricle. Opening into the atrium is a well-developed sinus venosus and leading from ventricle into ventral aorta is a well-developed rhythmically contractile conus arteriosus, containing a complex arrangement of pocket valves. These pocket valves are arranged in longitudinal rows, each row representing the remains of a longitudinal ridge in the conus of the embryo. The valves of each row tend to become differentiated in size, *e.g.* in *Rhina* the anterior valve in each row is considerably enlarged. Finally a condition may be reached in which all the valves of the row disappear except two as in *Scyllium canicula*. As regards the remaining parts of the blood-vascular system, probably the most characteristic feature is the tendency seen in various Selachians for the main venous trunks (cardinals and hepatic veins) to become dilated at their front ends into a special sinus which fills the cavity of the orbit. The kidneys are provided with a well-developed renal portal system.

Nervous System.—The brain of the Selachians shows a mixture of primitive and specialized characters. The hemisphere region is remarkable for the indistinctness of the two hemispheres. This has been looked on by some, *e.g.* Gegenbaur, as a primitive feature, the hemispheres having not yet been developed. To others, including the writer of this article, the balance of evidence seems in favour of the condition in Selachians being due to a secondary disappearance of the separation between the two hemispheres. In such comparatively primitive forms as the Notidanidae the paired character of the hemisphere region is still clearly indicated. In the Raiidae on the other hand even the lateral ventricles have lost their paired character, while in *Myliobatis* the ventricle of the region has disappeared entirely, leaving a solid unpaired mass. Although the hemisphere region has in great part lost its paired character, this does not apply to the anterior outgrowths from the hemispheres, the olfactory lobes. In the Holocephali the olfactory lobes remain close to the hemisphere surface. In other Selachians, however, the olfactory organ, with the olfactory lobe attached to it, becomes carried away by differential growth to a lesser or greater distance from the hemisphere. The result is that the middle part of the olfactory lobe becomes greatly drawn out (*Olfactory tract* or *peduncle*). The swelling at its anterior end is now spoken of as the olfactory lobe, while its hinder end, where it passes into the brain, is the *olfactory tubercle*.

In the region of the thalamencephalon there is a well-developed infundibular gland, and the pineal body is present in the form of a greatly elongated slender tube which passes upwards and forwards to end in contact with the cranial roof about the level of the anterior boundary of the hemisphere region. The pineal body ends in a small bulbous enlargement but shows no trace of eye structure. In the mesencephalon are a pair of well-developed optic lobes.

The cerebellum is highly developed—as in the case of other fishes which perform active and complex movements. The medulla oblongata shows a characteristic feature in *Torpedo*, where the nucleus of origin of the electric nerves forms a large swelling on the floor of the fourth ventricle on each side of the mesial plane. In connexion with the organs of special sense in the Selachians, there are various points of general interest. In various forms, *e.g. Scyllium* and *Raia*, the olfactory organ is connected with the mouth by means of an open gutter—the oronasal groove—in which we may probably see the homologue of the similar groove which appears in the embryo of the higher vertebrates and which, becoming covered in, gives rise to the communication between nose and buccal cavity *via* the internal nares. The *otocyst* or auditory organ, which arises in ontogeny as an involution of the ectoderm, is remarkable in the Selachians from the fact that it does not become completely enclosed. Throughout life the ductus endolymphaticus remains open to the exterior by a minute pore on the dorsal side of the head. In *Rhina* (4) this communication of otocyst with exterior is relatively wide, and through it grains of sand gain admission to the interior of the otocyst, where they take the place functionally of the small calcareous *otoconia* of other forms.

Cutaneous Sense Organs.—As in other fishes there is a rich development of sense buds scattered over the general surface of the head and body. Certain of these retain their superficial position throughout life, while others are carried inwards by involution of the ectoderm so that they come to be sunk in pits. These pits may become prolonged into tubes with dilatations at their inner ends containing the sense buds ("Ampullae of Lorenzini" of the head region), or their external opening may be narrowed to a fine slit, or they may become completely shut off from the exterior ("Savi's vesicles" on ventral side in *Torpedo*). Another series of these cutaneous sense buds is arranged in rows on the head and trunk to form the characteristic organs of the lateral line. These are innervated by the *lateralis* system of nerves. These organs, like the sense buds already mentioned, become sunk beneath the surface, lying first in the floor of an open groove (*Chimaera*) and later, as this becomes covered in, in a canal which opens to the exterior at intervals by pores.

Ontogenetic Development.—The Selachians possess large heavily yolked eggs and show corresponding modifications in their developmental processes. Segmentation is partial, resulting in the formation of a blastoderm. The process of gastrulation is much less modified than in the Sauropsida (where similar conditions prevail as regards quantity of yolk), and can be readily compared with the method seen in the larger types of holoblastic egg.

Fertilization is internal, the myxipterygia or claspers serving as intromittent organs. On its passage down the oviduct the egg normally becomes surrounded by a layer of albumen and by a tough external envelope of flattened quadrangular shape. The corners of the external capsule may be produced into points (*Raia*) or into long tendril-like structures (*Scyllium*) which serve to anchor it to seaweeds.

In a large number of Selachians the adoption of internal fertilization has been followed by the retention of the embryo within the oviduct (uterus) for a prolonged period. In such cases we find interesting adaptive arrangements for aiding the nutrition and respiration of the young individual. The highly vascular wall of the yolk sac may come into intimate relation with the uterine lining, so as to form a simple yolk sac placenta (*Mustelus laevis*, &c.). In other forms the uterine lining secretes a nutritive fluid or uterine milk which apparently is taken into the alimentary canal of the embryo through the spiracles (*Myliobatis* sp., *Taeniura* sp.). In certain Rays (*Pteroplataea micrura*) this secretory activity of the uterine lining is concentrated in long villous processes known as *trophonemata*, which pass through the wide spiracles of the young fish and pour their secretion directly into the cavity of its alimentary canal.

Classification

The following table gives a convenient classification (taken from Bridge (5)) of those Selachians at present known:—

Order I. Pleuropterygii (Extinct: palaeozoic).
,, II. Acanthodii (Extinct: palaeozoic mainly).
,, III. Ichthyotomi (Extinct: palaeozoic mainly).
,, IV. Plagiostomi.

Suborder I. *Squali* (Selachii *s.s.*).

Fam. 1. Notidanidae (*Notidanus* = Hexanchus and Heptanchus).
,, 2. Chlamydoselachidae (*Chlamydoselachus*).
,, 3. Heterodontidae (*Heterodontus* = *Cestracion*).
,, 4. Cochliodontidae (Extinct: palaeozoic).
,, 5. Psammodontidae (Extinct: palaeozoic).
,, 6. Petalodontidae (Extinct: mainly palaeozoic).
,, 7. Scylliidae (*Scyllium*, *Pristiurus*, *Stegostoma*).
,, 8. Carchariidae (*Carcharias*, *Galeus*, *Galeocerdo*, *Mustelus*).
,, 9. Sphyrnidae (*Sphyrna* = Zygaena).
,, 10. Lamnidae (*Lamna*, *Carcharodon*, *Alopecias*, *Mitsukurina*).
,, 11. Cetorhinidae (*Cetorhinus*).
,, 12. Rhinodontidae (*Rhinodon*).
,, 13. Spinacidae (*Acanthias*, *Spinax*, *Scymnus*, *Laemargus*, *Echinorhinus*).
,, 14. Rhinidae (*Rhina*).
,, 15. Pristiophoridae (*Pristiophorus*).

Suborder II. *Batoidei*.

Fam. 1. Pristidae (*Pristis*).
,, 2. Rhinobatidae (*Rhinobatus*).
,, 3. Raiidae (*Raia*).
,, 4. Tamiobatidae (Extinct: palaeozoic).
,, 5. Torpedinidae (*Torpedo*: *Narcine*).
,, 6. Trygonidae (*Trygon*, *Pteroplataea*, *Taeniura*).
,, 7. Myliobatidae (*Myliobatis*, *Aëtobatis*, *Ceratoptera*).

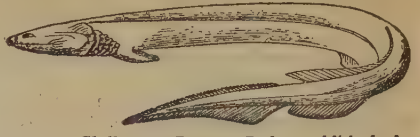
Order V. Holocephali.

Fam. 1. Ptychodontidae (Extinct: palaeozoic).
,, 2. Squaloraiidae (Extinct: mesozoic).
,, 3. Myriacanthidae (Extinct: mesozoic).
,, 4. Chimaeridae (*Chimaera*, *Callorhynchus*, *Harriotta*).

Existing Forms.—The Selachians known to survive to the present day are confined to orders IV. and V., the former including the Sharks (Squali) and Rays (Batoidei), and the latter including the remarkable *Chimaera* and its allies. For the more interesting members of the Plagiostomi see SHARK and RAY.

The general morphological features of the Plagiostomi are dealt with in the article Ichthyology. It remains now to refer shortly to one or two of the subdivisions which contain forms of special morphological interest from their in many respects primitive character. Such families are the Notidanidae, the Chlamydoselachidae and the Heterodontidae. The second of these is of very special interest: it contains the single living genus *Chlamydoselachus*, specimens of which have been obtained in considerable numbers from deep water off the coast of Japan, while isolated specimens have been taken off the coasts of Australia and Norway and near Madeira.

The general shape of *Chlamydoselachus* is elongated, almost eel-like (fig. 2). The mouth is nearly terminal, instead of being well back on the ventral surface as in other sharks. The teeth are very characteristic, flattened in shape, pointing backwards and overlapping one another in longitudinal rows. Each tooth has three slender pointed cusps and closely resembles the teeth of various members of the extinct group Ichthyotomi. The small placoid elements which cover the general body surface are seen to become enlarged at the margin of the mouth, especially posteriorly, these enlarged placoid elements functioning as accessory teeth and in fact being practically teeth in an early stage of evolution. It is interesting to note also that the lining of the mouth still develops a covering of placoid elements. (In the typical gnathostome the placoid elements have of course disappeared from the mouth lining, except in the case of the functional teeth.) There is no oronasal groove in the adult, and the spiracle is greatly reduced. The valvular flaps guarding the external openings of the gill (6) clefts are much larger than in other sharks, particularly the most anterior (hyoidean) which meets its fellow ventrally and is prolonged backwards for some distance as an incipient operculum. The tail is practically protocercal, although the median fin-fold is considerably more developed on its ventral side than dorsally. The lateral line organs on the sides of the body are situated at the bottom of an open groove; only in the head region has this become covered in.



From *Challenger Reports Zool.*, published by H.M. Stationery Office. (After Günther.)

FIG. 2.

The Notidanidae, like *Chlamydoselachus*, show more than the ordinary number of gill clefts. *Notidanus griseus* (*Hexanchus*) has six, while *N. cinereus* (*Heptanchus*) has seven postspiracular gill-clefts. In both Notidanidae and Chlamydoselachidae the vertebral column shows very primitive features with either very slight calcification or none at all.

The Heterodontidae include the recent genus *Heterodontus* (= *Cestracion*), the Port Jackson shark or Bullhead shark, widely distributed through the Pacific. Numerous Mesozoic and possibly also Palaeozoic forms belong to this family. The small and nearly terminal mouth, the amphistylic skull, and the egg cases with an external spiral lamina are characteristic features.

Palaeontological History (6).—It must be borne in mind that the sharply delimited groups into which animals appear to be divided are due to our imperfect knowledge, to the fact that our knowledge is limited to short isolated periods of geological time. Were our knowledge of palaeontology complete, it would be found that the various groups graded into one another by insensible gradations, so that it would be quite impossible to set definite limits to any one group. Already even in the extraordinarily imperfect condition of palaeontological knowledge this difficulty is making itself felt, and in the remains from the older deposits it becomes difficult to decide which of the recognized groups the various forms are most closely allied to.

Amongst the most ancient forms of fishes known at present are the remarkable *Ostracodermi* of the Upper Silurian and Devonian. The general form of these creatures gives the impression that they were ground-feeding fishes which had become highly specialized along much the same lines as the rays amongst existing Selachians. In the highly interesting Coelolepidae described by Traquair (7) from the Upper Silurian and Devonian and comprising the genera *Thelodus* and *Lanarkia* a placoid skeleton is present, the individual elements being in the form of small hollow spines without any basal plate of bone. The main organ of propulsion seems to have been the heterocercal tail, while the broad anterior region passes out on each side into a flap-like portion which may represent a pectoral fin. On the under surface of *Thelodus* there occur transverse markings which probably are caused by the presence of a branchial apparatus of the ordinary Selachian type. In the *Drepanaspidae* (Lower Devonian) and *Pteraspidae* (Upper Silurian and Lower Devonian) the isolated placoid elements of the *Coelolepidae* have undergone fusion to a less or greater extent into large plates which ensheath the anterior body region, the posterior portion possessing rhombic scales. The Ostracoderms so far mentioned are grouped together under the name Heterostraci. The Osteostraci form another main division of the Ostracoderms, distinguished from the Heterostraci by the presence of true unmodified bone in their skeletal plates. The orbits are more dorsal in position and a dorsal fin is known to occur, while none has as yet been recognized in the Heterostraci. The most familiar members of the group are the *Cephalaspidae* of the Silurian and Devonian with their highly characteristic crescentic shield covering the dorsal side of the head region. From behind the posterior horns of this shield there project in some specimens paddle-like structures which may be pectoral fins, or possibly structures serially homologous with limbs and not represented in modern Selachians.

Among the less doubtful members of the Selachii among fossil forms first place must be given to the *Pleuropterygii* represented by the genus *Cladoselache* (8) from the Upper Devonian of Ohio. This was a shark-like creature with the mouth apparently terminal. The body was covered with shagreen placoid elements: there were a series (five or seven) of gill slits on each side and the skull was probably hyostylic. The notochord was apparently persistent. The chief interest of *Cladoselache*, however, lies in its paired fins which are held by upholders of the "lateral fold" theory to be remarkably primitive. The unpaired fins are obviously highly developed—the tail being almost homocercal with a lateral keel on each side as in various existing sharks, and it seems on the whole unlikely that the paired fins should be very primitive while the unpaired fins are so highly developed. Moreover, the facts of structure of the paired fins so far as at present known seem to fit in quite well with the view that they are modifications of the uniserial archipterygial type (see ICHTHYOLOGY, fig. 2).

The *Ichthyotomi*, including the family *Pleuracanthidae* (Lower Carboniferous to Permian), are again of special interest as regards their paired fins which are obviously of the uniserial archipterygial type. The tail is protocercal and the mouth nearly terminal.

The *Acanthodei* are small fishes ranging from the Upper Silurian to Permian. They had strongly heterocercal tail, gill clefts apparently opening independently to the exterior, but they are specially characterized by the strong spines in front of each fin and by the calcified plates lying superficial to the cranium, jaw apparatus and pectoral girdles.

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(J. G. K.)

SELBORNE, ROUNDELL PALMER, 1ST EARL OF (1812–1895), English lawyer and statesman, was born at Mixbury, in the county of Oxford, on the 27th of November 1812. His father was rector of the parish: his grandfather and great-grandfather were merchants in the City of London, where their descendants for a long while continued to be influential people; his mother belonged to the family of Roundell, which had been settled for four centuries in the West Riding of Yorkshire. He was educated at Rugby and at Winchester, and in 1830 went into residence in the university of Oxford as a scholar of Trinity College. Here he lived in intimacy with many friends, especially P. C. Claughton and Charles Wordsworth. In 1834 he took a first class in *Literae Humaniores*; he won the Eldon scholarship and was elected to a fellowship at Magdalen College; and after a year, spent chiefly in private tuition, partly in Lord Winchilsea's house and partly in the university, he removed to London (November 1835) and commenced reading for the bar.

He was called to the bar on the 7th of June 1837, the same day on which John Rolt (1804–1871), a man of very different antecedents, but afterwards a worthy rival of Palmer, was also called. Through his family connexions in the City of London, clients soon came to Palmer's chambers, and his business at the Chancery bar increased rapidly. Meanwhile his interests were not wholly confined to law: for some time (1840–1843) he wrote for *The Times* and the *British Critic*; he made a plunge into patristic learning, from which he soon recoiled; he was much interested in the controversies which distracted the Church on the subject of Tract 90; in the treatment of the Episcopal Church in Canada by the Canadian government and the Colonial Office; in the establishment by the crown, in conjunction with the king of Prussia, of the Jerusalem bishopric; and in the contest for the professorship of poetry at Oxford on Keble's retirement.

In 1847, and again in 1853, Palmer was returned as member of Parliament for Plymouth, as a Peelite, and in the House of Commons he took an active and independent part. He advocated the admission of Jews to parliament; he opposed Lord John Russell's measure to repel the so-called papal aggression; he opposed the admission of Dissenters into the university of Oxford; and he was hostile to the action of the government in the Crimean War. On the question of the reform of the university of Oxford, he sympathized with the reformers, but felt himself prohibited, by the oaths which he had taken, from assuming any active part. In 1855 he supported Gladstone in the efforts to bring about peace with Russia before the capture of Sebastopol; in 1856 he opposed the opening of museums on Sunday; in the following year he supported Cobden in his disapproval of the second opium war with China. At the general election on March 1857, Palmer, finding that the independent part he had taken, especially in reference to the Chinese question, had alienated from him many of his constituents in Plymouth, abandoned the prospect of re-election for that borough, and did not seek for election elsewhere. In 1848 he married Lady Laura Waldegrave, daughter of Earl Waldegrave. In 1849 he had become a Q.C.; and in 1851 he took his seat in the Rolls Court, where he soon obtained a leading practice, and was engaged in many of the most important cases in the Court of Chancery. In July 1861 he accepted from Lord Palmerston the office of solicitor-general, a knighthood, and a safe seat for the borough of Richmond in Yorkshire, secured for him through the friendly action of Lord Zetland, and thus began the second spell of Palmer's membership of the House of Commons, which continued till his elevation to the woolsack and the peerage. In September 1863 he became attorney-general, and so continued till the government of which he was a member resigned in 1866.

The Civil War in America, and the questions which arose from the relations of Great Britain with both belligerents, rendered the duties of the law officers of the crown more than usually onerous, and Palmer was called upon to take part, as adviser of the ministry, in the courts, and in the House, in the questions which arose in respect of the "Trent" and the "Peterhoff," the cruisers "Alabama" and "Florida" and the "Alexandra," a ship which was seized by the government, and other matters. In 1865 he took a large part in the passing of the act under which all the law courts were gathered together in the Strand. In 1866 he expressed himself favourable to the making of household suffrage the basis of representation, an expression of opinion which probably influenced the Reform Bill of the following year—in the discussions on which Palmer took a prominent part, and especially in opposition to the so-called "fancy franchises" originally proposed by its authors. In the same year he took part in supporting the measure for the abolition of compulsory Church rates.

In 1868 occurred an event of great importance in his career. In April of that year Gladstone proposed his resolutions with reference to the Irish Church on which the bill for its disestablishment was subsequently based. This measure was opposed to many of the dearest beliefs and feelings of Palmer, and he evidenced his disapproval by abstaining from voting on the resolutions. At the election of November 1868 Palmer was again returned for Richmond, and Gladstone offered him the office of lord chancellor or the office of a lord justice with a peerage; both offers were declined by Palmer, and he assumed a position of independent opposition to the measure relative to the Irish Church. On the 22nd of March 1869 he delivered a very powerful speech against the second reading of the bill, and during its later stages exercised a considerable influence in modifying the severity of its provisions. The position of Palmer at this time was very remarkable. The foremost advocate at the bar, he was known to have declined the highest prize in the profession rather than promote a measure of which he disapproved; a very prominent member of the House of Commons, whose action had been more than usually independent of party, he had separated himself from his political friends and maintained a position as the dignified and forcible opponent of disestablishment. Without office and without combination with the Conservative Opposition, he exercised great influence within and without the walls of St Stephen's. What made his position the more remarkable was that he was frequently consulted by the government which he had declined to join, and that on some occasions they invoked the assistance which his great influence in the House enabled him to afford to them.

In 1869 he sought to modify rather than to oppose the bill for the abolition of tests in the universities. In 1870 he gave a qualified support to Gladstone's first Irish Land Act, and in the same year he supported Forster's Education Act. In 1872 he undertook the defence of his friend Lord Chancellor Hatherley, when attacked for his appointment of Sir Robert Collier to the judicial committee of the Privy Council, and, by a line of argument more ingenious than convincing, secured a majority for the government.

The treaty of Washington was the means of casting a great duty upon Palmer. After the conclusion of the Civil War in America very large claims were preferred against Great Britain for alleged breaches of her duty as a neutral power; and after long negotiations, England and the United States agreed to arbitration. Palmer, who had been advising the British government during these negotiations, and who (4th August 1871) had defended the treaty in the House of Commons, was briefed on behalf of Great Britain. In the end the Geneva tribunal made an award requiring the payment by Great Britain to the United States of a sum of about £3,000,000. To those who, in order to promote the cause of international arbitration, are desirous of acquiring a knowledge of the dangers and difficulties which beset this mode of settling disputes, the account which Palmer has left of his part in this arbitration may be commended.

In September 1872 Gladstone again offered him the great seal, which Lord Hatherley had resigned; in the same year he took up his residence in his newly erected house at Blackmoor, in the parish of Selborne, in the county of Hampshire, from which he took his new title as a peer. In the following year (1873) Lord Selborne carried through parliament the Judicature Act. The foundations of this measure were laid so long ago as February 1867, when Palmer had moved for a royal commission on the constitution of the courts, and had taken an active part in the work of that commission, of which the first report was made in 1869. The result of this act of 1873 was to effect a fundamental change in the judicature system. By the operation of the Judicature Act one supreme court with several divisions was constituted; each division could administer the whole law; the conflict of divergent systems of law was largely overcome by declaring that when they were at variance, the principles of equity should prevail over the doctrines of the common law. The details of this great change were embodied in a code of general rules prepared by a committee of judges, over which Lord Selborne for two years presided week by week, with unfaltering attention to the minutest detail. "If," wrote Lord Selborne in his memoirs, speaking of the Judicature Act of 1873, "I leave any monument behind me which will bear the test of time, it may be this." It is impossible to separate this fusion of law and equity, this union of all the higher courts into one supreme tribunal, from the construction of a single home for this great institution; and the opening of the Royal Courts in the Strand in the year 1882, when Queen Victoria personally presided in her one supreme court, and handed over the care of the building to Lord Selborne, as her chancellor and as the head of this great body, was impressive as an outward and visible sign of the silent revolution, which owed more to Lord Selborne than to any other individual. To the student of the natural history of jurisprudence the fusion of the two systems of law and equity may well recall a similar result brought about in Imperial Rome; to the student of British institutions, the supreme court, for once presided over in person by the sovereign, could not but recall the Aula Regia, where the Norman kings sat amid their counsellors before equity had arisen to correct law, and before the separation between the three great common law courts had begun. A small incident may illustrate the novelty of the assemblage of the one great court on that day. The queen, on the prayer of the attorney-general, ordered that the proceedings of the day should be recorded, an order which caused a momentary embarrassment to the lord chancellor, as the court had no existing registrar, and no existing book in which the record should be made. On the occasion of the opening of the Royal Courts Lord Selborne received an earldom.

The year 1885 was marked in Lord Selborne's life by the death of his wife, and by his final separation from the party of which Gladstone was the acknowledged leader. That statesman had in the latter part of the year indicated his leaning towards the disestablishment of the Church of England, and towards Home Rule for Ireland. Both these leanings were opposed to the deepest convictions of Lord Selborne; and it was an inevitable result that when in January 1886 Gladstone resumed office as premier, Lord Selborne should not be again his chancellor: on the 30th of January in that year they parted for ever; and Lord Selborne felt that his public life, except so far as he might serve his country by voice or pen, was now over. But neither his courage nor his industry forsook him; and he found, in opposing the new views of his old colleague, ample scope for both voice and pen; and as a member of the House of Lords he continued almost to the last to take part in hearing and deciding appeals, and sometimes in the ordinary business of the House.

In addressing the electors of Midlothian in September 1885, Gladstone had suggested the severance of the Church of England from the state as a subject on which the foundation of discussion had already been laid, and he averred the existence of "a current almost throughout the civilized world, slowly setting in the direction of disestablishment." Such an utterance from such a man greatly excited the hopes of Nonconformists, who had previously published a manifesto under the title of "The Case for Disestablishment." This stirring of the question deeply moved Lord Selborne, who was strongly opposed alike to disestablishment and disendowment, and in the following year, 1886, he published a work entitled *A Defence of the Church of England against Disestablishment*, with an introductory letter addressed to Gladstone. In the introductory letter he criticized Gladstone's pronouncement on the subject, and especially examined the allegation of a general tendency towards disestablishment in the civilized world at large, and arrived at a negative conclusion. In the body of the book the learned author treated of the history of the English Church, its endowments and the case of the advocates of disestablishment. The work is throughout characterized by an abundant supply of learning and of information as to the history and the state of the Church of England at that time, and by great dialectical acuteness. It is a powerful defence as well as a valuable summary of the history of the established Church in England. In 1888 Lord Selborne published a second work on the Church question, entitled *Ancient Facts and Fallacies concerning Churches and Tithes*, in which he examined more critically than in his earlier book the developments of early ecclesiastical institutions, both on the continent of Europe and in Anglo-Saxon England, which resulted in the formation of the modern parochial system and its general endowment with tithes. A second edition of this work, embodying the result of its author's subsequent researches in the Vatican library and elsewhere, was published in the year 1892. A perusal of these books will show with how wide a range of investigation and with what care Lord Selborne prepared himself for the discussion of these ecclesiastical questions which deeply stirred him. But Lord Selborne did not carry on his opposition to Gladstone's proposals only in his library or by his pen; in the year 1886–1887 he travelled to many parts of the country, and addressed meetings in defence of the union between the Church and state and against Home Rule; and in September 1893, in his eighty-first year, he addressed a powerful speech to the House of Lords in opposition to the Home Rule Bill.

Lord Selborne's health had, with the exception of two collapses in 1883 and 1888, which appear to have been due to overwork, continued excellent till February 1895, when he was attacked by influenza. He died on the 4th of May 1895 at his seat in Hampshire, full of years and of honours.

To the subject of university education Lord Selborne at different times in his life gave much time and attention. As a fellow of Magdalen College, he had been desirous of changes which he felt himself bound by his oath from advocating; and he had taken part in the discussions on the abolition of tests in the old universities.[1] He gave much time and attention to his duties as chairman of the second Oxford commission under the act of 1876; in 1878 he filled the office of lord rector of the university of St Andrews; and in the following year he presided over a commission on the subject of university education in London. Lord Selborne's literary labours included the publication in 1862 of a selection of hymns, under the title of *The Book of Praise*, a work in which he was greatly assisted by Daniel Sedgwick (1814–1879), a bookseller and publisher in the city of London. The work was characterized by the great pains taken to ascertain the true authorship of hymns which were either anonymous or attributed to those who had not composed them, and by a like effort to exclude all variations grafted on the original language, and to give the hymns "in the genuine uncorrupted text of the authors themselves." In the course of his labours as editor of this volume he was struck by the unity which was presented by Christian hymnody, "binding together by the force of a common attraction, more powerful than all causes of difference, times ancient and modern, nations of various race and language, Churchmen and Nonconformists, Churches reformed and unreformed" (Preface). In the same field of literature Lord Selborne further laboured by the publication of another collection called *The Book of Praise Hymnal*; a contribution to an edition of Bishop Ken's hymns; a paper on English Church Hymnody at a Church Congress; and the article in the *Encyclopaedia Britannica* on "Hymns" (*q.v.*), which was republished as a separate volume in 1892.

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[1] In 1867 he founded an association for the improvement of legal education, in the hope of bringing about the establishment or the restoration of "a general school of law in London on a scale worthy of the importance of the law and of the resources of the Inns of Court." This enterprise was not successful. The opposing forces were too strong to permit Lord Selborne to succeed.

During the last few years of his life Lord Selborne engaged in the composition, for the benefit of his children, of memorials of his own life and of the lives of many members of his family. These *Memorials, Part I., Family and Personal*, in 2 vols., which were published in 1896, *Memorials, Part II., Personal and Political*, also in 2 vols., were edited by his daughter, Lady Sophia Palmer, and published in 1898. In the years 1880–1881 Lord Selborne wrote to his son a series of letters on religious subjects, dealing in an elementary way with natural and revealed religion, the inspiration of the Bible and Biblical criticism. These were published in 1898, under the title of *Letters to His Son on Religion, by Roundell, First Earl of Selborne.*

In person Lord Selborne was of about the average height: his manners when among strangers were somewhat reserved; his style, both in speaking and writing, was fluent, tending to diffuseness; his oratory was marked by uniform good sense and lucidity, both of arrangement and language; and if he never reached the highest level of oratorical excellence, he never descended to what was commonplace or irrelevant. As a judge, whether in the Supreme Court or in the House of Lords, he displayed high qualities: he was patient, courteous, logical and learned, and his judgments contain many valuable expositions of the principles of law. The fusion of law and equity, the reorganization of the whole judicial system of England, and the association of all the supreme tribunals in one common home were works of no ordinary magnitude or importance, and give a character of unusual importance to his chancellorship. That Lord Selborne was a truly religious man it is impossible to doubt: his whole life was regulated and inspired by a sense of his duty towards God and his fellowmen, and a long life spent amid the temptations of legal and public life left not the faintest stain on his memory. He was a devout member of the Church of England, to which he looked up with unstinted affection and reverence; and he found in its service and formularies an adequate satisfaction for all his religious feelings. He belonged to the High Church school, which was influenced by the teaching of Newman and Pusey and the Oxford teachers of their day; but he by no means slavishly followed them. With the later High Church movement, usually described as Ritualism, he had less sympathy. His life was prosperous, for from his first prize at the university till his acquisition of an earldom, he went on a course of almost unbroken success. He had the double dignity of having refused the highest prize in his profession for conscience' sake, and of having accepted that dignity without loss of consistency; in his life he acquired a high reputation and the sincere admiration of his fellowmen, as well as an abundant fortune and ample titular distinctions. His life was also happy, for he had pleasure in his work, he loved and was loved by his wife and children; he had a strong constitution, and retained his bodily and mental powers to the last; his faith in the religion of his youth was unshaken to the end; and he lived throughout his long life with the consciousness of rectitude. (E. F.)

SELBORNE, WILLIAM WALDEGRAVE PALMER, 2ND EARL OF (1859–), son of the preceding, was educated at Winchester and University College, Oxford, where he took a first class in history. In 1883, being then Viscount Wolmer, he married Lady Beatrix Cecil, 3rd daughter of the 3rd marquess of Salisbury. He served a political apprenticeship as assistant private secretary to the chancellor of the exchequer (Mr Childers) from 1882 to 1885, when he was elected Liberal member of parliament for East Hampshire. Like his father, he became a Liberal Unionist when in 1886 Mr Gladstone proposed Home Rule for Ireland, and he retained his seat till 1892, when he was elected for West Edinburgh. From 1895 to 1900 he was under-secretary for the colonies, having Mr Chamberlain as his chief, and during the difficult period before the outbreak of the South African War he came rapidly to the front. In 1900 he entered the cabinet as first lord of the admiralty, and held this office till 1905, when he succeeded Lord Milner as high commissioner for South Africa and governor of the Transvaal and Orange River colonies. He assumed office at Pretoria in May of that year. He had gone out with the intention of guiding the destinies of South Africa during a period when the ex-Boer republics would be in a transitional state between crown colony government and self-government, and letters patent were issued granting the Transvaal representative institutions. But the Liberal party came into office in England in the December following, before the new constitution had been actually established, and the decision was now taken to give both the Transvaal and Orange River colonies self-government without delay. Lord Selborne loyally accepted the changed situation, and it was due in considerable measure to his moderation, common sense, administrative gifts and appreciation of the Boers' standpoint, that the experiment proved successful. He ceased to be governor of the Orange River Colony on its assumption of self-government in June 1907, but retained his other posts until May 1910, retiring on the eve of the establishment of the Union of South Africa. No one had done more to effect that union. The despatch, dated January 7th, 1907, in which he reviewed the situation in its economic and political aspects, was a masterly and comprehensive statement of the dangers inherent in the existing system and of the advantages likely to attend union. The force of its appeal had a marked influence on the course of events, while the loyalty with which Lord Selborne co-operated with the Botha administration was an additional factor in reconciling the Dutch and British communities. He returned to England with his reputation as a statesman enhanced by the respect of all parties, and with a practical experience, second only to that of Lord Milner, of British imperialism in successful operation. This experience made him a valuable ally in the movement among the Unionist party at home for Tariff Reform and Colonial Preference, to which he could now give his whole-hearted support.

SELBORNE, a village in the Petersfield parliamentary division of Hampshire, England, 4½ m. S.S.E. of Alton station on the London & South-Western railway. It is pleasantly situated in a thickly wooded valley, and is celebrated as the birthplace and scene of the work of Gilbert White the naturalist; his house is in the village, and his memorial and grave are in the ancient church. Fine views over the district of which he wrote are obtained from the hills (between 500 and 700 ft.) in the neighbourhood.

SELBY, WILLIAM COURT GULLY, 1ST VISCOUNT (1835–1909), Speaker of the British House of Commons, was born on the 29th of August 1835, the son of Dr James Manby Gully of Malvern. His grandfather was Daniel Gully, a Jamaican coffee-planter. He was educated at Trinity College, Cambridge, where he was president of the Union. He was called to the bar in 1860, went the northern circuit, and took silk in 1877. In 1880 and 1885 he unsuccessfully contested Whitehaven as a Liberal, but was elected for Carlisle in 1886, and continued to represent that constituency until his elevation to the peerage. In April 1895 he was elected Speaker by a majority of eleven votes over Sir Matthew White Ridley (cr. Viscount Ridley, 1900), the Unionist nominee. In 1905 he resigned and was raised to the peerage with the title of Viscount Selby, the name being that of his wife, Miss Elizabeth Selby (d. 1906), whom he married in 1865. He died on the 6th of November 1909, and was succeeded by his son, James William Herschell Gully (b. 1867).

SELBY, a market town in the Barkston Ash parliamentary division of the West Riding of Yorkshire, England, 13½ m. S. of York on the Great Northern and North-Eastern railways. Pop. of urban district (1901) 7786. It stands in a level plain on the left bank of the river Ouse, by which communication is provided with the Humber. The church of St Mary and St German belonged to a Benedictine abbey founded under a grant from William the Conqueror in 1069 and raised to the dignity of a mitred abbey by Pope Alexander II. The monastic buildings have practically disappeared, but the church was a splendid building of various dates from Norman to Decorated, the choir and Lady chapel representing the later period. The nave passes from Norman to Early English in the course of its eight bays from east to west and also from the arcade through the triforium to the clerestory. About midnight of the 19th–20th of October 1906, a fire broke out in the Latham chapel adjoining the north choir aisle, in which a new organ had recently been erected, and soon involved the whole building. Specially serious damage was done in the immediate neighbourhood of the chapel, the oak-groined roof and rich fittings of the choir were wholly destroyed, but the finely moulded arches and the magnificent tracery of the east window survived in great part. Much damage was done to the tower, and the nave roof perished, for the fire reached practically every part of the building, though the stonework of the nave suffered comparatively little. Schemes for the collection of funds and the complete restoration of the church were immediately set on foot, the architect being Mr Oldrid Scott.

Selby is the centre of a rich agricultural district, and its industries include rope and twine making, flax-scutching, boat-building, iron-founding, tanning and brewing. Tradition indicates Selby as the birth-place of Henry I., and thus accounts for the high privileges conferred upon the abbey. The town had a considerable part in the operations of the Civil Wars, being held at the outset by the Parliamentarians, and captured by the Royalists in 1644, but soon retaken by Sir Thomas Fairfax.

SELDEN, JOHN (1584–1654), English jurist, legal antiquary and oriental scholar, was born on the 16th of December 1584 at Salvington, in the parish of West Tarring, Sussex. His father, also John Selden, held a small farm. It is said that his accomplishments as a violin-player gained him his wife, whose social position was somewhat superior to his own. She was Margaret, the only child of Thomas Baker of Rustington, a village in the vicinity of West Tarring, and was more or less remotely descended from a knightly family of the same name in Kent. John Selden commenced his education at the free grammar-school at Chichester, whence in 1600 he proceeded to Hart Hall, Oxford. In 1603 he was admitted a member of Clifford's Inn, London, and in 1604 migrated to the Inner Temple, and in 1612 he was called to the bar. His earliest patron was Sir Robert Cotton, the antiquary, by whom he seems to have been employed in copying and abridging certain of the parliamentary records then preserved in the Tower. For some reason which has not been explained, Selden never went into court as an advocate, save on rare and exceptional occasions. But his practice in chambers as a conveyancer and consulting counsel is stated to have been large, and, if we may judge from the considerable fortune he accumulated, it must also have been lucrative.

It was, however, as a scholar and writer that Selden won his reputation both amongst his contemporaries and with posterity. His first work, an account of the civil administration of England before the Norman Conquest, is said to have been completed when he was only two- or three-and-twenty years of age. But if this was the *Analecton Anglo-Britannicon*, as is generally supposed, he withheld it from the world until 1615. In 1610 appeared his *England's Epinomis* and *Janus Anglorum; Facies Altera*, which dealt with the progress of English law down to Henry II.; and *The Duello, or Single Combat*, in which he traced the history of trial by battle in England from the Norman Conquest. In 1613 he supplied a series of notes, enriched by an immense number of quotations and references, to the first eighteen cantos of Drayton's *Polyolbion.* In 1614 he published *Titles of Honour*, which, in spite of some obvious defects and omissions, has remained to the present day the most comprehensive and trustworthy work of its kind that we possess; and in 1616 his notes on Fortescue's *De laudibus legum Angliae* and Ralph de Hengham's *Summae magna et parva.* In 1617 his *De diis Syriis* was issued, and immediately established his fame as an oriental scholar among the learned in all parts of Europe. It is remarkable for its brilliant use of the comparative method, in which it was far ahead of its age, and is still consulted by students of Semitic mythology. In 1618 his *History of Tithes*, although only published after it had been submitted to the censorship and duly licensed, nevertheless aroused the apprehension of the bishops and provoked the intervention of the king. The author was summoned before the privy council and compelled to retract his opinions, or at any rate what were held to be his opinions. Moreover, his work was suppressed and himself forbidden to reply to any of the controversialists who had come or might come forward to answer it.

This seems to have introduced Selden to the practical side of political affairs. The discontents which a few years later broke out into civil war were already forcing themselves on public attention, and it is pretty certain that, although he was not in parliament, he was the instigator and perhaps the draftsman of the memorable protestation on the rights and privileges of the House affirmed by the Commons on the 18th of December 1621. He was with several of the members committed to prison, at first in the Tower and subsequently under the charge of Sir Robert Ducie, sheriff of London. During his detention, which only lasted a short time, he occupied himself in preparing an edition of Eadmer's *History* from a manuscript lent to him by his host or jailor, which he published two years afterwards. In 1623 he was returned to the House of Commons for the borough of Lancaster, and sat with Coke, Noy and Pym on Sergeant Glanville's election committee. He was also nominated reader of Lyon's Inn, an office which he declined to undertake. For this the benchers of the Inner Temple, by whom he had been appointed, fined him £20 and disqualified him from being chosen one of their number. But he was relieved from this incapacity after a few years, and became a master of the bench. In the first parliament of Charles I. (1625), it appears from the "returns of members" printed in 1878 that, contrary to the assertion of all his biographers, he had no seat. In Charles's second parliament (1626) he was elected for Great Bedwin in Wiltshire, and took a prominent part in the impeachment of George Villiers, duke of Buckingham. In the following year, in the "benevolence" case, he was counsel for Sir Edmund Hampden in the court of king's bench. In 1628 he was returned to the third parliament of Charles for Ludgershall in Wiltshire, and had a large and important share in drawing up and carrying the Petition of Right. In the session of 1629 he was one of the members mainly responsible for the tumultuous passage in the House of Commons of the resolution against the illegal levy of tonnage and poundage, and, along with Eliot, Holles, Long, Valentine, Strode, and the rest, he was sent once more to the Tower. There he remained for eight months, deprived for a part of the time of the use of books and writing materials. He was then removed, under less rigorous conditions, to the Marshalsea, until not long afterwards owing to the good offices of Archbishop Laud he was liberated. Some years before he had been appointed steward to the earl of Kent, to whose seat, Wrest in Bedfordshire, he now retired. In 1628 at the suggestion of Sir Robert Cotton he had compiled, with the assistance of two learned coadjutors, Patrick Young and Richard James, a catalogue of the Arundel marbles. He employed his leisure at Wrest in writing *De successionibus in bona defuncti secundum leges Ebraeorum* and *De successione in pontificatum Ebraeorum*, published in 1631. About this period he seems to have inclined towards the court rather than the popular party, and even to have secured the personal favour of the king. To him in 1635 he dedicated his *Mare clausum*, and under the royal patronage it was put forth as a kind of state paper. It had been written sixteen or seventeen years before; but James I. had prohibited its publication for political reasons; hence it appeared a quarter of a century after Grotius's *Mare liberum*, to which it was intended to be a rejoinder, and the pretensions advanced in which on behalf of the Dutch fishermen to poach in the waters off the British coasts it was its purpose to explode. The fact that Selden was not retained in the great case of ship money in 1637 by John Hampden, the cousin of his former client, may be accepted as additional evidence that his zeal in the popular cause was not so warm and unsuspected as it had once been. During the progress of this momentous constitutional conflict, indeed, he seems to have been absorbed in his oriental researches, publishing *De jure naturali et gentium juxta disciplinam Ebraeorum* in 1640. He was not elected to the Short Parliament of 1640; but to the Long Parliament, summoned in the autumn, he was returned without opposition for the university of Oxford. He opposed the resolution against episcopacy which led to the exclusion of the bishops from the House of Lords, and printed an answer to the arguments used by Sir Harbottle Grimston on that occasion. He joined in the protestation of the Commons for the maintenance of the Protestant religion according to the doctrines of the Church of England, the authority of the crown, and the liberty of the subject. He was equally opposed to the court on the question of the commissions of lieutenancy of array and to the parliament on the question of the militia ordinance. In 1643 he participated in the discussions of the assembly of divines at Westminster, and was appointed shortly afterwards keeper of the rolls and records in the Tower. In 1645 he was named one of the parliamentary commissioners of the admiralty, and was elected master of Trinity Hall in Cambridge—an office he declined to accept. In 1646 he subscribed the Solemn League and Covenant, and in 1647 was voted £5000 by the parliament as compensation for his sufferings in the evil days of the monarchy. He had not, however, relaxed his literary exertions during these years. He published in 1642 *Privileges of the Baronage of England when they sit in Parliament* and *Discourse concerning the Rights and Privileges of the Subject*; in 1644, *Dissertatio de anno civili et calendario reipublicae Judaicae*; in 1646 his treatise on marriage and divorce among the Jews entitled *Uxor Ebraica*; and in 1647 the earliest printed edition of the old English law-book *Fleta*. In 1650 Selden passed the first part of *De synedriis et prefecturis juridicis veterum Ebraeorum* through the press, the second and third parts being severally published in 1653 and 1655, and in 1652 he wrote a preface and collated some of the manuscripts for Sir Roger Twysden's *Historiae Anglicae scriptores decem*. His last publication was a vindication of himself from certain charges advanced against him and his *Mare clausum* in 1653 by Theodore Graswinckel, a Dutch jurist.

After the death of the earl of Kent in 1639 Selden lived permanently under the same roof with his widow. It is believed that he was married to her, although their marriage does not seem to have ever been publicly acknowledged. He died at Friary House in Whitefriars on the 30th of November 1654, and was buried in the Temple Church, London. In 1880 a brass tablet was erected to his memory by the benchers of the Inner Temple in the parish church of West Tarring.

Several of Selden's minor productions were printed for the first time after his death, and a collective edition of his writings was published by Archdeacon Wilkins in 3 vols. folio in 1725, and again in 1726. His *Table Talk*, by which he is perhaps best known, did not appear until 1689. It was edited by his amanuensis, Richard Milward, who affirms that "the sense and notion is wholly Selden's," and that "most of the words" are his also. Its genuineness has sometimes been questioned, although on insufficient grounds.

See Wood's *Athenae Oxonienses*, ed. Bliss (London, 1817, 4 vols.); Aikin, *Lives of John Selden and Archbishop Usher* (London, 1812); Johnson, *Memoirs of John Selden*, &c. (London, 1835); Singer, *Table Talk of John Selden* (London, 1847); and Wilkins, *Johannis Seldeni opera omnia*, &c. (London, 1725).

SELĒNĒ, in Greek mythology, the divine personification of the moon, daughter of Hyperion and Theia, sister of Helios and Eos. By Zeus she was said to have been the mother of Pandia (the all-bright), who was worshipped with her father at the festival named after her Pandia.[1] She was also wooed by Pan in the form of a white ram, or she had selected a white ram from his flock as the price of her favours. The most famous of her amours was with Endymion (*q.v.*). Selene was represented as a beautiful young woman with wings and a golden diadem, sometimes riding in a chariot drawn by two white, sometimes winged, horses (or cows, symbolizing the moon's crescent, or bulls), or herself mounted on a horse, a bull, a mule or a ram. At Elis there was a statue of Selene, her head surmounted by a crescent. Later, she was identified with Artemis, and as such called Phoebe, the sister of Phoebus Apollo. She was worshipped on the days of the new and the full moon. Another name for Selene was Mēnē, in reference to the monthly changes of the moon. The existence of a male moon-god (Mēn), whose cult probably came to Attica from Asia Minor, is attested by inscriptions. The Roman goddess of the moon was Luna, who possessed sanctuaries on the Aventine and Palatine hills. In the former she was worshipped on the last day of March (the first month of the old Roman year); in the latter as *Noctiluca* (giving light by night), her sanctuary being illuminated on such occasions.

See W. H. Roscher, *Über Selene und Verwandtes* (1890), with *Nachträge* (1895); Preller, *Griechische Mythologie* (4th ed., 1894), pp. 443-446; A. Legrand, *s.v.* "Luna" in Daremberg and Saglio's *Dictionnaire des antiquités*.

SELENGA-ORKHON, a river of Central Asia, which rises in two principal head-streams, the Selenga and the Orkhon, on the plateau of N.W. Mongolia, not far apart in 101° E. Both flow generally E.N.E. as far as their confluence near Kiakhta, on the frontier of Mongolia and Siberia, at the eastern extremity of the Sayan Mountains. Beyond Kiakhta the river flows generally N. nearly as far as 52° N., when it turns W. and enters Lake Baikal on the S.W., forming a delta. It is navigable from Kiakhta downwards, a distance of 210 m., its total length being 750 m. From the left it receives the Eghin-gol and the Jida, and from the right the Tala, Kharagoy, Chikoy, Khilok and Uda, streams each 150 to 300 m. in length. Near the upper Orkhon was the permanent camp of Karakorum, from the 8th century down to the end of the 13th the centre of the Mongol power, especially under the sway of Jenghiz Khan and his son Ogotai or Ogdai in the 12th and 13th centuries.

Several remarkable inscriptions were discovered here in the end of the 19th century, and were interpreted by Professor V. Thomsen of Copenhagen *Inscriptions de l'Orkhon* (Helsingfors, 1900).

SELENIUM [symbol Se, atomic weight 79·2 (O=16)], a non-metallic chemical element, discovered in 1817 by J. J. Berzelius, who called it selenium (Gr. σελήνη, the moon) on account of its close analogy with tellurium (Lat. *tellus*, the earth). It is occasionally found in the native condition, but more frequently in combination with metals in the form of selenides, the more important seleniferous minerals being euchairite, crookesite, clausthalite, naumannite and zorgite. It is also found as a constituent of various pyrites and galenas, and in some specimens of native sulphur. The element is usually obtained from the flue dust or chamber deposits of sulphuric-acid works in which a seleniferous pyrites is burned. In this process, the residues are boiled with a dilute sulphuric acid to which nitric acid and potassium chlorate are added in order to transform the element into selenic acid, H_2SeO_4, which is then reduced to selenious acid, H_2SeO_3, by boiling with hydrochloric acid, and finally to selenium by sulphur dioxide. L. F. Nilson (*Ber.*, 1874, 7, p. 1719) digests the well-washed chamber mud with a moderately concentrated solution of potassium cyanide, whereby the element goes into solution in the form of potassium selenocyanide, $KSe(CN)$, from which it is precipitated by hydrochloric acid. As alternative methods, F. Wöhler (*Ann.*, 1859, 109, p. 375) heats the well-washed chamber residues with potassium nitrate and carbonate in order to obtain an alkaline selenate, which is then boiled with hydrochloric acid, yielding selenious acid, from which the element is obtained as above; whilst H. Rose (*Pogg. Ann.*, 1828, 90, p. 471) by the action of chlorine obtains selenium tetrachloride, which is converted into selenious acid by water, and the acid so prepared is finally reduced to selenium by treatment with sodium sulphite (see also G. Magnus, *Pogg. Ann.*, 1830, 96, p. 165; O. Pettersson, *Ber.*, 1873, 6, p. 1477; H. Koch, German Patent 167457, 1903). It is obtained from zorgite by heating the mineral with aqua regia; the excess of acid is evaporated, and the resulting syrupy liquid diluted, filtered and decomposed by sulphur dioxide, when the selenium is precipitated (Billandot, *Ency. chimique*, 1883, 5, p. 198).

The commercial element usually contains a certain amount of sulphur, and some tellurium, and various methods have been devised for its purification. L. Oppenheim (*Jour. prakt. Chem.*, 1857, 71, p. 279) fuses the commercial selenium with potassium cyanide in a stream of hydrogen, takes up the melt in water and passes air through the solution; the precipitated tellurium is filtered off, and the solution then supersaturated with hydrochloric acid, when selenium is gradually deposited. E. Divers, (*Chem. News*, 1885, 51, p. 199) dissolves the element in boiling concentrated sulphuric acid and reduces the resulting selenious acid with sulphur dioxide, filters off the precipitate and washes it with water and alcohol. The resulting product, however, still contains traces of sulphur. C. Hugot (*Ann. chim. phys.*, 1900 (7), 21, p. 34) converts the element by dilute nitric acid into selenium dioxide which is then sublimed, and dissolved in water. Any sulphuric acid present is removed by baryta water, the precipitated barium sulphate filtered off, the solution acidified by hydrochloric acid and reduced by sulphur dioxide

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[1] The connexion of Selene or Pandia with this festival is denied by Wilamowitz-Möllendorff (*Aus Kydathen*, p. 133).

Several allotropic forms of selenium have been described, but the work of A. P. Saunders (*Jour. Phys. Chem.*, 1900, 4, p. 423) seems to establish that the element exists in three distinct forms, namely *liquid selenium* (which includes the vitreous, soluble and amorphous forms), *crystalline red selenium* (which includes, perhaps, two very closely allied forms), and *crystalline, grey* or *metallic selenium.* Liquid selenium becomes more and more viscous in character as its temperature falls from 220° C. to 60° C.; it is soft at about 60°, but is hard and brittle between 30° and 40°. It shows a conchoidal fracture. The amorphous variety, which only differs from the vitreous form in its state of aggregation, is obtained by reducing solutions of selenious acid with sulphur dioxide. It is slightly soluble in carbon bisulphide. The red crystalline variety is obtained by crystallization of selenium from carbon bisulphide, or by leaving the amorphous form in contact with the same solvent. The grey crystalline form is obtained by heating the other varieties, and is the most stable form from ordinary temperatures up to 217°. All varieties of selenium dissolve in concentrated sulphuric acid, forming a green solution (see also R. Marc, *Ber.*, 1906, 39, p. 697; and W. Oechsner de Coninck, *Comptes rendus*, 1906, 143, p. 682). A colloidal selenium was obtained by C. Paal and C. Koch (*Ber.*, 1905, 38, p. 526) by reducing selenious acid dissolved in an aqueous solution of sodium protalbate with hydrazine hydrate and hydrochloric acid, the precipitate obtained being then dissolved in sodium carbonate. The specific gravity of selenium is 4·8; the specific heat varies from 0·0716 to 0·1147, depending upon the particular form. Selenium combines directly with hydrogen when heated in the gas, and with fluorine in the cold. It burns with a blue flame when heated in the air or in oxygen, at the same time giving a characteristic smell of rotten horseradish, a reaction which serves for the recognition of the element. It combines directly with nitrogen, phosphorus, antimony and carbon, and with all the metals (except gold) to form selenides, of which those of the alkali and alkaline earth metals are soluble in water. Metallic selenium is a conductor of electricity, and its conductivity is increased by light; this property has been utilized in apparatus for transmitting photographs by telegraphy (see TELEGRAPH).

Seleniuretted Hydrogen, H_2Se, is obtained by the direct union of its constituent elements in the heat; by the decomposition of various selenides with mineral acids; by the decomposition of aluminium selenide, or phosphorus selenide with water; by the action of selenium on a concentrated solution of hydriodic acid; and by heating selenium with colophene (H. Moissan), or better with paraffin wax (H. Wuyts and A. Stewart, *Bull. Soc. chim. Belg.*, 1909, 23, p. 9). It is a colourless gas which possesses a characteristic smell, more unpleasant than sulphuretted hydrogen. Its physiological effects are much more persistent and injurious than sulphuretted hydrogen, producing temporary paralysis of the olfactory nerves and inflammation of the mucous membrane. It may be liquefied, the liquid boiling at -41° to -42° C. and becoming solid at -68° C. (K. Olszewski). It is somewhat soluble in water and forms a hydrate. It is decomposed by heat, burns with a blue flame, and behaves as a reducing agent. It precipitates many of the heavy metals as selenides when passed into solutions of their salts. Its aqueous solution is unstable, gradually depositing red selenium on standing. *Selenium fluoride*, SeF_4, is obtained as a colourless liquid by the direct action of fluorine or selenium (P. Lebeau, *Comptes rendus*, 1907, 144, p. 1042). It boils at about 100° C., attacks glass readily, is decomposed by water, and dissolves iodine. *Selenium dichloride*, Se_2Cl_2, is obtained by the action of chlorine on selenium; by the action of phosphorus pentachloride on selenium or the dioxide; by the action of hydrochloric acid on seleno-sulphur trioxide (E. Divers, *Chem. News*, 1884, 49, p. 212): $2S\cdot SeO_3+2HCl=H_2SO_4+S\cdot SeO_3\cdot SeCl_2(+H_2O)\rightarrow Se_2Cl_2+SO_2(OH)Cl$; and by heating selenium and selenium tetrachloride to 100° C. in a sealed tube. It is a yellowish-brown oily liquid which commences to distil at 130° C. with partial decomposition into selenium and the tetrachloride. It is decomposed by water with formation of selenium and selenious acid: $2Se_2Cl_2+3H_2O=H_2SeO_3+3Se+4HCl$. *Selenium tetrachloride*, $SeCl_4$, is obtained by passing excess of chlorine over selenium; by the action of phosphorus pentachloride on selenium dioxide: $SeO_2+PCl_5=SeOCl_2+POCl_3$; $3SeOCl_2+2POCl_3=3SeCl_4+P_2O_5$; and by the action of thionyl chloride on selenium oxychloride. It is a white solid which can be obtained crystalline by sublimation in a current of chlorine. It dissociates when heated, and is decomposed by water with production of selenious acid. It dissolves selenium. Similar bromides and iodides are known. *Selenyl chloride*, $SeOCl_2$, is formed when selenium tetrachloride is heated with the dioxide to 150° C. (R. Weber, *Pogg. Ann.*, 1859, 184, p. 615), or when the dioxide is heated with common salt: $2SeO_2+2NaCl=SeOCl_2+Na_2SeO_3$. It is a yellow-coloured liquid which solidifies at 0° C., and fumes on exposure to air. It combines with titanium and tin bichlorides and with antimony trichloride, and it is decomposed by water.

Selenium dioxide, SeO_2, is prepared by burning selenium in oxygen, or by oxidizing selenium with nitric acid and heating the residue. It may also be prepared by the action of selenium on sulphur oxyfluoride (H. Moissan, *Bull. Soc. chim.*, 1902 (3), 27, p. 251): $2SO_2F_2+Se+SiO_2=SeO_2+2SO_2+SiF_4$. It crystallizes in needles or prisms and volatilizes when heated, giving a pale yellow vapour. It is very hygroscopic, and dissolves in water and alcohol. It reacts with the caustic alkalis to form selenites, and combines directly with hydrocyanic acid. It is decomposed by hydriodic acid with liberation of selenium and iodine, and by ammonia with formation of selenium and nitrogen. *Selenious acid*, H_2SeO_3, is obtained in the crystalline form when a solution of selenium dioxide in water is concentrated over sulphuric acid. It effloresces on exposure to air. Oxidizing agents readily convert it into selenic acid, whilst reducing agents transform it into selenium. It yields normal, acid and super-acid salts (*e.g.* $KHSeO_3\cdot H_2SeO_3$). It is decomposed by many acids with liberation of selenium. *Selenic acid*, H_2SeO_4, was discovered by E. Mitscherlich (*Pogg. Ann.*, 1827, 85, p. 623). Its salts, the selenates, are obtained by the oxidation of the selenites, and the free acid may be obtained by the decomposition of the lead or barium salt. It is also obtained in the electrolysis of solutions of selenious acid (C. Manuelli and G. Lazzarini, *Gazz.*, 1909, 39, 1, p. 50). The acid crystallizes in hexagonal prisms and melts at 58° C. It dissolves in water and yields a hydrate of composition $H_2SeO_4\cdot H_2O$. It is very hygroscopic, dissolves sulphur readily and acts on organic compounds in a manner similar to sulphuric acid. It decomposes when strongly heated. The selenates are isomorphous with the chromates and sulphates. A compound of selenium and sulphur has been described as resulting from the action of sulphuretted hydrogen on selenious acid, but A. Gutbier (*Zeit. anorg. Chem.*, 1905, 43, p. 384) is of the opinion that in this reaction, at ordinary temperature, a simple reduction takes place, leading to the formation of a mixture of sulphur and selenium. *Selenium sulphoxide*, $SeSO_3$, is formed as a yellowish crystalline mass when selenium is warmed with sulphur trioxide. It decomposes when heated above 35° C., and also in the presence of water. A compound of composition, $SeSO_5$, has been obtained by the addition of selenium dioxide to sulphuric acid saturated with sulphur trioxide (R. Metznen, *Ann. chim. phys.*, 1898, (7), 15, p. 203). It crystallizes in colourless needles. *Selenosulphuric acid*, H_2SeSO_3, is only known in the form of its salts, which are usually obtained by the action of selenium on solutions of the metallic sulphites, a selenotrithionate being simultaneously produced. The salts are unstable and readily decompose when heated. *Selenotrithionic acid*, $H_2SeS_2O_6$, is also obtained in the form of its potassium salt by the action of potassium hydrogen sulphite on a selenosulphate. It is readily decomposed by acids with liberation of sulphur dioxide and selenium.

Nitrogen selenide, N_2Se_2, is formed by the decomposition of selenium chloride with ammonia (A. Verneuil, *Bull. soc. chim.*, 1882, 38, p. 548). It crystallizes readily from benzene or acetic acid and explodes when subjected to shock or when heated. It is also obtained when dry ammonia gas is passed into a dilute solution of selenyl chloride in benzene, the precipitate produced being digested with potassium cyanide to remove any selenium (V. Lenher and E. Wolesensky, *Jour. Amer. Chem. Soc.*, 1907, 29, p. 215). It is a brick-red powder which explodes when heated to 130° C. *Selenium cyanide*, $Se(CN)_2$, is obtained by decomposing silver selenocyanide with cyanogen iodide, or by the action of silver cyanide on a solution of selenium bromide in carbon bisulphide. It crystallizes in tables and is very soluble in water. A more complex cyanide, $Se_3(CN)_2$, is obtained by passing a current of chlorine and air into an aqueous solution of potassium selenocyanide (A. Verneuil, *Ann. chim. phys.*, 1886 (6), 9, p. 289). It crystallizes in golden yellow needles and is decomposed by boiling water: $2Se_3(CN)_2+2H_2O=4HCN+SeO_2+5Se$. When heated to 180° C. *in vacuo* it yields the simple cyanide $Se(CN)_2$. *Potassium selenocyanide*, $KSeCN$, is obtained by the action of selenium on a concentrated aqueous solution of potassium cyanide, or by heating selenium with anhydrous potassium ferrocyanide (W. Crookes, *Ann.*, 1851, 78, p. 177). It crystallizes in needles, possesses an alkaline reaction, and is readily decomposed by acids with liberation of selenium. It forms numerous double salts.

Numerous determinations of the atomic weight of selenium have been made. The earlier results of J. J. Berzelius from an analysis of the chloride gave values from 79·2 to 79·35. Later determinations by V. Lenher (*Jour. Amer. Chem. Soc.*, 1898, 20, p. 595), from the analysis of silver selenite and the reduction of the double selenium ammonium bromide, give values from 79·277 to 79·367; whilst J. Meyer (*Ber.*, 1902, 35, p. 1591) by the electrolysis of silver selenite in the presence of potassium cyanide obtained the value 79·22.

SELEUCIA (Gr. Σελεύκεια), the name of several ancient Greek cities named after Seleucus I. Nicator, founder of the Seleucid dynasty. The following are the most important.

1. Seleucia on the Tigris, at the mouth of the great royal canal (*Naharmalka*, mod. *Radhwaniya*) from the Tigris to the Euphrates, about 50 m. N. of Babylon and 15 m. S. of Bagdad. It was founded by Seleucus Nicator (see Seleucid Dynasty), ruler of Babylonia from autumn 312. Seleucus, departing from the precedent of Alexander the Great, who, after his return from India, had settled in Babylon, preferred to build a new capital of a decidedly Greek character. The new city "was founded with the object of exhausting Babylon" (Plin. vi. 122; Strabo xvi. 738); a legend says that the Chaldaean priests, when they were consulted about the right hour for the initiation of the city, tried to frustrate the design of the king by naming a wrong hour, but that by chance the work was begun in the moment predicted by the stars and the decree of fate accomplished (Appian, *Syr.* 58). Seleucia was peopled with Macedonians and Greeks; Syrians and Jews were admitted to the citizenship (Joseph. *Ant.* xviii. 9. 8). It obtained a free constitution. A great many other Greek cities were founded in Babylonia by Seleucus I. and Antiochus I., while Babylon and the other ancient cities (Sippara, Erech, Ur, Borsippa) decayed into mere villages. Here the Chaldaean priests continued to teach their astrological wisdom (we possess many astrological tablets in cuneiform writing from the time of the Seleucids and the earlier Arsacids); but Seleucia became the centre of the new hellenistic civilization (see Hellenism). A great many Greek authors were born here (*e.g.* the Stoic Diogenes of Babylonia, 2nd century), though the inhabitants of Seleucia in Babylonia generally are simply called Babylonians by the Greeks. In the time of Pliny the town was said to have 600,000 inhabitants (vi. 122). Seleucia suffered from the rebellion of the satrap Molon of Media, who was put down by Antiochus III. the Great in 220 (Polyb. v. 54). Antiochus IV. *Epiphanes* once more restored the Seleucid supremacy in the east; but after his death (163) the decay of the empire began and was accelerated by the intrigues of the Romans. In Babylonia the governor Timarchus rebelled and was acknowledged by the Roman senate. But he was defeated and killed by Demetrius I. (*c.* 158), who was hailed as deliverer (*Soter*, "saviour") by the inhabitants (Appian, *Syr.* 45. 4 f.; Trogus, *Prol.* 34; Diod. 31. 27a). Soon after, the great conquests of the Arsacid king Mithradates I. began; Babylonia became subject to the Parthians (*c.* 140). The Greek towns were very unwilling to submit to the foreign rule, and welcomed Antiochus VII. Sidetes, when in 130 he attempted to restore his empire; but his defeat by Phraates II. in 129 ended the Seleucid rule in the east. Seleucia and other towns were cruelly punished by Phraates and his prefect Himerus, who also devastated Babylon (Justin xlii. 1; Trog. *Prol.* 42; Diod. xxxv. 19. 21; cf. Posidonius *ap.* Athen. xi. 466 B). Seleucia, however, maintained her self-government and her spirit of Greek independence (Plin. vi. 122; Tac. *Ann.* vi. 42; cf. Joseph. *Ant.* xviii. 9. 8 f.), and remained the greatest commercial town of the east. The Arsacids did not dare to bring their host of barbarian soldiers and retinue into Seleucia, but fixed their residence opposite to it on the left bank of the Tigris in Ctesiphon (Strabo xvi. 743; see Ctesiphon). In all the wars with the Romans Seleucia inclined to the western deliverers; from A.D. 37 to 43 it was in open rebellion against the Parthians (Tac. *Ann.* xi. 8 f.). Vologaeses I. (A.D. 50–91) "founded the town Vologesocerta (near Ctesiphon) with the intention of draining the stormy Seleucia" (Plin. vi. 122). Trajan occupied Seleucia in 116. In the war of Marcus Aurelius and L. Verus against the Parthians, Seleucia was taken by Avidius Cassius in 164, and then the Romans did what the Parthians had not dared to do: they burnt down the great Greek town with 300,000 inhabitants (Dio Cass. lxxi. 2; Zonar, xii. 2; Capitol. *Vit. Veri*, 8; Eutrop. 8. 10; Ammian. Marc. xxiii. 6. 24; xxiv. 5. 3). The great plague, which laid waste the Roman empire during the next years, is said to have sprung from the ruins of Seleucia. The destruction of Seleucia may be considered as the end of Hellenism in Babylonia. (See also Seleucid Dynasty and Hellenism.) (Ed. M.)

2. A city on the north frontier of Syria towards Cilicia about 4 m. N. of the mouth of the Orontes, near the shore at the foot of Mount Pieria (hence called Seleucia Pieria). This town also was founded by Seleucus I. It served as the port of Antioch (Acts xiii. 4), and with Apamea, Laodicea and Antioch formed the Syrian tetrapolis. Considerable remains are still visible: the chief are those of a cutting through the solid rock nearly 1100 yds. long, which Polybius describes as the road from the city to the sea; the triple line of walls; amphitheatre, cemetery, citadel, temples. It was of great importance in the struggle between the Seleucids and the Ptolemies; captured by Ptolemy Euergetes in 246, it was recovered by Antiochus III. the Great in 219. It was recognized as independent by the Romans in 70, but little of its subsequent history is known. It had practically ceased to exist in the 5th century A.D. The district stretching inland was known as Seleucis.

3. Seleucia Tracheotis, sometimes called Trachea, a city of Cilicia on the Calycadnus (Geuk Su), also founded by Seleucus I. about 300 B.C., near the older Olbia. It had considerable commercial prosperity as the port of Isauria, and was even a rival of Tarsus. In 1137 it was besieged by Leon, king of Cilician Armenia. On the 10th of June 1190 the emperor Frederick Barbarossa was drowned in trying to cross the Calycadnus. In the 13th century it was captured by the Seljuks. There are many ancient remains, and on the Acropolis the ruins of a castle; many rock-cut tombs with inscriptions have been found. On the site is the modern Selefke, the chief town of the Ichili sanjak.

Other towns bearing the name Seleucia were:—(4) Seleucia in Mesopotamia, the modern Birejik; (5) in the Persian Margiana, founded as Alexandria by Alexander the Great and rebuilt as Seleucia by Antiochus I. (of Syria); (6) in Pisidia; (7) in Pamphylia; (8) on the Belus in Syria. The city of Tralles (*q.v.*) also bore the name for a short period.

SELEUCID DYNASTY, a line of kings who reigned in Nearer Asia from 312 to 65 B.C.

The founder Seleucus (surnamed for later generations Nicator) was a Macedonian, the son of Antiochus, one of Philip's generals. Seleucus, as a young man of about twenty-three, accompanied Alexander into Asia in 333, and won distinction in the Indian campaign of 326. When the Macedonian empire was divided in 323 (the "Partition of Babylon") Seleucus was given the office of *chiliarch* (Gr. χίλιοι, a thousand), which attached him closely to the person of the regent Perdiccas. Seleucus himself had a hand in the murder of Perdiccas in 321. At the second partition, at Triparadisus (321), Seleucus was given the government of the Babylonian satrapy. In 316, when Antigonus had made himself master of the eastern provinces, Seleucus felt himself threatened and fled to Egypt. In the war which followed between Antigonus and the other Macedonian chiefs, Seleucus actively co-operated with Ptolemy and commanded Egyptian squadrons in the Aegean. The victory won by Ptolemy at Gaza in 312 opened the way for Seleucus to return to the east. His return to Babylon in that year was afterwards officially regarded as the beginning of the Seleucid empire. Master of Babylonia, Seleucus at once proceeded to wrest the neighbouring provinces of Persis, Susiana and Media from the nominees of Antigonus. A raid into Babylonia conducted in 311 by Demetrius, son of Antigonus, did not seriously check Seleucus's progress. Whilst Antigonus was occupied in the west, Seleucus during nine years (311–302) brought under his authority the whole eastern part of Alexander's empire as far as the Jaxartes and Indus. In 305, after the extinction of the old royal line of Macedonia, Seleucus, like the other four principal Macedonian chiefs, assumed the style of king.

His attempt, however, to restore Macedonian rule beyond the Indus, where the native Chandragupta had established himself, was not successful. Seleucus entered the Punjab, but felt himself obliged in 302 to conclude a peace with Chandragupta, by which he ceded large districts of Afghanistan in return for 500 elephants. The pressing need for Seleucus once more to take the field against Antigonus was at any rate in large measure the cause of his abandonment of India. In 301 he joined Lysimachus in Asia Minor, and at Ipsus Antigonus fell before their combined power. A new partition of the empire followed, by which Seleucus added to his kingdom Syria, and perhaps some regions of Asia Minor. The possession of Syria gave him an opening to the Mediterranean, and he immediately founded here the new city of Antioch upon the Orontes as his chief seat of government. His previous capital had been the city of Seleucia which he had founded upon the Tigris (almost coinciding in site with Bagdad), and this continued to be the capital for the eastern satrapies. About 293 he installed his son Antiochus there as viceroy, the vast extent of the empire seeming to require a double government. The capture of Demetrius in 285 added to Seleucus's prestige. The unpopularity of Lysimachus after the murder of Agathocles gave Seleucus an opportunity for removing his last rival. His intervention in the west was solicited by Ptolemy, Ceraunus, who, on the accession to the Egyptian throne of his brother Ptolemy II. (285), had at first taken refuge with Lysimachus and then with Seleucus. War between Seleucus and Lysimachus broke out, and on the field of Coru-pedion in Lydia Lysimachus fell (281). Seleucus now saw the whole empire of Alexander, Egypt alone excepted, in his hands, and moved to take possession of Macedonia and Thrace. He intended to leave Asia to Antiochus and content himself for the remainder of his days with the Macedonian kingdom in its old limits. He had, however, hardly crossed into the Chersonese when he was assassinated by Ptolemy Ceraunus near Lysimachia (281).

Antiochus I. Soter (324 or 323–262) was half a Persian, his mother Apame being one of those eastern princesses whom Alexander had given as wives to his generals in 324. On the assassination of his father (281), the task of holding together the empire was a formidable one, and a revolt in Syria broke out almost immediately. With his father's murderer, Ptolemy, Antiochus was soon compelled to make peace, abandoning apparently Macedonia and Thrace. In Asia Minor he was unable to reduce Bithynia or the Persian dynasties which ruled in Cappadocia. In 278 the Gauls broke into Asia Minor, and a victory which Antiochus won over these hordes is said to have been the origin of his title of *Soter* (Gr. for "saviour"). At the end of 275 the question of Palestine, which had been open between the houses of Seleucus and Ptolemy since the partition of 301, led to hostilities (the "First Syrian War"). It had been continuously in Ptolemaic occupation, but the house of Seleucus maintained its claim. War did not materially change the outlines of the two kingdoms, though frontier cities like Damascus and the coast districts of Asia Minor might change hands. About 262 Antiochus tried to break the growing power of Pergamum by force of arms, but suffered defeat near Sardis and died soon afterwards (262). His eldest son Seleucus, who had ruled in the east as viceroy from 275 (?) till 268/7, was put to death in that year by his father on the charge of rebellion (Wace, *J.H.S.* xxv., 1905, p. 101 f.). He was succeeded (261) by his second son Antiochus II. Theos (286–246), whose mother was the Macedonian princess Stratonice, daughter of Demetrius Poliorcetes. War with Egypt still went on along the coasts of Asia Minor (the "Second Syrian War"). Antiochus also made some attempt to get a footing in Thrace. About 250 peace was concluded between Antiochus and Ptolemy II., Antiochus repudiating his wife Laodice and marrying Ptolemy's daughter Berenice, but by 246 Antiochus had left Berenice and her infant son in Antioch to live again with Laodice in Asia Minor. Laodice poisoned him and proclaimed her son Seleucus II. Callinicus (reigned 246–227) king, whilst her partisans at Antioch made away with Berenice and her son. Berenice's brother, Ptolemy III., who had just succeeded to the Egyptian throne, at once invaded the Seleucid realm and marched victoriously to the Tigris or beyond, receiving the submission of the eastern provinces, whilst his fleets swept the coasts of Asia Minor. In the interior of Asia Minor Seleucus maintained himself, and when Ptolemy returned to Egypt he recovered Northern Syria and the nearer provinces of Iran. In Asia Minor his younger brother Antiochus Hierax was put up against him by a party to which Laodice herself adhered. At Ancyra (about 235?) Seleucus sustained a crushing defeat and left the country beyond the Taurus to his brother and the other powers of the peninsula. Of these Pergamum now rose to greatness under Attalus I., and Antiochus Hierax perished as a fugitive in Thrace in 228/7. A year later Seleucus was killed by a fall from his horse. His elder son, Seleucus III. Soter (reigned 227–223), took up the task of reconquering Asia Minor from Attalus, but fell by a conspiracy in his own camp.

Antiochus III. the Great (242–187), Callinicus's younger son, a youth of about eighteen, now succeeded to a disorganized kingdom (223). Not only was Asia Minor detached, but the further eastern provinces had broken away, Bactria under the Greek Diodotus (*q.v.*), and Parthia under the nomad chieftain Arsaces. Soon after Antiochus's accession, Media and Persis revolted under their governors, the brothers Molon and Alexander. The young king was in the hands of the bad minister Hermeias, and was induced to make an attack on Palestine instead of going in person to face the rebels. The attack on Palestine was a fiasco, and the generals sent against Molon and Alexander met with disaster. Only in Asia Minor, where the Seleucid cause was represented by the king's cousin, the able Achaeus, was its prestige restored and the Pergamene power driven back to its earlier limits. In 221 Antiochus at last went east, and the rebellion of Molon and Alexander collapsed. The submission of Lesser Media, which had asserted its independence under Artabazanes, followed. Antiochus rid himself of Hermeias by assassination and returned to Syria (220). Meanwhile Achaeus himself had revolted and assumed the title of king in Asia Minor. Since, however, his power was not well enough grounded to allow of his attacking Syria, Antiochus considered that he might leave Achaeus for the present and renew his attempt on Palestine. The campaigns of 219 and 218 carried the Seleucid arms almost to the confines of Egypt, but in 217 Ptolemy IV. confronted Antiochus at Raphia and inflicted a defeat upon him which nullified all Antiochus's successes and compelled him to withdraw north of the Lebanon. In 216 Antiochus went north to deal with Achaeus, and had by 214 driven him from the field into Sardis. Antiochus contrived to get possession of the person of Achaeus (see Polybius), but the citadel held out till 213 under Achaeus's widow and then surrendered. Having thus recovered the central part of Asia Minor—for the dynasties in Pergamum, Bithynia and Cappadocia the Seleucid government was obliged to tolerate—Antiochus turned to recover the outlying provinces of the north and east. Xerxes of Armenia was brought to acknowledge his supremacy in 212. In 209 Antiochus invaded Parthia, occupied the capital Hecatompylus and pushed forward into Hyrcania. The Parthian king was apparently granted peace on his submission. In 209 Antiochus was in Bactria, where the original rebel had been supplanted by another Greek Euthydemus (see further Bactria and articles on the separate rulers). The issue was again favourable to Antiochus. After sustaining a famous siege in his capital Bactra (Balkh), Euthydemus obtained an honourable peace by which the hand of one of Antiochus's daughters was promised to his son Demetrius. Antiochus next, following in the steps of Alexander, crossed into the Kabul valley, received the homage of the Indian king Sophagasenus and returned west by way of Seistan and Kerman (206/5). From Seleucia on the Tigris he led a short expedition down the Persian Gulf against the Gerrhaeans of the Arabian coast (205/4). Antiochus seemed to have restored the Seleucid empire in the east, and the achievement brought him the title of "the Great King." In 205/4 the infant Ptolemy V. Epiphanes succeeded to the Egyptian throne, and Antiochus concluded a secret pact with Philip of

Macedonia for the partition of the Ptolemaic possessions. Once more Antiochus attacked Palestine, and by 199 he seems to have had possession of it. It was, however, recovered for Ptolemy by the Aetolian Scopas. But the recovery was brief, for in 198 Scopas was defeated by Antiochus at the battle of the Panium, near the sources of the Jordan, a battle which marks the end of Ptolemaic rule in Palestine. In 197 Antiochus moved to Asia Minor to secure the coast towns which had acknowledged Ptolemy and the independent Greek cities. It was this enterprise which brought him into antagonism with Rome, since Smyrna and Lampsacus appealed to the republic of the west, and the tension became greater after Antiochus had in 196 established a footing in Thrace. The evacuation of Greece by the Romans gave Antiochus his opportunity, and he now had the fugitive Hannibal at his court to urge him on. In 192 Antiochus invaded Greece, having the Aetolians and other Greek states as his allies. In 191, however, he was routed at Thermopylae by the Romans under Manius Acilius Glabrio, and obliged to withdraw to Asia. But the Romans followed up their success by attacking Antiochus in Asia Minor, and the decisive victory of L. Cornelius Scipio at Magnesia ad Sipylum (190), following on the defeat of Hannibal at sea off Side, gave Asia Minor into their hands. By the peace of Apamea (188) the Seleucid king abandoned all the country north of the Taurus, which was distributed among the friends of Rome. As a consequence of this blow to the Seleucid power, the outlying provinces of the empire, recovered by Antiochus, reasserted their independence. Antiochus perished in a fresh expedition to the east in Luristan (187).

The Seleucid kingdom as Antiochus left it to his son, Seleucus IV. Philopator (reigned 187–176), consisted of Syria (now including Cilicia and Palestine), Mesopotamia, Babylonia and Nearer Iran (Media and Persis). Seleucus IV. was compelled by financial necessities, created in part by the heavy war-indemnity exacted by Rome, to pursue an unambitious policy, and was assassinated by his minister Heliodorus. The true heir, Demetrius, son of Seleucus, being now retained in Rome as a hostage, the kingdom was seized by the younger brother of Seleucus, Antiochus IV. Epiphanes (*i.e.* "the Manifest [god]"; parodied *Epimanes*, "the mad"), who reigned 176–164. In 170 Egypt, governed by regents for the boy Ptolemy Philometor, attempted to reconquer Palestine; Antiochus not only defeated this attempt but invaded and occupied Egypt. He failed to take Alexandria, where the people set up the younger brother of Philometor, Ptolemy Eurgetes, as king, but he left Philometor as his ally installed at Memphis. When the two brothers combined, Antiochus again invaded Egypt (168), but was compelled to retire by the Roman envoy C. Popillius Laenas (consul 172), after the historic scene in which the Roman drew a circle in the sand about the king and demanded his answer before he stepped out of it. Antiochus exercised his contemporaries by the riddles of his half-brilliant, half-crazy personality. He had resided at Rome as a hostage, and afterwards for his pleasure at Athens, and had brought to his kingdom an admiration for republican institutions and an enthusiasm for Hellenic culture—or, at any rate, for its externals. There is evidence that the forms of Greek political life were more fully adopted under his sway by many of the Syrian cities. He spent lavishly on public buildings at home and in the older centres of Hellenism, like Athens. Gorgeous display and theatrical pomp were his delight. At the same time he scandalized the world by his riotous living and undignified familiarities. But he could persevere in an astute policy under the cover of an easy geniality and had no scruples. It is his contact with the Jews which has chiefly interested later ages, and he is doubtless the monarch described in the pseudo-prophetic chapters of Daniel (*q.v.*). Jerusalem, near the Egyptian frontier, was an important point, and in one of its internal revolutions Antiochus saw, perhaps not without reason, a defection to the Egyptian side. His chastisement of the city, including as it did the spoliation of the temple, served the additional purpose of relieving his financial necessities. It was a measure of a very different kind when, a year or two later (after 168), Antiochus tried to suppress the practices of Judaism by force, and it was this which provoked the Maccabaean rebellion (see Maccabees). In 166 Antiochus left Syria to attempt the reconquest of the further provinces. He seems to have been signally successful. Armenia returned to allegiance, the capital of Media was recolonized as Epiphanea, and Antiochus was pursuing his plans in the east when he died at Tabae in Persis, after exhibiting some sort of mental derangement (winter 164/3).

He left a son of nine years, Antiochus V. Eupator (reigned 164–162), in whose name the kingdom was administered by a camarilla. Their government was feeble and corrupt. The attempt to check the Jewish rebellion ended in a weak compromise. Their subservience to Rome so enraged the Greek cities of Syria that the Roman envoy Graeus Octavius (consul 165 B.C.) was assassinated in Laodicea (162). At this juncture Demetrius, the son of Seleucus IV., escaped from Rome and was received in Syria as the true king. Antiochus Eupator was put to death. Demetrius I. Soter (reigned 162–150) was a strong and ambitious ruler. He crushed the rebellion of Timarchus in Media and reduced Judaea to new subjection. But he was unpopular at Antioch, and fell before a coalition of the three kings of Egypt, Pergamum and Cappadocia. An impostor, who claimed to be a son of Antiochus Epiphanes, Alexander Balas (reigned 150–145), was installed as king by Ptolemy Philometor and given Ptolemy's daughter Cleopatra to wife, but Alexander proved to be dissolute and incapable, and when Demetrius, the son of Demetrius I., was brought back to Syria by Cretan *condottieri*, Ptolemy transferred his support and Cleopatra to the rightful heir. Alexander was defeated by Ptolemy at the battle of the Oenoparas near Antioch and murdered during his flight. Ptolemy himself died of the wound he had received in the battle.

Demetrius II. Nicator (first reign 145–140) was a mere boy,[1] and the misgovernment of his Cretan supporters led to the infant son of Alexander Balas, Antiochus VI. Dionysus, being set up against him (145) by Tryphon, a magnate of the kingdom. Demetrius was driven from Antioch and fixed his court in the neighbouring Seleucia. In 143 Tryphon murdered the young Antiochus and assumed the diadem himself. Three years later Demetrius set off to reconquer the eastern provinces from the Parthians, leaving Queen Cleopatra to maintain his cause in Syria. When Demetrius was taken prisoner by the Parthians, his younger brother Antiochus VII. Sidetes (164–129) appeared in Syria, married Cleopatra and crushed Tryphon. Antiochus VII. was the last strong ruler of the dynasty (138–129). He took Jerusalem and once more brought the Jews, who had won their independence under the Hasmonaean family, to subjection (see Maccabees). He led a new expedition against the Parthians in 130, but, after signal successes, fell fighting in 129 (see also Persia, *History*). Demetrius (second reign 129–126), who had been allowed by the Parthians to escape, now returned to Syria, but was soon again driven from Antioch by a pretender, Alexander Zabinas, who had the support of the king of Egypt. Demetrius was murdered at the instigation of his wife Cleopatra in 126. The remaining history of the dynasty is a wretched story of the struggle of different claimants, while the different factors of the kingdom, the cities and barbarian races, more and more assert their independence. Both Demetrius II. and Antiochus VII. left children by Cleopatra, who form rival branches of the royal house. To the line of Demetrius belong his son Seleucus V. (126), assassinated by his mother Cleopatra, Antiochus VIII. Grypus (141–96), who succeeded in 126 the younger brother of Seleucus V., the sons of Grypus, Seleucus VI. Epiphanes Nicator (reigned 96–95), Antiochus XI. Epiphanes Philadelphus (reigned during 95), Philip I. (reigned 95–83), Demetrius III. Eukairos (reigned 95–88), and Antiochus XII. Dionysus Epiphanes (reigned 86?–85?), and lastly Philip II., the son of Philip I., who appears momentarily on the stage in the last days of confusion. To the line of Antiochus VII. belong his son Antiochus IX. Cyzicenus (reigned 116–95), the son of Cyzicenus, Antiochus X. Eusebes (reigned 95–83?), and the son of Eusebes, Antiochus XIII. Asiaticus (reigned 69–65). In 83 Tigranes, the king of Armenia, invaded Syria, and by 69 his conquest had reached as far as Ptolemais, when he was obliged to evacuate Syria to defend his own kingdom from the Romans. When Pompey appeared in Syria in 64, Antiochus XIII. begged to be restored to his ancestral kingdom or what shred was left of it. Pompey refused and made Syria a Roman province. Antiochus Grypus had given his daughter in marriage to Mithradates (*q.v.*), a king of Commagene, and the subsequent kings of Commagene (see under Antiochus) claimed in consequence still to represent the Seleucid house after it had become extinct in the male line, and adopted Antiochus as the dynastic name. The kingdom was extinguished by Rome in 72. The son of the last king, Gaius Julius Antiochus Epiphanes Philopappus, was Roman consul for A.D. 100.

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[1] Some of the indications of our documents would make him older, and these are followed by Niese (iii. p. 276, note 5). But in that case Demetrius I. must have already had a wife and son when he escaped from Rome, and it seems to me highly improbable that such a material factor in the situation would have been left out of account in Polybius's full narrative. After all, it is only a question of probabilities, and the difficulties of fitting a wife and child into the story seem to be very great, whether we conceive them left behind by Demetrius in Italy, or sent out of the country before him.

Authorities.—E. R. Bevan, *House of Seleucus* (1902), and the earlier literature of the subject there cited. In addition may be mentioned Dssa. Adalgisa Corvatta, *Divisione amministrativa dell' impero dei Seleucidi* (1901); Haussoullier, *Histoire de Milet et du Didymeion* (1902); B. Niese, *Gesch. d. griech. u. maked. Staaten*, Teil 3 (1903); J. Beloch. *Griechische Geschichte*, vol. iii.; G. Macdonald, "Early Seleucid Portraits," *Journ. of Hell. Stud.* xxiii. (1903), p. 92 f.; A. J. B. Wace, "Hellenistic Royal Portraits," *Journ. of Hell. Stud.* xxv. (1905), p. 86 f. For the chronology of the end of the reign of Antiochus Epiphanes and the Maccabaean revolt, see a paper by J. Wellhausen, "Über den geschichtlichen Wert des 2ten Makkabäerbuchs," *Nachrichten d. k. Gesellschaft d. Wissensch. zu Göttingen. Philol.-hist. Klasse*, 1905, Heft 2; and Maccabees, *History*. (E. R. B.)

SELF (O.Eng. *seolf*, *silf*, &c., cf. Dutch *zelf*, Ger. *selbe*, *selbst*), as a pronoun, an element attached to a personal pronoun or pronominal adjective to give emphasis, or to indicate a reflexive use; as an adjective a word properly meaning same, identical, also very (seen in the expression "self-same"), hence single, plain, not mixed with another colour. It is also a florist's term for a flower which has uniformity of tint, without markings or other tints. As a noun "self" means one's own person; for the psychological use of the term see Psychology, &c., and for its ethical aspect Egoism.

SELIGMAN, EDWIN ROBERT ANDERSON (1861–), American economist, was born at New York on the 25th of April 1861. He was educated at Columbia University, and, after studying for three years in Germany and France, became prize lecturer at Columbia University in 1885, being made adjunct professor of political economy in 1888. He became McVickar professor of political economy in the same university in 1904. His principal works are *Railway Tariffs* (1887), *The Shifting and Incidence of Taxation* (1899; 3rd ed., 1910), *Progressive Taxation in Theory and Practice* (1894; 2nd ed. 1908), *Economic Interpretation of History* (1902; 2nd ed. 1907), and *Principles of Economics* (1907).

SELIM, the name of three sultans of Turkey.

Selim I. (1465–1521) succeeded in 1512 his father Bayezid II., whom he dethroned, and whose death, following immediately afterwards, gave rise to suspicions which Selim's character certainly justified. He signalized his accession by putting to death his brothers and nephews; and gave early proof of resolution by boldly cutting down before their troops two officers who showed signs of insubordination. A bigoted Sunni, he resolved on putting down the Shiʽite heresy, which had gained many adherents in Turkey: the number of these was estimated as high as 40,000. Selim determined on war with Persia, where the heresy was the prevalent religion, and in order that the Shiʽites in Turkey should give no trouble during the war, "measures were taken," as the Turkish historian states, which may be explained as the reader desires, and which proved fully efficacious. The campaign which followed was a triumph for Selim, whose firmness and courage overcame the pusillanimity and insubordination of the Janissaries. Syria and Egypt next fell before him; he became master of the holy cities of Islam; and, most important of all, he induced the last Caliph of the Abbasid dynasty formally to surrender the title of caliph (*q.v.*), as well as its outward emblems, viz. the holy standard, the sword and the mantle of the prophet. The dignity with which the Ottoman sultans have thereby become invested lends them that prestige throughout the Mussulman world which is of such importance to the present day, and which has thrown into oblivion the condition that the caliph ought to be an Arab of the tribe of Koreish. After his return from his Egyptian campaign, he was preparing an expedition against Rhodes when he was overtaken by sickness and died, on the 22nd of September 1521, in the ninth year of his reign, near the very spot where he had attacked his father's troops, not far from Adrianople. He was about fifty-five years of age. He was bigoted, bloodthirsty and relentless, though one Turkish historian praises his humanity for having forbidden the cutting up alive of condemned persons, or the roasting of them before a slow fire; and at one time he was with difficulty dissuaded from ordering the complete extirpation of all the Christians in Turkey. His ambition was insatiable; he is said to have exclaimed when looking at a map that the whole world did not form a sovereignty vast enough for one monarch. His four months' victorious campaign against Persia was undertaken and successfully carried through contrary to the advice of his ministers, several of whom he executed for their opposition to his plans; and he achieved an enterprise which neither Jenghiz Khan nor Timur was able to carry out. It is said that he contemplated the conquest of India and that he was the first to conceive the idea of the Suez Canal.

Selim II. (1524–1574) was a son of Suleiman I. and his favourite Roxelana, and succeeded his father in 1566. He was the first sultan entirely devoid of military virtues and willing to abandon all power to his ministers, provided he were left free to pursue his orgies and debauches. Fortunately for the country, an able grand vizier, Mahommed Sokolli, was at the head of affairs, and two years after Selim's accession succeeded in concluding at Constantinople an honourable treaty with the emperor Maximilian II., whereby the emperor agreed to pay to Turkey an annual "present" of 30,000 ducats (Feb. 17, 1568). Against Russia he was less fortunate, and the first encounter between Turkey and her future northern rival gave presage of disaster to come. A plan had been elaborated at Constantinople for uniting the Volga and Don by a canal, and in the summer of 1569 a large force of Janissaries and cavalry were sent to lay siege to Astrakhan and begin the canal works, while an Ottoman fleet besieged Azov. But a sortie of the garrison of Astrakhan drove back the besiegers; 15,000 Russians, under Knes Serebianov, attacked and scattered the workmen and the Tatar force sent for their protection; and, finally, the Ottoman fleet was destroyed by a storm. Early in 1570 the ambassadors of Ivan the Terrible concluded at Constantinople a treaty which restored friendly relations between the sultan and the tsar. Expeditions in the Hejaz and Yemen were more successful, and the conquest of Cyprus in 1571, which provided Selim with his favourite vintage, led to the calamitous naval defeat of Lepanto in the same year, the moral importance of which has often been under-estimated, and which at least freed the Mediterranean from the corsairs by whom it was infested. Turkey's shattered fleets were soon restored, and Sokolli was preparing for a fresh attack on Venice, when the sultan's death on the 12th of December 1574 cut short his plans. Little can be said of this degenerate son of Suleiman, who during the eight years of his reign never girded on the sword of Osman, and preferred the clashing of wine-goblets to the shock of arms, save that with the dissolute tastes of his mother he had not inherited her ferocity.

Selim III. (1762–1808) was a son of Sultan Mustafa III. and succeeded his uncle Abd-ul-Hamid I. in 1789. The talents and energy with which he was endowed had endeared him to the people, and great hopes were founded on his accession. He had associated much with foreigners, and was thoroughly persuaded of the necessity of reforming his state. But Austria and Russia gave him no time for anything but defence, and it was not until the peace of Jassy (1792) that a breathing space was allowed him in Europe, while Bonaparte's invasion of Egypt and Syria soon called for Turkey's strongest efforts and for the time shattered the old-standing French alliance. Selim profited by the respite to abolish the military tenure of fiefs; he introduced salutary reforms into the administration, especially in the fiscal department, sought by well-considered plans to extend the spread of education, and engaged foreign officers as instructors, by whom a small corps of new troops called *nizam-i-jedid* were collected and drilled. So well were these troops organized that they were able to hold their own against rebellious Janissaries in the European provinces, where disaffected governors made no scruple of attempting to make use of them against the reforming sultan. Emboldened by this success, Selim issued an order that in future picked men should be taken annually from the Janissaries to serve in their ranks. Hereupon the Janissaries and other enemies of progress rose at Adrianople, and in view of their number, exceeding 10,000, and the violence of their opposition, it was decided that the reforms must be given up for the present. Servia, Egypt and the principalities were successively the scene of hostilities in which Turkey gained no successes, and in 1807 a British fleet appeared at Constantinople, strange to say to insist on Turkey's yielding to Russia's demands besides dismissing the ambassador of Napoleon I. Selim was, however, thoroughly under the influence of this ambassador, Sebastiani, and the fleet was compelled to retire without effecting its purpose. But the anarchy, manifest or latent, existing throughout the provinces proved too great for Selim to cope with. The Janissaries rose once more in revolt, induced the Sheikh-ul-Islam to grant a fetva against the reforms, dethroned and imprisoned Selim (1807), and placed his nephew Mustafa on the throne. The pasha of Rustchuk, Mustafa Bairakdar, a strong partisan of the reforms, now collected an army of 40,000 men and marched on Constantinople with the purpose of reinstating Selim. But he came too late; the ill-fated reforming sultan had been strangled in the seraglio, and Bairakdar's only resource was to wreak his vengeance on Mustafa and to place on the throne Mahmud II., the sole surviving member of the house of Osman.

For authorities see TURKEY: *History*.

SELINUS (Σελινοῦς), an ancient city on the S. coast of Sicily, 27 m. S.E. direct from Lilybaeum (the modern Marsala) and 7 m. S.E. of Castel Vetrano, which is 74 m. S.S.W. of Palermo by rail. It was founded, according to Thucydides, in 628 B.C. by colonists from Megara Hyblaea, and from the parent city of Megara (see SICILY: *History*). The name, which belonged both to the city and to the river on the W. of it, was derived from the wild celery[1] which grows there abundantly, and which appears on some of its coins (see NUMISMATICS, *Greek*, § "Sicily"). We hear of boundary disputes with Segesta as early as 580 B.C. Selinus soon grew in importance, and extended its borders from the Mazarus to the Halycus. Its wealth is shown by the fact that several of its temples belong to the first half of the 6th century B.C. Its government was at first oligarchical, but about 510 B.C. a short-lived despotism was maintained by Peithagoras and, after him, Euryleon (Herod. v. 43, 46). In 480 B.C. Selinus took the Carthaginian side. After this it seems to have enjoyed prosperity: Thucydides (vi. 20) speaks of its wealth and of the treasures in its temples, and the city had a treasury of its own at Olympia.

Table of Measurements of the Temples (in feet).

	A.	B.	C.	O.	D.	E.	F.	G.
Length excluding steps	132	31½	209¼	..	183¾	222½	203	362
Breadth excluding steps	53¼	18½	78½	..	77½	83	80¼	164⅓
Length of cella	94¼	..	136½	..	129	163⅓	(?)	226½ (?)
Breadth of cella	28½	..	34½	..	32¾	46⅔	30¼	69
Height of columns with capitals	23½ (?)	..	28¾	..	27¼	..	..	33¼
Diameter of columns at bottom	4⅓	..	6⅓	..	6	6⅔	5¾	8⅔ (11½)
Number of columns in peristasis	36	4	42	36 (?)	34	38	36	46
Class	Peripteros-hexastylos	Prostylos-tetrastylos	Peripteros-hexastylos	..	Peripteros-hexastylos	Peripteros-hexastylos	Peripteros-hexastylos	Pseudo-dipteros-octostylos
Approximate date	480 B.C.	After 240 B.C.	581 B.C.	480 B.C.	570–554 B.C.	Soon after 480 B.C.	570–554 B.C.	

A dispute between Selinus and Segesta (probably the revival of a similar quarrel about 454, when an Athenian force appears to have taken part[2]) was one of the causes of the Athenian expedition of 415 B.C. At its close the former seemed to have the latter at its mercy, but an appeal to Carthage was responded to, and an overwhelming force (the Siceliot cities delaying too much in coming to the rescue) under Hannibal took and destroyed the city in 409 B.C.; the walls were razed to the ground; 6000 inhabitants were killed, 5000 taken prisoners, and only 2600 escaped to Agrigentum (Acragas).[3] In 408 Hermocrates, returning from exile, occupied Selinus and rebuilt the walls; and it is to him that the fine fort on the neck of the acropolis must be attributed. Hence he attacked Motya and Panormus and the rest of Punic Sicily. He fell, however, in 407 in an attempt to enter Syracuse, and, as a result of the treaty of 405 B.C., Selinus became absolutely subject to Carthage, and remained so until its destruction at the close of the first Punic War, when its inhabitants were transferred to Lilybaeum. It was never afterwards rebuilt, and Strabo (vi. p. 272) mentions it as one of the extinct cities of Sicily.

The ancient city occupied a sand-hill running N. and S.; the S. portion, overlooking the sea, which was the acropolis, is surrounded by fine walls of masonry of rectangular blocks of stone, which show traces of the reconstruction of 408 B.C. It is traversed by two main streets, running N. and S. and E. and W., from which others diverged at right angles. There are, however, some traces of earlier buildings at a different orientation. Only the S.E. portion of the acropolis, which contains several temples, has been excavated: in the rest private houses seem to predominate. The deities to whom the temples were dedicated not being certainly known, they are as a rule indicated by letters. In all the large temples the cella is divided into two parts, the smaller and inner of which (the *adytum*) was intended for the cult image. The opisthodomus is sometimes omitted. All of them lie in a state of ruin, and, from the disposition of the drums of the columns, it is impossible to suppose that their fall was due to any other cause than an earthquake. Temple C is the earliest of those on the acropolis. It had six columns at each end (a double row in the front) and seventeen on each long side. From it came the three archaic metopes now in the museum at Palermo, which are of great importance in the history of the development of art, showing Greek sculpture in its infancy. Portions of the coloured terra-cotta slabs which decorated the cornice and other architectural members have also been discovered. Next to it on the N. lies temple D, both having been included in one *temenos*, with other buildings of less importance: to the E. of D is a large altar. B is a small temple of comparatively late date; while A and O lie on the S. side of the main street from E. to W. in another *peribolos*.

At the N. end of the acropolis are extensive remains of the fortifications of Hermocrates across the narrow neck connecting it with the rest of the hill. In front of the wall lies a deep trench, into which several passages descend, as at the nearly contemporary fort of Euryelus above Syracuse (*q.v.*). Outside this again lies a projecting semicircular bastion, which commands the entrance from the exterior of the city on the E., a winding trench approached by a pair of double gateways, which are not vaulted but covered by the gradual projection of the upper courses. Capitals and triglyphs from earlier buildings have been used in the construction of these fortifications: from their small size they may be mostly attributed to private houses. A way across the curving trench leads to an open space, where the Agora may have been situated: beyond it lay the town, the remains of which are scanty, though the line of the walls can be traced.

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[1] The plant was formerly thought to be wild parsley. It is now generally agreed that it is celery.

[2] Cf. Timaeus, fr. 99, with Diod. xi. 86 and *I.G.* xiv. p. 45, No. 268.

[3] The figures are those of Diodorus (xiii. 58), but seem strangely small.

Outside the ancient city, on the W. of the river Selinus, lie the ruins of a temple of Demeter, with a propylon leading to the sacred enclosure: the temple itself has a cella with a narrow door and without columns. A large number of votive terra-cotta figures, vases and lamps were found in the course of the excavations. The earliest temple must have been erected soon after the foundation of the city, while the later building which superseded it dates from shortly after 600 B.C. The propylon, on the other hand, may date from after 409 B.C.

On the hill E. of Selinus, separated from it by a small flat valley, lies a group of three huge temples. No other remains have been found round them, though it seems improbable that they stood quite alone and unprotected. It is likely that they were outside the town, but stood in a sacred enclosure. All of them have fallen, undoubtedly owing to an earthquake. The oldest of the three is F. A peculiarity of the construction of this temple is that all the intercolumniations were closed by stone screens. In it were found the lower parts of two metopes. Next in date comes the huge temple G, which, as an inscription proves, was dedicated to Apollo; though it was never entirely completed (many of the columns still remain unfluted), it was in use. The columns vary somewhat in diameter (more than even the difference caused by fluting would warrant) and three different types of capital are noticeable. The plan is a curious one: despite the comparative narrowness of the cella, it had two rows of ten columns in it, in line with the front angles of the inner shrine. The third temple, E, has been proved by the discovery of an inscription to have been dedicated to Hera. It is famous for its fine metopes now in the museum at Palermo, belonging to the beginning of the 5th century B.C.

See R. Koldewey and O. Puchstein, *Die griechischen Tempel in Unteritalien und Sicilien* (Berlin, 1899), 77-131. (T. As.)

SELJŪKS, Seljūḳs, or Seljuqs, the name of several Turkish dynasties issued from one family, which reigned over large parts of Asia in the 11th, 12th and 13th centuries of the Christian era. The history of the Seljūks forms the first part of the history of the Turkish empire. Proceeding from the deserts of Turkestan, the Seljūks reached the Hellespont; but this barrier was crossed and a European power founded by the Ottomans (Osmanli). The Seljūks inherited the traditions and at the same time the power of the Arabian caliphate, of which, when they made their appearance, only the shadow remained in the person of the Abbāsid caliph of Bagdad. It is their merit from a Mahommedan point of view to have re-established the power of orthodox Islam and delivered the Moslem world from the subversive influence of the ultra-Shīite tenets, which constituted a serious danger to the duration of Islam itself. Neither had civilization anything to fear from them, since they represented a strong neutral power, which made the intimate union of Persian and Arabian elements possible, almost at the expense of the national Turkish—literary monuments in that language being during the whole period of the Seljūk rule exceedingly rare.

The first Seljūk rulers were Toghrul Beg, Chaḳir Beg and Ibrahīm Niyāl, the son of Mikail, the son of Seljūk, the son of Tuḳāḳ, or Tuqāq (also styled Tīmūryāliḳ, "iron bow"). They belonged to the Turkish tribe of the Ghuzz (Οὗζοι of Const. Porphyr. and the Byzantine writers), which traced its lineage to Oghuz, the famous eponymic hero not only of this but of all Turkish tribes. There arose, however, at some undefined epoch a strife on the part of this tribe and some others with the rest of the Turks, because, as the latter allege, Ghuzz, the son (or grandson) of Yafeth (Japhet), the son of Nūḥ (Noah), had stolen the genuine *rain-stone*, which Turk, also a son of Yafeth, had inherited from his father. By this party, as appears from this tradition, the Ghuzz were not considered to be genuine Turks, but to be Turkmans (that is, according to a popular etymology, resembling Turks). But the native tradition of the Ghuzz was unquestionably right, as they spoke a pure Turkish dialect. The fact, however, remains that there existed a certain animosity between the Ghuzz and their allies and the rest of the Turks, which increased as the former became converted to Islam (in the course of the 4th century of the Flight). The Ghuzz were settled at that time in Transoxiana, especially at Jand, a well-known city on the banks of the Jaxartes, not far from its mouth. Some of them served in the armies of the Ghaznavids—Sabuktagīn (Sebuktegin) and Maḥmūd (997–1030); but the Seljūks, a royal family among them, had various relations with the reigning princes of Transoxiana and Khwārizm, which cannot be narrated here.[1] But, friends or foes, the Ghuzz became a serious danger to the adjoining Mahommedan provinces from their predatory habits and continual raids, and the more so as they were very numerous. It may suffice to mention that, under the leadership of Pīgu Arslān Israil, they crossed the Oxus and spread over the eastern provinces of Persia, everywhere plundering and destroying. The imprisonment of this chieftain by Masūd, the son and successor of Maḥmūd, was of no avail: it only furnished his nephews with a ready pretext to cross the Oxus likewise in arms against the Ghaznavids. We pass over their first conflicts and the unsuccessful agreements that were attempted, to mention the decisive battle near Merv (1040), in which Masūd was totally defeated and driven back to Ghazni (Ghazna). Persia now lay open to the victors, who proclaimed themselves independent at Merv (which became from that time the official capital of the principal branch of the Seljūks), and acknowledged Toghrul Beg as chief of the whole family. After this victory the three princes Toghrul Beg, Chaḳir Beg and Ibrahīm Niyāl separated in different directions and conquered the Mahommedan provinces east of the Tigris; the last named, after conquering Hamadān and the province of Jebel (Irak i Ajami), penetrated as early as 1048, with fresh Ghuzz troops, into Armenia and reached Manzikert, Erzerūm and Trebizond. This excited the jealousy of Toghrul Beg, who summoned him to give up Hamadān and the fortresses of Jebel; but Ibrahīm refused, and the progress of the Seljūkian arms was for some time checked by internal discord—an ever-recurring event in their history. Ibrahīm was, however, compelled to submit.

At this time the power of Qaim, the Abbāsid caliph of Bagdād (see Caliphate, section C, § 26), was reduced to a mere shadow, as the Shīite dynasty of the Būyids and afterwards his more formidable Fātimite rivals had left him almost wholly destitute of authority. The real ruler at Bagdād was a Turk named Basāsīrī, lieutenant of the last Būyid, Malik-ar-Raḥīm. Nothing could, therefore, be more acceptable to the caliph than the protection of the orthodox Toghrul Beg, whose name was read in the official prayer (*khotba*) as early as 1050. At the end of the same year (1055) the Seljūk entered the city and after a tumult seized the person of Malik-ar-Raḥīm. Basāsīrī had the good fortune to be out of his reach; after acknowledging the right of the Fātimites, he gathered fresh troops and incited Ibrahīm Niyāl to rebel again, and he succeeded so far that he re-entered Bagdād at the close of 1058. The next year, however, Toghrul Beg got rid of both his antagonists, Ibrahīm being taken prisoner and strangled with the bowstring, while Basāsīrī fell in battle. Toghrul Beg now re-entered Bagdād, re-established the caliph, and was betrothed to his daughter, but died before the consummation of the nuptials (September 1063). Alp Arslān, the son of Chakir Beg, succeeded his uncle and extended the rule of his family beyond the former frontiers. He made himself master, *e.g.* of the important city of Aleppo; and during his reign a Turkish amir, Atsiz, wrested Palestine and Syria from the hands of the Fātimites. He made successful expeditions against the Greeks, especially that of 1071, in which the Greek emperor Romanus Diogenes was taken prisoner and forced to ransom himself for a large sum (see Roman Empire, Later). The foundation of the Seljūk empire of Rūm (*q.v.*) was the immediate result of this great victory. Alp Arslān afterwards undertook an expedition against Turkestan, and met with his death at the hands of a captured chief, Barzami Yussuf (Yussuf Kothnal), whom he had intended to shoot with his own hand.

Malik Shāh, the son and successor of Alp Arslān, had to encounter his uncle Kāvurd, founder of the Seljūkian empire of Kermān (see below), who claimed to succeed Alp Arslān in accordance with the Turkish laws, and led his troops towards Hamadān. However, he lost the battle that ensued, and the bowstring put an end to his life (1073). Malik Shāh regulated also the affairs of Asia Minor and Syria, conceding the latter province as an hereditary fief to his brother Tutush, who established himself at Damascus and killed Atsiz. He, however, like his father Alp Arslān, was indebted for his greatest fame to wise and salutary measures of their vizier, Nizām ul-Mulk. This extraordinary man, associated by tradition with Omar Khayyām (*q.v.*), the well-known mathematician and free-thinking poet, and with Hassan (ibn) Sabbāh, afterwards the founder of the sect of the Assassins (*q.v.*), was a renowned author and statesman of the first rank, and immortalized his name by the foundation of several universities (the Nizāmiyah at Bagdād), observatories, mosques, hospitals and other institutions of public utility. At his instigation the calendar was revised, and a new era, dating from the reign of Malik Shāh and known as the Jelalian, was introduced. Not quite forty days before the death of his master this great man was murdered by the Assassins. He had fallen into disfavour because of his unwillingness to join in the intrigues of the princess Turkān Khātūn, who wished to secure the succession to the throne for her infant son Mahmūd at the expense of the elder sons of Malik Shāh.

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[1] Comp. Sachau, "Zur Geschichte und Chronologie von Khwārizm," in *Sitzungsberichte* of the Vienna Acad., lxxiv. 304 seq.

Constitution and Government of the Seljūk Empire.—It has been already observed that the Seljūks considered themselves the defenders of the orthodox faith and of the Abbāsid caliphate, while they on their side represented the temporal power which received its titles and sanction from the successor of the Prophet. All the members of the Seljūk house had the same obligations in this respect, but they had not the same rights, as one of them occupied relatively to the others a place almost analogous to that of the great khān of the Mongols in later times. This position was inherited from father to son, though the old Turkish idea of the rights of the elder brother often caused rebellions and violent family disputes. After the death of Malik Shāh the head of the family was not strong enough to enforce obedience, and consequently the central government broke up into several independent dynasties. Within the limits of these minor dynasties the same rules were observed, and the same may be said of the hereditary fiefs of Turkish amirs not belonging to the royal family, who bore ordinarily the title of *atabeg* or *atabek* (properly "father bey"), *e.g.* the atabegs of Fars, of Azerbaïjan, of Syria, &c. The title was first given to Nizām ul-Mulk and expressed the relation in which he stood to the prince,—as *lala*, "tutor." The affairs of state were managed by the divān under the presidency of the vizier; but in the empire of Rūm its authority was inferior to that of the *pervāneh*, whom we may name "lord chancellor." In Rūm the feudal system was extended to Christian princes, who were acknowledged by the sultan on condition of paying tribute and serving in the armies. The court dignitaries and their titles were manifold; not less manifold were the royal prerogatives, in which the sultans followed the example set by their predecessors, the Būyids.

Notwithstanding the intrigues of Turkān Khātūn, Malik Shāh was succeeded by his elder son Barkiyāroq (1092–1104), whose short reign was a series of rebellions and strange adventures such as one may imagine in the story of a youth who is by turns a powerful prince and a miserable fugitive.[1] Like his brother Mahommed (1104–1118), who successfully rebelled against him, his most dangerous enemies were the Isma‘īlites, who had succeeded in taking the fortress of Alamut (north of Kazvīn) and become a formidable political power by the organization of bands of *fedais*, who were always ready, even at the sacrifice of their own lives, to murder any one whom they were commanded to slay.

Mahommed had been successful by the aid of his brother Sinjar, who from the year 1097 held the province of Khorāsan with the capital Merv. After the death of Mahommed, Sinjar became the real head of the family, though Irak acknowledged Maḥmūd, the son of Mahommed. Thus there originated a separate dynasty of Irak with its capital at Hamadān (Ecbatana); but Sinjar during his long reign often interfered in the affairs of the new dynasty, and every occupant of the throne had to acknowledge his supremacy. In 1117 he led an expedition against Ghazni and bestowed the throne upon Bahrām Shāh, who was also obliged to mention Sinjar's name first in the official prayer at the Ghaznavid capital—a prerogative that neither Alp Arslān nor Malik Shāh had attained. In 1134 Bahrām Shāh failed in this obligation and brought on himself a fresh invasion by Sinjar in the midst of winter; a third one took place in 1152, caused by the doings of the Ghorids (Hosain Jihānsūz, or "world-burner"). Other expeditions were undertaken by him against Khwārizm and Turkestan; the government of the former had been given by Barkiyāroq to Mahommed b. Anushtagīn, who was succeeded in 1128 by his son Atsiz, and against him Sinjar marched in 1138. Though victorious in this war, Sinjar could not hinder Atsiz from afterwards joining the *gurkhan* (great khān) of the then rapidly rising empire of the Karakitai, at whose hands the Seljūk suffered a terrible defeat at Samarkand in 1141. By the invasion of these hordes several Turkish tribes, the Ghuzz and others, were driven beyond the Oxus, where they killed the Seljūk governor of Balkh, though they professed to be loyal to Sinjar. Sinjar resolved to punish this crime; but his troops deserted and he himself was taken prisoner by the Ghuzz, who kept him in strict confinement during two years (1153–1155), though treating him with all outward marks of respect. In the meantime they plundered and destroyed the flourishing cities of Merv and Nishāpūr; and when Sinjar, after his escape from captivity, revisited the site of his capital he fell sick of sorrow and grief and died soon afterwards (1157). His empire fell to the Karakitai and afterwards to the shāh Khwārizm. The successors of Mahommed in Irak were:—Maḥmūd (d. 1131); Toghrul, son of Mahommed, proclaimed by Sinjar (d. 1134); Masūd (d. 1152); Malik Shāh and Mahommed (d. 1159), sons of Maḥmūd; Suleimān Shāh, their brother (d. 1161); Arslān, son of Toghrul (d. 1175); and Toghrul, son of Arslān, killed in 1194 by Inānej, son of his atabeg, Mahommed, who was in confederation with the Khwārizm shāh of the epoch, Takash. This chief inherited his possessions; Toghrul was the last representative of the Seljūks of Irak.

The province of Kermān was one of the first conquests of the Seljūks, and became the hereditary fief of Kāvurd, the son of Chaḳir Beg. Mention has been made of his war with Malik Shāh and of his ensuing death (1073). Nevertheless his descendants were left in possession of their ancestor's dominions; and till 1170 Kermān, to which belonged also the opposite coast of Omān, enjoyed a well-ordered government, except for a short interruption caused by the deposition of Irān Shāh, who had embraced the tenets of the Isma‘īlites, and was put to death (1101) in accordance with a *fatwa* of the *ulema*. But after the death of Toghrul Shāh (1170) his three sons disputed with each other for the possession of the throne, and implored foreign assistance, till the country became utterly devastated and fell an easy prey to some bands of Ghuzz, who, under the leadership of Malik Dinār (1185), marched into Kermān after harassing Sinjar's dominions. Afterwards the shāhs of Khwārizm took this province.[2]

The Seljūkian dynasty of Syria came to an end after three generations, and its later history is interwoven with that of the crusaders. The first prince was Tutush, mentioned above, who perished, after a reign of continuous fighting, in battle against Barkiyāroq near Rai (Rhagae) in 1095. Of his two sons, the elder, Ridwān, established himself at Aleppo (d. 1113); the younger, Duqaq, took possession of Damascus, and died in 1103. The sons of the former, Alp Arslān and Sultān Shāh, reigned a short time nominally, though the real power was exercised by Lūlū till 1117.

After the great victory of Alp Arslān in which the Greek emperor was taken prisoner (1071), Asia Minor lay open to the inroads of the Turks. Hence it was easy for Suleimān, the son of Kutulmish,[3] the son of Arslān Pigu (Israil), to penetrate as far as the Hellespont, the more so as after the captivity of Romanus two rivals, Nicephorus Bryennius in Asia and Nicephorus Botaneiates in Europe, disputed the throne with one another. The former appealed to Suleimān for assistance, and was by his aid brought to Constantinople and seated on the imperial throne. But the possession of Asia Minor was insecure to the Seljūks as long as the important city of Antioch belonged to the Greeks, so that we may date the real foundation of this Seljūk empire from the taking of that city by the treason of its commander Philaretus in 1084, who afterwards became a vassal of the Seljūks. The conquest involved Suleimān in war with the neighbouring Mahommedan princes, and he met his death soon afterwards (1086), near Shaizar, in a battle against Tutush. Owing to these family discords the decision of Malik Shāh was necessary to settle the affairs of Asia Minor and Syria; he kept the sons of Suleimān in captivity, and committed the war against the unbelieving Greeks to his generals Bursuḳ (Προσουχ) and Buzān (Πουζανος). Barkiyāroq, however, on his accession (1092), allowed Kilij Arslān, the son of Suleimān, to return to the dominions of his father. Acknowledged by the Turkish amirs of Asia Minor, he took up his residence in Nicaea, and defeated the first bands of crusaders under Walter the Penniless and others (1096); but, on the arrival of Godfrey of Bouillon and his companions, he was prudent enough to leave his capital in order to attack them as they were besieging Nicaea. He suffered, however, two defeats in the vicinity, and Nicaea surrendered on the 23rd of June 1097. As the crusaders marched by way of Dorylaeum and Iconium towards Antioch, the Greeks subdued the Turkish amirs residing at Smyrna, Ephesus, Sardis, Philadelphia, Laodicea, Lampes and Polybotus;[1] and Kilij Arslān, with his Turks, retired to the north-eastern parts of Asia Minor, to act with the Turkish amirs of Sivās (Sebaste), known under the name of the Danishmand.

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[1] See Defrémery, *Journ. asiatique* (1853), i. 425 seq., ii. 217 seq.

[2] An outline of the history of this branch of the Seljūks is given in *Z.D.M.G.* (1885), pp. 362-401.

[3] This prince rebelled against Alp Arslān in 1064, and was found dead after a battle.

The history of the dynasty of the Danishmand is still very obscure, notwithstanding the efforts of Mordtmann, Schlumberger, Karabaçek, Sallet and others to fix some chronological details, and it is almost impossible to harmonize the different statements of the Armenian, Syriac, Greek and Western chronicles with those of the Arabic, Persian and Turkish. The coins are few in number, very difficult to decipher, and often without date. The founder of the dynasty was a certain Tailu, who is said to have been a schoolmaster (danishmand), probably because he understood Arabic and Persian. His descendants, therefore, took the style of "Ibn Danishmand," often without their own name. They took possession of Sivās, Tokāt, Niksār, Ablastān, Malatia, probably after the death of Suleimān, though they may have established themselves in one or more of these cities much earlier, perhaps in 1071, after the defeat of Romanus Diogenes. During the first crusade the reigning prince was Kumushtegīn (Ahmed Ghāzi), who defeated the Franks and took prisoner the prince of Antioch, Bohemund, afterwards ransomed. He died probably in 1106, and was succeeded by his son Mahommed (d. 1143), after whom reigned Jaghi Basān; but it is very probable that other members of the same dynasty reigned at the same time in the cities already named, and in some others, *e.g.* Kastamuni.

Afterwards there arose a natural rivalry between the Seljūks and the Danishmand, which ended with the extinction of the latter about 1175. Kilij Arslān took possession of Mosul in 1107, and declared himself independent of the Seljūks of Irak; but in the same year he was drowned in the Khaboras through the treachery of his own amirs, and the dynasty seemed again destined to decay, as his sons were in the power of his enemies. The sultan Mahommed, however, set at liberty his eldest son Malik Shāh, who reigned for some time, until he was treacherously murdered (it is not quite certain by whom), being succeeded by his brother Masūd, who established himself at Konia (Iconium), from that time the residence of the Seljūks of Rūm. During his reign—he died in 1155—the Greek emperors undertook various expeditions in Asia Minor and Armenia; but the Seljūk was cunning enough to profess himself their ally and to direct them against his own enemies. Nevertheless the Seljūkian dominion was petty and unimportant and did not rise to significance till his son and successor, Kilij Arslān II., had subdued the Danishmands and appropriated their possessions, though he thereby risked the wrath of the powerful atabeg of Syria, Nureddin, and afterwards that of Saladin. But as the sultan grew old his numerous sons, who held each the command of a city of the empire, embittered his old age by their mutual rivalry, and the eldest, Ḳutb ed-dīn, tyrannized over his father in his own capital, exactly at the time that Frederick I. (Barbarossa) entered his dominions on his way to the Holy Sepulchre (1190). Konia itself was taken and the sultan forced to provide guides and provisions for the crusaders. Kilij Arslān lived two years longer, finally under the protection of his youngest son, Kaikhosrau, who held the capital after him (till 1199) until his elder brother, Rukneddin Suleimān, after having vanquished his other brothers, ascended the throne and obliged Kaikhosrau to seek refuge at the Greek emperor's court. This valiant prince saved the empire from destruction and conquered Erzerūm, which had been ruled during a considerable time by a separate dynasty, and was now given in fief to his brother, Mughīt ud-dīn Toghrul Shāh. But, marching thence against the Georgians, Suleimān's troops suffered a terrible defeat. After this Suleiman set out to subdue his brother Masūd Shāh, at Angora, who was finally taken prisoner and treacherously murdered. This crime is regarded by Oriental authors as the reason of the premature death of the sultan (in 1204); but it is more probable that he was murdered because he displeased the Mahommedan clergy, who accused him of atheism. His son, Kilij Arslān III., was soon deposed by Kaikhosrau (who returned), assisted by the Greek Maurozomes, whose daughter he had married in exile. He ascended the throne the same year in which the Latin empire was established in Constantinople, a circumstance highly favourable to the Turks, who were the natural allies of the Greeks (Theodore Lascaris) and the enemies of the crusaders and their allies, the Armenians. Kaikhosrau, therefore, took in 1207 from the Italian Aldobrandini the important harbour of Attalia (Adalia); but his conquests in this direction were put an end to by his attack upon Lascaris, for in the battle that ensued he perished in single combat with his royal antagonist (1211). His son and successor, Kaikāūs, made peace with Lascaris and extended his frontiers to the Black Sea by the conquest of Sinope (1214). On this occasion he was fortunate enough to take prisoner the Comnenian prince (Alexius) who ruled the independent empire of Trebizond, and he compelled him to purchase his liberty by acknowledging the supremacy of the Seljūks, by paying tribute, and by serving in the armies of the sultan. Elated by this great success and by his victories over the Armenians, Kaikāūs was induced to attempt the capture of the important city of Aleppo, at this time governed by the descendants of Saladin; but the affair miscarried. Soon afterwards the sultan died (1219) and was succeeded by his brother, Alā ud-dīn Kaikobād I., the most powerful and illustrious prince of this branch of the Seljūks, renowned not only for his successful wars but also for his magnificent structures at Konia, Alaja, Sivās and elsewhere, which belong to the best specimens of Saracenic architecture. The town of Alaja was the creation of this sultan, as previously there existed on that site only the fortress of Candelor, at that epoch in the possession of an Armenian chief, who was expelled by Kaikobād, and shared the fate of the Armenian and Frankish knights who possessed the fortresses along the coast of the Mediterranean as far as Selefke (Seleucia). Kaikobād extended his rule as far as this city, and desisted from further conquest only on condition that the Armenian princes would enter into the same kind of relation to the Seljūks as had been imposed on the Comnenians of Trebizond. But his greatest military fame was won by a war which, however glorious, was to prove fatal to the Seljūk empire in the future: in conjunction with his ally, the Ayyubite prince Ashraf, he defeated the Khwārizm shāh Jalāl ud-dīn near Erzingān (1230). This victory removed the only barrier that checked the progress of the Mongols. During this war Kaikobād put an end to the collateral dynasty of the Seljūks of Erzerūm and annexed its possessions. He also gained the city of Khelāt with dependencies that in former times had belonged to the Shāh-i-Armen, but shortly before had been taken by Jalāl ud-dīn; this aggression was the cause of the war just mentioned. The acquisition of Khelāt led, however, to a new war, as Kaikobād's ally, the Ayyubite prince, envied him this conquest. Sixteen Mahommedan princes, mostly Ayyubite, of Syria and Mesopotamia, under the leadership of Malik al-Kāmil, prince of Egypt, marched with considerable forces into Asia Minor against him. Happily for Kaikobād, the princes mistrusted the power of the

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[1] The Turkmans who dwelt in these western parts of Asia Minor, which were never regained by the Seljūks, were called Utch (Outsiders).

Egyptian, and it proved a difficult task to penetrate through the mountainous, well-fortified accesses to the interior of Asia Minor, so that the advantage rested with Kaikobād, who took Kharput, and for some time even held Ḥarrān, Ar-Roha and Rakka (1232). The latter conquests were, however, soon lost, and Kaikobād himself died in 1234 of poison administered to him by his son and successor, Ghiyāss ed-dīn Kaikhosrau II. This unworthy son inherited from his father an empire embracing almost the whole of Asia Minor, with the exception of the countries governed by Vatatzes (Vataces) and the Christian princes of Trebizond and Lesser Armenia, who, however, were bound to pay tribute and to serve in the armies—an empire celebrated by contemporary reports for its wealth.[1] But the Turkish soldiers were of little use in a regular battle, and the sultan relied mainly on his Christian troops, so much so that an insurrection of dervishes which occurred at this period could only be put down by their assistance. It was at this epoch also that there flourished at Konia the founder of the order of the Mevlevis or Mawlawis, Jelāl ed-dīn Rūmī (see Rūmī), and that the dervish fraternities spread throughout the whole country and became powerful bodies, often discontented with the liberal principles of the sultans, who granted privileges to the Christian merchants and held frequent intercourse with them. Notwithstanding all this, the strength and reputation of the empire were so great that the Mongols hesitated to invade it, although standing at its frontiers. But, as they crossed the border, Kaikhosrau marched against them, and suffered a formidable defeat at Kuzadāg (between Erzingān and Sivās), in 1243, which forced him to purchase peace by the promise of a heavy tribute. The independence of the Seljūks was now for ever lost. The Mongols retired for some years; but, Kaikhosrau II. dying in 1245, the joint government of his three sons gave occasion to fresh inroads, till one of them died and Hulagu divided the empire between the other two, Izz ed-dīn (Kaikaus II.) ruling the districts west of the Halys, and Rukneddin (Kilij Arslan IV.) the eastern provinces (1259). But Izz ed-dīn, intriguing with the Mameluke sultans of Egypt to expel his brother and gain his independence, was defeated by a Mongol army and obliged to flee to the imperial court. Here he was imprisoned, but afterwards released by the Tatars of the Crimea, who took him with them to Sarai, where he died. Rukneddin was only a nominal ruler, the real power being in the hands of his minister, Muīn ed-dīn Suleimān, who in 1267 procured an order of the Mongol Khān Abaka for his execution. The minister raised his infant son, Ghiyāss ed-dīn Kaikhosrau III., to the throne, and governed the country for ten years longer, till he was entangled in a conspiracy of several amirs, who proposed to expel the Mongols with the aid of the Mameluke sultan of Egypt, Bibars (Beibars or Beybars). The latter marched into Asia Minor and defeated the Mongols in the bloody battle of Ablastān, the modern Albistan (1277); but, when he advanced farther to Caesarea, Muīn ed-dīn Suleimān retired, hesitating to join him at the very moment of action. Bibars, therefore, in his turn fell back, leaving Suleimān to the vengeance of the khān, who soon discovered his treason and ordered a barbarous execution. Kaikhosrau III. continued to reign in name till 1284, though the country was in reality governed by a Mongol viceroy. Masūd, the son of Izz ed-dīn, who on the death of his father had fled from the Crimea to the Mongol khān and had received from him the government of Sivās, Erzingān and Erzerūm during the lifetime of Kaikhosrau III., ascended the Seljūk throne on the death of Kaikhosrau. But his authority was scarcely respected in his own residence, for several Turkish amirs assumed independence and could only be subdued by Mongol aid, when they retired to the mountains, to reappear as soon as the Mongols were gone. Masūd fell, probably about 1295, a victim to the vengeance of one of the amirs, whose father he had ordered to be put to death. After him Kaikobād, son of his brother Farāmarz, entered Konia as sultan in 1298, but his reign is so obscure that nothing can be said of it; some authors assert that he governed only till 1300, others till 1315. With him ended the dynasty of the Seljūks; but the Turkish empire founded by them continued to exist under the rising dynasty of the Ottomans. (See Turkey.)

Bibliography.—The best, though insufficient, account of the Seljūks is still de Guignes, *Histoire générale des Huns*, bks. x.-xii., from whom Gibbon borrowed his dates. Among translations from original sources (of which the most trustworthy are yet unedited), comp. Mirkhond's *Geschichte der Seldschuken* (ed. Vullers), Giessen, (1838); *Tarikh-ī-Guzideh*, French translation by Defrémery in the *Journal asiatique*, 1848, i. 417 sqq., ii. 259 sqq., 334 sqq.; *Seid Locmani ex libro Turcico qui Oghuzname inscribitur excerpta* (ed. J. H. W. Lagus, Helsingfors, 1854) (on the Seljūks of Asia Minor exclusively, but of little value). Information respecting certain periods is given incidentally in the works of von Hammer and d'Ohsson (see bibliography to Turkey: *History*), and in Stanley Lane Poole's *Mahommedan Dynasties* (1894). (M. T. H.)

SELKIRK (or Selcraig), **ALEXANDER** (1676–1721), Scottish sailor, the prototype of "Robinson Crusoe," seventh son of John Selcraig, shoemaker and tanner of Largo, Fifeshire, was born in 1676. In his youth he displayed an unruly disposition, and, having been summoned on the 27th of August 1695 before the kirk-session for his indecent behaviour in church, "did not compear, being gone away to the seas." In May 1703 he joined Dampier in a privateering expedition to the South Seas, going with the "Cinque Ports" galley as sailing master. In September 1704 the "Cinque Ports" put in at Juan Fernandez Island, west of Valparaiso; here Selkirk had a dispute with his captain, Thomas Stradling, and at his own request was put ashore with a few ordinary necessaries. Before the ship left, he begged to be readmitted, but this was refused, and Selkirk remained alone in Juan Fernandez four years and four months, till on the 31st of January 1709 he was found, and on the 12th of February following taken off, by Captain Woodes Rogers, commander of the "Duke" privateer (with Dampier as pilot), who made him his mate and afterwards gave him command of one of his prizes, "The Increase" (March 29th). Selkirk returned to the Thames on the 14th of October 1711; he was back at Largo in 1712, in 1717 we find him again at sea, and in 1721 he died as master's mate of H.M.S. "Weymouth" (December 12th).

See Woodes Rogers, *Cruising Voyage round the World* (1712), and Edward Cooke, *Voyage in the South Sea and round the World* (1712), the earliest descriptions of Selkirk's adventures; also *Providence Displayed, or a Surprising Account of one Alexander Selkirk . . . written by his own Hand* (reprinted in *Harl. Miscell.* for 1810, v. 429); and Funnell's *Voyage round the World* (1707). Steele made Selkirk's acquaintance, and gave a sketch of the adventurer and his story in the *Englishman* for the 3rd of December 1713. In 1719, shortly after a second edition of Rogers' *Voyage* had appeared (1718), Defoe published *Robinson Crusoe.* While this is clearly indebted in its main outlines to Selkirk's story, most of its incidents are, of course, fairly independent of the latter; thus the decidedly tropical description of Crusoe's island and the whole narrative of the cannibals' visits, &c., agree rather with one of the West Indies than with Juan Fernandez.

The best modern biography is the *Life and Adventures of Alexander Selkirk* by John Howell (1829). In 1868 a tablet was put up on Juan Fernandez at a point on the hill road called "Selkirk's Look-out," where in a gap in the trap rock a magnificent view may be had of the whole island, and of the sea north and south, over which the exile must have often watched for an approaching sail. It bears the following inscription:—"In memory of Alexander Selkirk, mariner, a native of Largo in the county of Fife, Scotland, who was on this island in complete solitude for four years and four months. He was landed from the 'Cinque Porte' (*sic*) galley, 96 tons, 16 guns, 1704 A.D., and was taken off in the 'Duke' privateer, 12th February 1709. He died lieutenant of the 'Weymouth' 1723 A.D., aged forty-seven years. This tablet is erected near Selkirk's look-out by Commodore Powell and officers of H.M.S. 'Topaze,' 1868 A.D."

SELKIRK, THOMAS DOUGLAS, 5th Earl of (1771–1820), was born at St Mary's Isle, Kirkcudbrightshire, on the 20th of June 1771. He succeeded his father in 1799, his six elder brothers having predeceased him. At this time the Highlands of Scotland were being changed into grazing land and deer forests. Selkirk took deep interest in the evicted peasants, and tried to organize emigration to the British colonies. In 1803–1804 he founded a large and prosperous settlement in Prince Edward Island, and at about the same time a smaller one at Baldoon in Upper Canada. He later turned his attention to the Canadian west, and gradually acquired control of the Hudson's Bay Company. In May 1811 an immense tract was granted to him in the Red River valley, and he at once proceeded to send out settlers; but the hostility of the North-West Fur Company, with its headquarters at Montreal, eventually ruined the colony (see Red River Settlement), and the influence of his rivals led to the defeat of Selkirk in various legal proceedings. On the 8th of April 1820 he died broken-hearted at Pau. One of the most generous and disinterested men in the history of colonization, he fell a victim to the predatory selfishness of his rivals.

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[1] See the details in Vincent of Beauvais, *Speculum Historiale*, bk. xxx. chaps. 143, 144.

Copies of his papers, most of which are unpublished, are in the Canadian Archives Department at Ottawa.

SELKIRK, a royal and police burgh and the county town of Selkirkshire, Scotland. Pop. (1901) 6292. It lies on Ettrick Water, about 3 m. above its confluence with the Tweed, 6¼ m. S. of Galashiels by the North British Railway Company's branch line, of which it is the terminus. It is picturesquely situated on a hill on the right bank of the river, close to which are the mills and factories. The public buildings include the county buildings, public hall, library and the town hall (with a spire 110 ft. high). There are statues of Sir Walter Scott in his sheriff's robes, and Mungo Park, the African explorer, who was educated at the grammar school. Woollen manufactures (tweeds, tartans, plaids and shawls) are the principal industry, but the town is also an important agricultural centre. With Galashiels and Hawick it belongs to the Hawick or Border group of parliamentary burghs. Immediately south of the town are the beautiful grounds of the Haining.

As its early name (Scheleschyrche) indicates, Selkirk originally consisted of a number of *shiels* (huts), in the forest beside which a church had been planted by the Culdees of Old Melrose. David I., while prince of Cumbria, founded in 1113 the abbey, which was removed fifteen years afterwards to Kelso, and also erected a castle. Captured by Edward I., by whom it was enlarged and strengthened, the fortress was retaken by Wallace in 1297, and remained in the hands of the Scots till the battle of Halidon Hill (1333), when it was delivered to the English. It was probably destroyed in 1417 when Sir Robert Umfraville, governor of Berwick, set fire to the town, and nothing remains of it save some green mounds and the name Peel Hill. It is significant of the havoc wrought during the Border warfare that there is not in Selkirk, in spite of its antiquity, any building two hundred years old. Of the eighty burghers who marched to Flodden (1513) under William Brydone, the town clerk, only the leader survived, with a banner captured from the English; he was knighted by James V. This banner is locally supposed to be the one borne by the Weavers' Corporation in the annual ceremony of Riding the Common, but the claim cannot be verified. The charter granted by David I. and other muniments having perished, James V. renewed the charter in 1533, with the right to enclose 1000 acres of the common and leave to elect a provost. After the battle of Philiphaugh (1645), David Leslie, the Covenanters' general, had some prisoners confined in the tolbooth of Selkirk and afterwards massacred in the marketplace. From an early period the souters (shoemakers) were a flourishing craft, and in the rebellions of 1715 and 1746 were required to furnish the Jacobites with several thousand pairs of shoes. Though shoemaking is extinct, "the souters of Selkirk" is still a nickname for the inhabitants. Tradition of the ancient craft yet survives also in connexion with the enrolment of burgesses, when the burgess elect has to go through the ceremony of "licking the birse" (*i.e.* bristles). When the loving-cup reaches the candidate he dips in the wine a brush of bristles like that used by shoemakers and passes it through his lips.

SELKIRK MOUNTAINS, a range in the S.E. of British Columbia, Canada, extending N. for about 200 m. from the American frontier with a breadth of about 80 m. and bounded E., W. and N. by the Columbia river. Though often spoken of as part of the Rocky Mountain system, they are really distinct, and belong to an older geological epoch, consisting mainly of crystalline or highly metamorphosed rocks, granites, gneiss, schists; their outline too is rounder and less serrated than that of the Rockies. On the S.E. is the Purcell range, with the main chain of the Rockies still farther E., and on the W. the Gold range, prolonged northward as the Cariboo Mountains. They do not rise much above 10,000 ft., the highest peaks being Sir Donald (named after Lord Strathcona), 10,645 ft.; Macdonald (named after Sir John Macdonald), 9440 ft.; and Mount Tupper (after Sir Charles Tupper), 9030 ft. The scenery is wild and magnificent; below the snow-line, especially on the western side, the slopes are densely wooded, and enormous glaciers fill the upper valleys; of these the most celebrated is that of the Illecillewaet, near Glacier House, on the Canadian Pacific railway. The Selkirks are crossed by the railway at Rogers Pass, discovered in 1883. The engineering difficulties overcome are greater than at any other portion of the line, and the grades are in places very steep. A magnificent series of caverns, called the Nakimu Caves, occur in the Glacier Park Reserve not far from Glacier on the Canadian Pacific railway. These caves are formed by the Cougar Creek, and were first comprehensively surveyed in 1905–1906 (see the Canadian Surveyor-General's *Report* for that year).

SELKIRKSHIRE, a southern county of Scotland, bounded N. by the shires of Peebles and Midlothian, E. and S.E. by Roxburghshire, S. and S.W. by Dumfriesshire and W. by Peeblesshire. Its area is 170,762 acres or 266·8 sq. m. Almost the whole of the surface is hilly, the only low-lying ground occurring in the valleys of the larger streams. The highest hills are found in the extreme west and south-west. On the confines of Peeblesshire the chief heights are Dun Rig (2433 ft.), Black Law (2285), Broad Law (2723) and Lochcraig Head (2625); and on the Dumfriesshire borders, Bodesbeck Law (2173), Capel Fell (2223), Wind Fell (2180) and Ettrick Pen (2269). In the north, close to the Midlothian boundary, is Windlestraw Law (2161). The principal rivers are the Ettrick (32 m.) and its left-hand affluent the Yarrow (14 m.), but for a few miles the Tweed traverses the north of the county. Gala Water (21 m.), though it joins the Tweed a little below Galashiels, belongs rather to Midlothian, since it rises in the Moorfoot Hills and for most of its course flows in that shire. St Mary's Loch and its adjunct, the Loch of the Lornes, in the uplands, are the chief lakes, and of numerous small lakes in the south-east the two lochs of Shaws, Clearburn, Akermoor and Essenside may be mentioned. The vales of the Tweed and Yarrow and Ettrickdale are the principal valleys.

Geology.—This county is entirely occupied by Silurian and Ordovician rocks which are very much folded and crumpled; the axes of the folds run in a south-westerly, north-easterly direction. The Ordovician rocks, represented by the Glenkiln and Hartfell shales, appear in the crests of the anticlinal folds; in the western part of the county they are frequently sandy in character. Above the black Ordovician shales come the Birkhill graptolitic shales followed by the Queensberry grits, a series of greywackes, grits, flags and shales, which pass upwards into the Hawick rocks, shales with brown-weathering greywackes. Some of the Queensberry grits and underlying greywackes in the Ordovician are used as building stones. Igneous rocks are represented by the Tertiary basalt dikes of Bowerhope Law and dikes of quartz-felsite near Windlestraw Law and Caddon Water; dikes of minette occur near Todrig. A great deal of boulder-clay covers the older rocks; the ice-borne material travelled from west to east, and many of the hills show steep and bare slopes towards the west, but have gentle slopes covered with glacial deposits on the eastern side.

Climate and Agriculture.—The rainfall for the year, based on observations at Bowhill, between the confluence of the Yarrow and Ettrick, at a height of 537 ft. above the sea, averages 33·65 in. The mean temperature for the year, calculated at Galashiels (416 ft. above the sea), is 46·3° F., for January 36·2° F., and for July 58·2° F. The climate is thus cold and wet on the whole, and as the soil is mostly thin, over a subsoil of clayey till, agriculture is carried on at a disadvantage. About one-sixth of the surface is under cultivation, oats being almost the only grain crop and turnips the chief green crop. Live stock is pursued more profitably, the sheep walks carrying heavy stocks. Blackfaced are the principal breed on the higher ground, but on the lower pure Cheviots and a cross of Cheviot with Leicester are common. Cattle also are raised, and horses (mainly for agricultural operations) and pigs to only a moderate extent. There are comparatively few small holdings, farms between 100 and 300 acres being the most usual. More than one-third of the county (upwards of 60,000 acres) belongs to the duke of Buccleuch. The land between the Ettrick and the Tweed was formerly covered with forest to such an extent that the sheriffdom was described as Ettrick

Forest. The chief trees were oak, birch and hazel; and the wood being well stocked with the finest breed of red deer in the kingdom became the hunting-ground of the Stuarts. James V., however, to increase his revenues, let the domain for grazing, and it was soon converted into pasture for sheep, with the result that now only about 5000 acres in the shire are under wood.

Manufactures and Communications.—Woollen manufactures (tweeds, tartans, plaiding, yarn and hosiery) are the predominant industry at Galashiels and Selkirk. Tanning, dyeing, engineering, iron-founding and bootmaking also are carried on at Galashiels, and there are large vineries at Clovenfords.

The only railway communication is in the north, where there is a branch line from Galashiels to Selkirk, besides part of the track of the Waverley route from Edinburgh to the south and the line from Galashiels to Peebles. There are coaches from Selkirk to St Mary's Loch and periodically to Moffat.

Population and Administration.—In 1891 the population numbered 27,712, and in 1901 it was 23,356, or 88 to the sq. m., a decrease of 15·78 %, much the largest for the decade in Scotland. Fifty-seven persons spoke Gaelic and English, none Gaelic only. The chief towns are Galashiels (pop. 13,615) and Selkirk (6292). Selkirkshire combines with Peeblesshire to return a member to Parliament, and the county town and royal burgh of Selkirk and the municipal burgh of Galashiels united with Hawick (in Roxburghshire) to constitute the Border or Hawick group of parliamentary burghs. The shires of Selkirk, Roxburgh and Berwick form a sheriffdom, and a resident sheriff-substitute sits at Selkirk and Galashiels. There is a combination poorhouse at Galashiels. The county is under school board jurisdiction, and there are high schools at Selkirk and Galashiels, while some of the other schools in the shire earn grants for higher education. Part of the "residue" grant is spent in supporting short courses of instruction in dairying, and Selkirk town council subsidizes popular science classes in the burgh school.

History and Antiquities.—There are no Roman remains in Selkirkshire, the natives probably being held in check from the station at Newstead near the Eildons. The Standing Stone near Yarrow church bearing a Latin inscription is ascribed to the 5th or 6th century and is only a quasi-Roman relic. No so-called British camps have been found on the upper and middle waters of the Ettrick and Yarrow, and of the few situated in the lower valleys of these streams the most important is the large work on Rink Hill in the parish of Galashiels, the district containing various interesting prehistoric remains. At Torwoodlee, 2 m. north-west of Galashiels, are the ruins of the only example of a *broch* (round tower) in the Border counties. The diameter of the structure measures 75 ft., and that of the enclosed court 40 ft., giving a thickness for the wall of 17½ ft. The *broch* stands in an enclosure of mounds and a ditch, the whole being protected by an outer entrenchment at a considerable distance, of which only a fragment survives. Locally the works are called Torwoodlee Rings, or Eye Castle. The barrier known as the Catrail, or Picts' Work, starts near Torwoodlee, whence it runs southwards to Rink Hill. There it sweeps round to the south-west as far as Yarrow church, from which it again takes a due south direction to the valley of the Rankle, where it passes into Roxburghshire. Some Arthurian romance touches the shire at points, for the field of the battle of Coit Celidon (the Wood of Celidon) was probably in Ettrick Forest, and that of Guinnion in the vale of Gala. The history of the shire for six centuries following the retreat of the Romans is that of the whole of south-eastern Scotland. The country formed part, first, of the British kingdom of Strathclyde, then of the Saxon kingdom of Northumbria, and finally, about 1020, was annexed to Scotland. The first sheriff of whom there is record was Andrew de Synton, appointed by William the Lion (d. 1214). After Edward I. had overrun Scotland substantial burgesses of Selkirk were among those who took the oath of allegiance to him at Berwick in 1296, but next year William Wallace sought the covert of the forest to organize resistance. To the north of Hangingshaw in the country between the Yarrow and Tweed he constructed an earthwork, still called Wallace's Trench, 1000 ft. long and deep enough to conceal a moss horse and his rider, and paved in part with flat whinstones laid on edge. At the higher end on the top of a hill it terminated in a large square enclosure. Here he lay till his plans were completed and at last departed, his forces including a body of Selkirk archers, for a raid into the north of England. During the prolonged strife that followed the death of Robert Bruce (1329) the foresters were constantly fighting, and the county suffered more heavily at Flodden (1513) than any other district. The lawlessness of the Borderers was at length put down by James V. with a strong hand. He parcelled out the forest in districts, and to each appointed a keeper to enforce order and protect property. In 1529 the ringleaders, including William Cockburn of Henderland, Adam Scott of Tushielaw and the notorious Johnnie Armstrong, were arrested and promptly executed. This severity gradually had the desired effect, though after the union of the crowns in 1603 the freebooters and mosstroopers again threatened to be troublesome, until James VI.'s lieutenants ruthlessly stamped out disaffection. The Covenanters held many conventicles in the uplands, and their general, David Leslie, routed the marquis of Montrose at Philiphaugh in 1645.

The manufacture of woollen goods was introduced into Selkirk and Galashiels and attained great success, thus adding largely to the prosperity of the neighbourhood. In another direction the beauty and romance of Yarrow and Ettrick have proved a most stimulating force in modern Scottish literature.

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SELLA, QUINTINO (1827–1884), Italian statesman and financier, was born at Mosso, near Biella, on the 7th of July 1827. After studying engineering at Turin, he was sent in 1843 to study mineralogy at the Parisian school of mines. In Paris he witnessed the revolution of 1848, and only returned to Turin in 1852, when he taught applied geometry at the technical institute. In 1853 be became professor of mathematics at the university, and in 1860 professor of mineralogy in the school of applied engineering. In 1860 he was elected deputy for Cossato. A year later he was selected to be secretary-general of public instruction, and in 1862 received from Rattazzi the portfolio of finance. The Rattazzi cabinet fell before Sella could efficaciously provide for the deficit of £17,500,000 with which he was confronted; but in 1864 he returned to the ministry of finance in the La Marmora cabinet, and dealt energetically with the deficit of £8,000,000 then existing. Persuading the king to forgo £120,000 of his civil list, and his colleagues in the cabinet to relinquish part of their ministerial stipends, he effected savings amounting to £2,400,000, proposed new taxation to the extent of £1,600,000, and induced landowners to pay one year's instalment of the land tax in advance. A vote of the chamber compelled him to resign before his preparations for financial restoration were complete; but in 1869 he returned to the ministry of finance in a cabinet formed by himself, but of which he made over the premiership to Giovanni Lanza. By means of the grist tax (which he had proposed in 1865, but which the Menabrea cabinet had passed in 1868), and by other fiscal expedients necessitated by the almost desperate condition of the national exchequer, he succeeded, before his fall from power in 1873, in placing Italian finance upon a sound footing, in spite of fierce attacks and persistent misrepresentation. In 1870 his great political influence turned the scale against interference in favour of France against Prussia, and in favour of an immediate occupation of Rome. From 1873 until his premature death on the 14th of March 1884, he acted as leader of the Right, and was more than once prevented by an ephemeral coalition of personal opponents from returning to power as head of a Moderate Conservative cabinet. After the failure of an attempt to form a cabinet in May 1881 he practically retired from public life, devoting himself to his studies and his linen factory.

His *Discorsi parlamentari* were published (5 vols., 1887–1890) by order of the Chamber of Deputies. An account of his life and his scientific labours was given by A. Cossa in the *Proceedings of the Accademia dei Lincei* (1884–1885).

SELLAR, WILLIAM YOUNG (1825–1890), Scottish classical scholar, was born at Morvich, Sutherlandshire, on the 22nd of February 1825. Educated at the Edinburgh Academy and afterwards at Glasgow University, he entered Balliol College, Oxford, as a scholar. Graduating with a first-class in classics, he was elected fellow of Oriel, and, after holding assistant professorships at Durham, Glasgow and St Andrews, was appointed professor of Greek at St Andrews (1857). In 1863 he was elected professor of humanity in Edinburgh University, and occupied that chair down to his death on the 12th of October 1890. Sellar was one of the most brilliant of modern classical scholars, and was remarkably successful in his endeavours to reproduce the spirit rather than the letter of Roman literature.

His chief works, *The Roman Poets of the Republic* (3rd ed., 1889) and *The Roman Poets of the Augustan Age* (Virgil, 3rd ed., 1897), and *Horace and the Elegiac Poets* (2nd ed., by W. P. Ker, 1899), with memoir by Andrew Lang, are standard authorities. Sellar contributed to the 9th edition of the *Ency. Brit.* a series of brilliant articles on the Roman poets, the substance of which has been retained in the present edition.

SELMA, a city and the county-seat of Dallas county, Alabama, U.S.A., altitude 126 ft., on the right bank of the Alabama river, a little S. of the centre of the state, and known as the Central City. Pop. (1900) 8713, of whom 4429 were negroes; (1910 U.S. census) 13,649. It is served by the Louisville & Nashville, the Southern and the Western of Alabama railways. It has a Carnegie library, two parks and two Y.M.C.A. buildings. In the city are the Selma Military Institute (1907), and the Alabama Baptist Colored University (opened in 1878), which is one of the largest schools in the South owned and controlled by negroes, and has industrial, domestic, normal, collegiate and (especially) theological courses. The Society of United Charities supports the Selma Hospital (1889) for negroes and the Selma Infirmary (1890). The city has a large trade, principally in cotton (the chief crop of the surrounding country), and in lumber from the great pineries. There are cotton compresses, cotton warehouses, &c.; in 1905 the value of the factory products was $1,138,817. The water supply is obtained from artesian wells. The site was originally called Moore's Bluff, from one Thomas Moore, who owned a steamboat landing here about 1815. A town was established about 1817, and in 1820 was incorporated under its present name (from the Ossianic legend). Selma was first chartered as a city in 1852. During the Civil War it was the seat of Confederate arsenals, shipyards and military factories. On the 2nd of April 1865 it was captured by Federal troops under General James H. Wilson (b. 1837) and much of the city was destroyed by fire. Near Selma lived William Rufus King (1786–1853), a Democratic representative in Congress from North Carolina in 1811–1816, a member of the United States Senate from Alabama in 1819–1844 and 1846–1853, minister to France in 1844–1846, and vice-president of the United States from the 4th of March 1853 until his death on the 18th of April; and Selma was the home of John Tyler Morgan (1824–1907), a brigadier-general in the Confederate army in 1863–1865 and a prominent Democratic member of the United States Senate in 1877–1907; and of Edmund Winston Pettus (1821–1907), also a brigadier-general in the Confederate Army and, in 1897–1907, a Democratic member of the United States Senate.

SELMECZBÁNYA, officially called SELMECZ-ÉS BÉLABÁNYA (Ger. *Schemnitz*), the capital of the county of Hont, Hungary, 152 m. N. of Budapest by rail. Pop. (1900) 16,370, about two-thirds Slovaks. It is an old mining town, situated at an altitude of 1945 ft. in a deep ravine in the Hungarian Ore Mountains, and is built in terraces. Selmeczbánya is encircled by high mountains, notably the isolated peak of the Calvarienberg (2385 ft.) on the S.W., on which are situated a castle and a church, and the Paradiesberg (2400 ft.) on the N.W. It possesses a famous academy of mining and forestry, founded by Maria Theresa in 1760, to which are attached a remarkable collection of minerals, and a chemical laboratory. Among other buildings are a picturesque old castle dating from the 13th century, now in ruins with the exception of a few rooms used as a prison; the new castle, used as a fire watch-tower; and the town hall. The mines, chiefly the property of the state and of the corporation, yield silver, gold, lead, copper and arsenic. The town contains also flourishing potteries, where well-known tobacco pipes are manufactured. About 7 m. to the S.W. of the town lie the baths of Vihnye, with springs of iron, lime and carbonic acid, and about the same distance to the W. are the baths of Szkleno with springs of sulphur and lime.

Selmeczbánya is an old town whose mines existed in the 8th century. In the 12th century, together with the whole mining region of northern Hungary, it was colonized by German settlers, who later embraced the Reformation. Owing to the counter-reformation the German element was driven out during the 18th century, and its place taken by the actual Slovak population.

SELOUS, FREDERICK COURTNEY (1851–), British explorer and hunter, was born in London on the 31st of December 1851, and was educated at Rugby and in Germany. His love for natural history led to the resolve to study the ways of wild animals in their native haunts. Going to South Africa when he was nineteen he travelled from the Cape to Matabeleland, reached early in 1872, and was granted permission by Lobengula to shoot game anywhere in his dominions. From that date until 1890, with a few brief intervals spent in England, Selous hunted and explored over the then little-known regions north of the Transvaal and south of the Congo basin, shooting elephants, and collecting specimens of all kinds for museums and private collections. His travels added largely to the knowledge of the country now known as Rhodesia. He made valuable ethnological investigations, and throughout his wanderings—often among people who had never previously seen a white man—he maintained cordial relations with the Kaffir chiefs and tribes, winning their confidence and esteem, notably so in the case of Lobengula. In 1890 Selous entered the service of the British South Africa Company, acting as guide to the pioneer expedition to Mashonaland. Over 400 m. of road were constructed through a country of forest, mountain and swamp, and in two and a half months Selous took the column safely to its destination. He then went east to Manica, concluding arrangements there which brought the country under British control. Coming to England in December 1892 he was awarded the Founder's medal of the Royal Geographical Society "in recognition of his extensive explorations and surveys," of which he gave a summary in "Twenty Years in Zambesia" (*Geo. Journ.* vol. i., 1893). He returned to Africa to take part in the first Matabele War (1893), being wounded during the advance on Bulawayo. While back in England he married, but in March 1896 was again settled with his wife on an estate in Matabeleland when the native rebellion broke out. He took a prominent part in the fighting which followed, and published an account of the campaign entitled *Sunshine and Storm in Rhodesia* (1896). On the restoration of peace Selous settled in England. He continued, however, to make shooting and hunting expeditions—visiting Asia Minor, Newfoundland, the Canadian Rockies and other parts of the world. In none of his expeditions was his object the making of a "big bag," but as a hunter-naturalist and slayer of great game he ranks with the most famous of the world's sportsmen.

Besides the works mentioned he published *A Hunter's Wanderings in Africa* (1881, 5th ed., 1907), *Travel and Adventure in South-East Africa* (1893), *Sport and Travel, East and West* (1900), *Recent Hunting Trips in British North America* (1907), *African Nature Notes and Reminiscences* (1908), a valuable addition to the knowledge of African fauna, and made numerous contributions to *The Geographical Journal*, the *Field* and other journals.

SELVE, ODET DE (*c.* 1504–1563), French diplomatist, was the son of Jean de Selve, first president at the parlements of Rouen and Bordeaux, vice-chancellor of Milan, and ambassador of the king of France. In 1540 Odet was appointed councillor at the parlement of Paris and in 1542 at the grand council. In 1546, after the signature of the treaty of Ardres, he was sent on an embassy to England, in 1550 to Venice, and afterwards to Rome, where he obtained the election of Pope Paul IV. in 1555.

SELWYN, ALFRED RICHARD CECIL (1824–1902), British geologist, son of the Rev. Townshend Selwyn, Canon of Gloucester, was born at Kilmington in Somerset on the 28th of July 1824. Educated in Switzerland, he there became interested in geology, and in 1845 he joined the staff of the Geological Survey of Great Britain. He was actively engaged in the survey of North Wales and bordering portions of Shropshire, and a series of splendid geological maps resulted from his joint work with A. C. Ramsay and J. B. Jukes. In 1852 he was appointed director of the Geological Survey of Victoria, Australia, where he gave special attention to the gold-bearing rocks, until in 1869 the Colonial Legislature brought the Survey to an abrupt termination. At this date Sir W. E. Logan had just retired from the office of director of the Geological Survey of Canada, and Selwyn was appointed his successor. In this new sphere of activity he continued his geological work with marked success, devoting particular attention to the Pre-Cambrian rocks of Quebec. He retired in 1894. Meanwhile in 1874 he had been elected F.R.S., in 1876 he was awarded the Murchison Medal of the Geological Society of London, and he was created C.M.G. in 1886 for his distinguished work as assistant to the Canadian Commissioners at the exhibitions in Philadelphia (1876), Paris (1878) and London (1886). He retired to Vancouver in British Columbia, where he died on the 19th of October 1902.

See memoir with portrait in *Geol. Mag.* (Feb. 1899).

SELWYN, GEORGE AUGUSTUS (1719–1791), English wit, son of Colonel John Selwyn (d. 1751) of Matson, Gloucestershire, was born on the 11th of August 1719. Educated at Eton and Oxford, he became member of parliament for the family borough of Ludgershall in 1747, and from 1754, three years after he inherited Matson, to 1780 he represented Gloucester. In parliament he took no part in debate, but he managed to obtain two or three lucrative sinecures; in society he was very popular and won a great reputation as a wit. He is said to have been very fond of seeing corpses, criminals and executions, and Horace Walpole says he loved " nothing upon earth so well as a criminal, except the execution of him." He died in London on the 25th of January 1791. Like the eccentric duke of Queensberry Selwyn claimed to be the father of Maria Fagniani, who became the wife of Francis Charles Seymour, 3rd marquess of Hertford.

See J. H. Jesse, *George Selwyn and his Contemporaries* (1843–1844; new ed., 1882); and S. P. Kerr, *George Selwyn and the Wits* (1909).

SELWYN, GEORGE AUGUSTUS (1809–1878), English bishop, second son of William Selwyn (1775–1855), a distinguished legal writer, was born at Hampstead, London, on the 5th of April 1809. He was educated at Eton and at St John's College, Cambridge, where in 1829 he rowed in the first university boat-race. He took his degree (second in the classical tripos) in 1831. He returned to Eton as private tutor, was ordained deacon in 1833, and devoted himself with characteristic energy to work in the parish of Windsor. In 1841 it was proposed that he should go out as first bishop to New Zealand, then just beginning to be colonized. Despite the advice of his friends he accepted the offer. He studied navigation and the Maori language on the voyage, and gave himself up to a life of continual strain and hardship. He spent days and sometimes nights in the saddle, swam broad rivers and provided himself with a sailing vessel. Unfortunately, just when he had gained the confidence of the natives, his ascendancy was rudely shaken by the first Maori war. Selwyn endeavoured to mediate, but incurred the hostility of both parties. He went to the battlefield to minister to the sick and wounded in both camps; but the Maoris were persuaded that he had gone out to fight against them, and years afterwards one of them pointed out a scar on his leg to an Anglican bishop which he declared had been inflicted by Selwyn's own hands. It was long before he regained the confidence he had forfeited by his strict adherence to duty. In 1854 he returned to England for a short furlough; but he spent much of it in pleading the needs of his diocese. He returned to New Zealand with a band of able associates, including J. C. Patteson, and began to divide his large diocese into sees of more manageable proportions. The colonists came to respect his uprightness, and the Maoris learned to regard him as their father. In 1868, while he was in England to attend the first pan-Anglican synod, the bishopric of Lichfield became vacant, and after some hesitation he accepted it. In his new sphere of work he displayed the same unselfish activity as before, and in the " Black Country " portion of his diocese he won the hearts of the working classes. He called his clergy and laity together for consultation in the diocesan conference, an innovation the value of which he had proved by his colonial experience. On his death, on the 11th of April 1878, his great work for the church was celebrated by a remarkable memorial, Selwyn College, Cambridge, being erected by public subscription and incorporated in 1882.

See *Lives* by H. W. Tucker (2 vols., 1879) and G. H. Curteis (1889).

His son, John Richardson Selwyn (1844–1898), bishop of Melanesia, was born in New Zealand on the 20th of May 1844. He was educated at Eton and at Trinity College, Cambridge, and was ordained deacon in 1869. At first he laboured with energy and tact as vicar of Wolverhampton in his father's diocese of Lichfield; but the martyrdom of John Coleridge Patteson, bishop of Melanesia, led him to volunteer for service in the Australasian Archipelago. After three years' service, during which the bishopric remained vacant, he was nominated as Patteson's successor (1877). For twelve years he threw himself with intense energy into his arduous work, but his health broke down and he returned to England in 1890. There he found an appropriate sphere in the mastership of Selwyn College, where he remained until his death on the 12th of February 1898.

SEMANG, an aboriginal people of the Malay peninsula, found in northern Perak, Kedah, Kelantan, Trengganu and the northern districts of Pahang. They are a fairly pure branch of the woolly-haired Negrito race, which includes the natives of the Andaman islands, the Aetas of the Philippines and the dwarfs of Central Africa. The men average about 4 ft. 9 or 10 in., while the women are 3½ in. shorter. Their colour is a very dark brown or black. The shape of the head is round, or intermediate between round and long. The forehead is low and rounded, and projects over the root of the nose, which is short, depressed and pyramid-shaped. The eyes are wide open and round, showing no obliquity, the iris being of a very rich, deep brown. Lips vary from moderate to full, the mouth is rather large, the chin feebly developed, and the jaws are often slightly projecting. The hair is very dark-brown black, never blue-black as among Chinese and Malays. It grows in short, spiral tufts, curling closely all over the head. The arm-stretch is almost always greater than their height. The feet are usually short and splayed, with a remarkable inward curve of the great toe, and are very prehensile. The Semangs live in caves or leaf-shelters formed between branches. A waistcloth for the men, made of tree bark hammered out with a wooden mallet from the bark of the terap, a species of wild bread-fruit tree, and a short petticoat of the same for the women, is the only dress worn; many go naked. Tattooing, or rather scarring, is practised, by drawing the finely serrated edge of a sugar-cane leaf across the skin and rubbing in charcoal powder. They have bamboo musical instruments, a kind of Jews' harp and a nose flute. On festive occasions there is song and dance, both sexes decorating themselves with leaves. The Semangs bury their dead simply, food and drink being placed in the grave.

SEMAPHORE, a town of Adelaide county, South Australia, 9½ m. by rail from the city of Adelaide. It is one of the chief watering-places of the state, with a pier 1800 ft. long. Pop. about 8000.

SEMAPHORE (Gr. σῆμα, sign, and φορά, carrying, from φέρειν, to bear), the name of an apparatus or mechanical device by which information or messages can be signalled to a distance. It consists of movable arms or blades of wood, worked by levers and affixed to a high post or pole. The most familiar semaphore is that used in railway signalling on the block system, where the blade if horizontal signifies danger, if dropped safety. Used with a code, the semaphore is still used in the navy for signalling from ship to ship. Until the invention of the electric telegraph, the semaphore was used for transmitting messages over long distances.

SEMELĒ, in Greek mythology, daughter of Cadmus and Harmonia, and mother of Dionysus by Zeus. It is said that Hera, having assumed the form of Semelē's nurse, persuaded her rival to ask Zeus to show himself to her in all his glory. The god, who had sworn to refuse Semelē nothing, unwillingly consented. He appeared seated in his chariot surrounded by thunder and lightning; Semelē was consumed by the flames and gave birth prematurely to a child, which was saved from the fire by a miraculous growth of ivy which sprang up round the palace of Cadmus. Dionysus afterwards descended to the nether world, and brought up his mother, henceforth known as Thyōnē (the raging one), to Olympus. Zeus and Semelē probably represent the fertilizing rain of spring, and the earth, afterwards scorched by the summer heat. Another tradition represents Actaeon as the lover of Semelē, and his death as due to the jealousy of Artemis. A statue and grave were to be seen in Thebes.

See Apollodorus iii. 4; Pausanias iii. 24. 3, ix. 2. 3; Ovid, *Metam.* iii. 260.

SEMENDRIA (*Smederevo*), an important commercial town and capital of the Smederevo department, Servia, on the Danube, between Belgrade and the Iron Gates. Pop. (1900) 6912. It is believed to stand on the site of the Roman settlement *Mons aureus*, and there is a tradition that its famous vineyards—supplying Budapest and Vienna with some of the finest table grapes—were planted by the Roman emperor Probus (A.D. 276–282). In the 15th century, when the Servian prince George Brankovich became lord of Tokay, in Hungary, he planted vines from Semendria on his estates there; and from these came the famous white wine *Tokay*. At the eastern end of the town, close to the river, there is a picturesque triangular castle with twenty-four square towers, built by George Brankovich in 1430 on the model of the Constantinople walls. Semendria was the residence of that Servian ruler and the capital of Servia from 1430 to 1459. It is the seat of the district prefecture and a tribunal, and has a garrison of regular troops. Besides the special export of grapes and white wine, a great part of the Servian export of pigs, and almost all the export of cereals, pass through Semendria. In 1886 the town was connected with the Belgrade-Nish railway by a branch line.

SEMINARY (Lat. *seminarium*, from *semen*, seed), a term originally applied to a nursery-garden or place where seeds are sown to produce plants for transplanting. It was early used in its present sense of a place of education. Its most frequent use is for a training college for the Roman Catholic priesthood, and in a transferred sense for a priest who has been trained in a foreign seminary, also often termed a "seminarist." A German usage, adopted in America, applies the term *seminar* to a class for advanced study or research.

SEMINOLE (properly *Simanoli*, "renegade," "runaway," in allusion to their secession from the Creek confederacy), a tribe of North American Indians of Muskhogean stock. They originally formed part of the Creek confederacy, but separated from it early in the 18th century, and occupied the greater part of Florida. In 1817–1818 their attacks on the Georgian and Alabama settlements resulted in the invasion of their territory by General Andrew Jackson, who defeated them and hanged two British traders, named Arbuthnot and Ambrister, who were alleged to be the instigators of the raids. The long Seminole War of 1835–42, the hardest-fought of all the Indian wars, was due to the tribe's refusal to cede their lands and remove to Arkansas in accordance with the treaty (see OSCEOLA) of Payne's Landing (1832). At the close of this struggle, costing thousands of lives and millions of dollars, the Seminoles were removed to Arkansas. They were recognized as "the Seminole Nation," and as one of the "Five Civilized Tribes," and granted autonomy upon the scale permitted the other four, the Cherokee, Chickasaw, Choctaw and Creek. They live now mainly in Oklahoma, and a few in Florida.

SEMIPALATINSK, a province of the Russian dominions in Central Asia; administratively it forms a part of the general-governorship of the Steppes, although its northern portions really belong to the Irtysh plains of West Siberia. It is bounded on the N. by Tobolsk and Tomsk, on the S.E. by China, on the S. by Semiryechensk, and on the W. by Akmolinsk. As regards configuration, it differs widely in its northern and southern parts. The snow-clad ranges (9000 to 10,000 ft.) of the Altai and Narym enter it in the S.E., stretching S. to Lake Zaisan. Another complex of mountains, Kalbin, rising 5000 and 6000 ft. above the sea, continues them towards the west. A broad valley intervenes, through which the Irtysh finds its way from the Zaisan terrace to the lowlands of Siberia. Many extensions of these mountains and subordinate ranges stretch towards the north. The still lower but wild Chinghiz-tau mountains diversify the south-western part of Semipalatinsk, sending out their rocky spurs into the steppe region. In the south, the Tarbagatai (Marmots') range (9000 to 10,000 ft.) separates Semipalatinsk from Semiryechensk and Dzungaria. Wide steppes fill up the spaces between the mountains: *e.g.* the Zaisan steppe (1200 to 1500 ft.), between the Tarbagatai and the Altai ranges; the plains of Lake Balkash, some 300 ft. lower, to the south of the Chinghiz-tau; and the plains of the Irtysh, which hardly rise 600 ft. above the sea. All kinds of crystalline rocks—granites, syenites, diorites and porphyries, as also slates of all descriptions—are met with in the mountainous tracts. There also occur rich gold-bearing sands, silver and lead mines, graphite, coal and the less valuable precious stones. The geology of the region and even its topography are still but imperfectly known. Numerous boulders scattered over the mountains testify to a much wider extension of glaciers in former times. The chief river of the province, the Irtysh, which issues from Lake Zaisan, flows north and north-west and drains Semipalatinsk for more than 760 m. Between Bukhtarma and Ust-Kamenogorsk it cuts its way through the Altai by a wild gorge, with dangerous rapids, through which, however, boats are floated. Lake Zaisan, 80 m. long and 10 to 20 m. wide, has depth sufficient for steamboat navigation; steamers traverse also for some 100 m. the lower course of the Black Irtysh, which flows from Kulja to Lake Zaisan. The Kurchum, the Narym and the Bukhtarma are the chief right-hand tributaries of the Irtysh, while the Char-urban, Chagan and many smaller streams join it from the left; none are navigable; neither are the Kokpekty and Bugaz, which enter Lake Zaisan on the west. Lake Balkash, which borders Semipalatinsk on the south-west, formerly received several tributaries from the Chinghiz-tau. Many smaller lakes (some of them merely temporary) occur on the Irtysh plain, and yield salt.

The climate is severe. The average yearly temperature reaches 43° in the south and 34° in the north; the winter is very cold, and frosts of −44° F. are not uncommon, while the thermometer rises to 122° in the shade in the summer. The yearly amount of rain and snow is trifling, although snow-storms are very common; strong winds prevail. Forests are plentiful in the hilly districts and on the Irtysh plain, the flora being Siberian in the north and more Central Asiatic towards lakes Balkash and Zaisan.

The area of the province is 183,145 sq. m., and in 1906 its population was estimated at 767,500. Only about 6% of the population is settled, the remainder, chiefly Kirghiz, being nomads. The province is divided into five districts, the chief towns of which are Semipalatinsk, Pavlodar, Kokpekty, Karkaralinsk and Ust-Kamenogorsk. The Russians are chiefly agriculturists, and have wealthy settlements on the right bank of the Irtysh, as well as a few patches in the south, at the foot of the mountains. The Kirghiz are almost exclusively live-stock breeders and keep large flocks of sheep, horses and cattle, as also camels. Hunting is a favourite and profitable occupation with the Cossacks and the Kirghiz. Bee-keeping is extensively followed, especially among the Cossacks. Fishing, which is carried on in lakes Zaisan and Balkash, as also in the Black Irtysh, is of considerable importance. Gold is mined, also silver, copper, salt and coal. There are two ironworks, but the only other industrial establishments of any size are a steam flour-mill and a distillery. A considerable amount of trade is carried on within the province, in which twenty fairs are held every year.

SEMIPALATINSK, a town of Asiatic Russia, capital of the province of the same name, on the right bank of the Irtysh, and on the highway from Dzungaria to Omsk, 683 m. by river S.E. of the latter. Pop. (1881) 17,820, (1897) 26,353. It carries on a considerable trade, especially with the Kirghiz, and has a flour-mill, distillery and tanneries. Steamers ply on the Irtysh down to Omsk and up to Lake Zaisan.

SEMĪRAMIS (*c.* 800 B.C.), a famous Assyrian princess, round whose personality a mass of legend has accumulated. It was not until 1910 that the researches of Professor Lehmann-Haupt of Berlin restored her to her rightful place in Babylonian-Assyrian history. The legends derived by Diodorus Siculus, Justin and others from Ctesias of Cnidus were completely disproved, and Semīramis had come to be treated as a purely legendary figure. The legends ran as follows: Semīramis was the daughter of the fish-goddess Atargatis (*q.v.*) of Ascalon in Syria, and was miraculously preserved by doves, who fed her until she was found and brought up by Simmas, the royal shepherd. Afterwards she married Onnes, one of the generals of Ninus, who was so struck by her bravery at the capture of Bactra that he married her, after Onnes had committed suicide. Ninus died, and Semīramis, succeeding to his power, traversed all parts of the empire, erecting great cities (especially Babylon) and stupendous monuments, or opening roads through savage mountains. She was unsuccessful only in an attack on India. At length, after a reign of forty-two years, she delivered up the kingdom to her son Ninyas, and disappeared, or, according to what seems to be the original form of the story, was turned into a dove and was thenceforth worshipped as a deity. The name of Semīramis came to be applied to various monuments in Western Asia, the origin of which was forgotten or unknown (see Strabo xvi. 1. 2). Ultimately every stupendous work of antiquity by the Euphrates or in Iran seems to have been ascribed to her —even the Behistun inscriptions of Darius (Diod. Sic. ii. 3). Of this we already have evidence in Herodotus, who ascribes to her the banks that confined the Euphrates (i. 184) and knows her name as borne by a gate of Babylon (iii. 155). Various places in Media bore the name of Semīramis, but slightly changed, even in the middle ages, and the old name of Van was Shamiramagerd, Armenian tradition regarding her as its founder. These facts are partly to be explained by observing that, according to the legends, in her birth as well as in her disappearance from earth, Semīramis appears as a goddess, the daughter of the fish-goddess Atargatis, and herself connected with the doves of Ishtar or Astartē. The same association of the fish and dove is found at Hierapolis (Bambyce, Mabbog), the great temple at which, according to one legend, was founded by Semīramis (Lucian, *De dea Syria*, 14), where her statue was shown with a golden dove on her head (33, 39). The irresistible charms of Semīramis, her sexual excesses (which, however, belong only to the legends: there is no historical groundwork), and other features of the legend, all bear out the view that she is primarily a form of Astartē, and so fittingly conceived as the great queen of Assyria.

Professor Lehmann-Haupt, by putting together the results of archaeological discoveries, has arrived at the following conclusions. Semīramis is the Greek form of Sammuramat. She was probably a Babylonian (for it was she who imposed the Babylonian cult of Nebo or Nabu upon the Assyrian religion). A column discovered in 1909 describes her as "a woman of the palace of Samsi-Adad, King of the World, King of Assyria, . . . King of the Four Quarters of the World." Ninus was her son. The dedication of this column shows that Semīramis occupied a position of unique influence, lasting probably for more than one reign. She waged war against the Indo-Germanic Medes and the Chaldaeans. The legends probably have a Median origin. A popular etymology, which connected the name with the Assyrian *summat*, "dove," seems to have first started the identification of the historical Semīramis with the goddess Ishtar and her doves.

See F. Lenormant, *La Légende de Sémiramis* (1873); A. H. Sayce, "The Legend of Semīramis," in *Hist. Rev.* (January, 1888).

SEMIRYECHENSK, a province of Russian Turkestan, including the steppes south of Lake Balkash and parts of the Tian-shan Mountains around Lake Issyk-kul. It has an area of 147,300 sq. m., and is bounded by the province of Semipalatinsk on the N., by China (Dzungaria, Kulja, Aksu and Kashgaria) on the E. and S., and by the Russian provinces of Ferghana, Syr-darya, and Akmolinsk on the W. It owes its name (*Jity-su*, *Semiryechie*, *i.e.* "Seven Rivers") to the rivers which flow from the south-east into Lake Balkash. The Dzungarian Ala-tau Mountains, which separate it from Kulja, extend south-west towards the river Ili, with an average height of 6000 ft. above the sea, several isolated snow-clad peaks reaching 11,000 to 14,000 ft. In the south Semiryechensk embraces the intricate systems of the Ala-tau and the Tian-shan. Two ranges of the former the Trans-Ili Ala-tau and the Kunghei Ala-tau, stretch along the north shore of Lake Issyk-kul, both ranging from 10,000 to 15,000 ft. and both partially snow-clad. South of the lake two ranges of the Tian-shan, separated by the valley of the Naryn, stretch in the same direction, lifting up their icy peaks to 16,000 and 18,000 ft.; while westwards from the lake the precipitous slopes of the Alexander chain, 9000 to 10,000 ft. high, with peaks rising 3000 to 4000 ft. higher, extend into the province of Syr-darya. Another mountain-complex of much lower elevation runs north-westwards from the Trans-Ili Ala-tau towards the southern extremity of Lake Balkash. In the north, where the province borders Semipalatinsk, it includes the western parts of the Tarbagatai range, the summits of which (10,000 ft.) do not reach the limit of perpetual snow. The remainder of the province consists of a fertile steppe in the north-east (Sergiopol), and vast uninhabitable sand-steppes on the south of Lake Balkash. Southwards from the last-named, however, at the foot of the mountains and at the entrance to the valleys, there are rich areas of fertile land, which are being rapidly colonized by Russian immigrants, who have also penetrated into the Tian-shan, to the east of Lake Issyk-kul.

The climate is thoroughly continental. In the Balkash steppes the winter is very cold; the lake freezes every year, and the thermometer falls to 13° F. In the Ala-kul steppes the winds blow away the snow. The passage from winter to spring is very abrupt, and the prairies are rapidly clothed with vegetation, which, however, is soon scorched up by the sun. The average temperatures are: at Vyernyi (2405 ft. high), for the year 46·4° F., for January 17°, for July 74°; at Przhevalsk (5450 ft.), for the year 36·5°, for January 23°, for July 63°; still higher in the mountains, at Naryn (6900 ft.) the average temperatures are only, for the year 43·7°, for January 1·4°, for July 64·4°. The yearly rainfall at these three places is 21·0, 16·0, and 11·8 in. respectively.

The most important river is the Ili, which enters the province from Kulja and drains it for 250 m. before it enters Lake Balkash. The Chu rises in the Tian-shan Mountains and flows north-westwards through Akmolinsk; and the Naryn flows south-westwards along a longitudinal valley of the Tian-shan, and enters Ferghana to join the Syr-darya. Lake Balkash, or Denghiz, Lake Ala-kul (which was connected with Balkash in the post-Pliocene period, but now stands some hundred feet higher, and is connected by a chain of smaller lakes with Sissyk-kul), Lake Issyk-kul and the alpine lakes of Son-kul and Chatyr-kul are the principal sheets of water.

The population was estimated in 1906 as 1,080,700. Kirghiz form 76% of the population, Taranchis 5·7 %, Russians 14 % and Dzungans most of the remainder. The province is divided into six districts, the chief towns of which are Vyernyi (the capital), Jarkent, Kopal, Pishpek, Przhevalsk and Sergiopol. The chief occupation of the Russians, the Taranchis and the Dzungans, and partly also of the Kirghiz, is agriculture. The most important crops are wheat, barley, oats, millet, rice and potatoes. A variety of oil-bearing plants and green fodder, as also cotton, hemp, flax and poppies, are grown. Live-stock breeding is very extensively carried on by the Kirghiz, namely, horses, cattle, sheep, camels, goats and pigs. Orchards and fruit gardens are well developed; the crown maintains two model gardens. Bee-keeping is widely spread. The factories consist of flour-mills, distilleries, tanneries and tobacco works; but a great many domestic trades, including carpet-weaving and the making of felt goods, saddlery and iron goods, are carried on, among both the settled inhabitants and the nomad Kirghiz. There is a trade with China, valued at less than half a million sterling annually. Previous to 1899 this province formed part of the general-governorship of the Steppes.

SEMITIC LANGUAGES, the general designation of a group of Asiatic and African languages, some living and some dead, namely Assyrian, Hebrew, Phoenician, Aramaic, Arabic, Ethiopic, Mahri-Socotri. The name, which was introduced by Schlözer, is derived from the fact that most nations which speak or spoke these languages are descended, according to Genesis, from Shem, son of Noah.[1] But the classification of nations in Genesis x. is founded neither upon linguistic nor upon ethnographical principles: it is determined rather by geographical and political considerations. For this reason Elam and Lud are also included among the children of Shem; but neither the Elamites (in Susiana) nor the Lydians appear to have spoken a language connected with Hebrew. On the other hand, the Phoenicians (Canaanites), whose dialect closely resembled that of Israel, are not counted as children of Shem. Moreover, the compiler of the list in Genesis x. had no clear conceptions about the peoples of south Arabia and Ethiopia. Nevertheless it would be undesirable to give up the universally received terms "Semites" and "Semitic."

Mutual connexion.

The connexion of the Semitic languages with one another is somewhat close, in any case closer than that of the Indo-European languages. The more ancient Semitic tongues differ from one another scarcely more than do the various Teutonic dialects. Hence even in the 17th century such learned Orientalists as Hottinger, Bochart, Castell and Ludolf had a tolerably clear notion of the relationship between the different Semitic languages with which they were acquainted; indeed the same may be said of some Jewish scholars who lived many centuries earlier, as, for instance, Jehuda ben Koreish. It is not difficult to point out a series of characteristic marks common to these languages,—the predominance of triconsonantal roots, or of roots formed after the analogy of such, similarity in the formation of nominal and verbal stems, a great resemblance in the forms of the personal pronouns and in their use for the purpose of verbal inflection, the two principal tenses, the importance attached to the change of vowels in the interior of words, and lastly, considerable agreement with regard to order and the construction of sentences. Yet even so ancient a Semitic language as the Assyrian appears to lack some of these features, and in certain modern dialects, such as New Syriac, Mahri and more particularly Amharic, many of the characteristics of older Semitic speech have disappeared. And the resemblance in vocabulary generally diminishes in proportion to the modernness of the dialects. Still we can trace the connexion between the modern and the ancient dialects, and show, at least approximately, how the former were developed out of the latter. Where a development of this kind can be proved to have taken place, there a relationship must exist, however much the individual features may have been effaced. The question here is not of logical categories but of organic groups.

All these languages are descendants of a primitive Semitic language which has long been extinct. Of course this should not be taken literally as implying an absolute unity. If, in the strictest sense of the words, no two men ever speak the same language, it must apply with still greater force to any considerable mass of men not living in the closest conjunction; and as such we must conceive the ancient Semites, so soon as they had severed themselves from other races. As long as the primitive Semitic people occupied no great extent of territory, many linguistic differences existent in their midst might still be reconciled. Other differences, however, might even then have formed the germs of the subsequent dialectical distinction. Thus, if the gradual, or sudden, separation of individual sections of the people led to alienation on a large scale, their dialects must necessarily have developed decided lines of cleavage and become finally distinct languages. With all this, it is still possible that, even in that pre-historic era, peaceful or warlike intercourse may have exercised an influence tending to assimilate these languages once again. Within the limitations which we have intimated rather than discussed, the expression "proto-Semitic language" is thoroughly justifiable.

Primitive Semitic language.

Many of its most important features may be reconstructed with at least tolerable certainty, but we must beware of attempting too much in this respect. When the various cognate languages of a group diverge in essential points, it is by no means always possible to determine which of them has retained the more primitive form. The history of the development of these tongues during the period anterior to the documents which we possess is often extremely obscure in its details. Even when several Semitic languages agree in important points of grammar we cannot always be sure that in these particulars we have what is primitive, since in many cases analogous changes may have taken place independently. To one who should assert the complete reconstruction of the primitive Semitic language to be possible, we might put the question, Would the man who is best acquainted with all the Romance languages be in a position to reconstruct their common mother, Latin, if the knowledge of it were lost? And yet there are but few Semitic languages which we can know as accurately as the Romance languages are known. As far as the vocabulary is concerned, we may indeed maintain with certainty that a considerable number of words which have in various Semitic languages the form proper to each were a part of primitive Semitic speech. Nevertheless even then we are apt to be misled by independent but analogous formations and by words borrowed at a very remote period.[2] Each Semitic language or group of languages has, however, many words which we cannot point out in the others. Of such words a great number no doubt belonged to primitive Semitic speech, and either disappeared in some of these languages or else remained in use, but not so as to be recognizable by us. In the case of certain proto-Semitic words, we can even yet observe how they gradually recede from the foreground. So, for instance, in Hebrew, Aramaic and Arabic, the common designation of the lion, *laith*, has disappeared, almost before our eyes, in order to make room for other expressions. Yet many isolated words and roots may in very early times have been borrowed by the Hebrew, the Aramaic, the Ethiopic, &c., perhaps from wholly different languages, of which no trace is left. To what extent the separate languages created new roots is an extremely obscure problem.

The question which of the known Semitic dialects most resembles the primitive Semitic language is less important than one might at first suppose, since the question is one not of absolute but only of relative priority. After scholars had given up the notion (which, however, was not the fruit of scientific research) that all Semitic languages, and indeed all the languages in the world, were descendants of Hebrew or of Aramaic, it was long the fashion to maintain that Arabic bore a close resemblance to the primitive Semitic language.[3] But, just as it is now recognized with ever-increasing clearness that Sanskrit is far from having retained in such a degree as was even lately supposed the characteristics of primitive Indo-European speech, so in the domain of the Semitic tongues we can assign to Arabic only a relative antiquity. It is true that in Arabic very many features are preserved more faithfully than in the cognate languages,—for instance, nearly all the original abundance of consonants, the short vowels in open syllables, particularly in the interior of words, and many grammatical distinctions which in the other languages are more or less obscured. On the other hand, Arabic has coined, simply from analogy, a great number of forms which, owing to their extreme simplicity, seem at the first glance to be primitive, but which nevertheless are only modifications of the primitive forms; whilst perhaps the other Semitic languages exhibit modifications of a different kind. In spite of its great wealth, Arabic is characterized by a certain monotony, which can scarcely have existed from the beginning. Both Hebrew and even Aramaic are in many respects more ancient than Arabic. This would no doubt be far more apparent if we knew Hebrew more completely and according to the original pronunciation of its vowels, and if we could discover how Aramaic was pronounced about the 13th century before our era. It must always be borne in mind that we are far more fully and accurately acquainted with Arabic than with the other Semitic languages of antiquity. The opinion sometimes maintained by certain over-zealous Assyriologists, that Assyrian is the "Sanskrit of the Semitic world," has not met with the approval even of the Assyriologists themselves, and is unworthy of a serious refutation.

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[1] In Eichhorn's *Repertorium*, viii. 161 (1781). Universally accepted from Eichhorn's *Einleitung in das Alte Testament*, 2nd ed., i. 15 (Leipzig, 1787).

[2] The more alike two languages are the more difficult it usually is to detect, as borrowed elements, those words which have passed from one language into the other.

[3] This theory is carried to its extreme limit in Olshausen's very valuable *Hebrew Grammar* (Brunswick, 1861).

A comparative grammar of the Semitic languages must of course be based upon Arabic, but must in every matter of detail take into consideration all the cognate languages, as far as they are known to us. In the reconstruction of the primitive Semitic tongue Hebrew might perhaps afford more assistance than Ethiopic; but Aramaic, Assyrian, and even the less known and the more modern dialects might furnish valuable materials.

The method by which these younger languages, especially the dialects of to-day, have received their present form, may be traced with tolerable comprehensiveness. Thus we gain valuable analogies for determining the genetic process in the older tongues. At the same time, a conscientious investigation forces upon us the conviction that there are many and important phenomena which we are powerless to explain; and this applies, in part, to cases where, at first, the solution appears perfectly simple. So, although we have seen that the main features of the correspondence between the Semitic languages have long been definitely established—years before Bopp scientifically demonstrated the connexion of the Indo-European tongues—still in our domain it is a task of extreme difficulty to create a comparative grammar which shall be minutely exact and yield permanent results. Only the most accomplished philologist could attempt the task, and it is very doubtful whether the time is yet ripe for such an attempt.[1] Much careful and minute investigation is still indispensable. One great obstacle lies in the fact, that, in most Semitic languages, the sounds are very inadequately transmitted. It would probably be easier to give a comparative presentment of Semitic syntax than of Semitic phonetics and the theory of Semitic forms.

Character of Semitic mind.

It is not a formidable undertaking to describe in general terms the character of the Semitic mind, as has been done, for example, by Lassen (*Indische Altertumskunde*, i. 414 sq.) and by Renan in the introduction to his *Histoire des langues sémitiques*.[2] But still there is a danger of assuming that the most important characteristics of particular Semitic peoples, especially of the Israelites and of the Arabs, are common to all Semites, and of ascribing to the influence of race certain striking features which are the result of the external conditions of life, and which, under similar circumstances, are also developed among non-Semitic races. And, though it is said, not without reason, that the Semites possess but little talent for political and military organization on a large scale, yet we have in the Phoenicians, especially the Carthaginians, in Hamilcar and in Hannibal, a proof that under altered conditions the Semites are not incapable of distinguishing themselves in these domains. It is a poor evasion to deny that the Phoenicians are genuine Semites, since even our scanty sources of information suffice to show that in the matter of religion, which among Semites is of such supreme importance, they bore a close resemblance to the ancient Hebrews and Aramaeans. In general descriptions of this kind it is easy to go too far. But to give in general terms a correct idea of the Semitic languages is a task of very much greater difficulty. Renan's brilliant and most interesting sketch is in many respects open to serious criticism. He cites, for example, as characteristic of the Semitic tongues, that they still retain the practice of expressing psychological processes by means of distinct imagery. In saying this he is taking scarcely any language but Hebrew into account. But the feature to which he here alludes is owing to the particular stage of intellectual development that had been reached by the Israelites, is in part peculiar to the poetical style, and is to be found in like manner among wholly different races. That the Semitic languages are far from possessing the fixity which Renan attributes to them we shall see below. But, however this may be, certain grammatical peculiarities of the Semitic languages—above all, the predominance of triliteral roots—are so marked that it is scarcely possible to doubt whether any language with which we are tolerably well acquainted is or is not Semitic. Only when a Semitic language has been strongly influenced not only in vocabulary but also in grammar by some non-Semitic speech, as is the case with Amharic, can such a doubt be for a moment entertained.

Relations with other families of speech.

Many attempts have been made, sometimes in a very superficial fashion and sometimes by the use of scientific methods, to establish a relationship between the Semitic languages and the Indo-European. It was very natural to suppose that the tongues of the two races which, with the single exceptions of the Egyptians and the Chinese, have formed and moulded human civilization, who have been near neighbours from the earliest times, and who, moreover, seem to bear a great physical resemblance to one another, can be nothing else than two descendants of the same parent speech. But all these endeavours have wholly failed. It is indeed probable that the languages, not only of the Semites and of the Indo-Europeans, but also those of other races, are derived from the same stock, but the separation must have taken place at so remote a period that the changes which these languages underwent in prehistoric times have completely effaced what features they possessed in common; if such features have sometimes been preserved, they are no longer recognizable. It must be remembered that it is only in exceptionally favourable circumstances that cognate languages are so preserved during long periods as to render it possible for scientific analysis to prove their relationship with one another.[3]

On the other hand, the Semitic languages bear so striking a resemblance in some respects to certain languages of northern Africa that we are forced to assume the existence of a tolerably close relationship between the two groups. We allude to the family of languages known in modern times as the "Hamitic," and composed of the Egyptian, Berber, Beja (Bishārī, &c.), and a number of tongues spoken in Abyssinia and the neighbouring countries (Agaw, Galla, Dankali, &c.). It is remarkable that some of the most indispensable words in the Semitic vocabulary (as, for instance, "water," "mouth" and certain numerals) are found in Hamitic also, and that these words happen to be such as cannot well be derived from triliteral Semitic roots, and are more or less independent of the ordinary grammatical rules. We notice, too, important resemblances in grammar—for example, the formation of the feminine by means of a *t* prefixed or affixed, that of the causative by means of *s*, similarity in the suffixes and prefixes of the verbal tenses, and, generally, similarity in the personal pronouns, &c. It must be admitted that there is also much disagreement—for instance, the widest divergence in the mass of the vocabulary; and this applies to the Semitic languages as compared not only with those Hamitic languages that are gradually becoming known to us at the present day, but with the Egyptian, of which we possess documents dating from the fourth and perhaps fifth millennium before the Christian era. The question is here involved in great difficulties. Some isolated resemblances may, improbable as it appears, have been produced by the borrowing of words. Uncivilized races, as has been proved with certainty, sometimes borrow from others elements of speech in cases where we should deem such a thing impossible—for example, numerals and even personal suffixes. But the great resemblances in grammatical formation cannot be reasonably explained as due to borrowing on the part of the

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[1] By this we do not wish to call in question the merits of the following works: William Wright, *Lectures on the Comparative Grammar of the Semitic Languages* (Cambridge, 1890, a posthumous work); O. E. Lindberg, *Vergleichende Grammatik d. semitischen Sprachen* (pt. 1, Göteborg, 1897); Heinr. Zimmern, *Vergl. Gramm. d. semit. Sprachen* (Berlin, 1898); C. Brockelmann, *Semitische Sprachwissenschaft* (Leipzig, 1906) and *Grundriss der vergl. Gramm. d. semit. Sprachen*, vol. i. (Berlin, 1908).

[2] Cf. Th. Nöldeke, *Some Characteristics of the Semitic Races*, in *Sketches from Eastern History* (London and Edinburgh, 1892), 1 ff.

[3] The following is an instance of the manner in which we may be deceived by isolated cases. "Six" is in Hebrew *shēsh*, almost exactly like the Sanskrit and modern Persian *shash*, the Latin *sex*, &c. But the Indo-European root is *sweks*, or perhaps even *ksweks*, whereas the Semitic root is *shidth*, so that the resemblance is a purely accidental one, produced by phonetic change.

Hamites, more especially as these points of agreement are also found in the language of the Berbers, who are scattered over an enormous territory, and whose speech must have acquired its character long before they came into contact with the Semites. We are even now but imperfectly acquainted with the Hamitic languages; and the relation in which Egyptian stands to Berber on the one hand and to the south Hamitic languages on the other requires further elucidation. The attempt to write a comparative grammar of the Semitic and Hamitic languages would be, to say the least, very premature.[1]

Original seat of Semites.

The connexion between the Semitic languages and the Hamitic appears to indicate that the primitive seat of the Semites is to be sought in Africa; for it can scarcely be supposed that the Hamites, amongst whom there are gradual transitions from an almost purely European type to that of the Negroes, are the children of any other land than "the dark continent." There seems, moreover, to be a considerable physical resemblance between the Hamites and the Semites, especially in the case of the southern Arabs; we need mention only the slight development of the calf of the leg, and the sporadic appearance amongst Semites of woolly hair and prominent jaws.[2] But both Semites and Hamites have been mingled to a large extent with foreign races, which process must have diminished their mutual similarity. All this, however, is offered not as a definite theory, but as a modest hypothesis.

It was once the custom to maintain that the Semites came originally from certain districts in Armenia. This supposition was founded on the book of Genesis, according to which several of the Semitic nations are descended from Arphaxad, *i.e.* the eponym of the district of Arrapachitis, now called Albak, on the borders of Armenia and Kurdistan. It was also thought that this region was inhabited by the primitive race from which both the Semites and the Indo-Europeans derived their origin. But, as we saw above, this ancient relationship is a matter of some doubt; in any case, the separation does not date from a period so recent that the Semites can be supposed to have possessed any historical tradition concerning it. There cannot be a greater mistake than to imagine that nations have been able to preserve during long ages their recollection of the country whence their supposed ancestors are said to have emigrated. The fantastic notion once in vogue as to the permanence of historical memories among uncivilized races must be wholly abandoned. The period in which the Hebrews, the Arabs and the other Semitic nations together formed a single people is so distant that none of them can possibly have retained any tradition of it. The opinion that the Hebrews and the tribes most closely related to them were descendants of Arphaxad is apparently due to the legend that Noah's ark landed near this district. The notion has therefore a purely mythical origin. Moreover, in Genesis itself we find a totally different account of the matter, derived from another source, which represents all nations, and, therefore, the Semites among them, as having come from Babylon. Scarcely any man of science now believes in the northern origin of the Semites.

Some prominent scholars consider the birthplace of the Semitic race to have been in Arabia. There is much that appears to support this theory. History proves that from a very early period tribes from the deserts of Arabia settled on the cultivable lands which border them and adopted a purely agricultural mode of life. Various traces in the language seem to indicate that the Hebrews and the Aramaeans were originally nomads, and Arabia with its northern prolongation (the Syrian desert) is the true home of nomadic peoples. The Arabs are also supposed to display the Semitic character in its purest form, and their language is, on the whole, nearer the original Semitic than are the languages of the cognate races. To this last circumstance we should, however, attach little importance. It is by no means always the case that a language is most faithfully preserved in the country where it originated. The Romance dialect spoken in the south of Sardinia is far more primitive than that spoken at Rome; and of all living Teutonic languages the most ancient is the Icelandic. Besides, we cannot unreservedly admit that the Arabs display the Semitic character in its purest form; it would be more correct to say that, under the influence of a country indescribably monotonous and of a life ever changing yet ever the same, the inhabitants of the Arabian deserts have developed most exclusively certain of the principal traits of the Semitic race. All these considerations are indecisive; but we willingly admit that the theory which regards Arabia as the primitive seat of all Semites is by no means untenable.

Finally, one of the most eminent of contemporary Orientalists, Ignazio Guidi,[3] has attempted to prove that the home of the Semites is on the lower Euphrates. He contends that the geographical, botanical and zoological conceptions which are expressed in the various Semitic languages by the same words, preserved from the time of the dispersion, correspond to the natural characteristics of no country but the above-mentioned. Great as are the ingenuity and the caution which he displays, it is difficult to accept his conclusions. Several terms might be mentioned which are part of the common heritage of the northern and the southern Semites, but which can scarcely have been formed in the region of the Euphrates. Moreover, the vocabulary of most Semitic languages is but very imperfectly known, and each dialect has lost many primitive words in the course of time. It is therefore very unsafe to draw conclusions from the fact that the various Semitic tongues have no one common designation for many important local conceptions, such as "mountain." The ordinary words for "man," "old man," "boy," "tent," "block," "to beat," &c., are quite different in the various Semitic languages, and yet all these are ideas for which the primitive Semites must have had names.

Connexions between the Semitic languages.

It is not very easy to settle what is the precise connexion between the various Semitic languages, considered individually. In this matter one may easily be led to hasty conclusions by isolated peculiarities in vocabulary or grammar. Each of the older Semitic languages occasionally agrees in grammatical points with some other to which in most respects it bears no very close resemblance, while dialects much more nearly related to it are found to exhibit different formations. Each Semitic tongue also possesses features peculiar to itself. For instance, the Hebrew-Phoenician group and the Arabic have a prefixed definite article (the etymological identity of which is, however, not very probable); the dialect nearest to Arabic, the Sabaean, expresses the article by means of a suffixed *n*; the Aramaic, which in general more closely resembles Hebrew than does the Arabic group, expresses it by means of a suffixed *ā*; whereas the Assyrian in the north and the Ethiopic in the south have no article at all. Of the termination *n* for the definite article there is no certain trace in either Arabic or Hebrew; the Sabaean, the Ethiopic, and the Aramaic employ it to give emphasis to demonstrative pronouns; and the very same usage has been detected in a single Phoenician inscription.[4] In this case, therefore, Hebrew and Arabic have, independently of one another, lost something which the languages most nearly related to them have preserved. In like manner, the strengthening of the pronoun of the third person by means of *t* (or *tū*) is only found in Ethiopic, Sabaean and Phoenician and perhaps in some Arabic particles too. Aramaic alone has no certain trace of the reflexive conjugation formed with prefixed *n*; Hebrew alone has no certain trace of the causative with *sha*.[5] In several of the Semitic languages we can see how the formation of the passive by means of internal vocal change (as *kullima*, "he was addressed," as distinguished from *kallama*, "he addressed") gradually dropped out of use; in Ethiopic this process was already complete when the language first became literary; in Aramaic it was not wholly so and in most modern Arabic dialects the old passive forms have nearly or totally disappeared. In a few cases phonetic resemblances have been the result of later growth. For example, the termination of the plural masculine of nouns is in Hebrew *īm*, in Aramaic *īn*, as in Arabic. But we know that Aramaic also originally had *m*, whereas the ancient Arabic forms have after the *n* an *a*, which appears to have been originally a long *ā* (*ūna*, *īna*); in this latter position (that is, between two vowels) the change of *m* into *n* is very improbable.[6] These two similar terminations were therefore originally distinct. We must indeed be very cautious in drawing conclusions from points of agreement between the vocabularies of the various Semitic tongues. The

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[1] This of course applies yet more strongly to Benfey's work, *Über das Verhältnis der ägyptischen Sprache zum semitischen Sprachstamm* (Leipzig, 1844); but his book has the permanent merit of having for the first time examined the relationship in a scientific manner. The investigation of the relationship between Egyptian and Semitic has been greatly advanced by the distinguished Egyptologist Ad. Erman: cf. especially his treatise, "Die Flexion des ägyptischen Verbums," in the *Sitzungsberichte der Berliner Akademie der Wissenschaften* (1900), xix., especially p. 34 sq. See also HAMITIC LANGUAGES.

[2] Cf. G. Gerland, *Atlas der Ethnographie* (Leipzig, 1876), p. 40 of the text.

[3] "Della sede primitiva dei popoli semitici," in the *Proceedings* of the Accademia dei Lincei (1878–1879).

[4] Viz. the great inscription of Byblus, *C.I.S.*, fasc. i. No. 1.

[5] *Shalhebeth*, "flame," is borrowed from Aramaic.

[6] Arabic seems to have transplanted the termination from the verb to the noun, or to have at least modified the substantival termination in accordance with the verbal.

Ethiopians and the Hebrews have the same word for many objects which the other Semites call by other names—for instance, "stone," "tree," "enemy," "enter," "go out"; and the same may be said of Hebrew as compared with Sabaean. But to build theories upon such facts would be unsafe, since the words cited are either found, though with some change of meaning, in at least one of the cognate languages, or actually occur, perhaps quite exceptionally and in archaic writings, with the same signification. The sedentary habits of the Ethiopians and the Sabaeans may possibly have rendered it easier for them to retain in their vocabulary certain words which were used by the civilized Semites of the north, but which became obsolete amongst the Arabian nomads. To the same cause we may attribute the fact that in religion the Sabaeans seem to resemble the northern Semites more closely than do the tribes of central Arabia; but these considerations prove nothing in favour of a nearer linguistic affinity.

Northern and Southern groups.

One thing at least is certain, that Arabic (with Sabaean, Mahri and Socotri) and Ethiopic stand in a comparatively close relationship to one another, and compose a group by themselves, as contrasted with the other Semitic languages, Hebraeo-Phoenician, Aramaic and Assyrian. Only in these southern dialects do we find, and that under forms substantially identical, the important innovation known as the "broken plurals," consisting in the employment of certain forms, denoting abstracts, for the expression of plurals. They agree, moreover, in employing a peculiar development of the verbal root, formed by inserting an *ā* between the first and second radicals (*qātala*, *taqātala*), in using the vowel *a* before the third radical in all active perfects—for example, (*h*)*aqtala*, *qattala*, instead of the *haqtil*, *qattil* of the northern dialects—and in many other grammatical phenomena. This is not at all contradicted by the fact that certain aspirated dentals of Arabic (*th*, *ḋh*, *ẓ̇*) are replaced in Ethiopic, as in Hebrew and Assyrian, by pure sibilants—that is, *s* (Hebrew and Assyrian *sh*), *z* *ṣ*—whereas in Aramaic they are replaced by simple dentals (*t*, *d*, *ṭ*), which seem to come closer to the Arabic sounds. Still, after the separation of the northern and the southern groups, we suppose, the Semitic languages possessed all these sounds, as the Arabic does, but afterwards simplified them, for the most part, in one direction or the other. Hence there resulted, as it were by chance, occasional similarities. Even in many modern Arabic dialects *th*, *dh* become *t*, *d*.[1] Ethiopic, moreover, has kept *ḍ*, the most peculiar of Arabic sounds, distinct from *ṣ*, whereas Aramaic has confounded it with the guttural ʿ*ain*, and Hebrew and Assyrian with *ṣ*. It is therefore evident that all these languages once possessed the consonant in question as a distinct one. One sound, *sīn*, appears only in Hebrew, in Phoenician, and in the older Aramaic. It must originally have been pronounced very like *sh*, since it is represented in writing by the same character; in later times it was changed into an ordinary *s*. Assyrian does not distinguish it from *sh*.[2] The division of the Semitic languages into the northern group and the southern is therefore justified by facts. Even if we were to discover really important grammatical phenomena in which one of the southern dialects agreed with the northern, or vice versa, and that in cases where such phenomena could not be regarded either as remnants of primitive Semitic usage or as instances of parallel but independent development, we ought to remember that the division of the two groups was not necessarily a sudden and instantaneous occurrence, that even after the separation intercourse may have been carried on between the various tribes who spoke kindred dialects and were therefore still able to understand one another, and that intermediate dialects may once have existed, perhaps such as were in use amongst tribes who came into contact sometimes with the agricultural population of the north and sometimes with the nomads of the south (see below). All this is purely hypothetical, whereas the division between the northern and the southern Semitic languages is a recognized fact. It is perfectly certain, moreover, that Hebraeo-Phoenician and Aramaic are closely related with each other, and form a group of their own, distinct even from Assyrian. In fact, Assyrian seems to be so completely *sui generis* that we should be well advised to separate it from all the cognate languages, as an independent scion of proto-Semitic. We should classify these languages consequently in the following order: (1) Assyrian; (2) the remaining Semitic languages, viz.: *A.* Hebraeo-Phoenician and Aramaic, *B.* the southern Semitic tongues.

Lost Semitic languages.

Although we cannot deny that there may formerly have existed Semitic languages quite distinct from those with which we are acquainted, yet that such was actually the case cannot be proved. Nor is there any reason to think that the domain of the Semitic languages ever extended very far beyond its present limits. Some time ago many scholars believed that they were once spoken in Asia Minor and even in Europe, but, except in the Phoenician colonies, this notion rested upon no solid proof. It cannot be argued with any great degree of plausibility that even the Cilicians, who from a very early period held constant intercourse with the Syrians and the Phoenicians, spoke a Semitic language.

Assyrian.

Long before there existed any other Semitic culture, there flourished on the Lower Euphrates a sister language which has been preserved to us in the cuneiform inscriptions. It is usually called the Assyrian, after the name of the country where the first and most important excavations were made; but the term "Babylonian" would be more correct, as Babylon was the birthplace of this language and of the civilization to which it belonged. Certain Babylonian inscriptions go back to the fourth millennium before our era; but the great mass of these cuneiform inscriptions date from between 1000 and 500 B.C.

Assyrian.

Assyrian differs in many respects from all the cognate languages. The ancient perfect has wholly disappeared, or left but few traces, and the gutturals, with the exception of the hard *kh*, have been smoothed down to a degree which is only paralleled in modern Aramaic dialects. So at least it would appear from the writing, or rather from the manner in which Assyriologists transcribe it. The Babylonian form *bēl* (occurring in Isa. xlvi. 1; Jer. l. 2 and li. 44—passages all belonging to the 6th century B.C., and in many other ancient monuments), the name of the god who was originally called *baʿl*, is a confirmation of this; but, on the other hand, the name of the country where Babylon was situated, viz. Shinʿar, and that of a Babylonian god, ʿAnammelek (2 Kings xvii. 31), as well as those of the tribes Shōʿa and Qōʿa (Ezek. xxiii. 23) who inhabited the Assyrio-Babylonian territory, seem to militate against this theory, as they are spelt in the Old Testament with ʿ*ain*. So, too, is the biblico-Aramaic word *ṭeʿem*, *ṭaʿam*, "order," "decree," which is derived from the Assyrian; and we may also compare some Babylonian local names, *e.g.* ʿ*Anat*. *H* is found in the name of the town *Hīt*, and in the name of a man, written in Aramaic characters but formed quite in the Babylonian manner, *Hadadnadinakh*. Thus the Babylonians may have pronounced some gutturals, though they did not write them, precisely as the Persian cuneiform inscriptions omit many *h*'s, which, no doubt, were audible. The Assyrian system of writing is so complicated, and, in spite of its vast apparatus, is so imperfect an instrument for the accurate representation of sounds, that we are hardly yet bound to regard the transcriptions of contemporary Assyriologists as being in all points of detail the final dictum of science. However this may be, the present writer does not feel able to speak at greater length upon Assyrian. Attention may, however, be called to the fact, that, as might have been expected from the important rôle played by the Babylonians and Assyrians in the history of civilization and of peoples, many words passed over from their language into Hebrew and, more especially, into Aramaic, some of which attained a still wider vogue.[3] (Compare the article CUNEIFORM.)

Hebrew.

Hebrew and Phoenician are but dialects of one and the same language. It is only as the language of the people of Israel that Hebrew can be known with any precision. Since in the Old

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[1] In words borrowed from the literary language, *s*, *z*, habitually appear in place of *th*, *dh*.

[2] It is not quite certain whether all the Semitic languages originally had the hardest of the gutturals *gh* and *kh* in exactly the same places that they occupy in Arabic. In the case of *kh* we may assume so; since not only Arabic here agrees with Ethiopic, but Assyrian, also, has a particular guttural in roots which in Arabic have *kh*. But it would appear that in Hebrew and Aramaic the distinction between *gh* and ʿ*ayin*, between *kh* and *ḥ* was often different from what it is in Arabic.

[3] So the Assyrian *mashkēnū* was adopted into Hebrew and Aramaic as *miskēn*; from the Aramaic it was borrowed by Arabic and Ethiopic (*miskēn*), and from Arabic it found its way into the Romance languages (*mesquinho*, *mezquino*, *meschino*, *mesquin*).

Testament a few of the neighbouring peoples are represented as being descended from Eber, the eponym of the Hebrews, that is, are regarded as nearly related to the latter, it was natural to suppose that they likewise spoke Hebrew—a supposition which, at least in the case of the Moabites, has been fully confirmed by the discovery of the Mesha inscription (date, soon after 900 B.C.). The language of this inscription scarcely differs from that of the Old Testament; the only important distinction is the occurrence of a reflexive form (with *t* after the first radical), which appears also in Arabic and Assyrian. We may remark in passing that the style of this inscription is quite that of the Old Testament, and enables us to maintain with certainty that a similar historical literature existed amongst the Moabites. But it must be remembered that ancient Semitic inscriptions exhibit, in a sense, nothing but the skeleton of the language, since they do not express the vowels at all, or do so only in certain cases; still less do they indicate other phonetic modifications, such as the doubling of consonants, &c. It is therefore very possible that *to the ear* the language of Moab seemed to differ considerably from that of the Judaeans.

Ancient Hebrew.

The Mesha inscription is the only non-Israelite source from which any knowledge of ancient Hebrew can be obtained. Still several Hebrew words occur even in the Tellel-Amarna letters, discovered in Egypt, and written in the Babylonian language by princes of Palestine during the second millennium B.C. They clearly show that the "Hebrew" language existed in Palestine even before the migration of the Israelites into Canaan. Some fragments in the Old Testament belong to the last centuries of the second millennium before our era—particularly the song of Deborah (Judges v.), a document which, in spite of its many obscurities in matters of detail, throws much light on the condition of the Israelites at the time when the Canaanites were still contending with them for the possession of the country. The first rise of an historical literature may very probably date from before the establishment of the monarchy. Various portions of the Old Testament belong to the time of the earlier kings; but it was under the later kings that a great part of extant Hebrew literature came into shape. To this age also belong the Gezer and the Siloam inscriptions and a daily increasing number of seals and gems bearing the names of Israelites.

Pronunciation.

The Hebrew language is thus known to us from a very ancient period. But we are far from being acquainted with its real phonetic condition in the time of David or Isaiah. For, much as we owe to the labours of the later Jewish schools, which with infinite care fixed the pronunciation of the sacred text by adding vowels and other signs, it is evident that even at the best they could only represent the pronunciation of the language in its latest stage, not that of very early ages. Besides, their object was not to exhibit Hebrew simply as it was, but to show how it should be read in the solemn chant of the synagogue. Accordingly, the pronunciation of the older period may have differed considerably from that represented by the punctuation. Such differences are now and then indicated by the customary spelling of the ancient texts,[1] and sometimes the orthography is directly at variance with the punctuation.[2] In a few rare cases we may derive help from the somewhat older tradition contained in the representation of Hebrew words and proper names by Greek letters, especially in the ancient Alexandrine translation of the Bible (the so-called Septuagint). It is of particular importance to remark that this older tradition still retains an original *a* in many cases where the punctuation has the later *i* or *e*. We have examined this point somewhat in detail, in order to contradict the false but ever-recurring notion that the ordinary text of the Bible represents without any essential modification the pronunciation of ancient Hebrew, whereas in reality it expresses (in a very instructive and careful manner, it is true) only its latest development, and that for the purpose of solemn public recitation. A clear trace of dialectal differences within Israel is found in Judges xii. 6, which shows that the ancient Ephraimites pronounced *samek* instead of *shīn*.

Period of exile in Babylon.

The destruction of the Judaean kingdom dealt a heavy blow to the Hebrew language. But it is going too far to suppose that it was altogether banished from ordinary life at the time of the exile, and that Aramaic came into use among all the Jews. In the East even small communities, especially if they form a religious body, often cling persistently to their mother-tongue, though they may be surrounded by a population of alien speech; and such was probably the case with the Jews in Babylonia. See HEBREW LANGUAGE. Even so late as the time of Ezra, Hebrew was in all probability the ordinary language of the new community. In Neh. xiii. 24 we find a complaint that the children of Jews by wives from Ashdod and other places spoke half in the "Jewish" language and half in the language of Ashdod, or whatever else may have been the tongue of their mothers. No one can suppose that Nehemiah would have been particularly zealous that the children of Jews should speak an Aramaic dialect with correctness. He no doubt refers to Hebrew as it was then spoken—a stage in its development of which Nehemiah's own work gives a very fair idea.

Hebrew supplanted by Aramaic.

After the time of Alexander large bodies of the Jewish population were settled in Alexandria and other western cities, and were very rapidly Hellenized. Meanwhile the principal language of Syria and the neighbouring countries, Aramaic, which had already become the language of the older Jewish colonies in Egypt (see below), and the influence of which may be perceived even in some pre-exilic writings, began to spread more and more among the Jews of Palestine. Hebrew gradually ceased to be the language of the people and became that of religion and the schools. The book of Daniel, written in 167 or 166 B.C., begins in Hebrew, then suddenly passes into Aramaic, and ends again in Hebrew. Similarly the redactor of Ezra (or more correctly of the Chronicles, of which Ezra and Nehemiah form the conclusion) borrows large portions from an Aramaic work, in most cases without translating them into Hebrew. No reason can be assigned for the use of Aramaic in Jewish works intended primarily for Jerusalem, unless it were already the dominant speech, whilst, on the other hand, it was very natural for a pious Jew to write in the ancient "holy" language even after it had ceased to be spoken. Esther, Ecclesiastes, and a few Psalms, which belong to the 3rd and 2nd centuries before our era, are indeed written in Hebrew, but are so strongly tinctured by the Aramaic influence as to prove that the writers usually spoke Aramaic. It is certain, of course, that there were still many Jews capable both of writing and speaking Hebrew. So the Book of Sirach, composed shortly after 200 B.C., was written in an almost absolutely pure Hebrew, as is proved by the portions of the original, amounting to about two-thirds of the whole, which have come to light in our day. But we are not likely to be far wrong in saying that in the Maccabean age Hebrew had died out among the Jews as a current popular language, and there is nothing to show that it survived longer among any of the neighbouring peoples.

But in the last period of the history of Jerusalem, and still more after the destruction of the city by Titus, the Jewish schools played so important a part that the life of the Hebrew language was in a manner prolonged. The lectures and discussions of the learned were carried on in that tongue. We have very extensive specimens of this more modern Hebrew in the Mishnah and other works, and scattered pieces throughout both Talmuds. But, just as the "classical" Sanskrit, which has been spoken and written by the Brahmans during the last twenty-five centuries, differs considerably from the language which was once in use among the people, so this "language of the learned" diverges in many respects from the "holy language"; and this distinction is one of which the rabbis were perfectly conscious. The "language of the learned" borrows a great part of its vocabulary from Aramaic,[3] and this exercises a strong influence upon the grammatical forms. The grammar is perceptibly modified by the peculiar style of these writings, which for the most part treat of legal and ritual questions in a strangely laconic and pointed manner. But, large as is the proportion of foreign words and artificial as this language is, it contains a considerable number of purely Hebrew elements which by chance do not appear in the Old Testament. Although we may generally assume, in the case of a word occurring in the Mishnah but not found in the Old Testament, that it is borrowed from Aramaic, there are several words of this class which, by their radical consonants, prove themselves to be genuine Hebrew. And even some grammatical phenomena of this language are to be regarded as a genuine development of Hebrew, though they are unknown to earlier Hebrew speech.

Medieval and Modern Hebrew.

From the beginning of the middle ages down to our own times the Jews have produced an enormous mass of writings in Hebrew, sometimes closely following the language of the Bible, sometimes that of the Mishnah, sometimes introducing in a perfectly inorganic manner a great quantity of Aramaic forms, and occasionally imitating the Arabic style. The study of these variations has but little interest for the linguist, since they are nothing but a purely artificial imitation, dependent upon the greater or less skill of the individual. The language of the Mishnah stands in much closer connexion with real life, and has a definite *raison d'être*; all later Hebrew is to be classed with medieval and modern Latin. The dream of some Zionists, that Hebrew—a would-be Hebrew, that is to say—will again become a living, popular language in Palestine, has still less prospect of realization than their vision of a restored Jewish empire in the Holy Land. Much Hebrew also was written in the middle ages by the hostile brethren of the Jews, the Samaritans; but for the student of language these productions have, at the most, the charm attaching to curiosities.

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[1] For example, we may conclude with tolerable certainty, from the presence and absence of the vowel-letters *y* and *w*, that in older times the accented *e* and *o* were not pronounced long, and that, on the other hand, the diphthongs *au* and *ai* were used for the later *ó* and *é*.

[2] The very first word of the Bible contains an Aleph (*spiritus lenis*), which is required by etymology and was once audible, but which the pronunciation represented by the point-system ignores.

[3] It is a characteristic feature that "my father" and "my mother" are here expressed by purely Aramaic forms. Even the learned did not wish to call their "papas" and "mammas" by any other names than those to which they had been accustomed in infancy.

Character of ancient Hebrew.

The ancient Hebrew language, especially in the matter of syntax, has an essentially primitive character. Parataxis of sentences prevails over hypotaxis to a greater extent than in any other literary Semitic language with which we are well acquainted. The favourite method is to link sentences together by means of a simple "and." There is a great lack of particles to express with clearness the more subtle connexion of ideas. The use of the verbal tenses is in a great measure determined by the imagination, which regards things unaccomplished as accomplished, and the past as still present. There are but few words or inflexions to indicate slight modifications of meaning, though in ancient times the language may perhaps have distinguished certain moods of the verb somewhat more plainly than the present punctuation does. But in any case this language was far less suited for the definite expression of studied thought, and less suited still for the treatment of abstract subjects, than for poetry. We must remember, however, that as long as Hebrew was a living language it never had to be used for the expression of the abstract. Had it lived somewhat longer it might very possibly have learnt to adapt itself better to the formulating of systematic conceptions. The only book in the Old Testament which attempts to grapple with an abstract subject in plain prose—namely, Ecclesiastes—dates from a time when Hebrew was dying out or was already dead. That the gifted author does not always succeed in giving clear expression to his ideas is partly due to the fact that the language had never been employed for any scientific purposes whatsoever. With regard to grammatical forms, Hebrew has lost much that is still preserved in Arabic; but the greater richness of Arabic is in part the result of later development.

Vocabulary.

The vocabulary of the Hebrew language is, as we have said, known but imperfectly. The Old Testament is no very large work; it contains, moreover, many repetitions, and a great number of pieces which are of little use to the lexicographer. On the other hand, much may be derived from certain poetical books, such as Job.[1] The numerous ἅπαξ λεγόμενα are a sufficient proof that many more words existed than appear in the Old Testament, the writers of which never had occasion to use them. Were we in possession of the whole Hebrew vocabulary in the time of Jeremiah, for example, we should be far better able to determine the relation in which Hebrew stands to the other Semitic languages, the Old Testament would be far more intelligible to us, and it would be very much easier to detect the numerous corrupt passages in our text.

Phoenician.

Phoenician.

The Phoenician dialect closely resembles Hebrew, and is known to us from only one authentic source, namely, inscriptions, some of which date from about 600 B.C. or earlier; but the great mass of them begin with the end of the 5th century before our era. These inscriptions[2] we owe to the Phoenicians of the mother-country and the neighbouring regions (Cyprus, Egypt and Greece), as well as to the Phoenicians of Africa, especially Carthage. Inscriptions are, however, a very insufficient means for obtaining the knowledge of a language. The number of subjects treated in them is not large; many of the most important grammatical forms and many of the words most used in ordinary life do not occur. Moreover, the "lapidary style" is often very hard to understand. The repetition of obscure phrases, in the same connexion, in several inscriptions does not help to make them more intelligible. Of what use is it to us that, for instance, thousands of Carthaginian inscriptions begin with the very same incomprehensible dedication to two divinities? The difficulty of interpretation is greatly increased by the fact that single words are very seldom separated from one another, and that vowel-letters are used extremely sparingly. We therefore come but too often upon very ambiguous groups of letters. In spite of this, our knowledge of Phoenician has made considerable progress of late. Some assistance is also got from Greek and Latin writers, who cite not only many Phoenician proper names, but single Phoenician words: Plautus in particular inserts in the *Poenulus* whole passages in Punic, some of which are accompanied by a Latin translation. This source of information must, however, be used with great caution. It was not the object of Plautus to exhibit the Punic language with precision, a task for which the Latin alphabet is but ill adapted, but only to make the populace laugh at the jargon of the hated Carthaginians. Moreover, he had to force the Punic words into Latin *senarii*; and finally the text, being unintelligible to copyists, is terribly corrupt. Much ingenuity has been wasted on the Punic of Plautus; but the passage yields valuable results to cautious investigation which does not try to explain too much.[3]

In its grammar Phoenician closely resembles Hebrew. In both dialects the consonants are the same, often in contrast to Aramaic and other cognate languages.[4] As to vowels, Phoenician seems to diverge rather more from Hebrew. The connecting of clauses is scarcely carried farther in the former language than in the latter. A slight attempt to define the tenses more sharply appears once at least in the joining of *kān* (fuit) with a perfect, to express complete accomplishment (or the pluperfect).[5] One important difference is that the use of *wāw* conversive with the imperfect—so common in Hebrew and in the inscription of Mesha—is wanting in Phoenician. The vocabulary of the language is very like that of Hebrew, but words rare in Hebrew are often common in Phoenician. For instance, "to do" is in Phoenician not *'as ā* but *pa'al* (the Arabic *fa'ala*), which in Hebrew occurs only in poetry and elevated language. "Gold" is not (*zahab* as in most Semitic languages), but *ḥarūṣ* (Assyrian *ḥurāṣ*), which is used occasionally in Hebrew poetry. Traces of dialectical distinctions have been found in the great inscription of Byblus, the inhabitants of which seem to be distinguished from the rest of the Phoenicians in Josh. xiii. 5 (and 1 Kings v. 32? [A.V. v. 18]). It is probable that various differences between the language of the mother-country and that of the African colonies arose at an early date, but our materials do not enable us to come to any definite conclusion on this point. It is tolerably certain that the language of Carthage possessed many dull vowels which were strange to Greek and Latin, so that the manner in which they are reproduced in proper names by the Greeks and Romans shows great diversity. In the later African inscriptions there appear certain phonetic changes, especially in consequence of the softening of the gutturals—changes which show themselves yet more plainly in the so-called Neo-Punic inscriptions (beginning with the 1st, if not the 2nd, century before our era). In these the gutturals, which had lost their real sound, are frequently interchanged in writing: and other modifications may also be perceived. Unfortunately the Neo-Punic inscriptions are written in such a debased indistinct character that it is often impossible to discover with certainty the real form of the words. This dialect was still spoken about 400, and perhaps long afterwards, in those districts of North Africa which had once belonged to Carthage. It would seem that in the mother-country the Phoenician language withstood the encroachment of Greek on the one hand and of Aramaic on the other somewhat longer than Hebrew did.

Aramaic.

Geographical extent of Aramaic.

Aramaic is nearly related to Hebraeo-Phoenician; but there is nevertheless a sharp line of demarcation between the two groups. Of its original home nothing certain is known. In the Old Testament "Aram" appears at an early period as a designation of certain districts in Syria ("Aram of Damascus," &c.) and in Mesopotamia ("Aram of the Two Rivers"). The language of the Aramaeans gradually spread far and wide, and occupied all Syria, both those regions which were before in the possession of the Kheta, probably a non-Semitic people, and those which were most likely inhabited by Canaanite tribes; last of all, Palestine became Aramaized. Towards the east this language was spoken on the Euphrates, and throughout the districts of the Tigris south and west of the Armenian and Kurdish mountains; the province in which the capitals of the Arsacids and the Sassanids were situated was called "the country of the Aramaeans." In Babylonia and Assyria a large, or perhaps the larger, portion of the population were most probably Aramaeans, even at a very early date, whilst Assyrian was the language of the government.

The oldest extant Aramaic documents consist of inscriptions on monuments and on seals, weights and gems. Latterly, a very remarkable inscription of a king of Ḥamāth[6] belonging to the 8th century B.C. has been found in Central Syria, and a few years before excavations in the extreme north of Syria (Zengīrli and district; Nērab) brought to light some not less remarkable inscriptions which go back to the same century. The language of all these inscriptions is Aramaic, though in certain places it agrees with Hebrew. It is especially surprising that in the case of the Arabic sounds *th*, *dh*, *ẓ*, they have not *t*, *d*, *t*,—as Aramaic generally has,—but *sh*, *z*, *ṣ*, as is the rule in Hebrew and Assyrian. It is extremely strange, however, that, in place of the Arabic *ḍ*, *'ain* does not appear, as elsewhere in Aramaic, nor yet *ṣ* as in Hebrew and Assyrian,—and, in isolated cases, even in Aramaic,—but *q*. These phenomena may be observed on several smaller monuments. We have no entirely satisfactory explanation at our disposal: perhaps Assyrian influence has been at work. Individual monuments prove, however, that the phonetic system of general Aramaic was already in existence in the period of our inscriptions: it would seem, therefore, that we must assume a dialectical cleavage, perhaps originated by the influence of Hebrew or Canaanean. Particularly remarkable is the use of the *waw consecutivum* in the inscriptions of the king of Ḥamāth hitherto only known from Hebrew. Traces of the divergent phonetic treatment are found in the Hellenistic era, and—here and there—even later. Still, at the most, these can scarcely be more than conscious archaisms,—a view which is particularly corroborated by the fact, that, in certain Aramaic documents of the Persian period, both forms are used interchangeably, *e.g.* *arqā*, "earth," and *ar'ā*. The latter orthography doubtless represents the actual pronunciation of the writer. It is to be observed, however, that *zī* for *dī*, held its ground with especial tenacity as a form of the relative pronoun and in other capacities. In the Persian period Aramaic was the official language of the provinces west of the Euphrates; and this explains the fact that coins which were struck by governors and vassal princes in Asia Minor, and of which the stamp was in some cases the work of skilled Greek artists, bear Aramaic inscriptions, whilst those of other coins are Greek. This, of course, does not prove that Aramaic was ever spoken in Asia Minor and as far north as Sinope and the Hellespont. In Egypt some Aramaic inscriptions have been found of the Persian period, one bearing the date of the fourth year of Xerxes (482 B.C.). We possessed, even before this, a few official documents and other written pieces in Aramaic, inscribed upon papyrus, and dating from this period, but unfortunately in a very dilapidated condition. Latterly, however, we have had a whole series of similar documents of the 5th century B.C., in a very good state of preservation, bearing upon the affairs of Jewish colonists in the far south of Egypt. In that country, where the native writing was so formidable to the learner, the Aramaic language and script may well have appeared peculiarly serviceable. Thus they were employed, and frequently, even by indigenous Egyptians. But we need not doubt that, in Egypt, Aramaic was also spoken by many who had migrated from Syria; and this must be assumed to have been the case with the Jewish colonists mentioned. The fact is now established that these Jews who had come to Egypt before the Persian period were military colonists, and were often referred to in documents as "Aramaeans." According to Deut. xvii. 16, the kings of Judah sold their subjects to the kings of Egypt, who at that time obtained numbers of warriors from foreign countries, instead of employing their own unwarlike subjects. The Syrian kings also sent soldiers to Egypt, from whom the Jews learned Aramaic. That this was used not only as an official language, but also as a vernacular, is shown by the fact that fragments of ordinary speech are found in Judaeo-Aramaic papyri. That the Egyptian-Aramaic documents exhibit traces of Hebrew and Phoenician influence is a matter for no surprise. Probably the preference shown by the Persians for Aramaic originated under the Assyrian empire, in which a very large proportion of the population spoke Aramaic, and in which this language would naturally occupy a more important position than it did under the Persians. We therefore understand why it was taken for granted that a great Assyrian official could speak Aramaic (2 Kings xviii. 26; Isa. xxxvi. 11), and for the same reason the dignitaries of Judah appear to have learned the language (*ibid.*), namely, in order to communicate with the Assyrians. The short dominion of the Chaldaeans very probably strengthened this preponderance of Aramaic. A few ancient Aramaic inscriptions have been discovered far within the limits of Arabia, in the palm oasis of Teimā (in the north of the Ḥijāz); the oldest and by far the most important of these was very likely made before the Persian period. We may presume that Aramaic was introduced into the district by a mercantile colony, which settled in this ancient seat of commerce, and in consequence of which Aramaic may have remained for some time the literary language of the neighbouring Arabs.

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[1] The Siloam inscription affords us one new word, the original of Sirach some others. In the Gezer inscription there seem to be some new words of dubious interpretation.

[2] The scattered materials are being collected in the *Corpus inscriptionum Semiticarum* of the Paris Academy.

[3] See Gildemeister, in Ritschl's *Plautus* (vol. ii. fasc. v., Leipzig, 1884).

[4] At an early period the Phoenician pronunciation may have distinguished a greater number of original consonants than are distinguished in writing. It is at least remarkable that the Greeks render the name of the city of Ṣur (Hebrew Ṣōr), which must originally have been pronounced Ṭhurr, with a τ (Τύρος), and the name of Ṣīdōn (where the radical ṣ runs through all the Semitic languages, with a σ (Σιδών). Distinctions of this kind, justified by etymology, have perhaps been obscured in Hebrew by the imperfection of the alphabet. In the case of *sīn* and *shīn* this can be positively proved.

[5] *Kān nadar*, "had vowed," Idal. 5 (*C.I.S.* Phoen. No. 93).

[6] The consonants of his name are ZKR; the pronunciation, perhaps, was *Zakkūr*.

Biblical Aramaic.

The Aramaic portions of the Old Testament show us the form of the language which was in use among the Jews of Palestine. Isolated passages in Ezra perhaps belong to the Persian period, but have certainly been remodelled by a later writer.[1] Yet in Ezra we find a few antique forms which do not occur in Daniel. The Aramaic pieces contained in the Bible have the great advantage of being furnished with vowels and other orthographical signs, though these were not inserted until long after the composition of the books, and are sometimes at variance with the text itself. But, since Aramaic was still a living language when the punctuation came into existence, and since the lapse of time was not so very great, the tradition ran less risk of corruption than in the case of Hebrew. Its general correctness is further attested by the innumerable points of resemblance between this language and Syriac, with which we are accurately acquainted. The Aramaic of the Bible still exhibits various antique features, found in the Egyptian papyri too, which afterwards disappeared,—for example, the formation of the passive by means of internal vowel-change, and the causative with *ha* instead of with *a*,—phenomena which have been falsely explained as Hebraisms. Biblical Aramaic agrees in all essential points with the language used in the numerous inscriptions of Palmyra (beginning soon before the Christian era and extending to about the end of the 3rd century), and on the Nabataean coins and stone monuments (concluding about the year 100). Aramaic was the language of Palmyra, the aristocracy of which were to a great extent of Arabian extraction. In the northern portion of the Nabataean kingdom (not far from Damascus) there was probably a large Aramaic population, but farther south Arabic was spoken. At that time, however, Aramaic was highly esteemed as a cultivated language, for which reason the Arabs in question made use of it, as their own language was not reduced to writing, just as in those ages Greek inscriptions were set up in many districts where no one spoke Greek. That the Nabataeans were Arabs is sufficiently proved by the fact that, with the exception of a few Greek names, almost all the numerous names which occur in the Nabataean inscriptions are Arabic, in many cases with distinctly Arabic terminations. A further proof of this is that in the great inscriptions over the tombs of Ḥejr (not far from Teimā) the native Arabic continually shows through the foreign disguise,—for instance, in the use of Arabic words whenever the writer does not happen to remember the corresponding Aramaic terms, in the use of the Arabic *ghair*, "other than," and in several syntactic features. The great inscriptions cease with the overthrow of the Nabataean kingdom by Trajan (105); but the Arabian nomads in those countries, especially in the Sinaitic peninsula, often scratched their names on the rocks down to a later period, adding some benedictory formula in Aramaic. We know hundreds of these Sinaitic inscriptions.[2] In any case Aramaic then exercised an immense influence. This is also proved by the place which it occupies in the strange Pahlavī writing, various branches of which date from the time of the Parthian empire (see PAHLAVI). Biblical Aramaic, as also the language of the Palmyrene and Nabataean inscriptions, may be described as an older form of Western Aramaic. The opinion that the Palestinian Jews brought their Aramaic dialect direct from Babylon—whence the incorrect name "Chaldee"—is altogether untenable.

Aramaic of Targums, etc.

We may now trace somewhat farther the development of Western Aramaic in Palestine; but unhappily few of the sources from which we derive our information can be thoroughly trusted. In the synagogues it was necessary that the reading of the Bible should be followed by an oral "targum" or translation into Aramaic, the language of the people. The Targum was at a later period fixed in writing, but the officially sanctioned form of the Targum to the Pentateuch (the so-called Targum of Onkelos) and of that to the prophets (the so-called Jonathan) was not finally settled till the 4th or 5th century, and not in Palestine, but in Babylonia. The redactors of the Targum preserved on the whole the older Palestinian dialect; yet that of Babylon, which differed considerably from the former, exercised a vitiating influence. The text of the Targums was punctuated later in Babylonia, in the supra-linear system there prevalent. Although this task was performed carefully, the punctuation is hardly as trustworthy as that of the Aramaic pieces of the Bible,—much less the transcriptions in the known Tiberian system used in the European Targum manuscripts. The language of Onkelos and Jonathan differs but little from Biblical Aramaic. The language spoken some time afterwards by the Palestinian Jews, especially in Galilee, is exhibited in a series of rabbinical works, the so-called Jerusalem Targums (of which, however, those on the Hagiographa are in some cases of later date), a few Midrashic works, and the Jerusalem Talmud. Unfortunately all these books, of which the Midrashīm and the Talmud contain much Hebrew as well as Aramaic, have not been handed down with care, and require to be used with great caution for linguistic purposes. Moreover, the influence of the older language and orthography has in part obscured the characteristics of these popular dialects; for example, various gutturals are still written, although they are no longer pronounced. The adaptation of the spelling to the real pronunciation is carried farthest in the Jerusalem Talmud, but not in a consistent manner. Besides, all these books are without vowel-points; but the frequent use of vowel-letters in the later Jewish works renders this defect less noticeable. Attempts have been made latterly to utilize the above-mentioned books as a means of reconstructing to some extent the dialect spoken by Jesus and the Apostles, and of retranslating the utterances of Jesus into their original Galilaean form. This, however, is a far too venturesome undertaking. How far these Jewish works actually exhibit the Galilean language can hardly be definitely determined; and to this must be added the inexactitude of the traditional text, and, finally, the by no means inconsiderable difference in time.

Christian-Palestine dialect.

Not only the Jews, but also the Christians of Palestine retained their native dialect for some time as an ecclesiastical and literary language. We possess translations of the Gospels and fragments of other works in this dialect by the Palestinian Christians dating from about the 5th century, partly accompanied by a scanty punctuation which was not added till some time later. This dialect closely resembles that of the Palestinian Jews, as was to be expected from the fact that those who spoke it were of Jewish origin.

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[1] The decree which is said to have been sent by Ezra (vii. 12 sqq.) is in its present form a comparatively late production.

[2] Even to the *Cosmas Indicopleustes* (first half of the 6th century) the Sinaitic inscriptions, the latest of which were then no more than 200–300 years old, were described as memorials of the Israelite exodus under Moses. And similar views have been propounded down to a short while ago!

Samaritan dialect.

Finally, the Samaritans, among the inhabitants of Palestine, translated their only sacred book, the Pentateuch, into their own dialect. The critical study of this translation proves that the language which lies at its base was very much the same as that of the neighbouring Jews. Perhaps, indeed, the Samaritans may have carried the softening of the gutturals a little farther than the Jews of Galilee. Their absurd attempt to embellish the language of the translation by arbitrarily introducing forms borrowed from the Hebrew original has given rise to the false notion that Samaritan is a mixture of Hebrew and Aramaic. The introduction of Hebrew and even of Arabic words and forms was practised in Samaria on a still larger scale by copyists who lived after Aramaic had become extinct. The later works written in the Samaritan dialect are, from a linguistic point of view, as worthless as the compositions of Samaritans in Hebrew; the writers, who spoke Arabic, endeavoured to write in languages with which they were but half acquainted.

All these Western Aramaic dialects, including that of the oldest inscriptions, have this feature among others in common, that they form the third person singular masculine and the third person plural masculine and feminine in the imperfect by prefixing *y*, as do the other Semitic languages. And in these dialects the termination *ā* (the so-called "status emphaticus") still retained the meaning of a definite article down to a tolerably late period.

As early as the 7th century the conquests of the Moslems greatly circumscribed the domain of Aramaic and a few centuries later it was almost completely supplanted in the west by Arabic. For the Christians of those countries, who, like every one else, spoke Arabic, the Palestinian dialect was no longer of importance, and they adopted as their ecclesiastical language the dialect of the other Aramaean Christians, the Syriac (or Edessene). The only localities where a Western Aramaic dialect, much changed from the old language, still survives are a few villages in Anti-Libanus.

Babylonian and Mandaean dialects.

The popular Aramaic dialect of Babylonia from the 4th to the 6th century of our era is exhibited in the Babylonian Talmud, in which, however, as in the Jerusalem Talmud, there is a constant mingling of Aramaic and Hebrew passages. To a somewhat later period, and probably not to exactly the same district of Babylonia, belong the writings of the Mandaeans (*q.v.*), a strange sect, half Christian and half heathen, who from a linguistic point of view possess the peculiar advantage of having remained almost entirely free from the influence of Hebrew, which is so perceptible in the Aramaic writings of Jews as well as of Christians. The orthography of the Mandaeans comes nearer than that of the Talmud to the real pronunciation, and in it the softening of the gutturals is most clearly seen. In other respects there is a close resemblance between Mandaean and the language of the Babylonian Talmud. The forms of the imperfect which we have enumerated above take in these dialects *n* or *l*. In Babylonia, as in Syria, the language of the Arabic conquerors rapidly drove out that of the country. The latter has long been totally extinct, unless possibly a few surviving Mandaeans still speak among themselves a more modern form of their dialect.

Syriac or Edessan Aramaic.

At Edessa, in the west of Mesopotamia, the native dialect had already been used for some time as a literary language, and had been reduced to rule through the influence of the schools (as is proved by the fixity of the grammar and orthography) even before Christianity acquired power in the country in the 2nd century. At an early period the Old and New Testaments were here translated, with the help of Jewish tradition. This version and its transformations became the Bible of Aramaean Christendom, and Edessa became its capital. Thus the Aramaean Christians of the neighbouring countries, even those who were subjects of the Persian empire, adopted the Edessan dialect as the language of the church, of literature, and of cultivated intercourse. Since the ancient name of the inhabitants, "Aramaeans," just like that of Ἕλληνες, had acquired in the minds of Jews and Christians the unpleasant signification of "heathens," it was generally avoided, and in its place the Greek terms "Syrians" and "Syriac" were used. But "Syriac" was also the name given by the Jews and Christians of Palestine to their own language, and both Greeks and Persians designated the Aramaeans of Babylonia as "Syrians." It is therefore, properly speaking, incorrect to employ the word "Syriac" as meaning the language of Edessa alone; but, since it was the most important of these dialects, it has the best claim to this generally received appellation. It has, as we have said, a shape very definitely fixed; and in it the above-mentioned forms of the imperfect take an *n*. As in the Babylonian dialects, the termination *ā* has become so completely a part of the substantive to which it is added that it has wholly lost the meaning of the definite article, whereby the clearness of the language is perceptibly impaired. The influence exercised by Greek is very apparent in Syriac. From the 3rd to the 7th century an extensive literature was produced in this language, consisting chiefly, but not entirely, of ecclesiastical works. In the development of this literature the Syrians of the Persian empire took an eager part. In the eastern Roman empire Syriac was, after Greek, by far the most important language; and under the Persian kings it virtually occupied a more prominent position as an organ of culture than the Persian language itself. The conquests of the Arabs totally changed this state of things. But meanwhile, even in Edessa, a considerable difference had arisen between the written language and the popular speech, in which the process of modification was still going on. About the year 700 it became a matter of absolute necessity to systematize the grammar of the language and to introduce some means of clearly expressing the vowels. The principal object aimed at was that the text of the Syriac Bible should be recited in a correct manner. But, as it happened, the eastern pronunciation differed in many respects from that of the west. The local dialects had to some extent exercised an influence over the pronunciation of the literary tongue; and, on the other hand, the political separation between Rome and Persia, and yet more the ecclesiastical schism—since the Syrians of the east were mostly Nestorians, those of the west Monophysites and Catholics—had produced divergencies between the traditions of the various schools. Starting, therefore, from a common source, two distinct systems of punctuation were formed, of which the western is the more convenient; but the eastern the more exact and generally the more in accordance with the ancient pronunciation; it has, for example, *ā* in place of the western *ō*, and *ō* in many cases where the western Syrians pronounce *ū*. In later times the two systems have been intermingled in various ways.

Arabic everywhere put a speedy end to the predominance of Aramaic—a predominance which had lasted for much more than a thousand years—and soon began to drive Syriac out of use. At the beginning of the 11th century the learned metropolitan of Nisibis, Elias bar Shinnāyā, wrote his books intended for Christians either entirely in Arabic or in Arabic and Syriac arranged in parallel columns, that is, in the spoken and in the learned language. Thus, too, it became necessary to have Syriac-Arabic glossaries. Up to the present day Syriac has remained in use for literary and ecclesiastical purposes, and may perhaps be even spoken in some monasteries and schools; but it has long been a dead language. When Syriac became extinct in Edessa and its neighbourhood is not known with certainty (see SYRIAC LANGUAGE).

This language, called Syriac *par excellence*, is not the immediate source whence are derived the Aramaic dialects still surviving in the northern districts. In the mountains known as the Ṭūr ʻAbdīn in Mesopotamia, in certain districts east and north of Mosul, in the neighbouring mountains of Kurdistan, and again beyond them on the western coast of the Lake of Urmia, Aramaic dialects are spoken by Christians and occasionally by Jews, and some of these dialects we know with tolerable precision. The dialect of Ṭūr ʻAbdīn differs considerably from all the rest; the country beyond the Tigris is, however, divided, as regards language, amongst a multitude of local dialects. Among these, that of Urmia has become the most important, since American missionaries have formed a new literary language out of it. Moreover, the Roman Propaganda has printed books in two of the Neo-Syriac dialects. All these dialects exhibit a complete transformation of the ancient type, to a degree incomparably greater than is the case, for example, with Mandaean. In particular, the ancient verbal tenses have almost entirely disappeared, but have been successfully replaced by new forms derived from participles. There are also other praiseworthy innovations. The dialect of Ṭūr ʻAbdīn has, for instance, again coined a definite article. By means of violent contractions and phonetic changes some of these dialects, particularly that of Urmia, have acquired a euphony scarcely known in any other of the Semitic languages, with their "stridentia anhelantiaque verba" (Jerome). These Aramaeans have all adopted a motley crowd of foreign words, from the Arabs, Kurds, Persians and Turks, on whose borders they live and of whose languages they can often speak at least one.

Characteristics of Aramaic.

Aramaic is frequently described as a *poor* language. This is an opinion which we are unable to share. It is quite possible, even now, to extract a very large vocabulary from the more ancient Aramaic writings, and yet in this predominantly theological literature a part only of the words that existed in the language have been preserved. It is true that Aramaic, having from the earliest times come into close contact with foreign languages, has borrowed many words from them, firstly from Assyrian, later from Persian and Greek; but, if we leave out of consideration the fact that many Syrian authors are in the habit of using, as ornaments or for convenience (especially in translations), a great number of Greek words, some of which were unintelligible to their readers, we shall find that the proportion of really foreign words in older Aramaic books is smaller than the proportion of Romance words in German or Dutch. The influence of Greek upon the syntax and phraseology of Syriac is not so great as that which it has exercised, through the medium of Latin, upon the literary languages of modern Europe. The literal reproduction of Greek phraseology and Greek construction is contrary to the whole spirit of the language. With regard to sounds, the most characteristic feature of Aramaic (besides its peculiar treatment of the dentals) is that it is poorer in vowels than Hebrew, not to speak of Arabic, since nearly all short vowels in open syllables either wholly disappear or leave but a slight trace behind them (the so-called *shĕwā*). In this respect the punctuation of Biblical Aramaic agrees with Syriac, in which we are able to observe from very early times the number of vowels by examining the metrical pieces constructed according to the number of syllables, and with the Mandaean, which expresses every vowel by means of a vowel-letter.

When several distinct dialects so agree, the phenomenon in question must be of great antiquity. There are nevertheless traces which prove that the language once possessed more vowels, and the Aramaeans, for instance, with whom David fought may have pronounced many vowels which afterwards disappeared. Another peculiarity of Aramaic is that it lends itself far more readily to the linking together of sentences than Hebrew and Arabic. It possesses many conjunctions and adverbs to express slight modifications of meaning. It is also very free as regards the order of words. That this quality, which renders it suitable for a clear and limpid prose style, is not the result of Greek influence may be seen by the Mandaean, on which Greek has left no mark. In its attempts to express everything clearly Aramaic often becomes prolix,—for example, by using additional personal and demonstrative pronouns. The contrast between Aramaic as the language of prose and Hebrew as the language of poetry is one which naturally strikes us, but we must beware of carrying it too far. Even the Aramaeans were not wholly destitute of poetical talent. Although the religious poetry of the Syrians has but little charm for us, yet real poetry occurs in the few extant fragments of Gnostic hymns. Moreover, in the modern dialects popular songs have been discovered which, though very simple, are fresh and full of feeling. It is therefore by no means improbable that in ancient times Aramaic was used in poems which, being contrary to the theological tendency of Syrian civilization, were doomed to total oblivion.

Arabic.

Early Arabic Inscriptions.

Thamudic (Lihyānī) Inscriptions.

The southern group of Semitic languages consists of Arabic, Ethiopic and Mahri-Socotri. Arabic, again, is subdivided into the dialects of the larger portion of Arabia and those of the south (the Sabaean). At a very much earlier time than we were but lately justified in supposing, some of the northern Arabs reduced their language to writing. For travellers have recently discovered at al Ula in the northern Ḥijāz inscriptions in a hitherto unknown character, derived from the Sabaean (see below), which appear to have been written before our era. Since it is probable that TLMJ, the name of two kings mentioned in them, is Πτολεμαῖος, we are directed to the Hellenistic period, and other circumstances confirm this conjecture. These inscriptions have been called "Thamudic," because they were found in the country of the Thamūd; but this designation is scarcely a suitable one, because during the period when the power of the Thamūd was at its height, and when the buildings mentioned in the Koran were hewn in the rocks, the language of this country was Nabataean (see above). A more commendable proposal is to call the inscriptions Lihyānī, since the tribe of Lihyān is sometimes mentioned in them. Unfortunately the inscriptions hitherto discovered are all short and for the most part fragmentary, and consequently furnish but little material to the student of languages. But there can be no doubt that they are written in an Arabic dialect. The treatment of the dentals, among other things, is a sufficient proof of this.

In some districts of the northern Ḥijāz and the neighbouring portion of Nejd, other brief inscriptions, for the most part cursorily scratched upon rocks, have been discovered. These have been—not very happily—named "Proto-Arabic," while the title Thamudic has been proposed for them also. Their writing is a somewhat later form of the Lihyānī, and the dialect, as well, seems to be very similar to Lihyānī. Unfortunately, the brevity of the inscriptions, which generally contain only proper names, together with the incertitude of the meaning of many, does not allow an accurate insight into their language.

To the first centuries of the Christian era belong the thousands of Arabic inscriptions, found in the wild, rocky districts south-east of Damascus, which are commonly termed Safaitic, after Safa, a locality in their neighbourhood. For the most part, these also are short fugitive pieces scratched on rough stones, though a few of them show more careful execution. Their writing is, again, a later stage of development of the Sabaean. The task of decipherment was at first rendered extremely difficult by the scanty number of exemplars and the lack of perfectly exact facsimiles. To this must be added the fact that the Safaites insert extraordinarily few vowel letters. But the zeal of several scholars and the ever increasing number of good copies have rapidly brought us farther towards the goal; and we now know the language of the Safa inscriptions much better than that of the Lihyānī and "Proto-Arabic,"—to which it stands in a close relationship. Although the inscriptions yield us no information as to unknown events of importance, still they teach us much with regard to the life and occupation of Arabian tribes who seem to have been subsequently displaced by others. The great mass of proper names, alone, is enough to make them of value to the philologist.

The Arabs who inhabited the Nabataean kingdom wrote in Aramaic, but, as has been remarked above, their native language, Arabic, often shows through the foreign disguise. We are thus able to satisfy ourselves that these Arabs, who lived a little before and a little after Christ, spoke a dialect closely resembling the later classical Arabic. The nominative of the so-called "triptote" nouns has, nearly as in classical Arabic, the termination *ū* or *ō*; the genitive has *ī* (the accusative therefore probably ended in *ā*), but without the addition of *n*. Generally speaking, those proper names which in classical Arabic are "diptotes" are here devoid of any inflexional termination. The *ū* of the nominative appears also in Arabic proper names belonging to more northern districts, as, for example, Palmyra and Edessa. All these Arabs were probably of the same race. It is possible that the inscription of Nemāra, south-east of Damascus, Arabic, but in Nabataean letters, dating from A.D. 328, and the two oldest known specimens of distinctively Arabic writing—namely, the Arabic portion of the trilingual inscription of ʽZabad, south-east of Haleb (Aleppo), written in Syriac, Greek and Arabic, and dating from 512 or 513 A.D., and that of the bilingual inscription of Harrān, south of Damascus, written in Greek and Arabic, of 568—represent nothing but a somewhat more modern form of this dialect. In these inscriptions proper names take in the genitive the termination *ū*, which shows that the meaning of such inflexions was no longer felt. The three inscriptions have not yet been satisfactorily interpreted in all their details.

During the whole period of the preponderance of Aramaic this language exercised a great influence upon the vocabulary of the Arabs. The more carefully we investigate the more clearly does it appear that numerous Arabic words, used for ideas or objects which presuppose a certain degree of civilization, are borrowed from the Aramaeans. Hence the civilizing influence of their northern neighbours must have been very strongly felt by the Arabs, and contributed in no small measure to prepare them for playing so important a part in the history of the world.

Classical Arabic.

In the 6th century the inhabitants of the greater part of Arabia proper spoke everywhere essentially the same language, which, as being by far the most important of all Arabic dialects, is known simply as the Arabic language. Arabic poetry, at that time cultivated throughout the whole of central and northern Arabia as far as the lower Euphrates and even beyond it, employed one language only. The extant Arabic poems belonging to the heathen period were not indeed written down till much later, and meanwhile underwent considerable alterations; but the absolute regularity of the metre and rhyme is a sufficient proof that on the whole these poems all obeyed the same laws of language. It is indeed highly probable that the rhapsodists and the grammarians have effaced many slight dialectical peculiarities; in a great number of passages, for example, the poems may have used, in accordance with the fashion of their respective tribes, some other case than that prescribed by the grammarians, and a thing of this kind may afterwards have been altered, unless it happened to occur in rhyme; but such alterations cannot have extended very far. A dialect that diverged in any great measure from the Arabic of the grammarians could not possibly have been made to fit into the metres. Moreover, the Arabic philologists recognize the existence of various small distinctions between the dialects of individual tribes and of their poets, and the traditions of the more ancient schools of Koran readers exhibit very many dialectical *nuances*. It might indeed be conjectured that for the majority of the Arabs the language of poetry was an artificial one,—the speech of certain tribes having been adopted by all the rest as a *dialectus poëtica*. And this might be possible in the case of wandering minstrels whose art gained them their livelihood, such as Nābigha and Aʽshā. But, when we find that the Bedouin goat-herds, for instance, in the mountainous district near Mecca composed poems in this very same language upon their insignificant feuds and personal quarrels, that in it the proud chiefs of the Taghlibites and the Bekrites addressed defiant verses to the king of Hīra (on the Euphrates), that a Christian inhabitant of Hīra, Adī b. Zaid, used this language in his serious poems,—when we reflect that, as far as the Arabic poetry of the heathen period extends, there is nowhere a trace of any important linguistic difference, it would surely be a paradox to assume that all these Arabs, who for the most part were quite illiterate and yet extremely jealous of the honour of their tribes, could have taken the trouble to clothe their ideas and feelings in a foreign, or even a perfectly artificial, language. The Arabic philologists also invariably regarded the language of the poets as being that of the Arabs in general. Even in the 3rd century after Mahomet the Bedouins of Arabia proper, with the exception of a few outlying districts, were considered as being in possession of this pure Arabic. The most learned grammarians were in the habit of appealing to any uneducated man who happened to have just arrived with his camels from the desert, though he did not know by heart twenty verses of the Koran, and had no conception of theoretical grammar, in order that he might decide whether in Arabic it were allowable or necessary to express oneself in this or that manner. It is evident that these profound scholars knew of only one classical language, which was still spoken by the Bedouins. The tribes which produced the principal poets of the earlier period belonged for the most part to portions of the Ḥijāz, to Najd and its neighbourhood, and to the region which stretches thence towards the Euphrates. A great part of the Ḥijaz, on the other hand, plays a very unimportant part in this poetry, and the Arabs of the north-west, who were under the Roman dominion, have no share whatever in it. The dialects of these latter tribes probably diverged farther from the ordinary language. The fact that they were Christians does not explain this, since the Taghlibites and other tribes who produced eminent poets

Dialect of the Koraish.

also professed Christianity. Moreover, poets from the interior were gladly welcomed at the court of the Ghassānian princes, who were Christian vassals of the emperor residing near Damascus; in this district, therefore, their language was at least *understood*. It may be added that most of the tribes which cultivated poetry appear to have been near neighbours at an epoch not very far removed from that in question, and afterwards to have been scattered in large bands over a much wider extent of country. And nearly all those who were not Christians paid respect to the sanctuary of Mecca. It is a total mistake, but one frequently made by Europeans, to designate the Arabic language as "the Koraishite dialect." This expression never occurs in any Arabic author. True, in a few rare cases we do read of the dialect of the Koraish, by which is meant the peculiar local tinge that distinguished the speech of Mecca; but to describe the Arabic language as "Koraishite" is as absurd as it would be to speak of English as the dialect of London or of Oxford. This unfortunate designation has been made the basis of a theory very often repeated in modern times—namely, that classical Arabic is nothing else but the dialect of Mecca, which the Koran first brought into fashion. So far from this being the case, it is certain that the speech of the *towns* in the Ḥijāz did not agree in every point with the language of the poets, and, as it happens, the Koran itself contains some remarkable deviations from the rules of the classical language. This would be still more evident if the punctuation, which was introduced at a somewhat later time, did not obscure many details. The traditions which represent the Koraish as speaking the purest of all Arabic dialects are partly the work of the imagination and partly compliments paid to the rulers descended from the Koraish, but are no doubt at variance with the ordinary opinion of the Arabs themselves in earlier days. In the Koran Mahomet has imitated the poets, though, generally speaking, with little success; the poets, on the other hand, never imitated him. Thus the Koran and its language exercised but very little influence upon the poetry of the following century and upon that of later times, whereas this poetry closely and slavishly copied the productions of the old heathen period. The fact that the poetical literature of the early Moslems has been preserved in a much more authentic form than the works of the heathen poets proves that our idea of the language of its pattern, the ancient poetry, is on the whole just.

Changes in classical Arabic.

The Koran and Islam raised Arabic to the position of one of the principal languages of the world. Under the leadership of the Koraish the Bedouins subjected half the world to both their dominion and their faith. Thus Arabic acquired the additional character of a sacred language. But soon it became evident that not nearly all the Arabs spoke a language precisely identical with the classical Arabic of the poets. The north-western Arabs played a particularly important part during the period of the Omayyads. The ordinary speech of Mecca and Medina was, as we have seen, no longer quite so primitive as that of the desert. To this may be added that the military expeditions brought those Arabs who spoke the classical language into contact with tribes from out-of-the-way districts, such as ʿOmān, Baḥrain (Bahrein), and particularly the north of Yemen. The fact that numbers of foreigners, on passing over to Islam, became rapidly Arabized was also little calculated to preserve the unity of the language. Finally, the violent internal and external commotions which were produced by the great events of that time, and stirred the whole nation, probably accelerated linguistic change. In any case, we know from good tradition that even in the 1st century of the Flight the distinction between correct and incorrect speech was in places quite perceptible. About the end of the 2nd century the system of Arabic grammar was constructed, and never underwent any essential modification in later times. The theory as to how one should express oneself was now definitely fixed. The majority of those Arabs who lived beyond the limits of Arabia already diverged far from this standard; and in particular the final vowels which serve to indicate cases and moods were no longer pronounced. This change, by which Arabic lost one of its principal advantages, was no doubt hastened by the fact that even in the classical style such terminations were omitted whenever the word stood at the end of a sentence (in pause); and in the living language of the Arabs this dividing of sentences is very frequent. Hence people were already quite accustomed to forms without grammatical terminations. But in the language of certain Bedouin tribes remnants of those terminations have been preserved down to our time.

Vocabulary.

Through the industry of Arabic philologists we are able to make ourselves intimately acquainted with the system, and still more with the vocabulary of the language. Although they have not always performed their task in a critical manner, we are obliged to thank them sincerely. We should be all the more disposed to admire the richness of the ancient Arabic vocabulary when we remember how simple are the conditions of life amongst the Arabs, how painfully monotonous their country, and consequently how limited the range of their ideas must be. Within this range, however, the slightest modification is expressed by a particular word. It must be confessed that the Arabic lexicon has been greatly augmented by the habit of citing as words by themselves such rhetorical phrases as an individual poet has used to describe an object: for example, if one poet calls the lion the "tearer" and another calls him the "mangler," each of these terms is explained by the lexicographers as equivalent to "lion." One branch of literature in particular, namely, lampoons and satirical poems, which for the most part have perished, no doubt introduced into the lexicon many expressions coined in an arbitrary and sometime in a very strange manner. Moreover, Arabic philologists seem to have underrated the number of words which, though they occur now and then in poems, were never in general use except among particular tribes. But in spite of these qualifications it must be admitted that the vocabulary is surprisingly rich, and the Arabic dictionary will always remain the principal resource for the elucidation of obscure expressions in all the other Semitic tongues. This method, if pursued with the necessary caution, is a perfectly legitimate one.

Poems seldom enable us to form a clear idea of the language of ordinary life, and Arabic poetry happens to have been distinguished from the very beginning by a certain tendency to artificiality and mannerism. Still less does the Koran exhibit the language in its spoken form. This office is more performed by the prose of the ancient normative traditions (*Ḥadīth*). And the genuine accounts of the deeds of the Prophet and of his companions, and especially the stories concerning the battles and adventures of the Bedouins in the heathen period and in the earlier days of Islam, are excellent models of a prose style, although in some cases their redaction dates from a later time.

Grammatical forms and rules.

Classical Arabic is rich not only in words but in grammatical forms. The wanton development of the broken plurals, and sometimes of the verbal nouns, must be regarded as an excess of wealth. The sparing use of the ancient terminations which mark the plural has somewhat obscured the distinction between plurals, collectives, abstract nouns, and feminines in general. In its manner of employing the verbal tenses genuine Arabic still exhibits traces of that poetical freedom which we see in Hebrew; this characteristic disappears in the later literary language. In connecting sentences Arabic can go much further than Hebrew, but the simple parataxis is by far the most usual construction. Arabic has, however, this great advantage, that it scarcely ever leaves us in doubt as to where the apodosis begins. The attempts to define the tenses more clearly by the addition of adverbs and auxiliary verbs lead to no very positive result (as is the case in other Semitic languages also), since they are not carried out in a systematic manner. The arrangement of words in a sentence is governed by very strict rules. As the subject and object, at least in ordinary cases, occupy fixed positions, and as the genitive is invariably placed after the noun that governs it, the use of case-endings loses much of its significance.

Arabic of educated society.

This languge of the Bedouins had now, as we have seen, become that of religion, courts and polished society. In the streets of the towns the language already diverged considerably from this, but the upper classes took pains to speak "Arabic." The poets and the *beaux esprits* never ventured to employ any but the classical language, and the "Atticists," with pedantic seriousness, convicted the most celebrated among the later poets (for instance, Motanabbí) of occasional deviations from the standard of correct speech. At the same time, however, classical Arabic was the language of business and of science, and at the present day still holds this position. There are, of course, many gradations between the pedantry of purists and the use of what is simply a vulgar dialect. Sensible writers employ a kind of κοινή, which does not aim at being strictly correct and calls modern things by modern names, but which, nevertheless, avoids coarse vulgarisms, aiming principally at making itself intelligible to all educated men. The reader may pronounce or omit the ancient terminations as he chooses. This language lived on, in a sense, through the whole of the middle ages, owing chiefly to the fact that it was intended for educated persons in general and not only for the learned, whereas the poetical schools strove to preserve exactly the grammar and the lexicon of the long extinct language of the Bedouins. As might be expected, this κοινή, like the κοινή of the Greeks, has a comparatively limited vocabulary, since its principle is to retain only those expressions from the ancient language which were generally understood, and it does not borrow much new material from the vulgar dialects.

It is entirely a mistake to suppose that Arabic is unsuited for the treatment of abstract subjects. On the contrary, scarcely any language is so well adapted to be the organ of scholasticism in all its branches. Even the tongue of the ancient Bedouins had a strong preference for the use of abstract verbal nouns (in striking contrast to the Latin, for example); thus they oftener said "Needful is thy sitting" than "It is needful that thou shouldest sit." This tendency was very advantageous to philosophical phraseology. The strict rules as to the order of words, though very unfavourable to the development of a truly eloquent style, render it all the easier to express ideas in a rigidly scientific form.

Minor Arabic dialects.

In the meantime Arabic, like every other widely spread language, necessarily began to undergo modification and to split up into dialects. The Arabic scholars are mistaken in attributing this development to the influence of those foreign languages with which Arabic came into contact. Such influences can have had but little to do with the matter; for were it otherwise the language of the interior of Arabia must have remained unchanged, yet even in this region the inhabitants are very far from speaking as they did a thousand years back. A person who in Arabia or elsewhere should trust to his knowledge of classical Arabic only would resemble those travellers from the north who endeavour to make themselves understood by Italian waiters through the medium of a kind of Latin. The written language has, it is true, greatly retarded the development of the dialects. Every good Moslem repeats at least a few short sūras several times a day in his prayers. Nor is this all: the sacred book meets him everywhere. Now the majority of Arabian Moslems understand something at least of the passages they recite or hear; so that the Koran was bound to exercise, on the language of the widest circles, an influence such as has been exercised by no other book in the world. The idiom of the church, of learning and of diplomacy was brought—partially at least—nearer to the average man, with the result that many of its words and locutions passed, with more or less correctitude, into the language of common life, or that its mode of expression was taken as a model, precisely as Latin, the language of the church, science and the state, exerted a powerful influence on the living Romance tongues, even before the Renaissance. Yet, in spite of this, the Arabic dialects have developed on their own lines and have diverged widely from each other. Our knowledge of them has made rapid progress in late years, and we have now good grammars of several dialects. We are best acquainted with the present speech of Egypt, and we are well posted in the dialects of the Maghrib—the African coastal lands from Tripoli to Morocco. To the Maghrib group of dialects belonged that once spoken in Sicily, of which we know little in especial, together with the Spanish Arabic of former times, which is better known to us through several literary monuments and the Grammar and Lexicon of Pedro de Alcala (1505). The shibboleth of these Western dialects is that, in the imperfect, they pronounce the 1st person plural with the ending *u* (as the 2nd and 3rd), and give to the 1st person singular the prefix *n* (as in the plural form). Maltese, also, is of the Maghrib family. This Arabic dialect, the only one spoken exclusively by Christians, is of peculiar interest to the philologist, owing to the fact that for some 900 years it has been completely withdrawn from the action of literary Arabic. On the other hand, it has been exposed to the influence of Italian. Nevertheless, it has developed in a very similar manner to the dialects of the neighbouring African coast: still it possesses many features which are peculiar to itself. Of the dialects of Syria, inner and southern Arabia, and other oriental countries, we also know more than was the case a short while ago; but the gaps in our knowledge are still too great to allow us to classify them in fixed groups. For the most part the Bedouin language is somewhat strongly distinguished from that of the sedentary tribes; but we should hardly be justified in believing that the Bedouin dialects form a contrasting unity as against the other idioms.

There can be no doubt that the development of these dialects is in part the result of older dialectical variations which were already in existence in the time of the Prophet. The histories of dialects which differ completely from one another often pursue an analogous course. In general, the Arabic dialects still resemble one another more than we might expect when we take into consideration the immense extent of country over which they are spoken and the very considerable geographical obstacles that stand in the way of communication. But we must not suppose that people, for instance, from Mosul, Morocco, Ṣanʻā, and the interior of Arabia would be able to understand one another without difficulty. It is a total error to regard the difference between the Arabic dialects and the ancient language as a trifling one, or to represent the development of these dialects as something wholly unlike the development of the Romance languages. No living Arabic dialect diverges from classical Arabic so much as French or Rouman from Latin; but, on the other hand, no Arabic dialect resembles the classical language so closely as the Lugodoric dialect, which is still spoken in Sardinia, resembles its parent speech, and yet the lapse of time is very much greater in the case of the latter. Side by side with the poetry of the old literary language there arose, in quite early days, another school of poetry which availed itself of the younger, living dialects. So, even in the 12th century, dialectic poetry was flourishing in Spain; and down to the present day, in the most diverse quarters of the vast linguistic domain of Arabic, songs have been composed in the various dialects. But this poetry, probably with the sole exception of Maltese, stands in some connexion or other with the antique, and is subject, more or less, to the influence of the classical language. And this is still more the case in other departments of literature. *Märchen*, and other tales, written by the uneducated, merely show a dialectic colouring, frequently combined with a catachrestic use of the grammatical forms of classical Arabic, not the genuine aspect of the dialect itself. These features are particularly evident in works by Jews and Christians. Purely "vulgar" texts, of any magnitude, would be hard to discover. The isolated Maltese alone has succeeded in producing a new written language distinct from the classical tongue; and in this a fair amount of material has already been printed in Latin characters. In recent years, however, earnest attempts have been made to elevate the Egyptian dialect to the rank of a literary language: whether these attempts will be crowned with permanent success is a question to be resolved by time. In any case, the ancient written language, though with all kinds of modifications, will long continue to exist. The very fact that it does not express the vocalization with exactitude is an advantage; for thus the Arabs, from the Persian Gulf to the Atlantic, can recognize the same word, although they may pronounce it with different vowels.

Sabaean.

Sabaean inscriptions.

Long before Mahomet, a peculiar and highly developed form of civilization had flourished in the table-land to the south-west of Arabia. The more we become acquainted with the country of the ancient Sabaeans and with its colossal edifices, and the better we are able to decipher its inscriptions, which are being discovered in ever-increasing numbers, the easier it is for us to account for the haze of mythical glory wherewith the Sabaeans were once invested. The Sabaean incriptions (which till lately were more often called by the less correct name of "Himyaritic") begin long before our era and continue till the 6th century. The somewhat stiff character is always very distinct; and the habit of regularly dividing the words from one another renders decipherment easier, which, however, has not yet been performed in a very satisfactory manner, owing in part to the fact that the vast majority of the documents in question consist of religious votive tablets with peculiar sacerdotal expressions, or of architectural notices abounding in technical terms. These inscriptions fall into two classes, distinguished partly by grammatical peculiarities and partly by peculiarities of phraseology. One dialect, which forms the causative with *ha*, like Hebrew and others, and employs, like nearly all the Semitic languages, the termination *h* (*hū*) as the suffix of the third person singular, is the Sabaean properly speaking. The other, which expresses the causative by *sa* (corresponding to the Shaphel of the Aramaeans and others), and for the suffix uses *s* (like the Assyrian *sh*), is the Minaic. To this latter branch belong the numerous South Arabic inscriptions recently found in the north of the Ḥijāz, near Ḥejr, where the Minaeans must have had a commercial settlement. On the other hand, the very old inscriptions, emanating from a colony at Jeha in Abyssinia, are Sabaean. The difference between the two classes of inscriptions is no doubt ultimately based upon a real divergence of dialect. But the singular manner in which districts containing Sabaean inscriptions and those containing Minaic alternate with one another seems to point in part to a mere hieratic practice of clinging to ancient modes of expression. Indeed it is very probably due to conscious literary conservatism that the language of the inscriptions remains almost entirely unchanged through many centuries. A few inscriptions from districts rather more to the east exhibit certain linguistic peculiarities, which, however, may perhaps be explained by the supposition that the writers did not, as a rule, speak this dialect, and therefore were but imperfectly acquainted with it.

Grammatical forms.

A great hindrance to the completion of our knowledge of the Sabaean language lies in the paucity of vowel-letters in the inscriptions. The unvarying style of the inscriptions excludes further a great number of the commonest grammatical forms. Not a single occurrence of the first or second person has yet been detected, with the possible exception of one proper name, in which "our god" apparently occurs. But the knowledge which we already possess amply suffices to prove that Sabaean is closely related to Arabic as we are acquainted with it. The former language possesses the same phonetic elements as the latter. It possesses the broken plural, a dual form resembling that used in Arabic, &c. It is especially important to notice that Sabaean expresses the idea of indefiniteness by means of an appended *m*, just as Arabic expresses it by means of an *n*, which in all probability is a modification of the former sound. But we may maintain that, in the later centuries, the *m* had fallen away in the pronunciation, either completely or in the majority of cases. Both in this point and in some others Sabaean appears more primitive than Arabic, as might be expected from the earlier date of its monuments. The article is formed by appending an *n*. In its vocabulary also Sabaean bears a great resemblance to Arabic, although, on the other hand, it often approaches more nearly to the northern Semitic languages in this respect; and it possesses much that is peculiar to itself.

Soon after the Christian era Sabaean civilization began to decline, and completely perished in the wars with the Abyssinians, who several times occupied the country, and in the 6th century remained in possession of it for a considerable period. In that age the language of central Arabia was already penetrating into the Sabaean domain. It is further possible that many tribes which dwelt not far to the north of the civilized districts had always spoken dialects resembling central Arabic rather than Sabaean. About the year 600 "Arabic" was the language of all Yemen, with the exception perhaps of a few isolated districts, and this process of assimilation continued in later times. True, a few echoes of Sabaean have survived in certain grammatical forms and the vocabulary of present-day dialects in those districts; but these dialects are, on the whole, thoroughly "Arabic." Several centuries after Mahomet, learned Yemenites were acquainted with the characters of the inscriptions which abounded in their country; they were also able to decipher the proper names and a small number of Sabaean words the meaning of which was still known to them, but they could no longer understand the inscriptions as a whole. Being zealous local patriots, they discovered in those inscriptions which they imagined themselves to be capable of deciphering many fabulous stories respecting the glory of the ancient Yemenites.

Mahrī and Socotrī.

Farther to the east, in the sea-coast districts of Shihr and Mahra, up to the borders of the barren desert of the interior, and also in the island of Socotra, dialects very unlike Arabic are still spoken. Allusions to this fact are found in Arabic writers of the 10th century. Mahrī, from which Shkhaurī forms a distinct dialect, and Socotrī are probably scions of dialects which were related to Sabaean and Minaean; but they have developed on altogether independent lines, and we can scarcely hope that they will render us any great assistance in the interpretation of the inscriptions. They certainly show the southern Semitic type in a most pronounced manner. The strange form of the words is produced, *inter alia*, by all manner of vowel lengthenings and violent mutations of consonants (*e.g.* in Socotrī *s* frequently becomes *h*, a phonetic change otherwise unknown in Semitic philology). Exact investigation will undoubtedly still discover an old acquaintance in many a strange-seeming word. Here and there, however, in Mahrī we discover words which at the first glance we recognize as common in Hebrew or Aramaic, while Arabic knows them either not at all or only in derivative significations. Still, a very large part—perhaps the preponderating part—of the Mahrī vocabulary is formed by words which have been borrowed from the Arabic at different periods. Many of them have subsequently undergone drastic phonetic alterations, so that at first they might be taken for genuine Mahrī. In Socotrī, which has been more protected by its insular position, the borrowed Arabic words are rarer, but even here they are not lacking. These languages, however, especially Socotrī, still contain a number of words, with regard to which we may well doubt whether they are Semitic at all. The conjecture that Hamites also were once settled in those districts and have left traces of themselves in the language, appears to be favoured by the bodily characteristics of the inhabitants.[1]

Ethiopic.

Geez, or Ethiopic proper.

In Abyssinia, too, and in the neighbouring countries we find languages which bear a certain resemblance to Arabic. The Geez, or Ethiopic[2] proper, the language of the ancient kingdom of Axūm, was reduced to writing at an early date. At first Sabaean letters were employed. But even the monument of King Aeizanas (*c.* A.D. 350), as is now well established, bears, in addition to the Greek inscription, one in Ethiopian. This, however, is both in Sabaean and in Geez characters, *i.e.* in a systematic transformation of the Sabaean. Here the Geez is still unvocalized; and some few inscriptions besides, without vowel signs, have been discovered. But two great inscriptions of the same king of Axūm—so it appears to be after the newest researches—already have the full vocalization which obtains in the Ethiopian Bible and the remaining literature: the language, too, is identically the same. The indication of the vowels gives Ethiopic an advantage over all other Semitic scripts. By whom it was introduced is unknown. Not long after the time of the inscriptions the Bible was translated into Geez from the Greek, in part by Jews; for Jews and Christians were at that time actively competing with one another, both in Arabia and in Abyssinia; nor were the former unsuccessful in making proselytes. The missionaries who gave the Bible to the Abyssinians must, at least in some cases, have spoken Aramaic as their mother-tongue, for this alone can explain the fact that in the Ethiopic Bible certain religious conceptions are expressed by Aramaic words. During the following centuries various works were produced by the Abyssinians in this language; they were all, so far as we are able to judge, of a more or less theological character, almost invariably translations from the Greek. We cannot say with certainty when Geez ceased to be the language of the people, but it was probably about a thousand years ago. From the time when the Abyssinian kingdom was reconstituted, towards the end of the 13th century, by the so-called Solomonian dynasty (which was of southern origin), the language of the court and of the government was Amharic; but Geez remained the ecclesiastical and literary language, and Geez literature even showed a certain activity in numerous translations from those Arabic and Coptic works which were in use amongst the Christians of Egypt; besides these, original writings were composed by monks and priests, namely, lives of saints, hymns, &c. This literary condition lasted till modern times. The language, which had long become extinct, was by no means invariably written in a pure form: we may often observe, *inter alia*, a servile imitation of Arabic modes of expression. Even in manuscripts of more ancient works we find many linguistic corruptions, which have crept in partly through mere carelessness and ignorance, partly through the influence of the later dialects. On points of detail we are still sometimes left in doubt, as we possess no manuscripts belonging to the older period.

Characteristics of Geez.

Geez is more nearly related to Sabaean than to Arabic, though scarcely to such a degree as we might expect. The historical intercourse between the Sabaeans and the people of Axūm does not, however, prove that those who spoke Geez were simply a colony from Sabaea; the language may be descended from an extinct cognate dialect of south Arabia, or may have arisen from a mingling of several such dialects. And this colonization in Africa probably began much sooner than is usually supposed. In certain respects Geez represents a more modern stage of development than Arabic; we may cite as instances the loss of some inflexional terminations and of the ancient passive, the change of the aspirated dentals into sibilants, &c. In the manuscripts, especially those of later date, many letters are confounded, namely, *h*, *ḥ*, and *kh*, *s* and *sh*, *ṣ* and *ḍ*; this, however, is no doubt due only to the influence of the modern dialects. To this same influence, and indirectly perhaps to that of the Hamitic languages, we may ascribe the very hard sound now given to certain letters, *q*, *ṭ*, *ṣ*, and *ḍ*, in the reading of Geez. The last two are at present pronounced something like *ṭs* and *ts* (the German *z*). A peculiar advantage possessed by Geez and by all Ethiopic languages is the sharp distinction between the imperfect and the subjunctive: in the former a vowel is inserted after the first radical, a formation which exists also in Mahrī and Socotrī, and—though in another signification—in Assyrian as well. Geez has no definite article, but is very rich in particles. In the ease with which it joins sentences together and in its freedom as to the order of words it resembles Aramaic. The vocabulary is but imperfectly known, as the theological literature, which is for the most part very arid, supplies us with comparatively few expressions that do not occur in the Bible, whereas the more modern works borrow their phraseology in part from the spoken dialects, particularly Amharic. With regard to the vocabulary, Geez has much in common with the other Semitic tongues, but at the same time possesses many words peculiar to itself; of these a considerable proportion may be of Hamitic origin. However, the grammar shows, at most, some slight and dubious traces of Hamitic influence. Geez seems to have been originally the language of a tribe almost exempt from non-Semitic blood. But we must not suppose that all the inhabitants of the ancient kingdom of Axum were pure Semites. The immigration of the Semites from Arabia was, in all probability, a slow process, beginning at a very ancient period, and under such circumstances there is every reason to assume that they largely intermingled with the aborigines. This opinion seems to be confirmed by anthropological facts.

Tigrē and Tigriña.

Not only in what is properly the territory of Axūm (namely, Tigrē, north-eastern Abyssinia), but also in the countries bordering upon it to the north, including the islands of Dahlak, dialects are still spoken which are but more modern forms of the linguistic type clearly exhibited in Geez, viz. that spoken in Tigrē proper and that of the neighbouring countries. In reality, the name of Tigrē belongs to both, and it would be desirable to distinguish them from one another as Northern and Southern Tigrē. But it is the custom to call the northern dialect Tigrē simply, whilst that spoken in Tigrē itself bears the name of Tigrai or, with an Amharic termination, Tigriña. Tigrē bears a somewhat closer resemblance to Geez than does Tigriña, although this latter is spoken in the very home of Geez, for Tigriña has during several centuries been very strongly influenced by Amharic, which has not been the case with Tigrē, which is spoken mostly by nomads. But Tigrē, on the other hand, seems to have been greatly influenced by Hamitic dialects. In late years careful observations on both languages have been made by scholars *in loco*, and we already have a number of printed texts, comprising partly original works, partly translations of Biblical books and so forth. But in this domain our knowledge still stands in great need of being perfected.

Amharic.

Although Tigrē and Tigriña are not free from foreign influences, yet at the core they are purely Semitic. This is not fundamentally the case with Amharic, a language of which the domain extends from the left bank of the Takkazē into regions far to the south. Although by no means the only language spoken in these countries, it always tends to displace those foreign tongues which surround it and with which it is interspersed. We here refer especially to the Agaw dialects. Although Amharic has been driven back by the invasions of the Galla tribes, it has already compensated itself to some extent for this loss, as the Yedju and Wollo Gallas, who penetrated into eastern Abyssinia, have adopted it as their language. With the exception, of course, of Arabic, no Semitic tongue is spoken by so large a number of human beings as Amharic. The very fact that the Agaw languages are being gradually, and, as it were, before our own eyes, absorbed by Amharic makes it appear probable that this language must be spoken chiefly by people who are not of Semitic race.[3] This supposition is confirmed by a study of the language itself. Amharic has diverged from the ancient Semitic type to a far greater extent than any of the dialects which we have hitherto enumerated. Many of the old formations preserved in Geez are completely modified in Amharic. Of the feminine forms there remain but a few traces; and that is the case also with the ancient plural of the noun. The strangest innovations occur in the personal pronouns. And certainly not more than half the vocabulary can without improbability be made to correspond with that of the other Semitic languages. In this, as also in the grammar, we must leave out of account all that is borrowed from Geez, which, as being the ecclesiastical tongue, exercises a great influence everywhere in Abyssinia. On the other hand, we must make allowance for the fact that in this language the very considerable phonetic modifications often produce a total change of form, so that many words which at first have a thoroughly foreign appearance prove on further examination to be but the regular development of words with which we are already acquainted. But the most striking deviations occur in the syntax. Things which we are accustomed to regard as usual or even universal in the Semitic languages, such as the placing of the verb before the subject, of the governing noun before the genitive, and of the attributive relative clause after its substantive, are here totally reversed. Words which are marked as genitives by the prefixing of the relative particle, and even whole relative clauses, are treated as one word, and are capable of having the objective suffix added to them. It is scarcely going too far to say that a person who has learnt no Semitic language would have less difficulty in mastering the Amharic construction than one to whom the Semitic syntax is familiar. What here appears contrary to Semitic analogy is sometimes the rule in Agaw. Hence it is probable that in this case tribes originally Hamitic retained their former modes of thought and expression after they had adopted a Semitic speech, and that they modified their new language accordingly. And it is not certain that the partial Semitization of the southern districts of Abyssinia (which had scarcely any connexion with the civilization of Axum during its best period) was entirely or even principally due to influences from the north.

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[1] What certain knowledge we possess of Mahrī and Socotrī is almost wholly based on the researches of Vienna scholars. We hope to receive from them still more light on these strange tongues.

[2] This name is due to the fact that the Abyssinians, under the influence of false erudition, applied the name Αἰθιοπία to their own kingdom.

[3] Only an advanced guard of the Agaw languages, the Bīlīn or dialect of the Bogos, is being similarly absorbed by the Tigrē.

In spite of its dominant position, Amharic did not for several centuries show any signs of becoming a literary language. The oldest documents which we possess are a few songs of the 15th and 16th centuries, which were not, however, written down till a later time, and are very difficult to interpret. There are also a few Geez-Amharic glossaries, which may be tolerably old. Since the 17th century various attempts have been made, sometimes by European missionaries, to write in Amharic, and in modern times this language has to a considerable extent been employed for literary purposes; nor is this to be ascribed exclusively to foreign influence. A literary language, fixed in a sufficient measure, has thus been formed. Books belonging to a somewhat earlier period contain tolerably clear proofs of dialectical differences. Scattered notices by travellers seem to indicate that in some districts the language diverges in a very much greater degree from the recognized type.

The Abyssinian chronicles have for centuries been written in Geez, largely intermingled with Amharic elements. This "language of the chronicles," in itself a dreary chaos, often enables us to discover what were the older forms of Amharic words. A similar mixture of Geez and Amharic is exemplified in various other books, especially such as refer to the affairs of the government and of the court.

Hararī and Gurāguē.

The town of Harar, situated at some distance east of Shoa, forms a Semitic island; for its language is extremely similar to Amharic. In comparison with this, it exhibits sometimes later, sometimes older formations. A few centuries ago, Hararī was perhaps a dialect only slightly divergent from Amharic. To-day, Amharians and the inhabitants of Harar can no longer understand each other, especially as the latter have drawn largely on the languages of the surrounding Hamites (Galla, Somāl, and probably also Danākil), and on Arabic, which exercises a strong influence upon them as Moslems. We may fairly regard them as an old colony of Abyssinians. As the case is with Hararī, so it is probably with the dialects of Gurāguē (south of Shoa). These dialects, which are markedly divergent from one another and have assumed a highly peculiar form, placed as they are in the midst of entirely alien idioms, yet give unmistakable signs of an origin either from Amharic or a dialect extremely close to Amharic. It is certainly a matter for desire that we should soon receive some really comprehensive and at the same time trustworthy account of Hararī and the language of Gurāguē. We repeat that the immigration of the Semites into these parts of Africa was probably no one single act, that it may have taken place at different times, that the immigrants perhaps belonged to different tribes and to different districts of Arabia, and that very heterogeneous peoples and languages appear to have been variously mingled together in these regions. (TH. N.)

SEMLER, JOHANN SALOMO (1725–1791), German church historian and biblical critic, was born at Saalfeld in Thuringia on the 18th of December 1725, the son of a clergyman in poor circumstances. He grew up amidst pietistic surroundings, which powerfully influenced him his life through, though he never became a Pietist. In his seventeenth year he entered the university of Halle, where he became the disciple, afterwards the assistant, and at last the literary executor of the orthodox rationalistic professor S. J. Baumgarten (1706–1757). In 1749 he accepted the position of editor, with the title of professor, of the Coburg official *Gazette*. But in 1751 he was invited to Altdorf as professor of philology and history, and in 1752 he became a professor of theology in Halle. After the death of Baumgarten (1757) Semler became the head of the theological faculty of his university, and the fierce opposition which his writings and lectures provoked only helped to increase his fame as a professor. His popularity continued undiminished for more than twenty years, until 1779. In that year he came forward with a reply (*Beantwortung der Fragmente eines Ungenannten*) to the *Wolfenbüttel Fragments* (see REIMARUS) and to K. F. Bahrdt's confession of faith, a step which was interpreted by the extreme rationalists as a revocation of his own rationalistic position. Even the Prussian government, which favoured Bahrdt, made Semler painfully feel its displeasure at this new but really not inconsistent aspect of his position. But, though Semler was really not inconsistent with himself in attacking the views of Reimarus and Bahrdt, his popularity began from that year to decline, and towards the end of his life he felt the necessity of emphasizing the apologetic and conservative value of true historical inquiry. His defence of the notorious edict of July 9, 1788, issued by the Prussian minister for ecclesiastical affairs, Johann Christoph von Wöllner (1732–1800), the object of which was to enforce Lutheran orthodoxy, might with greater justice be cited as a sign of the decline of his powers and of an unfaithfulness to his principles. He died at Halle on the 14th of March 1791, worn out by his labours, and disappointed at the issue of his work.

The importance of Semler, sometimes called "the father of German rationalism," in the history of theology and the human mind is that of a critic of biblical and ecclesiastical documents and of the history of dogmas. He was not a philosophical thinker or theologian, though he insisted, with an energy and persistency before unknown, on certain distinctions of great importance when properly worked out and applied, *e.g.* the distinction between religion and theology, that between private personal beliefs and public historical creeds, and that between the local and temporal and the permanent elements of historical religion. His great work was that of the critic. He was the first to reject with sufficient proof the equal value of the Old and the New Testaments, the uniform authority of all parts of the Bible, the divine authority of the traditional canon of Scripture, the inspiration and supposed correctness of the text of the Old and New Testaments, and, generally, the identification of revelation with Scripture. Though to some extent anticipated by the English deist Thomas Morgan, Semler was the first to take due note of and use for critical purposes the opposition between the Judaic and anti-Judaic parties of the early church. He led the way in the task of discovering the origin of the Gospels, the Epistles, the Acts of the Apostles, and the Apocalypse. He revived previous doubts as to the direct Pauline origin of the Epistle to the Hebrews, called in question Peter's authorship of the first epistle, and referred the second epistle to the end of the 2nd century. He wished to remove the Apocalypse altogether from the canon. In textual criticism Semler pursued further the principle of classifying MSS. in families, adopted by R. Simon and J. A. Bengel. In church history Semler did the work of a pioneer in many periods and in several departments. Friedrich Tholuck pronounces him "the father of the history of doctrines," and F. C. Baur "the first to deal with that history from the true critical standpoint." At the same time, it is admitted by all that he was nowhere more than a pioneer.

Tholuck gives 171 as the number of Semler's works, of which only two reached a second edition, and none is now read for its own sake. Amongst the chief are: *Commentatio de demoniacis* (Halle, 1760, 4th ed. 1779), *Umständliche Untersuchung der dämonischen Leute* (1762), *Versuch einer biblischen Dämonologie* (1776), *Selecta capita historiae ecclesiasticae* (3 vols., Halle, 1767–1769), *Abhandlung von freier Untersuchung des Kanon* (Halle, 1771–1775), *Apparatus ad liberalem N.T. interpretationem* (1767; *ad V.T.*, 1773), *Institutio ad doctrinam Christ. liberaliter discendam* (Halle, 1774), *Über historische, gesellschaftliche, und moralische Religion der Christen* (1786), and his autobiography, *Semler's Lebensbeschreibung, von ihm selbst abgefasst* (Halle, 1781–1782).

For estimates of Semler's labours, see W. Gass, *Gesch. der prot. Dogmatik* (Berlin, 1854–1867); Isaak Dorner, *Gesch. der prot. Theol.* (Munich, 1867); the art. in Herzog's *Realencyklopädie*; Adolf Hilgenfeld, *Einleitung in das Neue Test.* (Leipzig, 1875); F. C. Baur, *Epochen der kirchlichen Geschichtsschreibung* (1852); and Albrecht Ritschl, *Gesch. des Pietismus* (Bonn, 1880–1884).

SEMLIN (Hungarian, *Zimony*; Servian, *Zemun*), a town of Croatia-Slavonia, in the county of Syrmia, situated beside the south bank of the Danube, on a tongue of land between that river and the Save. Pop. (1900) about 15,079; the majority being Serbs, the remainder Croats, Jews, Germans, Magyars and Gipsies. Semlin is the seat of an Orthodox archbishop; but most of the inhabitants are Roman Catholic. Apart from numerous churches, its chief buildings are the law-courts, prison, theatre, synagogue, a higher grade school or real-gymnasium, and two technical schools, one being for girls. Much of the town is modern, but its suburb Franzenthal near the Danube consists partly of mud huts thatched with reeds. Standing at the confluence of two navigable rivers, and on the main line from Buda-Pest to Constantinople and Salonica, Semlin is the principal customs and quarantine station for travellers between Austria-Hungary and the Balkan states. It communicates with Vienna and the Black Sea, by the Danube; with Sissek, by the Save; and with Belgrade by a steam-ferry and a bridge over the Save. There are a few factories, but far more important is the transit trade in grain, fruit, livestock and timber.

Various Roman remains have been discovered near Semlin. On the top of Zigeunerberg, a hill overlooking the Danube, are the ruins of the castle of Hunyadi János, who died here in 1456. Until 1881 the town belonged to the Military frontier (*q.v.*).

SEMMELWEISS, IGNATZ PHILIPP (1818–1865), Hungarian physician, was born at Buda on the 1st of July 1818, and was educated at the universities of Pest and Vienna. At first he intended to study law, but soon abandoned it for medicine; and such was his promise that, even as an undergraduate, he attracted the attention of men like Joseph Skoda and Carl Rokitansky. He graduated M.D. at Vienna in 1844, and was then appointed assistant professor in the maternity department, under Johann Klein. In Klein's time the deaths in this department from what was then known as "puerperal fever" became portentous, the ratio being rarely under 5·03 and sometimes exceeding 7·45%. Between October 1841 and May 1843, of 5139 parturient women 829 died; giving the terrible death-rate of 16%, not counting those of patients transferred to other wards. It was observed that this rate of mortality prevailed in the students' clinic; in the midwives' clinic it ruled much lower. Semmelweiss found no satisfactory explanations of this mortality in such causes as overcrowding, fear, mysterious atmospheric influences or even contaminated wards; yet that the cause lay in some local conditions he felt certain. The patients would die in rows, others escaping; and women delivered before arrival, or prematurely, would escape. At last, he tells us, the death of a colleague from a dissection wound "unveiled to my mind an identity" with the fatal puerperal cases; and the beginning of a scientific pathology of septicaemia was made. The students often came to the lying-in wards from the dissecting-room, their hands cleansed with soap and water only. In May 1847 Semmelweiss prescribed ablutions with chlorinated lime water: in that month the mortality stood at 12·24%; before the end of the year it had fallen to 3·04, and in the second year to 1·27; thus even surpassing the results in the midwives' clinic. Skoda and other eminent physicians were convinced by these results (*Zeitschrift d. k. k. Gesellschaft der Ärzte in Wien*, J. vi. B. i. p. 107). Klein, however, apparently blinded by jealousy and vanity, supported by other reactionary teachers, and aided by the disasters which then befell the Hungarian nation, drove Semmelweiss from Vienna in 1849. Fortunately, in the following year Semmelweiss was appointed obstetric physician at Pest in the maternity department, then as terribly afflicted as Klein's clinic had been; and during his six years' tenure of office he succeeded, by antiseptic methods, in reducing the mortality to 0·85%. Semmelweiss was slow and reluctant as an author, or no doubt his opinions would have obtained an earlier vogue; moreover, he was not only tender-hearted, but also irascible, impatient and tactless. Thus it cannot be said that the stupidity or malignity of his opponents was wholly to blame for the tragical issue of the conflict which brought this man of genius within the gates of an asylum on the 20th of July 1865. Strange to say, he brought with him into this retreat a dissection wound of the right hand, and on the 17th of the following August he died, a victim of the very disease for the relief of which he had already sacrificed health and fortune.

His chief publication was *Die Ätiologie der Begriff und die Prophylaxis des Kindbettfiebers* (Vienna, 1861). There are biographies by Hegar (Freiburg, 1882), Bruck (Vienna and Tischen, 1887), Duka (Hertford, 1882), Grosse (Vienna, 1898) and Schürer von Waldheim (Vienna, 1905). For the relations in the order of discovery of Semmelweiss to Lister see LISTER. (T. C. A.)

SEMMERING PASS, the lowest of all the great passes across the Alps. The hospice, near the summit, was founded about 1160, but the pass was certainly used at a much earlier date. Between 1848 and 1854 a railway line (the first in any sense to cross the Alps) was constructed, but passes 282 ft. below the summit of the pass (3225 ft.) by a tunnel about 1 m. long. The line runs from Wiener Neustadt (30½ m. from Vienna) past Bruck to Graz (139 m. from Vienna), the capital of Styria, whence it is 227 m. by rail to Trieste.

SEMOIS (also spelt SEMOY and SEMOYS), a river of less than 120 m. in length rising near Arlon in Belgium, and flowing into the Meuse near Monthermé in France. It is Belgian for about 100 m. and French for the remainder, entering France a short distance west of the village of Bohan. It passes through the most picturesque scenery in Belgium and is remarkable for its sinuous course, its length of 120 m. representing only 47 in a straight line. Bouillon is the only town on its banks, and since it is not navigable it has escaped the contamination of manufacturing life; its valley remains an ideal specimen of sylvan scenery and medieval tranquillity.

SÉMONVILLE, CHARLES LOUIS HUGUET, MARQUIS DE (1759–1839), French diplomat, was born in Paris on the 9th of March 1759, the son of one of the royal secretaries. Minister and envoy extraordinary of France at Genoa in 1790–1791, he was instructed by Dumouriez to go to Turin to detach Victor Amadeo III. of Sardinia from the Austrian alliance, but was not permitted to cross the Sardinian frontier. In 1793 he had started with H. B. Maret (afterwards duc de Bassano) for Italy where they had missions to Florence and Naples respectively, when the two envoys were kidnapped by Austrian orders in the Valtelline. They remained in a Tirolese prison until December 1795, when there was an exchange of prisoners on the release of Madame Royale, daughter of Louis XVI., from the Temple. In 1799 Bonaparte, through whose influence his release had been obtained, sent him to the Hague to consolidate the alliance between France and the Batavian Republic. In this mission he was entirely successful, and he is credited with another diplomatic success in the inception of the Austrian marriage. He accepted the Restoration and sat on the commission which drew up the charter. Sémonville, who enjoyed a great measure of Louis XVIII.'s confidence, took no part in the Hundred Days. A frank opponent of the extremist policy of Charles X., he tried to save him in 1830; in company with Antoine d'Argout he visited the Tuileries and persuaded the king to withdraw the ordinances and to summon the Council. He had been made a count of the Empire in 1808, and marquis in 1819. He died in Paris on the 11th of August 1839.

SEMO SANCUS, an Italian divinity worshipped by the Sabines, Umbrians and Romans, also called Dius Fidius and (perhaps wrongly) identified with the Italian Hercules. His dual nature, as a god of light and good faith, is indicated by the names Dius Fidius. *Sancus* is obviously from *sancire*, meaning one who hallows the acts in which he takes part. *Semo* has been variously explained as: (1) one who presides over seed-time and harvest (*serere*, cf. the female Semonia); (2) a being apart from and superior to man (*se-homo*); (3) a demi-god (*semis*). The priests called *bidentales*, whose existence is attested by inscriptions, were specially connected with his worship, since lightning which fell from heaven during the day was looked upon as sent by Dius Fidius, and a special class of birds (*sanquales*) was under his protection. As the god of oaths, he protected the sanctity of the marriage tie, the rights of hospitality, international treaties and alliances. In his sanctuary on the Quirinal, the foundation of which was celebrated on the 5th of June, there were shown the distaff and spindle of Tanaquil, the wife of Tarquinius Priscus, and in the eyes of Roman matrons the embodiment of all wifely virtues. Dionysius of Halicarnassus (iv. 58) states that the treaty concluded between Tarquinius Superbus and the town of Gabii was deposited in the same temple of Sancus, whose name he translates by *Ζεὺς πίστιος*. He could only be invoked under the open sky, as partaking of the nature of a god of light and day; hence a round opening was made in the roof of his temple through which prayers might ascend to heaven. If he was invoked in a private house, those who called upon his name stood beneath the opening in the roof called *compluvium*. The bronze orbs mentioned by Livy (viii. 20. 8) as having been set up in his temple are also supposed to have some connexion with this, although they may be merely symbols of the eternal power of Rome. There was a second chapel of Semo Sancus on the island in the Tiber with an altar, the inscription on which led Christian writers (Justin Martyr, Tertullian, Eusebius) to confuse him with Simon Magus, and to infer that the latter was worshipped at Rome as a god. The cult of Semo Sancus never possessed very great importance at Rome; authorities differ as to whether it was of Sabine origin or not. The plural Semones was used of a class of supernatural beings, a kind of tutelary deities of the state.

See Preller, *Römische Mythologie*; article "Dius Fidius," by Wissowa, in Roscher's *Lexikon der Mythologie*, and his *Religion und Kultus der Römer* (1902), who rejects the identity of Semo Sancus Dius Fidius with Hercules; W. W. Fowler, *The Roman Festivals* (1899); E. Jannettaz, *Étude sur Semo Sancus Fidius* (Paris, 1885), according to whom he was a Sabine fire god.

SEMPACH, a small town in the Swiss canton of Lucerne, built above the eastern shore of the lake of the same name, and about $1\frac{1}{2}$ m. by road north of the Sempach railway station (9 m. N.W. of Lucerne) on the main line between Lucerne and Olten. In 1900 it had 2592 inhabitants, German-speaking and Romanists. It has retained some traces of its medieval appearance, especially the main gateway, beneath a watch tower, and reached by a bridge over the old moat. About half an hour distant to the north-east, on the hillside, is the site of the famous battle of Sempach (9th July 1386), in which the Swiss defeated the Austrians, whose leader, Duke Leopold, lost his life. The legendary deed of Arnold of Winkelried (*q.v.*) is associated with this victory. The spot is now marked by an ancient and picturesque Battle Chapel (restored in 1886) and by a modern monument to Winkelried. Some miles north of Sempach is the quaint village of Münster or *Beromünster* (973 inhabitants in 1900), with a collegiate church founded in the 10th century and dating, in parts, from the 11th and 12th centuries (fine 17th-century choir stalls and altar frontals), the chapter of secular canons now consisting of invalided priests of the canton of Lucerne: it was in Beromünster that the first dated book was printed (1470) in Switzerland, by care of the canons, while thence came Gering who introduced printing into France.

See Th. von Liebenau, *Die Schlacht bei Sempach* (Lucerne, 1886).
(W. A. B. C.)

SEMPER, GOTTFRIED (1803–1879), German architect and writer on art, was born at Altona on the 29th of November 1803. His father intended him for the law, but his impulses towards an artistic career were irresistible. His early mastery of classical literature led him to the study of classic monuments in classic lands, while his equally conspicuous talent for mathematics gave him the laws of form and proportion in architectural design. At the university of Göttingen he fell under the influence of K. O. Müller. His architectural education was carried out successively in Hamburg, where later, upon his return from Greece, he built the Donner Museum, in Berlin, in Dresden, in Paris under Gau and in Munich under Gärtner; afterwards he visited Italy and Greece. While in Greece he made observations which showed that in ancient architecture the use of polychrome was frequent. In the diffusion of this discovery he was much aided by Jacques Ignace Hittorff. In 1834 he was appointed professor of architecture in Dresden, and during fifteen years received many important commissions from the Saxon court. He built the opera-house in Renaissance style, the new museum and picture gallery, and a Byzantine synagogue. In 1848 his turbulent spirit led him to side with the revolution against his royal patron; he furnished the rebels with military plans, and was eventually driven into exile. Semper came to London at the time of the Great Exhibition of 1851, and Prince Albert found him an able ally in carrying out his plans. He was appointed teacher of the principles of decoration; his lectures in manuscript are preserved in the art library, South Kensington. He was also employed by the prince consort to prepare a design for the Kensington Museum; and he made the drawings for the Wellington funeral car. In 1853 Semper left London for Zurich on his appointment as professor of architecture, and with a commission to build in that town the polytechnic school and the hospital. He also built the observatory and the railway station in that city. Here, too, he made plans for a large theatre in Rio Janeiro. In 1870 he was called to Vienna to assist in the great architectural projects since carried out around the Ring. A year later, after an exile of over twenty years, he received a summons to Dresden, on the rebuilding of the first opera-house, which had been destroyed by fire in 1869; his second design was a modification of the first. The closing years of his life were passed in comparative tranquillity between Venice and Rome, and in the latter city he died on the 15th of May 1879. In 1892 a bronze statue of Semper, by Johannes Schelling, was unveiled on the Brühlsche Terrasse in Dresden.

Semper's style was a growth from the classic orders through the Italian Cinque Cento. He forsook the base and rococo forms he found rooted in Germany, and, reverting to the best historic examples, fashioned a purer Renaissance. He stands as a leader in the practice of polychrome, since widely diffused, and by his writings and example did much to reinstate the ancient union between architecture, sculpture and painting. Among his numerous literary works are *Über Polychromie u. ihren Ursprung* (1851), *Die Anwendung der Farben in der Architektur u. Plastik bei den Alten*, *Der Stil in den technischen u. tektonischen Künsten* (1860–1863). His *Notes of Lectures on Practical Art in Metals and Hard Materials: its Technology, History and Style*, were left in MS.

SEMPILL, the name of a Scottish family long seated in Renfrewshire. An early member, Sir Thomas Sempill (d. 1488), was killed whilst fighting for James III. at the battle of Sauchieburn, and his son John (d. 1513), who was made a lord of parliament about 1489, fell at Flodden. John's grandson, Robert, 3rd Lord Sempill (*c.* 1505–1572), assisted the Scottish regent, Mary of Lorraine, in her struggle with the lords of the congregation, and was afterwards one of the partisans of Mary, queen of Scots; about 1566, however, he deserted the queen, against whom he fought at Carberry Hill and at Langside. His grandson, Robert (d. 1611), became the 4th Lord Sempill, and another grandson was Sir James Sempill of Beltrees (*q.v.*).

The title of Lord Sempill descended to Francis, the 8th lord (d. 1684), who was succeeded by his sister Anne (d. 1695), the wife of Francis Abercromby (d. 1703), who was created a peer for life as Lord Glassford. Their sons, Francis, John and Hugh, who took the surname of Sempill, succeeded in turn to the title. Hugh, 12th Lord Sempill (d. 1746), fought in Spain and in Flanders, and held a command in the English army at Culloden; in 1747 he was made colonel of the Black Watch. His title descended to Selkirk Sempill, the 15th lord (1788–1835), who was succeeded by his sister, Maria Janet (1790–1884). She was succeeded by a cousin, William Forbes (1836–1905), a descendant of the 13th lord, who took the name of Forbes-Sempill; in 1905 his son, John Forbes-Sempill (b. 1863), became the 18th lord.

A certain Robert Sempill, who served James Edward, the Old Pretender, in France, and is described as a captain in Dillon's famous Irish regiment, was created Lord Sempill by this prince after 1723. This circumstance has given rise to a certain amount of confusion between the different holders of the title.

SEMPILL (or Semple), **SIR JAMES, ROBERT AND FRANCIS,** three Scottish ballad-writers, known as the Sempills of Beltrees from their place in Renfrewshire.

Sir James Sempill (1566–1626) was the son of John Sempill of Beltrees, and Mary Livingstone, one of the "four Marys," companions of Mary, queen of Scots. He was brought up with James VI. under George Buchanan, and later assisted the king in the preparation of his *Basilikon Doron*. Ambassador to England 1590–1600, he was made a knight bachelor, and in 1601 was sent to France. He died at Paisley in 1626. His wife was Egidia or Geillis Elphinstone of Blythswood. He wrote some theological works in prose, but is chiefly remembered for the poem "The Packman's Pater Noster," a vigorous attack upon the Church of Rome. An edition was published at Edinburgh in 1669 entitled "A Pick-tooth for the Pope, or the Packman's Pater Noster, translated out of Dutch by S. I. S., and newly augmented and enlarged by his son R. S." (reprinted by Paterson). Seven poems, chiefly of an amorous character, are printed in T. G. Stevenson's edition of *The Sempill Ballates*.

Robert Sempill [the younger] (1595?–1665?), son of the above, was educated at the university of Glasgow, having matriculated in March 1613. During the Civil War he fought for the Stuarts, and seems to have suffered heavy pecuniary losses under the Commonwealth. He died between 1660 and 1669. He married Mary, daughter of Sir Thomas Lyon of Auldbar. His reputation is based on the ballad, "The Life and Death of Habbie Simpson, Piper of Kilbarchan," written *c.* 1640. It is an interesting picture of the times; and it gave fresh vogue to the popular six-lined stanza which was much used later by Ramsay, Fergusson and Burns (see particularly, Burns's "Poor Mailie's Elegy"). Two broadside copies were printed before 1700, and it appeared in James Watson's *Collection of Poems* (1706–1710). Sempill is supposed to be the author also of an epitaph on "Sawney Briggs, nephew to Habbie Simpson," written in the same stanza. He wrote a continuation of his father's "Packman's Pater Noster."

Francis Sempill (1616?–1682) was a son of Robert Sempill the younger. No details of his education are known. His fidelity to the Stuarts involved him in money difficulties, to meet which he alienated portions of his estates to his son. Before 1677 he was appointed sheriff-depute of Renfrewshire. He died at Paisley in March 1682. Sempill wrote many occasional pieces, and his fame as a wit was widespread. Among his most important works is the "Banishment of Poverty," which contains some biographical details. "The Blythsome Wedding," long attributed to Francis Sempill, has been more recently asserted to be the work of Sir William Scott of Thirlestane. Sempill's claim to the authorship of the celebrated song "She raise and let me in," and of the ballad "Maggie Lauder," has been discussed at considerable length. It seems probable that he had some share in both.

See the works mentioned below in the article on the elder Robert Sempill, and *The Poems of the Sempills of Beltrees*, ed. James Paterson (Edinburgh, 1849); *A Literary History of Scotland*, by J. H. Millar (1903); and *Notes and Queries*, 9th series (xi., 1903, pp. 436-437).

SEMPILL, ROBERT [the elder] (*c.* 1530–1595), Scottish ballad-writer, was in all probability a cadet of illegitimate birth of the noble house of Sempill or Semple. Very little is known of his life. He appears to have spent some time in Paris. He was probably a soldier, and must have held some office at the Scottish court, as his name appears in the lord treasurer's books in February 1567–1568, and his writings show him to have had an intimate knowledge of court affairs. He was a bitter opponent of Queen Mary and of the Catholic Church. Sempill was present at the siege of Leith (1559–1560), was in Paris in 1572, but was driven away by the massacre of St Bartholomew. He was probably present at the siege of Edinburgh Castle (1573), serving with the army of James Douglas, earl of Morton. He died in 1595. His chief works are: "The Ballat maid vpoun Margret Fleming callit the Flemyng bark"; "The defence of Crissell Sandelandis"; "The Claith Merchant or Ballat of Jonet Reid, ane Violet and Ane Quhyt," all three in the Bannatyne MS. They are characterized by extreme coarseness, and are probably among his earlier works. His chief political poems are "The Regentis Tragedie," a broadside of 1570; "The Sege of the Castel of Edinburgh" (1573), interesting from an historical point of view; "Ane Complaint vpon fortoun . . ." (1581), and "The Legend of the Bischop of St Androis Lyfe callit Mr Patrik Adamsone" (1583).

See *Chronicle of Scottish Poetry* (ed. James Sibbald, Edinburgh, 1802); and "Essays on the Poets of Renfrewshire." by William Motherwell, in *The Harp of Renfrewshire* (Paisley, 1819; reprinted 1872). Modern editions of Sempill are: "Sege of the Castel of Edinburgh," a facsimile reprint with introduction by David Constable (1813); *The Sempill Ballates* (T. G. Stevenson, Edinburgh, 1872) containing all the poems; *Satirical poems of the Reformation* (ed. James Cranstoun, Scottish Text Soc., 2 vols., 1889–1893), with a memoir of Sempill and a bibliography of his poems.

SEMUR-EN-AUXOIS, a town of eastern France, capital of an arrondissement in the department of Côte-d'Or, 45 m. W.N.W. of Dijon on the Paris-Lyon railway. Pop. (1906) 3278. Semur occupies one of the finest sites in France, on the extremity of a plateau dominating the river Armançon, which surrounds the town on three sides. The river forms this extremity into a peninsula which is occupied by the old town, once surrounded by ramparts, the remains of which are still to be seen. An isthmus, on which stands the castle, unites the older to the newer quarter, in which are situated an old gateway of the 15th century and the church of Notre-Dame. This building, which belongs mainly to the 13th century, is one of the purest examples of Gothic architecture in Burgundy, though the narrowness of the nave, to some degree, spoils its proportions. The portal with its three arched openings projects from the façade, which is flanked by two square towers surmounted by balustrades. Of the artistic features of the interior one of the most noteworthy is the sculptured keystone of the vaulting of the apse, representing the crowning of the Virgin. The castle (13th and 14th centuries) consists of a rectangular keep flanked by four towers. Portions of it are still in use. Among the numerous old houses in the town is one belonging to the time of Louis XIV. of which the last proprietor was Florent Claude du Châtelet, husband of the friend of Voltaire. It is now used as a hospital. Semur possesses a sub-prefecture, a tribunal of first instance and a communal college. It is an important market centre for the Auxois and Morvan, and has trade in horses, grain, sheep, fruit and vegetables. Cement, leather, oil, and chemical manures are among its industrial products.

Semur (*Sinemurum*) was a Gallic fortress in the dark ages and in feudal times a castle of the dukes of Burgundy. In the 11th century it became capital of Auxois. Its communal charter dates from 1276. The incorporation of Burgundy with France was resisted by the town, which was taken and pillaged by the royal troops in 1478. During the wars of religion in the 16th century it served as refuge for the Leaguers, and though it submitted to Henry IV. at his accession its fortifications were destroyed in 1602.

SÉNAC DE MEILHAN, GABRIEL (1736–1803), French writer, son of Jean Sénac, physician to Louis XV., was born in Paris in 1736. He entered the civil service in 1762; two years later he bought the office of master of requests, and in 1766 further advanced his position by a rich marriage. He was successively intendant of La Rochelle, of Aix and of Valenciennes. In 1776 he became intendant-general for war, but was soon compelled to resign. He had hoped to be made minister of finance, and was disappointed by the nomination of Necker, of whom he became a bitter opponent. He was intimate with the comtesse de Tessé, sister of the duc de Choiseul, and in 1781 met Madame de Créquy, then sixty-seven years of age, and began a long friendship with her. His first book was the fictitious *Mémoires d'Anne de Gonzague, princesse palatine* (1786), thought by many people at the time to be genuine. In the next year followed the *Considérations sur les richesses et le luxe*, combating the opinions of Necker; and in 1788 the more valuable *Considérations sur l'esprit et les mœurs*, a book which abounds in sententious, but often excessively frank, sayings. Sénac witnessed the beginnings of the Revolution in Paris, but emigrated in 1790, making his way first to London, and then, in 1791, to Aix-la-Chapelle, where he met Pierre Alexandre de Tilly, who asserts in his *Memoirs* that Sénac attributed the misfortunes of Louis XVI. to the refusal of his own services. In 1793, while his recollections of the Revolution were still fresh, he wrote a novel, *L'Émigré* (Hamburg, 4 vols., 1797), which shows perspicacity and good judgment in its treatment of events. It was reprinted in 1904 in an abridged form by Casimir Stryienski and Frantz Funck-Brentano. At the invitation of Catherine II. Sénac went in 1792 to Russia, where he hoped to become imperial historiographer, but his manners displeased Catherine, who contented herself with dismissing him with a pension. From Russia he went to Hamburg, and thence to Vienna, where he found a friend in the prince de Ligne. He died on the 16th of August 1803. Sénac also wrote a moderate exposition of the causes that led to the revolution, entitled *Du gouvernement, des mœurs et des conditions en France avant la Révolution, avec les caractères des principaux personnages du règne de Louis XVI*; the last part was reprinted (1813) by the duc de Levis with a notice of the author as *Portraits et caractères.* Sénac collected his own *Œuvres philosophiques et littéraires* (2 vols.) at Hamburg in 1795.

See his *Œuvres choisies*, edited by M. de Lescure in 1862; *Lettres inédites de Madame de Créqui à Sénac de Meilhan* (1856), edited by Edouard Fournier; Louis Legrand, *Sénac de Meilhan et l'intendance du Hainaut et du Cambrésis* (1868); and the notice by Fernand Caussy prefixed to his edition (1905) of the *Considérations sur l'esprit et les mœurs.*

SENANCOUR, ÉTIENNE PIVERT DE (1770–1846), French author, was born in Paris in November 1770. His father desired him to enter the seminary of Saint-Sulpice preparatory to becoming a priest, but Senancour, to avoid a profession for which he had no vocation, went on a visit to Switzerland in 1789. At Fribourg he married in 1790 a young Frenchwoman, Mademoiselle Daguet, but the marriage was not a happy one. His wife refused to accompany him to the Alpine solitude he desired, and they settled in Fribourg. His absence from France at the outbreak of the Revolution was interpreted as hostility to the new government, and his name was included in the list of emigrants. He visited France from time to time by stealth, but he only succeeded in saving the remnants of a considerable fortune. In 1799 he published in Paris his *Rêveries sur la nature primitive de l'homme*, a book containing impassioned descriptive passages which mark him out as a precursor of the romantic movement. His parents and his wife died before the close of the century, and Senancour was in Paris in 1801 when he began *Obermann*, which was finished in Switzerland two years later, and printed (Paris, 2 vols.) in 1804. This singular book, which has never lost its popularity with a limited class of readers, was followed in the next year by a treatise *De l'amour*, in which he attacked the accepted social conventions. *Obermann*, which is to a great extent inspired by Rousseau, was edited and praised successively by Sainte-Beuve and by George Sand, and had a considerable influence both in France and England. It is a series of letters supposed to be written by a solitary and melancholy person, whose headquarters are placed in a lonely valley of the Jura. The idiosyncrasy of the book in the large class of Wertherian-Byronic literature consists in the fact that the hero, instead of feeling the vanity of things, recognizes his own inability to be and do what he wishes. Professor Brandes has pointed out that while *René* was appreciated by some of the ruling spirits of the century, *Obermann* was understood only by the highly gifted, sensitive temperaments, usually strangers to success. Senancour was tinged to some extent with the older *philosophe* form of free-thinking, and had no sympathy with the Catholic reaction. Having no resources but his pen, Senancour was driven to hack-work during the period which elapsed between his return to France (1803) and his death at St Cloud (10th of January 1846); but some of the charm of *Obermann* is to be found in the *Libres Méditations d'un solitaire inconnu.* Thiers and Villemain successively obtained for Senancour from Louis Philippe pensions which enabled him to pass his last days in comfort. He wrote late in life a second novel in letters entitled *Isabelle* (1833). He composed his own epitaph; *Éternité, sois mon asile.*

Senancour is immortalized for English readers in the *Obermann* of Matthew Arnold. *Obermann* itself was translated into English, with biographical and critical introduction, by A. G. Waite (1903). See the preface by Sainte-Beuve to his edition (1833, 2 vols.) of *Obermann*, and two articles *Portraits contemporains* (vol. i.); *Un Précurseur* and *Sénancour* (1867) by J. Levallois, who received much information from Sénancour's daughter, Eulalie de Sénancour, herself a journalist and novelist; and a biographical and critical study *Sénancour*, by J. Merlant (1907).

SENARMONT, ALEXANDRE ANTOINE HUREAU DE (1769–1810), French artillery general, was born at Strassburg, and educated at the Metz school for engineer and artillery cadets. In 1785 he was commissioned in the artillery, in which he served as a regimental officer for fifteen years. In 1800 he won great credit both by his exertions in bringing the artillery of the Army of Reserve over the Alps and by his handling of guns in the battle of Marengo. In 1806, as a general of brigade, and commander of the artillery of an army corps, he took part in the Jena and Eylau campaigns. But he is remembered chiefly in connexion with the "caseshot attack" which was the central feature of Napoleon's matured tactical system, and which Senarmont put into execution for the first time at Friedland (*q.v.*). For this feat he was made a baron, and in 1808 he was promoted general of division by Napoleon on the field of battle in front of Madrid. He was killed at the siege of Cadiz on the 26th of October 1810.

SENARMONT, HENRI HUREAU DE (1808–1862), French mineralogist and physician, was born at Broué, Eure et Loire, on the 6th of September 1808. He became engineer-in-chief of mines, and professor of mineralogy and director of studies at the École des Mines at Paris. He was distinguished for his researches on polarization and on the artificial formation of minerals. He also wrote essays and prepared maps on the geology of Seine et Marne and Seine et Oise for the Geological Survey of France (1844). He died in Paris on the 30th of June 1862.

SENATE (Lat. *senatus*, from root *sen-*, as in *senex*, old; the root is the Sanskrit *sana*, cf. Gr. ἕνος; the same element appears in *señor*, *seigneur*, *seneschal*) literally the assembly of old men,[1] originally the heads of the chief families, and hence, in general, the upper council in a governmental system. The Latin word corresponds with the Greek *gerousia* (*q.v.*), the name of the similar body at Sparta; it must not be used of the Cleisthenic council (see BOULĒ) at Athens, which was in all respects a different body. The Athenian Areopagus (*q.v.*) represents the Roman senate. The word is applied primarily to the aristocratic Roman assembly (see below). It is also used to designate the second chamber in the legislatures of France, Italy and the United States, as also in those of the separate states composing the Union; in the British legislature it is represented by the House of Lords. By analogy the title is used for the governing bodies of various educational institutions, *e.g.* in the universities of Cambridge and London, and also in certain American colleges and universities, where it denotes an advisory body composed of representatives of the students as well as members of the faculty. So in the Scottish colleges the governing body is the Senatus Academicus. In Scottish law, the lords of session (*i.e.* judges) are called senators of the College of Justice, which is itself spoken of as a senate.

The Ancient Roman Senate. (A) *History.*— The senate or council of elders formed the oldest and most permanent element in the Roman constitution.

Under the monarchy.

The authorities are unanimous in ascribing the origin of the senate to Romulus, who chose out 100 of the best of his subjects to form his advising body. They are, however, far from unanimous in their account of the subsequent history of the senate down to the foundation of the republic. The only facts on which they are all agreed are that in 509 B.C. it already contained 300 members, and that a distinction already existed within it between *patres maiorum gentium* and *minorum gentium* (Livy i. 35; Cic. *De rep.* ii. 20. 35; Dionys. ii. 47). Moreover, with one exception they agree in asserting that throughout the monarchical period the senate consisted entirely of patricians. There is undoubtedly some connexion between the increase in the numbers of the senate by the admission of new members and the distinction between two classes of *patres.* The most probable view seems to be that the rise in the number of the senators was due to the gradual incorporation of fresh elements into the patrician community, with a consequent increase of *gentes*; and that the new clans, out of which new members came into the senate, were the *gentes minores.* The exclusively patrician character of the senate at this period seems an inevitable inference from all that we know of the political position of the *plebs* at the time, and the evidence of Zonaras to the contrary is universally discredited. The appointment of senators depended entirely upon the king. They were not appointed for life, but at the pleasure of the king who summoned them. It is possible that a king might change his advisers during his reign, and a new king could certainly abstain from summoning some of those convened by his predecessors.[1] The powers of the senate at this time were very indefinite. Tradition ascribes to it the control of the *interregnum* and a power of sanctioning acts of state (*patrum auctoritas*), to which it is difficult to give any significance for this early period. It seems also to have possessed a customary right of controlling foreign policy, for the ancient formula of the Fetiales refers to the sanction of the *patres* (Livy i. 32). From the senate also must have been chosen the delegates appointed by the king either to be his executive representative when he was absent in the field (*praefectus urbi*), or to assist him in jurisdiction (*IIviri perduellionis*, *quaestores parricidii*).

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[1] With the idea of age is conjoined that of superior wisdom and experience, worthy of respect and qualified to decide; cf. the Anglo-Saxon Witanagemot, the assembly of the wise men. Originally the members were the advisers of the king, and their spirit was generally aristocratic and conservative.

Under the Republic.

The abolition of monarchy, and the substitution of two annually elected consuls did not at first bring any important change in the position of the senate. It was the consulting body of the consuls, meeting only at their pleasure, and owing its appointment to them, and remained a power distinctly secondary to the magistrates, as it had been formerly to the king. The magistrates at this time were chosen entirely from the patrician houses, and the senate long remained a stronghold of patrician prejudice. Tradition ascribes to the first consuls some change in the class from which senators were drawn, but various accounts of the change are given (Livy ii. 1; Festus, p. 254; Dionys. v. 13; cf. Tac. *Ann.* xi. 25). Whatever the exact nature of the change, we may be certain that plebeians were not introduced into the senate at this time. Such a change is utterly improbable at the crisis of a patrician *coup d'état*, such as the expulsion of the Tarquins certainly was; and there is no evidence for the existence of a plebeian senator before the year 401 B.C. The statement that some modification in the original principle of selection was made in this year is invariably introduced as an explanation of the title *patres conscripti*, which is held to imply a distinction of rank within the senate, as derived from the formula of summons "qui patres, qui conscripti (*estis*)."[2] But either this formula is not as early as 509 B.C. or the term *conscripti* does not refer only to plebeians. In one respect the substitution of consuls for kings tended to the subordination of the chief magistrates to the senate. The consuls held office only for one year, while the senate was a permanent body; in experience and prestige its individual members were often superior to the consuls of the year. It was therefore improbable that the magistrate would venture to disregard the advice of his *consilium*, especially as he himself would pass into the senate at the close of his year of office, according to a recognized custom which was gradually modifying the theoretical freedom of choice that the consuls possessed with regard to their *consilium*. It was probably in their capacity of ex-magistrates that plebeians first entered the senate; for the first plebeian senator mentioned by Livy, P. Licinius Calvus, was also the first plebeian consular tribune. This is hardly likely to be mere coincidence. Of the two standing powers which the senate inherited from the monarchy, the *interregnum* and the *patrum auctoritas*, the first had become even rarer of exercise than before; for if either consul existed to nominate a successor, *interregnum* could not be resorted to. The *patrum auctoritas*, on the other hand, developed into a definite right claimed by the senate to give or withhold its consent to any legislative or elective act of the *comitia*, which could not be valid without such consent. The control, too, which it had long exercised over foreign policy must have increased the importance of the senate in a period of constant warfare with the nations of Italy. But in the early republic the senate remained primarily an advising body, and had as yet assumed no definite executive powers.

In the last two centuries of the republic we find that a great change has taken place in the position of the senate. It is now a self-existent, automatically constituted body, independent of the magistrates, a recognized factor in the constitution and the wielder of extensive powers. Its self-existence could only be secured by a transference of the selection of the senate from the magistrate to some other authority, and was actually effected by entrusting the selection to the recently instituted college of censors. The censorship was instituted in 443 B.C., and some time before the year 311 it was placed in charge of the *lectio senatus*. Conditions of selection had also been imposed by 311, which made the constitution of the senate practically automatic. Ex-curule magistrates were now admitted as a matter of course, together with any other persons who had done conspicuous public service in the lower grades of the magistracy or the higher ranks of the army; and for some time before Sulla's dictatorship little power of choice can really have rested with the censors. L. Cornelius Sulla, while abolishing the censorship (immediately revived), also secured an entirely automatic composition for the senate by increasing the number of quaestors, and enacting that all ex-quaestors should pass at once into the senate. This enactment provided for the maintenance even of the increased number of 600 senators, twenty quaestorians passing into the senate every year. The senate's powers had now extended far beyond its two ancient prerogatives of appointing an interrex, and ratifying decisions of the comitia. The first of these powers, as has been shown above, had fallen into practical disuse, and the second had for some reason become a mere form by the last century of the republic. It is improbable that the change was entirely the result of the *lex Publilia* of 287 B.C., which decreed that the senate should exercise its *auctoritas* before the voting instead of after, though this law may have formed part of a process very imperfectly known to us by which senatorial control of legislation in this form was gradually nullified. But the senate had acquired a far more effective control over the popular vote through the observance of certain unwritten rules regulating the relation between senate and magistrates. It was generally understood that the magistrate should not question the people on any important matter without the senate's consent, nor refuse to do so at its request; that one magistrate should not employ his veto to quash the act of another except at the senate's bidding, nor refuse to do so when directed. Such was the situation which had developed out of the tendency noticed above for the magistrate to be advised by his council in all important matters. Again, the earlier control of foreign policy developed into a definite claim put forward by the senate and recognized by the constitution to conduct all negotiations with a foreign power and frame an alliance which should merely be offered to the people for ratification. For the organization of a new Roman province even this formal ratification was dispensed with, and a commission of senators alone aided the victorious general in the organization of his conquests. The senate also held an important power in its right to distribute spheres of rule among the various magistrates. It seems also to have had entire control over the external relations of the free cities which were scattered throughout the provinces, but formed no administrative parts of those provinces, holding their rights by charter for which they depended upon the senate. The control of finance was also entirely in the senate's hands. Three circumstances had combined to bring about this result. The censors, who were only occasional officials, were entrusted with the leasing of the public revenues; the senate not only directed the arrangements made by them, and received appeals against oppressive contracts, but also controlled any financial assignments that had to be made during the vacancy in the censorship. Again, the details of public expenditure had been in very early times entrusted to the quaestors, who, when the magistracies were multiplied, occupied an entirely subordinate position; this strengthened the position of the senate as the natural director of a young and inexperienced magistrate. Thirdly, the general control exercised by the senate over provincial affairs implied its direction of the income derived from the provinces, which in the later republic formed the chief property of the state. It had also claimed a right, unchallenged till the time of Tiberius Gracchus, of granting occupation and decreeing alienation of public lands, or of accepting or rejecting gifts and bequests to the state. Every branch of state finance was therefore in its hands. In matters of criminal jurisdiction the senate claimed the right to set free by its decree in case of emergency the full powers of *coercitio* contained in the imperium of a magistrate, but limited normally in capital cases by successive laws of appeal. The exercise of this right amounted to a declaration of martial law, and had the effect of giving the consul the same powers of summary jurisdiction which had resided in the dictatorship. It was only resorted to in cases of special urgency, such as the epidemic of poisoning in 331 B.C. (Livy viii. 18), the prevalence of Bacchanalian licence in the city in 186 B.C. (*id.* xxxix. 18) and the formidable preponderance of the revolutionary tribune Tiberius Gracchus in 133 B.C. The action of the senate on this last occasion evoked a vigorous protest from the people, on the ground that the senate was not acting on behalf of the state against its enemies, but in the interest of one party in the state against the other; and a law of C. Gracchus subsequently forbade any such exercise of capital jurisdiction on the part of a magistrate, whether authorized by the senate or not. The senate continued, however, to make use of this decree, and the question of its right to do so was one of the chief points at issue in the final struggle between the senatorial and democratic parties. The best known instance of this *decretum ultimum* in the last century of the republic is that of 63 B.C., when Cicero took summary action against the Catilinarians, and justified his action on the plea that this decree had authorized him to do so. The senate also exercised a police control in Rome in sudden emergencies. It dissolved by a decree passed in 64 B.C. a number of trade gilds which had become the centres of political disturbance, and framed decrees from time to time dealing with bribery and corruption. The chief feature of the democratic revolution at Rome which occupied the century following the tribunate of T. Gracchus was an uncompromising opposition to the tenure of these extensive powers by the senate. Sulla's enactments in 81 B.C., which aimed at restoring its ascendancy, show clearly how much power it had already lost; and his attempts to reinstate it were short-lived (see ROME: *History* II. "The Republic"). The Gracchi and Caesar alike found themselves obliged to override senatorial prerogative in the interests of progressive legislation, and though the senate, owing to its strong hold over the magistracy, succeeded repeatedly in dealing death to its opponents, it never regained the popular confidence; and the practical extinction of the old senate in 49 B.C. was hardly lamented.

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[1] For other views on this point see Dionys. ii. 12, who maintains that the senators were elected by the clans, and T. Mommsen, *Staatsrecht*, iii. 844, 854, who maintains an automatic composition of the early senate.

[2] For another view, however, see Willems, *Le Sénat*, i. p. 37 seq.

Under the Empire.

Caesar's revision of the senatorial list and his increase of the senate to 900 was a return to the old practice by which kings and the early magistrates had chosen their own body of councillors. And though after this revision Sulla's arrangement for the automatic replenishing of the senate was restored, yet the growing influence exercised by Caesar and his successors over elections secured their control over the *personnel* of the senate. Still, the senate was regarded in the early principate as the great representative of republican institutions, and Augustus took elaborate pains to divide his authority with the senate. In legislation, indeed, the senate was supreme under the principate. The legislative powers of the comitia became very gradually extinct; but long before they had disappeared *senatus consulta* had come to take the place of *leges* in ordinary matters, and with this prerogative of the senate the princeps never directly interfered. Jurisdiction remained largely in the hands of the republican courts, but such cases as did not come under their cognizance were divided between princeps and senate. The senate, moreover, was left at the head of the ordinary administration of Rome and Italy, together with those provinces which, not requiring any military force nor presenting special administrative difficulties, were left to the care of the Roman people. It also retained control of the public treasury (see AERARIUM), while Caesar administered his own treasury (*fiscus*). It gradually became the electing body for the annual magistracies; and, as entrance to it was still won chiefly through the magistracy, co-optation became practically the principle of admission. But the power the senate theoretically possessed of creating and deposing a princeps was, formally at least, the chief of its prerogatives at this time, though considerably limited in practice. It had, on the other hand, lost all its control of foreign administration, which had once been the bulwark of its power; and though occasionally consulted by the princeps, it was entirely subordinate to him in this department. It was clearly to the advantage of the early Caesars to pay an apparent deference to the senate, and so give to their rule an appearance of constitutionalism. But even in this capacity the senate did not long survive the overthrow of republican government. Though occasionally roused into activity during the 2nd and 3rd centuries, it ceased after the period of the Julian emperors to have any real control of affairs. Vespasian had admitted Italians and provincials into the senate, with a view, no doubt, to increasing its value as a representative council of the empire; but this widening was counterbalanced by the institution of an hereditary senatorial order by Augustus, who thus gave recognition to the practical exclusiveness which had grown up in the later republican period, while reserving to himself the right of recruiting the order.

B. *Procedure.*—Senatorial procedure remained comparatively unchanged throughout the republic and the first three centuries of the empire. The right of summoning the senate belonged originally to the consuls, and later to the consuls, praetors, and tribunes of the plebs. In the Ciceronian period, when all these were entitled to summon the meeting, the right belonged to them in the above order of precedence. The magistrate who summoned the senate also presided and brought business before it. He first made statements to the house on important public affairs, and might then at his discretion ask the opinion of the house on points arising out of them, or invite other senators to speak without himself putting forward any definite proposition. In both of these cases he was expected to follow a regular order of precedence in asking for votes or speeches, and the magistrates of the year were precluded from expressing their opinion. When the chief senators had expressed their opinion on the motion of the president, or made proposals of their own, in the former case the house divided on the motion, in the latter the president put to the house in succession the various proposals made. The only important modification of this procedure introduced by the principate was the extension of all the presiding magistrate's rights to the princeps, who, however, enjoyed also the right of giving his opinion as a private senator.

C. *Insignia.*—The senatorial *insignia* were not at first distinguished from those of ex-curule magistrates. But by degrees the broad stripe (*latus clavus*) on the tunic and the red shoe (*calceus mulleus*) became distinctive of the senator (hence *laticlavius*, a senator). Seats in the theatre were reserved for senators; and even the sons of senators adopted the *latus clavus* as early as the reign of Augustus, and probably at an earlier time. Certain disqualifications were attached to senators in republican times, chief of which was their exclusion from trade; and these were increased under the principate. Failure to observe these disqualifications, or any public disgrace or gross misconduct, was punished by removal from the senate by the censors, until that office fell into abeyance after the time of Sulla. The censorial right of removing unworthy members from the senate was revived by Augustus, and was exercised by subsequent emperors at a yearly revision of the list, which supplemented the formal *lectiones senatus* periodically held by the princeps in his capacity of censor.

It has been questioned whether the two traditional prerogatives of the senate, the control of the *interregnum* and the *patrum auctoritas*, belonged in historical times to the senate as a body, or to its patrician members only, or, as some have maintained, to the whole body of patricians. For conflicting views on this subject, see P. Willems, *Le Sénat*, vol. ii. p. 1; T. Mommsen, *Staatsrecht*, iii. 1037 et seq.; and *Röm. Forschungen*, i. 218-249; C. C. L. Lange, *De patrum auct. comm.* (Leipzig, 1876–1877); O. Clason, *Kritische Erörterungen über den röm. Staat* (Rostock, 1817), p. 41 et seq. In favour of the view that the words *patres* and *patricii* are used in this connexion as the equivalent of senators may be cited the parallel use of the term patrician magistrates as the equivalent of curule magistrates, a usage due to the fact that these magistracies were for more than a century reserved for patricians.

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SENEBIER, JEAN (1742–1809), Swiss pastor and voluminous writer on vegetable physiology, was born at Geneva on the 6th of May 1742. He is remembered on account of his contributions to our knowledge of the influence of light on vegetation. Though Marcello Malpighi and Stephen Hales had shown that a great part of the substance of plants must be obtained from the atmosphere, no progress was made until Charles Bonnet observed on leaves plunged in aerated water bubbles of gas, which Joseph Priestley recognized as oxygen. Jan Ingenhousz proved the simultaneous disappearance of carbonic acid; but it was Senebier who clearly showed that this activity was confined to the green parts, and to these only in sunlight, and first gave a connected view of the whole process of vegetable nutrition in strictly chemical terms. He died at Geneva on the 22nd of July 1809.

See Sachs, *Geschichte d. Botanik*, and *Arbeiten*, vol. ii.

SENECA, the name of two famous men (father and son), natives of Corduba (Cordova) in Spain, who attained eminence in Rome under the Early Empire.

Lucius Annaeus Seneca (*c.* 54 B.C.–A.D. 39), called Seneca "the elder" or "the rhetorician," belonged to a well-to-do equestrian family of Corduba. His praenomen is uncertain, but in any case Marcus is an arbitrary conjecture of Raphael of Volterra. During a lengthy stay on two occasions at Rome he attended the lectures of famous orators and rhetoricians, to prepare for an official career as an advocate. His ideal orator was Cicero, and he disapproved of the florid tendencies of the oratory of his time. During the civil wars (which kept him in Spain and thus prevented him from ever hearing Cicero speak) his sympathies, like those of his native place, were probably with Pompey, as were those of his son and his grandson (the poet Lucan). By his wife Helvia of Corduba he had three sons: L. Annaeus Novatus, adopted by his father's friend, the rhetorician Junius Gallio, and subsequently called L. Junius Gallio; L. Annaeus Seneca, the philosopher; Annaeus Mela, the father of the poet Lucan. As he died before his son was banished by Claudius (41; Seneca, *ad Helviam*, ii. 4), and the latest references in his writings are to the period immediately after the death of Tiberius, he probably died about A.D. 39. At an advanced age, at the request of his sons, he prepared, it is said from memory, a collection of various school themes and their treatment by Greek and Roman orators. These he arranged in ten books of *Controversiae* (imaginary legal cases) in which 74 themes were discussed, the opinions of the rhetoricians upon each case being given from different points of view, then their division of the case into different single questions (*divisio*), and, finally, the devices for making black appear white and extenuating injustice (*colores*). Each book was introduced by a preface, in which the characteristics of individual rhetoricians were discussed in a lively manner. The work is incomplete, but the gaps can be to a certain extent filled up with the aid of an epitome made in the 4th or 5th century for the use of schools. The romantic elements were utilized in the collection of anecdotes and tales called *Gesta Romanorum* (*q.v.*). For books i., ii., vii., ix., x. we possess both the original and the epitome; for the remainder we have to rely upon the epitome alone. Even with the aid of the latter, only seven of the prefaces are available. The *Controversiae* were supplemented by the *Suasoriae* (exercises in hortatory or deliberative oratory), in which the question is discussed whether certain things should or should not be done. The whole forms the most important authority for the history of contemporary oratory. Seneca was also the author of a lost historical work, containing the history of Rome from the beginning of the civil wars almost down to his own death, after which it was published by his son. Of this we learn something from the younger Seneca's *De vita patris* (H. Peter, *Historicorum Romanorum fragmenta*, 1883, pp. 292, 301), of which the beginning was discovered by B. G. Niebuhr. The father's claim to the authorship of the rhetorical work, generally ascribed to the son during the middle ages, was vindicated by Raphael of Volterra and Justus Lipsius.

Editions.—N. Faber (Paris, 1587); J. F. Gronovius (Leiden, 1649, Amsterdam, 1672); (critical) C. Bursian (Leipzig, 1857); A. Kiessling (Leipzig, 1872); H. J. Müller (Prague, 1887, with many unnecessary conjectures). See also article by O. Rossbach in Pauly-Wissowa's *Realencyklopädie*, i. pt. 2 (1894); Teuffel-Schwabe, *Hist. of Roman Literature* (Eng. trans., 1900), 269; M. Schanz, *Geschichte der römischen Litteratur*, ii. 1 (1899); and the chapter on "The Declaimers," in G. A. Simcox, *History of Latin Literature*, i. (1883). On Seneca's style, see Max Sander, *Der Sprachgebrauch des Rhetor A. S.* (Waren, 1877–1880); A. Ahlheim, *De Senecae rhetoris usu dicendi* (Giessen, 1886); E. Norden, *Die antike Kunstprosa* (1898), p. 300; on his influence upon his son the philosopher, E. Rolland, *De l'influence de Sénèque le père et des rhéteurs sur Sénèque le philosophe* (1906). On the use of Seneca in the *Gesta Romanorum*, see L. Friedländer, *Darstellungen aus der Sittengeschichte Roms* (Eng. trans., iii. p. 16 and appendix in iv.).

Lucius Annaeus Seneca (*c.* 3 B.C.–A.D. 65), statesman and philosopher, was the second son of the rhetorician. His teachers were Attalus, a Stoic, and Sotion, a pupil of the Sextii. In his youth he was a vegetarian and a water-drinker, but his father checked his indulgence in asceticism. He devoted himself to rhetorical and philosophical studies and early won a reputation at the bar. Gaius criticised his style as mere mosaic (*commissuras meras*) or "sand without lime," yet being in reality jealous of his successes he would have put him to death had he not been assured that he was too consumptive to live long (Suet. *Calig.* 63; Dio Cassius lix. 19. 7). Under Claudius his political career (he had been quaestor) received a sudden check, for the influence of Messallina having effected the ruin of Julia, the sister of Gaius, Seneca, who was compromised by her downfall, was banished to Corsica, A.D. 41. There eight weary years of waiting were relieved by study and authorship, with occasional attempts to procure his return by such gross flattery of Claudius as is found in the work *Ad Polybium de consolatione* or the panegyric on Messallina which he afterwards suppressed. At length the tide turned; the next empress, Agrippina, had him recalled, appointed praetor, and entrusted with the education of her son Nero, then (48) eleven years old. Seneca became in fact Agrippina's confidential adviser; and his pupil's accession increased his power. He was consul in 57, and during the first bright years of the new reign, the *quinquennium Neronis*, he shared the administration of affairs with Burrus, the praetorian prefect. The government in the hands of these men was wise and humane; their influence over Nero, while it lasted, was salutary, though sometimes maintained by doubtful means (see Nero). We must, however, regard the general tendency of Seneca's measures; to judge him as a Stoic philosopher by the counsels of perfection laid down in his writings would be much the same thing as to apply the standard of New Testament morality to the career of a Wolsey or Mazarin. He is the type of the man of letters who rises into favour by talent and suppleness (*comitas honesta*), and is entitled as such to the rare credit of a beneficent rule. In course of time Nero got to dislike him more and more; the death of Burrus in 62 gave a shock to his position. In vain did he petition for permission to retire. Even when he had sought privacy on the plea of ill-health he could not avert his doom; on a charge of being concerned in Piso's conspiracy he was forced to commit suicide. His manly end might be held in some measure to redeem the weakness of his life but for the testimony it bears to his constant study of effect and ostentatious self-complacency. His second wife, Pompeia Paulina, of noble family, attempted to die with him. His enormous wealth was estimated at 300 millions of sesterces. He had 500 ivory tables inlaid with citron wood (Dio lxi. 10, lxii. 2). Some of the Fathers, probably in admiration of his ethics, reckoned Seneca among the Christians; this assumption in its turn led to the forgery of a correspondence between St Paul and Seneca which was known to Jerome (cf. Augustin, *Ep.* 153: "Seneca . . . cujus etiam ad Paulum apostolum leguntur epistolae"). This has given rise to an interesting historical problem, most thoroughly discussed in many works on the Church in the Roman Empire.

Seneca is at once the most eminent among the Latin writers of the Silver Age and in a special sense their representative, not least because he was the originator of a false style. The affected and sentimental manner which gradually grew up in the first century A.D. became ingrained in him, and appears equally in everything which he wrote, whether poetry or prose, as the most finished product of ingenuity concentrated upon declamatory exercises, substance being sacrificed to form and thought to point. Every variety of rhetorical conceit in turn contributes to the dazzling effect, now tinsel and ornament, now novelty and versatility of treatment, or affected simplicity and studied absence of plan. But the chief weapon is the epigram (*sententia*), summing up in terse incisive antithesis the gist of a whole period. "Seneca is a man of real genius," writes Niebuhr, "which is after all the main thing; not to be unjust to him, one must know the whole range of that literature to which he belonged and realize how well he understood the art of making something even of what was most absurd." His works were upon various subjects. (1) His *Orations*, probably the speeches which Nero delivered, are lost, as also a biography of his father, and (2) his earlier scientific works, such as the monographs describing India and Egypt and one upon earthquakes (*Nat. Qu.* vi. 4. 2). The seven extant books of *Physical Investigations* (*Naturales Quaestiones*; trans. John Clarke, with introd. by Sir Archibald Geikie, 1910) treat in a popular manner of meteorology and astronomy; the work has little scientific merit, yet here and there Seneca, or his authority, has a shrewd guess, *e.g.* that there is a connexion between earthquakes and volcanoes, and that comets are bodies like the planets revolving in fixed orbits. (3) The *Satire on the Death* (and deification, literally "pumpkinification") *of Claudius* (ed. Bücheler, Berlin, 1882) is a specimen of the "satira Menippea" or medley of prose and verse. The writer's spite against the dead emperor before whom he had cringed servilely shows in a sorry fashion when he fastens on the wise and liberal measure of conferring the franchise upon Gaulish nobles as a theme for abuse. (4) The remaining prose works are of the nature of moral essays, bearing various titles—twelve so-called *Dialogues*, three books *On Clemency* dedicated to Nero, seven *On Benefits*, twenty books of *Letters to Lucilius* (ed. Hense, Leipzig, 1898; W. C. Summers published a selection in 1910). They are all alike in discussing practical questions and in addressing a single reader in a tone of familiar conversation, the objections he is supposed to make being occasionally cited and answered. Seneca had the wit to discover that conduct, which is after all "three-fourths of life," could furnish inexhaustible topics of abiding universal interest far superior to the imaginary themes set in the schools and abundantly analysed in his father's *Controversiae* and *Suasoriae*, such as poisoning cases, or tyrannicide, or even historical persons like Hannibal and Sulla. The innovation took the public taste,—plain matters of urgent personal concern sometimes treated casuistically, sometimes in a liberal vein with serious divergence from the orthodox standards, but always with an earnestness which aimed directly at the reader's edification, progress towards virtue and general moral improvement. The essays are in fact Stoic sermons; for the creed of the later Stoics had become less of a philosophical system and more of a religion, especially at Rome, where moral and theological doctrines alone attracted lively interest. The school is remarkable for its anticipation of modern ethical conceptions, for the lofty morality of its exhortations to forgive injuries and overcome evil with good; the obligation to universal benevolence had been deduced from the cosmopolitan principle that all men are brethren. In Seneca, in addition to all this, there is a distinctively religious temperament, which finds expression in phrases curiously suggestive of the spiritual doctrines of Christianity. Yet the verbal coincidence is sometimes a mere accident, as when he uses *sacer spiritus*; and in the same writings he sometimes advocates what is wholly repulsive to Christian feeling, as the duty and privilege of suicide.

In the tragedies which bear Seneca's name (*Hercules Furens*, *Thyestes*, *Phoenissae*, *Phaedra*, *Oedipus*, *Troades*, *Medea*, *Agamemno*, *Hercules Oetaeus*) the defects of his prose style are exaggerated: as specimens of pompous rant they are probably unequalled; and the rhythm is unpleasant owing to the monotonous structure of the iambics and the neglect of synapheia in the anapaestic systems. The praetexta *Octavia*, also ascribed to him, contains plain allusions to Nero's end, and must therefore be the product of a later hand. The doubt as to his authorship of the tragedies is due to a blunder of Sidonius Apollinaris (ix. 229-231); against it must be set Quintilian's testimony ("ut Medea apud Senecam," ix. 2. 8). The judgment of Tacitus (*Ann.* xiii. 4, 13, 42 sq., xiv. 52-56, xv. 60 sq.) is more favourable than that of Dio, who may possibly derive his account from the slanders of some personal enemy like Suilius. At least eighteen prose works have been lost, among them *De superstitione*, an attack upon the popular conceptions of the gods, and *De matrimonio*, which, to judge by the extant fragments, must have been interesting reading. Since Gellius (xii. 2. 3) cites a book xxii. of the *Letters to Lucilius*, some of these have been lost.

The best text of the prose works, that of Haase in Teubner's series (1852), was re-edited in 1872–1874 and 1898. More recently Gertz has revised the text of *Libri de beneficiis et de clementia* (Berlin, 1876), H. A. Koch that of the *Dialogorum libri xii.* (completed by Vahlen, Jena, 1879), and Gertz the *Dialogi* (Copenhagen, 1886). There is no complete exegetical commentary, either English or German. Little has been done systematically since the notes of Lipsius and Gronovius. There is, however, Ruhkopf's ed. with Latin notes, 5 vols. (Leipzig, 1797–1811), and Lemaire's variorum ed. (Paris, 1827–1832, 8 vols., prose and verse). The text of the tragedies was edited by Peiper and Richter, 1867, 2nd ed. 1902, and by F. Leo (2 vols., Berlin, 1878–1879); verse trans. by F. J. Miller (Chicago and London, 1908). Nisard, *Études de mœurs et de critique sur les poètes de la décadence* (4th ed., Paris, 1878), has criticized them in detail. Of some 300 monographs enumerated in Engelmann may be mentioned, in addition to the above, G. Boissier, *Les Tragédies de Sénèque ont-ils été représentés ?* (Paris, 1861); A. Dörgens, *Senec. disciplinae moralis cum Antoniniana comparatio* (Leipzig, 1857); E. F. Gelpke, *De Senec. vita et moribus* (Bern, 1848); Holzherr, *Der Philosoph Seneca* (Rastadt, 1858). See also Sir S. Dill, *Roman Society from Nero to Marcus Aurelius* (1904).

(R. D. H.; X.)

SENECA, a tribe of North American Indians of Iroquoian stock. They call themselves *Tshoti-nondawaga*, "people of the mountain." The French called them *Tsonnontouan*. Their former range was in western New York state between Seneca lake and the Genesee river. They were one of the Six Nations League of the Iroquois, and eventually became the most important tribe of the league. They were foremost in all the Iroquoian wars, and were the official guardians of the western frontier of the league. On the defeat of the Erie and Neuter tribes they occupied the county west of Lake Erie and south along the Alleghany to Pennsylvania. They fought on the English side in the War of Independence. About 2700 are now on reservations in New York State, while a few are in Oklahoma and on Grand River reservation, Ontario.

For Seneca Cosmology see *21st Ann. Report Bureau Amer. Ethnol.* (1899–1900).

SENECA FALLS, a village of Seneca county, New York, U.S.A., in the township of Seneca Falls, on Seneca Outlet, or river (which connects Lake Seneca and Lake Cayuga), about 42 m. W.S.W. of Syracuse. Pop. (1900) 6519, of whom 801 were foreign-born; (1905) 6733; (1910) 6588; of the township, including the village (1910) 7407. The village is served by the New York Central & Hudson River, the Lehigh Valley and electric suburban railways, and by the Seneca & Cayuga Canal. In the village are the Mynderse (public) Library and the Johnson Home for Old Ladies (1868). Cayuga Lake Park, a pleasure resort, is 3 m. distant and is reached by electric railway. The village is the shipping point for a farming and dairying region. The river here falls 50 ft. and provides a good water power; among the manufactures are pumps and hydraulic machinery, woollen goods, wagons and farm implements. Seneca Falls was settled about 1790, and was first incorporated as a village in 1831, its charter as revised in 1902 being similar in some respects to that of a city. In Seneca Falls on the 19th and 20th of July 1848 was held a Woman's Rights Convention, the first in the United States.[1]

SENEFELDER, ALOIS (1771–1834), German inventor of lithography, was born at Munich on the 6th of November 1771, his father Peter being an actor at the Theatre Royal. Owing to the death of his father he was unable to continue his legal studies at the university of Ingolstadt, and tried to support himself as a performer and author, but without success. In order to accelerate the publication of one of his works, he frequently spent whole days in the printing office, and found the process of printing so simple that he conceived the idea of purchasing a small printing press, thus enabling himself to print and publish his own compositions. Unable to pay for the engraving of his compositions, he attempted to engrave them himself. He made numerous experiments with little success; tools and skill were alike wanting. Copper-plates were expensive, and the want of a sufficient number entailed the tedious process of grinding and polishing afresh those he had used. About this period his attention was accidentally directed to a fine piece of Kellheim stone which he had purchased for the purpose of grinding his ink. His first idea was to use it merely for practice in his exercises in writing backwards, the ease with which the stone could be ground and polished afresh being the chief inducement. While he was engaged one day in polishing a stone slab on which to continue his exercises, his mother entered the room and desired him to write her a bill for the washer-woman, who was waiting for the linen. Neither paper nor ink being at hand, the bill was written on the stone he had just polished. The ink used was composed of wax, soap and lamp-black. Some time afterwards, when about to wipe the writing from the stone, the idea all at once struck him to try the effect of biting the stone with aqua fortis. Surrounding the stone with a border of wax, he covered its surface with a mixture of one part of aqua fortis and ten parts of water. The result of the experiment was that at the end of five minutes he found the writing elevated about the tenth part of a line ($\frac{1}{120}$ in.). He then proceeded to apply the printing ink to the stone, using at first a common printer's ball, but soon found that a thin piece of board covered with fine cloth answered better, communicating the ink more equally. He was able to take satisfactory impressions, and, the method of printing being new, he hoped to obtain a patent for it, or even some assistance from the government. For years Senefelder continued his experiments, until the art not only became simplified, but reached a high degree of excellence in his hands. In later years the king of Bavaria settled a handsome pension on Senefelder. He died at Munich in 1834, having lived to see his invention brought to comparative perfection.

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[1] The convention, under the leadership of Lucretia Mott and Elizabeth Cady Stanton, adopted a "Declaration of Sentiments" modelled after the American Declaration of Independence, and resolved "that it is the duty of the women of this country to secure to themselves their sacred right to the elective franchise," and "that the same amount of virtue, delicacy and refinement of behaviour that is required of woman in the social state should also be required of man, and the same transgressions should be visited with equal severity on both man and woman."

SENEGA, the dried root of the Polygala Senega, which is official in the British and United States pharmacopoeias. Senega contains an active principle, saponin. Senega is used chiefly as a stimulating expectorant in chronic bronchitis. It is occasionally used as a diuretic in renal dropsy. It is a cardiac depressant, and is contra-indicated in diseased conditions of the heart. It has a tendency to upset the digestion, and is therefore only used in combination with other drugs in what are termed expectorant mixtures.

SENEGAL, a river of West Africa, entering the Atlantic about 16° N., some 10 m. below St Louis, after a course of fully 1000 m. It is formed by the junction of the Bafing or Black river and the Bakhoy or White river, and its chief affluent is the Faleme. North of the Senegal the Sahara reaches the coast, and for over 1000 miles no river enters the ocean.

The Bafing rises in the Futa Jallon highlands about 2400 ft. above sea-level, in 10° 28′ N., 10° 5′ W., its source being within 125 m. of Konakry on the Gulf of Guinea. It is joined in about 11° 10′ N. and 11° 45′ W. by the Tene, which rises in 13° W. and 10° 37′ N. and flows north-east. A little south of 12° N. the Bafing is a large stream 250 yds. wide, and is here separated from the sources of the Faleme by a line of hills 2600 ft. high, which send to the latter river four important streams rising in about 12° N. The Bafing follows a northward course for about 350 m., during which it descends by a series of rapids till it reaches a level of 360 ft. above the sea. The headstreams of the Bakhoy rise between 11° 30′ and 12° N. and 9° 20′ and 9° 50′ W. on the N.E. versant of the hills which here form a narrow divide between the basin of the Senegal and that of the upper Niger. The Bakhoy, in its upper course much interrupted by rapids, flows N.E., but about 12° 15′ N. turns north-westward. Its principal affluent, the Baule (Red river), and its headstreams rise farther east on the northern slopes of the hills which above Bamako shut in the Niger. The eastern headwaters of the Senegal thus drain a large area adjacent to the upper Niger. The Baule flows north and in a series of loops reaches 14° 20′ N., where it turns westward and in about 13° 30′ N. and 10° W. joins the Bakhoy. After receiving the Baule, the Bakhoy, now a river of fine proportions, flows W. by N. through rocky country in a narrow valley. In 11° 55′ W. and 13° 48′ N. it unites with the Bafing. At the confluence the Bakhoy is 800 ft. wide, the Bafing at this point having a width of 360 ft.

After the junction of the Black and White rivers the united stream is known as the Senegal. The confluence is called Bafulabé, *i.e.* "meeting of the waters." Below Bafulabé the river flows N.W. through a valley bordered on either side by hills which throw out rocky spurs, over which the Senegal descends in a succession of falls, those of Guina (160 ft.) and of Felu (50 or 60 ft.) being the most important. It receives from the north several intermittent streams, the chief, usually carrying a fair amount of water, being the Khulu or Kolimbine, coming from the Kaarta plateau. From the south it is joined by the Faleme, a considerable river which rises in hilly country in about 11° 50′ N. and 11° 30′ W. The first rise in the lower Senegal is due to the rains in the source region of the Faleme, the flood water passing down that stream more quickly than down the Bafing owing to its shorter course. A short distance below the Felu Falls is the town of Kayes on the left bank of the river. Between the falls and Bakel (85 m.) there are twenty-seven "narrows," of which several, such as that at Kayes, are difficult. Kayes is the limit of navigability from the sea. From that town a railway connects with the navigable waters of the upper Niger at Bamako (see SENEGAL: *Country, I.*).

Below Bakel the river passes through flatter country and presents a series of great reaches. It sends off numbers of divergent channels (called *marigots*) forming several islands, the largest being that of Morfil, 110 m. long. The river attains its most northerly point, 16° 30′ N., in about 15° 10′ W. Thereafter it runs S.W. and finally due S. In the last 10 m. of its course it runs parallel to the sea, from which it is separated by a narrow line of dunes. On an island at the head of this 10 m. is St Louis, the capital of the colony of Senegal. At this point the right branch of the river is only 500 ft. from the open Atlantic. A marigot, called the Ndiadier or Maringuins, leaves the river 40 m. above St Louis, pierces the dunes at flood time and reaches the sea, 50 m. N. of the mouth of the river. The Senegal indeed has what is styled an interior delta, but, with the exception of the marigot named, all the divergent branches rejoin the main stream before the sea is reached.

The comparative scantiness of its sources, the steepness of its upper course and the rapid evaporation which takes place after the short rainy season would make the Senegal an insignificant stream for more than half the year; but natural dams cross the channel at intervals and the water accumulates behind them in deep reaches, which thus act as reservoirs. In the rainy season the barriers are submerged in succession, the reaches are filled and the plains of the lower Senegal are changed into immense marshes. Lake Cayor on the right side of the lower Senegal and Lake Panieful (Guier) on the left constitute reserve basins, receiving the surplus waters of the river during flood and restoring them in the dry season. In the upper part of the river the reservoirs are partially protected by curtains of verdure from the effects of the evaporation which makes itself so severely felt on the treeless seaboard. Owing to these natural "locks," the Senegal never discharges less than 1700 or 1800 cubic ft. per second. The lower Senegal forms the boundary between the Sahara and the western Sudan; the line of its inundations is an ethnographic march between the nomadic Berber and the settled Negro.

From July to October the level of the Senegal shows a series of fluctuations, with, however, a general increase till the end of August or beginning of September, when the maximum occurs. Boats drawing from 1 ft. to 2 ft. 6 in. can ascend to Kayes from the beginning of June to the middle of November; steamers drawing 4 ft. 3 in., from July to October inclusive; and ocean steamers, lightened so as to draw 11-13 ft., during August and September. From Mafu to the sea, a distance of 215 m., the Senegal is navigable all the year round by vessels drawing not more than 10 ft.

The existence of the Senegal appears to have been known to the ancients. It is usually regarded as the Chretes or Chremetes of Hanno, and the Nachyris and Bambotus of the Greeks and Romans, but it is not possible definitely to identify it with any of the rivers on Ptolemy's map. Idrisi and other medieval Arabian geographers undoubtedly refer to it. The seamen of Dieppe are said to have discovered the river about 1360, and even to have built a fort which became the nucleus of the town of St Louis, but this claim is unproved (see GUINEA). The mouth of the Senegal, then called Senaga, was entered in 1445 by the Portuguese navigator Dinas Diaz (who thought it a western arm of the Nile), and in 1455 Cadamosto ascended the river for some distance. Leo Africanus rightly describes its lower course as "severing by its winding channel the barren and naked soil from the green and fruitful." It was not until 1637 that the explorations of the upper river began, Jannequin, Sieur de Rochfort, in that year ascending the river some 200 m. above St Louis. In 1697 André Brüe reached the island of Morfil, while in 1698 he penetrated past the Felu Falls. At that period geographers regarded the Senegal as the termination of the Niger, a theory held until Mungo Park's demonstration of the eastward course of that stream. Park himself added much to the knowledge of the upper basin of the Senegal. It was not until 1818 that the source (*i.e.* of the Bafing) was located, by Gaspard Mollien.

See G. Mollien, *Découverte des sources du Sénégal et de la Gambie* (Paris, ed. 1889), with introduction by L. Ravaisson-Mollien; J. Ancelle, *Les Explorations au Sénégal et dans les contrées voisines* (Paris, 1886); M. Olivier, *Le Sénégal* (Paris, 1908); Captain Fromaget, "L'Hydrographie du fleuve Sénégal," in *B.S.G. Comm. Bordeaux*, xxxii. (1909).

SENEGAL, a country of West Africa belonging to France. As a geographical expression it is the land watered by the Senegal river; politically it has a much wider significance. The French possessions in this region are divided into (1) the colony of Senegal, and dependent native states; (2) the colony of Upper Senegal and Niger, with a dependent Military Territory; (3) the Territory of Mauretania. The first colony includes the most westerly coast region of Africa; a large part of the second colony is the country enclosed in the great bend of the Niger; while the Military Territory is east of that river. The Territory of Mauretania is part of the western Sahara, stretching indefinitely north from the Senegal river. It includes the oasis of Adrar Temur (see ADRAR) and the coast regions between Cape Blanco and the Senegal river. In the present article the two colonies are dealt with in separate sections (I. and II. below), the story of French conquest and colonization throughout this vast region forming section III.

I. SENEGAL

Senegal is bounded N. by the Territory of Mauretania, W. by the Atlantic, S. by Portuguese Guinea and French Guinea, and E. by the Faleme, which separates it from Upper Senegal and Niger. Wedged into Senegal and surrounded by it save seawards is the British colony of the Gambia. Senegal colony proper consists of the towns of Dakar, St Louis, Goree and Rufisque, a narrow strip of territory on either side of the Dakar-St Louis railway, and a few detached spots, and has an area of 438 sq. m. with a population (census of 1904) of 107,826. The rest of the country consists of native states under French protection, and includes, since 1909, the northern bank of the river Senegal below Bakel. In this larger sense, which is that employed in this article, Senegal covers about 74,000 sq. m., with an estimated population of 1,800,000. Among the protected states is Bondu (*q.v.*) lying immediately west of the lower Faleme.

Physical Features.—The coast follows a S.S.W. direction from the mouth of the Senegal to Cape Verde, the most western point of the African continent; thence it bends south as far as Cape Roxo, where the Portuguese frontier begins. The only gulf on the coast is that which lies to the south of Cape Verde and contains the island of Goree (*q.v.*). The coast in the northern part is low, arid, desolate and dune-skirted, its monotony relieved only here and there by cliffs and plateaus. Further south it becomes marshy, and clothed with luxuriant vegetation. A little to the north of the Gambia the coast-line is much broken by the archipelago of islands formed by the Salum estuary, whilst south of the Gambia is the broad estuary of the Casamance. Between the Senegal and the Gambia and as far east as about 13° W., the country behind the seaboard is a slightly elevated and, for the most part, barren plain. Further east is a mountainous and fertile region with altitudes of over 4000 ft. The mountains sink abruptly towards the Niger valley, while southwards they join the Futa Jallon highlands. On the north they extend to the left bank of the Senegal and throw out spurs into the desert beyond. The Senegal (*q.v.*), its tributary the Faleme, and the upper course of the Gambia (*q.v.*) are the chief rivers which drain the country. The Salum, already mentioned, is a river-like estuary which penetrates fully 100 m. and is split into many channels. It is navigable from the sea for 60 m. The Casamance flows between the Gambia to the north and the Cacheo to the south, and has a drainage area of some 6000 sq. m. Rising in the Futa Jallon, the river has a course of about 212 m., and at Sedhiu, 105 m. from the sea, is 1½ m. broad. Forty miles lower down it is joined by a northern tributary, the Songrogu, and thence to the ocean forms, with its numerous lateral channels, an estuary. The mouth of the river is fully 6 m. wide. Six to seven feet of water cover the bar at low tide, the river being navigable by shallow draught vessels for the greater part of its length.

Geology.—The low region of the seaboard has a very uniform character. It consists of sandstones or clay rocks and loose beds of reddish soil, containing marine shells. At certain points, such as Cape Verde and Cape Roxo (or Rouge), the red sandstones crop out, giving to the latter its name. Clay slates also occur, and at intervals these sedimentary strata are interrupted by basaltic amygdaloid and volcanic rocks. For instance, the island of Goree is basaltic. The base of the mountains is formed in certain places of clay slate, but more generally of granite, porphyry, syenite or trachyte. In those districts mica-schists and iron ores occur. Iron and gold are found in the mountains and the alluvial deposits. Many of the valleys are covered with fertile soils; but the rest of the country is rather arid and sterile.

Climate.—There are two seasons, the dry and the rainy or winter, the latter contemporaneous with the European summer. In the rainy season the wind blows from the sea, in the dry season the harmattan sweeps seaward from the Sahara. Along the seaboard the dry season is cool and agreeable; in the interior it is temperate in the three months which correspond to the European winter, for the rest of the year the heat is excessive. The maximum readings (90° to 100° F.), which are exceptional at St Louis, become almost the rule at Bakel on the upper Senegal. The mean temperature at St Louis is 68° to 70° F. The rainy season begins at Goree between the 27th of June and the 13th of July. During this period storms are frequent and the Senegal overflows and floods the lowlands, the heat and humidity rendering the country affected very unhealthy. Several districts formerly covered with forest, to which fact Cape Verde owed its name, are now treeless, a continual slow diminution in the rainfall being the result.[1] No part of the country is suited for permanent occupation by Europeans. Yellow fever, malaria, &c., once prevalent in the towns, have been successfully combated by attention to sanitation.

Flora.—The principal tree is the baobab (*Adansonia digitata*), which sometimes at the height of 24 ft. has a diameter of 34 and a circumference of 104 ft. Acacias are numerous, one species, *A. adansonia*, being valuable for ship-timber. Among the palm-trees is the *ronier*, whose wood resists moisture and the attacks of insects; in some places, as in Cayor, it forms magnificent forests. The mampatas grows sometimes 100 ft. high, its branches beginning at a height of about 25 ft. *Landolphia* and other rubber plants, and the oil-palm, grow luxuriantly in the Casamance district. The karite, or shea-butter tree, is common. Wild indigo is abundant, and the cotton plant is indigenous.

Fauna.—The lion of Senegal and the neighbouring countries differs from the Barbary lion; its colour is a deeper and brighter yellow, and its mane is neither so thick nor so long. Other beasts of prey are the leopard, the wild cat, the cheetah, the civet and the hyena. The wild boar is clumsier than the European variety. Antelopes and gazelles occur in large herds; the giraffe is found in the region of the upper Senegal; the elephant is rare; the hippopotamus is gradually disappearing. Crocodiles swarm in the upper Senegal. Monkeys and apes of different species (the chimpanzee, the colobus, the cynocephalus, &c.), the squirrel, rat and mouse abound. The hedgehog, marmot, porcupine, hare, rabbit, &c., are also met with. Among the more noteworthy birds are the ostrich, which migrates to the Sahara; the bustard, found in desert and uncultivated districts; the marabout, a kind of stork, with its beak black in the middle and red at the point, which frequents the moist meadowlands and the lagoons; the brown partridge, the rock partridge and the quail in the plains and on the mountain sides; and the guinea-fowl in the thickets and brushwood. Along the coast are caught the sperm whale, the manatee and the cod-fish.

Inhabitants.—The inhabitants of Senegal are, mainly, "Moors" and allied Berber races, and Negroids. The Moors, or rather Berbers (Trarzas, Braknas and Duaish), inhabit the right bank of the Senegal. Fula (Peuls) are found in various parts of the country. Negroids, however, form the bulk of the population. There are few, if any, tribes of unmixed Negro blood, though in most of them the Negro element largely predominates. The best known of these tribes are the Wolofs and Mandingos, the last-named a widespread group of allied peoples bearing many names such as Sarakolés and Bambaras. Mandingos inhabit the basins of the upper Niger and the upper Senegal, and the western slope of the mountains of Futa Jallon. Under the name of Wakore or Wangara they are also found in all the immense tract enclosed in the bend of the Niger. The Berbers, Fula and Mandingos are Moslems. The Wolofs and the Serers inhabit the seaboard from St Louis to the Gambia, and the left bank of the Senegal from its mouth to Dagana. The Balanta inhabit the left bank of the Casamance; they are allied to the Mandingos. The principal languages spoken are Wolof, Fula, Serer, Mandingo and Arabic. The river Senegal marks the line of separation between Wolof and Arabic. Fula is the language of the Fula and Tukulors (Fula half-breeds); Mandingo comprises several dialects and is widely spoken. Polygamy is generally practised. Slave raiding has been stopped and domestic slavery is not recognized by the French. (See BERBERS, FULA, WOLOF, MANDINGO, &c.)

Towns.—The chief towns of Senegal are St Louis, pop. (1904) 28,469, Dakar (23,452), Goree (1500) (all separately noticed) and Rufisque. Rufisque (12,446; including suburbs, 19,177) is a seaport 14 m. E. of Dakar and is on the railway connecting that town with St Louis. It is the chief place in the colony for the export of groundnuts. Portudal and Joal are small places on the coast south of Rufisque. (Midway between Cape Verde and Cape Blanco is the small port of Marsa or Portendic, a little south of Jeil [Old Portendic], which was formerly noted for the export of gum arabic, and on the shores of the bay formed by Cape Blanco is Port Étienne, a fishing station provided with jetties and guarded by a military post. These last-named ports are in the Territory of Mauretania, but are most conveniently mentioned here.) On the river Senegal are the towns of Richard-toll (Richard's garden), Dagana and Bakel, all three founded by the French government in 1821. Carabane, Zighinchor and Sedhiu are settlements on the Casamance river. St Louis, Dakar, Goree and Rufisque are communes, with a franchise exercised by natives and Europeans alike. The total white population of the four towns is about 5000.

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[1] See A. Knox, "The Isohyets 'twixt Sahara and Western Sudan," in *Geog. Journ.* (June 1909).

Agriculture and Trade.—Senegal's chief commercial product is the ground-nut, which, since 1888, has yielded about 30,000 tons a year. Millet, the staple food of the native population, maize and rice occupy about two-thirds of the cultivated land. Acacia gum is gathered by the Moors in the northern region; the kola nut is cultivated and rubber is collected in the district of Casamance, which projects between Portuguese Guinea and British Gambia. There are large herds of cattle and flocks of sheep and goats, besides numerous camels, asses and horses. Gold, iron, quicksilver and copper are found. The natives carry on weaving, pottery, brickmaking, and manufacture trinkets. Cotton goods (chiefly from England) form the most important articles of import, and after them come kola nuts (mainly from Sierra Leone), rice, wines and spirits, tobacco, implements, sugar, coal and fancy goods; the exports are mostly ground-nuts; rubber (much of which comes from the Niger regions), gum and gold coming next in value. The imports and exports of Senegal are not shown separately, the figures for Upper Senegal and Niger being included. The average annual value for the five years ending 1905 was £3,100,000. By 1910 the value had risen to nearly £4,000,000. France takes 75% of the exports; Belgium, the Netherlands and Denmark the bulk of the remainder In value ground-nuts form four-fifths of the exports.

Communications.—A railway, 163 m. long, goes from Dakar to St Louis, from which point the Senegal river is navigable by steamer from August to November, both inclusive, for about 500 m., the navigable reach terminating at Kayes, whence a railway runs to the Niger. Direct communication between Dakar and the Niger is afforded by a railway starting from Thies, a station on the way to St Louis, and ending at Kayes. The construction of this line began in 1907. Telegraph lines connect the colony with all other parts of French West Africa. Dakar is in direct cable communication with Brest, and another cable connects St Louis with Cadiz. Steamship communication between Europe and Dakar and Rufisque is maintained by several French, British and German lines. Over 50% of the shipping is French, Great Britain coming second.

II. Upper Senegal and Niger

This colony is bounded N. by the Saharan territories dependent on Algeria, W. by Senegal and the Territory of Mauretania, S. by the French colonies of Guinea and the Ivory Coast, the Northern Territories of the Gold Coast (British), Togoland (German) and Dahomey (French). The Military Territory dependent on the colony extends E. of the Niger to the Lake Chad territory of French Congo, being bounded S. by Nigeria (British). The colony and its dependent territory thus form the link connecting all the possessions of France in north, west and central Africa. Their area is estimated at 210,000 sq. m., with a population of some 3,000,000. Those tribes living north and east of the Niger are mainly of Berber (Tuareg) stock; the inhabitants of the Niger bend are chiefly Negroids, such as the Mandingo, with Fula in certain districts.

The colony, as a whole, consists of a great plateau of granite and sandstone, rarely more than 1600 ft. high, and in its N.W. part, the Kaarta, all but desert. Hydrographically the western portion belongs to the basin of the Senegal, the central to that of the Niger. At Mopti, 200 m. S.W. of Timbuktu, the Niger receives the Mahel Balevel, which rises in about 9½°N. and with its tributaries drains a very large area. In its lower courses its divergent channels, uniting with offshoots from the Niger, form in the flood season an immense lake. This region—apparently the Wangara country of Idrisi—is sometimes called Bambara, the name of the chief race inhabiting it. The lakes or widenings of the Niger itself occupy vast areas; Lake Debo, the Lake of Horo, the Lake of Dauna, Lake Faguibini are all to the south or west of Timbuktu, and are permanent. The greater part of the colony lies within the bend of the Niger, but westward it includes both banks of the Senegal as far as the Faleme confluence. It also extends north of the Niger so as to include the fertile land on the borders of the Sahara. On the S.W. and S. the country is somewhat mountainous and the general trend of the land and the course of the rivers is south to north. East of the Niger the conditions are mostly Saharan, but there is a belt of fairly fertile country, bordering northern Nigeria and extending to Lake Chad. This region includes the state of Zinder (*q.v.*) and the oases of Air or Asben and Bilma (*q.v.*). The country west of the Niger contains patches of forest, but it consists mainly of open land well adapted to agriculture and stock-raising. The fauna includes the lion, elephant, hippopotamus, wild boar, panther and various kinds of antelope. The climate is tropical, but, apart from the districts inundated by the Niger floods, dry and not unhealthy.

The Protected States.—Of the native states included in the colony Bambuk lies between the Senegal and the Faleme and Bafing. It is traversed from N.W. to S.E. by the steep and wall-like range of the Tamba-Ura Mountains. The soil in a large part of the country is of remarkable fertility; rice, maize, millet melons, manioc, grapes, bananas and other fruits grow abundantly; the forests are rich in a variety of valuable trees; and extensive stretches are covered with abundant pasturage of the long guinea-grass. The inhabitants, a branch of the Mandingo race, own large herds of cattle and sheep. The reports which reached Europe during the 17th and 18th centuries of a country in Upper Senegal rich in gold referred to this district, where both alluvial and quartz deposits have been found, though the stories of "hills of gold" remain unverified. In all the protected states the native rulers retain a considerable degree of authority and native law is administered.

Towns.—The principal towns in the colony are, in Upper Senegal, Kayes, Bafulabé and Kita; in the Niger regions Sikaso, the centre of the rubber trade; Bamako,[1] the seat of government; Kulikoro, Segu, Sansandig, Bambara, Jenné (*q.v.*) and Timbuktu (*q.v.*). Nioro is the capital of the Kaarta country; between it and Timbuktu are Gumbu and Sokolo; Gao (*q.v.*), Zinder or Sinder (not to be confounded with the Zinder mentioned above), Sansanne Hausa, Niamey and Say are towns on the Niger below Timbuktu, Say (*q.v.*) being an entrepôt for the trade of the east Nigerian regions. In the centre of the Niger bend is the important city of Wagadugu, the capital of Mossi, a negroid and pagan state dating from the 14th century. Satadugu is on the upper course of the Faleme. Sati and Leo are towns just north of the British Gold Coast hinterland.

Of these towns Kayes is situated on the Senegal at the point of which that river ceases to be navigable from the sea—a distance of 460 m. from St Louis. Bamako, chosen in 1904 as the capital of the colony, is on the upper Niger at the head of its navigable waters and is in railway communication with Kayes. Segu, where Mungo Park first reached the Niger, is regarded as the capital of Bambara rather than the town of Bambara, which is on a backwater of the Niger some 100 m. S. of Timbuktu. Before the French occupation the possessor of Segu was the ruler of the surrounding country; and the town was the headquarters of the emirs Omar and Ahmadu (see below, *History*). Sansandig stands on the north bank of the Niger below Segu. It was visited by Mungo Park in 1796, and Lieut. E. Mage and Dr Quintin, French officers, witnessed the stand it made in 1865 against a siege by Ahmadu, sultan of Segu, from whom it had revolted. Before its conquest by the Tuareg in the first half of the 19th century Sansandig was an important mart, owing to its position at the upper end of the stretch of the Niger navigable for large vessels all the year round. After its occupation by France in 1900 its commercial importance gradually returned. It possesses good anchorage and landing places.

Communications.—There is regular communication by rail and river between Dakar, the principal port of Senegal, and Timbuktu, the journey occupying ten to twelve days. A railway linking the Senegal and Niger rivers starts at Kayes on the Senegal, passes S.E. through Bafulabé and Kita, whence it goes E. to Bamako on the Niger, and follows the left bank of that river to Kulikoro, the terminus, from which point the Niger is navigable down stream all the year round for a distance of 900 m., while from Bamako the Niger is navigable up stream to Kurussa, a distance of 225 m., for the greater part of the year. The Senegal-Niger railway is 347 m. long, and occupied twenty-four years in construction, owing to bad management and periods of retrogressive policy in Paris. The total cost was upwards of £3,500,000. Construction of the line was sanctioned in 1880; by 1882, when £700,000 had been spent, but 10 m. of rails had been laid. The 33rd mile was reached at a cost of £7,252 per mile for actual construction. Notwithstanding this heavy expense the line was condemned as hopelessly defective. In 1888 it reached Bafulabé (82 m.) when work was suspended, not to be vigorously resumed until 1898. The entire line was opened for traffic in 1905. Steamers ply on the Niger between Kabara, the port of Timbuktu, and Kulikoro and Bamako. Good roads connect Mossi and other countries in the Niger bend with the river ports and the colonies on the Gulf of Guinea. There is a complete system of telegraphic communication with all the French colonies in West Africa. The principal line (over 2000 m. long) connects Dakar with Timbuktu and from Timbuktu goes east to Zinder. At Burrem on the Niger, 212 m. below Timbuktu, starts a line across the Sahara to Algeria.

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[1] For a monograph on Bamako see *Quest. dipl. et col.* (1907), pp. 561-576.

Trade and Agriculture.—The chief exports are gum (which comes largely from the northern districts such as Kaarta), rubber, gold, kola nuts, leather and ostrich feathers. Part of the trade is still done by caravans across the Sahara to Morocco and Algeria, and a goodly proportion of the exports from the middle Niger are shipped from Konakry in French Guinea. Under the direction of French officials, cotton-growing on scientific methods was begun in the Niger basin in 1904. American and Egyptian varieties were introduced, the American varieties proving well adapted to the soil. Indigenous varieties of cotton are common and are cultivated by the natives for domestic use, weaving being a general industry. Gold is found in the basin of the Faleme and of the Tankisso. Rubber is abundant in the southern part of the Niger bend, the latex being extracted by the natives in large quantities. The people are great agriculturists, their chief crops being millet, maize, rice, cotton and indigo. Tobacco is cultivated by the river folk along the banks inundated by the floods. Wheat is grown in the neighbourhood of Timbuktu, the seed having been, in all probability, brought from Morocco at the time of the Moorish invasion (see TIMBUKTU). The oil of the karite or shea-butter tree, common in the southern and western regions, is largely used. Cattle are plentiful; there are several good breeds of horses; donkeys are numerous and largely used as transport animals; wool-bearing sheep—distinct from the smooth-haired sheep of the coast regions—are bred in many districts, the natives using the wool largely in the manufacture of blankets and rugs. Ostriches are fairly numerous in the upper portion of the Niger bend and on the left bank of the Niger east of Timbuktu, and their feathers form a valuable article of trade. Most of the trade of this vast region is with France and through Senegal.

III. HISTORY AND ADMINISTRATION

The story of the French conquests throughout West Africa is inseparably connected with the history of Senegal. Trading stations were established elsewhere on the coast, but the line of penetration into the interior of the continent was, until the last few years of the 19th century, invariably by way of the river Senegal. Hence there is a peculiar interest in the record of the early settlements on this coast. The Portuguese had some establishments on the banks of the Senegal in the 15th century; they penetrated to Bambuk in search of gold, and were for some time masters of that country, but the inhabitants rose and drove them out. Remains of their buildings are still to be seen. The first French settlement was probably made in 1626 (see SENEGAL, river). Between 1664, when the French settlements were assigned to Colbert's West India Company, and 1758, when the colony was seized by the British, Senegal had passed under the administration of seven different companies, none of which attained any great success, though from 1697 to 1724 affairs were conducted by a really able governor, André Brue, who did not, however, spend the whole of his time in Africa; from 1703 to 1714 he directed the affairs of Senegal from Paris. Brue made many exploring expeditions and was on one occasion (1701) captured by the natives, who extorted a heavy ransom. Under his direction the auriferous regions of Bambuk, long since abandoned by the Portuguese, were revisited (1716) and the first map of Senegal drawn (1724). In the meantime (1677) the French had captured from the Dutch Rufisque, Portudal, Joal and Goree and they were confirmed in possession of these places by the treaty of Nijmwegen (1678). In 1717 the French acquired Portendic, a roadstead half way between capes Verde and Blanco, and in 1724 Arguin, an island off the coast of the Sahara, which still belongs to the colony. Goree and the district of Cape Verde were captured by the British under Commodore Keppel in 1758, but were surrendered to the French in 1763, and by the treaty of peace in 1783 the whole of the Senegal was also restored. The British again captured the colony in the wars of the First Empire (Goree 1800, St Louis 1809) and, though the treaty of Paris authorized a complete restitution, the French authorities did not enter into possession till 1817. At that time the authority of France did not extend beyond the island of Goree and the town of St Louis, whilst up to 1854 little was effected by the thirty-seven governors who followed each other in rapid succession. Of these governors Captain (afterwards Admiral) Bouët-Willaumez had previously explored the Senegal river as far as Médine and was anxious to increase French influence, but his stay in Senegal (1842–1844) was too brief to permit him to accomplish much.

The appointment of General Faidherbe as governor in 1854 proved the turning-point in the history of Senegal. In the meantime the Niger had been explored, Timbuktu visited by Europeans and the riches of the region were attracting attention. General Faidherbe sought to bring these newly opened-up lands under French sway, and dreamed of a French empire stretching across Africa from west to east. As far as concerned West Africa he did much to make that dream a reality. On taking up the governorship he set about subduing the Moorish (Berber) tribes of the Trarzas, Braknas and Duaish, whose "kings," especially the king of the Trarzas, had subjected the French settlers and traders to grievous and arbitrary exactions; and he bound them by treaty to confine their authority to the north bank of the Senegal. In 1855 he annexed the country of Walo and, ascending the river beyond Kayes, erected the fort of Médine for the purpose of stemming the advancing tide of Moslem invasion, which under Omar al-Haji (Alegui) threatened the safety of the colony. In 1857 Médine was brilliantly defended by the mulatto Paul Holle against Omar, who with his army of 20,000 men had to retire before the advance of General Faidherbe and turn his attention to the conquest of the native states within the bend of the Niger. The conquest of the Senegambian region by the French followed. The outbreak of the Franco-Prussian War in 1870 checked the French schemes of penetration for some five or six years, but the delay proved to be no disadvantage for Great Britain, France's only serious rival in West Africa at the time, remained inert.

Conquest of the upper Niger regions.

The first French expedition into the heart of the Niger country was undertaken in 1863, when General Faidherbe sent Lieut. E. Mage[1] and Dr Quintin to explore the country east of the Senegal. The two travellers pushed as far as Segu on the Niger, then the capital of the almany Ahmadu, a son of Omar al-Haji. At Segu they were forcibly detained from February 1864 to March 1866. During this period they gathered much valuable information concerning the geography, ethnology and history of the middle Niger region. In 1878 the explorer Paul Soleillet (1842–1886) also penetrated to Segu. In 1879 Colonel Brière de l'Isle (governer of Senegal, 1876–1881) appointed Captain Joseph S. Gallieni to investigate the route for a railway and to reopen communications with the almany Ahmadu; and at this time the post of Bafulabé was constructed. The armed conquest began in 1880, and for more than fifteen years was carried on by Borgnis-Desbordes, J. S. Gallieni, H. N. Frey, Louis Archinard, Col. Combes, Tite Pierre Eugène Bonnier and other officers. In 1881 the Niger was reached; the fort of Kita was erected to the south-east of Médine to watch the region between the Senegal and the Joliba (upper Niger); the fort of Bamako on the Niger was built in 1883; a road was made, 400 m. of telegraph line laid down and the work of railway construction begun. In 1887 Ahmadu, who had formerly been anxious to obtain British protection, signed a treaty placing the whole of his country under French protection.[2] Besides Ahmadu the principal opponent of the French was a Malinké (Mandingo) chieftain named Samory, a man of humble origin, born about 1846, who first became prominent as a reformer of Islam, and had by 1880 made himself master of a large area in the upper Niger basin. In 1887, and again in 1889, he was induced to recognize a French protectorate, but peace did not long prevail either with him or with Ahmadu. The struggle was resumed in 1890; Ahmadu lost Segu; Nioro the capital of Kaarta was occupied (1891); Jenné was taken in 1893. Samory proved a veritable thorn in the flesh to his opponents. Wily and elusive, he made and broke promises, tried negotiation, shifted his "empire" to the states of Kong, and after numberless encounters was finally defeated on the Cavalla to the north of Liberia, and taken prisoner in September 1898. He was deported to the Gabun, where he died in 1900. Timbuktu was occupied in December 1893, in defiance of orders from the civil authorities. Colonel Bonnier, who went to the relief of the advance party, after having effected that purpose, was slain by the Tuareg (15th of January 1894), whom he had pursued into the desert. In the meantime France had signed with Great Britain the convention of the 5th of August 1890, which reserved the country east of the Niger and south of the Sahara to Great Britain.

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[1] Lieut. E. Mage (1837–1869) of the French navy, an officer of brilliant promise, first visited Senegal in 1856 when, under Faidherbe's direction, he went on a mission to the Duaish Moors. The "Gorgone," which he commanded, was wrecked off Brest in December 1869 and Mage was drowned.

[2] It was in this year (1887) that the governor of Senegal took possession of a small uninhabited group of islands, named the Alcatras, lying off the coast of French Guinea. This act had a tragic sequel. By agreement with the governor, a chieftain of the neighbouring mainland sent four of his warriors to the islands to guard the tricolour. These soldiers were, however, like the islands themselves, completely forgotten by the authorities, and, the Alcatras producing nothing but sand, the four men starved to death, after exhausting the supplies with which they had been originally provided.

Determined to profit by the convention, the French government despatched Colonel P. L. Monteil to West Africa to visit the countries on the Anglo-French frontier. That officer, starting from St Louis in 1891, traversed the Niger bend from W. to E., visited Sokoto and Zinder and arrived at Kuka on Lake Chad, whence he made his way across the Sahara to the Mediterranean. In the following years French expeditions from Senegal penetrated south-east into the hinterland of the British colonies and protectorates on the Guinea coast and descended the Niger (February 1897) as far as Bussa, the limit of navigation from the ocean. These actions brought them into contact with the British outposts in the Gold Coast, Lagos and Nigeria. A period of tension between the two countries was put an end to by a convention signed on the 14th of June 1898 whereby the territories in dispute were divided between the parties, Great Britain retaining Bussa, while France obtained Mossi and other territories in the Niger bend to which Great Britain had laid claim. In the same year it was determined to send an expedition to Lake Chad, which should co-operate with other expeditions from Algeria and the Congo. The Senegal expedition was entrusted to Captains Voulet and Chanoine, officers who had served many years in West Africa. Reports of the misconduct and cruelty of these officers reaching St Louis, Lieut.-Colonel Klobb of the Marines was sent to supersede them. Colonel Klobb overtook the expedition at a spot east of the Niger on the 14th of July 1899. Voulet, fearing arrest and punishment, ordered his men to fire on Klobb and his escort, and the colonel was killed. Thereupon Voulet, joined by Chanoine, declared his intention to set up an independent state, and with the majority of his troops marched away, leaving the junior officers, who remained loyal to France, with a small remnant. Within a fortnight both Voulet and Chanoine had been killed by their own men, who returned to the French camp. Lieut. Pallier assumed command and led the force to Zinder, reached on the 29th of July. Here, in the November following, they were joined by F. Foureau and Commandant Lamy, who had crossed the Sahara from Algeria. The combined force marched to Lake Chad, and, having been joined by the Congo expedition, met and defeated the forces of Rabah (*q.v.*). Thus was accomplished in fact the linking up of the French possessions in Africa, an object of French ambition since 1880, and theoretically effected by the Anglo-French convention of 1890.

In 1904, in virtue of another convention between Great Britain and France, the Senegal colony obtained a port (Yarbatenda) on the Gambia accessible to sea-going vessels, while the trans-Niger frontier was again modified in favour of France, that country thereby obtaining a fertile tract the whole way from the Niger to Lake Chad. During 1905–1906 the oases of Air and Bilma, in the central Sahara, were brought under French control, notwithstanding a claim by Turkey to Bilma as forming part of the Tripolitan hinterland.

Administrative divisions.

At first the whole of the conquered or protected territories were either administered from Senegal, or placed under military rule. Subsequently the upper Senegal country and the states included in the bend of the Niger were formed into a separate administration and were given the title "French Sudan." As the result of further reorganization (October 18, 1899) the colonies of French Guinea, Ivory Coast and Dahomey were given their geographical hinterlands, and in October 1902 the central portion was created a protectorate under the style of the Territories of Senegambia and of the Niger. A further change was made in 1904 (decree of the 18th of October) when this central portion was changed into "The Colony of Upper Senegal and Niger." The new colony was placed under a lieutenant-governor.

Soon after the reorganization of the country in 1902, the effective area of French control was increased by M. Coppolani, secretary-general of French West Africa, who in February 1903 induced the emirs of certain Trarza and Brakna Moors inhabiting a fertile region on the northern bank of the lower Senegal to place their country under the direct supervision of French officials. In the following year these regions were formally constituted the Territory of Mauretania, being placed under the direct control of the governor-general of French West Africa represented on the spot by a civil commissioner. In 1905 M. Coppolani, the commissioner, was murdered by a band of fanatics at an oasis in the Tagant plateau. During 1908–1909 a force under Colonel Gouraud, after considerable fighting—the natives receiving help from Morocco—made effective French influence in Adrar Temur.

For the history of the native states in this vast region, see TIMBUKTU, JENNE, MANDINGO, GUINEA, &c. Consult also the article NIGERIA.

Government.

The general oversight of both colonies is in the hands of the governor-general of French West Africa. Senegal proper has been the subject of special legislation, its government being modelled on that of a department in France. The lieutenant-governor, who controls the military as well as the civil administration, is assisted by a secretary-general and by a privy council (*conseil privé*) consisting of high officials and a minority of unofficial nominated members, but he is not bound to follow its advice. This council corresponds to the prefectural council of a department. There is also a council-general (*conseil général*) with powers analogous to those of the similar councils in France. The Senegal council, however, does not share the right, possessed by the councils of other French colonies, of voting the budget, which is fixed by the governor-general of French West Africa. The inhabitants of "communes with full powers" (*i.e.* St Louis, Dakar, Goree and Rufisque) alone have the right of electing the council-general. The same constituencies—in which no distinction of colour or race is made—elect (law of April 1879) to the French chambers one deputy, who is also a member of the superior council of the colonies, a consultative body sitting in Paris. The communes named have the same municipal rights as in France. There have been, in addition, since 1891, "mixed" and native communes with restricted powers of local government. The judicial system applied to Europeans resembles that of France, and the judicature is independent of the executive. Native laws and customs not repugnant to justice are respected. Education is given in village, commercial and technical schools, all maintained by the state. Arabic is taught in all Mahommedan districts.

The colony of Upper Senegal and Niger has a more rudimentary constitution. Its administrative council contains three "notables," unofficial members nominated by the lieutenant-governor.

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questions, and gives a chronological table of leading events. For history, consult "Les Compagnies de colonisation en Afrique occidentale sous Colbert," by P. Chemin-Dupontes, in *Revue coloniale* (1902–1903 and 1903–1904); J. Machat, *Documents sur les établissements français de l'Afrique occidentale au XVIII^{e} siècle* (Paris, 1906); and J. Ancelle, *Les Explorations au Sénégal et dans les contrées voisines depuis l'antiquité jusqu'à nos jours* (Paris, 1906). For a summary of the military operations see the *Jnl. Roy. United Service Inst.*, vol. 38 (1894) and vol. 44 (1900), containing articles by Capt. S. Pasfield Oliver and Capt. A. Hilliard-Atteridge.

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See further the works of Faidherbe and Gallieni quoted in their biographies, and the reports on the trade, &c., of French West Africa issued by the British Foreign Office. (F. R. C.)

SENEGAMBIA, a term used to denote the region between the rivers Senegal and Gambia on the west coast of Africa. The country south of the Gambia as far as Sierra Leone was formerly also regarded as part of Senegambia. As a geographical expression Senegambia fell into disuse towards the end of the 19th century. Part of the hinterland is included in the French colony of Upper Senegal and Niger (see SENEGAL, II.)

SENESCHAL (the O. Fr. form, mod. *sénéchal*, of the Low Lat. *senescalcus*, a word of Teutonic origin, meaning "old or senior servant," Goth. *sini-* old; cf. Lat. *senex* and *scalks*, servant; Du Cange's derivation from *seneste*, flock, herd, must be rejected), the title of an official equivalent to "steward." The seneschal began presumably by being the major-domo of the German barbarian princes who settled in the empire, and was therefore the predecessor of the mayors of the palace of the Merovingian kings. But the name seneschal became prominent in France under the third or Capetian dynasty. The seneschal, called in medieval Latin the *dapifer* (from *daps*, a feast, and *ferre*, to carry), was the chief of the five great officers of state of the French court between the 11th and the 13th centuries, the others being the butler, the chamberlain, the constable and the chancellor. His functions were described by the term *major regiae domus*, and *regni Franciae procurator*—major-domo of the royal household, and agent of the kingdom of France. The English equivalent was the lord high steward, but the office never attained the same importance in England as in France. Under the earlier Capetian sovereigns the seneschal was the second person in the kingdom. He inherited the power and position of the mayor of the palace—had a general right of supervision over the king's service, was commander-in-chief of the military forces (*princeps militiae regis*, or *Francorum*), was steward of the household and presided in the king's court in the absence of the king. Under weak rulers the seneschal would no doubt have played the same part as the mayors of the palace of the Carolingian line. It was the vast possibilities of the office which must be presumed to have tempted the counts of Anjou of the Plantagenet line to claim the hereditary dapifership of France, and to support their claim by forgeries. A count of Anjou who was also in effective possession of the office would soon have reduced his feudal lord to absolute insignificance. French historical scholars have shown that the pretension of the Anjevins was unfounded, and that the treatise concocted to support it—the *De majoratu et senescalia Franciae*, attributed to Hugues de Clères—is a medieval forgery. At the close of the 11th century the seneschalship was in the hands of the family of Rochefort, and in the early part of the following century it passed from them to the family of Garlande. The power of the office was a perpetual temptation to the vassal, and a cause of jealousy to the king. The Garlandes came to open conflict with the king, and were forcibly suppressed by Louis VI. in 1127. After their fall the seneschalship was conferred only on great feudatories who were the king's kinsmen—on Raoul of Vermandois till 1152, and on Thibaut of Blois till 1191. From that time forward no seneschal was appointed except to act as steward at the coronation of the king. The name of the seneschal was added with those of the other great officers to the kings in charters, and when the office was not filled the words *dapifero vacante* were written instead. The great vassals had seneschals of their own, and when the great fiefs, Anjou, Touraine, Maine, Poitou, Saintonge, Guienne, were regained by the crown, the office was allowed to survive by the king. In the south of France, Périgord, Quercy, Toulouse, Agenais, Rouergue, Beaucaire and Carcassonne were royal *sénéchaussées*. In Languedoc the landlords' agent and judicial officer, known in the north of France as a *bailli*, was called *sénéchal*. The office and title existed till the Revolution.

See Du Cange, *Glossarium mediae et infimae Latinitatis* (Paris, 1840–1850); A. Luchaire, *Histoire des institutions monarchiques de la France sous les premiers Capétiens* (Paris, 1883–1885); *Manuel des institutions françaises* (Paris, 1892); Paul Viollet, *Droit publique—Hist. des institutions politiques et administratives de la France* (Paris, 1890–1898).

SENIGALLIA, or SINIGAGLIA (anc. *Sena Gallica*), a city and episcopal see of the Marches, Italy, in the province of Ancona, on the coast of the Adriatic, 15 m. by rail N. of Ancona. Pop. (1901) 5556 (town), 23,195 (commune). It is situated at 14 ft. above sea-level, and, despite its ancient origin, presents a modern appearance, with wide streets. The Palazzo Comunale dates from the 17th century. The cathedral was erected after 1787. The castle, of Gothic origin, was restored by Baccio Pontelli, a famous military architect, in 1492. The church of S Maria delle Grazie outside the town is one of the only two churches which he is known to have executed (the other is at Orciano near Mondavio, about 15 m. to the west by road). The small port is formed by the lower reaches of the Misa, a stream which flows through the town between embankments constructed of Istrian marble. The inhabitants are chiefly occupied in fishing, and in the summer the town is greatly frequented by visitors for the good sea-bathing. Senigallia used to hold one of the largest fairs in Italy, which dated originally from 1200, when Sergius, count of Senigallia, received from the count of Marseilles, to whose daughter he was affianced, certain relics of Mary Magdalene; this fair used to be visited by merchants from France, Switzerland, Austria, Germany and especially the Levant. Senigallia is the residence of the Mastai-Ferretti family; the house in which Pope Pius IX. was born is preserved, and contains a few memorials of him.

The ancient *Sena Gallica* was a city of Umbria. A colony was founded there by the Romans after their victory over the Senones, rather before 280 B.C. The place is also mentioned in connexion with Hasdrubal's defeat at the Metaurus (*q.v.*) in 207 B.C. It was destroyed by Pompey in 82 B.C., and is not often mentioned afterwards. No ancient remains and very few inscriptions exist. The name Gallica distinguishes it from Saena (Siena) in Etruria. Ravaged by Alaric, fortified by the exarch Longinus, and again laid waste by the Lombards in the 8th century and by the Saracens in the 9th, Senigallia was at length brought so low by the Guelph and Ghibelline wars, and especially by the severities of Guido de Montefeltro, that it was chosen by Dante as the typical instance of a ruined city. In the 15th century it was captured and recaptured again and again by the Malatesta and their opponents. Sigismondo Malatesta of Rimini erected strong fortifications round the town in 1450–1455. The lordship of Senigallia was bestowed by Pius II. on his nephew Antonio Piccolomini, but the people of the town in 1464 placed themselves anew under Paul II., and Giacomo Piccolomini in 1472 failed in his attempt to seize the place. Sixtus IV. assigned the lordship to the Della Rovere family, from whom it was transferred to Lorenzo de' Medici in 1516. After 1624 it formed part of the legation of Urbino.

SENIOR, NASSAU WILLIAM (1790–1864), English economist, was born at Compton, Berks, on the 26th of September 1790, the eldest son of the Rev. J. R. Senior, vicar of Durnford, Wilts. He was educated at Eton and Magdalen College, Oxford; at the university he was a private pupil of Richard Whately, afterwards archbishop of Dublin, with whom he remained connected by ties of lifelong friendship. He took the degree of B.A. in 1811, was called to the bar in 1819, and in 1836, during the chancellorship of Lord Cottenham, was appointed a master in chancery. On the foundation of the professorship of political economy at Oxford in 1825 Senior was elected to fill the chair, which he occupied till 1830, and again from 1847 to 1852. In 1830 he was requested by Lord Melbourne to inquire into the state of combinations and strikes, to report on the state of the law and to suggest improvements in it. He was a member of the Poor Law Inquiry Commission of 1832, and of the Handloom Weavers Commission of 1837; the report of the latter, published in 1841, was drawn up by him, and he embodied in it the substance of the report he had prepared some years before on combinations and strikes. He was also one of the commissioners appointed in 1861 to inquire into popular education in England. In the later years of his life, during his visits to foreign countries, he studied with much care the political and social phenomena they exhibited. Several volumes of his journals have been published, which contain much interesting matter on these topics, though the author probably rated too highly the value of this sort of social study. Senior was for many years a frequent contributor to the *Edinburgh*, *Quarterly*, *London* and *North British Reviews*, dealing in their pages with literary as well as with economic and political subjects. He died at Kensington on the 4th of June 1864.

His writings on economic theory consisted of an article in the *Encyclopaedia Metropolitana*, afterwards separately published as *An Outline of the Science of Political Economy* (1836), and his lectures delivered at Oxford. Of the latter the following were printed: *An Introductory Lecture* (1827); *Two Lectures on Population*, with a correspondence between the author and Malthus (1831); *Three Lectures on the Transmission of the Precious Metals from Country to Country, and the Mercantile Theory of Wealth* (1828); *Three Lectures on the Cost of obtaining Money and on some Effects of Private and Government Paper Money* (1830); *Three Lectures on Wages and on the Effects of Absenteeism, Machinery and War, with a Preface on the Causes and Remedies of the Present Disturbances* (1830, 2nd ed. 1831); *A Lecture on the Production of Wealth* (1847); and *Four Introductory Lectures on Political Economy* (1852). Several of his lectures were translated into French by M. Arrivabène under the title of *Principes Fondamentaux d'Économie Politique* (1835). Senior also wrote on administrative and social questions—*A Letter to Lord Howick on a Legal Provision for the Irish Poor, Commutation of Tithes and a Provision for the Irish Roman Catholic Clergy* (1831, 3rd ed., 1832, with a preface containing suggestions as to the measures to be adopted in the "present emergency"); *Statement of the Provision for the Poor and of the Condition of the Labouring Classes in a considerable portion of America and Europe, being the Preface to the Foreign Communications in the Appendix to the Poor Law Report* (1835); *On National Property, and on the Prospects of the Present Administration and of their Successors* (anon.; 1835); *Letters on the Factory Act, as it affects the Cotton Manufacture* (1837); *Suggestions on Popular Education* (1861); *American Slavery* (in part a reprint from the *Edinburgh Review*, 1862); *An Address on Education delivered to the Social Science Association* (1863). His contributions to the reviews were collected in volumes entitled *Essays on Fiction* (1864); *Biographical Sketches* (1865, chiefly of noted lawyers); and *Historical and Philosophical Essays* (1865). In 1859 appeared his *Journal kept in Turkey and Greece in the Autumn of 1857 and the Beginning of 1858*; and the following were edited after his death by his daughter: *Journals, Conversations and Essays relating to Ireland* (1868); *Journals kept in France and Italy from 1848 to 1852, with a Sketch of the Revolution of 1848* (1871); *Conversations with Thiers, Guizot and other Distinguished Persons during the Second Empire* (1878); *Conversations with Distinguished Persons during the Second Empire, from 1860 to 1863* (1880); *Conversations and Journals in Egypt and Malta* (1882); also in 1872 *Correspondence and Conversations with Alexis de Tocqueville from 1834 to 1859*.

Senior's literary criticisms do not seem to have ever won the favour of the public; they are, indeed, somewhat formal and academic in spirit. The author, while he had both good sense and right feeling, appears to have wanted the deeper insight: the geniality and the catholic tastes which are necessary to make a critic of a high order, especially in the field he chose—that, namely, of imaginative literature. His tracts on practical politics, though the theses they supported were sometimes questionable, were ably written and are still worth reading, but cannot be said to be of much permanent interest. But his name continues to hold an honourable, though secondary, place in the history of political economy. Senior regards political economy as a purely deductive science, all the truths of which are inferences from four elementary propositions. It is, in his opinion, wrongly supposed by J. S. Mill and others to be a hypothetic science—founded, that is to say, on postulates not corresponding with social realities. The premises from which it sets out are, according to him, not assumptions but facts. It concerns itself, however, with wealth only, and can therefore give no practical counsel as to political action: it can only suggest considerations which the politician should keep in view as elements in the study of the questions with which he has to deal. The conception of economics as altogether deductive is certainly erroneous, and puts the science from the outset on a false path. But deduction has a real, though limited, sphere within it. Hence, though the chief difficulties of the subject are not of a logical kind, yet accurate nomenclature, strict definition and rigorous reasoning are of great importance. To these Senior gave special attention, and, notwithstanding occasional pedantries, with very useful results. In several instances he improved the forms in which accepted doctrines were habitually stated. He also did excellent service by pointing out the arbitrary novelties and frequent inconsistencies of terminology which deface Ricardo's principal work—as, for example, his use of "value" in the sense of "cost of production," and of "high" and "low" wages in the sense of a certain proportion of the product as distinguished from an absolute amount, and his peculiar employment of the epithets "fixed" and "circulating" as applied to capital. He shows, too, that in numerous instances the premises assumed by Ricardo are false. Thus he cites the assertions that rent depends on the difference of fertility of the different portions of land in cultivation; that the labourer always receives precisely the necessaries, or what custom leads him to consider the necessaries, of life; that, as wealth and population advance, agricultural labour becomes less and less proportionately productive; and that therefore the share of the produce taken by the landlord and the labourer must constantly increase, whilst that taken by the capitalist must constantly diminish; and he denies the truth of all these propositions. Besides adopting some terms, such as that of "natural agents," from Say, Senior introduced the word "abstinence"—which, though obviously not free from objection, is for some purposes useful—to express the conduct of the capitalist which is remunerated by interest; but in defining "cost of production" as the sum of labour and abstinence necessary to production he does not seem to see that an amount of labour and an amount of abstinence are disparate, and do not admit of reduction to a common quantitative standard. He added some important considerations to what had been said by Smith on the division of labour. He distinguishes usefully between the rate of wages and the price of labour. But in seeking to determine the law of wages he falls into the error of assuming a determinate wage-fund, and states as an economic truth what is only an identical proposition in arithmetic. Whilst entertaining such an exaggerated estimate of the services of Malthus that he extravagantly pronounces him "as a benefactor of mankind on a level with Adam Smith," he yet shows that he modified his opinions on population considerably in the course of his career, regards his statements of the doctrine with which his name is associated as vague and ambiguous, and asserts that, "in the absence of disturbing causes, subsistence may be expected to increase in a greater ratio than population." It is urged by H. X. C. Périn, and must, we think, be admitted, that by his isolation of economics from morals, and his assumption of the desire of wealth as the sole motive-force in the economic domain, Senior, in common with most of the other followers of Smith, tended to set up egoism as the legitimate ruler and guide of practical life. It is no sufficient answer to this charge that he makes formal reserve in favour of higher ends. From the scientific side Cliffe Leslie has abundantly proved the unsubstantial nature of the abstraction implied in the phrase "desire of wealth," and the inadequacy of such a principle for the explanation of economic phenomena. (J. K. I.)

SENLIS, a town of northern France, in the department of Oise, on the right side of the Nonette, a left-hand affluent of the Oise, 34 m. N.N.E. of Paris by the Northern railway on the branch line (Chantilly-Crépy) connecting the Paris-Creil and Paris-Soissons lines. Pop. (1906) 6074. Its antiquity, its historical monuments and its situation in a beautiful valley, in the midst of the three great forests of Hallatte, Chantilly and Ermenonville, render it interesting. Its Gallo-Roman walls, 23 ft. high and 13 ft. thick, are, with those of St Lizier (Ariège) and Bourges, the most perfect in France. They enclose an oval area 1024 ft. long from E. to W. and 794 ft. wide from N. to S. At each of the angles formed by the broken lines of which the circuit of 2756 ft. is composed stands or stood a tower; numbering originally twenty-eight, and now only sixteen, they are semicircular in plan, and up to the height of the wall are unpierced. The Roman city had only two gates; the present number is five. The site of the praetorium was afterwards occupied by a castle occasionally inhabited by the kings of

France from Clovis to Henry IV., and still represented by ruins dating from the 11th, 13th and 16th centuries. In the neighbourhood of Senlis the foundations of a Roman amphitheatre have also been discovered. The old cathedral of Notre Dame (12th, 13th and 16th centuries) was begun in 1155 on a vast scale; but owing to the limited resources of the diocese progress was slow and the transept was finished only under Francis I. The total length is 312 ft. (outside measurement), but the nave (92 ft. high) is shorter than the choir. At the west front there are three doorways and two bell towers. The right-hand tower (256 ft. high) is very striking: it consists, above the belfry stage, of a very slender octagonal drum with open-work turrets and a spire with eight dormer windows. The left-hand tower, altered in the 16th century, is crowned by a balustrade and a sharp roof. In the side portals, especially in the southern, the flamboyant Gothic is displayed in all its delicacy. Externally the choir is extremely simple. In the interior the sacristy pillars with capitals of the 10th century are noteworthy. The episcopal palace, now an archaeological museum, dates from the 13th century; the old collegiate church of St Frambourg was built in the 12th century in the style which became characteristic of the "saintes chapelles" of the 13th and 14th centuries; St Pierre (chiefly of the 15th and 16th centuries) serves as a market. The ecclesiastical college of St Vincent, occupying the old abbey of this name, has an interesting church probably of the 12th century. Its date has, however, been greatly disputed by archaeologists, who sometimes wrongly refer it to Queen Anne of Russia, foundress in the 11th century of the abbey. The town hall (15th century) and several private houses are also of architectural interest.

Senlis has tribunals of first instance and of commerce and a sub-prefecture. The manufacture of bricks and tiles, cardboard, measures and other wares are among the industries. The town is an agricultural market.

Senlis can be traced back to the Gallo-Roman township of the Silvanectes, which afterwards became Augustomagus. Christianity was introduced by St Rieul probably about the close of the 3rd century. During the first two dynasties of France Senlis was a royal residence and generally formed part of the royal domain; it obtained a communal charter in 1173. In the middle ages local manufactures, especially that of cloth, were active. The burgesses took part in the Jacquerie of the 14th century, then sided with the Burgundians and the English; whom, however, they afterwards expelled. The Leaguers were there beaten in 1589 by Henry I., duke of Longueville, and François de La Noue. The bishopric was suppressed at the Revolution, and this suppression was confirmed by the Concordat. Treaties between Louis XI. and Francis II., duke of Brittany (1475), and between Charles VIII. and Maximilian of Austria (1493) were signed at Senlis.

SENNA (Arab. *sanâ*), a popular purgative, consisting of the leaves of two species of *Cassia* (natural order Leguminosae), viz. *C. acutifolia* and *C. angustifolia*. These are small shrubs about 2 ft. high, with numerous lanceolate or narrowly lanceolate leaflets arranged pinnately on a main stalk with no terminal leaflet; the yellow flowers are borne in long-stalked racemes in the leaf-axils, and are succeeded by broad flattish pods about 2 in. long. *C. acutifolia* is a native of many districts of Nubia, *e.g.* Dongola, Berber, Kordofan and Senaar, but is grown also in Timbuctoo and Sokoto. The leaflets are collected twice a year by the natives, the principal crop being gathered in September after the rainy season and a smaller quantity in April. The leaves are dried in the simplest manner by cutting down the shrubs and exposing them on the rocks to the burning sun until quite dry. The leaflets then readily fall off and are packed in large bags made of palm leaves, and holding about a quintal each. These packages are conveyed by camels to Assouan and Darao and thence to Cairo and Alexandria, or by ship by way of Massowah and Suakim. The leaflets form the Alexandrian senna of commerce. Formerly this variety of senna was much adulterated with the leaves of *Solenostemma Argel*, which, however, are readily distinguishable by their minutely wrinkled surface. Of late years Alexandrian senna has been shipped of much better quality. Occasionally a few leaves of a similar species with broader obovate leaves, *C. obovata*, may be found mixed with it. *C. angustifolia* affords the Bombay, East Indian, Arabian or Mecca senna of commerce. This plant grows wild in the neighbourhood of Yemen and Hadramaut in the south of Arabia, in Somaliland, and in Sind and the Punjab in India. The leaves are chiefly shipped from Mocha, Aden, Jeddah and other Red Sea ports to Bombay and thence to Europe, the average imports into Bombay amounting to about 250 tons annually, of which one-half is re-exported. Bombay senna is very inferior in appearance to the Alexandrian, as it frequently contains many brown and decayed leaflets and is mixed with leaf-stalks, &c. *C. angustifolia* is also cultivated in the extreme south of India, and there affords larger leaves, which are known in commerce as Tinnevelly senna. This variety is carefully collected, and consists almost exclusively of leaves of a fine green colour, without any admixture of stalks. It is exported from Tuticorin. American senna is *Cassia marilandica.*

The British Pharmacopoeia recognizes both *Senna Alexandrina* and *Senna Indica*. The composition of the leaves is the same in either case. The chief ingredient is cathartic acid, a sulphur containing glucoside of complex formula. It occurs combined with calcium and magnesium to form soluble salts. That this is the active principle of senna is shown by the fact that the cathartate of ammonia, when given separately, acts in precisely the same manner as senna itself. Cathartic acid can easily be decomposed into glucose and cathartogenic acid. The leaves contain at least two other glucosides, sennapicrin and sennacrol, but as these are insoluble in water, they are not contained in most of the preparations of senna. Senna also contains a little chrysophanic acid.

Of the numerous pharmacopoeial preparations three must be mentioned. The *confectio sennae*, an admirable laxative for children, contains senna, coriander fruit, figs, tamarind, cassia, pulp, prunes, extract of liquorice, sugar and water. When coated with chocolate it is known as Tamar Indien. The *pulvis glycerhizae compositus* contains two parts of senna in twelve, the other ingredients being unimportant. A third preparation, rarely employed nowadays, is the nauseous "black draught," once in high favour. It is known as the *mistura sennae composita*, and contains sulphate of magnesium, liquorice, cardamoms, aromatic spirit of ammonia and infusion of senna. All the preparations are made indifferently from either kind of leaflet.

When taken internally, senna stimulates the muscular coat of the bowel in its entire length, the colon being more particularly affected. As some congestion of the rectum is thereby produced, senna is contra-indicated whenever haemorrhoids are present. The secretions of the bowel are not markedly stimulated, and the flow of bile is only slightly accelerated. The drug has the advantage, for most cases, of not producing subsequent constipation. The chief purgative ingredients are the cathartates already described. Partial absorption occurs, so that the colour of the urine may be darkened, and as the drug is also excreted by the active mamma it may cause purgation in a baby to whose mother it has been given.

Senna should not be used alone, as its taste and the pain induced by its muscular stimulation are both objectionable. There are many ways of using it. A few of the leaflets may be put into a dish of prunes, when a convenient aperient for children is desired. It is especially valuable in cases of atony of the colon, and the compound liquorice powder is safe and useful in the treatment of the constipation of pregnancy.

SENNACHERIB (Ass. *Sin-akhi-erba*, "the Moon-god has increased the brethren"), the son and successor of Sargon, mounted the throne on the 12th of Ab 705 B.C. His first campaign was against Babylonia, where Merodach-baladan had reappeared. The Chaldaean usurper was compelled to fly, and Bel-ibni was appointed king of Babylon in his place. Then Sennacherib marched against the Kassi in the northern mountains of Elam and ravaged the kingdom of Ellip where Ecbatana afterwards stood. In 701 B.C. came a great campaign in the west, which had revolted from Assyrian rule. Sidon and other Phoenician cities were captured, but Tyre held out, while its king Lulia (Elulaeus) fled to Cyprus. Ashdod, Ammon, Moab and Edom now submitted, but Hezekiah of Judah with the dependent Philistine princes of Ashkelon and Ekron defied the Assyrian army, trusting to the fortifications of Jerusalem and Egyptian help. Hezekiah, however, was forced to restore the anti-Jewish Padi to the government of Ekron, from which he had been removed by the Jewish party, and, after the defeat of his Egyptian allies at Eltekeh, to see his country wasted with fire and sword, forty-six fortresses being taken and 200,150 persons carried into captivity. He then endeavoured to buy off the invaders by numerous presents—30 talents of gold, 800 talents of silver, precious stones, couches and thrones inlaid with ivory, girls and eunuchs—but all in vain. Jerusalem was saved eventually by a plague, which decimated the Assyrian army and obliged Sennacherib to return to Nineveh. The following year he was again in Babylonia, where he made his son Assur-nadin-sum king in place of Bel-ibni and drove Merodach-baladan out of the marshes in which he had taken refuge. A few years later he had a fleet of ships built near Birejik on the Euphrates by his Phoenician captives; these were manned by Ionians and transported from Opis overland to the Euphrates and so to the Persian Gulf. Then they sailed to the coast of Elam, and there destroyed the colony of Merodach-baladan's followers at Nagitu. In return for this unprovoked invasion of Elamite territory the Elamites descended upon Babylonia, carried away Assur-nadin-sum (694 B.C.) and made Nergal-yusezib king. Three years later a great battle was fought at Khalulē on the Tigris between the Assyrians on the one side and the Elamites and Babylonians on the other. Both sides claimed the victory, but the advantage remained with Sennacherib, and in 689 B.C. he captured Babylon and razed it to the ground, a deed which excited the horror of all western Asia. Some time previously—the date is not known—he had overrun the mountain districts of Cilicia. On the 20th of Tebet 681 B.C. he was murdered by his two sons, who fled to Armenia after holding Nineveh for forty-two days. Sennacherib was vainglorious and a bad administrator; he built the palace of Kuyunjik at Nineveh, 1500 ft. long by 700 ft. broad, as well as the great wall of the city, 8 m. in circumference.

See George Smith, *History of Sennacherib* (1878). (A. H. S.)

SENNAR, a country of north-east Africa, part of the Anglo-Egyptian Sudan. Its boundaries have varied considerably, but Sennar proper is the triangular-shaped territory between the White and Blue Niles north of 10° N. This region is called by the Arabs "The Island of Sennar" and by the negro inhabitants "Hui." The northern part, where the two Niles approach nearer one another, is also known as El Gezira, *i.e.* "the Island." Whilst Sennar has never been held to extend westward of the White Nile, the term has often been used to embrace "the Island of Meroe," *i.e.* the country between the Blue Nile and the Atbara, and the land between the Blue Nile and its most eastern tributary the Rahad, this latter district being known as the "Isle of Isles." South-east Sennar stretches to the Abyssinian hills. By the Sudan administration this region has been divided into *mudirias* (provinces), one, including the central portion, retaining the name of Sennar. The present article deals with the country as a whole.

In general Sennar is a vast plain, lying for the most part much higher than the river-levels and about 2000 ft. above the sea, its western part, towards the White Nile, being largely wilderness. From the plain rise isolated granitic hills, attaining heights of 1000 to 2000 ft. above the general level. Jebel Segadi is red granite of the finest quality. The plain, sandy in its northern part, is in the south a deep bed of argillaceous marl, scattered over with great granite boulders and fragments of greenstone.

Sennar lies in the region of light rain, increasing in the S.E. districts to as much as 20 in. in the year. The rainy season is from July to September. The climate is generally unhealthy during that period and the months following. The miasmatic exhalations caused by the sun playing on stagnant waters after the floods give rise to the "Sennar fever," which drives even the natives from the plains to the southern uplands. The temperature, which rises at times to over 120° Fahr., is also very changeable, often sinking from 100° during the day to under 60° at night.

The soil, mainly alluvial, is naturally very fertile, and wherever cultivated yields abundant crops, durra being the principal grain grown. Many kinds of vegetables, and cotton, wheat and barley are also grown. The forest vegetation, largely confined to the "Isle of Isles" and the southern uplands, includes the *Adansonia* (baobab), which in the Fazogli district attains gigantic proportions, the tamarind, of which bread is made, the deleb palm, several valuable gum trees (whence the term Sennari often applied in Egypt to gum-arabic), some dyewoods, ebony, ironwood and many varieties of acacia. In these forests are found the two-horned rhinoceros, the elephant, lion, panther, numerous apes and antelopes, while the crocodile and hippopotamus frequent the rivers. The chief domestic animals are the camel, horse, ass, ox, buffalo (used both as a beast of burden and for riding), sheep with a short silky fleece, the goat and the pig, which last here reaches its southernmost limit.

The country is occupied by a partly settled, partly nomad population of an extremely mixed negroid character. There is evidence of the existence of a once dominant fair race, of which the still surviving Sienetjo, a people of a yellow or fair complexion, are regarded as descendants. The great plain of Sennar is mainly occupied by Hassania Arabs in the north, by Abu-Rof (Rufaya) Hamites of Beja stock in the east as far as Fazogli, and elsewhere by the negroid Funj (*q.v.*) and the group of tribes collectively known as Shangalla (the Bertat, Legas, Sienetjo, Gumus, Kadalos, &c.; see SHANGALLA). The chief towns are on the banks of the Blue Nile. They are: Wad Medani (*q.v.*), 148 m. above Khartum, one of the most thriving towns in the eastern Sudan; Sennar, 241 m above Khartum, the capital of the Funj empire and chief town of the *mudiria* of Sennar—of the ancient city little remains except a mosque with a high minaret; and Roseires, 426 m. from Khartum and the limit of navigation up stream from that city. Near the Abyssinian frontier are Fazogli (left bank) and Famaka (right bank) on a navigable stretch of the Blue Nile above the rapids at Roseires and close to the Tumat confluence and the gold district of Beni Shangul. On the river Dinder is the town of Singa. A railway, built in 1909–1910, connects Khartum, Wad Medani and Sennar with Kordofan, the White Nile being bridged near Goz Abu Guma.

History.—Sennar, lying between Nubia and Abyssinia, was in ancient times under Egyptian or Ethiopian influence and its inhabitants appear to have embraced Christianity at an early period. The capital of Aloa, which appears to have been at one time a powerful Christian state, was at Soba on the Blue Nile. In the 7th or 8th centuries A.D. there was a considerable emigration of Arabs into the country. Christianity very gradually died out (see DONGALA, mudiria). The Funj who had meantime settled in Sennar became the dominant race by the 15th century. They adopted the Mahommedan religion and founded an empire which in the 17th and 18th centuries ruled over a large part of the eastern Sudan. This empire was finally overthrown by the Egyptians in 1821. Since that period Sennar has had no history distinct from that of the rest of the Anglo-Egyptian Sudan (see SUDAN, § ANGLO-EGYPTIAN, *History*). The chief ambition of the people under Anglo-Egyptian rule was to own cattle rather than to improve their houses, food or clothing (vide *Egypt*, No. 1, 1910, p. 79).

The country was visited by few Europeans before the time of the Egyptian conquest. In 1699 a French surgeon, J. C. Poncet, passed through Sennar on his way from Egypt to Abyssinia, and an account of his experiences has been published (*Lettres . . . des missions étrangères*, Paris, ed. of 1870, tome iii.). He was followed by Janus de Noir, le sieur du Roule, who was sent by Louis XIV. to open diplomatic relations with Abyssinia, but was murdered (1703) in Sennar. The most noteworthy, however, of the earlier travellers was James Bruce, the explorer of the Blue Nile. He spent some time in Sennar in 1772, and in his *Travels* has left an interesting account of the kingdom in its decadence. Various Egyptian expeditions added considerably to the knowledge of the district, which between 1854 and 1864 was explored by the Belgian scientist E. Pruyssenaere. Later explorers included the Viennese Ernst Marno (1870) and the Dutchman J. M. Schuver, who in 1881–1882 visited the sources of the Tumat. To this list should be added the names of those who, like Sir Samuel Baker, explored the Blue Nile. Since the establishment of the Anglo-Egyptian condominium (1899) the country has been thoroughly surveyed.

Lists of the kings of Sennar, and of the tributary rulers of Halfaya, Shendi, and Fazokl are given in vol. i. pp. 437-438 of A. M. N. J. Stokvis' *Manuel d'histoire* (Leiden, 1888).

SENONES, in ancient geography, a Celtic people of Gallia Celtica, who in Caesar's time inhabited the district which now includes the departments of Seine-et-Marne, Loiret and Yonne. From 53–51 B.C. they were engaged in hostilities with Caesar, brought about by their expulsion of Cavarinus, whom he had appointed their king. In the last-named year a Senonian named Drappes threatened the Provincia, but was captured and starved himself to death. From this time the Gallic Senones disappear from history. In later times they were included in Gallia Lugdunensis. Their chief towns were Agedincum (later Senones, whence Sens), Metiosedum (Melun; according to A. Holder, Meudon), and Vellaunodunum (site uncertain).

See Caesar, *Bell. Gall.* v. 54, vii. 75, viii. 30, 44; T. R. Holmes, *Caesar's Conquest of Gaul* (1899), pp. 482-483, 755-766, 819; A. Holder, *Altceltischer Sprachschatz*, ii. (1904).

More important historically was a branch of the above (called Σένωνες, Senōnes, by Polybius), who about 400 B.C. made their way over the Alps and, having driven out the Umbrians, settled on the east coast of Italy from Ariminum to Ancona, in the so-called *ager Gallicus*, and founded the town of Sena Gallica (Sīnigaglia), which became their capital. In 391 they invaded Etruria and besieged Clusium. The Clusines appealed to Rome, whose intervention, accompanied by a violation of the law of nations, led to war, the defeat of the Romans at the Allia (18th of July 390) and the capture of Rome. For more than 100 years the Senones were engaged in hostilities with the Romans, until they were finally subdued (283) by P. Cornelius Dolabella and driven out of their territory. Nothing more is heard of them in Italy. It is probable that they formed part of the bands of Gauls who spread themselves over the countries by the Danube, Macedonia and Asia Minor. A Roman colony was established at Sena, called Sena Gallica to distinguish it from Sena Julia (Siena) in Etruria.

For ancient authorities see A. Holder as above; on the subjugation of the Senones by the Romans, Mommsen, *Hist. of Rome* (Eng. trans.), bk. ii. ch. vii.

SENS, a town of north-central France, capital of an arrondissement in the department of Yonne, 71 m. S.E. of Paris on the Paris-Lyon-Méditerranée railway. Pop. (1906) 13,701. It is situated on the right bank of, and on an island in, the Yonne just below its confluence with the Vanne. The streets of the town are narrow, but it is surrounded by fine promenades. The cathedral of St Étienne, one of the earliest Gothic buildings in France, is additionally interesting because the architecture of its choir influenced through the architect, William of Sens, that of the choir of Canterbury cathedral. St Étienne was begun in 1140 and only completed early in the 16th century. It belongs mainly to the 12th century, and it is characterized by solidity rather than by beauty of proportion or richness of ornamentation. The west front is pierced by three portals; that in the middle has good sculptures, representing the parable of the virgins and the story of St Stephen. The right-hand portal contains twenty-two remarkable statuettes of the prophets, which have suffered considerable injuries. Above this portal rises the stone tower, decorated with armorial bearings and with statues representing the principal benefactors of the church. The bells in the campanile by which the tower is surmounted enjoyed immense reputation in the middle ages; the two which still remain, La Savinienne and La Potentienne, weigh respectively 15 tons 7 cwt. and 13 tons 13 cwt. The left portal is adorned with two bas-reliefs, Liberality and Avarice, as well as with the story of John the Baptist. The portal on the north side of the cathedral is one of the finest examples of French 16th-century sculpture, that on the south side is surmounted by magnificent stained-glass windows. Other windows of the 12th to the 16th century are preserved, some of them representing the legend of St Thomas of Canterbury. Among the interior adornments are the tomb of the dauphin (son of Louis XV.) and his consort, Marie Josèphe of Saxony, one of the works of William Coustou the younger, and bas-reliefs representing scenes from the life of Cardinal Duprat, chancellor of France and archbishop of Sens from 1525 to 1535. The mausoleum from which they came was destroyed at the Revolution. The treasury, one of the richest in antiquities in France, contains a fragment of the true cross presented by Charlemagne, and the vestments of St Thomas of Canterbury. It was in the cathedral of Sens that St Louis, in 1234, married Marguerite of Provence, and five years later deposited the crown of thorns. To the south of the cathedral are the official buildings, dating from the 13th century, but restored by Viollet-le-Duc. The old judgment-hall and the dungeons had remained intact; in the former is a collection of fragments of sculpture from the cathedral; on the first story is the synod hall, vaulted with stone and lighted by beautiful grisaille windows. A Renaissance structure connects the buildings with the archiepiscopal palace, which also dates from that period. The oldest of the other churches of Sens is St Savinian, the foundation of which dates from the 3rd century; the crypt and other portions of the church are of Romanesque architecture. The museum of Sens contains, among other antiquities, some precious MSS., notably a famous missal with ivory covers, and a collection of sculptured stones mainly derived from the old Roman fortifications, which were themselves constructed from the ruins of public monuments at the beginning of the barbarian invasions. The town has statues of Baron J. J. Thénard, the famous chemist, and of the sculptor Jean Cousin. Sens is the seat of a sub-prefect, and includes among its public institutions a tribunal of first instance, a tribunal of commerce, a chamber of commerce, a council of trade arbitrators and a lycée for boys. Among the industries are flour-milling, tanning and the manufacture of agricultural implements, boots and shoes, chemicals and cutlery; there is trade in wine, grain, wood, coal and wool, in which the port on the Yonne has some share.

Sens, when the capital of the Senones, one of the most powerful peoples of Gaul, bore the name of *Agedincum.* It was not finally subdued by the Romans till after the defeat of Vercingetorix. On the division of Gaul into seventeen provinces under the emperor Valens, *Agedincum* became the metropolis of the 4th Lugdunensis. Theatres, circuses, amphitheatres, triumphal arches and aqueducts were all built in the town by the Romans. It was the meeting-point of six great highways. The inhabitants, converted to Christianity by the martyrs Savinian and Potentian, held out against the Alamanni and the Franks in 356, against the Saracens in 731 or 738, and finally against the Normans in 886—the last having besieged the town for six months. At the beginning of the feudal period Sens was governed by counts, who had become hereditary towards the middle of the 10th century; and the contests of these counts with the archbishops or with their feudal superiors often led to much bloodshed and disaster, until, in 1055, the countship was united to the royal domain. Several councils were held at Sens, notably that of 1140, at which St Bernard and Abelard met. The burgesses in the middle of the 12th century formed themselves into a commune which carried on war against the clergy. This was suppressed by Louis VIII., and restored by Philip Augustus. In the ardour of its Catholicism Sens massacred the Protestants in 1562, and it was one of the first towns to join the League. Henry IV. did not effect his entrance till 1594, and he then deprived the town of its privileges. In 1622 Paris, hitherto suffragan to Sens, was made an archbishopric, and the bishoprics of Chartres, Orleans and Meaux were transferred to the new jurisdiction. In 1791 the archbishopric was reduced to a bishopric of the department of Yonne. Suppressed in 1801, the see was restored in 1817 with the rank of archbishopric. The town was occupied by the Allies in 1814 and by the Germans in 1870–1871.

SENSATIONALISM, in psychology, the theory that all knowledge comes from sensation (see PSYCHOLOGY). Thus Aristippus the Cyrenaic held that there could be no knowledge save that which the senses give, but the Stoics, while finding the origin of knowledge in the senses, do not restrict it to this. Sensationalism in modern times is chiefly associated with Hobbes, Locke, Hume and the French philosophers of the Enlightenment, Voltaire, Condillac and others. In its extreme sense it has rarely been held, and is practically abandoned by modern philosophers on the plain ground that a sensation as such lasts only as long as the stimulus is applied. Any connexion of sensation is something over and above sensation, and without this connexion there can be no knowledge (see EMPIRICISM, PHENOMENON, &c.).

The term has also come into colloquial use for the practice of appealing—*e.g.* in art, literature and especially in journalism—solely to the emotions, disregarding proportion and fact.

SENTENCE (Lat. *sententia*, a way of thinking, opinion, judgment, vote, *sentire*, to feel, think), a word of which the principal meanings now are: (*a*) in grammar, a thought expressed in words in complete grammatical form and composed of subject and predicate, and (*b*) in law, a judicial decision. In law, the term signifies either (1) a judgment of a court of criminal jurisdiction imposing a punishment such as a fine or imprisonment, or (2) a decree of certain competent courts, as ecclesiastical and admiralty courts. In sense (1) a sentence may be either *definite* or *final*, *i.e.* one giving finality to the case, or *interlocutory*, determining some point in the progress of the case (see, however, JUDGMENT). The sentences inflicted by the courts of various countries vary according to the gravity of the offence (see CRIMINAL LAW; also CAPITAL PUNISHMENT; and, for the "indeterminate" sentence, RECIDIVISM). Concurrent sentences are those which run from the same date in respect of convictions on various indictments. A cumulative sentence is the sum total of consecutive sentences passed in respect of each distinct offence of which an accused person has been found guilty on several counts of an indictment. A sentence, in the case of trials before a court of assize, commences to run from the first day of the sitting of the court, but in that of courts of quarter sessions from the time the sentence is pronounced.

SENTINEL, or SENTRY, a guard or watch, a soldier posted at a particular spot to challenge all comers, passing those who give a countersign, and refusing those who do not, and giving alarm in case of attack. The etymology has been the subject of much controversy. The original word seems to be Ital. *sentinella*, adapted as Fr. *sentinelle* (the modern French military term is *factionnaire*, and the Ger. *Fachmann*). For the Italian word the source has been suggested in *sentire*, to perceive, but there are philological objections to this, and more plausibility attaches to a connexion with *sentina*, the bilge-water in a ship, figuratively rabble, camp-followers. If an Italian origin, as agreed on by most authorities, be set aside, the French word suggests a more appropriate formation as the diminutive of *sentier*, path, Lat. *semita*, meaning properly the sentry's beat. The O. Fr. *senteret* (a form of *sentier*) would account for the English form "sentry."

SENTINUM, an ancient town of Umbria, Italy, lying to the S. of the modern town of Sassoferrato, in the low ground. The foundations of the city walls are preserved, and a road and remains of houses have been discovered, including several mosaic pavements (T. Buccolini in *Notizie degli scavi*, 1890, 346) and inscriptions of the latter half of the 3rd century A.D., including three important *tabulae patronatus*. In the neighbourhood the battle took place in which the Romans defeated the combined forces of the Samnites and Gauls in 295 B.C. It was taken and destroyed in 41 B.C. by the troops of Octavian, but continued to exist under the Empire. It was, however, only a *municipium*, never (as some wrongly suppose) a *colonia*. Sassoferrato gave its name to Giambattista Salvi, surnamed Sassoferrato (1605–1685), a painter celebrated for his Madonnas.

SENUSSI [SANUSI] and **SENUSSITES,** the names respectively of a Moslem family (and especially its chief member) and of the fraternity or sect recognizing the authority of the Senussi. Considerable diversity of opinion has prevailed among writers and travellers claiming knowledge of the *Senussia*; it is possible, however, to distinguish the main facts in the lives of the Senussi sheiks and to indicate the range of their direct political influence. The extent of their spiritual influence, the ramifications of the fraternity and the aims of its chiefs cannot be gauged so accurately.

Seyyid or Sidi (*i.e.* Lord) Mahommed ben Ali ben Es Senussi el Khettabi el Hassani el Idrissi el Mehajiri, the founder of the order, commonly called the Sheik es Senussi, was born near Mostaganem, Algeria, and was called es Senussi after a much venerated saint whose tomb is near Tlemçen. The date of his birth is given variously as 1791, 1792, 1796 and 1803. He was a member of the Walad Sidi Abdalla tribe of Arabs and his descent is traced from Fatima, the daughter of Mahomet. As a young man he spent several years at Fez, where he studied theology. When about thirty years old he left Morocco and travelled in the Saharan regions of Algeria preaching a reform of the faith. From Algeria he went to Tunisia and Tripoli, gaining many adherents, and thence to Cairo, where he was opposed by the Ulema of El Azhar, who considered him unorthodox. Leaving Egypt Senussi went to Mecca, where he joined Mahommed b. Idris el Fassi, the head of the Khadirites, a fraternity of Moroccan origin. On the death of el Fassi Senussi became head of one of the two branches into which the Khadirites divided, and in 1835 he founded his first monastery at Abu Kobeis near Mecca. While in Arabia Senussi visited the Wahhabites, and his connexion with that body caused him to be looked upon with suspicion by the Ulema of Mecca. It was at Mecca, however, that Senussi gained his most powerful supporter, Mahommed Sherif, a prince of Wadai, who became in 1838 sultan of his native state, the most powerful Mahommedan kingdom in the Central Sudan. Finding the opposition to him at Mecca too powerful Senussi quitted that city in 1843 and settled in the Cyrenaica, where in the mountains near Derna he built the Zawia Baida or White Monastery. There he was in close touch with all the Maghribin, gaining many followers among the Tripolitans and Moroccans. He also maintained a close correspondence with the sultan of Wadai, who greatly favoured the spread of the *Senussia* in his state. The sultan of Turkey viewed with some disfavour the growth of Senussi's influence as likely to become detrimental to his own position as the Khalifa of Islam. Probably with the desire to be independent of pressure from the Turks, Senussi removed in 1855 to Jarabub (Jaghbub), a small oasis some 30 m. N.W. of Siwa. Here he died in 1859 or 1860, leaving two sons, one Mahommed Sherif (named after the sultan of Wadai), born in 1844, and the other, El Mahdi, born in 1845. To the second son was left the succession. It is related that as the younger son showed a spirit in all things superior to that of his brother the father decided to put them to the test. Before the whole *zawia* at Jarabub he bade both sons climb a tall palm tree and then adjured them by Allah and His Prophet to leap to the ground. The younger lad leapt at once and reached the ground unharmed; the elder boy refused to spring. To El Mahdi, "who feared not to commit himself to the will of God," passed the birthright of Mahommed Sherif. Mahommed appears to have accepted the situation without complaint. He held the chief administrative position in the fraternity under his brother until his death in 1895.

Foundation of the order.

Senussi el Mahdi, only fourteen when his father died, was at first under the guidance of his father's friends Amran, Reefi and others. He enjoyed all his father's reputation for holiness and wisdom, attributes consistent with all that is known of his life. Mahommed Sherif, the sultan of Wadai, had died in 1858, but his successors the Sultan Ali (who reigned until 1874) and the Sultan Yusef (reigned from 1874 to 1898) were equally devoted to the *Senussia*. Under the Senussi el Mahdi the *zawias* of the order extended from Fez to Damascus, to Constantinople and to India. In the Hejaz members of the order were numerous. In most of these countries the Senussites occupied a position in no respect more powerful than that of numbers of other Moslem fraternities. In the eastern Sahara and in the central Sudan the position was different. From the western borders of Egypt south to Darfur, Wadai and Bornu, east to Bilma and Murzuk, and north to the coast lands of Tripoli, Senussi became the most powerful sheik, acquiring the authority of a territorial sovereign. The string of oases leading from Siwa to Wadai—Kufra, Borku, &c.—were occupied and cultivated by the Senussites, trade with Tripoli and Benghazi was encouraged, law and order were maintained among the savage Bedouin of the desert. But the eastern Sahara, though vast (covering approximately about 500,000 sq. m.), is among the most desolate and thinly populated parts of the world, and of more importance to the order was the dominating influence possessed by the sheik at the court of Wadai.

Senussi el Mahdi.

Although named El Mahdi by his father there is no evidence to show that the younger Senussi ever claimed to be *the* Mahdi, though so regarded by some of his followers. When, however, Mahommed Ahmed, the Dongalese, rose against the Egyptians in the eastern Sudan and proclaimed himself *the* Mahdi, Senussi was disquieted. He sent an emissary via Wadai to Mahommed

Ahmed, this delegate reaching the Mahdi's camp in 1883 soon after the sack of El Obeid.

"The moral and industrial training of the Senussi" [delegate], writes Sir Reginald Wingate, "revolted from the slaughter and rapine he saw around him. The sincere conviction of the regeneration of the world by a mahdi whose earnest piety should influence others to lead wholesome and temperate lives, the dignity of honest labour and self-restraint, these were the sentiments which filled the mind of the emissary from Wadai."

The sheik Senussi, there is reason to believe, shared the lofty views which Wingate attributes to his agent. He decided to have nothing to do with the Sudanese Mahdi, though Mahommed Ahmed wrote twice asking him to become one of his four great khalifs. In his second letter, the text of which has been preserved, the Mahdi urged Senussi either to attack Egypt or to join him in the Sudan. To neither letter did Senussi reply, and he warned the people of Wadai, Bornu and neighbouring states against the new creed. In 1890 the Mahdists advancing from Darfur were stopped on the frontier of Wadai, the sultan Yusef being firm in his adherence to the Senussi teaching. As evidence of the influence of the sheik may be instanced the appeal made to him in 1888 by the sultan of Borku (or Borgo), a state to the north of Wadai, when invited by the chiefs of Darfur to rise against the khalifa Abdullah. Senussi advised Borku to abstain from Sudan affairs and only to fight against the Mahdists should they attack his kingdom. The Darfurian revolt of 1888–1889 against the khalifa was nevertheless carried out in the name of the Senussi.

The growing fame of the sheik Senussi el Mahdi drew upon him the unwelcome attention of the Turks. In many parts of Tripoli and in Benghazi the power of the sheik was greater than that of the Ottoman governors, and though Abdul Hamid II. looked favourably on an organization which might become actively anti-Christian, he did not desire that a new mahdi should arise to dispute his authority. In 1889 the sheik Senussi was visited at Jarabub by the pasha of Benghazi at the head of some troops. This event showed the sheik the possibility of danger and led him (in 1894) to leave Jarabub and fix his headquarters at Jof in the oases of Kufra, a place sufficiently remote to secure him from any chance of sudden attack. By this time a new danger to Senussia had arisen; the French were advancing from the Congo towards the western and southern borders of Wadai. In 1898 Senussi, in his character of peacemaker, wishing also to range together all the states menaced by the French advance, sought to reconcile Rabah Zobeir (*q.v.*) and the sultan of Bagirmi; neither of those chieftains belonged to the Senussi order and the sheik's appeal was unavailing. At the end of the previous year, at the request of Sultan Yusef, the sheik had sent an envoy to Wadai to be his permanent representative in that country. Yusef's successor Ibrahim, who ascended the throne of Wadai in 1898, showed signs of resenting the advice of the sheik, stirred perhaps by the overthrow of the khalifa Abdullah at Omdurman. Senussi retaliated, says Captain Julien in his history of Wadai, by prohibiting the people of Wadai from smoking tobacco or drinking merissa, the native beer, "which is to the Wadaiin what the skin is to the body." Sultan Ibrahim rejoined that his people would fight and die for merissa; rather than give it up they would renounce Senussiism. The sheik had the wisdom to give way, declaring that in response to his prayers Allah had deigned to make an exception in favour of the faithful Wadaiins. Ibrahim died in 1900 and his successors fell again under the influence of the sheik, who again changed his headquarters, leaving Kufra for Geru, in Dar Gorane, a western province of Wadai, where he was welcomed with veneration. He built and strongly fortified a *zawia* on the top of a rocky hill, difficult of access. His object in taking up this position was, presumably, to prevent the advance of the French. But, as Julien points out, Senussi was too late; Rabah had been slain by the French (April 1900), and Bagirmi was occupied by them. Nevertheless the sheik made an effort to prevent the French obtaining possession of Kanem, a country north-east of Lake Chad and on its northern and eastern frontiers bordering Saharan territory, which the Senussites considered their particular preserve. A *zawia* was built at Bir Allali, in Kanem, that site being chosen as it was an entrepôt for the trade of Tripoli with all the Chad countries. Bir Allali was strongly garrisoned by the Senussites and war with the French followed.[1] After a severe engagement Bir Allali was captured by a French column under Commandant Tétard in January 1902. The sheik Senussi, much affected by the loss of Kanem, died shortly afterwards (May 30, 1902). He was succeeded by his nephew Ahmed-el-Sherif, who in view of the presence of the French on the borders of Dar Gorane removed to Kufra.

Conflict with the French.

The new head of the Senussites maintained the friendly relations of his predecessors with Wadai, and, following the example of his uncle, made advances to Ali Dinar, the sultan of Darfur, which were not reciprocated. To keep in touch with Darfur a *zawia* had been built on the caravan route from Kufra to that country. The adherents of the Senussi el Mahdi in the deserts bordering Egypt maintained for years that he was not dead, and in March 1906 a public declaration was made at Siwa that "Sidi Mahommed-el-Mahdi had returned from his secret journey to Kufra." Commenting on this announcement Sir R. Wingate wrote: "It is well known that the body of the late sheik lies in a tent at Zawia-el-Taj in the identical shrine which was made for it at Geru when he died" (Egypt No. 1 (1907), p. 120).

The power of the Senussites.

It will be seen that the Senussites occupy desert fastnesses which could only be attacked by Europeans after overcoming great difficulties. By Henri Duveyrier and other writers of the last half of the 19th century they were regarded as likely to proclaim a *jihad* or holy war against the Christians of North Africa. This view was founded upon the supposed tenets of the order and upon geographical and political considerations. The record of the first and second Senussi sheiks shows them, however, to have acted chiefly on the defensive. A study of all available data up to 1906 led M. L. G. Binger, one of the greatest authorities, to the conclusion that the politics of the sect were subordinated to the material interests of their chief, and that the Senussi sheik was as unable as were other noted Moslem leaders (such as Abd el Kader in Algeria; Samory in the western Sudan and the Dongolese Mahdi in the Egyptian Sudan) to overcome the rivalries and divergence of interests of their own co-religionists. This view received confirmation in the events of 1906–1910 when the French came in conflict with the sultanate of Wadai. Although there was severe fighting the French found less difficulty than had been expected in seizing the capital of Wadai, nor was there any general movement of the Senussites against them. The French also sent flying columns into Borku and Enndi. The comparative ease with which these operations were carried out seemed to demonstrate the weakness of the Senussites (see WADAI). Nevertheless, like any other Moslem fraternity, and perhaps more readily, the Senussites might be speedily transformed into a powerful fighting organization. Through the seaports of Tripoli and Benghazi, with the connivance (or in defiance) of the Turks, the importation of arms and ammunition into the eastern Sahara is a matter of little or no difficulty, and the Bedouin of that region could furnish a numerous and well-armed fighting force. A Senussi sheik would also recruit many followers in the central Sudan. At the same time the Senussi organization is not so widespread in the Sudan and the western Sahara as would appear from the exaggerated reports once current. The Senussi sheiks, with the doubtful exception of Darfur, are without followers in the Anglo-Egyptian Sudan. Bagirmi, Kanem and other states once dependent on Wadai did not embrace Senussiism. In the Hausa States and in the greater part of the western Sudan as far as Timbuktu the Moslems acknowledge the spiritual headship of the emir of Sokoto, whose influence is believed to be sufficiently strong to prevent the spread of Senussiism among his followers. The general attitude of the Mahommedans in the western Sudan towards the Senussi emissaries was described by European observers in 1907 as one of good-natured tolerance. They are occasionally allowed to preach, but apparently with little effect. In Bornu, which does not acknowledge the spiritual supremacy of Sokoto, the Senussi propaganda meets with less opposition, but the adherents of the order are not numerous. Here and there in the western Sahara are tribes professing Senussiism, but they are regarded as unimportant.

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[1] In the accounts of the fighting in French equatorial Africa at this period it is necessary to distinguish between the sheik Senussi el Mahdi and the sultan Mahommed el Senussi (b. *c.* 1850) of N'Delé, a prince who had married the sister of Rabah Zobeir. Senussi of N'Delé became an ally of the French. The state of N'Delé lies S. of Wadai and is cut by 9° N., and 20° E. (See Karl Kumm in *Geog. Jour.*, Aug. 1910.)

Tenets.

It should, however, be remembered that while other dervish fraternities are mystical and latitudinarian in theology, and only sporadically meddle in politics, the Senussites have exercised a continuous political influence and have sought to revive the faith and usages of the early days of Islam. The order is in a sense an outcome of the Wahhabite movement, but, as gathered from the writings of Mahommed el Hechaish, a Tunisian sheik, and other trustworthy sources, appears to be neither mystical nor puritan. There is less of secrecy about their rites than is usual in Moslem fraternities. The use of tobacco and coffee is forbidden, but the drinking of tea is encouraged, and the wearing of fine clothes is allowed. While they profess to belong to the Malikite rite (one of the four orthodox sects of Islam), the Senussites are charged by the Ulema of Cairo with many deviations from the true faith; chiefly they are accused of interpreting the Koran and Sunna without consulting one of the recognized glosses. Thus the Egyptian theologians regard the Senussites as inaugurating a new rite rather than forming a simple fraternity; in this, if not in puritanism, resembling the Wahhabites. Their great work in the eastern Sahara, apart from proselytism, has been colonization and the encouragement of trade. Wells have been dug and oases cultivated, rest houses built along caravan routes, merchants from Tripoli, Bornu, Wadai and Darfur welcomed. Such at least is the report of Mahommedan writers and of French and British political agents; very few Europeans have had opportunities of making personal observations. Gustav Nachtigal was in Wadai in 1873, Gerhard Rholfs traversed the Cyrenaica and visited Kufra in 1879; but in general the Senussi, supported by the Turks at Tripoli, have closed the regions under their control to Europeans. At the oasis of Siwa (Jupiter Ammon), however, they are in contact with the Egyptian administration. Siwa was visited by Silva White in 1898 and by Freiherr von Grünau in 1899. The last-named reports that he found the representative of Sheik Senussi living in perfect agreement with the Egyptian authorities, the inhabitants of the oasis being divided into two sections, known respectively as the Mussulmans and the Senussites, a distinction which goes to show the special position occupied by the Senussites in Islam.

The missionary zeal of the Senussites is undoubted. Outside the regions adjacent to their headquarters they appear to be most strongly represented in Arabia. In the eastern Sahara and Wadai practically all the population are Senussites; the order in other countries draws its adherents from a higher social rank than the generality of Moslem secret societies. Its chief agents are personages of wealth and importance and highly educated in Oriental lore. They are in general on good terms with the rulers of the countries in which they live, as instanced in 1902 by the conferment of the Legion of Honour on the head of the *zawia* at Hillil in Algeria. These agents make regular tours to the various *zawias* placed under their charge, and expound the Senussi doctrines at the Moslem universities. From all that has been said it is apparent that the Senussi sheik controls a very powerful organization, an organization probably unique in the Moslem world.

Bibliography.—L. Rinn, *Marabouts et Khouan*, a good historical account up to the year 1884; O. Depont and X. Coppolani, *Les Confréries religieuses musulmanes* (Algiers, 1897), an authoritative work; Si Mohammed el Hechaish, "Chez les Senoussia et les Touareg," in *L'Expansion col. française* for 1900 and the *Revue de Paris* for 1901. These are translations from the Arabic of an educated Mahommedan who visited the chief Senussite centres. An obituary notice of Senussi el Mahdi by the same writer appeared in the Arab journal *El Hadira* of Tunis, Sept. 2, 1902; a condensation of this article appears in the *Bull. du Com. de l'Afr. française* for 1902; "Les Senoussia," an anonymous contribution to the April supplement of the same volume, is a judicious summary of events, a short bibliography being added; Capt. Julien, in "Le Dar Ouadai" published in the same *Bulletin* (vol. for 1904), traces the connexion between Wadai and the Senussi; L. G. Binger, in "Le Péril de l'Islam" in the 1906 volume of the *Bulletin*, discusses the position and prospects of the Senussite and other Islamic sects in North Africa. Von Grunau, in *Verhandl. ges. f. Erdk.* for 1899, gives an account of his visit to Siwa. Sir F. R. Wingate, in *Mahdiism and the Egyptian Sudan* (London, 1891), narrates the efforts made by the Mahdi Mahommed Ahmed to obtain the support of the Senussi; Sir W. Wallace, in his report to the Colonial Office on Northern Nigeria for 1906–1907, deals with Senussiism in that country. Consult also H. Duveyrier, *La Confrérie musulmane de Sidi Mohammed ben Ali es Senoûssi* (Paris, 1884), a book containing much exaggeration, and A. Silva White, *From Sphinx to Oracle* (London, 1898), which, while repeating the extreme views of Duveyrier, contains useful information.

The present writer, in endeavouring to arrive at a just conclusion on an obscure and much controverted subject, is indebted, in addition to the above, to the article by D. A. Cameron in the 10th ed. of this encyclopaedia, and to communications from Prof. D. B. Macdonald. (F. R. C.)

SEONI, a town and district of British India, in the Jubbulpore division of the Central Provinces. The town is 2043 ft. above sea-level, half-way on the road between Nagpur and Jubbulpore. Pop. (1901) 11,864. It was founded in 1774, and contains large public gardens, a fine market place and a handsome tank.

The District of Seoni forms part of the Satpura tableland, containing the headwaters of the Wainganga. It is largely covered with forest, and 40% of the inhabitants belong to aboriginal tribes. Area 3206 sq. m. The district is remarkable for the beauty of its scenery and the fertility of its valleys. The northern and western portions include the plateaus of Lakhnādon and Seoni; the eastern section consists of the watershed and elevated basin of the Wainganga; and in the south-west is a narrow strip of rocky land known as Dongartāl. The plateaus of Seoni and Lakhnādon vary in height from 1800 to 2000 ft.; they are well cultivated and clear of jungle, and their temperature is always moderate and healthy. Geologically the north part of Seoni consists of trap hills and the south of crystalline rock. The soil of the plateaus is the rich black cotton soil formed by distintegrated trap, of which about two-thirds of the district are said to consist; but towards the south, where cliffs of gneiss and other primitive formations occur, the soil is silicious and contains a large proportion of clay. The chief river is the Wainganga, with its affluents the Hirī, Sāgar, Thelī, Bijnā and Thānwar; other streams are the Tīmar and the Sher, tributaries of the Nerbudda. The annual rainfall averages 53 in. The population in 1901 was 327,709, showing a decrease of 12% in the decade due to the effects of famine. The principal crops are wheat, millets, rice, pulse, oil-seeds and cotton. Three lines of the Bengal-Nagpur system traverse the district.

There is also a town called Seoni, or Seoni-Malwa, in the Central Provinces, a railway station in Hoshangabad district. Pop. (1901) 7531.

See R. A. Sterndale, *Seonee*, or Camp Life on the Satpura Range (1877); *Seoni District Gazetteer* (Allahabad, 1907).

SEOUL (*Han-yang*), the capital of Korea (Chosen), situated in 37° 34′ N. and 127° 6′ E., at an altitude of 120 ft., 25 m. from Chemulpo, its seaport, and 4 from Mapu, its river-port. Pop. about 200,000. It lies in a basin among granite hills, nowhere exceeding 2627 ft., remarkable for their denudation and their abrupt black crags and pinnacles. A well-built, crenelated stone wall from 20 to 30 ft. high, about 11 m. in circuit, and pierced by 8 gateways with double-roofed gate towers, surrounds it. The native houses are built of stone or mud, deeply eaved, and either tiled or thatched. Above these rise the towers of the Roman Catholic cathedral, the high curved roofs of the royal audience halls, the palace gateways, and the showy buildings of the Russian and French legations. The antiquities are the Bell Tower, with a huge bronze bell dated 1468, a marble pagoda elaborately carved, but not of Korean workmanship, seven centuries old, and a "Turtle-Stone" of about the same date.

Seoul has some wide streets of shops, hundreds of narrow alleys, and is very fairly clean. It has an electric tramway 4 m. long, and is the centre of the railway system of the country.

SEPIA (Gr. σηπία, cuttlefish), a deep brown pigment obtained from the ink-sacs of various species of cuttlefish (*q.v.*). To obtain sepia the ink-sac, immediately on the capture of the animal, is extracted from the body and speedily dried to prevent putrefaction. The contents are subsequently powdered, dissolved in caustic alkali, and precipitated from the solution by neutralizing with acid. The precipitate after washing with water is ready to make up into any form required for use.

Sepia-bone or *cuttle-bone* consists of the internal "shell" or skeleton of *Sepia officinalis* and other allied species. It is an oblong convex structure from 4 to 10 in. in length and 1 to 3 in. in greatest width, consisting internally of a highly porous cellular mass of calcium carbonate with some animal matters covered by a hard thin glassy layer. It is used principally as a polishing material and for tooth powder, and also as a moulding material for fine castings in precious metals.

SEPOY, the usual English spelling of *sipāhī*, the Persian and Urdū term for a soldier of any kind, cf. *spahi*. The word *sipāh*, "army," from which *sipāhī*, "soldier," is derived, corresponds to the Zend *çpādha*, Old Persian *çpāda*, and has also found a home in the Turkish, Kurdish and Pashto (Pushtu) languages (see Justi, *Handbuch der Zendsprache*, p. 303, 6), while its derivative is used in all Indian vernaculars, including Tamil and Burmese, to denote a native soldier, in contradistinction to *gorā*, "a fair-complexioned (European) soldier." A sepoy is at the present day strictly a private soldier in the native infantry of the Indian army.

SEPPINGS, SIR ROBERT (1767–1840), English naval architect, was born at Fakenham, Norfolk, in 1767, and in 1782 was apprenticed in Plymouth dockyard. In 1800, when he had risen to be master shipwright assistant in the yard, he invented a device which, as compared with the laborious process of lifting then in vogue, greatly reduced the time required for effecting repairs to the lower portions of ships in dry dock. His plan was to make the keel of the ship rest upon a series of supports placed on the floor of the dock and each consisting of three parts—two being wedges arranged one on each side of the keel at right angles to it, with their thin ends together, while the third was a vertical wedge fitting in and supported by the lower pair. The result was that it became possible in a comparatively short time to remove these supporting structures by knocking out the side wedges, when the workmen gained free access to the whole of the keel, the vessel remaining suspended by the shores. For this invention Seppings received £1000 from the Admiralty, and in 1804 was promoted to be a master shipwright at Chatham. There, in spite of the repugnance to innovation displayed by the naval authorities of that period, he was able to introduce important improvements in the methods of ship-construction. In particular he increased the longitudinal strength of the vessels by a system of diagonal bracing, and modified the design of the bows and stern, so that they became stronger, not only offering better protection than the old forms to the crews against the enemy's fire, but also permitting a powerful armament to be fitted. Seppings, who received a knighthood in 1819, was appointed surveyor of the navy in 1813, and held that office till his retirement in 1832. He died at Taunton on the 25th of September 1840.

SEPSIS (Gr. σῆψις, putrefaction), or Septic Infection, a term applied in medicine and surgery to indicate the resultant infection of a wound or sore by micro-organisms or by their products. Under this general heading come three great constitutional diseases, differing radically from each other in their aetiology and pathology: *sapraemia*, *septicaemia* and *pyaemia*.

Sapraemia (Gr. σαπρός, rotten, αἷμα, blood), or septic intoxication, is the result of the absorption of a dose of the toxins produced by micro-organisms from some area of infection without the entrance of the micro-organisms themselves into the blood. This condition was for a long time confounded with septicaemia, but is distinguished from it in being a chemical intoxication. The blood in sapraemia if injected into an animal is incapable of reproducing the disease as in septicaemia. Any condition in which there is a mass of decomposing tissue in the neighbourhood of an unhealed wound may give rise to sapraemia. In surgical practice it may be met with in large, deep and badly-drained wounds where a quantity of putrifying material is pent up. When it arises in connexion with wounds accidentally received, it may be unavoidably due to the dirty state of the skin or to foreign bodies entering the wound. Absorption of toxins is notably frequent in portions of decomposing placental tissue which may accidentally have remained behind in the uterus after childbirth, and may give rise to puerperal sapraemia. Sapraemia is acute or subacute directly according to the amount of toxin absorbed. By some writers it is divided as follows: (1) Hectic fever is a chronic blood poisoning with continual absorption of small doses of the toxins. This variety usually arises in long-continued suppuration of bones and joints, and in decomposition occurring in a pulmonary cavity. The marked symptom is a sharp rise of temperature in the evenings; the face becomes flushed and the pulse rapid. After profuse sweating the temperature drops. Diarrhoea and wasting are a usual accompaniment. (2) Septic traumatic fever is a slight form which may follow burns or compound fractures and which tends to subside in a few days. (3) In acute septic intoxication large amounts of the poison are absorbed. It generally starts with a severe rigor followed by a continuous high temperature, dry tongue, rapid pulse and severe headache, together with nausea and vomiting, and in the later stages diarrhoea. If the case be a severe one rapid prostration speedily comes on with low muttering delirium, the temperature may fall to subnormal, and a gradually deepening coma may end in death; other cases pass into a typically "typhoid state," death occurring from exhaustion at the end of about a week. (4) Amyloid (Gr. ἄμυλον, starch, εἶδος, form), or lardaceous disease, usually of the liver, spleen, kidneys or other organs, is one of the results of long-continued septic intoxication. A substance derived from the breaking down of pus and tissue cells is carried in the blood and deposited in the connective tissue of the coats of the smaller arteries, and the viscera become infiltrated with a material looking like lard. The liver and spleen, being the organs most usually affected, become immensely enlarged.

No form of septic infection yields so easily to treatment as sapraemia. The prompt removal of the cause of septic absorption, the flushing out of the wound with weak antiseptic solutions, in order to mechanically remove any decomposing masses, and the establishment of proper drainage in deep wounds, is usually followed by a fall in temperature and an improvement in the general condition. A strong, preferably mercurial, purgative should be given to aid in the elimination of toxic material. For the same purpose the injection into the veins or into the cellular tissue of large quantities of normal saline solution is useful. Heart depression should be overcome by diffusible stimulants and hypodermic injections of strychnine. When the wound has become "surgically clean" recovery is usually rapid.

Septicaemia is an acute infective disease differing from sapraemia in that the micro-organisms themselves are absorbed, entering the general circulation, and may on examination be found in greater or lesser number in the blood-stream itself. The organism or organisms grow and reproduce themselves in the blood or tissues. A number of different organisms have been isolated from the blood-stream in cases of septicaemia. The most frequently found is the *Streptococcus pyogenes*, which is present in 50% of the cases and is common in puerperal septicaemia and in ulcerative endocarditis. The *Staphylococcus pyogenes aureus et albus* is also a frequent cause, but sometimes septicaemia may be due to other pathogenic microbes such as the *Pneumococcus*, the *Bacillus coli communis*, *Bacillus pyocyaneus*, *Bacillus oedematis maligni* and the *Gonococcus*. The micro-organisms are conveyed by the blood-stream to different parts of the body, in which as in the original wound itself they both multiply and set up factories for the production of toxins. The disease commonly follows blows or wounds which have not been treated on surgical lines. Much laceration of the tissues at the time of the injury offers increased liability to infection. Septicaemia is frequent in spreading gangrene, in diseases of the periosteum, and in fevers such as scarlatina, diphtheria or plague, and in the puerperal state. The period of incubation may be from a few hours to several days. The condition of the wound or site of injury shows marked changes. In severe cases following a prick received in conducting a post-mortem the finger in a few hours becomes greatly swollen and painful, the pain spreading up the lymphatic vessels to the nearest lymphatic glands, which may become enlarged, and sloughing or gangrene of the parts involved may take place. In milder cases the wound remains with reddened and oedematous margins in a more or less unhealthy state. In mild cases of septicaemia the local condition of the wound, high temperature and feeling of illness are the distinguishing features. The treatment of septicaemia may be preventive or active. The preventive side consists in the performance of operations with all due aseptic precautions. Since the days when I. P. Semmelweiss (*q.v.*) of Vienna insisted on cleanliness in his maternity wards, the death-rate of puerperal septicaemia has been enormously reduced. In the British registrar-general's returns for 1868 it was stated that in twenty-two years no less than 23,689 women in England and Wales had died of puerperal septic diseases. In the reports of the Rotunda Hospital, Dublin, the largest maternity hospital in the United Kingdom, we ascertain that of 30,023 women delivered during the ten years 1894–1903 there was only a mortality of 21 due to sepsis, a ratio of 0·066%, while the registrar-general's returns for England and Ireland for the period have a ratio for sepsis of 0·216%. When dealing with a wound that is already septic, free incision and swabbing the surface with pure carbolic acid may have to be resorted to, and constitutional treatment must be undertaken at once. Should the infection be due to a *Streptococcus*, an antistreptococcic serum may be injected. There are, however, many strains of *Streptococci*, and a polyvalent serum may give good results. Menzer's antistreptococcic serum has been successful in puerperal septicaemia not of gonococcic origin. Many cases have also now been recorded in which the systemic infection is combated by means of an autogenous vaccine. The first case was described by Sir James Barr before the Liverpool Medical Institute in May 1906. In urgent cases, where time will not allow of the manufacture of a vaccine, quinine in large doses, stimulants and liquid nourishment must be given, and the temperature controlled by tepid sponging.

Pyaemia (Gr. *πύον*, pus, *αἷμα*, blood), which got its name from an erroneous idea that the pus passed into the blood, is now understood to mean an acute disease with the formation of metastatic abscesses. The first definite account of the disease was published by Boerhaave in 1720. Virchow in 1846 pointed out that it was not pus in the veins, but altered blood-clot. Jean D'Arcet showed the separate processes of poisoning by products of decomposition and the blocking of the veins with emboli. Any pyogenic organism may give rise to pyaemia, or it may follow any acute abscess. The cause of pyaemia may be said to be any condition favouring the formation of emboli. An occasional cause of pyaemia is infective endocarditis, while puerperal pyaemia may arise from infection of the genital tract. When the emboli lodge in the lung there is a breaking down of the tissue in front of the embolus, a haemorrhagic infarct being formed. The clinical symptoms of acute pyaemia generally start with a rigor repeated at periodic intervals; the skin becomes hot and the patient soon develops an earthy colour, the pulse becomes frequent and weak and the tongue dry. In about a week secondary abscesses appear, most frequently in the region of joints. There may be little or no pain to herald the formation of an abscess, but usually there is intense pain followed by suppuration. Unless early treatment is undertaken the joint may be rapidly destroyed. In acute cases multiple abscesses in the kidney may give rise to pain and albuminuria, abscesses in the lungs to dyspnoea, while acute peritonitis may arise from rupture of a splenic abscess into the peritoneal cavity, and sudden blindness be the result of the plugging of the arteria centralis retinae. The duration of a case of pyaemia depends on the severity of the infection. Death may occur from the formation of abscesses in vital organs such as the brain and heart, or from exhaustion from continued suppuration, or chronic forms may after months pass on to complete recovery. Unfortunately pyaemia cannot be recognized apart from other blood infections until abscesses begin to form. The local treatment is to endeavour to prevent the detachment of infected emboli and the infection of the general blood-stream thereby. An infected limb may be dealt with by amputation above the seat of the lesion, or it may be feasible to dissect out the infected veins. When abscesses have formed they must be dealt with by opening and washing out the cavities. Antistreptococcic serum may be tried, as in septicaemia; and if there be time to prepare a vaccine it offers the best prospects, more particularly in the subacute and chronic forms of pyaemia. The usual administration of nourishing diet and stimulants when required should be undertaken, and every effort made to keep up the patient's strength.

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SEPT, a clan, the term generally applied to the tribes or families of Ireland, used also sometimes as by Sir H. Maine (*Early History of Institutions*, 231) of the Indian joint undivided family, the "combined descendants of an ancestor long since dead." Wedgewood (*Dict. of Eng. Etym.*), quoted by Skeat, takes the word as a corruption of "sect" (*q.v.*), and cites from the State Papers of 1536 and 1537, where *secte* and *septe* are used respectively. If so, the word must have been influenced by Lat. *saeptum*, fence or enclosure (*saepire*, to enclose, *saepes*, hedge), a word which has been adopted as "septum" into scientific terminology for any partition or wall dividing two cavities—*e.g.* in anatomy, of the partition between the nostrils, *septum naris*, or that between the right and left ventricles of the heart, *septum cordis*.

SEPTEMBER (Lat. *septem*, seven), the seventh month of the old Roman year, in which it had thirty days assigned to it. In the Julian calendar, while retaining its former name and number of days, it became the ninth month. The Ludi Magni (Ludi Romani) in honour of Jupiter, Juno and Minerva began on the 4th of September. The principal ecclesiastical feasts falling within the month are: the Nativity of the Blessed Virgin on the 8th, the Exaltation of the Holy Cross on the 14th, St Matthew the apostle on the 21st, and St Michael the archangel on the 29th. September was called "harvest month" in Charlemagne's calendar, and it corresponds partly to the Fructidor and partly to the Vendémiaire of the first French republic. The Anglo-Saxons called the month *Gerstmonath*, barley month, that crop being then usually harvested. It is still called *Herbstmonat*, harvest month, in Switzerland.

SEPTUAGINT, THE (Gr. *οἱ* O′, Lat. LXX.), or the "Alexandrian version of the Old Testament," so named from the legend of its composition by seventy (Lat. *septuaginta*), or more exactly seventy-two, translators. In the *Letter of Aristeas to Philocrates*[1] this legend is recounted as follows: Demetrius of Phalerum, keeper of the Alexandrian library, proposed to King Ptolemy II. Philadelphus (285–247 B.C.) to have a Greek translation of the Jewish law made for the library. The king consented and, after releasing 100,000 Jewish captives in his kingdom, sent an embassy with rich presents to the high priest Eleazar at Jerusalem asking him to send six ancient, worthy and learned men from each of the twelve tribes to translate the law for him at Alexandria. Eleazar readily sent the seventy-two men with a precious roll of the law. They were honourably received at the court of Alexandria and conducted to the island (Pharos), that they might work undisturbed and isolated. When they had come to an agreement upon a section Demetrius wrote down their version; the whole translation was finished in seventy-two days. The Jewish community of Alexandria was allowed to have a copy, and accepted the version officially; indeed a curse was laid upon the introduction of any changes in it.

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[1] Edited by H. St J. Thackeray in H. B. Swete's *Introd. to the Old Testament in Greek* (1900), and by P. Wendland in the Teubner series (1900).

There is no question that this *Letter* (which is condensed in Josephus, *Ant.* xii. 2) is spurious.[1] Aristeas, an official at Ptolemy's court, is represented as a heathen, but the real writer must have been a Jew and no heathen. Aristeas is represented as himself a member of the embassy to Eleazar; but the author of the *Letter* cannot have been a contemporary of the events he records, else he would have known that Demetrius fell out of favour at the very beginning of the reign of Philadelphus, on a charge of intriguing against his succession to the throne.[2] Nor could a genuine honest witness have fallen into the absurd mistake of making delegates from Jerusalem the authors of the Alexandrian version. There are also one or two passages (§§ 28, 182) where the author seems to forget that he is playing the rôle of Aristeas. The forgery, however, seems to be an early one.[3] "There is not a court-title, an institution, a law, a magistracy, an office, a technical term, a formula, a peculiar phrase in this letter which is not found on papyri or inscriptions and confirmed by them."[4] That in itself would not necessarily imply a very early date for the piece; but what is decisive is that the author limits canonicity to the law and knows of no other holy book already translated into Greek. Nor does he claim any inspiration for the translators. Further, what he tells about Judaea and Jerusalem is throughout applicable to the period when the Ptolemies bore sway there and gives not the slightest suggestion of the immense changes that followed the conquest of Palestine by the Seleucids. It is probable that the Jewish philosopher Aristobulus, who lived under Ptolemy VI. Philometor (180–145 B.C.), derived his account of the origin of the LXX. from this *Letter*, with which it corresponds.[5] There seems good ground for believing that the letter contains some elements derived from actual tradition as to the origin of the LXX. Ptolemy Philadelphus was a king of eclectic literary tastes, and the welcome he gave to a Buddhist mission from India might well have been extended to Jews from Palestine. The letter lays great stress on the point that the LXX. is the official and authoritative Bible of the Hellenistic Jews, having not only been formally accepted by the synagogue at Alexandria, but authorized by the authorities at Jerusalem. This, and the fact that the style of the version is not that of a book intended for literary use, points to the conclusion that the translation was made to satisfy the religious needs of the Jews in Alexandria, and possibly also in the hope of gaining proselytes. In view of the Jewish prejudice against *writing* Scripture in any but the old holy form (the Targum, for instance, was for centuries handed down orally), it is quite possible that some impulse to the Alexandrian version came from without. Philadelphus may have encouraged it both to satisfy his own curiosity and to promote the use of Greek among the large Jewish population of the city. That the work is purely Jewish in character is only what was inevitable in any case. The translators were necessarily Jews, though Egyptian and not Palestinian Jews, and were necessarily and entirely guided by the living tradition which had its focus in the synagogal lessons.[6] And hence it is easily understood that the version was ignored by the Greeks, who must have found it barbarous and largely unintelligible, but obtained speedy acceptance with the Jews, first in private use and at length also in the synagogue service.

The next direct evidence which we have as to the origin of the LXX. is the prologue to Ecclesiasticus, from which it appears that about 130 B.C. not only the law but "the prophets and the other books" were extant in Greek.[7] With this it agrees that the text of Ecclesiasticus and the other ancient relics of Jewish Greek literature, preserved in the extracts made by Alexander Polyhistor (Eusebius, *Praep. Ev.* ix.), all show acquaintance with the LXX.[8] The experiment on the Pentateuch (of which alone *Aristeas* speaks) had evidently been extended to other rolls as they arrived from Jerusalem. These later translations were not made simply to meet the needs of the synagogue, but express a literary movement among the Hellenistic Jews, stimulated by the favourable reception given to the Greek Pentateuch, which enabled the translators to count on finding an interested public. If a translation was well received by reading circles among the Jews, it gradually acquired public acknowledgment and was finally used also in the synagogue, so far as lessons from other books than the Pentateuch were used at all. But originally the translations were mere private enterprises, as appears from the prologue to Ecclesiasticus and the colophon to Esther. It appears also that it was long before the whole Septuagint was finished and treated as a complete work. We may grant that the Pentateuch (and perhaps part of Joshua) was translated in the 3rd century B.C. The other books followed, generally speaking, in the order in which they occur in the Hebrew Canon. Isaiah perhaps dates from *c.* 180, Jeremiah, Ezekiel and the Twelve Prophets, as also 1 Kings (= 1 Samuel), *c.* 150. Most of the "Writings," together with Judges and 2-4 Kings, were probably translated in the 1st century B.C., while Ecclesiastes and Daniel (the latter incorporated from Theodotion) date only from the 2nd century of the Christian era.

As the work of translation went on so gradually, and new books were always added to the collection, the compass of the Greek Bible came to be somewhat indefinite. The law always maintained its pre-eminence as the basis of the canon; but the prophetic collection changed its aspect by having various Hagiographa incorporated with it according to an arbitrary arrangement by subjects. The distinction made in Palestine between Hagiographa and Apocrypha was never properly established among the Hellenists. In some books the translators took the liberty of making considerable additions to the original, *e.g.* those to Daniel, and these additions became a part of the Septuagint. Nevertheless, learned Hellenists were quite well aware of the limits of the canon and respected them. Philo can be shown to have known the Apocrypha, but he never cites them, much less allegorizes them or uses them in proof of his tenets. And in some measure the widening of the Old Testament canon in the Septuagint must be laid to the account of Christians.

The vocabulary and accidence of the Greek of the Septuagint are substantially those of the κοινὴ διάλεκτος or Hellenistic Greek spoken throughout the empire of Alexander. The language of the Pentateuch attains the higher level shown by the papyri of the early Ptolemaic age, that of the prophets reflects the less literary style of the papyri of *c.* 130–100 B.C. In the latest parts of the translation Mr St John Thackeray notes two opposing influences, (*a*) the growing reverence for the letter of Scripture, tending to a pedantic literalism, (*b*) the influence of the Atticistic school, strongest in free writings like 4 Maccabees but leaving its mark also on 4 Kings. But if in some respects the Septuagint is the great monument of the κοινή, in others, especially in syntax, it is strongly tinged with Hebraisms, and there are many passages where it is difficult, if not impossible, to extract any rational meaning. In some cases a book bears the marks of two hands: thus Jeremiah i.-xxviii. was not translated by the worker that undertook ch. xxix.-li. (the former is indifferent, the latter unintelligible Greek), and in Ezekiel one hand is responsible for ch. i.-xxvii., xl.-xlviii., and another for ch. xxviii.-xxxix. (except xxxvi. 24-38). So 1 Kings stands apart from 2-4 Kings. Isaiah is more akin to classical Greek; like the Pentateuch and 1 Maccabees it is good *κοινή*. The two chief MSS. of Judges vary so much as to point to different recensions. In some books, especially Jeremiah xxv.-li., the order of the Septuagint is totally different from that of the Massoretic Hebrew text (cf. also Proverbs xxiv.-xxix.). In other cases, notably in Job, the original LXX. text was much shorter than that of the Massoretes; in Esther and Daniel there are numerous additions. The Septuagint does not keep the triple Hebrew division of Law, Prophets and Hagiographa or Writings, but instead of this order of canonization principle it groups its books according to subject matter, Law, History, Poetry, Prophecy, a divergence which had much importance for the history of the Old Testament canon in the Christian church. The early Christians generally accepted the LXX. canon, which through the old Latin, despite Jerome's Vulgate adoption of the Hebrew canon, passed into the West, and into the Latin Bibles, where the Apocrypha (except 1 Esdras) are still included. The German and English churches followed Jerome in giving a less honoured place to the impugned books.

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[1] Its claims were demolished by Humphry Hody, Regius Professor of Greek at Oxford, in 1684.

[2] Hermippus Callimachius, *ap.* Diog. Laërt. v. 78. Irenaeus indeed, evidently following some other account, fixes the translation in the time of Ptolemy I.

[3] P. Wendland, however, puts it after the Maccabean age (say 96 B.C.) and before the Roman invasion of Palestine (63 B.C.).

[4] G. Lumbroso, *Recherches sur l'écon. pol. de l'Égypte sous les Lagides* (Turin, 1870), p. xiii.

[5] Clem. Alex. *Strom.* i. p. 342, ed. Sylb.; Eusebius, *Praep. Ev.* ix. 6, p. 410 seq.; cf. Valckenaer, *Diatribe de Aristobulo* (Leiden, 1806), reprinted in Gaisford's edition of the *Praep. Ev.* One must not overlook the possibility that Aristobulus's *Interpretation of the Holy Laws* may itself be the pseudonymous work of some otherwise unknown Jewish author. It and the *Letter of Aristeas* seem to be of the same date, if not even by the same hand. And Philo (*Vita Mosis*, ii. § 7, ii. 141) describes an annual festival held at Pharos in honour of the origin of the Greek Bible.

[6] It is quite likely that they worked on rolls newly brought from Jerusalem. There was no desire to found an Alexandrian canon or type of text.

[7] This does not necessarily mean that the whole of the section of the Hebrew Old Testament known as "The Writings" was translated by that date.

[8] Philo seems to have known the Greek version of most of the Old Testament except Esther. Ecclesiastes. Canticles and Daniel.

The Septuagint came into general use with the Grecian Jews even in the synagogue. Philo and Josephus use it, and so do the New Testament writers. But at an early date small corrections seem to have been introduced, especially by such Palestinians as had occasion to use the LXX., in consequence partly of divergent interpretation, partly of differences of text or of pronunciation (particularly of proper names). The Old Testament passages cited by authors of the first century of the Christian era, especially those in the Apocalypse, show many such variations from the Septuagint, and, curiously enough, these often correspond with the later versions (particularly with Theodotion), so that the latter seem to rest on a fixed tradition. Corrections in the pronunciation of proper names so as to come closer to the Massoretic pronunciation are especially frequent in Josephus. Finally a reaction against the use of the Septuagint set in among the Jews after the destruction of the temple—a movement which was connected with the strict definition of the canon and the fixing of an authoritative text by the rabbins of Palestine. But long usage had made it impossible for the Jews to do without a Greek Bible, and to meet this want a new version was prepared corresponding accurately with the canon and text of the Pharisees. This was the version of Aquila, which took the place of the Septuagint in the synagogues, and long continued in use there. On this, together with the versions of Theodotion and Symmachus, Origen's *Hexapla*, and the recensions of Hesychius and Lucian, see BIBLE (*Old Testament*, "Texts and Versions").

The LXX. is of great importance in more than one respect. "It was the first step towards that fusion of the Hebraic with the Hellenic strain, which has issued in the mind and heart of modern Christendom. Like the opening of the Suez Canal it let the waters of the East mingle with those of the West, bearing with them many a freight of precious merchandise." Again, it is probably the oldest translation of considerable extent that ever was written, and at any rate it is the starting-point for the history of Jewish interpretation and the Jewish view of Scripture. And from this its importance as a document of exegetical tradition, especially in lexical matters, may be easily understood. It was in great part composed before the close of the canon—nay, before some of the Hagiographa were written—and in it alone are preserved a number of important ancient Jewish books that were not admitted into the canon. As the book which created or at least codified the dialect of Biblical Greek, it is the key to the New Testament and all the literature connected with it. To many its chief value lies in the fact that it is the only independent witness for the text of the Old Testament which we have to compare with the Massoretic text. It may seem that the critical value of the LXX. is greatly impaired, if not entirely cancelled, by the corrupt state of the text. If we have not the version itself in authentic form we cannot reconstruct with certainty the Hebrew text from which it was made, and so cannot get at various readings which can be confidently confronted with the Massoretic text; and it may be a long time before we possess a satisfactory edition of the genuine Septuagint. The difficulties in getting behind the confusion of versions and recensions to produce such a result are indeed formidable. The materials at our disposal are of the usual threefold kind, Manuscripts, Versions and Patristic Quotations. The earliest MSS. are about a score of fragments on papyrus, a few of which go back to the 3rd century A.D. The chief uncial MSS. are, as for the New Testament ℵ, A, B, C and others. Of these A and B are largely complete, but though both of Egyptian origin vary considerably. A (with which the quotations in the New Testament generally agree) may represent the edition of Hesychius; B, which is often, especially in the Psalms, in accord with the Bohairic version, resembles the text used by Origen in the Hexapla. Of versions the Bohairic (Lower Egypt), the Sahidic (Upper Egypt), the various Syriac translations (unfortunately we have no Old Syriac for the Old Testament), and the Latin (Old Latin and Vulgate, especially the former) are the most important. The evidence of the Fathers is valuable as helping to distinguish local types of text. The testimony of the earliest patristic quotations seems to be in favour of A rather than B. The immediate aim of textual criticism is a recovery of the three main editions, those of Origen, Lucian and Hesychius, and then of the pre-Origenian LXX. text, which lies behind them all. When this has been accomplished there still remains the problem of the relation of the LXX. to the Hebrew. There is no doubt that the Hebrew text from which the LXX. translators worked was often divergent from that represented by the Massoretic. For the Pentateuch we have additional material in the Samaritan version, but here the variants are least. In view of the palpable mistakes made by the Septuagint translators and their often inadequate knowledge of Hebrew, we must not hastily assume that in cases of difference the Greek is to be preferred. The book of Ecclesiasticus (the Hebrew of which has recently been discovered) furnishes a useful lesson here. Yet there is no doubt that much (*e.g.* in 1 Samuel) may be learned from the Septuagint; all one can say is that each case must be treated on its own merits.

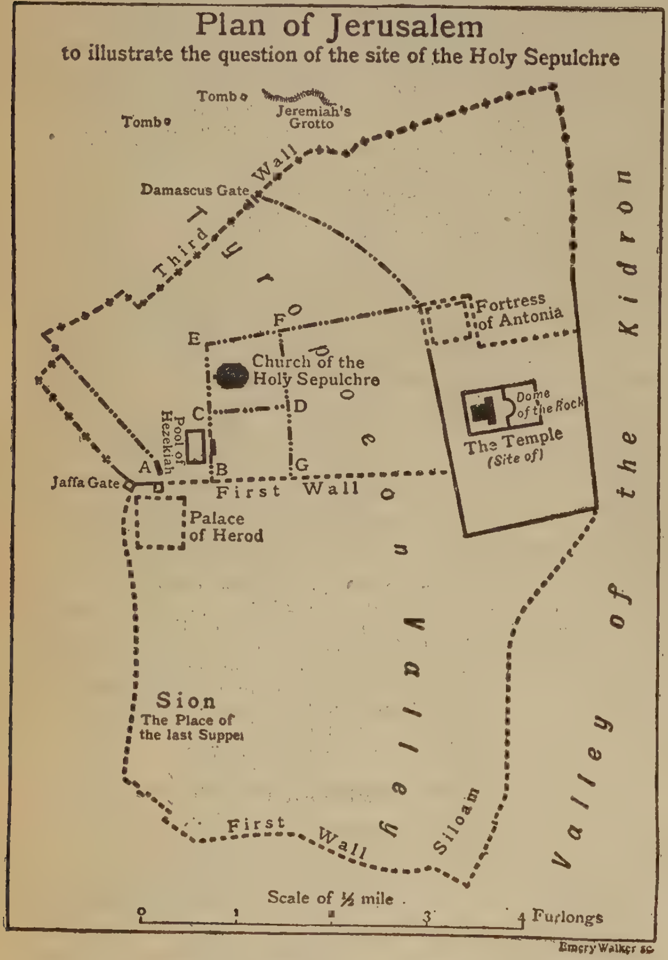
EDITIONS.—The Septuagint was first printed in the Complutensian Polyglot (1514–1517), but before it was published in 1521 Aldus published another edition in 1519. The Textus Receptus issued by Pope Sixtus V. (Rome, 1587) was based mainly on Cod. Vaticanus (B) with some collection of the Venice MS. (V). This edition was the basis of the great work of R. Holmes and J. Parsons (Oxford, 1798–1827), who furnished the Sixtine text with an apparatus (not always accurate) drawn from 20 uncials and nearly 280 minuscule MSS., in addition to versions. In 1707–1720 Grabe had published an edition based on Cod. Alexandrinus (A). C. Tischendorf's text (1850; 7th ed., 1887) was a revision of that of Holmes and Parsons with an apparatus drawn from the chief uncials. H. B. Swete's edition in 3 vols. (1887–1894; revised 1895–1899) gives the text of B, and, where this fails, that of A or ℵ, with variant readings from the chief uncials. The larger Cambridge edition, begun in 1906 by A. E. Brooke and N. McLean, follows the same plan with the text, but its apparatus includes all the uncials, the best and most representative minuscules, and the chief versions and patristic quotations.

LITERATURE.—H. B. Swete, *Introduction to the Old Testament in Greek* (1900); E. Nestle, *Septuagintastudien* (1886–1907); F. G. Kenyon, *Our Bible and the Ancient MSS.*, pp. 48-92 (1898); A. Rahlfs, *Septuaginta-Studien* (1904, Kings; 1907, Psalms); E. Hatch and H. A. Redpath, *A Concordance to the Septuagint* (Oxford, 1897–1906); H. St J. Thackeray, *A Grammar of the Old Testament in Greek*, vol. i. (Cambridge, 1909), containing a useful Septuagint bibliography; F. C. Conybeare and St G. Stock, *Selections from the Septuagint* (Boston and London, 1905); the articles in the various Bible-dictionaries, and other works mentioned in the course of this article. (A. J. G.)

SEPULCHRE, CANONS REGULAR OF THE HOLY, an order said to have been founded in 1114 (or, according to other accounts, during the rule of Godfrey of Bouillon in Jerusalem) on the rule of St Augustine. Pope Celestine III., in 1143, confirms the Church and Canons of the Holy Sepulchre in all their possessions, and enumerates several churches both in the Holy Land and in Italy belonging to the Canons. According to Jacques de Vitry, the canons served the churches on Mount Sion and Mount Olivet in addition to that of the Holy Sepulchre. The canons survived in Europe till the French Revolution. In Italy they seem to have been suppressed by Innocent VIII. in 1489, and their property given to the Knights of St John. The canons are now extinct, but canonesses of the Holy Sepulchre are still to be found in various countries of Western Europe.

SEPULCHRE, EASTER, in church architecture an arched recess, generally in the north wall of the chancel, in which from Good Friday to Easter day were deposited the crucifix and sacred elements in commemoration of Christ's entombment and resurrection. It was generally only a wooden erection, which was placed in a recess or on a tomb. There are throughout England many fine examples in stone, some of which belong to the Decorated period, such as at Navenby and Heckington (1370) in Lincolnshire, Sibthorpe and Hawton (1370) in Nottinghamshire, Patrington in Yorkshire, Bampton in Oxfordshire, Holcombe Burnell in Devonshire, and Long Itchington and other churches in Warwickshire.

SEPULCHRE, THE HOLY, the tomb in which, after His crucifixion, the body of Jesus Christ was laid. Although the facts of the crucifixion and of the interment of the body of Christ in the tomb of Joseph of Arimathea are related in the New Testament with considerable detail, sufficient indications are not supplied to locate the actual position of the tomb with reference to the city of Jerusalem. It would appear that Golgotha, the place of crucifixion, was outside the city, near a public thoroughfare leading to one of the gates, and visible from some distance. There is, however, no reason for supposing that it was a hill, and the expression "Mount Golgotha" was not used until some centuries later. Adjoining the place Golgotha was a garden, in which was a new rock-cut tomb, the property of Joseph of Arimathea. Rock-cut tombs were common in the vicinity of Jerusalem, as, in consequence of the geological formation, the faces of the hills are frequently broken by low cliffs with terraces between. The comparatively level terraces were used for cultivation while the tombs were excavated in the rock faces. Many instances of tombs so situated can be seen on the hillsides near Jerusalem, and it is not unreasonable to suppose that the tomb of Joseph was of a similar character. As it was outside the city, the question of the validity of the traditional site, upon which the church of the Holy Sepulchre now stands, necessarily depends, to a great extent, upon whether this place was within or without the walls at the date of the crucifixion. At that time, it is clear, judging from the careful description written by Josephus a few years later, that Jerusalem was defended by two walls, as the third wall was not begun by King Herod Agrippa until A.D. 41. Of these, the first, or old wall, ran from the palace of Herod the Great, which was situated at the N.W. corner of the city, and, following an easterly direction, crossed the Tyropoeon Valley and terminated at the west wall of the Temple enclosure. On the other hand, going south from Herod's palace, it encircled the city on the west and south, and then turning at Siloam it followed the direction of the Kidron Valley and ended at the east wall of the Temple enclosure.



The second wall, which was built at some period between the return of the Jews from Babylon and the reign of Herod the Great, was on the north, and in front of the old wall. According to Josephus, it started "from the Gate Genath in the first wall, and, enclosing only the northern quarter of the city, went up to the fortress of Antonia." The site of the Antonia, which was situated on the rising ground north of the Temple, is known with tolerable certainty, but the position of the Gate Genath has not been fixed, and, as no certain traces of the second wall have hitherto been found, the line it followed is purely a matter of conjecture. Various theories on the subject are maintained by different authorities. Some of these are indicated on the plan. One suggestion is that the second wall started from a point in the first wall near the palace of Herod, and that some remains of an old wall, situated at the point A, formed part of it. The wall is then supposed to have been carried in a direction slightly west of north, up to the line of the existing city wall, to have followed this line to the Damascus gate, and then turned south-east to the Antonia. If this theory were correct, it is clear that the traditional site of the Holy Sepulchre would be impossible, as it would be some way within the city wall. The arguments against the proposal are, that, according to the account of the siege of Jerusalem given by Josephus, it is improbable that the second wall started from a point so near to Herod's palace, that the line of the present city wall is more likely to be that of the third wall, and that Josephus states that the second wall went "up to" and not "down to" the fortress of Antonia. Another theory is that the Gate Genath was at a point marked B on plan, and that some ancient masonry which lies east of the so-called Pool of Hezekiah, and over which the houses on the west side of Christian Street are built, represents a portion of the second wall. The wall is then supposed to have been carried north to the point C, and either to have turned east to D, and again north to F, and from this to the Antonia; or to have continued north to E, and thence east to the Antonia. The first supposition excludes the site of the Holy Sepulchre, while the second includes it within the wall. A third theory is that the Gate Genath was at the point G, and that the second wall ran north to F, and thence to the Antonia. This proposal places the site of the Holy Sepulchre outside the wall, but it makes the part of the city protected by the latter smaller than is probable. Speaking generally, it may be stated that there is no certain evidence as to the line followed by the second wall, and it is impossible to say whether the traditional site lies inside or outside this wall. From the description in the Gospels of the burial of Jesus, it is not clear whether the tomb of Joseph was intended to be the final resting-place, or whether the body was only placed in it temporarily because the feast of the Passover was at hand and the disciples intended to remove it to some other place after the Passover. But whatever may have been proposed, the Resurrection of Jesus Christ on the first day of the week, leaving the tomb empty, turned the attention of the disciples from the sepulchre to the living presence of their Master. After He had risen from the dead, the place of His burial does not appear to have had any attraction for His followers, and there is nothing in the writings of the first three centuries to lead us to suppose that the actual rock-cut tomb was regarded with any special feelings of veneration. Whether even a recollection of the site was preserved traditionally is doubtful. There have been many who consider that the early Christians could not have forgotten the exact locality of so important a place; on the contrary, others maintain that to the followers of Jesus Christ it was the fact of the Resurrection that was important and not the empty tomb; and that knowledge of the latter was lost during the vicissitudes from which Jerusalem suffered in the years succeeding the crucifixion. About forty years after the crucifixion, the great revolt of the Jewish people against the Romans took place, and ended with the siege and capture of Jerusalem by Titus. Prior to the siege, the Christians, following the orders of their Master had retired to the city of Pella, east of Jordan, and the date of their return to Jerusalem is uncertain. Whether any of the disciples returned after the triumph of the Romans and recognized the tomb of Christ is matter of conjecture.

Among the temples built by Hadrian about A.D. 135 was one dedicated to Aphrodite or Venus; it was erected at that place where the church of the Holy Sepulchre now stands, but it is impossible to say whether it was purposely so placed because it was the site of the tomb of the Lord, or whether the selection of this position was accidental. The extent of the walls of Aelia Capitolina is not known with any accuracy, but it is probable that the northern wall followed the same line as the present north wall of Jerusalem, and therefore that the site of the temple of Aphrodite was then within the walls. Although it is doubtful whether the Christians returned to Jerusalem immediately after the destruction of the city by Titus, they were certainly there when Hadrian built Aelia Capitolina; according to Epiphanius, they had a small place of worship on Sion at the place where Jesus Christ ate the Last Supper. Eusebius also states that the Christians worshipped at the Mount of Olives where Jesus instructed His disciples, but no writer up to the time of Constantine speaks of the tomb, or of worship being performed there.

Constantine the Great became emperor of Rome in A.D. 306, and was converted to Christianity six years afterwards. Embracing his new religion with enthusiasm he attributed his victories to the power of the Divine Cross, which was placed on the ensigns of the army. After the great council of the Church had been held at Nicaea in A.D. 325, the emperor decided to find the sites of the crucifixion and resurrection at Jerusalem, and to build a church at this place. Full descriptions of the discovery of the Holy Sepulchre and of the churches that were built are given by Eusebius in his *Life of Constantine*, but it is difficult to say from his account if the main object of Constantine was to find the sepulchre of the Lord or the cross upon which He suffered. Eusebius does not mention the cross directly and lays more stress on the recovery of the sepulchre; whereas later writers imply that the great wish of the emperor and of his mother Helena, who visited Jerusalem for the purpose, was to find the Holy Cross. The task of searching for the tomb and the cross was entrusted to Bishop Macarius. Whether the bishop was guided in his selection of the site by tradition or not is difficult to say, but he decided that the desired place was under Hadrian's temple of Aphrodite. By imperial order the temple was removed, and a rock-cut Jewish tomb, which lay below, was identified as the sepulchre of the Lord. In another cavity in the rock, 280 ft. to the east, three crosses were discovered, which were assumed to be the crosses upon which Jesus Christ and the two thieves were crucified, the cross of Jesus being identified by its power of healing the sick. Immediately on the receipt of the intelligence of this remarkable discovery, the emperor wrote to Macarius, ordering the erection of magnificent buildings on the site. Two churches were built, one over the tomb, and the second, which was larger and grander, over the place where the crosses had been found. Between the two churches was a small hill, which was identified as Mount Golgotha. The ground surrounding the two churches was levelled and surrounded with porticoes or colonnades. The description of the buildings as detailed by Eusebius is rather obscure, but fortunately there still exists, in the church of Santa Pudenziana at Rome, a mosaic, supposed to have been originally executed in the 4th or 5th century, which shows the buildings clearly. The church of the Anastasis or Holy Sepulchre is herein delineated as a round church with a domed roof; the church of the Martyrion or Holy Cross, as a polygonal building, also with a domed roof; while between the two churches is Mount Golgotha, with the cross erected upon it. In another ancient mosaic, which still exists in a church of Madeba, east of the Jordan, a map of Palestine is represented which contains a rough plan of the walls and gates of Jerusalem. In this plan, also, it is possible to recognize the churches built by Constantine. The Bordeaux pilgrim who visited Jerusalem about A.D. 333, when the church of the Holy Sepulchre was in course of construction, describes the place, which was evidently the same as that on which the existing church of the Holy Sepulchre stands. There can, therefore, be no reasonable doubt that the present site is that which was fixed upon by Bishop Macarius in the time of Constantine.

The churches were completed about A.D. 336, and were doubtless visited by numbers of pilgrims. Among these a lady from the west of Europe, who is supposed to have been St Sylvia of Aquitania and who came to Jerusalem about A.D. 385, fortunately kept a diary of her travels, and she identifies very distinctly the great church of the Cross, the church of the Holy Sepulchre, and Mount Calvary between them. In A.D. 614 Jerusalem was captured by the Persians under Chosroes II., who did considerable damage to the churches, but they were repaired by Modestus after the defeat of the Persians by the emperor Heraclius. The caliph Omar, who captured the city in 636, behaved with leniency to the Christians, and left them in undisputed possession of the church of the Holy Sepulchre. In 1010 the third Fatimite caliph Hakim practically destroyed it. It is remarkable that from the beginning of the 8th century, while the church of the Holy Sepulchre is always mentioned in the accounts written by visitors to Jerusalem, the church of the Cross seems to have ceased to exist, although the place where the crosses were found was shown to pilgrims, and a church was built on Mount Calvary. After the capture of Jerusalem by the Crusaders in A.D. 1099, the church of the Holy Sepulchre was repaired and enlarged by the addition of a nave and chancel, and other churches were erected, so that the Holy Sepulchre became the centre of a group of ecclesiastical buildings and has so remained up to the present time.

The Authenticity of the Traditional Site.—From early times doubts have arisen as to whether the tomb discovered by Bishop Macarius was the veritable sepulchre. As early as 754, when the pilgrim Wildebald visited Jerusalem, he remarked, in describing the Holy Places, that "Calvary was formerly outside the city, but that the Empress arranged that place so that it should be within the city Jerusalem." Saewulf in 1102, Wilbrand of Oldenburg in 1211, Jacques de Vitry in 1226, and Burchard of Mount Sion in 1283, had evidently some doubts about the site, and explained the difficulty by suggesting that Hadrian had enclosed it within the walls but that it was outside before he rebuilt the city. Jacques le Saige in 1518, Gretzer in 1598, and F. Quaresmius in 1639, also alluded to the difficulty felt by some in believing in the traditional site. Monconys in 1647 stated that Calvary was formerly outside Jerusalem, but that it was now in the centre of the city, which was smaller than at the time of the crucifixion. In 1738 Jonas Korte of Altona visited Jerusalem and published a book on his travels, in which he expressed the view that the Calvary shown to visitors could not be the true Calvary because it was in the middle of the town. He placed the true site to the west of Jerusalem, near the Birket Mamilla which lies ½ m. west of the Jaffa gate. This view was supported by J. F. Plessing in 1789. Dr E. Clarke in 1812 came to the conclusion that Calvary was outside the Sion gate, while Dr E. Robinson, who published his *Biblical Researches in Palestine* in 1841, expressed himself satisfied that the traditional site could not be the true one, but did not venture to suggest an alternative. In 1842 Otto Thenius asserted that the crucifixion must have taken place on the north of Jerusalem on the rising ground outside the Damascus gate above the quarry known as Jeremiah's Grotto. Thenius considered that the Holy Sepulchre was on the west side of the hill, and his views were adopted by a number of later writers, including Canon Tristram, Dr Selah Merrill, Fisher Howe and General C. G. Gordon. Colonel C. R. Conder, R.E., who carried out the survey of Palestine under the Palestine Exploration Fund, also adopted the same hill as the probable scene of the crucifixion, but considered that the tomb of Christ was an ancient rock-cut tomb, about 200 yds. west of Jeremiah's Grotto. Since General Gordon gave his opinion in favour of the site, it has been adopted by many, and the tomb in the face of the hill is sometimes called "Gordon's Tomb of Christ" or "The Garden Tomb." A careful examination of the question, however, leads to the conclusion that the sites are not probable either for Calvary or the tomb. The hill in question, though not far outside the present north wall of the city, is at too great a distance from the probable line of the second wall, which was the outside line of fortification at the time of the crucifixion. The quarry, known as Jeremiah's Grotto, is likely to be of later date than the third wall, which was built some years after the crucifixion, and the tomb identified as that of Christ has with good reason been attributed to the Christian rather than to the Jewish period. On the whole, therefore, the balance of argument is against the identification proposed by Thenius.

An entirely different theory regarding the site of the tomb of Christ was proposed by James Fergusson, the architect, who, in 1847, in his *Essay on the Ancient Topography of Jerusalem*, made the startling proposal that the Dome of the Rock, generally believed to have been erected by Abdalmalik (Abd el Melek) in A.D. 691, was the church built by the emperor Constantine over the Holy Sepulchre. He further elaborated his views in the interesting work entitled *The Temples of the Jews and other buildings in the Haram area at Jerusalem* (1878). Fergusson's proposal, which found a considerable number of supporters, was based on architectural evidence, and he maintained that the building must have been designed in the time of Constantine and could not have been constructed by the Mahommedans at the end of the 7th century. Fergusson's views were strongly supported by F. W. Unger in *Die Bauten Constantins des Grossen am Heiligen Grab zu Jerusalem*, published at Göttingen in 1863, but the objections to them on historical and topographical grounds are so considerable that they can hardly now be maintained. The theory involves placing the Temple of the Jews at the S. W. part of the Haram enclosure, and the explorations made by General Sir C. Warren showed conclusively that if the Temple had been in this position, it would have stood over the deepest part of the Tyropoeon Valley, and the foundations must have been of a most unnecessarily gigantic character. Sir C. Warren, in *The Temple and the Tomb*, 1880, replied *seriatim* to Fergusson's proposals. The historical evidence also is entirely against the latter, and the discovery of the Madeba mosaic, which, as has been already explained, shows the church of the Holy Sepulchre in the same position as at present, is another proof that the latter was not placed by Constantine on Mount Moriah.

The final conclusion that may be arrived at with regard to the authenticity of the traditional site of the Holy Sepulchre is as follows. It may be taken as certain that the present site is that which was adopted by Macarius as the correct one early in the 4th century, but there is not sufficient evidence to prove that this tomb was the one in which the body of Christ was laid, or that remembrance of the latter had been preserved during the three centuries that had elapsed between the time of the crucifixion and the conversion of Constantine. No other suggested site, however, has more claim to be the true one than that over which the church of the Holy Sepulchre now stands.

LITERATURE.—By far the most important of the many works which have been published on the subject is *Golgotha and the Holy Sepulchre*, by Sir C. W. Wilson (Palestine Exploration Fund, London, 1906). Sir C. Wilson was employed upon the Ordnance Survey of Jerusalem in 1864–1865, and made careful plans of the church of the Holy Sepulchre; he had an extensive knowledge of the question, and his work forms a valuable index to the topographical and historical considerations which are involved. Among ancient writers, see Eusebius, *The Life of Constantine*, *The Praise of Constantine*, *Theophania*; Rufinus (A.D. 345–410), *Ecclesiastical History*; Sulpicius Severus (A.D. 363–420), *Sacred History*; Sozomen (A.D. 375–450), *Ecclesiastical History*; Socrates (*circa* A.D. 379), *Ecclesiastical History*. The Publications of the Palestine Pilgrims' Text Society contain a collection of translations of the records of pilgrims, who visited the Holy Places after the erection of Constantine's churches; among these are included (the dates are approximate): The Bordeaux Pilgrim, A.D. 333; St Sylvia, A.D. 385; Eucherius, A.D. 440; Theodosius, A.D. 530; Antoninus Martyr, A.D. 530; Arculfus, A.D. 630; Willibald, A.D. 754; Bernard the Wise, A.D. 870; Saewulf, A.D. 1102; Burchard of Mount Sion, A.D. 1283; Ludolph von Suchem, A.D. 1350; Felix Fabri, A.D. 1483. Among the writers of the 16th, 17th and 18th centuries, see J. Gretzer, *Omnia opera* (Ingoldstadt, 1598); F. Quaresmius, *Historica, theologica et moralis Terrae Sanctae elucidatio* (Antwerp, 1639); T. Fuller, *A Pisgah Sight of Palestine* (London, 1650); B. de Monconys, *Journal des voyages* (Paris, 1665); A. Bynœus, *De morte Jesu Christi* (Amsterdam, 1698); J. Korte, *Reise nach dem weiland Gelobten Lande* (2nd ed., Altona, 1743); J. F. Plessing, *Über Golgotha und Christi Grab* (Halle, 1789). Of the numerous writers of the 19th century some of the more important are: E. D. Clarke, *Travels in the Holy Land* (Cambridge, 1823); F. R. de Chateaubriand, *Itinéraire de Paris à Jerusalem* (Paris, 1837); E. Robinson, *Biblical Researches in Palestine* (London, 1841 and 1856); O. Thenius, "Golgatha et Sanctum Sepulchrum" in *Zeitschrift für die historische Theologie* (1842); J. Fergusson, *The Ancient Topography of Jerusalem* (London, 1847), *The Holy Sepulchre and the Temple* (1865), *The Temples of the Jews* (1878); G. Williams, *The Holy City* (2nd ed., London, 1849); Hayter Lewis, *The Holy Places of Jerusalem* (London, 1888); J. T. Barclay, *The City of the Great King* (1857); F. Bovet, *Voyage en Terre Sainte* (Paris, 1862); F. W. Unger, *Die Bauten Constantins des Grossen am Heiligen Grabe zu Jerusalem* (Göttingen, 1863); General Sir C. Warren, G.C.M.G., *The Recovery of Jerusalem* (London, 1871), *The Temple and the Tomb* (1880); Colonel C. R. Conder, R.E., *Handbook to the Bible* (London, 1887); General C. G. Gordon, C.B., *Reflections in Palestine* (London, 1884); C. Clermont Ganneau, *Archaeological Researches in Palestine* (London, 1899); C. Mommert, *Golgatha und das Heilige Grab zu Jerusalem* (Leipzig, 1900). See also articles in *The Quarterly Statement of the Palestine Exploration Fund*; Hasting's *Dictionary of the Bible*; Smith's *Dictionary of the Bible*; *Recueil d'archéologie orientale*; *Zeitschrift des Deutschen Palästina-Vereins*. A large scale plan of the church of the Holy Sepulchre forms part of the *Survey of Jerusalem*, published by the Ordnance Survey, Southampton. (C. M. W.)

SEQUANI, in ancient geography, a Celtic people who occupied the upper basin of the Arar (Saône), their territory corresponding to Franche-Comté and part of Burgundy. Before the arrival of Caesar in Gaul, the Sequani had taken the part of the Arverni against their rivals the Aedui and hired the Germans under Ariovistus to cross the Rhine and help them (71 B.C.). But although his assistance enabled them to defeat the Aedui, the Sequani were worse off than before, for Ariovistus deprived them of a third of their territory and threatened to take another third. The Sequani then appealed to Caesar, who drove back the Germans (58), but at the same time obliged the Sequani to surrender all that they had gained from the Aedui. This so exasperated the Sequani that they joined in the revolt of Vercingetorix (52) and shared in the defeat at Alesia. Under Augustus, the district known as Sequania formed part of Belgica. After the death of Vitellius, the inhabitants refused to join the Gallic revolt against Rome instigated by Julius Civilis and Julius Sabinus, and drove back Sabinus, who had invaded their territory. A triumphal arch at Vesontio (Besançon), which in return for this service was made a colony, possibly commemorates this victory. Diocletian added Helvetia, and part of Germania Superior to Sequania, which was now called Provincia maxima Sequanorum, Vesontio receiving the title of Metropolis civitas Vesontiensium. Fifty years later Gaul was overrun by the barbarians, and Vesontio sacked (355). Under Julian it recovered some of its importance as a fortified town, and was able to withstand the attacks of the Vandals. Later, when Rome was no longer able to afford protection to the inhabitants of Gaul, the Sequani became merged in the newly formed kingdom of Burgundy.

See T. R. Holmes, *Caesar's Conquest of Gaul* (1899), p. 483; A. Holder, *Altceltischer Sprachschatz*, ii. (1904); Mommsen, *Hist. of Rome* (Eng. trans.), bk. v. ch. vii.; Dunod de Charnage, *Hist. des Séquanois* (1735); J. D. Schöpflin, *Alsatia illustrata*, i. (1751; French trans. by L. W. Ravenèz, 1849).

SEQUEIRA, DOMINGO ANTONIO DE (1768–1837), Portuguese painter, was born at Lisbon in 1768, and studied art first at the academy of Lisbon, and subsequently under A. Cavallucci in Rome. By the age of thirteen he had evinced such marked talent that F. de Setubal employed him as assistant in his work for the Joao Ferreiras Palace. Sequeira sojourned in Rome from 1788 to 1794, when he was made honorary member of the Academy of St Luke. After another two years' travel and study in Italy, he returned to his native country preceded by so great a reputation that important commissions for churches and palaces were immediately entrusted to him—scriptural subjects, large historical compositions and cabinet pictures. In 1802 he was appointed first court painter, in which capacity he executed many works for the prince regent, for Donna Maria Teresa, and for the members of the court. He designed the valuable silver service which was presented by the Portuguese nation to Wellington, and a monument that was erected in 1820 in the Rocio square at Lisbon. In 1823 he visited Paris, where he is known to have tried his skill in lithography and etching. The last years of his life he spent in Rome, devoting himself chiefly to devotional subjects and to his duties as head of the Portuguese Academy. He died in Rome in 1837. His best-known pictures are the "Last Moments of the Poet Camoens," "Flight into Egypt," "Ugolino," the "St Bruno" at the Lisbon Academy, and the "Descent from the Cross." Numerous paintings by Sequeira are in the royal palace at Mafra, the convent of Laveinas, the new palace of Ajuda, and in the principal palaces and churches of Lisbon.

SEQUESTER, VIBIUS (4th or 5th century, A.D.), the supposed author of an alphabetical list of geographical names occurring in the Roman poets, with special reference to Virgil, Ovid and Lucan. Several of the names given cannot be traced; unless this is the result of carelessness or ignorance, the compiler must have had access to sources no longer extant.

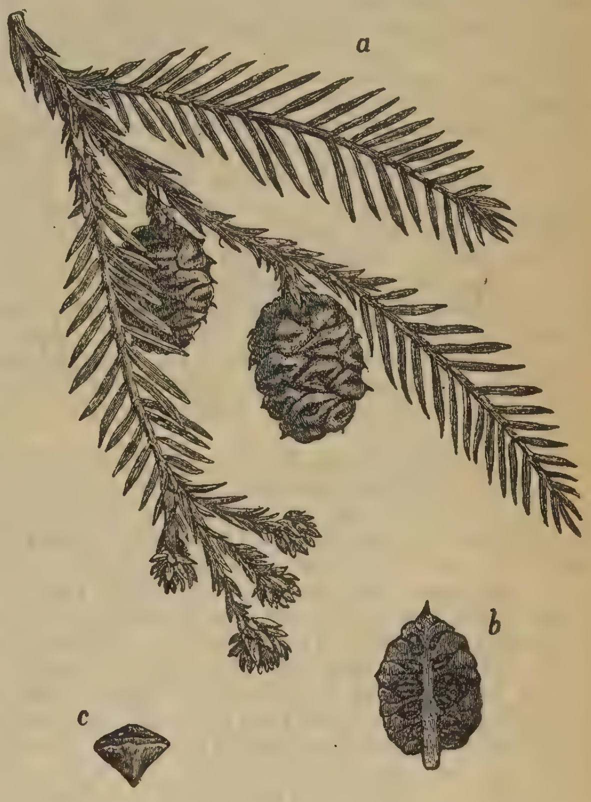
Editions by C. Bursian (Zürich, 1867), and in A. Riese, *Geographi Latini minores* (1878); see also Teuffel, *Hist. of Roman Literature* (Eng. trans., 1900), 445, 1.

SEQUESTRATION, the act of removing, separating or seizing anything from the possession of its owner, particularly in law, of the taking possession of property under process of law for the benefit of creditors or the state. The Latin *sequestrare*, to set aside or surrender, a late use, is derived from *sequester*, a depositary or trustee, one in whose hands a thing in dispute was placed till the dispute was settled; this was a term of Roman jurisprudence (cf. *Digest* L. 16,115). By derivation it must be connected with *sequi*, to follow; possibly the development in meaning may be follower, attendant, intermediary, hence trustee. In English "sequestered" means merely secluded, withdrawn. In law, the term "sequestration" has many applications; thus it is applied to the act of a belligerent power which seizes the debts due from its own subject to the enemy power; to a writ directed to persons, "sequestrators," to enter on the property of the defendant and seize the goods (see EXECUTION); to the action of taking profits of a benefice to satisfy the creditors of the incumbent. As the goods of the Church cannot be touched by a lay hand, the writ is issued to the bishop, and he issues the sequestration order to the churchwardens who collect the profits and satisfy the demand. Similarly when a benefice is vacant the churchwardens take out sequestration under the seal of the Ordinary and manage the profits for the next incumbent. In the Scots law of bankruptcy the term "sequestration" is used of the taking of the bankrupt's estate by order of the court for the benefit of the creditors (see BANKRUPTCY, § *Scottish Bankruptcy Legislation*).

SEQUIN (the French form of Ital. *zecchino*, *zecchino d'oro*), the name of a Venetian gold coin, first minted about 1280, and in use until the fall of the Venetian Republic. It was worth about nine shillings. It bore on the obverse a figure of St Mark blessing the banner of the republic, held by a kneeling doge, and on the reverse a figure of Christ. Milan and Genoa also issued gold sequins. The word in Italian was formed from *zecca*, Span. *zeca*, a mint, an adaptation of Arabic *sikka*, a die for coins. In the sense of "newly-coined," the Hindi or Persian *sikka*, anglicised *sicca*, was specifically used of a rupee, containing more silver than the East India Company's rupee, coined in 1793 by the Bengal government. The "sicca-rupee" ceased to be circulated after 1836. The term "sequin" is now used for small discs made of thin pieces of metal, tinfoil, celluloid or other composite material, highly glazed and brightly coloured, and applied as trimming for ladies' dresses.

SEQUOIA, a genus of conifers, allied to *Taxodium* and *Cryptomeria*, forming one of several surviving links between the firs and the cypresses. The two species are evergreen trees of large size, indigenous to the west coast of North America. Both bear their round or ovoid male catkins at the ends of the slender terminal branchlets; the ovoid cones, either terminal or on short lateral twigs, have thick woody scales dilated at the extremity, with a broad disk depressed in the centre and usually furnished with a short spine; at the base of the scales are from three to seven ovules, which become reversed or partially so by compression, ripening into small angular seed with a narrow wing-like expansion.

The redwood of the Californian woodsmen, *S. sempervirens*, on which the genus was originally founded by Stephan Endlicher, abounds on the Pacific coast from the southern borders of Oregon southward to about 12 m. south of Punta Gorda, Monterey county, California, forming a narrow mountain forest belt, rarely extending more than 20 or 30 m. from the coast or beyond the influence of ocean fogs, or more than 3000 ft. above sea-level (see C. S. Sargent, *Silva of North America*, vol. x.). It grows to a gigantic size, from 200 to 300 ft. or more in height, with a diameter of from 12 to 15, or rarely 20 to 28 ft. at the much-buttressed base. Professor Sargent refers to it as the tallest American tree, which probably occasionally reaches 400 ft. or more in height. In old age the huge columnar trunk rises to a great height bare of boughs, while on the upper part the branches are short and irregular. The bark is red, like that of the Scots fir, deeply furrowed, with the ridges often much curved and twisted. When young the tree is one of the most graceful of the conifers: the stem rises straight and tapering, with somewhat irregular whorls of drooping branches, the lower ones sweeping the ground—giving an elegant conical outline. The twigs are densely clothed with flat spreading linear leaves of a fine glossy green above and glaucous beneath; in the old trees they become shorter and more rigid and partly lose their distichous habit. The cones, from $\frac{3}{4}$ to 1 in. long, are at first of a bluish-green colour, but when mature change to a reddish brown; the scales are very small at the base, dilating into a broad thick head, with a short curved spine below the deep transverse depression. From the great size of the trunk and the even grain of the red cedar-like wood it is a valuable tree to the farmer and carpenter: it splits readily and evenly, and planes



Sequoia sempervirens—*a*, Branch with green cones and male catkins; *b*, Section of cone; *c*, Scale of cone. All slightly reduced.

and polishes well; cut radially, the medullary plates give the wood a fine satiny lustre; it is strong and durable, but not so elastic as many of the western pines and firs. Professor Sargent describes it as the most valuable timber tree of the forests of Pacific North America. In England the tree grows well in warm situations, but suffers much in severe winters—its graceful form rendering it ornamental in the park or garden, where it sometimes grows 30 or 40 ft. in height; its success as a timber tree would be doubtful. In the eastern parts of the United States it does not flourish. It was discovered by Archibald Menzies in 1795 and was first described as *Taxodium sempervirens*, under which name it was known until distinguished by Stephan Endlicher as a new genus in 1847.

The only other member of the genus is the giant tree of the Sierra Nevada, *S. gigantea*, the largest of known conifers; it is confined to the western portion of the great Californian range for a length of about 260 m., at an altitude of from 5000 to 8400 ft. above the sea, and forms extensive forests, or, in the northern part of the area, isolated groves, such as the Calaveras Grove, the Mariposa Grove, and others. The leaves of this species are awl-shaped, short and rigid, with pointed apex; closely adpressed, they completely cover the branchlets. The male catkins are small, solitary, and are borne at the ends of the twigs; the cones are from 1½ to 3 in. long, ovoid, with scales thicker at the base than those of the redwood, and bearing below the depression a slender prickle. The young tree is more formal and rigid in growth than *S. sempervirens*, but when old the outline of the head becomes cylindrical, with short branches sparsely clad with foliage sprays. The bark, of nearly the same tint as that of the redwood, is extremely thick and is channelled towards the base with vertical furrows; at the root the ridges often stand out in buttress-like projections. The average height is about 275 ft. with a diameter near the ground of 20 ft.; but specimens from 300 to 320 ft. tall, with trunks 25-35 ft. thick, are not rare.

The famous group known as the Mammoth Grove of Calaveras in California, containing above ninety large trees, stands in 38° N., about 4370 ft. above the sea, between the San Antonio and Stanislaus rivers. It was discovered by a hunter named Dowd in pursuit of a bear in 1852, but had been visited before by John Bidwill, who crossed the Sierra in 1841. Some trees in the Mariposa Grove rival these in size: one measures 101 ft. round the root, and a cut stump is 31 ft. in diameter. Gigantic as these trees are and imposing from their vast columnar trunks, they have little beauty, owing to the scanty foliage of the short rounded boughs; some of the trees stand very close together; they are said to be about four hundred in number. The age of the trees has been greatly overestimated. A few years ago a full-sized tree was felled in Fresno county, California, and contiguous transverse sections have been set up, one in the Museum of Natural History at New York, the other (upper one) in the British Museum of Natural History at South Kensington; the annual rings of the latter section have been carefully counted and found to indicate an age of 1335 years.

The growth of the "mammoth tree" is fast when young, but old trees increase with extreme slowness. The timber is not of great value, but the heartwood is dense and of deeper colour than that of *S. sempervirens*, varying from brownish red to very deep brown; oiled and varnished, it has been used in cabinet work. *S. gigantea* was brought to England by Lobb in 1853, and received from Dr Lindley the name of *Wellingtonia*, by which it is still popularly known, though its affinity to the redwood is too marked to admit of generic distinction. In America it is sometimes called *Washingtonia*. In the Atlantic States it does not succeed; and, though nearly hardy in Great Britain, it is planted only as an ornament of the lawn or paddock.

In early geological times the sequoias occupied a far more important place in the vegetation of the earth. They occur in the Lower Chalk formations, and in Tertiary times were widely diffused; the genus is represented in the Eocene flora of Great Britain, and in the succeeding Miocene period was widely distributed in Europe and western Asia. It is presumed that in the Glacial epoch the genus was exterminated except in the areas in western North America where it still persists.

SERAING, a town of Belgium in the province of Liége, adjoining the city of that name. Pop. (1904) 39,843. It lies on the right bank of the Meuse above Liége, with which it is connected by rail and tramway. Seraing owes all its prosperity and importance to the firm founded by John Cockerill, an Englishman, in 1817, with the co-operation of King William I. of the Netherlands, who provided half the capital. The Cockerill family has long disappeared, and the enterprise is now known as "the John Cockerill Company." It is one of the largest factories of engines and machinery—apart from war material—on the continent. Its headquarters occupy the old summer palace of the prince-bishops of Liége. In 1890 it established a branch at Hoboken on the Scheldt for the purpose of undertaking shipbuilding. The company employs 14,000 hands.

SERAJEVO (pronounced Serájevo, "the city of palaces"; Turkish, *Bosna Serai*; Ger. *Sarajewo*; Ital. *Seraglio*), the capital of Bosnia, situated on the Miljačka, a small right-hand tributary of the Bosna and on the railway from Bosna-Brod, 167 m. N., to Ragusa. Pop. (1895) 37,713, chiefly Serbo-Croatians, with small colonies of gipsies and Jews. The city, frequently called the "Damascus of the North," spreads over a narrow valley, closed on the east by a semicircle of rugged hills. Though still half oriental, and wholly beautiful, with its Turkish bazaar, its hundred mosques, wooden houses and cypress groves, it was largely rebuilt, after 1878, in western fashion. The river was also canalized, a telephone service introduced, and extensive drainage works carried out. Serajevo is the seat of the provincial government, of a Roman Catholic bishop, an Orthodox metropolitan, the highest Moslem ecclesiastical authority or *Reis-el-ulema*, and the supreme court. It is the centre of Bosnian education, containing the celebrated orphanage founded in 1869 by Miss Irby and Miss Mackenzie (afterwards Lady Sebright); the *Scheriat-Schule*, which derives its name from the Turkish code or *scheri*, and is maintained by the state for Moslem law-students; a gymnasium, a technical institute and a teachers' training-college. The *Begova Djamia* (*Džamia*), or mosque of Husref Bey, is only surpassed, among European mosques, by those of Adrianople and Constantinople. It was founded, in 1465, by Husref or Usref, pasha of Bosnia. The castle and barracks, occupied by an Austrian garrison, stand on a cliff commanding a fine view of the city. Other noteworthy buildings are the *konak* or governor's residence, the Roman Catholic and Orthodox cathedrals, the hospital, the townhall and the museum, with fine antiquarian and natural history collections. In the *Sinan Tekke* or Dervish monastery the ceremonies of the howling and dancing Dervishes may be witnessed. Turkish baths and cafés are numerous. The bazaar, or *čaršija*, is a labyrinth of dark lanes, lined with booths, where embroideries, rugs, embossed fire-arms, filagree-work in gold and silver, and other native wares are displayed. There are also large potteries, silk-mills, a brewery and a tobacco factory. At the mineral baths of Ilidze near the city, where many Roman remains have been found, a hydropathic establishment was opened in 1899. The whole neighbourhood is rich in prehistoric remains.

Founded, in 1262, by the Hungarian General Cotroman, under the name of Bosnavar or Vrhbosna, Serajevo was enlarged by Husref Bey two centuries later, and takes its name from the palace (Turkish, *serai*), which he founded. During the wars between Turkey and Austria, its ownership was often contested; and it fell before King Matthias I. of Hungary in 1480, and before Prince Eugene of Savoy in 1697. Destructive fires laid it waste in 1480, 1644, 1656, 1687 and 1789. It was chosen as the seat of Turkish government in 1850, instead of Travnik. In 1878 it was seized by the Austrians, under Baron Philippović.

SERAMPUR, a town of British India, in the Hugli district of Bengal, on the right bank of the river Hugli, opposite Barrackpore, on the East Indian railway, 12 m. from Howrah. Pop. (1901) 44,451. A Danish factory was established here about the middle of the 17th century, and called by them Frederiksnagar. With the rest of the Danish possessions in India, it was acquired by purchase by the English in 1845. Serampur was the home of the Baptist mission founded by Carey. The mission press has been transferred to Calcutta, but a training college is still maintained by the mission. There is a jute mill, and paper is manufactured.

SERAO, MATILDA (1856–), Italian novelist, was born at Patras in Greece. Her father was an Italian, a political emigrant, and her mother a Greek. She began by becoming a schoolmistress at Naples, and afterwards she described those years of laborious poverty in the preface to a book of short stories called *Leggende Napolitane* (1881). But attention was first attracted to her name by her *Novelle*, published in a paper of Rocco de Zerbi's, and later by her first novel, *Fantasia* (1883), which definitely established her as a writer full of feeling and analytical subtlety. She spent the years between 1880 and 1886 in Rome, where she published her next five volumes of short stories and novels, all dealing with ordinary Italian, and especially Roman, life, and distinguished by great accuracy of observation and depth of insight: *Cuore Inferno* (1881), *Fior di Passione* (1883), *La Conquista di Roma* (1885), *La Virtù di Checchina* (1884), and *Piccole Anime* (1883). With her husband, Epoardo Scarfoglio, she founded *Il Corriere di Roma*, the first Italian attempt to model a daily journal on the lines of the Parisian press. The paper was short-lived, and when it was given up Matilda Serao established herself in Naples, where she edited *Il Corriere de Napoli*, and in 1891 founded *Il Mattino*, which became the most important and most widely read daily paper of southern Italy. But the stress of a journalistic career in no way limited her literary activity; between 1890 and 1902 she produced *Paese di Cuccagna, Ventre di Napoli, Addio Amore, All' Erta Sentinella, Castigo, La Ballerina, Suor Giovanna della Croce, Paese di Gesu*, novels in which the character of the people is rendered with minute sensitive power and sympathetic breadth of spirit. Most of these have been translated into English.

Matilda Serao's place as a contemporary Italian novelist is one apart: she is a naturalist, but her naturalism should be understood in a much wider sense than that which is generally given to it. She is a naturalist because her books reflect life with the utmost simplicity of means, sometimes with an utter neglect of means, and at the same time she is an idealist through her high sense of the beauty and nobility which humanity can attain, and to which her writings continually aspire. All her work is truly and profoundly Italian; it is the literature of a great mass of individuals, rather than of one peculiarly accentuated individual; the joy and pain of a whole class rather than the perplexities of a unique case or type pulsates through her pages. Matilda Serao's defects are always defects of style; her want of sufficient choice of detail often clogs the movement of her narrative and mars the artistic effect of her always animated pages. Like Fogazzaro's, her speech is too often the popular speech of her particular province, in description as well as in dialogue.

SERAPHIM, the imaginary supernatural guardians of the threshold of Yahweh's sanctuary, only mentioned in Isa. vi. (Isaiah's vision). Their form is not described, but they have not only six wings (verse 2), but hands (verse 6) and feet (verse 2). They are of colossal height, for they overtop Him who is seated on the high throne; and with a voice that shakes the thresholds they proclaim the *Trisagion*, like the four "living creatures" (cf. CHERUBIM) in Rev. iv. 6-8. Probably in the lost Hebrew text of Enoch xx. 7 "seraphim" stood where the Ethiopic and the Greek give "the serpents" or "the dragons"; Paradise, serpents and cherubim are here made subject to Gabriel. In late Jewish writings, more recognized than "Enoch," they are classed among the celestials with the cherubim and the 'ophannim ("wheels," cf. Ezek. i.). Now as to their origin and significance. They may originally have had a serpent form, for it is difficult not to regard "seraphim" as originally (as in Num. xxi. 8) = "serpents"; cf. also the flying serpents of Israelitish folklore in Isa. xiv. 29. If so, Isaiah has transformed and ennobled these supernatural guardians of sacred things and persons. The "Nehushtan" broken in pieces under Hezekiah (2 Kings xviii. 4) may have given an impulse to the prophet's imagination. Was it not a greater thing to ennoble them than to destroy their artistic representation? There is no precise Babylonian or Egyptian equivalent, though attempts have been made to produce points of contact with Babylonian or Egyptian beliefs.

See further *Enc. Bib.* "Seraphim," and cf. Duhm's *Jesaia*, ed. 2 (1902), on Isa. vi. (T. K. C.)

SERAPION, or SARAPION (*flor. c.* 350), bishop of Thmuis in the Nile Delta and a prominent supporter of Athanasius in the struggle against Arianism (sometimes called, for his learning, Scholasticus), is best known in connexion with a prayer-book or sacramentary intended for the use of bishops. This document, contained in a collection of Egyptian documents in an 11th-century MS. at the Laura on Mount Athos, was published by A. Dmitrijewskij in 1894, but attracted little attention until independently discovered and published by G. Wobbermin in 1899. It is a celebrant's book, containing thirty prayers belonging to the mass (19-30, 1-6), baptism (7-11, 15, 16), ordination (12-14), benediction of oil, bread and water (17), and burial (18), omitting the fixed structural formulae of the rites, the parts of the other ministers, and almost all rubrication, except what is implied in the titles of the prayers. The name of Serapion is prefixed to the anaphora of the mass (1) and to the group 15-18: but whether this indicates authorship is doubtful; for whereas the whole collection is bound together by certain marks of vocabulary, style and thought, 15-18 have characteristics of their own not shared by the anaphora, while no part of the collection shows special affinities with the current works of Serapion.[1] But his name is at least a symbol of probable date and provenance: the theology, which is orthodox so far as it goes, but "conservative," and perhaps glancing at Arianism, shows no sign that the Macedonian question has arisen; the doxologies, of a type abandoned by the orthodox, and by *c.* 370 treated by Didymus of Alexandria as heretical; the apparent presupposition that the population is mainly pagan (1, 20); the exclusive appropriation of the mass to Sunday (19; cp. Ath. *ap. c. Ar.* 11), whereas the liturgical observance of Saturday prevailed in Egypt by *c.* 380; the terms in which monasticism is referred to—together point to *c.* 350: the occurrence of official interpreters (25) points to a bilingual Church, *i.e.* Syria or Egypt; and certain theological phrases (ἀγέννητος, ἐπιδημία, **μόνη** καθολικὴ ἐκκλησία) characteristic of the old Egyptian creed, and the liturgical characteristics, indicate Egypt; while the petition for rains (23), without reference to the Nile-rising, points to the Delta as distinguished from Upper Egypt. The book is important, therefore, as the earliest liturgical collection on so large a scale, and as belonging to Egypt, where evidence for 4th-century ritual is scanty as compared with Syria.

The rites form a link between those of the *Egyptian Church Order* (a 3rd- or early 4th-century development of the Hippolytean Canons, which are perhaps Egyptian of *c.* 260) and later Egyptian rites—marking the stage of development reached in Egypt by *c.* 350, while exhibiting characteristics of their own. I. The Mass has the Egyptian notes—a prayer before the lections, elsewhere unknown in the East; an exceptionally weighty body of intercessions after the catechumens' dismissal, followed by a penitential act, probably identical with the ἐξομολόγησις of *Can. Hippol.* 2, which disappeared in later rites; a setting of the Sanctus found in several Egyptian anaphoras; the close connexion of the commemorations of the offerers and of the dead; and the form of the conclusion of the anaphora. The structure of the communion—with a prayer before and prayers of thanksgiving and blessing after—shows that Egypt had already developed the common type, otherwise first evidenced in Syria, *c.* 375 (*Ap. Const.* viii. 13). Among the special characteristics of Serapion are the simplicity of the Sanctus, and of the Institution, which lacks the dramatic additions already found in *Ap. Const.*; the interpolation of a passage containing a quotation from *Didachē* 9 between the institutions of the bread and of the chalice; the form of the ἀνάμνησις; and the invocation of the Word, not of the Holy Ghost, to effect consecration. That the Lord's Prayer before communion is not referred to may be only because it is a fixed formula belonging to the structure of the rite. II. The Order of Baptism has a form for the consecration of the water, and a preliminary prayer for the candidates, perhaps alluding to their exorcism; a prayer for steadfastness following the renunciation and the confession of faith; the form of anointing with oil; appropriate prayers preceding and following the act of baptism; and the prayer of confirmation with imposition of the hand, chrism and crossing. All this corresponds to and fills up the outline of the *Church Order* and allusions in 4th-century writers, and is in line with later Egyptian rites. III. Forms of Ordination are provided only for deacons, presbyters and bishops, the orders of divine institution (12). They are concise, but of the normal type. That for deacons (12) commemorates St Stephen, invokes the Holy Ghost, and prays for the gifts qualifying for the diaconate. That for presbyters (13) recalls the Mosaic LXX, invokes the Holy Ghost, and asks for the gifts qualifying for administration, teaching, and the ministry of reconciliation. That for bishops (14) appeals to the mission of our Lord, the election of the apostles, and the apostolic succession, and asks for the " Divine Spirit " conferred on prophets and patriarchs, that the subject may " feed the flock " " unblamably and without offence continue in " his office. The minor orders, interpreters, readers and subdeacons (25) are evidently, as elsewhere in the middle of the 4th century, appointed without sacramental ordination. IV. The use of exorcised or blessed oil, water and bread is fully illustrated by the lives of the fathers of the desert (cp. the Gnostic use, Clem. Al. *Excerpta* 82). Serapion has a form of benediction of oil and water (5) offered in the mass (like *Can. Hippol.* and *Ch. Ord.* for oil), probably for the use of individual offerers. A longer form for all three matters (17) perhaps has in view the general needs of the Church in the visitation of the sick. The occurrence in both prayers of " the Name " and the commemoration of the Passion, Resurrection, &c., corresponds with early allusions, in Origen and elsewhere, to the usual form of exorcism. V. For burial of the dead Serapion gives a prayer for the departed and the survivors (18). But the funeral procession is alluded to (*ἐκκομιζομένου*), and in the mass (1) the particular commemoration of departed persons is provided for. Hence we have the elements of the 4th-century funeral, as we know it in Egypt and elsewhere: a preliminary office (of readings and psalms) to which the prayer belongs, the procession (with psalmody) to the cemetery, the burial and the mass *pro domitione*.

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[1] These are: a vigorous and acute refutation of the Manichaeans, and some letters. A book on the titles of the Psalms has not survived.

AUTHORITIES.—Dmitrijewskij in *Trudy* (Journal of the Eccl. Acad. of Kiev, 1894), No. 2; separately (Kiev, 1894); reviewed by A. Favlov, *Χρονικὰ Βυζαντινά*, i. 207-213; cp. *Byzant. Zeitschr.* iv. 1 (1895), p. 193; G. Wobbermin in Harnack-Gebhardt, *Texte u. Untersuch.*, new series, ii. 3 *b* (1899); P. Drews, " Über Wobbermins Altchristliche liturgische Stücke aus d. Kirche Ägyptens " in *Zeitschr. f. Kirchen-Geschichte*, xx. 4 (Oct. 1899, Jan. 1900); F. E. Brightman, " The Sacramentary of Serapion of Thmuis " in *Journal of Theological Studies*, i. and ii. (Oct. 1899, Jan. 1900); J. Wordsworth, *Bishop Sarapion's Prayer-Book* (London, 1899); P. Batiffol in *Bulletin de lit. ecclés.* p. 69 sqq. (Toulouse, 1899). (F. E. BR.)

SERAPIS, the famous Graeco-Egyptian god. The statue of Serapis in the Serapeum of Alexandria was of purely Greek type and workmanship—a Hades or Pluto enthroned with a basket or corn measure on his head, a sceptre in his hand, Cerberus at his feet, and (apparently) a serpent. According to Plutarch, Ptolemy Soter stole it from Sinope, having been bidden by the unknown god in a dream to bring him to Alexandria. On its arrival the statue was pronounced to be Serapis by two experts in religious matters: the one the Eumolpid Timotheus, the other the Egyptian Manetho. This story may not be true (some contend that Sinope as the provenance of the statue originated in the hill of Sinopeion, *i.e.* place of Apis (?), a name given to the site of the Serapeum at Memphis), but there is little doubt that Ptolemy Soter fixed the iconic type to serve for the god of the new capital of Egypt, where it was soon associated with Isis and Harpocrates in a triad. His policy was evidently to find a deity that should win the reverence alike of Greeks and Egyptians. The Greeks of that day would have had little respect for a grotesque Egyptian figure, while the Egyptians were more willing to accept divinity in any shape. A Greek statue was therefore chosen as the idol, and it was proclaimed as the anthropomorphic equivalent of a much revered and highly popular Egyptian beast-divinity, the dead Apis, assimilated to Osiris. The Greek figure probably had little effect on the native ideas, but it is likely that it served as a useful link between the two religions. The god of Alexandria soon won an important place in the Greek world. The anthropomorphic Isis and Horus were easily rendered in Greek style, and Anubis was prepared for by Cerberus. The worship of Serapis along with Isis, Horus and Anubis spread far and wide, reached Rome, and ultimately became one of the leading cults of the west. The destruction in A.D. 385 of the Serapeum of Alexandria, and of the famous idol within it, after the decree of Theodosius, marked the death-agony of paganism throughout the empire.

It is assumed above that the name Serapis (so written in later Greek and in Latin, in earlier Greek Sarapis) is derived from the Egyptian Userhapi—as it were Osiris-Apis—the name of the bull Apis, dead and, like all the blessed dead, assimilated to Osiris, king of the underworld. There is no doubt that Serapis was before long identified with Userhapi; the identification appears clearly in a bilingual inscription of the time of Ptolemy Philopator (221–205 B.C.), and frequently later. It has, however, been contended by an eminent authority (Wilcken, *Archiv für Papyrusforschung*, iii. 249) that the parallel occurrence of the names Sarapis and Osorapis (Userhapi) points to an independent origin for the former. But doublets, *e.g.* Petisis-Petēsis, are common in Graecisms of Egyptian names. The more accurate form is then generally the later, found in documents written by Greeks in familiar intercourse with Egyptians, the less accurate is traditional from an older date in the mouths of pure Greeks and Hellenists, and is used in literary writings. Thus Sarapis would be the literary and official form of the name; it might be traditional, dating perhaps from the reign of Amasis or from the Persian period. We know that in Herodotus's day, and long before, the discovery of the new Apis was the occasion of universal rejoicing, and his death of universal mourning. The ancient Serapeum (Puserhapi) and the name Userhap would be almost as familiar to early Greek wanderers in Egypt as the Apieum and Apis itself.

But why was a Plutonic Serapis selected rather than another god to furnish the Egyptian element to the chief divinity of Alexandria? According to one account in Tacitus, Sarapis was the god of the village of Rhacotis before it suddenly expanded into a great capital; but it is not very probable that temples were erected to the dead Apis except at his Memphite tomb. Alexander had courted Ammon. But Ammon had little hold on the affections of the Egyptian people. He was the god of Ethiopia and the Thebais which were antagonistic to the progressive north. On the other hand, Osiris with Isis and Horus was everywhere honoured and popular, and while the artificer Ptah, the god of the great native capital of Egypt, made no appeal to the imagination, the Apis bull, an incarnation of Ptah, threw Ptah himself altogether into the shade in the popular estimation. The combination of Osiris and the Apis bull which was found in the dead Apis was thus a most politic choice in naming the new divinity, whose figure represented a god of the underworld wearing an emblem of fruitfulness.

The earliest mention of Sarapis is in the authentic death scene of Alexander, from the royal diaries (Arrian, *Anabasis*, vii. 26). Here Sarapis has a temple at Babylon and is of such importance that he alone is named as being consulted on behalf of the dying king. It would considerably alter our conception of the dead Apis if we were to find that a travelling shrine of his divinity accompanied Alexander on his expedition or was set up for him in Babylon. On the other hand, the principal god of Babylon was Zeus Belus (Bel Marduk), and it is difficult to see why he should have been called Sarapis on this occasion. Evidence has, however, been found to prove that Ea, entitled Šarapsi, " king of the deep (sea)," who was also great in learning and magic, had a temple in the city (Lehmann in *Beiträge zur alten Geschichte*, iv. 396). It seems unwarranted to make this Šarapsi = Sarapis travel to Sinope and thence to Alexandria as the type of the Egyptian god; but whether or no the Egyptian appellation Sarapis was applied to express the Babylonian Šarapsi, the part it played in the last days of Alexander may have determined the choice by which the Egyptian Osiris-Apis supplied the name and some leading characteristics to the god of Alexandria.

See Isis; A. Bouché-Leclercq, *Histoire des Lagides*, i. (1903), ch. iv.; J. G. Milne, *History of Egypt under Roman Rule* (1898), p. 140; G. Lafaye, *Histoire du culte des divinités d'Alexandrie hors de l'Égypte* (Paris, 1884). (F. Ll. G.)

SERENA, or La Serena, a city of Chile, capital of the province of Coquimbo, on the S. bank of the Coquimbo river about 5 m. from the sea. Pop. (1895) 15,712; (1902, estimate) 19,536. As the see of a bishop and the most important town politically of the semi-arid region, it contains a number of important public edifices, including a cathedral (1844–1860; 216 ft. long, 66 ft. wide) built of a light porous stone, an episcopal residence, several convents, a large hospital, an orphans' asylum, a beggars' asylum and a lazaretto. It is the seat of a court of appeal for Atacama and Coquimbo, and has an excellent lyceum and other schools, including a school of mines. It has a good water supply, well-paved streets, gas illumination, tramway service and several small industries, including brewing and the making of fruit conserves. The annual rainfall is only 1·6 in. and its mean annual temperature is 59·2°. Its railway connexions include a line to Coquimbo (9 m.), its port, one to the Tamaya copper mines, and a narrow-gauge line up the valley of the Elqui to Guanta, through a region celebrated for its fruit. It is also in direct railway communication with the national capital.

Serena was founded by Juan Bohon in 1544, on the opposite side of the river, and was named after Pedro Valdivia's birthplace in Estremadura, Spain. It was destroyed by the Indians soon after, and was rebuilt on its present site in 1549 by Francisco de Aguirre.

SERENADE (from Ital. *serenata*, Lat. *serenus*, bright; the Italian term being applied, partly by confusion with *serus*, late, and partly through the use of *Serena*—cf. Gr. σελήνη—as an epithet for the moon, to a form of courting music played at night in the open air; whence also the synonym *Notturno*), in music; a term classically applied to a light kind of symphony, more rarely a piece of chamber music, in a light sonata style with several extra movements, and in a few cases (as in the two serenades of Beethoven) not containing any fully developed examples of first-movement form. The *divertimento* is a similar composition, more often for chamber music, and frequently on a scale altogether too small for the sonata style to show itself, though some examples by Mozart (*e.g.* those for strings and two horns) are very large. The *cassation* is a smaller composition, beginning (like Beethoven's serenade op. 8) with a march. The classics of the serenade forms are among the works of Mozart and Haydn. Mozart's larger and later serenades, from the "Haffner" serenade onwards, are among his most delightful and voluminous lighter instrumental works. His two serenades for eight wind instruments are more serious, and that in C minor (which he afterwards arranged as a string quintet) is a majestic work in four normal movements, which Mozart probably called a serenade only because he did not find the term *octet* then in common use.

The typical scheme of a large serenade or divertimento differs from that of a symphony only in having six movements instead of four, the additions being another slow movement and minuet or scherzo. Beethoven's septet and Schubert's octet are on this plan, and are just as much serenades as Mozart's "Haffner" serenade, which is (not counting introductions) in eight movements with a kind of violin concerto in the middle. The six-movement scheme (though without the serenade style) was adopted by Beethoven in one of the profoundest and most serious works in all music, the string quartet in B flat, Op. 130.

Brahms's first essays in symphonic form took the shape of two orchestral serenades, of which the first was originally sketched for a large group of solo instruments. If it had finally taken that form Brahms would have called it a divertimento.

Other applications of the term in music are merely literary. Even its use, from the 17th century onwards, for a kind of operetta was clearly no more than a natural allusion to the notion of serenades as addressed at night by minstrels to ladies and by clients to patrons. (D. F. T.)

SERENUS, SAMMONICUS, Roman savant, author of a didactic medical poem, *De medicina praecepta* (probably incomplete). The work (1115 hexameters) contains a number of popular remedies, borrowed from Pliny and Dioscorides, and various magic formulae, amongst others the famous Abracadabra (*q.v.*), as a cure for fever and ague. It concludes with a description of the famous antidote of Mithradates VI. of Pontus. It was much used in the middle ages, but is of little value except for the ancient history of popular medicine. The syntax and metre are remarkably correct. It is uncertain whether the author was the famous physician and polymath, who was put to death in A.D. 212 at a banquet to which he had been invited by Caracalla, or his son, the tutor of the younger Gordian. The father, who was one of the most learned men of his age, wrote upon a variety of subjects, and possessed a library of 60,000 volumes, bequeathed to his son and handed on by the latter to Gordian.

The editio princeps (ed. Sulpitius Verulanus, before 1484) is very rare; later ed. by J. G. Ackermann (Leipzig, 1786) and E. Bährens, *Poetae Latini minores*, iii.; see also A. Baur, *Quaestiones Sammoniceae* (Giessen, 1886); M. Schanz, *Geschichte der römischen Literatur*, iii. (1896); Teuffel, *Hist. of Roman Literature* (Eng. trans., 1900), 374, 4, and 383.

SERENUS "of Antissa," Greek geometer, probably not of Antissa but of Antinoeia or Antinoupolis, a city in Egypt founded by Hadrian, lived, as may be safely inferred from the character and contents of his writings, long after the golden age of Greek geometry, most probably in the 4th century, between Pappus and Theon of Alexandria. Two treatises of his have survived, viz. *On the Section of the Cylinder* and *On the Section of the Cone*, the Greek text of which was first edited by Edmund Halley along with his Apollonius (Oxford, 1710), and has now appeared in a definitive critical edition by J. L. Heiberg (*Sereni Antissensis opuscula*, Leipzig, 1896). A Latin translation by Commandinus appeared at Bologna in 1566, and a German translation by E. Nizze in 1860–1861 (Stralsund). Besides these works Serenus wrote commentaries on Apollonius, and in certain MSS. of Theon of Smyrna there appears a proposition "of Serenus the philosopher, from the Lemmas" to the effect that, if a number of rectilineal angles be subtended, at a point on a diameter of a circle which is not the centre, by equal arcs of that circle, the angle nearer to the centre is always less than the angle more remote (Heiberg, preface, p. xviii.).

The book *On the Section of the Cylinder* had for its primary object the correction of an error on the part of many geometers of the time who supposed that the transverse sections of a cylinder were different from the elliptic sections of a cone. When this has been done, Serenus, in a series of theorems ending with Prop. 19 (ed. Heiberg), shows in Prop. 20 that "it is possible to exhibit a cone and a cylinder cutting one another in one and the same ellipse." He then solves problems such as—"given a cone (cylinder) and an ellipse on it, to find the cylinder (cone) which is cut in the same ellipse as the cone (cylinder)" (Props. 21, 22); "given a cone (cylinder) to find a cylinder (cone), and to cut both by one and the same plane so that the sections thus formed shall be similar ellipses" (Props. 23, 24). In Props. 27, 28 he deals with subcontrary and other similar sections of a scalene cylinder or cone. He then gives the theorems: "All the straight lines drawn from the same point to touch a cylindrical (or conical) surface, on both sides, have their points of contact on the sides of a single parallelogram (or triangle)" (Props. 29, 32). Prop. 31 states indirectly the property of a harmonic pencil.

The treatise *On the Section of the Cone*, though Serenus claims originality for it, is unimportant. It deals with the areas of triangular sections of right or scalene cones by planes through the vertex, finding *e.g.* the maximum triangular section of a right cone and the maximum triangle through the axis of a scalene cone, and solving, in some easy cases, the problem of finding triangular sections of given area. (T. L. H.)

SERERS, a Negroid people, living in Senegambia. They are of the same stock as the Wolof, and in some parts form communities with them. Elsewhere they have mixed with the Mandingo, to which race belong most of their ruling families. The country of the pure Serers lies between the Gambia and Salum rivers to the south of Cape Verde. In this domain of nearly 5000 sq. m. the tribe has two main divisions, the None Serers and the Sine Serers. The Serers are an extraordinarily tall race, even excelling in height their kinsfolk, the Wolof. Men of 6 ft. 6 in., with muscular development in proportion, are by no means rare. They are less black than the Wolof and have features more purely negroid with coarser lips and heavier jaws. Many Serers are nominally Mahommedans, but nature-worship is still prevalent. Their two chief gods are Takhar, god of justice, and Tiurakh, god of wealth, who are worshipped at the foot of trees. Snakes, too, have their cult, and formerly living animals were sacrificed to them. A belief in transmigration, as shown by their funeral customs, is general among the Serers. They are an honest and industrious people, but are very heavy drinkers.

SÉRES, Serros or Siros, chief town of a sanjak in the vilayet of Salonica, European Turkey, on Lake Takhino, a navigable expansion of the river Karasu or Struma (ancient *Strymon*), 43 m. by rail N.E. of Salonica. Pop. (1905) about 30,000, of whom about half are Bulgarians (one-third of them being Mussulmans), nearly one-fourth Greeks, about one-seventh Turks and the remainder Jews. Séres is built in a district so fertile as to bear among the Turks the name of Altin Ovassi, or Golden Plain, and so thickly studded with villages as to appear, when seen from the outliers of Rhodope on the north, like a great city with extensive gardens. It is the seat of a Greek archbishop and patriarch. It consists of the old town, *Varosh*, situated at the foot and on the slope of the hill crowned by the old castle, and of the new town built in the European fashion on the plain, and forming the commercial centre. The principal buildings are the Greek archiepiscopal palace, the Greek cathedral, restored since the great fire of 1879, by which it was robbed of its magnificent mosaics and woodwork, the Greek gymnasium and hospital (the former built of marble), the richly endowed Eski Jami mosque, and the ruins of the once no less flourishing Ahmed Pasha or Hagia Sophia mosque, whose revenues were formerly derived from the Crimea. On a hill above the town are the ruins of a fortress described in a Greek inscription as a "tower built by Helen in the mountainous region." Séres is the headquarters of the Turkish wool trade, and has also manufactures of cloth and carpets. There is a large trade in rice and cereals, and the other exports include tobacco and hides.

Séres is the ancient *Seris, Sirae or Sirrhae*, mentioned by Herodotus in connexion with Xerxes's retreat, and by Livy as the place where Aemilius Paulus received a deputation from Perseus. In the 14th century, when Stephen Dushan of Servia assumed the title emperor of Servia, he chose Sirrhae as his capital; and it remained in the hands of the Servians till its capture by Sultan Murad II. (1421–1451).

SERFDOM (from Fr. *serf*, Lat. *servus*, a servant or slave). The notion of serfdom is distinct from those of freedom and of slavery. The serf is not his own master: to perform services for other persons is the essence of his status, but he is not given over to his lord to be owned as a thing or an amimal—there are legal limits to the lord's power. Serfdom is very often conceived as a perpetual adherence to the soil of an estate owned by a lord, but this praedial character is not a necessary feature of the condition. Hereditary serfdom may sometimes assume the shape of a personal relation between servant and master. Such being the general features of serfdom, it is sure to appear in very different ages and countries. It will be formed naturally, for instance, in cases when one barbarous community conquers another, but it is not able to destroy entirely the latter or to treat its members as mere chattels. This mitigated form of appropriation of human beings by their conquerors may be brought about as well by the paucity or comparative weakness of the victors as by the difficulty for them to draw income from pure slaves. In a state of backward agriculture and natural economy it will sometimes be more profitable for the conquerors as well as for the conquered to leave the dependent population in their own households and on their own plots, at the same time taxing them heavily in the way of tribute and services. Such an arrangement clearly obtained in several of the agricultural states on ancient Greece. The Penestae of Thessaly appear as a remnant of a distinct tribe settled on the confines of Macedonia and at the same time as a class of tributary peasants serving Thessalian aristocrats. The Mnoitae, Klarotae and Aphamiotae of Crete were more or less in the same position. Their chief occupation was the cultivation of the shares (κλᾶροι) of the Dorian aristocracy, but they lived in households of their own and were considered as subjects rather of the Cretan commonwealths than of private men. The relation between both classes is well illustrated by a fragment of the Cretan poet Hybrias, who thus glories in his shield and sword: "I till the land with them, I press the wine from the grapes. On account of them I am called the lord of the Mnoa." Even in the case of the Helots of Sparta, although their condition was very hard and they were made to perform services to any Spartiate who might require them to do so, features of a similar tributary condition are apparent. The chief work of the Helots was to provide a certain quantity of corn, wine and oil for the lords of the shares on which they were settled (roughly 82 medimni of barley a year per share); personal services to other Spartiates were exceptional. Pollux in his account of the Helots places them distinctly in an intermediate position between free men and slaves. The fact that in these instances governments had a good deal to say in the regulation of the status of such serfs is well worth noting: it explains to a great extent the legal limitations of the power of the lords. Even downright slaves belonging to the state or to some great temple corporation were treated better and carefully distinguished from private slaves by the Greeks.

We shall not be astonished to find, therefore, in the Hellenistic states of Asia a population of peasants who seem to have been in a condition of hereditary subjection and adherent to the glebe on the great estates of the Seleucid kings (see Rostowtzew in Lehmann's *Beiträge zur alten Geschichte*, ii.). It is not unlikely that the customs of these λαοὶ βασιλικοί went back to the epoch of the Persian monarchy. In any case these peasants (γεωργοί) were certainly not slaves, while, on the other hand, their condition was closely bound up with the cultivation of the estates where they lived. The regulation by the state of the duties and customary status of peasants on government domains turns out to be one of the roots of serfdom in the Roman world, which in this respect as in many others follows on the lines laid down by Hellenistic culture. It is important for our purpose to notice that the condition of *coloni* was developed as a result of historic necessity by the working of economic and social agencies in the first centuries of the Roman empire and was made the subject of regular legislation in the 4th and 5th centuries. In the enactments of Justinian, summing up the whole course of development (C.J. xi., 48, 23), two classes of coloni are distinguished—the *adscripticii*, representing a more complete state of serfdom, and the free coloni, with property of their own. But the whole class, apart from minor variations, was characterized by the idea that the peasants in question were serfs of the soil (*servi terrae*) on which they were settled, though protected by the laws in their personal and even in their praedial status. Thus the ascription to the soil, although originally a consequence of ascription to the tributes (*adscriptio censibus*), became the mark of the legal status of serfdom. The emperors actually tried in their legislation to prevent the landowners from evicting their coloni and from raising their rents. In this way fixity of tenure and service was aimed at and to a certain degree enforced by the state.

With the break-up of the Roman empire the legal protection in regard to serfs could not be kept up in the same way as before. The weak governments which took the place of imperial authority were not able to maintain the strict discipline and the stress of judicial power which would have been necessary to guarantee the tenure and status of the serfs. And yet serfdom became the prevailing condition for the lower orders during the middle ages. Custom and economic requirements produced checks on the sway of the masters which proved effectual even when legal protection was insufficient. The direction of events towards the formation of serfdom is already clearly noticeable in Celtic communities. In Wales and Ireland the greater part of the rural working classes was reduced not to a state of slavery, but to serfdom. The male slave (W. *cæth*) does not play an important part in Celtic economic arrangements: there is not much room for his activity as a completely dependent tool of the master. The female slave (*cumal*) was evidently much more prominent in the household. Prices are reckoned out in numbers of such slaves and there must have been a constant call for them both as concubines and as household servants. As for male workmen they are chiefly *tæogs* in Wales, that is half-free bondmen with a certain though base standing in law. Even these, however, could not be said to form the social basis for the existence of an upper free class. The latter was numerous, not wealthy as a rule, and had to undertake directly a great part of the common work; as may be seen from the extent of the free and servile tenures on the estates carved out for English conquerors in Wales and Ireland. Anyhow, the tæog class of half-free peasants stands by the side of the smaller tribesmen as subjected to heavier burdens in the way of taxation and services in kind. In Wales they are distributed into *gavells* and *gwelys*, like the free tribesmen themselves and thus connected with the land, but there is nothing to show that this connexion was deemed a servitude of the glebe. The tie with the lord is after all a personal one.

The Germanic tribes moved on similar lines. Slavery was not a natural institution with them, although it did occur. In the eyes of a Roman observer, however, even downright slavery was turned into serfdom by the force of circumstances. As Tacitus tells us, the ancient Germans made use of their slaves in a different way from the Romans. These slaves had their separate households, while the masters exacted tribute from them in the shape of corn, cattle or clothes, and the serfs had to obey to the extent of rendering such tribute (Tacitus, *Germania*, 21). This means, of course, that it was in the interest of the master to levy tribute and not to organize slave labour. After the conquest of the provinces by the Germanic invaders the Roman stock of coloni naturally combined with German tributary peasants to form medieval serfdom. A half-free group is marked off in the early laws under the designation of *liti*, *lazzi*, *aldiones*. But in process of time this group was merged with freedmen, settled slaves (*servi casati*) and small freedmen into the numerous class of serfs (*servi*, *rustici*, *villani*) which appears under different names in all western European countries. The customary regulations of the duties of an important group of this class in regard to their lords are clearly expressed in the Bavarian law (7th century): serfs settled on the estates of the church have to work, as a rule, three days in the week for their masters and are subject to divers rents and payments in kind. The regulations in question, although entered in a legal text, are not a legislative enactment but the result of a slow process of adjustment of claims between the ecclesiastical landowners and masters on one side and their rural dependents on the other. There can be no doubt that they were largely representative of the conditions prevailing on Bavarian estates belonging not only to the church but also to the duke and to lay lords. The old English *Rectitudines singularum personarum* (11th century) present other variations of the same customary arrangements. The rustic class appears in them to be differentiated into several subdivisions—the *geneats* performing riding duties and occasional services, the *gebûrs* burdened with week work and the *cotsets* holding cottages and performing light work in the shape of one day in the week and services to match (see VILLENAGE). Of these various groups that of the gebûrs corresponds more closely to the continental serfs (*coloni*, *Hörige*, *unfreie Hintersassen*).

The dualism characteristic of medieval serfdom, its formation out of debased freedom and rising servitude, may be traced all through the history of the middle ages. French jurists of the 13th century, *e.g.*, lay stress on a fundamental difference in law between the complete serf whose very body belongs to his lord (cf. the German *Leibeigenschaft*) and the villein or *roturier*, who is only bound to perform certain duties and ought not to be further oppressed by the landowners on whose soil he is settled (Beaumanoir, *Coutume de Beauvaisis*). But the same texts which draw the line between the two classes make it clear that there were no other guarantees to the maintenance of the rights of the superior rustics than the moral sense and the self-interest of their masters. Should the lords infringe the well-established rights of their subjects, the latter had no court to appeal to and only God could inflict punishment on the oppressors. It must be added, however, that even in the darkest times of feudal sway, economic forces provided some protection for the peasants who had lost the means of appealing to legal remedies. A certain balance had to be struck in most cases between the greed and selfishness of the class of landowners and the necessary requirements and human aspirations of the subjects. Feudal masters could not afford to act with the ruthless cruelty of slaveholders relying on government and civilization to back their claims to a complete sway over their human chattels. Lords who did not wish to see their estates deserted had to submit to the rule of custom in respect of exactions. And the screen of rural custom proved sufficient to allow of the growth of some property in the hands of the toiling class, a result which in itself rendered possible further emancipation.

A very instructive example of the formation of serfdom is presented by the history of Russia. Personal slavery in the sense in which it existed in the West was practised in ancient Russia (*kholopi*) and arose chiefly from conquest, but also from voluntary subjection in cases of great hardship and from the redemption of fines and debts (cf. the O. Eng. *wite-theow*). But the number of personal serfs was not large and they were principally to be met in the households of great people. The great mass of the peasantry was originally free. Even when in the course of time landownership was appropriated by the crown, the ecclesiastical corporations and the nobles, the tillers of the land retained their personal freedom and were considered to be farmers holding their plots under contracts. They were free to leave their farms provided they were able to effect a settlement in regard to all outstanding rent arrears and debts. Members of the household who were not directly responsible for the farms could look out for their livelihood as they pleased. The custom of the country gradually took the shape of a simultaneous resettlement of all conditions of rural occupation about St George's day (November 24), that is after the gathering of the harvest and the practical winding up of rural work. Such was the legal state of affairs up to the end of the 16th century. A great change supervened, however, through the slow working of economic and political causes. The peasants settled under the sway of nobles and churches could very seldom produce a clean bill in regard to their money relations with the landlords. They generally had to account for arrears and got into debt from the very start by taking over stock with the farm. The longer they remained on the same plot, the more entangled became the ties of their economic dependence. Thus, as in the case of many Roman coloni, thoroughly free settlers gradually lapsed into a state of perpetual subjection from which they could not emancipate themselves by legal means. On the other hand, the growth of the Muscovite state with its fiscal and governmental requirements involved a watchful repartition of burdens among the population and led ultimately to a system of collective liability in which the farms were considered chiefly as the sources of taxable income. The government was directly interested in maintaining their efficiency and in preventing migrations and desertions which led to a weakening of the taxpaying communities. A third aspect of the question must also not be desregarded, namely, the keen competition between landowners trying to attract settlers to their estates at the expense of their needy or less powerful neighbours. The first legislative measures of the Moscow rulers directed towards the establishment of a servile class similar to the Roman coloni fall into the first years of the 17th century (A.D. 1601, 1606) and consist in enactments against landowners depriving their neighbours of the tillers of their estates. But matters were clearly ripe for a wider application of the view that the peasant ought to stick to the soil, and the restoration of the Muscovite empire under the Romanovs brought with it the consolidation of all rural arrangements around this principle. Peter the Great regularized and completed this evolution by effecting a comprehensive cadastre and census of the rural population. The ultimate result was, however, not only the fixity of peasant tenures, but the subjection of the entire peasant population as a separate class (*Krepostrie*) to the personal sway of the landowners. The state insisted to a certain extent on the public character of this subjection and drew distinctions between personal slavery and serfdom. In the midst of the peasants themselves there lived a consciousness of their special claims as to tenant right, claims which sometimes assumed the shape of the quaint saying, "The land is ours, though we are yours." But, in fact, serfdom naturally took the form of an ugly ownership of live chattels on the part of a privileged class, and all sorts of excesses, of cruelty, ruthless exploitation and wanton caprice, followed as a matter of course. Emancipation was brought about in the 19th century by economic causes as well as by humanitarian considerations. The fabric of a state built up on the basis of serfdom proved inadequate to meet the tasks of modern times. Private enterprise and the free application of capital and labour were hindered in every way by the bondage of the peasant class. Even such a necessary measure as that of moving cultivators to the rich soil of the south was thwarted by the adherence of the northern peasantry to the glebe. On the humanitarian and liberal ideas making for emancipation we need not dwell, as they are self-evident. After several half-hearted attempts directed in the course of Nicholas I.'s reign to face the question while safeguarding at the same time the rights and privileges of the old aristocracy, the moral collapse of the *ancien régime* during the Crimean war brought about the Emancipation Act of the 19th of February 1861, by which some 15 millions of serfs were freed from bondage. The most characteristic feature of this act was that the peasants, as distinct from household servants, received not only personal freedom but allotments in land in certain proportions to their former holdings. The state indemnified the former landowners, and the peasants had to redeem the loan by yearly payments extending over a number of years.

If we turn back from this course of development to the history of serfdom and emancipation in the West striking contrasts appear. As we have already noticed, medieval serfdom in the West was the result of a process of customary feudal growth hardly interfered with by central governments. The loosening of bondage is also, to a great extent, prepared by the working of local economic agencies. Villeins and serfs in France rise gradually in the social scale, redeem many of the onerous services of feudalism and practically acquire tenant-right on most of the plots occupied by them. Tocqueville has pointed out that already before the revolution of 1789 the greater part of the territory of France was in the hands of small peasant owners, and modern researches have confirmed Tocqueville's estimate. Thus feudal overlordship in France had resolved itself into a superficial dominion undermined in all directions by economic realities. The fact that there still existed all kinds of survivals of harsh forms of dependence, *e.g.* the bondage of the serfs in the Jura Mountains, only rendered the contrast between legal conditions and social realities more pointed. The night of the 4th of August 1789 put an end to this contrast at one stroke and the further history of rural population came to depend entirely on the play of free competition and free contract.

The evolution of serfdom in Germany was effected by the working of somewhat more complicated causes. The regulating influence of government made itself felt to a greater extent, especially in the east. The colonization of the eastern provinces and the struggle against the Slavs necessitated a stronger concentration of aristocratic power, and the reception of Roman law during the 15th and 16th centuries hardened the forms of subjection originated by customary conditions. It may be said in a general way that Germany occupied in this respect, as in many others, an intermediate position between the west of Europe and Russia. Emancipation followed also a middle course. It was brought about chiefly by governmental measures, although the ground was to a great extent prepared by social evolution. The reforms of Stein and Hardenberg in Prussia, of the French and of their clients in South Germany, opened the way for a gradual redemption of the peasantry. Personal serfdom (*Leibeigenschaft*) was abolished first, hereditary subjection (*Erbunterthänigkeit*) followed next. Emancipation in this case was not connected with a recognition of the full tenant-right of the peasants; they had to part with a good deal of their land. To the last the landowners were not disturbed in their economic predominance, and succeeded very well in working their estates by the help of agricultural labourers and farmers. In the west the small peasant proprietorship had a better chance, but it arose in the course of economic competition rather than through any general recognition of tenant-right. On the whole serfdom appears as a characteristic corollary of feudalism. It grew up as a consequence of customary subjection and natural husbandry; it melted away with the coming in of an industrial and commercial age.

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SERGEL, JOHAN TOBIAS (1740–1814), Swedish sculptor, was born on the 8th of September 1740 in Stockholm. After studying for some time in Paris he went to Rome, where he remained for twelve years and sculptured a number of groups in marble, including, besides subjects from classical mythology, a colossal representation of "History," in which are depicted the achievements of Gustavus Adolphus before the Chancellor Oxenstierna. It was in Rome also that he modelled the statue of Gustavus III., subsequently cast in bronze and purchased by the city of Stockholm in 1796. Sergel returned to Stockholm in 1779 and continued to produce his works there. Among them are a tomb for Gustavus Vasa, a monument to Descartes, and a large relief in the church of St Clarens in Stockholm, representing the Resurrection. He died in his native city on the 26th of February 1814.

SERGINSK, UPPER and **LOWER,** two towns of East Russia, in the government of Perm, 53 and 44 m. W.S.W. of Ekaterinburg respectively. They are noted for their iron-works. Upper Serginsk, which had a population of 8000 in 1897, yields annually over 8000 tons of pig-iron and 12,000 tons of steel. Lower Serginsk, with 14,000 inhabitants, yields about 7250 tons of pig-iron and 14,500 tons of steel. The latter town is well built and has a monument to Alexander II. Mineral waters (sulphurous) are found close by.

SERGIPE (originally SERGIPE D'EL-REY), a small Atlantic state of Brazil, bounded N. by Alagôas, E. by the Atlantic, and S. and W. by Bahia. Area, 15,093 sq. m. Pop. (1900) 356,264, three-fourths half-castes and negroes. The São Francisco forms its northern boundary, and the drainage of the northern part of the state is northward and eastward to that river. The southern half of the state, however, slopes eastward and is drained directly into the Atlantic through a number of small rivers, the largest of which are the Irapiranga (whose source is in the state of Bahia and which is called Vasa Barris at its mouth), the Real, and the Cotinguiba. These streams are navigable for short distances, but are obstructed by sand-bars at their mouths, that of Cotinguiba being especially dangerous. The surface of the state resembles in part that of Bahia, with a zone of forested lands near the coast, and back of this a higher zone of rough open country, called *agrestes*. There is a sandy belt along the coast, and the western frontier is slightly mountainous. The intermediate lands are highly fertile, especially in the forested region, where the rainfall is abundant. Further inland the year is divided into wet and dry seasons with occasional prolonged droughts. These districts are pastoral, and the lower fertile lands are cultivated for sugar, cotton, maize, tobacco, rice, beans, and *mandioca*—sugar being the principal product.

Rubber and some other natural products are exported. There is only one railway in the state, which runs from Aracajú northward to Capella, with a branch running westward to Simão Dias. The only manufacturing industries of importance are cotton mills, sugar factories and distilleries, one of the largest sugar usines in Brazil being located at Riachuelo near Larangeiras. There are no good ports on the coast because of the bars at the mouths of the rivers.

The capital of the state is Aracajú (pop. 1890, 16,336; 1906 estimate, 25,000), on the lower course, or estuary, of the Cotinguiba river, near the coast. The bar at the entrance to this river is exceptionally dangerous, and the port is frequented only by coasting vessels of light draught. The town stands on a sandy plain, and there are sand dunes within the city limits. The public buildings are a large plain church with unfinished twin towers, the government palace, the legislative halls, a normal school and public hospital. The other principal towns are Estancia (pop. 1890, 14,555) on the Rio Real in the southern part of the state, with manufactures of cotton textiles, cigars and cigarettes, and soap, and an active trade; Laranjeiras (11,350), in a highly productive sugar district N. of the capital; Capella (11,034); Simão Dias (10,984); Lagarto (10,473); São Christovão, formerly Sergipe d'el-Rey (8793), the old capital, near the mouth of the Irapiranga, and Maroim (7851).

SERGIUS, ST, generally associated with St Bacchus, one of the most celebrated martyrs of Christian antiquity. His festival is on the 7th of October, and the centre of his cult was Resafa, or Rosafa, in Syria, in the province of Augusta Euphratesia. This town, which since the middle of the 6th century was also called Sergiopolis, acquired importance as a place of pilgrimage, and became a bishop's see (Le Quien, *Oriens Christ.* ii. 951). The cult of the saint spread rapidly. In 353 we find a church of St Sergius at Eitha, in Batanaea (Waddington, *Inscriptions de Syrie*, n. 2124)—the most ancient example of a dedication of this kind. In the 6th century St Sergius was honoured in the West (Gregory of Tours, *De gloria martyrum*, 96). According to their *Acta* (which, however, have little authority), SS. Sergius and Bacchus were soldiers. In art they are most generally represented in military costume.

See *Acta sanctorum* (October), iii. 833-883; *Analecta Bollandiana*, xiv. 373-395. (H. De.)

SERGIUS, the name of four popes.

Sergius I., pope from 687 to 701, came of an Antiochene family which had settled at Palermo. He was elected after a fierce struggle between two other candidates, Paschal and Theodore. In the second year of his pontificate he baptized King Ceadwalla of Wessex at Rome. For rejecting certain canons of the Trullan (Quinisext) council of 692, Justinian II. commanded his arrest and transportation to Constantinople, but the militia of Ravenna and the Pentapolis forced the imperial protospatharius to abandon the attempt to carry out his orders. Sergius was followed by John VI. as pope.

Sergius II., pope from 844 to 847, a Roman of noble birth, elected by the clergy and people to succeed Gregory IV., was forthwith consecrated without waiting for the sanction of the emperor Lothair, who accordingly sent his son Louis with an army to punish the breach of faith. A pacific arrangement was ultimately made, and Louis was crowned king of Lombardy by Sergius. He was a man of weak health, suffering much from gout, and abandoned the direction of affairs to unworthy persons, whose administration provoked many complaints. In this pontificate Rome was ravaged, and the churches of St Peter and St Paul robbed, by Saracens (August 846). Sergius was succeeded by Leo IV.

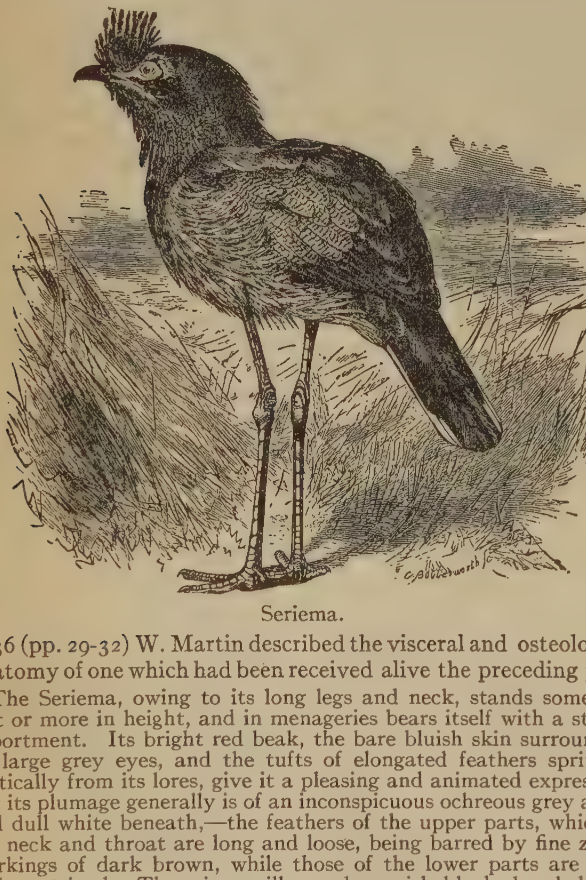
Sergius III., elected pope by one of the factions in Rome in 898, simultaneously with John IX., was expelled from the city by his adversaries. Circumstances becoming more favourable, he reappeared in 904, seized the two claimants, Leo V. and Christopher, who were disputing the succession of Benedict IV., and had them strangled. His adherents rallied round the *vestiarius* Theophylact, a powerful Roman functionary, and his wife Theodora. Sergius is reputed to have been the lover of Theodora's daughter Marozia, by whom he is said to have had a son, who became pope as John XI. This is the beginning of the so-called "pornocracy." Unlike John IX. and his successors, Sergius was very hostile to the memory of Pope Formosus, and refused to recognize any of the ordinations celebrated by him, thus causing grave disorders. He also affected to consider as anti-popes, not only John IX., but also his successors down to and including Christopher. He restored the Lateran basilica, which had fallen down in 897. He died on the 14th of April 911, and was succeeded by Anastasius III.

Sergius IV., pope from 1009 to 1012, originally bore the name of Bucca porca (*Os porci*). He was a mere tool in the hands of the feudal nobility of the city; he was succeeded by Benedict VIII.

SERGIYEVO, a town of Russia, in the government of Moscow, 44 m. by rail N.N.E. of Moscow. It has grown up round the monastery or *lavra* of Troitsko-Sergiyevskaya. It is situated in a beautiful country, the buildings extending partly over the hill occupied by the monastery and partly over the valley below. Including the suburbs it had, in 1884, 31,400 inhabitants, and 31,413 in 1900. Sergiyevo has long been renowned for its manufacture of holy pictures (painted and carved), spoons, and other articles carved in wood, especially toys, which are sold to pilgrims who resort to the place to the number of 100,000 annually.

The Troitsk or Trinity monastery is the most sacred spot in middle Russia, the Great Russians regarding it with more veneration than even the cathedrals and relics of the Kremlin at Moscow. It occupies a picturesque site on the top of a hill, protected on two sides by deep ravines and steep slopes. The walls, 25 to 50 ft. in height, are fortified by nine towers, one of which is a prison for both civil and ecclesiastical offenders. Thirteen churches, including the Troitskiy (Trinity) and Uspenskiy cathedrals, a bell-tower, a theological academy, various buildings for monks and pilgrims, and a hospital stand within the precincts, which are two-thirds of a mile in circuit. A small wooden church, erected by the monk Sergius, and afterwards burned (1391) by the Tatars, stood on the site now occupied by the cathedral of the Trinity, which was built in 1422, and contains the relics of Sergius, as well as ecclesiastic treasures of priceless value and a holy picture which has frequently been brought into requisition in Russian campaigns. The Uspensky cathedral was erected in 1585; close beside it are the graves of Tsar Boris Godunov (died in 1605) and his family. In the southern part of the monastery is the church of Sergius, beneath which are spacious rooms where 200,000 dinners are distributed gratis every year to the pilgrims. The bell-tower, 320 ft. high, has a bell weighing 64 tons. Several monasteries of less importance exist in the neighbourhood. In 1340 two brothers erected a church on the spot. The elder took monastic orders under the name of Sergius, and became famous among the peasants around. His monastery acquired great fame and became the wealthiest in middle Russia. Ivan the Terrible in 1561 made it the centre of the ecclesiastical province of Moscow. During the Polish invasion at the beginning of the 17th century it organized the national resistance. In 1608–1609 it withstood a sixteen months' siege by the Poles; at a later date the monks took a lively part in the organization of the army which crushed the outbreak of the peasants. In 1685 Peter the Great took refuge here from the revolted *streltzi*, or Muscovite military guards. The theological seminary, founded in 1744 and transformed in 1814 into an academy, reckoned Platon and Philarete among its pupils.

SERIEMA, or Cariama, a South-American bird, sufficiently well described and figured in G. de L. Marcgrav's work (*Hist. rer. nat. Brasiliae*, p. 203), posthumously published by De Laet in 1648, to be recognized by succeeding ornithologists, among whom M. J. Brisson in 1760 acknowledged it as forming a distinct genus *Cariama*, while Linnaeus regarded it as a second species of *Palamedea* (see Screamer), under the name of *P. cristata*, Englished by J. Latham in 1785 (*Synopsis*, v. 20) the "Crested Screamer,"—an appellation since transferred to a wholly different bird. Nothing more seems to have been known of it in Europe till 1803, when Azara published at Madrid his observations on the birds of Paraguay (*Apuntamientos*, No. 340), wherein he gave an account of it under the name of "Saria," which it bore among the Guaranis,—that of "Cariama" being applied to it by the Portuguese settlers, and both expressive of its ordinary cry.[1] It was not, however, until 1809 that this very remarkable form came to be autoptically described scientifically. This was done by the elder Geoffroy St-Hilaire (*Ann. du muséum*, xiii. pp. 362-370, pl. 26), who had seen a specimen in the Lisbon museum; and, though knowing it had already been received into scientific nomenclature, he called it anew *Microdactylus marcgravii*. In 1811 J. K. W. Illiger, without having seen an example, renamed the genus *Dicholophus*—a term which has since been frequently applied to it—placing it in the curious congeries of forms having little affinity which he called *Alectorides*. In the course of his travels in Brazil (1815–1817), Prince Max of Wied met with this bird, and in 1823 there appeared from his pen *N. Act. Acad. L.-C. nat. curiosorum*, xi. pt. 2, pp. 341-350, tab. xlv.) a very good contribution to its history, embellished by a faithful life-sized figure of its head. The same year Temminck figured it in the *Planches coloriées* (No. 237). It is not easy to say when any example of the bird first came under the eyes of British ornithologists; but in the Zoological *Proceedings* for 1836 (pp. 29-32) W. Martin described the visceral and osteological anatomy of one which had been received alive the preceding year.



Seriema.

The Seriema, owing to its long legs and neck, stands some two feet or more in height, and in menageries bears itself with a stately deportment. Its bright red beak, the bare bluish skin surrounding its large grey eyes, and the tufts of elongated feathers springing vertically from its lores, give it a pleasing and animated expression; but its plumage generally is of an inconspicuous ochreous grey above and dull white beneath,—the feathers of the upper parts, which on the neck and throat are long and loose, being barred by fine zigzag markings of dark brown, while those of the lower parts are more or less striped. The wing-quills are brownish black, banded with mottled white, and those of the tail, except the middle pair, which are wholly greyish brown, are banded with mottled white at the base and the tip, but dark brown for the rest of their length. The legs are red. The Seriema inhabits the *campos* or elevated open parts of Brazil, from the neighbourhood of Pernambuco to the Rio de la Plata, extending inland as far as Matto Grosso (long. 60°), and occurring also, though sparsely, in Paraguay. It lives in the high grass, running away in a stooping posture to avoid discovery on being approached, and taking flight only at the utmost need. Yet it builds its nest in thick bushes or trees at about a man's height from the ground, therein laying two eggs, which Professor Burmeister likens to those of the Land-Rail in colour.[2] The young are hatched fully covered with grey down, relieved by brown, and remain for some time in the nest. The food of the adult is almost exclusively animal,—insects, especially large ants, snails, lizards and snakes, but it also eats certain large red berries.

Until 1860 the Seriema was believed to be without any near relative in the living world of birds;[3] but in the Zoological *Proceedings* for that year (pp. 334–336) G. Hartlaub described an allied species discovered by H. C. C. Burmeister in the territory of the Argentine Republic.[4] This bird, which has since been regarded as entitled to generic division under the name of *Chunga burmeisteri* (*P.Z.S.*, 1870, p. 466, pl. xxxvi.), and seems to be known in its native country as the "Chunnia," differs from the Seriema by frequenting forest or at least bushy districts. It is also darker in colour, has less of the frontal crest, shorter legs, a longer tail, and the markings beneath take the form of bars rather than stripes, while the bill, eyes and legs are all black. In other respects the difference between the two birds seems to be immaterial.

There are few birds which have more exercised the taxonomer than this, and the reason seems to be plain. The Seriema must be regarded as the not greatly modified heir of some very old type, such as one may fairly imagine to have lived before many of the existing groups of birds had become differentiated, and it is probable that the extinct birds known as *Stereornithes*, and in particular the fossil *Phororhachos* from the Miocene of Patagonia, were closely allied to its ancestors. It is now placed in the family *Cariamidae* of Gruiform birds (see BIRD). (A. N.)

SERIES (a Latin word from *serere*, to join), a succession or sequence. In mathematics, the term is applied to a succession of arithmetical or algebraic quantities (see below); in geology it is synonymous with *formation*, and denotes a stage in the classification of strata, being superior to *group* (and consequently to *bed*, and *zone* or *horizon*) and inferior to *system*; in chemistry, the term is used particularly in the form *homologous series*, given to hydrocarbons of similar constitution and their derivatives which differ in empirical composition by a multiple of CH_2, and in the form *isologous series*, applied to hydrocarbons and their derivatives which differ in empirical composition by a multiple of H_2; it is also used in the form *isomorphous series* to denote elements related isomorphously. The word is also employed in zoological and botanical classification.

In mathematics a set of quantities, real or complex, arranged in order so that each quantity is definitely and uniquely determined by its position, is said to form a series. Usually a series proceeds in one direction and the successive terms are denoted by $u_1, u_2, \ldots u_n, \ldots$; we may, however, have a series proceeding in both directions, a back-and-forwards series, in which case the terms are denoted by

$$\ldots u_{-m}, \ldots u_{-2}, u_{-1}, u_0, u_1, u_2, \ldots u_n \ldots ;$$

or its general term may depend on two integers positive or negative, and its general term may be denoted by $u_{m,n}$; such a series is called a double series, and so on. The number of terms may be limited or unlimited, and we have two theories, (1) of finite series and (2) of infinite series. The first concerns itself mainly with the summation of a finite number of terms of the series; the notions of convergence and divergence present themselves in the theory of infinite series.

Finite Series.

1. When we are given a series, it is supposed that we are given the law by which the general term is formed. The first few terms of a series afford no clue to the general term; the series of which the first four terms are 1, 2, 4, 8, may be the series of which the general term is 2^n; it may equally well be the series of which the general term is $\frac{1}{6}(n^3+5n+6)$; in fact we can construct an infinite number of series of which the leading terms shall be any assigned quantities. The only case in which the series may be completely determined from its leading terms is that of a "recurring series." A recurring series is a series in which the consecutive terms, after the earlier ones, are connected by a linear relation; thus if we have a relation of the form

$$a_pu_r + a_{p-1}u_{r+1} + a_{p-2}u_{r+2} + \ldots + a_1u_{r+p-1} + a_0u_{r+p} = 0,$$

the series is said to be a recurring series with a scale of relation

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[1] Yet Forbes states (*Ibis*, 1881, p. 358) that *Seriema* comes from *Siri*, "a diminutive of Indian extraction," and *Ema*, the Portuguese name for the Rhea (see EMEU), the whole thus meaning "Little Rhea."

[2] This distinguished author twice cites the figure given by Thienemann (*Fortpflanzungsgesch. gesammt. Vögel*, pl. lxxii. fig. 14) as though taken from a genuine specimen; but little that can be called Ralline in character is observable therein. The same is to be said of an egg laid in captivity at Paris; but a specimen in Mr Walter's possession undeniably shows it (cf. *Proc. Zool. Society*, 1881, p. 2).

[3] A supposed fossil *Cariama* from the caves of Brazil, mentioned by Bonaparte (*C.R.* xliii. p. 779) and others, has since been shown by Reinhardt (*Ibis*, 1882, pp. 321-332) to rest upon the misinterpretation of certain bones, which the latter considers to have been those of a Rhea.

[4] Near Tucuman and Catamarca (Burmeister, *Reise durch die La Plata Staaten*, ii. p. 508).

$a_0+a_1x+a_2x^2+\ldots+a_px^p$. It is clear that we can regard the series $u_0+u_1x+u_2x^2+\ldots$ as the expansion in powers of x of an expression of the form

$$(b_0+b_1x+\ldots+b_{p-1}x^{p-1})/(a_0+a_1x+\ldots+a_px^p),$$

and by splitting this expression into partial fractions we can obtain the general term of the series. If we know that a series is a recurring series and know the number of terms in its scale of relation, we can determine this scale if we are given a sufficient number of terms of the series and obtain its general term. It follows that the general term of a recurring series is of the form $\Sigma\phi(n)\alpha^n$, where $\phi(n)$ is a rational integral algebraic function of n, and α is independent of n. The series whose general term is of the form $K\alpha^n+\phi(n)$, where $\phi(n)$ is a rational integral algebraic function of degree r, is a recurring series whose scale of relation is $(1-\alpha x)(1-x)^{r+1}$, but the general term of this series may be obtained by another method. Suppose we have a series $u_0, u_1, u_2,\ldots$ From this we can form a series $v_0, v_1, v_2,\ldots$ where $v_n=u_{n+1}-u_n$; from $v_0, v_1, v_2,\ldots$ we similarly form another series and so on; we write $v_n\equiv\Delta u_n$, and we suppose E to be an operation such that $Eu_n\equiv u_{n+1}$ (the notation is that of the calculus of finite differences); the operations E and $1+\Delta$ are equivalent and hence the operations E^n and $(1+\Delta)^n$ are equivalent, so that we obtain $u_n=u_0+n\Delta u_0+\frac{n.n-1}{1.2}\Delta^2u_0+\ldots$ This is true whatever the form of u_n. When u_n is of the form $K\alpha^n+\phi(n)$, where $\phi(n)$ is of degree r, $\Delta^{r+1}u_0$, $\Delta^{r+2}u_0$, ... form a geometrical progression, of which the common difference is $\alpha-1$, or vanish if the term $K\alpha^n$ is absent. In either case we readily obtain the expression for u_n.

2. The general problem of finite series is to find the sum of n terms of a series of which the law of formation is given. By finding the sum to n terms is meant finding some simple function of n, or a sum of a finite number of simple functions, the number being independent of n, which shall be equal to this sum. Such an expression cannot always be found even in the case of the simplest series. The sum of n terms of the arithmetic progression a, $a+b$, $a+2b,\ldots$ is $na+\frac{1}{2}n(n-1)b$; the sum of n terms of the geometric progression a, ab, $ab^2,\ldots$ is $a(1-b^n)/(1-b)$; yet we can find no simple expression to represent the sum of n terms of the harmonic progression

$$1+\tfrac{1}{2}+\tfrac{1}{3}+\ldots+\frac{1}{n}.$$

3. The only type of series that can be summed to n terms with complete generality is a recurring series. If we let $S_n=u_0+u_1x+\ldots+u_{n-1}x^{n-1}$, where $u_0,\ldots$ is a recurring series with a given scale of relation, for simplicity take it to be $1+px+qx^2$, we shall have

$$S_n(1+px+qx^2)=u_0+(u_1+pu_0)x+(pu_{n-1}+qu_{n-2})x^n+qu_{n-1}x^{n+1}.$$

If x had a value that made $1+px+qx^2$ vanish, this method would fail, but we could find the sum in this case by finding the general term of the series. For particular cases of recurring series we may proceed somewhat differently. If the nth term is u_nx^n we have from the equivalence of the operations E and $1+\Delta$,

$$u_1x+u_2x^2+\ldots+u_nx^n=\frac{xu_1-x^{n+1}u_{n+1}}{1-x}+\frac{x^2\Delta u_1-x^{n+2}\Delta u_{n+1}}{(1-x)^2}+\frac{x^3\Delta^2u_1-x^{n+3}\Delta^2u_{n+1}}{(1-x)^3}+\ldots$$

in general, and for the case of $x=$unity we have

$$u_1+u_2+\ldots+u_n=nu_1+\frac{n.n-1}{1.2}\Delta u_1+\frac{n.n-1.n-2}{1.2.3}\Delta^2u_1+\ldots,$$

which will give the sum of the series very readily when u_n is a polynomial in n or a polynomial + a term of the form $K\alpha^n$.

4. Other types of series, when they can be summed to n terms at all, are summed by some special artifice. Summing the series to 3 or 4 terms may suggest the form of the sum to n terms which can then be established by induction. Or it may be possible to express u_n in the form $w_{n+1}-w_n$, in which case the sum to n terms is $w_{n+1}-w_1$. Thus, if $u_n=a(a+b)(a+2b)\ldots(a+\overline{n-1}b)/c(c+b)(c+2b)\ldots(c+\overline{n-1}b)$, the relation $(c+nb)u_{n+1}=(a+nb)u_n$ can be thrown into the form $(c+nb)u_{n+1}-(c+\overline{n-1}b)u_n=(a-c+b)u_n$, whence the sum can be found. Again, if $u_n=\tan nx\tan(n+1)x$, the summation can be effected by writing u_n in the form $\cot x(\tan\overline{n+1}x-\tan nx)-1$. Or a series may be recognized as a coefficient in a product. Thus, if $f(x)\equiv u_0+u_1x+u_2x^2+\ldots$, $u_0+u_1+\ldots+u_n$ is the coefficient of x^n in $f(x)/(1-x)$; in this way the sum of the first n coefficients in the expansion of $(1-x)^{-k}$ may be found. The sum of one series may be deduced from that of another by differentiation or integration. For further information the reader may consult G. Chrystal's *Algebra* (vol. ii.).

5. The sum of an infinite series may be deduced from the sum to n terms, when this is known, by increasing n indefinitely and finding the limit, if any, to which it tends, but a series may often be summed to infinity when it cannot be summed to n terms; the sum of the infinite series $\frac{1}{1^2}+\frac{1}{2^2}+\frac{1}{3^2}+\ldots$ is $\frac{\pi^2}{6}$, the sum to n terms cannot be found.

For methods and transformations by means of which the sum to n terms of a series may be found approximately when it cannot be found exactly, the reader may consult G. Boole's *Treatise on the Calculus of Finite Differences.*

Infinite Series.

6. Let $u_1, u_2, u_3,\ldots u_n$, be a series of numbers real or complex, and let S_n denote $u_1+u_2+\ldots+u_n$. We thus form a sequence of numbers $S_1,S_2,\ldots S_n$. This sequence may tend to a definite finite limit S as n increases indefinitely. In this case the series $u_1+u_2+\ldots+u_n$ is said to be *convergent*, and to converge to a sum S. If by taking n sufficiently large $|S_n|$ can be made to exceed any assignable quantity, however large, the series is said to be *divergent.* If the sequence $S_1, S_2,\ldots$ tends to finite but different limits according to the form of n the series is said to oscillate, and is also classed under the head of divergent series. The sum of n terms of the geometric series $1+x+x^2+\ldots$ is $(1-x^n)/(1-x)$. If x is less than unity S_n clearly tends to the limit $1/(1-x)$, and the series is convergent and its sum is $1/(1-x)$. If x is greater than unity S_n clearly can be made greater than any assignable quantity by taking n large enough, and the series is divergent. The series $1-1+1-1+\ldots$, where S_n is unity or zero, according as n is odd or even, is an example of an oscillating series. The condition of convergency may also be presented under the following form. Let ${}_pR_n$ denote $S_{n+p}-S_n$: let ϵ be any arbitrarily assigned positive quantity as small as we please; if we can find a number m such that for $m=$ or $>n$, $|{}_pR_n|<\epsilon$ for all values $1, 2,\ldots$ of p, then the series converges. The least value of the number m corresponding to a given value of ϵ, if it can be found, may be regarded as a measure of rapidity of the convergency of the series; it may happen that when u_n involves a variable x, m increases indefinitely as x approaches some value; in this case the convergence of the series is said to be infinitely slow for this value of x.

7. An infinite series may contain both positive and negative terms. The terms may be positive and negative alternately or they may occur in groups which without altering the order of the terms of the series may each be collected into a single term; thus all series may be regarded as belonging to one of two types, $u_1+u_2+u_3+\ldots$ in which the terms are all positive, or $u_1-u_2+u_3-\ldots$ in which the terms are alternately positive and negative.

8. It is clear that if a series is convergent u_n must tend to the limit zero as n is increased indefinitely. This condition though necessary is by no means sufficient. If all the terms of a convergent series are positive a series obtained by writing its terms in any other order is convergent and converges to the same sum. For if S_n denotes the sum of n terms of the first series and Σ_n denotes the sum of n terms of the new series, then, when n is any large number, we can choose numbers p and q such that $S_q>\Sigma_n>S_p$; so that Σ_n tends to the common limit of S_p and S_q, which is the sum of the original series. If $u_1, u_2, u_3,\ldots$ are all positive, and if after some fixed term, say the p^{th}, u_n continually decreases and tends to the limit zero, the series $u_1-u_2+u_3-u_4+\ldots$ is convergent. For $|S_{p+2n}-S_p|$ lies between $|u_{p+1}-u_{p+2}|$ and $|u_{p+1}-u_{p+2n}|$ so that, when n is increased indefinitely, $|S_{p+2n}|$ remains finite; also $|S_{p+2n+1}-S_{p+2n}|$ tends to zero, so that the series converges. If u_n tends to a limit a, distinct from zero, then the series $v_1-v_2+v_3-\ldots$, where $v_n=u_n-a$, converges and the series $u_1-u_2+u_3\ldots$ oscillates. As examples we may take the series $1-\frac{1}{2}+\frac{1}{3}-\frac{1}{4}+\ldots$ and $2-\frac{3}{2}+\frac{4}{3}-\frac{5}{4}+\ldots$; the first of these converges, the second oscillates.

9. The series $u_1+u_3+u_5+\ldots$, $u_2+u_4+u_6+\ldots$ may each of them diverge, though the series $u_1-u_2+u_3-\ldots$ converges. A series such that the series formed by taking all its terms positively is convergent is said to be *absolutely convergent*; when this is not the case the series is said to be *semi-convergent* or *conditionally convergent.* A series of complex numbers in which $u_n=p_n+iq_n$, where p_n and q_n are real (i being $\sqrt{-1}$), is said to be convergent when the series $p_1+p_2+p_3+\ldots$, $q_1+q_2+q_3+\ldots$ are separately convergent, and if they converge to P and Q respectively the sum of the series is $P+iQ$. Such a series is said to be absolutely convergent when the series of moduli of u_n, *i.e.*, $\Sigma(p_n{}^2+q_n{}^2)^{\frac{1}{2}}$, is convergent; this is sufficient but not necessary for the separate convergence of the p and q series.

There is an important distinction between absolutely convergent and conditionally convergent series. In an absolutely convergent series the sum is the same whatever the order of the terms; this is not the case with a conditionally convergent series. The two series $1-\frac{1}{2}+\frac{1}{3}-\frac{1}{4}+\ldots$, and $1+\frac{1}{3}-\frac{1}{2}+\frac{1}{5}+\frac{1}{7}-\frac{1}{4}+\ldots$, in which the terms are the same but in different orders, are convergent but not absolutely convergent. If we denote the sum of the first by S and the sum of the second by Σ it can be shown that $\Sigma=\frac{3}{2}S$. G. F. B. Riemann and P. G. L. Dirichlet have shown that the terms of a semi-convergent series may be so arranged as to make the series converge to any assigned value or even to diverge.

10. Tests for convergency of series of positive terms are obtained by comparing the series with some series whose convergency or divergency is readily established. If the series of positive terms $u_1+u_2+u_3+\ldots$, $v_1+v_2+v_3+\ldots$ are such that u_n/v_n is always finite, then they are convergent or divergent together; if $u_{n+1}/u_n<v_{n+1}/v_n$ and Σv_n is convergent, then Σu_n is convergent; if $u_{n+1}/u_n>v_{n+1}/v_n$ and Σv_n is divergent, then Σu_n is divergent. By comparison with the ordinary geometric progression we obtain the

following tests. If $\sqrt[n]{u_n}$ approaches a limit l as n is indefinitely increased, Σu_n will converge if l is less than unity and will diverge if l is greater than unity (Cauchy's test); if u_{n+1}/u_n approaches a limit l as n is indefinitely increased, Σu_n will converge if l is less than unity and diverge if l is greater than unity (D'Alembert's test). Nothing is settled when the limit l is unity, except in the case when l remains greater than unity as it approaches unity. The series then diverges. It may be remarked that if u_{n+1}/u_n approaches a limit and $\sqrt[n]{u_n}$ approaches a limit, the two limits are the same. The choice of the more useful test to apply to a particular series depends on its form.

In the case in which u_{n+1}/u_n approaches unity remaining constantly less than unity, J. L. Raabe and J. M. C. Duhamel have given the following further criterion. Write $u_n/u_{n+1}=1+a_n$, where a_n is positive and approaches zero as n is indefinitely increased. If na_n approaches a limit l, the series converges for $l>1$ and diverges for $l<1$. For $l=1$ nothing is settled except for the case where l remains constantly less than unity as it approaches it; in this case the series diverges.

If $f(n)$ is positive and decreases as n increases, the series $\Sigma f(n)$ is convergent or divergent with the series $\Sigma a^n f(a^n)$ where a is any number >2 (Cauchy's condensation test). By means of this theorem we can show that the series whose general terms are

$$\frac{1}{n^\alpha},\ \frac{1}{n(\mathrm{l}n)^\alpha},\ \frac{1}{n\mathrm{l}n(\mathrm{l}^2n)^\alpha},\ \frac{1}{n\mathrm{l}n\mathrm{l}^2n(\mathrm{l}^3n)^\alpha},\ldots,$$

where $\mathrm{l}n$ denotes log n, l^2n denotes log·log n, l^3n denotes log log log n, and so on, are convergent if $\alpha>1$ and divergent if $\alpha=$ or <1.

By comparison with these series, a sequence of criteria, known as the logarithm criteria, has been established by De Morgan and J. L. Bertrand. A. De Morgan's form is as follows: writing $u_n=1/\phi(n)$, put $p_0=x\phi'(x)/\phi(x)$, $p_1=(p_0-1)\mathrm{l}x$, $p_2=(p_1-1)\mathrm{l}^2x$, $p_3=(p_2-1)\mathrm{l}_3x,\ldots$ where l^rx denotes log log log . . . x. If the limit, when x is infinite, of the first of the functions $p_0, p_1, p_2,\ldots$, whose limit is not unity, is greater than unity the series is convergent, if less than unity it is divergent.

In Bertrand's form we take the series of functions

$$\mathrm{l}\frac{1}{u_n}/\mathrm{l}n,\ \mathrm{l}\frac{1}{nu_n}/\mathrm{l}^2n,\ \mathrm{l}\frac{1}{nu_n\mathrm{l}n}/\mathrm{l}^3n,\ldots$$

If the limit, when n is infinite, of the first of these functions, whose limit is not unity, is greater than unity the series is convergent, if less than unity it is divergent. Other forms of these criteria may be found in Chrystal's *Algebra*, vol. ii.

Though sufficient to test such series as occur in ordinary mathematics, it is possible to construct series for which they entirely fail. It follows that in a convergent series not only must we have Lt $u_n=0$ but also Lt $nu_n=0$, Lt $n\mathrm{l}nu_n=0$, &c. Abel has, however, shown that no function $\phi(n)$ can exist such that the series Σu_n is convergent or divergent as Lt $\phi(n)u_n$ is or is not zero.

11. Two or more absolutely convergent series may be added together, thus $(u_1+u_2+\ldots)+(v_1+v_2+\ldots)=(u_1+v_1)+(u_2+v_2)+\ldots$, that is, the resulting series is absolutely convergent and has for its sum the sum of the sums of the two series. Similarly two or more absolutely convergent series may be multiplied together thus $(u_1+u_2+u_3+\ldots)(v_1+v_2+v_3+\ldots)=u_1v_1+(u_1v_2+u_2v_1)+(u_1v_3+u_2v_2+u_3v_1)+\ldots$, and the resulting series is absolutely convergent and its sum is the product of the sums of the two series. This was shown by Cauchy, who also showed that the series Σw_n, where $w_n=u_1v_n+u_2v_{n-1}+\ldots+u_nv_1$, is not necessarily convergent when both series are semi-convergent. A striking instance is furnished by the series $1-\frac{1}{\sqrt{2}}+\frac{1}{\sqrt{3}}-\frac{1}{\sqrt{4}}+\ldots$ which is convergent, while its square $1-\frac{2}{\sqrt{2}}+\left(\frac{2}{\sqrt{3}}+\frac{1}{2}\right)-\ldots$ may be shown to be divergent. F. K. L. Mertens has shown that a sufficient condition is that one of the two series should be absolutely convergent, and Abel has shown that if Σw_n converges at all, it converges to the product of Σu_n and Σv_n. But more properly the multiplication of two series gives rise to a double series of which the general term is u_mv_n.

12. Before considering a double series we may consider the case of a series extending backwards and forwards to infinity

$$\ldots u_{-m}+\ldots+u_{-2}+u_{-1}+u_0+u_1+u_2+\ldots+u_n+\ldots$$

Such a series may be absolutely convergent and the sum is then independent of the order of the terms and is equal to the sums of the two series $u_0+u_1+u_2+\ldots$ and $u_{-1}+u_{-2}+\ldots$, but, if not absolutely convergent, the expression has no definite meaning until it is explained in what manner the terms are intended to be grouped together; for instance, the expression may be used to denote the foregoing sum of two series, or to denote the series $u_0+(u_1+u_{-1})+(u_2+u_{-2})+\ldots$, and the sum may have different values, or there may be no sum, accordingly. Thus, if the series be $\ldots-\frac{1}{2}-\frac{1}{1}+0+\frac{1}{1}+\frac{1}{2}+\ldots$, with the former meaning the two series $0+\frac{1}{1}+\frac{1}{2}+\ldots$ and $-\frac{1}{1}-\frac{1}{2}-\ldots$ are each divergent, and there is no sum; but with the latter meaning the series is $0+0+0+\ldots$ which has a sum 0. So, if the series be taken to denote the limit of $(u_0+u_1+\ldots+u_n)+(u_{-1}+u_{-}+\ldots+u_{-m})$, where n and m are each of them ultimately infinite, there may be a sum depending on the ratio $n:m$, which sum acquires a determinate value only when this ratio is given. In the case of the series given above, if this ratio is k, the sum of the series is log k.

13. In a singly infinite series we have a general term u_n, where n is an integer positive in the case of an ordinary series, and positive or negative in the case of a back-and-forwards series. Similarly for a doubly infinite series we have a general term $u_{m,n}$ where m, n are integers which may be each of them positive, and the form of the series is then

$$\begin{array}{l} u_{0,0},\ u_{0,1},\ u_{0,2},\ldots \\ u_{1,0},\ u_{1,1},\ u_{1,2},\ldots \\ \cdot\quad\cdot\quad\cdot \\ \cdot\quad\cdot\quad\cdot \end{array}$$

or they may be each of them positive or negative. The latter is the more general supposition, and includes the former, since $u_{m,n}$ may $=0$, for m or n each or either of them negative. To attach a definite meaning to the notion of a sum, we may regard m, n as the rectangular coordinates of a point in a plane; if m and n are each positive we attend only to the positive quadrant of the plane, but otherwise to the whole plane. We may imagine a boundary depending on a parameter T, which for T infinite is at every point thereof at an infinite distance from the boundary; for instance, the boundary may be the circle $x^2+y^2=\mathrm{T}$, or the four sides of a rectangle, $x=\pm\alpha\mathrm{T}$, $y=\pm\beta\mathrm{T}$. Suppose the form is given and the value of T, and let the sum $\mathrm{S}_{m,n}$ be understood to denote the sum of the terms $u_{m,n}$ within the boundary, then, if as T increases without limit, $\mathrm{S}_{m,n}$ continually approaches a determinate limit (dependent, it may be, on the form of the boundary) *for such form of boundary* the series is said to be convergent, and the sum of the doubly infinite series is the limit of $\mathrm{S}_{m,n}$. The condition of convergency may be otherwise stated; it must be possible to take T so large that the sum $\mathrm{R}_{m,n}$ for all terms $u_{m,n}$ which correspond to points outside the boundary shall be as small as we please.

14. It is easy to see that, if each of the terms $u_{m,n}$ is positive and the series is convergent for any particular form of boundary, it will be convergent for any other form of boundary, and the sum will be the same in each case. Suppose that in the first case the boundary is the curve $f_1(x, y)=\mathrm{T}$. Draw any other boundary $f_2(x, y)=\mathrm{T}'$. Wholly within this we can draw a curve $f_1(x, y)=\mathrm{T}_1$ of the first family, and wholly outside it we can draw a second curve of the first family, $f_1(x, y)=\mathrm{T}_2$. The sum of all the points within $f_2(x, y)=\mathrm{T}'$ lies between the sum of all the points within $f_1(x, y)=\mathrm{T}_1$ and the sum of all the points within $f_1(x, y)=\mathrm{T}_2$. It therefore tends to the common limit to which these two last sums tend. The sum is therefore independent of the form of the boundary. Such a series is said to be absolutely convergent, and similarly a doubly infinite series of positive and negative terms is absolutely convergent when the series formed by taking all its terms positively is convergent.

15. It is readily seen that when the series is not absolutely convergent the sum will depend on the form of the boundary. Consider the case in which m and n are always positive, and the boundary is the rectangle formed by $x=m$, $y=n$, and the axes. Let the sum within this rectangle be $\mathrm{S}_{m,n}$. This may have a limit when we first make n infinite and then m; it may have a limit when we first make m infinite and then n, but the limits are not necessarily the same; or there may be no limit in either of these cases but a limit depending on the ratio of m to n, that is to say, on the shape of the rectangle.

When the product of two series is arranged as a doubly infinite series, summing for the rectangular boundary $x=\alpha\mathrm{T}$, $y=\beta\mathrm{T}$ we obtain the product of the sums of the series. When we arrange the double series in the form $u_1v_1+(u_1v_2+u_2v_1)+\ldots$ we are summing over the triangle bounded by the axes and the straight line $x+y=\mathrm{T}$, and the results are not necessarily the same if the terms are not all positive. For full particulars concerning multiple series the reader may consult E. Goursat, *Cours d'analyse*, vol. i.; G. Chrystal, *Algebra*, vol. ii.; or T. J. I'A. Bromwich, *The Theory of Infinite Series*.

16. In the series so far considered the terms are actual numbers, or, at least, if the terms are functions of a variable, we have considered the convergency only when that variable has an assigned value. In the case, however, of a series $u_1(z)+u_2(z)+\ldots$, where $u_1(z), u_2(z),\ldots$ are single-valued continuous functions of the general complex variable z, if the series converges for any value of z, in general it converges for all values of z, whose representative points lie within a certain area called the "domain of convergence" and within this area defines a function which we may call S(z). It might be supposed that S(z) was necessarily a continuous function of z, but this is not the case. G. G. Stokes (1847) and P. L. Seidel (1848) independently discovered that in the neighbourhood of a point of discontinuity the convergence is infinitely slow and thence arises the notion of *uniform* and *non-uniform* convergence.

17. If for any value of z the series $u_1(z)+u_2(z)+\ldots$ converges it is possible to find an integer n such that $|\mathrm{S}(z)-\mathrm{S}_n(z)|<\epsilon$, $|\mathrm{S}(z)-\mathrm{S}_{n+1}(z)|<\epsilon,\ldots$, where ϵ is any arbitrarily assigned positive quantity, however small. For a given ϵ the least value of n will vary throughout any region from point to point of that region. It may, however, be possible to find an integer ν which is a superior limit to all the values of n in that region, and we thus have, throughout this region, $|\mathrm{S}(z)-\mathrm{S}_\nu(z)|<\epsilon$, $|\mathrm{S}(z)-\mathrm{S}_{\nu+1}(z)|<\epsilon\ldots$ where z is any point in the region and ν is a finite integer depending only on ϵ and not on z.

The series is then said to converge uniformly throughout this region.

If, as z approaches the value z_1, n increases as $|z-z_1|$ diminishes and becomes indefinitely great as $|z-z_1|$ becomes indefinitely small the series is said to be non-uniformly convergent at the point z_1.

A function represented by a series is continuous throughout any region in which the series is uniformly convergent; there cannot be discontinuity with uniform convergence; on the other hand there may be continuity and non-uniform convergence. If $u_1(z)+u_2(z)+\ldots$ is uniformly convergent we shall have $\int S(z)dz=\int u_1(z)dz+\int u_2(z)dz+\ldots$ along any path in the region of uniform convergence; and we shall also have $\frac{d}{dz}S(z)=\frac{d}{dz}u_1(z)+\frac{d}{dz}u_2(z)+\ldots$ if the series $\frac{d}{dz}u_1(z)+\frac{d}{dz}u_2(z)+\ldots$ is uniformly convergent.

Uniform convergence is essentially different from absolute convergence; neither implies the other (see FUNCTION).

18. A series of the form $a_0+a_1z+a_2z^2+\ldots$, in which $a_0, a_1, a_2, \ldots$ are independent of z, is called a power series.

In the case of a power series there is a quantity R such that the series converges if $|z|<R$, and diverges if $|z|>R$. A circle described with the origin as centre and radius R is called the circle of convergence. A power series may or may not converge on the circle of convergence. The circle of convergence may be of infinite radius as in the case of the series for sin z, viz. $z-\frac{z^3}{3!}+\frac{z^5}{5!}-\ldots$ In this case the series converges over the whole of the z plane. Or its radius may be zero as in the case of the series $1+1!\,z+2!\,z^2+\ldots$, which converges nowhere except at the origin. The radius R may be found usually, but not always, from the consideration that a series converges absolutely if $|u_{n+1}/u_n|<1$, and diverges if $|u_{n+1}/u_n|>1$.

A power series converges absolutely and uniformly at every point within its circle of convergence; it may be differentiated or integrated term by term; the function represented by a power series is continuous within its circle of convergence and, if the series is convergent on the circle of convergence, the continuity extends on to the circle of convergence. Two power series cannot be equal throughout any region in which both are convergent without being identical.

19. Series of the type $a_0+a_1\cos z+a_2\cos 2z+\ldots$
$+b_1\sin z+b_2\sin 2z+\ldots$,
where the coefficients $a_0, a_1, a_2, \ldots b_1, b_2, \ldots$ are independent of z, are called Fourier's series. They are of the greatest interest and importance both from the point of view of analysis and also because of their applications to physical problems. For the consideration of these series and the expansion of arbitrary functions in series of this type see FUNCTION and FOURIER'S SERIES. For the general problem of the development of functions in infinite series of various types see FUNCTION.

20. The modern theory of convergence dates from the publication in 1821 of Cauchy's *Analyse algébrique*. The great mathematicians of the 18th century used infinite series freely with very little regard to their convergence or divergence and with, occasionally, very extraordinary results. Series which are ultimately divergent may be used to calculate values of functions in special cases and to represent what are called "asymptotic expansions" of functions (see FUNCTION).

Infinite Products.

21. The product of an infinite number of factors formed in succession according to any given law is called an infinite product. The infinite product $\Pi_n\equiv(1+u_1)(1+u_2)\ldots(1+u_n)$ is said to be convergent when $\mathrm{Lt}_{n=\infty}\Pi_n$ tends to a definite finite limit other than zero. If Lt Π_n is zero or infinite or tending to different finite values according to the form of n the product is said to be divergent.

The condition for convergency may also be stated in the following form. (1) The value of Π_n remains finite and different from zero however great n may become, and (2) Lt Π_n and Lt Π_{n+r} must be equal, when n is increased indefinitely, and r is any positive integer. Since in particular Lt $\Pi_n=$ Lt Π_{n+1}, we must have Lt $u_{n+1}=0$. Hence after some fixed term $u_1, u_2, \ldots$ or their moduli in the case of complex quantities, must diminish continually down to zero. Since we may remove any finite number of terms in which $|u_n|>1$ without affecting the convergence of the whole product, we may regard as the general type of a convergent product $(1+u_1)(1+u_2)\ldots(1+u_n)\ldots$ where $|u_1|, |u_2|, \ldots |u_n|, \ldots$ are all less than unity and decrease continually to zero.

A convergent infinite product is said to be absolutely convergent where the order of its factors is immaterial. Where this is not the case it is said to be semi-convergent.

22. The necessary and sufficient condition that the product $(1+u_1)(1+u_2)\ldots$ should converge absolutely is that the series $|u_1|+|u_2|+\ldots$ should be convergent. If $u_1, u_2, \ldots$ are all of the same sign, then, if the series $u_1+u_2+\ldots$ is divergent, the product is infinite if $u_1, u_2, \ldots$ are all positive and zero if they are all negative.

If $u_1+u_2+\ldots$ is a semi-convergent series the product converges, but not absolutely, or diverges to the value zero, according as the series $u_1^2+u_2^2+\ldots$ is convergent or divergent. These results may be deduced by considering, instead of Π_n, log Π_n which is the series $\log(1+u_1)+\log(1+u_2)+\ldots$ (see G. Chrystal's *Algebra*, vol. ii., or E. T. Whittaker's *Modern Analysis*, chap. ii.); they may also be proved by means of elementary theorems on inequalities (see E. W. Hobson's *Plane Trigonometry*, chap. xvii.).

23. If $u_1, u_2, \ldots$ are functions of a variable z, a convergent infinite product $(1+u_1)(1+u_2)\ldots$ defines a function of z. For such products there is a theory of uniform convergence analogous to that of infinite series. Is is not in general possible to represent a function as an infinite product; the question has been dealt with by Weierstrass (see his *Abhandlungen aus der Functionlehre* or A. R. Forsyth's *Theory of Functions*). One of the simplest cases of a function expressed as an infinite product is that of sin z/z, which is the value of the absolutely convergent infinite product.

$$\left(1-\frac{z^2}{\pi^2}\right)\left(1-\frac{z^2}{2^2\pi^2}\right)\ldots\left(1-\frac{z^2}{n^2\pi^2}\right)\ldots$$

24. K. T. W. Weierstrass has shown that a semi-convergent or divergent infinite product may be made absolutely convergent by the association with each factor of a suitable exponential factor called sometimes a "convergency factor." The product $\left(1+\frac{z}{\pi}\right)\left(1+\frac{z}{2\pi}\right)\left(1+\frac{z}{3\pi}\right)\ldots$ is divergent; the product $\left(1+\frac{z}{\pi}\right)e^{-\frac{z}{\pi}}\left(1+\frac{z}{2\pi}\right)e^{-\frac{z}{2\pi}}\ldots$ is absolutely convergent. The product for sin z/z is semi-convergent when written in the form

$$\left(1-\frac{z}{\pi}\right)\left(1+\frac{z}{\pi}\right)\left(1-\frac{z}{2\pi}\right)\left(1+\frac{z}{2\pi}\right)\ldots,$$

but absolutely convergent when written in the form

$$\left(1-\frac{z}{\pi}\right)e^{\frac{z}{\pi}}\left(1+\frac{z}{\pi}\right)e^{-\frac{z}{\pi}}\left(1-\frac{z}{2\pi}\right)e^{\frac{z}{2\pi}}\left(1+\frac{z}{2\pi}\right)e^{-\frac{z}{2\pi}}\ldots$$

From this last form it can be shown that if

$$\phi(z)\equiv\left(1-\frac{z}{\pi}\right)\left(1-\frac{z}{2\pi}\right)\ldots\left(1-\frac{z}{n\pi}\right)\left(1+\frac{z}{\pi}\right)\left(1+\frac{z}{2\pi}\right)\ldots\left(1+\frac{z}{m\pi}\right),$$

then the limit of $\phi(z)$ as m and n are both made infinite in any given ratio is

$$\left(\frac{m}{n}\right)^{\frac{z}{\pi}}\frac{\sin z}{z}.$$

Another example of an absolutely convergent infinite product, whose convergency depends on the presence of an exponential factor, is the product $z\Pi\left(1-\frac{z}{\Omega}\right)e^{\frac{z}{\Omega}+\frac{1}{2}\frac{z^2}{\Omega^2}}$, where Ω denotes $2m\omega_1+2n\omega_2$, ω_1 and ω_2 being any two quantities having a complex ratio, and the product is taken over all positive and negative integer and zero values of m and n, except simultaneous zeros. This product is the expression in factors of Weierstrass's elliptic function $\sigma(z)$.

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(A. E. J.)

SERINGAPATAM, or SRIRANGAPATANA, a town of India, formerly capital of the state of Mysore, situated on an island of the same name in the Cauvery river. Pop. (1901) 8584. The town is chiefly noted for its fortress, which figured prominently in Indian history at the close of the 18th century. This formidable stronghold of Tippoo Sultan twice sustained a siege from the British, and was finally stormed in 1799. After its capture the island was ceded to the British, but restored to Mysore in 1881. The island of Seringapatam is about 3 m. in length from east to west and 1 in breadth, and yields valuable crops of rice and sugar-cane. The fort occupies the western side, immediately overhanging the river. Seringapatam is said to have been founded in 1454 by a descendant of one of the local officers appointed by Ramanuja, the Vishnuite apostle, who named it the city of Sri Ranga or Vishnu. At the eastern or lower end of the island is the Lal Bagh or "red garden," containing the mausoleum built by Tippoo Sultan for his father Hyder Ali, in which Tippoo himself also lies.

SERJEANT, or SERGEANT (from Lat. *serviens*, *servire*, to serve, through O. Fr. *sergant*, *serjant*, mod. Fr. *sergent*), the title (1) of a non-commissioned officer in the army and of a subordinate officer of police; (2) of certain officials of the royal household (see *Serjeants-at-arms*, below). (3) The name was also given formerly to the highest rank of barristers in England and Ireland (see SERJEANT-AT-LAW). In the middle ages *serviens* had a variety of applications all connoting the sense of service, from the *serviens de pane et mensa*, the domestic servant of a monastery, to the *servientes de armis*, the serjeants-at-arms (Fr. *sergeans d'armes*) of monarchs, the *servientes* (*sergeans*) who were the apparitors of the French king, and vassals who held by a special service (serjeanty, *q.v.*). The *serjeants* (*fratres servientes*) formed also an important division of the great military orders (see SAINT JOHN OF JERUSALEM, KNIGHTS OF THE ORDER OF, and TEMPLARS). Du Cange (*Glossarium*, *s.v.* "Serviens") gives many other instances.

1. *Military Title.*—In its early military uses the word implied a subordinate, and it is not clear how it came to be used for a minor commander. The "serjeants" of ordinary medieval armies were the heavy-armed (generally mercenary) cavalry or men-at-arms. In the 15th century it became usual to subdivide troops of all sorts into groups of dissimilar combatants, graded amongst themselves according to military or social importance. Thus a "lance," or group, might consist of a heavy-armed lancer (man-at-arms), a mounted and a foot archer and an armed valet, and the "serjeant" would be its most important member. But the general evolution of armies led to their being classed by arms and grouped in more homogeneous regiments. Under such an organization the title of the group-leader lost its cavalry significance and became specifically the designation of an infantry rank. From the cavalry it disappeared altogether, the titles "corporal of horse," "maréchal des logis," &c., taking its place. In 16th and 17th century armies the title serjeant is found amongst the highest ranks of an army. With a partial return to the old meaning it signifies, in all its forms, an expert professional soldier, the serjeant of a company, the serjeant-major of a regiment and the serjeant-major-general of the army (these last the originals of the modern ranks, major and major-general) being charged with all duties pertaining to the arraying, camping and drill of their units.

In modern armies the word serjeant is used of a non-commissioned officer ranking between corporal and serjeant-major. A "lance-serjeant" is a corporal holding the appointment and performing the duties, but not having the rank of serjeant. The serjeant-major in the British service is a "warrant-officer," although in the cavalry and artillery the ranks of "troop," "squadron" or "battery serjeant-major" are non-commissioned and correspond to the "colour-serjeant" of infantry. This last officer is the senior non-commissioned officer of a company, and has, besides his duties in the colour-party, the pay and accounting work of his unit. The former "corporal of horse" and "corporal-major" still survive in the British Household Cavalry. In Germany, Austria and Russia the regimental serjeant-majors of infantry and cavalry are styled *Feldwebel* and *Wachtmeister* respectively, while in France the titles are *adjudant* and *maréchal des logis* or *maréchal des logis chef*.

2. *Serjeants-at-Arms.*—In the British royal household there are eight serjeants-at-arms, whose duties are ceremonial; they have to be in attendance only at drawing-rooms, levees, state balls and state concerts. There are also two other serjeants-at-arms to whom special duties are assigned, the one attending the Speaker of the House of Commons and the other the lord chancellor in the House of Lords, carrying their maces and executing their orders. The Speaker's serjeant-at-arms is the disciplinary officer of the House of Commons, whose duty it is to expel members at the order of the Speaker and to arrest and keep in custody those persons condemned to this punishment by the authority of the House. The serjeants-at-arms have no special uniform. At court they wear any naval, military or civil uniform to which they may be entitled, or the court dress of those holding legal appointments, but not entitled to wear robes, *i.e.* a suit of black cloth, with knee-breeches, lace bands and ruffles, a black silk cocked hat with rosette and steel loop and a sword. A silver collar of office is worn on special occasions. This costume, with the chain, is that worn by the serjeants-at-arms in the House of Lords and the House of Commons always.

SERJEANT-AT-LAW, the name (see above) given to what was formerly an order of the highest rank of barristers at the English or Irish bar. The word is a corruption of *serviens ad legem*, as distinguished from *apprenticius ad legem*, or utter barrister, who probably originally obtained his knowledge of law by serving a kind of apprenticeship to a serjeant. When the order of serjeants was instituted is unknown, but it certainly dates from a very remote period. The authority of serjeant counters or countors (*i.e.* pleaders, those who frame counts in pleading) is treated in the *Mirror of Justices*, and they are named in 3 Edw. I. c. 29. They may possibly have been the representatives of the *conteurs* mentioned in the great customary of Normandy. The position of the serjeant had become assured when Chaucer wrote. One of the characters in the *Canterbury Tales* is

> "A serjeant of the law, wary and wise,
> That often had y-been at the parvis."[1]

Serjeants (except king's serjeants) were created by writ of summons under the great seal, and wore a special and distinctive dress, the chief feature of which was the coif, a white lawn or silk skull-cap, afterwards represented by a round piece of black silk at the top of the wig. They enjoyed a social precedence after knights bachelors and before companions of the Bath and other orders. In this they differed from king's counsel, who had simply professional as distinguished from social rank. Socially the serjeant had precedence, professionally the king's counsel, unless indeed, as was often the case, a patent of precedence was granted to the former. The serjeants at the Irish bar had precedence next after the law officers of the crown. Till past the middle of the 19th century a limited number of the serjeants were called "king's (queen's) serjeants." They were appointed by patent and summoned to parliament. Until 1814 the two senior king's serjeants had precedence of even the attorney-general and solicitor-general. It was the custom for serjeants on their appointment to give gold rings with mottoes to their colleagues. Down to 1845 the order enjoyed a very valuable monopoly of practice. The serjeants had the right of exclusive audience as leading counsel in the Court of Common Pleas. In 1834 a royal mandate of William IV. attempted to abolish this privilege, but in 1840 the judicial committee of the privy council declared the mandate informal and invalid. The monopoly was finally abolished in 1845 by Act of Parliament. For at least 600 years the judges of the superior courts of common law were always serjeants, but by the Judicature Act 1873 no person appointed a judge of the High Court of Justice or the Court of Appeal was required to take or have taken the degree of serjeant-at-law. The serjeants had their own inn of court known as Serjeants' Inn, which was formerly in two divisions, one in Fleet Street and one in Chancery Lane. In 1758 the members of the former joined the latter. In 1877 the society was dissolved, the inn sold to one of the members and the proceeds divided among the existing serjeants. The order is now extinct.

See *Serviens ad Legem*, by Mr Serjeant Manning; and *The Order of the Coif*, by Mr Serjeant Pulling.

SERJEANTY. Tenure by serjeanty was a form of land-holding under the feudal system, intermediate between tenure by knight-service (*q.v.*) and tenure in socage. It originated in the assignation of an estate in land on condition of the performance of a certain duty, which can hardly be described more exactly than as not being that of knight-service. Its essence, according to Pollock and Maitland, might be described as "servantship," the discharge of duties in the household of king or noble; but it ranged from service in the king's host, distinguished only by equipment from that of the knight, to petty renders scarcely distinguishable from those of the rent-paying tenant or socager. Serjeanties, as Miss Bateson has expressed it, "were neither always military nor always agricultural, but might approach very closely the service of knights or the service of farmers. . . . The serjeanty of holding the king's head when he made a rough passage across the Channel, of pulling a rope when his vessel landed, of counting his chessmen on Christmas day, of bringing fuel to his castle, of doing his carpentry, of finding his potherbs, of forging his irons for his ploughs, of tending his garden, of nursing the hounds gored and injured in the hunt, of serving as veterinary to his sick falcons, such and many others might be the ceremonial or menial services due from a given serjeanty." The many varieties of serjeanty were afterwards increased by lawyers classing for convenience under this head such duties as those of escort service to the abbess of Barking, or of military service on the Welsh border by the men of Archenfield.

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[1] The parvis was the porch of old St Paul's, where each serjeant had his particular pillar at which he held interviews with his clients.

Serjeants (*servientes*) are already entered as a distinct class in Domesday Book (1086), though not in all cases differentiated from the barons, who held by knight-service. Sometimes, as in the case of three Hampshire serjeanties—those of acting as king's marshal, of finding an archer for his service, and of keeping the gaol in Winchester Castle—the tenure can be definitely traced as far back as Domesday. It is probable, however, that many supposed tenures by serjeanty were not really such, although so described in returns, in inquests after death, and other records. The simplest legal test of the tenure was that serjeants, though liable to the feudal exactions of wardship, &c., were not liable to scutage; they made in place of this exaction special composition with the crown.

The germ of the later distinction between "grand" and "petty" serjeanty is found in the Great Charter (1215), the king there renouncing the right of prerogative wardship in the case of those who held of him by the render of small articles. The legal doctrine that serjeanties were (*a*) inalienable, (*b*) impartible, led to the "arrentation," under Henry III., of serjeanties the lands of which had been partly alienated, and which were converted into socage tenures, or, in some cases, tenures by knight-service. Gradually the gulf widened, and "petty" serjeanties, consisting of renders,[1] together with serjeanties held of mesne lords, sank into socage, while "grand" serjeanties, the holders of which performed their service in person, became alone liable to the burden of wardship and marriage. In Littleton's *Tenures* this distinction appears as well defined, but the development was one of legal theory.

When the military tenure of knight-service was abolished at the Restoration (by 12 Charles II., cap. 24), that of grand serjeanty was retained, doubtless on account of its honorary character, it being then limited in practice to the performance of certain duties at coronations, the discharge of which as a right has always been coveted, and the earliest record of which is that of Queen Eleanor's coronation in 1236. The most conspicuous are those of champion, appurtenant to the Dymokes' manor of Scrivelsby, and of supporting the king's right arm, appurtenant to that of Worksop. The latter duty was performed at the coronation of King Edward VII. (1902).

The meaning of serjeant as a household officer is still preserved in the king's serjeants-at-arms, serjeant-surgeons and serjeant-trumpeter. The horse and foot serjeants (*servientes*) of the king's host in the 12th century, who ranked after the knights and were more lightly armed, were unconnected with tenure.

The best summary of tenure by serjeanty is in Pollock and Maitland's *History of English Law*; McKechnie's *Magna Carta* (1905) should also be consulted; and for Domesday the *Victoria History of Hampshire*, vol. i. The best list of serjeanties is in the *Red Book of the Exchequer* ("Rolls" series), but the *Testa de Nevill* (Record Commission) contains the most valuable records concerning them. Blount's *Tenures* is useful, but its modern editions very uncritical. Wollaston's *Coronation Claims* is the best authority on its subject.
(J. H. R.)

SERMON (Lat. *sermo*, a discourse), an oration delivered from a pulpit with fullness and rhetorical effect. Pascal, than whom no greater authority can be desired, defines a sermon as a religious address, in which the word of God is stated and explained, and in which an audience is excited to the practice of virtue. This may be so extended as to include a discourse in favour of pure morality, though, even in that case, the morals are founded on Christian doctrine, and even the sermon which the fox preaches in La Fontaine's *Fables* is a parody of a Christian discourse. The Latin sermons of St Augustine, of which 384 are extant, have been taken as their models by all sensible subsequent divines, for it was he who rejected the formal arrangement of the divisions of his theme, and insisted that simplicity and familiarity of style were not incompatible with dignity and religion. His object was not to dazzle by a conformity with the artificial rules of oratory, but to move the soul of the listener by a direct appeal to his conscience. His adage was *Qui sophistice loquitur odibilis est*, and his influence has been exercised ever since in warning the Christian orator against artificiality and in urging upon him the necessity of awakening the heart. Nevertheless, on many occasions, fashion has led the preachers of a particular epoch to develop rules for the composition of sermons, the value of which is more than doubtful. Cardinal Siffrein, who is known as the Abbé Maury (1746–1817), resumed all the known artifices of sermon-style in a volume which has a permanent historical value, the well-known *Essai sur l'éloquence de la chaire* (1810); he was himself rather a fiery politician than a persuasive divine. Maury describes all the divisions of which a good sermon should consist—an exordium, a proposition, a section, a confirmation in two or more points, a peroration; and he holds that a sermon on morals should have but two points, while one on the Passion must have three. These are effects of pedantry, and seem rather to be founded on a cold-blooded analysis of celebrated sermons than on any instinctive sense of the duty of the preacher. We may wish to see in a good sermon, what Bossuet recommended, not the result of slow and tedious study, but the flush of a celestial fervour. Voltaire makes an interesting observation on the technical difference between an English and a French sermon in the 18th century; the former, he says, is a solid and somewhat dry dissertation which the preacher reads to the congregation without a gesture and without any inflection of his voice; the latter is a long declamation, scrupulously divided into three points, and recited by heart with enthusiasm.

Among the earliest examples of pulpit oratory which have been preserved in English literature, the discourses of Wycliffe and his disciples may be passed by, to arrive at the English sermons of John Fisher (1469?–1535), which have a distinct literary value. But Hugh Latimer (1485?–1555) is the first great English preacher, and the wit and power of his sermons (1549) give them prominence in our literature. One of the expository discourses of John Knox (1505–1572), we are told, was of more power to awaken his hearers than a blast from "five hundred trumpets." When we come to Elizabethan times, we possess a few examples of the sermons of the "judicious" Hooker (1554–1600); Henry Smith (1550–1591) was styled "the prime preacher of the nation"; and Lancelot Andrewes (1555–1626), whose sermons were posthumously printed at the command of James I. in 1628, dazzled his contemporaries by the brilliancy of his euphemism; Andrewes was called "the star of preachers." At a slightly later date John Donne (1573–1621) and Joseph Hall (1574–1656) divided the suffrages of the pious. In the middle of the 17th century the sermon became one of the most highly-cultivated forms of intellectual entertainment in Great Britain, and when the theatres were closed at the Commonwealth it grew to be the only public form of eloquence. It is impossible to name all the eminent preachers of this time, but a few must be mentioned. John Hales (1584–1656); Edmund Calamy (1600–1666); the Cambridge Platonist, Benjamin Whichcote (1609–1685); Richard Baxter (1615–1691); the puritan John Owen (1616–1683); the philosophical Ralph Cudworth (1617–1688); Archbishop Leighton (1611–1684)—each of these holds an eminent position in the records of pulpit eloquence, but all were outshone by the gorgeous oratory and art of Jeremy Taylor (1613–1667), who is the most illustrious writer of sermons whom the British race has produced. His matchless collection of discourses delivered at Golden Grove, *The Eniautos*, was published in 1653–1655. The fault of the 17th-century sermon was a tendency, less prominent in Jeremy Taylor than in any other writer, to dazzle the audience by a display of false learning and by a violence in imagery; the great merit of its literary form was the fullness of its vocabulary and the richness and melody of style which adorned it at its best. Some of the most remarkable divines of this great period, however, are scarcely to be mentioned as successful writers of sermons. At the Restoration, pulpit oratory in England became drier, less picturesque and more sententious. The great names at this period were those of Isaac Barrow (1630–1677); Robert South (1634–1716), celebrated for his wit in the pulpit; John Tillotson (1630–1694), the copyright of whose sermons fetched the enormous sum of 2500 guineas after his death, and of whom it was said that he was "not only the best preacher of the age, but seemed to have brought preaching to perfection"; and Edward Stillingfleet (1635–1699), styled, for his appearance in the pulpit, "the beauty of holiness." These preachers of the Restoration were controversialists, keen, moderate and unenthusiastic. These qualities were accentuated in the 18th century, when for a while religious oratory ceased to have any literary value. The sermons of Benjamin Hoadly (1676–1761) have a place in history, and those of Joseph Butler (1692–1752), the *Rolls Sermons* of 1726, have great philosophical importance. Thomas Boston's (1676–1732) memory has been revived by the praise of Stevenson, but his zeal was far exceeded by that of John Wesley (1703–1791), who preached 40,000 sermons, and by that of George Whitefield (1714–1770).

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[1] Usually a bow, sword, dagger or other small thing belonging to war.

Of all countries, however, France is the one which has shown most brightly in the cultivation of the sermon. In the 14th century Gerson (1363–1429) seems to have been the earliest divine who composed and preached in French, but his example was not followed by any man of equal genius. It was the popular movement of the Reformation, which made the sermon a piece of literature, on the lips of Jean Calvin (1509–1564), Pierre Viret (1511–1571) and Théodore de Bèze (1519–1605). With these stern Protestant discourses may be contrasted the beautiful, but somewhat euphuistical sermons of St François de Sales (1605–1622), full of mystical imagery. Father Claude de Lingendes (1591–1660) has been looked upon as the father of the classic French sermon, although his own *conciones* were invariably written in Latin, but his methods were adopted in French, by the school of Bourdaloue and Bossuet. In the great body of noble religious eloquence delivered from French pulpits during the 17th century, the first place is certainly held by the sermons of J. B. Bossuet (1627–1704), who remains perhaps the greatest preacher whom the world has ever seen. His six *Oraisons Funèbres*, the latest of which was delivered in 1687, form the most majestic existing type of this species of literature. Around that of Bossuet were collected other noble names: Louis Bourdaloue (1632–1704), whom his contemporaries preferred to Bossuet himself; Esprit Fléchier (1632–1710), the politest preacher who ever occupied a Parisian pulpit; and Jules Mascaron (1634–1703), in whom all forms of eloquence were united. A generation later appeared Baptiste Massillon (1663–1742), who was to Bossuet as Racine to Corneille; and Jacques Saurin (1677–1730), whose evangelical sermons were delivered at the Hague. These are the great classic preachers whose discourses continue to be read, and to form an inherent part of the body of French literature. There was some revival of the art of the sermon at Versailles a century later, where the Abbé Maury, whose critical work has been mentioned above, preached with vivid eloquence between 1770 and 1785; the Père Elisée (1726–1783), whom Diderot and Mme Roland greatly admired, held a similar place, at the same time, in Paris. Since the end of the 18th century, although a great number of volumes of sermons have been and continue to be published, and although the pulpit holds its own in Protestant and Catholic countries alike, for purposes of exhortation and encouragement, it cannot be said that the sermon has in any way extended its influence as a form of pure literature. It has, in general, been greatly shortened, and the ordinary sermon of to-day is no longer an elaborate piece of carefully balanced and ornamental literary architecture, but a very simple and brief homily, not occupying the listener for more than some ten minutes in the course of an elaborate service.

In Germany, the great preachers of the middle ages were Franciscans, such as Brother Bertold of Regensburg (1220–1272), or Dominicans, such as Johann Tauler (1290–1361), who preached in Latin. The great period of vernacular preaching lasted from the beginning of the 16th to the end of the 17th century. Martin Luther was the most ancient type of early Reformation preacher, and he was succeeded by the mystic Johann Arndt (1555–1621); the Catholic church produced in Vienna the eccentric and almost burlesque oratory of Abraham a Santa Clara (1642–1709). The last of the great German preachers of this school was P. J. Spener, the founder of the Pietists (1635–1705).

Among the best authorities on the history of the sermon are Abbé Maury: *Essai sur l'éloquence de la chaire* (2 vols., Paris, 1810); Rothe, *Geschichte der Predigt* (Bremen, 1881). (E. G.)

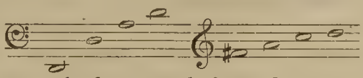
SEROUX D'AGINCOURT, JEAN BAPTISTE LOUIS GEORGE (1730–1814), French archaeologist and historian, was born at Beauvais on the 5th of April 1730. He belonged to a good family, and in his youth served as an officer in a regiment of cavalry. Finding it necessary to quit the army in order to take charge of his younger brothers who had been left orphans, he was appointed a farmer-general by Louis XV. In 1777 he visited England, Germany and Holland; and in the following year he travelled through Italy, with the view of exploring thoroughly the remains of ancient art. He afterwards settled at Rome, and devoted himself to preparing the results of his researches for publication. He died on the 24th of September 1814, leaving the work, which was being issued in parts, unfinished; but it was carried on by M. Gence, and published complete under the title *L'Histoire de l'art par les monuments, depuis sa décadence au quatrième siècle jusqu'à son renouvellement au seizième* (6 vols. fol. with 325 plates, Paris, 1823). An English translation by Owen Jones was published in 1847. In the year of his death Seroux d'Agincourt published in Paris a *Recueil de fragments de sculpture antique, en terre cuite* (1 vol. 4to).

SEROW, or SARAU, the Himalayan name of a goat-like antelope of the size of a donkey, nearly allied to the goral (*q.v.*) of the same region, but considerably larger, and with small face-glands. The Himalayan animal is a local race of the Sumatran *Nemorhaedus sumatrensis*; and the name serow is now extended to embrace all the species belonging to the same genus, the range of which extends from the Himalaya to Burma, the Malay Peninsula and Sumatra in one direction, and to Tibet, China, Japan and Formosa in another. Serows inhabit scrub-clad mountains, at no great elevation. (R. L.*)

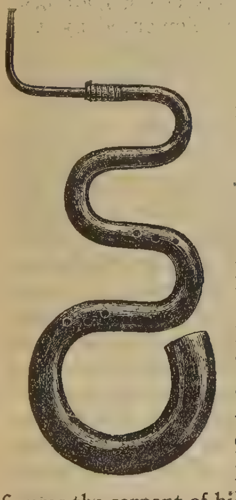
SERPA PINTO, ALEXANDRE ALBERTO DE LA ROCHA (1846–1900), Portuguese explorer in Africa, was born at the castle of Polchras, on the Douro, on the 10th of April 1846. Entering the army in 1864, he served in Mozambique, and in 1869 took part in an expedition against tribes in revolt on the lower Zambezi. In 1877 he and Captains Capello and Ivens of the Portuguese navy were sent on an expedition to south central Africa. The explorers left Benguella in November 1877 for the interior, but Serpa Pinto soon parted from his colleagues, who went north, while Serpa Pinto continued east. He crossed the Kwando in June 1878, and in August reached Lialui, the Barotse capital on the Zambezi, where he received help from the Rev. F. Coillard which enabled him to continue his journey down the river to the Victoria Falls, whence he turned south, arriving at Pretoria on the 12th of February 1879. He was the fourth explorer to traverse Africa from west to east, and was the first to lay down with approximate accuracy the route between Bihe and Lialui. Among other rewards the Royal Geographical Society of London awarded him (1881) the Founder's medal. The account of his travels appeared in English under the title *How I crossed Africa* (2 vols., London, 1881). In 1884 he attempted, with less success, the exploration of the regions between Mozambique and Lake Nyasa. Appointed governor of

Mozambique in 1889, he organized an expedition with the object of securing for Portugal the Shiré highlands and neighbouring regions, but the vigorous action of the British agents (John Buchanan and H. H. Johnston) frustrated this design (see AFRICA, § 5). Shortly afterwards Serpa Pinto returned to Lisbon and was promoted to the rank of colonel. He died on the 28th of December 1900.

SERPENT (Lat. *serpens*, creeping, from *serpere*; cf. "reptile" from *repere*, Gr. ἕρπειν), a synonym for reptile or snake (see REPTILE, and SNAKES), now generally used only of dangerous varieties, or metaphorically. See also SERPENT-WORSHIP below.

In music the serpent (Fr. *serpent*, Ger. *Serpent*, *Schlangenrohr*, Ital. *serpentone*) is an obsolete bass wind instrument derived from the old wooden cornets (*Zinken*), and the progenitor of the bass-horn, Russian bassoon and ophicleide. The serpent is composed of two pieces of wood, hollowed out and cut to the desired shape. They are so joined together by gluing as to form a conical tube of wide calibre with a diameter varying from a little over half an inch at the crook to nearly 4 in. at the wider end. The tube is covered with leather to ensure solidity. The upper extremity ends with a bent brass tube or crook, to which the cup-shaped mouthpiece is attached; the lower end does not expand to form a bell, a peculiarity the serpent shared with the cornets. The tube is pierced laterally with six holes, the first three of which are covered with the fingers of the right hand and the others with those of the left. When all the holes are thus closed the instrument will produce the following sounds, of which the first is the fundamental and the rest the harmonic series founded thereon: 

Each of the holes on being successively opened gives the same series of harmonics on a new fundamental, thus producing a chromatic compass of three octaves by means of six holes only.



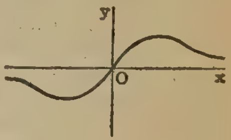
The holes are curiously disposed along the tube for convenience in reaching them with the fingers; in consequence they are of very small diameter, and this affects the intonation and timbre of the instrument adversely. With the application of keys to the serpent, which made it possible to place the holes approximately in the correct theoretical position, whereby the diameter of the holes was also made proportional to that of the tube, this defect was remedied and the timbre improved.

The serpent was, according to Abbé Lebœuf,[1] the outcome of experiments made on the *cornon*, the bass cornet or *Zinke*, by Edmé Guillaume, canon of Auxerre, in 1590. The invention at once proved a success, and the new bass became a valuable addition to church concerted music, more especially in France, in spite of the serpent's harsh, unpleasant tone. Mersenne (1636) describes and figures the serpent of his day in detail, but it was evidently unknown to Praetorius (1618). During the 18th century the construction of the instrument underwent many improvements, the tendency being to make the unwieldy windings more compact. At the beginning of the 19th century the open holes had been discarded, and as many as fourteen or seventeen keys disposed conveniently along the tube. Gerber, in his *Lexikon* (1790), states that in 1780 a musician of Lille, named Régibo, making further experiments on the serpent, produced a bass horn, giving it the shape of the bassoon for greater portability; and Frichot, a French refugee in London, introduced a variant of brass which rapidly won favour under the name of "bass horn" or "basson russe" in English military bands. On being introduced on the continent of Europe, this instrument was received into general use and gave a fresh impetus to experiments with basses for military bands, which resulted first in the ophicleide (*q.v.*) and ultimately in the valuable invention of the piston or valve.

Further information as to the technique and construction of the serpent may be gained from Joseph Fröhlich's excellent treatise on all the instruments of the orchestra in his day (Bonn, 1811), where clear and accurate practical drawings of the instruments are given. (K. S.)

SERPENTARIUS, or OPHIUCHUS, in astronomy, a constellation of the northern hemisphere, anciently named Aesculapius, and mentioned by Eudoxus (4th century B.C.) and Aratus (3rd century B.C.). According to the Greek fables it variously represents: Carnabon (or Charnabon), king of the Getae, killing one of the dragons of Triptolemus, or Heracles killing the serpent at the river Sangarius (or Sagaris), or the physician Asclepius (Aesculapius), to denote his skill in curing snake bites. Ptolemy catalogued 29 stars, Tycho Brahe 15, and Hevelius 40. "New" stars were observed in 1604 and 1848.

SERPENTINE, in geometry, a cubic curve described by Sir Isaac Newton, and given by the cartesian equation $y(a^2+x^2)=abx$. The origin is a point of inflection, the axis of x is an asymptote, and the curve lies between the parallel lines $2y=\pm b$.



SERPENTINE, a mineral which, in a massive and impure form, occurs on a large scale as a rock, and being commonly of variegated colour, is often cut and polished, like marble, for use as a decorative stone. It is generally held that the name was suggested by the fancied resemblance of the dark mottled green stone to the skin of a serpent, but it may possibly refer to some reputed virtue of the stone as a cure for snake-bite. Serpentine was probably, at least in part, the λίθος ὀφίτης of Dioscorides and the *ophites* of Pliny; and this name appears in a latinized form as the *serpentaria* of G. Agricola, writing in the 16th century, and as the *lapis serpentinus* and *marmor serpentinum* of other early writers. Italian sculptors have sometimes termed it *ranochia* in allusion to its resemblance to the skin of a frog.

Although popularly called a "marble," serpentine is essentially different from any kind of limestone, in that it is a magnesium silicate, associated however, with more or less ferrous silicate. Analyses show that the mineral contains $H_4Mg_3Si_2O_9$, and if the water be regarded as constitutional the formula may be written $Mg_2(SiO_4)_2H_3(MgOH)$. Serpentine occurs massive, fibrous, lamellar or granular, but never crystallized. Fine pseudomorphs having the form of olivine, but the composition of serpentine, are known from Snarum in Buskerud, Norway, the crystals revealing their character by containing an occasional kernel of the original mineral. The alteration of rocks rich in olivine has given rise to much of the serpentine occurring as rock-masses (see PERIDOTITE). Studied microscopically, the change is seen to proceed from the surface and from the irregular cracks of the olivine, producing fibres of serpentine. The iron of the olivine passes more or less completely into the ferric state, giving rise to grains of magnetite, which form a black dust, and may ultimately yield scales of haematite or limonite. Considerable increase of volume generally accompanies serpentinization, and thus are produced fissures which afford passage for the agents of alteration, resulting in the formation of an irregular mesh-like structure, formed of strings of serpentine enclosing kernels of olivine in the meshes, and this olivine may itself ultimately become serpentinized. Serpentine may also be formed by the alteration of other non-aluminous ferro-magnesian silicates such as enstatite, augite or hornblende, and in such cases it may show microscopically a characteristic structure related to the cleavage of the original mineral, notably lozenge-shaped in the case of hornblende. Many interesting pseudomorphs of serpentine were described by Professor J. D. Dana from the Tilly Foster iron-mine, near Brewster, New York, U.S.A., including some remarkable specimens with cubic cleavage.

The purest kind of serpentine, known as "noble serpentine," is generally of pale greenish or yellow colour, slightly translucent, and breaking with a rather bright conchoidal fracture. It occurs chiefly in granular limestone, and is often accompanied by forsterite, olivine or chondrodite. The hardness of serpentine is between 3 and 4, while the specific gravity varies from 2·5 to 2·65. A green serpentine of the exceptional hardness of 6, formerly regarded as jade, is known as bowenite, having been named by J. D. Dana after G. T. Bowen. The original bowenite came from Smithfield, Rhode Island, U.S.A., and a similar mineral was described by General C. A. McMahon as occurring in Afghanistan, where it is carved for ornamental purposes in the belief that it is jade (*q.v.*). Many common carvings regarded as jade are really serpentine, and therefore soft. Serpentine of columnar or coarsely fibrous form is termed picrolite, a name proposed by J. F. L. Hausmann from the Greek πικρός (bitter) in allusion to the presence of magnesia. The finely fibrous serpentine is called chrysotile from the lustrous yellowish colour which it usually presents (χρυσός, gold; τίλος, fibre) and this variety is extensively worked, especially in Canada, for use as asbestos (*q.v.*). In order to avoid confusion between the words chrysotile and chrysolite, it has been proposed by Dr J. W. Evans that the fibrous serpentine should be distinguished as karystiolite—a modification of the ancient name, taken from its occurrence near Karystos in Euboea. Foliated serpentine is usually termed marmolite—a name given by G. T. Nuttall, from μαρμαίρω (to glisten) in reference to its lustre. A thin lamellar or flaky serpentine supposed to occur in the Antigorio valley north of Domodossola in Piedmont is called antigorite, having been named in 1840 by M. E. Schweizer, after whom a somewhat similar mineral is termed schweizerite. Antigorite has been studied by Professor T. G. Bonney and Miss C. Raisin (*Quart. Journ. Geol. Soc.*, lxi., 1905, p. 690; lxiv., 1908, p. 152). An apple-green translucent serpentine passes under the name of williamsite, having been so called by C. U. Shepard in honour of its discoverer L. White Williams, of West Chester, Pennsylvania, where this variety occurs.

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[1] See *Mémoire concernant l'histoire ecclésiastique et civile d'Auxerre* (Paris, 1848), ii. 189.

"Common serpentine" is the impure massive kind which occurs in rock-masses and is extensively worked as "serpentine-marble." It is sometimes veined with steatite, or magnesite, and may contain scattered crystals of diallage, bronzite or bastite (an altered rhombic pyroxene), which by schillerization may present a metallic lustre. In England the chief localities of serpentine are in Cornwall, especially in the Lizard district, where it is quarried and carved into mantelpieces, columns, vases and other ornaments. Much of it presents a rich red or brown colour, often mottled and sometimes veined. Professor Bonney has shown that it has been largely derived from olivine. Green serpentine occurs near Holyhead in Anglesey. A beautiful serpentine, generally mottled red and green, with veins of steatite, is found at Portsoy in Banffshire, Scotland, and was used for pillars in the great hall at Versailles. Serpentine containing chromite is found in the Shetland Islands.

The rock called "ophicalcite" consists of an intimate association of serpentine with limestone, often forming an ornamental stone which is beautifully clouded and zoned with various shades of green. It generally results from the metamorphism of an impure dolomitic limestone, the impurities having crystallized as new minerals which become altered to serpentine. Pseudomorphs of serpentine occur after forsterite. The best known serpentinous marble of the British Isles occurs in Connemara in Galway, Ireland, and passes in trade under the name of "Irish green." Ophicalcites are developed also in various parts of Scotland, and the green pebbles found in Iona belong to this type of rock. The famous eozoonal marble of Canada is also of similar character.

In Saxony common serpentine is largely worked at Zöblitz near Marienberg and Waldheim. The rock of Zöblitz, mentioned by G. Agricola in the 16th century, is usually of dull green or brown colour, and frequently contains dark red Bohemian garnet or pyrope (*q.v.*). It was used in the mausoleum of Prince Albert at Frogmore, Windsor, and in Abraham Lincoln's monument at Springfield, Illinois, U.S.A. Italy is rich in serpentine, the best-known being the *verde di Prato*, which has been quarried for centuries at Monteferrato near Prato in Tuscany, and has been largely used in ecclesiastical architecture in Florence, Prato and Pistoja. Much serpentine is found near Genoa and Levanto. The *verde di Pegli* comes from Pegli not far from Genoa, while the *verde di Genova* is a brecciated serpentinous limestone from Pietra Lavezzara. Serpentine occurs also at many localities in the Apennines, in Elba and in Corsica. The term ophiolite has been vaguely used to include not only serpentines but many other rocks associated with the Italian serpentines. *Verde antico* is a brecciated serpentine with fragments of limestone, originally brought by the Romans from Atrax in Thessaly, and called *lapis atracius*. It is sometimes known as *vert antique*, or, following the old French, *verd antique*. The term serpentine is often improperly applied to the ancient green porphyry of Laconia in the Peloponnesus (*porfido serpentino verde*). True serpentine occurs at numerous localities in the Alps and in France, an elegant variety being quarried at Épinal in the Vosges, whilst a fine ophicalcite is worked at St Véran and Maurins, dep. Hautes-Alpes. The Ronda Mountains in Spain also yield serpentine.

In North America serpentine is so widely distributed that only a few localities can be specified. It is found in St Lawrence county, Essex county and Warren county, New York, and also on Staten Island; at Montville and Hoboken in New Jersey; at Newport, Rhode Island; at Newbury and Newburyport, Massachusetts; Texas, Lancaster county, and West Chester, Chester county, Pennsylvania; at many localities in Vermont, and in California, Connecticut, Georgia, Maine, Maryland, Michigan, New Mexico, North Carolina and Washington.

For American serpentine see *Stones for Building and Decoration*, by George P. Merrill (New York, 1903); and for serpentine asbestos see the same author's *Non-metallic Minerals* (New York, 1904). (F. W. R.*)

1. Prevalence in varying forms.

SERPENT-WORSHIP. From all parts of the world there is a very considerable body of evidence for the prominence of the serpent in religion, mythology and folk-lore. Snake-worship still prevails largely in India, and a writer in 1896 remarks that the previous census showed in the North-West Provinces over 25,000 Nāga (serpent) worshippers, 123,000 votaries of the snake-god Gūga, and, in the Punjab, some 35,000 special votaries of the snake godlings.[1] The evidence from modern India can be supplemented by the medieval and ancient Indian sources, and, in particular, by the representations of the adoration of snake-deities on the Buddhist topes of Sanchi and Amravati.[2] There we find, not indeed living serpents, but deities with serpent-symbolism, indicating a composition of various strata of religious belief, analogous to the evidence for serpent-symbolism from Babylonia, Crete, Greece or Peru; for the higher religions have almost invariably retained in their ritual and belief, sometimes with only slight modification, cruder conceptions which can still be studied in less elevated form among the lower races of India, Africa or America. The result is instructive when we turn to the numerous serpent myths and legends from the Old World and the New, to the stray notices in old writers, or to the fragmentary scraps of popular superstition everywhere. Modern scientific research has vividly illustrated the stereotyped nature of the human mind; there is a general similarity in the effect of similar phenomena upon people at a similar stage of mental growth; there is an almost inherent or unconscious belief which has been transmitted through the countless ages of man's history. At the same time, apart from the gradual evolution of religious and other conceptions there are the more incidental and artificial influences which have shaped them. Hence, our evidence for serpent-cults everywhere represents varying stages in the historical development of a few related fundamental ideas which are psychologically explicable; and it is impossible to deal with the subject geographically or historically. It is most useful, perhaps, to survey some of the general features of belief as an introduction to the more complex inquiries which involve a consideration of other subjects over a larger field.

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[1] See W. Crooke, *The Popular Religion and Folk-lore of Northern India* (London, 1896), ii. 122.

[2] See the elaborately illustrated work of James Fergusson, *Tree and Serpent Worship, or Illustrations of Mythology and Art in India* (2nd ed., London, 1873); also M. Winternitz, "der Sarpabali, ein altindischer Schlangen-cult," in *Mitteil. d. anthrop. Gesell.* of Vienna, xviii. (1888), pp. 25-52, 250-264. Both give abundant information on the various features of serpent-cults.

Haunting buildings and famous ruins, gliding around pools, walls and trees, mysteriously disappearing below ground, the serpent and all its kind invariably arrested attention through its uncanny distinctiveness from bird or beast. Its gliding motion suggested the winding river. Biting its tail it symbolized the earth surrounded by the world-river. Its patient watchfulness, the fascination it exerted over its victims, the easy domestication of some species, and the deadliness of others have always impressed primitive minds. Its swift and deadly dart was likened to the lightning; equally marvellous seemed its fatal power. It is little wonder that men who could tame and handle the reptiles gained esteem and influence. Sometimes the long life of the serpent and its habit of changing the skin suggested ideas of immortality and resurrection, and it is noteworthy that one Indian snake-festival occurs after or at the sloughing, when the sacred being is thus supposed to become purified.[1]

2. Serpents' wealth and wisdom.

A very common belief associates serpents or dragons and other monsters with the guardianship of treasure or wealth; comp., *e.g.*, the golden apples of the Hesperides, and the Egyptian gods Kneph and Osiris, and the Indian Krishna and Indra. Serpents adorned with necklaces of jewels or with crowns were familiar in old superstition, and the serpent with a ruby in its mouth was a favourite love-token. Many stories tell of the grateful reptile which brought valuable gifts to a benefactor. According to a common Indian belief a wealthy man who dies without an heir returns to guard his wealth in the form of a serpent, and Italian superstition supposed that to find a serpent's skin brought good luck (Leland).[2] No singular preference for jewels on the part of serpents will explain the belief, and creatures like the jackdaw which have this weakness do not enjoy this prominence in folk-lore. A rationalistic explanation might be found in the connexion between the chthonic serpent and subterranean sources of wealth.[3] Moreover, the serpent is often associated with metallurgy, and to serpent deities have been ascribed the working of metals, gem-cutting and indeed culture in general. The Aztec Quetzalcoatl taught metallurgy and agriculture, gave abundance of maize, also wisdom and freedom from disease. The Babylonian Ea, who sometimes has serpent attributes, introduced—like the American serpent Votan—knowledge and culture. The half-serpent Cadmus brought knowledge of mines, agriculture, and the "Cadmean" letters, while Cecrops inculcated laws and ways of life and was the first to establish monogamy. Although the reptile is not particularly intelligent, it has become famed for shrewdness and wisdom, whether in the Garden of Eden (Gen. iii. 1; 2 Cor. xi. 3) or generally (cf. Matt. x. 16). The Ophites (*q.v.*) actually identified the serpent with Sophia ("Wisdom"); the old sage Garga, one of the fathers of Indian astronomy, owed his learning to the serpent-god Sesha Nāga; and the Phoenician γέρων ’Οφίων wrote the seven tablets of fate which were guarded by Harmonia.[4] Not only is the serpent connected with oracles, the beneficent *agathodaemon* of Phoenicia also symbolized immortality. In Babylonian myth a serpent, apparently in a well or pool, deprived Gilgamesh of the plant which rejuvenated old age, and if it was the rightful guardian of the wonderful gift, one is reminded of the Hebrew story, now reshaped in Gen. iii., where the supernatural serpent is clearly acquainted with the properties of the tree of life.[5]

3. Serpents in healing.

Serpents were supposed to know of a root which brought back their dead to life, and an old Greek story told how certain mortals took the hint.[6] In one form or another the healing powers of the serpent are very familiar in legend and custom. Siegfried bathed in the blood of the dragon he slew and thus became invulnerable; the blind emperor Theodosius recovered his sight when a grateful serpent laid a precious stone upon his eyes; Cadmus and his wife were turned into serpents to cure human ills. "In 1899 a court in Larnaca, Cyprus, awarded £80 (Turkish) as damages for the loss of a snake's horn which had been lent to cure a certain disease" (Murison, p. 117, n. 9). Not to multiply examples, it must suffice to refer to the old popular idea that medical skill could be gained by eating some part of a serpent: the idea that its valuable qualities would thus be assimilated belongs to one of the fundamental dogmas of primitive mankind (cf. Porphyry, *De abst.* ii. 48). Now, serpents were tended in the sanctuaries of the Greek Aesculapius (Asklēpios), the famous god of healing. Among his symbols was a serpent coiled round a staff, and physicians were for long wont to place this at the head of their prescriptions. He is also represented leaning on a staff while a huge serpent rears itself up behind him, or (on a coin from Gythium) a serpent seems to come to him from a well. At Athens, Asklepios Amynos had a sanctuary with altar and well, and among the votive offerings have been discovered models of snakes.[7] The god-hero came from Epidaurus to the shrine at Sicyon in the form of a serpent, and the serpent sent from Epidaurus to stay a plague at Rome remained there, and a temple was erected to Aesculapius. The sanctuary of the deified healer at Cos marked the site where another serpent brought from Epidaurus dived into the earth (Pausanias, ii. 10, 3, iii. 23, 4). Hygieia, goddess of health, passed for his daughter, and is commonly identified with the woman in Greek art who feeds a serpent out of a saucer. Moreover, the temple of the earth-goddess Bona Dea on the slopes of the Aventine was a kind of herbarium, and snakes were kept there as a symbol of the medical art. Even in Upper Egypt a few decades ago, there was a tomb of the Mahommedan sheikh Herīdī, who—it is alleged—was transformed into a serpent; in cases of sickness a spotless virgin entered the cave and the serpent-occupant might permit itself to be taken in procession to the patient. The place was the scene of animal sacrifices and a yearly visit of women, and apparently preserved the traces of an old serpent-cult.[8]

4. As remedy against snake-bite.

Several practices conform to the idea that "a hair of the dog that bit you" is a sure remedy, and that the serpent was best fitted to overcome other serpents.[9] At Emesa in Syria, watered by the Orontes, an image, the lower part of which was a scorpion, cured the sting of scorpions and freed the city from snakes.[10] Constantinople was similarly protected by the serpent-trophy of Delphi which Constantine removed thither; an emperor was said to have performed an enchantment over the monument well known in Greek history.[11] In modern India a walking-stick from a species of cane in the neighbourhood of a certain serpent-shrine protects against snake-bite.[12] At Fernando Po, when there was an epidemic among children, they were brought to touch a serpent's skin which hung on a pole. The same ideas underlie the story of the Brazen Serpent which cured the Israelites of the bites of the serpents in the Wilderness (Num. xxi. 6-9; 1 Cor. x. 9). The object, however, was no temporary device; centuries later, 250 years after the founding of the temple of Jerusalem, the Brazen Serpent was regarded as unorthodox by the reforming king Hezekiah, and the historian who relates its overthrow ascribes its origin to the founder of Israelite national religion (2 Kings xviii. 4). The story in fact may have arisen to explain the object of cult; in any case it illustrates a general belief.

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[1] Fergusson, p. 259. Perhaps the sloughing more than any other feature stimulated primitive speculation; cf. Winternitz, p. 28.

[2] See Crooke, ii. 1 and 33 sqq.; C. G. Leland, *Etruscan Roman Remains*, p. 283; Winternitz 37 seq.; A. W. Buckland, *Anthropological Studies* (1891), pp. 104-139 (on serpents in connexion with metallurgy and precious stones).

[3] Excavators know how the popular mind associates their labours with search for hidden treasure, and no doubt the wealth of dead civilizations often stimulated the imagination of subsequent generations. A gruesome Indian story (Crooke, ii. 136) shows how old treasure-chambers could actually harbour enormous and deadly snakes.

[4] Nonnus (Dion. xli. 340 sqq.), cited by W. W. G. Baudissin, *Stud. z. Relig.-Gesch.* (Leipzig, 1876), i. 274 seq. (pp. 255-292, Semitic serpent-cult). See, for Garga, C. F. Oldham, *The Sun and the Serpent* (London, 1905), p. 54; and, for the serpent's wisdom, F. L. Schwartz, *Ursprung der Mythologie* (1860), pp. 55 seq.; J. Maehly, *Die Schlange im Mythus u. Cultus d. class. Völker* (1867), pp. 9 seq., 11, 23 seq.

[5] See H. Gressmann, *Archiv f. Religionswissenschaft*, x. 357 sqq. A Babylonian cylinder represents two figures (divine?) on either side of a fruit-tree, and behind one of them a serpent coils upwards. The interpretation is uncertain, but the motive has parallels (see Goblet d'Alviella, *Migration of Symbols*, London, 1894, pp. 129, 133, 167 seq.). R. G. Murison, "The Serpent in the O.T." (*Amer. Journ. of Sem. Lang.* xxi. 128), cites an American-Indian belief in a tree of healing, or rather of knowledge, inhabited by a serpent.

[6] J. G. Frazer, *Adonis, Attis and Osiris* (2nd ed., London, 1907), p. 153; also his notes on Pausanias, vol. iii. p. 65 seq.

[7] Similar votive offerings are known in India (Oldham, 87), and, though their true significance is uncertain, in ancient Arabia, Palestine and Elam (see H. Vincent, *Canaan d'après l'exploration récente*, Paris, 1907, pp. 174 sqq.).

[8] A. H. Sayce, "Serpent Worship in Ancient and Modern Egypt," *Contemporary Review* (Oct. 1893), p. 523; cf. also Fergusson, 34.

[9] See, for analogies, Frazer, *Golden Bough* (2nd ed.), ii. 426 seq.

[10] Even clothes washed in the waters of Emesa similarly protected the wearers. See Guy Le Strange, *Palestine under the Moslems*, 353 sqq., and for other miscellaneous evidence, 396, 405, 495.

[11] Ruy Gonzalez de Clarijo, *Hakluyt Society* (1859), p. 35.

[12] *Journal of the Bombay Branch of the Royal Asiatic Society*, ix. p. 180.

5. In wells and lakes.

According to primitive thought, rivers, lakes, springs and wells are commonly inhabited by spirits which readily assume human or animal form. Here the serpent and its kind are frequently encountered.[1] In India the serpent-godlings are very often associated with water, and, even at the digging of a well, worship is paid to the "world serpent," and the Sālagrāma (spiral ammonite), sacred to Vishnu, is solemnly wedded to the Tulasī or basil plant, representative of the garden which the pool will fertilize.[2] It is often supposed that the Nāga (serpent) chiefs rule countries in or under the water, and in Kashmir a submarine serpent-king became a convert and built churches. Especially common are the popular stories connecting serpents with submarine palaces and treasures (Crooke i. 45, cf. § 2 above); and one submarine realm in the Ganges was reputed to possess "the water of strength." In Palestine and Syria, where demoniacal beings are frequently associated with water, local opinion is sometimes uncertain whether the water is under the care of a *jinn* or of a patron-saint. Several springs are named after the serpent, and the sacred fountain of Ephca at Palmyra, whose guardian in the early Christian era was appointed by the god Yarḥibol, is still tenanted by a female serpent-demon which can impede its flow.[3] Jerusalem had the stone Zōḥeleth (possibly "serpent") by the well En-Rogel (1 Kings i. 9) and also its Dragon Well (Neh. ii. 13); in modern times the curative Virgin's Spring or St Mary's Well has its dragon which, when awake, swallows the intermittent flow of the water.[4] Serpents of the water are often healers (cf. § 3). A serpent in a lagoon near Gimbo-Amburi in Africa could cure madness; another, which haunted an Algerian well, embodied the soul of a Mahommedan saint and could cure sore eyes. This feature is especially intelligible when the waters have medicinal qualities. Among the southern Arabs the hot well of Msaʿide was virtually a sanctuary, and the serpent-demon was honoured by annual festivals in the sacred month Rajab. As recently as 1882, when the grand Llama of Tashilumpo was not relieved by the hot springs of Barchutsan, religious services were held to propitiate the serpent-deities (Oldham, 203). Finally, although in the sanctuary of Aesculapius healing came directly or indirectly as the patients dreamed, it appears from the burlesque of Aristophanes (*Plutus*, 653 sqq.) that they first bathed in the sacred spring.

6. Serpent and Cosmological connexions.

The serpent of the water is also the serpent of the great sea upon which the earth rested.[5] Sometimes the reptile lives in submarine infernal regions (with his wife, Crooke i. 43), and as the demon of the underworld it is sometimes the earth-shaker.[6] The Greek demon or snake Poseidon, god of sea and springs, was an earthquake god. To the great half-serpent monster Typhon were ascribed numerous springs; he was also the cause of earthquakes, and when he buried himself in the earth he formed the bed of the Syrian Orontes. This river, which was otherwise called Drakōn, Typhōn or Ophites, is known at the present day as the "river of the rebel" (*Nahr El-ʿAṣi*; Baudissin ii. 163). The waterspout, sometimes taken for a long-tailed dragon, is a huge sea-serpent, according to the Wanika of East Africa (Tylor i. 292 seq.). In ancient Persia the rainbow was the celestial serpent, and among some African tribes it is the subterranean wealth-conferring serpent, stretching its head to the clouds, and spilling the rain in its greedy thirst.[7] An early Indian name of the Milky Way is "the path of the serpent" (Crooke i. 25), and a great dragon or serpent is often the cause of eclipses, so that in India, on the occasion of an eclipse, its attention can be attracted by bathing in a sacred stream, or by a ritual which includes the worship of the image of the snake-god (i. 22 seq.).[8] Again the serpent is often associated with the lightning (Winternitz, 33).[9] Hence, as the reptile's range seems to be boundless, one is prepared for the serpentine deity of the Samoan and Tonga natives which connects heaven and earth (Tylor ii. 309 seq.), and for the part the serpent plays in the traditions of a universal deluge.[10]

7. Serpent and parentage.

The fok-lore of the Old and New World contains many examples of supernatural conception, an idea which is to be supplemented by the actual living belief (*e.g.* in Palestine) that supernatural beings can be fathers.[11] In Annam where water spirits may take the form of serpents or of human beings, two deified heroes were said to have been serpents born of a childless woman, who drank from a bowl of water into which a star had fallen.[12] Leland (132) cites the medieval belief that the household snake (see § 9), if not propitiated, can prevent conception, and in Bombay barrenness is sometimes attributed to a serpent which has been killed by the man or his wife in a former state of their existence. Hence the demon is laid to rest by burning the serpent-image with due funereal rites.[13] In the sanctuary of Aesculapius at Epidaurus women were visited in their dreams by a serpent—the reputed father of the child that was born, and elsewhere Sicyon who had such a progenitor was regarded as the son of the divine healer.[14] Similar also was the origin of Augustus in a temple of Apollo, the god who had his tame serpents in the grove on Epirus. Further, as the serpent-"father" of Alexander the Great came with a healing-root to cure his general Pompey (Cicero, *De div.* ii. 66), so in an Indian story the son of a king of serpents and of a virgin (or, in a variant form, a widow) was succoured in warfare by his sire (Fergusson, 266). In India the serpent origin of kings and rulers is famous. The same idea meets us in China, Greece (*e.g.* Aegeus, and Drakōn or Cecrops the first king of Athens), the Arabian dynasty of Edessa, the dynasty of Abyssinia, &c.; it is proper, therefore, to notice the serpent-symbol of royalty on the signets of the Rajahs of Chota Nagpur, the fire-spitting serpent which adorned the head of Egyptian Pharaohs, and the dragons which entwine King Arthur as he stands at the tomb of the emperor Maximilian at Innsbruck.[1] Sometimes the serpent stands at the head of the human race as the mother of all.[2] This, following an old and still well supported interpretation of the name Eve (*ḥawwah*), was apparently also the belief of one branch of the Hebrews.[3]

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[1] See Frazer's notes on Pausanias (1898), vol. v. pp. 44 seq.

[2] Crooke i. 42 seq., 49; see also Oldham, 51, 114; Winternitz, 259. The ammonite, here an instrument in a nature "marriage," has elsewhere given rise to legends of the destruction of serpents, viz. by St Hilda at Whitby in Yorkshire, and perhaps also by St Patrick in Ireland (see E. B. Tylor, *Primitive Culture*, 1903, i. 372).

[3] W. R. Smith, *Religion of the Semites*, 2nd ed., pp. 168 seq., with references. Cf. G. F. Abbot, *Macedonian Folk-lore*, 261: "the drakos held back the water"; see further § 11 below.

[4] C. R. Conder, *Tent-work in Palestine* (1878), i. 313 seq., who notes the "moving" of the water in John v. 3, 4 (see R.V. marg.).

[5] Cf. Amos ix. 3 and the Babylonian Tiamat, a serpent of the sea; see Baudissin in Hauck's *Realency. f. Theol.* v. p. 5 (1898); T. K. Cheyne, *Ency. Bib.*, art. "Serpent."

[6] See Fergusson, 57; J. G. Frazer, *Adonis*, 165; and R. Lasch, *Arch. f. Relig.* v. 236 sqq., 369 sqq.

[7] Crooke ii. 144; Tylor i. 294; A. B. Ellis, *The Eŵe-Speaking Peoples of the Slave Coast of West Africa* (1890), pp. 47 seq.

[8] See also R. Lasch, *op. cit.* iii. 97 sqq.

[9] D. G. Brinton, *Myths of the New World* (1896), 135; A. S. Palmer, *Nineteenth Century* (Oct. 1909), pp. 694 sqq.

[10] For the latter, see J. T. Medina, *Les Aborigènes de Chile* (1882), 28 sqq.; D. G. Brinton, *op. cit.*, 176 sqq.; Frazer, *Pausanias*, v. 44 seq.; J. F. Maclennan, *Studies in Anc. Hist.*, 2nd series, 203 seq. The Babylonian story of Ea (see § 2) and the deluge finds an Indian parallel in the fish (or, otherwise a manifestation of Vishnu the many-headed serpent) which warned Manu. Among the Austrian gipsies the serpent is supposed to be able to swallow up prolonged rains, and it may be conjectured that the stories associating the commencement or conclusion of great floods with chasms (*e.g.* Lucian, *De dea Syria*, § 12 seq.) are connected with the beliefs associating wells or springs with serpents and other occupants.

[11] See E. S. Hartland, *Primitive Paternity* (1909); Frazer, *Adonis* (Index, *s.v.* Conception), and *Totemism and Exogamy* (1910; Index, *s.vv.* "Conception," "Snake").

[12] E. S. Hartland, *The Legend of Perseus* (1894–1896), i. 121. In many places streams or springs are credited with the power of removing barrenness which, in primitive thought, is often ascribed to supernatural malevolence. See Hartland, *op. cit.*, i. 71 sqq., 133, 167 sqq.

[13] *Journal of the Bombay Royal As. Soc.* ix. 188; for sacrifices and snake-deities to obtain offspring, see Crooke i. 226; Winternitz, 258. In the *Arabian Nights* Solomon prescribes the flesh of two serpents for the childless wives of the king of Egypt and his vizier.

[14] Frazer, *Adonis*, 72 (with other examples). The Inca hero Yupanqui had as father a divine being with serpent and lion attributes who revealed himself in a well (Hartland ii. 14 seq.).

8. Relations with clans.

There are many instances of tribes or clans named after the serpent. These are not necessarily examples of nicknames, since a relationship between the two often shows itself in custom or belief. This feature sometimes applies, also, to cases where the clan does not bear the serpent name. In accordance with universal ideas of the reality of the "name," there are tribes who will refrain from mentioning the serpent.[4] Also there are clans like the American Apaches and Navahos who will neither kill nor eat rattlesnakes for purely "superstitious" reasons. Where the reptile is venerated or feared it is usually inviolable, and among the Brassmen of the Niger the dangerous and destructive cobra was especially protected by an article in the diplomatic treaty of 1856 for the Bight of Biafra (Maclennan, 524). The North American Indians fear lest their venerated rattlesnake should incite its kinsfolk to avenge any injury done to it, and when the Seminole Indians begged an English traveller to rid them of one of these troublesome intruders, they scratched him—as a matter of form—in order to appease the spirit of the dead snake.[5] The snake-tribes of the Punjab clothe and bury a dead serpent, and elsewhere in India when one is killed in the village a copper coin is placed in its mouth and the body ceremonially burned to avert evil.[6] These snake-tribes claim to be free from snake-bite, as also the ancient Psylli of Africa and the Ophiogenes ("serpent born") of Cyprus who were supposed to be able to cure others. This power (cf. above § 3 seq.) was claimed likewise by the Marsians of ancient Italy, and is still possessed by the snake-clan of Senegambia.[7] In Kashmir the serpent-tribes became famous for medical skill in general, and they attributed this to the health-giving serpent (Fergusson, 260). Moreover, the Psylli would test the legitimacy of their new-born by exposing them to serpents which would not harm those of pure birth, and a similar ordeal among the Ophiogenes of Asia Minor showed whether a man was really of their kin.[8] This peculiar "kinship" between serpent-clans and serpents may be further illustrated from Senegambia, where a python is supposed to visit every child of the python-clan within eight days of birth, apparently as a sign of recognition. Also at Fernando Po there was an annual ceremony where children born within the year were made to touch the skin of a serpent suspended from a tree in the public square.[9]

9. Relations with families.

We have next to notice the very general belief that the household snake was an agreeable guest, if not a guardian spirit. In Sweden, even in the 16th century, such snakes were virtually household gods and to hurt them was a deadly sin. Among the old Prussians they were invited to share an annual sacrificial meal, and their refusal was a bad sign.[10] Mahomet, it is said, declared that the house-dwelling snakes were a kind of *jinn*, and the heathen Arabs invariably regarded them as alike malevolent or benevolent demoniacal beings.[11] Among the Romans every place had its *genius* equally in the form of a serpent—cf. the doubt of Aeneas (Verg. *Aen.* v. 84 sqq.)—and household snakes were lodged and fed in vast numbers. They were the guardian-spirits of men and families, and stories are told of the way in which human life depended upon the safety of the reptile.[12] As a chthonic animal the serpent has often been regarded as an embodiment of the soul of the dead. Grimm's story of king Gunthram tells how, while he slept, his soul in serpent-form visited a mountain full of gold (Paulus Diac. iii. 34), and Porphyry relates that a snake crawled from beneath the bed of Plotinus at the moment of the philosopher's death (cf. the Indian story, Oldham, 79). In Bali near Java, where the Nāga-cult flourishes, a serpent is carried at the funeral ceremonies of the Kshatriya caste and burned with the corpse. Among many African tribes the house-haunting serpents are the dead, who are therefore treated with respect and often fed with milk.[13] But it does not appear that every venerated serpent was an incarnation or that every incarnation was reverenced or even tolerated. Among the Nāyars of Malabar, the family-serpent is capable of almost unlimited powers for good or evil; it is part of the household property, but does not seem to be connected with ancestral cults.[14]

10. As heroes and local guardians.

In Greece, however, "the dead man became a chthonic *daemon*, potent for good or evil; his natural symbol as such, often figured on tombs, was the snake."[15] "The men of old time," as Plutarch observed, "associated the snake most of all beasts with heroes," and in Photius the term "speckled hero" thus finds an explanation. At the battle of Salamis the serpent which appeared among the ships was taken to be the hero Cychreus.[16] These heroes might become objects of cult and local divinities of healing; people would pass their tombs in awe, or resort thither for divination or for taking oaths.[17] In Egypt not only are there serpents of the houses, but each quarter in Cairo had a serpent-guardian (Lane). This is said also of the villages and districts of Armenia, and Buddhist legends affirm it for India.[18] The Satī (Suttee) wife immolated to accompany her deceased husband often became the guardian of the village, and on the Satī shrine a snake may be represented in the act of rising out of the masonry.[19] Athene ("the Athenian one") was primarily the guardian spirit of Athens, and at the Erechtheum her sacred serpent (apparently known to the 3rd century A.D.), was fed monthly with honey-cakes; when, during the Persian War, it left the food untouched it was taken as a sign that the protectors had forsaken the city.[20] At Lebadeia in the shrine of Trophonios (to whom serpents were sacred) offerings of honey cakes were made to an oracular serpent. At Delphi a virgin superintended a similar oracle; and in the sacred grove of Apollo at Epirus a nude virgin-attendant brought offerings, and it was a sign of a plentiful year if they were accepted. So also at Lanuvium, south of Rome, in a grove near the temple of the Argive Hera, sacred maidens descended blindfolded once a year with a barley-cake, and if the serpent took it, it indicated that they were pure and that the husbandmen would be fortunate. On a Greek vase-painting the snake is the vehicle of the wrath of Athene, even as Chryse, another local "maiden," had a snake-guardian of a shrine which she sent against Philoctetes.[1] Similarly Orestes in serpent-form would slay Clytaemnestra (Aeschylus, *Choëphori*): the serpent is thus the avenging spirit of the deceased, the embodiment of Vengeance (cf. Acts xxviii. 4).[2]

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[1] Fergusson, 65; Crooke ii. 124; Oldham, 37, 85 sqq., 200 sqq.; Maclennan, p. 526 seq.

[2] Murison, p. 130 n. 43; Maclennan, 527.

[3] Possibly the Kenite and allied families; cf. the conjecture associating Moses and the Levites with a serpent-clan (E. Meyer and B. Luther, *Die Israeliten*, 116, 426 sqq.). It is curious that Thermuthis, the traditional name of the princess who adopted Moses (Josephus, *Ant.* ii. 9. 5), is also the name of a serpent-deity (Aelian, *De anim.* x. 31; see Wiedemann on Herod. ii. 74 seq.).

[4] Examples in Frazer, *Golden Bough*, i. 456 sqq.; N. W. Thomas, *Encyc. of Rel. and Ethics*, i. 526, col. 1.

[5] Frazer, citing W. Bartram, *Travels through N. and S. Carolina* (London, 1792), 258 sqq.

[6] See Fergusson, 259; Winternitz, 257; Crooke ii. 151 seq.

[7] The 'Omar ibn 'Isa of the Hadhramaut had the same gift (so Makrīzī); cf. also Lane's account of the "Saadeeyeh" sect who charm away serpents from houses (*Modern Egyptians*).

[8] Strabo xiii. 1. 14. Serpents which would only attack those who were not natives were to be found on the banks of the Euphrates and also at Tiryns (*Mir. Ausc.* 149 seq.; Pliny viii. 59. 84). In Sicily also, where Pliny (xxxvii. 10. 54) records some mystery about harmless scorpions, old John Maundeville in his travels (chap. v.) found a belief in snakes which were harmful only to illegitimate children.

[9] Frazer, *Golden Bough*, ii. 370 seq.; *Totemism and Exog.* i. 20. See also Crooke ii. 124, 142, 151 seq. (descent from a serpent involves immunity from its bite, and a serpent is supposed to identify the rightful heirs of a kingdom).

[10] See also B. Deane, *Serpent Worship*, 245 seq., Fergusson, 23; J. Grimm, *Teutonic Mythology* (1888), iv. 1490 sqq.; Tylor ii. 240.

[11] T. Nöldeke (on serpent-beliefs in Arabia), *Zeit. f. Völkerpsychol.* i. 412 sqq. (1860).

[12] So, in the stories of Tiberius and D. Laelius; Frazer, *Adonis*, 74 n. 2 (with references); cf. Fergusson, 19.

[13] Frazer, *Adonis*, 73 seq.; for India, see Winternitz, 258.

[14] F. Fawcett, *Madras Bulletin*, iii. 279 (1901).

[15] *Companion to Greek Studies*, ed. L. Whibley (1905), p. 502 and fig. 97. The libations of milk which the Greeks poured upon graves were possibly for these embodiments of the dead.

[16] Pausanias, i. 36, 1; see Rohde, *Psyche*, 2nd ed., i. 196.

[17] See especially, on the Greek hero as a snake, Miss Jane E. Harrison, *Journ. of Hell. Studies*, xix. (1889), 204 sqq.; *Proleg. to Study of Greek Religion* (1903), 326 sqq.

[18] Abeghian, *Armen. Volksglaube*, 74 sqq.; Crooke ii. 127.

[19] Crooke i. 187 seq. To these local examples may be added the lord (or lady) of life, a serpent-deity of the Assyrian city Dēr (Winckler and Zimmern, *Keilinschrift. u. d. alte Test.* 505: for other evidence, see Index, *s.v.* "Schlange").

[20] Herod. viii. 41. The serpent was probably regarded as the embodiment of the king Erechtheus; see Frazer, *Adonis*, 75; A. Frickenhaus, *Athen. Mitt.* xxxiii. (1908), 171-176.

11. Human sacrifice.

To these characteristics of serpents and serpent-godlings we must add the control of the weather. This was ascribed to the nāga demi-gods and rajahs of India and to the "king of snakes" among North American Indians.[3] It is significant that in India the widely-distributed Naga-pančami-festival occurs in the rainy season. We have seen how closely the serpent is associated with water generally (§ 5 seq.), and since we meet with the belief that sources will dry up when the serpent-occupant is killed (Bechuanas, Zulus), or that they will resent impurities thrown into their springs by causing storms (tribes of the Hindu-Kush), it is not surprising to find elaborate precautions for the propitiation of such powerful beings. Now, there are popular stories of springs and waters which could only be used in return for regular human sacrifices.[4] In a story from the isle of Lesbos the dragon must receive a human victim twice a day. Curiously enough, an old authority tells us that the people of Lesbos were directed to throw a virgin into the sea to Poseidon, and the hero who vainly tried to save her reappeared years later with a wonderful cup of gold (Hartland, iii. 43 seq., 79, see Athenaeus xi. 15). In the Chinese annals of Khotan in Cashgar, when a certain stream dried up, a female dragon declared that her husband had died; one of the royal grandees sacrificed himself to meet the want, the water flowed once more, and the "husband" of the being became the guardian of the kingdom's prosperity.[5] A careful study of all the related traditions suggests that they preserve an unmistakable recollection of human sacrifice to serpents and other spirits of the water, and that the familiar story of the hero who vanquishes the demon and rescues the victim (usually a female, and especially a virgin) testifies to the suppression of the rite.

An extremely rich dynasty in the Upper Niger was supposed to owe its wealth to a serpent in a well which received yearly a maiden attired as a bride; the cessation of the practice brought drought and sickness (Hartland iii. 57 seq.). In Mexico the half-serpent Ahuizotl dragged into its pool hapless passers-by; however, their souls were supposed to go to the terrestrial paradise—see on this idea, Rohde, ii. 374, n. 2—and the relatives became rich through the unhappy accident (Hartland, 86 seq.). But in India human sacrifice was actually made in the expectation of gaining hidden treasure, and doubtless we have a survival of this when snake-charmers, for a drop of blood from the finger of a first-born, will track the snakes which are guardians of treasure (Crooke ii. 135, 170 seq.). Indian traditions tell how reformers have persuaded the people in the past to stop their human sacrifices to serpent-spirits (Fergusson, 64, Oldham, 101), and a survival may be recognized in parts of the N.W. Provinces when, at the Guruī serpent-festival, women make vicarious offerings by throwing to Nāg Deotā, the river demon, dolls which the village lads beat with long switches (Crooke ii. 139). It is unnecessary to refer more fully to the evidence for former human sacrifice or to the popular stories and grim superstitions which indicate its persistence; the grisly custom of our ancestors has been attested by comparatively recent observation in Mexico, Peru, Fiji and W. Africa.[6]

12. The famous Dahomey cult.

A conspicuous feature in serpent-cults is the prominence of females. In India, in Behār, during August there is a colourless festival in which women, "wives of the snake," go round begging on behalf of the Brahmans and the villages (Crooke ii. 138). Among the Nāyars of Malabar at the ceremonies of the Pambantullel, the household serpent-deities show their benevolence by inspiring with oracles certain women who must be of perfect purity.[7] In Travancore a serpent-god is the property of a family, the priests of a temple; the eldest female carries the image at the festal processions and must lead a celibate life (Oldham, 153 seq.). Far more noteworthy is the cult of the Python Dañh-gbi of Whydah, which after taking root in Dahomey, became the most remarkable example of a thoroughly organic serpent-cult.[8] The python-deity is god of wisdom and earthly bliss and the benefactor of man (cf. § 2): he opened the eyes of the first human pair who were born blind. He is specially invoked on behalf of the king (the nominal head of the priesthood) and the crops, and a very close connexion was supposed to exist between the god's agency and all agricultural life. Initiated priests, after remaining silent in his temple for seven days, receive a new name and thus become ordained. They possess a knowledge of poisons and antidotes and thereby acquire considerable income (cf. §§ 3, 8). Children who touch or are touched by one of the many temple-snakes are sequestered for a year and learn the songs and dances of the cult. Women who are touched become "possessed" by the god. In addition to his ministrant priestesses, the god has numerous "wives," who form a complete organization. Neither of these classes may marry, and the latter are specially sought at the season when the crops begin to sprout.[9] These "wives" take part in licentious rites with the priests and male worshippers, and the python is the reputed father of the offspring (cf. § 7). Every snake of its kind receives the profound veneration of the native of Whydah, who salutes it as master, father, mother and benefactor. Such snakes must be treated with every respect, and if they are even accidentally killed, the offending native might be burned alive (cf. § 8). In 1890 a semblance of the penalty was still maintained: the offender being allowed to escape from a burning hut through a crowd of snake-worshippers armed with clubs; if discreet in his bribes, and lucky, he might reach running water and could purify himself there. On the day of public procession—the last took place in 1857 or 1858—naked priests and "wives" escorted the company with songs and dances; death was the penalty of those caught peering from their houses, and, apart from this, the natives feared loathsome diseases should they gaze upon the sacred scene. It is said that Europeans who violated the prohibition have been poisoned. Occasional human sacrifice in honour of the god is attested (cf. § 11).

13. Various developments of cults.

While Dahomey furnishes this elaborate example of the modern worship of a god in the embodiment of a serpent, elsewhere we find either less organic types, or the persistence and survival of cults whose original form can only be reconstructed by inference. In the gloomy rites of the Diasia, the Olympian Zeus, as Zeus Meilichios god of wealth, has been imposed upon a chthonic snake-deity who is propitiated by holocausts of pigs and by a ritual of purgation (Harrison, *Prol.* 12-28). In the Thesmophoria, a sowing festival of immemorial antiquity performed by women, cakes and pigs were thrown to serpents kept in caves and sacred to the corn-goddess Demeter, who, like the Bona Dea, was representative of the fertility of nature. Myth explained it as a celebration of the capture of Kore by Plouton.[1] The Maenads (“ mad ones ”) or Bacchae, the women attendants of Dionysus, with their snake-accompaniments, are only one of the various snake-features associated with the cult of a deity who was also a god of healing. The symbol of the Bacchic orgies was a consecrated serpent, and the snakes kept in the sacred cistae of the cult of Dionysus find a parallel among the sect of the Ophites where, at the sacramental rites, bread was offered to the living serpent and afterwards distributed among the worshippers.[2] Other developments may be illustrated from the cult of Aesculapius, who seems to have been merely a deified ancestor, like the Egyptian Imhotep (below) or the interesting Indian healer Sokha Bāba (Crooke i. 147, ii. 122). Introduced into Athens about 421 B.C., Aesculapius inherited the older local cult of the serpent “ protector ” Amynos (Harrison, 346 seq.). In Laodicea he apparently replaced an older deity with serpent attributes.[3] In Egypt, he superseded the sage Imhotep at Memphis, and at the temple sacred to Aesculapius and Hygieia at Ptolemais the money-box has been found with the upper part in the form of a great snake.[4] Finally among the Phoenicians he was identified with Eshmun, an earlier god of healing, who in turn was already closely associated with Dionysus and with Caelestis-Astarte.[5]

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[1] Sophoc, *Phil.* 1327; Harrison, *Prol.* 301 seq., 306 seq.

[2] Compare the snake attributes of the Erinyes; see Harrison, 217 sqq., 233 sqq.

[3] Fergusson, 48 seq., 82, 257 seq.; Crooke, ii. 129; Oldham, 49-51, 121, 123, 129, 200; cf. Winternitz, 44 seq., 259 seq.

[4] Hartland iii. 2, 4, 10 seq., 14, 28, 30, 74, 87-94; Frazer, *Paus.* v. 45; *Lectures on the Early History of the Kingship* (1905), 183 seq., 192.

[5] Hartland iii. 73 seq., cf. also J. G. R. Forlong, *Faiths of Man* (1906), iii. 268.

[6] See Deane, *Serpent Worship*, 245 seq. (Livonia); and for more modern evidence, Maclennan, 216, 219; Oldham, 40, 50, 100 seq.; and A. B. Ellis (§ 12 below). Folk-lore adds to the survivals some of the customs for producing rain, *e.g.* bathing and drenching willing or unwilling victims, dipping holy images in water, and otherwise disturbing springs and fountains (Frazer, *Golden Bough*, i. 95 sqq., 108, 111 seq., 209 sqq.). Here also are the superstitions which associate rivers or pools with the safety of human life (*e.g* Frazer iii. 318 seq.; Hartland ii. 20, 22 sqq.; G. L. Gomme, *Ethnology in Folklore* [1892], 71 sqq., 77 seq.).

[7] F. Fawcett, Madras Gov. Museum, *Bull.* iii. 277. (For the stress laid upon the personal purity of the females, cf. p. 282). For other evidence for the prominence of females, see Fergusson, 82, 257 seq.

[8] A. B. Ellis (above, § 6, n. 7), 47 sqq., 140 sqq., cf. Frazer, *Adonis*, 57 sqq. The cult taken by slaves to America is the Vōdu (Vaudoo or Vaudoux) worship of Haiti (Ellis, 29 seq.).

[9] On their marriage to the god these devotees are marked with his image (said to be imprinted by the god himself); cf. the story that Atia, the mother of Augustus, when touched by the serpent in the temple of Apollo, was marked with a stain like a painted serpent.

14. Contests with serpents.

For the retention of older cults under a new name, Mahommedanism supplies several examples, as when a forest-serpent of India receives a Mahommedan name (Oldham 128). But sometimes there is a contest between the new cult and the old. Thus Apollo has to fight the oracle serpent of Gaia, and it has been observed that where Apollo prevailed in Greek religion the serpent became a monster to be slain.[6] At Thebes—the Thebans were Serpentigenae—Apollo took the place of Cadmus, who, after killing the dragon which guarded a well and freeing the district, had ended by being turned into a serpent. This looks like the assumption of indigenous traits by a foreigner—cf. Aesculapius (§ 13)—much in the same way as Hercules has contests with serpents and dragons, becomes the patron of medicinal springs, and by marrying the serpent Echidna was the ancestor of the snake-worshipping Scythians.[7] But an ethnological tradition appears when Phorbas killed the serpent Ophiusa, freed Rhodes of snakes and obtained supremacy, or when Cychreus slew the dragon of Salamis and took the kingdom.[8] A story told by Herodotus (i. 78) admirably shows how the serpent as a child of earth was a type of indigenous peoples, and there was a tendency to represent the earlier conquered races as monsters and demons, though not necessarily unskilled (*e.g.* the Cretan Kourētes), or to depict the conquest of barbarians as the overthrow of serpents or serpent-like beings.[9] This obviously complicates the investigation of serpent-*cults*. Moreover, the serpent or dragon may have an opponent like the eagle (see Goblet d'Alviella, 17), or a cosmical antagonist—the lightning, thunder or rain-god. Indra, the rain-god, slew with a thunderbolt Ahi or Vitra, who kept back the waters (Oldham, 32 sqq.); the thunder-god of the Iroquois killed the subterranean serpent which fed on human flesh (Hartland iii. 151).[10] Or the victor is the sun: the Egyptian sun-god Re had his fire-spitting serpent to oppose his enemies, of which one was the cloud and storm serpent Apophis, while in Greek myth the sanctuary of Helios (the sun) sheltered the young Orpheus from the snake.

15. In Christianity.

It is impossible to trace a safe path through the complicated aetiological myths, the fragments of reshaped legend and tradition, or the adjustment of rival theologies. It remains to observe the overthrow or supersession of the serpent in Christian lands. At Axum in Abyssinia, where worship was divided between the serpent and the Mosaic Law, it is said that the great dragon was burst asunder by the prayers of Christian saints (*c.* A.D. 340; Fergusson, 35). At the Phrygian Hierapolis the serpent Echidna was expelled by the Apostles Philip and John.[11] France had its traditions of the destruction of serpents by the early missionaries (Deane, 283 seq.), and the memory possibly survived at Luchon in the Pyrenees, where the clergy and people celebrated the eve of St John by burning live serpents.[12] Christian saints have also stepped into the shoes of earlier serpent-slayers, while, in the stories of “ St George and the Dragon ” type, the victory of the pious over the enemy of mankind has often been treated as a literal conflict with dragons, thus introducing a new and confusing element into the subject. This purely secondary aspect of the serpent as the devil cannot be noticed here.[13] At Rouen the celebration of St Romain seems to preserve a recollection of human sacrifice to a serpent-demon which was primarily suppressed by a pagan hero, and at Metz, where St Clement is celebrated as the conqueror of a dragon, its image (formerly kept in the cathedral) was taken round the streets at the annual festival and received offerings of food.[14] Most remarkable of all, at Cocullo in the Abruzzi mountains on the border of the old territory of the Marsi snake-men (see § 8), the serpent-deity has a lineal descendant in the shape of St Domenico of Foligno (A.D. 950–1031). The shrine is famous for its cures, and when the saint has his serpent-festival on the first Thursday in May, Serpari or serpent-men carry coils of live reptiles in procession before his image, which in turn is hung with serpents of all sizes. The rites, we may suppose, have become modified and more orthodox, but none the less they are a valuable testimony to the persistence of the cult among people who still claim power over serpents and immunity from their bite, and who live hard by the home of the ancient tribe which ascribed its origin to the son of Circe.[15] One may recall the old cult of Sabazios where men waved great red snakes over their heads as they marched in procession. One may even recall the cult of Dahomey. Moreover, we find at Madagascar the procession of the god of fertility and healing, the patron of serpents who are the ministers of his vengeance (Frazer, *Paus.* v. 66 seq.). In a Bengal festival the men march entwined with serpents, while the chief man has a rock-boa or python round his neck and is carried or rides on a buffalo (Fergusson, 259). Again, among the Moquis of America, where the snake-clan claim descent from a woman who gave birth to snakes, the reptiles are freely handled at the "snake dances" which are performed partly to secure the fertility of the soil.[1]

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[1] Harrison, 109 seq., 120 sqq., and art. THESMOPHORIA. The rites included the “pursuit,” possibly derived from the intentional opportunity of escape allowed the victim. Plouton, also associated with Proserpine, the great mother-goddess, was patron of the chasms with mephitic vapours in the valley of the Maeander (see Frazer, *Adonis*, 170 sqq.).

[2] A Greek vase shows snake-bodied nymphs at the grape-harvest (Harrison 259 seq.), and in Egypt the harvest goddess Rannut had snake-form (F. Petrie, *Relig. of Ancient Egypt*, 1906, p. 26). The serpent-god revered by Taxilus (king of Taxila), which was seen by Alexander the Great on his way to India, was identified by Greek writers with Dionysus or Bacchus. For the serpent in the cult of Sabazius, see Harrison, *Prol.* 418, 535. A kind of sacramental communion with a snake is found among a Punjab snake-tribe (Frazer, *Golden Bough*, ii. 441 seq.; *Punjab Notes and Queries*, ii. 91).

[3] For this and other Phrygian evidence, see W. M. Ramsay, *Cities and Bishoprics of Phrygia*, i. 52, 94, 104.

[4] *Äg. Zeit.* xl. 140 seq. Aelian (*De anim.* xvi. 36) mentions a huge serpent at the temple dedicated to Aesculapius. Serapis (Osiris-Apis) who came to acquire the attributes of Aesculapius and of Pluto, god of the dead, sometimes had serpent-form, and even in the reign of Constantine popular belief connected the rise of the Nile with his agency (Frazer, *Adonis*, 398).

[5] See on this branch of the subject, W. W. G. Baudissin, *Zeit. d. morgenl. Gesell.* lix. (1905), 459-522, and *Orient. Stud. Theodor Nöldeke* (ed. Bezold, 1906), ii. 729 sqq.

[6] Harrison, *Journ. Hell. Stud.* xix. 223, cf. *Proleg.* 392; and E. Rohde, *Psyche*, i. 133 seq.

[7] Herod. iv. 9; for Hercules and healing waters, see Frazer, *Adonis*, 174 seq.; cf. above, § 5. Here arises the question of the tendency to attribute to outside aid the introduction of culture (cf. § 2), and even of law (F. Pollock, ed. of Maine's *Ancient Law*, 1907, p. 19).

[8] Cf. the similar view of serpent-conflicts in Persian tradition (Fergusson, 44 seq.), and the story of the colonization of Cambodia, where the new-comer marries the dragon-king's daughter (*ib.* 53).

[9] Cf. the serpent-pillars found in the old Roman provinces of Europe (Frazer, *Pausanias*, ii. 49, v. 478 seq.). For the Kourētes, the fish and serpent-like peoples struck down by Zeus or Apollo, see Harrison, *Annual of Brit. School at Athens*, xv. 308 sqq.

[10] In popular Macedonian lore the lightning or thunder is the enemy of the serpent-dragon (G. F. Abbott, *Macedonian Folklore*, 261; cf. also Schwartz, 150 sqq., W. R. Smith, 175, n. 1; Winternitz, 45).

[11] W. M. Ramsay, *op. cit.* i. 86 seq.; cf. Gutschmid, *Rhein. Mus.* (1864), pp. 398 sqq.

[12] Fergusson, p. 29, n. 2 (see, however, Frazer, *Golden Bough*, iii. 323 seq.). For analogous traditions, see Fergusson, 32.

[13] See ANTICHRIST; DEVIL; DRAGON.

[14] See further Frazer, *Kingship*, 184-192; Schwartz, 73 seq.; Hocker, *Deutscher Volksglaube* (Göttingen, 1853), p. 231. Similarly, food is offered to the snake of dough in the Punjab festival already mentioned (note [2] above).

[15] The festival is described (as seen in 1906) by Marian C. Harrison, *Folklore*, xviii. (1907), 187 sqq. A combination of a cult of the house-snake with that of the (Christian) saint of the master of the house is said to prevail in modern Greece (J. C. Lawson, *Modern Greek Religion*, 1910, p. 260).

16. Complexity of motives. These last examples are important because they illustrate the immense difficulty of determining the true significance of any isolated piece of evidence. It cannot be assumed that isolated features which find a parallel in more completely known cults presuppose such cults; yet it may be inferred that they point to earlier, more perfect structures, to rites which perhaps linger only as a memory, and to conceptions and beliefs which have been elevated or modified by other religions. Hence also the impossibility of treating the present subject schematically. Apart from the more obvious characteristics of the serpent likely to impress all observant minds (§ 1), its essentially *chthonic* character shows itself markedly when it is associated with the treasures and healing herbs of the earth, the produce of the soil, the source of springs—and thence of all water—and the dust unto which all men return.[2] Although much evidence connects the serpent with *the dead*, especially as a guardian-spirit over the living, any discussion of this aspect of the subject is bound up with the varying beliefs regarding ancestors and death. Among the Arunta of Central Australia, the ghosts of the dead haunt certain localities, and, entering the bodies of passing women, are constantly reincarnated; the Black-snake clan of the Warramunga tribe embodies the spirits which the original ancestor had deposited by a certain creek.[3] On the other hand, the "rattlesnake" men of the Moqui are merely transformations and expect to return at death to their original reptile form (Maclennan, 357). It is another stage when only the more conspicuous mortals assume serpent guise, and the deification of heroes involves yet another course of ideas. Here it is evident that some of the attributes of prominent serpent-gods will be purely secondary. Moreover, it is a human weakness to manipulate one's ancestry, and the common claim to be descended from the local godling is not to be confused with the Arunta type of reincarnation.[4]

Again, in the part taken by *women* in serpent-lore other problems of primitive society and religion intermingle. For example, when one considers how often milk is used in the tending and propitiation of venerated snakes, it is noteworthy that in Roman cult the truly rustic deities are offered milk (Fowler), and it is no less singular that many of the old goddesses of Greece have serpent attributes (Harrison).[5] Now anthropological research has vividly shown that woman, naturally fitted (as it seemed) to understand the mysteries of increase, was assigned a prominent part in rites for the furtherance of *growth and fertility*. And the same thread of ideas seems to recur in the "wives" of the python Dañh-gbi (§ 12), the Shakti ceremonies in India for the increase of the divine energy of nature (Fergusson, 258 seq.), and, to a certain extent, in the providing of deities or demons of serpent-type with consorts.[6] There is everywhere a danger of misunderstanding isolated evidence, of wrongly classifying different motives, and of overlooking necessary links in the chain of argument. There is an obvious development from the serpent *qua* reptile to the deity or the devil, and that the original theriomorphic form is not at once forgotten can be seen in Zeus Meilichios, Aesculapius Amynos, in the Cretan snake-goddesses, or in the Buddhist topes illustrated by Fergusson. But naturally there are other developments to be noticed when originally distinct attributes are combined, when, for example, Greek goddesses take the forms of birds as well as of snakes (Harrison, 322), or when the Aztec snake-deity Huitzilcpochtli, like the Votan of the Mayas, has feathers (Maclennan, 384).[7]

Thus it will be perceived that the subject of this article involves at every turn problems of the history of thought (cf. the similar difficulties in the discussion of TREE-WORSHIP). There is ample material for purely comparative purposes and for an estimate both of the general fundamental ideas and of the artificially-developed secondary speculations; but for any scientific research it is necessary to observe the social, religious and historical conditions of the provenance and period of the evidence, and for this the material is often insufficient. The references in this article furnish fuller information and are usually made to works suitable for pursuing the subject more thoroughly. One may also consult the English and foreign journals devoted to folklore, comparative religion or anthropology (especially the volumes of *Folklore*, Index, *s.v.* "Snakes"), and the articles in this *Encyclopaedia* on the various departments of primitive religion. In general, works which endeavour to reduce the evidence for this fascinating subject to clear-cut systems are more useful for the data they provide than for their conclusions, and it is not unnecessary to warn readers against the unscientific studies of "ophiolatry" and especially against "that portentous nonsense called the 'arkite symbolism'" (see E. B. Tylor's remarks, *Primitive Culture*, 4th ed., ii. 239).

(S. A. C.)

SERPUKHOV, a town of Russia, in the government of Moscow, 62 m. by rail S. of the city of Moscow. The population in 1884 was 22,420, and 24,456 in 1897. Built on high cliffs on both banks of the river Nara, 3 m. above its confluence with the Oka, Serpukhov is an important manufacturing and commercial town. Its manufactories produce cotton and woollen stuffs, paper, leather, chemicals and candles. Petty trades are much developed in the neighbourhood—textile fabrics, furniture, and earthenware and porcelain. The manufactured goods of Serpukhov are sent—mostly by rail—to the fairs of Nizhniy-Novgorod and the Ukraine, while large amounts of grain, hemp and timber, brought from the east down the Oka, are discharged at Serpukhov and sent on to Moscow and St Petersburg. The cathedral (1380) was rebuilt in the 18th century; the old fortress has almost entirely disappeared.

Serpukhov is one of the oldest towns of the principality of Moscow; in 1328 it was a nearly independent principality under the protectorate of Moscow. Its fortress protected Moscow on the south and was often attacked by the Tatars; the Mongol prince Toktamish plundered it in 1382, and the Lithuanians in 1410. In 1556 the town was strongly fortified, so that fifteen years later it was able to resist the Mongols. Its commercial importance dates from the 18th century.

SERRANO Y DOMINGUEZ, FRANCISCO, Duke de la Torre and Count of San Antonio (1810–1885), Spanish marshal and statesman, was born in the island of Leon at Cadiz on the 17th of December 1810. His father was a general officer and a Liberal. Serrano began his studies at Vergara in the Basque provinces, became a cadet in 1822, cornet in 1833 in the lancers of Sagunto, passed into the carabineers in 1829, and when the Carlist agitation began in 1833 he exchanged into the cuirassiers. He formed part of the escort which accompanied Don Carlos, the first pretender and brother of Ferdinand VII., to the frontier of Portugal. As aide-de-camp of Espoz y Mina, then under the orders of Generals Cordoba and Espartero, in the armies of Queen Isabella, Serrano took such an active part in the Carlist War from 1834 to 1839 that he rose from the rank of captain to that of brigadier-general. His services obtained for him the Cross of San Fernando and many medals. In 1839 he was elected a member of Cortes for the first time by Malaga, and in 1840 he was made a general of division and commander of the district of Valencia, which he relinquished to take his seat in congress. From that day Serrano became one of the chief military politicians of Spain. In 1841 he helped Espartero to overthrow the regency of Queen Christina; in 1843 at Barcelona he made a *pronunciamiento* against Espartero; he became minister of war in the Lopez cabinet, which convoked the Cortes that declared Queen Isabella of age at fifteen, served in the same capacity in an Olozaga cabinet, sulked as long as the Moderados were in office, was made a senator in 1845, captain-general of Granada in 1848, and from 1846 to 1853 lived quite apart from politics on his Andalusian estates or travelling abroad. He assisted Marshal O'Donnell in the military movements of 1854 and 1856, and was his staunch follower for twelve years. O'Donnell made him marshal in 1856 and captain-general of Cuba from 1859 to 1862; and Serrano not only governed that island with success, and did good service in the war in Santo Domingo, but he was the first viceroy who advocated political and financial reforms in the colony. On his return to Spain he was made duke de la Torre, grandee of the first class, and minister of foreign affairs by O'Donnell. Serrano gallantly exposed his life to help O'Donnell quell the formidable insurrection of the 22nd of June 1866 at Madrid, and was rewarded with the Golden Fleece. At the death of O'Donnell, he became the chief of the Union Liberal, and as president of the senate he assisted Rios Rosas to draw up a petition to Queen Isabella against her Moderado ministers, for which both were exiled. Nothing daunted, Serrano began to conspire with the duke of Montpensier, Prim and Sagasta; and on the 7th of July 1868 Gonzalez Bravo had Serrano and other generals arrested and taken to the Canary Isles. There Serrano remained until Admiral Topete sent a steamer to bring him to Cadiz on the 18th of September of the same year. On landing he signed the manifesto of the revolution with Prim, Topete, Sagasta, Martos and others, and accepted the command of the revolutionary army, with which he routed the troops of Queen Isabella under the orders of the marquis of Novaliches at the bridge of Alcolea. The queen fled to France, and Serrano, having entered Madrid, formed a Provisional Government, convoked the Cortes Constituyentes in February 1869, and was appointed successively president of the executive and regent. He acted very impartially as a ruler, respecting the liberty of action of the Cortes and cabinets, and bowing to their selection of Amadeus of Savoy, though he would have preferred Montpensier. As soon as Amadeus reached Madrid, after the death of Prim, Serrano consented to form a coalition cabinet, but it kept together only a few months. Serrano resigned, and took the command of the Italian king's army against the Carlists in North Spain. He tried to form one more cabinet under King Amadeus, but again resigned when that monarch declined to give his ministers dictatorial powers and sent for Ruiz Zorilla, whose mistakes led to the abdication of Amadeus on the 11th of February 1873. Serrano would have nothing to do with the federal republic, and even conspired with other generals and politicians to overthrow it on the 23rd of April 1873; but having failed, he had to go to France until General Pavia, on the eve of his *coup d'état* of the 3rd of January 1874, sent for him to take the head of affairs. Serrano assumed once more the title of president of the executive; tried first a coalition cabinet, in which Martos and Sagasta soon quarrelled, then formed a cabinet presided over by Sagasta, which, however, proved unable to cope with the military and political agitation that brought about the restoration of the Bourbons by another *pronunciamiento* at the end of December 1874. During the eleven months he remained in office Serrano devoted his attention chiefly to the reorganization of finance, the renewal of relations with American and European powers, and the suppression of revolt. After the Restoration, Serrano spent some time in France, returned to Madrid in 1876, attended palace receptions, took his seat as a marshal in the senate, coquetted a little with Sagasta in 1881, and finally gave his open support to the formation of a dynastic Left with a democratic programme defended by his own nephew, General Lopez Dominguez. He died in Madrid on the 26th of November 1885, twenty-four hours after Alphonso XII. (A. E. H.)

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[1] J. G. Bourke, *Snake-Dance of the Moquis* (1884), p. 180 seq.; see Frazer, *Totem. and Exog.* iii. 229 sqq.

[2] Here one will note the prevalence of the ideas of "mother earth,"' and also the association in higher religions of chthonic powers with the serpent, so, *e.g.* the winds (viz. Boreas in Greece, cf. Harrison, *Prol.* 68, 181), subterranean gods (for Assyria, cf. *Zeit. f. Assyr.* [1894] p. 116, and for the Finns, Fergusson, p. 250 seq.). For the serpent (sometimes with anthropomorphic hints) in the *Tabellae devotionis*, see R. Wünsch, *Sethianische Verfluchungstafeln* (Leipzig, 1898), 100 sqq., and for a Carthaginian triad of the under world (cf. the threefold Hecate) including *ḥ-w-t* (cf. *ḥawwah*, Eve, "serpent"), see G. A. Cooke, *N. Semit. Inscr.* (1903), p. 135.

[3] Spencer and Gillen, *N. Tribes of Central Australia*, 162, 330 seq. (Frazer, *Adonis*, p. 80); A. Lang, *Origins of Religion* (1890), p. 124.

[4] There appears to be a fundamental inclination towards ideas of rebirth and reincarnation (see F. B. Jevons, *Introd. to Study of Comp. Religion*, 1908, pp. 50 sqq., 59 sqq.); it would seem to be wrapped up in the feeling of the essential "one-ness" of the group (including its deity), and involves the belief that such corporate bodies never die (cf. even the Roman conception of the family, Maine, *op. cit.* 197 sqq.).

[5] W. W. Fowler, *Roman Festivals*, 103-105; Harrison, *Journ. Hell. Stud.* xix. 221. For the use of milk, cf. Frazer, *Adonis*, 74 (with the suggestion that it is because milk is the food of babes), Crooke ii. 130, and F. Fawcett, *Madras Gov. Bull.* (1900), iii. 1, 58 (a South-Indian festival on the fifth of Srāvana, when the serpent-deity is *bathed* in milk).

[6] Here the transition from mother-right to paternity should probably be taken into consideration. For the view that the serpent as a *genius* or *daemon* may be replaced by the human (and female) victim, who thus becomes in time the guardian (cf. § 10), see J. C. Lawson, *op. cit.* pp. 271 sqq.

[7] One may note the Indian local saint Gūga, who punishes by snake-bite and can cure his worshippers (similarly the Egyptian Mert-seger, the serpent-patroness of the Theban necropolis and the serpent, the saviour-god of the Phrygian Hierapolis); he is represented on horseback descending to the infernal regions; over him two snakes meet, one being coiled round the long staff which he holds in his hands (Crooke i. 212 seq.). But how many different factors may not have influenced the representation!

SERRES, OLIVIA (1772–1834), an English impostor, who claimed the title of Princess Olive of Cumberland, was born at Warwick on the 3rd of April 1772. She was the daughter of Robert Wilmot, a house-painter in that town, who subsequently moved to London. In 1791 she married her drawing-master, John Thomas Serres (1759–1825), marine painter to George III., but in 1804 separated from him. She then devoted herself to painting and literature, producing a novel, some poems and a memoir of her uncle, the Rev. Dr Wilmot, in which she endeavoured to prove that he was the author of the *Letters of Junius*. In 1817, in a petition to George III., she put forward a claim to be the natural daughter of Henry Frederick, duke of Cumberland, the king's brother, and in 1820, after the death of George III., claimed to be the duke's legitimate daughter. In a memorial to George IV. she assumed the title of Princess Olive of Cumberland, placed the royal arms on her carriage and dressed her servants in the royal liveries. Her story represented that her mother was the issue of a secret marriage between Dr Wilmot and the princess Poniatowski, sister of Stanislaus, king of Poland, and that she had married the duke of Cumberland in 1767 at the London house of a nobleman. She herself, ten days after her birth, was, she alleged, taken from her mother, and substituted for the still-born child of Robert Wilmot. Mrs Serres's claim was supported by documents, and she bore sufficient resemblance to her alleged father to be able to impose on the numerous class of persons to whom any item of so-called secret history is attractive. In 1823 Sir Robert Peel, then Home Secretary, speaking in parliament, declared her claims unfounded, and her husband, who had never given her pretensions any support, expressly denied his belief in them in his will. Mrs Serres died on the 21st of November 1834, leaving two daughters. The eldest, who married Antony Ryves, a portrait painter, upheld her mother's claims and styled herself Princess Lavinia of Cumberland. In 1866 she took her case into court, producing all the documents on which her mother had relied, but the jury, without waiting to hear the conclusion of the reply for the crown, unanimously declared the signatures to be forgeries. Mrs Serres's pretensions were probably the result of an absurd vanity. Between 1807 and 1815 she had managed to make the acquaintance of some members of the Royal family, and from this time onwards seems to have been obsessed with the idea of raising herelf, at all costs, to their social level. The tale once invented, she brooded so continuously over it that she probably ended by believing it herself.

See W. J. Thoms, *Hannah Lightfoot, and Dr Wilmot's Polish Princess* (London, 1867); *Princess of Cumberland's Statement to the English Nation*; *Annual Register* (1866), Case of *Ryves* v. *the Attorney-General*.

SERTORIUS, QUINTUS, Roman statesman and general, was a native of Nursia in Sabine territory. After acquiring some reputation in Rome as a jurist and orator, he entered upon a military career. He served under Marius in 102 B.C. at the great battle of Aquae Sextiae (mod. Aix) in which the Teutones were decisively defeated. In 97 he was serving in Spain. In 91 he was quaestor in Cisalpine Gaul, and on his return to Rome he would have been elected to the tribuneship but for the decided opposition of Sulla. He now declared for Marius and the democratic party, though of Marius himself as a man he had the worst opinion. He must have been a consenting party to the hideous massacres of Marius and Cinna in 87, though he seems to have done what he could to mitigate their horrors. On Sulla's return from the East in 83, Sertorius went to Spain, where he represented the Marian or democratic party, but without receiving any definite commission or appointment. Having been obliged to withdraw to Africa in consequence of the advance of the forces of Sulla over the Pyrenees, he carried on a campaign in Mauretania, in which he defeated one of Sulla's generals and captured Tingis (Tangier). This success recommended him to the people of Spain, more particularly to the Lusitanian tribes in the west, whom Roman generals and governors of Sulla's party had plundered and oppressed. Brave and kindly, and gifted with a rough telling eloquence, Sertorius was just the man to impress them favourably, and the native militia, which he organized, spoke of him as the "new Hannibal." Many Roman refugees and deserters joined him, and with these and his Spanish volunteers he completely defeated one of Sulla's generals and drove Q. Caecilius Metellus Pius, who had been specially sent against him from Rome, out of Lusitania, or Further Spain as the Romans called it. Sertorius owed much of his success to his statesmanlike ability. His object was to build up a stable government in the country with the consent and co-operation of the people, whom he wished to civilize after the Roman model. He established a senate of 300 members, drawn from Roman emigrants, with probably a sprinkling of the best Spaniards, and surrounded himself with a Spanish bodyguard. For the children of the chief native families he provided a school at Osca (Huesca), where they received a Roman education and even adopted the dress of Roman youths. Strict and severe as he was with his soldiers, he was particularly considerate to the people generally, and made their burdens as light as possible. It seems clear that he had a peculiar gift for evoking the enthusiasm of rude tribes, and we can well understand how the famous white fawn, a present from one of the natives, which was his constant companion and was supposed to communicate to him the advice of the goddess Diana, promoted his popularity. For six years he may be said to have really ruled Spain. In 77 he was joined by M. Perperna (or Perpenna) Vento from Rome, with a following of Roman nobles, and in the same year the great Pompey (*q.v.*) was sent to conquer him. Sertorius proved himself more than a match for his adversaries, utterly defeating their united forces on one occasion near Saguntum. Pompey wrote to Rome for reinforcements, without which, he said, he and Metellus would be driven out of Spain. Sertorius was in league with the pirates in the Mediterranean, was negotiating with the formidable Mithradates, and was in communication with the insurgent slaves in Italy. But owing to jealousies among the Roman officers who served under him and the Spaniards of higher rank he could not maintain his position, and his influence over the native tribes slipped away from him, though he won victories to the last. In 72 he was assassinated at a banquet, Perperna, it seems, being the chief instigator of the deed.

See Plutarch's lives of *Sertorius* and *Pompey*; Appian, *Bell. civ.* and *Hispanica*; the fragments of Sallust; Dio Cassius xxxvi. 25, 27, 28, xliv. 47; Vell. Pat. ii. 25, 29, 30, 90.

SERURIER, JEAUME MATHIEU PHILIBERT, Comte (1742–1819), French soldier, was born at Laon of middle-class parentage. After being lieutenant of the Laon militia, he entered the royal army, and served in the campaigns in Hanover (1759), Portugal (1762) and Corsica (1771). At the beginning of the Revolution he had attained the rank of major, and in its course he became colonel, brigadier-general and finally general of division. He fought under Kellermann and B. L. J. Schérer in the army of the Alps in 1795, and under Bonaparte in Italy at Vico, Mondovi, Castiglione and Mantua. Besides his military qualities, he showed great administrative talent in governing Venice (1797) and Lucca (1798). He helped Bonaparte in the *coup d'état* of 18 Brumaire, and had a brilliant career under the empire, when he was made senator, count, marshal, and governor of the palace of the Invalides. In 1814, however, he voted for the downfall of Napoleon, and under the Restoration was made a peer of France. He was dismissed from all his posts for having joined Napoleon during the Hundred Days, and died in retirement. A statue has been raised to his memory at Laon.

See L. Tuetey, *Un Général de l'armée d'Italie, Serurier* (Paris, 1899).

SERVAL (*Felis serval*), an African wildcat, ranging from Algeria to the Cape. It is of medium size, with long limbs, short tail, and tawny fur spotted with black; the head and body may measure 40 in. and the tail 16 in. Messrs Nicolls and Eglington, joint authors of *The Sportsman in South Africa*, state that the serval is fairly common in South Central Africa, frequenting the thick bush near rivers, and preying on the smaller antelopes, guinea-fowls and francolins. The mantles made from its skin are reserved for chiefs and dignitaries of native tribes. Serval kittens can be tamed with little trouble, but are difficult to rear.

SERVAN, JOSEPH MICHEL ANTOINE (1737–1807), French publicist, was born at Romans (Dauphiné) on the 3rd of November 1737. After studying law he was appointed *avocat-général* at the parlement of Grenoble at the age of twenty-seven. In his *Discours sur la justice criminelle* (1766) he made an eloquent protest against legal abuses and the severity of the criminal code. In 1767 he gained great repute by his defence of a Protestant woman who, as a result of the revocation of the Edict of Nantes, had been abandoned by her Catholic husband. In 1772, however, on the parlement refusing to accede to his request that a present made by a grand seigneur to a singer should be annulled on the ground of immorality, he resigned, and went into retirement. He excused himself on the score of ill-health from sitting in the States General of 1789, to which he had been elected deputy, and refused to take his seat in the *Corps Législatif* under the Empire. Among his writings may be mentioned *Réflexions sur les Confessions de J.-J. Rousseau* (1783) and *Essai sur la formation des assemblées nationales, provinciales, et municipales* (1789). His *Œuvres choisies* and *Œuvres inédites* have been published by De Portets. His brother Joseph Servan de Gerbey (1741–1808) was war minister in the Girondist ministry of 1792.

See "Lettres inédites de Servan," in *Souvenirs et mémoires* (vol. iv., Paris, 1900).

SERVAN (or Servando known as Servandoni), **JEAN NICOLAS** (1695–1766), French decorator, architect and scene-painter, was born on the 2nd of May 1695. He was the son of a carriage-builder at Lyons. From 1724 to 1742 he was director of decorations at the Paris Opera, at that time situated in a wing of the Palais-Royal. His activity was considerable, whether as a painter or as an inventor of scenic contrivances for fêtes at the marriage of royal personages. He also designed the decorations for altars, and the façade for the church of Saint Sulpice in Paris. He died in Paris on the 19th of January 1766. His writings include *Description abrégée de l'église Saint Pierre de Rome* (Paris, 1738), and *La Relation de la représentation de la forêt enchantée sur le théâtre des Tuileries, le 31 mars 1754.*

SERVETUS, MICHAEL [Miguel Serveto] (1511–1553), physician and polemic, was born in 1511[1] at Tudela in Navarre, his father being Hernando Villanueva, a notary of good family in Aragon. His surname is given by himself as "Serveto" in his early works, "per Michaelem Serueto, alias Reues." Later he Latinized it "Servetus"; when writing French (1553) he signs "Michel Seruetus."[2] It is probable that he was of the same family as the Spanish ecclesiastic Marco Antonio Serveto de Reves (d. 1598), born at Villanueva de Sigena in the diocese of Huesca (Latassa, *Bibl. nueva*, 1798, i. 609). At this place is the traditional mansion of the family, and in the parish church the family altar with the family arms (*Christian Life*, 29th Sept. 1888). Servetus at Geneva makes Villanueva his birthplace, assigning it to the adjoining diocese of Lerida. His later adopted surname, Villanovanus or de Villeneufve, was no mere pseudonym since he followed his father's example. Of his education we only know that his father sent him to study law at Toulouse, where he first became acquainted with the Bible (1528). From 1525 he had found a patron in Juan de Quintana (d. 1534), a Franciscan promoted in 1530 to be confessor to Charles V. In the train of Quintana he witnessed at Bologna the double coronation of Charles in February 1530, visited Augsburg, and perhaps saw Luther at Coburg. The spectacle of the adoration of the pope at Bologna impressed him strongly in an anti-papal direction. He left Quintana, visited Lyons and Geneva, repaired to Oecolampadius at Basel, and pushed on to Bucer and Capito at Strassburg. Considerable attention was attracted by his first publication, *De Trinitatis erroribus* (1531, printed by John Setzer at Hagenau). It is crude, but original and earnest, and shows a wide range of reading very remarkable in so young a man. Melanchthon writes "Servetũm multum lego." Quintana, who describes him as *di grandissimo ingegno*, and *gran sophista*, thought the matter was Serveto's, but the execution too good to be his (H. Lämmer, *Monumenta Vaticana*, 1861, 109). The essay was followed in 1532 by a revised presentation of his views in dialogue form. We next find him at Lyons (1535) editing scientific works for the Trechsel firm, adopting the "Villanovanus" surname, which he constantly used till the year of his death. At Lyons he found a new patron in Dr Symphorien Champier (Campegius) (1472–1539), whose profession he resolved to follow. Resorting (1536) to Paris, he studied medicine under Johann Günther, Jacques Dubois and Jean Fernel. It was in 1536, when Calvin was on a hurried and final visit to France, that in Paris he first met Servetus, and as he himself says, proposed to set him right on theological points.[1] Servetus succeeded Vesalius as assistant to Günther, who extols his general culture, and notes his skill in dissection, and ranks him *vix ulli secundus* in knowledge of Galen. He graduated in arts, and claims to have graduated in medicine (of this there is no record at Paris), published six lectures on "syrups" (the most popular of his works), lectured on geometry and "astrology" (from a medical point of view) and defended by counsel a suit brought against him (March 1538) by the medical faculty on the ground of his astrological lectures. In June 1538 he writes from Louvain (enrolled there as a university student on the 14th of December 1537 as Michael Villanova) to his father (then resident at San Gil), explains his removal from Paris, early in September, in consequence of the death (8th August) of his master (*el señor mi maestro*), says he is studying theology and Hebrew, and proposes to return to Paris when peace is proclaimed. After this he practised medicine for a short time at Avignon, and for a longer period at Charlieu (where he contemplated marriage, but was deterred by a physical impediment). In September 1540 he entered himself for further study in the medical school at Montpellier, possibly gaining there a medical degree.

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[1] This date rests on his own testimony (both at Vienna and Geneva) and that of Calvin. An isolated passage of the Geneva testimony may be cited in favour of 1509.

[2] The form Servet first appears in a letter of Oecolampadius to the senate of Basel (1531) and is never used by himself. Mosheim's "Servede" is an imaginary form.

Among attendants on his Paris lectures was Pierre Paulmier, since 1528 archbishop of Vienne. Paulmier now invited Servetus to Vienne as his confidential physician. He thus acted for twelve years (1541–1553), making money by his practice, and also by renewed editorial work for the Lyons publishers—work in which he constantly displayed his passion for original discovery in all departments. Outwardly he was a conforming Catholic; privately he pursued his theological speculations. It is probable that in 1541 he had been rebaptized (he maintained the duty of adult baptism at the age of thirty). Late in 1545, or very early in 1546, he opened a fatal correspondence with Calvin, forwarding the manuscript of a much-enlarged revision of his theological tracts and expressing a wish to visit Geneva. Calvin replied (13th February 1546) in a letter now lost; in which, he says, he expressed himself "plus durement que ma coustume ne porte." On the same day he wrote to Guillaume Farel, "si venerit, modo valeat mea autoritas, vivum exire nunquam patiar," and to Pierre Viret in the same terms. Evidently Servetus had warning that if he went to Geneva it was at his peril. Writing to Abel Pouppin (in or about 1547) he complains that Calvin would not return his manuscript, and adds, "mihi ob eam rem moriendum esse certo scio." The volume of theological tracts, again recast, was declined by two Basel publishers, Jean Frellon (at Calvin's instance) and Marrinus, but an edition of 1000 copies was secretly printed at Vienna by Balthasar Arnollet. Ready by the 3rd of January 1553, the bulk of the impression was privately consigned to Lyons and Frankfort for the Easter market. On 26th February, a letter, enclosing a sheet of the printed book, and revealing the secret of its authorship, was written from Geneva by Guillaume H. C. de Trye, formerly *échevin* of Lyons, to his cousin Antoine Arneys in that city. The letter bears no sign of dictation by Calvin (who must, however, have furnished the enclosed sheet), and de Trye's part may be explained by an old grudge of his against the Lyons booksellers. For a subsequent letter Calvin furnished (reluctantly, according to de Trye) samples of Servetus's handwriting, expressly to secure his conviction. The inquisitor-general at Lyons, Matthieu Ory (the "Doribus" of Rabelais) took up the case on 12th March; Servetus was interrogated on 16th March, arrested on 4th April, and examined on the two following days. His defence was that, in correspondence with Calvin, he had assumed the character of Servetus for purposes of discussion. At 4 A.M. on 7th April he escaped from his prison, evidently by connivance. He took the road for Spain, but turned back in fear of arrest. How he spent the next four months is not known. His own account is that he never left France; Calvin believed he was wandering in the North of Italy; the absurd suggestion that he lay hid as a conspirator in Geneva was first started by J. Spon (*Hist. de Genève*, 1680). On Saturday the 12th of August he rode into Louyset, a village on the French side of Geneva. Next morning, having sold his horse, he walked into Geneva, put up at "the Rose," and asked for a boat to take him towards Zürich on his way to Naples. Finding he could not get the boat till next day (Monday) he attended afternoon service (he would probably have got into trouble if he had not done so), was recognized at church *par quelques frères*, and immediately arrested. The process against him (Nicholas de la Fontaine being in the first instance the nominal prosecutor) lasted from 14th August to 26th October, when sentence "estre brusle tout vyfz" was passed, and carried out next day at Champel (Oct. 27th, 1553). Calvin would have had him beheaded. Meanwhile the civil tribunal at Vienne had ordered (17th June) that he be fined and burned alive; the sentence of the ecclesiastical tribunal at Vienne was delayed till 23rd December. Jacques Charmier, a priest in Servetus's confidence, was condemned to three years' imprisonment in Vienne. The only likeness of Servetus is a small copperplate by C. Sichem, 1607 (often reproduced); the original is not known and the authenticity is uncertain. In 1876 a statue of Servetus was erected by Don Pedro Gonsalez de Velasco in front of his Instituto Antropologico at Madrid; in 1903 an expiatory block was erected at Champel; in 1907 a statue was erected in Paris (Place de la Mairie du XIV^{e} Arrondissement); another is at Aramnese; another was prepared (1910) for erection at Vienne.

The religious views of Servetus, marked by strong individuality, are not easily described in terms of current systems. His denial of the tripersonality of the Godhead and the eternity of the Son, along with his anabaptism, made his system abhorrent to Catholics and Protestants alike, in spite of his intense Biblicism, his passionate devotion to the person of Christ, and his Christocentric scheme of the universe. His earliest theological writings, in which he approximates to the views of F. Socinus, are better known than his riper work. He has been classed with Arians, but he endorses in his own way the homoousian formula, and denounces Arius as "Christi gloriae incapacissimus." He has had many critics, some apologists (*e.g.* Postel and Lincurius), few followers. The fifteen condemnatory clauses, prefacing the sentence at Geneva, set forth in detail that he was guilty of heresies, blasphemously expressed, against the foundation of the Christian religion. An instance of his injurious language was found in his use of the term "trinitaires" to denote "ceux qui croyent en la Trinité." No law, current in Geneva, has ever been adduced as enacting the capital sentence. Claude Rigot, the procureur-général, put it to Servetus that his legal education must have warned him of the provisions of the code of Justinian to this effect; but in 1535 all the old laws on the subject of religion had been set aside at Geneva; the only civil penalty recognized by the edicts of 1543 being banishment. The Swiss churches, while agreeing to condemn Servetus, say nothing of capital punishment in their letters of advice. The extinct law seems to have been revived for the occasion. A valuable controversy followed on the question of executing heretics, in which Beza (for), Mino Celsi (against), and several caustic anonymous writers (especially Castellio) took part.

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[1] Beza incorrectly makes Servetus the challenger, and the date 1534.

The following is a list of his writings:—

1. *De Trinitatis erroribus libri septem* (Hagenau, 1531).

2. *Dialogorum de Trinitate libri duo* (Hagenau, 1532); two reprints of 1 and 2, to pass for originals; No. 1 in Dutch version (1620), by Regnier Telle.

3. *Claudii Ptolomaei Alexandrini geographicae enarrationis libri octo; ex Bilibaldi Pirckheymeri translatione, sed ad Graeca et prisca exemplaria a Michaele Villanovano jam primum recogniti. Adjecta insuper ab eodem scholia, &c.* Lyons, Melchior and Gaspar Trechsel (1535; 2nd ed., Lyons, Hugo à Porta (1541), *i.e.* 1542 fol.; printed by Caspar Trechsel at Vienne); on this work Tollin founds his high estimate of Servetus as a comparative geographer; the passage incriminated on his trial as attacking the verity of Moses is from Lorenz Friese; the accounts of the language and character of modern nations show original observation.

4. *In Leonardum Fuchsium apologia. Autore Michaele Villanovano* (1536, reproduced by photography, 1909).

5. *Syruporum universa ratio*, &c. (Paris, 1537); four subsequent editions; latest, Venice, 1548 (six lectures on digestion; syrups treated in fifth lecture).

6. *Michaelis Villanovani in quendam medicum apologetica disceptatio pro astrologia* (Paris, 1538; reprinted, Berlin, 1880); the medicus is Jean Tagault, who interrupted Servetus's lectures on astronomy, including meteorology.

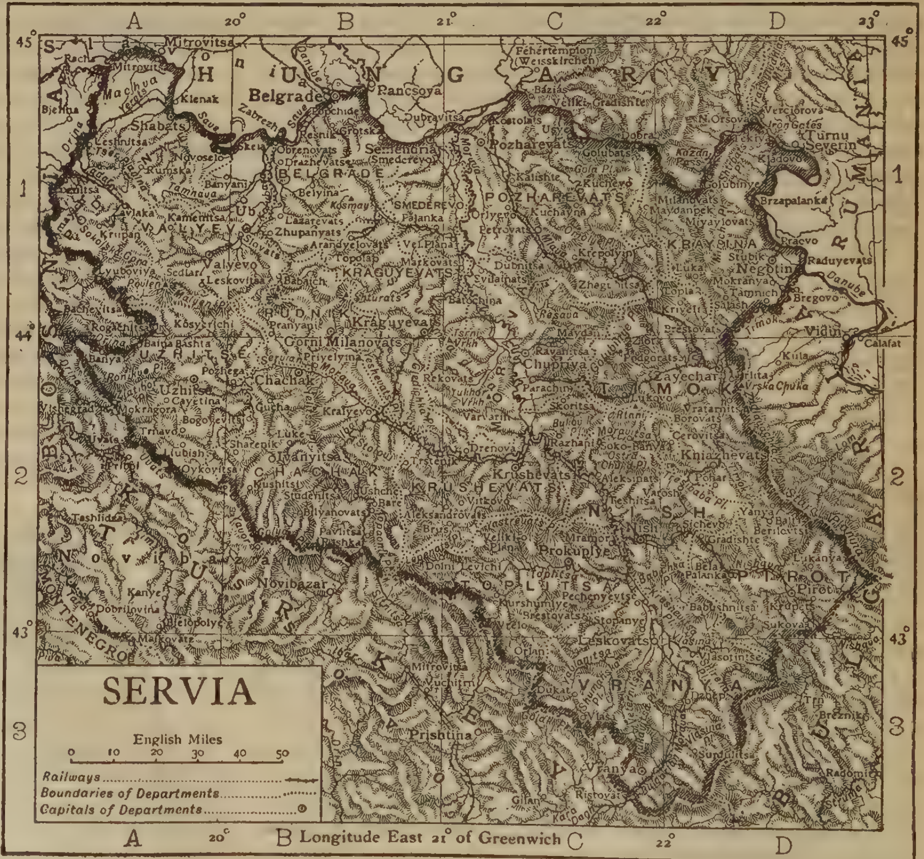
7. *Biblia Sacra ex Santis Pagnini tralatione . . . recognita et scholiis illustrata*, &c. (Lyons, Hugo à Porta, 1542, fol.), remarkable for its theory of prophecy, explained in the preface and illustrated in the notes.

8. D'Artigny says Servetus *fit les argumens* to a Spanish version of the *Summa* of Aquinas; this, and *divers traités de grammaire* from Latin into Spanish have not been identified.

9. *Christianismi restitutio* (1553; perfect copies in Vienna and Paris); a copy in Edinburgh University Library is complete except that the missing first sixteen pages are replaced by a transcript from the original draft, containing matter not in the print (this supplementary manuscript was reproduced by photography, 1909); a transcript of other portions of the draft is in the Bibl. Nat., Paris; partly reprinted (London, 1723), (copies in London and Paris); reprinted (page for page) from the Vienna copy (Nuremberg, Rau. 1790); German version, by B. Spiess (Wiesbaden, 1892–1895); the last section *Apologia* to Melanchthon, is given in the original Latin. The book is not strictly anonymous; the initials M.S.V. are given at the end; the name Seruetus on p. 199. The often-cited description of the pulmonary circulation (which occurs in the 1546 draft) begins p. 169; it has escaped even Sigmond that Servetus had an idea of the composition of water and of air; the hint for his researches was the dual form of the Hebrew words for blood, water, &c. Two treatises, *Desiderius* (*ante* 1542) and *De tribus impostoribus* (1598) have been wrongly ascribed to Servetus. Most of his few remaining letters are printed by Mosheim; his letter from Louvain was despatched in duplicate (to evade capture), but both were seized; one is in the Record Office (U. 140), the other in the British Museum (Cotton MSS., Galba B. x.).

Authorities.—The literature relating to Servetus is very large; a bibliography is in A. v. d. Linde, *Michael Servet* (1891); the following are among the important pieces. Calvin's *Defensio orthodoxae fidei* (1554) (in French, *Déclaration pour maintenir*, &c., 1554), is the source of prevalent misconceptions as to Servetus's opinions, and attitude on his trial. De la Roche's *Historical Account* in *Mem. of Lit.* (1711–1712) (in French, *Biblioth. Ang.* Amsterdam, 1717) was followed by *An Impartial History*, &c., 1724 (said to be by Sir Benjamin or Nathaniel Hodges). Allwoerden's *Historia*, &c. (1728) (materials furnished by Mosheim) is superseded by Mosheim's *Anderweitiger Versuch* (1748, with appendix, *Neue Nachrichten*, &c., 1750), reproducing the records of the Vienne examination (since lost) first printed by D'Artigny, *Nouveaux Mémoires d'hist.*, &c., vol. ii. (1749). Chaufepié's valuable article, *Nouv. Dict. historique*, iv. (1756), fol. (in English, by Rev. James Yair, 1771) makes no use of Mosheim's later researches. Trechsel's *Die Prot. Antitrinitaires vor F. Socin*, bk. i. (1839), uses all available material up to date. The investigations of H. Tollin, M.D. (forty separate articles in various journals, 1874 to 1885) have thrown much light, mixed ~~with~~ some conjecture. The records of the Geneva trial, first published by De la Roche, reproduced in Rilliet's *Relation* &c., (1844), and elsewhere, are best given in vol. viii. (1870) of the *Corpus reformatorum* edition of Calvin's works; Roget's *Hist. du peuple de Genève*, vol. iv. (1877), has a good account of both trials. The passage on the pulmonary circulation, first noticed by W. Wotton, *Reflections upon Anc. and Mod. Learning* (1694), has given rise to a literature of its own; see, especially, Tollin's *Die Entdeckung des Blutkreislaufs*, &c. (1876); Huxley, in *Fortnightly Rev.* (February 1878); Tollin's *Kritische Bemerkungen über Harvey und seine Vorgänger* (1882). Other physiological speculations of Servetus are noted by G. Sigmond, *Unnoticed Theories of Servetus* (1826). The best study of Servetus as a theologian is Tollin's *Lehrsystem M. Servets* (3 vols., 1876–1878); Pünyer's *De M. Serveti doctrina* (1876), is useful. From a Unitarian point of view, Servetus is treated by R. Wright, *Apology* (1807); W. H. Drummond, D.D. (1848); R. Wallace, *Antitrin. Biog.* (1850); J. S. Porter, *Servetus and Calvin* (1854). E. Saisset, *Rev. des deux Mondes* (1848), treats Servetus as a pantheist; he is followed by Menendez Pelayo, *Los Heterodoxos españoles* (1880, vol. ii.), and by R. Willis, M.D., *Servetus and Calvin* (1877, an unsatisfactory book; cf. A. Gordon, *Theol. Rev.*, April and July 1878). Of Servetus's personal character the best vindication is Tollin's *Characterbild M. Servets* (1876, in French, with additions by Dardier, *Portrait Caractère*, 1879). His story has been dramatized by Max Ring, *Die Genfer* (1850), by José Echegaray, *La Muerte en los Labios* (1880), by Albert Hamann, *Servet* (1881), and by Prof. Shields, *The Reformer of Geneva* (1897). Recent pamphlets by Spanish and French writers are numerous; some of the illustrations in Dr W. Osler's *Michael Servetus* (1909), are useful. (A. Go.*)

SERVIA[1] [*Srbiya*], an inland kingdom of south-eastern Europe, situated in the north of the Balkan Peninsula. The frontier, as defined by the Berlin Treaty of 1878, is, roughly speaking, indicated by rivers in the north, and by mountains in the south. In the north, between Verciorova and Belgrade, the Danube divides Servia from Hungary for 157 m.; and between Belgrade and the border village of Racha the Save divides it from Croatia-Slavonia for 80 m. In the north-west the Drina flows for 102 m. between Bosnia and Servia;



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[1] The English-speaking races alone write this word with a *v* instead of a *b*, *Servia* for *Serbia*; a practice resented by the Serbs, as suggesting the derivation of their name from the Latin *Servus*, "a slave."

in the north-east the Danube, for 50 m., and the Timok for 23 m., constitute respectively the Rumanian and Bulgarian boundaries. Various mountain ranges mark the frontiers of Bosnia, on the west, Turkey on the south-west and south, and Bulgaria on the south and south-east. According to the survey carried out by the Servian general staff in 1884 the area of the country is 18,782 sq. m.

Mountains.—The mountain groups which rise confusedly over almost the whole surface of the land, fall into two main blocks, one on either side of the river Morava. On the east of this river, three vast ranges, the Transylvanian Alps, the Balkans and Rhodope, encroach upon Servian soil; while on the west there is a chaos of mountain masses, outliers of the Bosnian and Albanian highlands.

Rivers.—The chief navigable river of Servia is the Danube, which enters the country at Belgrade and pierces the Transylvanian Alps by way of the Kazan (*i.e.* "Cauldron") Pass, near the famous Iron Gates (see RUMANIA). The Timok, which formed the Bulgarian frontier as long ago as the 9th century, springs in the western Balkans, or Stara Planina, and issues into the Danube, near Negotin, after a course of 70 m. Sooner or later, indeed, all the Servian rivers reach the Danube. The Save, which is also navigable, meets it at Belgrade, after being joined, at Racha, by the Drina, a Bosnian river, which rises on the Montenegrin border, 155 m. S. by W. Near Obrenovats the Kolubara also enters the Save, after traversing 45 m. from its source in the Sokolska Gora. Apart from frontier rivers, the most important stream is the Morava, which, rising on the western slopes of the Kara Dagh, a little beyond the Servian frontier, enters the country with a north-easterly course near the extreme S.E., and then turns N.N.W. and flows almost in a straight line through the heart of the kingdom to the Danube. Its total length is about 150 m. In the upper part of its course it is known as the Bulgarian Morava, and only after receiving the Servian Morava on the left is it known as the Morava simply or as the Great Morava. The Servian Morava is joined on the south by the Ibar, which comes from the Albanian Alps; the combined length of these rivers being about 130 m. The only other important tributary of the Great Morava is the Nishava, which it receives on the right, at Nish. This stream flows 68 m. W. by N. from its source among the foothills of the Stara Planina. The valleys of all these rivers, especially those of the Bulgarian and the Great Morava, and of the Nishava, contain considerable areas of level or low-lying country well suited for the growth of corn, and the low grounds along the Save and the Danube from the Drina to the Morava are also well adapted for agriculture, except the tract of fenland called the Machva, in the extreme north-west.

Geology.—The geological structure of Servia is varied. In the south and west the sedimentary rocks most largely developed are of ancient, pre-Carboniferous date, interrupted by considerable patches of granite, serpentine and other crystalline rocks. Beyond this belt there appear in the north-west Mesozoic limestones, such as occupy so extensive an area in the north-west of the Balkan Peninsula generally, and the valleys opening in that quarter to the Drina have the same desolate aspect as belongs to these rocks in the rest of that region. In the extreme north-east the crystalline schists of the Carpathians extend to the south side of the Danube, and stretch parallel to the Morava in a band along its right bank. Elsewhere east of the Morava the prevailing rocks belong to the Cretaceous series, which enters Servia from Bulgaria. The Shumadia is mainly occupied by rocks of Tertiary age, with intervening patches of older strata; and the Rudnik Mountains are traversed by metalliferous veins of syenite.

Minerals.—Gold, silver, iron and lead were worked by the Romans, whose operations can still be traced in the Kostolats mine, near Pozharevats, and elsewhere. Even more ancient is the Avala mercury mine, near Belgrade. The heaps of débris which cover so many acres near Belgrade, on the Kopaonik foothills and in the Toplitsa valley bear witness to the importance of this industry in the past. During the later middle ages the Servian mines brought in a large revenue to the merchant princes of Ragusa. They prospered greatly during the 14th century, but Turkish rule put a stop to this industry after 1459; and the revival only began in 1835, under the patronage of Prince Milosh. The richest coal and lignite seams occur among the north-eastern mountains, generally near the Danube or Timok, and along the Morava. They are worked by the state, by Belgian companies and by private enterprise, the output in 1907 being valued at £121,000. Lead is principally raised in the Podrinye, especially at Krupan; and at Kuchayna, in the Pozharevats department, where zinc and small quantities of gold and silver are obtained. Antimony is mined at Zayechar. Copper and iron are worked by Belgians at Maydanpek, the chief mining centre east of the Morava. Nickel, mercury, manganese, graphite, marble, sulphur and oil shales are found in various regions, but the mineral resources of the country, as a whole, remain almost undeveloped.

The numerous mineral springs are even more neglected than the mines. Waters rich in iodine and sulphur occur in the Machva. About 1878 an unsuccessful attempt was made to convert Arandyelovats into a popular health-resort. The baths near Nish and Vranya are comparatively prosperous, while the beautiful surroundings attract visitors even from abroad.

Climate.—The climate of Servia is on the whole mild, though subject to the extremes characteristic of inland Eastern countries. In summer the temperature may rise as high as 106° F., while in winter it often sinks to 13° or even 20° below zero. The high-lying valleys in the south are colder than the rest of the country, not only on account of their greater elevation but also because of their being exposed to cold winds from the north and north-east.

Fauna.—The wild life of the Servian highlands is unusually varied. A few bears and wild boars and lynxes find shelter in the remoter forests, with many badgers, wolves, foxes, wildcats, martens and weasels. Otters are common along the rivers; chamois may very rarely be seen on the least accessible peaks; roe-deer, red-deer, squirrels and rabbits people the lower woodlands; and hares abound in the open. The beaver is extinct. Among land birds may be enumerated several varieties of eagle, vulture, falcon, owl, crow, jay, magpie, stork, quail, thrush, dove, &c. Pheasants are easily acclimatized; grouse and woodcock are indigenous on the uplands of the north; partridges, in all districts. Game laws were instituted in 1898. Innumerable aquatic birds haunt the banks of the Save, Danube and Drina, and the lower reaches of the Timok and Morava; among them being pelicans, cranes, grey and white herons, and many other kinds of waders, besides wild geese, ducks, rail and snipe. Edible frogs, tree-frogs, lizards, snakes, tortoises and scorpions are found in all parts. The principal fisheries are in the Danube and Save.

Forests.—About one tenth of the land is covered by forests, which give place, at an altitude of 5000 ft., to lichens and mosses. Little care was bestowed on forestry in the 19th century, apart from government supervision of the national and communal domains, a task usually delegated to the local mayor. Much of the finest timber was felled in the wars of 1876–1878 and of 1885, and the rights of grazing and wood-cutting also caused widespread destruction. The total forest area (official estimate, 1909) is about 3,800,000 acres, of which 1,625,000 belong to the communes and 1,375,000 to the state. Oaks and beeches predominate in the north; pines, often of gigantic size, among the fantastic white or grey rocks of the wild south-western ridges.

Agriculture.—Servian methods of farming remain in many respects primitive. Real progress was, however, achieved in the period 1890–1910, chiefly owing to improvements in agricultural education. Indian corn is the principal crop, for corn-cake forms the staple diet of the peasantry, while the grain is also used for feeding pigs, the heads for feeding cattle and the stubble for manure. The normal yield exceeds 5,000,000 bushels yearly, wheat coming next with a little less than 4,000,000. Flax, hemp and tobacco are also grown; hemp especially near Leskovats. The cultivation of sugar-beet, introduced in 1900, became an important industry, but the attempt to introduce cotton failed. The native tobacco plantations meet all the local demand, except for a small quantity of Turkish tobacco imported for the manufacture of special blends. The best Servian wines are those of Negotin and Semendria. Before the appearance of *Phylloxera* in 1882 wine was exported to France and Switzerland, but in 1882–1895 thousands of acres of vines were destroyed. *Phylloxera* was checked by the importation of American vines and the establishment of schools of viticulture. The creation of state vine-nurseries, stocked with American plants, was authorized by a law of 1908. Orchards are very extensive, and all the fruits of central Europe will thrive in Servia. The chief care is bestowed on plums, from which is distilled a mild spirit known as *raki* or *rakiya*. The favourite kind of *raki* is *shlivovitsa* (the *sliwowitz* of Austria), extracted solely from plums. There is a considerable trade in dried plums and plum marmalade. Bees are very generally kept, the honey being consumed in the country, the wax exported. Mulberries are grown on many farms for silkworms; sericulture is encouraged and taught by the state, and over 100,000 ℔ of cocoons are annually exported. Relatively to its population, Servia possesses a greater number of sheep (3,160,000 in 1905) and pigs (908,000 in 1905) than any country in Europe. Large herds of swine fatten, in summer and autumn, on the beech-mast and acorns of the forests, returning in winter to the lowlands. The Servian pig is pure white or black, but other breeds, notably the Berkshire and Yorkshire, are kept. Despite American competition and Austro-Hungarian tariffs the export of swine remains the principal branch of Servian commerce. Cheeses are made from the milk of both sheep and goats; but cattle are mostly bred for export or draught purposes. The cumbrous wooden carts which afford the sole means of transport in many districts are generally drawn by oxen, although buffaloes may be seen in the south. The native horses, though strong, are, like the cattle, of small size.

Land Tenure.—More than four-fifths of the Servians are peasant farmers; and the great majority of these cultivate the land belonging to their own families. Holdings are generally small, not exceeding an average of 20 acres for each household. They cannot be sold or mortgaged entire; the law forbids the alienation for debt of a peasant's cottage, his garden or courtyard, his plough, his last six *yutara*[1] of land and the cattle necessary for working his farm. Besides the small farms there is the *zadruga*, a form of community which appears to date from prehistoric times, and mainly survives along the Bosnian frontier, though tending to disappear everywhere and to be replaced by rural co-operation. Under the zadruga system, each homestead or cluster of cottages is occupied by a group of families connected by blood and dwelling together on strictly communistic principles. The association is ruled by a house-father (*domanyin* or *staryeshina*) and a house-mother (*domanyitsa*), who assign to the members their respective tasks. The *staryeshina* may be the patriarch of the community, but is often chosen by the rest of the members on account of his prudence and ability; nor is his wife necessarily the *domanyitsa*. In addition to the farm work, the members often practise various trades, the proceeds of which are paid into the common treasury. The community sometimes includes a priest, whose fees for baptism, &c., augment the common fund. The buildings belonging to the homesteads are enclosed within an immense palisade, inside which a large expanse of fields is mostly planted with plum, damson, and other fruit-trees, surrounding the houses of the occupiers. In the midst of these is the house of the *staryeshina*, which contains the common kitchen, eating hall, and family hall of the entire homestead. Here all the members assemble in the evening for conversation and amusement, the women spinning, while the children play. The houses are mostly very small wooden structures, serving for little else but sleeping places. But that of the *staryeshina* is often of brick, and is invariably of better construction than the rest. The houses are often raised on piles, above the level of the floods which occur so frequently near the Save and Drina. Zadrugas were very prosperous, as they had always a sufficient number of hands at command, and their members combined to obtain implements and cattle. But with the establishment of order and security, the zadrugas began rapidly to disappear, a further cause of their dissolution being the fact that members could legally acquire private property (*osobina*). A new stimulus was given to agriculture by the encouragement which King Alexander personally extended to the establishment of rural co-operative associations on the Raiffeisen principles. The object of these associations is principally to facilitate the acquisition of improved implements and better breeds of cattle. No fewer than 100 of such credit societies were founded between 1894 and 1899. The total number of agricultural co-operative societies exceeded 500 in 1910; each has its tribunal (*Conseil des Prud'hommes*), which arbitrates in disputes; and all together, with the state-aided Co-operative Caisse, which lends money to the smaller societies, form a single great organization known as the General Union.

Small holdings were in themselves a hindrance to Servian agricultural progress, inasmuch as small farmers cannot afford the cost of scientific farming; hence the great success of co-operation. As a rule, also, the lots of ground belonging to one household or family do not lie together, but are dispersed in different, very often distant, parts of the village land. To meet this difficulty, a farmer with more crops than he can reap unaided will summon his neighbours to his assistance, supplying them with food, but no money, and binding himself to repay the service in kind. This form of voluntary co-operation is called *moba*. Another serious drawback to the economic position is that Servia has no seaboard, and that it is far from the nearest export harbours (*e.g.* Galatz, Salonica, Fiume). In such a situation the country is at the mercy of hostile tariffs.

Manufactures and Commerce.—The scarcity of labour prevents the growth of any great manufacturing industries. There is no native artisan class; for except in very rare cases, the people value their independence too highly to work in factories, or even to enter domestic service. A large proportion of the artisans throughout Servia are Austro-Hungarians or gipsies. The chief manufacturing industries are those for which the country supplies raw material, notably meat-packing, flour-milling, brewing, tanning, and the weaving or spinning of hemp, flax and wool. There are also iron-foundries, potteries, and sugar, tobacco and celluloid factories. A law of 1898 authorizes the government to grant concessions on very favourable terms to foreign capitalists willing to promote mining and manufactures in Servia; but in 1910 the number of large industrial establishments in the kingdom did not exceed 60, nor the number of hands employed 5000. There are a few domestic industries, such as the manufacture of sandals (*opanke*), and of the hand-woven carpets and rugs made at Pirot, which are popular throughout the Balkan Peninsula.

Commerce.—The following table shows the value of Servian imports and exports for five years:—

Year.	Imports.	Exports.
1904	£2,437,000	£2,486,000
1905	2,224,000	2,879,000
1906	1,773,000	2,864,000
1907	2,823,000	3,259,000
1908	3,025,000	3,019,000

Cotton and woollen fabrics, leather, salt, sugar, iron and machinery are the principal imports, and come chiefly from Austria-Hungary, Germany and Great Britain. Large quantities of prunes, grain, meat, raw hides, eggs and copper are exported, chiefly to Austria-Hungary, Germany and Turkey.

Finance.—Up to 1878 the principal revenues were derived from the customs, excise and a sort of poll-tax. The government required the town and village communities to pay into the state treasury £1, 4s. per head of the able-bodied citizens living in the community, and the municipal board made repartition of the total amount due to the government from its citizens according to their estimated wealth or earnings. That system yielded without the slightest difficulty about £750,000 annually. But the Berlin Treaty (1878) stipulated that Servia should construct part of the international railway to Constantinople and to Salonica, and should pay the Turkish landowners an indemnity for the estates which had been taken from them and divided among their Servian tenants. This and the necessity of indemnifying the people from whom, during the wars with Turkey (1876–1878), requisitions had been taken and money borrowed, forced the government to enter the European financial markets. Up to that time (1881) Servia had practically no public foreign debt, although it owed Russia about £240,000 lent privately for war preparations, and to its own people about £320,000 taken by a forced loan for war purposes. The first public loans were made in 1881 by French banks at 71¾ for 5% bonds, and the expenditure had to be immediately increased to £1,240,000. The introduction of new taxes and the reorganization of the financial administration of the country could not keep pace with the increase of public expenditure, chiefly because the skupshtina was for some time reluctant to replace the old system of direct taxation by a more modern system. When in 1884 the new law of taxation was adopted, the situation became so serious that in 1895 a new scheme was adopted by which the government gave to the bondholders additional securities, the bondholders at the same time accepting the new 4% unified bonds in exchange for their old 5% bonds. The following table gives an analysis of the national debt on the 1st of January 1909:—

Russian debt of 1876 (5%) . . .	£150,000
Lottery loan of 1881 (2%) . .	989,000
Loan of the Uprava Fondova (5%) .	291,000
Primary loan of 1888	367,000
Unified loan of 1895 (4%) . . .	13,516,000
Railway loan of 1899 (5%) . .	192,000
Monopoly loan of 1902 (5%) . .	2,300,000
Loan of 1906 (4½%)	3,767,000
Total	£21,572,000

The chief sources of revenue are customs duties, the state monopolies of salt, sugar, tobacco, matches and petroleum; national property, *e.g.* forests, railways, postal service; direct taxes, of which the most important are the poll-tax and the land taxes (graduated according to the quality of the land). The heaviest charges are for the service of the national debt and for the army; each of these items exceeded £1,000,000 in 1909. The estimated revenue and expenditure for five years are shown below:—

Year.	Revenue.	Expenditure.
1905	£3,522,000	£3,505,000
1906	3,595,000	3,566,000
1907	3,618,000	3,615,000
1908	3,832,000	3,830,000
1909	4,145,000	4,132,000

Banks and Money.—The National Bank of Servia, founded in Belgrade in 1883, has a nominal capital of £800,000 (£260,000 paid). The Mortgage Bank (*Uprava Fondova*), founded in 1862, is a state institution which lends money for agricultural operations, &c. The Export Bank, founded in 1901, is a private bank under state supervision, with branches in Budapest, Vienna, Berlin, &c. Its chief object is the furtherance of Servian foreign commerce.

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[1] One *yutro* is the area which two oxen can plough in a day.

In 1875 Servia adopted the decimal system for money, weights and measures, which came into actual use in 1883. The monetary unit is the *dinar* (franc) of 100 *paras* (centimes). In circulation there are gold pieces of 10 and 20 *dinars*; silver of 50 *paras*, and 1, 2 and 5 *dinars*; nickel of 5, 10 and 20 *paras*; and bronze of 2 paras. Twenty-five dinars equal £1 sterling.

Chief Towns.—The chief towns of Servia are Belgrade, the capital, with 69,097 inhabitants in 1900; Nish (24,451); Kraguyevats (14,160); Pozharevats (12,957); Leskovats (13,000); Shabats (12,072); Vranya (11,921); Pirot (10,421); Krushevats (10,000); Uzhitse (7000); Valyevo (6800); Semendria (6912); Chupriya (6000); and Kralyevo (3600).

Communications.—Until the middle of the 19th century, travellers through the Balkan Peninsula had a choice between two main routes, which started as a single highway from Belgrade, and up the Morava valley to Nish. Here two roads diverge; one branching off south-eastwards to Pirot, Sofia and Constantinople; the other proceeding southwards to Vranya, Usküb and Salonica. The railway which connects western and central Europe with Constantinople and Salonica takes the same course. That section of it which traverses Servia was begun in 1881 and finished in 1888. Branch lines give access to Kraguyevats, Zayechar, Semendria and other important towns, and there are several smaller railways in the valleys of the Save, the Danube, the Servian Morava and their tributaries. Apart from country lanes and footpaths, there are three classes of highways, controlled, respectively, by the nation, department and commune. Construction and repairs are, in theory, carried out by compulsory labour; but this right is seldom enforced. Even in the Shumadia, where materials are plentiful, the roads rapidly give way under heavy traffic, or after bad weather; in the Machva, Podrinye and remoter districts, they are often impassable. The Constantinople and Salonica roads remain the best in Servia. Besides the frontier streams on the north and west, the only river of any importance for navigation is the Morava, which is navigable by steamers of light draught as high as Chupriya, about 60 m. from its mouth.

The postal system dates from 1820, when an organized system of couriers was established, for state correspondence only. From 1843 in 1868 the Servian government undertook the carriage of letters in Servia itself, while the Austro-Hungarian consulate in Belgrade forwarded correspondence to and from central and western Europe. In 1868 the whole business of posting was taken over by the state; post offices are also maintained by many communes, and a few are itinerant. Servia joined the International Telegraphic Union in 1866, the Postal Union in 1874. The first telegraph line was constructed as early as 1855; telegrams between Constantinople, Sofia, Budapest and Vienna pass over lines constructed by the Servian government (under conventions with Austria-Hungary and Turkey) in 1899 and 1906. The telephone service, inaugurated in 1900, is a state monopoly (both for construction and operation).

Population.—With a continuous excess of births over deaths, and of male over female children, the population of Servia rose from 2,161,961 in 1890 to 2,493,770 in 1900, and to about 2,750,000 in 1910. More than four-fifths of this number belong to the Serbo-Croatian branch of the Slavonic race; while the remainder is composed of about 160,000 Rumans, 47,000 gipsies, 8000 Austro-Hungarians and Germans, and 5000 Jews. Many Servian emigrants returned, after 1878, to the territories which the Treaty of Berlin restored to their country. These territories had been occupied, under Turkish rule, by Albanians, west of the Morava, and by Bulgarians, along the Nishava; but, after 1878, the Albanians withdrew, and the Bulgarians were absorbed. The Rumans reside principally in the north-east, near the borders of their native land, and are peasant farmers, like the Serbs. The gipsies occasionally settle down, forming separate camps or villages, but in most cases they prefer a wandering life. They are often admirable artisans and musicians, almost every town possessing a gipsy band. The Germans and Austro-Hungarians control a large share of the commerce of the country; the Jews, as elsewhere in the Balkans, are retail traders. Anti-Semitism is not prevalent in Servia, owing to the smallness of the Jewish communities. The stature and features of the Serbs vary in different regions; but the northern peasantry are generally fairer and shorter than the mountaineers of the south. Those of the Shumadia are blue-eyed or grey-eyed. In many parts the prevailing types have been modified by intermarriage with Bulgars, Albanians and Vlachs; so that, along the Timok, for instance, it is impossible to make physiognomy a test of nationality. Even language does not afford a sure criterion, so nearly akin are many spoken dialects of Servian and Bulgarian.

National Characteristics.—Servia is a land without aristocracy or middle class. Instead, it possesses an army of placemen and officials; but these being mainly recruited from the peasantry, do not disturb the prevailing social equality. In 1900 there was neither pauper nor workhouse in the country. The people, less thrifty and industrious than the Bulgars, less martial than the Montenegrins, less versatile and intellectual than the Rumans, value comfort far more highly than progress. A moderate amount of work enables them to live well enough, and to pass their evenings at the village wine-shop; although, being a sober race, they meet there rather to discuss politics than to drink. Of politics they never tire; and still greater is their devotion to music, poetry and dancing. Perhaps their most characteristic dance is the *kolo*, sometimes performed by as many as 100 men and women, in a single serpentine line. Their national instrument, the *gusle* (gusla), is a single-stringed fiddle, often roughly fashioned of wood and ox-hide, the bow being strung with horse-hair. All classes delight in hearing or intoning the endless romances which celebrate the feats of their national heroes; for every true Serb lives as much in the past as in the present, and medieval wars still constantly furnish themes of new legends and ballads. It is largely this enthusiasm for the past which keeps alive the desire for a reunion of the whole race, in another Servian Empire, like that overthrown by the Turks in 1389. The fasts of the Orthodox Church are strictly kept; while the festivals, which are hardly less numerous, are celebrated even by the Servian Moslems. As in Bulgaria and Rumania, the *slava*, or patron saint's day, is set aside for rejoicing. A Servian crowd at a festival presents a medley of brilliant and picturesque costumes, scarlet being the favourite colour. Men wear a long smock of homespun linen, beneath red or blue waistcoats with trousers of white frieze. The women's dress consists of a similar smock, a "zouave" jacket of embroidered velvet and two brightly coloured aprons tied over a white skirt, one in front and one behind. The head-dress is a small red cap, tambourine-shaped, and strings of coins are coiled in the hair, or worn as necklaces and bracelets. In this manner a farmer's wife will often decorate herself with her entire dowry. During the cold months, both sexes wrap themselves in thick woollen coats or sheepskins, with the fleece inwards; both are also shod with corded sandals, called *opanke.* The Rumanian women retain their native costume, and are further distinguished by the wooden cradles, slung over the shoulders, in which they carry their infants; the Servian mothers prefer a canvas bag. Women weave most of the garments and linen for their families, besides sharing in every kind of manual labour. Turkish ideas prevail about their social position; but so highly valued are their services, that parents are often unwilling to see their daughters marry; and wives are in many cases older than their husbands. The relationship called *pobratimstvo* is only less common than in Montenegro (*q.v.*); equally binding is *kumstvo*, or sponsorship, *e.g.* the relation subsisting between the "best man" and the bridegroom at a wedding, or between godparents and god-children. Persons connected by *kumstvo*, *pobratimstvo*, or cousinship, however distant, may not marry. At a funeral, the coffin is left open until the last moment—a custom found everywhere in the Balkans, and said to have been introduced by the Turks, who found that coffins were a convenient hiding-place for arms. The same practice is, however, common in Spain and Portugal. Few countries are richer than Servia in myth and folklore. The peasants believe in charms and omens, in vampires, were-wolves, ghosts, the evil eye and *vile* or white-robed spirits of the earth, air, stream and mountain, with hoofs like a goat and henna-dyed nails and hair. Even at the beginning of the 20th century, education had done little to dispel such superstitions.

Constitution and Government.—In 1903, after the murder of King Alexander Obrenovich, and the accession of Peter Karageorgevich, the constitution of 1889 was revived. By this instrument the government of Servia is an independent constitutional monarchy, hereditary in the male line, and in the order of primogeniture. The executive power is vested in the king, advised by a cabinet of eight members, who are collectively and individually responsible to the nation and represent the ministers of foreign affairs, war, the interior, finance, public works, commerce, religion and education, and justice. The king and the national assembly, or *Narodna Skupshtina*, of 130[1] members, together form the legislature. A general election must be held every fourth year. Each member receives 15 dinars for every day of actual attendance, and travels free on the railways. There is also a state council which deals with various legal and financial matters. Of its 16 members, half are chosen by the king, and half by the Skupshtina. Apart from soldiers of the active army, all male citizens of full age may vote, if they pay 15 dinars in direct taxes; while, apart from priests, communal mayors and state servants, all citizens of 30 years, paying 60 dinars, are eligible to the Skupshtina. The *Velika Skupshtina* or Grand Skupshtina is only convoked to discuss the most serious national questions, such as changes in the succession, the constitution or the territories of the kingdom. Its vote is regarded as a referendum, and its members are twice as numerous as those of the Narodna Skupshtina. For purposes of local government Servia is divided into 17 departments (*okrug*, pl. *okruzhi*), each under a prefect (*nachalnik*), who is assisted by a staff of civil servants, dealing with finance, public works, sanitation, religion, education, police, commerce and agriculture. He also commands the departmental constabulary or *pandurs*. Every department is divided into districts (*srez*), administered by the sub-prefect (*sreski nachalnik*); and the districts are sub-divided into communes or municipalities, each having its salaried mayor (*kmet* or *knez*), who presides over a council elected on a basis of population. Within the smaller spheres of their jurisdiction, the sub-prefect and mayor have the same duties to fulfil as their superior, the prefect. The mayor is, further, responsible for the maintenance of the communal granary, forests and other property. He presents to the councillors (*odbornik*, pl. *odbornitsi*) a yearly statement of accounts and estimates, which they may reject or amend. All taxes levied by the state are paid by the communal council, which assesses the property owned by each family under its authority, collects the amount due and has the right to retain one-fourth, or more, for local requirements. The central government cannot veto the election of a communal mayor or councillor.

Justice.—The highest judicial authority in Servia is the Court of Cassation, created in 1855 and reorganized in 1865. The court of appeal (1840) has two sections, one competent for Belgrade and the seven northern departments, the other for the rest of the kingdom. There are also departmental tribunals of first instance in every department, and a commercial court of first instance in Belgrade. Communal courts exist in every commune or municipality, and certain judicial powers are delegated to the police, under laws dated 1850–1904. Trial by jury, which existed among the Serbs at least as early as the 13th century and fell into desuetude under Turkish rule, was revived in 1871.

Defence.—The medieval citadels of Belgrade, Nish, Pirot and Semendria have no military value, but some strategic points on the Bulgarian frontier were entrenched between 1889 and 1899, while the modern forts of Nish, Pirot and Zayechar were strengthened and re-armed at the beginning of the 20th century. The defensive force of the country, as reorganized in 1901, consists of the national army (*narodna voyska*) and the landsturm. In the national army, which is organized in 5 divisions, with headquarters at Nish, Belgrade, Valyevo, Kraguyevats and Zayechar, every able-bodied citizen must serve (for two years in the artillery and cavalry or eighteen months in other branches) between his 21st and his 45th year. He must also belong to the landsturm at the ages of 17-21 and 45-50. Exemption from service is granted in a few exceptional cases. The national army consists of three *bans* or classes; the first is the field army, the units of the second exist in peace as cadres only, the third is unorganized. On a peace footing the strength of the army is 35,000 men; in war it might reach 225,000, including landsturm. The infantry were armed in 1910 with the Mauser rifle (model 99); the field artillery with quick-firing guns on the Schneider-Canet system.

Religion.—The Servian Church is an autocephalous branch of the Orthodox Eastern communion. It is subject, as a whole, to the ministry of education; for internal administration its governing body is a synod of five prelates, presided over by the archbishop of Belgrade, who is also the metropolitan of Servia. Belgrade is the only archiepiscopal see; the four dioceses are Nish, Shabats, Chachak and the Timok (episcopal see at Zayechar). The synod is the highest ecclesiastical tribunal; there are also two ecclesiastical courts of appeal and diocesan courts of first instance in every bishopric; the canon law is an important part of the law of the land. In 1910 there were 54 monasteries, but only 110 monks, all belonging to the order of St Basil. Studenitsa, near Kralyevo, and Manasia and Ravanitsa, near Chupriya, are the most interesting monasteries. Much political influence is wielded by the priests, who played a prominent part in the struggles for national independence. They marry and work, and sometimes even bear arms like their parishioners, from whom a large part of their income is derived, in the shape of offerings and fees. The remainder comes principally from church lands; only the highest dignitaries being paid by the state. No able-bodied man may become a priest or monk unless he has served in the army. Liberty of conscience is unrestricted. Liberty of worship is accorded to Roman Catholics, Jews, Mahommedans and certain Protestant communities. The Mahommedans (about 3000 Turks and 11,000 gipsies) are the largest religious body apart from the national Church.

Education.—In 1910, 17% of the population could read and write. Primary education in the state schools is free and compulsory; the reading of Church Slavonic, nature-study and agriculture (for boys), domestic science (for girls), certain handicrafts, singing and gymnastics are among the subjects taught. There are higher schools (mostly *Real-Gymnasien*) in many of the larger towns, besides (1910) one theological seminary, 4 training schools for teachers, 4 technical schools, a military academy, and 5 secondary schools for girls. The communes and municipalities pay the entire cost of primary education, except the salaries of teachers, which, with the cost of higher education, are paid by the state. In February 1905 the Great School (*Velika Shkola*) in Belgrade was reorganized as the University of Servia, with faculties of theology, philosophy, law, medicine and engineering. Other important institutions of a semi-educational character are the Royal Servian Academy (1836), which controls the national museum and national library in Belgrade, and publishes periodicals, &c.; the ethnographical museum (1891), the natural history museum (1904), the national theatre (1890), the State Archives (1866, reorganized 1901), and the state printing office (1831), all in Belgrade.

See *Servia by the Servians*, ed. A Stead (London, 1909); J. Mallat, *La Serbie contemporaine* (Paris, 1902); E. Lazard and J. Hogge, *La Serbie de nos jours* (Paris, 1901). For topography:—the Servian and Austrian General Staff Maps; P. Coquelle, *La Royaume de Serbie* (Paris, 1894); and A. de Gubernatis, *La Serbie et les Serbes* (Florence, 1897). For geology and minerals:—J. Cvijic (Tsviyich), *Grundlinien der Geographie und Geologie*, &c. (Belgrade, 1908); J. M. Zhuyovich (Žujović), *Geologiya Srbiye* (with map, Belgrade, 1893); D. J. Antula, *Revue générale des gisements métallifères en Serbie* (with map, Paris, 1900); Th. Mirkovich (Mirković), *Les Eaux minérales en Serbie* (Paris, 1892). For commerce:—Annual British Consular Reports; Statistical Reports of the Servian Ministry of Commerce. For agriculture:—L. R. Yovanovich (Jovanović), *L'Agriculture en Serbie* (Paris, 1900). For religion:—Bishop N. Ruzhichich (Ružičić), *Istoriya Srpske Tsrkve* (Belgrade, 1893–1895); and, by the same author, *Das kirchlich-religiöse Leben bei den Serben* (Göttingen, 1896). (X.)

HISTORY

The Serbs (*Srbi*, as they call themselves) are a Slavonic nation, ethnically and by language the same as the Croats (*Hrvati*, *Horvati*, *Croati*). The Croats, however, are Roman Catholics and use the Latin alphabet, while the Serbs belong to the Orthodox Church and use the Cyrillic alphabet, augmented by special signs for the special sounds of the Serb language. (See SLAVS.)

The earliest mention of the Serbs is to be found in Ptolemy (Σίρβοι) and in Pliny (*Sirbi*). Nothing is known of their earlier history except that they lived as an agricultural people in Galicia, near the sources of the rivers Wissla and Dniester. In the beginning of the 6th century they descended to the shores of the Black Sea. Thence they began to move on in a westerly direction along the left shore of the Danube, crossed that river and occupied the north-western corner of the Balkan Peninsula. According to the emperor Constantine Porphyrogenitus, the emperor Heraclius (610–640) invited the Serbs to come over to settle down in the devastated north-western provinces of the Byzantine empire and to defend them against the incursions of the Avars. According to newer investigations, Heraclius only made peace with them, confirming them in the possession of the provinces which they already had occupied, and obtaining from them at the same time the recognition of his suzerainty. Their known history as a Balkan nation begins towards the middle of the 7th century.

The Zhupaniyas.—In their new settlements the Serbs did not form at once a united political organization. The clans (*plemena*, sing. *pleme*), more or less related to each other, occupied a certain territory, which as a geographical and political unit was called *Zhupa* or *Zhupaniya* (county), the political and military chief of which was called *Zhupan*. The country was divided into many such Zhupaniyas, which were originally independent of each other. The history of the Serbs during the first five centuries after their arrival in their present country was a struggle between the attempts at union and centralization of the Zhupaniyas into one state under one government, and the resistance to such union and centralization, a struggle between the centripetal and the centrifugal political forces. The more powerful Zhupan was tempted to subjugate and absorb the neighbouring less powerful Zhupaniyas. If successful, he would take the title of *Veliki Zhupan* (Grand Zhupan). But such unions were followed again and again by decentralization and disruption. It is not to be wondered at that this struggle gave occasion for wars between the Zhupaniyas, for civil wars within the Zhupaniyas, for popular risings, court revolutions, dethronements, political assassinations and such like. The earlier history of the Serbs on the Balkan territory is especially turbulent and bloody. One of the minor causes of that turbulence is to be found in the struggle between the ancient Slavonic order of inheritance, according to which a Zhupan ought to be succeeded by the oldest member of the family and not necessarily by his own son, and the natural desire of every ruler that his own son should inherit the throne.

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[1] One member is chosen to represent every 4500 electors.

This internal political process was complicated by the struggle between the Greek Church and Greek emperors on the one side, and the Roman Catholic Church and the Roman Catholic Powers (Venice and Hungary) on the other side, for the possession of exclusive ecclesiastical and political influence in the provinces occupied by the Serbs. The danger increased when the Bulgarians came, towards the end of the 7th century, and formed a powerful kingdom on the eastern and south-eastern frontiers of the Serbs. Practically from the 8th to the 12th century the bulk of the Serbs was under either Bulgarian or Greek suzerainty, while the Serbo-Croat provinces of Dalmatia acknowledged either Venetian or Hungarian supremacy.

The Visheslav Dynasty.—The first Serb princes who worked with more or less success at the union of several Zhupaniyas into one state, belonged to what might be called "the Visheslav dynasty." Zhupan Visheslav lived in the beginning of the 9th century, and seems to have been the descendant of that leader of the Serbs who signed the settlement treaty with the emperor Heraclius towards the middle of the 7th century. His ancestral Zhupaniya comprised Tara, Piva, Lim (the neck of land between the Montenegro and Servia of our days). Visheslav's son Radoslav, his grandson Prissegoy, and his great-grandson Vlastimir, continued his work. Vlastimir successfully defended the western provinces of Servia against the Bulgarian attacks, although the eastern provinces (Branichevo, Morava, Timok, Vardar, Podrimlye) were occupied by the Bulgars. The Bulgarian danger, and probably the energetic and successful operations of the Greek emperor Basil the Macedonian (867–886), determined the Servian Zhupans to acknowledge again the suzerainty of the Greek emperors. One of the important consequences of this new vassalship to the Byzantine empire was that the entire Servian people embraced Christianity, between 871 and 875. In all important transactions the Servians were led by the Grand Zhupan Mutimir Visheslavich (d. 891). During the reign of his heirs almost all the Servian provinces were conquered by the Bulgarian Tsar Simeon (924). In 931 Chaslav, one of the princes of the Visheslav dynasty, liberated the largest part of the Servian territory from Bulgarian domination, but to maintain that liberty he had to acknowledge the Byzantine emperors as his suzerains.

The Princes of Zetta and the First Serb Kingdom.—Towards the end of the 9th century the political centre of the Serbs was transferred to Zetta (Zeta or Zenta: see MONTENEGRO) and the Primorye (Sea-Coast). The prince (sometimes called king) of Zetta, Yovan Vladimir, tried to stop the triumphal march of the Bulgarian Tsar Samuel through the Serb provinces, but in 989 was defeated, made prisoner and sent to Samuel's capital, Prespa. The historical fact that Vladimir married Kossara, the daughter of Samuel, and was sent back to Zetta as reigning prince under the Bulgarian suzerainty, forms the subject of the first Serb novel, *Vladimir and Kossara*, as early as the 13th century. Vladimir, who seems to have been a noble-minded and generous man, was murdered by Samuel's heir, Tsar Vladislav (1015). By the Christians of both churches in Albania he is to this day venerated as a saint. But after the death of Samuel the Bulgarian power rapidly lost the Serb provinces, which, to get rid of the Bulgarians, again acknowledged the Greek overlordship. About 1042, however, Prince Voislav of Travuniya (Trebinje), cousin of the assassinated Vladimir of Zetta, started a successful insurrection against the Greeks, and united under his own rule Travuniya, Zahumlye and Zetta. His son Michael Voislavich annexed the important Zhupaniya of Rashka (Rascia or Rassia), and in 1077 proclaimed himself a king (*rex*), receiving the crown from Pope Gregory VII. His son Bodin continued the work of his father, and enlarged the first Serb kingdom by annexing territories which up to that time were under direct Greek rule. A body of Crusaders under Count Raymond of Toulouse passed through Bodin's kingdom about 1101. After Bodin's death the civil wars between his sons and relatives materially weakened the first Serb kingdom. Bosnia reclaimed her own independence; so did Rashka, whose Grand Zhupans came forward as leaders of the Serb national policy, which aimed at freedom from Greek suzerainty and the union of all the Serb Zhupaniyas into one kingdom under one king. The task was difficult enough, as the Byzantine empire, then under the reign of the energetic Manuel Comnenus, regained much of its lost power and influence. About the middle of the 12th century all the Serb Zhupaniyas were acknowledging the suzerainty of the Byzantine emperors.

The Nemanyich Dynasty and the Serb Empire.—A change for the better began when Stephen Nemanya became the Grand Zhupan of Rashka (1169). He succeeded in uniting all the Serb countries under his rule, and although he never took the title of king, he was the real founder of the Serb kingdom and of the royal dynasty of Nemanyich, which reigned over the Serb people for nearly 200 years. The youngest son of Stephen Nemanya, Prince Rastko, secretly left his father's royal court, went to a convent in Mount Athos, made himself a monk, and afterwards, under the name of Sava, became the first archbishop of Servia. As such he established eight bishoprics and encouraged schools and learning. He is regarded as the great patron and protector of education among the Serbs, as a saint, and as one of the greatest statesmen in the national history. After Stephen Nemanya and Sava the most distinguished members of the Nemanyich dynasty were Urosh I. (1242–1276), his son Milutin (1282–1321) and Stephen Dushan[1] (1331–1355). Urosh married Helen, a French princess of the house de Courtenay, and through her he kept friendly relations with the French court of Charles of Anjou in Naples. He endeavoured to negotiate an alliance between Serbs and French for the overthrow and partition of the Byzantine empire. His son Milutin continued that policy for some time, and increased his territory by taking several fortified places from the Greeks; but later he joined the Greeks under the emperor Andronicus against the Turks. Milutin's grandson, Stephen Dushan, was a great soldier and statesman. Seeing the danger which menaced the disorganized Byzantine empire from the Turks, he thought the best plan to prevent the Turkish invasion of the Balkan Peninsula would be to replace that empire by a Serbo-Greek empire. He took from the Greeks Albania and Macedonia excepting Salonica, Kastoria and Iannina. Towards the end of 1345 he proclaimed himself "emperor of the Serbs and the Greeks," and was as such solemnly crowned at Usküb on Easter Day 1346. At the same time he raised the archbishop of Ipek, the primate of Servia, to the dignity of patriarch. Three years later he convoked the *Sabor* (parliament) at Usküb to begin a codification of the laws and legal usages. The result was the publication, in 1349, of the *Zakonik Tsara Dushana* (Tsar Dushan's Book of Laws), a code of great historical interest which proves that Servia was not much behind the foremost European states in civilization. In 1355 Dushan began a new campaign against the Greeks, the object of which was to unite Greeks, Serbs and Bulgars into one empire, and by their united forces prevent the Turkish power taking root on European ground. To attain that object he was making preparations for a siege of Constantinople, but in the midst of these preparations, or, as some historians assert, on the march towards Constantinople, he died suddenly at the village of Deabolis on the 20th of December 1355. His only son Urosh, a young man of nineteen, seemed physically and mentally incapable of holding together an empire composed of such different races and upheaving with such divergent interests. Some of the powerful viceroys of Dushan's provinces speedily made themselves independent. The most prominent amongst them was Vukashin, who proclaimed himself king of Macedonia. He wished to continue Dushan's policy and to expel the Turks from Europe, but in the battle of Taenarus, on the 26th of September 1371, his army was destroyed by the Turks, and he was slain. This was the first great blow which shook the fragile structure of the Serb empire to its foundation. Two months later (December 1371) Tsar Urosh died, and with his death ended the rule of the Nemanyich dynasty.

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[1] *Dushan* is a term of endearment, derived from *dusha*, "the soul," and not, as formerly believed by Western philologists, from *dushiti*, "to strangle."

The Turkish Invasion: Kossovo.—After a few years of indecision and anarchy the Sabor met at Ipek in 1374 and elected Knez (count) Lazar Hrebelyanovich, a kinsman of Urosh, as ruler of the Serbs. Lazar accepted the position and its responsibilities, but never would assume the title of tsar, although the people commonly called him "Tsar Lazar." He tried to stop the further disruption of the Serb empire and worked to organize a Christian league against the Turks. When this was reported to the Turks, they at once decided to prevent the formation of such a league by attacking its prospective members one by one. This was the real cause of the Turkish attacks on Bulgaria and Servia in 1389, which resulted in the complete subjugation of Bulgaria and in the defeat of the Serb army in the battle of Kossovo (15th of June 1389). No historic event has made such a deep impression on the mind of the Serbs as the battle of Kossovo—probably because the flower of the Serb aristocracy fell in that battle, and because both the tsar of the Serbs, Lazar, and the sultan of the Turks, Murad I., lost their lives. The sultan was killed by the Serb knight or voyvode Milosh Obilich (otherwise Kobilovich). There exists a cycle of national songs—sung to this day by the Serb bards (*guslari*)—concerning the battle of Kossovo, the treachery of Vuk Brankovich and the glorious heroism of Milosh Obilich.

The Despotate.—After the battle of Kossovo Servia existed for some seventy years (1389–1459) as a country tributary to the sultans but governing itself under its own rules, who assumed the Greek title of "despot." The first despot after Kossovo was Tsar Lazar's eldest son "Stephen the Tall," who was an intimate friend of Sigismund IV., king of Hungary and emperor of the Germans. Being childless, Stephen on his deathbed in 1427 appointed his nephew, George Brankovich, to be his successor. As despot, George worked to establish an alliance between Servia, Bosnia and Hungary. But before such an alliance could practically be arranged, Murad II. attacked Servia in 1437 and forced George to seek refuge in Hungary, where he continued to work for a Serbo-Hungarian alliance against the Turks. Having at his disposal a large fortune he succeeded in organizing a Serbo-Hungarian expedition against the Turks in 1444. This expedition, under the joint command of the Despot George and of Hunyádi János, defeated the Turks in a great battle at Kunovitsa. The sultan was forced to conclude peace, restoring to George all the countries previously taken from him. For the remainder of his life George was rather estranged from his former allies the Hungarians. At the age of ninety he was wounded in a duel by a Hungarian nobleman, Michael Szilagyi, and died of his wound on the 24th of December 1457. His youngest son Lazar succeeded him, but only for a few months. Lazar's widow Helena Palaeologina gave Servia to the pope, hoping thereby to secure the assistance of Roman Catholic Europe against the Turks. But no one in Europe moved a finger to help Servia, and Sultan Mahommed II. occupied the country in 1459, making it a pashalik under the direct government of the Porte.

For fully 345 years Servia remained a Turkish pashalik, enduring all the miseries which that lawless régime implied (see TURKEY, *History*). But the more or less successful invasions of the Turkish empire in Europe by the Austrian armies in the course of the 18th century—invasions in which thousands of Serbs always participated as volunteers—prepared the way for a new state of things.

The Struggle for Servian Independence.—The disorganization and anarchy in the Turkish empire at the beginning of the 19th century gave the Serbs their opportunity, and the people rose *en masse* against its oppressors (January 1804). A national assembly met in February 1804 in the village of Orashats, and elected George Petrovich—more generally known under the name of "Tsrni Gyorgye" or "Karageorge" (*q.v.*)—both meaning "Black George"—as commander-in-chief of all the nation's armed forces and the leader of the nation (*Vozhd naroda*). Under his command the Serbs quickly succeeded in breaking the power of the Dahias, as the four chieftains of the Janissaries of Belgrade were called, who, having rebelled against the sultan, took possession of Servia, became its political and military masters, and exploited the country as their own private property. The Serbs cleared their country altogether of the Turks, and began to organize it as a modern European state. In 1807 the sultan offered to grant the Serbs self-government, and to acknowledge Karageorge as the chief of the nation with the title of prince. On the advice of the Russians, who were just going to war with Turkey, the Serbs refused that offer, preferring to fight against the Turks as Russian allies. The principal scene of the Russo-Turkish war being transferred to the Lower Danube, only a few unimportant actions took place on Servian territory. From 1804 till the autumn of 1813 the Serbs governed themselves as an independent nation. But when in 1812 Russia, attacked by Napoleon, had in great haste to conclude at Bucharest a treaty of peace with Turkey, and omitted to make sufficient provision for the security of her allies the Serbs, the Turkish army invaded and reconquered Servia, occupying all its fortresses. Karageorge, with most of the leading men, left the country (September 1813) and found a refuge first in Austria and then in Russia. Of those who remained in Servia the natural leader, by his own position, talents and influence, was Milosh Obrenovich, voyvode of Rudnik. He surrendered to the Turks and was appointed by them the ruler of central Servia. Not quite two years later Milosh began the second insurrection of the Serbs against the Turks (on Palm Sunday 1815, near the little wooden church of Takovo). He was successful not only in the field but in his diplomacy, and by 1817 Servia had regained autonomy under the suzerainty of the sultan. That autonomy was placed on an international basis by the treaty of Adrianople, concluded between Turkey and Russia in 1829. In compliance with that treaty the sultan by the Hatti-Sherif of 1830 formally granted full autonomy to the Serbs, retaining at the same time Turkish garrisons in the Servian fortresses.

Servia an Autonomous State: 1830–1879.—Milosh, declared hereditary prince of Servia, worked hard for the internal organization and for the economic and educational progress of his country. But his attempts to make Servia independent of Russian protection brought him into conflict with Russia, and his autocratic methods of government united against him all who wished for a constitution. The result was that Prince Milosh was forced to abdicate and leave the country in 1839. Three days before his abdication he was induced to sign a constitution (that of 1838) imposed on Servia by the Porte, at the instance of Russia, with the object of undermining his position. This constitution delegated part of the prince's authority to a council of 70 members appointed for life. Prince Milosh's elder son, Prince Milan (Obrenovich II.), died in a few months, and the younger son Michael (Obrenovich III.) ascended the throne. But the politicians who forced Milosh to abdicate did not feel safe with Milosh's second son as the reigning prince of Servia. They started a military revolt, drove Michael also into exile (1842), and elected Alexander

Karageorgevich, the younger son of Karageorge, as prince of Servia. His reign (1842–1858) was quiet and prosperous, and the country made remarkable progress in culture and wealth. But he feared to summon the national assembly, was personally weak and vacillating, and in foreign politics was Turcophil and Austrophil rather than Russophil. Not only Russia but Servia also was dissatisfied with such a policy, and when Alexander Karageorgevich, forced by public opinion, at last dared convoke a national assembly, that assembly's first resolution was that Prince Alexander should be dethroned and replaced by the old Prince Milosh Obrenovich I. This change of the reigning dynasty was effected without the slightest disorder or loss of life. Milosh returned to power at the beginning of 1859, but died in 1860. His son Michael then ascended the throne for the second time. He was a man of refinement who had learned much during his long exile (1842–1859). His political programme was that the law should be respected as the supreme will in the country, that Servia's political autonomy should be jealously guarded, and every encroachment on the part of the suzerain power should be resented and rebuffed. He introduced many important reforms in administration, and replaced the old constitution, granted to Servia by the Porte in 1830, by a new constitution which he himself gave to the country. When in 1862 the Turkish garrison in the citadel of Belgrade bombarded the town, he demanded the evacuation of all the Servian fortresses and forts by the Turks. Only a few of the less important forts were delivered to the Serbs at that time; but in 1863 Prince Michael sent his wife, the beautiful and accomplished Princess Julia (*née* Countess Hunyadi), to plead the cause of Servia in London, and she succeeded in interesting prominent English politicians (Cobden, Bright, Gladstone) in the fate of the Balkan countries. Prince Michael organized the national army, armed it and drilled it, and entered into understandings with Greece, Montenegro, Bosnia and Herzegovina, Bulgaria and Albania, for an eventful general rising against the Turks. In the beginning of 1867 he addressed to the Porte a formal demand that the Turkish garrisons should be withdrawn from Belgrade and other Serb fortresses. To prevent a general conflagration in the Balkan Peninsula, the powers advised the sultan to comply with the demand, and when the British government strongly supported that advice the sultan yielded and delivered all the fortresses on Servian territory to the keeping of the prince of Servia (March 1867). Prince Michael's great popularity in consequence of his diplomatic successes alarmed the friends of the exiled Karageorgevich dynasty, more especially when rumours began to circulate that the prince contemplated divorcing his childless wife Julia and remarrying. A conspiracy was formed, and Prince Michael was assassinated on the 10th of June 1868. The conspirators failed to overthrow the government, and the army proclaimed Milan, the son of Prince Michael's first cousin Milosh Obrenovich (son of Yephrem, brother to Milosh the founder of the dynasty), as prince of Servia. The choice was unanimously approved by the Velika Skupshtina, which had been immediately convoked. As Milan Obrenovich IV. was a boy of only thirteen, a regency, presided over by Jovan Ristich or Ristitch (*q.v.*), was appointed to manage the government until the boy prince attained his full age, which took place in 1872. In 1869 the regency had substituted a new constitution for that of 1838. Prince Milan followed the policy of his dynasty, and, encouraged by the Russian Panslavists, declared war on Turkey (June 1876). His army, commanded by the Russian General Chernyayev, was defeated by Abdul-Kerim Pasha, whose advance was stopped by the intervention of Tsar Alexander II. But the situation created by Prince Milan's action in the Balkans forced the hand of the tsar, and Russia declared war on Turkey (1877).

The Treaty of Berlin.—Prince Milan was educated in the political school favourable to Russia, and unhesitatingly followed the Russian lead up to the conclusion of the preliminary treaty of peace between Russia and Turkey at San Stefano. By that treaty Russia, desiring to create a great Bulgaria, took within its limits districts inhabited by Servians, and considered by the Servian politicians and patriots as the natural and legitimate inheritance of their nation. This act of Russia created great dissatisfaction in Servia, and became the starting-point for a new departure in Servian politics. At the Berlin Congress the Servian plenipotentiary, Jovan Ristich, in vain appealed to the Russian representatives to assist Servia to obtain better terms. The Russians themselves advised him to appeal to Austria and to try to obtain her support. The utter neglect of the Servian interests by Russia at San Stefano, and her evident inability at the Berlin Congress to do anything for Servia, determined Prince Milan to change the traditional policy of his country, and instead of continuing to seek support from Russia, he tried to come to an understanding with Austria-Hungary concerning the conditions under which that power would give its support to Servian interests. This new departure was considered by the Russians—especially by those of the Panslavist party—almost as an apostasy, and it was decided to oppose Prince Milan and his supporters, the Servian Progressives. The treaty of Berlin (13th of July 1878) disappointed Servian patriots, although the complete independence of the country was established by it (art. 34). This was proclaimed at Belgrade by Prince (afterwards King) Milan on the 22nd of August.

The Progressive Régime.—The political history of Servia from 1879 to the abdication of King Milan on 3rd March 1889 was an uninterrupted struggle between King Milan and the Progressives on one side, and Russia with her adherents, the Servian Radicals, on the other. King Milan and his government were badly handicapped by several unfortunate circumstances. To fulfil the engagements accepted in Berlin and the conditions under which independence had been granted to Servia, railways had to be constructed within a certain time, and the government had also to pay to the Turkish landlords in the newly acquired districts an equitable indemnity for their estates, which were divided among the peasants. These objects could not be attained without borrowing a considerable amount of money in the European markets. To pay regularly the interest on the loans the government of King Milan had to undertake the unpopular task of reforming the entire financial system of the country and of increasing the taxation. The expenditure increased more rapidly than the revenue. Deficits appeared, which had to be covered temporarily by new loans, and which forced the government to establish monopolies on salt, tobacco, matches, mineral oils, &c. Every such step increased the unpopularity of the government and strengthened the opposition. An attempt on the life of King Milan was made in 1882, and an insurrection in the south-eastern districts was started in 1883. But the majority of the people, and especially the regular army, remained loyal, and the revolt was quickly suppressed.

War with Bulgaria.—The union of Bulgaria and Eastern Rumelia inspired King Milan and his government with the notion that either that union must be prevented, or that Servia should obtain some territorial compensation, so that the balance of power in the Balkan Peninsula might be maintained. This view, which did not find support anywhere outside Servia, led to war between Servia and Bulgaria (see *Servo-Bulgarian War*); the Servians were defeated at Slivnitza and had to abandon Pirot, whilst the farther advance of the Bulgarian army on Nish was stopped by the intervention of Austria-Hungary. An honourable peace was concluded between the two contending powers in March 1886. Then came the unhappy events connected with Milan's divorce from Queen Natalie. That domestic misfortune was cleverly exploited by King Milan's enemies in the country and abroad, and did him more harm than all his political mistakes. He tried to retrieve his position in the country, and succeeded in a great measure, by granting a very liberal constitution (January 1889, or Dec. 1888 O.S.) at a time when all agitation for a new constitution had been given up. Then, to the great astonishment of the Servians and of his Russian enemies, King Milan voluntarily abdicated, placing the government of the country in the hands of a regency during the minority of his only son Alexander, whom he proclaimed king of Servia on the 6th of March 1889.

King Alexander: The Regency.—The leading man of the regency was Jovan Ristich, who had already been regent during the minority of King Milan (1868–1871). Although he had been since 1868 the leader of the Liberal party, he showed himself, as regent, extremely Conservative. The new constitution was the embodiment of Radical principles, and the numerically strongest party in the country was Radical. The national assembly was composed, therefore, almost exclusively of Radicals, and the government was Radical likewise. From the very beginning the Conservative regency and the Radical government distrusted each other. The government was not strong enough to resist the clamour of their numerous partisans for participation in the spoils of party warfare. Political passions, which had been stirred up by the long struggle against King Milan's Progressive régime, could not be allayed so quickly; and as the anarchical element of the Radical party obtained the ascendancy over the more cultured and more moderate members, all sorts of political excesses were committed. The old system of borrowing money to cover the yearly deficits were continued, and the expenditure went on increasing from year to year. The administration lost all authority, the police were paralysed and brigandage became rife. The Radical government thought to strengthen their position by letting the national assembly vote a law prohibiting the return of the king's father to Servia, and forcibly expelling the king's mother, Queen Natalie. But such laws and such acts only embittered political passions and greatly encouraged the adherents of Prince Peter Karageorgevich, who, having married the eldest daughter of Prince Nicholas of Montenegro and living at Cettigne, was supposed to enjoy the support of Russia. The political situation became still more confused when on the death of the third regent, General Kosta Protich, the government tried to force the regency to accept in his stead M Pashich, the leader of the Radical party. The regents thereupon dismissed the Radical cabinet and called the Liberals to the government (August 1892). The Liberal cabinet dissolved the Radical national assembly, and at the general elections used very great pressure to secure a Liberal majority. In this they did not succeed, and the situation became hopelessly entangled by the fact that the national assembly was Radical, the government Liberal, and the regency practically in all its tendencies Conservative. The legislative machinery as well as the administration of the country was thus completely paralysed. Then the young king Alexander suddenly proclaimed himself of age (although at that time only in his seventeenth year), dismissed the regents and the Liberal cabinet, and formed his first cabinet from among the moderate Radicals (13th April 1893).

The King's Administration.—The moderate Radicals quickly showed themselves unable to do any serious work. They were fettered by the dissatisfaction of the Left wing of their own party. To satisfy the extreme Radicals they had to impeach the members of the last cabinet. This increased the bitterness of the Liberals, who, though not so numerous as the Radicals, included in their ranks more men of wealth and culture. Political passions were again in full blaze. The anti-dynastic party raised its head again, and in many Radical publications the expulsion of the reigning dynasty and its replacement by the Karageorgevich were advocated. At the same time reports were reaching King Alexander that Russia was discussing with the leaders of the extreme Radicals the conditions under which a Russian grand-duke was to be proclaimed king of Servia.

The ex-King Milan's Return.—In such circumstances King Alexander thought best to invite his father the ex-King Milan (who was living in Paris) to his side, and to use his great knowledge of men and his political experience. In the beginning of January 1894 King Milan arrived in Belgrade. The Radical cabinet resigned and was replaced by a cabinet composed of politicians standing outside the political parties. In June the Radical constitution of 1889 was suspended, and in its place the constitution of 1869 was re-established.

The nation was evidently tired of the violent agitations of recent years. This feeling gave rise to Conservative, even somewhat reactionary, legislation. The duration of the legislature was extended from three to five years; the liberty of the press was curtailed by the enactment that proprietors of political papers must pay to the government a deposit of 5000 dinars (£200), and that the editors must have completed their studies at a university; the laws on *lèse-majesté* were made more severe. After the advent to power of Dr Vladan Georgevich (October 1897) persistent and successful efforts were made to improve the country's financial and economic condition. The violent party strife which from 1880 to 1895 had absorbed the best energies of the country and paralysed every serious and productive work, ceased almost completely, and the nation as a whole turned to improve its agriculture and commerce. The sustained improvement in the political and commercial situation was not influenced materially by the temporary excitement in consequence of the attempt on the life of King Milan (6th July 1899), and of the state trial of several prominent Radicals accused of having conspired for the overthrow of the dynasty. One remarkable feature in the foreign policy of Servia in the last years of the 19th century was that after King Milan was appointed commander-in-chief of the Servian regular army (1898), Russia and Montenegro practically, although not formally, broke off their diplomatic relations with Servia, while at the same time the relations of that country with Austria-Hungary became more friendly than under the Radical régime.

King Alexander's Marriage.—All this was suddenly changed when in July 1900 King Alexander married Mme Draga Mashin, once lady-in-waiting to his mother Queen Natalie. He threw himself into the arms of Russia, forbade his father Milan to reside in Servia, and followed Russian guidance in all questions of foreign policy. To strengthen his position in the country he promulgated a new constitution in April 1901, establishing for the first time in the history of Servia a parliament with two houses (skupshtina and senate). But the unpopularity of the king's marriage was not lessened. Constitutional liberties and especially the free press were mercilessly used to attack both the king and the queen, who neither wished nor were able to conceal their dissatisfaction. A general feeling that King Alexander contemplated changing the situation by one of his bold and clever *coups d'état* increased the political unrest. Matters went from bad to worse when persistent rumours were set in motion that Queen Draga had succeeded in persuading King Alexander to proclaim one of her two brothers heir-apparent to the throne. In 1902 a widespread military conspiracy was rumoured to exist, while Austria and Russia repeatedly gave proofs that they were indifferent to the fate of Alexander, and so encouraged the malcontents. King Alexander felt that he could eventually fortify his position either by a great foreign policy or by his divorce from the childless Queen Draga. He seems to have been working for joint action with Bulgaria for the liberation of Macedonia from Turkish rule. Some of his intimate friends asserted that he contemplated divorcing the queen, and that he was only waiting for her departure for an Austrian watering-place, which departure was fixed for the 15th of June 1903. In the first hours of the 11th of June the conspirators surrounded the palace with troops, forced an entrance and assassinated both King Alexander and Queen Draga in a most cruel and savage manner. (C. Mi.)

King Peter Karageorgevich.—The regicides proclaimed Prince Peter Karageorgevich king of Servia; and a provisional cabinet was formed, with Colonel Mashin, brother-in-law of the murdered Queen Draga and organizer of the conspiracy, as minister of public works. The skupshtina and senate assembled, restored the constitution of 1889 instead of the reactionary constitution promulgated by King Alexander on the 19th of April 1901, and ratified the election of Prince Peter, who entered Belgrade as king on the 24th of June 1903. Born in 1844, he was the son of Alexander Karageorgevich and grandson of Karageorge; in 1883 he had married Princess Zorka, daughter of Prince (afterwards king) Nicholas of Montenegro. His authority was at first merely nominal; the highest administrative offices were occupied by the regicides, who received the unanimous thanks of the skupshtina for the assassination of King Alexander and Queen Draga. Russia, Austria-Hungary and Montenegro were the only Powers which congratulated King Peter on his accession, and in December 1903 all the Powers temporarily withdrew their representatives from Belgrade, as a protest against the attitude of the Servian government towards the regicides. But at the coronation of King Peter, in September 1904, all the European powers except Great Britain were officially represented, some concessions, more apparent than real, having been made in the matter of the regicides, who were very unpopular among the peasants and in the army. Further protests were made by many of the powers when the illusory nature of these concessions became known, and it was not until May 1906 that diplomatic relations with Servia were resumed by Great Britain. In the same year a convention was concluded by Servia and Bulgaria as a preliminary to a customs union between the two states. This convention, which tended to neutralize the dependence of Servia upon Austria-Hungary by facilitating the export of Servian goods through the Bulgarian ports on the Black Sea, brought about a war of tariffs between Servia and the Dual Monarchy.

The Bosnian Crisis.—In 1908 the annexation of Bosnia and Herzegovina by Austria-Hungary and the revolution in Turkey brought about an acute crisis. Many Serbs still hoped for the realization of the so-called "Great Servian Idea," *i.e.* the union in a single empire of Servia, Bosnia and Herzegovina, Montenegro and Old Servia (*Stara Srbiya*) or the sanjak of Novibazar with north-western Macedonia—all countries in which the population consists largely, and in some cases almost exclusively, of Orthodox Serbs. The whole nation clamoured for war with Austria-Hungary, and was supported in this attitude by Montenegro, despite a temporary rupture of diplomatic relations between Belgrade and Cettigne, due to the alleged complicity of the Servian crown prince in a plot for the assassination of Prince Nicholas. As, however, the armaments and finances of Servia were unequal to a conflict with Austria-Hungary, while Great Britain, Russia, France and Italy counselled peace, the skupshtina, meeting in secret session on the 11th of October 1908, determined to avoid open hostilities, and sent M Milanovich, the minister for foreign affairs, to press the claims of Servia upon the powers. The tariff war with Austria-Hungary was at the same time renewed. Servia demanded compensation in various forms for the annexation of Bosnia and Herzegovina; what the government hoped to obtain was the cession to Servia of a strip of territory between Herzegovina and Novibazar, which would check the advance of Austria-Hungary towards Salonica, make Servia and Montenegro conterminous, pave the way for a union between them, and give Servian commerce an outlet to the Adriatic. Neither the Dual Monarchy nor the Young Turks would consider the cession of any territory, and in January 1909 the outcry for war was renewed in Servia. But the threatening attitude of Austria-Hungary, with the moderating influence of M Pashich, who became the real, though not the nominal, head of a new ministry in February 1909, induced Servia to accept the advice of the Russian government by abandoning all claim to territorial "compensation," and leaving the Balkan question for solution by the Powers. The Servian government defined its attitude in a circular note to the Powers (9th of March), and finally accepted the terms of a conciliatory declaration suggested by the British government (31st of March). By this declaration Servia abandoned all its demands as against Austria-Hungary, while the Austro-Hungarian foreign minister made simultaneously a public declaration that the Dual Monarchy harboured no unfriendly designs against Servia.

On the 27th of March 1909 the crown prince George (b. 1887), who had been the most outspoken leader of the anti-Austrian party in 1908, was induced to resign his right of succession to the throne. It was alleged that his violence had caused the death of one of his own male servants, and that he was partially insane. On the 27th of March 1909 his brother Alexander (b. Dec. 17, 1888) took the oath as heir-apparent.

The books by Stead, Mallat and Hogge, mentioned above, contain important historical matter. See also the bibliography to the article BALKAN PENINSULA, with L. von Ranke, *Geschichte Serbiens bis 1842* (Leipzig, 1844; Eng. trans. by A. Kerr, *The History of Servia* (London, 1847); id., *Serbien und die Türkei im 19. Jahrhundert* (Leipzig, 1879); A. Hilferding, *Geschichte (ältere) der Serben und Bulgaren* (2 vols. from the Russian, Bantzen, 1856–1864); S. Novaković, *Srbi i Turtsi xiv. i xv. veka, &c.* (Belgrade, 1893); B. S. Cunibert, *Essai historique sur les révolutions et l'indépendance de la Serbie: 1804–1850* (2 vols., Paris, 1850–1855); E. L. Mijatovich, *History of Modern Servia* (London, 1872); Rachić, *Le Royaume de Serbie, étude d'histoire diplomatique* (Paris, 1901); V. Georgević, *Das Ende der Obrenović* (Leipzig, 1905); C. Mijatovich, *A Royal Tragedy* (London, 1906). (X.)

LANGUAGE

The Servian language belongs to the family of Slavonic languages (see SLAVS). According to the Servian philologist Danichich (*Dioba Slov. yezika*, Belgrade, 1874), the Servians were the first Slavonic branch which separated from the original Slavonic stem, while the Russians and the Bulgarians only separated from it at a considerably later date. The Russian and Bulgarian languages undoubtedly stand nearer to Old Slavonic than the Servian. According to another theory (T. Schmidt, *Vocalismus* ii. 179) two separate branches developed from the Old Slavonic stem, one identical with the western Slavs, and the other with the south-eastern group; and from the Slavonic of the south-east the first languages to separate were the Russian and the South Slavonic. From the latter developed Bulgarian, on one side, and Servian-Slovene on the other, while from the last-named branch Servian or Serbo-Croatian and Slovene developed on two separate twigs. There can be no doubt that in the south-eastern group of the Slavonic languages Serbo-Croatian and Slovene form a special closely-connected group, in which the Servian and the Croat languages are almost identical.

Both the Servians and the Croats arrived in the first half of the 7th century (or more precisely about A.D. 635) in the north-western corner of the Balkan Peninsula. There they met the partly Romanized Illyrians, and in course of time absorbed them. There can be little doubt that this absorption softened and enriched the Serbo-Croatian dialects, a process to which climatic conditions and intercourse with Italy also contributed, until Serbo-Croatian became one of the richest and most melodious of Slavonic languages.

Servian is spoken in the following countries, forming geographically (although not politically) a connected whole: southern Hungary, the kingdom of Servia, Old Servia (the Turkish vilayet of Kossovo), western Macedonia, the sanjak of Novi-Bazar, Bosnia, Herzegovina, Croatia-Slavonia, Dalmatia and Montenegro. It ranks with Bulgarian as one of the two principal Slav languages of the Balkan Peninsula; the Macedonian dialects are intermediate between these two. Between eight and nine millions of people speak Serbo-Croatian in the countries just enumerated.

Considering the extent of territory in which the language is spoken, it is not surprising that it should have several dialects. Practically, however, there are only three principal dialects, which are differentiated by the manner in which the Old Slavonic double vocal *ye* (the so-called *yach*) is pronounced. The Old Slavonic words *lyepo*, *byelo*, are pronounced by the Servians of Herzegovina, Bosnia, Montenegro, Dalmatia, Croatia and south-western Servia as *leeyepo*, *beeyelo*; by the Servians of Syrmia the same vowel is pronounced sometimes as *e* (*lepo*, *belo*), sometimes as *ee* (*videeti*, *leteeti*); by the Servians of the Morava valley and its accessory Ressava valley, always only as *e* (*lepo*, *belo*, *videti*, *leteti*). Vuk Stefanovich Karajich called the first dialect the "South-Western or Herzegovinian dialect," the second the "Syrmian," the third the "Ressava" dialect. Professor Belich of Belgrade University has tried to give in the *Servian Dialectological Compendium* (Belgrade, 1905) a new division of the Servian dialects into five groups, viz. Prizren-Timok, Kossovo-Ressava, Shumadiya-Srem (Syrmia), Zetta-Bosnia, Adriatic coast. Of all the Servian dialects the most correct, richest and softest is the Herzegovinian or Zetta-Bosnian dialect. Karajich and his followers tried to make it the literary language of the Servians. All the national songs which he transcribed from the recitations of the bards were written and published by him in that dialect, into which the Bible has also been translated. But, as in the second half of the 19th century the kingdom of Servia, speaking the Ressava or Shumadiya-Syrmian dialect, became the centre of Servian literary activity, the last-mentioned dialect tended to become the literary language.

Servian and Croatian are only two dialects of the same Slavonic language. Servian is sometimes called *shtokavski* because the Servian word for "what" is *shto*, whereas the Croats say *cha* for *shto*, and therefore their language is called *chakavski*. The more important differences between the two languages were pointed out by Danichich (*Glasnik*, ix., 1857). They are as follows: (*a*) while the Servians pronounce the Old Slavonic *yach* as *ye* or *e* or *ee*, the Croats pronounce it always as *ee* (Servian *beeyelo* or *belo*, Croatian *beelo*); (*b*) the Servians have the sound *gye* (softened *d* or *g*), the Croats are without it, but have instead *ya* or *ye* (Servian *gospogya*, Croatian *gospoya*); (*c*) the Servians let the vowel *i* transform the preceding consonant into a soft consonant, whereas the Croats pronounce the consonant unaffected by the softening influence of *i* (Servian *bratya*, Croatian *bratia*); (*d*) the Servians change the letter *l* at the end of a word into *o* whereas the Croats always pronounce it as *l*. These differences are so insignificant that it was very natural that the Croats after having tried to convert the *chakavski* dialect into a separate literary language were compelled to abandon that attempt and to adopt the *shtokavski*. To facilitate this reform, to overcome the ecclesiastical prejudices of the Roman Catholic Croats against the Eastern Orthodox Servians, and vice versa, certain Croatian patriots, led by Ljudevit Gaj, proposed that all the Slavonic peoples in the north-western part of the Balkan Peninsula should call themselves *Illyri* and their language *Illyrian* (see CROATIA-SLAVONIA: *Language and Literature* and *History*). The appellation "Serbo-Croatian" for the literary language of both nations now finds more favour. The great dictionary compiled and published by the South Slavonic Academy of Agram is called *The Lexicon of the Servian or Croatian Language*. Although the Croats write and print in Latin characters, while the Servians write and print in Cyrillic, and although many a Servian cannot read Croatian books, and vice versa, the literary language of both nations is one and the same. (C. MI.)

LITERATURE

1. *Formation of a Servian-Slavonic Language*.—Servian literature begins with the biblical and liturgical books, written in "Old Slavonic," or "Church Slavonic," into which "the Slavonic apostles" Cyril and Methodius (see SLAVS) had translated the Bible and other church books about the middle of the 9th century. Cyril and Methodius used the Greek alphabet somewhat modified and adapted to the necessities of the Slavonic language. That alphabet is called "Cyrillic" (in Servian *Kyrilitsa*), and is—simplified and modernized—practically the alphabet used by the Servians, Bulgarians and Russians of our times. The Cyrillic aphabet replaced an older Servian, or probably Old Slavonic, alphabet called "Glagolitic" (see SLAVS: *Alphabets*). A few Servian books are still printed in Glagolitic, and some in Latin letters; but by far the greatest number are written and printed in Cyrillic.

The Old Slavonic church books had naturally to be copied from time to time, and the Servian, Bulgarian and Russian copyists were unable to resist the influences of their respective living languages. Thus comparatively soon there appeared church books no longer written in pure Old Slavonic (of which the so-called "Asseman's Gospel" in the Vatican is the best type), but in Old Slavonic modified by Servian, Bulgarian, Russian influences, or in the languages which could be called Servian-Slavonic, Bulgarian-Slavonic, Russian-Slavonic. The best extant specimen of the Servian-Slavonic is "Miroslav's Gospel," written in the second half of the 12th century for the Servian prince Miroslav; a facsimile edition was published in 1897 in Belgrade. Servian-Slavonic was the literary language of the Servians from the 12th century to the end of the 15th, *i.e.* during the first period of their literary history.

2. *Servian-Slavonic Literature*.—The only noteworthy literary productions of this first period of Servian literature were *zhivoti* (biographies) and *letopisi* (chronicles). The best writers of the time were Archbishop Sava (St Sava), his brother King Stephen (*Stefan*) Prvovenchani (*i.e.* the "first-crowned"), the monks Domentiyan and Theodosius, Archbishop Danilo, Gregorius Tsamblak, Stephen Lazarevich, prince of Servia, and Constantine the Philosopher. The most important literary work of St Sava (d. 1237) was *The Life of St Simeon*, in which he described the life of his father, Stephen Nemanya, the first sovereign of the united Servian provinces, who towards the end of his life became a monk and took the name of Simeon. Domentiyan wrote a life of St Sava in the involved and bombastic Byzantine style of the middle of the 13th century. The best literary creations of the period are undoubtedly *The Lives of the Servian Kings and Archbishops* by Archbishop Danilo (d. 1338), and Constantine the Philosopher's *Life of Despot Stephen Lazarevich*, written in 1432.

The chronicles (*letopisi*) are without any literary value, although as historical material they are useful. They number about thirty. The oldest of them was written between 1371 and 1390. The best are *Letopis of Ypek*, which ends with the year 1391; *Letopis of Koporin*, written by Deacon Damyan in 1453; *Letopis of Carlovitz*, 1503; and the chronicle of the monastery of Tronosha, 1526.

To this period of Servian literature belongs the first attempt by an unknown author to write a romance. The story of the love and sufferings of the Servian prince Vladimir, who lived in the 11th century, and his wife, the Bulgarian princess Kossara, written probably in the 13th century, was very popular among the Servians of the 14th and 15th centuries. Other comparatively widely-read books of the period were the *Life of Alexander the Great*, *The Story of the Siege of Troy*, *Stefanite and Ikhnylat* (an Indian story) and *The Journey of a Soul from this World to that Other*, all of which were translations from the Greek.

A characteristic example of the literary and also, as it appears, of the official language of the Servians in the middle ages is the Codex of Tsar Dushan (*Zakonik Tsara Dushana*), which was promulgated at the Servian parliament (*Sabor*) in Skoplye (Usküb) in 1349 and 1354. Very interesting material for the study of the Servian literary language during the 12th, 13th and 14th centuries is to be found in several collections of old charters and letters of that period (F. Miklosich's *Monumenta Serbica*, Putsich's *Srpski Spomenitsi u Dubrovachkoy Arkhivi*, and the publications of the Royal Servian Academy in Belgrade and the South Slavonic Academy of Science in Agram). The oldest document written in the vernacular Servian is considered to be a charter by which Kulin, the ban of Bosnia, grants certain commercial privileges to the Ragusan merchants in 1189.

The oldest printed book in Servian-Slavonic issued in 1483 from the printing-press of Andreas de Theresanis de Asula in Venice. A few years later the Servian nobleman Bozhidar Vukovich bought a printing-press in Venice and established it at Obod in Montenegro, from which issued in 1493 the first church book (the *Octoich*) printed on Servian territory. There is a copy of this book in the British Museum. Vicentius, the son of Bozhidar Vukovich, carried on the enterprise of his father, and their printing-press continued to work up to 1566, issuing several church books in the Servian-Slavonic language. During the first half of the 16th century the Servians had printing-presses in Belgrade, Skadar (Scutari) on the river Boyana, Gorazhde, Mileshevo and elsewhere. But in the second half of that century all printing absolutely ceased in the Servian countries under the direct rule of the Turks, and was not resumed until the middle of the 18th century. Books for the use of the churches had to be imported from Russia, printed in the Russian-Slavonic language.

3. *Dalmatian Literature*—While among the Servians belonging to the Eastern Church all literary work had practically stopped from the middle of the 16th century to the middle of the 18th, the Roman Catholic Servians of Dalmatia, and more especially those of the semi-independent republic of Ragusa, became more active. Being for centuries politically, ecclesiastically and commercially connected with Venice, Rome and Italy in general, they came under the influence of Italian civilization, and during the 15th, 16th and 17th centuries were the most cultured branch of the Servian nation. The awakening of literary ambition among these Servians of the Adriatic coast was originally due to the influence of immigrant Greek scholars who came to Ragusa after the fall of Constantinople in 1453.

Between 1450 and 1530 there had already been founded in Spalato a small literary society, in which the Servian poets Marulich, Papalich, Martinich and others read their poetical compositions, mostly lyrical and religious songs. About the same time (1457–1501) there appeared in Ragusa the poet Menchetich, who wrote nearly four hundred love-songs and elegies, taking Ovid as his model, and George Drzhich (1460–1510), author of many erotic poems and of a drama. Two of the finest works of this early period of the Servian literature of Ragusa are the poem *Dervishiyada*, written by the Ragusan nobleman Stepan Guchetich (1495–1525), rich in humour and satire, and the poem *Yegyupka* ("The Gipsy Woman"), written by Andreas Chubranovich (1500–1550), a goldsmith by profession and a very original and clever lyrical poet. Another remarkable Ragusan poet was Hectorovich (1486–1572), who wrote the poem *Ribanye* ("The Fishing and Talking with Fishermen"), and anticipated a new movement in Servian literature by publishing three national songs as he heard them from the popular bards (*guslars*). But the true glory of Ragusan literature was established by its three poets, Ivan Gundulich (1558–1638), Gyon Palmotich (1606–1657) and Ignacius Gyorgyich (1675–1737). Of these the greatest was Gundulich (*q.v.*). Palmotich is remarkable as a dramatic poet. The subjects of most of his dramas were taken from Latin and Italian poets (*Atalanta* after Ovid, *Lavinia* after Virgil, *Armida* after Tasso); but at least in two dramas, *Pavlimir* and *Tsaptislava*, he displayed some originality, taking his themes from Servian national history. All the works of Palmotich have been published by the South Slavonic Academy (*Stari Pisči*, vols. xii., xiii., xiv. xix.). Gyorgyich's best work is considered to be his translation of the Psalms into Servian verse (*Saltiyer Slovinski*). He also wrote *The Sighs of the Repenting Magdalen* and the unfinished tragedy *Judith.*

After Gyorgyich the Servian literature of Ragusa and Dalmatia during the 18th century has no great name to show, except that of the mathematician, Ruggiero Boshkovich (see BOSCOVICH). His two brothers and his sister Anitsa Boshkovich were known in their time as poets. But on the whole Servian literature on the Adriatic coast showed little originality in the 18th century; its writers were content to produce good translations of Latin, Italian and French works.

Mention must be made, however, of an author whose work connects the literature of the Adriatic Servians of the 18th century with the regenerative efforts of the Danubian Servians in the second decade of the 19th century. The literature of the Adriatic Servians was, with very few exceptions, Servian only in language, but Italian in form and spirit. About the middle of the 18th century a learned Dalmatian monk, Andrea Kachich Mioshich by name, emancipated himself from the yoke of pseudo-classicism and slavery to Western models. As a papal delegate he had to visit all the Roman Catholic communities in Dalmatia, Herzegovina and Bosnia, and had numerous opportunities of hearing the bards recite songs on old national heroes. In 1756 he published a book entitled *Razgovor Ugodni Naroda Slovinskoga* ("The Popular Talk of the Slavonic People"), in which in 261 songs he described—in the manner and in the spirit of the national bards—the more important historic or legendary events and heroes of the "Slavonic people." Under this denomination he comprised Servians, Croats, Slovenes and Bulgarians, anticipating the modern appellations of the *Yugo-Sloveni* (Southern Slavs). His book immediately became the most popular that ever appeared among the Servians, and was again and again reprinted, under the less ponderous title *Pesmaritsa*, "The Book of Songs." Some sixty years after its appearance it inspired Vuk Stefanovich Karajich with the vision of his true mission. But Kachich Mioshich found no immediate followers among the Servian *literati* of the second half of the 18th century.

4. *The Revival of Servian Literature: Obradovich and Karajich.*—As long as the countries inhabited by the Orthodox Servians were under the deadening immediate rule of the Turks, they produced no serious literature. But when the Austrian wars of the 17th century began to roll back the Turkish power, and Hungary recovered its freedom, the Servians living in that country rapidly acquired some culture, and their literature began to revive. During the 18th century, however, they did not write in the living language of the Servian people. After the disappearance of the Servian printing-presses in the 16th century, all liturgical books were brought from Russia and printed in the Russian-Slavonic language; while the teachers in the Servian schools were Russians. Russian-Slavonic thus became the literary language of the Orthodox Servians.

The more important works of the time were the *History of Montenegro*, by the Montenegrin bishop Basil Petrovitch (Moscow, 1754); the *Short Introduction into the History of the Origin of the Slaveno-Servian Nation*, by Paul Yulinats (Venice, 1765); and above all the *History of the Slavonic Nations, more especially of the Bulgarians, Croats and Servians*, by Archimandrite Yovan Raich (Vienna, 1794). During extensive travels in Russia and the Balkan countries Raich had collected a rich historical material and was able to write, for the first time in the annals of Servian literature, a work which has every claim to be considered as a real history. The Servians call him "the father of Servian history."

But Russian-Slavonic was not readily understood by the Servian reading public. It was not much better when through the influence of the living language it began to approach nearer to Servian than to Russian, and was called "Slavonic-Servian" (*Slaveno-Serbski*). The Servians had some authors in the 18th century, but it could hardly have been said that they had readers. All this suddenly changed when Dositey (Dositheus) Obradovich (1739–1811) appeared on the scene. In boyhood he had entered the monastery of Hoppovo in south Hungary and had become a monk. But as very soon he found that the monastery could not satisfy his aspirations, he left it and started to travel, acquiring a knowledge of classical and modern languages and literatures. An ardent Servian patriot, he proclaimed the principle that books ought to be written for the people and therefore in the language which the people understood and spoke. His first book, *The Life and the Adventures of Demeter Obradovich—a monk named Dositey* (Leipzig, 1783), was written in the language spoken in Servian towns. It immediately made a great impression, which was enhanced by the continuation of his autobiography (*Home Letters*) and especially by his *Fables of Aesop and of other Writers* (Leipzig, 1789). These books created a reading public among the Servians and mark the beginning of a really modern period of Servian literature. Obradovich, or rather "Dositey" as Servians call him, was so highly appreciated as an author, savant and patriot that in 1807 Karageorge invited him to Servia and appointed him a senator and minister of public education, in which capacity he established in Belgrade the first Servian college (*Velika Shkola*). Dositey was an admirer of England and English literature. While staying in London in 1783 he was much encouraged by the patronage and friendship of Dr William Fordyce, while his pupil, Paul Solarich, another distinguished author, was befriended by the Hon. Frederick North, afterwards 5th earl of Guildford, state secretary for public instruction in the Ionian Islands.

Only a few of his contemporaries followed the example which Dositey set in writing in the vernacular (although even he introduced from time to time purely Slavonic words and forms). It was believed that the vernacular could not be raised to the dignity of a literary language, and that literature and science needed words and expressions which were entirely lacking in the common language. But Vuk Stefanovich Karajich, a self-taught writer, proved the fallacy of that assumption. By his publication of the national songs and poems, which he carefully collected, he opened the eyes of Servian authors to the wealth and beauty of their own language, as spoken by the mass of the people and used by the national bards. Besides collecting national songs and poems, folk-lore, proverbs, &c., he wrote a grammar of the Servian language (Vienna, 1814) and the first Servian lexicon, with explanations in German and Latin (Vienna, 1818). His thorough knowledge of the Servian language led him to reform the Cyrillic alphabet, in which several letters were redundant and certain sounds of the spoken language were unrepresented. His efforts to make Servian writers adopt his reformed alphabet, and accept the language of the common people as a literary language, met with fierce opposition, especially on the part of the clergy and friends of the artificial Slaveno-Servian literary language. It was only after 1860 that his principles won a complete victory in all directions. (See KARAJICH.)

5. *Modern Servian Literature.*—The activity of Karajich brought new life to the Servian literature of the 19th century. The poets abandoned classical models and ceased to write in hexameters; they preferred to derive their inspiration from popular poetry, of which Karajich collected for them hundreds of examples. Writers in different departments of literature vied with each other to write in pure and correct Servian. And, although it could not be justly said that the Servians of the 19th century produced a really great work from the literary point of view, they certainly made progress and produced some remarkable poetry.

Their three greatest poets are Sima Milutinovich Sarayliya (1791–1847), Peter Petrovich Nyegosh (1813–1851), prince-bishop of Montenegro, and "Zmay" Yovan Yovanovich (1833–1904). Sarayliya's most important work is *Serbiyanka* (Leipzig, 1826), in which he describes the rising of the Servians against the Turks in 1804 and 1815. His imagination is lively, his descriptions graphic, but the impetuosity of his genius cannot find adequate words to express itself, and then he creates new words of which the meaning is not always clear. For this reason he never was really popular among the Servians. Nyegosh composed his first important poem, *Lucha Microcosma* or "The Light of the Microcosm" (Belgrade, 1847), under the influence of *Paradise Lost.* In the *Lucha* he describes how the spirit of man wished to solve the problem of human destiny. He was led by a protecting angel to the beginning of time when Satan, supported by an angel called Adam, was in full rebellion against God. But the co-rebel Adam repented and God then created the Earth and sent Adam to expiate his sin by living amidst difficulties and sufferings on that planet. In *Gorski Viyenats*, "The Mountain Wreath" (Vienna, 1847), Nyegosh describes the liberation of Montenegro from the Turks towards the end of the 17th century in the form of a drama. There is, however, hardly anything dramatic in the poem, but the characters deliver magnificent descriptions of Montenegro and Montenegrins, and the play is full of noble sentiments and great thoughts. The Servians consider *Gorski Viyenats* the finest poetical work in their literature. It has been translated into all the principal European languages except English. Dr Yovan Yovanovich, called by his admiring countrymen *Zmay* (the Dragon) on account of the high flight of his poetry and his ardent patriotism, began his poetical career by producing melodious translations of some of the best poems of other nations (the Hungarian Arany's *Toldi János*, Petöfi's *János Vitéz*, Lermontov's *Demon*, Tennyson's "Enoch Arden," Bodenstedt's *Mirza-Shaffy*, Goethe's *Iphigenie*, &c.). His own lyrical and satirical poems are without a rival in Servian literature. In his later years he gave much of his time and talent to the interests of children, editing papers for boys and dedicating hundreds of his finest songs to children. There are several editions of his collected poems; one of the best is that of the Servian Literary Association (Belgrade, 1896).

Among the other prominent Servian poets of the 19th century may be mentioned Dr Milosh Svetich (1799–1869), Branko Radichevich (1824–1853), Gyura Yakshich (1832–1878), Yovan Subotich (1817–1886), Dr Laza Kostich (b. 1841), Aberdar (1842–1893), Voislav Ilich (1862–1894), Prince Nicholas of Montenegro (b. 1841).

The Servians have as yet no great novelist, but they have several very successful writers of short stories. Among these the first place belongs to Dr Laza Lazarevich. After him the most popular authors of short stories are: Stefan Sremats, whose mild satire and sparkling humour earned for him the name of the "Servian Dickens"; Yanko Veselinovich, author of some delightful sketches from the life of Servian peasants; Sima Matavuly, whose stories give a true picture of the Servians of Dalmatia and of Montenegro. Delightful stories of old times and of the Adriatic coast were written by Stefan Mitrov Lyubisha (1824–1878).

In dramatic literature the Servians are comparatively rich. The poet Dr Laza Kostich made excellent translations from Shakespeare (*King Lear*, *Romeo and Juliet*, *King Richard III.*), and gave the Servian stage two of its best tragedies: *Maxim Tsrnoyevich* and *Petar Segedinats*; also the comedy *Gordana*. Matiya Ban's *Meyrimah* is considered the best tragedy in the Serbo-Croatian language. The patriotic drama *Balkanska Tsaritsa*, by Prince Nicholas of Montenegro, has been often played and enthusiastically received by the public, but the critics deny to it much dramatic value. Milosh Tsvetich has given fine and lasting contributions to the Servian stage in his drama *Stefan Nemanya* and tragedy *Todor of Stalach*. Among the writers of comedy the first place must be assigned to Kosta Trifkovich (d. 1875); Milovan Glishich (d. 1908) was also very popular; and Branislav Nushich was the most successful of Servian dramatists early in the 20th century.

In modern scientific literature the principal Servian names are those of the electrician Nicholas Tesla, the botanist Dr Josif Panchich, and the geologists Dr Yovan Zhuyevich and Dr Yovan Tsviyich (Cvijić). In philology a very high place is occupied by Gyuro Danichich, once professor of philology at the high school in Belgrade and secretary to the South Slavonic Academy at Agram, where he was for years the principal editor of the great lexicon of the Servian or Croatian language. He had a very distinguished pupil in Stoyan Novakovich, who wrote numerous studies on philological subjects, and whose Servian grammar is still the standard book in all Servian schools. In historical literature we find besides Yovan Raich, mentioned earlier, Panta Sretykovich, with his *History of the Servian Nation*; Stoyan Boshkovich (d. 1908), with his *Servia under Tsar Dushan*; Stoyan Novakovich, with his numerous essays on subjects from the medieval history of Servia, his *History of Servian Literature*, his *Resurrection of the Servian National State* and *Rising against the Dahis* (the two last-named books appeared in Belgrade in 1904); Lyubomir Kovachevich and Lyuba Yovanovich, who together wrote a standard work on the history of the Servian nation; Chedo Mijatovich, with his monographs on Gyuragy Brankovich and the conquest of Constantinople by the Turks.

Bibliography.—The best works on the Servian language and literature are those already mentioned as written by Servian authors: Karajich, Danichich, Stoyan Novakovich, &c. See also on the language Dr F. Miklosich's *Vergleichende Lautlehre der slav. Sprachen*; Section II.: *Serbisch und Chorvatisch* (Vienna, 1879), and his *Wortbildungslehre der slav. Sprachen* (Vienna, 1876); W. Vondrak *Vergleichende slavische Grammatik* (Göttingen, 1906 and 1908); J. Florinsky, *Lektsi po slavyankomu yazykoznaniye* (Kiev, 1895). Good text-books are P. Budmani, *Grammatica della lingua serbo-croata* (Vienna, 1867); Parchich, *Grammaire de la langue serbo-croate* (Paris, 1877); Fr. Vymezal, *Serbische Grammatik* (Brünn, 1882). For the literature see A. N. Pypin and V. D. Spassovich, *History of Slavonic Literatures* (in Russ., St Petersburg, 1879, in French, Paris, 1881), and Dr Mathias Murko, *Die Kultur osteuropäischer Literaturen und die slavischen Sprachen* (Berlin and Leipzig, 1908). (C. Mi.)

SERVICE TREE, *Pyrus domestica*, a native of the Mediterranean region, not infrequently planted in southern Europe for its fruit. It has been regarded as a native of England on the evidence of a single specimen, which has probably been planted, now existing in the forest of Wyre. Though not much cultivated its fruit is esteemed by some persons, and therefore two or three trees may very well be provided with a place in the orchard, or in a sheltered corner of the lawn. The tree is seldom productive till it has arrived at a goodly size and age. The fruit has a peculiar acid flavour, and, like the medlar, is fit for use only when thoroughly mellowed by being kept till it has become bletted. There is a pear-shaped variety, *pyriformis*, and also an apple-shaped variety, *maliformis*, both of which may be propagated by layers, and still better by grafting on seedling plants of their own kind. The fruit is sometimes brought to market in winter. The service is nearly allied to the mountain ash, *Pyrus Aucuparia*, which it resembles in having regularly primate leaves. *P. torminalis* is the wild service, a small tree occurring locally in woods and hedges from Lancashire southwards; the fruit is sold in country markets. These, with other species, including *P. Aria*, white beam, so-called from the leaves which are white and flocculent beneath, form the subgenus *Sorbus*, which was regarded by Linnaeus as a distinct genus.

SERVIEN, ABEL, marquis de Sablé and ~~de~~ Boisdauphin, comte de la Roche-Servien (1593–1659), French diplomat, was born at Grenoble, the son of Antoine Servien, procurator-general of the estates of Dauphiné. He succeeded his father in that office in 1616, and in the following year attended the assembly of notables at Rouen. In 1618 he was named councillor of state and in 1624 was called to Paris, where he found favour with Richelieu. He displayed administrative ability and great loyalty to the central government as intendant in Guienne in 1627, and in 1628 negotiated the boundary delimitation with Spain. Appointed president of the parlement of Bordeaux in 1630, he soon resigned to accept an embassy to Italy, where he was one of the signatories of the treaty of Cherasco and of the treaties with the duke of Savoy (1631–1632). In 1634 he was admitted to the French Academy. Two years later he retired from public life as the result of court intrigue. Servien lived at Angers or on his estates at Sablé until the death of Louis XIII., when Mazarin entrusted him with the conduct, conjointly with the comte d'Avaux, of French diplomatic affairs in Germany. After five years' negotiations, and a bitter quarrel with the comte d'Avaux, which ended in the latter's recall, Servien signed the two treaties of the 24th of October 1648 which were part of the general peace of Westphalia. He received the title of minister of state on his return to France in April 1649, remained loyal to Mazarin during the Fronde, and was made superintendent of finances in 1653. He was an adviser to Mazarin in the negotiations which terminated in the treaty of the Pyrenees (1659). He amassed a considerable fortune, and was unpopular, even in court circles. He died at the château of Meudon on the 17th of February 1659.

Servien left an important and voluminous correspondence. See R. Kerviler, *A. Servien, étude sur sa vie politique et littéraire*, (Mamers, 1879).

SERVITES, or "Servants of Mary," an order under the Rule of St Augustine, founded in 1233. In this year seven merchants of Florence, recently canonized as "the seven holy Founders," gave up their wealth and position, and with the bishop's sanction established themselves as a religious community on Monte Senario near Florence. They lived an austere life of penance and prayer, and being joined by others, they were in 1240 formed into an order following the Augustinian rule supplemented by constitutions borrowed from the Dominicans. Soon they were able to establish houses in various parts of Italy, where within twenty-five years four provinces were formed; they also at an early date founded many houses in France, Germany and Spain, but they never came to England before the Reformation. The most illustrious member of the order and its chief propagator and organizer was St Filippo Benizi, the fifth general, who died in 1285. The order received papal approbation in 1255; in 1424 it was recognized as a Mendicant order, and in 1567 it was ranked with the four great orders of Mendicant friars. The Servites undertook missions in Tartary, India and Japan. As in the other orders there were various mitigations and relaxations of the rule, producing a variety of reforms, the chief being that of the eremitical Servites. There are at the present day 64 Servites houses, mostly in Italy; there are two or three in England and in America.

There are Servite nuns and also tertiaries, founded by St Juliana Falconieri, 1305, who are widespread and devote themselves chiefly to primary education. They have several convents in England. The habit of the Servites is black.

The chief work on the Servites is the *Monumenta* by Morini and Soulier, 1897, &c. See Helyot, *Histoire des ordres religieux* (1715), iii. cc. 39-41; Max Heimbucher *Orden u. Kongregationen* (1907), ii. § 73; Wetzer u. Welte, *Kirchenlexicon* (2nd ed.); Herzog-Hauck *Realencyklopädie* (3rd ed.). The most interesting part of Servite history is told by P. Soulier, *Vie de S. Philippe Benizi* (1886). (E. C. B.)

SERVITUDE (Lat. *servitus*, from *servire*, to serve), a right over the property of another. In Roman law, servitudes were classified into (1) personal, *i.e.* those given to a particular person, and (2) praedial, *i.e.* those enjoyed over something else (*praedium serviens*) by being owner or tenant of a piece of land or a house (*praedium dominans*). Personal servitudes were subdivided into (*a*) *usus*, the right of using property; (*b*) *usufructus* the right of using and enjoying the fruits of property; and (*c*) and (*d*) *operas servorum sive animalium.* Praedial servitudes were either (*a*) *rustic*, such as *jus eundi*, the right of walking or riding along the footpath of another; *aquae ductus*, the right of passage for water; *pascendi*, the right of pasture, &c ; or (*b*) *urban*. Urban servitudes were of various kinds, as *oneris ferendi*, the right of using the wall of another to support a man's own wall; *projiciendi*, the right of building a structure, such as a balcony or verandah, so as to project over another's land; *stillicidii*, *fumi immittendi* and several others. Servitudes were created by a disposition *inter vivos*, or by contract; by testamentary disposition; by the conveyance of land or by prescription They might be extinguished by destruction of either the res serviens or the res dominans; by release of the right, or by the vesting of the ownership of the res serviens and res dominans in the same person.

In English law there may be certain limited rights over the land of another, corresponding somewhat to servitudes, and termed easements (*q.v.*). In Scots law the term is still in use (see EASEMENT).

SERVIUS HONORATUS, MAURUS (or MARIUS), Roman grammarian and commentator on Virgil, flourished at the end of the 4th century A.D. He is one of the interlocutors in the *Saturnalia* of Macrobius, and allusions in that work and a letter from Symmachus to Servius show that he was a pagan. He was one of the most favourable examples of the Roman "grammatici" and the most learned man of his time. He is chiefly known for his commentary on Virgil, which has come down to us in two distinct forms. The first is a comparatively short commentary, definitely attributed to Servius in the superscription in the MSS. and by other evidence. A second class of MSS. (all going back to the 10th or 11th century) presents a much expanded commentary, in which the first is embedded; but these MSS. differ very much in the amount and character of the additions they make to the original, and none of them bears the name of Servius. The added matter is undoubtedly ancient, dating from a time but little removed from that of Servius, and is founded to a large extent on historical and antiquarian literature which is now lost. The writer is anonymous and probably a Christian. A third class of MSS., written for the most part in Italy and of late date, repeats the text of the first class, with numerous interpolated scholia of quite recent origin and little or no value. The real Servian commentary practically gives the only complete extant edition of a classic author written before the destruction of the empire. It is constructed very much on the principle of a modern edition, and is partly founded on the extensive Virgilian literature of preceding times, much of which is known only from the fragments and facts preserved in the commentary. The notices of Virgil's text, though seldom or never authoritative in face of the existing MSS., which go back to, or even beyond, the times of Servius, yet supply valuable information concerning the ancient recensions and textual criticism of Virgil. In the grammatical interpretation of his author's language, Servius does not rise above the stiff and overwrought subtleties of his time; while his etymologies, as is natural, violate every law of sound and sense. As a literary critic the shortcomings of Servius, judged by a modern standard, are great, but he shines in comparison with his contemporaries. In particular, he deserves credit for setting his face against the prevalent allegorical methods of exposition. But the abiding value of his work lies in his preservation of facts in Roman history, religion, antiquities and language, which but for him might have perished. Not a little of the laborious erudition of Varro and other ancient scholars has survived in his pages. Besides the Virgilian commentary, other works of Servius are extant: a collection of notes on the grammar (*Ars*) of Aelius Donatus; a treatise on metrical endings (*De finalibus*); and a tract on the different metres (*De centum metris*).

Editions of the Virgilian commentary by G. Fabricius (1551); P. Daniel, who first published the enlarged commentary (1600); and G. Thilo and H. Hagen (1878–1902). The *Essai sur Servius* by E. Thomas (1880) is an elaborate and valuable examination of all matters connected with Servius; many points are treated also by O. Ribbeck in his *Prolegomena* to Virgil; see also a review of Thilo's edition by H. Nettleship in *Journal of Philology*, x. (1882). The smaller works of Servius are printed in H. Keil's *Grammatici Latini*, iv.

SERVIUS TULLIUS, sixth legendary king of Rome (578–534 B.C.). According to one account he was the son of the household genius (Lar) and a slave named Ocrisia, of the household of Tarquinius Priscus. He married a daughter of Tarquinius and succeeded to the throne by the contrivance of his mother-in-law, Tanaquil, who was skilled in divination and foresaw his greatness. Another legend, alluded to in a speech by the emperor Claudius (fragments of which were discovered on a bronze tablet dug up at Lyons in 1524), represented him as an Etruscan soldier of fortune named Mastarna, who attached himself to Caeles Vibenna (Caelius Vivenna), the founder of an Etruscan city on the Caelian Hill (see also Tacitus, *Annals*, iv. 65). An important event of his reign was the conclusion of an alliance with the Latins, whereby Rome and the cities of Latium became members of one great league, whose common sanctuary was the temple of Diana on the Aventine. His reign of forty-four years was brought to a close by a conspiracy headed by his son-in-law, Tarquinius Superbus.

The legend of Servius presents certain similarities to that of the founder of Rome. His miraculous birth, commemorated by Servius himself in the festival established by him in honour of the Lares, recalls that of Romulus. Again, as Romulus was the author of the patrician groundwork of the constitution, so Servius was regarded as the originator of a new classification of the people, which laid the foundation of the gradual political enfranchisement of the plebeians (for the constitutional alterations with which his name is associated, see ROME: *Ancient History*; for the Servian Wall see ROME: *Archaeology*). His supposed Latin descent is contradicted by the Etruscan tradition alluded to above (on which see V. Gardthausen, *Mastarna oder Servius Tullius*, 1882), and his insertion among the kings of Rome is due to the need of providing an initiator of subsequent republican institutions. The treaty with the Latins is mentioned by Dionysius of Halicarnassus alone, who had not seen it himself; indeed, it is doubtful whether it was then in existence, and in any case, considering the changes which the language had undergone, it would have been unintelligible. It is also suspicious that no list of the members of the league is given, contrary to the usual custom.

For a critical examination of the story see Schwegler, *Römische Geschichte*, bks. xvi., xvii.; Sir G. Cornewall Lewis, *Credibility of early Roman History*, ch. xi.; W. Ihne, *History of Rome*, i.; E. Pais, *Storia di Roma*, i. (1898); and *Ancient Legends of Roman History* (Eng. trans., 1906), where he comes to the conclusion that "instead of being the sixth *rex* of Rome, he was originally the *rex servus*, the priest of the cult of Diana Aricina transferred to the Aventine, the priest of the protecting goddess of fugitive slaves"; C. Pascal, *Fatti e legende di Roma antica* (Florence, 1903); also O. Gilbert, *Geschichte und Topographie der Stadt Rom im Altertum* (1883–1885), and J. B. Carter, *The Religion of Numa* (1906), on the reorganization of Servius.

SERVO-BULGARIAN WAR (1885). The Berlin Congress of 1878, by its revision of the treaty of San Stefano, created two states in the Balkan Peninsula—the principality of Bulgaria owning a nominal suzerainty to Turkey, and the autonomous province of eastern Rumelia, presided over by a Turkish governor-general, and apparently intended to remain in close relations with the porte. This settlement came to an end when the movement in favour of a united Bulgaria culminated (September 1885) in a revolution in the Rumelian capital. Prince Alexander of Bulgaria, recognizing that the movement was irresistible and that, unless directed by authority, it might degenerate into anarchy and civil war, placed himself at its head, and, proceeding to Philippopolis, formally accepted the government of the united Bulgarian states. As it was assumed that the sultan would reassert his claim by force of arms, the Bulgaro-Rumelian forces were concentrated as rapidly as possible near the Turkish frontier. Prince Alexander, however, had taken the step of acknowledging the sultan's suzerainty; and Turkey was not inclined to begin a war which would probably cause a revolt in Macedonia and might end by rendering Russian influence paramount in Bulgaria. But, while a conference of ambassadors was vainly discussing the situation at Constantinople, the Gordian knot was cut by the announcement that

Servia, seeking compensation for the aggrandizement of Bulgaria, had constituted herself the champion of the treaty of Berlin.

King Milan had issued orders for the Servian army mobilization on the very day of Prince Alexander's proclamation at Philippopolis, and large forces were concentrated (October 1st–12th) on the Bulgarian frontier. On the 19th the prince ordered troops to the quarter thus threatened, but it seems certain that, whilst in eastern Rumelia every preparation had been made for war, Prince Alexander had so little expectation of, and wish for, a war with Servia, that few measures were taken to supply the needs of a field army on that side, though fortifications were begun at several places, notably at Sofia and Slivnitza, towards the end of October.

Unlike the Servian army, which contained few permanent units and consisted mainly of militiamen, the standing army of Bulgaria, trained and commanded by Russian officers since 1877–1878, was organized on the German system of filling up relatively strong *cadres* to war strength and forming additional units. When fully mobilized the field army numbered about 55,000 men. The Rumelian forces (militia) consisted in all of about 35,000 men. Besides these forces was the "Bandit brigade" of Captain Panitza, an irregular force some 3000 strong, composed of Macedonians, Turks, Jews and other miscellaneous volunteers. This force did good service as a flying right wing of the main army. In the Bulgarian army the whole of the staff and superior officers, as well as about half the regimental captains, were Russians. When the mobilization of the Bulgarian and Rumelian forces was decreed by the prince, the whole of the Russian officers were at once withdrawn, and the heavy task of creating a staff and selecting young officers for all the superior commands had to be undertaken in front of the enemy. Moreover, when on the 14th of November Milan finally declared war, the Bulgarian forces were mostly far away beyond the Balkans on the Turkish frontier. The Servian main army (under King Milan), and the army of the Timok promptly crossed the frontier and soon came in contact with small forces of the enemy. On the Timok little or nothing of importance took place throughout the war, as the forces opposing the army of the Timok near Vidin effectually neutralized that force. In front of Dragoman and Trn the Bulgarians fell back, engaging in stubborn rearguard combats at every favourable place. The Servian "Army of the Nishava" advanced but slowly and with hesitation, while the most strenuous exertions were made by Prince Alexander and his newly-formed staff to collect their far-distant troops in the Slivnitza position. Every commander was given the simple order to march on Slivnitza. The civilian population was warned to be ready with supplies to meet the troops by the roadside, and under these peculiar conditions, and extraordinary difficulties of country and weather, the Bulgarians marched on the decisive point at the highest possible speed of man and horse. Some remarkable marches are recorded: the 8th infantry, 4500 strong, covered 59 m. in thirty-two hours, leaving only sixty-two men behind; the 3rd and part of another Rumelian battalion reached Sofia so exhausted that they were sent to the front on horseback, two men to each horse; the troops that were sent up by rail were packed in open trucks, sixty men to a truck. The furious energy displayed had its reward on the field of battle. Before the last shot of the battle of Slivnitza was fired, nearly half of the entire forces of Bulgaria and Rumelia were in the lines, and 14,000 men more faced the army of the Timok at Widdin. With the main army—a striking display of what could be accomplished by patriotism and vigour—were fifty-six pieces of artillery, most of which had been dragged over the Balkan passes in mid-winter.

The position of Slivnitza, barring the high road between Nish and Sofia, had been extensively fortified, but when the Servians opened their attack on the 17th of November, there were but few troops available to occupy the works. On the right of the Bulgarian line was the Meka Krud height, occupied by some battalions under Captain Benderev; here fighting went on through the short winter day, which ended with a gallant, and for the time successful, counter-attack by six Bulgarian battalions led by Benderev. The prince, not yet ready for the offensive, withdrew these troops to their original position. In the centre, near the high road, a hot and, at one moment of the day, almost successful attack of the Servians ended with their complete repulse. The latter had had 17,000 men against the Bulgarians' 11,000; yet they had, owing mainly to faults in the superior leading, been unsuccessful. Next day their chances of victory would be even less, for the defenders were hourly reinforced from Sofia, and on the 18th were actually somewhat superior in numbers. On this day the Servians made a very heavy attack on the Bulgarian left wing, which was eventually repulsed, though not without great difficulty, by the newly arrived troops from Sofia. Later a half-hearted attack was made on the centre, and from his position on Meka Krud Benderev again attacked the Servian "Danube" division. On this day a Servian division pushed the Bulgarians out of Breznik, but made no farther advance either on Sofia or on the left flank of the Bulgarians at Slivnitza, in spite of orders to do so. On the 19th alarm and consternation at Sofia, caused by the presence of hostile forces at Breznik, were so great that Alexander left the command in the hands of his chief of staff, Major Guchev, and hurried back to the capital in order to organize the defence. The Servian leader was, however, as inactive on the 19th as on the 18th, and when he at last moved forward towards Slivnitza it was only with a portion of his force; this was driven back, by a detachment from the left wing of the Bulgarian position, to Rakita. Meanwhile, the active Benderev had reopened his attack on the Danube division. Twice he was repulsed, but finally at about 3 P.M. his battalions carried the heights held by the Servians. A little before this the Bulgarian centre likewise moved forward, and, though a final attack of the Servians on the gap caused by the absence of the Bulgarian troops detached towards Breznik came near to success, the prince returned to the battlefield to find his troops everywhere victorious and driving the enemy before them. Two days later, reorganized and reinforced, the Bulgarians took the offensive and carried the Dragoman pass.

On the 25th Prince Alexander received at Tzaribrod proposals for an armistice from King Milan; these were not accepted, and the Bulgarian army, crossing the frontier, advanced in several columns upon Pirot, where the army of the Nishava took up a defensive position in the town and on the surrounding heights. A two-days' engagement followed (26th and 27th of November). On the 26th the Bulgarians were successful, but a heavy counter attack on the following day almost snatched the victory out of their hands, and it was only after a severe contest lasting eleven hours that the Servians finally gave way. The Bulgarians were not permitted to reap the fruits of their success. As they were preparing to pursue the defeated and now greatly demoralized enemy on the 28th, the Austrian minister at Belgrade arrived at headquarters and hostilities ceased. The intervention of Austria saved the Servian army, which was greatly demoralized, and was now threatened by the united Bulgarian force of nearly 55,000 men. On the same day the army of the Timok was repulsed with heavy loss in an attack on Vidin.

Servia escaped almost unpunished from her war of aggression. The young Bulgarian army, with its improvised staff and newly-appointed field officers, displayed admirable marching power and fighting qualities, and the Rumelian militiamen proved themselves to be good soldiers. The Servians had, however, fought with great bravery also, and the victory must be ascribed in the main to the personal influence, the strenuous exertions and the sound military judgment of Prince Alexander; and the brief but decisive campaign set the seal to Bulgarian unity.

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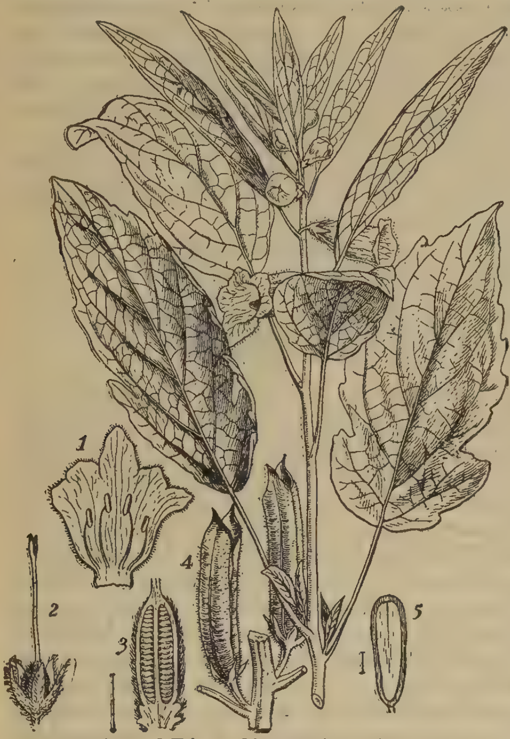
SESAME, the most important plant of the genus *Sesamum* (nat. ord. Pedalineae), is that which is used throughout India and other tropical countries for the sake of the oil expressed from its seeds. *S. indicum* is a herb 2 to 4 ft. high, with the lower leaves on long stalks, broad, coarsely toothed or lobed. The upper leaves are lanceolate, and bear in their axils curved, tubular, two-lipped flowers, each about ¾ in. long, and pinkish or yellowish in colour. The four stamens are of unequal length, with a trace of a fifth stamen, and the two-celled ovary ripens into a two-valved pod with numerous seeds. The plant has been cultivated in the tropics from time immemorial, and is supposed on philological grounds to have been disseminated from the islands of the Indian Archipelago, but at present it is not known with certainty in a wild state. The plant varies in the colour of the flower, and especially in that of the seeds, which range from light yellow or whitish to black. Sesame oil, otherwise known as gingelly or til (not to be confounded with that derived from *Guizotia oleifera*, known under the same vernacular name), is very largely used for the same purposes as olive oil, and, although less widely known by name, is commercially a much more important oil. The oil is included in the Indian and Colonial Addendum (1900) to the British Pharmacopeia. The seeds and leaves also are used by the natives as demulcents and for other medicinal purposes. The soot obtained in burning the oil is said to constitute one of the ingredients in India or Chinese ink. The plant might be cultivated with advantage in almost all the tropical and semi-tropical colonies of Britain, but will not succeed in any part of Europe.



From Bentley and Trimen, *Medicinal Plants*, by permission of J. & A. Churchill.

Sesame (*Sesamum indicum*).

1, Corolla cut open with stamens.
2, Flower after removal of corolla.
3, Ovary cut lengthwise.
4, Fruit.
5, Seed cut lengthwise. 3 and 5 enlarged.

A detailed account of its history and the cultivation of the plant in India is given by Sir G. Watt, *Dictionary of Economic Products of India* (1893).

SESOSTRIS, the name of a legendary king of Egypt. According to Herodotus, Diodorus Siculus (who calls him Sesoosis) and Strabo, he conquered the whole world, even Scythia and Ethiopia, divided Egypt into administrative districts or nomes, was a great law-giver, and introduced a system of caste and the worship of Serapis. He has been considered a compound of Seti I. and Rameses II., belonging to the XIXth Dynasty. In Manetho, however, he occupied the place of the second Senwosri (formerly read Usertesen) of the XIIth Dynasty, and his name is now usually viewed as a corruption of Senwosri. So far as is known no Egyptian king penetrated a day's journey beyond the Euphrates or into Asia Minor, or touched the continent of Europe. The kings of the XVIIIth and XIXth dynasties were the greatest conquerors that Egypt ever produced, and their records are clear on this point. Senwosri III. raided south Palestine and Ethiopia, and at Semna beyond the second cataract set up a stela of conquest that in its expressions recalls the stelae of Sesostris in Herodotus: Sesostris may, therefore, be the highly magnified portrait of this Pharaoh. Khian, the powerful but obscure Hyksos king of Egypt, whose prenomen might be pronounced Sweserenrē, is perhaps a possible prototype, for objects inscribed with his name have been found from Bagdad to Cnossus. Sesostris is evidently a mythical figure calculated to satisfy the pride of the Egyptians in their ancient achievements, after they had come into contact with the great conquerors of Assyria and Persia. When we recollect that the Ethiopian Tearchus (Tirhaka) of the 7th century B.C., who was hopelessly worsted by the Assyrians and scarcely ventured outside the Nile valley, was credited by Megasthenes (4th century) and Strabo with having extended his conquests as far as India and the pillars of Hercules, it is not surprising if the dim figures of antiquity were magnified to a less degree. In the case of Tearchus, the miscellaneous levies which he employed himself and those which composed the Egyptian and Assyrian armies opposed to him, and the lands that Egypt and Ethiopia traded with, must all have been counted, partly through misunderstanding, partly through wilful perversion, to his empire.

Herodotus ii. 102-111; Diod. Sic. i. 53-59; Strabo xv. p. 687; see also article EGYPT; and Kurt Sethe, "Sesostris," 1900, in his *Unters. z. Gesch. u. Altertumskunde Ägyptens*, tome ii. (F. LL. G.)

SESSA AURUNCA, a town and episcopal see of Campania, Italy, in the province of Caserta, on the S.W. slope of the extinct volcano of Rocca Monfina, 27 m. by rail W.N.W. of Caserta and 20½ m. E. of Formia by the branch railway to Sparanise, 666 ft. above sea-level. Pop. 5945 (town), 22,077 (commune). It is situated on the site of the ancient Suessa Aurunca, on a small affluent of the Liri. The hill on which Sessa lies is a mass of volcanic tufa. The town contains many ancient remains, notably the ruins of an ancient bridge in brickwork of twenty-one arches, of substructures in *opus reticulatum* under the church of S. Benedetto, of a building in *opus quadratum*, supposed to have been a public portico, under the monastery of S. Giovanni, and of an amphitheatre. The Romanesque cathedral is a basilica with a vaulted portico and a nave and two aisles begun in 1103, a mosaic pavement in the Cosmatesque style, a good ambo resting on columns and decorated with mosaics showing traces of Moorish influence, a Paschal candelabrum, and an organ gallery of similar style. The portal has curious sculptures with scenes from the life of SS. Peter and Paul. In the principal streets are memorial stones with inscriptions in honour of Charles V., surmounted by an old crucifix with a mosaic cross. The hills of Sessa are celebrated for their wine.

The ancient chief town of the Aurunci, Aurunca or Ausona, is believed to have lain over 2000 ft. above the level of the sea, on the narrow south-western edge of the extinct crater of Rocca Monfina. Here some remains of Cyclopean masonry exist; but the area enclosed, about 100 yds. by 50, is too small for anything but a detached fort. It dates, doubtless, from a time prior to Roman supremacy. In 337 B.C. the town was abandoned, under the pressure of the Sidicini, in favour of the site of the modern Sessa. The new town kept the old name until 313, when a Latin colony under the name Suessa Aurunca was founded here. It was among the towns that had the right of coinage, and it manufactured carts, baskets, &c. Cicero speaks of it as a place of some importance. The triumviri settled some of their veterans here, whence it appears as Colonia Julia Felix Classica Suessa. From inscriptions it appears that Matidia the younger, sister-in-law of Hadrian, had property in the district. It was not on a highroad, but on a branch between the Via Appia at Minturnae and the Via Latina at Teanum; the pavement of the road between the latter place and Suessa is in places well preserved, especially near Teano, and so is that of a road ascending from Suessa northward towards the crater mentioned.

See A. Avena, *Monumenti dell' Italia Meridionale* (Naples, 1902), i. 181 sqq. (T. As.)

SESSION (through Fr. from Lat. *sessio*, *sedere*, to sit), the act of sitting or the state of being seated, more generally the sitting together or assembly of a body, judicial, legislative, &c., for the transaction of its business, and also the time during which the body sits until its adjournment or dispersion. A session of parliament is reckoned from its assembling till prorogation; usually there is one session in each year. In particular the term is applied to the sittings of various judicial courts, especially criminal, such as the sessions of the Central Criminal Court in London. The sittings of the justices of the peace or magistrates in the United Kingdom are " sessions of the peace " for the transaction of the judicial business committed to them by statute or by their commission. These are either " petty sessions," courts of summary jurisdiction held by two or more justices of the peace or by a stipendiary or metropolitan police magistrate under statute for the trial of such cases as are not of sufficient importance to be tried before quarter-sessions, or for a preliminary inquiry into indictable offences (see JUSTICE OF THE PEACE and SUMMARY JURISDICTION). The " special sessions " of the justices are held for licensing purposes, styled " Brewster sessions," or for carrying out the provisions of the Highway Acts, &c. The only sessions which are " general sessions " of the peace are now " quarter-sessions " (*q.v.*). The supreme court of Scotland is termed the " Court of Session " (see SCOTLAND), and the name is given in the Presbyterian church to the lowest ecclesiastical court, composed of the elders of the church presided over by the minister. In the Established Church of Scotland this is usually styled the " Kirk-session."

SESTETT, the name given to the second division of a sonnet, which must consist of an octave, of eight lines, succeeded by a sestett, of six lines. In the usual course the rhymes are arranged *abc* | *abc*, but this is not necessary. Early Italian sonnets, and in particular those of Dante, often close with the rhyme-arrangement *abc* | *cba*; but in languages where the sonority of syllables is not so great as it is in Italian, it is dangerous to leave a period of five lines between one rhyme and another. In the quatorzain, there is properly speaking no sestett, but a quatrain followed by a couplet, as in the case of Shakespeare's so-called " Sonnets." Another form of sestett has only two rhymes, *ab* | *ab* | *ab*; as is the case in Gray's famous sonnet " On the Death of Richard West." The sestett should mark the turn of emotion in the sonnet; as a rule it may be said that the octave having been more or less objective, in the sestett reflection should make its appearance, with a tendency to the subjective manner. For example, in Matthew Arnold's ingenious " The Better Part," the rough inquirer, who has had his own way in the octave, is replied to as soon as the sestett commences:—

" So answerest thou ? But why not rather say:
' Hath Man no second life ? *Pitch this one high.*
More strictly, then, the inward judge obey !
Was Christ a man like us ? Ah ! let us try
If we, then, too, can be such men as he ! ' "

Wordsworth and Milton are both remarkable for the dignity with which they conduct the downward wave of the sestett in their sonnet. The French sonneteers of the 16th century, with Ronsard at their head, preferred the softer sound of the arrangement *aab* | *ccb* |. The German poets have usually wavered between the English and the Italian forms.

SESTINA, one of the most elaborate forms of verse employed by the medieval poets of Provence and Italy, and retained in occasional use by the modern poets of Western Europe. The scheme on which the sestina is built was the invention of the great troubadour, Arnaut Daniel (d. 1199), who wrote many sestinas in the *lingua di sì*. Dante, a little later, wrote sestinas in Italian, and of these the most famous is that beginning " Al poco giorno ed al gran cerchio d' ombra." In the *De vulgari Eloquio*, Dante admits that he copied the structure of his sestinas from Arnaut Daniel; " et nos eum secuti sumus," he says, after praising the work of the Provençal poet. The sestina, in its pure medieval form, is independent of rhyme; it consists of six stanzas of six lines each of blank verse. This recurrence of the number six gives its name to the poem. The final words of the first stanza appear in inverted order in all the others, the order as laid down by the Provençals being as follows:—*abcdef*, *faebdc*, *cfdabe*, *ecbfad*, *deacfb*, *bdfeca*. To these six stanzas followed a *tornada*, or *envoi*, of three lines, in which all the six key-words were repeated in the following order:— *b-e*, *d-c*, *f-a*. It has been supposed that there was some symbolic mystery involved in the rigid elaboration of this form, from which no slightest divergence was permitted, but if so this cryptic meaning has been lost. Petrarch cultivated a slightly modified sestina, but after the middle ages the form fell into disuse, until it was revived and adapted to the French language by the poets of the Pléiade, in particular by Pontus de Thyard. In the 19th century, the sestina or sextine was assiduously cultivated by the Comte de Gramont, who, between 1830 and 1848, wrote a large number of examples, included in his *Chant du passé* (1854). He followed the example of Petrarch rather than of the Provençal troubadours, by introducing two rhymes instead of the rigorous blank verse. A sestina by Gramont, beginning:—

" L'étang qui s'éclaircit au milieu des feuillages,
La mare avec ses joncs rubanant au soleil,
Ses flotilles de fleurs, ses insectes volages
Me charment. Longuement au creux de leurs rivages
J'erre, et les yeux remplis d'un mirage vermeil,
J'écoute l'eau qui rêve en son tiède sommeil,"

has been recommended to all who wish to " triumph over the innumerable and terrible difficulties " of the sestina, as a perfect model of the form in its " precise and classic purity." The earliest sestina in English was published in 1877 by Mr Gosse; this was composed according to the archaic form of Arnaut Daniel. Since that time it has been frequently employed by English and American writers, particularly by Swinburne, who has composed some beautiful sestinas on the rhymed French pattern; of these, that beginning " I saw my soul at rest upon a day " is perhaps the finest example of this poem existing in English. Mr Swinburne is, moreover, like Petrarch, the author of an astonishing *tour de force*, " The Complaint of Lisa," which is a double sestina of twelve verses of twelve lines each. The sestina was cultivated in Germany in the 17th century, particularly by Opitz and by Weckherlin. In the 19th century an attempt was made, not without success, to compose German sestinas in dialogue, while the double sestina itself is not unknown in German literature.

SESTRI LEVANTE (anc. *Segesta Tiguliorum*), a seaport of Liguria, Italy, in the province of Genoa, from which it is 28½ m. distant by rail, 33 ft. above sea-level. Pop. (1901) 3034 (town); 12,038 (commune). It is both a summer and a winter resort, with fine views. Part of the town is situated on a promontory (230 ft.) between two bays. The ancient town was the port of exportation of the slate of the district, for we hear of a place called Tigulia or Tegulata on the coast-road; but we know practically nothing of the political condition of the district in Roman times.

SESTRI PONENTE, a town of Liguria, Italy, in the province of Genoa, 4 m. W. of that town on the coast. Pop. (1901) 17,225. It has important shipbuilding yards and iron-works, with factories for macaroni, matches and tobacco, tanneries and saw-mills, and, in the vicinity, alasbaster quarries. A mile and a half west is Pegli, also a favourite seaside resort, with beautiful walks and fine villas, among which the Villa Pallavicina, with rare trees and fantastic buildings, fountains and grottoes, is noticeable.

SETH (שֵׁת according to Dillmann, " setting " or " slip "; Septuagint, Philo and New Testament, Σήθ, but 1 Chron. i. 1 Σής in A ; Josephus, Σῆθος, Vulg. *Seth*), in Gen. iv. 25, 26 (J) and v. 3-8 (P), the son of Adam. At the age of 105 he begat Enos; he lived in all 912 years. Seth was born after the murder of Abel, and in iv. 25 a popular etymology is given of his name—Adam's wife called his name Seth, " For God," saith she, " hath appointed, *shāth*, me another seed instead of Abel." It is further said that after Enos was born, men began to worship Yahweh. Apparently Gen. iv. 25, 26 had no original connexion with J.'s story of the creation, which speaks of Yahweh freely from the outset. As Enos is a Hebrew word for man, it is probably derived from a tradition in which Enos was the first man. An examination of the Sethite genealogy, vv. 12-27, *Kenan, Mahalalel, Jared, Enoch, Methuselah, Lamech*, shows that it is a slightly different version of the Cainite genealogy, iv. 17-18, *Cain* (Heb. *Kayin*), *Enoch, Irad, Mehujael, Methusael, Lamech*. Seth is named in the opening genealogy of Chronicles, 1 Chron. i. 1, and in Luke's genealogy of Christ, Luke iii. 38. The Hebrew text of Ecclesiasticus xlix. 16 has "And Shem and Seth and Enosh were visited,"—probably with divine favour; the Greek version runs, "Shem and Seth were glorified among men."

In Num. xxiv. 17, the Authorized Version has "the children of Sheth" in a list of nations; the Hebrew is the same as *Seth* in Genesis. The passage may perhaps indicate that Seth was originally the name of a tribe. The "Seth" of Numbers is sometimes identified with the Bedouin, who appear as *Sutu* in Assyrian and Babylonian inscriptions. But the Revised Version takes the word *shēth* as a common noun, "tumult," and others interpret it as "pride"; cf. Gray's *Numbers*, p. 371.

If the ten patriarchs of Gen. v. (see Noah) correspond to the ten primitive kings of Babylon, Seth, as second, will correspond with the Adapa of the Babylonian inscriptions, the Alaparos or Adaparos of Berosus. The two have been compared in that Adapa was demiurge and Logos; and Seth figures as the Messiah in later Jewish tradition.[1] We may also note the resemblance between the names Sheth, *Set*, the Egyptian god of war, and the Hittite deity *Suteh*. The latter has been supposed to be a Hyksos or Semitic deity and to have some connexion with Sheth; but Cheyne and Müller reject this view.[2] Seth is also identified with Moab or the land of Moab.[3]

A mass of Christian and Jewish tradition has gathered round the name of Seth. Philo, *De posteriori Caini*, § 3, explains the name as meaning ποτισμός, "watering" or "irrigation," connecting it with the Hebrew root *Sh Th H*. Josephus, *Ant.* I. ii. 3, tells us that Seth was a virtuous man, and that his descendants lived in perfect harmony and happiness. They discovered astronomy, and inscribed their discoveries on two pillars, one of which, says Josephus, survived in his time. In the *Book of Jubilees* (1st century A.D.) the name of Seth's wife is given as Azura. In the Ascension of Isaiah (1st century A.D.) Seth is seen in heaven. In the Book of Adam and Eve (A.D 500–900) Seth is described as perfectly beautiful, like Adam, only more beautiful. Seth was the last child born to Adam; he grew in stature and strength, and began to fast and pray strenuously. A Gnostic sect took the name Sethians. (W. H. Be.)

SETIA (mod. *Sezze*, 52 m. by rail S.E. of Rome), an ancient town of Latium (adjectum), Italy, on the south-west edge of the Volscian mountains, overlooking the Pomptine Marshes, 1047 ft. above sea-level, and over 900 ft. above the plain. It was an ancient Volscian town, a member of the Latin league of 499 B.C., which became a Latin colony in 382 B.C., and, owing to the strength of its position as a frontier fortress, is frequently mentioned in the military history of Rome up to the time of Sulla, by whom it was captured in 82 B.C. Under the empire it was well known for its wine, which Augustus preferred even to Falernian. Considerable remains of the city walls exist, built of large blocks of limestone in the polygonal style. This style may also be seen in several terrace walls belonging to a later date, as is indicated by the careful jointing and bossing of the blocks of which they are composed. Such intentional archaism is by no means uncommon in the neighbourhood of Rome. The modern town, occupying the ancient site, is an episcopal see, with a much-restored 13th-century Gothic cathedral. Pop. (1901) 6944 (town), 10,827 (commune). At the foot of the hill on which the town stands are considerable remains of Roman villas. (T. As.)

SET-OFF, in law, a statutory defence to the whole or to a portion of a plaintiff's claim. It had no existence under the English common law, being created by 2 Geo. II. c. 22 for the relief of insolvent debtors. Such a defence could be pleaded only in respect of mutual debts of a definite character, and did not apply to cases in which damages were claimed, nor to equitable claims or demands. By the rules of the Supreme Court (O. XIX. r. 3) a defendant in an action may set off or set up any right or claim by way of counterclaim against the claims of a plaintiff, and such set-off or counterclaim has the same effect as a statement of claim in a cross-action. (See Pleading.)

In architecture, the term set-off is given to the horizontal line shown where a wall is reduced in thickness, and consequently the part of the thicker portion appears projecting before the thinner. In plinths this is generally simply chamfered. In other parts of work the set-off is generally concealed by a projecting string. Where, as in parapets, the upper part projects before the lower, the break is generally hid by a corbel table. The portions of buttress caps which recede one behind another are also called sets-off.

SETON (*Family*). The Scottish family of Seton, Seyton or Seatoun, claims descent from a Dougall Seton who lived in the reign of Alexander I. Sir Richard Maitland of Lethington counted seven generations between this personage and Sir Christopher Seton (d. 1306), the first of the house who emerges in history with any distinctness, but these links are not all supported by documentary evidence. The name was derived from the Anglo-Norman family of Say, the Anglo-Norman immigrant being supposed to have given the name of Sey-toun to the lands granted to him in East Lothian. The family honours include the earldoms of Wintoun (cr. 1600) and Dunfermline; of Eglinton through marriage with the Montgomeries; and through alliance with a Gordon heiress a Seton became the ancestor of the earls and marquesses of Huntly and dukes of Gordon. The Setons were connected by marriage with the royal family of Scotland, and also with the Dunbars, Lindsays, Hays and Maitlands.

Sir Christopher Seton, son and heir of John de Seton, a Cumberland gentleman, and his wife Erminia Lascelles, was born probably in 1278, since his age is given in March 1299 as twenty-one, in an inquisition into the lands of his deceased father. He did homage for these in October of that year, and was in the service of Edward I. at Lochmaben in 1304. In 1305 he came into possession of lands which had been granted by Sir John Seton to Robert Bruce and his wife Christian, who was perhaps a Seton. He had married about 1301 Christian Bruce, sister of King Robert, who was possibly his second cousin. He was present at his brother-in-law's coronation at Scone in 1306, and saved his life at the battle of Methven later in the same year. According to Dugdale he shut himself up in Lochdoon Castle in Ayrshire, and on the surrender of that castle was hanged as a traitor at Dumfries by order of Edward I. He left no heirs. His widow was in March 1307 in receipt of three pence a day from Edward I. for her support at the monastery of Sixhill in Lincolnshire. She was afterwards placed in the custody of Sir Thomas de Gray. His Cumberland estates, with the exception of his mother's dower, were given to Robert de Clifford. Another Seton, John de Seton, described as having no lands or chattels, was hanged for helping in the defence of Tibbers Castle, and for aiding in the murder of John Comyn, with other prisoners of war, at Newcastle in August 1306.

Sir Alexander Seton (d. *c.* 1360) was probably the brother of Sir Christopher. He received considerable grants of land from King Robert Bruce, and was one of the signatories of the letter addressed by the Scottish nobles to the pope to assert the independence of Scotland. He was twice sent on embassies to England, and in 1333 he defended the town of Berwick against the English. He agreed with the English to surrender the town on a certain date unless he received relief before that time, giving his eldest surviving son Thomas as a hostage. On the refusal of the Scots to surrender at the expiry of the term Thomas Seton was hanged in sight of the garrison. This incident is related by Fordun and Boece, but with inconsistencies that have rendered it suspect. An elder son, Alexander, had perished in 1332 in opposing the landing of Edward Baliol; according to some authorities the third son, William, was hanged with his brother, but he is generally said to have been drowned during the siege; his daughter Margaret married Alan de Wintoun. The tragic death of young Thomas Seton was the subject of a ballad of "Seton's Sons," printed in Sheldon's *Minstrelsy of the Scottish Border*; of a tragedy, *The Siege of Berwick* (1794, printed 1882) by Edward Jerningham, and of another by James Miller (1824).

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[1] A. Jeremias, *Das A. T. im Lichte des alten Orients*, p. 118.

[2] *Encycl. Biblica*, "Seth," "Egypt."

[3] E. Meyer, *Die Israeliten und ihre Nachbarstämme*, p. 219.

Sir William Seton of Seton (fl. 1371–1393) is said to have been ennobled with the title of Lord Seton, and his heirs laid claim that the barony of Seton was the oldest in Scotland. By his wife Catherine Sinclair he had eight children. John succeeded him; Alexander married Elizabeth, daughter and heiress of Sir Adam de Gordon, by whom he became the ancestor of the Gordons of Huntly.

Sir John of Seton (d. *c.* 1441) was taken prisoner at Homildon Hill in 1402. He was hostage in England for the earl of Douglas in 1405, and again in 1423 for James I. He married Lady Janet Dunbar, daughter of the 10th earl of March. His son Sir William was killed at Verneuil, fighting on the French side, leaving as heir George (d. 1478), 1st Lord Seton, who was created a lord of parliament in 1448 as Lord Seton. By his first marriage with Margaret, daughter of John Stewart, earl of Buchan, he had a son John, who died during his father's lifetime. He was succeeded by his grandson George, 2nd Lord Seton (d. 1508), who was a scholar of St Andrews and Paris, and in common report a necromancer. He was captured by the Flemings, and on his release fitted out and maintained a ship for the purpose of harassing Flemish travellers. His son George, 3rd Lord Seton, was killed at Flodden in 1513. He redeemed estates which his father had sacrificed to support his enterprises against the Flemings. By his marriage with Janet, daughter of Patrick Dunbar, 1st earl of Bothwell, he left a son George, 4th Lord Seton (d. 1549), who allowed Cardinal Beaton to escape from custody in 1543, and received considerable grants of land in the sequel. The castle and church of Seton were burnt by Hertford in revenge for the part he had taken against the English in 1544.

George, 5th Lord Seton (1530?–1585), was a firm friend of Mary, queen of Scots. He was present at her marriage with the dauphin in 1557, and three years later he was again in France because of his adherence to the old religion. When Mary returned to Scotland he became privy councillor and master of the household, but four years later he again found it advisable to retire to France. Mary and Darnley spent their honeymoon at Seton Palace, and Mary found a retreat there after the murder of Rizzio and again after the murder of Darnley. She spent the night before Carberry Hill under Seton's roof, and he was waiting for her on her escape from Lochleven in May 1568. He took her to his castle at Niddrie, Linlithgowshire, and thence to Hamilton. A week later he was taken prisoner at Langside. He was set free after the assassination of the regent Moray, and made his way to Flanders, where he was said to have made his living as a wagoner. He was, in fact, entrusted by Mary's supporters with a mission to the duke of Alva, and sought in vain to secure for service in Scotland two regiments of Scots then in Spanish pay. He returned home in 1571, being apparently reconciled with the government, but he retained his Catholicism and his friendship for Mary, who wrote to Elizabeth in 1581 desiring a passport for Lord Seton that he might alleviate her solitude. In 1581 he was one of Morton's judges, and in 1583 he was sent as ambassador to France, where he sought interference on Queen Mary's behalf. He died soon after his return on the 8th of January 1585. The 5th Lord Seton figures in Sir Walter Scott's *Abbot*. He was succeeded by his second and eldest surviving son, Robert, who became 6th Lord Seton and 1st earl of Wintoun. His third son, Sir John Seton of Barns, was a gentleman of the bedchamber to Philip II. of Spain. He was recalled to Scotland by James VI., and served as lord of session from 1587 to 1594.

Mary Seton, one of the "Four Maries" attendant on the queen, is supposed to have been the 5th Lord Seton's half-sister, being the daughter of the 4th lord by his second wife, a Frenchwoman named Mary Pieris, maid of honour to Mary of Guise. She had been educated with Queen Mary in France, being about a year older than her mistress, with whom she returned to Scotland in 1561. She helped Mary to escape from Lochleven by assuming her clothes. Later on she joined her at Carlisle, and remained with her in her various prisons until 1583, when prison life had undermined her health and spirits. She retired to the abbey of St Pierre at Rheims, and she was still living there, an old lady of seventy-four, in poverty in 1614.

Robert Seton (d. 1603) succeeded his father as 6th lord in 1585, and was created earl of Wintoun in 1600. He married, about 1582, Margaret, eldest daughter of Hugh Montgomerie, 3rd earl of Eglinton. His sons Robert and George were successively earls of Wintoun; the third, Alexander, became, in right of his mother, 6th earl of Eglinton; the fourth, Thomas, was the ancestor of the Setons of Oliveston.

George, 4th earl of Wintoun (1640–1704), succeeded his grandfather, George Seton, 3rd earl, in 1650. He saw some service in the French army, and fought against the Covenanters at Pentland and at Bothwell Bridge. By his second marriage, with Christian Hepburn, he had a son George, who quarrelled with his father and is said to have been working as a journeyman blacksmith abroad when he succeeded to the title in 1704. In 1715 the 5th earl joined Kenmure with 300 men at Moffat, but it was against his advice that the Jacobite army invaded England. He was lying in the Tower under sentence of death when he succeeded in making his escape, and proceeding to the continent, he became well known in Rome, where he was grand master of the Roman lodge of freemasons. He died there in 1749. With him the earldom became extinct, but it was revived in 1840 in favour of the earls of Eglinton.

Some of the cadet branches of the family remain to be noticed. The Setons of Parbroath in Fife, represented by American descendants, are descended from Sir George Seton (fl. 1589–1595). The Setons of Touch, near Stirling, descended from Alexander Seton, 1st earl of Huntly. They were hereditary armour-bearers and squires of the body to the king, dignities which passed, in the female line, to the Seton-Stewarts in 1786. From the Setons of Touch were descended the Setons of Culbeg or Abercorn. The Setons of Preston (Linlithgow) and Ekolsund (Sweden) have been connected with the Swedish army since the 18th century when George Seton, a merchant, settled in Stockholm. The Setons of Meldrum descended from William Seton, brother of the 1st earl of Huntly. The Pitmedden branch was an offshoot from Meldrum; the baronetcy was created (1686) for the judge Sir Alexander Seton, Lord Pitmedden (*c.* 1639–1719). The Setons of Mounie again were a branch of the Pitmedden family; one of their house, Lieut.-Colonel Alexander Seton, 74th Highlanders, was in charge of the troops on the ill-fated "Birkenhead" in 1852. The Setons of Cariston, descended from John, second son of the 6th Lord Seton, obtained the barony of Cariston in 1553. Other branches are Seton-Gordon of Embo, with a baronetcy created in 1631, and Seton of Garleton, with a baronetcy created in 1664. The viscounty of Kingston was created for Alexander Seton (d. 1691), third son of the 3rd earl of Wintoun, and became extinct on the attainder of James, 3rd viscount, in 1715. See Huntly, Earls and Marquesses of.

Authorities.—Sir Richard Maitland, *History of the House of Seton*, continued by A. Seton, 1st Viscount Kingston (mod. ed., Glasgow 1829, and Edinburgh 1830); G. Seton, *The History of the House of Seton* (2 vols., 1896); Sir R. Douglas, *Scots Peerage*, new ed. by Sir J. B. Paul; *Calendar of Documents relating to Scotland* in the "Rolls" series; and G. E. C(okayne), *Complete Peerage.*

SETTEE, a long upholstered seat, usually high-backed and with arms at each end. Its ancestors were the settle and the chair—it has alternately resembled the one and the other. It is broadly distinguished from the many varieties of sofa by being intended for sitting rather than reclining—its seat is of the same height as that of a chair; its arms and much of its detail are chair-like. It dates from about the middle of the 17th century, but examples of that early period are exceedingly rare. There is a famous one at Knole, made about midway between the restoration of Charles II. and the revolution of 1688. By that time the settee had acquired the splendid upholstery and convoluted woodwork which adorned the end of the Stuart period. Early in the 18th century the conjoined double or triple chair form became fashionable. The form was artless, and the absence of upholstery, save on the seat, produced a somewhat angular effect. This type of settee was in essence two chairs with one set of arms. Chippendale made many such pieces, some of them of great beauty. As the taste for carved furniture waned these sturdy settees were replaced by lighter ones, often graceful enough in outline—Hepplewhite and Sheraton were distinguished practitioners—but partaking more and more of the "stuffed-over" character. The desire for comfort and ease gradually drove out the original idea that the settee was intended only for sitting bolt upright. Its modern varieties are many, but in all of them the frame, once so lavishly ornamented, is almost concealed by upholstery.

SETTEMBRINI, LUIGI (1813–1877), Italian man of letters and politician, was born in Naples. At the age of twenty-two he was appointed professor of eloquence at Catanzaro, and married Raffaela Luigia Faucitano (1835). While still a young man he had been affected by the wave of liberalism then spreading all over Italy, and soon after his marriage he began to conspire mildly against the Bourbon government. Betrayed by a priest, he was arrested in 1839 and imprisoned at Naples; although liberated three years later he lost his professorship and had to maintain himself by private lessons. Nevertheless he continued to conspire, and in 1847 he published anonymously a "Protest of the People of the Two Sicilies," a scathing indictment of the Bourbon government. On the advice of friends he went to Malta on a British warship, but although, when King Ferdinand II. granted a constitution (16th of February 1848), he returned to Naples and was given an appointment at the ministry of education, he soon resigned on account of the prevailing chaos, and retired to a farm at Posilipo. When reaction set in, once more Settembrini was arrested as a suspect (June 1849) and imprisoned. After a monstrously unfair trial, he and two other "politicals" were condemned to death, and nineteen others to varying terms of imprisonment (February 1851). The death sentences were, however, commuted to imprisonment for life, and Settembrini was sent to the dungeons of San Stefano. There he remained for eight years. His friends, including Antonio Panizzi, then in England, made various unsuccessful attempts to liberate him, and at last he was deported with sixty-five other political prisoners. The exiles received an enthusiastic welcome in London, but Settembrini after a short stay in England joined his family at Florence in 1860. On the formation of the Italian kingdom he was appointed professor of Italian literature at the university of Naples, and devoted the rest of his life to literary pursuits. In 1875 he was nominated senator. He died in 1877. His chief work is his *Lezioni di letteratura italiana*, of which the dominant note is the conviction that Italian literature "is as the very soul of the nation, seeking, in opposition to medieval mysticism, reality, freedom, independence of reason, truth and beauty" (P. Villari).

See L. Settembrini, *Ricordanze*, 2 vols., edited by F. de Sanctis (Naples, 1879–1880); *Epistolario di Luigi Settembrini*, edited by F. Fiorentino; P. Villari, *Saggi critici* (Florence, 1884); Countess Martinengo Cesaresco, *Italian Characters* (London, 1901).

SETTLE, ELKANAH (1648–1724), English poet and playwright, was born at Dunstable on the 1st of January 1648. He entered Trinity College, Oxford, in 1666, but left the university without taking a degree. His first tragedy, *Cambyses, King of Persia*, was produced at Lincoln's Inn Fields in 1667. The success of this play led the earl of Rochester to encourage the new writer as a rival to Dryden. Through his influence Settle's *Empress of Morocco* (1671) was twice acted at Whitehall, and proved a signal success on the stage. It is said by Dennis to have been "the first play that was ever sold in England for two shillings, and the first play that was ever printed with cuts." These illustrations represent scenes in the theatre, and make the book very valuable. The play was printed with a preface to the earl of Norwich, in which Settle described with scorn the effusive dedications of other dramatic poets. Dryden was obviously aimed at, and he co-operated with Crowne and Shadwell in an abusive pamphlet entitled "Notes and Observations on the Empress of Morocco" (1674), to which Settle replied in "Some Notes and Observations on the Empress of Morocco revised" (1674). In the second part of *Absalom and Achitophel*, in a passage certainly by Dryden's hand, he figures as "Doeg." Neglected by the court party he took an active share in the anti-popish agitation. When this subsided he turned round to expose Titus Oates, and with the Revolution he veered towards the Whig party. But he had lost the confidence of both sides, and "recanting Settle" accordingly abandoned politics for the appointment (1691) of city poet. In his old age he kept a booth at Bartholomew Fair, where he is said to have played the part of the dragon in a green leather suit devised by himself. He became a poor brother of the Charterhouse, where he died on the 12th of February 1724.

Settle's numerous works include, beside numerous political pamphlets and occasional poems, *Ibrahim, the Illustrious Bassa* (1676), a tragedy taken from Madeleine de Scudéry's romance; *The Female Prelate; being the History of the Life and Death of Pope Joan* (1680), a tragedy; *The Ambitious Slave: or A Generous Revenge* (1694); *The World in the Moon* (1697), an opera, of which the first scene was formed by a moon fourteen feet across; and *The Virgin Prophetess, or The Fate of Troy* (1701), an opera.

SETTLE, a market town in the Skipton parliamentary division of the West Riding of Yorkshire, England, 41½ m. N.W. from Leeds by the Midland railway. Pop. (1901) 2302. It lies in the upper part of the Ribble valley, amid the wild scenery of the limestone hills of the Pennine system. The district includes several caves, such as Victoria Cave, close to the town, where bones of animals, and stone, bone and other implements and ornaments have been discovered. Other points of interest are Malham Cove and tarn, the ravine of Gordale Scar, the cliffs of Attermyre, Giggleswick Scar and Castleberg (the last immediately above Settle itself), the Clapham and Weathercote caves, the chasm of Helln Pot and the waterfall of Stainforth Foss. In the town are cotton factories and a tannery. To the west of the town is the grammar school of Giggleswick, one of the principal public schools in the north of England, founded in 1512.

SETTLE, a wooden bench, usually with arms and a high back, long enough to accommodate three or four sitters. It is most commonly movable, but occasionally fixed as in the "boxes" of those old coffee-houses of which a few examples still remain in London, and perhaps elsewhere. It shares with the chest and the chair the distinction of great antiquity. Its high back was a protection from the draughts of medieval buildings—a protection which was sometimes increased by the addition of winged ends or a wooden canopy. It was most frequently placed near the fire in the common sitting-room. Constructed of oak, or other hard wood, it was extremely heavy, solid and durable. Few English examples of earlier date than the middle of the 16th century have come down to us; survivals from the Jacobean period are more numerous. Settles of the more expensive type were often elaborately carved or incised; others were divided into plain panels. A well-preserved specimen, with its richly polished oak, darkened by time and beeswax, is a handsome piece of furniture often still to be found in its original environment—the farm-house kitchen or the manorial hall. Its vogue did not long outlast the first half of the 18th century, to which period most of the existing specimens belong.

SETTLEMENT, in law, a mutual arrangement between living persons for regulating the enjoyment of property, and the instrument by which such enjoyment is regulated. Settlements may be either for valuable consideration or not: the latter are usually called voluntary, and are in law to some extent in the same position as revocable gifts; the former are really contracts, and in general their validity depends upon the law of contract. They may accordingly contain any provisions not contrary to law or public policy.[1]

The elements of the modern settlement are to be found in Roman law. The *vulgaris*, *pupillaris* or *exemplaris substitutio* (consisting in the appointment of successive heirs in case of the death, incapacity or refusal of the heir first nominated) may have suggested the modern mode of giving enjoyment of property in succession. Such a *substitutio* could, however, only have been made by will, while the settlement of English law is, in the general acceptation of the term, exclusively an instrument *inter vivos*. The *dos* or *donatio propter nuptias* corresponds to a considerable extent with the marriage settlement, the instrument itself being represented by the *dotale instrumentum* or *pacta dotalia*. In the earliest period of Roman law no provision for the wife was required, for she passed under *manus* of her husband, and became in law his daughter, entitled as such to a share of his property at his death. In course of time the plebeian form of marriage by *usus*, according to which the wife did not become subject to *manus*, gradually superseded the older form, and it became necessary to make a provision for the wife by contract. Such provision from the wife's side was made by the *dos*, the property contributed by the wife or some one on her behalf towards the expenses of the new household. *Dos* might be given before or after marriage, or might be increased after marriage. It was a duty enforced by legislation to provide *dos* where the father possessed a sufficient fortune. *Dos* was of three kinds: *profectitia*, contributed by the father or other ascendant on the male side; *adventitia*, by the wife herself or any person other than those who contributed *dos profectitia*; *receptitia*, by any person who contributed *dos adventitia*, subject to the stipulation that the property was to be returned to the person advancing it on dissolution of the marriage. The position of the husband gradually changed for the worse. From being owner, subject to an obligation to return the *dos* if the wife predeceased him, he became a trustee of the *corpus* of the property for the wife's family, retaining only the enjoyment of the income as long as the marriage continued. The contribution by the husband was called *donatio propter nuptias*.[1] The most striking point of difference between the Roman and the English law is that under the former the children took no interest in the contributions made by the parents. Other modes of settling property in Roman law were the life interest or *usus*, the *fideicommissum*, and the prohibition of alienation of a *legatum*.

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[1] In this English law allows greater freedom than French. By §791 of the Code Napoléon, in a contract of marriage the succession to a living person cannot be renounced.

The oldest form of settlement in England was perhaps the gift in frankmarriage to the donees in frankmarriage, and the heirs between them two begotten (Littleton, § 17). This was simply a form of gift in special tail, which became up to the reign of Queen Elizabeth the most usual kind of settlement. The time at which the modern form of settlement of real estate came into use seems to be doubtful. There does not appear to be any trace of a limitation of an estate to an unborn child prior to 1556. In an instrument of that year such a limitation was effected by means of a feoffment to uses. The plan of granting the freehold to trustees to preserve contingent remainders[2] is said to have been invented by Lord Keeper Sir O. Bridgeman in the 17th century, the object being to preserve the estate from forfeiture for treason during the Commonwealth.[3] The settlement of chattels is no doubt of considerably later origin, and the principles were adopted by courts of equity from the corresponding law as to real estate.

Settlement in English law is, so far as regards real property, used for two inconsistent purposes—to "make an eldest son," as it is called, and to avoid the results of the right of succession to real property of the eldest son by making provision for the younger children. The first result is generally obtained by a strict settlement, the latter by a marriage settlement, which is for valuable consideration if ante-nuptial, voluntary if post-nuptial. But these two kinds of settlement are not mutually exclusive: a marriage settlement may often take the form of a strict settlement and be in substance a resettlement of the family estate. (See CONVEYANCING.)

In Scotland a *disposition and settlement* is a mode of providing for the devolution of property after death, and so corresponds rather to the English will than to the English settlement. The English marriage settlement is represented in Scotland by the *contract of marriage*, which may be ante- or post-nuptial.

In the United States settlements other than marriage settlements are practically unknown. Marriage settlements are not in common use, owing to the fact that most states long ago adopted the principles of the English Married Women's Property Acts.

The word "settlement" is also used to denote such residence of a person in a parish, or other circumstances pertaining thereto, as would entitle him to obtain poor relief (see POOR LAW). On the English Stock Exchange it is a term for the series of operations by which bargains are concluded, or carried over (see ACCOUNT and STOCK EXCHANGE). The word is also applied generally to the termination of a disputed matter by the adoption of terms.

SETTLEMENT, ACT OF, the name given to the act of parliament passed in June 1701, which, since that date, has regulated the succession to the throne of Great Britain and Ireland. Towards the end of 1700 the need for the act was obvious, if the country was to be saved from civil war. William III. was ill and childless; his sister-in-law, the prospective queen, Anne, had just lost her only surviving child, William, duke of Gloucester; and abroad the supporters of the exiled king, James II., were numerous and active. In these circumstances the Act of Settlement was passed, enacting that, in default of issue to either William or Anne, the crown of England, France[4] and Ireland was to pass to "the most excellent princess Sophia, electress and duchess dowager of Hanover," a grand-daughter of James I., and "the heirs of her body being Protestants." The act is thus responsible for the accession of the house of Hanover to the British throne. In addition to settling the crown the act contained some important constitutional provisions, of which the following are still in force. (1) That whosoever shall hereafter come to the possession of this crown shall join in communion with the Church of England as by law established. (2) That in case the crown and imperial dignity of this realm shall hereafter come to any person not being a native of this kingdom of England, this nation be not obliged to engage in any war for the defence of any dominions or territories which do not belong to the Crown of England, without the consent of parliament. (3) That after the said limitation shall take effect as aforesaid, judges' commissions be made *quamdiu se bene gesserint* and their salaries ascertained and established; but upon the address of both houses of parliament it may be lawful to remove them. This clause established the independence of the judicial bench. (4) That no pardon under the great seal of England be pleadable to an impeachment by the Commons in parliament. The act as originally passed contained four other clauses. One of these provided that all matters relating to the government shall be transacted in the Privy Council, and that all resolutions "shall be signed by such of the Privy Council as shall advise and consent to the same"; and another declared that all office-holders and pensioners under the Crown shall be incapable of sitting in the House of Commons. The first of these clauses was repealed, and the second seriously modified in 1706. Another clause was framed to prevent the sovereign from leaving England, Scotland or Ireland without the consent of parliament; this was repealed just after the accession of George I. Finally a clause said that "no person born out of the kingdoms of England, Scotland or Ireland, or the dominions thereunto belonging (although he be naturalized or made a denizen) except such as are born of English parents, shall be capable to be of the Privy Council, or a member of either House of Parliament, or enjoy any office or place of trust, either civil or military, or to have any grant of lands, tenements or hereditaments from the Crown to himself, or to any other or others in trust for him." By the Naturalization Act of 1870 this clause is virtually repealed with regard to all persons who obtain a certificate of naturalization. This and some of the other clauses amount practically to censures on the policy of William III.

The importance of the Act of Settlement appears from the fact that, in all the regency acts, it is mentioned as one of the acts to the repeal of which the regent may not assent. To maintain or affirm the right of any person to the crown, contrary to the provisions of the act, is high treason by an act of 1707.

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[1] See Hunter, *Roman Law*, p. 150; Maine, *Early History of Institutions*, Lect. xi.

[2] The appointment of such trustees was rendered unnecessary by acts of 1845 and 1877.

[3] See Joshua Williams, *Papers of the Juridical Society*, i. 45.

[4] The title of king of France was retained by the British sovereigns until 1801. Scotland accepted the Act of Settlement by Art. II. of the Act of Union.

See T. P. Taswell-Langmead's *English Const. Hist.* (1905); H. Hallam, *Constitutional History*, vol. iii. (1855); and L. von Ranke, *Englische Geschichte* (1859–1868).

SETUBAL (formerly called in English *St Ubes* and in French *St Yves*), a seaport of Portugal, in the district of Lisbon (formerly included in the province of Estremadura), 18 m. S.E. of Lisbon by the Barreiro-Pinhal Novo-Setubal railway. Pop. (1900) 22,074. Setubal is built on the north shore of a deep estuary, formed by the rivers Sado, Marateca and São Martinho, which discharge their waters into the Bay of Setubal 3 m. below the city. Setubal is overtopped on the west by the treeless red heights of the Serra da Arrabida. There are five forts for the defence of the harbour; the castle of St Philip, built by Philip III. of Spain (1578–1621), commands the city. Setubal is the third seaport and fourth largest city of Portugal. It exports large quantities of fine salt, oranges and muscatel grapes; it has many sardine-curing and boat-building establishments, and manufactures of fish-manure and lace. Its port is officially included in that of Lisbon. Under John II. (1481–1495) Setubal was a favourite royal residence, and one of the churches dates from this period; but most of the ancient buildings were destroyed by the great earthquake of 1755. There are some fine public buildings, statues and fountains of later date, including a statue of the poet M. M. de B. du Bocage (1766–1806), who was a native of Setubal. In the sandhills of a low-lying promontory in the bay opposite Setubal are the so-called ruins of "Troia," uncovered in part by heavy rains in 1814 and excavated in 1850 by an antiquarian society. These ruins of "Troia," among which have been brought to view a beautiful Roman house and some 1600 Roman coins, are those of Cetobriga, which flourished A.D. 300–400. In the neighbourhood, on a mountain 1600 ft. high, is the monastery of Arrabida.

SEUME, JOHANN GOTTFRIED (1763–1810), German author, was born at Poserna, near Weissenfels, on the 29th of January 1763. He was educated, first at Borna, then at the Nikolai school and university of Leipzig. The study of Shaftesbury and Bolingbroke weakened his interest in theology, and, breaking off his studies, he set out for Paris. On the way he was seized by Hessian recruiting officers and sold to England, whereupon he was drafted to Canada. After his return in 1783 he deserted at Bremen, but was captured and brought to Emden; a second attempt at flight also failed. In 1787, however, a citizen of Emden became surety for him to the amount of 80 talers, and he was allowed to visit his home. He did not return, but paid off his debt in Emden with the remuneration he received for translating an English novel. He taught languages for a time in Leipzig, and became tutor to a Graf Igelström, whom, in 1792, he accompanied to Warsaw. Here he became secretary to General von Igelström, and, as a Russian officer, experienced the terrors of the Polish insurrection. In 1796 he was again in Leipzig and, resigning his Russian commission, entered the employment of the publisher Göschen. In December 1801 he set out on his famous nine months' walk to Sicily, described in his *Spaziergang nach Syrakus* (1803). Some years later he visited Russia, Finland and Sweden, a journey which is described in *Mein Sommer im Jahr 1805* (1807). His health now began to fail, and he died on the 13th of June 1810, at Teplitz. His reputation rests on the two books just mentioned, to which may be added his autobiography, *Mein Leben* (1813, continued by C. A. H. Clodius). These works reflect Seume's sterling character and sturdy patriotism; his style is clear and straightforward; his descriptions realistic and vivid. As a dramatist (*Miltiades*, 1808), and as a lyric poet (*Gedichte*, 1801), he had but little success.

Seume's *Gesammelte Schriften* were first edited by J. P. Zimmermann (1823–1826); his *Sämtliche Werke* (1826–1827) passed through seven editions. The most recent edition is J. G. Seume's *Prosaische und poetische Werke* (10 vols., 1879). See O. Planer and C. Reissmann, *J. G. Seume. Geschichte seines Lebens und seiner Schriften* (1898).

SEVASTOPOL, or Sebastopol, an important naval station of Russia on the Black Sea, on the S.W. coast of the Crimea, in 44° 37′ N. and 33° 31′ E., 956 m. from Moscow, with which it is connected by rail via Kharkov. Pop. (1882) 26,150; (1897) 50,710. The estuary, which is one of the best roadsteads in Europe and could accommodate the combined fleets of Europe, is a deep and thoroughly sheltered indentation among chalky cliffs, running east and west for nearly 4 m., with a width of three-quarters of a mile, narrowing to 930 yds. at the entrance. It has a depth of 6 to 10 fathoms, with a good bottom, and large ships can anchor at a cable's length from the shore. The main inlet has also four smaller indentations—Quarantine Bay at its entrance, Yuzhnaya (Southern) Bay, which penetrates more than 1 m. to the south, with a depth of 4 to 9 fathoms, Dockyard Bay and Artillery Bay. A small river, the Chornaya, enters the head of the inlet. The main part of the town, with an elevation of 30 to 190 ft., stands on the southern shore of the chief inlet, between Yuzhnaya and Artillery Bays. A few buildings on the other shore of the chief bay constitute the "northern side." Before the Crimean War of 1853–56 Sevastopol was a well-built city, beautified by gardens, and had 43,000 inhabitants; but at the end of the siege it had not more than fourteen buildings which had not been badly injured. After the war many privileges were granted by the government in order to attract population and trade; but both increased slowly, and at the end of seven years the population numbered only 5750.

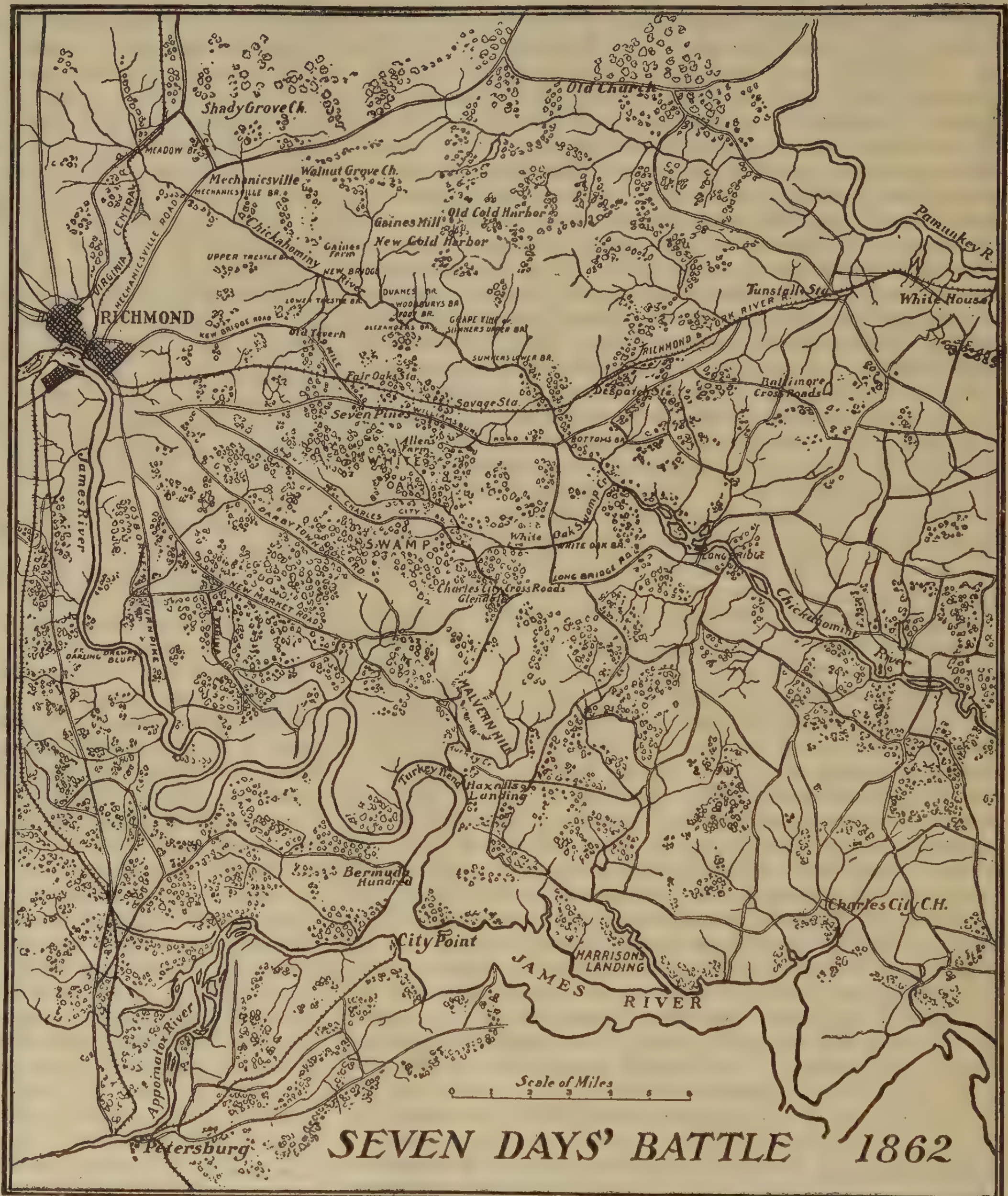
The present town is well built and is becoming a favourite watering-place on account of its sea-bathing and numerous sanatoria. It has a zoological marine station (1897), a museum commemorative of the siege (1895), a cathedral of Classical design and another finished in 1888, monuments of Admirals Nakhimov (1898) and Kornilov (1895) and of General Todleben, and two navigation schools. In 1890 Sevastopol was made a third-class fortress, and the commercial port has been transferred to Theodosia.

The peninsula between the Bay of Sevastopol and the Black Sea was known in the 7th century as the Heracleotic Chersonese. In the 5th century B.C. a Greek colony was founded here and remained independent for three centuries, when it became part of the kingdom of the Bosporus, and subsequently tributary to Rome. Under the Byzantine empire Chersonesus was an administrative centre for its possessions in Taurida. Vladimir, prince of Kiev, conquered Chersonesus (Korsuñ) before being baptized there, and restored it to the Greeks on marrying (988) the princess Anna. Subsequently the Slavs were cut off from relations with Taurida by the Mongols, and only made occasional raids, such as that of the Lithuanian prince Olgierd. In the 16th century a new influx of colonists, the Tatars, occupied Chersonesus and founded a settlement named Akhtyar. This village, after the Russian conquest in 1783, was selected for the chief naval station of the empire in the Black Sea and received its present name ("the August City"). In 1826 strong fortifications were begun. In 1854 the allied English, French and Turkish forces laid siege to the southern portion of the town, and on the 17th of October began a heavy bombardment. Sevastopol sustained a memorable eleven months' siege, and on the 8th of September 1855 was evacuated by the Russians. The fortifications were blown up by the allies, and by the Paris treaty the Russians were bound not to restore them (see Crimean War). In November 1870, during the Franco-German War, the Russian government decided again to make Sevastopol a naval arsenal.

SEVEN CHAMPIONS OF CHRISTENDOM, the name given in medieval tales to the seven national saints—of England, Scotland, Ireland, Wales, France, Spain and Italy—*i.e.* Saints George, Andrew, Patrick, David, Denis, James and Anthony. The classical version of their achievements is that of Richard Johnson (1573–*c.* 1659), *Famous Historie of the Seaven Champions of Christendom* (3 parts, 1596, 1608, 1610: many editions). The oldest known copy is dated 1597; there is also a poetical version by Sir George Buc (published 1623).

SEVEN DAYS' BATTLE, a name given to a series of combats in the neighbourhood of Richmond, Virginia, during the American Civil War, June 26–July 2, 1862. The Federal Army of the Potomac, advancing from the sea and the river Pamunkey over the Chickahominy on Richmond, had come to a standstill after the battle of Seven Pines (or Fair Oaks), and General Robert Lee, who succeeded Joseph Johnston in command of the Confederates, initiated the series of counter attacks upon it which constitute the "Seven Days."

McClellan had at his disposal 32 brigades and 67 batteries organized in five corps each of two or three divisions. His cavalry consisted of 10 regiments and 22 companies. Lee's army consisted of 40 brigades and 59 batteries organized in eleven divisions and an independent brigade: four divisions were grouped under Jackson and three under Magruder. The reserve artillery consisted of 23 batteries and Stuart's cavalry corps of 3000 sabres. McClellan lingered north of Richmond, despite President Lincoln's constant demand that he should "strike a blow" with the force he had organized and taken to the Yorktown peninsula in April, until General Lee had concentrated 73,000 infantry in his front; then the Federal commander, fearing to await the issue of a decisive battle, ended his campaign of invasion in the endeavour to "save his army"; and he so far succeeded that on July 3 he had established himself on the north bank of the James in a position to which reinforcements and supplies could be brought from the north by water without fear of molestation by the enemy. But he lost 15,000 men in the course of his seven days' retreat, and 20% of the remainder became ineffective from disease contracted in the swamps of the Chickahominy, while enormous quantities of valuable stores at White House on the Pamunkey had been burnt to avoid seizure by the enemy. McClellan described this flight to the James as a change of base, but his resolve to abandon the attitude of an invader was formed when General Lee in the middle of June had caused Stuart's cavalry to reconnoitre the flanks and rear of McClellan's army, and had summoned Jackson's corps from the Shenandoah Valley (*q.v.*). The news soon reached McClellan, who thereupon prepared to evacuate White House on June 25 and moved his trains southward to the James covered by his army. Jackson had preceded his troops in order personally to confer with Lee, and had then appointed the morning of June 26 for his appearance north of the Chickahominy to lead the march and attack McClellan's right wing under General FitzJohn Porter. Jackson was to be supported by the divisions of A. P. Hill, Longstreet and D. H. Hill. Lee's other divisions under Magruder, Huger and Holmes were to defend the lines which covered Richmond from the east, and so prevent McClellan effecting a counterstroke. Huger had demonstrated on the Williamsburg Road on June 25 in order to draw McClellan's attention to his left wing, and though on June 26 Jackson had failed to appear, General A. P. Hill at 3 p.m. crossed the Chickahominy and attacked the enemy's right wing at Beaver Dam Creek assisted by D. H. Hill, while Longstreet crossed at Mechanicsville. General Lee and President Davis were present and witnessed the loss of 2000 men in a frontal attack which continued till 9 p.m. Meanwhile General Jackson, with Stuart's cavalry corps, "marched by the fight without giving attention, and went into camp at Hundley's Corner half a mile in rear of the enemy's position."


Shady Grove Ch.
Old Church
Meadow Br.
Mechanicsville
Mechanicsville Br.
Walnut Grove Ch.
Virginia Central
Mechanicsville Road
Chickahominy River
Gaines Farm
Gaines Mill
Old Cold Harbor
New Cold Harbor
Pamunkey R.
Upper Trestle Br.
New Bridge
Duanes Br.
Woodburys Br.
Foot Br.
Alexanders Br.
Grape Vine Br.
Sumners Upper Br.
Sumners Lower Br.
Lower Trestle Br.
New Bridge Road
Richmond
Old Tavern
Nine Mile Road
Tunstalls Sta.
Richmond & York River R.R.
White House
Fair Oaks Sta.
Savage Sta.
Despatch Sta.
Baltimore Cross Roads
Seven Pines
Williamsburg Road
Bottoms Br.
Allens Farm
White Oak Swamp
Charles City Road
Darbytown Road
White Oak Swamp Cr.
White Oak Br.
Long Bridge
Long Bridge Road
Charles City Cross Roads
Glendale
New Market Road
Osborne Turnpike
James River
Ft. Darling Drewry's Bluff
Malvern Hill
Turkey Cr.
Turkey Bend
Haxalls Landing
Bermuda Hundred
Charles City C.H.
City Point
Harrisons Landing
James River
Appomattox River
Petersburg
Scale of Miles
0 1 2 3 4 5 6

SEVEN DAYS' BATTLE 1862

The Federal detachment retreated during the night to a stronger position in rear at Gaines's Mill near Cold Harbor, and on June 27 the Confederates again attacked Porter's corps. Lee's six divisions formed an échelon. D. H. Hill moving towards the enemy's right was followed by Jackson's corps (three divisions), while A. P. Hill engaged the enemy in front and Longstreet in reserve moved along the left bank of the Chickahominy. The resistance of the Federals was stubborn; at 5 p.m. General Lee required Longstreet to attack the enemy's left, and at this moment he procured the assistance of some part of Jackson's corps which had become separated from the remainder. About sunset the Federals under Porter (three divisions) yielded to the pressure of the attack at all points, and withdrew in the night across the Chickahominy, leaving 5000 prisoners in the hands of General Lee. The Confederates lost 7000 men on June 27.

Lee's right wing had in the meantime demonstrated against the main body of the Federals about Fair Oaks, on the south bank of the river. On June 28 complete inactivity supervened among the Confederates north of the Chickahominy save that Stuart's cavalry and Ewell's division were advanced as far as the railway to reconnoitre, but on this day McClellan was making good his retreat southwards to the James with little interference, for Magruder was instructed to "hold his lines at all hazards," and accordingly acted on the defensive except that Jones's division opposed a Federal division under W. F. Smith near Fair Oaks. On June 29 General Lee became aware of the situation and then issued orders for his six divisions to cross the Chickahominy in pursuit. Jackson's corps and D. H. Hill's division were to follow the enemy, while Longstreet and A. P. Hill were to move their divisions via New Bridge to the Darbytown or James River Road to cut off McClellan from the James. Stuart was to operate at his discretion north of the Chickahominy, and it seems that he was attracted by the enemy's abandoned depot at White House more than by McClellan's retreating army. On this day Magruder with two divisions attacked superior forces about Fair Oaks and was repulsed, and again attacked at Savage Station with like results. General Lee, however, rebuked Magruder for slackness in pursuit. Holmes's division was moving in front of Longstreet on the James River Road, but two Federal divisions were holding the route at Willis Church and at Jordan's Ford. On June 30 Jackson got into action with Whiting's division at White Oak Swamp, while Longstreet encountered the Federals at Frazier's Farm (or Glendale). Longstreet was supported by A. P. Hill and together they lost 3200 men; it was hoped that Jackson's corps would come up during the engagement and attack the enemy's rear, and Huger's division assail his right, but Federal artillery stopped Huger, and of Jackson's three divisions only one came into action. Magruder and Holmes were engaged to their own advantage at Turkey Bridge. Longstreet and Hill were thus opposed to five Federal divisions, while General McClellan was pushing his wagons forward to Malvern Hill, on which strong position the Army of the Potomac was concentrated at nightfall. On July 1 Jackson's corps and D. H. Hill's division had been drawn again into the main operation and followed the Federal line of retreat to Malvern Hill with Huger and Magruder on their right. The divisions of Longstreet and A. P. Hill were in support.

General Lee had thus on the seventh day concentrated his army of ten divisions in the enemy's front; but Jackson's dispositions were unfortunate and General Lee's plan of attack was thus upset; and while seeking a route to turn the enemy's right the Confederate commander was apprised that a battle had been improvised by the divisions in advance. In the result these troops were repulsed with a loss of 6000 men, a circumstance hardly to be wondered at, since McClellan had entrenched eight divisions on the strongest position in the country, and was aided by his siege artillery and also by a flanking fire from his gunboats on the river near Haxall's Landing. General Lee's offensive operations now ended, though Stuart's cavalry rejoined the main army at night and followed the enemy on July 2 to Evelington Heights, while Lee rested his army. Stuart discovered a position which commanded the Federal camp, and maintained his cavalry and horse artillery in this position until the afternoon of July 3, when, his ammunition being expended, he was compelled to retire before a Federal force of infantry and a battery. Longstreet and Jackson had been despatched to his support, but the former did not arrive before nightfall and the latter failed to appear until the next day (July 4). Stuart afterwards moved farther down the James, and shelled McClellan's supply vessels in the river until recalled by General Lee, who on July 8 withdrew his army towards Richmond.

The operations resulted in re-establishing the confidence of the Confederates in their army which Johnston's retreat from Yorktown had shaken, in adding prestige to President Davis and his government, and in rectifying the popular view of General Lee as a commander which had been based upon his failure to recover West Virginia in the autumn of 1861. In the north a feeling of despondency overtook Congress at the "lame and impotent conclusion" of a campaign of invasion which was expected to terminate the war by the defeat of the Confederate army, the capture of Richmond and the immediate overthrow of the Confederacy. (G. W. R.)

SEVENOAKS, a market town in the Sevenoaks parliamentary division of Kent, England, 22 m. S.E. by S. of London by the South-Eastern and Chatham railway. Pop. of urban district (1901) 8106. It is beautifully situated on high ground among the wooded undulations of the North Downs, above the valley of the river Darent. The town consists principally of two streets which converge at the south end, near which is the church of St Nicholas, of the 13th, 14th and 15th centuries. It contains monuments of the Amherst family and a tablet to William Lambarde (d. 1601), which was removed from the old parish church of Greenwich when that was demolished. Lambarde was author of the *Perambulation of Kent*, and founded the College of the Poor of Queen Elizabeth at Greenwich. The grammar school founded in 1418 by Sir William Sevenoke was reconstituted as a first-grade modern school in 1877. There is also a school founded by Lady Margaret Boswell, wife of Sir William Boswell, ambassador to Charles I. at The Hague, and almshouses founded by Sir William Sevenoke in connexion with his school. Close to Sevenoaks is Knole Park, one of the finest old residences in England, which in the time of King John was possessed by the earl of Pembroke, and after passing to various owners was bought by Archbishop Bourchier (d. 1486), who rebuilt the house. He left the property to the see of Canterbury, and about the time of the dissolution it was given up by Cranmer to Henry VIII. By Elizabeth it was conferred first on the earl of Leicester and then on Thomas Sackville, afterwards earl of Dorset. By this earl it was in great part rebuilt and fitted up in regard to decoration much as it now exists. The gateway in the outer court and the Perpendicular chapel are from Archbishop Bourchier's time. The great hall, with elaborately carved music-gallery, is mainly the work of the first earl.

SEVEN SLEEPERS OF EPHESUS, THE, according to the most common form of an old legend of Syrian origin, first referred to in Western literature by Gregory of Tours (*De glor. mart.* c. 95), seven Christian youths of Ephesus, who, in the Decian persecution (A.D. 250), hid themselves in a cave. Their hiding-place was discovered and its entrance blocked. The martyrs fell asleep in a mutual embrace. Nearly 200 years later a herdsman of Ephesus rediscovered the cave on Mount Coelian, and, letting in the light, awoke the inmates, who sent one of their number (Jamblicus) to buy food. The lad was astonished to find the cross displayed over the city gates, and, on entering, to hear the name of Christ openly pronounced. By tendering coin of the time of Decius at a baker's shop he roused suspicion, and was taken before the authorities as a dishonest finder of hidden treasure. He confirmed his story by leading his accusers to the cavern where his six companions were found, youthful and beaming with a holy radiance. The emperor Theodosius II., hearing what had happened, hastened to the spot in time to hear from their lips that God had wrought this wonder to confirm his faith in the resurrection of the dead. This message delivered, they again fell asleep.

Gregory says he had the legend from the interpretation of "a certain Syrian"; in point of fact the story is common in Syriac sources. It forms the subject of a homily of Jacob of Sarug (*ob.* A.D. 521), which is given in the *Acta sanctorum*. Another Syriac version is printed in Land's *Anecdota*, iii. 87 seq.; see also Barhebraeus, *Chron. eccles.* i. 142 seq., and compare Assemani, *Bib. Or.* i. 335 seq. Some forms of the legend give eight sleepers—*e.g.* an ancient MS. of the 6th century now in the British Museum (*Cat. Syr. MSS.* p. 1090). There are considerable variations as to their names. The legend rapidly attained a wide diffusion throughout Christendom; its currency in the East is testified by its acceptance by Mahomet (*sur.* xviii.), who calls them *Aṣḥāb al-Kahf*, "the men of the cave."

According to Bīrūnī (*Chronology*, tr. by Sachau, p. 285) certain undecayed corpses of monks were shown in a cave as the sleepers of Ephesus in the 9th century. The seven sleepers are a favourite subject in early medieval art. The story is well told in Gibbon's *Decline and Fall of the Roman Empire*, ch. xxxiii.

SEVEN WEEKS' WAR, the name given to the war of 1866 between Prussia on the one side, and Austria, Bavaria, Hanover, Saxony and allied German states on the other. Concurrently with this war another was fought in Venetia between the Italians and the Austrian army of the South, for which see ITALIAN WARS (1848–1870).

In 1850 Prussia, realizing from the breakdown of her mobilization for the war then impending with Austria that success was impossible, submitted to the Austrian demands, but her statesmen saw from the first that the "surrender of Olmütz," as it was termed, rendered eventual war with Austria "a military necessity." Preparation was begun in earnest after the accession of King William I., who selected Bismarck as his chancellor, Moltke as his chief of staff and Roon as his minister of war, and gave them a free hand to create the political situation and prepare the military machinery necessary to exploit it. Within six years the mobilization arrangements were recast, the war against Denmark in 1864 proving an opportune test of the new system. The number of field battalions was nearly doubled, two-thirds of the artillery received breech-loading rifled guns, the infantry had for some years had the breech-loading "needle-gun," and steps were initiated to train an adequate number of staff officers to a uniform appreciation of strategical problems, based on Moltke's personal interpretation of Clausewitz's *Vom Kriege*. There was, however, a fundamental disagreement in the tactical ideas of the senior and those of the junior officers. The former, bred in the tradition of the Napoleonic battle, looked for the decision only from the employment of "masses"; the latter, trained with the breech-loader and without war experience, expected to decide battles by infantry fire only. Both overlooked the changes brought by the introduction of the long-range rifle (muzzle- and breech-loading alike), which had rendered impossible the "case shot preparation" which had formed the basis of Napoleon's tactical system. The men were trained for three years in the infantry and four years in the cavalry and artillery, but the war was not popular and many went unwillingly.

In contemporary military opinion, the Austrians were greatly superior in all arms to their adversary. Their rifle,[1] though a muzzle-loader, was in every other respect superior to the Prussian needle-gun, and their M.L. rifled guns with shrapnel shell were considered more than sufficient to make good the slight advantage then conceded to the breech-loader. The cavalry was far better trained in individual and real horsemanship and manœuvre, and was expected to sweep the field in the splendid cavalry terrain of Moravia. All three arms trained their men for seven years, and almost all officers and non-commissioned officers had considerable war experience. But the Prussians having studied their allies in the war of 1864 knew the weakness of the Austrian staff and the untrustworthiness of the contingents of some of the Austrian nationalities, and felt fairly confident that against equal numbers they could hold their own.

The occasion for war was engineered entirely by Bismarck; and it is doubtful how far Moltke was in Bismarck's confidence, though as a far-seeing general he took advantage of every opening which the latter's diplomacy secured for him. The original scheme for the strategic deployment worked out by Moltke as part of the routine of his office contemplated a defence of the kingdom against not only the whole standing army of Austria, but against 35,000 Saxons, 95,000 unorganized Bavarians and other South Germans, and 60,000 Hanoverians, Hessians, &c., and to meet these he had two corps (VII. and VIII.) on the Rhine, the Guard and remaining six in Brandenburg and Prussia proper. Bismarck diverted three Austrian corps by an alliance with Italy, and by consenting to the neutralization of the Federal fortresses set at liberty von Beyer's division for field service in the west. Moltke thereupon brought the VIII. corps and half the VII. to the east and thus made himself numerically equal to his enemy, but elsewhere left barely 45,000 men to oppose 150,000. The magnitude of the risk was sufficiently shown at Langensalza. The direction of the Prussian railways, not laid out primarily for strategic purposes, conditioned the first deployment of the whole army, with the result that at first the Prussians were distributed in three main groups or armies on a front of about 250 m. As there had been no money available to purchase supplies beforehand, each of these groups had to be scattered over a wide area for subsistence, and thus news as to the enemy's points of concentration necessarily preceded any determination of the plan of campaign.

Of the lines of concentration open to the Austrians, the direction of the roads and railways favoured that of Olmütz so markedly that Moltke felt reasonably certain that it would be chosen, and the receipt of the complete *ordre de bataille* of the Austrian army of the north secured by the Prussian secret service on the 11th of June set all doubts at rest.

According to this, the Austrian troops already in Bohemia, 1st corps, Count Clam-Gallas, 30,000 strong, were to receive the Saxons if the latter were forced to evacuate their own country, and to act as an advanced guard or containing wing to the main body under Feldzeugmeister von Benedek (2nd, 3rd, 4th, 8th, 10th corps) which was to concentrate at Olmütz, whence the Prussian staff on insufficient evidence concluded the Austrians intended to attack Silesia, with Breslau as their objective. On this date (June 11th) the Prussians stood in the following order: The army of the Elbe, General Herwarth von Bittenfeld, three divisions only, about Torgau; the I. army, Prince Frederick Charles (II., III., IV. corps), about Görlitz; the II. army under the crown prince (I., V., VI.) near Breslau; the Guard and a reserve corps of Landwehr at Berlin. As the army of the Elbe was numerically inferior to Clam-Gallas and the Saxons, the reserve corps was at once despatched to reinforce it, and the Guard was sent to the crown prince. Further, in deference to political (probably dynastic) pressure, the crown prince was ordered eastwards to defend the line of the Neisse, thus increasing the already excessive length of the Prussian front. Had the Austrians attacked on both flanks forthwith, the Prussian central (I.) army could have reached neither wing in time to avert defeat, and the political consequences of the Austrian victory might have been held to justify the risks involved, for even if unsuccessful the Austrians and Saxons could always retreat into Bavaria and there form a backbone of solid troops for the 95,000 South Germans.

Advance of the Elbe and I. Armies.—This was one of the gravest crises in Moltke's career. To overcome it he at length obtained authority (June 15th) to order the army of the Elbe into Saxony, and on the 18th the Prussians entered Dresden, the Saxons retiring along the Elbe into Bohemia; and on the same day the news that the Austrian main body was marching from Olmütz towards Prague arrived at headquarters. Moltke took three days to solve the new problem, then, on the 22nd, he ordered the I. and II. armies to cross the Austrian frontier and unite near Gitschin, a point conveniently situated about the convergence of the roads crossing the Bohemian mountains. As during this operation the II. army would be the most exposed, the I., to which the army of the Elbe had now been attached, was to push on its advance to the utmost. Apparently with this purpose in view, Prince Frederick Charles was instructed to break up his army corps into their constituent divisions, and move each division as a separate column on its own road, the reserve of cavalry and artillery following in rear of the centre. The consequences were the reverse of those anticipated. On the afternoon of the 26th the advance guards of the I. army and army of the Elbe came in contact with the Austrians at Hühnerwasser and Podol and drove the latter back after a sharp engagement, but, having no cavalry, could neither observe their subsequent proceedings nor estimate their strength. The prince, seeing the opportunity for a battle, immediately issued orders for an enveloping attack on Münchengrätz by his whole army, but, owing to distances and the number of units now requiring direction, it was late in the following day before all were in readiness for action. The Austrians then slipped away, and the whole of the next day was spent in getting the divisions back to their proper lines of advance. Clam-Gallas then retired deliberately to Gitschin and took up a new position. The Prussians followed on the 29th, but, owing to the lie of the roads, they had to march in two long columns, separated by almost a day's march, and when the advanced guard of the left column, late in the afternoon, gained touch with the enemy, the latter were in a position to crush them by weight of numbers, had they not suddenly been ordered to continue the retreat on Miletin.

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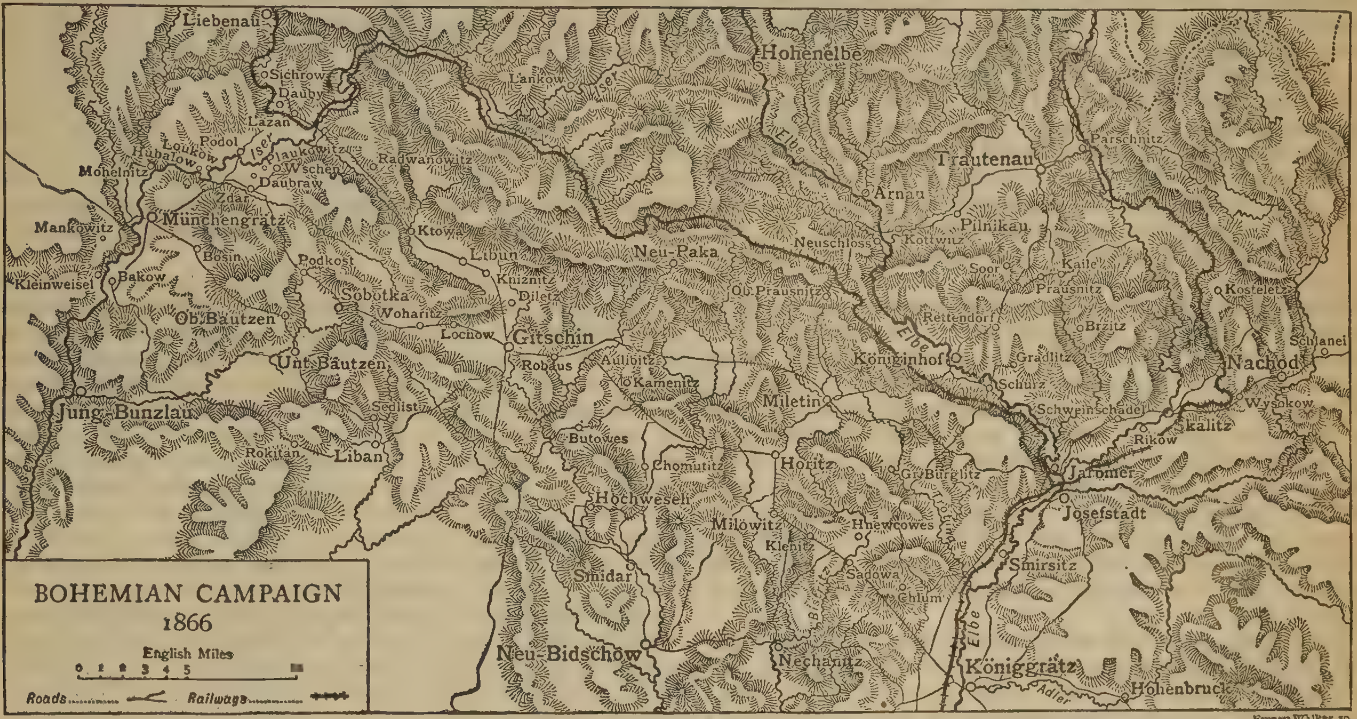
[1] The Lorenz rifle carried a ·57 bullet and was sighted to 1000 yds.; the needle-gun with a much lighter bullet was sighted to 400 only.

Battles of the II. Army: Trautenau and Nachod.—Meanwhile the situation of the II. army had become critical. On its right wing the I. corps (General v. Bonin) had received orders on the 27th to seize the passages over the Aupa at Trautenau. This was accomplished without much difficulty, but the main body was still in the defiles in rear, when about 3 p.m. the leading troops were attacked by an overwhelming Austrian force and driven back in confusion; the confusion spread and became a panic, and the I. corps was out of action for the next forty-eight hours. Almost at the same hour, a few miles to the south-eastward, the advanced guard of the V. corps (Steinmetz) began to emerge from the long defile leading from Glatz to Nachod, and the Prussians had hardly gained room to form for action beyond its exit before they too were attacked. Steinmetz was a different man from Bonin, and easily held his own against the disconnected efforts of his adversary, ultimately driving the latter before him with a loss of upwards of 5000 men. Still the situation remained critical next day, for the I. corps having retreated, the Guard corps (next on its left) was endangered, and Steinmetz on his line of advance towards Skalitz (action of Skalitz, June 28th) could only count on the gradual support of the VI. corps. Benedek's resolution was, however, already on the wane. From the first his supply arrangements had been defective, and the requisitions made by his leading troops left nothing for the rest to eat. While trying to feed his army he omitted to fight it, and, with the chance of overwhelming the Prussians by one great effort of marching, he delayed the necessary orders till too late, and the Prussian II. army made good its concentration on the upper Elbe with insignificant fighting at Soor and Königinhof (Guard corps) on the 28th and 29th, and at Schweinschädel (Steinmetz) on the 29th, the Prussians in every encounter proving themselves, unit for unit, a match for their adversaries. It is customary to ascribe their successes to the power of the breech-loader, but there were actions in which it played no part, cavalry *versus* cavalry encounters, and isolated duels between batteries which gave the Prussian gunners a confidence they had not felt when first crossing the frontier.


Liebenau
Sichrow
Dauby
Lazan
Podol
Loukow
Hubalow
Iser
Plaukowitz
Wschen
Daubraw
Radwanowitz
Lankow
Mohelnitz
Zdar
Münchengrätz
Mankowitz
Ktowa
Bosin
Podkost
Libun
Kniznitz
Diletz
Kleinweisel
Bakow
Sobotka
Woharitz
Ob. Bautzen
Lochow
Gitschin
Unt. Bautzen
Robaus
Aulibitz
Kamenitz
Jung-Bunzlau
Sedlist
Butowes
Rokitan
Liban
Chomutitz
Hochweseli
Smidar
Neu-Bidschow
Hohenelbe
Elbe
Trautenau
Parschnitz
Arnau
Pilnikau
Neuschloss
Kottwitz
Neu-Paka
Soor
Kaile
Ob. Prausnitz
Prausnitz
Kosteletz
Rettendorf
Brzitz
Schlanei
Königinhof
Gradlitz
Nachod
Schurz
Miletin
Schweinschädel
Wysokow
Skalitz
Rikow
Horitz
Gr. Bürglitz
Jaromer
Josefstadt
Milowitz
Hnewcowes
Trotina
Klenitz
Sadowa
Smirsitz
Chlum
Bistritz
Nechanitz
Königgrätz
Adler
Hohenbruck
English Miles
0 1 2 3 4 5
Roads
Railways

BOHEMIAN CAMPAIGN
1866

Emery Walker sc.

Junction of the Prussian Armies.—By the morning of the 30th it was clear that the junction between the two armies could be completed, whenever desired, by a forward march of a few miles. But Moltke, wishing to preserve full freedom for manœuvre for each army, determined to preserve the interval between them, and began his dispositions to manœuvre the Austrians out of the position he had selected as the best for them to take up, on the left or farther bank of the Elbe.

This is so characteristic of von Moltke's methods and of the tactical preconceptions of the time that it deserves more detailed notice. Neither army had covered its front by a cavalry screen, both preferring to retain the mounted troops for battlefield purposes. Hence, though they were only a few miles apart, each was ignorant of the other's position. Moltke, knowing well the danger for a great army of being forced into a battle with an unfordable river behind it, and with his naturally strong bent towards the defensive in tactics, concluded that Benedek would elect to hold the left bank of the Elbe, between the fortified towns of Josephstadt and Königgrätz, with his right thrown back and covered by the lower courses of the Aupa and the Mettau. Frontal attack on such a position being out of the question, he decided, after weighing well the weaknesses of the Austrian flanks, to direct his principal efforts against the left (*i.e.* southern), although that entailed the uncovering of the communication of the II. army and a flank march of almost the whole of the I. and II. armies across the front of the Austrians in position. As an eminent French critic (General Bonnal) says, this was but to repeat Frederick the Great's manœuvre at Kolin (*q.v.*), and, the Austrians being where they actually were and not where Moltke decided they ought to be, the result might have been equally disastrous. Nevertheless the necessary movements were initiated by orders at noon on the 2nd of July, and one phrase in these saved the situation. According to these orders, the Elbe army was directed to Chlumetz on the way to Pardubitz, the I. army diagonally to the south-east across the front of the Austrian position. Two corps of the II. army were to make a demonstration against Josephstadt on the 3rd of July, and the other two were to move in a general direction south-west to keep touch with the I. Prince Frederick Charles was warned to guard the left flank of his marching troops and authorized to attack any forces of the enemy he might encounter in that direction, if not too strong for him. On receipt of these orders (about 3·30 p.m. July 2nd) the prince immediately despatched officers' patrols towards the Elbe, and about 6 p.m. these, having crossed the Bistritz, discovered the enemy in considerable force, at least three corps, behind the line of low hills which here border that stream. The remainder of the Austrian main body, the whole of which was in fact still on the right bank of the Elbe, was hidden from view behind high ground farther to the eastward.

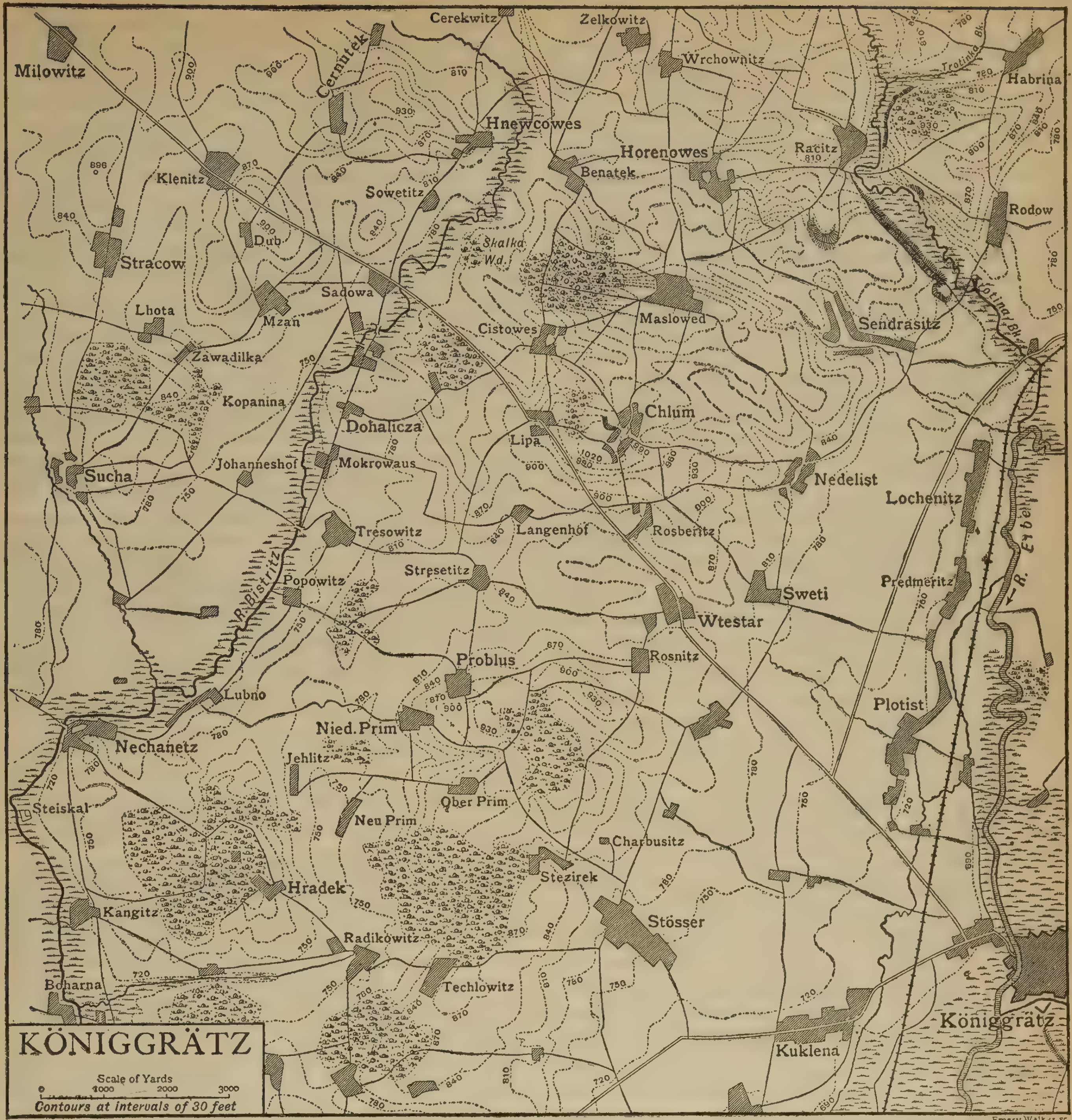
The 2nd of July.—The three Austrian corps were exactly the target Prince Frederick Charles desired. He promised himself with the I. and the Elbe armies an easy victory if he attacked them. Orders in this sense were issued about 7 p.m. They instructed every corps under his command to be in readiness for action towards the Bistritz at 3 a.m. on the 3rd, and in a concluding paragraph announced that the crown prince had been requested to co-operate from the north. A copy of the orders and an explanatory letter were in fact despatched to the II. army, another copy also went direct to the king. Both appear to have been delayed in transmission, for the former only reached the crown prince's quarters at 2 a.m. He was then asleep and had given orders that he was not to be awakened. His chief of the staff, Blumenthal, was absent at the royal headquarters, and since the bearer of the order had not been warned of the importance of the despatch he carried, no one roused the prince. At 3 a.m. Blumenthal returned and read the letter, and without troubling to disturb his chief he dealt with the matter himself in what is certainly one of the most remarkable documents ever issued in a grave crisis by a responsible staff officer. Briefly he informed Prince Frederick Charles that the orders for the II. army based on the instructions received from the royal headquarters, having been already issued, the co-operation of the I. corps alone might be looked for.

Meanwhile the duplicates had reached Moltke, and he, knowing well the temperament of the "Red Prince" and the impossibility of arresting the intended movement, obtained the royal sanction to a letter addressed to the crown prince, in which the latter was ordered to co-operate with his whole command. This vital despatch was sent off in duplicate at midnight and reached von Blumenthal at 4 a.m. In face of this no evasion was possible. Army orders were issued at 5 a.m., but still the urgency of the situation was so little understood that had they been verbally adhered to the force of the II. army could hardly have been brought to bear before 5 p.m., by which time the defeat of the I. army might well have been an accomplished fact. Fortunately, however, the initiative of the Prussian subordinates was sufficient to meet the strain.

Battle of Königgrätz (*Sadowa*).—Thick mist and driving rain delayed the I. and Elbe armies, but by 5 a.m. the troops had reached their allotted positions. The 7th division now moved forward, taking as point of direction the wood of Maslowed (or Swiep Wald), and supported on the right by the 8th division which was to seize the bridge of Sadowa. The leading troops of the former easily rushed the Austrian outposts covering the wood, but the reserves of the Austrian outposts counter-attacked. The firing drew other troops towards the critical point, and very shortly the wood of Maslowed became the scene of one of the most obstinate conflicts in military history. In about two hours the 12 Prussian battalions and 3 batteries found themselves assailed by upwards of 40 Austrian battalions and 100 guns, and against such swarms of enemies each man felt that retreat from the wood across the open meant annihilation. The Prussians determined to hold on at all costs. The 8th division, belonging to the same corps, could not see their comrades sacrificed before their eyes, and pushed on through Sadowa to relieve the pressure on the right of the 7th division. Meanwhile fresh Austrian batteries appeared against the front of the 8th division, and fresh Prussians in turn had to be engaged to save the 8th. Fortunately the Prussians here derived an unexpected advantage from the shape of the ground, and indeed from the weather. The heavy rain, which had delayed the commencement of the action, had swollen the Bistritz so as to check their advance and thus postpone the decision, whilst the mist and driving rain hid the approaching troops from the Austrian gunners, whose shells burst almost harmlessly on the sodden ground. Then when once across the stream it was discovered that unlike the normal slopes in the district the hillside in front of them showed a slight convexity under cover of which they were able to re-form in regular order. The advantage of the breech-loader now began to assert itself, for the Austrian skirmishers who covered the front of the guns could only load when standing up, while the Prussians lay down or fired from cover. The defenders were therefore steadily driven up the hill, and then cleared the front to give the guns room to act. But the Austrian gunners were intent on the Prussian batteries farther back, which as the light improved had come into action. The Prussian infantry crept nearer and nearer, till at under 300 yds. range and from cover they were able to open fire on the Austrian gunners under conditions which rendered the case fire of the latter practically useless; but here was the opportunity a great cavalry leader on the Austrian side might have seized to restore the battle, for the ground, the shortness of the distance and the smoke and excitement of the cannonade were all in favour of the charge. Such a charge as prelude to the advance of a great infantry bayonet attack must have swept the exhausted Prussians down the hill like sheep, but the opportunity passed, and the gunners finding their position untenable, limbered up, not without severe losses, and retired to a second position in rear. This withdrawal took place about 2 p.m., and the crisis on the Prussian side may be said to have lasted from about 11 a.m. By this time every infantry soldier and gun within call had been thrown into the fight, and the Austrians might well have thrown odds of three to one upon the Prussian centre and have broken it asunder.

Arrival of the II. Army.—But suddenly the whole aspect of affairs was changed. The 2nd and 4th Austrian corps found themselves all at once threatened in flank and rear by heavy masses of Prussian infantry, the leading brigades of the crown prince's army, and they began to withdraw towards the centre of their position in ordered brigade masses, apparently so intent on keeping their men in hand that they seem never to have noticed the approach of the Prussian reserve artillery of the Guard which (under Prince Kraft zu Hohenlohe-Ingelfingen) was straining forward over heavy soil and through standing corn towards their point of direction, a clump of trees close to the tower of the church of Chlum. Not even deigning to notice the retreating columns, apparently too without escort, the batteries pressed forward till they reached the summit of the ridge trending eastward from Chlum towards the Elbe, whence the whole interior of the Austrian position was disclosed to them, and then they opened fire upon the Austrian reserves which lay below them in solid masses of army corps. Occurring about 2.30, and almost simultaneously with the withdrawal of the Austrian guns on their left already alluded to, this may be said to have decided the battle, for although the Saxons still stood firm against the attacks of the Elbe army, and the reserves, both cavalry and infantry, attempted a series of counterstrokes, the advantage of position and moral was all on the side of the Prussians. The slopes of the position towards the Austrians now took on the usual concave section, and from the crest of the ridge every movement could be seen for miles. The Austrian cavalry, on weak and emaciated horses, could not gallop at speed up the heavy slopes ($\frac{1}{20}$), and the artillery of both Prussian wings practically broke every attempt of the infantry to form for attack.

Close of the Battle.—Still the Austrians made good their retreat. Their artillery driven back off the ridges formed a long line from Stösser to Plotist facing the enemy, and under cover of its fire the infantry at length succeeded in withdrawing, for the Prussian reserve cavalry arrived late on the ground, and the local disconnected efforts of the divisional cavalry were checked by the still intact Austrian squadrons. Whereas at 2.30 absolute destruction seemed the only possible fate of the defeated army, by 6 p.m., thanks to the devoted heroism of the artillery and the initiative of a few junior commanders of cavalry,


KÖNIGGRÄTZ
Scale of Yards
0 1000 2000 3000
Contours at intervals of 30 feet
Milowitz
Cerekwitz
Zelkowitz
Wrchownitz
Habrina
Cernitek
Hnewcowes
Horenowes
Benatek
Racitz
Trotinka Bk.
Rodow
Klenitz
Sowetitz
Dub
Skalka Wd.
Stracow
Sadowa
Maslowed
Sendrasitz
Lhota
Mzan
Cistowes
Zawadilka
Kopanina
Chlum
Dohalicza
Lipa
Sucha
Johanneshof
Mokrowaus
Nedelist
Lochenitz
Tresowitz
Langenhof
Rosberitz
R. Bistritz
Popowitz
Stresetitz
Sweti
Predmeritz
R. Elbe
Wtestar
Problus
Rosnitz
Lubno
Plotist
Nied. Prim
Nechanetz
Jehlitz
Ober Prim
Steiskal
Neu Prim
Charbusitz
Stezirek
Hradek
Kangitz
Stösser
Radikowitz
Boharna
Techlowitz
Königgrätz
Kuklena

Emery Walker sc

it had escaped from the enclosing horns of the Prussian attack. In spite of heavy losses the Austrians were perhaps better in hand and more capable of resuming the battle next morning than the victors, for they were experienced in war, and accustomed to defeat, and retired in good order in three organized columns within easy supporting distance of each other. On the other hand, the Prussians were new to the battlefield, and the reaction after the elation of victory was intense; moreover, if what happened at Hühnerwasser affords a guide, the staff would have required some days to disentangle the units which had fought and to assign them fresh objectives.

Final Operations.—The convergence of the Prussian armies on the battlefield ended in the greatest confusion. The Elbe army had crossed the front of the I. army, and the II. army was mixed up with both. The reserve cavalry reached the front too late in the day to pursue. Thus the Austrians gained 24 hours, and the direction of their retreat was not established with any degree of certainty for several days. Moreover the little fortresses of Josephstadt and Königgrätz both refused to capitulate, and the whole Prussian armies were thus compelled to move down the Elbe to Pardubitz before they could receive any definite new direction. Meanwhile Benedek had in fact assigned only one corps with the reserve cavalry to oppose a Prussian advance towards Vienna, and the remaining seven retired to Olmütz, where they were on the flank of a Prussian advance on Vienna, and had all the resources of Hungary behind them to enable them to recuperate. They were also still in railway communication with the capital. On purely military grounds the Prussians should have marched at once towards the Austrian field army, *i.e.* to Olmütz. But for political reasons Vienna was the more important objective, and therefore the I. and Elbe armies were directed towards the capital, whilst the II. army only moved in the direction of the Austrian main body. Political motives had, however, in the meantime exercised a similar influence on the Austrian strategy. The emperor had already consented to cede Venetia to Italy, had recalled two corps from the south (see ITALIAN WARS, 1848–1870) to the capital, and had appointed the archduke Albert to command the whole army. The Army of the North, which had reached Olmütz on the 10th of July, now received orders to move by road and rail towards Vienna, and this operation brought them right across the front of the II. Prussian army. The cavalry established contact on the 15th in the neighbourhood of Tobitschau and Rochetinitz (action of Tobitschau, July 15th), and the Austrians finding their intention discovered, and their men too demoralized by fear of the breech-loader to risk a fresh battle, withdrew their troops and endeavoured to carry out their concentration by a wide circuit down the valley of the Waag and through Pressburg. Meanwhile the Prussian main army was pursuing its advance under very adverse circumstances. Their railway communication ended abruptly at the Austrian frontier; the roads were few and bad, the country sparsely cultivated and inhospitable, and the troops suffered severely. One third of the cavalry broke down on a march of 97 m. in five days, and the infantry, after marching 112 m. in ten days, had to have a two days' halt accorded them on the 17th. They were then in the district about Brünn and Iglau, and on the 18th the royal headquarters reached Nikolsburg. News had now been received of the arrival of Austrian reinforcements by rail at the capital both from Hungary and Italy, and of the preparation of a strong line of provisional defences along the Florisdorf position directly in front of Vienna. Orders were therefore issued during the 18th for the whole army to concentrate during the following days in the position held by the Austrians around Wagram in 1809, and these orders were in process of execution when on the 21st an armistice was agreed upon to commence at noon on the 22nd. The last fight was that of Blumenau near Pressburg on the 22nd; this was broken off at the stated time.

Langensalza.—In western Germany the Prussian forces, depleted to the utmost to furnish troops for the Bohemian campaign, were opposed to the armies of Hanover and Bavaria and the 8th Federal corps (the last consisting of Hessians, Württembergers, Badensers and Nassauers with an Austrian division drawn from the neutralized Federal fortresses), which were far superior in number. These minor enemies were, however, unready and their troops were mostly of indifferent quality. Hanover and Hesse-Cassel, which were nearest to Prussia and therefore immediately dangerous, were dealt with promptly and without waiting for the decision in the main theatre of war. The 13th Prussian division (v. Goeben) was at Minden, Manteuffel's troops from the Elbe duchies at Altona, v. Beyer's division (Federal fortress garrisons) at Wetzlar. On the 15th and 16th of June Beyer moved on Cassel, while the two other Prussian generals converged on Hanover. Both places were in Prussian hands before the 20th. The Hessians retired upon Hanau to join the 8th Federal corps; only the Hanoverians remained in the north, and they too, threatened by Beyer's advance, marched from their point of concentration at Göttingen southward for the Main. With proper support from Bavaria the Hanoverians could perhaps have escaped intact; but the Bavarians considered that their allies (about 20,000) were strong enough by themselves to destroy whichever of the converging Prussian columns tried to bar their way, and actually the Hanoverian general v. Arentschild won a notable success over the improvised Prussian and Coburg division of General v. Flies, which advanced from Gotha and barred the southward march of the Hanoverians at Langensalza. The battle of Langensalza (June 27th) showed that the risks Moltke deliberately accepted when he transferred so many of the western troops to the Bohemian frontier were by no means imaginary, for v. Flies, outnumbered by two to one, sustained a sharp reverse before the other columns closed in. But the strategical object of General Vogel v. Falckenstein, the Prussian commander-in-chief in the west, was achieved next day. By the morning of the 29th Manteuffel and Goeben lay north, v. Flies's column (backed by a fresh brigade) south of Langensalza, and Beyer approached from Eisenach. Whatever had been the prospects of the Hanoverian army five days previously, it was now surrounded by twice its numbers, and on the 29th of June the capitulation of Langensalza closed its long and honourable career.

The Main Campaign.—The Prussian army, now called the "Army of the Main," of three divisions (one being unusually strong), had next to deal with the 7th (Bavarians) and 8th (other South Germans) Federal corps in the valley of the Main. These were nominally over 100,000 strong and were commanded by Prince Charles of Bavaria. The *ordre de bataille* of the 8th corps is interesting. It was commanded by Prince Alexander of Hesse; the 1st division (3 infantry brigades, 1 cavalry brigade, 6 batteries) came from Württemberg; the 2nd division (2 infantry and 1 cavalry brigades, 5 batteries) from Baden, the least anti-Prussian of all these states; the 3rd division (2 infantry and 1 cavalry brigades, 1 rifle battalion, 4 batteries) from Hesse-Darmstadt; the 4th division consisted of an Austrian brigade of 7 battalions (three of which were Italians), a Nassau brigade, and two batteries and some hussars of Hesse-Cassel. The remainder of the Hesse-Cassel troops, which had retired southward before Beyer's advance on Cassel, went to the Rhine valley about Mainz. The centre of the *rayon* of the 8th corps was Darmstadt, and the Bavarian line extended from Coburg to Gemünden. It appears that Prince Charles wished to march via Jena and Gera into Prussia, as Napoleon had done sixty years before, but the scheme was negatived by the Austrian government, which exercised the supreme command of the allies. The Bavarians did, however, advance, and made for the Eisenach-Gotha region, where the Prussian-Hanoverian struggle was in progress. Meanwhile the 8th Federal corps advanced also, but actuated probably by political motives it took the general direction of Cassel, and between the two German corps a wide gap opened, of which Vogel v. Falckenstein was not slow to take advantage. On the day of Königgrätz the Prussians moved into position to attack the Bavarians, and on the 4th of July v. Goeben won the victory of Wiesenthal (near Dermbach). The 7th corps thereupon drew back to the Franconian Saale, the 8th to Frankfurt, and on the 7th of July the Prussian army was massed about Fulda between them. Vogel v. Falckenstein moved forward again on the 8th, and on the 10th the Bavarians were again defeated in a series of actions around Kissingen, Waldaschach and Hammelburg. Meanwhile Prince Alexander's motley corps began its advance from Frankfurt up the Main valley to join the Bavarians, who had now retired on Schweinfurt. The army of the Main, however, had little difficulty in defeating the 8th corps at Laufach on the 13th and Aschaffenburg on the 14th of July. The Prussians occupied Frankfurt (16th). Vogel v. Falckenstein was now called to Bohemia, and v. Manteuffel was placed in command of the army of the Main for the final advance. The 7th and 8th corps now at last effected their junction about Würzburg, whither the army of the Main marched from Frankfurt to meet them. The Federals advanced in their turn, the Bavarians on the right, the 8th on the left, and the opponents met in the valley of the Tauber. More partial actions, at Hundheim (23rd), Tauber Bischofsheim (24th), Gerchsheim (25th), Helmstadt (25th) and Rossbrunn (26th) ended in the retreat of the Germans to Würzburg and beyond; the armistice (Aug. 2nd) then put an end to operations. A Prussian reserve corps under the grand duke of Mecklenburg-Schwerin, formed at Leipzig, had meanwhile overrun eastern Bavaria up to Nuremberg.

This campaign presents the sharpest contrast to that of Bohemia. Small armies moving freely within a large theatre of war, the occupation of hostile territory as a primary object of operations, the absence of a decision-compelling spirit on either side, the hostile political "view" over-riding the hostile "feeling"—all these conditions remind the student of those of 17th and 18th century warfare. But the improved organization, better communications and supplies, superior moral, and once again the breech-loader *versus* a standing target, which caused the Prussian successes, at least give us an opportunity of comparing the old and the new systems under similar conditions, and even thus the principle of the "armed nation" achieved the decision in a period of time which, for the old armies, was wholly insufficient.

The various treaties of Prague, Berlin and Vienna which followed the armistice secured the annexation by Prussia of Hanover, the Elbe duchies, the electorate of Hesse, Nassau and Frankfurt, the dissolution of the existing confederation and the creation of a new North German Confederation under the hegemony of Prussia, and the payment of war indemnities to Prussia (the Austrian share being £6,000,000). Venetia was ceded by Austria to Napoleon III. and by him to King Victor Emmanuel.

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SEVEN WISE MASTERS, THE, a cycle of stories of Oriental origin. A Roman emperor causes his son to be educated away from the court in the seven liberal arts by seven wise masters. On his return to court his stepmother the empress seeks to seduce him. To avert some danger presaged by the stars he is bound over to a week's silence. During this time the empress accuses him to her husband, and seeks to bring about his death by seven stories which she relates to the emperor; but her narrative is each time confuted by tales of the craft of women related by the sages. Finally the prince's lips are unsealed, the truth exposed, and the wicked empress is executed.

The cycle of stories, which appears in many European languages, is of Eastern origin. An analogous collection occurs in Sanskrit, but the Indian original is unknown. Travelling from the east by way of Arabic, Persian, Syriac and Greek, it was known as the book of Sindibâd, and was translated from Greek into Latin in the 12th century by Jean de Hauteseille (Joannes de Alta Silva), a monk of the abbey of Haute-Seille near Toul, with the title of *Dolopathos* (ed. H. Oesterley, Strassburg, 1873). This was translated into French about 1210 by a *trouvère* named Herbers as *Li Romans di Dolopathos*; another French version, *Li Romans des sept sages*, was based on a different Latin original. The German, English, French and Spanish chap-books of the cycle are generally based on a Latin original differing from these. Three metrical romances probably based on the French, and dating from the 14th century, exist in English. The most important of these is *The Sevyn Sages* by John Rolland of Dalkeith edited for the Bannatyne Club (Edinburgh, 1837).

The Latin romance was frequently printed in the 15th century, and Wynkyn de Worde printed an English version about 1515. See G. Paris, *Deux Rédactions du roman des sept sages de Rome* (Paris, 1876, Soc. des. anc. textes fr.); Büchner, *Historia septem sapientium* . . . (Erlangen, 1889); K. Campbell, *A Study of the Romance of the Seven Sages with special reference to the middle English versions* (Baltimore, 1898); D. Comparetti, *Researches respecting the Book of Sindibâd* (Folk-Lore Soc., 1882).

SEVEN WISE MEN OF GREECE, THE, a collective name for certain sages who flourished *c.* 620–550 B.C. The generally accepted list is Bias, Chilon, Cleobulus, Periander, Pittacus, Solon, Thales (see separate articles), although ancient authorities differ as to names and number. They obtained great influence in their respective cities as legislators and advisers, and a reputation throughout the Greek world. Their rules of life were embodied in poems and short sayings in common use.

See O. Bernhardt, *Die sieben Weisen Griechenlands* (1864); F. Bohren, *De septem sapientibus* (1867); "Septem sapientium carmina et apophthegmata," with short biographies in F. Mullach, *Fragmenta philosophorum Graecorum*, i. (1860); H. Wulf in *Dissertationes philologicae Halenses*, xiii. (1896).

SEVEN WONDERS OF THE WORLD, the name conferred on a select group of ancient works of art which had obtained pre-eminence among the sight-seers of the Alexandrian era. The earliest extant list, doubtless compiled from the numerous guide books then current in the Greek world, is that of the epigrammatist Antipater of Sidon (2nd century B.C.). A second and slightly divergent list from the hand of a Byzantine rhetorician has been incorporated in the works of Philo of Byzantium. The monuments are as follows: (1) the pyramids of Egypt, (2) the gardens of Semiramis at Babylon, (3) the statue of Zeus at Olympia (see PHEIDIAS), (4) the temple of Artemis at Ephesus, (5) the Mausoleum at Halicarnassus (see MAUSOLEUM), (6) the Colossus at Rhodes, (7) the Pharos (lighthouse) of Alexandria, or the Walls of Babylon.

See "Philo" *De septem mundi miraculis* (ed. Hercher, Paris, 1858).

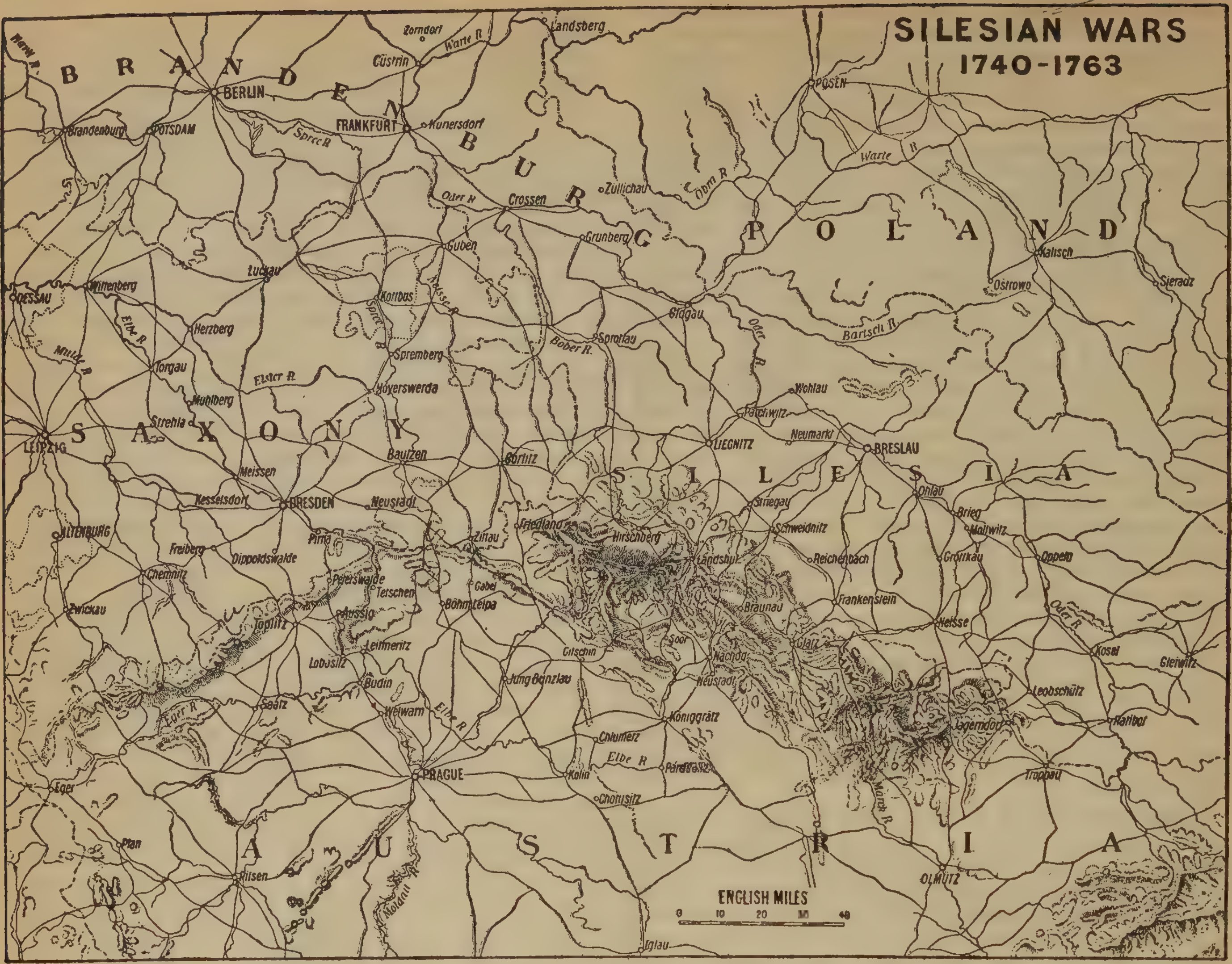
SEVEN YEARS' WAR (1756–1763), the name given to the European war which arose from the formation of a coalition between Austria, France, Russia, Sweden and Saxony against Prussia, with the object of destroying, or at least crippling, the power of Frederick the Great. Prussia was joined by England, and between England and France, as usual, a maritime and colonial war broke out at the first pretext; this war laid the foundations of the British empire, for ere the seven campaigns had been fought in Europe, the French dominion in Canada and the French influence in India, in spite of Dupleix, Lally and Montcalm, had been entirely overthrown by the victories of Clive, Amherst and Wolfe. Great as was the effect of these victories on the history of the world, however, it is at least questionable whether the steadfast resistance of Prussia, almost single-handed as she was—the resistance which laid the solid, if then unseen, foundations of modern Germany—is not as important a phenomenon, and from the technical military standpoint Rossbach and Leuthen, Zorndorf and Kunersdorf possess an interest which it would be possible perhaps to claim for Plassy and for Quebec, but not for border conflicts in Canada and India. It is not only battles, the distinct and tangible military events, that make up the story of Frederick's defence. There are countless marches and manœuvres, devoid of interest as regards their details; but, as indications of the equilibrium of forces in 18th-century warfare, indispensable to a study of military history as a whole.

Pirna.

Learning of the existence and intentions of the coalition, Frederick determined to strike first, and to that end, during the months preceding the outbreak of hostilities, he concentrated his 150,000 men as follows:—11,000 men in Pomerania to watch the Swedes, 26,000 on the Russian frontier, 37,000 men under Field Marshal Schwerin in Silesia, and a main body of 70,000 in three columns ready to advance into Saxony at a moment's notice, the king being in chief command. On the 29th of August 1756 the Saxon frontier was crossed. Dresden was occupied on the 10th of September, the Saxon army, about 14,000 strong, falling back before the invaders to the entrenched camp of Pirna, an almost inaccessible plateau parallel to the Elbe and close to the Bohemian frontier. The secret of the Prussian intentions had been so well kept that the Austrians were still widely disseminated in Bohemia and Moravia. 32,000 men under Field Marshal Browne were at Kolin, and 22,000 under Piccolomini at Olmütz, when on the 31st of August the news of the invasion arrived, and such was their unreadiness that Browne could not advance till the 6th of September, Piccolomini until the 9th. Meanwhile the Prussians, leaving detachments to watch the exits from Pirna, moved up the Elbe and took post at Aussig to cover the investment of the Saxons. Learning of Browne's approach on the 28th of September, the king, assuming the command of the covering force, advanced yet farther up the Elbe to meet him, and the two armies met at Lobositz (opposite Leitmeritz) on the morning of the 1st of October. The battle began in a thick fog, rendering dispositions very difficult, and victory fell to the Prussians, principally owing to the tenacity displayed by their infantry in a series of disconnected local engagements. The nature of the ground rendered pursuit impossible, and the losses on both sides were approximately equal—viz. 3000 men—but the result sealed the fate of the Saxons, who after a few half-hearted attempts to escape from their entrenchments, surrendered on the 14th of October, and were taken over bodily into the Prussian service. Prussian administrators were appointed to govern the captured country and the troops took up winter quarters.

Battle of Prague.

Campaign of 1757.—The Coalition had undertaken to provide 500,000 men against Prussia, but at the beginning of the year only 132,000 Austrians stood ready for action in northern Bohemia. Against these the king was organizing some 250,000, 45,000 of whom were paid for by British subsidies and disposed to cover Hanover from a French attack. After leaving detachments to guard his other frontiers, Frederick was able to take the field with nearly 150,000 men, but these also were scattered to guard a frontier some 200 m. in length—the left wing in Silesia under Schwerin and the duke of Brunswick-Bevern, the centre and right under the king. In April the operations began. Schwerin and Bevern crossed the mountains into Bohemia and united at Jung Bunzlau, the Austrians falling back before them and surrendering their magazines. The king marched from Pirna and Prince Maurice of Dessau from Zwickau on Prague, at which point the various Austrian commands were ordered to concentrate. On the morning of the 5th the whole army, except a column under Field Marshal Daun, was united here under Prince Charles of Lorraine, and the king, realizing the impossibility of

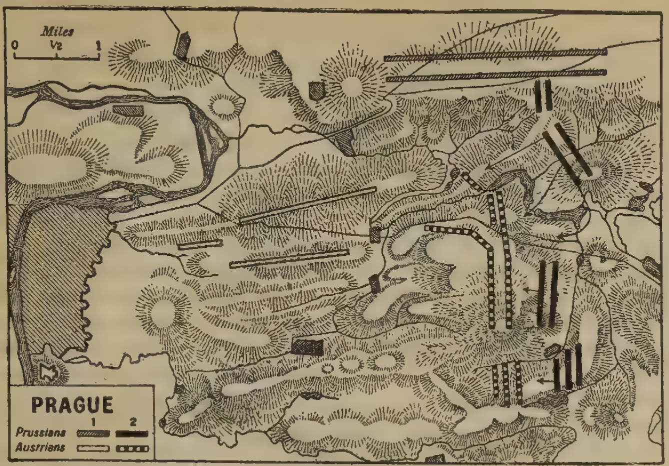

SILESIAN WARS
1740-1763
BRANDENBURG
POLAND
SAXONY
SILESIA
AUSTRIA
BERLIN
POTSDAM
Brandenburg
FRANKFURT
Kunersdorf
Zorndorf
Cüstrin
Landsberg
Posen
Warte R.
Spree R.
Oder R.
Crossen
Züllichau
Grünberg
Guben
Luckau
Kottbus
Wittenberg
Dessau
Herzberg
Torgau
Elster R.
Mulde R.
Elbe R.
Spremberg
Hoyerswerda
Sprottau
Bober R.
Glogau
Wohlau
Kalisch
Ostrowo
Sieradz
Bartsch R.
Muhlberg
Strehla
Leipzig
Meissen
Bautzen
Görlitz
Liegnitz
Neumarkt
BRESLAU
Kesselsdorf
DRESDEN
Neustadt
Pirna
Zittau
Friedland
Hirschberg
Striegau
Schweidnitz
Ohlau
Brieg
Mollwitz
Altenburg
Freiberg
Dippoldiswalde
Chemnitz
Peterswalde
Tetschen
Gabel
Landshut
Reichenbach
Grottkau
Oppeln
Zwickau
Töplitz
Aussig
Böhm Leipa
Braunau
Frankenstein
Neisse
Leitmeritz
Lobositz
Gitschin
Soor
Nachod
Glatz
Kosel
Gleiwitz
Budin
Jung Bunzlau
Neustadt
Leobschütz
Saaz
Welwarn
Königgrätz
Jägerndorf
Ratibor
Eger R.
Chlumetz
Elbe R.
Pardubitz
Troppau
Eger
PRAGUE
Kolin
Chotusitz
March R.
Plan
Pilsen
Moldau R.
OLMÜTZ
Iglau
ENGLISH MILES
0 10 20 30 40

storming the heights before him, left a corps under Keith and a few detachments to watch Prague and the fords across the river, and marched during the night upstream and, crossing above the Austrian right, formed his army (about 64,000) for attack at right angles to the Austrian front. The ground had not been reconnoitred, and in the morning mist many mistakes in the deployment had been made, but as Daun was known to be but 20 m. away and the Austrian army was changing its front to meet the unexpected attack, the king threw caution to the winds and sending Zieten with his cavalry by a wide détour to cover his left, he ordered the whole to advance. One of the most savage battles in history was the result. Almost immediately the Prussian infantry became entangled in a series of morasses, the battalion guns had to be left behind and the troops had to correct their alignment under the round shot fired by the Austrians, who had completed their change of front in time and now stood ready to sweep the open glacis before them. Before the storm of bullets and the grape and canister of the heavy and battalion guns the Prussian first line faltered and fell in thousands. Their attempts to prepare the way for the bayonet assault broke down. Schwerin was killed. But the second line carried the survivors on, and in the nick of time Zieten's cavalry drove the Austrian horsemen off the field and broke in on the flank and rear of their infantry. This turned the scale, and the Austrians retreated into Prague in hopeless confusion, leaving some 10,000 men (14·8%) on the ground, and 4275 prisoners, out of about 66,000, in their enemy's hands. The Prussians lost 11,740 men killed and wounded and 1560 prisoners, and in all 20·8% of their strength. The actual fighting seems only to have lasted about two hours, though firing did not cease till late at night; 16,000 Austrians managed in the confusion to evade capture and join Daun, who made no movement either on this or succeeding days to come to the assistance of his comrades, but began a leisurely retreat towards Vienna.

Kolin.

The Prussians immediately began the siege of the town, and after a month's delay Daun, now at the head of some 60,000 men, moved forward to the relief of the city. Learning of his approach, the king, taking with him all the men who could be spared from the investment and uniting all available detachments, moved to meet him with only 34,000 men, and on the 18th of June he found Daun strongly entrenched. He immediately endeavoured to march past him and attack him on the right flank as at Prague, but the Austrian light troops harassed his columns so severely during the movement that without orders they wheeled up to drive them off and, being thus thrown into disarray, they took three divergent objectives. Their disunited attacks all fell upon superior numbers, and after a most obstinate struggle they were badly beaten with a loss in killed and wounded of 6710 (18·6%) and 5380 prisoners with 22 colours and 45 guns. The fighting lasted 5½ hours. The Austrian loss was only 8000 out of 53,500, or 15·2%, of whom only 1500 were taken prisoners.

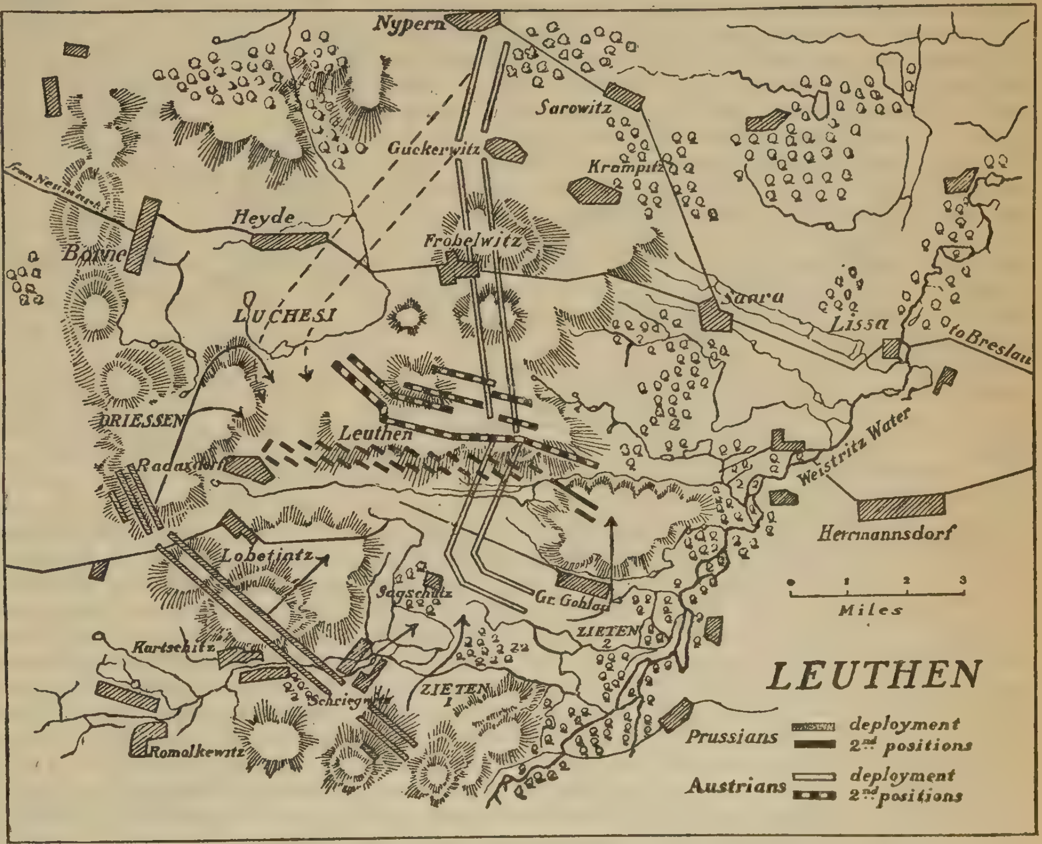
This disaster entailed raising the siege of Prague, and the Prussians fell back on Leitmeritz. The Austrians, reinforced by the 48,000 troops in Prague, followed them 100,000 strong, and, falling on Prince August Wilhelm of Prussia, who was retreating eccentrically (for commissariat reasons) on Zittau, inflicted a severe check upon him. The king was compelled to abandon Bohemia, falling back on Bautzen. Having re-formed his men and calling in Keith's 27,000 men from Pirna, he again advanced, but found the enemy so strongly posted at Burkersdorf (south of Bischofswerda) that he relinquished his purpose and retreated on Bernstadt.



Frederick in the west.

Rossbach.

Meanwhile his enemies had been gathering around him. France had despatched 100,000 men under d'Estrées against Hanover, where Cumberland with 54,000 stood to meet him, and another 24,000 men were marching through Franconia to unite with the "Army of the Holy Roman Empire" under the prince of Saxe-Hildburghausen. Fortunately this latter army was not as formidable as its title, and totalled only some 60,000 most undisciplined and heterogeneous combatants. In the north 100,000 Russians under Apraxin were slowly advancing into East Prussia, where Lehwald with 30,000 was preparing to confront them, and 16,000 Swedes had landed in Pomerania. On the 26th of June Cumberland had been beaten at Hastenbeck by d'Estrées, and the French overran Hanover and Brunswick. The king, leaving Bevern with only 13,600 men in Silesia to watch the Austrians, began to march across Germany to succour Cumberland. Arrived at Leipzig on the 3rd of September, he heard of Lehwald's defeat at Gross-Jägerndorf on the 30th of August and immediately afterwards of Cumberland's convention of Kloster Seven, which gave up Hanover to the French. Fearing that the French army now set free in Hanover might unite with the Army of the Empire under Hildburghausen and with 150,000 men march direct on Berlin, Frederick, taking with him 23,000 men, marched to join Prince Ferdinand in the district about Halberstadt, hoping to strike his blow before the enemy's junction could be completed. Mobility, therefore, was the first consideration, and arrangements for supply having been made in advance along his road, his troops covered 170 m. in 12 days (September 1–13). But Hildburghausen, not having been joined by d'Estrées, refused to fight and fell back into the wooded districts of Thuringia and Franconia. Bad news now reached Frederick from Silesia; leaving Ferdinand to observe Hildburghausen, he marched with all haste to Eckersberg to support Bevern. Arrived here, he found more bad news from Berlin, which had been entered by a body of Austrian raiders under Hadik and plundered. Prince Maurice and Seydlitz were sent by forced marches to its aid, and before them Hadik retired at once (October 18th). Finding the Austrians for the moment quiescent and hearing that Hildburghausen was again advancing, the king now concentrated all available men on Leipzig and marched to support Prince Ferdinand. Hildburghausen took up a position about Meucheln on the 2nd of November, and on the 5th moved off to repeat Frederick's manœuvre of Prague against its inventor. The battle of Rossbach (*q.v.*) followed. In this Seydlitz and the Prussian cavalry won imperishable renown. Aided only by the fire of 18 guns and of 7 battalions of infantry, only two of which fired more than five rounds, the Prussian squadrons swept down upon the marching columns of the Allies and in about 40 minutes the whole 64,000 were in full flight. Never was a victory more timely, for the Prussian army was almost worn out and more bad news was even then on the way.



Bevern in Silesia, who had been beaten at Moys near Görlitz (September 7th) and in the battle of Breslau on the 22nd of October, had been compelled to retire behind the Oder, leaving the fortresses of Schweidnitz and Breslau to their fate, and both had capitulated within a few days. Leaving a small reinforcement for Ferdinand, the king now moved by forced marches to Liegnitz. The distance, about 170 m. through difficult country, was covered again in 12 days, but the numbers were small, only 13,000, which shows how tremendous had been the drain upon the men of the previous six weeks' exertions. On the night of the 4th of December, having joined the beaten forces of Bevern at Parschwitz, making in all 43,000 men of very unequal fighting value, he decided to attack the 72,000 Austrians who lay across the Breslau road, their centre marked by the village of Leuthen (*g.v.*). His position appeared so desperate that he sent for all his generals, laid the facts before them, announced his decision to attack and offered to accept any man's resignation without prejudice to his character should he deem the risk too hazardous. Needless to say, not one accepted the offer.

Leuthen.

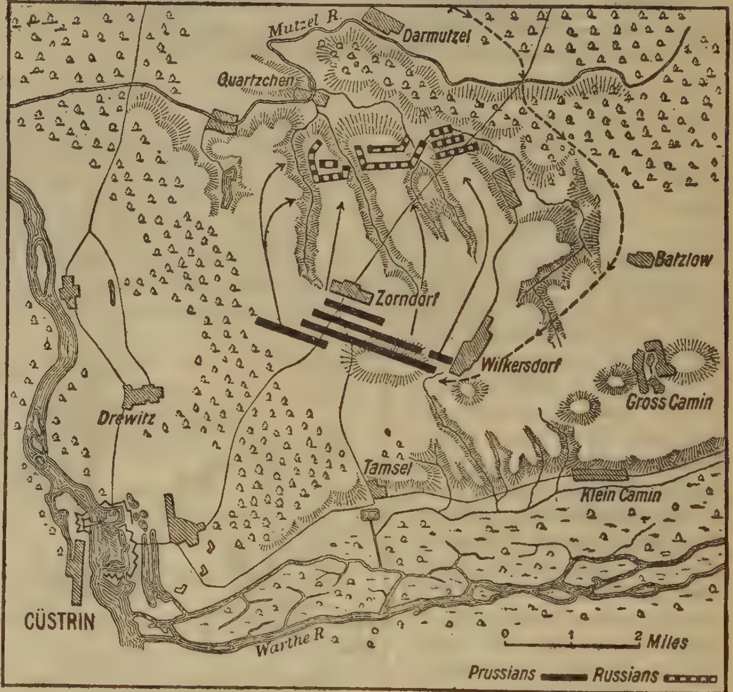
Covered by the low rolling hillocks of the district, the army now moved off to its right across the Austrian front, the advance led by Zieten and half the cavalry, the rear covered by Driessen with the remaining half—some 40 weak squadrons. The infantry having gained a position sufficiently on the Austrian flank, now wheeled into line and attacked in échelon of battalions from the right. The battle soon became desperate, and the Austrian cavalry on their right wing under Luchesi, unaware of Driessen's presence as a flank guard, issued out of their lines, wheeled to their left and swept down upon the refused flank of the Prussian infantry; but they never reached them, for Driessen, seizing his opportunity, set his squadrons in motion and attacked. The Austrians, completely surprised, were ridden down and driven back on to the front of their own infantry, and the pressure of the fugitives threw the rear of their left wing into confusion and in a short time the ruin of their army was completed. When the news of Driessen's charge was brought to the king his astonishment was expressed in the single phrase, "What, that old fool Driessen?" The fighting, however, had been desperate, and though the Austrians out of their 72,000 lost 37% including 20,000 prisoners, with 116 guns and 51 colours, the Prussians lost 6200 (14%) making with the other battles of the year a total of nearly 75,000 men, and not including losses in minor skirmishes and on the march.

Campaign of 1758.—The raid upon Berlin had accomplished nothing, and the advance of the Russian main body had died out for want of resolution to seize the opportunities offered by Frederick the Great's absence. The Czarina, annoyed by his slowness, recalled Apraxin and appointed Fermor in his place. Utilizing the winter snows, he collected some 31,000 men and crossed the frontiers of East Prussia (January 10th, 1758) and attempted to annex the province, driving out all the Prussian officials who refused to swear fealty to Elizabeth. This took time, and when the period of thaw supervened the Russians were immobilized and could not advance until approaching summer had dried the roads again. For the moment, therefore, no danger threatened Frederick from this quarter, and Rossbach had effectually tamed the French. The Swedes, too, showed little energy, the "roadless" period affecting them equally with the Russians.

Siege of Olmütz.

Frederick therefore resolved to seize the opportunity to renew his invasion of Austria. As a beginning he recaptured Schweidnitz in April with 5000 prisoners. The Austrian field army under Daun lay about Königgrätz, covering all the passes out of Silesia; but covered by the newly formed "Free Corps" (his answer to the semi-savage Croats, Pandours and Tolpatches of the Austrians), Frederick marched right across their front on Olmütz, whilst a special corps (30,000) under Prince Henry threatened their left from Saxony and the Elbe. He had with him about 40,000 men. But Olmütz lay 90 m. from the Prussian frontier, and the Austrian light troops swarmed in the intervening district. Ultimately a great Prussian convoy was destroyed in the action of Domstädl, and the siege of Olmütz had to be raised (July 1st); but instead of marching back the way he had come Frederick led his troops through Bohemia practically in the rear of Daun's army, and on the 14th of July entered Daun's empty entrenchments at Königgrätz. Fermor's Russians were now again in the field and had reached Posen, burning and plundering horribly. By skilful manœuvring the king deceived the Austrians till the roads to Silesia by Skalitz and Nachod were open and then by a rapid march passed over into Silesia, reaching Grüssau (near Landshut) on the 8th of August. Leaving Keith with half his force to hold this district, he then marched to Frankfurt-on-the-Oder, taking with him only some 15,000 men, to strengthen the wing already engaged against the Russians. Frankfurt was reached on the 20th of August. Fermor was then besieging Cüstrin with 52,000 men, and hearing of the king's approach he raised the siege and placed himself behind a formidable obstacle facing north, near Zorndorf, from which direction the king was approaching. Seeing that the same obstacle that prevented him from attacking the Russians prevented them equally from attacking him, the king marched right round Fermor's eastern flank—the Russians gradually forming a fresh front to meet him—so that when the Prussian attack began on the morning of the 25th of August they stood in three irregular squares, divided from each other by marshy hollows, and thus unable to render one another support. The king made his first effort against the square on the right—Seydlitz with his squadrons covering the movement. But the Russian troops fought with far more spirit than the Austrians had ever shown, and things were going very badly with the Prussians when Seydlitz, who in the meanwhile had succeeded in making paths across the Zaberngrund on which the Russian right rested, flung himself upon the great square, and rode over and destroyed the whole mass in a prolonged mêlée in which quarter was neither given nor asked. Relieved by this well-timed charge, the king now re-formed the infantry already engaged, and concentrated all his efforts on the south-west angle of the great centre square. Again the Russians more than held their own, issuing forth from their squares and capturing many field-pieces. Some of the Prussian infantry was actually broken and in full flight when Seydlitz, with his ranks re-formed and his horses rested, returned and again threw himself upon the square exactly as on the previous occasion and with the same result—the square, as a formation, was broken, but groups still stood back to back and the most savage butchery ensued. The combatants could not be separated and only darkness put a stop to the slaughter. Of 36,000 Prussians 12,500 were killed or wounded, 1000 prisoners or missing (37·5%), and of 42,000 Russians about 21,000 had fallen (50%).

Zorndorf.



In the night the survivors gradually rallied, and morning found the Russians in a fresh position a couple of miles to the northward, but Frederick's troops were too weary to renew the attack. Gradually the Russians withdrew towards Landsberg and Königsberg, and the king, leaving Dohna to follow them up, marched with the remainder of his forces on the 2nd of September for Saxony, covering 22 m. a day. They arrived only in the nick of time, for Daun had united with portions of the Empire Army and was threatening to crush

Prince Henry under the weight of more than two-fold numbers. The prince had been driven into an entrenched position above Gahmig near Dresden and Daun was about to attack, but the mere name of Frederick was enough, and learning of his arrival Daun fell back to Stolpen on the 12th of September.

Hochkirch.

The Prussian army now lay around Grossenhain, Prince Henry's force covering Dresden and the Elbe bridges. The Empire Army was at Pirna, Daun at Stolpen, and in these positions they remained until the 26th of September, the Prussians getting the rest they so urgently needed. On that date, however, the state of truce was broken and the king moved towards Bischofswerda, where Daun's subordinate Loudon was posted. The latter retired, opening the road to Bautzen. The king arrived at Bautzen on the 7th of October and had to wait until the 10th for provisions from Dresden. He then moved forward to Hochkirch, where he found Daun strongly entrenched across his path at Kittlitz with 90,000 men, the Prussians having only 37,000. The king determined to attack the Austrian right. So confident had the Prussians become in the belief that Daun would never take the offensive himself that the most elementary precautions of safety were forgotten and only Zieten kept his horses saddled. During the night of the 13th the Austrians, leaving their watch-fires burning and moving silently through the woods, which covered much of the ground, formed up almost all round the Prussian camp. At 5 a.m. the attack was delivered from all quarters simultaneously and a most desperate struggle ensued. Nothing but the superb discipline of the Prussians saved the situation. Zieten with his squadrons managed to keep a way of escape open, and after a most obstinate conflict the wreck of the army succeeded in withdrawing, leaving 101 guns and 9450 men on the ground or in their enemies' hands (25·5%). The Austrians, in spite of the advantage of a well-conceived surprise, lost 7590 men and were too shaken for pursuit. They fell back to their old camp, where they remained for a week, thus giving Frederick time to bring up reinforcements from Dresden (6000 men) and, starting on the 23rd, he marched right round the Austrian right and raised the siege of Neisse, the prime object with which he had set out. Daun, learning that the king had gone past him into Silesia, now laid siege to Dresden. On the 15th of November he heard that Frederick was marching to its relief through Lusatia and incontinently gave way, retiring on Pirna. The king was in Dresden again on the 20th.

Campaign of 1759.—The drain on Frederick's resources had been prodigious. On the battlefields of the previous three years he had lost at least 75,000 men, not counting the waste of life in his marches and skirmishes; but he still managed to keep 150,000 men in the field, though for want of the old two years' training in loading, firing and manœuvring the average efficiency had much diminished. In cavalry, too, he was relatively weaker, as there was no time to train the remounts. His enemies felt their losses far less and were beginning to understand his tactics; fortunately they remained incapable of combined action.

Kunersdorf.

After minor operations on the frontiers the Russians took the field. Fermor had been superseded by Soltikov, and Dohna with his 18,000 men proved quite inadequate to arrest the Russians' progress. He was superseded by Wedell, who, on the 23rd of July, with 26,000 men boldly attacked the 70,000 Russians whilst on the march near Züllichau. He was defeated with a loss of 6000 and fell back to Crossen bridge, 5 m. below Crossen, which Soltikov occupied next day, thence he moved down the river towards Frankfurt, keeping on the eastern bank. Daun had detached Loudon and Hadik with 35,000 men to join him, and it became vital to Frederick to prevent the combination. Leaving Prince Henry at Schmöttseifen to watch Daun, he marched with all available forces and joined Wedell on the 6th of August at Müllrose near Frankfurt, after vainly searching for the Hadik-Loudon force. Here he was joined on the 10th by Finck with 10,000 men, bringing his whole force up to 50,000 against the Russian and Austrian 90,000, who lay entrenched in the sandhills about Kunersdorf. On the 11th he crossed his whole force over the Oder at Reitwein and on the 12th marched forward, intending to envelop the Russians on both flanks; but his columns lost their way in the woods and their attacks were delivered successively. In spite of their usual disciplined gallantry, the Prussians were completely beaten, even Seydlitz and his squadrons failed to achieve the impossible, and the night closed down on the greatest calamity Frederick had ever experienced. Of 43,000 men 20,720 (48·2%) were left on the ground and 178 guns and 28 colours fell into the hands of the enemy; and the allied Austro-Russian force only lost 15,700. The battle had only lasted six hours. In the depression following this terrible day he wrote to Schmettau, commanding at Dresden, telling him to expect no help, and on the 4th of September Dresden fell.

Maxen.

As usual Frederick was saved by the sluggishness of his enemies, who attempted no pursuit, and being reinforced the day after the battle by 23,000 men, and having ordered up Kleist (who had been watching the Swedes), he was again at the head of an army. Week after week went by, during which he countered all attempts of Daun and Soltikov to combine, and ultimately the Russians, having consumed all the food and forage in the districts they occupied, were compelled to fall back on their own frontiers. Then, uniting with Prince Henry, the king turned to fall upon Daun; but his contempt for his adversary proved his own undoing. Contrary to all his own teaching, he sent a detachment of 12,000 men under Finck to work round the Austrians' flank by Dippoldiswald to Maxen, but the latter, learning of the movement and calling up a wing of the Empire Army to their assistance, fell upon Finck with 42,000 men and compelled him to surrender after two days' hard fighting. The combination having failed, the two armies stood facing one another till far into the winter. But for Prince Ferdinand's glorious victory at Minden on the 1st of August, the year would have been one catalogue of disaster to the Prussian arms, and these operations must now be mentioned.

In the early part of 1758 Prince Ferdinand with 30,000 men had advanced from Lüneburg and was joined by Prince Henry with 8600 from Halberstadt. The approach of the latter threatened the right wing of the French army under Clermont, which was posted along the Aller, and the whole line gave way and retreated without making any serious stand behind the Rhine. Prince Ferdinand followed and defeated them on the 23rd of June at Crefeld. Clermont was relieved by Contades and at the same time Soubise, who had at last reorganized his command, shattered by the disaster of Rossbach, moved forward through Hesse and compelled Prince Ferdinand to withdraw from his very advanced position. No engagement followed; Soubise fell back upon Frankfurt and Prince Ferdinand held a line through Münster, Paderborn and Cassel during the winter.

Fortunately events in Canada and the glory of his victories had made Frederick's cause thoroughly popular in Great Britain, and at last it became possible to detach a considerable force of British troops to Prince Ferdinand's assistance, whose conduct turned the scale in the critical moment of the campaign. During the winter the French had organized their forces in two columns—based on Frankfurt and Wesel respectively. Broglie was now in command of the former; Contades still led the latter.

Minden.

In April Prince Ferdinand advanced to drive the French out of Hesse and Frankfurt, and actually reached Bergen, a village some 10 m. to the north, but here he was defeated by Broglie (13th April) and forced to retreat the way he had come, the French following along their whole front and by sheer weight of numbers manœuvring him successively out of each position he assumed. On the 10th of July Broglie surprised Minden, thus securing a bridge over the Weser and free access into Hanover, and light troops overran the south of the electorate. On the 16th Contades with the left column joined Broglie and the French now had some 60,000 men against the 45,000 Ferdinand could muster. The latter's position was extremely difficult, for the French had only to continue in possession of the bridges at Minden to ruin the whole country by their exactions, and the position they held was too well protected on the flanks and too strong in front for direct attack.

Nevertheless Prince Ferdinand drew up before it and met the French plundering raids by a threat on their communication with Cassel, and as a further inducement to tempt Contades to attack him, he detached a column under Wangenheim, which entrenched itself across the only outlet by which the right of the French army could debouch from behind the marshes which lie in the angle between the Weser and the Bastau, a small tributary joining the former below Minden. The bait took, and during the early hours of the 1st of August the French army moved out to attack Wangenheim. But Ferdinand's troops had been lying in instant readiness for action, and as soon as the outposts gave the alarm they were in motion in eight columns, *i.e.* practically deployed for action to meet the French as they emerged from their positions. Unfortunately the outpost reports were delayed by about two hours, owing to the heavy gale and storm that was prevailing, and the French had made far greater progress with their deployment than Ferdinand had reckoned on. An almost front-to-front engagement ensued. Things were going badly with the Prussians when, through a mistake in the delivery of an order, the British brigade (12th, 20th, 23rd, 25th, 37th, 51st), followed by some Hanoverian battalions, began to advance straight upon the masses of French cavalry who stood protected by the cross-fire of several batteries. Once launched, neither fire nor shock could check their progress; halting for a moment to pour volleys into the charging squadrons hastily thrown against them, they swiftly resumed their advance. French infantry too were hurled against them, but were swept away by fire and bayonet, and presently they had pierced right through the French line of battle. Now came the moment when cavalry should have been at hand to complete the victory, and this cavalry, the Blues, the 1st and 3rd Dragoons, Scots Greys and 10th Dragoons under Lord George (afterwards Viscount) Sackville (*q.v.*) stood ready, waiting only the order to advance. This Sackville refused to give, though called on three times by the prince; no satisfactory explanation of his conduct has ever been discovered, but he was tried by a general court-martial and cashiered. Nevertheless, so brilliant had been the conduct of all the troops engaged, especially of the infantry brigade that the victory was won even in spite of this failure of the cavalry, and before evening the French were retreating as a demoralized mass towards Cassel, leaving some 10,000 men, 17 colours and 45 guns in the hands of the victors, who on their side out of 43,000 had lost 2600 killed and wounded. Of the six British regiments that went into action 4434 strong, 1330 (30%) had fallen, but their feat is not to be measured only by the losses victoriously borne—these were not unusual in the period—but by the astounding discipline they maintained throughout the advance, resuming their march after beating off cavalry charges with the cool precision of a review in peace-time. Ferdinand followed up his victory by a pursuit which was vigorous for three days and had all but reached the Rhine when his movement was stayed by the necessity of detaching 12,000 men to the king to make good the losses of Kunersdorf.

Campaign of 1760.—The year opened gloomily for Frederick. His embarrassment both for men and money was extreme, and his enemies had at last agreed on a combined plan against him. They purposed to advance in three columns concentrically upon him: Daun with 100,000 men in Saxony, Loudon with 50,000 from Silesia, Soltikov's Russians from East Prussia; and, against whichever column the king turned, the others were to continue towards Berlin. Only in Hanover were the conditions more favourable, for Ferdinand had 70,000 (20,000 British) against the 125,000 of the French.

Early in April the king stood with 40,000 men, west of the Elbe near Meissen facing Daun, Prince Henry with 34,000 in Silesia from Crossen to Landeshut, 15,000 under Forcade and Jung-Stutterheim in Pomerania facing the Swedes and Russians. Towards the end of May Loudon moved to besiege Glatz, and Fouqué, who commanded at Landeshut, marched with 13,000 to cover Breslau. Loudon at once seized Landeshut, and Fouqué, returning in response to urgent orders from the king, was attacked by Loudon with 31,000 men and almost destroyed. Meanwhile, Prince Henry had moved to Landsberg against the Russians, but failed to seize his opportunities and thus Silesia lay open to the Austrians. Frederick decided to march with his main body against Loudon and attack him if unsupported, but, if his movement induced Daun to move to Loudon's support, then to double back and besiege Dresden. For this purpose a siege train was held in readiness at Magdeburg. He marched rapidly on Bautzen, then hearing that Daun was approaching to support Loudon he returned and besieged Dresden (July 12th). The town was bombarded, there being no time for regular siege approaches, but it held out, and by the 28th of July Daun's army returning had almost surrounded Frederick. The siege had to be raised, and during the night of the 29th of July the Prussians slipped away to Meissen. On the same day Frederick learnt that Glatz, the key to Southern Silesia, had fallen into the hands of the Austrians, but as a set-off the news shortly afterwards arrived of Prince Ferdinand's brilliant victory at Warburg, in which the British cavalry led by the marquis of Granby amply wiped out the disgrace incurred by Sackville. On the 1st of August Frederick began his march into Silesia, summoning Prince Henry from Landsberg to join him, which he did by a splendid march of some 90 m. in three days. The king's march was almost as remarkable, for the roads were very bad and the Austrians had freely obstructed them, nevertheless in five days he reached Bautzen, having marched more than 100 m. from his starting-point, and crossed five considerable rivers on his way. Thence he continued more easily to Bunzlau. Daun was in front of him and Lacy with clouds of light troops on his right, the Russians under Czernicheff with Loudon not far away to his left front, 114,000 men in all to his 30,000, but he held to his decision to reach Schweidnitz. With this purpose in view he moved south-east on Jauer, marching 25 m. on the 9th of August, but the enemy was still in front of him and hovering on his flanks. On the 10th he tried the Liegnitz road with the same result, and his position became desperate as his food was almost exhausted. He had already covered 15 m. that day, but at 11 P.M. he called on his men for a night march and formed up again on his old position next morning, the 11th of August. He appeared to be completely surrounded, and things looked so desperate that Mitchell, the British ambassador, burnt his papers and cipher key. At sunset on the 12th, however, Frederick again broke camp and by a night march evaded the enemy's scouts and reached Liegnitz at noon on the 13th, the Austrians appearing a couple of hours later. The troops rested during the 13th and 14th, but at nightfall, leaving their watch-fires burning, marched off by the Glogau road, and the only way of escape still open. The Austrians, however, had planned a night attack, and Loudon's columns were moving to close this last loophole of escape. Fortunately for the Prussians they arrived just a few minutes too late, and in the combat that ensued 15,000 Prussians inflicted a loss of 10,000 men and 82 guns upon their assailants, afterwards resuming their march undisturbed.

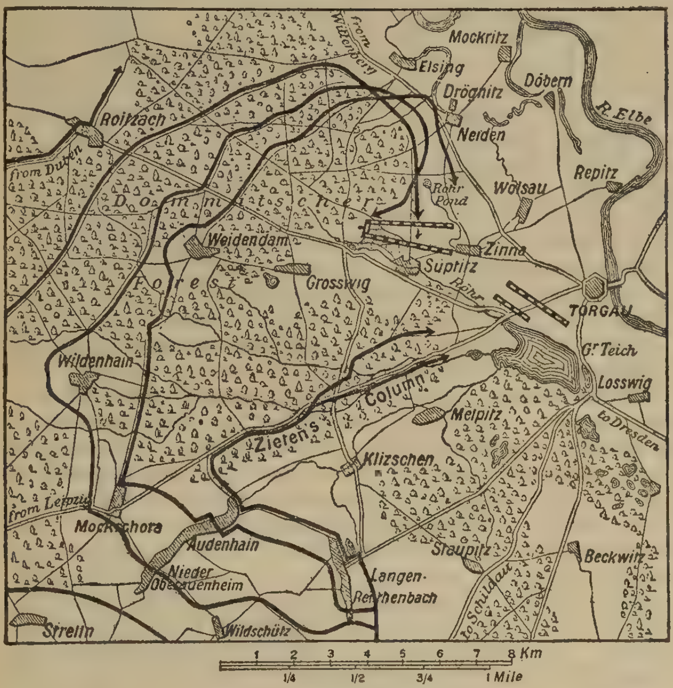
Liegnitz.

But the danger was not yet over. Czernicheff was known to be in the immediate vicinity; so as to get him out of the way, Frederick gave to a peasant a despatch addressed to Prince Henry containing the words: "Austrians totally defeated to-day, now for the Russians. Do what we agreed upon." The peasant was to take care to be captured by the Russians and only give up the paper to save his life. The plan worked as he had anticipated, the paper duly reached Czernicheff's hands and he immediately evacuated the dangerous neighbourhood. Elated with his success the king now abandoned his retreat on Glogau and determined to press on at all hazards to Breslau, which in spite of many anxious moments he reached on the 17th of August.

The Russians now abandoned the campaign in the open field and besieged Colberg on the Baltic coast. Frederick in Silesia manœuvred for some weeks between Breslau, Schweidnitz and Glatz, but was suddenly recalled by the news of the capture of Berlin on the 9th of October by Cossacks and portions of the Empire Army and Austrians from Saxony. On the 11th of October the king was in full march, but the news of his approach was enough and the enemy dispersed, the

Torgau.

Austrians and Empire Army making for Torgau. Daun, relieved of Frederick's pressure, now also moved to Torgau, leaving Loudon in Silesia, and had concentrated over 64,000 men at and around Torgau before Frederick had collected an attacking force of 45,000. The position held by the Austrians was an entrenched camp fronting in all directions, but it was too cramped for their numbers and difficult to leave for a counter-stroke. Frederick determined to attack it both front and rear, and leaving Zieten to act against the former, he marched off at 6·30 of the 3rd of November to attack it as soon as Zieten should have thoroughly attracted the enemy's attention. But for once Zieten failed; he allowed himself to be drawn off by the Austrian light troops, and Frederick, in ignorance of the real state of affairs, launched his grenadiers against a thoroughly intact enemy, strongly entrenched, with, it is said, 400 guns in position to sweep the approaches. The grenadiers were simply swept away by grape and case—only 600 out of 6000 remained, and Prussian batteries hurrying up to their support were destroyed before they had time to load. The attack was, however, renewed by fresh brigades as they came to hand, and the Prussian artillery did something to diminish the intensity of the Austrian case fire. The action began at 2 p.m. At 4.30, as the sun was setting, the king's last reserve of horse and foot at last succeeded in breaking the Austrian line and in the darkness there ensued a confused slaughter as at Zorndorf. The result was still in the balance when at length Zieten reached the field and attacked at once. For an hour or so the struggle still raged, but the Austrians were by now completely spent and withdrew gradually into the fortress and then across the river. Out of 44,000 the Prussians had lost 13,120 men (30%), out of 65,000 the Austrians only 11,260 (17·3%), but of these over 7000 were prisoners. Both sides, however, were completely paralysed by the struggle, and the year ended without further effort on either side.



On the western theatre of war Prince Ferdinand after the victory of Warburg had pressed the French back to the Rhine and besieged Wesel, but was compelled to raise the siege after suffering the defeat of Kloster-Kamp (16th Oct.) and to withdraw to Lippstadt and Warburg.

Campaign of 1761.—Torgau proved to be Frederick's last great battle. All parties were now so completely exhausted that they no longer were able to face the risks of a decision on the field. In the west Prince Ferdinand was first in the field, and in February and March he drove the French southward as far as Fulda, but an attempt to capture Marburg failed and the gradual pressure of French numerical superiority, together with the reduction of the British contingent on the death of George II., compelled him to retreat gradually until by the beginning of October both Brunswick and Wolfenbüttel fell into their hands. In the east the king had barely 100,000 men against 300,000 Austrians and Russians. Leaving Prince Henry to observe Daun in Saxony he marched to join von der Goltz, who with 23,000 stood about Schweidnitz. The Russians (50,000) under Buturlin were approaching from Posen, and Loudon with 72,000 men starting from Glatz manœuvred to join them. After two months' skirmishing and marching the Allies effected their junction between Liegnitz and Jauer, having completely severed Frederick's communications with Prussia. But Frederick depended for his food and immediate supplies on Southern Silesia, and not caring to risk a battle with odds of three to one against him he withdrew into the entrenched camp of Bunzelwitz, where the Allies did not dare to attack him. Ultimately, as usual, the Russian commissariat broke down, and in September Buturlin withdrew the way he had come. Relieved of this antagonist, Frederick manœuvred to draw Loudon out of his positions and compel him to fight in the open, but Loudon refused the challenge and after an attempt to surprise Schweidnitz, which failed, withdrew into winter quarters. Prince Henry in Saxony held his own against Daun.

England now threatened to withdraw her subsidies, and as the Prussian armies had dwindled to 60,000 men the end seemed very near. But a turn of fortune was already at hand. On the 5th of January 1762 the tsarina died, and her successor, Peter III., at once offered peace. On the 16th of March an armistice was agreed to, and shortly afterwards the treaty of St Petersburg was signed, by which Pomerania was given back to Prussia and a contingent of 18,000 men placed at Frederick's disposal. The withdrawal of the Russians led in turn to the withdrawal of the Swedes, and thus only France and Austria remained—the former bled white by the strain of her colonial disasters, the latter too weary to make further great exertions. Though the war dragged on for some months, and Prince Henry, assisted by Seydlitz, won the victory of Freiberg over the Empire Army (29th Oct. 1762), no great battle was attempted, and although a revolution at St Petersburg deprived Frederick of Russian assistance, in the autumn Ferdinand drove the French back over the Rhine, and thereupon an armistice was agreed upon by all. Final terms of peace were adjusted on *status quo ante* basis at Hubertusburg on the 15th of February 1763. Prussia had maintained all her possessions and made good her claim to rank for all time with the Great Powers. (F. N. M.)

Bibliography.—The three principal works on the "Third Silesian" part of the war are the Prussian General Staff, *Der siebenjährige Krieg* (Berlin, 1901–); Austrian Official "Kriegsarchiv," *Kriege der Kaiserin Marie Theresia* (in progress), and Carlyle's *Frederick the Great*. See also C. B. Brackenbury, *Frederick the Great*; Bernhardi, *Friedrich der Grosse als Feldherr* (Berlin, 1881); biographies of Prince Henry, Zieten, Seydlitz, Maurice of Dessau, &c.; von Arneth, *Maria Theresia und der Siebenjährige Krieg* (Vienna, 1875); the older histories of the war by Tempelhoff, Archenholz and Lloyd; Jomini, *Traité des grandes opérations militaires*; Masslowski, *Die russische Armee im 7jähr. Kriege* (Berlin, 1893). The main authorities for Ferdinand's Campaign are Westphalen, *Feldzüge des Herzogs Ferdinand von Braunschweig*, and J. W. Fortescue, *Hist. British Army*, vol. ii.

Naval Operations

The naval operations of the Seven Years' War began nearly a year before the declaration of hostilities. In June 1755 a British squadron under Boscawen was sent into the Straits of Belle Isle to intercept French ships carrying soldiers and stores to Quebec, in retaliation for aggressions on British possessions in North America. On the 8th of June Boscawen seized two French line-of-battle ships fitted as transports, the "Alcide" and the "Lys." A general seizure of French merchant ships followed, and thousands of French sailors were in prison in England by the early days of 1756. The government of Louis XV. did not reply by a declaration of war, but prepared to retaliate by a threat of invasion, which created something like a panic in Great Britain. The government, then in the weak hands of the duke of Newcastle, accumulated warships in the Channel, and on the 3rd of February 1756 issued a proclamation which instructed the inhabitants of the southern counties of England to drive their cattle inland in case of a French landing, and thereby much aggravated the prevailing fear. But the invasion scheme was so far only a cover for an attack on Minorca, then held by Great Britain.

A squadron of twelve sail of the line was prepared at Toulon under La Galissonière, a veteran admiral who had entered the navy in the reign of Louis XIV. It escorted transports carrying 15,000 troops under the duc de Richelieu. The danger to Minorca, where the garrison had been allowed to fall below its due strength, was well known to the British ministers. On the 11th of March they appointed Admiral John Byng to command a squadron which was to carry reinforcements. He did not, however, leave St Helens till the 6th of April. Byng had with him ten sail of the line, and carried 3000 soldiers for the garrison. The ships were indifferently manned, and the admiralty refused to strengthen him by drafts from the ships it proposed to retain in the Channel. In order to find room for the soldiers, the marines of the squadron were left behind. There was therefore a danger that, if an encounter with the French fleet took place after the reinforcements were landed, the British squadron would be short-handed. Byng reached Gibraltar on the 2nd of May. The French invasion of Minorca had been carried out on the 19th of April. The governor of Gibraltar, General Fowke, refused to part with any of his soldiers to reinforce Minorca. On the 8th of May Byng sailed, and on the 19th he was in communication by signal with General Blakeney, governor of the fortress. Before the soldiers could be landed the French fleet came in sight. Byng had been joined by three ships of the line at Gibraltar, and had therefore thirteen ships to twelve. One of the French vessels, the "Foudroyant" (84), was a finer warship than any in the British line, but in effective power Byng was at least equal to his opponent, and if his ships were poorly manned La Galissonière was in worse case. The British admiral rejected one of his small line-of-battle ships in order to engage in the then orthodox manner—van to van, centre to centre, and rear to rear, ship against ship. By the manœuvres of the afternoon of the 19th and morning of the 20th he gained the weather-gage, and then bore down on the enemy at an angle, the van of the English steering for the van of the French. The sixth ship in his line, the "Intrepid" (74), having lost her foretopmast, became unmanageable and threw the vessels behind her out of order. Thus the six in front were exposed to the fire of all the French, who ran past them and went off. Byng could have prevented them by bearing down, but refused to alter the formation of his fleet. Being now much disturbed by the crippled state of the ships in his van, he made no effort either to land the soldiers he had on board or to renew the action; and after holding a council of war on the 24th of May, which confirmed his own desire to retreat, he sailed for Gibraltar (see BYNG, JOHN, for his trial and execution). The loss of Minorca, which was the consequence of this retreat, gave the French a great advantage in the Mediterranean. During the rest of the year no very vigorous measures were taken on either side, though the British government reinforced its squadrons both in the Mediterranean and on the coast of America.

In 1757 the naval war began to be pushed with a vigour hitherto unprecedented. The elder Pitt became the effective head of the government, and was able to set about ruining the French power at sea. Owing to the long neglect of the French navy, it was so inferior in strength to the British that nothing short of the worst mismanagement on Pitt's part could have deprived Great Britain of victory. Some of the minister's measures were not indeed wise. He sent out, during the last months of 1757 and the whole of 1758, a series of combined expeditions against the French coast, which were costly and for the most part unsuccessful. They terminated in September 1758 with a disaster to the troops engaged in St Cas Bay. Yet these assaults on the French coast did much to revive the spirit of the nation, by removing the fear of invasion. Meanwhile a sound aggressive policy was followed in distant seas during 1758. In the East Indies the squadron which had been engaged during 1757 in co-operating with Clive in the conquest of Bengal was strengthened. Under the command of Sir George Pocock it was employed against the French squadron of M. d'Aché, who brought a body of troops from Europe under General Lally-Tollendal to attack the possessions of the East India Company on the Coromandel coast. The two actions fought at sea on the 29th of April and the 1st of August in the Bay of Bengal were not victories for Sir George Pocock, but neither were they defeats. The French admiral was so uncertain of his power to overcome his opponent that he sailed for the islands of the Indian Ocean so soon as Lally and the authorities at Pondicherry would allow him to go. In America the strong squadron of Boscawen rendered possible the capture of Louisburg, on the 26th of July, and cleared the way for the conquest of Canada in the following year. During 1759 the French government, trusting that the multiplicity of the calls upon its fleet would compel Great Britain to scatter its naval forces, laid plans for a great invasion (for the details of this plan and its results, see QUIBERON, BATTLE OF). But the British navy proved numerous enough not only to baffle invasion at home but to effect large conquests of French possessions abroad. In North America the co-operation of the navy rendered possible the capture of Quebec by Wolfe. In the West Indies, though an attack on Martinique was repulsed, Guadaloupe was taken in January. In the East Indies the squadron of M. d'Aché reappeared in the Bay of Bengal in September. He fought another undecided action with Sir George Pocock on the 8th, and gave some small help to the French army. But the bad state of his squadron forced him to retreat soon, and the resources of the French being now exhausted in those seas, he did not reappear. The British navy was left in complete command of the Bay of Bengal and the coast of Malabar. On shore, Lally, cut off from reinforcements, was crushed, and Pondicherry fell.

During 1760 and 1761 the French fleet made no attempt to keep the sea. The British navy went on with the work of conquering French possessions. During 1760 it co-operated on the Lakes and on the St Lawrence in the final conquest of Canada. Between April and June of 1761 it covered the capture of the island of Belle-Île on the French coast, which both strengthened its means for maintaining blockade and gave the British government a valuable pledge to be used for extorting concessions when the time for making peace came. The complete ruin of French merchant shipping and the collapse of the navy left the maritime population free to seek a livelihood in the privateers. Commerce-destroying was carried on by them with considerable success. The number of British merchant ships taken has been put as high as one-tenth of the whole. But this percentage was the price paid for the enormous advantage gained by the ruin of the French as commercial rivals. The merchant shipping of Great Britain increased largely in the course of the war, and from it dates her commercial predominance.

By the close of 1761 the helplessness of France at sea had been demonstrated, but the maritime war was revived for a few months by the intervention of Spain. A close alliance, known as "the family compact," was made between the royal houses of that country and France in the course of 1761. The secret was divulged, and Pitt would have made war on Spain at once. He was overruled and retired. So soon, however, as the treasure ships from America had reached Spain, at the close of 1761, the Spanish government declared war. Its navy was incapable of offering a serious resistance to the British, nor did it even attempt to operate at sea. The British government was left unopposed to carry out the plans which Pitt had prepared against Spain. The only aggressive movement undertaken by the Spanish government was an attack on Portugal, which was the close ally of Great Britain and gave her most useful help by allowing her the free use of Portuguese ports. As the king of Portugal refused to join the French and Spanish alliance, his country was invaded by a Spanish army. Great Britain supported her ally. A regiment of cavalry and seven battalions of foot were landed. They gained several small actions against the invaders, and had the most active share in the operations which forced them to retire. But the most effective blows delivered against Spain were directed at her colonies. The British troops, left free by the recent success against the French in America, were employed in an attack on Havana. A powerful fleet left England on the 5th of March, bringing troops which were joined by others in the West Indies; Sir George Pocock, who had returned from the East Indies, was in command. Under his direction the fleet reached its destination without loss, and Havana was assailed. The citadel known as the Moro Castle made a stout defence, and some of the ships suffered severely in a bombardment. But the worst losses of the besiegers were due to the climate of Cuba, aided by bad sanitary arrangements. Of the 10,000 troops landed, three-fourths are said to have suffered from fever or dysentery, and the majority of the sick died. Yet the Moro was taken on the 30th of September, and Havana, which could have made a longer resistance, surrendered on the 10th of October. Martinique, the last important possession of France in the New World except her half of San Domingo, had fallen in February. In the East Indies, where the surrender of Pondicherry had left other forces free, a combined expedition triumphed easily in October over the natives of Manila, under the direction of the archbishop, who acted as governor. The preliminaries of the peace of Paris were signed on the 3rd of November 1762.

See Beatson, *Naval and Military Memoirs of Great Britain* (London, 1804); Captain Mahan, *Influence of Sea Power upon History*; Lacour Gayet, *La Marine militaire de la France sous le règne de Louis XV* (Paris, 1902). (D. H.)

SEVERIANA, VIA, an ancient highroad of Italy, running S.E. from Ostia to Terracina, a distance of 73 m. along the coast, and taking its name, no doubt, from the restoration of an already existing road by Septimius Severus, who was a great benefactor of Ostia. It ran along the shore at first, just behind the line of villas which fronted upon the sea, and are now half a mile inland, or even upon its edge (for an inscription records its being damaged by the waves). Farther S.E. it seems to have kept rather more distant from the shore, and it probably kept within the lagoons below the Circean promontory. As is natural in a sandy district where building materials are rare, remains of it are scanty.

See R. Lanciani in *Monumenti dei Lincei*, xiii. (1903), 185; xvi. (1906), 241; T. Ashby in *Mélanges de l'École française de Rome* (1905), 157 sqq. (T. As.)

SEVERINUS, pope in 640, successor of Honorius. He occupied the papal chair only three months after his consecration, having had to wait a year and a half for its ratification by the emperor. During this long vacancy the exarch of Ravenna, supported by the military body of Rome (*exercitus Romanus*), occupied the Lateran and seized the treasure of the Church.

SEVERN, JOSEPH (1793–1879), English portrait and subject painter, was born at Hoxton on the 7th of December 1793, his father, a musician, coming of an old Gloucestershire family. During his earlier years he practised portraiture as a miniaturist; and, having studied in the schools of the Royal Academy, in 1818 he gained the gold medal for his "Una and the Red Cross Knight in the Cave of Despair." In 1819 he exhibited at the Academy his "Hermia and Helena." He was an intimate friend of Keats the poet, whom he accompanied to Italy in 1820 and nursed till his death in 1821. His picture of "The Death of Alcibiades" then obtained for him an Academy travelling studentship, and he returned to Rome, where he lived till 1841, marrying in 1828 the daughter of Lord Montgomerie, a ward of Lady Westmoreland, one of his chief patrons, and mingling in the congenial art circles of the city. In 1861, after living in England for nineteen years, mainly for the education of his children, he was appointed British consul at Rome, a post which he held till 1872, and during a great part of the time he also acted as Italian consul. His most remarkable work is the "Spectre Ship" from the *Ancient Mariner*. He painted "Cordelia watching by the Bed of Lear," the "Roman Beggar," "Ariel," "The Fountain," and "Rienzi," executed a large altar-piece for the church of St Paul at Rome, and produced many portraits, including one of Baron Bunsen and several of Keats. He died at Rome on the 3rd of August 1879. He had six children, of whom Walter, Arthur and Ann (wife of Sir Charles Newton) were well-known artists.

See the *Life and Letters*, by William Sharp (1892).

SEVERN, a river of Wales and England. It rises on the N.E. side of Plinlimmon, on the S.W. border of Montgomeryshire, and flows with a nearly semicircular course of about 210 m. to the Bristol Channel; the direct distance from its source to its mouth is about 80 m. Its Welsh name is Hafren, and its Roman name was *Sabrina*. Through Montgomeryshire its course is at first in a S.E. direction, and for the first 15 m. it flows over a rough precipitous bed. At Llanidloes it bends towards the N.E., passing Newtown and Welshpool; this part of the valley bearing the name of the Vale of Powis. It receives the Vyrnwy near Melverley, and forms a mile of the Welsh border, and then turning in an E.S.E. direction enters Shropshire, and waters the broad rich plain of Shrewsbury, after which it bends southward past Ironbridge and Bridgnorth to Bewdley in Worcestershire. In Shropshire it receives a number of tributaries, the chief of which is the Tern. Continuing its southerly course through Worcestershire it passes Stourport, where it receives the Stour (left), and Worcester, shortly after which it receives the Teme (right). It enters Gloucestershire close to Tewkesbury, where it receives the Upper Avon (left), after which, bending in a S.W. direction, it passes the city of Gloucester, below which it becomes estuarine and tidal. A high bore or tidal wave, for which the Severn is notorious, may reverse the flow as high up as Tewkesbury Lock ($13\frac{1}{2}$ m. above Gloucester), and has sometimes caused great destruction. The estuary merges into the Bristol Channel at the point where it receives on the left the Lower or Bristol Avon, and on the right the Wye.

The source lies at an elevation of about 2000 ft.; the fall from Llanidloes is about 550 ft., from Newtown 365 ft. and from Shrewsbury, 90 m. above Gloucester, 180 ft. The scenery of the upper valley is wild and picturesque, and that of the lower river is at some points very beautiful. The course between the height of the Wrekin and Wenlock Edge (despite the manufacturing towns on the banks at this point), the valley above Bewdley, where the Forest of Wyre borders the left bank, and the fine position of Worcester, with its cathedral rising above the river, may be noticed. The distance from Gloucester to Avonmouth is 44 m., but the upper part of the estuary is tortuous, and, owing to the bores and shifting shoals, difficult of navigation. On this account the Gloucester and Berkeley Ship Canal, $16\frac{3}{4}$ m. in length, was constructed, admitting vessels of 350 tons to Gloucester from the docks at Sharpness on the estuary. The navigation extends up to Arley, above Bewdley, 47 m. from Gloucester, but is principally used up to Stourport (43 m.), from which the Staffordshire and Worcestershire canal gives access to the Wolverhampton industrial district and the Trent and Mersey navigation. The Berkeley canal and the Worcester and Birmingham canal are maintained by the Sharpness New Docks and Gloucester and Birmingham navigation company. There is connexion with the Thames by the Stroudwater canal from Framilode on the estuary, joining the Thames and Severn canal near Stroud. The Wye is in part navigable; the Bristol Avon gives access to the great port of Bristol, and the Upper Avon is in part navigable. The Severn is a good salmon river, and is famous for its lampreys, while many of the tributaries afford fine trout-fishing, such as the Teme and the Vyrnwy. The drainage area of the Severn is 6850 sq. m., including the Wye and the Bristol Avon, or 4350 sq. m. without these rivers.

Severn Tunnel.—The first bridge above the mouth of the Severn is that near Sharpness, which carries the Great Western and Midland joint railway between Berkeley Road and Lydbrook Junction. But the Severn tunnel, carrying the Great Western railway under the estuary 14 m. below the bridge, forms the direct route between the south of England and South Wales. Before the tunnel was made there was a steam ferry at a point known as "New Passage," where a ferry had existed from early times. The steam ferry was opened in connexion with the Bristol and South Wales Union railway in 1863, and was subsequently taken over by the Great Western company. Parliamentary powers to construct the tunnel were obtained by this company in 1872, and work began in the following year. The originator of the scheme and chief engineer was Mr Charles Richardson, and Sir John Hawkshaw was consulting engineer. The principal difficulty encountered in the construction was the tendency to flooding, owing both to the river breaking into the works, and, more especially, to the underground springs encountered, one of which when tapped completely flooded the works at a rate of 6000 gallons per minute, and delayed the work for more than a year. In 1879, after this disaster, the contract for the whole work was let to Mr T. A. Walker. The total length of the tunnel is 4 m. 624 yds., of which 2¼ m. are beneath the river. On the east side the cutting leading to the tunnel has a gradient of 1 in 100, which is continued in the tunnel itself until the deepest part is reached beneath the river-channel known as "the Shoots," which has a depth of about 60 ft. at low tide and 100 at high tide (ordinary spring). Beneath this the rails run level for 12 chains, after which the ascent of the tunnel and cutting on the west side is on a gradient of 1 in 90. At Sudbrook on the west side there is a pumping and ventilating station. The tunnel was completed in 1886; the time for passenger trains between Bristol and Cardiff was immediately reduced by nearly one half, and the value of the new route was especially apparent in connexion with the mineral traffic between the South Wales coal-field and London and the ports of the south of England.

SEVERUS,[1] **LUCIUS SEPTIMIUS** (A.D. 146–211), Roman emperor, was born in 146 at Leptis Magna on the coast of Africa. Punic was still the language of this district, and Severus was the first emperor who had learned Latin as a foreign tongue. The origin of his family is obscure. Spartianus, his biographer in the *Historia Augusta*, doubtless exaggerates his literary culture and his love of learning; but the taste for jurisprudence which he exhibited as emperor was probably instilled into him at an early age. The removal of Severus from Leptis to Rome is attributed by his biographer to the desire for higher education, but was also no doubt due in some degree to ambition. From the emperor Marcus Aurelius he early obtained, by intercession of a consular uncle, the distinction of the broad purple stripe. At twenty-six, that is, almost at the earliest age allowed by law, Severus attained the quaestorship and a seat in the senate, and proceeded as *quaestor militaris* to the senatorial province of Baetica, in the Peninsula. While Severus was absent in Africa in consequence of the death of his father, the province of Baetica, disordered by Moorish invasions and internal commotion, was taken over by the emperor, who gave the senate Sardinia in exchange. On this Severus became military quaestor of Sardinia. His next office, in 174 or 175, was that of legate to the proconsul of Africa, and soon after he was tribune of the plebs. This magistracy, though far different from what it had been in the days of the republic, was still one of dignity, and brought promotion to a higher grade in the senate. In 178 or 179 Severus became praetor by competition for the suffrages of the senators. Then, probably in the same year, he went to Hispania Citerior as *legatus juridicus*; after that he commanded a legion in Syria. After the death of Marcus Aurelius he was unemployed for several years, and, according to his biographer, studied at Athens. He became consul about 189. In this time also falls the marriage with his second wife, afterwards famous as Julia Domna, whose acquaintance he had no doubt made when an officer in Syria. Severus was governor in succession of Gallia Lugdunensis, Sicily and Pannonia Superior; but the dates at which he held these appointments cannot be determined. He was in command of three legions at Carnuntum, the capital of the province last named, when news reached him that Commodus had been murdered by his favourite concubine and his most trusted servants.

Up to this moment Severus had not raised himself above the usual official level. He had seen no warfare beyond the petty border frays of frontier provinces. But the storm that now tried all official spirits found his alone powerful enough to brave it. Three imperial dynasties had been ended by assassination. The Flavian line had enjoyed much shorter duration and less prestige than the other two, and the circumstances of its fall had been peculiar in that it was probably planned in the interest of the senate, and the senate reaped the immediate fruits. But the crises which arose on the deaths of Nero and of Commodus were alike. In both cases it was left to the army to determine by a struggle which of the divisional commanders should succeed to the command-in-chief, that is, to the imperial throne. In each case the contest began with an impulsion given to the commanders by the legionaries themselves. The soldiers of the great commands competed for the honour and advantages to be won by placing their general on the throne. The officer who refused to lead would have suffered the punishment of treason.

There is a widespread impression that the Praetorian guards at all times held the Roman empire in their hands, but its erroneousness is demonstrated by the events of the year 193. For the first time in the course of imperial history the Praetorians presumed to nominate as emperor a man who had no legions at his back. This was Pertinax, who has been well styled the Galba of his time—upright and honourable to severity, and zealous for good government, but blindly optimistic about the possibilities of reform in a feeble and corrupt age. After a three months' rule he was destroyed by the power that lifted him up. According to the well-known story, true rather in its outline than in its details, the Praetorians sold the throne to Didius Julianus. But at the end of two months both the Praetorians and their nominee were swept away by the real disposers of Roman rule, the provincial legions. Four groups of legions at the time were strong enough to aspire to determine the destiny of the empire—those quartered in Britain, in Germany, in Pannonia and in Syria. Three of the groups took the decisive step, and Severus in Pannonia, Pescennius Niger in Syria, Clodius Albinus in Britain, received from their troops the title of Augustus. Severus outdid his rivals in promptness and decision. He secured the aid of the legions in Germany and of those in Illyria. These, with the forces in Pannonia, made a combination sufficiently formidable to overawe Albinus for the moment. He probably deemed that his best chance lay in the exhaustion of his competitors by an internecine struggle. At all events he received with submission an offer made by Severus, who confirmed Albinus in his power and bestowed upon him the title of Caesar, making him the nominal heir-apparent to the throne.

Before the action of Severus was known in Rome, the senate and people had shown signs of turning to Pescennius Niger, that he might deliver them from the poor puppet Didius Julianus and avenge on the Praetorians the murder of Pertinax. Having secured the co-operation or neutrality of all the forces in the western part of the empire, Severus hastened to Rome. To win the sympathy of the capital he posed as the avenger and successor of Pertinax, whose name he even added to his own, and used to the end of his reign. The feeble defences of Julianus were broken down and the Praetorians disarmed and disbanded without a blow. A new body of household troops was enrolled and organized on different principles from the old. In face of the senate, as Dio tells us, Severus acted for the moment like "one of the good emperors in the olden days." After a magnificent entry into the city he joined the senate in execrating the memory of Commodus, and in punishing the murderers of Pertinax, whom he honoured with splendid funeral rites. He also encouraged the senate to pass a decree directing that any emperor or subordinate of an emperor who should put a senator to death should be treated as a public enemy. But he refrained from asking the senate to sanction his accession.

The rest of Severus' reign is in the main occupied with wars. The power wielded by Pescennius Niger, who called himself emperor, and was supposed to control one half of the Roman world, proved to be more imposing than substantial. The magnificent promises of Oriental princes were falsified as usual. Niger himself, as described by Dio, was the very type of mediocrity, conspicuous for no faculties, good or bad. This character had no doubt commended him to Commodus as suited for the important command in Syria, which might have proved a source of danger in abler hands. The contest between Severus and Niger was practically decided after two or three engagements, fought by Severus' officers. The last battle, which took place at Issus, ended in the defeat and death of Niger (194). After this the emperor spent two years in successful attacks upon the peoples bordering on Syria, particularly in Adiabene and Osrhoene. Byzantium, the first of Niger's possessions to be attacked, was the last to fall, after a glorious defence.

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[1] For Marcus Aurelius Alexander Severus, Roman emperor from 222 to 235, see ALEXANDER SEVERUS.

Late in 196 Severus turned westward, to reckon with Albinus. He was better born and better educated than Severus, but in capacity far inferior. As Severus was nearing Italy he received the news that Albinus had been declared emperor by his soldiers. The first counter-stroke of Severus was to affiliate himself and his elder son to the Antonines by a spurious and posthumous adoption. The prestige of the old name, even when gained in this illegitimate way, was evidently worth much. Bassianus, the elder son of Severus, thereafter known as Aurelius Antoninus, was named Caesar in place of Albinus, and was thus marked out as successor to his father. Without interrupting the march of his forces, Severus contrived to make an excursion to Rome. Here he availed himself with much subtlety of the sympathy many senators were known to have felt for Niger. Though he was so far faithful to the decree passed by his own advice that he put no senator to death, yet he banished and impoverished many whose presence or influence seemed dangerous or inconvenient to his prospects. Of the sufferers probably few had seen or communicated with Niger.

The collision between the forces of Severus and Albinus was the most violent that had taken place between Roman troops since the contest at Philippi. The decisive engagement was fought in February of the year 197 on the plain between the Rhone and the Saône, to the north of Lyons, and resulted in a complete victory for Severus.

Thus, released from all need for disguise, he "poured forth on the civil population all the wrath which he had been storing up for a long time" (Dio). He frightened the senate by calling himself the son of Marcus and brother of Commodus, whom he had before insulted. He read a speech in which he declared that the severity and cruelty of Sulla, Marius and Augustus had proved to be safer policy than the clemency of Pompey and Julius Caesar, which had wrought their ruin. He ended with an apology for Commodus and bitter reproaches against the senate for their sympathy with his assassins. Over sixty senators were arrested on a charge of having adhered to Albinus, and half were put to death. In most instances the charge was a pretence to enable the emperor to crush the forward and dangerous spirits in the senate. The murderers of Commodus were punished; Commodus himself was deified; and on the monuments from this time onward Severus figures as the brother of that reproduction of all the vice and cruelty of Nero with the refinement left out.

The next years (197–202) were devoted by Severus to one of the dominant ideas of the empire from its earliest days—war against the Parthians. The results to which Trajan and Verus had aspired were now fully attained, and Mesopotamia was definitely established as a Roman province. Part of the time was spent in the exploration of Egypt, in respect of which Dio takes opportunity to say that Severus was not the man to leave anything human or divine uninvestigated. The emperor returned to a well-earned triumph, commemorated to this day by the arch in Rome which bears his name. During the six years which followed (202–208) Severus resided at Rome and gave his attention to the organization of the empire. Severus had confided much of the administration of the empire to Plautianus, the commander of the reorganized Praetorians, who is described by the ancient historians as a second Sejanus. In 203 Plautianus fell, owing, it is said, to an intrigue set on foot by Caracalla, who had shortly before married the daughter of his victim.

Severus spent the last three years of his life (208–211) in Britain, amid constant and not very successful warfare, which he is said to have provoked partly to strengthen the discipline and powers of the legions, partly to wean his sons from their evil courses by hard military service. He died at York on the 4th of February 211. There are traditions that his death was in some way hastened by Caracalla. This prince had been, since about 197, nominally joint emperor with his father, so that no ceremony was needed for his recognition as monarch.

The natural gifts of Severus were of no unusual order. He had a clear head, promptitude, resolution, tenacity and great organizing power, but no touch of genius. That he was cruel cannot be questioned, but his cruelty was of the calculating kind, and always directed to some end. He threw the head of Niger over the ramparts of Byzantium, but merely as the best means of procuring a surrender of the stubbornly defended fortress. The head of Albinus he exhibited at Rome, but only as a warning to the capital to tamper no more with pretenders. The children of Niger were held as hostages and kindly treated so long as they might possibly afford a useful basis for negotiation with their father; when he was defeated they were killed, lest from among them should arise a claimant for the imperial power. Stern and barbarous punishment was always meted out by Severus to the conquered foe, but terror was deemed the best guarantee for peace. He felt no scruples of conscience or honour if he thought his interest at stake, but he was not wont to take an excited or exaggerated view of what his interest required. He used or destroyed men and institutions alike with cool judgment and a single eye to the secure establishment of his dynasty. The few traces of aimless savagery which we find in the ancient narratives are probably the result of fear working on the imagination of the time.

As a soldier Severus was brave, but he can hardly be called a general, in spite of his successful campaigns. He was rather the organizer of victory than the author of it. The operations against Niger were carried out entirely by his officers. Dio even declares that the final battle with Albinus was the first at which Severus had ever been present. When a war was going on he was constantly travelling over the scene of it, planning it and instilling into the army his own pertinacious spirit, but the fighting was usually left to others. His treatment of the army is the most characteristic feature of his reign. He broke with the decent conventions of the Augustan constitution, ignored the senate, and based his rule upon force. The only title he ever laid to the throne was the *pronunciamiento* of the legions, whose adherence to his cause he commemorated even on the coinage of the realm. The legions voted him the adopted son of Marcus Aurelius; the legions associated with him Caracalla in the government of the empire. Severus strove earnestly to wed the army as a whole to the support of his dynasty. He increased enormously the material gains and the honorary distinctions of the service, so that he was charged with corrupting the troops. Yet it cannot be denied that, all things considered, he left the army of the empire more efficient than he found it. He increased the strength of it by three legions, and turned the Praetorians, heretofore a flabby body without military experience or instinct, into a chosen corps of veterans. Their ranks were filled by promotion from all the legions on service, whereas previously there had been special enlistment from Italy and one or two of the neighbouring provinces. It was hoped that these picked men would form a force on which an emperor could rely in an emergency. But to meet the possibility of a legionary revolt in the provinces, one of the fundamental principles of the Augustan empire was abrogated: Italy became a province, and a legion was quartered at Alba Fucens under the direct command of the emperor. Further to obviate the risk of revolution, the great commands in the provinces were broken up, so that, excepting on the turbulent eastern frontier, it was not possible for a commander to dispose of troops numerous enough to render him dangerous to the government.

But, while the policy of Severus was primarily a family policy, he was by no means careless of the security and welfare of the empire. Only in one instance, the destruction of Byzantium, did he weaken its defences for his own ends—an error for which his successors paid dearly, when the Goths came to dominate the Euxine. The troublesome Danubian regions received the special attention of the emperor, but all over the realm the status and privileges of communities and districts were recast in the way that seemed likely to conduce to their prosperity. The administration acquired more and more of a military character, in Italy as well as in the provinces. Retired military officers now filled many of the posts formerly reserved for civilians of equestrian rank. The praefect of the Praetorians received large civil and judicial powers, so that the investment of Papinian with the office was less unnatural than it seems at first sight. The alliance between Severus and the jurisconsults had important consequences. While he gave them new importance in the body politic, and co-operated with them in the work of legal reform, they did him material service by working an absolutist view of the government into the texture of Roman law. Of the legal changes of the reign, important as they were, we can only mention a few details. The emperor himself was a devoted and upright judge, but he struck a great blow at the purity of the law by transferring the exercise of imperial jurisdiction from the forum to the palace. He sharpened in many respects the law of treason, put an end to the time-honoured *quaestiones perpetuae*, altered largely that important section of the law which defined the rights of the fiscus, and developed further the social policy which Augustus had embodied in the *lex Julia de adulteriis* and the *lex Papia Poppaea*.

Severus boldly adopted as an official designation the autocratic title of *dominus*, which the better of his predecessors had renounced. During his reign the senate was powerless; he took all initiative into his hands. He broke down the distinction between the servants of the senate and the servants of the emperor. All nominations to office or function passed under his scrutiny. The estimation of the old consular and other republican titles was diminished. The growth of capacity in the senate was checked by cutting off the tallest of the poppy-heads early in the reign. The senate became a mere registration office for the imperial determinations, and its members, as has been well said, a choir for drawling conventional hymns of praise in honour of the monarch. Even the nominal restoration of the senate's power at the time of Alexander Severus, and the accession of so-called "senatorial emperors" later on, did not efface the work of Septimius Severus, which was resumed and carried to its fulfilment by Diocletian.

No period in the history of Latin literature is so barren as the reign of Severus. Many later periods—the age of Stilicho, for example—shine brilliantly by comparison. The only great Latin writers are the Christians Tertullian and Cyprian. The Greek literature of the period is richer, but not owing to any patronage of the emperor, except perhaps in the case of Dio Cassius, who, though no admirer of Severus, attributes to encouragement received from him the execution of the great historical work which has come down to our time. The numerous restorations of ancient buildings and the many new constructions carried out by Severus show that he was not insensible to the artistic glories of the past; and he is known to have paid much attention to works of art in foreign countries where his duties took him. But he was in no sense a patron or connoisseur of art. As to religion, if we may trust Dio, one of the most superstitious of historians, Severus was one of the most superstitious of monarchs. But apart from that it is difficult to say what was his influence on the religious currents of the time. He probably did a good deal to strengthen and extend the official cult of the imperial family, which had been greatly developed during the prosperous times of the Antonines. But what he thought of Christianity, Judaism or the Oriental mysticism to which his wife Julia Domna gave such an impulse in the succeeding reign, it is impossible to say. We may best conclude that his religious sympathies were wide, since tradition has not painted him as the partisan of any one form of worship.

AUTHORITIES.—Severus himself wrote an autobiography which was regarded as candid and trustworthy on the whole. The events of the reign were recorded by several contemporaries. The first place among these must be given to Dio Cassius, who stands to the empire in much the same relation as Livy to the republic. He became a senator in the year when Marcus Aurelius died (180) and retained that dignity for more than fifty years. He was well acquainted with Severus, and was near enough the centre of affairs to know the real nature of events, without being great enough to have personal motives for warping the record. Though this portion of Dio's history no longer exists in its original form, we have copious extracts from it, made by Xiphilinus, an ecclesiastic of the 11th century. The faults which have impaired the credit of Dio's great work in its earlier portions—his lack of the critical faculty, his inexact knowledge of the earlier Roman institutions, his passion for signs from heaven—could do little injury to the narrative of an eye-witness; and he gives the impression of unusual freedom from passion, prejudice and insincerity. His Greek, too, stands in agreeable contrast to the debased Latin of the *Scriptores historiae Augustae.* The Greek writer Herodian was also a contemporary of Severus, but the mere fact that we know nothing of his life is in itself enough to show that his opportunities were not so great as those of Dio. The reputation of Herodian, who was used as the main authority for the times of Severus by Tillemont and Gibbon, has not been proof against the criticism of later scholars. His faults are those of rhetoric and exaggeration. His narrative is probably in many places not independent of Dio. The Augustan historians, unsatisfactory compilers, form a principal source for the history of the reign. The numerous inscriptions belonging to the age of Septimius Severus enable us to control at many points and largely to supplement the literary records of his reign, particularly as regards the details of his administration. The juridical works of Justinian's epoch embody much that throws light on the government of Severus.

The principal modern works relating to this emperor, after Tillemont and Gibbon, are—J. J. Schulte, *De imperatore L. Septimio Severo* (Münster, 1867); Höfner, *Untersuchungen zur Geschichte des Kaisers L. Septimius Severus* (Giessen, 1875); *Untersuchungen zur römischen Kaisergeschichte*, ed. by M. Budinger; H. Schiller, *Geschichte der römischen Kaiserzeit* (Gotha, 1880–1883); De Ceuleneer, *Essai sur la vie et le règne de Septime Sévère* (Brussels, 1880); Réville, *La Religion à Rome sous les Sévères* (Paris, 1886); Fuchs, *Geschichte des Kaisers L. Septimius Severus* (1884). On Julia Domna, see M. G. Williams, in *American Journal of Archaeology*, vi. (1902), pp. 259-306. (J. S. R.)

SEVERUS, SULPICIUS (*c.* 363–*c.* 425), Christian writer, was a native of Aquitania. He was imbued with the culture of his time and of his country, which was then the only true home of Latin letters and learning. Almost all that we know of Severus' life comes from a few allusions in his own writings, and some passages in the letters of his friend Paulinus, bishop of Nola. In his early days he was famous as a pleader, and his knowledge of Roman law is reflected in parts of his writings. He married a wealthy lady belonging to a consular family, who died young, leaving him no children. At this time Severus came under the powerful influence of St Martin, bishop of Tours, by whom he was led to devote his wealth to the Christian poor, and his own powers to a life of good works and meditation. To use the words of his friend Paulinus, he broke with his father, followed Christ, and set the teachings of the "fishermen" far above all his "Tullian learning." He rose to no higher rank in the church than that of presbyter. He is said to have been led away in his old age by Pelagianism, but to have repented and inflicted long-enduring penance on himself. His time was passed chiefly in the neighbourhood of Toulouse, and such literary efforts as he permitted to himself were made in the interests of Christianity. In many respects no two men could be more unlike than Severus, the scholar and orator, well versed in the ways of the world, and Martin, the rough Pannonian bishop, ignorant, suspicious of culture, champion of the monastic life, seer and worker of miracles. Yet the spirit of the rugged saint subdued that of the polished scholar, and the works of Severus are only important because they reflect the ideas, influence and aspirations of Martin, the foremost ecclesiastic of Gaul.

The chief work of Severus is the *Chronica* (*c.* 403), a summary of sacred history from the beginning of the world to his own times, with the omission of the events recorded in the Gospels and the Acts, "lest the form of his brief work should detract from the honour due to those events." The book was a text-book, and was used as such in the schools of Europe for about a century and a half after the *editio princeps* was published by Flacius Illyricus in 1556. Severus nowhere clearly points to the class of readers for whom his book is designed. He disclaims the intention of making his work a substitute for the actual narrative contained in the Bible. "Worldly historians" had been used by him, he says, to make clear the dates and the connexion of events and for supplementing the sacred sources, and with the intent at once to instruct the unlearned and to "convince" the learned. Probably the "unlearned" are the mass of Christians and the learned are the cultivated Christians and pagans alike, to whom the rude language of the sacred texts, whether in Greek or Latin, would be distasteful. The literary structure of the narrative shows that Severus had in his mind principally readers on the same level of culture with himself. He was anxious to show that sacred history might be presented in a form which lovers of Sallust and Tacitus could appreciate and enjoy. The style is lucid and almost classical. Though phrases and even sentences from many classical authors are inwoven here and there, the narrative flows easily, with no trace of the jolts and jerks which offend us in almost every line of an imitator of the classics like Sidonius. It is free from useless digressions. In order that his work might fairly stand beside that of the old Latin writers, Severus ignored the allegorical methods of interpreting sacred history to which the heretics and the orthodox of his age were wedded.

As an authority for times antecedent to his own, Severus is of little moment. At only a few points does he enable us to correct or supplement other records. Bernays has shown that he based his narrative of the destruction of Jerusalem by Titus on the account given by Tacitus in his "Histories," a portion of which has been lost. We are enabled thus to contrast Tacitus with Josephus, who warped his narrative to do honour to Titus. In his allusions to the Gentile rulers with whom the Jews came into contact from the time of the Maccabees onwards, Severus discloses some points which are not without importance. But the real interest of his work lies, first, in the incidental glimpses it affords all through of the history of his own time; next and more particularly, in the information he has preserved concerning the struggle over the Priscillianist heresy, which disorganized and degraded the churches of Spain and Gaul, and particularly affected Aquitaine. The sympathies here betrayed by Severus are wholly those of St Martin. The bishop had withstood Maximus, who ruled for some years a large part of the western portion of the empire, though he never conquered Italy. He had reproached him with attacking and overthrowing his predecessors on the throne, and for his dealings with the church. Severus loses no opportunity for laying stress on the crimes and follies of rulers, and on their cruelty, though he once declares that, cruel as rulers could be, priests could be crueller still. This last statement has reference to the bishops who had left Maximus no peace till he had stained his hands with the blood of Priscillian and his followers. Martin, too, had denounced the worldliness and greed of the Gaulish bishops and clergy. Accordingly we find that Severus, in narrating the division of Canaan among the tribes, calls the special attention of ecclesiastics to the fact that no portion of the land was assigned to the tribe of Levi, lest they should be hindered in their service of God. "Our clergy seem," he says, "not merely forgetful of the lesson but ignorant of it, such a passion for possessions has in our days fastened like a pestilence on their souls." We here catch a glimpse of the circumstances which were winning over good men to monasticism in the West, though the evidence of an enthusiastic votary of the solitary life, such as Severus was, is probably not free from exaggeration. Severus also fully sympathized with the action of St Martin touching Priscillianism. This mysterious Western offshoot of Gnosticism had no single feature about it which could soften the hostility of a character such as Martin's, but he resisted the introduction of secular punishment for evil doctrine, and withdrew from communion with those bishops in Gaul, a large majority, who invoked the aid of Maximus against their erring brethren. In this connexion it is interesting to note the account given by Severus of the synod held at Rimini in 359, where the question arose whether the bishops attending the assembly might lawfully receive money from the imperial treasury to recoup their travelling and other expenses. Severus evidently approves the action of the British and Gaulish bishops, who deemed it unbecoming that they should lie under pecuniary obligation to the emperor. His ideal of the church required that it should stand clear and above the state.

After the *Chronica* the chief work of Severus is his *Life of Martin*, a contribution to popular Christian literature which did much to establish the great reputation which that wonder-working saint maintained throughout the middle ages. The book is not properly a biography, but a catalogue of miracles, told in all the simplicity of absolute belief. The power to work miraculous signs is assumed to be in direct proportion to holiness, and is by Severus valued merely as an evidence of holiness, which he is persuaded can only be attained through a life of isolation from the world. In the first of his *Dialogues* (fair models of Cicero), Severus puts into the mouth of an interlocutor (Posthumianus) a pleasing description of the life of coenobites and solitaries in the deserts bordering on Egypt. The main evidence of the virtue attained by them lies in the voluntary subjection to them of the savage beasts among which they lived. But Severus was no indiscriminating adherent of monasticism. The same dialogue shows him to be alive to its dangers and defects. The second dialogue is a large appendix to the Life of Martin, and really supplies more information of his life as bishop and of his views than the work which bears the title *Vita S. Martini*. The two dialogues occasionally make interesting references to personages of the epoch. In Dial. 1, cc. 6, 7, we have a vivid picture of the controversies which raged at Alexandria over the works of Origen. The judgment of Severus himself is no doubt that which he puts in the mouth of his interlocutor Posthumianus: "I am astonished that one and the same man could have so far differed from himself that in the approved portion of his works he has no equal since the apostles, while in that portion for which he is justly blamed it is proved that no man has committed more unseemly errors." Three *Epistles* on the death of Martin (ad Eusebium, ad Aurelium diaconum, ad Bassulam) complete the list of Severus' genuine works. Other letters (to his sister), on the love of God and the renunciation of the world, have not survived.

AUTHORITIES.—The text of the *Chronica* rests on a single 11th century MS., one of the Palatine collection now in the Vatican; of the other works MSS. are abundant, the best being one of the 6th century at Verona. Some spurious letters bear the name of Severus; also in a MS. at Madrid is a work falsely professing to be an epitome of the *Chronica* of Severus, and going down to 511. The chief editions of the complete works of Severus are those by De Prato (Verona, 1741) and by Halm (forming vol. i. of the *Corpus scriptorum ecclesiasticorum Latinorum*, Vienna, 1866). There is a most admirable monograph on the *Chronica* by J. Bernays (Berlin, 1861). See also Goelzer, *Grammaticae in Sulp. Severum observationes* (1884) (thesis).

SEVERY (probably connected with the English word "sever"), in architecture, any main compartment or division of a building. The word has been supposed to be a corruption of Ciborium, as Gervase of Canterbury uses the word in this sense; but he probably alludes to the *vaulted* form of the upper part of the web of each severy.

SEVIER, JOHN (1745–1815), American frontiersman, first governor of Tennessee, was born in Rockingham county, Virginia, on the 23rd of September 1745, of Huguenot ancestry, the family name being Xavier. He settled on the Watauga on the western slope of the Alleghanies in 1772, and served as a captain in Lord Dunmore's War in 1774. Early in 1776 the Watauga settlements were annexed to North Carolina, and Sevier, who from the beginning had been a member of the Watauga government, now represented the district in the provincial congress, which met at Halifax in November–December 1776 and adopted the first state constitution, and in 1777 he was a member of the state House of Commons. He took part in the campaign of 1780 against the British, especially distinguishing himself in the battle of King's Mountain, where he led the right wing. In December 1780 he defeated the Cherokees at Boyd's Creek (in the present Sevier county, Tennessee), laying waste their country during the following spring. Later in the same year (1781), under General Francis Marion, he fought the British in the Carolinas and Georgia. In 1784, when North Carolina first ceded its western lands to the Federal government, he took part in the revolt of the western settlements; he was president of the first convention which met in Jonesboro on the 23rd of August, and opposed the erection of a new state, but when the state of Frankland (afterwards Franklin, in honour of Benjamin Franklin) was organized in March 1785, he became its first and only governor (1785–1788), and as such led his riflemen against the Indians; in May 1788, after the end of his term, men in his command massacred several Indians from a friendly village, and thus provoked a war in which Sevier again showed his ability as an Indian fighter. He was arrested by the North Carolina authorities, partly as a leader of the independent government and partly for the Indian massacre, but escaped. About this time he attempted to make an alliance with Spain on behalf of the state of Franklin. In 1789 he was a member of the North Carolina Senate, and in 1790–1791 of the National House of Representatives. After the final cession of its western territory by North Carolina to the United States in 1790 he was appointed brigadier-general of militia for the eastern district of the "Territory South of the Ohio"; and conducted the Etowah campaign against the Creeks and Cherokees in 1793. When Tennessee was admitted into the Union as a state, Sevier became its first governor (1796–1801) and was governor again in 1803–1809. He was again a member of the National House of Representatives in 1811–1815, and then was commissioner to determine the boundary of Creek lands in Georgia. He died near Fort Decatur, Georgia, on the 24th of September 1815.

See J. R. Gilmore, *The Rear-Guard of the Revolution* (New York, 1886), and *John Sevier as a Commonwealth Builder* (New York, 1887); errors in Gilmore's books are pointed out in Theodore Roosevelt's *The Winning of the West* (New York, 1894–1896).

SÉVIGNÉ, MARIE DE RABUTIN-CHANTAL, MARQUISE DE (1626–1696), French letter-writer, was born at Paris on the 5th of February 1626. The family of Rabutin (if not so illustrious as Bussy, Madame de Sévigné's notorious cousin, affected to consider it) was one of great age and distinction in Burgundy. It was traceable in documents to the 12th century, and the castle which gave it name still existed, though in ruins, in Madame de Sévigné's time. The family had been *gens d'épée* for the most part, though François de Rabutin, the author of valuable memoirs on the sixth decade of the 16th century, belonged to it. Marie's father, Celse Bénigne de Rabutin, Baron de Chantal, was the son of the celebrated "Sainte" Chantal, friend and disciple of St Francis of Sales; her mother was Marie de Coulange[s]. Celse de Rabutin, a great duellist, was killed during the English descent on the Isle of Rhé in July 1627. His wife did not survive him many years, and Marie was left an orphan at the age of seven years and a few months. She then passed into the care of her grandparents on the mother's side; but they were both aged, and the survivor of them, Philippe de Coulanges (or Coulange), died in 1636, Marie being then ten years old. Her uncle Christophe de Coulanges, abbé de Livry, was chosen as her guardian. He was somewhat young for the guardianship of a girl, being only twenty-nine, but readers of his niece's letters know how well "Le Bien Bon" —for such is his name in Madame de Sévigné's little language— acquitted himself of the trust. He lived till within ten years of his ward's death, and long after his nominal functions were ended he was in all matters of business the good angel of the family, while for half a century his abbacy of Livry was the favourite residence both of his niece and her daughter. Coulanges was much more of a man of business than of a man of letters, but either choice or the fashion of the time induced him to make of his niece a learned lady. Jean Chapelain and Gilles Ménage are specially mentioned as her tutors, and Ménage at least fell in love with her. Tallemant des Réaux gives more than one instance of the cool and good-humoured raillery with which she received his passion, and the earliest letters of hers that we possess are addressed to Ménage. Another literary friend of her youth was the poet Denis Sanguin de Saint-Pavin. Among her own sex she was intimate with all the coterie of the Hôtel Rambouillet, and her special ally was Mademoiselle de la Vergne, afterwards Madame de la Fayette. In person she was extremely attractive, though the minute critics of the time (which was the palmy day of portraits in words) objected to her divers deviations from strictly regular beauty, such as eyes of different colours and sizes, a "square-ended" nose and a somewhat heavy jaw. Her beautiful hair and complexion, however, were admitted even by these censors, as well as the extraordinary spirit and liveliness of her expression. Her long minority, under so careful a guardian as Coulanges, had also raised her fortune to the amount of 100,000 crowns—a large sum for the time, and one which with her birth and beauty might have allowed her to expect a brilliant marriage. There had been some talk of her cousin Bussy, but fortunately for her this came to nothing. She married Henri, marquis de Sévigné, a Breton gentleman of good family, allied to the oldest houses of that province, but of no great estate. The marriage took place on August 4, 1644, and the pair went almost immediately to Sévigné's manor-house of Les Rochers, near Vitré, a place which Madame de Sévigné was in future years to immortalize. It was an unfortified chateau of no great size, but picturesque, with the peaked turrets common in French architecture, and surrounded by a park and grounds. The abundance of trees gave it the repute of being damp and somewhat gloomy. Fond, however, as Madame de Sévigné was of society, it may be suspected that the happiest days of her brief married life were spent there. For there at any rate her husband had less opportunity than in Paris of neglecting her, and of wasting her money and his own. Very little good is said of Henri de Sévigné by any of his contemporaries. He was one of the innumerable lovers of Ninon de l'Enclos, and made himself even more conspicuous with a certain Madame de Gondran, known in the nickname slang of the time as "La Belle Lolo." He was wildly extravagant. That his wife loved him and that he did not love her was generally admitted. At last his vices came home to him. He quarrelled with the Chevalier d'Albret about Madame de Gondran, fought with him and was mortally wounded on the 4th of February 1651; he died two days afterwards. There is no reasonable doubt that his wife regretted him a great deal more than he deserved. Though only six and twenty, and more beautiful than ever, she never married again despite frequent offers, and no aspersion was ever thrown, save in one instance, on her fame. For the rest of her life she gave herself up to her children. These were two in number, and they divided their mother's affections by no means equally. The eldest was a daughter, Françoise Marguerite, who was born on the 10th of October 1646, whether at Les Rochers or in Paris is not certain. The second, a son, Charles, was born at Les Rochers in the spring of 1648. To him Madame de Sévigné was an indulgent, a generous (though not altogether just) and in a way an affectionate mother. Her daughter, the future Madame de Grignan, she worshipped with an almost insane affection, which only its charming literary results and the delightful qualities which accompanied it in the worshipper, though not in the worshipped, save from being ludicrous if not revolting.

After her husband's death Madame de Sévigné passed the greater part of the year 1651 in retirement at Les Rochers, but she returned to Paris in November of that year. For nearly ten years little of importance occurred in her life, which was passed at Paris in a house she occupied in the Place Royale (not as yet in the famous Hôtel Carnavalet), at Les Rochers, at Livry or at her own estate of Bourbilly in the Mâconnais. She had, however, in 1658, a quarrel with her cousin Bussy. Notwithstanding Bussy's various delinquencies the cousins had always been friends; and the most amusing and characteristic part of Madame de Sévigné's correspondence, before the date of her daughter's marriage, is addressed to him. She had a strong belief in family ties; she recognized in Bussy a kindred spirit, and she excused his faults as *Rabutinades* and *Rabutinages*. But a misunderstanding about money brought about a quarrel, which in its turn had a long sequel, and results not unimportant in literature. Bussy and his cousin had jointly come in for a considerable legacy, and he asked her for a loan. If this was not positively refused, there was a difficulty made about it, and Bussy was offended. A year later, at the escapade of Roissy (see BUSSY), according to his own account, he improvised (according to probability he had long before written it) the famous portrait of Madame de Sévigné which appears in his notorious *Histoire amoureuse*, and is a triumph of malice. Circulated at first in manuscript and afterwards in print, this caused Madame de Sévigné the deepest pain and indignation, and the quarrel between the cousins was not fully made up for years, though after Bussy's disgrace and imprisonment in 1666 the correspondence was renewed. What might have been, and to some extent was, a much more serious matter occurred in 1661 at the downfall of the Superintendent Fouquet. It was announced on indubitable authority that communications from her had been found in the coffer where Fouquet kept his love letters. She protested that the notes in question were of friendship merely, and Bussy (one of the not very numerous good actions of his life) obtained from Le Tellier, who as minister had examined the letters, a corroboration of the protest. But these letters were never published, and there have always been those who held that Madame de Sévigné regarded Fouquet with at least a very warm kind of friendship. It is certain that her letters to Pomponne describing his trial are among her masterpieces of unaffected, vivid and sympathetic narration.

During these earlier years Madame de Sévigné had a great affection for the establishment of Port Royal, which was not without its effect on her literary work. That work, however, dates in its bulk and really important part almost entirely from the last thirty years of her life. Her letters before the marriage of her daughter, though by themselves they would suffice to give her a very high rank among letter-writers, would not do more than fill one moderate-sized volume. Those after that marriage fill nearly ten large volumes in the latest and best edition. We do not hear very much of Mademoiselle de Sévigné's early youth. For a short time, at a rather uncertain date, she was placed at school with the nuns of Sainte-Marie at Nantes. But for the most part her mother brought her up herself, assisted by the Abbé de la Mousse, a faithful friend, and for a time one of her most constant companions. La Mousse was a great Cartesian, and he made Mademoiselle de Sévigné also a devotee of the bold soldier of Touraine. But she was bent on more mundane triumphs than philosophy had to offer. Her beauty is all the more incontestable that she was by no means generally liked. Bussy, a critical and not too benevolent judge, called her "la plus jolie fille de France," and it seems to be agreed that she resembled her mother, with the advantage of more regular features. She was introduced at court early, and as she danced well she figured frequently in the ballets which were the chief amusement of the court of Louis XIV. in its early days. If, however, she was more regularly beautiful than her mother she had little or nothing of her attraction, and like many other beauties who have entered society with similar expectations she did not immediately find a husband. Various projected alliances fell through for one reason or another, and it was not till the end of 1668 that her destiny was settled. On January 29 in the next year she married François d'Adhémar, comte de Grignan, a Provençal, of one of the noblest families of France, and a man of amiable and honourable character, but neither young, nor handsome, nor in reality rich. He had been twice married and his great estates were heavily encumbered. Neither did the large dowry (300,000 livres) which Madame de Sévigné, somewhat unfairly to her son, bestowed upon her daughter, suffice to clear encumbrances, which were constantly increased in the sequel by the extravagance of Madame de Grignan as well as of her husband.

Charles de Sévigné was by this time twenty years old. He never appears to have resented his mother's preference of his sister; but, though thoroughly amiable, he was not (at any rate in his youth) a model character. Nothing is known of his education, but just before his sister's marriage he volunteered for a rather harebrained expedition to Crete against the Turks, and served with credit. Then his mother bought him the commission of *guidon* (a kind of sub-cornet) in the Gendarmes Dauphin, in which regiment he served for some years. But though he always fought well he was not an enthusiastic soldier, and was constantly and not often fortunately in love. He followed his father into the nets of Ninon de l'Enclos, and was Racine's rival with Mademoiselle Champmeslé. The way in which his mother was made confidante of these discreditable and not very successful loves is characteristic both of the time and of the country. In 1669 M. de Grignan, who had previously been lieutenant-governor of Languedoc, was transferred to Provence. The governor-in-chief was the young duke of Vendôme. But at this time he was a boy, and he never really took up the government, so that Grignan for more than forty years was in effect viceroy of this important province. His wife rejoiced greatly in the part of vice-queen; but their peculiar situation threw on them the expenses without the emoluments of the office, so that the Grignan money affairs hold a larger place in Madame de Sévigné's letters than might perhaps be wished.

In 1671 Madame de Sévigné, with her son, paid a visit to Les Rochers, which is memorable in her history and in literature. The states of Brittany were convoked that year at Vitré. This town being in the immediate neighbourhood of Les Rochers, Madame de Sévigné's usually quiet life at her country-house was diversified by the necessity of entertaining the governor, the duc de Chaulnes, of appearing at his receptions and so forth. All these matters are recorded in her letters, together with much good-natured raillery on the country ladies of the neighbourhood and their ways. She remained at Les Rochers during the whole summer and autumn of 1671, and did not return to Paris till late in November. The country news is then succeeded by news of the court. At the end of the next year, 1672, one great wish of her heart was gratified by paying a visit to her daughter in her vice-royalty of Provence. Madame de Grignan does not seem to have been very anxious for this visit—perhaps because, as the letters show in many cases, the exacting affection of her mother was somewhat too strong for her own colder nature, perhaps because she feared such a witness of the ruinous extravagance which characterized the Grignan household. But her mother remained with her for nearly a year, and did not return to Paris till the end of 1673. During this time we have (as is usually the case during these Provençal visits and the visits of Madame de Grignan to Paris) some letters addressed to Madame de Sévigné, but comparatively few from her. A visit of the second class was the chief event of 1674. 1675 brought with it the death of Turenne (of which Madame de Sévigné has given a noteworthy account, characteristic of her more ambitious but not perhaps her more successful manner), and also serious disturbances in Brittany. Notwithstanding these it was necessary for Madame de Sévigné to make her periodical visit to Les Rochers. She reached the house in safety, and the friendship of Chaulnes protected her both from violence and from the exactions which the miserable province underwent as a punishment for its resistance to excessive and unconstitutional taxation. No small part of her letters is occupied by these affairs.

The year 1676 saw several things important in Madame de Sévigné's life. For the first time she was seriously ill—it would appear with rheumatic fever—and she did not thoroughly recover till she had visited Vichy. Her letters from this place are among her best, and picture life at a 17th-century watering-place with unsurpassed vividness. In this year, too, took place the trial and execution of Madame de Brinvilliers. This event figures in the letters, and the references to it are among those which have given occasion to unfavourable comments on Madame de Sévigné's character. In the next year, 1677, she moved into the Hôtel Carnavalet, a house which still remains and is inseparably connected with her memory, and she had the pleasure of welcoming the whole Grignan family to it. They remained there a long time; indeed nearly two years seem to have been spent by Madame de Grignan partly in Paris and partly at Livry. The return to Provence took place in October 1678, and next year Madame de Sévigné had the grief of losing La Rochefoucauld, the most eminent and one of the most intimate of her close personal friends and constant associates. In 1680 she again visited Brittany, but the close of that year saw her back in Paris to receive another and even longer visit from her daughter, who remained in Paris for four years. Before the end of the last year of this stay (in February 1684) Charles de Sévigné, after all his wandering loves, and after more than one talked-of alliance, was married to a young Breton lady, Jeanne Marguerite de Mauron, who had a considerable fortune. In the arrangements for this marriage Madame de Sévigné practically divided all her fortune between her children (Madame de Grignan of course receiving an unduly large share), and reserved only part of the life interest. The greed of Madame de Grignan nearly broke her brother's marriage, but it was finally concluded, and proved happy in a somewhat singular fashion. Both Sévigné and his wife became deeply religious, and at first Madame de Sévigné found their household (for she gave up Les Rochers to them) not at all lively. But by degrees she grew fond of her daughter-in-law. During this year she spent a considerable time in Brittany, first on business, afterwards on a visit to her son, and partly it would appear for motives of economy. But Madame de Grignan continued with only short absences to inhabit Paris, and the mother and daughter were practically in each other's company until 1688. The proportion of letters therefore that we have for the decade 1677–1687 is much smaller than that which represents the decade preceding it; indeed the earlier period contains the great bulk of the whole correspondence. In 1687 the Abbé de Coulanges, Madame de Sévigné's uncle and good angel, died, and in the following year the whole family were greatly excited by the first campaign of the young marquis de Grignan, Madame de Grignan's only son, who was sent splendidly equipped to the siege of Philippsbourg. In the same year Madame de Sévigné was present at the Saint-Cyr performance of *Esther*, and some of her most amusing descriptions of court ceremonies and experiences date from this time. 1689 and 1690 were almost entirely spent by her at Les Rochers with her son; and on leaving him she went across France to Provence. There was some excitement during her Breton stay, owing to the rumour of an English descent, on which occasion the Breton militia was called out, and Charles de Sévigné appeared for the last time as a soldier; but it came to nothing. 1691 was passed at Grignan and other places in the south, but at the end of it Madame de Sévigné returned to Paris, bringing the Grignans with her; and her daughter stayed with her till 1694. The year 1693 saw the loss of two of her oldest friends—Bussy Rabutin, her faithless and troublesome but in his own way affectionate cousin, and Madame de la Fayette, her life-long companion, and on the whole perhaps her best and wisest friend. Another friend almost as intimate, Madame de Lavardin, followed in 1694. Madame de Sévigné spent but a few months of this latter year alone, and followed her daughter to Provence. She never revisited Brittany after 1691. Two important marriages with their preparations occupied most of her thoughts during 1694–1695. The young marquis de Grignan married the daughter of Saint-Amant, an immensely rich financier; but his mother's pride, ill-nature and bad taste (she is said to have remarked in full court that it was necessary now and then to "manure the best lands;" referring to Saint-Amant's wealth and low birth, and the Grignan's nobility) made the marriage not very happy. His sister Pauline, who, in the impossibility of dowering her richly, had a narrow escape of the cloister, made a marriage of affection with the marquis de Simiane, and eventually became the sole representative and continuator of the families of Grignan and Sévigné.

Madame de Sévigné survived these alliances but a very short time. During an illness of her daughter she herself was attacked by smallpox in April 1696, and she died on the 17th of that month at Grignan, and was buried there. Her idolized daughter was not present during her illness. But in her will Madame de Sévigné still showed her preference for this not too grateful child, and Charles de Sévigné accepted his mother's wishes in a letter showing the good-nature which he had never lacked. But the two families were, except as has been said for Madame de Simiane and her posterity, to be rapidly broken up. Charles de Sévigné and his wife had no children, and he himself, after occupying some public posts (he was king's lieutenant in Brittany in 1697), went with his wife into religious retirement at Paris in 1703, and after a time sequestered himself still more in the seminary of Sainte-Magloire, where he died on March 26, 1713. His widow survived him twenty years. Madame de Grignan had died on August 16, 1705, at a country-house near Marseilles, of the very disease which she had tried to escape by not visiting her dying mother. Her son, who had fought at Blenheim, had died of the same malady at Thionville the year before. Marie Blanche, her eldest daughter, was in a convent, and, as all the comte de Grignan's brothers had either entered the church or died unmarried, the family, already bankrupt in fortune, was extinguished in the male line by Grignan's own death in 1714, at a great age. Madame de Simiane, whose connexion with the history of the letters is important, died in 1737.

The chief subjects of public interest and the principal family events of importance which are noticed in the letters of Madame de Sévigné have been indicated already. But, as will readily be understood, neither the whole nor even the chief interest of her correspondence is confined to such things. In the latest edition the letters extend to sixteen or seventeen hundred, of which, however, a considerable number (perhaps a third) are replies of other persons or letters addressed to her, or letters of her family and friends having more or less connexion with the subjects of her correspondence. As a rule her own letters, especially those to her daughter, are of great length. Writing as she did in a time when newspapers were not, or at least were scanty and jejune, gossip of all sorts appears among her subjects, and some of her most famous letters are pure *reportage* (to use a modern French slang term), while others deal with strictly private matters. Thus one of her best-known pieces has for subject the famous suicide of the great cook Vatel owing to a misunderstanding as to the provision of fish for an entertainment given to the king by Condé at Chantilly. Another (one of the most characteristic of all) deals with the projected marriage of Lauzun and Mademoiselle de Montpensier; another with the refusal of one of her own footmen to turn hay-maker when it was important to get the crop in at Les Rochers; another with the fire which burnt out her neighbour's house in Paris. At one moment she tells how a forward lady of honour was disconcerted in offering certain services at Mademoiselle's levée; at another how ill a courtier's clothes became him. She enters, as has been said, at great length into the pecuniary difficulties of her daughter; she tells the most extraordinary stories of the fashion in which Charles de Sévigné sowed his wild oats; she takes an almost ferocious interest and side in her daughter's quarrels with rival beauties or great officials in Provence.

Almost all writers of literary letters since Madame de Sévigné's days, or rather since the publication of her correspondence, have imitated her more or less directly, more or less consciously, and it is therefore only by applying that historic estimate upon which all true criticism rests that her full value can be discerned. The charm of her work is, however, so irresistible that, read even without any historical knowledge and in the comparatively adulterated editions in which it is generally met with, that charm can hardly be missed. Madame de Sévigné was a member of the strong and original group of writers—Retz, La Rochefoucauld, Corneille, Pascal, Saint-Évremond, Descartes and the rest—who escaped the influence of the later 17th century, while they profited by the reforms of the earlier. According to the strictest standard of the Academy her phraseology is sometimes incorrect, and it occasionally shows traces of the quaint and affected style of the *Précieuses*; but these things only add to its savour and piquancy. In lively narration few writers have excelled her, and in the natural expression of domestic and maternal affection none. She had an all-observant eye for trifles and the keenest possible appreciation of the ludicrous, together with a hearty relish for all sorts of amusements, pageants and diversions, and a deep though not voluble or over-sensitive sense of the beauties of nature. But with all this she had an understanding as solid as her temper was gay. Unlike her daughter, she was not a professed blue-stocking or philosophess. But she had a strong affection for theology, in which she inclined (like the great majority of the religious and intelligent laity of her time in France) to the Jansenist side. Her favourite author in this class was Nicole. She has been reproached with her fondness for the romances of Mlle de Scudéry and the rest of her school. But probably many persons who make that reproach have themselves never read the works they despise, and are ignorant how much merit there is in them. In purely literary criticism Madame de Sévigné was no mean expert. Her preference for Corneille over Racine has much more in it than the fact that the elder poet had been her favourite before the younger began to write; and her remarks on La Fontaine and some other authors are both judicious and independent. Nor is she wanting in original reflections of no ordinary merit. But to enjoy her work in its most enjoyable point—the combination of fluent and easy style with quaint archaisms and tricks of phrase—it must be read as she wrote it, and not in the trimmed and corrected version of Perrin and Madame de Simiane.

Great part of her purely literary merit lies in the extraordinary vividness of her presentation of character. But her own has not united quite such a unanimity of suffrage as her ability in writing. In her own time there were not wanting enemies who maintained that her letters were written for effect, and that her affection for her daughter was ostentatious and unreal. But no competent judge can admit this view. On the other hand, her excessive affection for Madame de Grignan, her blindness to anything but her daughter's interest; her culpable tolerance of her son's youthful follies on the one hand and the uneven balance which she held in money matters between him and his sister on the other; the apparent levity with which she speaks of the sufferings of Madame de Brinvilliers, of galley slaves, of the peasantry, &c.; and the freedom of language which she uses herself and tolerates from others,—have all been cast up against her. Here the historic estimate sufficiently disposes of some of the objections, a little common sense of others and a very little charity of the rest. If too much love felt by a mother towards a daughter be a fault, then Madame de Sévigné was one of the most offending souls that ever lived; but it will hardly be held damning. The singular confidences which Madame de Sévigné received from her son and transmitted to her daughter would even at the present day be less surprising in France than in England. They are only an instance, adjusted to the manners of the time, of the system of sacrificing everything to the maintenance of confidence between mother and son. Here too, as well as in reference to the immediately kindred charge of crudity of language, and to that want of sympathy with suffering, especially with the sufferings of the people, it is especially necessary to remember of what generation Madame de Sévigné was and what were her circumstances. That generation was the generation which Madame de Rambouillet endeavoured with only partial success to polish and humanize, to which belong the almost incredible yet trustworthy *Historiettes* of Tallemant, and in which Bussy Rabutin's *Histoire amoureuse* did not make him lose all caste as a gentleman and man of honour. It is absurd to expect at such a time, and in private letters, the delicacy proper to quite different times and circumstances. It is not true that Madame de Sévigné shows no sympathy with the oppression of the Bretons, though her incurable habit of humorous expression—of *Rabutinage*, as she says—makes her occasionally use light phrases about the matter. But it is in fact as unreasonable to expect modern political sentiments from her as it is to expect her to observe the canons of a 20th-century propriety. On the whole she may be as fairly and confidently acquitted of any moral fault, as she may be acquitted of all literary faults whatsoever. Her letters are wholly, what her son-in-law said well of her after her death, *compagnons délicieux*; and, far from faultless as Madame de Grignan was, none of her faults is more felt by the reader than her long visits to her mother, during which the letters ceased.

The bibliographic history of Madame de Sévigné's letters is of considerable interest in itself, and is moreover typical of much other contemporary literary history. From Madame de Sévigné herself we know that her own letters were copied and handed about, sometimes under specified titles, as early as 1673. None of them, however, was published until her correspondence with Bussy Rabutin appeared in his *Memoirs and Correspondence*, partly in the year of her death, partly next year. The remainder were not printed in any form for thirty years. Then between 1725 and 1728 appeared seven unauthorized editions, containing more or fewer additions from the copies which had been circulated privately. The bibliography of these must be sought in special works (see especially the *Grands Écrivains* edition, vol. xi.). They have interest, however, chiefly because they stirred up Madame de Simiane, the writer's only living representative, to give an authorized version. This appeared under the care of the Chevalier de Perrin in 6 vols. (Paris, 1734–1737). It contained only the letters to Madame de Grignan, and these were subjected to editing rather careful than conscientious, the results of which were never thoroughly removed until recently. In the first place, Madame de Simiane, who possessed her mother's replies, is said to have burnt the whole of these from religious motives; this phrase is explained by Madame de Grignan's Cartesianism, which is supposed to have led her to expressions alarming to orthodoxy. In the second, scruples partly having to do with the susceptibilities of living persons, partly concerning Jansenist and other prejudices, made her insist on numerous omissions. Thirdly, and most unfortunately, the change of taste seems to have required still more numerous alterations of style and language, such as the substitution of "Ma Fille" for Madame de Sévigné's usual and charming "Ma Bonne," and many others. Perrin followed this edition up in 1751 with a volume of supplementary letters not addressed to Madame de Grignan, and in 1754 published his last edition of the whole, which was long the standard (8 vols., Paris). During the last half of the 18th century numerous editions of the whole or parts appeared with important additions, such as that of 1756, giving for the first time the letters to Pomponne on the Fouquet trial; that of 1773, giving letters to Moulceau; that of 1775, giving for the first time the Bussy letters separate from his memoirs, &c. An important collected edition of all these fragments, by the Abbé de Vauxcelles, appeared in 1801 (Paris, An IX.) in 10 vols.; five years later Gouvelle (Paris, 1806, 8 vols.) introduced the improvement of chronological order; this was reprinted in 12 vols. (Paris, 1819) with some more unpublished letters which had separately appeared meanwhile. In the same year appeared the first edition of M. de Monmerqué. From that date continual additions of unpublished letters were made, in great part by the same editor, and at last the whole was remodelled on manuscript copies (the originals unfortunately are available for but few) in the edition called *Des Grands Écrivains*, which M. de Monmerqué began, but which owing to his death had to be finished by MM. Regnier, Paul Mesnard and Sommer (Paris, 1862–1868). This, which supersedes all others (even a handsome edition published during its appearance by M. Silvestre de Sacy), consists of twelve volumes of text, notes, &c., two volumes of lexicon and an album of plates. It contains all the published letters to and from Madame de Sévigné, with the replies where they exist, with all those letters to and from Madame de Simiane (many of which had been added to the main body) that contain any interest. To it must be added two volumes (printed uniformly) of *Lettres inédites*, published by M. Ch. Capmas in 1876 and containing numerous variants and additions from a MS. copy discovered in an old curiosity shop at Dijon. Of less elaborate and costly editions that in the collection Didot (6 vols., Paris, v.d.) is the best, though, in common with all others except the *Grands Écrivains* edition, it contains an adulterated text.

Works on Madame de Sévigné are innumerable. Besides essays by nearly all the great French critics from Sainte-Beuve (*Portraits de femmes*) to M. Brunetière (*Études critiques*), the work of F. Combes, *Madame de Sévigné, historien* (1885), and G. Boissier's volume in the *Grands Écrivains Français* (1881), should be consulted. The biography by Paul Mesnard is nearly exhaustive, but the most elaborate biographical book is that of Walckenaer (3rd ed., Paris, 1856, 5 vols.), to which should be added the remarkable *Histoire de Mme de Sévigné* of Aubenas (Paris and St Petersburg, 1842). In English an excellent little book by Miss Thackeray (Lady Ritchie) (1881) may be recommended, and also Janet Aldis's *Mme de Sévigné: The Queen of Letter-writers* (1907). Most of the editions have portraits. (G. Sa.)

SEVILLE, an inland province of southern Spain, one of the eight provinces into which Andalusia was divided in 1833; bounded on the N. by Badajoz, N.E. by Cordova, S. by Málaga and Cadiz and W. by Huelva. Pop. (1900) 555,256; area 5428 sq. m. The province is bisected by the navigable river Guadalquivir (*q.v.*), which here receives the Genil and Guadaira on the left, and the Guadalimar on the right. West of the Guadalquivir the surface is broken by low mountain ranges forming part of the Sierra Morena; the eastern districts are comparatively flat and very fertile, except along the frontiers of Cadiz and Málaga, where rise the Sierras of Gibalbin and Algodonales; and there are extensive marshes near the Guadalquivir estuary. Coal, copper, iron ore, silicate of alumina, marble and chalk are the chief mineral products; the province is famous for its oranges, and also exports wheat, barley, oats, maize, olives, oil, wine and chick-peas. Iron-founding and the manufacture of gunpowder and ordnance are carried on by the state, and a great expansion of the other manufactures—leather, pottery, soap, flour, cork products, &c.—took place after 1875 owing to the construction of railways between all the larger towns. Cattle-breeding is an important industry in the plains and marshes. Seville (*q.v.*) is the capital and chief river-port. Other towns described in separate articles are Écija (pop. 1900, 24,372), Osuna (17,826), Carmona (17,215), Utrera (15,138), Moron de la Frontera (14,190), Marchena (12,468), Lebrija (10,997).

SEVILLE (Span. *Sevilla*, Lat. *Ispalis* or *Hispalis*, Moorish *Ishbīliya*), the capital of the Spanish province of Seville, and the chief city of Andalusia, on the left bank of the river Guadalquivir, 54 m. from the Atlantic Ocean, and 355 m. by rail S.S.W. of Madrid. Pop. (1900) 148,315. Seville is an archiepiscopal see, a port with many thriving industries, and in size the fourth city in the kingdom, ranking after Madrid, Barcelona and Valencia. Its history, and its treasures of art and architecture render it one of the most interesting places in Europe. It is built in a level alluvial plain, as productive as a garden. Few parts of the city are more than 30 ft. above sea-level, and owing to the frequency of floods an elaborate system of defences against the Guadalquivir and its affluents the Guadaira, Tamarguillo and Tagarete, was undertaken in 1904. This entailed the construction (spread over many years) of dykes, walls and surface drains, the raising of certain streets and railway embankments and the diversion of the lower Tagarete along a new channel leading into the Tamarguillo. The climate is pleasant at all seasons except in summer, when a shade temperature of 116° Fahr. has been recorded. Water is provided by a British company, and a smaller quantity is obtained from Carmona, but the supply is inadequate.

On the right or western bank of the river is the suburb of the Triana, inhabited to a great extent by gipsies. Seville retains its Moorish appearance in the older quarters, although their narrow and tortuous alleys are lighted by electricity, and traversed, wherever they afford room, by electric tramways. In the more modern districts there are broad avenues and boulevards, the chief of which is the beautiful Paseo de los Delicias, along the river and below the city.

The animated and picturesque street-life of Seville has often been painted and described, or even, as in Mozart's *Figaro* and *Don Giovanni*, Rossini's *Barbiere di Siviglia* and Bizet's *Carmen*, set to music. The townsfolk, and the peasants who have come to town for bull-fights, fairs or carnival, have preserved many of the curious old customs which tend to die out in the other large cities of Spain; they continue to wear the vivid costumes which suit the sunny climate of Andalusia; and their own gaiety, wit and grace of manner are proverbial. Nowhere in Spain are the great Church festivals celebrated with so much splendour; Easter at Seville is especially famous, and at this season the city is usually crowded with foreigners. The stately reserve and formality of Madrid society are almost as unknown here as the feverish industrialism and political passion of Barcelona or Valencia; loyalty, good humour and light-hearted hedonism have always been characteristic of Seville.

Principal Buildings.—The cathedral, dedicated to Santa Maria de la Sede, is the largest church in the world, after St Peter's at Rome and the Mezquita at Cordova, being 414 ft. long, 271 ft. wide and 100 ft. high to the roof of the nave. The west front is approached by a high flight of steps, and the platform on which the cathedral stands is surrounded by a hundred shafts of columns from the mosque which formerly occupied the site. The work of building began in 1402 and was finished in 1519, so that the one style of Spanish Gothic is fairly preserved throughout the interior, however much the exterior is spoiled by later additions. Unfortunately the west front remained unfinished until 1827, when the central doorway was completed in a very inferior manner; but this has been renewed in a purer style. The fine relief above it representing the Assumption was added in 1885. At the east end are two Gothic doorways with good sculpture in the tympana; and on the north side the Puerta del Perdon, as it is called, has some exquisite detail over the horse-shoe arch, and a pair of fine bronze doors. The gateway in the southern façade, designed by Casanova, dates from 1887. The interior forms a parallelogram containing a nave and four aisles with surrounding chapels, a centre dome, 121 ft. high, and at the east end a royal sepulchral chapel, which was an addition of the 16th century. The thirty-two immense clustered columns, the marble floor (1787–1795) and the seventy-four windows filled with painted glass, mostly by Flemish artists of the 16th century, produce an unsurpassed effect of magnificence. The reredos is an enormous Gothic work containing forty-four panels of gilt and coloured wood carvings begun by the Fleming Dancart in 1479 and completed by Spanish artists in 1526; the silver statue of the Virgin is by Francisco Alfaro (1596). The archbishop's throne and the choir-stalls (1475–1548) are fine pieces of carving, and amongst the notable metal-work are the railings (1519), by Sancho Nuñoz, and the lectern by Bartolomé Morel of the same period. The bronze candelabrum for tenebrae, 25 ft. in height, is a splendid work by B. More (1562). In the Sacristia Alta is a silver repoussé reliquary presented by Alphonso the Wise in the 13th century; and in the Sacristia Mayor, which is a good plateresque addition made in 1535 from designs by Diego de Riaño (d. 1532), there is a magnificent collection of church plate and vestments, including the famous silver monstrance (1580–1587), 12 ft. high, by Juan de Arfe (Arphe). At the west end of the nave is the grave of Ferdinand, the son of Columbus, and at the east end in the royal chapel (1514–1566) lies the body of St Ferdinand of Castile (1200–1252), which is exposed three times in the year. This chapel also contains the tombs of Alphonso the Wise (1252–1284) and Pedro I. (1350–1369) and a curious life-size image of the Virgin, which was presented to St Ferdinand by St Louis of France in the 13th century. It is in carved wood with movable arms, seated on a silver throne and with hair of spun gold. The chief pictures in the cathedral are the "Guardian Angel," the "St Anthony,"[1] and other works of Murillo; the "Holy Family" of Alfonso Miguel de Tobar (1678–1738); the "Nativity" and "La Generacion" of Luis de Vargas; Valdés Leal's "Marriage of the Virgin," and Guadelupe's "Descent from the Cross." In the Sacristia Alta are three fine paintings by Alexo Fernandez, and in the Sala Capitular are a "Conception" by Murillo and a "St Ferdinand" by Francisco Pacheco. The organs (1777 and 1827) are among the largest in the world. A curious and unique ritual is observed by the choir boys on the festivals of Corpus Christi and the Immaculate Conception—a solemn dance with castanets being performed by ten of them before the altar; the custom is an old one but its origin is obscure. The Sagrario (1618–1662) on the north of the cathedral is a Baroque addition by Miguel de Zumarraga and Fernandez de Iglesias, which serves as the parish church.

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[1] This was stolen in 1874, sold in New York for £50, and returned by its purchaser, Mr Schaus.

At the north-east corner of the cathedral stands the Giralda, a bell tower of Moorish origin, 295 ft. in height. The lower part of the tower, or about 185 ft., was built in the latter half of the 12th century by Yūsuf I.; the upper part and the belfry, which is surmounted by a vane formed of a bronze figure 14 ft. high representing Faith, were added (1568) by Fernando Ruiz in the Renaissance style. The ascent is made by a series of inclined planes. The exterior is encrusted with delicate Moorish detail, and the tower is altogether the finest specimen of its kind in Europe. At the base lies the Court of Oranges, of which only two sides now remain; the original Moorish fountain, however, is still preserved. But the chief relic of the Arab dominion in Seville is the Alcazar, a palace comparable in interest and beauty only with the Alhambra of Granada. It was begun in 1181 during the best periods of the Almohades, and was surrounded by walls and towers, of which the Torre del Oro, a decagonal tower on the river side, is now the principal survival. The Torre del Oro (1220) has an 18th-century superstructure. Pedro I. made considerable alterations and additions in the Alcazar during the 14th century, and worse havoc was afterwards wrought by Charles V., Philip III. and Philip V. Restorations have been effected as far as possible, and the palace is now an extremely beautiful example of Moorish work. The façade, the hall of ambassadors and the Patio de las Muñecas are the most striking portions, after which may be ranked the Patio de las Doncellas and the chapel of Isabella. Among other Moorish remains in Seville may be mentioned the minaret of San Marcos, 75 ft. high. The Casa de Pilatos is Moorish and Renaissance of the 16th century, and in addition to its elegant courtyard surrounded by a marble colonnade, contains some fine decorative work. Somewhat similar in style are the 15th-century Casa de los Pinelos (Casa de Abades) and the 15th-century palace of the dukes of Alva (Palacio de las Dueñas or de las Pinedas). The following are the most notable churches in Seville: Santa Maria la Blanca, an old Jewish synagogue; San Pedro, 14th-century Gothic; Santa Marina, with the oldest Christian sculptures in Seville; San Marcos, badly restored, but with a remarkable mudejar portal; San Clemente el Real with beautiful blue and white tile-work (*azulejos*) of 1588; the Gothic Parroquia of Santa Ana, in the Triana suburb; and Omnium Sanctorum, built by Pedro I., with a Moorish tower and Roman foundations. The church of La Caridad belongs to an almshouse founded in 1661 by the Sevillian Don Juan, Miguel de Mañara. It possesses six masterpieces by Murillo, and two by Valdes Leal. The chapel of the convent of Santa Paula dates from 1475, and has a portal magnificently decorated with *azulejos*. Other churches, though generally deficient in architectural interest, are enriched by paintings or sculptures of Pacheco, Montañes, Alonso Cano, Valdes Leal, Roelas, Campaña, Morales, Vargas and Zurbaran. The museum was formerly the church and convent of La Merced. It now contains priceless examples of the Seville school of painting, which flourished during the 16th and 17th centuries. Among the masters represented are Velazquez and Murillo (both natives of Seville), Zurbaran, Roelas, Herrera the Elder, Pacheco, Juan de Castillo, Alonso Cano, Cespedes, Bocanegra, Valdes Leal, Goya and Martin de Vos. The school founded in 1256 by Alfonso X. became a university in 1502; its present buildings were originally a Jesuit college built in 1567 from designs either by Herrera or by the Jesuit Bartolomé de Bustamente, but devoted to their present use in 1767 on the expulsion of the Jesuits. The university has faculties of law, philosophy, natural science and medicine. The Casa del Ayuntamiento, in the Renaissance style, was begun in 1527 and has a fine staircase and hall and handsome carved doors. The Lonja, or exchange, was designed by Herrera in his severe classical style, and completed in 1598; the brown and red marble staircase which leads to the Archivo de Indias is the best part of the design. The archives contain 30,000 volumes relating to the voyages of Spanish discoverers, many of which are still unexamined. The archbishop's palace dates from 1697; the most notable features are the Churrigueresque doorway and staircase. The palace of San Telmo was formerly the seat of a naval college founded by Ferdinand Columbus. An immense doorway is its principal architectural feature, but its picture gallery is interesting and important. Other noteworthy buildings are the Mudejar palaces of the duke of Osuna and the count of Peñaflor; the house occupied by Murillo at the time of his death (1682); the civil hospital built in 1559 and enlarged in 1842; the foundling hospital (1558); the bull-ring, with room for 14,000 spectators; and fragments of the city walls, which formerly had a circumference of more than 10 m., with 12 gateways and 166 towers.

Commerce and Industries.—The port of Seville, in 37° 10′ N. and 6° 10′ W. has always been one of the chief outlets of the wealth of Spain. It is the terminus of three railways to Madrid, and of other lines to Cadiz, Almorchon, Ciudad Real, Huelva, Badajoz and Lisbon. Three of these lines have branches down to the water-side of the quays. The quay on the left bank, 4500 ft. long, is provided with powerful cranes, and sheds for merchandise. Navigation up the Guadalquivir from its mouth to Seville (where the river is still tidal) is less dangerous for steamers than for sailing vessels, but is nevertheless uncertain. The construction of a ship-canal 4 m. long from the Punta de los Remedios to the Punta del Verde—two points between which the windings of the river render navigation especially difficult—was first proposed in 1859, and was undertaken in 1907. Dredging operations were begun at the same time, so that on completion of the canal vessels drawing 25 ft. (instead of 16 ft.) could come up to Seville. The principal exports are Manzanilla, Amontillado and other wines, oranges and lemons, iron, copper and lead ores, mercury, olives, oil, cork and wool; the imports include coal, wood, iron, manufactured goods, hemp, flax and colonial produce. There are manufactures of machinery, tobacco, chocolate, soap, porcelain, beer, liqueurs, brandies, corks and silk. The royal artillery works and iron foundries are very important. The porcelain and earthenware factory in the Carthusian convent (Cartuja,[1] founded 1401) employs more than 2000 hands. Pottery has been the characteristic industry of the Triana from time immemorial; the patron saints of Seville, Justa and Rufina, are said by tradition to have been potters here. Equally important is the great tobacco and cigar factory, where 6000 women are employed.

History.—Seville appears originally to have been an Iberian town. Under the Romans the city was made the capital of Baetica in the second century B.C., and became a favourite resort for wealthy Romans. It was captured in 45 B.C. by Julius Caesar, who gave it the name of Colonia Julia Romula, and made it one of the *conventus juridici*. The emperors Hadrian, Trajan and Theodosius were born in the neighbourhood at Italica (now Santiponce), where are the remains of a considerable amphitheatre. The chief existing monument of the Romans in Seville itself is the remains of an aqueduct, on four hundred and ten arches, by which water from Alcalá de Guadaira was supplied to the town. At the beginning of the 5th century the Silingian Vandals made Seville the seat of their empire, until it passed in 531 under the Visigoths, who chose Toledo for their capital. After the defeat of Don Roderick at Guadalete in 712 the Moors took possession of the city after a siege of some months. Under the Moors Seville continued to flourish. Idrisi speaks in particular of its great export trade in the oil of Aljarafe. The district was in great part occupied by Syrian Arabs from Emesa, part of the troops that entered Spain with Balj in 741 at the time of the revolt of the Berbers. It was a scion of one of these Emesan families, Abū 'l-Kāsim Mahommed, cadi of Seville, who on the fall of the Spanish caliphate headed the revolt of his townsmen against their Berber masters (1023) and became the founder of the Abbādid dynasty, of which Seville was capital, and which lasted under his son Moʿtaḍid (1042–1069) and grandson Moʿtamid (1069–1091) till the city was taken by the Almoravides. The later years of the Almoravide rule were very oppressive to the Moslems of Spain; in 1133 the people of Seville were prepared to welcome the victorious arms of Alphonso VII., and eleven years later Andalusia broke out in general rebellion. Almohade troops now passed over into Spain and took Seville in 1147. Under the Almohades Seville was the seat of government and enjoyed great prosperity; the great mosque (now destroyed) was commenced by Yūsuf I. and completed by his son Almanzor. In the decline of the dynasty between 1228 and 1248 Seville underwent various revolutions, and ultimately acknowledged the Hafsite prince, but Ferdinand III. restored it to Christendom in 1248. Ferdinand brought temporary ruin on the city, for it is said that 400,000 of the inhabitants went into voluntary exile. But the position of Seville was too favourable for trade for it to fall into permanent decay, and by the 15th century it was again in a position to derive full benefit from the discovery of America. After the reign of Philip II. its prosperity gradually waned with that of the rest of the Peninsula; yet even in 1700 its silk factories gave employment to thousands of workpeople; their numbers, however, by the end of the 18th century had fallen to four hundred. In 1800 an outbreak of yellow fever carried off 30,000 of the inhabitants, and in 1810 the city suffered severely from the French under Soult, who plundered to the extent of six millions sterling. Politically Seville has always had the reputation of peculiar loyalty to the throne from the time when, on the death of Ferdinand III., it was the only city which remained faithful to his son Alphonso the Wise. It was consequently much favoured by the monarchs, and frequently a seat of the court. For its loyalty during the revolt of the Comuneros it received from Charles V. the motto *Ab Hercule et Caesare nobilitas; a se ipsa fidelitas.* In 1729 the treaty between England, France and Spain was signed in the city; in 1808 the central junta was formed here and removed in 1810 to Cadiz; in 1823 the cortes brought the king with them from Madrid; and in 1848 Seville combined with Malaga and Granada against Espartero, who bombarded the city but fled on the return of Queen Maria Christina to Madrid.

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[1] The interesting 15th-century tombs formerly in the Cartuja are now in the church of the university.

See P. de Madrazo, *Sevilla y Cádiz* (Madrid, 1884–1886); R. Contreras, *Estudio de los monumentos árabes de Sevilla y Córdova* (Madrid, 1885); J. Gestoso y Perez, *Sevilla monumental y artistica* (3 vols., Seville, 1889–1892); A. F. Calvert, *Seville* (London, 1907); J. Guichot y Parodi, *Historia del Ayuntamiento de la ciudad de Sevilla* (3 vols., Seville, 1896–1898); J. Cascales y Muñoz, *Sevilla intellectual* (Madrid, 1896); W. M. Gallichan, *The Story of Seville* (London, 1903).

SÈVRES, a town of northern France, in the department of Seine-et-Oise, on the left bank of the Seine, midway between Paris and Versailles, about 3 m. from the fortifications of the former. Pop. (1906) 7949. The town owes its celebrity to the porcelain manufactory established there in 1756 and taken over by the State three years later. In the museum connected with the works are preserved specimens of the different kinds of ware manufactured in all ages and countries and the whole series of models employed at Sèvres from the beginning of the manufacture, for an account of which see Ceramics. A technical school of ceramics is attached to the factory.

SEWALL, SAMUEL (1652–1730), American jurist, was born at Horton, near Bishopstoke, Hants, England, on the 28th of March 1652. He was taken to New England in 1661; graduated at Harvard in 1671; studied divinity; and was resident fellow of Harvard in 1673–1674, and keeper of the college library in 1674. In 1683 he was deputy to the General Court for Westfield; from 1681 to 1684 he managed the only licensed printing press in Boston; and as a member of the Board of Assistants in 1684–1686 and in 1689–1690 he was *ex efficio* a judge of the Superior Court. He was a member of the Council in 1691–1725, and in 1692 he was made one of the special commissioners of oyer and terminer to try persons accused of witchcraft in Suffolk, Essex and Middlesex counties. This court condemned nineteen. Sewall in January 1697 stood in meeting while a bill was read in which he took "the blame and shame" of the "guilt contracted upon the opening of the late commission of oyer and terminer at Salem," and asked pardon. He was a judge of the Superior Court from 1692 to 1728, and in 1718–1728 was its chief justice; in 1715–1728 he was judge of probate for Suffolk county. He died in Boston on the 1st of January 1730. Sewall has been called the "last of the Puritans" and his character is attractively portrayed in Whittier's *Prophecy of Samuel Sewall.* He was a strict Calvinist and opposed the growing liberal control of Harvard College; he contributed to the cause of Indian missions, built an Indian meeting-house (probably in Sandwich), was one of the commissioners of the Society for the Propagation of the Gospel in New England and Parts Adjacent, and for more than twenty years its secretary and treasurer.

He wrote: *The Selling of Joseph, a Memorial* (1700), the first anti-slavery tract printed in America; with Edward Rawson, anonymously, *The Revolution in New England Justified* (1691; reprinted in *Force's Tracts* and in *The Andros Tracts*); *Phaenomena quaedam apocalyptica ad aspectum novi orbis configurata* (1697) and *Talitha Cumi, or an Invitation to Women to look after their Inheritance in the Heavenly Mansions*, both full of strange Biblical interpretation; and a journal begun in 1673, which, with his other papers, was bought by the Massachusetts Historical Society in 1869, and was published in vols. xiv.-xlviii. of its *Collections.*

See the sketch in J. L. Sibley, *Biographical Sketches of Graduates of Harvard University*, ii. (1881), 345-371; an article by C. H. C. Howard in vol. xxxvii. (Salem, 1901) of the *Essex Institute Historical Collections*; N. H. Chamberlain, *Samuel Sewall and the World He Lived In* (Boston, 1897); and G. E. Ellis, *An Address on the Life and Character of Chief Justice Samuel Sewall* (Boston, 1885).

His son, Joseph Sewall (1686–1769), became pastor of the Old South Church in 1713, and was a powerful preacher who sided with Whitefield. A descendant, Samuel Edward Sewall (1799–1888), a lawyer, was prominent in the anti-slavery movement, first as a Garrisonian and afterwards as a member of the Liberty and Free-Soil parties; he was counsel for a number of fugitive slaves, and after the Civil War he worked for the improvement of the legal status of women.

See Nina M. Tiffany, *Samuel E. Sewall: A Memoir* (Boston 1898).

SEWANEE, a village of Franklin county, Tennessee, about 15 m. E. of Winchester, the county-seat, and (by rail) 95 m. S.S.E. of Nashville. Pop. about 1200. Sewanee is served by the Tracy City branch of the Nashville, Chattanooga & St Louis railway. It is on a spur of the Cumberland mountains about 2000 ft. above the sea and about 1000 ft. above the surrounding country. It is a resort for sufferers from malaria and pulmonary complaints. There are mineral springs, coal mines and sandstone quarries here, all on the "domain," about 10,000 acres, of the University of the South, a Protestant Episcopal institution of higher learning, founded in 1857, largely through the efforts of Bishop Leonidas Polk, but not opened until 1868. The principal buildings of the University, on a tract of 1000 acres, are all of Sewanee sandstone; they include Walsh Memorial (1890), with offices and college class-rooms; the Library (formerly Convocation Hall, 1886; remodelled 1901), with a tower copied from Magdalen College, Oxford; Thompson Hall (1883; enlarged 1901), with science lecture-rooms and laboratories; Hoffman Memorial (1898), a dormitory; All Saints' Chapel (1909), a copy of King's College Chapel, Cambridge; a Gymnasium (1901); Quintard Memorial (1901), the home of the Sewanee Military Academy (until 1908 the Sewanee Grammar School), the preparatory department of the University; and St. Luke's Memorial (1878), the home of the Theological Department; and St Luke's Memorial Chapel (1907). The University is governed by a board of trustees consisting of the bishop, one clergyman and two laymen from each of 19 Protestant Episcopal dioceses in the Southern States.

SEWARD, ANNA (1747–1809), English writer, often called the "Swan of Lichfield," was the elder daughter of Thomas Seward (1708–1790), prebendary of Lichfield and of Salisbury, and author. Born at Eyam in Derbyshire, she passed nearly all her life in Lichfield, beginning at an early age to write poetry partly at the instigation of Dr. Erasmus Darwin. Her verses include elegies and sonnets, and she also wrote a poetical novel, *Louisa*, of which five editions were published. Miss Seward's writings, which include a large number of letters, are decidedly commonplace, and Horace Walpole said she had "no imagination, no novelty."

Sir Walter Scott edited her *Poetical Works* in three volumes (Edinburgh, 1810); to these he prefixed a memoir of the authoress, adding extracts from her literary correspondence. He refused, however, to edit the bulk of her letters, and these were published in six volumes by A. Constable as *Letters of Anna Seward 1784-1807* (Edinburgh, 1811). Miss Seward also wrote *Memoirs of the Life of Dr Darwin* (1804). See E. V. Lucas, *A Swan and her Friends* (1907); and S. Martin, *Anna Seward and Classic Lichfield* (1909).

SEWARD, WILLIAM HENRY (1801–1872), American statesman, was born on the 16th of May 1801 in the village of Florida, Orange county, New York. He graduated from Union College in 1820, having taught school for a short time at Savannah, Georgia, to help pay his expenses; was admitted to the bar at Utica, N.Y., in 1822, and in the following year began the practice of law at Auburn, N.Y., which was his home for the rest of his life. He soon attained distinction in his profession, but drifted into politics, for which he had a greater liking, and early became associated with Thurlow Weed. He was at first an adherent of Daniel D. Tompkins in state, and a National Republican in national politics, after 1828 became allied with the Anti-Masonic party, attending the national conventions of 1830 and 1831, and as a member of the organization he served four years (1830–1834) in the state Senate. By 1833 the Anti-Masonic movement had run its course, and Seward allied himself with the other opponents of the Jackson Democrats, becoming a Whig. In 1834 he received the Whig nomination for governor, but was defeated by William L. Marcy. Four years later he was renominated, was elected, was re-elected in 1840, and served from January 1839 until January 1843. As governor, Seward favoured a continuance of works of internal improvement at public expense, although this policy had already plunged the state into financial embarrassment. His administration was disturbed by the anti-rent agitation and by the M'Leod incident growing out of the Canadian rebellion of 1837.[1] During this period he attracted much attention by his liberal and humane policy, promoting prison reform, and proposing to admit Roman Catholic and foreign teachers into the public schools of the state. His refusal soon after his inauguration to honour the requisition of the governor of Virginia for three persons charged with assisting a slave to escape from Norfolk, provoked retaliatory measures by the Virginia legislature, in which Mississippi and South Carolina soon joined. Laws were also passed during his term putting obstacles in the way of recovering fugitive slaves. Seward soon became recognized as the leader of the anti-slavery Whigs. He was one of the earliest political opponents of slavery, as distinguished from the radical Abolitionists, or the followers of William Lloyd Garrison, who eschewed politics and devoted themselves to a moral agitation.

On retiring from office Seward returned to the practice of law. His reputation was made in four great criminal cases—those of Abel F. Fitch and others, of Freeman, of Wyatt and of Van Zandt—the last-named bringing him especially the goodwill of opponents of slavery. Toward the end of his career at the bar, however, he changed from a general practitioner to a patent lawyer, and as such had a lucrative practice.

When the Whigs secured a momentary control of the state legislature in 1849 they sent Seward to the United States Senate. The antagonism between free labour and slave labour became the theme of many of his speeches. In his first set speech in the Senate, on the 11th of March 1850, in opposing the pending compromise measures, he attracted the attention of the whole country by his assertion that "there is a higher law than the constitution" regulating "our authority over the domain" (*i.e.* the Territories). When the Democrats, however, declared such language incendiary he tried to explain it away, and by so doing offended his friends without appeasing his opponents. In a speech at Rochester, New York, in 1858 he made the famous statement that there was "an irrepressible conflict between opposing and enduring forces, and it means that the United States must and will, sooner or later, become either entirely a slave-holding nation or entirely a free-labour nation." Although this idea had often been expressed by others, and by Seward himself in his speech of 1848, yet he was severely criticized, and four days later he sought to render this statement innocuous also.

In the election of 1852 Seward supported General Winfield Scott, but not his party platform, because it declared the Compromise of 1850 a finality. He naturally opposed the Kansas-Nebraska Bill of 1854, which repealed the Missouri Compromise and established the principle of popular sovereignty in the Territories. Subsequently he actively supported in the Senate the free-state cause in Kansas. In 1854–1855, when it became evident that the Whig party in the North was moribund, Seward helped to lead its scattered remnants into the Republican fold. As the recognized leader of the new party, his nomination by the Republicans for the presidency in 1856 and in 1860 was regarded as certain; but in each instance he was put aside for another. The heterogeneous elements of the new organization could not be made to unite on a man who for so many years had devoted his energies to purely Whig measures, and he was considered less "available" than Fremont in 1856 and than Lincoln in 1860. After Lincoln was elected in 1860 he chose Seward for his secretary of state. The new president was a man comparatively little known outside the state of Illinois, and many of his supporters, doubtful of his ability to deal with the difficult problems of 1861, looked to Seward as the most experienced man of the administration and the one who should direct its policy. Seward himself, apparently sharing these views, although not out of vanity, at first possessed an unbounded confidence in his ability to influence the president and his cabinet. He believed that the Union could be saved without a war, and that a policy of delay would prevent the secession of the border states, which in turn would gradually coax their more southern neighbours back into their proper relations with the Federal government. In informal conferences with commissioners from the seceded states he assured them that Fort Sumter should be speedily evacuated. Finding himself overruled by the war party in the cabinet, on the 1st of April 1861, Seward suggested a war of all America against most of Europe, with himself as the director of the enterprise. The conduct of Spain toward Santo Domingo and of France toward Mexico, and the alleged attitude of England and Russia toward the seceded states were to be the grounds for precipitating this gigantic conflict; and agents were to be sent into Canada, Mexico and Central America to arouse a spirit of hostility to European intervention. Dangers from abroad would destroy the centrifugal forces at home, and the Union would be saved. When this proposal was quietly put aside by the president, and Seward perceived in Lincoln a chief-executive in fact as well as in name, he dropped into his proper place, and as secretary of state rendered services of inestimable value to the nation. To prevent foreign states from giving official recognition to the Confederacy was the task of the hour, and in this he was successful. While he did not succeed in preventing the French occupation of Mexico or the escape of the Confederate cruiser "Alabama" from England, his diplomacy prepared the way for a future adjustment satisfactory to the United States of the difficulties with these powers. While his treaty with Lord Lyons in 1862 for the suppression of the slave trade conceded to England the right of search to a limited extent in African and Cuban waters, he secured a similar concession for American war vessels from the British government, and by his course in the Trent Affair he virtually committed Great Britain to the American attitude with regard to this right.

On the 5th of April 1865 Seward was thrown from his carriage and severely injured. Nine days later, while lying ill at his home at Washington, he was attacked by one Lewis Powell, alias Payne, a fellow-conspirator of John Wilkes Booth, at the same time that Lincoln was assassinated. The secretary's son, Frederick W. Seward, and three other persons who came to his assistance, were also wounded by the assailant. Seward's wife, an invalid, received such a shock that she died within two months, and his only daughter, who witnessed the assault, never recovered from the effects of the scene and died within the year. Seward gradually regained his health, and remained in the cabinet of President Johnson until the expiration of his term in 1869. In the struggle between the Executive and Congress over the method of reconstructing the Southern States, Seward sided with Johnson and thus shared some of the obloquy bestowed upon that unfortunate president. His greatest work in this period was the purchase of Alaska from Russia, in 1867. He also negotiated treaties for the purchase of the Danish West Indies, the Bay of Samana, and for American control of the isthmus of Panama; but these were not ratified by the Senate. After returning to private life, Seward spent two years and a half in travel and died at Auburn on the 10th of October 1872.

His son, FREDERICK WILLIAM SEWARD, was born in Auburn, New York, on the 8th of July 1830, graduated at Union College in 1849 and was admitted to the bar at Rochester, N.Y., in 1851. From 1851 to 1861 he was one of the editors and owners of the Albany *Evening Journal*, and during his father's term at the head of the State Department he was assistant secretary of state. He served in the New York Assembly in 1875, and from 1877 to 1881 was again assistant secretary of state. After 1881 he devoted his time to the practice of his profession and to lecturing and writing.

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[1] In 1837 the vessel "Caroline," which had been used by the Canadian insurgents, was seized by the Canadian authorities in American territory and was destroyed. In 1840 one Alexander M'Leod, a British subject then in New York, asserted that he had aided in the capture; he was promptly arrested and was held for trial on a charge of murder. The British minister demanded from the national government M'Leod's release, but his case was in the New York courts, over which the national government has no jurisdiction. In the trial M'Leod proved an alibi, was acquitted (October 1841), and a serious international complication was thus averted.

The best biography of Seward is that by Frederic Bancroft, *The Life of William H. Seward* (2 vols., New York, 1900); see also, *The Life and Works of William H. Seward* (5 vols., new ed., Boston, 1883), edited by George E. Baker; *William H. Seward: an Autobiography from 1801 to 1834, with a Memoir of his Life and Selections from his Letters* (3 vols., New York, 1891), by his son, Frederick W. Seward; *William H. Seward's Travels around the World* (New York, 1873), by his adopted daughter, Olive R. Seward; *Lincoln and Seward* (New York, 1874), by Gideon Welles; and *William Henry Seward* (new ed., Boston, 1899), by T. K. Lothrop, in the "American Statesmen Series."

SEWELL, WILLIAM (1804–1874), English divine and author, was born at Newport, Isle of Wight, on the 23rd of January 1804, the son of a solicitor. He was educated at Winchester and Merton College, Oxford, was elected a fellow of Exeter College in 1827, and from 1831–1853 was a tutor there. From 1836–1841 he was Whyte's Professor of Moral Philosophy. Sewell, who took holy orders in 1830, was a friend of Pusey, Newman and Keble in the earlier days of the Tractarian movement, but subsequently considered that the Tractarians leaned too much towards Rome, and dissociated himself from them. When, however, in 1849, J. A. Froude published his *Nemesis of Faith*, Sewell denounced the wickedness of the book to his class, and, when one of his pupils confessed to the possession of a copy, seized it, tore it to pieces, and threw it in the fire. In 1843 he, with some friends, founded at Rathfarnham, near Dublin, St Columba's College, designed to be a sort of Irish Eton, and in 1847 helped to found Radley College. Sewell's intention was that each of these schools should be conducted on strict High Church principles. He was originally himself one of the managers of St Columba, and sub-warden of Radley, but his business management was not successful in either case, and his personal responsibility for the debts contracted by Radley caused the sequestration of his Oxford fellowship. In 1862 his financial difficulties compelled him to leave England for Germany, and he did not return till 1870. He died on the 14th of November 1874.

His publications include translations of the *Agamemnon* (1846), *Georgics* (1846 and 1854) and *Odes and Epodes of Horace* (1850); *An Introduction to the Dialogues of Plato* (1841); *Christian Politics* (1844); *The Nation, the Church and the University of Oxford* (1849); *Christian Vestiges of Creation* (1861).

His elder brother, RICHARD CLARKE SEWELL (1803–1864), practised successfully as a barrister in England, and then went to Australia, where he obtained a large criminal practice. In 1857 he was appointed reader in law to the University of Melbourne. He was the author of a large number of legal works.

A younger brother, HENRY SEWELL (1807–1879), who became a solicitor, acted in London as secretary and deputy-chairman of the Canterbury Association for the Colonization of New Zealand, and eventually went out to the colony, and in 1854 was elected to the House of Representatives. In 1856 he became first premier of New Zealand. Subsequently he held the office of attorney-general (1861–1863) and minister of justice (1864–1865 and 1869–1872). In 1876 he returned to England, where he died on the 14th of May 1879.

Another brother, JAMES EDWARDS SEWELL (1810–1903), warden of New College, Oxford, was educated at Winchester and New College. In 1830 he became a fellow of his College, and practically passed the rest of his life there, being elected to the headship in 1860. The first University Commission had just released the colleges from the fetters of their original statutes, and Sewell was called on to determine his attitude towards the strong reforming party in New College. Though himself instinctively conservative, he determined that it was his duty to give effect to the desire of the majority, with the result that New College led the way in the general reform movement, and from being one of the smallest became the second largest college in Oxford. Sewell was vice-chancellor of the university 1874–1878. He died in his ninety-third year on the 29th of January 1903, having been warden for 43 years, and was interred in the College cloisters.

A sister, ELIZABETH MISSING SEWELL (1815–1906), was the author of *Amy Herbert* and many other High Church novels, and of several devotional books. An edition of her works was published in eleven volumes (1886).

SEWER, a large drain for carrying away by water excreta and other refuse, known therefore collectively as "sewage" (see SEWERAGE below); also, in a wider and older sense, the term for conduits such as are used for the draining of the fens, or of the water-courses, sea-defences, &c., over which the local authorities, known as commissioners of sewers, exercise jurisdiction. In English law a "sewer," as distinguished from a "drain," is that which carries away the sewage of more houses or other buildings than one. Many fanciful derivations of the word have been given, but there seems no doubt that the word is from O. Fr. *seuwiere*, Med. Lat. *seweria*, the sluice of a mill-pond, from the Late Lat. *ex-aquaria*, a means of conducting water out of anything; this is paralleled by Eng. "ewer," a water-jug, which undoubtedly comes from *aquaria*, through O. Fr. *ewe*, for water, mod. *eau*.

The old name "sewer," for a table attendant who placed and removed the dishes from the table, acted as waiter, &c., must be distinguished. In the household ordinances of Edward II. the word seems to appear in the form *asseour*, and in those of Edward IV. as *assewer*, an officer of the household who superintended the serving of a banquet. *Asseour* represents O. Fr. *asseoir*, to seat, set, Lat. *assidere*. The word was early connected with "sewe" or "sew," juice, broth, pottage, cognate with *sucus*, juice.

SEWERAGE, a general term for the process of systematically collecting and removing the fouled water-supply of a community. The matter to be dealt with may conveniently be classified as made up of three parts: (1) excreta, consisting of urine and faeces; (2) slop-water, or the discharge from sinks, basins, baths, &c., and the waste water of industrial processes; (3) surface water due to rainfall. Before the use of underground conduits became general, the second and third constituents were commonly allowed to sink into the neighbouring ground, or to find their way by surface channels to a watercourse or to the sea. The first constituent was conserved in middens or pits, either together with the dust, ashes, kitchen waste and solid waste generally or separately, and was carried away from time to time to be applied as manure to the land. In more modern times the pits in which excrement was collected took the form of covered tanks called cesspools, and with this modification the primitive system of conservancy, with occasional removal by carts, is still to be found in many towns. Even where the plan of removing excrement by sewers has been adopted, the kitchen waste, ashes and solid refuse is still treated by collecting it in pails or bins, whose contents are removed by carts either daily or at longer intervals, the refuse frequently being burned in destructors (*q.v.*). It therefore forms no part of the nearly liquid sewage which the other constituents unite to form.

The first constituent is from an agricultural point of view the most valuable, and from a hygienic point of view the most dangerous, element of sewage. Even healthy excreta decompose, if kept for a short time after they are produced, and give rise to noxious gases; but a more serious danger proceeds from the fact that in certain cases of sickness these products are charged with specific germs of disease. Speedy removal or destruction of excremental sewage is therefore imperative. It may be removed in an unmixed state, either in pails or tanks or (with the aid of pneumatic pressure) by pipes; or it may be defaecated by mixture with dry earth or ashes; or, finally, it may be conveyed away in sewers by gravitation, after the addition of a relatively large volume of water. This last mode of disposal is termed the water-carriage system of sewerage. It is the plan now usually adopted in towns which have a sufficient water supply, and it is probably the mode which best meets the needs of any large community. The sewers which carry the diluted excreta serve also to take slop-water, and may or may not be used to remove the surface water due to rainfall. The water-carriage system has the disadvantage that much of the agricultural value of sewage is lost by its dilution, while the volume of foul matter to be disposed of is greatly increased.

I. COLLECTION OF SEWAGE.—House drains, that is to say, those parts of the domestic system of drainage which extend from the soil-pipes and waste-pipes to the sewer, are generally made of glazed stoneware pipes having a diameter of 4 in., 6 in., or sometimes 9 or 12 in., according to the estimated amount of waste to be removed. In ordinary domestic dwellings there is rarely any occasion to use pipes of a greater diameter than 6 in., and this only for the main drain, the branches and single lines of piping being 4 in. in diameter. It is a good rule to make the pipes and other fittings, such as channels and bends, as small in diameter as possible, having due regard to efficient capacity. Such a drain is more cleanly than one too large for its purpose, in that it is more thoroughly flushed when in use, the sewage running at a much faster speed through a full pipe than through one only partially full. For this reason a pipe having too great a capacity for the work it has to do is liable to become corroded by sediment deposited from slowly moving waste.

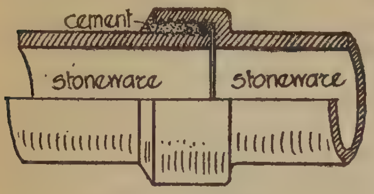


Fig. 1.—Stoneware.

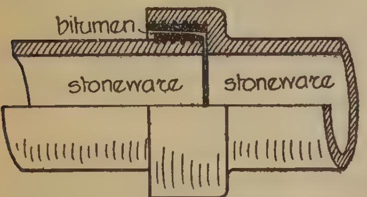


Fig. 2.—Stanford's Joint.

The pipes are made in 2 ft. lengths and are formed with a socket at one end into which the straight end of the next pipe fits loosely. This is wedged in position with a little gasket and the remaining space then carefully filled with neat Portland cement (fig. 1). Pipes are made also with a bituminous substance in the socket and around the spigot end, and by merely pushing the one into the other the joint is made. The bitumen is curved to allow self-adjustment to any slight settlement, so that damage to the joint is avoided (fig. 2). A composite joint may be used having the bitumen lining reinforced with the ordinary Portland cement filling (fig. 3). This type is somewhat more expensive than the ordinary jointing, but it makes a powerful and effective connexion. The method of connecting two lead pipes by a "wiped solder joint" is shown in fig. 4. Fig. 5 shows the method of connecting a lead pipe into the socket of a stoneware one, a brass sleeve piece or ferrule being used to give the necessary stiffness to the end of the lead pipe. This arrangement is frequently used, for example, at the base of a soil-pipe at its junction with the drain. In the next figure (fig. 6) the lead pipe has a brass socket attached to it to take the plain end of a stoneware pipe. This form of connexion is used between a water-closet and a lead trap. The joint shown in figs. 5 and 6 is similarly made when an iron pipe is substituted for a stoneware one, but instead of the Portland cement filling, molten lead is used and carefully caulked to form a water-tight joint.

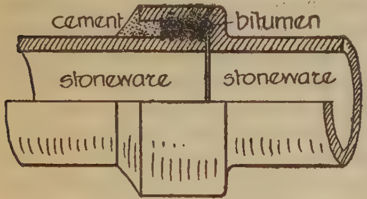


Fig. 3.—Composite Joint.

In the water-carriage system of drainage each house has its own network of drain-pipes laid under the ground, into which are taken the waste-pipes which lead from the closets, urinals, sinks, lavatory basins, and rain-water and other gulleys within and about the house. The many branches are gathered into one or more manholes, and connexion is finally made by means of a single pipe with the common public sewer. Gas from the sewer is prevented from entering the house drains by a disconnecting trap fixed in the manhole nearest the entrance to the sewer. The fundamental maxims of house sanitation are first, that there shall be complete disconnexion between the pipes within and without the house, and second, that the drainage shall be so constructed as to allow for the free admission of air in order to secure the thorough ventilation of all parts of the system and avoid the possibility of the accumulation ~~of~~ gas in any of the waste- or drain-pipes. The drains must be planned to conduct the waste material from the premises as quickly as possible without leakage or deposit by the way. The pipes should be laid in straight lines from point to point to true gradients of between 2 to 4 in. in 10 ft. Junctions with branch pipes and any bends necessary should be gathered, as far as practicable, in inspection chambers fitted with open channels instead of closed pipes. This allows of easy inspection and testing, and provides means of access for the drain-rods in cases of blockage. Sometimes it is desired, for reasons of economy or otherwise, to avoid the use of a manhole at a change of direction in the drain. A branch pipe which may have a specially shaped junction for cleaning the pipes in both directions is taken up with a slope to the ground or floor level and there finished with an air-tight cover which may be removed to allow the introduction of drain-rods should the pipes become blocked. Junctions of one pipe with another should be made obliquely in the direction of the floor. Stoneware pipes should be laid upon a bed of concrete not less than 6 in. thick and benched up at the sides with concrete to prevent any movement. When such pipes pass under a building they should be entirely surrounded by a concrete casing at least 6 in. in thickness. No drain should lie under a building if it is possible to avoid it, for injury is very liable to occur through some slight settlement of the building, and in a position such that the smells escaping from the damaged pipe would rise up through the floor into the building this would be an especially serious matter. The expense and annoyance of having the ground opened up for the repair of defects in the pipes beneath is another strong argument against drains being placed under a house. Where this is really necessary, however, pipes of cast-iron are recommended instead of the ordinary stoneware pipes, as being stronger; being made in lengths of 6 and 9 ft., they have a great advantage over the 2 ft. long stoneware tubes, for the joints of the latter are frequently a source of weakness. The joints, fewer in number, are made with molten lead (fig. 7), or flanged pipes are used and the joints packed with rubber and bolted (fig. 8).

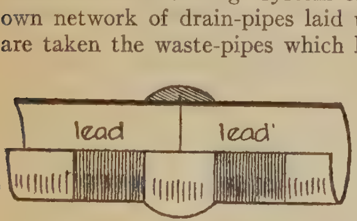


Fig. 4.—Lead-wiped Joint.

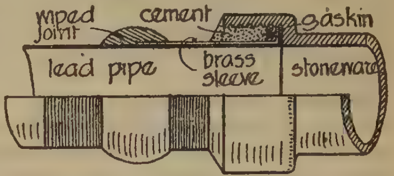


Fig. 5.—Lead into Stoneware.

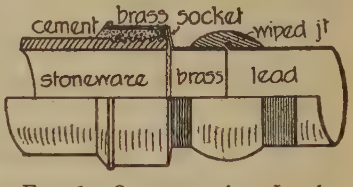


Fig. 6.—Stoneware into Lead.

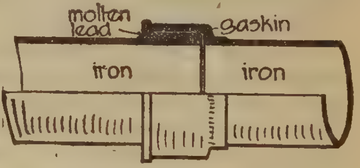


Fig. 7.—Iron Spigot and Socket Joint.

The principle of disconnexion adopted between the indoor and outdoor pipes should be retained between the latter and the sewer, and the domestic system should be cut off from the public drain by means of a disconnecting trap. This appliance is usually placed in a small chamber or manhole, easy of access for inspection, built close to the boundary of the premises, and as near as possible to the sewer into which the house drain discharges.

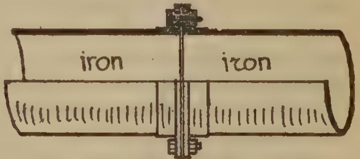
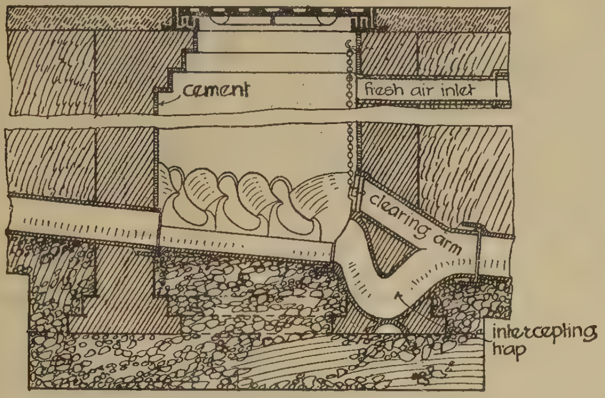


Fig. 8.—Iron-flanged and Bolted Joint.

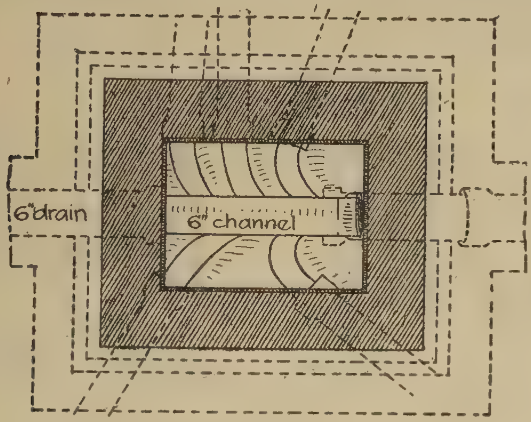
Fig. 9 shows a section and plan of such a manhole built in accordance with the London drainage by-laws. There are five inlets from branch drains discharging by specially-shaped glazed channels into the main channel in the centre. It will be seen that in case of blockage it would be a simple matter to clear any of the pipes with the drain-rods. The cap to the clearing arm has a chain attached by which it can be removed in case of flooding. The channels are benched up at the sides with cement, and the manhole is rendered on the inside with a cement lining. A fresh air inlet is taken out near the top of the chamber and is fitted with a mica flap inlet valve. The cover is of cast-iron in a cast-iron frame shaped with grooves to afford a double seal, the grooves being filled with a composition of tallow and fine sand. Where there is a danger of a backflow from the sewer due to its becoming flooded, a hinged flap should be placed at the junction of drain and sewer to prevent sewage from entering the house drain. A ball trap designed for this purpose may be used in place of a flap, and is more satisfactory, for the latter is liable to become corroded and work stiffly. In the ball-trap appliance the flowing back of the sewage forces a copper ball to fit tightly against the drain outlet, the ball dropping out of the way of the flow directly the pressure is relaxed.

Earth-closets.

The water-carriage system of drainage is undoubtedly the most nearly perfect yet devised. At the same time it is a very costly system to install with its network of sewers, pumping stations, and arrangements for depositing the sewage either in the sea or river, or upon the land or "sewage farm." In country districts and small towns and villages, however, excreta are often collected in small vessels and removed in tank carts and deposited upon the land. The dry-earth system introduced by the Rev. Henry Moule (1801–1880), and patented in 1860, takes advantage of the oxidizing effect which a porous substance such as dry earth exerts by bringing any sewage with which it is mixed into intimate contact with the air contained in its pores. The system is of rather limited application from the fact that it leaves other constituents of sewage to be dealt with by other means. But so far as it goes it is excellent, and where there is no general system of water-carriage sewerage an earth-closet will in careful hands give perfect satisfaction. Numerous forms of earth-closet are sold in which a suitable quantity of earth is automatically thrown into the pan at each time of use (fig. 10), but a box filled with dry earth and a hand scoop will answer the purpose nearly as well. A plan much used in towns on the continent of Europe is to collect excrement in air-tight vaults which are emptied at intervals into a tank cart by a suction pump. Another pneumatic system adopted on the continent has the cesspools at individual houses permanently connected with a central reservoir by pipes through which the contents of the former are sucked by exhausting air from the reservoir at the central station.



SECTION.



PLAN.

FIG. 9.—Manhole.

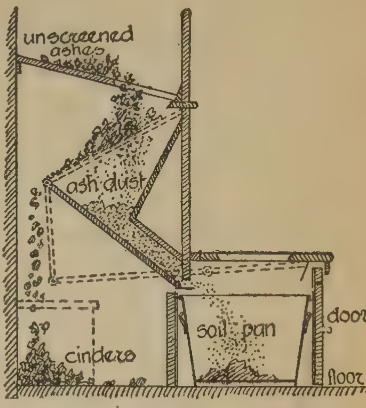


FIG. 10.—Ash or Earth-Closet.

Testing drains.

Newly laid drains should be carefully tested before the trenches are filled in to detect any defects in the pipes or joints. These should be made good and the test again applied until the whole system is in perfect order. Cement joints should be allowed to set for at least forty-eight hours before the test is made. There are several methods of testing. For the stoneware drains laid under the ground the *water test* is generally adopted. After the lower end of the length of drain to be tested has been securely stopped (fig. 11) the drain is filled with water from its upper end until the desired pressure is obtained. To obtain the required head of water extra lengths of pipe are sometimes taken up temporarily at the upper end of the drain or, as an alternative, both ends of the pipe may be plugged and water introduced under pressure by a force pump through a small aperture provided in the plug. The exact pressure may then be ascertained by a water pressure gauge. An escape of water through some defective portion of the drain is indicated by the subsidence of the level of the water in the upper part of the drain or by a diminution of the pressure shown by the gauge. Then the defect must be located and remedied and the drain re-tested until all weak points are eliminated. This process must be repeated in each section of the drainage system until the whole is found to be sound and tight. It is not necessary to test drains laid with ordinary socket joints made in cement with a greater pressure than is obtained with a 5 ft. or 6 ft. head of water. A foot head of water gives at its base a pressure of ·433 ℔ per square inch, so that a head of 6 ft. would result in a pressure of just over 2½ ℔ per square inch. Cast-iron drain-pipes with caulked lead joints will withstand a pressure of nearly 90 ℔ per square inch of internal surface, but in actual practice it is sufficient if they are tested with a pressure of 10 ℔ or say a head of 20 to 24 ft.

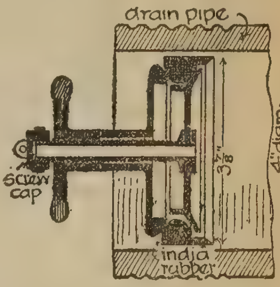


FIG. 11.—Drain Stopper.

The *atmospheric* or *air test* is sometimes applied instead of the water test. The drain is plugged, as in the latter, and air is then pumped into the pipes until the desired pressure is registered by the gauge attached to the apparatus. This pressure should be maintained without appreciable diminution for a stipulated period before the drains are passed as sound.

The *smoke test* is generally used for testing vertical shafts such as soil-pipes and ventilators to which the water test cannot be conveniently applied owing to the excessive pressure produced at the lower portion of the pipe by the head of water. It is applied by stopping the ends of the pipes and introducing smoke by a drain rocket or by a smoke-producing machine which forces volumes of thick smoke through an aperture in the stopper. The pipes and joints are then carefully inspected for any evidence of leakage.

The *scent test* is occasionally employed for testing soil and ventilating pipes, but the apparatus must be carefully handled to avoid the material being spilt in the building and thus misleading the operator. The test is made by introducing into the drain some substance possessing a powerful odour such as oil of peppermint, calcium carbide or other suitable material, and tracing any defect by means of the escaping odour. This is not so effective a method as the smoke test, as there is more difficulty in locating leakages. Gulleys, traps and other similar fittings should be tested by pouring in water and observing whether siphonage or unsealing occurs. This of course will not happen if the appliances are of good design and properly ventilated. A section of a drain plug or stopper is shown in fig. 11. It has a band of india-rubber which expands when the screw is turned and presses tightly against the inside of the drain-pipe. In the centre of the plug is a capped aperture which allows for smoke testing and also allows the water gradually to escape after a test by water.

Existing drains which have become defective and require to be made good must be exposed, taken up and relaid with new pipes, unless advantage be taken of a method which, it is claimed, renders it possible to make them permanently watertight so as to withstand the water test under pressure, and at the same time to disinfect them and the surrounding subsoil. This end is accomplished with the aid of patent machines which on being passed through the drain-pipe first remove all obstructions and accumulations of foul matter and then thoroughly cleanse and disinfect it, saturating the outside concrete and contaminated soil adjacent to any leak with strong disinfectants. Subsequently, loaded with the best Portland cement, another machine is passed through the drain, and, by powerful evenly-distributed circular compression, forces the cement into every hole, crack or crevice in the pipes and joints. This work leaves the inner surface of the pipes perfectly clean and smooth. After the usual time has been allowed for the cement to set the air test is applied, and the drain is claimed to be equal to, if not better than, a new drain, because the foundation is not disturbed by the process, and the risk of settlement, which is often the cause of leaky drains, is remote.

Traps. Every sanitary fitting should be trapped by a bend on the waste-pipe; this is generally made separately and fixed up near to the sink, closet or basin, as the case may be. The traps of small wastes such as those of sinks and lavatories should be fitted with a brass screw cap to facilitate clearing when a stoppage occurs. Their object is to hold a quantity of water sufficient to prevent the access of foul air through the waste-pipe into the house. The depth of the water "seal" should not be less than 2 in., or it may become easily unsealed in hot weather through the evaporation of the water. Unsealing may be caused, too, by "siphonage," when a number of fittings are attached to the same main waste without the branches being properly ventilated just below each trap. The discharge from one fitting in this case would create a partial vacuum in the other branches and probably suck the sealing water from one or more of the traps. To obviate such an occurrence an "anti-siphonage" pipe is fixed having its upper end open to the air and provided with branches tapping such waste-pipe just below the trap. Then, with this contrivance, a discharge from any fitting, instead of causing air to be sucked in through the trap of another fitting, thereby breaking the seal and allowing foul drain air to enter the house, merely draws the necessary air through the anti-siphonage pipe, leaving the other traps with their seals intact (fig. 12). There are many forms of traps for use in different positions although the principle and purposes of all are identical. Two forms commonly used are known as the S and the P trap. The bell trap and the D trap are obsolete.

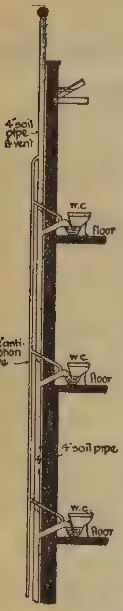


FIG. 12.—Soil Pipe with Anti-siphonage Pipe.

Gulleys. To collect the rain and waste water from areas, yards, laundry and other floors and similar positions an open trapped gulley is used. It is usually of stoneware and fitted with an open iron grating which admits the water (fig. 13). Many of these gulleys are made too shallow and speedily get choked if the water they receive is charged with mud or sand. To obviate this difficulty the gulleys are made with a deep container and are often fitted with a perforated basket of galvanized iron which catches the solid matter and has a handle which allows for its easy removal when necessary. Gulleys with slipper or channel heads as shown in fig. 14 are required to be fitted in some districts to receive the waste from sinks. The warm waste water from scullery and pantry sinks contains much grease, and should discharge into a trapped gulley specially constructed to prevent the passage of the grease into the drain (fig. 15). It should be of ample size to contain sufficient cold water to solidify the fat which enters it. This forms in cakes on the top of the water and should be frequently broken up and removed.

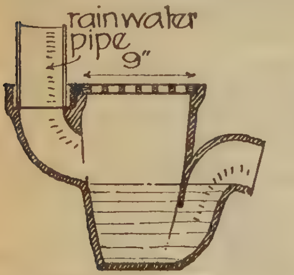


FIG. 13.—Gulley.

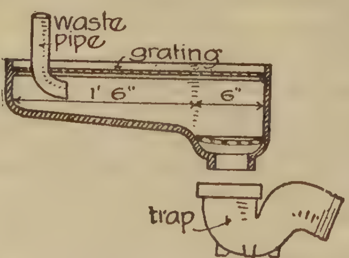


FIG. 14.—Docking's Slipper Head.

Great attention has been directed to the design of sanitary fittings, with the object of making them as nearly self-cleansing as possible. In the fixing of closets the wood casings which used to be fixed around every water-closet are going steadily out of use, their place being taken by a hinged seat supported on metal brackets—an arrangement which allows every part of the appliance to be readily cleaned with a cloth. In hospitals and similar institutions a form of closet is made fitted with lugs which are built into the wall; in this way support is obtained without any assistance from the floor, which is left quite clear for sweeping. Lavatory basins and sinks are also supported on cantilevers in the same way, and the wood enclosures which were formerly often fixed around these appliances are now generally omitted.

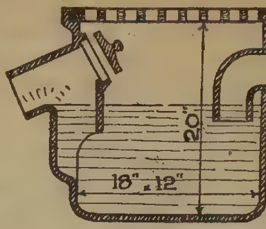


FIG. 15.—Stoneware Grease Trap.

Water-closets. There are several distinct types of water-closets. Each type is made in many different patterns, both good and bad from a sanitary point of view, and, whatever the type decided upon, care is necessary in selecting to obtain one efficient and hygienic in shape and working. The principal kinds of closets now in use are the washdown, siphonic, valve, washout and hopper.

Washdown closets (fig. 16) are most commonly used. They are inexpensive to buy and to fix, and being made in one piece and simple in construction without any mechanical working parts are not liable to get out of order. When strongly made or protected by brick or concrete work they will stand very rough usage. The objection is sometimes raised with regard to washdown closets that they are noisy in action. This must be allowed with many patterns, but some of the latest designs have been greatly improved in this respect, and when fitted with a silent flushing cistern are not open to this objection.

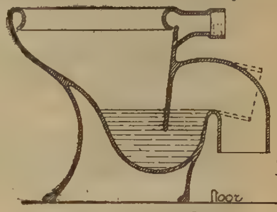


FIG. 16.—Washdown.

Siphonic closets (fig. 17) are a type of washdown in which the contents of the pan are removed by siphonic action, an after flush arrangement providing for the resealing of the trap. They are practically silent in action and with a flush of three gallons work very satisfactorily. Where the restrictions of the water company require the usual two gallon flush the ordinary washdown pan should be used.

Valve closets (fig. 18) are considered by many authorities on sanitation to be preferable to all other types. For domestic buildings, hotels, and where not subjected to the hardest wear, they are undoubtedly of great value. They should have a three gallon flush, and on this account they cannot be used in many districts owing to the water companies' regulations stipulating that a flush of not more than two gallons may be used.

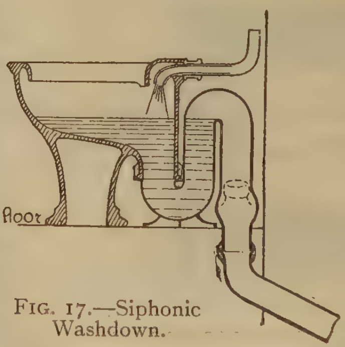


FIG. 17.—Siphonic Washdown.

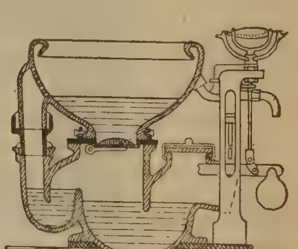


FIG. 18.—Valve.

The *washout closet* (fig. 19) is a type that never attained much popularity as it has been found by practical experience to be unsanitary and objectionable. The standing water is too shallow, and the receiving basin checks the force of the flush and the trap is therefore frequently imperfectly cleared.

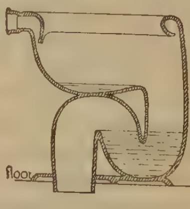


FIG. 19.—Washout.

Hopper closets are of two kinds—the long hopper and the short hopper. These are the forerunners of the washdown closet which the short hopper pan resembles, but instead of pan and trap being made in one piece the fitting consists of a fireclay or stoneware hopper, with straight sloping sides and central outlet jointed to a trap of lead or other material. The joint should be placed so as to be always kept under water by the seal of the trap. The long hopper pan is a most objectionable type of closet which should be rigorously avoided as it easily becomes foul and is most insanitary. In most districts its use is prohibited.

A water-waste preventer is a small tank fixed usually 4 or 5 ft. above a closet or urinal and connected therewith by a flushing pipe of $1\frac{1}{4}$ in. or greater internal diameter. This tank usually contains a siphon, and the flush is actuated by pulling a chain which admits water to the siphon; the contents are then discharged with some force down the flushing pipe into the pan of the closet, clearing out its contents and replacing the fouled water with clean. The flushing tank is automatically refilled with water by a valve fitted with a copper ball which rising on the surface of the incoming water shuts off the flow when the tank is full. Fig. 20 is a sectional drawing of one of the latest patterns and clearly shows its construction. The water-supply is shown near the top with the regulating ball valve attached. An overflow is provided and a pipe is led from this to an external outlet. The capacity of the ordinary domestic flushing cistern is two gallons, which is the maximum quantity allowed by most water companies. A three gallon flush is much better, however, and where this larger quantity is allowed should be adopted. Larger tanks for ranges of closets or urinals are often made to flush automatically when full, and for these the rate of water supply may be fast or very slow as desired, for the siphons are so constructed that even a drop-by-drop supply will start a full flush.

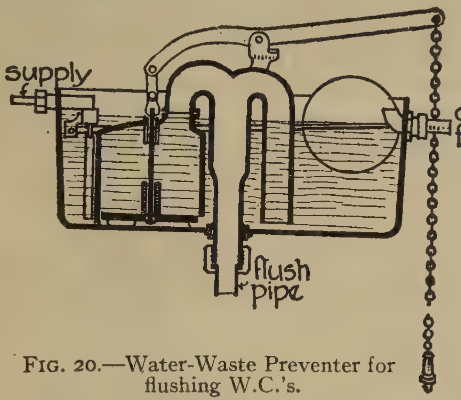


FIG. 20.—Water-Waste Preventer for flushing W.C.'s.

Regulations as to W.C.'s.

The by-laws of the London County Council contain very full regulations respecting the construction and fitting up of water-closets. These may be summarized as follows:—A water-closet or urinal must be furnished with an adequate flushing cistern distinct from any cistern used for drinking water. The service pipe shall lead to the flushing cistern and not to any other part of the closet. The pipe connecting the cistern with the pan shall have a diameter of not less than $1\frac{1}{4}$ in. in any part. The apparatus for the application of water to the apparatus must provide for the effectual flushing and cleansing of the pan, and the prompt and effectual removal therefrom, and from the trap connected therewith of all solid and liquid filth. The pan or basin shall be of non-absorbent material, of such shape, capacity and construction as to contain a sufficient quantity of water and to allow all filth to fall free of the sides directly into the water. No "container" or similar fitting shall be fixed under the pan. There shall be fixed immediately beneath or in connexion with the pan an efficient siphon trap constructed to maintain a sufficient water seal between the pan and the drain or soil pipe. No D trap or other similar trap is to be connected with the apparatus. If more than one water-closet is connected with a soil-pipe the trap of each closet shall be ventilated into the open air at a point as high as the top of the soil-pipe, or into a soil-pipe above the highest closet. This ventilating (or anti-shiphonage) pipe shall be not less than 2 in. in diameter, and connected at a point not less than 3 and not more than 12 in. from the highest part of the trap (fig. 12).

Baths.

Baths may be made of many different materials; copper, cast-iron, zinc and porcelain are those most generally employed. Metal baths have the great advantage of becoming hot with the water, while baths of porcelain, stoneware and marble, which are bad conductors of heat, impart to the user a sense of chilliness even though the water in the bath be hot. Copper baths are best; they may be finished on the inside by tinning, enamelling or nickel plating. Iron baths, usually tapering in shape, are very popular and are usually finished in enamel, but sometimes tinned. Fig. 21 illustrates a good type of cast-iron bath with standing waste. A good feature of this bath lies in the fact that all parts are accessible and easily cleaned. Porcelain baths are cumbersome and take a long time to heat, but they are often used for public baths. The practice of enclosing the bath with a wood casing is fast dying out; it is insanitary in that it harbours dust and vermin. Baths are now usually elevated upon short legs, so that every part of them and of the adjacent floor and wall is accessible for cleaning.

Fig. 22 is a section of a good type of scullery sink, and shows the waste and trap with brass clearing cap. The fitting is supported upon galvanized iron cantilever brackets which are built into the wall.

Urinals.

Like closets, urinals have undergone much improvement in design and manufacture. The best types are of glazed ware, and have vertical curved backs and sides about 4 ft. high with a flushing rim round the top and terminating in a base discharging into an open glazed channel waste, which, in the case of a range of urinals, collects the discharge from all and conveys it into a trapped gulley at one end of the range. This is the type usually fixed in street conveniences and similar positions. Plate and iron urinals are often fixed, but there is more difficulty in keeping them clean on account of the sharp angle and the unsuitability of the material. Urinals are seldom fixed in private houses or offices, an ordinary washdown pedestal closet with hinged "tip-up" seat serving every purpose. Such seats are often fitted with balance weights to cause them to lift automatically when not in use as a closet. Unless kept very clean and well flushed with water, urinals are liable to become a nuisance.

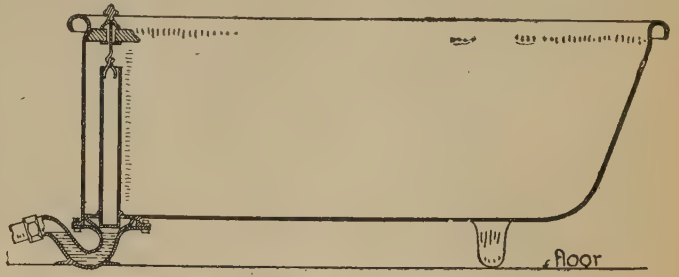


FIG. 21.—Bath, with Standing Waste.

In London among other towns the system of drainage is a "combined" one, that is, the storm water and the domestic sewage and waste is all collected in one sewer. For many reasons it is more satisfactory to have the two drains quite separate. In many districts this is done, but it entails the provision of a double system of drainage for each house, one drain being provided for rain-water, the other for sewage. Where combined drainage is installed an excess of water poured into the sewers during a storm often results in back flow and the flooding of basements and cellars with sewage. Such an occurrence might take place where there is a separate sewer for the storm water, but in this case the flooding would be with comparatively harmless rain-water instead of sewage and filth. Figs. 23 and 24 show two ground plans of the same house, a semi-detached suburban residence, one with combined drainage and the other with separate drains for storm water and sewage. In both figures the rain-water drains are shown in a dotted line, and other drains in a full line.

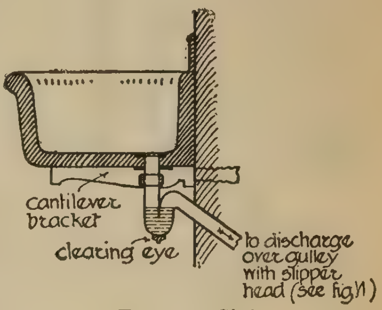


FIG. 22.—Sink.

In fig. 23, A is a 4 in. cast-iron rain-water down-pipe. B is a 4 in. ventilating-pipe taken up to a point above the building. C is a trapped gulley such as is shown in fig. 13. D is a gulley with channel head (fig. 14) into which are taken the discharges from the scullery sink on the ground floor, and from the bath and lavatory on the first floor. E is an untrapped manhole, with open channel bends and sealed cast-iron cover, from which any branch of the drains can easily be cleared by the use of drain-rods. F is a soil-pipe from a water-closet on the first floor, and is carried up above the roof to serve as a ventilator. G is a trapped gulley as fig. 13, taking the discharge from the rain-water pipe over it and serving also to drain the yard; H and J are similar gulleys. K is a manhole with trap for intercepting the foul gases from the sewer and preventing them from entering the house drains. The manhole is fitted with a sealed cast-iron cover and has an inlet at L with mica flap valve to admit fresh air to the drains; in construction it is similar to the one shown in fig. 9, but has only two branches entering it instead of five. In fig. 24, A is a rain-water pipe discharging to the gulley B, which is untrapped to allow of the ventilation of the branch C-B. C is a length of piping brought up to the surface of the ground and finished with a cap, which is removed when it is found necessary to clear away any obstruction. A special shaped junction here allows the rods to be pushed up either branch as required. D and E are trapped gulleys as already described. F is an untrapped gulley serving to ventilate the drain. G, H and J the same as for fig. 23. K is a pair of manholes built side by side, one for storm water and the other for sewage. Both are fitted with intercepting traps, and the sewage chamber is ventilated by an air inlet at L as in fig. 23. The cover of the storm water manhole need not be sealed, and if necessary could be fitted with a grating and be used to drain the forecourt.

Drainage by-laws.

The London by-laws regulating drainage are very full and are strictly enforced. They include requirements regarding the size, form, gradient and methods of construction and repair of drains, together with regulations affecting the design and fixing of traps, fittings and other apparatus connected with sanitary arrangements. Some of the headings of the different clauses of the by-laws are subjoined:—water-closets; earth-closets; drainage of subsoil; drainage of surface water; rain-water pipes; materials, &c., for drains; size of drains; drain to be laid on bed of concrete 6 in. thick; if under buildings to be encased with 6 in. of concrete; drain to be benched up with concrete to half its diameter; fall of drain; joints of drain; drain to be water-tight; thickness and weight of iron pipes; thickness of sockets and joints of stoneware pipes; drains under buildings; composition of concrete; every inlet to drain to be trapped; drain beneath wall to be protected by arch, flagstone, or iron lintel; drain connected with sewer to be trapped and means of access to trap provided; no right-angled junctions to be formed either vertical or horizontal; at least two untrapped openings to be provided for ventilation, each fitted with a grating or cowl with apertures for passage of air equal in area to that of the pipe to which it is fitted; ventilating shafts to be at least 4 in. in diameter, and if possible all bends and angles to be avoided; ventilating shafts to be of the same material, construction and weight as soil-pipes; no unnecessary inlets to drains to be made within buildings; waste-pipes from sinks and lavatories to be of lead, iron or stoneware, trapped immediately beneath the fitting; bell traps, dip traps and D traps are prohibited; waste-pipes to discharge in the open air into a properly trapped gulley; soil-pipes wherever practicable to be situate outside the building and to be of drawn lead or heavy cast-iron; if fixed internally the pipes to be of lead with wiped joints; iron pipes to have socket joints not less than 2½ in. in depth and to be made with molten lead or flanged joints securely bolted with some suitable insertion; the soil-pipe not to be connected with any rain-water or waste-pipe, and no trap to be placed between the soil-pipe and the drain; the soil-pipe to be circular with an internal diameter of not less than 3½ in., and to be taken up above the building and its end left open as an outlet for foul air; methods of connecting a lead pipe with an iron one; connexion of stoneware and lead, connexion of iron and stoneware; ventilation of trap of water-closet with an anti-siphonage pipe of not less than 2 in. diameter and ventilated into the open air or into the soil-pipe at a point above the highest fitting on the soil-pipe; construction of slop sinks and urinals.

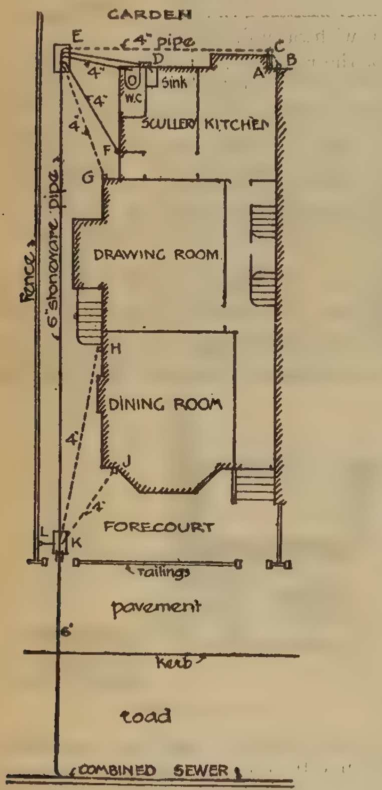


FIG. 23.—" Combined " System.

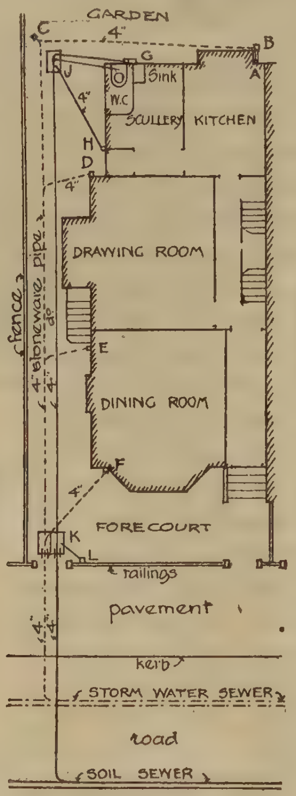


FIG. 24.—" Separate " System.

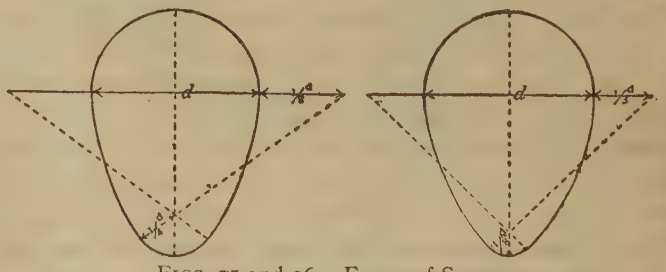
The by-laws respecting health and building in New York City are embodied in a large number of clauses. The more detailed health regulations are found in the Sanitary Code 1903. These are by-laws framed by the Board of Health under the authority of section 1172 of the New York Charter 1897. These must be taken in conjunction with the statute bearing on plumbing in New York City which was made by the Department of Buildings, 1896, and to which there have been several small amendments. Section 141 of the Building Code also deals with sanitation and in the Tenement House Act 1901, 1902, 1903, chap. 4, secs. 91 to 100 inclusive, deals with sanitary matters. From a general point of view the requirements of the American by-laws as to materials and methods of construction vary in a very slight degree from those in force under the London authorities. It is in the regulations affecting the execution of the work that we find a great difference, and these in New York are of a more stringent character than in any other capital. Thus no sanitary, plumbing or lighting work may be undertaken without first submitting for approval to the Department of Buildings complete and suitable drawings and particulars of the materials to be used. Such a notice is necessary even in the case of repairs and alterations to existing work. As a further guarantee of the work being satisfactory it is ordained that no such work shall be executed except under the superintendence of a registered plumber. Every master plumber in the city of New York or others working therein as such must obtain a certificate of competency from the Examination Board and be registered afresh every year during the month of March, as without such certificate or licence no work can be undertaken; any person violating such requirements shall upon conviction be fined for each offence $250 or undergo three months' imprisonment or both, while in the case of any certificated plumber or his employés wilfully breaking, with his knowledge, any of the rules and regulations relating to drainage and plumbing, the certificate of the master is to be forfeited in addition to the aforementioned fine.

Pipe sewers.

II. CONVEYANCE OF SEWAGE.—For small sewers, circular pipes of glazed stoneware or of moulded cement are used, from 6 in. to 18 in. and even 20 in. in diameter. The pipes are made in short lengths, and are usually jointed by passing the end or spigot of one into the socket or faucet of the next. Into the space between the spigot and faucet a ring of gasket or tarred hemp should be forced, and the rest of the space filled up with cement. Other methods of jointing have already been described and illustrated. The pipes are laid with the spigot ends pointing in the direction of the flow, with a uniform gradient, and, where practicable, in straight lines. In special positions, as under the bed of a stream, cast-iron pipes are used for the conveyance of sewage. Where the capacity of an 18-in. circular pipe would be insufficient, built sewers are used in place of stoneware pipes. These are sometimes circular or oval, but more commonly of an egg-shaped section,

Built sewers.

the invert or lower side of the sewer being a curve of shorter radius than the arch or upper side. The advantage of this form lies in the fact that great variations in the volume of flow must be expected, and the egg-section presents for the small or dry-weather flow a narrower channel than would be presented by a circular sewer of the same total capacity. Figs. 25 and 26 show two common forms of egg-sections, with dimensions expressed in terms of the diameter of the arch. Fig. 26 is the more modern form, and has the advantage of a sharper invert. The ratio of width to height is 2 to 3.



FIGS. 25 and 26.—Forms of Sewer.

Built sewers are most commonly made of bricks, moulded to suit the curved structure of which they are to form part. Separate invert blocks of glazed earthenware, terra-cotta or fire-clay are often used in combination with brickwork. The bricks are laid over a templet made to the section of the sewer, and are grouted with cement. The thickness of brickwork for sewers over 3 ft. in diameter should not be less than 9 in., but for smaller sewers laid in good ground at depths not exceeding 20 ft. from the surface a thickness of 4½ in. will suffice if well backed up with concrete. The thickness of brickwork for a sewer of any size may be determined in feet by the formula $dr/100$, where d = depth of excavation in feet and r = external radius in feet.

An egg-shaped sewer, made with two thicknesses of brick, an invert block, and a concrete setting, is illustrated in fig. 27.

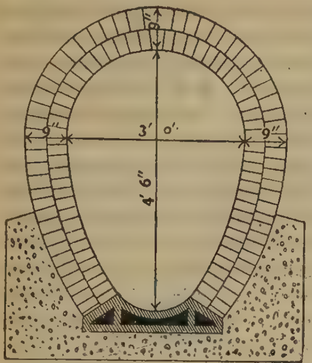


FIG. 27.—Brick Sewer.

Concrete is largely used in the construction of sewers, either in combination with brickwork or alone. For this purpose the concrete consists of from 5 to 7 parts of sand and gravel or broken stone to 1 of Portland cement. It may be used as a cradle for or as a backing to a brick ring, or as the sole material of construction by running it into position round a mould which is removed when the concrete is sufficiently set, the inner surface of the sewer being in this case coated with a thin layer of cement. A development in the construction of concrete sewers, whether laid in sectional pipes or constructed and moulded *in situ*, is the use of iron or steel bars and wires embedded in the material as a reinforcement. Such conduits can be constructed of any size and designed to withstand high pressures. Fig. 28 is a section of a concrete sewer having a diameter of more than 9 ft. constructed with round rod reinforcement. With regard to the method for calculating the proportions, generally speaking the thickness of the concrete shell should in no place be less than one-twelfth of the greatest internal diameter of the tube, while the steel reinforcement should be designed to resist the whole of the tensile stress. Where the safe tensile stress in the steel is 8 tons per sq. in. P = the pressure in pounds per sq. in., and r = the internal radius in inches; the weight of the reinforcement per sq. ft = $Pr/450$, while its area at each side of the pipe per longitudinal foot, when f = safe tensile stress in the reinforcement in pounds, is $12\,Pr/f$.

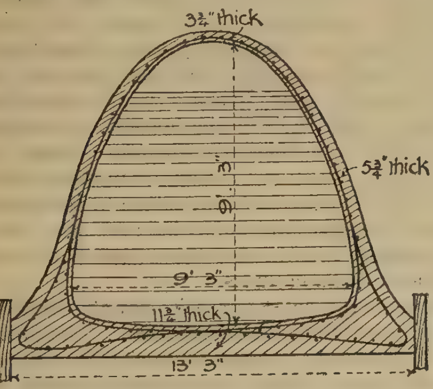


FIG. 28.—Reinforced Concrete Sewer. Section.

Dimensions of sewers.

In determining the dimensions of sewers, the amount of sewage proper may be taken as equal to the water supply (generally about 30 gallons per head per diem), and to this must be added (when the "combined" system is adopted) an allowance for the surface water due to rainfall. The latter, which is generally by far the larger constituent, is to be estimated from the maximum rate of rainfall for the district and from the area and character of the surface. In the sewerage of Berlin, for example, the maximum rainfall allowed for is ⅞ of an inch per hour, of which one-third is supposed to enter the sewers. In any estimate of the size of sewers based on rainfall account must of course be taken of the relief provided by storm-overflows, and also of the capacity of the sewers to become simply charged with water during the short time to which very heavy showers are invariably limited. Rainfall at the rate of 5 or 6 in. per hour has been known to occur for a few minutes, but it is unnecessary to provide (even above storm-overflows) sewers capable of discharging any such amount as this; the time taken by sewers of more moderate size to fill would of itself prevent the discharge from them from reaching a condition of steady flow; and, apart from this, the risk of damage by such an exceptional fall would not warrant so great an initial expenditure. Engineers differ widely in their estimates of the allowance to be made for the discharge of surface water, and no rule can be laid down which would be of general application.

Velocity of discharge.

In order that sewers should be self-cleansing, the mean velocity of flow should be not less than 2½ ft. per second. The gradient necessary to secure this is calculated on principles which are stated in the article HYDRAULICS (*q.v.*). The velocity of flow, V, is

$$V = c\sqrt{im},$$

where i is the inclination, or ratio of vertical to horizontal distance; m is the "hydraulic mean depth," or the ratio of area of section of the stream to the wetted perimeter; and c is a coefficient depending on the dimensions and the roughness of the channel and the depth of the stream. A table of values of c will be found in § 98 of the article referred to. This velocity multiplied by the area of the stream gives the rate of discharge. Tables to facilitate the determination of velocity and discharge in sewers of various dimensions, forms and gradients will be found in Latham's and other practical treatises.

Interception sewers.

Where the contour of the ground does not admit of a sufficient gradient from the gathering ground to the place of destination, the sewage must be pumped to a higher level at one or more points in its course. To minimize this necessity, and also for other reasons, it is frequently desirable not to gather sewage from the whole area into a single main, but to collect the sewage of higher portions of the town by a separate high-level or interception sewer.

Storm-water overflows.

It is undoubtedly necessary to construct overflows for storm water in connexion with combined systems of sewerage. No combined sewer of such size as will make it comparatively self-cleansing under normal conditions can hope to carry off the volume of water resulting from heavy rain. It might be thought that the overflow resulting from a storm would consist of nearly pure rain-water, but this is not the case, as the pressure of storm water has the effect of scouring out from the sewers a great deal of foul matter that is deposited when the flow is small. This being the case it is obviously bad policy to take the overflow into a stream, which would thereby suffer contamination. A better plan is to direct the discharge into a dry ditch or channel where the liquid may soak into the soil, and the solid particles by contact with the air may quickly become oxidized. In agricultural districts it might be possible by arrangement with farmers to run the overflow over grass-land, as it has good manurial properties.

Inverted siphons.

Occasionally when a sewer has to cross a stream or other obstruction it is found impossible to bridge or carry the pipe across and preserve its proper gradient. In such cases it must be carried under the obstruction by means of an inverted siphon. The exact form that should be given to inverted siphons is disputed, but it is generally agreed that they are expedients to be avoided wherever possible. The majority take roughly the form of the stream section, that is, they have two sloping pieces corresponding with the banks with a flat cross-piece under the bed of the stream. The pipes are invariably of iron and should be laid in duplicate, as they are liable to silt up in the flat length. For this reason it is usual in constructing a siphon to place permanent chains in the pipes, and these are periodically pulled backward and forward to stir up the silt. Brushes may also be attached to the chains and pulled through from end to end. At either end of the siphon pipes there are manholes into which the pipes are built. Penstock valves also should be provided at each end so that sewage can be shut out of one or both of the siphons as desired for clearing purposes.

Connexion between high- and low-level sewers.

Tumbling bays being prohibited, the usual method of leading a high-level sewer into a low-level sewer is by means of a ramp. This is constructed in connexion with a manhole into which the end of the high-level sewer is taken and finished usually with a flap valve. Some distance back along this sewer a wide-throated junction is put in the invert of the sewer, and from this junction a ramp-pipe is taken down to the invert of the low-level sewer, so that the sewage in the upper sewer instead of having a direct fall runs down the slope of the ramp. The ramp-pipe is usually constructed of iron and is of smaller section than the high-level sewer because of the greater fall and pressure.

In the low-lying parts of towns storage tanks are often constructed to receive the sewage of such districts. They are periodically emptied of their contents, which are pumped up into the main sewers through which the sewage travels to the outfall. This storing of sewage should be avoided whenever possible. It is much better to provide for raising it as it is produced either by an installation of one or more automatic lifts, such as Adams's sewage lifts, or, where a large amount of material is to be dealt with, necessitating continual pumping, by a Shone ejector worked by compressed air.

Ventilation of sewers.

Sewer gas is a term applied to the air, fouled by mixture with gases which are formed by the decomposition of sewage, and by the organic germs which it carries in suspension, that fills the sewer in the variable space above the liquid stream. It is universally recognized that sewer gas is a medium for the conveyance of disease, and in all well-designed systems of sewerage stringent precautions are taken to keep it out of houses. It is equally certain that the dangerous character of sewer gas is reduced, if not entirely removed, by free admixture with the oxygen of fresh air. Sewers should be liberally ventilated, not only for this reason, but to prevent the air within them from ever having its pressure raised (by sudden influx of water) so considerably as to force the "traps" which separate it from the atmosphere of dwellings. The plan of ventilation now most approved is the very simple one of making openings from the sewer to the surface of the street at short distances—generally shafts built of brick and cement—and covering these with metallic gratings. Under each grating it is usual to hang a box or tray to catch any stones or dirt that may fall through from the street, but the passage of air to and from the sewer is left as free as possible. The openings to the street are frequently made large enough to allow a man to go down to examine or clean the sewers, and are then called "manholes." Smaller openings, large enough to allow a lamp to be lowered for purposes of inspection, are called "lampholes," and are often built up of vertical lengths of drain-pipe, 6 in. or 9 in. in diameter, and finished at the surface with a cover similar to that used for a manhole but smaller. A length of 150 ft. of pipe sewer is about the limit that can be sighted through. Lampholes are mostly used in the construction of pipe and other small sewers.

Flushing of sewers.

To facilitate inspection and cleaning, sewers are, as far as possible, laid in straight lines of uniform gradient, with a manhole or lamphole at each change of direction or of slope and at each junction of mains with one another or with branches. The sewers may advantageously be stepped here and there at manholes. Sir R. Rawlinson pointed out that a difference of level between the entrance and exit pipes tends to prevent continuous flow of sewer gas towards the higher parts of the system, and makes the ventilation of each section more independent and thorough. When the gradient is slight, and the dry-weather flow very small, occasional flushing must be resorted to. Flap valves or sliding penstocks are introduced at manholes; by closing these for a short time sewage (or clean water introduced for the purpose) is dammed up behind the valve either in higher parts of the sewer or in a special flushing chamber, and is then allowed to advance with a rush. Many self-acting arrangements for flushing have been devised which act by allowing a continuous stream of comparatively small volume to accumulate in a tank that discharges itself suddenly when full. A valuable contrivance of this kind is Rogers Field's siphon flush tank. When the liquid in the tank accumulates so that it reaches the top of the annular siphon, and begins to flow over the lip, it carries with it enough air to produce a partial vacuum in the tube. The siphon then bursts into action, and a rapid discharge takes place, which continues till the water-level sinks to the foot of the bell-shaped cover. Adams's "Monster Flusher" is constructed on similar principles and is of simple and strong design. Its flushing-power is claimed to be greater than that of the ordinary siphon. By the use of this appliance, which is automatic in action, shallow sewers can be effectively flushed. Fig. 29 is a section of a flushing chamber fitted with this siphon. Such flushing apparatus may be operated by a water-supply from an ordinary tap which may be regulated for a large or small flow. The capacity of flush tanks is a little difficult to determine. As a rule 250 to 400 gallons are allowed for 9-in. sewers, 400 to 600 gallons for 12-in., and 600 to 800 gallons for 15-in. sewers, the amount increasing by 200 gallons for each 3-in. additional diameter.

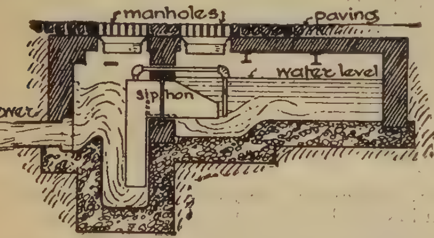


Fig. 29.—Flushing Chamber for Shallow Sewers.

III. Disposal of Sewage.—The composition of domestic sewage is now fairly well known and is generally reduced for the purposes of comparison to a standard; that is to say, ordinary sewage is that due to a water-supply of about 30 gallons per head per diem. If the supply is less, and there is no leakage of subsoil water into the drainage system, the sewage will be stronger; conversely, if there is leakage, &c., the sewage will be more dilute, but obviously, the quantity of impurities will, for any given population, be the same in amount. The subjoined table shows the kind of sewage referred to:—

Average Domestic Sewage, in Grains per Gallon.

Total Solids in Solution.	Organic Carbon.	Organic Nitrogen.	Ammonia.	Chlorine.	Suspended.		
					Mineral.	Organic.	Total Combined Nitrogen.
50·54	3·287	1·543	4·70	7·46	16·92	14·36	5·41

For all practical purposes we may say that average sewage contains two tons of suspended matters in each million gallons, one-half of which is mineral matter. When, however, we come to a consideration of trade waste, the question becomes difficult in the extreme, because of the great variety of trades, and the ever varying quantities added to the sewage. Some of the principal trade wastes are from dye-works, print-works, bleach-works, chemical works, tanneries, breweries, paper-makers, woollen-works, silk-works, iron-works and many others. In some cases one only of these trade wastes finds its way to the sewers; in others, several of them may be found. In some instances, again, these trade wastes are of an alkaline nature, in others they are acid; the mixtures may be either, and of greatly varying character. Next comes the manner in which sewage is discharged at the works. The flow is variable throughout the entire 24 hours, but in the case of sewers discharging domestic sewage only, such sewage being of the standard strength, it will be a close approximation to the facts to say that about two-thirds is discharged between the hours of 7 A.M. and 7 P.M., one-half during the eight hours of maximum flow, two-fifths during the six hours of maximum flow, and about 7½% per hour during the two hours of maximum flow. These data will be sufficient for the design of the works intended for dealing with the sewage. Separate calculations must be made if there is trade refuse, or much leakage of subsoil water. In very large systems, again, the maxima are rather less because of the time occupied by the sewage in travelling to the outfall from the more remote parts of the district. In cases where one set of sewers is employed for both sewage and rainfall the sewage flow may be increased more than a hundredfold within a few minutes by heavy rainstorms. Of course the sewage disposal works can only deal with a small proportion of such flow, and the balance is discharged into some convenient water-course or other suitable place. Even when the separate system is employed, as in the case of the smaller towns, the flow may be increased ten to fifteen times by rain, because it is unusual to carry two sets of drains to the backs of the houses. In designing outfall works, therefore, all these circumstances must be carefully considered. Again, when the sewage is pumped, as is frequently the case, the size of the tanks must often be increased, because in the smaller installations the whole of the day's sewage is frequently pumped out in a few hours; this fact must also be remembered when designing filters.

Nearly every town upon the coast turns its sewage into the sea. That the sea has a purifying effect is obvious. The object to be attained is its dispersion in a large volume of sea-water. As it is lighter than salt water it tends to rise after leaving the sewer; the outfall should, therefore, if practicable, terminate in deep water, so that the two liquids may become well mixed. The currents must be studied by means of floats, and in most cases the sewage must be discharged upon the ebb tide only, and then perhaps not throughout the entire period, the object being to prevent it from being carried towards the shore. That the purification is effected mainly by means of living organisms is well established, and it has been urged by competent authorities that this system is not wasteful, since the organic matter forms the food of the lower organisms, which in turn are devoured by fish. Thus the sea is richer, if the land is the poorer, by the adoption of this cleanly method of disposal. The next step is the partial purification of the sewage by means of a chemical process. When a town lies some distance up an estuary, as for example London, Glasgow, Rochester and many others, the dilution may be insufficient to prevent a nuisance, or the suspended matters may be deposited upon the foreshore to be uncovered at low water. The first stage of purification is then employed, namely, clarification in tanks. Practice varies with regard to tank capacity, but as a general rule it should be at least equal to half a day's dry weather flow. This will enable the works manager to turn out a good effluent, even in wet weather, when the volume is much increased. With regard to the practical effect of any particular treatment, it is now recognized that the matters in solution are scarcely touched by any chemical process that can be employed, but the removal of the suspended matter is a great gain, as has been proved in the case of London. Briefly, a good chemical process will do about one-half of the work of purification; and in many cases it is not necessary to go further. With regard to the kind of chemical to use, lime, either alone or in conjunction with aluminium sulphate or with ferrous sulphate, is most frequently employed. When the resulting sewage sludge has to be filter-pressed, lime is almost essential for the primary treatment of the sewage, in order to destroy the glutinous nature of the sludge. In the case of large towns like London, Manchester and Salford, the sludge is shipped in specially designed steamers, of 600 tons to 1000 tons burden, and discharged into the sea at a distance from the coast. The London outfall works have a fleet of six steamers, which convey the sludge out to Barrow Deep, a channel in the North Sea about 10 m. east of the Nore lightship. Each vessel has four oblong tanks having a total capacity of 1000 tons of sludge, which can be discharged in seven minutes when the valves are fully opened. The sludge is discharged about 10 ft. under the water and being agitated by the action of the ship's screws is very completely diffused. The sand and earthy matters soon subside and the organic matter is rapidly consumed by the organic life in the sea-water. A careful microscopical examination and chemical analysis failed to detect more than the merest trace of the mineral portion of the sludge, either in dredgings from the bottom of the channels or on the surface of the sandbanks. The cost of the disposal works out at about 4½d. per ton of sludge.

In the case of towns situated on rivers above the range of tidal waters, the further purification is effected either on land, or by means of artificial filters, or a combination of the two. The question of land treatment is frequently considered from the standpoint of so many persons to the acre; but the best method is to ascertain how many gallons per day an acre of land will purify. As the quality of land varies greatly, the proper volume to be applied per acre can only be ascertained after a good deal of experience. The range lies between about 3000 gallons per acre per day in the case of poor land, to about 30,000 gallons in the same period in the case of the best. Let us assume an instance of the latter kind. The works have been designed on a basis of 1000 persons per acre, producing 30,000 gallons of sewage per day; the land being of a highly suitable character, and the sewage having been clarified, success is assured. But, conversely, through faulty construction of the sewers, the sewage amounts, say, to 60 gallons per head; the land, unable to deal with the liquid, quickly becomes water-logged and offensive, and the works are a failure. Precisely the same remarks apply to artificial filters, which are always designed upon the basis of so many gallons per square yard of filtering material. Many failures of both land and filters have been due to the fact that the actual sewage flow was greatly in excess of the original estimates. We may say that clay soils lie at one end of the scale, and very porous sands or gravels at the other; obviously, therefore, each case must be considered on its merits. It should be remembered that when such moderate quantities as 3000 gallons per acre per day are applied to land, there is no necessity to remove the suspended matter; broad irrigation being resorted to, the land readily assimilates the solids, and thus one source of expense may be eliminated.

The artificial filters are now generally called bacteria beds; although filters have been in constant use in some cases, as for instance at Wimbledon, for a great number of years. The first filters constructed at these works were made in 1876, and were about 7000 sq. yds. in extent. With the growth of population additions have been made of at least five times that area. One of the original beds was used for crude sewage, but the mineral matter choked it completely, and experience pointed to the necessity of clarifying the sewage before filtration. Whether the treatment should be in open or in closed tanks, or whether chemicals should be added, has been much debated; but seeing that ordinary sewage contains one ton of suspended mineral matter in each million gallons, it is clear that if this is not removed before filtration, it will be retained in the filters and ultimately choke them, as happened at Wimbledon. The common cesspool has been resuscitated and improved under the name of a septic tank. In this the disintegration of the suspended matter is brought about by anaërobic organisms, and the liquid in passing slowly through the tank absorbs most of the gases due to the breaking down of the organic matter. There is no oxidation at this stage. The liquid is next passed through artificial filters, of which there are many types. What is known as a "contact" filter was constructed, probably for the first time on a large scale, at the London (Barking) works. The object sought to be attained was that of making each cubic yard of filtering material perform the same amount of work, and the least expensive way was apparently to close the outlet, and charge the filter with liquid, allowing it to remain in contact for about two hours, and then drawing it off so that the bed could be thoroughly aërated. No doubt a better way would be to distribute the sewage in the form of a shower of liquid, and work the beds continuously, but this involves a good deal of expense for spreading appliances, and a fall is necessary in the works, which is not always obtainable. Probably the most complete installation of the kind last referred to is that at Salford. Iron pipes are led over the surface of the filters, and spraying nozzles are placed at short intervals, so that the sewage is applied in the form of a heavy shower. But whatever form the filters and appliances may assume, the final result is the same. If the beds are properly aërated, the aërobic organism establishes itself in prodigious numbers, and attacks the organic matter, breaking it down into harmless, soluble and gaseous products. It is, of course, assumed that the filters are adequate in area, and are properly managed. With regard to the materials to be employed in making sewage filters, it is now well established that the size of the particles has a more important bearing than their composition. At the same time, it may be remarked that materials with very rough surfaces, as for instance coke breeze, are more effective than those with smooth surfaces. Doubtless the former classes afford, in the interstices, a lodging for the bacteria, and no doubt a given quantity of material with rough surfaces will harbour greater numbers than the same amount of smooth.

A reference must be made to the Manchester experiments. The experts' report suggested the provision of 60 acres of filters for dealing with the sewage of the city, which is said to average 30 million gallons per day in dry weather. But after inquiry into the merits of the proposal the officials of the Local Government Board recommended that the filters should be 92 acres in extent, and that the effluent should be finished on land. Storm water filters to take the excess after the sewage was diluted six times were also recommended, such filters being designed to pass 500 gallons per sq. yd. per diem. In this case clarified sewage was to be dealt with on filters 3 ft. 4 in. in depth, composed of clinkers broken to pass a sieve with meshes of 1½ in., but retained on one with meshes of ⅛ in. It will be observed, therefore, that the bacterial treatment of sewage has scarcely as yet emerged from the experimental stage, but it will certainly be adopted in many cases where it is impracticable to obtain good land in sufficient quantity for the purification of the sewage. With regard to the disposal of sewage-sludge in inland towns, until it has been fairly established by a long trial that bacteria will dispose of this material, the reduction of its bulk by means of filter-presses will be found to be the most satisfactory method of dealing with it. The practical effect is the conversion of 5 tons of offensive mud into 1 ton of hard cake, which may be readily handled and carted. The cost is usually about 2s. 6d. per ton of cake, and a million gallons of average sewage produce about 8 tons.

The chief works of reference upon this subject are:—Colonel E. C. S. Moore, *Sanitary Engineering*; L. Parkes and H. Kenwood, *Hygiene and Public Health*; A. J. Martin, *The Sewage Problem*; A. P. Poley, *Law Affecting Sewers and Drains*; J. J. Cosgrove, *Principles and Practice of Plumbing, The Purification of Sewage*; Colonel E. C. S. Moore, *New Tables for the Complete Solution of Ganguillet and Kutter's Formula for the Flow of Liquid in Open Channels, Pipes, Sewers and Conduits*; W. J. Dibden, *The Purification of Sewage and Water*; W. Spinks, *House Drainage Manual*; S. Rideal, *Sewage and the Bacterial Purification of Sewage. Municipal Engineers' Specification.*

(J. Bt.)

SEWING[1] MACHINES. The sewing machine, as is the case with most mechanical inventions, is the result of the efforts of many persons, although it would appear that the most meritorious of these worked in ignorance of the labours and successes of others in the same field. Many of the early attempts to sew by machinery went on the lines of imitating ordinary hand-sewing, and all such inventions proved failures. The method of hand-sewing is of necessity slow and intermittent, seeing that only a definite length of thread is used, which passes its full extent through the cloth at every stitch, thus causing the working arm, human or otherwise, to travel a great length for every stitch made, and demanding frequent renewals of thread.

The foundation of machine-sewing was laid by the invention of a double-pointed needle, with the eye in the centre, patented by Charles F. Weisenthal in 1755, with the object of avoiding the necessity for inverting the needle in sewing or embroidering. Many of the features of the sewing machine are distinctly specified in a patent secured in England by Thomas Saint in 1790, in which he, *inter alia*, described a machine for stitching, quilting, or sewing. Saint's machine, which appears to have been intended principally for leather work, was fitted with an awl which, working vertically, pierced a hole for the thread. A spindle and projection laid the thread over this hole, and a descending forked needle pressed a loop of thread through it. The loop was caught on the under side by a reciprocating hook; a feed moved the work forward the extent of one stitch; and a second loop was formed by the same motions as the first. It, however, descended within the first, which was thrown off by the hook as it caught the second, and being thus secured and tightened up an ordinary tambour or chain stitch was formed. Had Saint hit on the idea of the eye-pointed needle his machine would have been a complete anticipation of the modern chain-stitch machine.

The inventor who first devised a real working machine was a poor tailor, Barthélemy Thimmonier, of St Étienne, who obtained letters patent in France in 1830. In Thimmonier's apparatus the needle was crocheted, and descending through the cloth it brought up with it a loop of thread which it carried through the previously made loop, and thus it formed a chain on the upper surface of the fabric. Though the machine was rather clumsy, made principally of wood, as many as eighty were being worked in Paris in 1841, making army clothing, when an ignorant and furious crowd wrecked the establishment and nearly murdered the unfortunate inventor. Thimmonier, however, was not discouraged, for in 1845 he twice patented improvements on it, and in 1848 he obtained both in England and the United Kingdom patents for further improvements. The machine was then made entirely of metal, and vastly improved on the first model. But the troubles of 1848 blasted the prospects of the resolute inventor. His patent rights for Great Britain were sold; a machine shown in the Great Exhibition of 1851 attracted no attention, and he died in 1857 unfriended and unrewarded.

The most important ideas of an eye-pointed needle and a double thread or lock-stitch are strictly of American origin, and that combination was first conceived by Walter Hunt of New York about 1832–1834. Hunt reaped nothing of the enormous pecuniary reward which has been shared among the introducers of the sewing machine, and it is therefore all the more necessary that his great merit as an inventor should be insisted on. He constructed a machine having a vibrating arm, at the extremity of which he fixed a curved needle with an eye near its point. By this needle a loop of thread was formed under the cloth to be sewn, and through that loop a thread carried in an oscillating shuttle was passed, thus making the lock-stitch of all ordinary two-thread machines. Hunt's invention was purchased by a blacksmith named Arrowsmith, and a good deal was done towards improving its mechanical details, but no patent was sought, nor was any serious attempt made to draw attention to the invention. After the success of machines based on his two devices was fully established, Hunt in 1853 applied for a patent; but his claim was disallowed on the ground of abandonment. The most important feature in Hunt's invention—the eye-pointed needle—was first patented in the United Kingdom by Newton and Archbold in 1841, in connexion with glove-stitching.

Apparently unconscious of the invention of Walter Hunt, Elias Howe, a native of Spencer, Mass., directed his attention to machine-sewing about the year 1843. In 1844 he completed a rough model, and in 1846 he patented his sewing machine (fig. 1). Howe was thus the first to patent a lock-stitch machine, but his invention had the two essential features—the curved eye-pointed needle and the under-thread shuttle—which were invented by Walter Hunt twelve years previously. Howe's invention was sold in England to William F. Thomas of Cheapside, London, a corset manufacturer, for £250. Thomas secured in December 1846 the English patent in his own name, and engaged Howe on weekly wages to adapt the machine for his manufacturing purposes. The career of the inventor in London was unsuccessful; and, having pawned his American patent rights in England, he returned in April 1849 in poverty to America. There in the meantime the sewing machine was beginning to excite public curiosity, and various persons were making machines which Howe found to trench on his patent rights. The most prominent of the manufacturers, if not of inventors, ultimately appeared in Isaac Merritt Singer (1811–1875), who in 1851 secured a patent for his machine (fig. 2). Howe now became alert to vindicate his rights, and, after regaining possession of his pawned patent, he instituted suits against the infringers. An enormous amount of litigation ensued, in which Singer figured as a most obstinate defendant, but ultimately all makers became tributary to Elias Howe. It is calculated that Howe received in the form of royalties on machines made up to the period of the expiry of his extended patent (September 1867—he died in the next month) a sum of not less than two millions of dollars.

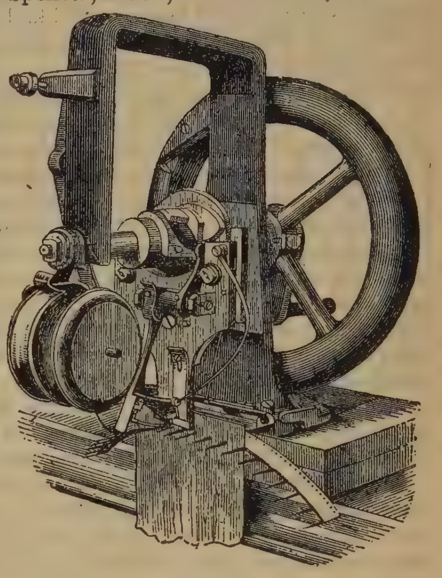


Fig. 1.—Howe's original Machine.

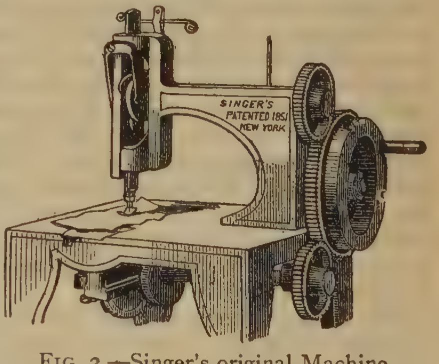


Fig. 2.—Singer's original Machine.

The practicability of machine-sewing being demonstrated, inventions of considerable originality and merit followed in quick succession. One of the most ingenious of all the inventors—who worked also without knowledge of previous efforts—was Mr Allan B. Wilson. In 1849 he devised the rotary hook and bobbin combination, forming the special feature of the Wheeler & Wilson machine. Wilson obtained a patent for his machine, which included the important and effective four-motion feed for moving the work after every stitch, in November 1850. In February 1851 William O. Grover, a tailor, of Boston, patented his double chain-stitch action, which formed the basis of the Grover & Baker machine. In 1856 James A. E. Gibbs (1829–1902), a Virginia farmer, devised the chain-stitch machine, improved subsequently by J. Willcox and now known as the Willcox & Gibbs. These together—all American inventions—form the types of the various machines now in common use. Thousands of patents have been issued in the United States and Europe, covering improvements in the sewing machine; but, although its efficiency and usefulness have been greatly increased by numerous accessories and attachments, the main principles of the various machines have not been affected thereby.

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[1] "Sew," for stitching with a needle, is a word common to Indo-European languages; cf. Lat. *suere*, Gr. *κασσύειν*, *καττύειν*, Sansk. *siv*.

In machine sewing three varieties of stitch are made—(1) the simple chain or tambour stitch, (2) the double chain stitch and (3) the lock stitch. In the first variety the machine works with a single thread; the other forms use two, an upper and an under thread.

The structure of the chain stitch is shown in fig. 3. The needle first descends through the cloth, then as it begins to ascend the friction of the thread against the fabric is sufficient to form a small loop into which the point of a hook operating under the cloth plate enters, expanding and holding the loop while the needle rises to its full height. The feed then moves the fabric forward one stitch length, the hook with its loop is also projected so that when next the needle descends its loop is formed within the previous loop. The hook then releases loop No. 1, seizes and expands loop No. 2, and in so doing draws up the previous loop into a stitch, chain-like on the under side but plain on the upper surface of the fabric. The seam so made is firm and elastic, but easily undone, for if at any point a thread is broken the whole of the sewing can be readily run out backwards by pulling the thread, just as in crochet work. To a certain extent this imperfection in the chain-stitch machine is overcome in the Wilcox & Gibbs machine, in which each loop, by means of a rotating hook, is twisted half a revolution after it has passed through its predecessor. The somewhat complicated course of the threads in the double chain stitch of the Grover & Baker machine is shown in fig. 4. The under thread was supplied from an ordinary bobbin and was threaded through a circular needle of peculiar form. The machine was wasteful of thread, and the sewing formed a knotted ridge on the under side of the fabric.

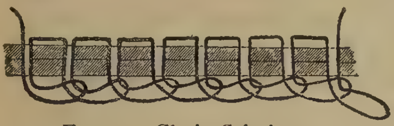
FIG. 3.—Chain Stitch.

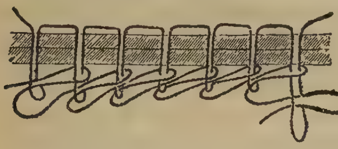
FIG. 4.—Double Chain Stitch.

The lock stitch is that made by all ordinary two-thread sewing machines, and is a stitch peculiar to machine sewing. Its structure is, as shown in fig. 5, very simple, and when by proper tension the threads interlock within the work it shows the same on both sides and is very secure. When, however, the tension on the upper thread is weak, the under thread runs along the surface as at *b*, held more or less tightly by the upper loops. It will be seen that to make the lock stitch the under thread has to be passed quite through the loop of the upper thread. That is done in two principal ways. By the first plan a small metal shuttle, holding within it a bobbin of thread, is carried backward and forward under the cloth plate, and at each forward movement passes through the upper thread loop formed by each succeeding stroke of the needle. Such is the principle devised by Hunt, introduced by Howe, and improved by Singer and many others. The second principal method of forming the lock stitch consists in seizing the loop of the upper thread by a rotating hook, expanding the loop and passing it around a stationary bobbin within which is wound the under thread. The method is the invention of A. B. Wilson, and is known generally as the Wheeler & Wilson principle. The rotary hook seen at *b*, fig. 6, is so bevelled and notched that it opens and expands the upper thread loop, causing it quite to enclose the bobbin of under thread, after which it throws it off and the so-formed lock stitch is pulled up and tightened either by an independent take-up motion as in later machines, or by the expansion of the next loop as in the older forms. The bobbin A, lenticular in form, and its case B, fig. 6, fit easily into a circular depression within the hook, against which they are held by the bobbin holder *a*, fig. 6.

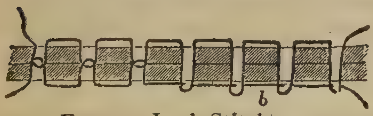

FIG. 5.—Lock Stitch.

Intermediate between the shuttle and the rotary-hook machines is the oscillating-shuttle machine introduced by the Singer Co. The shuttle is hook-formed, not unlike the Wilson hook, and it carries within it a capacious circular bobbin of thread *h*. fig. 7. This shuttle is driven by an oscillating driver *db* within an annular raceway *a a*, and, instead of revolving completely like the Wilson hook, it oscillates only in an arc of 150°, so far as serves to catch and clear the upper thread. The oscillating-shuttle and rotary-hook machines work with great smoothness and rapidity.

Sewing machines are now made in hundreds of varieties for special kinds of work. Some, for example, are capable of performing the most complicated operations in ornamental stitching, a horizontal right and left motion, in addition to the ordinary vertical motions, being for this purpose often imparted to the needle bar; others will sew button-holes at the rate of 8 or 10 a minute; while others again will sew on the buttons, making the required number of stitches, stopping automatically with the needle at its highest point, and cutting the threads off close to the underside of the work. In some cases two or more needles are fitted, producing parallel rows of stitches; with a machine having 12 needles a single operation may make as many as 24,000 stitches a minute. Special forms of machine are designed to meet the requirements of the glove-sewer, the umbrella-maker, &c. In sewing carpets the great weight of the material makes feeding difficult, and therefore machines have been invented that move along the carpet, which itself remains stationary. The earlier forms were hand-worked; the two lengths of carpet were stretched across the room, and the machine travelled along the seam, followed by the operator, who turned it by means of a hand-crank. One of these machines was capable of doing the work of eight or ten hand-sewers. With later forms, operated by electricity or other power and running along a track, the carpet is stretched and sewed so rapidly that one power machine does the work of eight or ten hand machines. The introduction of sewing machines has revolutionized the boot and shoe industry, and books are stitched by machine, the Brehmer wire-sewing machine and Smyth thread-sewing machine being prominent representatives of this class.

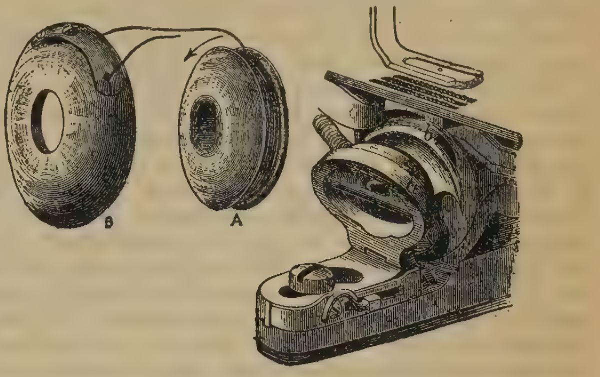

FIG. 6.—Rotary Hook, Bobbin, and Bobbin Case (Wheeler & Wilson Machine).

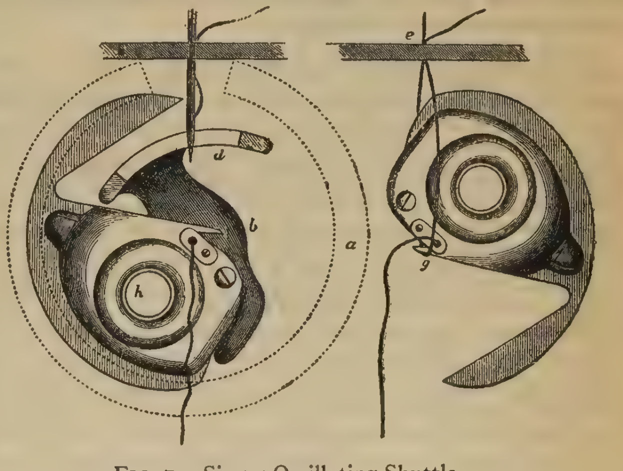

FIG. 7.—Singer Oscillating Shuttle.

SEX (Lat. *sexus*; possibly connected with *secare*, to cut), the character of being either male or female, which can be attributed to the vast majority of animals, but less correctly to the higher plants, where the so-called male and female organs, or flowers, are part of the sexless generation (see REPRODUCTION: *Plants*). The primary distinction of sex resides in the essential organs of reproduction (*q.v.*). An organism that contains the germinal tissue or mass of tissue known as the testis, and producing the sexual cells known as spermatozoa, is a male; an organism containing the tissue which produces ova is known as a female; one producing both ova and spermatozoa is a true hermaphrodite; and one producing neither, if it belong to the sexual generation, is known as a neuter, although neuters are for the most part incomplete females. The primary sexual tissues and the gametes are described in the article REPRODUCTION (*Animals*).

Associated with the presence of the primary reproductive organs there may be a large number of other characters, and attempts have been made to classify these as secondary and tertiary sexual characters. It is impossible to define a series of logical categories in which any accessory character will find its inevitable place, but a convenient practical distinction first made by John Hunter may be drawn between characters directly auxiliary to the processes of reproduction and those which, although limited to one sex, are not immediately connected with reproductive processes. We may then make the division into (1) Primary Sexual Characters (A. *Essential*: power of producing respectively ova and spermatozoa. B. *Auxiliary*: possession of sexual ducts and reservoirs, intromittent and copulatory organs, organs associated with oviposition, gestation, parturition, and nutrition of the immature young in any stage); and (2) Secondary Sexual Characters (differences between the sexes in size, shape, appearance, ornamentation, armament, colour and coloration, voice, and instincts and habits not directly associated with the reproductive processes).

Those characters which are here grouped as primary are described in the article REPRODUCTION. It is sufficient to repeat that in many animals only the essential primary characters are present. There is much diversity in the possession of secondary sexual characters, and in many cases these apparently are absent. Among mammals it is impossible to distinguish the sex without examination of the reproductive organs or observation of the sexual habits, in such cases as the domestic cat, the tiger and many other feline animals, hyaenas, bears, rabbits, hares, mice and a vast number of others. So also among birds there are many cases where the sexes are alike, as for instance, some humming-birds, parrots, owls, cranes, kingfishers, and many small birds such as robins and hedge-warblers. In reptiles and batrachians, in fish and a very large number of invertebrates there are no visible secondary sexual characters

C. Darwin, in the portion of the *Descent of Man* devoted to "Selection in relation to Sex," brought together what remains the most complete and valuable account of the existence and distribution amongst animals of secondary sexual characters, and it would be impracticable here to give more than the most summary description of the groups of facts involved. Among Crustacea the sexes frequently differ, but in most cases the differences concern auxiliary primary characters, such as the possession of intromittent and clasping organs. Differences in size are frequent; in the higher Decapods the males and in the lower Crustacea the females frequently being larger, the disparity being extreme in some of the parasitic Copepods and Isopods where the males are minute and attached to the females, whilst in the Cirripedes, as Darwin himself discovered, very minute complementary males may live as parasites in the mantle cavity of large hermaphrodite or female forms. Amongst Arachnids conspicuous differences in colour and size occur, the males generally being smaller, more active and possessed of relatively longer appendages, and more highly decorated. Amongst Insects, the differences between the sexes may be very great, quite apart from those relating to intromittence, prehension of the female, oviposition, or the higher development of sense organs by which the males can more readily seek out the females. In many cases the males are winged, the females wingless and grub-like. In a few instances, the males are highly pugnacious and are furnished with special weapons for fighting with their rivals. Amongst the Homoptera and Orthoptera there are many instances where the males possess organs capable of producing loud sounds, and these are rudimentary or absent in the females, whilst in other cases, both sexes produce call-notes. Particularly amongst the Coleoptera, the males may differ very greatly from the females in the shape of the body and may be decorated with extraordinary growths of the head and thorax. The most notable sexual differences are in coloration, and whilst there are many instances where both sexes are inconspicuous, and a few where both are brilliant, there are still more where the males differ from the females by the display of more conspicuous patterns and of brighter colours. It may be said of Insects in general that it is the more common case for secondary sexual characters to exist in such a degree that the sexes may be distinguished at a glance.

Among Fishes, secondary sexual characters ~~are~~ common. Spines are developed on the head and pectoral fins of the males of some Rays, but it is probable that these may be auxiliary primary characters, useful in the prehension of the female. In the male salmon, a cartilaginous projection, developed during the breeding season, appears on the upper surface of the point of the lower jaw, whilst in old males the jaws become hook-like and the teeth are greatly increased in size. In the thornback, the adult male has the teeth sharp-pointed and backwardly-directed, while those of the female are flat and pavement-like. In almost all fishes the males when adult are smaller than the females, and may be much smaller. Beards of stiff, hair-like structures, elongated processes of the fins, tubercles and many other structures that may be classed as ornaments, because their function is unknown, occur in males and are absent in females. Differences in pattern and colour are extremely frequent, become much more marked in the breeding season, and are of such a nature that the males are more conspicuous. Among Batrachia, differences between the sexes in size and general shape are not striking, but there are many instances of the males exhibiting crests, or special processes which may be classed as ornaments, and peculiar patterns and bright colours, during the breeding season.

Secondary sexual differences appear in the vast majority of birds. The shape seldom differs markedly, but differences in size are common, sometimes, as in birds of prey, the females, and sometimes, as in the allies of the domestic fowl, the males being larger. In a large number of instances the males are very pugnacious and are better armed, the bones and musculature being heavier, the beaks and claws stronger, while spurs or knobs on the wings and spurs on the legs may be present only in the males or be relatively small in the females. Special ornaments such as crests and wattles, combs, carbuncles, excrescences of the skin, and elongated or peculiarly shaped feathers are extremely frequent, and are developed or intensified in the breeding season, and in the vast majority of cases confined to the males. The voice almost invariably varies with the sex, is associated with the breeding period and is much more highly developed in the male, whilst structural developments such as modifications of the trachea, vocal sacs and resonators and differences in the larynx are frequently present and on the whole distinctive of the males. Differences in colour and pattern are extremely well marked, and these are well known to be associated with the breeding period, which in many cases is preceded by a moult, after which the sexual plumage is assumed, or the colour of the naked parts intensified. In a few exceptional cases such as some button-quails (*Turnix*), painted snipes (*Rhynchaea*), phalaropes (*Phalaropus*), and cassowaries, the females exceed the males in size and brilliancy, and it is interesting to notice that in such cases the usual distinction of habit may be reversed, the females being pugnacious, aggressive, and courtiers of the males, whilst the latter are shy and may attend to the brood. Such exceptions are so rare that they may be called abnormal, for the rule among birds is that where secondary sexual characters are displayed, ornamentation, voice, brilliant pattern and colour, pugnacity and amorousness are distinctive of the male. Secondary sexual differences of the same nature are abundant among mammals. The males are usually larger and have greater strength with corresponding bones and muscles, and courage and pugnacity. Special weapons of offence or defence are common and are usually limited to the males or more highly developed in them; familiar instances are the horns of cattle, sheep and antelopes, the canine teeth, the mane of the lion. The antlers of the stags are certainly used in combats between the males, but in their more extreme development they may be classed as sexual ornaments. The males of many mammals emit powerful odours during the breeding season, whilst their voices, whether as a battle cry or a call to the female, are frequently more powerful. Crests, tufts and mantles, rudimentary in the female, conspicuous in the male, are extremely common. Differences in pattern and colour are rare except in monkeys, but when these exist they are usually found in the male.

The sexes, then, are distinguished by primary and secondary characters, these two categories being convenient rather than logical. The real dividing line is between the essential primary sexual character, the presence of a male or female gonad, and the various auxiliary and secondary differences which appear in every grade of elaboration. It is to be noted, moreover, that all the other sexual characters depend on the activity of the essential primary character. Immature males and females are closely alike; the auxiliary and secondary sexual characters almost invariably begin to appear only when the gonads become mature, and fade away when these are injured or destroyed by accident, disease, senescence or artificial interference, and finally, when the activity of the gonads waxes and wanes periodically, there is a corresponding periodicity in the display of the secondary characters. A number of observations and experiments support the conclusion that the gonads, in addition to their obvious function of producing the sexual cells, discharge secretions into the blood and tissues, and that these internal secretions or hormones, are the physiological stimulus which awakens the development of the auxiliary and secondary sexual characters.

Auxiliary primary and secondary sexual characters are so many and various that general statements regarding them are difficult and uncertain. In the broadest fashion, however, the following generalizations appear to be true. Secondary sexual characters begin to appear at puberty. Young or immature forms resemble the sex in which such characters are least marked, while the young and the undistinguished sex resemble ancestral forms. The sex that is distinguished is usually the male, and the characters are usually hypertrophies or specializations of characters that appear in the females and the young. (It is to be remembered that specialization may be the result of the suppression of characters as well as their acquisition, and there are a remarkable number of cases in which we may, at least tentatively, picture the bright sexual colour of males as due to the suppression of a pigment which masks them in the female.)

Hermaphroditism is the condition in which gonads producing ova and gonads producing spermatozoa are contained in the same individual. Its distribution in the animal kingdom is irregular, and apparently independent of natural affinity, and the balance of opinion is in favour of regarding it not as a primitive condition, but as a secondary acquisition. C. Claus has pointed out that it is frequent among sessile animals, as for instance Sponges, Anemones, Corals, Polyzoa, bivalve Molluscs, and Tunicates, and sluggish animals such as many of the worms and snails, whilst it is extremely common amongst almost every kind of parasitic animal. The obvious suggestion is that if the condition be primitive, it has been preserved, and if not primitive, acquired, because in animals of such habit, the chances of sexual congress would be greater than if the sexes were separate. Against such an interpretation, however, it must be noticed that in most hermaphrodites the sexual maturity of the male and female gonads is not coincident, so that cross-fertilization commonly occurs. Self-fertilization is said to occur in the fish *Serranus*, and it certainly occurs in many parasitic Trematodes, in Tapeworms and a few Nematodes. The real meaning of the occurrence of the condition remains obscure. Both gonads are present in many Sponges, in the Ctenophora, in many Anemones and Corals, in degenerate Hydroids such as *Hydra*, in most Turbellarians and Trematodes, in all the Tapeworms, in a few Nematodes, in the Leeches, in many Chaetopods, in a few Brachiopods and in many Polyzoa. It is absent in most Echinoderma and Arthropoda, but occurs in Cirripedes and some Isopods. It occurs in some bivalves, such as the common oyster, cockle and clam, and is present in the Euthyneurous Gastropods and in Pteropods. Amongst vertebrates it is rare. A number of observers have urged that the vertebrate embryo passes through a hermaphrodite condition. J. T. Cunningham and F. Nansen have stated that a testis is embedded in the ovary of the young hagfish (*Myxine*) and that this ripens before the ovary, but later observers have disputed their interpretation of the facts. In a few fish and some Batrachia, hermaphroditism has been demonstrated, but it is not certain, whether as a normal or aberrant occurrence, whilst in many of the Batrachian cases, the animals are known to be normally unisexual. The term hermaphroditism, however, has been applied frequently to cases of a different kind, in which there is no evidence of the essential sexual organs being affected, the appearances relating wholly to the auxiliary primary or the secondary sexual characters. It is most probable that such conditions differ entirely from true hermaphroditism. With regard to the auxiliary primary organs, and especially the genital ducts and external organs of sex, in a majority of cases as in vertebrates, the embryonic or youthful condition is undifferentiated, and so to say, contains the initial material which may be elaborated by specialization in one direction or the other, by the proliferation of certain portions and the suppression of others, into the structures characteristic of the male or of the female. Sometimes, growth takes place without normal differentiation, sometimes the specialization in one direction lags, with the result that a dubious appearance arises. Subsequent dissection or the approach of maturity, however, make it plain that the dubiety was superficial and that the gonad of only one sex was present. Among mammals, including man, every normal male retains relics of the female side of the undifferentiated condition of the accessory sexual organs, whilst every normal female contains similar if less well-marked relics of the male condition. Apparent hermaphroditism depending on a dubious condition of the secondary sexual characters is equally widespread in possible occurrence. Amongst insects which have been much studied, such as the butterflies and moths, many curious conditions have been described; sometimes the pattern and colour of the upper and under sides, sometimes of different parts of the same wing, sometimes of different wings, present the characters of different sexes. Among birds and mammals, the secondary sexual characters of one sex, such as size, pattern or colour, weapons or habits, may appear in animals with the gonads of the other sex, in every degree of development, reaching to an apparently complete reversal. In many cases these abnormal occurrences are associated with arrest of the functional activity of the primary organs of sex, by disease, accident, or decay, and the failure of the necessary stimulus would certainly serve to explain cases where the apparent reversal is no more than the suppression of a specialization in one direction. The facts, however, go further; it appears as if the suppression of femaleness allows the development of a latent maleness.

Determination of Sex.—Answers to the question why a particular individual becomes a male or a female fall into two groups, in one of which it is supposed that external conditions determine the result, in the other that the sexual cells differ from the first. G. Canestrini suggested that the sex was determined by the number of spermatozoa which entered the ovum, but fuller knowledge of the details of fertilization (see REPRODUCTION) has made it plain that only a single spermatozoon, normally conjugates with the ovum, whilst polyspermy, if it occur, results only in abnormalities which do not proceed to full development. Professor Thury in 1863 and C. Düsing in 1883 urged that ova fertilized soon after ovulation gave rise to females, whilst those impregnated later produced males. Some evidence exists as to the effect of delay in fertilization; V. Hensen (1881) suggested that females were produced when both ova and spermatozoa were in the most active condition, and H. M. Vernon (1898) has shown that in hybridizing Echinoderms the fresher gamete appears to exert a greater influence, but it cannot be said that there is definite evidence as to the determination of sex on such lines. J. D. Hofacker in 1823 and M. T. Sadler in 1830 collected a large series of statistics from which they drew the conclusion that when the male parent is older, more males are produced, whilst many observers have attempted to draw conclusions from the comparative vigour of the parents. Popular belief and some observations with regard to the breeding of domestic animals have led to the inference that the sex of the offspring tends to be that of the least vigorous parent, and such a theory, as it would appear to imply the existence of a natural law for rectifying the proportions of the sexes, has gained more attention than the facts supporting it would justify, and several unbiassed observers have interpreted the events in the sense that the vigorous parent produces his or her own sex. It is to be noted that such theories of relative vigour do not necessarily imply that external conditions determine the sex, for they would apply equally were it the case that there was a power of selection amongst gametes of predetermined sex. A large number of investigators have been led to believe that conditions of nutrition are of importance, and this view is specially plausible in the case of vertebrates, if it be accepted that the embryos pass through a hermaphrodite condition. E. Yung found that when tadpoles were reared under normal conditions, the proportion of male to female was about as 43 to 57, but that when a flesh diet was provided the percentage of females was very greatly increased. It has been noted that when Aphides are under the favourable conditions of summer temperature and nutrition, they produce only females, but that the advent of autumn brings with it an equality in sex production. Mrs Treat showed that starved caterpillars turned into males; E. Maupas, in the case of Rotifers, and other observers in the cases of some Crustacea, have similarly pointed to a relation between abundant nutrition and the excessive production of females. In nearly every case, however, other observers have either obtained conflicting results, or placed another interpretation on similar results, whilst in none of the cases has the factor of selective mortality been sufficiently excluded. Even were it proved that a correlation existed between excessive diet and over-production of females, it might be that the incidence of mortality was differential. Many attempts have been made to derive information by examining the statistics of human births in times of plenty and of hardship, but the results are inconclusive. C. Darwin, reviewing the evidence, was disposed to believe that the proportions of the sexes varied, that the tendency to produce male and female offspring was inherited, and that by a process of natural selection it was adjusted to the needs of the species, but he was too cautious to lean to any particular view as to the nature of the determining factors. C. Düsing (1883 and 1885) also believed in the existence of such a power of adaptation or adjustment, and attributed it to the action of a large number of external conditions. P. Geddes and J. A. Thomson (1889) similarly came to the conclusion that factors external to the sexual cells had a predominating importance, and these authors linked the determination of sex with their general theory of the nature of sex. They regarded sex as an expression of an alternating rhythm of anabolism and katabolism to be observed throughout the living world, and supposed that femaleness was specially associated, was in fact an outcrop of the anabolic or constructive processes of living matter, whilst maleness represented the katabolic, destructive or liberating processes. Their view ranges many diverse facts in apparent harmony, but has to encounter many facts that apparently contradict it. In a later work J. A. Thomson himself (1907) assigns less weight to his own theory, and quotes with approval T. H. Morgan's suggestion that the determination of sex may be brought about in different fashions in different cases.

Theories as to sex being predetermined in the sexual cells have been numerous, but it is only recently that any exact evidence appearing to point to such a conclusion has been adduced. When parthenogenesis (see REPRODUCTION) was first being investigated, it was found that eggs which gave rise to females were different from those which produced males, but when it was demonstrated that at least in many cases there was the further difference as to whether the eggs were fertilized or not, it was assumed that the presence or absence of fertilization determined the sex. Physicians have repeatedly propounded the theory that one ovary produces eggs capable of developing only into females, the other only those capable of becoming males, and the suggestion has been made that in the case of human beings ovulation takes place alternately from the ovaries. From this it would follow that were the sex resulting from one fertilization known, the sex of a subsequent fertilization could be predicted, or by choosing the date of fertilization, selected. These views, however, rest on no satisfactory evidence and remain uncorrelated with any observations as to the structure of the eggs themselves. On the other hand, more exact workers, using modern cytological methods, have accumulated striking facts as to the existence of different kinds of sexual cells, the differences relating chiefly to the nuclear changes which occur in ovogenesis and spermatogenesis, and have been established with more certainty in the case of the spermatozoa. E. B. Wilson (1909) has given a full summary and discussion of various interpretations of these observations. In over a hundred species of insects, Myriapods and Arachnids, two kinds of spermatozoa are produced. The spermatozoa are formed in pairs, and the mother cell which gives rise to each pair exhibits, in the ordinary fashion of nuclear division, paired chromosomes, one member of each pair passing into each spermatozoon. The mother cell contains also an unpaired element, consisting in its simplest form of a single large chromosome, but sometimes represented by a group of peculiar chromosomes, which, for convenience, Wilson terms the "X" element, or "heterochromosome." The "X" element passes into one or other of the spermatozoa, from which it results that spermatozoa of two kinds are formed in equal numbers, the difference being the presence or absence of the "X" element. Eggs fertilized by spermatozoa containing the "X" element become females, those fertilized by spermatozoa without it become males. There is evidence that in some cases (*e.g.* bees) the spermatozoa devoid of the "X" element degenerate, with the result that any fertilized eggs must produce females.

E. B. Wilson's suggestion, advanced in the most cautious way, is that the "X" element referred to in the last paragraph is the determinant, or at least the index, of sex, and further that the difference between the male and female organism is that the male comes from an egg which, developing either parthenogenetically or after fertilization, contains only a single unit of the "X" element, while the female starts from an ovum which, whether developing after fertilization or parthenogenetically, contains the two "X" units. The ovum of a sexual egg in the process of maturation discards half its normal complement of the "X" element; if it be fertilized by a spermatozoon containing an "X" unit it gives rise to a female; if it be fertilized by one without this it becomes a male. A large number of different forms of nuclear change have been described in the maturation of normal and parthenogenetic eggs, and by the exercise of a little ingenuity it is easy to select from these various processes modes of nuclear division which if they actually occurred in the appropriate instances would adapt Wilson's hypothesis to cases in which parthenogenetic eggs give rise to males or to females. In some individual instances the process which the hypothesis would demand appears actually to occur.

Various workers on Mendelian lines (see MENDELISM) have endeavoured to correlate the facts discussed by Wilson and their experimental inquiries into the inheritance of primary and secondary sexual characters, with the additional difficulty, absent from Wilson's hypothesis, that their theory requires them to suppose the unfertilized cells to be unisexual. W. E. Castle suggested that both males and females were Mendelian male-female hybrids with respectively male and female dominance, and that in the usual way disruption took place in the formation of the germ cells, with the result that male and female spermatozoa and male and female ova were produced. He assumed further that there was a selection or repulsion in fertilization, so that ova and spermatozoa bearing the same sex never conjugated. C. Correns assumed the male to be sex-hybrid, the female to be homozygous or pure female, the male character being dominant. Ova were, therefore, unisexual, always female, while spermatozoa were either male or female, and when a female egg was fertilized by a female spermatozoon the result naturally was a female, but when it was fertilized by a male spermatozoon the result was a sex-hybrid appearing as a male because of the dominance of male characters. Correns's theory avoids the unlikely supposition of selective fertilization, but breaks down in those cases of parthenogenesis where the unfertilized egg produced by a female gives rise to a male. W. Bateson reverses the theory of Correns and supposes that the female is a hybrid with femaleness dominant, while the male is pure male. The female in fact contains a factor which makes her female whilst the male is a male because it is without this factor. This view, however, leaves unexplained the existence of two kinds of spermatozoa and involves a series of elaborate hypotheses to reconcile it with cases of parthenogenesis. L. Doncaster has elaborated the extremely ingenious suggestion that the Mendelian pairs are not male and female, but male and absence of sex and female and absence of sex. The male is a pure male but produces two kinds of spermatozoa, those with the determinant for sex and those without it. The normal female is a sex-hybrid and produces male and female eggs in equal numbers, and it is assumed that there is a selective fertilization, female eggs being fertilized by male spermatozoa and giving rise to females, whilst male eggs are fertilized by spermatozoa without the sex factor and give rise to males. In cases of parthenogenesis, it is supposed that there are two kinds of females, the result of fertilization by different kinds of spermatozoa, and that those going through different kinds of maturation processes give rise without fertilization to males or to females. Doncaster has discovered many interesting details of the maturation processes in insects which agree with his suggestion. The Mendelian interpretations, however, are more ingenious than conclusive, but at least they combine with other work in supporting the probability that the determination of sex depends on the sexual cells and not on conditions influencing the developing embryo. Similarly they combine with other work in pointing to the conclusion that the male organism differs from the female by the absence of something present in the female. The Mendelian interpretations suggest that male and female sex determinants are different in kind; Wilson's interpretation suggests that they differ only, so to say, in quantity. Both interpretations harmonize with the observed fact that cases in which a female assumes male characters are much more frequent and much more definite than cases in which a male assumes femaleness.

Theory of Sexual Dimorphism.—Males and females may be alike, apart from their possession of male or female gonads, or may differ to almost any degree. It is plain, therefore, that although the presence and the maturity of the gonads may be, and probably are, the immediate stimulus to the appearance of the secondary differences, they cannot be the prime cause. Why, although equally potent sexually, do some males and females differ, others resemble one another? This is a question distinct from that of the primary determination of sex and the mechanism by which it is brought about. C. Darwin's theory of sexual selection remains the only comprehensive suggestion. Like his theory of the Origin of Species, it is not a theory of the origin of variations. He starts from the observed fact that variations occur and are transmitted; he supposes that by natural selection individuals favoured by suitable variations are preserved, and that in such a fashion the divergence which leads to the origin of species has come about; he also supposes that by sexual selection, or preferential mating, the differences between male and female have been brought about. "Courage, pugnacity, perseverance, strength and size of body, weapons of all kinds, musical organs, both vocal and instrumental, bright colours, stripes and marks, and ornamental appendages, have all been indirectly gained by the one sex or the other, through the influence of love and jealousy, through the appreciation of the beautiful in sound, colour or form, and through the exertion of a choice; and these powers of the mind manifestly depend on the development of the cerebral system" (*Descent of Man*, ii. p. 402). The characters to be accounted for are confined to one sex and are in close relation with the breeding season and breeding habits. In those cases where they differ from the females, the males are the most active in courtship, and the best armed, and are rendered the most attractive in various ways. They fight with their rivals for the possession of the female, or display their attractions before her, and either by conquest or by being preferred have an advantage over less favoured males. Darwin was in some doubt as to how far it could be shown that such favoured individuals had a chance of leaving more progeny, except in cases where males were polygamous or much more numerous than females, but he suggested that on the whole the more vigorous female would be the the first to breed and to choose the more attractive males, or be captured by the stronger males. A. R. Wallace was unable to accept the theory of sexual selection except in the most limited way, and in particular laid great stress on the want of evidence, to which Darwin himself has called attention, that females prefer more highly ornamented males. He thought that natural selection was sufficient to explain sexual differences such as the possession of weapons, scents and call-notes. With regard to colour and pattern, he regarded these as natural outcrops of specialized structure, better displayed in more vigorous animals, and therefore likely to increase under natural selection. The inconspicuous patterns and dull colours of females he believed to depend on natural selection, and to be associated with the greater need for females to be inconspicuous whilst engaged in their duties to their young. More recent writers have shown that in a large number of cases brilliant colours and patterns are in themselves really protective (see COLOURS OF ANIMALS), so that the facts left to be explained by the theory of sexual selection are still further restricted.

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SEXBY, EDWARD (d. 1658), English soldier, "leveller" and conspirator, was a private soldier in Cromwell's regiment of horse when first heard of about 1643. He opposed the proposal to disband the army in 1647; and as one of the "agitators" he resisted all attempts to come to an arrangement with Charles I., and advocated extreme democratic doctrines. He rose to the rank of colonel, but was deprived of his commission in 1651. When Cromwell assumed the title of lord protector, Sexby became one of his most violent opponents, and in 1655 tried to bring together the levellers and the royalists in a combination to overturn the government. Compelled to fly from England, he intrigued with the Spanish government with a view to restoring Charles II., as the only feasible plan for destroying Cromwell; and he was concerned in several plots to assassinate the protector. About 1657 he wrote the celebrated apology for tyrannicide entitled "Killing No Murder," under the pseudonym William Allen, which was printed in Holland and distributed in England. In July 1657 he was arrested in disguise in England, whither he had come to attempt Cromwell's assassination, and he died in the Tower of London on the 13th of January 1658.

SEXPARTITE VAULT, in architecture, a name given to the single bay of a vault, which, in addition to the transverse and diagonal ribs, has been divided by a second transverse rib, forming six compartments. The principal examples are those in the Abbaye-aux-Hommes and Abbaye-aux-Dames at Caen (which were probably the earliest examples of a construction now looked upon as transitional), Notre Dame, Paris, and the cathedrals of Bourges, Laon, Noyon, Senlis and Sens; from the latter cathedral the sexpartite vault was brought by William of Sens to Canterbury, and it is afterwards found at Lincoln and in St Faith's Chapel, Westminster Abbey.

SEXTANT, an instrument for measuring angles on the celestial sphere. The name (indicating that the instrument is furnished with a graduated arc equal to a sixth part of a circle) is now only used to designate an instrument employing reflection to measure an angle; but originally it was introduced by Tycho Brahe, who constructed several sextants with two sights, one on a fixed, the other on a movable radius, which the observer pointed to the two objects of which the angular distance was to be measured.

The imperfections of the astrolabe and cross-staff for taking altitudes (see NAVIGATION) were so evident that the idea of employing reflection to remove them occurred independently to several minds. R. Hooke contrived two reflecting instruments. The first, described in his *Posthumous Works* (p. 503), had only one mirror, which reflected the light from one object into a telescope which is pointed directly at the other. Hooke's second plan employed two single reflections, whereby an eye placed at the side of a quadrant could at the same time see the images formed in two telescopes, the axes of which were radii of the quadrant and which were pointed at the two objects to be measured. This plan is described in Hooke's *Animadversions to the Machina Coelestis of Hevelius*, published in 1674, while the first one seems to have been communicated to the Royal Society in 1666. Newton also studied this subject, but nothing was known about his ideas till 1742, when a description in his own handwriting of an instrument devised by him was found among Halley's papers and printed in the *Philosophical Transactions* (No. 465). It consists of a sector of brass, the arc of which, though only equal to one-eighth part of a circle, is divided into 90°. A telescope is fixed along a radius of the sector, the object-glass being close to the centre and having outside it a plane mirror inclined 45° to the axis of the telescope, and intercepting half the light which would otherwise fall on the object glass. One object is seen through the telescope, while a movable radius, carrying a second mirror close to the first, is turned round the centre until the second object by double reflection is seen in the telescope to coincide with the first. But before Newton's plan was published the sextant in its present form had come into practical use. On May 13, 1731, John Hadley described an "octant," employing double reflection, and a fortnight later he exhibited the instrument.[1] On the 20th of May Halley stated to the Royal Society that Newton had invented an instrument founded on the same principle, and had communicated an account of it to the society in 1699, but on search being made in the minutes it was only found that Newton had shown a new instrument "for observing the moon and stars for the longitude at sea, being the old instrument mended of some faults," but nothing was found in the minutes concerning the principle of the construction. Halley had evidently only a dim recollection of Newton's plan, and at a meeting of the Royal Society on December 16, 1731, he declared himself satisfied that Hadley's idea was different from Newton's. The new instrument was tried in August 1732 on board the "Chatham" yacht by order of the Admiralty, and was found satisfactory, but otherwise it does not seem to have superseded the older instruments for at least twenty years. Hadley's instrument could only measure angles up to 90°; but in 1757 Captain Campbell of the navy, one of the first to use it assiduously, proposed to enlarge it so as to measure angles up to 120°, in which form it is now generally employed.

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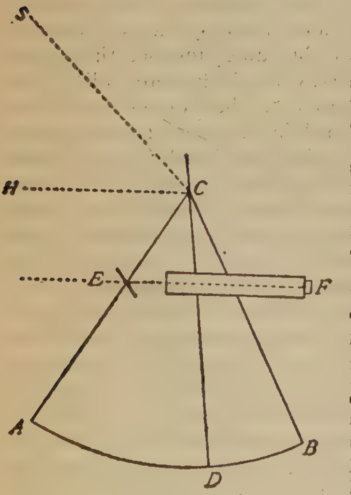
[1] Hadley described two different constructions: in one the telescope was fixed along a radius as in Newton's form, in the other it was placed in the way afterwards universally adopted; an octant of the first construction was made in the summer of 1730, according to a statement made to the Royal Society by Hadley's brother George on Feb. 7, 1734.

Independently of Hadley and Newton the sextant was invented by Thomas Godfrey (1704–1749), a poor glazier in Philadelphia. In May 1732 James Logan wrote to Halley that Godfrey had about eighteen months previously showed him a common sea quadrant "to which he had fitted two pieces of looking-glass in such a manner as brought two stars at almost any distance to coincide." The letter gave a full description of the instrument; the principle was the same as that of Hadley's first octant, which had the telescope along a radius. At the meeting of the Royal Society on January 31, 1734, two affidavits sworn before the mayor of Philadelphia were read, proving that Godfrey's quadrant was made about November 1730, that on November 28 it was brought by G. Stewart, mate, on board a sloop, the "Truman," John Cox, master, bound for Jamaica, and that in August 1731 it was used by the same persons on a voyage to Newfoundland. The statement that a brother of Godfrey, a captain in the West India trade, sold the quadrant at Jamaica to a Captain or Lieutenant Hadley of the British navy, who brought it to London to his brother, an instrument maker in the Strand, is devoid of foundation.[1]



Sextant.

The figure shows the construction of the sextant. ABC is a light framework of brass in the shape of a sector of 60°, the limb AB having a graduated arc of silver (sometimes of gold or platinum) inlaid. It is held in the hand by a small handle at the back, either vertically to measure the altitude of an object, or in the plane passing through two objects the angular distance of which is to be found. It may also be mounted on a stand. CD is a radius movable round C, where a small plane mirror of silvered plate-glass is fixed perpendicular to the plane of the sextant and in the line CD. At D is a vernier read through a microscope, also a clamp and a tangent screw for giving the arm CD a slow motion. At E is another mirror "the horizon glass," also perpendicular to the plane of the sextant and parallel to CB. F is a small telescope fixed across CB, parallel to the plane CAB and pointed to the mirror E. As only the lower half of E is silvered, the observer can see the horizon in the telescope through the unsilvered half, while the light from the sun or a star S may be reflected from the "index glass" C to the silvered half of E and thence through F to the observer's eye. If CD has been moved so as to make the image of a star or of the limb of the sun coincide with that of the horizon, it is seen that the angle SCH (the altitude of the star or solar limb) equals twice the angle BCD. The limb AB is graduated so as to avoid the necessity of doubling the measured angle, a space marked as a degree on the limb being in reality only 30′. The vernier preferably of the extended type, *i.e.* a vernier whose divisions are twice the distance apart of those on the arc, should point to 0° 0′ 0″ when the two mirrors are parallel, or in other words, when the direct and reflected images of a distant object coincide.

The sextant was formerly much used on land for determining latitudes in which case an artificial horizon (see below) is required, but it has now been largely superseded by the portable altazimuth or theodolite, while at sea it continues to be indispensable.

The telescopes employed in sextants are of two kinds: the direct, for the more ordinary observations; and the inverting, for astronomical work, one of the eyepieces of which should be of high magnifying power, not less than 15 diameters. Each eyepiece has two pairs of wires, each pair perpendicular to the other, and dividing the field of view into nine divisions, of which the central is square. Contacts should be made as nearly as possible in the centre of this square. It is convenient if the telescope is fitted with an interrupted thread to screw into the collar of the up and down piece. Both mirrors are supplied with coloured shades of different degrees of shade, and may be used either singly or combined for sea observations; they are subject to errors of refraction, due to non-parallelism of the sides of the glass. Coloured eyepieces of neutral glass of different intensities are fitted to slip on and off the conically ground surface of the eyepieces of the telescope; they are used for index error and for observations in the artificial horizon. Introducing no refraction error, they also ensure the suns being of the same brilliancy; a very important point. The up and down piece, when adjusted to equalize the suns, will bring the axis of the telescope nearly exactly in line with the edge of the silvered surface of the horizon glass, which is the best position for observing, and from this it must never be moved until the equal altitude or other observations are complete.

For observations on shore the sextant should be mounted on a stand. In an improved form of stand, the bearing which carries the sextant is square, and the whole bearing revolving on a centre is controlled by a clamp and tangent screw. The counterpoise should exactly balance the sextant, and they may be fitted to allow for adjustment. A small spirit-level fixed on one of the arms of the sextant stand, and another level pivoting round the pillar on the index bar of the sextant carrying the microscope, working in a plane parallel to that of the instrument, and fixed by means of a set screw, are of use in placing the sextant exactly in the required position when observing faint stars. With the telescope pointing to the centre of the artificial horizon, the direct and reflected images of the sun at any convenient altitude are made to coincide. The levels are then adjusted and permanently fixed by their set screws. To observe a faint star, it is only necessary to set its double altitude on the sextant, turn the instrument and the stand to bring the bubbles of their respective levels in the centre of their runs, and move the stand until the telescope points to the centre of the artificial horizon and in the direction of the star, when the direct and reflected images will be seen in the field. A small electric light fitted on the arm carrying the microscope, and worked by a dry battery, enables the sextant to be read at night.

The artificial horizon in common use consists of a glass trough containing mercury and protected from the wind by a glass roof. The glass in the roof should be of the best quality, and the faces of each pane of the trough accurately parallel. A new form of horizon consists of a shallow rectangular trough of metal gilt. After cleansing the surface by wetting it with a few drops of dilute sulphuric acid, a drop of mercury is rubbed on until the whole surface is bright, when a very small quantity of amalgamated mercury added will form an even horizontal surface. The dross is wiped off with a broad camel-hair brush. In this shallow trough waves are killed almost instantaneously.

The horizon is placed upon a stand, consisting of two iron plates, the upper resting on the lower, supported by three long large-headed screws, by means of which it can be levelled. If the stand is raised off the ground a foot or so, on a firm foundation, thus bringing the artificial horizon closer to the telescope, faint stars are more easily observed, and the movement of the sextant necessary to keep the star in the field, owing to its motion in the heavens, will be lessened. A lantern placed on the ground behind, or a little on one side of, the observer, and faintly showing on the artificial horizon, will sufficiently illuminate the wires of the telescope on a dark night.

Adjustments.—The planes of both the index glass and the horizon glass should be perpendicular to the plane of the instrument, and they should also be parallel to one another when the vernier is set to zero. The line of collimation of the telescope must be parallel to the plane of the sextant. This adjustment, though less liable to alter than either of the others, should be examined from time to time as follows:—With the sextant mounted on a stand, move the index so as to separate the direct and reflected images of a star by a distance nearly equal to the length of the parallel wires of the telescope, and turn the eyepiece until, the direct image of the star coinciding with one extremity of the wire, the reflected image coincides with the other extremity; the wires will then be parallel to the plane of the sextant. Select two bright stars and make a coincidence of the reflected and direct images on the middle of one wire, and then on the middle of the other. If the two readings agree, the adjustment is correct; if not, the adjusting screws in the collar of the up and down piece must be moved until the coincidence is exact.

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[1] See Professor Rigaud, *Naut. Mag.* vol. ii. No. 21. John Hadley was a country gentleman of independent means, and the fact that he was the first to bring the construction of reflecting telescopes to any perfection has made many authors believe that he was a professional instrument maker. His brother George, who assisted him, was a barrister.

"Centring error" is very important, but cannot be corrected. In an indifferent instrument it may be sufficient to vitiate the result of any observations on one side only of the zenith. It arises from the eccentricity of the centres of the index arm and of the arc, and varies with the angle measured, being generally greater as the angle increases; but the index arm becoming bent, or any part of the frame receiving a blow which alters its shape, the flexure of the instrument from varying temperature, and defective graduation, will all produce errors which it is generally impossible to disentangle, and they are all included in the one correction for centring. This correction is found by comparing the angle measured by the sextant (corrected for index error) with the true angle. The most accurate method, because it employs a large number of observations for the same or nearly the same angle, is by observations of pairs of circum-meridian stars in the artificial horizon at various altitudes. Double the difference between the resulting latitude by each star and the mean latitude will be the centring error for an angle equal to the double altitude of that star, that is, the angle actually measured by the sextant, index error being ascertained and applied before working out. Measurement of the angles between stars, compared with their calculated apparent distance, is another method. At Kew Observatory (National Physical Laboratory) the centring error is determined for certain angles by fixed collimators. Including, as it does, errors from so many causes, the correction does not remain perfectly steady, and it should be ascertained from time to time. In a good sextant the error should not exceed one minute over the whole of the arc.

SEXTON (an early corruption of "sacristan," properly the keeper of sacred vessels and vestments, Med. Lat. *sacristanus* or *sacrista*), a minor officer of an ecclesiastical parish. In the early church the sexton was identical with the *ostiarius*, or door-keeper, whose duty it was to open and shut the church at certain hours, guard the church and all it contained, and prevent the heathen and excommunicated from entering. The duties of the modern sexton are practically those of the ancient sacristan. He has the custody of the church keys, is responsible for keeping the church clean, for the bell-ringing and lighting, and looks after the vestments and *instrumenta* of the church, but the duties may vary by custom in different parishes. Where his duties are confined to the care of the vestments and *instrumenta* the right of appointment of a sexton lies in the churchwardens; if his duties are confined to the churchyard the right of appointment is in the incumbent, and where his duties extend to both the right of appointment is jointly in the churchwardens and the incumbent. By custom, however, he may be appointed by the parishioners. He usually has a freehold in his office, and in some parishes is entitled to certain customary fees.

SEXTUS EMPIRICUS (2nd and 3rd centuries A.D.), physician and philosopher, lived at Alexandria and at Athens. In his medical work he belonged to the "methodical" school (see ASCLEPIADES), as a philosopher, he is the greatest of the later Greek Sceptics. His claim to eminence rests on the facts that he developed and formulated the doctrines of the older Sceptics, and that he handed down a full and, on the whole, an impartial account of the members of his school. His works are two, the *Pyrrhonian Hypotyposes* and *Against the Mathematici* (ed. Fabricius, Paris, 1621, and Bekker, Berlin, 1842).

See Brochard, *Les Sceptiques grecs* (1887); Pappenheim, *Lebensverhältnisse des Sextus Empiricus* (Berlin, 1875); Jourdain, *Sextus Empiricus* (Paris, 1858); Patrick, *Sextus Empiricus and the Greek Sceptics* (1899, with trans. of *Pyrrh. Hyp.* i.); also SCEPTICISM.

SEYCHELLES, an archipelago in the Indian Ocean, consisting of forty-five islands—besides a number of rocks or islets—situated between 3° 38′ and 5° 45′ S., and 52° 55′ and 53° 50′ E. Together with the Amirantes, Cosmoledo, Aldabra and other islands they form the British colony of Seychelles. The outlying islands lie south-west of the Seychelles group and between that archipelago and Madagascar. In all ninety islands with a total area of over 156 sq. m. are under the Seychelles government. There are in addition 40,000 to 50,000 sq. m. of coral banks within the bounds of the colony.

The Seychelles lie, with two exceptions, towards the centre of a large submarine bank and are all within the 50 fathoms line. Mahé, the largest and most central island, is 934 m. N.N.W. of Mauritius, 970 m. E. by N. of Zanzibar and 600 m. N.E. of the northernmost point of Madagascar. The other chief islands form two principal groups: (i.) Praslin, 26 m. N.N.E. of Mahé, and the adjacent smaller islands of La Digue, Félicité, East Silver, West Silver, Curieuse and Aride; (ii.) Silhouette, 14 m. W. by N. of Mahé, and North Island. The most easterly island is Frigate, the most southerly Platte; on the northern edge of the reef are Bird and Denis islands. The general aspect of the islands is one of great beauty and fertility, and in the opinion of General C. G. Gordon they formed the Garden of Eden.

Mahé is 17 m. long, and from 4 to 7 broad and of highly irregular shape, with an area of about 55 sq. m. There are small areas of lowlands, chiefly at the mouths of the river valleys, but most of the island is mountainous, and in general the hills rise abruptly from the sea. There are ten heights between 1000 and 2000 ft., and seven over 2000 ft. The highest point is Morne Seychellois, 2993 ft.; next comes Trois Frères, 2390 ft. Both these mountains are in the northern half of the island. The main ridge runs north and south along the line of the greatest diameter, and from the heights descend many torrents, the whole island being well watered. The principal harbour, Port Victoria, is on the north-east coast in 4° 37′ S., 55° 27′ E. It is approached by a deep channel through the coral reef which fringes the entire eastern side of the island. Of the small islands close to Mahé the chief are St Anne and Cerf, off the east, and Conception and Thérèse off the west coast.

Praslin Island is 8 m. long and from 1 to 3 m. broad, has an area of about 27 sq. m. and its highest point is 1260 ft.; La Digue covers 4 sq. m. and its greatest height is 1175 ft.: Silhouette is roughly circular in shape, covers 8 sq. m. and culminates in Mon Plaisir, 2473 ft. None of the other islands exceeds 1½ sq. m.

Geology.—Except Bird and Denis islands, which are of coralline limestone, the Seychelles are of granite, with in places fringing reefs of coral based on granite foundations. The granite is of the same formation or closely related to that of Madagascar and throughout the islands is closely uniform in its composition, but exhibits dikes of finer grain. The rocks are deeply furrowed and cut into ridges, evidence of the long period over which they have been subjected to atmospheric influences. There is no sign of marine action over four-fifths of the islands, which nowhere exhibit any trace of volcanic action, recent or remote. The islands are regarded as a remnant of the continental land which in remote geological ages united South Africa and India. J. Stanley Gardiner supposes that when first cut off the Seychelles were the size of the present bank—about 12,000 sq. m. This cutting off was caused largely by subsidence, though partly by marine action. The subsequent dwindling of the 12,000 sq. m. to 156 divided into many small islands is attributed to marine action which had its chief force in the Eocene and Miocene periods. (Cf. "The Indian Ocean," *Geo. Journ.* vol. xxviii., 1906).

Climate.—The climate is healthy and equable, and for a tropical country the temperature is moderate. It varies on the coast from about 68° to 88° F., falling at night in the higher regions to 60° or 55° F. The mean coast temperature slightly exceeds 79° F. The south-east monsoon blows from May to October, which is the dry season, and the west-north-west monsoon from December to March. During April and November the winds are variable. The average annual rainfall on the coast is 100·8 in.; it increases to about 120 in. at a height of 600 ft. and at heights exceeding 2000 ft. is about 150 in. The Seychelles lie outside the track of the hurricanes which occasionally devastate Réunion and Mauritius and are also immune from earthquakes. The public health is good, and fevers and plague are unknown.

Flora and Fauna.—Both flora and fauna include species and genera peculiar to the Seychelles. Of these the best known is the *Lodoicea sechellarum*, a palm tree indigenous only in Praslin Island—but since introduced into Curieuse—noted for its fruit, the so-called Maldive double coco-nut or *coco de mer*. The nut was long known only from sea-borne specimens cast up on the Maldive and other coasts, was thought to grow on a submarine palm, and, being esteemed a sovereign antidote to poisons (*Lusiad*, x. 136), commanded exorbitant prices in the East. This palm will grow to a height of 100 ft., and shows enormous fern-like leaves. Another tree found only in the islands is the capucin (*Northea sechellarum*), whose massive dead trunks are a striking feature in the landscape. This tree has almost completely fallen a victim to the ravages of a green beetle, probably introduced from Mauritius. The islands were formerly densely wooded, but only patches of forest remain. The central mountain zone of Mahé was in 1909 acquired by the government for reafforestation purposes. This zone also included one of the last remaining portions of indigenous forest. The forests of the coast belt resembled those of the coral islands of the neighbouring parts of the Indian Ocean. Characteristic of this region are the mangrove and *Pandanus*, and, a little inland, the banyan (*Ficus*), *Pisonia* and *Hernandia*. The coco-nut, now a conspicuous feature of the coast flora, is probably not indigenous. The forests of the granitic land, of which typical patches remain, had the characteristics of a tropical moist region, palms, shrubs, climbing and tree ferns growing luxuriantly, the trees on the mountain sides, such as the *Pandanus sechellarum* sending down roots over the rocks and boulders from 70 to 100 ft. Of timber trees the bois gayac has disappeared, but bois de fer (*Stadtmannia sideroxylon*) and bois de natte (*Maba sechellarum*) still flourish on Silhouette Island. Besides the cutting down for building purposes of the timber trees the jungle was largely cleared for the plantation of vanilla; while a multitude of other tropical plants have been introduced tending to the extermination of the indigenous flora. The most important of the trees introduced since 1900 are various kinds of rubber, including Para (*Hevea Brasiliensis*), which grows well. For other introduced plants see below, *Industries*.

The indigenous fauna, so far as its limited range affords comparison, resembles that of Madagascar. It is deficient in mammals, of which the only varieties are the rat and bat. The dugong, which formerly frequented the waters of the islands, does so no longer. The reptiles include certain lizards and snakes; the crocodile, once common, has been exterminated. Land tortoises have also disappeared,[1] but one freshwater species (*Sternothaerus sinuatus*) is still found; and the adjacent seas contain many turtles. Three coecilians, three batrachians (including a mountain-frequenting frog) and three fresh-water crustaceans are also indigenous, and about twenty-six species of land shells. The islands are the home of a large number of birds, including terns, gannets and white egrets, though most of the indigenous species are extinct. The neighbouring seas abound in fish. Among the domestic animals introduced are the ass and pig.

Inhabitants.—Like Mauritius, Réunion and Rodriguez the Seychelles were uninhabited when first visited by Europeans; though fragments of ruins found on Praslin and Frigate islands may indicate the presence of man in earlier centuries. The islands were colonized by Mauritian and Bourbon creoles; the white element, still prevailingly French, has been strengthened by the settlement of several British families. The first planters introduced slaves from Mauritius, and the negro element has been increased by the introduction of freed slaves from East Africa. There has been also an immigration of Chinese and, in larger numbers, of Indians (mainly from the Malabar coast). An official report issued in 1910 stated that the greater part of the valuable town property had passed into the hands of Indians, and that Indians and Chinese had the bulk of the retail trade. Of the coloured population those born in the Seychelles of negro, or negro-Indian blood are known as "*enfants des îles*." They speak a rude creole patois, based on French but with a large admixture of Indian, Bantu and English words. The Seychellois are of fine physique, and are excellent and fearless sailors.

At the census of 1881 the inhabitants numbered 14,081, in 1891 the figure was 16,603 and in 1901 the population numbered 19,237, of whom 9805 were males and 9432 females. The population on December 31st, 1909, was officially estimated at 22,409, or 149·59 persons per sq. m. The pure white population is about 600. About two-thirds of the inhabitants are Roman Catholics.

Agriculture and Industries.—Apart from fisheries the wealth of the islands depends upon agriculture, and the industries connected therewith. These are fostered by the government, which in 1901 created an agricultural board and established a botanic station at Victoria. Spices (cloves, cinnamon, nutmegs) were the chief articles of trade in the 18th century, and these with cotton, coffee, tobacco, sugar, maize and rice were the main crops grown until about 1850. Bananas, yams, &c., were also largely cultivated, and there was considerable trade in coco-nut oil, timber, fish and fish oil and tortoise-shell, whaling being carried on, chiefly by Americans and French, in the neighbouring seas. Subsequently cocoa was cultivated extensively, and from about 1890 vanilla largely superseded the other crops; in 1899 the vanilla exported was valued at over £100,000 out of a total export of £140,000, and from 1896 to 1903 the crop represented more than half the total value of the exports. Owing to increased competition, and in some degree to careless harvesting, there was a great fall in prices after 1900, and the Seychellois, though still producing vanilla in large quantities, paid greater attention to the products of the coco-nut palm—copra, soap, coco-nut oil and coco-nuts—to the development of the mangrove bark industry, the collection of guano, the cultivation of rubber trees, the preparation of banana flour, the growing of sugar canes, and the distillation of rum and essential oils. The tortoise-shell and calipee fisheries and the export of salt fish are important industries. Minor exports are cocoa, coco-de-mer and bêche-de-mer. From the leaves of the coco-de-mer are made baskets and hats.

The imports consist chiefly of cotton goods and hardware from Great Britain; rice, flour and cotton from India, sugar and rum from Mauritius, coffee from Aden, wines and spirits and clothing from France. The value of the imports and exports (exclusive of specie) for the six years 1901–1906 was: imports, £360,520; exports, £377,613. The increase of trade is indicated by the figures for 1907 (a record year) to 1909. In the three years the value of imports was £233,863, that of exports £355,306. Over 75% of the total trade is with Great Britain or British possessions. The medium of exchange is the Indian rupee (= 16d.), with the subsidiary coinage of Mauritius.

Towns and Communications.—The only town of any size is the capital, Port Victoria (or Mahé), picturesquely situated at the head of an excellent harbour. Many of the houses are built of massive coral, *Porites gaimardi*, hewn into square building blocks which at a distance glisten like white marble. The port is a coaling station of the British navy and is connected by telegraphic cables with Zanzibar and Mauritius. There is no inland telegraph system. All the islands are well provided with metalled roads. Regular monthly communication with Marseilles is maintained by the Messageries Maritimes steamers. German and British lines serve the South African and Indian ports. The government employ steam vessels for passenger and mail services between the islands, and there are large numbers of sailing craft belonging to the islanders.

Government, Revenue, &c.—Seychelles is a crown colony administered by a governor, assisted by nominated executive and legislative councils. Revenue is derived chiefly from customs, licences, court fees and the post office, while among the principal heads of expenditure figure telegraph and steamer subsidies and the education, medical, legal and police departments. For the ten years 1899–1908 the average yearly revenue was £28,726; the average yearly expenditure £27,304. A public debt of £20,000, repayable in thirty annual instalments, was contracted in 1899. The law in force is based on the Code Napoléon, considerably modified, however, by local ordinances. The simplification and codification of the laws was carried out during 1899–1904 (see the Colonial Office annual reports, especially that for 1903, § 37). Education is under the control, of a government board and, besides primary schools, there are institutions for higher education and a Carnegie Library. Grants are made to schools of all denominations. The creole patois is unsuited to be a medium of instruction, and English is used as far as possible, though its acquisition by the peasantry is that of a foreign language. The same difficulty, to an almost equal degree, would apply to the use of French as a medium.

History.—The Seychelles are marked on Portuguese charts dated 1502. The first recorded visit to the islands was made in 1609 by an English ship; then for 133 years there is no documentary evidence of any further visit. The second recorded visit, in 1742, was made by Captain Lazare Picault, who, returning two years later, formally annexed the islands to France. Though then uninhabited there is a strong tradition, probably well founded, that the Seychelles had been from Arab times a rendezvous of the pirates and corsairs who infested the high seas between South Africa and India. Picault, who acted as agent of the celebrated Mahé de la Bourdonnais, governor of the Île de France (Mauritius), named the principal island Mahé and the group Îles de la Bourdonnais, a style changed in 1756, when the islands were renamed after Moreau de Séchelles, at that time contrôleur des finances under Louis XV. The first permanent settlement was made about 1768, when the town of Mahé was founded. Soon afterwards Pierre Poivre, intendant of Île de France, seeing the freedom of the Seychelles archipelago from hurricanes, caused spice plantations to be made there, with the object of wresting from the Dutch the monopoly they then enjoyed of the spice trade. The existence of these plantations was kept secret, and it was with that object that they were destroyed by fire by the French on the appearance in the harbour in 1778 of a vessel flying the British flag. The ship, however, proved to be a French slaver who had hoisted the Union Jack fearing to find the British in possession. Mahé proved very useful to French ships during the wars of the Revolution, and this led to its capture by the British in 1794, but no troops were left to garrison the place, and the administration went on as before. In 1806 the island capitulated to the captain of another British ship, but again no garrison was left, and it was not until after the capture of Mauritius in 1810 that the Seychelles were occupied by the British, to whom they were ceded by the treaty of Paris in 1814. Throughout this period Mons. J. B. Quéau de Quincy (1748–1827) administered the islands. This remarkable man, a Parisian by birth, became governor of the Seychelles in 1789 under the monarchy, continued to serve under the First Republic, and Napoleon I.,—acknowledging the British authority when ships of that nationality entered the harbour,—and when the Seychelles were made a dependency of Mauritius was appointed by the British agent-civil. In all he governed the islands thirty-eight years, dying in 1827. His tomb is in Government House garden. Under de Quincy's administration the islands prospered; the cultivation of cotton and coffee was then begun, much of the land being deforested for this purpose—a deforestation practically completed when vanilla was introduced. In 1834 the abolition of slavery led to a decline in the prosperity of the islands, but as many of the slaves captured by British cruisers off the east coast of Africa were landed at Seychelles economic conditions were gradually ameliorated. There was also a slight immigration of coolies from India. From 1810 until 1872 the administration was dependent upon Mauritius; from that date onward greater powers were given to the local authorities, until in 1903 Seychelles was erected into a separate colony with its own governor. The over-dependence placed on one product caused waves of depression to alternate with waves of prosperity, and the depression following the fall in the price of vanilla was aggravated by periods of drought, "agricultural sloth and careless extravagance."[1] But during 1905–1910 successful efforts were made to broaden the economic resources of the colony. A natural field for the energies of the surplus population was also found in colonization work in British East Africa. The islands were chosen in 1897 as the place of deportation of Prempeh, ex-king of Ashanti, and in 1901 Mwanga, ex-king of Uganda, and Kabarega, ex-king of Unyoro were also deported thither. Mwanga died at the Seychelles in May 1903.

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[1] The gigantic land tortoise (*Testudo elephantina*) is found only in the Aldabra Islands.

Dependencies.—The outlying islands forming part of the colony of Seychelles consist of several widely scattered groups and have a total population of about 900. The Amirante archipelago is situated on a submarine bank west and south-west of the Seychelles, the nearest island being about 120 m. from Mahé. The archipelago consists of a number of coral islets and atolls comprising the African Islands (4), the St Joseph group (8), the Poivre Islands (9) and the Alphonso group (3). Farther south and within 170 m. of Madagascar is the Providence group (3) formed by the piling up of sand on a surface reef of crescent shape. The Cosmoledo Islands, 12 in number, lie some 210 m. west of Providence Island, while 70 m. further west are the Aldabra Islands (*q.v.*). The chief island in the Cosmoledo group is 9 m. long by 6 broad. Coetivy (transferred from Mauritius to the Seychelles in 1908) lies about 100 m. S.S.E. of Platte. The majority of the outlying islands are extremely fertile, coco-nut trees and maize growing luxuriantly. Several of the islands contain valuable deposits of guano and phosphate of lime, and their waters are frequented by edible and shell turtle. Like the Amirantes all the other islands named are of coral formation.

See *Unpublished Documents on the History of the Seychelles Islands Anterior to 1810*, with a cartography and a bibliography compiled by A. A. Fauvel (Mahé, 1909); *Ancient Maps of Seychelles Archipelago*, a portfolio containing 28 maps (Mahé, 1909); J. Stanley Gardiner, "The Seychelles Archipelago" (with bibliographical notes), in *Geo. Jnl.* vol. 29 (1907) and "The Indian Ocean," *Geo. Jnl.* vol. 28 (1906). See also the annual reports on the Seychelles issued by the Colonial Office; those from 1901 onward contain valuable botanical reports. For the dependencies see R. Dupont, *Report on a Visit of Investigation to St Pierre, Astove, Cosmoledo, Assumption and the Aldabra Group of the Seychelles Islands* (Seychelles, 1907).

SEYDLITZ, FRIEDRICH WILHELM, FREIHERR VON (1721–1773), Prussian soldier, one of the greatest cavalry generals of history, was born on the 3rd of February 1721 at Calcar in Cleve duchy, where his father, a major of Prussian cavalry, was stationed. After his father's death in 1728 he was brought up in straitened circumstances by his mother, but at the age of thirteen he went as a page to the court of the margrave of Schwedt, who had been his father's colonel. Here he acquired a superb mastery of horsemanship, and many stories are told of his feats, the best known of which was his riding between the sails of a wind-mill in full swing. In 1740 he was commissioned a cornet in the margrave's regiment of Prussian cuirassiers. Serving as a subaltern in the first Silesian War, he was taken prisoner in May 1742 after so gallant a defence that King Frederick offered to exchange an Austrian captain for him. In 1743 the king made him a captain in the 4th Hussars, and he brought his squadron to a state of conspicuous efficiency. He served through the second war, and after Hohenfriedberg was promoted major at the age of twenty-four. At the close of the war he had an opportunity of successfully handling 15 squadrons in front of the enemy, and this, with other displays of his capacity of leading cavalry in the searching tests of Frederick's "reviews," secured his promotion in 1752 to the rank of lieutenant-colonel and in 1753 to the command of the 8th cuirassiers. Under his hands this regiment soon became a pattern to the rest of the army. In 1755 he was made colonel. Next year the Seven Years' War, that was to make his name immortal, broke out. In 1757, regardless of the custom of keeping back the heavy cavalry in reserve, he took his regiment to join the advanced guard, at Prague he nearly lost his life in attempting to ride through a marshy pool, and at Kolin, at the head of a cavalry brigade, he distinguished himself in checking the Austrian pursuit by a brilliant charge. Two days later the king made him major-general and gave him the order *pour le mérite*, which promotion he felt to be no more than his deserts, for to Zieten's congratulations he responded: "It was high time, Excellency, if they wanted more work out of me. I am already thirty-six." Four times in the dismal weeks that followed the disaster of Kolin, Seydlitz asserted his energy and spirit in cavalry encounters, and on the morning of Rossbach Frederick, superseding two senior generals, placed Seydlitz in command of the whole of his cavalry. The result of the battle was the complete rout and disorganization of the enemy, and in achieving that result only seven battalions of Frederick's army had fired a shot. The rest was the work of Seydlitz and his 38 squadrons. The same night the king gave him the order of the Black Eagle, and promoted him lieutenant-general. But he had received a wound in the mêlée, and for some months he was away from the army. He rejoined the king in 1758, and at the battle of Zorndorf Seydlitz's cavalry again saved the day and won the victory. At Hochkirch with 108 squadrons he covered the Prussian retreat, and in the great disaster of Kunersdorf he was severely wounded in a hopeless attempt to storm a hill held by the Russians. During his convalescence he married Countess Albertine Hacke. He rejoined the army in May 1760, but his health was so impaired that Frederick sent him home again. It was not until 1761 that he reappeared at the front. He now commanded a wing of Prince Henry's army, composed of troops of all arms, and many doubts were expressed as to his fitness for this command, as his service had hitherto been with the cavalry exclusively. But he answered his critics by his conduct at the battle of Freyburg (October 29, 1762), in which, leading his infantry and his cavalry in turn, he decided the day. After the peace of Hubertusburg he was made inspector-general of the cavalry in Silesia, where eleven regiments were permanently stationed and whither Frederick sent all his most promising officers to be trained by him. In 1767 he was made a general of cavalry. But his later years were clouded by domestic unhappiness. His wife was unfaithful to him, and his two daughters, each several times married, were both divorced, the elder once and the younger twice. His formerly close friendship with the king was brought to an end by some misunderstanding, and it was only in his last illness, and a few weeks before his death, that they met again. Seydlitz died of paralysis at Ohlau on the 27th of August 1773.

See Varnhagen von Ense, *Das Leben des Generals von Seydlitz* (Berlin, 1834); and Bismarck, *Die kgl. preussische Reiterei unter Friedrich dem Grossen* (Karlsruhe, 1837).

SEYMOUR, or ST MAUR, the name of an English family in which several titles of nobility have from time to time been created, and of which the duke of Somerset is the head. The family was settled in Monmouthshire in the 13th century. The original form of the name, which has been resumed by the dukes of Somerset since 1863, seems to have been St Maur, of which Camden says that Seymour was a later corruption. It appears that about the year 1240 Gilbert Marshal, earl of Pembroke, assisted William St Maur to wrest a place called Woundy, near Caldecot in Monmouthshire, from the Welsh. Woundy and Penhow, at the latter of which he made his residence, were the property of Sir Richard St Maur at the end of the 13th century, but they passed away from the family through the marriage of Sir Richard's great-great-granddaughter, the only child of John St Maur, who died in 1359. John St Maur's younger brother Roger married Cecily, one of the daughters and co-heiresses of John Beauchamp of Hache, Baron Beauchamp de Somerset (d. 1361), who brought to her husband the greater part of her father's extensive estates in Somersetshire, Devonshire, Buckinghamshire and Suffolk. The eldest son of this marriage was Sir William St Maur, or Seymour (for the later form of the name appears to have come into use about this date), who was an attendant on the Black Prince, and who died in his mother's lifetime, leaving a son Roger, who inherited the estates and added to them by his marriage with Maud, daughter of Sir William Esturmi of Wolf Hall, Wiltshire. During the next three or four generations the wealth and importance of the Seymours in the western counties increased, until in the reigns of Henry VII. and Henry VIII. Sir John Seymour of Wolf Hall became a personage of note in public affairs. He took an active part in suppressing the Cornish rebellion in 1497; and afterwards attended Henry at the Field of the Cloth of Gold, and on the occasion of the emperor Charles V.'s visit to England in 1522. The eldest of his ten children was Edward Seymour, 1st duke of Somerset (*q.v.*), the famous Protector in the reign of Edward VI.; his third son was Thomas Seymour, Baron Seymour of Sudeley (*q.v.*); and his eldest daughter Jane was third wife of King Henry VIII., and mother of Edward VI. The Protector was twice married; and, probably owing to the adultery of his first wife whom he repudiated about 1535, his titles and estates were entailed first on the issue of his second marriage with Anne, daughter of Sir Edward Stanhope. (See SOMERSET, EARLS AND DUKES OF.)

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[1] *Colonial Reports . . . Seychelles* (1907).

The Protector's eldest surviving son by his first marriage, Sir Edward Seymour (d. 1593), knight, of Berry Pomeroy, Devon, was father of Sir Edward Seymour (d. 1613) who was created a baronet in 1611; and the baronetcy then descended for six generations from father to son, all of whom were named Edward, until in 1750, on the failure of heirs of the Protector by his second marriage, Sir Edward Seymour, 6th baronet of Berry Pomeroy, succeeded to the dukedom of Somerset. The 3rd baronet, in whose time the family seat at Berry Pomeroy was plundered and burnt by the Roundheads, had a younger brother Henry (1612–1686), who was a close personal attendant of Prince Charles during the Civil War, and bore the prince's last message to his father, Charles I., before the latter's execution. Henry Seymour continued his service to Charles II. in exile, and at the Restoration he received several valuable offices from the king. In 1669 he bought the estate of Langley in Buckinghamshire, where he lived till his death in 1686. In 1681 his son Henry, at the age of seven years, was created a baronet.

Sir Edward Seymour, 4th baronet (1633–1708), speaker of the House of Commons, was elected member of parliament for Gloucester in 1661, and his influence at Court together with his natural abilities procured for him a position of weight in the House of Commons. He was appointed to the lucrative post of treasurer of the navy; and in 1667 he moved the impeachment of Lord Clarendon, which he carried to the House of Lords. In 1672 he was elected speaker, an office which he filled with distinction until 1679, when, having been unanimously re-elected to the Chair, the king refused to confirm the choice of the Commons. On the accession of James II., Seymour courageously opposed the arbitrary measures of the Crown; and at the revolution he adhered to the Prince of Orange. In 1691 he became a lord of the treasury, but losing his place three years later he took an active part in the tory opposition to William's whig ministers; and in later years he was not less hostile to those of Queen Anne, but owing to the ascendancy of Marlborough he lost all influence for some time before his death, which took place in 1708. Seymour was not less arrogant than his relative "the Proud Duke" of Somerset; but he was described by Burnet as "the ablest man of his party, the first speaker of the House of Commons that was not bred to the law; a graceful man, bold and quick, and of high birth." Sir Edward Seymour was twice married. By his first wife he had two sons, Edward, 5th baronet, whose son Edward became the 8th duke of Somerset, and William, who became a lieutenant-general; by his second wife, a daughter of Alexander Popham of Littlecote, he had six sons, the eldest of whom, Popham, on succeeding to the estates of his mother's cousin, Edward, earl of Conway, assumed the name of Conway in addition to that of Seymour. Popham was killed in a duel with Colonel Kirk in 1669, and his estates devolved on his next brother, Francis, who likewise assumed the name of Conway, and having been created Baron Conway in 1703 was the father of Francis Seymour Conway (1719–1794), created marquess of Hertford in 1793, and of field-marshal Henry Seymour Conway (*q.v.*). (See HERTFORD, EARLS AND MARQUESSES OF.)

The eldest son of the Protector's second marriage, Edward Seymour (1537–1621), was relieved by act of parliament in the reign of Queen Mary from the attainder passed on his father in 1551, and was created Baron Beauchamp and earl of Hertford in 1559. In 1560 he secretly married Lady Catherine Grey, second daughter of Henry Grey, duke of Suffolk, and sister of Lady Jane Grey, claimant of the crown as great-granddaughter of Henry VII., on whose death Catherine stood next in succession to the throne after Queen Elizabeth under the will of Henry VIII. On this account both parties to the marriage incurred the displeasure of Queen Elizabeth; they were imprisoned in the Tower of London, and the fact of their marriage, together with the legitimacy of their two sons, was denied. The eldest of these sons was Edward Seymour (1561–1612), styled Lord Beauchamp notwithstanding the question as to his legitimacy, who in 1608 obtained a patent declaring that after his father's death he should become earl of Hertford. He, however, died before his father, leaving three sons, one of whom, William, became 2nd duke of Somerset; and another, Francis, was created Baron Seymour of Trowbridge in 1641. The latter had at first taken an active part in the opposition in the House of Commons to the government of Charles I., having been elected member for Wiltshire in 1620. He represented the same constituency in both the Short and the Long Parliaments; and he refused to pay ship money in 1639. When, however, the popular party proceeded to more extreme measures, Francis Seymour refused his support, and was rewarded by being raised to the peerage; he voted in the House of Lords against the attainder of Strafford, and in 1642 he joined Charles at York and fought on the royalist side throughout the Great Rebellion. He died in 1664. His grandson Francis, 3rd baron, succeeded to the dukedom of Somerset in 1675; and on the death of his nephew Algernon, 7th duke of Somerset, in 1750, the male line of the Protector by his second marriage became extinct, and the dukedom reverted to the elder line, the 6th baronet of Berry Pomeroy becoming 8th duke of Somerset.

Henry Seymour (1729–1805), a son of the 8th duke of Somerset's brother Francis, was elected to the House of Commons in 1763; in 1778 he went to France, and fixing his residence at Prunay, near Versailles, he became the lover of Madame du Barry, many of whose letters to him are preserved in Paris. He was twice married, and in addition to children by both wives he left an illegitimate daughter, Henriette Félicité, who married Sir James Doughty-Tichborne, by whom she was the mother of Sir Roger Tichborne, impersonated in 1871 by the famous impostor Arthur Orton.

Lord Hugh Seymour (1759–1801), a younger son of Francis Seymour-Conway, marquess of Hertford, was a distinguished naval officer who saw much active service especially under Lord Howe, in whose famous action on the 1st of June 1794 he took a conspicuous part. His son Sir George Francis Seymour (1787–1870), admiral of the fleet, began his naval career by serving under Nelson; in 1818 he became Sergeant-at-arms in the House of Lords, a post which he retained till 1841, when he was promoted to the rank of rear-admiral and appointed a lord of the admiralty; his eldest son, Francis George Hugh Seymour (1812–1884), succeeded his cousin Richard Seymour-Conway as 5th marquess of Hertford in 1870. Lord Hugh Seymour's younger son, Sir Horace Beauchamp Seymour, was the father of Frederick Beauchamp Paget Seymour, Baron Alcester (*q.v.*).

A younger branch of the great house of Seymour is said to have settled in Ireland in the reign of Elizabeth, from which Sir Michael Seymour (1768–1834) claimed descent. Sir Michael, like so many of his name, was an officer in the navy, in which he rendered much distinguished service in the last decade of the 18th century. He lost an arm in Howe's action on the 1st of June 1794; and between 1796 and 1810 as commander of the "Spitfire," and afterwards of the "Amethyst," he captured a great number of prizes from the French in the Channel. Seymour became a rear-admiral in 1832, and died two years later while in chief command on the South American station. His son, Sir Michael Seymour (1802–1887), entered the navy in 1813, and attained the rank of rear-admiral in 1854, in which year he served under Sir Charles Napier in the Baltic during the war with Russia. In 1856 he was in command of the China station, and conducted the operations arising out of the affair of the lorcha "Arrow"; he destroyed the Chinese fleet in June 1857, took Canton in December, and in 1858 he captured the forts on the Pei-ho, compelling the Chinese government to consent to the treaty of Tientsing. In 1864 he was promoted to the rank of admiral.

AUTHORITIES.—*The Wiltshire Archaeological Magazine*, vol. xv.; William Camden, *Britannia*, English translation, edited by Richard Gough (4 vols., London, 1806); Arthur Collins, *Peerage of England* (8 vols., London, 1779); G. E. C., *Complete Peerage*, *sub.* "Somerset," "Seymour of Trowbridge," and "Hertford" (London, 1896); Burke's *Peerage*, *sub.* "Somerset," *Dictionary of National Biography*, *sub.* "Seymour," vol. li. (London, 1897).

SEYMOUR, HORATIO (1810–1886), American statesman, was born at Pompey, Onondaga county, New York, on the 31st of May 1810. His ancestor, Richard Seymour, a Protestant Episcopal clergyman, was an early settler at Hartford, Connecticut, and his father, Henry Seymour, who removed from Connecticut to New York, was prominent in the Democratic party in the state, being a member of the "Albany Regency" and serving as state senator in 1816–1819 and in 1822, and as canal commissioner in 1819–1831. The son was brought up in Utica, studied in 1824–1825 at Geneva Academy (afterwards Hobart College), and then at a military school in Middletown, Conn., and was admitted to the bar in 1832. He was military secretary to Governor W. L. Marcy in 1833–1839, was a member of the New York Assembly in 1842, in 1844 and in 1845, being speaker in 1845; mayor of Utica in 1843, and in 1852 was elected governor of the state over Washington Hunt (1811–1867), the Whig candidate, who had defeated him in 1850. He vetoed in 1854 a bill prohibiting the sale of intoxicating liquors (which was declared unconstitutional almost immediately after its re-enactment in 1855), and in consequence he was defeated in 1854 for re-election as governor by Myron Holley Clark (1806–1892), the Whig and temperance candidate. Seymour was a conservative on national issues and supported the administrations of Pierce and Buchanan; he advocated compromise to avoid secession in 1860–1861; but when war broke out he supported the maintenance of the Union. In 1863–1865 he was again governor of New York state. His opposition to President Lincoln's policy was mainly in respect to emancipation, military arrests and conscription. The president tried to win him over early in 1863, but Seymour disapproved of the arrest of C. S. Vallandigham in May, and, although he responded immediately to the call for militia in June, he thought the Conscription Act unnecessary and unconstitutional and urged the president to postpone the draft until its legality could be tested. During the draft riots in July he proclaimed the city and county of New York in a state of insurrection, but in a speech to the rioters adopted a tone of conciliation—a political error which injured his career. He was defeated as Democratic candidate for governor in 1864. In 1868 he was nominated presidential candidate by the National Democratic Convention, Francis P. Blair, Jr., being nominated for the vice-presidency; but Seymour and Blair carried only eight states (including New York, New Jersey and Oregon), and received only 80 electoral votes to 214 for Grant and Colfax. Seymour did not re-enter political life, refusing to be considered for the United States senatorship from New York in 1876. He died on the 12th of February 1886 in Utica, at the home of his sister, who was the wife of Roscoe Conkling.

The Public Record of Horatio Seymour (New York, 1868) includes his speeches and official papers between 1856 and 1868.

SEYMOUR, THOMAS DAY (1848–1907), American educationist, was born in Hudson, Ohio, on the 1st of April 1848. He graduated in 1870 at Western Reserve College, where his father, Nathan Perkins Seymour, was long professor of Greek and Latin. Here, after studying in Berlin and Leipzig, the son was professor of Greek in 1872–1880; and he became professor of Greek at Yale University in 1880, holding his position until his death in New Haven on the 31st of December 1907. He was from 1887 to 1901 chairman of the managing committee of the American School of Classical Studies at Athens, and was president of the Archaeological Institute of America from 1903. Except for his *Selected Odes of Pindar* (1882), his published work was practically confined to the study of the Homeric poems: *An Introduction to the Language and Verse of Homer* (1885); Homer's *Iliad*, i.-iv. (1887–1890); *Homeric Vocabulary* (1889); *Introduction and Vocabulary to School Odyssey* (1897); and *Life in the Homeric Age* (1907). He edited, with Lewis R. Packard and John W. White, the "College Series of Greek Authors."

SEYMOUR, a city of Jackson county, Indiana, U.S.A., about 59 m. S. by E. of Indianapolis. Pop. (1890) 5337; (1900) 6445, (321 foreign-born); (1910) 6305. It is served by the Baltimore & Ohio, South-Western (which has repair shops here), the Pittsburg, Cincinnati, Chicago & St Louis, and the Southern Indiana railways, and by the Indianapolis, Columbus & Southern and the Indianapolis & Louisville interurban electric lines. The city has a considerable trade in produce, and has various manufactures, including woollen-goods, furniture, carriages and automobiles. Seymour was settled in 1854, incorporated as a town in 1864, and chartered as a city in 1867.

SEYMOUR OF SUDELEY, THOMAS SEYMOUR, BARON (*c.* 1508–1549), lord high admiral of England, was fourth son of Sir John Seymour of Wolf Hall, Wiltshire, and younger brother of the Protector Edward Seymour, 1st duke of Somerset. His sister Jane Seymour became the third wife of Henry VIII. in 1536, and another sister, Elizabeth, married Thomas Cromwell's son. Seymour's connexions thus ensured his promotion, and he quickly won the favour of the king, who gave him many grants of land and employed him in the royal household and on diplomatic missions abroad. From 1540 to 1542 he was at Vienna, and in 1543 in the Netherlands, where he served with distinction in the war against France, holding for a short time the supreme command of the English army. In 1544 he was rewarded with the post of master of the ordnance for life, becoming admiral of the fleet a few months later, in which capacity he was charged with guarding the Channel against French invasion. Henry VIII. left Seymour a legacy by his will, and is said to have directed that he should be raised to the peerage. In February 1547 he was accordingly created Baron Seymour of Sudeley and appointed lord high admiral. From this time forward he was mainly occupied in intrigue against his brother the Protector, of whose power he was jealous; and he aimed at procuring for himself the position of guardian of the young king, Edward VI. Several matrimonial projects entered into Seymour's schemes for gratifying his ambitions. No sooner was Henry VIII. dead than the lord high admiral tried to secure the princess (afterwards queen) Elizabeth in marriage; and when this project was frustrated he secretly married the late king's widow, Catherine Parr, whose hand he had vainly sought as early as 1543. He also took steps to ingratiate himself with Edward, and proposed a marriage between the king and the Lady Jane Grey. He entered into relations with pirates on the western coasts, whom it was his duty as lord high admiral to suppress, with a view to securing their support; and when the Protector invaded Scotland in the summer of 1547 Seymour fomented opposition to his authority in his absence. On the death of his wife in September of the next year he made renewed attempts to marry the princess Elizabeth. Somerset strove ineffectually to save his brother from ruin, and in January 1549 Seymour was arrested and sent to the Tower; he was convicted of treason, and executed on the 20th of March 1549.

See Sir John Maclean, *Life of Sir Thomas Seymour* (London, 1869); *Chronicle of Henry VIII.*, translated from the Spanish, with notes by M. A. S. Hume (London, 1889); *Literary Remains of Edward VI.*, with notes and memoir by J. G. Nichols (2 vols., London

1857); Mary A. E. Green, *Letters of Royal and Illustrious Ladies of Great Britain to the Close of the Reign of Mary* (3 vols., London, 1846). See also Somerset, Edward Seymour, 1st Duke of, and the authorities there cited.

SEYNE SUR MER, or La Seyne, an industrial suburb of Toulon, S.W. of that port, and connected with it by rail and steamer. Pop. (1901) 21,002. It owes its importance to the shipbuilding trade, the *Société des Forges et Chantiers de la Méditerranée* having here one of the finest shipbuilding yards in Europe (it is a branch of the greater establishment at Marseilles), which gives employment to about 3000 workmen.

SFAX (Arabic *Asfākis* or *Safākus*, the cucumbers), a city of Tunisia, second in importance only to the capital, 78 m. due S. of Susa, on the Gulf of Gabes (Syrtis Minor) opposite the Kerkenna Islands, in 34° 43′ N., 10° 46′ E. Sfax occupies the site of the ancient Taphrura, of which few vestiges remain. The town consists of a European quarter, with streets regularly laid out and fine houses, and the Arab town, with its kasbah or citadel, and tower-flanked walls pierced by three gates. Many of the private houses, mosques and *zawias* are good specimens of native art of the 17th and 18th centuries. North-east of the native town is a camp for the European garrison. Sfax was formerly the starting-point of a caravan route to Central Africa, but its inland trade now extends only to the phosphate region beyond Gafsa, reached by a railway which, after skirting the coast southwards from Sfax to Mahares, runs inland past Gafsa. With Susa there is regular communication by steamer and motor car. Olive oil is manufactured, and the fisheries are important, notably those of sponges and of octopuses (exported to Greece). The prosperity of the town is largely due to the export trade in phosphates, esparto grass, oil, almonds, pistachio nuts, sponges, wool, &c. There is in the Gulf of Gabes a rise and fall of 5 ft. at spring tides, which is rare in the Mediterranean. Formerly the only anchorage at Sfax was 2 m. from shore; but a harbour, completed in 1900 and entered by a channel 1¼ m. long and 21½ ft. deep, now renders vessels independent of the tide. There are separate basins for fishing boats and a dock for torpedo-boat flotilla. Round the town for 5 or 6 m. to the north and west stretch orchards, gardens and country houses. Dates, almonds, grapes, figs, peaches, apricots, olives, and in rainy years melons and cucumbers grow there without irrigation. Two enormous cisterns, maintained by public charitable trusts, supply the town with water in dry seasons.

Sfax is on the site of a Roman settlement. Many of its Arab inhabitants claim descent from Mahomet. The Sicilians under Roger the Norman took it in the 12th century, and in the 16th the Spaniards occupied it for a brief period. The bombardment of the town in 1881 was one of the principal events of the French conquest of Tunisia; it was pillaged by the soldiers on the 16th of July, and the inhabitants had afterwards to pay a war indemnity of £250,000. The population, about 15,000 at the time of the French occupation, had increased to 50,000 in 1906.

SFORZA, the name of a famous Italian family. They were descended from a peasant condottiere, Giacomo or Muzio (sometimes abbreviated into Giacomuzzo) Attendolo, who was born at Cotignola in the Romagna on the 10th of June 1369, gained command of a band of adventurers by whom he had been kidnapped, took the name of Sforza in the field, became constable of Naples under Joanna II., fought bravely against the Spaniards, served Pope Martin V., by whom he was created a Roman count, and was drowned on the 4th of January 1424 in the Pescara near Aquila while engaged in a military expedition. His natural son Francesco (1401–1466) succeeded in command of the condottieri, and showed military genius and political acumen. He served the Visconti against the Venetians and then the Venetians against the Visconti; he attacked the pope, deprived him of the Romagna, and later defended him; he married in 1441 Bianca, the only daughter of Filippo Maria Visconti, duke of Milan, and received Pontremoli and Cremona as dowry and the promise of succession to the duchy of Milan. The short-lived Ambrosian republic, which was established by the Milanese on the death of Visconti (1447), was overthrown by Francesco, who made his triumphal entry as duke of Milan on the 25th of March 1450. He suppressed a revolt at Piacenza, formed close alliances with Cosmo de' Medici and with Louis XI. of France, and exercised authority over Lombardy, several districts south of the Po and even Genoa. He rebuilt the fortress of Porta Giovio and constructed the Great Hospital and the canal of the Martesana, which connects Milan with the Adda; and his court, filled with Italian scholars and Greek exiles, speedily became one of the most splendid in Italy. His daughter Ippolita was renowned for her Latin discourses.

Francesco left several sons, among whom were Galeazzo Maria, Lodovico, surnamed the Moor, and Ascagnio, who became a cardinal.

Galeazzo Maria, who succeeded to the duchy, was born in 1444, and was a lover of art, eloquent in speech, but dissolute and cruel. He was assassinated at the porch of the cathedral on the 26th of December 1476 by three young Milanese noblemen desirous of imitating Brutus and Cassius. His daughter Caterina is separately noticed. Gian Galeazzo (1469–1494), son of Galeazzo, succeeded to the duchy under the regency of his mother, Bona of Savoy, who was supplanted in her power (1481) by the boy's uncle, Lodovico the Moor. Gian Galeazzo married Isabella of Aragon, granddaughter of the king of Naples, and his sudden death was attributed by some to poison administered by the regent. His daughter, Bona Sforza (1493–1557), married King Sigismund of Poland in 1518. She displayed remarkable ability in government, built castles, schools and hospitals, but increased corruption and intrigue at the Polish court. She was accused of having killed her daughter-in-law, the wife of Sigismund Augustus. On the death of her husband she returned to Italy and was poisoned (1557) by her paramour Pappacoda.

Lodovico the Moor [Lodovico il Moro] (1451–1508), who is famed as patron of Leonardo da Vinci and other artists, had summoned Charles VIII. of France to his aid (1494) and received the ducal crown from the Milanese nobles on the 22nd of October in the same year, but finding his own position endangered by the French policy, he joined the league against Charles VIII., giving his niece Bianca in marriage to Maximilian I. and receiving in return imperial investiture of the duchy. Lodovico was driven from Milan by Louis XII. in 1499, and although reinstated for a short time by the Swiss he was eventually delivered over by them to the French (April 1500) and died a prisoner in the castle of Loches. Francesco, the son of Gian Galeazzo, was also taken to France by Louis XII., became abbot of Marmoutiers, and died in 1511.

The two sons of Lodovico, Massimiliano and Francesco Maria, took refuge in Germany; the former was restored to the duchy of Milan by the Swiss in 1512, but after the overwhelming defeat of his allies at Marignano (1515) he abandoned his rights to Francis I. for a pension of 30,000 ducats, and died at Paris in 1530; the latter was put in possession of Milan after the defeat of the French at La Bicocca in 1522, subsequently entered the Italian League against the emperor Charles V., was unpopular on account of oppressive taxation, and his death (24th of October 1535) marked the extinction of the direct male line of the Sforza. The duchy went to Charles V.

The dukes of Sforza-Cesarini and the counts of Santa Fiora are descended from collateral branches of the Sforza family.

See J. Burckhardt, *The Civilization of the Renaissance in Italy*, trans. by S. G. C. Middlemore (London, 1898); J. A. Symonds, *Age of the Despots* (New York, 1888); W. P. Urquhart, *Life and Times of Francesco Sforza* (2 vols., Edinburgh, 1852); Mrs Julia Ady, *Beatrice d'Este, duchess of Milan, 1475–1497* (London, 1905); F. Calvi, *Bianca Maria Sforza-Visconti e gli ambasciatori di Lodovico il Moro* (Milan, 1888); A. Segre, "Lodovico Sforza, duca di Milano," in *R. Accad. d. Sci. Atti*, vol. 36 (Turin, 1901). There is a critical bibliography by Otto von Schleinitz in *Zeitschrift für Bücherfreunde*, vol. v. (Bielefeld, 1901). (C. H. Ha.)

SFORZA, CATERINA (1463–1509), countess of Forlì, was an illegitimate daughter of Galeazzo Maria Sforza (see above). In 1473 she was betrothed to Girolamo Riario, a son of Pope Sixtus IV., who was thus able to regain possession of Imola, that city being made a fief of the Riario family. After a triumphal entry into Imola in 1477 Caterina Sforza went to Rome with her husband, who, with the help of the pope, wrested the lordship of Forlì from the Ordelaffi. Riario, by means of many crimes, for which his wife seems to have blamed him, succeeded in accumulating great wealth, and on the death of Sixtus in August 1484, he sent Caterina to Rome to occupy the castle of St Angelo, which she defended gallantly until, on the 25th of October, she surrendered it by his order to the Sacred College. They then returned to their fiefs of Imola and Forlì, where they tried to win the favour of the people by erecting magnificent public buildings and churches and by abolishing taxes; but want of money obliged them to levy the taxes once more, which caused dissatisfaction. Riario's enemies conspired against him with a view to making Franceschetto Cybò, nephew of Pope Innocent VIII., lord of Imola and Forlì in his stead. Riario thereupon instituted a system of persecution, in which Caterina was implicated, against all whom he suspected of treachery. In 1488 he was murdered by three conspirators, his palace was sacked, and his wife and children were taken prisoners. The castle of Forlì, however, held out in Caterina's interest, and every inducement and threat to make her order its surrender proved useless; having managed to escape from her captors she penetrated into the castle, whence she threatened to bombard the city, refusing to come to terms even when the besiegers threatened to murder her children. With the assistance of Lodovico il Moro she was able to defeat her enemies and to regain possession of all her dominions; she wreaked vengeance on those who had opposed her and re-established her power. Being now a widow she had several lovers, and by one of them, Giacomo Feo, whom she afterwards married, she had a son. Feo, who made himself hated for his cruelty and insolence, was murdered before the eyes of his wife in August 1495; Caterina had all the conspirators and their families, including the women and children, massacred. She established friendly relations with the new pope, Alexander VI., and with the Florentines, whose ambassador, Giovanni de' Medici, she secretly married in 1496. Giovanni died in 1498, but Caterina managed with the aid of Lodovico il Moro and of the Florentines to save her dominions from the attacks of the Venetians. Alexander VI., however, angered at her refusal to agree to a union between his daughter Lucrezia Borgia and her son Ottaviano, and coveting her territories as well as the rest of Romagna for his son Cesare, issued a bull on the 9th of March 1499, declaring that the house of Riario had forfeited the lordship of Imola and Forlì and conferring those fiefs on Cesare Borgia. The latter began his campaign of conquest with Caterina Sforza's dominions and attacked her with his whole army, reinforced by 14,000 French troops and by Louis XII. Caterina placed her children in safety and took strenuous measures for defence. The castle of Imola was held by her henchman Dionigi Naldi of Brisighella, until resistance being no longer possible he surrendered (December 1499) with the honours of war. Caterina absolved the citizens of Forlì from their oath of fealty, and defended herself in the citadel. She repeatedly beat back the Borgia's onslaughts and refused all his offers of peace. Finally when the situation had become untenable and having in vain given orders for the magazine to be blown up, she surrendered, after a battle in which large numbers were killed on both sides, to Antoine Bissey, *bailli* of Dijon, entrusting herself to the honour of France (January 12, 1500). Thus her life was spared, but she was not saved from the outrages of the treacherous Cesare; she was afterwards taken to Rome and held a prisoner for a year in the castle of St Angelo, whence she was liberated by the same *bailli* of Dijon to whom she had surrendered at Forlì. She took refuge in Florence to escape from persecution from the Borgias, and the power of that sinister family having collapsed on the death of Alexander VI. in 1503, she attempted to regain possession of her dominions. In this she failed owing to the hostility of her brothers-in-law, Pierfrancesco and Lorenzo de' Medici, and as they wished to get her son Giovanni de' Medici (afterwards Giovanni dalle Bande Nere) into their hands, she took refuge with him in the convent of Annalena, where she died on the 20th of May 1509.

See Buriel, *Vita di Caterina Sforza-Riario* (Bologna, 1785); F. Oliva, *Vita di C. Sforza, signora di Forlì* (Forlì, 1821); Pietro Desiderio Pesolini Dall' Onda, *Caterina Sforza* (Rome, 1893); English translation by P. Sylvester (1898). This is the best and most complete work on the subject; E. M. de Vogüé, *Histoire et poésie* (Paris, 1898); and Ernesto Masi, "C. Sforza," in the *Nuova Antologia* for May 1 and May 15, 1893.

SGAMBATI, GIOVANNI (1843–   ), Italian composer, was born in Rome on the 28th of May 1843, of an Italian father and an English mother. His early education took place at Trevi, in Umbria, and there he wrote some church music, and obtained experience as a singer and conductor. In 1860 he settled in Rome, and definitely took up the work of winning acceptance for the best German music, which was at that time neglected in Italy. The influence and support of Liszt, who was in Rome from 1861, was naturally of the greatest advantage to him, and concerts were given in which Sgambati conducted as well as played the piano. His composition, of this period (1864–1865) included a quartet, two piano quintets, an octet, and an overture. He conducted Liszt's *Dante* symphony in 1866, and made the acquaintance of Wagner's music for the first time at Munich, whither he travelled in Liszt's company. His first album of songs appeared in 1870, and his first symphony was played at the Quirinal in 1881; this, as well as a piano concerto, was performed in the course of his first visit to England in 1882; and at his second visit, in 1891, his *Sinfonia epitalamio* was given at the Philharmonic. His most extensive work, a Requiem Mass, was performed in Rome 1901. His many pianoforte works have won permanent success; but his influence on Italian musical taste has been perhaps greater than the merits of his compositions, which, though often poetical and generally effective, are often slight in style.

SHABATS (also written *Šhabatz* and *Šabac*), a town in Servia, capital of the Drina department, on the right bank of the river Save. Pop. (1900) 12,072. It has a medieval castle, built in 1470 by Sultan Mahommed II., to facilitate the incursion of the Turks into Slavonia, which lies on the left bank of the river. It is the principal commercial town of north-western Servia, exporting cereals, prunes, cattle and pigs to Hungary. It is well known for the excellent white honey which comes from its neighbourhood. The district is rich in lime-trees. Shabats is the seat of a bishop, of the district prefecture, and of a tribunal. It has a college and a library, and a garrison occupies the old fort. The people of Shabats have the reputation of being the wittiest in Servia.

SHAD, the name given to certain migratory species of herrings (*Clupea*), which are distinguished from the herrings proper by the total absence of teeth in the jaws. Two species occur in Europe, much resembling each other—one commonly called allis shad (*Clupea alosa* or *Alosa vulgaris*), and the other known as twaite shad (*Clupea finta* or *Alosa finta*). Both, like the majority of herrings, are greenish on the back and silvery on the sides, but they are distinguished from the other European species *Clupea* by the presence of a large blackish blotch behind the gill-opening, which is succeeded by a series of several other similar spots along the middle of the side of the body. So closely allied are these two fishes that their distinctness can be proved only by an examination of the gill-apparatus, the allis shad having from sixty to eighty very fine and long gill-rakers along the concave edge of the first branchial arch, whilst the twaite shad possesses from twenty-one to twenty-seven stout and stiff gill-rakers only. In their habits and geographical distribution also the two shads are similar. They inhabit the coasts of temperate Europe, the twaite shad being more numerous in the Mediterranean. While they are in salt water they live singly or in very small companies, but during May (the twaite shad some weeks later) they congregate, and in great numbers ascend large rivers, such as the Severn (and formerly the Thames), the Seine, the Rhine, the Nile, &c., in order to deposit their spawn. A few weeks after they drop down the river, lean and exhausted, numbers floating dead on the surface, so that only a small proportion seem to regain the sea. At Elbeuf on the Seine above Rouen there was formerly a hatchery for the artificial propagation of shad. The eggs are spawned in May and June, and are similar in the two species; they are heavier than the fresh water in which they develop, but unlike the herring's eggs they are not adhesive. They remain free and separate at the bottom of the river, carried down by the current or up by the tide. In the Elbe the twaite shad spawns below Hamburg, the allis shad above Dresden. In November the fry have reached 3 to 5 in. in length, but very few specimens in their second year have been found in rivers. The majority seem to descend to the sea before their first winter, to return when mature. On rivers in which these fishes make their periodical appearance they have become the object of a regular fishery. They are much esteemed on the middle Rhine, where they are generally known as "Maifisch." The allis shad is caught at a size from 15 to 24 in., and is better flavoured than the twaite shad, which is generally smaller.

Other, but closely allied species, occur on the Atlantic coasts of North America, all surpassing the European species in importance as food-fishes and economic value, viz., the American shad (*Clupea sapidissima*), the gaspereau or ale-wife (*C. mattowocca* or *vernalis*), and the menhaden (*C. menhaden*).

SHADDOCK (*Citrus decumana*), a tree allied to the orange and the lemon, presumably native to the Malay and Polynesian islands, but generally cultivated throughout the tropics. The leaves are like those of the orange, but downy on the under surface, as are also the young shoots. The flowers are large and white, and are succeeded by very large globose fruits like oranges, but paler in colour, and with a more pungent flavour. The name Shaddock is asserted to be that of a captain who introduced the tree to the West Indies. The fruit is also known under the name of grape-fruit, pommeloes, and "forbidden fruit." Varieties occur with yellow and reddish pulp; and there are also pear-shaped varieties.

SHADOOF (Arab. *shādūf*), an apparatus for drawing water, used in the East generally, and particularly on the Nile for the purpose of irrigation. It consists of an upright frame on which is suspended a long pole at a distance of about one-fifth of its length from one end; to the other end is attached a bucket or skin bag, while at the short end a weight is suspended serving as the counterpoise of a lever. The vessel containing the water is then swung round and emptied into the runnel, which conveys the water in the direction required.

SHADOW (O. Eng. *Schadewe*, *sceadu*; a form of "shade"; connected with Gr. *σκότος*, darkness). When an opaque body is placed between a screen and a luminous source, it casts a "shadow" on the screen. If the source be a point, such as the image formed by a lens of small focus or by a fine hole in a plate held close to a bright flame, the outline of the shadow is to be found by drawing straight lines from the luminous point so as to envelop the opaque body. These lines form a cone. The points of contact form a line on the opaque body separating the illuminated from the non-illuminated portion of its surface. Similarly, when these lines are produced to meet the screen, their points of intersection with it form a line which separates the illuminated from the non-illuminated parts of the screen. This line is called the boundary of the *geometrical shadow*, and its construction is based on the assumption that light travels in straight lines (in homogeneous media) and suffers no deviation on meeting an obstacle. But a deviation, termed *diffraction*, does occur, and consequently the complete theory of shadows involves considerations based on the nature of the rays themselves; this aspect is treated in DIFFRACTION OF LIGHT. An instance of the geometrical shadow is seen when a very small gas-jet is burning in a ground-glass shade near a wall. In this case the cone, above mentioned, is usually a right cone with its axis vertical. Thus the boundary of the geometric shadow is a portion of a circle on the roof, but a portion of an hyperbola on the vertical wall. If the roof be not horizontal, we may obtain in this way any form of conic section. Hints in projection may be obtained by observing the shadows of bodies of various forms cast in this way by rays which virtually diverge from one point: *e.g.* how to place a plane quadrilateral of given form so that its geometric shadow may be a square; how to place an elliptic disk, with a small hole in it, so that the shadow may be circular with a bright spot at its centre, &c.

When there are more luminous points than one, we have only to draw separately the geometrical shadows due to each of the sources, and then superpose them. A new consideration now comes in. There will be, in general, portions of all the separate geometrical shadows which overlap one another in some particular regions of the screen. In such regions we still have full shadow; but around them there will be other regions, some illuminated by one of the sources alone, some by two, &c., until finally we come to the parts of the screen which are illuminated directly by all the sources. There will evidently be still a definite boundary of the parts wholly unilluminated, *i.e.* the true shadow or *umbra*, and also a definite boundary of the parts wholly illuminated. The region between these boundaries—*i.e.* the partially illumined portion—is called the *penumbra*.

Fig. 1 represents the shadow of a circular disk cast by four equal luminous points arranged as the corners of a square—the disk being large enough to admit of a free overlapping of the separate shadows. The amount of want of illumination in each portion of the penumbra is roughly indicated by the shading. The separate shadows are circular, if the disk is parallel to the screen. If we suppose the number of sources to increase indefinitely, so as finally to give the appearance of a luminous surface as the source of light, it is obvious that the degrees of darkness at different portions of the penumbra will also increase indefinitely; *i.e.* there will be a gradual increase of brightness in the penumbra from total darkness at the edge next the geometrical shadow to full illumination at the outer edge.

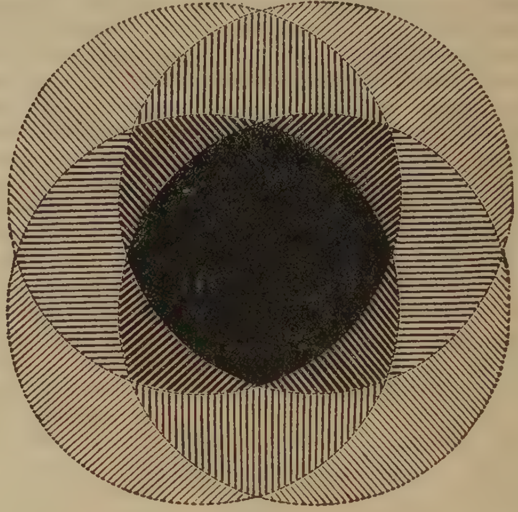


FIG. 1.

Thus we see at once why the shadows cast by the sun or moon are in general so much less sharp than those cast by the electric arc. For, practically, at moderate distances the arc appears as a mere luminous point. But if we place a body at a distance of a foot or two only from the arc, the shadow cast will have as much of penumbra as if the sun had been the source. The breadth of the penumbra when the source and screen are nearly equidistant from the opaque body is equal to the diameter of the luminous source. The notions of the penumbra and umbra are important in considering eclipses (*q.v.*). When the eclipse is total, there is a real geometrical shadow—very small compared with the penumbra (for the apparent diameters of the sun and moon are nearly equal, but their distances are as 370 : 1); when the eclipse is annular, the shadow is all penumbra. In a lunar eclipse, on the other hand, the earth is the shadow-casting body, and the moon is the screen, and we observe things according to our first point of view.

Suppose, next, that the body which casts the shadow is a large one, such as a wall, with a hole in it. If we were to plug the hole, the whole screen would be in geometrical shadow. Hence the illumination of the screen by the light passing through the hole is precisely what would be cut off by a disk which fits the hole, and the complement of fig. 1, in which the light and shade are interchanged, would give therefore the effect of four equal sources of light shining on a wall through a circular hole. The umbra in the former case becomes the fully illuminated portion, and vice versa. The penumbra remains the penumbra, but it is now darkest where before it was brightest, and vice versa.

Thus we see how, when a small hole is cut in the window-shutter of a dark room, a picture of the sun, and bright clouds about it, is formed on the opposite wall. This picture is obviously inverted, and also perverted, for not only are objects depicted lower the higher they are, but also objects seen to the right are depicted to the left, &c. But it will be seen unperverted (though still inverted) if it be received on a sheet of ground glass and looked at from behind. The smaller the hole (so far at least as geometrical optics is concerned) the less confused will the picture be. As the hole is made larger the illuminated portions from different sources gradually overlap; and when the hole becomes a window we have no indications of such a picture except from a body (like the sun) much brighter than the other external objects. Here the picture has ceased to be one of the sun, it is now a picture of the window. But if the wall could be placed 100 m. off, the picture would be one of the sun. To prevent this overlapping of images, and yet to admit a good deal of light, is one main object of the lens which usually forms part of the camera obscura (*q.v.*).

The formation of pictures of the sun in this way is well seen on a calm sunny day under trees, where the sunlight penetrating through small chinks forms elliptic spots on the ground. When detached clouds are drifting rapidly across the sun, we often see the shadows of the bars of the window on the walls or floor suddenly shifted by an inch or two, and for a moment very much more sharply defined. They are, in fact, shadows cast by a small portion of the sun's limb, from opposite sides alternately. Another beautiful illustration is easily obtained by cutting with a sharp knife a very small T aperture in a piece of note paper. Place this close to the eye, and an inch or so behind it place another piece of paper with a fine needle-hole in it. The light of the sky passing through the needle-hole forms a bright picture of the T on the retina. The eye perceives this picture, which gives the impression of the T much magnified, but turned upside down.

Another curious phenomenon may fitly be referred to in this connexion, viz. the phantoms which are seen when we look at two parallel sets of palisades or railings, one behind the other, or look through two parallel sides of a meat-safe formed of perforated zinc. The appearance presented is that of a magnified set of bars or apertures which appear to move rapidly as we slowly walk past. Their origin is the fact that where the bars appear nearly to coincide the apparent gaps bear the greatest ratio to the dark spaces; *i.e.* these parts of the field are the most highly illuminated. The exact determination of the appearances in any given case is a mere problem of convergents to a continued fraction. But the fact that the apparent rapidity of motion of this phantom may exceed in any ratio that of the spectator is of importance—enabling us to see how velocities, apparently of impossible magnitude, may be accounted for by the mere running along of the condition of visibility among a group of objects no one of which is moving at an extravagant rate.

SHADWELL, THOMAS (*c.* 1642–1692), English playwright and miscellaneous writer, was born about 1642, at Santon Hall, Norfolk, according to his son's account. He was educated at Bury St Edmund's School, and at Caius College, Cambridge, where he was entered in 1656. He left the university without a degree, and joined the Middle Temple. In 1668 he produced a prose comedy, *The Sullen Lovers, or the Impertinents*, based on *Les Fâcheux* of Molière, and written in avowed imitation of Ben Jonson. His best plays are *Epsom Wells* (1672), for which Sir Charles Sedley wrote a prologue, and the *Squire of Alsatia* (1688). Alsatia was the cant name for Whitefriars, then a kind of sanctuary for persons liable to arrest, and the play represents, in dialogue full of the argot of the place, the adventures of a young heir who falls into the hand of the sharpers there. For fourteen years from the production of his first comedy to his memorable encounter with Dryden, Shadwell produced a play nearly every year. These productions display a genuine hatred of shams, and a rough but honest moral purpose. They are disfigured by indecencies, but present a vivid picture of contemporary manners.

Shadwell is chiefly remembered as the unfortunate Mac Flecknoe of Dryden's satire, the "last great prophet of tautology," and the literary son and heir of Richard Flecknoe:—

> "The rest to some faint meaning make pretence,
> But Shadwell never deviates into sense."

Dryden had furnished Shadwell with a prologue to his *True Widow* (1679), and in spite of momentary differences, the two had been apparently on friendly terms. But when Dryden joined the court party, and produced *Absalom and Achitophel* and *The Medal*, Shadwell became the champion of the true-blue Protestants, and made a scurrilous attack on the poet in *The Medal of John Bayes: a Satire against Folly and Knavery* (1682). Dryden immediately retorted in *Mac Flecknoe, or a Satire on the True Blue Protestant Poet, T.S.* (1682), in which Shadwell's personalities were returned with interest. A month later he contributed to Nahum Tate's continuation of *Absalom and Achitophel* satirical portraits of Elkanah Settle as Doeg and of Shadwell as Og. In 1687 Shadwell attempted to answer these attacks in a version of the tenth satire of Juvenal. At the Whig triumph in 1688 he superseded his enemy as poet laureate and historiographer royal. He died at Chelsea on the 19th of November 1692.

His son, CHARLES SHADWELL, was the author of *The Fair Quaker of Deal* and other plays, collected and published in 1720.

A complete edition of Shadwell's works was published by his son Sir John Shadwell in 1720. His other dramatic works are—*The Royal Shepherdess* (1669), an adaptation of John Fountain's *Rewards of Virtue*; *The Humorist* (1671); *The Miser* (1672), adapted from Molière; *Psyche* (1675); *The Libertine* (1676); *The Virtuoso* (1676); *The history of Timon of Athens the Man-hater* (1678),—on this Shakespearian adaptation see O. Beber, *Shadwell's Bearbeitung des...Timon of Athens* (Rostock, 1897); *A True Widow* (1679); *The Woman Captain* (1680), revived in 1744 as *The Prodigal*; *The Lancashire Witches and Teague O'Divelly, the Irish Priest* (1682); *Bury Fair* (1689); *The Amorous Bigot, with the second part of Teague O'Divelly* (1690); *The Scowerers* (1691); and *The Volunteers, or Stockjobbers*, published posthumously (1693).

SHĀFIʻĪ [Mahommed ibn Idrīs ash-Shāfiʻī] (767–820), the founder of the Shāfiʻite school of canon law, was born in A.H. 150 (A.D. 767) of a Koreishite (Quraishite) family at Gaza or Ascalon, and was brought up by his mother in poor circumstances at Mecca. There, and especially in intercourse with the desert tribe of Hudhail, he gained a knowledge of classical Arabic and old Arabian poetry for which he was afterwards famous. About 170 he went to Medina and studied canon law (*fiqh*) under Malik ibn Anas. After the death of Malik in 179 legend takes him to Yemen, where he is involved in an ʻAlid conspiracy, carried prisoner to Bagdad, but pardoned by Hārūn al-Rashīd. He was certainly pursuing his studies, and he seems to have come to Bagdad in some such way as this and then to have studied under Ḥanifite teachers. He had not yet formulated his own system. After a journey to Egypt, however, we find him in Bagdad again, as a teacher, between 195 and 198. There he had great success and turned the tide against the Ḥanifite school. His method was to restore the sources of canon law which Abū Ḥanīfa, had destroyed by inclining too much to speculative deduction. Instead, he laid equal emphasis upon the four—Koran, tradition, analogy, and agreement. See further, under MAHOMMEDAN LAW. In 198 he went to Egypt in the train of a new governor, and this time was received as the leading orthodox authority in law of his time. There he developed and somewhat changed the details of his system, and died in 204 (A.D. 820). He was buried to the south-east of what is now Cairo, and a great dome (erected *c.* A.D. 1240) is conspicuous over his tomb.

See F. Wüstenfeld, *Schāfiʻiten*, 31 ff.; M. J. de Goeje in *ZDMG.* xlvii. 106 ff.; C. Brockelmann, *Geschichte*, i. 178 ff.; M'G. de Slane's transl. of Ibn Khallikan, ii. 569 ff., *Fihrist*, 209, Nawawi's *Biogr. Dict.* 56 ff. (D. B. Ma)

SHAFIROV, PETER PAVLOVICH, Baron (1670–1739), Russian statesman, one of the ablest coadjutors of Peter the Great, was of obscure, and in all probability of Jewish, extraction. He first made himself useful by his extraordinary knowledge of foreign languages. He was the chief translator in the Russian Foreign Office for many years, subsequently accompanying Peter on his travels. Made a baron and raised to the rank of vice-chancellor, he displayed diplomatic talents of the highest order. During the unlucky campaign of 1711, he succeeded against all expectations in concluding the peace of the Pruth (see Turkey: *History*). Peter left him in the hands of the Turks as a hostage, and on the rupture of the peace he was imprisoned in the Seven Towers. Finally, however, with the aid of the British and Dutch ambassadors, he defeated the diplomacy of Charles XII. of Sweden and his agents, and confirmed the good relations between Russia and Turkey by the treaty of Adrianople (June 5th, 1713). On the institution of the colleges or departments of state in 1718, Shafirov was appointed vice-president of the department of Foreign Affairs, and a senator. In 1723, however, he was deprived of all his offices and sentenced to death. The capital sentence was commuted on the scaffold to banishment, first to Siberia and then to Novgorod. Peculations and disorderly conduct in the senate were the offences charged against Shafirov, and with some justice. On the death of Peter, Shafirov was released from prison and commissioned to write the life of his late master. He had previously (1717), in an historical tract on the war with Charles XII., in which Peter himself collaborated, epitomized, in a high panegyric style, some of the greatest exploits of the tsar-regenerator. The successful rivalry of his supplanter, Andrei Osterman, prevented Shafirov from holding any high office during the last fourteen years of his life.

See B. M. Solovev, *History of Russia*, vols. xiii.-xvi. (Rus.) (Petersburg, 1895). (R. N. B.)

SHAFT (O. Eng., *sceaft*, from *scafan*, to shave; the word is common to Teutonic languages), any slender, smoothed rod or stick, and so first used of the body of an arrow or spear to which the head is attached; hence the word is applied to the handle of a tool, and to the pair of bars between which a horse is harnessed to a vehicle, and in machinery to connecting bars or rods conveying power from one part of a machine to another. It is also applied to an opening sunk in the ground for mining or other purposes (see Shaft-sinking). This use is probably due to the use of Ger. *Schacht*, a variant of *schaft*. In architecture the term "shaft" is applied to the body of a column between the capital and the base. In Romanesque work shafts are occasionally octagonal, and are sometimes ornamented with the zigzag or chevron, or fluted vertically or in spirals; the most beautiful examples of the latter being found in the cloisters of St John Lateran and at St Paul's outside the walls at Rome, where they are enriched with mosaics. Perhaps the earliest ornamented shafts are those of the Parthian Palace, now the mosque, at Diarbekr in Mesopotamia.

SHAFTESBURY, ANTHONY ASHLEY COOPER, 1st Earl of (1621–1683), son of Sir John Cooper of Rockbourne in Hampshire, and of Anne, the only child of Sir Anthony Ashley, Bart., and was born at Wimborne St Giles, Dorset, on the 22nd of July 1621. His parents died before he was ten years of age, and he inherited extensive estates in Hampshire, Wiltshire, Dorsetshire and Somersetshire, much reduced, however, by litigation in Chancery. He lived for some time with Sir Daniel Norton, one of his trustees, at Southwick, and upon his death in 1635 with Mr Tooker, an uncle by marriage, at Salisbury. In 1637 he went as a gentleman-commoner to Exeter College, Oxford, where he remained about a year. No record of his studies is to be found, but he has left an amusing account of his part in the wilder doings of the university life of that day, in which, in spite of his small stature, he was recognized by his fellows as their leader. At the age of eighteen, on the 25th of February 1639, he married Margaret, daughter of Lord Coventry, with whom he and his wife lived at Durham House in the Strand, and at Canonbury House in Islington. In Marcy 1640, though still a minor, he was elected for Tewkesbury, and sat in the parliament which met on the 13th of April, but appears to have taken no active part in its proceedings. In 1640 Lord Coventry died, and Cooper then lived with his brother-in-law at Dorchester House in Covent Garden. For the Long Parliament, which met on the 3rd of November 1640, he was elected for Downton in Wiltshire, but the return was disputed, and he did not take his seat—his election not being declared valid until the last days of the Rump. He was present as a spectator at the setting up of the king's standard at Nottingham on the 25th of August 1642; and in 1643 he appeared openly on Charles's side in Dorsetshire, where he raised at his own expense a regiment of foot and a troop of horse, of both of which he took the command. He was also appointed governor of Weymouth, sheriff of Dorsetshire for the king and president of the king's council of war in the county. In the beginning of January 1644, however, for reasons which are variously reported by himself and Clarendon, he resigned his governorship and commissions and went over to the parliament. He appeared on the 6th of March before the standing committee of the two Houses to explain his conduct, when he stated that he had come over because he saw danger to the Protestant religion in the king's service, and expressed his willingness to take the Covenant. In July 1644 he went to Dorsetshire on military service, and on the 3rd of August received a commission as field-marshal general. He assisted at the taking of Wareham, and shortly afterwards compounded for his estates by a fine of £500 from which, however, he was afterwards relieved by Cromwell. On the 25th of October he was made commander-in-chief in Dorsetshire, and in November he took by storm Abbotsbury, the house of Sir John Strangways—an affair in which he appears to have shown considerable personal gallantry. In December he relieved Taunton. His military service terminated at the time of the Self-denying Ordinance in 1645; he had associated himself with the Presbyterian faction, and naturally enough was not included in the New Model. For the next seven or eight years he lived in comparative privacy. He was high sheriff of Wiltshire during 1647, and displayed much vigour in this office. Upon the execution of Charles, Cooper took the Engagement, and was a commissioner to administer it in Dorsetshire. On the 25th of April 1650, he married Lady Frances Cecil, sister of the earl of Essex, his first wife having died in the previous year leaving no family. In 1651 a son was born to him, who died in childhood, and on the 16th of January 1652, another son, named after himself, who was his heir. On the 17th of January he was named on the commission for law reform, of which Hale was the chief; and on the 17th of March 1653, he was pardoned of all delinquency and thus at last made capable of sitting in parliament. He sat for Wiltshire in the Barebones parliament, of which he was a leading member, and where he supported Cromwell's views against the extreme section. He was at once appointed on the council of thirty. On the resignation of this parliament he became a member of the council of state named in the "Instrument." In the first parliament elected under this "Instrument" he sat for Wiltshire, having been elected also for Poole and Tewkesbury, and was one of the commissioners for the ejection of unworthy ministers. After the 28th of December 1654, he left the privy council, and henceforward is found with the Presbyterians and Republicans in opposition to Cromwell. His second wife had died during this year; in 1656 he married a third, who survived him, Margaret, daughter of Lord Spencer, niece of the earl of Southampton, and sister of the earl of Sunderland, who died at Newbury. By his three marriages he was thus connected with many of the leading politicians of Charles II.'s reign.

Cooper was again elected for Wiltshire for the parliament of 1656, but Cromwell refused to allow him, with many others of his opponents, to sit. He signed a letter of complaint, with sixty-five excluded members, to the speaker, as also a "Remonstrance" addressed to the people. In the parliament which met on the 20th of January 1658, he took his seat, and was active in opposition to the new constitution of the two Houses. He was also a leader of the opposition in Richard Cromwell's parliament, especially on the matter of the limitation of the power of the protector, and against the House of Lords. He was throughout these debates celebrated for the "nervous and subtle oratory" which made him so formidable in after days.

Upon the replacing of the Rump by the army, after the breaking up of Richard's parliament, Cooper endeavoured unsuccessfully to take his seat on the ground of his former disputed election for Downton. He was, however, elected on the council of state, and was the only Presbyterian in it; he was at once accused by Scot, along with Whitelocke, of corresponding with Hyde. This he solemnly denied. After the rising in Cheshire Cooper was arrested in Dorsetshire on a charge of corresponding with its leader Booth, but on the matter being investigated by the council he was unanimously acquitted. In the disputes between Lambert at the head of the military party and the Rump in union with the council of state, he supported the latter, and upon the temporary supremacy of Lambert's party worked indefatigably to restore the Rump. With Monk's commissioners he, with Haselrig, had a fruitless conference, but he assured Monk of his co-operation, and joined with eight others of the overthrown council of state in naming him commander-in-chief of the forces of England and Scotland. He was instrumental in securing the Tower for the parliament, and in obtaining the adhesion of Admiral Lawson and the fleet. Upon the restoration of the parliament on the 26th of December Cooper was one of the commissioners to command the army, and on the 2nd of January was made one of the new council of state. On the 7th of January he took his seat on his election for Downton in 1640, and was made colonel of Fleetwoods regiment of horse. He speedily secured the admission of the secluded members, having meanwhile been in continual communication with Monk, was again one of the fresh council of state, consisting entirely of friends of the Restoration, and accepted from Monk a commission to be governor of the Isle of Wight and captain of a company of foot. He now steadily pursued the design of the Restoration, but without holding any private correspondence with the king, and only on terms similar to those proposed in 1648 to Charles I. at the Isle of Wight. In the Convention parliament he sat for Wiltshire. Monk cut short these deliberations and forced on the Restoration without condition. Cooper was one of the twelve commissioners who went to Charles at Breda to invite him to return. On his journey he was upset from his carriage, and the accident caused an internal abscess which was never cured.

Cooper was at once placed on the privy council, receiving also a formal pardon for former delinquencies. His first duty was to examine the Anabaptist prisoners in the Tower. In the prolonged discussions regarding the Bill of Indemnity he was instrumental in saving the life of Haselrig, and opposed the clause compelling all officers who had served under Cromwell to refund their salaries, he himself never having had any. He showed indeed none of the avaricious temper so common among the politicians of the time. He was one of the commissioners for conducting the trials of the regicides, but was himself vehemently "fallen upon" by Prynne for having acted with Cromwell. He was named on the council of plantations and on that of trade. In the debate abolishing the court of wards he spoke, like most landed proprietors, in favour of laying the burden on the excise instead of on the land, and on the question of the restoration of the bishops carried in the interests of the court an adjournment of the debate for three months. At the coronation in April 1661 Cooper had been made a peer, as Baron Ashley of Wimborne St Giles, in express recognition of his services at the Restoration; and on the meeting of the new parliament in May he was appointed chancellor of the exchequer and under-treasurer, aided no doubt by his connexion with Southampton. He vehemently opposed the persecuting acts now passed—the Corporation Act, the Uniformity Bill, against which he is said to have spoken three hundred times, and the Militia Act. He is stated also to have influenced the king in issuing his dispensing declaration of the 26th of December 1662, and he zealously supported a bill introduced for the purpose of confirming the declaration, rising thereby in favour and influence with Charles. He was himself the author of a treatise on tolerance. He was now recognized as one of the chief opponents of Clarendon and the High Anglican policy. On the breaking out of the Dutch War in 1664 he was made treasurer of the prizes, being accountable to the king alone for all sums received or spent. He was also one of the grantees of the province of Carolina and took a leading part in its management; it was at his request that Locke in 1669 drew up a constitution for the new colony. In September 1665 the king unexpectedly paid him a visit at Wimborne. He opposed unsuccessfully the appropriation proviso introduced into the supply bill as hindering the due administration of finance, and this opposition seems to have brought about a reconciliation with Clarendon. In 1668, however, he supported a bill to appoint commissioners to examine the accounts of the Dutch War, though in the previous year he had opposed it. In accordance with his former action on all questions of religious toleration he opposed the shameful Five Mile Act of 1665. In 1667 he supported the bill for prohibiting the importation of Irish cattle, on the ground that it would lead to a great fall of rents in England. Ashley was himself a large landowner, and, moreover, was opposed to Ormonde, who would have benefited by the importation. In all other questions of this kind he shows himself far in advance of the economic fallacies of the day. His action led to an altercation with Ossory, the son of Ormonde, in which Ossory used language for which he was compelled to apologize. On the death of Southampton, Ashley was placed on the commission of the treasury, Clifford and William Coventry being his principal colleagues. He appears to have taken no part in the attempt to impeach Clarendon on a general charge of treason.

The new administration was headed by Buckingham, in whose toleration and comprehension principles Ashley shared to the full. An able paper written by him to the king in support of these principles, on the ground especially of their advantage to trade, has been preserved. He excepts, however, from toleration Roman Catholics and Fifth Monarchy men. His attention to all trade questions was close and constant; he was a member of the council of trade and plantations appointed in 1670, and was its president from 1672 to 1676. The difficulty of the succession also occupied him, and he co-operated thus early in the design of legitimizing Monmouth as a rival to James. In the intrigues which led to the infamous treaty to Dover he had no part. The treaty contained a clause by which Charles was bound to declare himself a Catholic, and with the knowledge of this Ashley, as a stanch Protestant, could not be trusted. In order to blind him and the other Protestant members of the Cabal a sham treaty was arranged in which this clause did not appear, and it was not until a considerable while afterwards that he found out that he had been duped. Under this misunderstanding he signed the sham Dover treaty on the 31st of December 1670. This treaty, however, was kept from public knowledge, and Ashley helped Charles to hoodwink parliament by signing a similar treaty on the 2nd of February 1672, which was laid before them as the only one in existence. His approval of the attempt of the Lords to alter a money bill led to the loss of the supply to Charles and to the consequent displeasure of the king. His support to the Lord Roos Act, ascribed generally to his desire to ingratiate himself with Charles, was no doubt due in part to the fact that his son had married Lord Roos's sister. So far from advising the "Stop of the Exchequer," he opposed this bad measure; the reasons which he left with the king for his opposition are extant. The responsibility rests with Clifford alone. In the other great measure of the Cabal ministry, Charles's Declaration of Indulgence, he concurred. He was now rewarded by being made earl of Shaftesbury and Baron Cooper of Pawlett by a patent dated the 23rd of April 1672. It is stated too that he was offered, but refused, the lord treasurership. On the 17th of November 1672, however, he became lord chancellor, Bridgman having been compelled to resign the seat. As chancellor he issued writs for the election of thirty-six new members to fill vacancies caused during the long recess; this, though grounded upon precedent, was open to suspicion as an attempt to fortify Charles, and was attacked by an angry House of Commons which met on the 4th of February 1673. The writs were cancelled, and the principle was established that the issuing of writs rested with the House itself. It was at the opening of parliament that Shaftesbury made his celebrated "delenda est Carthago" speech against Holland, in which he urged the Second Dutch War, on the ground of the necessity of destroying so formidable a commercial rival to England, excused the Stop of the Exchequer which he had opposed, and vindicated the Declaration of Indulgence. On the 8th of March he announced to parliament that the declaration had been cancelled, though he did his best to induce Charles to remain firm. For affixing the great seal to this declaration he was threatened with impeachment by the Commons. The Test Act was now brought forward, and Shaftesbury, who appears to have heard how he had been duped in 1670, supported it, with the object probably of thereby getting rid of Clifford. He now began to be regarded as the chief upholder of Protestantism in the ministry; he lost favour with Charles, and on Sunday, the 9th of September 1673, was dismissed from the chancellorship. Among the reasons for this dismissal is probably the fact that he opposed grants to the king's mistresses. He had been accused of vanity and ostentation in his office, but his reputation for ability and integrity as a judge was high even with his enemies.

Charles soon regretted the loss of Shaftesbury, and endeavoured, as did also Louis, to induce him to return, but in vain. He preferred now to become the great popular leader against all the measures of the court, and may be regarded as the intellectual chief of the opposition. At the meeting of parliament on the 8th of January 1674, he carried a motion for a proclamation banishing Catholics to a distance of 10 m. from London. During the whole session he organized and directed the opposition in their attacks on the king's ministers. On the 19th of May he was dismissed the privy council and ordered to leave London. He retired to Wimborne and urged upon his parliamentary followers the necessity of securing a new parliament. He was in the House of Lords, however, in 1675, when Danby brought forward his famous Non-resisting Test Bill, and headed the opposition which was carried on for seventeen days, distinguishing himself, says Burnet, more in this session than ever before. The bill was shelved, a prorogation having taken place in consequence of a quarrel between the two Houses, supposed to have been purposely got up by Shaftesbury, in which he supported the right of the Lords to hear appeal cases, even where the defendant was a member of the Lower House. Parliament was prorogued for fifteen months until the 15th of February 1677, and it was determined by the opposition to attack its existence on the ground that a prorogation for more than a year was illegal. In this matter the opposition were in the wrong, and by attacking the parliament discredited themselves. The result was that Shaftesbury, Buckingham, Wharton and Salisbury were sent to the Tower. In June Shaftesbury applied for a writ of *habeas corpus*, but could get no release until the 26th of February 1678, after his letter and three petitions to the king. Being brought before the bar of the House of Lords he made submission as to his conduct in declaring parliament dissolved by the prorogation, and in violating the Lords' privileges by bringing a *habeas corpus* in the King's Bench.

The breaking out of the Popish Terror in 1678 marks the worst part of Shaftesbury's career. That so clear-headed a man could have credited the lies of Oates and the other perjurers is beyond belief; and the manner in which he excited baseless alarms, and encouraged fanatic cruelty, for nothing but party advantage, is without excuse. On the 2nd of November he opened the great attack by proposing an address declaring the necessity for the king's dismissing James from his council. Under his advice the opposition now made an alliance with Louis whereby the French king promised to help them to ruin Danby on condition that they would compel Charles, by stopping the supplies, to make peace with France, doing thus a grave injury to Protestantism abroad for the sake of a temporary party advantage at home. Upon the refusal in November of the Lords to concur in the address of the Commons requesting the removal of the queen from court, he joined in a protest against the refusal, and was foremost in all the violent acts of the session. He urged on the bill by which Catholics were prohibited from sitting in either House of Parliament, and was bitter in his expressions of disappointment when the Commons passed a proviso excepting James, against whom the bill was especially aimed, from its operation. A new parliament met on the 6th of March 1679. Shaftesbury had meanwhile ineffectually warned the king that unless he followed his advice there would be no peace with the people. On the 25th of March he made a striking speech upon the state of the nation, especially upon the dangers to Protestantism and the misgovernment of Scotland and Ireland. He was suspected, too, of doing all in his power to bring about a revolt in Scotland. By the advice of Temple, Charles now tried the experiment of forming a new privy council in which the chief members of the opposition were included, and Shaftesbury was made president, with a salary of £4000, being also a member of the committee for foreign affairs. He did not, however, in any way change either his opinions or his action. He opposed the compelling of Protestant Nonconformists to take the oath required of Roman Catholics. That indeed, as Ranke says, which makes him memorable in English history is that he opposed the establishment of an Anglican and Royalist organization with success. The question of the succession was now again prominent, and Shaftesbury, in opposition to Halifax, committed the error, which really brought about his fall, of putting forward Monmouth as his nominee, thus alienating a large number of his supporters; he encouraged, too, the belief that this was agreeable to the king. He pressed on the Exclusion Bill with all his power, and, when that and the inquiry into the payments for secret service and the trial of the five peers, for which too he had been eager, were brought to an end by a sudden prorogation, he is reported to have declared aloud that he would have the heads of those who were the king's advisers to this course. Before the prorogation, however, he saw the invaluable Act of Habeas Corpus, which he had carried through parliament, receive the royal assent. In pursuance of his patronage of Monmouth, Shaftesbury now secured for him the command of the army sent to suppress the insurrection in Scotland, which he is supposed to have fomented. In October 1679, the circumstances which led Charles to desire to conciliate the opposition having ceased, Shaftesbury was dismissed from his presidency and from the privy council; when applied to by Sunderland to return to office he made as conditions the divorce of the queen and the exclusion of James. With nine other peers he presented a petition to the king in November, praying for the meeting of parliament, of which Charles took no notice. In April, upon the king's declaration that he was resolved to send for James from Scotland, Shaftesbury advised the popular leaders at once to leave the council, and they followed his advice. In March we find him unscrupulously eager in the prosecution of the alleged Irish Catholic plot. Upon the king's illness in May he held frequent meetings of Monmouth's friends at his house to consider how best to act for the security of the Protestant religion. On the 26th of June, accompanied by fourteen others, he presented to the grand jury of Westminster an indictment of the duke of York as a Popish recusant. In the middle of September he was seriously ill. On the 15th of November the Exclusion Bill, having passed the Commons, was brought up to the Lords, and an historic debate took place, in which Halifax and Shaftesbury were the leaders on opposite sides. The bill was thrown out, and Shaftesbury signed the protest against its rejection. The next day he urged upon the House the divorce of the queen. On the 7th of December, to his lasting dishonour, he voted for the condemnation of Lord Stafford. On the 23rd he again spoke vehemently for exclusion, and his speech was immediately printed. All opposition was, however, checked by the dissolution on the 18th of January. A new parliament was called to meet at Oxford, to avoid the influences of the city of London, where Shaftesbury had taken the greatest pains to make himself popular. Shaftesbury, with fifteen other peers, petitioned the king that it might as usual be held in the capital. He prepared instructions to be handed by constituencies to their members upon election, in which exclusion, disbanding, the limitation of the prerogative in proroguing and dissolving parliament, and security against popery and arbitrary power were insisted on. At this parliament, which lasted but a few days, he again made a personal appeal to Charles, which was curtly rejected, to permit the legitimizing of Monmouth. The king's advisers now urged him to arrest Shaftesbury; he was seized on the 2nd of July 1681, and committed to the Tower, the judges refusing his petition to be tried or admitted to bail. This refusal was twice repeated in September and October, the court hoping to obtain evidence sufficient to ensure his ruin. In October he wrote offering to retire to Carolina if he were released. On the 24th of November he was indicted for high treason at the Old Bailey, the chief ground being a paper of association for the defence of the Protestant religion, which, though among his papers, was not in his handwriting; but the grand jury ignored the bill. He was released on bail on the 1st of December. In 1682, however, Charles secured the appointment of Tory sheriffs for London; and, as the juries were chosen by the sheriffs, Shaftesbury felt that he was no longer safe from the vengeance of the court. Failing health and the disappointment of his political plans led him into violent courses. He appears to have entered into consultation of a treasonable kind with Monmouth and others; he himself had, he declared, ten thousand brisk boys in London ready to rise at his bidding. For some weeks he was concealed in the city and in Wapping; but, finding the schemes for a rising hang fire, he went to Harwich, disguised as a Presbyterian minister, and after a week's delay, during which he was in imminent risk of discovery, if indeed, as is probable, his escape was not winked at by the government, he sailed to Holland on the 28th of November 1682, and reached Amsterdam in the beginning of December. Here he was welcomed with the jest, referring to his famous speech against the Dutch, "nondum deleta Carthago." He was made a citizen of Amsterdam, but died there of gout in the stomach on the 21st of January 1683. His body was sent in February to Poole, in Dorset, and was buried at Wimborne St Giles.

Few politicians have been the mark of such abuse as Shaftesbury. Dryden, while compelled to honour him as an upright judge, overwhelmed his memory with scathing, if venal, satire; and Dryden's satire has been accepted as truth by later historians. Macaulay in especial exerted all his art, though in contradiction of probability and fact, to deepen still further the shade which rests upon his reputation. Christie, on the other hand, in possession of later sources of information, and with more honest purpose, did much to rehabilitate him. Occasionally, however, he appears to hold a brief for the defence, and, though the picture is comparatively true, this *Life* (1871) should be read with caution. Finally, in his monograph (1886) in the series of "English Worthies," H. D. Traill professes to hold the scales equally. He makes an interesting addition to our conception of Shaftesbury's place in English politics, by insisting on his position as the first great party leader in the modern sense, and as the founder of modern parliamentary oratory. In other respects his book is derived almost entirely from Christie. See also the present writer's article in the *Dict. Nat. Biog.* Much of Shaftesbury's career, increasingly so as it came near its close, is incapable of defence; but it has escaped most of his critics that his life up to the Restoration, apparently full of inconsistencies, was evidently guided by one leading principle, the determination to uphold the supremacy of parliament, a principle which, however obscured by self-interest, appears also to have underlain his whole political career. He was, too, ever the friend of religious freedom and of an enlightened policy in all trade questions. And, above all, it should not be forgotten, in justice to Shaftesbury's memory, that "during his long political career, in an age of general corruption, he was ever incorrupt, and never grasped either money or land." (O. A.)

SHAFTESBURY, ANTHONY ASHLEY COOPER, 3RD EARL OF (1671–1713), was born at Exeter House in London on the 26th of February 1670/1. He was grandson of the first and son of the second earl. His mother was Lady Dorothy Manners, daughter of John, earl of Rutland. According to a curious story, told by the third earl himself, the marriage between his father and mother was negotiated by John Locke, who was a trusted friend of the first earl. The second Lord Shaftesbury appears to have been a poor creature, both physically and mentally. At the age of three his son was made over to the formal guardianship of his grandfather. Locke, who in his capacity of medical attendant to the Ashley household had already assisted in bringing the boy into the world, though not his instructor, was entrusted with the superintendence of his education. This was conducted according to the principles enunciated in Locke's *Thoughts concerning Education*, and the method of teaching Latin and Greek conversationally was pursued with such success by his instructress, Mrs Elizabeth Birch, that at the age of eleven, it is said, Ashley could read both languages with ease. In November 1683, some months after the death of the first earl, his father entered him at Winchester as a warden's boarder. Being shy and constantly taunted with the opinions and fate of his grandfather, he appears to have been rendered miserable by his schoolfellows, and to have left Winchester in 1686 for a course of foreign travel. He was brought thus into contact with those artistic and classical associations which exercised so marked an influence on his character and opinions. On his travels he did not, we are told by the fourth earl, "greatly seek the conversation of other English young gentlemen on their travels," but rather that of their tutors, with whom he could converse on congenial topics.

In 1689, the year after the Revolution, Lord Ashley returned to England, and for nearly five years he appears to have led a quiet and studious life. There can be no doubt that the greater part of his attention was directed to the perusal of classical authors, and to the attempt to realize the true spirit of classical antiquity. He had no intention, however, of becoming a recluse, or of permanently holding himself aloof from public life. Accordingly he became a candidate for the borough of Poole, and was returned the 21st of May 1695. He soon distinguished himself by a speech in support of the Bill for Regulating Trials in Cases of Treason, one provision of which was that a person indicated for treason or misprision of treason should be allowed the assistance of counsel. But, though a Whig, alike by descent, by education and by conviction, Ashley could by no means be depended on to give a party vote; he was always ready to support any propositions, from whatever quarter they came, that appeared to him to promote the liberty of the subject and the independence of parliament. Unfortunately, his health was so treacherous that, on the dissolution of July 1698, he was obliged to retire from parliamentary life. He suffered much from asthma, a complaint which was aggravated by the London smoke.

Lord Ashley now retired into Holland, where he became acquainted with Le Clerc, Bayle, Benjamin Furly, the English Quaker merchant, at whose house Locke had resided during his stay at Rotterdam, and probably Limborch and the rest of the literary circle of which Locke had been a cherished and honoured member nine or ten years before. To Lord Ashley this society was probably far more congenial than his surroundings in England. Unrestrained conversation on the topics which most interested him—philosophy, politics, morals, religion—was at this time to be had in Holland with less danger and in greater abundance than in any other country in the world. To the period of this sojourn in Holland must probably be referred the surreptitious impression or publication of an imperfect edition of the *Inquiry concerning Virtue*, from a rough draught, sketched when he was only twenty years of age. This liberty was taken, during his absence, by Toland.

After an absence of over a twelvemonth, Ashley returned to England, and soon succeeded his father as earl of Shaftesbury. He took an active part, on the Whig side, in the general election of 1700–1701, and again, with more success, in that of the autumn of 1701. It is said that William III. showed his appreciation of Shaftesbury's services on this latter occasion by offering him a secretaryship of state, which, however, his declining health compelled him to decline. Had the king's life continued, Shaftesbury's influence at court would probably have been considerable. After the first few weeks of Anne's reign, Shaftesbury, who had been deprived of the vice-admiralty of Dorset, returned to his retired life, but his letters to Furly show that he retained a keen interest in politics. In August 1703 he again settled in Holland, in the air of which he seems, like Locke, to have had great faith. At Rotterdam he lived, he says in a letter to his steward Wheelock, at the rate of less than £200 a year, and yet had much "to dispose of and spend beyond convenient living." He returned to England, much improved in health, in August 1704. But, though he had received immediate benefit from his stay abroad, symptoms of consumption were constantly alarming him, and he gradually became a confirmed invalid. His occupations were now almost exclusively literary, and from this time forward he was probably engaged in writing, completing or revising the treatises which were afterwards included in the *Characteristics*. He continued, however, to take a warm interest in politics, both home and foreign, and especially in the war against France, of which he was an enthusiastic supporter.

Shaftesbury was nearly forty before he married, and even then he appears to have taken this step at the urgent instigation of his friends, mainly to supply a successor to the title. The object of his choice (or rather of his second choice, for an earlier project of marriage had shortly before fallen through) was a Miss Jane Ewer, the daughter of a gentleman in Hertfordshire. The marriage took place in the autumn of 1709, and on February 9, 1710/1, was born at his house at Reigate, in Surrey, his only child and heir, the fourth earl, to whose manuscript accounts we are in great part indebted for the details of his father's life. The match appears to have been happy, though Shaftesbury had little sentiment on the subject of married life.

With the exception of a *Preface to the Sermons of Dr Whichcote*, one of the Cambridge Platonists or latitudinarians, published in 1698, Shaftesbury appears to have printed nothing himself till 1708. About this time the French prophets, Camisards (*q.v.*), as they were called, attracted much attention by their extravagances and follies. Various repressive remedies were proposed, but Shaftesbury maintained that fanaticism was best encountered by "raillery" and "good-humour." In support of this view he wrote a letter *Concerning Enthusiasm* to Lord Somers, dated September 1707, which was published anonymously in the following year, and provoked several replies. In May 1709 he returned to the subject, and printed another letter, entitled *Sensus Communis, an Essay on the Freedom of Wit and Humour*. In the same year he also published *The Moralists, a Philosophical Rhapsody*, and in the following year *Soliloquy, or Advice to an Author*. None of these pieces seems to have been printed either with his name or his initials. In 1711 appeared the *Characteristics of Men, Manners, Opinions, Times*, in three volumes, also without any name or initials on the title-page, and without even the name of a printer. These volumes contain in addition to the four treatises already mentioned, *Miscellaneous Reflections*, now first printed, and the *Inquiry concerning Virtue or Merit*, described as "formerly printed from an imperfect copy, now corrected and published intire," and as "printed first in the year 1699."

The declining state of Shaftesbury's health rendered it necessary for him to seek a warmer climate, and in July 1711 he set out for Italy. He settled at Naples in November, and lived there considerably over a year. His principal occupation at this time must have consisted in preparing for the press a second edition of the *Characteristics*, which appeared in 1713, soon after his death. The copy, carefully corrected in his own handwriting, is preserved in the British Museum. He was also engaged, during his stay at Naples, in writing the little treatise (afterwards included in the *Characteristics*) entitled *A Notion of the Historical Draught or Tablature of the Judgment of Hercules*, and the letter concerning *Design*. A little before his death he had also formed a scheme of writing a Discourse on the Arts of Painting, Sculpture, Etching, &c., but when he died he had made but little progress with it. "Medals, and pictures, and antiquities," he writes to Furly, "are our chief entertainments here." His conversation was with men of art and science, "the virtuosi of this place."

The events preceding the peace of Utrecht, which he regarded as preparing the way for a base desertion of our allies, greatly troubled the last months of Shaftesbury's life. He did not, however, live to see the actual conclusion of the treaty (March 31, 1713), as he died the month before, February 4, 1712/3. He had not completed his forty-second year. His body was brought back by sea to England and buried at St Giles's, the family seat in Dorsetshire. His only son, Anthony Ashley, succeeded him as 4th earl, and his great-grandson was the famous philanthropist, the 7th earl.

Shaftesbury's amiability of character seems to have been one of his principal characteristics. Like Locke he had a peculiar pleasure in bringing forward young men. Among these may be especially mentioned Michael Ainsworth, a native of Wimborne St Giles, the young man who was the recipient of the *Letters* addressed to a student at the university, and was maintained by Shaftesbury at University College, Oxford. The interest which Shaftesbury took in his studies, and the desire that he should be specially fitted for the profession which he had selected, that of a clergyman of the Church of England, are marked features of the letters. Other protegés were Crell, a young Pole, the two young Furlys and Harry Wilkinson, a boy who was sent into Furly's office at Rotterdam, and to whom several of the letters still extant in the Record Office are addressed.

In the popular mind, Shaftesbury is generally regarded as a writer hostile to religion. But, however short his orthodoxy might fall if tried by the standards of any particular church, his temperament was pre-eminently religious. This fact is shown in his letters. The belief in a God, all-wise, all-just and all-merciful, governing the world providentially for the best, pervades all his works, his correspondence and his life. Nor had he any wish to undermine established beliefs, except where he conceived that they conflicted with a truer religion and a purer morality.

To the public ordinances of the church he scrupulously conformed. But, unfortunately, there were many things both in the teaching and the practice of the ecclesiastics of that day which were calculated to repel men of sober judgment and high principle. These evil tendencies in the popular presentation of Christianity undoubtedly begot in Shaftesbury's mind a certain amount of repugnance and contempt to some of the doctrines of Christianity itself; and, cultivating, almost of set purpose, his sense of the ridiculous, he was too apt to assume towards such doctrines and their teachers a tone of raillery.

But, whatever might be Shaftesbury's speculative opinions or his mode of expressing them, all witnesses bear testimony to the elevation and purity of his life and aims. As an earnest student, and ardent lover of liberty, an enthusiast in the cause of virtue, and a man of unblemished life and untiring beneficence, Shaftesbury probably had no superior in his generation. His character and pursuits are the more remarkable, considering the rank of life in which he was born and the circumstances under which he was brought up. In many respects he reminds us of the imperial philosopher Marcus Aurelius, whose works he studied with avidity, and whose influence is stamped upon his own productions.

Most of Shaftesbury's writings have been already mentioned. In addition to these there have been published fourteen letters from Shaftesbury to Molesworth, edited by Toland in 1721; some letters to Benjamin Furly, his sons, and his clerk Harry Wilkinson, included in a volume entitled *Original Letters of Locke, Sidney and Shaftesbury*, which was published by Mr T. Forster in 1830, and again in an enlarged form in 1847; three letters, written respectively to Stringer, Lord Oxford and Lord Godolphin, which appeared, for the first time, in the *General Dictionary*; and lastly a letter to Le Clerc, in his recollections of Locke, first published in *Notes and Queries*, Feb. 8, 1851. The *Letters to a Young Man at the University* (Michael Ainsworth), already mentioned, were first published in 1716. The Letter on Design was first published in the edition of the *Characteristics* issued in 1732. Besides the published writings, there are several memoranda, letters, rough drafts, &c., in the Shaftesbury papers in the Record Office.

Shaftesbury took great pains in the elaboration of his style, and he succeeded so far as to make his meaning transparent. The thought is always clear. But, on the other hand, he did not equally succeed in attaining elegance, an object at which he seems equally to have aimed. There is a curious affectation about his style—a falsetto note—which, notwithstanding all his efforts to please, is often irritating to the reader. Its main characteristic is perhaps best hit off by Charles Lamb when he calls it "genteel." He poses too much as a fine gentleman, and is so anxious not to be taken for a pedant of the vulgar scholastic kind that he falls into the hardly more attractive pedantry of the aesthete and *virtuoso*. But he is easily read and understood. Hence, probably, the wide popularity which his works enjoyed in the 18th century; and hence the agreeable feeling with which, notwithstanding all their false taste and their tiresome digressions, they impress the modern reader.

Shaftesbury's philosophical importance (see ETHICS) is due mainly to his ethical speculations, in which his motive was primarily the refutation of Hobbes's egoistic doctrine. By the method of empirical psychology, he examined man first as a unit in himself and secondly in his wider relations to the larger units of society and the universe of mankind. His great principle was that of Harmony or Balance, and he based it on the general ground of good taste or feeling as opposed to the method of reason. (1) In the first place man as an individual is a complex of appetites, passions, affections, more or less perfectly controlled by the central reason. In the moral man these factors are duly balanced. "Whoever," he says, "is in the least versed in this moral kind of architecture will find the inward fabric so adjusted, . . . that the barely extending of a single passion too far or the continuance . . . of it too long, is able to bring irrecoverable ruin and misery" (*Inquiry concerning Virtue or Merit*, Bk. II. ii. 1). (2) As a social being, man is part of a greater harmony, and, in order that he may contribute to the happiness of the whole, he must order his extra-regarding activities so that they shall not clash with his environs. Only when he has regulated his internal and his social relations by this ideal can he be regarded as truly moral. The egoist and the altruist are both imperfect. In the ripe perfection of humanity, the two impulses will be perfectly adjusted. Thus, by the criterion of harmony, Shaftesbury refutes Hobbes, and deduces the virtue of benevolence as indispensable to morality. So also he has drawn a close parallel between the moral and the aesthetic criteria. Just as there is a faculty which apprehends beauty in the sphere of art, so there is in the sphere of ethics a faculty which determines the value of actions. This faculty he described (for the first time in English thought) as the Moral Sense (see HUTCHESON) or Conscience (cf. BUTLER). In its essence, it is primarily emotional and non-reflective; in process of development it becomes rationalized by education and use. The emotional and the rational elements in the "moral sense" Shaftesbury did not fully analyse (see HUME).

From this principle, it follows (1) that the distinction between right and wrong is part of the constitution of human nature; (2) that morality stands apart from theology, and the moral qualities of actions are determined apart from the arbitrary will of God; (3) that the ultimate test of an action is its tendency to promote the general harmony or welfare; (4) that appetite and reason concur in the determination of action; and (5) that the moralist is not concerned to solve the problem of freewill and determinism. From these results we see that Shaftesbury, opposed to Hobbes and Locke, is in close agreement with Hutcheson (*q.v.*), and that he is ultimately a deeply religious thinker, inasmuch as he discards the moral sanction of public opinion, the terrors of future punishment, the authority of the civil authority, as the main incentives to goodness, and substitutes the voice of conscience and the love of God. These two alone move men to aim at perfect harmony for its own sake in the man and in the universe.

Shaftesbury's philosophical activity was confined to ethics, aesthetics and religion. For metaphysics, properly so called, and even psychology, except so far as it afforded a basis for ethics, he evidently had no taste. Logic he probably despised as merely an instrument of pedants—a judgment for which, in his day, and especially at the universities, there was only too much ground.

The main object of the *Moralists* is to propound a system of natural theology, and to vindicate, so far as natural religion is concerned, the ways of God to man. The articles of Shaftesbury's religious creed were few and simple, but these he entertained with a conviction amounting to enthusiasm. They may briefly be summed up as a belief in one God whose most characteristic attribute is universal benevolence, in the moral government of the universe, and in a future state of man making up for the imperfections and repairing the inequalities of the present life. Shaftesbury is emphatically an optimist, but there is a passage in the *Moralists* (pt. ii. sect. 4) which would lead us to suppose that he regarded matter as an indifferent principle, coexistent and coeternal with God, limiting His operations, and the cause of the evil and imperfection which, notwithstanding the benevolence of the Creator, is still to be found in His work. If this view of his optimism be correct, Shaftesbury, as Mill says of Leibnitz, must be regarded as maintaining, not that this is the best of all imaginable but only of all possible worlds. This brief notice of Shaftesbury's scheme of natural religion would be conspicuously imperfect unless it were added that it is popularized in Pope's *Essay on Man*, several lines of which, especially of the first epistle, are simply statements from the *Moralists* done into verse. Whether, however, these were taken immediately by Pope from Shaftesbury, or whether they came to him through the papers which Bolingbroke had prepared for his use, we have no means of determining.

The influence of Shaftesbury's writings was considerable both at home and abroad. His ethical system was reproduced, though in a more precise and philosophical form, by Hutcheson, and from him descended, with certain variations, to Hume and Adam Smith. Nor was it without its effect even on the speculations of Butler. Of the so-called deists Shaftesbury was probably the most important, as he was certainly the most plausible and the most respectable. No sooner had the *Characteristics* appeared than they were welcomed, in terms of warm commendation, by Le Clerc and Leibnitz. In 1745 Diderot adapted or reproduced the *Inquiry concerning Virtue* in what was afterwards known as his *Essai sur le Mérite et la Vertu*. In 1769 a French translation of the whole of Shaftesbury's works, including the *Letters*, was published at Geneva. Translations of separate treatises into German began to be made in 1738, and in 1776–1779 there appeared a complete German translation of the *Characteristics*. Hermann Hettner says that not only Leibnitz, Voltaire and Diderot, but Lessing, Mendelssohn, Wieland and Herder, drew the most stimulating nutriment from Shaftesbury. "His charms," he adds, "are ever fresh. A new-born Hellenism, or divine cultus of beauty presented itself before his inspired soul." Herder is especially eulogistic. In the *Adrastea* he pronounces the *Moralists* to be a composition in form well-nigh worthy of Grecian antiquity, and in its contents almost superior to it. The interest felt by German literary men in Shaftesbury was revived by the publication of two excellent monographs, one dealing with him mainly from the theological side by Dr Gideon Spicker (Freiburg in Baden, 1872), the other dealing with him mainly from the philosophical side by Dr Georg von Gizycki (Leipzig, 1876). (T. F.; J. M. M.)

AUTHORITIES.—In Dr Thomas Fowler's monograph on Shaftesbury and Hutcheson in the series of "English philosophers" (1882) he was able largely to supplement the printed materials for the Life by extracts from the Shaftesbury papers in the Record Office. These include, besides many letters and memoranda, two Lives of him, composed by his son, the fourth earl, one of which is evidently the original, though it is by no means always closely followed, of the Life contributed by Dr Birch to the *General Dictionary*. For a description and criticism of Shaftesbury's philosophy reference may also be made to James Mackintosh's *Progress of Ethical Philosophy*, W. Whewell's *History of Moral Philosophy in England*, Jouffroy's *Introduction to Ethics* (Channing's translation), Sir Leslie Stephen's *English Thought in the Eighteenth Century*, Martineau's *Types of Ethical Theory*, Windelband's *History of Philosophy* (Eng. trans., 1893); W. M. Hatch's unfinished edition with appendices of the *Characteristics* (1870); J. M. Robertson's edition of the *Characteristics* (1900); B. Rand's *Life* (1900). For his relation to the religious and theological controversies of his day, see, in addition to some of the above works, J. Leland, *View of the Principal Deistical Writers*, V. Lechler, *Geschichte des Englischen Deismus*, J. Hunt, *Religious Thought in England*, C. J. Abbey and J. H. Overton, *English Church in the Eighteenth Century* and A. S. Farrar's *Bampton Lectures*; G. Zart, *Einfluss der englischen Philosophen seit Bacon auf die deutsche Philosophie des 18ten Jahrhunderts* (Berlin, 1881).

SHAFTESBURY, ANTHONY ASHLEY COOPER, 7TH EARL OF (1801–1885), son of Cropley, 6th earl (a younger brother of the 5th earl; succeeded 1811), and Anne, daughter of the 3rd duke of Marlborough, was born on the 28th of April 1801. He was educated at Harrow and Christ Church, Oxford, where he obtained a first class in classics in 1822, and graduated M.A. in 1832. In 1841 he received from his university the degree of D.C.L. He entered parliament as member for the pocket borough of Woodstock in 1826; in 1830 he was returned for Dorchester; from 1831 till February 1846 he represented the county of Dorset; and he was member for Bath from 1847 till (having previously borne the courtesy title Lord Ashley) he succeeded his father as earl in 1851. Although giving a general support to the Conservatives, his parliamentary conduct was greatly modified by his intense interest in the improvement of the social condition of the working classes, his efforts in behalf of whom have made his name a household word. He opposed the Reform Bill of 1832, but was a supporter of Catholic emancipation, and his objection to the continuance of resistance to the abolition of the Corn Laws led him to resign his seat for Dorset in 1846. In parliament his name, more than any other, is associated with the new factory legislation. He was a lord of the admiralty under Sir Robert Peel (1834–1835), but on being invited to join Peel's administration in 1841 refused, having been unable to obtain Peel's support for the Ten Hours' Bill. Chiefly by his persistent efforts a Ten Hours' Bill was carried in 1847, but its operation was impeded by legal difficulties, which were only removed by successive Acts, instigated chiefly by him, until legislation reached a final stage in the Factory Act of 1874. The part which he took in the legislation bearing on coal mines was equally prominent. His efforts in behalf of the welfare of the working classes were guided by personal knowledge. Thus in 1846, after the resignation of his seat for Dorset, he explored the slums of the metropolis, and not only gave a new impulse to the movement for the establishment of ragged schools, but was able to make it more widely beneficial. For forty years he was president of the Ragged School Union. He was also one of the principal founders of reformatory and refuge unions, young men's Christian associations and working men's institutes. He took an active interest in foreign missions, and was president of several of the most important philanthropic and religious societies of London. He died on the 1st of October 1885. By his marriage (1830) to Lady Emily (d. 1872), daughter of the 5th earl Cowper, he left a large family, and was succeeded by his eldest son Anthony, who committed suicide in 1886, his son (b. 1869) becoming 9th earl.

See also Hodder's *Life* (1886).

SHAFTESBURY, a market town and municipal borough in the northern parliamentary division of Dorsetshire, England, 103 m. W.S.W. from London by the London & South-Western railway (Semley station). Pop. (1901) 2027. It lies high on a hill above a rich agricultural district. The church of St Peter is Perpendicular; those of Holy Trinity and St James are in the main modern reconstructions. The borough is under a mayor, 4 aldermen and 12 councillors. Area 157 acres.

Although there are traces of both British and Roman occupation in the immediate neighbourhood, the site of Shaftesbury (Cær Palladur, Cær Septon, Seaftonia, Sceafstesbyrig, Shafton) was probably first occupied in Saxon times. Matthew Paris speaks of its foundation by the mythical king Rudhudibras, while Asser ascribes it to Alfred, who made his daughter Ethelgeofu the first abbess. It is probable that a small religious house had existed here before the time of Alfred, and that it and the town were destroyed by the Danes, being both rebuilt about 888. In 980 Dunstan brought St Edward's body here from Wareham for burial, and here Canute died in 1035. Shaftesbury was a borough containing 104 houses in the king's demesne during the reign of Edward the Confessor; in 1086, 38 houses had been destroyed, but it was still the seat of a mint with three mint-masters. In the manor of the abbess of Shaftesbury were 111 houses and 151 burgesses; here 42 houses had been totally destroyed since St Edward's reign. In 1280 the abbess obtained the royal manor at an annual fee-farm rent of £12 and remained the sole mistress of the borough until it passed at the dissolution of the monasteries to Sir Thomas Arundel, after whose execution it was granted about 1552 to William Herbert, earl of Pembroke. In 1252 the burgesses received their first charter from Henry III. This granted that in all eyres the justices itinerant should come to Shaftesbury and that the burgesses should not answer for aught without the town and might choose for themselves two coroners annually. The reeve of the borough is mentioned in 1313–1317. The office of mayor was created between the years 1350–1352, and an inquisition of 1392 records that the mayor held a court of pie-powder and governed the town in the absence of the steward. The seal of the commonalty is extant for 1350, and that of the mayoralty first occurs in 1428. By 1471 a general asembly of burgesses had acquired power to take part in elections. There is no evidence that Elizabeth granted Shaftesbury a charter, as has been asserted, but she confiscated the common lands in 1585, the town only recovering them by purchase. This probably led to a charter of incorporation being obtained from James I. in 1604. A new charter was granted to the town in 1684, but without the surrender of the old charter confirmed by Charles II. in 1665. Shaftesbury returned two members to parliament from 1294 to 1832, when the representation was reduced to one, and it was lost in 1885. Leland speaks of Shaftesbury as a great market town, and it possessed a market in the time of Edward I. The Martinmas fair was granted in 1604. In the 17th century worsted, buttons and leather were manufactured, but these industries have disappeared.

See Charles Hubert Mayo, *The Municipal Records of the Borough of Shaftesbury* (Sherborne, 1889).

SHAFT-SINKING, an important operation in mining for reaching and working mineral deposits situated at a depth below the surface, whenever the topography does not admit of driving adits or tunnels. Shafts are often sunk also in connexion with certain civil engineering works, *e.g.* at intervals along the line of a railway tunnel, for starting intermediate headings, thus securing more points of attack than if the entire work were carried on from the end headings only. Sundry modifications of shaft-sinking are adopted in excavating for deep foundations of heavy buildings, bridge piers and other engineering structures.

If in solid rock, carrying but little water, shaft-sinking is a comparatively simple operation. But when much water is encountered or the formation penetrated comprises unstable, watery strata, special forms of lining become necessary and the work is slow and expensive. Mine shafts are often very deep; notably in the Witwatersrand, South Africa; the Michigan copper district; at Bendigo, Australia; and in certain parts of Europe. Many vertical shafts exceed 4000 ft. in depth, and at least two—the Whiting shaft, of the Calumet and Hecla mine and shaft No. 3 of the Tamarack mine (both in Michigan)—are over 5000 ft. deep. The last named at the beginning of 1907 was about 5200 ft., and was then the deepest in the world. Several inclined shafts, in the same district, approximate 6000 ft. in length.

Shape of Shafts.—In Europe shafts are generally cylindrical, sometimes of elliptical cross-section, and are lined with masonry, concrete, cast iron or steel; in the United States and elsewhere throughout the mining regions of the world, rectangular cross-sections are the rule for sinking in rock, the shaft walls being supported by timbering, occasionally by steel lining. For sinking in loose, water-bearing soils, the cross-section is almost invariably cylindrical, as this form best resists pressure tending to cause crushing or caving of the shaft walls. The European practice of sinking cylindrical shafts even in rock is based mainly on four considerations:—(1) custom; (2) high cost of timber; (3) apart from questions of first cost, a cylindrical shaft, lined with masonry or iron, is strong and permanent, and its cost of maintenance low; (4) more shafts in difficult formations have been sunk in Europe than elsewhere. The cheaper timber-lined, rectangular shaft, however, is generally appropriate under normal conditions in rocky strata, in view of the temporary character of mining operations. Vertical shafts may be either rectangular or cylindrical; when inclined they are always rectangular.

The primary purpose of mine shafts is to act as hoisting- and travelling-ways; incidentally they serve for ventilation, for pumping and for transmitting power underground by steam, compressed air or other means. Rectangular shafts are usually divided longitudinally into compartments. One or more of these are for the cages or skips, which run in guides bolted to the shaft timbering (see Mining). Another is generally provided for a ladder- and pipe-way and for ventilation. When much water is encountered a separate pump compartment is desirable. Cylindrical shafts may be similarly divided by subsidiary timbering, though in many timbering is omitted and the hoisting cages are guided by wire ropes stretched from top to bottom.

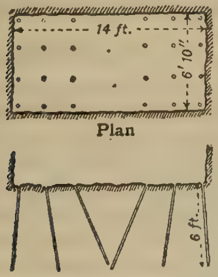
Dimensions.—The cross-sectional area of shafts depends mainly on the size of the cages or skips—*i.e.* on the hoisting loads. Small rectangular shafts of one or two compartments measure inside of timbers, say 4 by 6 ft. up to 7 by 12 ft.; larger shafts of three compartments, from 5 by 12 ft. up to 8 or 10 ft. by 20 ft. For four- or five-compartment shafts, sometimes required for large scale work, as in the deep-level mines of the Witwatersrand, the inside dimensions range from 6 by 20 ft. to 6 or 8 by 30 ft., and for some of the Pennsylvania colliery shafts, up to 13 by 52 ft. Cylindrical shafts rarely have more than two hoisting compartments and are commonly from 10 to 16 ft., sometimes 20 or 21 ft. diameter, the segmental areas surrounding the hoisting-ways being utilized for ventilation, piping, &c.

Sinking in Rock.—If the rock be overlaid by loose soil carrying little water, excavation is begun by pick and shovel, and after the rock is reached it is continued by drilling and blasting (see Blasting). The sinking plant, usually temporary, comprises a small hoist and boiler, several buckets or sometimes a skip, one or more sinking pumps, according to the quantity of water, occasionally a small ventilating fan, and a timber derrick or head-frame over the shaft mouth, with appliances for dumping the buckets, handling the rock and safe-guarding the men in the shaft against falling objects. In some circumstances a portion of the permanent mine plant is erected for sinking. The choice between hand and machine drilling depends chiefly on the kind of rock and the size and depth of shaft. For very hard rock or when rapid work is desired, machine drilling is advisable, a compressor and additional boiler capacity being then required. Remarkable speeds, however, have been made by hand-sinking in some of the deep vertical shafts on the Rand, the world's record being that of the Howard shaft, sunk by hand labour 203 ft. in one month. But such speeds are attainable only in dry, or nearly dry, ground, at a high cost per foot and by crowding as many men into the shaft as possible, both for drilling and loading away the blasted rock. The conditions being the same, inclined shafts closely approaching the vertical can be put down about as fast as vertical shafts; but for inclinations between say 75° and 30° to the horizontal, inclines are generally slower on account of the greater inconvenience of carrying on the work, both of excavation and timbering. Very flat shafts, on the other hand, can be sunk at speeds little less than for driving tunnels, unless there is much water. The highest speed on record for a very flat incline (10°) is 267 ft. in one month.

As a rule, the speed attained in sinking depends less on the drilling time per round of holes than on the time required to handle and hoist out the rock; hence the speed generally diminishes with increase of depth. Furthermore, omitting shafts of small area, the cost per foot of depth does not increase greatly with the cross-sectional dimensions. For the same rock the rate of advance in wet formations is always much slower than in dry and the cost greater.

The work of sinking in rock is carried on as follows. A round of holes is drilled, usually from 3 to 4 ft. deep if by hand, or from 5 to 8 or 9 ft. if by machine drilling (see BLASTING). A common mode of arranging machine drill holes is shown in plan and section in fig. 1. The holes are charged with dynamite and fired by fuze or electricity—in deep shafts preferably by electricity, as the men may have to be hoisted a long distance to reach a place of safety. After the smoke has cleared away (which may be hastened by sprays or by turning on the compressed air if machine drills are used), the work of hoisting out the broken rock is begun and drilling resumed as soon as possible. For shafts not over 6 or 8 ft. wide, machine drills are usually mounted on horizontal bars stretching across from wall to wall, or, in wider or cylindrical shafts, on tripods or special sinking-frames. In shafts of small area, or deep shafts which are timbered during sinking, the hoisting buckets must be guided to prevent them from striking against the sides. Small quantities of water are bailed into the buckets; when the inflow is too great to be so disposed of, a sinking pump is employed (see MINING).

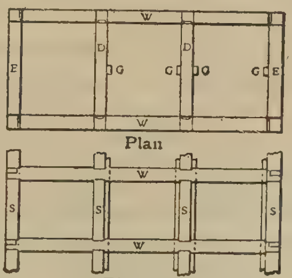
Shaft Timbering.—In sinking rectangular vertical shafts under normal conditions the excavation through the surface soil is commonly lined with cribbing, inside of which a concrete curb is sometimes built to dam out the surface water. After reaching rock the lining is generally composed of horizontal sets of 8 by 8 in. to 12 by 12 in. squared timber wedged against the walls, with smaller pieces, or planking, called "lagging," placed behind them, to prevent portions of the walls from falling away. In firm rock lagging may be omitted. Each set consists of (fig. 2) two long timbers (wall-plates) W, W, two shorter pieces (end plates) E,E, and usually one or more cross pieces (dividers or buntons) D,D, to form the compartments, strengthen the sets and support the cage guides, G,G. The sets are from 4 to 6 ft. apart, with vertical posts (studdles) S,S, between them. At intervals of say 80 to 120 ft., longer timbers ("bearers") are notched into the walls, under a set, to prevent displacement of the lining as a whole. A series of shaft sets, with their posts, are either built up from a bearing-set, or suspended from the latter by hanger-bolts. When the rock is firm, a considerable depth of shaft may be sunk and then timbered; generally, however, it is safer to put in a few sets at a time as sinking advances, the lowermost set being always far enough from the bottom to prevent it from being injured by the blasting. Inclined shafts in solid ground are often timbered as described above, though sometimes merely by setting longitudinal rows of posts, for supporting the roof and dividing the shaft into compartments.



Plan

Longitudinal Section

Fig. 1.



Plan

Elevation

FIG. 2.

Lining for Cylindrical Shafts in Rock.—Wooden linings are occasionally put in small shafts, or for temporary support, before the permanent lining is built, but a cylindrical shaft of any importance is lined with masonry or iron. Masonry linings are generally built in sections, as the sinking advances, each section being based on a walling-crib AB, CD, (fig. 3). Specially moulded tapered bricks are convenient, shaped to conform with the radius of the shaft. Concrete may be similarly moulded into large blocks, often weighing 1200 to 1600 lb each. The thickness of the walling depends on the depth of shaft and pressure anticipated; it is usually from 13 in. to 2 ft., laid in cement mortar. Such linings, while not entirely water-tight, will shut out much of the water present in the surrounding rock.

Iron lining, or "tubbing," is employed when the inflow of water is rather large. It is usually composed of cast iron flanged rings, each cast in a single piece for shafts of small diameter, or in segments bolted together for large diameters. To permit the rings to adjust themselves to the pressure, the horizontal joints are rarely bolted; they are packed with sheet-lead or thin strips of dry pine, any leaks appearing subsequently being stopped with wedges. Though preferably of cast iron, tubbing is occasionally built of steel plate rings, stiffened by angles or channels riveted to them. The irregular annular space between the tubbing and rock-walls is afterwards filled with concrete or cement grouting. The lowermost tubbing ring is based upon a "wedging-crib." This is a heavy cast iron ring, composed of segments bolted together, and set on a projecting shelf of rock, carefully dressed down. The space behind the crib is driven full of wooden wedges, which expand on becoming water-soaked and thus make a tight joint at the bottom of the tubbing with the rock just above the mineral deposit. By this means most of the water may be permanently shut out of the shaft, and the cost of pumping materially reduced.

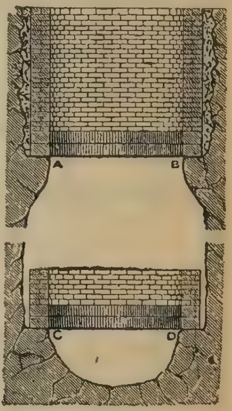


FIG. 3.

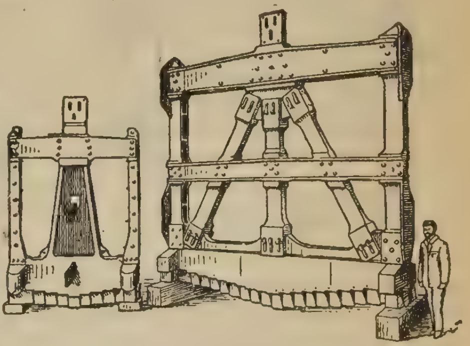


FIG. 4.—Large and Small Trepans for shaft sinking, Haniel & Lueg, Düsseldorf, makers.

Kind-Chaudron System of Sinking.—This ingenious method, introduced in 1852, has thus far been confined to Europe. Up to 1904, 79 shafts had been sunk by its use, some of them to depths of 1000 ft. or more, without a single instance of failure. It is applicable only to firm rock and was devised to deal with cases where the quantity of water is too great to be pumped out while excavation is in progress; that is, for inflows greater than 1000 or 1200 gallons per minute. In its after results the system is most successful when the water-bearing rocks rest on an impervious stratum, overlying the mineral deposit. The entire excavation is carried on under water; then a lining of special design is lowered into place and the shaft unwatered. The shaft is sunk by boring on an immense scale, by apparatus resembling the rod and drop-drill (see BORING). Instead of ordinary drills, massive tools called "trepans" are employed, consisting of a heavy iron frame, in the lower edge of which are set a number of separate cutters (fig. 4). Shafts not exceeding 8 ft. diameter are bored in one operation; for larger diameters an advance bore is usually made with a small trepan and afterwards enlarged to full size. The advance bore may be completed to the required depth of shaft before beginning enlargement, or the small and large trepans used alternately, the advance being kept 30 to 60 ft. ahead of the enlargement. An 8 ft. trepan weighs about 12 tons, those of 14 or 15 ft. 25 to 30 tons. The trepan is attached to a heavy rod, suspended from a walking-beam operated by an engine on the surface, as in ordinary boring. A derrick is erected over the shaft, with a hoisting engine for raising and lowering the tools. Average rock is bored at a speed of about 1½ ft. per 24 hours. The advance bore is cleaned of débris at intervals by a bailer similar to that used for bore-holes. The enlarging trepan is so shaped that the bottom of the enlargement slopes to the centre, whereby the cuttings, assisted by the agitation of the water, run into the advance bore and are bailed out. Owing to the difficulty of this latter procedure the advance bore is sometimes omitted even for large shafts, the débris being removed by a special dredger (*Coll. Guard.*, Dec. 22, 1899, p. 1181). For rather loose rock another somewhat similar system of drilling, the Pattberg, has been satisfactorily employed.

When the shaft has passed through the watery strata the lining is installed. This is composed of cast iron rings, like tubbing (*cc*, *dd*), bolted together at the shaft mouth and gradually lowered through the water (fig. 5). The first two rings, called the "moss-box" (*aa*, *bb*) are designed to telescope together and have a quantity of dry moss packed between their outer flanges. When the lowermost ring reaches the bottom, the weight of the lining compresses the moss and forces it against the surrounding rock, making a tight joint. The lining is suspended from the surface by threaded rods, and to regulate and reduce its weight while it is being lowered the bottom is closed by a diaphragm (*ff*), from the centre of which rises an open pipe (*g*). This pipe is provided with cocks for admitting inside the lining from time to time enough water to overcome buoyancy. Finally, concrete is filled in behind the lining, the diaphragm removed and the completed shaft pumped out. In some formations the moss-box is omitted, the concreting being relied on to make the lining water-tight. The cost of this method of sinking and lining (generally £35 to £60 per foot), as well as the speed, compare favourably with results obtainable under the same conditions by other means; in many cases it is the only practicable method.

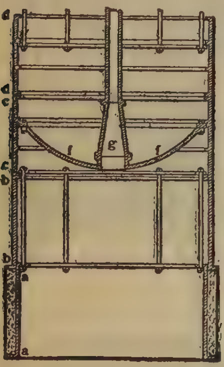


FIG. 5.

Sinking in unstable, watery soils, which often cause serious engineering difficulties, is accomplished by: (1) spiling, vertical or inclined; (2) drop-shafts; (3) caisson and compressed air; (4) the freezing process.

Vertical spiling consists in driving one or more series of spiles around the sides of the excavation, supported by horizontal timber cribs. When the first spiles have been driven, and the enclosed soil removed, a second set follows inside, and so on. As a result of the successive reductions in cross-section of the shaft, vertical spiling is inapplicable to depths much greater than say 75 ft.

Inclined spiling is also limited to small depths. Cribs are put in every few feet and around them, driven ahead of the excavation, are short, heavy planks, sharpened to a chisel edge. The spiles incline outward, being driven inside of one crib and outside of that next below (fig. 6). The shaft bottom also is usually sheathed with planking, braced against the lowest crib and advanced to new positions as sinking progresses.

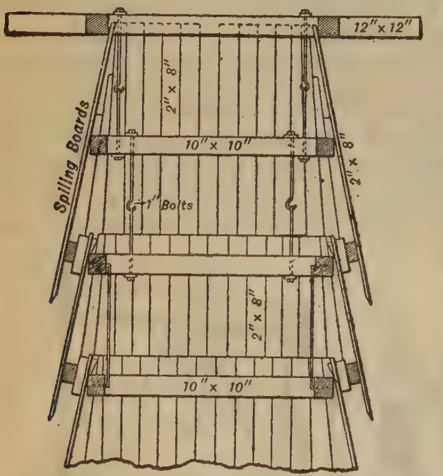


FIG. 6.

Drop-Shafts.—This important method has been used for depths of nearly 500 ft. A heavy timber, iron or masonry lining (usually cylindrical), is sunk through the soil, new sections being successively added at the surface, while the excavation goes on inside. In quite soft soil the lining or drop-shaft sinks with its own weight; when necessary, additional weights of pig-iron, rails, &c., are applied at the top. If, from excessive friction or other cause, the first lining refuses to sink farther, a second is lowered telescopically inside, followed by others if required. The drop-shaft, which must be strongly built to resist collapse, distortion or rupture, is based on a massive wooden or iron shoe, generally of triangular cross-section, which cuts into the soil as the weight of the structure increases and the excavation proceeds. When built of masonry the great weight of the drop-shaft may become unmanageable in very soft soil, either sinking too fast or settling irregularly and spasmodically, accompanied by inrushes of sand or mud at the bottom. It is then suspended by iron rods, fastened to the shoe and threaded for passing through large nuts supported by a framework on the surface. The rods are lengthened as required for lowering the lining. For deep shafts the lining must be of iron or steel, as wood is too weak and masonry too heavy. When the inflow of water can be met by a reasonable amount of pumping, the material is excavated by hand; otherwise, the water is allowed to stand at its natural level and the excavation carried on by dredging. This saves the cost of pumping during sinking, and the pressure of the unstable soil is largely counteracted by the weight of the column of water within the shaft. After the lining has come to rest on the solid sub-stratum, the shaft is pumped out, inflow underneath the shoe stopped as far as possible and sinking resumed by ordinary means. The dredging appliance commonly employed is the "sackborer." This consists of an iron or wooden rod, suspended vertically in the shaft, at the lower end of which on each side is attached a heavy hoop-like wing. The wings carry two large sacks of canvas and leather, opening in opposite directions. By rotating the rod by machinery at the surface, the sacks are swept round horizontally like the cutting edges of an auger, and partly filling after a few revolutions are then raised and emptied. The leakage under the shoe may be stopped in several ways, *e.g.* by concreting the shaft bottom, then pumping out the water and sinking through the concrete by drilling and blasting; by unwatering the shaft and calking below the shoe; or by inserting a wedging crib. There are various modifications of the drop-shaft which cannot here be detailed.

Sinking with caisson and compressed air is rarely adopted except in civil engineering operations, for deep foundations of bridge piers, &c. (see CAISSON).

Freezing Process.—This useful process was introduced in Germany in 1883, by F. H. Poetsch. The soil in which the shaft is to be sunk is artificially frozen and then excavated like solid rock. A number of drive-pipes are put down (see BORING), usually 4 to 6 in. diameter and about 3 ft. apart, in a circle whose radius is, say, 3 ft. greater than that of the shaft, and reaching to bed-rock or other firm formation. Each pipe is plugged at the lower end and within it is placed an open pipe, 1½ in. in diameter, extending nearly to the bottom. Or, preferably, after the drive-pipes are down, a slightly smaller pipe, closed at its lower end, is inserted in each drive-pipe, the latter being afterwards pulled out. The inner 1½ in. open pipes are then put in place. At the surface, the outer and inner pipes are connected respectively to two horizontal distributing rings, which in turn are connected with a pump and ice-machine. A circulatory system is thus established. The freezing fluid, a nearly saturated solution of calcium or magnesium chloride (freezing point about −29°F.), is pumped through the ice-machine, where it is cooled to at least 0°F., and goes thence to the freezing pipes. It passes down the inner pipes, up through the outer pipes, and returns to the ice-machine. The cold solution rising in the large pipes absorbs the heat from the surrounding watery soil, which freezes concentrically round each pipe. As the process goes on the frozen masses finally join (in from 3 to 4 weeks), forming an unbroken wall. The enclosed soft soil may then be excavated by dredging; or the freezing may be continued (total time usually from 5 to 10 weeks according to the depth), until the solidification reaches the centre and to some distance beyond the circle of pipes, after which the ground is drilled and blasted. This process has been successfully employed to depths of over 700 ft., and is applicable not only to the most unstable soils but also to heavily water-bearing rocks. It is questionable whether it will prove to be practicable for great depths, largely because of the difficulty of maintaining verticality of the bore-holes for the freezing pipes. Even a slight angular divergence would leave breaks in the wall of frozen soil and cause danger. In a modification of the Poetsch process, introduced by A. Gobert in 1891, the calcium chloride solution is replaced by anhydrous liquid ammonia, which on vaporizing in the freezing pipes produces a temperature of −25° to −30° F. Sixty-four shafts had been sunk by the freezing process up to 1904.

Another method proposed for dealing with quicksand or similar watery ground is to inject through pipes a mixture of cement and water. The entire mass of soil would be solidified by the setting of the cement, and the shaft sunk by drilling and blasting, with no trouble from water.

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SHAGĪA (Shaigia, Shaikīyeh), a tribe of Africans of Semitic origin living on both banks of the Nile from Korti to the Third Cataract, and in portions of the Bayuda Desert. The Shagīa are partly a nomad, partly an agricultural people. They claim descent from one Shayig Ibn Hamaidan of the Beni Abbas, and declare that they came from Arabia at the time of the conquest of Egypt in the 7th century. They must have dispossessed and largely intermarried with a people of Nuba origin. They appear (from a statement by James Bruce) to have been settled originally south of their present country and to have moved northward since 1772. Formerly subject to the Funj kings of Sennar, they became independent on the decline of that state in the 18th century. They were overcome *c.* 1811 at Dongola by the Mamelukes, but continued to dominate a considerable part of Nubia. To the Egyptians in 1820 they offered a stout resistance, but finally submitted and served in the Egyptian ranks during the suppression of the Jāʿalin revolt (1822). For their services they obtained lands of these latter between Shendi and Khartum. At that time they were far more civilized than the neighbouring tribes. Freedom-loving, brave, enlightened and hospitable, they had schools in which all Moslem science was taught, and were rich in corn and cattle. Their fighting men, mounted on horses of the famous Dongola breed, were feared throughout the eastern Sudan. Their chiefs wore coats of mail and carried shields of hippopotamus or crocodile skin. Their arms were lance, sword or javelin. The Shagīa are divided into twelve clans. Their country is the most fertile along the Nile between Egypt and Khartum. Many of their villages are well built; some of the houses are fortified. They speak Arabic and generally preserve the Semitic type, though they are obviously of very mixed blood. The typical Shagīa has a sloping forehead, aquiline nose and receding chin. They have adopted the African custom of gashing the chests of their children. In the wars of 1884–85 General Gordon's first fight was to rescue a few Shagīa besieged in a fort at Halfaya. In April 1884 Saleh Bey (Saleh Wad el Mek), head of the tribe, and 1400 men surrendered to the mahdi's forces. Numbers of Shagīa continued in the service of General Gordon and this led to the outlawry of the tribe by the mahdi. When Khartum fell Saleh's sons were sought out and executed by the dervishes. On the reconquest of the Sudan by the Anglo-Egyptian army (1896–98) it was found that the Shagīa were reduced to a few hundred families.

See *Anglo-Egyptian Sudan*, edited by Count Gleichen (London, 1905); A. H. Keane, *Ethnology of the Egyptian Sudan* (London, 1884).

SHAGREEN, a species of untanned leather with a roughened, granular surface. The word is the English form; cf. Ger. *Schagrin*, of Fr. *chagrin*, Ital. *zagrin*, *zigrino*; these are usually referred to Turkish and Persian *saghri*, lit. the back of a horse, and so applied to leather made from this part. The skin of the wild ass was especially used. The method of preparing the skins to secure the rough, granular surface is as follows. The seeds of a plant, usually some species of *Chinopodium*, are embedded in the skin while soft, the surface is then shaved down and soaked in water, when the edges of the indentations swell up. The leather is then dyed, green being a favourite colour. Shagreen is now commonly made of the skins of sharks and rays; the placoid scales of the shark skin giving the necessary roughened surface. Shagreen is used as an ornamental leather for making pocket-books, small cases and the like, and for the handles of swords, daggers, &c.

The figurative use in French of "chagrin," for anxiety, annoyance, was adopted in English in the 17th century. This application of the word is due to the rasping surface of the leather.

SHAH, the title of the kings of Persia, the full title being *padshah*, *i.e.* "lord king," Pers. *pati*, lord, and *shah*, king (see Padishah, the Turkish form of the word). The word *shah* is a much shortened form of the O. Pers. *khsayathiya*, probably formed from *khsayathi*, might, power, *khsi*, to rule. The Sanskrit *kshatram*, dominion, is allied, cf. also "satrap." From the Pers. *shāh māt*, the king is dead, is ultimately derived, through the Arab. pronunciation *shāg*, "check-mate," then "check," "chess," "exchequer," &c.

SHAHABAD, a district of British India, in the Patna division of Bengal, with an area of 4373 sq. m. About three-fourths of the area to the north is an alluvial flat, planted with mangoes, bamboos and other trees; while the southern portion is occupied by the Kaimur hills, a branch of the great Vindhyan range, and is a densely wooded tract. The chief rivers are the Ganges and the Sone, which unite in the north-eastern corner of Shahabad. In the southern portion large game abounds. The annual rainfall averages 43 in. In 1901 the population was 1,962,696, showing a decrease of 4·7% in the decade. The chief crops are rice, millets, wheat, pulses, oilseeds, poppy and sugarcane. Shahabad is protected against drought by a system of canals from the Sone, some of which are navigable. The district is traversed by the East Indian railway near the Ganges, and by a branch from Mogul Serai to Gaya, which crosses the Sone at Dehri-on-Sone, where are the workshops of the canal. The administrative headquarters are at Arrah. Among other historic sites, it includes the hill-fort of Rohtas, the tomb of Shere Shah at Sasseram and the battlefield of Buxar.

See *Shahabad District Gazetteer* (Calcutta, 1906).

SHAH ALAM (1728–1806), Mogul emperor of Delhi, son of Alamgir II., was born on the 15th of June 1728, and was originally known as the Shahzada Ali Gohar. Being proclaimed a rebel by his father, he fled to Shuja-ud-Dowlah, wazir of Oudh, and on the death of his father in 1759 assumed the name of Shah Alam. He joined Shuja-ud-Dowlah against the British, but after his defeat at the battle of Buxar, he sought British protection. In 1765 he granted the *diwani* (superintendence of the revenue) of Bengal to Lord Clive for the East India Company in return for a payment of 26 lakhs a year. In 1771 he fell into the power of the Mahrattas, was installed emperor of Delhi, and lost the British subsidy. In 1788 the Rohilla chief Ghulam Kadir seized Delhi and put out Shah Alam's eyes. Sindhia restored him to the throne, and after the Mahratta war of 1803 he was again taken under British protection. He died on the 10th of November 1806.

See W. Francklin, *History of the Reign of Shah Alam* (Calcutta, 1798).

SHAH JAHAN (fl. 1627–1658), Mogul emperor of Delhi, the fifth of the dynasty. After revolting against his father Jahangir, as the latter had revolted against Akbar, he succeeded to the throne on his father's death in 1627. It was during his reign that the Mogul power attained its greatest prosperity. The chief events of his reign were the destruction of the kingdom of Ahmadnagar (1636), the loss of Kandahar to the Persians (1653), and a second war against the Deccan princes (1655). In 1658 he fell ill, and was confined by his son Aurangzeb in the citadel of Agra until his death in 1666. The period of his reign was the golden age of Indian architecture. Shah Jahan erected many splendid monuments, the most famous of which is the Taj Mahal at Agra, built as a tomb for his wife Mumtaz Mahal; while the Pearl Mosque at Agra and the palace and great mosque at Delhi also commemorate him. The celebrated "Peacock Throne," said to have been worth £6,000,000 also dates from his reign; and he was the founder of the modern city of Delhi, the native name of which is Shahjahanabad.

SHAHJAHANPUR, a city and district of British India, in the Bareilly division of the United Provinces. The city is on the left bank of the river Deoha or Garra, 507 ft. above the sea-level, with a station on the Oudh and Rohilkhand railway, 768 m. N.W. of Calcutta, and a military cantonment. Pop.

(1901) 75,128. It was founded in 1647 during the reign of Shah Jahan, whose name it bears, by Nawab Bahadur Khan, a Pathan. His mosque is the only building of antiquarian interest. There is a manufacture of sugar, but no great trade.

The DISTRICT OF SHAHJAHANPUR has an area of 1727 sq. m. It consists of a long and narrow tract running up from the Ganges towards the Himalayas, and is for the most part level and without any hills. The principal rivers are the Gumti, Khanaut, Garai and Ramganga. To the north-east the country resembles the *tarai* in the preponderance of waste and forest over cultivated land, in the sparseness of population and in general unhealthiness. Between the Gumti and the Khanaut the country varies from a rather wild and unhealthy northern region to a densely inhabited tract in the south, with a productive soil cultivated with sugar-cane and other remunerative crops. The section between the Deoha and Garai comprises much marshy land; but south of the Garai, and between it and the Ramganga, the soil is mostly of a sandy nature. From the Ramganga to the Ganges in the south is a continuous low country of marshy patches, alternating with a hard clayey soil that requires much irrigation in parts. Shahjahanpur contains a number of *jhils* or lakes, which afford irrigation for the spring crops. The climate is very similar to that of most parts of Oudh and Rohilkhand, but moister than that of the Doab. The annual rainfall averages about 37 in. In 1901 the population was 921,535. The principal crops are wheat, rice, pulse, millets, sugar-cane and poppy. The district suffered very severely from the famine of 1877–1879. It is traversed by the Lucknow-Bareilly section of the Oudh and Rohilkhand railway, with a branch northwards from Shahjahanpur city. At Rosa is a large sugar refinery and rum distillery.

Shahjahanpur was ceded to the English by the nawab of Oudh in 1801. During the Mutiny of 1857 it became the scene of open rebellion. The Europeans were attacked when in church; three were shot down, but the remainder, aided by a hundred faithful sepoys, escaped. The force under Lord Clyde put a stop to the anarchy in April 1858, and shortly afterwards peace and authority were restored.

SHAHPUR, a town and district of British India, in Rawalpindi division of the Punjab. The town is near the left bank of the river Jhelum. Pop. (1901) 9386. The district of Shahpur has an area of 4840 sq. m. Its most important physical subdivisions are the Salt range in the north, the valleys of the Chenab and Jhelum, and the plains between those rivers and between the Jhelum and the Salt range. The characteristics of these two plains are widely different: the desert portion of the southern plain is termed the *bar;* the corresponding tract north of the Jhelum is known as the *thal*. The climate of the plains is hot and dry, but in the Salt range it is much cooler; the annual rainfall averages about 15 in. Tigers, leopards and wolves are found in the Salt range, while small game and antelope abound among the thick jungle of the *bar*. In 1901 the population was 524,259, showing an increase of 6% in the decade. The principal crops are wheat, millets, pulses and cotton. Irrigation is effected from government canals, and also from wells. The largest town and chief commercial centre is Bhera. The district is traversed by two branches of the North-Western railway.

Shahpur passed into the hands of the English along with the rest of the Punjab in 1849. During the Mutiny of 1857 the district remained tranquil, and though the villages of the *bar* gave cause for alarm no outbreak of sepoys occurred. Since annexation the limits and constitution of the district have undergone many changes.

SHAHRASTĀNĪ [Abū'l-Fatḥ Maḥommed ibn ʽAbdalkarīm ush-Shahrastānī] (1076 or 1086–1153) Arabian theologian and jurist, was born at Shahrastān in Khorasan and studied at Jurjānīyah and Nīshāpūr, devoting his attention chiefly to Ashʽarite theology. He made the pilgrimage in 1116, on his way back stayed at Bagdad for three years, then returned to his native place. His chief work is the *Kitāb ul Milal wan-Niḥal*, an account of religious sects and philosophical schools, published by W. Cureton (2 vols., London, 1846) and translated into German by T. Haarbrücker (2 vols., Halle, 1850–1851). After a preface of five chapters dealing with the divisions of the human race, an enumeration of the sects of Islam, the objections of Satan against God and against Mahomet and the principles on which the sects may be classified, he deals with (1) the sects of Islam in detail, (2) the possessors of a written revelation (Jews and Christians) or something resembling it (the Magi), (3) the men who follow their own reason, *i.e.* the philosophers of Greece and their followers among the Moslems; the pre-Islamic Arabs, the Indians and the heathen. Among Shahrastānī's other works still in manuscript only are a history of philosophers, a dogmatic text-book and a treatment of seven metaphysical questions.

A brief account of him is given on the authority of his pupil, the historian Samʽānī, in Ibn Khallikān, vol. ii., pp. 675 ff. (G. W. T.)

SHAHRUD, the capital of the Shahrud-Bostam province of Persia, situated about 258 m. E. of Teheran, on the highroad thence to Meshed, at an altitude of 4460 ft., in 36° 25′ N., 54° 59′ E. It has a population of about 10,000, post and telegraph offices, and a transit trade between western Khorasan and Astarabad. Although capital of the province, it is not the residence of the governor, who prefers the more healthy Bostam, a small city with fine gardens and a mosque of the 14th century, lying 3 m. to the north-east.

SHAH SHUJA (1780?–1842), king of Afghanistan, was the son of Timur Shah, and grandson of Ahmad Shah, founder of the Durani dynasty. After conspiracies that caused the dethronement of two brothers, Taman Shah and Mahmud Shah, he became king in 1803. He was, however, in his turn driven out of Afghanistan in 1809 by Mahmud Shah, and found refuge and a pension in British territory. Distrusting the attitude of the Amir Dost Mahommed towards Russia, Lord Auckland in 1839 attempted to restore Shah Shuja to the throne against the wishes of the Afghan people. This policy led to the disastrous first Afghan War. After the retreat of the British troops from Kabul, Shah Shuja shut himself up in the Bala Hissar. He left this retreat on the 5th of April 1842, and was immediately killed by the adherents of Dost Mahommed and his son Akbar Khan.

SHAIRP, JOHN CAMPBELL (1819–1885), Scottish critic and man of letters, was born at Houstoun House, Linlithgowshire, on the 30th of July 1819. He was the third son of Major Norman Shairp of Houstoun, and was educated at Edinburgh Academy and Glasgow University. He gained the Snell exhibition, and entered at Balliol College, Oxford, in 1840. In 1842 he gained the Newdigate prize for a poem on Charles XII., and took his degree in 1844. During these years the "Oxford movement" was at its height. Shairp was stirred by Newman's sermons, and he had a great admiration for the poetry of Keble, on whose character and work he wrote an enthusiastic essay; but he remained faithful to his Presbyterian upbringing. After leaving Oxford he took a mastership at Rugby under Tait. In 1857 he became assistant to the professor of humanity in the university of St Andrews, and in 1861 he was appointed to that chair. In 1864 he published *Kilmahoe, a Highland Pastoral*, and in 1868 he republished some articles under the name of *Studies in Poetry and Philosophy*. In 1868 he was presented to the principalship of the United College, St Andrews, and lectured from time to time on literary and ethical subjects. A course of the lectures was published in 1870 as *Culture and Religion*. In 1873 Principal Shairp helped to edit the life of his predecessor J. D. Forbes, and in 1874 he edited Dorothy Wordsworth's charming *Recollections of a Tour in Scotland*. In 1877 he was elected professor of poetry at Oxford in succession to Sir F. H. Doyle. Of his lectures from this chair the best were published in 1881 as *Aspects of Poetry*. In 1877 he had published *The Poetic Interpretation of Nature*, in which he enters fully into the "old quarrel," as Plato called it, between science and poetry, and traces with great clearness the ideas of nature in all the chief Hebrew, classical and English poets. In 1879 he contributed a life of Robert Burns to the "English Men of Letters" series. He was re-elected to the chair of poetry in 1882, and discharged his duties there and at St Andrews till the end of 1884. He died at Ormsary, Argyllshire, on the 18th of September 1885. In 1888 appeared *Glen Desseray, and other Poems*, edited by F. T. Palgrave.

See W. A. Knight's *Principal Shairp and his Friends* (1888).

SHAKERS, an American celibate and communistic sect, officially called "The United Society of Believers in Christ's Second Appearing" or "The Millennial Church."[1] The early Quakers were sometimes called Shakers, and the name, or its variant, Shaking Quakers, was applied in the early 18th century to a Manchester offshoot of the English Quakers, who, led by James and Ann Wardley, accepted the peculiar doctrines of the French Prophets, or Camisards, of Vivarais and Dauphiné.[2] The Wardleys were succeeded by the real founder of Shakerism, Ann Lee (1736–1784), the daughter of a Manchester blacksmith. Although a believer in celibacy, she had at her parents' urging married one Abraham Stanley (Standley, or Standerin); had borne him four children, who died in infancy; had joined the Wardleys in 1758; and had influenced their followers to preach more publicly the imminent second coming and to attack sin more boldly and unconventionally. She was frequently imprisoned for breaking the Sabbath by dancing and shouting, and for blasphemy; had many "miraculous" escapes from death; and once, according to her story, being examined by four clergymen of the Established Church, spoke to them for four hours in seventy-two tongues. While in prison in Manchester for fourteen days, she said she had a revelation that "a complete cross against the lusts of generation, added to a full and explicit confession, before witnesses, of all the sins committed under its influence, was the only possible remedy and means of salvation." After this, probably in 1770, she was chosen by the society as "Mother in spiritual things" and called herself "Ann, the Word." In 1774 a revelation bade her take a select band to America. Accompanied by her husband, who soon afterward deserted her; her brother, William Lee (1740–1784); Nancy Lee, her niece; James Whittaker (1751–1787), who had been brought up by Mother Ann and was probably related to her; John Hocknell (1723–1799), who provided the funds for the trip; his son, Richard; and James Shepherd and Mary Partington, Mother Ann arrived on the 6th of August 1774 in New York City. Here they stayed for nearly two years. In 1776 Hocknell bought land at Niskayuna, in the township of Watervliet, near Albany, and the Shakers settled there. A spiritualistic revival in the neighbouring town of New Lebanon sent many penitents to Watervliet, who accepted Mother Ann's teachings and organized in 1787 (before any formal organization in Watervliet) the New Lebanon Society, the first Shaker Society, at New Lebanon (since 1861 called Mt. Lebanon), Columbia county, New York. The Society at Watervliet, organized immediately afterwards, and the New Lebanon Society formed a bishopric. The Watervliet members, as non-resistants and non-jurors, had got into trouble during the War of Independence; in 1780 the Board of Elders were imprisoned, but all except Mother Ann were speedily set free, and she was released in 1781.

In 1781–1783 the Mother with chosen elders visited her followers in New York, Massachusetts and Connecticut. She died in Watervliet on the 8th of September 1784. James Whittaker was head of the Believers for three years. On his death he was succeeded by Joseph Meacham (1742–1796), who had been a Baptist minister in Enfield, Connecticut, and had, second only to Mother Ann, the spiritual gift of revelation. Under his rule and that of Lucy Wright (1760–1821), who shared the headship with him during his lifetime and then for twenty-five years ruled alone, the organization of the Shakers and, particularly, a rigid communism, began. By 1793 property had been made a "consecrated whole" in the different communities, but a "non-communal order" also had been established, in which sympathizers with the principles of the Believers lived in families. The Shakers never forbade marriage, but refused to recognize it as a Christian institution since the second coming in the person of Mother Ann, and considered it less perfect than the celibate state. Shaker communities in this period were established in 1790 at Hancock, West Pittsfield, Mass.; in 1791 at Harvard, Mass.; in 1792 at East Canterbury (or Shaker Village), New Hampshire; and in 1793 at Shirley, Mass.; at Enfield (or Shaker Station), Connecticut; at Tyringham, Mass., where the Society was afterwards abandoned, its members joining the communities in Hancock and Enfield; at Gloucester (since 1890, Sabbath-day Lake), Maine; and at Alfred, Maine, where, more than anywhere else among the Shakers, spiritualistic healing of the sick was practised. In Kentucky and Ohio Shakerism entered after the Kentucky revival of 1800–1801,[3] and in 1805–1807 Shaker societies were founded at South Union, Logan county, and Pleasant Hill, Mercer county, Kentucky. In 1811 a community settled at Busro on the Wabash in Indiana; but it was soon abandoned and its members went to Ohio and to Kentucky. In Ohio later communities were formed at Watervliet, Hamilton county, and at Whitewater, Dayton county. In 1828 the communal property at Sodus Bay, New York, was sold and the community removed to Groveland, or Sonyea; their land here was sold to the state and the few remaining members went to Watervliet. A short-lived community at Canaan, N.Y., was merged in the Mount Lebanon (New York) and Enfield (Connecticut) communities. The numerical strength of the sect decreased rapidly, probably from 4000 to 1000 in 1887–1908; and there has been little effort made to plant new communities. The Mt. Lebanon Society in 1894 established a colony at Narcoossee, Florida; the attempt of the Union Village Society in 1898 to plant a settlement at White Oak, Camden county, Georgia, was unsuccessful. In 1910 the Union Village Society went into the hands of a receiver.

The period of spiritual manifestations among the Believers lasted from 1837 to 1847; first, children told of visits to cities in the spirit realm and gave messages from Mother Ann; in 1838 the gift of tongues was manifested and sacred places were set aside in each community, with names like Holy Mount; but in 1847 the spirits, after warning, left the Believers. The theology of the denomination is based on the idea of the dualism of God: the creation of male and female "in our image" showing the bi-sexuality of the Creator; in Jesus, born of a woman, the son of a Jewish carpenter, were the male manifestation of Christ and the first Christian Church; and in Mother Ann, daughter of an English blacksmith, were the female manifestation of Christ and the second Christian Church—she was the Bride ready for the Bridegroom, and in her the promises of the Second Coming were fulfilled. Adam's sin was in sexual impurity; marriage is done away with in the body of the Believers in the Second Appearance, who must pattern after the Kingdom in which there is no marriage or giving in marriage. The four virtues are virgin purity; Christian communism; confession of sin, without which none can become Believers; and separation from the world. The Shakers do not believe in the divinity or deity of Jesus, or in the resurrection of the body. Their insistence on the bi-sexuality of God and their reverence for Mother Ann have made them advocates of sex equality. Their spiritual directors are elders and "eldresses," and their temporal guides are deacons and deaconesses in equal numbers. The prescribed uniform costume with woman's neckerchief and cap, and the custom of men wearing their hair long on the neck and cut in a straight bang on the forehead, still persist; but the women wear different colours. The communism of the Believers was an economic success, and their cleanliness, honesty and frugality received the highest praise. They made leather in New York for several years, but in selling herbs and garden seeds, in making "apple-sauce" (at

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[1] Some of its leaders prefer the name "Alethians," as they consider themselves children of the truth; but they do not repudiate the commonly applied name Shakers.

[2] The Wardleys' followers, when "wrestling in soul to be freed from the power of sin and a worldly life," writhed and trembled so that they won the name Shakers; their trances and visions, their jumping and dancing, were like those of many other sects, such as the Low Countries dancers of the 14th and 15th centuries, the French Convulsionnaires of 1720–1770, or the Welsh Methodist Jumpers.

[3] A prominent part in this revival had been taken by Richard McNemar, a Presbyterian, who had broken with his Church because of his Arminian tendencies and had established the quasi-independent Turtle Creek Church. McNemar was won by Shaker missionaries in 1805, and many of his parishioners joined him to form the Union Village Community on the site of the old Turtle Creek, 4 m. W. of Lebanon, Warren county, Ohio. McNemar was a favourite of Lucy Wright, who gave him the spiritual name Eleazer Right, which he changed to Eleazer Wright; he wrote *The Kentucky Revival* (Cincinnati, 1807), probably the earliest defence of Shakerism, and a poem, entitled *A Concise Answer to the General Inquiry Who or What are the Shakers* (1808).

Shirley), in weaving linen (at Alfred), and in knitting underwear they did better work.

See John P. MacLean, *A Bibliography of Shaker Literature. with an Introductory Study of the Writings and Publications Pertaining to Ohio Believers* (Columbus, Ohio, 1905), and his *Sketch of the Life and the Labors of Richard McNemar* (Franklin, Ohio, 1905); Charles Edson Robinson, *A Concise History of the United Society of Believers, called Shakers* (East Canterbury, N.H., 1893); Anna White and Leila S. Taylor, *Shakerism, Its Meaning and Message* (Columbus, Ohio, 1905); Frederick W. Evans, *Shakers: Compendium of the Origin, History, Principles, Rules and Regulations, Governments and Doctrines of the United Society of Believers in Christ's Second Appearing* (Albany, 1858; and often elsewhere under other titles); M. Catherine Allen, *A Century of Communism* (Pittsfield, 1902); and the works of Nordhoff, Noyes, Hinds, &c., on American communism.

Birth and parentage.

SHAKESPEARE, WILLIAM (1564–1616), English poet, player and playwright, was baptized in the parish church of Stratford-upon-Avon in Warwickshire on the 26th of April 1564. The exact date of his birth is not known. Two 18th-century antiquaries, William Oldys and Joseph Greene, gave it as April 23, but without quoting authority for their statements, and the fact that April 23 was the day of Shakespeare's death in 1616 suggests a possible source of error. In any case his birthday cannot have been later than April 23, since the inscription upon his monument is evidence that on April 23, 1616, he had already begun his fifty-third year. His father, John Shakespeare, was a burgess of the recently constituted corporation of Stratford, and had already filled certain minor municipal offices. From 1561 to 1563 he had been one of the two chamberlains to whom the finance of the town was entrusted. By occupation he was a glover, but he also appears to have dealt from time to time in various kinds of agricultural produce, such as barley, timber and wool. Aubrey (*Lives*, 1680) spoke of him as a butcher, and it is quite possible that he bred and even killed the calves whose skins he manipulated. He is sometimes described in formal documents as a yeoman, and it is highly probable that he combined a certain amount of farming with the practice of his trade. He was living in Stratford as early as 1552, in which year he was fined for having a dunghill in Henley Street, but he does not appear to have been a native of the town, in whose records the name is not found before his time; and he may reasonably be identified with the John Shakespeare of Snitterfield, who administered the goods of his father, Richard Shakespeare, in 1561. Snitterfield is a village in the immediate neighbourhood of Stratford, and here Richard Shakespeare had been settled as a farmer since 1529. It is possible that John Shakespeare carried on the farm for some time after his father's death, and that by 1570 he had also acquired a small holding called Ingon in Hampton Lucy, the next village to Snitterfield. But both of these seem to have passed subsequently to his brother Henry, who was buried at Snitterfield in 1596. There was also at Snitterfield a Thomas Shakespeare and an Anthony Shakespeare, who afterwards moved to Hampton Corley; and these may have been of the same family. A John Shakespeare, who dwelt at Clifford Chambers, another village close to Stratford, is clearly distinct. Strenuous efforts have been made to trace Shakespeare's genealogy beyond Richard of Snitterfield, but so far without success. Certain drafts of heraldic exemplifications of the Shakespeare arms speak, in one case of John Shakespeare's grandfather, in another of his great-grandfather, as having been rewarded with lands and tenements in Warwickshire for service to Henry VII. No such grants, however, have been traced, and even in the 16th-century statements as to "antiquity and service" in heraldic preambles were looked upon with suspicion.

The name Shakespeare is extremely widespread, and is spelt in an astonishing variety of ways. That of John Shakespeare occurs 166 times in the Council Book of the Stratford corporation, and appears to take 16 different forms. The verdict, not altogether unanimous, of competent palaeographers is to the effect that Shakespeare himself, in the extant examples of his signature, always wrote "Shakspere." In the printed signatures to the dedications of his poems, on the title-pages of nearly all the contemporary editions of his plays that bear his name, and in many formal documents it appears as Shakespeare. This may be in part due to the martial derivation which the poet's literary contemporaries were fond of assigning to his name, and which is acknowledged in the arms that he bore. The forms in use at Stratford, however, such as Shaxpeare, by far the commonest, suggest a short pronunciation of the first syllable, and thus tend to support Dr Henry Bradley's derivation from the Anglo-Saxon personal name, Seaxberht. It is interesting, and even amusing, to record that in 1487 Hugh Shakspere of Merton College, Oxford, changed his name to Sawndare, because his former name *vile reputatum est.* The earliest record of a Shakespeare that has yet been traced is in 1248 at Clapton in Gloucestershire, about seven miles from Stratford. The name also occurs during the 13th century in Kent, Essex and Surrey, and during the 14th in Cumberland, Yorkshire, Nottinghamshire, Essex, Warwickshire and as far away as Youghal in Ireland. Thereafter it is found in London and most of the English counties, particularly those of the midlands; and nowhere more freely than in Warwickshire. There were Shakespeares in Warwick and in Coventry, as well as around Stratford; and the clan appears to have been very numerous in a group of villages about twelve miles north of Stratford, which includes Baddesley Clinton, Wroxall, Rowington, Haseley, Hatton, Lapworth, Packwood, Balsall and Knowle. William was in common use as a personal name, and Williams from more than one other family have from time to time been confounded with the dramatist. Many Shakespeares are upon the register of the gild of St Anne at Knowle from about 1457 to about 1526. Amongst these were Isabella Shakespeare, prioress of the Benedictine convent of Wroxall, and Jane Shakespeare, a nun of the same convent. Shakespeares are also found as tenants on the manors belonging to the convent, and at the time of the Dissolution in 1534 one Richard Shakespeare was its bailiff and collector of rents. Conjectural attempts have been made on the one hand to connect the ancestors of this Richard Shakespeare with a family of the same name who held land by military tenure at Baddesley Clinton in the 14th and 15th centuries, and on the other to identify him with the poet's grandfather, Richard Shakespeare of Snitterfield. But Shakespeares are to be traced at Wroxall nearly as far back as at Baddesley Clinton, and there is no reason to suppose that Richard the bailiff, who was certainly still a tenant of Wroxall in 1556, had also since 1529 been farming land ten miles off at Snitterfield.

With the breaking of this link, the hope of giving Shakespeare anything more than a grandfather on the father's side must be laid aside for the present. On the mother's side he was connected with a family of some distinction. Part at least of Richard Shakespeare's land at Snitterfield was held from Robert Arden of Wilmcote in the adjoining parish of Aston Cantlow, a cadet of the Ardens of Parkhall, who counted amongst the leading gentry of Warwickshire. Robert Arden married his second wife, Agnes Hill, formerly Webbe, in 1548, and had then no less than eight daughters by his first wife. To the youngest of these, Mary Arden, he left in 1556 a freehold in Aston Cantlow consisting of a farm of about fifty or sixty acres in extent, known as Asbies. At some date later than November 1556, and probably before the end of 1557, Mary Arden became the wife of John Shakespeare. In October 1556 John Shakespeare had bought two freehold houses, one in Greenhill Street, the other in Henley Street. The latter, known as the wool shop, was the easternmost of the two tenements now combined in the so-called Shakespeare's birthplace. The western tenement, the birthplace proper, was probably already in John Shakespeare's hands, as he seems to have been living in Henley Street in 1552. It has sometimes been thought to have been one of two houses which formed a later purchase in 1575, but there is no evidence that these were in Henley Street at all.

William Shakespeare was not the first child. A Joan was baptized in 1558 and a Margaret in 1562. The latter was buried in 1563 and the former must also have died young, although her burial is not recorded, as a second Joan was baptized in 1569. A Gilbert was baptized in 1566, an Anne in 1571, a Richard in 1574 and an Edmund in 1580. Anne died in 1579; Edmund, who like his brother became an actor, in 1607; Richard in 1613. Tradition has it that one of Shakespeare's brothers used to visit London in the 17th century as quite an old man. If so, this can only have been Gilbert.

During the years that followed his marriage, John Shakespeare became prominent in Stratford life. In 1565 he was chosen as an alderman, and in 1568 he held the chief municipal office, that of high bailiff. This carried with it the dignity of justice of the peace. John Shakespeare seems to have assumed arms, and thenceforward was always entered in corporation documents as "Mr" Shakespeare, whereby he may be distinguished from another John Shakespeare, a "corviser" or shoemaker, who dwelt in Stratford about 1584–1592. In 1571 as an ex-bailiff he began another year of office as chief alderman.

Youth.

One may think, therefore, of Shakespeare in his boyhood as the son of one of the leading citizens of a not unimportant provincial market-town, with a vigorous life of its own, which in spite of the dunghills was probably not much unlike the life of a similar town to-day, and with constant reminders of its past in the shape of the stately buildings formerly belonging to its college and its gild, both of which had been suppressed at the Reformation. Stratford stands on the Avon, in the midst of an agricultural country, throughout which in those days enclosed orchards and meadows alternated with open fields for tillage, and not far from the wilder and wooded district known as the Forest of Arden. The middle ages had left it an heritage in the shape of a free grammar-school, and here it is natural to suppose that William Shakespeare obtained a sound enough education,[1] with a working knowledge of "Mantuan"[2] and Ovid in the original, even though to such a thorough scholar as Ben Jonson it might seem no more than "small Latin and less Greek." In 1577, when Shakespeare was about thirteen, his father's fortunes began to take a turn for the worse. He became irregular in his contributions to town levies, and had to give a mortgage on his wife's property of Asbies as security for a loan from her brother-in-law, Edmund Lambert. Money was raised to pay this off, partly by the sale of a small interest in land at Snitterfield which had come to Mary Shakespeare from her sisters, partly perhaps by that of the Greenhill Street house and other property in Stratford outside Henley Street, none of which seems to have ever come into William Shakespeare's hands. Lambert, however, refused to surrender the mortgage on the plea of older debts, and an attempt to recover Asbies by litigation proved ineffectual. John Shakespeare's difficulties increased. An action for debt was sustained against him in the local court, but no personal property could be found on which to distrain. He had long ceased to attend the meetings of the corporation, and as a consequence he was removed in 1586 from the list of aldermen. In this state of domestic affairs it is not likely that Shakespeare's school life was unduly prolonged. The chances are that he was apprenticed to some local trade. Aubrey says that he killed calves for his father, and "would do it in a high style, and make a speech."

Marriage.

Whatever his circumstances, they did not deter him at the early age of eighteen from the adventure of marriage. Rowe recorded the name of Shakespeare's wife as Hathaway, and Joseph Greene succeeded in tracing her to a family of that name dwelling in Shottery, one of the hamlets of Stratford. Her monument gives her first name as Anne, and her age as sixty-seven in 1623. She must, therefore, have been about eight years older than Shakespeare. Various small trains of evidence point to her identification with the daughter Agnes mentioned in the will of a Richard Hathaway of Shottery, who died in 1581, being then in possession of the farm-house now known as "Anne Hathaway's Cottage." Agnes was legally a distinct name from Anne, but there can be no doubt that ordinary custom treated them as identical. The principal record of the marriage is a bond dated on November 28, 1582, and executed by Fulk Sandells and John Richardson, two yeomen of Stratford who also figure in Richard Hathaway's will, as a security to the bishop for the issue of a licence for the marriage of William Shakespeare and "Anne Hathwey of Stratford," upon the consent of her friends, with one asking of the banns. There is no reason to suppose, as has been suggested, that the procedure adopted was due to dislike of the marriage on the part of John Shakespeare, since, the bridegroom being a minor, it would not have been in accordance with the practice of the bishop's officials to issue the licence without evidence of the father's consent. The explanation probably lies in the fact that Anne was already with child, and in the near neighbourhood of Advent within which marriages were prohibited, so that the ordinary procedure by banns would have entailed a delay until after Christmas. A kindly sentiment has suggested that some form of civil marriage, or at least contract of espousals, had already taken place, so that a canonical marriage was really only required in order to enable Anne to secure the legacy left her by her father "at the day of her marriage." But such a theory is not rigidly required by the facts. It is singular that, upon the day before that on which the bond was executed, an entry was made in the bishop's register of the issue of a licence for a marriage between William Shakespeare and "Annam Whateley de Temple Grafton." Of this it can only be said that the bond, as an original document, is infinitely the better authority, and that a scribal error of "Whateley" for "Hathaway" is quite a possible solution. Temple Grafton may have been the nominal place of marriage indicated in the licence, which was not always the actual place of residence of either bride or bridegroom. There are no contemporary registers for Temple Grafton, and there is no entry of the marriage in those for Stratford-upon-Avon. There is a tradition that such a record was seen during the 19th century in the registers for Luddington, a chapelry within the parish, which are now destroyed. Shakespeare's first child, Susanna, was baptized on the 26th of May 1583, and was followed on the 2nd of February 1585 by twins, Hamnet and Judith.

Obscure years, 1584–1592.

In or after 1584 Shakespeare's career in Stratford seems to have come to a tempestuous close. An 18th-century story of a drinking-bout in a neighbouring village is of no importance, except as indicating a local impression that a distinguished citizen had had a wildish youth. But there is a tradition which comes from a double source and which there is no reason to reject in substance, to the effect that Shakespeare got into trouble through poaching on the estates of a considerable Warwickshire magnate, Sir Thomas Lucy, and found it necessary to leave Stratford in order to escape the results of his misdemeanour. It is added that he afterwards took his revenge on Lucy by satirizing him as the Justice Shallow, with the dozen white louses in his old coat, of *The Merry Wives of Windsor.* From this event until he emerges as an actor and rising playwright in 1592 his history is a blank, and it is impossible to say what experience may not have helped to fill it. Much might indeed be done in eight years of crowded Elizabethan life. Conjecture has not been idle, and has assigned him in turns during this or some other period to the occupations of a scrivener, an apothecary, a dyer, a printer, a soldier, and the like. The suggestion that he saw military service rests largely on a confusion with another William Shakespeare of Rowington. Aubrey had heard that "he had been in his younger years a schoolmaster in the country." The mention in *Henry IV.* of certain obscure yeomen families, Visor of Woncote and Perkes of Stinchcombe Hill, near Dursley in Gloucestershire, has been thought to suggest a sojourn in that district, where indeed Shakespeares were to be found from an early date. Ultimately, of course, he drifted to London and the theatre, where, according to the stage tradition, he found employment in a menial capacity, perhaps even as a holder of horses at the doors, before he was admitted into a company as an actor and so found his way to his true vocation as a writer of plays. Malone thought that he might have left

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[1] It is worth noting that Walter Roche, who in 1558 became fellow of Corpus Christi College, Oxford, was master of the school in 1570–1572, so that its standard must have been good.

[2] Baptista Mantuanus (1448–1516), whose Latin Eclogues were translated by Turberville in 1567.

Stratford with one of the travelling companies of players which from time to time visited the town. Later biographers have fixed upon Leicester's men, who were at Stratford in 1587, and have held that Shakespeare remained to the end in the same company, passing with it on Leicester's death in 1588 under the patronage of Ferdinando, Lord Strange and afterwards earl of Derby, and on Derby's death in 1594 under that of the lord chamberlain, Henry Carey, Lord Hunsdon. This theory perhaps hardly takes sufficient account of the shifting combinations and recombinations of actors, especially during the disastrous plague years of 1592 to 1594. The continuity of Strange's company with Leicester's is very disputable, and while the names of many members of Strange's company in and about 1593 are on record, Shakespeare's is not amongst them. It is at least possible, as will be seen later, that he had about this time relations with the earl of Pembroke's men, or with the earl of Sussex's men, or with both of these organizations.

Play-wright and poet.

What is clear is that by the summer of 1592, when he was twenty-eight, he had begun to emerge as a playwright, and had evoked the jealousy of one at least of the group of scholar poets who in recent years had claimed a monopoly of the stage. This was Robert Greene, who, in an invective on behalf of the play-makers against the play-actors which forms part of his *Groats-worth of Wit*, speaks of "an upstart Crow, beautified with our feathers, that with his *Tygers heart wrapt in a Players hide*, supposes he is as well able to bumbast out a blanke verse as the best of you: and being an absolute *Johannes fac totum*, is in his owne conceit the onely Shake-scene in a countrie." The play upon Shakespeare's name and the parody of a line from *Henry VI.* make the reference unmistakable.[1] The London theatres were closed, first through riots and then through plague, from June 1592 to April 1594, with the exception of about a month at each Christmas during that period; and the companies were dissolved or driven to the provinces. Even if Shakespeare had been connected with Strange's men during their London seasons of 1592 and 1593, it does not seem that he travelled with them. Other activities may have been sufficient to occupy the interval. The most important of these was probably an attempt to win a reputation in the world of non-dramatic poetry. *Venus and Adonis* was published about April 1593, and *Lucrece* about May 1594. The poems were printed by Richard Field, in whom Shakespeare would have found an old Stratford acquaintance; and each has a dedication to Henry Wriothesley, earl of Southampton, a brilliant and accomplished favourite of the court, still in his nonage. A possibly super-subtle criticism discerns an increased warmth in the tone of the later dedication, which is supposed to argue a marked growth of intimacy. The fact of this intimacy is vouched for by the story handed down from Sir William Davenant to Rowe (who published in 1709 the first regular biography of Shakespeare) that Southampton gave Shakespeare a thousand pounds "to enable him to go through with a purchase which he heard he had a mind to." The date of this generosity is not specified, and there is no known purchase by Shakespeare which can have cost anything like the sum named. The mention of Southampton leads naturally to the most difficult problem which a biographer has to handle, that of the *Sonnets*. But this will be more conveniently taken up at a later point, and it is only necessary here to put on record the probability that the earliest of the sonnets belong to the period now under discussion. There is a surmise, which is not in itself other than plausible, and which has certainly been supported with a good deal of ingenious argument, that Shakespeare's enforced leisure enabled him to make of 1593 a *Wanderjahr*, and in particular that the traces of a visit to northern Italy may clearly be seen in the local colouring of *Lucrece* as compared with *Venus and Adonis*, and in that of the group of plays which may be dated in or about 1594 and 1595 as compared with those that preceded. It must, however, be borne in mind that, while Shakespeare may perfectly well, at this or at some earlier time, have voyaged to Italy, and possibly Denmark and even Germany as well, there is no direct evidence to rely upon, and that inference from internal evidence is a dangerous guide when a writer of so assimilative a temperament as that of Shakespeare is concerned.

Connexion with the Chamberlain's company of actors.

From the reopening of the theatres in the summer of 1594 onwards Shakespeare's status is in many ways clearer. He had certainly become a leading member of the Chamberlain's company by the following winter, when his name appears for the first and only time in the treasurer of the chamber's accounts as one of the recipients of payment for their performances at court; and there is every reason to suppose that he continued to act with and write for the same associates to the close of his career. The history of the company may be briefly told. At the death of the lord chamberlain on the 22nd of July 1596, it passed under the protection of his successor, George, 2nd Lord Hunsdon, and once more became "the Lord Chamberlain's men" when he was appointed to that office on the 17th of March 1597. James I. on his accession took this company under his patronage as grooms of the chamber, and during the remainder of Shakespeare's connexion with the stage they were "the King's men." The records of performances at court show that they were by far the most favoured of the companies, their nearest rivals being the company known during the reign of Elizabeth as "the Admiral's," and afterwards as "Prince Henry's men." From the summer of 1594 to March 1603 they appear to have played almost continuously in London, as the only provincial performances by them which are upon record were during the autumn of 1597, when the London theatres were for a short time closed owing to the interference of some of the players in politics. They travelled again during 1603 when the plague was in London, and during at any rate portions of the summers or autumns of most years thereafter. In 1594 they were playing at Newington Butts, and probably also at the Rose on Bankside, and at the Cross Keys in the city. It is natural to suppose that in later years they used the Theatre in Shoreditch, since this was the property of James Burbage, the father of their principal actor, Richard Burbage. The Theatre was pulled down in 1598, and, after a short interval during which the company may have played at the Curtain, also in Shoreditch, Richard Burbage and his brother Cuthbert rehoused them in the Globe on Bankside, built in part out of the materials of the Theatre. Here the profits of the enterprise were divided between the members of the company as such and the owners of the building as "housekeepers," and shares in the "house" were held in joint tenancy by Shakespeare and some of his leading "fellows." About 1608 another playhouse became available for the company in the "private" or winter house of the Black Friars. This was also the property of the Burbages, but had previously been leased to a company of boy players. A somewhat similar arrangement as to profits was made.

Shakespeare is reported by Aubrey to have been a good actor, but Adam in *As You Like It*, and the Ghost in *Hamlet* indicate the type of part which he played. As a dramatist, however, he was the mainstay of the company for at least some fifteen years, during which Ben Jonson, Dekker, Beaumont and Fletcher, and Tourneur also contributed to their repertory. On an average he must have written for them about two plays a year, although his rapidity of production seems to have been greatest during the opening years of the period. There was also no doubt a good deal of rewriting of his own earlier work, and also perhaps, at the beginning, of that of others. Occasionally he may have entered into collaboration, as, for example, at the end of his career, with Fletcher.

In a worldly sense he clearly flourished, and about 1596, if not earlier, he was able to resume relations as a moneyed man with Stratford-on-Avon. There is no evidence to show whether he had visited the town in the interval, or whether he had brought his wife and family to London. His son Hamnet died and was buried at Stratford in 1596. During the last ten years John Shakespeare's affairs had remained unprosperous. He incurred fresh debt, partly through becoming surety for

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[1] It is most improbable, however, that the apologetic reference in Chettle's *Kind-hart's Dream* (December 1592) refers to Shakespeare.

Stratford affairs.

his brother Henry; and in 1592 his name was included in a list of recusants dwelling at or near Stratford-on-Avon, with a note by the commissioners that in his case the cause was believed to be the fear of process for debt. There is no reason to doubt this explanation, or to seek a religious motive in John Shakespeare's abstinence from church. William Shakespeare's purse must have made a considerable difference. The prosecutions for debt ceased, and in 1597 a fresh action was brought in Chancery for the recovery of Asbies from the Lamberts. Like the last, it seems to have been without result. Another step was taken to secure the dignity of the family by an application in the course of 1596 to the heralds for the confirmation of a coat of arms said to have been granted to John Shakespeare while he was bailiff of Stratford. The bearings were *or* on a bend *sable* a spear *or* steeled *argent*, the crest a falcon his wings displayed *argent* supporting a spear *or* steeled *argent*, and the motto *Non sanz droict.* The grant was duly made, and in 1599 there was a further application for leave to impale the arms of Arden, in right of Shakespeare's mother. No use, however, of the Arden arms by the Shakespeares can be traced. In 1597 Shakespeare made an important purchase for £60 of the house and gardens of New Place in Chapel Street. This was one of the largest houses in Stratford, and its acquisition an obvious triumph for the ex-poacher. Presumably John Shakespeare ended his days in peace. A visitor to his shop remembered him as "a merry-cheekt old man" always ready to crack a jest with his son. He died in 1601, and his wife in 1608, and the Henley Street houses passed to Shakespeare. Aubrey records that he paid annual visits to Stratford, and there is evidence that he kept in touch with the life of the place. The correspondence of his neighbours, the Quineys, in 1598 contains an application to him for a loan to Richard Quiney upon a visit to London, and a discussion of possible investments for him in the neighbourhood of Stratford. In 1602 he took, at a rent of 2s. 6d. a year, a copyhold cottage in Chapel Lane, perhaps for the use of his gardener. In the same year he invested £320 in the purchase of an estate consisting of 107 acres in the open fields of Old Stratford, together with a farm-house, garden and orchard, 20 acres of pasture and common rights; and in 1605 he spent another £440 in the outstanding term of a lease of certain great tithes in Stratford parish, which brought in an income of about £60 a year.

London associations.

Meanwhile London remained his headquarters. Here Malone thought that he had evidence, now lost, of his residence in Southwark as early as 1596, and as late as 1608. It is known that payments of subsidy were due from him for 1597 and 1598 in the parish of St Helen's, Bishopsgate, and that an arrear was ultimately collected in the liberty of the Clink. He had no doubt migrated from Bishopsgate when the Globe upon Bankside was opened by the Chamberlain's men. There is evidence that in 1604 he "lay," temporarily or permanently, in the house of Christopher Mountjoy, a tire-maker of French extraction, at the corner of Silver Street and Monkwell Street in Cripplegate. A recently recovered note by Aubrey, if it really refers to Shakespeare (which is not quite certain), is of value as throwing light not only upon his abode, but upon his personality. Aubrey seems to have derived it from William Beeston the actor, and through him from John Lacy, an actor of the king's company. It is as follows: "The more to be admired q[uod] he was not a company-keeper, lived in Shoreditch, would not be debauched, & if invited to court, he was in paine." Against this testimony to the correctness of Shakespeare's morals are to be placed an anecdote of a green-room amour picked up by a Middle Temple student in 1602 and a Restoration scandal which made him the father by the hostess of the Crown Inn at Oxford, where he baited on his visits to Stratford, of Sir William Davenant, who was born in February 1606. His credit at court is implied by Ben Jonson's references to his flights "that so did take Eliza and our James," and by stories of the courtesies which passed between him and Elizabeth while he was playing a kingly part in her presence, of the origin of *The Merry Wives of Windsor* in her desire to see Falstaff in love, and of an autograph letter written to honour him by King James. It was noticed with some surprise by Henry Chettle that his "honied muse" dropped no "sable tear" to celebrate the death of the queen. Southampton's patronage may have introduced him to the brilliant circle that gathered round the earl of Essex, but there is no reason to suppose that he or his company were held personally responsible for the performance of *Richard II.* at the command of some of the followers of Essex as a prelude to the disastrous rising of February 1601. The editors of the First Folio speak also of favours received by the author in his lifetime from William Herbert, earl of Pembroke, and his brother Philip Herbert, earl of Montgomery.

Friends.

He appears to have been on cordial terms with his fellows of the stage. One of them, Augustine Phillips, left him a small legacy in 1605, and in his own will he paid a similar compliment to Richard Burbage, and to John Heminge and Henry Condell, who afterwards edited his plays. His relations with Ben Jonson, whom he is said by Rowe to have introduced to the world as a playwright, have been much canvassed. Jests are preserved which, even if apocryphal, indicate considerable intimacy between the two. This is not inconsistent with occasional passages of arms. The anonymous author of *The Return from Parnassus* (2nd part; 1602), for example, makes Kempe, the actor, allude to a "purge" which Shakespeare gave Jonson, in return for his attack on some of his rivals in *The Poetaster.*[1] It has been conjectured that this purge was the description of Ajax and his humours in *Troilus and Cressida.* Jonson, on the other hand, who was criticism incarnate, did not spare Shakespeare either in his prologues or in his private conversation. He told Drummond of Hawthornden that "Shakspeer wanted arte." But the verses which he contributed to the First Folio are generous enough to make all amends, and in his *Discoveries* (pub. 1641; written c. 1624 and later), while regretting Shakespeare's excessive facility and the fact that he often "fell into those things, could not escape laughter," he declares him to have been "honest and of an open and free nature," and says that, for his own part, "I lov'd the man and do honour his memory (on this side idolatry) as much as any." According to the memoranda-book (1661–1663) of the Rev. John Ward (who became vicar of Stratford in 1662), Jonson and Michael Drayton, himself a Warwickshire poet, had been drinking with Shakespeare when he caught the fever of which he died; and Thomas Fuller (1608–1661), whose *Worthies* was published in 1662, gives an imaginative description of the wit combats, of which many took place between the two mighty contemporaries.

Contemporary reputation.

Of Shakespeare's literary reputation during his lifetime there is ample evidence. He is probably neither the "Willy" of Spenser's *Tears of the Muses*, nor the "Aetion" of his *Colin Clout's Come Home Again.* But from the time of the publication of *Venus and Adonis* and *Lucrece* honorific allusions to his work both as poet and dramatist, and often to himself by name, come thick and fast from writers of every kind and degree. Perhaps the most interesting of these from the biographical point of view are those contained in the *Palladis Tamia*, a kind of literary handbook published by Francis Meres in 1598; for Meres not only extols him as "the most excellent in both kinds [*i.e.* comedy and tragedy] for the stage," and one of "the most passionate among us to bewaile and bemoane the perplexities of Love," but also takes the trouble to give a list of twelve plays already written, which serves as a starting-point for all modern attempts at a chronological arrangement of his work. It is moreover from Meres that we first hear of "his sugred Sonnets among his private friends." Two of these sonnets were printed in 1599 in a volume of miscellaneous verse called *The Passionate Pilgrim*. This was ascribed upon the title-page to Shakespeare, but probably, so far as most of its contents were concerned, without justification. The bulk of Shakespeare's sonnets remained unpublished until 1609.

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[1] Kempe (speaking to Burbage), "Few of the university pen plays well. They smell too much of that writer Ovid and that writer (*sic*) Metamorphosis, and talk too much of Proserpina and Jupiter. Why here's our fellow Shakespeare puts them all down; aye, and Ben Jonson too. O that Ben Jonson is a pestilent fellow. He brought up Horace giving the Poets a pill, but our fellow Shakespeare hath given him a purge that made him beray his credit."

Last years. About 1610 Shakespeare seems to have left London, and entered upon the definite occupation of his house at New Place, Stratford. Here he lived the life of a retired gentleman, on friendly if satirical terms with the richest of his neighbours, the Combes, and interested in local affairs, such as a bill for the improvement of the highways in 1611, or a proposed enclosure of the open fields at Welcombe in 1614, which might affect his income or his comfort. He had his garden with its mulberry-tree, and his farm in the immediate neighbourhood. His brothers Gilbert and Richard were still alive; the latter died in 1613. His sister Joan had married William Hart, a hatter, and in 1616 was dwelling in one of his houses in Henley Street. Of his daughters, the eldest, Susanna, had married in 1607 John Hall (d. 1635), a physician of some reputation. They dwelt in Stratford, and had one child, Elizabeth, afterwards Lady Barnard (1608–1670). The younger, Judith, married Thomas Quiney, a vintner, also of Stratford, two months before her father's death. At Stratford the last few of the plays may have been written, but it is reasonable to suppose that Shakespeare's connexion with the King's company ended when the Globe was burnt down during a performance of *Henry VIII*. on the 29th of June 1613. Certainly his retirement did not imply an absolute break with London life. In 1613 he devised an *impresa*, or emblem, to be painted by Richard Burbage, and worn in the tilt on Accession day by the earl of Rutland, who had been one of the old circle of Southampton and Essex. In the same year he purchased for £140 a freehold house in the Blackfriars, near the Wardrobe. This was conveyed to trustees, apparently in order to bar the right which his widow would otherwise have had to dower. In 1615 this purchase involved Shakespeare in a lawsuit for the surrender of the title-deeds. Richard Davies, a Gloucestershire clergyman of the end of the 17th century, reports that the poet "died a papist," and the statement deserves more attention than it has received from biographers. There is indeed little to corroborate it; for an alleged "spiritual testament" of John Shakespeare is of suspected origin, and Davies's own words suggest a late conversion rather than an hereditary faith. On the other hand, there is little to refute it beyond an entry in the accounts of Stratford corporation for drink given in 1614 to "a preacher at the Newe Place."

Will. Shakespeare made his will on the 25th of March 1616, apparently in some haste, as the executed deed is a draft with many erasures and interlineations. There were legacies to his daughter Judith Quiney and his sister Joan Hart, and remembrances to friends both in Warwickshire and in London; but the real estate was left to his sister Susanna Hall under a strict entail which points to a desire on the part of the testator to found a family. Shakespeare's wife, for whom other provision must have been made, is only mentioned in an interlineation, by which the "second best bed with the furniture" was bequeathed to her. Much nonsense has been written about this, but it seems quite natural. The best bed was an important chattel, which would go with the house. The estate was after all not a large one. Aubrey's estimate of its annual value as £200 or £300 a year sounds reasonable enough, and John Ward's statement that Shakespeare spent £1000 a year must surely be an exaggeration. The sum-total of his known investments amounts to £960. Mr Sidney Lee calculates that his theatrical income must have reached £600 a year; but it may be doubted whether this also is not a considerable overestimate. It must be remembered that the purchasing value of money in the 17th century is generally regarded as having been about eight times its present value. Shakespeare's interest in the "houses" of the Globe and Blackfriars probably determined on his death.

Death. A month after his will was signed, on the 23rd of April 1616, Shakespeare died, and as a tithe-owner was buried in the chancel of the parish church. Some doggerel upon the stone that covers the grave has been assigned by local tradition to his own pen. A more elaborate monument, with a bust by the sculptor Gerard Johnson, was in due course set up on the chancel wall. Anne Shakespeare followed her husband on the 6th of August 1623. The family was never founded. Shakespeare's grand-daughter, Elizabeth Hall, made two childless marriages, the first with Thomas Nash of Stratford, the second with John, afterwards Sir John, Barnard of Abington Manor, Northants. His daughter Judith Quiney had three sons, all of whom had died unmarried by 1639. There were, therefore, no direct descendants of Shakespeare in existence after Lady Barnard's death in 1670. Those of his sister, Joan Hart, could however still be traced in 1864. On Lady Barnard's death the Henley Street houses passed to the Harts, in whose family they remained until 1806. They were then sold, and in 1846 were bought for the public. They are now held with Anne Hathaway's Cottage at Shottery as the Birthplace Trust. Lady Barnard had disposed of the Blackfriars house. The rest of the property was sold under the terms of her will, and New Place passed, first to the Cloptons who rebuilt it, and then to the Rev. Francis Gastrell, who pulled it down in 1759. The site now forms a public recreation-ground, and hard by is a memorial building with a theatre in which performances of Shakespeare's plays are given annually in April. Both the Memorial and the Birthplace contain museums, in which books, documents and portraits of Shakespearian interest, together with relics of greater or less authenticity, are stored.

No letter or other writing in Shakespeare's hand can be proved to exist, with the exception of three signatures upon his will, one upon a deposition (May 11, 1612) in a lawsuit with which he was remotely concerned, and two upon deeds (March 10 and 11, 1613) in connexion with the purchase of his Blackfriars house. A copy of Florio's translation of Montaigne (1603) in the British Museum, a copy of the Aldine edition of Ovid's *Metamorphoses* (1502) in the Bodleian, and a copy of the 1612 edition of Sir Thomas North's translation of Plutarch's *Lives of the Noble Grecians and Romaines* in the Greenock Library, have all been put forward with some plausibility as bearing his autograph name or initials, and, in the third case, a marginal note by him. A passage in the manuscript of the play of *Sir Thomas More* has been ascribed to him (*vide infra*), and, if the play is his, might be in his handwriting. Aubrey records that he was "a handsome, well-shap't man," and the lameness attributed to him by some writers has its origin only in a too literal interpretation of certain references to spiritual disabilities in the *Sonnets*.

Dramas. A collection of *Mr William Shakespeare's Comedies, Histories and Tragedies* was printed at the press of William and Isaac Jaggard, and issued by a group of booksellers in 1623. This volume is known as the First Folio. It has dedications to the earls of Pembroke and Montgomery, and to "the great Variety of Readers," both of which are signed by two of Shakespeare's "fellows" at the Globe, John Heminge and Henry Condell, and commendatory verses by Ben Jonson, Hugh Holland, Leonard Digges and an unidentified I. M. The Droeshout engraving forms part of the title-page. The contents include, with the exception of *Pericles*, all of the thirty-seven plays now ordinarily printed in editions of Shakespeare's works. Of these eighteen were here published for the first time. The other eighteen had already appeared in one or more separate editions, known as the Quartos.

The following list gives the date of the First Quarto of each such play, and also that of any later Quarto which differs materially from the First.

The Quarto Editions.

Titus Andronicus (1594).
2 *Henry VI.* (1594).
3 *Henry VI.* (1595).
Richard II. (1597, 1608).
Richard III. (1597).
Romeo and Juliet (1597, 1599).
Love's Labour's Lost (1598).
1 *Henry IV.* (1598).
2 *Henry IV.* (1600).
Henry V. (1600).
A Midsummer Night's Dream (1600).
The Merchant of Venice (1600).
Much Ado About Nothing (1600).
The Merry Wives of Windsor (1602).
Hamlet (1603, 1604).
King Lear (1608).
Troilus and Cressida (1609).
Othello (1622).

Entries in the *Register* of copyrights kept by the Company of Stationers indicate that editions of *As You Like It* and *Anthony and Cleopatra* were contemplated but not published in 1600 and 1608 respectively.

The Quartos differ very much in character. Some of them contain texts which are practically identical with those of the First Folio; others show variations so material as to suggest that some revision, either by rewriting or by shortening for stage purposes, took place. Amongst the latter are 2, 3 *Henry VI.*, *Richard III.*, *Romeo and Juliet*, *The Merry Wives of Windsor*, *Hamlet* and *King Lear*. Many scholars doubt whether the Quarto versions of 2, 3 *Henry VI.*, which appeared under the titles of *The First Part of the Contention betwixt the two famous Houses of York and Lancaster* and *The True Tragedy of Richard Duke of York*, are Shakespeare's work at all. It seems clear that the Quartos of *The Troublesome Reign of John King of England* (1591) and *The Taming of A Shrew* (1594), although treated for copyright purposes as identical with the plays of *King John* and *The Taming of the Shrew*, which he founded upon them, are not his. The First Quartos of *Romeo and Juliet*, *Henry V.*, *The Merry Wives of Windsor*, and *Hamlet* seem to be mainly based, not upon written texts of the plays, but upon versions largely made up out of shorthand notes taken at the theatre by the agents of a piratical bookseller. A similar desire to exploit the commercial value of Shakespeare's reputation probably led to the appearance of his name or initials upon the title-pages of *Locrine* (1595), *Sir John Oldcastle* (1600), *Thomas Lord Cromwell* (1602), *The London Prodigal* (1605), *The Puritan* (1607), *A Yorkshire Tragedy* (1608), and *Pericles* (1609). It is not likely that, with the exception of the last three acts of *Pericles*, he wrote any part of these plays, some of which were not even produced by his company. They were not included in the First Folio of 1623, nor in a reprint of it in 1632, known as the Second Folio; but all seven were appended to the second issue (1664) of the Third Folio (1663), and to the Fourth Folio of 1685. Shakespeare is named as joint author with John Fletcher on the title-page of *The Two Noble Kinsmen* (1634), and with William Rowley on that of *The Birth of Merlin* (1662); there is no reason for rejecting the former ascription or for accepting the latter. Late entries in the Stationers' *Register* assign to him *Cardenio* (with Fletcher), *Henry I.* and *Henry II.* (both with Robert Davenport), *King Stephen*, *Duke Humphrey*, and *Iphis and Ianthe*; but none of these plays is now extant. Modern conjecture has attempted to trace his hand in other plays, of which *Arden of Feversham* (1592), *Edward III.* (1596), *Mucedorus* (1598), and *The Merry Devil of Edmonton* (1608) are the most important; it is quite possible that he may have had a share in *Edward III.* A play on *Sir Thomas More*, which has been handed down in manuscript, contains a number of passages, interpolated in various handwritings, to meet requirements of the censor; and there are those who assign one of these (ii. 4, 1-172) to Shakespeare.

Dates.

Unfortunately the First Folio does not give the dates at which the plays contained in it were written or produced; and the endeavour to supply this deficiency has been one of the main preoccupations of more than a century of Shakespearian scholarship, since the pioneer essay of Edmund Malone in his *An Attempt to Ascertain the Order in which the Plays of Shakespeare were Written* (1778). The investigation is not a mere piece of barren antiquarianism, for on it depends the possibility of appreciating the work of the world's greatest poet, not as if it were an articulated whole like a philosophical system, but in its true aspect as the reflex of a vital and constantly developing personality. A starting-point is afforded by the dates of the Quartos and the entries in the Stationers' *Register* which refer to them, and by the list of plays already in existence in 1598 which is inserted by Francis Meres in his *Palladis Tamia* of that year, and which, while not necessarily exhaustive of Shakespeare's pre-1598 writing, includes *The Two Gentlemen of Verona*, *The Comedy of Errors*, *Love's Labour's Lost*, *A Midsummer Night's Dream*, *The Merchant of Venice*, *Richard II.*, *Richard III.*, *Henry IV.*, *King John*, *Titus Andronicus* and *Romeo and Juliet*, as well as a mysterious *Love's Labour's Won*, which has been conjecturally identified with several plays, but most plausibly with *The Taming of the Shrew.* There is a mass of supplementary evidence, drawn partly from definite notices in other writings or in diaries, letters, account-books, and similar records, partly from allusions to contemporary persons and events in the plays themselves, partly from parallels of thought and expression between each play and those near to it in point of time, and partly from considerations of style, including the so-called metrical tests, which depend upon an analysis of Shakespeare's varying feeling for rhythm at different stages of his career. The total result is certainly not a demonstration, but in the logical sense an hypothesis which serves to colligate the facts and is consistent with itself and with the known events of Shakespeare's external life.

The following table, which is an attempt to arrange the original dates of production of the plays without regard to possible revisions, may be taken as fairly representing the common results of recent scholarship. It is framed on the assumption that, as indeed John Ward tells us was the case, Shakespeare ordinarily wrote two plays a year; but it will be understood that neither the order in which the plays are given nor the distribution of them over the years lays claim to more than approximate accuracy.

Chronology of the Plays.

1591.
(1, 2) *The Contention of York and Lancaster* (2, 3 *Henry VI.*).
1592.
(3) 1 *Henry VI.*
(The theatres were closed for riot and plague from June to the end of December.)
1593.
(4) *Richard III.*
(5) *Edward III.* (part only).
(6) *The Comedy of Errors.*
(The theatres were closed for plague from the beginning of February to the end of December.)
1594.
(7) *Titus Andronicus.*
(The theatres were closed for plague during February and March.)
(8) *Taming of the Shrew.*
(9) *Love's Labour's Lost.*
(10) *Romeo and Juliet.*
1595.
(11) *A Midsummer Night's Dream.*
(12) *The Two Gentlemen of Verona.*
(13) *King John.*
1596.
(14) *Richard II.*
(15) *The Merchant of Venice.*
1597.
(The theatres were closed for misdemeanour from the end of July to October.)
(16) 1 *Henry IV.*
1598.
(17) 2 *Henry IV.*
(18) *Much Ado About Nothing.*
1599.
(19) *Henry V.*
(20) *Julius Caesar.*

1600.
(21) *The Merry Wives of Windsor.*
(22) *As You Like It.*
1601.
(23) *Hamlet.*
(24) *Twelfth Night.*
1602.
(25) *Troilus and Cressida.*
(26) *All's Well that Ends Well.*
1603.
(The theatres were closed on Elizabeth's death in March, and remained closed for plague throughout the year.)
1604.
(27) *Measure for Measure.*
(28) *Othello.*
1605.
(29) *Macbeth.*
(30) *King Lear.*
1606.
(31) *Anthony and Cleopatra.*
(32) *Coriolanus.*
1607.
(33) *Timon of Athens* (unfinished).
1608.
(34) *Pericles* (part only).
1609.
(35) *Cymbeline.*
1610.
(36) *The Winter's Tale.*
1611.
(37) *The Tempest.*
1612.
1613.
(38) *The Two Noble Kinsmen* (part only).
(39) *Henry VIII.* (part only).

A more detailed account of the individual plays may now be attempted. The figures here prefixed correspond to those in the table above.

Composition.

1, 2. The relation of *The Contention of York and Lancaster* to 2, 3 *Henry VI.* and the extent of Shakespeare's responsibility for either or both works have long been subjects of controversy. The extremes of critical opinion are to be found in a theory which regards Shakespeare as the sole author of 2, 3 *Henry VI.* and *The Contention* as a shortened and piratical version of the original plays, and in a theory which regards *The Contention* as written in collaboration by Marlowe, Greene and possibly Peele, and 2, 3 *Henry VI.* as a revision of

The Contention written, also in collaboration, by Marlowe and Shakespeare. A comparison of the two texts leaves it hardly possible to doubt that the differences between them are to be explained by revision rather than by piracy; but the question of authorship is more difficult. Greene's parody, in the "Shake-scene" passage of his *Groats-worth of Wit* (1592), of a line which occurs both in *The Contention* and in 3 *Henry VI.*, while it clearly suggests Shakespeare's connexion with the plays, is evidence neither for nor against the participation of other men, and no sufficient criterion exists for distinguishing between Shakespeare's earliest writing and that of possible collaborators on grounds of style. But there is nothing inconsistent between the reviser's work in 2, 3 *Henry VI.* and on the one hand *Richard III.* or on the other the original matter of *The Contention,* which the reviser follows and elaborates scene by scene. It is difficult to assign to any one except Shakespeare the humour of the Jack Cade scenes, the whole substance of which is in *The Contention* as well as in *Henry VI.* Views which exclude Shakespeare altogether may be left out of account. *Henry VI.* is not in Meres's list of his plays, but its inclusion in the First Folio is an almost certain ground for assigning to him some share, if only as reviser, in the completed work.

3. A very similar problem is afforded by 1 *Henry VI.*, and here also it is natural, in the absence of tangible evidence to the contrary, to hold by Shakespeare's substantial responsibility for the play as it stands. It is quite possible that it also may be a revised version, although in this case no earlier version exists; and if so the Talbot scenes (iv. 2-7) and perhaps also the Temple Gardens scene (ii. 4), which are distinguished by certain qualities of style from the rest of the play, may date from the period of revision. Thomas Nash refers to the representation of Talbot on the stage in his *Pierce Penilesse, his Supplication to the Divell* (1592), and it is probable that 1 *Henry VI.* is to be identified with the "Harey the vj." recorded in Henslowe's *Diary* to have been acted as a new play by Lord Strange's men, probably at the Rose, on the 3rd of March 1592. If so, it is a reasonable conjecture that the two parts of *The Contention* were originally written at some date before the beginning of Henslowe's record in the previous February, and were revised so as to fall into a series with 1 *Henry VI.* in the latter end of 1592.

4. The series as revised can only be intended to lead directly up to *Richard III.*, and this relationship, together with its style as compared with that of the plays belonging to the autumn of 1594, suggest the short winter season of 1592–1593 as the most likely time for the production of *Richard III.* There is a difficulty in that it is not included in Henslowe's list of the plays acted by Lord Strange's men during that season. But it may quite well have been produced by the only other company which appeared at court during the Christmas festivities, Lord Pembroke's. The mere fact that Shakespeare wrote a play, or more than one play, for Lord Strange's men during 1592–1594 does not prove that he never wrote for any other company during the same period; and indeed there is plenty of room for guess-work as to the relations between Strange's and Pembroke's men. The latter are not known to have existed before 1592, and many difficulties would be solved by the assumption that they originated out of a division of Strange's, whose numbers, since their amalgamation with the Admiral's, may have been too much inflated to enable them to undertake as a whole the summer tour of that year. If so, Pembroke's probably took over the *Henry VI.* series of plays, since *The Contention*, or at least the *True Tragedy*, was published as performed by them, and completed it with *Richard III.* on their return to London at Christmas. It will be necessary to return to this theory in connexion with the discussion of *Titus Andronicus* and *The Taming of the Shrew.* The principal historical source for *Henry VI.* was Edward Hall's *The Union of the Noble and Illustre Families of Lancaster and York* (1542), and for *Richard III.*, as for all Shakespeare's later historical plays, the second edition (1587) of Raphael Holinshed's *Chronicles of England, Scotland and Ireland* (1577). An earlier play, *The True Tragedy of Richard the Third* (1594), seems to have contributed little if anything to *Richard III.*

5. Many scholars think that at any rate the greater part of the first two acts of *Edward III.*, containing the story of Edward's wooing of the countess of Salisbury, are by Shakespeare; and, if so, it is to about the time of *Richard III.* that the style of his contribution seems to belong. The play was entered in the Stationers' *Register* on December 1, 1595. The Shakespearian scenes are based on the 46th Novel in William Paynter's *Palace of Pleasure* (1566). The line, "Lilies that fester smell far worse than weeds" (ii. 1. 451), is repeated verbatim in the 94th sonnet.

6. To the winter season of 1592–1593 may also be assigned with fair probability Shakespeare's first experimental comedy, *The Comedy of Errors,* and if his writing at one and the same time for Pembroke's and for another company is not regarded as beyond the bounds of conjecture, it becomes tempting to identify this with "the gelyous comodey" produced, probably by Strange's men, for Henslowe as a new play on January 5, 1593. The play contains a reference to the wars of succession in France which would fit any date from 1589 to 1594. The plot is taken from the *Menaechmi,* and to a smaller extent from the *Amphitruo* of Plautus. William Warner's translation of the *Menaechmi* was entered in the Stationers' *Register* on June 10, 1594. A performance of *The Comedy of Errors* by "a company of base and common fellows" (including Shakespeare?) is recorded in the *Gesta Grayorum* as taking place in Gray's Inn hall on December 28, 1594.

7. *Titus Andronicus* is another play in which many scholars have refused to see the hand of Shakespeare, but the double testimony of its inclusion in Meres's list and in the First Folio makes it unreasonable to deny him some part in it. This may, however, only have been the part of a reviser, working, like the reviser of *The Contention,* upon the dialogue rather than the structure of a crude tragedy of the school of Kyd. In fact a stage tradition is reported by Edward Ravenscroft, a late 17th-century adapter of the play, to the effect that Shakespeare did no more than give a few "master-touches" to the work of a "private author." The play was entered in the Stationers' *Register* on February 6, 1594, and was published in the same year with a title-page setting out that it had been acted by the companies of Lords Derby (*i.e.* Strange, who had succeeded to his father's title on September 25, 1593), Pembroke and Sussex. It is natural to take this list as indicating the order in which the three companies named had to do with it, but it is probable that only Sussex's had played Shakespeare's version. Henslowe records the production by this company of *Titus and Andronicus* as a new play on January 23, 1594, only a few days before the theatres were closed by plague. For the purposes of Henslowe's financial arrangements with the company a rewritten play may have been classed as new. Two years earlier he had appended the same description to a play of *Tittus and Vespacia,* produced by Strange's men on April 11, 1592. At first sight the title suggests a piece founded on the lives of the emperor Titus and Vespasian, but the identification of the play with an early version of *Titus Andronicus* is justified by the existence of a rough German adaptation, which follows the general outlines of Shakespeare's play, but in which one of the sons of Titus is named Vespasian instead of Lucius. The ultimate source of the plot is unknown. It cannot be traced in any of the Byzantine chroniclers. Strange's men seem to have been still playing *Titus* in January 1593, and it was probably not transferred to Pembroke's until the companies were driven from London by the plague of that year. Pembroke's are known from a letter of Henslowe's to have been ruined by August, and it is to be suspected that Sussex's, who appeared in London for the first time at the Christmas of 1593, acquired their stock of plays and transferred these to the Chamberlain's men, when the companies were again reconstituted in the summer of 1594. The revision of *Titus and Vespasian* into *Titus Andronicus* by Shakespeare may have been accomplished in the interval between these two transactions. The Chamberlain's men were apparently playing *Andronicus* in June. The stock of Pembroke's men probably included, as well as *Titus and Vespasian,* both *Henry VI.* and *Richard III.*, which also thus passed to the Chamberlain's company.

8. In the same way was probably also acquired an old play of *The Taming of A Shrew.* This, which can be traced back as far as 1589, was published as acted by Pembroke's men in 1594. In June of that year it was being acted by the Chamberlain's, but more probably in the revised version by Shakespeare, which bears the slightly altered title of *The Taming of The Shrew.* This is a much more free adaptation of its original than had been attempted in the case of *Henry VI.*, and the Warwickshire allusions in the Induction are noteworthy. Some critics have doubted whether Shakespeare was the sole author of *The Shrew*, and others have assigned him a share in *A Shrew*, but neither theory has any very substantial foundation. The origins of the play, which is to be classed as a farce rather than a comedy, are to be found ultimately in widely distributed folk-tales, and more immediately in Ariosto's *I Suppositi* (1509) as translated in George Gascoigne's *The Supposes* (1566). It may have been Shakespeare's first task for the newly established Chamberlain's company of 1594 to furbish up the old farce. Thenceforward there is no reason to think that he ever wrote for any other company.

9. *Love's Labour's Lost* has often been regarded as the first of Shakespeare's plays, and has sometimes been placed as early as 1589. There is, however, no proof that Shakespeare was writing before 1592 or thereabouts. The characters of *Love's Labour's Lost* are evidently suggested by Henry of Navarre, his followers Biron and Longaville, and the Catholic League leader, the duc de Maine. These personages would have been familiar at any time from 1585 onwards. The absence of the play from the lists in Henslowe's *Diary* does not leave it impossible that it should have preceded the formation of the Chamberlain's company, but certainly renders this less likely; and its lyric character perhaps justifies its being grouped with the series of plays that began in the autumn of 1594. No entry of the play is found in the Stationers' *Register*, and it is quite possible that the present First Quarto of 1598 was not really the first edition. The title-page professes to give the play as it was "corrected and augmented" for the Christmas either of 1597 or of 1598. It was again revived for that of 1604. No literary source is known for its incidents.

10. *Romeo and Juliet*, which was published in 1597 as played by Lord Hunsdon's men, was probably produced somewhat before *A Midsummer Night's Dream*, as its incidents seem to have suggested the parody of the Pyramus and Thisbe interlude. An attempt to date it in 1591 is hardly justified by the Nurse's references to an earthquake eleven years before and the fact that there was a real earthquake in London in 1580. The text seems to have been partly revised before the issue of the Second Quarto in 1599. There had been an earlier play on the subject, but the immediate source used by Shakespeare was Arthur Brooke's narrative poem *Romeus and Juliet* (1562).

11. *A Midsummer Night's Dream*, with its masque-like scenes of fairydom and the epithalamium at its close, has all the air of having been written less for the public stage than for some courtly wedding; and the compliment paid by Oberon to the "fair vestal throned by the west" makes it probable that it was a wedding at which Elizabeth was present. Two fairly plausible occasions have been suggested. The wedding of Mary countess of Southampton with Sir Thomas Heneage on the 2nd of May 1594 would fit the May-day setting of the plot; but a widowed countess hardly answers to the "little western flower" of the allegory, and there are allusions to events later in 1594 and in particular to the rainy weather of June and July, which indicate a somewhat later date. The wedding of William Stanley, earl of Derby, brother of the lord Strange for whose players Shakespeare had written, and Elizabeth Vere, daughter of the earl of Oxford, which took place at Greenwich on the 26th of January 1595, perhaps fits the conditions best. It has been fancied that Shakespeare was present when "certain stars shot madly from their spheres" in the Kenilworth fireworks of 1575, but if he had any such entertainment in mind it is more likely to have been the more recent one given to Elizabeth by the earl of Hertford at Elvetham in 1591. There appears to be no special source for the play beyond Chaucer's *Knight's Tale* and the widespread fairy lore of western Europe.

12. No very definite evidence exists for the date of *The Two Gentlemen of Verona*, other than the mention of it in *Palladis Tamia.* It is evidently a more rudimentary essay in the genre of romantic comedy than *The Merchant of Venice*, with which it has other affinities in its Italian colouring and its use of the inter-relations of love and friendship as a theme; and it may therefore be roughly assigned to the neighbourhood of 1595. The plot is drawn from various examples of contemporary fiction, especially from the story of the shepherdess Filismena in Jorge de Montemayor's *Diana* (1559). A play of *Felix and Philiomena* had already been given at court in 1585.

13. *King John* is another play for which 1595 seems a likely date, partly on account of its style, and partly from the improbability of a play on an independent subject drawn from English history being interpolated in the middle either of the Yorkist or of the Lancastrian series. It would seem that Shakespeare had before him an old play of the Queen's men, called *The Troublesome Reign of King John.* This was published in 1591, and again, with "W. Sh." on the title-page, in 1611. For copyright purposes *King John* appears to have been regarded as a revision of *The Troublesome Reign*, and in fact the succession of incidents in the two plays is much the same. Shakespeare's dialogue, however, owes little or nothing to that of his predecessor.

14. *Richard II.* can be dated with some accuracy by a comparison of the two editions of Samuel Daniel's narrative poem on *The Civil Wars Between the Two Houses of Lancaster and York*, both of which bear the date of 1595 and were therefore issued between March 25, 1595 and March 24, 1596 of the modern reckoning. The second of these editions, but not the first, contains some close parallels to the play. From the first two quartos of *Richard II.*, published in 1597 and 1598, the deposition scene was omitted, although it was clearly part of the original structure of the play, and its removal leaves an obvious mutilation in the text. There is some reason to suppose that this was due to a popular tendency to draw seditious parallels between Richard and Elizabeth; and it became one of the charges against the earl of Essex and his fellow-conspirators in the abortive *émeute* of February 1601, that they had procured a performance of a play on Richard's fate in order to stimulate their followers. As the actors were the Lord Chamberlain's men, this play can hardly have been any other than Shakespeare's. The deposition scene was not printed until after Elizabeth's death, in the Third Quarto of 1608.

15. *The Merchant of Venice*, certainly earlier than July 22, 1598, on which date it was entered in the Stationers' *Register*, and possibly inspired by the machinations of the Jew poisoner Roderigo Lopez, (who was executed in June 1594, shows a considerable advance in comic and melodramatic power over any of the earlier plays, and is assigned by a majority of scholars to about 1596. The various stories of which its plot is compounded are based upon common themes of folk-tales and Italian *novelle.* It is possible that Shakespeare may have had before him a play called *The Jew*, of which there are traces as early as 1579, and in which motives illustrating "the greedinesse of worldly chusers" and the "bloody mindes of usurers" appear to have been already combined. Something may also be owing to Marlowe's play of *The Jew of Malta.*

16, 17. The existence of *Richard II.* is assumed throughout in *Henry IV.*, which probably therefore followed it after no long interval. The first part was published in 1598, the second not until 1600, but both parts must have been in existence before the entry of the first part in the Stationers' *Register* on February 25th 1598, since Falstaff is named in this entry, and a slip in a speech-prefix of the second part, which was not entered in the *Register* until August 23rd 1600, betrays that it was written when the character still bore the name of Sir John Oldcastle. Richard James, in his dedication to *The Legend of Sir John Oldcastle* about 1625, and Rowe in 1709 both bear witness to the substitution of the one personage for the other, which Rowe ascribes to the intervention of Elizabeth, and James to that of some descendants of Oldcastle, one of whom was probably Lord Cobham. There is an allusion to the incident and an acknowledgment of the wrong done to the famous Lollard martyr in the epilogue to 2 *Henry IV.* itself. Probably Shakespeare found Oldcastle, with very little else that was of service to him, in an old play called *The Famous Victories of Henry the Fifth,* which had been acted by Tarlton and the Queen's men at least as far back as 1588, and of which an edition was printed in 1598. Falstaff himself is a somewhat libellous presentment of the 15th century leader, Sir John Fastolf, who had already figured in *Henry VI.*; but presumably Fastolf has no titled descendants alive in 1598.

18. An entry in the Stationers' *Register* during 1600 shows that *Much Ado About Nothing* was in existence, although its publication was then directed to be "stayed." It may plausibly be regarded as the earliest play not included in Meres's list. In 1613 it was revived before James I. under the alternative title of *Benedick and Beatrice.* Dogberry is said by Aubrey to have been taken from a constable at Grendon in Buckinghamshire. There is no very definite literary source for the play, although some of its incidents are to be found in Ariosto's *Orlando Furioso* and Bandello's *novelle,* and attempts have been made to establish relationships between it and two early German plays, Jacob Ayrer's *Die Schöne Phaenicia* and the *Vincentius Ladiszlaus* of Duke Henry Julius of Brunswick.

19. The completion of the Lancastrian series of histories by *Henry V.* can be safely placed in or about 1599, since there is an allusion in one of the choruses to the military operations in Ireland of the earl of Essex, who crossed on March 27 and returned on September 28, 1599. The First Quarto, which was first "stayed" with *Much Ado About Nothing* and then published in 1600, is a piratical text, and does not include the choruses. A geniune and perhaps slightly revised version was first published in the First Folio.

20. That *Julius Caesar* also belongs to 1599 is shown, not only by its links with *Henry V.* but also by an allusion to it in John Weever's *Mirror of Martyrs,* a work written two years before its publication in 1601, and by a notice of a performance on September 21st, 1599 by Thomas Platter of Basel in an account of a visit to London. This was the first of Shakespeare's Roman plays, and, like those that followed, was based upon Plutarch's *Lives* as translated from the French of Jacques Amyot and published by Sir Thomas North in 1580. It was also Shakespeare's first tragedy since *Romeo and Juliet.*

21. It is reported by John Dennis, in the preface to *The Comical Gallant* (1702), that *The Merry Wives of Windsor* was written at the express desire of Elizabeth, who wished to see Falstaff in love, and was finished by Shakespeare in the space of a fortnight. A date at the end of 1599 or the beginning of 1600, shortly after the completion of the historical Falstaff plays, would be the most natural one for this enterprise, and with such a date the evidence of style agrees. The play was entered in the Stationers' *Register* on January 18th, 1602. The First Quarto of the same year appears to contain an earlier version of the text than that of the First Folio. Among the passages omitted in the revision was an allusion to the adventures of the duke of Württemberg and count of Mompelgard, whose attempts to secure the Garter had brought him into notice. The Windsor setting makes it possible that *The Merry Wives* was produced at a Garter feast, and perhaps with the assistance of the children of Windsor Chapel in the fairy parts. The plot has its analogies to various incidents in Italian *novelle* and in English adaptations of these.

22. *As You Like It* was one of the plays "stayed" from publication in 1600, and cannot therefore be later than that year. Some trifling bits of evidence suggest that it is not earlier than 1599. The plot is based upon Thomas Lodge's romance of *Rosalynde* (1590), and this in part upon the pseudo-Chaucerian *Tale of Gamelyn.*

23. A play of *Hamlet* was performed, probably by the Chamberlain's men, for Henslowe at Newington Butts on the 9th of June 1594. There are other references to it as a revenge-play, and it seems to have been in existence in some shape as early as 1589. It was doubtless on the basis of this that Shakespeare constructed his tragedy. Some features of the so-called *Ur-Hamlet* may perhaps be traceable in the German play of *Der bestrafte Brudermord.* There is an allusion in *Hamlet* to the rivalry between the ordinary stages and the private plays given by boy actors, which points to a date during the vogue of the children of the Chapel, whose performance began late in 1600, and another to an inhibition of plays on account of a "late innovation," by which the Essex rising of February 1601 may be meant. The play was entered in the Stationers' *Register* on July 26, 1602. The First Quarto was printed in 1603 and the Second Quarto in 1604. These editions contain texts whose differences from each other and from that of the First Folio are so considerable as to suggest, even when allowance has been made for the fact that the First Quarto is probably a piratical venture, that the play underwent an exceptional amount of rewriting at Shakespeare's hands. The title-page of the First Quarto indicates that the earliest version was acted in the universities of Oxford and Cambridge and elsewhere, as well as in London. The ultimate source of the plot is to be found in Scandinavian legends preserved in the *Historia Danica* of Saxo Grammaticus, and transmitted to Shakespeare or his predecessor through the *Histoires tragiques* (1570) of François de Belleforest (see HAMLET).

24. *Twelfth Night* may be fairly placed in 1601-1602, since it quotes part of a song included in Robert Jones's *First Book of Songs and Airs* (1600), and is recorded by John Manningham to have been seen by him at a feast in the Middle Temple hall on February 2nd, 1602. The principal source of the plot was Barnabe Riche's "History of Apolonius and Silla" in his *Farewell to Military Profession* (1581).

25. Few of the plays present so many difficulties as *Troilus and Cressida,* and it cannot be said that its literary history has as yet been thoroughly worked out. A play of the name, "as yt is acted by my Lord Chamberlens men" was entered in the Stationers' *Register* on February 7th, 1603, with a note that "sufficient authority" must be got by the publisher, James Roberts, before he printed it. This can hardly be any other than Shakespeare's play; but it must have been "stayed," for the First Quarto did not appear until 1609, and on the 28th of January of that year a fresh entry had been made in the *Register* by another publisher. The text of the Quarto differs in certain respects from that of the Folio, but not to a greater extent than the use of different copies of the original manuscript might explain. Two alternative title-pages are found in copies of the Quarto. On one, probably the earliest, is a statement that the play was printed "as it was acted by the Kings Maiesties seruants at the Globe"; from the other these words are omitted, and a preface is appended which hints that the "grand possessors" of the play had made difficulties about its publication, and describes it as "never staled with the stage." Attempts have been made, mainly on grounds of style, to find another hand than Shakespeare's in the closing scenes and in the prologue, and even to assign widely different dates to various parts of what is ascribed to Shakespeare. But the evidence does not really bear out these theories, and the style of the whole must be regarded as quite consistent with a date in 1601 or 1602. The more probable year is 1602, if, as seems not unlikely, the description of Ajax and his humours in the second scene of the first act is Shakespeare's "purge" to Jonson in reply to the *Poetaster* (1601), alluded to, as already mentioned, in the *Return from Parnassus,* a Cambridge play acted probably at the Christmas of 1602–1603 (rather than, as is usually asserted, 1601–1602). It is tempting to conjecture that *Troilus and Cressida* may have been played, like *Hamlet,* by the Chamberlain's men at Cambridge, but may never have been taken to London, and in this sense "never staled with the stage." The only difficulty of a date in 1602 is that a parody of a play on Troilus and Cressida is introduced into *Histriomastix* (*c.* 1599), and that in this Troilus "shakes his furious speare." But Henslowe had produced another play on the subject, by Dekker and Chettle, in 1599, and probably, therefore, no allusion to Shakespeare is really intended. The material for *Troilus and Cressida* was taken by Shakespeare from Chaucer's *Troilus and Criseyde*, Caxton's *Recuyell of the Historyes of Troye*, and Chapman's Homer.

26. It is almost wholly on grounds of style that *All's Well that Ends Well* is placed by most critics in or about 1602, and, as in the case of *Troilus and Cressida*, it has been argued, though with little justification, that parts of the play are of considerably earlier date, and perhaps represent the *Love's Labour's Won* referred to by Meres. The story is derived from Boccaccio's *Decameron* through the medium of William Paynter's *Palace of Pleasure* (1566).

27. *Measure for Measure* is believed to have been played at court on the 26th of December 1604. The evidence for this is to be found, partly in an extract made for Malone from official records now lost, and partly in a forged document, which may, however, rest upon genuine information, placed amongst the account-books of the Office of the Revels. If this is correct the play was probably produced when the theatres were reopened after the plague in 1604. The plot is taken from a story already used by George Whetstone, both in his play of *Promos and Cassandra* (1578) and in his prose *Heptameron of Civil Discourses* (1582), and borrowed by him from Giraldi Cinthio's *Hecatommithi* (1566).

28. A performance at court of *Othello* on November 1, 1604, is noted in the same records as those quoted with regard to *Measure for Measure*, and the play may be reasonably assigned to the same year. An alleged performance at Harefield in 1602 certainly rests upon a forgery. The play was revived in 1610 and seen by Prince Louis of Württemberg at the Globe on April 30 of that year. It was entered in the Stationers' *Register* on October 6, 1621, and a First Quarto was published in 1622. The text of this is less satisfactory than that of the First Folio, and omits a good many lines found therein and almost certainly belonging to the play as first written. It also contains some profane expressions which have been modified in the Folio, and thereby points to a date for the original production earlier than the Act to Restrain Abuses of Players passed in the spring of 1606. The plot, like that of *Measure for Measure*, comes from the *Hecatommithi* (1566) of Giraldi Cinthio.

29. *Macbeth* cannot, in view of its obvious allusions to James I., be of earlier date than 1603. The style and some trifling allusions point to about 1605 or 1606, and a hint for the theme may have been given by Matthew Gwynne's entertainment of the *Tres Sibyllae*, with which James was welcomed to Oxford on August 27, 1605. The play was revived in 1610 and Simon Forman saw it at the Globe on April 20. The only extant text, that of the First Folio, bears traces of shortening, and has been interpolated with additional rhymed dialogues for the witches by a second hand, probably that of Thomas Middleton. But the extent of Middleton's contribution has been exaggerated; it is probably confined to act iii. sc. 5, and a few lines in act. iv. sc. 1. A ballad of *Macdobeth* was entered in the Stationers' *Register* on August 27, 1596, but is not known. It is not likely that Shakespeare had consulted any Scottish history other than that included in Raphael Holinshed's *Chronicle*; he may have gathered witchlore from Reginald Scot's *Discoverie of Witchcraft* (1584) or King James's own *Demonologie* (1599).

30. The entry of *King Lear* in the Stationers' *Register* on November 26, 1607, records the performance of the play at court on December 26, 1606. This suggests 1605 or 1606 as the date of production, and this is confirmed by the publication in 1605 of the older play, *The True Chronicle History of King Leir*, which Shakespeare used as his source. Two Quartos of *King Lear* were published in 1608, and contain a text rather longer, but in other respects less accurate, than that of the First Folio. The material of the play consists of fragments of Celtic myth, which found their way into history through Geoffrey of Monmouth. It was accessible to Shakespeare in Holinshed and in Spenser's *Faerie Queene*, as well as in the old play.

31. It is not quite clear whether *Antony and Cleopatra* was the play of that name entered in the Stationers' *Register* on May 20, 1608, for no Quarto is extant, and a fresh entry was made in the *Register* before the issue of the First Folio. Apart from this entry, there is little external evidence to fix the date of the play, but it is in Shakespeare's later, although not his last manner, and may very well belong to 1606.

32. In the case of *Coriolanus* the external evidence available is even scantier, and all that can be said is that its closest affinities are to *Antony and Cleopatra*, which in all probability it directly followed or preceded in order of composition. Both plays, like *Julius Caesar*, are based upon the *Lives* of Plutarch, as Englished by Sir Thomas North.

33. There is no external evidence as to the date of *Timon of Athens*, but it may safely be grouped on the strength of its internal characteristics with the plays just named, and there is a clear gulf between it and those that follow. It may be placed provisionally in 1607. The critical problems which it presents have never been thoroughly worked out. The extraordinary incoherencies of its action and inequalities of its style have prevented modern scholars from accepting it as a finished production of Shakespeare, but there agreement ceases. It is sometimes regarded as an incomplete draft for an intended play; sometimes as a Shakespearian fragment worked over by a second hand either for the stage or for printing in the First Folio; sometimes, but not very plausibly, as an old play by an inferior writer which Shakespeare had partly remodelled. It does not seem to have had any relations to an extant academic play of *Timon* which remained in manuscript until 1842. The sources are to be found, partly in Plutarch's *Life of Marcus Antonius*, partly in Lucian's dialogue of *Timon or Misanthropos*, and partly in William Paynter's *Palace of Pleasure* (1566).

34. Similar difficulties, equally unsolved, cling about *Pericles*. It was entered in the Stationers' *Register* on May 20, 1608, and published in 1609 as "the late and much admired play" acted by the King's men at the Globe. The title-page bears Shakespeare's name, but the play was not included in the First Folio, and was only added to Shakespeare's collected works in the Third Folio, in company with others which, although they also had been printed under his name or initials in quarto form, are certainly not his. In 1608 was published a prose story, *The Painful Adventures of Pericles Prince of Tyre*. This claims to be the history of the play as it was presented by the King's players, and is described in a dedication by George Wilkins as "a poore infant of my braine." The production of the play is therefore to be put in 1608 or a little earlier. It can hardly be doubted on internal evidence that Shakespeare is the author of the verse-scenes in the last three acts, with the exception of the doggerel choruses. It is probable, although it has been doubted, that he was also the author of the prose-scenes in those acts. To the first two acts he can at most only have contributed a touch or two. It seems reasonable to suppose that the non-Shakespearian part of the play is by Wilkins, by whom other dramatic work was produced about 1607. The prose story quotes a line or two from Shakespeare's contribution, and it follows that this must have been made by 1608. The close resemblances of the style to that of Shakespeare's latest plays make it impossible to place it much earlier. But whether Shakespeare and Wilkins collaborated in the play, or Shakespeare partially rewrote Wilkins, or Wilkins completed Shakespeare, must be regarded as yet undetermined. Unless there was an earlier Shakespearian version now lost, Dryden's statement that "Shakespeare's own Muse her Pericles first bore" must be held to be an error. The story is an ancient one which exists in many versions. In all of these except the play, the name of the hero is Apollonius of Tyre. The play is directly based upon a version in Gower's *Confessio Amantis*, and the use of Gower as a "presenter" is thereby explained. But another version in Laurence Twine's *Patterne of Painefull Adventures* (*c.* 1576), of which a new edition appeared in 1607, may also have been consulted.

35. *Cymbeline* shows a further development than *Pericles* in the direction of Shakespeare's final style, and can hardly have come earlier. A description of it is in a note-book of Simon Forman, who died in September 1611, and describes in the same book other plays seen by him in 1610 and 1611. But these were not necessarily new plays, and *Cymbeline* may perhaps be assigned conjecturally to 1609. The mask-like dream in act v. sc. 4 must be an interpolation by another hand. This play also is based upon a wide-spread story, probably known to Shakespeare in Boccaccio's *Decameron* (day 2, novel 9), and possibly also in an English book of tales called *Westward for Smelts*. The historical part is, as usual, from Holinshed.

36. *The Winter's Tale* was seen by Forman on May 15, 1611, and as it clearly belongs to the latest group of plays it may well enough have been produced in the preceding year. A document amongst the Revels Accounts, which is forged, but may rest on some authentic basis, gives November 5, 1611 as the date of a performance at court. The play is recorded to have been licensed by Sir George Buck, who began to license plays in 1607. The plot is from Robert Greene's *Pandosto, the Triumph of Time, or Dorastus and Fawnia* (1588).

37. The wedding-mask in act iv. of *The Tempest* has suggested the possibility that it may have been composed to celebrate the marriage of the princess Elizabeth and Frederick V., the elector palatine, on February 14, 1613. But Malone appears to have had evidence, now lost, that the play was performed at court as early as 1611, and the forged document amongst the Revels Accounts gives the precise date of November 1, 1611. Sylvester Jourdan's *A Discovery of the Bermudas*, containing an account of the shipwreck of Sir George Somers in 1609, was published about October 1610, and this or some other contemporary narrative of Virginian colonization probably furnished the hint of the plot.

38. The tale of Shakespeare's independent dramas is now complete, but an analysis of the *Two Noble Kinsmen* leaves no reason to doubt the accuracy of its ascription on the title-page of the First Quarto of 1634 to Shakespeare and John Fletcher. This appears to have been a case of ordinary collaboration. There is sufficient resemblance between the styles of the two writers to render the division of the play between them a matter of some difficulty; but the parts that may probably be assigned to Shakespeare are acts i. scc. 1-4; ii. 1; iii. 1, 2; v. 1, 3, 4. Fletcher's morris-dance in act iii. sc. 5 is borrowed from that in Beaumont's *Mask of the Inner Temple and Gray's Inn*, given on February 20, 1613, and the play may perhaps be dated in 1613. It is based on Chaucer's *Knight's Tale*.

39. It may now be accepted as a settled result of scholarship that *Henry VIII.* is also the result of collaboration, and that one of the collaborators was Fletcher. There is no good reason to doubt that the other was Shakespeare, although attempts have been made to substitute Philip Massinger. The inclusion, however, of the play in the First Folio must be regarded as conclusive against this theory. There is some ground for suspicion that the collaborators may have had an earlier work of Shakespeare before them, and this would explain the reversion to the "history" type of play which Shakespeare had long abandoned. His share appears to consist of act i. scc. 1, 2; act ii. scc. 3, 4; act iii. sc. 2, ll. 1-203; act v. sc. 1. The play was probably produced in 1613, and originally bore the alternative title of *All is True*. It was being performed in the Globe on June 29, 1613, when the thatch caught fire and the theatre was burnt. The principal source was Holinshed, but Hall's *Union of Lancaster and York*, Foxe's *Acts and Monuments of the Church*, and perhaps Samuel Rowley's play of *When You See Me, You Know Me* (1605), appear also to have contributed.

Poems.

Shakespeare's non-dramatic writings are not numerous. The narrative poem of *Venus and Adonis* was entered in the Stationers' *Register* on April 18, 1593, and thirteen editions, dating from 1593 to 1636, are known. The *Rape of Lucrece* was entered in the *Register* on May 9, 1594, and the six extant editions range from 1594 to 1624. Each poem is prefaced by a dedicatory epistle from the author to Henry Wriothesley, earl of Southampton. The subjects, taken respectively from the *Metamorphoses* and the *Fasti* of Ovid, were frequent in Renaissance literature. It was once supposed that Shakespeare came from Stratford-on-Avon with *Venus and Adonis* in his pocket; but it is more likely that both poems owe their origin to the comparative leisure afforded to playwrights and actors by the plague-period of 1592–1594. In 1599 the stationer William Jaggard published a volume of miscellaneous verse which he called *The Passionate Pilgrim*, and placed Shakespeare's name on the title-page. Only two of the pieces included herein are certainly Shakespeare's, and although others may quite possibly be his, the authority of the volume is destroyed by the fact that some of its contents are without doubt the work of Marlowe, Sir Walter Raleigh, Richard Barnfield and Bartholomew Griffin. In 1601 Shakespeare contributed *The Phoenix and the Turtle*, an elegy on an unknown pair of wedded lovers, to a volume called *Love's Martyr, or Rosalin's Complaint*, which was collected and mainly written by Robert Chester.

Problems of the Sonnets.

The interest of all these poems sinks into insignificance beside that of one remaining volume. The *Sonnets* were entered in the *Register* on May 20, 1609, by the stationer Thomas Thorpe, and published by him under the title *Shake-speares Sonnets, never before Imprinted*, in the same year. In addition to a hundred and fifty-four sonnets, the volume contains the elegiac poem, probably dating from the *Venus and Adonis* period, of *A Lover's Complaint*. In 1640 the *Sonnets*, together with other poems from *The Passionate Pilgrim* and elsewhere, many of them not Shakespeare's, were republished by John Benson in *Poems Written by Wil. Shake-speare, Gent.* Here the sonnets are arranged in an altogether different order from that of 1609 and are declared by the publisher to "appeare of the same purity, the Authour himselfe then living avouched." No Shakespearian controversy has received so much attention, especially during recent years, as that which concerns itself with the date, character, and literary history of the *Sonnets*. This is intelligible enough, since upon the issues raised depends the question whether these poems do or do not give a glimpse into the intimate depths of a personality which otherwise is at the most only imperfectly revealed through the plays. On the whole, the balance of authority is now in favour of regarding them as in a very considerable measure autobiographical. This view has undergone the fires of much destructive argument. The authenticity of the order in which the sonnets were printed in 1609 has been doubted; and their subject-matter has been variously explained as being of the nature of a philosophical allegory, of an effort of the dramatic imagination, or of a heartless exercise in the forms of the Petrarchan convention. This last theory has been recently and strenuously maintained, and may be regarded as the only one which now holds the field in opposition to the autobiographical interpretation. But it rests upon the false psychological assumption, which is disproved by the whole history of poetry and in particular of Petrarchan poetry, that the use of conventions is inconsistent with the expression of unfeigned emotions; and it is hardly to be set against the direct conviction which the sonnets carry to the most finely critical minds of the strength and sincerity of the spiritual experience out of which they were wrought. This conviction makes due allowance for the inevitable heightening of emotion itself in the act of poetic composition; and it certainly does not carry with it a belief that all the external events which underlie the emotional development are capable at this distance of time of inferential reconstruction. But it does accept the sonnets as an actual record of a part of Shakespeare's life during the years in which they were written, and as revealing at least the outlines of a drama which played itself out for once, not in his imagination but in his actual conduct in the world of men and women.

There is no advantage to be gained by rearranging the order of the 1609 volume, even if there were any basis other than that of individual whim on which to do so. Many of the sonnets are obviously linked to those which follow or precede them; and altogether a few may conceivably be misplaced, the order as a whole does not jar against the sense of emotional continuity, which is the only possible test that can be applied. The last two sonnets, however, are merely alternative versions of a Greek epigram, and the rest fall into two series, which are more probably parallel than successive. The shorter of these two series (cxxvii.-clii.) appears to be the record of the poet's relations with a mistress, a dark woman with raven brows and mourning eyes.

In the earlier sonnets he undertakes the half-playful defence of black beauty against the blonde Elizabethan ideal; but the greater number are in a more serious vein, and are filled with a deep consciousness of the bitterness of lustful passion and of the slavery of the soul to the body. The woman is a wanton. She has broken her bed-vow for Shakespeare, who on his side is forsworn in loving her; and she is doubly forsworn in proving faithless to him with other men. His reason condemns her, but his heart has not the power to throw off her tyranny. Her particular offence is that she, "a woman coloured ill," has cast her snares not only upon him, but upon his friend, "a man right fair," who is his "better angel," and that thus his loss is double, in love and friendship. The longer series (i.-cxxvi.) is written to a man, appears to extend over a considerable period of time, and covers a wide range of sentiment. The person addressed is younger than Shakespeare, and of higher rank. He is lovely, and the son of a lovely mother, and has hair like the auburn buds of marjoram. The series falls into a number of groups, which are rarely separated by any sharp lines of demarcation. Perhaps the first group (i.-xvii.) is the most distinct of all. These sonnets are a prolonged exhortation by Shakespeare to his friend to marry and beget children. The friend is now on the top of happy hours, and should make haste, before the rose of beauty dies, to secure himself in his descendants against devouring time. In the next group (xviii.-xxv.) a much more personal note is struck, and the writer assumes the attitudes, at once of the poet whose genius is to be devoted to eternizing the beauty and the honour of his patron, and of the friend whose absorbing affection is always on the point of assuming an emotional colour indistinguishable from that of love. The consciousness of advancing years and that of a fortune which bars the triumph of public honour alike find their consolation in this affection. A period of absence (xxvi.-xxxii.) follows, in which the thought of friendship comes to remedy the daily labour of travel and the sorrows of a life that is "in disgrace with fortune and men's eyes" and filled with melancholy broodings over the past. Then (xxxiii.-xlii.) comes an estrangement. The friend has committed a sensual fault, which is at the same time a sin against friendship. He has been wooed by a woman loved by the poet, who deeply resents the treachery, but in the end forgives it, and bids the friend take all his loves, since all are included in the love that has been freely given him. It is difficult to escape the suggestion that this episode of the conflict between love and friendship is the same as that which inspired some of the "dark woman" sonnets. Another journey (xliii.-lii.) is again filled with thoughts of the friend, and its record is followed by a group of sonnets (liii.-lv.) in which the friend's beauty and the immortality which this will find in the poet's verse are especially dwelt upon. Once more there is a parting (lvi.-lxi.) and the poet waits as patiently as may be his friend's return to him. Again (lxii.-lxv.) he looks to his verse to give the friend immortality. He is tired of the world, but his friend redeems it (lxvi.-lxviii.). Then rumours of some scandal against his friend (lxix.-lxx.) reach him, and he falls (lxxi.-lxxiv.) into gloomy thoughts of coming death. The friend, however, is still (lxxv.-lxxvii.) his argument; and he is perturbed (lxxviii.-lxxxvi.) by the appearance of a rival poet, who claims to be taught by spirits to write "above a mortal pitch," and with "the proud full sail of his great verse" has already won the countenance of Shakespeare's patron. There is another estrangement (lxxxvii.-xc.), and the poet, already crossed with the spite of fortune, is ready not only to acquiesce in the loss of friendship, but to find the fault in himself. The friend returns to him, but the relation is still clouded by doubts of his fidelity (xci.-xciii.) and by public rumours of his wantonness (xciv.-xcvi.). For a third time the poet is absent (xcvii.-xcix.) in summer and spring. Then comes an apparent interval, after which a love already three years old is renewed (c.-civ.), with even richer praises (cv.-cviii.). It is now the poet's turn to offer apologies (cix.-cxii.) for offences against friendship and for some brand upon his name apparently due to the conditions of his profession. He is again absent (cxiii.) and again renews his protestations of the imperishability of love (cxiv.-cxvi.) and of his own unworthiness (cxvii.-cxxi.), for which his only excuse is in the fact that the friend was once unkind. If the friend has suffered as Shakespeare suffered, he has "passed a hell of time." The series closes with a group (cxxii.-cxxv.) in which love is pitted against time; and an *envoi*, not in sonnet form, warns the "lovely boy" that in the end nature must render up her treasure.

Such an analysis can give no adequate idea of the qualities in these sonnets, whereby the appeal of universal poetry is built up on a basis of intimate self-revelation. The human document is so legible, and at the same time so incomplete, that it is easy to understand the strenuous efforts which have been made to throw further light upon it by tracing the identities of those other personalities, the man and the woman, through his relations to whom the poet was brought to so fiery an ordeal of soul, and even to the borders of self-abasement. It must be added that the search has, as a rule, been conducted with more ingenuity than judgment. It has generally started from the terms of a somewhat mysterious dedication prefixed by the publisher Thomas Thorpe to the volume of 1609. This runs as follows:—"To the onlie begetter of these insuing sonnets Mr W. H. all happinesse and that eternitie promised by our ever-living poet wisheth the well-wishing adventurer in setting forth T. T." The natural interpretation of this is that the inspirer or "begetter" of the sonnets bore the initials W. H.; and contemporary history has accordingly been ransacked to find a W. H. whose age and circumstances might conceivably fit the conditions of the problem which the sonnets present. It is perhaps a want of historical perspective which has led to the centring of controversy around two names belonging to the highest ranks of the Elizabethan nobility, those of Henry Wriothesley, earl of Southampton, and William Herbert, earl of Pembroke. There is some evidence to connect Shakespeare with both of these. To Southampton he dedicated *Venus and Adonis* in 1593 and *The Rape of Lucrece* in 1594, and the story that he received a gift of no less than £1000 from the earl is recorded by Rowe. His acquaintance with Pembroke can only be inferred from the statement of Heminge and Condell in their preface to the First Folio of the plays, that Pembroke and his brother Montgomery had "prosequuted both them and their Authour living, with so much favour." The personal beauty of the rival claimants and of their mothers, their amours and the attempts of their families to persuade them to marry, their relations to poets and actors, and all other points in their biographies which do or do not fit in with the indications of the sonnets, have been canvassed with great spirit and some erudition, but with no very conclusive result. It is in Pembroke's favour that his initials were in fact W. H., whereas Southampton's can only be turned into W. H. by a process of metathesis; and his champions have certainly been more successful than Southampton's in producing a dark woman, a certain Mary Fitton, who was a mistress of Pembroke's, and was in consequence dismissed in disgrace from her post of maid of honour to Elizabeth. Unfortunately, the balance of evidence is in favour of her having been blonde, and not "black." Moreover, a careful investigation of the sonnets, as regards their style and their relation to the plays, renders it almost impossible on chronological grounds that Pembroke can have been their subject. He was born on the 9th of April 1580, and was therefore much younger than Southampton, who was born on the 6th of October 1573. The earliest sonnets postulate a marriageable youth, certainly not younger than eighteen, an age which Southampton reached in the autumn of 1591 and Pembroke in the spring of 1598. The writing of the sonnets may have extended over several years, but it is impossible to doubt that as a whole it is to the years 1593–1598 rather than to the years 1598–1603 that they belong. There is not, indeed, much external evidence available. Francis Meres in his *Palladis Tamia* of 1598 mentions Shakespeare's "sugred sonnets among his private friends,"[1] but this allusion might come as well at

Mystery of "Mr W. H."

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[1] "The sweet witty soul of Ovid lives in mellifluous and honey-tongued Shakespeare, witness his *Venus and Adonis*, his *Lucrece*, his sugred sonnets among his private friends."

the beginning as at the end of the series; and the fact that two, not of the latest, sonnets are in *The Passionate Pilgrim* of 1599 is equally inconclusive.

The only reference to an external event in the sonnets themselves, which might at first sight seem useful, is in the following lines (cvii.):—

> "The mortal moon hath her eclipse endured,
> And the sad augurs mock their own presage;
> Incertainties now crown themselves assured,
> And peace proclaims olives of endless age."

This has been variously interpreted as referring to the death of Elizabeth and accession of James in 1603, to the relief caused by the death of Philip II. of Spain in 1598, and to the illness of Elizabeth and threatened Spanish invasion in 1596. Obviously the "mortal moon" is Elizabeth, but although "eclipse" may well mean "death," it is not quite so clear that "endure an eclipse" can mean "die."

Nor do the allusions to the rival poet help much. "The proud full sail of his great verse" would fit, on critical grounds, with Spenser, Marlowe, Chapman, and possibly Peele, Daniel or Drayton; and the "affable familiar ghost," from whom the rival is said to obtain assistance by night, might conceivably be an echo of a passage in one of Chapman's dedications. Daniel inscribed a poem to Southampton in 1603, but with this exception none of the poets named are known to have written either for Southampton or for Pembroke, or for any other W. H. or H. W., during any year which can possibly be covered by the sonnets. Two very minor poets, Barnabe Barnes and Gervase Markham, addressed sonnets to Southampton in 1593 and 1595 respectively, and Thomas Nash composed improper verses for his delectation.

But even if external guidance fails, the internal evidence for 1593–1598 as approximately the sonnet period in Shakespeare's life is very strong indeed. It has been worked out in detail by two German scholars, Hermann Isaac (now Conrad) in the *Shakespeare-Jahrbuch* for 1884, and Gregor Sarrazin in *William Shakespeares Lehrjahre* (1897) and *Aus Shakespeares Meisterwerkstatt* (1906). Isaac's work, in particular, has hardly received enough attention even from recent English scholars, probably because he makes the mistakes of taking the sonnets in Bodenstedt's order instead of Shakespeare's, and of beginning his whole chronology several years too early in order to gratify a fantastic identification of W. H. with the earl of Essex. This, however, does not affect the main force of an argument by which the affinities of the great bulk of the sonnets are shown, on the ground of stylistic similarities, parallelisms of expression, and parallelisms of theme, to be far more close with the poems and with the range of plays from *Love's Labour's Lost* to *Henry IV.* than with any earlier or later section of Shakespeare's work. This dating has the further advantage of putting Shakespeare's sonnets in the full tide of Elizabethan sonnet-production, which began with the publication of Sidney's *Astrophel and Stella* in 1591 and Daniel's *Delia* and Constable's *Diana* in 1592, rather than during years for which this particular kind of poetry had already ceased to be modish. It is to the three volumes named that the influence upon Shakespeare of his predecessors can most clearly be traced; while he seems in his turn to have served as a model for Drayton, whose sonnets to Idea were published in a series of volumes in 1594, 1599, 1602, 1605 and 1619. It does not of course follow that because the sonnets belong to 1593–1598 W. H. is to be identified with Southampton. On general grounds he is likely, even if above Shakespeare's own rank, to have been somewhat nearer that rank than a great earl, some young gentleman, for example, of such a family as the Sidneys, or as the Walsinghams of Chislehurst.

It is possible that there is an allusion to Shakespeare's romance in a poem called "Willobie his Avisa," published in 1594 as from the pen of one Henry Willoughby, apparently of West Knoyle in Wiltshire. In this Willoughby is introduced as taking counsel when in love with "his familiar friend W. S. who not long before had tryed the curtesy of the like passion, and was now newly recovered of the like infection." But there is nothing outside the poem to connect Shakespeare with a family of Willoughbys or with the neighbourhood of West Knoyle. Various other identifications of W. H. have been suggested, which rarely rest upon anything except a similarity of initials. There is little plausibility in a theory broached by Mr Sidney Lee, that W. H. was not the friend of the sonnets at all, but a certain William Hall, who was himself a printer, and might, it is conjectured, have obtained the "copy" of the sonnets for Thorpe. It is, of course, just possible that the "begetter" of the title-page might mean, not the "inspirer," but the "procurer for the press" of the sonnets; but the interpretation is shipwrecked on the obvious identity of the person to whom Thorpe "wishes" eternity with the person to whom the poet "promised" that eternity. The external history of the *Sonnets* must still be regarded as an unsolved problem; the most that can be said is that their subject may just possibly be Southampton, and cannot possibly be Pembroke.

The man and the artist.

In order to obtain a glimmering of the man that was Shakespeare, it is necessary to consult all the records and to read the evidence of his life-work in the plays, alike in the light of the simple facts of his external career and in that of the sudden vision of his passionate and dissatisfied soul preserved in the sonnets. By exclusive attention to any one of these sources of information it is easy to build up a consistent and wholly false conception of a Shakespeare; of a Shakespeare struggling between his senses and his conscience in the artistic Bohemianism of the London taverns; of a sleek, bourgeois Shakespeare to whom his art was no more than a ready way to a position of respected and influential competence in his native town; of a great objective artist whose personal life was passed in detached contemplation of the puppets of his imagination. Any one of these pictures has the advantage of being more vivid, and the disadvantage of being less real, than the somewhat elusive and enigmatic Shakespeare who glances at us for a perplexing moment, now behind this, now behind that, of his diverse masks. It is necessary also to lay aside Shakespeareolatry, the spirit that could wish with Hallam that Shakespeare had never written the *Sonnets*, or can refuse to accept *Titus Andronicus* on the ground that "the play declares as plainly as play can speak, 'I am not Shakespeare's; my repulsive subject, my blood and horrors, are not, and never were his.'" The literary historian has no greater enemy than the sentimentalist. In Shakespeare we have to do with one who is neither beyond criticism as a man nor impeccable as an artist. He was for all time, no doubt; but also very much of an age, the age of the later Renaissance, with its instinct for impetuous life, and its vigorous rather than discriminating appetite for literature. When Ben Jonson said that Shakespeare lacked "art," and when Milton wrote of his "native wood-notes wild," they judged truly. The Shakespearian drama is magnificent and incoherent; it belongs to the adolescence of literature, to a period before the instrument had been sharpened and polished, and made unerring in its touch upon the sources of laughter and of tears. Obviously nobody has such power over our laughter and our tears as Shakespeare. But it is the power of temperament rather than of art; or rather it is the power of a capricious and unsystematic artist, with a perfect dramatic instinct for the exposition of the ideas, the characters, the situations, which for the moment command his interest, and a perfect disregard for the laws of dramatic psychology which require the patient pruning and subordination of all material that does not make for the main exposition. This want of finish, this imperfect fusing of the literary ore, is essentially characteristic of the Renaissance, as compared with ages in which the creative impulse is weaker and leaves room for a finer concentration of the means upon the end. There is nearly always unity of purpose in a Shakespearian play, but it often requires an intellectual effort to grasp it and does not result in a unity of effect. The issues are obscured by a careless generosity which would extend to art the boundless freedom of life itself. Hence the intrusive and jarring elements which stand in such curious incongruity with the utmost reaches of which the dramatic spirit is capable; the conventional and melodramatic endings, the inconsistencies of action and even of character, the emotional confusions of tragicomedy, the complications of plot and subplot, the marring of the give-and-take of dialogue by superfluities of description and of argument, the jest and bombast lightly thrown in to suit the taste of the groundlings, all the flecks that to an instructed modern criticism are only too apparent upon the Shakespearian sun. It perhaps follows from this that the most fruitful way of approaching Shakespeare is by an analysis of his work rather as a process than as a completed whole. His outstanding positive quality is a vast comprehensiveness, a capacity for growth and assimilation, which leaves no aspect of life unexplored, and allows of no finality in the nature of his judgments upon life. It is the real and sufficient explanation and justification of the pains taken to determine the chronological order of his plays, that the secret of his genius lies in its power of development and that only by the study of its development can he be known. He was nearly thirty when, so far as we can tell, his career as a dramatist began; and already there lay behind him those six or seven unaccounted-for years since his marriage, passed no one knows where, and filled no one knows with what experience, but assuredly in that strenuous Elizabethan life with some experience kindling to his intellect and formative of his character. To the woodcraft and the familiarity with country sights and sounds which he brought with him from Stratford, and which mingle so oddly in his plays with a purely imaginary and euphuistic natural history, and to the book-learning of a provincial grammar-school boy, and perhaps, if Aubrey is right, also of a provincial schoolmaster, he had somehow added, as he continued to add throughout his life, that curious store of acquaintance with the details of the most diverse occupations which has so often perplexed and so often misled his commentators. It was the same faculty of acquisition that gave him his enormous vocabulary, so far exceeding in range and variety that of any other English writer.

His first group of plays is largely made up of adaptations and revisions of existing work, or at the best of essays in the conventions of stage-writing which had already achieved popularity. In the Yorkist trilogy he takes up the burden of the chronicle play, in *The Comedy of Errors* that of the classical school drama and of the page-humour of Lyly, in *Titus Andronicus* that of the crude revenge tragedy of Kyd, and in *Richard III.* that of the Nemesis motive and the exaltation of the Machiavellian superman which properly belong to Marlowe. But in *Richard III.* he begins to come to his own with the subtle study of the actor's temperament which betrays the working of a profound interest in the technique of his chosen profession. The style of the earliest plays is essentially rhetorical; the blank verse is stiff and little varied in rhythm; and the periods are built up of parallel and antithetic sentences, and punctuated with devices of iterations, plays upon words, and other methods of securing emphasis, that derive from the bad tradition of a popular stage, upon which the players are bound to rant and force the note in order to hold the attention of a dull-witted audience. During the plague-vacations of 1592 to 1594, Shakespeare tried his hand at the ornate descriptive poetry of *Venus and Adonis* and *Lucrece*; and the influence of this exercise, and possibly also of Italian travel, is apparent in the next group of plays, with their lyric notes, their tendency to warm southern colouring, their wealth of decorative imagery, and their elaborate and not rarely frigid conceits. Rhymed couplets make their appearance, side by side with blank verse, as a medium of dramatic dialogue. It is a period of experiment, in farce with *The Taming of the Shrew*, in satirical comedy with *Love's Labour's Lost*, in lyrical comedy with *A Midsummer Night's Dream*, in lyrical tragedy with *Romeo and Juliet*, in lyrical history with *Richard II.*, and finally in romantic tragicomedy with *The Two Gentlemen of Verona* and with the masterpiece of this singular genre, *The Merchant of Venice*. It is also the period of the sonnets, which have their echoes both in the phrasing and in the themes of the plays; in the black-browed Rosaline of *Love's Labour's Lost*, and in the issue between friendship and love which is variously set in *The Two Gentlemen of Verona* and in *The Merchant of Venice*. But in the latter play the sentiment is already one of retrospection; the tempest of spirit has given way to the tender melancholy of renunciation. The sonnets seem to bear witness, not only to the personal upheaval of passion, but also to some despondency at the spite of fate and the disgrace of the actor's calling. This mood too may have cleared away in the sunshine of growing popularity, of financial success, and of the possibly long-delayed return to Stratford. Certainly the series of plays written next after the travels of 1597 are light-hearted plays, less occupied with profound or vexatious searchings of spirit than with the delightful externalities of things. The histories from *King John* to *Henry V.* form a continuous study of the conditions of kingship, carrying on the political speculations begun in *Richard II.* and culminating in the brilliant picture of triumphant efficiency, the Henry of Agincourt. Meanwhile Shakespeare develops the astonishing faculty of humorous delineation of which he had given foretastes in Jack Cade, in Bottom the weaver, and in Juliet's nurse; sets the creation of Falstaff in front of his vivid pictures of contemporary England; and passes through the half-comedy, half melodrama, of *Much Ado About Nothing* to the joyous farce of *The Merry Wives of Windsor*, and to his two perfectly sunny comedies the sylvan comedy of *As You Like It* and the urban comedy of *Twelfth Night.*

Then there comes a change of mood, already heralded by *Julius Caesar*, which stands beside *Henry V.* as a reminder that efficiency has its seamy as well as its brilliant side. The tragedy of political idealism in Brutus is followed by the tragedy of intellectual idealism in *Hamlet*; and this in its turn by the three bitter and cynical pseudo-comedies, *All's Well That Ends Well*, in which the creator of Portia, Beatrice, Rosalind and Viola drags the honour of womanhood in the dust—*Troilus and Cressida*, in which the ideals of heroism and of romance are confounded in the portraits of a wanton and a poltroon—and *Measure for Measure*, in which the searchlight of irony is thrown upon the paths of Providence itself. Upon the causes of this new perturbation in the soul of Shakespeare it is perhaps idle to speculate. The evidence of his profound disillusion and discouragement of spirit is plain enough; and for some years the tide of his pessimistic thought advances, swelling through the pathetic tragedy of *Othello* to the cosmic tragedies of *Macbeth* and *King Lear*, with their Titan-like indictments not of man alone, but of the heavens by whom man was made. Meanwhile Shakespeare's style undergoes changes no less notable than those of his subject-matter. The ease and lucidity characteristic of the histories and comedies of his middle period give way to a more troubled beauty, and the phrasing and rhythm often tend to become elliptic and obscure, as if the thoughts were hurrying faster than speech can give them utterance. The period closes with *Antony and Cleopatra* and *Coriolanus*, in which the ideals of the love of woman and the honour of man are once more stripped bare to display the skeletons of lust and egoism, and in the latter of which signs of exhaustion are already perceptible; and with *Timon of Athens*, in which the dramatist whips himself to an almost incoherent expression of a general loathing and detestation of humanity. Then the stretched cord suddenly snaps. *Timon* is apparently unfinished, and the next play, *Pericles*, is in an entirely different vein, and is apparently finished but not begun. At this point only in the whole course of Shakespeare's development there is a complete breach of continuity. One can only conjecture the occurrence of some spiritual crisis, an illness perhaps, or some process akin to what in the language of religion is called conversion, which left him a new man, with the fever of pessimism behind him, and at peace once more with Heaven and the world.

The final group of plays, the Shakespearian part of *Pericles*, *Cymbeline*, *The Winter's Tale*, *The Tempest*, all belong to the class of what may be called idyllic romances. They are happy dreams, in which all troubles and sorrows are ultimately resolved into fortunate endings, and which stand therefore as so many symbols of an optimistic faith in the beneficent dispositions of an ordering

Providence. In harmony with this change of temper the style has likewise undergone another change, and the tense structure and marmoreal phrasing of *Antony and Cleopatra* have given way to relaxed cadences and easy and unaccentuated rhythms. It is possible that these plays, Shakespeare's last plays, with the unimportant exceptions of his contributions to Fletcher's *Henry VIII.* and *The Two Noble Kinsmen*, were written in retirement at Stratford. At any rate the call of the country is sounding through them; and it is with no regret that in the last pages of *The Tempest* the weary magician drowns his book, and buries his staff certain fathoms deep in the earth.

(E. K. C.)

The Shakespeare-Bacon Theory.

In view of the continued promulgation of the sensational theory that the plays, and presumably the poems also, so long associated with the name of Shakespeare, were not written by the man whose biography is sketched above, but by somebody else who used this pseudonym—and especially that the writer was Lord Chancellor Francis Bacon, Viscount St Albans (1561–1626)—it appears desirable to deal here briefly with this question. No such idea seems to have occurred to anybody till the middle of the 19th century (see *Bibliography* below), but having once been started it has been elaborated in certain quarters by a variety of appeals, both to internal evidence as disclosed by the knowledge displayed in Shakespeare's works and by their vocabulary and style, and to external evidence as represented by the problems connected with the facts of Shakespeare's known life and of the publication of the plays. To what may be called ingenious inferences from data of this sort have even been added attempts to show that a secret confession exists which may be detected in a cipher or cryptogram in the printing of the plays. It must suffice here to say that the contentions of the Americans, Mr Donnelly and Mrs Gallup, on this score are not only opposed to the opinion of authoritative bibliographers, who deny the existence of any such cipher, but have carried their supporters to lengths which are obviously absurd and impossible. Lord Penzance, a great lawyer whose support of the Baconian theory may be found in his "judicial summing-up," published in 1902, expressly admits that "the attempts to establish a cipher totally failed; there was not indeed the semblance of a cipher." Sir Edwin Durning-Lawrence, in his *Bacon is Shakespeare* (1910), goes still farther in an attempt to prove the point by cryptographic evidence. According to him the classical "long word" cited in *Love's Labour's Lost*, "honorificabilitudinitatibus," is an anagram for "hi ludi F. Baconis nati tuiti orbi" (these plays F. Bacon's offspring preserved for the world); and he juggles very curiously with the numbers of the words and lines in the page of the First Folio containing this alleged anagram. He also cites the evidence of (more or less) contemporary illustrations to books, which he explains as cryptographic, in confirmation. These interpretations are in the highest degree speculative. But perhaps his argument is exposed in its full depth of incredibility when he counts up the letters in Ben Jonson's verses "To the Reader," describing the Droeshout portrait in the First Folio, and, finding them to be 287 (taking each "w" as two "v's"), concludes (by adding 287 to 1623, *i.e.* the date of the First Folio) that Bacon intended to reveal himself as the author in the year 1910! This sort of argument makes the plain man's head reel. On similar principles anything might prove anything. What may be considered the more reasonable way of approaching the question is shown in Mr G. Greenwood's *Shakespeare Problem Restated* (1908), in which the alleged difficulties of the Shakespearian authorship are competently presented without recourse to any such extravagances.

The plausibility of many of the arguments used by Mr Greenwood and those whom he follows depends a good deal upon the real obscurity which, for lack of positive evidence, shrouds the biography of Shakespeare and our knowledge of the precise facts as to the publication of the works associated with his name; and it has been assisted by the dogmatism of some modern biographers, or the differences of opinion between them, when they attempt to interpret the known facts of Shakespeare's life so as to account for his authorship. But it must be remembered that, if Shakespeare (or Shakspere) wrote Shakespeare's works, it is only possible to reconcile our view of his biography with our knowledge of the works by giving *some* interpretation to the known facts or accepting *some* explanation of what may have occurred in the obscure parts of his life which will be consistent with such an identification. That different hypotheses are favoured by different orthodox critics is therefore no real objection, nor that some may appear exceedingly speculative, for the very reason that positive evidence is irrecoverable and that speculation—consistent with what is possible—is the only resource. In so far as evidence is to be twisted and strained at all, it is right, in view of the long tradition and the prima facie presumptive evidence, to strain it in any possible direction which can reasonably make the Shakespearian authorship intelligible. As a matter of fact the evidence is strained alike by one side and the other; but as between the two it has to be remembered that the onus lies on the opponent of the Shakespearian authorship to show, first that there is no possible explanation which would justify the tradition, and secondly that there is positive evidence which can upset it and which will saddle the authorship of Shakespeare's works on Bacon or some one else. The contempt indiscriminately thrown on supporters of the Baconian theory by orthodox critics is apt to be expressed in terms which are occasionally unwarranted. But even if we leave out of account the lunatics and fabricators who have been so prominently connected with it, the adventurous amateur—however eminent as a lawyer or however acute as a critic of everyday affairs—may easily be too ingenious in his endeavours to solve a literary problem in which judgment largely depends on a highly trained and subtle sense of literary style and a special knowledge of the conditions of Elizabethan England and of the early drama. In such an exposition of what may be called the "anti-Shaksperian" case as Mr Greenwood's, many points appear to make for his conclusion which are really not more than doubtful interpretations of evidence; and though these interpretations may be derived from orthodox Shakespearians—orthodox, that is to say, so far at all events as their view of Shakespearian authorship is concerned—there have been a good many such interpreters whose zeal has outrun their knowledge. The fact remains that the most competent special students of Shakespeare, however they may differ as to details, and also the most authoritative special students of Bacon, are unanimous in upholding the traditional view. The Baconian theory simply stands as a curious illustration of the dangers which, even in the hands of fair judges of ordinary evidence, attend certain methods of literary investigation.

There is one simple reason for this: in order to establish even a prima facie case against the identification of the man Shakespeare (however the name be spelt) with the author of Shakespeare's works, the Baconian must clearly account for the positive contemporary evidence in its favour, and this cannot well be done; it is highly significant that it was not attempted or thought of for centuries. It is comparatively easy to point to certain difficulties, which are due to the gaps in our knowledge. As already explained, the orthodox biographer, armed with the results of accurate scholarship and prolonged historical research, attempts to reconstruct the life of the period so as to offer possible or probable explanations of these difficulties. But he does so backed by the unshaken tradition and the positive contemporary evidence that the Stratford boy and man, the London actor, the author of *Venus and Adonis* and *Lucrece*, and the dramatist (so far at least as criticism upholds the canon of the plays ascribed to Shakespeare), were one and the same.

It may be useful here to add to what has been written in the preceding article some of the positive contemporary allusions to Shakespeare which establish this presumption. The evidence of Francis Meres in *Palladis Tamia* (1598) has already been referred to. It is incredible that Ben Jonson, who knew both Shakespeare and Bacon intimately, who himself dubbed Shakespeare the "swan of Avon," and who survived Bacon for eleven years, could have died without revealing the alleged secret, at a time when there was no reason for concealing it. Much has been made of Jonson's varying references to Shakespeare, and of certain inconsistencies in his references to both Shakespeare and Bacon; but these can be twisted in more than one direction and their explanation is purely speculative. His positive allusions to Shakespeare are inexplicable except as the most authoritative evidence of his identification of the man and his works. Richard Barnfield (1598) speaks of Shakespeare as "honey-flowing," and says that his *Venus* and *Lucrece* have placed his name "in Fame's immortal book." John Weever (1599) speaks of "honey-tongued Shakespeare," admired for "rose-cheeked Adonis," and "Romeo, Richard, more whose names I know not." John Davies of Hereford (1610) calls him "our English Terence, Mr Will Shakespeare." Thomas Freeman (1614) writes "to Master W. Shakespeare:"—"Who loves chaste life, there's Lucrece for a teacher | Who list read lust there's Venus and Adonis | . . . | Besides in plays thy wit winds like Meander." Other contemporary allusions, all treating Shakespeare as a great poet and tragedian, are also on record.

Finally, it may be remarked that although many problems in connexion with Shakespeare's authorship can only be solved by the answer that he was a "genius," the Baconian view that "genius" by itself could not confer on Shakespeare, the supposed Stratford "rustic," the positive knowledge of law, &c., which is revealed in his works, depends on a theory of his upbringing and career which strains the evidence quite as much as anything put forward by orthodox biographers, if not more. As shown in the preceding article, it is by no means improbable that the Stratford "rustic" was quite well educated, and that his rusticity is a gross exaggeration. We know very little about his early years, and, in so far as we are ignorant, it is legitimate to draw inferences in favour of what makes the remainder of his career and achievements intelligible. The Baconian theory entirely depends on straining every assumption in favour of Shakespeare's *not* having had any opportunity to acquire knowledge which in any case it would require "genius" to absorb and utilize; and this method of argument is directly opposed to the legitimate procedure in approaching the undoubted difficulties. Isolated phrases, such as Ben Jonson's *dictum* as to his small knowledge of Latin and Greek, which may well be purely comparative, the contemptuous expression of a university scholar for one who had no academic training, can easily be made too much of. The extreme inferences as to his illiteracy, drawn from his handwriting, depend on the most meagre data. The preface to the First Folio says that "what he thought he uttered with that easiness that we have scarce received from him a blot in his papers"; whereas Ben Jonson, in his *Discoveries*, says, "I remember the players often mentioned it as an honour to Shakespeare that in his writing, whatsoever he penned, he never blotted a line. My answer had been, would he had blotted a thousand!—which they thought a malevolent speech." Reams have been written about these two sayings, but we do not know the real circumstances which prompted either, and the non-existence of any of the Shakespeare manuscripts leaves us open, unfortunately, to the wildest conjectures. That there were such manuscripts (unless Ben Jonson and the editors of the First Folio were liars) is certain; but there is nothing peculiar in their not having survived, though persons unacquainted with the history of the manuscripts of printed works of the period sometimes seem to think so.

We know so little of the composition of Shakespeare's works, and the stages they went through, or the influence of other persons on him, that, so far as technical knowledge is concerned (especially the legal knowledge, which has given so much colour to the Baconian theory), various speculations are possible concerning the means which a dramatic genius may have had to inform his mind or acquire his vocabulary. The theatrical and social *milieu* of those days was small and close; the influence of culture was immediate and mainly oral. We have no positive knowledge indeed of any relations between Shakespeare and Bacon; but, after all, Bacon was a great contemporary, personally interested in the drama, and one would expect the contents of his mind and the same sort of literary expression that we find in his writings to be reflected in the mirror of the stage; the same phenomenon would be detected in the drama of to-day were any critic to take the trouble to inquire. Assuming the genius of Shakespeare, such a poet and playwright would naturally be full of just the sort of matter that would represent the culture of the day and the interests of his patrons. In the purlieus of the Temple and in literary circles so closely connected with the lawyers and the court, it is just the dramatic "genius" who would be familiar with anything that could be turned to account, and whose works, especially plays, the vocabulary of which was open to embody countless sources, in the different stages of composition, rehearsal, production and revision, would show the imagination of a poet working upon ideas culled from the brains of others. Resemblances between phrases used by Shakespeare and by Bacon, therefore, carry one no farther than the fact that they were contemporaries. We cannot even say which, if either, originated the echo. So far as vocabulary is concerned, in every age it is the *writer* whose record remains and who by degrees becomes its representative; the truth as to the extent to which the intellectual *milieu* contributed to the education of the writer, or his genius was assisted by association with others, is hard to recover in after years, and only possible in proportion to our knowledge of the period and of the individual factors in operation.

(H. Ch.)

The Portraits of Shakespeare

The mystery that surrounds much in the life and work of Shakespeare extends also to his portraiture. The fact that the only two likenesses of the poet that can be regarded as carrying the authority of his co-workers, his friends, and relations—yet neither of them a life-portrait—differ in certain essential points, has opened the door to controversy and encouraged the advance and acceptance of numerous wholly different types. The result has been a swarm of portraits which may be classed as follows: (1) the genuine portraits of persons not Shakespeare but not unlike the various conceptions of him; (2) memorial portraits often based on one or other of accepted originals, whether those originals are worthy of acceptance or not; (3) portraits of persons known or unknown, which have been fraudulently "faked" into a resemblance of Shakespeare; and (4) spurious fabrications especially manufactured for imposition upon the public, whether with or without mercenary motive. It is curious that some of the crudest and most easily demonstrable frauds have been among those which have from time to time been, and still are, most eagerly accepted and most ardently championed. There are few subjects which have so imposed upon the credulous, especially those whose intelligence might be supposed proof against the chicanery practised upon them. Thus, in the past, a president of the Royal Academy in England, and many of the leading artists and Shakespearian students of the time, were found to support the genuineness, as a contemporary portrait of the poet, of a picture which, in its faked Shakespeare state, a few months before was not even in existence. This, at least, proves the intense interest taken by the world in the personality of Shakespeare, and the almost passionate desire to know his features. It is desirable, therefore, to describe those portraits which have chief claim to recollection by reason either of their inherent interest or of the notoriety which they have at some time enjoyed; it is to be remarked that such notoriety once achieved never entirely dies away, if only because the art of the engraver, which has usually perpetuated them either as large plates, or as illustrations to reputable editions of the works, or to commentaries or biographies, sustains their undeserved credit as likenesses more or less authentic.

Exhaustive study of the subject, extended over a series of years, has brought the present writer to the conclusion—identical with that entertained by leading Shakespearian authorities—that two portraits only can be accepted without question as authentic likenesses: the bust (really a half-length statue) with its structural wall-monument in the choir of Holy Trinity Church, Stratford-on-Avon, and the copper-plate engraved by Martin Droeshout as frontispiece to the First Folio of Shakespeare's works (and used for three subsequent issues) published in 1623, although first printed in the previous year.

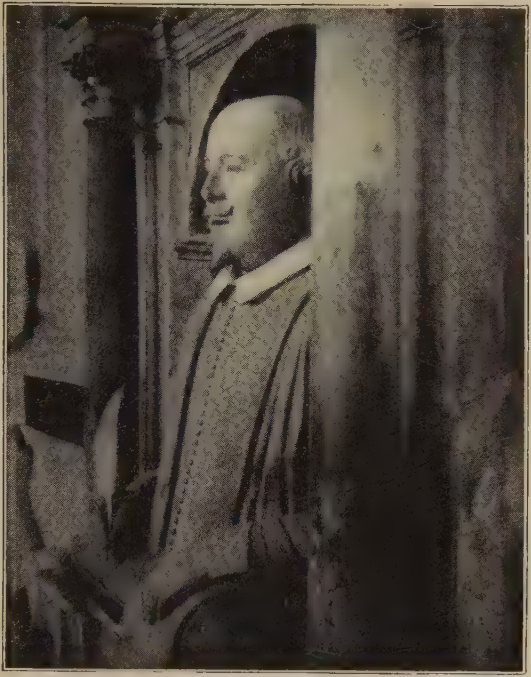
The Stratford bust and monument must have been erected on the N. wall of the chancel or choir within six years after Shakespeare's death in 1616, as it is mentioned in the prefatory memorial lines by Leonard Digges in the First Folio. The design in its general aspect was one often adopted by the "tombe-makers" of the period, though not originated by them, and according to Dugdale was executed by a Fleming resident in London since 1567, Garratt Johnson (Gerard Janssen), a denizen, who was occasionally a collaborator with Nicholas Stone. The bust is believed to have been commissioned by the poet's son-in-law, Dr John Hall, and, like the Droeshout print, must have been seen by and likely enough had the approval of Mrs Shakespeare, who did not die until August 1623. It is thought to have been modelled from either a life or death mask, and inartistic as it is has the marks of facial individuality; that is to say, it is a portrait and not a generalization such as was common in funereal sculpture. According to the practice of the day, especially at the hands of Flemish sculptors of memorial figures, the bust was coloured; this is sufficient to account for the technical summariness of the modelling and of the forms. Thus the eyebrows are scarcely more than indicated by the chisel, and a solid surface represents the teeth of the open mouth; the brush was evoked to supply effect and detail. To the colour, as reapplied after the removal of the white paint with which Malone had the bust covered in 1793, must be attributed a good deal of the wooden appearance which is now a shock to many. The bust is of soft stone (not alabaster, as incorrectly stated by "the accurate Dugdale"), but a careful examination of the work reveals no sign of the alleged breakage and restoration or reparation to which some writers have attributed the apparently inordinate length of the upper lip. As a matter of fact the lip is not long; it is less than seven-eighths of an inch: the appearance is to a great extent an optical illusion, the result partly of the smallness of the nose and, especially, of the thinness of the moustache that shows the flesh above and below. Some repair was made to the monument in 1649, and again in 1748, but there is no mention in the church records of any meddling with the bust itself. Owing, however, to the characteristic inaccuracy of the print by one of Hollars' assistants in the illustration of Dugdale's *Antiquities of Warwickshire* (p. 688), the first edition of which was published in 1656, certain writers have been misled into the belief that the whole monument and bust were not merely restored but replaced by those which we see to-day. As other prints in the volume depart grossly from the objects represented, and as Dugdale, like Vertue (whose punctilious accuracy has also been baselessly extolled by Walpole), was at times demonstrably loose in his descriptions and presentments, there is no reason to believe that the bust and the figures above it are other than those originally placed in position. Other engravers, following the Dugdale print, have further stultified the original, but as they (Vertue, Grignion, Foudrinier, and others) differ among themselves, little importance need be attached to the circumstance. A warning should be uttered against many of the so-called "casts" of the busts. George Bullock took a cast in 1814 and Signor A. Michele another about forty years after, but those attributed to W. R. Kite, W. Scoular, and others, are really copies, departing from the original in important details as well as in general effect. It is from these that many persons derive incorrect impressions of the bust itself.

Mention should here be made of the "Kesselstadt Death Mask," now at Darmstadt, as that has been claimed as the true death-mask of Shakespeare, and by it the authenticity of other portraits has been gauged. It is not in fact a death-mask at all, but a cast from one and probably not even a direct cast. In three places on the back of it is the inscription—+Aº Dm̄ 1616: and this is the sole actual link with Shakespeare. Among the many rapturous adherents of the theory was William Page, the American painter, who made many measurements of the mask and found that nearly half of them agreed with those of the Stratford bust; the greater number which do not he conveniently attributed to error in the sculptor. The cast first came to light in 1849, having been searched for by Dr. Ludwig Becker, the owner of a miniature in oil or parchment representing a corpse crowned with a wreath, lying in bed, while on the background, next to a burning candle, is the date —Aō 1637. This little picture was by tradition asserted to be Shakespeare, although the likeness, the death-date, and the wreath all point unmistakably to the poet-laureate Ben Jonson. Dr Becker had purchased it at the death-sale at Mainz of Count Kesselstadt in 1847, in which also "a plaster of Paris cast" (with no suggestion of Shakespeare then attached to it) had appeared. This he found in a broker's rag-shop, assumed it to be the same, recognized in it a resemblance to the picture (which most persons cannot see) and so came to attribute to it the enormous historical value which it would, were his hypothesis correct, unquestionably possess. In searching for the link of evidence necessary to be established, through the Kesselstadt line to England and Shakespeare, a theory has been elaborated, but nothing has been proved or carried beyond the point of bare conjecture. The arguments against the authenticity of the cast are strong and cogent—the chief of which is the fact that the skull reproduced is fundamentally of a different form and type from that shown in the Droeshout print—the forehead is receding instead of upright. Other important divergencies occur. The handsome, refined, and pleasing aspect of the mask accounts for much of the favour in which it has been held. It was believed in by Sir Richard Owen and was long on view in the British Museum, and was shown in the Stratford Centenary Exhibition in 1864.

The "Droeshout print" derives its importance from its having been executed at the order of Heminge and Condell to represent, as a frontispiece to the *Plays*, and put forth as his portrait, the man and friend to whose memory they paid the homage of their risky enterprise. The volume was to be his real monument, and the work was regarded by them as a memorial erected in a spirit of love, piety, and veneration. Mrs Shakespeare must have seen the print; Ben Jonson extolled it. His dedicatory verses, however, must be regarded in the light of conventional approval as commonly expressed in that age of the performances of portrait-engravers and habitually inscribed beneath them. It is obvious, therefore, that in the circumstances an authentic portrait must necessarily have been the basis of the engraving; and Sir George Scharf, judging from the contradictory lights and shadows in the head, concluded that the original must have been a limning—more or less an outline drawing—which the youthful engraver was required to put into chiaroscuro, achieving his task with but very partial success. That this is the case is proved by the so-called "unique proof" discovered by Halliwell-Phillips, and now in America. Another copy of it, also an early proof but not in quite the same "state," is in the Bodleian Library. No other example is known. In this plate the head is far more human. The nose is here longer than in the bust, but the bony structure corresponds. In the proof, moreover, there is a thin, wiry moustache, much widened in the print as used; and in several other details there are important divergencies. In this engraving by Droeshout the head is far too large for the body, and the dress—the costume of well-to-do persons of the time—is absurdly out of perspective: an additional argument that the unpractised engraver had only a drawing of a head to work from, for while the head shows the individuality of portraiture the body is as clearly done *de chic*. The first proof is conclusive evidence against the contention that the "Flower Portrait" at the Shakespeare Memorial Museum, Stratford-on-Avon—the gift of Mrs Charles Flower (1895) and boldly entitled the "Droeshout original"—is the original painting from which the engraving was made, and is, therefore the actual life-portrait for which Shakespeare sat. This view was entertained by many connoisseurs of repute until it was pointed out that had that been the case the first proof, if it had been engraved from it, would have resembled it in all particulars, for the engraver would have merely copied the picture before him. Instead of that, we find that several details in the proof—the incorrect illumination, the small moustache, the shape of the eyebrow and of the deformed ear, &c.—have been corrected in the painting, in which further improvements are also imported. The conclusion is therefore irresistible. At the same time the picture may possibly be the earliest painted portrait in existence of the poet, for so far as we can judge of it in its present condition —(it was to some extent injured by fire at the Alexandra Palace) —it was probably executed in the earlier half of the 17th century. The inscription—*Willm̆ Shakespeare*, 1609—is suspect on account of being written in cursive script, the only known example at the date to which it professes to belong. If it were authentic it might be taken as showing us Shakespeare's appearance seven years before his death, and fourteen years before the publication of the Droeshout print. The former attribution of it to Cornelis Janssen's brush has been abandoned—it is the work of a comparatively unskilful craftsman. The picture's pedigree cannot definitely be traced far back, but that is of little importance, as plausible pedigrees have often been manufactured to bolster up the most obvious impostures. The most interesting of the copies or adaptations of this portrait is perhaps that by William Blake now in the Manchester Corporation Art Gallery. One of the cleverest imitations, if such it be, of an old picture is the "Buttery" or "Ellis portrait," acquired by an American collector in 1902. This small picture, on panel, is very poor judged as a work of art, but it has all the appearance of age. In this case the perspective of the dress has been corrected, and Shakespeare's shield is shown on the background. The head is that of a middle-aged man; the moustache, contrary to the usual type, is drooping. It is curious that the "Thurston miniature" done from the Droeshout print gives the moustache of the "proof."

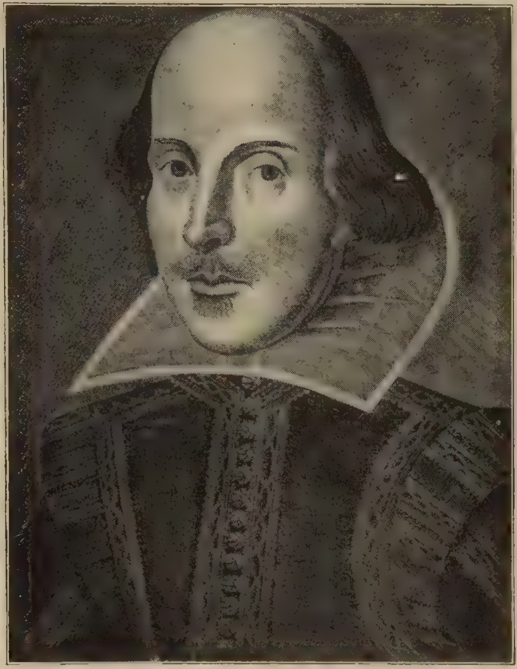
Two other portraits of the same character of head and arrangement are the "Ely Palace portrait" and the "Felton portrait," both of which in their time have had, and still have, convinced believers. The "Ely Palace portrait" was discovered in 1845 in a broker's shop, and was bought by Thomas Turton, bishop of Ely, who died in 1864, when it was bought by Henry Graves and by him was presented to the Birthplace. An unsatisfactory statement of its history, similar to that of many other portraits, was put forth; the picture must be judged on its merits. It bears the inscription "Æ 39 + 1603," and it shows a moustache and a right eyebrow identical with those in the Droeshout "proof." It was therefore hailed by many competent judges as the original of the print; by others it was dismissed as a "make-up"; at the same time it is very far from being a proved fraud. Supposing both it and the "Flower portrait" to be genuine, this picture, which came to light long before the latter, antedates it by six years. Judged by the test of the Droeshout "proof" it must have preceded and not followed it. The "Felton portrait," which made its first appearance in 1792, had the valiant championship of the astute and cynical Steevens, of Britton, Drake, and other authorities, as the original of the Droeshout print, while a few—those who believed in the "Chandos portrait"—denounced it as "a rank forgery." On the back of the panel was boldly traced in a florid hand "Gul. Shakespear 1597 R.B." (by others read "R.N."). If

PORTRAITS OF SHAKESPEARE



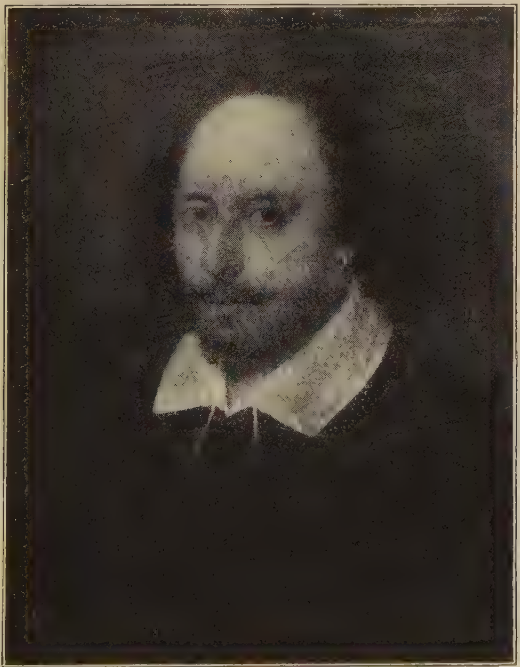
Photo, Harold Baker, Birmingham.

THE STRATFORD BUST AND MONUMENT IN HOLY TRINITY CHURCH, STRATFORD-ON-AVON. Erected before 1623.



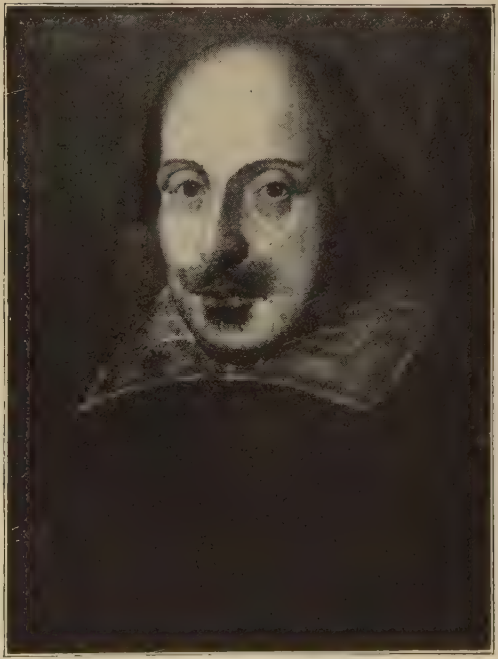
Photo, Emery Walker.

THE ENGRAVING BY MARTIN DROESHOUT. In the First Folio Edition. 1623.



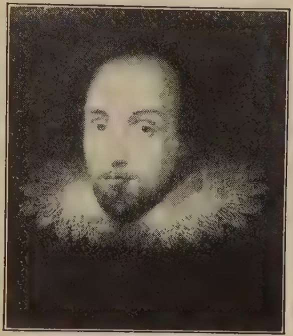
Photo, Emery Walker.

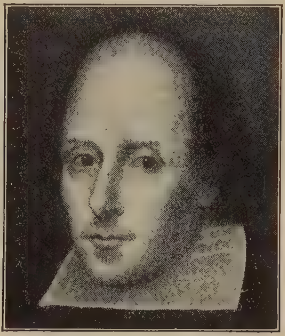
THE CHANDOS PORTRAIT. In the National Portrait Gallery.

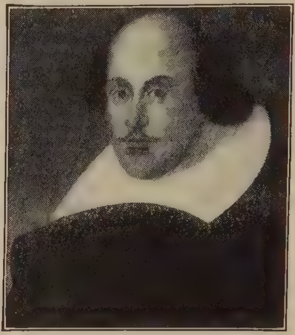


THE FLOWER PORTRAIT. (The " Droeshout Original "). In the Shakespeare Memorial Gallery.

PORTRAITS OF SHAKESPEARE


1. THE JANSSEN.


2. THE FELTON.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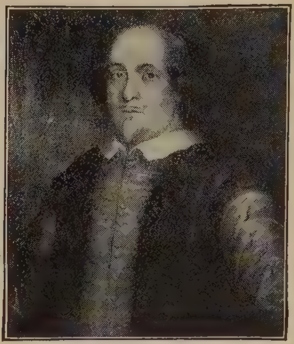
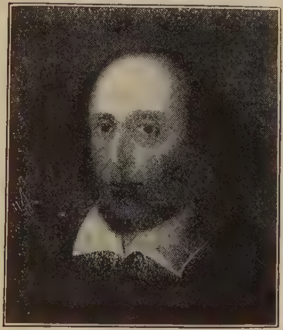
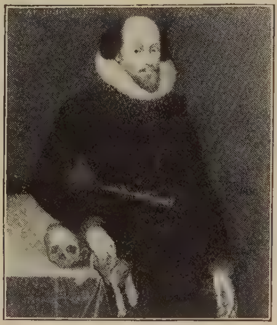

4. THE HUNT OR STRATFORD.


5. THE LUMLEY.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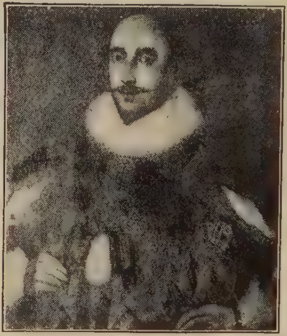
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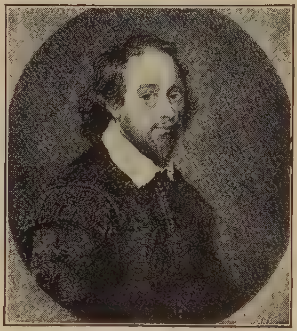
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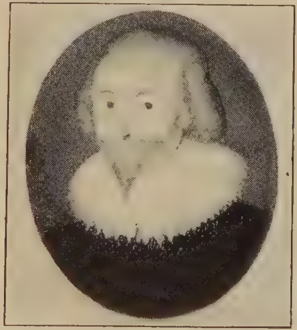
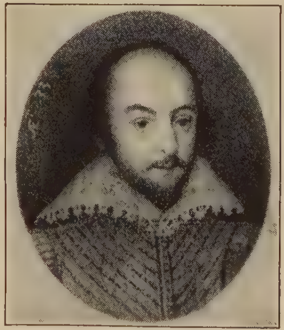

9. THE HILLIARD MINIATURE.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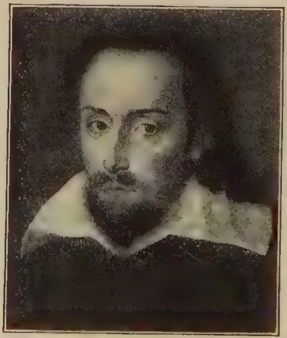
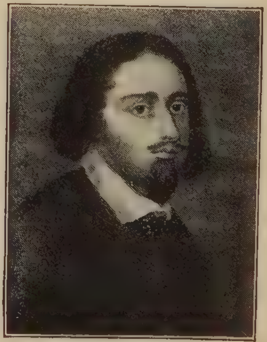
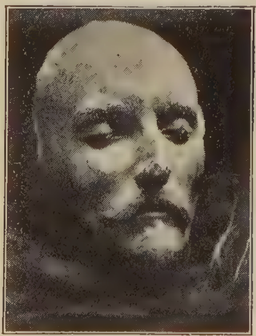
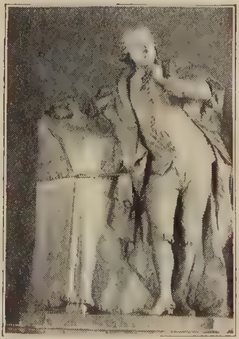
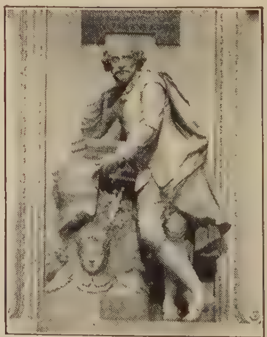
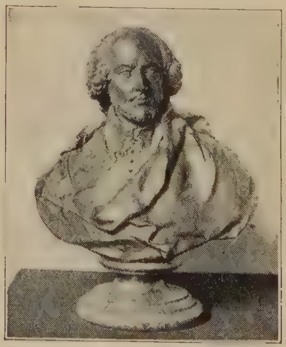

Photo, W. A. Mansell.
11. THE DUNFORD.


Photo, W. A. Mansell.
12. THE STACE.


13. THE DEATH-MASK.


14. THE ROUBILIAC STATUE.


15. THE SCHEEMAKERS STATUE.


16. THE DAVENANT BUST.

R.B. is correct, it is contended the initials indicate Richard Burbage, Shakespeare's fellow-actor. Traces of the writing may still be detected. Boaden's copy, made in 1792, repeating the inscription on the back, has "Guil. Shakspeare 1587 R.N." The spelling of Shakespeare's name—which in succeeding ages has been governed by contemporary fashion—has a distinct bearing on the authenticity of the panel. At the first appearance of the "Felton portrait" in a London sale-room it was bought by Samuel Felton of Drayton, Shropshire, for five pounds, along with a pedigree which carried its refutation along with it. Nevertheless, it bears evidence of being an honest painting done from life, and is probably not a make-up in the sense that most of the others are. It fell into the hands of Richardson the printseller, who issued fraudulent engravings of it by Trotter and others (by which it is best known), causing the characteristic lines of the shoulders to be altered, so that it is set upon a body attired in the Droeshout costume, which does not appear in the picture; and then, arguing from this falsely-introduced costume, the publisher maintained that the work was the original of the Droeshout print and therefore a life-portrait of Shakespeare. Thus foisted on the public it enjoyed for years a great reputation, and no one seems to have recognized that with its down-turned moustache it agrees with the inaccurate print after the Droeshout engraving which was published as frontispiece to Ayscough's edition of Shakespeare in 1790, *i.e.* two years before the discovery of the Felton portrait! The "Napier portrait," as the excellent copy by John Boaden is known, has recently been presented to the Shakespeare Memorial. Josiah Boydell also made a copy of the picture for George Steevens in 1797. Quite a number of capital miniatures from it are in existence. With these should be mentioned a picture of a similar type discovered by Mr M. H. Spielmann in 1905. Finding a wretched copy of the Chandos portrait executed on a panel about three hundred years old, he had the century-old paint cleaned off in order to ascertain the method of the forger. On the disappearance of the Chandos likeness under the action of the spirit another portrait of Shakespeare was found beneath, irretrievably damaged but obviously painted in the 17th century. At the time of the "fake" only portraits of the Chandos type were saleable, and this would account for the wanton destruction of an interesting work which was probably executed for a publisher—likely enough for Jacob Tonson—but not used. Early as it is in date it can make no claim to be a life-portrait.

The "Janssen" or "Somerset portrait" is in many respects the most interesting painted likeness of Shakespeare, and undoubtedly the finest of all the paintings in the series. It is certainly a genuine as well as a very beautiful picture of the period, and bears the inscription—$\genfrac{}{}{0pt}{}{\text{Æ}^{\text{t}}\ 46}{1610}$—but doubt has been expressed whether the 6 of 46 has not been tampered with, and whether it was not originally an o and altered to fit Shakespeare's age. It was made known through Earlom's rare mezzotint of it, but the public knowledge of it has been mainly founded on Cooper's and Turner's beautiful but misleading mezzotint plates until a photograph of the original was published for the first time in 1909 (in *The Connoisseur*) by permission of the owner, the Lady Guendolen Ramsden, daughter of the duke of Somerset, the former owner of the picture. The resemblance to the main forms of the death-mask is undoubted; but that is of little consequence as confirmation unless the mask itself is supported by something beyond vague conjectures. Charles Jennens, the wealthy and eccentric amateur editor of the poor edition of *King Lear* issued in 1770, was the first known owner, but vouchsafed no information of its source and shrank from the challenge to produce the picture. Of the beauty, excellence, and originality of this portrait there is no question; it is more than likely that Janssen was the author of it; but that it was intended to represent Shakespeare is still to be proved. A number of good copies of it exist, all but one (which enjoys a longer pedigree) made in the 18th century: the "Croker Janssen" now lost, unless it be that of Lord Darnley's; the "Staunton Janssen," the "Buckston Janssen," the "Marsden Janssen," and the copy in the possession of the duke of Anhalt. These are all above the average merit of such work.

The portrait which has made the most popular appeal is that called the "Chandos," formerly known as the "d'Avenant," the "Stowe," and the "Ellesmere," according as it passed from hand to hand; it is now in the National Portrait Gallery. Tradition, tainted at the outset, attributes the authorship of it to Richard Burbage, although it is impossible that the painter of the head in the Dulwich Gallery could have produced a work so good in technique; and Burbage is alleged to have given it to his fellow-actor Joseph Taylor, who bequeathed it to Sir William d'Avenant, Shakespeare's godson. As a matter of fact, Taylor died intestate. Thenceforward, whether or not it belonged to d'Avenant, its history is clear. At the great Stowe sale of the effects of the duke of Buckingham and Chandos (who had inherited it) the earl of Ellesmere bought it and then presented it to the nation. Many serious inquirers have refused to accept this romantic, swarthy, Italian-looking head here depicted as a likeness of Shakespeare of the Midlands, if only because in every important physiognomical particular, and in face-measurement, it is contradicted by the Stratford bust and the Droeshout print. It is to be noted, however, that judged by the earlier copies of it—which agree in the main points—some of the swarthiness complained of may be due to the restorer. Oldys, indifferent to tradition, attributed it to Janssen, an unallowable ascription. This, except the "Lumley portrait," the "Burdett Coutts portrait," and the admitted fraud, the "Dunford portrait," is the only picture of Shakespeare executed before the end of the 18th century which represents the poet with earrings—the wearing of which, it should be noted, either simple gold circles or decorated with jewel-drops, was a fashion that extended over two centuries, in England mainly, if not entirely, affected by nobles and exquisites. Contrary to the general belief, the picture has not been subjected to very extensive repair. That it was not radically altered by the restorer is proved by the fine copy painted by Sir Godfrey Kneller, and by him presented to John Dryden. The poet acknowledged the gift in his celebrated Fourteenth Epistle, written after 1691 and published in 1694, and containing the passage beginning, "Shakespeare, thy gift, I place before my sight; With awe I ask his blessing ere I write." D'Avenant had died in 1668, and so could not, as tradition contends was the case, have been the donor. In Malone's time the picture was already in the possession of the earl Fitzwilliam. This at least proves the esteem in which the Chandos portrait was held so far back as the end of the 17th century, only three-quarters of a century after Shakespeare's death.

From among the innumerable copies and adaptations of the Chandos portrait a few emerge as having a certain importance of their own. That which Sir Joshua Reynolds is traditionally said to have made for the use of Roubiliac, then engaged in his statue of Shakespeare for David Garrick (now in the British Museum), and another alleged to have been done for Bishop Newton, are now lost. That by Ranelagh Barret was presented in 1779 to Trinity College Library, Cambridge, by the Shakespearian commentator Edward Capell. Dr Matthew Maty, principal librarian of the British Museum, presented his copy to the museum in 1760. There are also the smooth but rather original copy (with drapery added) belonging to the earl of Bath at Longleat; the Warwick Castle copy; the fair copy known as the Lord St Leonards portrait; the large copy in coloured crayons, formerly in the Jennens collection and now belonging to Lord Howe, by van der Gucht, which seems to be by the same hand as that which executed the pastel portrait of Chaucer in the Bodleian Library; the "Clopton miniature" attributed to John Michael Wright, which formed the basis of the drawing by Arlaud, by whose name the engravings of this modified type are usually known; the Shakespeare Hirst picture, based on Houbraken's engraving; the full-size chalk drawing by Ozias Humphry, R.A., at the Birthplace, which Malone guaranteed to be a perfect transcript, but which more resembles the late W. P. Frith, R.A., than Shakespeare. Humphry also, adhering to his modified type, executed three beautiful but inaccurate miniatures from the picture, one of which is in the Garrick Club, and the others in private hands.

The "Lumley portrait" is in type a curious blend of the faces in the Chandos portrait and the Droeshout print, with a dash of the "Auriol miniature" (see later). It represents a heavy-jowled man with pursed-up lips, and with something of the expression but little of the vitality of the Chandos. Although it is thought to be indicated though not actually mentioned in the Lumley sale catalogues of 1785 and 1807, it was only when it came into the possession of George Rippon, presumably about the year 1848, that it was brought to the notice of the world, and additional attention was secured by the owner's contention that it was the original of the Chandos. It is claimed that the picture originally belonged to the portrait collector John, Lord Lumley, of Lumley castle, Durham, who died in 1609, and descended to Richard, the 4th earl of Scarborough, and George Augustus, the 5th earl, at whose respective sales at the dates mentioned it was put up to auction. On the first occasion it was bought in, and on the second it was acquired by George Walters. It is to be observed, however, that it does not appear by name in the early inventory, and it is unconvincingly claimed that it was mistakenly entered as Chaucer, a portrait of whom is mentioned. When in the possession of George Rippon the picture was so superbly chromo-lithographed by Vincent Brooks that copies of it, mounted on old panel or canvas, and varnished, have often changed hands as original paintings. It is clear that if the picture was indeed in possession of John, Lord Lumley, we have here a contemporary portrait of Shakespeare, and the fact that it is an amateur performance would in no way invalidate the claim. It is thinly painted and scarcely looks the age that is claimed for it; but it is an interesting work, which, in 1875, entered the collection of the late Baroness Burdett-Coutts.

To Frederigo Zuccaro are attributed three of the more important portraits now to be mentioned; upon him also have been foisted several of the more impudent fabrications herein named. The "Bath" or "Archer portrait"—it having been in the possession of the Bath Librarian, Archer, when attention was first drawn to it in 1859—is worthy of Zuccaro's brush. It is Italian in feeling, with an inscription ("W. Shakespear") in an Italian but apparently more modern hand. The type of head, too, is Italian, and it is curious that in certain respects it bears some resemblance not only to the Chandos, and to the Droeshout and Janssen portraits, but also to the "death-mask"; yet it differs in essentials from all. Certain writers have affirmed that Reynolds in one of his Discourses expressed his faith in the picture; but the alleged passage cannot be identified. This eloquent, refined, and well-bred head suggests an Italian noble, or, if an English poet, a man of the type of Edmund Spenser; a lady-love shoe-string, or "twist" (often used to tie on a jewel), threads the ear and a fine lace ruff frames the head. The whole picture is beautifully painted by a highly accomplished artist. If this portrait represents Shakespeare at about the age of 30, that is to say in 1594, the actor-dramatist had made astonishing progress in the world, and become well-to-do, and had adopted the attire of a dandy. But Zuccaro came to England in 1574, and as his biographers state "did not stay long," and returned to Florence to complete the work at the Duomo there begun by Vasari. The conclusion appears to be definite. The picture was acquired for the Baroness Burdett-Coutts by W. H. Wills.

Stronger objection applies to the "Boston Zuccaro" or "Joy portrait," now in Boston, U.S.A. A Mr Benjamin Joy, who emigrated from London to Boston, owned a picture with a doubtful pedigree—transparently a manufactured tradition. R. S. Greenough, the American sculptor, used it along with "other authentic portraits" to produce his bust. In parts it has been viciously restored, but it is in very fair condition and appears to be a good picture of the Flemish school. In the vague assertion that it was found in the Globe Tavern which was frequented by Shakespeare and his associates, no credence can be placed, if only because no such tavern is known to have existed.

The "Cosway Zuccaro portrait" is now ~~in~~ America; but the reproduction of it exists in England in the miniature of it by Cosway's pupil, Charlotte Jones, as well as in the rare mezzotint by Hanna Greene. The picture is alleged to have disappeared from the possession of Richard Cosway; it was sold in his sale, however, and passed through the hands of Lionel Booth and of Augustin Daly. No one would imagine that it is intended for a portrait of the poet. It is far more like Shelley (somewhat caricatured, especially as to the cat-like eyes and the Mephistophelian eyebrows) or Torquato Tasso. The attribution to Zuccaro is absurd, yet Cosway and Sir Charles Eastlake believed in it. The inscription on the back, "Guglielm: Shakespear," with its mixture of Italian and English, resembles in wording and spelling that adopted in the case of several admitted "fakes." No attempt at discovering the history of the picture was ever made, but there is no doubt that at the beginning of the 19th century it was widely credited; Wivell and others attributed it to Lucas Franchois. It is said to be well painted, but the copies show that it is ill drawn. The miniature by Charlotte Jones, a fashionable artist in her day, is pretty and weak, but well executed; it was painted in 1823.

Of the "Burdett-Coutts portrait" (the fourth interesting portrait of Shakespeare in the possession of Mr Burdett-Coutts) there is no history whatever to record. No name has been suggested for the artist, but the hands and accessories of dress strongly resemble those in the portrait of Elizabeth Hardwick, countess of Shrewsbury, in the National Portrait Gallery. The ruff, painted with extreme care, reveals a *pentimento*. The picture is admirably executed, but the face is weak and is the least satisfactory part of it; especially feeble is the ear with the ring. Shakespeare's shield, crest, with red mantling, which appear co-temporary with the rest, and the figures "37" beneath it, appear on the background, in the manner adopted in 17th-century portraits. From this picture the "Craven portrait" seems to have been "faked."

Equally striking is the "Ashbourne portrait," well known through G. F. Storm's engraving of it. It is sometimes called the "Kingston portrait" as the first known owner of it was the Rev. Clement U. Kingston, who issued the engraving in 1847. It is an important three-quarter length, representing a figure in black standing beside a table at the corner of which is a skull whereon the figure rests his right forearm. It is an acceptable likeness of Shakespeare, in the manner of Paul van Somer, apparently pure except in the ruff. The inscription "ÆTATIS SVAE. 47. A° 1611," and the decoration of cross spears on a book held by the right hand, are also raised from the ground, so that it would be injudicious to decide that these are not of a later date yet at the same time ancient additions. It is the only picture—if we disregard the inadmissible "Hampton Court portrait"—in which Shakespeare is shown wearing a sword-belt and a thumb-ring, and holding a gauntleted glove. The type is that of a refined, fresh-coloured, fair-haired English gentleman. There is no record of the picture before Mr Kingston bought it from a London dealer.

More famous, but less reputable, is the "Stratford" or "Hunt portrait," amusingly exhibited in an iron safe in the Birthplace at Stratford, to which it was presented by W. O. Hunt, town clerk, in 1867. It had been in the Hunt family for many years and represented a black-bearded man. Simon Collins, the picture cleaner and restorer who had cleansed the Stratford bust of Malone's white paint and restored its colours, declaring that another picture was beneath it, was engaged to exercise himself upon it. He removed the top figure from the dilapidated canvas with spirit and found beneath it the painted version of the Stratford bust. At that time Mr Rabone's copy, now at Birmingham, was made; it is valuable as evidence. Then Collins, always a suspect in this matter, proceeded with the restoration, and by treatment of the hair made the portrait more than ever like the bust; and the owner, and not a few others, proclaimed the picture to be the original from which the bust was made. No judge of painting, however, accepts the picture as dating further back than the latter half of the 18th century—when it was probably executed, among a score of others, about the time of the bicentenary of Shakespeare's birth, an event which gave rise to much celebration. The ingenious but entirely unconvincing explanations offered to account for the state in which the picture was found need not be recounted here.

The “Duke of Leeds' portrait,” now at Hornby castle, has been for many years in the family, but the circumstances of its provenance are unknown. It has been thought possible that this is the lost portrait of which John Evelyn speaks as having been in the collection of Lord Chancellor Clarendon, the companion picture to that of Chaucer; but no evidence has been adduced to support the conjecture. It represents a handsome, fair man, with auburn beard, with an expression recalling the Janssen portrait; the nose, however, is quite different. He wears a standing “wired band,” as in the Droeshout print. It is a workmanlike piece of painting, but there is nothing in the picture to connect it with Shakespeare. The same may be said of the “Welcombe portrait,” which was bought by Mark Philips of Welcombe and descended to Sir George Trevelyan. It is a fairly good picture, having some resemblance to the “Boston Zuccaro” with something of the Chandos. The figure, a half-length, wears a falling spiked collar edged with lace, and from the ear a love-lace, the traces of which only are left. Two other portraits at the Shakespeare Memorial should be named. The “Venice portrait,” which was bought in Paris and is said to have come from Venice, bears an Italian undecipherable inscription on the back; it seems to have no obvious connexion with Shakespeare apart from its exaggeration of the general aspect of the Chandos portrait; it is a weak thing. The “Tonson portrait,” inscribed on the frame “The Jacob Tonson Picture, 1735,” a small oval, with the attributes of comedy and tragedy, is believed to have been executed for Tonson's 4th edition of Shakespeare, but not used.

The “Soest portrait” (often called Zoust or Zoest), formerly known as “the Douglas,” the “Lister Kaye” or the “Clarges portrait,” according to the owner of the moment, was for many years a public favourite, mainly through J. Simon's excellent mezzotint. The picture, a short half-length within an oval, is manifestly meant for Shakespeare, but the head as nearly resembles the head of Christ at Lille by Charles Delafosse (1636–1716) who also painted pictures in England. Gerard Soest was not born until 1637, and according to Granger the picture was painted in Charles II.'s reign. It is a pleasing but weak head, possibly based on the Chandos. The whereabouts of the picture is unknown, unless it is that in the possession of the earl of Craven. A number of copies exist, two of which are at the Shakespeare Memorial. Simon's print was the first announcement of the existence of the picture, which at that time belonged to an obscure painter, F. Wright of Covent Garden.

The “Charlecote portrait,” which was exhibited publicly at Stratford in 1896, represents a burly, bull-necked man, whose chief resemblance to Shakespeare lies in his baldness and hair, and in the wired band he wears. The former possession of the picture by the Rev. John Lucy has lent it a sort of reputation; but that gentleman bought it as recently as 1853.

Similarly, the “Hampton Court portrait” derives such authority as it possesses from the dignity of its owner and its habitat. William IV. bought it as a portrait of Shakespeare, but without evidence, it is suggested, from the de Lisles. This gorgeously attired officer in an elaborate tunic of green and gold, with red bombasted trunks, with fine worked sword and dagger pendent from the embroidered belt, and with a falling ruff and laces from his ear, bears some distant resemblance to the Chandos portrait. Above is inscribed, “Ætat. suae. 34.” It appears to be the likeness of a blue-eyed soldier; but it has been suggested that the portrait represents Shakespeare in stage dress—a frequent explanation for the strange attire of quaintly alleged portraits of the poet. A copy of this picture was made by H. Duke about 1860. Similarly unacceptable is the “H. Danby Seymour portrait” which has disappeared since it was lent to the National Portrait Exhibition of 1866. This is a fine three-quarter length in the Miervelt manner. The dignified bald-headed man has a light beard, brown hair, and blue eyes, and wears white lace-edged falling collars and cuffs over a doublet gold-embroidered with points; and in the left hand holds a black hat. The “Lytton portrait,” a royal gift made to Lord Lytton from Windsor Castle, is mainly interesting as having been copied by Miller in his original profile engraving of Shakespeare. The “Rendelsham” and “Crooks” portraits also belong to the category of capital paintings representing some one other than Shakespeare; and the same may be hazarded of the “Grafton” or “Winston” portrait, the “Sanders portrait,” the “Gilliland portrait” (an old man's head impudently advanced), the striking “Thorne Court portrait,” the “Aston Cantlow portrait,” the “Burn portrait,” the “Gwennet portrait,” the “Wilson portrait” and others of the class.

Miniature-painting has assumed a certain importance in relation to the subject. The “Welbeck Abbey” or “Harleian miniature,” is that which Walpole caused to be engraved by Vertue for Pope's edition of Shakespeare (1723–1725), but which Oldys declared, incorrectly, to be a juvenile portrait of James I. According to Scharf, it belonged to Robert Harley, 1st earl of Oxford, but it is more likely that it was bought by his son Edward Harley in the father's lifetime. It already was in his collection in 1719, but whence it came is not known. It has been denounced as a piece of arrant sycophancy that Pope consented to adopt this very beautiful but entirely unauthenticated portrait, which bears little resemblance to any other accepted likeness (more, however, to the Chandos than to the rest) simply in order to please the aristocratic patron of his literary circle. It measures 2 in. high; Vertue's exquisite engraving, executed in 1721, enlarged it to 5¼, and became the “authority” for numerous copies, British and foreign. The “Somerville” or “Hilliard miniature,” belonging to Lord and Lady Northcote, is claimed to have descended from Shakespeare's friend, Somerville of Edstone, grandfather of the poet William Somerville. It was first publicly spoken of in 1818 when it was in the possession of Sir James Bland Burges. It is certainly by Hilliard, but although Sir Thomas Lawrence and many distinguished painters and others agreed that it was an original life-portrait of the poet, few will be disposed to give adherence to the theory, in view of its complete departure from other portraits. It represents a pale man with flaxen hair and beady eyes; yet in it Burges found “a general resemblance to the best busts (*sic*) of Shakespeare,” and an attempt was made to prove a relationship between the Ardens and the Somervilles—an untenable theory. The miniature has frequently been exhibited and has figured in important collections on its own merits. The well-known “Auriol miniature,” now in America, is one of the least sympathetic and the least acceptable of the Shakespeare miniatures, excellent though it is in technique. It has the forehead and hair of the Chandos, but it is utterly devoid of the Shakespeare expression. In the background appears “Æ^{t} 33.” The costume is that worn by the highest in the land. It first appeared in its present character in 1826, but it had been known for a few years before, as being in the collection of “Dog” Jennings, and ultimately it came into the hands of the collector, Charles Auriol. Its early history is unknown. The other principal miniatures of interest, but lacking authority, are the “Waring miniature,” the “Tomkinson miniature” (which, like the “Hilliard” and the “Auriol,” was formerly in the Lumsden Propert collection), the doubtful “Isaac Oliver miniature” (alleged to have been in the Jaffé collection at Hamburg), the “Mackey” and “Glen” miniatures, and those presented to the Shakespeare Memorial by Lord Ronald Sutherland Gower, T. Kite, and Henry Graves. These are all contemporary or early works. Miniature copies of recognized portraits are numerous and many of them of high excellence, but they do not call for special enumeration. That, however, by Mary Anne Nichols, “an imitative cameo after Roubiliac,” exhibited in the Royal Academy, 1848, claims notice. In this category are a number of enamels by accomplished artists, the chief of them Henry Bone, R.A., H. P. Bone, and W. Essex.

Several recorded painted portraits have disappeared, other than those already mentioned; these include the “Earl of Oxford portrait” and the “Challis portrait.” The “Countess of Zetland's portrait,” which had its adherents, was destroyed by fire.

Not a few of the existent representations of Shakespeare, unauthoritative as they are, were honestly produced as memorial pictures. There is another class, the earnest attempts made to reconstitute the face and form of the poet, combining within them the best and most characteristic features of the earliest portraits. The most successful, perhaps, is that by Ford Madox Brown, in the Manchester Corporation Art Gallery. Those by J. F. Rigaud, R.A., and Henry Howard, R.A., take a lower rank. It is to be regretted that Gainsborough did not execute the portrait for Garrick, for which he made serious preparations. The “Booker portrait,” which gained wide publicity in Stratford, might be included here; it has dignity, but the pigment forbids us to allow the age claimed for it. The portraits by P. Krämer and Rumpf are among the best recently executed in Germany. The remarkable pen-and-ink drawings by Minanesi and Philip H. Newman deserve to be remembered.

The "faked" portraits have been at times as ardently accepted as those with some solid claim to consideration. The "Shakespeare Marriage picture," with its rhyming confirmatory "tag" intended as an inscription, was discovered in 1872. It is a genuine Dutch picture of man and wife weighing out money in the foreground—a frequent subject—while through the open door Shakespeare and, presumably, Ann Hathaway are seen going through the ceremony of handfasting. The inscription and the Shakespeare head (probably the whole group) are fakes. The "Rawson portrait," inscribed with the poet's name, is faked; it is really a beautiful little portrait of Lord Keeper Coventry by Janssen. The "Matthias Alexander portrait" shows a modern head on an old body. The "Belmount Hall portrait" with its pseudo-Garrick MS. inscription on the back, is in the present writer's opinion not the genuine thing which it claims to be. It represents the poet looking up from his literary work. In the early part of the 19th century two clever "restorers," Holder and Zincke, made a fairly lucrative trade of fabricating spurious portraits of Shakespeare (as well as of Oliver Cromwell and Nell Gwynn) and the clumsiness of most of them did not impede a ready sale. The way in which they imposed upon scholars as well as on the public is marvellous. Many of these impudent impostures won wide acceptance, sometimes by the help of the fine engravings which were made of them. Such are the "Stace" and the "Dunford portraits"—so named after the unscrupulous dealers who put them forward and promulgated them. They have both disappeared, but of the latter a copy is still in existence known as the "Dr Clay portrait." The former is based upon the portrait of Robert Carr, earl of Somerset. These are the two "Winstanley portraits," the "Bishop Newton," the "Cygnus Avoniæ," the "Norwich" or "Boardman," the "Bellows" or "Talma" portraits—most of them, as well as others, traceable to one or other or both of the enterprising fakers already named. At least a dozen are reinforced, as corroborative evidence, with verses supposed to issue from the pen of Ben Jonson. These are all to be attributed to one ready pseudo-Elizabethan writer whose identity is known. With these pictures, apparently, should be ranged the composition, now in America, purporting to represent Shakespeare and Ben Jonson playing chess.

The "fancy-portraits" are not less numerous. The 18th-century small full-length "Willett portrait" is at the Shakespeare Memorial. It is a charmingly touched-in little figure. There are many representations of the poet in his study in the act of composition—they include those by Benjamin Wilson (Stratford Town Hall), John Boaden, John Faed, R.A., Sir George Harvey, R.S.A., C. Bestland, B. J. N. Geiger, and the painter of the Warwick Castle picture, &c.; others have for subject Shakespeare reading, either to the Court or to his family, by John Wood, E. Ender, R. Westall, R.A., &c.; or the infancy and childhood of Shakespeare, by George Romney (three pictures), T. Stothard, R.A., John Wood, James Sant, R.A.; Shakespeare before Sir Thomas Lucy, by Sir G. Harvey, R.S.A., Thomas Brooks, A. Chisholme, &c. These, and kindred subjects such as "Shakespeare's Courtship," have provided infinite material for the industry and ingenuity of Shakespeare-loving painters.

The engraved portraits on copper, steel, and wood are so numerous —amounting to many hundreds—that it is impossible to deal with them here; but one or two must be referred to, as they have genuine importance and interest. Vertue and Walpole speak of an engraved portrait by John Payne (fl. 1620, the pupil of Simon Pass and one of the first English engravers who achieved distinction); but no such print has even been found and its existence is doubted. Walpole probably confounded it with that by W. Marshall, a reversed and reduced version of the Droeshout, which was published as frontispiece to the spurious edition of Shakespeare's poems (1640). It is good but hard. An admirable engraving, to all but expert eyes unrecognizable as a copy, was made from it in 1815, and another later. William Faithorne (d. 1691) is credited with the frontispiece to Quarles's edition of "The Rape of Lucrece, by William Shakespeare, gent." (1655). It was copied for Rodd by R. Sawyer and republished in 1819. It represents the tragic scene between Tarquin and Lucrece, and above is inset an oval medallion, being a rendering of the Droeshout portrait reversed. The earliest engravings from the Chandos portrait are of interest. The first by L. du Guernier (Arlaud type) and that by M. (father of G.) van der Gucht are introduced into a pleasing composition. The same elaborate design was adopted by L. van der Gucht. These, like Vertue's earlier prints, look to the left; subsequent versions are reversed. Perhaps the most celebrated, partly because it was the most important and technically the finest, up to that time, is the large engraving (to the right) by Houbraken, a Dutchman, done for Birch's "Heads of Illustrious Persons of Great Britain" published by T. and P. Knapton (1747–1752). This free rendering of the Chandos portrait is the parent of the numerous engravings of "the Houbraken type." Since that date many plates of a high order, from all the principal portraits, have been issued, many of them extremely inaccurate.

Numerous portraits in stained glass have been inserted in the windows of public institutions. Typical of them are the German Chandos windows by Franz Mayer (Mayer & Co.) at Stationers' Hall, and in St Helens, Bishopsgate (Professor Blaim); and that of the Droeshout type in the great hall of the City of London school. Ford Madox Brown's design is one of the best ever executed.

We now come to the sculptured memorials. After Gerrard Johnson's bust no statuary portrait was executed until 1740, when the statue in Poets' Corner, Westminster Abbey, was set up by public subscription, mainly through the enthusiastic activity of the earl of Burlington, Dr Richard Mead, and the poet Pope. It was designed or "invented" by William Kent and modelled and carried out by Peter Scheemakers; what is, as Walpole said, "preposterous" about it—mainly the pedestal with its incongruous heads—may be credited to the former, and what is excellent to the latter. It is good sculpture, and is interesting as being the first sculptured portrait of the poet based upon the Chandos picture. Lord Pembroke possesses a replica of it. A free repetition, reversed and with many changes of detail, is erected in a niche on the exterior wall of the town-hall of Stratford-on-Avon. A copy of it in lead by Scheemakers' pupil, Sir Henry Cheere, used to stand in Drury Lane theatre. Wedgwood copied this work, omitting the absurdities of the pedestal, with much spirit in black basalt. The marble copy, much simplified, in Leicester Square, is by Fontana, a gift to London by Baron Albert Grant. Busts were executed by Scheemakers, founded on the same portrait. One is still at Stowe in the "Temple of British Worthies," and in Lord Cobham's possession is that presented by Pope to Lord Lyttelton. Some very fine engravings of the monument have been produced, the most important that in Boydell's *Shakespeare* (larger edition). By L. F. Roubiliac, Cheere's protégé, is the statue which in 1758 David Garrick commissioned him to carve and which he bequeathed to the British Museum. It is also based upon the Chandos portrait. The terra-cotta model for the statue is in the Victoria and Albert Museum; and a marble reproduction of it is in private hands. To Roubiliac also must be credited the celebrated "D'Avenant Bust" of blackened terra-cotta in the possession of the Garrick Club. This fine work of art derives its name from having been found bricked up in the old Duke's theatre in Portugal Row, Lincoln's Inn Fields, which 180 years before was d'Avenant's, but which afterwards passed through various vicissitudes. It was again adapted for theatrical purposes by Giffard, for whom this bust, together with one of Ben Jonson which was smashed at the moment of discovery, must have been modelled by the sculptor, who at the same time was engaged on Garrick's commission. The model for the British Museum statue is seen in the portrait of Roubiliac by Carpentiers, now in the National Portrait Gallery. Another portrait of Shakespeare is in Westminster Abbey—a medallion based on the Chandos picture, introduced into Webber's rather fantastic monument to David Garrick. An important alto-relievo representation of Shakespeare, by J. Banks, R.A., between the Geniuses of Painting and the Drama, is now in the garden of New Place, Stratford-on-Avon. It was executed for Boydell's Shakespeare Gallery in Pall Mall, and was presented to the British Institution which afterwards occupied the premises; on the dissolution of that body it was given to Stratford by Mr Holte Bracebridge. It is a fine thing, but the likeness adheres to no clearly specified type. It has been excellently engraved in line by James Stow, B. Smith, and others, and was reproduced on the admirable medal by Küchler, presented by Boydell to every subscriber to his great illustrated edition of Shakespeare's works. It is remarkable that Banks's was the first British hand to model a portrait of the poet.

In more recent times numerous attempts have been made to reconstitute the figure of Shakespeare in sculpture. The most ambitious of these is the elaborate memorial group modelled and presented by Lord Ronald Sutherland Gower to Stratford and set up outside the Memorial Theatre in 1888. The large seated figure of Shakespeare is mounted on a great circular base around which are arranged the figures of Hamlet, Lady Macbeth, Prince Henry, and Falstaff. In 1864 J. E. Thomas modelled the colossal group of Shakespeare with attendant figures of Comedy and Tragedy that was erected in the grounds of the Crystal Palace, and in the same year Charles Bacon produced his colossal Centenary Bust, a reproduction of which forms the frontispiece to John H. Heraud's *Shakspere: His Inner Life* (1865). The chief statues, single or in a group, in London still to be mentioned are the following: that by H. H. Armstead, R.A., in marble, on the southern podium of the Albert Memorial; by Hamo Thornycroft, R.A. (1871), on the Poets' Fountain in Park Lane; by Messrs Daymond on the upper storey of the City of London School, on the Victoria Embankment; and by F. E. Schenck, a seated figure, on the façade of the Hammersmith Public Library. The Droeshout portrait is the basis of the head in the bronze memorial by Professor Lanteri set into the wall on the conjectural site of the Globe Theatre (1909) and of the excellent bust by Mr C. J. Allen in the churchyard of St Mary the Virgin, Aldermanbury, in memory of Heminge and Condell (1896). A recumbent statue, with head of the Chandos type, was in preparation in 1910 for erection in the south aisle of Southwark Cathedral. Among statues erected in the provinces are those by Mr H. Pegram, A.R.A., in the building of Birmingham University (1908) and by M. Guillemin for Messrs Farmer and Brindley for the Nottingham University buildings.

Several statues of importance have been erected in other countries. The bronze by M. Paul Fournier in Paris (presented by an English resident) marks the junction of the Boulevard Haussmann and the Avenue de Messine (1888). The seated marble statue by Professor O. Lessing was set up in Weimar by the German Shakespeare Society; the sculptor has also modelled a couple of busts of a very personal and, it may be said, un-English type. A seated statue in stone roughly hewn with characteristic breadth by the Danish sculptor, Louis Hasselriis, has for some years been placed in the apartment of the Castle of Kronborg, in which, according to the Danish tradition, Shakespeare and his company acted for the king of Denmark. America possesses some well-known statues. That by J. Q. A. Ward is in Central Park, New York (1872). In 1886 William Ordway Partridge modelled and carved the seated marble figure for Lincoln Park, Chicago; and later, Frederick MacMonnies produced his very original statue for the Library of Congress, Washington, D.C. This is in some measure based on the Droeshout engraving. William R. O'Donovan also sculptured a portrait of Shakespeare in 1874. Great consideration is given by some to the bust made by William Page of New York in preparation for a picture of the poet he was about to paint. He founded it with pathetic faith and care and amazing punctiliousness on the so-called "Death Mask," which it little resembles; as he was no sculptor the bust is no more successful than the picture. The bust by R. S. Greenough, already mentioned as based in part on the "Boston Zuccaro" portrait, must be included here, as well as the romantic, dreamy, marble bust by Augusto Possaglio of Florence (presented to the Garrick Club by Salvini in 1876); the imaginative work by Altini (Duke of Northumberland, Alnwick Castle); and the busts by F. M. Miller, E. G. Zimmermann, Albert Toft, J. E. Carew (Mr Muspratt, Liverpool) and P. J. Chardigny of Paris. The last named was a study made in 1850, for a proposed statue, 100 ft. high, which the sculptor hoped to be commissioned to produce. A multitude of small bronze and silver busts and statuettes have also been produced. Some attention has been accorded for several years past to the great pottery bust attributed to John Dwight's Fulham Pottery (*c.* 1675). The present writer, however, has ascertained that it is by Lipscombe, in the latter portion of the 19th century.

The wood carvings are numerous. The most interesting among them is the medallion traditionally believed to have been carved by Hogarth, and inset in the back of the "Shakespeare chair" presented by the artist to David Garrick (in the possession of Mr W. Burdett-Coutts). The statuettes alleged to be carved from the wood of Shakespeare's mulberry-tree are numerous; among the most attractive are the archaic carvings by Salsbee (1761). One statuette of a primitive order of art was sold in 1909 in London for a fantastic sum; it was absurdly claimed to be the original of Scheemakers' statue, but without the slightest attempt at proof or justification.

The Medals and Coins of Shakespeare offer material for a separate numismatic study. Those of the Chandos type are by far the most numerous. The best of them are as follows: Jean Dassier (Swiss; in the "Series of Famous Men," *c.* 1730); J. J. Barre (French; in the "Series numismatica universalis," 1818); Westwood (Garrick Jubilee, 1769); J. G. Hancock—the young short-lived genius who engraved the die when only seven years old; J. Kirk (for the Hon. Order of Shakespeareians, 1777); W. Barnett (for the Stratford Commemoration, 1816); J. Moore (to celebrate the Birthplace, 1864); and L. C. Wyon (the gift of Mr C. Fox-Russell to Harrow School, 1870). The latest, and one of the most skilful, is the plaquette (no reverse) in the series of "Berühmter Männer" by Wilhelm Mayer and Franz Wilhelm of Stuttgart, the leading medal-partnership of Germany (1908). After the "Droeshout" engraving: Westwood (1821); T. A. Vaughton (1908–1909). After the "Stratford bust": W. F. Taylor (celebrating the Birthplace, 1842); and T. J. Minton; T. W. Ingram (for Shakespearean Club, Stratford, 1824); J. Moore, Birmingham; and, head only, Antoine Desbœufs (French, exhibited in the Salon, 1822—obverse only); B. Wyon (for the City of London School, Beaufoy Shakespearean prize, 1851); J. S. and A. B. Wyon (for the M'Gill University, Montreal, 1864); John Bell and L. C. Wyon (for the Tercentenary Anniversary, 1864); Allen and Moore (with incorrect birthdate, "1574," 1864). From the "Janssen" type: Joseph Moore (a medal imitating a cast medal, 1908). There is an Italian medal, cast, of recent date; with the exception of this all the medals are struck.

The 18th-century tradesmen's Tokens, which passed current as money when the copper coinage was inadequate for the public needs, constitute another branch for collectors. About thirty-four of these, including variations, bear the head of Shakespeare. With one exception (a farthing, 1815, issued much later than the bulk of the tokens) all represented half-pence. They comprise the "local" and "not local." There are the "Warwickshire" series, the "London and Middlesex," and the "Stratford Promissory" series. Many are stamped round the edge with the names of the special places in which they are payable. In addition to these may be mentioned the 24 "imitation regal" tokens which bear Shakespeare's name, around (except in one or two cases) the effigy of the king. They belong to the last quarter of the 18th century.

Many of the more important kilns have produced portraits of Shakespeare in porcelain and pottery, in statuettes, busts, in "cameos" and in painted pieces. We have them in Chelsea; old Derby; Chelsea-Derby; old Staffordshire (salt-glaze), frequently reproducing, as often as not with fantastic archaism, Scheemakers' statue; and on flat surfaces by transfer of printed designs—both 18th- and 19th-century productions; also French-Dresden and Wedgwood. In the last-named ware is the fine bust, half-life size, in black basalt, as well as several "cameos" in various sizes, in blue and white jasper, or yellow ground, and in black basalt. The busts were also produced in different sizes. Worcester produced the well-known "Benjamin Webster" service, with the portrait, Chandos type, *en camaïeu*, as well as the mug in "jet enamel," which was the fifth of the set of thirteen. Several of the portraits have also been produced commercially in biscuit china.

Gems with intaglio portraits of Shakespeare have been copiously produced since the middle of the 19th century, nearly all of them based upon earlier works by men who were masters of their still-living craft. The principal of these latter are as follows: Edward Burch, A.R.A., exhibited in 1765; Nathaniel Marchant, R.A., exhibited 1773 (Garrick turning to a bust of Shakespeare); Thomas Pownall (*c.* 1750); William Barnett; J. Wicksted the Elder (Shakespeare and Garrick); W. B. Wray (a beautiful drawing for this is in the Print Room of the British Museum); and Yeo. In the same class may be reckoned the Cameos, variously sardonyx, chalcedony, and shell, some excellent examples of which have been executed, and the Ivories, both in the round and in relief. The Waxes form a class by themselves; in the latter portion of the 18th century a few small busts and reliefs were put forth, very good of their kind. These have been imitated within recent years and attempts made to pass them off as originals, but only the novice is deceived by them. Similarly the old Shakespeare brass pipe-stoppers have latterly been widely reproduced, and the familiar little brass bust is widely reproduced from the bronze original. So voracious is the public appetite for portraits of the poet that the old embroideries in hair and more recently in woven silk found a ready market; reliefs in silver, bronze, iron, and lead are eagerly snapped up, and postage stamps with Shakespeare's head have been issued with success. The acquisitiveness of the collector paralyses his powers of selection. The vast number of other objects for daily use bearing the portrait of Shakespeare call for no notice here. (M. H. S.)

BIBLIOGRAPHY

The following is an attempt to supply the want of a select classified bibliography of the literature connected with Shakespeare (here abbreviated *S.*). The titles are arranged chronologically under each heading in order to give the literary history of the special subject. Articles in periodicals not issued separately, and modern critical editions of single plays, are not included; and only those of the plays usually contained in the collective editions are noticed.

I. Principal Collective Editions

Date.	Plays or Works.	Editors, Publishers, &c.
1623	P.	1st folio, J. Heminge and H. Condell (Jaggard & Blount) [reprinted by J. Wright (1807, folio) and by L. Booth (1862–4, 3 vols. 4to); photo-lithographic facsimile by H. Staunton (1866, folio); reduced by J. O. Halliwell-Phillipps, 1876, 8vo; reprod. from Chatsworth copy, introd. by S. Lee, 1902, folio; Methuen, 1910, folio].
1632	P.	2d folio (Cotes) [fasc. 1909 (Methuen) folio].
1663, 64	P.	3d folio (Chetwinde) [fasc. 1905 (Methuen) folio].
1685	P.	4th folio [fasc. 1904 (Methuen) folio].
1709	W.	1st 8vo, Rowe (Tonson), 7 vols., plates.
1723–25	W.	A. Pope (Tonson), 7 vols. 4to.
1733	W.	L. Theobald (Tonson), 7 vols. 8vo, plates.
1743, 44	P.	Sir T. Hanmer (Oxford), 6 vols. 4to, plates.
1747	P.	Bp. Warburton, 8 vols. 8vo.
1765	P.	Dr S. Johnson (Tonson), 8 vols. 8vo.
1767	P.	E. Capell (Tonson), 10 vols. sm. 8vo.
1773	P.	Johnson and G. Steevens, 10 vols. 8vo.
1773–75	P.	"Stage ed." (Bell), 8 vols. 12 mo, plates.
1790	W.	E. Malone (Baldwin), first "Variorum ed." 10 vols. sm. 8vo.
1793	P.	Johnson and Steevens's 4th ed., by I. Reed, 15 vols. 8vo.
1795–96	W.	1st American ed,. S. Johnson (Philadelphia), 8 vols. 12 mo.
1799–1801	W.	1st Continental ed. (Brunswick), 8 vols. 8vo; repr. of 1793 ed. at Basle, 1799–1802, 23 vols. 8vo.
1802	P.	Boydell's illus. ed. (Bulmer), 9 vols. fol., plates, and 2 additional vols.
1805	P.	A. Chalmers, 9 vols. 8vo, Fuseli's plates.
1807	P.	Heath's engravings, 6 vols. imp. 4to.
1818	P.	T. Bowdler's "Family ed.," complete, 10 vols. 18mo.
1821	W.	E. Malone, by J. Boswell, "Variorum ed.," 21 vols. 8vo.
1825	P.	Rev. W. Harness, 8 vols. 8vo.
1826	P.	S. W. Singer (Pickering), 10 vols. 18mo, woodcuts.
1829	P.	1st French ed. (Baudry), 8vo.
1830	W.	L. Tieck (Leipzig), roy. 8vo.
1832–34	W.	J. Valpy, "Cabinet Pictorial ed.," 15 vols. sm. 8vo.
1838–43	W.	C. Knight, "Pictorial ed.," 8 vols. imp. 8vo.
1839–43	W.	B. Cornwall, 3 vols. imp. 8vo, woodcuts by Kenny Meadows.
1841–44	W.	J. P. Collier, 8 vols. 8vo.
1842–44	W.	C. Knight, "Library ed.," 12 vols. 8vo, woodcuts.
1844	P.	O. W. Peabody (Boston, U.S.), 7 vols. 8vo.
1847	P.	Dr G. C. Verplanck (N.Y.), 3 vols. roy. 8vo, woodcuts.
1851	W.	W. Hazlitt, 4 vols. 12mo.
1852	P.	"Lansdowne ed." (White), 8vo.
1852–57	W.	Rev. H. N. Hudson (Boston, U.S.), 11 vols. 12mo.
1853	P.	J. P. Collier (see *Payne Collier Controversy*, xix.), 8vo.
1853–65	W.	J. O. Halliwell, 16 vols. folio, plates.
1854–65	W.	N. Delius (Elberfeld), 8 vols. 8vo.

Date.	Plays or Works.	Editors, Publishers, &c.
1856	P.	Singer and W. W. Lloyd (Bell), 10 vols. 12mo.
1857	W.	Rev. A. Dyce (Moxon), 6 vols. 8vo, 2d ed., 1864–67.
1857–60	W.	R. G. White (Boston, U.S.), 12 vols. cr. 8vo.
1858–60	W.	H. Staunton, 3 vols. roy. 8vo, illustrated by Sir J. Gilbert.
1860	W.	Mrs. Cowden Clarke (N.Y.), 2 vols. roy. 8vo.
1863–66	W.	W. G. Clark, J. Glover and W. A. Wright, "Cambridge ed.," 9 vols. 8vo.
1864	P.	J. B. Marsh, "Reference ed.," large 8vo.
1865–69	P.	C. and M. C. Clarke (Cassell), illustrated by H. C. Selous, 3 vols. la. 8vo.
1871 &c.	P.	H. H. Furness, "Variorum ed." (Phil.), vols. 1-16, 8vo in progress.
1872–74	P.	C. Knight, "Imperial," 4 vols. imp. 4to, plates.
1874	W.	W. G. Clark and W. A. Wright, "Globe," sm. 8vo.
1875	W.	S. Neil, "Library Shakespeare" (Mackenzie), 3 vols. 4to, illus.
1876	W.	G. L. Duyckinck (Phil.), large 8vo, illus.
1877 &c.	P.	A. A. Paton, "Hamnet ed.," 8vo, 1st folio text, spelling modernized.
1877	W.	N. Delius (F. J. Furnivall), "Leopold" Shakespeare, 4to.
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1883	P.	C. Wordsworth, "Historical Plays," 3 vols. sm. 8vo.
1883	W.	R. G. White, "Riverside ed." (Camb., Mass.), 3 vols. 8vo.
1884	W.	Rolfe's "Friendly ed.," 20 vols. 16mo (N.Y.).
1887–90	W.	Sir H. Irving and F. A. Marshall, "H. Irving ed.," 8 vols. 4to.
1888–92	P.	J. A. Morgan, "Bankside ed.," orig. players' text (N.Y. **S.** Soc.), 20 vols.
1889	W.	"Bedford ed.," N.Y., 12 vols. 8vo."
1891–93	W.	W. A. Wright, "Cambridge ed.," 9 vols. 8vo; also 1893–95, 40 vols. sm. 8vo.
1894–96	W.	I. Gollancz, "Temple ed.," 40 vols. sm. 8vo.
1899–1903	W.	C. H. Herford, "Eversley ed.," 10 vols. 8vo.
1899–1902	W.	J. Dennis, "Chiswick ed.," ill. by Byam Shaw, 39 vols. sm. 8vo.
1899 &c.	P.	W. J. Craig, "Arden ed.," each play separate editor.
1901–4	W.	W. E. Henley (and W. Raleigh), "Edinburgh folio ed.," 10 vols.
1906–9	W.	S. Lee, "Univ. Press **S.** Renaissance ed.," 40 vols.
1907 &c.	W.	F. J. Furnivall, "Old Spelling **S**" (I. Gollancz **S.** Lib.).
1907 &c.	P.	J. A. Morgan, "Bankside-Restoration **S.**" (N.Y. **S.** Soc.).
		[G. Steevens, *Twenty of the Plays*, 1766, 4 vols. 8vo, contains reprints of the early editions. 48 vols. of the quartos were facsimiled by E. W. Ashbee (1866–71), under the superintendence of Halliwell; photo-lithographic reproductions of early editions by Griggs and Praetorius, with introductions by Furnivall, &c., 1883–9, 43 vols. 4to.]

II. SELECTIONS AND READINGS

J. R. Pitman, *The School* **S.**, 1822, 8vo; B. H. Smart, **S.** *Readings*, 1839, 12mo; Howell, *Select Plays*, 1848, 12mo, Roman Catholic; C. Kean, *Selections, as at the Princess' Theatre*, 1860, 2 vols. sm. 8vo; T. and Rev. S. G. Bulfinch, **S.** *adapted for Reading Classes and the Family*, Boston, 1865, 12mo; W. A. Wright, *Select Plays*, 1869–86, 14 vols. sm. 8vo; J. W. S. Hows, *Historical* **S.***ian Reader*, N.Y., 1870, 8vo; R. J. Lane (editor), *C. Kemble's* **S.** *Readings*, 1870, sm. 8vo; R. Baughan, *Plays, Abridged and Revised for Girls*, 1871, 8vo; H. N. Hudson, *Plays, Selected*, Boston, 1872, 3 vols. sm. 8vo; H. Cundell, *The Boudoir* **S.**, 1876, 77, 3 vols. 8vo, eight plays for reading aloud; H. C. Bowen, **S.** *Reading Book*, 1881, 3 pts. 8vo. seventeen plays for schools and reading aloud; S. Brandram, *Selected Plays, abridged for the Young*, 1882, sm. 8vo; C. M. Yonge, **S.**'*s Plays for Schools*, 1883–85, five plays abridged and annotated; M. A. Woods, *Scenes from* **S.** *for use in Schools*, 1898, &c., 8vo; *Lamb*, **S.** *for the Young* (I. Gollancz, **S.** *Lib.*) 1908, &c., based on *Lamb's Tales from* **S.**

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IV. CRITICISM, ILLUSTRATION AND COMMENT

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Eccles, *Illustrations and Variorum Comments on Lear, Cymbeline, and Merchant of Venice*, 1792–1805, 3 vols. 12mo; E. Malone, *Letter to R. Farmer*, 1792, 8vo; J. Ritson, *Cursory Criticism on Malone's Edition*, 1792, 8vo; E. Malone, *Prospectus of an Edition in 15 vols. roy. 8vo*, 1792, 4to; Bishop Percy, *Origin of the English Stage*, 1793, 8vo; E. Malone, *Proposals for an Intended Edition in 20 vols. roy. 8vo*, 1795, folio; W. Richardson, *Essays on some of* **S.**'*s Dramatic Characters*, 1797, 1812, 8vo, reprint of separate pieces; Lord Chedworth, *Notes on some Obscure Passages*, 1805, 8vo, privately printed; E. H. Seymour, *Remarks on the Plays of* **S.**, 1805, 2 vols. 8vo; F. Douce, *Illustrations of* **S.** *and Ancient Manners*, 1807, 2 vols. 8vo, new edition 1839, 8vo; H. J. Pye, *Comments on the Commentators*, 1807, 8vo; J. M. Mason, *Comments on the several Editions*, 1807, 8vo; C. (and M.) Lamb, *Tales from* **S.**, 1807, 2 vols. 12mo, plates, frequently translated and reprinted; A. Becket, **S.** *himself again*, 1815, 2 vols. 8vo; W. Hazlitt, *Characters of* **S.**'*s Plays*, 1817, 8vo, new edition 1873; N. Drake, **S.** *and his Times*, 1817, 2 vols. 4to, and *Memorials of* **S.**, 1828; Z. Jackson, **S.**'*s Genius Justified, Examples of 700 Errors in his Plays*, 1819, 8vo; [*Variorum*] *Annotations Illustrative of the Plays of* **S.**, 1819, 2 vols. 12mo, published with Scholey's edition; W. Hazlitt, *Lectures on the Dramatic Literature of the Age of Elizabeth*, 1820, 8vo; R. Bowdler, *Letter to Editor of British Critic*, 1823, 8vo, defends omissions; T. P. Courtenay, *Commentaries upon the Historical Plays of* **S.**, 1840, 2 vols. sm. 8vo; K. Sybrandi, *Verhandeling over Vondel en* **S.**, Haarlem, 1841, 4to; Rev. A. Dyce, *Remarks on Collier's and Knight's Editions*, 1844, 8vo; J. Hunter, *New Illustrations of* **S.**, 1845, 2 vols. 8vo; G. 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Dowden, *Introd. to* **S.**, 1893, sm. 8vo; T. S. Baynes, **S.** *Studies*, 1894, 8vo; B. Wendell, **W. S.**, a *Study in Elizabethan Literature*, 1894, 8vo; W. Winter, **S.**'*s England*, N.Y., 1894, new ed., 1910, 8vo; V. F. Janssen, **S.** *Studien*, 1897, 8vo; T. F. Ordish, **S.**'*s London*, 1897, sm. 8vo; J. M. Robertson, *Montaigne and* **S.**, 1897, 8vo; G. Brandes, **S.**, transl., 1898, 2 vols. 8vo; L. Kellner, **S.**, 1900, 8vo; A. H. Thorndike, *The Influence of Beaumont and Fletcher on* **S.**, Worc. (U.S.), 1901, 8vo; R. G. Moulton, *The Moral System of* **S.**, 1903, 8vo; M. J. Wolff, **W. S.** *Studien und Aufsätze*, 1903, 8vo; T. Seccombe and J. W. Allen, *The Age of* **S.**, 1903, 2 vols. 8vo; A. C. Bradley, **S.***ean Tragedy*, 1904, 8vo; J. C. Collins, *Studies in* **S.**, 1904, sm. 8vo; S. A. Brooke, *On Ten Plays of* **S.**, 1905, 8vo; A. P. Wright, *Children of* **S.**, 1905, 8vo; H. J. Stephenson, **S.**'*s London*, 1905, sm. 8vo; F. W. Kilbourne, *Alterations and Adaptations of* **S.**, Boston (U.S.), 1906, sm. 8vo; T. R. Lounsbury, *The Text of* **S.**, *its History*, 1906, 8vo; E. H. Griggs, **S.**: *a Handbook*, 1907, 8vo; W. Raleigh, **S.** (Engl. Men of Letters), 1907, sm. 8vo; Count L. N. Tolstoi, **S.** *and the Drama*, transl., 1907, 8vo; J. Kohler, *Verbrecher-Typen in* **S.**'*s Dramen*, Berlin [1907], 8vo; G. F. Boardman, **S.**: *Five Lectures*, 1908, 8vo; B. A. Goll, *Verbrecher bei* **S.**, 1908, 8vo; C. F. Johnson, **S.** *and his Critics*, 1909, 8vo; A. C. Swinburne, *Three Plays of* **S.**, 1909, sm. 8vo; and **S.** (written in 1905), 1909, sm. 8vo; Carlyle, Emerson and Goethe *On* **S.** (De la More Booklets), 3 vols.; F. E. Schelling, *Engl. Lit. during Lifetime of* **S.**, 1910, 8vo.

B.—*Special Works on Separate Plays, &c., with Dates of Early Quartos.*

All's Well that Ends Well (1st ed. in F. 1, 1623): H. v. Hagen, *Üb. die altfranzös. Vorstufe des Lustspieles*, Halle, 1879, 8vo. **Antony and Cleopatra** (1st ed. in F. 1). **As You Like It** (1st ed. in F. 1.): W. Whiter, *Specimen of a Commentary*, 1794, 8vo; A. O. Kellogg, *Jacques*, Utica, 1865, 8vo; C. Sheldon, *Notes*, 1877, 8vo; T. Stothard, **S.**'*s Seven Ages Illustrated*, 1799, folio; J. Evans, **S.**'*s Seven Ages*, 3d ed., 1834, 12mo; J. W. Jones, *Origin of the Division of Man's Life into Stages*, 1861, 4to; C. Semler, **S.**'*s Wie es euch gefällt*, 1899, 8vo. **Comedy of Errors** (1st ed. in F. 1): F. Lang, **S.**'*s Comedy of Errors*, 1909, 8vo. **Coriolanus** (1st ed. in F. 1): F. A. Leo, *Die Delius'sche Ausgabe kritisch beleuchtet*, Berlin, 1861, 8vo; F. von Westenholz, *Die Tragik in* **S.**'*s Coriolanus*, Stuttgart, 1895, 8vo. **Cymbeline** (1st ed. in F. 1): K. Elze, *Letter to C. M. Ingleby*, 1885, 8vo; R. 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V. LANGUAGE, INCLUDING GRAMMARS AND GLOSSARIES

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VI. QUOTATIONS

C. Gildon, *Shakespeariana*, in his *Complete Art of Poetry*, 1718, 12mo, the first of the class; Dr W. Dodd, *The Beauties of **S.***, 1752, 2 vols. 12mo, reprinted (in various forms) more frequently than any similar work; *The Beauties of **S.*** (G. Kearsley), 1784, 12mo, not the same as Dodd's *Beauties*; C. Lofft, *Aphorisms from **S.***, 1812, 12mo; T. Dolby, *The Shakespearian Dictionary*, 1832, 8vo, and *A Thousand Shakespearian Mottoes*, 1856, 32mo; T. Price, *The Wisdom and Genius of **S.***, 1838, 12mo; Mrs M. C. Clarke, ***S.** Proverbs*, 1847, sm. 8vo, reprinted; J. B. Marsh, *Familiar, Proverbial, and Select Sayings from **S.***, 1864, 8vo; E. Routledge, *Quotations from **S.***, 1867, 8vo; C. W. Stearns, *The **S.** Treasury*, N.Y., 1869, 12mo; Capt. A. F. P. Harcourt, *The **S.** Argosy*, 1874, sm. 8vo; G. S. Bellamy, *New Shakespearian Dictionary*, 1877, 8vo; A. A. Morgan, *The Mind of **S.***, 1880, 8vo, quotations in alphabetical order; C. Arnold, *Index to Shakespearian Thought*, 1880, 8vo.

VII. CONCORDANCES AND INDEXES

A. Becket, *Concordance*, 1787, 8vo, the earliest; S. Ayscough, *Index*, 1790, large 8vo, 2nd ed. enlarged, 1827, useful; F. Twiss, *Complete Verbal Index*, 1805, 2 vols. 8vo; M. Cowden Clarke, *Complete Concordance*, 1844, new ed. 1889, 8vo, deals only with the plays; Mrs H. H. Furness, *Concordance to Poems*, Philadelphia, 1874, 8vo, completing Mrs C. Clarke's; C. and M. C. Clarke, *The S. Key*, 1879, 8vo, companion to the *Concordance*; J. Bartlett, *The S. Phrase Book*, 1881, 8vo; W. H. D. Adams, *Concordance to Plays*, 1886, 8vo; E. M. O'Connor, *An Index to the Work of S.*, N.Y., 1887, 8vo; J. Bartlett, *New and Complete Concordance*, 1894, 4to, the best; M. Edwardes, *Pocket Lexicon and Concordance to Temple S.*, 1909, 12mo.

VIII Probable Sources

Mrs C. Lennox, *S. Illustrated*, 1753–54, 3 vols. 12mo, dedication by Johnson, many of the observations also said to be by him; T. Hawkins, *The Origin of the English Drama*, 1773, 3 vols. 8vo; J. Nichols, *The Six Old Plays on which S. founded Measure for Measure, &c.*, 1779, 2 vols. 12mo; S. W. Singer, *S.'s Jest Book*, 1814–15, 2 pts. 8vo; T. Echtermeyer, L. Henschel, and K. Simrock, *Quellen des S.*, Berlin, 1831, 3 vols. 16mo; L. Tieck, *S.'s Vorschule*, Leipzig, 1823–29, 2 vols. 8vo; J. P. Collier, *S.'s Library* [1843], 2 vols. 8vo, 2nd ed. [by W. C. Hazlitt] 1875, 6 vols. 8vo; W. C. Hazlitt, *S.'s Jest Books*, 1864, 3 vols. 8vo; W. W. Skeat, *S.'s Plutarch*, 1875, 8vo; F. A. Leo, *Four Chapters of North's Plutarch*, 1878, folio; R. Simpson, *The School of S*, 1878, 2 vols. 8vo; P. Stapfer, *S. et l'antiquité*, 1879–1882, 2 pts. 8vo, transl. 1880; E. Viles and F. J. Furnivall, *The Rogues and Vagabonds of S.'s Youth*, 1880, 8vo; J. J. Jusserand, *Le Roman du temps de S.*, 1887, sm. 8vo, transl. 1890, 8vo; B. Graefe, *D. Commedia als Quellen f. S. u. Göthe*, 1896, 8vo; J. W. White, *Our English Homer*, 1892, 8vo; W. G. Boswell Stone, *S.'s Holinshed*, 1896, 4to; R. K. Root, *Classical Mythology in S.*, N.Y., 1903, 8vo; H. R. D. Anders, *S.'s Books, on S.'s Reading and Immediate Sources*, Berlin, 1904, 8vo; C. F. Tucker Brooke, *S.'s Plutarch*, 1909, 2 vols. sm. 8vo; W. Theobald, *Classical Element in S.'s Plays*, 1909, 8vo; W. M. MacCullum, *S.'s Roman Plays*, 1910, 8vo; *The S. Classics*, 1908, &c. and *S.'s England*, 1908, &c. (I. Gollancz, *S. Library*).

IX. Special Knowledge

Angling: H. N. Ellacombe, *S. as an Angler*, 1883, 8vo. **Bible**: T. R. Eaton, *S. and the Bible*, 1858, 8vo; J. Brown, *Bible Truths with Shakespearian Parallels*, 3rd ed. 1872, 8vo; J. Rees, *S. and the Bible*, Phil., 1876, sm. 8vo; Bp. C. Wordsworth, *S.'s Knowledge and Use of the Bible*, 1864, 8vo; C. Bullock, *S.'s Debt to the Bible*, 1879, 8vo; W. H. Malcolm, *S. and Holy Writ*, 1881, 8vo; G. Q. Colton, *S. and the Bible*, N.Y., 1888, 8vo; C. Ellis, *S. and the Bible*, 1897, sm. 8vo, 3rd ed. with title, *The Christ in S.*, 1902, sm. 8vo; W. Burgess, *The Bible in S.*, 1903, 8vo. **Botany**: J. E. Giraud, *Flowers of S.*, 1847, 4to, plates; S. Beisly, *S.'s Garden*, 1864, 8vo; H. N. Ellacombe, *Plant-lore and Garden-craft of S.*, 2d ed. 1884, sm. 8vo; L. H. Grindon, *S.'s Flora*, 1883, 4to; L. Holmesworth, *S.'s Garden*, 1903, 8vo; J. H. Bloom, *S.'s Garden*, 1903, 8vo. **Emblems**: H. Green, *S. and the Emblem Writers*, 1870, 4to. **Folk-lore and Use of Supernatural**: W. Bell, *S.'s Puck and his Folks-lore*, 1852–64, 3 vols. sm. 8vo; W. J. Thoms, "The Folk-lore of Shakespeare," in *Three Notelets*, 1865, 8vo, reprinted from *Athenaeum*, 1847; B. Tschischwitz, *Nachklänge Germanischer Mythe in S.*, Halle, 1868, 8vo; [W. C. Hazlitt, editor], *Fairy Tales, Legends, and Romances illustrating S., &c.*, 1875, 8vo; T. F. T. Dyer, *Folk-lore of S.*, 1884, 8vo; T. A. Spalding, *Elizabethan Demonology*, 1880, 8vo; A. Nutt, *Fairy Mythology of S.*, 1900, 8vo; J. P. S. R. Gibson, *S.'s Use of the Supernatural*, 1907, 8vo; M. Lucy, *S. and the Supernatural*, 1906, 8vo; H. H. Stewart, *The Supernatural in S.*, 1908, 8vo; J. E. Poritzky, *S.'s Hexen*, 1909, 8vo. **Learning**: P. Whalley, *Enquiry into the Learning of S.*, 1748, 8vo; R. Farmer, *Essay on the Learning of S.*, 1767, 8vo, reprinted in the variorum (1821) and other editions, criticized by W. Maginn, see *S. Papers, annotated by S. Mackenzie*, N.Y., 1856, sm. 8vo; [K. Prescot], *Essay on the Learning of S.*, 1774, 4to; E. Capell, *The School of S.*, 1780, 4to (vol. iii. of his *Notes and Various Readings to S.*, 1779–83, 3 vols. 4to); see also PROBABLE SOURCES (above). **Legal**: W. L. Rushton, *S. a Lawyer*, 1858, 8vo, *S.'s Legal Maxims*, 1859, 8vo, new ed. 1907, *S.'s Testamentary Language*, 1869, 8vo, and *S. illustrated by the Lex Scripta*, 1870, 8vo; Lord Campbell, *S.'s Legal Acquirements*, 1859, 8vo; H. T., *Was S. a Lawyer?* 1871, 8vo; J. Kohler, *S. vor dem Forum der Jurisprudenz, und Nachwort*, 1883–84, 2 pts. 8vo; F. F. Heard, *S. as a Lawyer*, Boston, 1884, 16mo; C. K. Davis, *The Law in S.*, St Paul, U.S., 1884, 8vo; W. C. Devecmon, *In re S.'s Legal Acquirements*, N.Y., 1899, sm. 8vo. **Medicine**: G. Farren, *Essays on Mania exhibited in Hamlet, Ophelia, &c.*, 1833, 8vo; J. C. Bucknill, *The Medical Knowledge of S.*, 1860, 8vo, and *The Mad Folk of S.*, 1867, sm. 8vo; C. W. Stearns, *S.'s Medical Knowledge*, N.Y., 1865, sm. 8vo; G. Cless, *Medicinische Blumenlese aus S.*, Stuttgart, 1865, 8vo; A. O. Kellogg, *S.'s Delineations of Insanity, &c.*, N.Y., 1866, 16mo; H. R. Aubert, *S. als Mediciner*, Rostock, 1873, 8vo, J. P. Chesney, *S. as a Physician*, St Louis, 1884, 8vo; B. R. Field, *Medical Thoughts of S.*, 2nd ed., Easton, U.S., 1885, 8vo; J. Moyes, *Medicine and Kindred Arts in the Plays of S.*, 1896, 8vo; H. Lähr, *Die Darstellung Krankhafter Geisteszustände in S.'s Dramen*, Stuttgart, 1898, 8vo. **Military**: W. J. Thoms, "Was **S.** ever a Soldier?" in his *Three Noteiets*, 1865, 8vo. **Natural History**: R. Patterson, *Insects mentioned in S.'s Plays*, 1838, 8vo; J. H. Fennell, *S. Cyclopaedia*, 1862, 8vo, pt. i. Zoology, Man (all published); J. E. Harting, *Ornithology of S.*, 1871, 8vo; C. R. Smith, *The Rural Life of S.*, 1874, 8vo; J. Walter, *S.'s Home and Rural Life*, 1874, 4to, illustrated; B. Mayou, *Natural History of S.*, 1877, 8vo, quotations; E. Phipson, *Animal Lore of S.'s Time*, 1883, sm. 8vo; W. H. Seager, *Natural History in S.'s Time*, 1896, 8vo; E. O. von Lippmann, *Naturwiss. aus S.*, 1902, 8vo. **Philosophy**: W. J. Birch, *Philosophy and Religion of S.*, 1848, sm. 8vo; V. Knauer, *W. S., der Philosoph*, Innsbruck, 1879, 8vo. **Printing**: W. Blades, *S. and Typography*, 1872, 8vo. **Psychology**: J. C. Bucknill, *The Psychology of S.*, 1859, 8vo; E. Onimus, *La Psychologie dans les Drames de S.*, 1876, 8vo; Biauté, *Étude médico-psychologique sur S. et ses œuvres*, 1889, 8vo. **Sea**: J. Schuemann, *See u. Seefahrt in S.'s Dramen*, 1876, 4to; W. B. Whall, *S.'s Sea Terms explained*, 1910, 8vo. **Sports**: D. H. Madden, *Diary of Master William Silence*, 1897, new ed. 1907, 8vo; W. L. Rushton, *S. an Archer*, 1897, 8vo.

X. Periodicals

S. Museum, edited by M. L. Moltke, Leipzig, 23rd April 1870 to 23rd February 1874, 20 Nos. (all published); *Shakespeariana*, 1883, &c., sm. 8vo; *New Shakespeareana* (N.Y. Shakespeare Soc.), 1902, &c. From the commencement of *Notes and Queries* in 1856, a special Shakespeare department (see Indexes) has been carried on.

XI. Shakespeare Societies and their Publications

Proceedings of the Sheffield S. Club (1819–29), 1829, 8vo; Shakespeare Society (1841) various publications, 1841–53, 48 vols. 8vo; New Shakspere Society, *Transactions* and other publications, reprints of quartos, &c., 1874, &c., 8vo; Deutsche **S.** Gesellschaft (1864), *Jahrbuch*, Weimar, 1865, &c., in progress. The **S.** Society of New York (1885) has published the *Bankside S.* (1888–92), 20 vols., and *Bankside Restoration S.* (1907, &c.), under the editorship of J. A. Morgan, its first President, and has issued other publications. The **S.** Societies of Philadelphia, Birmingham and Clifton may also be mentioned.

XII. Music

W. Linley, *S.'s Dramatic Songs*, n.d., 2 vols. folio; *The S. Album, or Warwickshire Garland* (C. Lonsdale), 1862, folio; G. G. Gervinus, *Händel u. S.*, Leipzig, 1868, 8vo; H. Lavoix, *Les Traducteurs de S. en musique*, 1869, 8vo; A. Roffe, *Handbook of S. Music*, 1878, 4to; *List of Songs and Passages set to Music* (N.S. Soc.), 1884, 8vo; E. W. Naylor, *S. and Music*, 1896; W. K. White, *Index to the Songs, &c., in S. which have been set to Music*, 1900, 8vo; L. C. Elson, *S. in Music*, 1901, 8vo; H. J. Conrat, *La Musica in S.*, 1903, 8vo. See also the musical works of J. Addison, T. A. Arne, C. H. Berlioz, Sir H. R. Bishop, C. Dibdin, W. Linley, M. Locke, G. A. Macfarren, F. Mendelssohn-Bartholdy, H. Purcell, Sir A. Sullivan, G. Verdi, &c.

XIII. Pictorial Illustrations

C. Taylor, *Picturesque Beauties of S.*, after Smirke, Stothard, &c., 1783–87, 2 vols. 4to; W. H. Bunbury, *Series of Prints illustrative of S.*, 1792–96, oblong folio; S. Harding, *S. illustrated*, 1793, 4to; S. Ireland, *Picturesque Scenes upon the Avon*, 1795, 8vo; J. and J. Boydell, *Collection of Prints from Pictures illustrating the Dramatic Works of S.*, 1802–3, 2 vols. atlas folio, 100 plates, forms supplement to Boydell's edition; reproduced by photography, 1864, 4to, reduced, and edited by J. P. Norris, Philadelphia, 1874, 4to; *S. Portfolio*, 1821–29, roy. 8vo; Stothard, *Illustrations of S.*, 1826, 8vo; F. A. M. Retzsch, *Gallerie zu S.'s dramat. Werken in Umrissen*, Leipzig, 1828–46, 8 vols. obl. 4to; J. Thurston, *Illustrations of S.*, 1830, 8vo; F. Howard, *The Spirit of the Plays of S.*, 1833, 5 vols. 8vo; L. S. Ruhl, *Skizzen zu S.'s dram. Werken*, Frankfort, 1827–31, Cassel, 1838–40, 6 vols. oblong folio; G. F. Sargent, *S. illustrated in a Series of Landscape and Architectural Designs*, 1842, 8vo, reproduced as *The Book of S. Gems*, 1846, 8vo; A. Pichot, *Galerie des personnages de S*, 1844, 4to; J. Tyrrel, *Cat. of an Extensive Collection of Prints illustrative of W. S.*, 1850, 8vo; W. v. Kaulbach, *S. Gallerie*, Berlin, 1857–58, 3 pts. folio; P. Konewka, *Ein Sommernachtstraum*, Heidelb., 1868, 4to, and *Falstaff u. seine Gesellen*, Strasburg, 1872, 8vo; E. Dowden, *S. Scenes and Characters*, 1876, 4to, illustrations from A. F. Pecht's *S. Gallerie*, Leipzig, 1876, 4to; J. O. Halliwell Phillipps, *Hand List of Drawings and Engravings illustrative of the Life of S.*, 1884, 8vo; W. E. Henley, *The Graphic Gallery of S.'s Heroines*, 1888, folio; R. L. Böócke, *S.ian Costumes*, 1889, 8vo; R. Dudley and others, *S. Pictures*, 1896, 8vo; M. Miller, *S.ean Costumes* (characters of each play).

XIV. Biography

A.—*General Works.*

N. Rowe, *The Life of Mr W. S.*, 1743, 8vo, the first separate life; N. Drake, *S. and his Times*, 1817, 2 vols. 4to; J. Britton, *Remarks on the Life and Writings of S.*, revised edition, 1818, sm. 8vo; A. Skottowe, *Life of S.*, 1824, 2 vols. 8vo; J. P. Collier, *New Facts*, 1835, 8vo [see XIX. Payne-Collier Controv.] and *Traditionary Anecdotes of S. collected in 1673*, 1838, 8vo; T. Campbell, *Life and Writings of W. S.*, 1838, 8vo; C. Knight, *S., a Biography*, 1843, 8vo, reprinted in *Studies*, 1850, 2 vols. 8vo; J. O. Halliwell-Phillipps, *The Life of W. S.*, 1848, 8vo, *S. Facsimiles*, 1863, folio, *Illustrations of the Life of S.*, 1874, folio, and *Outlines of the Life of S.*, 1881, 8vo, 6th ed. 1886, 2 vols. 8vo; F. P. G. Guizot, *S. et son temps*, 1852, 8vo, translated into English, 1852, 8vo; G. M. Tweddell, *S., his Times and Contemporaries*, 1852, 12mo, 2nd ed. 1861–63, unfinished: W. W. Lloyd, *Essays on Life and Plays of S.*, 1858, 8vo; S. Neil, *S., a Critical Biography*, 1861, 8vo; T. De Quincey, *S., a Biography*, 1864, 8vo; T. Kenny, *Life and Genius of S.*, 1864, 8vo; W. Bekk, *W. S., eine biogr. Studie*, Munich, 1864, sm. 8vo; S. W. Fullom, *The History of W. S.*, 2nd ed. 1864, 8vo; Victor M. Hugo, *W.S.*, 1864, 8vo, translated into Dutch, German and English; H. G. Bohn, *Biography and Bibliography of S.* (Philobiblon Soc., 1863), 8vo, illustrations; J. Jordan, *Original Collections on S. and Stratford*, 1780, edited by J. O. Halliwell Phillipps, 1864, 4to: J. A. Heraud, *S.'s Inner Life as intimated in his Works*, 1865, 8vo; R. G. White, *Memoirs of the Life of W. S.*, Boston, 1865, 8vo; S. A. Allibone, Biography of **S.** (in *Dictionary*, vol. 2, 1870); H. N. Hudson, *S.: his Life, Art, and Characters*, Boston, 1872, 4th ed. 1883, 2 vols. 12mo; R. Genée, *S., sein Leben u. s. Werke*, Hildburghausen, 1872, 8vo; F. K. Elze, *W. S.* Halle, 1876, large 8vo, transl. 1888; G. H. Calvert, *S.: A Biographic, Aesthetic Study*, Boston, 1879, 16mo; W. Tegg, *S. and his Contemporaries*, 1879, 8vo; W. Henty, *S., with some Notes on his early Biography*, 1882, sm. 8vo; E. Hermann, *Ergänzungen u. Berichtigungen der hergebrachten S. Biograph.*, Erl., 1884, 2 vols. 8vo; F. G. Fleay, *Chronicle History of the Life and Work of W. S.*, 1886, 8vo; R. Waters, *W. S. portrayed by himself*, 1888, 8vo (as in character of Prince Henry); W. J. Rolfe, *S. the Boy*, 1897, sm. 8vo; Sidney Lee, *Life of W. S.*, 1898, 6th ed. 1908, 8vo, illustrated ed. 1899, large 8vo; Goldwin Smith, *S. the Man*, Toronto, 1899, 8vo; G. Duval, *La Vie véridique de S*, 2nd ed. 1900, sm. 8vo; D. H. Lambert, *Cartae S.ianae*, **S.** documents, 1904, sm. 8vo; W. J. Rolfe, *Life of W. S.*, 1904, 8vo, illustrated; W. C. Hazlitt, *S., the Man and his Work*, 3rd ed., 1908, 8vo; Frank Harris, *The Man S. and his Tragic Life Story*, 1909, 8vo; E. Law, *S. as Groom of the Chamber*, 1910, sm. 8vo.

B.—*Special Works.*

Autograph: Sir F. Madden, *Autograph and Orthography of S.*, 1837, 4to; *S.'s Autograph*, copied and enlarged by J. Harris, &c. (Rodd), 1843; J. O. Halliwell Phillipps, *S.'s Will*, 1851, 4to; H. Staunton, *Memorials of S. Photographed*, 1864, folio; J. H. Friswell, *Photogr. Reprod. of S.'s Will*, 1864, 4to; J. Toulmin Smith, *S. Autographs*, 1864, 4to; F. J. Furnivall, *On S.'s Signatures*, 1895, 8vo; A. Hall, *S.'s Handwriting further illustrated*, 1899, 8vo; **Birthday**: B. Corney, *Argument on the Assumed Birthday*, 1864, 8vo. **Bones**: C. M. Ingleby, *S.'s Bones*, 1883, sm. 4to; W. Hall, *S.'s Grave, Notes of Traditions*, 1884, 8vo. **Crab Tree**: C. F. Green, *Legend of S.'s Crab Tree*, 1857, 4to, illustrated. **Deer Stealing**: C. H. Bracebridge, *S. no Deer Stealer*, 1862, 8vo, illustrated. **Genealogy and Family**: J. Jordan, *Pedigree of the Family of S.*, 1796, in vol. iii. of R. Ryan's *Dramatic Table Talk*, 1825–30, 3 vols. 8vo; *Memoirs of the Families of S. and Hart*, 1790, ed. Halliwell, 1865, 4to; G. R. French, *Shakspeareana Genealogica*, 1869, 8vo; J. O. Halliwell Phillipps, *Entries respecting S., his Family and Connexions*, 1864, 4to; C. C. Stopes, *S.'s Warwickshire Contemporaries*, 1897, new ed. 1907, 8vo, and *Family, with an Account of the Ardens*, 1901, 8vo; C. I. Elton, *W. S., His Family and Friends*, 1904, 8vo; J. W. Gray, *S.'s Marriage*, etc., 1905, 8vo. **Ghost-Belief**: A. Roffe, *The Ghost Belief of S.*, 1851, 8vo. For **S.**'s use of the supernatural see IX. SPECIAL KNOWLEDGE (**Folk-lore**, etc.). **Name**: J. O. Halliwell Phillipps, *New Lamps or Old?* 1880, 8vo, advocates "Shakespeare"; J. Winsor, *Was S. Shapleigh?* Boston, U.S., 1887, 8vo; W. H. Edwards, *Shaksper not S.*, 1900, 8vo; J. L. Haney, *The Name of W. S.*, 1906, 8vo. **Occupation**: See IX. SPECIAL KNOWLEDGE, above. **Religion**: F. Fritzart, *War S. ein Christ?* Heidelberg, 1832, 8vo; W. J. Birch, *Philosophy and Religion of S.*, 1848, sm. 8vo, thinks him a sceptic; E. Vehse, *S. als Protestant, Politiker, Psycholog, u. Dichter*, Hamburg, 1851, 2 vols. sm. 8vo; J. J. Reitmann, *Über S.'s religiöse u. ethische Bedeutung*, St Gall, 1853, 12mo; A. F. Rio, *S.* 1864, 8vo (S. Roman Catholic); W. Koenig, *S. als Dichter, Weltweiser, u. Christ*, Leipzig, 1873, 8vo; A. Gilman, *S.'s Morals*, N.Y., 1880, 8vo; J. M. Raich, *S.'s Stellung zur Kathol. Religion*, 1884, 8vo; J. M. Robertson, *The Religion of S.*, 1887, 8vo; W. Kloeti, *S. als religiöser Dichter*, Berlin, 1890, 8vo; G. W. Baynham, *Swedenborg and S.*, 1894, 8vo; J. Carter, *S., Puritan and Recusant*, 1897, sm. 8vo; S. Boswin, *The Religion of S.*, 1899, 8vo; H. S. Bowden, *The Religion of S., chiefly from the Writings of R. Simpson*, 1899, sm. 8vo; J. Countermine, *The Religious Belief of S.*, 1906, 8vo. **Stratford-upon-Avon**: R. B. Wheler, *History and Antiquities of Stratford*, 1806, 8vo, *Account of the Birthplace*, new edition, 1863, 8vo, and *Collectanea*, 1865, 4to; F. W. Fairholt, *The Home of S.*, 1847, 8vo, engravings reproduced in S. Neil's *Home of S.*, 1871, 8vo; J. O. Halliwell Phillipps, *New Boke about S. and Stratford*, 1850, 4to, *Brief Hand List of the Borough Records*, 1862, 8vo, *Descriptive Calendar*, 1863, folio, *Brief Guide to the Gardens*, 1863, 8vo, *Historical Account of the New Place*, 1864, folio illustrated, and *Stratford in the Times of the S.'s*, 1864, folio; E. Lees, *Stratford as connected with S.*, 1854, 8vo; J. R. Wise, *S., his Birthplace and its Neighbourhood*, 1861, 8vo; J. C. M. Bellew, *S.'s Home at New Place*, 1863, sm. 8vo, illustrated, with pedigrees; R. E. Hunter, *S. and Stratford*, 1864, 8vo; J. M.

Jephson, S., *his Birthplace, Home, and Grave*, 1864, 4to, illustrated; J. Walter, *S.'s Home and Rural Life*, 1874, 4to, illustrative of localities; C. M. Ingleby, *S. and the Welcombe Enclosures*, 1883, folio; S. Lee, *Stratford-on-Avon*, 1884, folio, illustrated, 1907, 8vo; T. Greene, *S. and Enclosure of Common Fields at Welcombe*, 1885, 4to; J. L. Williams, *The Home and Haunts of S.*, 1892, folio; C. J. Ribton Turner, *S.'s Land*, 1893, sm. 8vo; R. C. A. Windle, *S.'s Country*, 1899, 8vo; W. S. Brassington, *S.'s Homeland*, 1903, 8vo; Marie Corelli, *The Plain Truth of the Stratford-on-Avon Controversy*, 1903, 8vo, birthplace; S. Lee, *The Alleged Vandalism*, 1903, 8vo; G. Morley, *Sweet Avon*, 1906, 8vo.

XV. Portraits

G. Steevens, *Proposals for Publishing the Felton Portrait*, 1794, 8vo; J. Britton, *On the Monumental Bust*, 1816, 8vo; J. Boaden, *Authenticity of Various Pictures and Prints offered as Portraits of S.*, 1824, 4to; A. Wivell, *The Monumental Bust*, 1827, 8vo, and *Inquiry into the S. Portraits*, 1840, 8vo; H. Rodd, *The Chandos Portrait* [1849], 8vo; R. H. Forster, *Remarks on the Chandos Portrait*, 1849, 8vo; J. P. Collier, *Dissertation upon the Imputed Portraits*, 1851, 8vo; C. Wright, *The Stratford Portrait of S.*, 1861, 8vo; J. H. Friswell, *Life Portraits of W. S.*, 1864, 8vo; Sir G. Scharf, *On the Principal Portraits of S.*, 1864, 12mo; E. T. Craig, *S. and his Portraits, Bust, and Monument*, 2nd ed. 1864 and 1886, 8vo, and *S.'s Portraits phrenologically considered*, Philadelphia, 1875, 8vo; G. Harrison, *The Stratford Bust*, Brooklyn, 1865, 4to; W. Page, *Study of S.'s Portraits*, 1876, sm. 4to; J. P. Norris, *Bibliography of Works on the Portraits of S.*, Philadelphia, 1879, 8vo, 44 titles, *The Death Mask of S.*, 1884, and *The Portraits of S.*, Phil., 1885, 4to, with bibliography of 111 references and illustrations; Amédée Pichot, "S., avec les portraits authentiques," *Revue Britannique*, Paris, 1888; Edwin Bormann, *Der S. Dichter: wer war's und wie sah er aus*, Leipzig, 1902 (Baconian); A. A. Bekk, *Des Dichters Bild*, Berlin, 1902, 8vo; John Corbin, *A New Portrait of S.* (the "Ely Palace"), 1903, 8vo; C. C. Stopes, *True Story of the Stratford Bust*, 1904, 8vo; M. H. Spielmann, *The Portraits of S.*, 1907, 8vo. An elaborate account by A. M. Knapp of the portraits in the Barton collection, Boston Public Library, may be found in the *S. Catalogue*, 1880, large 8vo. For medals and tokens, see E. Hawkins (ed. A. W. Franks and H. A. Grueber), *Medallic Hist. of Great Britain*, Brit. Mus., 1885; for tokens, James Atkin's *Tradesmen's Tokens of the 18th Century*, 1892.

XVI. Literary and Dramatic History

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SHALLOT, *Allium ascalonicum*, a hardy bulbous perennial, which has not been certainly found wild and is regarded by A. de Candolle as probably a modification of *A. Cepa*, dating from about the beginning of the Christian era (*Origin of Cultivated Plants*, p. 71). It is extensively cultivated and is much used in cookery, besides which it is excellent when pickled. It is propagated by offsets, which are often planted in September or October, but the principal crop should not be got in earlier than February or the beginning of March. In planting, the tops of the bulbs should be kept a little above ground, and it is a commendable plan to draw away the soil surrounding the bulbs when they have got root-hold. They should not be planted on ground recently manured. They come to maturity about July or August. There are two sorts—the common, and the Jersey or Russian, the latter being much larger and less pungent.

SHALMANESER [Ass. *Ṣulmānu-aṣarid*, "the god Sulman (Solomon) is chief"], the name of three Assyrian princes.

SHALMANESER I., son of Hadad-nirari I., succeeded his father as king of Assyria about 1310 B.C. He carried on a series of campaigns against the Aramaeans in northern Mesopotamia, annexed a portion of Cilicia to the Assyrian empire, and established Assyrian colonies on the borders of Cappadocia. According to his annals, discovered at Assur, in his first year he conquered eight countries in the north-west and destroyed the fortress of Arinnu, the dust of which he brought to Assur. In his second year he defeated Sattuara, king of Malatia, and his Hittite allies, and conquered the whole country as far south as Carchemish. He built palaces at Assur and Nineveh, restored "the world-temple" at Assur, and founded the city of Calah.

SHALMANESER II. succeeded his father Assur-nazir-pal III. 858 B.C. His long reign was a constant series of campaigns against the eastern tribes, the Babylonians, the nations of Mesopotamia and Syria, as well as Cilicia and Ararat. His armies penetrated to Lake Van and Tarsus, the Hittites of Carchemish were compelled to pay tribute, and Hamath (Hamah) and Damascus were subdued. In 854 B.C. a league formed by Hamath, Arvad, Ammon, "Ahab of Israel" and other neighbouring princes, under the leadership of Damascus, fought an indecisive battle against him at Karkar (Qarqar), and other battles followed in 849 and 846 (see JEWS § 10). In 842 Hazael was compelled to take refuge within the walls of his capital. The territory of Damascus was devastated, and Jehu of Samaria (whose ambassadors are represented on the Black Obelisk now in the British Museum) sent tribute along with the Phoenician cities. Babylonia had already been conquered as far as the marshes of the Chaldaeans in the south, and the Babylonian king put to death. In 836 Shalmaneser made an expedition against the Tibareni (Tabal) which was followed by one against Cappadocia, and in 832 came the campaign in Cilicia. In the following year the old king found it needful to hand over the command of his armies to the Tartan (commander-in-chief), and six years later Nineveh and other cities revolted against him under his rebel son Assur-danin-pal. Civil war continued for two years; but the rebellion was at last crushed by Samas-Rimmon or Samsi-Hadad, another son of Shalmaneser. Shalmaneser died soon afterwards in 823 B.C. He had built a palace at Calah, and the annals of his reign are engraved on an obelisk of black marble which he erected there.

See V. Scheil in *Records of the Past*, new series, iv. 36-79.

SHALMANESER III. (or IV.) appears as governor of Zimirra in Phoenicia in the reign of Tiglath-pileser IV. (or III.) and is supposed by H. Winckler to have been the son of the latter king. At all events, on the death of Tiglath-pileser, he succeeded to the throne the 25th of Tebet 727 B.C., and changed his original name of Ululā to that of Shalmaneser. The revolt of Samaria took place during his reign (see JEWS § 15), and while he was besieging the rebel city he died on the 12th of Tebet 722 B.C. and the crown was seized by Sargon.

For all these rulers see BABYLONIA AND ASSYRIA, Sections V. and VIII., and works quoted. (A. H. S.)

SHAMANISM, the name commonly given to the religion of the Ural-Altaic peoples. Properly speaking, however, there is nothing to distinguish Shamanism from the religions of other peoples in a similar stage of culture. On the other hand, the shaman or priest (Tungus *saman*, Altain Turk *kama*, cf. Russian *kamlanie*) performs duties which differ in some respects from those of the ordinary magician; one of his main functions is to protect individuals from hostile supernatural influence. He deals both with good and bad spirits; he also performs sacrifices and procures oracles. The drum (*tungur*) is an important instrument in his ceremonies; it may be assumed that in many cases the effect of the preliminary performances is to induce autohypnotic phenomena. The shaman's office is held to be hereditary and his chief assistants are ancestral spirits.

See Radloff, *Aus Sibirien*, ii.; C. de Harlez, *Religion nationale des Tatares orientaux*; Hiekisch, "Die Tungusen," *Mitt. der anthropologischen Gesellschaft*, Wien, xviii. 165-182; *Revue de l'histoire des religions*, xl. 321, xlvii. 51.

SHAMASH, or ŠAMAŠ, the common name of the sun-god in Babylonia and Assyria. The name signifies perhaps "servitor," and would thus point to a secondary position occupied at one time by this deity. Both in early and in late inscriptions Shamash is designated as the "offspring of Nannar," *i.e.* of the moon-god, and since, in an enumeration of the pantheon, Sin generally takes precedence of Shamash, it is in relationship, presumably, to the moon-god that the sun-god appears as the dependent power. Such a supposition would accord with the prominence acquired by the moon in the calendar and in astrological calculations, as well as with the fact pointed out (see SIN) that the moon-cult belongs to the nomadic and therefore earlier, stage of civilization, whereas the sun-god rises to full importance only after the agricultural stage has been reached. The two chief centres of sun-worship in Babylonia were Sippara (Sippar), represented by the mounds at Abu Habba, and Larsa, represented by the modern Senkerah. At both places the chief sanctuary bore the name E-barra (or E-babbara) "the shining house"—a direct allusion to the brilliancy of the sun-god. Of the two temples, that at Sippara was the more famous, but temples to Shamash were erected in all large centres—as Babylon, Ur, Nippur and Nineveh.

The attribute most commonly associated with Shamash is justice. Just as the sun disperses darkness, so Shamash brings wrong and injustice to light. Khammurabi attributes to Shamash the inspiration that led him to gather the existing laws and legal procedures into a code, and in the design accompanying the code the king represents himself in an attitude of adoration before Shamash as the embodiment of the idea of justice. Several centuries before Khammurabi, Ur-Engur of the Ur dynasty (*c.* 2600 B.C.) declared that he rendered decisions "according to the just laws of Shamash." It was a logical consequence of this conception of the sun-god that he was regarded also as the one who released the sufferer from the grasp of the demons. The sick man, therefore, appeals to Shamash as the god who can be depended upon to help those who are suffering unjustly. This aspect of the sun-god is vividly brought out in the hymns addressed to him, which are, therefore, among the finest productions in the entire realm of Babylonian literature.

It is evident from the material at our disposal that the Shamash cults at Sippara and Larsa so overshadowed local sun-deities elsewhere as to lead to an absorption of the minor deities by the predominating one. In the systematized pantheon these minor sun-gods become attendants that do his service. Such are Bunene, spoken of as his chariot driver, whose consort is Atgimakh, Kettu ("justice") and Mesharu ("right"), who are introduced as servitors of Shamash. Other sun-deities, as Ninib (*q.v.*) and Nergal (*q.v.*), the patron deities of important centres, retained their independent existence as certain phases of the sun, Ninib becoming the sun-god of the morning and of the spring time, and Nergal the sun-god of the noon and of the summer solstice, while Shamash was viewed as the sun-god in general.

Together with Sin and Ishtar, Shamash forms a second triad by the side of Anu, Bel and Ea. The three powers, Sin, Shamash and Ishtar (*q.v.*), symbolized the three great forces of nature, the sun, the moon and the life-giving force of the earth. At times, instead of Ishtar, we find Adad (*q.v.*), the storm-god, associated with Sin and Shamash, and it may be that these two sets of triads represent the doctrines of two different schools of theological thought in Babylonia which were subsequently harmonized by the recognition of a group consisting of all four deities.

The consort of Shamash was known as A. She, however, is rarely mentioned in the inscriptions except in combination with Shamash. (M. Ja.)

SHAMBLES, a slaughter-house, a place where butchers kill animals for domestic food, an "abattoir." The word in the singular means properly a bench or stall on which butchers display their meat for sale in a market, and appears in O. Eng. *fōt-scamel*, foot-stool. It represents the La. *scamellum*, diminutive of *scamnum*, step, bench; the root is seen in Gr. σκήπτειν, to prop, cf. "sceptre." The distinct word "shamble," meaning to walk awkwardly, is to be traced to the O. Du. *schampelen*, to stumble, an adaptation of O. Fr. *escamper*, to decamp (Lat. *ex*, out of, and *campus*, field). The same French word has given the English "scamp," a worthless rascal, a rogue, vagabond.

SHAMMAI, a Jewish scribe of the time of King Herod, whom tradition almost invariably couples with Hillel (*q.v.*), with whom he stood in striking contrast, not merely in legal-religious decisions and discussions, but also in character and temperament. His motto (Aboth i. 15) reads: "Make thy study of the Thora a firmly established duty; say little and do much; and receive every man with friendly countenance." The last admonition is characteristic, as Shammai was choleric and brusque. The opposition between Shammai and Hillel was perpetuated by their respective schools, till, under Gamaliel II., the strife was decided at Jabneh in favour of the school of Hillel. (W. Ba.)

SHAMOKIN, a borough of Northumberland county, Pennsylvania, U.S.A., on Shamokin Creek, about 45 m. (73 m. by rail) N. by E. of Harrisburg. Pop. (1900) 18,202, of whom 2703 were foreign-born; (1910 U.S. census) 19,588. Shamokin is served by the Philadelphia & Reading, the Northern Central, and two interurban railways. There are two parks. The mining and shipping of anthracite coal and the manufacture of silk goods and of hosiery and knit goods are the borough's principal industries, but it has, also, foundries and machine shops, and manufactories of powder, powder-kegs, shirts, overalls, hooks and eyes, brick, flour and dressed lumber. The total value of its factory product in 1905 was $1,443,915. The borough was named from Shamokin Creek; the name is probably a mutilation of a Delaware Indian word meaning "full of eels." The Indian village named Shamokin was on the site of the present Sunbury, Pa. Shamokin was formed in 1852 by the union of two villages, Groveville and Mary Ann. It was incorporated as a borough in 1864.

SHAMPOO, a word now principally used as a hair-dresser's term for washing the head and hair with soap and water or some special preparation. It is properly the Hindustani word (*champna*, to thrust, press; imperative *champo*) for the kneading and rubbing of the body, &c., which is one of the principal features of the various forms of hot bath as practised in the East.

SHAMYL (*c.* 1797–1871), the leader of the tribes of the Caucasus in the war against Russia. He was born about 1797 and, educated by the Mullah Djemaleddin, soon took a leading part in preaching a holy war against the Russians. He was both the spiritual and military leader of the tribes, who maintained the struggle for twenty-five years (1834–1859). This perpetual guerrilla was a severe strain upon the resources of the great power, and Shamyl's romantic fight for independence, making him a sort of ally of England and France at the time of the Crimean War (1853–55), earned him a European reputation. But the capacity of the tribes for resistance was already failing, and when at the close of the Crimean War Russia was able to employ large forces on the Caucasus, the defenders were gradually subdued, Shamyl himself being captured in 1859. The rest of his life was spent in an easy captivity at Kaluga, St Petersburg and Kiev. He died at Mecca during a pilgrimage in 1871. One of his sons took service in the Russian, the other in the Turkish army.

SHANGALLA, or Shankalla, a name loosely applied by Abyssinians to the non-Arab and non-Abyssinian tribes living west of Gojam in the Abyssinian-Sudan frontier lands. The principal tribes included are the Legas, Bertat, Gumus, Kadalos and Sienetjo. In some tribes Galla blood appears to predominate; others are Negroids.

SHANGHAI, a city in the Chinese province of Kiang-su. The native city of Shanghai is situated in 31° 15′ N., 121° 27′ E. and stands on the left or W. bank of the Hwang-p'u river, about 12 m. from the point where that river empties itself into the estuary of the Yangtsze-kiang. The walls which surround it are about 3½ m. in circumference, and are pierced by seven gates. The streets and thoroughfares may be said to illustrate all the worse features of Chinese cities; while the want of any building of architectural or antiquarian interest robs the city of any redeeming traits. On the E. face of the city, between the walls and the river, stands the principal suburb, off which the native shipping lies anchored. Situated in the extreme E. portion of the province of Kiang-su, and possessing a good and commodious anchorage, as well as an easy access to the ocean, it forms the principal port of central China. From the W. wall of the city there stretches a rich alluvial plain extending over 45,000 sq. m., which is intersected by waterways and great chains of lakes and bears a population of 800 to the sq. m. The products of this fertile district, as well as the teas and silks of more distant regions, find their natural outlet at Shanghai. The looms of Suchow and the tea plantations of Ngan-hui, together with the rice of this "garden of China," for many years before treaty days, supplied the Shanghai junks with their richest freight. But though thus favourably situated as an emporium of trade, Shanghai did not attract the attention of foreign diplomatists until the outbreak of the War of 1841, when the inhabitants purchased protection from the attacks of Admiral Parker by the payment of a ransom of £145,000. In the Nanking treaty, which was signed in the following year, Shanghai was included among the four new ports which were thrown open to trade. In 1843 Captain (afterwards Sir) George Balfour was appointed British consul, and it was on his motion that the site of the present English settlement, which is bounded on the N. by the Suchow creek, on the S. by the Yang-king canal, and on the E. by the river, was chosen. The site, thus defined on its three sides (on the W. no boundary was marked out), is three-fifths of a mile in length, and was separated from the native city by a narrow strip of land which was subsequently selected as the site of the French settlement. Later again the Americans established themselves on the other side of the Suchow creek, on a piece of land fronting on the river, which there makes a sharp turn in an easterly direction.

A handsome bund runs along the river frontage of the three foreign settlements, and the public buildings, especially in the British settlement, are large and fine. The cathedral, which is built in the Gothic style, is a notable example of Sir G. Gilbert Scott's skill, and the municipal offices, club-house and hospitals are all admirable in their way. The climate is somewhat trying. Shanghai lies low, and, though the early winter is enjoyable, snow and ice being occasionally seen, the summer months are excessively hot. Cholera occurs in the native city every summer, malarial fever exists and dysentery is apt to become chronic in spring and autumn on account of the sudden changes of temperature—a fall of 20° to 30° taking place in a few hours—and the moisture-laden atmosphere. Smallpox is endemic in the Chinese city during the autumn and winter, and enteric is common in the autumn. In the foreign settlements, owing to sanitary enactments, cholera is rare, and Europeans who adopt ordinary precautions "have nothing to fear from the climate of Shanghai" (*China Sea Directory*, vol. iii., ed. 1904).

At first merchants appeared disinclined to take advantage of the opportunities offered them at Shanghai. "At the end of the first year of its history as an open port Shanghai could count only 23 foreign residents and families, 1 consular flag, 11 merchants' houses, and 2 Protestant missionaries. Only forty-four foreign vessels had arrived during the same period."[1] By degrees, however, the manifold advantages as a port of trade possessed by Shanghai attracted merchants of all nationalities; and from the banks of the Hwang-p'u arose handsome dwelling-houses, which have converted a reed-covered swamp into one of the finest cities in the East.

The number of foreigners, other than British, who took up their abode in the British settlement at Shanghai made it soon necessary to adopt some more catholic form of government than that supplied by a British consul who had control only over British subjects, and by common agreement a committee of residents, consisting of a chairman and six members, was elected by the renters of land for the purposes of general municipal administration. It was expected when the council was formed that the three settlements—the British, French and Americans—would have been incorporated into one municipality, but international jealousy prevented the fulfilment of the scheme, and it was not until 1863 that the Americans threw in their lot with the British. In 1853 the prosperity of the settlements received a severe check in consequence of the capture of the native city by the T'ai-p'ing rebels, who held possession of the walls from September in that year to February 1855. This incident, though in many ways disastrous, was the cause of the establishment of the foreign customs service, which has proved of such inestimable advantage to the Chinese government. The confusion into which the customs system was thrown by the occupation of the city by the rebels induced the Chinese authorities to request the consuls of Great Britain, France and the United States to nominate three officers to superintend the collection of the revenue. This arrangement was found to work so well that on the reoccupation of the city the native authorities proposed that it should be made permanent, and H. N. Lay, of the British consular service, was in consequence appointed inspector of the Shanghai customs. The results of Mr Lay's administration proved so successful that when arranging the terms of the treaty of 1858 the Chinese willingly assented to the application of the same system to all the treaty ports, and Mr Lay was thereupon appointed inspector-general of maritime customs. On the retirement of Mr Lay in 1862 Sir Robert Hart was appointed to the post.

From 1856 to 1864 the trade of Shanghai vastly increased, and its prosperity culminated between 1860 and 1864, when the influx of Chinese into the foreign settlement in consequence of the advance E. of the T'ai-p'ing rebels added enormously to the value of land. Both in 1860 and again in 1861 the rebels advanced to the walls of Shanghai, but were driven back by the British troops and volunteers, aided by the naval forces of England and France. It was in this connexion that General Gordon assumed the command of the Chinese force, which under his direction gave a reality to the boastful title of "ever-victorious army" it had assumed under the two American adventurers Ward and Burgevine. To Shanghai the successful operations of Gordon brought temporarily disastrous consequences. With the disappearance of the T'ai-p'ings the refugees returned to their homes, leaving whole quarters deserted. The loss thus inflicted on the municipality was very considerable, and was intensified by a commercial crisis in cotton and tea, in both of which there had been a great deal of over-speculation. But, though the abnormal prosperity was thus suddenly brought to an end, the genuine trade of the port has steadily advanced, subject of course to occasional fluctuations. For example, in 1880 the value of trade was £8,223,017, and in 1908 it was £40,400,000. The total burthen of foreign steamers which entered and cleared at Shanghai during 1884 was 3,145,242 tons, while in 1908 it was over 15,000,000 tons. The principal items of import are cotton yarns, metals, sugar, petroleum and coal; of export, silk, representing in value 34% of the total exports, cotton, tea, rice, hides and skins, wool, wheat and beans. Great Britain and the British colonies supply nearly 31% of the imports, Japan 12½%, and the United States 12%; and of the exports Great Britain and the British colonies take 18%, the United States 12% and Japan 10%. Shanghai, moreover, is not only a port of trade, but is rapidly becoming a large manufacturing and industrial centre. In this category the first place must be given to cotton mills, which, though not very numerous, give promise of considerable development. The demand in China for cotton yarn, chiefly the produce of the Bombay mills, has been steadily on the increase. On the other hand, China produces raw cotton in indefinite quantity, and has hitherto been the main source of supply for the Japanese mills. Cloth weaving has been tried in two of the mills, but abandoned in favour of spinning. Next in importance is the reeling of silk cocoons by machinery. This is gradually supplanting the wasteful method of native reeling, giving a much better finished and consequently more valuble article. Shanghai also contains three large establishments for docking, repairing and building ships. Among minor industries are match factories, rice and paper mills, ice, cigarette, piano, carriage and furniture factories, wood carving, &c.

The vastness of British interests in China and the large British population at Shanghai gave rise in 1865 to the establishment of a British supreme court for China and Japan, Sir Edmund Hornby, then judge of the British court at Constantinople, being the first judge appointed to the new office. Now, by virtue of extra-territorial clauses in the various treaties, all foreigners, subjects of any treaty power, are exempted from the jurisdiction of the Chinese authorities, and made justiciable only before their own officials. As there are now fourteen treaty powers represented at Shanghai, there are consequently fourteen distinct courts sitting side by side, each administering the law of its own nationality. In addition, there is also a Chinese court, commonly called the Mixed Court, though it is no more mixed than any of the others in an international sense, except that a foreign assessor sits with the Chinese judge in cases where any of his own nationality are interested as plaintiffs. At first sight this arrangement seems somewhat complicated, but the principle is simple enough, viz. that a defendant must always be sued in the court of his own nationality. In criminal cases there is, of course, no difficulty. For the British, English law alone prevails, and they can only be tried and punished in the British court, and so on for every nationality. In civil cases, where both parties are of the same nationality, there is also no difficulty, *e.g.* for British subjects the British court is the forum, for German subjects it is the German court. In cases involving cross actions with mutual accounts, say between an Englishman and a German, if the German constitutes himself plaintiff he must sue his opponent before the British court, and vice versa. The greatest anomaly, however, in respect of the government of Shanghai is the local municipal control. This is exercised by the foreign community as a whole without regard to nationality, and is a share of the power which properly belonged to the Chinese local authorities, but which by convention or usage they have allowed to fall into foreign hands. It is exercised only within the area termed the foreign settlements, which were originally nothing more than the "area set apart for the residence of foreign merchants." Of these "settlements" there were and are still only three—the British, acquired in 1845, the French, acquired in 1849, and the American, acquired in 1862. At an early date, as a foreign town began to spring up, the necessity of having some authority to lay out and pave streets, to build drains, &c., for the common benefit, became evident, and as the Chinese authorities shirked the work and the expense, the foreigners resolved to tax themselves voluntarily, and appointed a committee of works to see the money properly laid out. In 1854 the consuls of Great Britain, France and the United States drew up a joint code of regulations applicable to both the then settlements, British and French, which being ratified by the respective governments became binding on their respective subjects. The two areas thus became an international settlement, and the subjects of all three nationalities—the only powers then interested—acquired the same privileges and became liable to the same burdens. The code thus settled was acquiesced in by the Chinese authorities and by other nationalities as they came in, and it conferred on the foreign community local self-government, practically free from official control of any description. In 1863 the area covered by the regulations was extended by the addition of the American settlement, which meanwhile had been obtained by that government from the Chinese. But about the same time, 1862, the French decided to withdraw from the joint arrangement, and promulgated a set of municipal regulations of their own applicable to the French area. These regulations differed from those applicable to the joint settlement, in that a general supervision over municipal affairs was vested in the French consul-general, his approval being made necessary to all votes, resolutions, &c., of the ratepayers before they could be enforced at law. Since the above date there have, consequently, been two municipalities at Shanghai, the French and the amalgamated British and American settlements, to which the original regulations continued to apply. The area of the latter now amounts to some 9 or 10 sq. m. The regulations have been altered and amended from time to time, and they have been accepted expressly or impliedly by all the treaty powers which have since come into the field. The settlements have thus lost their original character of British or American, and become entirely cosmopolitan. The consuls of all the treaty powers rank equally, and claim to have an equal voice in municipal affairs with the British or American consuls.

The powers of self-government thus conferred on the foreign community consist in exclusive police control within the area, in draining, lighting, maintenance of streets and roads, making and enforcement of sanitary regulations, control of markets, dairies and so forth. To meet these expenses the foreign ratepayers are authorized to levy taxes on land and houses, to levy wharfage dues on goods landed or shipped, and to charge licence fees. Taxes are payable by every one living within the settlements, Chinese included, though the latter have no voice in the local administration.

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[1] *The Treaty Ports of China and Japan*, by W. F. Mayers.

The executive is entrusted to a municipal council of nine, elected annually from among the general body of foreign ratepayers, irrespective of nationality. The legislative function is exercised by all ratepayers possessing a certain pecuniary qualification in public meeting assembled. Proxies for absentee landlords are allowed. One such public meeting must be held annually to pass the budget and fix the taxation for the year. No official sanction is required, and no veto is allowed for such money votes. Special meetings may be held at any time for special purposes. New legislation of a general kind requires to be approved by all the treaty powers in order to be binding on their several nationalities, but within certain limits the ratepayers can pass by-laws which do not require such sanction. The French municipality is worked on similar lines, except that every vote and every disbursement of money is subject to the approval of the French consul-general. The executive council consists of eight members, four of whom must be French and four may be foreign. The French consul-general is chairman *ex officio*, so that the control in any case is French and practically official.

Both settlements were originally intended for the residence of foreign merchants only, but as the advantages of living under foreign protection became evident by reason of the security it gave from arbitrary taxation and arrest, Chinese began to flock in. This movement has continued, and is now particularly noticeable in the cases of retired officials, many of whom have made Shanghai their home. The total native population in the settlements by the census of 1895 was 286,753, and the estimated population of the native city was 125,000, making a total for all Shanghai of 411,753. The census of the foreign population in 1905 showed 3713 British, 2157 Japanese, 1329 Portuguese, 991 Americans, 785 Germans and 568 Indians, out of a total of 11,497. The magnitude of the foreign interests invested in Shanghai may be gathered from the following rough summary: Assessed value of land in settlements registered as foreign-owned £5,500,000; docks, wharves and other industrial public companies—market value of stock, £2,250,000; private property estimated £1,500,000—total £9,250,000. This is exclusive of banks, shipping and insurance companies, and other institutions which draw profits from other places besides Shanghai.

SHANHAI-KWAN, a garrison town in the extreme east of the province of Chih-li, China. Pop. about 30,000. It is situated at the point where the range of hills carrying the Great Wall of China dips to the sea, leaving a *kwan* or pass of limited extent between China proper and Manchuria. It is thus an important military station, and the thoroughfare of trade between Manchuria and the great plain of China. The Imperial Northern railway from Tientsin and Taku, 174 m. from the former, runs through the pass, and skirts the shore of the Gulf of Liao-tung as far as the treaty port of Niu-chwang, where it connects with the railways leading from Port Arthur to the Siberian main line. The pass formed the southern limit of the Russian sphere of influence as defined in the convention between Great Britain and Russia of the 28th of April 1899.

SHANKARSETT, JAGANNATH (1800–1865), the recognized leader of the Hindu community of Bombay for more than forty years, was born in 1800 into a family of goldsmiths of the Daivadnya caste. Unlike his forefathers, he engaged in commerce, and soon acquired what was in those days a large fortune, a great part of which he devoted to the good of the public. So high was his credit that Arabs, Afghans and other foreign merchants chose to place their treasures in his custody rather than with the banks. Foreseeing the need of better methods of education, he became one of the founders of the School Society and the Native School of Bombay, the first of its kind in Western India, which in 1824 developed into the Bombay Native Institution, and again in 1840 into the Board of Education which preceded the Elphinstone Educational Institution founded in 1856. When the Students' Literary and Scientific Society first opened their girls' schools, in spite of strong opposition of the Hindu community, he set the good example of providing another girls' school entirely at his private cost. His zeal for progress was also shown in his starting the English School, the Sanskrit Seminary and the Sanskrit Library, all in Girgaum. To Jagannath Shankarsett and his public-spirited friends, Sir George Birdwood and Dr Bhau Daji, Bombay is also indebted for the reconstruction which, beginning in 1857, gradually changed a close network of lanes and streets into a spacious and airy city, adorned with fine avenues and splendid buildings. He was the first Indian to be nominated to the legislative council of Bombay under the Act of 1861. While his influence was used by Sir John Malcolm to induce the Hindus to acquiesce in the suppression of suttee or widow-burning, his own community remember gratefully that to him they owe the cremation ground at Sonapur. He died at Bombay on the 31st of July 1865, regretted by all classes of society, who, about a year before his death, in a public meeting assembled at the Town Hall, voted a marble statue to perpetuate his memory.

SHANKLIN, a watering-place in the Isle of Wight, England, 8½ m. S. of Ryde by rail. Pop. of urban district (1901) 4533. It is beautifully situated on the cliffs bordering the S.E. coast, and is sheltered W. by high-lying downs. The church of St John the Baptist is Perpendicular. There are several modern churches and chapels, numerous villas, a pier and a lift connecting the town with the esplanade beneath the cliff. The picturesque winding chasm of Shanklin Chine breaches the cliffs S. of the town.

SHANNON, CHARLES HAZELWOOD (1865–), English artist, was born at Sleaford in Lincolnshire, the son of the Rev. Frederic Shannon. He attended the Lambeth school of art, and was subsequently considerably influenced by his friend Charles Ricketts and by the example of the great Venetians. In his early work he was addicted to a heavy low tone, which he abandoned subsequently for clearer and more transparent colour. He achieved great success with his portraits and his Giorgionesque figure compositions, which are marked by a classic sense of style, and with his etchings and lithographic designs. The Dublin Municipal Gallery owns his circular composition "The Bunch of Grapes" and "The Lady with the Green Fan" (portrait of Mrs Hacon). His "Study in Grey" is at the Munich Gallery, a "Portrait of Mr Staats Forbes" at Bremen, and a "Souvenir of Van Dyck" at Melbourne. One of his most remarkable pictures is "The Toilet of Venus" in the collection of Lord Northcliffe. Complete sets of his lithographs and etchings have been acquired by the British Museum and the Berlin and Dresden print rooms. He was awarded a first-class gold medal at Munich in 1895 and a first-class silver medal in Paris in 1900.

SHANNON, JAMES JEBUSA (1862–), Anglo-American artist, was born at Auburn, New York, in 1862, and at the age of eight was taken by his parents to Canada. When he was sixteen, he went to England, where he studied at South Kensington, and after three years won the gold medal for figure painting. His portrait of the Hon. Horatia Stopford, one of the queen's maids of honour, attracted attention at the Royal Academy in 1881, and in 1887 his portrait of Henry Vigne in hunting costume was one of the successes of the exhibition, subsequently securing medals for the artist at Paris, Berlin and Vienna. He soon became one of the leading portrait painters in London. He was one of the first members of the New English Art Club, and in 1897 was elected an associate of the Royal Academy, and R.A. in 1909. His picture, "The Flower Girl," was bought in 1901 for the National Gallery of British Art.

SHANNON, the principal river of Ireland. It flows with a bow-shaped course from N. to S. and S.W., from the N.W. part of the island to its mouth in the Atlantic on the S.W. coast, with a length of about 240 m. and a drainage area of 4544 sq. m. Rising in county Cavan in some small pools at the foot of Cuilcagh Mountain, the Shannon crosses county Leitrim, traversing the first of a series of large lakes, Lough Allen (9 m. in length). It then separates county Roscommon on the right (W.) bank from counties Leitrim, Longford, Westmeath and King's County on the left. In this part of its course it forms Loughs Boderg (7 m. long), Forbes (3 m.) and Ree (18 m.), and receives from W. the river Boyle and from E. the Inny, while in county Longford it is joined by the Royal Canal. It now separates county Galway on the right from King's County and county Tipperary; receiving the Suck from W. and the Brosna from E., and forming Lough Derg (23 m.). Dividing county Clare from counties Tipperary and Limerick, the Shannon reaches the city of Limerick as a broad and noble river, and debouches upon an estuary 60 m. in length with a direction nearly E. and W. This divides county Clare on the right from counties Limerick and Kerry on the left.

A wide branch estuary, that of the Fergus, joins from N., and the rivers Mulkear, Maigne and Deel enter from S. From Lough Allen to Limerick, where the Shannon becomes tidal, its fall is 144 ft. With the assistance of short canals the river is navigable for light vessels to Lough Allen, and for small steamers to Athlone; while Limerick is accessible for large vessels. The salmon-fishing is famous; trout are also taken in the loughs and tributary streams. Carrick-on-Shannon, Athlone, Killaloe, and Castleconnel are favourite stations for sportsmen. The scenery is generally pleasant, and on the loughs, with their deeply indented shores and numerous islands, often very beautiful. These islands are in several cases sites of early religious settlements, while of those on the river-banks the most noteworthy is that of the seven churches of Clonmacnoise.

SHANS, a collective name, probably from Chinese *Shan-tse*, *Shan-yen* (*Shan* = "mountain"), "highlanders," given by the Burmese to all the tribes of Thai stock subject to the former kingdom of Burma (see SHAN STATES below). The Shans call themselves Tai or Punong; while the Chinese call them Pai or Pai-yi. Among them exist the purest types of the Thai race. They are found all over the province of Yunnan and in the borderland between China and Burma. Politically, where not under the direct control of Chinese magistrates, the tribes are organized under their own chiefs, who are recognized by the Chinese government and endowed with official rank and title. In Burmese such native chiefs are termed *Sawbwa*.

For the history of the Thai race see THAIS. See also LAOS, MIAOTZE, LOLOS. Also A. R. Colquhoun, *Amongst the Shans* (1885); E. Aymonier, "Les Tchaines," in *Revue de l'histoire des religions* for 1891.

SHAN-SI, a northern province of China, bounded N. by Mongolia, E. by Chih-li, S. by Ho-nan, and W. by Shen-si. Estimates of its area vary from 66,000 to 81,000 sq. m. and it has besides its capital, Tai-yuen Fu (pop. 230,000), eight prefectural cities. The population is returned as 12,200,000. It includes, in the northern districts, about 500,000 Mongols. The configuration of Shan-si is noteworthy, forming, from its southern frontier as far north as Ning-wu Fu—an area of about 30,000 sq. m.—a plateau 2600 to 6000 ft. above the level of the sea, the whole of which is one vast coal-field. North and west the plateau is bounded by high mountain ranges trending south-west and north-east. Down the central line of the province from north to south lies a series of deep depressions, all of which are ancient lake basins. But though forming a series these lakes were not formerly connected with each other, some being separated from those next adjoining by high ridges, and being drained by different rivers and in different directions. The Fên-ho, the largest river in Shan-si, with a general S.S.W. direction, and the Chin-ho, also a considerable stream, are both tributaries of the Yellow river.

A vast coal-field.

Shan-si is one of the most remarkable coal and iron regions in the world, a veritable second Pennsylvania, and Baron von Richthofen gave it as his opinion that the world, at the present rate of consumption of coal, could be supplied for thousands of years from Shan-si alone. In the south the neighbourhood of Tsi-chow Fu abounds in both coal and iron, and has probably, partly through being within reach of the populous plain of Hwai-king Fu, of the Yellow river, of Tao-kow Chin and Sew-wu Hien (the shipping places for Tientsin and the Grand Canal) and of Ho-nan Fu, furnished more iron to the Chinese than any other region of a similar extent in the empire. The iron is of great purity and easily fusible, while clay and sand for crucibles, moulds, &c., and a superior anthracite coal, lie ready to hand. The coal is of two kinds, bituminous and anthracite, the line of demarcation between the two being formed by the hills which are the continuation of the Ho-shan range, the fields of bituminous coal being west of these hills, and those of anthracite east. In the neighbourhood of P'ing-ting Chow the extent of the coal-field is incalculable; and speaking of the whole plateau, Baron von Richthofen says: "These extraordinary conditions, for which I know no parallel on the globe, will eventually give rise to some curious features in mining. It may be predicted that, if a railway should ever be built from the plain to this region, . . . branches of it will be constructed within the body of one or other of these beds of anthracite, which are among the thickest and most valuable known anywhere, and continue for miles underneath the hills west of the present coal-belt of P'ing-ting Chow. Such a tunnel would allow of putting the produce of the various coal-beds immediately on railroad carts destined for distant places." These mines are worked by the Peking Syndicate, who have gained a concession to develop them, and have a railway to connect their workings with the Lu-Han trunk line, which traverses the east of the province.

Salt is produced in the prefecture of P'ing-yang in the south of the province, both from a salt lake and from the alluvial soil in the neighbourhood of the Fên-ho. Shan-si produces cereals, tobacco, cotton and sometimes rice, but in agricultural products the province is poor; the means of transport are rude and insufficient. The people of Shan-si are great traders, and nearly all the commerce of southern Mongolia is in their hands. A railway connecting the capital with Pekin was opened in 1908. The only wagon road leading into and through Shan-si is the great highway from Peking to Si-gan Fu, which enters Shan-si west of Chêng-ting Fu, and leaves the province at Tung-kwan at the great bend of the Hwang-ho. Transport is chiefly on the backs of camels, mules and asses. The province suffered from a terrible famine in 1878–1879, about which time Protestant missionaries began work in the capital. In the north, beyond the Great Wall, is the city of Kwei-hwa-Cheng (pop. about 200,000), formerly the residence of the grand Lama of Mongolia; it has many Lama monasteries.

Shan-si university, one of the best equipped in China, owes its existence to the Boxer rising. Certain Protestant missionary bodies in the province refused to accept the compensation awarded them for damage to their property, and at their request the money was devoted to the foundation of a university, the missionaries being guaranteed for ten years the control of the western side of the education given therein.

See Richard's *Comprehensive Geography of the Chinese Empire* (Shanghai, 1908), § 1, ch. iii. and the authorities there cited.

SHAN STATES, a collection of semi-independent states on the E. frontier of Upper Burma inhabited by the Shan or Thai race. The Shan States have a total area of 57,915 sq. m. and a total population (1901) of 1,137,444. There are six states under the supervision of the superintendent of the N. Shan States, and 37 under the superintendent and political officer of the S. Shan States. In addition, two states are under the commissioner of the Mandalay division, namely, Hkamti Lông on the N. of Myitkyina district and Möng Mit which is temporarily administered as a subdivision of the Ruby Mines district; and two states, Sinkaling Hkamti and Hsawng Hsup, near Manipur, are under the supervision of the commissioner of the Sagaing division. There are besides a number of Shan States beyond the border of Burma, which are tributary to China, though China exercises an authority which is little more than nominal. The British Shan States were tributary to Burma and came under British control at the time of the annexation of Upper Burma. They rank as British territory, not as native states. By section 11 of the Burma Laws Act 1898, the civil, criminal and revenue administration of each state is vested in the chief, subject to the restriction specified in the *sanad* or order of appointment granted to him. Under the same section the law to be administered is the customary law of each state so far as it is in accordance with justice, and not opposed to the spirit of the law in British India.

Physical Features.—The shape of the Shan States is roughly that of a triangle, with its base on the plains of Burma and its apex on the Mekong river. The Shan plateau is properly only the country between the Salween and Irrawaddy rivers. On the W. it is abruptly marked by the long line of hills, which begin about Bhamo and run S. till they sink into the plains of Lower Burma. On the E. it is no less sharply defined by the deep and narrow rift of the Salween. The average height of the plateau is between 2000 and 3000 ft., but it is seamed and ribbed by mountain ranges, which split up and run into one another. On the N. the Shan States are barred across by the E. and W. ranges which follow the line of the Namtu. The huge mass of Loi Ling, 9000 ft., projects S. from this, and from either side of it and to the S. extends the wide plain which extends down to Möng Nai. The highest peaks are in the N. and the S. Loi Ling is the highest point W. of the Salween, and in Kokang and other parts of N. Hsenwi there are many peaks above 7000 ft. The majority of the intermediate parallel ranges have an average of between 4000 and 5000 ft. with peaks rising to over 6000. The country beyond the Salween is a mass of broken hills, ranging in the S. towards the Menam from 2000 to 3000 ft., while in the N. towards the Wa states they average from 5000 to 7000. Several peaks rise to 8000 ft. such as Loi Maw (8102). The climate varies considerably. From December to March it is cool everywhere, and 10° of frost are experienced on the open downs. The hot season temperature is 80° to 90°, rising to 100° in the Salween valley. The rains begin about the end of April, but are not continual till August, which is usually the wettest month. They last until the end of October or beginning of November. The annual rainfall varies from 60 in. in the broader valleys to 100 on the higher mountains.

Race and Language.—According to the census of 1901 there were 787,087 Shans (see above) in Burma. The Thai or Tai, as they call themselves, were first known to the Burmese as Tarôks or Tarets. The original home of the Thai race was S.W. China, or rather that was the region where they attained to a marked separate development as a people. It is probable that their first settlement in Burma proper was in the Shweli valley, and that from this centre they radiated at a comparatively recent date N., W. and S.E. through Upper Burma into Assam. It is supposed that the Thai race boasts of representatives across the whole breadth of Indo-China, from the Brahmaputra as far as the gulfs of Siam and Tongking; that it numbers among its members not only the Shans proper, the Laos and the Siamese, but also the Muongs of French Indo-China, the Hakas of S. China, and the Li, the inhabitants of the interior of the far Eastern island of Hainan in the China seas. But no exhaustive survey of the Thai has yet been accomplished. For the purposes of Burma they may be divided into the N.W., the N.E., the E. and the S. Shans. The Siamese and the Laos are the principal representatives of the S. division. Siamese are found in considerable numbers in the districts of Amherst, Tavoy and Mergui in the Tenasserim division. The total at the time of the census of 1901 was 31,800, while that of the Laos was 1047. The country of the E. Shans lies between the Rangoon-Mandalay railway and the Mekong, and is bounded roughly on the N. and S. by the 22nd and 20th parallels of latitude. It includes the S. Shan States, and comprises the country of the Lü and the Hkün of the states of Kēngtūng and Kēnghūng. Linguistically the connexion between the latter two races and the Laos is very close, but apparently the racial affinity is not sufficiently near to justify the classification of the Hkün and the Lü with the S. Thai. The N.W. Shan region is the area extending from Bhamo to Assam between the 23rd and 28th parallels of latitude. It corresponds more or less with those portions of Katha, Myitkyina, Bhamo and Upper Chindwin districts which at one time or other during the palmy days of the Shan dominion acknowledged the suzerainty of the Sawbwa of Mogaung. The N.E. Shans are the Chinese-Shans who are found where Upper Burma and the N. Shan states border on China.

The Thai language may be divided into two sub-groups, the N. and the S. The S. includes Siamese, Lao, Lü and Hkün; the N., the three forms of Shan, namely, N. Burmese-Shan, S.-Burmese Shan and Chinese-Shan with Hkamti and Ahom. The vernacular of the people who are directly known in Burma as Shan is S. Burmese-Shan. This language is isolating and polytonic. It possesses five tones, a mastery of which is a *sine quâ non* if the language is to be properly learnt. It is exhaustively described in the works of Dr Cushing. The Shans are a peaceful race, fond of trading. During the past decade the trade with Burma has increased very largely, and with the construction of the railway to Lashio a still further increase may be expected in the N. states. The cultivation of wheat and potatoes in the S. states promise them wealth also when a railway furnishes them means of getting the produce out of the country. Since 1893 the peace of the Shan States has been practically undisturbed.

See Ney Elias, *Introductory Sketch of the History of the Shans in Upper Burmah and West Yun-nan* (Calcutta, 1876); Cushing, *Shan Dictionary* (Introduction); Bock, *Temples and Elephants*; Sir A. Phayre, *History of Burmah*; A. R. Colquhoun, *Across Chrysé* (London, 1883), and *Amongst the Shans* (1885); Diguet, *Étude de la langue Thai* (Paris, 1896). (J. G. Sc.)

SHAN-TUNG (" East of the Mountains "), a maritime province of China, bounded N. by the province of Chih-li and the Gulf of Chih-li, E. by the Yellow Sea, S. by Kiang-su and the Yellow Sea and W. by Chih-li. Area about 56,000 sq. m., population (estimated) 37,500,000. It is the most densely inhabited part of China, and is celebrated as the native province both of Confucius and Mencius. It is divided into ten prefectures, with as many prefectural cities, of which Chi-nan Fu (*q.v.*), the provincial capital, is the chief.

The physical features of the province are very plainly marked. The centre and eastern are occupied by mountain ranges running N.E. and S.W., between which lie fertile valleys, while the north-western, southern and western portions form part of the great deltaic plain of the north of China. The mountainous region projects seaward beyond the normal coast line forming a large peninsula, the shores of which are deeply indented and contain some good harbours, such as that of Kiao-chow. The most considerable range of mountains occupies the centre of the province, the highest peak being the T'ai-shan (5060 ft.), a mountain famous in Chinese history for more than 4000 years, and to which hundreds of pilgrims annually resort. The Lao-shan, east of Kiao-chow, fringes the south-eastern coast for about 18 m. With the exception of the Hwang-ho, which traverses the province in a north-easterly direction to the sea, there are no large rivers in Shan-tung. The most considerable are the Wei, which flows into the Gulf of Chih-li; the I-ho, which empties into a lake lying east of the Grand Canal; and the Ta-wen, which rises at the southern foot of the I-sham Mountains and terminates in the Grand Canal. The canal traverses the provinces S. to N. east of the mountain region. There are several lakes, notably the Tu-shan Hu, which borders on the Grand Canal in the south-west. The fauna includes wild boars, wolves, foxes, badgers, partridges, quails and snipe. Cotton, silk, coal, grain, &c. are produced in the fertile tracts in the neighbourhood of the lakes. Not being a loess region, the mountains are unproductive, and yield only brushwood and grass, while the plain to the north is so impregnated with salt that it is almost valueless, especially near the sea, for agricultural purposes. The valleys between the mountains and the plain to the south-west are, however, extremely rich and fertile.

The chief wealth of Shan-tung consists in its minerals, the principal of which is coal. Several coal-fields are worked; the most considerable lies in the valley of the Lao-fu river in the centre of the province. Another large field lies on the plain a little to the south of I-chow Fu in the south. A third field is in the district of Wei Hien to the north; and a fourth in the neighbourhood of I-Hien in the south-west. Iron ore, ironstone, gold, galena, lead and copper are also found in considerable quantities in many districts.

Agricultural products are wheat, millet, Indian corn, pulse, arrowroot and many varieties of fruits and vegetables. Rice is grown in the extreme south of the province. Among trees, stunted pines, dwarf oaks, poplars, willows and the cypress are fairly plentiful. The castor-oil plant is common, and the wax tree grows plentifully in the neighbourhood of Lai-yang in the east, giving rise to a considerable trade in the wax produced by the wax insects. Unlike those of their kind in Sze Ch'uen, the wax insects of Shan-tung breed and become productive in the same districts. They are placed upon the trees in the spring, and at the close of the summer they void a peculiar substance which when melted forms wax. In the autumn they are taken off the trees, and are preserved within doors until the following spring. Sericulture is an important industry. The worms are fed in the west on mulberry leaves, in the east on those of the dwarf oak, the material made from the silk produced from the oak-fed worms being known as *pongee* or Chifu silk. The worm itself, after the cocoon has been used, is eaten and is esteemed a delicacy.

Besides Chi-nan Fu, the provincial capital, other inland cities are Tsao-Chow Fu (pop. 150,000) on the Grand Canal (an industrial centre) and Wei-hsien (100,000), a commercial centre. The ports of Shan-tung include Chifu, Wei-hai-wei and Kiao-chow (Tsing-tao), all separately noticed.

As part of compensation for the murder of two German missionaries in 1897 in this province—Protestant mission work in Shan-tung dates from 1860—the Germans took possession on lease of the port of Kiao-chow, 300 m. N. of Shanghai, a 36 hours' run by steamer, with which were associated many railway and mining rights in the district. In fulfilment of these rights a railway has been constructed connecting Kiao-chow with Chinan-fu, the capital; there it connects with another railway crossing the province north to south and forming part of the Tientsin and Chin-kiang line. In consequence of this acquisition of territory by Germany and the subsequent seizure of Port Arthur by Russia, Great Britain accepted the lease of Wei-hai-wei on the same terms. The convention confirming this arrangement was signed on the 1st of July 1898. It was in Shang-tung that the Boxer movement was first turned against foreigners (see CHINA, § *History*).

See M. Broomhall, *The Chinese Empire* (London, 1907), pp. 93-100; L. Richard, *Comprehensive Geography of the Chinese Empire* (Shanghai, 1908), pp. 79-89, and authorities there cited.

SHAPIRA, M. W. (*c.* 1830–1884), Polish vendor of spurious antiquities, was of Jewish birth, but appears to have become a Christian early in life. He opened a shop for the sale of antiquities in Palestine, and after the discovery of the Moabite Stone in 1872 was successful in selling to the Prussian government for 20,000 thaler a number of alleged pieces of Moabite pottery. These were shown by Clermont-Ganneau and others (cf. Kautzsch and A. Socin, *Ächtheit der moabitischen Altertümer*, 1876) to be forgeries produced by Shapira's client Selim al-Kari. Undeterred by this exposure, Shapira continued to do a considerable trade especially in Hebrew MSS. from Yemen, but ultimately ruined himself by a fraud perpetrated upon the British Museum. In 1883 he offered, for the price, it is said, of £1,000,000, a number of leather strips containing speeches of Moses varying in many particulars from, though similar in matter to, those in Deuteronomy, and written in archaic Hebrew characters. He pretended that he had obtained them from a Bedouin who had discovered them in a Moabite cave. The fragments were submitted to C. D. Ginsburg, who published translations in *The Times* of Aug. 4, 17, 22, 1883. The French government, however, sent over Clermont-Ganneau to investigate, and, though the British Museum authorities declined to give him permission to make a complete study, he satisfied himself from a few strips which were publicly exhibited that the whole collection must be a forgery (*The Times*, Aug. 15). This view was confirmed by Ginsburg's report to the Museum. Shapira, who was never shown to have been the actual forger, committed suicide in Rotterdam on the 11th of March 1884.

For the fragments see Guthe, *Fragmenta einer Lederhandschrift* (Leipzig, 1884); see also Clermont-Ganneau, *Les Fraudes archéologiques* (Paris, 1885), iii., iv.

SHAPUR (Pahlavi, *Shāhpuhre*, "son of the king"; Greek *Sapores*, commonly *Sapor*), the name of three Sassanian kings.

1. Shapur I. (A.D. 241–272), son of Ardashir I. The Persian legend which makes him the son of an Arsacid princess is not historical. Ardashir I. had towards the end of his reign renewed the war against Rome; Shapur conquered the Mesopotamian fortresses Nisibis and Carrhae and advanced into Syria; but he was driven back by C. Furius Timesitheus,[1] father-in-law of the young emperor, Gordianus III., and beaten at Resaena (243). Shortly afterwards Timesitheus died, and Gordianus (*q.v.*) was murdered by Philip the Arabian, who concluded an ignominious peace with the Persians (244). When the invasion of the Goths and the continuous elevation of new emperors after the death of Decius (251) brought the Roman empire to utter dissolution, Shapur resumed his attacks. He conquered Armenia, invaded Syria, and plundered Antioch. At last the emperor Valerianus marched against him, but suffered near Edessa the fate of Crassus (260). Shapur advanced into Asia Minor, but was beaten by Ballista; and now Odaenathus (Odainath), prince of Palmyra, rose in his rear, defeated the Persian army, reconquered Carrhae and Nisibis, captured the royal harem, and twice invested Ctesiphon (263–265). Shapur was unable to resume the offensive; he even lost Armenia again. But according to Persian and Arabic traditions, which appear to be trustworthy, he conquered the great fortress of Hatra in the Mesopotamian desert; and the great glory of his reign was that a Roman emperor was by him kept prisoner to the day of his death. In the valley of Istakhr (near Persepolis), under the tombs of the Achaemenids at Nakshi Rustam, Shapur is represented on horseback, in the royal armour, with the crown on his head; before him kneels Valerian, in Roman dress, asking for grace. The same scene is represented on the rocks near the ruins of the towns Darabjird and Shapur in Persis. Shapur left other reliefs and rock inscriptions; one, at Nakshi-Rajab near Persepolis, is accompanied by a Greek translation; here he calls himself "the Mazdayasnian (worshipper of Ahuramazda), the god Sapores, king of kings of the Aryans (Iranians) and non-Aryans, of divine descent, son of the Mazdayasnian, the god Artaxares, king of kings of the Aryans, grandson of the god-king Papak." Another long inscription at Hajjiabad (Istakhr) mentions the king's exploits in archery in the presence of his nobles.

From his titles we learn that Shapur I. claimed the sovereignty over the whole earth, although in reality his domain extended little farther than that of Ardashir I. Shapur built the great town Gundev-Shapur near the old Achaemenian capital Susa, and increased the fertility of this rich district by a barrage through the Karun river near Shushter, which was built by the Roman prisoners and is still called Band-i-Kaisar, "the mole of the Caesar." Under his reign the prophet Mani, the founder of Manichaeism (*q.v.*) began his preaching in Persia, and the king himself seems to have favoured his ideas.

For the monuments and inscriptions cf. Sir R. Ker Porter, *Travels*; Flandin and Coste, *Voyage en Perse*; Stolze, *Persépolis*; Thomas, *Journal R. Asiat. Soc.*, new series, iii., 1868; West in *Grundriss der iranischen Philologie*, ii. 76 f.; Dittenberger, *Orientis Graeci inscr.* i., No. 434. A gem with the portrait of the king is in the museum of Gotha, cf. Pertsch, *Zeitsch. d. deutschen morgenl. Ges.* xxii. 280.

2. Shapur II. (310–379). When King Hormizd II. (302–310) died, the Persian magnates killed his eldest son, blinded the second, and imprisoned the third (Hormizd, who afterwards escaped to the Romans); the throne was reserved for the unborn child of one of the wives of Hormizd. This child, named Shapur, was therefore born king; the government was conducted by his mother and the magnates. But when Shapur came of age, he turned out to be one of the greatest monarchs of the dynasty. Under his reign the collection of the *Avesta* was completed, heresy and apostasy punished, and the Christians persecuted. This was the natural oriental reaction against the transformation of the Roman empire into a Christian empire by Constantine. In 337, just before the death of Constantine, Shapur broke the peace concluded in 297 between Narses and Diocletian, which had been observed for forty years, and a war of twenty-six years (337–363) began. Shapur attempted with varying success to conquer the great fortresses of Roman Mesopotamia, Singara, Nisibis (which he invested three times in vain), Amida (Diarbekr). The emperor Constantius II. was always beaten in the field. Nevertheless Shapur made scarcely any progress; the military power of his kingdom was not sufficient for a lasting occupation of the conquered districts. At the same time he was attacked in the E. by nomad tribes, among whom the Chionites are named. After a prolonged struggle they were forced to conclude a peace, and their king, Grumbates, accompanied Shapur in the war against the Romans. Shapur now conquered Amida after a siege of seventy-three days (359), and took Singara and some other fortresses in the next year. In 363 the emperor Julian, at the head of a strong army, advanced to Ctesiphon, but was killed. His successor Jovian was defeated and made an ignominious peace, by which the districts on the Tigris and Nisibis were ceded to the Persians, and the Romans promised to interfere no more in Armenia. In the rock-sculptures near the town Shapur in Persis (Stolze, *Persépolis*, pl. 141) the great success is represented; under the hoofs of the king's horse lies the body of an enemy, probably Julian, and a suppliant Roman, the emperor Jovian, asks for peace.

Shapur now invaded Armenia, took king Arsaces III. (of the Arsacid race), the faithful ally of the Romans, prisoner by treachery and forced him to commit suicide. He then attempted to introduce Zoroastrian orthodoxy into Armenia. But the Armenian nobles resisted him successfully, secretly supported by the Romans, who sent King Pap, the son of Arsaces III. into Armenia. The war with Rome threatened to break out again; but Valens sacrificed Pap and caused his assassination in Tarsus, where he had taken refuge (374). Shapur had conducted great hosts of captives from the Roman territory into his dominions, most of whom were settled in Susiana. Here he rebuilt Susa, after having killed her rebellious inhabitants, and founded some other towns. He was successful in the east, and the great town Nishapur in Khorasan (E. Parthia) was founded by him.

3. Shapur III. (383–388), son of Shapur II., elevated to the throne by the magnates against his uncle, Ardashir II., and killed by them after a reign of five years. He concluded a treaty with Theodosius the Great. (Ed. M.)

SHARE (O. Eng. *scearu*, chiefly in compounds, *e.g. land-scearu*, a share of land, from *sceran* to cut; cf. "shear"), something cut off, a portion, a definite part of anything distributed among a number of persons. The word is particularly applied to the fixed and equal amounts into which the capital of a limited company is divided (see STOCKS AND SHARES; COMPANY; and DEBENTURES). From the same O. Eng. verb *sceran* is derived "share" (O. Eng. *scear*), the cutting blade of a plough (*q.v.*).

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[1] Timesitheus is the generally accepted variant for the Misitheus ("God-Hater") of Capitolinus; Zosimus, i. 16. 17, preferred Timesicles. In a paper read before a meeting of the British School of Archaeology at Rome on the 30th of January, 1908, Mr A. S. Yeames endeavoured to show that Timesitheus is the general commemorated by a bust in the Sala delle Colombe of the Capitoline Museum, and by the great sarcophagus in the Museo delle Terme, representing a battle between Romans and barbarians. On the forehead in each case is a non-Christian incised cross of unknown significance.

SHARI, an important river of North-Central Africa, carrying the drainage of a large area into Lake Chad (*q.v.*). Its headstreams rise on the watersheds between the Lake Chad basin and those of the Nile and Congo. The principal headstream, known variously as the Wahme, Wa, Wam or Wom, rises, in about 6° 30′ N., 15° E., in mountainous country forming the divide between the Chad system and the basin of the Sanga affluent of the Congo.

The Wam flows east and then north and in about 7° 20′ N., 18° 20′ E. is joined by the Fafa, a considerable stream rising east of the Wam. The upper course of the Wam is much obstructed by rapids, but from a little above the Fafa confluence it becomes navigable. Below the confluence the river, now known as the Bahr Sara, receives three tributaries from the west. In about 9° 20′ N., 18° E., it is joined by the Bamingi, which is formed by the junction of the eastern headstreams of the Shari. The Bamingi, before the exploration of the Wam, was thought to be the true upper course of the Shari. One of its branches, the Kukuru, rises in about 7° N., 21° 15′ E. Some 90 m. from its source the Bamingi becomes navigable, being 12 ft. deep and flowing with a gentle current. In 8° 42′ N. it receives on the west bank the Gribingi, a river rising in about 6° 20′ N. It is narrow and tortuous with rocky banks and often broken by rapids, but navigable at high water to 7° N. It flows in great part through a forest-clad country. A few miles above its confluence with the Bahr Sara the Bamingi receives on the right hand another large river, the Bangoran, which rises in about 7° 45′ N. and 22° E., in a range of hills which separates the countries of Dar Runga and Dar Banda, and, like the Bamingi, flows through open or bush-covered plains with isolated granite ridges.

Below the junction of the Bahr Sara and the Bamingi the Shari, as it is now called, becomes a large river, reaching, in places, a width of over 4 m. in the rains; while its valley, bordered by elevated tree-clad banks, contains many temporary lakes and back-waters. Its waters abound with hippopotami and crocodiles, and the country on either side with game of all kinds. In 9° 46′ N. it receives the Bakare or Awauk (Aouk) from the east, known in its upper course as the Aukadebbe. This, like the Bahr es Salamat, which enters the Shari in 10° 2′ N., traverses a wide extent of arid country in southern Wadai, and brings no large amount of water to the Shari. In 10° 12′ a divergent branch, the Ergig, leaves the main stream, only to rejoin it in 11° 30′.

In 12° 15′ N. and 15° E. the Shari receives on the west bank its largest tributary, the Logone, the upper branches of which rise far to the south between 6° and 7° N. The principal headstreams are the Pende and the Mambere. The Pende rises some 30 m. N. by E. of the source of the Wam. It flows northwards through a fertile valley and in 9° 35′ N. and 16° E. is joined by the Mambere, which rises in the hills of Adamawa and flows in a course roughly parallel to the Pende. Below the junction of the Pende and Mambere the Logone is a broad and deep river. Its system is connected with that of the Benue (see NIGER) by the Tuburi Swamp, which sends northward a channel joining the Logone in about 10° 30′ N. Below the Logone confluence the Shari, here a noble stream, soon splits up into various arms, forming an alluvial delta, flooded at high water, before entering Lake Chad. From the source of the Wam to the mouth of the river is a distance, following the windings of the stream, of fully 1400 m.

The existence of the Shari was made known by Oudney, Denham and Clapperton, the first Europeans to reach Lake Chad (1823). In 1852 Heinrich Barth spent some time in the region of the lower Shari and Logone, and in 1872–1873 Gustav Nachtigal studied their hydrographical system and explored the Gribingi, which he called the Bahr el Ardhe. It was not, however, until the partition of the Chad basin between Great Britain, France and Germany (1885–1890) that the systematic exploration of the Shari and its affluents was undertaken. The most prominent explorers have been Frenchmen. In 1896 Émile Gentil reached the Bamingi and in a small steamer passed down the river to its mouth. The existence of the Bahr Sara had been made known by C. Maistre in 1892, and in 1894 F. J. Clozel discovered the Wam. In 1900 A. Bernard demonstrated the identity of these two streams. In 1907 an expedition under Captain E. Lenfant followed the Wam-Bahr Sara from its source to the confluence with the Bamingi and showed it to be the true upper course of the Shari. The same expedition also discovered the Pende tributary of the Logone. Captain Lenfant had previously demonstrated (1903) the connexion between the Benue and Logone. From the mouth of the Shari in Lake Chad there is a current towards the Bahr-el-Ghazal channel at the south-eastern end of that lake. This channel has been supposed to be a dried-up affluent of the lake (see CHAD). Investigations by the French scientists E. F. Gautier and R. Chudeau led Chudeau to the conclusion that the Shari did not end in Lake Chad, but, by way of the Bahr-el-Ghazal, passed between Tibesti and Ennedi and ended in some *shat* in the Libyan desert. That the Shari may have reached the Nile is an hypothesis not absolutely rejected. (See *Missions au Sahara*, tome ii. (Paris, 1909), and for theories as to the Niger-Nile connexion see NIGER.)

From the spot where it is intersected by 10° 40′ N. to Lake Chad the Shari forms the boundary between the German colony of Cameroon and French Congo. The best route from the Congo to Lake Chad is via the Sanga affluent of the Congo to the station of Carnot, and thence across the watershed to the Pende.

See the works of Barth, Nachtigal and other travellers, especially Lenfant's *La Découverte des grandes sources du centre de l'Afrique* (Paris, 1909).

SHARK, a Selachian fish (see SELACHIANS), belonging to the order Plagiostomi, suborder Squali.

Sharks are almost exclusively inhabitants of the sea, but some species enter the mouths of large rivers, and one species (*Carcharias gangeticus*) occurs frequently high up in the large rivers of India. *C. nicaraguensis* of the lake of Nicaragua and the Rio San Juan appears to have taken up its residence permanently in fresh water. Sharks are most numerous between the tropics, a few only reaching the Arctic circle; it is not known how far they advance S. in the Antarctic region. Altogether some hundred and fifty different species have been described.

With regard to their habits many are littoral species, the majority pelagic, and a few are known to belong to the deep-sea fauna, having hitherto been obtained down to a depth of nearly 1000 fathoms.

Littoral Sharks.—The littoral forms are of small size, and generally known under the name of "dog-fishes," "hounds," &c. Some pelagic sharks of larger size also live near the shore on certain parts of a coast, but they are attracted to it by the abundance of food, and are as frequently found in the open sea, which is their birthplace; therefore we shall refer to them when we speak of the pelagic kinds.

The majority of the littoral species live on the bottom, sometimes close inshore, and feed on small marine animals or on any animal substance. The following are deserving of special notice.

The tope (*Galeus*) is common on the coasts not only of England, Ireland and of S. Europe, but also of S. Africa, California, Tasmania and New Zealand. Its teeth are equal in both jaws, of rather small size, flat, triangular, with the point directed towards the one side, and with a notch and denticulations on the shorter side (fig. 1). It is of a uniform slaty-grey colour, and attains to a length of 6 ft. The female brings forth some thirty living young at one birth in May. It becomes troublesome at times to fishermen by taking their bait and driving away other fish they desire to catch. The fins of *G. zyopterus* of the Californian coast are much esteemed for culinary purposes by the Chinese.

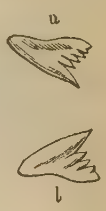

FIG. 1.—Teeth of Tope. *u*, Upper; *l*, lower.

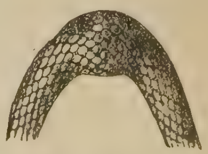

FIG. 2.—Teeth of *Mustelus*.

The hounds proper (*Mustelus*) possess a very different dentition, the teeth being small, obtuse, numerous, arranged in several rows like pavement (fig. 2). Five or six species are known from the shores of the various temperate and subtropical seas, one (*M. vulgaris*) being common on the coasts of Great Britain and the United States, on the Pacific as well as the Atlantic side. It is of a uniform grey colour or sparingly spotted with white, and attains to a length of 3 or

4 ft. The young, about twelve in number, are brought forth alive in November. It is comparatively harmless and feeds on shells, crustaceans and decomposing animal substances.

The dogfishes proper (*Scyllium*, *Chiloscyllium*, &c.) are spread over nearly all the temperate and tropical seas. Their teeth are small, in several series, with a longer pointed cusp in the middle, and generally one or two smaller ones on each side (figs. 3 and 5). They are all oviparous, their oblong egg-shells being produced at each corner into a long thread by which the egg is fastened to some fixed object. Some of the tropical species are ornamented with a pretty pattern of coloration. The two British species, the lesser and the larger spotted dogfish (*Sc. canicula* and *Sc. catulus*), belong to the most common fishes of the coast and are often confounded with each other. But the former is finely dotted with brown above, the latter having the same parts covered with larger rounded brown spots, some of which are nearly as large as the eye. As regards size, the latter exceeds somewhat the other species, attaining to a length of 4 ft. Dogfishes may become extremely troublesome by the large numbers in which they congregate at fishing stations; they are rarely used as food, except in the Mediterranean countries, in China and Japan, and in the Orkneys, where they are dried for home consumption. The black-mouthed dogfish (*Pristiurus melanostomus*) is rarely caught on the British coasts, and is recognized by a series of small, flat spines with which each side of the upper edge of the caudal fin is armed.

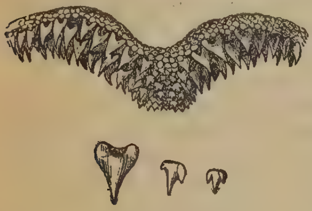

FIG. 3.—Teeth of *Scyllium canicula.*

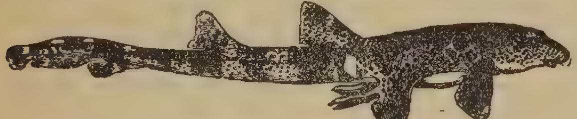

FIG. 4.—*Chiloscyllium trispeculare.*

The tiger-shark (*Stegostoma tigrinum*) is one of the commonest and handsomest sharks in the Indian Ocean. The ground colour is a brownish-yellow, ornamented with black or brown transverse bands or rounded spots. It is a littoral species, but adult specimens, which are from 10 to 15 ft. long, are met far from land. It is easily recognized by its enormously long bladelike tail, which is half as long as the whole fish. The teeth are small, trilobed, in many series. The fourth and fifth gill-openings are close together.

The genus *Crossorhinus*, of which three species are known from the coasts of Australia and Japan, is remarkable as the only instance in this group of fishes in which the integuments give a "celative" rather than a "protective" resemblance to their surroundings. Skinny frond-like appendages are developed near the angle of the mouth, or form a wreath round the side of the head, and the irregular and varied coloration of the whole body closely assimilates that of a rock covered with short vegetable and coralline growth. The species of *Crossorhinus* grow to a length of 10 ft.

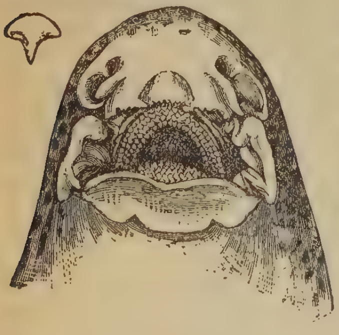

FIG. 5.—Confluent Nasal and Buccal Cavities of the same fish.

The so-called Port Jackson shark (*Heterodontus = Cestracion*) is likewise a littoral form. Besides the common species (*H. philippi*), three other closely allied kinds from the Indo-Pacific are known. This genus, which is the only existing type of a separate family, is one of special interest, as similar forms occur in Primary and Secondary strata. The jaws are armed with small obtuse teeth in front, which in young individuals are pointed, and provided with from three to five cusps. The lateral teeth are larger, pad-like, twice as broad as long and arranged in oblique series (fig. 7). The fossil forms far exceeded in size the living, which scarcely attain to a length of 5 ft. The shells of their eggs are found thrown ashore like those of our dogfishes. The shell is pyriform, with two broad lamellar ridges each wound edgewise five times round it (fig. 8).

The spiny or piked dogfish (*Acanthias*) inhabits the temperate seas of both the N. and S. hemispheres. For some part of the year it lives in deeper water than the sharks already noticed, but at uncertain irregular times it appears at the surface and close inshore in almost incredible numbers. Couch says that he has heard of 20,000 having been taken in a seine at one time; and in March 1858 the newspapers reported a prodigious shoal reaching W. to Uig, whence it extended from 20 to 30 m. seaward, and in an unbroken phalanx E. to Moray, Banff and Aberdeen. These fishes are distinguished by each of the two dorsal fins being armed in front by an acute spine. They do not possess an anal fin. Their teeth are rather small, placed in a single series, with the point so much turned aside that the inner margin of the tooth forms the cutting edge (fig. 9). The spiny dogfish are of a greyish colour, with some whitish spots in young specimens, and attain to a length of 2 or 3 ft. They are viviparous, the young being produced throughout the summer months.

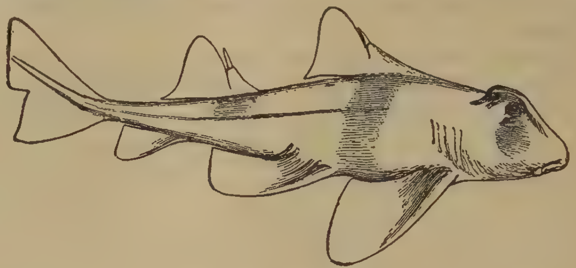

FIG. 6.—*Heterodontus galeatus.*

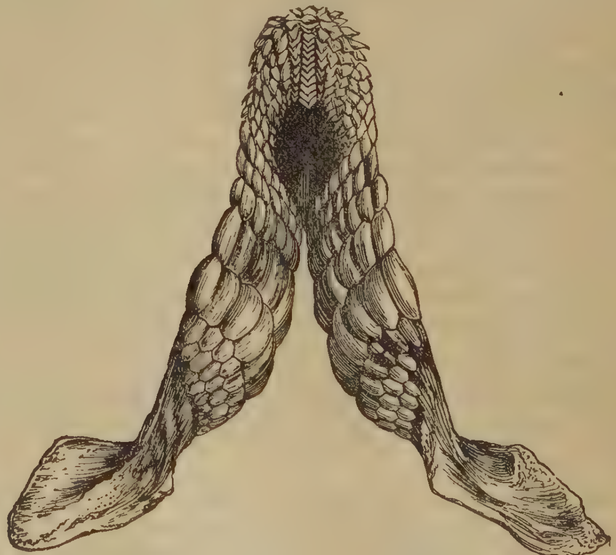

FIG. 7.—Upper Jaw of Port Jackson Shark (*Heterodontus philippi*).

Finally, we have to notice among the littoral sharks the "angel-fish" or "monk-fish" (*Rhina squatina*), which, by its broad flat head and expanded pectoral fins, approaches in general appearance the rays. It occurs in the temperate seas of the S. as well as the N. hemisphere, and is not uncommon on sandy parts of the coast of England and Ireland. It does not seem to exceed a length of 5 ft., and is too rare to do much injury to other fish. It is said to produce about twenty young at a birth.

Pelagic Sharks.—All these are of large size, and some are surpassed in bulk and length only by the larger kinds of cetaceans. Those armed with powerful cutting teeth are dangerous to man, whilst others, which are provided with numerous but very small teeth, feed on small fishes only or marine invertebrates, and are of a timid disposition, which causes them to retire into the solitudes of the open sea. On this account we know very little of their life. All pelagic sharks have a wide geographical range, and nearly all seem to be viviparous.

Of the more remarkable forms which we propose to notice here the genus most abundantly represented in species and individuals is *Carcharias*, now split up by many authors into several separate genera. Perhaps nine-tenths of the sharks of which we read in books of travel belong to this genus. Between thirty and forty species have been distinguished, all of which are found in tropical seas. They are the sharks which so readily attach themselves to sailing vessels, following them for weeks. Others affect more the neighbourhood of land. One of the most common species is the blue shark (*Carcharias glaucus*), of which specimens (4 to 6 ft. long) are frequently caught on the S. coasts of England and Ireland. Other species of *Carcharias* attain a length of 30 ft. The mouth of all is armed with a series of large flat triangular teeth, which have a sharp, smooth or serrated edge (fig. 10).

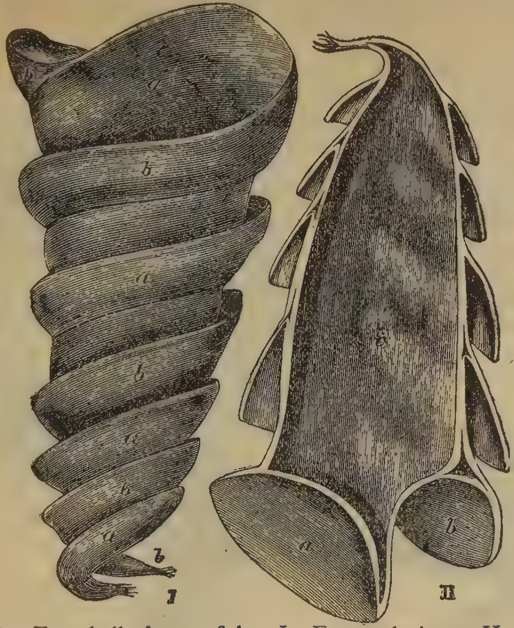

Fig. 8.—Egg-shell of same fish. I., External view; II., section; *a* and *b*, the two spiral ridges; *c*, cavity for the ovum.

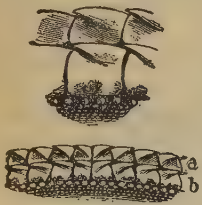

Fig. 9.—Teeth of *Acanthias vulgaris.*

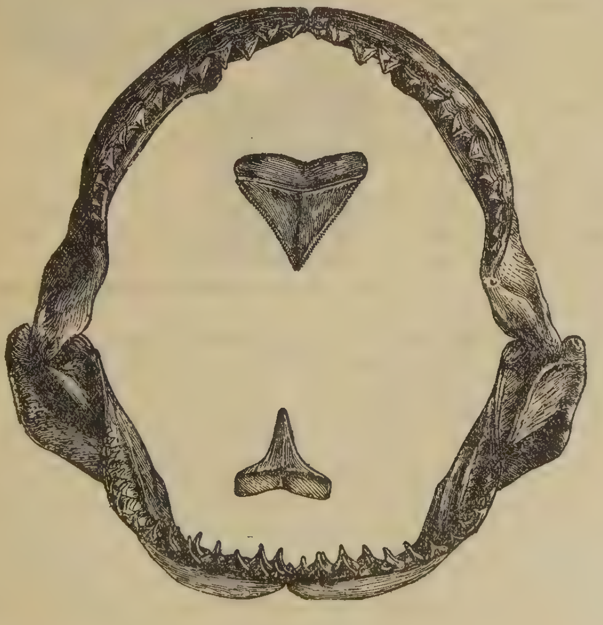

Fig. 10.—Dentition of the Blue Shark (*Carcharias glaucus*). The single teeth are of the natural size.

Galeocerdo is likewise a large shark very dangerous to man, differing from the preceding chiefly by having the outer side of its teeth deeply notched. It has long been known to occur in the N. Atlantic, close to the Arctic Ocean (*G. arcticus*), but its existence in other parts has been ascertained within a recent period; in fact, it seems to be one of the most common and dangerous sharks of the Indo-Pacific, the British Museum having obtained specimens from Mauritius, Kurrachee, Madras and the W. coast of Australia.

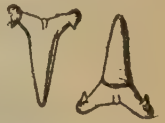

Fig. 11.—Upper and Lower Tooth of *Lamna.*

Hammerheaded sharks (*Sphyrna*= *Zygaena*) are sharks in which the anterior portion of the head is produced into a lobe on each side, the extremity of which is occupied by the eye. The relation of this unique configuration of the head to the economy of the fish is unknown. Otherwise these sharks resemble *Carcharias*, and are equally formidable, but seem to be more stationary in their habits. They occur in all tropical and subtropical seas, even in the Mediterranean, where *S. Zygaena* is by no means rare. In the Indian Ocean it is common, and Cantor states that specimens may be often seen ascending from the clear blue depths of the ocean like a great cloud.

The porbeagles (*Lamna*) differ from the preceding sharks in their dentition and are not dangerous to man; at least there is no instance known of a person having been attacked by the species common on the British coast (*L. cornubica*). This is referred to in the works of older British authors as "Beaumaris shark." The short and stout form of its body contrasts strikingly with its much attenuated tail, which, however, is strengthened by a keel on each side and terminates in a large and powerful caudal fin. The snout is pointed, and the jaws are armed with strong lanceolate teeth, each of which bears a small cusp on each side of the base (see fig. 11). The teeth are not adapted for cutting, like the flat triangular teeth of man-eating sharks, but rather for seizing and holding the prey, which consists chiefly of various kinds of fishes and cephalopods. In the upper jaw there are from thirteen to sixteen teeth on each side, the third being remarkable for its small size; in the lower jaw from twelve to fourteen. The gill-openings are very wide. The porbeagle attains to a length of 10 or 12 ft., and is a pelagic fish, not rare in the N. Atlantic and Mediterranean, and frequently wandering to the British and more rarely to the American shores. This species is widely distributed over the N. of the Atlantic and Pacific Oceans. Other closely allied species (*L. spallanzanii*, *L. glauca*) are known to occur in the S. Atlantic, from the Mediterranean to the Cape of Good Hope.

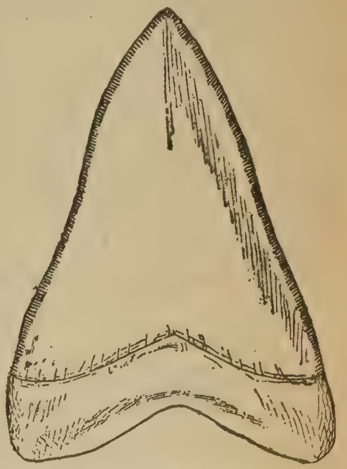

Fig. 12.—Tooth of *Carcharodon rondeletii.*

To the genus *Carcharodon* particular interest is attached, because the single still existing species is the most formidable of all sharks, as were those which preceded it in Tertiary times. The existing species (*C. rondeletii*) occurs in almost all tropical and subtropical seas, but seems to be verging towards extinction. It is known to attain to a length of 40 ft. The tooth figured here of the natural size (fig. 12) is taken from a jaw much shrunk in drying, but still 20 in. wide in its transverse diameter, and taken from a specimen $36\frac{1}{2}$ ft. long. The extinct species must have been still more gigantic in bulk, probably reaching a length of 90 ft., as we may judge from teeth which are found in the crag or which were dredged up from the Pacific Ocean by the "Challenger" expedition, and which are 4 in. wide at the base and 5 in. long measured along their lateral margin. In some Tertiary strata these teeth are extremely abundant, so much so that—for instance, in Florida—the strata in which they occur are quarried to obtain the fossil remains for export to England, where they are converted into artificial manure.

The fox-shark or thresher (*Alopecias vulpes*), of which every year specimens are captured on the British coast, but which is common in the N. and S. hemispheres, is readily recognized by its extremely slender tail, the length of which exceeds that of the remainder of the body. Its teeth are small, flat, triangular and without serrature. It follows the shoals of herrings, pilchards and sprats in their migrations, destroying incredible numbers and frequently injuring the nets. When feeding it uses the long tail in splashing the surface of the water, whilst it swims in gradually decreasing circles round a shoal of fishes which are thus kept crowded together. Sometimes two threshers may be seen working together. Statements that it has been seen to attack whales and other large cetaceans rest upon erroneous observations; its dentition is much too weak to bite through their skin. The thresher attains to a length of 15 ft., the tail included.

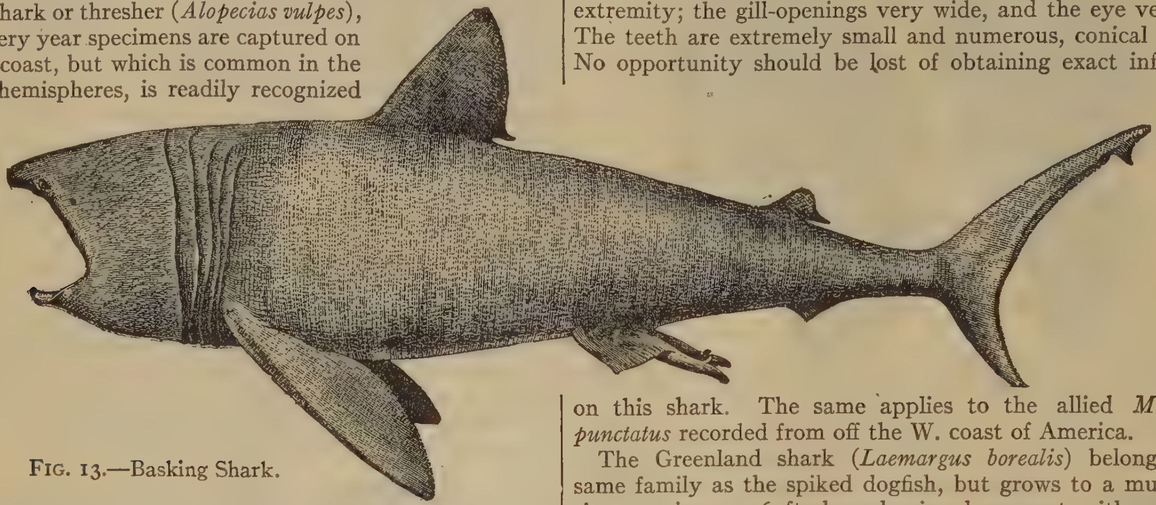

FIG. 13.—Basking Shark.

The basking shark (*Selache maxima*), sometimes erroneously called "sunfish," is the largest fish of the N. Atlantic, growing to a length of more than 30 ft. Though best known from the N. of the Atlantic or Pacific oceans, this species has also been recorded from the Australian seas. The mouth is of an extraordinary width, and, like the gill-cavity, capable of great expansion, so as to enable the fish to take at one gulp an enormous quantity of the small fish and other marine creatures on which it subsists. Also the gill-clefts are of great width, and the internal opening of each is guarded by a kind of strainer, formed by the enormously elongated gill-rakers, which serves to prevent the food organisms from passing out through the clefts. The teeth are very small, numerous, arranged in several series, conical and probably without use in feeding. This shark is therefore quite harmless if not attacked. Off the W. coast of Ireland it was at one time hunted for the sake of the oil from the liver, one fish yielding from a ton to a ton and a half. Its capture is not unattended with danger, as one blow from the tail is sufficient to stave in the sides of a large boat. The basking shark is gregarious, and may be seen in calm weather lying with the upper part of the back raised above the surface of the water, a habit which it has in common with the true sunfish (*Orthagoriscus*), and from which it has derived its name.

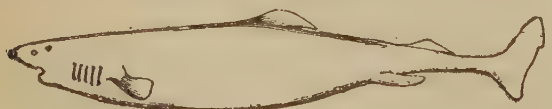

FIG. 14.—Greenland Shark (*Laemargus borealis*).

A shark similar in many points to the basking shark, and an inhabitant of the Indo-Pacific Ocean, is *Rhinodon typicus*. So far as our present knowledge goes, it is the largest of all sharks, as it is known to exceed a length of 50 ft., but it is stated to attain that of 70. The captures of only a few specimens are on record, at the Cape of Good Hope and near the Seychelles, where it is known as the "chagrin." The snout is extremely short, broad and flat, with the mouth and nostrils placed at its extremity; the gill-openings very wide, and the eye very small. The teeth are extremely small and numerous, conical in shape. No opportunity should be lost of obtaining exact information on this shark. The same applies to the allied *Micristodus punctatus* recorded from off the W. coast of America.

The Greenland shark (*Laemargus borealis*) belongs to the same family as the spiked dogfish, but grows to a much larger size, specimens 26 ft. long having been met with. The two dorsal fins are small and destitute of spines. The teeth (fig. 15) in the upper jaw are small, narrow, conical in shape; those of the lower flat, arranged in several series, one on the top of the other, so that only the uppermost forms the sharp dental edge of the jaw. The points of these lower teeth are so much turned aside that the inner margin only enters the dental edge. The Greenland shark is an inhabitant of the Arctic regions, sometimes straying to the latitudes of Great Britain and of Cape Cod in the W. Atlantic; it is one of the greatest enemies of the whale, which is often found with large pieces bitten out of the tail by this shark. Its voracity is so great that, as Scoresby tells us, whilst engaged in feeding on the carcase of a whale it will allow itself to be stabbed with a lance or knife without being driven away.

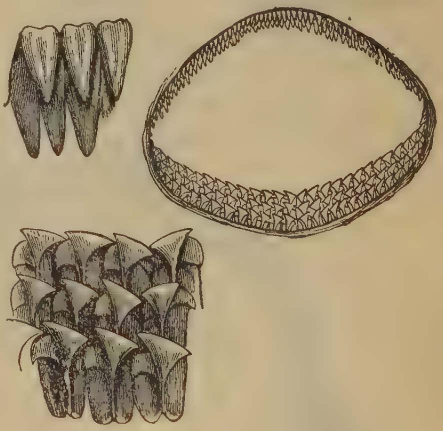

FIG. 15.—Dentition of Greenland Shark.

The spinous shark (*Echinorhinus spinosus*) is readily recognized by the short bulky form of its body, its short tail, and the large round bony tubercles which are scattered all over its body, each of which is raised in the middle into a pointed conical spine. While most frequently recorded from the E. Atlantic, specimens have also been obtained from the coasts of N. America and of New Zealand. It always lives on the bottom, and probably descends to some depth. It does not seem to exceed a length of 10 ft.

Bathybial Sharks.—Sharks do not appear to have yet reached the greatest depths of the ocean; and so far as we know at present we have to fix the limit of their vertical distribution at 1000 fathoms. Those which we find to have reached or to pass the 100 fathoms line belong to generic types which, if they include littoral species, are ground-sharks—as we generally find the bottom-feeders of our littoral fauna much more strongly represented in the deep sea than the surface swimmers. All belong to two families only, the *Scylliidae* and *Spinacidae*, the littoral members of which live for the greater part habitually on the bottom and probably frequently reach to the 100 fathoms line. Distinctly bathybial species are two small dogfishes—*Spinax granulatus* from 120 fathoms, and *Scyllium canescens* from 400 fathoms, both on the S.W. coast of S. America; also *Centroscyllium granulatum* from 340 fathoms in the S. Ocean, whose congener from the coast of Greenland probably descends to a similar depth. The shark which reaches the greatest depth recorded hitherto appears to be *Scylliorhinus indicus* obtained by the Valdivia expedition from a depth of nearly 1000 fathoms in the W. Indian Ocean. It belongs to the genus *Centrophorus*, of which some ten species are known, all from deep water in the N. Atlantic, Mediterranean, the Molucca and Japanese seas. The Japanese species were discovered by the naturalists of the "Challenger" on the Hyalonema ground off Inosima in 345 fathoms. Dr E. P. Wright found *C. coelolepis* at a still greater depth on the coast of Portugal. The fishermen of Sétubal fish for these sharks in 400 or 500 fathoms, with a line of some 600 fathoms in length. "The sharks caught were from 3 to 4 ft. long, and when they were hauled into the boat fell down into it like so many dead pigs"; in fact, on being rapidly withdrawn from the great pressure under which they lived they were killed, like other deep-sea fishes in similar circumstances. It is noteworthy that the organization of none of these deep-sea sharks has undergone such a modification as would lead us to infer that they are inhabitants of great depths.

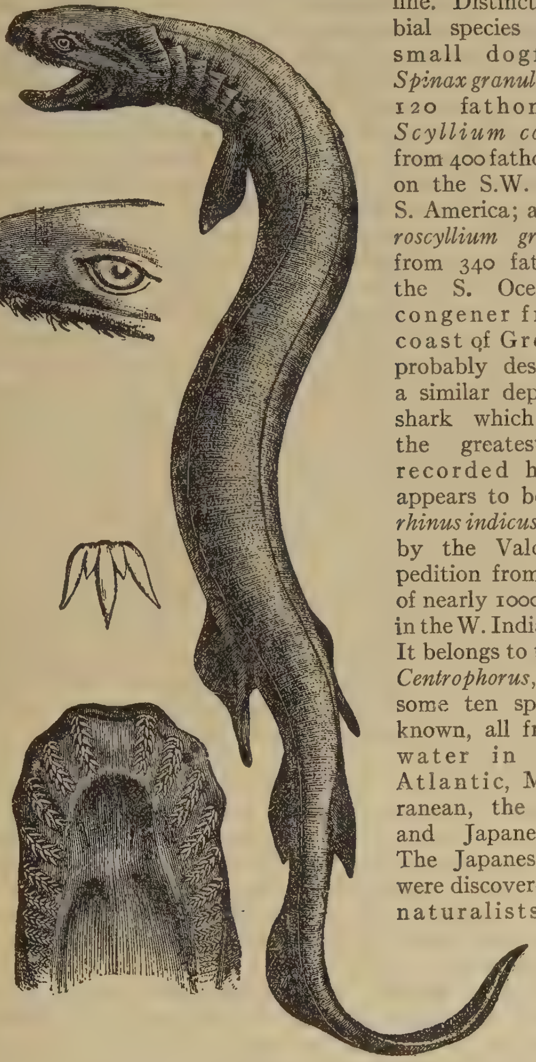

FIG. 16.—*Chlamydoselachus anguineus.*

One of the most interesting types of the division of sharks is the small family of *Notidanidae*, which is externally distinguished by the presence of a single dorsal fin only, without spine and opposite to the anal, and by having six or seven wide branchial openings. They represent an ancient type, the presence of which in Jurassic formations is shown by teeth extremely similar to those of the living species. Their skeleton is notochordal. Only four species are known, of which one (*Notidanus griseus*) has now and then strayed N. to the English coast. Allied to the Notidanidae are the Chlamydoselachidae or frilled sharks, represented so far as is known by a single living species, *C. anguineus* Garman (fig. 16), which occurs frequently in deep water off the coast of Japan and as isolated specimens off the coasts of New South Wales, Madeira and Norway. A fossil species has been described from the Pliocene of N. Italy. It resembles a conger in shape, and differs from the *Notidani* proper by its elongated body, wide nearly terminal mouth, extremely wide gill-openings and peculiarly formed teeth. The teeth are similar in both jaws, each composed of three slender curved cusps separated by a pair of minute intermediate points, and with a broad base directed backwards.

A few words may be added with reference to the economic uses of this group of fishes. As mentioned above, some of the smaller dogfishes are eaten at certain seasons by the captors, and by the poorer classes of the population. An inferior kind of oil, chiefly used for the adulteration of cod-liver oil, is extracted on some of the N. fishing-stations from the liver of the spiked dogfishes, and occasionally of the larger sharks. Cabinet-makers make extensive use of shark's-skin under the name of "shagreen" for smoothing or polishing wood. This shagreen is obtained from species (such as our dogfishes) whose skin is covered with small, pointed, closely-set, calcified papillae, whilst very rough skins, in which the papillae are large or blunt, are useless for this purpose. The dried fins of sharks (and of rays) form in India and China an important article of trade, the Chinese preparing gelatin from them, and using the better sort for culinary purposes. They are assorted in two kinds, viz. "white" and "black." The former consists exclusively of the dorsal fins, which are reputed to yield more gelatin than the other fins. The pectoral, ventral and anal fins constitute the "black" sort; the caudal are not used. (A. C. G.; J. G. K.)

SHARON, a borough of Mercer county, Pennsylvania, U.S.A., on the Shenango river, about 70 m. by rail N.N.W. of Pittsburg. Pop. (1900) 8916, of whom 1805 were foreign-born and 113 were negroes; (1910 U.S. census) 15,270. Sharon is served by the Erie, the Lake Shore & Michigan Southern, and the Pennsylvania (Erie and Pittsburg division) railways. Sharon has an excellent public school system, and the F. H. Buhl Club (1903) is a social and educational institution, named in honour of its founder, an iron manufacturer of the borough. The borough has blast furnaces and rolling-mills; and iron and steel products, tin-plate and terne-plate are its principal manufactures. The total value of factory products in 1905 was $4,776,914, being 26·9% more than in 1900. Sharon and South Sharon (pop. by U.S. census in 1910, 10,190), which was separately incorporated as a borough in 1901, form what is virtually a single industrial community. Sharon was first settled in 1795, but was only a small village when a movement for developing the coal-mines in the vicinity was begun in 1836. It was incorporated as a borough in 1841

SHARP, GRANVILLE (1735–1813), English philanthropist, was the ninth of the fourteen children of Thomas Sharp (1693–1758), a prolific theological writer and biographer of his father, John Sharp, archbishop of York. Granville, who was born at Durham in 1735, was educated at the grammar school there, and apprenticed to a London draper, but obtained employment in the government ordnance department in 1758. Sharp's tastes were scholarly; he managed to acquire knowledge of Greek and Hebrew, and before 1770 he had published more than one treatise on biblical criticism. His fame rests, however, on his untiring efforts for the abolition of slavery. In 1767 he had become involved in litigation with the owner of a slave called Jonathan Strong, in which it was decided that a slave remained in law the chattel of his master even on English soil. Sharp devoted himself to fighting this judgment both with his pen and in the courts of law; and finally it was laid down in the case of James Sommersett that a slave becomes free the moment he sets foot on English territory. Sharp was an ardent sympathizer with the revolted American colonists, and at home advocated parliamentary reform and the legislative independence of Ireland, and agitated against the impressment of sailors for the navy. It was through his efforts that bishops for the United States of America were consecrated by the archbishop of Canterbury in 1787. In the same year he was the means of founding a society for the abolition of slavery, and a settlement for emancipated slaves at Sierra Leone. Granville Sharp was also one of the founders of the British and Foreign Bible Society, and of the Society for the Conversion of the Jews. One of his tracts, entitled *Remarks on the Uses of the definitive article in the Greek text of the New Testament*, published in 1798, propounded the rule known as "Granville Sharp's canon," which on account of its important bearing on Unitarian doctrine led to a celebrated controversy, in which many leading divines took part, including Christopher Wordsworth. This rule was to the effect that "when two personal nouns of the same case are connected by the copulate *καί*, if the former has the definite article and the latter has not, they both belong to the same person." Sharp died on the 6th of July 1813, and a memorial of him was erected in Westminster Abbey.

See Prince Hoare, *Memoirs of Granville Sharp* (London, 1820), which contains observations by Bishop Burgess on Sharp's biblical criticisms; Sir James Stephen, *Essays in Ecclesiastical Biography* (London, 1860); Thomas Clarkson, *History of the Rise, Progress and Accomplishment of the Abolition of the African Slave Trade by the British Parliament* (London, 1839).

SHARP, JAMES (1618–1679), Scottish divine, the son of William Sharp, sheriff-clerk of Banffshire, and Isabel Leslie or Lesley, daughter of Leslie of Kininvie, of the family of Halyburtons of Pitcur in Angus, was born in Banff Castle on the 4th of May 1618. In 1633 he went to King's College, Aberdeen, and graduated in 1637. He there studied divinity for one or two years, Aberdeen being at that time the home of Episcopal sentiment. On the outbreak of the Covenanting war he went to England (1639) and visited Oxford and perhaps Cambridge, becoming acquainted with the principal English divines. Upon his return he was chosen in 1643, through the influence of Lord Rothes, to be one of the "regents" of philosophy in St Leonard's College, St Andrews. In December 1647 he went through his ordinary trials for the ministerial office before the presbytery of St Andrews, and was appointed minister of Crail in Fifeshire, on the presentation of the earl of Crawford, in January 1648. In the great schism of Resolutioners and Protestors, he, with the large majority of educated men, took active part with the former. As early as March 1651 he was recognized as one of the leading men of the party, and was taken prisoner by Cromwell's forces. For eight months he was kept in the Tower of London, and liberated on parole. His first public employment was in 1656, when he went to London to endeavour to counteract with the Protector the influence of Archibald Johnston, Lord Warriston, who was acting for the Protestors. He displayed all his undoubted talents for small diplomacy, and considerable subtlety in argument, while on this service, and his mission was decidedly successful. He returned to Scotland in 1659, but upon Monk's march to London was again, in February 1660, sent by the Resolutioners to watch over their interests in London, where he arrived on the 13th of February. He was most favourably received by Monk, to whom it was of great importance to remain on good terms with the dominant party in Scotland. His letters to Douglas and others during this period, if they may be trusted, are useful towards following the intrigues of the time day by day. In the beginning of May he was despatched by Monk to the king at Breda. His letters on this occasion to Douglas show that he regarded himself equally as the emissary of the Scottish kirk. It is to be noticed that he was also the bearer of a secret letter from Lauderdale to the king. There can be little doubt that while on this mission he was finally corrupted by Charles and Clarendon, not indeed so far as to make up his mind to betray the kirk, but at any rate to decide in no way to imperil his own chances by too firm an integrity. The first thing that aroused the jealousy of his brethren was his writing from Holland in commendation of Clarendon. This jealousy was increased on his return to London (May 26) by his plausible endeavours to stop all coming of Presbyterian commissioners from Scotland and Ireland, though he professed to desire the presence of Douglas and Dickson, by his urgent advice that the Scots should not interfere in the restoration of Episcopacy in England, and by his endeavours to frustrate the proposed union of Resolutioners and Protestors. He informed them that Presbyterianism was a lost cause in England, but as late as August 11 he intimated that, though there had been great danger for the Scottish kirk as well, this danger had been constantly and successfully warded off by his efforts. He returned to Scotland in this month, and busied himself in endeavouring to remove all suspicions of his loyalty to the kirk; but at the same time he successfully stopped all petitions from Scottish ministers to king, parliament or council. His letters to Drummond, a Presbyterian minister in London, and to Lauderdale, without absolutely committing him, show clearly that he was certain that Episcopacy was about to be set up. How far he was actively a traitor in the matter had always been disputed until the question was set at rest by the discovery of his letter, dated May 21, from London, whither he went in April 1661, to Middleton, the high commissioner, whose chaplain he now was, showing that he was in confidential communication with Clarendon and the English bishops, that he was earnestly co-operating in the restoration of Episcopacy in Scotland, that he had before leaving Scotland held frequent conferences with Middleton on the subject (a fact which he had vehemently denied) and was aware that Middleton had all along intended it, and that he drew up the quibbling proclamation of June 10, the sole purpose of which was "the disposing of minds to acquiesce in the king's pleasure." The original of this letter (which is printed in the *Lauderdale Papers* and in the *Scottish Review*) is preserved in the Museum of the Society of Antiquaries, Edinburgh. It should be noticed that as late as the end of April, on the eve of starting on his mission to court with Rothes and Glencairne, he declared to Baillie that no change in the kirk was intended. The mask was at length dropped in August, when Episcopacy was restored, and Sharp was appointed archbishop of St Andrews. He and Leighton, Fairfoul and Hamilton "were dubbed, first preaching deacons, then presbyters, and then consecrated bishops in one day, by Dr Sheldon and a few others." On April 8th the new prelates entered Scotland, and on the 20th of April 1662 Sharp preached his first sermon at St Andrews.

Sharp had carefully kept on good terms with Lauderdale, and when the Billeting Plot was concocted in September 1662 against the latter by Middleton, he managed to avoid acting against him; indeed it is probable that, after being appointed under an oath of secrecy to be one of the scrutineers of the billets, he, in violation of the oath, was the cause of Lauderdale receiving timely information of the decision against him; and yet he shortly went up to London to explain the whole affair in Middleton's interest. When Lauderdale's supremacy was established he readily co-operated in passing the National Synod Act in 1663, the first step in the intended subjection of the church to the crown. In 1664 he was again in London, returning in April, having secured the grant of a new church commission. So oppressive was his conduct and that of others of the bishops that it called forth a written protest from Gilbert Burnet. Sharp at once summoned him before the bishops and endeavoured to obtain a sentence of deprivation and excommunication against him, but was overruled by his brethren. On the death of Glencairne, the chancellor's greatest efforts were made to secure the vacant office for Sharp, and he was not inactive in his own interest; the place was not, however, filled up until 1667, and then by the appointment of Rothes. He was in strict alliance with Rothes, Hamilton and Dalyell, and the other leaders of oppression, and now placed himself in opposition to the influence of Lauderdale, attacking his friends, and especially the earl of Kincardine. In 1665 he was again in London, where, through his own folly and mendacity, he suffered a complete humiliation at the hands of Lauderdale, well described by the historian Burnet. The result of their system of violence and extortion was the rising of the Covenanters, during which, being in temporary charge during Rothes's absence, he showed, according to Bellenden, the utmost fear, equalled only by his cruelty to the prisoners after the rout of Pentland. When the convention of estates met in January 1667 Hamilton was substituted for him as president. He now wrote letters of the most whining contrition to Lauderdale, who extended him a careless reconciliation. For a time he made himself actively useful, and helped to restrain his brethren from writing to London to complain of the conciliation policy which for a while Lauderdale carried out. On July 10, 1668 an attempt was made upon his life by James Mitchell, who fired a pistol at him while driving through the streets of Edinburgh. The shot, however, missed Sharp, though his companion, the bishop of Orkney, was wounded by it, and Mitchell for the time escaped. In August Sharp went up to London, returning in December, and with his assistance Tweeddale's tolerant proposals for filling the vacant parishes with some of the "outed" ministers were carried out. In the debates on the Supremacy Act, by which Lauderdale destroyed the autonomy of the church, Sharp at first showed reluctance to put in motion the desired policy, but gave way upon the first pressure. When, however, Leighton, as archbishop of Glasgow, endeavoured to carry out a comprehensive scheme, Sharp actively opposed him, and expressed his joy at the failure of the attempt. From this time he was completely subservient to Lauderdale, who had now finally determined upon a career of oppression, and in 1674 he was again in London to support this policy. In this year also Mitchell, who had shot at him six years before, was arrested, and, upon Sharp's promise to obtain a pardon, privately made a full confession. When Mitchell later claimed this promise, Sharp denied that any such promise had been given. His falsehood was proved by the entry of the act in the records of the court. Mitchell was finally condemned, but a reprieve would have been granted had not Sharp himself insisted on his death. This was speedily avenged. On the 3rd of May 1679, as he was driving with his daughter Isabel to St Andrews, he was set upon by nine men, and, in spite of the appeals of his daughter, was cruelly murdered. The place of the murder, on Magus Muir, now covered with fir trees, is marked by a monument erected by Dean Stanley, with a Latin inscription recording the deed.

Unless otherwise mentioned, the proofs of the statements in this article will be found in vols. i. and ii. of the *Lauderdale Papers* (Camden Society) and in two articles in the *Scottish Review*, July 1884 and January 1885.

SHARP, JOHN (1645–1714), English divine, archbishop of York, was born at Bradford on the 16th of February 1645, and was educated at Christ's College, Cambridge. He was ordained deacon and priest on August 12th 1667, and until 1676 was chaplain and tutor in the family of Sir Heneage Finch at Kensington House. Meanwhile he became archdeacon of Berkshire (1673), prebendary of Norwich, rector of St Giles's-in-the-Fields, and in 1681 dean of Norwich. In 1686, when chaplain to James II., he was suspended for ten months on a charge of having made some reflections on the king, and in 1688 was cited for refusing to read the declaration of indulgence. Under William and Mary he succeeded Tillotson as dean of Canterbury in 1689, and (after declining a choice of sees vacated by nonjurors who were his personal friends) followed Thomas Lamplugh as archbishop of York in 1691. He made a thorough investigation of the affairs of his see, and regulated the disordered chapter of Southwell. He preached at the coronation of Queen Anne and became her almoner and confidential adviser in matters of church and state. He welcomed the Armenian bishops who came to England in 1713, and corresponded with the Prussian court on the possibility of the Anglican liturgy as a means of reconciliation between Lutherans and Calvinists. He died at Bath on the 2nd of February 1714.

His works (chiefly sermons) were published in 7 volumes in 1754, and in 5 volumes at Oxford in 1829.

SHARP, RICHARD (1759–1835), known as "Conversation Sharp," was born in Newfoundland in 1759, the son of a British officer in garrison there. He was for many years in business in London, and amassed a large fortune. He was the host of leading literary and political men at his houses in Park Lane and near Dorking. Johnson, Burke, Rogers, Hallam, Grattan, Sydney Smith, James Mill, Wordsworth and Coleridge were among his many friends. From 1806 to 1812 he was M.P. for Castle Rising, and subsequently he represented Portarlington and Ilchester. He was the author of a volume of *Letters and Essays in Prose and Verse* (1834), which the *Quarterly Review* declared to be remarkable for "wisdom, wit, knowledge of the world and sound criticism." Sharp died at Dorchester on the 30th of March 1835.

SHARP, WILLIAM (1749–1824), English line-engraver, was born at London on the 29th of January 1749. He was originally apprenticed to what is called a bright engraver, and practised as a writing engraver, but gradually became inspired by the higher branches of the engraver's art. Among his earlier plates are some illustrations, after Stothard, for the *Novelists' Magazine*. He engraved the "Doctors Disputing on the Immaculateness of the Virgin" and the "Ecce Homo" of Guido Reni, the "St Cecilia" of Domenichino, the "Virgin and Child" of Dolci, and the portrait of John Hunter of Sir Joshua Reynolds. His style of engraving is thoroughly masterly and original, excellent in its play of line and rendering of half-tints and of "colour." He died at Chiswick on the 25th of July 1824. In his youth, owing to his hotly expressed adherence to the politics of Paine and Horne Tooke, he was examined by the privy council on a charge of treason. Mesmer and Brothers found in Sharp a stanch believer; and for long he maintained Joanna Southcott at his own expense. As an engraver he achieved a European reputation, and at the time of his death he enjoyed the honour of being a member of the Imperial Academy of Vienna and of the Royal Academy of Munich.

SHARP, WILLIAM (1856–1905), Scottish poet and man of letters, was born at Paisley on the 12th of September 1856. His was a double personality, for during his lifetime he was known solely by a series of poetical and critical works of great, but not of outstanding merit, while from 1894 onwards he published, with elaborate precautions of secrecy, under the name of "Fiona Macleod," a series of stories and sketches in poetical prose which made him perhaps the most conspicuous Scottish writer of the modern Gaelic renaissance. His early life was spent chiefly in the W. highlands of Scotland, and after leaving Glasgow University he went to Australia in 1877 in search of health. After a cruise in the Pacific he settled for some time in London as clerk to a bank, became an intimate of the Rossettis, and began to contribute to the *Pall Mall Gazette* and other journals. In 1885 he became art critic to the *Glasgow Herald*. He spent much time abroad, in France and Italy, and travelled extensively in America and Africa. In 1885 he married his cousin, Elizabeth Amelia Sharp, who helped him in much of his literary work and collaborated with him in compiling the *Lyra Celtica* (1896). His volumes of verse were *The Human Inheritance* (1882), *Earth's Voices* (1884), *Romantic Ballads and Poems of Fantasy* (1886), *Sospiri di Roma* (1891), *Flower o' the Vine* (1894), *Sospiri d' Italia* (1906). William Sharp was the general editor of the "Canterbury Poets" series. He was a discriminating anthologist, and his *Sonnets of the Century* (1886), to which he prefixed a useful treatise on the sonnet, ran through many editions. This was followed by *American Sonnets* (1889). He wrote biographies of Dante Gabriel Rossetti (1882), of Shelley (1887), of Heinrich Heine (1888), of Robert Browning (1890), and edited the memoirs of Joseph Severn (1892). The most notable of his novels was *Silence Farm* (1899). During the later years of his life he was obliged for reasons of health to spend all his winters abroad. The secret of his authorship of the "Fiona Macleod" books was faithfully kept until his death, which took place at the Castello di Manlace, Sicily, on the 12th of December 1905. As late as the 13th of May 1899 Fiona Macleod had written to the *Athenaeum* stating that she wrote only under that name and that it was her own. She began to publish her tales and sketches of the primitive Celtic world in 1894 with *Pharais: A Romance of the Isles*. They found only a limited public, though an enthusiastic one. The earlier volumes include *The Mountain Lovers* (1895), *The Sin-Eater* (1895), *The Washer of the Ford and other Legendary Moralities* (1896), &c. In 1897 a collected edition of the shorter stories, with some new ones, was issued as *Spiritual Tales, Barbaric Tales and Tragic Romances*. Later volumes are *The Dominion* *of Dreams* (1899); *The Divine Adventure: Iona: and other Studies in Spiritual History* (1900), and *Winged Destiny* (1904).

SHARPE, DANIEL (1806–1856), English geologist, was born in Marylebone, London, on the 6th of April 1806. His mother was a sister of Samuel Rogers, the poet. At the age of 16 he entered the counting-house of a Portuguese merchant in London. At the age of 25, after spending a year in Portugal, he joined his elder brother as a partner in a Portuguese mercantile business. As a geologist he first became known by his researches (1832–1840) on the geological structure of the neighbourhood of Lisbon. He studied the Silurian rocks of the Lake District and North Wales (1842–1844), and afterwards investigated the structure of the Alps (1854–1855). He was elected F.R.S. in 1850. He published several essays on cleavage (1847–1852), and showed from the evidence of distortion of organic remains that the direction of the pressure producing contortions in the rocks was perpendicular to the planes of cleavage. Most of his papers were published in the *Quarterly Journal of the Geological Society*, but one "On the Arrangement of the Foliation and Cleavage of the Rocks of the North of Scotland," was printed in the *Phil. Trans.* 1852. He was author also of a *Monograph on the Cephalopoda of the Chalk*, published by the Palaeontographical Society (1853–1857). In 1856 he was elected president of the Geological Society, but he died in London, from the effects of an accident, on the 31st of May that year.

SHARPSBURG, a borough of Allegheny county, Pennsylvania, U.S.A., on the Allegheny river, opposite the N.E. part of Pittsburg. Pop. (1900) 6842 (1280 foreign-born); (1910) 8153. Sharpsburg is served by the Pennsylvania and the Baltimore & Ohio railways. Coal is mined in the vicinity. Among the manufactures are iron pipes, truck and bar iron, wire, stoves, paint and lubricating oil. Sharpsburg was settled in 1826, was named in honour of James Sharp, the original proprietor, and was incorporated in 1841.

SHASI, a city in the province of Hu-peh, China, on the left bank of the river Yangtsze, about 85 m. below Ich'ang. Pop. about 80,000. It was opened to foreign trade under the Japanese treaty of 1895. The town lies below the summer level of the Yangtsze, from which it is protected by a strong embankment. Formerly Shasi was a great distributing centre, but the opening of Ich'ang to foreign trade diverted much of the traffic to the last-named port. It is the terminus of an extensive network of canals which run through the low country lying on the north bank of the Yangtsze as far down as Hankow. Native boats, as a rule, prefer the canal route to the turbulent waters of the Yangtsze, their cargoes being transhipped at Shasi across the embankment into river boats. Foreign residents are few, and the trade passing through the maritime customs is comparatively insignificant. The place is still, however, a large distributing centre for native trade, and is the seat of an extensive manufacture of native cotton cloth. The British consulate was withdrawn in January 1899, British interests being placed under the care of the consul at Ich'ang.

SHAW, GEORGE BERNARD (1856–   ), British dramatist and publicist, was born in Dublin on the 26th of July 1856. His father, George Carr Shaw, was a retired civil servant, the younger son of Bernard Shaw, high sheriff of Kilkenny. His mother, Lucinda Elizabeth Gurly, was a good musician, who eventually became a teacher of singing in London. G. B. Shaw went to school in Dublin, and began to earn his living when he was fifteen. He was for five years a clerk in the office of an Irish land-agent, but came to London with his family in 1876, and in 1879 was, according to his own account in the preface to *The Irrational Knot*, in the offices of the Edison telephone company. He had begun to write novels, which did not immediately find their market. *The Irrational Knot*, written in 1880, and *Love among the Artists* (written in 1881) first appeared as serials in *Our Corner*, a monthly edited by Mrs Annie Besant; *Cashel Byron's Profession* (reprinted in 1901 in the series of "Novels of his Nonage") and *An Unsocial Socialist* first appeared in a Socialist magazine *To-day*, which no longer exists. Shaw joined the Fabian Society in 1884, a year after its formation, and was active in socialistic propaganda, both as a street orator and as a pamphleteer. In 1889 he edited the *Fabian Essays*, to which he contributed "The Economic Basis of Socialism" and "The Transition to Social Democracy." He began journalism, through the influence of William Archer, on the reviewing staff of the *Pall Mall Gazette* in 1885; he then became art and musical critic, writing from 1888 to 1890 for the *Star*, where his articles were signed "Corno di Bassetto," and then in 1890 to 1894 for the *World*. In 1895 to 1898 he was dramatic critic to the *Saturday Review*, his articles being collected in 1907 as *Dramatic Opinions and Essays*. He was an early champion of Richard Wagner and of Henrik Ibsen, and indicated his aesthetic point of view in the pamphlets, *The Quintessence of Ibsenism* (1891) and *The Perfect Wagnerite* (1898). His first play, *Widowers' Houses*, two acts of which had been written in 1885 in collaboration with Mr William Archer, was produced by the Independent Theatre under the management of Mr J. T. Grein at the Royalty in 1892. This found few admirers outside Socialist circles, and was hooted by the ordinary playgoer. In 1893 he wrote *The Philanderer*, a topical comedy on Ibsenism and the "new woman," for the same theatre, but the piece proved technically unsuitable for Mr Grein's company. To replace it Mr Shaw wrote *Mrs Warren's Profession*, a powerful but disagreeable play, which was rejected by the censor and not presented until the 5th of January 1902, when it was privately given by the Stage Society at the New Lyric Theatre. When it was played in New York by Mr Arnold Daly's company in 1905 the actors were prosecuted. These three plays were classed by the author as "unpleasant plays" in the printed version. *Arms and the Man* was produced at the Avenue Theatre (21st of April 1894) by Miss Florence Farr, who was experimenting on the lines of the Independent Theatre, and by Mr Richard Mansfield at the Herald Square Theatre, New York (the 17th of Sept. 1894). The scene was laid in Bulgaria, the piece being a satire on romanticism, a destructive criticism on military "glory." *Candida* was written in 1894 for Mr Mansfield, who did not produce it until December 1903; but it was played in Aberdeen in July 1897 by the Independent Theatre Company. This defence of the poetic point of view against brute force and common sense was admirably constructed and it proved one of the most popular of his plays. The pieces which followed are: *The Man of Destiny* (written in 1895, played at Croydon in 1897 by Mr Murray Carson), a Napoleonic drama, which was revived at New York by Arnold Daly in 1904; *You Never Can Tell* (written in 1896, produced at the Strand Theatre in 1900), a farcical comedy; *The Devil's Disciple* (produced at New York by Richard Mansfield in 1897, and in London in 1899), the scene of which is laid in the War of American Independence, *Caesar and Cleopatra* (1898) and *Captain Brassbound's Conversion* (1898)—printed as *Three Plays for Puritans* (1900); *The Admirable Bashville* (Stage Society, Imperial Theatre, 1903), a dramatization of *Cashel Byron's Profession*.

He had found no regular English audience when he published *Plays Pleasant and Unpleasant* (2 vols.) in 1898, and his pieces first became well known to the ordinary playgoer by the performances given at the Royal Court Theatre under the management of Messrs Vedrenne and H. Granville Barker. *Man and Superman* (published in 1903) was produced there on the 23rd of May 1905, in a necessarily abridged form, with Granville Barker in the part of John Tanner, the author of the "Revolutionists's Handbook and Pocket Companion," printed as an appendix to the play. Mr Shaw asserted that the piece originated in a suggestion from Mr A. B. Walkley that he should write a Don Juan play, which he proceeded to do in a characteristic topsy-turvy fashion. John Tanner (Juan Tenor) is a voluble exponent of Schopenhauer and Nietzsche, who finally falls a victim to the life force in Ann. *Major Barbara* (Court Theatre, Nov. 1905), a "discussion in three acts," placed the Salvation Army on the stage. The Vedrenne-Barker management also revived *Candida* (April 1904), *You Never Can Tell* (May 1905), *Captain Brassbound's Conversion* (March 1906) and *John Bull's other Island* (November 1904), a statement of the Irish land question, which had been produced at the Camden Theatre in 1903, and later by the Stage Society. At the same theatre was produced (20th of November 1906) *The Doctor's Dilemma*, a satire on the medical profession, and *How He lied to Her Husband* (Feb. 1905), which had been previously played in New York. Later plays were: *Getting Married* (1908), *The Showing-up of Blanco Posnet* (1909) and *Press-cuttings* (1909). Among Mr Shaw's later writings on economics are: *Socialism for Millionaires* (1901), *The Common Sense of Municipal Trading* (1904), and *Fabianism and the Fiscal Question* (1904). Although an energetic member of the South St Pancras borough council, he failed to secure election to the London County Council when he stood as a candidate in 1904. Mr Shaw married in 1898 Miss Charlotte Frances Payne-Townshend.

There are essays on his work by H. L. Mencken (Boston and London, 1905), by E. E. Hale (*Dramatists of To-Day*, London, 1906), &c.; "The Plays of Mr Bernard Shaw," in the *Edinburgh Review* (April 1905); "Mr Bernard Shaw's Counterfeit Presentment of Women," in the *Fortnightly Review* (March 1906); "Bernard Shaw as Critic," in the *Fortnightly Review* (June 1907); and an appreciation by Holbrook Jackson, *Bernard Shaw* (1907).

SHAW, HENRY WHEELER (1818–1885), American humorist, known by the pen-name of "Josh Billings," was born of Puritan stock at Lanesborough, Massachusetts, on the 21st of April 1818, the son of Henry Shaw (1788–1857), who was a representative in Congress in 1817–1821. The son left Hamilton College to go West. In 1858 he settled in Poughkeepsie, N.Y., as a land-agent and auctioneer, and began writing newspaper articles, especially for the *Poughkeepsie Daily Press*. His "Essa on the Muel bi Josh Billings" (1860) in a New York paper was followed by many similar articles, chiefly in the *New York Weekly* and the *New York Saturday Press*, and by several popular volumes, among which are *Josh Billings: His Sayings* (1866), *Josh Billings on Ice* (1868), *Everybody's Friend* (1876), *Josh Billings: His Works, Complete* (1876), *Trump Kards* (1877), *Old Probabilities* (1879), *Josh Billings' Spice-Box* (1881), and *Josh Billings' Farmers' Allminax*, burlesquing the *Old Farmers' Almanac*, issued annually between 1870 and 1880, and collected into a volume in 1902 under the title *Josh Billings' Old Farmers' Allminax*. He died in Monterey, California, on the 14th of October 1885. His platform lectures, such as "Milk," "Hobby Horse," "The Pensive Cockroach," and "What I kno about Hotels," his mannerisms and apparently unstudied witticisms made him conspicuous.

See *Life and Adventures of Josh Billings* (New York, 1883), by Francis S. Smith.

SHAW, LEMUEL (1781–1861), American jurist, was born at Barnstable, Massachusetts, son of the minister of the West Parish there, on the 9th of January 1781. He graduated from Harvard College in 1800, and was admitted to the bar (of New Hampshire and of Massachusetts) in 1804. In 1805 he began to practise law in Boston. He was a prominent Federalist and was a member of the Massachusetts House of Representatives in 1811–1814, in 1820, and in 1829, and of the state Senate in 1821–1822, a delegate to the state constitutional convention of 1820–1821, and chief justice of the Supreme Court of the state from 1830 to 1860. He died in Boston on the 30th of March 1861. As chief justice Shaw maintained the high standard of excellence set by Theophilus Parsons. He presided over the trial in 1850 of Professor John White Webster (1793–1850) for the murder of Dr George Parkman. His work in extending the equity, jurisdiction and powers of the court was especially notable. He was also largely instrumental in defeating an attempt (1843) to make a reduction of salary apply to judges already in office, and an attempt (1853) to abolish the life term of judges. His opinion in *Cary* v. *Daniels* (8 Metcalf) is the basis of the present law in Massachusetts as to the regulation of water power rights of riparian proprietors.

See the address by B. F. Thomas in *Proceedings of the Massachusetts Historical Society*, x. 50-79 (Boston, 1869); and the sketches by Samuel S. Shaw and P. Emory Aldrich in vol. iv. pp. 200-247, of *Memorial Biographies of the New England Historic Genealogical Society* (Boston, 1885).

SHAW, RICHARD NORMAN (1831–), British architect, was born in Edinburgh on the 7th of May 1831. At the age of sixteen he went to London and became a pupil of William Burn. In Burn's office he formed that friendship with William Eden Nesfield which so profoundly influenced the careers of both, and was thoroughly grounded in the science of planning and in the classical vernacular of the period. He also attended the architectural schools of the Royal Academy, and devoted careful study both to ancient and to the best contemporary buildings. In 1854, having finished his term of apprenticeship with Burn, he gained the gold medal and travelling studentship of the Royal Academy, and until 1856 travelled on the continent, studying and drawing old work. On his return in 1856 he was requested by the Council of the Royal Academy to publish his drawings. This work, entitled *Architectural Sketches from the Continent*, was issued in 1858. In the meantime Nesfield was continuing his studies with Anthony Salvin; Mr Shaw also entered his office, and remained there until 1857, when he widened his experience by working for three years under George Edmund Street. In 1863, after sixteen years of severe training, he began to practise. For a short time he and Nesfield joined forces, but their lines soon diverged. Mr Shaw's first work of importance was Leyes Wood, in Surrey, a building of much originality, followed shortly afterwards by Cragside, for Lord Armstrong, which was begun in 1869. From that time until he retired from active practice his works followed one another in quick succession. In 1872 Mr Shaw was elected an Associate of the Royal Academy, and a full member in 1877; he joined the "retired" list towards the end of 1901.

Other characteristic examples of Shaw's work are Preen Manor, Shropshire; New Zealand Chambers, Leadenhall Street; Pierrepont, Wispers, and Merrist Wood, in Surrey; Lowther Lodge, Kensington; Adcote, in Shropshire; his houses at Kensington, Chelsea, and at Hampstead; Flete House, Devonshire; Greenham Lodge, Berkshire; Dawpool, in Cheshire; Bryanstone, in Dorsetshire; Chesters, Northumberland; New Scotland Yard, on the Thames Embankment; besides several fine works in Liverpool and the neighbourhood. He also built and restored several churches, the best known of which are St John's Church, Leeds; St Margaret's, Ilkley, and All Saints', Leek. His early buildings were most picturesque, and contrasted completely with the current work of the time. The use of "half timber" and hanging tiles, the projecting gables and massive chimneys, and the cunningly contrived bays and recessed fireplaces, together with the complete freedom from the conventions and trammels of "style," not only appealed to the artist, but gained at once a place in public estimation. Judged in the light of his later work, some of those early buildings appear almost too full of feature and design; they show, however, very clearly that Mr Shaw, in discarding "academic style," was not drifting rudderless on a sea of fancy. His buildings, although entirely free from archaeological pedantry, were the outcome of much enthusiastic and intelligent study of old examples, and were based directly on old methods and traditions. As his powers developed, his buildings gained in dignity, and had an air of serenity and a quiet homely charm which were less conspicuous in his earlier works; the "half timber" was more sparingly used, and finally disappeared entirely. His work throughout is especially distinguished by treatment of scheme. There is nothing tentative or hesitating. His planning is invariably fine and full of ingenuity. Adcote (a beautiful drawing of which hangs in the Diploma Gallery at Burlington House) is perhaps the best example of the series of his country houses built between 1870 and 1880. The elements are few but perfectly proportioned and combined, and the scale throughout is consistent. The Great Hall is the keynote of the plan, and is properly but not unduly emphasized. The grouping of the rooms round the Hall is very ably managed—each room is in its right position, and has its proper aspect. New Zealand Chambers, in Leadenhall Street, another work of about the same period (1870–1880), is a valuable example of Mr Shaw's versatility. Here he employed a completely different method of expression from any of his preceding works, in all of which there is a trace of "Gothic" feeling. This is a façade only of two storeys, divided by piers of brickwork into three equal spaces, filled by shaped bays rich with modelled plaster; above, drawing the whole composition together, is a finely enriched plaster cove. An attic storey, roofed with three gables, completes the building, which is the antithesis of the accepted type of city offices; it is yet perfectly adapted to modern uses. New Scotland Yard is undoubtedly Mr Shaw's finest and most complete work. The plain granite base is not only subtly suggestive of the purposes of the building, but by dividing the height with a strongly marked line gives a greater apparent width to the structure; it suggests also a division of departments. By its mass, too, it prevents the eye from dwelling on the necessary irregularity of the lower windows, which are not only different in character from those of the upper storeys, but more numerous and quite irregularly spaced. The projecting angle turrets are most happily conceived, and besides giving emphasis to the corners, form the main point of interest in the composition of the river front. The chimneys are not allowed to cut the sky-line in all directions, but have been drawn together into massive blocks, and contribute much to the general air of dignity and strength for which this building is remarkable. Simple roofs of ample span complete a composition conspicuous for its breadth and unity.

Mr Shaw's influence on his generation can only be adequately gauged by a comparison of current work with that which was in vogue when he began his career. The works of Pugin, Scott, and others, and the architectural literature of the time, had turned the thoughts both of architects and the public towards a "revived Gothic." Before he entered the field, this teaching had hardened into a creed. Mr Shaw was not content to hold so limited a view, and with characteristic courage threw over these artificial barriers and struck out a line of his own. The rapidity with which he conceived and created new types, and as it were set a new fashion in building, compelled admiration for his genius, and swelled the ranks of his adherents. It is largely owing to him that there is now a distinct tendency to approach architecture as the art of Building rather than as the art of Designing, and the study of old work as one of methods and expressions which are for all time, rather than as a means of learning a language of forms proper only to their period.

SHAW-KENNEDY, SIR JAMES (1788–1865), British soldier and military writer, was the son of Captain John Shaw, of Dalton, Kirkcudbrightshire. Joining the 43rd (Monmouthshire) Light Infantry in 1805, he first saw service in the Copenhagen Expedition of 1807 as a lieutenant, and under Sir David Baird took part in the Corunna Campaign of 1808–9. In the retreat Shaw contracted a fever, from the effects of which he never fully recovered. The 43rd was again engaged in the Douro and Talavera Campaigns, and Shaw became adjutant of his now famous regiment at the battle of Talavera. As Robert Craufurd's aide-de-camp he was on the staff of the Light Division at the Coa and the Agueda, and with another officer prepared and edited the "Standing Orders of the Light Division" (printed in Home's *Précis of Modern Tactics*, pp. 257-277), which serve as a model to this day. He was wounded at Almeida in 1810, but rejoined Craufurd at the end of 1811 and was with his chief at the siege of Ciudad Rodrigo in January 1812. At the great assault of January 19th Shaw carried his general, mortally wounded, from the glacis, and at Badajoz, now once more with the 43rd, he displayed, at the lesser breach, a gallantry which furnished his brother officer William Napier with the theme of one of his most glorious descriptive passages (*Peninsular War*, bk. xvi. ch. v.). At the siege and the battle of Salamanca, in the retreat from Burgos, Shaw, still a subaltern, distinguished himself again and again, but he had to return to England at the end of the year, broken in health. Once more in active service in 1815, as one of Charles Alten's staff officers, Captain Shaw, by his reconnoitring skill and tactical judgment was of the greatest assistance to Alten and to Wellington, who promoted him brevet-major in July, and brevet lieut.-colonel in 1819. During the occupation of France by the allied army Shaw was commandant of Calais, and on his return to England was employed as a staff officer in the North. In this capacity he was called upon to deal with the Manchester riots of 1819, and his memorandum on the methods to be adopted in dealing with civil disorders embodied principles which have been recognized to the present day. In 1820 he married, and in 1834, on succeeding, in right of his wife, to the estate of Kirkmichael, he took the name of Kennedy. Two years later Colonel Shaw-Kennedy was entrusted with the organization of the Royal Irish Constabulary, which he raised and trained according to his own ideas. He remained inspector-general of the R.I.C. for two years, after which for ten years he led a retired country life. In 1848, during the Chartist movements, he was suddenly called upon to command at Liverpool, and soon afterwards was offered successively a command in Ireland and the governorship of Mauritius. Ill-health compelled him to decline these, as also the Scottish command a little later, and for the rest of his life he was practically an invalid. He became full General in 1862 and was made K.C.B. a year later. In 1859, at the time of the Orsini case, he published a remarkable essay on *The Defence of Great Britain and Ireland*, and in 1865 appeared his famous *Notes on Waterloo*, appended to which is a *Plan for the defence of Canada*. He died the same year.

See the autobiographical notice in *Notes on Waterloo*, also the regimental history of the 43rd and Napier, *passim.*

SHAWL, a square or oblong article of dress worn in various ways dependent from the shoulders. The term is of Persian origin (*shâl*), and the article itself is most characteristic of the natives of N.W. India and Central Asia; but in various forms, and under different names, the same piece of clothing is found in most parts of the world. The shawls made in Kashmir occupy a pre-eminent place among textile products; and it is to them and to their imitations from Western looms that specific importance attaches. The Kashmir shawl is characterized by the elaboration of its design, in which the "cone" pattern is a prominent feature, and by the glowing harmony, brilliance, depth, and enduring qualities of its colours. The basis of these excellences is found in the very fine, soft, short, flossy under-wool, called pashm or pashmina, found on the shawl-goat, a variety of *Capra hircus* inhabiting the elevated regions of Tibet. There are several varieties of pashm, but the finest is a strict monopoly of the maharaja of Kashmir. Inferior pashm and Kirman wool—a fine soft Persian sheep's wool—are used for shawl weaving at Amritsar and other places in the Punjab, where colonies of Kashmiri weavers are established. Of shawls, apart from shape and pattern, there are only two principal classes: (1) loom-woven shawls called tiliwalla, tilikár or káni kár—sometimes woven in one piece, but more often in small segments which are sewn together with such precision that the sewing is quite imperceptible; and (2) embroidered shawls—amlikár—in which over a ground of plain pashmina is worked by needle a minute and elaborate pattern.

SHAWM, Shalm (Fr. *chalumeau*, *chalemelle*, *hautbois*; Ger. *Schalmei*, *Schalmey*; Ital. *Piffar cenamelle*; Lat. *calamus*; *tibia*; Gr. αὐλός), the medieval forerunner of the oboe, the treble members of the large family of reed instruments known in Germany as the *Pommer* (*q.v.*), *Bombart* or *Schalmey* family. Michael Praetorius, at the beginning of the 17th century, enumerates the members of this family (see Oboe); the two of highest pitch are Schalmeys, the first or little Schalmey being in B♭ (third line) or A, and the second, also called cantus or discant, in E or D below. The shawm or Schalmey had a compass of two octaves, the second diatonic octave being obtained by overblowing each of the notes of the first octave an octave higher; the chromatic semitones were produced by half stopping the holes and by cross-fingering. In some instances the reed mouthpiece was half enclosed in a *pirouette*, a small case having a slit through which that part of the reed which is taken into the mouth of the player was alone exposed, the edges of the slit thus forming a rest for his lips.

In the miniatures of the illuminated MSS. of all countries, more especially from the 14th century, and in early printed books, Schalmeys and Pommers are represented in every conceivable phase of social life in which music takes a part. (K. S.)

SHAWNEE or Shawano (said to mean "southerner"), a tribe of North American Indians of Algonquian stock. They are said to have been first found in Wisconsin. Under the name Sacannahs towards the end of the 17th century they had their headquarters in South Carolina on the upper Savannah. Moving eastward they came in contact with the Iroquois, by whom they were driven S. again into Tennessee. Thence they crossed the mountains into South Carolina and again spread northward as far as New York state and southward to Florida. Subsequently they recrossed the Alleghany mountains, once more came in contact with the Iroquois and were driven into Ohio. They joined in Pontiac's conspiracy. They fought on the English side in the War of Independence and again in 1812 under Tecumseh. They are now on a reservation in Oklahoma.

SHAWNEE, a city of Pottawatomie county, Oklahoma, U.S.A., on the North Fork of the Canadian river, about 38 m. E.S.E. of Oklahoma city. Pop. (1907) 10,955, including 748 negroes and 20 Indians; (1910) 12,474. Shawnee is served by the Atchison, Topeka & Santa Fé, the Chicago, Rock Island & Pacific, and the Missouri, Kansas & Texas railways and by interurban electric lines. The city has two large public parks and a Carnegie library, and is the seat of the Curtice Industrial School. Shawnee is situated in a fine agricultural region, is a shipping-point for alfalfa, cotton and potatoes, is an important market for mules, and has large railway repair shops, and cotton-gins and cotton compresses; among its manufactures are cotton-seed oil, cotton goods, lumber, bricks and flour. Shawnee was first settled in 1895 and was chartered as a city in 1896.

SHAYS, DANIEL (1747–1825), American soldier, the leader of Shays's Insurrection in W. Massachusetts in 1786–1787 (see MASSACHUSETTS: *History*), was born in Hopkinton, Massachusetts, in 1747. In the War of Independence he served as second lieutenant in a Massachusetts regiment from May to December 1775, became captain in the 5th Massachusetts regiment in January 1777, and resigned his commission in October 1780. After the collapse of Shays's Insurrection he escaped to Vermont. He was pardoned in June 1788, and died at Sparta, New York, on the 29th of September 1825.

SHEARER, THOMAS, English 18th-century furniture designer and cabinet-maker. The solitary biographical fact we possess relating to this distinguished craftsman is that he was the author of most of the plates in *The Cabinet Maker's London Book of Prices and Designs of Cabinet Work*, issued in 1788 "For the London Society of Cabinet Makers." The majority of these plates were republished separately as *Designs for Household Furniture*. They exhibit their author as a man with an eye at once for simplicity of design and delicacy of proportion. Indeed some of his pieces possess a dainty and slender elegance which has never been surpassed in the history of English furniture.

There can be little doubt that Shearer exercised considerable influence over Hepplewhite, with whom there is reason to suppose that he was closely associated, while Sheraton has recorded his admiration for work which has often been attributed to others. Shearer, in his turn, owes something to the brothers Adam, and something no doubt, to the stock designs of his predecessors. There is every reason to suppose that he worked at his craft with his own hands and that he was literally a cabinet-maker—so far as we know, he never made chairs. Much of the elegance of Shearer's work is due to his graceful and reticent employment of inlays of satinwood and other foreign woods. But he was as successful in form as in decoration, and no man ever used the curve to better purpose. In Shearer's time the sideboard was in process of evolution; previously it had been a table with drawers, the pedestals and knife-boxes being separate pieces. He would seem to have been first to combine them into the familiar and often beautiful form they took at the end of the 18th century. The combination may have been made before, but his plate is, in point of time, the first published document to show it.

Shearer, like many of his contemporaries, was much given to devising "harlequin" furniture. He was a designer of high merit and real originality, and occupies a distinguished place among the little band of men, often, like himself, ill-educated and obscure of origin, who raised the English cabinet-making of the second half of the 18th century to an illustrious place in artistic history.

SHEARS, an implement for cutting or clipping. The O. Eng. *sceran*, to clip, cut, represents one branch of a very large number of words in Indo-European languages which are to be referred to the root *skar-*, to cut, and of which may be mentioned Gr. *κείρειν*, Lat. *curtus*, Eng. "short," "share," "sherd," "score." For cutting cloth "shears" take the form of a large, heavy pair of scissors with two crossed flat blades pivoted together, each with a looped handle for the insertion of the fingers; for clipping or "shearing" sheep the usual form is a single piece of steel bent round, the ends being shaped into the cutting blades, and the bend or "bow" forming a spring which opens the blades when the pressure used in cutting is released. Another form of the same word, "sheers," is used of an apparatus for hoisting heavy weights, generally known as "sheer-legs." These consist of two or more uprights meeting at the top, where the hoisting tackle is placed, and set wide apart at the bottom. The masting of ships was formerly carried out from another vessel, a dismasted hulk, hence called a "sheer-hulk," on which the "sheer-legs" were placed (see CRANE). From this word must be distinguished "sheer," straight, precipitous, also absolute, downright; this is to be connected with Dan. *skjaer*, clear, bright, Ger. *schier*, free, clear; the root is also seen in O. Eng. *scinan*, to shine. The nautical phrase "to sheer off," to deviate from a course, is due to a similar Dutch use of *scheren*, to cut, shear, to cut off a course abruptly.

SHEARWATER, the name of a bird, first published in F. Willughby's *Ornithologia* (p. 252), as made known to him by Sir T. Browne, who sent a picture of it with an account that is given more fully in J. Ray's translation of that work (p. 334), stating that it is "a Sea-fowl, which fishermen observe to resort to their vessels in some numbers, swimming[1] swiftly to and fro, backward, forward and about them, and doth as it were *radere aquam*, shear the water, from whence perhaps it had its name."[2] Ray's mistaking young birds of this kind obtained in the Isle of Man for the young of the coulterneb, now usually called "Puffin," has already been mentioned under that heading; and not only has his name *Puffinus anglorum* hence become attached to this species, commonly described in English books as the Manx puffin or Manx shearwater, but the barbarous word *Puffinus* has come into use for all birds thereto allied, forming a well-marked group of the family Procellariidae (see PETREL), distinguished chiefly by their elongated bill, and numbering some twenty species, if not more—the discrimination of which has taxed the ingenuity of ornithologists. Shearwaters are found in nearly all the seas and oceans of the world,[3] generally within no great distance from the land, though rarely resorting thereto, except in the breeding season. But they also penetrate to waters which may be termed inland, as the Bosporus, where they are known to the French-speaking part of the population as *âmes damnées*, it being held by the Turks that they are animated by condemned human souls. Four species of *Puffinus* are recorded as visiting the coasts of the United Kingdom; but the Manx shearwater is the only one that at all commonly breeds in the British Islands. It is a very plain-looking bird, black above and white beneath, and about the size of a pigeon. Some other species are larger, and almost whole-coloured, being of a sooty or dark cinereous hue both above and below. All over the world shearwaters seem to have precisely the same habits, laying their single purely white egg in a hole under ground. The young are thickly clothed with long down, and are extremely fat. In this condition they are thought to be good eating, and enormous numbers are caught for this purpose in some localities, especially of a species, the *P. brevicaudus* of Gould, which frequents the islands off the coast of Australia, where it is commonly known as the "Mutton-bird." (A. N.)

SHEATHBILL, a bird so-called by T. Pennant in 1781 (*Gen. Birds*, ed. 2, p. 43) from the horny case[4] which ensheaths the basal part of its bill. It was first made known from having been met with on New-Year Island, off the coast of Staten Land, where Cook anchored on New Year's eve 1774.[5] A few days later he discovered the islands that now bear the name of South Georgia, and there the bird was again found—in both localities frequenting the rocky shores. On his third voyage, while seeking some land reported to have been found by Kerguelen, Cook in December 1776 reached the cluster of desolate islands now generally known by the name of the French explorer, and here, among many other kinds of birds, was a Sheathbill, which for a long while no one suspected to be otherwise than specifically identical with that of the western Antarctic Ocean; but, as will be seen, its distinctness has been subsequently admitted.

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[1] Meaning, no doubt, skimming or "hovering," the latter the word used by Browne in his *Account of Birds found in Norfolk* (Mus. Brit. MS. Sloane, 1830, fol. 5. 22 and 31), written in or about 1662. Edwards (*Gleanings*, iii. 315) speaks of comparing his own drawing "with Brown's old draught of it, still preserved in the British Museum," and thus identifies the latter's "shearwater" with the "puffin of the Isle of Man."

[2] *Lyrie* appears to be the most common local name for this bird in Orkney and Shetland; but *Scraib* and *Scraber* are also used in Scotland. These are from the Scandinavian *Skraape* or *Skrofa*, and considering Skeat's remarks (*Etym. Dictionary*) as to the alliance between the words *shear* and *scrape* it may be that Browne's hesitation as to the derivation of "shearwater" had more ground than at first appears.

[3] The chief exception would seem to be the Bay of Bengal and thence throughout the W. of the Malay Archipelago, where, though they may occur, they are certainly uncommon.

[4] A strange fallacy arose that this case or sheath was movable. It is absolutely fixed.

[5] Doubtless some of the earlier voyagers had encountered it, as Forster suggests (*Descr. animalium*, p. 330) and Lesson asserts

The Sheathbill, so soon as it was brought to the notice of naturalists, was recognized as belonging to a genus hitherto unknown, and J. R. Forster in 1788 (*Enchiridion*, p. 37) conferred upon it, from its snowy plumage, the name *Chionis*, which has most properly received general acceptance, though in the same year the compiler Gmelin termed the genus *Vaginalis*, as a rendering of Pennant's English name, and the species *alba*. It has thus become the *Chionis alba* of ornithology. It is about the size of and has much the aspect of a Pigeon;[1] its plumage is pure white, its bill somewhat yellow at the base, passing into pale pink towards the tip. Round the eyes the skin is bare, and beset with cream-coloured papillae, while the legs are bluish-grey. The second or eastern species, first discriminated by G. Hartlaub (*Rev. zoologique*, 1841, p. 5; 1842, p. 402, pl. 2)[2] as C. *minor*, is smaller in size, with plumage just as white, but having the bill and bare skin of the face black and the legs much darker. The form of the bill's "sheath" in the two species is also quite different, for in *C. alba* it is almost level throughout, while in *C. minor* it rises in front like the pommel of a saddle. The western and larger species gathers its food, consisting chiefly of sea-weeds and shell-fish, on rocks at low water; but it is also known to eat birds' eggs. As to the flavour of its flesh, some assert that it is wholly uneatable, and others that it is palatable. Though most abundant as a shore-bird, it is frequently met with far out at sea, and has once been shot in Ireland. It is not uncommon on the Falkland Isles, where it breeds. *C. minor* of Kerguelen Land, Prince Edward Island, Marion Island and the Crozets, is smaller, with pinkish feet. The eggs of both species, though of peculiar appearance, bear an unmistakable likeness to those of oyster-catchers, while occasionally exhibiting a resemblance to those of the tropic-birds.

The systematic position of the sheathbills has been the subject of much hesitation, but they are now placed in a special family, Chionidae, amongst Charadriiform birds (see BIRDS), not far from the curious little group of "seed-snipes" of the genera *Thinocorys* and *Attagis*, which are peculiar to certain localities in S. America and its islands. (A. N.)

SHEBOYGAN, a city and the county seat of Sheboygan county, Wisconsin, U.S.A., on the W. shore of Lake Michigan at the mouth of the Sheboygan river, about 52 m. N. of Milwaukee. Pop. (1910 census) 26,398. The population is largely of German descent, and two German newspapers are published; many Greeks settled here after 1895. Sheboygan is served by the Chicago & North-Western railway, by interurban electric lines and by a steam-boat line (the Goodrich Transportation Co.). The city N. of the river and the southern half of the part S. of the river are built on a plateau 20-40 ft. above the lake level. Along the river is the factory district. The principal public buildings are a fine Federal building in which are housed the post office and the office of the internal revenue; a Carnegie library, the Sheboygan County Court House, an opera house, St Nicholas Hospital and a county insane asylum. Included in the public school system is a school for deaf children, partly supported by the state. The city has a good harbour and is an important distributing point for coal and salt. A rich agricultural region, devoted largely to dairying, extends to the N., S. and W., and large quantities of cheese are exported. Among the city's other manufactures are furniture, particularly chairs (for which the city is noted), toys, machinery, bee hives, gloves, knit goods, brick, carriages, wagons, excelsior, tanned leather, shoes, enamel ware, canned vegetables (especially peas), beer, flour, pianos and plumbing supplies. The total value of the factory product in 1905 was $10,086,648, 38·1% representing furniture; and 56·7% of the whole number of factory wage-earners were employed in the furniture factories. A trading post at the mouth of the Sheboygan river was established about 1820 and was maintained for about fourteen years; in 1834 a saw-mill was built at the first rapids of the river, about 2 m. from its mouth, and during the next three years many settlers came and a great city was platted on paper. Sheboygan was incorporated as a village in 1846, and was first chartered as a city in 1853. Several miles from Sheboygan Falls (pop. in 1905, 1411), a village about 5 m. W. of Sheboygan and S.W. of Plymouth (pop. in 1905, 2764), the Spring Farms Association, a Fourierite community of ten families, farmed successfully thirty acres of land from 1845 until 1848, when lack of interest in the experiment brought about a dissolution by mutual agreement.

SHECHEM (mod. *Nāblus*), an ancient town of Palestine, S.E. of Samaria, which first appears in history as the place where Jacob and his family settled for a while (Gen. xxxiii. 18; cf. John iv. 12). It was occupied then by Hivites (Gen. xxxiv. 2), and a tragedy took place in connexion with the chieftain's violation of Jacob's daughter Dinah. It was set apart as a city of refuge (Jos. xx. 7) and was occupied by the Kohathite Levites in the tribe of Ephraim (xxi. 21). Here, between Ebal and Gerizim, Joshua made his last speech to the elders of the Israelites (Jos. xxiv. 1). The mother of Abimelech the son of Gideon was a Shechemite, and Shechem was the centre of his short-lived kingdom (Jud. viii. 31, ix.). Here Rehoboam made the foolish speech which kindled the revolt of the N. kingdom (1 Kings xii. 1), after which it was for a time the headquarters of Jeroboam (1 Kings xii. 25).

Shechem was evidently a holy place in remote antiquity. The "oak" under which Jacob hid his teraphim (Gen. xxxv. 4) was doubtless a sacred tree, as there the images (which it was not seemly to bring on a pilgrimage to Beth-el) would be safe. The god of the Canaanite city was Baal-Berith: his temple was destroyed when Abimelech quelled the rising of his fickle subjects (Jud. ix. 4, 46). A great standing stone under an oak-tree here was traditionally associated with Joshua's last speech (Jos. xxiv. 26). During the latter part of the Hebrew monarchy we hear nothing of Shechem, no doubt on account of the commanding importance of the neighbouring city of Samaria. It no doubt owed its subsequent development to the destruction of Samaria and the rise in the district surrounding of the Samaritan nation founded on the colonists settled by Sargon and Assurbani-pal. To Josephus it was "the new city" by the inhabitants called Mabortha (*B. J.*, IV. viii. 1), but the official name *Neapolis* or *Flavia Neapolis*, so called to commemorate its restoration by Vespasian (Titus Flavius Vespasianus), soon became universal, and is still preserved in the modern name Nāblus—a signal exception to the general rule that the place-names of Palestine, whenever disturbed by foreign influence, usually revert in time to the old Semitic nomenclature.

There was a bishopric at Neapolis during the Byzantine period, and an attack made by the Samaritans on the bishop (Pentecost, A.D. 474) was punished by the emperor Zeno, who gave Gerizim to the Christians. It was captured by the crusaders under Tancred soon after the conquest of Jerusalem (1099); they held it till 1184, when they lost it to Saladin. The principal mosque of the town is a church of the crusaders converted to Mahommedan worship. Towards the end of the 18th century it was the headquarters of the turbulent sheikh Kasim el-Ahmad. In 1834 the soldiers of Ibrahim Pasha pillaged it.

Nāblus is now the chief town of a subdivision of the province of Beirut. It lies in the valley between Ebal and Gerizim, on the main caravan route from Jerusalem northward. The situation

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(*Man. d'ornithologie*, ii. 343); but for all practical purposes we certainly owe its discovery to the naturalists of Cook's second voyage. By some error, probably of transcription, New Zealand, instead of New-Year Island, appears in many works as the place of its discovery, while not a few writers have added thereto New Holland. Hitherto there is no real evidence of the occurrence of a Sheathbill in the waters of Australia or New Zealand.

[1] In the Falkland Isles it is called the "Kelp-Pigeon," and by some of the earlier French navigators the "Pigeon blanc antarctique." The cognate species of Kerguelen Land is named by the sealers "Sore-eyed Pigeon," from its prominent fleshy orbits, as well as "Paddy-bird"—the last doubtless from its white plumage calling to mind that of some of the smaller Egrets, so-called by the English in India and elsewhere.

[2] Lesson (*loc. cit.*) cites a brief but correct indication of this species as observed by Lesquin (*Lycée armoricain*, x. 36) on Crozet Island, and, not suspecting it to be distinct, was at a loss to reconcile the discrepancies of the latter's description with that given of the other species by earlier authors.

is famous for its beauty. There are about 24,000 inhabitants—all Moslems except about 150 Samaritans and perhaps 700 Christians. The inhabitants are notorious for fanaticism and lawlessness, and Europeans are usually greeted with vile epithets. There are missions, both Protestant and Roman Catholic; and an important hospital under the auspices of the Church Missionary Society. There is a flourishing trade in soap, which is here manufactured, and a considerable commerce in wool and cotton with the regions E. of the Jordan.

In the neighbourhood of Nāblus are shown: (1) a modern building which covers the traditional site of the tomb of Joseph, as accepted by Jews, Samaritans and Christians. The authority for the burial of Joseph at Shechem is the speech of Stephen (Acts vii. 16), though Josephus places the sepulchre at Hebron (*Ant.* II. viii. 2). Moslem tradition also regards Shechem as the burial-place of Joseph; but it appears as though the actual site, as shown, has not been always in one unvarying spot. (2) The well of Jacob, about a mile and a half from Nāblus on the way to Jerusalem, which is an excavation of great depth. The tradition fixing this hallowed place seems to have been constant throughout the whole of the Christian centuries, and it is one of the very few "holy places" shown to travellers and pilgrims in Palestine, the authenticity of which deserves consideration. It is one of the small number of sites mentioned by the Bordeaux pilgrim (A.D. 333).

The site of the sacred oak has been sought at two places: one called *El-'Amūd*, "the column"—where is "Joseph's tomb"; and the other at *Balāta* (a name containing the consonants of the Semitic word for "oak"), near Jacob's well. (R. A. S. M.)

SHED. (1) A small hut, shelter or outhouse, especially one with a "shed roof" or "lean-to," a roof with only one set of rafters, falling from a higher to a lower wall, like an aisle roof. "Shed" is also the term applied to a large roofed shelter open at the sides for the storage of goods, rolling-stock, locomotives, &c., on a railway or dock-wharf. According to Skeat, the word is a Kentish form of "shade," "shadow," in O. Eng. *scæd*, *sceadu*, cf. Ger. *Schatten*; the ultimate origin is the root *ska-*, to cover, seen in Gr. σκιά, shadow, σκηνή, tent, shelter, stage, whence Eng. "scene"; the Eng. "sky" comes from a closely allied root *sku*, also to cover, cf. Lat. *obscurus*. (2) To spill, to scatter, to cast off; originally the word seems to have meant to part, to divide, a use only surviving in "watershed." The O. Eng. verb was *sceâdan*, in Mid. Eng. *shæden*, to divide, separate. "Shed" in the sense of to spill has, however, by some etymologists been taken to be a separate word from that meaning to part; it would in that case appear to be connected with O. Fris. *schedda*, to shake, the root of which is found in "shudder."

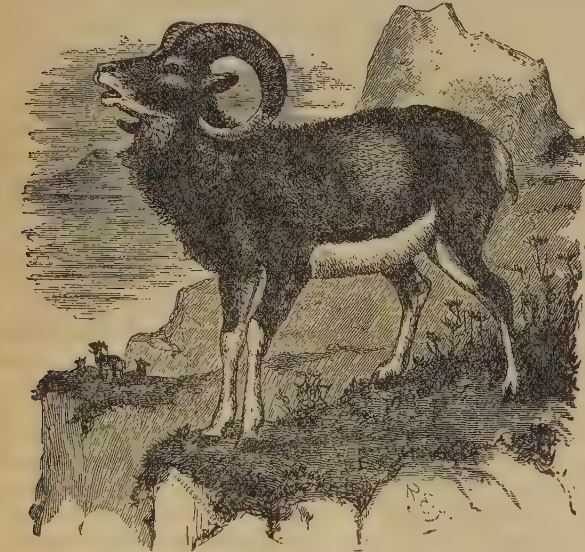
SHEDD, WILLIAM GREENOUGH THAYER (1820–1894), American Presbyterian, was born in Acton, Massachusetts, on the 21st of June 1820. In 1839 he graduated at the University of Vermont, and in 1843 at Andover Theological Seminary. After a short pastorate at Brandon, Vermont, he was successively professor of English literature in the University of Vermont (1845–1852), professor of sacred rhetoric in Auburn Theological Seminary (1852–1854), professor of church history in Andover Theological Seminary (1854–1862), and, after one year (1862–1863) as associate pastor of the Brick Church of New York City, of sacred literature (1863–1874) and of systematic theology (1874–1890) in Union Theological Seminary. He died in New York City on the 17th of November 1894.

Dr Shedd was a high Calvinist and was one of the greatest systematic theologians of the American Presbyterian church. His great work was *Dogmatic Theology* (3 vols., 1888–1894). He also wrote *Lectures on the Philosophy of History* (1856), in which he applied to history the doctrine of organic evolution; *Discourses and Essays* (1856); *A Manual of Church History* (2 vols., 1857), a translation of Guericke; *A History of Christian Doctrine* (2 vols., 1863); *Theological Essays* (1877); *Literary Essays* (1878); *Commentary on the Epistle to the Romans* (1879); *The Doctrine of Endless Punishment* (1885); and he edited Coleridge's *Complete Works* (7 vols., New York, 1894).

SHEE, SIR MARTIN ARCHER (1770–1850), English portrait-painter and president of the Royal Academy, was born in Dublin on the 23rd of December 1770. He was sprung from an old Irish family, and his father, a merchant, regarded the profession of a painter as no fit occupation for a descendant of the Shees. Young Shee became, nevertheless, a student of art in the Dublin Society, and came early to London, where he was, in 1788, introduced by Burke to Reynolds, by whose advice he studied in the schools of the Royal Academy. In 1789 he exhibited his first two pictures, the Head of an Old Man and Portrait of a Gentleman. During the next ten years he steadily increased in practice. He was chosen an associate of the Royal Academy in 1798, shortly after Flaxman, and in 1800 he was made a Royal Academician. In the former year he had married, removed to Romney's house in Cavendish Square, and set up as his successor. Shee continued to paint with great readiness of hand and fertility of invention, although his portraits were eclipsed by more than one of his contemporaries, and especially by Lawrence, Hoppner, Phillips, Jackson and Raeburn. The earlier portraits of the artist are carefully finished, easy in action, with good drawing and excellent discrimination of character. They show an undue tendency to redness in the flesh painting—a defect which is still more apparent in his later works, in which the handling is less "square," crisp and forcible. In addition to his portraits he executed various subjects and historical works, such as Lavinia, Belisarius, his diploma picture Prospero and Miranda, and the Daughter of Jephthah. In 1805 he published a poem consisting of *Rhymes on Art*, and it was succeeded by a second part in 1809. Byron spoke well of it in his *English Bards and Scotch Reviewers*, and invoked a place for "Shee and genius" in the temple of fame. Shee published another small volume of verses in 1814, entitled *The Commemoration of Sir Joshua Reynolds, and other Poems*, but this effort did not greatly increase his fame. He now produced a tragedy called *Alasco*, of which the scene was laid in Poland. The play was accepted at Covent Garden, but Colman, the licenser, refused it his sanction, on the plea of its containing certain treasonable allusions, and Shee, in great wrath, resolved to make his appeal to the public. This violent threat he carried out in 1824, but *Alasco* is still on the list of unacted dramas. On the death of Lawrence in 1830, Shee was chosen president of the Royal Academy, and shortly afterwards he received the honour of knighthood. In the dispute regarding the use of rooms to be provided by government, and in his examination before the parliamentary committee of 1836, he ably defended the rights of the Academy. He continued to paint till 1845, and died on the 13th of August 1850.

SHEEP (from the Anglo-Saxon *sceâp*, a word common in various forms to Teutonic languages; *e.g.* the German *Schaf*), a name originally bestowed in all probability on the familiar domesticated ruminant (*Ovis aries*), but now extended to include its immediate wild relatives. Although many of the domesticated breeds are hornless, sheep belong to the family of hollow-horned ruminants or Bovidae (*q.v.*). Practically they form a group impossible of definition, as they pass imperceptibly into the goats. Both sexes usually possess horns, but those of the females are small. In the males the horns are generally angulated, and marked by fine transverse wrinkles; their colour being greenish or brownish. They are directed outwards, and curve in an open spiral, with the tips directed outwards. Although there may be a fringe of hair on the throat, the males have no beard on the chin; and they also lack the strong odour characteristic of goats. Usually the tail is short; and in all the wild species the coat takes the form of hair, and not wool. Like goats, sheep have narrow upper molar teeth, very different from those of the oxen, and narrow hairy muzzles. Between the two middle toes, in most species, is lodged a deep glandular bag having the form of a retort with a small external orifice, which secretes an unctuous and odorous substance. This, tainting the herbage or stones over which the animal walks, affords the means by which, through the powerfully developed sense of smell, the neighbourhood of other individuals of the species is recognized. The crumen or suborbital face-gland, which is so largely developed and probably performs the same office in some antelopes and deer, is present, although in a comparatively rudimentary form, in most species, but is absent in others. Wild sheep attain their maximum development, both in respect of number and size, in Central Asia. They associate either in large flocks, or in family-parties; the old males generally keeping apart from the rest. Although essentially mountain animals, sheep generally frequent open, undulating districts, rather than the precipitous heights to which goats are partial. It may be added that the long tails of most tame breeds are, like wool, in all probability the results of domestication.

The Pamir plateau, on the confines of Turkestan, at an elevation of 16,000 ft. above the sea-level, is the home of the magnificent *Ovis poli*, named after the celebrated Venetian traveller Marco Polo, who met with it in the 13th century. It is remarkable for the great size of the horns of the old rams and the wide open sweep of their curve, so that the points stand boldly out on each side, far away from the animal's head, instead of curling round nearly in the same plane, as in most of the allied species. A variety inhabiting the Thian Shian is known as *O. poli carelini*. An even larger animal is the argali, *O. ammon*, typically from the Altai, but represented by one race in Ladak and Tibet (*O. ammon hodgsoni*), and by a second in Mongolia. Although its horns are less extended laterally than those of *O. poli*, they are grander and more massive. In their short summer coats the old rams of both species are nearly white. *Ovis sairensis* from the Sair mountains and *O. littledalei* from Kulja are allied species. In the Stanovoi mountains and neighbouring districts of E. Siberia and in Kamchatka occur two sheep which have been respectively named *O. borealis* and *O. nivicola*. They are, however, so closely allied to the so-called bighorn sheep of N. America, that they can scarcely be regarded as more than local races of *O. canadensis*, or *O. cervina*, as some naturalists prefer to call the species. These bighorns are characterized by the absence of face-glands, and the comparatively smooth front surface of the horns of the old rams, which are thus very unlike the strongly wrinkled horns of the argali group. The typical bighorn is the khaki-coloured and white-rumped Rocky Mountain animal; but on the Stickin river there is a nearly black race, with the usual white areas (*O. canadensis stonei*), while this is replaced in Alaska by the nearly pure white *O. c. dalli*; the grey sheep of the Yukon (*O. c. fannini*) being perhaps not a distinct form. Returning to Asia, we find in Ladak, Astor, Afghanistan and the Punjab ranges, a sheep whose local races are variously known as urin, urial and shapo, and whose technical name is *O. vignei*. It is a smaller animal than the members of the argali group, and approximates to the Armenian and the Sardinian wild sheep or mouflon (*Ovis orientalis* and *O. musimon*) (see MOUFLON). We have in Tibet the bharal or blue sheep, *Ovis* (*Pseudois*) *bharal*, and in N. Africa the udad or aoudad, *O.* (*Ammotragus*) *lervia*, both of which have no face-glands and in this and their smooth horns approximate to goats (see BHARAL and AOUDAD).


A Mouflon Ram (*Ovis musimon*).

The sheep was domesticated in Asia and Europe before the dawn of history, though unknown in this state in the New World until after the Spanish conquest. It has now been introduced by man into almost all parts of the world where agricultural operations are carried on, but flourishes especially in the temperate regions of both hemispheres. Whether this well-known and useful animal is derived from any one of the existing wild species, or from the crossing of several, or from some now extinct species, are matters of conjecture. The variations of external characters seen in the different breeds are very great. They are chiefly manifested in the form and number of the horns, which may be increased from the normal two to four or even eight, or may be altogether absent in the female alone or in both sexes; in the shape and length of the ears, which often hang pendent by the side of the head; in the peculiar elevation or arching of the nasal bones in some eastern races; in the length of the tail, and the development of great masses of fat at each side of its root or in the tail itself; and in the colour and quality of the fleece.

On the W. coast of Africa two distinct breeds of hairy sheep are indigenous, the one characterized by its large size, long limbs and smooth coat, and the other by its inferior stature, lower build and heavily maned neck and throat. Both breeds, which have short tails and small horns (present only in the rams), were regarded by the German naturalist Fitzinger as specifically distinct from the domesticated *Ovis aries* of Europe; and for the first type he proposed the name *O. longipes* and for the second *O. jubata*. Although such distinctions may be doubtful (the two African breeds are almost certainly descended from one ancestral form), the retention of such names may be convenient as a provisional measure.

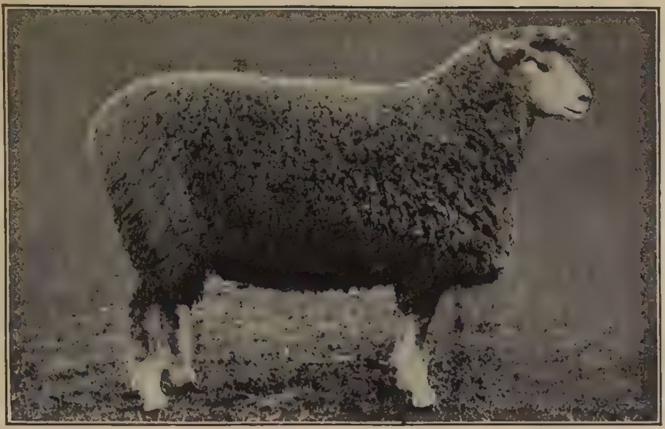
The long-legged hairy sheep, which stands a good deal taller than a Southdown, ranges, with a certain amount of local variation, from Lower Guinea to the Cape. In addition to its long limbs, it is characterized by its Roman nose, large (but not drooping) ears, and the presence of a dewlap on the throat and chest. The ewes are hornless, but in Africa the rams have very short, thick and somewhat goatlike horns. On the other hand, in the W. Indian breed, which has probably been introduced from Africa, both sexes are devoid of horns. The colour is variable. In the majority of cases it appears to be pied, showing large blotches of black or brown on a white ground; the head being generally white with large black patches on the sides, most of the neck and the fore-part of the body black, and the hind-quarters white with large coloured blotches. On the other hand, these sheep may be uniformly yellowish white, reddish brown, greyish brown or even black. The uniformly reddish or chestnut-brown specimens approach most nearly to the wild mouflon or urial in colour, but the chestnut extends over the whole of the under-parts and flanks; domestication having probably led to the elimination of the white belly and dark flank band, which are doubtless protective characters. The feeble development of the horns is probably also a feature due to domestication.

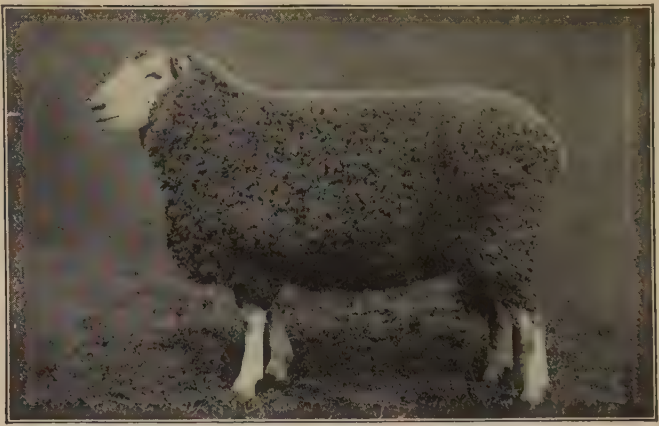
In Angola occurs a breed of this sheep which has probably been crossed with the fat-tailed Malagasy breed; while in Guinea there is a breed with lappets, or wattles, on the throat, which is probably the result of a cross with the lop-eared sheep of the same district. The Guinea lop-eared breed, it may be mentioned, is believed to inherit its drooping ears and throat wattles from an infusion of the blood of the Roman-nosed hornless Theban goat (see GOAT). Hairy long-legged sheep are also met with in Persia, but are not pure-bred, being apparently the result of a cross between the long-legged Guinea breed and the fat-tailed Persian sheep.

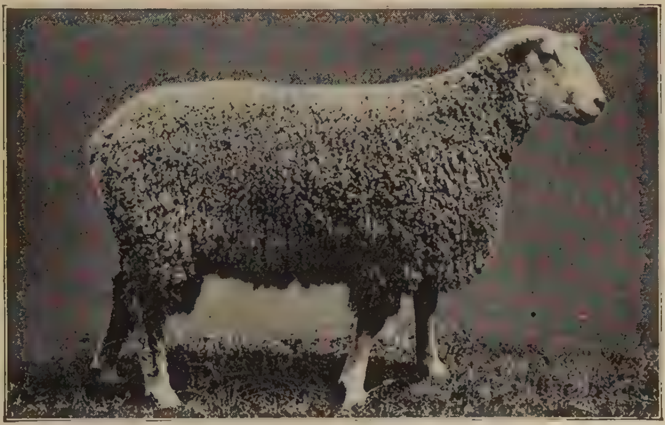
The maned hairy sheep (*Ovis jubata*), which appears to be confined to the W. coast of Africa, takes its name from a mane of longish hair on the throat and neck; the hair on the body being also longer than in the ordinary long-legged sheep. This breed is frequently black or brown and white; but in a small sub-breed from the Cameroons the general colour is chestnut or foxy red, with the face, ears, buttocks, lower surface of tail and under-parts black. The most remarkable thing about this Cameroon sheep is, however, its extremely diminutive size, a full-grown ram standing only 19 in. at the withers.

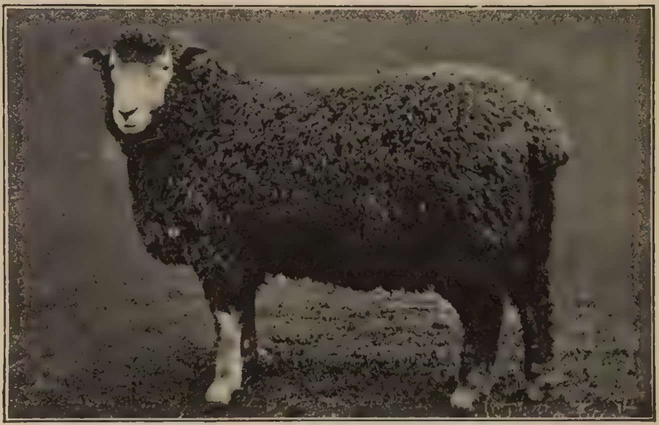
In point of size this pigmy Cameroon breed comes very close to an exceedingly small sheep of which the limb-bones have been

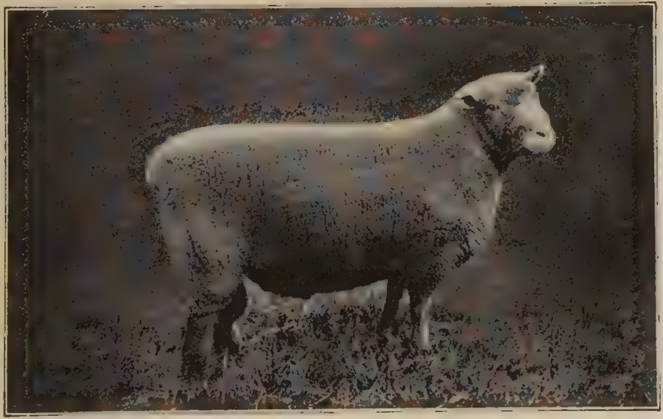
SHEEP

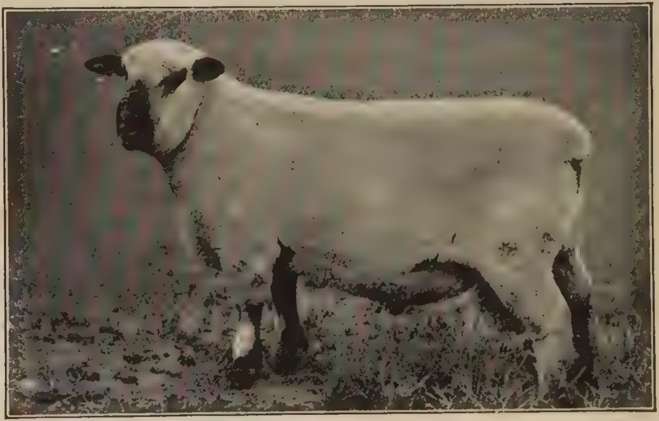

LINCOLN LONGWOOL RAM.

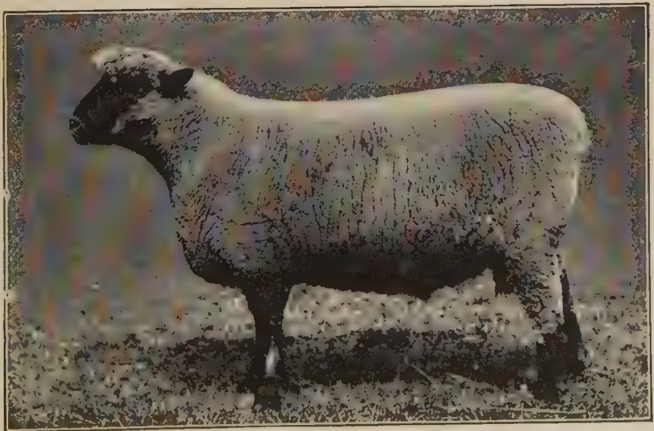

LEICESTER RAM.

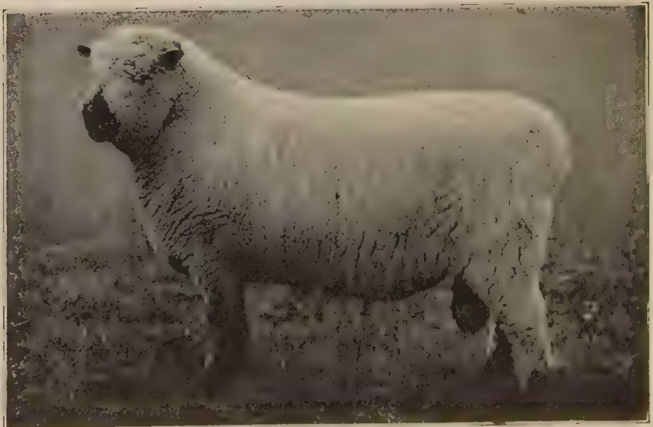

WENSLEYDALE RAM.


DEVON LONGWOOL RAM.


SOUTHDOWN RAM.


HAMPSHIRE DOWN RAM.


OXFORD DOWN RAM.


SHROPSHIRE RAM.

BRITISH BREEDS OF SHEEP, from photographs by F. Babbage. The comparative sizes of the animals are indicated by the scale of reproduction.

name, a strictly local breed, which likewise exemplify the good results of crossing with the Leicesters. The South Devons have a fairly fine silky fleece of long staple, heavier than that of the Devon Longwool, which it also excels in size.

The *Roscommon*—the one breed of modern sheep native to Ireland—is indebted for its good qualities largely to the use of Leicester blood. It is a big-bodied, high-standing sheep, carrying a long, wavy, silky fleece. It ranges mainly from the middle of Ireland westwards, but its numbers have declined considerably in competition with the Shropshire.

The *Kent* or *Romney Marsh* is native to the rich tract of grazing land on the S. coast of Kent. They are hardy, white-faced sheep, with a close-coated longwool fleece. They were gradually, like the Cotswolds, improved from the original type of slow-maturity sheep by selection in preference to the use of rams of the Improved Leicester breed. With the exception of the Lincoln, no breed has received greater distinction in New Zealand, where it is in high repute for its hardiness and general usefulness. When difficulties relating to the quantity and quality of food arise the Romney is a better sheep to meet them than the Lincolns or other longwools.

The *Oxford Down* is a modern breed which owes its origin to crossing between Cotswolds and Hampshire Downs and Southdowns. Although it has inherited the forelock from its longwool ancestors, it approximates more nearly to the shortwool type, and is accordingly classified as such. An Oxford Down ram has a bold masculine head; the poll well covered with wool and the forehead adorned by a topknot; ears self-coloured, upright, and of fair length; face of uniform dark brown colour; legs short, dark, and free from spots; back level and chest wide; and the fleece heavy and thick. The breed is popular in Oxford and other midland counties. Its most notable success in recent years is on the Scottish and English borders, where, at the annual ram sales at Kelso, a greater number of rams is auctioned of this than of any other breed, to cross with flocks of Leicester-Cheviot ewes especially, but also with Border Leicesters and three-parts-bred ewes. It is supplanting the Border Leicester as a sire of mutton sheep; for, although its progeny is slower in reaching maturity, tegs can be fed to greater weights in spring —65 to 68 lb per carcass—without becoming too fat to be classed as finest quality.

The *Southdown*, from the short close pastures upon the chalky soils of the South Downs in Sussex, was formerly known as the Sussex Down. In past times it did for the improvement of the shortwool breeds of sheep very much the same kind of work that the Leicester performed in the case of the longwool breeds. A pure-bred Southdown sheep has a small head, with a light brown or brownish grey (often mouse-coloured) face, fine bone, and a symmetrical, well-fleshed body. The legs are short and neat, the animal being of small size compared with the other Down sheep. The fleece is of fine, close, short wool, and the mutton is excellent. "Underhill" flocks that have been kept for generations in East Anglia, on the Weald, and on flat meadow land in other parts of the country, have assumed a heavier type than the original "Upperdown" sheep. It was at one time thought not to be a rent-paying breed, but modern market requirements have brought it well within that category.

The *Shropshire* is descended from the old native sheep of the Salopian hills, improved by the use of Southdown blood. Though heavier in fleece and a bulkier animal, the Shropshire resembles an enlarged Southdown. As distinguished from the latter, however, the Shropshire has a darker face, blackish brown as a rule, with very neat ears, whilst its head is more massive, and is better covered with wool on the top and at the sides. This breed has made rapid strides in recent years, and it has acquired favour in Ireland as well as abroad. It is an early-maturity breed, and no other Down produces a better back to handle for condition—the frame is so thickly covered with flesh and fat.

The *Hampshire Down* is another breed which owes much of its improved character to an infusion of Southdown blood. Early in the 19th century the old Wiltshire white-faced horned sheep, with a scanty coat of hairy wool, and the Berkshire Knot, roamed over the downs of their native counties. Only a remnant of the former under the name of the *Western* sheep survives in a pure state, but their cross descendants are seen in the modern Hampshire Down, which originated by blending them with the Southdown. Early maturity and great size have been the objects aimed at and attained, this breed, more perhaps than any other, being identified with early maturity. One reason for this is the early date at which the ewes take the ram. Whilst heavier than the Shropshire, the Hampshire Down sheep is less symmetrical. It has a black face and legs, a big head with Roman nose, darkish ears set well back, and a broad level back (especially over the shoulders) nicely filled in with lean meat.

The *Dorset Down* or *West Country Down*, "a middle type of Down sheep pre-eminently suited to Dorsetshire," is a local variety of the Hampshire Down breed, separated by the formation of a Dorset Down sheep society in 1904, about eighty years after the type of the breed had been established.

The *Suffolk* is another Down, which took its origin about 1790 in the crossing of improved Southdown rams with ewes of the old black-face Horned Norfolk, a breed still represented by a limited number of animals. The characteristics of the latter are retained in the black face and legs of the Suffolk, but the horns have been bred out. The fleece is moderately short, the wool being of close, fine, lustrous fibre, without any tendency to mat. The limbs, woolled to the knees and hocks, are clean below. The breed is distinguished by having the smoothest and blackest face and legs of all the Down breeds and no wool on the head. Although it handles hard on the back when fat, no breed except the old Horned Norfolk equals it in producing a saddle cut of mutton with such an abundance of lean red meat in proportion to fat. It carried off the highest honours in the dressed carcass competition at Chicago in 1903, and the championship in the "block test" at Smithfield Club Show was won for the five years 1902–1906 by Suffolks or Suffolk cross lambs from big-framed Cheviot ewes. In 1907, the championship went to a Cheviot wether, but in the two pure, short-woolled classes all the ten awards were secured by Suffolks, and in the two cross-bred wether classes nine of the ten awards went to a Suffolk cross. The mutton of all the Down breeds is of superior quality, but that of the Suffolk is pre-eminently so.

The *Cheviot* takes its name from the range of hills stretching along the boundary between England and Scotland, on both sides of which the breed now extends, though larger types are produced in East Lothian and in Sutherlandshire. The Cheviot is a hardy sheep with straight wool, of moderate length and very close-set, whilst wiry white hair covers the face and legs. Put to the Border Leicester ram the Cheviot ewe produces the *Half-bred*, which as a breeding ewe is unsurpassed as a rent-paying, arable-land sheep.

The *Scotch Black-face* breed is chiefly reared in Scotland, but it is of N. of England origin. Their greater hardiness, as compared with the Cheviots, has brought them into favour upon the higher grounds of the N. of England and of Scotland, where they thrive upon heather hills and coarse and exposed grazing lands. The colour of face and legs is well-defined black and white, the black predominating. The spiral horns are low at the crown, with a clear space between the roots, and sweep in a wide curve, sloping slightly backwards, and clear of the cheek. The fashionable fleece is down to the ground, hairy and strong, and of uniform quality throughout.

The *Lonk* has its home amongst the moorlands of N. Lancashire and the W. Riding of Yorkshire, and it is the largest of the mountain breeds of the N. of England and Scotland. It bears most resemblance to the Scotch Black-face, but carries a finer, heavier fleece, and is larger in head. Its face and legs are mottled black and white, and its horns are strong. The tail is long and rough.

The *Herdwick* is the hardiest of all the breeds thriving upon the poor mountain land in Cumberland and Westmorland. The rams sometimes have small, curved, wide horns like those of the Cheviot ram. The colour of the fleece is white, with a few darkish spots here and there; the faces and legs are dark in the lambs, gradually becoming white or light grey in a few years.

The wool is strong and coarse, standing up round the shoulders and down the breast like a mane. The forehead has a topknot, and the tail is well covered.

The *Limestone* is a breed of which little is heard. It is almost restricted to the fells of Westmorland, and is probably nearly related to the Scotch Black-face. The breed does not thrive off its own geological formation, and the ewes seek the ram early in the season. The so-called "Limestones" of the Derbyshire hills are really Leicesters.

The *Welsh Mountain* is a small, active, soft-woolled, white-faced breed of hardy character. The legs are often yellowish, and this colour may extend to the face. The mutton is of excellent quality. The ewes, although difficult to confine by ordinary fences, are in high favour in lowland districts for breeding fattening lambs to Down and other early maturity rams.

The *Clun Forest* is a local breed in W. Shropshire and the adjacent part of Wales. It is descended from the old Tan-faced sheep. It is now three parts Shropshire, having been much crossed with that breed, but its wool is rather coarser.

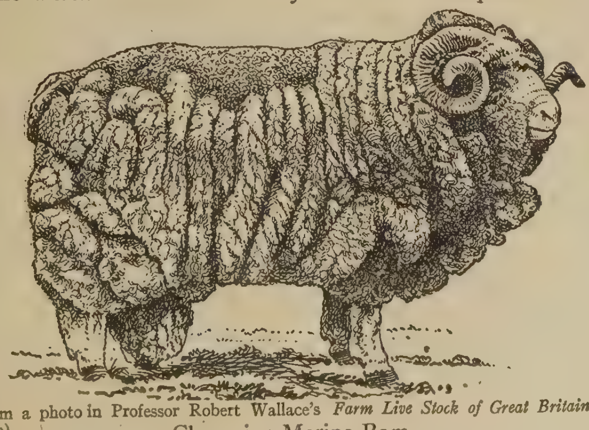
The *Radnor* is short-limbed and low-set with speckled face and legs. It is related to the Clun Forest and the Kerry Hill sheep. The draft ewes of all three breeds are in high demand for breeding to Down and longwool rams in the English midlands.

The *Ryeland* breed is so named from the Ryelands, a poor upland district in Herefordshire. It is a very old breed, against which the Shropshires have made substantial headway. Its superior qualities in wool and mutton production have been fully demonstrated, and a demand for rams is springing up in S. as well as in N. America. The Ryeland sheep are small, hornless, have white faces and legs, and remarkably fine short wool, with a topknot on the forehead.

The *Dartmoor*, a hardy local Devonshire breed, is a large hornless, longwool, white-fleeced sheep, with a long mottled face. It has been attracting attention in recent years.

The *Exmoor* is a horned breed of Devonshire moorland, one of the few remaining remnants of direct descent from the old forest breeds of England. They have white legs and faces and black nostrils. The coiled horns lie more closely to the head than in the Dorset and Somerset Horn breed. The Exmoors have a close, fine fleece of short wool. They are very hardy, and yield mutton of choice flavour.

The *Dorset and Somerset Horn* is an old west-country breed of sheep. The fleece is fine in quality, of close texture, and the wool is intermediate between long and short, whilst the head carries a forelock. Both sexes have horns, very much coiled in the ram. The muzzle, legs and hoofs are white; the nostrils pink. This is a hardy breed, in size somewhat exceeding the Southdown. The special characteristic of the breed is that the ewes take the ram at an unusually early period of the year, and cast ewes are in demand for breeding house lamb for Christmas. Two crops of lambs in a year are sometimes obtained from the ewes, although it does not pay to keep such rapid breeding up regularly.


From a photo in Professor Robert Wallace's *Farm Live Stock of Great Britain* (4th edition).

Champion Merino Ram.

The *Merino* is the most widely distributed sheep in the world. It has been the foundation stock of the flocks of all the great sheep countries. A few have existed in Britain for more than a hundred years. They thrive well there, as they do everywhere, but they are wool-sheep which produce slowly a secondary quality of mutton—thin and blue in appearance. The Merino resemble the Dorset Horn breed. The rams possess large coiling horns—the ewes may or may not have them. The muzzle is flesh-coloured and the face covered with wool. The wool, densely set on a wrinkled skin, is white and generally fine, although it is classified into long, short, fine and strong. Merino cross with early-maturity longwool, Down, or other close-wooled rams, are good butchers' sheep, and most of the frozen mutton imported into the United Kingdom has had more or less of a merino origin. (W. Fr.; R. W.)

Lowland Sheep-breeding and Feeding.—A Shropshire flock of about two hundred breeding ewes is here taken as a typical example of the numerous systems of managing sheep on a mixed farm of grazing and arable land. The ewes lamb from early in January till the end of February. The lambs have the shelter of a lambing shed for a few days. When drafted to an adjoining field they run in front of their mothers and get a little crushed oats and linseed cake meal, the ewes receiving kail or roots and hay to develop milk. Swedes gradually give place to mangolds, rye and clover before the end of April, when shearing of the ewe flock begins, to be finished early in May. At this time unshorn lambs are dipped and dosed with one of Cooper's tablets of sulphur-arsenic dip material to destroy internal parasites. The operation is repeated in September. The lambs are weaned towards the end of June and the ewes run on the poorest pasture till August to lose surplus fat. In August the ewes are culled and the flock made up to its full numbers by selected shearling ewes. All are assorted and mated to suitable rams. Most of the older ewes take the ram in September, but maiden ewes are kept back till October. During the rest of the year the ewes run on grass and receive hay when necessary, with a limited amount of dry artificial food daily, $\frac{1}{4}$ ℔ each, gradually rising as they grow heavy in lamb to 1 ℔ per day. Turnips before lambing, if given in liberal quantities, are an unsafe food. To increase the number of doubles, ewes are sometimes put on good fresh grass, rape or mustard a week before the tups go out—a ram to sixty ewes is a usual proportion, though with care a stud ram can be got to settle twice the number. With good management twenty ewes of any of the lowland breeds should produce and rear thirty lambs, and the proportion can be increased by breeding from ewes with a prolific tendency. The period of gestation of a ewe is between 21 and 22 weeks, and the period of oestrum 24 hours. If not settled the ewe comes back to the ram in from 13 to 18 (usually 16) days. To indicate the time or times of tupping three colours of paint are used. The breast of the ram is rubbed daily for the first fortnight with blue, for a similar period with red, and finally with black.

Fattening tegs usually go on to soft turnips in the end of September or beginning of October, and later on to yellows, green-rounds and swedes and, in spring and early summer, mangolds. The roots are cut into fingers and supplemented by an allowance of concentrated food made up of a mixture of ground cakes and meal, $\frac{1}{4}$ ℔ rising to about $\frac{1}{2}$ ℔; and $\frac{1}{2}$ ℔ to 1 ℔ of hay per day. The dry substance consumed per 100 ℔ live weight in a ration of $\frac{1}{2}$ ℔ cake and corn, 12 ℔ roots and 1 ℔ hay daily, would be $16\frac{1}{2}$ ℔ per week, and this gives an increase of nearly 2% live weight or 1 ℔ of live weight increase for $8\frac{1}{4}$ ℔ of dry food eaten. Sheep finishing at 135 ℔ live weight yield about 53% of carcass or over 70 ℔ each.

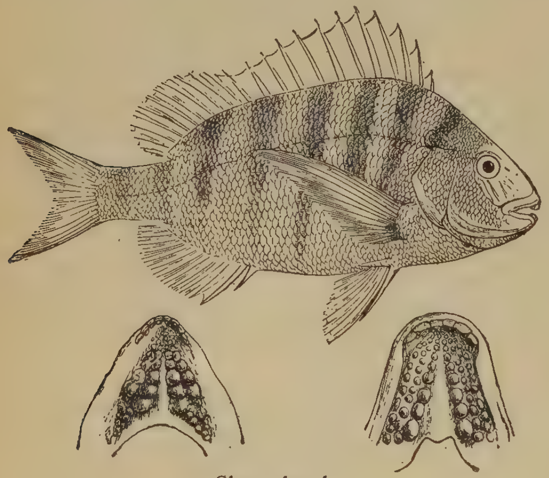
Management of Mountain Breeds.—Ewes on natural pastures receive no hand feeding except a little hay when snow deeply covers the ground. The rams come in from the hills on the 1st of January and are sent to winter on turnips. Weak ewes, not safe to survive the hardships of spring, are brought in to better pasture during February and March. Ewe hogs wintered on grass in the low country from the 1st of November are brought home in April, and about the middle of April on the average mountain ewes begin to lamb. One lamb at weaning time for every ewe is rather over the normal amount of produce. Cheviot and cross-bred lambs are marked, and the males are castrated, towards the end of May. Nearly a month later black-face lambs are marked and the eild sheep are shorn—the shearing of milch ewes being delayed till the second week of July. Towards the end of July sheep are all dipped to protect them from maggot flies (which are generally worst during August) with materials containing arsenic and sulphur, like that of Cooper and Bigg. Fat wethers for the butcher are drafted from the hills in August and the two succeeding months. Lamb sales are most numerous in August, when lowland farmers secure their tegs to feed in winter. In this month breeding ewes recover condition and strength to withstand the winter storms. Ram auctions are on in September and draft ewe sales begin and continue through October. Early this month winter dipping is done at midday in dry weather. Early in November stock sheep having lost the distinguishing "buist" put on at clipping time with a large iron letter dipped in hot tar, have the distinctive paint or kiel mark claimed by the farm to which they belong rubbed on the wool. The rams are turned out to the hills between the 15th and the 24th of November.

Lowland rams put to breed half-bred and cross lambs receive about 1 lb of grain daily to prevent their falling off too rapidly in condition, as they would do if exclusively supported on mountain fare.

LITERATURE.—D. Low, *Breeds of the Domestic Animals of the British Isles* (1842, illustrated, and 1845); R. Wallace, *Farm Live Stock of Great Britain* (1907); J. Coleman, *Sheep of Great Britain* (1907), and the *Flock Books* of the various breed societies. (R. W.)

SHEEPSHANKS, JOHN (1787–1863), British manufacturer and art collector, was born in Leeds, and became a partner in his father's business as a cloth manufacturer. His brother Richard (1794–1855) was a distinguished astronomer and man of science, whose collection of instruments eventually passed to the Royal Astronomical Society. John Sheepshanks collected pictures, mainly by British artists, and in 1857 presented his magnificent collection to the nation. He retired from business in 1833 and died a bachelor in 1863.

SHEEPSHEAD, the name of one of the largest species of the genus *Sargus*, marine fishes known on the coasts of S. Europe as "sargo" or "saragu." These fishes possess two kinds of teeth:—one, broad and flat, like incisors, occupying in a single series the front of the jaws; the other, semiglobular and molar-like, arranged in several series on the sides of the jaws. The genus belongs to the Acanthopterygian family *Sparidae* which includes the Sea-breams. The sheepshead, *Sargus ovis*, occurs in abundance on the Atlantic coasts of the United States, from Cape Cod to Florida, and is one of the most valued food-fishes of North America. It is said to attain to a length of 30 in. and a weight of 15 lb. Its food consists of shellfish, which it detaches with its incisors from the base to which they are fixed, crushing them with its powerful molars. It may be distinguished from other allied species by seven or eight dark cross-bands traversing the body, by a recumbent spine in front of the dorsal fin, by twelve spines and as many rays of the dorsal and ten rays of the anal fin, and by forty-six scales along the lateral line. The term "sheepshead" is also given in some parts of North America to a freshwater Sciaenoid, *Corvina oscula*, which is much less esteemed for the table.



Sheepshead.

SHEERNESS, a garrison town and naval seaport in the Faversham parliamentary division of Kent, England, in the Isle of Sheppey, on the right bank of the Medway estuary at its junction with the Thames, 51 m. E. of London by the South-Eastern & Chatham railway. Pop. of urban district (1901) 18,179. Blue Town, the older part of the town, with the dockyard, is defended by strong modern-built fortifications, especially the forts of Garrison Point and Barton's Point, commanding the entrance of both the Thames and the Medway. The dockyard, chiefly used for naval repairs, covers about 60 acres, and consists of three basins and large docks, the depth of water in the basins ranging down to 26 ft. Within the yard there are extensive naval stores and barracks. Outside the dockyard are the residences of the admiral of the home fleet and other officers, and barracks. The harbour is spacious, sheltered, and deep even at low water. Sheerness has some trade in corn and seed, and there is steamboat connexion with Port Victoria, on the opposite side of the Medway; with Southend, on the opposite side of the Thames; and with Chatham and London, and the town is in some favour as a seaside resort. A small fort was built at Sheerness by Charles II., which, on the 10th of July 1667, was taken by the Dutch fleet under De Ruyter.

SHEET, an expanse or surface, flat and thin, of various materials; a rope attached to a sail. These two apparently widely separated meanings are to be explained by the generally received etymology. In O. Eng. there are three words, all from the root seen in "shoot," to dart, let fly, thrust forward; *scete* or *scȳte*, a sheet of cloth, *sceat*, corner or fold of a garment, projecting angles, region (*e.g. sæs sceāt*, portion of the sea, gulf, bay), and *scēata*, foot of a sail, *pes veli* (Wright, *Gloss.*). The original meaning, according to Skeat, is "projection," or that which shoots out, then a corner, especially of a garment or of a cloth; after which it was extended to mean a whole cloth or "sheet." In Icelandic, the cognate word *skaut* has much the same meanings, including that of a rope attached to a sail. Other cognate forms in Teutonic languages are Ger. *Schoss*, lap, bosom, properly fold of a garment, Dutch *schoot*, Icel. *skaut*, &c. In current English usage, "sheet" is commonly applied to any flat, thin surface, such as a sheet of paper, a sheet of metal, or, in a transferred application, to an expanse of water, ice, fire, &c. More specifically it is used of a rectangular piece of linen or cotton used as that part of the usual bed clothes which are next the sleeper's body. In nautical usage the term "sheet" is applied to a rope or chain attached to the lower corners of a sail for the purpose of extension or change of direction (see RIGGING). The connexion in derivation with "shoot" is clearly seen in "sheet-anchor," earlier "shoot-anchor"—one that is kept in reserve, to be "shot" in case of emergency (see ANCHOR).

SHEFFIELD, JOHN BAKER HOLROYD, 1ST EARL OF (1735–1821), English politician, came of a Yorkshire family, a branch of which had settled in Ireland. He inherited considerable wealth, and in 1769 bought Sheffield Place in Sussex from Lord de la Warr. Having served in the army he entered the House of Commons in 1780, and in that year was prominent against Lord George Gordon and the rioters. In 1783 he was created an Irish peer as Baron Sheffield of Roscommon, a barony of the United Kingdom (Sheffield of Sheffield, Yorks) being added in 1802. In 1816 he was created Viscount Pevensey and earl of Sheffield. He was a great authority on farming, and in 1803 he was made president of the Board of Agriculture; but he is chiefly remembered as the friend of Gibbon (*q.v.*), whose works he afterwards edited. His son and grandson succeeded as 2nd and 3rd earls, the latter (1832–1909) being a well-known patron of cricket, at whose death the earldom became extinct. The Irish barony, however, under a special remainder, passed to the 4th baron Stanley of Alderley, who thus became Baron Sheffield of Roscommon.

SHEFFIELD, a city, and municipal, county and parliamentary borough in the West Riding of Yorkshire, England, 158½ m. N.N.W. from London. Pop. (1901) 409,070. It is served by the Midland, Great Central and Great Northern railways, and has direct connexion with all the principal lines in the north of England. The principal stations are Victoria (Great Central) and Midland. Sheffield is situated on hilly ground in the extreme south of the county, and at the junction of several streams with the river Don, the principal of which are the Sheaf, the Porter, the Rivelin and the Loxley. The manufacturing quarter lies mainly in the Don valley, while the chief residential suburbs extend up the picturesque hills to the south. The centre of the city, with the majority of the public buildings, lies on the slope south of the Don, and here are several handsome thoroughfares. The older portions were somewhat irregular and overcrowded, but a great number of improvements were effected under an act of 1875, and have been steadily continued. There is an extensive system of tramways, serving the outlying townships. The parish church of St Peter is a cruciform building, mainly Perpendicular. The original Norman building is supposed to have been burned during the wars of Edward III. with the barons, and the most ancient existing part is the tower, dating from the 14th century. A restoration in 1880, when transepts and a W. front were added, improved the church by demolishing the galleries and other heavy internal fittings. There are a number of interesting mural monuments; and the Shrewsbury chapel contains a fine tomb of the 4th earl of Shrewsbury, who founded it in the 16th century. Of the principal public buildings, the town hall was opened by Queen Victoria in 1897. It is a fine building in the style of the Renaissance, surmounted by a lofty tower, which is crowned by an emblematic statue in bronze. The Cutlers' hall was built in 1832 and enlarged in 1857 by the addition of a magnificent banqueting hall. The handsome corn exchange, in Tudor style, and the market hall were acquired from the duke of Norfolk by the corporation. Among several theatres, the Theatre Royal was originally erected in 1793. Others are the Alexandra, Lyceum and Alhambra. There are extensive barracks. Literary and social institutions include the Athenaeum (1847), with news-room and library; the literary and philosophical society (1822), the Sheffield club (1862), the Sheffield library, founded in 1777, and the free library (1856), with several branches. The public museum and the Mappin art gallery are situated in Weston Park; and in Meersbrook Hall is the fine Ruskin museum, containing Ruskin's art, mineralogical, natural history, and botanical collections, and some original drawings and valuable books. These are in the custody of the corporation. Beyond St Peter's church relics of antiquity are few, but there remains a part of the manor-house of Hallam, dating from the 16th century. In the S. of the city is Broom Hall, a fine ancient half-timbered building.

The educational establishments are important. University College, constituted by that title in 1897, was founded in 1879 as the Firth College by Mark Firth (1819–1880), an eminent steel-manufacturer. This institution was enlarged in 1892, and comprised, besides the college, a technical department (1886) occupying the buildings of the former grammar school, and equipped with metallurgical laboratories, steel works, iron foundry, a machine and fitting shop, &c.; and a medical school, together with a school of pharmacy. In 1903 the foundation was laid of a building, at Western Bank, to contain the departments of medicine, arts, pure science, commerce, &c. When the college became dissociated in 1904 from the Victoria University, Manchester, of which it had formed a constituent, the necessary financial and other preparations were taken in hand to enable the college to be incorporated as the Sheffield University, and it was opened as such by King Edward VII. Other educational institutions are the free writing school (1715, rebuilt in 1827), the boys' charity school (founded 1706), the girls' charity school (1786), the Church of England educational institute, the Roman Catholic reformatory (1861), the Wesley College, associated with London University, Ranmoor College of the Methodist New Connexion, the mechanics' institute, and the school of art.

Among numerous medical or benevolent institutions may be mentioned the general infirmary, opened in 1797; the public hospital, erected in 1858 in connexion with the Sheffield medical school established in 1792; the school and manufactory for the blind, 1879, and the South Yorkshire lunatic asylum, 1872. Among many charities founded by citizens the most noteworthy is the Shrewsbury hospital for twenty men and twenty women, originally founded by the 7th earl of Shrewsbury (d. 1616), but greatly enlarged by successive benefactions.

Among public monuments are the statue of Queen Victoria before the town hall; the statue to James Montgomery the poet (1771–1854), chiefly erected by the Sunday school teachers of Sheffield; the monument in Weston Park to Ebenezer Elliot (1781–1849), known as the Corn Law rhymer; the column to Godfrey Sykes the artist (1825–1866); the monument to those who died during an outbreak of cholera in 1833; and the monument to the natives of Sheffield who fell in the Crimean War. Sir Francis Chantrey, the eminent sculptor, was born (1781) and died (1842) near Norton in Derbyshire, in the neighbourhood of Sheffield, which was the scene of his earlier work.

Sheffield is well supplied with parks and public grounds. In the western suburbs is Weston Park, occupying the grounds of Weston Hall, purchased by the corporation in 1873. The Firth Park, of 36 acres, on the N.E. of the city, was presented by Mark Firth, and was opened in 1875 by King Edward VII. and Queen Alexandra when prince and princess of Wales. There are botanical gardens of 18 acres in the western suburbs. A park and other recreation grounds have been presented by the duke of Norfolk as lord of the manor. To the N.W., towards Penistone, is Wharncliffe, retaining much of the characteristics of an ancient forest, and overlooking the valley of the Don from bold rocky terraces and ridges. The Bramall Lane cricket ground in Sheffield is the scene of many of the Yorkshire county cricket matches.

The prosperity of Sheffield is chiefly dependent on the manufacture of steel. The smelting of iron in the district is supposed to date from Roman times, and there is distinct proof carrying it back as far as the Norman Conquest. The town had become famed for its cutlery by the 14th century, as is shown by allusions in Chaucer. There was an important trade carried on in knives in the reign of Elizabeth, and the Cutlers' Company was incorporated in 1624. In early times cutlery was made of blister or bar steel; afterwards shear steel was introduced for the same purpose; but in 1740 Benjamin Huntsman of Handsworth introduced the manufacture of cast steel, and Sheffield retains its supremacy in steel manufacture, notwithstanding foreign competition, especially that of Germany and the United States, its trade in heavy steel having kept pace with that in the other branches. It was with the aid of Sheffield capital that Henry Bessemer founded his pioneer works to develop the manufacture of his invention, and a large quantity of Bessemer steel is still made in Sheffield. The heavy branch of the steel manufacture includes armour plates, rails, tyres, axles, large castings for engines, steel shot, and steel for rifles. The cutlery trade embraces almost every variety of instrument and tool—spring and table knives, razors, scissors, surgical instruments, mathematical instruments, edge tools, files, saws, scythes, sickles, spades, shovels, engineering tools, hammers, vices, &c. The manufacture of engines and machinery is also largely carried on, as well as that of stoves and grates. The art of silver plating was introduced by Thomas Bolsover in 1742, and specimens of early Sheffield plate are highly prized. Among the other industries of the town are tanning, confectionery, cabinet-making, bicycle-making, iron and brass founding, silver refining, the manufacture of brushes, combs, optical instruments, horse-hair cloth, and railway fittings, and testing. The Cutlers' Company (1624) exercises, by acts of 1883–1888, jurisdiction in all matters relating to the registration of trade marks, over all goods composed in whole or in part of any metal, wrought or unwrought, as also over all persons carrying on business in Hallamshire and within 6 m. thereof. There are numerous collieries in the neighbourhood.

Sheffield is the seat of a suffragan bishop in the diocese of York. The town trust for the administration of property belonging to the town dates from the 14th century, and in 1681 the number and manner of election of the "town trustees" was definitely settled by a decree of the Court of Chancery. Additional powers were conferred on the trustees by an act passed in 1874. The town first returned members to parliament in 1832. In 1885 the representation was increased from two to five members, the parliamentary divisions being Attercliffe, Brightside, Central, Ecclesall and Hallam. The county borough was created in 1888, and in 1893 the town became a city. The corporation consists of a lord mayor (the title was conferred on the chief magistrate in 1897), 16 aldermen, and 48 councillors. Area, 23,662 acres.

At the time of the Domesday Survey the four manors of Grimesthorpe, Hallam, Attercliffe and Sheffield (Escafeld) made up what is now the borough of Sheffield. Of these Hallam was the most important, being the place where Earl Waltheof, the Saxon lord of the manors, had his court. After the Conquest the earl was allowed to retain his possessions, and when he was executed for treason they passed to his widow Judith, niece of William the Conqueror, of whom Roger de Busli was holding Hallam with the three less important manors at the time of the Domesday Survey. From him the manors passed to the family of de Lovetot, but in the reign of Henry II., William de Lovetot, the 2nd lord, died without male issue, and his property passed to his daughter Maud, afterwards married to Gerard de Furnival. By the end of the 14th century Sheffield had become more important than Hallam, partly no doubt on account of the castle which one of the Furnivals had built here. Thomas de Furnival, great-great-grandson of Gerard and Maud, in 1296 obtained a grant of a market every Tuesday and a fair every year on the eve, day and morrow of Holy Trinity, and in the following year he gave the inhabitants a charter granting them the privileges of holding the town at a fee-farm rent of £3, 8s. 9¼d. yearly, of having a court baron held every three weeks, and of freedom from toll throughout the whole of Hallamshire. From the Furnivals the manor passed by marriage to John Talbot, afterwards earl of Shrewsbury, whose descendant the 6th earl was entrusted with the care of Mary Queen of Scots during her twelve years' imprisonment in Sheffield castle. In the reign of Edward VI. the property belonging to the town which had been amalgamated with other land left to the burgesses in trust for certain charitable uses was forfeited to the crown under the act for the suppression of colleges and chantries, but on their petition it was restored in 1554 by Queen Mary, who at the same time incorporated the town under the government of twelve capital burgesses.

See *Victoria County History, Yorkshire:* Joseph Hunter, *Hallamshire: the history and topography of the parish of Sheffield* (1869).

SHEFFIELD PLATE, the name applied to a variety of articles of domestic use or ornament, made of copper coated with silver by a special and now abandoned process. Many of them were actually manufactured in Birmingham, but as the secret of producing the material was discovered and brought to perfection in Sheffield, the name of that town was naturally connected with it, and thence transferred to articles constructed from it.

In 1742 a workman named Thomas Bolsover was mending the handle of a knife made of silver and copper, when, accidentally overheating it, he caused the metals to fuse and flow, and found that as a consequence the silver adhered to the copper as a thin coating. Being an intelligent man, he perceived the commercial value of his chance discovery, and began the manufacture of articles which, with all the appearance of silver, were both cheaper and stronger than those made of the pure metal. He apparently, however, confined himself to applying the silver direct to the surface of the copper after the latter had been given the shape destined to it, and was thus limited to the production of small articles such as snuff-boxes, knife handles, toilet articles, &c. It was reserved to Joseph Hancock to realize that by making the plate first and working it into the desired form afterwards he could almost indefinitely extend the possibilities of the material. The process in its final and highest development was as follows. The groundwork was a mixture of copper and brass, either metal alone having serious defects. This was cast into an oblong ingot, 1 to 1½ in. in thickness, 2½ in. in breadth, and of a length regulated by the size of the plate desired. The surface of this was brought by planing, grinding and other means to the highest possible pitch of smoothness and evenness. A sheet of silver of a finer quality than standard, ranging in thickness from $\frac{1}{16}$ in. to nearly 1 in. according to the quality aimed at, and of the same superficial extent as the copper bar, was levelled and polished in the same way and accurately fitted to it, neither surface at any time being soiled by contact with the workman's fingers. A sheet of copper, rather smaller than the other two and $\frac{1}{16}$ in. thick was laid upon the silver, and on the top of all was added a piece of iron, ¼ in. thick, 1 in. wide, and a little shorter than the three others, to protect them from the direct contact of the strong iron wire with which all were firmly bound together. The junction of the edges of the silver and copper-blend was treated with a flux of borax and the whole was submitted to the heat of a furnace until the silver was seen to be melting, when it was instantly removed, care being taken to avoid pressing upon the upper or lower surfaces, as the liquid silver in that case would have been squeezed out from between the two enclosing plates and the operation ruined. It was then left to cool, and after being thoroughly cleansed presented the appearance of a copper ingot with one silver side. This was passed again and again between gradually approximated rollers, with occasional annealing, until the desired thickness had been attained. The great extension of surface thus produced had the drawback of exaggerating any small defect in the union of the two metals, increasing it to a blister of an inch or more in diameter. It was, however, fortunately found easy to remedy this. The blister if unbroken was heated, pricked, and then rubbed level with a burnisher; if, as sometimes happened, the silver had flaked away it was replaced by coatings of pure leaf silver rubbed in with a burnisher. The plate when passed as flawless was cut into the desired form and moulded as far as possible into shape, the edges where necessary being soldered. At first only one surface of the copper was plated with silver and thus its usefulness was necessarily restricted, but it was a simple matter to apply the silver to both sides and thenceforward whatever was made in solid metal could be reproduced in plate, and firm after firm went into the business, ever and anon introducing further improvements. The possibility of embossing the metal beyond a certain point without fracturing the coating of silver was got over by casting or stamping the raised ornament in silver, filling the hollows with a form of pewter and soldering the result to the appropriate part of the general design. Another difficulty, the concealment of the inner core of copper which was seen as a thin red line when a cut edge was exposed, was met about 1784 by George Cadman, who adopted the practice of soldering on an edging, generally ornamented, of solid silver so as to cover the junction, and the presence of this is one of the trustworthy tests by which genuine Sheffield plate may be recognized. The labour of rolling the metal by hand was done away with about 1760, by the firm of Tudor, Leader & Sherburn, who first employed horse-power, and for more than half a century the trade both in Sheffield and Birmingham continued to flourish. In 1736 there were under 10,000 inhabitants in the former city; in 1760 when Horace Walpole passed through it, buying for two guineas a pair of candlesticks of the local plate, which he thought "quite pretty," and pronouncing it to be "one of the foulest towns in England," there were two-and-twenty thousand who remitted eleven thousand pounds a week to London. It would be impossible, were it desirable, to enumerate all the varieties of the articles turned out, or to overpraise the beauty and elegance of most of them. The designs were identical with those in favour with the gold- and silver-smiths of the period, which was happily one when exceptionally good taste prevailed. The appreciation of light and well-proportioned curves and the skilful employment of well-contrived pierced work are conspicuous features.

The success was, however, doomed to be short lived and to come to an end as swiftly as it had grown up. In the year 1800 W. Cruikshank was already experimenting with a process of electro-plating, and in 1837 Mr Spencer in England, and in 1838 Professor M. H. Jacobi (1801–1874) in Russia, working independently, succeeded in contriving methods which could be made commercially profitable. Two years later Messrs Elkington in London and M. de Ruolz of Paris started in business on those lines, and the slower and consequently more costly manufacture at Sheffield and Birmingham rapidly died out.

Of recent years old Sheffield plate after long neglect has come into fashion again, and genuine articles in good condition have greatly gone up in value, often exceeding in cost those of more modern date in sterling silver. Concurrently fraudulent imitation has regrettably increased. In some cases the whole object is a modern reproduction in electro-plate, but more often really old articles from which the original plating has been worn off in course of time have been replated, both equally being in the eyes of the connoisseur unworthy of serious attention and comparatively valueless. The difference after a little experience is not difficult to detect, though inexpressible in words. The pressure to which the Sheffield plate was submitted produces a definite colour and texture which is absent from the surface produced by the deposit of silver in a liquid medium by electrical means, and the coat of silver is spread by the latter uniformly over the whole surface without a break, while in the former the junction between the embossed ornaments and the silver strips covering the cut edges may often be detected on careful examination.

See *Sheffield Plate* by Bertie Wyllie; H. N. Veitch, *Sheffield Plate: its history, manufacture and art* (London, 1908). (M. Be.)

SHEIKH, or Shaikh, an Arabic title of respect. Strictly it means a venerable man, of more than fifty years of age. It is specially borne by heads of religious orders, chiefs of tribes and headmen of villages. Every village, however small, every separate quarter of a town, has a sheikh in whom is lodged the executive power of government—a power loosely defined, and of more or less extent according to the personal character and means of the individual who wields it. A village sheikh is a sort of head magistrate and chief of police. The Koran, the sole authentic authority in all matters, legal or civil, never accurately distinguished between the sheikh and the cadi (*q.v.*), and its phrases, besides, are vague and capable of admitting different and even opposite interpretations. (For the Sheikh ul-Islam see MUFTI.)

SHEIL, RICHARD LALOR (1791–1851), Irish politician and writer, was born at Drumdowney, Tipperary, on the 17th of August 1791. His father, Edward Sheil, had acquired considerable wealth in Spain, and owned an estate in Tipperary. The son was taught French and Latin by the Abbé de Grimeau, a French refugee. He was then sent to a school in Kensington, London, presided over by another émigré, M. de Broglie. In October 1804 he was removed to Stonyhurst college, Lancashire, and in November 1807 entered Trinity College, Dublin, where he specially distinguished himself in the debates of the Historical Society. After taking his degree in 1811 he entered Lincoln's Inn, and was admitted to the Irish bar in 1814. His play of *Adelaide, or the Emigrants*, was played at the Crow Street theatre, Dublin, on the 19th of February 1814, with complete success, and on the 23rd of May 1816 it was performed at Covent Garden. The *Apostate*, produced at the latter theatre on the 3rd of May 1817, firmly established his reputation as a dramatist. His principal other plays are *Bellamira* (written in 1818), *Evadne* (1819), *Huguenot*, produced in 1822, and *Montini* (1820). In 1822 he began, along with W. H. Curran, to contribute to the *New Monthly Magazine* a series of graphic and racy papers entitled *Sketches of the Irish Bar*. These were edited by M. W. Savage in 1855 in two volumes, under the title of *Sketches Legal and Political*. Sheil was one of the principal founders of the Catholic Association in 1823 and drew up the petition for inquiry into the mode of administering the laws in Ireland, which was presented in that year to both Houses of Parliament. In 1825 Sheil accompanied O'Connell to London to protest against the suppression of the Catholic Association. The protest was unsuccessful, but, although nominally dissolved, the association continued its propaganda after the defeat of the Catholic Relief Bill in 1825; and Sheil was one of O'Connell's leading supporters in the agitation persistently carried on till Catholic emancipation was granted in 1829. In the same year he was returned to Parliament for Milborne Port, and in 1831 for Louth. He took a prominent part in all the debates relating to Ireland, and although he was greater as a platform orator than as a debater, he gradually won the somewhat reluctant admiration of the House. In August 1839 he became vice-president of the board of trade in Lord Melbourne's ministry. After the accession of Lord John Russell to power in 1846 he was appointed master of the mint, and in 1850 he was appointed minister at the court of Tuscany. He died at Florence on the 23rd of May 1851.

See *Memoirs of Richard Lalor Sheil*, by W. Torrens M'Cullagh (2 vols., 1855). His *Speeches* were edited in 1845 by Thomas McNevin.

SHEKEL (from Heb. *shakal*, to weigh), originally a Jewish unit of weight ($\frac{1}{50}$ of a mina, and $\frac{1}{3000}$ of a talent) and afterwards a coin of the same weight. The Biblical references to shekels must refer to uncoined ingots. In the time of Josephus it seems that the *light* shekel weighed from 210 to 210·55 grains; the *heavy* shekel was twice that amount, which is practically identical with the Phoenician weight (224·4 grains). It corresponds to 1s. 4½d. and 2s. 9d. respectively in English silver. Jewish shekels were first coined by Simon the Hasmonean, probably in 139–138 B.C. These bear inscriptions in the archaic Hebrew and various emblems, such as the cup or chalice, the lily branch with three flowers, the candlestick, the citron and palm branch and so forth. They never bear the portraits of rulers or figures of animals. A later series of shekels, belonging to the Roman period, are tetradrachms, "which came from the mints of Caesarea and Antioch and were used as blanks on which to impress Jewish types." Hence in Matt. xvi. 24 the temple tax of half a shekel is called a didrachm (2 drams). In 2 Samuel xiv. 26 we read of "shekels after the King's weight." The royal norm was heavier than the common norm. The Hebrews divided the shekel into 20 parts, each of which was called a *gerah*. (See also NUMISMATICS.)

See articles in *Ency. Bibl.* col. 4442, and Hastings' *Dict. of the Bible*, ii. 417 seq.; F. W. Madden, *Coins of the Jews* (1881); T. Reinach, *Jewish Coins* (1903). (I. A.)

SHEKINAH, a Hebrew word meaning "that which dwells" or "the dwelling." It is one of the expressions used in the Targums in place of "God."

In the Targums.—The word "Shekinah" is of constant occurrence in the *Targums* or Aramaic paraphrases of the Biblical lections that were read in the synagogue-service to the people. Great care was taken by the scribes in these renderings to mitigate the anthropomorphic expressions applied to God in the Scriptures, and by paraphrase, the use of abstract terms and indirect phraseology, to prevent such expressions from giving rise to erroneous views as to God's personal manifestation in the popular mind. Whenever, *e.g.* any indication of local limitation or action was implied or expressed, in the Hebrew text, of God the Targumists were careful to substitute some expression involving the use of "Shekinah." In these connexions "Shekinah" thus becomes the equivalent of "God" or its synonyms. One or two examples will make the Targum-usage clear. Thus Ex. xxix. 45 ("and I will dwell among the children of Israel and will be their God") is rendered in the Targum (Onkelos): "And I will *cause my Shekinah to dwell* in the midst of the children of Israel, and I will be their God." All expressions implying God's *local* presence are similarly rendered: thus *e.g.* Habak. ii. 20 ("Jehovah is in His holy temple") is rendered "Jehovah *was pleased to cause His Shekinah to dwell*," &c. "To see" God is similarly paraphrased. Thus Is. xxxiii. 17 ("thine eyes shall see the King in His beauty") is rendered (Targum of Jonathan): "Thine eyes shall see *the Shekinah of the king of the worlds* in His beauty." So too "hiding the face" when used of God is regularly paraphrased "remove His Shekinah" (Is. lvii. 17, viii. 17, lix. 2; Jer. xxxiii. 5; cf. Is. i. 15, &c.).

Closely connected with the idea of the Shekinah, but distinct from it, is that of "the glory of the Lord." "Glory," indeed, in this connexion was conceived of as a property of the Shekinah (as, in fact, it is of God for whom "Shekinah" is the equivalent). For the divine "glory" as a property of the Shekinah, cf. *e.g.* Is. vi. 5 ("mine eyes have seen the King, the Lord of hosts"), which is rendered in the Targum: "mine eyes have seen *the glory of the Shekinah* of the King of the worlds the Lord of hosts."

In the New Testament.—In the New Testament both the term and the idea are referred to in various ways. The close association of the divine "glory" with the visible Shekinah has already been referred to. This Shekinah-glory is several times denoted in the New Testament by δόξα. The most notable passage is Rom. ix. 4 where St Paul, enumerating the list of Israel's privileges, says: "whose is the adoption, *and the glory*" (*i.e.* the Shekinah-glory, the visible presence of God among His people), &c. cf. Luke ii. 9. There is also an obvious allusion to the Shekinah in the description of the theophanic cloud of the transfiguration-narrative (St. Matt. xvii. 5: "a bright cloud overshadowed them, and behold a voice out of the cloud, saying" &c.; cf. St Mark ix. 7; St Luke ix. 34), the same verb being used as in the LXX. of Exod. xl. 34, 35, of the cloud which rested on the tabernacle when it was filled with "the glory of the Lord." There can be no doubt, too, that the word rendered "tabernacle" (σκηνή) with the corresponding verb "to tabernacle" (σκηνοῦν) has been chosen for use in St John i. 14 and Rev. xii. 3, from its likeness both in sound and meaning to the term "Shekinah." The passage in Revelation runs: "Behold the tabernacle (σκηνή) of God is with men, and He will tabernacle (σκηνώσει) with them." In St John i. 14 there is an allusion to the Word (=*memra* of the Targums), the Shekinah, and the Shekinah-glory, all of which the writer declares became incarnate in Jesus. Cf. also Heb. i. 3 (" effulgence of the [Shekinah] glory ").

In Talmud and Midrash.—It is remarkable that the *memra* (=Logos or " Word ") of the Targums almost entirely disappears in the Midrashic literature and the Talmud, its place being taken by *Shekinah*. The Rabbis apparently dreaded the possibility of such terms becoming hypostasized into personal entities distinct from God. Against this they emphasized the Shekinah-idea. It is safe to say that wherever Shekinah is mentioned in Rabbinic literature it is God's direct action or activity that is thought of. Independent personality is never imputed to it.[1] It is probable that the use of the term was often in Rabbinic writings polemical (against Jewish Christians or gnostic sects).

See under " Shekinah " in Hastings' *Dict. of the Bible*, and *Dict. of Christ and the Gospels*, and in the *Jewish Encyclopedia*; also Weber, *Jüdische Theologie*, 2nd ed., especially pp. 185-190. For the Targums in English, cf. Etheridge, *The Targums on the Pentateuch* (2 vols., 1862 and 1865); and Pauli, *The Chaldee Paraphrase of the Prophet Isaiah* (London, 1871). (G. H. Bo.)

SHELBY, ISAAC (1750–1826), American soldier and pioneer, was born at North Mountain, near Hagerstown, Maryland, on the 11th of December 1750. With his father, Evan Shelby (1720–1794), an emigrant from Wales, he removed to what is now Bristol, Tennessee, in 1771, and in 1774 took a conspicuous part in the battle of Point Pleasant.[2] He was a surveyor in Kentucky for the Transylvania Company in 1775; became a captain of Virginia minute-men in 1776, and in 1777 became commissary with supervision over transportation of supplies from Staunton, Virginia, to the frontier. In 1779 he was elected to the Virginia House of Delegates, but, by the line established between Virginia and North Carolina at this time, he became a resident of North Carolina and he was appointed colonel of the Sullivan county militia, which in 1780 he commanded in guerilla fighting, and he led the left centre of the American force at King's Mountain (October 7). He served under General Francis Marion in 1781, and in 1782 was a member of the North Carolina House of Commons. He was active in the movement for the erection of the state of Kentucky, was a member of the Kentucky Constitutional Convention of 1792, and was governor of the new state in 1792–1796 and in 1812–1816; in 1813 he commanded twelve Kentucky regiments at the battle of the Thames, and for his services received the thanks of Congress and a gold medal. In 1818 he was a commissioner with Andrew Jackson to the Chickasaws. He died on his estate in Lincoln county, Kentucky, on the 18th of July 1826.

SHELBYVILLE, a city and the county-seat of Shelby county, Indiana, U.S.A., about 27 m. S.E. of Indianapolis, on the Big Blue river. Pop. (1890) 5451; (1900) 7169, including 326 foreign-born; (1910) 9500. It is served by the Cleveland, Cincinnati, Chicago & St Louis and the Pittsburg, Cincinnati, Chicago & St Louis railways, and by an interurban electric line. It has a public library, a hospital and a children's home. The city is a trading centre for the surrounding farming region; among its manufactures furniture is the most important. Shelbyville, named in honour of General Isaac Shelby of Kentucky, was platted in 1822, incorporated as a town in 1850, and chartered as a city in 1860.

SHELD-DRAKE, or, as commonly spelt in its contracted form, SHELDRAKE, a word whose derivation[3] has been much discussed, one of the most conspicuous birds of the duck tribe, *Anatidae*, called, however, in many parts of England the " Burrow-Duck" and in some districts by the almost obsolete name of " Bergander" (Du. *Berg-eende*, Ger. *Bergente*), a word used by Turner in 1544.

The sheldrake is the *Anas tadorna*[4] of Linnaeus, and the *Tadorna cornuta* of modern ornithology, a bird somewhat larger and of more upright stature than an ordinary duck, having its bill, with a basal fleshy protuberance (whence the specific term *cornuta*), pale red, the head and upper neck very dark glossy green, and beneath that a broad white collar, succeeded by a still broader belt of bright bay extending from the upper back across the upper breast. The outer scapulars, the primaries, a median abdominal stripe, which dilates at the vent, and a bar at the tip of the middle tail-quills are black; the inner secondaries and the lower tail-coverts are grey; and the *speculum* or wing-spot is a rich bronzed-green. The rest of the plumage is pure white, and the legs are flesh-coloured. There is little external difference between the sexes, the female being only somewhat smaller and less brightly coloured. The sheldrake frequents the sandy coasts of nearly the whole of Europe and North Africa, extending across Asia to India, China and Japan, generally keeping in pairs and sometimes penetrating to favourable inland localities. The nest is always made under cover, usually in a rabbit-hole among sandhills; and in the Frisian Islands the people supply this bird with artificial burrows, taking large toll of it in eggs and down.

T. radjah of Australia, Papuasia and the Moluccas almost equals the true sheldrake in its brightly contrasted plumage, but the head is white in both sexes. Barbary, south-eastern Europe, and Central Asia are inhabited by an allied species of more inland range and very different coloration, the *T. casarca* or *Casarca rutila* of ornithologists, the ruddy sheldrake of English authors—for it has several times strayed to the British Islands—and the " Brahminy Duck " of Anglo-Indians, who find it resorting in winter, whether by pairs or by thousands, to their inland waters. This species is of an almost uniform bay colour all over, except the quill-feathers of the wings and tail, and (in the male) a ring round the neck, which are black, while the wing-coverts are white and the *speculum* shines with green and purple; the bill and legs are dark-coloured.[5] A species closely resembling the last, but with a grey head, *C. cana*, inhabits South Africa. In Australia occurs another species of more sombre colours, the *C. tadornoides*; and New Zealand is the home of another species, *C. variegata*, still less distinguished by bright hues. In the last two the plumage of the sexes differs not inconsiderably.

Sheldrakes will, if attention be paid to their wants, breed freely in captivity, crossing if opportunity be given them with other species, and an incident therewith connected possesses an importance hardly to be overrated by the philosophical naturalist. In the Zoological Society's gardens in London in the spring of 1859 a male of *T. cornuta* mated with a female of *C. cana*, and, as will have been inferred from what has been before stated, these two species differ greatly in the colouring of their plumage. The young of their union, however, presented an appearance wholly unlike that of either parent, and an appearance which can hardly be said, as has been said (*P.Z.S.*, 1859, p. 442), to be " a curious combination of the colours of the two." Both sexes of this hybrid have been admirably portrayed by J. Wolf; and, strange to say, when these figures are compared with equally faithful portraits by the same master of the Australian and New Zealand species, *C. tadornoides* and *C. variegata*, it will at once be seen that the hybrids present an appearance almost midway between the two species last named—species which certainly had nothing to do with their production.[1]

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[1] Maimonides, however, regarded the Shekinah, like the *memra* and " the glory," as a distinct entity.

[2] Isaac Shelby's letter describing the battle is printed in Theodore Roosevelt's *Winning of the West*, i. 341-344.

[3] Ray in 1674 (*Engl. Words*, p. 76) gave it from the local " sheld " (=particoloured), which, applied to animals, as a horse or a cat, still survives in East Anglia. This opinion is not only suitable but is confirmed by the bird's Old Norsk name *Skjöldungr*, from *Skjöldr*, primarily a patch, and now commonly bestowed on a piebald horse, just as *Skjalda* (Cleasby's *Icel. Dict.*, *sub voce*), from the same source, is a particoloured cow. But some scholars interpret *Skjöldungr* by the secondary meaning of *Skjöldr*, a shield, asserting that it refers to " the shield-like band across the breast " of the bird. If they be right the proper spelling of the English word would be " Shield-drake," as some indeed have it. A third suggested meaning, from the Old Norsk *Skjól*, shelter, is philologically to be rejected, but, if true, would refer to the bird's habit, described in the text, of breeding under cover.

[4] This is the Latinized form of the French *Tadorne*, first published by Belon (1555), a word on which Littré throws no light except to state that it has a southern variant *Tardone*.

[5] Jerdon (*B. India*, iii. 793) tells of a Hindu belief that once upon a time two lovers were transformed into birds of this species, and that they or their descendants are condemned to pass the night on the opposite banks of a river, whence they unceasingly call to one another: " Chakwa, shall I come?" " No, Chakwi." " Chakwi, shall I come?" " No, Chakwa." As to how, in these circumstances, the race is perpetuated the legend is silent.

The genera *Tadorna* and *Casarca*, as shown by the tracheal characters and coloration, are most nearly related to *Chenalopex*, containing the bird so well known as the Egyptian goose, *C. aegyptiaca*, and an allied species, *C. jubata*, from South America. For the same reason the genus *Plectropterus*, composed of the spur-winged geese of Africa, and perhaps the Australian *Anseranas* and the Indian and Ethiopian *Sarcidiornis*, also appear to belong to the same group, which should be reckoned rather to the Anatine than to the Anserine section of the *Anatidae*. (A. N.)

SHELDON, CHARLES MONROE (1857–), American Congregational clergyman, was born in Wellsville, New York, on the 26th of February 1857. Graduating at Brown University in 1883 and at Andover Theological Seminary in 1886, he was pastor of a church at Waterbury, Vermont, in 1886–1888, and in 1889 became pastor of the Central Congregational Church of Topeka, Kansas. He is well known as the author of a number of widely read books of fiction, which at the same time inculcate an uncompromising obedience to the precepts of the Gospel in everyday life. Of these, *In His Steps* (1896), though not the earliest, is perhaps the best, and it is this one which first brought him into prominence.

SHELDON, GILBERT (1598–1677), archbishop of Canterbury, was born at Stanton in the parish of Ellastone, Staffordshire, and educated at Oxford. He was ordained in 1622 and was appointed chaplain to Thomas Lord Coventry (1578–1640). Four years later he was elected warden of All Souls' College, Oxford. During the years 1632–1639 he received the livings of Hackney (1633); Oddington, Oxfordshire; Ickford, Buckinghamshire (1636); and Newington, Oxfordshire; besides being a prebendary of Gloucester from 1632. In 1638 he was on a commission appointed to visit Merton College, Oxford. He was intimate with the Royalist leaders, participated in the negotiations for the Uxbridge treaty of 1644, and collected funds for Charles II. in exile. In 1648 he was ejected from All Souls' by order of parliament, and imprisoned for some months, but he regained the wardenship in 1659. In 1660 he became bishop of London and master of the Savoy, and the Savoy Conference was held at his lodgings. He was consecrated archbishop of Canterbury in 1663. He was greatly interested in the welfare of Oxford University, of which he became chancellor in 1667, succeeding Clarendon (1609–1674). The Sheldonian theatre at Oxford was built and endowed at his expense.

SHELL (O. Eng. *scell*, *scyll*, cf. Du. *schel*, shell, Goth. *skalja*, tile; the word means originally a thin flake, cf. Swed. *skalja*, to peel off; it is allied to "scale" and "skill," from a root meaning to cleave, divide, separate), the hard outside natural covering of anything, as of some fruits and seeds; more particularly, the conch (*q.v.*) or integument which acts as a defence for the bodies of various animals (see MOLLUSCA, GASTROPODA, MALACOSTRACA, &c.), the test, crust or carapace; also the outer covering of an egg. The word is also used of many objects resembling the natural shell in use or shape, and especially of a hollow projectile filled with explosives (see AMMUNITION, § *Shell*, and ORDNANCE).

See also SHELL-HEAPS, SHELL-MONEY.

SHELLEY, MARY WOLLSTONECRAFT (1797–1851), English writer, only daughter of William Godwin and his wife Mary Wollstonecraft, and second wife of the poet Percy Bysshe Shelley, was born in London on the 30th of August 1797. For the history of her girlhood and of her married life see GODWIN, WILLIAM, and SHELLEY, P.B. When she was in Switzerland with Shelley and Byron in 1816 a proposal was made that various members of the party should write a romance or tale dealing with the supernatural. The result of this project was that Mrs Shelley wrote *Frankenstein*, Byron the beginning of a narrative about a vampyre, and Dr Polidori, Byron's physician, a tale named *The Vampyre*, the authorship of which used frequently in past years to be attributed to Byron himself. *Frankenstein*, published in 1818, when Mrs Shelley was at the utmost twenty-one years old, is a very remarkable performance for so young and inexperienced a writer; its main idea is that of the formation and vitalization, by a deep student of the secrets of nature, of an adult man, who, entering the world thus under unnatural conditions, becomes the terror of his species, a half-involuntary criminal, and finally an outcast whose sole resource is self-immolation. This romance was followed by others: *Valperga, or the Life and Adventures of Castruccio, Prince of Lucca* (1823), an historical tale written with a good deal of spirit, and readable enough even now; *The Last Man* (1826), a fiction of the final agonies of human society owing to the universal spread of a pestilence—this is written in a very stilted style, but possesses a particular interest because Adrian is a portrait of Shelley; *The Fortunes of Perkin Warbeck* (1830); *Lodore* (1835), also bearing partly upon Shelley's biography, and *Falkner* (1837). Besides these novels there was the *Journal of a Six Weeks' Tour* (the tour of 1814 mentioned below), which is published in conjunction with Shelley's prose-writings; and *Rambles in Germany and Italy* in 1840–1842–1843 (which shows an observant spirit, capable of making some true forecasts of the future), and various miscellaneous writings. After the death of Shelley, for whom she had a deep and even enthusiastic affection, marred at times by defects of temper, Mrs Shelley in the autumn of 1823 returned to London. At first the earnings of her pen were her only sustenance; but after a while Sir Timothy Shelley made her an allowance, which would have been withdrawn if she had persisted in a project of writing a full biography of her husband. In 1838 she edited Shelley's works, supplying the notes that throw such invaluable light on the subject. She succeeded, by strenuous exertions, in maintaining her son Percy at Harrow and Cambridge; and she shared in the improvement of his fortune when in 1840 his grandfather acknowledged his responsibilities and in 1844 he succeeded to the baronetcy. She died on the 21st of February 1851.

SHELLEY, PERCY BYSSHE (1792–1822), English poet, was born on the 4th of August 1792 at Field Place, near Horsham, Sussex. He was the eldest child of Timothy Shelley (1753–1844), M.P. for Shoreham, by his wife Elizabeth, daughter of Charles Pilfold, of Effingham, Surrey. His father was the son and heir of Sir Bysshe Shelley, Bart. (d. 1815), whose baronetcy (1806) was a reward from the Whig party for political services. Sir Bysshe's father Timothy had emigrated to America, and he himself had been born in Newark, New Jersey; but he came back to England, and did well for himself by marrying successively two heiresses, the first, the mother of Timothy, being Mary Catherine, daughter of the Rev. Theobald Michell of Horsham. He was a handsome man of enterprising and remarkable character, accumulated a vast fortune, built Castle Goring, and lived in sullen and penurious retirement in his closing years. None of his talent seems to have descended to his son Timothy, who, except for being of a rather oddly self-assertive character, was undistinguishable from the ordinary run of commonplace country squires. The mother of the poet is described as beautiful, and a woman of good abilities, but not with any literary turn; she was an agreeable letter-writer. The branch of the Shelley family to which the poet Percy Bysshe belonged traces its pedigree to Henry Shelley, of Worminghurst, Sussex, who died in 1623. These Worminghurst or Castle Goring Shelleys are of the same stock as the Michelgrove Shelleys, who trace up to Sir William Shelley, judge of the common pleas under Henry VII., thence to a member of parliament in 1415, and to the reign of Edward I., or even to the epoch of the Norman Conquest. The Worminghurst branch was a family of credit, but not of special distinction, until its fortunes culminated under the above-named Sir Bysshe.

In the character of Percy Bysshe Shelley three qualities became early manifest, and may be regarded as innate: impressionableness or extreme susceptibility to external and internal impulses of feeling; a lively imagination or erratic fancy, blurring a sound estimate of solid facts; and a resolute repudiation of outer authority or the despotism of custom. These qualities were highly developed in his earliest manhood, were active in his boyhood, and no doubt made some show even on the borderland between childhood and infancy. At the age of six he was sent to a day school at Warnham, kept by the Rev. Mr Edwards; at ten to Sion House School, Brentford, of which the principal was Dr Greenlaw, while the pupils were mostly sons of local tradesmen; at twelve (or immediately before that age, on the 29th of July 1804) to Eton. The headmaster of Eton, up to nearly the close of Shelley's sojourn in the school, was Dr Goodall, a mild disciplinarian; it is therefore a mistake to suppose that Percy (unless during his very brief stay in the lower school) was frequently flagellated by the formidable Dr Keate, who only became headmaster after Goodall. Shelley was a shy, sensitive, mopish sort of boy from one point of view—from another a very unruly one, having his own notions of justice, independence and mental freedom; by nature gentle, kindly and retiring—under provocation dangerously violent. He resisted the odious fagging system, exerted himself little in the routine of school-learning, and was known both as "Mad Shelley" and as "Shelley the Atheist." Some writers try to show that an Eton boy would be termed atheist without exhibiting any propensity to atheism, but solely on the ground of his being mutinous. However, as Shelley was a declared atheist a good while before attaining his majority, a shrewd suspicion arises that, if Etonians dubbed him atheist, they had some relevant reason for doing so.

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[1] It is further worthy of remark that the young of *C. variegata* when first hatched closely resemble those of *C. rutila*, and when the former assume their first plumage they resemble their father more than their mother (*P.Z.S.*, 1866, p. 150).

Shelley entered University College, Oxford, in April 1810, returned thence to Eton, and finally quitted the school at midsummer, and commenced residence in Oxford in October. Here he met a young Durham man, Thomas Jefferson Hogg, who had preceded him in the university by a couple of months; the two youths at once struck up a warm and intimate friendship. Shelley had at this time a love for chemical experiment, as well as for poetry, philosophy, and classical study, and was in all his tastes and bearing an enthusiast. Hogg was not in the least an enthusiast, rather a cynic, but he also was a steady and well-read classical student. In religious matters both were sceptics, or indeed decided anti-Christians; whether Hogg, as the senior and more informed disputant, pioneered Shelley into strict atheism, or whether Shelley, as the more impassioned and unflinching speculator, outran the easy-going jeering Hogg, is a moot point; we incline to the latter opinion. Certain it is that each egged on the other by perpetual disquisition on abstruse subjects, conducted partly for the sake of truth and partly for that of mental exercitation, without on either side any disposition to bow to authority or stop short of extreme conclusions. The upshot of this habit was that Shelley and Hogg, at the close of some five months of happy and uneventful academic life, got expelled from the university. Shelley—for he alone figures as the writer of the "little syllabus," although there can be no doubt that Hogg was his confidant and coadjutor throughout—published anonymously a pamphlet or flysheet entitled *The Necessity of Atheism*, which he sent round to bishops and all sorts of people as an invitation or challenge to discussion. It amounted to saying that neither reason nor testimony is adequate to establish the existence of a deity, and that nothing short of a personal individual self-revelation of the deity would be sufficient. The college authorities heard of the pamphlet, identified Shelley as its author, and summoned him before them—"our master, and two or three of the fellows." The pamphlet was produced, and Shelley was required to say whether he had written it or not. The youth declined to answer the question, and was expelled by a written sentence, ready drawn up. Hogg was next summoned, with a result practically the same. The precise details of this transaction have been much controverted; the best evidence is that which appears on the college records, showing that both Hogg and Shelley (Hogg is there named first) were expelled for "contumaciously refusing to answer questions," and for "repeatedly declining to disavow" the authorship. Thus they were dismissed as being mutineers against academic authority, in a case pregnant with the suspicion—not the proof—of atheism; but how the authorities could know beforehand that the two undergraduates would be contumacious and stiff against disavowal, so as to give warrant for written sentences ready drawn up, is nowhere explained. Possibly the sentences were worded without ground assigned, and would only have been produced *in terrorem* had the young men proved more malleable. The date of this incident was the 25th of March 1811.

Shelley and Hogg came up to London, where Shelley was soon left alone, as his friend went to York to study conveyancing. Percy and his incensed father did not at once come to terms, and for a while he had no resource beyond pocket-money saved up by his sisters (four in number altogether) and sent round to him, sometimes by the hand of a singularly pretty school-fellow, Miss Harriet Westbrook, daughter of a retired and moderately rich hotel-keeper. Shelley, in early youth, had a somewhat "priggish" turn for moralizing and argumentation, and a decided mania for proselytizing; his school-girl sisters, and their little Methodist friend Miss Westbrook, aged between fifteen and sixteen, must all be enlightened and converted to anti-Christianity. He therefore cultivated the society of Harriet, calling at the house of her father, and being encouraged in his assiduity by her much older sister Eliza. Harriet not unnaturally fell in love with him; and he, though not it would seem at any time ardently in love with her, dallied along the flowery pathway which leads to sentiment and a definite courtship. This was not his first love-affair; for he had but a very few months before been courting his cousin Miss Harriet Grove, who, alarmed at his heterodoxies, finally broke off with him—to his no small grief and perturbation at the time. It is averred, and seemingly with truth, that Shelley never indulged in any sensual or dissipated amour; and, as he advances in life, it becomes apparent that, though capable of the passion of love, and unusually prone to regard with much effusion of sentiment women who interested his mind and heart, the mere attraction of a pretty face or an alluring figure left him unenthralled. After a while Percy was reconciled to his father, revisited his family in Sussex, and then stayed with a cousin in Wales. Hence he was recalled to London by Miss Harriet Westbrook, who wrote complaining of her father's resolve to send her back to her school, in which she was now regarded with repulsion as having become too apt a pupil of the atheist Shelley. He replied counselling resistance. "She wrote to say" (these are the words of Shelley in a letter to Hogg, dating towards the end of July 1811) "that resistance was useless, but that she would fly with me, and threw herself upon my protection." Shelley, therefore, returned to London, where he found Harriet agitated and wavering; finally they agreed to elope, travelled in haste to Edinburgh, and there, on the 28th of August, were married with the rites of the Scottish Church. Shelley, it should be understood, had by this time openly broken, not only with the dogmas and conventions of Christian religion, but with many of the institutions of Christian polity, and in especial with such as enforce and regulate marriage; he held—with William Godwin and some other theorists—that marriage ought to be simply a voluntary relation between a man and a woman, to be assumed at joint option and terminated at the after-option of either party. If, therefore, he had acted upon his personal conviction of the right, he would never have wedded Harriet, whether by Scotch, English or any other law; but he waived his own theory in favour of the consideration that in such an experiment the woman's stake, and the disadvantages accruing to her, are out of all comparison with the man's. His conduct, therefore, was so far entirely honourable; and, if it derogated from a principle of his own (a principle which, however contrary to the morality of other people, was and always remained matter of genuine conviction on his individual part), this was only in deference to a higher and more imperious standard of right.

Harriet Shelley was not only beautiful; she was amiable, accommodating, adequately well educated and well bred. She liked reading, and her reading was not strictly frivolous. But she could not (as Shelley said at a later date) "feel poetry and understand philosophy." Her attractions were all on the surface;

there was (to use a common phrase) "nothing particular in her." For nearly three years Shelley and she led a shifting sort of life upon an income of £400 a year, one-half of which was allowed (after his first severe indignation at the *mésalliance* was past) by Mr Timothy Shelley, and the other half by Mr Westbrook. The couple left Edinburgh for York and the society of Hogg; broke with him upon a charge made by Harriet, and evidently fully believed by Shelley at the time, that, during a temporary absence of his upon business in Sussex, Hogg had tried to seduce her (this quarrel was entirely made up at the end of about a year); moved off to Keswick in Cumberland, where they received kind attentions from Southey, and some hospitality from the duke of Norfolk, who, as chief magnate in the Shoreham region of Sussex, was at pains to reconcile the father and his too unfilial heir; sailed thence to Dublin, where Shelley was eager, and in some degree prominent, in the good cause of Catholic emancipation, conjoined with repeal of the union; crossed to Wales, and lived at Nant-Gwillt, near Rhayader, then at Lynmouth in Devonshire, then at Tanyrallt in Carnarvonshire. All this was between September 1811 and February 1813. At Lynmouth an Irish servant of Shelley's was sentenced to six months' imprisonment for distributing and posting up printed papers, bearing no printer's name, of an inflammatory or seditious tendency—being a *Declaration of Rights* composed by the youthful reformer, and some verses of his named *The Devil's Walk*. At Tanyrallt Shelley was (according to his own and Harriet's account, confirmed by the evidence of Miss Westbrook, the elder sister, who continued an inmate in most of their homes) attacked on the night of 26th February by an assassin who fired three pistol-shots. It was either a human assassin or (as Shelley once said) "the devil." The motive of the attack was undefined; the fact of its occurrence was generally disbelieved, both at the time and by subsequent inquirers. Shelley was full of wild unpractical notions; he dosed himself occasionally with laudanum as a palliative to spasmodic pains; he was given to strange assertions and romancing narratives (several of which might properly be specified here but for want of space), and was not incapable of conscious fibbing. His mind no doubt oscillated at times along the line which divides sanity from insane delusion. It is now, however, at last proved that he did not invent such a monstrous story to serve a purpose. The *Century Magazine* for October 1905 contained an article entitled "A Strange Adventure of Shelley's," by Margaret L. Croft, which shows that a shepherd close to Tanyrallt, named Robin Pant Evan, being irritated by some well-meant acts of Shelley in terminating the lives of dying or diseased sheep, did really combine with two other shepherds to scare the poet, and Evan was the person who played the part of "assassin." He himself avowed as much to members of a family, Greaves, who were living at Tanyrallt between 1847 and 1865. This was the break-up of the residence of the Shelleys at Tanyrallt; they revisited Ireland, and then settled for a while in London. Here, in June 1813, Harriet gave birth to her daughter Ianthe Eliza (she married a Mr Esdaile, and died in 1876). Here also Shelley brought out his first poem of any importance, *Queen Mab*; it was privately printed, as its exceedingly aggressive tone in matters of religion and morals would not allow of publication. In July the Shelleys took a house at Bracknell near Windsor Forest, where they had congenial neighbours, Mrs Boinville and her family.

The speculative sage whom Shelley especially reverenced was William Godwin, the author of *Political Justice* and of the romance *Caleb Williams*; in 1796 he had married Mary Wollstonecraft, authoress of *The Rights of Woman*, who died shortly after giving birth, on the 30th of August 1797, to a daughter Mary. With Godwin Shelley had opened a volunteered correspondence late in 1811, and he had known him personally since the winter which closed 1812. Godwin was then a bookseller, living with his second wife, who had been a Mrs Clairmont; there were four other inmates of the household, two of whom call for some mention here—Fanny Wollstonecraft, the daughter of the authoress and Mr Imlay, and Claire (Clara Mary Jane), the daughter of Mrs Clairmont. Fanny committed suicide in October 1816, being, according to some accounts which remain unverified, hopelessly in love with Shelley; Claire was closely associated with all his subsequent career. It was towards May 1814 that Shelley first saw Mary Wollstonecraft Godwin as a grown-up girl (she was well on towards seventeen); he instantly fell in love with her, and she with him. Just before this, on the 24th of March, Shelley had remarried Harriet in London, apparently with a view to strengthening his position in his relations with his father as to the family property; but, on becoming enamoured of Mary, he seems to have rapidly made up his mind that Harriet should not stand in the way. She was at Bath while he was in London. They had, however, met again in London and come to some sort of understanding before the final crisis arrived—Harriet remonstrating and indignant, but incapable of effective resistance—Shelley sick of her companionship, and bent upon gratifying his own wishes, which as we have already seen were not at odds with his avowed principles of conduct. For some months past there had been bickerings and misunderstandings between him and Harriet, aggravated by the now detested presence of Miss Westbrook in the house; more than this cannot be said, and it seems dubious whether more will be hereafter known. Shelley, and not he alone, alleged grave misdoing on Harriet's part—perhaps mistakenly. The upshot came on the 28th of July, when Shelley aided Mary to elope from her father's house, Claire Clairmont deciding to accompany them. They crossed to Calais, and proceeded across France into Switzerland. Godwin and his wife were greatly incensed. Though he and Mary Wollstonecraft had entertained and avowed bold opinions regarding the marriage-bond, similar to Shelley's own, and had in their time acted upon these opinions, it is not clearly made out that Mary Godwin had ever been encouraged by paternal influence to think or do the like. Shelley and she chose to act upon their own likings and responsibility—he disregarding any claim which Harriet had upon him, and Mary setting at nought her father's authority. Both were prepared to ignore the law of the land and the rules of society.

The three young people returned to London in September. In the following January 1815 Sir Bysshe Shelley died, and Percy, who had lately been in great money-straits, became the immediate heir to the entailed property inherited by his father Sir Timothy. This entailed property seems to have been worth £6000 per annum, or little less. There was another very much larger property which Percy might shortly before have secured to himself, contingently upon his father's death, if he would have consented to put it upon the same footing of entail; but this he resolutely refused to do, on the professed ground of his being opposed upon principle to the system of entail; therefore, on his grandfather's death the larger property passed wholly away from any interest which Percy might have had in it, in use or in expectancy. He now came to an understanding with his father as to the remaining entailed property; and, giving up certain future advantages, he received henceforth a regular income of £1000 a year. Out of this he assigned £200 a year to Harriet, who had given birth in November to a son, Charles Bysshe (he died in 1826). Shelley, and Mary as well, were on moderately good terms with Harriet, seeing her from time to time. His peculiar views as to the relations of the sexes appear markedly again in his having (so it is alleged) invited Harriet to return to his and Mary's house as a domicile; a curious arrangement which of course did not take effect. He had, undoubtedly, while previously abroad with Mary, invited Harriet to stay in their immediate neighbourhood. Shelley and Mary (who was naturally always called Mrs Shelley) now settled at Bishopgate, near Windsor Forest; here he produced his first excellent poem, *Alastor, or the Spirit of Solitude*, which was published soon afterwards with a few others. Thomas Love Peacock was one of his principal associates at Bishopgate.

In May 1816 the pair left England for Switzerland, together with Miss Clairmont, and their own infant son William. They went straight to Sécheron, near Geneva; Byron, whose separation from his wife had just then taken place, arrived there immediately afterwards. A great deal of controversy has arisen as to the motives and incidents of this foreign sojourn. The clear fact is that Miss Clairmont, who had a fine voice and some inclination for the stage, had seen Byron, as connected with the management of Drury Lane theatre, early in the year, and an amorous intrigue had begun between them in London. Prima facie it seems quite reasonable to suppose that she had explained the facts to Shelley or to Mary, or to both, and had induced them to convoy her to the society of Byron abroad; were this finally established as the fact, it would show no inconsistency of conduct, or breach of his own code of sexual morals, on Shelley's part. On the other hand, documentary evidence exists showing that Mary was totally ignorant of the amour shortly before they went abroad. Whether or not they knew of it while they and Claire were in daily intercourse with Byron, and housed close by him on the shore of the Lake of Geneva, may be left unargued. The three returned to London in September 1816, Byron remaining abroad; and in January 1817 Miss Clairmont gave birth to his daughter named Allegra.

The return of the Shelleys was closely followed by two suicides—first that of Fanny Wollstonecraft (already referred to), and second that of Harriet Shelley, who on the 9th of November drowned herself in the Serpentine. The body was not found until the 10th of December. The latest stages of the lovely and ill-starred Harriet's career have never been very explicitly recorded. It seems that she formed a connexion with some gentleman from whom circumstances or desertion separated her, that her habits became intemperate, and that she was treated with contumelious harshness by her sister during an illness of their father. She had always had a propensity (often laughed at in earlier and happier days) to the idea of suicide, and she now carried it out in act—possibly without anything which could be regarded as an extremely cogent predisposing motive, although the total weight of her distresses, accumulating within the past two years and a half, was beyond question heavy to bear. Shelley, then at Bath, hurried up to London when he heard of Harriet's death, giving manifest signs of the shock which so terrible a catastrophe had produced on him. Some self-reproach must no doubt have mingled with his affliction and dismay; yet he does not appear to have considered himself gravely in the wrong at any stage in the transaction, and it is established that in the train of quite recent events which immediately led up to Harriet's suicide he had borne no part.

This was the time when Shelley began to see a great deal of Leigh Hunt, the poet and essayist, editor of the *Examiner*; they were close friends, and Hunt did something to uphold the reputation of Shelley as a poet—which, we may here say once for all, scarcely obtained any public acceptance or solidity during his brief lifetime. The death of Harriet having removed the only obstacle to a marriage with Mary Godwin, the wedding ensued on the 30th of December 1816, and the married couple settled down at Great Marlow in Buckinghamshire. Their tranquillity was shortly disturbed by a Chancery suit set in motion by Mr Westbrook, who asked for the custody of his two grandchildren, on the ground that Shelley had deserted his wife and intended to bring up his offspring in his own atheistic and anti-social opinions. Lord Chancellor Eldon delivered judgment on the 27th of March 1817. He held that Shelley, having avowed condemnable principles of conduct, and having fashioned his own conduct to correspond, and being likely to inculcate the same principles upon his children, was unfit to have the charge of them. He appointed as their curator Dr Hume, an orthodox army-physician, who was Shelley's own nominee. The poet had to pay for the maintenance of the children a sum which stood eventually at £120 per annum; if it was at first (as generally stated) £200, that was no more than what he had previously allowed to Harriet. This is the last incident of marked importance in the perturbed career of Shelley; the rest relates to the history of his mind, the poems which he produced and published, and his changes of locality in travelling. The first ensuing poem was *The Revolt of Islam*, referred to near the close of this article.

In March 1818, after an illness which he regarded (rightly or wrongly) as a dangerous pulmonary attack, Shelley, with his wife, their two infants William and Clara, and Miss Clairmont and her baby Allegra, went off to Italy, where the short remainder of his life was passed. Allegra was soon sent on to Venice, to her father, who, ever since parting from Miss Clairmont in Switzerland, showed a callous and unfeeling determination to see and know no more about her. In 1818 the Shelleys—always nearly with Miss Clairmont in their company—were in Milan, Leghorn, the Bagni di Lucca, Venice and its neighbourhood, Rome, and Naples; in 1819 in Rome, the vicinity of Leghorn, and Florence (both their infants were now dead, but a third was born late in 1819, Percy Florence Shelly, who in 1844 inherited the baronetcy); in 1820 in Pisa the Bagni di Pisa (or di San Giuliano), and Leghorn; in 1821 in Pisa and with Byron in Ravenna; in 1822 in Pisa and on the Bay of Spezia, between Lerici and San Terenzio. The incidents of this period are but few, and of no great importance apart from their bearing upon the poet's writings. In Leghorn he knew Mr and Mrs Gisborne, the latter a once intimate friend of Godwin; she taught Shelley Spanish, and he was eager to promote a project for a steamer to be built by her son by a former marriage, the engineer Henry Reveley; it would have been the first steamer to navigate the Gulf of Lyons. In Pisa he formed a sentimental intimacy with the Contessina Emilia Viviani, a girl who was pining in a convent pending her father's choice of a husband for her; this impassioned but vague and fanciful attachment—which soon came to an end, as Emilia's character developed less favourably in the eyes of her Platonic adorer—produced the transcendental love-poem of *Epipsychidion* in 1821. In Ravenna the scheme of the quarterly magazine the *Liberal* was concerted by Byron and Shelley, the latter being principally interested in it with a view to benefiting Leigh Hunt by such an association with Byron. In Pisa Byron and Shelley were very constantly together, having in their company at one time or another Shelley's cousin and schoolfellow Captain Thomas Medwin (1788–1869), Lieutenant Edward Elliker Williams (1793–1822) and his wife, to both of whom the poet was very warmly attached, and Captain Edward John Trelawny, the adventurous and romantic-natured seaman, who has left important and interesting reminiscences of this period. Byron admired very highly the generous, unworldly and enthusiastic character of Shelley, and set some value on his writings; Shelley half-worshipped Byron as a poet, and was anxious, but in some conjunctures by no means able, to respect him as a man. In Pisa he knew also Prince Alexander Mavrocordato, one of the pioneers of Grecian insurrection and freedom; the glorious cause fired Shelley, and he wrote the drama of *Hellas* (1821).

The last residence of Shelley was the Casa Magni, a bare and exposed dwelling on the Gulf of Spezia. He and his wife, with the Williamses, went there at the end of April 1822 to spend the summer, which proved an arid and scorching one. Shelley and Williams, both of them insatiably fond of boating, had a small schooner named the "Don Juan" (or more properly the "Ariel"), built at Genoa after a design which Williams had procured from a naval friend, but the reverse of safe. They received her on the 12th of May, found her rapid and alert, and on the 1st of July started in her to Leghorn, to meet Leigh Hunt, whose arrival in Italy had just been notified. After doing his best to set things going comfortably between Byron and Hunt, Shelley returned on board with Williams on the 8th of July. It was a day of dark, louring, stifling heat. Trelawny took leave of his two friends, and about half-past six in the evening found himself startled from a doze by a frightful turmoil of storm. The "Don Juan" had by this time made Via Reggio; she was not to be seen, though other vessels which had sailed about the same time were still discernible. Shelley, Williams, and their only companion, a sailor-boy, perished in the squall. The exact nature of the catastrophe was from the first regarded as somewhat disputable. The condition of the "Don Juan" when recovered did not favour any assumption that she had capsized in a heavy sea—rather that she had been run down by some other vessel, a felucca or fishing-smack. In the absence of any counter-evidence this would be supposed to have occurred by accident; but a rumour, not strictly verified and certainly not refuted, exists that an aged Italian seaman on his deathbed confessed that he had been one of the crew of the fatal felucca, and that the collision was intentional, as the men had plotted to steal a sum of money supposed to be on the "Don Juan," in charge of Lord Byron. In fact there was a moderate sum there, but Byron had neither embarked nor intended to embark. This may perhaps be the true account of the tragedy; at any rate Trelawny, the best possible authority on the subject, accepted it as true. He it was who laboriously tracked out the shore-washed corpses of Williams and Shelley, and who undertook the burning of them, after the ancient Greek fashion, on the shore near Via Reggio, on the 15th and 16th of August. The great poet's ashes were then collected, and buried in the new Protestant cemetery in Rome. He was, at the date of his untimely death, within a month of completing the thirtieth year of his age—a surprising example of rich poetic achievement for so young a man.

The character of Shelley can be considered according to two different standards of estimation. We can estimate the original motive forces in his character; or we can form an opinion of his actions, and thence put a certain construction upon his personal qualities. We will first try the latter method. It cannot be denied by his admirers and eulogists, and is abundantly clear to his censors, that his actions were in some considerable degree abnormal, dangerous to the settled basis of society, and marked by headstrong and undutiful presumption. But it is remarkable that, even among the censors of his conduct, many persons are none the less impressed by the beauty of his character; and this leads us back to our first point—the original motive forces in that. Here we find enthusiasm, fervour, courage (moral and physical), an unbounded readiness to act upon what he considered right principle, however inconvenient or disastrous the consequences to himself, sweetness and indulgence towards others, extreme generosity (he appears to have given Godwin, though sometimes bitterly opposed to him, between £4000 and £5000), and the principle of love for humankind in abundance and superabundance. He respected the truth, such as he conceived it to be, in spiritual or speculative matters, and respected no construction of the truth which came to him recommended by human authority. No man had more hatred or contempt of custom and prescription; no one had a more authentic or vivid sense of universal charity. The same radiant enthusiasm which appeared in his poetry as idealism stamped his speculation with the conception of perfectibility and his character with loving emotion.

In person Shelley was attractive, winning and almost beautiful, but not to be called handsome. His height was nearly 5 ft. 11; he was slim, agile, and strong, with something of a stoop; his complexion brilliant, his hair abundant and wavy, dark brown but early beginning to grizzle; the eyes, deep blue in tint, have been termed "stag-eyes"—large, fixed and beaming. His voice was wanting in richness and suavity—high-pitched, and tending to the screechy; his general aspect, though extremely variable according as his mood of mind and his expression shifted, was on the whole uncommonly juvenile. The only portrait of Shelley, from which some idea of his looks used to be formed, is that painted by an amateur, Miss Curran, in 1819; Mrs Shelley, later, pronounced it to be "in many things very like." This is now in the National Portrait Gallery, together with a quasi-duplicate of it painted by Clint, chiefly from Miss Curran's likeness, and partly from a water colour (now lost) by Lieutenant Williams. In 1905 (*Century Magazine*) another portrait was brought forward: a pencil sketch taken in the last month of the poet's life by an American artist, William E. West, followed by an oil-painting founded on that sketch. The two works differ very considerably, and neither of them resembles Miss Curran's portrait, yet we incline to believe that the sketch was really taken from Shelley.

If we except Goethe (and leave out of count any living writers, whose ultimate value cannot at present be assessed), we must consider Shelley to be the supreme poet of the new era which, beginning with the French Revolution, remains continuous into our own day. Victor Hugo comes nearest to him in poetic stature, and might for certain reasons be even preferred to him; Byron and Wordsworth also have their numerous champions —not to speak of Tennyson or Browning. The grounds, however, on which Shelley may be set highest of all are mainly three. He excels all his competitors in ideality, he excels them in music, and he excels them in importance. By importance we here mean the direct import of the work performed, its controlling power over the reader's thought and feeling, the contagious fire of its white-hot intellectual passion, and the long reverberation of its appeal. Shelley is emphatically the poet of the future. In his own day an alien in the world of mind and invention, and in our day but partially a denizen of it, he appears destined to become, in the long vista of years, an informing presence in the innermost shrine of human thought. Shelley appeared at the time when the sublime frenzies of the French revolutionary movement had exhausted the elasticity of men's thought—at least in England—and had left them flaccid and stolid; but that movement prepared another in which revolution was to assume the milder guise of reform, conquering and to conquer. Shelley was its prophet. As an iconoclast and an idealist he took the only position in which a poet could advantageously work as a reformer. To outrage his contemporaries was the condition of leading his successors to triumph and of personally triumphing in their victories. Shelley had the temper of an innovator and a martyr; and in an intellect wondrously poetical he united speculative keenness and humanitarian zeal in a degree for which we might vainly seek his precursor. We have already named ideality as one of his leading excellences. This Shelleian quality combines, as its constituents, sublimity, beauty and the abstract passion for good. It should be acknowledged that, while this great quality forms the chief and most admirable factor in Shelley's poetry, the defects which go along with it mar his work too often—producing at times vagueness, unreality and a pomp of glittering indistinctness, in which excess of sentiment welters amid excess of words. This blemish affects the long poems much more than the pure lyrics; in the latter the rapture, the music and the emotion are in exquisite balance, and the work has often as much of delicate simplicity as of fragile and flower-like perfection.

Some of Shelley's principal writings have already been mentioned above; we must now give a brief account of others. Of his early work prior to *Queen Mab*—such romances as *Zastrozzi* and *St Irvyne*, such verse as the *Poems by Victor and Cazire*, and the *Fragments of Margaret Nicholson*—we can only here say that they are intrinsically worthless. *Alastor* was succeeded (1817) by *The Revolt of Islam*, a poem of no common length in the Spenserian stanza, preaching bloodless revolution; it was written in a sort of friendly competition with Keats (who produced *Endymion*) and is amazingly fine in parts, but as a whole somewhat long-drawn and exhausting. This transcendental epic (for such it may be termed) was at first named *Laon and Cythna, or the Revolution of the Golden City*, and the lovers of the story were then brother and sister as well as lovers—an experiment upon British endurance which the publishers would not connive at. The year 1818 produced *Rosalind and Helen*, a comparatively weak poem, begun in England and finished in Italy, and *Julian and Maddalo*, a very strong one, written in the neighbourhood of Venice—demonstrating in Shelley a singular power of seeing ordinary things with directness, and at once figuring them as reality and transfiguring them into poetry. In each of these two poems Shelley gives a quasi-portraiture of himself. The next year, 1819, was his culmination, producing as it did the grand tragedy of *The Cenci* and the sublime ideal drama *Prometheus Unbound*, composed partly on the ruins of the Baths of Caracalla in Rome. This last we have no hesitation in calling his masterpiece. It embodies, in forms of surpassing imagination and beauty, Shelley's deepest and most daring conceptions. Prometheus, the human mind and will, has invested with the powers proper to himself Jupiter, the god of heaven, who thereupon chains and torments Prometheus and oppresses mankind; in other words, the anthropomorphic god of religion is a creation of the human mind, and both the mind of man and man himself are enslaved as long as this god exercises his delegated but now absolute power. Prometheus, who is from of old wedded to Asia, or Nature, protests against and anathematizes the usurper enthroned by himself. At last the anathema (although Prometheus has revoked it by an act of self-conquest) takes effect: Eternity, Demogorgon, dismisses Jupiter to unending nothingness. Prometheus is at once unbound, the human mind is free; he is reunited to his spouse Nature, and the world of man passes from thraldom and its degradation into limitless progression, or (as the phrase goes) perfectibility, moral and material. This we regard as in brief the argument of *Prometheus Unbound.* It is closely analogous to the argument of the juvenile poem *Queen Mab*, but so raised in form and creative touch that, whereas to write *Queen Mab* was only to be an ambitious and ebullient tiro, to invent *Prometheus Unbound* was to be the poet of the future. *The Witch of Atlas* (1820) is the most perfect work among all Shelley's longer poems, though it is neither the deepest nor the most interesting. It may be rated as a pure exercise of roving imagination—guided, however, by an intense sense of beauty, and by its author's exceeding fineness of nature. The poem has often been decried as practically unmeaning; we do not subscribe to this opinion. The "witch" of this subtle and magical invention seems to represent that faculty which we term "the fancy"; using this assumption as a clue, we find plenty of meaning in the poem, but necessarily it is fanciful or volatile meaning. The elegy on Keats, *Adonais*, followed in 1821; the *Triumph of Life*, a mystical and most impressive allegory, constructed upon lines marked out by Dante and by Petrarch, was occupying the poet up to the time of his death. The stately fragment which remains is probably a minor portion of the projected whole. The translations—chiefly from Homer, Euripides, Calderon and Goethe—date from 1819 to 1822, and testify to the poetic endowment of Shelley not less absolutely than his own original compositions; there are also prose translations from Plato.

Shelley, it will be seen, was not only a prolific but also a versatile poet. Works so various in faculty and in form as *The Revolt of Islam, Julian and Maddalo, The Cenci, Prometheus Unbound, Epipysychidion*, and the grotesque effusions of which *Peter Bell the Third* is the prime example, added to the consummate array of lyrics, have seldom to be credited to a single writer—one, moreover, who died before he was thirty years of age. In prose Shelley could be as admirable as in poetry. His letters to Thomas Love Peacock and others, and his uncompleted *Defence of Poetry*, are the chief monuments of his mastery in prose; and certainly no more beautiful prose—having much of the spirit and the aroma of poetry, yet without being distorted out of its proper essence—is to be found in the English language.

The chief original authorities for the life of Shelley (apart from his own writings, which contain a good deal of autobiography, if heedfully sifted and collated) are—(1) the notices by Mrs Shelley interspersed in her edition of the *Poems*; (2) Hogg's amusing, discerning and authentic, although in some respects exaggerated, book; (3) Trelawny's *Records*; (4) the *Life* by Medwin; and (5) the articles written by Peacock. Some other writers, especially Leigh Hunt, might be mentioned, but they come less close to the facts. Among biographical books produced since Shelley's death, by authors who did not know him personally, the leading work is the *Life* by Professor Dowden (2 vols., 1886), which embodies important materials imparted by the Shelley family. *The Real Shelley*, by J. C. Jeaffreson (1885), is controversial in method and decidedly hostile in tendency, and tries a man of genius by tests far from well adapted (in our opinion) to bring out a right result; it contains, however, an ample share of solid information and sharp disquisition. The memoir by W. M. Rossetti, prefixed to an edition of Shelley's *Poems* in two forms of publication (1870 and 1878), was an endeavour to formulate in brief space, out of the then confused and conflicting records, an accurate account of Shelley—admiring, but not uncandidly one-sided. There is valuable material in Lady Shelley's *Shelley Memorials*, and in Dr Garnett's *Relics of Shelley*; and the memoir by J. Addington Symonds, in the *English Men of Letters* series, is characteristic of the writer. The most complete edition of Shelley's poems is now the Oxford edition, edited by Thomas Hutchinson (Clarendon Press, 1905), which includes several pieces not in any other edition, and uses the emendations, &c., published by Mr C.D. Locock (1903) from examination of the MSS. in the Bodleian Library. Mr Buxton Forman's earlier and excellent edition includes the writings in prose as well as in verse. (W. M. R.)

SHELLEY'S CASE, RULE IN, an important decision in the law of real property. The litigation was brought about by the settlement made by Sir William Shelley (*c.* 1480–1549), a judge of the common pleas, of an estate which he had purchased on the dissolution of Sion Monastery. After prolonged argument the celebrated rule was laid down by Lord Chancellor Sir Thomas Bromley, who presided over an assembly of all the judges to hear the case in Easter term 1580–1581. The rule may be stated as follows: when an ancestor by any gift or conveyance takes an estate of freehold and in the same gift or conveyance an estate is limited, either mediately or immediately, to his heirs or the heirs of his body, in such a case the word "heirs" is a word of limitation and not of purchase; that is to say, the estate of the ancestor is not a life or other freehold estate with remainder to the heirs or heirs of the body, but an estate in fee or an estate tail according to circumstances. The rule is a highly technical one, and has led to much litigation and in many cases without a doubt to the defeat of a testator's intentions. It is said to have had its origin in the wish of the law to preserve to the lords their right of wardship, which would have been ousted by the heir taking as purchaser and not as successor. The rule is reported by Lord Coke in 1 *Reports* 93 b. (see also *Van Grutten* v. *Foxwell*, 1897, A.C. 658). In the United States the rule in Shelley's case was at one time in operation as a part of the common law, but it has been repealed by statute in most states.

SHELL-HEAPS, or KITCHEN-MIDDEN (Dan. *Kjökken-mödding*), prehistoric refuse heaps or mounds found in all quarters of the globe, which consist chiefly of the shells of edible molluscs mixed with fragments of animal bones, and implements of stone, bone and horn. They may sometimes, as in the Straits of Magellan, be seen in process of formation. Many having a prehistoric origin have been examined, notably on the eastern coast of Denmark. These were at first thought to be raised beaches, but a cursory examination at once proved their artificial construction. Further investigation by archaeologists proved these shell-heaps to belong to a very ancient period, probably the early part of the Neolithic age, "when the art of polishing flint implements was known, but before it had reached its greatest development" (Lord Avebury, *Prehistoric Times*, 6th ed. p. 235). They contained the remains of quadrupeds, birds and fish, which served as the food of the prehistoric inhabitants. Among the bones were those of the wild bull or aurochs, beaver, seal and great auk, all now extinct or rare in this region. Moreover, a striking proof of the antiquity of these shell-heaps is that they contain full-sized shells of the common oyster, which cannot live at present in the brackish waters of the Baltic except near its entrance, the inference being that the shores where the oyster at that time flourished were open to the salt sea. Thus also the eatable cockle, mussel and periwinkle abounding in the kitchen-middens are of full ocean size, whereas those now living in the adjoining waters are dwarfed to a third of their natural size by the want of saltness. It thus appears that the connexion between the ocean and the Baltic has notably changed since the days of these rude stone-age peoples. The masses of debris were in some places ten to twenty feet thick and stretched a thousand feet. It does not appear that the men of the kitchen-middens had any knowledge of agriculture, no traces of grain of any sort being found. The only vegetable remains were burnt pieces of wood and some charred substance, possibly a sea-plant used in the production of salt. Flat stones blackened with fire, forming hearths, were also found. That periods of scarcity must have been frequent in the absence of cereals is indicated by the discovery of bones of the fox, wolf and other carnivora, which would hardly have been eaten from choice. The kitchen-middens of Denmark were not mere summer-quarters: the ancient fishermen appear to have stayed in the neighbourhood for two-thirds, if not the whole, of the year. This is suggested by an examination of the bones of the wild animals, from which it is often possible to tell the time of year when they were killed. Thus the remains of the wild swan (*Cygnus musicus*), a winter visitor, leaving the Danish coast in March and returning in November, are found in abundance. Additional proof is afforded among the mammalian remains by two periodical phenomena, the shedding of the stag's antlers and the birth and growth of the young. The flint implements found include flakes, axes, awls, sling-stones or net-weights, and rude lance-heads. A fragment of one polished axe was found at Havelse which had been worked up into a scraper. Small pieces of coarse pottery are also met with. The Danish kitchen-midden men were not cannibals. In physique they seem to have resembled the Lapps, a race of small men with heavy overhanging brows and round heads. The excavation of the Danish shell-heaps was followed by the investigation of others in other countries. At Omori (Japan), in the Aleutian Islands, in British Columbia, Oregon and California shell-mounds were explored, always with the result of proving that the present populations had been preceded by ruder tribes of great antiquity. On the Atlantic coast of Brazil shell-heaps, which must have taken thousands of years to accumulate, are now overgrown with dense forests.

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SHELL-MONEY, a medium of exchange common to many primitive races, consisting of sea shells or pieces of them worked into beads or artificially shaped. Shell-money has not been restricted to one quarter of the globe, but in some form or other appears to have been almost universal. It has been found in America, Asia, Africa and Australia. The shell used by the Indians of Alaska and California was the *Dentalium pretiosum*, a species of tusk-shell found along the north-west coast. It received its name from its tusk-like appearance, and was valued by length and not by the number of shells. The usual method of measuring was by the finger-joints, and the *ligua*, the highest denomination of their coinage, consisted of twenty-five shells strung together, which from end to end made a total measurement of a fathom (6 ft.) or thereabouts, equalling in English coinage about £50. Farther south on the shore of California the Indians used the *Saxidomus gracilis* or *Tapis gracilis*, while in the islands close to the littoral the *Litornia obesa* was in commonest use.

But the shell most used by primitive peoples has always been the *Cypraea moneta*, or money-cowry (see Cowry). It is most abundant in the Indian Ocean, and is collected more particularly in the Maldive Islands, in Ceylon, along the Malabar coast, in Borneo and other East Indian islands, and in various parts of the African coast from Ras Hafun to Mozambique. It was formerly in familiar use in Bengal, where, though it required 3840 to make a rupee, the annual importation was valued at about £30,000. In western Africa it was, until past the middle of the 19th century, the usual tender, and before the abolition of the slave trade there were large shipments of cowry shells to some of the English ports for reshipment to the slave coast. As the value of the cowry was very much greater in West Africa than in the regions from which the supply was obtained, the trade was extremely lucrative, and in some cases the gains are said to have been 500%. The use of the cowry currency gradually spread inland in Africa, and about 1850 Heinrich Barth found it fairly recognized in Kano, Kuka, Gando, and even Timbuktu. Barth relates that in Muniyoma, one of the ancient divisions of Bornu, the king's revenue was estimated at 30,000,000 shells, every full-grown man being required to pay annually 1000 shells for himself, 1000 for every pack-ox, and 2000 for every slave in his possession. In the countries on the coast the shells were fastened together in strings of 40 or 100 each, so that fifty or twenty strings represented a dollar; but in the interior they were laboriously counted one by one, or, if the trader were expert, five by five. The districts mentioned above received their supply of *kurdi*, as they were called, from the west coast; but the regions to the north of Unyamwezi, where they were in use under the name of *simbi*, were dependent on Moslem traders from Zanzibar. The shells are still used in the remoter parts of Africa, but are yearly tending to give way to ordinary currency. The shell of the land-snail, *Achatina monetaria*, cut into circles with an open centre has been long used as coin in Benguella, Portuguese West Africa. In parts of Asia *Cyproea annulus*, the ring cowry, so-called from the bright orange-coloured ring on the back or upper side of the shell, was commonly used. Many specimens were found by Sir Henry Layard in his excavations at Nimrud in 1845–1851.

In north Australia different shells were used, one tribe's shell being often absolutely valueless in the eyes of another tribe. In the islands north of New Guinea the shells are broken into flakes. Holes are bored through these flakes, which are then valued by length, as in the case of the American tusk-shell, the measuring, however, being done between the nipples of the breasts instead of by the finger-joints. Two shells are used by these Pacific islanders, one a cowry found on the New Guinea coast, and the other the common pearl shell broken into flakes. As late as 1882 local trade in the Solomon Islands was carried on by means of a coinage of shell beads, small shells laboriously ground down to the required size by the women. No more than were actually needed were made, and as the process was difficult, the value of the coinage was satisfactorily maintained. The custom of breaking or flaking shells was common among some of the American Indian tribes, but the shells so manipulated were of the ponderous *Pachyderma crassatelloides* species, while in the South Pacific Islands the *Oliva carneola* was used.

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SHELTON, THOMAS (fl. 1612–1620), English translator of *Don Quixote*. In the dedication of *The delightfull history of the wittie knight, Don Quishote* (1612) he explains to his patron, Lord Howard de Walden, afterwards 2nd Earl of Suffolk, that he had translated *Don Quixote* from Spanish into English some five or six years previously in the period of forty days for a "very dear friend" who was unable to understand the original. Shelton did not use the original edition of Cervantes, but one published in Brussels in 1607. On the appearance of the Brussels imprint of the second part of *Don Quixote* in 1616, he translated that also into English, completing his task in 1620, and printing at the same time a revised edition of the first part. His performance has become a classic among English translations for its racy, spirited rendering of the original. Light was thrown on Thomas Shelton's personal history by the researches of Mr Alexander T. Wright in a paper published in October 1898. Among the kinsfolk of the earl of Suffolk were three persons bearing the name Thomas Shelton, and though all died before 1600 he was probably a member of the same family. It seems safe to identify him with the Thomas Shelton who wrote a sonnet prefixed to the *Restitution of Decayed Intelligence* (1605) of Richard Verstegan, who was most likely the friend referred to in Shelton's preface, for there is reason to believe that both of them were then employed in a matter of doubtful loyalty, the intrigues of the Roman Catholics in England. He was acquainted with the "cries of the wild Irish," and seems to have been honestly employed in carrying letters to persons in England from Lord Deputy Fitzwilliam at Dublin Castle. But in 1599 he apparently acted as agent for Florence McCarthy to offer his service to the king of Spain, a commission for which his knowledge of Spanish especially fitted him. Soon afterwards an official précis of the facts was drawn up, in which Shelton was implicated by name. A second version of this document in 1617 is actually signed by him, but all reference to his share in the matter is omitted. Lady Suffolk, the wife of his patron, received yearly £1000 in secret service money from the Spanish king, and Shelton may have been her accomplice. If the "many affairs" of his preface were official he would not wish to call attention to his antecedents by owning friendship with Verstegan.

The 1612 edition is available in Mr Fitzmaurice Kelly's reprint for the *Tudor Translations* (1892); that of 1620 is reproduced in Macmillan's "Library of English Classics" with an introduction by Mr A. W. Pollard, who incorporates the suggestions made by Mr A. T. Wright in his *Thomas Shelton, Translator*.

SHEM (Hebrew for "name, renown, posterity"), in the Bible, the eldest of the three sons of Noah, whose superiority over Canaan is reflected in the tradition that Noah pronounced a curse upon the latter (Gen. ix. 20-27). In the genealogies (x. 21 sqq.), Shem numbers among his descendants Assyrian, Arabian, Aramaean and Hebrew populations, whence the ethnic *Semitic* (strictly speaking, *Shemitic*) has been coined as a convenient term for these peoples. It is not altogether scientific, since the Lydians (Lud) and Elamites are included among Shem's "sons," apparently on account of their geographical position or because of their indebtedness to Assyrian culture. On the traditions of Shem, see E. Meyer, *Israeliten u. Nachbarstämme* (Halle, 1906), pp. 219 sqq.

SHEMAKHA, a town of Russian Transcaucasia, in the government of Baku, 70 m. W. of the town of Baku, and in 40° 38′ N. and 48° 40′ E. It has some 20,000 inhabitants, consisting of Tatars (75%), Armenians and Russians. Shemakha was the capital of the khanate of Shirvan, and was known to the Roman geographer Ptolemy as Kamachia. About the middle of the 16th century it was the seat of an English commercial factory, under the traveller Jenkinson, afterwards envoy extraordinary of the khan of Shirvan to Ivan the Terrible of Russia. In 1742 Shemakha was taken and destroyed by Nadir Shah of Persia, who, to punish the inhabitants for their creed (Sunnite Mahommedanism), built a new town under the same name about 16 m. to the W., at the foot of the main chain of the Caucasus. The new Shemakha was at different times a residence of the khan of Shirvan, but it was finally abandoned, and the old town rebuilt. The Russians first entered Shirvan in 1723, but soon retired. In 1795 they captured Shemakha as well as Baku; but the conquest was once more abandoned, and Shirvan was not finally annexed to Russia until 1805.

SHENANDOAH, a borough of Schuylkill county, Pennsylvania, U.S.A., about 40 m. N.N.W. of Reading. Pop. (1910, census), 25,774. Among the foreign-born the Lithuanians and Poles predominate—in 1910 a Lithuanian and a Polish paper were published here. Shenandoah is served by the Pennsylvania, the Lehigh Valley and the Philadelphia & Reading railways. The borough has a public library. The United Greek Catholic Church (Ruthenian Rite) here is said to be the first of this sect in the United States; it was organized as St Michael's Parish in 1885, the first building was erected in 1886, and a new building was completed in 1909. Shenandoah is situated in the eastern part of the middle basin of the great anthracite coal region of Pennsylvania, and the mining and shipping of coal are its chief industries. A log house was built on the site of the present Shenandoah as early as 1835, but there was no further development until 1862, when the first colliery was opened. The borough was incorporated in 1866.

SHENANDOAH VALLEY CAMPAIGNS. During the American Civil War the Shenandoah Valley was frequently the scene of military operations, and at two points in the war these operations rose to the height of separate campaigns possessing great significance in the general development of the war. From a military point of view the Shenandoah Valley was valuable to the army which controlled it as a requisitioning area, for in this fertile region crops and cattle were plentiful. There were, moreover, numerous mills and factories. For the Confederates the Valley was also a recruiting area. A macadamized road from Lexington via Staunton and Winchester to Martinsburg gave them easy access to Maryland and enabled them to cover Lynchburg from the north. By a system of railways which united at Gordonsville and Charlottesville troops from Richmond and Lynchburg were detrained within easy distance of five good passes over Blue Ridge, and as Strasburg in the valley lies almost due west of Washington it was believed in the North that a Confederate army thereabouts menaced a city the protection of which was a constant factor in the Federal plan of campaign. The Valley was 60 m. wide at Martinsburg and had been cleared of timber, so that the movements of troops were not restricted to the roads: the creeks and rivers were fordable at most places in summer by levelling the approaches: the terrain was specially suitable for mounted troops. The existence of the parallel obstacle between Strasburg and Newmarket, the two forks of the Shenandoah river enclosing the Massanutton range, afforded opportunities for strategic manœuvres.

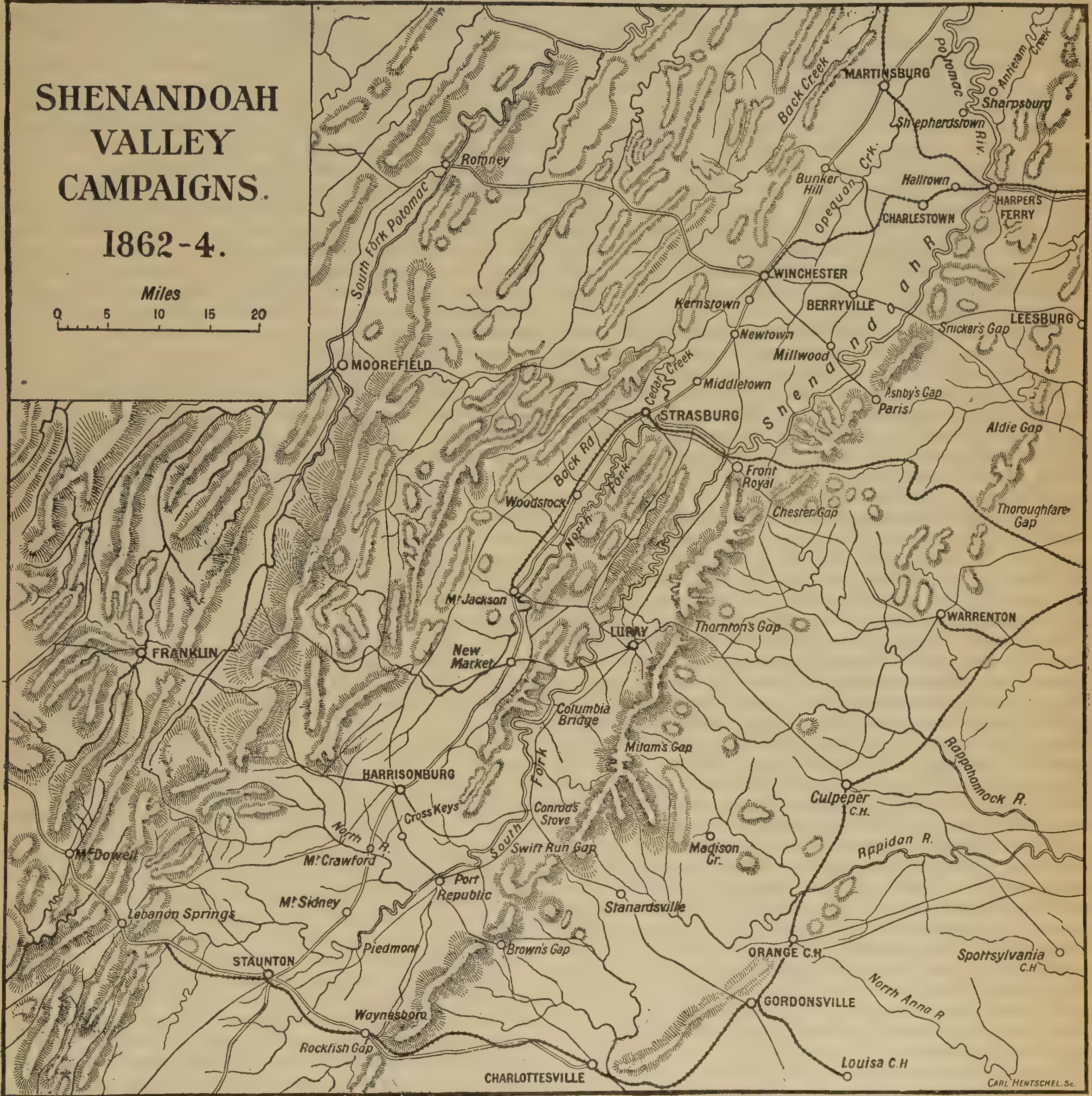
In the spring of 1862 the immense army organized by General McClellan advanced and threatened to sweep all before it. The Confederates, based on Richmond, were compelled to show a front westward to the Alleghanies, northward to the Potomac and eastwards to the Atlantic. The main armies were engaged on the Yorktown peninsula and the other operations were secondary. Yet in one instance a Confederate detachment that varied in strength between 5000 and 17,000 contrived to make some stir in the world and won renown for its commander. General Thomas J. Jackson with small means achieved great results, if we look at the importance which politics played in the affairs of the belligerents; and even in a military sense he was admirable for skilfully utilizing his experiences, so that his discomfitures of the winter of 1861, when Rosecrans and Lander and Kelley were opposed to him, taught him how to deal with such Federal leaders as Shields and Banks, Milroy and Frémont, fettered as they all were by the Lincoln administration. The Valley operations in 1862 began by a retrograde movement on the part of the Confederates, for Jackson on the 12th of March retired from Winchester, and Banks at the head of 20,000 men took possession. Banks pushed a strong detachment under General Shields on to Strasburg a week later, and Jackson then withdrew his small division (5000) to Mount Jackson, so yielding the Shenandoah Valley for 40 m. south of Winchester. He was now acting under instructions to employ the invaders in the Valley and prevent any large body being sent eastward to reinforce their main army; but he was not to expose himself to the danger of defeat. He was to keep near the enemy, but not so near as to be compelled to fight Banks's superior forces. Such instructions, however, were difficult to carry out. When, on the 21st of March, Banks recalled Shields in accordance with orders from Washington, Jackson conceived that he was bound to follow Shields, and, when Shields stood at bay at Kernstown on the 23rd of March with 7000 men, Jackson at the head of 3500 attacked and was badly beaten.

For such excess of zeal two years later Sigel was removed from his command. But in 1862 apparently such audacity was true wisdom, for the proof thus afforded by Jackson of his inability to contend with Shields seems to have been regarded by the Federal authorities as an excuse for reversing their plans: Shields was reinforced by Williams's division, and with this force Banks undertook to drive Jackson from the Valley. A week after the battle of Kernstown, Banks moved to Strasburg with 16,000 men, and a month later (April 29) is found at Newmarket, after much skirmishing with Jackson's rear-guard which burnt the bridges in retiring. Meanwhile Jackson had taken refuge in the passes of Blue Ridge, where he too was reinforced. Ewell's division joined him at Swift Run Gap, and at the beginning of May he decided to watch Banks with Ewell's division and to proceed himself with the remainder of his command to join Edward Johnson's division, then beset by General Milroy west of Staunton. Secretly moving by rail through Rockfish Gap, Jackson united with Johnson and in a few days located Milroy at the village of McDowell. After reconnaissance Jackson concentrated his forces on Setlington Hill and proposed to attack on the morrow (May 8th), but on this occasion the Federals (Milroy having just been joined by Schenck) took the initiative, and after a four

Jackson's campaign.

hours' battle Jackson was able to claim his first victory. The Confederates lost 500 out of 6000 men and the Federals 250 out of 2500 men. Jackson's pursuit of Milroy and Schenck was profitless, and he returned to his camp at McDowell on the 14th of May. Meanwhile General Banks had been ordered by President Lincoln to fall back from Newmarket, to send Shields's division to reinforce General McDowell at Fredericksburg, to garrison Front Royal and to entrench the remainder of his command at Strasburg: and in this situation the enemy found him on the 22nd of May. Jackson's opportunity had come to destroy Banks's force completely. The Confederates numbered 16,000, the Federals only 6000 men. Jackson availed himself of the Luray Valley route to intercept Banks after capturing the post at Front Royal. He captured the post, but failed to intercept Banks, who escaped northwards by the turnpike road and covered his retreat across the Potomac by a rear-guard action at Winchester on the 25th of May. Jackson followed and reached Halltown a few days later. But his stay there was of brief duration, for McDowell was moving westward from Fredericksburg and Frémont eastward from Franklin under instructions from Washington to intercept him. On the 31st of May Frémont had reached Cedar Creek, McDowell was at Front Royal and Jackson had retired to Strasburg, where he was compelled to wait for a detachment to come in. This rejoined on the evening of the 1st of June. Ewell's division held Frémont back until Jackson was on his way to Newmarket. McDowell had sent Shields up the Valley by the Luray route. But Jackson gained Newmarket in safety and destroyed the bridge by which Shields could emerge from the Luray Valley to join Frémont, who was left to cope with Jackson single-handed. Jackson's rearguard destroyed the bridges and otherwise impeded Frémont's advance, but a week later (June 7th) Frémont at Harrisonburg located his enemy at Cross Keys and next day he attacked with 10,500 men. Shields was still at Luray. Jackson held Frémont with Ewell's division (8000) and with the remainder proceeded to the left bank

Cross Keys and Port Republic.


SHENANDOAH VALLEY CAMPAIGNS. 1862-4.
Miles
0 5 10 15 20
Romney
South Fork Potomac
MARTINSBURG
Back Creek
Potomac
Antietam Creek
Sharpsburg
Shepherdstown
Riv.
Opequan Crk.
Bunker Hill
Hallrown
HARPER'S FERRY
CHARLESTOWN
WINCHESTER
Kernstown
BERRYVILLE
Shenandoah R.
Snicker's Gap
LEESBURG
Newtown
Millwood
MOOREFIELD
Cedar Creek
Middletown
Ashby's Gap
Paris
STRASBURG
Aldie Gap
Back Rd
North Fork
Front Royal
Woodstock
Chester Gap
Thoroughfare Gap
Mt Jackson
WARRENTON
LURAY
Thornton's Gap
FRANKLIN
New Market
Columbia Bridge
Milam's Gap
Rappahannock R.
HARRISONBURG
Cross Keys
Conrad's Store
South Fork
Culpeper C.H.
North R.
Swift Run Gap
Madison Cr.
Rapidan R.
McDowell
Mt Crawford
Port Republic
Mt Sidney
Stanardsville
Lebanon Springs
Piedmont
Brown's Gap
Spottsylvania C.H.
STAUNTON
ORANGE C.H.
North Anna R.
GORDONSVILLE
Waynesboro
Rockfish Gap
Louisa C.H.
CHARLOTTESVILLE
CARL HENTSCHEL Sc.

of the Shenandoah near Port Republic to await developments, for Shields had pushed forward a strong advanced guard under General Tyler, whose vanguard (two squadrons) crossed the river while Frémont was engaged with Ewell. Tyler's cavalry was driven back with heavy loss. Jackson retained possession of the bridge by which Tyler and Frémont could unite, and next day he crossed the river to attack Tyler's two brigades. The engagement of the 9th of June is called the battle of Port Republic. Jackson with 13,000 men attacked Tyler with 3000 men, and Tyler, after stoutly resisting in the vain hope that the main body under Shields would come up from Conrad's Store or that Frémont would cross the river and fall upon Jackson, retired with a loss of some 800 men, leaving as many Confederates *hors de combat.* Tyler's brave efforts were in vain, for Shields had once more received orders from Washington which appeared to him to justify leaving his detachment to its fate, and Frémont could not reach the river in time to save the bridge, which Ewell's rear-guard burnt after Jackson had concentrated his forces against Tyler on the right bank. A few days later Jackson received orders to quit the Valley and join the main army before Richmond, and President Lincoln simultaneously discovered that he could not afford to keep the divisions of Frémont, Banks and McDowell engaged in operations against Jackson: so the Valley was at peace for a time.

In stricter connexion with the operations of the main armies in Virginia, the Confederates brought off two great *coups* in the Valley—Jackson's capture of Harper's Ferry and Martinsburg in the autumn of 1862 and Ewell's expulsion of Milroy from Martinsburg and Winchester in June 1863. The concentration of the Federal forces in N. Virginia in May 1864 for the campaign which ultimately took Grant and Lee south of the James involved a fresh series of operations in the Valley. At first a Union containing force was placed there under Sigel; this general, however, took the offensive and unwisely accepted battle and was defeated at Newmarket. Next Hunter, who superseded Sigel in command in West Virginia and the Valley, was to co-operate with the Army of the Potomac by a movement on Staunton and thence to Gordonsville and Lynchburg, with the object of destroying the railways and canal north of the James river by which troops and supplies reached the Confederates from the West. Sigel meanwhile was to cover the Ohio railroad at Martinsburg. Hunter encountered Jones's division at Piedmont (Mount Crawford) on the 5th of June and caused General Lee to detach from his main army a division under Breckinridge to aid Jones. Grant then detached Sheridan to join Hunter at Charlottesville, but Lee sent Hampton's cavalry by a shorter route to intercept Sheridan, and a battle at Trevillian Station compelled Sheridan to return and leave Hunter to his fate. The losses in this cavalry combat exceeded 1000, for the dense woods, the use of barricades and the armament of the mounted troops caused both sides to fight on foot until lack of ammunition brought the action to an end. Sheridan during his three months' command of the Federal cavalry had steadfastly adhered to the principle of always fighting the enemy's cavalry, and, though now compelled to return to the Pamunkey, he contrived to draw Hampton's force after him in that direction. Meanwhile on the 13th of June General Early had moved from Cold Harbor to add his command to the Confederate forces in the Valley. Early succeeded in interposing between Hunter and Lynchburg, and within a week drove Hunter out of Virginia by the Kanawha river route. Early then moved down the Valley turnpike unmolested. Expelling Sigel from Martinsburg on the 4th of July and crossing the Potomac opposite Sharpsburg, he soon appeared before Washington, after defeating an improvised force under Lew Wallace on the Monocacy. Grant then detached Wright's corps (VI.) from Petersburg and called Emory's corps (XIX.) from the West to oppose Early, who after creating serious alarm retired, on the 13th of July, by Leesburg and Snicker's Gap into the Valley at Winchester. Hunter had meanwhile gained Harper's Ferry via the Baltimore and Ohio Railroad, and, when Early withdrew towards Strasburg, General Crook collected the forces of Hunter and Sigel to follow the Confederates, but Early turned upon Crook and drove him back to the Potomac. Early then sent a detachment into Maryland to burn the town of Chambersburg. The alarm in the North for the safety of Washington was only quieted by the appointment of General Sheridan to command in the Valley.

Sheridan's campaign.

He arrived on the scene early in August. His mission was to drive Early up the Valley or, if the Confederates crossed into Maryland, to intercept their return, and in any case he was to destroy all supplies in the country which could not be consumed by his own army. Sheridan made Harper's Ferry his headquarters and concentrated at Halltown. Early retained his position about Bunker's Hill, destroyed the Ohio railroad, and held the main road up the Valley until Sheridan moved out in force on the 10th of August. Early then retreated up the Valley to Fisher's Hill (Strasburg), where he expected to be joined by Anderson's corps from Richmond. Sheridan had followed Early, but hearing of this reinforcement to the enemy, he decided to take up a defensive line at Halltown—the only point in the Valley which did not favour flanking operations—and await reinforcements. Sheridan's retrograde movement from Cedar Creek on the 17th of August was, however, regarded in the North as a sign of pusillanimity, and his removal from the Valley command was loudly called for. During the retreat Sheridan's cavalry encountered Early's reinforcements, Anderson's corps and Fitz Lee's cavalry, about Winchester. Early had observed the Federal movements from the heights south of Strasburg, and now followed Sheridan down to Halltown. On the 21st of August he again attacked Sheridan at Summit Point south of Charlestown. A few days later Early detached a force to raid Williamsport, and concentrated his main body behind the Opequan near Bunker's Hill, leaving outposts on the railway, a position which he held at the end of August. Sheridan meanwhile had moved out between the Shenandoah and the Opequan to seize all routes towards Washington, from Martinsburg on Early's left as far up as the Winchester-Berryville turnpike by which his own reinforcements reached the Valley through Snicker's Gap. Sheridan also held the Smithfield crossing of the Opequan in Early's front. Each commander, however, hesitated to bring on a battle, Sheridan because the result of the Presidential election would be seriously affected by his defeat at this moment, and Early because with his inferior forces he was content to know that his position on Sheridan's flank effectively covered the Valley. But Sheridan was now at the head of the most formidable army that had ever invaded this region. It consisted of three small army corps under Wright (VI.), Emory (XIX.) and Crook (VIII.) and Torbert's cavalry (6000) in three divisions under Averell, Merritt and Wilson, the whole numbering 30,000 infantry, 6000 cavalry and 27 batteries. Early continued to hold Winchester with four divisions under Rodes, Gordon, Breckinridge and Ramseur and two cavalry divisions under Fitz Lee and Lomax. He had soon been deprived of Anderson's corps which was sorely needed at Richmond, a fact which Sheridan discovered through his spies in Winchester, and indeed Sheridan had been waiting a fortnight for this movement by which Early's command was to be reduced. For a month the two armies had manœuvred between Halltown and Strasburg, each commander hoping for such an increase to his own or decrease of his enemy's numbers as would justify attack. The Valley operations were aided indirectly by assaults and sorties about Petersburg. Grant aimed at preventing Lee sending reinforcements to Early until Sheridan's plans had been carried out. Meanwhile Early had been gathering up the harvests in the lower Valley, but on the 20th of August Sheridan was able to report " I have destroyed everything that was eatable south of Winchester, and they will have to haul supplies from well up to Staunton." Sheridan in September could put 23,000 infantry and 8000 cavalry into action, and at this moment he was visited by Grant, who encouraged his subordinate to seize an opportunity to attack the enemy.

The first encounter of Sheridan and Early took place on the

19th of September about 2 m. east of Winchester. Sheridan had crossed the Opequon and found the enemy in position astride the Winchester-Berryville road. **Winchester.** Early was outnumbered and outfought, but he attributed his defeat to the enemy's "immense superiority in cavalry," and in fact Sheridan depicts Merritt's division as charging with sabre or pistol in hand and literally riding down a hostile battery, taking 1200 prisoners and 5 guns. The Federal victory, however, cost Sheridan 4500 casualties and he had hoped for greater success, since Early had divided his forces. Sheridan's plan was to overwhelm Ramseur before he could be supported by Rodes and Gordon, but Early contrived to bring these divisions up and counter-attack while Sheridan was engaged with Ramseur. Early had confided his left to Fitz Lee's cavalry and taken Breckinridge to strengthen his right. But Merritt's horsemen rode through the Confederate cavalry, who fled, communicating their panic to the infantry of the left wing, and the day was lost. **Fisher's Hill.** Early retreated through Newtown and Strasburg, but at Fisher's Hill behind Tumbling Run, where the Valley was entrenched on a front of 3 m. between the Shenandoah river and Little North Mountain, Early rallied his forces and again detailed his cavalry to protect his left from a turning movement. But Sheridan repeated his manœuvre, and again on the 22nd of September Early was attacked and routed, General Crook's column having outflanked him by a détour on the western or Back road. Early now retreated to Mount Jackson, checked the pursuit at Rode's Hill, and, evading all Sheridan's efforts to bring him again to battle, reached Port Republic on the 25th of September. On learning of this disaster, and the distress of his troops, General Lee promised to send him boots, arms and ammunition, but under pressure of Grant's army, he could not spare any troops. Lee had estimated Sheridan's force at 12,000 effective infantry, and Early's report as to his being outnumbered by three or four to one was not credited. Yet Early had much to do to avoid destruction, for Sheridan had planned to cut off Early by moving his cavalry up the Luray Valley to Newmarket while the infantry held him at Fisher's Hill; but Torbert with the cavalry blundered. Sheridan made Harrisonburg his headquarters on the 25th of September, where he relieved Averell of his command for having failed to pursue after the battle of Fisher's Hill. In the first week of October Sheridan held a line across the Valley from Port Republic along North river to the Back road, and his cavalry had advanced to Waynesboro to destroy the railroad bridge there, to drive off cattle, and burn the mills and all forage and breadstuffs. Early had taken refuge in Blue Ridge at Rockfish Gap, where he awaited Rosser's cavalry and Kershaw's division (Longstreet's corps), for Lee had resolved upon again reinforcing the Valley command, and upon their arrival Early advanced to Mount Crawford and thence to Newmarket. The Federals retired before him, but his cavalry was soon to suffer another repulse, for Rosser and Lomax having followed up Sheridan closely on the 9th of October with five brigades, the Federal cavalry under Torbert turned upon this body when it reached Tom's Brook (Fisher's Hill) and routed it. Sheridan burnt the bridges behind him as he retired on Winchester, and apparently trusted that Early would trouble him no more and then he would rejoin Grant at Petersburg. But Early determined to go north again, though he had to rely upon Augusta county, south of Harrisonburg, for supplies, for Sheridan had wasted Rockingham and Shenandoah counties in accordance with Grant's order. The Union commander-in-chief, contemplating a longer struggle between the main armies than he had at first reckoned on, had determined that the devastation of the Valley should be thorough and lasting in its effect.

Sheridan at Winchester was now free to detach troops to aid Grant, or remain quiescent covering the Ohio railroad, or move east of Blue Ridge. He had resisted the demand of the government, which Grant had endorsed, that Early should be driven through the Blue Ridge back on Richmond. Sheridan pointed out that guerrilla forces were always in his rear, that he would need to reopen the Alexandria railroad as a line of supply, that he must detach forces to hold the Valley and protect the railroads, and that on nearing Richmond he might be attacked by a column sent out by Lee to aid Early. Yet in fact Sheridan carried out the government programme at the beginning of 1865, and therefore we may assume that his objections in October were not well-founded. Then he was expected to drive Early out of the Valley, but halted at Harrisonburg and, although in superior force, afterwards retired to Winchester, and his boast of having wasted the Valley seemed ill-timed, since Early was able to follow him down to Strasburg. There was evidently some factor in the case which is not disclosed by Sheridan in his Memoirs.

Cedar Creek. Early at Newmarket on the 9th of October said that he could depend on only 6000 muskets if he detached Kershaw, and he had discovered that all positions in the Valley could be turned, that the open country favoured the shock tactics of the Federal cavalry, and so placed his own cavalry at a disadvantage, who, he declared, could not by dismounted action withstand attacks by superior numbers with the *arme blanche*. In these circumstances it would appear that Early showed great enterprise in following Sheridan down to Strasburg on the 13th of October "to thwart his purposes if he should contemplate moving across the Ridge or sending troops to Grant." But as his forward position at Fisher's Hill could not be long maintained for want of forage, he resolved to attack Sheridan, and on the night of the 18th of October he sent three divisions under Gordon to gain the enemy's rear, while Kershaw's division attacked his left and Wharton's division and the artillery engaged him in front. The attack was timed to commence at 5 A.M. on the 19th of October, when Rosser's cavalry was to engage Sheridan's cavalry and that of Lomax was to close the Luray Valley. This somewhat complicated disposition of forces was entirely successful, and Early counted his gains as 1300 prisoners and 18 guns after routing the Federal corps VIII. and XIX. and causing Wright's corps (VI.) to retire. Yet before nightfall Early's force was in turn routed and he lost 23 guns. Early's report is that of a disheartened general. He complains that his troops took to plundering, that his regimental officers were incapable; and it is always the Federal cavalry that cause panic by threatening to charge; he has to confess that with a whole day before him he could neither complete his victory nor take up a position for defence, nor even retreat in good order with the spoils of battle. Sheridan had, it seems, actually put Wright's corps in march for Petersburg when news of Early's advance down the Valley reached him; then he recalled Wright and on the 14th of October was holding a defensive line along the north bank of Cedar Creek west of the Valley pike about Middleton. Early had reconnoitred and withdrawn as far as Fisher's Hill near Strasburg. Sheridan at this juncture was called to Washington to consult Halleck, the "chief of staff," on the 16th of October in reference to his future movements: for Halleck claimed to control Sheridan and often modified Grant's instructions to his subordinate. Before Sheridan could rejoin his army on the 19th of October Early had attacked and routed it, but Sheridan met the fugitives and rallied them with the cry: "We must face the other way." He found Getty's division and the cavalry acting as rear-guard, and resolved to attack as soon as his troops could be reorganized. Sheridan was, however, disturbed by reports of Longstreet's coming by the Front Royal road to cut him off at Winchester, and hesitated for some hours; but at 4 p.m. he attacked and drove back the Confederates and so recovered all the ground lost in the morning, and recaptured his abandoned guns and baggage.

After the battle of Cedar Creek, Early again retreated south to Newmarket and Sheridan was in no condition to pursue. The Federal government had agreed to Sheridan's proposal to fortify a defensive line at Kernstown and hold it with a detachment while Sheridan rejoined Grant with the main body. On the 11th of November, Early again advanced to reconnoitre at Cedar Creek, but was driven back to Newmarket. At the beginning of December the weather threatened to interfere with movement, and both sides began to send back troops to Petersburg. During the winter there were only cavalry raids and guerrilla warfare, and in February 1865 the infantry remaining on each side was less than a strong division. Sheridan seized the opportunity to advance with 10,000 cavalry. Early delayed this advance with his cavalry, while he evacuated Staunton; he called up a brigade to defend Lynchburg and proceeded to Waynesboro to await developments. Sheridan feared to advance on Lynchburg leaving Early on his flank and decided to attack Early at Waynesboro; and on the 2nd of March the Federal commander was rewarded by decisive victory, capturing 1600 Confederates and their baggage and artillery. Early himself escaped and Rosser's cavalry dispersed to their homes in the Valley, but with Early's third defeat all organized resistance in the Shenandoah Valley came to an end. Sheridan moved over Blue Ridge to Charlottesville and began his work of destruction south and east. Lynchburg was too strongly held to be captured, but from Amherst Court House the railway to Charlottesville and the canal to Richmond were destroyed, and thus Lee's army was deprived of these arteries of supply. On the 10th of March at Columbia, on the James river south of Charlottesville, Sheridan sent couriers to advise Grant of his success, and on the 19th of March he rejoined the main army in Eastern Virginia, receiving Grant's warm commendation for having "voluntarily deprived himself of independence." (G. W. R.)

SHENDI, a town in the Anglo-Egyptian Sudan in the *mudiria* (province) of Berber, on the right bank of the Nile in 18° 1′ N., 33° 59′ E., and 104 m. N.N.W. of Khartum by rail. Shendi possesses small manufactories of leather, iron and cotton; extensive railway workshops and a government experimental farm. It is the headquarters of the cavalry of the Egyptian army stationed in the Sudan. Shendi lies within the "Island of Meroë" and is a town of great antiquity. Thirty miles north are the pyramids of Meroë. On the opposite (west) bank of the Nile is the village of Metemma, whence there is a caravan route across the Bayuda Desert to the Merawi (Merowe) by Jebel Barkal; this was the route followed by the desert column under Sir Herbert Stewart in 1884 in the Gordon relief expedition. In 1772 James Bruce stayed some time at Shendi—then governed by a woman—on his way to Egypt after visiting the source of the Blue Nile. When the Egyptians invaded the Sudan in 1820 Shendi, then a place of considerable size, submitted to Ismail Pasha, son of Mehemet Ali, the pasha of Egypt. In 1822, however, Ismail and his chief followers were treacherously burnt to death at Shendi by order of the *mek* (ruler) of the town, in revenge for the cruelties committed by the Egyptians. Later in the same year an Egyptian army from Kordofan razed the town to the ground, most of the inhabitants being massacred. From that period until the establishment of Anglo-Egyptian rule in 1898 Shendi was but a poor village. Its subsequent growth has been comparatively rapid. There is a considerable area of fertile land on either side of the Nile in the neighbourhood.

SHÊNG-KING, Shen-king, or Liao-tung, a province of the Chinese empire, in southern Manchuria. It occupies an area of 50,000 sq. m. and contains a population of 4,000,000. Its capital is Mukden, or, as it is otherwise known, Shêng-king, "the Flourishing Capital." The province includes the Liao-tung peninsula, the most southern part of which, including Port Arthur, is leased to Japan.

Shêng-king is largely mountainous. A line drawn from King-chow Fu (41° 12′ N., 121° 10′ E.) N.E. to Mukden, and then south by west through Lêaoi-yang and Hai-chêng to Kai-ping and the sea, would define the level country. A large portion of the plain, being an alluvial deposit, is extremely fertile, but in the neighbourhood of the sea the saline exudation common in the north of China renders futile all attempts at cultivation. North and east of this district run numerous mountain ranges, for the most part in a north-and-south direction. The climate of Shêng-king is marked by extremes of heat and cold. In summer the temperature varies from 70° to 90° F., and in winter from 50° above to 10° below zero. The mountain scenery is extremely picturesque, and the trees and shrubs are such as are common in England, the mountain ash being the only common English tree which is there conspicuous by its absence. The most important rivers are the Liao-ho and the Yalu. The former takes its rise in Mongolia, and after running an easterly course for about 400 m., turns S.W., and empties into the Gulf of Liao-tung, in the neighbourhood of Ying-tsze, up to which town, 20 m. from the bar, the river is navigable for large junks. The Yalu rises in the mountains to the south of the plain, and empties into the Yellow Sea.

The chief cities, Mukden, Liao-yang, Niu-chwang, Port Arthur and Tairen (Dalny) are separately noticed. Niu-chwang is the chief port of the province. Shêng-king is well supplied with railways, Mukden being in direct railway connexion with Peking, Niu-chwang, Port Arthur and Tairen as well as with the Korean railways, and with Europe and Vladivostock by the trans-Siberian line. The Mukden-Peking railway follows the route of the imperial highway from Peking, which passes through the Great Wall at Shan-kai-kwan and along the shores of the Gulf of Chih-li, and after leaving Mukden divides into three branches—one going eastward to Korea, another going by Kirin and A-she-ho to San-sing, while a third diverges N. by W. to Fakumen, thence through Mongolia to Pe-tu-na, and then to Tsi-tsi-har, Mergen, and the Amur. Another road leads east from Niu-chwang to Fung-hwang-chung, now a station on the Mukden-Korea railway. The chief agricultural products are wheat, barley, millet, oats, maize, cotton, indigo and tobacco. Coal, iron and gold are also found in considerable quantities in various localities. (See also Manchuria and China.)

SHEN-SI, a northern province of China, bounded N. by the Great Wall, W. by the province of Kan-suh, S. by the province of Sze-ch'uen, and E. by Shan-si, from which it is separated by the Hwang-ho. Area about 75,000 sq. m.; pop. about 8,300,000. Si-gan Fu (*q.v.*), or Sian Fu, is the provincial capital; there are six other prefectural cities. Shen-si is divided into two parts by a barrier of mountains, consisting of the Fu-niu Shan and the Tsing-ling Shan, which attain elevations of over 11,000 ft., and run across the southern portion of the province from east to west. To the north of the mountains lie the basins of the Wei-ho and of several other tributaries to the Hwang-ho. The name Shen-si, "west of the pass," refers to the Tungkwan pass, near the confluence of the Wei and the Hwang-ho. The valley of the Wei, situated between high tableland (the Ordos plateau) on the north and rugged mountains to the south, forms the great channel of communication between Eastern China and Central Asia. Were it in the hands of an enemy the Chinese colonies in Central Asia would be completely severed from the mother country, hence the eagerness evinced by the government throughout all history to retain possession of the region. In this district are the sites of cities used as capitals of China in remote antiquity. Si-gan Fu, founded in the 3rd century B.C., was usually the capital until the time of the Kin dynasty (A.D. 1127), and it was chosen by the dowager empress as the temporary capital during the stress of the Boxer outbreak (1900–1901). It is noted also as containing the celebrated Nestorian tablet, erected A.D. 781, on which is engraved an edict according tolerance to the Nestorian missionaries. Modern Christian (Protestant) mission work in the city dates from 1876. The walls of Si-gan enclose a square space of 6 m. each way, and, unlike most Chinese cities, its fortifications are kept in perfect repair. During the Mahommedan rebellion it was closely invested for two years (1868–1870) by the rebels, who, however, failed to capture it. During a great famine which occurred in 1902 about 2,500,000 persons in the province died of starvation.

From Si-gan Fu radiate a number of roads going east, south and west. The east road is the great Tung-kwan road, which forms the principal means of communication between Peking and the north-eastern provinces of the empire, and Sze-ch'uen, Yun-nan and Tibet. To the south, one road crosses the mountains to Shang Chow, and on to the Tan river, an affluent of the Han-kiang, and is thus connected with the trade of the Yangtsze-kiang; and another leads to Han-chung Fu and Sze-ch'uen. Leaving the west gate of the city two roads lead to Lan-chow Fu, from which town begins the great high road into Central Asia by way of Lian-chow Fu, Kan-chow Fu and Su-chow to Hami, where it forks into two branches which follow respectively the northern and southern foot of the Tian-shan range, and are known as the Tian-shan pei lu and the Tian-shan nan lu. It was along these roads that the fame of China first reached Europe, and it was by the Tian-shan nan lu that Marco Polo entered the empire. To defend this line of communication the Great Wall was extended beyond Su-chow, and the Kia-yu gate, "the door of the empire," was built. During the reign of Hia-wu Ti of the Han dynasty, Chinese colonies and high roads lined with fortified cities were established along this route, and though at times the government have lost possession of the line beyond the Great Wall, it has always succeeded in re-establishing its supremacy over it. Occupying a position, then, at the confluence of the roads which connect north-eastern China with its western and south-western portions, Si-gan Fu is a city of great commercial importance. It has few manufactures, but does an extensive trade principally in the importation of silk from Cheh-kiang and Sze-ch'uen, tea from Hu-peh and Hu-nan, and sugar from Sze-ch'uen, and in the exportation of these and other articles (such as skins and furs) to Kan-suh, Russia and Central Asia.

Shen-si is purely an agricultural province. Its principal products are cotton, wheat and opium—the anti-opium decrees of 1906 had little effect on the province up to 1910—and these it exchanges with the neighbouring provinces for coal, iron, salt, &c. Kao-liang, pulse, millet, maize, groundnut, barley, beans, pease, lucerne, and rape seed are also grown. The Wei basin being a loess region is unfit for rice, but for the same reason it produces fine crops of the kinds mentioned at a minimum expenditure of labour. The Shen-si opium is much valued by smokers and ranked next to the Shan-si drug, which was second only to that produced in Kan-suh. Coal abounds in the northern part of the province, but owing to difficulty of transit it is not worked to any great extent. The winters are cold, but short, and though fruit trees abound and are most productive, no evergreen trees or shrubs are to be met with within the province. Shen-si is specially noted for the varnish tree. Wolves are numerous in the mountains; the heron, ibis, wild goose and snipe in the valley of the Wei.

See M. Broomhall, *The Chinese Empire* (London, 1907), pp. 198-208; L. Richard, *Comprehensive Geography of the Chinese Empire* (Shanghai, 1908), pp. 39-46, and the authorities there cited.

SHENSTONE, WILLIAM (1714–1763), English poet, son of Thomas Shenstone and Anne, daughter of William Penn of Harborough Hall, Hagley, was born at the Leasowes, a property in the parish of Halesowen, now in Worcestershire, but then included in the county of Shropshire. At school he began a lifelong friendship with Richard Jago, and at Pembroke College, Oxford, where he matriculated in 1732, he made another firm friend in Richard Graves, the author of *The Spiritual Quixote*. He took no degree, but, while still at Oxford, he published for private circulation *Poems on various occasions, written for the entertainment of the author* (1737). This edition, containing the first draft of "The Schoolmistress," Shenstone tried hard to suppress, but in 1742 he published anonymously a revised form of *The Schoolmistress, a Poem in imitation of Spenser....* The original was Sarah Lloyd, teacher of the village school where Shenstone received his first education. Isaac D'Israeli pointed out that it should not be classed, as it was by Robert Dodsley, as a moral poem, but that it was intended as a burlesque, to which Shenstone appended in the first instance a "ludicrous index." In 1741 he published *The Judgment of Hercules*. He inherited the Leasowes estate, and retired there in 1745 to undertake what proved the chief work of his life, the beautifying of his property. He embarked on elaborate schemes of landscape gardening which gave the Leasowes a wide celebrity, but sadly impoverished the owner. Shenstone was not a contented recluse. He desired constant admiration of his gardens, and he never ceased to lament his lack of fame as a poet.

Shenstone's poems of nature were written in praise of her most artificial aspects, but the emotions they express were obviously genuine. His *Schoolmistress* was admired by Goldsmith, with whom Shenstone had much in common, and his "Elegies" written at various times and to some extent biographical in character won the praise of Robert Burns who, in the preface to *Poems, chiefly in the Scottish Dialect* (1786), called him "that celebrated poet whose divine elegies do honour to our language, our nation and our species." The best example of purely technical skill in his works is perhaps his success in the management of the anapaestic trimeter in his "Pastoral Ballad in Four Parts" (written in 1743), but first printed in Dodsley's *Collection of Poems* (vol. iv., 1755). Shenstone died unmarried on the 11th of February 1763.

His works were first published by his friend Robert Dodsley (3 vols., 1764–1769). The second volume contains Dodsley's description of the Leasowes. The last, consisting of correspondence with Graves, Jago and others, appeared after Dodsley's death. Other letters of Shenstone's are included in *Select Letters* (ed. Thomas Hill 1778). The letters of Lady Luxborough (*née* Henrietta St John) to Shenstone were printed by T. Dodsley in 1775; much additional correspondence is preserved in the British Museum—letters to Lady Luxborough (Add. MS. 28958), Dodsley's letters to Shenstone (Add. MS. 28959), and correspondence between Shenstone and Bishop Percy from 1757 to 1763—the last being of especial interest. To Shenstone was due the original suggestion of Percy's *Reliques*, a service which would alone entitle him to a place among the precursors of the romantic movement in English literature. See also Richard Graves, *Recollections of some particulars in the Life of the Late William Shenstone* (1788); H. Sydney Grazebrook, *The Family of Shenstone the Poet* (1890); Lennox Morison, "Shenstone," in the *Gentleman's Magazine* (vol. 289, 1900, pp. 196-205); A. Chalmers, *English Poets* (1810, vol. xiii.), with "Life" by Samuel Johnson; his *Poetical Works* (Edinburgh, 1854), with "Life" by G. Gilfillan; T. D'Israeli, "The Domestic Life of a Poet—Shenstone vindicated," in *Curiosities of Literature*; and "Burns and Shenstone," in *Furth in Field* (1894), by "Hugh Haliburton" (J. L. Robertson).

SHEPPARD, JOHN [JACK] (1702–1724), English criminal, was born at Stepney, near London, in December 1702. His father, who, like his grandfather and great-grandfather, was a carpenter, died the following year, and Jack Sheppard was brought up in the Bishopsgate workhouse. One of his father's old employers apprenticed him to the family trade, but young Sheppard fell into bad company at a neighbouring Drury Lane tavern. Here he met Elizabeth Lyon, known as "Edgeworth Bess," a woman of loose character with whom he lived, and to gratify whose tastes he committed many of his crimes. At the end of 1723 he was arrested as a runaway apprentice, and thenceforward, he says, "I fell to robbing almost every one that stood in my way," Joseph Blake, known as "Blueskin," being a frequent confederate. In the first six months of 1724 he twice escaped from gaol, and towards the end of that period he was responsible for an almost daily robbery in or near London. Eventually, however, his independent attitude provoked the bitter enmity of Jonathan Wild, who procured his capture at the end of July. Sheppard was tried at the Old Bailey and condemned to death, but, largely thanks to "Edgeworth Bess," he managed to escape from the condemned cell, and was soon back in his old haunts. In September he was rearrested and imprisoned in the strongest part of Newgate, being actually chained to the floor of his cell, but by a combination of strength and skill he escaped through the chimney to the roof of the prison, whence he lowered himself into the adjoining house. After a few days' concealment he was rash enough to reappear in the Drury Lane quarter. He was captured, hopelessly drunk, in a Clare Market tavern and reimprisoned, his cell being now watched night and day. On the 16th of November 1724 he was hanged at Tyburn. He was then not quite twenty-two.

Sheppard has been made the unworthy hero of much romance, of which Harrison Ainsworth's novel, *Jack Sheppard* (1839), is the most notable instance. In truth he was merely a vulgar scoundrel, who did not hesitate to rob his only real friend.

See *A Narrative of all the Robberies, Escapes, &c., of John Sheppard*, attributed to Daniel Defoe (London, 1724); *Newgate Calendar*, ed. Knapp and Baldwin; Griffiths, *Chronicles of Newgate; British Journal* (August, October 1724); *Weekly Journal* (August, September, November 1724); *Celebrated Trials*.

SHEPPEY, an island off the Kentish coast of England, included in the north-eastern parliamentary division of Kent. It is the largest of the several low islands which are separated from the mainland by the ramifying creeks about the mouth of the river Medway. The strait isolating Sheppey is called the Swale; it is about 3 m. broad at its eastern end, but narrows to some 300 yds. at the west, where it is crossed on a bridge by a branch of the South-Eastern & Chatham railway, and by a road. There was formerly a ferry here, as there are at two other points. Sheppey is low-lying, with one small elevation slightly exceeding 200 ft. near the north coast, which presents slight cliffs towards the shallow sea. These are frequently encroached upon by the sea, while the flat shore on the south is protected by embankments. Sheppey is 10½ m. in extreme length from E. to W., while the greatest breadth is about 5 m. On the south, narrow branches of the Swale, formerly wider, divide the isles of Harty and Elmley from the main island, of which, however, they now practically form part. Sheppey is for the most part treeless but very fertile.

bearing much grain and fruit; its name, meaning the "island of sheep," is still appropriate, as great flocks are bred. On the west are the port of Queenborough and the naval station of Sheerness. From here the Sheppey light railway runs east through the island, serving Minster and Leysdown, which are in some favour as seaside resorts. The London clay, of which the island is composed, abounds in fossils.

SHEPSTONE, SIR THEOPHILUS (1817–1893), British South African statesman, was born at Westbury near Bristol, England, on the 8th of January 1817. When he was three years old his father, the Rev. William Shepstone, emigrated to Cape Colony. Young Shepstone was educated at the native mission stations at which his father worked, and the lad acquired great proficiency in the Kaffir languages, a circumstance which determined his career. In the Kaffir War of 1835 he served as headquarters interpreter on the staff of the governor, Sir Benjamin D'Urban, and at the end of the campaign remained on the frontier as clerk to the agent for the native tribes. In 1838 he was one of the party sent from Cape Colony to occupy Port Natal on behalf of Great Britain. This force was recalled in 1839, when Shepstone was appointed British resident among the Fingo and other tribes in Kaffraria. Here he remained until the definite establishment of British rule in Natal and its organization as an administrative entity, when Shepstone was made (1845) agent for the native tribes. In 1848 he became captain-general of the native levies; in 1855 judicial assessor in native causes; and, in 1856, on the remodelling of the Natal government, secretary for native affairs and a member of the executive and legislative councils. This position he held until 1877. Thus for over thirty years he was the director of native policy in Natal. A man of strong will and pronounced views he gained a great influence over the natives, by whom he was called "father," and, in acknowledgment of his hunting exploits, "Somsteu." The main line of his policy was to maintain tribal customs as far as consistent with principles of humanity, and not to attempt to force civilization. The result of his policy is still traceable in the condition and status of the Natal natives. While he remained in charge there was but one serious revolt of the natives—that of Langalibalele in 1873—against white control.

Shepstone's influence with the Zulus was made use of by the Natal government; in 1861 he visited Zululand and obtained from Panda a public recognition of Cetywayo as his successor. Twelve years later Shepstone attended the proclamation of Cetywayo as king, the Zulu chief promising Shepstone to live at peace with his neighbours. In 1874 and again in 1876 Shepstone was in London on South African affairs, and to his absence from Natal Cetywayo's failure to keep his promises is, in part, attributed. When in London in 1876 Shepstone was entrusted by the 4th earl of Carnarvon, then secretary of state for the colonies, with a special commission to confer with the Transvaal executive on the question of the federation of the South African states, and given power, should he deem it necessary, to annex the country, subject to the confirmation of the British government. Shepstone went to Pretoria in January 1877, and on the 12th of April issued a proclamation announcing the establishment of British authority over the Transvaal. Shepstone's force consisted of twenty-five mounted policemen only, but no overt opposition was made to the annexation; the republic at the time was in a condition bordering on anarchy. "Nothing but annexation," wrote Sir Theophilus to the Colonial Office, "will or can save the state, and nothing else can save South Africa from the direst consequences. All the thinking and intelligent people know this, and will be thankful to be delivered from the thraldom of petty factions by which they are perpetually kept in a state of excitement and unrest because the government and everything connected with it is a thorough sham" (Martineau's *Life of Sir Bartle Frere*, ch. 18). Shepstone's action has been condemned as premature. He had, however, reason to believe that if Great Britain remained inactive, Germany would be induced to undertake the protection of the Transvaal.[1] Moreover, had the policy of self-government for the Boers which he outlined in his annexation proclamation been carried out, the revolt of 1880–81 might not have occurred. The annexation also, probably, saved the Transvaal from an attack by the Zulus under Cetywayo. Shepstone remained in Pretoria as administrator of the Transvaal until January 1879; his rule was marked, according to Sir Bartle Frere, who described him as "a singular type of an Africander Talleyrand," by an "apparent absence of all effort to devise or substitute a better system" than that which had characterized the previous régime. Shepstone had been summoned home to advise the Colonial Office on South African affairs and he reached England in May 1879; on his return to Natal he retired (1880) from the public service. In 1883, however, he was commissioned to replace Cetywayo as king in Zululand. He was active in church matters in Natal, and a friend of Bishop Colenso. He opposed the grant of self-government to Natal. He died at Pietermaritzburg on the 23rd of June 1893. Shepstone married in 1833 Maria, daughter of Charles Palmer, commissary-general at Cape Town, and had six sons and three daughters. One of his sons was killed at Isandhlwana; of the other sons H. C. Shepstone (b. 1840) was secretary for native affairs in Natal from 1884 to 1893; Theophilus was adviser to the Swazis (1887–1891); and A. J. Shepstone (b. 1852) served in various native expeditions, as assistant-commissioner in Zululand, in the South African War, 1899–1902, and became in 1909 secretary for native affairs (Natal) and secretary of the Natal native trust. A younger brother of Sir Theophilus, John Wesley Shepstone (b. 1827), filled between 1846 and 1896 various offices in Natal in connexion with the administration of native affairs.

SHEPTON MALLET, a market town in the eastern parliamentary division of Somersetshire, England, 22 m. S.W. of Bath, on the Somerset & Dorset and the Great Western railways. Pop. of urban district (1901), 5238. The old town extends in a narrow line along the river Sheppey, while the newer town has for its main street a viaduct across the river valley. The church of St Peter and St Paul is especially noteworthy. Consisting of a chancel, clerestoried nave, and aisles, it is Early English and Perpendicular in style, and contains a beautiful 13th-century oak roof of 350 panels, each with a different design; a 15th-century pulpit of carved stone; and some interesting old monuments of the Strode, Mallet and Gournay families. The market cross, over 50 ft. high, and one of the finest in Somerset, was erected by Walter and Agnes Buckland in 1500. Shepton possesses a grammar school of the 17th century, and a science and art school. The once flourishing cloth and woollen trades have declined, but there are large breweries, roperies, potteries, and, in the neighbourhood, marble, granite, asphalt and lime works.

Shepton, before the conquest called Sepeton, was in the possession of the abbots of Glastonbury for four hundred years, and then passed to a Norman, Roger de Courcelle. Afterwards it came into the possession of the Norman barons Malet or Mallet, one of whom was fined for rebellion in the reign of King John. From the Mallets it went to the Gournays, but in 1536 it reverted to the crown, and it is now included in the duchy of Cornwall. The town received the grant of a market from Edward II. Monmouth and the rebel army passed through Shepton twice in 1685, and twelve of the rebels were hanged here by Judge Jeffreys.

SHERANI, or SHIRANI, a Pathan tribe on the Dera Ismail Khan border of the North-west Frontier Province of India. The Sherani Agency occupies an area of 1500 sq. m. and had a population in 1901 of 12,371. The Sheranis occupy the principal portion of the mountain known as the Takht-i-Suliman and the country thence eastward down to the border of Dera Ismail Khan district. They are bounded on the north by the Gomal Pass, and beyond that by the Mahsud Waziris; on the south by the Ustaranas and Zmarais; and on the west by the Haripals, Kakars and Mandu Khels. Between the Sherani country and the British border lie several small mountain ridges, across which the three chief passes are the Zarakni or Sheikh Haidar.

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[1] Frere to J. M. Maclean, 22nd of April 1881 (*Life of Sir Bartle Frere*, vol. ii. p. 183).

the Draband and the Chandwan. The Sheranis are generally of middling stature, thin, but hardy and active. They have bold features, high cheek-bones, and their general appearance is wild and manly. Their dress consists of a coarse black blanket tied round the waist, and another thrown over the shoulders. Their chief occupation is agriculture, but they carry on an extensive trade in the autumn months in Dera Ismail Khan district. The Sherani tribe and country are divided into two well-defined branches called Bargha and Largha, or the Highlands and the Lowlands, the inhabitants being called respectively Barghawals and Larghawals. The Highlands are on the side of Zhob, the Lowlands on the side of the Derajat, the dividing line being generally the watershed and higher peaks of the Takht-i-Suliman range of mountains. The physical configuration of the country makes the separation so complete that the two tribal divisions act independently of each other. After the Zhob expedition of 1890 the question of boundaries between the Punjab and Baluchistan came up for settlement, and the government decided that Bargha should remain with Baluchistan and Largha with the Punjab. The Gomal river from Kundar-Domandi to Kajuri-Kach is the boundary between Baluchistan and Waziristan, as well as between the respective provinces. In 1901 these frontier districts were transferred from the Punjab to the North-west Frontier Province.

SHERATON, THOMAS (*c.* 1751–1806), next to Chippendale the most famous English furniture-designer and cabinet-maker, was born in humble circumstances at Stockton-on-Tees. His education was rudimentary, but he picked up drawing and geometry. He appears to have been apprenticed to a cabinet-maker, but he was ever a strange blend of mechanic, inventor, artist, mystic and religious controversialist. Indeed, it is as a writer on theological subjects that we first hear of him. Although his parents were church people he was a Baptist, and in 1782 he published at Stockton *A Scriptural Illustration of the Doctrine of Regeneration*, to which was added *A Letter on the Subject of Baptism*, describing himself on the title page as a "mechanic, one who never had the advantage of a collegiate or academical education." Of his career as a maker and designer of furniture nothing is known until he is first heard of in London in 1790, when he was nearly forty. The date of his migration is uncertain, but it probably took place while he was still a young man. In London he did work which, although it has made him illustrious to posterity, never raised him above an almost sordid poverty. Biographical particulars are exceedingly scanty, and we do not know to what extent, if at all, he worked with his own hands, or whether he confined himself to evolving new designs, or modifying and adapting, and occasionally partly copying, those of others. Such evidence as there is points to artistic, rather than mechanical work, after he began to write, and we know that some part of his scanty income was derived from giving drawing lessons. Even the remarkable series of volumes of designs for furniture which he published during the last sixteen years of his life, and upon which his fame depends, were not a commercial success. He was a great artistic genius who lived in chronic poverty. The only trustworthy information we possess regarding his circumstances is found in the *Memoirs of Adam Black*, who when he first arrived in London lodged a week in his house, only two years before Sheraton's death. "Sheraton," he says, "lived in a poor street in London, his house half shop, half dwelling-house, and himself looked like a worn-out Methodist minister, with threadbare black coat. I took tea with them one afternoon. There was a cup and saucer for the host, and another for his wife, and a little porringer for their daughter. The wife's cup and saucer were given to me, and she had to put up with another little porringer. My host seemed a good man, with some talent. He had been a cabinet-maker, and was now author, publisher, and teacher of drawing, and, I believe, occasional preacher." Black shrewdly put his finger upon the causes of Sheraton's failure. "This many-sided worn-out encyclopaedist and preacher is an interesting character. . . . He is a man of talent and, I believe, of genuine piety. He understands the cabinet business—I believe was bred to it. He is a scholar, writes well, and, in my opinion, draws masterly—is an author, bookseller, stationer and teacher. . . I believe his abilities and resources are his ruin in this respect—by attempting to do everything he does nothing." There is, however, little indication that Sheraton chafed under the tyranny of "those twin jailors of the daring heart, low birth and iron fortune." "I can assure the reader," he writes in one of his books, "though I am thus employed in racking my invention to design fine and pleasing cabinet-work, I can be well content to sit upon a wooden-bottom chair, provided I can but have common food and raiment wherewith to pass through life in peace."

His first book on furniture was published in 1791 with the title of *The Cabinet-Maker and Upholsterer's Drawing Book.* It was issued in parts by T. Bensley, of Bolt Court, Fleet Street; there was a second edition in 1793 and a third in 1802, each with improvements. In the first edition it was stated that copies could be obtained from the author at 41 Davies Street, Grosvenor Square; in the second, that he was living at 106 Wardour Street; the last address we have is 8 Broad Street, Golden Square. There was also an "Accompaniment" and an "Appendix." In this book, which contained 111 copper-plate engravings, Sheraton gives abundant evidence of the arrogance and conceit which marred all his publications. He dismisses Chippendale's designs in a patronizing way as "now wholly antiquated and laid aside, though possessed of great merit according to the times in which they were executed." His lack of practical common sense is suggested by the fact that more than half the book is taken up with a treatise on perspective, needless then and unreadable now. He falls foul of every volume on furniture which had been published before his time, and is abundantly satisfied of the merit of his own work. The designs in the book are exceedingly varied and unequal, ranging from pieces of perfect proportion and the most pleasing simplicity to efforts ruined by too abundant ornament. Some of the chair-backs are delightful in their grace and delicacy, but in them, as in other of his drawings, it is easy to trace the influence of Hepplewhite and Adam—it has even been suggested that he collaborated with the Adams. Sheraton, indeed, like his predecessors, made extensive use not so much perhaps of the works of other men as of the artistic ideas underlying them which were more or less common to the taste of the time. He was sometimes original, sometimes adaptive—what Alexandre Dumas *père* called a "conqueror"—sometimes a copyist. His "conquest" of Hepplewhite was especially unmerciful, for he abused as well as pillaged him. But his slender forms and sweeping curves were his own inspiration, and his extensive use of satinwood differentiated his furniture from most of that which had preceded it.

It must be remembered that Sheraton's books, like those of the other great cabinet-makers of the second half of the 18th century, were intended not for the "general reader" but for the practical use of the trade, which, no doubt, copied their designs extensively, although it is reasonable to suppose that he himself obtained orders by the publication of his books and employed other cabinet-makers to manufacture the work. It seems certain, however, that he himself never possessed anything more than a small shop. Of his own actual manufacture only one piece is known with certainty—a glass-fronted book-case, of somewhat frigid charm, stamped "T.S." on the inside of one of the drawers. It lacks the agreeable swan-necked pediment so closely associated with his style. *The Drawing Book*, of which a German translation appeared at Leipzig in 1794, was followed in 1802 and 1803 by *The Cabinet Dictionary, containing an Explanation of all the Terms used in the Cabinet, Chair and Upholstery branches, containing a display of useful articles of furniture*, illustrated with eighty-eight copperplate engravings. The text is in alphabetical form, and, in addition to a supplement with articles on drawing and painting, the book contained a list of "most of the master-cabinet-makers, upholsterers, and chair makers," 252 in number, then living in and around London. Sheraton told his readers that he had hitherto derived no profit from his publications on account of the cost of producing them.

Some of the designs in this volume show the earlier stages of the tendency to the tortured and the bizarre which disfigured so much of Sheraton's later work. This debased taste reached its culmination in *The Cabinet Maker, Upholsterer and General Artists' Encyclopedia*, the publication of which began in 1804. It was to consist of 125 numbers, but when the author died two years later only a few had been issued. The plates are in colour. The scope of this work was much wider than the title suggests. It dealt not only with furniture and decoration, but with history, geography, biography, astronomy, botany and other sciences. This fragmentary undertaking makes it clear that Sheraton ruined his style, once so graceful and so delicate, by an over-anxious following of the pseudo-classical taste which in France marked the period of the Consulate and the Empire. The harmonious marquetry, the dainty painting of flowers in wreaths and festoons, the lightness and finish were replaced by pieces of furniture which at the best were clumsy and at the worst were hideous. Some of the chairs especially which he designed in this last period are amazingly grotesque, their backs formed of fabulous animals, their "knees" and legs of the heads and claws of crowned beasts. Many charming little work-tables bear Sheraton's attribution, but even these graceful trifles in his later forms lose their delicacy and become squat and heavy. He designed many beautiful sideboards and bookcases, but he finished by drawing pieces that were ruined by insistence upon the characteristics, and often the worst characteristics, of the Empire manner. Sheraton's inventive ingenuity had led him to devise many of the ingenious pieces of combination or "harlequin" furniture which the later 18th century loved. Thus a library table would conceal a step-ladder for reaching the top shelves of bookcases, a dressing table would be also a wash-stand and an escritoire—but this he admitted that he did not introduce—looking-glasses would enclose dressing-cases, writing-tables or work-tables. But his most astonishing fancy was an ottoman with "heating urns" beneath, "that the seat may be kept in a proper temperature in cold weather." How far he was responsible for the introduction of the hideous hall chair, made of mahogany, with the owner's crest painted on the back, which was common for three-quarters of a century after he died, is not clear; but he describes and illustrates it.

That Sheraton can have been personally popular is incredible. His books make it evident that his character was tart, angular and self-assertive, and that he was little disposed to be generous towards the work of predecessors or rivals. Such an attitude towards the world would suffice to explain his lack of substantial success. He appears to have preached occasionally to the end, and even in his furniture books he sometimes falls into improving remarks of a religious character. As we have seen, his first publication was a religious work, and when in 1794 his friend Adam Callender, the landscape painter, wrote a pamphlet entitled *Thoughts on the Peaceable and Spiritual Nature of Christ's Kingdom*, Sheraton contributed to it an exhortation upon *Spiritual Subjection to Civil Government*, which was reprinted separately with additions a year later. In 1805 he issued *A Discourse on the Character of God as Love*. He died on Oct. 22nd, 1806, at No. 8 Broad Street, Golden Square, aged about 55, from, it is said, over-work. An obituary notice of him appeared in the *Gentleman's Magazine* of the following month, which stated that he had been for many years "a journeyman cabinet-maker, but since 1793 supported a wife and two children by authorship." He was described as "a well-disposed man, of an acute and enterprising disposition." The writer added that he had "left his family, it is feared, in distressed circumstances," and that he had travelled to Ireland to obtain subscribers for the *Encyclopedia*, of which at the time of his death nearly 1000 copies had been sold. In 1812 there appeared a folio volume, *Designs for Household Furniture exhibiting a Variety of Elegant and Useful Patterns in the Cabinet, Chair and Upholstery Branches on eighty-four Plates. By the late T. Sheraton, Cabinet-maker*. This was in the main, if not entirely, a collection of plates from the *Cabinet Dictionary* and the *Encyclopedia*.

Thomas Sheraton is unquestionably the most remarkable man in the history of English furniture. His genius was less sane and less balanced than that of Chippendale, but despite his excursions into the Chinese and Louis Quinze manners, Chippendale always produced an impression of English work. Sheraton's greater adaptability, his readiness to receive foreign impressions, his adaptations of Louis Seize ideas, the lightness of his forms and the grace of his conceptions had about them a touch of the exotic which was heightened by his lavish employment of satin-wood and other beautifully grained woods susceptible of a high polish. There are no more charming things outside French furniture than some of the creations of Sheraton in his great period. The severe and balanced forms, the delicate inlay, the occasional slight carving in low relief, the painted enrichments, the variety of the backs and legs of his chairs produce an impression of lightness and grace that has never been surpassed; whether he designed a little knife-case or the body of a long clock, harmony, proportion and a delicate fancy were ever present. It is true that he adapted and even copied extensively, but so did every one else, and it is impossible to be sure that a given conception is rightly attributed to the particular man whose name has become associated with it. Indeed "Sheraton," like "Chippendale," has come to indicate a style rather than a personal attribution. But the volume and the beauty of the designs in his books is such that, when every allowance has been made for adaptation, there remains a mass of beautiful work which cannot be denied to him. In later life his very adaptability was his undoing. The public, always ready to take its mobiliary fashions from France, demanded Empire furniture, and Sheraton may have been, or have believed himself to be, compelled to give them what they wanted. His extravagant creations in that sphere—far worse than anything that was designed in France—had much to do with the development of a fashion of English Empire which finally ruined British furniture design. He rioted in sphinxes and lions and fabulous beasts, he evolved forms that were dull and cumbrous, and added to their heaviness by brass mounts at once massive and uninspired. After his death the eccentricity may have been less, but the heaviness and dullness were greater, and with the disappearance of Sheraton the brief but splendid summer of English furniture ended in gloom. It had lasted little more than half a century, but it was a half-century which only France ever could, or did, rival. It is one of the strangest ironies in the history of art that the last and almost the greatest exponent of the English genius in the sphere of furniture was in the end mainly responsible for a decay from which there has as yet been no renaissance. (J. P.-B.)

SHERBET (the Turkish form of the Arabic *sharbat*, drink, *shariba*, he drank, cf. "shrub," an English derivative), properly the name of an Oriental beverage, consisting of the juice of such fruits as the lemon, citron, &c., dropped upon a cake of sugar and partially frozen with snow or otherwise cooled. The word, and also the French form *sorbet*, are applied in Western usage to a water-ice not frozen as hard as the ordinary ice, and flavoured with fruit juice, spirit, &c. A cheap sweetened effervescing drink is also so styled.

SHERBORNE, a market town in the northern parliamentary division of Dorsetshire, England, 118 m. W.S.W. from London by the London & South-Western railway. Pop. of urban district (1901), 5760. It lies near the border of Somersetshire, on the southern slope of a hill overlooking the river Yeo, in a fertile, well-wooded district. The abbey church of St Mary the Virgin is a stately cruciform building with central tower, the nave and choir having aisles and clerestory. Some pre-Norman work appears in the western wall, the tower arches and south porch are Norman, and there are an Early English chapel and some Decorated windows. The church, however, was almost wholly reconstructed in the Perpendicular period, and is a fine example of that style, the interior gaining in beauty from the scheme of colour-decoration in the choir, while the magnificent stone-vaulted roof with fan tracery, extending throughout the church, excepting the south transept, is unsurpassed. The parish church of All Hallows adjoined the abbey church on the west, but was taken down after the Dissolution, when the abbey church was sold to the parish. Portions of the abbey buildings, including the Lady chapel of the church, now converted into a dwelling-house, are incoporated in those of Sherborne grammar school, founded (although a school existed previously) by Edward VI. in 1550, and now holding a high rank among English public schools. The almshouse known as the hospital of St John the Baptist and St John the Evangelist was founded in 1437 on the site of an earlier establishment, and retains a Perpendicular chapel, hall and other portions. The abbey conduit, of the middle of the 14th century, is conspicuous in the main street of the town. Of the old castle, the gatehouse and other parts are of Norman construction, but the mansion near it was built by Sir Walter Raleigh.

As there is no evidence of Roman or British settlement, it is probable that Sherborne (Scireburn, Shireburne) grew up after the Saxon conquest of the country from the Corn-Welsh in the middle of the 7th century. It is first mentioned in 705 as the place where St Aldhelm fixed his bishop-stool for the new diocese of Western Wessex, being chosen probably for its central position. Æthelberht, king of Wessex, was buried here by the side of his brother Æthelbald in 866. For the next eighteen years its freedom from Danish attack made Sherborne the capital of Wessex. In 978 Bishop Wulfsey introduced the stricter form of Benedictine rule into his cathedral of Sherborne, and became the first abbot. The see, which was united with that of Ramsbury in 1058, was removed to Old Sarum in 1075. In 1086 the bishop of Sarum and the monks of Sherborne held the place, which seems to have been of fair size and an agricultural centre. On the separation of the offices of bishop and abbot in 1122, the abbot's fee was carved out of the bishop's manor, but did not include the town. Bishop Roger of Caen (1107–1139) built the castle, described by Henry of Huntingdon as scarcely inferior to that of Devizes, "than which there was none greater within the confines of England." Its strength made Stephen force Bishop Roger to surrender it in 1139, but during the civil war in his reign it passed into the hands of the empress Maud. It was later granted to the earls of Salisbury, who seem to have allowed it to fall into disrepair, for in 1315 and in 1319 the abbot of Sherborne was appointed to inquire into its condition. It was recovered by the bishop in 1355, and retained by the see until granted in 1599 to Elizabeth, who gave it to Sir Walter Raleigh. The abbey church was partly burnt in 1437, in a riot due to the monks' refusal to recognize the town's chapel of All Hallowes as the parish church, though they had restricted their use of the abbey church for parochial purposes. Signs of this fire are still visible on the walls, which are in part tinged red by the flames. The town, though frequently the centre for medieval assizes and inquisitions, never became a municipal or parliamentary borough, but was governed by two constables, elected in the manorial court. In 1540 Sir John Horsey, who had bought the manor and church at the Dissolution, sold the abbey to the vicar and parishioners. The Reformation made no break in the continuity of the school, which had probably existed in the abbey since the 11th century. Edward VI. by his charter in 1550 made its governors one of the first purely lay educational corporations founded in England. The town suffered severely during the civil wars, the castle being besieged by the parliamentary forces in 1642 and 1645. The fairs now held on the 8th of May, the 26th of July and the first Monday after the 10th of October were granted to the bishop in 1227, 1240 and 1300. After the decline of the medieval trade in cloth, lace and buttons were the only articles manufactured here until the introduction of silk-weaving in 1740. In June 1905, in commemoration of the 1200th anniversary of "the town, the bishopric and the school," an historical pageant, invented and arranged by Louis N. Parker (at one time music-master at the school), was held in the grounds of Sherborne Castle, and set the model for a succession of pageants held subsequently in other historic English towns.

See William Beauchamp Wildman, *A Short History of Sherborne from A.D. 705* (1902), and *Life of S. Ealdhelm, first Bishop of Sherborne* (Sherborne, 1905).

SHERBROOKE, ROBERT LOWE, VISCOUNT (1811–1892), British statesman, was born on the 4th of December 1811 at Bingham, Notts, where his father was the rector. He was educated at Winchester and University College, Oxford, where he took a first class in classics and a second in mathematics, besides taking a leading part in the Union debates. In 1835 he won a fellowship at Magdalen, but vacated it on marrying, in 1836, Miss Georgina Orred (*d.* 1884). He was for a few years a successful "coach" at Oxford, but in 1838 was bitterly disappointed at not being elected to the professorship of Greek at Glasgow. In 1841 Lowe moved to London, to read for the Bar ("called" 1842); but his eyesight showed signs of serious weakness, and, acting on medical advice, he determined to try his fortune in the colonies rather than in London. He went to Sydney, where he set to work in the law courts. In 1843 he was nominated by Sir George Gipps, the governor, to a seat in the New South Wales Legislative Council; owing to a difference with Gipps he resigned his seat, but was elected shortly afterwards for Sydney. Lowe soon made his mark in the political world by his clever speeches, particularly on finance and education; and besides obtaining a large legal practice, he was one of the principal writers for the *Atlas* newspaper. In 1850 he went back to England, in order to enter political life there. His previous university reputation and connexions, combined with his colonial experience, stood him in good stead. *The Times* was glad to employ his ready pen, and as one of its ablest leader-writers he made his influence widely felt. In 1852 he was returned to Parliament for Kidderminster in the Liberal interest. In the House of Commons his acute reasoning made a considerable impression, and under successive Liberal ministries (1853–1858) he obtained official experience as secretary of the Board of Control and vice-president of the Board of Trade. In 1859 he went to the Education Office as vice-president of the Council in Lord Palmerston's ministry; there he pursued a vigorous policy, insisting on the necessity of payment by results, and bringing in the revised code (1862), which embodied this principle and made an examination in "the three R's" the test for grants of public money. He felt then, and still more after the Reform Act of 1866, that "we must educate our masters,"[1] and he rather scandalized his old university friends by the stress he laid on physical science as opposed to classical studies. Considerable opposition was aroused by the new régime at the Education Office, and in 1864 Lowe was driven to resign by an adverse vote in Parliament with reference to the way in which inspectors' reports were "edited." The result was unjust to Lowe, but a good deal of feeling had been aroused against Lingen's administration of the Education Office (see LINGEN, BARON), and this was the outcome. Lord Palmerston's death in October 1865 was followed by the formation of the Russell-Gladstone ministry and the introduction of the Reform Bill of 1866. Lowe, a Liberal of the school of Canning and Peel, had already made known his objections to the advance of "democracy"—notably in his speech in 1865 on Sir E. Baines's Borough Franchise Bill—and he was not invited to join the new ministry. He retired into what Bright called the "Cave of Adullam," and opposed the bill in a series of brilliant speeches, which raised his reputation as an orator to its highest point and effectually caused the downfall of the government. He remained, nevertheless, a Liberal; and after the franchise question had been settled by what Lowe considered Disraeli's betrayal, and he had been elected the first member for London University, he accepted office again in the Gladstone Cabinet of 1868 as chancellor of the exchequer. Lowe was a rather cut-and-dry economist, who prided himself that during his four years of office he took twelve millions off taxation; but later opinion has hardly accepted his removal of the shilling registration duty on corn (1869) as good statesmanship, and his failures are remembered rather than his successes. His proposed tax of a halfpenny a box on lucifer matches in 1871 (for which he suggested the epigram *ex luce lucellum*, "out of light a little profit") roused a storm of opposition, and had to be dropped. In 1873 he was transferred to the Home Office, but in 1874 the government resigned. When the Liberals returned to power in 1880 he was raised to the peerage as Viscount Sherbrooke, but from 1875 till his death at Warlingham, Surrey, on the 27th of July 1892, his health was constantly failing, and by degrees he figured less and less in public life.

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[1] This phrase is always ascribed to Lowe, and has become history in association with him. But what he really said in his address to the Edinburgh Philosophical Institution in 1867 was that it was necessary "to induce our future masters to learn their letters."

Bobby Lowe, as he was popularly known, was one of the most remarkable personalities of his day, with his tall, striking figure, albino complexion and hair, and faculty for epigram and irony. During the 'seventies the following epitaph was suggested for him by one of the wits of his day:—

> "Here lies poor old Robert Lowe;
> Where he's gone to I don't know;
> If to the realms of peace and love,
> Farewell to happiness above;
> If, haply, to some lower level,
> We can't congratulate the devil."

Lowe was delighted with this, and promptly translated it into Latin, as follows:—

> "Continentur hac in fossa
> Humilis Roberti ossa;
> Si ad coelum evolabit,
> Pax in coelo non restabit;
> Sin in inferis jacebit,
> Diabolum ejus poenitebit."

His literary talent, though mainly employed in journalism, was also shown in a little volume of verses, *Poems of a Life* (1884). He married a second time, in 1885, but left no children.

See *Life and Letters* by A. Patchett Martin (London, 1893). (H. Ch.)

SHERBROOKE, a city and port of entry of Quebec, Canada, and capital of Sherbrooke county, 101 m. E. of Montreal, at the confluence of the rivers Magog and St Francis, and on the Grand Trunk, Canadian Pacific, Quebec Central and Boston & Maine railways. Pop. (1901) 11,765. It is the seat of a Roman Catholic bishopric and of the district courts, and contains manufactories of woollen and cotton goods and machinery, also saw and grist mills. It derives its name from Sir John Coape Sherbrooke (1764–1830), who from 1816 to 1818 was governor-general of Canada.

SHERE ALI KHAN (1825–1879), Amir of Afghanistan, was born in 1825, one of the younger sons of the amir Dost Mahommed, whom he succeeded in 1863. For some time after his succession Afghanistan was in a state of anarchy, and his rebellious half-brothers overran the country while he remained at Kandahar mourning the loss of a favourite son. At length, however, the capture of Kabul in 1866 roused him to action; but in spite of his own bravery he suffered general defeat until 1868, when he regained Kabul. Supported by the viceroys of India, Lord Lawrence and Lord Mayo, Shere Ali remained on good terms with the British government for some years; but after the rebellion of his son Yakub Khan, 1870–74, he leaned towards Russia, and welcomed a Russian agent at Kabul in 1878, and at the same time refused to receive a British mission. This led to long negotiations, and ultimately to war, when the British forced the Khyber Pass in November 1878, and defeated the amir's forces on every occasion. Shere Ali fled from his capital and, taking refuge in Turkestan, died at Mazar-i-Sharif on the 21st of February 1879.

SHERIDAN, the name of an Anglo-Irish family, made illustrious by the dramatist Richard Brinsley (No. 4 below), but prominently connected with literature in more than one generation before and after his.

1. Thomas Sheridan (1687–1738), grandfather of the dramatist, was born at Cavan in 1687, and was educated at Trinity College, Dublin, taking his B.A. degree in 1711 and that of M.A. in 1714; he became B.D. in 1724 and D.D. in 1726. By a marriage with Elizabeth, heiress of Charles MacFadden, he restored to the Sheridan family Quilcagh House, which they had forfeited by their Jacobite sympathies. Thomas Sheridan is chiefly known as the favourite companion and confidant of Swift during his later residence in Ireland. His correspondence with Swift and his whimsical treatise on the "Art of Punning"[1] make perfectly clear from whom his grandson derived his high spirits and delight in practical joking. The "Art of Punning" might have been written by the author of *The Critic*. Swift had a high opinion of his scholarship, and that it was not contemptible is attested by a translation of the *Satires* of Persius, printed in Dublin in 1728. He also translated the *Satires* of Juvenal and the *Philoctetes* of Sophocles. When Swift came to Dublin as dean of St Patrick's, Sheridan was established there as a schoolmaster of very high repute, and the two men were soon close friends. Sheridan was his confidant in the affair of *Drapier's Letters*; and it was at Quilcagh House that *Gulliver's Travels* was prepared for the press. Through Swift's influence he obtained a living near Cork, but damaged his prospects of further preferment by a feat of unlucky absence of mind. Having to preach at Cork on the anniversary of Queen Anne's death he hurriedly chose a sermon with the text, "Sufficient unto the day is the evil thereof," and was at once struck off the list of chaplains to the lord-lieutenant and forbidden the castle. In spite of this mishap, for which the archdeacon of Cork made amends by the present of a lease worth £250 per annum, he "still remained," said the earl of Orrery (*Remarks on the Life and Writings of Jonathan Swift*, 1751), "a punster, a quibbler, a fiddler and a wit," the only person in whose genial presence Swift relaxed his habitual gloom. His latter days were not prosperous, probably owing to his having "a better knowledge of books than of men or of the value of money." He offended Swift by fulfilling an old promise to tell the dean if he ever saw signs of avarice in him, and the friends parted in anger. He died in poverty on the 10th of October 1738.

The original source of information about Dr Sheridan is his son's *Life of Swift* (vol. i. pp. 369-395), where his scholarship is dwelt upon as much as his improvident conviviality and simple kindliness of nature.

2. Thomas Sheridan (1719–1788), son of the above, was born in Dublin in 1719. His father sent him to an English school (Westminster); but he was forced by stress of circumstances to return to Dublin and complete his education at Trinity College, where he took his B.A. degree in 1739. Then he went on the stage, and at once made a local reputation. He even wrote a play, *Captain O'Blunder, or the Brave Irishman*, which became a stock piece, though it was never printed. There is a tradition that on his first appearance in London he was set up as a rival to Garrick, and Moore countenances the idea that Garrick remained jealous of him to the end. For this tradition there is little foundation. Sheridan's first appearance in London was at Covent Garden in March 1744, when, heralded in advance as the brilliant Irish comedian, he acted for three weeks in a succession of leading parts, *Hamlet* being the first. In October he appeared at Drury Lane, playing Horatio in Rowe's *Fair Penitent*, and subsequently as Pierre in Otway's *Venice Preserved*, and in *Hamlet* and other parts. On his return to Dublin he became manager of the Theatre Royal, and married Frances Chamberlaine. He was driven from Dublin as a result of his unpopular efforts to reform the theatre. A young man named Kelly had insulted the actresses, and when Sheridan interfered threatened him. A riot followed, in consequence of which Kelly was imprisoned, but he was released on Sheridan's petition. This disturbance was followed in 1754 by another outbreak, when he refused to allow the actor, West Digges, to repeat a passage reflecting on the government in James Miller's tragedy, *Mahomet the Impostor*. After two seasons in London he tried Dublin again, but two years more of unremunerative management induced him to leave for England in 1758. By this time he had conceived his scheme of British education, and it was to push this rather than his connexion with the stage that he crossed St George's Channel. He lectured at Oxford and Cambridge, and was incorporated M.A. in both universities. But the scheme did not make way, and we find him in 1760 acting under Garrick at Drury Lane. His merits as an actor may be judged from

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[1] Published in Nichols's Supplement to the works of Swift (1779).

the description of him in the *Rosciad* (l. 987) at this period. He is placed in the second rank, next to Garrick, but there is no hint of possible rivalry. Churchill describes him as an actor whose conceptions were superior to his powers of execution, whose action was always forcible but too mechanically calculated, and who in spite of all his defects rose to greatness in occasional scenes. Churchill never erred on the side of praising too much, and his description may be accepted as correct, supported as it is by the fact that the actor eked out his income by giving lessons in elocution. Sheridan solicited a pension for Samuel Johnson from Lord Bute through Wedderburn. The pension, £300 a year, was granted, and shortly afterwards Bute was so favourably impressed with a scheme submitted to him by Sheridan of his *Pronouncing Dictionary* that he bestowed a pension of £200 on him also. Some hasty remarks of Johnson's on the matter were repeated to Sheridan, who broke off his acquaintance with the doctor in consequence. Sheridan, however, attracted attention chiefly by his enthusiastic advocacy, in public lectures and books, of his scheme of education, in which elocution was to play a principal part. In the case of his son, Richard Brinsley Sheridan, his instruction was certainly not wasted. Sheridan's indictment of the established system of education was that it did not fit the higher classes for their duties in life, that it was uniform for all and profitable for none; and he urged as a matter of vital national concern that special training should be given for the various professions. Oratory came in as part of the special training of men intended for public affairs, but his main contention was one very familiar now—that more time should be given in schools to the study of the English language. He rode his hobby with great enthusiasm, published an elaborate and eloquent treatise on education, and lectured on the subject in London, Oxford, Cambridge, Edinburgh and other towns. In 1764 he went to live in France, partly for economy, partly for Mrs Sheridan's health, and partly to study the system of education. His wife died in 1766 and soon afterwards he returned to England. In 1769 he published a matured *Plan of Education for the Young Nobility and Gentry* with a letter to the king, in which he offered to devote the rest of his life to the execution of his theories on condition of receiving a pension equivalent to the sacrifice of his professional income. His offer was not accepted; but Sheridan, still enthusiastic, retired to Bath, and prepared his pronouncing *General Dictionary of the English Language* (2 vols., 1780). After his son's brilliant success he assisted in the management of Drury Lane, and occasionally acted. His *Life of Swift*, a very entertaining work in spite of its incompleteness as a biography, was written for the 1784 edition of Swift's works. He died at Margate on the 14th of August 1788.

3. Frances Sheridan (1724–1766), wife of the above and mother of the dramatist, was the daughter of Dr Philip Chamberlaine of Dublin. When only fifteen years of age she wrote a story, *Eugenia and Adelaide*, published after her death in two volumes. She took Sheridan's part in the so-called Kelly riots, writing some verses and a pamphlet in his defence. This led to her acquaintance, and finally in 1747 to her marriage, with the unpopular manager. It was by Richardson's advice that she wrote the *Memoirs of Miss Sidney Bidulph. . . .* It was issued anonymously in 1761 with a dedication to Richardson, and had great success, both in England and France. A second part (2 vols.) was published in 1767. Two of her plays were produced in 1763 at Drury Lane, *The Discovery* and *The Dupe*. We have it on the authority of Moore that, when *The Rivals* and *The Duenna* were running at Covent Garden, Garrick revived *The Discovery* at Drury Lane, as a counter-attraction, "to play the mother off against the son, taking on himself to act the principal part in it." But the statement, intrinsically absurd, is inaccurate. *The Discovery* was not an old play at the time, but one of Garrick's stock pieces, and Sir Anthony Branville was one of his favourite characters. It was first produced at Drury Lane in 1763. So far from being jealous of the elder Sheridan, Garrick seems to have been a most useful friend to the family, accepting his wife's play—which he declared to be "one of the best comedies he ever read"—and giving the husband several engagements. *The Dupe* was a failure and was only played once. Her last work was an Oriental tale, *Nourjahad*, written at Blois, where she died on the 26th of September 1766. Her third play, *A Journey to Bath*, was refused by Garrick, and R. B. Sheridan made some use of it in *The Rivals*.

4. Richard Brinsley Butler Sheridan (1751–1816), third son of Thomas and Frances Sheridan, was born in Dublin on the 30th of October 1751. There is a story, discredited by Mr Fraser Rae, that Mrs Sheridan on placing her sons with their first schoolmaster, Samuel Whyte, said that she had been the only instructor of her children hitherto, and that they would exercise the schoolmaster in the quality of patience, "for two such impenetrable dunces she had never met with." One of the children thus humorously described was Richard Brinsley, then aged seven. At the age of eleven he was sent to Harrow school. Sheridan was extremely popular at school, winning somehow, Dr Parr confesses, "the esteem and even admiration of all his schoolfellows"; and he acquired, according to the same authority, more learning than he is usually given credit for. He left Harrow at the age of seventeen, and was placed under the care of a tutor. He was also trained by his father daily in elocution, and put through a course of English reading. He had fencing and riding lessons at Angelo's.

After leaving Harrow he kept up a correspondence with a school friend who had gone to Oxford. With this youth, N. B. Halhed, he concocted various literary plans, and between them they actually executed and published (1771) metrical translations of Aristaenetus. In conjunction with Halhed he wrote a farce entitled *Jupiter*, which was refused by both Garrick and Foote and remained in MS., but is of interest as containing the same device of a rehearsal which was afterwards worked out with such brilliant effect in *The Critic*. Some of the dialogue is very much in Sheridan's mature manner. Extracts given from papers written in the seven years between his leaving Harrow and the appearance of *The Rivals*—sketches of unfinished plays, poems, political letters and pamphlets—show that he was far from idle. The removal of the family to Bath in 1770–1771 led to an acquaintance with the daughters of the composer Thomas Linley. The eldest daughter, Elizabeth Ann (b. 1754), a girl of sixteen, the *prima donna* of her father's concerts, was exceedingly beautiful,[1] and had many suitors, among them Sheridan, N. B. Halhed and a certain Major Mathews. To protect her from this man's persecutions, Sheridan, who seems to have acted at first only as a confidential friend, carried out the romantic plan of escorting Miss Linley, in March 1772, to a nunnery in France. Sheridan returned and fought two duels with Mathews, which made a considerable sensation at the time. The pair had gone through the ceremony of marriage in the course of their flight, but Sheridan kept the marriage secret, and was sternly denied access to Miss Linley by her father, who did not consider him an eligible suitor. Sheridan was sent to Waltham Abbey, in Essex, to continue his studies, especially in mathematics. He was entered at the Middle Temple on the 6th of April 1773, and a week later he was openly married to Miss Linley.

His daring start in life after this happy marriage showed a confidence in his genius which was justified by its success. Although he had no income, and no capital beyond a few thousand pounds brought by his wife, he took a house in Orchard Street, Portman Square, furnished it "in the most costly style," and proceeded to return on something like an equal footing the hospitalities of the fashionable world. His first comedy, *The Rivals*, was produced at Covent Garden on the 17th January 1775. It is said to have been not so favourably received on its first night, owing to its length and to the bad playing of the part of Sir Lucius O'Trigger. But the defects were remedied before the second performance, which was deferred to the 28th of the month, and the piece at once took that place on the stage which it has never lost. His second piece, *St Patrick's Day, or the Scheming Lieutenant*, a lively farce, was written for the benefit performance (2nd of May 1775) of Lawrence Clinch, who had succeeded as Sir Lucius. In November 1775, with the assistance of his father-in-law, he produced the comic opera of *The Duenna*, which was played 75 times at Covent Garden during that season. Sheridan now began to negotiate with Garrick for the purchase of his share of Drury Lane, and the bargain was completed in June 1776. The sum paid by Sheridan and his partners, Thomas Linley and Dr Ford, for the half-share was £35,000; of this Sheridan contributed £10,000. The money was raised on mortgage, Sheridan contributing only £1300 in cash.[1] Two years afterwards Sheridan and his friends bought the other half of the property for £35,000.

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[1] Her portrait, by Gainsborough, one of the best examples of the artist's work, hangs at Knole, Sevenoaks, Kent.

From the first the direction of the theatre would seem to have been mainly in the hands of Sheridan, who derived very material assistance from his wife. In February 1777 he produced his version of Vanbrugh's *Relapse*, under the title of *A Trip to Scarborough*. This is printed among Sheridan's works, but he has no more title to the authorship than Colley Cibber to that of *Richard III*. His chief task was to remove indecencies; he added very little to the dialogue. *The School for Scandal* was produced on the 8th of May 1777. Mrs Abington, who had played Miss Hoyden in the *Trip*, played Lady Teazle, who may be regarded as a Miss Hoyden developed by six months' experience of marriage and town life. The lord chamberlain refused to license the play, and was only persuaded on grounds of personal friendship with Sheridan to alter his decision. There are tales of the haste with which the conclusion of *The School for Scandal* was written, of a stratagem by which the last act was got out of him by the anxious company, and of the fervent "Amen" written on the last page of the copy by the prompter, in response to the author's "Finished at last, thank God!" But, although the conception was thus hurriedly completed, we know from Sheridan's sister that the idea of a "scandalous college" had occurred to him five years before in connexion with his own experiences at Bath. His difficulty was to find a story sufficiently dramatic in its incidents to form a subject for the machinations of the character-slayers. He seems to have tried more than one plot, and in the end to have desperately forced two separate conceptions together. The dialogue is so brilliant throughout, and the auction scene and the screen scene so effective, that the construction of the comedy meets with little criticism. *The School for Scandal*, though it has not the unity of *The Rivals*, nor the same wealth of broadly humorous incident, is universally regarded as Sheridan's masterpiece. He might have settled the doubts and worries of authorship with Puff's reflection: "What is the use of a good plot except to bring in good things?"

Sheridan's farce, *The Critic*, was produced on the 29th of October 1779, *The School for Scandal* meantime continuing to draw larger houses than any other play every time it was put on the stage. In *The Critic* the laughable infirmities of all classes connected with the stage—authors, actors, patrons and audience—are touched off with the lightest of hands; the fun is directed, not at individuals, but at absurdities that grow out of the circumstances of the stage as naturally and inevitably as weeds in a garden. It seems that he had accumulated notes for another comedy to be called *Affectation*, but his only dramatic composition during the remaining thirty-six years of his life was *Pizarro*, produced in 1799—a tragedy in which he made liberal use of some of the arts ridiculed in the person of Mr Puff. He also revised for the stage Benjamin Thompson's translation, *The Stranger*, of Kotzebue's *Menschenhass und Reue*.

He entered parliament for Stafford in 1780, as the friend and ally of Charles James Fox. Apparently he owed his election for Stafford to substantial arguments. He is said to have paid the burgesses five guineas each for the honour of representing them, beside gifts in dinners and ale to the non-voting part of the community, for their interest and applause. His first speech in parliament was to defend himself against the charge of bribery, and was well received. He spoke little for a time and chiefly on financial questions, but soon took a place among the best speakers in the House. Congress recognized his services in opposing the war in America by offering him a gift of £20,000 which, however, he refused. Under the wing of Fox he filled subordinate offices in the short-lived ministries of 1782 and 1783. He was under-secretary for foreign affairs in the Rockingham ministry, and a secretary of the treasury in the Coalition ministry. In debate he had the keenest of eyes for the weak places in an opponent's argument, and the happy art of putting them in an irresistibly ludicrous light without losing his good temper or his presence of mind. In those heated days of parliamentary strife he was almost the only man of mark that was never called out, and yet he had no match in the weapon of ridicule.

Sheridan found his great opportunity in the impeachment of Warren Hastings. His speeches in that proceeding were by the unanimous acknowledgment of his contemporaries among the greatest delivered in that generation of great orators. The first was on the 7th of February 1787, on the charges brought against Hastings with regard to the begums or princesses of Oude. Sheridan spoke for more than five hours, and the effect of his oratory was such that it was unanimously agreed to adjourn and postpone the final decision till the House should be in a calmer mood. Of this, and of his last great speech on the subject in 1794, only brief abstracts have been preserved; but with the second, the four days' speech delivered in his capacity of manager of the trial, in Westminster Hall, on the occasion so brilliantly described by Macaulay, posterity has been more fortunate. Gurney's verbatim reports of the speeches on both sides at the trial were published at Sir G. Cornewall Lewis's instigation in 1859, and from them we are able to form an idea of Sheridan's power as an orator. There are passages here and there of gaudy rhetoric, loose ornament and declamatory hyperbole; but the strong common sense, close argumentative force and masterly presentation of telling facts enable us to understand the impression produced by the speech at the time.

From the time of the break-up of the Whig party on the secession of Burke he was more or less an "independent member," and his isolation was complete after the death of Fox. When Burke denounced the French Revolution, Sheridan joined with Fox in vindicating the principle of non-intervention. He maintained that the French people should be allowed to settle their constitution and manage their affairs in their own way. But when the republic was succeeded by the empire, and it became apparent that France under Napoleon would interfere with the affairs of its neighbours, he employed his eloquence in denouncing Napoleon and urging the prosecution of the war. One of his most celebrated speeches was delivered in support of strong measures against the mutineers at the Nore. He was one of the few members who actively opposed the union of the English and Irish parliaments. When the Whigs came into power in 1806 Sheridan was appointed treasurer of the navy, and became a member of the Privy Council. After Fox's death he succeeded his chief in the representation of Westminster, and aspired to succeed him as leader of the party, but this claim was not allowed, and thenceforward Sheridan fought for his own hand. When the prince became regent in 1811 Sheridan's private influence with him helped to exclude the Whigs from power. Throughout his parliamentary career Sheridan was one of the boon companions of the prince, and his champion in parliament in some dubious matters of payment of debts. But he always resented any imputation that he was the prince's confidential adviser or mouthpiece. A certain proud and sensitive independence was one of the most marked features in Sheridan's parliamentary career. After a coolness arose between him and his Whig allies he refused a place for his son from the government, lest there should be any suspicion in the public mind that his support had been bought.

His last years were harassed by debt and disappointment. He sat in parliament for Westminster in 1806–1807. At the general election of 1807 he stood again for Westminster and was defeated, but was returned as member for Ilchester, at the expense apparently of the prince of Wales. In 1812 he failed to secure a seat at Stafford. He could not raise money enough to buy the seat. He had quarrelled with the Prince Regent, and seems to have had none but obscure friends to stand by him. As a member of parliament he had been safe against arrest for debt, but now that this protection was lost his creditors closed in upon him, and the history of his life from this time till his death in 1816 is one of the most painful passages in the biography of great men. It may be regarded as certain, however, that the description of the utter destitution and misery of the last weeks of his life given in the *Croker Papers* (i. pp. 288-312, ed. L. J. Jennings) is untrue. In any attempt to judge of Sheridan as he was apart from his works, it is necessary to make considerable deductions from the mass of floating anecdotes that have gathered round his name. It was not without reason that his grand-daughter Mrs Norton denounced the unfairness of judging of the real man from unauthenticated stories. The real Sheridan was not a pattern of decorous respectability, but we may fairly believe that he was very far from being the Sheridan of vulgar legend. Against the stories about his reckless management of his affairs we must set the broad facts that he had no source of income but Drury Lane theatre, that he bore from it for thirty years all the expenses of a fashionable life, and that the theatre was twice rebuilt during his proprietorship, the first time (1791) on account of its having been pronounced unsafe, and the second (1809) after a disastrous fire. Enough was lost in this way to account ten times over for all his debts. The records of his wild bets in the betting book of Brooks's Club date from the years after the loss, in 1792, of his first wife, to whom he was devotedly attached. He married again in 1795, his second wife being Esther Jane, daughter of Newton Ogle, dean of Winchester. The reminiscences of his son's tutor, Mr Smyth, show anxious and fidgetty family habits, curiously at variance with the accepted tradition of his imperturbable recklessness. He died on the 7th of July 1816, and was buried with great pomp in Westminster Abbey.

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[1] For the elucidation of these transactions, see Brander Matthews's edition (1885) of *Sheridan's Comedies* (pp. 29-31).

Sheridan's only son by his first marriage, Thomas Sheridan (1775–1817), was a poet of some merit. He became colonial treasurer at the Cape of Good Hope. His wife, Caroline Henrietta, *née* Callander (1779–1851), wrote three novels, which had some success at the time. She received, after her husband's death, quarters at Hampton Court, and is described by Fanny Kemble as more beautiful than anybody but her daughters. The eldest child, Helen Selina (1807–1867), married Commander Price Blackwood, afterwards Baron Dufferin. Her husband died in 1841, and in 1862 she consented to a ceremony of marriage with George Hay, Earl of Gifford, who died a month later. Her *Songs, Poems and Verses* (1894) were published, with a memoir, by her son, the marquess of Dufferin. The second daughter, Caroline, became Mrs Norton (*q.v.*). The youngest, Jane Georgina, married Edward Adolphus Seymour, afterwards 12th duke of Somerset.

Bibliography.—*Memoirs of the . . . Life of . . . R. B. Sheridan, with a Particular Account of his Family and Connexions* (1817), by John Watkins (" who deals," said Byron, " in the life and libel line"), was an altogether inadequate piece of work, and made many false statements. The *Memoirs, &c.* (1825), compiled by Thomas Moore did not make full use of the papers submitted by the family. William Smyth (*Memoir of Mr Sheridan*, 1840), who had been a tutor in Sheridan's house, was responsible for many of the scandalous and sometimes baseless stories connected with Sheridan's name. Accounts of the dramatist's parents and of his grandfather are given by Alicia Lefanu in her *Memoirs of the Life and Writings of Mrs Frances Sheridan, &c.* (1824). There are numerous references to Sheridan in the *Letters and Journals* of Byron, and several anecdotes (see especially vol. v. p. 411 seq., ed. Prothero, 1901). Popular works on the Sheridans are Mrs Oliphant's *Sheridan* (1883) in the " English Men of Letters " series; Mr Percy Fitzgerald's *Lifes of the Sheridans* (2 vols., 1886); and the *Life of R. B. Sheridan* (1890) by Lloyd C. Sanders in the " Great Writers " series. An admirable sketch of Sheridan's political career is given in *Wilkes, Sheridan, Fox: the Opposition under George the Third* (1874), by Mr W. Fraser Rae, who reconstructed Sheridan's biography from the original sources and vindicated his reputation from the misstatements of earlier writers, in *Sheridan: a Biography* (2 vols., 1896), which has an introduction by the marquess of Dufferin and Ava, the great-grandson of the dramatist. The *Life of R. B. Sheridan* by Walter Sichel (1909) is, however, the best account now available.

Among the numerous modern editions of Sheridan's plays, of which only *The Rivals* was published by the dramatist himself, may be mentioned: *Sheridan's Plays now printed as he wrote them* (1902), edited by W. Fraser Rae, who quotes at length the criticisms in the contemporary press; *The Plays of R. B. Sheridan* (1900), edited by Mr A. W. Pollard; and *Sheridan's Comedies* (Boston, U.S.A., 1885), with a valuable introduction by Mr Brander Matthews. For further details consult the extensive bibliography by Mr J. P. Anderson in the *Life* by Lloyd C. Sanders.

SHERIDAN, PHILIP HENRY (1831–1888), American general, was born at Albany, N.Y., on the 6th of March 1831. His early life was spent in a country district in Perry county, Ohio, and he proceeded to West Point in 1848, graduating in 1853. He was assigned to the infantry and served on the frontier and on the Pacific coast, gaining some experience of war in operations against the Indians. At the outbreak of the Civil War in 1861 he had just become first lieutenant, and soon afterwards he was promoted captain and entrusted with administrative duties in the western theatre of war. Early in 1862 he was commissioned colonel of the 2nd Michigan cavalry, with which he served in Halleck's army on the Tennessee. In June he was placed in command of a cavalry brigade, and a month later he won promotion to the rank of brigadier-general U.S.V. by his skilful conduct of the fight of Booneville on the 1st of July. He took part in General Buell's campaign against Bragg, and led the 11th division of the Army of the Ohio at the hard-fought battle of Perryville (October 8). Sheridan distinguished himself still more at the sanguinary battle of Murfreesboro (Stone river), and on the recommendation of Rosecrans was made major-general of volunteers, to date from the 31st of December 1862. His division took part in Rosecrans's campaign of 1863 and a very distinguished part at Chickamauga and Chattanooga (*q.v.*). Sheridan's leading of his division at the latter battle attracted the notice of General Grant, and when the latter, as general in chief of the U.S. armies, was seeking an " active and energetic man, full of spirit and vigour and life " to command the cavalry of the Army of the Potomac, Sheridan was chosen on the suggestion of General Halleck. The extraordinary activity of the Union cavalry under his command justified the choice. Sheridan's corps took part in the battles of the Wilderness and Spottsylvania Court House (see the article Wilderness), incidents of which led to a bitter quarrel between Sheridan and Meade and to Sheridan's being despatched by General Grant on a far-reaching cavalry raid towards Richmond. In the course of this was fought the battle of Yellow Tavern, where the Confederate general J. E. B. Stuart was killed. After rejoining the army Sheridan fought another well-contested action at Hawes' Shop and took and held Cold Harbor. After the battle at that place Sheridan undertook another raid, this time towards Charlottesville (June 7–28), in view of co-operation with the army of General David Hunter in the Valley. In the course of this was fought the action of Trevilian's Station (June 11). A little later came General Sheridan's greatest opportunity for distinction. He was appointed to command a new " Army of the Shenandoah " to oppose the forces of General Early, and conducted the brilliant and decisive campaign which crushed the Confederate army and finally put an end to the war in Northern Virginia (see American Civil War and Shenandoah Valley Campaigns). The victories of the Opequan, or Winchester (September 19), Fisher's Hill (September 22) and Cedar Creek (October 19), produced great elation in the North and corresponding depression in the Confederacy, and Sheridan was made successively brigadier-general U.S.A. for Fisher's Hill and major-general U.S.A. for Cedar Creek. " Sheridan's Ride " of 20 m. from Winchester to Cedar Creek to take command of the hard-pressed Union troops is a celebrated incident of the war. His capacity for accepting the gravest responsibilities was shown, not less than by his handling of an army in battle, by his ruthless devastation of the Valley—a severe measure felt to be necessary both by Sheridan himself and by Grant. From the Valley the cavalry rode through the enemy's country to join Grant before Petersburg, fighting the action of Waynesboro', destroying communications and material of war, and finally reporting to the general-in-chief on the 25th of March 1865. A few days later the indefatigable Sheridan won the last great victory of the war at Five Forks. The operations were conducted entirely by him and were brilliantly successful, leading to the retreat of Lee from the lines of Petersburg and the final catastrophe of Appomattox Court House. In the course of the battle of Five Forks Sheridan once more displayed his utter fearlessness of criticism by summarily dismissing from his command General G. K. Warren, an officer of the highest repute, whose corps was only temporarily under Sheridan's orders. The part played by the cavalry corps in the pursuit of Lee was most conspicuous, and Sheridan himself commanded the large forces of infantry and cavalry which cut off Lee's retreat and compelled the surrender of the famous Army of Northern Virginia (see AMERICAN CIVIL WAR and PETERSBURG).

Soon after the close of the war Sheridan, who by these services had gained his reputation as one of the greatest soldiers of the time, was sent to exercise the military command in the south-west, where a corps of observation, on the Mexican frontier, watched the struggle between Maximilian and the Liberals (see MEXICO: *History*). General Sheridan stated in his memoirs that material assistance was afforded to the Liberals out of the U.S. arsenals, and the moral effect of his presence on the frontier certainly influenced the course of the struggle to a very great extent. Later, in the Reconstruction period, he commanded the Fifth Military District (Louisiana and Texas) at New Orleans, where his administration of the conquered states was most stormy, his differences with President Johnson culminating in his recall in September 1867. He was then placed in charge of the Department of the Missouri, which he commanded for sixteen years, and in 1869, on Grant's election to the presidency and Sherman's consequent promotion to the full rank of general, he was made lieutenant-general. In 1868–1869 he conducted a winter campaign against the Indians, which resulted in their defeat and surrender. During the Franco-German War of 1870 General Sheridan accompanied the great headquarters of the German armies as the guest of the king of Prussia. In 1873, at the time of the "Virginius" incident (see CUBA), when an invasion of Spain was projected, Sheridan was designated to command the United States field army. In 1875 he was sent to New Orleans to deal with grave civil disorder, a duty which he carried out with the same uncompromising severity that he had previously shown in 1867. In 1883 he succeeded Sherman in the chief command of the United States army, which he held until his death at Nonquitt, Mass., on the 5th of August 1888. A few months previously he had been raised to the full rank of general.

As a soldier, Sheridan combined brilliant courage and painstaking skill. As a fighting general he was unsurpassed. Few of the leaders of either side could have stemmed the tide of defeat as he did at Stone river and turned a mere rally into a great victory as he did at Cedar Creek, by the pure force of personal magnetism. His restless energy was that of a Charles XII., to whom in this respect he has justly been compared, while, unlike the king of Sweden, he was as careful and vigilant as the most methodical strategist. He was a devout Roman Catholic, and in his private life he had the esteem and admiration of all who knew him well. General Sheridan was president of the Society of the Army of the Potomac and of the Society of the Army of the Cumberland, the latter for fourteen years. In 1875 he married Irene, daughter of General D. H. Rucker, U.S.A.

His *Personal Memoirs* (2 vols.) were published soon after his death.

SHERIFF, or SHIRE-REEVE (O. Eng. *scir-gerefa* or *scirman*,[1] Latin, *vice-comes*), often called "high sheriff," the English and Irish executive authority in a county, or other place, often called his "bailiwick." The office also exists in about twenty ancient cities and boroughs, among which may be named London, Norwich, York, Bristol, Oxford, Lincoln, Chester and Canterbury in England, and Dublin, Cork, Limerick and other places in Ireland. In most of these the office is of an honorary nature. The office is at present an annual one, though this has not been always the case. Three names are put on the list by the chancellor of the exchequer and the judges of king's bench division on the morrow of St Martin (12th of November), and the first name is usually pricked by the king in council in the February or March following. City and borough sheriffs are usually appointed by the corporations on the 9th of November. London and Middlesex are specially provided for by the act of 1887, s. 33, and the sheriffs of the counties of Cornwall and Lancaster are separately appointed, the act not applying to them.

The shrievalty was at one time a far more important office than it is at present. "The whole history of English justice and police," says Maitland (*Justice and Police*, 69), "might be brought under this rubric, the decline and fall of the sheriff." That the sheriff sometimes abused his power is obvious from the grievances stated in the Inquest of Sheriffs of 1170. But he was necessary to protect the interests of the crown and the people against the powerful local baronage. Besides executing the king's writs, he called out the *posse comitatus* on any emergency needing an armed force. He had the *ferm* of the shire[2] (the rent he paid being called "sheriff-geld") and presided in the county court and the hundred court. For more purely judicial purposes he held as the king's deputy the sheriff's *tourn*,[3] where his jurisdiction had not been ousted by franchise. He might be a peer or a judge, Bracton being an instance of the latter. The appointment seems to have been originally by popular election, a right confirmed by 28 Edw. I. c. 8, but ultimately vested in the crown unless where certain powerful landowners had contrived to make the office hereditary. The hereditary shrievalty of Westmorland was not abolished until 1850 by 13 & 14 Vict. c. 30.[4] The tendency of the hereditary office to become obsolete was no doubt helped by the creation of Viscount Beaumont as an hereditary peer under the new dignity of *vice-comes* in 1440. At one time contributions to the expense of the office were made by the magistrates and others of the county. "Sheriff-tooth" was a tenure on condition of supplying entertainment to the sheriff at the county court. Up to the 19th century "riding with the sheriff" was an incident of the assizes, the riders being some of the principal men of the shire who brought with them wine and victuals in order to assist the sheriff in showing hospitality to the judges.

At the present day the expensive duties of the sheriff depend on numerous statutes beginning with 2 Edw. III. c. 3 (1328). The most important is the Sheriffs Act 1887, mainly a consolidating act applying to England only. The person nominated is usually a magistrate for the county, but anyone is eligible provided that he have land in the county sufficient to answer the king.[5] Exempt are peers, clergy, officers in active service, practising barristers and solicitors and others. Poverty is also a ground of exemption. The sheriff appoints his undersheriff. The duties of the office at the present day are both administrative and judicial. Among the former the most important is attendance on the judges at assizes and election petitions. A certain amount of stately ceremony is required, and any lack of it is punishable by fine either by the judge of assize or by the High Court. Other administrative duties are execution of writs[6] and of the sentence of death, acting as returning officer at parliamentary elections, preparing the panel of jurors for assizes, the keeping prisoners in safe custody, he being liable for their escape, and the—now nominal—duty of summoning the *posse comitatus*. His judicial duties consist in himself or his deputy sitting to assess damages under the Lands Clauses Act 1845, and also in cases set down for trial where the defendant has made default in appearance and the issue resolves itself into one of damages. The expenses of the office are partly met by the

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[1] The word occurs as early as the laws of Ine (*c.* 8), about 690.

[2] The ferm is abolished by the act of 1887, s. 19.

[3] Abolished by s. 18 of the same act.

[4] Repealed and re-enacted by the act of 1887, s. 31.

[5] The counties of Cambridge and Huntingdon are combined for the purposes of the shrievalty. See the act of 1887, s. 32.

[6] Where a question arises as to the ownership of goods seized in execution the sheriff may have to undergo the process known as sheriff's interpleader.

Treasury in accordance with the Treasury order of the 2nd of August 1898. The order lays down with somewhat grim humour that the sheriff is not limited to the allowances, but may spend more if he likes. A sheriff cannot during his year of office act as a magistrate for the county of which he is sheriff.

See the works on the history of law by Stubbs, Pollock and Maitland and Holdsworth. Also W. S. McKechnie, *Magna Carta* (1905); Sir M. Hale, *A Short Treatise touching Sheriff's Accompts* (1683); Greenwood, *Bouleuterion* (1685); *The Compleat Sheriff* (1696); *Impey* (1786); *Atkinson* (1878); Churchill and Bruce (1882); and Mather (1903).

Scotland.—As far as is known the sheriff did not exist in Scotland before the beginning of the Norman period. In the feudal system he became as in England the centre of the local administration of justice, the representative of the crown in executive as well as judicial business, and was always a royal officer appointed by and directly responsible to the king. The earliest sheriffs on record belong to the reigns of Alexander I. and David I., and the office was common before the death of Alexander III. In many cases it had become hereditary, instances being those of De Sinton in Selkirk and Agnew in Galloway. The ordinance of Edward I. in 1305 rejected the hereditary character of the office, but an act of James II. shows that the office had again become hereditary.

One of the consequences was that sheriffs ignorant of law required deputes to discharge their judicial duties. In the course of succeeding reigns, down to that of James VI., the jurisdiction of the sheriffs came to be much limited by grants of baronies and regalities which gave the grantees the right to hold both civil and criminal courts of less or greater jurisdiction to the exclusion of the sheriff.

The civil jurisdiction of the sheriff was originally of very wide extent, and was deemed specially applicable to questions relating to the land within the shire, but after the institution of the court of session in 1532 it became restricted, and all causes relating to property in land, as well as those requiring the action called declarator for establishing ultimate right, and most of those requiring equitable remedies, were withdrawn from it. Nor did it possess any consistorial jurisdiction. Practically, therefore, the civil jurisdiction of the sheriff fell under the head of actions concluding for payment of money and actions to regulate the possession of land. The criminal jurisdiction of the sheriff was in like manner in its origin of almost universal extent. But this was first limited to cases where the offenders were caught in or shortly after the act, afterwards to cases in which the trial could be held within forty days, and subsequently further restricted as the business of the justiciary court became more organized. The punishment of death, having by long disuse come to be held beyond the power of the sheriff, and the statutory punishments of transportation or penal servitude never having been entrusted to him, his jurisdiction as regards crimes was usually said to be limited to those punishable arbitrarily, that is, by imprisonment, fine or admonition.

As a consequence of the suppression of the Jacobite rising of 1745, after the 1st of March 1748 all heritable sheriffships were extinguished by 20 Geo. II. c. 43. The act declared that there should be but one sheriff-depute or stewart-depute in every shire or stewartry, who was to be an advocate of three years' standing, appointed by the crown. Since 1769 the sheriff-depute has held his office *ad vitam aut culpam.* Power was given to him by 20 Geo. II. c. 43 to appoint one or more sheriffs-substitute. In 1787 the sheriff-substitute was placed on the civil establishment and paid by the crown; in 1825 a qualification of three years' standing (now five years by the Sheriff Courts (Scotland) Act 1877) as an advocate or procurator before a sheriff court was required (6 Geo. IV. c. 23); in 1838 he was made removable by the sheriff-depute only with the consent of the lord president and lord justice clerk, and it was made compulsory that he should reside in the sheriffdom, the provision of 20 Geo. II. c. 43, which required the sheriff-depute so to reside for four months of each year, being repealed (1 & 2 Vict. c. 119). In 1877 the right of appointment of the substitutes was transferred from the sheriff-depute to the crown by the act of 1877.

While the sheriff-depute has still power to hear cases in the first instance, and is required to hold a certain number of sittings in each place where the sheriff-substitute holds courts, and also once a year a small-debt court in every place where a circuit small-debt court is appointed to be held, the ordinary course of civil procedure is that the sheriff-substitute acts as judge of first instance, with an appeal under certain restrictions from his decision to the sheriff-depute, and from him to the court of session in all causes exceeding £25 in value. An appeal direct from the sheriff-substitute to the court of session is competent, but is not often resorted to. By the Interpretation Act 1889, s. 28, the word "sheriff" in any act relating to Scotland is to include a sheriff-substitute.

As regards criminal proceedings, summary trials are usually conducted by the sheriff-substitute; trials with a jury either by him or, in important cases, by the sheriff-depute. The sheriff-substitute also has charge of the preliminary investigation into crime, the evidence in which, called a precognition, is laid before him, and if necessary taken before him on oath at the instance of his procurator-fiscal, the local crown prosecutor.

The duties of the sheriff-depute are now divided into ministerial or administrative and judicial. The ministerial are the supervision of the accounts of the inferior officers of the sheriffdom; the superintendence of parliamentary elections; the holding by himself or his substitutes of the courts for registration of electors; the preparation of the list of persons liable to serve both on criminal and civil juries; the appointment of sheriff officers and supervision of the execution of judicial writs by them; and the striking of the "fiars." He has also to attend the judges of justiciary at the circuit courts for the county or counties over which his jurisdiction extends.

The judicial duties of the sheriff-depute are, as regards crimes, the trial of all causes remitted by the counsel of the crown for the trial by sheriff and jury, as well as summary trials if he chooses to take them. This now means most crimes for which a maximum of two years' imprisonment (in practice eighteen months is the longest sentence imposed) is deemed sufficient, and which are not by statute reserved for the justiciary court. His civil jurisdiction is regulated by several statutes too technical for detail, but may be said generally to extend to all suits which conclude for payment of money, whatever may be the cause of action, with the exception of a few where the payment depends on status, all actions with reference to the possession of land or right in land, and actions relative to the right of succession to movable property. In bankruptcy he has a cumulative and alternative jurisdiction with the court of session, and in the service of heirs with the sheriff of chancery.

The courts which the sheriff holds are (1) the criminal court; (2) the ordinary civil court; (3) the small-debt court for cases under £12 in value (6 Geo. IV. c. 48); (4) the debts recovery court for cases above £12 and under £50 in value (Debts Recovery [Scotland] Act 1867); and (5) the registration court. His judgment in the criminal court is subject to review by the court of justiciary, and in the ordinary civil court and the debts recovery court by the court of session. In the small-debt court it is final, except in certain cases where an appeal lies to the next circuit court of justiciary. The sheriff-substitute may competently exercise all the judicial jurisdiction of the sheriff, subject to appeal in civil cases other than small debt cases. As regards his administrative functions he assists the sheriff generally, and may act for him in the registration and fiars court, and he superintends the preliminary stage of criminal inquiries, consulting with the sheriff if necessary; but the other administrative duties of the office are conducted by the sheriff-depute in person. The executive functions of the sheriff are performed by messengers-at-arms. The civil jurisdiction depends on numerous statutes known as the Sheriff Courts and Small Debts Acts. The salaries of sheriffs-depute vary from £2000 to £500 a year, those of sheriffs-substitute from £1400 to £500.

There is a principal sheriff-clerk appointed by the crown for each county, who has depute clerks under him in the principal towns, and a procurator-fiscal for the conduct of criminal prosecutions for each county and district of a county, who is appointed by the sheriff with the sanction of the home secretary.

Besides the sheriffs of counties, there is a sheriff of chancery appointed by the crown, whose duties are confined to the service of heirs, with a salary of £500.

See the various works on sheriff court practice, such as those of J. D. Wilson (1883) and J. M. Lees (1889), and Green, *Encyc. of Scots. Law, s.v.* "Sheriff."

Ireland.—The sheriff has much the same duties as in England. His position is defined by numerous statutes, beginning with 53 Geo. III. c. 68 (1817). There is no consolidating act such as that of 1887 in England.

United States.—The office of sheriff is generally elective.

The sheriff has administrative and limited judicial authority. He sometimes serves for combined counties, as in England for Cambridge and Huntingdon. (J. W.)

SHERIFFMUIR, a battlefield situated on the verge of the extreme north-western flank of the Ochils, Perthshire, Scotland, watered by Wharry Burn, an affluent of the Allan. It lies within the bounds of the parish of Dunblane, 2½ m. E. by N. of the town. It was the site of an indecisive battle (13th of November 1715) between the Jacobites, about 12,000 strong, under John Erskine, 6th or 11th earl of Mar, and 4000 Royalists under Archibald Campbell, afterwards 3rd duke of Argyll. Both sides, each of which lost 500 men, claimed the victory, although in point of fact Mar deemed it prudent to retreat. The "battle stone" enclosed by a railing marks the scene of the encounter.

SHERIF PASHA (1818–1887), Egyptian statesman, was a Circassian who filled numerous administrative posts under Said and Ismail pashas. He was of better education than most of his contemporaries, and had married a daughter of Colonel Sèves the French non-commissioned officer who became Soliman Pasha under Mehemet Ali. As minister of foreign affairs he was useful to Ismail, who used Sherif's bluff *bonhomie* to veil many of his most insidious proposals. Of singularly lazy disposition, he yet possessed considerable tact—he was in fact an Egyptian Lord Melbourne, whose policy was to leave everything alone. His favourite argument against any reform was to appeal to the Pyramids as an immutable proof of the solidity of Egypt financially and politically. His fatal optimism rendered him largely responsible for the collapse of Egyptian credit which brought about the fall of Ismail. Upon the military insurrection of September 1881, Sherif was summoned by the khedive Tewfik to form a new ministry. The impossibility of reconciling the financial requirements of the national party with the demands of the British and French controllers of the public debt, compelled him to resign in the following February. After the suppression of the Arabi rebellion he was again installed in office (September 1882) by Tewfik, but in January 1884 he resigned rather than sanction the evacuation of the Sudan. As to the strength of the mahdist movement he had then no conception. When urged by Sir Evelyn Baring (Lord Cromer) early in 1883 to abandon some of the more distant parts of the Sudan, he replied with characteristic light-heartedness: "Nous en causerons plus tard; d'abord nous allons donner une bonne raclée à ce monsieur" (*i.e.* the mahdi). Hicks Pasha's expedition was at the time preparing to march on El Obeid. (*Vide Egypt* No. 1 (1907), p. 115). Sherif died at Gratz, on the 20th of April 1887.

SHERLOCK, THOMAS (1678–1761), English divine, the son of William Sherlock (*q.v.*), was born at London in 1678. He was educated at Eton and at St Catharine's Hall, Cambridge, and in 1704 succeeded his father as master of the Temple, where he was very popular. In 1714 he became master of his old college at Cambridge and vice-chancellor of the university, whose privileges he defended against Richard Bentley. In 1715 he was appointed dean of Chichester. He took a prominent part in the Bangorian controversy against Benjamin Hoadly, whom he succeeded as bishop of Bangor in 1728; he was afterwards translated to Salisbury in 1734, and to London in 1748. Sherlock was a capable administrator, and cultivated friendly relations with dissenters. In parliament he was of good service to his old schoolfellow Robert Walpole. He published against Anthony Collins's deistic *Grounds of the Christian Religion* a volume of sermons entitled *The Use and Interest of Prophecy in the Several Ages of the World* (1725); and in reply to Thomas Woolston's *Discourses on the Miracles* he wrote a volume entitled *The Tryal of the Witnesses of the Resurrection of Jesus* (1729), which soon ran through fourteen editions. His *Pastoral Letter* (1750) on "the late earthquakes" had a circulation of many thousands, and four or five volumes of *Sermons* which he published in his later years (1754–1758) were also at one time highly esteemed. He died in July 1761.

A collected edition of his works, with a memoir, in 5 vols. 8vo, by J. S. Hughes, appeared in 1830.

SHERLOCK, WILLIAM (*c.* 1641–1707), English divine, was born at Southwark about 1641, and was educated at Eton and at Peterhouse College, Cambridge. In 1669 he became rector of St George's, Botolph Lane, London, and in 1681 he was appointed a prebendary of St Paul's. In 1674 he showed his controversial bent by an attack on the puritan John Owen, in *The Knowledge of Jesus Christ and Union with Him.* In 1684 he published *The Case of Resistance of the Supreme Powers stated and resolved according to the Doctrine of the Holy Scriptures*, an ably written treatise, in which he drew the distinction between active and passive obedience which was at that time generally accepted by the high church clergy; in the same year he was made master of the Temple. In 1686 he was reproved for his anti-papal preaching, and his pension stopped. After the Revolution he was suspended for refusing the oaths to William and Mary, but before his final deprivation he yielded, justifying his change of attitude in *The Case of the Allegiance due to Sovereign Powers stated and resolved according to Scripture and Reason and the Principles of the Church of England* (1691). During the period of his suspension he wrote a *Practical Discourse concerning Death*, which became very popular. In 1690 and 1693 he published volumes on the doctrine of the Trinity which helped rather than injured the Socinian cause, and involved him in a warm controversy with Robert South and others. He became dean of St Paul's in 1691, and died at Hampstead in June 1707.

His sermons were collected in 2 vols. 8vo (4th ed., 1755).

SHERMAN, JOHN (1823–1900), American financier and statesman, a younger brother of General W. T. Sherman, was born at Lancaster, Ohio, on the 10th of May 1823. He began the study of law at Mansfield, Ohio, and was admitted to the bar in 1844. For ten years he practised his profession with success, and with only casual interest in politics. His associations and predilections were with the Whigs, and he was a delegate to the National Convention that nominated General Zachary Taylor in 1848. Upon the repeal of the Missouri Compromise by the Kansas-Nebraska Bill in 1854, he joined the great popular movement in Ohio against the policy represented by this bill, and was elected to Congress in the autumn of that year as an "Anti-Nebraska" man. In the summer of the next year he took an active part in the formal organization of the Republican party in the state, and at the opening of Congress in December began a long career of public service. As a member of the House (1855–1861), he quickly manifested the qualities which characterized his whole political life. Though a thorough and avowed partisan, he was within the party the counsellor of moderate rather than extreme measures, and thus gained on the whole a position of great influence. He was a member of the committee sent by the House in 1856 to investigate the troubles in Kansas, and drafted the report of the majority. In 1859 he was the Republican candidate for Speaker of the House, but was obliged, after a contest that lasted two months, to withdraw, largely because of the recommendation he had inadvertently given to an anti-slavery book, *The Impending Crisis of the South* (1857), by Hinton Rowan Helper (1829–1909). He became, however, chairman of the Committee on Ways and Means, and was instrumental in the enactment of the Morrill Tariff Act of 1860. In March 1861 he took his seat in the Senate, to which he had been elected to succeed Salmon P. Chase, when the latter became secretary of the treasury. As senator he sat continuously until he became secretary of the treasury in 1877. His interest and efficiency in financial legislation in the House led to his appointment on the Senate Committee of Finance, and after 1867 he was chairman of this influential committee. He thus became associated with the enactment of all the great fiscal laws through which the strain of war and of reconstruction was sustained. He gave earnest support to the Legal Tender Act, and the substitution of the national for the state banking system. When after the end of the war the question of financial readjustment came up, he vigorously opposed Secretary Hugh McCulloch's policy of retiring the legal tenders, and urged a different plan for effecting the resumption of specie payments. On the questions relating to political reconstruction and the policy of President Johnson, he supported his party, though opposed to its Radical leaders. He warmly advocated the insertion in the Reconstruction Acts of a provision ensuring the early termination of military government; and he opposed the impeachment of President Johnson, though he voted for conviction on the trial. During the administrations of President Grant his leadership in shaping financial policy became generally recognized. The Resumption Act of 1875, which provided for the return of specie payments four years later, was largely his work both in inception and in formulation, and his appointment to the head of the Treasury Department by President Hayes in 1877 enabled him to carry the policy embodied in the law to successful execution. His administration of the department, in circumstances of great difficulty arising out of the "greenback" agitation and the adverse political complexion of Congress, won him high distinction as a financier.

At the end of the Hayes administration he was again elected to the Senate from Ohio and held his seat until 1897. During this period he was largely concerned in the enactment of the Anti-Trust Law of 1890, and of the so-called Sherman Act of the same year, providing for the purchase of silver and the issuing of Treasury notes based upon it. This latter Act he approved only as a means of escaping the free coinage of silver, and he supported its repeal in 1893. In 1880 and 1888 he aspired actively to the Republican nomination for the presidency, but failed to obtain the requisite support in the Convention. During the last years of his senatorial career he was chairman of the Senate Committee on Foreign Affairs. Upon the accession of President McKinley in 1897, he resigned from the Senate and became secretary of state; but under the tension of the war with Spain the duties of the office became too exacting for his strength at his age, and in April 1898 he resigned and withdrew into private life. Infirmities multiplied upon him, until his death at Washington on the 22nd of October 1900.

A selection from the correspondence of John Sherman and his brother Gen. W. T. Sherman was published as *The Sherman Letters* in 1894. Sherman published *Recollections of Forty Years in the House, Senate and Cabinet: an Autobiography* (Chicago and New York, 1895). A volume of *Selected Speeches* was published in 1879. See *Life*, by T. E. Burton (1906). (W. A. D.)

SHERMAN, ROGER (1721–1793), American political leader, a signer of the Declaration of Independence, was born at Newton, Massachusetts, on the 19th of April 1721 (O.S.). He removed with his parents to Stoughton in 1723, attended the country school there, and at an early age learned the cobbler's trade in his father's shop. Removing to New Milford, Connecticut, in 1743, he worked as county surveyor, engaged in mercantile pursuits, studied law, and in 1754 was admitted to the bar. He represented New Milford in the Connecticut Assembly in 1755–1756 and again in 1758–1761. From 1761 until his death New Haven was his home. He was once more a member of the Connecticut Assembly in 1764–1766, was one of the governor's assistants in 1766–1785, a judge of the Connecticut superior court in 1766–1789, treasurer of Yale College in 1765–1776, a delegate to the Continental Congress in 1774–1781 and again in 1783–1784, a member of the Connecticut Committee of Safety in 1777–1779 and in 1782, mayor of New Haven in 1784–1793, a delegate to the Federal Constitutional Convention of 1787 and to the Connecticut Ratification Convention of the same year, and a member of the Federal House of Representatives in 1789–1791 and of the United States Senate in 1791–1793. He was on the committee which drafted the Declaration of Independence, and also on that which drafted the Articles of Confederation. His greatest public service, however, was performed in the Federal Constitutional Convention. In the bitter conflict between the large state party and the small state party he and his colleagues, Oliver Ellsworth and William Samuel Johnson, acted as peacemakers. Their share in bringing about the final settlement, which provided for equal representation in one house and proportional representation in the other, was so important that the settlement itself has come to be called the "Connecticut Compromise." He helped to defeat the proposal to give Congress a veto on state legislation, showing that it was illogical to confer such a power, since the constitution itself is the law of the land and no state act contravening it is legal. In the Federal Congress (1789–1793) he favoured the assumption of the state debts, the establishment of a national bank and the adoption of a protective tariff policy. Although strongly opposed to slavery, he refused to support the Parker resolution of 1789 providing for a duty of ten dollars per head on negroes brought from Africa, on the ground that it emphasized the property element in slavery. He died in New Haven on the 23rd of July 1793. Sherman was not a deep and original thinker like James Wilson, nor was he a brilliant leader like Alexander Hamilton; but owing to his conservative temperament, his sound judgment and his wide experience he was well qualified to lead the compromise cause in the convention of 1787.

Two of Sherman's grandsons, William M. Evarts and George F. Hoar, were prominent in the later history of the country.

Lewis H. Boutell's *Life of Roger Sherman* (Chicago, 1896), based on material collected by Senator Hoar, is a careful and accurate work.

SHERMAN, WILLIAM TECUMSEH (1820–1891), American general, was born on the 8th of February 1820, at Lancaster, Ohio. He was descended from Edmond Sherman, who emigrated from England to the Massachusetts Bay Colony in 1634. His father, Charles R. Sherman, a judge of the Supreme Court of Ohio, died suddenly in 1829, leaving his widow with a family of young children. William was adopted by the Hon. Thomas Ewing, a close friend of the father, sometime a senator of the United States and a member of the national cabinet. In 1836 he entered West Point, and on graduating near the head of his class he was appointed second lieutenant in the 3rd artillery regiment. His first field service was in Florida against the Seminole Indians. The usual changes of station and detached duty made him acquainted with the geography of all the Southern states, and Sherman improved the opportunity by making topographical studies which proved of no small value to him later. He also employed much of his time in the study of law. When the war with Mexico began in 1846 he asked for field duty, and was ordered to join an expedition going to California by sea. He was made adjutant-general to Colonel Mason, military governor, and as such was executive officer in the administration of local government till peace came in the autumn of 1848 and the province was ceded to the United States. In 1847 he served on the staff of the general commanding the division of the Pacific. In 1850 he married Ellen Boyle, daughter of Thomas Ewing, then secretary of the interior. Transferred in the same year to the commissariat department as a captain, he resigned three years later and went back to California to conduct at San Francisco a branch of an important St Louis banking-house. He continued successfully in the management of this business through a financial crisis incident to a wildly speculative time, until in the spring of 1857 the house, by his advice, withdrew from Californian affairs. Afterwards for a short time he was engaged in business at New York and in 1858 practised law at Leavenworth, Kansas. In 1859, the state of Louisiana proposing to establish a military college, Sherman was appointed its superintendent. On the 1st of January 1860 the "State Seminary of Learning and Military Academy" was opened, and here Sherman remained until the spring of 1861, when it was evident that Louisiana would join the states seceding from the Union. He thereupon resigned the superintendency and returned to St Louis, parting with the governor of the state and his colleagues in the school with regret and mutual esteem. Though his brother John Sherman was a leader in the party which had elected Lincoln, William Sherman was very conservative on the slavery question, and his distress at what he thought an unnecessary rupture between the states was extreme. Yet his devotion to the national constitution was unbounded, and he offered his services as soon as volunteers for the three years' enlistments were called out. On the 14th of May 1861 he was appointed colonel of the 13th U.S. Infantry, a new regiment, and was soon assigned to command a brigade in General McDowell's army in front of Washington. He served with it in the first battle of Bull Run, on the 21st of July. Promoted brigadier-general of volunteers, Sherman was in August sent to Kentucky to serve under General Robert Anderson. In October he succeeded to the command of the department. On the 26th of October he reported that 200,000 men would be required for the Kentucky campaign. He was relieved of his post soon afterwards in consequence, but the event justified Sherman's view. He was soon re-employed in a minor position, and, at the head of a division of new troops, accompanied Grant's army to Pittsburg Landing. At the battle of Shiloh Sherman's gallant conduct gained him promotion to major-general. His appreciation of Grant, and his sympathy with the chagrin he suffered after this battle, cemented the friendship between the two. He took part in Halleck's advance on Corinth, Mississippi, and at the close of 1862 led the Mississippi column in the first Vicksburg campaign. He suffered defeat at Chickasaw Bayou, but the capture of Fort Hindman, near Arkansas Post, compensated to some extent for the Vicksburg failure. In Grant's final Vicksburg campaign Sherman commanded the XV. corps and the right of the investing line, and after the surrender he was sent to oppose General Johnston in the country about Jackson, Miss. In July he was made a brigadier-general in the regular army. When, after Rosecrans's defeat at Chickamauga, Grant was placed in supreme command in the west, Sherman succeeded to the command of the Army of the Tennessee, with which he took part in the great battle of Chattanooga (*q.v.*). He had already prepared for a further advance by making an expedition into the heart of Mississippi as far as Meridian, destroying railways and making impracticable, for a season, the transfer of military operations to that region; and on Grant becoming general-in-chief (March 1864) he was made commander of the military division of the Mississippi, including his Army of the Tennessee, now under McPherson, the Army of the Cumberland, under Thomas, and the Army of the Ohio, under Schofield. Making detachments for garrisons and minor operations in a theatre of war over 500 m. wide, he assembled, near Chattanooga, his three armies, aggregating 100,000 men, and began (May 1864) the invasion of Georgia. After a brilliant and famous campaign of careful manœuvre and heavy combats (see AMERICAN CIVIL WAR), Sherman finally wrested Atlanta (*q.v.*) from the Confederates on the 1st of September. His able opponent Johnston had been removed from his command, and Hood, Johnston's successor, began early in October a vigorous movement designed to carry the war back into Tennessee. After a devious chase of a month Hood moved across Alabama to northern Mississippi. Sherman thereupon, leaving behind Thomas and Schofield to deal with Hood, made the celebrated "March to the Sea" from Atlanta to Savannah with 60,000 picked men. After a march of 300 m. Savannah was reached in December. Railways and material were destroyed, the country cleared of supplies, and the Confederate government severed from its western states. In January 1865 Sherman marched northwards again, once more abandoning his base, towards Petersburg, where Grant and Lee were waging a war of giants. Every mile of his march northwards through the Carolinas diminished the supply region of the enemy, and desperate efforts were made to stop his advance. General Johnston was recalled to active service, and showed his usual skill, but his forces were inadequate. Sherman defeated him and reached Raleigh, the capital of North Carolina, on the 13th of April, having marched nearly 500 m. from Savannah. Lee's position in Virginia was now desperate. Hood had been utterly defeated by Thomas and Schofield, and Schofield (moved 2000 m. by land and sea) rejoined Sherman in North Carolina. With 90,000 men Sherman drove Johnston before him, and when Lee surrendered to Grant Johnston also gave up the struggle. There was much friction between Sherman and the war secretary, Stanton, before the terms were ratified, but with their signature the Civil War came to an end.

Sherman had the good fortune to learn the art of command by degrees. At Bull Run his brigade was wasted in isolated and disconnected regimental attacks, at Shiloh his division was completely surprised owing to want of precaution; but his bravery and energy were beyond question, and these qualities carried him gradually to the front at the same time as he acquired skill and experience. When therefore he was entrusted with an independent command he was in every way fitted to do himself justice. At the head of a hundred thousand men he showed, besides the large grasp of strategy which planned the Carolinas march, besides the patient skill in manœuvre which gained ground day by day towards Atlanta, the strength of will which sent his men to the hopeless assault of Kenesaw to teach them that he was not afraid to fight, and cleared Atlanta of its civil population in the face of a bitter popular outcry. Great as were his responsibilities they never strained him beyond his powers. He has every claim to be regarded as one of the greatest generals of modern history.

When Grant became full general in 1866 Sherman was promoted lieutenant-general, and in 1869, when Grant became president, he succeeded to the full rank. General Sherman retired, after being commanding general of the army for fifteen years, in 1884. He died at New York on the 14th of January 1891. An equestrian statue, by Saint Gaudens, was unveiled at New York in 1903, and another at Washington in the same year.

Sherman's *Memoirs* were published in 1875 (New York). See also Rachel Sherman Thorndike, *The Sherman Letters* (New York, 1894); *Home Letters of Gen. Sherman* (1909), edited by M. A. De Wolfe Howe; S. M. Bowman and R. B. Irwin, *Sherman and his Campaigns: a Military Biography* (New York, 1865); W. Fletcher Johnson, *Life of William Tecumseh Sherman* (Philadelphia, 1891); Manning F. Force, *General Sherman* (Great Commanders series) (New York, 1899).

SHERMAN, a city and the county-seat of Grayson county, Texas, U.S.A., 64 m. by rail N. by E. of Dallas and 9 m. S. of Denison. Pop. (1890) 7335; (1900) 10,243, of whom 2131 were negroes; (1910 census) 12,412. Sherman is served by the St Louis & San Francisco (Frisco System), which has car shops here, the St Louis & South-Western, the Gulf, Colorado & Santa Fé, the Missouri, Kansas & Texas, the Texas & Pacific, and the Houston & Texas Central railways, and by electric lines connecting with Denison and Dallas. In the city are Austin College (Presbyterian, 1850; removed from Austin to Sherman in 1876) for men, Carr-Burdette College (Christian, 1894) for girls, North Texas Female College and Conservatory (Methodist Episcopal, 1877) and Saint Joseph's Academy (Roman Catholic) for girls. Sherman is situated on a ridge 720 ft. above sea-level between the Red river and the Trinity river, near a fertile part of the Red River Valley, in which the principal industries are the growing of cotton, Indian corn, wheat, oats, potatoes and alfalfa, and stock raising. The city contains cotton gins and compresses, and has various manufactures; in 1905 the value of factory products was $2,841,066 (94·4% more than in 1900). The municipality owns and operates the waterworks and the electric lighting plant. Sherman was settled in 1848 and was chartered as a city in 1895.

SHERRY, originally the name of wine coming from Xeres (Jerez de la Frontera), near Cadiz, Spain, and now the general name of the strong white wines, the lower grades excepted, which are made in the south of Spain (see WINE). The early form of the word in English was "sherris" (abbreviated from "sherris-wine" or "sherris-sack"), which was taken to be a plural, and "sherry" was formed as a singular by mistake.

'S HERTOGENBOSCH ('sBosch, or den Bosch, French *Bois-le-Duc*), the capital of the province of North Brabant, Holland, at the confluence of the rivers Dommel and Aa, which unite to form the Dieze, and a junction station 29½ m. S.S.E. of Utrecht and 27½ m. W.S.W. of Nijmwegen by rail. It is connected by steam tramway with Helmond (21 m. S.E.) and by the Zuid-Willem's canal with Maastricht (60 m. S. by E.). Pop. (1900) 32,345. 's Hertogenbosch is a well-built city and contains several churches. The Roman Catholic cathedral of St John, the Janskerk, with its interior in a state of preservation rare in Holland, is one of the finest architecturally in the country. Occupying the site of a much earlier building, of which there are remains, the present church with its fine choir was built in the middle of the 15th century. The 15th-century font, the pulpit (1570), the organ (1617), and the early Gothic Lady chapel containing a much venerated 13th-century image of the Virgin, which was annually carried in procession through the town, are all noticeable. The choir-screen was sold to the South Kensington Museum in London for £900, this sum being devoted to the work of modern restoration. The town hall contains an interesting series of decorative panels by a modern artist, A. Derkinderen, describing the founding of the city. It also includes a museum of local antiquities. In the Provincial museum are interesting Roman, German and Frankish antiquities. The principal other buildings are the court house, government buildings (formerly a Jesuit monastery), episcopal palace, grammar school (once attended by Erasmus), a prison, hospitals, arsenal and barracks. 's Hertogenbosch is the market of the fertile Meiery district, and carries on a considerable trade, chiefly by water, with Dordrecht and Rotterdam, Nijmwegen, Amhem, Maastricht and Liège. The chief industries include distilleries, breweries, glass works, cigar factories and the ancient linen and cutlery manufactures.

SHERWIN, JOHN KEYSE (1751–1790), English engraver and history-painter, was born in 1751 at East Dean in Sussex. His father was a wood-cutter employed in shaping bolts for shipbuilders, and the son followed the same occupation till his seventeenth year, when, having shown an aptitude for art by copying some miniatures with exceptional accuracy, he was befriended by William Mitford, upon whose estate the elder Sherwin worked, and was sent to study in London, first under John Astley, and then for three years under Bartolozzi—for whom he is believed to have executed a large portion of the plate of Clytie, after Annibal Caracci, published as the work of his master. He was entered as a student of the Royal Academy, and gained a silver medal, and in 1772 a gold medal for his painting of "Coriolanus taking Leave of his Family." From 1774 till 1780 he was an exhibitor of chalk-drawings and of engravings in the Royal Academy. Establishing himself in St James's Street as a painter, designer and engraver, he speedily attained popularity and began to mix in fashionable society. His drawing of the "Finding of Moses," a work of but slight artistic merit, which introduced portraits of the princess royal of England and other leading ladies of the aristocracy, hit the public taste, and, as reproduced by his burin, sold largely. In 1785 he succeeded Woollett as engraver to the king, and he also held the appointment of engraver to the prince of Wales. His professional income rose to about £12,000 a year; but he was constantly in pecuniary difficulties, for he was shiftless, indolent, and without method, open-handed and even prodigal in his benefactions—and prodigal, too, in less reputable directions, for he became a reckless gambler, and habits of intemperance grew upon him. He died in extreme penury on the 24th of September 1790—according to Steevens, the editor of Shakespeare, at "The Hog in the Pound," an obscure alehouse in Swallow Street, or, as stated by his pupil J. T. Smith, in the house of Robert Wilkinson, a printseller in Cornhill.

It is as an engraver that Sherwin is most esteemed; and it may be noted that he was ambidexterous, working indifferently with either hand upon his plates. His drawing is correct, his line excellent and his textures are varied and intelligent in expression. Such of his plates as the "Holy Family" after Nicholas Poussin, "Christ Bearing the Cross" after Murillo, the portrait of the marquis of Buckingham after Gainsborough and that of Pitt occupy a high place among the productions of the English school of line-engravers. He also worked after Pine, Dance and Kauffman.

SHERWOOD, MARY MARTHA (1775–1851), English author, was born at Stanford, Worcestershire, on the 6th of May 1775, the daughter of the Rev. George Butt, D.D., then rector of Stanford. In 1803 she married her cousin, Captain Henry Sherwood, an officer in the British army, and subsequently accompanied him to India, where she devoted herself to charitable work and to writing. Her Indian story, *Little Henry and his Bearer*, was translated into many languages. Her best-known work, however, is *The History of the Fairchild Family*, written after her return to England, of which the first part appeared in 1818, and the second and third parts in 1842 and 1847 respectively. The sub-title of this tale is *The Child's Manual, being a series of stories calculated to show the importance and effects of a religious education.* The book had a very large sale among the English middle-classes. Mrs Sherwood wrote nearly a hundred stories of a religious type and tracts, mainly for the young. She died on the 22nd of September 1851.

See *The Life and Times of Mrs Sherwood. From the Diaries of Captain and Mrs Sherwood*, edited by F. J. H. Darton (1910).

SHERWOOD FOREST, one of the ancient English forests, in Nottinghamshire. It extended from Nottingham northward to Worksop, being over 20 m. long and from 5 to 9 m. broad. The soil is sandy and poor, and although a considerable portion has been brought under cultivation, the district preserves many traces of its ancient character, especially as a great part of it is covered by the domains included under the modern name of the Dukeries (*q.v.*). Sherwood was a crown forest from the time of Henry II. and a favourite hunting-ground of several kings; the land was divided between various lords of the manor, and its disafforestation was carried out at various times. The forest is traditionally noted as the retreat of Robin Hood, whose cave is seen at Papplewick near Newstead.

SHETLAND, or ZETLAND, a group of islands constituting a county of Scotland, and the most northerly British possession in Europe. It consists of an archipelago of islands and islets, over 100 in number, situated to the north-east of Orkney, between 59° 50′ and 60° 52′ N. and 0° 55′ and 2° 14′ W., and bounded on the W. by the Atlantic and on the E. by the North Sea. The distance from Dennis Head in North Ronaldshay of the Orkneys to Sumburgh Head in Shetland is 50 m., but Fair Isle, which belongs to Shetland, lies midway between the groups. The islands occupy an area of 352,889 acres or 551·4 sq. m. Besides Mainland, the principal member of the group, the more important are Yell, Unst and Fetlar in the north, Whalsay and Bressay in the east, Trondra, East and West Burra, Papa Stour, Muckle Roe and Foula in the west, and Fair Isle in the south. The islands present an irregular surface, frequently rising into hills of considerable elevation (an extreme of 1475 ft. is found in the north-west of Mainland). Most of the inland scenery is bleak and dreary, consisting of treeless and barren tracts of peat and boulders. The coast scenery, especially on the west, is always picturesque and often grand, the cliffs, sheer precipices of brilliant colouring, reaching a height of over 1000 ft. at some places. The shores are so extensively indented with *voes*, or firths—the result partly of denudation and partly caused by glaciers—that no spot in Shetland is more than 3 m. from the sea. There are sheets of fresh water in the larger islands, the most important being Strom Loch (2 m. long), Girlsta (1½ m. long) and Spiggie (1½ m.) in Mainland, and Loch of Cliff (2 m.) in Unst, and numerous short streams. The principal capes are Sumburgh Head, the most southerly point of Mainland, a bold promontory 300 ft. high; Fitful Head, on the south-west of the same island, a magnificent headland, 2 m. in length and nearly 1000 ft. high, where Norna, the prophetess of Sir Walter Scott's *Pirate*, was supposed to have her abode and which the Norsemen called the White Mountain, in allusion to the colour of the clay slate composing it; and the Noup and Herma Ness, two of the most northerly points in Unst.

Geology.—The geological characters of this group of islands resemble those of the northern part of Scotland. Old Red Sandstone, red grits, sandstones and marls and conglomerate occur in a narrow belt on the east side of Mainland from Sumburgh Head to Rova Head, north of Lerwick; they also form the island of Bressay. In the western portion of Mainland, in Northmavine, there is a considerable tract of rocks of this age which are formed largely of intrusive diabase-porphyrite; similar volcanic rocks occur in Papa Stour. These are penetrated by intrusions of granitic and felsitic character; one of these masses in Papa Stour is a handsome pink felsite. Practically all the remaining area in these islands is occupied by metamorphic schists and gneisses which occur in great variety and with which are associated numerous dikes and masses of intrusive igneous rock. The southern part of Mainland, from Laxfirth Voe to Fitful Head a series of dark schists and slates, is found with subordinate limestones. The metamorphic rocks of the rest of Mainland are principally coarse gneisses, micaceous and chloritic schists, quartzites, &c.; in these rocks at Tingwall and Wiesdale considerable beds of limestone occur, which may be followed across the island in a northerly direction to Yell Sound, and to Dales Voe in Delting.

Gabbro occurs in the peninsula of Fethland; diorite in Northmavine between Rinas Voe and Mavis Grind; and epidote-syenite in Dunrossness. Yell is formed of coarse gneiss and granitic rocks. In Unst the high ground on the west coast consists of gneiss, which is followed eastward by schists of various kinds, then by a belt of serpentine, 2 m. to a quarter of a mile in breadth, which crosses the island from S.W. to N.E.; this is succeeded by a belt of gabbro, and finally the eastern border is again occupied by micaceous and chloritic schists. Similar rocks occur in Fetlar. Whalsay is built of coarse gneisses and schists. During the height of the glacial period the ice must have crossed the islands from E. to W., for many of the rocks belonging to the eastern side are found as boulders scattered over the western districts. Important formations of chromite are found at Hagdale and the Heog Hills; steatite occurs at Kleber Geo, and many interesting minerals have been recorded from these islands.

Climate and Fauna.—The average annual rainfall amounts to 46 in., and the mean temperature for the year is 45° 3 F., for March 39° F. and for August 54° F. The winter, which is very stormy, lasts from November to March; spring begins in April, but it is the middle of June before warmth becomes general, and by the end of August summer is gone. The summer is almost nightless, print being legible at midnight, but in winter the days are only six hours long, though the nights are frequently illuminated with brilliant displays of the *aurora borealis*. The well-known Shetland breed of shaggy ponies are in steady demand for underground work in collieries. The native cattle, also diminutive in size, with small horns and short legs, furnish beef of remarkable tenderness and flavour; while the cows, when well fed, yield a plentiful supply of rich milk. The native sheep possess many of the characteristics of goats. Ewes as well as rams generally have short horns, and the wool is long and very fine. White, black, speckled grey and a peculiar russet brown, called *moorat*, are the prevailing colours. It is customary to pluck the wool by hand rather than shear it, as this is believed to ensure a finer second crop. Black-faced and Cheviots are also found in some places. Large numbers of geese and poultry are kept. The lochs and tarns are well stocked with brown trout, and the voes and *gios*, or narrow inlets of the sea with steep rocks on both sides, abound with sea trout. Hares, for a long period extinct, were reintroduced about 1830, rabbits are very numerous, and the northern limit of the hedgehog is drawn at Lerwick. Whales of various species are frequently captured in the bays and sounds; the grampus, dolphin and porpoise haunt the coasts, and seals occasionally bask on the more outlying islets. Besides the commoner kinds of fishes, sharks, the torsk, opah and sunfish occur. There is an immense variety of water-fowl, including the phalarope, fulmar petrel, kittiwake, Manx shearwater, black guillemot, whimbrel, puffin and white-tailed eagle.

Industries.—There has been no agricultural advance corresponding to that which has taken place in Orkney, mainly owing to the poverty and insufficiency of the soil. Although there are some good arable farms in favoured districts, the vast majority of holdings are small crofts occupied mostly by peasants who combine fishing with farming. Crofting agriculture is conducted on primitive methods, spade tillage being almost universal, and seaweed the principal manure. The cottages are generally grouped in small hamlets called "touns." The size of the crofts varies greatly. There are several hundreds under 5 acres, but the average holding runs from 5 to 20 acres. At one time the land was held on the "runrig" system—that is, different tenants held alternate ridges—but now as a rule each holding is separate. About one-sixth of the total area is under cultivation, oats and barley being the chief grain, and potatoes (introduced in 1730) and turnips (1807) the chief green crops. Cabbage, said to have been introduced by a detachment of Cromwellian soldiers, is also raised, and among fruits black and red currants ripen in sheltered situations. In spite of somewhat adverse climatic conditions, live stock is reared with a fair amount of success.

The distinctive manufacture is knitted goods. The finest work is said to come from Unst, though each parish has its own speciality. The making of gloves was introduced about 1800, of shawls about 1840 and of veils about 1850. So delicate is the workmanship that stockings have been knitted that could pass through a finger-ring. Women do most of the farm work and spend their spare time in knitting. Fishing is the occupation of the men, and the real mainstay of the inhabitants. Formerly the fishery was in the hands of the Dutch, whose supremacy was destroyed, however, by the imposition of the salt tax in 1712. So complete was their control that they are estimated to have derived from it more than 200 millions sterling while it lasted. Then the fishery was neglected by the natives, who were content to use the "sixerns," or six-oared fishing boats, till the last quarter of the 19th century, when boats of modern type were introduced. Since 1890 the herring fishery has advanced rapidly, and the Shetland fishery district is the most important north of Aberdeenshire. The haaf or deep-sea catch principally consists of cod, ling, torsk and saithe. Communication with the islands is maintained by steamers from Leith and Aberdeen to Lerwick, the capital (twice a week), and to Scalloway, the former capital, and other points (once a week).

Population.—In 1891 the population amounted to 28,711 and in 1901 it was 28,166 or 51 persons to the sq. m. The females numbered 15,753, or 127 to every 100 males, considerably the largest proportion to any county in Scotland. In 1901 there were 55 persons speaking Gaelic and English, none who spoke Gaelic only, and 92 foreigners (almost all Scandinavians). Only twenty-seven islands of the group are inhabited, but in the case of some of them the population consists solely of a few lighthouse attendants, shepherds and keepers.

The Inhabited Isles.—The following is a list of the inhabited isles, proceeding from south to north; but it will be understood that they do not lie in a direct line, that several are practically on the same latitude, that the bulk are situated off the east and west coast of Mainland, and that two of them are distinctly outlying members of the group. The figures within brackets indicated the population in 1901. Fair Isle (147) lies 24 m. S.W. of Sumburgh Head, and is 3 m. long by about 2 m. broad. The name is derived from the Norse *faar*, a sheep (a derivation better seen in the Faroe Isles). It is a hilly island, with rocky cliffs; North Haven, on the east coast, being almost the only place where landing can be safely effected. From the survivors of a vessel of the Spanish Armada that went ashore in 1588 the natives are said to have acquired the art of knitting the coloured hosiery for which they are noted. The shipwrecked sailors taught the people how to prepare dyes from the plants and lichens, and many of the patterns still show signs of Moorish origin. Mainland (19,676), the largest and principal island, measures 54 m. from N. to S., and 21 m. from E. to W., though the shores are indented to an extraordinary degree and the bulk of the island is much narrower than the extreme width would indicate. The parish of Walls, in the west, is said to contain more voes, whence its name (an erroneous rendering of the Norse *waas*), than all the rest of Shetland; while the neck of land at Mavis Grind (Norse, *maev*, narrow; *eid*, isthmus; *grind*, gate), forming the boundary between the parishes of Northmavine and Delting, is only 60 yds. wide and about 20 ft. above the sea, almost converting the north-western area of Mainland into an island. In the promontory of Eshaness may be seen some wonderful examples of sea sculpture. The Grind of the Navir ("Gate of the Giants") is a staircase carved by the waves out of the porphyry cliffs. In the rock of Dore Holm is a natural archway, 70 ft. wide, through which the tide constantly surges, and to the south-east of it are the Drougs, stacks of quaint shapes, suggesting a ship in full sail, a ruin, a cowled monk and so forth. Besides Lerwick (*q.v.*) the county town, one of the most interesting places in the island is Scalloway (857), the ancient capital. According to Dr Jakob Jakobsen, the name means the voe (*waa*) of the *skollas*, or booths, occupied by the men who came to attend the meeting of the *ting*, or open-air law court, which assembled in former days on an island in the Loch of Tingwall (hence its name), about 3 m. farther north. Scalloway stands at the head of a bay and has piers, quays, warehouses and cooperages in connexion with the fishing industry. The ruins of the castle built in 1600 by Patrick Stewart, earl of Orkney, stand at the east end of the bay and are in good preservation. An iron ring on one of the chimneys is said to be that on which he hung the victims of his oppression. On the opposite side of the bay is Gallow Hill, the old place of execution of witches and criminals. Off the south-eastern coast of Mainland, separated by a sound 1 m. broad and usually visited from Sandwick, lies the uninhabited island of Mousa (correctly spelled Moosa, the moory isle, from the Norse *mó-r*, moor), famous for the most perfect specimen of a Pictish *broch*, or tower of defence, in the British Isles. The broch, which stands on a rocky promontory at the south-west of the isle, now measures about 45 ft. in height, but as some of the top courses of masonry have fallen down it is supposed to have been 50 ft. high originally. It was entire in 1154, and was partially restored in 1861. It has a diameter at the foot of 50 ft., and at the top of 38 ft. The interior court, open to the sky, is 30 ft. in diameter, the enclosing wall having a thickness, at the base, of 15½ ft. There are three separate beehive-shaped rooms on the ground floor, which were entered from the court, from which also there was an entrance to the stair leading to the galleries, which were lighted by windows facing the court. Hevera

(25) lies off the west coast of Mainland, south of the two Burras. East Burra (203), about 4 m. long by 1 m. broad, is separated from Mainland by Clift Sound, a narrow arm of the sea, 8 m. long. West Burra (612), 6 m. long by 1 m. broad, with a very irregular coast-line, lies alongside of East Burra and contains a church. It is said to be the Burgh Westra of Sir Walter Scott's *Pirate*. Burra is a contraction of *Borgar-öy*, meaning "Broch island." Trondra (151), "Trond's island," Trond being an old Norse personal name, in the mouth of Scalloway Bay. Oxna (36) lies about 4 m. S.W. of Scalloway, and Papa (priest's isle, 16), to the E. of Oxna. Bressay (679) lies 1 m. E. of Lerwick, from which it is separated by the Sound of Bressay, in which Haakon V., king of Norway, anchored his galleys on the expedition that ended so disastrously for him at Largs (1263). The island is 6 m. long by 3 m. broad and has several notable natural features. Ward Hill (742 ft.) is the sailors' landmark for Lerwick harbour. Bard Head (264 ft.), the most southerly point, is a haunt of eagles, at the foot of which is an archway called the Giant's Leg. On the west side of the Bard is the Orkney Man's Cave—a great cavern with fine stalactites and a remarkable echo. Noss (7), to the E. of Bressay, from which it is separated by a channel 220 yds. wide. On the east coast the rocks form a headland (592 ft.) called the Noup of Noss ("the peak of the nose"), once the source from which falcons were obtained for the royal mews. Off the south-east shore lies the Holm (160 ft.), with which communication used to be maintained by means of the Cradle of Noss swing or ropes. Both Noss and Bressay are utilized in connexion with the rearing of Shetland ponies. Holm of Papal, "isle of the priest" (2), belonging to Bressay parish, and Linga, "heather isle" (8), to the parish of Tingwall, lie S.E. of Hildasay. Foula, pronounced Foola (Norse, *fugl-öy*, "bird island") (230), lies 27 m. W. of Scalloway, and 16 m. W. of the nearest point of Mainland. It measures 3½ m. long by 2½ m. broad. The cliffs on the west coast attain in the Sneug (Norse, Snjoog, "hill top") a height of 1272 ft. They are the home of myriads of sea-birds and one of the nesting-places of the bonxie, or great skua (*Lestris cataractes*), which used to be fostered by the islanders to keep down the eagles, and the eggs of which are still strictly preserved. The natives are daring cragsmen. The only landing-place is the village of Ham, on the east coast. Vaila (21), in the mouth of the Bay of Walls, affords good pasturage. Linga (4) lies immediately to the north of Vaila. Papa Stour (272), properly spelt Stoor, "the big [Norse *stor*] island of the priests," lies in the south-west of the great bay of St Magnus. It measures 2 m. in length by about 3 m. in breadth and has a coast-line of 20 m. Christie's Hole and Francie's Hole, two of the caves for which it is noted, are reputed to be among the finest in the United Kingdom. The sword dance described in the *Pirate* may still be seen occasionally. Four miles N.W. are the islets known as the Ve Skerries, where seals are sometimes found. Whalsay, "whale island" (975), measuring 5 m. from N.E. to S.W. by 2½ m. wide, is an important fishing station. Muckle Roe, "great red island" (202), roughly circular in shape and about 3 m. in diameter, lies in the E. of St Magnus Bay. Gruay, "green isle" (10), Housay (68), Bruray (44), Bound (2) are members of the group of Out Skerries, about 4 m. N.E. of Whalsay. There is a lighthouse on Bound, and the rest are fishing stations. Yell (2483), separated from the north-east coast of Mainland by Yell Sound, is the second largest island of the group, having a length of 17 m., and an extreme width of 6½ m., though towards the middle the voes of Mid Yell and Whale Firth almost divide it into two. It contains several *brochs* and ruined chapels and is an important fishing station. Fetlar (347) lies off the east coast of Yell, from which it is divided by Colgrave Sound and the isle of Hascosay and is 5 m. long by 6½ m. broad. It ranks with the most picturesque and most fertile members of the group and contains a breed of ponies, a cross between the native pony and the horse. Uyea, "the isle," from the Old Norse *öy* (3), to the south of Unst, from which it is divided by the narrow sounds of Uyea and Skuda, yields a beautiful green serpentine. Unst (1940), to the N.E. of Yell and separated from it by Bluemull Sound, is 12 m. long and 6 m. wide. It has been called the "garden of Shetland," and offers inducements to sportsmen in its trout and game. The male inhabitants are mostly employed in the fisheries and the women are the most expert knitters of hosiery in the islands. Unst contains several places of historic interest. Near the south-eastern promontory stands Muness Castle, now in ruins, built in 1598—according to an inscription on a tablet above the door—by Laurence Bruce, natural brother to Lord Robert Stewart, 1st earl of Orkney. Buness, near Balta Sound, was the house of Dr Laurence Edmonston (1795–1879), the naturalist. Near Balliasta are the remains of three stone circles. It is supposed the Ting, or old Assembly, met at this spot before it removed to Tingwall. Farther north, at the head of a small bay, lies Haroldswick, where Harold Haarfager is believed to have landed in 872, when he annexed the Orkney and Shetland Islands to Norway. Burra Firth, in the north of Unst, is flanked on both sides by magnificent cliffs, including the Noup of Unst, the hill of Saxavord (934 ft.), the Gord and Herma Ness. Muckle Flugga (3), about 1 m. N. of Unst, is the most northerly point of Shetland, and the site of a lighthouse.

Administration.—Shetland unites with Orkney to return a member to parliament. The island is divided into Mainland district (comprising the parishes of Northmavine, Delting, Nesting, Sandsting, Walls, Tingwall, Bressay, Lerwick and Dunrossness) and North Isles district (the parishes of Unst, Fetlar and Yell). It forms a sheriffdom with Orkney and Caithness, and there is a resident sheriff-substitute at Lerwick, the county town. There are parish poorhouses in Dunrossness and Unst, besides the Shetland combination poorhouse at Lerwick. The county is under school board jurisdiction and Lerwick has a secondary school, and a few of the other schools earn grants for higher education. The "residue" grant is expended on navigation and swimming classes.

History and Antiquities.—The word Shetland is supposed to be simply a modernized rendering of the Old Norse *Hjaltland*, of which the meaning is variously given as "high land," "Hjalti's land"—after Hjalti, a man whose name occurs in ancient Norse literature, but of whom little else is known—and "hilt land," in allusion to an imagined, though not too obvious, resemblance in the configuration of the archipelago to the hilt of a sword. Of the original Pictish inhabitants remains exist in the form of stone circles (three in Unst and two in Fetlar) and *brochs* (of which 75 examples survive). The islanders were converted to Christianity in the 6th and 7th centuries by Irish missionaries, in commemoration of whose zeal several isles bear the name of Papa or "priest." Four stones with Ogam inscriptions have been found at different places. About the end of the 8th century both the Shetlands and Orkneys suffered from the depredations of Norse vikings, or pirates, until Harold Haarfager annexed the islands to Norway in 875. Henceforward the history of Shetland is scarcely separable from that of Orkney (*q.v.*). The people, more remote and less accessible to external influences, retained their Scandinavian characteristics longer than the Orcadians. The Norse language and customs survived in Foula till the end of the 18th century, and words and phrases of Norse origin still colour their speech. George Low (1747–1795), the naturalist and historian of Orkney, who made a tour through Shetland in 1774, described a Runic monument which he saw in the churchyard of Crosskirk, in Northmavine parish (Mainland), and several fragments of Norse swords, shield bosses and brooches have been dug up from time to time.

See George Low, *Tour through the Islands of Orkney and Shetland in 1774* (published in 1879); A. Edmondston, *Zetland Islands* (1809); Samuel Hibbert-Ware, *Description of the Shetland Isles* (1822); C. Rampini, *Shetland and the Islanders* (1884); C. Sinclair, *Shetland and the Shetlanders* (1840); R. S. Cowie, *Shetland* (1896); Dr Jakob Jakobsen, *The Dialect and Place Names of Shetland* (1897).

SHEVAROY HILLS, a detached range in southern India, in the Salem district of Madras, covering an area of 150 sq. m., with plateaus from 4000 to 5000 ft. above sea-level. They include the sanatorium of Yercaud, and several coffee plantations.

SHIBARGHAN, a town and khanate of Afghan Turkestan. The town lies some 60 m. W. of Balkh, and contains 12,000 inhabitants, Uzbegs and Parsiwans. It has a citadel, but is not otherwise fortified, and is surrounded by good gardens and excellent cultivation. The khanate is one of the "four domains," which were long in dispute between Bokhara and Kabul, but were allotted to the Afghans by the Anglo-Russian boundary agreement of 1873.

SHIBBOLETH, a Hebrew word, meaning an ear of corn or a stream or river, from *shābal*, to grow, increase, flow, used by Jephthah, probably in the second sense with reference to the river Jordan, as a test-word to distinguish the Ephraimites, who were unable to pronounce the *sh*, from the men of Gilead (see Judges xii. 6) at the passage of the Jordan. The word *ciceri* was similarly used at the time of the massacre of the French known as the Sicilian Vespers, for they betrayed their nationality by their inability to pronounce it. The term has also come generally to mean a watchword, catch-phrase or cry, to which the members of a party adhere after any significance or meaning which it may have imported has disappeared.

See ALPHABET, i. 725, for a discussion of the sibilant difficulty involved in the test of Judges xii. 6.

SHIEL, LOCH, a lake near the Atlantic seaboard of Scotland, lying between the district of Moidart in Inverness-shire and the districts of Ardgour and Sunart in Argyllshire. The boundary line between the two counties is drawn lengthwise down the centre of the lake and is continued down the river Shiel to the sea. The loch is 17½ m. long and varies in width from 200 yds. to 1 m., and is only 11½ ft. above the sea. The maximum depth is 420 ft. with a mean depth of 81½ ft. The lake has an area of 4840 acres or 7½ sq. m., and drains directly a basin of 72½ sq. m., and with an outflow from Loch Dilate, or Doilake, of 85½ sq. m. Loch Dilate lies 1½ m. E. of Loch Shiel, into which it flows by the Polloch. It is 1½ m. long at its maximum, with a maximum depth of 55 ft., and covers an area of 142 acres. For fully three-fourths of its length Loch Shiel has a south-westerly direction, but at Eilean Fhianain (Finnan's Island) it strikes towards the west. It receives the Finnan and other small streams and discharges by the Shiel to the salt-water Loch Moidart. On the north-west and south-east it is skirted by lofty hills (Sgor Choileam (3164), Sgor nau Coireachan (3133) and others of over 2000 ft.), but the land at the western extremity in Ardnamurchan is low-lying.

SHIELD, WILLIAM (1748–1829), English musical composer, was born at Swalwell, near Newcastle, in 1748. His father began to teach him singing before he had completed his sixth year, but died three years later, leaving him in charge of guardians, who made no provision whatever for continuing his musical education, for which he was thenceforward dependent entirely upon his own aptitude for learning, aided by a few lessons in thoroughbass which he received from Charles Avison. Notwithstanding the difficulties inseparable from this imperfect training, he obtained admission in 1772 to the orchestra at the Italian Opera in London, at first as a second violin, and afterwards as principal viola, and this engagement he retained for eighteen years. In the meantime he turned his serious attention to composition, and in 1778 produced his first English comic opera, *The Flitch of Bacon*, at the Little Theatre in the Haymarket, with so great success that he was immediately engaged as composer to Covent Garden Theatre, for which he continued to produce English operas and other dramatic pieces in quick succession until 1797, when he resigned his office, and devoted himself to compositions of a different class, producing a great number of very beautiful glees, some instrumental chamber music, and other miscellaneous compositions. In 1817 he was made master of the royal music. He died in London on the 25th of January 1829, and was buried in the south cloister at Westminster Abbey.

Shield's most successful dramatic compositions were *Rosina*, *The Mysteries of the Castle*, *The Lock and Key* and *The Castle of Andalusia*. As a composer of songs he was in no degree inferior to his great contemporary Charles Dibdin. Indeed *The Arethusa*, *The Heaving of the Lead* and *The Post Captain* are as little likely to be forgotten as Dibdin's *Tom Bowling* or *Saturday Night at Sea*. His vein of melody was inexhaustible, thoroughly English in character and always conceived in the purest and most delicate taste, and hence it is that many of his airs are still sung at concerts, though the operas for which they were written have long been banished from the stage. His *Introduction to Harmony* (1794 and 1800) contains a great deal of valuable information; and he also published a useful treatise, *The Rudiments of Thoroughbass*.

SHIELD (O. Eng. *scild*, cf. Du. and Ger. *Schild*, Dan. *Skjold*; the origin is doubtful, but may be referred to the root seen in "shell" or "scale"; another suggestion connects it with Icel. *skjalla*, to clash, rattle; it is not connected with the Indo-Ger. root *skeu*, seen in Gr. *σκῦτος*, *κύτος* Lat. *cutis*, skin, *scutum*, shield, O. Eng. *hyd*, hide, and in "sky"), a piece of defensive armour borne upon the left arm or carried in the left hand as a protection against missiles. Varying in shape and form, it was the principal piece of defensive armour from the Bronze and Iron Age to the introduction of fire-arms, and is still borne by savage warriors throughout the world (see ARMS AND ARMOUR, and for the heraldic shield HERALDRY).

In modern times the principle of the shield has been applied to guns of all calibres from 11 and 10 in. calibre downwards. Whereas the turret, barbette, cupola and other heavy-armoured structures are intended to be proof against the heaviest projectiles, the shield is usually only designed to resist rifle and shrapnel bullets or very light shells. For the application of shields to field artillery, &c., see the articles ARTILLERY and ORDNANCE.

SHIELDS, JAMES (1810–1879), American soldier, was born in Dungannon, county Tyrone, Ireland, in 1810. He emigrated to the United States in 1826, and in 1832 began to practice law in Kaskaskia, Illinois. He was prominent in Democratic politics, was a member of the Illinois House of Representatives in 1836–1838, was state auditor in 1841–1843, was judge of the supreme court of the state in 1843–1845, and was commissioner of the U.S. General Land Office in 1845–1847. In the Mexican War he served as a brigadier-general of volunteers under General Zachary Taylor on the Rio Grande, under General John E. Wool in Chihuahua, and under General Winfield Scott in the southern campaign; he was breveted major-general for gallantry at Cerro Gordo, where he was severely wounded, and he was again wounded at Chapultepec. In 1849–1855 he was a United States senator from Illinois; and in 1858–1859 was a senator from Minnesota. In 1860 he removed to California. In August 1861, soon after the outbreak of the Civil War, he was commissioned brigadier-general of volunteers; in March 1862 he succeeded to the command of General Frederick W. Lander's division; he was in command on the Federal side at Winchester (23 March 1862) and at Port Republic (9 June); and in March 1863 he resigned his commission. He then settled in Carrollton, Missouri, and in 1875 was a member of the State House of Representatives; in 1879 he was United States senator from Missouri for six weeks to fill an unexpired term. He died at Ottumwa, Iowa, on the 1st of June 1879.

SHIFNAL, or SHIFFNAL, a market town in the Newport (N.) parliamentary division of Shropshire, England, 154 m. N.W. from London on the Wolverhampton-Shrewsbury line of the Great Western railway. Pop. (1901) 3321. The church of St Andrew is cruciform and full of fine details of late Norman, Early English and Decorated work. Trade is mainly agricultural, and cattle-fairs are held. There are large iron-works. The name of the town was Idsall when in 1591 a fund was raised by royal favour in Shropshire and neighbouring counties in order to rebuild it after a serious fire.

Within 6 m. E. of Shifnal are Tong, Boscobel and the nunnery of White Ladies. Tong Castle shares with the castle of the same name in Kent the legend of the dealings of the Saxon Hengest with the British chieftain Vortigern. The medieval building was demolished late in the 18th century, and the present castle erected in mingled Gothic and Moorish styles. Tong church, of fine early Perpendicular work, contains a remarkable series of ornate tombs, mainly of the 15th and 16th centuries, to members of the Vernon and Stanley families, former owners of the castle.

The Golden Chapel on the south side is rich late Perpendicular, with a roof of fan-tracery, showing signs of the original decoration in colours. The mansion of Boscobel is famous as the house in which Charles II. was concealed in 1651 after an adventurous journey from Worcester, where his arms had failed before those of Cromwell. The secret chamber which hid him is preserved, but he also found refuge in a tree of the forest which then surrounded Boscobel. A tree close to the house still bears the name of Charles's oak, but tradition goes no further than to assert that it grew from an acorn of the original tree. White Ladies was a Cistercian nunnery; and the slight remains are Norman. The pleasant wooded district was formerly part of Brewood Forest, which extended into Staffordshire.

SHIGATSE, one of the largest towns in Tibet, next in importance to Lhasa, the capital. The town, which is at the confluence of the Nyang chu with the Tsangpo, contains about 9000 inhabitants (exclusive of priests), and is about ¾ m. long by a ½ m. broad. About 1 m. to the north-east is situated a monastery called Konkaling, whilst to the south-west is the far-famed Tashilhunpo monastery, the residence of one of the great high priests of Tibet, co-equal with the Dalai-Lama of Lhasa. Between the Tashilhunpo monastery and the city is the Thom or open market, where all the business of the place is daily transacted. A wall about 1 m. in circumference surrounds the Tashilhunpo monastery, within which are numerous temples and houses, four of the larger temples being decorated with gilded spires. A great wealth of jewels and precious metal is said to enrich the numerous idols of Tashilhunpo. The monastery maintains 3300 priests. The city is protected by a fort which stands on a low hill to the north-west, and a garrison of 1000 Tibetan soldiers is quartered here. The municipal government is in the hands of two dēpen assisted by resident Jongpons. The soil around Shigatse is rich and productive, the elevation being between 11,000 and 12,000 ft. Shigatse lay to the west of the British route of advance on Lhasa in 1904, but it was visited by Captain Rawling on his way to open the market at Gartok.

SHIGNAN and **ROSHAN,** two small hill states E. of the Badakshan province of Afghanistan. They extend eastwards from the Panja, where it forms the eastern boundary of Badakshan to the Pamirs. The native rulers of Roshan and Shignan claim descent from Alexander the Great, of whom legends are still current in the country about the upper Oxus. The two states were conquered by Abdur Rahman in 1882, but were assigned to Russia by the Durand agreement of 1893. Since that agreement Russia has retired from all districts previously occupied by her on the left bank of the Panja, or upper Oxus.

SHIʽITES (from Arab. *shiʽa*, a party, and then a sect), the name of one of the two great religious divisions of Islam. The Shiites hold that the imāmate and caliphate belong to the house of Mahomet (Muḥammad) alone, and so to ʽAlī, Mahomet's son-in-law, and his successors. After the arbitration on the claims of ʽAlī and Moawīyā to the caliphate (A.D. 658), two great parties emerged from the strife of feeling caused in the East by the deposition of ʽAlī.[1] Those who were known as the Khārijites, being mainly country Arabs, were democratic, and claimed that the office of caliph was elective, and that the caliph might be chosen from any Arab Moslem family. In strong opposition to these stood the party afterwards called the Shiites, who regarded ʽAlī and his descendants as the only rightful caliphs. For them the caliphate was a God-given office, and not one to be given by human appointment. Belief in this was an ordinance of God, an article of the faith. He who did not accept it as such was an unbeliever. Moreover, the party consisted largely of Persians who on their conversion to Islam brought with them many of the doctrines of their old faith, religious and political. Among these was the belief in the divinity of the sovereign and the duty of worshipping him. Gnostic elements, which may have come from the old religion of Babylonia, were also introduced. The idea of an absolute personal and hereditary monarchy was thus developed among the subjects of ʽAlī. But in Islam there is no separation between politics and theology. The theological position of the Shiites was that the superhuman power of Mahomet descended to the members of his house (ʽAlī and his children), so that they could interpret the will of God and tell future events. The imām was infallible and a mahdi or guide for life. What the imām gained the Koran lost, and many of the Shiites held the Muʽtazilite or rationalistic opinion of the created nature of the sacred book.

The growth of the Shiites was fostered by the great discontent of the eastern half of the caliphate with Omayyad rule (see CALIPHATE, and PERSIA: *History*). Before long an active propaganda was started, and leaders (often adventurers) arose who formed parties and founded sects of their own in the ranks of the Shiites. One of the earliest of these was ʽAbdallah ibn Ṣabā (founder of the Ṣabāʽīyya), who in the caliphate of Othman had preached the return of Mahomet (founded on Koran xxviii. 84), had been concerned in the assassination of Othman, and had proclaimed the divinity of ʽAlī, but had been disowned and punished by him. On ʽAlī's death he declared the thunder to be the voice, and the lightning the scourge of the translated caliph, and announced that his divine power had passed to his successors, the imāms.

Another sect, the Kaisānīyya, followed Kaisān, a freedman of ʽAlī, in believing in the superhuman knowledge of Mahommed ibn Hanafīyya, a son of ʽAlī but not by Fatima. Religion for these was obedience not to law but to a person. When the doctrine of a hidden imām arose, they differed from the Ṣabāʽīyya in expecting his return from his place of concealment on earth, not from heaven. Among them an adventurer Mokhtar (Mukhtār) had a large following for a time. He taught the mutability both of the knowledge and of the will of God—a development of Mahomet's own teaching. He claimed to fight to avenge the death of Hosain (see HASAN AND ḤOSAIN) and to serve Maḥommed ibn Hanafīyya, who, however, disowned him. He was killed in 687. Some of the Shiite leaders, as Abu Moslim, when renounced by the members of the house of ʽAlī, transferred their allegiance to the house of ʽAbbās (see RĀWENDIS). The success of the Abbasids in supplanting the Omayyads was largely due to the help of the Shiites, and the early Abbasid caliphs, to the time of Motawakkil, were half-Shiites of a lax order. Shahrastānī (*q.v.*) in his Book on the Sects (*Kitāb Milal wan-Niḥal*, ed. Cureton, pp. 109 ff.; Haarbrücker's translation, vol. i. pp. 164 ff.) divides the Shiites into five main divisions: the Kaisānīyya, the Zaidīyya, the Imāmīyya, the Ghālīyya and the Ismaʽīlīyya. Of these the Ghālīyya are represented by the followers of Ibn Ṣaba (see above), and the Kaisānīyya have been already described. These parties as such have now ceased to exist, the others still remain. The Zaidites or Zaidīyya are the followers of Zaid, a grandson of Hosain, and are the most moderate of the Shiites, for though holding that the imāmate belongs only to the descendants of ʽAlī by Fatima, and that any of these might be imām (even though two or three should be in existence at the same time), they allow that circumstances might justify the appointment of another caliph for the time. Thus they acknowledge the imāmate of Abu Bekr and Omar, though ʽAlī was more entitled to the office. One branch of the Zaidites held Tabaristan from 864 until overturned by the Samanids in 928; another branch, arising about 893 in Yemen, has remained there until the present day. The Ismaʽīlites or Ismaʽīlīyya are the followers of Ismaʽīl, the elder son of Jaʽfar us-Sadīq, the sixth imām (see table below). He was rejected as successor by his father for drinking wine, and his party might soon have disappeared if he had not served as imām for the adventurous sceptic ʽAbdallah ibn Maimūn (for his propaganda see CARMATHIANS). Owing to the success of this man the Ismaʽīlites have given rise to the Carmathians (*q.v.*), the Fātimites (*q.v.*), the Assassins (*q.v.*) and the Druses (*q.v.*).

At the present time the Ismaʽīlīyya still exist in small numbers, chiefly about Surat and Bombay. The Imāmīyya believe that each imām has been definitely named by his predecessor. This party broke up into numerous divisions, and imāms manifest or hidden secured each his own following. The most important of these parties is that of the Twelve (the Ithnaʽasharīyya), who accept and follow the twelve descendants of ʽAlī numbered in the accompanying table.

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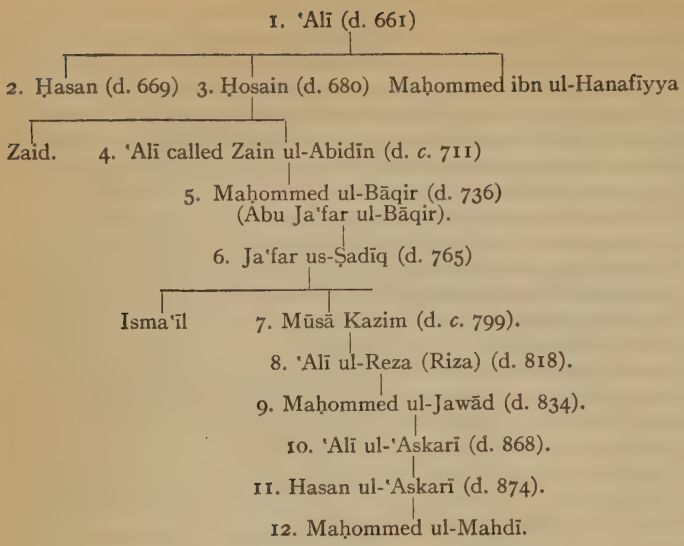
[1] For these and following events see CALIPHATE.


1. ʿAlī (d. 661)
2. Ḥasan (d. 669)
3. Ḥosain (d. 680)
Maḥommed ibn ul-Hanafīyya
Zaid.
4. ʿAlī called Zain ul-Abidīn (d. c. 711)
5. Maḥommed ul-Bāqir (d. 736) (Abu Jaʿfar ul-Bāqir).
6. Jaʿfar us-Ṣadīq (d. 765)
Ismaʿīl
7. Mūsā Kazim (d. c. 799).
8. ʿAlī ul-Reza (Riza) (d. 818).
9. Maḥommed ul-Jawād (d. 834).
10. ʿAlī ul-ʿAskarī (d. 868).
11. Hasan ul-ʿAskarī (d. 874).
12. Maḥommed ul-Mahdī.

The twelfth imām Maḥommed is said to have vanished and to be in hiding, but will be restored by God to his people, when it pleases Him. The creed of this party was introduced into Persia in 1502, when the Safāwids conquered the country, and still remains its official creed. The shah is thus only the temporary substitute for the hidden imām; and authoritative decisions in religious matters are pronounced by *Mujtahids, i.e.* theologians who can form their own opinions and require obedience to their decisions.

Shiite tenets.

Other points in which Shiites differ from Sunnites depend on their legitimistic opinions, or are accommodations of the rites of Islam to the Persian nationality, or else are petty matters affecting ceremonial. The rejection of all the Sunnite books of tradition goes with the repudiation of the caliphs under whose protection these were handed down. The Shiites, however, have their own collections of traditions. An allegorical and mystical interpretation reconciles the words of the Koran with the inordinate respect paid to ʿAlī; the Sunnite doctrine of the uncreated Koran is denied. To the Mahommedan confession "There is no god but God and Mahomet is His ambassador" they add "and ʿAlī is the viceregent of God" (*walī*, properly "confidant"). There are some modifications in detail as to the four main religious duties of Islam—the prescriptions of ritual purity, in particular, being made the main duty of the faithful. The prayers are almost exactly the same, but to take part in public worship is not obligatory, as there is at present no legitimate imām whose authority can direct the prayer of the congregation. Pilgrimage to Mecca may be performed by a hired substitute, or its place can be taken by a visit to the tombs of Shiite saints, *e.g.* that of ʿAlī at Nejef, of Ḥosain at Kerbelā, of Reẓā at Meshed, or of the "unstained Fāṭima" at Ḳum (Fāṭima-i-maʿaṣūm, daughter of Mūsā, the 7th imām). The Shiites are much the most zealous of Moslems in the worship of saints (real or supposed descendants of ʿAlī) and in pilgrimages to their graves, and they have a characteristic eagerness to be buried in those holy places. The Persians have an hereditary love for pomps and festivities, and so the Shiites have devised many religious feasts. Of these the great sacrificial feast (*ʿīd-i-Qurbān*; Turkish *Qurbān Bairām*) is also Sunnite; the first ten days of the month Moḥarram are dedicated to the mourning for the death of Ḥosain at Kerbelā (*q.v.*), which is celebrated by passion-plays (*taʿzīya*), while the universal joy of the Nauroz, or the New Year of the Old Persian calendar, receives a Mahommedan sanction by the tradition that on this day the prophet conferred the caliphate on ʿAlī.

While they naturally reject the four Sunnite schools of jurisprudence, the Shiites also derive all law from the Koran, and their trained clergy (*mollahs*) are the only class that can give legitimate legal responses. The training of the *mollah* resembles that of the Sunnite *ʿālim*. The course at the *madrasa* (*medresse*) embraces grammar, with some rhetoric and prosody, logic, dogmatic Koran exegesis, tradition and jurisprudence, and finally some arithmetic and algebra. The best *madrasa* is at Kerbelā. The scholar discharged from ~~his~~ studies becomes first a simple mollah, *i.e.* local judge and notary. A small place has one such judge, larger towns a college of judges under a head called the *sheikh ul-Islām*. The place of the Sunnite muftis is filled by certain of the *imām-jumʿa*, *i.e.* presidents of the chief mosques in the leading towns, who in respect of this function bear the title of *imām mujtahid*. This is a dignity conferred by the tacit consent of people and clergy, and is held at one time only by a very few distinguished men. In Persia, the cadi (*ḳāẓi*) is an inferior judge who acts for the sheikh u 'l-Islām in special cases, and a mufti is a solicitor acting under the judge to prepare cases for court.

Under the Safawids, when the clergy had great influence, they had at their head the *ṣadru 'ṣ-ṣodūr*, who administered all pious foundations and was the highest judicial authority. But so great a power was found dangerous; ʿAbbās the Great (1586–1628) abstained from filling up a vacancy which occurred in it, and, though Shāh Safī (1628–1641) restored the office, he placed it in commission. Nādir Shāh abolished it in his attempt to get rid of the Shiite hierarchy (1736), and since then it has not been restored. Yet the imām-jumʿa of Isfāhān, the old Safawi capital, is tacitly regarded as representative of the invisible imām of the house of ʿAlī, who is the true head of the church. Various vain attempts were made in the 19th century to subordinate the authority of the clergy to the government. Outside the clergy the greatest influence in religious matters is that exercised by the dervishes (*q.v.*). As it was long necessary to profess orthodoxy for fear of the Arabs, it came to be an established Shiite doctrine that it is lawful to deny one's faith in case of danger. This "caution" (*taqīya*) or "concealment" (*ketmān*) has become a second nature with the Persians. Another mischievous thing is the permission of temporary marriages—marriages for a few hours on a money payment. This legitimized harlotry (*motʿa*) is forbidden by the Sunna, but the Shiites allow it, and the mollahs adjust the contract and share the women's profits. There is still mental life and vigour among the Shiites, as appears among the sects, which, allowance being made for "taqīya," play no inconsiderable part. The Akhbārīs (traditionalists), who adopt a semi philosophical way of explaining away the plainest doctrines (such as the resurrection of the flesh) on the authority of false traditions of ʿAlī, are not so much a sect as a school of theology within the same pale as the orthodox Shia or Mujtahids. A real dissenting sect, however, is the Sheikhīs, of whose doctrines we have but imperfect and discrepant accounts. Representatives of the old extreme Shiites, who held ʿAlī for a divine incarnation, are found all over Persia in the ʿAlī-Ilāhī or ʿAlī-Allāhī sect ("ʿAlī deifiers"). Finally, in the 19th century arose the remarkable attempt at reform known as Bābiism (*q.v.*).

Bibliography.—The work of Shahrastānī (*q.v.*) on the Sects of Islam; R. Dozy, *Essai sur l'histoire de l'islamisme* (Leiden and Paris, 1879); G. van Vloten, *Recherches sur la domination arabe, le Chiitisme, &c.* (Amsterdam, 1894); various works of A. von Kremer and I. Goldziher; J. E. Polak, *Persien. Das Land und seine Bewohner* (2 vols., Leipzig, 1865); E. G. Browne, *A Year among the Persians* (London, 1893). (G. W. T.)

SHIKAR, the Hindostani term for sport, in the sense of shooting and hunting. The word is in universal use by Anglo-Indians for the pursuit of large game, such as tiger-shooting and pig-sticking. The shikari is either the native expert, who marks the game for the sportsman, or else the European sportsman himself.

SHIKARPUR, a town of British India, in the Sukkur district of Sind, Bombay. It is situated about 18 m. from the right bank of the Indus, with a station on the North-Western railway, 23 m. N.W. of Sukkur. Pop. (1901) 49,491. Shikarpur has always been an important place as commanding the trade route through the Bolan Pass, and its merchants have dealings with many towns in Central Asia. It has a large market and manufactures of carpets, cotton cloth and pottery. Shikarpur was formerly the headquarters of a district of the same name. In 1901 two subdivisions of this district were detached to form the new district of Larkana, and the two other subdivisions were then constituted the district of Sukkur.

SHILDON, a market town in the Bishop Auckland parliamentary division of Durham, England, 9 m. N.W. from Darlington by a branch of the North Eastern railway. Pop. of urban district of Shildon and East Thickley (1901) 11,759. At New Shildon or East Thickley are extensive railway engine and wagon works belonging to the railway company. A large coal traffic is handled here, as there are collieries and foundries in the vicinity.

SHILLETO, RICHARD (1809–1876), English classical scholar, was born at Ulleskelf in Yorkshire on the 25th of November 1809. He was educated at Repton and Shrewsbury schools, and Trinity College, Cambridge, and in 1867 was elected a fellow of Peterhouse. His whole life was spent in Cambridge, where he died on the 24th of September 1876. Shilleto was one of the greatest Greek scholars that England has produced; in addition, he had an intimate acquaintance with the Latin and English languages and literature. He published little, being obliged to devote the best years of his life to private tuition. He was the most famous classical "coach" of his day, and almost all the best men passed through his hands. His edition of the *De falsa legatione* of Demosthenes will always remain a standard work, but his first two books of Thucydides (an instalment of a long-contemplated edition) hardly came up to expectation. His pamphlet *Thucydides or Grote ?* excited a considerable amount of feeling. While it undoubtedly damaged Grote's reputation as a scholar, it was felt that it showed a want of appreciation of the special greatness of the historian. Shilleto's powers as a translator from English into Greek (especially prose) and Latin were unrivalled; a selection of his versions was published in 1901.

See B. H. Kennedy in Cambridge *Journal of Philology* (1877).

SHILLING, an English silver coin of the value of twelve pence. The origin of the word is somewhat obscure. There was an Anglo-Saxon coin termed *scilling*, or *scylling*, worth about fivepence, which is said to be derived from a Teutonic root, *skil*, to divide, *+ling* on the analogy of farthing (*q.v.*). The silver shilling was first struck in 1504, in the reign of Henry VII. In Charles II.'s reign shillings were first issued with milled edges. In George IV.'s reign were issued the so-called "lion shillings," bearing the royal crest, a crowned lion on a crown, a design reverted to in the coinage of Edward VII. A shilling is token money merely, it is nominally in value the one-twentieth of a pound, but one troy pound of silver is coined into sixty-six shillings, the standard weight of each shilling being 87·27 grains.

SHILLONG, a town of British India, in the Khasi Hills district of Eastern Bengal and Assam. It is situated in 25° 34′ N. and 91° 53′ E., on a plateau 4978 ft. above the sea, 63 m. by cart-road S. of Gauhati, on the Brahmaputra. Pop. (1901) 8384. Shillong practically dates from 1864, when the district headquarters were transferred from Cherrapunji. It was chosen as the seat of government in 1874, when the province of Assam was constituted. Every one of the public buildings and houses that quickly grew up was levelled to the ground by the great earthquake of the 12th of June 1897, but they have since been rebuilt. Cantonments are provided for a battalion of Gurkhas with two guns, and Shillong is the headquarters of the Assam brigade of the 8th division of the Northern army. There are a government high school and a training school for masters. The Welsh Presbyterian mission is active in promoting education. Since 1905, when Dacca became the capital of the new province of Eastern Bengal and Assam, Shillong has declined in importance; but it is still the summer residence of the government and the headquarters of the district.

SHILLUH, or Shlūh ("vagabonds"), the name given by the Arabized Moors to the Berber peoples of southern Morocco. They occupy chiefly the province of Sus. The name is said to be a corruption of *áshlūh* (pl. *íshlâh*), a camel-hair tent. They are of fine physique, strong and wiry, and true Berbers in features and fairness. They are as a rule shorter than the Berbers of Algeria (see Berbers and Morocco).

SHILLUK, a Negro race of the upper Nile valley, occupying the lands west of the White Nile from the Sobat northward for about 360 m., and stretching westward to the territory of the Baggara tribes. They are the most numerous of the Negro tribes of the Anglo-Egyptian Sudan, and form one great family with the Alur and Acholi (*q.v.*) and others in the south. Formerly extending as far north as Khartum and constituting a powerful Negro kingdom, they are now decadent. They are the only race on the upper Nile recognizing one chief as ruler of all the tribes, the chiefship passing invariably to the sister's child or some other relative on the female side. The Shilluk towns on the Nile bank are usually placed near to one another. They own large herds of cattle. In physique the Shilluks are typical Negroes and jet black. The men used to wear nothing, the women a calf-skin attached to their girdle, but with the establishment of Anglo-Egyptian control, *c.* 1900, they gradually adopted clothes. The poorer people smear themselves with ashes. They ornament the hair with grass and feathers in fantastic forms such as a halo, helmet, or even a broad-brimmed hat. When they saw Schweinfurth wearing a broad felt hat they thought him one of them, and were amazed when he took it off. They are skilful as hunters, and especially as fishermen, spearing fish while wading or from ambach rafts. Their arms are spears, shields and clubs. Their religion is a kind of ancestor and nature worship.

See G. A. Schweinfurth, *Heart of Africa* (1874); W. Junker, *Travels in Africa*, Eng. ed. (London, 1890–1892); *The Anglo-Egyptian Sudan*, edited by Count Gleichen (London, 1905).

SHILOH, BATTLE OF. This, the second great battle in the American Civil War, also called the battle of Pittsburg Landing, was fought on the 6th–7th of April 1862 between the Union forces under Grant and Buell and the Confederates under A. S. Johnston and Beauregard. In view of operations against Corinth, Mississippi, Grant's army had ascended the Tennessee to Pittsburg Landing and there disembarked, while the co-operating army under Buell moved across country from Nashville to join it. The Confederates concentrated above 40,000 men at Corinth and advanced on Pittsburg Landing with a view to beating Grant before Buell's arrival, but their concentration had left them only a narrow margin of time, and the advance was further delayed by the wretched condition of the roads. Beauregard advised Johnston to give up the enterprise, but on account of the bad effect a retreat would have on his raw troops Johnston resolved to continue his advance. Grant meantime had disposed his divisions in camps around the Landing rather with a view to their comfort than in accordance with any tactical scheme. No entrenchments were made; Halleck, the Union commanding general in the West, was equally over-confident, and allowed Buell to march in leisurely fashion. Even so, more by chance than intentionally, Buell's leading division was opposite the Landing, awaiting only a ferry, on the evening before the battle; Grant, however, declined to allow it to cross, as he thought that there would be no fighting for some days. At 6 A.M. on the 6th of April, near Shiloh Church (2 m. from Pittsburg Landing), the Confederate army deployed in line of battle, and advancing directly on the Landing, surprised and broke up a brigade of the most advanced Union division (Prentiss's) which had been sent forward from camp to reconnoitre. The various Union divisions hurriedly prepared to defend themselves, but they were dispersed in several camps which were out of sight of one another, and thus the Confederate army lapped round the flanks of each local defence as it encountered it. The two advanced divisions were swiftly driven in on the others, who were given a little time to prepare themselves by the fact that in the woods the Confederate leaders were unable to control or manœuvre their excited troops. But the rear Union divisions, though ready, were not connected, and each in turn was isolated and forced back, fighting hard, towards the Landing. The remnant of Prentiss's division was cut off and forced to surrender. Another division had its commander, W. H. L. Wallace, killed. But on the other side the disorder became greater and greater, many regiments were used up, and Johnston himself killed in vainly attacking on a point of Wallace's line called the Hornet's Nest. The day passed in confused and savage scuffles between the raw enthusiasts of either side, but by 5.30 P.M. Grant had formed a last (and now a connected) line of defence with Buell's leading division (Nelson's) and all of his own infantry that he could rally. This line was hardly 600 yds. from the Landing, but it was in a naturally strong position, and Beauregard suspended the attack at sunset. There was a last fruitless assault, delivered by some of the Confederate brigades on the right that had not received Beauregard's order against Nelson's intact troops, who were supported by the fire of the gunboats on the Tennessee. During the night Grant's detached division (Lew Wallace's) and Buell's army came up, totalling 25,000 fresh troops, and at 5 A.M. on the 7th Grant took the offensive. Beauregard thereupon decided to extricate his sorely-tried troops from the misadventure, and retired fighting on Corinth. About Shiloh Church, a strong rearguard under Bragg repulsed the attacks of Grant and Buell for six hours before withdrawing, and all that Grant and Buell achieved was the reoccupation of the abandoned camps. It was a Confederate failure, but not a Union victory, and, each side being weakened by about 10,000 men, neither made any movements for the next three weeks.

SHILOH, a town of Ephraim, where the sanctuary of the ark was, under the priesthood of the house of Eli. According to 1 Sam. iii. 3, 15, this sanctuary was not a tabernacle but a temple, with doors. But the priestly narrator of Josh. xviii. 1 has it that the tabernacle was set up there by Joshua after the conquest. In Judges xxi. 19 seq. the yearly feast at Shiloh appears as of merely local character. The sanctuary at Shiloh seems to have been destroyed, probably by the Philistines after the battle of Ebenezer; cf. Jeremiah vii. 12 seq. The position described in Judges, *loc. cit.*, gives certainty to the identification with the modern Seilun lying some 2 m. E.S.E. of Khan Labban (Lebonah), on the road from Bethel to Shechem. Here there is a ruined village, on an elevation protected by lofty hills on three sides, and open only towards the south, offering a strong position, which suggests that the place was a stronghold as well as a sanctuary. Fertile land surrounds the hill. The name Seilun corresponds to Σιλοῦν in Josephus. LXX. has Σηλω, Σηλωμ. The forms given in the Hebrew Bible (שׁלה, שׁלו) have dropped the final consonant, which reappears in the adjective שׁלוני.

SHIMOGA, or SHEEMOGA, a town and district in the state of Mysore, southern India. The town is situated on the Tunga river, and is the terminus of a branch railway. Pop. (1901) 6240. The area of the district is 4025 sq. m. Its river system is twofold; in the east the Tunga, Bhadra and Varada unite to form the Tungabhadra, which ultimately falls into the Kistna and so into the Bay of Bengal, while in the west a few minor streams flow to the Sharavati, which near the north-western frontier bursts through the Western Ghats by the celebrated Falls of Gersoppa (*q.v.*).

The western half of the district is mountainous and covered with magnificent forest, and is known as the Malnad or hill country, some of the peaks being 4000 ft. above sea-level. The general elevation of Shimoga is about 2000 ft.; and towards the east it opens out into the Maidan or plain country, which forms part of the general plateau of Mysore. The Malnad region is very picturesque, its scenery abounding with every charm of tropical forests and mountain wilds; on the other hand, the features of the Maidan country are for the most part comparatively tame. The mineral products of the district include iron-ore and laterite. The soil is loose and sandy in the valleys of the Malnad, and in the north-east the black cotton soil prevails. Bison are common in the *taluk* of Saugor, where also wild elephants are occasionally seen; while tigers, leopards, bears, wild hog, *sambhar* and *chitál* deer are numerous in the wooded tracts of the west. Shimoga presents much variety of climate. The south-west monsoon is felt in full force for about 25 m. from the Ghats, bringing an annual rainfall of more than 150 in., but the rainfall gradually diminishes to 31 in. at Shimoga station and to 25 in. or less at Chennagiri. The population in 1901 was 531,736. Rice is the staple crop; next in importance is sugar-cane; areca nuts are also extensively grown; and miscellaneous crops include vegetables, fruits and pepper. The chief manufactures are coarse cotton cloths, rough country blankets, iron implements, brass and copper wares, pottery and jaggery. The district is noted for its beautiful sandal-wood carving.

During the Mahommedan usurpation of Mysore from 1761 to 1799, unceasing warfare kept the whole country in constant turmoil. After the restoration of the Hindu dynasty Shimoga became the scene of disturbances caused by the mal-administration of the Deshast Brahmans, who had seized upon every office and made themselves obnoxious. These disturbances culminated in the insurrection of 1830, which led to the direct assumption of the administration by the British.

SHINGLE. (1) A Middle English corruption of *schindle*, from Lat. *scindula* or *scandula*, a wooden tile, from *scandere*, to cut—a kind of wooden tile, generally of oak, used in places where timber is plentiful, for covering roofs, spires, &c. In England they are generally plain, but on the continent of Europe the ends are sometimes rounded, pointed or cut into ornamental form. (2) Water-worn detritus, of larger and coarser form than gravel, chiefly used of the pebbly detritus of a sea-beach. This word is of Norwegian origin, from *singl* or *singling*, coarse gravel. It is apparently derived from *singla*, to make a ringing sound, a form of "to sing," with allusion to the peculiar noise made when walking over shingle. (3) The word "shingles," the common name of *herpes zoster*, a particular form of the inflammatory eruption of the skin known as herpes (*q.v.*), is the plural of an obsolete word for a girdle, *sengle*, taken through O. Fr. *cengle* from Lat. *cingulum*, *cingere*, to gird.

SHINWARI, a Durani Afghan tribe occupying the northern slopes of the Safed Kob below Jalalabad. One clan, the Ali Sher Khel, fall within the British sphere in the North-West Frontier Province of India. They live on the Loargai border of Peshawar district, and number some 3000 fighting men. The remaining three clans are Afghan subjects.

SHIO-GHI, the Japanese game of chess. Like *Go-bang*, the game of the middle classes, and Sugorochu (double-six), that of the common people, it was introduced from China many centuries ago and is still popular with the educated classes. It is played on a board divided into 81 squares, nine on a side, with 20 pieces on each side, arranged on the three outer rows. The pieces, which are flat and punt-shaped with the smaller end towards the front, represent, by means of different inscriptions, the *O*, or *Sho*, King-General, with whose checkmate the game ends, his two chief aids, the *Kin* and *Ghin*, Gold and Silver Generals (two of each), *Ka-Ma*, horse or knight (two), *Yari*, spearman (two), one *Hisha*, or flying chariot (rook), one *Kaku* (bishop), and nine *Hio* or *Fu*, soldiers or pawns. All these pieces, like those in chess, possess different functions. The chief difference between chess and *Shio-ghi* is that in the Japanese game a piece does not cease to be a factor in the game when it is captured by the opponent, but may be returned by him to the board at any time as a reserve; and, secondly, all pieces, except the King and Gold General, are promoted to higher powers upon entering the last three rows of the enemy's territory. This possibility of utilizing captured forces against their former masters and the altering values of the different men render *shio-ghi* a very difficult and complicated game.

See *Games Ancient and Oriental*, by E. Falkener (London, 1892); the *Field* (Sept. 1904).

SHIP, the generic name (O. Eng. *scip*, Ger. *Schiff*, Gr. σκάφος, from the root *skap*, cf. "scoop") for the invention by which man has contrived to convey himself and his goods upon water. The derivation of the word points to the fundamental conception by which, when realized, a means of flotation was obtained superior to the raft, which we may consider the earliest and most elementary form of vessel. The trunk of a tree hollowed out, whether by fire, or by such primitive tools as are fashioned and used with singular patience and dexterity by savage races, represents the first effort to obtain flotation depending on something other than the mere buoyancy of the material. The poets, with characteristic insight, have fastened upon these points. Homer's hero Ulysses is instructed to make a raft with a raised platform upon it, and selects trees "withered of old, exceeding dry, that might float lightly for him" (*Od.* v. 240). Virgil, glorifying the dawn and early progress of the arts, tells us, "Rivers then first the hollowed alders felt" (*Georg.* i. 136, ii. 451). Alder is a heavy wood and not fit for rafts. But to make for the first time a dug-out canoe of alder, and so to secure its flotation, would be a triumph of primitive art, and thus the poet's expression represents a great step in the history of the invention of the ship.

Primitive efforts in this direction may be classified in the following order: (1) rafts—floating logs, or bundles of brushwood or reeds or rushes tied together; (2) dug-outs—hollowed trees; (3) canoes of bark, or of skin stretched on framework or inflated skins (balsas); (4) canoes or boats of pieces of wood stitched or fastened together with sinews or thongs or fibres of vegetable growth; (5) vessels of planks, stitched or bolted together with inserted ribs and decks or half decks; (6) vessels of which the framework is first set up, and the planking of the hull nailed on to them subsequently. All these in their primitive forms have survived, in various parts of the world, with different modifications marking progress in civilization. Climatic influences and racial peculiarities have imparted to them their specific characteristics, and, combined with the available choice of materials, have determined the particular type in use in each locality. Thus on the north-west coast of Australia is found the single log of buoyant wood, not hollowed out but pointed at the ends. Rafts of reeds are also found on the Australian coast. In New Guinea catamarans of three or more logs lashed together with rattan are the commonest vessel, and similar forms appear on the Madras coast and throughout the Asiatic islands. On the coast of Peru rafts made of a very buoyant wood are in use, some of them as much as 70 ft. long and 20 ft. broad; these are navigated with a sail, and, by an ingenious system of centre boards, let down either fore or aft between the lines of the timbers, can be made to tack. The sea-going raft is often fitted with a platform so as to protect the goods and persons carried from the wash of the sea. Upright timbers fixed upon the logs forming the raft support a kind of deck, which in turn is itself fenced in and covered over.[1] Thus the idea of a deck, and that of side planking to raise the freight above the level of the water and to save it from getting wet, are among the earliest typical expedients which have found their development in the progress of the art of shipbuilding.

I. History to the Invention of Steamships

Whether the observation of shells floating on the water, or of split reeds, or, as some have fancied, the nautilus, first suggested the idea of hollowing out the trunk of a tree, the practice ascends to a very remote antiquity in the history of man. Dug-out canoes of a single tree have been found associated with objects of the Stone Age among the ancient Swiss lake dwellings; nor are specimens of the same class wanting from the bogs of Ireland and the estuaries of England and Scotland, some obtained from the depth of 25 ft. below the surface of the soil. The hollowed trunk itself may have suggested the use of the bark as a means of flotation. But, whatever may have been the origin of the bark canoe, its construction is a step onwards in the art of shipbuilding. For the lightness and pliability of the material necessitated the invention of some internal framework, so as to keep the sides apart, and to give the stiffness required both for purposes of propulsion and the carrying of its freight. Similarly, in countries where suitable timber was not to be found, the use of skins or other water-tight material, such as felt or canvas, covered with pitch, giving flotation, demanded also a framework to keep them distended and to bear the weight they had to carry. In the framework we have the rudimentary ship, with longitudinal bottom timbers, and ribs, and cross-pieces, imparting the requisite stiffness to the covering material. Bark canoes are found in Australia, but the American continent is their true home. In northern regions skin or woven material made water-tight supplies the place of bark.

The next step in the construction of vessels was the building up of canoes or boats by fastening pieces of wood together in a suitable form. Some of these canoes, and probably the earliest in type, are tied or stitched together with thongs or cords. The Madras surf boats are perhaps the most familiar example of this type, which, however, is found in the Straits of Magellan and in Central Africa (on the Victoria Nyanza), in the Malay Archipelago and in many islands of the Pacific. Some of these canoes show a great advance in the art of construction, being built up of pieces fitted together with ridges on their inner sides, through which the fastenings are passed.[2] These canoes have the advantage of elasticity, which gives them ease in a seaway, and a comparative immunity where ordinary boats would not hold together. In these cases the body of the canoe is constructed first and built to the shape intended, the ribs being inserted afterwards, and attached to the sides, and having for their main function the uniting of the deck and cross-pieces with the body of the canoe. Vessels thus stitched together, and with an inserted framework, have from a very early time been constructed in the Eastern seas far exceeding in size anything that would be called a canoe, and in some cases attaining to 200 tons burthen.

From the stitched form the next step onwards is to fasten the materials out of which the hull is built up by pegs or treenails; and of this system early types appear among the Polynesian islands and in the Nile boats described by Herodotus (ii. 96), the prototype of the modern "nuggur." The raft of Ulysses described by Homer presents the same detail of construction. It is remarkable that some of the early types of boats belonging to the North Sea present an intermediate method, in which the planks are fastened together with pins or treenails, but are attached to the ribs by cords passing through holes in the ribs and corresponding holes bored through ledges cut on the inner side of each plank.

We thus arrive, in tracing primitive efforts in the art of ship construction, at a stage from which the transition to the practice of setting up the framework of ribs fastened to a timber keel laid lengthwise, and subsequently attaching the planking of the hull, was comparatively simple. The keel of the modern vessel may be said to have its prototype in the single log which was the parent of the dug-out. The side planking of the vessel, which has an earlier parentage than the ribs, may be traced to the attempt to fence in the platforms upon the sea-going rafts, and to the planks fastened on to the sides of dug-out canoes so as to give them a raised gunwale.[3] The ribs of the modern vessel are the development of the framework originally inserted after the completion of the hull of the canoe or built-up boat, but with the difference that they are now prior in the order of fabrication. In a word, the skeleton of the hull is now first built up, and the skin, &c., adjusted to it; whereas in the earlier types of wooden vessels the outside hull was first constructed, and the ribs, &c., added afterwards.[4] It is noticeable that the invention of the outrigger and weather platform, the use of which is at the present time distributed from the Andaman Islands eastward throughout the whole of the South Pacific, has never made its way into the Western seas. It is strange that Egyptian enterprise, which seems at a very early period to have penetrated eastward down the Red Sea and round the coasts of Arabia towards India, should not have brought it to the Nile, and that the Phoenicians, who, if the legend of their migration from the shores of the Persian Gulf to the coast of Canaan be accepted, would in all probability, in their maritime expeditions, have had opportunities of seeing it, did not introduce it to the Mediterranean. That they did not do so, if they saw it at all, would tend to prove that even in that remote antiquity both nations possessed the art of constructing vessels of a type superior to the outrigger canoes, both in speed and in carrying power.

The earliest representations that we have as yet of Egyptian vessels carry us back, according to the best authorities, to a period little short of 3000 years before Christ. Some of these are of considerable size, as is shown by the number of rowers, and by the cargo consisting in many cases of cattle. The earliest of all presents us with the peculiar mast of two pieces, stepped apart but joined at the top. In some the masts are shown lowered and laid along a high spar-deck. The larger vessels show on one side as many as twenty-one or twenty-two and in one case twenty-six oars, besides four or five steering. They show considerable camber, the two ends rising in a curved line which in some instances ends in a point, and in others is curved back and over at the stern and terminates in an ornamentation, very frequently of the familiar lotus pattern. At the bow the stem is sometimes seen to rise perpendicularly, forming a kind of forecastle, sometimes to curve backward and then forward again like a neck, which is often finished into a figure-head representing some bird or beast or Egyptian god. On the war galleys there is frequently shown a projecting bow with a metal head attached, but well above the water. This, though no doubt used as a ram, is not identical with the beak *à fleur d'eau*, which we shall meet with in Phoenician and Greek galleys. It is more on a level with the proembolion of the latter.

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[1] The raft of Ulysses described in Homer (*Od.* v.) must have been of this class.

[2] See Captain Cook's account of the Friendly Islands, La Pérouse on Easter Island, and Williams on the Fiji Islands.

[3] Compare the planks upon the Egyptian war galleys, added so as to protect the rowers from the missiles of the enemy.

[4] It is curious that these two methods should still survive, and be in use, in the construction of light racing 8-oared boats. Some of these are built ribs first, and skin laid on afterwards; others, skin laid on moulds and framework first, and ribs inserted in the shell when turned over.

The impression as regards the build created by the drawings of the larger galleys is that of a long and somewhat wall-sided vessel with the stem and stern highly raised. The tendencies of the vessel to "hog," or rise amidships, owing to the great weight fore and aft unsupported by the water, is corrected by a strong truss passing from stern to stern over crutches. The double mast of the earlier period seems in time to have given place to the single mast furnished with bars or rollers at the upper part, for the purpose apparently of raising or lowering the yard according to the amount of sail required. The sail in some of the galleys is shown with a bottom as well as a top yard. In the war galleys during action it is shown rolled up like a curtain with loops to the upper yard. The steering was effected by paddles, sometimes four or five in number, but generally one or two fastened either at the end of the stern or at the side, and above attached to an upright post in such a way as to allow the paddle to be worked by a tiller.

There are many remarkable details to be observed in the Egyptian vessels figured in Duemichen's *Fleet of an Egyptian Queen*, and in Lepsius's *Denkmäler*. The Egyptian ship, as represented from time to time in the period between 3000 and 1000 B.C., presents to us a ship proper as distinct from a large canoe or boat. It is the earliest ship of which we have cognizance. But there is a noticeable fact in connexion with Egypt which we gather from the tomb paintings to which we owe our knowledge of the Egyptian ship. It is evident from these records that there were at that same early period, inhabiting the littoral of the Mediterranean, nations who were possessed of sea-going vessels which visited the coasts of Egypt for plunder as well as for commerce, and that sea-fights were even then not uncommon. Occasionally the combination of these peoples for the purpose of attack assumed serious proportions, and we find the Pharaohs recording naval victories over combined Dardanians, Teucrians and Mysians, and, if we accept the explanations of Egyptologists, over Pelasgians, Daunians, Oscans and Sicilians. The Greeks, as they became familiar with the sea, followed in the same track. The legend of Helen in Egypt, as well as the numerous references in the *Odyssey*, point not only to the attraction that Egypt had for the maritime peoples, but also to long-established habits of navigation and the possession of an art of shipbuilding equal to the construction of sea-going craft capable of carrying a large number of men and a considerable cargo besides.

But the development of the ship and of the art of navigation clearly belongs to the Phoenicians. It is tantalizing to find that the earliest and almost the only evidence that we have of this development is to be gathered from Assyrian representations. The Assyrians were an inland people, and the navigation with which they were familiar was that of the two great rivers, Tigris and Euphrates. After the conquest of Phoenicia, they had knowledge of Phoenician naval enterprise, and accordingly we find the war galley of the Phoenicians represented on the walls of the palaces unearthed by Layard and his followers in Assyrian discovery. But the date does not carry us to an earlier period than 700 B.C. The vessel represented is a bireme war galley which is "aphract," that is to say, has the upper tier of rowers unprotected and exposed to view. The apertures for the lower oars are of the same character as those which appear in Egyptian ships of a much earlier date, but without oars. The artist has shown the characteristic details, though somewhat conventionally. The fish-like snout of the beak, the line of the parodus or outside gangway, the wickerwork cancelli,[1] the shields ranged in order along the side of the bulwark, and the heads of a typical crew on deck (the *πρωρεύς* looking out in front in the forecastle, an *ἐπιβάτης*, two chiefs by the mast, and, aft, the *κελευστής* and *κυβερνήτης*). The supporting timbers of the deck are just indicated. The mast and yard and fore and back stays, with the double steering paddle, complete the picture.

But, although there can be little doubt that the Phoenicians, after the Egyptians, led the way in the development of the shipwright's art, yet the information that we can gather concerning them is so meagre that we must go to other sources for the description of the ancient ship. The Phoenicians at an early date constructed merchant vessels capable of carrying large cargoes, and of traversing the length and breadth of the Mediterranean, perhaps even of trading to the far Cassiterides and of circumnavigating Africa. They in all probability (if not the Egyptians) invented the bireme and trireme, solving the problem by which increased oar-power and consequently speed could be obtained without any great increase in the length of the vessel.

It is, however, to the Greeks that we must turn for any detailed account of these inventions. The Homeric vessels were aphract and not even decked throughout their entire length. They carried crews averaging from fifty to a hundred and twenty men, who, we are expressly told by Thucydides, all took part in the labour of rowing, except perhaps the chiefs. The galleys do not appear to have been armed as yet with the beak, though later poets attribute this feature to the Homeric vessel. But they had great poles used in fighting, and the term employed to describe these (*ναύμαχα*) implies a knowledge of naval warfare. The general characteristics are indicated by the epithets in use throughout the *Iliad* and the *Odyssey*. The Homeric ship is sharp (*θοή*) and swift (*ὠκεῖα*); it is hollow (*κοίλη*, *γλαφυρή*, *μεγακήτης*), black, vermilion-cheeked (*μιλτοπάρῃος*), dark-prowed (*κυανόπρῳρος*), curved (*κορωνίς*, *ἀμφιέλισσα*), well-timbered (*ἐΰσσελμος*), with many thwarts (*πολύζυγος*, *ἑκατόζυγος*). The stems and sterns are high, upraised, and resemble the horns of oxen (*ὀρθοκραίραι*). They present in the history of the shipping of the Mediterranean a type parallel with that of the Vikings' vessels of the North Sea.

On the vases, the earliest of which may date between 700 and 600 B.C., we find the bireme with the bows finished off into a beak shaped as the head of some sea monster, and an elevated forecastle with a bulwark evidently as a means of defence. The craft portrayed in some instances are evidently pirate vessels, and exhibit a striking contrast to the trader, the broad ship of burden (*φορτὶς εὐρεῖα*), which they are overhauling. The trireme, which was developed from the bireme and became the Greek ship of war (the long ship, *ναῦς μακρά*, *navis longa*, *par excellence*), dates, so far as Greek use is concerned, from about 700 B.C. according to Thucydides, having been first built at Corinth. The earliest sea-fight that the same author knew of he places at a somewhat later date—664 B.C., more than ten centuries later than some of those portrayed in the Egyptian tomb paintings.

The trireme was the war ship of Athens during her prime, and, though succeeded and in a measure superseded by the larger rates,—quadrireme, quinquereme, and so on, up to vessels of sixteen banks of oars (*inhabilis prope magnitudinis*),—yet, as containing in itself the principle of which the larger rates merely exhibited an expansion, a difference in degree and not in kind, has, ever since the revival of letters, concentrated upon itself the attention of the learned who were interested in such matters. The literature connected with the question of ancient ships, if collected, would fill a small library, and the greater part of it turns upon the construction of the trireme and the disposition of the rowers therein.

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[1] See Rawlinson, *Ancient Monarchies*, vol. ii. p. 176.

During the 19th century a fresh light was thrown upon the subject by the discovery (1834) at the Peiraeus of some records of the Athenian dockyard superintendents, belonging to several years between 373–324 B.C. These were published and admirably elucidated by Boeckh. Further researches were carried out by his pupil Dr Graser. Since the publication of Graser's notable work, *De re navali veterum*, the subject has been copiously treated by A. Cartauld, Breusing, C. Torr and others. The references to ancient writers, and the illustrations from vases, coins, &c., have been multiplied, and, though the vexed question of the seating of the rowers cannot be regarded as settled, yet, notwithstanding some objections raised, it seems probable that something like Graser's solution, with modifications, will eventually hold the field, especially as practical experiment has shown the possibility of a set of men, seated very nearly according to his system, using their oars with effect, and without any interference of one bank with another.

On one point it is necessary to insist, because upon it depends the right understanding of the problem. The ancients *did not employ more than one man to an oar.* The method employed on medieval galleys was alien to the ancient system. A. Jal, Admiral Fincati, Admiral Jurien de la Gravière and a host of other writers on the subject, some as recently as 1906, have been led to advocate erroneous, if ingenious, solutions of the problem, by neglect of, and in contradiction to, the testimony of ancient texts and representations, which overwhelmingly establish as an axiom of the ancient marine the principle of "one oar, one man."

The distinction between "aphract" and "cataphract" vessels must not be overlooked in a description of the ancient vessels. The words, meaning "unfenced," and "fenced," refer to the bulwarks which covered the upper tier of rowers from attack. In the aphract vessels these side plankings were absent and the upper tier of rowers was exposed to view from the side. Both classes of vessels had upper and lower decks, but the aphract class carried their decks on a lower level than the cataphract. The system of side planking with a view to the protection of the rowers dates from a very early period, as may be seen in some of the Egyptian representations, but among the Greeks it does not seem to have been adopted till long after the Homeric period. The Thasians are credited with the introduction of the improvement.

In our account of the trireme, both as regards the disposition of the rowers and the construction of the vessel, we have mainly, though not entirely, followed Graser. Any such scheme must at the best be hypothetical, based upon inference from the ancient texts, or upon necessities of construction, and in every case plenty of room will be left for the critic, along with the Horatian invitation, "si quid novisti rectius istis, Candidus imperti."

In the ancient vessels the object of arranging the oars in banks was to economize horizontal space, and to obtain an increase in the number of oars without having to lengthen the vessel. It has been reasonably inferred from a passage in Vitruvius[1] that the "interscalmium," or space horizontally measured from oar to oar, was 2 cubits. This is exactly borne out by the proportions of an Attic aphract trireme, as shown on a fragment of a bas-relief found in the Acropolis. The rowers in all classes of banked vessels sat in the same vertical plane, and seats ascending in a line obliquely towards the stern of the vessel. Thus in a trireme the thranite, or oarsman of the highest bank, was nearest the stern of the set of three to which he belonged. Next behind him and somewhat below him sat his zygite, or oarsman of the second bank; and next below and behind the zygite sat the thalamite, or oarsman of the lowest bank. The vertical distance between these seats was probably 2 ft., the horizontal distance about 1 ft. The horizontal distance, it is well to repeat, between each seat in the same bank was 3 ft. (the seat itself about 9 in. broad). Each man had a resting place for his feet, somewhat wide apart, fixed to the bench of the man on the row next below and in front of him. In rowing, the upper hand, as is shown in most of the representations which remain, was held with the palm turned inwards towards the body. This is accounted for by the angle at which the oar was worked. The lowest rank used the shortest oars, and the difference of the length of the oars on board was caused by the curvature of the ship's side. Thus, looked at from within, the rowers amidship seemed to be using the longest oars, but outside the vessel, as we are expressly told, all the oar-blades of the same bank took the water in the same longitudinal line. The lowest or thalamite oar-ports were 3 ft., the zygite $4\frac{1}{4}$ ft., the thranite $5\frac{1}{2}$ ft. above the water. Each oar-port was protected by an *ascoma* or leather bag, which fitted over the oar, closing the aperture against the wash of the sea without impeding the action of the oar. The oar was attached by a thong (τροπός, τροπωτήρ) to a thowl (σκαλμός). The port-hole was probably oval in shape (the Egyptian and Assyrian pictures show an oblong). We know that it was large enough for a man's head to be thrust through it.

The benches on which the rowers sat ran from the vessel's side to timbers, which, inclined at an angle of about 64° towards the ship's stern, reached from the lower to the upper deck. These timbers were, according to Graser, called the diaphragmata. In the trireme each diaphragma supported three, in the quinquereme five, in the octireme eight, and in the famous tesseraconteres forty seats of rowers, who all belonged to the same "complexus," though each to a different bank. In effect, when once the principle of construction had been established in the trireme, the increase to larger rates was effected, so far as the motive power was concerned, by lengthening the diaphragmata upwards, while the increase in the length of the vessel gave a greater number of rowers to each bank. The upper tiers of oarsmen exceeded in number those below, as the contraction of the sides of the vessel left less available space towards the bows.

Of the length of the oars in the trireme we have an indication in the fact that the length of supernumerary oars (περίνεῳ) rowed from the gangway above the thranites, and, therefore, probably slightly exceeding the thranitic oars in length, is given in the Attic tables as 14 ft. 3 in. The thranites were probably about 14 ft. The zygite, in proportion to the measurement, must have been $10\frac{1}{2}$, the thalamite $7\frac{1}{2}$ ft. long. Comparing modern oars with these, we find that the longest oars used in the British navy are 18 ft. The university boat race has been rowed with oars 12 ft. 6 in. The proportion of the loom inboard was about one third, but the oars of the rowers amidship must have been somewhat longer inboard. The size of the loom inboard preserved the necessary equilibrium. The long oars of the larger rates were weighted inboard with lead. Thus the topmost oars of the tesseraconteres, of which the length is given as 53 ft., were exactly balanced at the rowlock. (See Oar.)

Let us now consider the construction of the vessel itself. In the cataphract class the lower deck was 1 ft. above the water-line. Below this deck was the hold, which contained a certain amount of ballast, and through an aperture in this deck the buckets for baling were worked, entailing a labour which was constant and severe on board an ancient ship at sea. The keel (τρόπις) appears to have had considerable camber. Under it was a strong false keel (χέλυσμα), very necessary for vessels that were constantly drawn up on the shore. Above the keel was the kelson, under which the ribs were fastened. These were so arranged as to give the necessary intervals for the oar-ports above. Above the kelson lay the upper false keel, into which the mast was stepped. The stem (στεῖρα) rose from the keel at an angle of about 70° to the water. Within was an apron (φάλκης), which was a strong piece of timber curved and fitting to the end of the keel and beginning of the stern-post and firmly bolted into both, thus giving solidity to the bows, which had to bear the beak and sustain the shock of ramming. The stem was carried upwards and curved generally backwards towards the forecastle and rising above it, and then curving forwards again terminated in an ornament which was called the acrostolion. The stern-post was carried up at a similar angle to the bow, and, rising high over the poop, was curved round into an ornament which was called "aplustre" (ἄφλαστον). But, inasmuch as the steering was effected by means of two rudders (πηδάλια), one on either side, there was no need to carry out the stern into a rudder post as with modern ships, and the stern was left, therefore, much more free, an advantage in respect of the manœuvring of the ancient Greek man-of-war, the weapon being the beak or rostrum, and the power of turning quickly being of the highest importance.

Behind the "aplustre," and curving backwards, was the "cheniscus" (χηνίσκος), or goose-head, symbolizing the floating powers of the vessel. After the ribs had been set up and covered in on both sides with planking, the sides of the vessel were further strengthened by waling-pieces carried from stern to stem and meeting in front of the stern-post. These were further strengthened with additional balks of timber, the lower waling-pieces meeting about the water-level and prolonged into a sharp three-toothed spur, of which the middle tooth was the longest. This was covered with hard metal (generally bronze) and formed the beak. The whole structure of the beak projected about 10 ft. beyond the stern-post. Above it, but projecting much less beyond the stern-post, was the "proembolion" (προεμβόλιον), or second beak, in which the prolongation of the upper set of waling-pieces met. This was generally fashioned into the figure of a ram's head, also covered with metal; and sometimes again between this and the beak the second line of waling-pieces met in another metal boss called the προεμβολίς. These bosses, when a vessel was rammed, completed the work of destruction begun by the sharp beak at the water-level, giving a racking blow which caused it to heel over and so eased it off the beak, and releasing the latter before the weight of the sinking vessel could come upon it. At the point where the prolongation of the second and third waling-pieces began to converge inwards towards the stem on either side of the vessel stout catheads (ἐπωτίδες) projected, which were of use, not only as supports for the anchors, but also as a means of inflicting damage on the upper part of an enemy's vessel, while protecting the side gangways of its own and the banks of oars that worked under them. The catheads were strengthened by strong balks of timber, which were firmly bolted to them under either extremity and both within and without, and ran to the ship's side. Above the curvature of the upper waling-pieces into the προεμβόλιον were the cheeks of the vessel, generally painted red, and in the upper part of these the eyes (ὀφθαλμοί), answering to our hawse holes, through which ran the cables for the anchors. On either side the trireme, at about the level of the thranitic benches, projected a gangway (πάροδος) resting against the ribs of the vessel. This projection was of about 18 to 24 in., which gave a space, increased to about 3 ft. by the inward curve of the prolongation of the ribs to form supports for the deck, for a passage on either side of the vessel. This gangway was planked in along its outer side so as to afford protection to the seamen and marines, who could pass along its whole length without impeding the rowers. Here, in action, the sailors were posted as light-armed troops, and when needed could use the long supernumerary oars (περίνεῳ) mentioned above. The ribs, prolonged upwards upon an inward curve, supported on their upper ends the cross beams (στρωτῆρες) which tied the two sides of the vessel together and carried the deck. In the cataphract class these took the place of the thwarts (ζύγα) which in the earlier vessels, at a lower level, yoked together the sides of the vessel, and formed also benches for the rowers to sit on, from which the latter had their name (ζυγῖται), having been the uppermost tier of oarsmen in the bireme; while those who sat behind and below them in the hold of the vessel were called θαλαμῖται or θαλάμακες (from θάλαμος). In the trireme the additional upper tier was named from the elevated bench (θρᾶνος) on which they were placed (θρανῖται). On the deck were stationed the marines (ἐπιβάται), fighting men in heavy armour, few in number in the Attic trireme in its palmy days, but many in the Roman quinquereme, when the ramming tactics were antiquated, and wherever, as in the great battles in the harbour at Syracuse, land tactics took the place of the maritime skill which gave victory to the ram in the open sea. The space occupied by the rowers was termed ἔγκωπον. Beyond this, fore and aft, were the παρεξειρέσιαι, or parts outside the rowers. These occupied about 12 ft. of the bows and 15 ft. in the stern. In the fore part was the forecastle, with its raised deck. In the stern the decks (ἴκρια) rose in two or three gradations, upon which was a kind of deck-house for the captain and a seat for the steerer (κυβερνήτης), who steered by means of ropes attached to the tillers fixed in the upper part of the paddles, which, in later times at least, ran over wheels (τροχιλίαι), giving him the power of changing his vessel's course with great rapidity. Behind the deck-house rose the flagstaff, on which was hoisted the pennant, and from which probably signals were given in the case of an admiral's ship. On either side of the deck ran a balustrade (*cancelli*), which was covered for protection during action with felt (*cilicium*, παραρρύματα τριχινά) or canvas (π. λευκά). Above was stretched a strong awning of hide (κατάβλημα), as a protection against grappling irons and missiles of all kinds. In Roman vessels towers were carried up fore and aft from which darts could be showered on the enemy's deck; the heavy corvus or boarding bridge swung suspended by a chain near the bows; and the ponderous δελφίς hung at the ends of the yards ready to fall on a vessel that came near enough alongside. But these were later inventions and for larger ships. The Attic trireme was built light for speed and for ramming purposes.

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[1] In Vitruvius 1, 2, 4 the MSS. give DIPHECIACA (or DIFECIACA), which is an unknown word. Many of the editions read ΔΙΠΗΧΑΙΚΗ, an emendation which commends itself as consonant with probability, though in itself conjectural. (We may suggest the reading ΔΙΠΗΧΙΑΚΑ, by which the scribe's error would be reduced to EC for X.)

The dimensions of some dry docks discovered at Munychium and Zea, " ship-houses " as the ancients called them, afford some indications as to limitations of length and breadth in the Attic ships that used them. The measurements indicate for these houses about 150 ft. in length and 20 ft. in breadth. We may infer, therefore, that the ships housed in them did not exceed 150 by 20 ft. But there must necessarily have been some spare room in the dock houses, on either side and at both ends. Allowing 2 ft. on either side for passage room, and 10 ft. at either end, we should have room for a vessel of about 130 ft. in length including the beak, and of about 16 ft. beam. Adopting the 2 cubit "interscalmium," the rowing space in the trireme (31 by 3) for the upper tier would equal 93 ft. Allowing 12 ft. for bows and 15 for stern and 10 ft. for beak, we have 130 ft. as the aggregate length of the war vessel of three banks of oars. This of course is conjectural, but we submit that it is a reasonable conjecture from the evidence which we possess. There was indeed every reason for keeping the vessel as short as was compatible with the necessary requirements, and it is to be remembered that it was constantly being hauled up on shore for the night and launched again in the morning. As to the "interscalmium," it does not appear to exceed 3 ft. even in the largest boats now used in the royal navy. In the Chinese dragon boats, which are 73 ft. long and under 5 ft. beam, and have each 54 rowers or paddlers, it does not exceed 2 ft. 6 in. An oarsman whose feet are nearly on a level with his seat, as in a modern racing eight, requires more room for the swing forward of the handle of his oar in the recovery, than a man whose feet rest on a level well below that of his seat. It is not likely that the ancient oarsman swung forward more than blue-jackets do now-a-days in a man-of-war's cutter. All the Attic triremes appear to have been built upon the same model, and their gear was interchangeable. The Athenians had a peculiar system of girding the ships with long cables (ὑποζώματα), each trireme having two or more, which, passing through eyeholes in front of the stern-post, ran all round the vessel lengthwise immediately under the waling-pieces. They were fastened at the stern and tightened up with levers. These cables by shrinking as soon as they were wet, tightened the whole fabric of the vessel, and in action, in all probability, relieved the hull from part of the shock of ramming, the strain of which would be sustained by the waling-pieces convergent in the beaks. These rope-girdles are not to be confused with the process of undergirding or frapping, such as is narrated of the vessel in which St Paul was being carried to Italy. The trireme appears to have had two masts. In action the Greeks did not use sails, and everything that could be lowered was stowed below. The mainmasts and larger sails were often left ashore if a conflict was expected.

The crew of the Attic trireme consisted of from 200 to 225 men in all. Of these 170 were rowers—54 on the lower bank (thalamites), 54 on the middle bank (zygites), and 62 on the upper bank (thranites), —the upper oars being more numerous because of the contraction of the space available for the lower tiers near the bow and stern. Besides the rowers were about 10 marines (ἐπιβάται) and 20 seamen. The officers were the trierarch and next to him the helmsman (κυβερνήτης), who was the navigating officer of the trireme. The rowers descended into the seven-foot space between the diaphragmata and took their places in regular order, beginning with the thalamites. The economy of space was such that, as Cicero remarks, there was not room for one man more.

The improvement made in the build of their vessels by the Corinthian and Syracusan shipwrights, by which the bows were so much strengthened that they were able to meet the Athenian attack stem on (προσβολή), caused a change of tactics, and gave an impetus to the building of larger vessels—quadriremes and quinqueremes—in which increased oar-power was available for the propulsion of the heavier weights.

In principle these vessels were only expansions of the trireme, so far as the disposition of the rowers was concerned, but the speed could not have increased in proportion to the weight, and hence arose the variety of contrivances which superseded the ramming tactics of the days of Phormio. In the century that succeeded the close of the Peloponnesian War the fashion of building big vessels became prevalent. We hear of various numbers of banks of oars up to sixteen (ἑκκαιδεκήρης)—the big vessel of Demetrius Poliorcetes. The famous tesseraconteres or forty-banked vessel of Ptolemy Philopator, if it ever existed except in the imagination of Callixenus, was in reality nothing more than a costly and ingenious toy, and never of any practical use. The story, however, of its construction indicates the perfection to which the shipwright's art had been carried among the ancients.

The Romans, who developed their naval power during the First Punic War, though it is clear from the treaty with Carthage, 509 B.C., that they had had some maritime interests and adventurings before that great struggle began, were deficient in the art of naval construction. A Carthaginian quinquereme, which had drifted ashore, served them for a model, and with crews taught to row in a framework set up on dry land they manned a fleet which was launched in sixty days from the time that the trees were felled. Their first attempt was, as might have been expected, a failure. But they persevered, and the invention of the "corvus," by means of which boarding were opposed to ramming tactics, gave them under Duilius (260 B.C.) victory at Mylae, and eventually the command of the sea. From that time onwards they continued to build ships of many banks, and seem to have maintained their predilection for fighting at close quarters. The larger vessels with their "turres," or castles, fore and aft, deserved Horace's description as "alta navium propugnacula." The "corvus" and the "dolphin" were ready in action to fall on the enemy's decks, and in Caesar's battle with the Veneti off the coast of Gaul the "falces," great spars with curved steel heads like a sickle, mowed through the rigging and let down the sails on which alone the foe depended for movement.

But the fashion of building big ships received a severe shock at the battle of Actium (31 B.C.), when the light Liburnian "biremes," eluding the heavy missiles of the larger vessels, swept away their banks of oars, leaving them crippled and unable to move, till one by one they were burnt down to the water's edge and sank.[1] After this experience the Romans adopted the Liburnians as their principal model, and though the building of vessels with many banks continued for some centuries, yet the Liburnian type was so far dominant that the name was used generically, just as the name of trireme had been used before, to signify a man-of-war, without reference to the size of vessel or the number of banks of oars.

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[1] Merivale, *Hist. of Romans under the Empire*, c. 28.

Meanwhile, with the peace of the Mediterranean ensured, for piracy was kept in abeyance by the imperial power, and with increased commercial activity, the building of large merchant vessels naturally followed. These were propelled by sails and not by oars, which, however, continued to furnish the principal motive power for the ship of war until the necessity for increasing its carrying power began to make it too unwieldy for propulsion by rowing.

The great corn ships, which brought supplies from Egypt to the capital, were, if we may take the vessel described by Lucian as a typical instance, 120 cubits long by 30 broad and 29 deep. The ship in which St Paul and his companions were wrecked carried 276 souls besides cargo. Even larger vessels than these were constructed by the Romans for the transport of marbles and great obelisks to Italy. These huge vessels carried three masts, with square sails, and on the main mast a topsail, which the corn ships from Alexandria alone were allowed to keep set when coming into the Italian port. All other merchant vessels were compelled to strike the *supparum*.

But while the construction of large vessels for commercial purposes was thus developed, the policy of keeping the war-vessel light and handy for manœuvring purposes prevailed, and, though vessels of three, four or even five banks were still built, the great majority did not rise above two banks. In the war with the Vandals (A.D. 440–470) we hear of ships of a single bank, with decks above the rowers. These, we are told, were of the type which at a later date were called Dromons (δρόμωνες) in allusion to their speedy qualities, a name which gradually superseded the Liburnian, as indicating a man-of-war. During the following centuries the Mediterranean was the scene of constant naval activity. The rise of the Mussulman power, which by A.D. 825 had mastered Crete and Sicily, made the maintenance of their fleet a matter of first importance to the emperors of the East, and as the Arab inroads became more threatening, and piracy more rife, so the necessity of improving their galleys as regards speed and armament became more and more pressing. It was during this period, and that very largely by the Arabs, that a great advance was made in the employment of what we should call artillery. The use of Greek fire and of other detonating and combustible mixtures, launched by siphons or in the form of bombs thrown by hand or machinery, led to various devices by way of protective armour, such as leather or felt casing, or woollen stuffs soaked in vinegar, and all such contrivances tended gradually to alter the character as well as the equipment of the war vessel.

During the same period the rise and growth of the Venetian republic mark the entrance on the scene of a new seafaring and shipbuilding power.

Meanwhile, the northern seas were breeding a new terror. In the 5th century the Roman fleet which guarded the narrow entrance into the British Channel had disappeared. The Frankish power gradually established itself in Gaul. But behind the Franks still fiercer races, born to the use of oar and sail, were gathering for the invasion of the west and south. For a while it seemed as if the empire consolidated by Charlemagne would be able to withstand their inroads. Yet even in the year of his coronation (A.D. 800) the piratical Northmen had carried their ravages as far as Aquitaine. Charlemagne organized a naval force at Boulogne and at Ghent. But, though in alliance with the kings of Mercia and Wessex, he had not that control of the Channel which the possession of both shores had given to the Romans. The ships of the Vikings, propelled by oar and sail, were seagoing vessels of an excellent type. They were of various sizes, ranging from the *skuta* of about 30 oars to *ask* or *skeid* with 64 oars and a crew of 240, and to the still larger *dreki* or dragon boats, and the famous *snekkjur* or serpents, said to be represented on the Bayeux tapestry. Of these vessels we have fortunately, though of the smaller class, a typical instance in the well-known Viking ship discovered in 1880 in a tomb-mound at Gokstad near Christiania, of which the dimensions are given as: length 78 ft., beam 16 ft. 7 in., depth 5 ft. 9 in., with high stem and stern; clinker-built of oak throughout, with 16 oars on either side. Of this type were the vessels large and small which had by the 9th century or even earlier found their way into the Mediterranean. Such were the fleets which continually infested the northern and western coasts of Gaul, carrying swarms of the fierce Northmen who eventually came to stay, and gave their name to the portion of Neustria which they had wrested from the Frankish king (912). If, as is probable, the Danes who invaded England used the same class of vessel, Alfred the Great must, according to the *Saxon Chronicle*, be credited with improvements in construction, which enabled him to defeat them at sea (897). He built, we are told, vessels twice as long as those of the Danes, swifter, steadier and higher, some of them for 60 oars, and after his own design, not following either the Danish or Frisian types.

While the northern seas were thus full of activity and conflict, there was little repose in the Mediterranean. The emperors of the West do not seem to have maintained their fleets or naval stations as they had been of old. Ravenna and Misenum were shorn of their ancient glories. But in the East things were different. There, as we have said, it was fully perceived that the maintenance of the empire depended upon sea power. The *Tactica* of the Emperor Leo (886–911), followed by Constantine Porphyrogenitus (911–959), give us full details as to the composition of a Byzantine fleet and its units. *Dromons* of two sizes and of two banks of oars are described, and, besides these, smaller Dromons of great speed are referred to as "galleys or single-banked ships." In all these the rule was still "one oar, one man," but the way was being prepared for improvements by which the medieval galley, still preserving a comparatively low freeboard, was enabled to equal or to surpass the many-banked vessel in speed, while it was gradually adapted to carry greater weight and more powerful means of offence.

The medieval man-of-war was essentially a one-banked vessel (μονόκροτον), but the use of longer oars or sweeps took the place of the smaller paddling oars of the ancient vessel, and altered greatly the angle at which the oars reached the water. It was the increase in the length and weight of the oar, requiring for its efficiency greater power than that of one man, which led to the employment of more than one man to an oar. With the longer oar the necessity arose of placing the weight at a greater distance from the power applying the lever. This was gained by the invention of the *apostis*, which was practically a framework standing out on each side of the hull and running parallel to it; a strong external timber, in which the thowls, against which the oars were rowed, were set. By this means it became possible not only to arrange the oars horizontally, in sets of three or more of different lengths (*alla zenzile*), instead of in banks one above the other obliquely, but still further to make an innovation, unknown to the ancients, which, while greatly increasing the length and substance of the oar, and its leverage, applied the strength of three or four men (or even up to seven with the larger galleys and galleasses) for the motive power of each blade. As time went on oars of from 30 to 50 ft. came into vogue, the inboard portion of which was about one-third of the length, and furnished with handles (*manettes*) attached to the loom, while the men for each oar were arranged in steps (*alla scaloccio*).

It must not be imagined that these developments took place all at once, or that any improvements in building, or in the method of propulsion, were generally adopted but by slow degrees. Moreover, as commerce increased and merchant vessels gained in size, the necessity of being able to defend themselves against piratical attacks became more and more cogent, a necessity which ultimately led the way to the supersession of the galley by the sailing vessel. Yet the galley for centuries, especially in the Mediterranean, maintained its place as the ship of war *par excellence*, even when mixed fleets of galleys and sailing vessels were not uncommon. In the Atlantic and northern seas it was less *en évidence*, though even with the Spanish Armada some galleys and galleasses were included in the invading fleet.

The period of the Crusades was one of great activity in shipbuilding, in which the Venetians and the Genoese were the leaders in the Mediterranean, but the enterprise of England under Richard Cœur de Lion (1189–1199) shows that in the northern seas great efforts were being made in the same direction, with the undoubted result that the English nation became more familiarized with the sea, and more eager for maritime adventure. Richard's fleet which sailed from Dartmouth consisted of 110 vessels, and its total in the Mediterranean after reinforcement amounted to 230 vessels. Among these were Busses, or Dromons of large size, with masts and sails, ships of burden and triremes. Nor were the Saracens without great vessels, if the story of Richard's destruction of a three-masted vessel, carrying reinforcements to Acre, on board of which there were no less than 1500 men, be true. The attack of a swarm of galleys upon the great ship as she lay becalmed reads almost like the attack of a swarm of torpedo boats upon a disabled battleship to-day.

The whole period of the Crusades was, as regards naval matters, one of mixed fleets, in which the sailing vessels were mostly merchant vessels armed for fighting purposes. The effect of the Crusades upon the seafaring races of northern Europe was that the revelation of the East and its traffic quickened their desire for adventure in that and other directions. Hence rivalries between them and the Mediterranean sea powers, and consequent improvement in sea-going vessels and in seamanship. The steering side-paddle gradually disappears, and the rudder slung at the stern becomes the usual means of directing the vessel's course. The merchant vessels when prepared for war have fore-castles and stern-castles (compare the Roman *turres*) erected on them, of which the one survives in name, and the other in the quarter-deck of modern times. But a change was at hand which was destined to affect all classes, from the galley with its low freeboard to the *alta propugnacula* of the great sailing vessels.

The invention of gunpowder, and the consequent use of cannon on board ship, was the cause of many new departures in building and armaments. In the galleys we find guns mounted in the bows, and broadside on the upper deck, *en barbette*, firing over the bulwarks. Soon, however, the need of cover suggested portholes cut for the guns, just as in the ancient galleys they had been cut for the oars. The desire to carry many guns led to many alterations in build, such as the tumble-home of the sides, and the desire for speed to many improvements in rig, as well as to an increase in the number of masts and consequently larger spread of sail. About 1370–1380 French, Venetians and Spaniards are using the new artillery in action, and the policy of maintaining a navy composed of sailing vessels built for the purposes of war, and not merely of armed merchant ships impressed for the emergency, soon began to take effect.

In England Henry V. (1413) built large vessels for his fleet, "great ships, cogs, carracks, ships, barges and ballingers," some of which were of nearly 1000 tons, but the generality from 420 to 520 tons. In the list of his fleet no galleys seem to be included. Meanwhile in the south the type of vessel called "caravel" was being developed, in which Portuguese and Spaniards dared the Atlantic and made their great discoveries. It was in a vessel of this kind that Columbus (1492) sought to reach the Indies by a western route.[1] She was but little over 230 tons when fully laden. Her forecastle overhung the stem by nearly 12 ft. Aft she had a half deck and a quarter deck. Her total length was 128 ft., her beam nearly 26 ft. She had three masts and a bowsprit. Her fore and main masts were square-rigged, but the mizzen had a lateen sail. The vessels in which Vasco da Gama first doubled the Cape of Good Hope (1497) were of the same type but larger. The ship of John Cabot (1497) in which he discovered Newfoundland must have been much smaller, as he had a crew of only eighteen men.

Among the results of these world-famous voyages and discoveries was naturally a great increase in maritime adventure. In England during the Tudor times a great advance in shipbuilding is observable. Henry VII. with his new ships, the "Regent" and the "Sovereign," and Henry VIII. with his "Henry Grace à Dieu," or "Great Harry," both came abreast of their times, but it is worthy of notice that the French then, as well as at a later period, were providing the best models for naval architecture. These big ships were armed at first with "serpentines," and later with cannon and culverins. The representations of them show several tiers of guns, four or even five masts, and enormous structures by way of forecastles and deck-houses aft. As regards merchant vessels, the Genoese and the Venetians during the 15th and 16th centuries carried out great improvements. The "carracks" of the 16th century often reached as much as 1600 tons burden. There is a record of a Portuguese carrack captured by the English, of which the dimensions reached 165 ft. in length and 47 ft. in beam. She carried 32 pieces of brass ordnance and between 600 and 700 passengers. The Spanish Armada (1588) was composed of 132 vessels, of which the largest was about 1300 tons and 30 under 100 tons. Four galleys and four galleasses accompanied the fleet. The opposing fleet consisted of 197 vessels of which only 34 belonged to the royal navy. Of these the largest was the "Triumph" of about 1000 tons. The "Ark," the flagship of the English admiral, was of 800 tons, carrying 55 guns. Among the armed merchant vessels employed with the fleet was the "Buonaventure," the first English vessel that made a successful voyage to the Cape and India. The result to England of the defeat of the Spaniards was a great increase of mercantile activity. Merchants, instead of hiring Genoese or Venetian carracks, began to prefer building and owning home-built ships, and though the foreign merchant vessels appear to have been on a larger scale, yet, as sea-going craft, the English-built ships certainly held their own. We hear also during this period of many improvements in details, such as striking topmasts, the use of chain pumps, the introduction of studding, topgallant, sprit and top sails, also of the weighing of anchors by means of the capstan, and the use of long cables. In the men-of-war the lower tier of guns, which, as in the galleys, had been carried dangerously near the water-line, began to be raised. This improvement, however, does not seem to have been adopted in the English ships till after the Restoration. Meanwhile, in the Mediterranean the galley was still in vogue, being only partially superseded by the great galleasses, six of which are recorded to have taken part in the battle of Lepanto (1571), in which the Venetians and their allies employed no less than 208 galleys with single banks and long sweeping oars. The contrast between the conditions and the character of the vessels used in this battle and those engaged in the case of the Spanish Armada is interesting and instructive as typical of the different development of naval power in the inland and the open seas.

During the 17th century the expansion of trade and the increase of mercantile enterprise were incessant. The East India Company organized its fleet of armed vessels of about 600 tons, and fought its way through Portuguese obstruction to the Indian coast. The Dutch were also competing for the trade of the East and the West, and formed similar companies with this object in view. Conflicts owing to commercial rivalry and international jealousies were inevitable. Hence in the British navy the construction of large vessels such as the "Prince Royal" and the "Sovereign of the Seas" (see RIGGING), which may be considered as among the earliest types of the modern wooden man-of-war. English oak afforded the best timber for shipbuilding, and skilful naval architects, such as Phineas Pett, succeeded in constructing the kind of sea-going war vessel which eventually gave England the superiority in its struggle with other naval powers in this and the following century. This, however, was by no means easily gained. The Dutch and the French were not slack in the building of merchant vessels and men-of-war. The capture of vessels from time to time on either side served to enlarge the area of improvement and to assist in the progress of the art of construction. The French navy especially, under the fostering care of Colbert, was greatly strengthened. During the 18th century it was constantly found that the dimensions of French ships exceeded those of British ships of the same date, and that French vessels were superior in speed. This led from time to time to an increase of the measurements of the various classes of vessels in the British navy. These were now rated according to the number of guns which they were constructed to carry.

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[1] See Sir G. V. Holmes, *Ancient and Modern Ships*, i. 87, to which the writer is indebted for many of the details concerning modern vessels.

A 90-gun ship of the line at the beginning of the 18th century averaged 164 ft. in length of gun deck, 47 ft. beam, and about 1570 tons, while the frigates now ran to 120 ft. with 34 ft. beam and from 600 to 700 tons. These dimensions, however, were not always maintained, and towards the middle of the century the Admiralty seem to have recognized the consequent inferiority of their ships. The famous and ill-fated "Royal George," launched in 1756, was the result of an effort to improve the line-of-battle ship of the period. She was 178 ft. in length, 52 ft. in beam, was of over 2000 tons, and carried 100 guns and a crew of 750 men. The "Victory," Nelson's flagship, was built nearly ten years later. Her dimensions were 186 ft., 52 ft., 2162 tons, and she carried 100 guns. During the same period frigates, which were cruisers carrying their armament on one deck, were built to carry 32 or 36 guns, but in this class also the French cruisers were superior in speed and of larger dimensions. The remainder of the 18th century and the beginning of the 19th witnessed a continuous rivalry in naval architecture, the French and Spanish models being constantly ahead of the British in dimensions and armament. In the American war (1812) the same disparity as regards dimensions became apparent, and the English frigates, and sloops used as cruisers, were generally outclassed, and in some instances captured, by American vessels of their own rate. This as usual led to the construction of larger vessels with greater speed, and though, after the conclusion of the long war, the activity of the royal dockyards slackened, yet the great three-deckers of the last period, before the adoption of steam power, had reached a length of over 200 ft., with more than 55 ft. beam, and over 3000 tons.

Meanwhile the mercantile navies of the world, but more especially of England, had largely increased. The East Indiaman, as the armed vessels of the East India Company were called, really performed the functions of merchant vessel, passenger ship, and man-of-war. But, where there was no monopoly, competition soon quickened the development of trading vessels. The Americans with their fast-sailing "clippers" again taught the English builders a lesson, showing that increased length in proportion to beam gave greater speed, while admitting of lighter rigging in proportion to tonnage, and of economy as regards the number of men required to work the ship. The English shipyards were for a long time unequal to the task of producing vessels capable of competing with those of their American rivals, and their trade suffered accordingly. But after the repeal of the Navigation Laws in 1850 things improved, and we find clippers from Aberdeen and from the Clyde beginning to hold their own on the long voyages to China and elsewhere.

At this epoch steam power appears in use on the scene, and the period of great wooden vessels closes with iron and steel taking their place in the construction of the hulls, while the sail gives way to the paddle and the screw.

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II. HISTORY SINCE THE INTRODUCTION OF STEAMSHIPS

Before steam was applied to the propulsion of ships, the voyage from Great Britain to America lasted for some weeks; at the beginning of the 20th century the time had been reduced to about six days, and in 1910 the fastest vessels could do it in four and a half days. Similarly, the voyage to Australia, which took about thirteen weeks, had been reduced to thirty days or less. The fastest of the sailing tea-clippers required about three months to bring the early teas from China to Great Britain; in 1910 they were brought to London by the ordinary P. & O. service in five weeks. Atlantic liners now run between England and America which maintain speeds of 25 and 26 knots over the whole course, as compared with about 12 knots before the introduction of steam. The accommodation in the modern passenger ships is palatial compared with that in the corresponding wooden sailing ships of the middle of the 19th century.

The changes from sail power to steam power for propulsion, and from wood to iron and steel for constructional purposes, proceeded together, though at first very slowly. The marine steam engine was at first a very imperfect motor, and the services upon which steamships could be used to advantage were, in consequence, much restricted. There was, moreover, a national prejudice against the substitution of iron for "the Wooden Walls of Old England."

Introduction of iron.

It is recorded that an iron boat, intended apparently for passenger service, was built and launched on the river Foss, in Yorkshire, in 1777, and shortly afterwards iron was used for the shell plating of lighters for canal service. One of these, having its shell constructed of plates five-sixteenths of an inch thick, was built near Birmingham in 1787. About the same time parts of wooden ships began to be replaced by iron, the first being beam knees. Early in the 19th century iron "diagonal riders" for providing the longitudinal strength were introduced by Sir Robert Seppings, and from this period down to the present day iron strengthenings for resisting both transverse and longitudinal strains have been generally used in wooden ships. The introduction of iron as a recognized material for ship construction is often given as dating from 1818, when the lighter "Vulcan" was built on the Monkland canal, near Glasgow.

Among the early objections were: (1) from its weight iron could not be expected to float, and was therefore unsuitable for the construction of a floating body; (2) when a ship constructed of this material grounded and was exposed to bumping on a shore, the bottom would be easily perforated; (3) the bottom could not be preserved from fouling by weeds and barnacles; and (4) the iron affected the compass, making it untrustworthy, if not useless. Gradually, however, the material made its way, and the objections to it proved to be for the most part untenable. Objection (1), although often repeated, was proved to involve a fallacy. With regard to objection (2) it was found that iron ships might ground and be subjected to a great deal of bumping and rough usage without being destroyed, and that, on the whole, they were better off in this respect than wooden ships. On more than one occasion when iron and wooden ships were stranded together by the same gale and in approximately the same circumstances, the iron ships were got off, and, apart from local injury, were found to be little the worse for the grounding, while the wooden ships were either totally wrecked, or, if got off, were strained to such an extent as to be beyond repair. The power of resistance of iron ships to the strains produced by grounding received, in 1846–1847, a remarkable confirmation in connexion with the grounding of the "Great Britain," the first large screw steamer built of iron. This ship had been initiated by, and built under the supervision of, Mr I. K. Brunel, who had bestowed much attention upon the details of her construction. In 1846 she ran ashore in Dundrum Bay, in Ireland, and settled on two detached rocks; and although she remained aground for eleven months, including a whole winter, she was subsequently got off and repaired, and afterwards did good service. As regards (3), the fouling of the bottom, this evil, although not preventable, can be lessened materially by frequent cleaning and repainting, provided, of course, that docks are available. The fourth objection, the effect of iron on the compass, was very serious. After experimenting with the "Rainbow" at Deptford and the "Ironsides" at Liverpool, Sir G. B. Airy in 1839 read a paper on the subject before the Royal Society, and the rules which he gave for the correction of the error caused by the iron at once became the guide for future practice. Besides the above, a further objection was raised which applied only to warships, namely, the nature of the damage which would be done to an iron ship by the enemy's shot: this also was found to be less serious, when proper appliances were supplied, than the damage done in the same circumstances to a wooden ship. Thus during the Chinese War in 1842 the "Nemesis," an iron vessel, was able to repair her damage from shot in twenty-four hours at the scene of the fight, while some wooden ships had to go to Bombay, the nearest port at which repairs could be carried out.

Introduction of steel.

Steel, as a material for shipbuilding, was introduced under modern conditions of manufacture during the years 1870–1875. It is a homogeneous metal, stronger than iron, and of a more uniform and more trustworthy character. Its quality is to a considerable extent independent of the skill of those employed in its manufacture, whereas iron is produced by a laborious and unhealthy process, and is largely dependent for its quality on the skill of the workmen. Among the advantages which experience has proved iron and steel to possess over wood for the purposes of ship construction are: (1) the structure of the ship has less weight; (2) it has greater durability; (3) the requisite general and local strengths are much more easily obtained.

The importance of the first of these advantages can scarcely be overstated. The primary object of a particular ship is to carry cargo or passengers, or both, from place to place, at a given speed (in the case of a warship, the armament, ammunition, armour, &c., constitute the weight to be carried); and since at the maximum draught at which the vessel can properly and safely proceed on her passage the total weight of vessel, cargo, &c., complete, must be a definite quantity, namely, the weight of the water displaced by the ship, it follows that the less the weight required for the structure of the ship, the greater is that available for the cargo, &c.

As to durability, in wooden ships the chief source of deterioration is dry-rot, in iron or steel ships the wasting of the surfaces, especially of such portions of the outer surfaces of the bottom plating as are frequently left bare of paint and exposed to the sea, and of the inner surfaces of the bottom in machinery spaces, &c. If dry-rot can be prevented, the life of the wooden ship will be lengthened; so also will the life of the iron or steel ship if the surfaces can be kept covered with paint, to prevent the corrosive action of air and water. With both wood and iron or steel ships, if the parts which have become deteriorated can be removed and replaced, this is usually worth doing when the deterioration is only local. At the end of the 18th century the preservation of wood was not so well understood as it is at the present day, and teak, one of the most durable of woods, was, in Great Britain at least, little known. The ships for the Royal Navy as then constructed were only expected to be available for service some fifteen or twenty years. The ships built for the East India Company made, on an average, four voyages, which occupied eight years. This at one time was considered the vessel's life, so far as the Company's service was concerned; but subsequently, if on examination at the expiration of that time they appeared worth repairing, this was done, and they were allowed to make two more voyages. It was unusual for one of these ships to make more than six voyages; after this they were sold or broken up.

In certain cases, however, ships lasted a considerable length of time; a number of vessels built in the 17th century continued in the service of the Royal Navy until the middle of the 18th century, though with a reduced number of guns, and specimens of the old wooden battleships which served in the fleet in the earlier part of the last century are still to be found in the naval and other ports as training vessels, hospital ships, &c. The best-known example is Nelson's "Victory" (fig. 1, Plate XIII.). Laid down in 1759, she had been afloat 40 years before she took part in the battle of Trafalgar, and to-day flies the flag of the commander-in-chief at Portsmouth. Of small wooden merchant vessels there are instances of the attainment of very remarkable ages. Lloyd's Register for 1909–1910 shows one sailing vessel, the "Olivia" of 94 tons, as having been built as early as in 1819, two vessels built in the 'twenties, and twelve built between 1830 and 1840. The collier brig "Brotherly Love," of South Shields, was over one hundred years old when she was broken up; and the schooner "Polly" built in 1805, was still sailing in 1902; as also was the brig "Hvalfisken," built at Calmar in Sweden in 1801. The dimensions of the last vessel are: length, 88 ft. 8 in.; breadth, 21 ft. 2 in.; depth of hold, 14 ft. 7 in.; and her ~~gross~~ tonnage, 211. The oldest vessel afloat in 1910 was said to be the Danish sloop "Constance"—a small wooden sailing vessel built in 1723 and still employed in the coasting trade of Denmark. This vessel is 52 ft. 6 in. long, 14 ft. 8 in. beam, 6 ft. 8 in. depth in hold and of 35 tons gross.

In the cases of these very old wooden vessels it should be remembered that many portions of the original structures have been replaced by continual repairs. We have less experience concerning the life of iron and steel ships when taken care of, and in most instances ships have been condemned and broken up only because they were obsolete; but after twenty or even forty years' service, those parts which by accident or intention had remained properly covered and protected were found very little the worse for wear. Thus the inner surface of the outside plating of such vessels, coated with cement, have been found to be in as good condition as when the ships were first built. The hulls of many of the early iron vessels still afloat are known to be in excellent condition. The "Himalaya," an iron vessel of 3453 tons and 700 h.p., 6 guns, length 340 ft. 5 in., breadth 46 ft. 2 in., depth 24 ft., built by Mare of Blackwall in 1853 for the P. & O. Steam Packet Co., and purchased by the Admiralty, was actively employed, chiefly as a troop-ship, until 1896, when she was converted into a coal depot, it being found that her plating and framing were almost as good as new. Known as "C. 60," she seemed likely in 1910 to survive for many years in her new service. The "Warrior"—the first British iron battleship, built in 1861, was converted into a floating workshop forty years later at Portsmouth, where in 1910 she was known as "Vernon III." The hull and framing of the vessel were then practically as sound as when first put together. Experience up to 1910 with vessels built of mild steel indicates that this is more liable to surface corrosion than iron, especially where exposed to the action of bilge water and coal ashes in boiler rooms. Some owners on this account require the plating for the tank tops under the boilers to be of iron in vessels otherwise built of mild steel, although the iron is inferior in strength and costs more than the mild steel.

That general and local strength are more easily obtained in an iron or steel ship than in a wooden one follows partly from the fact that the weight required for the structure is less in the former than in the latter, and also from the fact that iron and steel are more suitable materials for the purpose. They can be obtained in almost any desired shape, the parts can be readily united to one another with comparatively little loss of strength, and great local strength can be provided in very little space.

For some purposes, and in some markets, wood is still in favour. In scientific expeditions to the Polar regions, it is of the highest importance to avoid any disturbance of the compass, and this can be ensured by constructing the vessel of wood, with metal fastenings. The "Fram," built in 1892 for Nansen's Arctic expedition, was of wood, her outside planking, in three thicknesses, amounting in the aggregate to from 24 in. up to 28 in.; she was 117 ft. long, rigged as a three-masted schooner, and provided with auxiliary machinery working a screw propeller. The "America," fitted out for the Ziegler expedition to the North Pole, was an old Dundee whaler (the "Esquimaux"), and was reported to be still a "stout" ship with timbers as sound as on the day they were put in thirty-six years before. She is 157 ft. long, 29½ ft. beam, 19¼ ft. deep, net tonnage 466; her engines have a nominal horse-power of 100, and she has a lifting screw. In 1901 the "Discovery," a wooden vessel, 172 ft. in length, was built at Dundee for Antarctic exploration, under Captain Robert Scott, R.N.,[1] and a wooden vessel for similar service was constructed in Germany, and in 1910 the "Terra Nova" (Plate I., fig. 2), a wooden Dundee whaler, 187 ft. long, barque-rigged and fitted with auxiliary steam power, which had already seen service in the Far South, carried to the Antarctic regions an expedition also led by Captain Scott. Some wooden sailing vessels are still built in the United States and employed in the coasting and other trades. One of these, the "Wyoming," the largest wooden sailing vessel ever built, was launched in December 1909 at Bath. She was a six-masted schooner 350 ft. long, 50 ft. wide and 30 ft. deep. Wood is also in favour for most of the large and palatial river steamers of the Western states of America.

Steam propulsion.

Some progress had been made in the introduction of steam propulsion before the end of the 18th century, but the advance became more rapid in the 19th. In the early steam vessels paddle-wheels only were used for propulsion.

In 1801–1802 the "Charlotte Dundas," one of the earliest steam vessels, was constructed by Symington in Scotland. She proved her capability for towing purposes on the Forth and Clyde canal. Fulton now made his experiments in France, and after visiting Scotland and witnessing the success of the "Charlotte Dundas," constructed the "Clermont" on the Hudson river in America in 1807. The engines for this vessel were obtained from Boulton & Watt, of England. She ran as a passenger boat between New York and Albany, and at the end of her second season proved too small for the crowd that thronged to take passage in her. In 1809 the "Phoenix" made the passage from Hoboken, in New Jersey, to Philadelphia, and was thus the first steamer to make a sea voyage. In 1812 Bell began running his steamer "Comet," with passengers, between Glasgow, Greenock and Helensburgh: she was 42 ft. long, 11 ft. broad, $5\frac{1}{2}$ ft. deep, and her engine had one cylinder 11 in. in diameter, with a 16-in. stroke. Owing to the success achieved by these and other vessels in America and Great Britain, steamers soon began to make their appearance on many of the principal rivers of the world. Early in 1814 there were five steamboats on the Thames, and the steamboat "Margery," built on the Clyde, was brought through the Forth and Clyde canal and round by the east coast to the Thames. In the same year a writer in the *Gentleman's Magazine* was able to say: "Most of the principal rivers in North America are navigated by steamboats; one of them passes 2000 m. on the great river Mississippi in twenty-one days, at the rate of 5 m. an hour against the descending current." In 1816 the first steam passenger-boat ran across the English Channel from Brighton to Havre, and a line of steamers was started to run between New York and New London. All of these vessels were built of wood; but in 1820 the first iron steamship, the "Aaron Manby," was constructed and employed in a direct service between London and Paris. In 1822 a return was made to the House of Commons showing the times occupied by steamers as compared with sailing vessels on some thirty coasting routes; the average speed given for steamers in the best of these was from eight to nine knots, while the average time taken varied from one-half to one-sixth (or even less) of the time taken by the sailing vessels.

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[1] A very complete account of this vessel was given by her designer, Mr W. E. Smith, C.B., in the *Transactions of the Institution of Naval Architects* (1905).

Steam vessels were employed at a very early date upon the mail services, for besides being very much quicker than the sailing vessels, they were practically independent of the direction of the wind, and to a considerable extent of the weather; consequently the regularity of their passages contrasted very favourably with the irregular times kept by the sailing vessels. The mail service across the Irish Channel, between Holyhead and Dublin, was especially uncertain in the days of the sailing packets, frequently occupying three or four days, and occasionally as much as seven and nine days. All this was altered when in 1821 the steamers "Royal Sovereign" and "Meteor" were placed on the service. The advantages were so apparent that steam mail packets between Great Britain and the Continent, and on many other services, were soon established. The mail boats had been for many years owned by the crown, but in 1833 the carrying of the mails to and from the Isle of Man, and between England and Holland and Hamburg, was entrusted to private companies. Marked improvement in the services, and especially in the boats employed, resulted from the competition to secure the distinction and other advantages of carrying His Majesty's mails. An intermediate stage followed, extending over a comparatively short period, during which the crown still held many of the mail boats, while in a considerable number of cases the mail services were let to private companies. After this the British government abandoned altogether the policy of being the owners of the boats, and the mail services have since been competed for by private companies.

The "Savannah" was the first steamship to cross the Atlantic. She ran from Savannah to Liverpool in 1819 in twenty-five days, under steam, however, only for a portion of the time. She was built at New York as a sailing ship, but before launching was fitted with steam power, the paddle-wheels being arranged to be removed and placed on deck when not required. She was 130 ft. long, 26 ft. broad, $16\frac{1}{2}$ ft. deep and of about 380 tons. The success of the "Enterprise," of 470 tons, which made the voyage from London to Calcutta by the Cape of Good Hope in 1825 in 103 sailing days, is noteworthy. The distance is 11,450 nautical miles, and the vessel was under steam for 64 days and under sail for 39 days. The steamer afterwards (1829–1830) made the trip between Bombay and Suez in 54 days, in furtherance of a scheme to reach the former place from London by the Red Sea route. The year 1838 witnessed the successful transatlantic voyages of the steamers "Sirius" and "Great Western." The latter vessel, built under the advice of I. K. Brunel, the engineer of the Great Western Railway Company, was the first steamer actually constructed for the transatlantic service. She was built of wood, her dimensions being—length 212 ft., breadth $35\frac{1}{2}$ ft., depth $23\frac{1}{4}$ ft. and tonnage 1340 B.O.M.; and her total displacement on a draught of 16 ft. 8 in. was 2300 tons. Although not originally built for the service, the "Sirius" was subsequently placed on it at the recommendation of Mr M'Gregor Laird of Birkenhead. This vessel also was built of wood, and was 178 ft. long, $25\frac{1}{2}$ ft. broad, $18\frac{1}{4}$ ft. deep and her tonnage was 703. Mr Laird's arguments in favour of placing the vessel on the transatlantic service throw light on the steaming capabilities of vessels of that day. He pointed to the steamers "Dundee" and "Perth" making 11 m. per hour, "in all weathers, winter and summer, fair and foul"; and to the other vessels making from 10 to $10\frac{1}{2}$ m. per hour. He based his estimate for the coal required on the voyage on a speed of 10 m. per hour and a coal consumption of 30 tons per day, which gave 525 tons for the whole voyage. Finally, he allowed 800 tons, corresponding to the difference of the displacement at 15 ft. load draught and at 11 ft. light draught, so that he had a margin of 275 tons for contingencies.

Jet propulsion.

All the vessels just named were propelled by paddle-wheels. The screw propeller had been advocated as a means of propulsion by many inventors in England, France and America during the latter half of the 18th and the early part of the 19th century; a number of experiments had been made, but these had not been brought to a successful issue, as no suitable steam engine was available for driving the propeller. Benjamin Franklin, in 1775, drew attention to the inefficiency of side paddle wheels as a means of propulsion, and proposed as an alternative to set the steam engine to pump water in at the bow and force it out at the stern, the water passing along a trunk. In 1782 a boat 80 ft. long, fitted with this means of propulsion by James Rumsey, was driven at 4 m. an hour on the river Potomac, and a number of other vessels similarly fitted followed. In 1839 Dr Ruthven took out a patent for this method of propulsion in which the piston pump was replaced by a centrifugal pump; and in 1865 the "Nautilus," a vessel of this type, so impressed the British Admiralty of the day that an armoured gunboat—the "Waterwitch"—was provided with this system of propulsion. She was built of iron, 162 ft. long, 32 ft. broad, 13 ft. 9 in. deep, was double-ended and fitted with bow and stern rudders, but was otherwise similar to the armoured gunboat "Viper" built at the same time and fitted with a screw propeller. Many trials were carried out with the "Waterwitch" and "Viper," but the system adopted in the former was not repeated because of the great advances made in connexion with the screw propeller.

The screw propeller.

Many useful experiments appear to have been carried out by Colonel John Stevens in the United States in the early years of the 19th century, but, although some beautiful models of propellers made by him still remain, the system was not generally adopted until its commercial possibilities were more successfully demonstrated by Captain John Ericsson—formerly an officer in the Swedish army—and F. P. Smith of England. Smith took out his patent for the propulsion of ships by means of a screw fitted in a recess formed in the deadwood, in May 1836, and in July of the same year Ericsson, then practising as a civil engineer in London, took out his patent. Small vessels were built and fitted by both inventors and both were tested in the Thames. In 1838 Captain Robert F. Stockton, on behalf of the U.S. Navy, ordered two iron boats of Messrs Lairds of Birkenhead, to be supplied with steam engines and screw propellers of Ericsson's design. The first boat was named the "Robert F. Stockton," and arrived at New York under sail early in 1839, with her machinery on board. The machinery was fitted in her at Bordentown, and under the name of "New Jersey" the boat afterwards served as a tow boat on the river Delaware. She was 70 ft. long, 10 ft. beam and 6 ft. 9 in. draught, and could steam about 10 m. an hour. Ericsson had the satisfaction of seeing his plans very largely adopted in the American Navy, but the mercantile marine adhered with great pertinacity to the paddle-wheel.

Fincham, writing in 1851, says that in England engineers were reluctant to admit the success of the screw propeller, and adds: "A striking instance of prevailing disinclination to the screw propeller was shown on the issue of a new edition of the *Encyclopaedia Britannica*, in which the article on steam navigation contained no notice whatever of the subject."

Smith, however, persevered, and with the assistance of some influential people of the day—notably Messrs Rennie & Co.—formed the *Ship Propeller Company*, and in 1838 built the "Archimedes," a vessel of 237 tons burthen, to illustrate the value of the plan. The length of the vessel was 106 ft. 8 in., breadth 21 ft. 10 in., depth in hold 13 ft., draught of water 9 ft. 6 in., h.p. 80 nominal, but only 66 could be developed. A speed of about $7\frac{1}{2}$ knots could usually be maintained, but on one run of 30 m. under very favourable circumstances a speed of 10·9 m. was reported. In 1840 she was placed at the disposal of the Admiralty for experiment, and the trials were favourably reported on. She afterwards passed into the hands of Brunel, who was so satisfied with the results of further trials that he modified the design of the "Great Britain" steamship then in hand (1843), and fitted her with a screw propeller instead of paddle-wheels as originally intended. The success of this and other vessels was sufficient to largely influence public opinion in favour of the propeller, and the Admiralty took the important step of building the "Rattler," a vessel of 888 tons and 200 H.P., to test the system. She was practically a repeat of the "Alecto," as far as her hull and the power of her machinery were concerned, but she was propelled by a screw propeller, whereas the "Alecto" was propelled by paddle-wheels. These vessels were tested together at sea in March 1845, when the "Rattler" proved the faster vessel; but the great test took place on Thursday, 3rd April following, when the two vessels were secured stern to stern, and it was found that with the engines of both ships working at full power the "Rattler" towed the "Alecto" astern at a speed of 2½ knots.[1] In a few years the screw almost entirely superseded the paddle-wheel for war vessels, and in 1854, during the war with Russia, Great Britain possessed a screw steam fleet, including all classes of ships, built of wood.

Improvements in machinery.

The performances of the *Great Western* and other vessels had demonstrated that ships could traverse the oceans of the world by steam power alone, but great advance had to be made in the marine engine before the ordinary trade could be carried on by its means with economy. In the early marine engines only one cylinder was provided, and various means were employed for transmitting the power to the paddle shaft; later came the oscillating cylinder engine and the diagonal engine, the latter being the type of paddle engine now most frequently adopted in Great Britain. With the introduction of the screw propeller the arrangements became much modified. At first the engines were run at comparatively low speeds, as in paddle-boats, gearing being supplied to give the screw shaft the number of revolutions required, but direct-acting two-cylinder engines gradually replaced the geared engines. The compound engine was first adapted successfully to marine work by John Elder in 1854, and in time direct-acting vertical engines, with one high and one low pressure cylinder, became the common type for all ships. The boiler pressure, moreover, in 1854, had been raised to 42 lb per sq. in. The further change, accompanying still higher pressures of steam, from compound to triple-expansion engines was, like many other changes, foreseen and in some measure adopted by various workers at about the same time, but the first successful application of the principle was due to Dr A. C. Kirk. In 1874 he fitted a three-crank triple-expansion engine in the *Propontis*. The boiler used proved a failure, but in 1882 he fitted a similar set of engines in the *Aberdeen*, with a boiler pressure of 125 lb, and the result was entirely successful.

Continuous improvements have enabled engineers to produce machinery of less and less weight for the same power, and at the same time to reduce the spaces required for its accommodation, the vibration due to the working of the engines, and the consumption of fuel per horse power. For engines of high power, quadruple expansion has sometimes been adopted, while scientific methods of balancing have been employed, improved qualities of steel and bronze have been introduced, the rate of revolution has been increased, and forced lubrication fitted. In the boilers higher steam pressures have been used, superheating in some cases being resorted to; the rate of combustion has been accelerated by supplying air under pressure in the stokehold or in the furnaces, and in some cases by placing fans in the exhaust to draw the air and products of combustion more rapidly through the fires; the former being known as *forced draught* and the latter as *induced draught*. In the Navy, with the view of saving weight, water-tube boilers have been adopted, but boilers of this type have not yet been generally fitted in the mercantile marine. Steam pressures now in common use vary from 100 to 180 lb per sq. in. in cargo ships; from 140 to 220 lb in passenger ships, including the large Atlantic liners; from 210 to 300 lb in large warships where water-tube boilers are used; while in destroyers and other classes of warships in which small tube water-tube boilers are used it varies from 180 to 250 lb per sq. in.

A century ago the reciprocating steam engine was slowly making its way as a means of propulsion as an auxiliary to, or as a substitute for sail power—the steam being obtained by burning wood or coal. In 1815 nine small steam vessels, having an aggregate tonnage of 786 tons, were built and registered in the United Kingdom; in 1825 24 steam vessels were built, having an aggregate of 3003 tons; in 1835 86 vessels were built, having an aggregate of 10,924 tons. In 1910 the reciprocating steam engine, after reaching a very high degree of perfection and universal adoption, was being largely replaced by the turbine, coal was being replaced to a considerable extent by oil as a fuel for raising steam, and steam itself was being challenged as a motive agent by the development of the internal combustion engine.

III. STATISTICS

Decrease of sailing tonnage.

For some years before 1870 the total tonnage of sailing ships built each year in the United Kingdom had been about equal to that of steam ships, but then a great change took place; 541 sailing vessels, amounting to 123,910 tons, were added to the register of the United Kingdom, while 433 steam ships, amounting to 364,860 tons, were added; the steam tonnage thus added being nearly three times that of sailing vessels. A uniform rate of increase of production of steam vessels was on the whole maintained after 1870, but, as will be seen by referring to Table I. and fig. 3, considerable fluctuations have occurred, the falling off in steam tonnage being simultaneous with increases of sailing tonnage and vice versa down to 1895. The dotted lines on fig. 3 show approximately the average output for 50 years of sailing and steam tonnage separately and combined. Roughly speaking, it may be said that from 1860 to 1895 the output of sailing tonnage fell from about 200,000 tons per annum to 100,000 tons; during the later 'nineties the falling off was more rapid, and between 1900 and 1910 the output varied between 15,000 and 30,000 tons.

Average size of sailing vessels.

The average tonnage of the sailing vessels built in the United Kingdom in 1860 was 206 tons; this increased with a fair degree of regularity to 532 tons in 1890, 749 tons in 1891 and 963 tons in 1892, after which a rapid decrease took place, and by 1898 the average size had fallen to 75 tons; there were fluctuations after this date, but the average never rose above 163 tons; and these vessels are practically restricted to the coasting trade and pleasure purposes.

Although the building of large sailing vessels of wood and steel has almost ceased in the United Kingdom, the sizes of the largest of such vessels built abroad have continued to increase. Under the influence of the shipbuilding bounties granted in France between 1895 and 1902 something like 150 sailing vessels of from 2000 to 3500 tons each were built, but few since. In Germany and in America a few large sailing vessels continue to be built.

Growth of steam tonnage.

Lloyd's Register for 1841 gives a table of "the Steam Vessels belonging to England, Scotland and Ireland in the years 1814 to 1839," which shows that in 1839 there were 720 vessels of a total tonnage of 79,240 tons owned in the United Kingdom. Between 1839 and 1860 considerable numbers of steam ships were built for various services, and the production from 1860 is shown by fig. 3 and Table I. The tonnage added to the Register in 1860 amounted to 93,590 tons, rising over four years to 293,140 tons in 1865; after a gradual decline extending over three years to 100,000 tons it again rose till 1872, when nearly 500,000 tons were added. In 1876 it had fallen to about 200,000 tons; then came the great rise extending to 1883, when it reached a maximum of 885,495 tons. A rapid decrease followed, and in 1886 it had fallen practically to what it had been ten years before. In another three years the figure was again what it had been in 1883; and for a period of seventeen years, with much smaller fluctuations than previously, great increases were maintained. In 1906 a maximum of 1,428,793 tons was reached, when another rapid fall occurred —over two years—the minimum reached being 600,837 tons in 1908. The fluctuations in output, shown by fig. 3, synchronize approximately with the improvements and depressions in trade.

Average size of steam ships.

The average tonnage of British steam vessels rose slowly from 80 tons in 1815 to 102 tons in 1830, and to 473 tons in 1860, reaching a maximum of 1442 tons in 1882. During the next four years it fell gradually to 896 tons, rising again to 1515 tons in 1890, and the average tonnage built since 1890 has remained, with a certain amount of fluctuation, nearly 1500 tons. These figures may be taken as roughly representing the average tonnage of the ships produced throughout the world; but as in these averages large numbers of comparatively small vessels are included, the vast increase in the numbers of large-sized vessels which have been built, especially during recent years, is not adequately represented. Of the vessels built in 1890 only 1 % exceeded 8000 tons in displacement, whereas the vessels of over 8000

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[1] The original propeller used by the "Rattler" is now to be seen in the Victoria and Albert Museum.

TABLE I.—*Showing the Number, Tonnage (Gross and Average), and Description of all Vessels (excluding Warships) built in and added to the Register of the United Kingdom during each year enumerated.*

Year.	Mode of Propulsion.	Wood and Composite.		Iron.		Steel.		Totals.		Average Gross Tonnage.
		No.	Gross Tonnage.[1]	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	
1860	Sail . . .	786	154,130	32	14,290	. .	. .	818	168,420	206
	Steam . .	49	7,050	149	86,540	. .	. .	198	93,590	473
1865	Sail . . .	806	160,430	116	88,970	. .	. .	922	249,400	270
	Steam . .	38	5,780	344	287,360	. .	. .	382	293,140	767
1870	Sail . . .	478	72,970	63	50,940	. .	. .	541	123,910	229
	Steam . .	51	7,290	382	357,570	. .	. .	433	364,860	843
1875	Sail . . .	373	46,060	193	206,110	. .	. .	566	252,170	446
	Steam . .	66	8,740	291	281,390	. .	. .	357	290,130	813
1880	Sail . . .	273	18,159	39	40,015	4	1,671	316	59,845	189
	Steam . .	20	1,779	362	447,389	26	36,493	408	485,661	1190
1885	Sail . . .	266	17,841	144	160,034	27	30,569	437	208,444	477
	Steam . .	37	2,751	177	148,508	122	154,249	336	305,508	909
1890	Sail . . .	142	7,704	6	5,911	59	96,374	207	109,989	532
	Steam . .	26	1,326	110	40,144	432	817,010	568	858,480	1515
1891	Sail . . .	156	8,541	3	1,544	93	178,593	252	188,678	749
	Steam . .	25	1,212	167	31,381	388	730,051	580	762,644	1315
1892	Sail . . .	151	8,372	6	5,121	128	260,874	285	274,367	963
	Steam . .	19	1,026	86	18,937	365	660,847	470	680,810	1449
1893	Sail . . .	154	7,980	4	418	66	113,097	224	121,495	542
	Steam . .	27	1,551	64	12,458	328	622,099	419	636,108	1518
1894	Sail . . .	155	7,570	3	207	67	83,167	225	90,944	404
	Steam . .	26	1,183	65	12,400	389	751,668	480	765,251	1594
1895	Sail . . .	150	7,529	9	782	32	41,313	191	49,624	260
	Steam . .	35	1,579	66	9,879	379	736,412	480	747,888	1558
1896	Sail . . .	161	7,519	5	792	36	37,709	202	46,020	228
	Steam . .	17	591	79	11,593	398	750,106	494	762,290	1543
1897	Sail . . .	183	8,317	2	232	34	28,481	219	37,030	169
	Steam . .	33	1,581	63	9,974	366	658,646	462	670,201	1451
1898	Sail . .	196	8,813	6	798	40	8,456	242	18,067	75
	Steam . .	20	765	80	13,654	546	996,814	646	1,011,233	1565
1899	Sail . . .	165	7,342	2	182	60	11,757	227	19,281	85
	Steam . .	29	1,497	64	12,184	534	1,152,999	627	1,166,680	1861
1900	Sail . . .	159	8,718	5	420	46	8,598	210	17,736	84
	Steam . .	64	3,809	86	16,375	476	1,102,890	626	1,123,074	1794
1901	Sail . . .	146	7,826	2	174	54	22,118	202	30,118	149
	Steam . .	83	5,479	14	2,474	469	1,115,227	566	1,123,180	1984
1902	Sail . . .	142	7,479	. .	. .	63	25,985	205	33,464	163
	Steam . .	71	4,098	32	5,870	476	1,109,511	579	1,119,479	1933
1903	Sail . . .	139	7,637	. .	. .	60	15,077	199	22,714	114
	Steam . .	68	4,034	3	537	538	943,333	609	947,904	1556
1904	Sail . . .	161	8,626	. .	. .	51	15,166	212	23,792	112
	Steam . .	52	2,961	5	827	519	1,016 324	576	1,020,112	1771
1905	Sail . . .	130	7,962	. .	. .	36	7,125	166	15,087	91
	Steam . .	45	1,840	2	147	567	1,204,293	614	1,206,280	1964
1906	Sail . . .	104	5,731	2	330	42	8,810	148	14,871	100
	Steam . .	110	6,242	1	79	660	1,422,472	771	1,428,793	1853
1907	Sail . . .	121	7,017	. .	. .	45	8,228	166	15,245	92
	Steam . .	196	15,069	. .	. .	629	1,182,566	825	1,197,635	1452
1908	Sail . . .	108	4,931	1	97	58	18,468	167	23,496	141
	Steam . .	142	9,056	1	483	415	591,298	558	600,837	1077
1909	Sail . . .	75	3,362	. .	. .	44	11,020	119	14,382	121
	Steam . .	92	3,880	. .	. .	383	752,424	475	756,304	1592

The above table is based upon information supplied to Lloyd's Registry by the Registrar-General of Shipping.

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[1] As no actual returns are available for the gross tonnages for the years from 1860 to 1879 inclusive (only net tonnages having been recorded), the gross for these years are only approximate, and are based on the relation of gross to net for the years 1883 and 1900

TABLE II.—*Shipping owned in each Country in the World (extracted from Lloyd's Register of British and Foreign Shipping for 1910–1911). Number, Tonnage and Description of all Vessels (exclusive of War Vessels) of 100 Tons and upwards.*

Flag.	Steam Vessels.															Sailing.										Grand Total.	
	Wood.			Composite.			Iron.			Steel.			Total.			Wood.		Composite.		Iron.		Steel.		Total.			
	No.	Net Tonnage.	Gross Tonnage.	No.	Net Tonnage.	Gross Tonnage.	No.	Net Tonnage.	Gross Tonnage.	No.	Net Tonnage.	Gross Tonnage.	No.	Net Tonnage.	Gross Tonnage.	No.	Net Tonnage.	No.	Net Tonnage.	No.	Net Tonnage.	No.	Net Tonnage.	No.	Net Tonnage.	No.	Tonnage. (Net Tonnage of Sailing Vessels and Gross Tonnage of Steamers.)
British United Kingdom	81	6,597	12,153	11	1,031	3,735	1536	503,396	900,300	6,832	9,692,618	15,851,495	8,460	10,203,642	16,767,683	399	63,427	4	801	202	209,312	352	475,256	957	748,796	9,417	17,516,479
*Colonies	357	52,919	91,650	25	6,084	10,637	267	113,555	189,447	728	584,329	999,620	1,377	756,887	1,291,354	613	149,481	10	5,746	46	27,356	32	21,878	701	204,461	2,078	1,495,815
Total	438	59,516	103,803	36	7,115	14,372	1803	616,951	1,089,747	7,560	10,276,947	16,851,115	9,837	10,960,529	18,059,037	1012	212,908	14	6,547	248	236,668	384	497,134	1658	953 257	11,495	19,012,294
American (United States) Sea	402	131,292	201,055	2	848	953	168	189,999	278,881	501	749,506	1,161,030	1,073	1,071,645	1,641,919	1605	984,858	..	..	32	38,010	64	96,818	1701	1,119,686	2,774	2,761,605
*Northern Lakes	..	..	..	9	12,926	17,464	21	19,394	24,564	533	1,591,030	2,104,741	563	1,623,350	2,146,769	..	..	..	..	..	..	43	109,850	43	109,850	606	2,256,619
Philippine Islands	28	3,386	5,788	1	130	251	27	11,420	17,484	20	8,964	14,803	76	23,900	38,326	13	2,128	..	..	..	..	..	..	13	2,128	89	40,454
Total	430	134,678	206,843	12	13,904	18,668	216	220,813	320,929	1,054	2,349,500	3,280,574	1,712	2,718,895	3,827,014	1618	986,986	..	..	32	38,010	107	206,668	1757	1,231,664	3,469	5,058,678
German	..	..	..	1	89	171	209	85,899	143,985	1,612	2,330,471	3,815,162	1,822	2,416,459	3,959,318	30	13,537	3	484	37	43,950	286	315,897	356	373,868	2,178	4,333,186
Norwegian	77	17,623	30,627	21	3,685	5,748	312	139,617	248,365	902	698,703	1,137,266	1,312	859,628	1,422,006	395	175,592	3	1,879	252	285,228	103	129,828	753	592,527	2,065	2,014,533
French	16	1,370	2,750	..	..	..	229	161,338	273,735	630	673,678	1,171,687	875	836,386	1,448,172	400	72,421	..	..	18	17,918	172	343,769	590	434,108	1,465	1,882,280
Italian	13	564	1,843	..	..	..	211	172,339	287,461	226	425,301	698,255	450	598,204	987,559	434	125,787	..	..	138	149,409	58	57,898	630	333,094	1,080	1,320,653
‡Japanese	306	47,513	78,053	8	3,265	4,755	124	136,339	208,692	408	539,644	855,477	846	726,761	1,146,977	5	2,245	..	..	..	..	..	..	5	2,245	851	1,149,222
†Dutch	7	536	945	..	..	..	59	21,616	35,955	466	585,670	946,149	532	607,822	983,049	14	2,420	2	2,264	7	4,062	73	23,398	96	32,144	628	1,015,103
Swedish	27	3,068	4,937	106	11,523	20,662	373	169,585	279,985	458	280,287	476,924	964	464,463	782,508	475	119,613	8	2,179	7	6,842	18	6,937	508	135,571	1,472	918,079
*†Russian	13	1,164	2,011	6	691	1,286	238	78,870	135,205	385	321,891	552,026	642	402,616	690,528	556	141,790	5	3,372	25	34,634	13	17,001	599	196,797	1,241	887,325
Austro-Hungarian	2	133	241	1	146	248	46	23,362	38,359	316	462,313	738,881	365	485,954	777,729	2	250	..	..	1	792	1	258	4	1,300	369	779,029
Danish	8	1,430	2,431	3	346	561	113	36,749	79,139	429	355,039	580,697	553	393,564	671,828	282	47,242	..	..	5	4,164	23	13,328	310	64,734	863	736,562
Spanish	4	211	481	1	144	220	206	105,245	171,985	300	353,953	574,062	511	459,553	746,748	62	14,484	1	543	3	2,944	2	741	68	18,712	579	765,460
†Greek	7	502	903	..	..	..	114	56,958	96,049	177	255,338	402,232	298	312,798	499,184	109	27,970	..	..	1	427	..	..	110	28,397	408	527,581
Belgian	..	..	..	..	..	..	24	11,315	20,037	135	183,021	275,876	159	194,336	295,913	3	556	..	..	1	874	2	2,295	6	3,725	165	299,638
Brazilian	4	622	933	..	..	..	59	33,681	53,434	250	108,901	178,991	313	143,204	233,358	66	14,959	1	338	2	2,249	1	849	70	18,395	383	251,753
†Turkish	11	685	1,436	..	..	..	77	54,243	85,098	54	14,510	25,672	142	69,438	112,206	190	63,663	..	..	..	..	..	..	190	63,663	332	175,869
Argentine	2	217	359	..	..	..	31	9,591	15,749	162	72,827	123,597	195	82,635	139,705	27	7,213	..	..	8	5,169	37	11,334	72	23,716	267	163,421
Chilean	7	468	820	..	..	..	24	15,370	24,224	67	57,238	89,843	98	73,076	114,887	22	12,994	..	..	18	22,005	1	1,332	41	36,331	139	151,218
Portuguese	1	116	178	1	60	102	16	7,387	11,909	59	41,290	66,920	77	48,853	79,109	101	23,208	2	2,042	5	4,994	5	830	113	31,074	190	110,183
Chinese	9	2,030	3,290	1	1,468	2,330	20	17,170	25,920	38	37,356	58,880	68	58,024	90,420	..	..	..	..	..	..	..	..	..	..	68	90,420
Uruguayan	1	206	374	..	..	..	5	1,394	2,503	30	28,721	45,834	36	30,321	48,711	8	5,196	1	793	6	5,744	3	2,968	18	14,701	54	63,412
Cuban	13	3,973	5,916	..	..	..	15	5,569	9,484	26	26,596	43,010	54	36,138	58,410	6	1,035	..	..	..	..	..	..	6	1,035	60	59,445
Mexican	5	967	1,413	..	..	..	6	1,926	3,067	30	14,587	24,257	41	17,480	28,737	14	3,405	..	..	..	..	2	473	16	3,878	57	32,615
Rumanian	..	..	..	..	..	..	3	144	404	19	16,546	31,284	22	16,690	31,688	1	285	..	..	..	..	..	..	1	285	23	31,973
Peruvian	1	10	210	..	..	..	1	810	1,249	11	4,544	9,122	13	5,364	10,581	33	10,243	3	2,288	7	7,276	1	1,199	44	21,006	57	31,587
Siamese	..	..	..	..	..	..	..	..	..	11	7,792	12,607	11	7,792	12,607	..	..	..	..	..	..	..	..	..	..	11	12,607
Sarawak	1	46	120	..	..	..	1	189	300	4	2,191	3,653	6	2,426	4,073	..	..	..	..	..	..	..	..	..	..	6	4,073
Venezuelan	..	..	..	..	..	..	6	1,750	3,006	1	106	160	7	1,856	3,166	5	692	..	..	..	..	..	..	5	692	12	3,858
Haytian	..	..	..	..	..	..	..	..	..	5	2,017	3,387	5	2,017	3,387	..	..	..	..	..	..	..	..	..	..	5	3,387
Other countries:— Bulgaria, Colombia, Costa Rica, Ecuador, Egypt, Honduras, Liberia, Montenegro, Nicaragua, Oman, Panama, Persia, Salvador, Samos, Zanzibar, &c.	4	420	667	1	551	756	13	6,509	9,265	24	5,360	11,392	42	12,840	22,080	22	6,580	..	..	..	..	2	571	24	7,151	66	29,231
Total	1407	278,068	451,584	198	42,987	69,879	4554	2,192,729	3,675,240	15,849	20,532,338	33,093,992	22,008	23,046,122	37,290,695	5892	2,093,274	43	22,729	821	873,359	1294	1,634,708	8050	4,624,070	30,058	41,914,765

* Excluding Vessels trading on the Caspian Sea, and Wooden Vessels trading on the Great Lakes of North America.

† In the absence of satisfactory information numerous small sailing vessels (belonging chiefly to Greece, Turkey, Southern Russia and the Dutch East Indies) are not included.

‡ Excluding Japanese sailing vessels of under 300 tons net.

tons built in 1900 made up 12 % of the whole tonnage. In 1890 there were no vessels built whose displacement exceeded 9000 tons; in 1900 such vessels constituted 11½ % of the whole, and about ¾ % of the whole were over 16,000 tons. The year 1908 was notable for the number of large vessels launched; 10 British and 4 German vessels were launched whose tonnage averaged about 15,000 tons each, their tons displacement being about 50 % greater. In 1910 there were afloat more than 80 vessels exceeding 12,000 tons, and having an average tonnage of more than 15,500 tons each (see Table XI. page 885). Six of these vessels were over 20,000 tons and had an average gross tonnage of 25,640 tons each. The tonnage of the largest vessels has almost continuously increased, and vessels with a tonnage of 45,000 tons are now being built, the fully loaded displacement of the vessels being more than 50,000 tons.

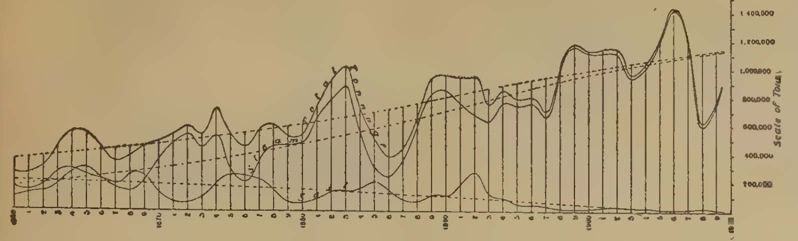


FIG. 3.—Gross tonnage of all sailing and steam merchant vessels built in and added to the register of the United Kingdom during each year from 1860 to 1910. The dotted lines may be taken as representing the average production from year to year.

Tonnage built of wood, iron and steel. Fig. 4 shows the tonnage of wood, composite, iron and steel vessels added to the Register year by year since 1860, and figures for a number of the years are given in Table I. The tonnage of *wood and composite* vessels added in 1860 was 161,180, increasing to 166,210 tons in 1865 and then falling away at a fairly uniform rate until in 1880 only 19,938 tons were reported, and since that date practically no increase in output of this class of tonnage has taken place. The tonnage of *iron* ships produced in 1860 was about 63 % of that of wood ships; while wood shipbuilding fell off, iron shipbuilding increased, and in 1870 the tonnage of iron ships was more than five times that of wood and composite ships. The output of iron ships increased until 1883, when a maximum of 856,990 tons was reached. Steel had now come into use, and iron shipbuilding fell away rapidly, amounting only to 50,579 tons in 1888; this figure fell to 10,679 tons in 1895, and since then very few vessels have been built of iron. *Steel*, which had been used in shipbuilding to a limited extent for special purposes for some eight years, came into use for the hulls of merchant ships in the later 'seventies. In 1880 the tonnage built—38,164 tons—was 4½ % of that of iron ships, by 1885 the ratio was 60 %, and in 1890 the tonnage of steel ships, 913,484 tons, was just 20 times that of iron ships. From that date the statistics of steel shipbuilding are practically those of steam vessels above given.

The world's shipping: tonnage and distribution of. From Table II., which gives the distribution of ownership of existing merchant vessels and other vessels, excepting warships, it appears that the total tonnage of the world's shipping, excluding vessels under 100 tons and the wood vessels on the Great Lakes of America, is about 42 millions. Of this total, rather less than one-ninth is in sailing vessels, and the remainder in steam vessels. Taking the number of ships instead of their aggregate tonnage, the sailing vessels are 27 % of the whole. Out of the 42 million tons, Great Britain and her colonies own about 19 millions, or 45⅓ % of the whole, 18 millions being steamers and 1 million sailing vessels.

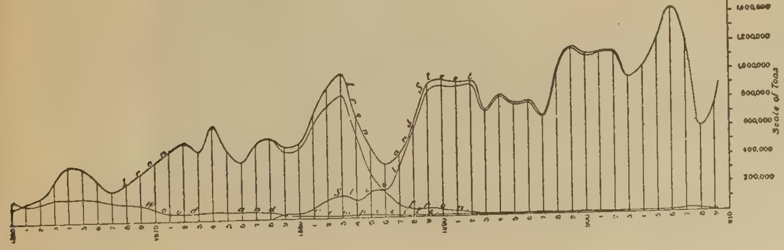


FIG. 4.—Gross tonnage of all wood, composite, iron and steel merchant vessels built in and added to the register of the United Kingdom during each year from 1860 to 1910.

Next to Great Britain, the largest shipowning country in the world is the United States of America, with 5 million tons of shipping, 12 % of the total. Then come in order Germany, with nearly 4½ millions, 10⅓ % of the total; Norway, with 4·8 %; France, with 4·5 %; Italy, with 3·2 %; Japan, with 2·7 %; Holland, Sweden and Russia with 2·4 to 2·1 %; and Austria-Hungary, Spain and Denmark each with about 1·8 %. The leading particulars as to the distribution of ownership of the merchant shipping throughout the world for 1873, 1890, 1900 and 1910 respectively are represented graphically in the block diagrams given in fig. 5, which have been constructed from particulars given in Table II. and similar tables for the other years named. The total tonnage owned in these years, excluding vessels under 100 tons and wood vessels on the Great Lakes of America, is represented by squares drawn to scale, in duplicate, and divided up amongst the countries owning shipping in proportion to their ownership. Parts of each holding are shaded in the squares on the right so as to show what portion is sailing tonnage and what steam tonnage, and in the squares on the left so as to show the distribution of the total as regards materials of construction in each country. The total tonnage owned is given for each year named, and the percentages owned by various countries are tabulated between the pairs of squares.

The tonnage of the shipping of the world has advanced at an increasing rate for many years; the character of this advance may be gathered from the data given in fig. 5. In 1873 Great Britain and her colonies owned 43·25 %, and in 1890 52·35 %; but although the advance in the shipping of Great Britain and her colonies has continued approximately at the same uniform rate, such has been the increasing rate of the advance of the world's shipping that the percentage owned by the British Empire fell to 49·1 % in 1900 and to 45·36 in 1910. This increasing rate of advance of the tonnage of the world's shipping is shown by Table III. The remarkable rate at which the shipping of the United States and Germany has advanced will also be seen.

TABLE III.—*Rate of Increase of the World's Shipping.*

Year.	1873.	1890.	1900.	1910.
World's tonnage (tons) . . .	17,545,563	22,151,651	29,043,728	41,914,765
World's tonnage taking 1873 as 100	100	126	165	240
Average rate of increase per annum from 1873	. .	1·5 %	2·4 %	3·8 %
Proportion owned by Britain . .	43·25 %	52·35 %	49·1 %	45·36 %
Proportion owned by United States . . .	14·27 %	8·23 %	9·47 %	12·06 %
Proportion owned by Germany .	5·88 %	7·08 %	9·13 %	10·34 %

World's output of ships. Table IV. gives the output, for the year 1909, of merchant and other vessels throughout the world, excluding warships, all ships of less than 100 tons and the wood vessels of the Great Lakes of North America. The block diagrams in fig. 6 are constructed in the same way as the diagrams in fig. 5, and are arranged to show the output of the principal shipbuilding countries of the world in 1900 and in 1909, the reference square for scale representing one-tenth the amount of that of fig. 5. The total output for the year 1909 was 2,343,854 tons, of which 1,509,837 tons, or 65 % of the whole, was built in the United Kingdom; 303,339 tons or 13 % was built by the United States of America; 9·4 % by Germany and 5·4 % by France. In 1909 the total output was 1,551,532 tons, of which 971,113 tons or 63·5 % was built in the United Kingdom; 178,402 or 11·5 % was built in the United States of America; Germany built 8·1 %; France only 3 %; the output of Holland and Belgium has risen from 1·38 % in 1900 to 4·34 % in 1909; and Japan appears with 2·98 % instead of about ·6 % in 1900.

American Shipping.—Under the Registration Laws of the United States vessels may be (*a*) registered; (*b*) enrolled; or (*c*) licensed. The proportion of vessels coming under these three headings as given by the United States Commissioner of Navigation, 30th June 1909, is shown in Table V.

It will be seen that the *Registered Tonnage* includes only vessels engaged in the Foreign Trade and in Whale Fisheries, which amount in the total to 1633 vessels of 887,505 tons and include the smallest vessels crossing the St Lawrence equally with ocean liners. Two hundred and twenty-seven of the registered vessels are less than 100 tons, and only nine are over 10,000 tons, namely the "Minnesota," "Manchuria," "Mongolia," "Siberia" and "Korea" on the Pacific, and the "St Louis" and "St Paul," "New York" and "Philadelphia" on the Atlantic routes. The *Enrolled Tonnage* includes vessels engaged in the coasting trade and local fisheries which are over 20 tons; and the *Licensed Tonnage* vessels similarly engaged, but of a size not exceeding 20 tons. The whole of the tonnage included is officially described as tonnage

TABLE IV.—*Number, Gross Tonnage and Description of all Sailing Vessels of 100 Tons net and Steamers of 100 Tons gross and upwards built in each of the several Countries of the World during the Year 1909 according to Lloyd's Register for 1910–1911.*

Country in which Built	Whether Sail or Steam.	Wood and Composite.									Steel.															Grand Total.	
		100 to 199.	200 to 399.	400 to 599.	600 to 799.	800 to 999.	1000 to 1999.	2000 and above.	Total.		100 to 199.	200 to 399.	400 to 599.	600 to 799.	800 to 999.	1000 to 1499.	1500 to 1999.	2000 to 2999.	3000 to 3999.	4000 to 4999.	5000 to 6999.	7000 to 9999.	10,000 to 14,999.	Total.		No.	Tonnage.
									No.	Tonnage.														No.	Tonnage.		
United Kingdom	Sail	1	..	..	..	..	..	..	1	120	1	8	1	..	..	..	..	..	..	..	..	..	..	10	2,790	11	2,910
	Steam	..	..	..	..	..	..	..	..	..	47	86	23	17	24	44	35	44	37	62	17	7	9	452	968,203	452	968,203
	Total	1	..	..	..	..	..	..	1	120	48	94	24	17	24	44	35	44	37	62	17	7	9	462	970,993	463	971,113
*British Colonies	Sail	18	5	1	..	..	..	..	24	4,656	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	24	4,656
	Steam	14	5	..	..	..	..	..	19	3,347	3	..	1	1	..	..	..	..	..	..	1	..	..	6	6,871	25	10,218
	Total	32	10	1	..	..	..	..	43	8,003	3	..	1	1	..	..	..	..	..	..	1	..	..	6	6,871	49	14,874
*America (United States)	Sail	2	2	4	4	1	..	1	14	9,293	..	..	1	1	4	2	..	..	..	..	..	..	..	8	6,860	22	16,153
	Steam	2	3	..	..	1	..	..	6	2,048	4	7	2	1	1	3	1	5	6	3	10	5	..	48	160,201	54	162,249
	Total	4	5	4	4	2	..	1	20	11,341	4	7	3	2	5	5	1	5	6	3	10	5	..	56	167,061	76	178,402
Germany	Sail	..	..	..	..	..	..	..	..	..	5	5	..	..	..	..	1	..	..	..	..	..	..	11	3,870	11	3,870
	Steam	..	..	..	..	..	..	..	..	..	11	4	2	6	5	4	4	11	3	6	6	..	..	62	121,438	62	121,438
	Total	..	..	..	..	..	..	..	..	..	16	9	2	6	5	4	5	11	3	6	6	..	..	73	125,308	73	125,308
Holland and Belgium	Sail	..	..	..	..	..	..	..	..	..	27	..	..	..	..	3	..	..	..	..	..	..	..	30	6,877	30	6,877
	Steam	..	..	..	..	..	..	..	..	..	7	6	2	3	..	5	2	6	3	..	2	1	..	37	60,507	37	60,507
	Total	..	..	..	..	..	..	..	..	..	34	6	2	3	..	8	2	6	3	..	2	1	..	67	67,384	67	67,384
†Japan	Sail	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Steam	4	..	1	..	..	..	..	5	1,023	5	..	3	1	1	..	..	..	1	..	2	3	..	16	45,246	21	46,269
	Total	4	.	1	..	..	..	..	5	1,023	5	..	3	1	1	..	..	..	1	..	2	3	..	16	45,246	21	46,269
France	Sail	12	2	..	..	..	..	..	14	2,174	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	2,174
	Steam	1	..	..	..	..	..	..	1	143	2	1	5	1	1	..	2	3	1	1	1	..	1	19	43,748	20	43,891
	Total	13	2	..	..	..	..	..	15	2,317	2	1	5	1	1	..	2	3	1	1	1	..	1	19	43,748	34	46,065
Norway	Sail	2	1	..	..	..	..	..	3	549	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	549
	Steam	..	..	..	..	..	..	..	..	..	11	7	4	8	2	12	..	..	1	..	..	..	..	45	30,741	45	30,741
	Total	2	1	..	..	..	..	..	3	549	11	7	4	8	2	12	..	..	1	..	..	..	..	45	30,741	48	31,290
Italy	Sail	9	1	..	..	..	..	..	10	1,605	2	..	..	..	..	..	..	..	..	..	..	..	..	2	305	12	1,910
	Steam	1	..	..	..	..	..	..	1	107	..	..	..	..	2	..	..	..	..	..	..	3	..	5	26,569	6	26,676
	Total	10	1	..	..	..	..	..	11	1,712	2	..	..	..	2	..	..	..	..	..	..	3	..	7	26,874	18	28,586
Austria-Hungary	Sail	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Steam	..	..	..	..	..	..	..	..	..	4	2	..	..	4	2	..	..	4	..	..	..	..	16	22,235	16	22,235
	Total	..	..	..	..	..	..	..	..	..	4	2	..	..	4	2	..	..	4	..	..	..	..	16	22,235	16	22,235
Denmark	Sail	4	..	..	..	..	..	..	4	668	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	668
	Steam	..	..	..	..	..	..	..	..	..	..	1	..	1	1	1	2	..	..	..	..	..	..	6	6,548	6	6,548
	Total	4	..	..	..	..	..	..	4	668	..	1	..	1	1	1	2	..	..	..	..	..	..	6	6,548	10	7,216
Sweden	Sail	3	..	..	..	..	..	..	3	345	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	345
	Steam	1	..	..	..	..	..	..	1	189	..	4	1	1	1	..	..	..	1	..	..	..	..	8	6,233	9	6,422
	Total	4	..	..	..	..	..	..	4	534	..	4	1	1	1	..	..	..	1	..	..	..	..	8	6,233	12	6,767
Russia	Sail	5	1	..	..	..	..	..	6	1,040	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	1,040
	Steam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	5	1	..	..	..	..	..	6	1,040	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	1,040
Other Countries	Sail	..	1	..	..	..	..	..	1	310	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	310
	Steam	2	..	..	..	..	..	..	2	228	1	..	..	..	..	..	..	2	..	..	..	..	..	3	4,445	5	4,673
	Total	2	1	..	..	..	..	..	3	538	1	..	..	..	..	..	..	2	..	..	..	..	..	3	4,445	6	4,983
Totals	Sail	56	13	5	4	1	..	1	80	20,760	35	13	2	1	4	5	1	..	..	..	..	..	..	61	20,702	141	41,462
	Steam	25	8	1	..	1	..	..	35	7,085	95	118	43	40	42	71	46	71	57	72	39	19	10	723	1,502,985	758	1,510,070
	Total	81	21	6	4	2	..	1	115	27,845	130	131	45	41	46	76	47	71	57	72	39	19	10	784	1,523,687	899	1,551,532

*Excluding wood vessels built on the North American lakes.

†Excluding Japanese sailing vessels under 300 tons net (if any) built in Japan.

Note.—The above figures for sailing vessels are based on *net* tonnage, and those for steam vessels on *gross* tonnage.

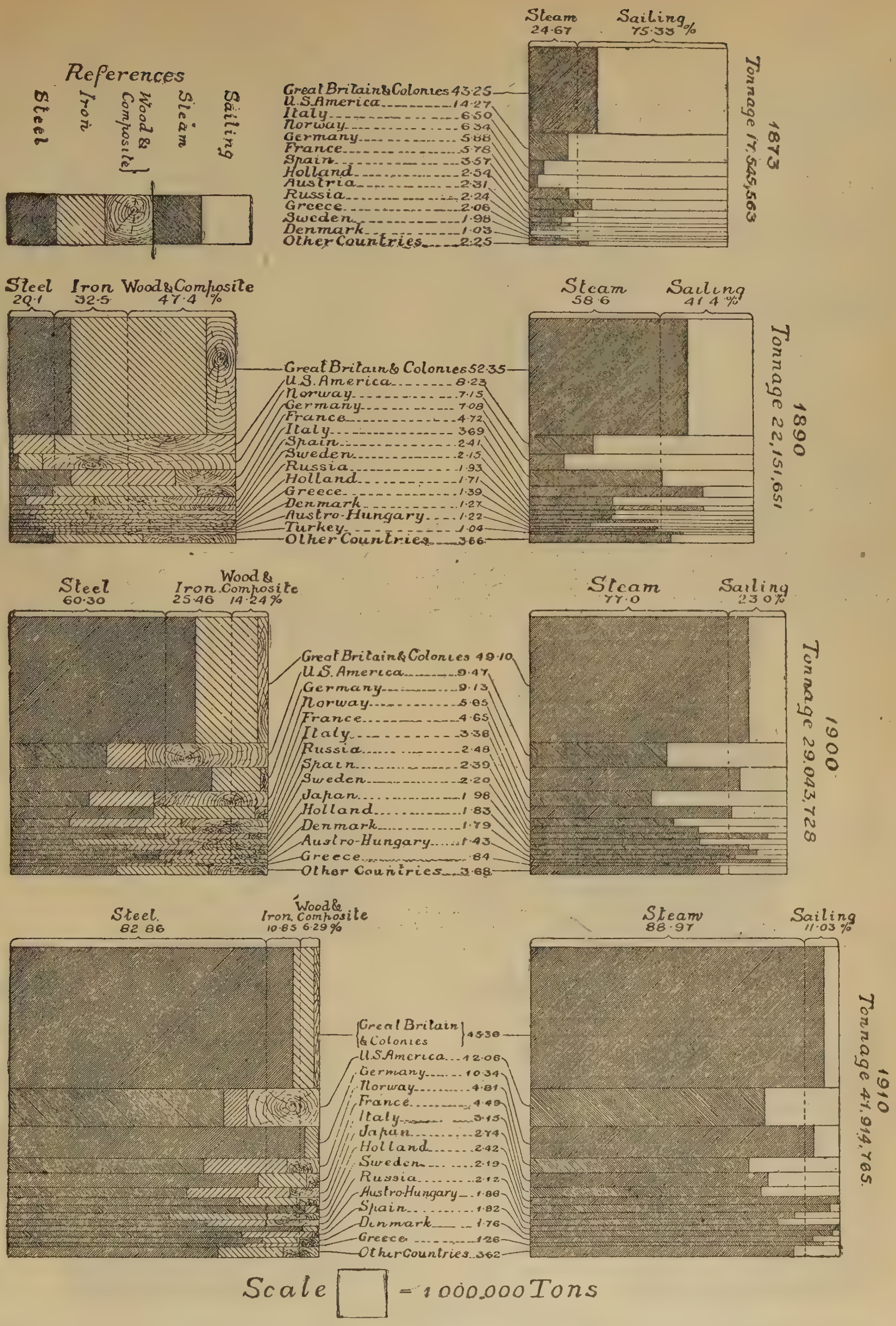


FIG. 5.—Distribution of ownership of merchant shipping throughout the world. The tonnages are gross steam and net sailing as given in Table II. for 1910. The tonnages for 1900 and 1890 are prepared on the same basis, while those for 1873 are gross steam and gross sailing.

Table V.—*Showing the Tonnage of the United States Shipping. 30th June* 1909.

Class.	Sailing.		Steam.		Canal.		Barge.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
(*a*) Registered:—										
Foreign trade	445	225,376	490	575,226	..	..	665	77,921	1,600	878,523
Whale fisheries	25	5,682	8	3,300	..	..	..	..	33	8,982
Total	470	231,058	498	578,526	..	..	665	77,921	1,633	887,505
(*b*) Enrolled:—										
Coasting trade	3799	1,391,965	6,327	4,099,087	745	80,951	2769	767,839	13,640	6,339,842
Cod and mackerel fisheries	341	33,232	91	7,979	..	..	..	..	432	41,211
Total	4140	1,425,197	6,418	4,107,066	745	80,951	2769	767,839	14,072	6,381,053
(*c*) Licensed:—										
Coasting trade	4672	50,986	4,241	58,470	..	..	156	1,744	9,069	111,200
Cod and mackerel fisheries	430	3,835	484	5,162	..	..	..	..	914	8,997
Total	5102	54,821	4,725	63,632	..	..	156	1,744	9,983	120,197
Grand Total	9712	1,711,076	11,641	4,749,224	745	80,951	3590	847,504	25,688	7,388,755

documented in the United States, and the division is based on the trade on which the vessels are employed, and not as in the United Kingdom on the character of the vessels and their fitness to engage in trade to distant countries or on more local service.

By the United States Navigation Laws all trade between American ports no matter how far they are separated—such as New York to San Francisco, or from either of these ports to Honolulu or Manila—is declared to be *coasting trade.* None but United States vessels are allowed to engage in this trade, which in recent years has developed so rapidly as to employ the main part of the American Mercantile Marine; it demands large numbers of ocean-going vessels, and many vessels have been transferred from the Foreign Trade to meet the demand.

Lloyd's Register for 1909–1910 gives the following figures for United States shipping, excluding all vessels under 100 tons and all wooden vessels on the Great Lakes:—

	Number.	Tons.
On Sea Coasts	2899	2,791,282
Northern Lakes	583	2,118,276
Philippines	108	44,254
	3590	4,953,812

Large numbers of American vessels are not included in the American Returns—such as yachts, boats and lighters employed within the

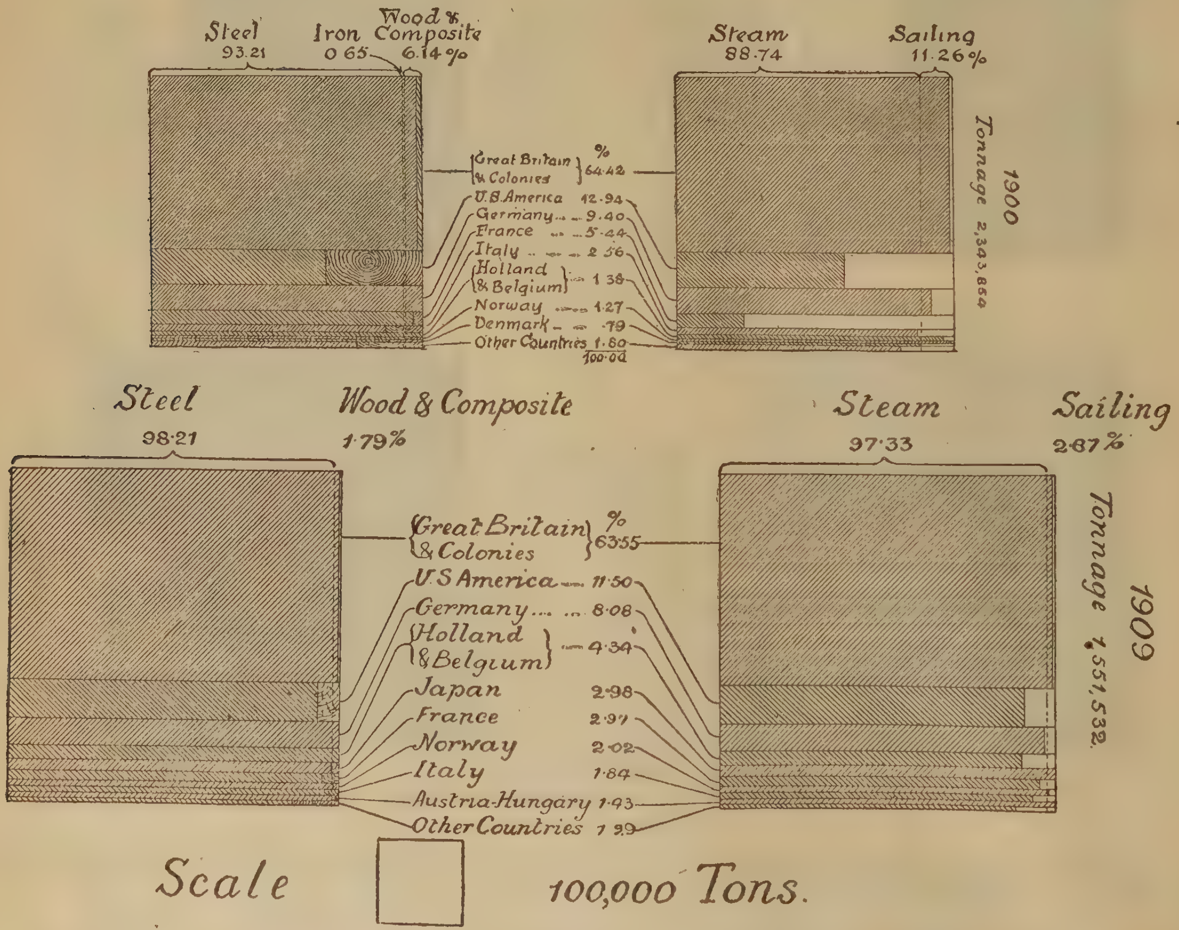


Fig. 6.—Merchant shipping built in each of the countries of the world in 1900 and in 1909. The tonnages are gross, and are based on the figures given in Lloyd's Register; see notes appended to Table IV.

limits of any harbour; canal boats and barges without sails or motive power employed entirely within any State; barges and boats on the rivers and lakes of the United States which do not carry passengers and do not trade to any foreign territory. None of these vessels are registered, enrolled or licensed. A census of shipping taken in 1889 revealed the fact that at that date the tonnage of these undocumented vessels amounted to just half the total shipping of the United States; since then their numbers have greatly decreased because of the improved means of transport by rail.

The distribution of the total documented shipping on the coasts of the United States in 1909 is shown by Table VI. The Atlantic Coasts employ 67 % of the number and 47 % of the tonnage; the Great Lakes 12 % of the number and nearly 38 % of the tonnage. The total includes a great number of wooden sailing vessels as shown by Table VII., which also shows that the coasting trade employs over 1,000,000 tons of wooden steamships and over 3,000,000 tons of steel steamships (Enrolled and Licensed vessels), while the steel steamships in the Foreign Trade only reach a total of just over 500,000 tons (Registered Vessels).

TABLE VI.—*United States Shipping documented in 1909.*

	No. of Ships.	Tons.
Atlantic and Gulf Coasts.	17,203	3,500,394
Porto Rico	83	8,740
Pacific	3,378	915,357
Hawaii.	43	19,120
Northern Lakes	3,199	2,782,481
Western Rivers . . .	1,782	162,663
Total	25,688	7,388,755

TABLE VII.—*Details of Ships documented in United States in 1909.*

	Steam.		Sailing.		Barges.	
	No.	Tons.	No.	Tons.	No.	Tons.
Registered—						
Wood	349	71,474	448	185,728	644	72,277
Metal	149	507,052	22	45,330	21	5,644
Enrolled and Licensed—						
Wood	9,431	1,084,690	9135	1,281,064	2804	687,924
Metal	1,712	3,086,008	107	198,954	121	81,659
Total Documented Vessels .	11,641	4,749,224	9712	1,711,076	3590	847,504
Grand Total	25,688 Vessels.			7,388,755 Tons.		

Though the American Mercantile Marine has greatly varied in the rate of its growth (see Table VIII.), very great increases have taken place from time to time, and after 1880 the average rate of increase was very considerable, the increase in thirty years amounting to 3,300,000 tons or over 80 %. In the nine years 1900–1909 the increase was 2,220,000 tons, which is more than 40 % of the total in 1900. The increase of the general commerce of the United States in these periods was, however, so vast that, notwithstanding the great increases of tonnage, increasing proportions of the tonnage were absorbed by the home or coastwise trade, and the percentage of United States shipping carrying United States commerce to foreign ports was steadily reduced, as shown by Table IX.

TABLE VIII.—*Growth of United States Shipping.*

Year.	Total Tons.	Increase in Ten Years.	
	Documented.	Tons.	Percentage.
1790	478,377		
1800	972,492	+494,115	+103·3
1810	1,424,783	+452,291	+46·5
1820	1,280,167	−144,616	−10·1
1830	1,191,776	−88,391	−6·9
1840	2,180,764	+988,988	+82·9
1850	3,535,454	+1,354,690	+62·1
1860	5,353,868	+1,818,414	+51·4
1870	4,246,507	−1,107,361	−20·6
1880	4,068,034	−178,473	−4·2
1890	4,424,497	+356,463	+8·8
1900	5,164,839	+740,342	+16·8
		Increase in Three Years.	
		Tons.	Percentage.
1903	6,087,345	+922,506	+17·9
1906	6,674,969	+587,624	+ 9·7
1909	7,388,755	+713,786	+10·7

From 1895 to 1908 very great progress was made in the output of ships in the United States; in 1901 a maximum of 483,489 tons was reached; decreases occurred until 1905, when a minimum of 330,316 tons was reported, but a rapid recovery took place; and in 1908 the unprecedented American total of 614,216 tons was made. In 1909 the output fell off. Out of a total of 1247 vessels of 238,090 tons, built and documented during the year ending June 30, 1909, 61,000 tons consisted of barges and canal boats, nearly 30,000 tons consisted of sailing vessels, 798 vessels of 47,353 tons are classed as river steamers, 17 steamers of 84,428 tons were built in the Great Lakes, and only 6 steam vessels of 16,427 tons were built for ocean trade, while no vessel was registered as built for the foreign trade.

TABLE IX.—*Additions to and Employment of United States Shipping.*

Period.	Average Tonnage of Ships built per Annum in the United States.	Average percentage of United States Commerce carried in United States Ships.	Average percentage of United States tonnage trading in United States Ports.
1810	102,452	. .	. .
1810–1820	89,797	. .	. .
1820–1830	89,372	90·2	88·2
1830–1840	118,960	83·9	68·7
1840–1850	185,309	78·1	66·6
1850–1860	366,603	71·2	65·4
1860–1870	299,690	38·1	50·4
1870–1880	253,800	26·2	29·0
1880–1890	220,197	15·2	21·0
1890–1900	235,698	11·2	22·5
1901–1903	462,824	8·7	22·0
1904–1906	375,868	11·5	22·3
1907	471,332	10·6	22·0
1908	614,216 [1]	9·8	22·0
1909	238,090 [2]	9·5	22·0

[1] Maximum recorded. [2] Lowest for ten years.

Canadian Shipping.—A steamboat service between Montreal and Quebec was commenced in November 1809, two years before the "Comet" was set to work on the Clyde, and in 1816 the steamer "Frontenac" commenced running on the Lakes and a number of other vessels followed. During the middle of the 19th century Canada turned out large numbers of wooden ships, the output in 1874 being 487 ships of 183,010 tons. As wood shipbuilding diminished the output fell off. In 1900 only 29 steam and sailing ships of over 100 tons were built, amounting in the aggregate to 7751 tons. Afterwards improvements took place, and in 1907 59 vessels of 38,288 tons were launched. Among the largest ships built in Canada are the passenger and freight vessel "Harmonic" of 5240 tons gross, and the "Midland Prince," a cargo vessel of 6636 tons gross—both built at Ontario. Smaller vessels are built to pass through the canals from the lakes to the sea, such as the "Haddington" of 1603 tons built at Toronto.

Japanese Shipping.—Recent years have seen a considerable development of shipbuilding in Japan. Several small vessels were built previous to 1898, but in that year the "Hitachi Maru," a steamer of 6000 tons, was built by the Mitsu Bishi Works.

Lloyd's Register Reports show that in the five-year period 1895–1899 there were launched 61 ships with a tonnage of 45,661; in 1900–1904, 279 ships (tonnage 138,052); and in 1905–1909, 414 (tonnage 252,512).

The figures quoted by various authorities for the amount of shipping owned in Japan vary considerably, particularly as regards sailing vessels. Large numbers of wood sailing vessels are, however, passing away, their places are being taken by steel steamers of the highest class in great variety and increasing tonnage, and the finest and fastest vessels now on service in the Pacific Ocean are Japanese liners built in Japan. Lloyd's Register shows that in 1900 Japan possessed 503 steam vessels of 524,125 tons gross, while in 1908 she possessed 861 steam vessels of no less than 1,150,858 tons—an increase of 120 % in eight years.

German Shipping.—For many years the mercantile marine of Germany has progressed at a very great rate, large numbers of vessels being built in Germany and in the United Kingdom for German owners. The average output in Germany per annum from 1895 to 1899 was 84 ships of a total tonnage of 139,000 tons; from 1900 to 1904, 114 ships of 204,600 tons; and from 1905 to 1909, 149 ships of 241,000 tons. The total net tonnage owned in 1870 was about 982,000 tons, and this was doubled by 1900, *i.e.* in thirty years. The total tonnage of Germany in 1900 was 2,905,782 tons, taking gross steam and net sailing tonnage; in 1910 the total on the same basis was 4,333,186 tons, an increase of nearly 50 % in the ten years.

IV. MERCHANT VESSELS

Sailing Ships.—Generally speaking, so far as the distribution of sails is concerned, except as regards the abolition of studding-sails, the sailing ships of to-day differ little from those which existed in the middle of the 19th century, and in the case of many types at a much earlier period. The change from wood to iron and steel resulted, of course, in some changes in rig, to suit the longer and larger vessels; and steel masts, with wire rope standing rigging and various labour-saving appliances, have been introduced. The larger ships also carry steam winches for various purposes, steam windlasses, and steam steering gear, but the general appearance of the vessels has changed very little.

Barges.—Rivers and canals abound with barges of various types, such as the Thames barge, the Tyne wherry or keel, and the Dutch galliot or pink. The Thames barge, which may be taken as a representative vessel of this class, has a length of from 70 to 80 ft., and a carrying capacity of from 100 to 120 tons on about 6 ft. draught. Like the Dutch galliot, she is provided with lee-boards, and is fore-and-aft rigged with sprit-sail and jigger.

In recent years the use of barges or lighters has been extended beyond river and canal service, and rapidly increasing numbers are now used, in addition, for sea transport. For example, on the east coast of England lighters of about 500 tons carrying capacity are used in the coal trade. The system has been carried much farther on the Great Lakes of North America, where cargo barges are in use of over 350 ft. in length, and approaching 5000 tons displacement when loaded. On the east coast of the United States barges, built sometimes of wood and sometimes of steel, are employed, carrying from 2000 to 4000 tons of coal, oil, grain, &c.

Smacks or Cutters.—This type of rig is still largely adopted in the merchant service for small vessels, usually called smacks, of a length, say, from 60 to 90 ft., and a displacement from 150 to 200 tons. They are single-masted, sharp-built vessels, provided with fore-and-aft sails only, and fitted with a running bowsprit; they have no standing jib stay. Such vessels were at one time generally used for coasting passenger traffic. The term "cutter" is also applied to an open sailing boat carried on board ship.

Schooners, Brigs and Brigantines.—A schooner (fig. 7, Plate I.) is usually a two-masted vessel, with yards only on the foremast and fore-and-aft sails on the main. The foresail is not bent to the yard, but is set flying. In some cases there are no yards at all and the schooner is then called a fore-and-aft schooner, a schooner with yards being sometimes called a square-rigged schooner. Before the days of steam, two- and three-masted schooners, known as "Fruiterers," were extensively employed in the fruit trade from the Western Islands, Italy, Malta and other orange-growing countries to London. In the 'fifties as many as three hundred were thus employed; they kept their place till the 'eighties, and some even yet survive the introduction of steam as a motive power. They were beautifully modelled craft, and very fast under canvas. A brig is a two-masted vessel having yards, or square-rigged on both masts. A brigantine is a two-masted vessel having the foremast square-rigged, as in a brig, the main mast being rigged as in a schooner. Much of the coasting trade of the world is carried on by schooners, brigs and brigantines. These vessels were formerly employed in the Baltic, and to some extent in the West Indies and the Mediterranean. Schooners such as the above are usually from 80 to 100 ft. long, 20 to 25 ft. broad, 10 to 15 ft. deep, and have a gross tonnage of 130 to 200 tons. Brigs are generally larger, varying in tonnage from 200 to 350 tons; they are from 90 to 115 ft. long, from 24 to 30 ft. broad, and from 12 to 18 ft. in depth of hold. Brigantines usually occupy, as to size, a position intermediate between schooners and brigs.

Vessels somewhat larger than two-masted schooners and brigs, but of a similar form, are often rigged as three-masted schooners and as the so-called barquentines. The former is like a schooner with a third or mizzen mast added, this being rigged fore and aft, as is the main mast. The latter resembles a brigantine with a third mast added, which is also fore-and-aft rigged. The two rigs thus very nearly resemble each other: both types are square-rigged on the foremast, and fore-and-aft rigged on the main and mizzen; but while in the former the foresail is set flying, in the latter it is bent to the yard.

Larger vessels than these are sometimes fitted with four, five, six and even seven masts, as fore-and-aft schooners. A large number of vessels fitted in this manner are much in favour for the coasting trade of America. Fig. 8 (Plate I.) shows the "Helen W. Martin," a five-masted wooden schooner, built in 1900 in the United States; she is 280 ft. 6 in. long, 44 ft. 9 in. broad and 21 ft. depth of hold, and her gross tonnage is 2265. Another vessel built at the same time, also of wood, and named the "Eleanor A. Percy," is 323 ft. 5 in. long, 50 ft. broad and 24 ft. 8 in. depth of hold, with a gross tonnage of 3402; she is rigged as a six-masted schooner. An interesting vessel of this class was the seven-masted schooner, "Thomas W. Lawson," built in 1902 by the Fore River Ship and Engine Co., Quincy, Massachusetts, of steel, 368 ft. long, 50 ft. beam, 34½ ft. depth of hold, and on a draught of 26 ft. 6 in. of 10,000 tons displacement, thus being the largest vessel yet constructed for sailing only. She was recently wrecked on the Scilly Isles.

Barques and Ships.—Vessels intended to sail to all quarters of the globe are usually rigged as barques or ships; but, as indicated above, these rigs are very far from embracing all those in use; many others are very common. A barque is a three-masted vessel, square-rigged on the two foremost masts (the fore and main masts) and fore-and-aft rigged on the mizzen mast. A ship (a ship-rigged vessel) has three masts, each of which is square-rigged. These were the rigs employed in types of vessels now fast passing away, if indeed they must not be considered as already obsolete, in which great speed was the quality chiefly aimed at, and carrying power was of secondary importance. For instance, the "Phoenician," built in 1852, had a length of 150 ft. and a net tonnage of 478; the "Shannon," built in 1862, was 217 ft. long and her tonnage 1292. The former made the quickest run on record, up to 1852, from Sydney to London, accomplishing the distance in 83 days; and the latter made a round voyage from Melbourne to London and back from thence to Sandbridge Pier in 5 months and 27 days, handling two full cargoes in the time. The American ship "Witch of the Wave," built in 1852, and the British ship "Cairngorm," built in 1853, were engaged in the keen competition carried on between Great Britain and the United States for the rapid conveyance of early teas from China to London. The American builders had for some years been more successful than the British builders, and the "Cairngorm" was the first ship which equalled the American ships in speed, and it was, moreover, claimed for her that she delivered her cargo in better condition than the American ships. She was 215 ft. long, and her tonnage was 1250 old measurement, or 938 new measurement. The "Witch of the Wave" on her best voyage made the passage from Whampoa to Dungeness in 90 days, the best day's run being 338 knots in 24 hours, a very remarkable performance. Later, in 1856, the "Lord of the Isles" beat the two fastest American clippers then existing in a race from China to Great Britain, one of them only by a few minutes; her length was 183 ft., and her tonnage, new measurement, 630. It is noteworthy that the competition in bringing the early teas home from China, started between British and American ships, was carried on subsequently between British ships alone. In the memorable race of 1866 from Foo-Chow to London, five ships, the "Ariel," "Taeping," "Serica," "Fiery Cross" and "Taitsing" took part. The first three left Foo-Chow the same day—the "Ariel" first, followed 20 minutes later by the "Taeping" and "Serica" together. The vessels separated, and lost one another till they reached the English Channel, when the "Ariel" and "Taeping" got abreast, and raced to the Downs, the former arriving some ten minutes before the latter, the "Serica" reaching the Downs a few hours later. These three occupied 99 days on the voyage; the "Fiery Cross" and "Taitsing" took two days longer, making the passage from Foo-Chow to the Downs in 101 days. The best day's run on the passage for all these ships differed but little, the "Fiery Cross" showing a slight superiority in this respect, having run 328 knots in the 24 hours. The time occupied in the above voyages was beaten in 1869 by the "Thermopylae" and "Sir Lancelot," both British ships and of composite build; the times occupied by their passages were respectively 90 days from Foo-Chow to Dungeness for the former, and 88 days from Foo-Chow to Deal for the latter, each taking one day more to get into the docks. The dimensions of the "Thermopylae" were 212 ft. by 36 ft. by 21 ft. depth of hold, and of the "Sir Lancelot" 197½ ft. by 33¾ ft. by 21 ft. The best day's run of the "Sir Lancelot" was 354 knots in 24 hours. Shortly before the above voyage the "Thermopylae" made the passage from London to Melbourne in an unprecedentedly short time, namely, 62 days from Gravesend to Port Phillip harbour. With the opening of the Suez Canal and the general introduction of steam, the demand for exceptionally fast sailing vessels of these types has very considerably diminished, and, indeed, almost ceased to exist. The type of cargo sailing ship usually met with to-day is better illustrated by fig. 9 (Plate I.), which represents the "Victoria Regina," built of iron in 1881 at Southampton; she is 270 ft. long and has a gross tonnage of 2006.

Ships with four and five masts were employed by several countries during the 19th century. Sometimes, in the case of four-masted ships, these were square-rigged on the fourth or mizzen mast, and sometimes fore-and-aft rigged; in the latter case they were called four-masted barques in Great Britain and shipentines in America. Five-masted ships are sometimes square-rigged on the fourth mast and fore-and-aft rigged on the fifth mast, and sometimes fore-and-aft rigged on both of these masts. The *Naval Chronicle*, vol. vii. (1802), contains particulars of the French privateer "L'Invention," which was captured by the British ship "Immortalité"; she was rigged as a four-masted ship, carried 26 guns, and had a complement of 220 men. It is remarkable how little her rig differs from that of modern vessels. A five-masted vessel is described in the same number of the *Naval Chronicle* which was square-rigged on the foremast and fore-and-aft rigged on the other four masts; she was apparently a forerunner of the American five-masted schooner of the present day. The shipentine clipper "Great Republic," built in 1853, is noteworthy as being the first ship fitted with double topsails, now so generally adopted. She was 305 ft. long and her tonnage was 3400; she could spread 40,500 square ft. of canvas, excluding stay-sails; she had four decks and was built of wood, though her framing was diagonally braced with iron. The shipentine "Madeleine" built in France in 1896, is almost identical in rig to the "Great Republic"; her length is 321 ft. and her gross tonnage 2892. A five-masted barque "France," built in Glasgow in 1890, is 361 ft. long and has a gross tonnage of 3942. As further examples of the large sailing ships built in recent years may be mentioned the "Astral" and "Potosi." The "Astral" was built by Arthur Sewall & Co. at Bath, Maine, in 1900, for the oil trade,

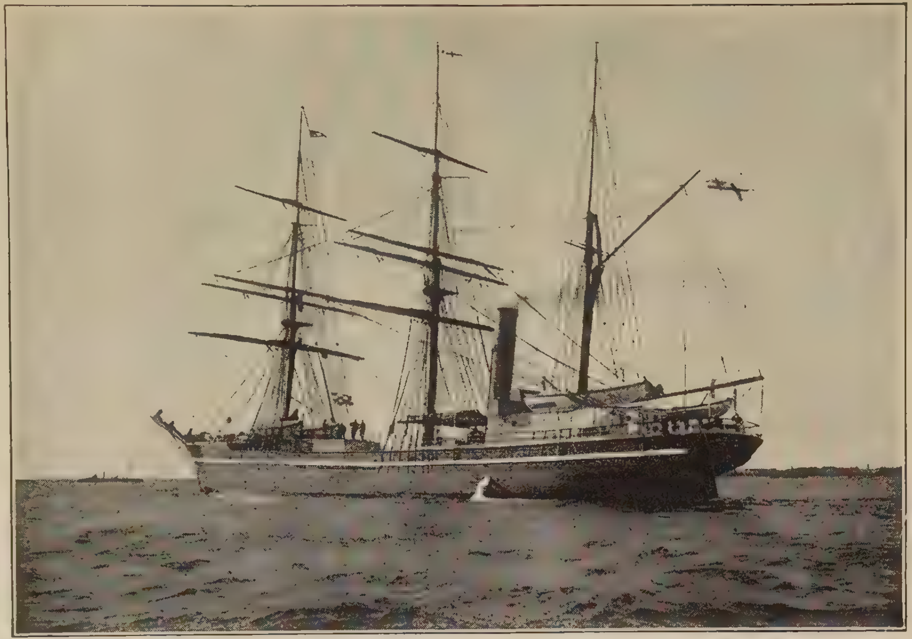


FIG. 2.—Antarctic Vessel *Terra Nova*.

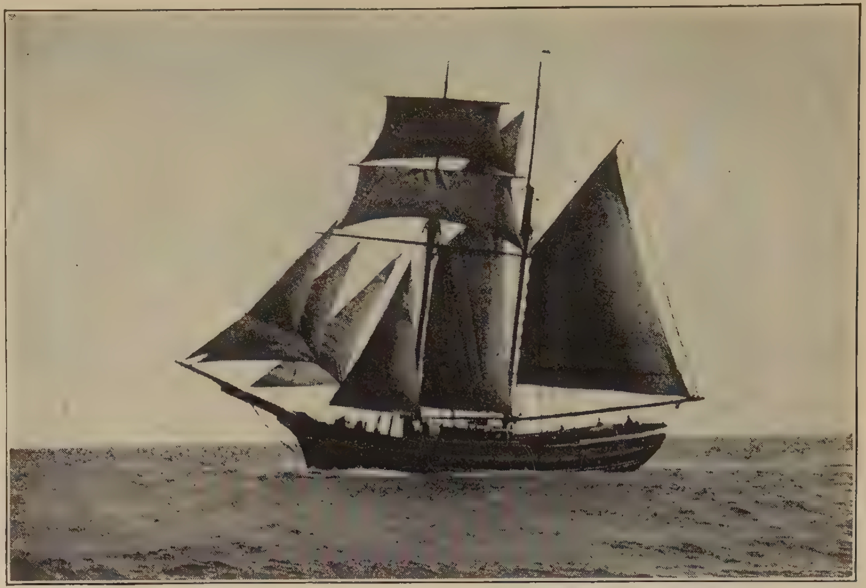


FIG. 7.—Coasting Schooner.

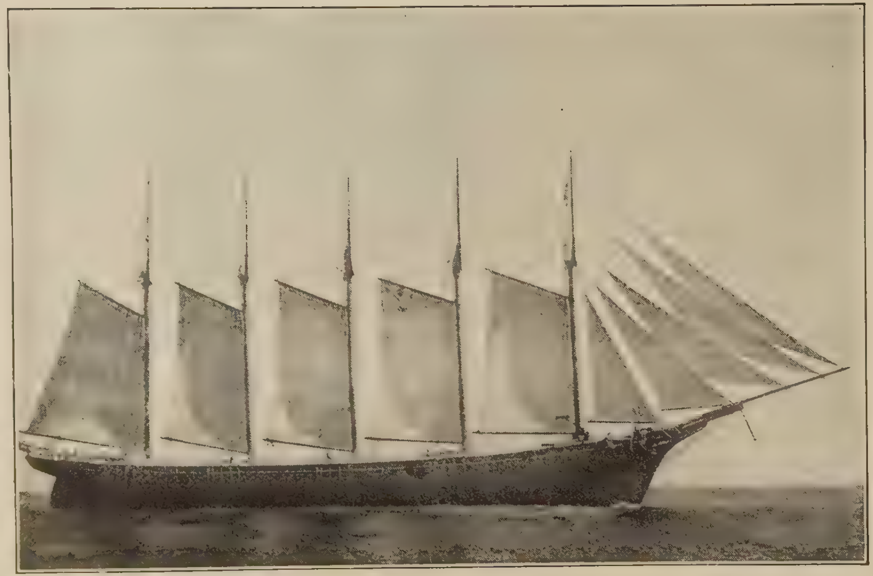


FIG. 8.—Schooner *Helen W. Martin*.

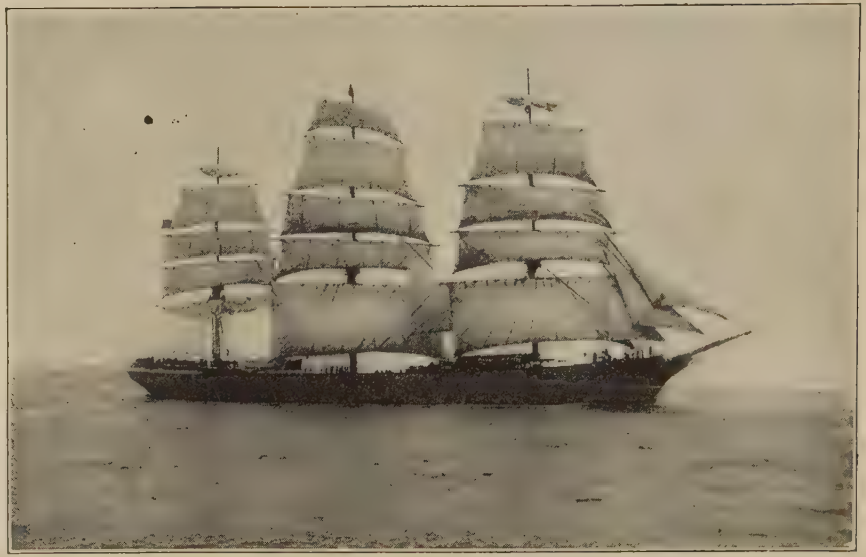


FIG. 9.—Ship *Victoria Regina*.

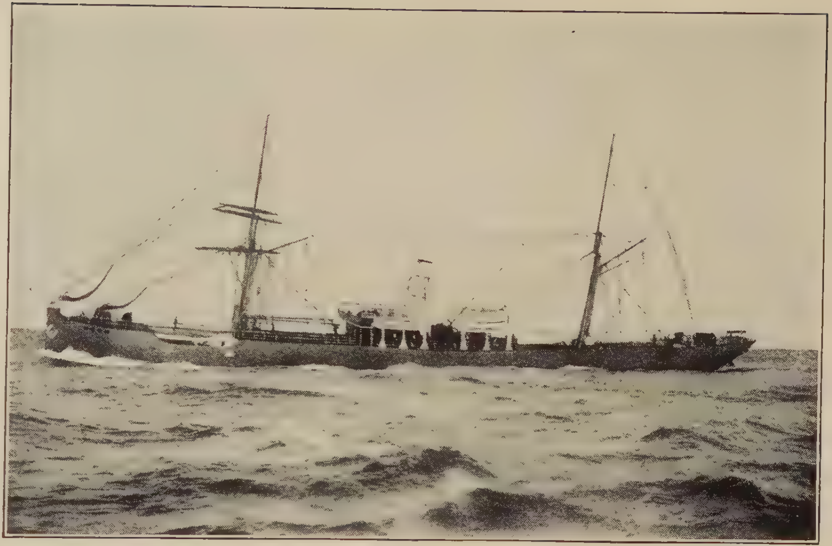


FIG. 13.—Well-Decked Vessel.

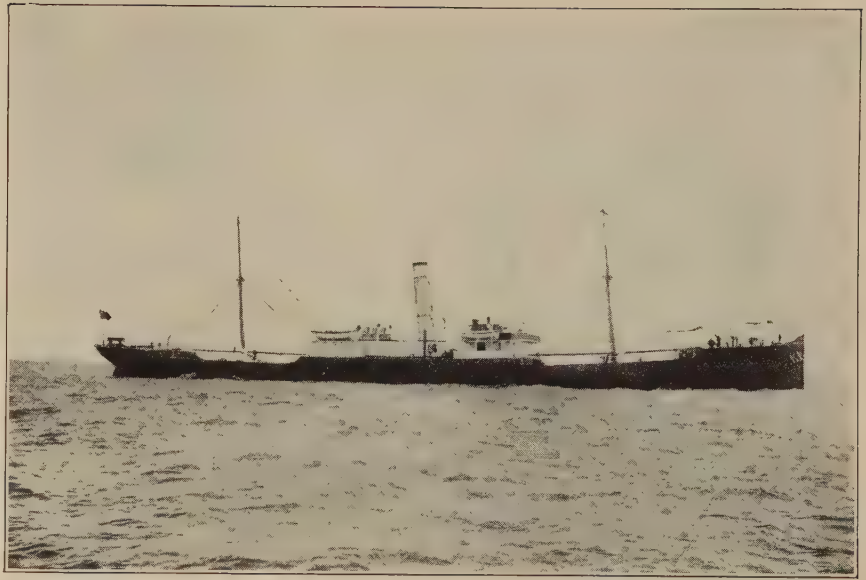


FIG. 14.—Vessel with top-gallant forecastle, bridge house, and poop.

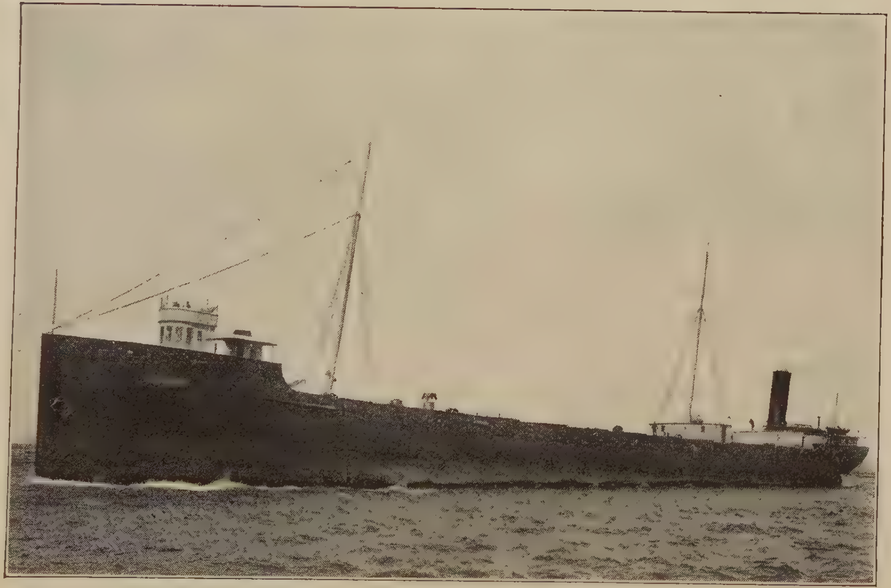


FIG. 15.—American Lake Steamer.

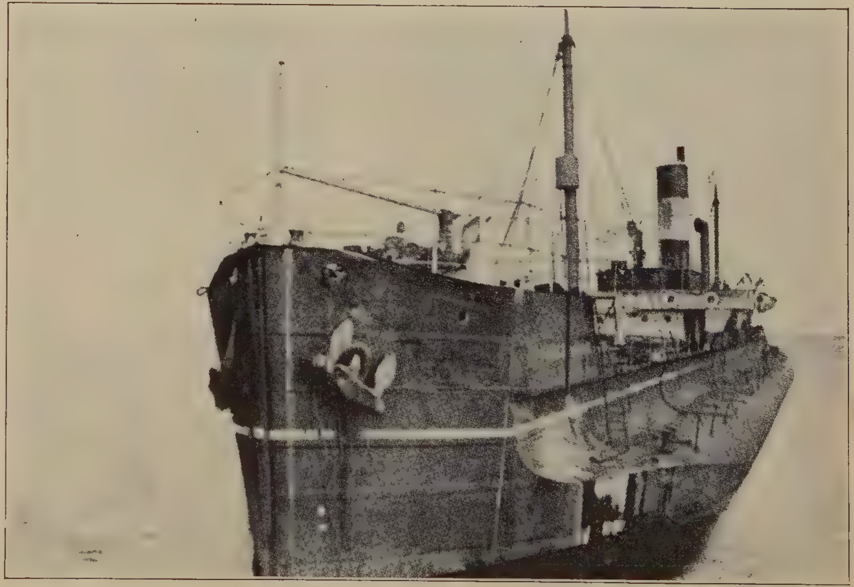


FIG. 10.—Turret Steamer *Tulloch Moor*.

She is a full-rigged four-masted ship, 332 ft. long, $45\frac{1}{2}$ ft. beam, 26 ft. moulded depth, gross tonnage 3292, and intended to carry 1,500,000 gallons of oil in cases of 10 gallons each from the United States to Shanghai, returning with cargoes of sugar, hemp, &c. The masts and yards of this vessel, as well as the hull, are of steel. The five-masted German barque "Potosi," built in 1895, which is 366 ft. long, has a gross tonnage of 4027 and a dead-weight capacity of 6200 tons; she has a splendid record of quick passages, one reducing the record from Portland Bill to Iquique to 62 days. In 1902 the five-masted ship-rigged vessel "Preussen," of 5081 tons gross, was built in Germany (wrecked at Dover in November 1910), followed in 1906 by the five-masted barque "R. C. Rickmers" of 5548 tons gross, 441 ft. long over all, 53 ft. 8 in. beam, 30 ft. 5 in. depth of hold; her displacement when loaded is about 11,400 tons, of which 8000 tons are cargo. She carries 50,000 sq. ft. of canvas, and on her first voyage reached a speed of $15\frac{3}{4}$ knots for a short time under sail alone, maintaining 13 knots for long periods. Although fitted with auxiliary steam power the "R. C. Rickmers" usually trusts wholly to canvas on her ocean voyages, and may thus be considered the largest sailing vessel afloat in 1910.

As instances of the times occupied on the voyages of modern sailing ships the following may be given: 66 days from Iquique in Chile to the English Channel by the British ship "Maxwell," gross tonnage 1856; 29 days from Newcastle, New South Wales, to Valparaiso by the British four-masted ship "Wendur," 2046 gross tonnage; 30 days from the Lizard to Rio de Janeiro by the British ship "Salamanca," of gross tonnage 1233; and 78 days from Dover to Sydney for the same ship; 153 sailing days for a voyage round the world, made up of 50 days from Cardiff to Algoa Bay, 28 days from Algoa Bay to Lyttleton, and 74 days from Lyttleton to the Lizard, by the British ship "Talavera," gross tonnage 1796; 59 days from Cape Town to Iquique by the British ship "Edenballymore," of gross tonnage 1726; 88 days from San Francisco to Queenstown by the British four-masted barque "Falls of Garry," of gross tonnage 2102; and 69 days from Scilly to Calcutta by the "Coriolanus," gross tonnage 1074. Amongst the voyages recorded recently by German ships the following may be enumerated: 58 days from the English Channel to Valparaiso by the four-masted barque "Placilla," gross tonnage 2845; 71 days from the English Channel to Melbourne by the barque "Selene," gross tonnage 1319; and 69 days from the English Channel to Adelaide by the four-masted barque "Hebe," of gross tonnage 2722.

Although alterations in the rigs of ships have not caused much difference in their appearance over a very long period, a number of changes have been made, mostly for the purpose of saving labour. The mechanical reefing of topsails and top-gallant sails was introduced about 1858, but only remained in favour for a few years; double topsails, on the other hand, first used in the four-masted American shipentine clipper "Great Republic," have held their own, and double top-gallant sails have since been adopted. Until about 1875 almost all ships carried studding-sails, but since this date they have been gradually discontinued, and at present are usually only to be found in training vessels, and now and again in square-rigged yachts. As already stated, wire rope has been adopted for standing rigging, and deadeyes and lanyards have given place almost universally to rigging screws. Masts and the heavier yards have been made of iron for many years, and more recently of steel, and the lower masts and top masts have in a number of cases been made in one length; when constructed in this manner the mast is termed a pole mast. This arrangement is very common in America, where the latest steel sailing ships are so fitted. Most large sailing ships carry a steam boiler or boilers, and engines are provided for all sorts of purposes, for which hand labour used to be commonly employed. The result of this and other labour-saving arrangements has been to effect a very considerable reduction in the number of hands carried. As indicating the nature of the change which has taken place, it may be mentioned that whereas a 1000-ton ship of the East India Company in the middle of last century had a crew of 80 all told, a modern four-masted barque of 2500 tons has a total complement of 33 only.

As to the employment of sailing ships, there can at the present day be seen at most large shipping ports a number of sailing ships of various types and sizes. Some of the largest ships are employed in the jute trade of India, the grain trade of California, British Columbia, &c., the nickel ore trade from New Caledonia and the nitrate trade of Chile. From Great Britain they usually take out coal, which, however low freights may be, may in nearly all cases be relied on.

Sailing ships with auxiliary power.

Sailing ships are sometimes provided with *auxiliary steam propelling machinery* of low power to save cost of tugs in getting in and out of harbour, to make headway when becalmed, and to increase the safety of the vessel. In the early days of steam, all sea-going vessels retained their rig, and the machinery fitted was only regarded as auxiliary. In the "Savannah"—the first steam vessel to cross the Atlantic—the paddle wheels were portable; they were removed and packed up on board in case of bad weather or when attempting a long voyage, but were replaced and used for getting into port after crossing the Atlantic. The screw propeller was found preferable in such cases, as it offered less obstruction than paddle wheels when the sails were set and the engines stationary; but the resistance offered by the screw when not in use led to various devices for either lifting it completely out of the water, or for "feathering" the blades and fixing them fore and aft, so as to offer less obstruction in going through the water. Auxiliary power is of great advantage to vessels engaged in seal or whale fishing as it enables them to avoid ice floes, and to proceed through open channels in the ice as opportunity offers. In 1902, six such vessels—all barque rigged, and one fitted with a lifting propeller—hailed from Dundee, and a few others hailed from Norway, from Newfoundland and from New Bedford, U.S.A. Several navies have employed vessels fitted with auxiliary steam power for training purposes, such as the Chilean training ship "General Baquendo" built in 1899 of steel, sheathed with teak and coppered; she is 240 ft. long, $45\frac{3}{4}$ ft. broad, and of 2500 tons displacement on a mean draught of 18 ft.; she has a large spread of canvas, and under steam alone is equal to a speed of 13 knots. In recent years the *internal combustion motor* has been adopted in some cases in place of the steam engine as a source of auxiliary power, especially in the smaller classes of sailing ships, and in many cases it has made the employment of such vessels remunerative once more. Should the heavy oil engines introduced in 1910 prove sufficiently simple and reliable for auxiliary power in the larger vessels, vessels so fitted might compete successfully with tramp steamers in certain trades.

Steamships.—Of merchant steamships, vessels of all sizes are to be met with, from a small launch to the stately Atlantic liner of over 30,000 tons gross and 25 to 26 knots speed, and the huge cargo ship of over 20,000 tons gross and 15 knots speed. They are employed on every service for which sailing ships are used, and upon others for which sailing ships are not employed, and they monopolize nearly the whole of the passenger traffic of the world. The passenger vessel is provided with airy and spacious accommodation for her living freight above water, while the upper part of the cargo vessel is cut down as much as possible consistent with due provision for safe navigation at sea. The passenger ship thus becomes a lofty vessel, especially amidships, while the cargo ship appears long and low lying. Apart from this broad difference, the various sizes of merchant steamships have in general no bold characteristic features like sailing ships; they possess different deck structures and certain differences in form, but, to the ordinary eye, a photograph of a vessel of, say, 1000 tons, apart from details of known size that may serve to fix the scale, may often be taken to represent a vessel of even *ten* or *twenty* times the size.

Types of Steamships.—A steam vessel may be little more than an open boat with the boiler and engines placed amidships if intended for river use, and may be of any shape necessary to suit local conditions and fulfil the services required. Vessels which proceed to sea must be decked over to prevent them from being "swamped" and built of a suitable form to make them otherwise seaworthy; the height of the deck above water, or the *freeboard*, will be increased, and the sides carried up above the deck; these *topsides* meet at the extremity of the vessel, and as the size of the vessel increases or larger seas have to be encountered the topsides are covered in forward and aft to further improve the sea-keeping qualities of the vessel. If only a short portion is so covered in, the covering is often rounded off along its sides and is then termed a *turtle back*, or *monkey forecastle*, when fitted forward, and a *turtle back*, or *hood*, when fitted aft; if made larger and of sufficient height above the upper deck to be serviceable for accommodation forward it is called a *top gallant forecastle*, and aft a *poop*. It is frequently desirable to build up cabins or other accommodation across the middle of the ship beneath the bridge, forming what is called a *bridge house.* Instead of fitting a turtle back or hood aft, a break is sometimes made in the upper deck and the after portion is raised a step higher than the midship portion, the after portion is then called a *raised quarter deck.* If a poop be extended forward to join the bridge house it is called a *long poop.* In very many cases when a top gallant forecastle is fitted, the gap which occurs between this forecastle and the bridge house is partly shut in at the sides by the ship's topside plating; the space so formed is then called a *well,* and the ship a *well-decked* ship.

Vessels arranged as above described are illustrated by figs. 10, 13, 14, on Plate II.; they include most of the vessels in the coasting trades of Europe, and many of the smaller and medium sized ocean-going cargo vessels. In larger vessels the forecastle, bridge and poop decks are frequently joined to form a light continuous structure. The vessel is then termed a *shade-decked vessel*—if the ship's sides up to this level are not completely closed in. In still larger ships the sides are completely built in, the deck made stronger, other decks or deck houses are fitted above it, and the ship is called an *awning decked, spar decked, shelter decked* or *three decked vessel*—according to the details of her construction. Above these strong steel decks light *promenade decks, sun decks* and *boat decks* are built according to the requirements of the accommodation for passengers, &c.

Cargo-ships.

Barges.—The simplest cargo steamer is the *steam barge* or *lighter,* often merely a long narrow box of wood or steel made small enough in section to pass through locks and canals, with the ends fashioned more or less abruptly, and spaces allotted aft for the machinery and forward for the crew. For service on rivers and estuaries they are made larger and wider as the circumstances of draught and dock or wharf accommodation permit, the bottoms being generally flat in order that they may ground safely in tidal waters; they are used for transferring cargoes of sea-going vessels to or from warehouses, and are frequently fitted so that they can tow one or more *dumb* barges.

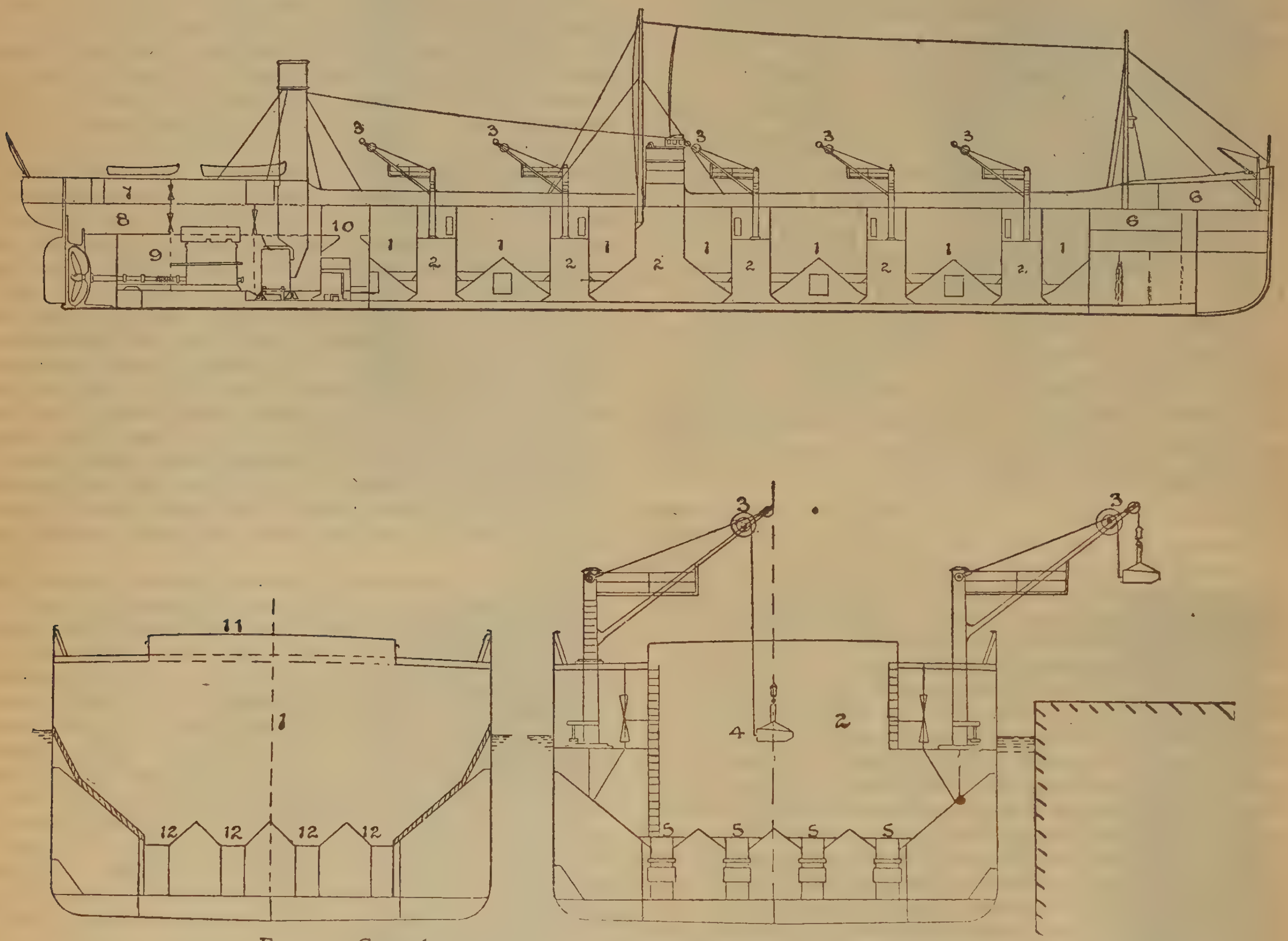


Fig. 11.—General arrangement of ore-carrying steamer "Vollrath Tham."

1. Hold.
2. Discharging trunk.
3. Electric crane.
4. Skip, or bucket.
5. Discharging doors.
6. Crew's space.
7. Officers' quarters.
8. Stores.
9. Engine and boiler room.
10. Coal bunker.
11. Loading hatch.
12. Slopes to discharging doors.

Many sea-going vessels are built to carry a particular cargo on one voyage and a general cargo on the return voyage. This usually results in their having certain features which adapt them for the special cargo, and do not interfere materially with their carrying a general cargo at remunerative rates. Ordinary cargo ships, or "Ocean Tramps" as they are called, do a very large portion of the world's cargo-carrying. They are mostly built of steel, and their usual speed is from 10 to 11 knots. In the early 'nineties well-decked vessels formed a large proportion of the total number; but ten years later comparatively few of this type were being built, and these were principally intended for the coal trade, or were comparatively small vessels for coasting purposes. Partial awning-decked steamers, again, which were much in favour at the same period, gave place, a decade later, to other types; and vessels having a raised fore-deck went entirely out of fashion, the tendency being to revert to flush-deck vessels, having short poop, bridge house and forecastle.

Modern Developments.—The last few years have been remarkable for great development in special types of cargo vessels. While the vessels have frequently been specially designed to meet the requirements of the particular trades on which they are to be employed, certain general features apply to the lines of their development:—

1. In order to accommodate the maximum cargo possible in vessels of convenient size, the lines of the vessels have been filled out, giving block co-efficients which are frequently over 80 % and in some of the Great Lake freighters have reached 88 %.

2. Such portions of the ship above the water as do not contribute usefully to carrying cargo, but would be measured for registered tonnage, are cut down to the smallest amount consistent with the provision of sufficient reserve of buoyancy and stability.

3. To provide for a return journey without a cargo, in addition to the double bottom and peak tanks, large water ballast tanks are provided abreast of and above the cargo spaces, and arranged so that when ballasted down the metacentric height of the vessel is not excessive. Much of the ballast is carried in side or wing tanks extending to the upper or main deck, or in triangular tanks beneath the main deck, ballast discharge valves or pipes being arranged so that the tanks may be emptied by gravity when practicable.

4. The holds have been cleared of obstructions—such as pillars, hold beams and web frames—so that the stowage space for the cargo is unbroken, the necessary strength being given by a heavier system of framing of the ship and by the construction of the wing or side tank bulkheads.

5. To facilitate rapid handling of cargo, hatches have been increased in size and number, and special appliances fitted for rapidly loading and unloading the vessel—particularly, large numbers of derricks or cranes, with convenient steam or electric winches.

Several well-known types of cargo vessels have thus been produced, such as the "Mancunia" built by Messrs W. Gray & Co. at West Hartlepool in 1898, with *side-ballast tanks* on McGlashan's patent; *cantilever-framed* vessels by Messrs Raylton Dixon & Co. on Harrowby and Dixon's patents; *trunk-deck* vessels by Messrs Rayner & Co., and *turret-deck* vessels by Messrs Doxford & Co. of Sunderland. Fig. 10 (Plate II.) is a photo of a turret-deck steamer. Her dimensions are: length 439 ft. 8 in., beam 51 ft. 7 in., gross tonnage 5995 and net tonnage 3794 tons. Many such vessels have been built; they have the reputation of being good dead-weight carriers, and the shelf on each side of the central trunking can very conveniently be used for carrying timber and for other purposes. The "Echunga," built by Sir Raylton Dixon & Co. in 1907, is an example of a modern cantilever-framed flush-decked vessel,—she is 404 ft. long over all, 56 ft. beam, 23·6 ft. moulded depth. On a draught of 23 ft. 9 in. her displacement is about 12,000 tons and dead-weight capacity over 8000 tons, while as regards space she has a stowage capacity of more than 400,000 cub. ft. These results are obtained on the low net register tonnage of 2245 tons, the gross tonnage being 4590 tons. The vessel has continuous upper and main decks, and the underside of the wing tanks carried by the cantilever frames is at such a slope that coal will naturally stow close up on being dumped into the hold. The triangular wing tanks take 1350 tons of water ballast and the double bottoms and the fore- and after-peaks take 1850 tons.

The "Herman Frasch," a modern American cargo vessel of 3804 tons, gross, built in 1909 by the Fore River Shipbuilding Co., Quincy, Massachusetts, for the sulphur trade, is a single-decked vessel, with triangular side ballast tanks and fitted with a short forecastle which carries the windlass gear, a bridge-house well forward to accommodate captain and navigating officers, a poop for firemen and crew, and cabins above the poop for the engineer officers. Her dimensions are: length 345 ft., breadth 48 ft. 3 in., depth of hold 27·1 ft. At a draught of 23 ft. 6 in. her displacement is 8770 tons, of which 6125 tons may be dead-weight carried. Her engines are of 2100 I.H.P., are fitted right aft, and give her a speed of 10·5 knots.

An interesting cargo vessel of a different type is the "Vollrath Tham," recently completed by Messrs Hawthorn, Leslie & Co. for the Swedish ore trade. She is 387 ft. long, 56 ft. 6 in. beam, depth 30·9 ft., tonnage 5826 tons, gross, and dead-weight capacity 8000 tons. Instead of the usual open hold arrangement she has been divided into a series of hoppers and automatic discharging holds, and fitted with 10 electric discharging cranes. Trunks are provided in each hold, through which buckets or skips of two tons capacity can be lowered into position beneath discharging doors under the cargo hold. (Fig. 11 shows the general arrangement of this vessel.)

Great Lake Freighters.—The greatest development of cargo handling the world has yet seen is, however, to be found in North America, where the Great Lake freighters have been built to meet the rapidly growing trade in iron ore, coal and grain. Some of these vessels are 600 ft. or upwards in length, 60 ft. beam, and 32 ft. moulded depth, and on a draught of 20 ft. can carry 12,500 tons of coal or ore or 450,000 bushels of grain. The hatches of these vessels are 12 ft. apart, and are so wide that the holds are self-stowing. The holds are quite unobstructed fore and aft, and built with flat bottoms and vertical sides, so that practically the whole of the ore can be removed by clam shell grabs. For loading, the vessels are brought alongside huge stacks of ore stored on long lofty piers called ore docks; these docks are provided with shoots from which the cargo is run into the ships by gravity, thus loading large vessels in two hours. When unloading at the Cleveland end of the voyage the cranes and transporters fitted ashore can hoist out the cargo of 12,500 tons in ten hours, using grabs of 5 to 15 tons capacity. The propelling machinery is placed right aft and develops from 1800 to 2200 H.P., giving a speed of from 10 to 12 knots. They are well equipped with auxiliary machinery including steam steering gear, steam winches and hoists, pumps and electric light. The wheel-house and bridge are fitted at the after end of a short forecastle; the officers are accommodated forward and the crew aft, both being provided with excellent quarters (see fig. 15, Plate II., and fig. 16).

Colliers.—In a number of cases vessels are built to carry special cargoes; coal carrying vessels, *colliers*, are well-known examples of this class. One of the first colliers to be fitted with steam-engines was the sailing vessel "Q.E.D.," built at Wallsend in 1844, and fitted by Messrs R. & W. Hawthorn with auxiliary machinery of 20 N.H.P driving a screw propeller. She was constructed of iron, had an overall length of 150 ft. with a breadth of 27½ ft. In certain respects she was a remarkable vessel, for she was fitted with a double bottom, the space between the bottoms being divided into tanks and arranged for water ballast, a system which has since been re-invented and is now common in colliers and in most cargo ships. The advantage of the arrangement in colliers is especially great, as they usually carry a full cargo one way and return empty; in their light condition sufficient water ballast can be at once added to make them seaworthy, and this at the end of the voyage can be pumped out at a small cost. It was not until about 1852 that steam alone began to be relied on for propelling colliers; in that year the iron screw collier, "John Bowes," was built by Messrs Palmer of Jarrow; she was 152 ft. long, 26 ft. 4 in. beam, had a dead-weight capacity of about 540 tons, was fitted with temporary tanks for water ballast; had machinery of 70 N.H.P. placed right aft; and she took her cargo to London in 48 hours. The saving in time and cost, as compared with the transport of coals to London by the sailing colliers then in vogue, was very great, and this led to the building of many other such vessels.

In 1880 the ordinary steam collier carried 600 or 700 tons of cargo; a steady increase in size has been in progress, and the popular collier of to-day carries about 3000 tons, while for long voyages vessels of from 8000 to 10,000 tons capacity are used. While improvements have been made in hull and machinery, so also have improvements been made to enable the colliers' cargoes to be handled more rapidly. Appliances have been adopted for emptying truckloads of coal into the vessels when loading, and many arrangements have been devised for discharging rapidly, but derricks and winches supplemented in some cases by Temperley transporters are still generally relied on. An interesting vessel in which special appliances have been fitted to reduce the amount of hand labour in discharging is the "Pallion," built by Messrs Doxford & Sons in 1909. She is of the following dimensions: length 269 ft., breadth 44½ ft., depth 22 ft.; tonnage 2474 tons gross, 1307 tons net, and can carry 3100 tons on a draught of 17 ft. 10 in. She is a single screw ship fitted with three cylinder compound engines of 217 N.H.P. and 1200 I.H.P. fitted aft. Systems of conveyor-belts are fitted so that the cargo can be delivered direct into trucks ashore or into barges or other vessels alongside by steam power, and under trial conditions at Sunderland the rate of discharge was found to be 1000 tons per hour.

Oil Tank Steamers.—These form another class of vessels built for a particular cargo, and their construction and the character of the material carried are such that they cannot ordinarily be used for other purposes. In 1863 two sailing tank vessels were built on the Tyne. In 1872 Messrs Palmer built the "Vaderland," which appears to have been the first oil tank steamer. The oil carrying steamer "Zoroaster" was built in 1877 in Sweden and in 1910 was still on service. She was built of steel of length 184 ft., breadth 27 ft., draught 9 ft., and had a loading capacity of 250 tons. The oil tanks in the "Zoroaster" were separate from the hull, but after successful trials other vessels were built for Messrs Nobel Bros. in which the skin plating itself formed the tank. In 1886 Messrs Armstrong, Whitworth & Co. built the "Baku," and since that date large numbers of steamers have been built for this trade, the majority of them having been built by the Armstrong firm. Many of these steamers are of large dimensions while some are comparatively small. On the Caspian Sea, for instance, numerous small steamers are employed conveying oil from the Baku district to other ports, and to towns along the Volga; and in other places small steamers are used for the local distribution of oil brought across the ocean and stored in large depots. Such a small steamer is the "Chira," built by Smith's Dock Company in 1909; in size and appearance this vessel resembles a steam trawler, she is 95 ft. long, 19 ft. 3 in. beam, depth moulded 7 ft. 9 in., 108 tons gross, 46 tons net tonnage. The fish hold is in this vessel replaced by a tank for carrying oil in bulk and a hold for case oil. Vessels of 6000 to 12,000 tons carrying capacity are now preferred by the large companies for transporting oil over very great distances on account of their relatively great economy. Fig. 12 shows the general arrangements of a typical modern oil tank steamer. As an example of a large oil vessel, the "Pinna," engaged in carrying petroleum from Russian ports to the East, may also be mentioned. She is 420 ft. long, 52 ft. broad, and 32 ft. deep, and can carry 9000 tons of oil in her fully-laden condition. The machinery is placed well aft, and the cargo space is divided up into twelve large tanks, extending to the height of the main deck, by seven transverse bulkheads and a longitudinal middle-line bulkhead. The spaces between the transverse bulkheads are called Nos. 1, 2, 3, 4, 5 and 6 holds respectively, and each hold has a port and a starboard tank. Each tank is provided with an expansion trunk, in order that the free surface of the oil may always be small, however much the bulk of the latter may expand or contract with changes of temperature.

Motor Tank Vessels.—Several oil tank vessels have been fitted with internal combustion engines instead of steam propelling machinery In 1903 the "Vandale" and "Sarmat," capable of carrying 750 tons of refined petroleum each, were built for Messrs Nobel Bros., and fitted with Diesel motors of 360 H.P. More recently the "Emanuel Nobel" and "Karl Hagelin" have been built for the same firm; they are fitted with Diesel motors of 1200 H.P., are 380 ft. long, 46 ft. beam, 16½ ft. draught and carry 4600 tons of kerosene oil. The large motor-driven vessels are arranged somewhat similarly to the steam-driven oil-tank vessels, but with the machinery fitted in a comparatively shorter space, no boiler room being then required.

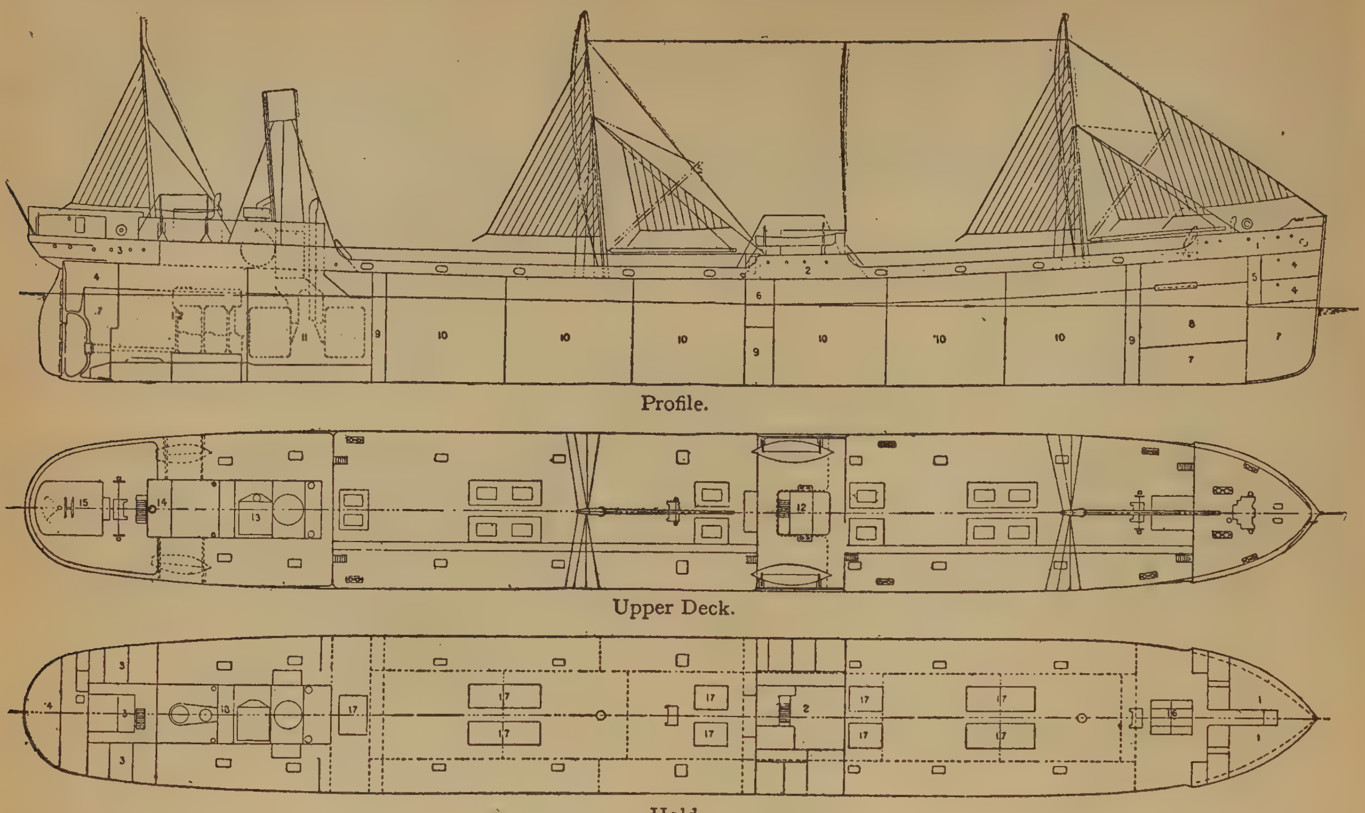


FIG. 12.—General Arrangement of a Modern Oil-Tank Steamer.

1, Crew space.
2, Cabins.
3, Engineers' cabins.
4, Store.
5, Chain locker.
6, Pump-room.
7, Water-ballast tank.
8, Fore-hold.
9, Coffer dam.
10, Oil-tank.
11, Boiler-room.
12, Engine-room.
13, Donkey boiler.
14, Galley.
15, Steering engine house.
16, Cargo hatch.
17, Oil and cargo hatch.
18, Coal shoot.

Table X. gives the dimensions, carrying capacity and other leading particulars of four cargo steamers of different types, and one steamer carrying mails and passengers as well as a large cargo. A is a well-decked vessel (fig. 13, Plate II.), having a top-gallant forecastle with a long raised quarter-deck and bridge-house combined, and is fitted with one deck, but has two tiers of beams. B (fig. 14, Plate II.) is a vessel with a top-gallant forecastle, bridge-house and poop, and a single deck. C is an awning-decked vessel with two decks, but three tiers of beams. D is a shelter-decked vessel of the highest class fitted with three decks and four tiers of beams and having machinery of high power. E is an American lake steamer in which the draught was limited to 20 ft., similar in many respects to the smaller vessels shown in fig. 15 (Plate II.) and in fig. 16 below. Besides the principal dimensions and light and load displacements, the block "coefficients" corresponding to the load conditions are given in Table IV., in order to show the fullness of form commonly adopted in these vessels. The *block coefficient* is the ratio of the

TABLE X.—*Types of Cargo Carrying-Steamers.*

When built	A. Built in 1881.	B. Built in 1894.	C. Built in 1897.	D. Built in 1909.	E. Built in 1909.
Type of Vessel	Well-decked.	With Top-gallant Forecastle, Bridge House and Poop.	Awning-decked.	Shelter-decked.	American Lake Steamer.
Length	263′ 6″	300′ 0″	470′ 0″	535′ 0″	580′ 0″
Breadth	35′ 8″	40′ 0″	50′ 0″	63′ 0″	58′ 0″
Depth (moulded)	20′ 6″	23′ 6″	34′ 10″	38′ 0″	32′ 0″
Draught (without keel)	19′ 3″	19′ 2″	27′ 5″	28′ 0″	19′ 0″
Weight of steel or iron in hull	820 tons	. .	3676 tons	7650 tons	4145 tons
,, wood, outfit, &c.	166 ,,	. .	509 ,,		300 ,,
,, propelling machinery	184 ,,	. .	615 ,,	2200 tons	350 ,,
Total light displacement	1170 ,,	1620 tons	4800 ,,	9850 ,,	4795 ,,
Load displacement	3740 ,,	5530 ,,	16,710 ,,	18,350 ,,	15,795 ,,
,, block coefficient	·72	·80	·81	·68	·886
Ratio of light to load displacement . . .	·313	·293	·287	·537	·304
Dead-weight carried	2570 tons	3910 tons	11,910 tons	8500 tons	11,000 tons
Ratio of dead-weight carried to load displacement	·687	·707	·713	·463	·696
Cargo capacity in cubic feet	115,000	170,000	680,000	. .	650,000
Tonnage under deck	1436	2150	7038	8480	7100
,, gross	1816	2385	7296	12,100	7268
,, net	1167	1500	4770	6780	5484
Water-ballast capacity	357 tons	500 tons	3346 tons	. .	9464 tons

volume of the immersed portion of the ship to the volume of the parallelepiped, whose length, breadth and depth are the same as the length, breadth and mean draught (without keel) of the vessel itself; and it will be seen that in three cases out of the five given, the immersed volume, *i.e.* the displacement, is 80, or upwards of 80% of this circumscribing parallelepiped. The low speed, which is found economical for the "ocean tramp," admits of this fullness, and provides that capability for large stowage accommodation for cargo which has brought it into existence. In vessels whose speed is of great importance the block coefficient varies from ·5 to ·68, the lower limit being reached on the smaller vessels on cross-channel services, and the higher limit on very long vessels, such as Atlantic liners. In the moderately fast vessel D shown in table the block coefficient is ·68. The total weight of material in the hull, *i.e.* the iron or steel and woodwork, outfit, &c. and the propelling machinery, is called the vessel's *light displacement.* The *load displacement* is made up of the light displacement, together with the weight of the cargo, &c., or the dead-weight carried; this, it will be seen from Table X., varies from two to two and a half times the amount of the light displacement, except in case D in which the machinery and the passenger accommodation absorb much weight. British vessels may not be loaded deeper than a certain mark, known for many years as the Plimsoll mark, which has to be placed on the sides of all merchant vessels. The mode of measuring tonnage is based on the Act of 1894, which embodies preceding legislation and subsequent Acts (see TONNAGE).

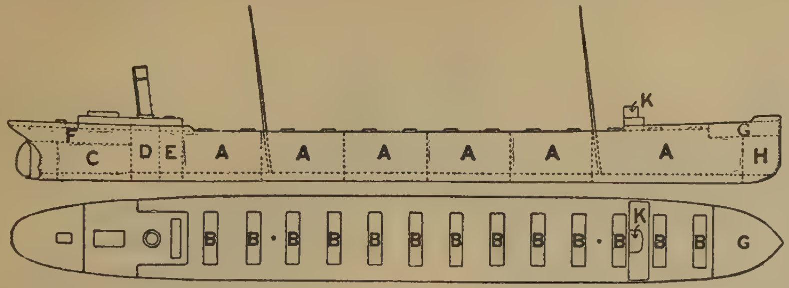


FIG. 16.—Plan of Great Lake Cargo Steamer.

A, Cargo hold.
B, Hatches.
C, Engine-room.
D, Boiler-room.
E, Coal-bunker.
F, Officers' Quarters.
G, Crew's space.
H, Water ballast.
K, Pilot-house.

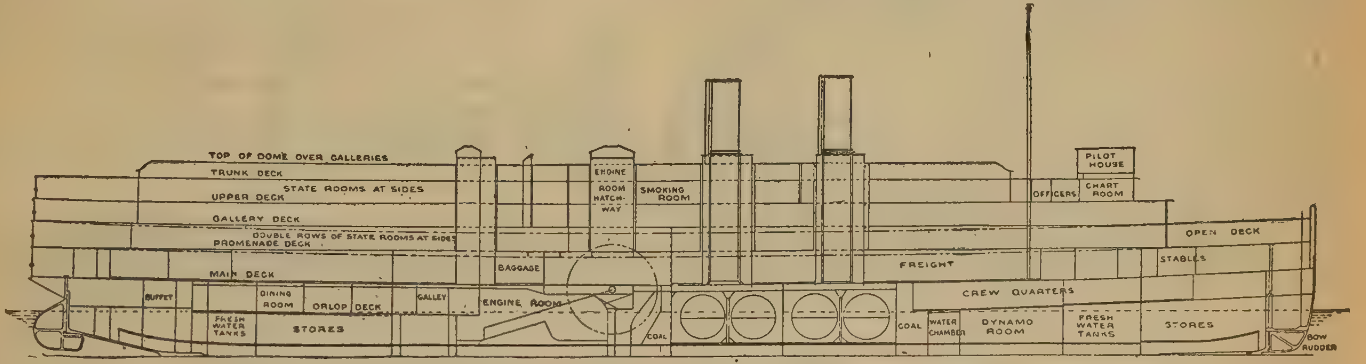


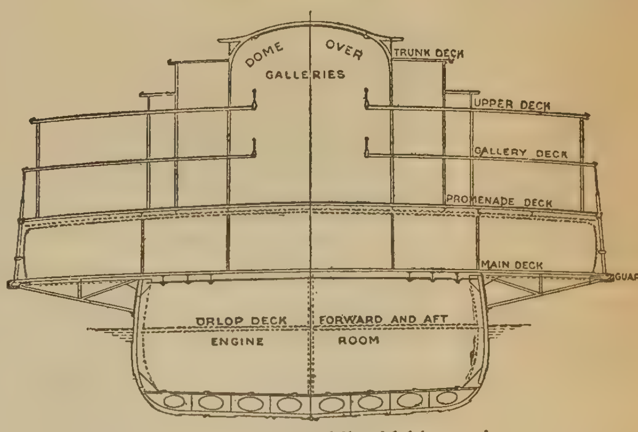
FIG. 19.—Great Lake Passenger Steamer "City of Cleveland," longitudinal section.

Passenger steamers. The numerous varieties of passenger steamers may for convenience be taken in the following order:—Ferry; River and Sound; Cross Channel; and Ocean Steamers; although it must be understood that in many cases a hard and fast line cannot be drawn between steamers for the several services.

Ferry Steamers.—Ferry steamers are found on many rivers and harbours in the United Kingdom; they perform important services in transporting passengers and road traffic across sheltered waters where bridges are not available; and others are built in the United Kingdom for service in all parts of the world. The "Guanabacoa," a double-ended steel vessel built by Messrs Cammell, Laird & Co., for ferry service on Havana Bay, is 140 ft. long overall, breadth moulded 38 ft., depth moulded amidships 13 ft. 2½ in. Well-decorated saloons 12 ft. high extend along the sides of the vessel, and between them are wood-paved tracks for 30 to 40 carts and horses. One thousand passengers can be carried, and a fine promenade deck for them extends over the saloons, &c. Above all a light sun deck extends right fore and aft. Compound surface-condensing engines are fitted with a screw propeller at each end of the vessel, which drive her either way at from 10 to 11 knots. She made the passage to Havana under her own steam. A number of ferry-boats have been built by Messrs Thornycroft for service in India; they are 105 ft. long overall, of 20 ft. beam, 10 ft. moulded depth and 5 ft. draught; their machinery of 500 I.H.P. is placed amidships and gives a speed of 12 knots; two saloons are arranged forward and two aft with access to a promenade deck from each, accommodation for 200 passengers with luggage being provided. A light wooden awning extends over all. These vessels are built of steel and divided into eight water-tight compartments; they were built and put together at Southampton, then taken to pieces, packed and shipped abroad, re-erected and completed at Calcutta.

The largest ferry-boats are to be found in America, and an interesting example is the "Hammonton" built in 1906 by the New York Shipbuilding Company. She is 168 ft. long overall, 38 ft. beam, 8 ft. 6 in. draught, 625 tons displacement. A feature of this vessel is that all details are arranged with the view to making the vessel practically fireproof, wood fittings being reduced to a minimum. The vessel is double-ended, carries over a thousand passengers and a large number of horses and vehicles on one deck. As in many American river vessels, the upper works extend to a considerable width beyond the body of the hull beneath to give large deck areas; the main deck being about 6 ft. above water and 55 ft. wide. Cart tracks are arranged along the midship portions of the deck with passenger saloons, &c., at the sides. A light shade deck extends forward and aft and carries a pilot house near each end. Water-tube boilers and three cylinder compound engines of 600 H.P. are fitted beneath the deck amidships and drive a propeller at each end of the boat. The "Oakland," "Berkeley" and "Newark" running at San Francisco are much larger than the "Hammonton," and have a seating capacity for 2000 people each, with a fine promenade deck above the upper deck. The first two are fitted with beam engines driving side paddle-wheels, while the third has a screw propeller at each end of the vessel driven by vertical triple expansion engines. Each of them burns oil fuel only.

River and Sound Steamers.—For service on rivers, harbours and estuaries where the traffic is considerable, paddle-wheel vessels of limited speed are usually preferred, as possessing great manœuvring power, and therefore the capability of being brought alongside the landing-places with rapidity and safety. The paddle-wheel steamer "La Marguerite," which formerly in the summer months made trips from London to the coast of Kent and to France, now conducts service between Liverpool and North Wales. She is 330 ft. long, has accommodation for a large number of passengers, and obtained 22 knots with 7500 I.H.P. on trial. Another well-known Thames steamer is the "Royal Sovereign," of length 300 ft., breadth 33 ft., depth moulded 10 ft. 6 in., draught 6 ft. 6 in., tonnage 891 tons gross, 190 tons net; carrying 2320 passengers at a speed of 21 knots.



"City of Cleveland," midship section.

Excursion steamers working round the coast are frequently of similar type to this vessel, but of less length and less extensive open promenade decks. A popular south coast pleasure steamer, built in 1909, is the paddle boat "Bournemouth Queen," shown in fig. 17 (Plate X.). She is 200 ft. long, 24 ft. breadth moulded and 48 ft. 6 in. outside guards, 8 ft. moulded depth, tonnage 353 tons gross, 139 tons net; she can carry 610 passengers on a No. 3 certificate and 704 on a No. 4 certificate. Her displacement at 5 ft. 2 in. load draught is 406 tons and her speed 15½ knots. The "King Edward," a steamer which began to ply on the Clyde in 1901, is 250 ft. long, 30 ft. wide, 10 ft. 6 in. deep to the main deck, and 17 ft. 9 in. to the promenade deck. She was the first passenger steamer to be driven by Parsons steam turbine. Her speed is 20 knots. A second turbine steamer, the "Queen Alexandra," began to run on the Clyde in 1902; she is generally similar to the "King Edward," but larger and faster.

These vessels are popular because of their great speed and the absence of vibration. They have been followed by others such as the "Kingfisher" on the Thames and the "Atalanta" on the Clyde. The latter being 227 ft. long, 27 ft. beam, depth 10 ft. 6 in., draught 5 ft. 6 in., displacement 520 tons and gross tonnage 400; the machinery of 2500 H.P. gives a speed of 18 knots, and is of interest as it was utilized for very extensive shop experiments to obtain data for the construction of the turbines of the great Cunarders. Numerous steamers of this class are to be found on the rivers and coasts of the Continent, but the finest are employed on the rivers and harbours of America, together with large numbers of a smaller class. Most of the light-draught river steamers of the United States are built of wood, but those employed elsewhere are usually built of steel. The "Hendrick Hudson" (fig. 18, Plate III.), built of steel in 1906, one of the most famous river boats of America, carries 5000 passengers, for whom five decks, which have a breadth of 82 ft.—the full width over the paddle-boxes—are set apart. She is 380 ft. long, 45 ft. breadth moulded, 13 ft. 5 in. moulded depth, draught 8 ft., freeboard amidships 6 ft. 3 in., tonnage gross 2847 tons. The old walking-beam arrangement of engines, for many years a distinctive feature of American river steamers, is in this vessel replaced by inclined, three-cylinder, compound, direct acting engines; her feathering paddle wheels are 24 ft. in diameter and 16 ft. 6 in. wide, and her speed is 22 knots.

Some of the boats of the Fall River Line are larger than the "Hendrick Hudson"; the "Puritan" is 420 ft. long, of 7500 I.H.P. and 4650 tons gross; the "Priscilla," built in 1904, is very similar to the "Puritan," but is 440 ft. long and 20½ ft. depth moulded; her moulded breadth is 52½ ft. and her decks extend to an extreme breadth of 93 ft.; her tonnage is 5292 tons gross; the side wheels are 35 ft. in diameter and 14 ft. wide, driven by inclined engines of 8500 I.H.P., and running at about 24 revolutions per minute maintain a speed of about 15 knots on service. A still larger vessel of the same type is the "Commonwealth," which is 456 ft. overall; breadth of hull 55 ft., breadth of decks outside guards 96 ft., horse power 11,000. The "Puritan," "Priscilla" and "Commonwealth" run on night service only to Fall River through Long Island Sound, and the accommodation provided is very large; the "Priscilla," for instance, can sleep 1500 persons besides her crew of over 200. In these vessels the freeboard is carried to one deck higher than in the "Hendrick Hudson," to enable them to accomplish the exposed ocean portion of their passage with safety; and they form a link between the fast river steamer and the fast cross-channel steamer. Similar passenger vessels are employed on the Great Lakes, an example being the "City of Cleveland" (fig. 19), built in 1908, of the following dimensions: length overall 404 ft., breadth hull proper 54 ft., width over paddle-boxes 92 ft. 6 in., depth 22 ft.; tonnage 4568 tons gross, 2403 tons net. She is built of mild steel, divided into 10 principal water-tight compartments and fitted with a cellular double bottom, and has a water chamber of 100 tons capacity to check rolling in a sea way. The engines are compound, three-cylinder, inclined, connected directly to cranks on the paddle-wheel shaft, the diameters of the cylinders being one of 54 in. and two of 82 in., and the stroke 8 ft.; eight single-ended cylindrical boilers fitted with Howden forced draught supply steam at 160 lb, and on service the vessel can maintain 20 m. or 17·5 knots per hour without difficulty, developing about 6000 I.H.P. at 28 revolutions per minute.

Cross-Channel Steamers.—Cross-channel steamers are of a heavier type than those just considered and require higher freeboard and better sea-keeping qualities to be able to make passages across more exposed waters in all weathers. Over 200 such vessels are employed carrying mails, passengers, luggage, cattle and merchandise between Great Britain and Ireland, the Isle of Man, and continental ports. The mail service between Holyhead and Kingstown has for many years employed a number of splendid vessels of this class. The four paddle-steamers, "Ulster," "Munster," "Leinster" and "Connaught," built in 1860, were 337 ft. long, 35 ft. broad and 19 ft. deep; their speed was 18 knots with 6000 I.H.P. A vessel of the same type, but larger, named the "Ireland," was added to the fleet in 1885. In 1896 and 1897 four new twin-screw steamers were built, and received the same names as the four vessels built in 1860, which they have replaced. Their length is 360 ft., breadth 41 ft. 6 in., depth 29¼ ft., tonnage 2633 tons gross, 733 tons net, and displacement 2230 tons at 14 ft. 6 in. load draught. Their engines are of 9000 I.H.P. and sea-going speed 23 knots, over 24 knots having been reached on trial. They have sleeping-berths for 238 first-class and 124 second-class passengers, and large dining and other public rooms for general accommodation.

In recent years large numbers of very fine vessels of the cross-channel type have been built for other services. In 1903 the "Queen," the first turbine vessel for the Dover-Calais service, was built by Messrs Denny of Dumbarton; she is 310 ft. long and obtained 21¾ knots. In 1905 the "Invicta" was built of the same dimensions and boiler power, and by means of improved turbines the speed was increased to 23 knots. In the same year the Midland Railway Company ordered three vessels each 330 ft. long, 42 ft. beam and 25 ft. 6 in. moulded depth; and a fourth similar but a foot wider. Two of these vessels, the "Antrim" and "Donegal," were fitted with four-cylinder triple-expansion engines driving twin screws; the third and fourth, the "Londonderry" and "Manxman," were fitted with turbines of 6000 and 8000 H.P. respectively. All had cylindrical boilers of the same dimensions. The "Antrim" did better than the "Donegal" and obtained a speed of 21·86 knots with very remarkable economy; of the turbine vessels, the "Manxman" did better than the "Londonderry," reaching 23·12 knots, and proving more economical than the "Antrim" at all speeds above 14 knots.

Other successful vessels of this class are the "St George" and three sister vessels, 350 ft. long, 2500 tons displacement, 11,000 H.P. and 22½ knots speed, built for the Great Western Railway Company for service from Fishguard to Rosslare; and the "Princesse Elisabeth," of 24 knots, employed on the Dover-Ostend service. But all these vessels were surpassed by the "Ben-my-Chree," built at Barrow for the Isle of Man Steam Packet Company. She is 375 ft. long, 46 ft. beam, 18 ft. 6 in. moulded depth, carries 2549 passengers on a No. 2 certificate, and displaces 3353 tons at 13 ft. 5 in. draught. On trial she attained 25½ knots on the measured mile, and maintained 24½ knots for over 6 hours; on service she averages 24 knots at sea and 23 knots between the Liverpool landing stage and Douglas pier. Numbers of cross-channel steamers are owned by continental companies, among which the "Prinses Juliana" (fig. 20, Plate III.) and her two sister vessels, belonging to the Zeeland Steamship Company of Holland, run on the night service between Queenboro' and Flushing. They are 350 ft. long, 42 ft. 6 in. beam, 16 ft. 4 in. depth, gross tonnage 2885 tons; they have four-cylinder triple-expansion engines of 10,000 H.P., and attained 22½ knots on the mile, and 22 knots on a six hours' run; they have excellent accommodation for 350 passengers.

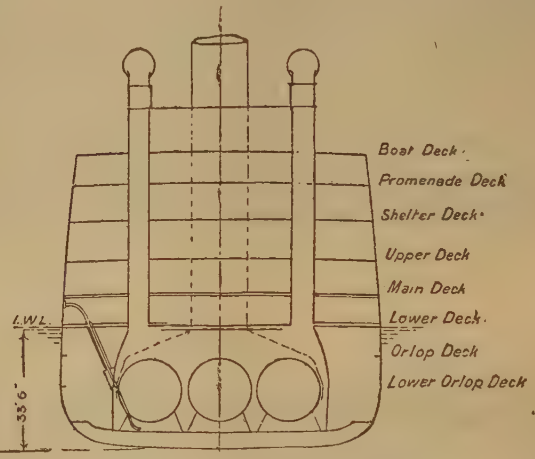


FIG. 29.—Section of "Mauretania."

For services on which relatively large cargoes and fewer passengers are carried smaller vessels of less speed are built, such as the "Rowan," built by Messrs D. & W. Henderson & Co. for the Laird Line service between Glasgow and Dublin. She is 292 ft. long, 38 ft. beam, 17 ft. 6 in. depth moulded, has sleeping accommodation for 200 passengers, triple-expansion engines, and a speed of 16 knots.

In America a number of vessels of the cross-channel type have recently been built. One of these, the "Governor Cobb," 290 ft. long, 54 ft. beam, 20 ft. 6 in. moulded depth, 14 ft. draught loaded, was the first merchant vessel in America to be driven by turbines. She was followed by the "Harvard" and "Yale" of the same type, 407 ft. overall, 63 ft. extreme breadth, 16 ft. draught loaded; they carry 800 passengers and 600 tons freight on a night service between New York and Boston; turbines of 10,000 H.P. give them a speed of 20 knots, making them at the time the fastest sea-going vessels on the American coast.

The "Prince Rupert," "Princess Charlotte," &c., recently built for service on the western coast of Canada, also belong to this section. The first-named (fig. 21, Plate III.) is 306 ft. long, 42 ft. beam, 24 ft. moulded depth. At 15 ft. draught her displacement is 3150 tons, of which 1000 tons is cargo; she is of 3379 tons gross, 6000 I.H.P. and her speed 18¼ knots. The "Prince George" is similar to the "Prince Rupert" and obtained 19·2 knots on trial at 13 ft. 3 in. draught and 2622 tons displacement; both vessels can carry 220 first-class and a

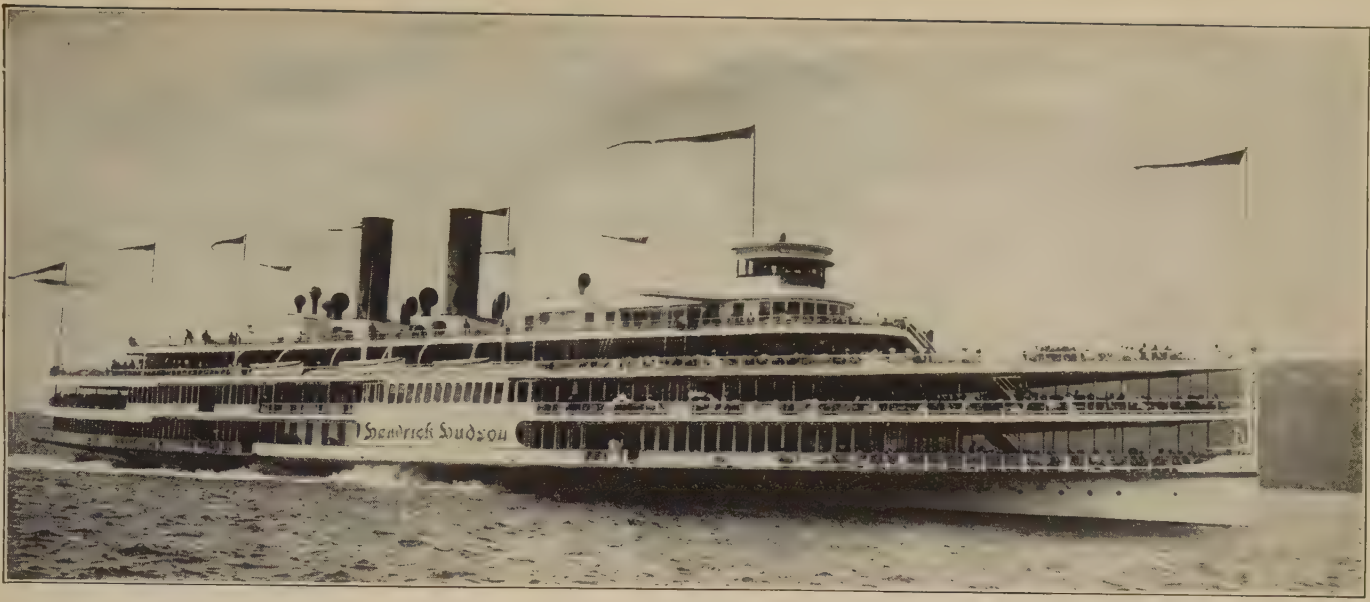


FIG. 18.—American River Steamer *Hendrick Hudson.*

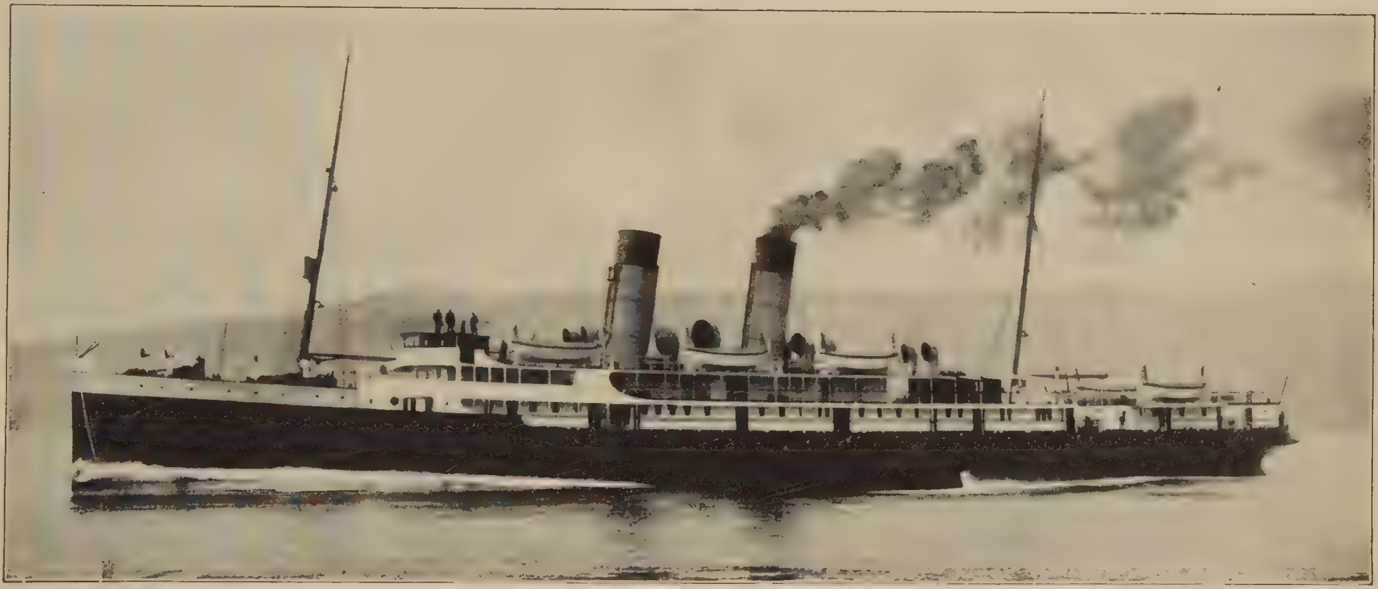


FIG. 20.—Cross-Channel Steamer *Prinses Juliana.* *(Photo, Frank & Son.)*

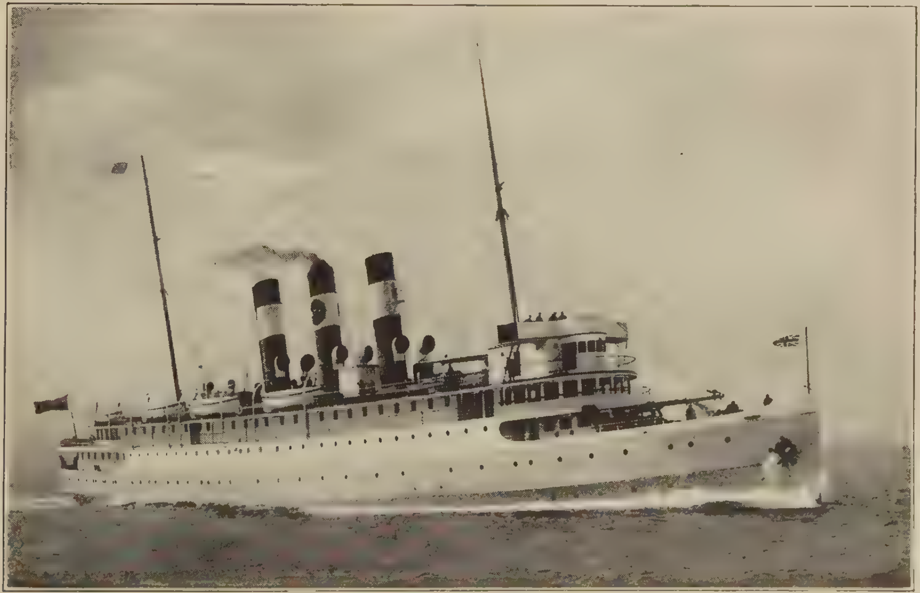


FIG. 21.—Canadian Coasting Steamer *Prince Rupert.*

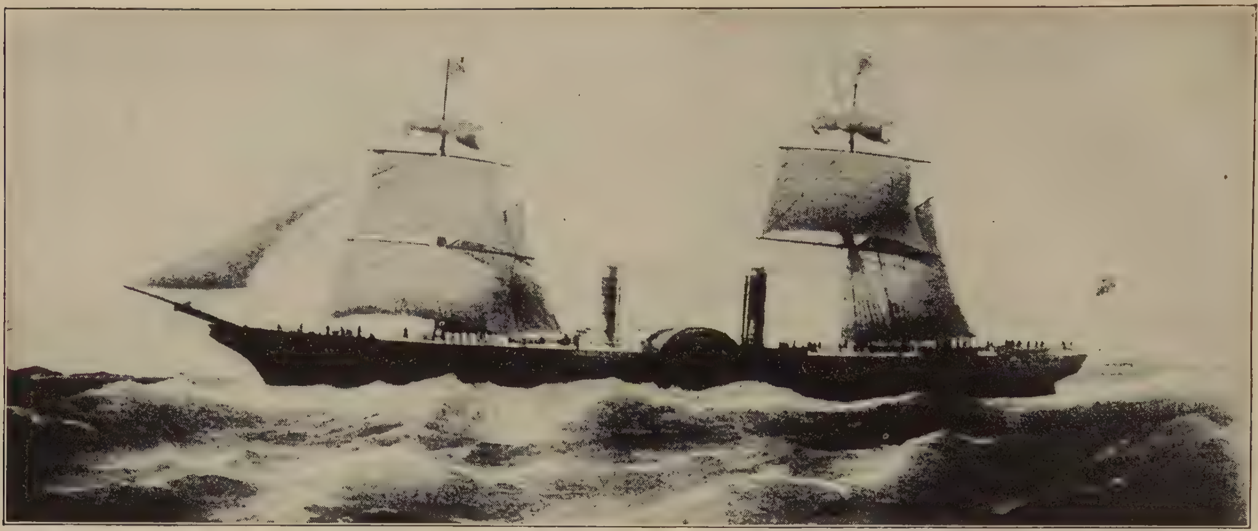


FIG. 22.—Early Cunard Steamer *Persia*.

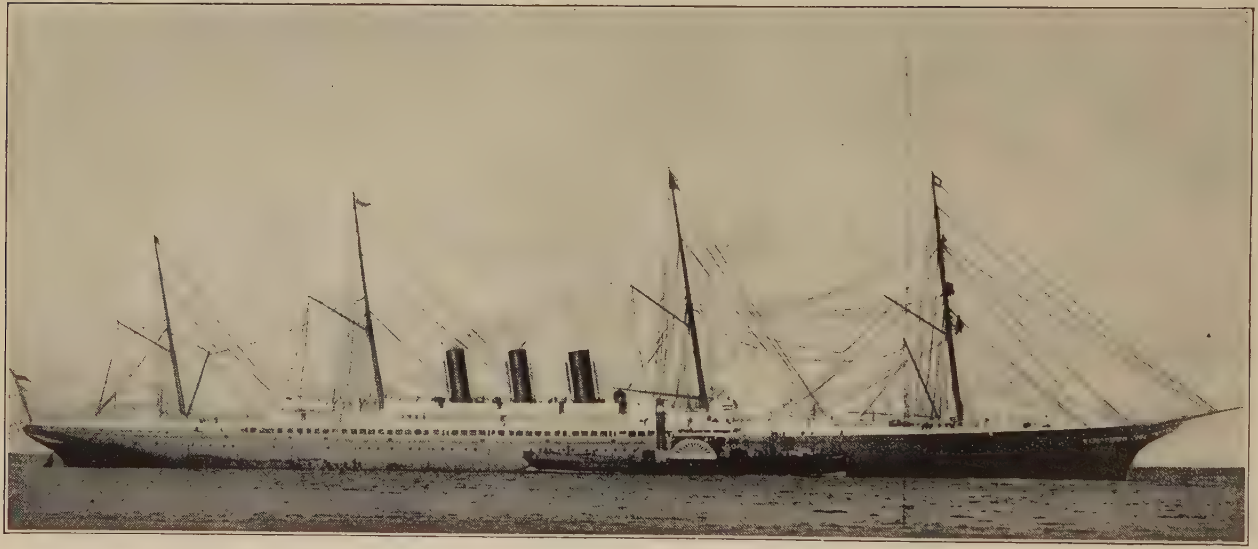


FIG. 23.—Inman Liner *City of Rome*.

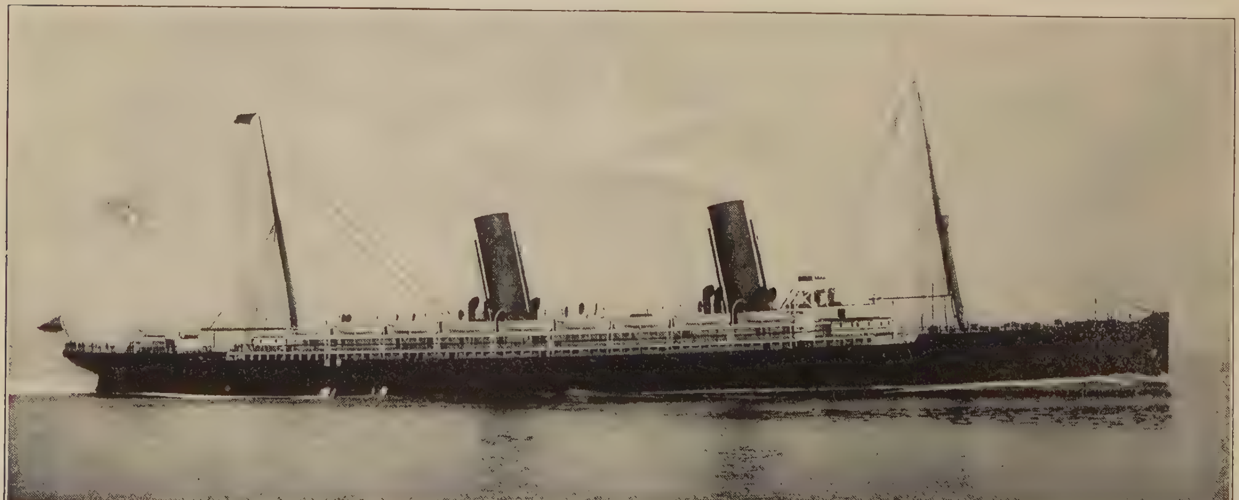


FIG. 24.—Cunard Liner *Campania*.

large number of second-class passengers. The "Princess Charlotte" is of 3600 tons and 20 knots speed.

Japan has built and engined two cross-channel steamers, which maintain a service between Japan and Korea. They are 335 ft. long, 43 ft. beam, gross tonnage 3200, displacement, at 17 ft. draught, 3880 tons. Parsons turbines of 8500 H.P., made in Japan, are fitted and give a speed of 21 knots.

Ocean Liners.—The article on STEAMSHIP LINES gives an account of the rise of the great shipping companies. The steamships of 12,000 tons and upwards, referred to on page 873, are shown in Table XI.:—

TABLE XI.—*Vessels of 12,000 Tons and upwards afloat June 1910.*

Name.	Gross Tonnage.
British.[1]	
Mauretania	31,938
Lusitania	31,550
Adriatic	24,541
Baltic	23,876
Cedric	21,035
Celtic	20,904
Caronia	19,687
Carmania	19,524
Oceanic	17,274
Arabic	15,801
Laurentic	14,892
Megantic	14,878
Minnewaska	14,317
Saxonia	14,281
Empress of Ireland	14,191
Empress of Britain	14,189
Ivernia	14,067
	326,945
25 other vessels of 12,000-14,000 tons	317,358
42 vessels. Total	644,303
Dutch.	
Rotterdam	24,149
Niew Amsterdam	16,967
Noordam	12,531
Rijndam	12,527
Potsdam	12,522
5 ships. Total	78,696
American.	
Minnesota[2]	20,718
Manchuria	13,639
Mongolia	13,639
3 ships. Total	47,996
German.	
George Washington	25,570
Kaiserin Auguste Victoria	24,581
Amerika	22,622
Kronprinzessin Cecilie	19,503
Kaiser Wilhelm II.	19,361
President Lincoln	18,168
President Grant	18,072
Berlin	17,324
Prinz Friedrich Wilhelm	17,082
Cleveland	16,960
Deutschland	16,502
Cincinnati	16,339
Kronprinz Wilhelm	14,908
Kaiser Wilhelm der Grosse	14,349
	261,341
8 other vessels of 12,000-14,000 tons	103,435
22 ships. Total	364,776
Belgian.	
Lapland	17,540
Finland	12,185
Kroonland	12,185
Vaderland	12,018
4 ships. Total	53,928
French.	
La Provence	13,753
Espagne	13,600
2 ships. Total	27,353
Japanese.	
Tenyo Maru[3]	13,454
Chiyo Maru	13,426
2 ships. Total	26,880

Summary.

Country.	Ships in No.	Gross Tonnage.	Average (Tons).
British	42	644,303	15,341
German	22	364,776	16,581
Dutch	5	78,696	15,739
Belgian	4	53,928	13,482
American	3	47,996	15,999
French	2	27,353	13,676
Japanese	2	26,880	13,440
Grand Total	80	1,243,932	15,549

Atlantic Liners.—The Atlantic liners running between Europe and the United States of America are the best known of all ocean liners; they exhibit the highest attainment of excellence in merchant-ship building, and their great size and speed, and continuous rivalry, excite universal interest.

Particulars of the famous liners which have had a share in the development of the trans-Atlantic service from 1819 to 1900 are given in Table XII., some of which is taken from *The Atlantic Ferry* by A. J. Maginnis. The "Persia" (fig. 22, Plate IV.) was the first iron steamer to be placed on the Atlantic service by the Cunard Company (1856). She was followed two years later by the "Great Eastern," 688 ft. long, 82·8 ft. broad, 48·2 ft. depth and 32,160 tons displacement with a gross tonnage of 18,915 tons and 11,000 H.P., giving her a speed of 13 knots by paddle-wheels and screw. She was built from designs by I. K. Brunel, and remained the largest vessel afloat until the "Cedric" was built 45 years later. Fig. 23 is the "City of Rome," built in 1881 at Barrow for the Inman Line, one of the most graceful vessels placed on the Atlantic. The "Campania" (fig. 24) and her sister-ship the "Lucania," each 600 ft. long and built in 1893 for the Cunard Company by the Fairfield Shipbuilding Company, held the record for fast passages across the Atlantic for several years. With twin screws and triple-expansion engines they attained a speed of 23⅛ knots on trial with 31,050 I.H.P. On her best runs the "Lucania" crossed the Atlantic, 2823 nautical miles, in 5 days 8 hours 38 minutes, the mean speed being 22 knots for the run, maintained with a consumption of coal amounting to 20½ tons an hour.

In the 'fifties the Collins Line took the record for speed to America, but, apart from that, the competition was chiefly between British companies until 1897, when the "Kaiser Wilhelm der Grosse" made a better record than the "Campania" or "Lucania," and for ten years from that date the fastest vessels were in German hands. The "Deutschland" (fig. 25, Plate V.), built at Stettin for the Hamburg-American Line, took the record in 1900, traversing the Atlantic from New York to the Eddystone in 5 days 17 hours 28 minutes, at a mean speed of 23·36 knots. The North German Lloyd Co. added three splendid vessels: the "Kronprinz Wilhelm" in 1901, the "Kaiser Wilhelm II." in 1902, and the "Kronprinzessin Cecilie" in 1906, the machinery being respectively of 35,000, 42,000 and 45,000 I.H.P. and forming the finest series of reciprocating engines ever built for ships. The "Kaiser Wilhelm II." raised the record on the homeward run to 23·71 knots, and made practically the same speed as the "Deutschland" on the outward run, viz. 23·12 knots. The "Kronprinzessin Cecilie" (fig. 26, Plate VI.) raised the outward record to 23·21 knots, and homeward her best passage was at 23·58 knots.

In 1903 the British government made an agreement with the Cunard Company under which two vessels of 24 to 25 knots speed across the Atlantic were to be built for mail and passenger service, and to be available for the use of the Admiralty in time of war. In accordance with this agreement the "Mauretania" (fig. 27, Plate VI.) was built by Swan, Hunter, Wigham Richardson & Co., and the "Lusitania" by John Brown & Co., and both were supplied with Parsons turbines of 70,000 H.P. driving four screws. The latter vessel was the first on service in 1907, and at once regained for Great Britain the Atlantic record, the "Mauretania" following a little later and doing still better. Both vessels maintained very high speeds, and steadily improved their records, until the "Mauretania" averaged 26·06 knots and the "Lusitania" 25·85 knots on the passage. They are 790 ft. long overall, of 88 ft. beam, 57 ft. moulded depth, 42,000 tons displacement on a draught of 33½ ft. and of 32,000 tons gross tonnage. They are thus 100 ft. longer, 5 ft. wider, 6000 tons more displacement and of 70% greater gross tonnage than the "Great Eastern." Figure 28 is a section of the "Mauretania," which shows clearly the great height of the decks.

The French liner "La Provence" was built in 1905, of 13,753 tons gross, and 22 knots speed. On her displacement of 19,160 tons she must carry about 3500 tons of coal for the voyage, which leaves a margin of about 900 tons for passengers and cargo. The "France," launched September 10, is of 23,000 tons, 45,000 H.P. and 23½ knots.

A notable tendency in recent years is to build vessels of great size to run at more moderate speeds. The American liners "St Louis" and "St Paul" (fig. 29, Plate VII.), built in 1895, are of 11,630 tons gross and 21 knots; while the "Finland" and "Kroonland," built in America in 1902, are of 12,185 tons and only 16 knots. The last-named vessels are now running under the Belgian flag (see Table XII.). The "Caronia" and "Carmania," built by the Cunard Company in 1905, furnished evidence of the advantage of the turbine for Atlantic liners, and also illustrate the gain due to a lower speed. Their dimensions are given in Table XII.; as compared with "La Provence" it will be seen that they are of 12,000 tons greater displacement, 2 knots less speed and 10,000 less H.P. Allowing for the voyage two-thirds the quantity of coal carried by "La Provence," these vessels thus have a margin of about 10,000 tons compared with the 900 tons of that vessel, so that a much larger quantity of cargo may be taken when required. The "Rotterdam," of 24,170 tons gross tonnage, can load to a displacement of 37,200 tons. Her speed is 17 knots; the reduction of engine-power gives space and weight for no less than 3585 passengers and nearly 13,000 tons of cargo after allowing for accommodation of crew and for coal, water and stores for the voyage. The second "Oceanic," of 17,274 tons (fig. 30, Plate V.), built in 1899 for the White Star Company, was the largest vessel then built and had 21·5 knots speed; she was followed by the "Celtic," "Cedric," "Baltic" and "Adriatic" for the same company, of 16 to 18 knots speed and size increasing up to nearly 25,000 tons gross. These vessels each carry about 3000 passengers as well as a crew of 350 and upwards, and very large cargoes. The "Adriatic" (fig. 31, Plate VII.) is of 24,541 tons gross, 30% greater tonnage than the "Great Eastern." The "Titanic" and "Olympic," which in 1910 were in course of building by Harland & Wolff for the White Star Line, are not only much larger than the "Adriatic," but they are 90 ft. longer, of 13,000 tons greater tonnage and of 18,000 tons greater displacement than the "Mauretania"; a combination of reciprocating and turbine machinery of 50,000 H.P. is provided for driving the vessels at a speed of 21 knots.

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[1] "Titanic," launched October 10, 43,500 tons.

[2] Sister vessel "Dakota" was lost on Japan coast March 1907.

[3] A third vessel of same size was being completed

TABLE XII.—*Showing Dimensions, &c., of Famous Atlantic Liners, 1819–1910.*

Name of Ship.	Owners.	When Built.	Where Built.	Material.	Length between Perpendiculars.	Breadth.	Depth.	Displacement.	Gross Tonnage.	Speed.	How Propelled.	Steam Pressure per Square Inch.	Indicated Horse-Power.
					Feet.	Feet.	Feet.	Tons.		Knts.		Lb.	
Savannah	Colonel Stevens	1819	New York	Wood	130	26	16.5	1,850	320	6	Paddles	10	90
Royal William	City of Dublin Co.	1838	Liverpool	"	145	27	17.5	1,980	720	7.5	"	5	400
Sirius	Brit. & Amer. St. Nav. Co.	1838	Leith	"	178	25.5	18.25	1,995	703	8.5	"	15	600
Great Western	Great Western S. S. Co.	1838	Bristol	"	212	35.3	23.25	2,300	1,340	8.5	"	15	750
British Queen	Brit. & Amer. St. Nav. Co.	1839	London	"	275	37.5	27.0	2,970	1,863	8	"	15	700
Britannia	Cunard	1840	Greenock	"	207	34.5	22.5	2,050	1,150	8.5	"	12	740
Great Britain	Great Western	1843	Bristol	Iron	274	48.2	31.5	5,780	3,270	11	Single Screw	25	1,500
America	Cunard	1848	Greenock	Wood	251	38	25.3	4,250	1,825	10.25	Paddles	13	1,400
Asia	Cunard	1850	"	"	268	45	24	3,620	2,227	12	"	15	2,000
Arctic	Collins	1850	New York	"	282	45	31.5	6,200	2,860	12.5	"	17	2,000
Persia	Cunard	1856	Glasgow	Iron	360	45	29.9	7,130	3,300	12.5	"	20	3,600
Adriatic	Collins	1857	New York	Wood	355	50	35.0	7,564	3,670	13.5	"	25	4,000
Great Eastern	Great Eastern S.S. Co.	1858	Millwall	Iron	680	82.8	48.2	32,160	18,915	13	S. Screw and Paddles	30	11,000
Scotia	Cunard	1862	Glasgow	"	379	47.8	30.5	7,600	3,871	13.5	Paddles	25	4,000
City of Paris	Inman	1866	"	"	346	40.4	26.2	6,411	2,651	13.5	Single Screw	30	2,600
Russia	Cunard	1867	"	"	358	43	28.8	6,770	2,959	13.5	" "	25	2,500
City of Brussels	Inman	1869	"	"	390	40.3	27.1	6,900	3,081	14.5	" "	30	3,000
Oceanic	White Star	1871	Belfast	"	420	41	31	7,240	3,707	14.75	" "	65	3,000
City of Richmond	Inman	1874	Glasgow	"	441	43.5	34	9,320	4,623	15	" "	70	4,000
Britannic	White Star	1874	Belfast	"	455	45.2	33.7	9,600	5,000	16	" "	75	5,100
City of Berlin	Inman	1875	Greenock	"	488.5	44.2	35	10,100	5,491	16	" "	75	5,200
Arizona	Guion	1879	Glasgow	"	450.2	45.4	35.7	9,900	5,147	16.25	" "	90	6,300
Servia	Cunard	1881	"	Steel	515	52.1	37.9	12,300	7,392	16.5	" "	90	12,000
City of Rome	Inman	1881	Barrow	Iron	560.2	52.3	37	13,500	8,144	17.5	" "	90	11,500
Alaska	Guion	1881	Glasgow	"	500	50	38	9,500	7,142	17.75	" "	100	11,000
Notting-Hill	Notting-Hill S. S. Co.	1881	"	Steel	420	45.1	26.5	6,210	3,920	12	Twin Screw	100	2,800
Aurania	Cunard	1882	"	"	470	57.2	37.3	13,360	7,269	17	Single Screw	90	8,500
Oregon	Guion and Cunard	1883	"	Iron	501	54.2	40	12,500	7,375	19	" "	110	13,000
America	National	1884	"	Steel	432	51.3	38.6	9,550	5,528	18.75	" "	95	8,300
Etruria	Cunard	1885	"	"	501	57 3	38.2	13,300	8,120	19.5	" "	110	14,500
Aller	North German Lloyd	1886	"	"	438	48	34.6	10,460	5,400	16.5	" "	150	8,200
City of Paris (second of name)	Inman	1889	"	"	527.6	63.2	39.2	17,650	10,670	21	Twin Screw	150	18,500
Teutonic	White Star	1889	Belfast	"	566	57.8	39.2	16,740	9,984	20	" "	180	17,500
Fürst Bismarck	Hamburg-American	1890	Stettin	"	502.6	57.6	38	15,200	8,874	19.5	" "	160	17,000
Campania	Cunard	1893	Glasgow	"	598	65	43	21,000	12,950	22	" "	165	30,000
St Louis	American	1895	Philadelphia	"	535.7	63	42	16,000	11,630	21	" "	200	20,500
Kaiser Wilhelm der Grosse	North German Lloyd	1897	Stettin	"	625	66	43	23,760	14,350	23	" "	178	32,000
Kaiser Friedrich	North German Lloyd	1898	Danzig	"	584	64	41	20,100	12,000	21.5	" "	226	27,000
Oceanic (second of name)	White Star	1899	Belfast	"	685	68	44.5	26,100	17,274	21.5	" "	192	29,000
Deutschland (second of name)	Hamburg-American	1899	Stettin	"	666	65.5	45.5	24,400	14,500	23.25	" "	225	36,000
Kronprinz Wilhelm	North German Lloyd	1901	"	"	637.3	66.3	39.3	22,300	14,908	23.47	" "	213	35,000
Celtic	White Star	1901	Belfast	"	680.9	75.3	44.1	37,900	20,904	17.0	" "	210	13,000
Kaiser Wilhelm II	North German Lloyd	1902	Stettin	"	684.3	72.3	40.2	26,000	19,361	23.71	" "	213	42,000
Finland	Red Star	1902	Philadelphia	"	560.0	60.2	38.4		12,185	16.0	" "	170	10 000
Cedric	White Star	1903	Belfast	"	680.9	75.3	44.1	38,000	21,035	16.0	" "	210	13,000
Baltic	White Star	1904	"	"	709.2	75.6	52.6	40,700	23,876	16.0	" "	210	13,000
Kaiserin Auguste Victoria	Hamburg-American	1905	Stettin	"	677.5	77.3	50.2	43,000	24,581	17.5	" "	213	16,700
La Provence	Cie Générale Transatlantique	1905	St Nazaire	"	602.3	65.0	38.3	19,160	13,753	22.0	" "	198	30,000
Carmania	Cunard	1905	Glasgow	"	650.4	72.2	40	31,000	19,524	20.0	Parsons Turbines 3 Screws	195	21,000
Caronia	Cunard	1905	"	"	650.0	72.2	40.2	31,000	19,687	19.0	Twin Screw	210	21,000
Amerika	Hamburg-American	1905	Belfast	"	669.0	74.3	47.8	42,000	22,622	17.5	" "	210	15,800
Kronprinzessin Cecilie	North German Lloyd	1906	Stettin	"	685.4	72.2	40.5	27,000	19,503	23.58	" "	213	45,000
Nieuw Amsterdam	Holland Amerika	1906	Belfast	"	600.3	68.9	35.6	31,000	16,967	16.0	" "	215	10,000
Adriatic	White Star	1906	"	"	709.2	75.5	52.6	40,800	24,541	18.0	" "	210	16,000
Mauretania	Cunard	1907	Newcastle	"	762.2	88.0	57.1	42,000	31,938	26.06	Parsons Turbines 4 Screws	195	70,000
Lusitania	Cunard	1907	Glasgow	"	762.2	87.8	56.6	42,000	31,550	25.85		195	70,000
Rotterdam	Holland Amerika	1908	Belfast	"	650.5	77.4	43.5	37,200	24,149	17.0	Twin Screw	215	15,000
Lapland	Red Star	1908	"	"	605.8	70.4	37.4	30,500	17,540	17.5	" "	..	13,000
George Washington	North German Lloyd	1908	Stettin	"	699.1	78.2	50.1	37,000	25,570	19.0	" "	213	20,000
Minnewaska	Atlantic Transport Co.	1909	Belfast	"	600.3	65.4	39.6	26,530	14,317	16.0	" "	214	11,000
Titanic	White Star	1910	"	"	850.0	92.5	64.5	52,300	43,500	21.0	Combination of Parsons Turbines and Reciprocating Engines, 3 Screws	215	50,000
Olympic	White Star	..	"	"	850.0	92 5	64.5	52,300	43,500	21.0		215	50,000

The Hamburg-American Company followed a similar course to the White Star Line and added two large vessels of 17½ knots speed—the "Amerika" of 22,622 tons gross, built by Messrs Harland & Wolff, and the "Kaiserin Auguste Victoria" (fig. 32, Plate VII.), of 24,581 tons gross, built at Stettin. The largest German vessel afloat in 1910 was the "George Washington," built in 1908 at Stettin for the North German Lloyd.

The Hamburg-American Company ordered in 1910 two vessels, not only much larger than the "George Washington," but exceeding even the "Olympic" in dimensions. They were said to be over 900 ft. long over all, 94 to 95 ft. beam, 20,000 tons gross greater tonnage than the "George Washington," 13,000 tons more than "Mauretania" and 2000 tons more than "Titanic" and "Olympic"; turbines of 60,000 to 70,000 H.P. being provided to maintain a speed of 22 knots across the Atlantic. The Cunard Company ordered in Dec. 1910 a 50,000-ton turbine-driven ship from John Brown & Co., to steam at 23 knots on service.

The "Minnewaska" of the Atlantic Transport Company is typical of vessels on the Atlantic route carrying a large cargo together with a limited number of passengers of one class. Three hundred and twenty-six first-class passengers are carried and provided with excellent accommodation. When fully loaded the displacement is over 26,000 tons and the speed 16 knots; the horse-power required being only a sixth that of the fast Cunarders. To large numbers of passengers the additional period on the voyage is no disadvantage, while the transport of a large cargo at the relatively high speed of 16 knots is a great advantage.

Canadian Liners.—With the increasing trade between Europe and Canada the direct Canadian liners increased in numbers and importance, and now bear favourable comparison with the great liners running between Europe and the United States. The "Victorian" and "Virginian" of the Allan line, built in 1904 and 1905 and plying between Liverpool and Montreal, were the first ocean liners to be fitted with Parsons turbines; they are 520 ft. long, 60 ft. 5 in. beam, 38 ft. moulded depth and 10,629 tons gross; and they can carry 1500 passengers and a large cargo at a speed of 17 knots. They were followed in 1906 by the "Empress of Britain" and "Empress of Ireland," built by the Fairfield Company for the Canadian Pacific Railway Company; they are 570 ft. long over all, 549 ft. between perpendiculars, 65 ft. 6 in. beam, 36 ft. 8 in. depth moulded, tonnage 14,189 gross tons, displacement 20,000 tons at 28 ft. draught; quadruple-expansion engines of 18,000 I.H.P. are fitted and a speed of over 20 knots was obtained on trial. Excellent accommodation is provided for 1580 passengers; and a considerable quantity of meat can be carried in insulated holds provided with refrigerating arrangements, besides a large general cargo, a total of 6500 tons

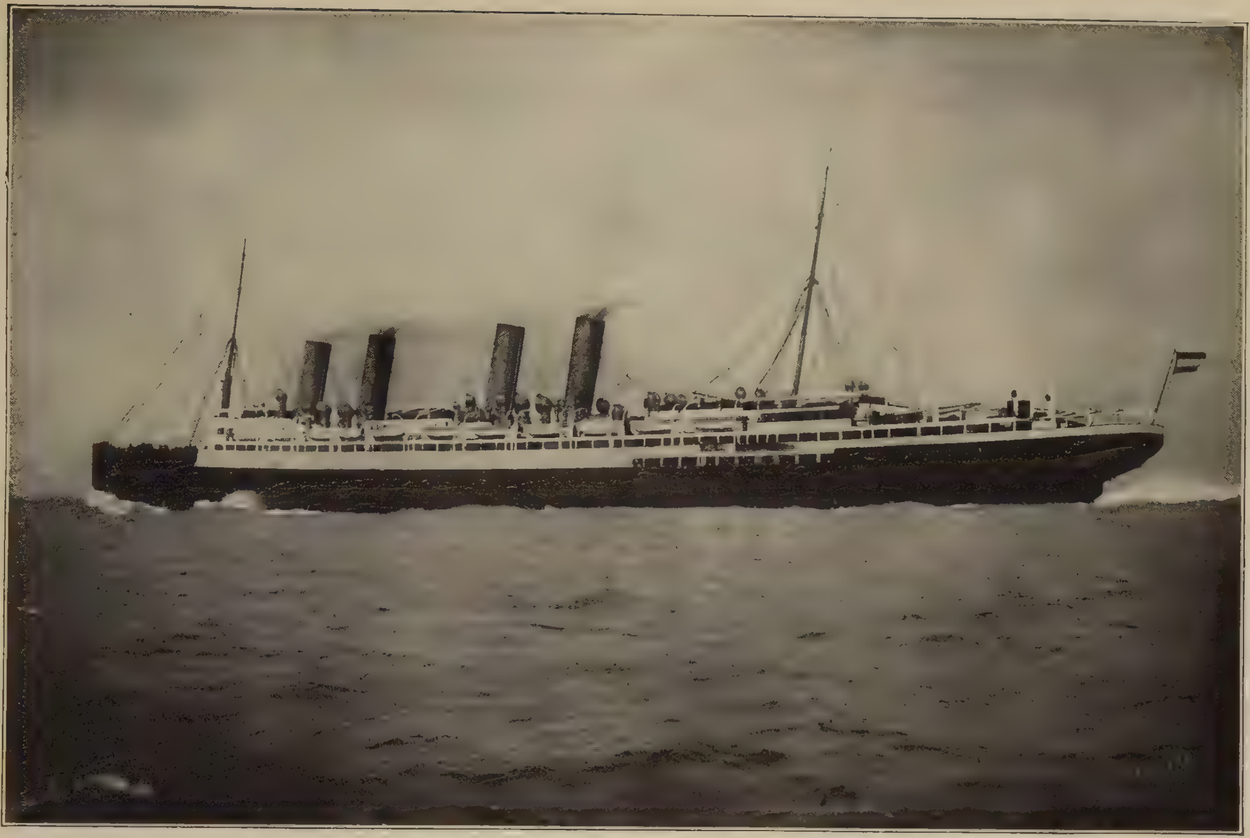


FIG. 25.—Hamburg-American Liner *Deutschland.*

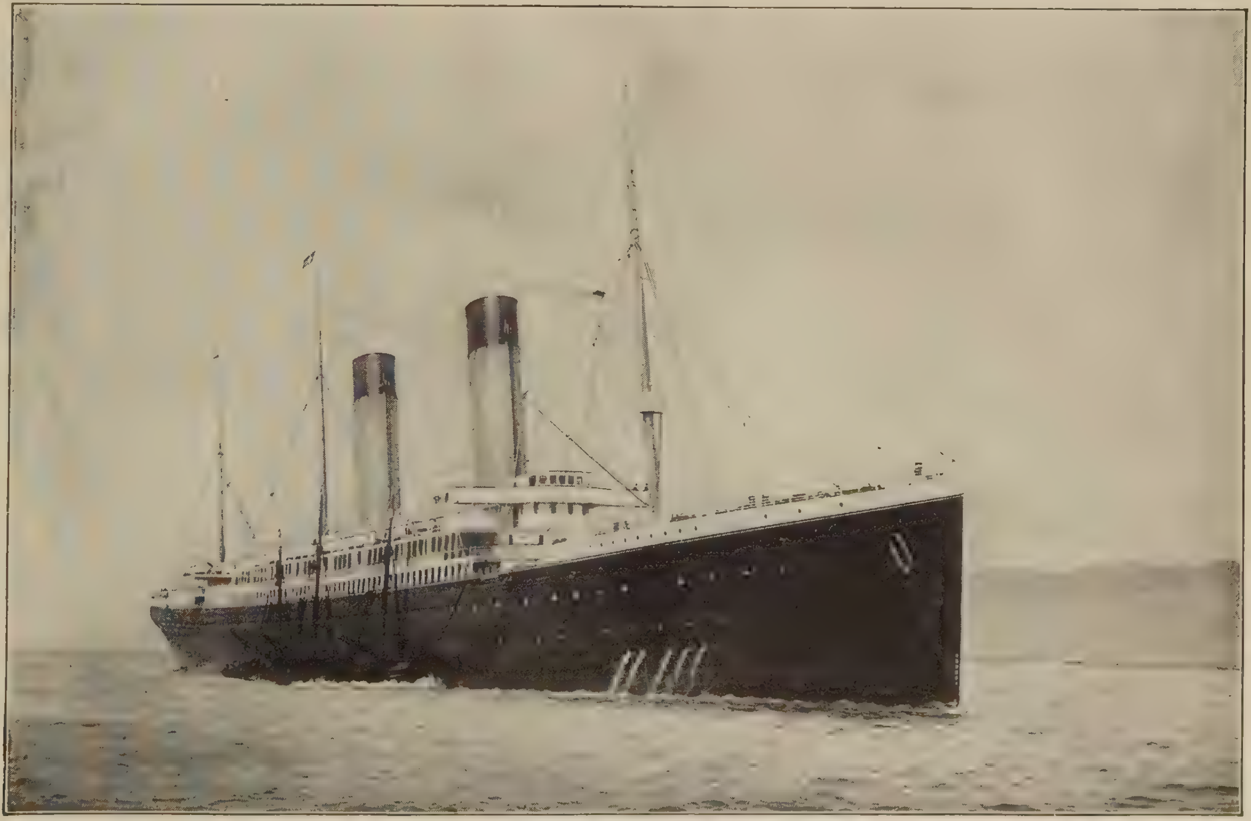
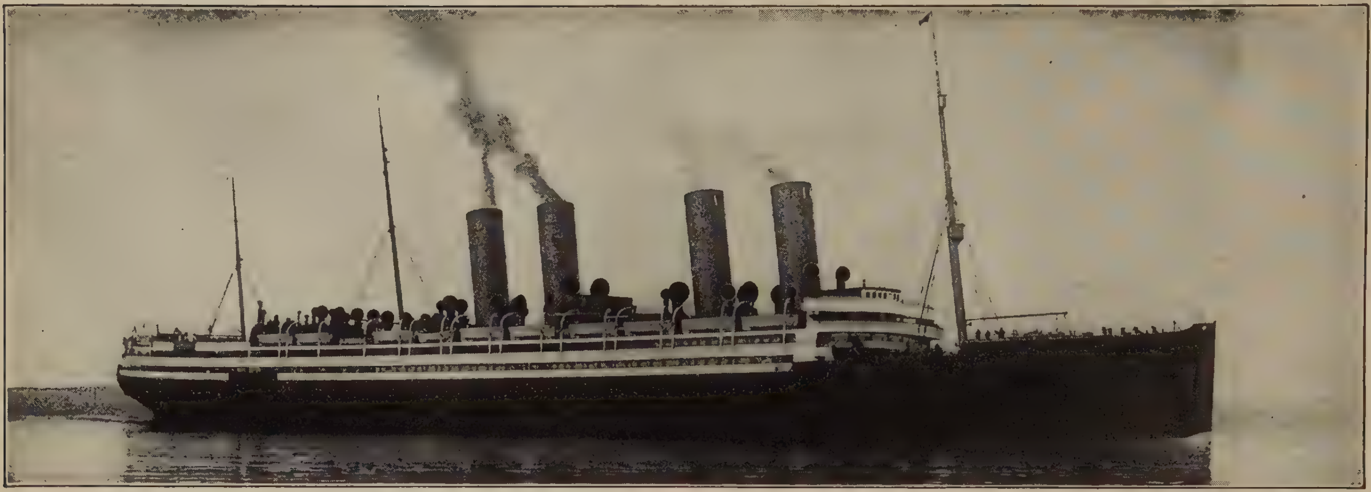


FIG. 30.—White Star Liner *Oceanic.*



(*Stuart, Southampton.*)

Fig. 26.—North German Lloyd Liner *Kronprinzessin Cecilie.*

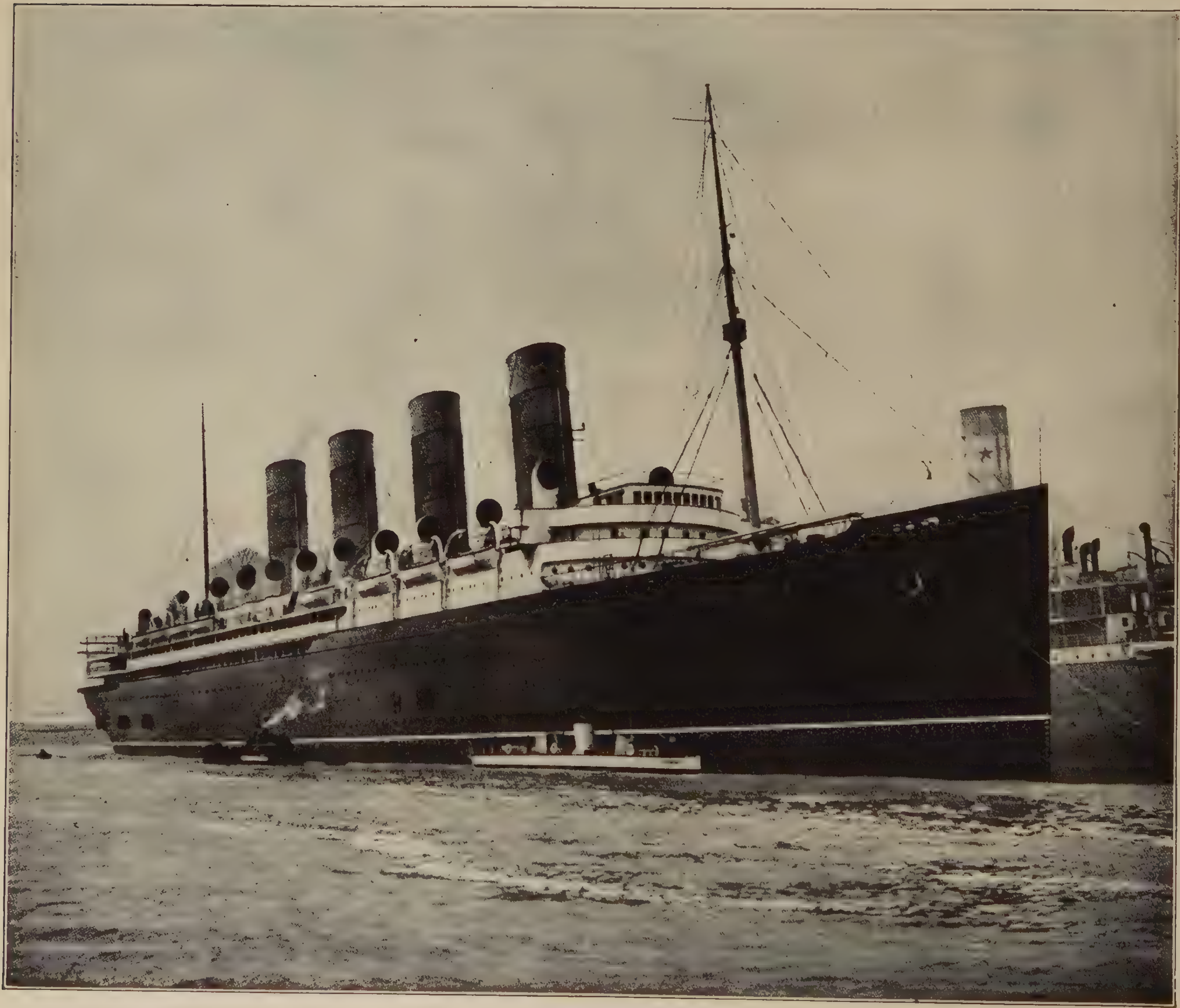


Fig. 27.—Cunard Liner *Mauretania*, with *Turbinia* alongside.

of cargo being carried in addition to the coals, water and stores required for the passage across the Atlantic.

In 1908 the “Laurentic” and “Megantic” were built by Messrs Harland & Wolff for the White Star Canadian Service; they are 550 ft. long, 67 ft. 4 in. beam, 41 ft. 2 in. depth moulded and 14,890 tons gross; they can carry 1660 passengers and a very large cargo. The “Laurentic” is provided with reciprocating engines of 6500 I.H.P. in combination with Parsons turbines of 3500 H.P., while the “Megantic” is fitted with reciprocating engines only. On trial the “Laurentic” developed 12,000 H.P. with a speed of 17½ knots, and on service her coal consumption is 12 to 15% less than that of the “Megantic.” A service from Bristol to Quebec and Montreal was opened in 1910 by the “Royal George” and the “Royal Edward,” which ran for some time in a fast mail service from Marseilles to Alexandria under the names of “Heliopolis” and “Cairo” respectively. They were built in 1908 and are 545 ft. long, breadth 60 ft., depth 38 ft., tonnage 11,150 tons gross, displacement 15,000 tons at 22 ft. 6 in. draught. Parsons turbines of 18,000 H.P. are fitted, driving three screws at 370 revolutions per minute and giving a maximum speed of 20¾ knots, while 19·1 knots has been maintained by the “Royal Edward” from Bristol to Quebec. Accommodation is provided for over 1000 passengers. Still larger and faster vessels were being arranged for in 1910.

Emigrant Vessels.—Many vessels on the Atlantic Service are fitted up for carrying emigrants either with or without other passengers; they are always arranged to carry as much cargo as possible. Ships built for such services include the “Gerania,” built by the Northumberland Shipbuilding Company in 1909 for Austrian owners. Her dimensions are: length 402 ft., beam 52 ft. 6 in., moulded depth 27 ft. 1 in., 4900 tons gross. She can carry 8000 tons dead-weight on 24 ft. draught at a speed of 11 knots, but her ’tween decks are arranged so that they can be used to carry cattle, troops or emigrants as required. The “Tortona,” built in 1909 by Messrs Swan & Hunter for the Italian emigrant trade to Canada, is 464 ft. long over all, beam 54 ft., depth 29 ft., she is 7900 tons gross and can carry 8600 tons dead-weight as well as over 1000 emigrants. The “Ancona,” built in 1908 by Messrs Workman, Clark & Co. for the Italian emigrant trade to the United States, is 500 ft. long, 8188 tons gross, 7500 I.H.P.; she can carry 2500 emigrants and a large cargo, and in addition 60 first-class passengers in spacious cabins on a promenade deck amidships. Some of the finest vessels carrying emigrants are the ships of the “Cleveland” type belonging to the Hamburg-American Company. The “Cleveland” is 587 ft. long, 65 ft. breadth moulded, 46·7 ft. depth, 27,000 tons displacement on a draught of 32 ft. 8 in., 13,000 tons dead-weight capacity, about 17,000 tons gross and 10,000 tons net, with machinery of 9300 I.H.P. and 16 knots speed. She can carry 250 first-class, 392 second-class, 494 third-class and 2064 fourth-class or emigrant passengers, making with a crew of 360 a total of 3560 persons, and has cold storage spaces of 10,000 cub. ft. for provisions, and 30,000 cub. ft. for cargo.

Liners on other Routes.—Only a few typical vessels engaged on other routes can be mentioned here. The Royal Mail Company’s “Avon” (fig. 33, Plate VIII.), trading to the West Indies and round South America to the Pacific coasts, is 520 ft. long, 62 ft. 4 in. beam, 31 ft. 9 in. depth moulded and 11,073 tons gross tonnage. The “Kenilworth Castle” (fig. 34, Plate VIII.), in 1910 one of the latest additions to the Union-Castle Line Fleet trading to South Africa, is 570 ft. long, 64 ft. 8 in. beam, 38 ft. 8 in. moulded depth, 12,975 tons gross tonnage, 12,500 I.H.P. and 17½ knots speed. The “Osterley” (fig. 35, Plate VIII.) is typical of the splendid ships running via the Suez Canal to the Eastern ports, Australia and New Zealand; she was built in 1909 by the London & Glasgow Shipbuilding Company for the new fleet of the Orient Line. She is 535 ft. long, 63 ft. beam, 38 ft. depth to upper deck, 18,360 tons displacement at 28 ft. draught, 12,129 tons gross, and obtained 18·76 knots on trial with 13,790 I.H.P.; 1150 passengers can be carried as well as some 7000 tons of cargo. The “Maloja,” which in 1910 was being built for the P. & O. Company, is a little larger than the “Osterley,” being 550 ft. long, 62½ ft. broad, 12,500 tons gross, of 15,000 I.H.P. and 19 knots speed.

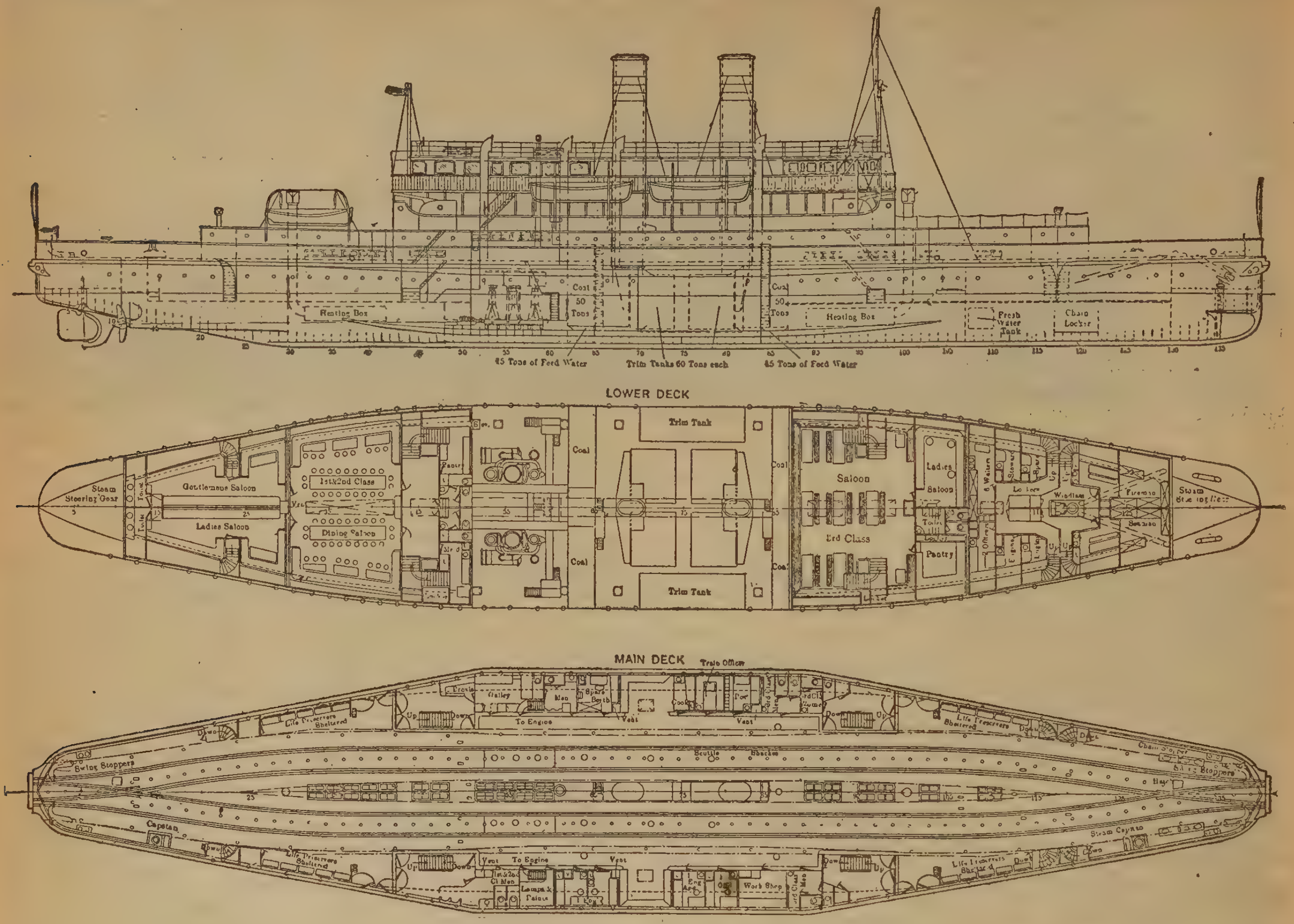
Many vessels carrying very large cargoes and comparatively few passengers are engaged in the meat and fruit trades, and are fitted up with refrigerating machinery, insulated holds and cooling appliances so as to keep the fruit, vegetables or meat at the required temperature, and at the same time maintain a proper degree of humidity or of dryness of the atmosphere. The number and size of vessels engaged in these trades continue to increase, and the enormous volume of the trade may be indicated by the fact that thirteen million carcases of mutton would be required to fill the holds of the vessels fitted for that particular trade. A typical vessel is the “Highland Laddie,” built for the Argentine trade in 1909, 420 ft. long, 56 ft. beam, 37 ft. 6 in. moulded depth to shelter deck, 7500 tons gross, 4600 H.P. and speed 15¾ knots on trial. She can carry over 500 passengers in well-fitted and comfortable apartments amidships, and has insulated cargo-holds of 343,000 cub. ft. capacity. To control the temperature of the chilled beef or frozen mutton in these holds she is fitted with powerful refrigerating machinery, and cooled brine is circulated through tubes lining the sides and ceilings of the holds, some 20 miles of brine pipes being so used. The “Ruahine,” built in 1909 for the New Zealand trade, is similarly fitted; she is 480 ft. long, 60 ft. broad, 44 ft. depth moulded, speed on trial 15·9 knots. The “Port Royal” of the Elder Dempster Line has insulated holds capable of transporting 3,000,000 bananas, besides pineapples, oranges and other tropical and semi-tropical fruits. The fruit is kept at the desired temperature by means of large volumes of cold dry air circulated through the holds, and the air is cooled by contact with nests of pipes through which brine of a low temperature is circulated. The “Tortuguero,” a vessel 390 ft. long, 48 ft. beam, 29 ft. 6 in. depth, 4200 tons gross, built for Messrs Elders & Fyffes, has a storage capacity of 2½ times that of the “Port Royal.”

Pacific Liners.—The “Empress” vessels of the Canadian Pacific Railway Company were the first liners built specially for the transpacific ocean service. The railway reached the Pacific seaboard in 1885, and in 1891 these vessels began running. They reached a maximum speed of 19·75 knots on trial, and in 1910 could still maintain 17 knots across the Pacific. In 1901 the “Korea” and “Siberia” were built for the service; they were in their day the largest American-built vessels, each being 552 ft. long, 63 ft. beam and 41 ft. depth, of tonnage 11,276 gross, and displacement 18,600 tons when loaded to 27 ft. draught. Quadruple-expansion engines of 18,000 I.H.P. gave them a speed of 20 knots on trial and 18 knots sea-going speed. Two hundred and twenty first-class passengers are carried in cabins and saloons above the upper deck, and provision is made for 60 third-class, and for 1200 Chinese steerage passengers. In 1904 these were joined by the American-built vessels the “Manchuria” and “Mongolia,” of 2000 tons greater tonnage. They are 616 ft. long, 65 ft. beam, depth 31 ft. 1 in., 13,639 tons gross, 27,000 tons displacement and 20 knots maximum speed, and can each carry 1920 passengers and a large cargo. These were again outstripped in size by the “Minnesota” and “Dakota,” which arrived shortly afterwards. They were 622 ft. long, of 20,718 tons gross, 33,000 tons displacement, 14 knots speed, and had capacity for 2850 passengers and 20,000 tons of cargo. The “Dakota” was lost off the coast of Japan in March 1907, but the “Minnesota” was in 1910 still on service, and was the largest merchant vessel yet built in the United States. These American vessels carry on the transpacific service from San Francisco and Seattle, and replace the older vessels with which the American Pacific Mail Company carried on the service for many years. The American and British vessels were all outstripped by the Japanese vessels “Tenyo Maru” and “Chiyo Maru” of the Toyo Kaisen Kaisha (Japanese Oriental S.S. Co.). They were built in Japan, of the following dimensions: length over all 575 ft., between perpendiculars 558 ft., breadth 63 ft., depth to shelter deck 46 ft. 6 in., to upper deck 38 ft. 6 in., gross tonnage 14,700 tons; displacement 21,500 tons at 31 ft. 8 in. draught. They are driven by three sets of Parsons turbines of a total H.P. of 17,000 at 270 revolutions per minute, and have attained 21·6 knots on trial and 20 knots on ocean service. Steam is supplied by 13 cylindrical boilers, working at 180 ℔ pressure and fired by oil fuel only. They have accommodation for 275 first-class, 54 second-class and 800 steerage passengers, and over 8000 tons of cargo.

Special Vessels.—Many vessels are built for special and exceptional purposes, and cannot be classed with either ordinary cargo or passenger vessels. Amongst these may be included dredgers, train-carrying ferry-boats, ice-breakers, surveying vessels, lightships, fishing vessels, coastguard and fishery cruisers, salvage and fire vessels, lifeboats and tugs. To DREDGERS a special article is devoted (see DREDGE).

Train Ferries.—In 1869 Mr Scott Russell described (*Trans. Inst. Nav. Arch.*) a train ferry-boat of special construction in use on the Lake of Constance, having a length of 220 ft., a breadth over the paddle-boxes of 60 ft., and a displacement of 1600 tons; the horse-power of her machinery was 200, divided between two paddle-wheels, each of which was driven by a pair of independent oscillating engines. The object of this steamer was to convey trains between Romanshorn, on the one side of the lake, and Friedrichshafen, on the other; she was built of iron, and was designed to have great strength combined with light draught.

In 1872 train ferry-boats were introduced into Denmark to carry trains between the mainland and the islands and, later, between Denmark and Sweden. The first was a single track iron paddle vessel, the “Lille Baelt,” built by Richardson of Newcastle for the service from Fredericia to Strib (2 m.); her dimensions were: length 139 ft., breadth moulded 26 ft., extreme 44 ft. 6 in., draught 8 ft., tonnage 306, I.H.P. 280, and speed 8 knots. A similar boat, the “Fredericia,” was afterwards built by Schichau of Elbing for the same service; in 1883 this firm built two very similar but longer vessels for ferries of 2–2½ m. across, which proved very successful; and others of various types followed for ferries of 16, 18½ and 48 m. across. The Danish government in 1910 employed 22 vessels of a total of about 16,000 tons on eight ferries for railroad cars, as well as separate vessels for other traffic. These services have to be maintained all the year round, and several of the vessels are specially strengthened for passage through ice; in addition, four other vessels of 497 to 553 tons gross and 600 to 800 I.H.P. are employed wholly as ice-breakers. The latest of these vessels in 1910 was the “Christian IX.” employed on the ferry across the Great Belt, a distance of 16 m. Fig. 36 shows the profile and deck plans of this vessel, for which, with other particulars of the Danish ferries, we are indebted to *International Marine Engineering*. Particulars of the most important Danish train-carrying vessels are given in Table XIII.



Resting Box
Coal 50 Tons
Coal 50 Tons
Resting Box
Fresh Water Tank
Chain Locker
85 Tons of Feed Water
Trim Tanks 60 Tons each
85 Tons of Feed Water
LOWER DECK
Steam Steering Gear
Gentlemens Saloon
Ladies Saloon
1st & 2nd Class
Dining Saloon
Pantry
Coal
Trim Tank
Trim Tank
Coal
Saloon
3rd Class
Ladies Saloon
Pantry
Firemen
Seamen
Steam Steering Gear
MAIN DECK
Train Officer
Galley
To Engine
Vent
Scuttle
Swing Stoppers
Capstan
Life Preservers Sheltered
Chain Stopper
Steam Capstan
To Engine
Lamps & Paints
Work Shop

FIG. 36.—Profile and Deck Plans of Twin-Screw Ferry "Christian IX."

The longest ferry, from Gjedser to Warnemunde, traverses a distance of 48 m. across the lower part of the Baltic Sea, and on this ferry the "Prinsesse Alexandrine" and "Prins Christian" are employed. Two other vessels belonging to the Prussian government also work on this ferry, and the great success of the service led to the Swedish and German governments undertaking a direct ferry service between Sweden and Germany from Trelleborg to Sassnitz, a distance of 65 m. For this service the "Dröttning-Victoria" (fig. 37, Plate IX.) was built by Messrs Swan, Hunter, Wigham Richardson & Co. Her dimensions are: length 370 ft. over all, 350 ft. between perpendiculars, breadth extreme 53 ft. 6 in., 3050 tons gross, displacement 4270 tons dead-weight capacity, 600 tons at a draught of 16 ft. 6 in., 5400 I.H.P. and speed 16½ knots. Two rail tracks are provided, the trains are shipped at the stern and are completely protected from the weather when on board, the bow of the ship being completed as usual for a sea-going vessel; ten full-sized passenger or sleeping carriages can be taken, or eighteen

TABLE XIII.

Name of Ferry.	Type.	Lengths.		Breadth.		Depth.	Draught.	Dis-placement. Tons.	Tonnage.		Speed. Knots.	Revolutions per minute.
		Over all.	On L. W. L.	Moulded.	Over Guards.				Gross.	Net.		
Christian IX.	Twin screw, double track	293′ 9″	290′ 0″	48′ 6″	58′ 0″	18′ 7″	12′ 6″	2600	1504	598	13·0	..
Prinsesse Alexandrine	Paddle wheel, double track	333′ 6″	333′ 6″	36′ 0″	61′ 6″	18′ 9″	12′ 6″	2425	1733·4	676·6	13·8	36
Prins Christian	Twin screw, double track	284′ 9″	281′ 0″	41′ 6″	57′ 9″	22′ 6″	14′ 5″	2065	1824·0	686·0	13·75	124
Korsoer . .	Paddle wheel, double track	252′ 6″	250′ 0″	34′ 0″	58′ 0″	16′ 0″	9′ 6″	1267	971·0	436·0	12·25	33
Kjoebenhavn	Paddle wheel, double track	278′ 0″	272′ 0″	34′ 0″	58′ 0″	16′ 9″	10′ 0″	1455	1091·0	425·0	12·5	36
Helsingborg .	Single forward and aft screw, single track .	180′ 0″	177′ 0″	32′ 0″	43′ 0″	14′ 6″	10′ 3″	720	530·0	187·0	10·0	138
Marie . . .	Two screws aft, one screw forward, single track	204′ 6″	199′ 3″	31′ 6″	43′ 0″	13′ 0″	9′ 0″	950	500·0	250·0	10·0	{ 125 { 150
Valdemar . .	Single screw, single track, ice-breaker .	144′ 0″	140′ 0″	31′ 6″	43′ 0″	13′ 0″	9′ 0″	550	361·0	129·0	10·0	134
Lille Baelt .	Paddle wheel, single track	140′ 6″	139′ 0″	26′ 0″	44′ 6″	11′ 6″	8′ 0″	399	306·0	125·0	8·0	34
Ingeborg . .	Paddle wheel, single track	168′ 9″	167′ 0″	26′ 0″	44′ 0″	12′ 0″	7′ 0″	440	343·0	136·0	10·25	37

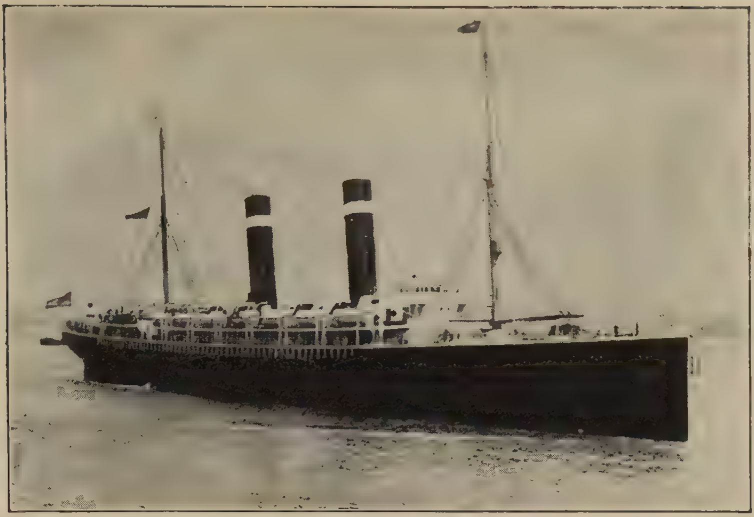


FIG. 29.—American Liner *St. Paul.*

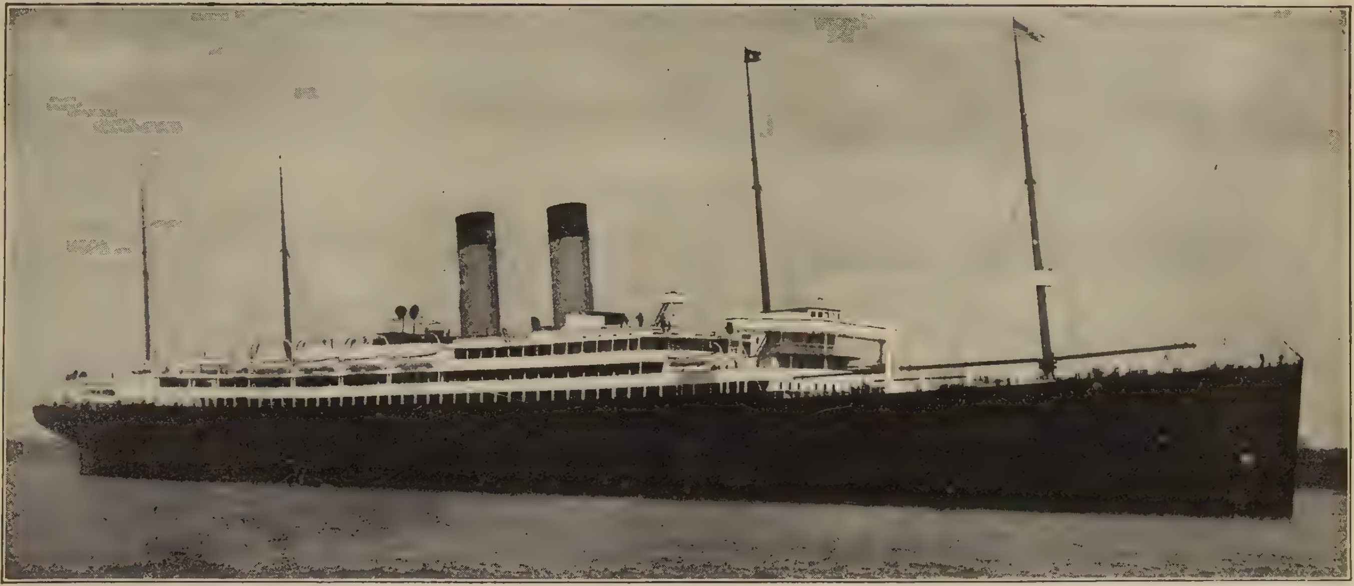
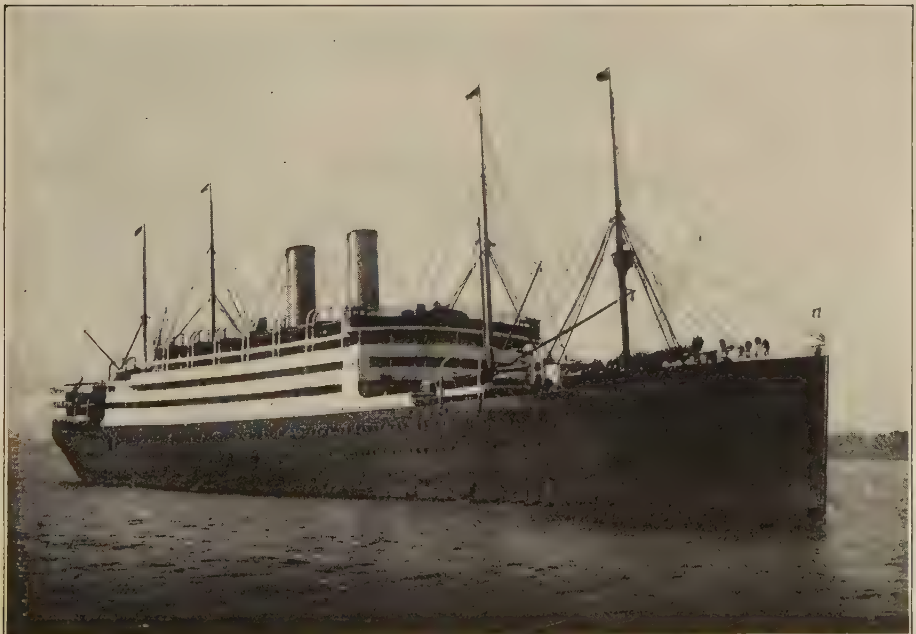
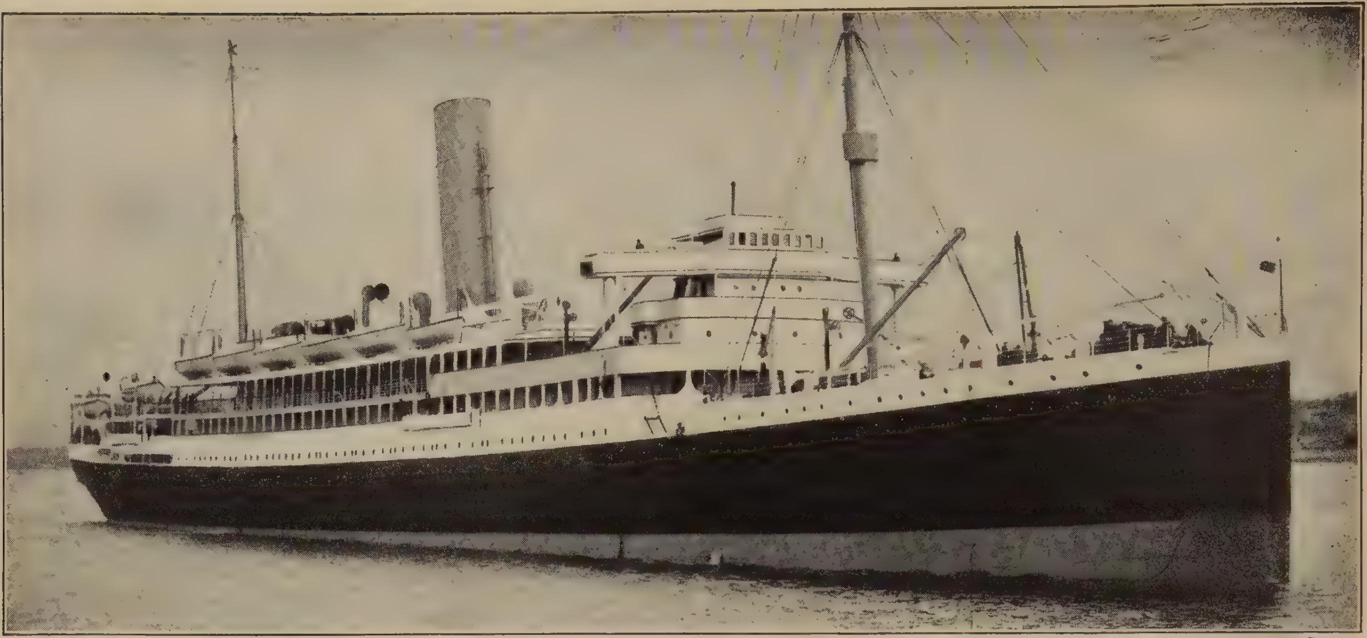


FIG. 31.—White Star Liner *Adriatic.*



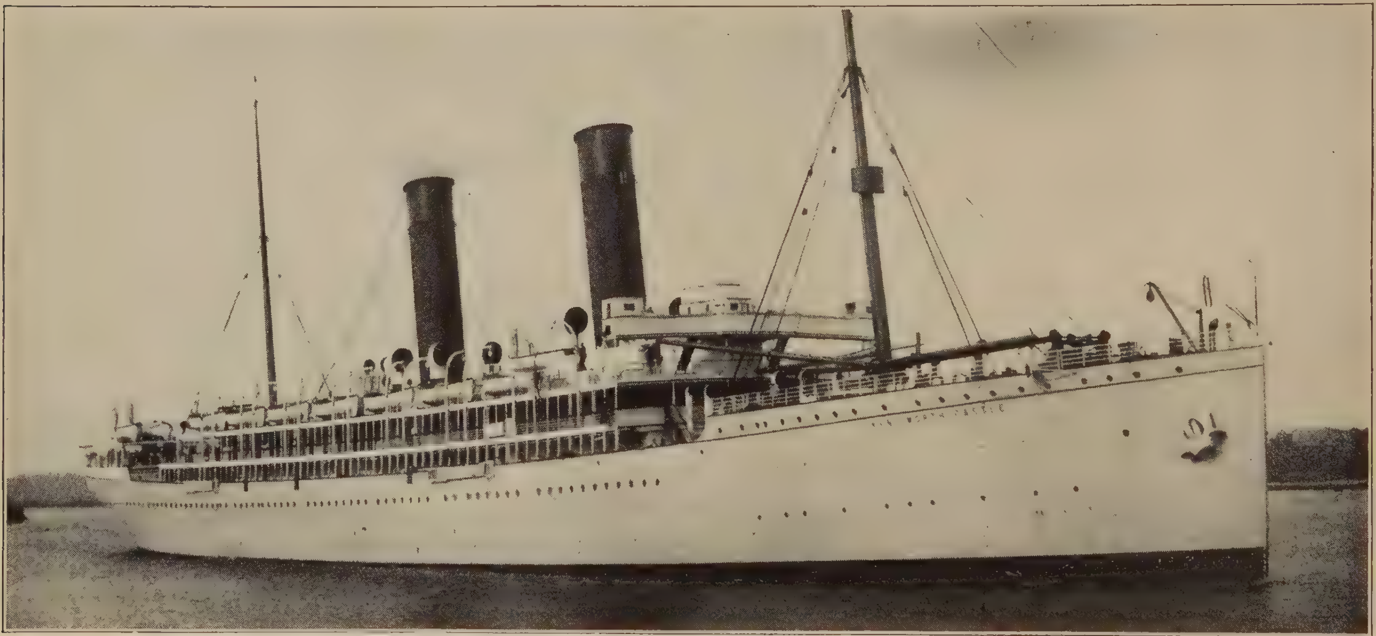
(*Stuart, Southampton.*)

FIG. 32.—Hamburg-American Liner *Kaiserin Auguste Victoria.*



(*Stuart.*)

FIG. 33.—Royal Mail Steamer *Avon.*



(*Stuart.*)

FIG. 34.—Union-Castle Liner *Kenilworth Castle.*

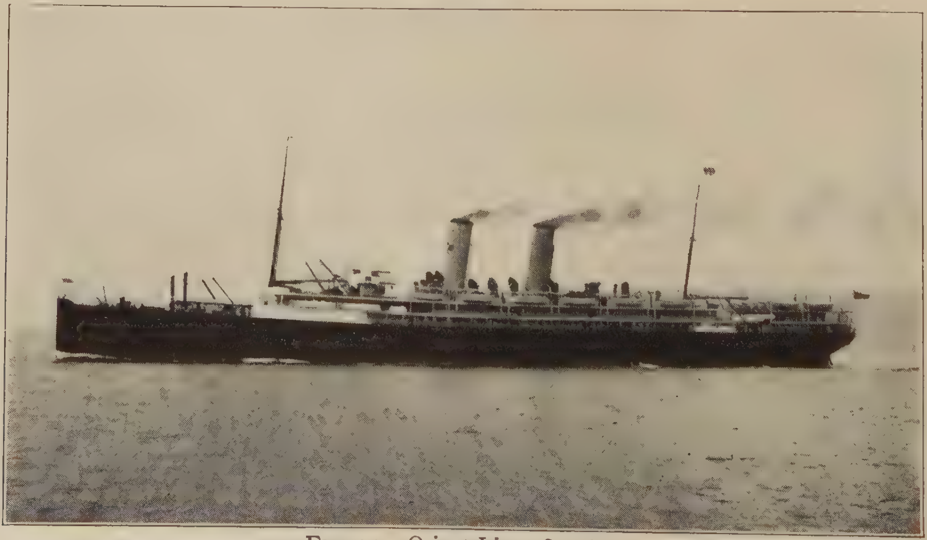


FIG. 35.—Orient Liner *Osterley.*

goods wagons. Ballast tanks are provided, and powerful centrifugal pumps fitted, so that the trim of the vessel can be adjusted as necessary while embarking and disembarking the trains; she is built specially strong so that she can be driven through ice during the winter months.

In 1883 the "Solano," a large train ferry 406 ft. long, was built by Messrs Harlan & Hollingsworth of Wilmington, Delaware, to run between Bernicia and Porto Casta in connexion with the Central Pacific railway. In 1899 the American railways employed nearly 200 ferries, with an aggregate capacity of over 2000 large wagons, and by 1909 the numbers and capacity had increased to about three times those amounts, on Lake Michigan alone nine such ferries being at work.

Two other interesting examples of train ferries were built on the Tyne by Sir W. G. Armstrong, Whitworth & Co., Ltd., in 1895 and 1896, the former for service on the river Volga, and the latter for service on Lake Baikal in Siberia. The Volga has a rise and fall of no less than 45 ft. between spring and midsummer, and the ice upon it in winter is usually 2 ft., and sometimes 3 ft., thick; thus the problem presented considerable difficulties, which were increased by the fact that the locks of the Marinsky canal system, through which all vessels bound for the Volga must pass, are of such dimensions that it was impossible for vessels of sufficient size to be got through in one piece. It was decided to use two vessels to do the work, the first to act only as an ice-breaker, and the other to act only as a train-carrier. The ice-breaker was built in two pieces, the parting being at the longitudinal middle-line plane of the vessel. This was satisfactorily carried out by means of a double longitudinal middle-line bulkhead extending the whole length of the vessel. On arrival at the canal she was divided into halves, and was joined up again after passing through the last of the locks. Her dimensions were: length 147 ft., breadth 37 ft. 6 in. and depth 16 ft. 6 in., and she was fitted with compound engines and twin screws. The ferry steamer itself (fig. 38, Plate IX.) was 252 ft. long, of 55 ft. 6 in. beam, and of 14 ft. 6 in. depth. Four lines of rails were laid upon her deck, sufficient space being provided for 24 trucks or carriages, which are shown in position in the figure. The difficulty presented by the great difference in the river level was got over by an arrangement of hydraulic hoists, placed at the bow, by which two trucks could be lifted at once to a height of 25 ft., and by having lines of rails at the landing-stages at two levels. The vessel was fitted with twin screws and compound engines, which gave her a speed of 9 knots. It was found necessary to divide her into four parts for the passage through the canal locks; the divisions were made at the longitudinal middle-line plane and athwartships at her middle. Each quarter, when apart, formed a water-tight hull, and reunion was effected while the parts were afloat.

The *Lake Baikal Ferry* was built for carrying trains across the lake in connexion with the Siberian railway. For more than half the year the lake is frozen over to a considerable thickness, and in this case the vessel must of necessity be herself a powerful ice-breaker as well as a ferry steamer. Her dimensions are: length 290 ft., beam 57 ft., draught under ordinary conditions 18 ft. 6 in., and displacement 4200 tons. The hull is closely subdivided for additional safety in case of perforation. She has three sets of triple-expansion engines, working three independent screw propellers, two placed aft, as in ordinary twin-screw ships, and one placed at the forward extremity for the purpose of disturbing the water under the ice, thus assisting the heavy cast-steel stem and armoured bow to break up the solid field-ice which the vessel has to encounter. The complete structure was first erected on the Tyne, then taken to pieces and shipped to St Petersburg; from thence its numerous parts were carried to what was at that time the terminus of the Siberian railway, whence they were taken to their destination on sledges, and there the ship was re-erected and launched. The boilers constituted the heaviest individual pieces thus transported, as the weight of each could not be reduced below 20 tons.

An interesting example of a modern river train ferry is the "Fabius," built by Messrs G. Rennie & Co., Greenwich, in 1909, for service in southern Nigeria, where the river is 2 m. across. She is a double-ended paddle-wheel vessel; length 160 ft., beam 33 ft. 6 in., depth 10 ft., draught 5 ft. 6 in., speed 7 knots. She can carry six railway carriages and freight and passengers up to a total of 200 tons.

Ice-Breakers.—Steamboats for breaking a passage through frozen waters date from an early period; one is spoken of as early as 1851. The "Ermack" (fig. 39, Plate IX.), built in 1898, is one of the largest and most effective vessels of this type. Her dimensions are: length 320 ft., breadth 71 ft., depth to the upper deck 42 ft. 6 in., and displacement 8000 tons; her engines develop 8000 I.H.P., giving her a speed of 15 knots. Her general outline is shown in fig. 40, from which it will be seen that her bow slopes upwards from below, so as to enable her to run up on to the ice and bring her weight to bear in breaking it. The "Ermack" made her maiden voyage in the winter of 1898–1899, when she steamed through the Baltic to Kronstadt, crushing the ice with comparative ease.

Surveying Vessels.—Special vessels are employed by various governments, and occasionally by institutions or individuals, to survey the oceans and ocean beds, and pursue scientific inquiries of a general nature regarding the sea. The British Admiralty employs the "Egeria," "Fantome" and "Mutine," sloops of about 1000 tons displacement, modified and fitted up for the purpose, as well as two yachts purchased and suitably modified, and two vessels built especially for the purpose. The yachts are the "Waterwitch," 150 ft. long, 640 tons displacement and 10 knots speed, purchased in 1893; and the composite built vessel "Sealark," 180 ft. long, 1034 tons displacement and 11 knots speed, purchased in 1903; both are employed in Eastern waters. The vessels built for the purpose are the "Triton," 145 ft long, 415 tons displacement, 10 knots speed, built in 1882; and the "Research," 155 ft. long, 545 tons displacement, 10½ knots speed, built in 1888; both these vessels are propelled by paddle wheels, and both are of composite build. The "Dart," a steel yacht 130 ft. long, 500 tons displacement, 7½ knots speed, purchased by the Admiralty in 1882, was in 1910 employed by the New South Wales government. The Canadian government has provided vessels such as the "Cartier," a twin-screw steel vessel, built in 1909, 164 ft. long, 29 ft. beam, 648 tons gross and 11½ knots speed, for survey work on the coast of British Columbia. The Indian government had the steel single-screw vessel "Investigator" built by Messrs Vickers, Sons & Maxim for survey of Indian waters; she is 204 ft long, 33 ft. beam, 15 ft. 3 in. moulded depth, has a displacement of 1170 tons and a speed of 13½ knots.

The United States government built a surveying vessel, the "Pathfinder," in 1899. She is a steel single-screw vessel rigged as a brigantine, length over all 193 ft., on water-line 165 ft., beam 33 ft. 6 in., depth moulded 19 ft. 8 in., displacement 875 tons at 10 ft. draught, I.H.P. 1170 and speed 13½ knots. She has bunkers for 230 tons of coal, and is fitted up with very complete auxiliary machinery arrangements, electric lighting and ventilation, steam heating, and accommodation for a large staff. The outfit for hydrography and research is perhaps the most complete ever provided. The Carnegie Institution of Washington has fitted out the special non-magnetic vessel "Carnegie," 128 ft. long, 35 ft. beam, 12 ft. 7 in. draught, 568 tons displacement.

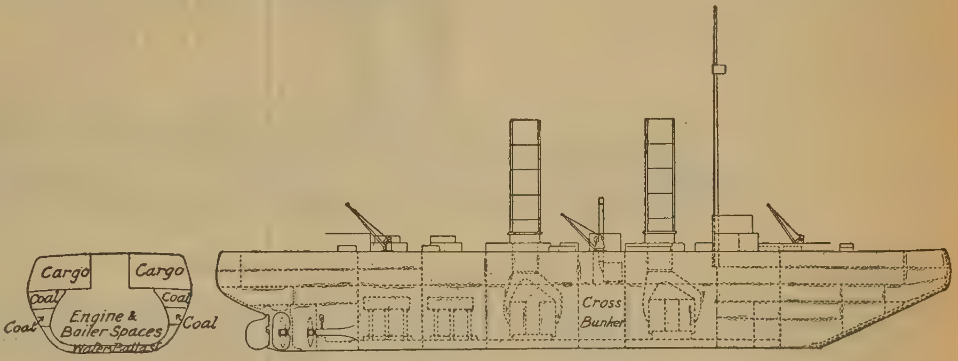


FIG. 40.—Section of "Ermack."

Lightships.—In many places round the coast the safe navigation of ships is assisted by vessels called lightships, moored in positions where lighthouses cannot well be built. Around the southern portion of Great Britain these vessels are maintained by the Trinity Corporation (see LIGHTHOUSE).

Fishing Vessels.—It is not many years since a few old paddle tugs were fitted up with fishing appliances. They proved very profitable, and the experiment led to the building and fitting out of steam vessels specially designed for such employment. Screw steam trawlers (see TRAWL) or other fishing-boats are among the vessels most frequently met with round the British coasts. In 1910 some 3000 such steam vessels of an average net tonnage of 50 tons were on the British register, as well as 23,000 sailing boats of an aggregate net register tonnage exceeding 200,000 tons. Fig. 41 (Plate X.) is the steam herring drifter "Three," and gives a general idea of the type, but there is considerable variety in the methods of fishing, and the fittings of the vessels vary accordingly.

Coastguard and Fishery Cruisers.—The lightships give warning of danger, and can also send signals ashore for the benefit of vessels in distress, but cannot themselves render help. The principal organizations for giving assistance to vessels in distress and for saving life around the British coasts are:—

1. The coastguard service maintained by the Admiralty.
2. The signal services, stations and agents maintained by Lloyd's.
3. The lifeboat services maintained by the Royal National Lifeboat Institution.

The coastguard cruisers not only watch the coast but proceed to the fishery grounds to act as international marine police. They are controlled by an admiral, with headquarters at 66 Queen Victoria Street, London, who in 1910 had at his services the torpedo gunboats "Halcyon," "Leda," "Skipjack" and "Spanker"; the old composite gunboats "Ringdove" and "Thrush"; the vessels "Colleen," "Julia" and "Fanny," purchased and fitted up for the work; and the "Squirrel" and "Argus," two yacht-like vessels specially built for the service. The "Colleen," a wooden vessel built in 1869 and propelled by horizontal trunk engines of 250 I.H.P., is 145 ft. long and 415 tons displacement, and at one time the engines gave her a speed of 8½ knots; the "Argus" is a steel vessel built in 1904, 130 ft. long, 380 tons displacement, 23 ft. beam, 8 ft. 10 in. draught; she has a light fore and aft rig, and vertical triple expansion engines of 500 I.H.P. give her a speed of 12 knots. The Fishery Board of Scotland has provided itself with some small cruisers, such as the "Freya," built in 1904, of length 138 ft., beam 24 ft., moulded depth 12 ft., and gross tonnage 280 tons; and the "Norma," built in 1909, which is 159 ft. long, 25 ft. beam, 14 ft. moulded depth, 457 tons gross tonnage and 950 I.H.P. In 1908 the Irish Fisheries Board procured the small cruiser "Helga," built by the Dublin Dockyard Co., 155 ft. long, 24 ft. 6 in. beam, 13 ft. 3 in. moulded depth; she obtained a speed of 14½ knots on trial with a total deadweight of 140 tons carried.

Salvage and Fire Vessels.—Several private companies maintain special vessels which are available for assistance of vessels in distress, salvage, wreck-raising, &c. Many of these vessels are powerful tugs fitted with derricks and winches for hoisting out cargo and ships' fittings, and provided with powerful steam or electrically driven pumps and special hoses for pumping out flooded compartments of the vessels in distress. Some have been specially built and fitted up for salvage and wreck-raising; others have been built and fitted for salvage and fireboats.

A fire and salvage boat at Elswick is 45 ft. long, 11 ft. beam and 3 ft. draught; she is fitted with a Merryweather quick-steaming boiler, and engines arranged to drive the boat at 8½ knots, or as an alternative to pump out vessels on either side, or to pump from the river for fire purposes and deliver up to 1500 gallons a minute. Many small vessels of this character are provided for harbours, docks and shipbuilding works. One of the most powerful in England is that built for the Manchester Ship Canal. This boat is 90 ft. long, and is fitted with salvage pumps capable of clearing 5000 gallons a minute, as well as independent fire service pumps capable of delivering 4000 gallons per minute at a pressure of 150 ℔ per square inch. Fire and salvage boats of much greater capacity have been provided at San Francisco, New York and Chicago. Two fireboats of special design were built in 1908 for Chicago. They are 120 ft. long over all, 28 ft. beam, 15 ft. moulded depth, and 9½ ft. draught. Powerful turbine pumps are driven by two Curtis steam turbines on the same shafts, which also carry 275-volt 200-kilowatt electric motors for operating the propeller motors. The pumps can be worked so as to deliver 4500 gallons per minute at 300 ℔ per sq. in., 9000 gallons at 150 ℔ or larger volumes at lower pressures; the maximum speed of the turbines and pumps is 1700 revolutions per minute. Twin screws are fitted and each is driven by a motor arranged to develop 250 H.P. at 200 revolutions per minute. The boats are fitted with electric light, search-light, and steam steering gear. New York has ten powerful fireboats, several of which can throw over 10,000 gallons of water per minute. The "Beta" of the London Fire Brigade is 100 ft. long, 11 knots speed, and can deliver 4000 gallons per minute at a pressure of 140 ℔ per sq. in., engines and pumps being driven by vertical steam engines.

Lifeboats and Vessels.—The lifeboat services around the British shores are maintained almost entirely by the Royal National Lifeboat Institution. In March 1910 there were 281 lifeboats in service, varying in length from 30 ft. to 56 ft. All are fitted with air-casing or watertight air-cases of sufficient capacity to keep them afloat if completely filled by the sea, and all are arranged so as automatically to relieve themselves of any sea breaking into the boat. The type of boat varies according to the service intended and the views of the men who use them—182 are self-righting if capsized and 99 not self-righting. The conditions of service are such that the application of steam or other motive power to assist the crews presents many difficulties; these difficulties have, however, been successfully overcome by the institution and its advisers, and details of the power-driven boats are given in a paper read by Mr J. R. Barnett at the Institute of Naval Architects, March 1910. Four steam lifeboats have been tried and found very useful under the conditions in which they are employed, while three petrol-driven lifeboats, 40 to 43 ft. in length, 13 to 16 tons weight, 24 to 40 H.P. and about 7 knots speed, have been supplied as an experimental measure, and on their voyages to their stations proved to be very seaworthy and reliable boats. The institution employs one steamship, the steel twin-screw tug "Helen Peel" of 230 tons displacement, which is stationed at Falmouth and used to tow lifeboats to sea and assist them in their work, and also to render aid to vessels in distress which have no chance of getting private tugs. The United States government has, however, taken the lead in this direction, in building and equipping a special vessel, the "Snohomish," for life-saving services on the North Pacific coast. This vessel is officially termed a revenue cruiser, and is 152 ft. long over all, 29 ft. beam, 17 ft. 6 in. moulded depth, and displaces 795 tons at a draught of 12 ft. 4½ in.; a single screw driven by triple-expansion engines of 1370 I.H.P. gave a speed of 13½ knots on trial. (See LIFEBOAT.)

Tugs or Tow-Boats.—On canals and rivers steam barges are often employed for towing, and small tugs are also built for this purpose, but on swift, large rivers the tugs are often of considerable power. The tug "Little John," built by Messrs Yarrow for service on the Trent canals, is 80 ft. long, 14 ft. 6 in. beam, draught with steam up 22 in., displacement about 40 tons. Twin screws are fitted working in tunnels, and this little vessel has towed five barges, weighing with their loads 247 tons, at a speed of 5¾ knots. A river tug recently built by Messrs Thornycroft & Co. for service on the swift waters of the Upper Yangtse, and named the "Shutung," is 150 ft. long, 15 ft. beam, with a depth of 6 ft. 6 in., fitted with compound surface-condensing engines of 550 I.H.P., driving twin screws working in tunnels (as the draught of the vessel is very limited) and giving a speed of about 11 knots. After trial at Southampton the tug was taken to pieces, the sections shipped to China, with sections of a barge of corresponding dimensions, and both were put together and completed at Kiangnan. This was the first steamer to attempt regular passages in these troubled waters, and steamer and consort performed their first voyage with success. The American river tow-boat "Sprague" is 318 ft. long over all, 64 ft. 8 in. wide, depth amidships 7 ft., displacement 2200 tons, registered tonnage 1479. She is fitted with a stern wheel 40 ft. in diameter and 40 ft. in width, driven by two tandem compound engines of 12-ft. stroke, the cylinders being 28 in. and 63 in. in diameter; and at 9⅓ revolutions per minute her horse-power is estimated at 1500 H.P. In 1907 she towed on one occasion 56 coal boats, each 180 ft. long and 26 ft. wide, loaded with over 67,000 tons of coal and covering a water area of nearly 7 acres. On the American rivers the superiority of the screw propeller is, however, now realized, and shallow-draught tow-boats with propellers working in tunnels have been adopted. Interesting tugs have been built by Messrs Cox & Co. of Falmouth for work in the North-Eastern Railway Docks on the Tyne. Great power in small length was required, and engines of 1000 I.H.P. are installed in vessels 75 ft. long, 26 ft. beam, 12 ft. 6 in. deep, having a mean draught of 10 ft.; twin screws set widely apart being provided to give manœuvring power. Tugs in common use in harbour and coasting services are often 90 ft. to 120 ft. in length, 20 to 23 ft. beam, 10 to 12 ft. depth, 9 to 12 ft. draught, 400 to 600 I.H.P. and 11 to 12 knots speed; tugs fitted with independent acting paddle-wheels are popular for some services on account of their great handiness, but the great majority of new vessels are fitted with single or twin screws. For ocean service larger vessels are built. A steel tug built by the Bath Iron Works for the American coal trade is 165 ft. over all and 1045 tons displacement, with triple-expansion engines of 900 H.P. The "Cornell" is one of the largest American sea-going tugs; when towing she has developed 1390 I.H.P. at 97 revolutions, and when running light 1900 I.H.P. at 135 revolutions and a speed of 15½ knots. The "Hearty," built to go out under her own steam to work in the Hooghly, is 212 ft. long, 30 ft. beam, 12 ft. 6 in. draught, 1300 tons displacement, vertical compound engines of 2100 I.H.P. drive, twin screws, and the vessel can steam at 14½ knots. Recent screw tugs of the "Rover" type, built for the British Admiralty, are 154 ft. long, 27 ft. 4½ in. beam, 11 ft. draught, 615 tons displacement, 1400 I.H.P., giving 13½ knots with twin screws. The latest paddle tugs of the "Grappler" type are 152 ft. long, 28 ft. beam moulded, 53 ft. 3 in. over guards, 11 ft. 4 in. draught and 690 tons displacement. Inclined compound engines are fitted with means to work the wheels independently or together as desired. 1250 I.H.P. gives a speed of 12 knots. In these tugs the towing hook is carried well forward to permit the tugs to manœuvre freely, and good beam is given so that in case of a heavy side pull the tug will not capsize.

Each year from 20 to 30 tugs are built in the United Kingdom, and many of them are fitted with powerful pumps and heavy derricks and winches, so that they are of service in case of fire or salvage. The North-Eastern railway tugs referred to are able to pump 500 gallons a minute, *i.e.* about 140 tons an hour, while the "Lady Crundall," belonging to Dover, can pump 700 tons an hour.

Yachts.—Vessels built for pleasure purposes and for racing have for many years been known as *Yachts.* (See YACHTING.)

In 1825 Mr Assheton Smith built a steam yacht, and although the building of such yachts was discouraged by the clubs, he continued to build, and produced between 1825 and 1851 nine steam yachts of various sizes; one built in 1844 had a screw propeller, the others were fitted with paddle wheels. In 1856 the ban on steam yachts was withdrawn by the clubs, and others began to build; but as late as 1864 there were only 30 steam yachts afloat. In 1876, however, Lloyd's Register Committee issued *Rules for the Building and Classification of Yachts*, and from about that date great improvements were made in the design and construction of yachts of all classes, as well as in their propelling machinery, and steam yachts were built in much greater numbers.

As with trading vessels, the machinery at first fitted in yachts was only regarded as auxiliary; a well-known example of a successful auxiliary steam yacht is Lord Brassey's "Sunbeam" (fig. 42, Plate XI.), built in 1874, of the following dimensions: length over all 170 ft., beam 27 ft. 6 in., depth of hold 13 ft. 9 in., displacement 576 tons, registered tonnage 334 tons gross, 227 tons net, and Thames

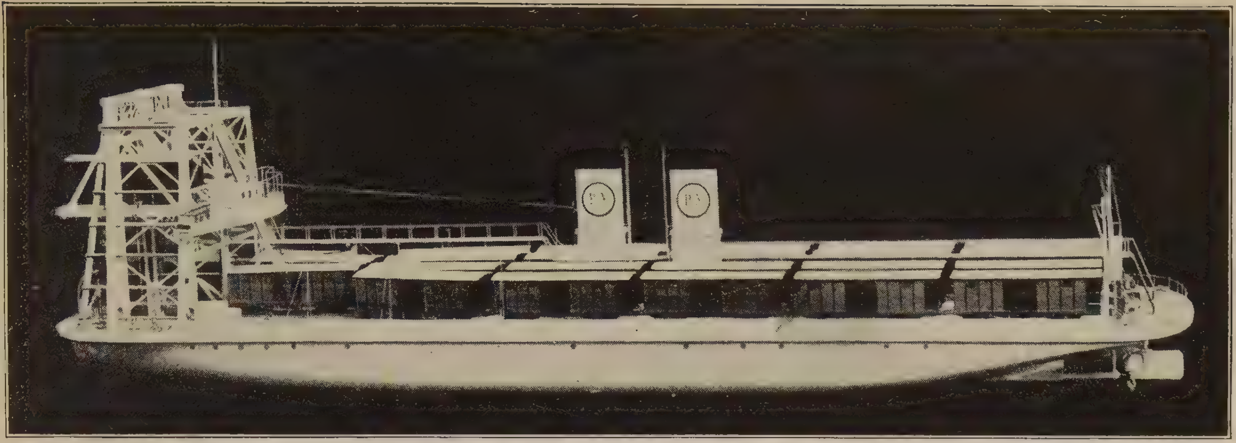
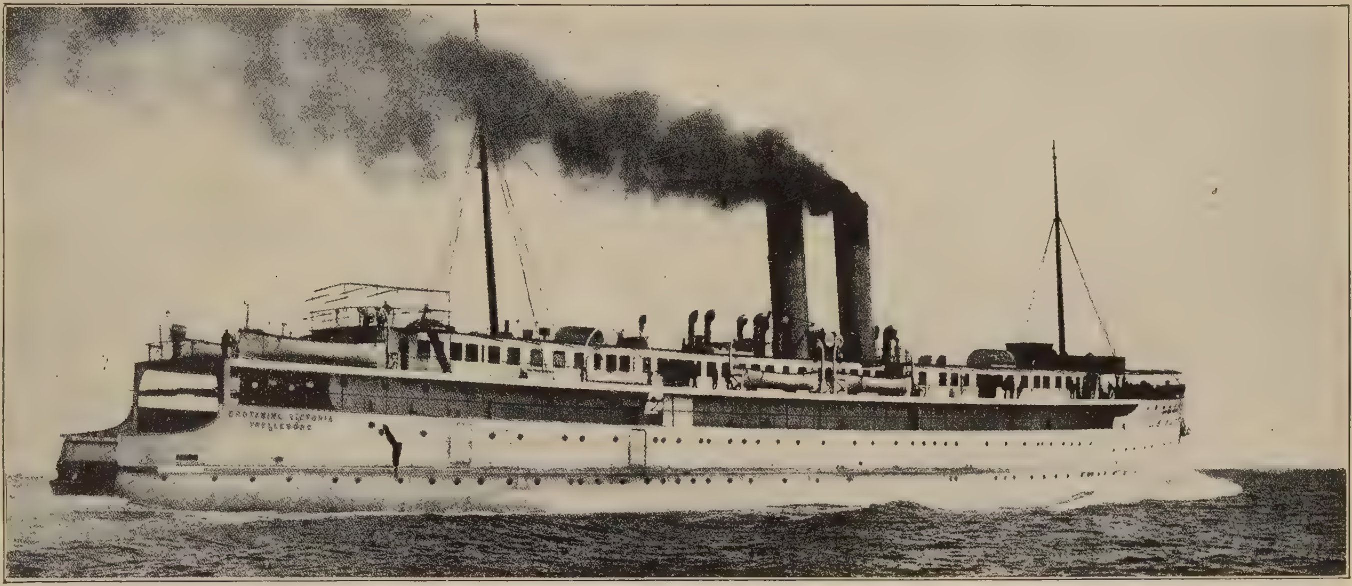


FIG. 38.—River Volga Train Ferry.



(Frank & Sons.)

FIG. 37.—Sea-going Train Ferry Steamer *Dröttning Victoria.*

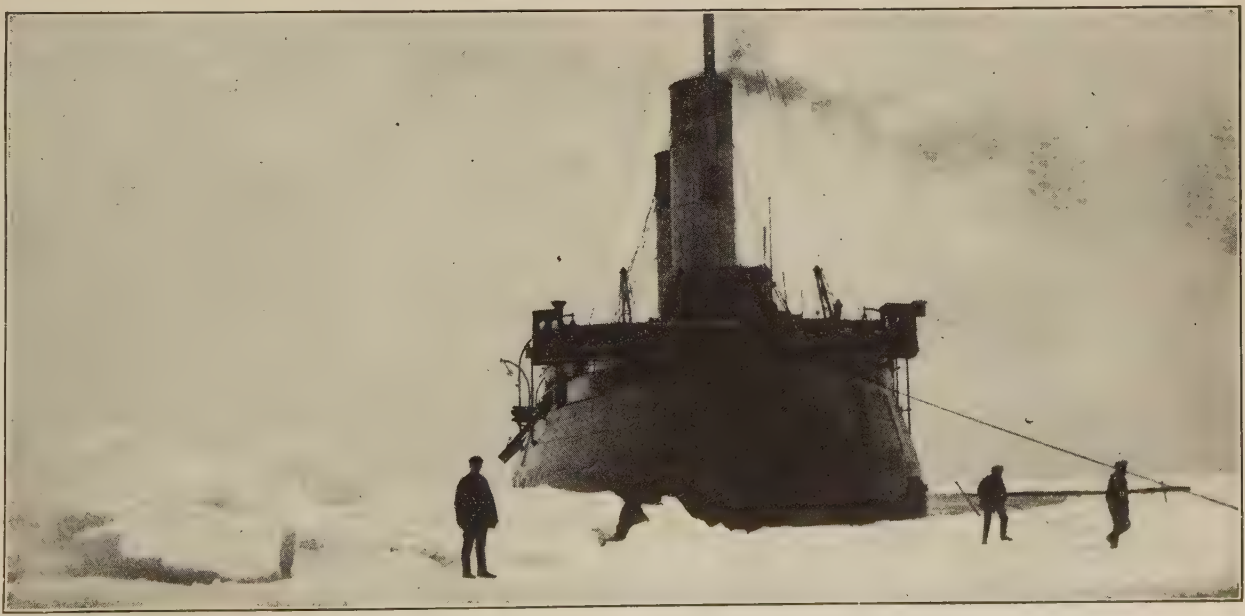


FIG. 39.—Ice-breaking Steamer *Ermack.*

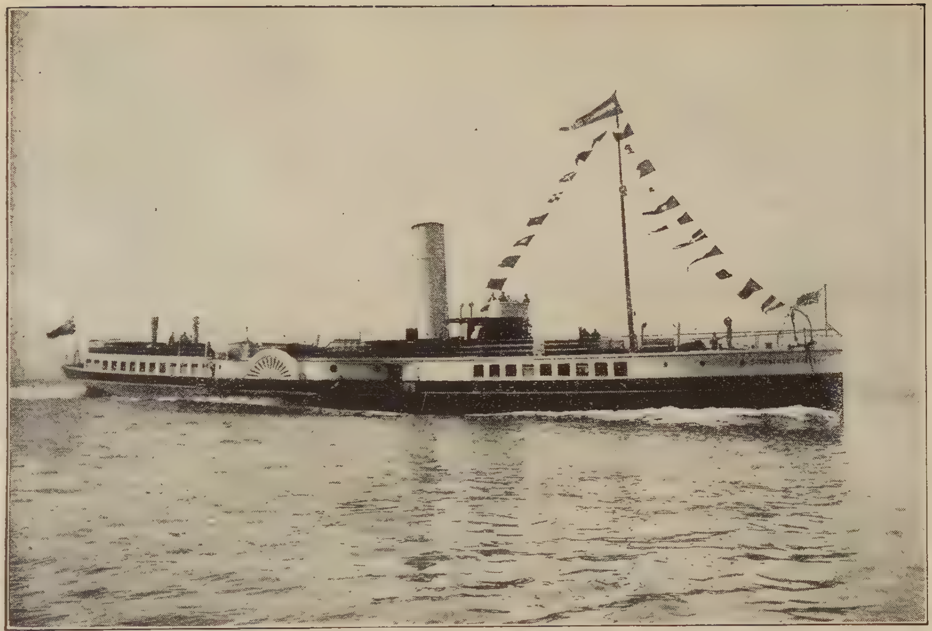


FIG. 17.—Excursion Steamer *Bournemouth Queen.*

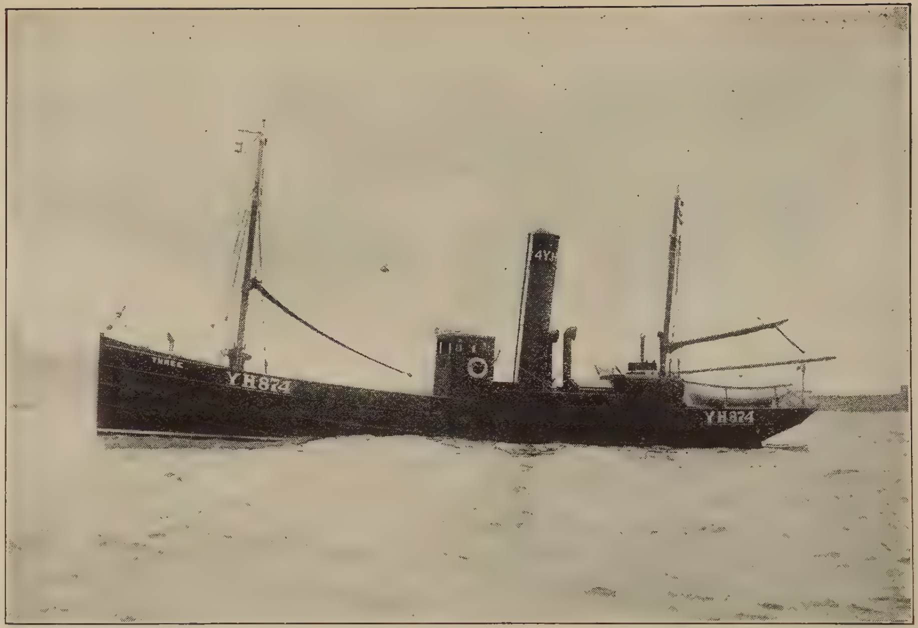


FIG. 41.—Steam Fishing Vessel—Steel Screw Drifter *Three.*

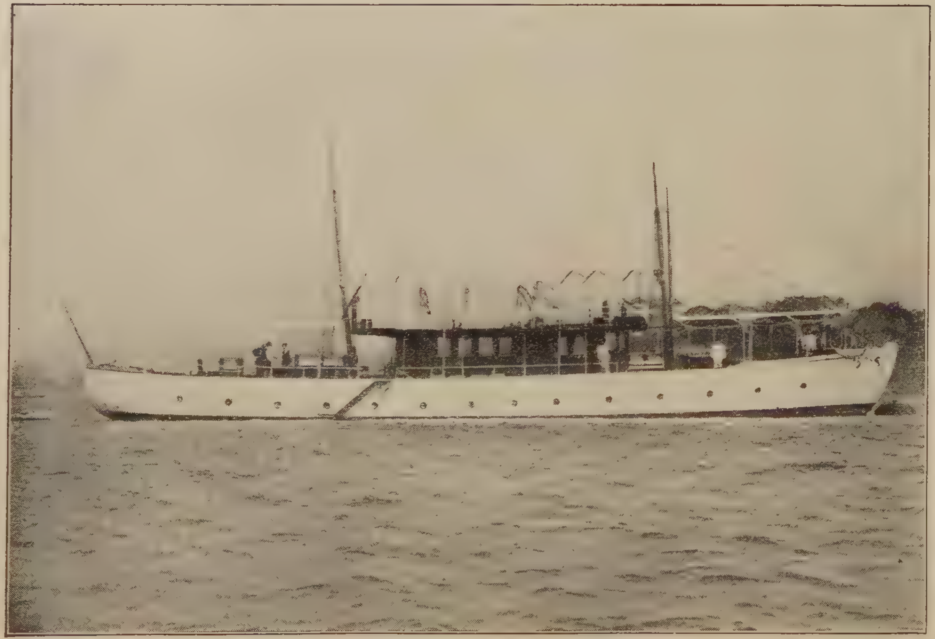


FIG. 45.—Australian Motor Yacht *Bronzewing.*

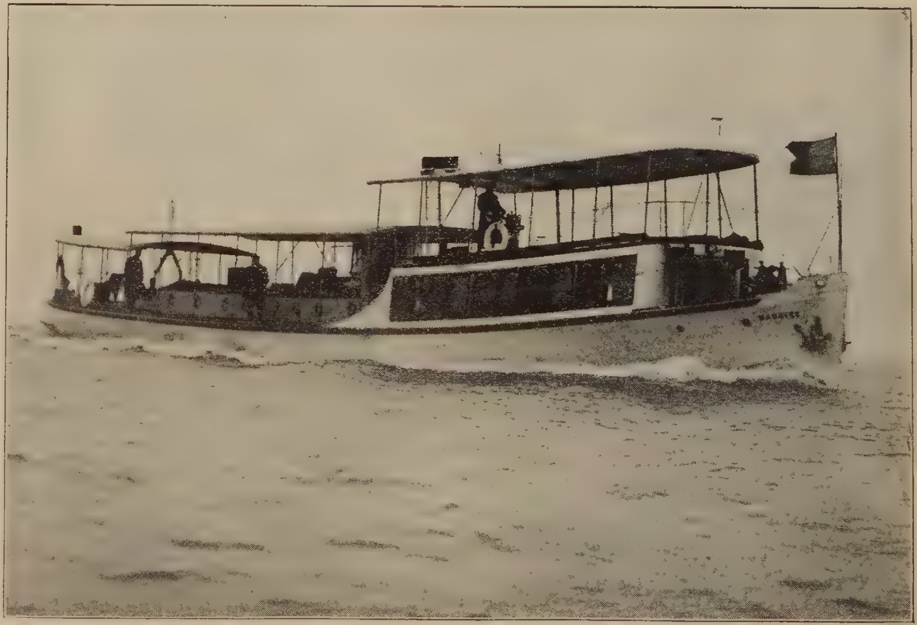


FIG. 46.—Motor-Driven Mail Boat *Manatee.*

yacht measurement 532 tons; she is rigged as a three-masted schooner; her original sail area, 9200 sq. ft., has recently been reduced to 7950 sq. ft.; her hull is *composite*, the frames being of iron and the planking of teak; her engines are compound of 70 N.H.P. Very much larger yachts have been built in recent years, such as the “Lysistrata,” 286 ft. long, 40 ft. beam, 13 ft. 9 in. depth of hold, 1943 tons gross tonnage and 2089 tons Thames Y.M., built in 1900; and the “Liberty,” 268 ft. long, 35 ft. 6 in. beam, 17 ft. 9 in. depth of hold, 1607 tons gross tonnage and 1571 tons Thames Y.M., built in 1908. These two vessels and many others of similar types are American-owned. The yacht “Emerald,” of 750 tons yacht measurement and 1400 H.P., built on the Clyde in 1902, crossed the Atlantic in May 1903, and was the first turbine steamer to be classed in any registry. The “Atalanta” (ex “Lorena”), of 1398 tons Y.M., built in 1903, fitted with turbines of 3800 H.P., was the finest turbine-driven private yacht afloat in 1910. The “Tarantula,” built in 1902, of 122 tons Y.M. and fitted with turbines of 2200 H.P., is a high-speed vessel resembling a torpedo-boat destroyer. The “Winchester,” built in 1909, is of a similar type; she is 165 ft. long, 15 ft. 6 in. beam, 188 tons Y.M., and has turbines of 2500 H.P., which give her a speed of 26½ knots.

The royal yachts of European sovereigns are the largest yachts yet built. They include the imperial Russian yacht “Pole Star,” of 3270 tons and 5600 I.H.P., built in 1888; the imperial German yacht “Hohenzollern” (fig. 43, Plate XI.), of 3773 tons Y.M. and 9500 H.P., built in 1893; the Spanish royal yacht “Giralda,” of 1664 tons Y.M., built in 1894; the imperial Russian yacht “Standart,” of 4334 tons Y.M. and 11,000 H.P., built in 1895; and the British royal yachts, “Victoria and Albert,” of 5005 tons Y.M. and 11,000 I.H.P., built in 1899, and the “Alexandra” (fig. 44, Plate XI.), of 2157 tons Y.M. and 4500 H.P., built in 1907.

Propulsion by Electricity.—In 1883 Messrs Siemens & Co. fitted up a launch, 40 ft. long and 6 ft. beam, with an electric motor driving a single propeller and operated by a battery of secondary cells, and at a displacement of 5 tons a speed of 7 knots was obtained. A launch 25 ft. long, provided with an electric motor capable of giving a speed of 7 knots, also was supplied to H.M. yacht “Victoria and Albert” in 1903. A number of other electric launches similarly fitted have been built chiefly for river service, the batteries being recharged from shore stations from time to time; but the method has not been extensively adopted, except in submarines. In some cases the submarine's secondary battery has been used for propulsion on the surface as well as when submerged, being recharged from shore or from a parent vessel as required; but in nearly all recent vessels they are used only for propulsion when submerged, the engines fitted for propulsion on the surface being arranged to drive dynamos for recharging the cells. In a number of small vessels and oil-tank steamers electric motors are fitted for driving the propeller and supplied with current from dynamos driven by steam turbines or internal combustion engines.

Propulsion by Naphtha Engines.—In 1888 several launches were built on the Thames in which petroleum spirit was used for fuel in place of coal, and also as an expanding agent for driving the propelling machinery in place of steam. A number of these boats were afterwards built in England and America, and known as *zephyr* or *naphtha* boats. Further particulars of these boats will be found in a paper read by Mr Yarrow before the Institute of Naval Architects in 1888.

Propulsion by Internal Combustion Engines.—Experiments have been made at various times with machinery in which the fuel is burnt or exploded in the engine itself without having recourse to the transfer of energy by means of an expanding and condensing agent such as steam or naphtha, and by these experiments the modern internal combustion engine has been slowly evolved and adapted for marine propulsion. In 1680 an engine was patented in which gunpowder was exploded, and the engine was operated by the vacuum produced by the cooling of the gases; in 1794 an engine was patented in which the explosion of turpentine spirit drove the pistons forward, and about 1823 a gas-driven vessel was run on the river Thames. In the later years of the 19th century gas engines were highly developed for use in factories, &c., on shore, and petrol engines for driving motor cars, &c., and since the beginning of the present century similar engines adapted for marine propulsion have been greatly improved and produced in considerable numbers, especially in the United States, some of the vessels being as large as 800 tons gross.

Such vessels may be considered in three groups. (1) High-speed racing boats, pleasure boats of various sizes for service on rivers and in harbours, fireboats, patrol boats and launches for river work, yachts' tenders and sea-going yachts of light scantlings, in which highly volatile and readily exploded fuels such as gasolene, petrol and naphtha are used. (2) Vessels of low speed, in which the weight of the engine is not of great importance, such as barges for use on rivers and canals, ferry-boats, small tug-boats, slow-speed cargo vessels and slow-speed oil-tank vessels, which have been fitted with engines using kerosene or paraffin, as well as oil fuels of greater specific gravity, and of higher flash-point and requiring a higher temperature for evaporation; in some cases these low-speed vessels have been fitted with engines using gas produced from anthracite coal, prepared charcoal and heavy oil. (3) Vessels in which auxiliary propelling machinery of low power is fitted; they include a large number of fishing vessels, smaller numbers of coasting schooners, lifeboats and a few large vessels; in these both light and heavy oils and gas have been employed.

As examples of class (1) may be mentioned the racing boats “Ursula,” built at Cowes in 1908, 49 ft. 6 in. long, 5 tons total weight, fitted with petrol engines of 800 H.P., driving twin screws at about 950 revolutions, and giving a speed of 38½ knots; and “Columbine,” built on the so-called hydroplane principle in 1910, 26 ft. long, 65 H.P. and over 30 knots speed; the American yacht “Kalmia,” 83 ft. long, 14 ft. 3 in. beam, 3 ft. 9 in. draught; and the yacht “Swiftsure,” 70 ft. long, 11 ft. beam, 38 tons gross, 3 ft. draught, 160 H.P. and 16 knots speed, built at Cowes in 1909 and navigated under her own power to St Petersburg.

Examples of class (2) are the double-ended ferry-boat “Miss Vandenburg,” employed on the St Lawrence, 100 ft. long, 20 ft. 9 in. beam, 9 ft. depth, 5 ft. draught, 150 tons displacement, fitted with two paraffin engines each of 75 H.P.; the yacht “Bronzewing” (fig. 45, Plate X.), built at Sydney in 1908, 110 ft. long, fitted with three paraffin engines each of 105 H.P.; the “Lochinvar,” a West of Scotland passenger vessel of 12 knots speed, 145 ft. long, 200 tons gross, fitted with three paraffin engines each of 100 H.P.; and the “Manatee” (fig. 46, Plate X.), 93 ft. long, 16 ft. beam, 5 ft. 6 in. draught, fitted with two paraffin motors of 75 H.P., giving her 10½ knots speed, built at Cowes in 1909 for service as a mail and passenger boat in Southern Nigeria, which was navigated to Forcados, a distance of 4000 m., under her own power and without escort.

Amongst examples of class (3) may be mentioned the three-masted topsail schooner “San Antonio” of Rotterdam, 165 ft. long, 27 ft. 3 in. beam, 9 ft. 2 in. depth and 410 tons gross, fitted with engines of 160 H.P., using crude heavy oil and driving a single screw; the “Modwena” of Glasgow, a barque-rigged sailing yacht of 400 tons, fitted with paraffin engines of 200 H.P., giving a speed of 9½ knots, the “Carnegie,” already referred to under surveying vessels, which is fitted with gas engines of 150 H.P., driving twin screws; and the yacht “Lady Evelyn,” of 366 tons Y.M., fitted in 1910 with heavy oil engines of 500 H.P.

The power of individual internal combustion engines completed up to 1910 was somewhat limited, and great difficulties had been encountered in the use of heavy oil fuels; but great advances and improvements had been made which were opening up the way for the more extensive adoption of motors of large power using heavy oil fuels. An ocean-going motor-driven cargo vessel of 9000 tons and 12 knots speed, was in 1910 being built in Germany for the Hamburg-American line, and fitted with heavy oil engines of 3000 H.P. driving twin screws, while engines of 10,000 H.P. were also being manufactured.

V. War Vessels

The adoption of iron and steel as the material for shipbuilding, and the development of the steam engine, have influenced warship construction in the same manner as they have influenced the construction of ships for the mercantile marine; but, in addition, the introduction of armour for the protection of ships, the great advances made in its manufacture, and, above all, the marvellous improvements in explosives and in the design and manufacture of guns and torpedoes, have changed the conditions of naval warfare, and called for corresponding changes in the design of warships. Those who are concerned in such questions may refer with advantage to an interesting comparison between the old “Victory” (fig. 1, Plate XIII.) and a modern battleship instituted by Sir Andrew Noble in his address to the Mechanical Science Section of the British Association in 1890. Sir Andrew Noble's remarks in this connexion are the more weighty, coming as they did from the director of the great arsenal of Sir W. G. Armstrong, Whitworth & Co., and from one whose scientific research has incalculably advanced our knowledge of artillery and explosives. Sir Andrew follows up this comparison by the following reference to the condition of things just before the Crimean War:—

“The most improved battleships of the period just anterior to the Crimean War differed from the type I have just described mainly by the addition of steam power, and for the construction of these engines the country was indebted to the great pioneers of marine engineering, such as J. Penn & Sons, Maudslay Sons & Field, Ravenhill, Miller & Co., Rennie Bros., &c., not forgetting Messrs Humphreys & Tennant, whose reputation and achievements now are even more brilliant than in those earlier days. Taking the ‘Duke of Wellington,’ completed in 1853, as the type of a first-rate just before the Crimean War, her length was 240 ft., her breadth 60 ft., her displacement 5830 tons, her indicated horse-power 1999, and her speed on the measured mile 9·89 knots. Her armament consisted of 131 guns, of which thirty-six 8-in. and 32-pdrs. were mounted on the lower deck, a similar number on the middle deck, thirty-eight 32-pdrs. on the main deck, and twenty short 32-pdrs. and one 68-pdr. pivot gun on the upper deck. Taking the ‘Caesar’ and the ‘Hogue’ as types of second- and third-rate line-of-battle ships, the former, which had nearly the displacement of the 'Victory,' had a length of 207 ft., a breadth of 56 ft., and a mean draught of 21. She had 1420 indicated horse-power, and her speed on the measured mile was 10·3 knots. Her armament consisted of twenty-eight 8-in. guns and sixty-two 32-pdrs., carried on her lower, main and upper decks. The 'Hogue' had a length of 184 ft., a breadth of 48 ft. 4 in., a mean draught of 22 ft. 6 in.; she had 797 indicated horse-power and a speed of 8¾ knots. Her armament consisted of two 68-pdrs. of 95 cwt., four 10-in. guns, twenty-six 8-in. guns, and twenty-eight 32-pdrs. of 50 cwt.—sixty guns in all.

"Vessels of lower rates (I refer to the screw steam frigates of the period just anterior to the Crimean War) were, both in construction and armament, so closely analogous to the line-of-battle ships that I will not fatigue you by describing them, and will only allude to one other class, that of the paddle-wheel steam frigate, of which I may take the 'Terrible' as a type. This vessel had a length of 226 ft., a breadth of 43 ft., a displacement of about 3000 tons, and an indicated horse-power of 1950. Her armament consisted of seven 68-pdrs. of 95 cwt., four 10-in. guns, ten 8-in. guns and four light 32-pdrs."

The warships which existed at the beginning of the latter half of the 19th century were, with the exception of special vessels, divided roughly into three classes—ships of the line, frigates and gun-vessels. For many years the corresponding types of iron and steel vessels were known as battleships, cruisers and gunboats, but recently we have seen the power of the cruiser increased to that of the battleship, and new types have been produced such as the torpedo boat, the torpedo boat destroyer and the scout, the latter developing into the fast cruiser of continually increasing size; while the submarine torpedo boat has become a recognized sea-going vessel, and is becoming comparable in size with the gun-vessel or the small cruiser. It is proposed to refer to these in the order named. (See also NAVY.)

Battleships.—The destruction of the Turkish fleet at Sinope (30th November 1853) by the Russian fleet, the latter alone being armed with shell guns, and the combined experience of the British and French fleets before Sevastopol when engaging Fort Constantine, demonstrated conclusively that for ships of the line armour protection had become essential. The French government immediately began to build five armour-plated vessels, or batteries, as they were called, for service in the Black Sea; and eight similar vessels were begun shortly afterwards by the British government for the same service.[1] The British vessels did not arrive in time to take any part in the war; but three of the French batteries did, and were very favourably reported on by Admiral Bruat after an engagement with the Kinburn Forts on the 17th of October 1855. With the exception of these three French batteries, the whole of the fleets employed in the operations were composed of unarmoured wooden ships, and a large number of them were sailing line-of-battle ships. As the result of the engagement with the Kinburn Forts, the French began to armourplate sea-going vessels, and the first step in this direction was taken by the celebrated French naval architect M. Dupuy de Lôme, who razeed the "Napoleon," a wooden two-decker, and fitted her with a complete belt of 5-in. armour on a backing of 26 in. of wood. This work was completed in 1859, and the ship, renamed "La Gloire," became the first sea-going armour-clad. Two other vessels of the same design, the "Invincible" and "Normandie," were also laid down, and with the "Magenta," "Solferino" and the "Couronne," a few years later, formed the first fleet of French armour-clads.

In June 1859 the armour-plated iron frigate "Warrior" was commenced by the British government. Others quickly followed, including the "Black Prince," which was a sister ship to the "Warrior," and four other vessels, the "Achilles," the sister ships "Minotaur" and "Agincourt," and the "Northumberland." The distribution of the armour and other features of these vessels are shown in fig. 47. The "Warrior" and "Black Prince" were 380 ft. long and of 8830 tons displacement, had engines of 6000 I.H.P. and a speed of 14¼ knots; they were designed to carry thirty-six 68-pdr. 100-cwt. guns, but during construction the 7-in. 6½-ton gun was introduced into H.M. Service, and the ships when completed for sea carried an armament of 28 of these 7-in. guns. They had a central citadel 213 ft. long, protected with 4½-in. iron armour extending from a few feet below the water-line to the height of the upper deck. Their outline was similar to the outline of the wooden frigates of the day, and their rudder-heads and steering-gear were above water and unprotected against injury by shot and shell. In the four vessels which immediately followed, which were from 500 to 1500 tons more displacement, the overhanging bow, as will be seen from fig. 51, was given up, bows adapted for ramming were introduced, and some protection was afforded to the steering-gear by water-line belts of armour which extended the whole length of the vessel. In 1861 the British government began the construction of eleven armour-clads, six of which, including the "Hector" and "Valiant," sister ships of 6700 tons displacement and 3500 I.H.P., were iron vessels, and five, the "Caledonia," "Royal Oak," "Ocean," "Prince Consort," and "Royal Alfred," were wooden vessels of rather over 4000 tons.

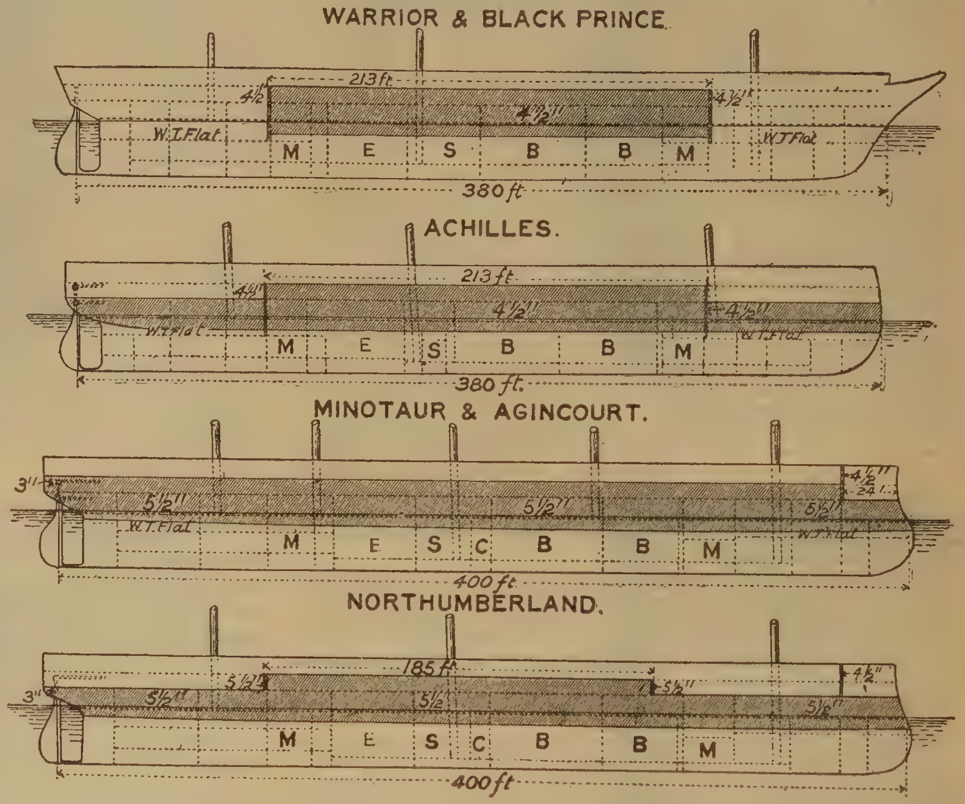


FIG. 47.—"Warrior" and "Black Prince," "Achilles," "Minotaur" and "Agincourt," and "Northumberland." E, Engine-room; B, boiler-room; C, coal bunkers; M, magazines; S, shell-rooms.

Sir E. J. Reed.

The reconstruction of the British fleet was taken in hand in earnest in 1863, when Mr (afterwards Sir) Edward J. Reed was placed at the head of the Construction Department at the Admiralty, with Messrs Barnaby, Barnes, Crossland, Morgan and Wright—the last-named (afterwards Sir James Wright) holding the position of engineer-in-chief—as

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[1] See letters of the earl of Rosse on this subject, *Transactions of Inst. of Naval Architects* for 1908.

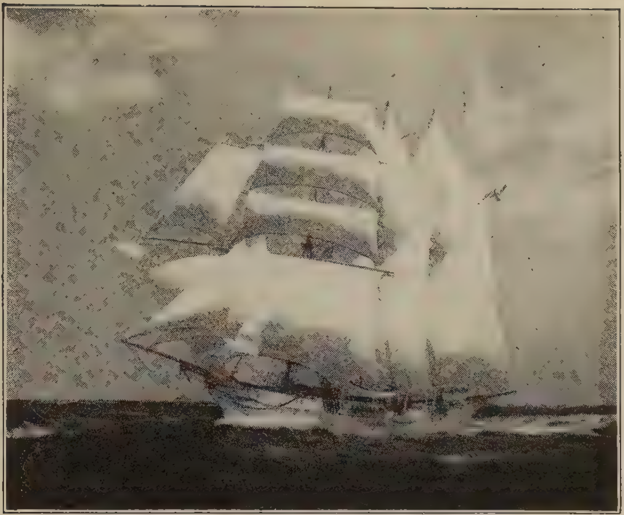
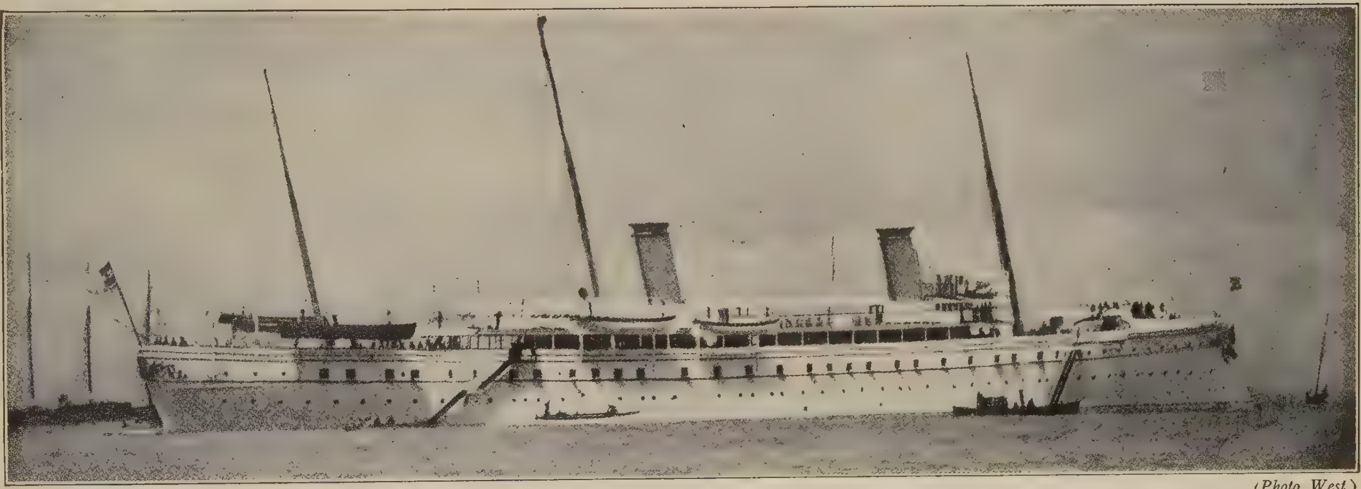
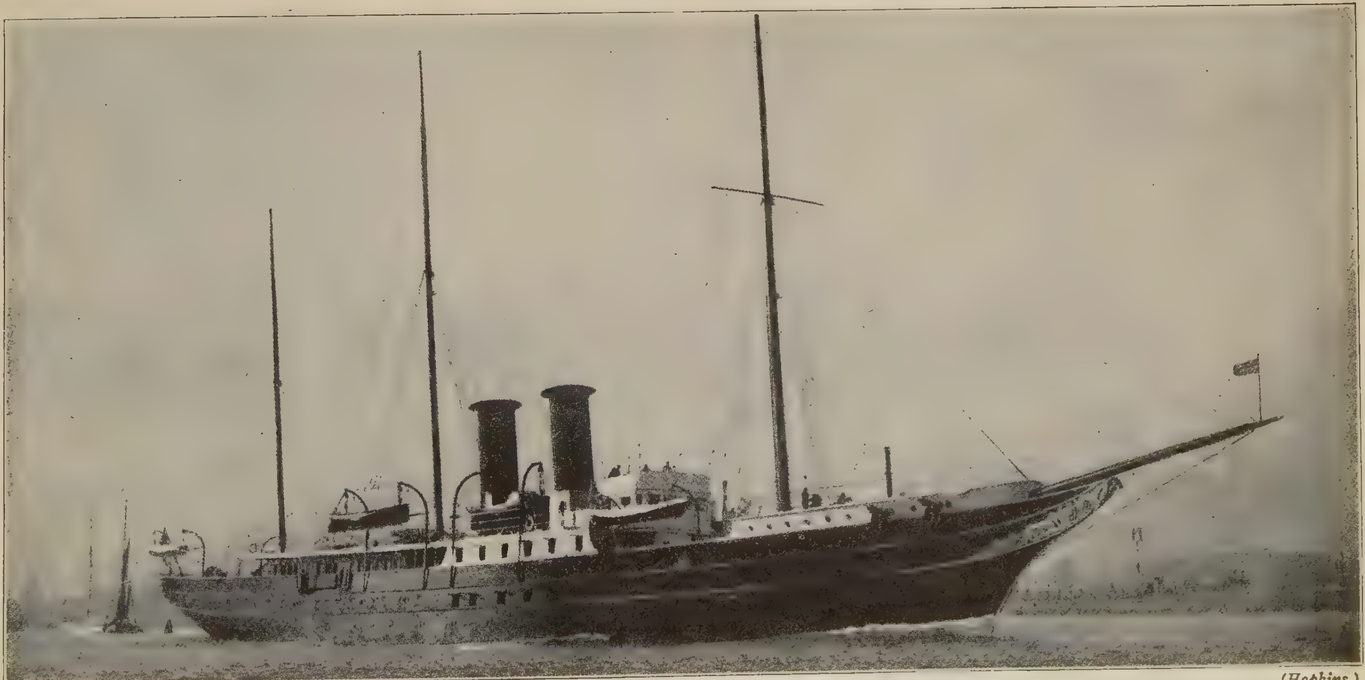


FIG. 42.—Sailing Yacht, with Auxiliary Steam Power, *Sunbeam*.



(*Photo, West.*)

FIG. 43.—Imperial German Steam Yacht *Hohenzollern*.



(*Hopkins.*)

FIG. 44.—The Royal Steam Yacht *Alexandra*.

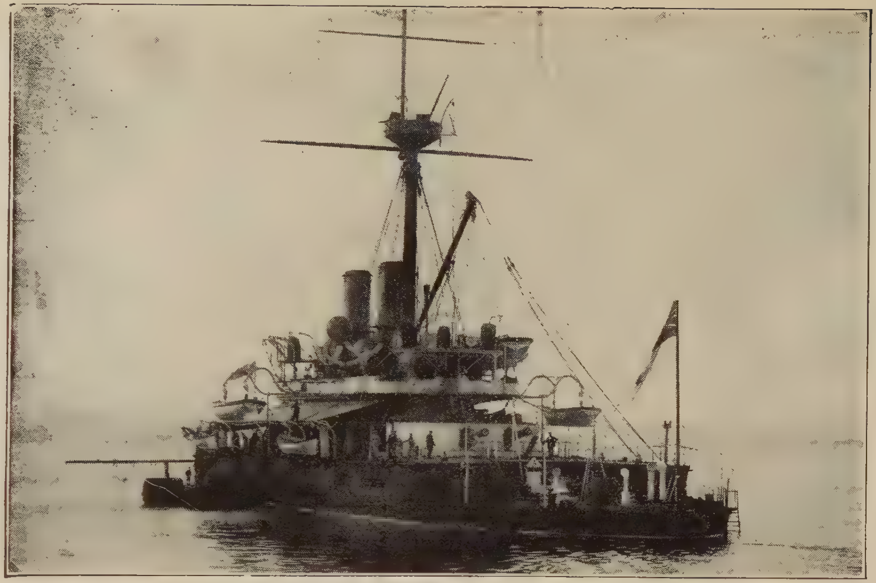


FIG. 49.—H.M.S. *Devastation.*

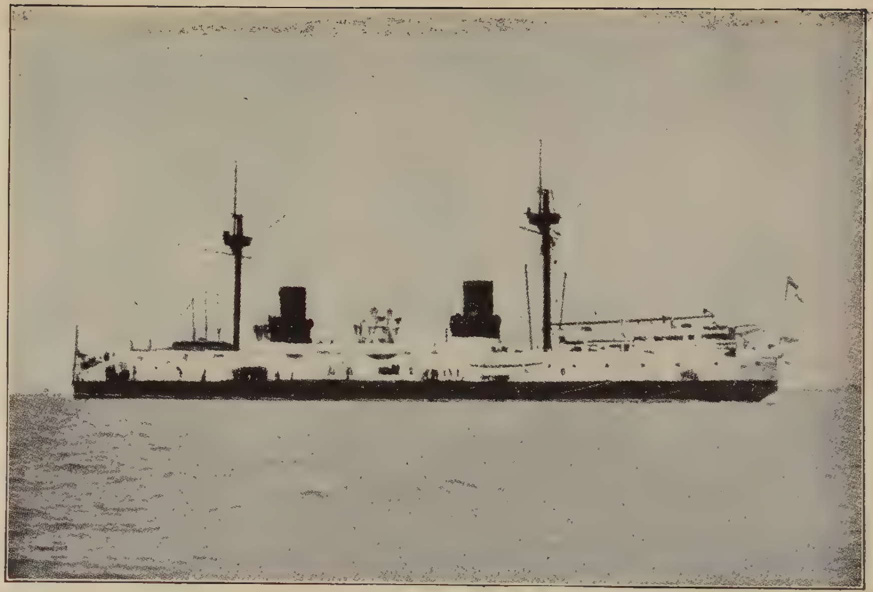


FIG. 50.—H.M.S. *Inflexible.*

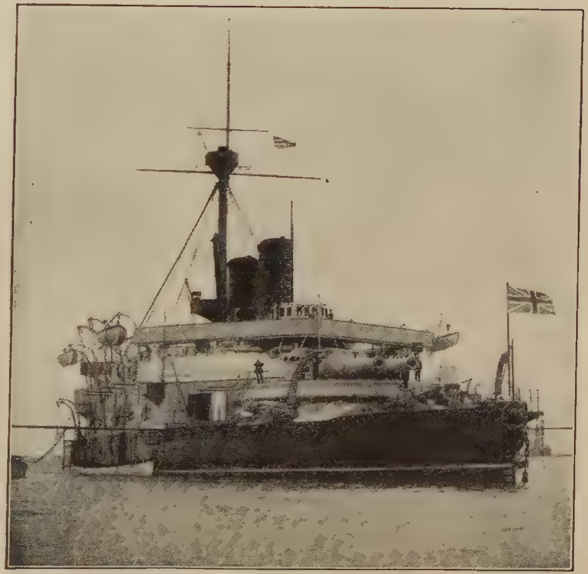


FIG. 53.—H.M.S. *Camperdown.*

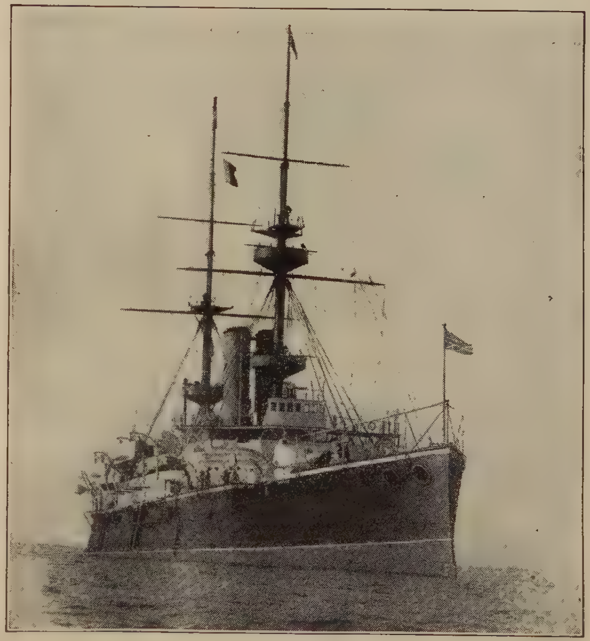


FIG. 55.—H.M.S. *Renown.*

his immediate assistants. Various types of vessels were devised, with arrangements of armour and dispositions of guns, to provide for the new conditions which had been introduced; and, in addition, great advance was made in the structural arrangements of ships, which up to this period had been considerably influenced by the old systems of construction in use in wooden ships. In investigating the qualities of ships, Sir Edward Reed had the good fortune to secure the co-operation and assistance of Mr William Froude, F.R.S., who had been the first to demonstrate accurately the theory upon which the behaviour of ships in a seaway depends. Mr Froude's experimental investigations on the forms of ships and kindred matters, begun in 1870 on behalf of the Admiralty and continued till his death in May 1879, had a most important bearing on the improvement of ships and on the science of naval construction generally. It is not too much to say that nearly the whole of the accurate information as to the best forms of ships and their resistance at various speeds, in the possession of naval architects to-day, is the direct result of Mr Froude's work, and that of his son, Mr R. E. Froude, F.R.S., who continued the work after his father's death.

Among the considerations which Reed had in view in the reconstruction of the navy may be enumerated the following: (1) Steadiness of ship as a gun platform, with ample stability in all conditions of lading to enable her to keep the sea in all weathers, and sufficient stability in a partially riddled condition to enable her to reach port in safety. (2) Protection by armour of the vitals of the ship, and of the heavy-gun positions, especially against shell fire. (3) The carrying of guns of power sufficient to penetrate the armour of any possible enemy. (4) Mounting the guns sufficiently high above the water-line to enable them to be fought in bad weather. (5) Simultaneous all-round fire, with concentration of as many guns as possible on any given point of the compass. (6) Speed to overtake or get away from an enemy. (7) Manœuvring power to maintain, as far as possible, any desired position with regard to an enemy. (8) Large radius of action. (9) Proper provision for the berthing of officers and crew. (10) Limitation of size and cost.

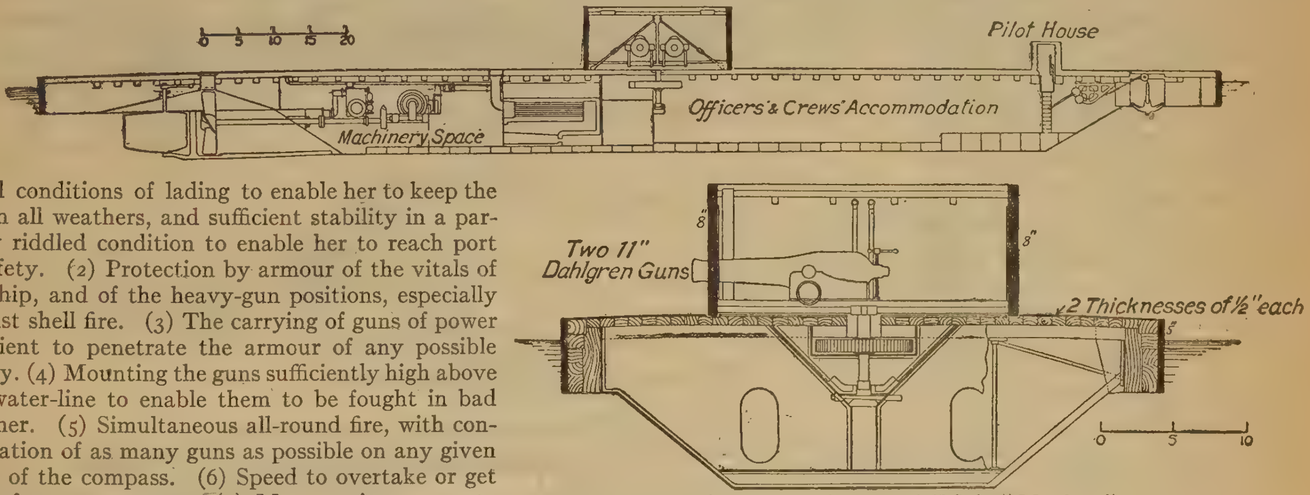


FIG. 48.—Diagram of U.S.A. "Monitor."

Objections were raised to the early armour-plated ships on the score of their unhandiness, heavy rig, exposed position of guns, &c. To meet these, Reed designed a number of vessels. The "Bellerophon," launched in 1865, was a vessel of 7550 tons displacement, 6500 I.H.P., 14 knots speed, and was 300 ft. long. Her armament consisted of ten 9-in. 14-ton and five 7-in. 6½-ton guns. Her water-line was wholly protected by 6-in. armour, and she was provided with a central battery 98 ft. long, protected with armour of the same thickness. She carried a considerable spread of canvas, and she was fitted with a balanced rudder. The "Hercules," completed in 1868, was a much more important ship, her dimensions being: length 325 ft., breadth 59 ft., draught 26½ ft., displacement 8680 tons. Her engines of 8500 I.H.P. gave her a speed of about 14½ knots. She had two 9-in. guns, mounted one forward and one aft on the main deck behind 6-in. armour, and eight 10-in. guns, mounted in a central battery on the main deck. Her water-line was protected by armour 9 in. thick amidships, reduced to 6 in. at her ends, and her battery was protected by 6-in. armour. The "Sultan," completed in 1871, was in many respects a similar ship but larger, having a displacement of 9300 tons, 2 ft. more beam and 1 ft. more draught; she attained a speed of upwards of 14 knots. Her main-deck battery carried the same guns as the main-deck battery of the "Hercules," but the 9-in. guns at the extremities of the vessel on this deck were dispensed with, and she carried, in addition, an upper-deck battery, placed over the after-end of the main-deck battery, in which four 9-in. guns were carried. Both batteries were protected with 6-in. armour; elsewhere the armour followed that of the "Hercules."

Turret Ships.—The system of mounting heavy guns in revolving turrets was advocated in England by Captain Cowper Coles after experience in the Crimean War; and in June 1860 he embodied his ideas in a paper read before the United Service Institution. When the American Civil War broke out, Congress ordered a number of armoured vessels to be built, and one of the first to be completed was the turret vessel "Monitor" designed by Ericsson. She was 170 ft. in length, 41½ ft. beam, 1200 tons displacement, of low speed and low freeboard, the sides being protected by 3- to 5-in. armour, built up of 1-in. plates on 27 in. of wood backing, and the single revolving turret which carried two 11-in. smooth-bore guns protected by 8-in. armour built up of 1-in. plates and placed amidships as shown in fig. 48. Her defeat of the "Merrimac" belongs to history. Several other similar low-freeboard turret vessels were built in America, and one of them, the "Miantonomoh," 250 ft. long, 55½ ft. beam, 14 ft. draught, 3850 tons displacement, 1800 I.H.P., 12 knots speed, with twin screws and two turrets carrying four 10-in. B.L. guns, of only 2 to 3 ft. freeboard, succeeded in crossing the Atlantic, returning again in safety; but the "Monitor" herself was caught in a gale and foundered off Cape Hatteras in 1862.

The first turret ships in the British navy were the "Royal Sovereign" and "Prince Albert." The former, a wooden ship, launched in 1857 as a 121-gun three-decked line-of-battle ship, of a tonnage of 3760 tons, was in 1864 cut down to 7 ft. above water and fitted with 5½-in. side-armour bedded on a 36-in. wood side, and with four turrets on Captain Cowper Coles' plan; and the latter, an iron vessel, 240 ft. long, 48 ft. beam, launched in 1864, with 4½-in. side-armour with 18-in. backing fitted on 1-in. skin plating, also carried four turrets, two fitted with pairs and two with single 12-ton guns; both were low-freeboard vessels and were reserved for coast defence. The "Monarch," of 8300 tons displacement, was laid down in June 1866 as a sea-going turret ship. She was launched in May 1868, her dimensions being: length 330 ft., breadth 57 ft. 6 in. and draught 26 ft.; her I.H.P. was 8000, giving her a speed of about 15 knots, and she carried a large spread of canvas. She had a complete armour belt 9 ft. 9 in. wide and 7 in. thick, reduced to 6 in. at the extremities. Above this armour belt amidships, for a length of 84 ft., she was provided with a citadel, also of 7-in. armour, which protected the bases of two revolving turrets, each protected with 10-in. armour and carrying two 12-in. guns. She also carried two 9-in. guns forward on the upper deck and one 7-in. gun aft on the main deck, all protected by armour.

The design of the "Monarch" did not satisfy Captain Coles, and he induced the Admiralty to build a turret ship of much lower freeboard, in accordance with his views. This vessel was the "Captain," built at Birkenhead and launched in March 1869. By an unfortunate error her freeboard was even less than Captain Coles had contemplated. She was fully rigged, with tripod masts and large sail-spread; this spread of canvas, with her low freeboard and deficient stability, resulted in her capsizing in the Bay of Biscay on 6th September 1870, amongst those drowned being her designer.

A number of low-freeboard turret vessels of the "Monitor" class, without masts and sails, were built for the British navy at this time, mostly for coast defence. Amongst these, the "Cerberus" for Australia and the "Abyssinia" and "Magdala" for India were completed in 1870. The "Abyssinia" had a displacement of 2900 tons and a speed of about 9½ knots; her dimensions were: length 225 ft., beam 42 ft., draught 14½ ft., and her armament consisted of four 10-in. 18-ton guns. The other two vessels had the same armament, but were somewhat larger, being of 3340 tons displacement; and the thickness of their side-armour was 8 to 6 in., against 7 to 6 in. in the "Abyssinia." Several vessels of this type were also built for home service, including the single-turret vessels "Glatton" of 4910 tons and "Hotspur" of 4010 tons, each carrying two

18-in. 25-ton guns, and the "Cyclops," "Gorgon," "Hecate" and "Hydra," each of 3560 tons and provided with two turrets carrying two 10-in. 18-ton guns. They were protected with armour from 8 to 12 in. thick, and their speed was from 10 to 12 knots.

The "Devastation," commenced in 1869, represented Reed's views of what a sea-going turret ship should be. Low sides were adopted, but not in combination with rigging and sails. She was the first sea-going battleship in the British navy which depended wholly on steam power for propulsion. She was 285 ft. long, 62 ft. 3 in. broad, 27 ft. mean draught and 9330 tons displacement. Her sides, which, except right forward, rose only to a height of 4 ft. 6 in. above water, were protected with armour 12 in. thick. Her armament consisted of four 35-ton guns, mounted in pairs in two turrets, one at each end of a raised breastwork or redoubt which extended about 150 ft. along the middle of the upper deck. The guns were thus elevated to the height of some 14 ft. above the surface of the water. The turrets were protected by armour 12 in. and 14 in. thick, and the breastwork or redoubt by armour 10 in. and 12 in. thick. A forecastle extended forward from the fore-end of the breastwork at a height of 9 ft. 3 in. above the water-line; but in wake of this forecastle the side armour dropped to a height of only 4 in. above the surface of the water, at which level there was an armoured deck. She was provided with twin-screw machinery of 7000 I.H.P., which gave her a speed of 14·2 knots, and she carried a large coal supply. After the loss of the "Captain," a special committee, including many of the highest professional and scientific authorities in the United Kingdom, was appointed to examine into the design of such vessels. Of the "Devastation" they reported that "ships of this class have stability amply sufficient to make them safe against the rolling and heaving action of the sea"; they agreed, however, in recommending a plan which the constructors of the Admiralty had proposed, with the view of increasing her range of stability and the accommodation of the crew. This consisted in the addition of side superstructures, formed by continuing up the ship's side with light framing and plating as high as the level of the top of the breastwork, and carrying the breastwork deck over to the sides. The structures were continued aft on each side some distance beyond the breastwork, providing two spacious wings, which added largely to the cabin accommodation. A good idea of her general appearance may be obtained from fig. 49 (Plate XII.). The "Devastation" was followed by the "Thunderer" of the same dimensions, and the "Dreadnought" of 10,820 tons displacement, 8000 I.H.P. and 14 knots speed; a vessel of higher freeboard, plated with 14 in. of armour and carrying four 38-ton guns; she was the most powerful and best protected vessel of her day.

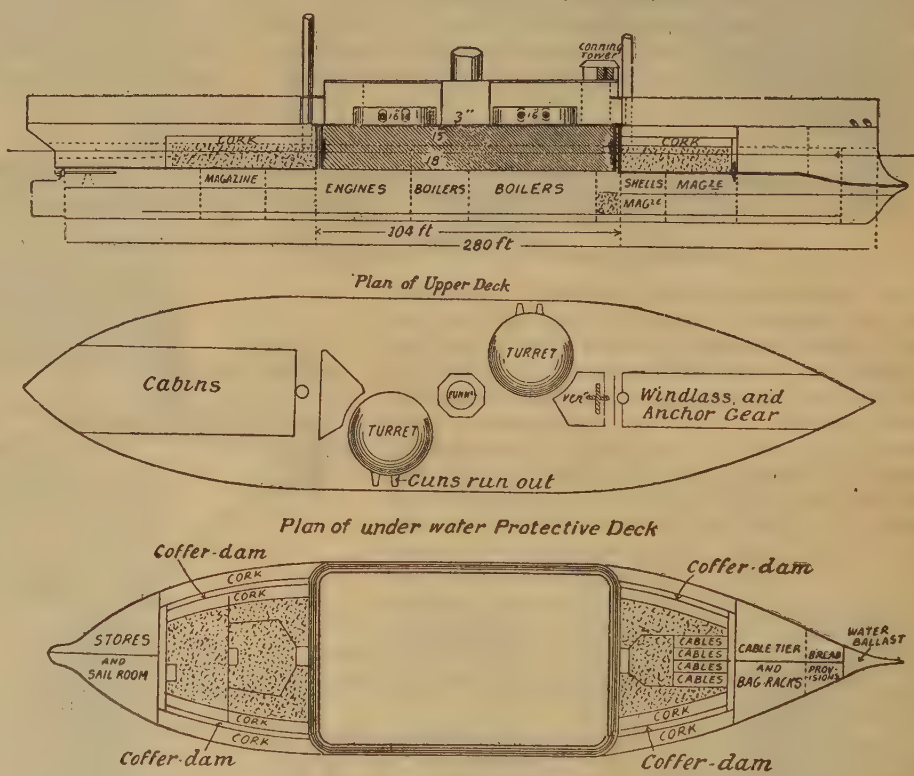

AJAX and AGAMEMNON (of 1876)

FIG. 51.—Arrangement of "Ajax" and "Agamemnon."

Sir Edward Reed retired from the Admiralty a short time before the "Captain" foundered at sea. During his seven years' term of office some forty iron armourclads of various sizes and types, besides iron cruisers and numerous other vessels, had been added to the British navy, the adoption of armour for the protection of the vital parts of ships had become established, and especially had the importance of utilizing armour in such a manner as to exclude projectiles from the region of the water-line become recognized. The change from the widely-distributed armament of the first broadside armour-clads to the highly concentrated armament of the turrets, and from the high freeboard ship with sail-power to the low freeboard turret ship without sails, had also been effected; so that when Sir Edward Reed retired in 1870, the latest type of battleship was entirely different from that which existed when he took office; and although the construction of broadside ironclads had not been discontinued, "the wooden walls" had practically ceased to exist. Sir Edward Reed was succeeded by a Council of Construction composed of his immediate assistants, with Mr Barnaby (afterwards Sir Nathaniel Barnaby) as its president; but three years later this council was dissolved, and Sir N. Barnaby was placed at the head of the Construction Department.

Sir Nathaniel Barnaby.

The sea-going qualities of the "Devastation" had successfully demonstrated that the battleship of the future might depend wholly on steam propulsion; and although many naval officers and others continued to hold the view that sea-going ironclads must of necessity be rigged ships, in the designs which immediately followed sail power was omitted. In the "Inflexible" (fig. 50, Plate XII.), and the sister ships "Ajax" and "Agamemnon," the offensive power was concentrated mainly in two pairs of heavy guns, as it was in the "Devastation" and other turret ships which preceded them; but in them the armour defence also was concentrated over a comparatively small space amidships, the unprotected ends being formed into what was called raft bodies by belts of cork, within which was placed a portion of the ship's coal, &c. Thus the buoyancy was secured by a citadel amidships which could not be penetrated, and by ends which might be riddled but (it was contended) not be destroyed. The arrangement shown in fig. 51 represents the "Ajax" and "Agamemnon." The "Inflexible" was similar but larger. Sir N. Barnaby described the design of the "Inflexible" in 1874 before the Institution of Naval Architects thus:

> "Imagine a floating castle 110 ft. long and 75 ft. wide, rising 10 ft. out of the water, and having above that again two round turrets planted diagonally at its opposite corners. Imagine this castle and its turrets to be heavily plated with armour, and that each turret has within it two guns of about 80 tons each—perhaps in the course of a few years guns of twice 80 tons each. Conceive these guns to be capable of firing, all four together, at an enemy ahead or on either beam, and in pairs towards every point of the compass.
>
> "Attached to this rectangular armoured castle, but completely submerged, every part being 6 ft. to 7 ft. under water, there is a hull of the ordinary form, with a powerful ram bow, with twin screws and a submerged rudder and helm. This compound structure is the fighting part of the ship. Seaworthiness, speed and shapeliness would be wanting in such a structure if it had no additions to it; there is therefore an unarmoured structure lying above the submerged ship and connected with it, both before and abaft the armoured castle; and as this structure rises 20 ft. out of the water,

from stem to stern, without depriving the guns of that command of the horizon already described, and as it moreover renders a flying deck unnecessary, it gets over the objections which have been raised against the low freeboard and other features in the ‘Devastation,’ ‘Thunderer’ and ‘Fury.’[1] These structures furnish also most luxurious accommodation for officers and seamen. The step in advance has therefore been from 14 in. of armour to 24 in., from 35-ton guns to 80-ton guns, from two guns ahead to four guns ahead, from a height of 10 ft. for working anchors to 20 ft., and this is done without an increase in cost, and with a reduction of nearly 3 ft. in draught of water, &c.”

The dimensions of the “Inflexible” were: length 320 ft., beam 75 ft., mean draught 26 ft. 4 in., and displacement 11,880 tons, and her speed was 14 knots. The dimensions of the “Ajax” and “Agamemnon,” begun in 1876, were: length 280 ft., beam 66 ft., mean draught 24 ft. 9 in., and displacement 8660 tons. They carried four 12½-in. guns; their citadels were 104 ft. long, protected with 18-in. armour, their turrets being protected by 16-in. armour; and their speed was 12 knots. The “Edinburgh” and “Colossus,” begun three years later, were of the same type, but were built of steel and were of 9480 tons displacement. Their citadels were longer, and their speed was 14½ knots. Compound armour, adopted in these two ships for the first time, gave them a great advantage in defensive power.

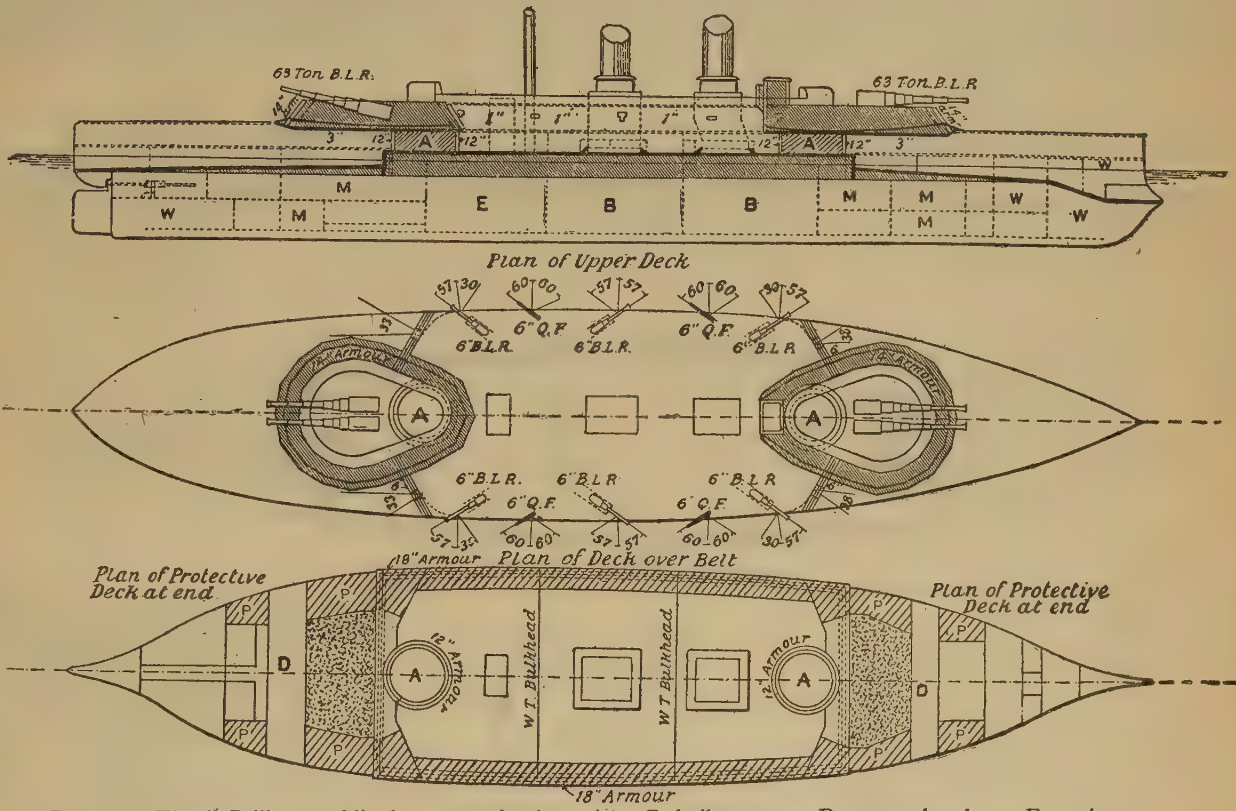


FIG. 52.—The “Collingwood.” A, communicating tubes; B, boiler-rooms; D, water-chambers; E, engine-room; M, magazines and shell-rooms; P, patent fuel packing; W, water-ballast tanks.

The “Collingwood,” begun in 1880, was the first of the battleships of a new type known as the “Admiral” class. In these vessels the main armament consisted of four heavy guns mounted in pairs on the middle line of the ship, in fixed heavily protected gun-positions called barbettes, one at each end of the ship; this main armament was supplemented by a secondary armament of lighter and more rapid-firing guns mounted on the broadsides between the barbettes. This arrangement of the armament, which is illustrated in fig. 52, continued, with small modification, to be adopted in the battleships of the British navy down to 1903.

The principal features of the “Collingwood” were: length 325 ft., beam 68 ft., mean draught 27 ft., displacement 9500 tons. She carried 18-in. armour on her sides, 16-in. on bulkheads, 11½-in. on barbettes and 12-in. conning towers. Her armament consisted of four 12-in. 45-ton guns, six 6-in. guns, and a number of smaller guns. Her speed was 16½ knots, and she carried 900 tons of coal, with capacity for 1200. She was followed two years later by the “Rodney,” “Howe,” “Benbow,” “Camperdown” and “Anson,” which were of the same type, but larger. These six ships constitute what is known as the “Admiral” class. A good idea of their general appearance is obtained from fig. 53 (Plate XII.), which represents the “Camperdown.” The “Victoria”[2] and the “Sans Pareil,” built a few years later, were, with the “Benbow,” the only ships of the British navy built to carry 110-ton guns, the former having them in pairs in a turret heavily armoured, and the latter singly in barbettes.

Among the last of the battleship designs undertaken by Sir N. Barnaby was that of the “Trafalgar” and “Nile,” which was completed by Messrs. F. K. Barnes and H. Morgan after his retirement. These vessels, laid down in January and April 1886, were the largest ships then built for the British navy. They were 11,940 tons displacement, 345 ft. long, 73 ft. beam, and 28 ft. 10 in. mean draught; had engines of 12,000 I.H.P. and a speed of 16¾ knots. Their armour-protection consisted of a belt 230 ft. long and 20 in. thick, with bulkheads 18 in. and 14 in. thick. Above the belt was an armoured redoubt of 18-in. compound armour which enclosed the turret bases. The turrets themselves had 18-in. armour, and between the turrets was an octagonal battery of 3 in. to 5 in. of steel containing the 4·7-in. Q.F. guns. The thickness of the protective deck was 3 in. The disposition of armament originated in the “Collingwood” was adopted in these vessels, but the heavy guns were placed in turrets instead of in barbettes. The armament consisted of four 13·5-in. 67-ton B.L. guns, six 4·7-in. Q.F., eight 6-pdrs. Q.F., twelve 3-pdrs. Q.F., besides boat guns and six torpedo tubes. They carried 900 tons of coal at normal displacement, and had stowage for 1100 tons.

Sir Nathaniel Barnaby retired from office in 1885. During his term of office there were built for the British navy upwards of twenty armoured battleships of various classes, in addition to a much larger number of cruisers of all sizes. The fight for supremacy between the gun and the armour plate had begun in earnest when Sir N. Barnaby took office, the increased weight of projectile and penetrative power obtained by the concentration of the armament into a few heavy guns being followed by the concentration of the armour into a short belt. The concentration of guns and armour reached a limit in the “Inflexible” and her immediate successors; the later ships of Sir N. Barnaby’s design carried a secondary battery of lighter guns in addition to the heavy main armament, and had much longer water-line belts. These changes, combined with the introduction of compound armour and the adoption of steel instead of iron for the building material, both of which date from his time, allowed of greater armour protection and of other advantages, including increased speed, &c.

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[1] The “Fury” was modified and renamed “Dreadnought” before being launched.

[2] The “Victoria” was accidentally rammed and sunk by the “Camperdown” during the Mediterranean manœuvres of 1893.

Sir W. H. White.

Sir Nathaniel Barnaby was succeeded in October 1885 by Mr W. H. White (afterwards Sir W. H. White, F.R.S.). The battleships then building were of four different types and included two of the “Colossus” class, six of the “Admiral” class, two “Trafalgars,” and the “Victoria” and “Sans Pareil.” Their completion proceeded very slowly, and no new battleships were laid down till 1889, when the Naval Defence Act resulted in a reconsideration of the subject by the Board of Admiralty.

Before coming to a decision various designs were discussed, and the First Lord convened a meeting, not only of the members of the Board, but of a number of distinguished and experienced naval officers as well as the Director of Naval Ordnance and the Director of Naval Construction. Subsequently the Board issued instructions for the preparation of detailed designs embodying the features which were agreed upon as being most desirable; and on these designs the seven barbette battleships of the “Royal Sovereign” class and the turret ship “Hood” were built.

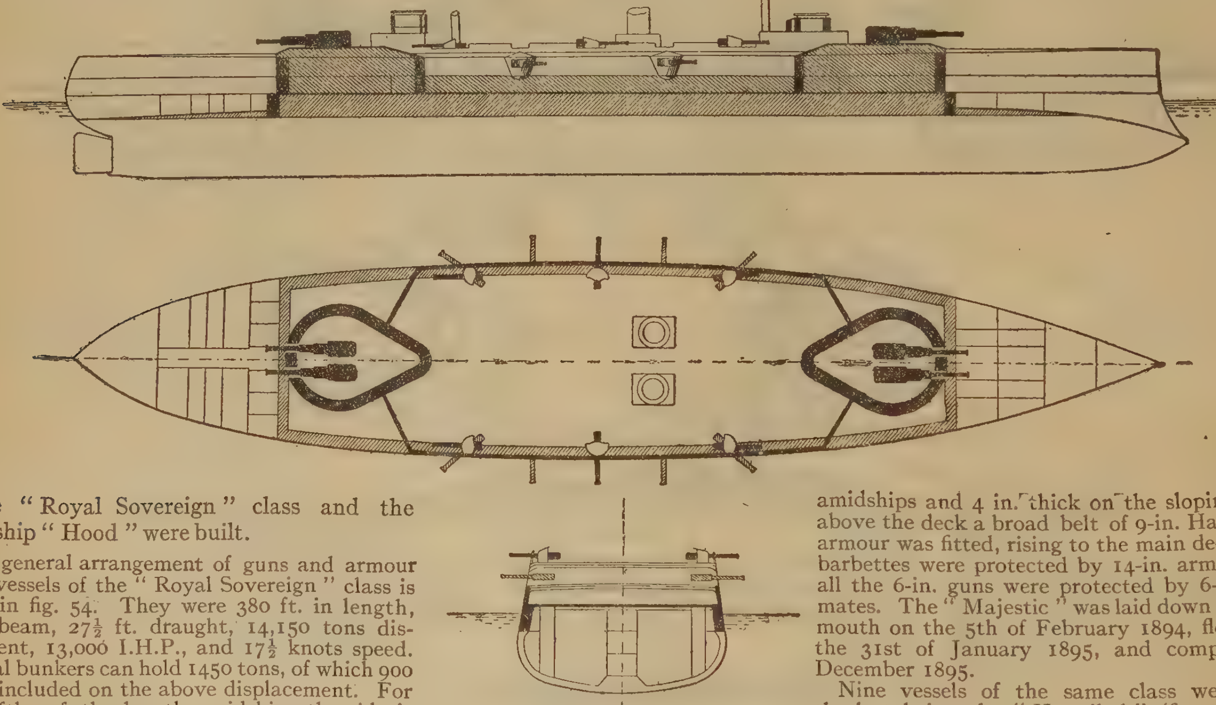
Fig. 54.—The “Royal Sovereign.”

The general arrangement of guns and armour in the vessels of the “Royal Sovereign” class is shown in fig. 54. They were 380 ft. in length, 75 ft. beam, 27½ ft. draught, 14,150 tons displacement, 13,000 I.H.P., and 17½ knots speed. The coal bunkers can hold 1450 tons, of which 900 tons is included on the above displacement. For three-fifths of the length amidships the side is protected by an 18-in. belt of armour, a horizontal 3-in. protective deck being worked across the ship at the *middle* or *belt* deck; between the belt deck and main deck 4-in. side armour is worked. Before and abaft the belt curved protective decks 2½ in. thick were worked, extending down to the ram forward and covering the steering gear aft. Four 13½-in. B.L. 67-ton guns were fitted in pairs in pear-shaped barbettes forward and aft, protected by 17-in. armoured barbettes extending down to the belt deck; ten 6-in. Q.F. guns were fitted, four being on the main deck in 6-in. armoured casemates, which were adopted in these vessels for the first time; sixteen 6-pdr. and twelve 3-pdr. Q.F. guns were fitted, and seven torpedo tubes. The “Royal Sovereign” was laid down at Portsmouth in September 1889, floated in February 1891, and completed in May 1892. (The six upper-deck 6-in. guns were protected by 5-in. casemates added 1901 to 1904.)

The “Hood” was similar in displacement, armament, armour, horse-power, speed and general dimensions, but was of less freeboard, the heavy guns being fitted in turrets revolving on armoured redoubts of reduced heights.

The “Centurion” and “Barfleur,” laid down in 1890, were designed as sheathed second-class battleships for service in distant waters; they were 360 ft. in length, 70 ft. beam, 25 ft. 6 in. mean draught, 10,500 tons displacement, 13,000 I.H.P., and 18¼ knots speed. They were armed with four 10-in. B.L. guns in circular barbettes of 9-in. armour, ten 4·7-in. and twenty-two small Q.F. guns, and five torpedo-tubes, four of the 4·7-in. guns being on the main deck in casemates of 5-in. armour; the armour belt was 12 in. thick, the protective decks 2 in., and the side armour between belt and main decks 3 in. thick. They were re-armed and improved in 1902–1903.

The “Renown” (fig. 55, Plate XII.), laid down in 1893, was 380 ft. long, 72 ft. beam, 25 ft. 6 in. mean draught, 12,000 I.H.P., and 18 knots speed, armed with four 10-in., ten 6-in., fourteen 12-pdr. and eight 3-pdr. guns, and five torpedo tubes. She was the first vessel in the British navy to be protected by Harveyized armour; the belt armour had a maximum thickness of 8 in., the barbettes were of 10-in. armour, the casemates 6 in., and the decks 2 in. to 3 in. thick. An innovation was made in the form of the protective deck, the sides being bent down to the level of the lower edge on the side armour, while the midship portion was kept flat at the level of the upper edge of the side armour. This method of construction was followed in all succeeding British battleships.

The “Majestic,” laid down about the same time, was an unsheathed first-class battleship, 390 ft. long, 75 ft. beam, 27½ ft. mean draught, 14,900 tons displacement, 12,000 I.H.P., and 17 knots speed; her bunkers held 2000 tons of coal, of which 900 tons are included in the displacement named. Her armament consisted of four 12-in. wire-wound guns, which were more powerful than the heavier 13½-in. guns of the “Royal Sovereign,” twelve 6-in. Q.F., eighteen 12-pdr., twelve 3-pdr. and smaller guns, and five torpedo tubes, four of them submerged. Her protective deck was 2½ in. thick on the flat part amidships and 4 in. thick on the sloping sides; above the deck a broad belt of 9-in. Harveyized armour was fitted, rising to the main deck. The barbettes were protected by 14-in. armour, and all the 6-in. guns were protected by 6-in. casemates. The “Majestic” was laid down at Portsmouth on the 5th of February 1894, floated on the 31st of January 1895, and completed in December 1895.

Nine vessels of the same class were built, the last being the “Hannibal” (fig. 56, Plate XIV.), completed in April 1898. In two of the vessels, “Caesar” and “Illustrious,” the barbettes were made circular, central revolving hoists being fitted and the guns arranged to load at any angle of training, a system which was adopted in the heavy gun mountings of all the later British battleships.

The “Formidable” and “London” classes, laid down from 1898 to 1901, differ very slightly from each other, and for all practical purposes may be taken as identical, the main difference being in a rearrangement of the armour protection to the bow in the later ships. The former class consists of the three battleships “Formidable,” “Irresistible” and “Implacable,” and the latter of the five battleships “London,” “Bulwark” (fig. 57, Plate XV.), “Venerable,” “Queen” and “Prince of Wales.” These classes represent a development of the “Majestic” class, being 400 ft. long, 75 ft. beam, 26 ft. 9 in. draught, and 15,000 tons displacement, the belt being of the same general thickness and extent as in the “Majestic,” but of Krupp steel, protection being given to the bow by 2-in. side-plating. In the “Formidable” the protective deck proper was formed as in the “Majestic,” but thinner, being 2 in. to 3 in. thick, and a second protective deck, 1 in. thick, was formed at the main deck, giving a flat top to the citadel formed by the side belt and the bulkheads. In the “London” class the lower protective deck was thinner and the upper one thicker than in the “Formidable” class, the protection being extended forward by thinner material, tapering to 2 in. at the bow, and the forward transverse armour bulkhead being omitted. The 12-in. guns in both classes were longer and heavier than in the ships of the "Majestic" class, and were in barbettes 12 in. thick; in addition, there were twelve 6-in. Q.F. guns—all in casemates—sixteen 12-pdrs. and four torpedo tubes. These eight battleships were each provided with 20 Belleville boilers, developed 15,000 H.P., and had a speed of 18 knots. They carried 900 tons of coal at their normal displacement, and had bunker space for 2200 tons; they were afterwards fitted to burn oil as well as coal in their boilers, the double bottom compartments having been adapted for the stowage of oil in bulk.

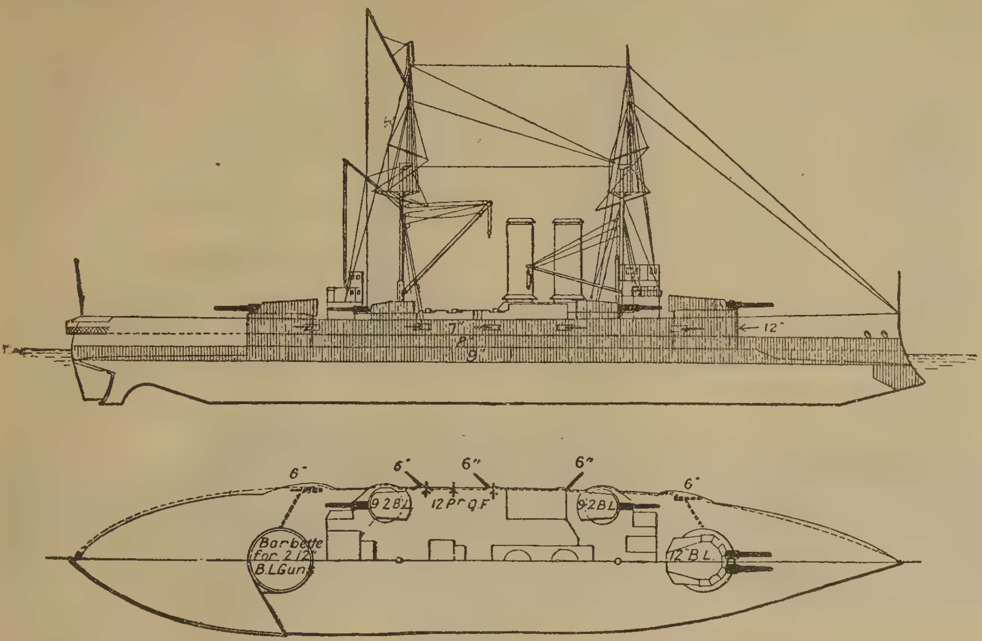

FIG. 59.—Arrangement of Guns and Armour, H.M.S. "King Edward VII."

The line of development, as traced above, may be taken to begin with the "Collingwood" and to run through the "Admiral" class, the "Nile" and "Trafalgar," the "Royal Sovereign" class, the "Majestic" class, and the "Formidable" class to the "London" class, the most powerful type of warship constructed for the British navy up to the end of the 19th century. Branching off from this line, at a time when battleships became much heavier (the "Royal Sovereign" class were of 2200 tons more displacement than the "Nile" and "Trafalgar"), a series of smaller, faster, and more lightly armed and armoured battleships than the series terminating with the "London" class was also built. These began with the "Barfleur" and "Centurion," which, though contemporary with the "Royal Sovereign" class, were of 1440 tons less displacement; they were followed by the "Renown," the "Canopus" and the "Duncan" class.

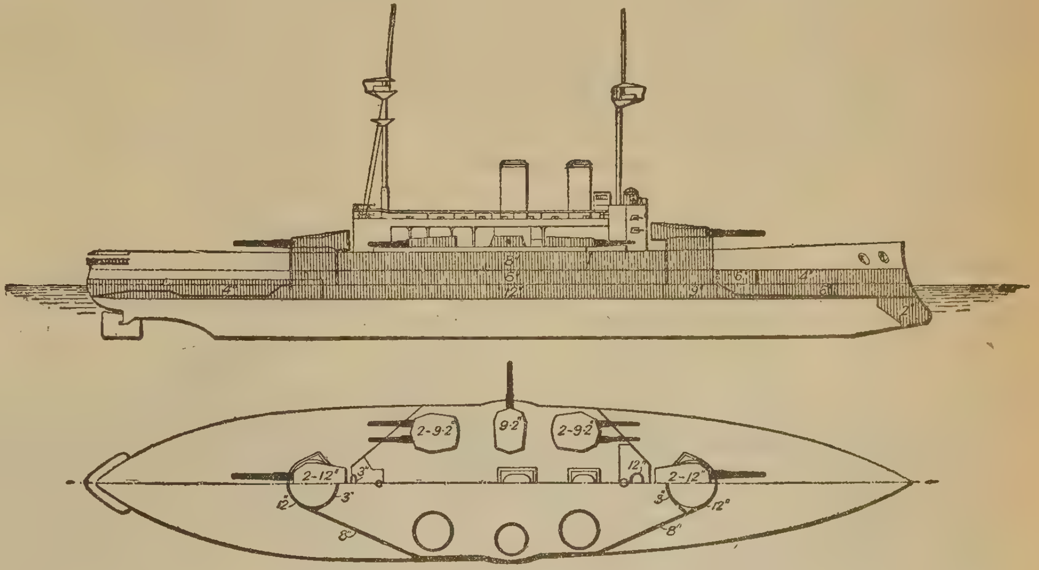

FIG. 61.—Arrangement of Guns and Armour, H.M.S. "Lord Nelson."

The six ships of the "Canopus" class may be regarded as a development of the "Renown." Begun in 1896, they were 12,950 tons in displacement, 390 ft. long, 74 ft. beam, and 26 ft. draught. They had a 6-in. Harveyized belt, 14 ft. broad and 195 ft. long; two protective decks (anticipating the "Formidable" in this respect); and two 12-in. barbettes, each carrying two wire-wound 12-in. guns, against the "Renown's" 10-in. They also carried twelve 6-in. guns in 5-in. casemates, ten 12-pdrs., a number of smaller and machine guns, and four submerged torpedo tubes. They were the first battleships of the British navy to be fitted with water-tube boilers; they had 20 Bellevilles, developed 13,500 H.P., and had a speed of 18¼ knots. They carried 1000 tons of coal at normal load, and had bunkers for 2300 tons. The ships of the "Duncan" class were longer and larger than those of the "Canopus" class. They were begun in July 1899, were of 14,000 tons displacement, 405 ft. long, 75 ft. 6 in. beam, 26 ft. 6 in. draught. They had a belt of Krupp steel, 7 in. thick amidships, tapering to 3 in. at bow, and two protective decks, as in the "Canopus"; they had two barbettes, 11 in. thick, for four 12-in. guns, and carried twelve 6-in. Q.F. guns in 6-in. casemates on the main and upper decks; also a number of smaller guns and four submerged torpedo tubes. They were provided with 24 Belleville boilers, would develop 18,000 H.P., and attain a speed of 19 knots. Their normal coal supply was 900 tons, and they had bunker capacity for 2000 tons. Six of these ships were built, one of them, the "Montagu," being lost on Lundy Island in 1906. Vessels of similar type had been built abroad, but there was a tendency to provide in them a more powerful secondary armament. In 1901 France built the "République" with eighteen 6·5-in. guns as her secondary armament; Italy laid down the "Regina Elena," carrying twelve 8-in. guns as her secondary armament; and Germany the "Braunschweig," carrying fourteen 6·7-in. and twelve 3·4-in. guns as her secondary armament. In 1902 the United States followed with the "Georgia," carrying a secondary armament of eight 8-in. and twelve 6-in. guns, while two English vessels, the "Libertad" and "Independencia," laid down for Chile, carried no less than fourteen 7·5-in. guns as their secondary armament.[1] In 1902 the "King Edward VII." (fig. 58, Plate XIV.), the last battleship for which Sir William White was responsible, was laid down, carrying four 12-in. guns, with a secondary armament of four 9·2-in. and ten 6-in. guns. She may be considered as an enlarged "Duncan," with the main-deck guns increased from eight to ten in number and enclosed in a battery having sides and ends protected by 7-in. armour, with the backs of the casemates replaced by splinter bulkheads 1 to 2 in. in thickness, and with the four 6-in. guns in casemates on the upper deck replaced by four 45-calibre 9·2-in. guns, protected by enclosed revolving armour shields. The general arrangements of the guns and armour are shown in fig. 59.[2]

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[1] These two vessels were afterwards purchased by the British government and became the "Swiftsure" and "Triumph" (fig. 69. Plate XVIII.).

[2] The gun and armour diagrams and many particulars of modern vessels are taken by permission from *Brassey's Naval Annual.*

The displacement of the “King Edward VII.” was 16,350 tons, the length 425 ft., beam 78 ft., draught 26¾ ft.; the H.P. 18,000, while the designed speed was 18½ knots. Eight vessels of this class were built, five being ordered in 1902 and three in 1903.

The principal changes to be noted in the development of the battleship type from 1885 to 1902 are:—(1) The successive improvements in armour by the introduction of the Harvey and Krupp processes, which enabled either a saving of weight to be effected for the same degree of protection, or a greater degree of protection to be provided for the same weight. (2) The belt armour was extended longitudinally and upward, shielding a greater portion of the hull and giving increased protection to the stability and to the secondary armament of the vessel. (3) Improvements in guns and explosives, by which more effective gun-fire was obtained with guns of smaller calibre and less weight than those previously in use. (4) The growth in importance of the secondary armament. (5) Improvements in machinery—the adoption of higher steam pressures, lighter and faster-running engines, and of water-tube boilers—which effected great savings in weight for a given power, and enabled increased speed to be obtained in successive ships.

Sir Philip Watts.

Sir William White held office for nearly seventeen years, and during that period a very large number of vessels of various classes were added to the British navy. He retired in February 1902, and was succeeded by Mr Philip Watts, F.R.S. (b. 1850), who was knighted in 1905.

In 1903 the design of the vessel which afterwards became the “Lord Nelson” was approved, her armament then including four 12-in. and twelve 9·2-in. guns, all of 50 calibre and all mounted in pairs in gun-houses above the upper deck. It was, however, decided to build the three additional “King Edwards” above referred to, in order to complete the squadron of eight vessels of the same type. In the “Lord Nelson,” as afterwards laid down in 1905, the condition that the vessels of this class should be capable of being docked in existing docks at Chatham and Devonport led to the reduction of the secondary armament to ten 9·2-in. guns, instead of twelve 9·2-in. guns. Only two vessels of the class were built, the “Lord Nelson” by Palmers Co. and the “Agamemnon” (fig. 60, Plate XIV.) by Beardmore & Co. They are 410 ft. long, 79½ ft. beam, 27 ft. draught, 16,500 tons displacement, 17,500 I.H.P. and 18½ knots speed. The general arrangements of the guns and armour are shown in fig. 61; the 12-in. guns are carried in pairs at each end of the ship in gun-houses upon barbettes protected by 12-in. armour, and the ten 9·2-in. guns are carried in gun-houses on the broadside, the midship gun-houses having single and the others pairs of guns instead of each having a pair of guns as originally contemplated. The gun-houses carry 8-in. and 7-in. armour, and the bases of the gun mountings are protected by a citadel of 8-in. armour rising to the upper deck and unperforated for doors or ports. There are also twenty-four 12-pdr. anti-torpedo-boat guns carried upon superstructures and a hurricane deck. The water-line is protected by 12-in. armour amidships, tapering to 6 in. forward and 4 in. aft, associated with protective decks. (See SHIPBUILDING.)

“Dreadnought” type.

Admiral Sir John Fisher (Baron Fisher of Kilverstone) became First Sea Lord of the Admiralty on the 20th of October 1904, and very shortly after he took office Lord Selborne, First Lord of the Admiralty, announced that the Board had appointed “a Special Committee on Designs to assist them and the Director of Naval Construction in the consideration of certain questions to be submitted to it by the Board in connexion with the features of the future designs of different types of fighting ships.” The Committee began to sit in December 1904. Their recommendations were approved in 1905 by the Board and embodied in the designs of the “Dreadnought” type of battleships, and the “Invincible” type of cruiser, as well as in new types of torpedo-boat destroyers.

The principal features of the “Dreadnought” design were as follows (Parl. Paper Cd. 3048 of 1906):—

Armament.—“Ten 12-in. guns and twenty-four 12-pdr. Q.F. anti-torpedo-boat guns and five submerged torpedo tubes.

“In arranging for a uniform armament of 12-in. guns it became at once apparent that a limitation to the number of guns that could be usefully carried was imposed by considerations of the blast effect of the guns on the crews of those guns adjacent to them. It is obviously uneconomical to place the guns in such relative positions that the blast of any single gun on any permissible training should very seriously hamper the use of one or more of the remaining guns.

“While it is recognized that broadside fire is held to be the most important in a battleship, all-round fire is also considered of great importance, since it lies in the power of an enemy to force an opponent, who is anxious to engage, to fight an end-on action.

“In the arrangement of armament adopted, six of the guns are mounted in pairs on the centre line of the ship; the remaining four guns are mounted in pairs on the broadside. Thus eight 12-in. guns (80% of the main armament) can be fired on either broadside, and four, or possibly six, 12-in. guns (or 60% of the main armament) can be fired simultaneously ahead or astern.

“In view of the potentialities of modern torpedo craft, and considering especially the chances of torpedo attack towards the end of an action, it is considered necessary to separate the anti-torpedo-boat guns as widely as possible from one another, so that the whole of them shall not be disabled by one or two heavy shells. This consideration led the Committee to recommend a numerous and widely distributed armament of 12-pdr. Q.F. guns of a new design and greater power than those hitherto carried for use against torpedo craft.”

Freeboard.—“In order to give the ship good sea-going qualities and to increase the command of the forward guns, a forecastle is provided giving the ship a freeboard forward of 28 ft.—a higher freeboard than has been given to any modern battleship.”

Armour.—“The main armour belt has a maximum thickness of 11 in., tapering to 6 in. at the forward and 4 in. at the after extremity of the vessel; the redoubt armour varies in thickness from 11 in. to 8 in.; the turrets and fore conning tower are 11 in. thick, and the after conning tower is 8 in. thick; the protective deck varies from 1¾ in. to 2¾ in. in thickness.

“Special attention has been given to safeguarding the ship from destruction by under-water explosion. All the main transverse bulkheads below the main deck (which will be 9 ft. above the water-line) are unpierced except for the purpose of leading pipes or wires conveying power. Lifts and other special arrangements are provided to give access to the various compartments.”

Speed.—“Mobility of forces is a prime necessity in war. The greater the mobility the greater the chance of obtaining a strategic advantage. This mobility is represented by speed and fuel endurance. Superior speed also gives the power of choosing the range. To gain this advantage the speed designed for the ‘Dreadnought’ is 21 knots.”

Type of Machinery.—“The question of the best type of propelling machinery to be fitted was also most thoroughly considered. While recognizing that the steam-turbine system of propulsion has at present some disadvantages, yet it was determined to adopt it because of the saving in weight and reduction in number of working parts, and reduced liability to breakdown; its smooth working, ease of manipulation, saving in coal consumption at high powers and hence boiler-room space, and saving in engine-room complement; and also because of the increased protection which is provided for with this system, due to the engines being lower in the ship; advantages which more than counterbalance the disadvantages. There was no difficulty in arriving at a decision to adopt turbine propulsion from the point of view of sea-going speed only. The point that chiefly occupied the Committee was the question of providing sufficient stopping and turning power for purposes of quick and easy manœuvring. Trials were carried out between the sister vessels ‘Eden’ and ‘Waveney’ and the ‘Amethyst’ and ‘Sapphire,’ one of each class fitted with reciprocating and the other with turbine engines; experiments were also carried out at the Admiralty Experimental Works at Haslar, and it was considered that all requirements promise to be fully met by the adoption of suitable turbine machinery, and that the manœuvring capabilities of the ship, when in company with a fleet or when working in narrow waters, will be quite satisfactory.

“The necessary stopping and astern power will be obtained by astern turbines on each of the four shafts. These astern turbines will be arranged in series, one high and one low pressure astern turbine on each side of the ship, and in this way the steam will be more economically used when going astern, and a proportionally greater astern power obtained than in the ‘Eden’ and ‘Amethyst.’”

Radius of Action.—“The ship has a total coal-bunker capacity of 2700 tons, and with this amount of coal she will be able to steam about 5800 sea miles at economical speed, and about 3500 sea miles at 18½ knots after allowance has been made for bad weather and for a small amount of coal being left in the bunkers. Stowage for oil fuel has been arranged for, but oil fuel has not been taken into account in estimating the radius of action, which, of course, will be greatly increased thereby.”

Accommodation.—“Considerable attention has been devoted to the arrangements for the accommodation of the officers and men. In view of the increasing length and greater power of modern ships the usual position of the admiral’s and captain’s quarters right aft is becoming more and more open to objection. Up to the present the principal officers have been berthed at the farthest possible distance from the fore bridge and conning tower, where their most important duties are performed. It has been decided that in this ship the admiral’s and captain’s quarters shall be placed on the main deck forward, near the conning tower; also that the officers’ quarters shall be placed forward, both on the main deck and on the upper deck, in the fore part of the ship. Ample accommodation

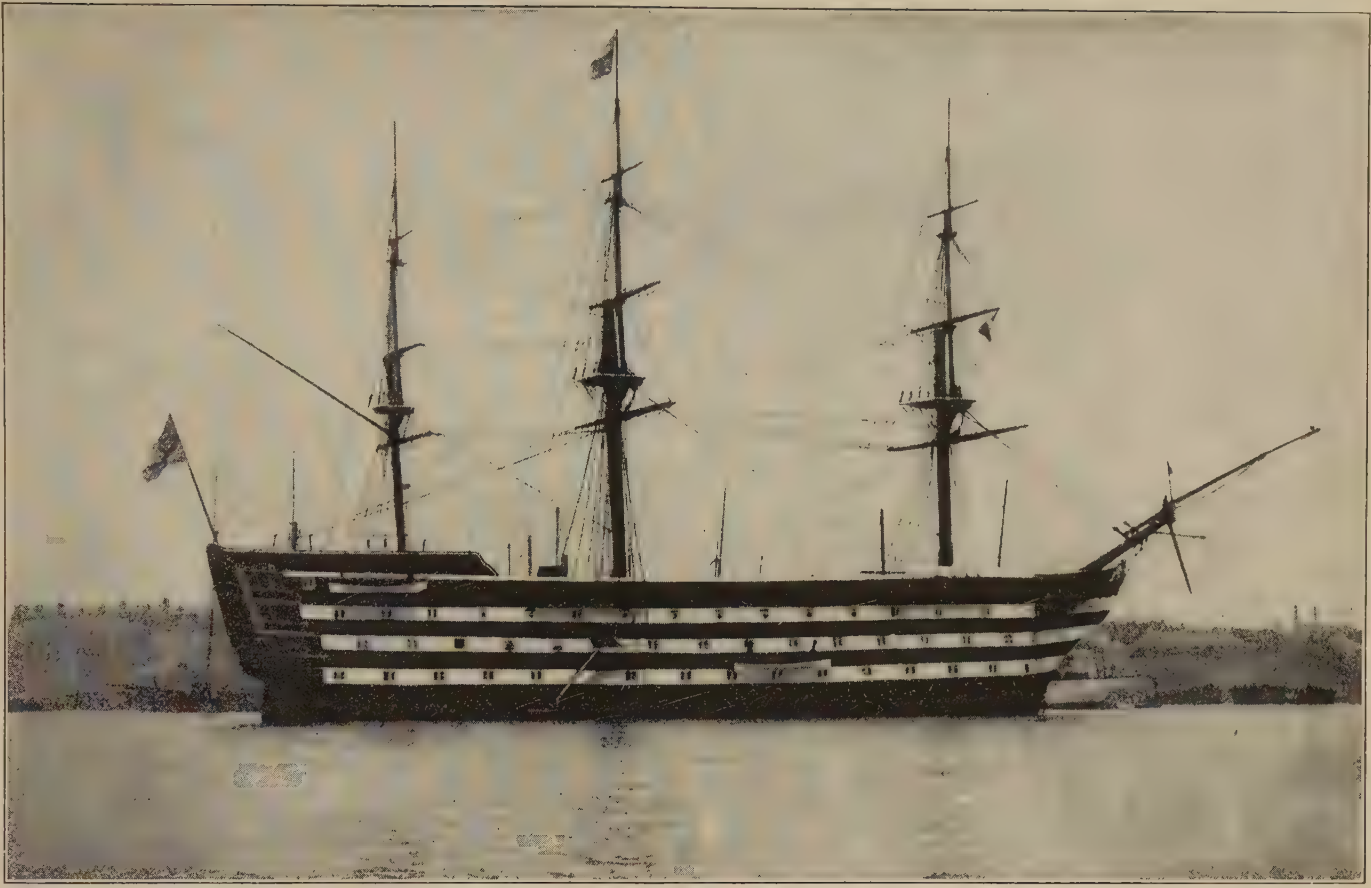

FIG. 1.—H.M.S. *Victory*.

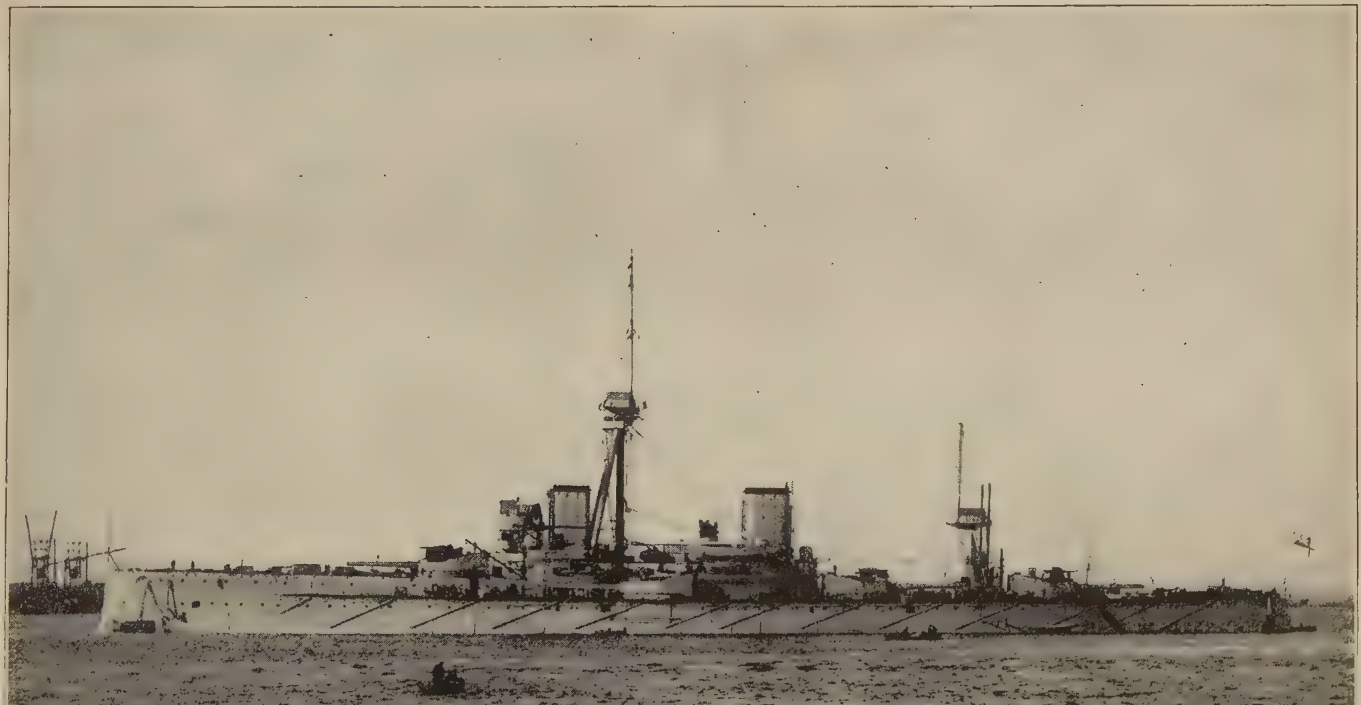

FIG. 64.—H.M.S. *Dreadnought*.

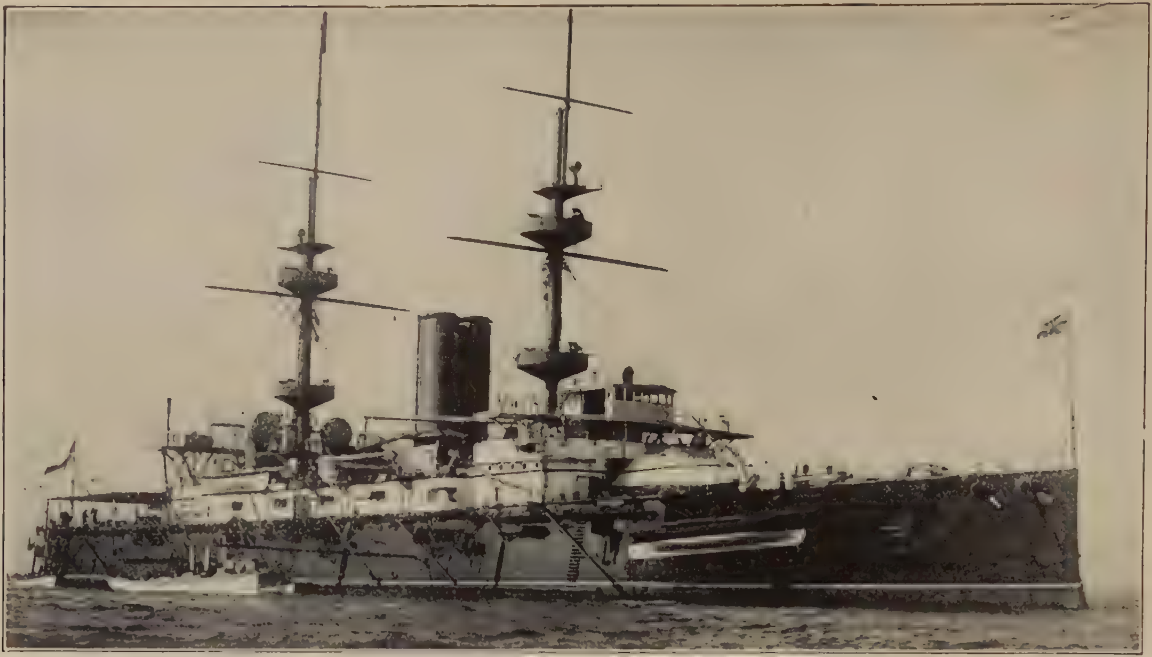

FIG. 56.—H.M.S. *Hannibal* (Majestic Class).

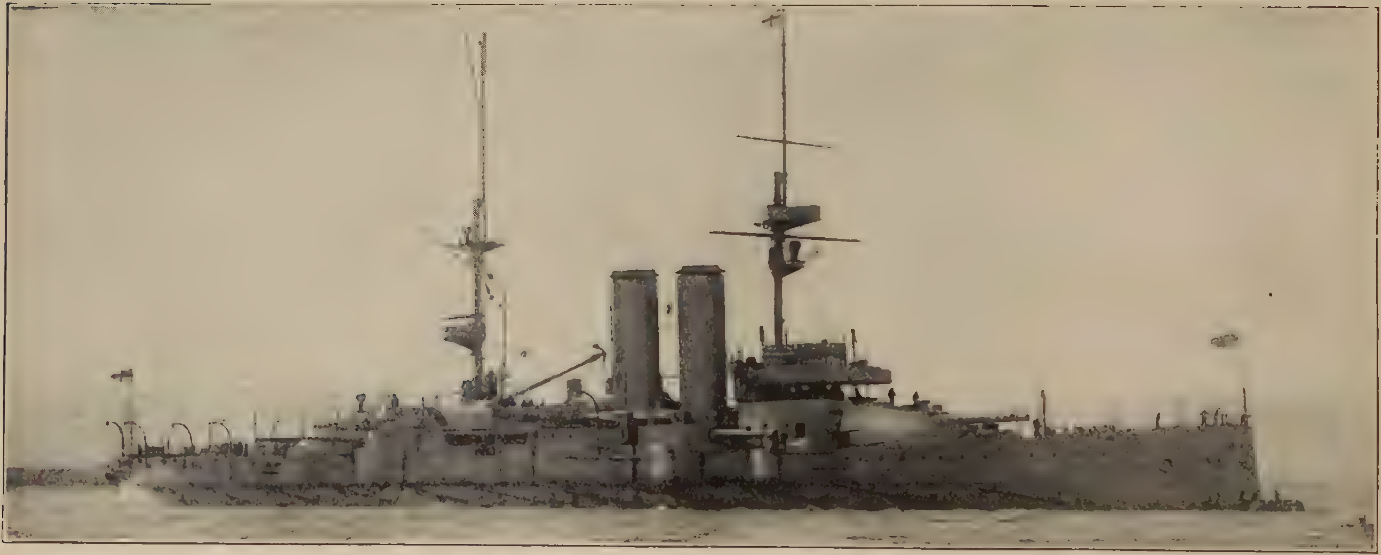

FIG. 58.—H.M.S. *King Edward VII.*

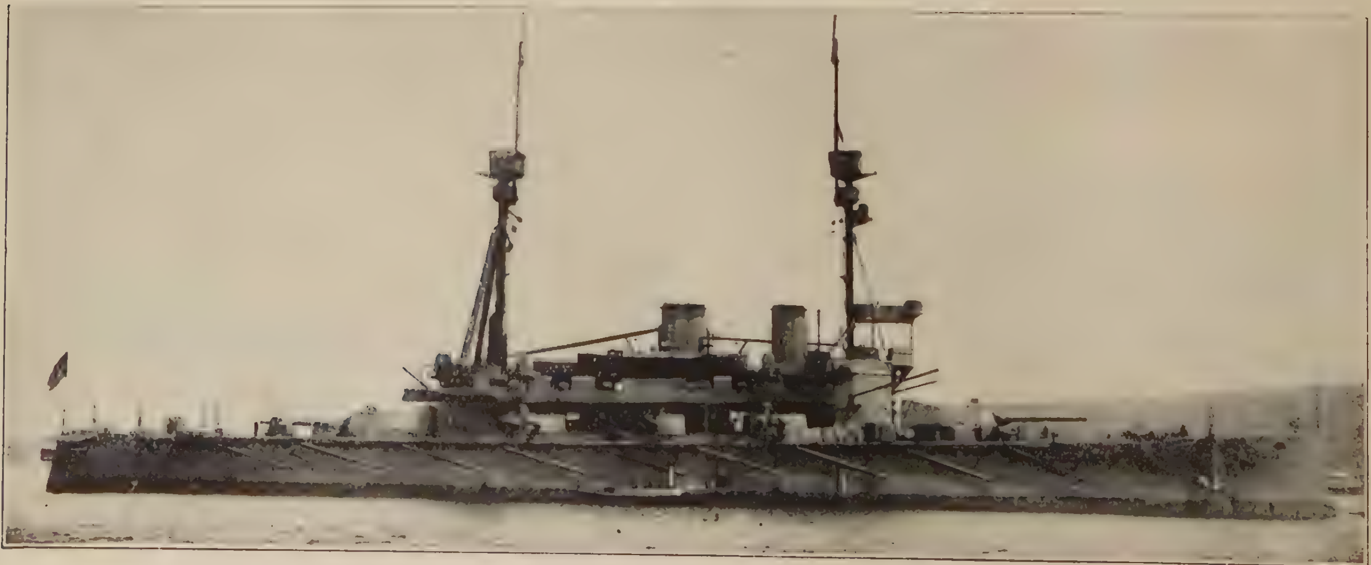

FIG. 60.—H.M.S. *Agamemnon* (Lord Nelson Class).

for the remainder of the crew is available on the main and lower decks aft."

The tabulated particulars given in Parl. Paper Cd. 3048 for the designs approved are shown in Table XIV.

It is interesting to note that the distribution of armament finally adopted in the "Dreadnought" was nearly that of a design considered by Sir Nathaniel Barnaby at the Admiralty in 1874, which was a combination of the "Devastation" and "Inflexible" designs. The armament was an all-one-calibre big gun armament of 16-in. 80-ton guns carried in pairs in turrets above the upper deck, one pair being placed at each extremity on the middle line, and two pairs on the broadside *en échelon*, having training on each broadside as well as ahead and astern, thus giving a fire of six guns ahead, six astern and eight on each broadside. The scheme was considered inadmissible on account of the great displacement involved, 16,000 tons. The arrangement of eight heavy guns then contemplated was actually adopted in the "Invincible" design, but it was not considered that four pairs of 12-in. guns was a sufficiently heavy armament for the battleships of the "Dreadnought" class; a proposal to place a fifth pair of guns on the middle line between the broadside guns and the aftermost pair of guns was finally adopted, the turrets on the broadside being placed abreast of each other instead of *en échelon* on account of the great increase of length and displacement involved.

The main features in which the "Dreadnought" differed from the "Lord Nelson" are:—(1) The all-one-calibre big gun armament in place of the mixed armament of 12-in. and 9·2-in. guns. (2) The increase of 3 knots in speed. (3) The height of freeboard provided forward to enable the vessel to fight her bow guns at high speed in a sea way. (4) Great increase in manœuvring power due to fitting twin rudders behind propellers.

The weight of the armament of the "Dreadnought" is the same as that of the "Lord Nelson"; it is 30% greater than that of the "King Edward VII.," the 1400 tons increase of displacement (about 8% of the displacement of the "Lord Nelson" and "King Edward VII.") being used in obtaining the increase of 3 knots of speed.

The general arrangements of guns and armour of the "Dreadnought" are shown in fig. 63, and on Plate XIII., fig. 64, a photograph of the vessel is given. She was built and tested as rapidly as possible, her keel was laid on the 2nd of October 1905, she was launched on the 10th of February 1906, King Edward VII. himself performing the christening ceremony and starting the vessel down the ways; and she went to sea, for steam, gunnery and torpedo trials, on the 1st of October 1906, one year after the laying of the keel. The whole of the trials were completed without hitch of any kind, the machinery realized the expectations as to power and smoothness of running, and a speed of 21·6 knots was obtained on the measured mile, with an expenditure of power well within the capacity of the boilers. She left England for a long experimental cruise on the 5th of December 1906.

Immediately after the trials of the "Dreadnought," three other vessels, the "Bellerophon," "Temeraire" and "Superb" of 18,600 tons were begun, the additional 700 tons in displacement being absorbed in additional armour protection and an improved anti-torpedo-boat armament consisting of sixteen 4-in. guns. In 1907 and 1908 the "St Vincent," "Collingwood" and "Vanguard" of 19,250 tons displacement were begun, in which further additions to the armour protection were made. These were followed by the "Neptune," "Hercules" and "Colossus," of about 20,000 tons displacement, laid down in 1909, the additional 800 tons lengthening the ships and enabling the 12-in. guns on the broadside to be placed *en échelon* and the second pair of guns from aft to be lifted high enough to fire over the aftermost pairs of guns; the whole of the main armament being thus able to fire on either broadside and eight guns to fire astern. Each of these vessels was completed in two years from the date of laying the keel. See Table XV.

On the 29th of November 1909 the "Orion," the leading vessel of what in 1910 was the most recent group of

TABLE XIV.

NAME OF SHIP	DREADNOUGHT.	INVINCIBLE.	INFLEXIBLE.	INDOMITABLE.
Class and type	Battleship	Armoured Cruiser	Armoured Cruiser	Armoured Cruiser
By whom designed	Sir Philip Watts, K.C.B.	Sir Philip Watts, K.C.B.	Sir Philip Watts, K.C.B.	Sir Philip Watts, K.C.B.
When and where laid down	2nd Oct. 1905, Portsmouth	2nd April 1906, Sir W. G. Armstrong, Whitworth & Co., Newcastle-on-Tyne	5th Feb. 1906, Messrs John Brown & Co., Glasgow	1st March 1906, Fairfield Shipbuilding and Engineering Co., Glasgow
Date of completion	1906–1907	1908–1909	1908–1909	1908–1909
Length	490 ft.	530 ft.	530 ft.	530 ft.
Breadth	82 „	78 ft. 6 in.	78 ft. 6 in.	78 ft. 6 in.
Mean load draught	26 ft. 6 in.	26 ft.	26 ft.	26 ft.
Weight of hull including armour and backing	11,100 tons	9,660 tons	9,660 tons	9,660 tons
Displacement at load draught	17,900 „	17,250 tons	17,250 „	17,250 „
Makers of machinery	Messrs Vickers, Sons & Maxim, Barrow-in-Furness	Messrs Humphreys, Tennant & Co., Deptford	Messrs John Brown & Co., Glasgow	Fairfield Shipbuilding and Engineering Co., Glasgow
Estimated horse-power (natural draught)	23,000	..	..	..
Corresponding estimated speed at load draught, smooth water, clean bottom (natural draught)	21 knots	..	..	..
Coal capacity at load draught	900 tons	1000 tons	1000 tons	1000 tons
Armament, not including machine guns or torpedoes	Ten 12″ B.L. and twenty-seven small Q.F. guns	..	..	..
Estimated first cost	£1,558,683	..	..	..
Estimated proportion of incidental charges	125,614	..	..	..
Total estimated cost, excluding guns and ordnance stores	1,684,297	..	..	..
Estimated cost of guns	113,200	..	..	..
Total estimated cost, including guns	1,797,497	£1,736,645	£1,726,990	£1,730,733

"Dreadnoughts," was laid down at Portsmouth,[1] and the following vessels of the group (the "Thunderer," "Monarch" and "Conqueror") were ordered to be built in the private yards of the Thames Iron Works, Sir W. G. Armstrong & Co. on the Tyne, and Beardmore & Co. on the Clyde a few weeks later. In these vessels there is a considerable increase in displacement, amounting to 2500 tons or 12½% beyond that reached in the preceding group, their displacement being 22,500 tons on a length of 545 ft. between perpendiculars. The additional displacement has allowed the whole of the turrets to be placed on the middle line, the side armour to be raised to the upper deck, and heavier guns to be carried.

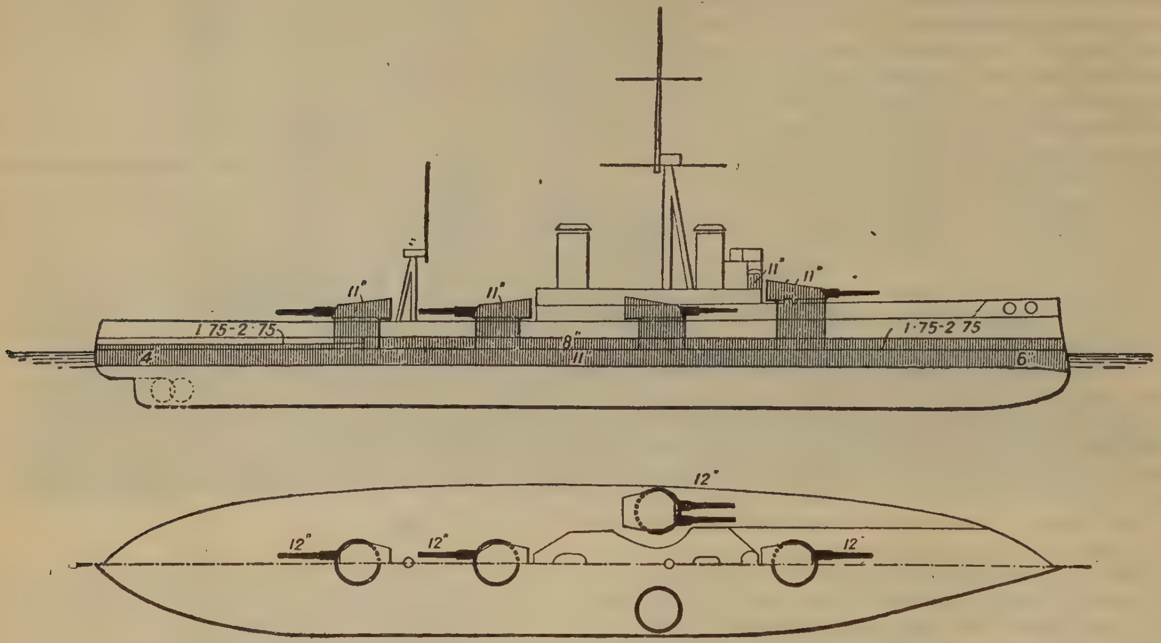

Fig. 63.—Arrangement of Guns and Armour. H.M.S. "Dreadnought."

Great Britain thus had in 1910 fourteen "Dreadnoughts" built and building, not including the "Dreadnought" cruisers described later on under cruisers.

In the first seven vessels—"Dreadnought," "Bellerophon," "Temeraire," "Superb," "St Vincent," "Collingwood" and "Vanguard"—six 12-in. guns could fire directly ahead and six directly astern, and eight could fire on the broadsides. In the next three—"Neptune," "Colossus" and "Hercules"—six 12-in. guns could fire ahead, eight could fire astern, and the whole ten could fire on either broadside. In the last four—"Orion," "Thunderer," "Monarch" and "Conqueror"—four guns could fire ahead, four astern and the whole ten on either broadside. Their displacement had been reached by five steps from that of the "King Edward VII." and "Lord Nelson,"—the first of 1400 tons, 8½%; the next three each of about 700 tons, say 4%; and the last of 2500 tons, or 12½%. The first of these increases, though not without precedent in the British navy,[2] elicited some hostile criticism. Its justification lay in the fact that all the world followed the lead. The 22,500 tons of the "Orion" was not acceptable in 1904, but her design was practically that advocated by Lord Fisher when he took office as First Sea Lord in October 1904 after certain modifications had been made as the result of investigations at the Admiralty.

Table XV.—*Particulars of British Battleships of Dreadnought Type.*

Vessel.	Date of Launch.	Hull.					Speed.	Horse Power.	Machinery.			Armament.	Heavy Guns where Mounted.	Thickest Armour.	Cost (excluding guns).
		Material.	Length.	Breadth.	Mean Draught.	Load Displacement.			No. of Screws.	Engines.	Boilers.				
			Feet.	Feet.	Feet.	Tons.	Knots.								£
Dreadnought .	1906	Steel.	490.0	82.0	26½	17,900	21.6	23,000	4	Parsons Turbines.	Babcock & Wilcox	10—12″ 24—12pr.	Barbettes.	11″	1,699,900
Bellerophon .	1907	"	490.0	82.0	27.0	18,600	21.8	23,000	4	" "	" "	10—12″ 16—4″	"	11″	1,649,042
Temeraire .	1907	"	490.0	82.0	27.0	18,600	22.07	23,000	4	" "	Yarrow large tube	10—12″ 16—4″	"	11″	1,627,655
Superb . .	1907	"	490.0	82.0	27.0	18,600	21.6	23,000	4	" "	Babcock & Wilcox	10—12″ 16—4″	"	11″	1,544,146
St. Vincent .	1908	"	500.0	84.0	27.0	19,250	21.7	24,500	4	" "	" "	10—12″ 20—4″	"	10″	1,612,810
Collingwood .	1908	"	500.0	84.0	27.0	19,250	21.5	24,500	4	" "	Yarrow large tube	10—12″ 20—4″	"	10″	1,589,240
Vanguard .	1909	"	500.0	84.0	27.0	19,250	22.1	24,500	4	" "	Babcock & Wilcox	10—12″ 20—4″	"	10″	1,465,381
Neptune . .	1909	"	510.0	85.0	27.0	20,000	21.0[1]	25,000	4	" "	Yarrow large tube	10—12″ 16—4″	"	10″	1,589,240
Colossus . .	1910	"	510.0	85.0	27.0	20,000	21.0[1]	25,000	4	" "	Babcock & Wilcox	10—12″ 16—4″	"	10″	..
Hercules . .	1910	"	510.0	85.0	27.0	20,000	21.0[1]	25,000	4	" "	Yarrow large tube	10—12″ 16—4″	"	10″	..

[1] Estimated.

The general growth of the fleets of British and foreign powers is dealt with in the article Navy. Some details may be given here of foreign battleships.

United States.—In 1889 the "Texas," designed by the late Mr William John, was laid down. On a displacement of 6315 tons she carried an armament of two 12-in. and six 6-in. guns at a speed of 17 knots—the 12-in. guns being mounted in two turrets placed diagonally in a central citadel and protected by 12-in. armour. She was followed by the "Maine," which was sunk in Havana Harbour. In 1891 the "Indiana," "Massachusetts" and "Oregon" were laid down, of 10,288 tons displacement and 16 knots speed, protected by 18-in. belt armour and armed with four 13-in. and eight 8-in.

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[1] She was launched on the 20th of August 1910.

[2] From the "Trafalgar" to the "Royal Sovereign," and from the "Duncan" to the "King Edward VII.," increases in each case of 17% were accepted.

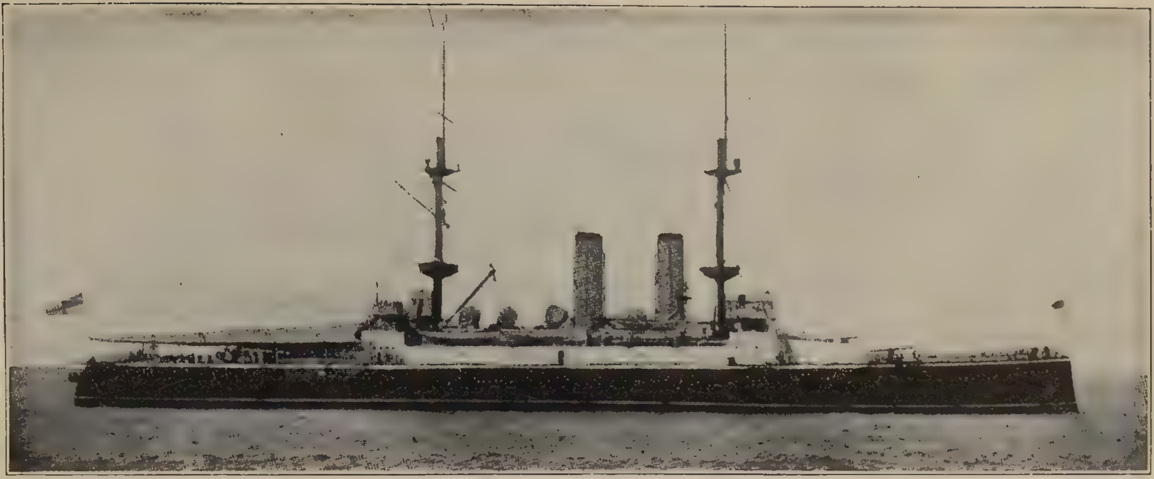


FIG. 57.—H.M.S. *Bulwark*.

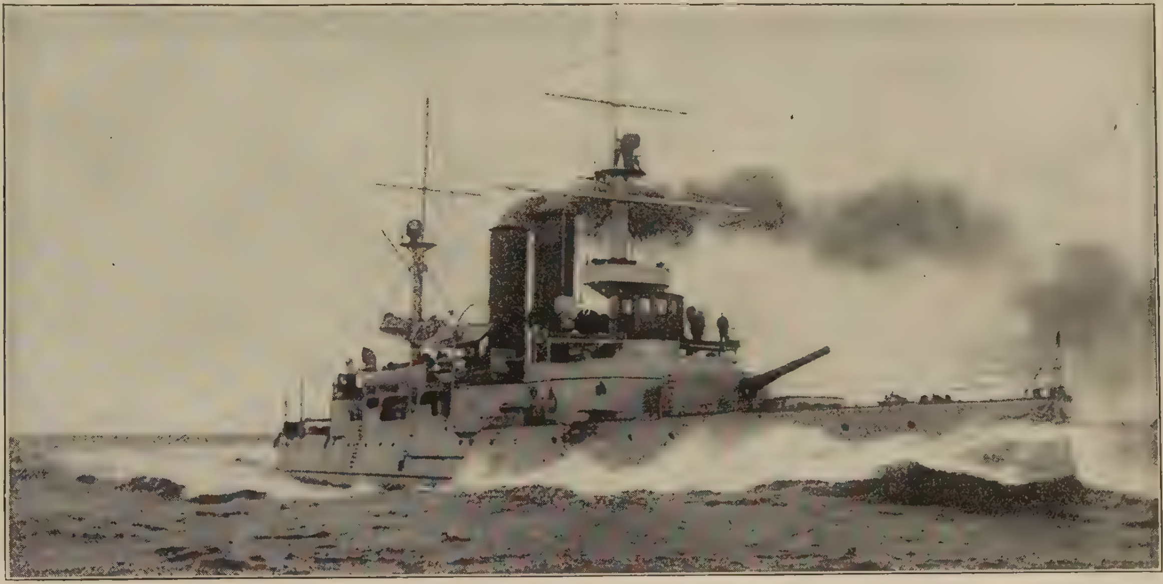


FIG. 81.—Norwegian *Norge*.

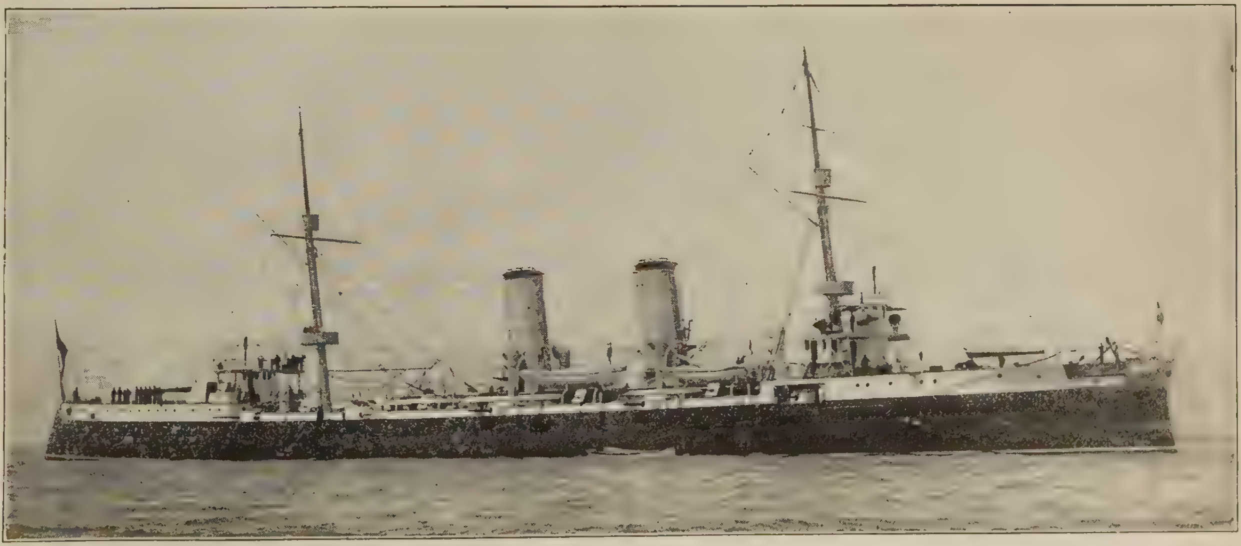


FIG. 98.—Chilean *Chacabuco*.

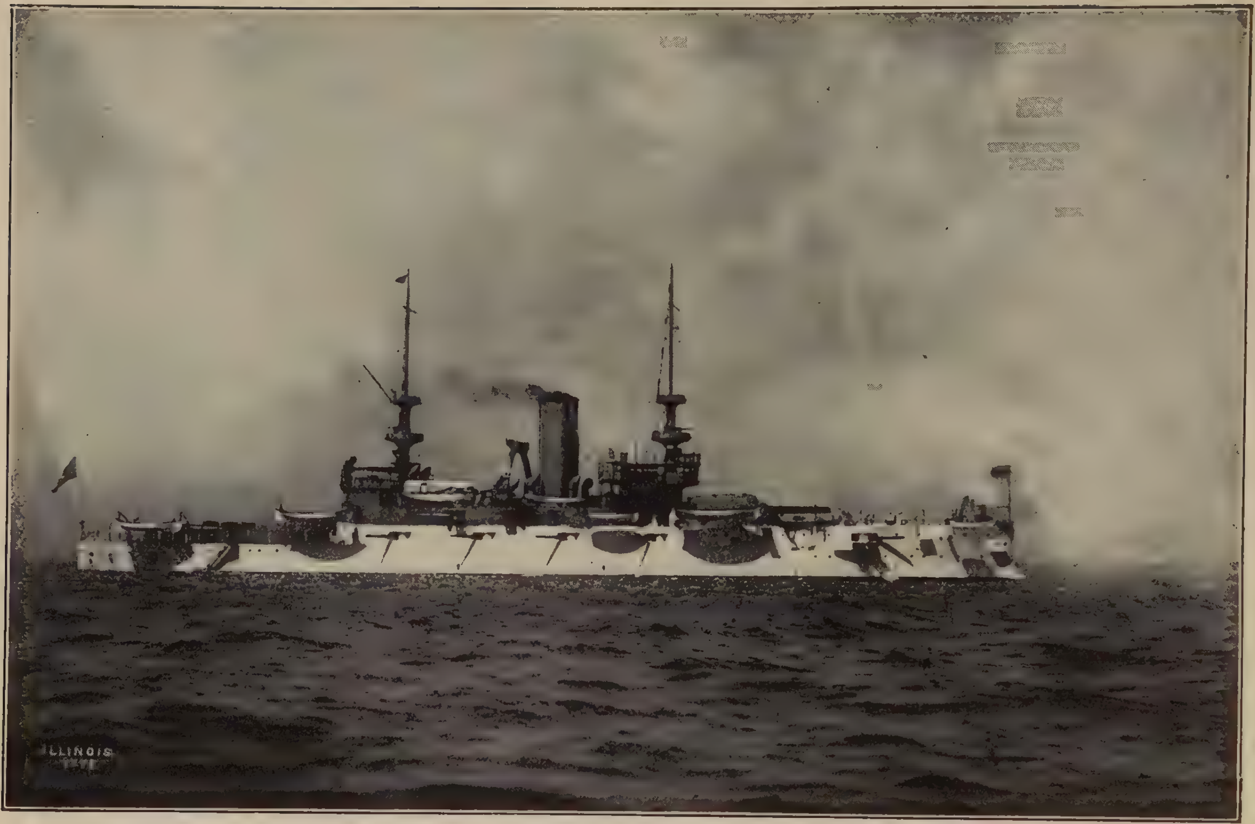


FIG. 66.—U.S.A. *Illinois.*

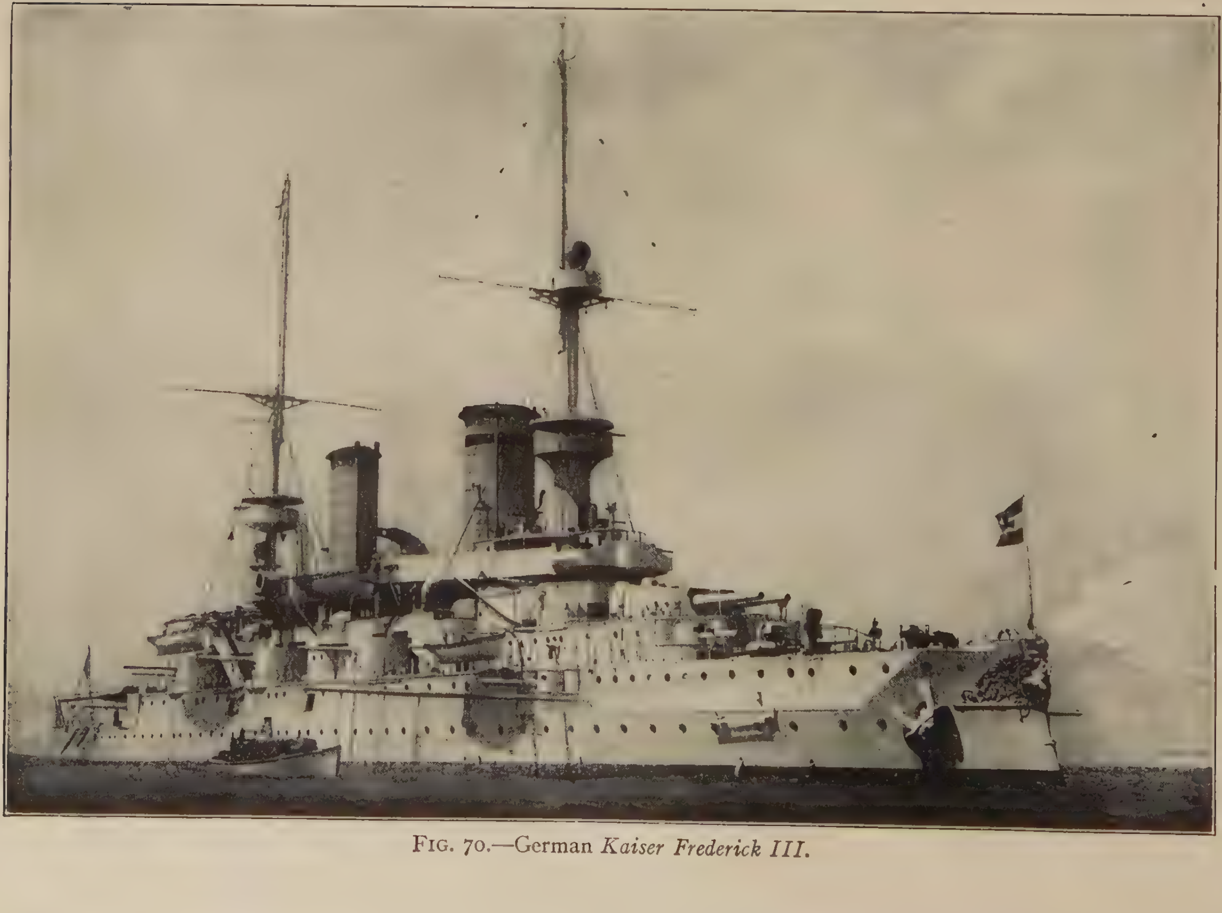


FIG. 70.—German *Kaiser Frederick III.*

guns, the 13-in. guns being mounted in pairs in turrets on the upper deck, and the four 8-in. guns singly in turrets at the corners of the superstructure deck. They were followed by the "Iowa" of 11,346 tons, laid down in 1893; and in 1896 by the "Kearsarge" and "Kentucky," whose principal dimensions were:—length 368 ft., beam 72 ft., mean draught 23 ft. 6 in., displacement 11,525 tons, I.H.P. 10,500 and speed 16 knots as designed, 12,000 I.H.P. and $16\frac{3}{4}$ knots being reached on trial. They carried four 13-in. guns in turrets 15 in. thick, four 8-in. guns in turrets 9 in. thick, fourteen 5-in. Q.F. guns, twenty-seven smaller guns, and four torpedo tubes; and at the above displacement they carried 410 tons of coal, but could stow 1590 tons. They had a novelty in the shape of two double-storeyed turrets, one forward and one aft. In this arrangement a second turret is superposed or built on the first, the structure so formed turning as a whole; a pair of 8-in. guns is mounted in the upper turret, and a pair of 13-in. guns in the lower. A later example of American design is furnished by the five first-class battleships of the "Georgia" class (fig. 65), laid down in 1902, which have a displacement of 15,320 tons, length 435 ft., beam 76 ft. 10 in., and a mean draught of 24 ft.; they have a complete water-line belt of Krupp armour, from 11 in. to 8 in. thick, tapering to 4 in. at the bow; above this belt there is a belt of lighter armour, 6 in. thick and 245 ft. long, forming a battery for the 6-in. Q.F. guns, which extends to the upper deck; there are also four turrets—two large double-storeyed turrets, as in the "Kentucky," placed one forward and one aft, and two smaller turrets, one placed on each side forward. The larger turrets carry each a pair of 12-in. guns and a pair of 8-in. guns, and are protected by a maximum thickness of 11-in. armour, and the smaller carry each a pair of 8-in. guns and are protected by $6\frac{1}{2}$-in. armour. In addition to the four 12-in. and eight 8-in. guns thus disposed, there are also twelve 6-in. guns on the main deck and some forty-two smaller guns.

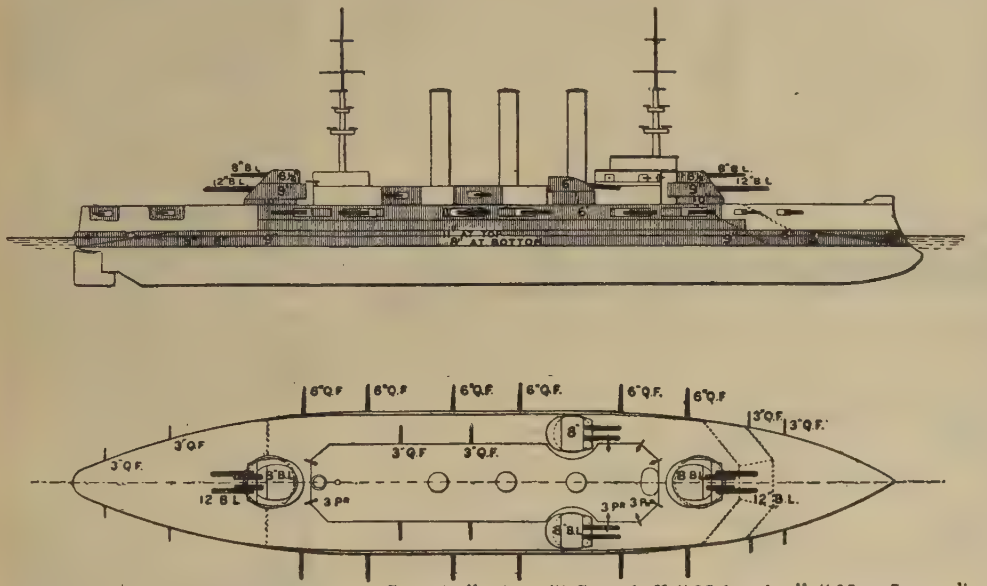


FIG. 65.—Gun and Armour Plan "Georgia" class ("Georgia," "Nebraska," "New Jersey," "Rhode Island" and "Virginia").

Machinery of 19,000 I.H.P. was provided for a speed of 19 knots, and both were exceeded on the trials of the vessels. They carry 900 tons coal on the trial draught, and when fully loaded with 1900 tons of coal have a draught of 26 ft. This comparatively shallow draught is a distinctive feature of all the early United States battleships, but in later years a notable increase of draught was accepted. Between the "Kearsarge" and the "Georgia" were built in 1896–1898 the "Alabama," "Illinois" (fig. 66, Plate XVI.), and "Wisconsin," somewhat similar to the "Kearsarge," carrying four 13-in. guns and fourteen 6-in. guns, and in 1899–1901 the second "Maine," the "Missouri" and "Ohio," which more nearly resembled the "Georgia," as they carried 12-in. guns for their main armament.

The "Georgia" class was followed by two much larger vessels the "Connecticut" and "Louisiana," laid down in 1903; they were 450 ft. long, 76 ft. 10 in. beam, 17,600 tons displacement and 24 ft. 6 in. draught when loaded with 900 tons coal, and 26 ft. 9 in. draught when loaded with full complement of ammunition and stores and 2200 tons coal; and they marked a great advance in fighting power. While retaining four 12-in. guns for the main armament, they carried eight 8-in. and twelve 7-in. guns as a secondary armament, and they were well protected, guns and armour being arranged as shown in fig. 67. Engines of 16,500 I.H.P. were provided for a speed of 18 knots, and both were considerably exceeded on trial. In these and later American vessels tall towers of open lattice-work, somewhat resembling the Eiffel Tower, were fitted instead of hollow steel masts for supporting signal and fire-control arrangements. While the vessels of the "Connecticut" class were building in 1904, two other very similar but smaller vessels, the "Idaho" and "Mississippi," were also laid down, of 13,000 tons with reduced armament and armour and less speed.

The first two American "Dreadnoughts," the "Michigan" and "South Carolina," were laid down in 1906; they are 450 ft. long, 80 ft. 3 in. beam, displacement 16,000 tons and draught 24 ft. 6 in. when carrying 900 tons of coal, increasing to 17,620 tons and 27 ft. draught when fully loaded. Engines of 16,500 I.H.P. are provided for 18·5 knots, and the armament consists of eight 12-in. guns mounted in four pairs, two pairs forward and two pairs aft, all on the middle line and arranged so that the guns of the second pair sweep over the turrets of the adjacent pair nearer the extremities of the vessel; an anti-torpedo boat armament of twenty-two 14-pdr. guns is provided, but no secondary armament. The sides and barbettes are protected by 8 in. to 12 in. of armour, the belt armour tapering to 4 in. at the bow and stern. In 1907 the "Delaware" and "North Dakota" were laid down; the size of the vessels was increased to 20,000 tons in order to carry 12-in. and 14-in. guns behind armour from 12 in. to 8 in. in thickness and obtain a speed of 21 knots, and they are 510 ft. long, 85 ft. beam, 26 ft. 10 in. mean draught. Ten 5-in. guns are carried on the main deck behind 5-in. armour, two are carried on the main deck forward and two aft, in casemates. Curtis turbines are fitted in the "North Dakota" and reciprocating engines of the latest type in the "Delaware"; the boilers provided on each ship are for 25,000 I.H.P.; on trial the "Delaware" developed 28,578 I.H.P. and recorded a speed of 21·56 knots, while the "North Dakota" reached 31,826 H.P. and 22·25 knots.

Parsons turbines were adopted for the four battleships next laid down. The first two, the "Florida" and "Utah," commenced in 1909, are very similar to the "Delaware," but of 21,825 tons displacement and 28 ft. 6 in. mean draught. The second pair, the "Arkansas" and "Wyoming," begun in 1910, are of much greater displacement, viz., 26,000 tons; 8100 tons greater than the "Dreadnought" and 3500 tons greater than the "Orion." They are 554 ft. long, while a beam of 93 ft. and the same mean draught of 28 ft. 6 in. have been accepted. Turbines of 33,000 H.P. are provided for a speed of 20·5 knots, four propellers being fitted as in H.M.S. "Dreadnought." The coal to be carried on trial has been increased to 1650 tons, in place of the 1000 tons in preceding vessels. Twelve 12-in. and twenty-one 5-in. guns are carried and vanadium steel armour of 8-in. to 11-in. thickness is fitted on sides and barbettes, associated with protective decks of increased thickness. Six pairs of 12-in. guns are carried, all on the middle line; the foremost pair is 34 ft. above the designed load-line, the second pair 40 ft., and the third pair 32 ft.; the aftermost guns are 25 ft. above water, the next forward 32 ft. and the third pair from stern again at a height of 25 ft. Twenty-one 5-in. anti-torpedo-boat guns are carried, and the complement of officers and men has reached the high total of 1100. The main armament of the later vessels, "New York" and "Texas," is composed of ten 14-in. instead of twelve 12-in. guns, and the displacement is increased to 27,000 tons and the H.P. to 35,000.

Germany.—In 1885 Germany had one first-class battleship, the "König Wilhelm," of 9567 tons displacement, and four smaller vessels, the "Baden," "Bayern," "Sachsen" and "Württemberg," of 7400 tons each. The "Kaiser" and "Deutschland," central-battery ships designed by Sir Edward Reed, and two turret ships, the "Preussen" and "F. der Grosse," followed shortly afterwards. The "Kaiser" and "Deutschland" were 285 ft. in length, had a displacement of 7600 tons, 8000 I.H.P. and $14\frac{1}{2}$ knots speed; were armed with eight 22-ton guns and one 18-ton gun, and had side armour of a maximum thickness of 10 in. The vessels of the "Preussen" class were sea-going ships of the "Monarch" type, 308 ft. in length and of 6750 tons displacement and 14 knots speed, with belt armour of a maximum thickness of $9\frac{1}{4}$ in. and turret armour $8\frac{1}{4}$ in. thick.

In 1891 an advance was made by laying down the "Brandenburg" class of 9901 tons, carrying six 11-in. guns in three barbettes, one forward and one aft, and one on the middle line amidships. They were followed by the five first-class battleships of the "Kaiser" class, the last of which, the "Kaiser Friedrich III." (fig. 70, Plate XVI.), was finished in 1900. They are of 10,900 tons displacement, length 377 ft., beam 66 ft. 10 in., draught 25 ft. 9 in., 13,000 I.H.P. and 18 knots speed. They have belts of Krupp steel extending from the after barbette to the stem, with a maximum thickness of 12 in., tapering to 6 in. at the bow; there is no side armour above this belt. The main armament consists of four 9·4-in. guns, placed in pairs in barbettes, one forward and one aft, protected by 10-in. armour. On the main deck they have four 5·9-in. Q.F. guns in 6-in. armoured casemates, two on each side; and on the upper deck they have eight similar guns, protected in like manner, and six others in turrets—three each side; in all, eighteen 5·9-in. guns, besides twelve 3·5-in. and smaller guns. There are five vessels of the "Wittelsbach" class, a development of the "Kaiser Friedrich III."; they are 700 tons more displacement, 15 ft. longer and 1½ ft. more beam, but are of shallower draught. They have engines of 15,000 H.P. and a speed of 19 knots, or a knot more than their predecessors. Their armament is the same, but the 9·4-in. guns are better protected. The main armour belt is somewhat longer, but in other respects the thicknesses and general disposition of the protection are similar to the "Kaiser Friedrich III." class.

In the next five vessels, the "Braunschweig" class, laid down in 1901–1902, the 9·4-in. guns were replaced by 11-in. guns for the main armament; and the eighteen 5·9-in. guns were replaced by fourteen 6·7-in. guns for the secondary armament. The displacement was increased to 12,988 tons, the speed of 18 knots was maintained, and the armour protection practically as in the preceding vessels. Five vessels of the new "Deutschland" class which followed in 1903–1905 were very similar to the "Braunschweig" class.

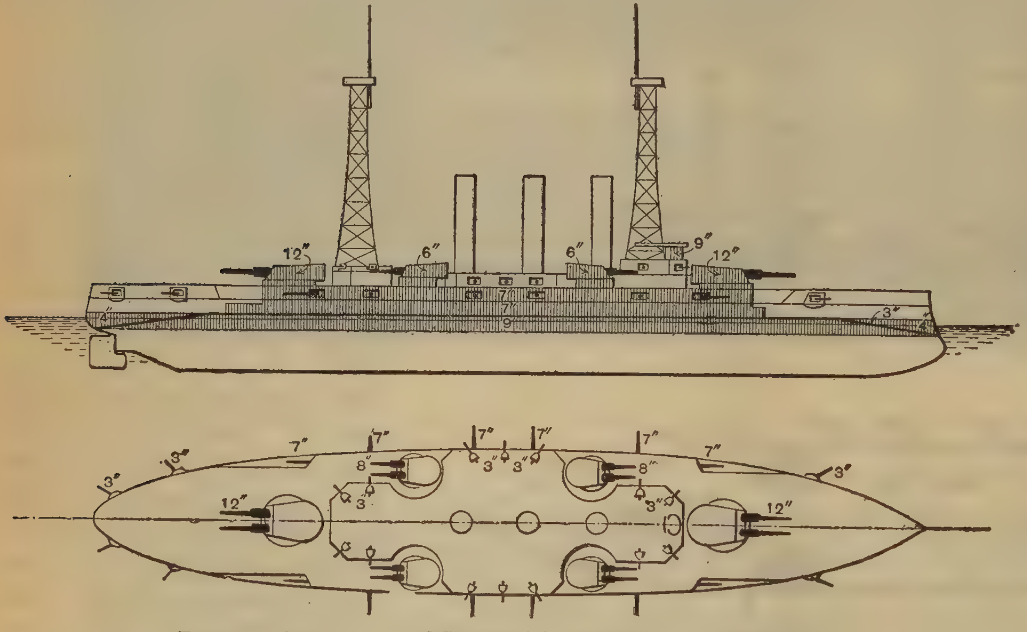


FIG. 67.—Arrangement of Guns and Armour of U.S. "Connecticut."

The "Nassau," the first of the German "Dreadnoughts" laid down in 1907, was 455 ft. in length and of 18,200 tons displacement, and carried an armament of twelve 11-in., twelve 5·9-in. and sixteen 3·4-in. guns, had an armour belt of Krupp steel 11 in. to 4 in. in thickness, I.H.P. 22,000 for 19 knots and speed on trial 20·7 knots. The "Posen" (fig. 71, Plate XVII.), "Rheinland" and "Westfalen" of the same type were also laid down in 1907 and were built and completed for sea with extraordinary rapidity. The "Westfalen" attained 20·25 knots on trial with 26,792 H.P. The next three vessels, "Thüringen," "Helgoland" and "Ostfriesland," laid down in 1908, are provided with twelve 12-in. guns arranged as in H.M.S. "Neptune"; they are of 22,150 tons displacement and 25,000 I.H.P. for 19·5 knots speed (probably at continuous sea speed; a measured-mile speed of about 2 knots more would doubtless be expected); they are protected by 12-in. Krupp steel armour; their dimensions are: length 489 ft., beam 98 ft., draught 27 ft. 6 in. The vessels laid down in 1910 were said to be still larger.

France.—For many years the French designers favoured the placing of the four heavy guns of their battleships in separate barbettes—a 12-in. gun at each end and a 10·8-in. gun on each side of the vessel amidships, intermediate positions being arranged for the smaller guns. Such vessels as the "Carnot," "Charles Martel," "Jaureguiberry," "Masséna," "Bouvet" approximating to 12,000 tons displacement, and built in the 'nineties, were so arranged. These were followed by a series of vessels in which the 12-in. gun alone was accepted for the main armament, and two pairs were fitted, one forward and one aft as in British vessels; the "Gaulois," "Charlemagne," "St Louis" and "Suffren" were so arranged. The "Suffren," commenced in 1899 (displacement 12,728 tons, length 410 ft., beam 70 ft. and draught 27 ft. 6 in.), had a complete water-line belt of Harveyized steel armour of 11¾ in. maximum thickness, and above this, up to the main deck, similar armour, 5 in. thick, extending from the after turret to the bow; she had also a short armoured battery on the main deck which enclosed the funnel uptakes. There were eight turrets on her upper deck—one forward and one aft, each carrying two 12-in. guns, and six arranged three on each broadside, each carrying a 6·4-in. gun. The armour of the larger turrets was of the same thickness as the armour belt, namely, 11¾ in., and that of the smaller turrets 5 in. She mounted eight 3·9-in. guns on the superstructure, and also had twenty-two smaller guns and four torpedo tubes, of which two were submerged. She had triple screws, engines of 16,000 I.H.P. and a speed of 18 knots. The "République," laid down in 1901, and the "Patrie," laid down in 1902, were superior in speed and armament to any British battleships then building. They had a displacement of 14,865 tons, and were of 439 ft. length, 79 ft. 6 in. beam and 27 ft. 6 in. extreme draught. They had three screws, and a nominal I.H.P. of 17,500 for a speed of 18 knots; but on trial these were considerably exceeded, the "Patrie" reporting 19,000 I.H.P. and 19·47 knots. They carried four 12-in. B.L. guns in pairs in turrets on the middle line, as in the British ships, twelve 6·4-in. Q.F. guns in pairs in turrets on the upper deck, six additional 6·4-in. Q.F. guns in casemates on the main deck, twenty-six 3-pdrs., three above-water and two submerged torpedo tubes. There was a complete water-line belt of a maximum thickness of 12 in., the bow was protected by 4-in. armour and there was a partial 4-in. belt above the 12-in. belt. The protective deck was 4 in. thick on the slopes, and the armour of the main turrets 12½ in., the whole armour being of Harvey quality.

Four later vessels of the class, "Justice," "Démocratie," "Liberté" and "Vérité," were given a still more powerful secondary armament of 7·6-in. guns—six placed in well-protected turrets at a great height above water, and four in casemates between decks. Six vessels, the "Condorcet," "Danton" (fig. 72), "Diderot," "Mirabeau," "Vergniaud" and "Voltaire," were laid down in 1907. All had Parsons turbines of 22,500 H.P. for a speed of 19·25 knots, and their main armament consisted of four 12-in. and twelve 9·4-in. guns, as shown in fig. 72. The later French ships "Courbet" and "Jean Bart" carry twelve 12-in. guns in six pairs, two forward and two aft on the middle line, one pair training over the other, and one pair on each side amidships as in "Dreadnought." They are of 23,000 tons displacement and 20 knots speed, and have an anti-torpedo boat armament of twenty-two 5·5-in. guns, all in casemates of 7-in. armour.

Japan.—Previous to the Russo-Japanese War Japan had provided herself with a number of excellent battleships built in Great Britain, such as the "Fuji" of 12,450 tons, laid down at the Thames Ironworks in 1894, the "Hatsuse," built at Elswick, the "Asahi," built at Clydebank, and the "Shikishima," built at the Thames Ironworks, all of about 15,000 tons displacement and laid down in 1897–1898. The dimensions of these vessels were: length 400 ft., beam 75 ft. 6 in., mean draught 27 ft. The I.H.P. was 15,000, giving a speed of 18 knots. The armour-belt extended the full length of the ship at the water-line, and had a maximum thickness of 9 in.; between the top of this belt and the main deck, for a length of some 220 ft., was an upper belt 6 in. thick, which was continued by oblique bulkheads to the sides of the heavy-gun barbettes. The barbettes themselves, which were two in number, one forward and one aft, had armour 14 in. thick, and the conning-tower also was 14 in. thick. The armament consisted of four 12-in. 49-ton B.L. guns, two mounted in each barbette and loading in any position of training; fourteen 6-in. Q.F. guns, all in 6-in. casemates, eight on the main deck and six on the upper deck; and twenty 12-pdrs., besides smaller guns and four submerged torpedo tubes. The "Mikasa," laid down at Barrow in 1899, was a slight modification of the "Hatsuse" class design, being 200 tons heavier and 6 in. more in draught. The principal difference was that the eight 6-in. Q.F. guns on the main deck were increased to ten in number, and instead of being in separate casemates were in a 6-in. armoured central battery, with 2-in. divisional screen bulkheads.

The "Hatsuse" was destroyed in the war by a mine explosion; and the "Mikasa" was seriously damaged by mines. After the war she was accidentally sunk on the 10th of September 1905; she was, however, refloated on the 8th of August 1906, repaired and recommissioned. The Japanese fleet in 1910 contained several vessels which were captured from Russia during the war, such as the "Iwami" of 13,515 tons (late "Orel"), the "Hizen" of 12,275 tons (late "Retvizan"), the "Segami" of 12,790 tons (late "Peresviet"), the "Suwo" of 12,997 tons (late "Pobyeda"), the "Tango" of 10,960 tons (late "Poltava"), and the "Iki" of 9700 tons (late "Imperator Nicolai I."). The "Suwo" and "Hizen" may be taken as typical examples of these captured vessels. The former is of the following dimensions: length 436 ft., beam 71¼ ft., draught 27½ ft., and displacement 12,670 tons; she has engines of 15,000 H.P. and a nominal speed of 19¼ knots, carried an armament of four 10-in. guns, mounted in pairs in turrets on the middle line forward and aft; eleven 6-in. guns, distributed five on each broadside and one in the extreme bow of the vessel; twenty 3-in. guns and twenty-six smaller pieces; and six torpedo tubes. She is protected by a complete water-line belt of armour, 9 in. thick amidships, tapering to 4 in. at the ends, reinforced by a protective deck 2¾ in. thick. Above the belt, for a length of 185 ft. amidships, is a lighter belt of 5-in. Krupp armour, protecting the bases of the 6-in. guns, and terminated by transverse bulkheads. The 10-in. gun turrets are 10 in. thick, and the 6-in. guns are protected by casemates 5 in. thick. This vessel carries 30 Belleville boilers, and has storage for 2000 tons of coal. The "Hizen" ("Retvizan") was built at Cramp's, U.S.A. She is of 12,700 tons displacement, 376 ft. long, 72¼ ft. beam, and 26 ft. draught. She has four 12-in. B.L. guns in pairs in turrets, twelve 6-in. Q.F. guns in 5-in. casemates, twenty 12-pdrs. and twenty-eight smaller guns, besides four submerged and two above-water torpedo tubes. She is protected by a water-line belt extending from the after-turret to the stem, and tapering in thickness from 9 in. to 2 in. Above this is a complete belt of 6 in. maximum thickness, and the main armament is protected by turrets 10 in. thick. She has 16,000 H.P. and a speed of 18 knots, and has stowage for 2000 tons of coal.

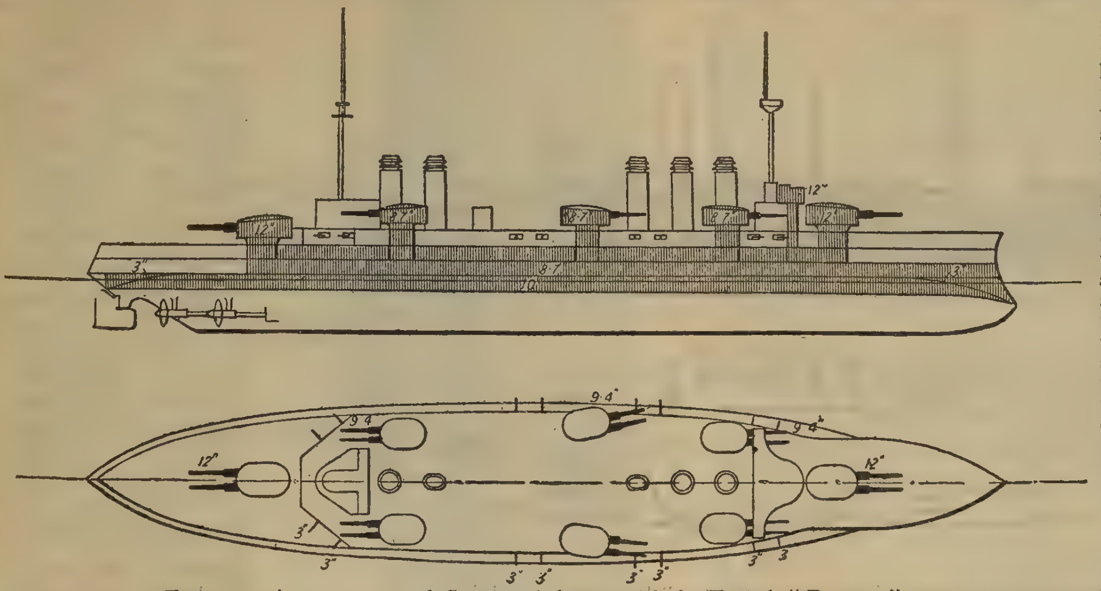


FIG. 72.—Arrangement of Guns and Armour of the French "Danton."

The "Kashima" (fig. 73, Plate XVII.) was laid down at Elswick in 1904 and the "Katori," at Barrow in the same year; they were not delivered until the war was over. Also during the war Japan laid down two very much larger vessels, the "Aki" and "Satsuma." The "Aki" is the larger of the two, being 492 ft. long, 83½ ft. beam, 27½ ft. draught, and 19,800 tons displacement; she carries four 12-in., twelve 10-in., eight 6-in. and twelve 12-pdr. guns and five torpedo tubes, and is protected by 9-in. to 5-in. armour. Curtis turbines of 24,000 H.P. are provided for a speed of 20 knots. It is noteworthy that this vessel was laid down on the 15th of March 1905, while the "Lord Nelson" of 16,500 tons was not laid down until the 18th of May 1905 and the "Dreadnought" of 17,900 tons not until the 2nd of October 1905. The "Aki" also exceeds in displacement the "St Vincent," laid down in 1907–1908, and her tonnage was not reached in Great Britain until 1909, when the "Neptune" was laid down. The "Aki" was followed by still larger vessels, the "Kawachi" and "Settsu," both of 20,800 tons. The "Kawachi" is thus 900 tons greater than the "Neptune," and she was laid down one day before that vessel. The general arrangement of armour and guns of these large vessels is shown in fig. 74; they are protected by armour of 12 in. to 5 in. in thickness, and in addition to twelve 12-in. guns they carry ten 6-in., twelve 4·7 in. and four 12-pdrs.

Russia maintained in 1910 two fleets, one being in the Black Sea, prevented by treaty from passing through the Dardanelles, and the other, the main Russian Fleet, in the Baltic.

In 1882 three remarkable vessels were laid down for the Black Sea Fleet, the "Catherine II.," "Tchesme" and "Sinope." They were barbette ships of 10,180 tons displacement, with a compound armour belt of a maximum thickness of 16 in., armed with six 12-in. B.L. guns mounted in pairs on the upper deck in a large pear-shaped barbette, and seven 6-in. guns on the main deck; and having a speed of 16 knots. Other vessels built for this fleet were the "Twelve Apostles" of 8709 tons, "George the Victorious," 11,032 tons, the "Three Prelates," 13,318 tons, the "Rostislav," of 8880 tons laid down in 1895 and the "Panteleimon" of 12,582 tons laid down in 1897. The latest vessels built on the Black Sea are the "Ioann Zlatoust" and "Evstafi," of 12,840 tons and 16 knots, carrying four 12-in., four 8-in., twelve 6-in., fourteen 12-pdr. and six 3-pdr. guns; both were laid down in 1903.

Of the main Russian Fleet outside the Black Sea only a few battleships survived the Russo-Japanese War; these included the "Tzesarevich" of 13,000 tons, built in France in 1899, carrying four 12-in. guns in two barbettes, and twelve 6-in. guns in pairs in turrets; also the "Slava," laid down on the Neva in 1902, 370 ft. long, of 13,516 tons displacement, 16,000 I.H.P. and 18 knots speed, her hull protected by armour of 9 in. to 4 in. in thickness. The "Slava" carried four 12-in. guns in barbettes having 10-in. armour, and twelve 6-in. guns in turrets having 6-in. armour.

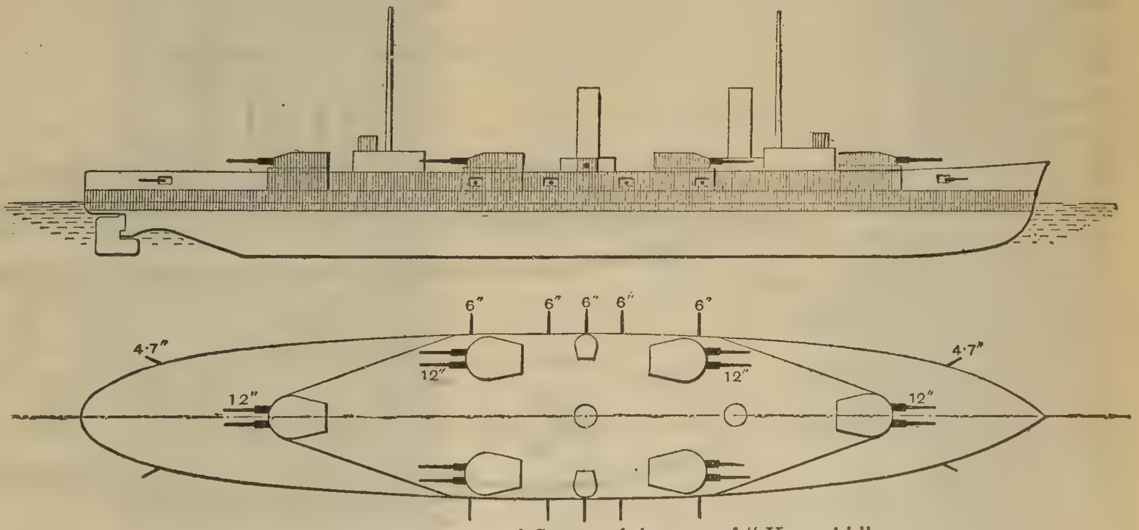


FIG. 74.—Arrangement of Guns and Armour of "Kawachi."

In January 1903 Russia laid down the "Imperator Pavel I.," a larger and more powerful vessel than any then building by any other power, being of 17,400 tons displacement—almost that of the

“Dreadnought,” but laid down 2½ years earlier; she carries four 12-in. and fourteen 8-in. guns as well as twelve 4·7-in. guns arranged as shown in fig. 75, from which it will be seen that an attempt was made to protect almost the whole of the vessel above water with armour varying from 8½ in. to 3 in. in thickness. Engines of 17,600 I.H.P. are provided for 18 knots speed. A sister vessel, “Andrei Pervozvanni,” was also laid down in 1903, but neither vessel was completed in time to take part in the war. In 1909 four vessels were laid down, which were again larger than any then building for any other power, viz. the “Sevastopol,” “Petropavlovsk,” “Gangut” and “Poltava,” of 23,000 tons displacement, with Parsons turbines of 42,000 H.P. for 23 knots speed, 600 ft. long, 89 ft. beam, 27 ft. 3 in. draught, protected by 11-in. armour, armed with twelve 12-in. and sixteen 4·7-in. guns, the 12-in. guns being carried in four three-gun turrets placed at considerable distances apart on the middle line.

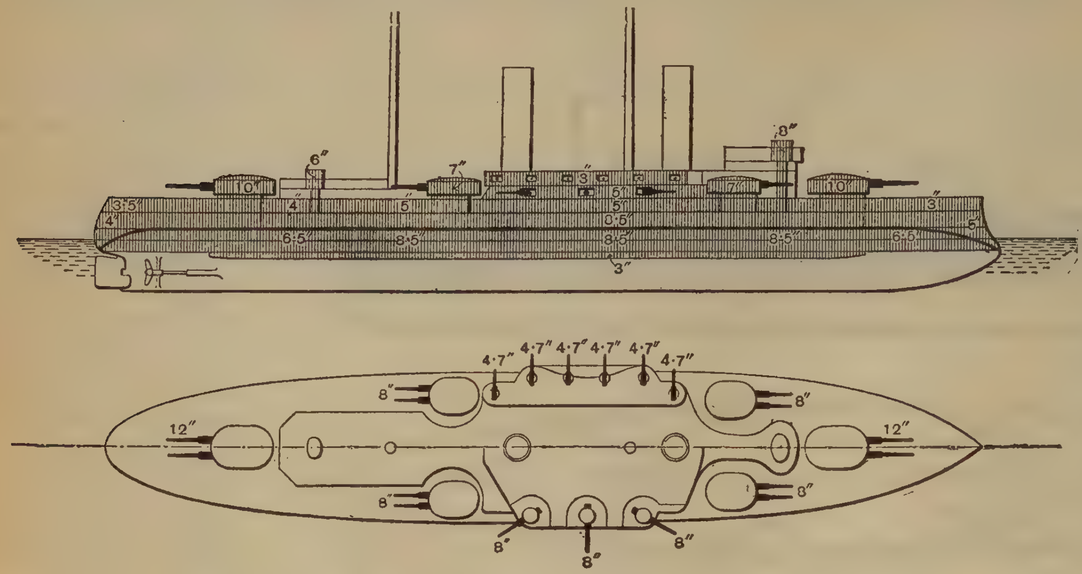


FIG. 75.—Arrangement of Guns and Armour of “Imperator Pavel.”

Italy.—The Italian navy has always contained interesting vessels embodying the independent thought and skill of her own designers. The “Duilio,” launched in 1876, and the “Dandolo,” launched in 1878, were 340 ft. in length, 10,400 tons displacement, and carried four 100-ton M.L. rifled guns, mounted in two turrets and capable of penetrating 22·7 in. of iron at 1000 yds. They had a central citadel 107 ft. in length, protected by 21½ in. of steel armour, with 18-in. armour on the turrets. Their engines were of 7900 I.H.P., giving a speed of 15 knots. In the “Italia” and “Lepanto,” launched in 1880 and 1883 respectively, side armour was dispensed with, a curved 3-in. armour deck, with its sides 5½ ft. below the water-line, being fitted from stem to stern, with armour glacis protection to the funnel openings, &c., in this deck; they carried four 100-ton breech-loading guns mounted in two barbettes arranged so as to permit all four guns to fire ahead, astern or on either broadside as in “Inflexible”; their displacement was 13,500 tons, their length 400 ft., and they had engines of 18,000 I.H.P. designed to give a speed of 18 knots. They were followed by three of the “Andrea Doria” class of 11,000 tons, launched in 1884 and 1885, armed with four 105-ton breech-loaders, and protected by an 18-in. belt of compound armour; and by the “Re Umberto,” “Sicilia” and “Sardegna” of 13,250 tons, launched 1888 to 1891, and armed with four 67-ton B.L. guns having a penetration of 27 in. of iron at 1000 yds. In 1897 Italy launched the second-class battleships “Ammiraglio di Saint Bon” and the “Emanuele Filiberto” of 9800 tons and 18 knots speed, carrying four 10-in., eight 6-in. and eight 4·7-in. guns and armoured with 10-in. to 4-in. armour. These were followed by the “Regina Margherita,” laid down in 1898, and the “Benedetto Brin,” laid down in 1899, two vessels of 13,426 tons displacement and 20 knots speed, of good freeboard, carrying an armament similar to that of the “Duncan” and in addition four 8-in. guns; the 12-in. guns are protected by 10-in. armour, the 6-in. guns and the ship's sides by 6-in. armour with 3-in. side plating forward and aft. Four very notable vessels were next laid down—the “Regina Elena” (fig. 76, Plate XVII.) and “Vittorio Emanuele III.” in 1901, and the “Napoli” and “Roma” in 1903, each on a displacement of 12,625 tons, carrying two 12-in. and twelve 8-in. guns in turrets, as well as a large number of small quick-firing guns; their machinery of 20,000 I.H.P. is provided for a speed of 22 knots; their hulls are cut down, giving reduced freeboard as compared with “Benedetto Brin,” and the hulls and machinery are built as lightly as possible. For several years no new design was adopted, but in 1909 the “Dante Alighieri” was laid down, of 18,700 tons displacement, an increase of 50% over that of the preceding vessels. She was reported to be 492 ft. long, 79 ft. beam, carrying twelve 12-in., eighteen 4·7-in. and sixteen 3-in. guns, turbines of 30,000 H.P. being provided for a speed of 23 knots, and side armour fitted 9 in. thick amidships tapering to 6 in. forward and 4½ in. aft. Three later vessels, the “Conte di Cavour,” “Giulio Cesare” and “Leonardo da Vinci,” are of 22,000 tons, 35,000 H.P., 23 knots, and carry thirteen 12-inch guns.

Austria.—Until quite recently Austria has made no attempt to maintain battleships of the first class. Three small battleships, the “Monarch,” “Budapest” and “Wien,” were laid down in 1893–1894, of 5550 tons displacement and 17½ knots speed, carrying four 9·4-in., six 6-in. and twelve 3-pdr. guns, with armour 10½ in. to 4 in. in thickness. In 1899 three larger vessels, the “Habsburg” (fig. 77, Plate XVII.), “Arpad” and “Babenberg,” were begun, of 8340 tons displacement and 18 knots speed, carrying three 9·4-in., twelve 6-in. and several smaller Q.F. guns and well armoured. In 1901 it was decided to build the “Erzherzog Karl Friedrich” and “Ferdinand Max,” of 10,600 tons and 19 knots, carrying four 9·4-in. and small Q.F. guns as in the “Monarch,” but with the secondary armament increased to twelv

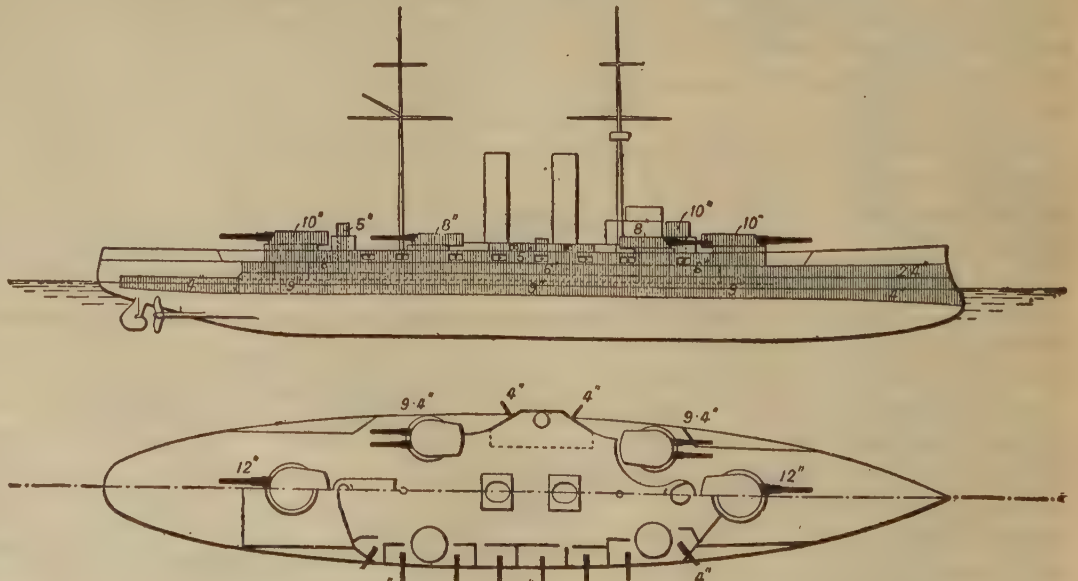
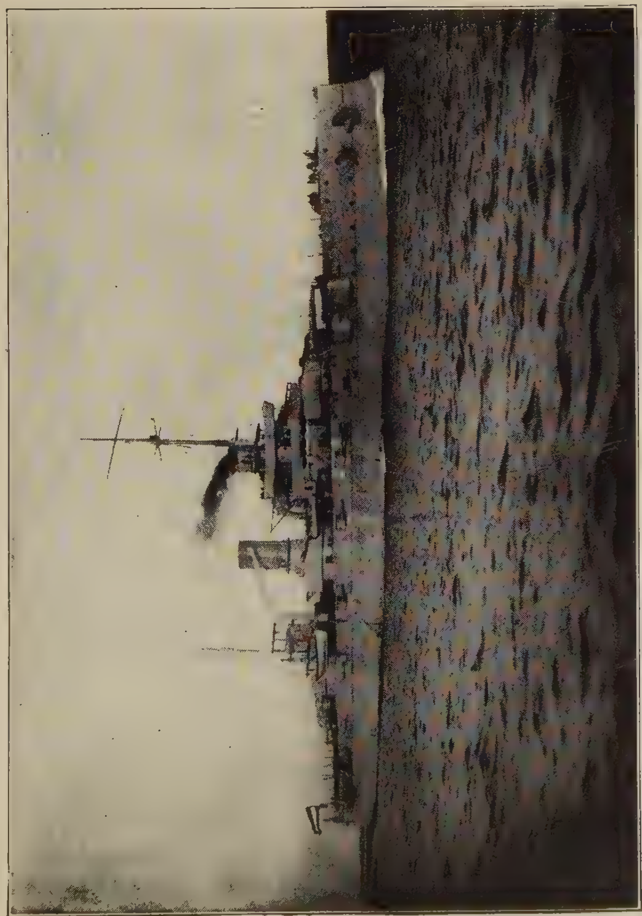
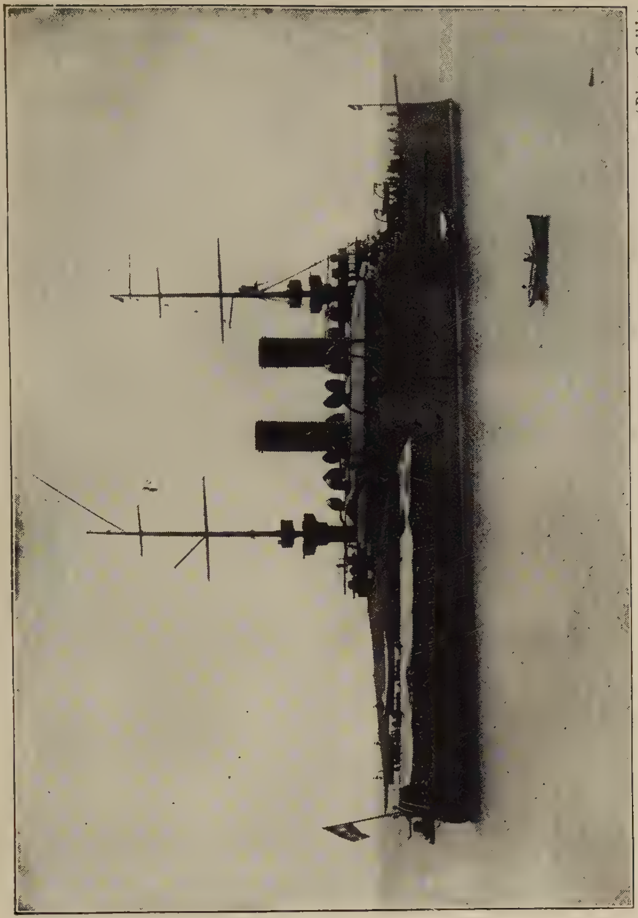


FIG. 78.—Arrangement of Guns and Armour of Austrian “Erzherzog Franz Ferdinand.”



(*Photo, Symons.*)

FIG. 71.—German *Posen.*



(*Photo, Cribb.*)

FIG. 77.—Austrian Habsburg Class.

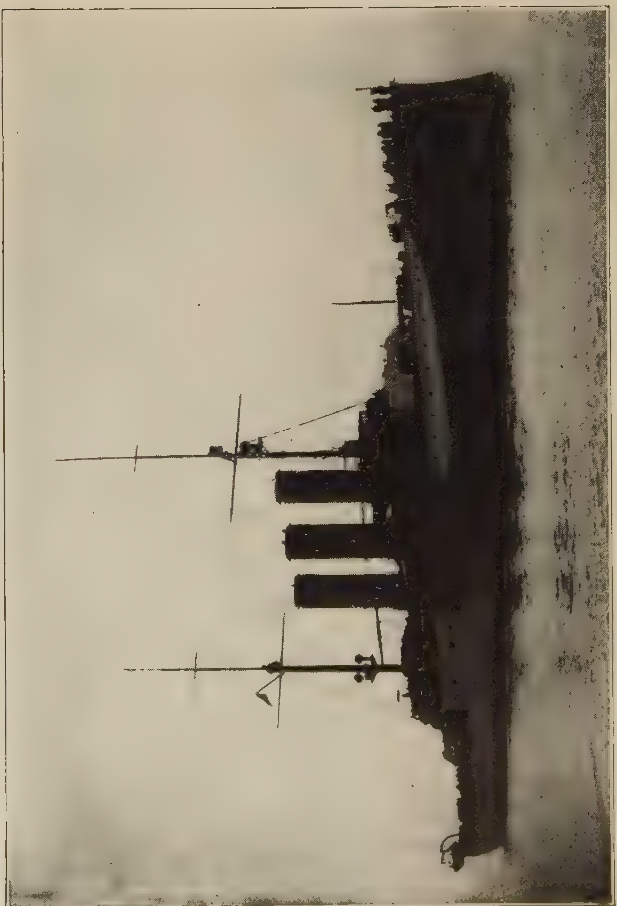
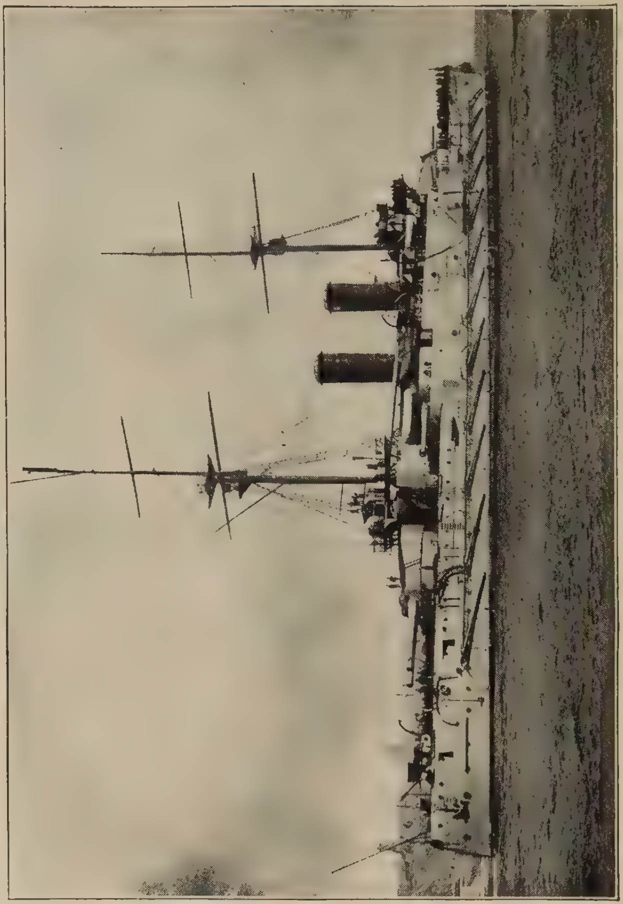


FIG. 76.—Italian *Regina Elena.*



(*Photo, Frank.*)

FIG. 73.—Japanese *Kashima.*

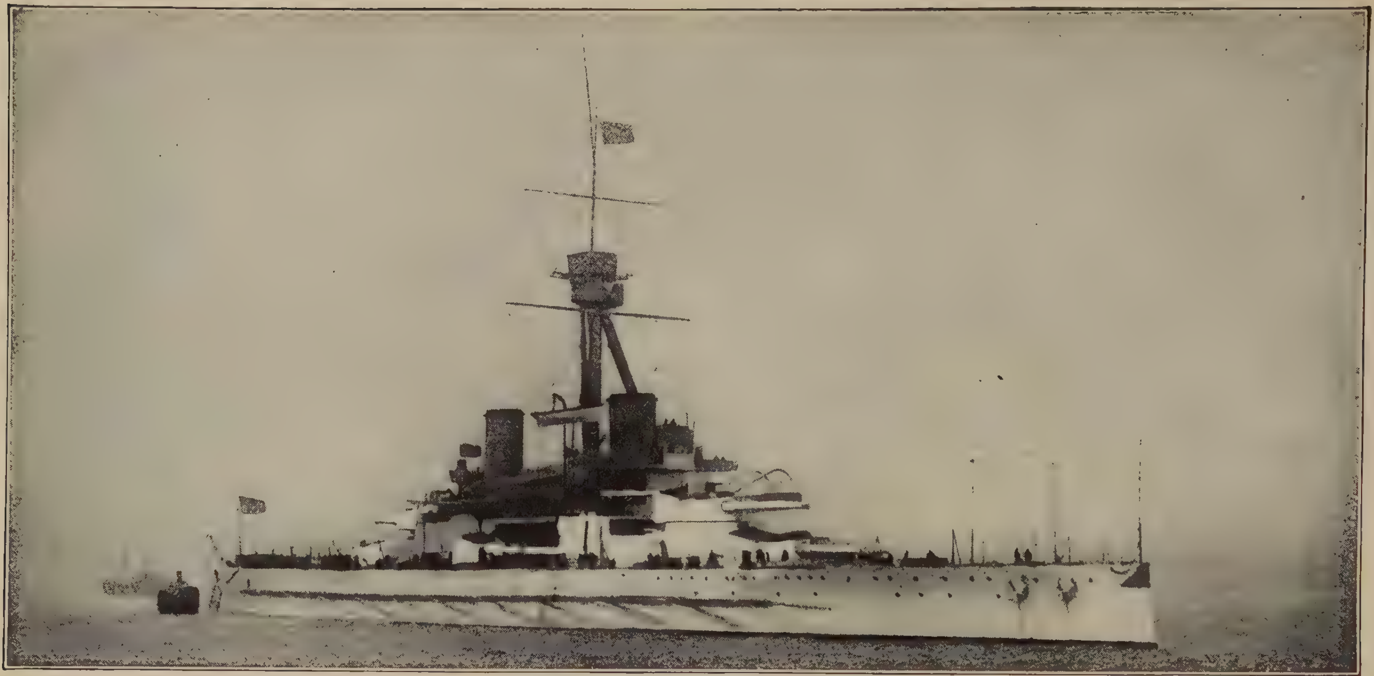


FIG. 79.—Brazilian *Minas Geraes.*

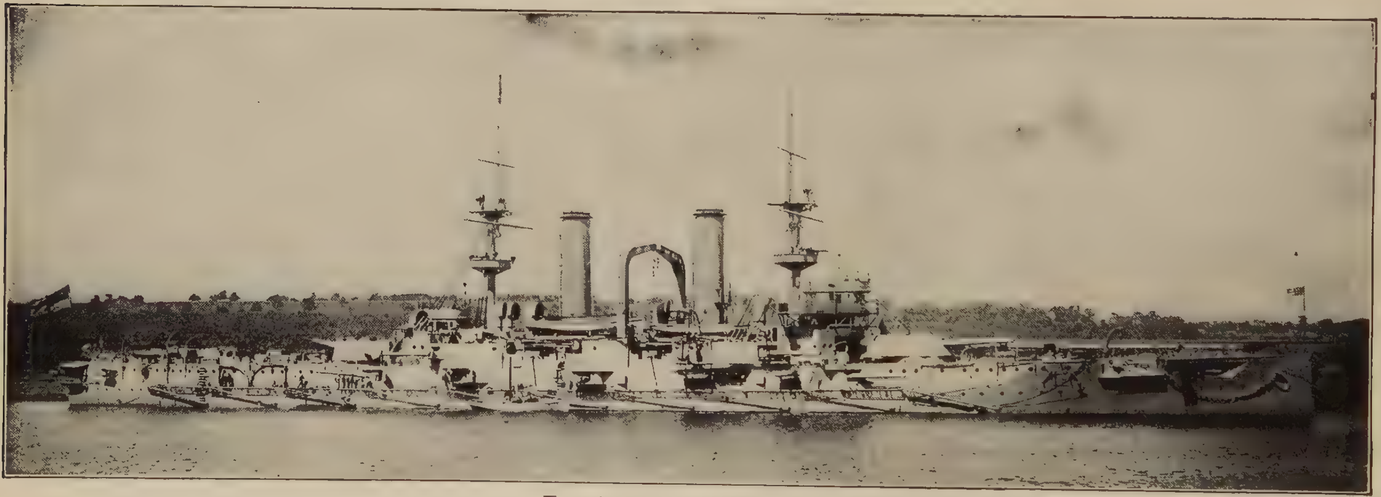


FIG. 69.—H.M.S. *Triumph.*

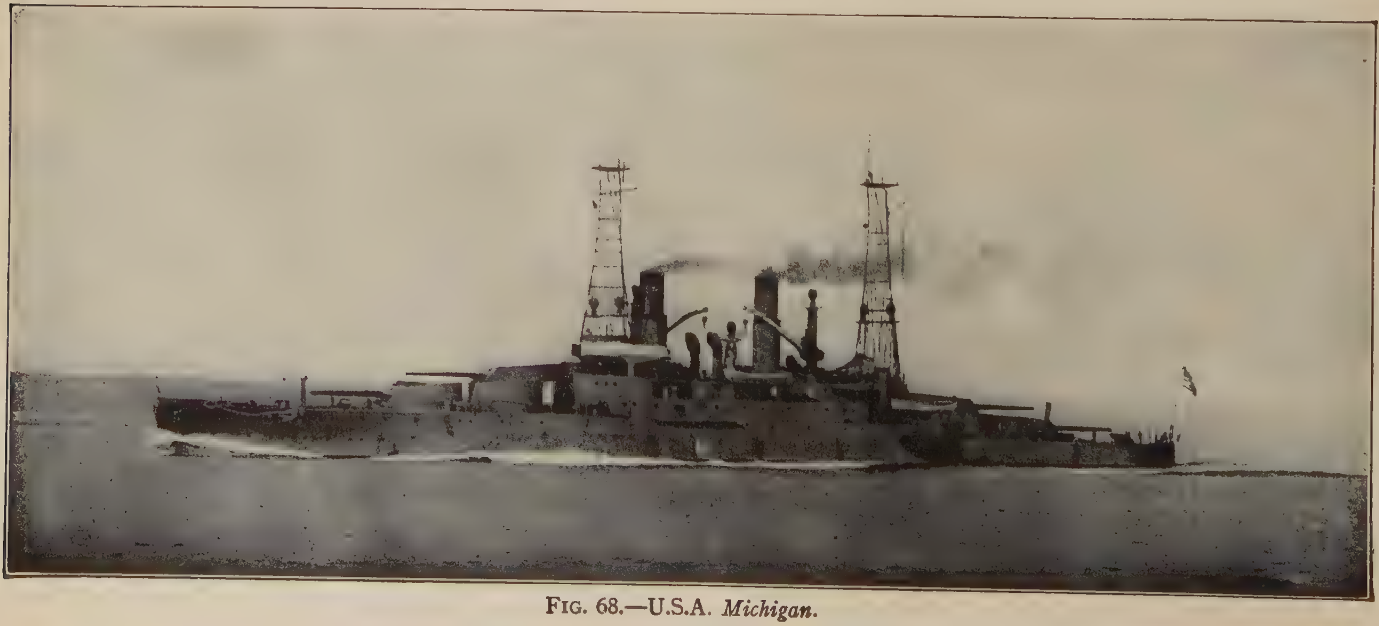


FIG. 68.—U.S.A. *Michigan.*

TABLE XVI.—*Development of some of the Leading Features of Notable Armoured Battleships from 1860 to 1910.*

Vessel.	Date of Launch.	Hull.						Speed.	I.H.P.	Propulsive Machinery.			Armament (including Machine Guns).	Heavy Guns—where mounted.	Thickest Armour.	Cost (excluding Guns).
		Material.	Length.	Breadth.		Mean Draught.				No. of Screws.	Engines.	Boilers.				
			Ft.	Ft.	In.	Ft.	In.	Tons Load Displacement.	Knots						Inches	£
Warrior	1860	Iron	380	58	0	26	7	8,830	14·25	6,000	1	Horizontal, trunk, jet-condensing 1 expansion 1 set of 2 cylinders; 112″×48″	10 rectangular 22 lb pressure	28—7″ 6½ ton guns	Broadside	4½	356,693
Agincourt	1865	,,	400	59	3	28	2	10,690	14·8	5,000	1	Horizontal, jet-condensing 1 expansion 1 set of 2 cylinders; 101″×54″	10 rectangular	17—12 ton M.L.R.	Broadside	5½	496,069
Bellerophon	1865	,,	300	56	1	26	0	7,550	14·2	6,500	1	Horizontal, trunk, surface-condensing 1 expansion 1 set of 2 cylinders; 104″×48″	Rectangular 26 lb pressure	10—14 ton and 5—6½ ton guns	Central battery	6	447,618
Monarch	1868	,,	330	57	6	26	0	8,300	15·0	7,850	1	Horizontal 1 expansion 1 set of 2 cylinders; 120″×54″	Rectangular 31½ lb pressure	4—12″ 25 ton, 2—9″ 12 ton, 1—7″ 6½ ton and 20 small guns	Turrets	Turrets, 10 Sides, 7	478,971
Sultan	1870	,,	325	61	0	26	1	9,300	14·1	7,700	1	Horizontal, trunk, surface-condensing 1 expansion 1 set of 2 cylinders; 118″×54″	Rectangular 30 lb pressure	8—18 ton and 4—12 ton guns	Central battery	9	485,155
Devastation	1871	,,	285	62	4	27	0	9,330	14·2	7,000	2	Horizontal, trunk, surface-condensing 1 expansion 2 sets of 2 cylinders; 88″×39″	8 rectangular 30 lb pressure	4—12″ 35 ton and 10 smaller guns 2 torpedo tubes	Turrets	Turrets, 14 Sides, 12	430,746
Inflexible	1876	,,	320	75	0	26	4	11,880	14·0	8,000	2	Vertical 2 expansions 2 sets of 3 cylinders; 70″+2@90″×48″	8 single-ended, oval 4 double ,, ,, 60 lb pressure	4—16″ 80 ton and 8—4″ 22 cwt. guns 4—14″ torpedo tubes	Turrets	24	951,406
Benbow	1885	Steel	330	68	6	28	0	10,600	16·9	11,500	2	Vertical 2 expansions 2 sets of 3 cylinders; 52″+2@74″×45″	12 oval	2—16¼″ 110 ton, 10—6″ and 13 smaller guns 5 torpedo tubes	Barbettes	18	774,791
Royal Sovereign	1891	,,	380	75	0	27	6	14,150	17·5	13,000	2	Vertical 3 expansions 2 sets of 3 cylinders; 40″+59″+88″×51″	8 single-ended return tube 148 lb pressure	4—13½″ 67 ton, 10—6″ and 38 smaller guns 7 torpedo tubes	Barbettes	18	839,136
Majestic	1896	,,	390	75	0	27	6	14,900	17·5	12,000	2	Vertical 3 expansions 2 sets of 3 cylinders; 40″+59″+88″×43″	8 single-ended return tube boilers	4—12″ 46 ton, 12—6″ and 38 smaller guns 5—18″ torpedo tubes	Barbettes, hooded	Barbettes, 14 Sides, 9 Harveyized	872,458
Formidable	1898	,,	400	75	0	26	9	15,000	18·0	15,000	2	Vertical 3 expansions 2 sets of 3 cylinders; 250 lb pressure 31½″+51½″+84″×51″	20 Belleville, with economizers 300 lb pressure	4—12″ 46 ton, 12—6″ and 32 smaller guns 4—18″ torpedo tubes	Barbettes, hooded	Barbettes, 12 Sides, 9 Krupp	1,022,745
Duncan	1901	,,	405	75	6	26	6	14,000	19·0	18,000	2	Vertical 3 expansions 2 sets of 4 cylinders; 33½″+54½″+2@63″×48″	24 Belleville, with economizers	4—12″, 12—6″ and 26 smaller guns 4 torpedo tubes	Barbettes, hooded	Barbettes, 14 Sides, 7	1,023,147
Swiftsure	1903	,,	436	71	0	24	7	11,800	20·0	12,500	2	Vertical triple expansion 2 sets of 4 cylinders; 29″+47″+2@54″×39″	Yarrow large tube	4—10″, 14—7·5″, 14—14 pr., 2—12 pr., and 8—6 pr. and machine guns	Barbettes	10	849,474
King Edward VII.	1903	,,	425	78	0	26	9	16,350	18·5	18,000	2	Vertical triple expansion 2 sets of 4 cylinders; 38″+60″+2@67″×48″	Babcock and Wilcox and cylindrical	4—12″, 4—9·2″, 10—6″, 14—12 pr., 17—3 pr. and machine guns 4 torpedo tubes	Barbettes	12	1,383,845
Lord Nelson	1906	,,	410	79	6	27	0	16,500	18·5	16,750	2	Vertical triple expansion 2 sets of 4 cylinders; 33″+53″+2@60″×48″	15 Yarrow large tube	4—12″, 10—9·2″, and 24—12 pr. and 5 machine guns 5 torpedo tubes	Barbettes	12	1,540,889
Dreadnought	1906	,,	490	82	0	26	6	17,900	21·6	23,000	4	Parsons turbines	Babcock and Wilcox	10—12″, 24—12 pr. and 5 machine guns 5 torpedo tubes	Barbettes	11	1,699,900
Imperator Pavel I. *(Russian)*	1907	,,	429′ 9″	79	9	28	6	17,400	18·0	17,600	2	Vertical triple expansion	Belleville	4—12″, 14—8″, 12—4·7″, and 14 smaller, light and machine guns 5 torpedo tubes	Barbettes	12	1,170,000
Posen *(German)*	1908	,,	455	88	6	26	6	18,200	20·5	20,000	3	3 sets 4-cylinder vertical triple expansion	Schultz-Thornycroft	12—11″, 12—5·9″, 20 smaller, light and machine guns 6 torpedo tubes	Barbettes	12	1,800,000

TABLE XVI. (*Continued*).—*Development of some of the Leading Features of Notable Armoured Battleships from 1860 to 1910.*

Vessel.	Date of Launch.	Hull.					Speed.	I.H.P.	Propulsive Machinery.			Armament (including Machine Guns).	Heavy Guns—where mounted.	Thickest Armour.	Cost (excluding Guns).
		Material.	Length.	Breadth.	Mean Draught.	Load Displacement.			No. of Screws.	Engines.	Boilers.				
			Ft.	Ft. In.	Ft. In.	Tons.	Knots							Inches	£
Erzherzog Franz Ferdinand (Austrian)	1908	Steel.	450′ 9″	80 6	26 6	14,226	20·5	20,000	2	2 sets 4-cylinder vertical triple expansion	Yarrow	4—12″, 8—9·4″, 20—3·9″, 6·12 pr. and 2 machine guns 3 torpedo tubes	Barbettes	10	..
Minas Geraes (Brazilian)	1908	,,	500	83 0	25 0	19,281	21·4	27,212	2	Vertical triple expansion	Babcock and Wilcox	12—12″, 22—4·7″, and 8—3 pr. guns	,,	12	1,821,400
Delaware (United States)	1909	,,	510	85 3	27 0	20,000	21·5	28,578	2	Vertical triple expansion	Babcock and Wilcox	10—12″, 14—5″, and 10 smaller, light and machine guns 2 torpedo tubes	,,	11	..
Danton (French)	1909	,,	476	84 0	27 0	18,028	19·25	22,500	4	Parsons turbines		4—12″, 12—9·4″, and 26 smaller, light and machine guns 2 torpedo tubes	,,	12	2 068,000
Kawachi (Japanese)	Bdg. in 1910	,,	520	84 0	27 0	20,800	20·0	26,500	4	Curtis turbines	Miyabara small tube	12—12″, 10—6″, and 12—4·7″ guns 5 torpedo tubes	,,	12	..
Alfonso XIII. (Spanish)	,,	,,	435	78 9	25 6	15,460	19·5	15,300	4	Parsons turbines	Yarrow	8—12″, 20—4″, 2—3 pr., 2 light, and 2 machine guns 3 torpedo tubes	,,	10	..
Moreno (Argentine)	,,	,,	578	95 9	27 6	28,000	21	39,500	..	Curtis turbines	Babcock and Wilcox	12—12″, 12—6″, 16—4″, and 10 smaller guns 2—21″ torp. tubes	,,	12	2,200,000

7½-in. guns all well protected, while the next step was to vessels of a type very similar to the "King Edward VII." class, but of greater gun-power and higher speed, with somewhat thinner armour and smaller coal capacity. These vessels, "Erzherzog Franz Ferdinand," "Radetsky" and "Zrinigi," were being completed in 1910. Their arrangements of guns and armour are shown in fig. 78. Battleships of far greater fighting value were in 1910 laid down by Austria; of 20,000 tons displacement, 25,000 H.P., and 22 knots speed, mounting ten 12-in. guns, protected by 11-in. armour, and costing about 2¼ millions sterling each.

Brazil.—For several years by mutual arrangement no battleships were added to the South American navies, but in 1906 Brazil ordered three vessels of 19,281 tons, 1380 tons heavier than the "Dreadnought," which was not then finished; the first two of these carry twelve 12-in. guns in place of the ten of the "Dreadnought," and can fire ten guns on either broadside, eight ahead and eight astern; they also carry fourteen 4·7-in. guns behind 9-in. armour on the main deck, and eight behind thinner armour on the upper deck. The ship's side, barbettes and gun mountings are protected by 9-in. armour, the belt armour tapering to 4-in. forward and aft. The vessels are 500 ft. long, 83 ft. beam and 25 ft. draught; engines of 23,500 I.H.P. being provided for 21 knots. The leading vessel, the "Minas Geraes" (fig. 79, Plate XVIII.), was built at Elswick; she obtained about 21½ knots on trial, and passed through all her severe gun trials with great success. Fig. 80 shows the general arrangements of guns and armour. The second vessel, the "Sao Paulo," was built at Barrow, and was also completed to the same design. The third vessel, the "Rio de Janeiro," which in 1910 was being built by the Elswick firm, has been redesigned to be 655 ft. in length over all, 92 ft. beam and 32,000 tons displacement on a draught of 26 ft. Her armament was to be twelve 14-in. guns, with a secondary armament of fourteen 6-in. guns, an anti-torpedo armament of fourteen 4-in. guns, as well as a number of smaller guns, and three submerged torpedo tubes. She was fitted with four screws and turbines of 45,000 H.P. to drive her at 22½ knots. Her cost was reported to be almost £3,000,000, and in 1910 she was by far the largest vessel on the stocks.

Argentine Republic.—Early in 1910 the Argentine Republic ordered two vessels, the "Moreno" and "Rivadavia," of 28,000 tons, armed with twelve 12-in. guns, twelve 6-in. and sixteen 4-in. guns, to be built by the New York Shipbuilding Co. and the Fore River Shipbuilding Co. respectively. Their displacement is much greater than that of the largest battleships building at the time they were ordered, although they are 4000 tons smaller than the "Rio de Janeiro." They are 578 ft. long, 96 ft. beam, 27½ ft. draught, and turbines of 40,000 H.P. are provided for a speed of 22½ knots. The armament is arranged somewhat as in "Minas Geraes," but with the midship barbettes arranged so that the guns can fire on either broadside, giving a fire of twelve guns on either broadside, eight ahead and eight astern. The ship's side and the heavy guns are protected by 12-in. armour, and the 6-in. guns by 6-in. armour; 1600 tons of coal are carried on the load draught out of a possible 4000 tons, and there is also a large stowage for oil fuel.

Spain.—For some years battleship building was suspended in Spain, but, after considerable negotiation with British firms, designs were approved for three vessels of 15,130 tons and 19½ knots, to carry eight 12-in. and twenty 4-in. guns, with 10-in. armour on the barbettes, 9 in. on side tapering to 3 in. at bow and 4 in. at stern, and fore and aft internal bulkheads 1½ in. thick for protection against torpedoes. These vessels were named "Espana," laid down in 1909, "Alfonso XIII." and "Jaime I.," in 1910.

Smaller Battleships.—At various times several of the naval powers have laid down smaller battleships than those already referred to, such as the British "Conqueror" and "Hero," of 6200 tons, launched in 1882 and 1888 respectively; the armoured Coast Defence ships of France, of which the "Admiral Trehouart," launched in 1893, of 6534 tons, 17 knots, carrying two 12-in. and eight 3·9-in. guns with good armour protection, is a good example; the monitors of the United States named "Little Rock," &c., launched in 1900, of 3235 tons and 12 knots, carrying two 12-in. and four 4-in. guns; and the principal battleships of the lesser European powers. A good example of the last is the Norwegian armour-clad "Norge" (fig. 81, Plate XV.). This vessel and her sister the "Eidsvold," with their predecessors "Harald Haarfagre" and "Tordenskjold," were built at Elswick for the royal Norwegian navy, and completed in 1900. They had a displacement of 3850 tons, length 290 ft., beam 50 ft. 6 in., draught 16 ft. 6 in., and with twin-screw engines of 4500 horse-power attained 16½ knots speed. They were heavily armed with two 8-in. B.L. guns in armoured gun-houses, one at each end of the vessel; six 6-in. Q.F. guns, four mounted in 5-in. nickel steel casemates, and two in the open, with strong shields; eight 12-pdrs. and six 3-pdrs.; and two submerged torpedo tubes. The water-line was protected with 6-in. Krupp armour over a length of 170 ft., and bulkheads of the same thickness were provided at each end of the belt. These ships form a class of vessels of small size which would prove formidable opponents to many larger armoured ships, and are especially useful for coast-defence purposes.

Table XVI. shows the development of the leading features of notable armoured battleships from the time of the "Warrior."

Cruisers.—The cruiser type was primarily intended to co-operate with armour-clad fleets, in the same manner as sailing frigates did with fleets of sailing line-of-battle ships, and the earliest cruisers were modelled directly upon the frigates which preceded them, the differences between the two being those incidental to the use of steam power and to the substitution of iron for wood as the building material. As steam propulsion grew in favour engines of greater power were provided, and the rig and sail-spread were reduced till at the present day they

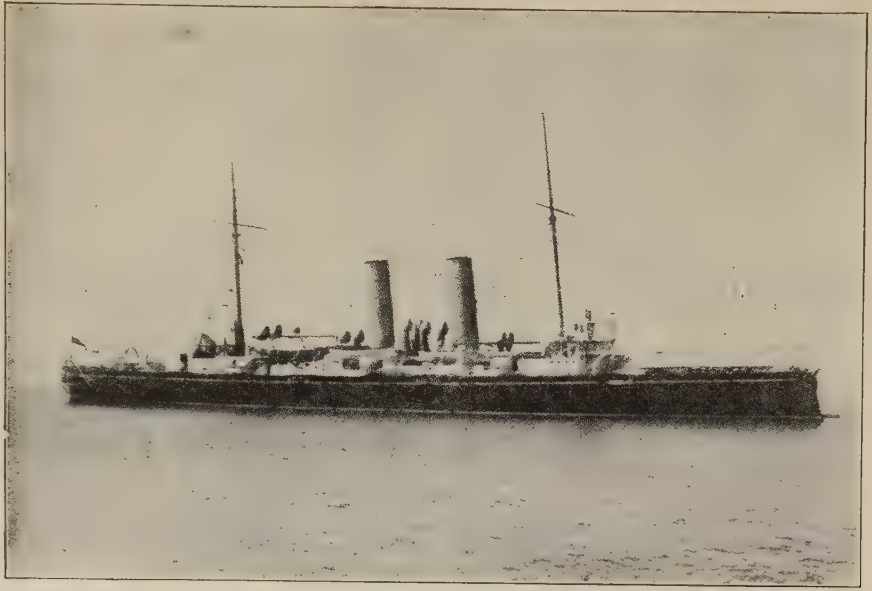


FIG. 87.—H.M.S. *Edgar*.

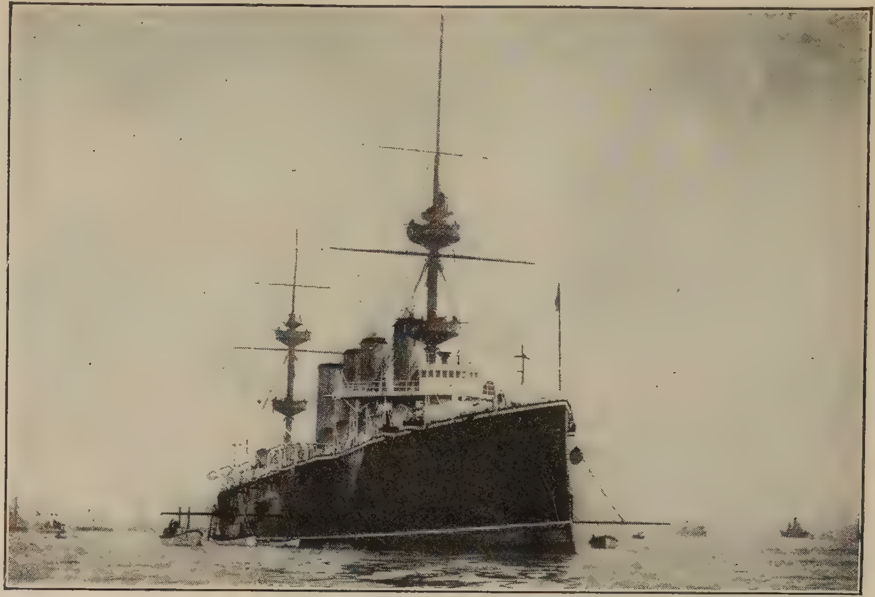
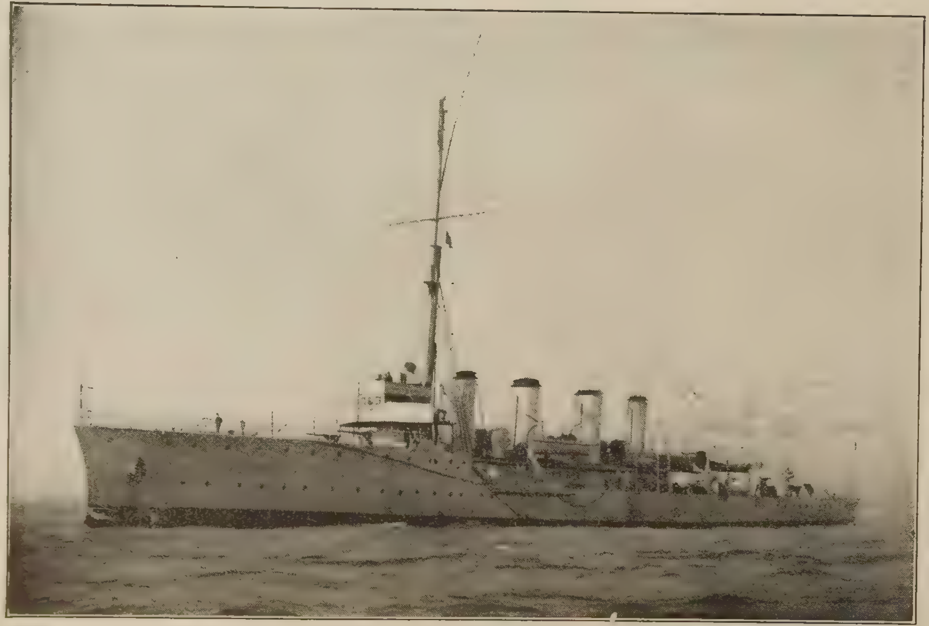


FIG. 88.—H.M.S. *Powerful*.



(*Photo, West.*)

FIG. 89.—H.M.S. *Attentive*.

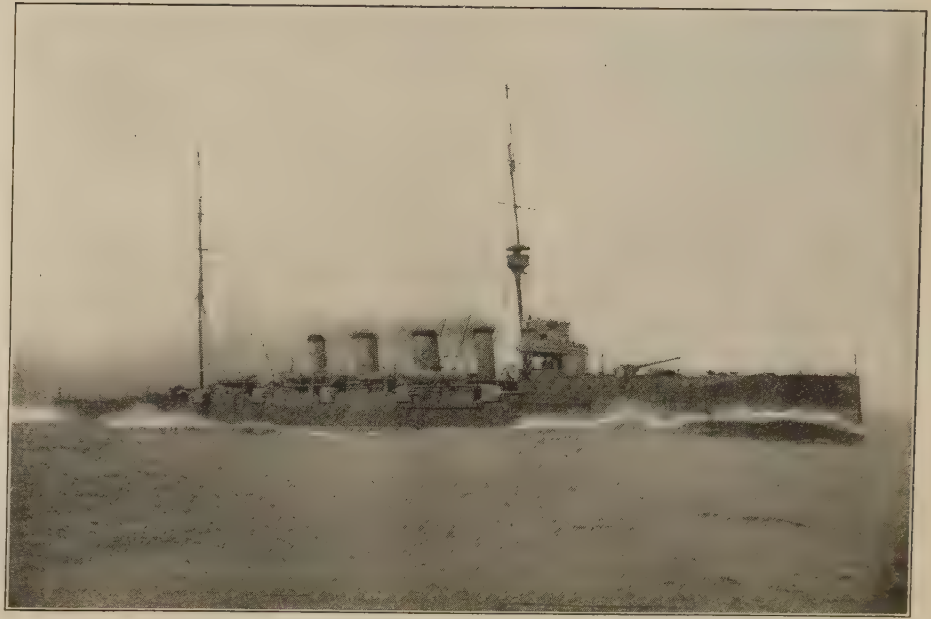


FIG. 90.—H.M.S. *Newcastle*.

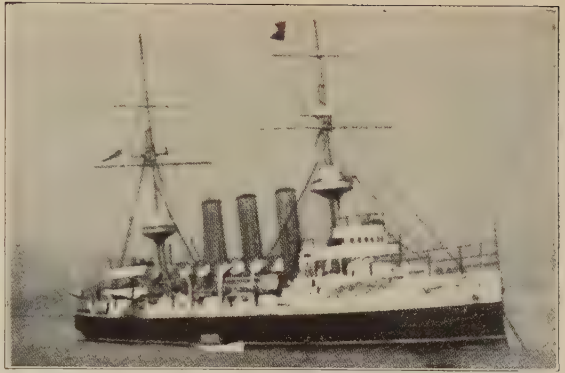


FIG. 85.—H.M.S. *Hermes*.

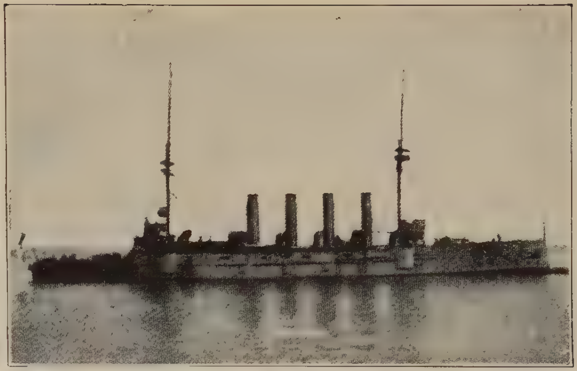


FIG. 86.—H.M.S. *Niobe*.

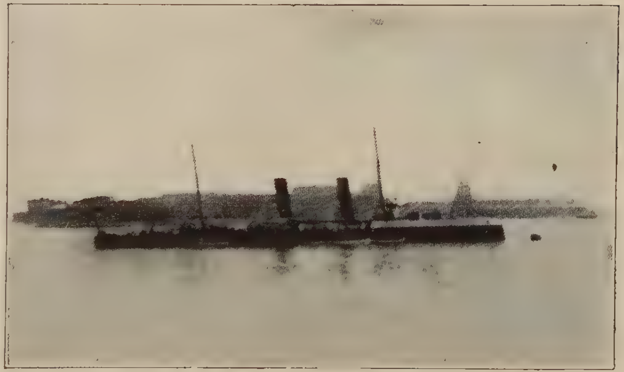


FIG 114.—H.M.S. *Sharpshooter*.

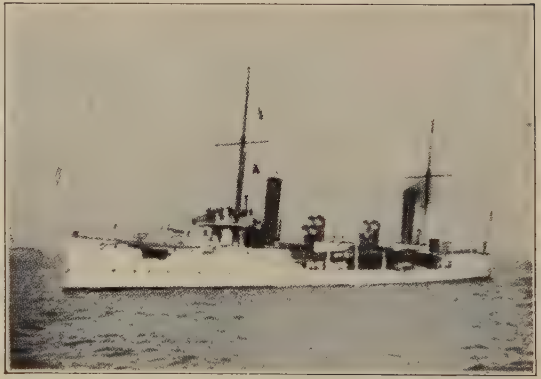


FIG. 115.—H.M.S. *Hazard*.

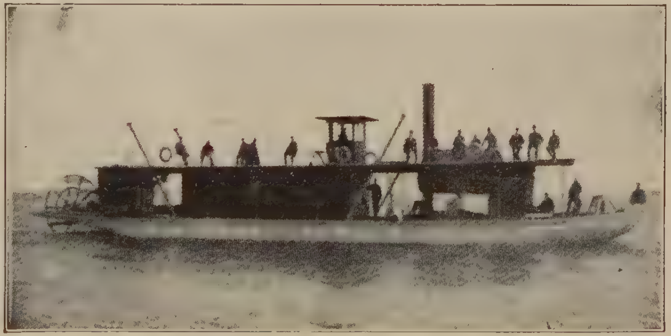


FIG. 111.—H.M.S. *Mosquito*.

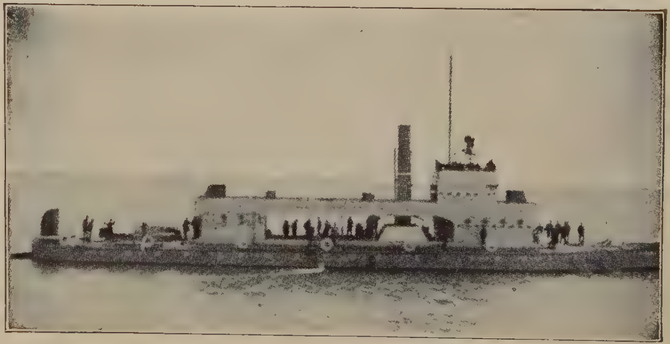


FIG. 112.—Nile Gunboat *Sultan*.

have entirely disappeared. When the final adoption of iron led to the remodelling of the details of construction by Sir E. J. Reed, the new system of construction was applied to the cruisers of the day, but no attempt was made till much later to give these cruisers any protection, nor was the question of their armament given the importance which it afterwards came to have.

Lord Armstrong was one of the first to recognize the importance of developing this class of vessel. He considered the essential features of a cruiser to be high speed, protection without the use of side armour, a powerful armament and minimum size and cost; and his views were adopted by the Elswick firm in a large number of cruisers built for foreign Powers down to the introduction of high explosives, when side armour was advocated in place of, or in addition to, the armour deck. The cruisers built for the British navy prior to 1880—of which the principal types were such vessels as the "Inconstant," of 5780 tons (1866); the "Active," of 3080 tons (1867); the "Raleigh," of 5200 tons (1871); and the faster despatch vessels "Iris" and "Mercury," of 3730 tons (1875)—had been almost entirely unprotected; and although the "Comus" and "Leander" classes had been given a partial protective deck, the Elswick-built "Esmeralda" (1883) (fig. 82, Plate XXIII.) may be quoted as the first vessel in which the important features of a complete protective deck and good protection to the guns were combined with high speed and a powerful armament. On the other hand, the "Impérieuse" and "Warspite," completed in 1881, of much greater displacement than the "Esmeralda," were provided with a partial belt of 10-in. compound armour in combination with a protective deck. Thus the necessity for protecting cruisers led to the introduction of two types—the "protected" cruiser, of which the "Esmeralda" may be taken as the pioneer, and the "armoured" cruiser, of which the "Impérieuse" and "Warspite" are early representatives; but while in the British navy the "protected" cruiser type was repeated and developed, the "armoured" type was discontinued, and with the exception of the "Orlando" class, built shortly afterwards, the whole of the cruisers built for the British navy for another fifteen years were of the "protected" type. In France and Russia, however, the armoured cruiser continued in favour, the "Dupuy de Lôme" of 1890, for the former, and the "Rurik" of 1892, for the latter, being vessels of this type.

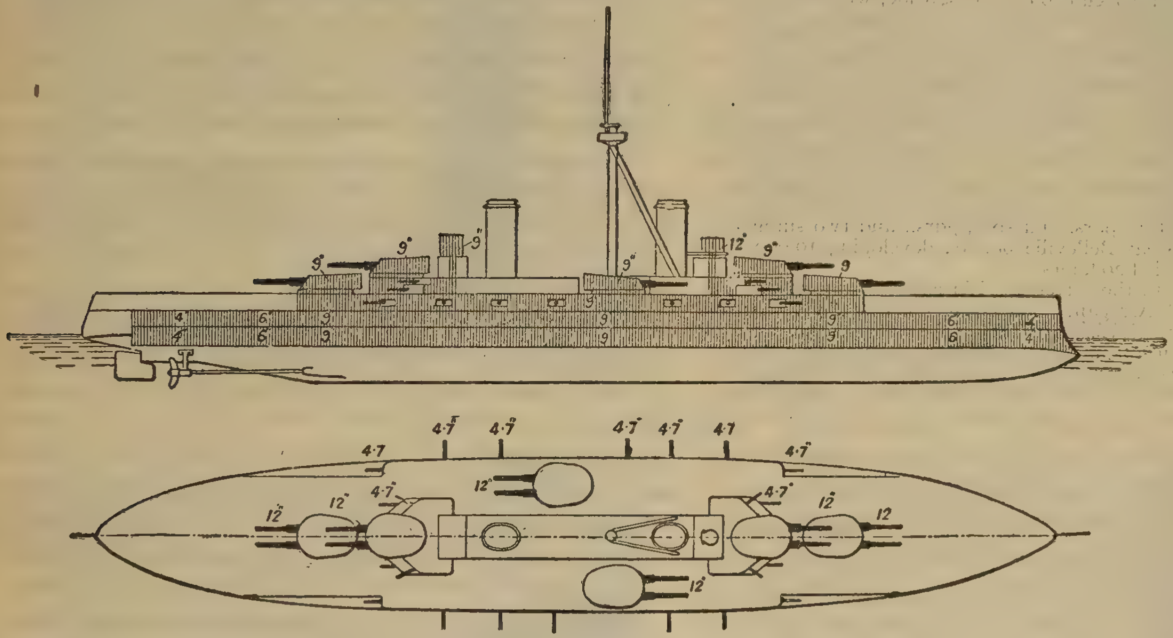


FIG. 80.—Arrangements of Guns and Armour of "Minas Geraes."

The reintroduction of side armour in British-built cruisers came about when the improvement of armour by the development of the Harvey and Krupp processes of manufacture enabled more efficient protection to be provided with a much thinner belt than had previously been possible. The Elswick cruiser "Esmeralda" (second), built for Chile in 1895, was one of the first in which the use of side armour was revived. She was followed by other vessels of the armoured type built by the same firm for the Chilean and Japanese navies. In 1898 the "Cressy" class (fig. 83, Plate XXI.) was begun for the British navy, and since this date all cruisers of 9000 tons and above for the British navy have been provided with side armour.

In the United States the adoption of armour belts of the new material for cruisers came somewhat earlier than it did in the British navy, the "Brooklyn" (fig. 84, Plate XXII.), built in 1895, being so protected; and the development of the type has been very marked in recent years, the tendency being to go to larger displacements, in order to provide greater protection and heavier armaments, with each new class of vessel. Indeed, the first-class armoured cruiser of 1910 might be very well described as a high-speed battleship.

In the British navy, as might be expected, the demand for vessels to meet the varied and diverse requirements that necessarily arise in a fleet of such magnitude has led to the production of a number of types, each adapted to its own special duties. They may be classified as (1) unprotected cruisers; (2) protected cruisers of first, second and third classes; and (3) armoured cruisers. Unprotected cruisers have neither side armour nor other protection against loss of buoyancy from injury by shot and shell. Protected cruisers have no side or vertical armour, but they have horizontal armour decks with strong sloping sides in the vicinity of the water-line, upon which coal is carried in minutely divided bunker compartments. Armoured cruisers have side or vertical armour in addition to protective decks. Each of these classes includes a number of groups of sister ships, but we shall confine ourselves to describing the main features of a representative ship in a few of the most important groups.

Second-class cruisers.

The protected cruiser of medium displacement affords a convenient starting-point, as the latest vessels of this type in 1910 were of about the same displacement as the largest first-class cruisers of thirty years before, and a comparison of representative ships of these classes illustrates the great advances made in thirty years in ships of approximately the same size; while a further comparison of these second-class cruisers (as the vessels of medium displacement are styled) with the first-class protected cruisers and the armoured cruisers of the present day shows the growth in size and power of the largest units of the cruiser type during the same period. It should, however, be noted that while some second-class cruisers reached such a displacement (5600 tons) as to allow of this comparison being made, the great bulk of the vessels of this class were smaller. The "Mersey" is an early example of a vessel of this class which has seen considerable service. Begun in 1883, her principal dimensions are: length 300 ft., beam 46 ft., mean draught about 20 ft., and displacement 4050 tons. Protection to the vitals of the ship is provided for by means of a protective deck a little above the level of the water-line, 2 to 3 in. in thickness, in combination with a system of coal-stowage in bunkers along the water-line. She carried two 8-in. and ten 6-in. B.L. guns and four torpedo tubes. Her horse-power was 6000 (forced draught) and speed 17·3 knots, and she carried 750 tons of coal at normal draught, with capacity for 900 tons. The "Astraea," begun in 1890, may be taken as representing the second-class cruisers of that date. She is built of steel, sheathed and coppered, is 320 ft. long, 49 ft. 6 in. beam, 21 ft. 6 in. mean draught and 4360 tons displacement, and carries two 6-in. Q.F. guns and eight 4·7-in. Q.F. guns, all on the upper deck and protected by shields, together with four torpedo tubes. She is protected by a steel deck 1 in. to 2 in. thick, and the engine cylinders, which project through this deck, are shielded by 5-in. sloping coamings. The coal bunkers in the neighbourhood of the water-line are minutely subdivided, and the stowage is arranged so as to make full use of the coal protection. Her engines develop 9000 H.P. (under forced draught) and her speed is 19·5 knots. Her coal stowage is 1000 tons.

The "Hermes" (fig 85, Plate XX.) is one of the largest second-class cruisers added to the Royal Navy. She is 350 ft. long, 54 ft. beam, 20 ft. 6 in. mean draught and 5600 tons displacement. She presents a striking contrast compared with the "Inconstant," built in 1866, of almost the same displacement. The "Inconstant" was fully rigged, and sailed almost as fast as she steamed; while the "Hermes" has no sail, and steams 20 knots, or 6 knots faster than did the older vessel. The "Inconstant" was entirely unprotected, and carried her guns on the broadside, with very limited arcs of training; whilst the "Hermes" has all-round fire, the fire ahead and astern is a very large percentage of that on the broadside, and her guns all train through large arcs (120° and above) and are well protected by enveloping shields, and the ship herself is protected by a steel deck 1½ to 3 in. thick, besides having coal protection. The "Inconstant's" main armament consisted of ten 9-in. and six 7-in. M.L. guns; the "Hermes'," of eleven 6-in. Q.F. guns, each firing probably ten rounds to one of the "Inconstant's" 9-in., and with a perforation of wrought iron of about one-third as much again. The "Hermes" is built of steel, sheathed with wood and coppered. She carries also eight 12-pdrs. and six 3-pdrs., and two submerged torpedo tubes. She has Belleville boilers, developing 10,000 H.P. and giving her a speed of 20 knots.

Somewhat similar to the "Hermes" in external appearance, the four vessels of the "Arrogant" class (fig. 86, Plate XX.) possess certain features of special interest which distinguish them from all other second-class cruisers, in which class they are usually included. They are of 150 tons greater displacement than the "Hermes," are 30 ft. shorter, but have 3 ft. 6 in. more beam and 6 in. more draught. They are built of steel and are unsheathed, have Belleville boilers, and engines giving 10,000 H.P. and a speed of 19 knots. They have an armament of four 6-in. Q.F. guns, three of which fire right ahead and one right astern; six 4·7-in. Q.F. guns, three on each broadside; eight 12-pdrs.; nine smaller guns; and two submerged torpedo tubes. All the guns are mounted on the upper deck in shields. The protective deck varies from 1½ in. to 3 in. in thickness. The bow is protected by a belt of 2-in. nickel steel extending to about 40 ft. back from the ram, the top of this belt being level with the main deck, and the bottom edge sloping downwards to strengthen the ram, and a cofferdam formed by two water-tight transverse bulkheads about 3 ft. apart, and extending from keel to main deck, separates the bow from the rest of the vessel. The "Arrogants" are fitted with tandem rudders, and the deadwood at the after end of the ship is cut away.

The "Gladiator," which was sunk in the Solent in 1908 after collision with the "St Paul," was one of the "Arrogant" class. The Canadian cruiser "Rainbow," one of the "Apollo" class, very similar to but smaller than the "Astraea" class, is of 3400 tons, 9000 I.H.P., 20 knots, and carries two 6-in. Q.F., six 4·7-in. Q.F., eight 6-pdrs., and four torpedo tubes.

First-class cruisers.

The protected cruisers of greater displacement, or first-class cruisers, as they were called, may be divided into four well-marked classes: "Blake" and "Blenheim" class, "Edgar" class (fig. 87, Plate XIX.), "Powerful" and "Terrible" class (fig. 88, Plate XIX.) and the "Diadem" class. The "Blake" and "Blenheim," begun in 1888, were amongst the earliest cruisers designed by Sir William White at the Admiralty; they are of 9000 tons displacement, 375 ft. long, 65 ft. beam and 27 ft. draught. They carry two 9·2-in. B.L. guns, one firing directly ahead and the other directly astern, protected by open shields 6 in. thick; ten 6-in. Q.F. guns, of which four are on the main deck, protected by casemates of 6-in. compound armour, and six on the upper deck in shields; sixteen 3-pdrs.; two submerged and two above-water torpedo tubes. Their protection consists of a complete armour deck of steel 3 in. to 6 in. thick, with a dome or coaming over the tops of the cylinders 4 in. to 8 in. thick. Their machinery consists of four independent sets of vertical triple-expansion engines, two on each shaft, for which steam is provided from six double-ended cylindrical boilers, giving 20,000, H.P. under forced draught, and a speed of 21 knots; with open stokeholds their power is 13,000 H.P., which gives them a speed of 19¼ knots. They carry 1500 tons of coal. The "Edgar" class, begun in 1889, are vessels of 7350 tons displacement, 360 ft. long, 60 ft. beam and 23 ft. 9 in. mean draught. Their armaments consist of two 9·2-in. B.L. guns and ten 6-in. Q.F., disposed and protected in the same way as the corresponding guns of the "Blake," with twenty-four smaller and machine guns, two submerged and two above-water torpedo tubes. The protective deck has a maximum thickness of 5 in., and the cylinders are protected by a raised coaming on this deck, with sloping sides 6 in. thick. They have six double-ended cylindrical boilers and two sets of vertical triple-expansion engines, developing with forced draught 12,000 I.H.P. and giving a speed of 20 knots They carry 850 tons of coal at normal draught, with storage for 1250 tons. Nine vessels of this class have been built, four of them being sheathed with wood and coppered, the remaining five, including the "Edgar," being unsheathed. The "Powerful" and her sister the "Terrible" are the largest protected cruisers which have been built. They were begun in 1894. They are of steel, sheathed with wood and coppered, are of 14,200 tons displacement, 500 ft. length, 71 ft. beam and 27 ft. mean draught, armed with bow and stern 9·2-in. B.L. chasers, and twelve 6-in. Q.F. guns, of which eight are in 6-in. Harveyized casemates on the main deck and four in similar casemates on the upper deck. They have also eighteen 12-pdr. Q.F. guns, twelve 3-pdrs., nine machine guns and four submerged torpedo tubes. The 9·2-in. guns are protected by a shallow ring of 6-in. Harveyized steel, surmounted by a 6-in. shield enveloping the gun and crew. The ship herself is protected by a complete deck at the water-line level of Harveyized steel plates 3 in. to 6 in. in thickness, and by a double line of coal bunkers above it. The machinery arrangements constitute the striking feature of these ships. They have no less than forty-eight Belleville boilers in eight boiler-rooms, with two sets of triple-expansion 4-cylinder engines, developing 25,000 H.P. with open stokeholds and giving the ships a speed of 22 knots. They carry as a normal supply 1500 tons of coal, and their bunkers will hold 3000 tons. Four 6-inch guns were added on the upper deck of these ships in 1902.

The "Diadem" class, launched in 1897 and 1898, were the last first-class protected cruisers added to the British navy. There are eight vessels of this class, but in the four last-built vessels, of which the "Spartiate" was one, some changes were made. The first vessel of the "Diadem" class was begun in 1895, is of 11,000 tons displacement, 435 ft. length, 69 ft. beam, 25 ft. 3 in. mean draught, and is built of steel, sheathed and coppered. Her principal armament consists entirely of 6-in. Q.F. guns, of which there are sixteen, twelve being protected by 5-in. casemates of Harveyized steel, and the others disposed, two on the forecastle as bow chasers, and two on the quarter-deck as stern chasers, all in separate shields. She also carries thirteen 12-pdrs., eleven smaller guns, including machine guns, and two submerged torpedo tubes. The protection consists of a steel deck, whose slopes are 4 in. thick and horizontal portions 2½ in. thick, upon which is stowed the 1000 tons of coal which the vessel ordinarily carries, the full coal capacity being 2000 tons. She is provided with 30 water-tube boilers of the Belleville type, and her machinery develops 16,500 H.P., giving her a speed of 20·5 knots. The Canadian cruiser "Niobe" is one of the first four; in the last four ships the casemates are 6 in. thick and the machinery is of greater power, viz. 18,000 I.H.P., giving a speed of a quarter of a knot higher.

Third-class cruisers.

Third-class protected cruisers included vessels varying in displacement from 1500 to 3000 tons. With a reduction of displacement come reduction of initial cost and cost of upkeep, a smaller crew, a shorter time for building, and the many advantages attendant upon reduced size and draught of water. It has been found possible to embody in a ship of about 2000 tons displacement many of the most important requirements of a modern cruiser, and a large number of vessels of this class have been added to the fleet. Among these may be mentioned the "Barham," a typical small cruiser, which was built in 1889 of steel, of 1830 tons displacement; she is 280 ft. long between perpendiculars, 35 ft. broad and of 12 ft. 8 in. draught of water. As originally completed, this vessel had cylindrical boilers and a H.P. of 4700, giving a speed of 19 knots. In 1898 she and her sister, the "Bellona," were reboilered with water-tube boilers of the Thornycroft type, and with these a H.P. of 6000 is obtained, and the vessel reaches a speed of nearly 20 knots. The protection afforded is in the usual form of a protective deck, 1 in. thick on the flat, and sloping sharply downwards near the water-line, where the thickness is increased to 2 in.; and above this deck the coal stowage is arranged in subdivided bunkers. She carries an armament of six 4·7-in. Q.F. guns in shields on the upper deck, four 3-pdrs., two machine guns and two above-water torpedo tubes. She carries 140 tons of coal in her normal condition, and her bunkers will take 250 tons. She has a light fore-and-aft rig. The "Barham" was followed by several vessels of the "Tauranga" class, built for service in Australian waters, and the "Pearl" class for service in other waters, all of 2575 tons displacement, 19 knots speed and carrying eight 4·7-in. and eight 3-pdr. Q.F. guns. In 1896–1898 nine smaller and faster cruisers were laid down, known as the "Pioneer" class, which might be taken to include the "Pelorus" class, the differences between them being small. Of the two classes eleven vessels have been built. The "Pioneer" is 305 ft. long, 36 ft. 9 in. broad, 13 ft. 6 in. mean draught and of 2200 tons displacement. She has water-tube boilers of the small-tube type,

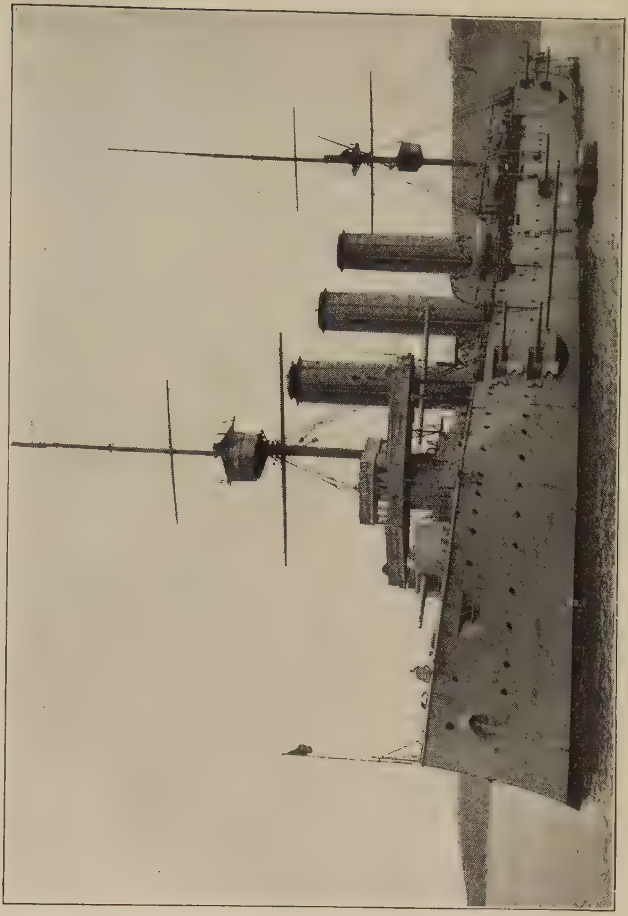


FIG. 93.—H.M.S. *Cornwall.*

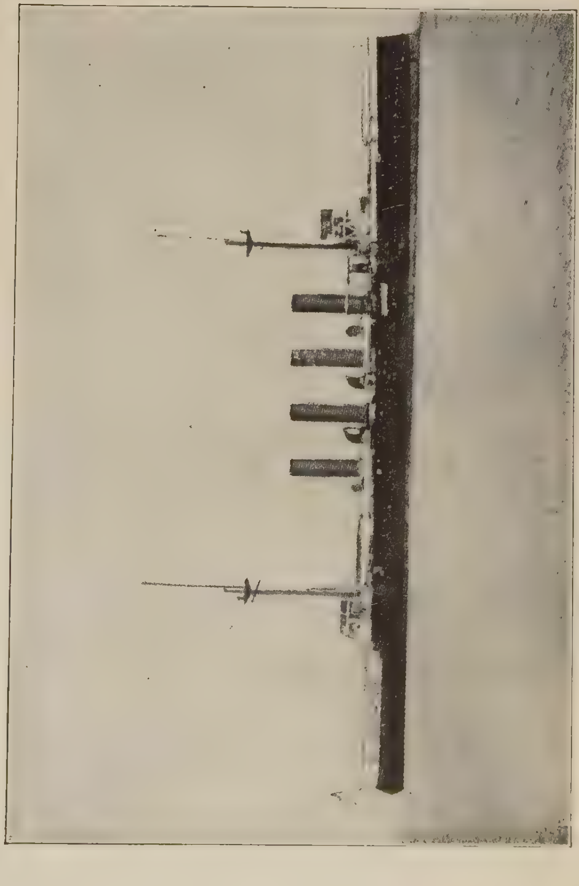
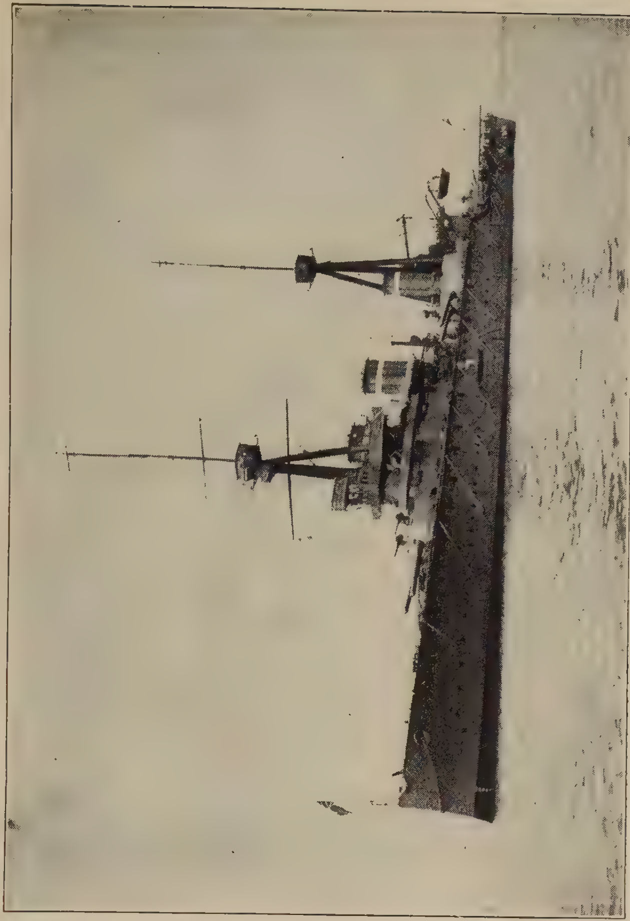


FIG. 83.—H.M.S. *Cressy.*



(*Hopkins.*)

FIG. 95.—H.M.S. *Invincible.*

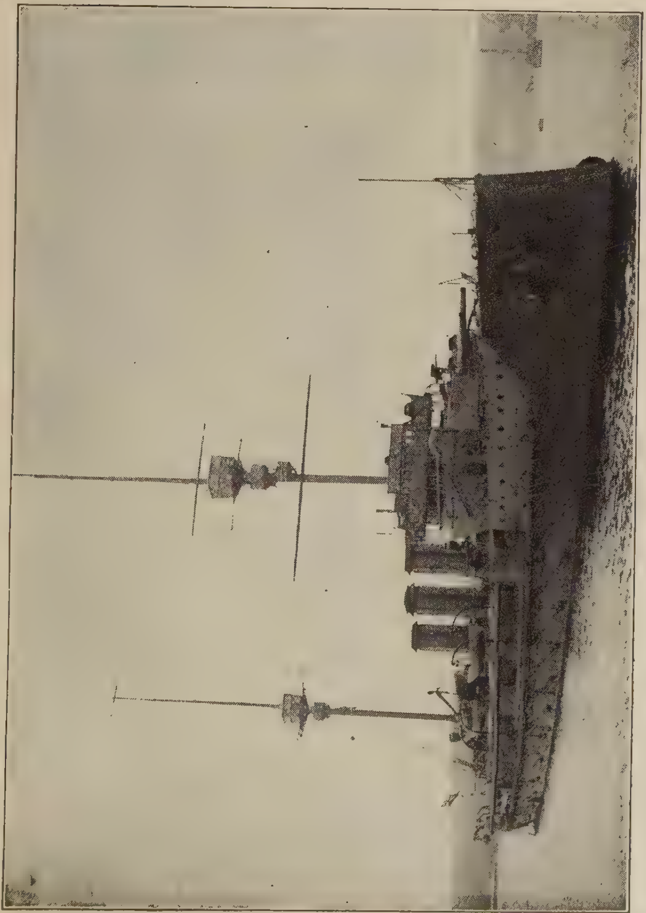


FIG. 94.—H.M.S. *Minotaur.*

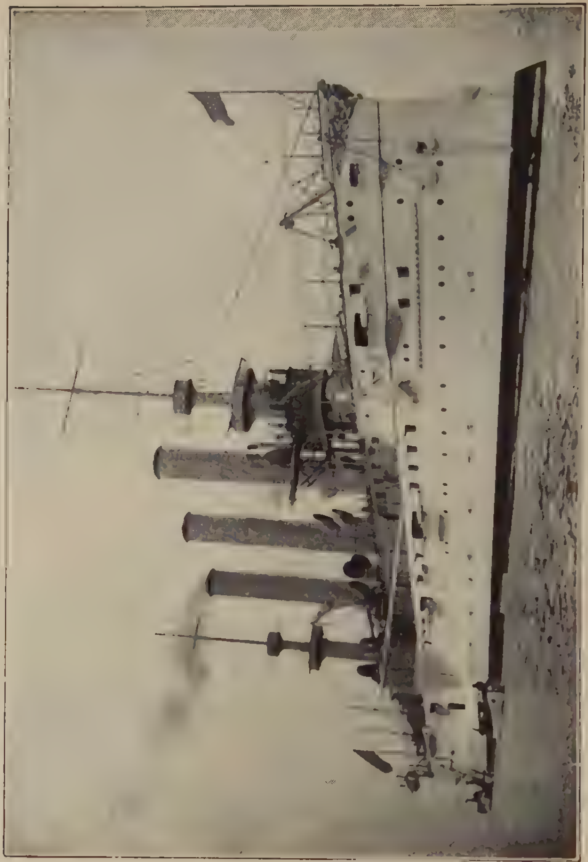
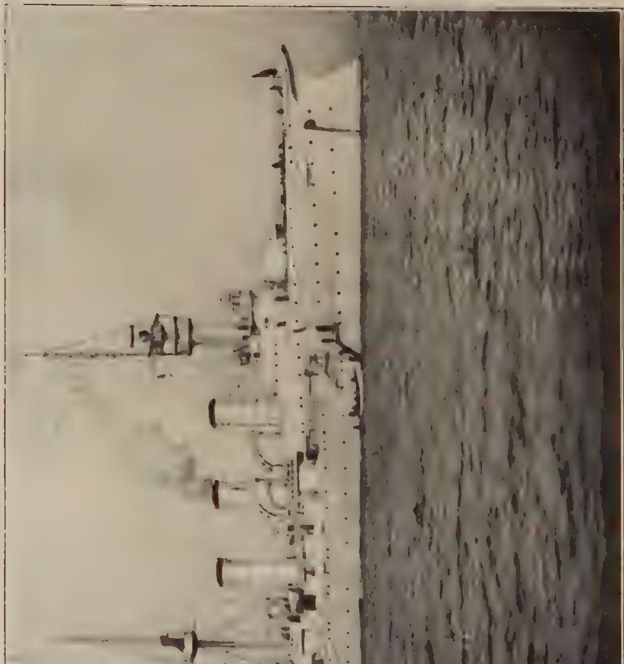
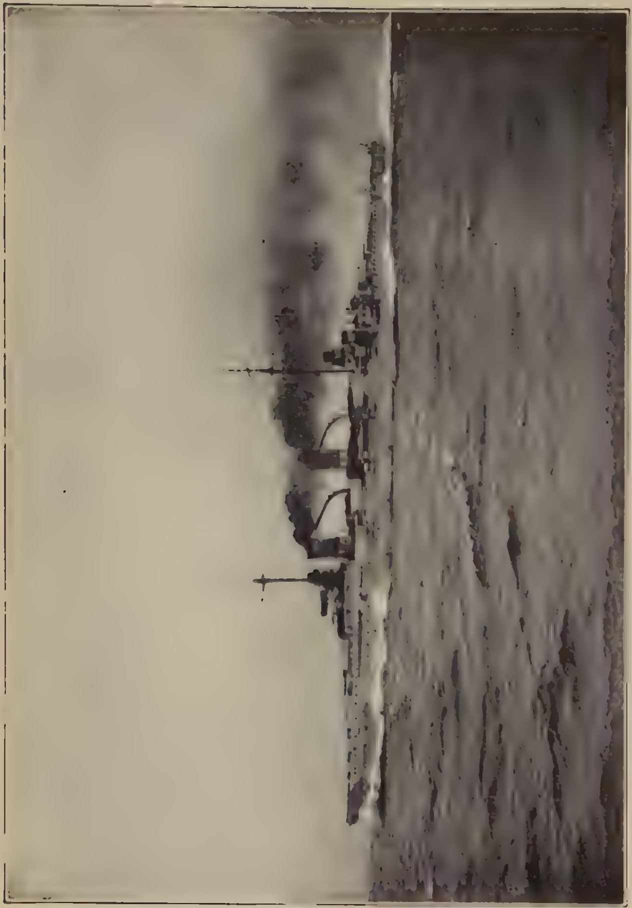


FIG. 84.—U.S.A. *Brooklyn*.



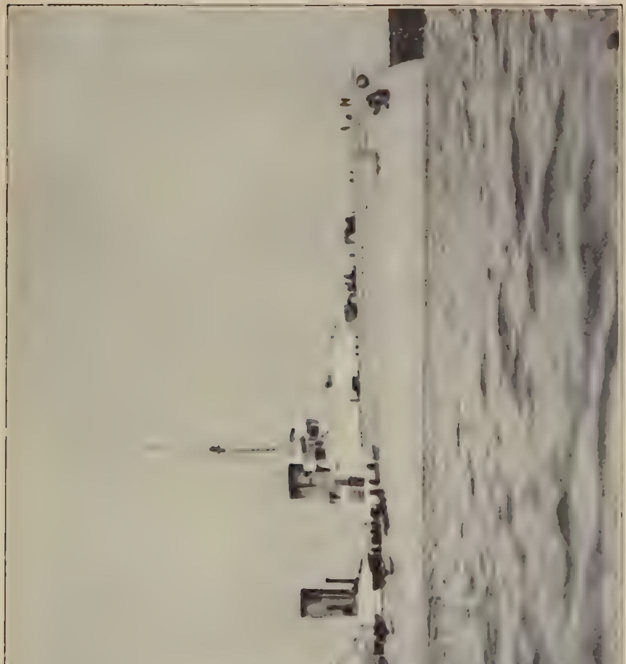
(*West.*)

FIG. 100.—German *Victoria Luise*.



(*Symons.*)

FIG. 101.—German *Blücher*.



(*Symons.*)

FIG. 102.—German *Von-der-Tann*.

and engines of 7000 H.P., giving her a speed of 20 knots. She carries 250 tons of coal at the above displacement, and has stowage for 550 tons. She has eight 4-in. Q.F. guns, eight 3-pdrs., and two above-water torpedo tubes, and a 2-in. protective deck.

This type of cruiser reached its final development in the four vessels of the "Diamond" class, of 3000 tons, laid down in 1902–1903, which were the last third-class cruisers designed by Sir William White. Three of the vessels, "Diamond," "Sapphire" and "Topaze," were fitted with reciprocating engines of 9800 I.H.P. for 22 knots, and in the fourth, the "Amethyst," Parsons turbines were fitted. All were 360 ft. long., 40 ft. beam, 14 ft. 6 in. draught, and carried twelve 4-in. and eight 3-pdr. Q.F. guns. On trial the "Topaze" reached a maximum speed of 22·25 knots, while the "Amethyst" obtained 23·63 knots, an advantage of 1·38 knots per hour for the turbine with practically the same coal consumption, and with a distinctly less rate of coal consumption at equal speeds for all speeds above 14 knots. The experiment was regarded as a great success for Parsons turbines, and materially influenced the question of their adoption in succeeding vessels at home and abroad.

In 1903 four vessels classed as *scouts* were laid down, viz., the "Pathfinder," "Patrol," "Sentinel" and "Skirmisher," of about 2900 tons displacement, and 25 knots speed; 370 ft. long, with engines of 17,000 I.H.P., and carrying ten 12-pdr. and eight 3-pdr. Q.F. guns as well as two torpedo tubes. Two others laid down in 1903 were named "Forward" and "Foresight," and carried fourteen 12-pdrs. and two 3-pdrs., and obtained the 25 knots with 15,000 I.H.P. The last two of the series — "Adventure" and "Attentive" (fig. 89, Plate XIX.)—of 16,000 I.H.P. and 26 knots, were laid down at Elswick in 1904; they were 374 ft. long, 38 ft. 3 in. beam, 12 ft. 6 in. draught, 2670 tons displacement, 16,000 I.H.P., carried ten 12-pdrs. and eight 3-pdrs.

Four vessels, named "Boadicea," "Bellona," "Blanche" and "Blonde," were laid down in 1907–1909, of slightly larger dimensions, the "Blonde" being 385 ft. long, 41 ft. 6 in. beam, 13 ft. 6 in. draught, 3360 tons displacement, 18,000 I.H.P., 25 knots, and armed with ten 4-in. Q.F. guns and two torpedo tubes.

In 1909 five vessels of 4800 tons displacement, 22,000 I.H.P., 25 knots speed, carrying two 6-in. and ten 4-in. Q.F. guns, with two torpedo tubes, were laid down and known as second-class protected cruisers of the "Bristol" class. They are 430 ft. long, 47 ft. beam, 15 ft. 3 in. draught and protected by a 1-in. steel deck with 2-in. slopes. Fig. 90, Plate XIX., shows the "Newcastle," a vessel of this class built at Elswick. Four other vessels, the "Dartmouth" class, laid down six months later, were very similar, but slightly larger to give one knot more speed. The navy estimates for 1910–1911 provided for laying down five larger vessels of this type. The Australian cruisers "Melbourne" and "Sydney" are of the "Dartmouth" class, while the new Canadian cruisers are of the later type.

Armoured cruisers.

Between 1870 and 1881, several armoured cruisers were laid down in England and abroad, those in England being the "Shannon," of 5390 tons and 12½ knots, laid down in 1873, the "Nelson" and "Northampton," of 7630 tons and 13 knots, laid down in 1874, and the "Impérieuse" and "Warspite," laid down in 1881. The two last-named ships were provided with masts and a good spread of sails, and were the last large vessels to be so fitted for the British navy. The sails were not found to be of much service and were removed. These vessels were of 8400 tons displacement, 315 ft. long, and were protected by a partial belt amidships of 10-in. compound armour over a length of about 140 ft., with a protective deck above it 1½ in. thick and transverse bulkheads at the ends of the belt 9 in. thick, the protective deck from these bulkheads to the ends of the ship being 3 in. thick. They had machinery of 10,000 H.P. and a speed of 16¾ knots. They carried four 9·2-in. B.L. guns in separate barbettes—one forward, one aft, and one on each beam—besides ten 6-in. guns, twenty-six smaller and machine guns, and six torpedo tubes. They were sheathed with wood and coppered, in order to be able to keep the sea for a long period without docking. The next vessels of the type were the "Orlando" class, begun in 1885. Seven of these were launched in 1886 and 1887. They were much smaller than the "Impérieuse," being only 5600 tons displacement, 300 ft. long and 56 ft. beam, and 22 ft. 6 in. draught. They had a water-line belt of compound armour, 10 in. thick and nearly 200 ft. long; extending over the top of this, and sloping down forward and aft to the ends of the ship, was a deck 2 in. to 3 in. thick. Their armament consisted of two 9·2 in. B.L. guns—one forward and one aft—instead of the four carried in the "Impérieuse" and "Warspite," but in other respects the same armament as the latter ships. They had engines of 8500 H.P. and a speed of over 18 knots. These vessels were all built from the designs of Sir N. Barnaby.

As already stated, between 1885 and 1898 no armoured cruisers were laid down for the British navy. The "Cressy" (fig. 83, Plate XXI.) class, commenced in 1898, consists of six vessels of 12,000 tons displacement, 440 ft. length, 69 ft. 6 in. beam, and 26 ft. 3 in. mean draught. They are built of steel, sheathed and coppered, have a belt of Harveyized steel 11 ft. 6 in. wide, 230 ft. long, and 6 in. thick, with bulkheads 5 in. thick and 2 in. protective plating on the sides from the forward bulkhead to the stem. They carry two 9·2-in. B.L. guns in barbettes and gun-houses 6-in. thick, mounted on the middle line forward and aft, twelve 6-in. Q.F. guns in 6-in. casemates, and twenty-five 12-pdrs. and smaller guns, with two submerged torpedo tubes. Their H.P. is 21,000 with natural draught, steam being supplied by 30 Belleville boilers, and their speed is 21 knots. They carry 800 tons of coal at normal draught, with capacity for 1600 tons.

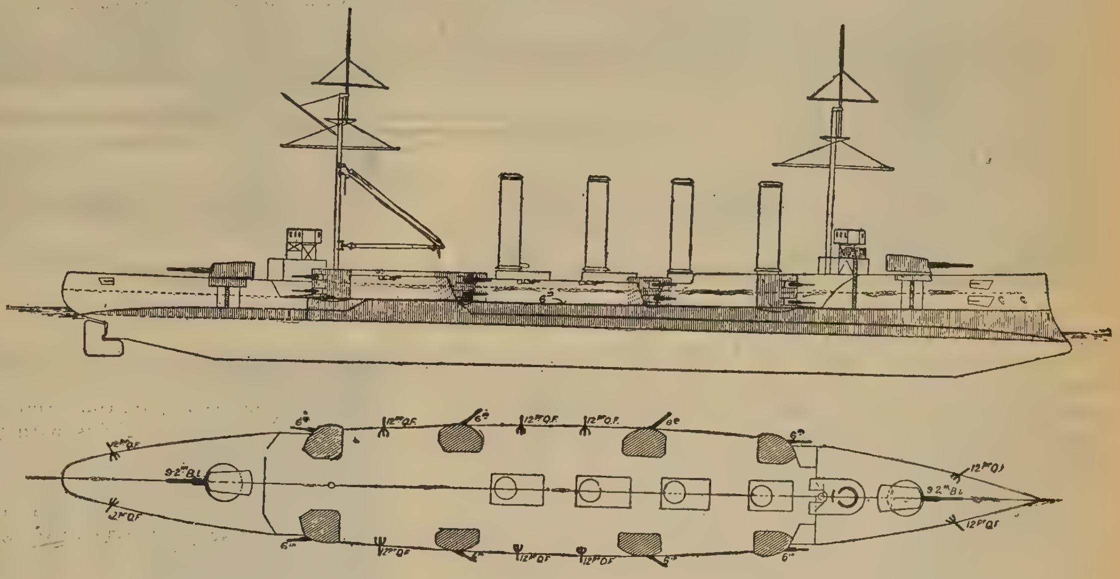


FIG. 92.—Arrangement of Guns and Armour of H.M.S. "Drake."

The four vessels of the "Drake" class (see fig. 91, Plate XXIV.), laid down in 1899, were for several years the largest and fastest armoured cruisers afloat. They are of 14,100 tons displacement, are 500 ft. long, 71 ft. beam, and 26 ft. mean draught. They are unsheathed, are protected by a Krupp steel 6-in. belt extending from barbette to barbette, and from 6 ft. below water to the height of the main deck, completed at the after end by a 5-in. bulkhead, and carried forward to the bow by 2-in. plating extending right up to the upper deck. There are two protective decks, the lower, being 3 in. to 2 in. in thickness, and the main deck, which is 1 in. thick. Their armament consists of two 9·2-in. B.L. guns in barbettes and gun-houses 6 in. thick on the middle line forward and aft as shown in fig. 92, sixteen 6-in. Q.F. guns in 6-in. casemates, fourteen 12-pdrs., twelve smaller and machine guns and two submerged torpedo tubes. Their speed was 23 knots as designed, and all the vessels of the class have attained over 24 knots on service. They have engines of 30,000 H.P., the boilers being of the Belleville type. They carry 1250 tons of coal, with bunker capacity for 2500 tons.

A consideration of the above features will illustrate the difficulties of the classification of modern ships. The "Drake" is called an armoured cruiser, but she is superior to the battleships "Renown," "Barfleur," and "Canopus" in armour protection and in her secondary quick-firing armament, as well as in speed and coal endurance, and is somewhat inferior to them only in the number, weight, and protection of primary armament. If 10-in. guns had been given to this vessel in lieu of her 9·2-in., she would probably have been called a first-class battleship, and would have been a 23-knot battleship at that. Each successive increase of size has given the battleship more speed and the armoured cruiser heavier guns and armour, thus tending to merge the two types in one.

The next series of armoured cruisers was composed of ships of much less power produced in reply to the fast lightly armed cruisers being built abroad as commerce destroyers, and a considerable number of such vessels so built, although weak compared with the "Drake," were much less costly and at the same time endowed with great sea-keeping power and were superior in all respects to the vessels which caused them to be built. The first set comprised ten vessels of the "Monmouth" class, laid down in 1900 and 1901. Fig. 93 (Plate XXI.) gives a view of the "Cornwall," which may be taken as typical of the class. They are of 9800 tons displacement, length 440 ft., beam 66 ft., mean draught 24 ft. 6 in. They are armoured with a belt of 6 in. of Krupp steel over the main part of the length, diminishing in thickness towards the extremities; they carry fourteen 6-in. Q.F. guns, of which ten are in 4-in. casemates, and the others mounted in pairs in turrets and gun-houses 4 in. thick, forward and aft; they also carry ten 12-pdr., eleven small and machine guns and two submerged torpedo tubes. Their horse-power is 22,000, giving them a speed of 23 knots.

They were followed by six vessels of the "Devonshire" class, laid down in 1902, which were given greater gun power and better armour protection to meet the corresponding advances in foreign vessels. They were of 10,850 tons displacement, 21,000 I.H.P. and 23¾ knots speed; were armed with four 7·5-in. and six 6-in. Q.F. guns protected by 6-in. armour, and the armour belt was increased from 4 in. to 6 in. in thickness. These were the last armoured cruisers designed by Sir William White.

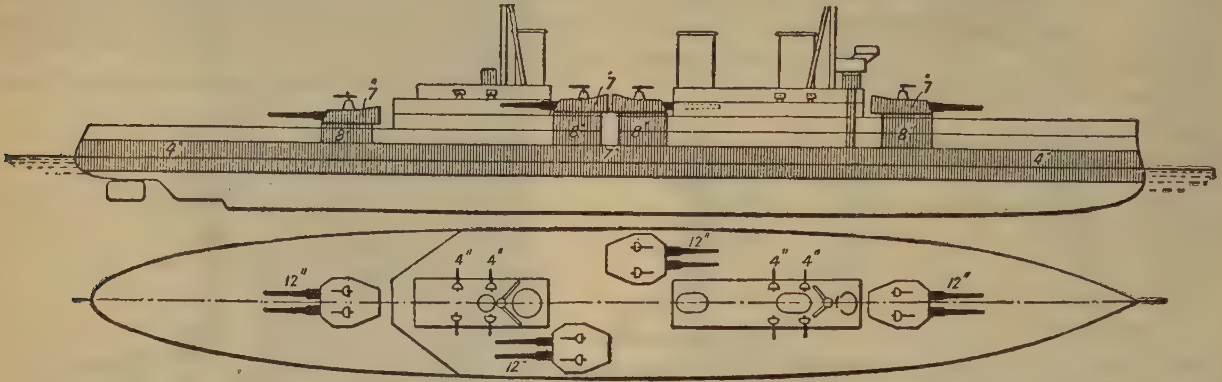


FIG. 96.—Arrangement of Guns and Armour of H.M.S. "Invincible."

The next armoured cruisers built for the British navy, the six vessels of the "Duke of Edinburgh" type, laid down in 1903–1904, were of much greater power, of 13,550 tons displacement, 23,500 I.H.P. and 23 knots speed, and have a main armament of six 9·2-in. guns, mounted singly in barbettes. The secondary armament consists of ten 6-in. Q.F. guns in the first two vessels of the class, but in the remaining four vessels the ten 6-in. guns are replaced by four 7·5-in. guns. They also carry from twenty-five to twenty-nine 3-pdrs. and machine guns and three torpedo tubes. The guns and ship's side are protected by 6-in. armour. In 1905 the "Minotaur" class (fig. 94, Plate XXI.) was laid down, consisting of three vessels of 14,600 tons displacement, 27,000 I.H.P. and 23 knots speed, carrying an armament of four 9·2-in. guns mounted in pairs in 7-in. barbettes forward and aft, and ten 7·5-in. guns all on the upper deck in shallow barbettes of 6-in. armour, with 6 in. enclosed shields. The belt armour is 6 in. thick amidships, tapering to 4 in. forward and 3 in. aft. These vessels are 490 ft. long, 74½ and 75½ ft. beam, 25 to 26 ft. mean draught, and are the last large cruisers to be propelled by reciprocating engines, or to be armed with 9·2-in. guns. They carry 1000 tons of coal on the load draught, and can stow 2000 tons of coal besides 700 tons of oil fuel.

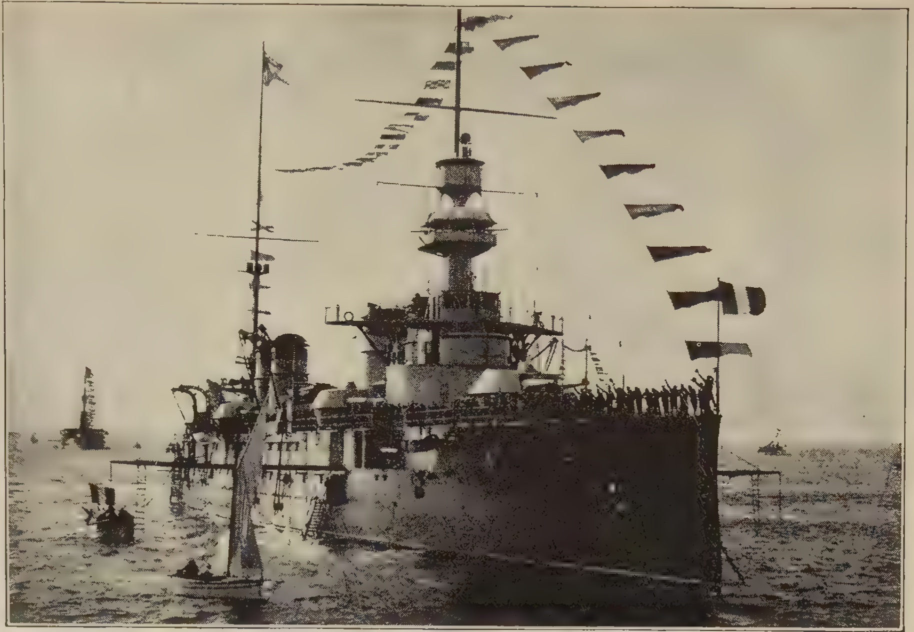
Dreadnought cruisers.

The next cruisers to be built were the "Invincibles," which might have been classed as battleships on account of their heavy armament and substantial armour protection; the former greatly exceeding in power the armament of any battleship before the "Lord Nelson," and the latter exceeding that provided in any armoured cruisers. Their most striking feature, however, is their great speed, previously only reached by torpedo boats and torpedo boat destroyers, in which everything was sacrificed to obtain the highest possible speed. They were named "Invincible" (fig. 95, Plate XXI.), "Indomitable" and "Inflexible," and were laid down in 1906 at the yards of the Elswick, Fairfield and Clydebank Companies respectively. Their dimensions were:—length 530 ft., breadth 78 ft. 6 in., draught 26 ft., displacement 17,250 tons. They were armed with eight 12-in. guns mounted in pairs in four barbette turrets placed as already stated in describing the development of the "Dreadnought" design (see Table XIV. and fig. 96). Thus three pairs of guns can fire directly ahead, three directly astern, and the whole armament can fire on either broadside. In the "Invincible," built at Elswick, all the heavy guns are worked by electric power; in the other vessels they are worked by hydraulic power as usual in H.M. Navy. An anti-torpedo boat armament of sixteen 4-in. guns is provided. The 12-in. guns are protected by 8-in. armour, and a broad belt of side armour is fitted 7 in. thick amidships, and 4 in. forward and aft, associated with thick protective decks. All are fitted with Parsons turbines of 41,000 H.P. and obtained over 27 knots on trial without pressing the boilers. The high steaming power of these ships was shown by the "Indomitable," which conveyed King George V. and Queen Mary (then prince and princess of Wales) to Canada and back in 1908, and steamed on her return journey across the Atlantic—from Belleisle to the Fastnet—at an average speed of 25·13 knots, a record speed at the time for a transatlantic voyage.

It is interesting to compare the "Indomitable's" performance on the voyage referred to above with that of the "Hero"—a screw line-of-battle ship of 91 guns and 600 nominal horse-power, when employed on a similar errand. This ship was considered a crack ship of her class in 1860, and in that year was selected to convey King Edward VII. (then prince of Wales) on a visit to Canada; she made the passage from Plymouth to St John's in 13 days under steam and sail, and this was considered an exceedingly good performance for a line-of-battle ship in those days.

In 1909 the "Indefatigable" of 18,750 tons displacement was laid down at Devonport; she is very similar to the "Invincible," with the same armament and certain minor improvements. She was followed in 1910 by the "Lion" at Devonport and "Princess Royal" at Barrow, each 660 ft. long, 88 ft. 6 in. beam, and of 26,350 tons displacement on a draught of 28 ft. Parsons turbines of 70,000 H.P. are provided to give a sea speed of 28 knots. Table XVII. contains further particulars of the British "Invincibles," from which it may be seen that the Australian cruisers "Australia" and "New Zealand" are similar to the "Indefatigable."

With regard to cruisers of other navies than the British, it may be said that the vessels constructed at Elswick exercised considerable influence in their development as well as of those of the British navy. The "Esmeralda" (fig. 82, Plate XXIII.) of 1883, built for the Chilean government, but bought by Japan in 1895 and re-named "Idzumi," was of 2950 tons displacement, had 6000 H.P. and 18·3 knots speed, was protected by a complete 1-in. steel deck, and carried the very heavy armament of two 10-in. B.L. guns, six 6-in. Q.F., two 6-pdrs., seven smaller guns and three torpedo tubes. The "Piemonte" (fig. 97, Plate XXIV.), built for the Italian navy in 1888, had a displacement of only 2640 tons, but was of 13,000 H.P. and had a speed of nearly 22½ knots. She was protected by a steel deck of 3 in. maximum thickness, and carried six 6-in. Q.F., six 4·7-in. Q.F., ten 6-pdrs., eleven smaller guns and three torpedo tubes, an armament which, as pointed out by Lord Armstrong, was capable of discharging in a given time twice the weight of shot and shell that could be fired by the largest war vessel then afloat. The "Buenos



(West.)

FIG. 104.—French *Leon Gambetta*.

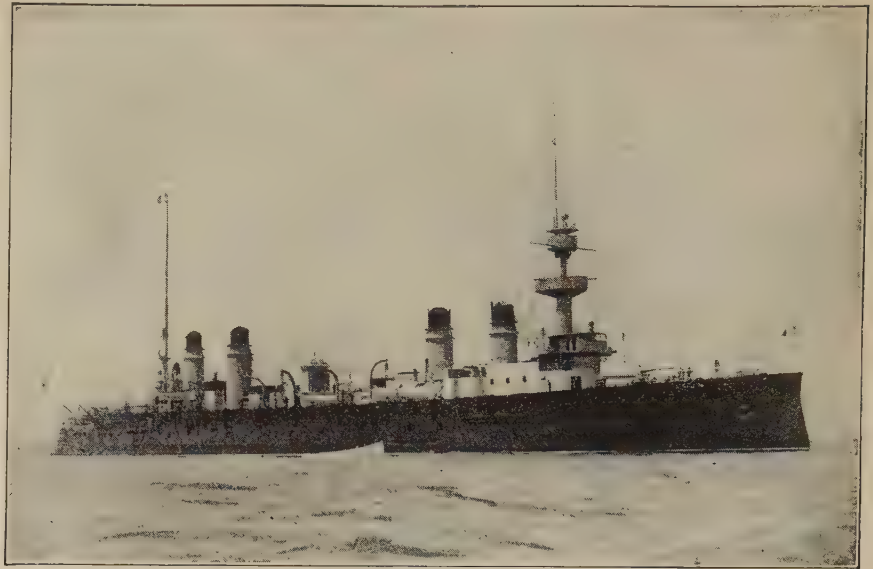


FIG. 103.—French *Montcalm*.

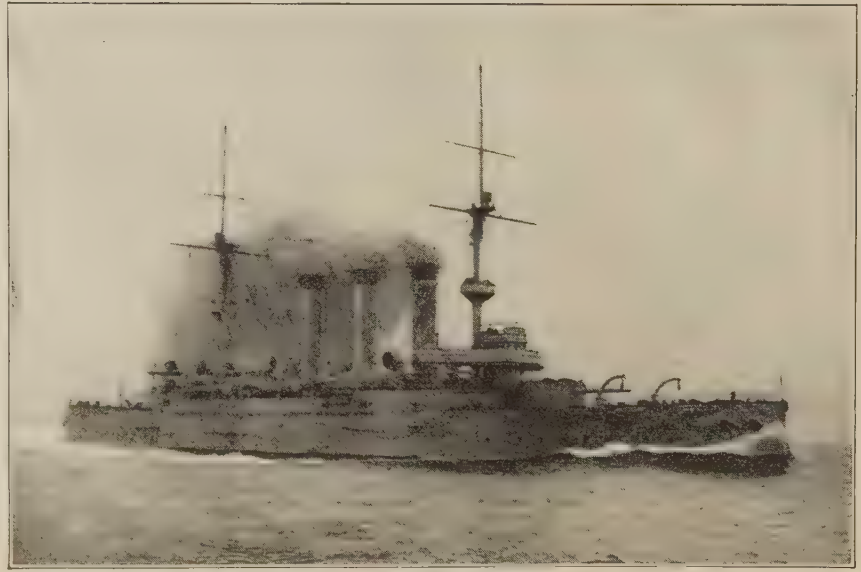


FIG. 99.—Japanese *Idzumo*.

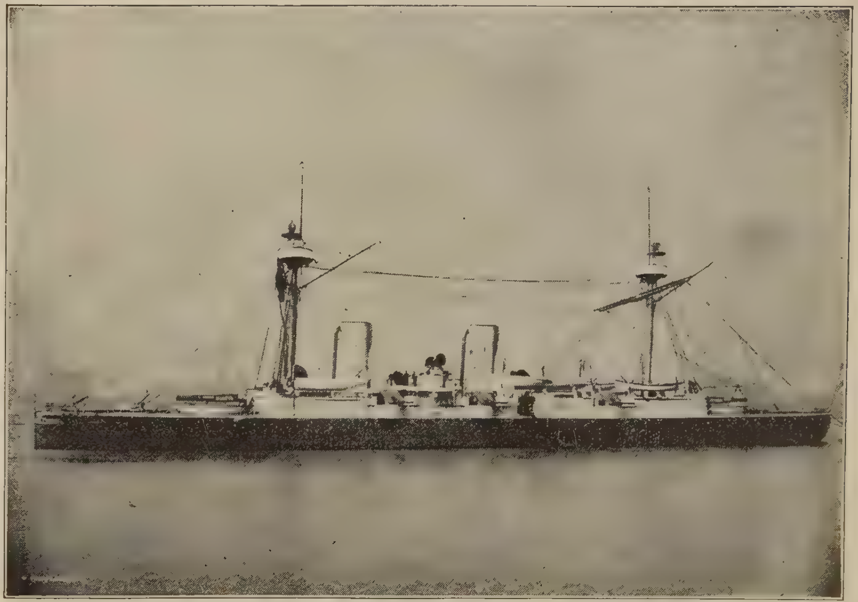


FIG. 82.—Japanese *Idzumi* (*ex Esmeralda*).

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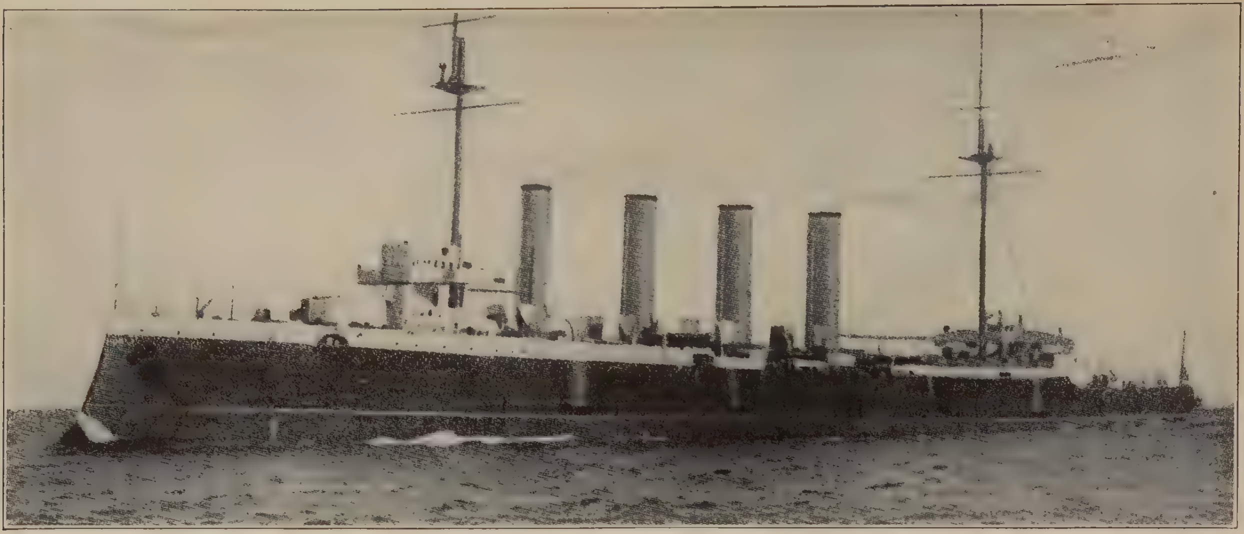

FIG. 91.—H.M.S. *Drake.*

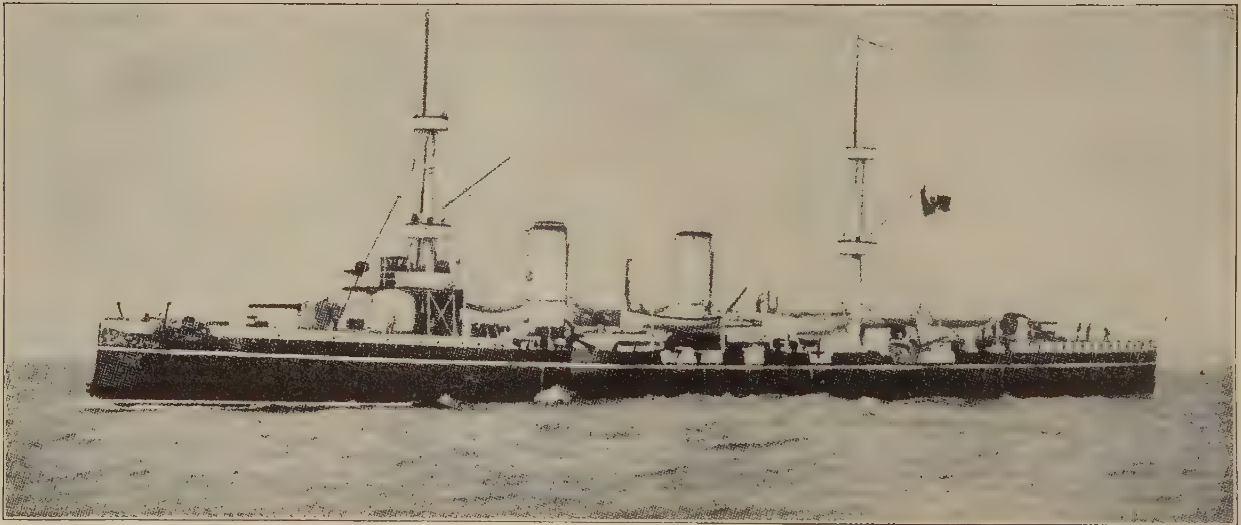

FIG. 97.—Italian *Piemonte.*

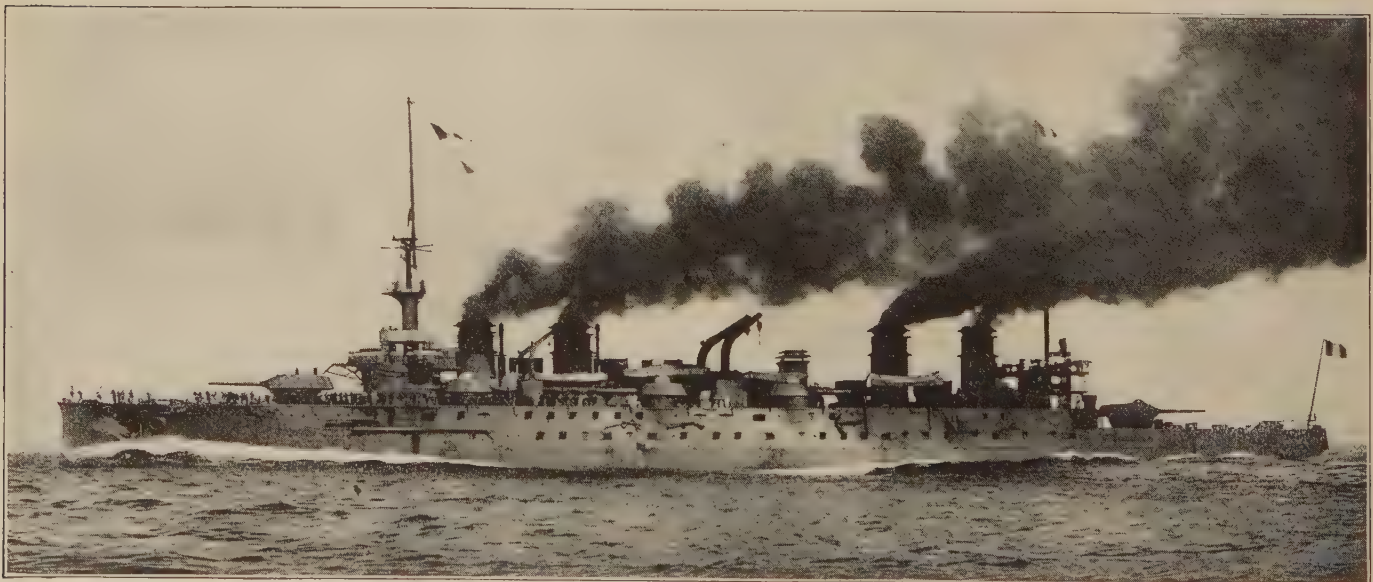

FIG. 105.—French *Jules Michelet.*

(*A. Borgault, Toulon.*)

TABLE XVII.—*Particulars of British Dreadnought Cruisers.*

Vessel.	Date of Launch.	Hull.					Speed.	Horse Power.	No. of Screws.	Machinery.		Armament (including machine guns).	Heavy Guns where Mounted.	Thickest Armour.	Cost (excluding guns).
		Material.	Length.	Breadth.	Mean Draught.	Load Displacement.				Engines.	Boilers.				
			Ft.	Ft.	Ft.	Tons.	Knots.								£
Invincible	1907	Steel.	530·0	78·5	26·0	17,250	20·5	41,000	4	Turbines.	Yarrow	8—12″ 16—4″ 5m.	Barbettes	7″	1,678,995
Inflexible	1907	,,	530·0	78·5	26·0	17,250	25·0	41,000	4	,,	,,	8—12″ 16—4″ 5m.	,,	7″	1,638,229
Indomitable	1907	,,	530·0	78·5	26·0	17,250	25·0	41,000	4	,,	Babcock & Wilcox	8—12″ 16—4″ 5m.	,,	7″	1,671,880
Indefatigable	1909	,,	555·0	80·0	26·5	18,750	25·0	43,000	4	,,	,, ,,	8—12″ 16—4″ 5m.	,,	7″	1,449,826
Australia	1909	,,	555·0	80·0	26·5	18,750	25·0	43,000	4	,,	,, ,,	8—12″ 16—4″ 5m.	,,	7″	1,449,826
New Zealand	1909	,,	555·0	80·0	26·5	18,750	25·0	43,000	4	,,	,, ,,	8—12″ 16—4″ 5m.	,,	7″	1,449,826
Lion	1910	,,	660·0	88·5	28·0	26,350	28·0	70,000	4	,,	Yarrow		,,	..	..
Princess Royal	..	,,	660·0	88·5	28·0	26,350	28·0	70,000	4	,,	,,		,,	..	..

Aires," built in 1895 for the Argentine Republic, is 396 ft. in length and of 4800 tons displacement, her machinery developing 13,300 H.P. with open stokeholds, and giving her a speed of 23·2 knots. She is protected by a complete deck 1½ in. to 3 in. thick, and carries a powerful armament of quick-firing guns, consisting of two 8-in., four 6-in., six 4·7-in., twenty-two smaller guns and five torpedo tubes. Her normal coal supply is 350 tons, and she can stow 1000 tons in her bunkers. Rather smaller than the "Buenos Aires," but of still later build (1901), is the Chilean cruiser "Chacabuco" (fig. 98, Plate XV.). She is a characteristic Elswick cruiser in design and general appearance, being heavily armed, fast and of moderate displacement. Her dimensions are: displacement 4500 tons, length 360 ft., breadth 46 ft. and draught 18 ft. She carries an armament of two 8-in. Q.F. guns, mounted on the middle line forward and aft, and protected by well-armoured gun-houses, ten 4·7-in. Q.F. guns in shields on the broadsides and nineteen smaller guns, including machine-guns. She is protected by a strong armoured deck 1¾ in. thick on the flat to 4½ in. on the slopes, and by the 1000 tons of coal which forms her normal supply. Her engines develop nearly 16,000 H.P., and her speed is 23 knots.

In the matter of armoured cruisers also Elswick has taken a leading place—among the cruisers built by this firm being the "Esmeralda" (second), of 7000 tons, in 1895 for Chile; the "O'Higgins," of 8500 tons, in 1896 for the same state; the "Asama" and "Tokiwa," of 9700 tons, in 1897 for Japan; and the "Idzumo" and "Iwate," in 1899, also for Japan. The "Idzumo" (fig. 99, Plate XXIII.) is 9750 tons displacement, 400 ft. long, 68 ft. 6 in. beam, 24 ft. 3 in. draught. She has 16,000 H.P. and a speed of 22 knots; is protected by a complete belt of Krupp steel 7 in. thick, tapering to 3½ in. at the ends, a 2½-in. steel deck with a citadel above it 5 in. thick, and carries an armament of four 8-in. Q.F., fourteen 6-in. Q.F., twelve 12-pdrs., seven smaller guns and four torpedo tubes. The 8-in. guns are in pairs in 6-in. barbettes and hoods, while of the 6-in. guns ten are in 6-in. casemates and four in shields. She carries, with bunkers full, 1300 tons of coal.

United States.—In the United States navy the proportion of "protected" cruisers is smaller than in the British navy, as the "armoured" type established itself at an earlier date. The "Philadelphia," begun in 1888, may be taken as an example of the U.S. protected cruiser. She is 4345 tons in displacement and 327 ft. long, has twin screws and a horse-power of 8800, giving her a speed of 19·6 knots. She is protected by a steel deck 2½ in. to 4 in. thick, and carries twelve 6-in. B.L. guns (later converted to Q.F.), seventeen smaller guns and five torpedo tubes.

The "Columbia" and "Minneapolis" are very fast armoured cruisers laid down in 1891. On a displacement of 7350 tons they carry one 8-in., two 6-in., eight 4-in. and twelve 6-pdr. and a number of smaller guns. They are protected by heavy steel decks and thin side armour. The "Columbia" developed 18,500 I.H.P. and 22·8 knots on trial, while the "Minneapolis" reached 20,860 I.H.P. and 23 knots; these powers and speeds were at that date the highest recorded for such vessels. The "Columbia" crossed the Atlantic at 18·4 knots in 1895, but the type has not been repeated in America although followed for a little while by France. The "Brooklyn" (fig. 84, Plate XXII.), begun in 1893, is of the "armoured" type. She is of 9215 tons displacement and 400 ft. long, has twin screws and develops 16,000 horse-power with forced draught, giving a speed of 21 knots. She is protected by a steel belt for two-thirds of her length 8 ft. broad and 8 in. to 3 in. thick, and a complete steel deck 6 in. to 3 in. thick. She carries eight 8-in. B.L. guns in pairs in 15-in. barbettes—disposed one forward, one aft and one on each beam—twelve 5-in. Q.F. guns in 4-in. shields, twenty smaller guns and five torpedo tubes. Her normal coal stowage is 900 tons, and she can stow 1650 tons in her coal spaces.

In 1903–1904 there were launched six armoured cruisers of the "California" class, of 13,700 tons, and in 1904–1905 three of the "St Louis" class, of 9700 tons. The former are vessels 502 ft. in length, 70 ft. beam and 26 ft. 6 in. draught, have machinery developing 23,000 indicated horse-power, and a speed of 22 knots. The latter are 424 ft. in length, 66 ft. beam and 23 ft. 6 in. draught, with engines of 21,000 indicated horse-power, and the same estimated speed, namely, 22 knots. Both classes have fourteen 6-in. Q.F. guns, but the larger vessels have in addition four 8-in. guns in two 6½-in. turrets, besides a heavier battery of smaller Q.F. guns. The "California" class are completely belted with armour having a thickness of 6 in. over half the length amidships and 3½ in. to the ends, and a battery of 5-in. armour enclosing the 6-in. Q.F. guns, and extending to the upper deck. The "St Louis" class have only a water-line belt for about one-half the vessel's length, with a similar battery above it, the whole of the armour being 4 in. thick of Krupp quality. The "California" class comes between the English "Cressy" and "Drake" classes. The "St Louis" class is practically the English "Monmouth," with about a knot less speed, bow-plating omitted and a 4-in. battery added.

In 1903 two larger armoured cruisers, the "Tennessee" and "Washington," were laid down. The speed of 22 knots was retained, but the armament consisted of four 10-in., sixteen 6-in., twenty-two 14-pdrs., twelve 3-pdrs., &c., with four 21-in. submerged torpedo tubes. The side armour was slightly reduced in thickness, but spread over a greater area, giving 5 in. uniformly on the belt and 3 in. forward and aft; the citadel and casemates remain 5 in. thick, but the protection of the heavy guns is increased to 9 in.; in addition, the 14-pdr. battery on the upper deck is protected by 2-in. plating. The displacement is 14,500 tons. Two similar vessels, "North Carolina" and "Montana," were laid down in 1905, but up to 1910 the United States had not proposed to lay down any cruisers corresponding in power and speed to the "Invincible."

Germany.—Germany for many years built a number of small cruisers of moderate speed for service on distant stations, &c., and subsequently a series of very successful third-class and second-class cruisers of increasing power and speed. Seven vessels of the "Gazelle" class were launched in 1898–1900. The "Gazelle" was of 2558 tons, 6370 I.H.P. and 19½ knots speed; the "Niobe," a sister vessel, was of the same displacement, and the five later vessels were of 2608 tons; several developed nearly 9000 I.H.P. and obtained 21¾ to 22¼ knots speed. The "Undine," "Arcona" and "Frauenlob," laid down in 1901, were of 2656 tons displacement; these were all sheathed with wood and coppered. Seven vessels of the "Hamburg" class were laid down in 1902–1904, of 3200 tons displacement, having the same protection as the preceding vessels and carrying the same armament at a higher speed, machinery of 10,000 I.H.P. being provided for 22 knots. The highest speed reached was 22·6 knots by the "Lübeck," which was fitted with Parsons turbines of 13,500 H.P. and driven by eight screws on four shafts. Four vessels of the "Königsberg" class, laid down in 1905, are of 3350 to 3500 tons displacement. They retain the same protection—a deck ·8 in. to 2 in. in thickness and the same armament—ten 4·1-in., fourteen smaller guns and two submerged torpedo tubes; but their machinery has been varied to admit of trial of various types of turbines and reciprocating engines. The "Königsberg," "Stuttgart" and "Nürnberg" are fitted with engines of 13,200 I.H.P. for 23·5 knots; while the "Stettin" is fitted with Parsons turbines of 15,500 H.P., and attained 24·0 knots on trial. The next two vessels, "Dresden" and "Emden," of 3592 tons, laid down in 1906, have the same protection as before, but twelve 4·1-in. guns are carried instead of ten, and a still higher speed is aimed at. The "Dresden" is fitted with Parsons turbines of 16,000 H.P., and the "Emden," with reciprocating engines of 15,000 I.H.P., to give a speed of 25 knots. Four later vessels are of 4230 to 4280 tons displacement, and are fitted with machinery of about 25,000 H.P. for a speed of 25 knots, as follows: the "Kolberg" with Schichau turbines, the "Mainz" with A.E.G. (modified Curtis) turbines, the "Cöln" with Zoelly turbines and the "Augsburg" with Parsons turbines. Two vessels of the same type were in 1910 under construction, in which a further increase of speed was contemplated; the displacement is increased to 4800 tons and the H.P. to 30,000; one of these, the vessel to replace "Bussard," was to have Schulz turbines. Thus in these second-class cruisers Germany was carrying out the greatest series of experiments on turbines which had been attempted, no less than five different types of large power being tested in comparison with reciprocating engines.

Besides the foregoing very fast vessels, in 1897–1898 Germany built five larger second-class cruisers of the "Hertha" class. They were lofty vessels, and carried a good armament of two 8·2-in., eight 5·9-in. and ten 3·4-in. guns, as well as other smaller guns and three submerged torpedo tubes; they were 344 ft. long, 56 ft. to 58 ft. beam, 21 to 22 ft. mean draught, 5575 to 5790 tons displacement; they had a protective deck 1·6 to 3·9 in. in thickness, and 3·9 in. gun houses. Fig. 100 (Plate XXII.) shows the "Victoria Luise," the second vessel of the class.

The older German cruisers, "Fürst Bismarck" and "Prinz Heinrich," laid down in 1896–1898, were armed with 9·4-in. and 5·9-in. guns, and had speeds of 19–20 knots. The "Prinz Adalbert" and "Friedrich Karl," laid down in 1901, and "Yorck" and "Roon," laid down in 1902–1903, were of 8850 to 9350 tons displacement and 21 knots speed, carrying four 8·2-in., ten 5·9-in., twelve 3·4-in. guns and four submerged torpedo tubes. The 8·2-in. guns were carried in enclosed 6-in. shields forward and aft; and the other guns were mostly in a very short citadel amidships, protected by 4-in. armour; the water-line being completely protected by 4-in. to 3-in. armour. The latest vessels of this type, the "Gneisenau" and "Scharnhorst," were laid down in 1905–1906 of 11,420 tons displacement and 22½ knots speed.

In 1907 Germany commenced a new series of large and powerful cruisers, the "Blücher" (fig. 101, Plate XXII.), the first of the series, being of 15,550 tons displacement, an increase of more than 4000 tons beyond that of the preceding German vessels. She carries twelve 8·2-in., eight 5·9-in., sixteen smaller guns and four submerged torpedo tubes, and is protected by 7-in. armour. Engines of 32,000 I.H.P. were provided, and the maximum speed on trial exceeded 25 knots. In the second vessel, the "Von der Tann" (fig. 102, Plate XXII.), the main armament was increased to eight 11-in. guns; she is 560 ft. in length, 85 ft. beam, 27 ft. draught and 18,700 tons displacement; Parsons turbines of 45,000 H.P. were provided for 25 knots speed, and both power and speed were exceeded on trial. The third vessel, the "Moltke," is of 23,000 tons displacement, of 26 knots speed, and is armed with 12-inch in place of 11-inch guns, and cost £2,200,000.

France.—In France the line of development of the cruiser has been similar to that in Great Britain. In 1887 four third-class cruisers were built, of which the "Forbin" may be taken as a type; she was 312 ft. long, 30½ ft. beam, 16 ft. draught, 1935 tons displacement, 5800 I.H.P. and 20 knots speed, protected by a 1½-in. deck and a belt of cellulose, and armed with four 5½-in. and eight 3-pdr. guns and five torpedo tubes. These were followed by "Linois," "Galilee," "Lavoisier," of about 2300 tons in 1893, and the "d'Estrées" and "Infernet" in 1897. The latter were 312 ft. long, 39 ft. beam, 17 ft. 9 in. draught and 2420 tons displacement, sheathed and coppered, protected by a 1½-in. deck and armed with two 5·5-in., four 3·9-in. and eight 3-pdr. guns and three torpedo tubes; 8500 I.H.P. was provided for 21 knots speed.

The French second-class cruisers may be said to have commenced with the "Davout," of 3027 tons, 9000 I.H.P. and 20½ knots, and the "Alger" and "Isly," of 4350 tons, 8000 I.H.P. and 19 knots, in 1887. They were followed by two of the "Friant" class in 1891, two of the "Pascal" class and three of the "Cassard" class in 1893, and the sheathed vessels, "Catinat" and "Protêt," in 1894 and 1895. These vessels were from 3700 to 4050 tons displacement, and 19½ to 20 knots speed, protected by decks 1¾ in. to 3 in. in thickness, and armed with four to six 6·5-in. guns, four to ten 3·9-in. guns, as well as smaller guns and torpedo tubes. The last of this series, the "Protêt," was laid down in 1895.

In 1894 France laid down a first-class protected cruiser, the "d'Entrecasteaux," of 8000 tons, carrying two 9·4-in., twelve 5·5-in., twelve 3-pdr. guns and six torpedo tubes, with a speed of 19½ knots, and then by three very remarkable vessels lightly built and armed, but of very high speed, viz. the "Jurien de la Gravière," of 5600 tons and 23 knots, the "Guichen," of 8150 tons and 23 knots and the "Chateaurenault," of 7900 tons and 24 knots.

A new departure was made in 1890 in laying down the armoured cruiser "Dupuy de Lome," of 6300 tons, 14,000 I.H.P. and 20 knots speed, carrying two 7·6-in., six 6·4-in. and several smaller guns; a protective deck 1½ in. thick was fitted, and the whole side of the ship was armoured, the thickness at the water-line amidships being 4·7 in., tapering gradually towards the extremities. This type has, however, not been repeated.

The "Jeanne d'Arc," launched in 1899 at Toulon, is 11,100 tons displacement, 477 ft. in length, 63 ft. 8 in. beam and 24 ft. 8 in. mean draught, has engines of 33,000 indicated horse-power and a speed of 21·8 knots. She has a complete water-line armour belt of Harveyized steel, having a maximum thickness of 6 in., and the bow is also protected as far aft as the bow guns with 1½ in. steel to the upper deck. Her armament consists of two 7·6-in. guns, fourteen 5·5-in. Q.F., twenty-two smaller guns and two submerged torpedo tubes. Of more recent date than the "Jeanne d'Arc," but smaller in size, is the "Montcalm" (fig. 103, Plate XXIII.), an armoured cruiser launched in 1900, of 9367 tons displacement, 453 ft. length, 63 ft. 8 in. beam and 24 ft. 6 in. draught. She carries an armament of two 7·6-in. guns in separate turrets of Harveyized steel 6 in. thick forward and aft, eight 6·5-in. Q.F. guns in casemates on the broadsides, four 3·9-in. Q.F. guns in shields on the broadsides, twenty-two smaller guns and two submerged torpedo tubes. She is protected by a water-line belt 6½ ft. deep, which extends from the bow to within 30 ft. of the stern, where it is terminated by a transverse bulkhead 4 in. thick; amidship this belt is 6 in. thick at its upper edge, diminishing to 2 in. at its lower edge, where it meets the 2-in. protective deck, but the maximum thickness tapers to 3 in. at the forward and after ends. Above this main belt is a thinner one extending over the same length, but only 3¾ in. maximum thickness and of about 4 ft. depth. The "Montcalm" has 20 water-tube boilers of the Normand-Sigaudy type, and engines of 19,600 H.P., giving her a speed of 21 knots. She carries 1000 tons of coal and some oil fuel. Her engine-rooms are placed between the two sets of boiler-rooms, instead of abaft them, as is usual in British vessels, the peculiar appearance of many French vessels, with two pairs of funnels widely separated, being thus accounted for.

Three vessels of the "Montcalm" class were ordered, and then three smaller vessels of "Kleber" type, of 7578 tons only, and four larger vessels of improved "Montcalm" type. The latter were very similar to "Montcalm," with improved armour protection and of 500 tons greater displacement. They were followed by three larger vessels, the "Léon Gambetta" (fig. 104, Plate XXIII.), "Jules Ferry" and "Victor Hugo." These vessels are armoured cruisers of about 12,400 tons displacement, length 480 ft., beam 70 ft. 3 in., draught 26 ft. 3 in., with an indicated horse-power of 28,500 and speeds of 22½ to 23 knots.

In 1904 the "Jules Michelet" (fig. 105, Plate XXIV.), of 12,370 tons, was laid down, of 30,000 I.H.P. and 23 knots speed. The "Ernest Renan" followed in 1903, the I.H.P. being 36,000 for 23½ knots.

The most powerful French cruisers built or building in 1910 were the "Edgar Quinet," laid down in 1905, and "Waldeck Rousseau," laid down in 1906, of 13,780 tons displacement, armed with fourteen 7·6-in. guns, eight being fitted in pairs in turrets and four in separate casemates, together with fourteen 6-pdr. and eight 3-pdr. guns and two submerged torpedo tubes; 36,000 I.H.P. is provided for a designed speed of 24 knots.

Japan.—Japan possesses a great variety of cruisers, many of which were built at Elswick, others were captured during the war with Russia, and refitted or reconstructed; the latter including the "Aso" (ex-"Bayan"), the "Tsugaru" (ex-"Pallada"), the "Soya" (ex-"Varyag") and "Sudzua" (ex-"Novik"). In addition, large and small cruisers were built in America, Germany and France, but the finest were built in Japan.

As examples of the Japanese cruisers laid down towards the end of the 19th century may be mentioned the second-class cruisers "Kasagi" and "Chitose," of 4800 and 4900 tons displacement, 15,500 I.H.P. and 22¾ knots speed, built in America and armed with two 8-in. and ten 4·7-in. guns, and the third-class cruisers "Suma" and "Akashi," of 2657 tons displacement and 19½ knots speed, built in Japan and armed with two 6-in., six 4·7-in. and ten 3-pdr. Q.F. guns.

In 1902 Japan launched the protected cruisers "Tsushima" and "Niitaka," of 3365 tons displacement, 9400 I.H.P. and 20 knots speed, armed with six 6-in. and fourteen smaller guns; in 1903 the "Otowa," of 3082 tons, 10,000 I.H.P. and 21 knots carrying two 6-in., six 4·7-in. and six smaller guns; and in 1907 the "Tone," of 4100 tons displacement, 15,000 I.H.P. and 23 knots speed, armed with two 6 in., ten 4·7 in. and three smaller guns and three torpedo tubes. All of these vessels are fitted with reciprocating machinery. The "Yahagi," "Chikuma" and "Hirato," laid down later, have turbine machinery of 22,500 H.P. to give 26 knots speed, two 6-in. and ten 4·7-in. guns and two torpedo tubes. They are 440 ft. long, 52 ft. beam and 5000 tons displacement.

Of first-class protected cruisers Japan possessed in 1910 only two, the "Tsugaru" (ex-"Pallada") and "Soya" (ex-"Varyag"). The "Tsugaru" was built at St Petersburg in 1899, is of 6630 tons, 11,600 I.H.P., 20 knots speed, armed with eight 6-in., twenty-two 12-pdr. and several smaller guns, and protected by an armour deck 1½ to 2½ in. in thickness. The "Soya" was built at Philadelphia in 1899, is of 6500 tons, 20,000 I.H.P., 23 knots speed, armed with twelve 6-in., twelve 12-pdr. and smaller guns, and protected by a 1½ to 3-in. deck. The "Sudzua" (ex-"Novik") is a lighter and faster vessel, of 3000 tons displacement, 25 knots speed, armed with two 6-in., four 4·7-in. and several smaller guns, and protected by a 1·2 to 2-in. deck.

Of armoured cruisers she possessed in 1910 a relatively large number. In 1897 Japan ordered the "Yakumo," of 9850 tons displacement, from Germany, and in 1899 the "Adzuma," of 9436 tons displacement, from France; both vessels have a speed of 21 knots, and carry an armament of four 8-in. guns mounted in pairs in two turrets, and twelve 6-in. guns in 6-in. casemates, and are protected by a complete belt of Krupp steel 7 in. to 3½ in. in thickness. They are somewhat similar to the "Iwate" and "Idzumo" (fig. 99, Plate XXIII.), built at Elswick, but with slightly less gun power and speed. The "Aso" (ex-"Bayan"), built in France in 1900, is 7700 tons displacement, 17,000 I.H.P., 21 knots, carrying two 8-in., eight 6-in. and a number of smaller guns, and protected by 8-in. armour.

In 1905 a very important advance was made. Early in that year Japan laid down the "Ikoma" and "Tskuba," 440 ft. in length, 13,750 tons displacement, 23,000 I.H.P. and of 21 knots speed.

These were the first cruisers laid down to carry the guns of a first-class battleship. Their armament includes four 12-in. guns mounted in pairs in two barbettes, one forward and one aft, twelve 6-in. guns in casemates and twelve 4·7-in. guns, and they have a complete armour belt 7 to 5 in. in thickness and 7 in. of armour on the barbettes (fig. 106). They were followed by the 22-knot cruisers "Kurama," laid down in 1905, and the "Ibuki," laid down in 1906, which are 10 ft. longer, of about 900 tons greater displacement, and 4500 more I.H.P. than in the "Tsukuba" type. The armament is also more powerful, twelve 6-in. guns being replaced by eight 8-in. guns mounted in pairs in barbettes, while the 4·7-in. guns are increased to fourteen in number. The "Ibuki" is fitted with turbines of 27,000 H.P., the "Kurama" with reciprocating engines of 22,500 I.H.P. The disposition of guns and armour are as shown in fig. 106. In 1910 Japan ordered of Vickers Co. an armoured cruiser of 27,000 tons and 72,000 H.P.

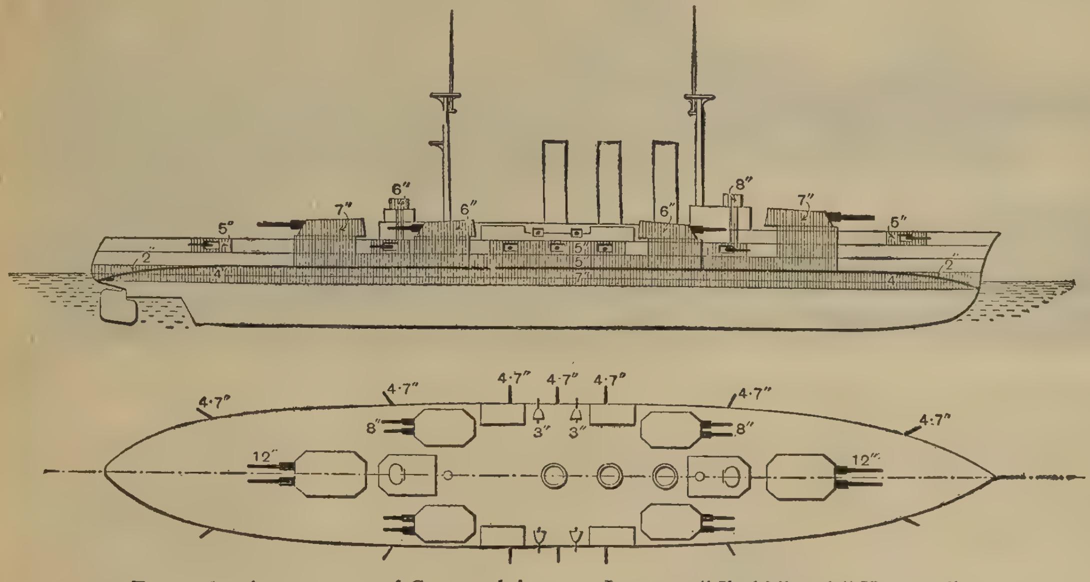

FIG. 106.—Arrangement of Guns and Armour, Japanese "Ibuki" and "Kurama."

Russia.—Before the Russo-Japanese War, Russia had provided herself with a great variety of fast, well-armed cruisers of various sizes, including some very notable vessels. Of those which remained in 1910 may be mentioned the protected cruiser "Zhemchug," of 3100 tons, 17,000 I.H.P., 24 knots, carrying eight 4·7-in. guns; the "Askold," built at Kiel in 1900, 6500 tons displacement, 20,000 I.H.P. and 23 knots speed, armed with twelve 6-in., twelve 12-pdr. and other smaller guns; the "Diana" and "Aurora," of 6630 tons and 20 knots; the "Bogatyr" and similar vessels launched 1901–1903, of 6675 tons displacement, 20,000 I.H.P., 24 knots speed, armed with twelve 6-in., twelve 12-pdr. and several smaller guns, and having a protective deck 1½ to 2 in. in thickness. The armoured cruisers, "Rossia," of 12,200 tons and 20 knots, and "Gromoboi," of 13,220 tons, 15,500 I.H.P. and 20 knots speed, carry four 8-in., twenty-two 6-in. and other smaller guns, and are protected by 6-in. armour. Since the war several vessels of this type have been built, including three of a new "Bayan" class, 7900 tons displacement, 19,000 I.H.P., 22 knots, armed with two 8-in., eight 6-in., twenty 12-pdr. and other smaller guns, and protected by 6-in. armour; and the "Rurik," built at Barrow in 1906, 490 ft. in length, 15,190 tons displacement, 19,100 I.H.P. and 21½ knots speed, armed with four 10-in. guns mounted in pairs in barbettes forward and aft, eight 8-in. and twenty 4·7-in. guns, and protected by a complete belt of armour 12 ft. deep, 6 in. thick amidships, tapering to 4 in. forward and 3 in. aft.

Italy.—Italy possesses several protected cruisers of the "Piemonte" type already described as well as a number of smaller vessels. She was in 1910 building scouts of the "Quarto" type of about 3500 tons displacement and 27 knots, armed with 4·7-in. and 12-pdr. guns. The most notable Italian cruisers are, however, those of the "Garibaldi" class, which are heavily armed, well armoured and of moderate speed. They have been developed from the "Marco Polo" type, which comprises three vessels; the "Marco Polo," launched in 1892, of 4500 tons, 19 knots, armed with six 6-in., ten 4·7-in. and several smaller guns, and protected by a 4-in. armour belt as well as a steel deck; the "Vettor Pisani" and the "Carlo Alberto," which are of 6400 tons, carry twelve 6-in., six 4·7-in., fourteen 6-pdr. and other smaller guns. The "Giuseppe Garibaldi," "Varese" and "Francesco Ferrucio," launched in 1899, are of 7400 tons displacement, 13,500 I.H.P., 20 knots speed; they are armed with one 10-in., two 8-in., fourteen 6-in. and a number of smaller guns, and are protected by armour disposed as shown in fig. 107; the belt, battery and gun protection are all 6 in., the belt tapering to 4½ in. in thickness at the bow and stern.

In 1905 Italy commenced a series of enlarged "Garibaldis" of 9830 tons and 22½ knots, carrying four 10-in. guns in barbettes forward and aft with a secondary armament of eight 7½-in. guns in turrets on the upper deck amidships, the bases being enclosed in an armoured citadel as shown in fig. 108, which gives the general arrangement of guns and armour in the "Amalfi" and "Pisa."

Gunboats and Torpedo Craft.—Gunboats include numerous small vessels which, even in times of general peace amongst the great maritime nations, have important duties allotted to them. For the patrolling of rivers and islands, protection of fisheries, &c., a battleship or a cruiser, from its size, would be unsuitable, and for the performance of these and other duties special vessels have been built. These types, and those included in the torpedo-craft division, may be conveniently grouped under three headings, as follows:—

I. Sloops.
II. Gun-vessels and Gunboats.
III. Torpedo-boats, Torpedo Gunboats and Torpedo-boat Destroyers.

Sloops.

The "Wild Swan" class, the first of which was launched in 1876 for the British navy, represents one of the earliest of the sloop type. She was a single-screw composite-built vessel of 1130 tons displacement and 170 ft. length, with a speed under steam of 10½ knots and an armament of two 6-in., six 5-in. B.L. guns, and four smaller guns. This proved a very useful class of ships, and in all sixteen of them were built. The "Beagle" class, commenced in 1889, represented an advance on the "Wild Swan." They were built of steel, sheathed with wood and coppered, and had twin-screws. Their displacement was 1170 tons, and they were 195 ft. long, steamed at 13 knots, and carried eight 5-in. B.L. guns and eight machine-guns. They were followed, at an interval of five years, by the "Torch" and "Alert," which were of 960 tons

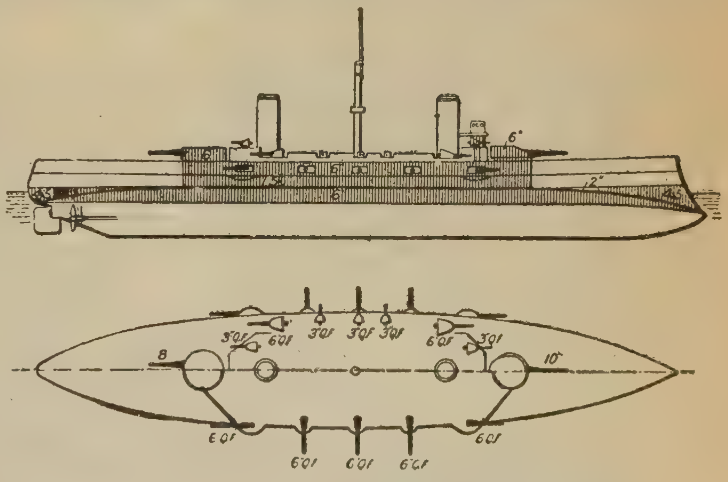

FIG. 107.—Arrangement of Guns and Armour, Italian "Giuseppe Garibaldi."

displacement, 180 ft. long, steamed at 13¼ knots and carried an armament of six 4-in. Q.F. guns, four 3-pdrs. and two machine-guns. They were single-screw vessels, built of steel, sheathed and coppered. The "Condor" class, which comprises six vessels built between 1898 and 1901, are very slightly modified "Torches," having 20 tons more displacement and 6 in. more beam, with the same length, speed and armament. They are able, however, to maintain a higher continuous speed, being fitted with water-tube boilers. In 1901 to 1902 there were laid down four sloops of the "Fantôme" class, which are larger vessels than the "Condors," being 1075 tons displacement and 185 ft. long. They are twin-screw vessels, built of steel, sheathed and coppered. They have water-tube boilers, giving 1400 H.P., and a speed of 13¼ knots. Their armament is similar to that of the "Condor." All the foregoing vessels are fitted as sailing vessels as well as steam. The "Beagle" is schooner-rigged, the others all barque-rigged.

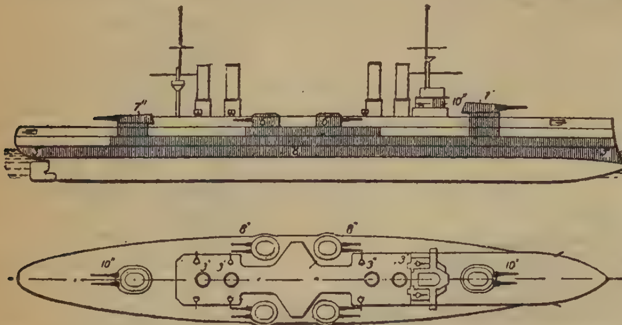

FIG. 108.—Arrangement of Guns and Armour, Italian "Amalfi" and "Pisa."

Gunboats.

Of the gun-vessel or gunboat type, one of the earliest built for the British navy is represented by the "Staunch," a twin-screw vessel designed by Mr G. W. Rendel, and built at Elswick in 1867. The guiding principle in the design of this vessel was that she should simply be a floating gun-carriage, propelled by steam and provided with plenty of manœuvring power. The 9-in. 12-ton gun which constituted her armament was arranged to sink into and be raised from a well by means of hydraulic power. She was only 180 tons in displacement and 75 ft. long, and had a speed of 6½ knots. The "Medina" class, consisting of twelve gunboats built about 1876, were twin-screw vessels of 363 tons displacement and 110 ft. length, and had a speed of 8¼ knots. Their armament was light, consisting only of three 64-pdrs. and three machine guns. They were fitted with bow rudders in addition to those at the stern, in order to increase their manœuvring power. The "Paluma" and "Gayundah" were built at Elswick in 1884 for the Queensland government. They had a displacement of 360 tons and were 115 ft. in length, were schooner-rigged, but had twin-screws and a speed under steam of 10 knots. They carried one 8-in. B.L. gun forward, which was mounted behind a breastwork and had a considerable arc of training; one 6-in. gun, which was mounted aft; and three machine-guns. The "Protector" was a more important craft. Built for the government of South Australia in 1884, she was 920 tons in displacement and 180 ft. long, had twin screws and a speed of 14 knots under steam. She carried one 8-in. B.L. gun forward, mounted as in the "Paluma," five 6-in. 4-ton guns, and five Gatlings. The "Cockchafer" class (1881) and the "Thrush" class (1889) are sea-going cruising vessels of a different type, carrying much lighter guns than in the "Staunch" class. The former, of which four were built, were composite-built, single-screw ships of 465 tons displacement and 125 ft. length, with a fore-and-aft rig and a speed under steam of 9½ knots; the latter, of which there were nine, were schooner-rigged composite vessels of 805 tons displacement and 165 ft. length, with a single screw and a speed of 13½ knots. The armament of the "Cockchafers" consisted of two 64-pdrs. R.M.L. guns, two 20-pdrs. R.B.L. guns, and two machine-guns; that of the "Thrush" (fig. 109, Plate XXVI.) was of six 4-in. B.L. guns and four smaller guns (she was commanded by H.M. King George V. when he was on active service in the navy). The "Bramble," launched in 1898, is a representative of what in 1910 was the most recent type of first-class gunboat. Her displacement is 710 tons, or 100 less than the "Thrush." She is 180 ft. long and has a speed of 13½ knots, is built of steel, sheathed and coppered, and carries two 4-in. Q.F. guns, four 12-pdrs. and ten machine-guns. She has water-tube boilers, twin screws and machinery of 1300 I.H.P. Four of these vessels have been built, named the "Bramble," "Britomart," "Dwarf" (fig. 110, Plate XXVI.) and "Thistle." They were designed specially for service on rivers in hot climates; their draught is limited to 8 ft.; their sails are reduced to a very light fore-and-aft rig, and they are fitted with a complete shade deck of teak and felt. They were still on active service in 1910, but no new vessels had been laid down since 1897.

A number of gun-vessels have been designed for special services, among which may be mentioned the "Mosquito" (fig 111, Plate XX.) and "Herald," two stern-wheel steamers for the Zambezi built by Messrs Yarrow in 1890 They are of 80 tons displacement and 77 ft. long, having a speed of 10½ knots and carrying an armament of four 3-pdrs. and eight machine-guns. They are built in sections, each of which forms a separate pontoon, so that the whole vessel can be readily taken to pieces for transport and easily put together in the water. These two gun-vessels were handed over to the Colonial authorities on the river Zambezi. Built for somewhat similar service, but of different design, are the four shallow-draught river gunboats of the "Sandpiper" class. They are steel twin-screw boats, built in 1897, also by Messrs Yarrow. They are 88 tons in displacement, 100 ft. long and 20 ft. broad, and carry an armament of two 6-pdrs. and four machine-guns. Their speed is 9 knots, and they draw only 2 ft. of water, their screws working in arched tunnels, the summits of which are above the water-level outside. These arches always remain full of water, and serve the double purpose of enabling sufficiently large screws to be fitted for the economical propulsion of the vessel without increasing the draught, and of protecting them from damage. The "Woodcock" and "Woodlark" are larger vessels of the same type, designed for service on the rapid and shallow rivers of China. They were built by Messrs Thornycroft in 1897, are 120 tons in displacement, 145 ft. long, 23 ft. beam and 2 ft. draught of water. They have twin screws, also carried in arched tunnels, and their speed is 15 knots. They carry the same armament as the "Sandpiper" class. In 1901 the "Teal" and "Moorhen," designed for service in China, were also constructed in sections, but are considerably larger than either the "Mosquito" or the "Woodcock," being about 180 tons displacement. They are twin-screw vessels, the propellers being in tunnels, as in the "Woodcock," and their speed is over 13 knots. Their furnaces will burn wood. They carry two 6-pdrs. and four machine-guns. The latest vessel of this type in 1910 was the "Widgeon," of similar construction, built by Messrs Yarrow in 1904 and carrying the same armament. She is 160 ft. long, 24 ft. 6 in. beam, 2 ft. 5 in. draught, 195 tons displacement, 800 I.H.P. and 13 knots speed.

Fig. 112 (Plate XX.) and fig. 113 show a light-draught gunboat of the "Sultan" class, of which several have been built for service on the Nile. She has a displacement of 140 tons, a length of 143 ft., a beam of 24 ft. 6 in., a draught of only 2 ft. and a speed of 12 knots. Her armament consists of one 12-pdr., one howitzer, and four Maxims, and she is protected by a ½-in. bullet-proof breastwork.

The gunboats of other navies are generally similar to those described above. The Brazilian twin-screw gunboat "Tiradentes," built in 1892, of steel, sheathed with teak and coppered, was 165 ft. long and 800 tons displacement, and attained a speed of 14·5 knots. She had an armament of four 4·7-in. guns, three 6-pdrs. and four machine-guns, and carried a considerable spread of canvas.

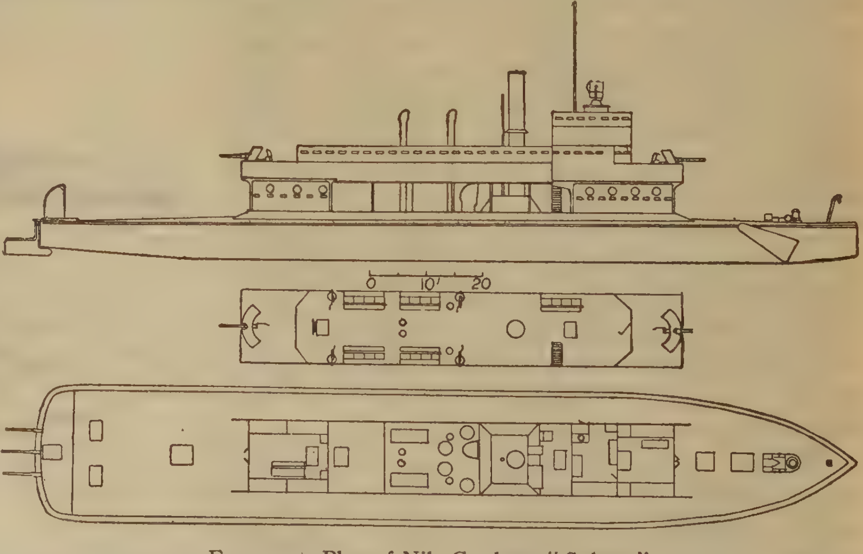

FIG. 113.—Plan of Nile Gunboat "Sultan."

In torpedo gunboats and torpedo craft generally, possibly the last thirty years of the 19th century showed more development and greater diversity than in any other type of war vessel then existing. The first small high-speed boat we have any record of is the

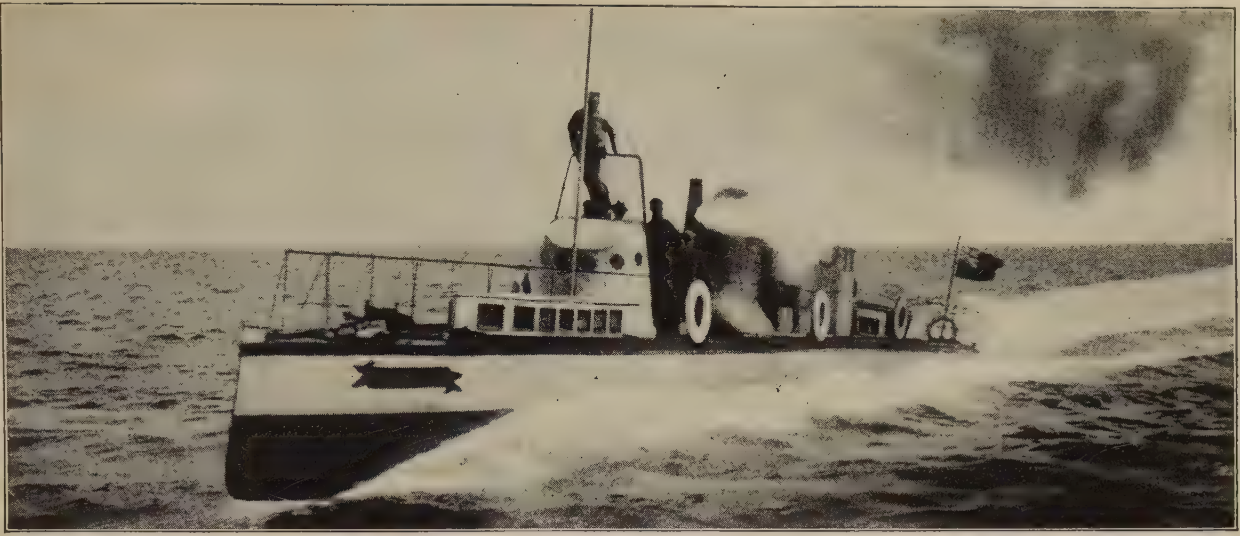

FIG. 117.—*Turbinia.*

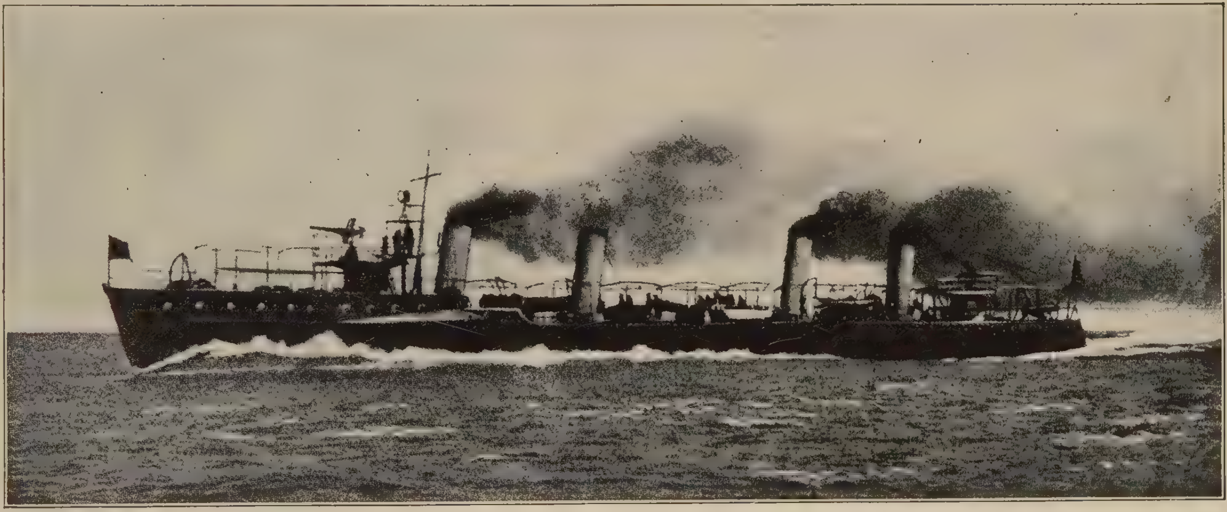

FIG. 120.—U.S.A. *Bainbridge.*

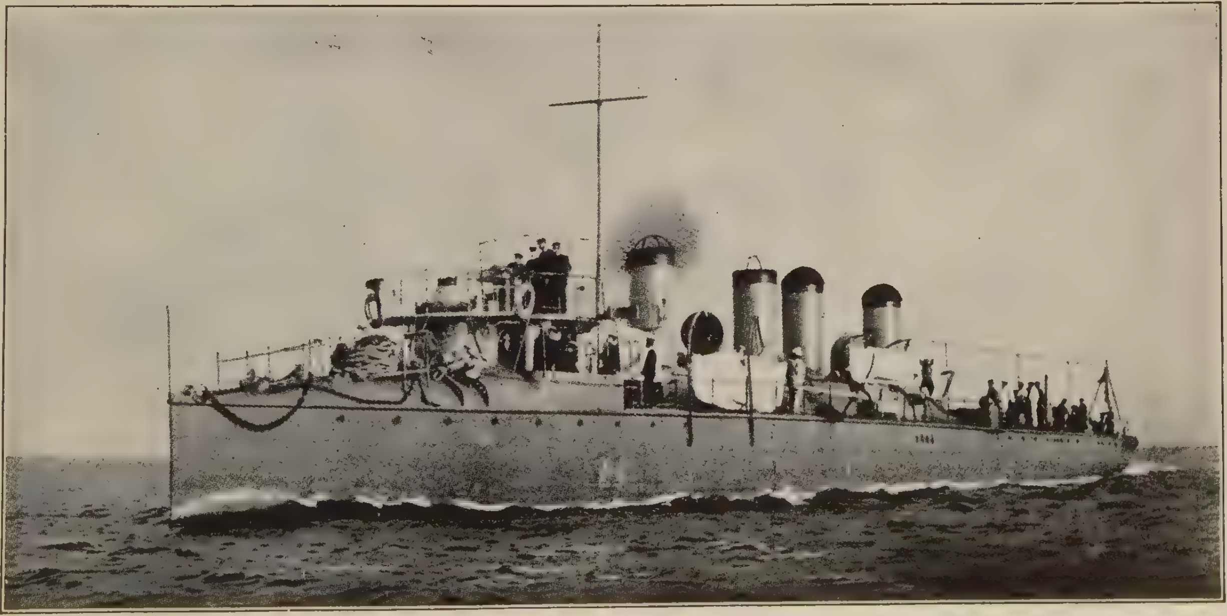

FIG. 121.—Japanese *Niji.*

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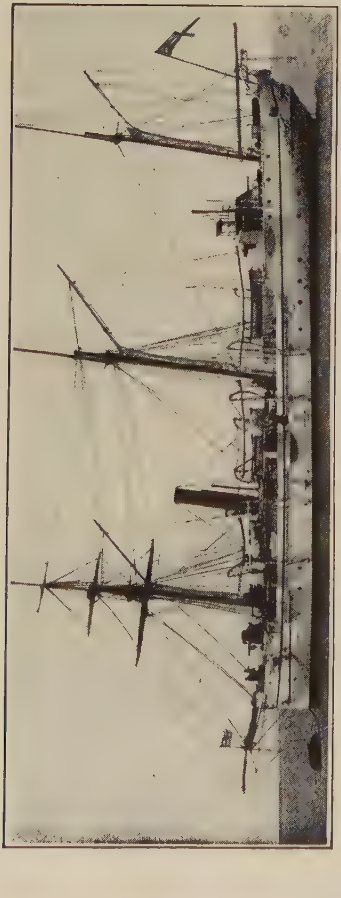


FIG. 109.—H.M.S. *Thrush.*

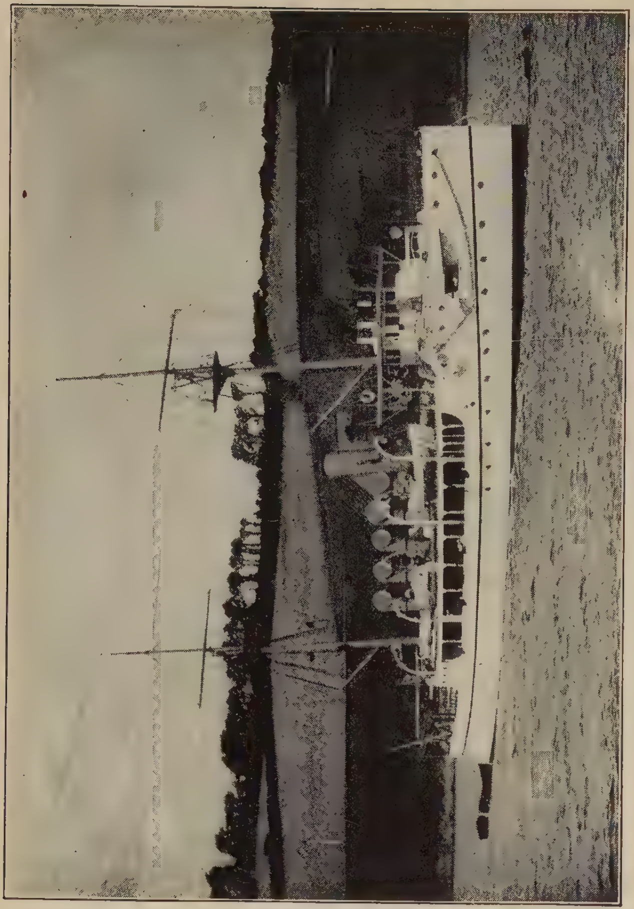


FIG. 110.—H.M.S. *Dwarf.*

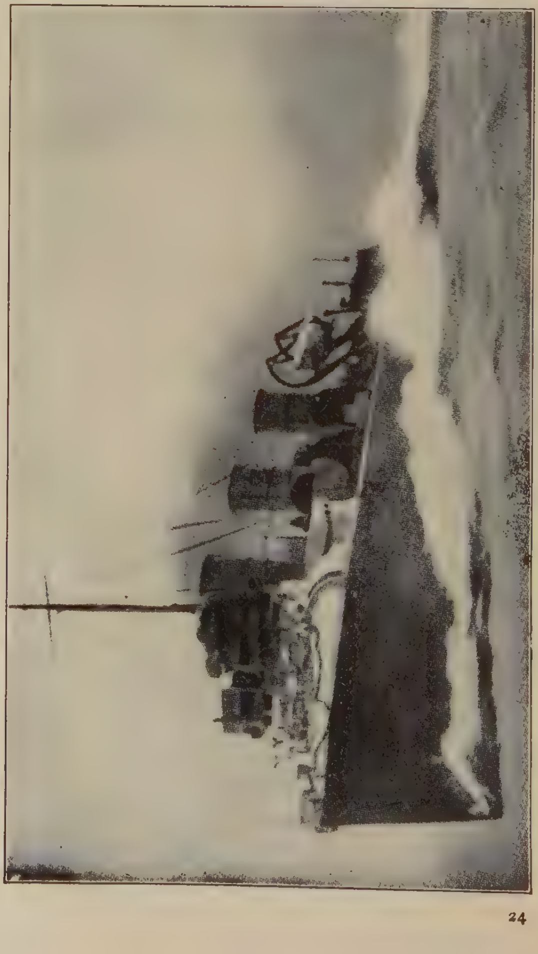


FIG. 116.—H.M.S. *Albatross.*

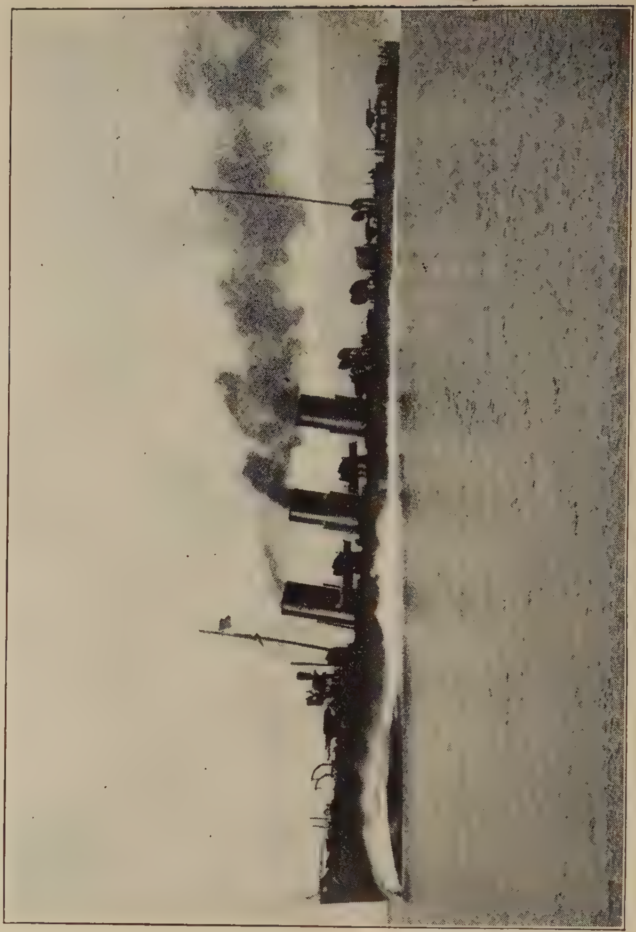


FIG. 119.—H.M.S. *Swift.*

Torpedo craft.

“Miranda,” built by Messrs Thornycroft in 1871. She was built of light steel, was 45 ft. in length, 6½ ft. beam and 2½ ft. draught, and attained a speed of 16·4 knots with a single screw, the engine running at 355 revolutions per minute and indicating 58 H.P. The results obtained with her attracted much attention, and in 1873 Thornycroft launched for the Norwegian government a somewhat larger boat, armed with a spar torpedo, which attained a speed of 15 knots. Owing to the introduction of machine-guns in warships as a defence against torpedo-boat attack, it was recognized that there was a very slight chance of a boat approaching sufficiently near to a vessel to successfully attack her by means of a towing or a spar torpedo, and the Whitehead torpedo fired from a revolving tube on the deck was accordingly adopted as the armament of future torpedo-boats. This rendered it unnecessary for the torpedo-boat to approach nearer than say 400 yds., and also enabled the torpedo to be fired without stopping the boat, a point of great importance. The first torpedo-boat for the British navy was built by Messrs Thornycroft four years later; she was called the “Lightning,” was 75 ft. in length and 34 tons displacement, had engines giving nearly 500 H.P., and obtained a speed of 19 knots. She was armed with a single torpedo tube. The boats which followed varied somewhat as regards size and speed, but on the whole pursued the usual course of growing larger and more powerful with each new design. By 1885 the length had gone up to 150 ft., the displacement to 125 tons and the speed to 20 knots. This last was not the highest that had been obtained, some of the earlier and smaller boats having reached 21½ knots; but the boats of 1885 carried a heavier armament, consisting of six 3-pdrs. and three torpedo tubes, and were more serviceable and seaworthy craft. A very notable boat of this date was the “Swift,” afterwards known as No. 81, built by J. S. White of Cowes; she marked a great advance in seaworthiness and fighting power in combination with high speed.

Messrs Yarrow built for the Austrian navy in 1886 the “Falke,” 135 ft. in length and 95 tons displacement, which obtained a speed of 22·4 knots on trial, and a similar boat for the British navy of 105 tons displacement, armed with 5 torpedo tubes and three 3-pdr. guns, which attained a speed of 23 knots on trial. About the same time Messrs Thornycroft built the “Ariete” and “Royo” for the Spanish navy. These vessels had twin screws and water-tube boilers. The former attained a speed of 26 knots on the measured mile and 24·9 knots on a 2 hours’ run, and the latter 25·5 knots on the measured mile and 24·6 knots on the 2 hours’ run. In 1895 M. Normand built the torpedo-boat “Forban” for the French navy, which attained a speed of 31·2 knots on trial, and the boats of the Normand type which followed her attained equally remarkable speeds. The maximum speeds for the British torpedo-boats up to the end of the 19th century were from 23 to 23½ knots. From 1901 to 1904 larger and faster types of torpedo-boats were constructed. These boats were 160 ft. to 165 ft. in length, 17 ft. to 18 ft. beam, 8½ ft. draught, 180 to 200 tons displacement, 2900 I.H.P., attained a speed of 25 knots and were armed with 3 torpedo tubes. In 1906 to 1909 boats of a new and still faster type were built with turbine machinery and burning oil fuel instead of coal. These boats, 36 in number, vary from 166 to 185 ft. in length, 17½ to 19 ft. beam, 5¾ to 6¾ ft. draught and 243 to 308 tons in displacement. They have engines of 3600 to 4000 H.P. giving speeds of 26 and 27 knots, and are armed with two 12-pdr. guns and three torpedo tubes. The first twelve ordered in 1905 were at first known as Coastal Torpedo-boat Destroyers, and given names such as the “Cricket,” “Gadfly” and “Mayfly.” They are now numbered throughout, *i.e.* from 1 to 36. The prefix O has been added to the numbers of such of the boats originally bearing these numbers as are still in existence, to distinguish them from the new type boats.

Table XVIII. gives particulars of many of the most notable torpedo-boats built between 1871 and 1910.

The torpedo-boat thus established was primarily a weapon of offence, the only two elements of a protective nature in its design being those of small size and high speed; but even these were also necessary for purposes of offence. The deadly nature of their attack, and the difficulty of meeting it in the ship attacked, led to the construction of special vessels intended, among other duties, to meet and destroy them. The French “Bombe” (1885) was one of the earliest of these; and the “Rattlesnake” and three sister vessels, the first of the English torpedo gunboats, came closely after her. The “Rattlesnake” was launched in 1886, was of 525 tons displacement, and had a speed of 19¼ knots. She carried a more powerful armament than the torpedo-boats, namely, one 4-in. gun, six 3-pdrs. and 4 torpedo tubes. She was followed in 1888 by the “Sharpshooter,” with ten sister vessels, still larger and more heavily armed. They were 230 ft. long and 735 tons displacement, had engines developing 3500 H.P., giving a speed of 19 knots, and carried two 4·7-in. Q.F. guns, four 3-pdrs. and two torpedo tubes.

France built six vessels of the “Bombe” class, and the “Leger” (a slightly larger vessel), and in 1891 to 1896 built five other torpedo gunboats of about 900 tons and 21 knots. The last was named “La Hire,” and was 241 ft. long, 27 ft. 6 in. beam, 12 ft. 9 in. draught, 890 tons displacement; was armed with six 9-pdr. and six 3-pdr. Q.F guns and was provided with engines of 6400 I.H.P. for 23 knots. These vessels have no torpedo tubes. The torpedo cruiser “Fleurus,” laid down in 1891, was armed with four torpedo tubes as well as five 3·9-in. and six 3-pdr. guns. She was also protected by a 1½-in. protective deck and fitted with a belt of cellulose 3 ft. thick in the vicinity of the water-line. Her dimensions were: length 230 ft., beam 29½ ft., draught aft 15 ft., displacement 1300 tons, I.H.P. 4000, and speed 18 knots.

The “Niger” class of 1892, which included eleven vessels (fig. 114, Plate XX.), were repeats of the “Sharpshooters,” except that they carried an additional torpedo tube and three machine-guns, with certain hull additions and more durable machinery, the displacement being increased by these causes to 810 tons, and the speed being reduced by a quarter of a knot. In 1893 a fourth series of this class of vessel was begun, known as the “Dryad” class, and considerably larger than the “Nigers,” being 250 ft. long and of 1070 tons displacement. They are of 3500 I.H.P., have a speed of 18¾ knots, and carry an armament of two 4·7-in. Q.F. guns, four 6-pdrs., and three torpedo tubes. Five vessels of this class were built, the difference between their general appearance and that of the preceding classes being illustrated by fig. 115 (Plate XX.), which shows the “Hazard,” which in 1910 was employed on special service in connexion with the reception and trials of British submarines. In these thirty-one British vessels of the torpedo gunboat class the elements of strength and seaworthiness are developed at the expense of speed, and they combine in themselves some of the functions of the torpedo-boat with many of the most important features of the small cruiser. The successive increases of displacement are very largely due to additions to the hull, giving greater habitability and trustworthiness for continuous work at sea. It will be noticed that the speed shows a continuous falling off; but the “Sharpshooter” class and subsequent vessels have been refitted with water-tube boilers in lieu of the locomotive boilers originally fitted, and some of them are in addition re-engined, with the result that a speed of 21 knots was obtained; this, in the ordinary weather met with at sea, would probably enable them to overtake craft of lighter types possessed of considerably greater smooth-water speeds. These vessels have not been repeated, many of them have been sold, but all those remaining are actively employed on a variety of subsidiary but important services.

TABLE XVIII.—*Particulars of Torpedo-boats.*

Vessel’s Name.	Country.	Where Built.	Principal Dimensions, &c.						Horse-Power.	Speed.	Armament, &c.
			Date of Launch.	Length.	Beam.	Draught.	Displacement.	Number of Screws.			
				Ft. In.	Ft. In.	Ft. In.	Tons.			Knots.	
Torpedo-boats—											
Miranda	Great Britain	Messrs Thornycroft, London.	1871	45 0	6 6	2 6	..	1	58	16.4	*Nil.* Experimental boat.
1st torpedo-boat built.	Norway	Messrs Thornycroft, London.	1873	57 0	7 6	3 0	..	1	..	15.0	1 spar torpedo.
Lightning (afterwards No. 1 T.B.)	Great Britain	Messrs Thornycroft, London.	1877	75 0	10 10	5 0	34	1	477	18.5	Single torpedo tube.
No. 10 T.B.	„	Messrs Thornycroft, London.	1880	90 6	10 10	4 0	28	1	450	21.7	1 torpedo tube.
Swift (afterwards No. 81 T.B.)	„	Messrs J. S. White & Co., Cowes.	1885	150 0	17 6	5 11	125	1	1300	20.5	6—3 pdrs., 3 tubes.
Falke.	Austria	Messrs Yarrow, London.	1886	135 0	13 9	5 8	95	1	900	22.4	2 mach.-guns, 2 tubes.
1st class T.B.	China	Elbing.	1886	144 4	16 5	7 6	128	1	1400	24.2	4—1 pdrs., 2 tubes.
Forban	France	Messrs Normand.	1895	144 2	15 2	10 0	135	2	3200	31.2	2—1 pdrs., 2 tubes.
No. 109 T.B.	Great Britain	Messrs Thornycroft, London.	1902	166 0	17 4	8 5	194	1	2900	25.0	3—3 pdrs., 3 tubes.
No. 11 T.B.	„	Messrs Yarrow, London.	1906	172 0	18 0	5 9	263	3	3750	26.0	2—12 pdrs., 3 tubes.
Goyaz	Brazil	Messrs Yarrow, London.	1907	152 6	15 4	..	130	3	..	26.5	2—3 pdrs., 2 tubes.
Gabbiano	Italy	Spezzia	1907	164 0	17 5	7 0	200	2	3000	26.0	3—3 pdrs., 3 tubes.
No. 29 T.B.	Great Britain	Messrs Denny, Dumbarton.	1908	180 0	18 0	5 9	278	3	4000	26.0	2—12 pdrs., 3 tubes.

Torpedo-boat Destroyers were primarily, as their name implies, intended to meet and destroy torpedo-boats, their larger size, greater coal capacity, heavier armament, and higher speed enabling them to overtake such boats before they could complete their attack; but it soon became evident that these additional powers also enabled the destroyer to perform the duties of the torpedo-boat more efficiently than the boat herself, and with the advent of the destroyer the production of the smaller boat declined.

The pioneers of this type of vessel were the "Daring," "Decoy," "Havock" and "Hornet," the construction of which was entered upon in July 1892, the two first-named at Messrs Thornycroft's and the other two at Messrs Yarrow's. They were thus contemporary with the "Dryads," the last of the torpedo gunboats. The success of these four vessels was followed with great interest, and in the following year (1893) six others were begun. One of these, the "Boxer," built by Thornycroft, attained a speed of 29·2 knots. A much greater number of destroyers (32 in all), nearly the whole of which were of 27 knots speed, were laid down in 1894. The succeeding year (1895) saw a great advance in size, power and speed, thirteen destroyers being laid down, for each of which the contract speed was 30 knots. Similar vessels were constructed by various firms in England for foreign powers, and abroad by Messrs Schichau in Germany and M. Normand in France; the "Sokol" being constructed by Messrs Yarrow for the Russian navy. Over sixty destroyers of the 30-knot type were built for the British navy between 1895 and 1905, and in only three vessels with reciprocating engines—the "Albatross," the "Express," and the "Arab"—were speeds exceeding 30 knots contracted for. In 1896 an attempt was made to realize greater speeds, but it was found that the power and cost necessary for the addition of a few knots were disproportionate to the value of the results obtained, and the attempt was not followed by any general increase of speed above 30 to 31 knots in destroyers fitted with reciprocating engines. The general appearance of a typical destroyer of this period is shown by fig. 116 (Plate XXVI.), which represents the "Albatross" at full speed.

Particulars of destroyers will be found in Table XIX.

TABLE XIX.—*Particulars of Torpedo-boat Destroyers.*

Vessel's Name.	Country.	Where Built.	Principal Dimensions, &c.									Horse-Power.	Speed.	Armament, &c.
			Date of Launch.	Length. Ft.	Length. In.	Beam. Ft.	Beam. In.	Draught. Ft.	Draught. In.	Displacement. Tons.	Number of Screws.		Knots.	
Daring	Great Britain	Messrs Thornycroft, London.	1893	185	0	19	0	6	6	275	2	4,200	27.0	1—12 pdr., 3—6 pdrs., 3 tubes.
Swordfish	,,	Armstrong, Whitworth, Elswick.	1895	200	0	19	0	6	6	330	2	4,500	27.6	1—12 pdr., 5—6 pdrs., 2 tubes.
Sokol	Russia	Messrs Yarrow, London.	1895	190	0	18	6	7	0	240	2	4,400	29.7	1—12 pdr., 8 others, 2 tubes.
Corrientes	Argentina	Messrs Yarrow, London.	1896	190	0	19	6	7	4	280	2	4,000	27.4	1—14 pdr., 2 tubes.
Chamois	Great Britain	Messrs Palmer.	1896	215	0	20	9	7	3	360	2	6,200	30.0	1—12 pdr., 5—6 pdrs., 2 tubes.
Express	,,	Messrs Laird Bros.	1897	235	0	22	0	9	0	465	2	9,250	31.0	1—12 pdr., 5—6 pdrs., 2 tubes.
Gipsy	,,	Messrs Fairfield.	1897	227	6	22	0	9	0	380	2	6,300	30.0	1—12 pdr., 5—6 pdrs., 2 tubes.
Turbinia	,,	Hon. C. A. Parsons.	1897	100	0	9	0	3	0	44½	3	2,100	32.75	*Nil.* Experimental boat.
Albatross	,,	Messrs Thornycroft, London.	1898	227	6	21	3	8	6	430	2	7,500	31.5	1—12 pdr., 5—6 pdrs., 2 tubes.
Cobra	,,	Armstrong, Whitworth, Elswick.	1899	210	0	21	0	6	9	350	8	12,000	34.0	1—12 pdr., 5—6 pdrs., 2 Hotchkiss, 2 tubes.
Bailey	United States	Morris Heights.	1899	205	0	19	0	6	0	280	2	5,600	30.0	4—6 pdrs., 2 tubes.
Lawrence	,,	Weymouth, Mass.	1900	242	3	22	3	6	2	400	2	8,400	30.0	2—14 pdrs., 5—6 pdrs., 2 tubes.
Derwent	Great Britain	Messrs Hawthorn, Leslie.	1904	220	0	23	6	8	6	555	2	7,000	25.5	4—12 pdrs., 2 tubes.
Swift	,,	Messrs Cammell, Laird.	1907	345	0	34	2	12	0	1800	4	30,000	35.0	4—4″, 2 tubes.
Tartar	,,	Messrs Thornycroft, London.	1907	270	0	26	0	9	1	870	3	14,500	33.0	3—12 pdrs., 2 tubes.
Para	Brazil	Messrs Yarrow, London.	1908	240	0	23	7	10	0	550	2	8,000	27.5	2—4″, 4—3 pdrs., 2 tubes.
Zulu	Great Britain	Messrs Hawthorn, Leslie.	1909	280	0	27	0	8	10	1000	3	15,500	33.0	2—4″, 2 tubes.
Beagle	,,	Messrs J. Brown.	1909	269	0	26	7	8	3	860	3	12,500	27.0	1—4″, 3—12 pdrs., 2 tubes.
S 167	Germany	Elbing.	1909	..		..		..		607	..	12,000	30.0	2—24 pdrs., 2 machine, 3 tubes.
Smith	United States	Philadelphia.	1909	289	0	26	0	8	0	700	3	10,000	28.35	5—14 pdrs., 2 machine, 3 tubes.
Mameluck	France	Nantes.	1909	210	7	21	9	10	4	405	3	7,750	28.0	6—9 pdrs., 3 tubes.
San Luis	Argentina	Messrs Cammell, Laird.	1910	285	0	28	0	9	0	960	2	20,000	32.0	4—4″, 4 tubes.

Experience with the marine steam turbine, the invention of the Hon. C. A. Parsons, dates only from the time of the "Turbinia" (fig. 117, Plate XXV.), which made her successful trials in 1898 after much investigation on the part of the inventor. The turbine machinery consisted of three separate turbines directly coupled to three screw shafts and working in series, one turbine being high pressure, one intermediate and one low pressure. Each screw shaft at first carried three propellers, the total number of propellers thus being nine; the weight of main engines was approximately 3 tons 13 cwt., and the total weight of machinery and boiler, screws and shafting, tanks, &c., 22 tons. The boilers were of the water-tube type, with a working pressure of 225 lb per square inch.

The "Turbinia" was followed by the "Cobra" and "Viper" torpedo-boat destroyers. The machinery of these boats consisted of two sets, one on each side of the ship; each set comprised two turbines, had two expansions, and drove two shafts (making four shafts in all). The outer shaft on each side was driven by a high-pressure turbine, from which the steam passed to a low-pressure turbine on the inner shaft and thence to the condenser; on the inner shaft also was a small turbine, added for going astern, the Parsons steam turbine not being adapted for reversal. Steam was supplied by water-tube boilers of the express type. These vessels attained a speed of upwards of 34 knots, the revolutions of the engines approaching 1200 and the power being estimated at about 12,000 H.P. At the time of their completion these were the fastest vessels of any type afloat, but both were unfortunately lost at sea, the "Viper" after a very short period of service being run upon the Renouquet Rock in the Channel Islands, and the "Cobra" being lost at sea on her first voyage after leaving the contractor's works.

The results attained by these vessels led the British Admiralty to make further experiments with this type of machinery. The "Velox," which had been launched in 1902, was purchased from the Parsons Company, and two experimental vessels were ordered from Messrs Hawthorn, Leslie & Co., both 220 ft. long, about 590 tons displacement and with similar boilers. Both vessels were launched in 1903. One, the "Eden," was fitted with Parsons turbines, and reached 26·1 knots on trial; the other, the "Waveney," with reciprocating engines, reached 25·6 knots on trial; the "Waveney" had twin screws; the "Eden" had six screws, two on each of three shafts, and at high speed showed a great saving in coal consumption.

Experience with the 30-knot boats led to a decision to order boats of stouter build and better sea-keeping qualities. In them the turtleback forward was replaced by a lofty forecastle, and it was laid down that the trials should be run with the boats more heavily loaded and more closely approaching their ordinary loaded condition on service. These changes were embodied in the "River" class, in which a trial speed of 25½ knots under the modified conditions was provided for.

In 1902–1904 thirty-four destroyers of the "River" class were ordered, of the following dimensions, &c.: length 220 to 230 ft., breadth 23½ to 24 ft., mean load draught 8 ft. 2 in. to 8 ft. 8 in., displacement 540 to 590 tons, I.H.P. 7000 to 7500, speed 25½ knots. The 1904 Committee on Designs recommended two new types of destroyers called "ocean-going" and "coastal" respectively, and also one experimental vessel of the highest speed obtainable, all to be fitted with Parsons turbines, and to use oil only for fuel. The ocean-going destroyers include five of 33 knots and the special destroyer of 35 knots named the "Swift" (fig. 118), built by Messrs Laird & Co. She was the largest destroyer afloat in 1910. Fig. 119 (Plate XXVI.) gives a view of this vessel.

From 1906 to 1908 eight ocean-going destroyers of 33 knots of the "Tribal" class were ordered, ranging from 970 to 1045 tons displacement and armed with two 4-in. guns and two 18-in. torpedo tubes. In 1908–1909 sixteen ocean-going destroyers of the "Beagle" class were ordered, of 27 knots speed, coal being used as the fuel instead of oil as in the preceding classes. In 1909–1910 twenty more ocean-going destroyers of the "Acorn" class, designed by Sir Philip Watts, were laid down; in these oil was again adopted for fuel and a speed of 29 knots obtained. These vessels are of 780 tons displacement, 240 ft. long, 25¼ ft. beam, 7¾ ft. draught, 13,500 turbine H.P., and carry two 4-in., four 12-pdr. guns and two 21-in. torpedo tubes. The "Acorn," "Alarm" and "Brisk" are provided with Brown-Curtis turbines, all the others with Parsons turbines. The navy estimates for 1910 provided for laying down twenty-three destroyers. The three Australian destroyers of the "Paramatta" class were designed by Professor Biles, and are of 700 tons displacement and 28 knots speed.

While the idea of the torpedo-boat destroyer originated in Great Britain, and the first boats of the type were built for the British navy, foreign powers were not slow in availing themselves of the results obtained, and large numbers of torpedo-boat destroyers have been added to the fleets of foreign navies, the boats built by Messrs Schichau of Germany and Normand of France having especially achieved success in the attainment of high speeds on trial. The "Bainbridge" class (fig. 120, Plate XXV.), built for the U.S. navy in 1901, are 245 ft. long, 23 ft. 7 in. wide, draw 6 ft. 6 in. of water, and have a displacement of 420 tons. Their sea-going speed is 29 knots, and their armament consists of two 18-in. torpedo tubes, two 3-pdr. Q.F. guns, and five 6-pdrs. The destroyers building in 1910 are of 742 tons with a speed of 29½ knots.

German destroyers are numbered consecutively, the numbers being prefixed by letters indicating the yard where built. Thus, S for Schichau works, Elbing; G, Germania works, Kiel; V, Vulcan works, Stettin. Numbers below 90 are appropriated for torpedo-boats. Two destroyers only have names, viz. S. 97, which also bears the name "Sleipner," and is fitted to serve as the emperor's yacht; and one without a number named "Taku," late "Hai-jing," taken from China in 1900, but built at the Schichau works in 1898. (The British navy list also contains the name of a destroyer "Taku," built at the same works in 1898, and also taken from China in 1900.) The German torpedo-boat flotilla is divided up into sections, each section led by a division boat of much larger size than the others. These division boats increased in size, from 226 tons displacement, 1800 I.H.P. and 21 knots speed in 1887, to 374 tons, 5500 I.H.P. and 28 knots speed in 1898. Division boats are numbered D 1 to D 10, and of these two bear names, D 1 that of "Carmen," and D 2 "Alice Roosevelt." Since 1898 torpedo-boat destroyers have been built in place of division boats. The first 46, built between 1898 and 1906, are of very similar type, the length gradually increasing from 207 to 216 ft., the displacement from 394 to 480 tons, engine-power from 5400 to 6500 I.H.P., speed from 26½ to 28 knots, while the breadth remained at 23 ft., and the draught at 7¾ ft. G 137, built at Kiel in 1906, is 235 ft. long, 560 tons displacement, 11,000 I.H.P., and obtained 33·9 knots speed. The nominal speed of the 48 vessels which followed is 30 knots, but several have exceeded this speed on trial. Recent destroyers are about 620 tons displacement, 12,000 H.P., and speeds of 34 to 36 knots have been reported. They are armed with two 24-pdr. Q.F., two machine-guns and three torpedo tubes, while two of 950 tons and 18,000 H.P. were launched in 1910.

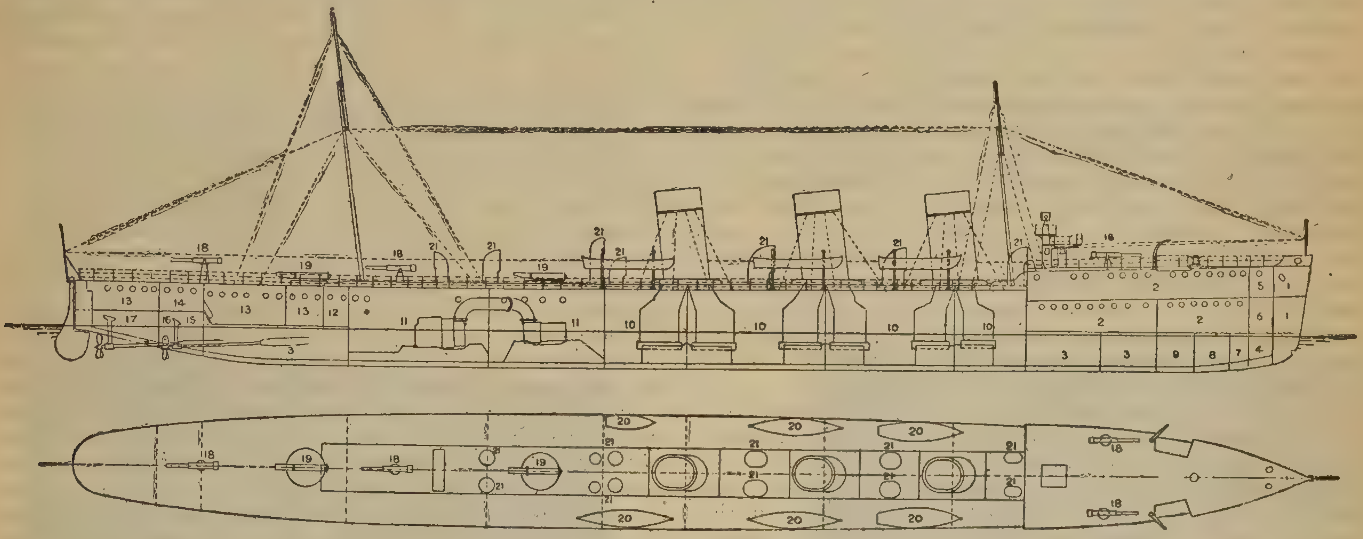


FIG. 118.—Torpedo-boat Destroyer "Swift."

1, Fore peak.
2, Crew space.
3, Oil-fuel tank.
4, W.T. compartment.
5, Paint-room.
6, Chain locker.
7, Fresh-water tank.
8, Naval store.
9, Magazine and shell-room.
10, Boiler-room.
11, Engine-room.
12, Dynamo-room.
13, Cabin.
14, Ward-room.
15, Magazine.
16, Spirit-room.
17, Store.
18, 4-in. Q.F. gun.
19, 18-in. torpedo tube.
20, Boat stowed.
21, Ventilator.

In 1902–1903 Japan built in her own yards three destroyers of 375 tons, 6000 I.H.P. and 29 knots, armed with two 12-pdr. and four 6-pdr. guns and two torpedo tubes. She had previously obtained a number of boats from Messrs Thornycroft & Yarrow. The "Niji" (fig. 121, Plate XXV.) was one of the "Ikadzuchi" class built by Messrs Yarrow; of 340 tons displacement, 6000 I.H.P. and 31 knots speed, armed with two 12-pdr. and four 6-pdr. guns and two torpedo tubes, and may be taken as typical of all of the foreign built Japanese destroyers. Between 1904 and 1908 Japan built 35 destroyers of 375 tons, 6000 I.H.P. and 29 knots, carrying six 12-pdr. guns and 2 torpedo tubes; and in 1910 was building two ocean-going destroyers, the "Umikaze" and "Yamakaze," of 1150 tons, 20,500 H.P. and 35 knots, armed with two 4-in. and five 12-pdr. guns and three 18-in. torpedo tubes.

The largest torpedo-boat destroyers building by France in 1910 were of 750 tons displacement, 14,000 H.P., 31 knots speed and armed with two 3·9-in. and four 9-pdr. guns and four torpedo tubes; Russia was building vessels of about 1000 tons and of 35 knots speed.

Submarine Boats.—About 1880 much attention began to be paid by several of the naval powers to the development of the submarine boat, the United States and France in particular.

The history of the subject goes back at least 300 years, but the first undoubted success with a submarine vessel was achieved by David Bushnell in America in 1775. It was worked by one man, for whom it provided just sufficient room; its general appearance, according to Bushnell's own description, bore some resemblance to two upper tortoise shells of equal size joined together, the entrance to the vessel being represented by the openings in the swellings of the shells at the animal's head; the body of the vessel was constructed of wood. The operations on board were entirely manual. By an oar in form of a screw with its spindle passing through the top the boat was sunk or raised, by another oar at the after end it was propelled; a rudder was used for guidance, and in some cases for propulsion; valves admitted water when submergence was required, and hand pumps discharged this water when it was desired to come to the surface, and a detachable weight of 200 ℔ was also supplied for emergency use. The air in the boat was capable of supporting the operator for thirty minutes; and as soon as he brought the boat to the surface, two air pipes, for discharge of foul and supply of fresh air, opened automatically. A compass, a pressure-gauge, and a sounding-line and lead were among the fittings. Behind the vessel was a large magazine containing 150 ℔ of powder, and a time-control for exploding it. From the magazine was led a rope to a wood screw at the fore part of the crown of the boat, and this screw, being worked from within, could be driven into the object to be destroyed in such a manner as to keep the magazine required for the explosion in position after it had been detached from the boat. During the War of Independence the boat was submerged beneath the British warship "Eagle," and the operator attempted to attach the wood screw to her bottom planking: in this he failed, apparently simply because he did not let go his detachable weight and so get enough upward pressure to drive the screw into the plank. The magazine was released and exploded an hour afterwards, but at some distance from its intended position.

The problem of submarine navigation received the practical attention of Fulton during the time that he was making his experiments upon steam propulsion, and even at an earlier period. He constructed two submarine boats in France, and one in America. One of the former, the "Nautilus," was built with the direct encouragement of Napoleon in 1801. It was supplied with compressed air for respiration, and with it Fulton conducted a series of experiments under the direction of a commission of naval officers. He descended to a depth of 25 ft., and remained under water for fully four hours, placing below a vessel provided for the purpose a torpedo by which it was blown into fragments. As with his steam engine, so too with his submarine boats, the report of the commission charged with investigation was so unfavourable that Fulton was much discouraged, and though he afterwards continued his labours in this direction, the results achieved by him were practically lost. Fulton's boat, like Bushnell's, was propelled by manual power, two horizontal screws being employed for propulsion, and two vertical screws for descending and ascending: it was built of wood with iron ribs, and was sheathed with copper.

The substitution of mechanical for hand power came later, and one of the first mechanically driven boats was the "Plongeur," built in France in 1863 from the designs of Charles Brun. This boat had a length of 146 ft. and a diameter of 12 ft., and was propelled by an 80-horse-power compressed-air engine. During the American Civil War the Confederates built a number of iron cigar-shaped boats; some were propelled by steam engines and some by hand. Each was armed with a torpedo containing 50 to 70 lb of powder carried at the end of a spar. These boats were known as "Davids," from their diminutive size as compared with the size of the ships attacked, and in 1864 one of the hand-worked boats, 50 ft. long, manned by a crew of nine men, successfully attacked the Federal ship "Housatonic," and sank her by means of a spar torpedo, but in so doing was herself sunk. It is claimed that the loss of the boat was due to faulty handling and not to inherent defect. Against the protest of her builder, she was immersed only to the hatch coaming; and the cover being left open, she was swamped and sunk by the wave thrown up by the explosion.

About the same time another hand-worked submarine, called the "Intelligent Whale," 26 ft. in length and 9 ft. in diameter, attracted some attention in America. An officer with two other persons dived with her in water about 16 ft. deep; the officer, in diver's dress, left the boat through a manhole in the bottom, placed a torpedo under a scow and blew the latter to pieces.

Holland's boat.

In 1875 Mr. J. P. Holland produced his first plan for a submarine vessel, and in 1877 he constructed a small experimental boat, which embodied features now accepted as essentials in American design. His plan ensured that when, for the purpose of diving, water was admitted into compartments of limited size, the total weight of the boat and its contents should still be a little less than the total buoyancy. Immersion was maintained by the action of horizontal rudders, which gave a downward tendency so long as the boat had any forward motion, and there always remained enough surplus buoyancy to bring the boat to the surface on the stoppage of her propelling machinery. Any weight consumed on board was automatically compensated for by admission of water, so that the total weight remained fixed and constant; while the confinement of the water to small compartments further secured a fixed centre of gravity. The securing of these qualities of fixed weight and fixed centre of gravity is essential, and the want of them has been the cause of failure in many other designs. With the necessarily slight longitudinal stability possessed by a submarine boat, any change of centre of gravity in the fore-and-aft direction has a notable effect on the angle of trim; and such a change may readily occur, for instance, from the surging of water in a large ballast-tank not completely full. An unintentional alteration of trim when the submarine boat is being propelled involves several possible dangers: in extreme cases the crew or some of the fittings may be thrown out of position, but in any case the path of the submarine is altered, and may tend either to too great immersion on the one hand, or to breaking the surface of the water on the other. From the risk of these dangers it is claimed by Mr Holland that his design is free. The first of his boats now under discussion was steered down and up inclines by her horizontal rudders, and motive-power was obtained from a petroleum engine. The tests to which she was subjected showed that inefficiency of the engine, difficulty of vision and trouble with the compass tended to destroy the boat's usefulness.

Nordenfeldt's boat.

In 1883 Mr Nordenfeldt, famous as an inventor in many directions, built a submarine boat at Stockholm. She had a length of 64 ft., a main diameter of 9 ft. and a displacement of 60 tons; she was propelled by a compound surface-condensing engine indicating 100 H.P., and on a measured-mile trial, not being submerged, attained a speed of 9 knots. Steam was supplied by an ordinary marine return-tube boiler, worked under forced draught, which could be fired as long as the boat was at the surface. Storage of steam was effected at the surface, and the steam thus stored was used to drive the engine in the submerged condition. To store sufficient steam two large tank reservoirs or cisterns were connected with the boiler, and the contents of boiler and tanks (8 tons of water in all) were raised to a temperature corresponding to 150 lb pressure. In preparing for submergence the firing of the boiler was stopped, and the steam given off by the heated water in boiler and tanks sufficed to propel the boat for a period. The smoke was driven out through two channels, which passed round the hull and pointed astern. The material of the hull was mild steel, the frames being 3 in. by 3 in. by $\frac{3}{8}$ in., and the plating $\frac{5}{8}$ in. to $\frac{3}{8}$ in. in thickness; the depth to which she could safely descend was about 50 ft. When ballasted ready for a submerged trip, this boat showed only a very small dome for observation above the level of the water, the reserve buoyancy represented by this dome being but 1 cwt. To overcome this reserve two propellers working on vertical shafts were fitted in sponsons, one on each side of the boat, nearly amidships. These propellers were driven by a 6-horse-power engine, and drew the boat under water to the desired depth; an automatic contrivance, set in motion by the water pressure outside the boat, closing the throttle-valve when the safety limit of depth was approached. On coming to rest, the reserve buoyancy brought the boat again to the surface. When propelled by the main engines in the submerged condition, the boat was kept horizontal by means of two bow rudders operated by a plumb weight. The crew consisted of three men only, this small number rendering unnecessary the employment of artificial means of maintaining a pure atmosphere. The scheme of attack was to approach the hostile ship running at the surface until the danger of discovery was imminent, then to descend to the "awash" condition with only the dome above water, and finally to go below the surface and advance to striking distance entirely submerged, rising if necessary once or twice to allow the direction to be adjusted by observations made from the dome "awash." The weapon of offence employed was a Whitehead torpedo, carried outside on the bow and discharged mechanically. Several larger boats were subsequently built from Mr Nordenfeldt's designs; they all involved the same principles, but were in some details made more efficient both for attack and defence.

The three main points insisted upon by Nordenfeldt were: (1) that his method of storing energy gave him a reservoir which was not liable to get out of order, could readily be repaired if necessary, and required for its manipulation no knowledge beyond that possessed by an ordinary engineer; (2) that for submergence he relied on mechanical means easily controlled, adding, as a criticism upon the alternative method of descending by steering downwards, "I need only point out the great risk of allowing an object 100 ft. long and of great weight to proceed in the downward direction even at a small angle, as the impetus gained would very easily carry it beyond a safe depth so quickly that they might not have time to check it"; (3) that the bow rudders always secured a horizontal position when the boat was running submerged, which position he had found to be a *sine qua non* for a submarine boat.

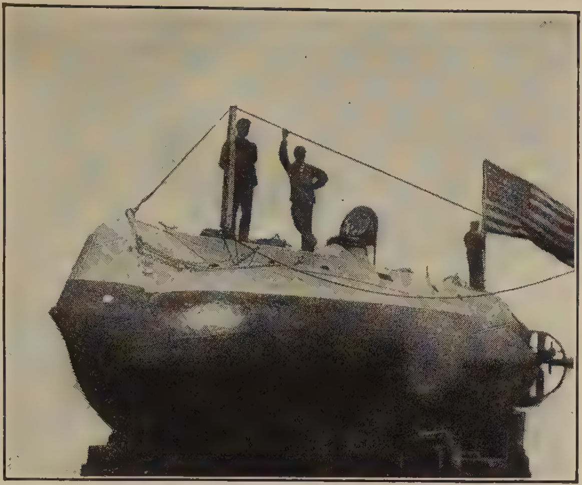


FIG. 122.—*Holland Submarine.*

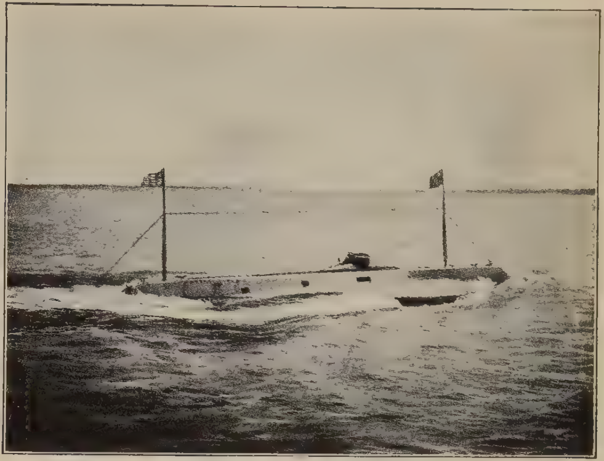
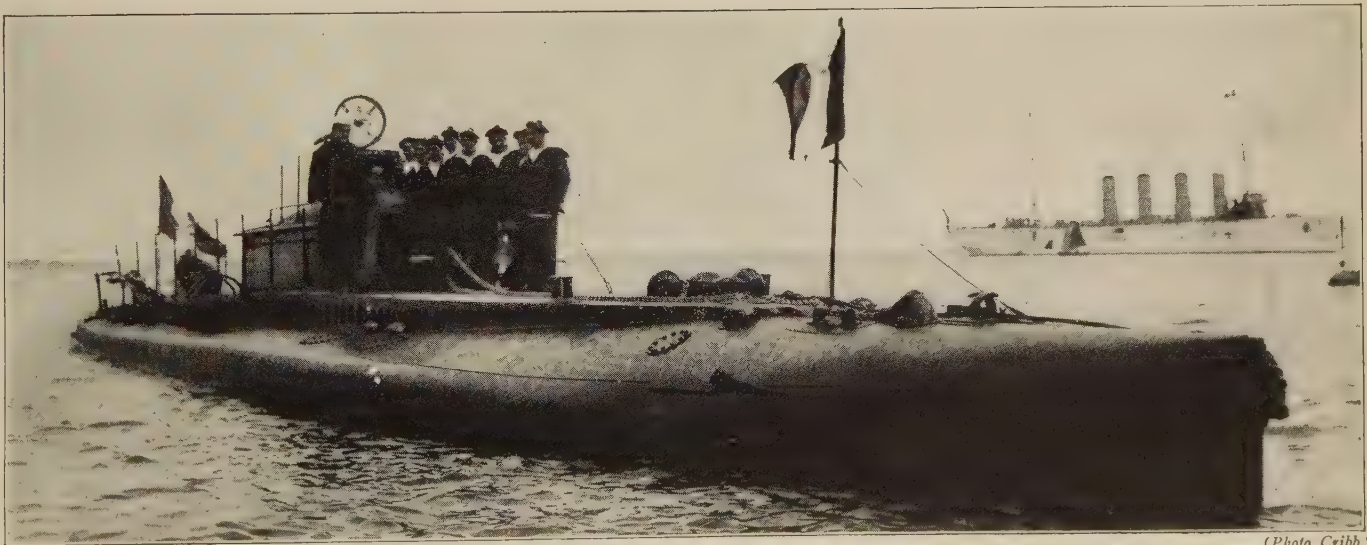


FIG. 123.—*Holland Submarine.*

FIG. 124.—*Holland Submarine.*

FIG. 125.—*Holland Submarine.*



(*Photo, Cribb.*)

FIG. 128.—French Submersible *Vendémiaire.*

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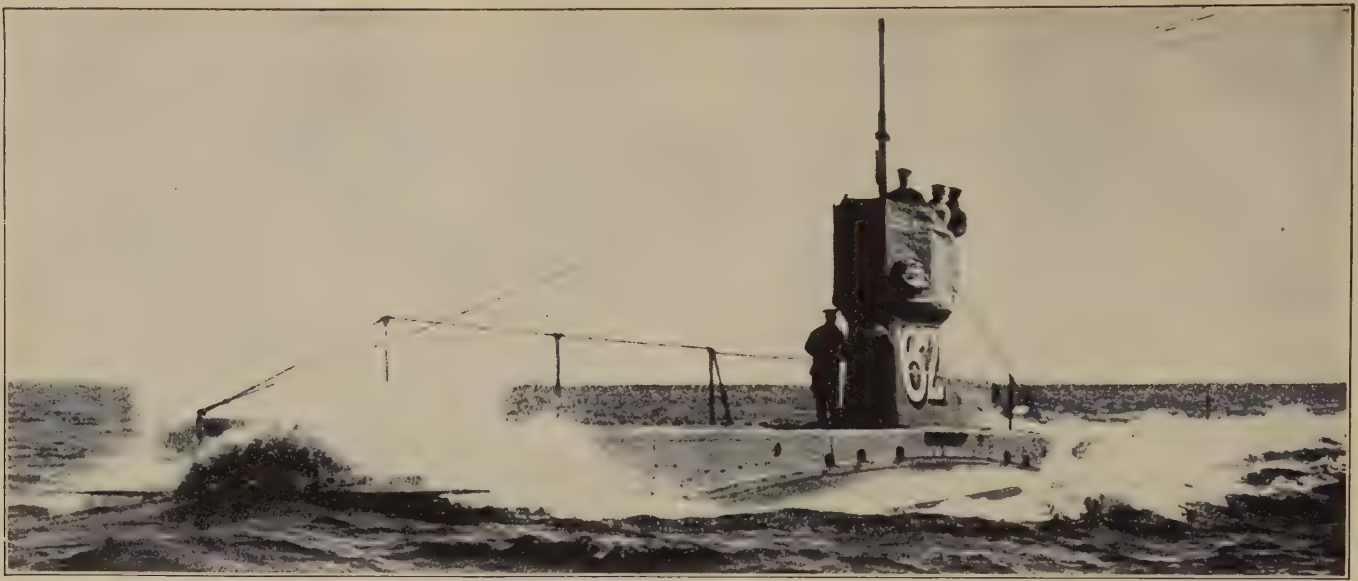

FIG. 129.—British Submarine *C 32*.

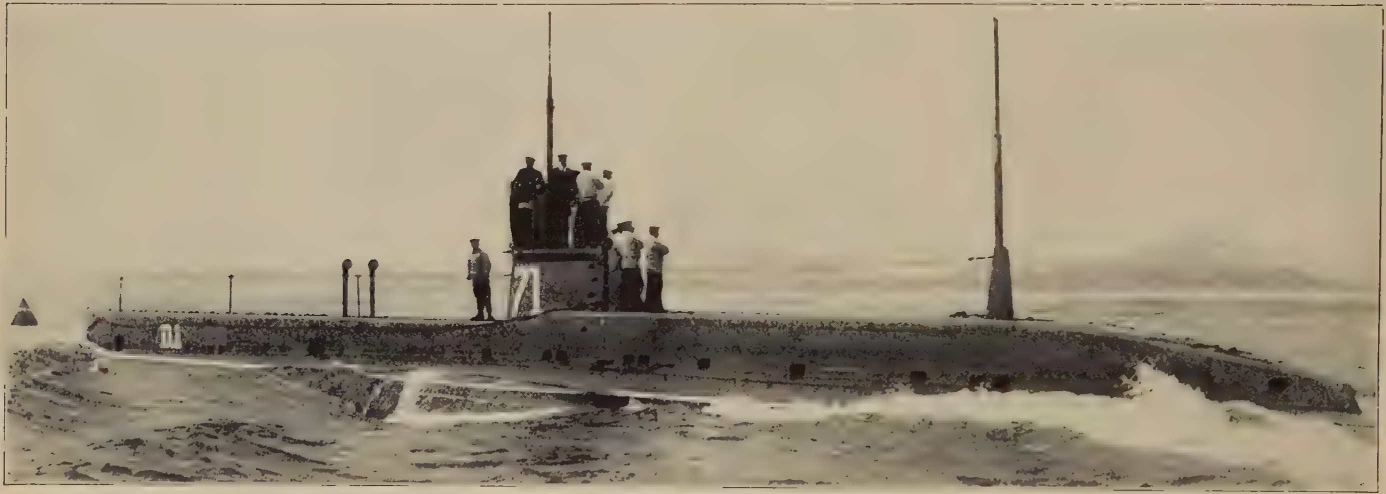

FIG. 130.—British Submarine *D 1*.

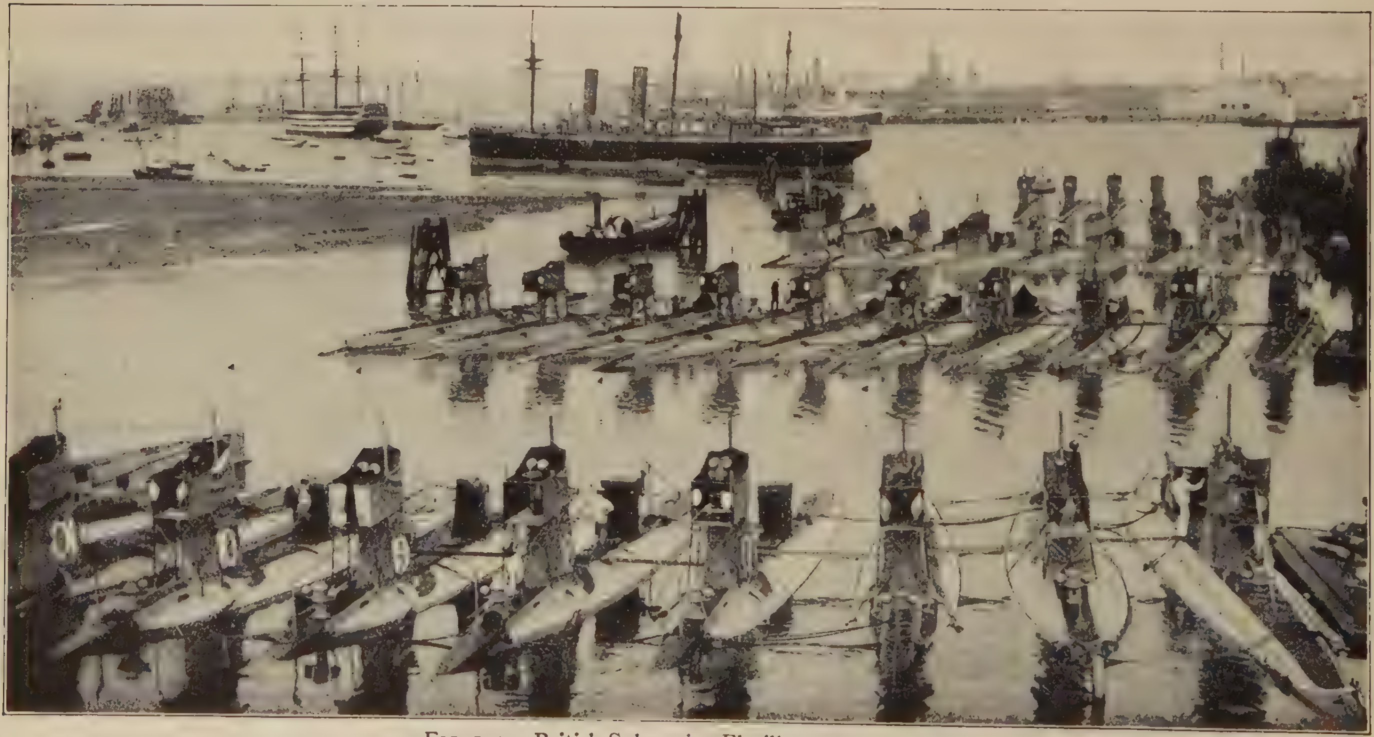

FIG. 131.—British Submarine Flotilla at Portsmouth.

(*Cribb.*)

In response to an invitation for proposals for submarines, made by the U.S. government in 1887, designs by Holland and Nordenfeldt were submitted After much consideration the proposals of the former designer were accepted, and formed the basis of the designs for the "Plunger," the "Holland" and the six vessels of the "Adder" class. From what has been already stated, the criticism of Admiral Hichborn (chief constructor of the U.S. navy) will be understood when he characterizes Holland's method as a "steering-under" or "diving" device, and Nordenfeldt's as a "down-haul" or "sinking" design. The great majority of modern boats are worked by the Holland method. The "Plunger" was authorized in 1903; she has a length of 85 ft., diameter $11\frac{1}{2}$ ft., light displacement 154 tons and load displacement 168 tons; she is of sufficient strength for a submergence of 75 ft., and when wholly submerged has a margin of buoyancy of $\frac{1}{4}$ ton. In addition to her horizontal rudders for diving, she has two down-haul screws, fitted in opposition to Mr Holland's recommendations; she may therefore be said to be a combination, for diving purposes, of both the Holland and the Nordenfeldt designs. The "Plunger's" main engines are used for propulsion when she is navigated at the surface of the water. As originally designed they were triple-expansion steam engines, driving triple screws, but have since been altered to gasolene internal-combustion engines driving a single screw. These engines are also used for charging electric accumulators, from which alone motive-power can be obtained when the boat is submerged. The current for charging the accumulators is obtained from a dynamo of 70 H.P., which can always be run in the awash condition to keep the accumulators fully charged. In the awash condition, when the boat is otherwise air- and water-tight, communication is kept up with the outer air by means of ducts and a smoke-pipe, the former bringing in air for combustion and respiration, and the latter carrying off deleterious products of all kinds. For submergence special fittings are used to close these ducts and pipes, and to stop the gasolene generator. The main engine is then no longer available, and for propulsion power is drawn from the accumulators, the dynamo thus becoming a motor which derives current from the accumulators and itself drives the screw-shaft. As was the case with Mr Holland's earlier boats, great attention is given to automatic control of weights, and water-ballast is admitted to compensate for any change, such as would be produced by the discharge of a torpedo. With her original machinery the "Plunger" was to have had a surface speed of 15 knots; her anticipated speed awash or submerged is now 8 knots. To assist in determining the boat's direction a *camera lucida* is ordinarily provided, but for correcting this Mr Holland prefers trusting to observations made during occasional rises to the surface; for this purpose the boat is provided with a conning tower 4 ft. high, protected with 4-in. steel. The "Plunger" is armed with Whitehead torpedoes, and has two tubes for discharging them. After many trials it was at last decided to build a repeat of the "Adder" to take her place, and this second "Plunger" was completed in 1903. The "Holland" is a smaller boat, having a length of about 54 ft., and was purchased in 1900. The official report on this vessel is that "she has shown herself capable of such perfect control in the vertical plane that she may be kept whilst moving within a few inches of any desired depth, and that she may be brought to the surface and submerged again in a very short time." A good idea of the general form of the "Holland" may be obtained from figs. 122, 123, 124 and 125 (Plate XXVII.), the last three of which represent this vessel when undergoing trials to test her driving qualities.

The design of the six submersibles of the "Adder" class is shown in fig. 126. They are of the following dimensions: length 63 ft. 4 in., diameter 11 ft. 9 in.; displacement for surface running 104 tons; submerged displacement 120 tons. The main features of this class are the same as for the "Plunger." The shell-plating is $\frac{7}{16}$ in. in thickness, and the frames $3\frac{1}{2}$ in. by 3 in., with a spacing of 18 in. The main machinery is a four-cylinder single-acting balanced Otto gasolene engine, which at 360 revolutions will develop 160 H.P. and give the boat a speed of about 8 knots. For propulsion in the submerged condition an electric motor is used, working at 800 revolutions, and giving a speed of 7 knots, a single left-handed propeller being employed. The current for the motor is provided by storage batteries capable of supplying 70 H.P. for four hours; and these batteries are charged by the main engine. The requisite air supply is obtained when the vessel is at the surface, and is stored under a pressure of 2000 ℔ by a pump driven by gearing off the main engine or main motor. Air at a pressure of 50 ℔ is used for the expulsion of torpedoes, and the same agent, at various degrees of pressure, works the trimming and ballast tanks and some parts of the machinery; while the exhaust air from the latter subserves the purpose of ventilation. The vessel is fitted with power and hand-steering gear, and there are automatic devices for securing a constant depth during submergence. Five Whitehead torpedoes, 45 cm. (about 18 in.) in diameter and 11 ft. 8 in. long, are provided, and there is one expulsion tube placed forward about 2 ft. below the light water-line.

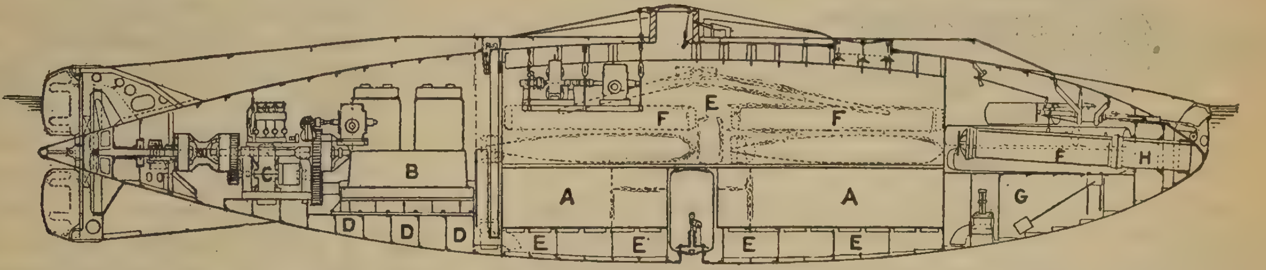

Fig. 126.—Plan of the U.S. "Adder" (reproduced by permission of Admiral Hichborn). A, storage batteries; B, gas-engine; C, dynamo and motor; D, water-tight compartments; E, main ballast tanks; F, air-flasks; G, gasolene tank; H, expulsion tube.

Goubet system.

The French submarine boat "Plongeur" has already been mentioned. A further advance in this direction was made in France in 1881, when a small submarine was completed by M. Goubet at Paris. An inspection of this vessel led to an order for the mechanism of a number of boats from this engineer for the Russian government, and several sets were built and delivered early in 1883. The length of a boat constructed by M. Goubet in 1885 was 16 ft. 5 in.; it had an oval section 5 ft. 9 in. in depth and 3 ft. 3 in. in breadth, and tapered to a point at each end. A longitudinal section of the boat is represented by fig. 127. The main portion of the hull was of bronze, cast in one piece, and at the centre of its length it was surmounted by a large dome having seven glazed openings. There was just sufficient room for an officer and a man seated back to back within it, their eyes in this position being level with the glass windows of the dome. All valves and other mechanism requiring regulation were brought within reach of these occupants, so that no movement on their part was required which might affect the trim; a reservoir of compressed air supplied the means of respiration, and an air-pump removed the vitiated atmosphere. The motive-power was furnished by accumulators, the electric energy stored therein driving a screw propeller by means of a motor. No means of recharging these accumulators when exhausted was provided on board. Submersion was effected by admitting water into tanks divided by transverse bulkheads at sufficient intervals to prevent the surging of the water in the fore and aft direction. A pump expelled this water again when desired, and a safety weight attached to the bottom of the boat was ready for detachment in the presence of danger. A pressure gauge indicated the depth of water reached, and the officer could regulate the opening of the inlet valves or the action of the pumps to maintain or vary this depth as desired. For controlling the boat in a horizontal direction a specially devised pendulum was employed, by means of which a clutch was moved, and a constantly running shaft was thrown into gear with a pump as soon as the boat departed appreciably from the horizontal plane. The action of the pump was reversible, and the clutch engaged it always in such a way that it drew water from a tank at the low end of the boat, and delivered it to a tank at the high end. Several other devices of great ingenuity were employed in the boat; notably a special form of universal joint introduced into the line of shafting. At the after end, close to the propeller, this universal joint was fitted in such a way that the screw could be set at an angle to the line of motion, and steering effected without the aid of a vertical rudder. A torpedo containing 100 lb of dynamite or other explosive was carried outside the hull, and secured by a catch joint. This torpedo, on the submarine boat being manœuvred into position, could be thrown off and allowed to rise and attach itself, by means of spikes, to some vulnerable part of the ship doomed to destruction. Retiring then to a safe distance, the submarine boat could explode the torpedo by the agency of an electric current.

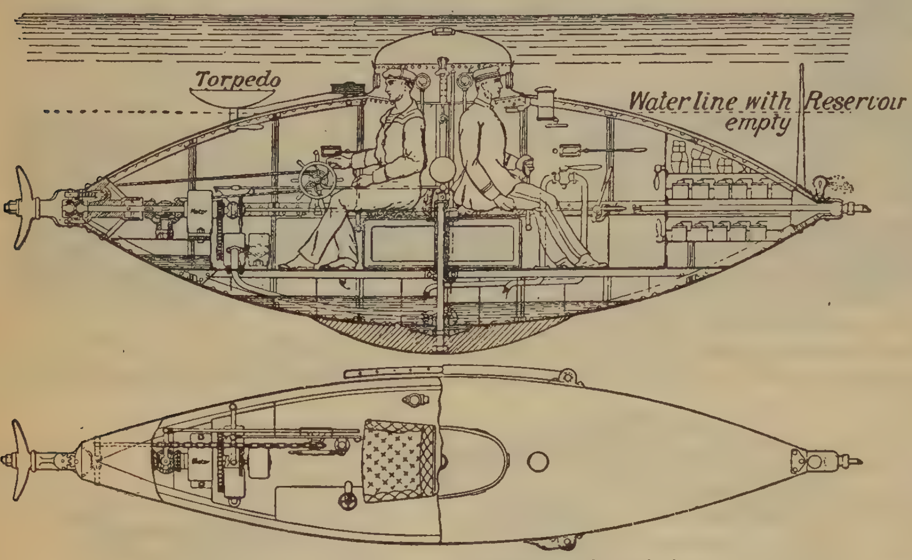

FIG. 127.—Section of Goubet Submarine Torpedo-boat.

Working in the light of his now considerable experience, M. Goubet built several other boats. These were of larger dimensions, having a length of 27 ft.; their material was also bronze, and they were cast in three pieces, the centre one having a thickness of 1 in., while the others were reduced to a little more than ½ in. at the ends. Possessing to a large extent the same contrivances as their predecessor, these improved boats were fitted also with an automatic apparatus for regulating the depth of submersion. In this regulator a piston is moved along a cylinder by the rotation of a rod with a screw thread cut in it, and so increases or diminishes the amount of water in the cylinder. The movement of the piston is effected by a small motor, and the direction of action of the motor is regulated by a commutator placed in juxtaposition to a pressure gauge. When the depth of submersion is too small, current is supplied to move the piston so as to admit more water; when the depth is too great, current is supplied in the opposite direction, and water is expelled. The speed attained by this boat was from 5 to 6 knots. Smaller boats of this type have been built for propulsion by manual power, but, however perfect the mechanism, the range of action of a submarine dependent on man-power for propulsion is very limited. Recent Goubet boats are being built, with motive-power, which it is proposed to carry on board ship and lower from davits when required.

The "Gymnote" was constructed at Toulon in 1888. She is a steel vessel, with a length of 59 ft. and a displacement of 30 tons; being of an experimental character only, she has no weapon of attack. The maximum speed obtainable is 8 knots. The designs of the "Gustave Zédé" and of the "Morse" were both based on those of the "Gymnote," the former having a length of 148 ft. and a displacement of 263 tons. In both of these the hull is of bronze; one great advantage of this metal being that, like the bronze of the Goubet boats, it is non-magnetic in character, and cannot therefore disturb the equilibrium of the compass. With their large dimensions they were intended to be formidable engines of war, and were furnished for attack with Whitehead torpedoes; of these latter they each carry three of 45 cm. (nearly 18 in.) diameter, discharging them by means of a torpedo tube. The "Morse" and the "Gustave Zédé," like the "Gymnote," possess only electric means of propulsion, the power being derived from batteries of accumulators. No power is provided in the vessels by which the accumulators can be recharged, so that the radius of action of these boats is necessarily very limited. The "Narval," designed by M. Laubeuf, and the outcome of a general competition in 1897, has a length of 112 ft. and a total displacement of 200 tons. She was built at Cherbourg in 1898, and is furnished with a triple-expansion steam-engine, obtaining its steam from a water-tube boiler of special form and heated by petroleum. As in the American submarines, this engine propels the boat when at the surface, and also drives a dynamo which recharges accumulators, the latter giving the reserve power for use in the submerged condition. A speed of 11 knots is obtained at the surface, and 8 knots when submerged. A new departure in the "Narval" is her double hull, the inner shell of which is of steel plate of sufficient thickness to resist any water-pressure to which the boat may be subjected, and the outer shell, placed at varying distances from the inner, forms a protection to the inner against attack. An armoured dome surmounts the boat, cutting through the external shell and carrying a short and narrow telescopic funnel, which, as in the case of the American boats, must be withdrawn preparatory to diving. Control in the vertical direction is obtained, when diving, by the use of two pairs of horizontal rudders, placed symmetrically—one pair forward, the other aft. By the above arrangement it is claimed that the horizontal direction of the boat is ensured, the American course of inclining the axis of the boat when diving being considered open to such grave objections that it is desirable to avoid it.

The early American boats of the "Holland" type, and the French boats built in the last decade of the 19th century, were the earliest really practical submarine boats, in the sense that unlike the boats which preceded them they were instruments of war which could be used by ordinary trained crews with the average chances of success and failure which attend all warlike operations. They owe their practicability not to any discovery of the method of controlling the movements of a boat beneath the surface of the water, as has been sometimes supposed, since the ordinary method of steering by means of a rudder or a combination of rudders perfectly analogous to that used for manœuvring a ship in the horizontal plane was well known and had been applied to steering submarines in the vertical plane before; but principally to the perfection of the accumulator cell as a means of storing energy for propulsion without the expenditure of air or other weight contained in the boat, and to the introduction of the optical tube. This latter instrument is a telescope with the optical axis twice bent through a right angle by totally reflecting prisms or mirrors; and under diverse forms and various names, such as periscope, cleptoscope, hyphydroscope, omniscope, &c., it affords the only practical means by which objects on the surface of the water can be seen at a distance from the interior of a submerged vessel. The problem of providing means for seeing at a distance through the water still awaits solution, and when solved, if it ever should be, will enormously add to the power of submarine boats as weapons of war.

By far the greater number of submarine boats in existence in 1910 were developments through a process of continuous experiment and improvement of the "Gymnote" and of the early Holland boats, although the process of evolution had been so rapid and extensive that the parentage of these modern boats is barely recognizable. There are, however, a considerable number of submarines built by the Lake Submarine Boat Co. of Bridgeport, U.S.A., in the service of various naval powers. These boats are designed by Mr Simon Lake, who was also a pioneer in submarine boat construction, contemporary with Mr J. P. Holland in the United States of America. His earliest boat, the "Argonaut," was intended rather for running along the bottom in shallow water than for ordinary navigation; and for sending out divers rather than for discharging torpedoes. For this purpose it was fitted with wheels for running along the bottom and with an air-tight chamber having a hatch at the bottom which could be opened when the air pressure in the chamber was made equal to that of the water outside. These features are still retained in many of the modern Lake boats, though these boats are now constructed like all other submarines, primarily for the purpose of submarine navigation.

Other boats which should be mentioned as laying claims to distinctive features in matters of detail are those built by the Fiat San Giorgio Company of Spezia, designed by Colonel Laurenti, and those built by the Germania Werft of Kiel, which are understood to embody the patents of M. d'Equevilley. The Russian government also possesses several boats generally regarded as of a distinctive type designed by M. Drzwiecki.

Perhaps the most outstanding distinction between different submarine boats is the amount of their submerged displacement which is devoted to carrying water ballast. This, of course, measures their reserve of buoyancy in the surface condition, which in different examples of boats varies from as little as 5% to as much as 60% of their surface displacement. It is obvious that, the more water ballast carried, the less of some other weight of machinery or equipment can be carried on a given submerged displacement, and the whole problem resolves itself into making the compromise which will best meet the requirements of the service for which the boat is intended. This fact has sometimes been lost sight of in discussions on this subject, which have tended sometimes to proceed on the assumption of a radical difference in character between boats of high reserve of buoyancy and those of low reserve, even to the extent of giving them the different names of "submersible" and "submarine." Another technical point in the design of submarines which has frequently been the subject of non-technical discussion is the desirability or otherwise of "bow-rudders" or "hydroplanes." This question depends on the form of the boat, and the manner in which it is proposed to handle her, and is unsuitable for discussion except in relation to the ascertained tendencies of a particular form under the vertical hydrodynamical forces which are set up by its propulsion through the water.

Similar considerations apply to the questions whether a submarine boat should have a separate means of propulsion for surface-running distinct from that fitted for submerged propulsion, and if so, whether it should consist of steam or internal-combustion engines. On account of the very limited capacity of even the best modern electric accumulator, any submarine which is intended to have a considerable radius of action must necessarily have heat engines of some description for surface propulsion and for charging batteries.

As to the type of heat engine, France was the only country which in 1910 had fitted steam engines in recently built submarines; and the general tendency was undoubtedly to use internal-combustion engines, of which those burning heavy oil are much less expensive in working than those using gasolene.

The general tendency in 1910 was to increase the size of submarine boats. Improvements in the design, apart from increase in size, depend principally on the improvements which may be made in the internal-combustion engines required for their surface propulsion, and in the improvement or possible elimination of the electric accumulators and motors for submerged propulsion, the weight of which is exceedingly great for the power obtained when compared with that which is obtained from heat engines.

It is the practice of all countries to keep secret the really important details of their submarine boats, to an even greater extent than those of ordinary warships. Some particulars, however, of the newer submarines of different countries are given below, principally to illustrate the progress in size and power.

In *France*, in 1901, M. Romazzotti, already referred to as the designer of the "Morse" and "Gustave Zédé," produced two other boats, the "Français" and "Algérien," similar to the "Morse." Four vessels, the "Sirène," "Triton," "Silure" and "Espadon," of a modified "Narval" type, were built from M. Laubeuf's designs in 1901; two others of a similar type, the "Aigrette" and "Cigogne," but of 170 tons surface displacement, were built in 1904, and two other still larger boats, the "Circé" and "Calypso," in 1905. These two boats are (155 ft. long, 16 ft. beam, 10 ft. draught) of 350 tons displacement on the surface, 480 tons submerged. Two Diesel heavy oil engines are fitted to give 11¾ knots speed on the surface and two electric motors for use when submerged. Four boats of the "Gnôme" type, of 200 tons and 280 H.P. and 135 ft. in length, designed by M. Maugas, were commenced in 1899. In 1901 twenty small submarines of the "Naïade" type were commenced to M. Romazzotti's design; they are 76 ft. in length and of 68 tons displacement, and have a surface speed of 8 knots and a speed of 4·5 knots when submerged. Their motive-power is electrical both for surface and submerged propulsion, except in the case of two boats which are provided with benzol motors for surface work. From 1905 to 1909, 34 boats of the "Pluviôse" type of twin-screw submersibles designed by M. Laubeuf were laid down; they have a displacement on the surface of 392 tons, and have engines of 700 H.P. and a speed of 12 knots on the surface, and 440 H.P. and a speed of 7¾ knots when submerged. Eighteen boats of the class have triple-expansion engines, and each of the remainder has two Diesel heavy oil motors for surface propulsion, while all have electric motors for use when submerged. Some of the steam-driven boats have traversed 730 m. in 82 hours, while the "Papin" with oil motors ran 1200 m. from Rochefort to Oran in six days without calling at any intermediate port. In fig. 128 (Plate XXVII.) is shown the "Vendemiaire," one of the boats of this class. The twin-screw submarines of the "Emeraude" class, six in number, designed by M. Maugas and laid down in 1906, are of approximately the same displacement as the "Pluviôse" class and of about the same speed; their motive-power consists of two Diesel heavy oil engines on surface and electric motors when submerged. A considerable advance in length and displacement was made in 1907, when the "Mariotte," 216 ft. in length, 522 tons displacement on the surface, and 615 tons submerged, the "Archimède," 199 ft. in length and 568 tons displacement on the surface and 797 tons submerged, and the "Admiral Bourgeois," 181 ft. in length and 555 tons surface displacement, were laid down. The H.P.s of these three submersibles are 1400, 1700 and 1500 respectively at the surface, giving a speed of 15 knots (submerged speed 10 knots).

After the completion of the last boat of the "Adder" class already referred to, a period of about three years elapsed before the acquisition for the *United States* navy of any additional submarine boats. The "Octopus," which underwent extended trials in 1907, was designed by the Electric Boat Company, the successors of the Holland Boat Company, and marked a great advance in all respects over the earlier boats. She is a twin-screw boat, having two torpedo tubes instead of one, as in the previous boats; she is of about 273 tons displacement submerged and 255 tons on the surface, and is credited with maximum trial speeds of 11 knots on the surface and 10 knots submerged. Three other boats, the "Cuttlefish," "Tarantula" and "Viper," generally similar to but somewhat smaller and less powerful than the "Octopus," were also completed during 1907 and 1908, and the "Snapper," "Bonita," "Stingray" and "Tarpon," of the same size as the "Octopus," in 1909. The "Salmon," a boat similar to the "Octopus," but of 278 tons displacement on the surface, 360 tons submerged and carrying four torpedo tubes, was completed in 1910, and is credited with trial speeds of 13 knots on the surface and 9½ knots submerged. In July 1910 this boat made the ocean passage of about 700 to 800 m. from Quincy, Mass., to Kingston, Bermuda, in four days, and returned in about the same time, proving herself remarkably seaworthy for so comparatively small a boat in the rough weather encountered. Several similar boats were in 1910 under construction.

In 1900 *Great Britain* ordered five submarine boats from Messrs Vickers, Sons & Maxim, at Barrow, who, by arrangement with the Electric Boat Company of New York, were enabled to embody in their designs all the features of the Holland boats of the "Adder" class, which these first British submarines resembled in size and most other respects, the length being about 63 ft. and submerged displacement 120 tons. Subsequent British submarines of the A, B and C classes were designed by Messrs Vickers, Sons & Maxim under instructions from the Admiralty. The progress in size and power has been continuous, and the departure from the original "Holland" type more and more marked with each successive new design. Table XX. indicates the various steps. All the boats there mentioned, except A13, which has heavy oil engines, are fitted with gasolene engines for surface propulsion. D1, which also has heavy oil engines, was completed in September 1909, and was the first of a new series of boats for the design of which Sir Philip Watts was personally responsible. She passed through her trials, and seven similar boats were in 1910 under construction. Fig. 129 (Plate XXVIII.) gives a view of C32, while fig. 130 shows D1 under weigh on the surface, and fig. 131 a flotilla in Portsmouth Harbour.

TABLE XX.

Name or Class of Boat.	Year of Completion.	Length.	Breadth.	Submerged Displacement.	Horse-Power of Engines.	Speed on Surface.
		Feet.		Tons.		Knots.
A1 . .	1903	100	11′ 9″	206	350	9
A2–A4 . .	1904–1905	99	12′ 8″	205	450	10½
A5–A12. .	1905–1906	99	12′ 8″	205	600	11½
A13 . .	1906–1907	99	12′ 8″	205	500	11½
B1–B11. .	1905–1907	135	13′ 6″	314	600	12½
C1–C17. .	1907–1909	135	13′ 6″	314	600	12½
C19–C38 .	1908–1910	135	13′ 6″	320	600	12½

Russia purchased the Lake demonstration boat "Protector" in 1904. This boat is 65 ft. long, 115 tons displacement on the surface and 170 tons submerged. The surface speed is stated to be 9 knots and the submerged 6 knots. A larger boat, of 135 tons displacement—the "Simon Lake"—was also purchased, and four others of the same size built in 1904–1905. In 1907 another small "Lake" boat of 110 tons was obtained, and in 1908 and 1909 seven larger vessels, 125 ft. long, 14 ft. beam, 450 tons on surface, 500 tons submerged, 16 knots speed on surface with petrol engines, and 6½ knots submerged, with electric motors. Of the "Holland" type Russia has obtained a considerable number; fifteen of these are from 106 to 175 tons on the surface, and one is 184 ft. long, 12 ft. beam, 11 ft. deep and 360 tons on the surface. She has also obtained three boats of the "Germania" type, 131 ft. long, 197 tons on the surface, as well as a specimen of a small submarine of 17 tons hoisting weight driven by electric accumulators only, giving 8 knots on the surface and 6 knots submerged, and armed with one torpedo tube. The large boats of the "Lake" type are driven by engines of 1200 H.P., and are stated to carry an armament of two 3-pdr. and two machine guns in addition to their four torpedo tubes. Three of the Russian submarines under construction in 1910 were 500 tons displacement on the surface.

Germany did not build submarines until 1906, when U1 was launched at the Germania Works, Kiel. She is 139 ft. long, 11 ft. 9 in. beam, 7 ft. 9 in. draught and 240 tons on the surface, being slightly larger than the Russian boats built by the same firm. She is fitted with twin-screws driven by petroleum motors of 450 H.P., giving a speed of 11 knots on the surface, and electric motors of 200 H.P., giving a speed of 9 knots when submerged. Three 18-in. torpedoes are carried, one bow tube only being provided. In 1908–1909 three larger boats were built at Dantzig, and in 1909–1910 three of 600 tons displacement at the Germania works. The boats were reported to have made very long sea passages without escort.

Japan commenced building "Holland" boats in 1905. The first five were 87 ft. in length and 125 tons displacement. Two smaller boats of 86 tons were also built. In 1908 two boats of 320 tons were built at Barrow, and despatched by steamer to Japan; and three similar boats were in 1910 being built in Japan.

In 1894 *Italy* launched the "Delfino," a single-screw boat of 105 tons and 150 H.P. The type has not been repeated, but in 1905 a fresh start was made with three boats of the "Glauco" type, twin-screw boats of 150 tons on the surface, 175 tons submerged, H.P. on surface 600 to 700, speed 14 knots on surface and 8 knots submerged. In 1908 three similar but larger boats followed, the largest being the "Foca," 137 ft. 9 in. long, 14 ft. beam, displacement 175 tons, 900 H.P. and 15 knots speed in surface condition, 225 tons displacement, 200 H.P. and 9 knots when submerged, fitted with two 18-in. torpedo tubes. In 1910 six similar but larger boats were laid down at Spezia.

The increased interest in naval matters in *Austria* is shown by the expenditure on submarines as well as on battleships. In 1907 two boats of the "Lake" type 100 ft. long, 250 tons submerged, were laid down at the government dockyard at Pola; between that date and 1910 two boats of modified "Holland" type, 138 ft. long, 300 tons submerged and 12 knots surface speed, were built at Fiume, and two of the "Germania" type ordered from Kiel.

The Swedish government began by building a submarine boat, the "Hojen," which is understood to have resembled the early "Holland" designs. In 1910 the "Hvalen," a boat similar to the latest Italian submarines, was built for the Swedish government by the Fiat San Giorgio Company at Spezia, and acquired some notoriety by making the voyage from Spezia to Stockholm without escort, including a longest run of about 700 m. from Spezia to Cartagena.

The "Dykkeren," a submarine of the "Laurenti" type, but entirely electrically propelled both at the surface and submerged, was built by the Fiat San Giorgio Company at Spezia for the Danish government in 1909. She is credited with a maximum speed of 12 knots on the surface and 8 knots submerged, but, depending entirely on the energy stored in electric accumulators, her radius of action is necessarily restricted.

Fleet Auxiliaries.—Various types of auxiliaries are provided in the principal navies to perform services of a supplementary, though frequently important character. In many cases fighting vessels of the older classes have been converted and adapted as well as is practicable for these services, but in other cases new vessels have been built or arrangements made with owners of suitable merchant ships for the adaptation and use of those ships when required by the navies. Amongst such auxiliaries the following are found in the British navy:—*Mine-laying vessels*—second-class cruisers of the Apollo class modified for the purpose; *fleet-repair ships*—the modified merchant-built vessels "Assistance" of 9600 tons displacement and the "Cyclops" of 11,300 tons; *distilling vessel*—"Aquarius" of 3660 tons, a modified merchant vessel, and a large number of *tank vessels* such as the "Provider" of 395 tons, specially built for distributing fresh water; *depot and repair ships for destroyers*—the modified cruisers "Blake," "Blenheim," "Leander" and "St George," and the modified merchant vessels "Hecla" and "Tyne"; *depot ships for submarines*—the modified cruisers "Bonaventure," "Thames," &c., and the repair ship "Vulcan," as well as a new vessel the "Maidstone," of 3600 tons, laid down at Scott's Yard, Greenock, in 1910; *oil tank vessels*—the merchant built vessels "Petroleum," of 9900 tons and "Kharki" of 1430 tons, and a new vessel, the "Burma" of 3870 tons, laid down at the Greenock Dockyard Co.'s Yard in 1910. The *hospital ship* "Maine" of 4540 tons was fitted up for service of the United States in the Spanish-American War, and was presented to the British government in 1901 by the Atlantic Transport Co.

Besides the foregoing, arrangements are made for fitting up fast vessels such as the "Mauretania" and "Lusitania" with a number of 6-in. or other Q.F. guns for service as merchant cruisers in time of war, when they would be used as ocean-going scouts, or for the protection of trade routes. Corresponding arrangements are made by several other countries, while in Russia and Japan special mercantile cruisers have been built under the title of Volunteer steamers. A full account of the Russian Volunteer Fleet is to be found in a paper read by Mr H. Rowell at the Institute of Naval Architects 1905, later vessels being described in *Engineering*, 11th March 1910, and an account of the Japanese Volunteer vessels will be found in *International Marine Engineering*, June 1909.

The writer is indebted to Mr J. H. Narbeth, M.V.O., for valuable assistance in preparing this article. (P. Wa.)

SHIPBUILDING. When ships were built of wood and propelled by sails their possible size and proportions were limited by the nature of the structural material, while the type of structure had been evolved by long experience and was incapable of any radical modification. Speed depended so much on circumstances independent of the design of the vessel, such as the state of the wind and sea, that it was impossible to include a definite speed over a voyage or measured distance as one of the essential requirements of a design; and the speed actually obtainable was low even under the most favourable conditions when judged by modern standards. Stability depended principally on the amount of ballast carried, and this was determined experimentally after the completion of the vessel. Under these conditions there was no room for any striking originality of design. One vessel followed so closely on the lines of another, that the qualities of the new ship could be determined for all practical purposes by the performance of an almost identical vessel in the past. The theoretical science of shipbuilding, the object of which is to establish quantitative relations between the behaviour and performance of the ship and the variations in design causing them, was generally neglected.

With the introduction of iron, and later of steel, as a structural material for the hulls of ships, and of heat engines for their propulsion, the possible variation of size, proportions and propelling power of ships was enormously increased. In order to make the fullest use of these new possibilities, and to adapt each ship, as closely as may be, to the special purpose for which it is intended, theoretic knowledge has become of paramount importance to the designer. He has been forced to investigate closely those branches of the abstract physical sciences that bear specially on ships and their behaviour, and these mathematical and experimental investigations constitute the study of Theoretical Shipbuilding. It embraces the consideration of problems and questions upon which the qualities of a ship depend and which determine the various features of the design, having regard to the particular services that the ship will be required to perform; *i.e.* the requirements that must be fulfilled in order that she may make her various passages economically and with safety in all conditions of wind and sea, the best form for the hull with regard to the resistance offered by the water and the engine power requisite in order to attain the speed desired, the nature of waves and their action upon the ship, and the structural arrangements necessary in order that she may be sufficiently strong to withstand the various stresses to which she will be subjected. The determination of the most suitable dimensions to fulfil certain conditions involves the consideration of a different set of circumstances for almost every service; and here the experience gained in vessels of similar type, together with the known effect of modifications made to fulfil new conditions of each particular design, can be used as a guide. The requirements of economical working, safety, &c., determine the length, breadth, depth and form. The length has a most important bearing on the economy of power with which the speed is obtained; and on the breadth, depth and height of side, or freeboard, depend to an important degree the stability and seaworthiness of the vessel.

While, however, the importance to the ship designer of mathematical theories based on first principles and experiment can hardly be overrated, it should be observed that the circumstances and conditions postulated are invariably much less complex than those which surround actual ships. The applicability of the theories depends on the closeness with which the assumed circumstances are realized in practice. The ultimate guide in the design of new ships must, therefore, still remain practical experience. To this experience theory is a powerful assistance, but can by no means replace it.

Theoretical Shipbuilding

Stability.

When a ship floats at rest in still water, the forces acting upon her must be in equilibrium. These consist of the weight of the ship acting vertically downwards through its centre of gravity and the resultant pressure of the water on the immersed hull.

Equilibrium. If the ship be supposed removed and the cavity thus formed filled with water, then, since this volume of water is in equilibrium under the same system of fluid pressures, the resultant of these pressures must be equal and opposite to the weight of the water in the cavity and will therefore act vertically upwards through the centre of gravity of this portion of water. Defining the weight of water displaced by the ship as the *displacement*, and its centre of gravity as the *centre of buoyancy*, it is seen that the fundamental conditions for the equilibrium of a ship in still water are (*a*) that the weight of the ship must be equal to the displacement, and (*b*) that its centres of gravity and buoyancy must be in the same vertical line.

A floating ship is always subject to various external forces disturbing it from its position of equilibrium, and it is necessary

Stability of equilibrium. to investigate the stability of such a position, *i.e.* to determine whether the ship, after receiving a small disturbance, will tend to return to its former position, in which case its equilibrium is termed *stable*, or whether, on the other hand, it will tend to move still farther from the original position, when the equilibrium is termed *unstable*. The intermediate case, when the ship tends to remain in its new position, is a third state of equilibrium, which is termed *neutral*.

Of the modes of disturbance possible, it is evident that a bodily movement of the ship in a horizontal direction or a rotation about a vertical axis will not affect the conditions of equilibrium; the equilibrium is also stable for vertical displacements of a ship. The remaining movements, viz. rotations about a horizontal axis, can be resolved into rotations in which the displacement is unaltered, and vertical displacements, the effect of the latter being considered separately. Of the various horizontal axes about which a ship can rotate two are of particular importance, viz. (1) an axis parallel to the longitudinal plane of symmetry, (2) an axis at right angles to this plane, both axes being so chosen that the displacement remains constant; the stability of a ship with reference to rotations about these axes is known as the *transverse stability* and the *longitudinal stability* respectively. In the following account the consideration of stability is confined at first to these two cases; the general case of rotation about any horizontal axis whatever being dealt with later.

Transverse stability. Let fig. 1 represent a transverse section of a ship, WL being its water line when upright, and W'L' its water line when inclined to a small angle θ as shown.

Assuming that the displacement is unaltered, if G be the position of the ship's centre of gravity and B, B' the positions of its centre of buoyancy in the upright and inclined positions respectively, the forces acting on the ship consist of its weight W vertically downwards through G and the resultant water pressure equal to W acting vertically upwards through B'. These constitute a couple of moment W×GZ where Z is the foot of the perpendicular from G on to the vertical through B'; the direction of the couple as drawn in the figure is such as would cause the ship to return to its original position, *i.e.* the equilibrium is stable for the inclination shown.

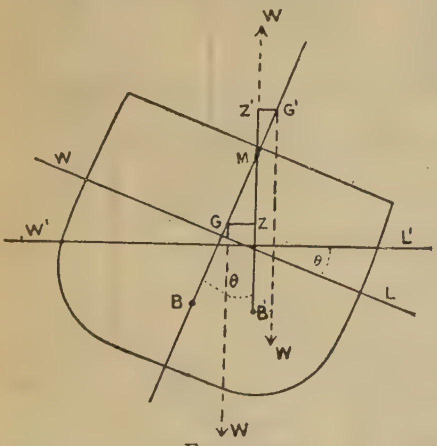

FIG. 1.

If M be the intersection of the vertical through B' with the original vertical, the moment of the restoring couple is equal to W×GM sin θ, and GM sin θ is termed the *righting lever*.

If, by moving weights on board, G be moved to a different position on the original vertical through B, the original position of the ship will remain one of equilibrium, but the moment of stability at the angle of inclination θ will vary with GM. If G be brought to the position G' above M the moment W×G'Z' will tend to turn the ship away from the original position. It follows that the condition that the original position of equilibrium shall be stable for the given inclination is that the centre of gravity shall be below the intersection of the verticals through the upright and inclined centre of buoyancy; and the moment of stability is proportional to the distance between these two points.

When the inclination θ is made smaller the point M approaches a definite position, which, in the limit when θ is indefinitely small, is termed the *metacentre*.

Small inclinations. In ships of ordinary form it is found that for 10 to 15 degrees of inclination, the intersection of the verticals through the centres of buoyancy B and B' remains sensibly at the metacentre M; and therefore within these limits the moment of stability is approximately equal to W×GM sin θ.

Since the angle on either side of the vertical within which a ship rolls in calm or moderate weather does not usually exceed the limit above stated, the stability and to a great extent the behaviour of a vessel in these circumstances are governed by the distance GM which is known as the *metacentric* height. The position of G can be calculated when the weights and positions of the component parts of the ship are known. This calculation is made for a new ship when the design is sufficiently advanced to enable these component weights and their positions to be determined with reasonable accuracy; in the initial stages of the design an approximation to the vertical position of G is made by comparison with previous vessels.

The position of the centre of gravity of a ship is entirely independent of the form or draught of water, except so far as they affect the amount and distribution of the component weights of the ship. The position of the metacentre, on the other hand, depends only on the geometrical properties of the immersed part of the ship; and it is determined as follows:

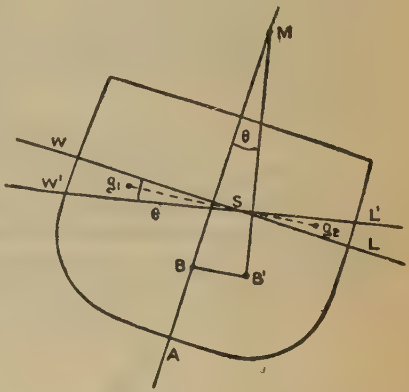

FIG. 2.

Let WL, W'L' (fig. 2) be the traces of the upright and inclined water planes of a ship on the transverse plane; B, B' the corresponding position of the centre of buoyancy; θ the angle of inclination supposed indefinitely small in the limit, and S the intersection of WL and W'L'; join BB'.

By supposition the displacement is unchanged, and the volumes WAL, W'AL' are equal; on subtracting W'AL it is seen that the two wedges WSW', LSL' are also equal. If dx represent an element of length at right angles to the plane of the figure, y_1, y_2, the half-breadths one on each side at any point in the original water line, so that WS$=y_1$, SL$=y_2$, the areas WSW', LSL' differ from $\frac{1}{2}y_1^2.\theta$, $\frac{1}{2}y_2^2.\theta$ by indefinitely small amounts, neglecting which the volumes of WSW', LSL' are equal to $\int\frac{1}{2}y_1^2\theta dx$ and $\int\frac{1}{2}y_2^2\theta dx$.

Since these are equal we have

$$\tfrac{1}{2}\int y_1^2dx=\tfrac{1}{2}\int y_2^2dx \text{ or } \int y_1dx\times\frac{y_1}{2}=\int y_2dx\times\frac{y_2}{2};$$

i.e. the moments of the two portions of the water plane about their line of intersection passing through S are equal. This line is also the axis of rotation, which therefore passes through the centre of gravity of the water plane. For vessels of the usual shape, having a middle line plane of symmetry and floating initially upright, for small inclinations consecutive water planes intersect on the middle line.

Again if g_1, g_2 are the centres of gravity of the wedges WSW', LSL', and v the volume of either wedge, the moment of transference of the wedges $v\times g_1g_2$ is equal to the moment of transference of the whole immersed volume V×BB' where V is the volume of displacement.

But $v\times g_1$S$=$moment of wedge WSW' about S$=\frac{1}{3}\int y_1^3.\theta.dx$, and $v\times$S$g_2=$moment of wedge LSL' about S$=\frac{1}{3}\int y_2^3.\theta.dx$. Adding, $\frac{1}{3}\int(y_1^3+y_2^3)\theta.dx=v\times g_1g_2=$V×BB'. But BB'=BM.$\theta$ to the same order of accuracy, and $\frac{1}{3}\int(y_1^3+y_2^3).dx$ is the moment of inertia of the water plane about the axis of rotation; denoting the latter by I, it follows that BM=I/V; *i.e.* the height of the metacentre above the centre of buoyancy is equal to the moment of inertia of the water plane about the axis of rotation divided by the volume of displacement. These quantities, and also the position of the centre of buoyancy can be obtained by the approximate methods of quadrature usual in ship calculations, and from them the position of the metacentre can be found.

If the ship is wholly immersed, or if the inertia of the water plane is negligible as in a submarine when diving, BM=O, and the condition for stability is that G should be below B; the righting lever at any angle of inclination is then equal to BG sin θ.

During the process of design the position of the centre of gravity is determined by the disposition of hull material and fittings, machinery, coal and all other movable weights, the position of which is necessarily fixed by other considerations than those of stability; but the height of the metacentre above the centre of buoyancy varies approximately as the cube of the breadth, and any desired value of GM is readily obtained by a suitable modification in the beam.

The metacentric height in various typical classes of ships at "normal load" is as follows:—

Class of Ship.	Approximate GM in Ft.
First class battleship and cruiser . .	3½ to 5
Second and third class cruiser and scout	2 to 3
Torpedo boat destroyer . . .	1½ to 2½
First class torpedo boat . . .	1 to 1½
Steam picket boat or launch . .	8 to 1½
River gunboat (shallow draught) . .	8 to 20
Large mail and passenger steamer .	·5 to 2
Cargo steamer	1 to 2
Sailing ship	2 to 6
Tug	1½ to 2½

The metacentric height adopted in steamships is governed principally by the following considerations:—

(*a*) It should be sufficiently large to provide such a position of G as will give ample stability at considerable angles of inclination and sufficient range.

(*b*) Where ample stability at large angles is obtained by other means, the stability at small angles, which is entirely due to the metacentric height, should be sufficient to prevent forces due to wind on upper works, movement of weights athwartships, turning, &c., causing large and uncomfortable angles of heel.

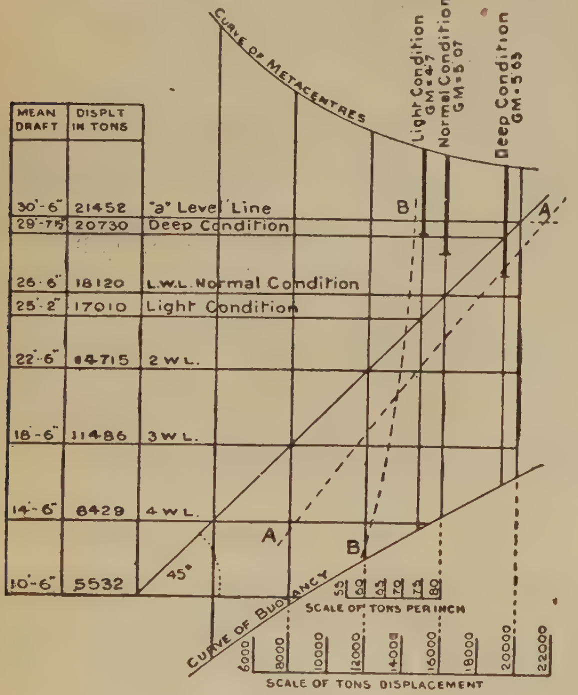
CURVE OF METACENTRES
Light Condition GM = 4·7
Normal Condition GM = 5·07
Deep Condition GM = 5·63
MEAN DRAFT
DISPLT IN TONS
30'-6" 21452 "a" Level Line
29'-7½" 20730 Deep Condition
26'-6" 18120 L.W.L. Normal Condition
25'-2" 17010 Light Condition
22'-6" 14715 2 W L.
18'-6" 11486 3 W L.
14'-6" 8429 4 W L.
10'-6" 5532
45°
A
B
A'
B'
CURVE OF BUOYANCY
55 60 65 70 75 80
SCALE OF TONS PER INCH
6000 8000 10000 12000 14000 16000 18000 20000 22000
SCALE OF TONS DISPLACEMENT

FIG. 3.—Metacentric Diagram of a Battleship.

(*c*) It should be sufficient to allow one or more compartments to become opened to the sea, through accidental damage, without risk of capsizing.

(*d*) It should, if possible, be sufficiently large in the normal condition of the ship to permit the greatest possible freedom in the stowage of a miscellaneous cargo without producing instability.

(*e*) On the other hand an excessive value causes rapid and uncomfortable rolling among waves.

A ship having small initial stability is said to be "crank," while one possessed of a large or excessive amount is termed "stiff." The former type is generally found to be steadier and easier in rolling among waves; and for this reason when other circumstances permit, the metacentric height is usually chosen as small as possible consistent with safety and comfort.

The metacentric height is affected by an alteration in displacement or in position of the centre of gravity caused by loading or unloading cargo, fuel and stores. In consequence the stability has to be investigated for a variety of conditions, particularly that in which the metacentric height is a minimum. The change in the position of the centre of gravity can be readily determined from an account of the weights removed, added or shifted; and the height of the metacentre is obtained by calculating its position at a number of water lines, and drawing a curve of heights of metacentre above keel on a base of the draught of water. The results are conveniently embodied in the form of a *metacentric diagram*; the curves of height of metacentres and vertical positions of centres of buoyancy being set up from a line intersecting the water lines at 45°.

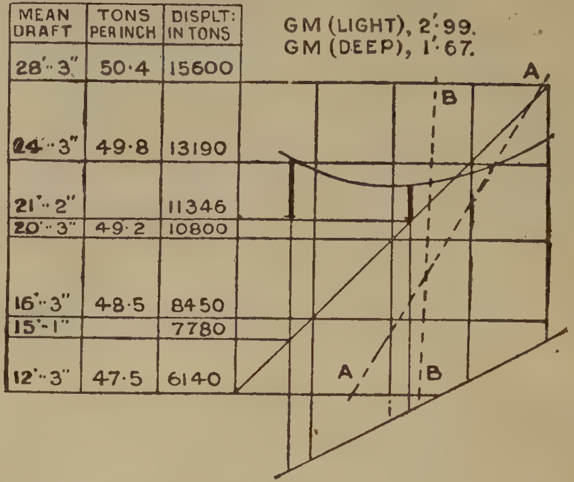
MEAN DRAFT
TONS PER INCH
DISPLT: IN TONS
GM (LIGHT), 2'·99.
GM (DEEP), 1'·67.
28'-3" 50·4 15600
24'-3" 49·8 13190
21'-2" 11346
20'-3" 49·2 10800
16'-3" 48·5 8450
15'-1" 7780
12'-3" 47·5 6140
A
B
A
B

FIG. 4.—Metacentric Diagram of a Merchant Vessel.

Figs. 3, 4 and 5 are the metacentric diagrams for a battleship, a vessel sharply curved at the bilge typical of a large number of merchant steamers, and a sailing ship of "Symondite" (or peg top) section; it will be observed that in the first and second the M curve is slightly concave upwards, and in the third sharply convex.

The buoyancy curve in all cases is nearly a straight line whose inclination at a particular water plane to the horizontal is equal to $\tan^{-1}Ah/V$; where A is the water plane area, and *h* the depth of the centre of buoyancy below the surface. The position of the metacentre at an intermediate water line is obtained from the diagram by drawing a horizontal line at the draught required, and squaring up from its intersection with the 45° line to meet the curve of metacentres.

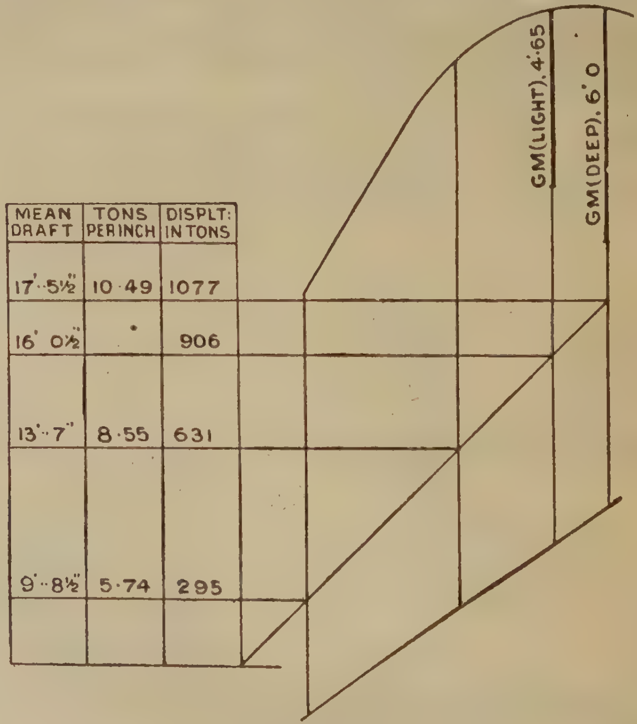
GM (LIGHT), 4'·65
GM (DEEP), 6'·0
MEAN DRAFT
TONS PER INCH
DISPLT: IN TONS
17'-5½" 10·49 1077
16' 0½" 906
13'-7" 8·55 631
9'-8½" 5·74 295

FIG. 5.—Metacentric Diagram of a Sailing Ship of "Symondite" section.

With these curves are associated (though usually drawn separately) two others known as the curves of *Displacement* and of *Tons per inch* and expressed by AA and BB respectively in the above figures. These have the mean draught of water as abscissa (vertical), and the displacement in tons and the number of tons required to increase the mean draught by 1 in., respectively, as ordinates (horizontal). The ordinate of the curve of displacement at any water line is clearly proportional to the area of the curve of tons per inch up to that water line.

Inclining experiment.

The properties of the metacentric stability at small angles are used when determining the vertical position of the centre of gravity of a ship by an "inclining experiment"; this gives a check on the calculations for this position made in the initial stages of the design, and enables the stability of the completed ship in any condition to be ascertained with great accuracy.

The experiment is made in the following manner:—

Let fig. 6 represent the transverse section of a ship; let w, w be two weights on deck at the positions P, Q, chosen as far apart transversely as convenient; and let G be the combined centre of gravity of ship and weights. When the weight at P is moved across the deck to Q′, the centre of gravity of the whole moves from G to some point G′ so that GG′ is parallel to PQ′ (assumed horizontal) and equal to hw/W where h is the distance moved through by P, and W is the total displacement. The ship in consequence heels to a small angle θ, the new vertical through G passing through the metacentre M; also $GM = GG' \cot\theta = hw/W \cot\theta$, the metacentric height being thereby determined and the position of G then found from the metacentric diagram. In practice θ is observed by means of plumb bobs or a short period pendulum recording angles on a cylinder;[1] the weight w at P, which is chosen so as to give a heel of from 3° to 5°, is divided into several portions moved separately to Q′. The weight at Q′ is replaced at P, the angle heeled through again observed; and the weight at Q similarly moved to P′ where $P'Q = h = PQ'$, and the angle observed; GM is then taken as the mean of the various evaluations.

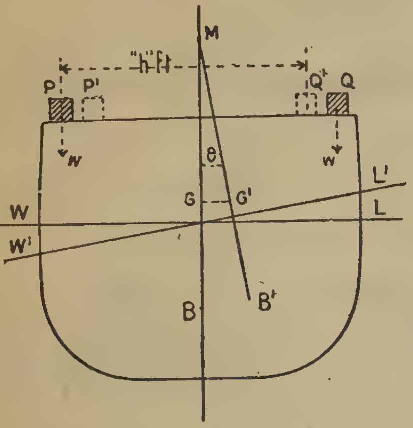

FIG. 6.

Large inclinations.

In the case of small transverse inclinations it has been assumed that the vertical through the upright and the inclined positions of the centre of buoyancy intersect, or, which is the same thing, that the centre of buoyancy remains in the same transverse plane when the vessel is inclined. This assumption is not generally correct for large transverse inclinations, but is nevertheless usually made in practice, being sufficiently accurate for the purpose of estimating the righting moments and ranges of stability of different ships, calculated under the same conventional system; this is all that is necessary for practical purposes.

With this assumption, there will always be a point of intersection (M′ in fig. 7) of the verticals through the upright and inclined centres of buoyancy; and the righting lever is, as before, $GZ = GM' \sin\theta$. In this case, however, there is no simple formula for BM′ as there is for BM in the limiting case where θ is infinitesimal; and other methods of calculation are necessary.

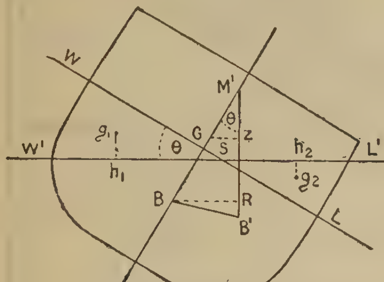

FIG. 7.

The development of this part of the subject was due originally to Atwood, who in the *Philosophical Transactions* of 1796 and 1798, advanced reasons for differing from the metacentric method which was published by Bouguer in his *Traité du navire* in 1746. Atwood's treatment of stability (which was the foundation of the modes of calculation adopted in England until about twenty years ago) was as follows:—

Let WL, W′L′ (fig. 7) be respectively the water lines of a ship when upright and inclined at an angle θ, S their point of intersection; B and B′ the centres of buoyancy, g_1 and g_2 the centres of gravity of the equal wedges WSW′, L′SL, and h_1, h_2 the feet of the perpendiculars from g_1, g_2 on the inclined water line. Draw GZ, BR parallel to W′L′, meeting the vertical through B′ in Z and R.

The righting lever is GZ as before; if V be the volume of displacement, and v that of either wedge, then

$$V \times BR = v \times h_1 h_2 \,.$$

also

$$GZ = BR - BG \sin\theta;$$

whence the righting moment or

$$W \times GZ = W \left\{ \frac{v \times h_1 h_2}{V} - BG \sin\theta \right\}.$$

This is termed Atwood's formula. Since BG, V and W are usually known, its application to the computation of stability at various angles and draughts involves only the determination of $v \times h_1 h_2$. A convenient method of obtaining this moment was introduced by F. K. Barnes and published in *Trans. Inst. N.A.* (1861). The steps in this method were as follows: (*a*) assume a series of trial water lines at equal angular intervals radiating from S′ the intersection of the upright water line with the middle line plane; (*b*) calculate the volumes of the various immersed and emerged trial wedges by radial integration, using the formula

$$v = \tfrac{1}{2}\int_0^\theta d\phi \int r^2 dx,$$

where r, ϕ are the polar co-ordinates of the ship's side, measured from S′ as origin, and dx an element of length; (*c*) estimate the moment of transference of the same wedges parallel to the particular trial water line by the formula

$$v \times h_1 h_2 = \tfrac{1}{3}\int_0^\theta \cos(\theta - \phi)\, d\phi \int r^3 dx,$$

adding together the moments for both sides of the ship; and (*d*) add or subtract a parallel layer at the desired inclination to bring the result to the correct displacement. The true water line at any angle is obtained by dividing the difference of volume of the two wedges by the area of the water plane (equal to $\int r dx$, for both sides) and setting off the quotient as a distance above or below the assumed water line according as the emerged wedge is greater or less than the immersed wedge. The effect of this "layer correction" on the moment of transference is then allowed.

The righting moment and the value of GZ are thus determined for the displacement under consideration at any required angle of heel.

A different method of obtaining the righting moments of ships at large angles of inclination has prevailed in France, the standard investigation on the subject being that of M. Reech first published in his memoir on the "Construction of Metacentric Evolutes for a Vessel under different Conditions of Lading" (1864). The principle of his method is dependent on the following geometrical properties:—

Let B′, B″ (fig. 8) be the centres of buoyancy corresponding to two water lines W′L′, W″L″ inclined at angles θ, $\theta + d\theta$, to the original upright water line WL, $d\theta$ being small; and let g_1, g_2 be the centres of gravity of the equal wedges W′TW″, L′TL″. The moment of either wedge about the line $g_1 g_2$ is zero, and the moments of W′L′A and of W″L″A about $g_1 g_2$ are therefore equal; since these volumes are also equal, the perpendicular distances of B′ and B″ from $g_1 g_2$ are equal, or B′B″ is parallel to $g_1 g_2$.

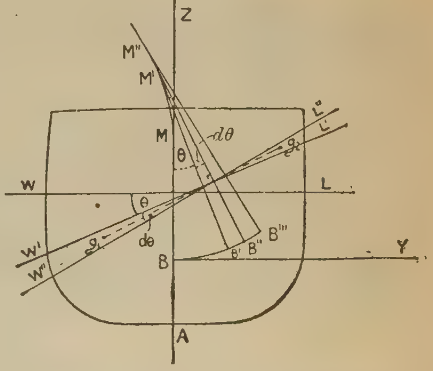

FIG. 8.

The projection on the plane of inclination of the locus of the centre of buoyancy for varying inclinations with constant displacement is termed the *curve of buoyancy*, a portion BB′B″ of which is shown in the figure. On diminishing the angle $d\theta$ indefinitely so that B″ approaches B′ to coincidence, the line B′B″ becomes, in the limit, the tangent to the curve BB′B″, and $g_1 g_2$ coincides with the water line W′L′; hence the tangent to the curve of buoyancy is parallel to the water line.

Again, if the normals to the curve at B′, B″ (which are the verticals corresponding to these positions of the centre of buoyancy) intersect at M′, and those at B″, B‴ (adjacent to B″) at M″, and so on, a curve may be passed through M′, M″, . . . , commencing at M, the metacentre. This curve, which is the evolute of the curve of buoyancy, is known as the *metacentric curve*, and its properties were first investigated by Bouguer in his *Traité du Navire.* The points M′M″, . . . on the curve are now termed *pro-metacentres.*

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[1] Such an instrument is described by Froude for recording the "relative" inclination of a ship amongst waves, *Transactions of Institution of Naval Architects*, 1873, p. 179. The pendulum should have sufficient weight and the arm carrying the pen may be about 4 ft. long. If the cylinder be fitted with a clock recording the time the natural period of the ship will also be obtained.

If ρ represent the length of the normal B′M′ or the radius of curvature of the curve of buoyancy at an angle θ, then $\rho . d\theta = ds$ the length of an element of arc of the B curve. In the limit when $d\theta$ is indefinitely small, $\frac{ds}{d\theta} = \rho$. Using Cartesian co-ordinates with B as origin and By, Bz, as horizontal and vertical axes, we have—

$$\frac{dy}{d\theta} = \frac{ds}{d\theta} \cos\theta = \rho \cos\theta, \qquad (1)$$

$$\frac{dz}{d\theta} = \frac{ds}{d\theta} \sin\theta = \rho \sin\theta; \qquad (2)$$

whence

$$y = \int_0^\theta \rho . \cos\theta . d\theta ; \; z = \int_0^\theta \rho . \sin\theta . d\theta ,$$

and the righting lever $GZ = y\cos\theta + (z - BG)\sin\theta$.

The radius ρ is (as for the upright position) equal to the moment of inertia of the corresponding water-plane about a longitudinal axis through its centre of gravity divided by the volume of displacement; the integration may be directly performed in the case of bodies of simple geometrical form, while a convenient method of approximation such as Simpson's Rules is employed with vessels of the usual ship-shaped type. As an example in the case of a box, or a ship with upright sides in the neighbourhood of the water-line, if $BG = a$ and $BM = \rho_0$, then $\rho = \rho_0 \sec^3\theta$; whence

$$y = \int_0^\theta \rho \cos\theta . d\theta = \rho_0 \tan\theta ,$$

$$z = \int_0^\theta \rho \sin\theta . d\theta = \tfrac{1}{2}\rho_0 \tan^2\theta ,$$

and

$$GZ = (\rho_0 - a)\sin\theta + \tfrac{1}{2}\rho_0 \tan^2\theta . \sin\theta ;$$

which relations will also hold for a prismatic vessel of parabolic section. It is interesting to note that in these cases if the stability for infinitely small inclinations is neutral, *i.e.* if $\rho_0 = a$, the vessel is stable for small finite inclinations, the righting lever varying approximately as the cube of the angle of heel.

The application of the preceding formulae to actual ships is troublesome and laborious on account of the necessity for finding by trial the positions of the inclined water-lines which cut off a constant volume of displacement. To avoid this difficulty the process was modified by Reech and Risbec in the following manner:—Multiply equations (1) and (2) by V.$d\theta$, V being the volume of displacement; we then have—

$$d(Vy) = I \cos\theta . d\theta , \qquad (3)$$

$$d(Vz) = I \sin\theta . d\theta , \qquad (4)$$

where I is the moment of inertia of the inclined water-line about a longitudinal axis passing through its centre of gravity. These formulae have been obtained on the supposition that the volume V is constant while θ is varying; but by regarding the above equations as representing the moments of transference horizontally and vertically due to the wedges, it is evident that V may be allowed to vary in any manner provided that the moment of inertia I is taken about the longitudinal axis passing through the intersection of consecutive water-lines. In particular the water-lines may all be drawn through the point of intersection of the upright water-line with the middle line, and the moments of inertia are then equal to $\frac{1}{3}\int r^3 dx$ for both sides of the ship, r being the half-breadth along the inclined water-line; the increase in volume is the difference between the quantity $\int d\theta \int \frac{1}{2} r^2 dx$ for the two sides of the ship.

If V_α, V_0 be the volumes of displacement at angles α and $_0$ respectively,

$$V_\alpha - V_0 = \int_0^\alpha d\theta \left[\int \tfrac{1}{2} r^2 dx \atop \text{difference} \right], \qquad (5)$$

and substituting in (3) and (4) and integrating,

$$V_\alpha y = \int_0^\alpha d\theta \left[\int \tfrac{1}{3} r^3 dx \atop \text{sum} \right] \cos\theta , \qquad (6)$$

$$V_\alpha z = \int_0^\alpha d\theta \left[\int \tfrac{1}{3} r^3 dx \atop \text{sum} \right] \sin\theta . \qquad (7)$$

On eliminating V_α in (5), (6) and (7), y and z can be found.

This is repeated at different draughts, and thus V_α, y and z are determined at a number of draughts at the same angle, enabling curves of y and z to be drawn at various constant angles with V for an abscissa; from these, curves may be obtained for y and z with the angle α as abscissa for various constant displacements; GZ being equal to

$$y \cos\alpha + (z - a)\sin\alpha .$$

From the foregoing it is evident that the elements of transverse stability, including the co-ordinates of the centre of buoyancy, position of pro-metacentre, values of righting lever and righting moment, depend on two variable quantities—the displacement and the angle of heel. The righting lever GZ is in England selected as the most useful criterion of the stability, and, after being evaluated for the various conditions, is plotted in a form of curves—(*a*) for various constant displacements on an abscissa of angle of inclination, (*b*) for a number of constant angles on an abscissa of displacement. These are known as *curves of stability* and *cross curves of stability* respectively; either of these can be readily constructed when the other has been obtained; which process is utilized in the method now almost universally adopted for obtaining GZ at large angles of inclination, a full description being given in papers by Merrifield and Amsler in *Trans. I.N.A.* (1880 and 1884). The procedure is as follows:

Curve of stability.

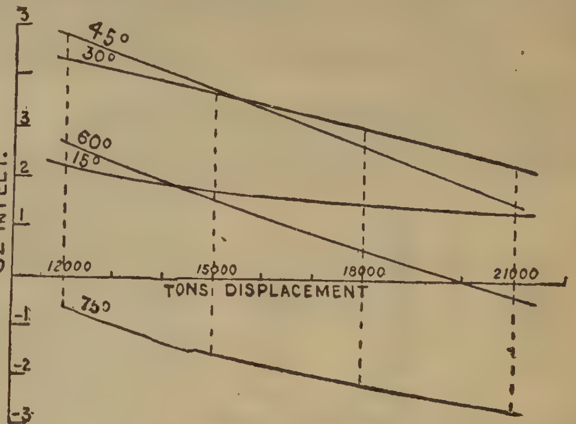


FIG. 9.—Cross Curves of Stability of a Battleship.

1. The substitution of calculations at constant angle for those at constant volume. A number of water-lines at inclinations having a constant angular interval (generally 15°) are drawn passing through the intersection S′ of the load water-line with the middle line on the body plan. Other water-lines are set off parallel to these at fixed distances above or below the original water-line passing through S′.

2. The volumes of displacement and the moments about an axis through S′ perpendicular to the water-line are determined for each draught and inclination by means of the Amsler-Laffon integrator, the pointer of this instrument being taken in turn round the immersed part of each section.

3. On dividing the moments by the corresponding volumes, the perpendicular distance of the centre of buoyancy from the vertical through S′ is obtained, *i.e.* the value of GZ, assuming G and S′ to coincide.

4. For each angle in turn "cross curves" of GZ are drawn on a base of displacement.

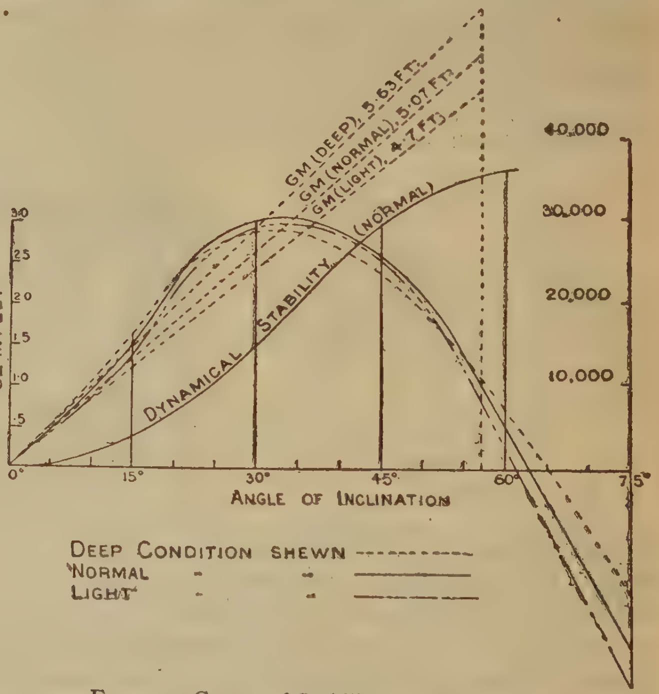


FIG. 10.—Curves of Stability of a Battleship.

5. From the cross curves, curves of stability on a base of angle of inclination can be constructed for any required displacement, allowance being made for the position of G by adding to, or subtracting from, each ordinate, the quantity GS′ sin a according as G is below or above S′.

A typical set of cross curves of stability for a battleship of about 18,000 tons displacement is shown in fig. 9. It will be observed that the righting levers decrease with an increase of displacement; and this is a general characteristic of the cross curves for ships of ordinary form. The additional weights that constitute the difference between light and deep load (*i.e.* cargo, coal, stores and water) are generally placed low down, and thus the position of the centre of gravity is usually lower when loaded than when light, causing an increase of stability which frequently more than compensates for the loss of stability indicated by the cross curves.

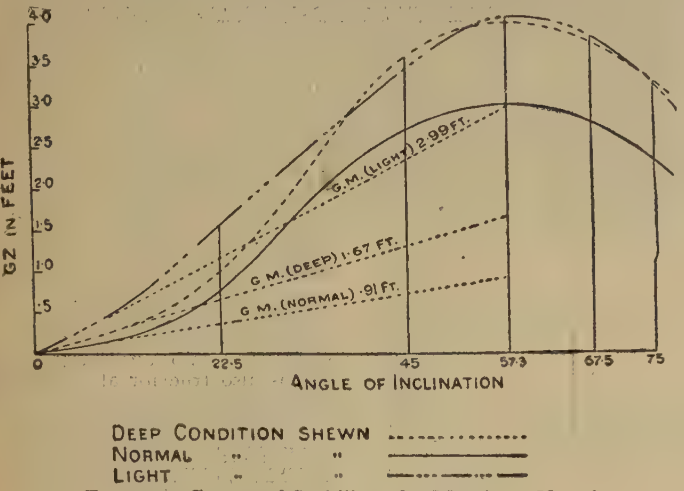
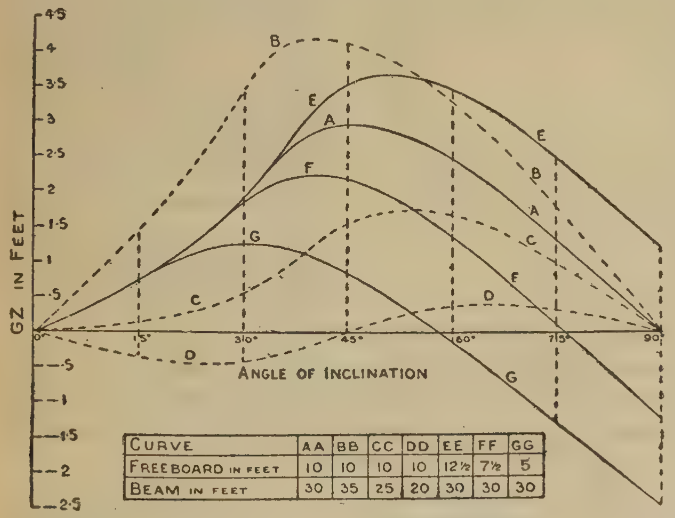


FIG. 11.—Curves of Stability of a Merchant Vessel.

The stability curves for the same vessel are reproduced in fig. 10. It is customary in warships to draw separate curves for three conditions: (*a*) normal load, *i.e.* fully equipped with bunkers about half full, and reserve feed tanks empty; (*b*) deep load with all bunkers and tanks full; (*c*) light with all coal, water (except in boilers), ammunition, provisions and consumable stores removed.

The curves for a cargo or passenger ship are generally drawn for the condition when light, when fully laden with passengers or with a homogeneous cargo, and sometimes for an intermediate condition; typical curves are given in fig. 11.



CURVE	AA	BB	CC	DD	EE	FF	GG
FREEBOARD IN FEET	10	10	10	10	12½	7½	5
BEAM IN FEET	30	35	25	20	30	30	30

FIG. 12.—Curves of Stability of a Box-shaped Vessel showing the influence of beam and freeboard.

Stability curves are obtained on the assumptions—

1. That all openings in the upper deck, forecastle and poop (if any) are covered in and made watertight; and the buoyancy of any erections above these decks is generally neglected.

2. That the side of the ship is intact up to the upper deck, all side scuttles, ports or other openings being closed.

3. That all weights in the ship are absolutely fixed.

4. That no changes of trim occur during the inclination.

In some cases curves are drawn (*a*) with forecastle and poop intact, (*b*) with these thrown open to the sea, the latter condition being more commonly considered.

The slope of the stability curve for small angles, the maximum righting lever with the angle at which it occurs, and the range or the inclination at which the stability vanishes are of particular interest, inasmuch as the curve depends principally on these features; and the effect on them, particulars of variation of freeboard, breadth and position of centre of gravity, is considered below.

Effect of freeboard.

The stability curve AA (fig. 12) is drawn for a box-shaped vessel of draught 10 ft., freeboard 10 ft. and beam 30 ft.; with C.G. in the water-plane. The curves EE, FF, GG are drawn for the same vessel, but with freeboard altered to 12½, 7½ and 5 ft. respectively; it will be observed that freeboard has no influence on the stability at small angles, but has a marked effect on the range and maximum righting lever. An increase of freeboard is generally accompanied by a rise in the position of the centre of gravity; this is not included in the curves, but would actually reduce the stability to some extent. The effect of freeboard on the range and on the safety of ships is also illustrated by a comparison between the curves of stability (fig. 13) of the armoured turret ships "Monarch" and "Captain," the latter of which was lost at sea in 1870. These vessels were similar in construction and dimensions except that the freeboard of the "Monarch" was 14′ 0″ and that of the "Captain" 6′ 6″; the smaller freeboard of the "Captain" was associated with a slightly lower position of the centre of gravity and a greater metacentric height. The stability curve of the "Captain" in consequence rises rather more steeply than that of the "Monarch" up to about 14° when the deck edge is immersed; the righting lever then rapidly declines, and vanishes at 54½°, in contrast to the "Monarch's," where the maximum righting lever is doubled and range augmented 1.3 times by the additional freeboard. For the influence of the range in enabling a ship to withstand a suddenly applied force see "Dynamical Stability."

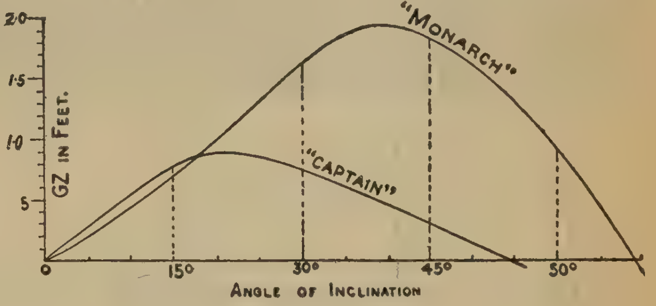


FIG. 13.—Curves of Stability of "Monarch" and "Captain."

Effect of beam.

Again, for the box-shaped vessel previously considered, if the breadth is modified successively from 30 ft. to 35, 25 and 20 ft., other features remaining unaltered, the curves of stability then obtained are represented by BB, CC and DD in fig. 12. It is seen that alteration in beam affects principally the stability levers at moderate angles of inclination, while at 90° inclination the curves all intersect. Since at small angles GZ=GM.θ (in circular measure) approximately, the initial slope of the curve is proportional to GM, and the tangent to this curve at the origin can be drawn by setting by the value of GM as an ordinate to an angle of one radian (57·3°) as abscissa, and joining the point to the origin. (See figs. 10 and 11.) The height of the metacentre above the centre of buoyancy will, *caeteris paribus*, vary with the cube of the breadth, and an increase of beam will result in a large increase of stability at moderate angles.

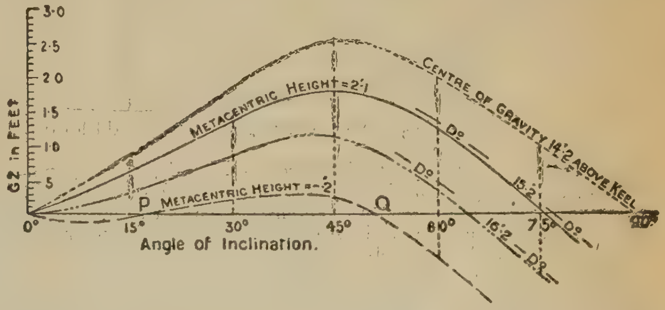


FIG. 14.—Curves of Stability of a Steam Yacht showing effect of variation in height of centre of gravity.

Effect of position of C.G.

Finally the effect of an alteration in the vertical position of the centre of gravity is illustrated by the three stability curves of a steam yacht in fig. 14, where the centre of gravity is successively raised 1 ft. In the condition corresponding to the fourth and lowest curve, the GM is negative (—·2 ft.) and so also are the righting levers up to 15° when the curve crosses the axis; from 15° to about 52° the GZ is positive, but above that value it again becomes negative. In this case the stability is unstable at the upright position, and the ship will roll to an angle of 15° on either side where the equilibrium is stable. This peculiarity is not uncommon in merchant steamers at light draught. Ample stability at large angles and good range is provided in such cases by high freeboard; but, apart from any considerations of safety, water ballast is used to lower the centre of gravity to a sufficient extent to avoid excessive tenderness.

Geometrical properties.

The properties of the loci of centres of buoyancy and of prometacentres were fully investigated by Dupin in 1822, including also the surfaces into which these curves develop when admitting inclinations about transverse and "skew" axes. It has been shown that the tangent to the curve of buoyancy at any point is parallel to the corresponding water-line; and assuming that the ship is only free to turn in a plane perpendicular to the axis of inclination, the positions of equilibrium are found by drawing from the centre of gravity all possible normals to the buoyancy curve, or equally, all possible tangents to its evolute, the metacentric curve, since the condition to be satisfied is, that the centres of gravity and buoyancy shall lie in the same vertical. Again, when the curve of statical stability crosses the axis, making an acute positive angle as at P in fig. 14, the values of GZ on either side of P are such as to tend to move the ship towards the position at P, and the equilibrium at P is stable. Similarly, when the curve crosses the axis "negatively," as at the origin and Q, the equilibrium is unstable. Since the angle of intersection cannot be either positive or negative twice in succession, on considering rotation in one direction only, it follows that positions of stable and unstable equilibrium occur alternately and the total number of positions of equilibrium is even.

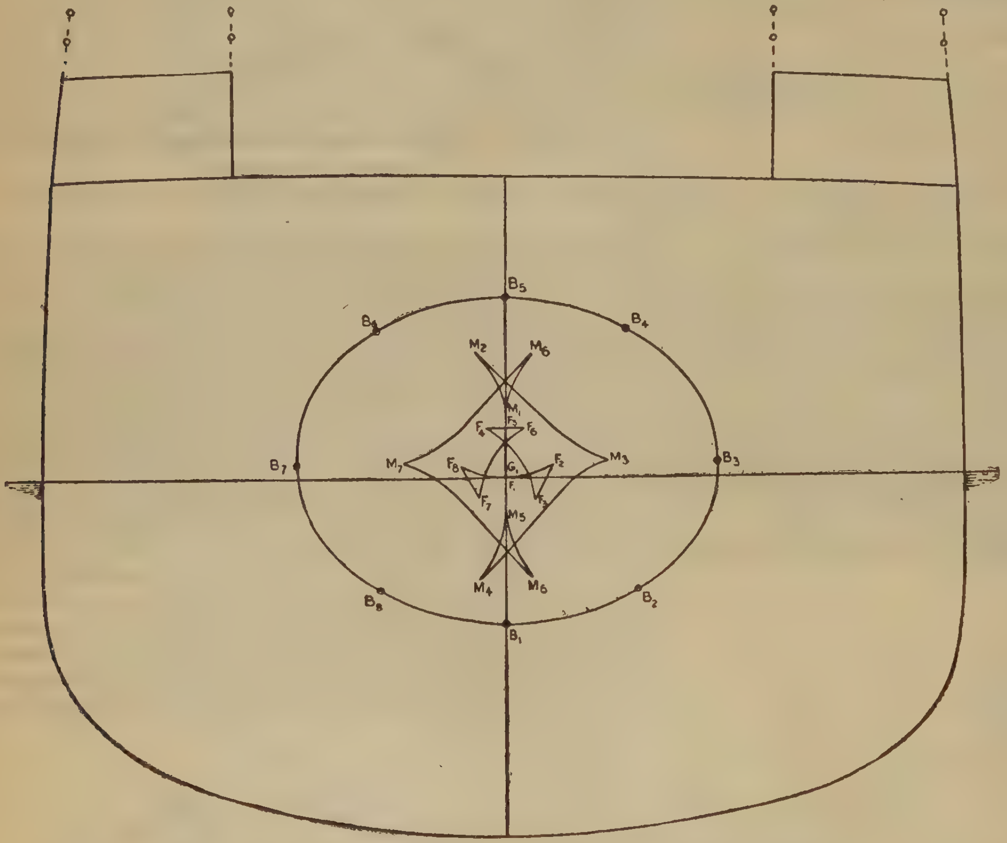


FIG. 15.—Metacentric, Buoyancy and Flotation Curves of "Serapis."

The radius of curvature of the curve of buoyancy is equal to I/V, and is always positive. The curve, therefore, has no re-entrant parts or cusps, is continuous and has no sudden changes in direction; parallel tangents (or normals) can be drawn through two points only (corresponding to inclinations separated by 180°), which property is shared by its evolute, the metacentric curve. On the other hand, the moment of inertia I varies continuously with the inclination, attaining maximum and minimum values alternately; and the metacentric curve, therefore, contains a series of cusps corresponding to the values of I when $dI=0$, which will generally occur at positions of symmetry (*e.g.* at 0° and 180°), near the angles at which the deck edge is immersed or emerged, and at about 90° and 270°.

The curves of buoyancy and flotation and the metacentric curve for H.M. troopship "Serapis" are shown with reference to the section of the ship in fig. 15, and on an enlarged scale for greater clearness in fig. 16.[1] It will be seen that the metacentric curve contains eight cusps, M_1, M_2, . . . M_8. Assuming the ship to heel to starboard, M_1 corresponds to the upright position, M_2 to the immersion of the starboard topsides and emersion of the port bilge; M_3 corresponds to 90° of heel, M_4 to the complete immersion of the deck and the emersion of the starboard bilge. M_5 corresponds to the bottom-up position and similarly for M_6, M_7 and M_8. There are also 6 nodes, of which P and Q are on the middle line. By means of those curves, the effect of a rise or fall in the position of the ship's centre of gravity can readily be traced. The positions of equilibrium correspond to the normals that can be drawn from G to the buoyancy curve, or equally to the tangents drawn to its evolute the metacentric curve. For stable equilibrium G lies below M, *i.e.* generally between B and M; and for unstable equilibrium, similarly, B is between G and M. In the ship under consideration, G_1 was the actual centre of gravity, and G_1M_1 corresponds to the upright position of stable equilibrium. As the vessel heels over, equilibrium (this time unstable) is again reached at about 90°, and a third position (stable) is obtained when the vessel is bottom up, G_1M_5 being then the metacentric height. A fourth (unstable) position is obtained at about 270°, after which the original position G_1M_1 is reached, the vessel having turned completely round. For this position of G_1 therefore, there are four positions of equilibrium, two of which are stable and two unstable; and this is also true for all positions of G between M_1 and M_5.

If G lies at G_4 between M_5 and the point P, there are six positions of equilibrium, alternately stable and unstable. If G is below P as at G_5, there are two positions of equilibrium of which the upright only is stable. A self-righting life-boat exactly corresponds to this condition, the vessel being capable of resting only in the original upright position. If G is above Q, on the other hand, as at G_3, there are again only two positions of equilibrium, the vessel being unstable when upright. If G is at G_2 there are again six positions of equilibrium; the upright position is unstable, but a stable position is reached at a certain angle on either side. This phase is often realised in merchant ships when light, as already stated (*vide* fig. 14). When G is exactly upon one of the branches of the metacentric curve, the equilibrium is neutral; if it is at M_1 the ship is stable for finite inclinations, and if at Q unstable; similarly for M_5 (except that the neutral state is then reached at 180°) and for P.

In all the above cases it will be observed that the positions of stable and unstable equilibrium are equal in number and occur alternately. There are two exceptions:—

1. When the moment of inertia of the water plane changes abruptly so that the B curve receives a sudden change of curvature. This is possible with bodies of peculiar geometrical forms, and two positions of M then correspond to one position of the body; if G lies between them, the equilibrium is stable for inclinations in one direction and unstable for those in the opposite direction, and is then termed "mixed."

2. When the equilibrium is neutral, this condition may be regarded as the coincidence of two or more positions of equilibrium alternately stable and unstable. The ship may then be either stable, unstable or neutral for finite inclinations; in exceptional cases she may be stable in one direction and unstable in the other, resembling to some extent the condition of "mixed equilibrium."

Another curve whose properties were originally investigated by Dupin is the *curve of flotation* $F_1F_2F_3$ . . . (fig. 15), which is the envelope of all the possible water-lines for the ship when inclined transversely at constant displacement. Since, as previously shown, consecutive water-planes intersect on a line passing through their centre of gravity, or, as it is termed, the centre of flotation, the curve of flotation will be the locus of the projections of the centres of flotation on the plane of the figure, which curve touches each water-line.

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[1] The curves of buoyancy and flotation and the metacentric curve for various forms, including that of H.M.S. "Serapis," were obtained by practical investigation by the writer in 1871. The results showed that Dupin's investigations, which were apparently purely theoretical, had not fully disclosed certain features of the curves, such as the cusps, &c.

From consideration of the slope of a ship's side around the periphery of a water-line, Dupin obtained the following expression for ρ', the radius of curvature of the curve of flotation,

$$\rho' = \frac{\int y^2 \tan \alpha . \, ds}{\text{area of water-plane}} \text{ for both sides,}$$

where ds is an element of the perimeter, α the inclination of the ship's side to the vertical, and y its distance from the longitudinal axis through the centre of flotation. M. Emile Leclert, in a paper read at the Institution of Naval Architects, 1870, proved the equivalence of the above formula to the two following, which are known as Leclert's Theorem:

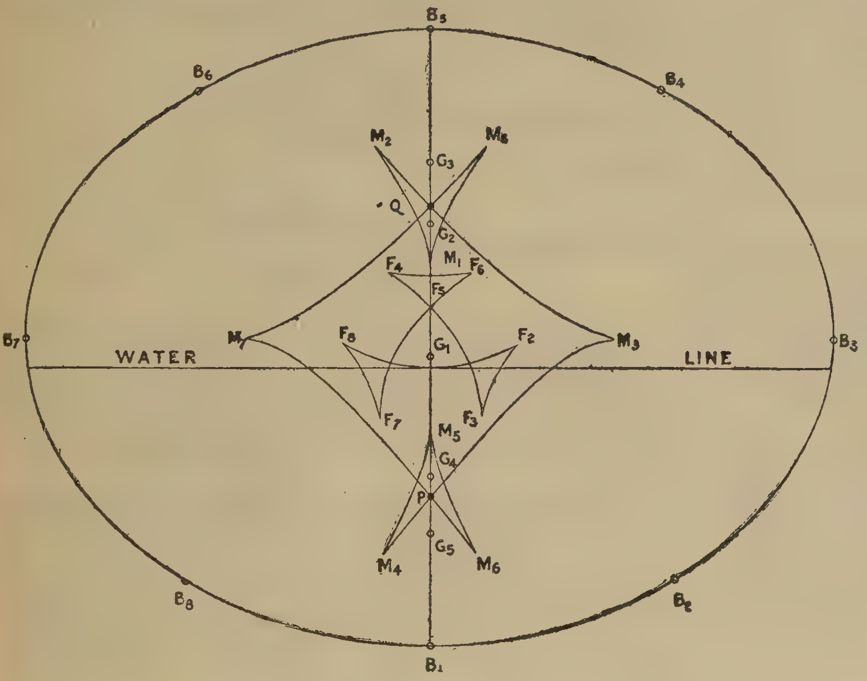

FIG. 16.

$$\rho' = \rho + V\frac{d\rho}{dV} \text{ and } \rho' = \frac{dI}{dV},$$

where I and V are respectively the moment of inertia of the water-plane and the volume of displacement, and ρ is the radius of the curve of buoyancy or B′M′. Independent analytical proofs of the formulae were given in the paper referred to; and (*Trans. I.N.A.*, 1894) a number of elegant geometrical theorems in connexion with stability, given by Sir A. G. Greenhill, include a demonstration of Leclert's Theorem as follows (in abbreviated form):

Let B, B_1 (fig. 17) be the centres of buoyancy of a ship in two consecutive inclined positions, and F, F_1 the corresponding centres of flotation. Draw normals BM, B_1M, meeting at the pro-metacentre M, and FC, F_1C, meeting at the centre of curvature C. Produce FB, F_1B_1 to meet at O; join OM, MC.

Then BM, CF and B_1M, CF_1 are respectively parallel, and ultimately also BB_1, FF_1; hence the triangles MBB_1, CFF_1 are similar and

$$\frac{BM}{CF} = \frac{BB_1}{FF_1} = \frac{OB}{OF},$$

so that O, M and C are collinear.

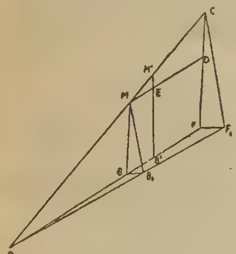

FIG. 17.

If the displacement V be now increased by dV, changing B to B′, and M to M′, then since the added displacement dV may be supposed concentrated at F, B′ will lie on OBF, and it may be shown similarly as before that M′ lies on OC. Further, considering the transference of moments, BB′×V = BF×dV.

Draw MED parallel to BF, then

$$\frac{dV}{V} = \frac{BB'}{BF} = \frac{ME}{MD} = \frac{M'E}{CD} = \frac{d\rho}{\rho' - \rho};$$

$$\therefore \frac{d\rho}{dV} = \frac{\rho' - \rho}{V} \text{ or } \rho' = \rho + V\frac{d\rho}{dV},$$

giving Leclert's first expression; also, since $\rho = \frac{I}{V}$,

$$\frac{dI}{dV} = \rho + V\frac{d\rho}{dV} = \rho',$$

which is Leclert's second expression for ρ'.

The value of ρ' at the upright can be obtained from the metacentric diagram by the following simple construction. Let M and B be the metacentre and the centre of buoyancy for a water-line WL on the metacentric diagram (fig. 18); draw the tangent to the B curve meeting WL at Q, and through Q draw QR to meet MB and parallel to the tangent to the M curve at M. Let BP = h, and area of water-line be A. Then

$$PQ = h \cot \theta = h\frac{V}{Ah} = \frac{V}{A};$$

also

$$MR = BM - (BP + PR) = \rho - \frac{V}{A}(\tan \theta + \tan \phi).$$

If D be the draught,

$$\tan \theta + \tan \phi = -\frac{d\rho}{dD} = -A \cdot \frac{d\rho}{dV},$$

whence

$$MR = \rho + V\frac{d\rho}{dV} = \rho'$$

the curve of flotation being concave upwards if R is below M.

For moderate inclinations from the upright, the buoyancy of the added layer due to a small additional submersion will act through the centre of curvature of the curve of flotation; this point may be regarded as that at which any additional weight will, on being placed on a ship, cause no difference to the values of the righting moment at moderate angles of inclination. The curve of flotation, therefore, and its evolute bear similar relations to the increase or decrease of the stability of a ship due to alteration of draught, as the curves of buoyancy and of pro-metacentres do to the actual amount of the stability.

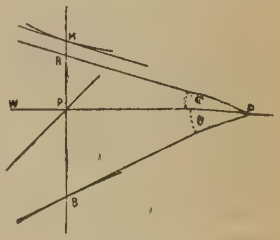

FIG. 18.

The curve of flotation resembles the curve of buoyancy in that not more than two tangents can be drawn to it in any given direction, but it differs in that its radius of curvature can become infinite or change sign. It contains a number of cusps determined by $\rho' = \frac{dI}{dV} = 0$. These occur in an ordinary ship-shape body at positions: (1) at or near the angles at which the deck is immersed or emerged (four in number); and (2) at or near the angles 90° and 270°. There are, therefore, six cusps in the curve of flotation of an ordinary ship; they are shown in figs. 15 and 16 by the points F_2, F_3, F_4, F_6, F_7, F_8.

The following relations between the curves of buoyancy and of pro-metacentres and the curve of statical stability are of interest, and enable the former curves to be constructed when the latter have been obtained. If GZ′, GZ″ (fig. 19) are the righting levers corresponding to inclinations θ, $\theta + d\theta$, where $d\theta$ vanishes in the limit; B′, B″, the centres of buoyancy, M′ the pro-metacentre; produce GZ′ to meet B″M′ in U.

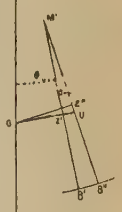

FIG. 19.

Then, neglecting squares of small quantities,

$$d(GZ') = Z'U = M'Z'.d\theta,$$

or vertical distance of M′ above $G = \frac{d(GZ')}{d\theta}$.

Also M′B′ = M′B″;
hence

$$Z''B'' - Z'B' = MZ' - MZ'' = Z''U = GZ'.d\theta,$$

or

$$GZ = \frac{d(B'Z')}{d\theta},$$

i.e. the vertical distance (B′Z′) of G over B is equal to $\int GZ.d\theta$.

It follows that by differentiating the levers of statical stability and finding the slope at each ordinate the vertical distance of M′ over G is obtained, and M′ may be plotted by setting up this value from Z′ above GZ′ drawn at the correct inclination; also that by integrating the curve of statical stability and finding its area up to any angle, the vertical separation of G and B′ is obtained, and B′ may be plotted by setting down this value increased by BG below Z′.

Dynamical stability.

The work done in inclining a ship slowly so as to maintain a constant displacement (and avoid communicating any unnecessary movement or disturbance to the water) is given by the expression $\int_0^\theta M.d\theta$ where M is the moment resisting the inclination. This may be written

$$W \times \int_0^\theta GZ.d\theta;$$

and it has been shown above that this is equal to the weight multiplied by the vertical separation of the centres of gravity and buoyancy. This is otherwise evident since the work is the sum of that done against the forces acting on the ship, viz. the weight and the buoyancy; these are respectively equal to W×rise of G, and W×fall of B, giving the value $W.(Z'B'-BG)$ as before.

The *dynamical stability* of a ship at any angle is defined as the work done in inclining the ship from the upright position; and its value is conveniently obtained by integrating the curve of statical stability as stated above. The dynamical stability can thus be calculated at various angles and a curve obtained, whose ordinates represent work done in foot-tons. The curve of dynamical stability is drawn for a battleship (normal condition) in fig. 10, and is there shown in relation to the curve of statical stability; it will be seen that the dynamical stability increases continuously until the righting moment vanishes, when it becomes a maximum.

A formula for the dynamical stability of a ship at any angle was given by Canon Moseley in a paper read before the Royal Society in 1850. Experiments on models made under his direction at Portsmouth Dockyard showed that the actual work in quickly inclining to a moderate angle agreed closely with that calculated in the case of a model of circular section; but considerable divergence was obtained with a model of triangular section owing to the motion of the water set up, and also, probably, to the variation in displacement during the roll.

Sailing ships.

The existence of large righting couples at moderate angles of heel is of greater importance in a sailing ship than in a steamship, since in the former it determines the amount of sail that can be safely carried under known weather conditions and thereby influences the speed. A sailing ship in motion is subjected to the wind-pressures on the sails and the upper works of the ship, and to the water-pressures on the hull. When the ship is in steady motion, these forces are equal and opposite; and, so far as the stability is concerned, it is sufficient to determine the transverse resultant of the wind-pressure on the sails, and its moment, the water-pressure on the hull affecting only the speed and leeway of the ship.

The pressure on the sails depends on their form and area, their position, and the apparent velocity of the wind, *i.e.* the velocity relative to the ship. The pressure of the wind on the hull is obtainable similarly to that on the sails, but is usually neglected as the heeling moment is small. Experiments have been made to determine the wind-pressure on plates by Dines, Langley, Eiffel, Stanton and others; and the results of the experiments are briefly as follows—

The normal pressure R in pounds on a plate of area A square feet exposed to face normally a wind of velocity V feet per second is given by the formula $R=KAV^2$, where K is a coefficient depending on the form and area of the plate. For a square or circular plate of about 1 sq. ft. in area K is about ·0014, corresponding to a pressure of 1 lb per sq. ft. at about 16 knots. The coefficient increases slightly for larger dimensions of the plate. It has also been found that a departure from the square or circular form involving an increase in perimeter for the same area causes an increase in the mean pressure. An alteration from the plane to the concave, analogous to the "bellying" of sails, is accompanied by a slight increase in the pressure per square foot of projected area; but for any large amount of concavity the increase is more than counterbalanced by the decrease in the projected area.

No simple law exists connecting the normal pressure on a plate exposed obliquely to the wind with the angle of incidence; it is found that the results for air exhibit a close agreement with those for water after allowing for the difference of density between the two fluids. At small angles of incidence up to about 20°, or even 40° (varying with the shape of the plate), the pressure varies directly as the angle; beyond this limit it is slightly diminished, afterwards increasing or decreasing to a value which is almost constant for the remaining angles up to and including 90°. The centre of pressure for oblique impact lies between the leading edge and the centre of gravity of the area. In a plate 1 ft. square, it lies 0·3 ft. from the leading edge at 10° inclination and 0·4 ft. at 30° inclination, gradually approaching the centre of the plate as the angle of inclination is increased. A slight curving or concavity of the plate does not appear to have much influence on the normal component of the wind-pressure.

The wind-pressure on the sails of a ship cannot be calculated with any degree of precision because existing information is insufficient to take account of (*a*) the variety in area and shape of the sails used; (*b*) the different positions in which the sails may be placed relative to the wind and to each other; and (*c*) the interference of adjacent sails with each other. On the other hand, conclusions based on these experiments are of value both in assisting in an intelligent appreciation of the effects of changes in the sail areas, sail positions, and in the form of rig, and in forming a comparison between the various qualities of speed, stability and general behaviour of vessels with which experience has been obtained.

The stability of a sailing vessel is usually estimated by assuming all plain sail to be placed in a fore and aft direction and to be subject to a normal pressure of 1 lb per sq. ft., corresponding to a wind of about 16 knots. The resultant pressure of the wind is supposed to act through the centre of gravity of the total sail area (termed the *centre of effort*). The resultant pressure of the water on the hull, which is equal and opposite to the wind-pressure, is assumed to pass through the centre of gravity of the area of the immersed middle line plane (termed the *centre of lateral resistance*). If h be the vertical distance between these points in feet, A the sail area in square feet, and α the angle of heel, the moment causing the heel is (on these assumptions)

$$\frac{Ah}{2240}\text{ foot-tons}$$

and the righting moment is approximately

$$W \times GM \sin \alpha.$$

Hence

$$\sin \alpha = \frac{Ah}{2240.W \times GM}.$$

The reciprocal of this quantity or

$$\frac{2240.W \times GM}{Ah}$$

is a measure of the capability of the ship to stand up under her canvas and is termed the *power to carry sail*. Its value varies with different sizes and classes of ships and boats. It is relatively small in small boats and small yachts owing to the practicability of reducing the angle of heel by movable ballast; and a low value is also permissible in large yachts on account of their great range of stability. In boats and yachts it varies from 3 to 4 and in full-rigged sailing ships from 15 to 20.

The stability of sailing vessels at large angles of inclination varies considerably with the class of vessel. In racing yachts and other completely decked sailing boats whose ratios of beam to depth and draught are comparatively small, initial stability is obtained by lowering the centre of gravity with ballast fitted on the keel, and the range then extends to considerably over 90°; on the other hand, a number of half-decked or open sailing boats immerse their gunwales when inclined to a moderate angle. With reference to this, Mr Dixon Kemp in his *Yacht Architecture* remarks that the deck edge should not be immersed at an angle of heel less than 20°; some small centre-board boats whose gunwales are awash at 12° or 15° cause anxiety. With full-rigged sailing ships this angle is commonly 20° to 25°.

The effect of a sudden gust of wind on a sailing ship is obtained by equating the work done on the ship by the gust to her dynamical stability; and the angle at which this equality holds will be the extreme angle of heel, assuming the ship to be originally upright and at rest. Since the dynamical stability is represented by the area of the statical stability curve it is convenient to represent this angle in relation to this latter curve. The effects of the resistance and inertia of the water and any change of displacement are neglected; the wind-pressure is assumed constant during the roll, in accordance with the results of experiments on oblique plates (the maximum angle of roll being supposed less than 50°); the modification of the pressure due to the motion of the sail is also neglected.

Let OPQ (fig. 20) be the curve of statical stability, the ordinates representing righting moments, and let the heeling couple due to the gust be represented by OS. If N be the extreme angle of heel, draw SPUR parallel to the base, cutting the curve at P, R; and PM, NQ perpendicular. The work done by the wind is the area OSUN and is equal to the dynamical stability of the ship or the area OPQN. Hence the areas OPS, PQU are equal, and the extreme angle of heel is determined by this equality. If P and Q lie on the initial and approximately straight portion of the curve, the extreme angle of heel ON is about twice that of the steady angle OM corresponding to the strength of the gust. The area QUR represents the reserve dynamical stability when the wind is blowing with strength corresponding to OS; the intercepts of the ordinates below SPUR doing work against the force of the wind, leaving the segments above SPR available for absorbing the kinetic energy possessed by the vessel at the position of steady heel PM. As the strength of the gust is increased the points P and Q travel farther along the curve until P′, Q′ are reached, such that the areas P′Q′Q, OTP′ are equal; the vessel will then come momentarily to rest at Q′ and will be in unstable equilibrium, any increase in the wind-pressure causing her to capsize. It follows that a ship sailing in a wind of sufficient strength to cause a moderate angle of heel equal to OM′ will be on the point of capsizing if the wind should happen to drop and afterwards return suddenly with its

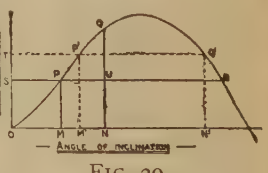

FIG. 20.

former force. A more dangerous, though improbable, case in which a gust of wind strikes the ship just as she has completed a roll to windward can similarly be investigated; it is found that the safe angle of steady heel under this condition is considerably less than that represented by OM′. It thus appears that it is of the greatest importance that sailing vessels should possess large dynamical stability in order to provide against the risk of capsizing due to fluctuations in the wind-pressure. Although the neglect of the wind and water resistances in the above investigation materially modifies the quantitative results, the general conclusions point to the necessity for sufficient range and freeboard however large the righting levers may be at small inclinations.

The centres of effort and of lateral resistance have not the same longitudinal position, consequently a horizontal couple is produced which turns the vessel either into the wind or away from it. In the former condition the vessel is said to be "ardent," and in the latter to be "slack." In order that a vessel may be quick in going about and yet not require too large a helm angle on a straight course, she should be slightly "ardent," *i.e.* the true centre of effort should be slightly abaft the true centre of lateral resistance. The assumed and true positions of these centres differ to some extent, and on making allowance for this it is found that in the majority of vessels possessing slight ardency the assumed C.E. lies slightly *before* instead of *abaft* the assumed C.L.R. In small sailing boats the points are usually very near together; but in a large number of sailing ships, including H.M. sloops, their distance apart is about ·05 L, and in yachts about ·02 L, where L is the length.

It may be noted in this connexion that the area of sail spread and the size of the ship are often connected by the coefficient $\frac{A}{W^{\frac{2}{3}}}$ known as the *Driving Power.* The value for small sailing boats and for yachts is about 200, and for full-rigged sailing ships from 80 to 100 (including plain sail only).

Longitudinal stability.

The method of estimating the righting moment of a ship when inclined from a position of equilibrium through a small angle in the longitudinal plane is exactly analogous to that used in the case of small transverse inclination, and similar propositions are true in both cases, viz.:—

1. Consecutive water-lines intersect about an axis passing through the centre of flotation.
2. The height of the longitudinal metacentre M above the centre of buoyancy is equal to the moment of inertia about this axis divided by the volume of displacement of the ship.
3. The righting moment at any small angle of inclination θ (circular measure) is equal to

$$W.GM.\theta.$$

In fig. 21 let WL be the water-line corresponding to the positions G and B, and conceive a longitudinal movement of a portion of the weights in the ship causing G to move horizontally to G′. If G′ be abaft G the ship will alter trim by the stern until B moves to B′ vertically beneath G′ and the water-line changes to W′L′, intersecting WL at the centre of flotation F.

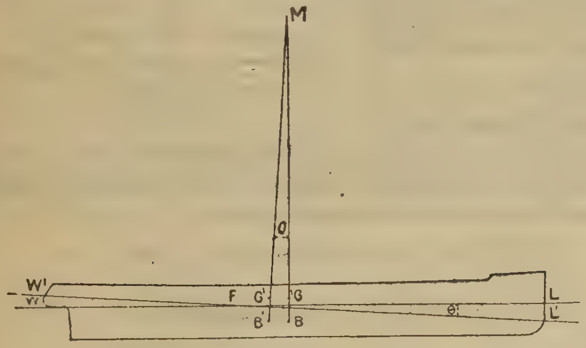

FIG. 21.

If L be the length of the ship between the draught marks, the change of trim (WW′+LL′) is equal to L.θ, and the moment changing trim is W.GG′ or W.GM.θ; the change of trim in inches (other linear dimensions being in feet) is therefore

$$W\times GG' \div \frac{W\times GM}{12L}.$$

The change of trim due to any horizontal movement of weights is therefore equal to the moment of the shift of weight divided by the quantity

$$\frac{W\times GM}{12\times L}$$

which is the moment required to change trim one inch. Since the longitudinal moment of inertia of the water-plane includes the cube of the length as a factor, the longitudinal BM is usually large compared with BG, and the moment to change trim 1 in. in foot-tons is nearly equal to

$$\frac{W\times BM}{12\times L}=\frac{W\times I}{12\times L\times V}=\frac{I}{420L},$$

which is approximately constant for moderate variations of draught.

If a weight of moderate amount w tons be placed at a distance of a feet abaft the *centre of flotation* F, the bodily sinkage in inches is $\frac{w}{T}$, the moment changing trim by the stern is wa foot-tons, and the change of trim is therefore $\frac{wa}{M}$ where T is the "tons per inch" and M the moment to change trim 1 in. If b be the distance of F abaft the middle of length, the draughts forward and aft are increased respectively by

$$w\left(\frac{1}{T}-\frac{a}{M}\cdot\frac{L+2b}{2L}\right)$$

and

$$w\left(\frac{1}{T}+\frac{a}{M}\,\frac{L-2b}{2L}\right)\text{ inches.}$$

Stability when damaged.

A ship provided with water-tight compartments is liable to have water admitted into any of them on account of damage received, or may require to carry water or other fluid in bulk as ballast or cargo. The effect of this addition on the draught and the stability is therefore of interest. There are three cases:—

1. When the water completely fills a compartment;
2. When the water partially fills a compartment up to the level of the water-line, remaining in free communication with the sea; and
3. When a compartment is partially filled with water without any communication with the sea.

In the first case the water is regarded as a weight added to the ship; the mean sinkage is obtained from the displacement curve, the change of trim from the "moment to change trim," and the angle of heel from the metacentric diagram, or (for large angles) the cross curves. In general, if the compartment filled is low in the ship, the stability is increased; if high, it is diminished.

In the second case, assume in the first place the compartment to be amidships, so that no heel or change of trim occurs, and to be moderate in size, so that the sinkage is moderate in amount.

Let ABCD (fig. 22) be such a compartment bounded by water-tight bulkheads sufficiently high to prevent water reaching adjoining compartments. Let the water-lines be WEFL, W′GHL′, before and after bilging; let A, a be the area of the whole water-plane WEFL and of the portion EF within the compartment respectively, in square feet; and let v be the volume contained in EBCF diminished by the volume of any solid cargo in the compartment. The buoyancy is reduced by an amount v by bilging, and the amount added through sinking must be equal to the amount so lost. If x be the sinkage in feet, then

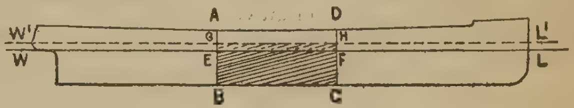

FIG. 22.

$$v=x(A-a),$$

so that the mean sinkage is equal to the buoyancy lost divided by the area of the intact water-plane. In the event of the compartment being so situated as to cause heel and change of trim, the mean sinkage is first determined as above, and the effect of heel and change of trim superposed.

To obtain the heel produced, the position of the centre of flotation for the intact portion of the water-plane is found, and thence the vertical and horizontal positions of the new centre of buoyancy are deduced by taking account of the buoyancy lost through bilging, and then regained by the layer between the two water-planes. The moment of inertia of the intact water-plane is found about an axis through the new centre of flotation and thence the height of the new metacentre M′ determined. The heel θ (assumed small) is found by equating the horizontal shift of B to sin $\theta\times$ the vertical distance of M′ above G, both being equal to the moment causing heel divided by the displacement. In a similar manner the change of trim is obtained. If the compartment bilged is large so that considerable changes in its area and that of the ship at the water-line result, the sinkage and alteration in stability are found by a tentative process, closer approximations to the final water-line being successively made.

An investigation of the stability when bilged at or near the water-line is of special importance in warships owing to their liability to damage by gunfire in action, with the consequent opening up of a large number of compartments to the sea. Calculations are made of the sinkage and stability when the unarmoured or lightly armoured parts of the ship are completely riddled; the stability should be sufficient to provide for this contingency.

The third case, where the ship is intact but has compartments partially filled with water or other liquid, is of frequent occurrence. Practical illustrations occur in connexion with the filling and emptying of water-ballast and oil-fuel tanks, and particularly in the case of ships fitted to carry large quantities of oil in bulk.

Let fig. 23 represent the section of a vessel fitted with a tank PQRS partly full of water. Let WL, *wl* be the upright water-lines

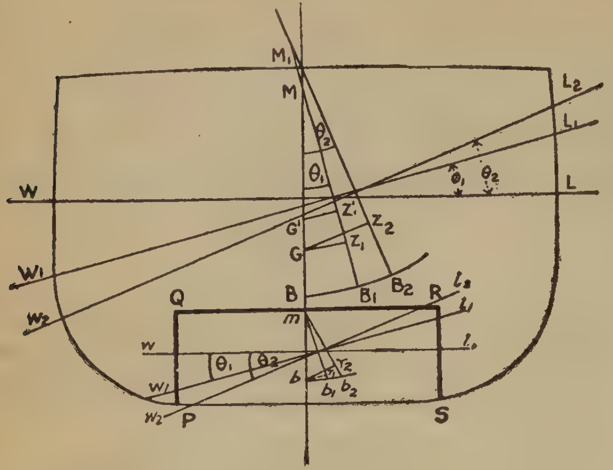

FIG. 23.

of the vessel and tank, G the centre of gravity of the vessel and water combined, B the centre of buoyancy of the vessel, and *b* the centre of gravity of the water.

As the ship is inclined successively through angles θ_1, θ_2, . . . the centre of buoyancy B moves along the curve of buoyancy to B_1, B_2,... the normals at which are tangential to the metacentric curve M_1 M_1,... those at small angles passing through the metacentre M. If the water in the tank could be kept from moving as the inclination proceeded, G would be fixed in the ship, and the righting levers would be GZ_1, GZ_2, ... those at small angles being equal to GM sin θ. Actually, if the inclination be slowly performed, the water-level in the tank changes successively to w_1l_1, w_2l_2,... maintaining a level surface at all times; its centre of gravity moves to b_1, b_2,... thereby causing a corresponding alteration in the combined centre of gravity G. Drawing br_1, br_2,... perpendicular to the verticals through b_1, b_2,... and calling *w*, W the weights of the water and of the water and ship combined, then at the angle θ_2 the line of action of the weight of the water *w* has moved through a distance br_2 and the righting moment of the ship is diminished by an amount $w \times br_2$. It is evident that the movement of the centre of gravity of the water in the tank is the same as would be the movement of the C.B. of a ship having the same form as the tank and water-lines corresponding to *wl*, w_1l_1, w_2l_2, &c. The values of the levers br_1, br_2...can therefore be obtained by a process similar to that used for obtaining the righting levers of the ship; cross curves and thence ordinary stability curves being drawn for various heights of water and inclinations. If θ_1 be a small angle of inclination, the line of action of the weight b_1m will be such as to pass through the metacentre *m* corresponding to the water-line *wl*, and determined by the formula $bm = \frac{i}{v}$ where *i* is the moment of inertia of the water-plane *wl* about a longitudinal axis through its centre of gravity and *v* the volume of water contained. The moving weight *w* at *b* may therefore be replaced by an equal weight fixed at *m*, which is the virtual centre of gravity of the water; and the centre of gravity G of ship and water is likewise raised to a virtual position G′ where

$$GG' = \frac{w}{W} \cdot bm = \frac{v}{V} \cdot \frac{i}{v} = \frac{i}{V}.$$

If the tank contain a fluid of specific gravity ρ the virtual rise of the centre of gravity is $\frac{\rho i}{V}$. The loss of stability at small angles due to the mobility of the water is thus independent of the quantity in the tank, but is proportional to the moment of inertia of its free surface. It is possible for a small quantity of water with an extensive free surface to render a ship unstable in the upright condition; the angle to which this large loss of stability extends depends, however, on the quantity of water in the tank, for the extent of the sideways movement of the centre of gravity G of ship and water is minute if the tank be either nearly empty or nearly full, and the loss of stability at all angles above a small amount will then be inappreciable; the loss at moderate angles is usually a maximum when the tanks are about half full.

The assumption made above, viz. that the ship is inclined so gradually as to maintain a level water surface in the tank, is by no means in accordance with the actual circumstances during rolling; waves are then set up in the water, causing it to wash from side to side, so that the loss of stability may be either more or less than the amount calculated. To avoid danger of capsizing in still water, large tanks in a ship are filled or emptied in succession as far as possible, so that not more than one or two are partly full at the same time. Water-tight longitudinal partitions are also fitted in wide tanks in order to reduce the moment of inertia of the free surface. On the other hand tanks, partly filled with water, have been fitted and found effective in certain ships in order to reduce the rolling oscillations among waves. (See § *Rolling*.)

Stability in any direction.

Hitherto the stability of a ship has been considered only with reference to inclinations about either a longitudinal or transverse axis. These are the only cases which it is necessary to deal with in practice for the purpose of ascertaining the probable qualities as regards stability of a vessel by comparing the elements of its stability in the design stage with those of existing ships whose qualities have been tested by experience. For the exact theoretical consideration of the stability of a ship or any floating body, however, it is necessary to take account of the true line of the action of the buoyancy and not merely of its projection on the plane of inclination. The development of this part of the subject has largely been due to M. Dupin in his *Mémoire de la stabilité des corps flottants* and to M. Guyou in his *Théorie du navire.* If a ship is inclined in all possible positions, keeping the displacement constant, the locus of the centre of buoyancy is a closed surface which is known as the surface of buoyancy; the curve of buoyancy for two-dimensional inclinations being the projection on the plane of rotation of the corresponding points on the surface of buoyancy. Similarly the envelope of all the water-planes is defined as the surface of flotation. The stability of a ship in all positions is known when (*a*) the forms and dimensions of the surface of buoyancy, and (*b*) the position of the centre of gravity relative to it, have been obtained; the former depends entirely on the geometrical form of the ship and on the constant volume of displacement assumed, and the latter has reference only to the arrangement and magnitude of the component weights of the structure and lading. For an infinitesimal inclination the line joining the centres of buoyancy when upright and inclined is parallel to the water-plane, and the tangent plane to the surface of buoyancy is therefore parallel to the water-plane, *i.e.* it is horizontal, and the normal to the surface is vertical. If the initial position is one of equilibrium, the centre of gravity must lie on the normal. To determine the effect of a small disturbance from the position of equilibrium, it is necessary, as in the particular inclinations already considered, to find the line of action of the buoyancy for adjacent positions, *i.e.* to trace the normals to the surface of buoyancy. Consecutive normals to this surface will not, in general, intersect; but, from the properties of curvature of surfaces, there are two particular directions of inclination for which adjacent normals to the surface will intersect the original normal, these directions being perpendicular to one another and parallel to the principal axes of the indicatrix of the surface of buoyancy.

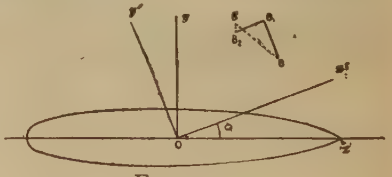

FIG. 24.

If fig. 24 be a plan of the water-plane, Ox^1 the axis of inclination passing through O the centre of flotation, Oy' and Oz perpendicular axes in and at right angles to the plane of flotation, then, from a consideration of the wedges of immersion and emersion for a small inclination θ, the travel of the centre of buoyancy B becomes:—

$$\frac{\theta}{V}\int\int y'^2 . dx' . dy' \text{ (or } BB_1 \text{ in fig. 24) parallel to } Oy'$$

$$\frac{\theta}{V}\int\int x'y' . dx' . dy' \text{ (or} - B_1B_2\text{) parallel to } Ox'$$

and

$$\tfrac{1}{2} \cdot \frac{\theta^2}{V}\int\int y'^2 . dx' . dy' \text{ (or } B_2B'\text{) parallel to } Oz.$$

These may be written:—

$$\frac{\theta}{V} \cdot I_x'; \ \frac{\theta}{V} \cdot P; \text{ and} \frac{\theta^2}{2V} I_x' \text{ respectively}$$

where I_x' is the moment of inertia of the water-plane about Ox', and P the product of inertia about Ox', Oy'. If the principal axes of inertia of the water-plane Ox, Oy make an angle ϕ with Ox', Oy', and if, from B as origin, axes Bx, By, Bz are drawn parallel to Ox, Oy, Oz, then the co-ordinates of B′ are as follows:—

$$x = -B_1B_2 \cos\phi - BB_1 \sin\phi = \frac{\theta}{V}(P \cos\phi - I_x' \sin\phi);$$

$$y = \ BB_1 \cos\phi - B_1B_2 \sin\phi = \frac{\theta}{V}(I_x' \cos\phi + P \sin\phi);$$

$$z = \ B_2B' = \frac{\theta^2}{2V} \cdot I_x'.$$

Also

$$I_x' = I_x \cos^2\phi + I_y \sin^2\phi;$$
$$P = (I_x - I_y) \sin\phi \cos\phi;$$

where I_x, I_y are the principal moments of inertia of the water-plane. Hence

$$x = -\frac{\theta}{V} \cdot I_y \cdot \sin\phi;$$
$$y = \frac{\theta}{V} \cdot I_x \cdot \cos\phi;$$
$$z = \tfrac{1}{2}\frac{\theta^2}{V}(I_x \cos^2\phi + I_y \sin^2\phi).$$

Eliminating θ and ϕ, the locus of the centre of buoyancy for small inclinations of the ship becomes the elliptic paraboloid—

$$2z = \frac{x^2}{I_y/V} + \frac{y^2}{I_x/V}.$$

The equation to the indicatrix referred to axes parallel to Bx, By is therefore

$$\frac{x^2}{I_y/V} + \frac{y^2}{I_x/V} = \text{constant};$$

and the indicatrix is therefore similar and similarly situated to the momental ellipse of the water-plane, and the surface of buoyancy is everywhere synclastic and concave to all points within it. The quantities I_y/V and I_x/V are evidently equal to BM_x and BM_y (referring to inclinations about Oy and Ox respectively); and the indicatrix and momental ellipse become

$$\frac{x^2}{BM_y} + \frac{y^2}{BM_x} = \text{constant}.$$

The angle ψ that BB_2 (the projection of BB′ on the plane of the indicatrix) makes with xO is given by

$$\tan\psi = -\frac{y}{x} = \frac{I_x}{I_y} \cdot \cot\phi;$$

hence the direction is conjugate to that of the axis of rotation with respect to the indicatrix.

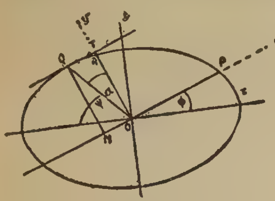

FIG. 25.

This is illustrated in fig. 25, where the ellipse shown is the indicatrix; OPx' the axis of inclination, OQ the conjugate radius, and ORMy' the perpendicular on the tangent. Draw QN parallel to OM to meet OP. The triangle OMQ is similar to BB_1B_2; and they can be made equal by giving a suitable value to the constant in the indicatrix equation. In that case QN is the projection on the plane of the figure of the normal to the surface at B^1, and the shortest distance between the normals at B and B^1 is equal to $ON = MQ = B_1B_2 = \frac{P\theta}{V}$, since ON or the axis of inclination is perpendicular to them both. Also, the length B′M of the normal at B′ intercepted between B″ and the foot of the common perpendicular is equal to $\frac{QN}{\theta}$ since θ is the angle between the normals at B and B′; it follows that

$$B'M' = \frac{BB_1}{\theta} = \frac{I_x'}{V},$$

an expression analogous to that obtained before for the case of small inclinations in the direction of the principal axes of the water-plane. It is worthy of note that the radius of curvature ρ of the normal section of the surface of buoyancy through Oy' is, in general, less than BM; the latter being equal to $\frac{OM^2}{2z}$, and ρ being equal to $\frac{OR^2}{2z}$; ρ is also obtainable by Euler's equation—

$$\frac{1}{\rho} = \frac{\cos^2\phi}{BM_x} + \frac{\sin^2\phi}{BM_y},$$

becoming equal to BM for inclinations about the principal axes. Similarly the radius of curvature of the normal section through Q is, in general, greater than BM.

If the centre of gravity G of the ship is coincident with B, the arm of the righting couple is OM or $\frac{I_x'}{V} \cdot \theta$; and there is also a couple of lever ON or $\frac{P}{V} \cdot \theta$ in a perpendicular vertical plane. The resultant couple lies in a plane containing OQ, having a lever equal to

$$OQ \text{ or } \frac{\theta}{V}\sqrt{I_x'^2 + P^2} \text{ or } \frac{\theta}{V}\sqrt{I_x^2 \cos^2\phi + I_y^2 \sin^2\phi}.$$

In the general case when G is situated at a distance a above B, the righting lever becomes $\left(\frac{I_x'}{V} - a\right)\theta$, and the perpendicular couple is unaltered. The resultant couple can be readily found, but in this case it bears no simple relation to the indicatrix, as before; it may be shown, however, that the plane of the couple is conjugate to the axis of inclination with respect to the confocal ellipse

$$\frac{x^2}{\frac{I_y}{V} - a} + \frac{y^2}{\frac{I_x}{V} - a} = \text{constant}.$$

In the case when GM = O, the ship being in neutral equilibrium for that direction of inclination, the resultant couple is parallel to the axis Ox', *i.e.* perpendicular to the plane of the indicatrix.

Numerical values of the metacentric height GM, the angle of obliquity α or QOM $\left(\text{equal to } \tan^{-1}\frac{P}{I_x' - aV}\right)$ and the angle ψ are given in the following table for a ship whose transverse GM is 4 ft., longitudinal GM 400 ft., and BG 10 ft.:—

ϕ	0°	1°	5°	10°	20°	30°	40°	50°	60°	70°	80°	90°
GM	4′	4·1	7′	16	50·4′	103′	168′	237	300	354	388	400′
α	0°	60°	78·5	76·8°	68·5°	59°	49·3°	39·5°	29·7°	19·8°	9·9°	0°
ψ	90°	29·0°	6·5°	3·2°	1·5°	1·0°	0·7°	0·5°	0·3°	0·2°	0·1°	0°

The greatest angle of obliquity (α) occurs in this case when ϕ is about $5\frac{3}{4}$° and the plane of the couple is nearly coincident with the middle line plane for all angles of ϕ greater than about 30°. It follows that if a weight is moved obliquely across the ship the axis of rotation is approximately longitudinal, except when the line of movement is nearly fore and aft; and in the latter case a small deviation from a fore and aft direction produces a large change in the position of the axis of rotation.

The direction of the axis of rotation is above expressed with reference to the position of the inclining couple in relation to the indicatrix of the surface of buoyancy; as, however, the couple is assumed small, the direction of the axis and the amount of inclination may equally be obtained by resolving the couple in planes perpendicular to the principal axes and superposing the separate inclinations produced by its components.

It has been shown above that the positions of equilibrium are found by drawing all possible normals to the surface of the buoyancy, and the condition for stability for an inclination in any direction is that the centre of gravity shall lie below the corresponding metacentre. The height of the metacentre varies with the moment of inertia of the water-plane about the axis of inclination, and the maximum and minimum heights are associated with the maximum and minimum moments of inertia, which again correspond to inclinations about the least and greatest axes of inertia respectively. If the centre of gravity lies below the lowest position of the metacentre (the transverse metacentre in the case of a ship when upright) the equilibrium is stable for all inclinations, and the condition is referred to as one of *absolute stability*; if it lies above the highest metacentre, the condition is one of *absolute instability*; if it lies between the highest and lowest metacentres, the condition is one of *relative stability*, the ship being stable for inclinations about a certain set of axes, and unstable otherwise.

The foregoing remarks apply to a vessel whose axis of inclination is fixed so that the component couple perpendicular to the plane of inclination is resisted. If, on the other hand, the vessel is free to move in all directions the resultant couple does not in general tend to restore the original position of equilibrium, although the component in the plane of inclination complies with the conditions above stated for absolute stability. If m_1 and m_2 be the greatest and least values of GM, the ratio of the component couples perpendicular to and in the plane of inclination, or $\tan\alpha$ (fig. 25), is greatest when $\tan\phi = \sqrt{\frac{m_1}{m^2}}$; and then $\tan\alpha = \frac{m_1 - m_2}{2\sqrt{m_1 m_2}}$. If m_2/m_1 be small, this ratio is large, being equal to 4·95 in the numerical example above. In such cases the extent of the movement that can result from a small initial disturbance cannot be readily determined by a statical method, but the investigation of the work done in moving the vessel from one position to another appears to meet this difficulty.

This process is employed by M. Guyon in his *Théorie du navire*, the stability of a ship in any condition being treated throughout from the dynamical standpoint. He proved that:—

1. For changes of displacement, without change in inclination, the potential energy of a system consisting of a floating body and the water surrounding is a minimum when the weight of the body is equal to its displacement.

2. For changes of direction, without change of displacement, the potential energy of the system is equal to the weight of the body, multiplied by the vertical resolute of BG; when this distance is a minimum or a maximum the stability is respectively stable or unstable. A statical proof of this has been given in the two-dimensional case.

The potential energy is thus equal to the dynamical stability increased by an arbitrary constant. If from any point B_1' of the surface of buoyancy (fig. 26) a tangent plane be drawn, the perpendicular upon it, GN, is proportional to the potential energy, and the stability of the body is thus the same as that of the surface of buoyancy regarded as a solid capable of rolling on a horizontal plane. The locus of the foot of the perpendicular N is called the "podaire" (shown dotted in the figure); this surface resembles the surface of buoyancy in its general shape, and touches it when GB is normal, *i.e.* at positions of equilibrium B_1, B_2, B_3, B_4; it has the property that a radius GN drawn from G is always vertical when the body is in the position corresponding to N, and has a length proportional to the potential energy.

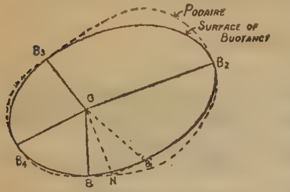

FIG. 26.

If the ship or body be supposed to move under no external forces, and the effect of any change in the displacement be neglected, the kinetic energy of the system can be expressed by $\Sigma mv^2/2g$, and the total energy by $(W \times GN) + \frac{1}{2g}.\Sigma mv^2$; the latter is constant when there are no resistances, and steadily decreases if resistances are in operation. Neglecting resistance, when the body is momentarily at rest, $W \times GN$ becomes $W.l$, where l is a linear quantity; and throughout the motion GN is less than l by $\frac{1}{2gW}\Sigma mv^2$. The effect of resistance is gradually to decrease l or the maximum value of GN; and it may be exhibited graphically by the following conception. Imagine a sphere of water, with centre at G, to be originally entirely within the podaire and then to be capable of expanding until the whole surface is submerged. It will first touch the podaire at the minimum normal, and will then form a small lake round it; similar lakes will form later at all other positions of absolute stability. Positions of absolute instability will be touched externally by the sphere, and if the water recede a little, will form small islands. At positions of relative stability the water will in general divide the surface into two parts meeting at an angle (fig. 27), and become one or the other of the branches XX′, YY′ according as the size of the sphere is slightly increased or diminished. Let the radius GN to the podaire along the edge of the water be represented by l; from the energy equation the radius for any other position of the body moving without external forces is less than l, and the position lies within the lake so bounded. The diminution of l due to resistances has the effect of gradually drying the lake. If the body is originally placed near a position of absolute stability, the small lake on drying will leave the body in or very near that position. On the other hand, if the body is placed at rest near a position of absolute instability, the water in drying will necessarily cause the body to move farther and farther from that position. Finally, if moving near a position of relative stability, the body will move freely from side to side until the drying has proceeded so far that separate branches XX′ or YY′ are obtained; when this occurs, the body will be fenced, as it were, on one side or the other, and will oscillate until a position of absolute stability is finally attained.

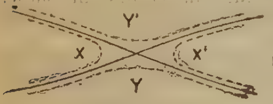

FIG. 27.

With regard to the surface of flotation it has been shown that in order that the displacement shall remain constant, consecutive waterlines must intersect on a line passing through the centre of gravity of the waterline or the centre of flotation. If the inclination take place from a given position in all possible directions, the lines of intersection with the original water-plane will all meet at the centre of flotation, which must, therefore, lie in the envelope of the water-planes, or the surface of flotation. The surface is therefore the locus of the centre of flotation for all possible inclinations. Since the curvature of the curve of flotation, which is the projection of the centre of flotation for inclinations about an axis perpendicular to the plane of projection, may change sign, the surface can also undergo similar changes in curvature and may be synclastic in certain parts and anti-clastic or saddle-shaped in others.

The relation between the surface of flotation and the stability of the ship is similar to that established in the two dimensional cases, *i.e.* the projection on the plane of inclination of the curve corresponding to the inclination has a centre of curvature whose height is a measure of the increase or decrease of stability caused by an alteration in displacement; the investigation, however, of the general case and the extension of Leclert's theorem to oblique inclinations contain no features of special interest or importance.

Rolling of Ships.

The action of the waves upon a ship at sea is such as to produce rolling or angular oscillations about a horizontal longitudinal axis, pitching or angular oscillations about a horizontal transverse axis, and heaving or translational oscillations in a vertical direction; also horizontal translations and rotations about a vertical axis which are not generally of an oscillatory character and will not materially affect the rolling. It is convenient when considering rolling to neglect the influence of the other accompanying oscillations, whose effect in most cases is slight in magnitude although complex in character.

Unresisted rolling.

The ship is in the first place conceived to be rolling in still water without any resistances operating to diminish the motion. The equation of motion for moderate angles of inclination within which the arm of the righting couple is approximately proportional to the angle of heel (*i.e.* $GZ = m \times \theta$), is

$$\frac{d^2\theta}{dt^2} = -\frac{g}{\epsilon^2}m.\theta, \quad . \quad . \quad . \quad . \quad . \quad (1)$$

where ϵ is the radius of gyration of the ship about the axis of rotation, m the metacentric height, θ the angle of inclination and g the acceleration produced by gravity. From this the time deduced for a single oscillation, from port to starboard, or vice versa, is

$$T = \pi\sqrt{\frac{\epsilon^2}{m.g}}, \quad . \quad . \quad . \quad . \quad . \quad (2)$$

showing that the time of oscillation varies directly as the radius of gyration, and inversely as the square root of the metacentric height.

The value of T is generally about 10 seconds in a large Atlantic liner, 7 to 8 seconds in a battleship, and 5 to 6 seconds in second-class cruisers and ships of similar type. In a large modern warship ϵ is about one-third the breadth of the ship.

For unresisted rolling of ships among waves the theory generally accepted is that due to Froude (see *Trans. Inst. Nav. Arch.*, 1861 and 1862). Before his work, many eminent mathematicians had attempted to arrive at a solution of this most difficult problem, but for the most part their attempts met with scanty success; wave-motion and wave-structure were imperfectly understood, and the forces impressed on a ship by waves could not be even approximated to. Froude's theory is based on the proposition that, when a ship is among waves, the impressed forces on her tend to place her normal to a wave sub-surface, which is assumed to be the surface passing through the ship's centre of buoyancy, and which is regarded as the effective wave surface, as far as the rolling is concerned. As in water at rest the ship is in equilibrium when her masts are normal to the surface of the water, so in waves she is in equilibrium when her masts are normal, instant by instant, to the effective surface of the wave that is passing her. When she at any instant deviates from this position, the effort by which she endeavours to return to the normal depends on the angle of deviation, in the same manner as the effort to assume an upright position, when forcibly inclined in still water, depends on the angle of inclination. Hence her stability (*i.e.* her effort to become vertical) in still water measures her effort to become normal to the wave at any instant on a wave. Froude made the assumptions that the profile of the wave was a curve of sines, and that the ship was rolling broadside on in a regular series of similar waves of given dimensions and of given period of recurrence. He was aware that the profile of the wave would be better represented by a trochoid, but in his first paper he gave several reasons why he preferred the curve of sines. He also assumed that the ship's rolling in still water was isochronous, and that the period of the rolling was given by $T = \pi\sqrt{\frac{\epsilon^2}{m.g}}$, as obtained theoretically. On these assumptions the equation of motion is obtained by substituting, for the angle of inclination in still water, the instantaneous angle between the ship and the normal to the wave-slope, and thus becomes

$$\frac{d^2\theta}{dt^2} = \frac{-gm}{\epsilon^2}(\theta - \theta_1) = -\frac{\pi^2}{T^2}(\theta - \theta_1), \quad . \quad . \quad . \quad (3)$$

where θ = angle of ship's masts to the vertical, and θ_1 = angle of normal to wave-slope to the vertical at the instant considered. θ_1 has to be expressed in terms of time, and is given by $\theta_1 = \Theta_1 \sin\frac{\pi t}{T_1}$, where Θ_1 is the maximum wave-slope, T_1 is the half period of the wave, *i.e.* half the time the wave takes to travel a distance equal to its length, and t is the time dating from the mid-trough of the wave. Equation (3) can therefore be written—

$$\frac{d^2\theta}{dt^2} = -\frac{\pi^2}{T^2}\left(\theta - \Theta_1.\sin\frac{\pi}{T_1}t\right), \quad . \quad . \quad . \quad (4)$$

which is the general differential equation of the unresisted motion of a ship in regular waves of constant period. The solution of this equation is—

$$\theta = C_1.\sin\frac{\pi}{T}t + C_2\cos\frac{\pi}{T}t + \frac{\Theta_1}{1 - \frac{T^2}{T_1^2}}\sin\frac{\pi}{T_1}t, \quad . \quad . \quad (5)$$

where C_1 and C_2 are constants depending on the initial movement and attitude of the ship.

The last term of this expression,

$$\frac{\Theta_1}{1 - \frac{T^2}{T_1^2}}.\sin\frac{\pi}{T_1}t,$$

represents the forced oscillations imposed on the ship by the passage of the series of waves during the time t; and the first and second terms,

$$C_1 \,.\, \sin\frac{\pi}{T}t + C_2 \,.\, \cos\frac{\pi}{T}t,$$

are the same as the free oscillations of the ship in still water.

Equation (5) indicates, therefore, that the ship performs oscillations as in still water, but has superposed on these a series of oscillations, governed by the wave-slope and the relation existing between the period of the ship and that of the wave. The equation shows that there will be innumerable phases, and of these three are worthy of notice.

(*a*) In the case in which the ship's period T is equal to the semi-period T_1 of the wave, equation (5) becomes indeterminate. The correct solution to equation (4) is then—

$$\theta = C_1 \sin\frac{\pi}{T}t + C_2 \cos\frac{\pi}{T}t - \frac{\pi}{2T}\Theta t \cos\frac{\pi}{T}t. \qquad (6)$$

It is seen that at each successive wave crest and hollow the range of the oscillation is increased, so that the ship under these conditions would inevitably capsize but for the effect of the resistances and the departure from synchronism at large angles of roll.

(*b*) When $\frac{T}{T_1} = 0$, in which case the ship is assumed to be quick in her movements, or the period of the wave is infinitely long as compared with that of the ship, the equation (5) becomes—

$$\theta = \Theta_1 \sin\frac{\pi}{T_1}t,$$

that is to say, the ship will behave very much as a thin flat board does on the surface of a wave, her masts being always perpendicular to the surface.

(*c*) If we choose the initial conditions in equation (5) so that the coefficients C_1 and C_2 are zero, then the equation will become—

$$\theta = \Theta \,.\, \frac{1}{1 - \frac{T^2}{T_1^2}} \sin\frac{\pi}{T_1}t.$$

Since θ_1, the slope of the wave, is equal to $\Theta_1 \sin\frac{\pi}{T_1}t$, the ratio of the ship's angle to the vertical to the angle that the normal to the wave-slope makes with the vertical, or θ/θ_1,

$$= \frac{1}{1 - \frac{T^2}{T_1^2}} = \text{constant}.$$

That is to say, the ship forsakes her own period and takes up "forced" oscillations in the period of the wave. Under these conditions the ship's masts will lean towards the wave-crest if T is greater than T_1, and from the wave-crest if T is less than T_1.

Froude in his first paper further showed how the successive angles of a ship's rolling may be exhibited graphically, and he touched on the influence of resistance in reducing rolling. The following is the summary he gave in 1862 of the conclusions he had reached:

"(i.) All ships having the same 'periodic time,' or period of natural roll, when artificially put in motion in still water, will go through the same series of movements when subjected to the same series of waves, whether this stability in still water (one of the conditions which govern the periodic time) be due to breadth of beam, or to deeply stowed ballast, or to any such peculiarity of form as is in practical use.

"This statement would be almost rigorously true if the oscillations were performed in a non-resisting medium, or if the surface-friction and keel-resistance, by which the medium operates to destroy motion, were of the same equivalent value for all the ships thus compared. It requires, however, to be modified in reference to the circumstance that of two ships having the same periodic time in still water, the comparative forms may be such that the one shall experience such resistance in a higher proportionate degree than the other, and the necessary modification may be expressed in terms of their relative behaviour when set in motion in still water. The vessel which is the more rapidly brought to rest by resistance in still water will in the greater degree resist the accumulations of angle imposed on her by consecutive wave-impulses, and will the more fall short of the maximum angle which both would alike attain if oscillating in a non-resisting medium.

"(ii.) The condition which develops the largest angles of rolling is equality in the periodic times of the ship and of the waves; and this is true alike for all ships, whether their scale of resistance, as above referred to, be large or small.

"(iii.) That ship will fare the best which, *caeteris paribus*, has the slowest periodic time.

"(*a*) The waves which have a periodic time as slow as hers will have a greater length from crest to crest than those of quicker period; and, on the whole, long waves are relatively less steep than short ones. Now it is the steepness of the waves in a wave-series, not their height simply, which governs the rate at which angles of rolling will accumulate in a given ship when exposed to it.

"(*b*) Of two ships one of which has periodic time rather slower than the waves in a given ratio, the quicker ship will accumulate the larger angles.

"(*c*) It will require a heavier or a more continued gale to rear waves which have the lengthened period.

"(*d*) When the gale has continued so long that the largest waves have outgrown the period of the ship, she will not thereby have been released from the operation of waves having her own period, since the larger waves carry on their surface smaller waves of every intermediate period (this, at least, I believe to be the case).

"(*e*) When the gale has ceased and the sea is going down, the slower the period of the ship the sooner she will be released from waves of as slow a period.

"(iv.) There are two, and only two, methods of giving a slow period to a ship:

"(*a*) By increasing her 'moment of inertia,' as by removing her weights as far as possible from her centre of gravity; an arrangement which for the most part can only be accomplished to a limited extent.

"(*b*) By diminishing her stability under canvas. This can always be accomplished in the construction of a ship, and generally in her stowage, to any degree consistent with her performance of her regular duties, by simply raising her weights. Were we to raise these so high as to render her incapable of standing up against the action of the wind on her sails, the steepest waves would pass under her without putting her in motion.

"Thus the enormous weights carried by the armour-plated ships, extended laterally to the greatest possible distance from the centre of gravity, and raised high above it, serve in both respects to moderate, not to enhance, this tendency to roll; and when it is said that with the weights thus placed, and once put in motion, a ship 'must roll deep (deep, though easy),' it should be remembered that those very relations of force and momentum, which show how difficult it must be to check her motion when once it has been impressed on her, show also that it must be equally difficult to impart that motion to her in the first instance. The difficulty of starting her has a priority in point of time over the difficulty of stopping her, and prevents it from being felt by limiting the motion which would have called it into play.

"(v.) The conditions which govern pitching may be noticed here, though they have not been discussed in the paper.

"Were it possible, by concentrating her weights or by extending her plane of flotation, to give to the ship a period indefinitely quick for both longitudinal and transverse oscillations, as compared with that of such waves as are large enough to put her in motion, she would acquire no cumulative oscillation, but would float always conformably to the mean surface of the wave which passes under her.

"But this condition, which is so unapproachable in practice in reference to transverse oscillations that the attempt to approach it will but develop the evils pointed out in (iii.), is of necessity so closely approached in practice in reference to longitudinal oscillations, that those evils can only be escaped by approaching it as closely as is possible. The plunging of a ship whose weights are extended far fore and aft is but an incipient development of those phases of oscillation which have their proper development in transverse motion only. The best that can be desired in reference to longitudinal motion is that the ship's period, for longitudinal oscillation, shall be as quick as possible, and her position always as conformable as possible to the mean surface of the passing waves.

"I have insisted here, more prominently than in the body of the paper, on the circumstance that a total loss of stability, using that word in the ordinary sense of power of carrying sail, implies the possession of absolute stability, as regards rolling motion due to wave-impulse, because it has been pointed out to me that the attention of readers should be more strongly directed to it, not indeed as representing a practically available possibility, but as serving best to force the mind, by contact with an extreme conclusion immediately deducible from the theory, to appreciate its fundamental principles. And the proposition thus certainly furnishes a crucial test of whether the principles have been appreciated or not, and it supplies also a ready means of testing the theory by a crucial experiment. I must, in addition, express my own confident belief that any one who will try the experiment fairly will find the proposition so fully verified that he will feel obliged to admit that the theory which leads to so paradoxical yet true a conclusion deserves at least a careful study. But the more practically useful aspect of the theory is that which presents to view the varying phases of cumulative oscillation which a ship tends to undergo when exposed to various types of wave-series; the phases depending on the relation which her natural period of rolling, when set in motion in still water, bears to the period of wave-recurrence, and on the maximum steepness of each individual wave of the series—phases, in fact, which she would actually undergo but for the effect of surface-friction and keel-resistance; the nature and value of which conditions, as well as the nature and necessity of experiments for their determination, have been pretty fully dealt with in the body of the paper.

"I will here only add a synoptical statement of the principal features of those phases, given in a rather more complete form than in that part of the paper which referred to them, though they are pretty fully exhibited by the diagrams.

"By a 'complete phase' is meant that series of oscillations which the ship undergoes counting from the time when, for a moment, she is stationary and upright in a similar position, and is about to recommence an identical repetition of the movements she has just completed.

"For the benefit of those who may glance at the appendix before they read the paper, I will mention that T is the number of seconds occupied by the ship in performing a single oscillation in still water, starboard to port, or vice versa. T_1 is the number of seconds occupied by the wave in passing from hollow to crest, or crest to hollow. Θ_1 is the number of degrees in slope of the steepest part of the wave; and p/q is the ratio T/T_1, with the numerator and denominator converted into the lowest whole numbers that will express the ratio, where, however, it must be noticed that for $T/T_1=1$, p/q must be taken as the limit of such a form as $\frac{999999}{1000000}$. Then—

"(i.) The ship will complete the phase in the time $=2qT$.

"(ii.) In completing the phase the ship will pass through the vertical position $2\,p$ times, or $2\,q$ times, according as p or q is the smaller number.

"(iii.) The ship will pass through the vertical position at the middle of the phase.

"(iv.) On either side of the middle of the phase there must occur, as equal maximum oscillation, the maximum in the phase, say Θ, which will approximately (but never in excess) $=\pm\Theta_1\frac{q}{q-p}$.

"(v.) From these propositions it appears that if we compare two cases, in one of which the value of T/T_1 is the reciprocal of its value in the other, the phase will in each case consist of the same number of oscillations similarly placed; but in that one in which the period of the wave is slower than the period of the ship, the angles of oscillation will be the larger in the ratio p/q or q/p, whichever is the greater. The following table expresses the results of the above propositions, as exhibited in the diagrams, based on the assumption that the period of the ship is in every case $T=5''$, and that the maximum slope of the wave $\Theta_1=9$ degrees:

Ship's Period, or T.	Wave's Period, or T_1.	T/T_1.	T/T_1, reduced to Lowest Whole Numbers $=p/q$.	Time of Complete Phase $=2qT$.	No. of Times Ship passes Vertical Position during Phase.	Approx. Outside Value of Θ, the Maximum Angle reached during Phase.
5″	5″	1	$\frac{999999}{1000000}$	Infinite.	Infinite.	Infinite.
5″	6·25″	0·8	$\frac{4}{5}$	50″	8	45 deg.
5″	4″	1·25	$\frac{5}{4}$	40″	8	36 ,,
5″	10″	0·5	$\frac{1}{2}$	20″	2	18 ,,
5″	2·5″	2	$\frac{2}{1}$	10″	2	9 ,,
5″	9″	0·55	$\frac{5}{9}$	90″	10	20 ,,
5″	2·77″	1·8	$\frac{9}{5}$	50″	10	11 ,,

The assumption made in equation (1) that

$$Gz=m\,.\,\theta$$

is true if the sections of the ship in the vicinity of the water-line are concentric circular arcs; and is approximately true generally for small angles of inclination as long as m is not small. If m be small, the relation does not generally hold.

In a wall-sided ship,

$$GZ=\sin\theta(m+\tfrac{1}{2}a\tan^2\theta),$$

where the BM is denoted by a; whence the equation for rolling through small angles becomes—

$$\frac{d^2\theta}{dt^2}+\frac{mg}{\epsilon^2}\theta+\frac{ag}{2\epsilon^2}\quad\theta^3=0,$$

where θ^5 and higher powers of θ are neglected.

Sections of other forms lead to a similar equation, but with different coefficients of θ^3; the above equation is therefore typical of all others. This condition has been worked out fully by Professor Scribanti,[1] who obtained a solution in the following form:

$$T=\frac{2\pi}{\Theta}\sqrt{\frac{I}{J}}\cdot\left[l-\left(\frac{1}{2}\right)^2.l^3+\left(\frac{1\,.\,3}{2\,.\,4}\right)^2l^5-\ldots\right],$$

where Θ* is the maximum angle of roll. J is defined as the moment of inertia of the water-plane expressed in foot-ton units, *i.e.* is equal to W.a, where W is the displacement in tons. I is the mass moment of inertia of the ship about its axis of oscillation, and $l^2=\frac{\Theta^2}{\Theta^2+4\frac{m}{a}}$. Some numerical results for $\frac{T_m}{T}$, where T_m is the period found by the usual "metacentric" formula and Θ is 12°, are:

a	16 ft.	16 ft.	16 ft.
m	3 ft.	4 in.	$\frac{3}{8}$ in.
$\frac{T_m}{T}$	1·04	1·31	2·98

When the metacentric height is zero, the formula becomes—

$$T=1{\cdot}67\frac{\pi}{\Theta}\sqrt{\frac{I}{J}}=\frac{5{\cdot}25}{\Theta}\sqrt{\frac{\epsilon^2}{ga}}.$$

Resisted rolling.

It has been assumed in the foregoing that the rolling in still water and among waves is unresisted; it remains to take into account the resistances which always operate during rolling. In still water these cause a degradation of the amplitude until the ship finally comes to a position of rest; and when a vessel is rolling among waves they cause a similar degradation of amplitude.

The earliest investigations of resisted rolling in *still* water were made by Froude in England, and by Bertin, Duhil de Bénazé, Risbec and Antoine in France. The method adopted was actually to roll the ship in still water and observe how the amplitude decreased roll by roll. Men were caused to run from side to side of the ship, their runs being so timed as to add to the angle of roll on each successive swing until the maximum angle obtainable was reached, when all movement on board was stopped, and the ship allowed to roll freely of herself until she came to rest. During this free movement a complete record of her angular motion was registered by means of a short-period pendulum and an electric timer, and from this a curve of "declining angles" was constructed, in which abscissae represented number of rolls and ordinates extreme angles of roll to one side of the vertical. From this curve another curve was constructed, which was termed a "curve of extinction," in which the abscissae represented angles of roll and the ordinates the angle lost per swing. Figs. 28 and 29 give examples of these curves obtained from experiments with H.M.S. "Revenge."[2] Having obtained such curves, Froude proceeded to investigate the relation between the degradation of the amplitude and the resistances which cause it. He assumed that the resistance to rolling varied partly as the angular velocity, and partly as the square of the angular velocity, thus obtaining the following equation for the angular motion of the ship:

$$\frac{W\epsilon^2}{g}\cdot\frac{d^2\theta}{dt^2}+K_1\frac{d\theta}{dt}+K_2\left(\frac{d\theta}{dt}\right)^2+W\,.\,m\,.\,\theta=0.$$

If K_2 is zero, a complete solution is—

$$\theta=A_e^{\frac{-K_1g}{2W\epsilon^2}t}\sin\left(t\sqrt{\frac{mg}{\epsilon^2}-\frac{K_1^2g^2}{4W^2\epsilon^4}}+\beta\right);\quad\ldots\quad(7)$$

where A and B are arbitrary, and the period Tr of resisted rolling is given by

$$T_r=\frac{\pi}{\sqrt{\frac{mg}{\epsilon^2}-\frac{K_1^2g^2}{4W^2\epsilon^4}}}=\frac{T}{\sqrt{1-\frac{K_1^2g}{4W^2\epsilon^2m}}}.$$

It appears, therefore, that the period is slightly increased and the amplitude progressively diminished by the resistance. In actual cases where K_2 is necessarily included in the differential equation, the complete solution cannot be conveniently expressed analytically, but it can be determined in effect either by any method of approximate quadrature or by a process of "graphic integration." The diminution of amplitude can also be approximately obtained by assuming the motion to be simple harmonic with amplitude Θ and by equating the work done by the resistances during the roll to the loss of dynamical stability—W. m. $\Theta\times$decrement. The differential equation for the curve of extinction is thus obtained, and is—

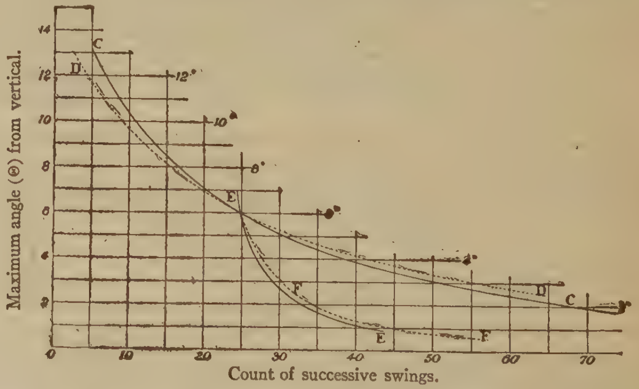

FIG. 28.—Curves of declining angles. C, light, and D, deep draught, no bilge keels; E, light, and F, deep draught, with bilge keels.

$$-\frac{d\Theta}{dn}=a\,.\,\Theta+b\,.\,\Theta^2,$$

where Θ = extreme angle (in degrees) reached at any particular oscillation, n the number of oscillations, and a and b are coefficients equal to

$$\frac{K_1\pi^2}{2WmT}\text{ and }\frac{4}{3}\cdot\frac{\pi}{180}\frac{K_2\pi^2}{WmT^2}$$

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[1] *Trans. Inst. Naval Arch.*, 1904.

[2] Given by Sir W. H. White, F.R.S., in a paper read before the Institution of Naval Architects in 1895.

respectively. Froude gave his reasons for expecting the resistance to vary partly as the first and partly as the second power of the angular velocity. The latter part he considered would be due to surface-friction and the head resistance of keels and deadwood, and the former to the resistance caused by the creation of a small wave at each roll, which, by travelling away from the ship, would cause dissipation of energy. Froude's views have been confirmed by the accuracy with which the expression $-\frac{d\Theta}{dn}=a.\Theta+b.\Theta^2$ may be made to fit the curve of extinction of practically any ship by the judicious selection of the coefficients a and b. M. Bertin has, however, preferred an expression equivalent to $-\frac{d\Theta}{dn}=b.\Theta^2$, while other French investigators have preferred an expression equivalent to $-\frac{d\Theta}{dn}=a.\Theta$.

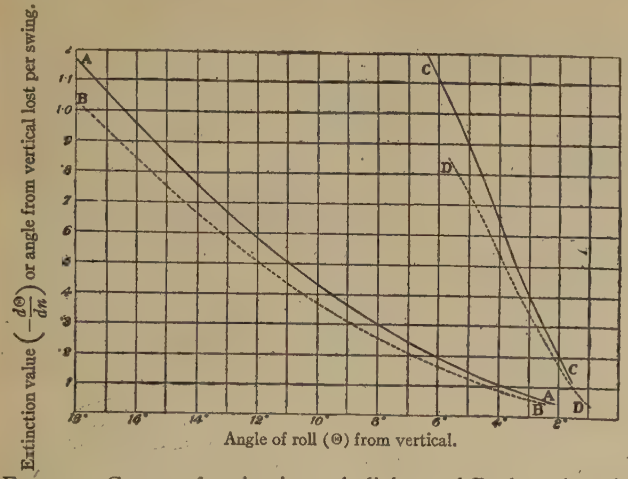

FIG. 29.—Curves of extinction. A, light, and B, deep draught, no bilge keels; C, light, and D, deep draught, with bilge keels.

On substituting the value of a in equation (7) it becomes—

$$\theta=Ae^{\frac{-at}{T}}\sin\left(\frac{\pi t}{T}\sqrt{1-\frac{a^2}{\pi^2}}+\beta\right), \quad . \quad . \quad . \quad (8)$$

a simplified form of the equation for resisted rolling when the coefficient b is neglected.

For the "Revenge" the following equations represent the curves of extinction given in fig. 29:

For *deep draught*:

$$\text{without bilge keels}-\frac{d\Theta}{dn}=\cdot0123\Theta+\cdot0025\Theta^2$$

$$\text{with} \quad ,, \quad ,, \quad -\frac{d\Theta}{dn}=\cdot065\ \Theta+\cdot017\ \Theta^2$$

For *light draught*:

$$\text{without bilge keels}-\frac{d\Theta}{dn}=\cdot015\ \Theta+\cdot0028\Theta^2$$

$$\text{with} \quad ,, \quad ,, \quad -\frac{d\Theta}{dn}=\cdot084\ \Theta+\cdot019\ \Theta^2$$

(Θ in all cases being measured in degrees and not in circular measure).

The large increase in the b coefficient after bilge keels had been fitted has given rise to considerable discussion. Mr R. E. Froude had experimented with a deeply submerged plane oscillating in water, and he found that at a speed of 1 foot per second the resistance per square foot was 1·6lb. Using this figure to calculate the work per swing from an extreme angle of 6°, the head-resistance of the bilge keels is found to account for about one-fourth the energy lost in a single swing due to the increased value of the b coefficient in the above formula. The energy abstracted in this particular case is thus about four times greater than the theoretical head-resistance of the bilge keels. This discrepancy has been observed in many cases, and it appears that when bilge keels are added to a ship they become effective, not merely as flat surfaces moving with the ship and experiencing direct resistances, but also by indirectly influencing the stream-line motions which would exist about the oscillating ship, if there were no bilge keels. Another cause of the difference is that the bilge keels during the early portion of the swing set into motion a large mass of water, only a small proportion of whose energy is returned to the ship towards the end of the roll. This condition is accentuated when the vessel is in motion ahead, and owing also to the increase of other resistances at high speeds, a more rapid extinction is then obtained. It appears from experiments made on H.M.S. "Revenge" and on a torpedo boat destroyer that the extinction at a given angle of roll is given by a linear formula $-d\theta=a+\beta V$, where a and β are coefficients independent of the speed V.[1]

Froude attacked the problem of resisted rolling in an inverse manner, endeavouring to ascertain "what wave-series is required to keep the given ship at a given range of steady rolling with any assigned period, including the effect of resistance." Subsequently he treated the problem in a direct manner by the process of "graphic integration," an exact method of determining the motion of a ship, the elements of the ship's rolling in still water and the wave-series acting upon her being given.[2] Some interesting developments of the process were made by Sir William White in a paper read before the Inst. Nav. Arch. in 1881 on the "Rolling of Sailing Ships," in which the action of the wind on the sails and the variation of the virtual weight of the ship on the wave are included. The effect of wind-pressure in heeling a ship is very much greater when she is at the crest of a wave than when she is at the trough, because her virtual weight is less. This must be taken into account when dealing with sailing vessels; the reduction of virtual weight, and therefore of righting moment, at the crest of a wave being very considerable, although the heeling moments due to the wind suffer no such reduction.

The differential equation for rolling among waves including the effect of resistances varying as the first power of the angular velocity is—

$$\frac{W\epsilon^2}{g}\frac{d^2\theta}{dt^2}+K\frac{d\theta}{dt}+W_m\left(\theta-\Theta_1\sin\frac{\pi}{T_1}t\right)=0,$$

which becomes on substitution (K being expressed in terms of a)—

$$\frac{d^2\theta}{dt^2}+\frac{2a}{T}\frac{d\theta}{dt}+\frac{\pi^2}{T^2}\theta=\frac{\pi^2}{T^2}.\Theta_1\sin\frac{\pi}{T_1}t.$$

The general solution is—

$$\theta=Ae^{\frac{-at}{T}}\sin\left(\frac{\pi t}{T}\cdot\sqrt{1-\frac{a^2}{\pi^2}}+\beta\right)+A_1\Theta_1\sin\left(\frac{\pi t}{T_1}-\beta_1\right), \quad . \quad . \quad (9)$$

where

$$\frac{1}{A_1^2}=\left(1-\frac{T^2}{T_1^2}\right)^2+\frac{4a^2}{\pi^2}\frac{T^2}{T_1^2}\text{ and }\beta_1=\tan^{-1}\frac{2aTT_1}{\pi(T_1^2-T^2)}$$

and A and β are arbitrary.

The first term represents a free oscillation of the ship, which in time dies out, leaving a forced oscillation in the period of the waves. From observations on rolling, however, it is found that, owing to the departure from exact uniformity in the waves encountered, a ship seldom, if ever, completely forsakes her own natural period of rolls; for each slight alteration in the wave period T_1 introduces afresh terms involving the free oscillations of the ship. In the synchronizing conditions where $T=T_1$, the forced oscillation is represented by

$$\theta=-\frac{\pi}{2a}\Theta_1\cos\frac{\pi t}{T},$$

the amplitude being limited entirely by the resistance; the phase is $\frac{\pi}{2}$ before that of the wave slope. The vessel is then upright in mid-height, and inclined to its maximum angle on the crest and in the hollow of the wave. The maximum amplitude Θ is given by $\frac{\pi}{2}.\Theta_1=a.\Theta$. Since the right-hand term represents the decrement of roll due to resistance, the left-hand side must represent the increment of roll due to the wave in this synchronizing steady motion. If this latter relation be assumed to hold when the resistance to motion is represented by the more general decremental equation, then the maximum amplitude Θ is given by

$$\frac{\pi}{2}\Theta_1=a.\Theta+b.\Theta^2.$$

In 1894 and 1895 M. Bertin, at the Institution of Naval Architects, extended this relation to cases in which T_1 is not equal to T, obtaining at the same time not simply the angles of steady rolling for these cases, but the maximum angles passed through on the way to the steady condition; to these maximum angles he gave the name of "apogee" rolls.

In 1896, at the Institution of Naval Architects, Mr R. E. Froude investigated the probable maximum amplitude of roll under the influence of a non-synchronous and non-harmonic swell. He imagined three identical ships, A, B and C, the first rolling in still water, and the two others placed in the same swell assumed recurrent in period $2T_1$, but not necessarily harmonic. Assuming resistance to vary as $\frac{d\theta}{dt}$, then denoting the vessels by suffixes, the effective wave slope by θ_1, and constants by K, K′ and K″,

$$\frac{d^2\theta_A}{dt^2}+K\frac{d\theta_A}{dt}+K'\theta_A=0;$$

$$\frac{d^2\theta_B}{dt}+K\frac{d\theta_B}{dt}+K'\theta_B=K''\theta_1;$$

$$\frac{d^2\theta_C}{dt^2}+K\frac{d\theta_C}{dt}+K'\theta_C=K''\theta_1.$$

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[1] See papers on this subject read before the Institution of Naval Architects in 1900 by Professor Bryan and in 1905 and 1909 by Mr A. W. Johns.

[2] See *Trans. Inst. Naval Arch.*, 1875.

If at any instant

$$\theta_A = \theta_C - \theta_B \text{ and } \frac{d\theta_A}{dt} = \frac{d\theta_C}{dt} - \frac{d\theta_B}{dt}$$

it follows that

$$\frac{d^2\theta_A}{dt^2} = \frac{d^2\theta_C}{dt^2} - \frac{d^2\theta_B}{dt^2};$$

whence the above three relations hold at the successive instants and consequently for all time. Hence the rolling of C differs from that of B in having the free oscillations of A in still water superposed upon it. If, therefore, it is possible to obtain any one motion in the swell, any other motion due to a different phase relation between ship and wave slope can be at once determined. A convenient motion in the swell to form a basis for obtaining other motions is the forced oscillation proper to the swell, *i.e.* the particular oscillation that is recurrent in the period of the swell. The amplitude of roll at any instant is therefore the sum of the amplitudes due to the forced oscillation and to an arbitrary free oscillation in still water. If the latter component be regarded as perfectly arbitrary there is no limit to the angle of roll obtained by postulating suitable initial conditions; to determine the practical limitation of rolling, however, it may reasonably be assumed that at or near the commencement of the motion there will be a brief period of no roll, and that the maximum angle of roll obtained will occur at no great interval of time after this period. At the instant when there is no roll, the forced and free oscillations are equal in magnitude and opposite in phase, and the period of maximum (termed the "criterion") amplitude Θ_c will occur as soon as the two components are in phase; the time interval between the two conditions is nT, where $n = \pm\frac{T_1}{T-T_1}$. It is assumed also that during the above interval—(1) the effect of the swell was sensibly the same as that of a simple harmonic wave, A being the amplitude of the forced oscillation (and of the initial free oscillation); (2) the extinction equation of the free oscillation $-\frac{c\Theta}{dn} = a\Theta + b\Theta^2$ can be replaced by the simple form $-\frac{d\Theta}{dn} = E\Theta$, where $E = a + b\Theta_c$ approximately; this has been implied by the absence of terms containing $\left(\frac{d\theta}{dt}\right)^2$ in the differential equation above. The amplitude of the free oscillation during the maximum roll is, from equation (8) $Ae^{-n\epsilon}$; whence

$$\Theta_c = A(1 + e^{-n\epsilon}).$$

Also, from equation (9), the forced oscillation is given by

$$\Theta_1 = A\sqrt{\left(1 - \frac{T^{22}}{T_1^{\,2}} +\right)\left(\frac{2}{\pi}\cdot\frac{T}{T_1}\cdot E\right)^2}$$

From these equations Θ_1 can be determined if T, T_1, a, b and Θ_C are given; conversely if Θ_C is known, Θ_1 can be tentatively obtained.

The following table gives the criterion angle (Θ_C) and the angle of steady roll (A) for the "Revenge," both without and with bilge keels, obtained on the above-mentioned assumptions:

Maximum Wave-Slope, 3 Degrees.

	$\frac{T}{T_1} = 1·3.$ $n = 3·33.$		$\frac{T}{T_1} = 1·2.$ $n = 5.$		$\frac{T}{T_1} = 1·1.$ $n = 10.$		$\frac{T}{T_1} = 1·0.$ $n = \infty.$	
	Criterion Angle.	Angle of Steady Roll.	Criterion Angle.	Angle of Steady Roll.	Criterion Angle.	Angle of Steady Roll.	Criterion Angle.	Angle of Steady Roll.
	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.
"Revenge" (deep draught), with no bilge keels	8·25	4·35	12·25	6·8	21·2	13·9	41·1	41·1
"Revenge" (deep draught), with bilge keels .	6·6	4·24	8·6	6·4	11·55	10·8	14·85	14·85

Among the conclusions reached by Mr R. E. Froude in the case of a ship rolling in a uniform swell were:

However non-uniform initially, the rolling ultimately falls into the uniform forced oscillation; it does so the sooner, *caeteris paribus*, the higher the resistance, and with the fewer "cycles" or alterations of amplitude of rolling, the more nearly synchronous the swell with the ship. The amplitude of the ultimate uniform rolling is an approximate mean of the alternate maxima and minima of the precedent non-uniform rolling. If the rolling starts from zero, the maximum amplitude falls short of twice the ultimate uniform amplitude, the more so the higher the resistance and the more synchronous the swell; and in a synchronous swell the maximum amplitude cannot exceed the ultimate uniform amplitude, unless it does so initially.

In two papers by Captain and Professor Kriloff of St Petersburg, read before the I.N.A. in 1896 and 1898, the whole motion of the ship, including pitching and rolling, is dealt with; every variation which can reasonably be conceived is taken into account in these papers.

Methods of reducing rolling.

Of the various appliances adopted to reduce rolling, the most important and successful are bilge keels. Some reference has already been made to the influence they exert on the rolling of ships, as illustrated by H.M.S. "Revenge," in which there was one bilge keel on each side, 200 ft. in length and 3 ft. in depth, tapered at the extreme ends. The great value of bilge keels in diminishing rolling was pointed out by Froude and demonstrated by him in 1872 by experiment with the "Perseus" and the "Greyhound," which were alike in every essential respect, except that the former was not provided with bilge keels and the latter was. The general conclusion was that the rolling of the "Greyhound," was only about one-half that of the "Perseus."

Bilge keels were usual in warships until, in the design of the "Royal Sovereign" class, it was decided not to fit them, owing to the large dimensions of the vessels and the difficulties in certain circumstances of docking them if provided with bilge keels. Ultimately one of the class, the "Repulse," had them fitted for purposes of comparison, and the effect on her rolling was so marked that it was resolved to fit them to all the ships of the class. Before fitting them on the "Revenge," a careful programme was drawn up of experiments to be made before and after the bilge keels were fitted; and on carrying out this programme some valuable results were obtained. The experiments were made at Spithead in smooth water, the general effect of the bilge keels was to reduce the rolling to one-third of its former amount. When, instead of having no motion in the line ahead, the ship had a speed of 12 knots, an even greater reduction in the rolling was observed. Their effect on other qualities of ships is on the whole beneficial, and in general little, if any, reduction in speed has resulted from their use. The experience of Great Britain with regard to bilge keels has been repeated in America. Bilge keels were omitted for the same reasons as they were in the "Royal Sovereign" class; they were afterwards fitted in the U.S.S. "Oregon," experimental investigation being made both without and with them, and the general conclusion arrived at was that the rolling was diminished by two-thirds by the adoption of the bilge keels.

A method for reducing rolling of ships in a sea-way by the use of water-chambers was devised by the writer in 1874 in connexion with the design of the "Inflexible," which was expected to be a bad roller. It consists in fitting one or more tanks across the ship of such shape that when filled to a suitable height with water the motion of the water from side to side as the vessel rolls is such as to retard the rolling. Let fig. 30 represent a series of transverse sections of a ship fitted with a water-chamber, in various positions in rolling from port to starboard; and suppose the water to move so as to be most effective in quelling rolling. Let G represent the centre of gravity of the ship including the water in the chamber, g the centre of gravity of the water in the chamber, and B the centre of buoyancy of the ship; and let the arrows over the sections indicate the direction in which the ship is rolling at the instant considered. In position No. 1 suppose the ship to have reached the extreme heel to port and to be on the point of commencing the return roll, then g should have reached the middle line on its way down towards the port side and the righting couple will be that due to the angle of heel, supposing the water to be a fixed weight amidships. In the position No. 2 the ship has performed part of the roll back towards the upright; the water will have moved farther down the incline, so that g will be some distance from the middle line on the port side as shown, and therefore G will also have moved out from the middle line on the port side; hence the righting couple will be less than what would correspond to the angle of heel if the water were a fixed weight amidships. In position No. 3 the ship has just reached the upright and will be moving with the maximum angular velocity; the water will have moved still farther down the incline, and g will be at a greater distance from the middle line on the port side, and therefore G will have moved farther out from the middle line, whereas B will have returned to the middle line; so that the weight of the ship and the upward pressure of the water will form a couple tending to retard the ship's rotation, although she is for the moment in the upright position. In the position No. 4 the ship is heeling over to starboard and the centre of gravity of the water is returning towards the middle line; but it and G are still on the port side, and the righting couple is therefore greater than that corresponding to the angle of heel of the ship and a fixed centre of gravity amidships. In the position No. 5 the ship has momentarily

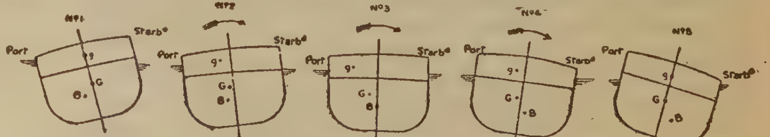

FIG. 30.

come to rest at the end of the starboard roll, the centre of gravity of the water should have again reached the middle line, and the righting couple should be neither increased nor diminished by the water-chamber, except in so far as it affects the displacement and the vertical position of the centre of gravity. The same process is repeated on the ship's roll back from starboard to port. Thus the water-chamber reduces the angle of roll of the ship chiefly by modifying the righting couple acting upon her throughout the rolling; it increases the righting couple which opposes the motion as the ship heels over, thereby reducing the amount of the heel, and on the return roll it lessens the righting couple and causes the ship to move more slowly than she otherwise would, so that she acquires less angular momentum on reaching the upright, and therefore tends to roll less deeply the other way.

Two water-chambers were originally contemplated in the old *Inflexible*, but the space occupied by one of these was required for other purposes, and only one, the smaller of the two, which was 51 ft. long (across the ship), and 14 ft. wide (fore and aft), was finally fitted. This was shown to reduce the rolling by about 25 %. Several ships have since been fitted with this device.[1]

In addition to trials at sea to ascertain the diminution of roll by this means, still-water rolling experiments were carried out in the "Edinburgh" and compared with the results obtained with a model water-chamber on a linear scale of $\frac{1}{20\cdot 5}$, loaded so that its period and stability corresponded to those of the ship. A close agreement was observed between the behaviour of the model and the ship; and this enabled the experiments to be carried out over a larger range of conditions than would have been practicable with the ship alone. The model was supported on knife edges and connected to a paddle partially immersed in the water of a tank; this was adjusted to represent to scale the natural extinction of roll in the ship without the water-chamber. The length of the chamber (in the ship) was 16 ft.; and widths of 43 ft., $51\frac{1}{2}$ ft. and 67 ft. were successively given to it. The displacement of the ship was about 7500 tons; the period 10 seconds; and the metacentric height 7·52 ft. On experimenting with different depths of water, it was found that the maximum extinctive effect at all angles of roll was obtained with the depth at which the period of motion of the water from side to side of the tank is equal to the period of the ship. The best depths were found to be 2·3 ft. and 3·35 ft. with breadths of 43 ft. and $51\frac{1}{2}$ ft. respectively, thus agreeing closely with the theoretical formula, $v = \sqrt{gh}$, for the speed of a solitary wave across the water-chamber. In these circumstances the water rushed across the tank in a breaking wave or bore, and consumed energy in its passage and through its violent impact with the sides of the tank. With other depths, the motion of the water, at moderate angles, took the form of a slope gently alternating from side to side at small angles of roll; and the effect was practically non-extinctive. With the critical depth the growth of the resistance to rolling commenced almost at zero angle; but, with other depths, the extinction was nearly nil, until a certain angle of roll was attained, whose amount increased with the departure from the critical depth. At the larger angles of roll, the disadvantage of the departure from the critical depth was not marked. The resistance of the chamber increased considerably with the breadth; the value of the $51\frac{1}{2}$-ft. chamber was roughly twice and that of the 67-ft. chamber three times that of the 43-ft. chamber.

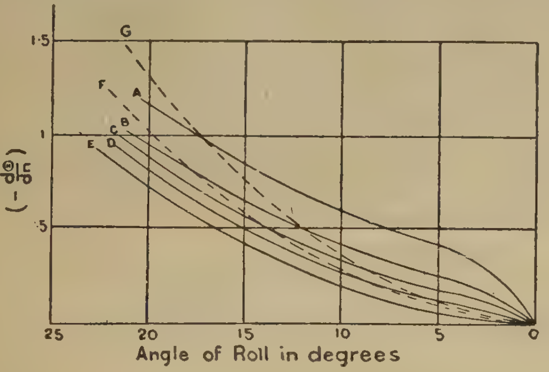

FIG. 31.

In order to compare the effect of water-chambers with that of other methods of extinction, it is observed that the resistance due to the former increases slowly at large angles of roll. The effectiveness of bilge keels, on the other hand, increases rapidly as the angle of roll increases. It was found that, with 12° roll, the resistance of the water-chamber was equivalent to that of 2 ft. of additional bilge keel; but at $17\frac{1}{2}°$ the water-chamber was relatively about half as effective. With 3° of roll, however, the water-chamber was about 9 times as effective as the additional bilge keel. Fig. 31 shows the comparative rates of extinction under the various conditions.[2]

Water-chambers have been successfully employed to limit the rolling motions at sea in ships of the old "Inflexible," "Edinburgh" and "Admiral" classes, and in other warships and merchant vessels.

Sir John Thornycroft devised an arrangement for overcoming the rolling motion of a ship amongst waves, consisting of a weight carried from side to side so as always to oppose the heeling couple caused by the wave slope. The weight was automatically worked by apparatus controlled by two pendulums (or their equivalent), one of which—a long period pendulum—remained vertical, and the other—a short-period pendulum—placed itself perpendicular to the effective wave slope. The gear was fitted on a yacht of about 230 tons displacement, the moving weight being 8 tons; and the net effect in this case was to reduce the rolling by about one-half. (See *Trans. Inst. Nav. Archs.* 1892.)

An interesting application of the gyroscope to the diminution of rolling was devised by Dr O. Schlick, and fitted by him to the S.S. "See-bar." The principle of its action, the details of the gear, and a description of the trials are given in papers read before the Inst. Nav. Archs. in 1904 and 1907. Particulars of the "See-bar" were: length 116 ft., breadth 11·7 ft., draught 3·4 ft., displacement 56 tons, metacentric height 1·64 ft., and period of double roll (gyroscope at rest) 4·14 seconds. The fly-wheel of the gyroscope was one metre in external diameter, weighed 1100 lb, and it was run at 1600 revolutions per minute; its axis was initially vertical, and the casing containing the wheel was capable of revolving about a horizontal athwartship axis, the centre of gravity of the apparatus lying slightly below this axis. A brake was fitted to control the longitudinal oscillations of the casing. When the wheel was revolving and the axis held by the brake, no effect was produced upon the motion of the ship; but when the axis was allowed to oscillate freely in the middle-line plane the period of roll was lengthened to 6 seconds, but no other extinctive effect was obtained. By suitably damping the longitudinal oscillations of the gyroscope, however, by means of the brake, a large extinctive effect upon the rolling was experienced; and during the trials made, the apparatus stopped practically all rolling motion.

Pitching and heaving.

The equations for the pitching motions of a vessel are identical in form with those for rolling; and the preceding remarks are, in general, equally applicable to pitching. In a large number of ships the period for pitching is approximately one-half of that for rolling; but the angles attained are considerably less. Where control over the longitudinal positions of weights is possible, *e.g.* in small sailing vessels, weights are removed as far as possible from the ends in order to shorten the period, the safety of short ships and boats being secured when the deck is maintained as nearly as possible parallel to the wave slope (*v.* remarks by Froude *ante*).

The single period for heaving and dipping oscillations is equal to $\pi\sqrt{\frac{12W}{gT''}}$ when W is the displacement in tons, and T″ the tons per inch immersion. When proceeding across waves of apparent semi-period T_1, forced heaving oscillations of semi-amplitude $a\frac{T_1^2}{T_1^2-T^2}$ are obtained, where T is the single period of dip, and $2a$ is the vertical distance between the statical positions of the ship on crest and in trough of wave. These oscillations combine with the free dipping oscillations due to the circumstances of the initial motion, the resultant motion being of interest in connexion with the longitudinal bending moments in the ship caused by the waves. (See section *Strength.*)

Pitching or rolling is frequently the cause of dipping oscillations, and the motion is then termed uneasy; this action may be of importance in ships whose sides near the water-line have a considerable slope to the vertical, since any rolling motion is then accompanied by vertical oscillations of the centre of gravity. It may also be shown that forced dipping oscillations of considerable amplitude are obtained when the period of roll (or pitch) in such cases approximates to twice the dipping period; the complex nature of the resistances attending the motion of the ship has, however, prevented a complete investigation being made.

Interference also occurs between the rolling and pitching movements of a ship, when the centres of gravity of the wedges of immersion and emersion for moderate angles of heel are separated by a considerable distance longitudinally; and occasionally uneasy rolling of a peculiar character is caused thereby.

Resistance.

The resistance of a ship in steady motion, or the force exerted by the surrounding water on the hull, opposing its progress, is equal and opposite to the thrust of the propellers. The ship is subjected to a system of balanced forces, each of which is in some degree affected by the others. It is convenient, however, first to confine attention to the resistance of the hull, assuming the propeller to be removed, and the ship to be towed through undisturbed water. Under these conditions the power expended in towing the vessel is termed the *effective horse power*, and is considerably less than the indicated horse power exerted by the propelling engines at the same speed. The relation between the effective and indicated horse powers, and the effect of the propellers on the resistance of the ship will be discussed under *Propulsion*, below.

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[1] See paper on "A Method of Reducing the Rolling of Ships at Sea" in *Trans. Inst. Nav. Archs.* 1883.

[2] See paper entitled "The Use of Water-Chambers for Reducing the Rolling of Ships at Sea," *Trans. Inst. Nav. Archs.* 1885.

If a body of "fair" form, *i.e.* without abruptness or discontinuity in its surface, moves uniformly at a considerable depth below the surface of an incompressible and perfect fluid, it can be shown that no resistance is experienced, and the uniform motion will, *caeteris paribus*, continue indefinitely. The motion of the fluid is extremely small, except in the close vicinity of the body. A clearer conception of the interaction of fluid and body is obtained by impressing upon the whole system a velocity equal and opposite to that of the body, which then becomes motionless and is situated in a uniform stream of the fluid. The particles of fluid move in a series of lines termed "stream lines"; and the surface formed by all the stream lines passing through a small closed contour is termed a "stream tube." If a denote the area of a stream tube, assumed sufficiently small for the velocity v at a point within it to be sensibly uniform across a section, then, since no fluid is leaving or entering the tube,

$$a.v=\text{constant}$$

throughout its length. The motion of the fluid is also subject to Bernoulli's energy quotation—

$$\frac{p}{w}+\frac{v^2}{2g}+h=\text{constant},$$

p, w and h being respectively the fluid pressure, the density and the height above a fixed datum.

The remaining conditions affecting the flow and determining the forms of the stream lines are purely geometrical, and depend on the form of the body.

The motion in a perfect fluid flowing past bodies of a few simple mathematical forms has been investigated with success, but in the general case the forms of the stream lines can only be obtained by approximate methods. It is evident that the flow is in all cases reversible since the equations are unaltered when the sign of v is changed; on the other hand any resistance must always oppose the motion, and therefore, as stated above, there can be no resistance under these conditions.

Components of resistance.

The circumstances attending the motion of a ship on the surface of the sea (or that of a stream of water flowing past a stationary vessel) differ from those hitherto assumed; and resistance is experienced through various causes. Frictional resistance results from the rubbing of the water past the surface of the hull; eddy resistances are caused by local discontinuities, such as shaft brackets; and resistance due to wind is experienced on the hull and upper works. Moreover, the stream-line motion, as will be shown later, causes a diminution in the relative velocity of the water at the ends of the ship; from the energy equation above, it is evident that the pressure is increased, resulting in an elevation of the surface of the water at those places. A wave is thus formed at the bow and stern, requiring an expenditure of energy for its maintenance and entailing additional resistance.

Of these components of resistance, that due to eddy making is usually small; eddying is caused by blunt beginnings or endings, particularly the latter, in the water-lines and underwater fittings. Air resistance also is generally of small importance; in the "Greyhound" (unrigged) it constituted 1·4 % of the total resistance at 10 knots in calm weather, and in a large Atlantic liner at 25 knots it absorbs about 4 % of the total power. In the case of average ships, unrigged or with moderate top-hamper, the proportion of air resistance is probably less than the latter value. The effect of wind and rough weather on the speed of ships is also largely due to the action of the waves and other motion of the sea, the additional effect of which is indeterminate.

The difference between the total resistance and that due to skin friction is termed the residuary resistance; from the foregoing remarks it appears that it consists principally of the resistance due to wave-making. Since the action of the waves is such as to distort the stream lines near the hull, and the form of the waves is in turn affected by the frictional wake, the frictional and wave-making resistances of a ship are to some extent mutually dependent. It is convenient, however, to neglect the interaction of these constituents, and to assume that the whole resistance is obtained by simple summation of its component parts as calculated independently. Considerable justification for this assumption is furnished by the close agreement between the results of experiments on models and on ships, where the proportion of frictional to total resistance is greatly different.

Wake.

Since the action and the reaction of the water pressure on the hull of a ship are equal and opposite, forward momentum is generated in the water at such a rate that the increase of momentum per second is equal to the total resistance. The water participating in the forward movement is termed the *wake*; the portion of the wake in the vicinity of the propellers is found to have considerable effect upon the propulsion of the ship. Experiments were made by Mr Calvert (*Trans. Inst. N.A.* 1893) to determine the wake velocity with a model of length 28½ ft. and displacement 2·9 tons. The extent of the wake was measured at various positions in the length, and its maximum velocity was observed to be 0·67 times the speed of the ship. Abreast the screw the mean velocity ratio over an area of the same breadth (3·66 ft.) as the ship and of depth equal to the draught (1·55 ft.) was 0·19, of which about 0·05 was ascribed to frictional resistance. In *Rep. Brit. Assoc.* 1874 is contained an investigation by Froude of the extent of the frictional wake and its velocity distribution based on the equality of the resistance to the momentum added per second. It may be here observed that for any ship propelled in the ordinary manner at uniform speed the momentum generated in the sternward race from the propeller is equal and opposite to that of the forward wake due to the hull. The motion of the water as a whole thus consists of a circulatory disturbance advancing with the ship, and having no linear momentum.

Frictional resistance.

The whole of the resistance at low speeds, and a considerable proportion of it at higher speeds, is due to surface friction, *i.e.* to the eddying belt surrounding the hull which is caused by the tangential frictional action between the water and the outside skin. It is nearly independent of the form of the vessel; and is conveniently estimated from the results of experiments made by towing in a tank planks coated with various surfaces. The most important of such experiments were those made by Froude in the experimental tank at Chelston Cross, Torquay. The object was to obtain the laws of variation of resistance with the speed, the length, and the quality of the surface. A dynamometric apparatus by which the planks were towed was used to register the resistance; the planks were given a fine edge at each end to avoid eddy making, and were fully immersed in order that no waves should be formed. The results are given in the *Reports of the British Association*, 1872 and 1874. In the following extract n is the index of the speed at which the resistance varies, A the mean resistance per square foot of surface over the length stated, and B the resistance per square foot at the after end of the plank; both A and B refer to a velocity of 10 ft. per second in fresh water.

Length of Surface in Feet.

	2 ft.			8 ft.			20 ft.			50 ft.		
	n.	A.	B.	*n.*	A.	B.	*n.*	A.	B.	*n.*	A.	B.
Tinfoil . . .	2·16	·30	·295	1·99	·278	·263	1·90	·262	·244	1·83	·246	·232
Paraffin . .	1·95	·38	·370	1·94	·314	·260	1·93	·271	·237	. .	. .	. .
Varnish . .	2·00	·41	·390	1·85	·325	·264	1·85	·278	·240	1·83	·250	·226
Fine sand . .	2·00	·81	·690	2·00	·583	·450	2·00	·480	·384	2·06	·405	·337
Calico . . .	1·93	·87	·725	1·92	·626	·504	1·89	·531	·447	1·87	·474	·423
Medium sand .	2·00	·90	·730	2·00	·625	·488	2·00	·534	·465	2·00	·488	·456
Coarse sand .	2·00	1·10	·880	2·00	·714	·520	2·00	·588	·490	. .	. .	. .

These results are in accordance with the formula—

$$\mathrm{R}=fw\mathrm{S}\cdot\frac{\mathrm{V}^n}{2g};$$

R being the frictional resistance, S the area of surface, V the speed, w the density of the water, f a coefficient depending on the nature and length of the surface, and n the index of the speed; the values of f and n can be readily obtained from the above table. It is seen that the resistance varies as the density of the water, but is independent of its pressure; it diminishes as the length of the surface increases, on account of the frictional wake, which reduces the velocity of rubbing between the water and the surface towards the after end. The index n is 1·83 for a varnished surface equivalent to the freshly painted hull of a ship. The results of Froude's experiments are closely corroborated by similar experiments undertaken by the late Dr Tideman.

When applying the data to ships of length greater than 50 ft., the coefficient B, denoting the resistance 50 ft. from the bow, is assumed to remain unaltered at all greater distances astern. The velocity of rubbing is assumed equal to the speed of the ship, any slight variation due to stream-line action being neglected. The wetted surface S, when not directly calculated, can be estimated with sufficient accuracy by the formula—

$$\mathrm{S}=1\cdot7\mathrm{LD}+\frac{\mathrm{V}}{\mathrm{D}}$$

where V is the volume of displacement, L the length, and D the mean draught.

Wave resistance.

The resistance due to wave making, although inconsiderable at low speeds, is of importance at moderate and at high speeds; it constitutes the greater portion of the total resistance in fast ships.

By impressing, as above, a suitable velocity on the whole system of ship and water, the problem is reduced to one of steady motion in a stream flowing past a stationary ship. The stream tubes, originally of uniform width, become broader on approaching the bow of the ship, and attain their greatest breadth close to the stem. Proceeding aft, the tubes contract, and near amidships they become smaller than they were originally; an enlargement in the tubes again takes place near the stern. The changes in size and velocity in the stream tubes lead to corresponding alterations of pressure in accordance with the energy equation, which alterations appear as elevations and depressions of the surface forming what is termed the statical wave system. If this were a permanent system, no resistance to the motion of the ship would be caused thereby. The surface disturbance, however, is subject to the dynamical laws underlying the propagation of waves; in consequence the wave formation differs from the "statical wave," the crest lagging astern of the "statical" wave crest, and the ship being followed by a train of waves whose lengths are appropriate to the speed attained. The energy within the wave system travels backward relative to the ship at one-half its speed; the resistance experienced by the ship is due to the sternward drain of the wave energy which requires work to be done on the ship to replace that absorbed by the waves.

The form of the wave system is not susceptible of complete mathematical investigation; but the circumstances are approximately realized and the conditions considerably simplified when the actions of the bow and stern of the vessel are each replaced by the mathematical conception of a "pressure point." This consists of an infinitely large pressure applied over an indefinitely small region of the water surface; it is assumed to move forward in place of the ship through still water, or, equally, to be stationary in a uniform stream. The resulting wave system has been investigated by Lord Kelvin and others. It is found to consist of a local disturbance surrounding the pressure point and depending on the pressure distribution combined with a series of waves which are confined within two straight lines drawn backwards through the pressure point and making angles of about $20°\left(\tan^{-1}\frac{1}{2\sqrt{2}}\right)$ with the line of motion. The waves within this region extend indefinitely astern with crests crossing the line of motion perpendicularly. The crest lines are slightly curved, convex to the pressure point, and at the bounding lines form cusps whose tangents are inclined to the line of flow at an angle of about $36°\left(\tan^{-1}\frac{1}{\sqrt{2}}\right)$. The crest lines afterwards curve forward towards the pressure point. The distance apart of the transverse wave crests is equal to the length l of wave appropriate to the speed v, as expressed in the formula $v^2 = gl/2\pi$. These results are of interest since they are in agreement in many respects with those of actual observation for ships and models. In fig. 32, reproduced from a paper in the *I.N.A.* 1877, read by Froude, is shown the bow-wave system obtained from a model, which is also illustrative of that produced by ships of all types. It appears therefore that two types of waves accompany a ship—(1) diverging waves having sharply defined crests placed in echelon, the foremost wave alone extending to the ship; (2) transverse waves limited in breadth by the diverging crests and reaching the sides of the vessel throughout its length. These compare with the crest lines obtained in the above hydrodynamical investigation; the transverse and diverging waves correspond to the different portions of the crest lines which are separated by the cusps.

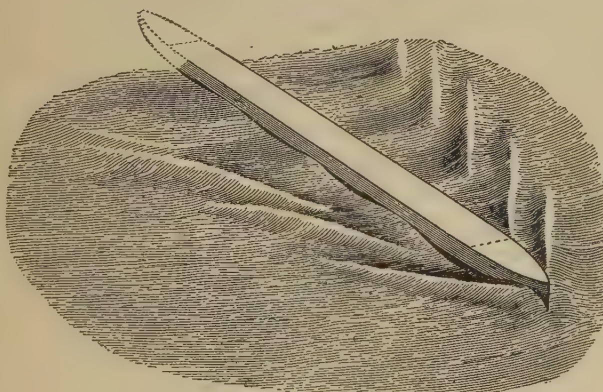


FIG. 32.

Since the bow diverging waves are not in contact with the ship except at the bow, the energy spent in their maintenance travels away from the ship and is lost. A diverging wave system of similar form but of smaller dimensions attends the passage of the stern; and the resistance due to the diverging systems of waves is therefore the sum of its components at the bow and stern, following a regular although unknown law, increasing with the speed, and depending considerably on the shape of the bow and stern.

On the other hand the interference between the transverse bow and stern wave systems produces a stern wave in contact with the ship; the resistance due to the resultant transverse wave system depends therefore on the phase relation between the waves of the component systems. The effect of interference on the wave resistance was investigated by Froude (*Trans. I.N.A.* 1877) by means of experiments on a series of models having the same entrance and run, but in which the length of parallel middle body was varied. At constant speed curves of residuary resistance on a length base consisted of humps and hollows, whose spacing was constant and approximately equal to the wave length appropriate to the speed; the amplitude of the fluctuation diminished as the length increased. For a given length the residuary resistance in general increased at a high power of the speed; but it was also subject to a series of fluctuations whose magnitude and spacing increased with the speed. The results of these experiments were fully analysed in 1881 by Mr R. E. Froude, who showed that a reduction in the resistance occurred when the trough of the bow wave coincided with the crest of the component stern wave, the resultant wave system being of relatively small dimensions. Conversely, the resistance was abnormally increased when the crests of the bow and stern systems coincided. The fluctuation in the resistance thereby obtained was smaller when the length of middle body became greater, owing to the greater degradation of the bow wave system at the stern through viscosity and lateral spreading. For very considerable lengths of middle body, the height of the bow wave system at the stern was insufficient to produce interference or affect the resistance.

The speed in knots (V) of a wave is related to the length in feet (l) by the formula $V^2 = 1{\cdot}8l$. If L′ be the distance apart of the component bow and stern waves (which is generally rather greater than the length of the ship), relatively small resistance would be anticipated when V^2 is approximately equal to 3·6 L′ or any odd submultiple of 3·6 L′; on the other hand when V^2 was not greatly different from 1·8 L′, or any submultiple of 1·8 L′, abnormal wave resistance would be developed. This result is to a great extent confirmed by experience with ships of all classes; for economical propulsion at a speed V, the length L of a ship should be generally equal to or slightly less than V^2, corresponding to the "favourable" value of about 1·2 of the ratio $\frac{V^2}{L'}$; torpedo-boat destroyers and similar vessels of extremely high speed constitute an exception, the value of the ratio $\frac{V^2}{L}$ being then frequently as great as 4, which approximately coincides with the highest "favourable" value of $\frac{V^2}{L'}$.

Law of comparison.

The foregoing description of the resistance experienced by ships through wave making makes it evident that the conditions underlying wave resistance are too complex to enable its amount to be directly estimated as is possible in the case of frictional resistance. Experiments also show that there is no simple law connecting wave resistance with size, form or speed. The effect of size alone, *i.e.* the scale of the experiment, can, however, be eliminated by means of the "principle of similitude" enunciated by Newton, which is applicable with certain limitations to all dynamical systems. The extension of this principle forms the foundation of all methods employed practically for estimating the residuary resistance and horse power of ships. The principle states that in two geometrically and mechanically similar systems, whose linear dimensions vary as the squares of the velocities of the corresponding particles, and whose forces vary as their masses, the motions of the two systems will be similar. A proof of this theorem follows at once from the equations of motion for any particle. The law of comparison, which is the application (originally made by Froude) of the principle of similitude to the resistance of ships, is enunciated as follows:

"If the linear dimensions of a ship be n times those of its model, and the resistances of the latter be R_1, R_2, R_3, . . . at speeds V_1, V_2, V_3, . . . , then the resistances of the ship at the 'corresponding speeds' $V_1\sqrt{n}$, $V_2\sqrt{n}$, $V_3\sqrt{n}$, . . . will be R_1n^3, R_2n^3, R_3n^3, . . . and therefore the effective horse powers at corresponding speeds are increased in the ratio $n^{\frac{7}{2}} : 1$."

It is necessary to ensure that the conditions underlying the principle of similitude are satisfied by all the components of resistance, when the law of comparison is employed for the purpose of obtaining the ratio between the total resistances of two ships at corresponding speeds. Residuary resistance, consisting of that caused by wave making, eddies, and air resistance, is attributable to normal pressures on various surfaces caused by changes of velocity in the water or air. It appears from Bernoulli's energy equation that the pressures per unit area are proportional to the square of the velocity, *i.e.* at corresponding speeds, to the linear dimensions. The total pressures are therefore proportional to the cube of the linear dimensions, *i.e.* to the masses, thus complying with the primary condition regarding the force ratios. Frictional resistance, which varies with the length of surface and as the 1·83 power of the speed, does not satisfy this condition. In the application of the law of comparison to ships and models where the linear ratio is considerable, the residuary resistance alone should be compared by that means, the frictional resistance being independently calculated for ship and model from the results of Froude's experiments. The law may, however, be extended without appreciable error to total resistance when the corresponding linear dimensions of the ships compared are not greatly different.

If it be assumed that the residuary resistance of a ship is capable of being expressed as the sum of a number of terms of the form $W^m V^n$, where W is the displacement, it appears from the law of comparison that $6m+n=6$ for each term of the expression; and in the construction of approximate formulae of this type for residuary resistance, the indices m and n must satisfy this equation. The values of the indices are found to vary irregularly with the speed and type of ship; at uneconomical speeds n may be equal to or greater than 5, and at "favourable" speeds its value may be as low as 1·5, 4 being an approximate mean value for n at moderate speeds. A fact pointed out by Professor Biles in a paper read before the Institution of Naval Architects in 1881 is interesting in this connexion. When the resistance of a ship varies as the 6th power of the speed, an increase in the displacement by a proportionate enlargement of dimension will not cause an increase in the resistance for the same speed; and if the resistance varied as a higher power of the speed than the 6th, the resistance would actually be reduced by increasing the displacement.

The accuracy of the law of comparison was verified by the "Greyhound" resistance experiments carried out by Froude on behalf of the Admiralty (*Trans. I.N.A.*, 1874).

The "Greyhound" was a twin-screw sloop 170 ft. long and of about 1160 tons displacement; the trials were made over a range of speeds extending from 3 to 12½ knots, and with varying draught and trim. She was towed from the end of a spar 48 ft. in length projecting over the side of the towing vessel, H.M.S. "Active"; this ensured that the wave system and wake of the "Active" were prevented from reaching the "Greyhound" and influencing her resistance. A dynamometric apparatus was placed in the bow of the "Greyhound," and arranged so as to record the horizontal component of the tension in the tow rope; by this means the ship's resistance was measured under various conditions and her effective horse-power obtained. A "log ship" or small board, ballasted to sink a few feet and remain normal to the direction of the pull, was attached to the end of a log line which was allowed to run freely out over the end of a spar during the trials. The slip of the "log ship" having been obtained during independent trials, the speed of the "Greyhound" was estimated from the log-line readings with fair accuracy. From these results curves of resistance on a base of speed were constructed for various conditions of draught and trim; the frictional resistance was estimated from the experiments on planks, and curves of residuary resistance were obtained. A model of the "Greyhound," on a scale of $\frac{1}{16}$ full size, was also towed in the experimental tank under conditions corresponding to those of the ship; as with the ship, the total resistance was measured, that due to friction was calculated, and the residuary resistance of the model was obtained. It was found, by assuming a particular value for the unknown frictional coefficient of the "Greyhound," that a close agreement occurred between the residuary resistances of ship and model. This coefficient corresponded to that for a mixture of ⅓ calico and ⅔ varnish, which was probably equivalent to the condition of the ship's bottom during the trials.

Similar experiments were carried out by Mr Yarrow (*Trans. I.N.A.*, 1883) on a torpedo boat 100 ft. long; it was found that the residuary resistance of the boat was then about 3% in excess of that deduced by the law of comparison from experiments on a model.

Model experiments.

As a result of the "Greyhound" trials, the accepted method of estimating the horse-power required for a new ship is by running a scale model under corresponding conditions in an experimental tank fitted and equipped for the purpose. The law of comparison is applied to the residuary resistance, or, if used for the total resistance, a "frictional correction" is made (see below). In 1871 Froude constructed a tank and suitable apparatus at Torquay on behalf of the British Admiralty. In 1885, six years after his death, the ground occupied by the Torquay tank was required for building purposes, and a new tank was constructed at Haslar, near Portsmouth, from the designs and under the supervision of Mr R. E. Froude, such improvements being added as experience at Torquay had shown to be desirable. At both these tanks models of propellers as well as of ships were experimented upon, besides a variety of matters connected with the general subject.

Similar establishments have now been instituted by several foreign governments and by two private firms in Great Britain, Messrs Denny at Dumbarton and Messrs John Brown at Clydebank. The experimental tank now under construction at Teddington should prove an important and useful addition to the number of such installations in this country. It is intended to be used for general research and to be available also for undertaking such private work as may be required by shipbuilding firms. Its inception is due to a committee composed largely of members of the Institution of Naval Architects, and the cost of installation is being defrayed by Mr A. F. Yarrow. The tank will form a part of the National Physical Laboratory, and its general control will be in the hands of officers of the laboratory.

The Admiralty experimental tank at Haslar is nearly 400 ft. long, 20 ft. wide and 9 ft. deep. The main experimental carriage spans the whole width of the tank, and carries a secondary railway on which the subsidiary carriages, which carry the experimental apparatus of different kinds, are adjusted in position. The main carriage runs on rails on the side walls, and can travel the whole length of the tank; it is driven at various speeds by a wire rope from a stationary engine of ample power. Ordinary speeds range from 100 to 800 ft. per minute, while an extreme speed of 1200 ft. per minute can be obtained; the speeds are regulated by a highly sensitive governor. The models, generally from 10 to 14 ft. long, are made of hard paraffin wax, somewhat over 1 in. in thickness; they are cast in a mould, with an allowance of about ¼ in. for finishing. The model is shaped accurately by being placed bottom up on the bed of a machine in which a pair of revolving cutters, one on each side of the model, cuts out on its surface a series of level lines, whose contours are precisely similar to those on the drawing of the ship whose model is under treatment. When all the level lines have been cut in, the model presents the appearance of a series of steps, the bottom angles of which correctly represent the true form the model should possess. The paraffin ridges between these level lines are trimmed off by the use of suitable tools and the outside surface made quite smooth with flexible steel scrapers. The model is ballasted to its required displacement and saddled with a frame, which carries the guiding attachment and also the towing-rod, and is then placed below the dynamometer. The towing-rod at its forward end is then in a position to impart horizontal forces by a hard steel surface to a knife-edge on the dynamometer lever within the model at about the level of the water surface. There are various delicate arrangements with knife-edge adjustments, which result in the horizontal forces being transmitted through a spiral spring, the extensions of which are multiplied by a lever and recorded by a pen on a paper-covered cylinder, distance and time being simultaneously recorded. The speed and resistance corresponding to each experiment are deduced from these elements, a most necessary condition being that the speed shall be uniform throughout each experiment. By somewhat similar arrangements on a subsidiary carriage, the action of model screw propellers is tested either in undisturbed water or behind a model, the speed, rate of rotation, rotary resistance and thrust being measured.

An interesting account by Dr Glazebrook of some experimental tanks in various countries, together with particulars of some improvements in their equipment, appears in *Trans. I.N.A.*, 1909.

Experimental results.

Of the very large number of experimental results that have now been obtained from the trials of ships' models in the tanks referred to above, comparatively few have been made public. In connexion with the Torquay and Haslar tanks some few of the reports by the elder Froude and Mr R. E. Froude have been published by order or permission of the Board of Admiralty, chiefly through the Institution of Naval Architects. Amongst these may be mentioned the "Greyhound" experiments recorded in 1874; the "Merkara" results in 1876; experiments on the effect produced on the wave-making resistance of ships by varying the length of parallel middle body, in 1877; results obtained from models of three merchant liners in 1881; papers in 1888 and 1892 on the "constant" system of notation of results of model experiments, used at the Admiralty Experimental Works; and some results of a systematic series of model experiments by Mr R. E. Froude appeared in 1904. Some records of the experiments made at private and foreign experiment establishments have also appeared.

Some of the most important of these experiments are described in these notes; it remains to show how they are applied in practice to obtain an estimate of the indicated horse-power required to drive a ship at any speed. If the resistance has been obtained from a model experiment, or inferred by the law of comparison from data obtained with a vessel of similar type, the effective horse-power is known; and by assuming a suitable value for the propulsive coefficient (vide *Propulsion*) the indicated horse-power is determined.

If model experiments or data for exactly similar ships are unavailable, the method of estimating the power which is probably most commonly used is one involving a relation between I.H.P., displacement, and speed, which is expressed by the formula—

$$\frac{(\text{Speed})^3 \times (\text{Displacement})^{\frac{2}{3}}}{\text{I.H.P.}} = \text{C},$$

C being called the Admiralty coefficient. The value of C varies considerably at different speeds even for the same ship. For it to be constant, the I.H.P. must vary as the cube of the speed; if resistance varied as the square of the speed and I.H.P. as resistance and speed, the condition of constancy would be fulfilled. Actually, owing to variations in the index of the speed to which the resistance is proportional, in the length and form of the ship and in the machinery and propellers, this method of estimating I.H.P can only be used with great caution, care being taken that the values of C selected for comparison are taken from ships of fairly similar type, and of corresponding lengths and speeds.

Another means of obtaining approximate estimates of the power required for ships of ordinary types is from curves of resistance drawn on a base of simple functions of the speed, length and displacement, the curves being faired through the spots obtained from a large number of results of model experiments with different classes of ships. Curves of this character have been constructed by Mr D. W. Taylor and Mr A. W. Johns (*Trans. I.N.A.*, 1907); the former series expresses the residuary resistance per ton of displacement in terms of $\frac{V^2}{L}$ and $\frac{W}{L^3}$; the latter gives the residuary horse-power divided by $W^{\frac{7}{6}}$ in terms of $\frac{V^2}{L}$ and the prismatic coefficient $\frac{\text{Volume of Displacement}}{\text{Area of Immersed Midship Section} \times \text{Length}}$; the frictional resistance is calculated independently by Froude's or Tideman's tables.

To furnish data for estimating the I.H.P. of vessels covering a considerable range of type, a series of experiments on systematically varied forms of hull were made by Mr R. E. Froude. The results were published by him in the *Trans. I.N.A.*, 1904; and are given in figs. 40 to 51.

The forms of hull dealt with may be primarily divided into two groups, A and B, differing in Beam and Draught ratio; $\frac{\text{Beam}}{\text{Draught}}$ being equal to 2·59 and 3·48 for A and B respectively. Each group is further divided into 6 types, differing in block coefficients, and the table following gives particulars of the coefficients for the models tried:—

	Stern snubbed, forward body as Type 1.			Bow snubbed, after body as Type 3.		
Type.	1.	2.	3.	4.	5.	6.
Block coefficients or $\frac{\text{Volume of Displacement}}{\text{Length} \times \text{Breadth} \times \text{Draught}}$	·495	·505	·516	·522	·529	·542
Largest section coefficient or $\frac{\text{Area of immersed midship section}}{\text{Breadth} \times \text{Draught}}$	·951					

The hull characteristics for A are shown in figs. 33 and 34,[1] and the mode of presenting these indicates the way in which the several types were formed, each being obtained from the type 1 model by successively cutting back its stern and bow. This cutting back is termed snubbing. A curve of areas of transverse sections is given (fig. 35, Plate I.) as well as the sheer draught. The lines of group B can be derived from A, by altering beam and draught scales in the ratio of $\frac{66}{57}$ and $\frac{17{\cdot}6}{20{\cdot}4}$ respectively. Each of the 12 forms which embodied these lines was the generator of a series, differing only in length proportion.

The curve of areas is an important item in the hull characteristics. Experiment shows that the resistance of a hull of given curve of areas, beam and water-line entrance, is practically unaltered however the lines are varied (so long as they are kept ship-shape, and no unfair features are introduced). It follows, therefore, that although the data correspond to a given type of lines, yet (consistently with the preceding conditions) they are capable of application over a wider field than at first sight seems likely, covering variations of draught, form of profile and transverse sections.

Regarding the foregoing statement of permissible variations of lines, alteration in $\frac{\text{Beam}}{\text{Draught}}$ ratio has some effect. Comparison of the two groups A and B gives the effect of the variation in the $\frac{\text{Beam}}{\text{Draught}}$ ratio tried; and it is found that (*caeteris paribus*) increasing $\frac{\text{Beam}}{\text{Draught}}$ by 34% (*i.e.* from 2·59 to 3·48) increases the E.H.P. by about 4%. A brief and approximate statement of the results of some experiments with models of varying $\frac{\text{Beam}}{\text{Draught}}$ ratio, by Lieut.-Colonel G. Rota, R.I.N. (see *Trans. I.N.A.*, 1905), is that beyond a value of $\frac{\text{Beam}}{\text{Draught}} = 2{\cdot}5$ an increase of 10% in $\frac{\text{Beam}}{\text{Draught}}$ causes about 1% to 2·5% increase in resistance (the lower value being appropriate to the higher speeds, and vice versa). This result accords with that deduced from the A and B groups.

By the aid of the law of comparison (and a correction for skin friction), the information provided can be used to obtain the E.H.P. for any size of ship of form included in the experiments (or covered by the possible extensions, *vide supra*). The I.H.P. follows by using a suitable propulsive coefficient. An example is given below as an illustration. In practical application it is important to notice that the lengths used in reckoning the proportions must be the total length of immersed form (*i.e.* of the curve of areas) and not the distance between perpendiculars arbitrarily placed.

The data are here given (figs. 40-51, Plates III.-VI.) in the form of curves of E.H.P. for ships of 1000 tons displacement, plotted for a given speed on a base of immersed length. The range in abscissae shows the amount of variation in length proportion tried in the experiments; and as regards speed range the group B is for generally higher speeds than group A. The curves may be termed standard E.H.P. curves.

The block coefficients of the forms dealt with are lower than those of the greater proportion of merchant ships, and hence the data are not directly applicable to these. At higher speeds, however, the E.H.P. might be approximately estimated from these curves, by assuming a further degree of snubbing appropriate to the required block coefficient; but at speeds which correspond to those of ordinary merchant ships (which are the lower speeds given in the diagrams) the effect of snubbing is variable, and depends really upon the actual speed-length ratio $\left(i.e. \frac{V}{\sqrt{L}}\right)$ of the ship we are dealing with.

In this connexion it may be noted that the diagrams not only afford a means of determining the I.H.P. of a given ship, but they may also be used in designing, and so enable the best form to be chosen, to fulfil the given conditions of displacement and speed, &c. For example, suppose a ship of given displacement is required to obtain a given speed, with a given maximum E.H.P. (or I.H.P. assuming an appropriate propulsive coefficient). First bring the given particulars to the proper scale for 1000 tons displacement (n, the ratio of the linear dimensions, is equal to $\left(\frac{1000}{\text{Dispt.}}\right)^{\frac{1}{3}}$ and hence E.H.P. becomes $\left(\frac{1000}{\text{Dispt.}}\right)^{\frac{7}{6}}$ and speed $\left(\frac{1000}{\text{Dispt.}}\right)^{\frac{1}{6}}$ times the given values). An E.H.P. curve for the given speed is easily interpolated on the diagrams, and we can at once obtain for the given E.H.P. (1) the length for each type, (2) the type which gives the most suitable length, (3) the economy resulting from any additional length, (4) the type for a given fixed length which gives the speed with least E.H.P., and (5) by inspection at lower speeds, how alternative forms compare at these speeds. The following points may commend themselves, from consideration of an instructive comparison shown in fig. 4, where for the B group, E.H.P. curves for types 1, 3 and 6 are drawn together. In drawing conclusions, it must be clearly remembered that the E.H.P.'s, speeds and lengths are for a standard displacement, viz. 1000 tons; and so in applications for different displacements, these quantities all undergo a numerical change, dependent upon the change in displacement. The first point is the effect of length on E.H.P.; this is most marked at high speeds; and even at low speeds, for the shorter lengths the E.H.P. begins to increase rapidly with decrease in length. At these low speeds if, on the other hand, the length be increased beyond a certain point, no economy at all results, but the reverse. The reason for this is clear. At the low speed-length ratio we are considering, the wave-making resistance is practically nil, the resistance being almost entirely due to skin friction and eddy making, &c. It is obvious that by continually reducing the transverse dimensions of a ship of constant displacement, we increase the wetted skin (in the limit when the transverse scale is zero the surface is infinite); hence the resistance due to skin friction increases, and so therefore does the total resistance. This point would be more evident if the diagrams had been continued to a greater length and lower speed. A second point is the effect of alteration in block coefficient. At all speeds above 20 knots, snubbing within the limits shown is beneficial as regards performance. At lower speeds the effect depends on the length. Since it is at these lower speeds the ordinary type of merchant ship works, we may say that the effect of snubbing is doubtful for these, and depends upon the speed-length ratio. A better result might be obtained in such cases if the method of increasing the block coefficient were by the insertion of parallel middle body and not by an extension of snubbing. (For fuller information on this point see Mr R. E. Froude's 1904 I.N.A. paper.) A third point is the effect of change in speed. For a given length, the rate of increase of E.H.P. with speed grows with the speed, but increases least for the more snubbed type. As an instance consider group B, types 1 and 6 at a length of 300 ft. (see fig. 36, Plate I.). The following table gives the increase in E.H.P. for the corresponding changes in speed, and the index of the speed, representing the variation of E.H.P. with speed. The figures in columns (4) and (5) are the means obtained from the individual pairs of speeds; at intermediate speeds these may have different and constantly changing values:—

---

[1] These lines differ from those tried in the models which are given in *Trans. I.N.A.*, 1904 (*q.v.*). Those now given have the same curve of areas and beam, but are modified in respect of draught, profile and shape of transverse sections, these latter being filled out so as more closely to represent modern forms. However, a model has been tried recently, embodying the modifications, and the results found to be practically identical with those obtained for the original lines.

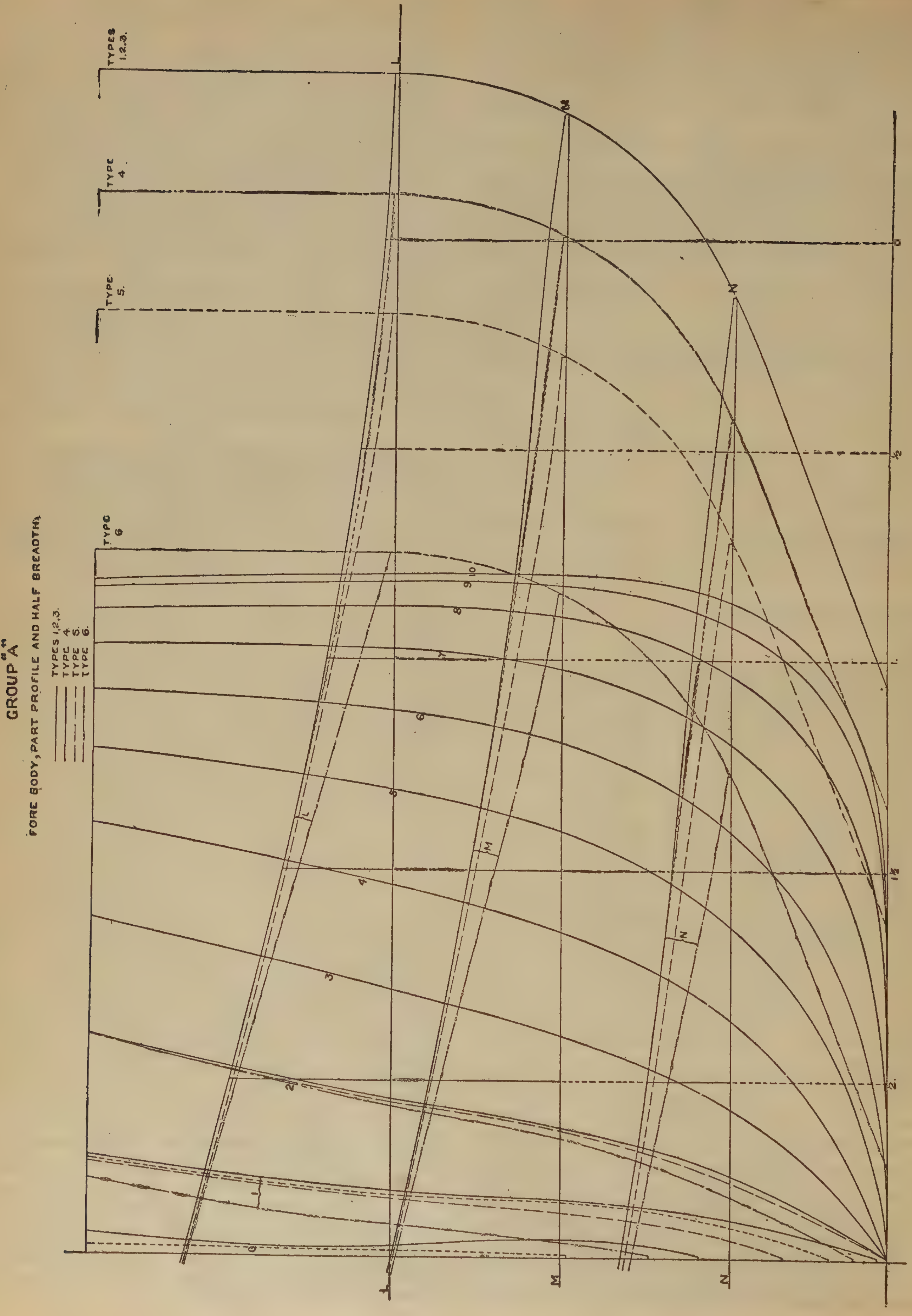

GROUP "A"
FORE BODY, PART PROFILE AND HALF BREADTH.
TYPES 1,2,3.
TYPE 4.
TYPE 5.
TYPE 6.
TYPES 1,2,3.
TYPE 4
TYPE 5.
TYPE 6
L
M
N
0
½
1.
1½
2.
0
1
2
3
4
5
6
7
8
9
10

FIG. 33.

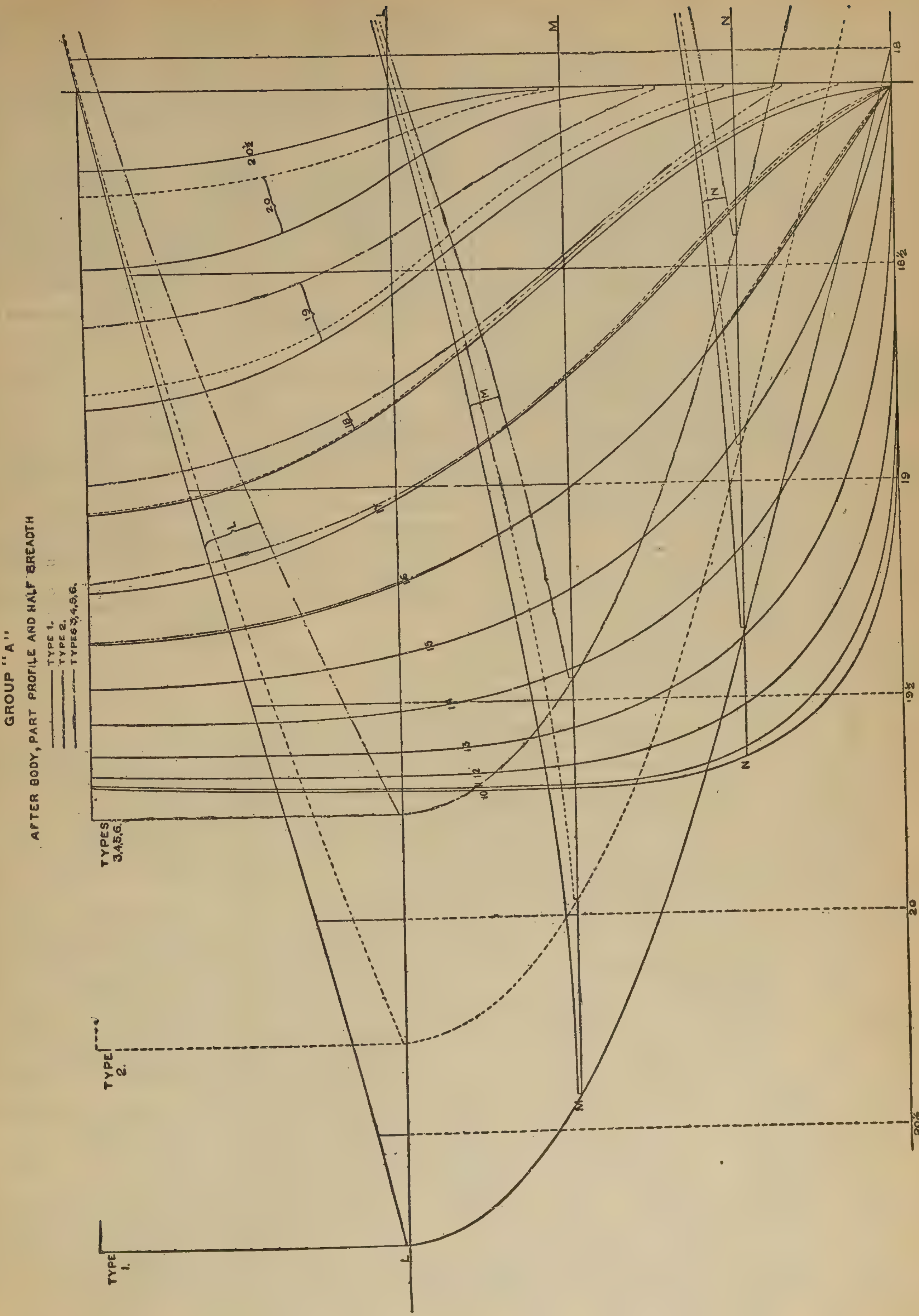

GROUP "A"
AFTER BODY, PART PROFILE AND HALF BREADTH
TYPE 1.
TYPE 2.
TYPES 3,4,5,6.
TYPES 3,4,5,6.
TYPE 2.
TYPE 1.
L
M
N
18
18½
19
19½
20
20½
20½
20
19
18
16
15
14
13
12
11
10

FIG. 34.

Change of Speed.	Corresponding Change in E.H.P.		Corresponding Index of Speed.	
Types(1)and(6).	Type (1).	Type (6).	Type (1).	Type (6).
14-16 knots	245 E.H.P.	273 E.H.P.	3·1	3·0
22-23 "	760 "	650 "	5·3	4·9
25-26 "	890 "	820 "	4·0	4·1

The variation of the rate of growth of I.H.P. (or E.H.P.) with the speed is a result of the interference of the bow and stern wave systems, and is dependent upon the speed-length ratio (*vide* "Wave Resistance," above). A good illustration is afforded by taking the case of a vessel such as a torpedo-boat destroyer, which is run over a considerable range of speed. Fig. 37, Plate II. shows, for such a vessel, three curves plotted to a base of speed, the ordinates being respectively—I.H.P., $\frac{\text{I.H.P.}}{(\text{speed})}$, $\frac{\text{I.H.P.}}{(\text{speed})^3}$. The second of these is of course a curve of resistance, and the rapid rise and fall of the rate of growth of resistance manifests itself in this resistance-curve by a very marked hump between 15 and 25 knots speed. The third curve, that of $\frac{\text{I.H.P.}}{(\text{speed})^3}$, is interesting as affording, by its slope at different points, a very good indication of this rate of growth. Up to about 13 knots this curve is not far from being horizontal, indicating that till then the resistance is varying about as the square of the speed. The rate of growth increases from this point till it reaches a maximum of 15 knots, and then falls off till at about 20 knots the resistance once more varies as the square of the speed. From this point onward the resistance increases at a less rate than the square of the speed.

It has been previously noted that the skin friction part of the E.H.P. does not obey the law of comparison; this is on account of variation of f with length, and the index of the speed being different from 2. The coefficient f varies much more rapidly at the smaller lengths, and hence for these the skin friction correction is more important for a given change in length. For such lengths as are dealt with in ships, *e.g.* 100 ft. and upwards, and such lengths as we should deal with in applying the data that are now given, it has been found possible to express the correction for skin friction very accurately by the curves in fig. 38, Plate II. These indicate the absolute correction that must be applied to the E.H.P. deduced for the given displacement from the standard curves when interpreted by the law of comparison, and are drawn for a series of displacements on a base of speed; the correction for any odd displacement can be easily interpolated. An addition must be made for displacements under, and a deduction for displacements over, the standard 1000 tons.

The following example illustrates this point and the method of using the standard curves:—

A vessel $320' \times 35\frac{1}{2}' \times 13' \times 2135$ tons is being designed; to construct an E.H.P. curve, for speeds 11–22½ knots. The proportions ($\frac{\text{Beam}}{\text{Draught}}$ ratio and block coefficient) of the design are most closely approximated to by type 2, group A (320′ being the immersed length). First find the length l for a similar vessel of 1000 tons displacement; $l \doteq \frac{320}{(2\cdot135)^{\frac{1}{3}}} = 248\cdot5$ ft., and then from fig. 41 read off ordinates representing E.H.P. for the given speeds of the 1000-ton standard ship. These figures are converted into those appropriate for the design, by the law of comparison. If v and e are the speed and E.H.P. for the 1000-ton ship, and V and E corresponding quantities for the design, then $\frac{V}{v} = (2\cdot135)^{\frac{1}{6}} = 1\cdot135$; and $\frac{E}{e} = (2\cdot135)^{\frac{7}{6}} = 2\cdot424$; using these ratios we get a table thus:—

As read from the Standard Curves at a Length = 248·5 Ft.		As converted by Law of Comparison for 2135-Tons Design.		Correction to Col.4 for Skin Friction: read from Figure.	Col.4-Col.5 = E.H.P. Corrected.
		Col. 1×($1\cdot135 = \frac{V}{v}$)	Col. 2×($2\cdot424 = \frac{E}{e}$)		
Knots.	E.H.P.	Knots.	E.H.P.	E.H.P.	E.H.P.
10	150	11·35	364	16	348
12	275	13·62	667	29	638
14	475	15·89	1151	42	1109
16	740	18·16	1794	55	1739
17	940	19·30	2278	61	2217
18	1285	20·43	3115	67	3048
19	1825	21·56	4423	74	4349
20	2590	22·70	6278	80	6198

The curve shown in fig. 39, Plate II. results from plotting col. (6) to a base of speed given by col. (3). Since the propulsive coefficient varies with the speed, it is preferable to take the E.H.P. from the curve and convert to I.H.P., using an appropriate coefficient, than to use a common coefficient by plotting a curve of I.H.P.

Shallow water. In the results hitherto recorded the depth of water has been supposed sufficient to prevent the disturbance attending the motion of a vessel on the surface from extending to the bottom; in these circumstances the resistance is unaffected by a moderate change in the depth. Conditions, however, frequently arise in which vessels are run at high speeds in comparatively shallow water; and a marked alteration is then observed in the resistance and power corresponding to a particular speed. An investigation of the effect of shallow water on resistance is therefore of importance and interest; and a brief account of this part of the subject is here appended.

The change from deep to shallow water modifies the shape of the stream lines, many of which in deep water are approximately in planes normal to the surface of the hull; those in shoal water tend to lie more nearly in horizontal planes, owing to the reduced space under the bottom of the ship. In consequence, the velocity in the stream tubes in the vicinity of the ship is increased, and the changes of pressure and the "statical" wave heights are exaggerated. This causes an increase in the frictional resistance as the depth of water becomes less; but the effect on the residuary resistance is more complicated.

Firstly, the length l of the waves corresponding to a speed v is increased from that expressed by

$$v^2 = \frac{gl}{2\pi}$$

to be in accordance with the formula

$$v^2 = \frac{gl}{2\pi} \tanh \frac{2\pi h}{l}$$

which applies to shallow-water waves for a depth h. When the depth h is equal to $\frac{v^2}{g}$, the length of wave is infinite, and the wave becomes of the type investigated by Scott Russell in canals, and termed a "solitary wave" or a "wave of translation." When the depth of water is less than $\frac{v^2}{g}$ no permanent wave system of speed v can exist. These changes in the wave length considerably affect the wave pattern and alter the speeds at which interference between the bow and stern systems has a favourable or unfavourable effect on the efficiency of propulsion.

In the second place the amount by which the speed of travel of the energy of the wave falls short of the speed of the ship is expressed by

$$\frac{v}{2}\left(1 - \frac{4\pi h/l}{\sinh\frac{4\pi h}{l}}\right).$$

In deep water this difference of speed is $\frac{v}{2}$; in shallow water it diminishes, becoming zero at the critical depth producing a wave of translation.

Thirdly, the local disturbance immediately surrounding the ship is increased in shallow water, theoretical investigation showing that, at the critical depth above referred to, it becomes indefinite or is only limited by its own viscosity and eddying resistance. In still shallower water, the amount of disturbance is reduced as the departure from the critical depth becomes greater.

Finally, the increase of the frictional resistance due to the higher velocity of rubbing is further modified by the large dimensions of the wave accompanying the ship; the particles of a wave in very shallow water are moving appreciably in the direction of travel, which might lead to a reduction in the frictional resistance.

From these considerations it appears impossible to obtain, a priori, the net effect of shallow water on the resistance, owing to the divergent character of the component effects producing the final result. This difficulty is confirmed by the inconsistency of the readings frequently obtained during experiments in shallow water, pointing to instability in the conditions then existing.

A number of experiments have been carried out in shallow water with both ships and models; the most important are those by Constructor Paulus (*Schleswig-Holstein District Club*, 1904), Captain Rasmussen, Mr Yarrow, Herr Popper and Major Rota, many of which are recorded in the *I.N.A. Transactions*. A summary of the conclusions drawn from them is appended:—

1. The minimum depth of water that has no appreciable influence on the resistance increases with the speed and, in some degree, with the dimensions of the ship.

2. At constant speed the resistance is, in general, greatest at the critical depth of water $\left(\frac{v^2}{g}\right)$. It is concluded, therefore, that the increase of resistance due to the enhanced dimensions of the wave then accompanying the ship is more than sufficient to counteract the gain resulting from the diminished drain of energy from the wave system astern.

3. At high speeds, when a considerable portion of the resistance is due to wave-making, the total resistance diminishes at depths lower than the critical depth, and is frequently less in very shallow water than in deep water.

4. The "humps" in the curves of resistance on a base of

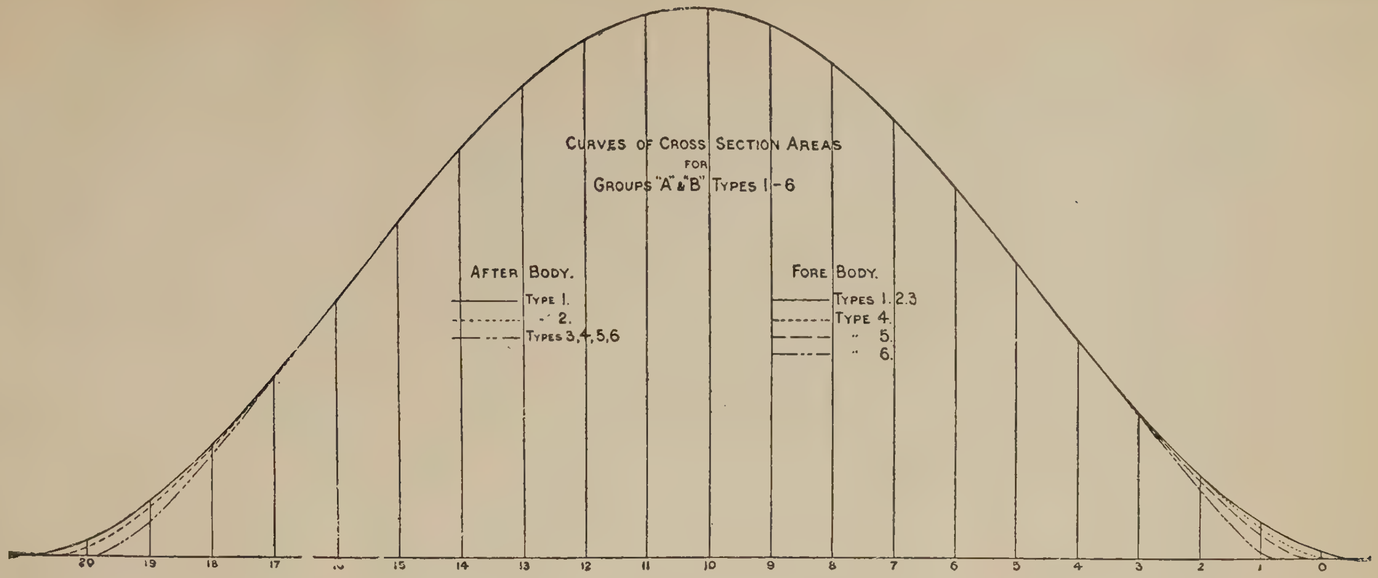

Curves of Cross Section Areas
for
Groups "A" & "B" Types 1–6
After Body.
Type 1.
" 2.
Types 3,4,5,6
Fore Body.
Types 1.2.3
Type 4.
" 5.
" 6.
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0

FIG. 35.—If length for 1,000-ton Ship be assumed 240 feet, then maximum ordinate of above curves represents—

279·9 square feet for Type 1
274·7 „ „ „ 2
269·0 „ „ „ 3 and for other lengths, the number of square
265·5 „ „ „ 4 feet varies inversely as the length.
262·1 „ „ „ 5
255·4 „ „ „ 6

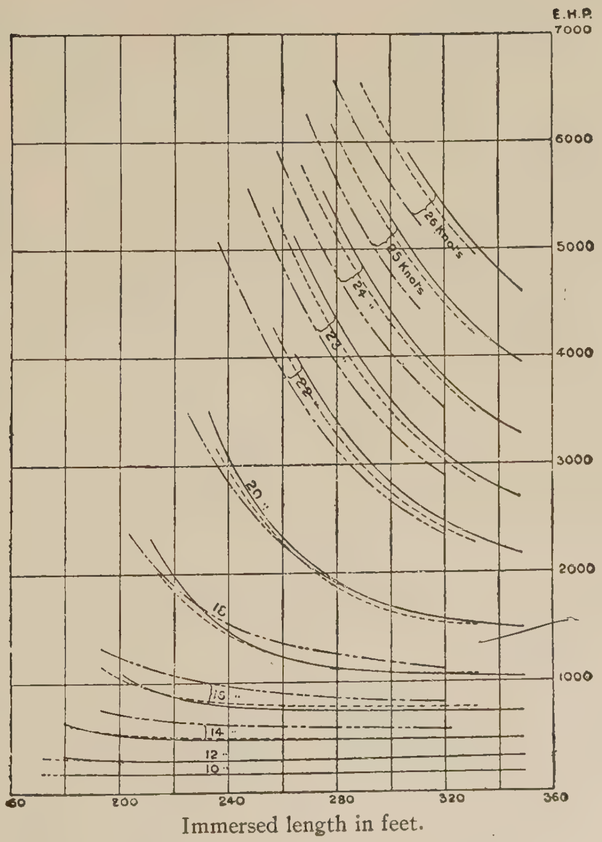


FIG. 36.—Group B. Comparison of Types.

Type 1. ————
„ 3. - - - - - - -
„ 6. —‧—‧—

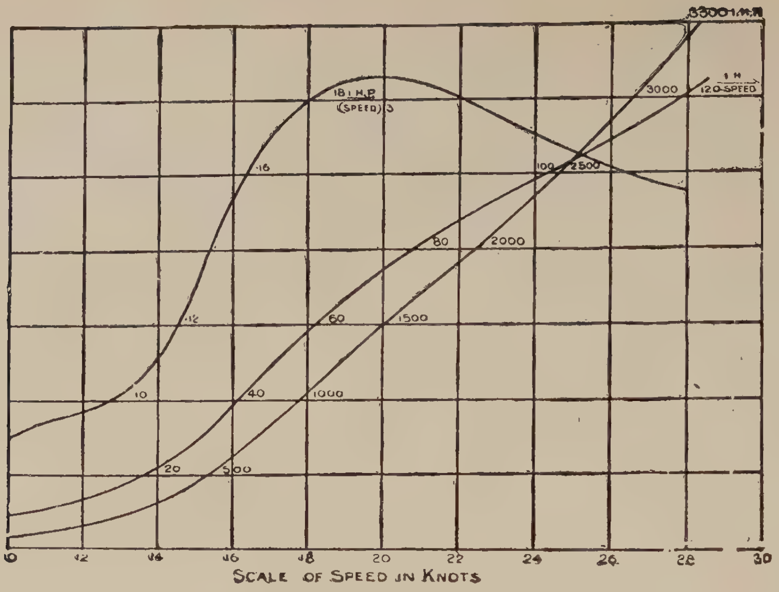


FIG. 37.

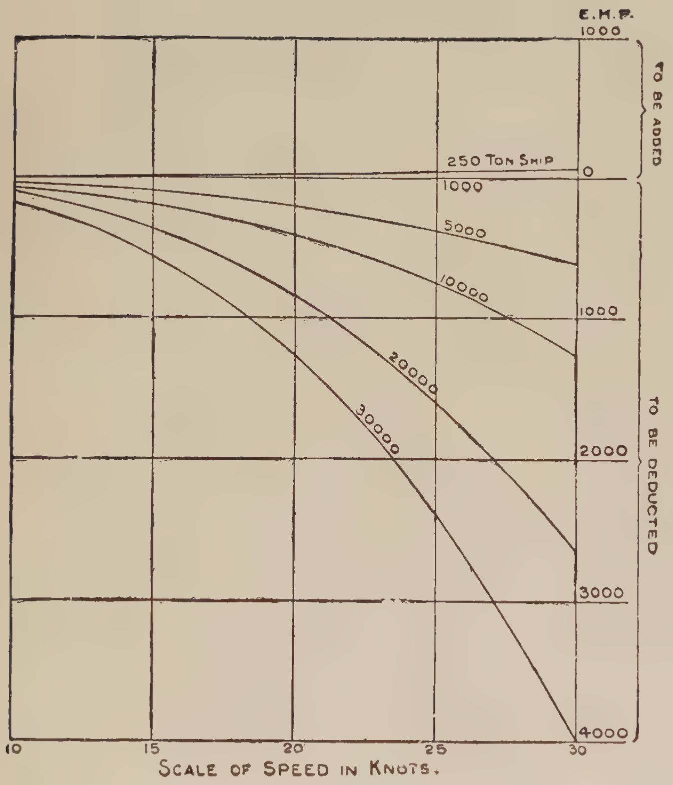


FIG. 38.—Curves of Surface Friction Correction.

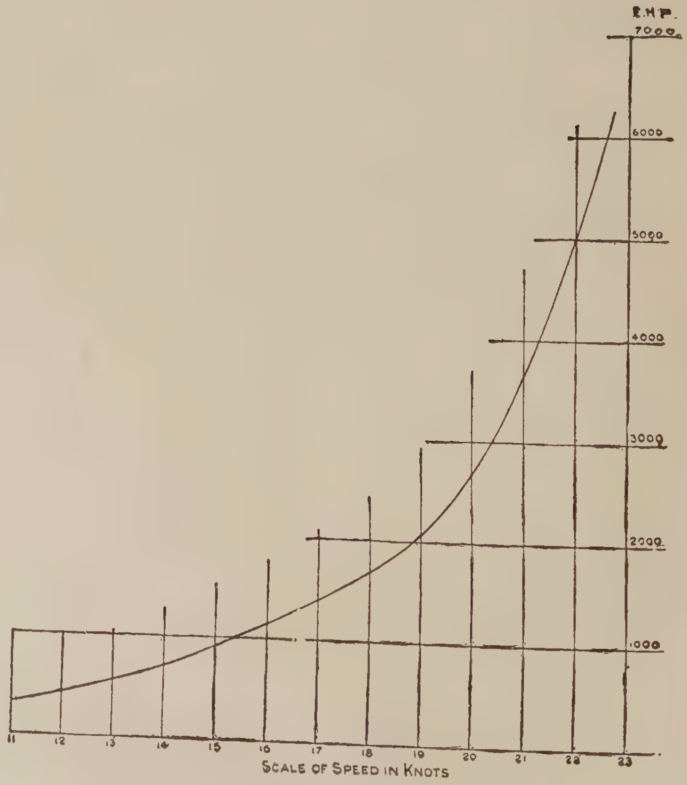
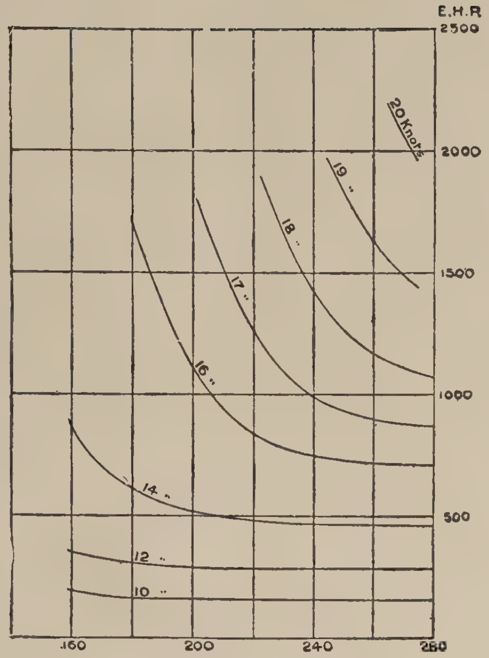
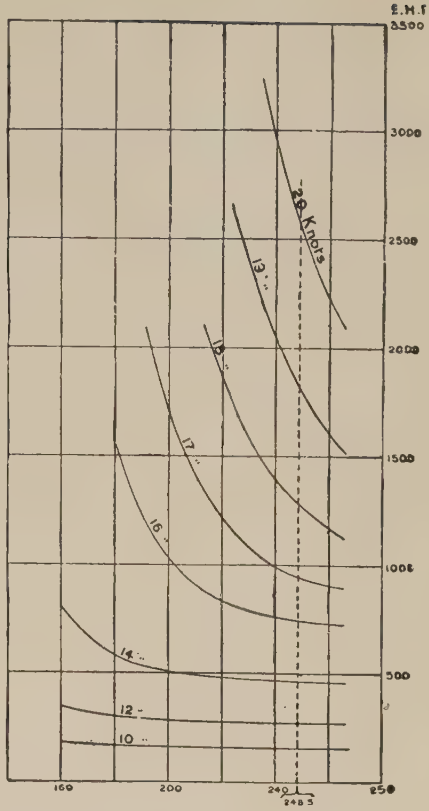


FIG. 39.—Estimated Curve of E.H.P. for Vessel.
320′ × 35½′ × 13′ × 2,135 Tons.



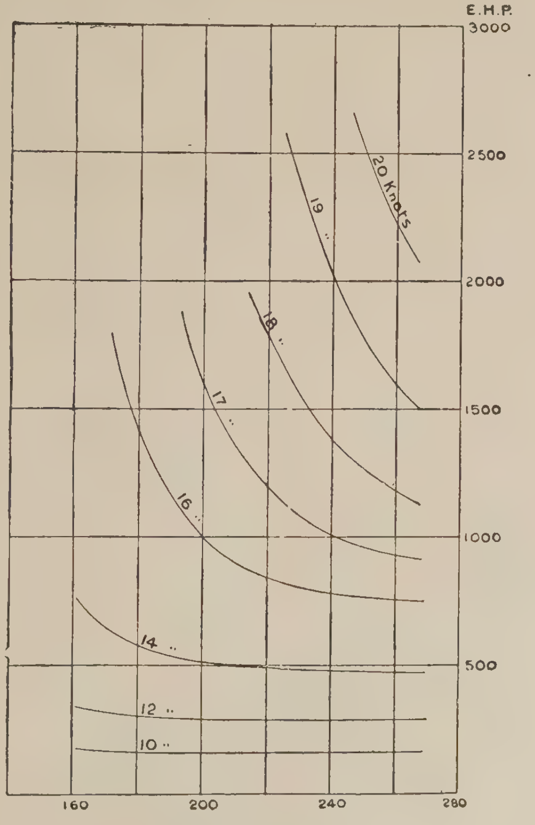
Immersed length in feet.

FIG. 40.—Curves of E.H.P. for 1,000-ton Ship.
Group "A."
Type 1. Block Coefficient ·495.



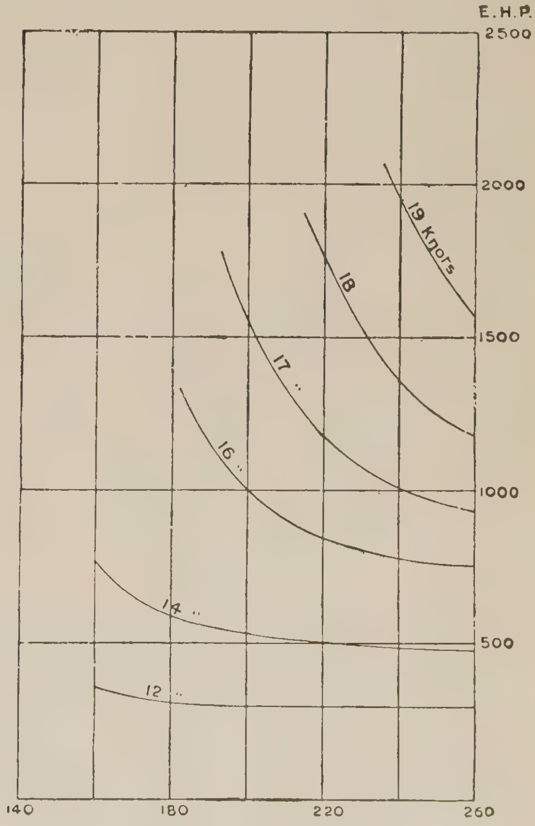
Immersed length in feet.

FIG. 41.—Curves of E.H.P. for 1,000-ton Ship.
Group "A."
Type 2. Block Coefficient ·505.



Immersed length in feet.

FIG. 42.—Curves of E.H.P. for 1,000-ton Ship.
Group "A."
Type 3. Block Coefficient ·516.



Immersed length in feet.

FIG. 43.—Curves of E.H.P. for 1,000-ton Ship.
Group "A."
Type 4. Block Coefficient ·522.

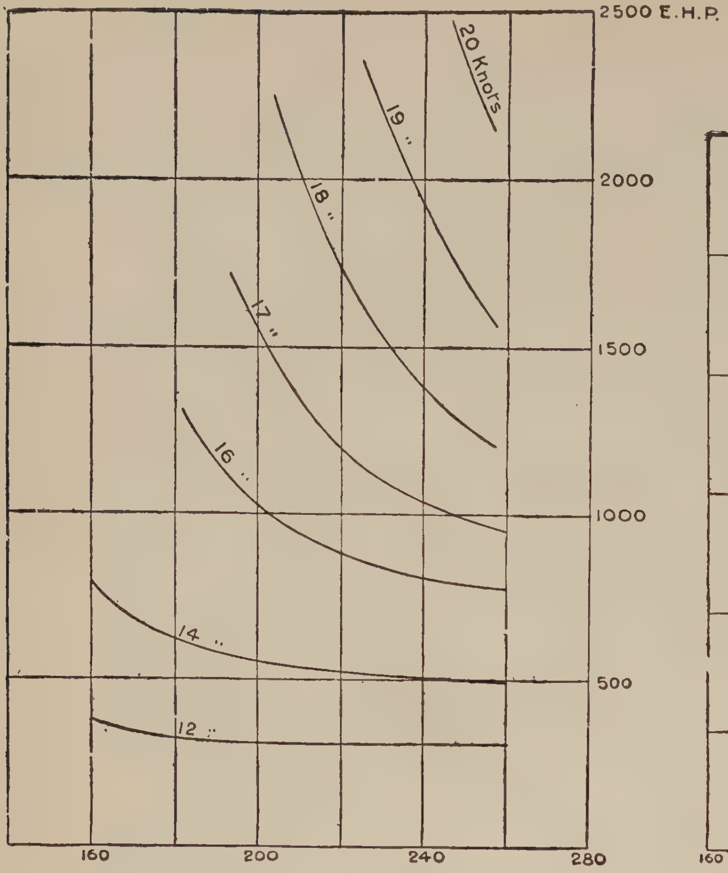


FIG. 44.—Curves of E. H. P. for 1,000-ton Ship. Group "A." Type 5. Block Coefficient ·529.

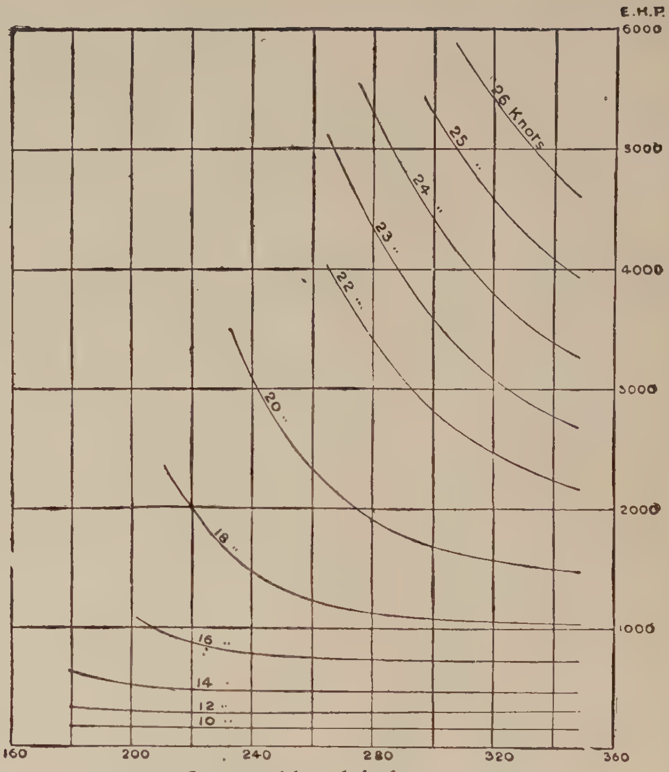


FIG. 46.—Curves of E. H. P. for 1,000-ton Ship. Group "B." Type 1. Block Coefficient ·495.

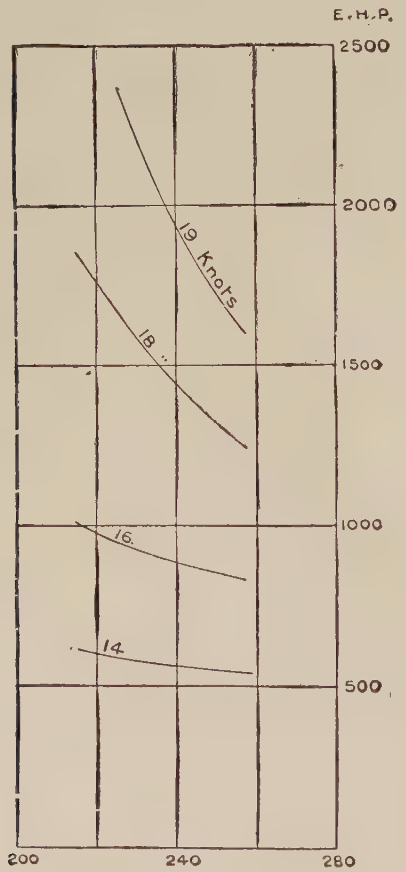


FIG. 45.—Curves of E. H. P. for 1,000-ton Ship. Group "A." Type 6. Block Coefficient ·542.

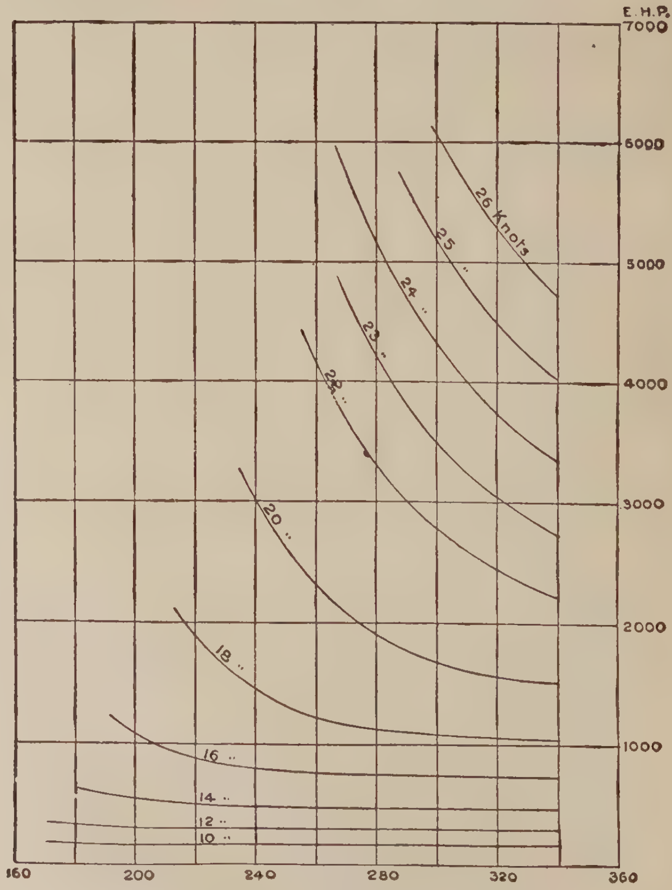
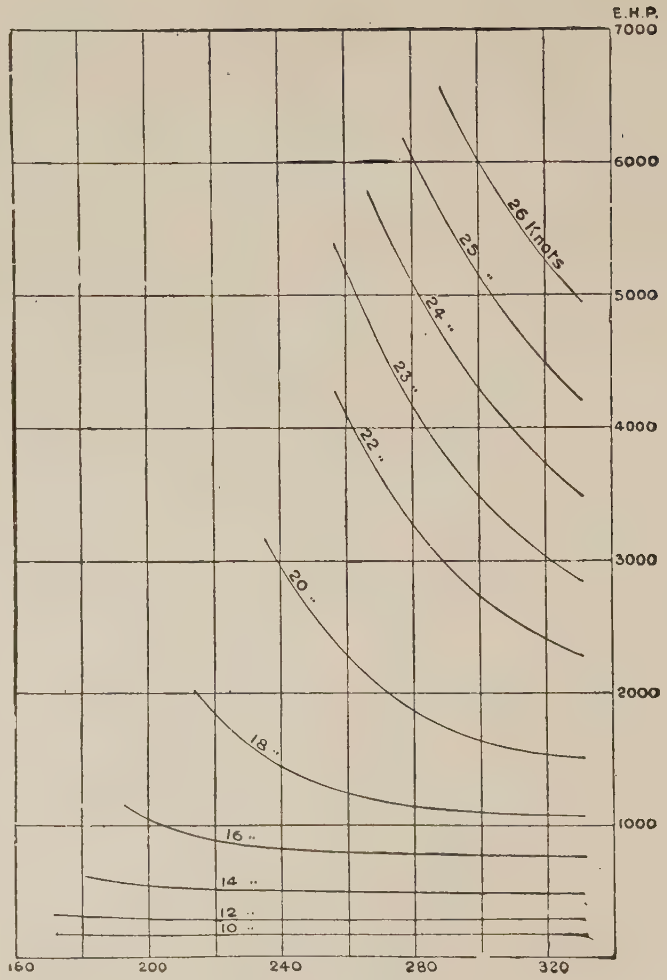
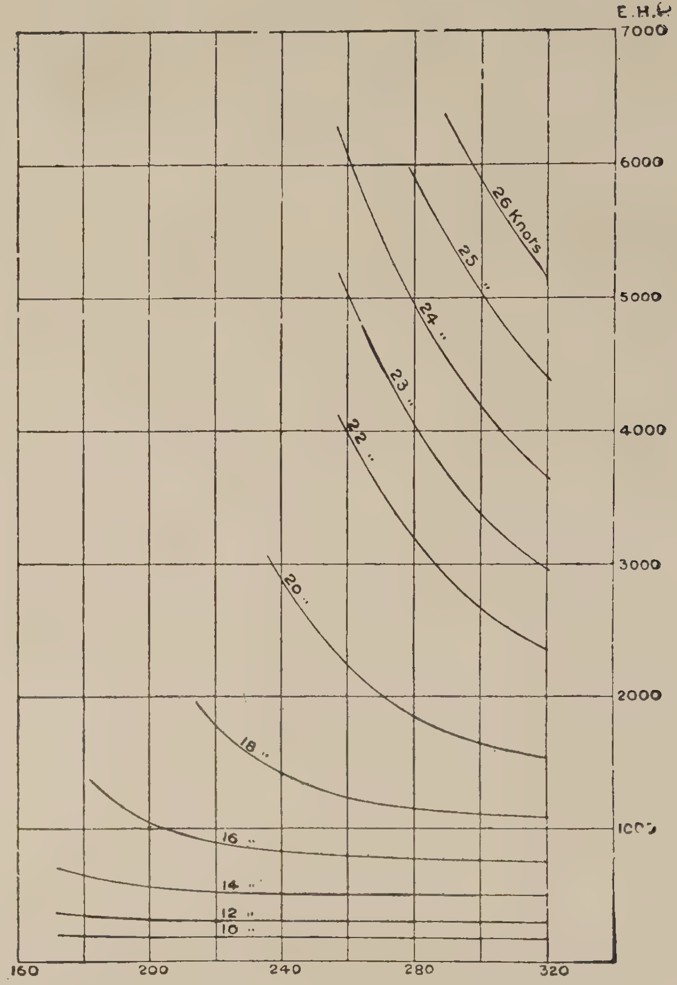


FIG. 47.—Curves of E. H. P. for 1,000-ton Ship. Group "B." Type 2. Block Coefficient ·505.



Immersed length in feet.

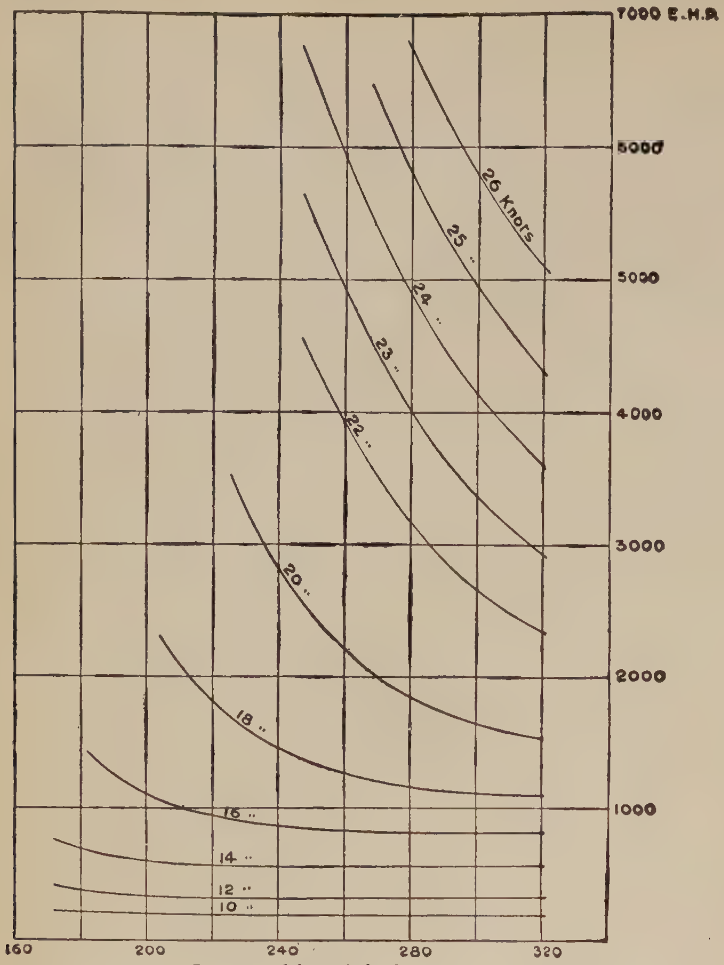
FIG. 48 —Curves of E.H.P. for 1,000-ton Ship.
Group "B."
Type 3. Block Coefficient ·516.



Immersed length in feet.

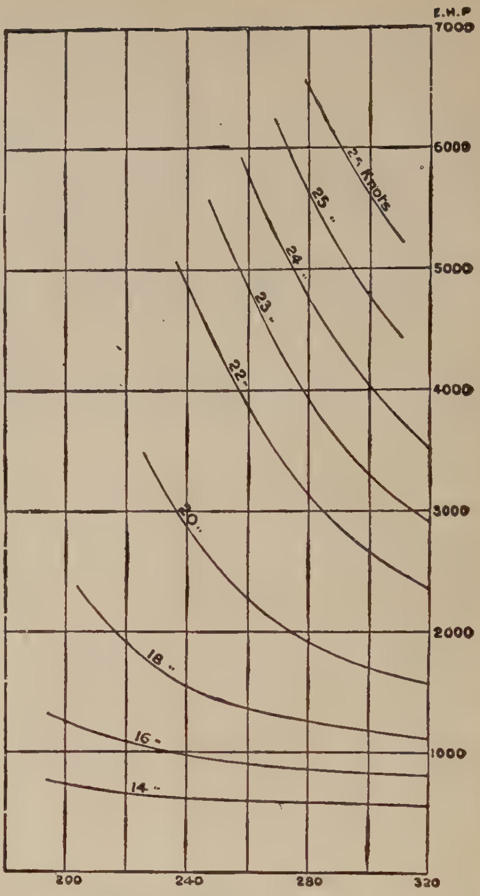
FIG. 49.—Curves of E.H.P. for 1,000-ton Ship.
Group "B."
Type 4. Block Coefficient ·522.

SHIPBUILDING



Immersed length in feet.

FIG. 50.—Curves of E. H. P. for 1,000-ton Ship. Group "B." Type 5. Block Coefficient ·529.



Immersed length in feet.

FIG. 51.—Curves of E. H. P. for 1,000-ton Ship. Group "B." Type 6. Block Coefficient ·542.

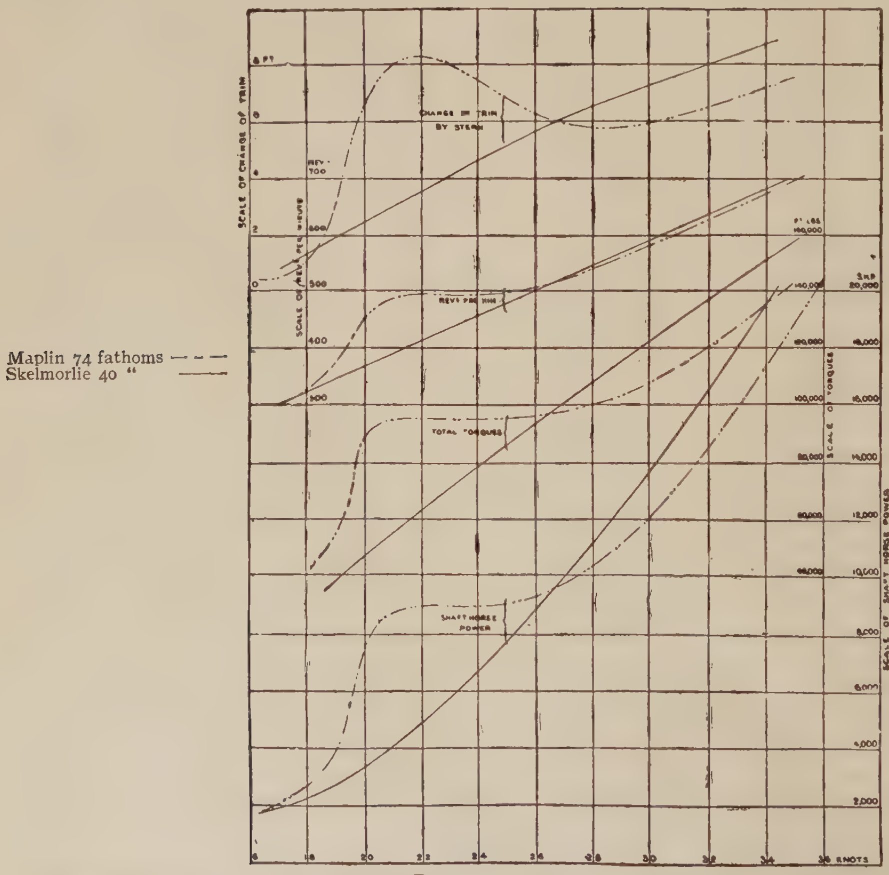


FIG. 52.—Speed trials of H.M. Torpedo Boat Destroyer "Cossack." At Maplin and Skelmorlie. Displacement 836 tons.

speed occur at lower speeds in shallow water, and are more pronounced; the resistance is occasionally reduced when the speed is increased.

5. The changes of resistance produced by shallowness are accompanied by corresponding changes in the speed of revolution of the engines and in the trim of the vessel. These are illustrated by the curves in fig. 52, Plate VI., which are taken from a paper read before the I.N.A. by the writer in 1909, giving the results of some trials on H.M. torpedo-boat destroyer "Cossack."

The data obtained from the various shallow water experiments are capable of extension to ships of similar types by the application of the law of comparison at corresponding depths (proportional to the linear dimensions) and at corresponding speeds. The influence of shallow water on the speed of a large number of ships can be thus obtained; but the data at present available are insufficient to enable a general law, if any exists, to be determined.

A further modification in the conditions arises when a ship proceeds along a channel of limited breadth and depth. Some interesting experiments were made in this connexion by Scott Russell on the resistance of barges towed in a narrow canal. He obtained (by measuring the pull in the tow rope) the resistance of a barge of about 6 tons displacement, for a mean depth of the canal of about 4½ ft., as follows:

Speed in miles per hour	6·19	7·57	8·52	9·04
Resistance in pounds	250	500	400	280

At the critical speed (8·2 m. per hour) corresponding to the depth, the resistance was in this case reduced; and at a higher speed a further reduction of resistance was observed. It is stated that the boat was then situated on a wave of translation extending to the sides of the canal, and which was capable of travelling unchanged for a considerable distance; the resistance of the boat was then almost entirely due to skin friction.

Acceleration.

When the speed of a ship is not uniform, the resistance is altered by an amount depending on the acceleration, the inertia of the ship and the motion of the surrounding water. In the ideal conditions of a vessel wholly submerged in a perfect fluid, the force producing acceleration is the product of the acceleration with the "virtual mass," which is the mass of the vessel increased by a proportion of the displacement; *e.g.* for a sphere, one half the displacement added to the mass is equal to the virtual mass. The effect of acceleration on a ship under actual conditions is less simple; and the virtual mass, defined as the increase of resistance divided by the acceleration of the ship, varies considerably with the circumstances of the previous motion. The mean value of the virtual mass of the "Greyhound," obtained by Froude from the resistance experiments, was about 20% in excess of the displacement. This value is probably approximately correct for all ships of ordinary form, and is of use in estimating the time and distance required to make a moderate alteration in speed; the conditions during the stopping, starting and reversing of ships are generally, however, such as to make this method inapplicable.

Propulsion.

The action of a marine propeller consists fundamentally of the sternward projection of a column of water termed the propeller race; the change of momentum per unit time of this water is equal to the thrust of the propeller, which during steady motion is balanced by the resistance of the ship.

Assuming in the first place that the passage of the ship does not affect and is uninfluenced by the working of the propeller, let V be the speed of the ship, v that of the propeller race relative to the ship, and m the mass of water added to the propeller race per second. The thrust T is then equal to $m\ (v-\mathrm{V})$, and the rate at which useful work is done is TV or $m\mathrm{V}\ (v-\mathrm{V})$. Loss of energy is caused by (*a*) shock or disturbance at the propeller, (*b*) friction at the propeller surface, (*c*) rotational motions of the water in the race, and (*d*) the astern motion of the race. Of these (*a*), (*b*) and (*c*) are capable of variation and reduction by suitable propeller design; though unavoidable in practice, they may be disregarded for the purpose of obtaining the theoretical maximum efficiency of a perfect propeller. The remaining loss, due to the sternward race, is equal to $\frac{1}{2}m(v-\mathrm{V})^2$; whence the whole energy supplied to the propeller in unit time is expressed by $\frac{1}{2}m(v^2-\mathrm{V}^2)$ and the efficiency by $\frac{2\mathrm{V}}{\mathrm{V}+v}$. The quantity $v-\mathrm{V}$ is commonly termed the *slip*, and $\frac{v-\mathrm{V}}{v}$ the *slip ratio*; the latter expression being denoted by s, the theoretical maximum efficiency obtained on this basis becomes $\frac{1-s}{1-\frac{1}{2}s}$. It appears, therefore, that the maximum efficiency should be obtained with minimum slip; actually, however, with screw propellers the losses here disregarded entirely modify this result, which is true only to the extent that very large slip is accompanied by a low efficiency. The foregoing considerations show that, with a given thrust, the larger m the quantity of water acted upon (and the smaller, therefore, the slip), the higher is the efficiency generally obtained.

The type of propeller most nearly conforming to the fundamental assumption is the jet propeller in which water is drawn into the ship through a pipe, accelerated by a pump, and discharged aft. The "Waterwitch" and a few other vessels have been propelled in this manner; since, however, the quantity of water dealt with is limited for practical reasons, a considerable sternward velocity in the jet is required to produce the thrust, and the slip being necessarily large, only a very low efficiency is obtained. A second type of propeller is the paddle, or stern-wheel which operates by means of floats mounted radially on a circular frame, and which project a race similar to that of the jet propeller. Certain practical difficulties inherent to this form of propulsion render it unsuitable or inefficient for general use, although it is of service in some ships of moderate speed which require large manœuvring powers, *e.g.* tugs and pleasure steamers, or in vessels that have to run in very shallow water. The screw, which is the staple form of steamship propeller, has an action similar in effect to the propellers already considered. Before proceeding to discuss the action of screw propellers, it is desirable to define some of the terms employed. The product of the revolutions and pitch is often called the speed of the propeller; it represents what the speed would be in the absence of slip. Speed of advance, on the other hand, is applied to the forward movement of the propeller without reference to its rotation; and is equal to the speed of the ship or body carrying the propeller. The difference between the speed of the propeller and the speed of advance is termed the slip; and if the two former speeds be denoted by v and V respectively, the slip is $v-\mathrm{V}$ and the slip ratio (or properly the apparent slip ratio) $\frac{v-\mathrm{V}}{v}$. This notation corresponds to that previously used, $v-\mathrm{V}$ being then defined as the absolute velocity of the race; it is found with propellers of the usual type, that zero thrust is obtained when $v=\mathrm{V}$, provided that the "conventional" pitch, which for large screws is approximately 1·02 times the pitch of the driving surface, is used in estimating v. The pitch divided by the diameter is termed the pitch ratio.

The theories formulated to explain the action of the screw propeller are divisible into two classes—(i.) those in which the action of the screw as a whole is considered with reference to the change of motion produced in the water which it encounters, the blade friction being, however, deduced from experiments on planes; and (ii.) those in which the action of each elementary portion of the blade surface is separately estimated from the known forces on planes moved through water with various speeds and at different angles of obliquity; the force on any element being assumed uninfluenced by the surrounding elements, and being resolved axially and circumferentially, the thrust, turning moment, and efficiency are given by summation. Professor Rankine in *Trans. Inst. Nav. Archs.*, 1865, assumed that the propeller impressed change of motion upon the water without change of pressure except such as is caused by the rotation of the race. In Sir George Greenhill's investigation (*Trans. Inst. Nav. Archs.*, 1888) it is assumed conversely that the thrust is obtained by change of pressure, the only changes of motion being the necessary circumferential velocity due to the rotation of the screw, and a sufficient sternward momentum to equalize the radial and axial pressures. These two theories are both illustrative of class (i.); and this idea was further developed by Mr R. E. Froude in 1889, who concluded that the screw probably obtained its thrust by momentarily impressing an increase of pressure on the water which eventually resulted in an increase of velocity about one-half of which was obtained before and one-half abaft the screw. A lateral contraction of the race necessarily accompanies each process of acceleration. These general conclusions have been in some degree confirmed by experiments carried out by Mr D. W. Taylor, *Proceedings of the (American) Society of Naval Architects, &c.*, 1906, and by Professor Flamm, who obtained photographs of a screw race in a glass tank, air being drawn in to show the spiral path of the wake.

In *Trans. Inst. Nav. Archs.*, 1878, Froude propounded a theory of the screw propeller illustrative of the second class above mentioned, the normal and tangential pressures on an elementary area being deduced from the results of his own previous experiments on obliquely moving planes. He was led to the following conclusions regarding maximum efficiency:—(1) The slip angle (obliquity of surface to the direction of its motion) should have a particular value (proportional to the square root of the coefficient of friction); and (2) when this is so, the pitch angle should be 45°. The maximum efficiency obtained from this investigation was 77%. This theoretical investigation, though of importance and interest, does not exactly represent the actual conditions, inasmuch as the deductions from a small element are applied to the whole blade, and, further, the considerable disturbance of the water when a blade reaches it, owing to the passage of the preceding blade, is ignored.

Experimental results.

The most complete information respecting the properties of screw propellers has been obtained from model experiments, the law of comparison which has been shown to hold for ship resistance being assumed to apply equally to screw propellers. No frictional correction is made in obtaining the values for large screws from the model ones; as stated by

Mr R. E. Froude in 1908, it is probable that the effect of friction would be in the direction of giving higher efficiencies for large screws than for small. The results obtained with ships' propellers are in general accordance with those deduced from model propellers, although the difficulties inherent to carrying out experiments with full-sized screws have hitherto prevented as exact a comparison being made as was done with resistance in the trials of the "Greyhound" and her model. Results of model experiments have been given by Mr R. E. Froude, Mr D. W. Taylor, Sir John Thornycroft and others; of these a very complete series was made by Mr R. E. Froude, an account of which appears in *Trans. Inst. Nav. Archs.*, 1908. Propellers of three and four blades, of pitch ratios varying from 0·8 to 1·5, and with blades of various widths and forms were successively tried, the slip ratio varying from zero to about 0·45. In each case the screw advanced through undisturbed water; the diameter was uniformly 0·8 ft., the immersion to centre of shaft 0·64 ft., and the speed of advance 300 ft. per minute. Curves are given in the paper which express the results in a form convenient for application. Assuming as in Froude's theory that the normal pressure on a blade element varies with the area, the angle of incidence, and the square of the speed, the thrust T would be given by a formula such as

$$T = a\,R^2 - bR$$

where R is the number of revolutions per unit time.

On rationalising the dimensions, and substituting for R in terms of the slip ratio s, the "conventional" pitch ratio p, the diameter D, and the speed of advance V, this relation becomes:

$$T = \frac{a}{p^2}\,D^2V^2\frac{s}{(1-s)^2}.$$

From the experiments the coefficient a was determined, and the final empirical formula below was obtained—

$$T = D^2V^2 \times B\,\frac{p+21}{p} \times \frac{1{\cdot}02s(1-{\cdot}08s)}{(1-s)^2}$$

$$\text{or } H = {\cdot}003216\,D^2V^3 \times B\cdot\frac{p+21}{p} \times s\,\frac{(1-{\cdot}08s)}{(1-s)^2}$$

where H is the thrust horse-power, R the revolutions in hundreds per minute, V is in knots, and D in feet. The "blade factor" B depends only on the type and number of blades; its value for various "disk area ratios," *i.e.* ratio of total blade area (assuming the blade to extend to the centre of shaft) to the area of a circle of diameter D is given in the following table:—

Disk area ratio . .	·30	·40	·50	·60	·70	·80
B for 3 blades elliptical	·0978	·1050	·1085	·1112	·1135	·1157
B for 3 blades, wide tip	·1045	·1126	·1166	·1195	·1218	·1242
B for 4 blades, elliptical	·1040	·1159	·1227	·1268	·1294	·1318

The ratio of the ordinates of the wide tip blades to those of the elliptical blades varies as $\frac{1}{2}+\frac{2r}{D}$, where r is the radius from centre of shaft.

Curves of propeller efficiency on a base of slip ratio are drawn in fig. 53, these are correct for a 3-bladed elliptical screw of disk area ratio 0·45; a uniform deduction from the efficiency obtained by the curves of ·02 for a 3-bladed wide tip and ·012 for a 4-bladed elliptical screw must be made. Efficiency corrections for different disk area ratios have also to be applied; for a disk ratio of 0·70 the deductions are ·06, ·035, ·02 and ·01 with pitch ratios of 0·8, 1·0, 1·2 and 1·4 respectively; for other disk ratios, the deduction is roughly proportional to (disk ratio−0·45), a slight increase in efficiency being obtained for low values of the disk ratio. A skew-back of the blades to an angle of 15° was found to make no material difference to the results.

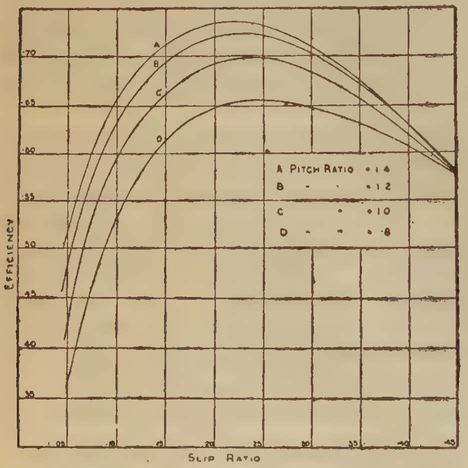


Fig 53.—Curves of Screw Propeller Efficiency.

Interaction between ship and screw. Hitherto, the theoretical and experimental considerations of the screw have been made under the convention that the propeller is advanced into undisturbed or "open" water, which conditions are very different from those existing behind the ship. The vessel is followed by a body of water in complex motion and the assumption usually made is that the "wake," as it is termed, can be considered to have a uniform forward velocity V′ over the propeller disk.

If V be the speed of the ship, the velocity of the propeller relative to the water in which it works, *i.e.* the speed of advance of the propeller is V–V′. The value of the wake velocity is given by the ratio $\frac{V'}{V-V'}=w$, which is termed the *wake value*.

The propeller behaves generally the same as a screw advancing into "open" water at speed V−V′ instead of at speed V and the real slip is $v-(V-V')=v-\frac{V}{1+w}$. The real slip is greater than the apparent slip v–V, since in general w is a positive fraction; and the real slip must be taken into account in the design of propeller dimensions.

On the other hand the influence of the screw extends sufficiently far forward to cause a diminution of pressure on the after part of the ship, thereby causing an increase in resistance. The thrust T, given by the screw working behind the ship, must be sufficient to balance the tow-rope resistance R and the resistance caused by the diminution in pressure. If this diminution of pressure be expressed as a fraction t of the thrust exerted by the screw then $T(1-t)=R$.

The power exerted by the propeller or the thrust horse-power is proportional to $T\times(V-V')$; the effective or tow rope horse-power is $R\times V$, and the ratio of these two powers $\frac{RV}{T(V-V')}=(1-t)(1+w)$ is termed the *hull efficiency*.

It is evident that the first factor $(1+w)$ represents the power regained from the wake, which is itself due to the resistance of the ship. As the wake velocity is usually a maximum close to the stern, the increase of w obtained through placing the screw in a favourable position is generally accompanied by an increase in t; for this reason the hull efficiency does not differ greatly from unity with different positions of the screw. Model screw experiments with and without a ship are frequently made to determine the values of w, t, and the hull efficiency for new designs; a number of results for different ships, together with an account of some interesting experiments on the effect of varying the speed, position of screw, pitch ratio, direction of rotation, &c., are given in a paper read at the Institution of Naval Architects in 1910 by Mr W. J. Luke.

The total propelling efficiency or propulsive coefficient (p) is the ratio of the effective horse-power (RV) to the indicated horse-power, or in turbine-driven ships to the shaft horse-power as determined from the torque on the shaft. In addition to the factor "hull efficiency," it includes the losses due to engine friction, shaft friction, and the propeller. Its value is generally about 0·5, the efficiencies of the propeller and of the engine and shafting being about 65 and 80% respectively. The engine losses are eliminated in the propulsive coefficient as measured in a ship with steam turbines; but the higher rate of revolutions there adopted causes a reduction in the propeller efficiency usually sufficient to keep the value of the propulsive coefficient about the same as in ships with reciprocating engines.

The table on the following page gives approximate values of w, t, and p in some ships of various types.

Cavitation. The action of a screw propeller is believed to involve the acceleration of the water in the race before reaching the screw, which is necessarily accompanied by a diminution of pressure; and it is quite conceivable that the pressure may be reduced below the amount which would preserve the natural flow of water to the screw. This would occur at small depths of immersion where the original pressure is low, and with relatively small blade-areas in relation to the thrust, when the acceleration is rapid; and it is in conjunction with these circumstances that so-called "cavitation" is generally experienced. It is accompanied by excessive slip, and a reduction in thrust; experiments on the torpedo-boat destroyer "Daring," made by Mr S. W. Barnaby in 1894,[1] showed that cavitation occurred when the thrust per square inch of projected blade area exceeded a certain amount (11¼ lb). Further trials have shown that the conditions under which cavitation is produced depend upon the depth of immersion and other factors, the critical pressure causing cavitation varying to some extent with the type of ship and with the details of the propeller; the phenomenon, however, provides a lower limit to the area of the screw below which irregularity in thrust may be expected, and the data for other screws (whether model or full-size) become inapplicable.

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[1] *Trans. I.N.A.* 1897 (vol. xxxix.).

Type of Ship.	Number of Screws.	Propulsive Coefficient, p.	Wake Value, w.	Thrust Deduction, t.	Hull Efficiency.	Remarks.
Battleship (turbine driven)	4	·47[1]	·15	·12	1·01	Inner screws
			·20	·16	1·01	Outer screws
Battleship (older types)	2	·47	·14	·17	·95	
First-class cruiser	2	·53	·10	·10	·99	..
Second "	2	·48	·06	·10	·95	..
Third "	2	·48	·05	·08	·97	..
Torpedo-boat destroyer	2	·62	·01	·02	·97	..
Mail steamer (turbine)	4	·46	·30	·17	1·08	Inner screws
" "			·22	·20	·98	Outer screws
Cargo vessel	2	..	·20	·14	1·03	..
Sloop	1	·45	·21	·17	1·00	..
Submarine (on surface)	2	..	·16	·10	1·04	..
" (diving)	2	..	·20	·12	1·05	..

The above figures refer to full speed and are affected by alteration of speed.

[1] Higher values have been obtained for the propulsive coefficients of the most recent turbine-driven ships.

Strength.

The forces tending to strain a ship's structure include (1) the static forces arising from the distribution of the weight and buoyancy when afloat, and the weight and supporting forces when in dock or ashore; (2) the dynamic forces arising from the inertia of the ship and its lading under the accelerations experienced in the various motions to which the ship is liable, such as rolling and pitching in a sea way; and (3) local forces and water pressures incidental to (*a*) propulsion and steering, and (*b*) the operation of the various mechanical contrivances which it carries.

The straining actions of the forces, due to the distribution of the weight and buoyancy of the ship at rest and to the inertia of the ship in motion, constitute the only part of the problem of the strength of the structure which can be considered theoretically with any generality; the character of the internal reactions arising in the structure is so complex, that simplifying assumptions have always to be made in order to enable them to be calculated.

The results of theoretical calculations as to the general structural strength of ships are therefore of value for comparative purposes and to some extent for the approximate estimation of stresses actually liable to occur in the structure. The comparison of the theoretical calculations with the results of experience forms an invaluable guide to the proper distribution of material. In making such a comparison the necessity of providing sufficient strength, on the one hand, and of keeping down the weight, on the other hand, has to be borne in mind; the latter point being especially important in a ship, since its economical performance is roughly dependent on the difference between the weight of the structure and the total available displacement.

Longitudinal bending. The greatest straining actions, to which vessels of ordinary forms and proportions are subject, are due to inequalities in the longitudinal distribution of the weight and the buoyancy. Let WWW (fig. 54) represent the weight, and BBB...the buoyancy per foot run of a ship plotted along the length AC; over the lengths A*a*, *bc*, *de*. *f*C the weight is in excess of the buoyancy; while from *a* to *b*, *c* to *d*, *e* to *f*, it is in defect. A curve LLL, whose ordinates are equal to the differences between those of WWW and BBB, is termed a curve of loads, and represents the net load of the ship regarded as a beam subject to longitudinal bending. Shearing forces are produced whose resultant at any transverse section is equal to the total net load on either side of the section; they are represented by the "shearing force" curve FFF ..., whose ordinate at any transverse section is proportional to the area of the "loads" curve LLL...up to that section. Similarly, on plotting the areas of the shearing force curve as ordinates, a "bending moment" curve MMM is obtained which gives the bending moment at any section. Symbolically, if w, F, M represent the load, shearing force, and bending moment, and x the co-ordinate of length,

$$w=\frac{dF}{dx} \text{ and } F=\frac{dM}{dx}.$$

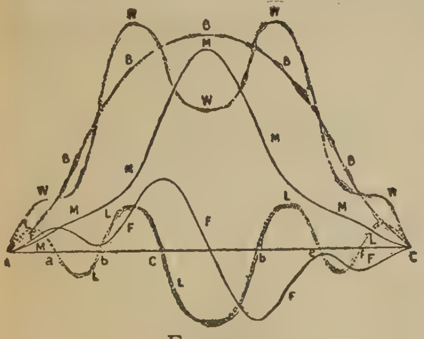

FIG. 54.

The conditions of equilibrium, viz. (*a*) that the total weight and buoyancy are equal, and (*b*) that the centre of gravity and the centre of buoyancy are in the same vertical transverse section, ensure that the end ordinates of the shearing force and bending moment curves are zero.

These curves are usually constructed for three standard conditions of a ship, viz. (i.) in still water; (ii.) on a trochoidal wave of length equal to that of the ship and height $\frac{1}{20}$th of the length, with the crest amidships; and (iii.) on a similar wave with the trough amidships. The curve of weight is obtained by distributing each item of weight over the length of the ship occupied by it and summing for the whole ship. Such a condition of the ship as regards stores, coal, cargo, &c., is selected, which will produce the greatest bending moment in each case. The ordinates of the curve of buoyancy are calculated from the areas of the immersed sections, the ship being balanced longitudinally on the wave in the second and third conditions. The shearing force and bending moment curves are then drawn by successive integration of the curve of loads. Typical curves are shown in figs. 55 to 59 for a first-class cruiser on wave crest, a torpedo-boat destroyer on wave crest (bunkers empty) and in trough (bunkers full), and a cargo vessel on wave crest (hold and bunkers empty) and in trough (hold and bunkers full). From these curves it is seen that the maximum bending moment occurs near amidships; its effect in figs. 55, 56 and 58 is to cause the ends to fall relatively to the middle, such a moment being termed "hogging"; the reverse or a "sagging" moment is illustrated in figs. 57 and 59. Curves of a similar character are obtained in the still-water condition, but the bending moments and shearing forces are then generally reduced in amount.

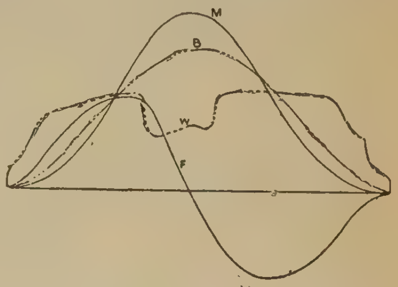

FIG. 55.—Cruiser of 14,000 Tons on Wave Crest.

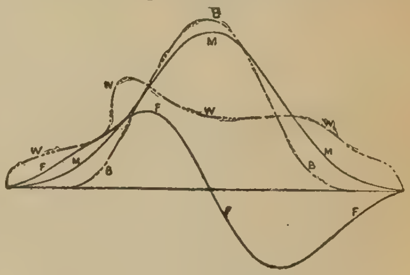

FIG. 56.—Torpedo Boat Destroyer on Wave Crest.

The maximum bending moment is frequently expressed as a ratio of the product of the ship's length and the displacement; average values for various types of ships are tabulated below:—

Class of Ship.	$\frac{W \times L}{\text{Maximum B.M.}}$	Whether Hogging (on Wave Crest) or Sagging (in Wave Hollow).
Mail steamer	From 25 to 30	H
Cargo vessel	From 30 to 35	H
Battleship (modern)	About 30	H
Battleship (older types)	About 40	H
First-class cruiser	About 32	H
Second-class cruiser	About 25	S
Scout	About 22	H
Torpedo-boat destroyer	About 22	H
	From 17 to 25	S
Torpedo boat	About 23	H
	About 23	S

The stresses at a transverse section due to bending are obtained from the usual formula $\frac{M}{I}=\frac{p}{y}$, where M is the bending moment, I the moment of inertia of the section about the neutral axis, y the distance from the neutral axis of the point at which the stress is required, and p the intensity of stress. In calculating I, a deduction from the area of plating in tension is made for rivet holes, and only the continuous longitudinal portions of the structure are assumed effective in resisting bending.

The stresses obtained by this method undergo considerable variation with class and size of ship. As regards the former, it is evident that the actual straining actions upon a ship necessarily vary with the type; and the stresses allowable, as calculated on a uniform basis of applied forces, must vary accordingly. The variation due to size is less obvious, but it is clear that the larger the ship, the less is the probability of encountering waves as long as herself; and, moreover, the proportion of height to length of the largest waves is generally less than that assumed. For these reasons greater calculated stresses are allowable in large ships than in small ships or in those of moderate size. The limiting stress frequently adopted for small ships is 6 tons per sq. in., which may be increased for portions in tension to 8 tons with high tensile steel; on the other hand, the calculated stresses in the largest vessels frequently exceed 8 tons compressive and 10 tons tensile.

The above method is that now universally adopted for comparing the stresses in ships caused by longitudinal bending; although imperfect, it affords a reasonable basis of comparison between the longitudinal strengths of vessels, especially when, as is generally the case, the comparison is made between two ships of similar type. The relation between stress and strain has therefore to be investigated, which involves the experimental determination of the modulus of elasticity of the structure.

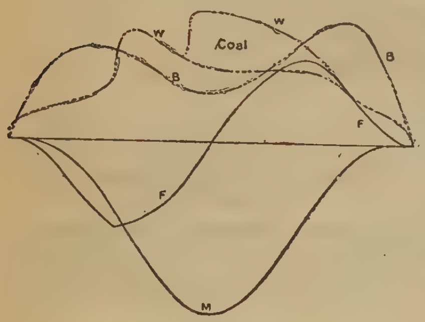

FIG. 57.—Torpedo-Boat Destroyer in Wave Trough.

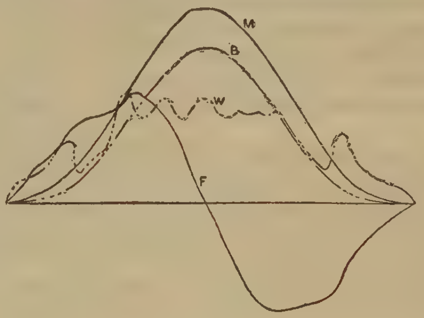

FIG. 58.—Cargo Vessel of 12,000 Tons on Wave Crest.

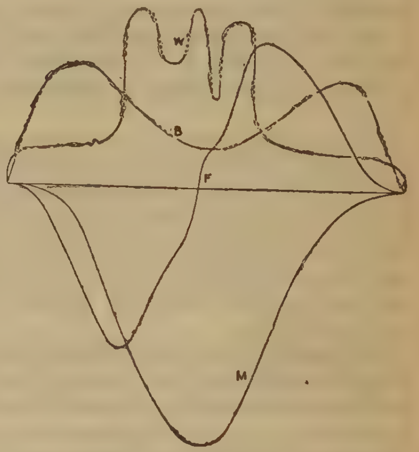

FIG. 59.—Cargo Vessel of 12,000 Tons in Wave Trough.

The assumptions on which the theory of bending is based are:

(*a*) At any transverse section the material lying on the neutral surface, which passes through the C.G. of the effective sectional material, is neither extended nor compressed.

(*b*) The material is homogeneous; and the layers comprised between adjacent surfaces parallel to the neutral surface act independently. (This is probably more nearly the case in a ship than in a beam of solid section.)

(*c*) The material situated at a distance y from the neutral surface is compressed (or extended) longitudinally by an amount $\frac{y}{\rho}$ of its original length; where $1/\rho$ is the curvature of the neutral surface if originally straight, or the alteration of curvature if originally curved.

(*d*) The stress is proportional to the strain and equal to $\frac{Ey}{\rho}$, E being Young's modulus for the material. It follows that the resultant longitudinal force across a section is zero, and the moment of the internal forces about the neutral axis (*i.e.* about the trace of the neutral surface in the section) is $\frac{EI}{\rho}$, which is equal and opposite to the external bending moment M.

(*e*) Taking axes—Ox longitudinal, Oz vertical, since ρ is large, $\frac{1}{\rho}$ may be replaced by $\frac{d^2z}{dx^2}$, and

$$E\frac{d^2z}{dx^2}=\frac{M}{I} \text{ or } Ez=\iint\frac{M}{I}\,dx\,dx,$$

giving the deflection z at any point.

The validity of the theory as applied to a ship was tested and confirmed in 1903 at Portsmouth Dockyard when experiments were made on H.M.S. "Wolf" by Professor J. H. Biles for the Committee on Torpedo-Boat Destroyers (see *Trans. Inst. Nav. Archs.*, 1905). The principal dimensions of the "Wolf" are—length 210 ft., breadth 21·7 ft., draught 5·3 ft., and displacement 360 tons, with a coal capacity of 80 tons. Two sets of experiments were made—(i.) under a hogging moment when supported in dock on two cradles 10 ft. wide, spaced 26 ft. apart centre to centre, and equidistant from the ship's centre of gravity, bunkers empty; (ii.) under a sagging moment when supported by similar blocks 120 ft. apart, bunkers full. The distribution of weight and buoyancy had previously been determined for each case so that the pressures on the blocks and the bending moments caused thereby could be accurately obtained. When thus supported the water-level in the dock was gradually lowered; and for successive water-levels spaced 6 in. apart the extension or compression of the plating was measured at various points of the structure by Stromeyer's strain indicators; the vertical deflections at various points of the length were also recorded. The observations were repeated several times, and the following are the general results:

(*a*) In the sagging condition the neutral axis was actually situated 7·55 ft. above the keel; the calculated distance was 7·8 ft. deducting rivet holes in parts in tension and 7·7 ft. without such deduction. In the hogging condition the observed height was 7·2 ft., those calculated as before being 7·5 ft. and 7·6 ft. All shell and deck plating, gunwale and keelson angles, and the side girders and angles were included in the calculation for the moment of inertia. The calculated and observed positions of the neutral axis are thus in fairly close agreement.

(*b*) The actual vertical distribution of strain over a transverse section was approximately in accordance with the linear law assumed in the theory of bending.

(*c*) The modulus of elasticity E was obtained by equating the sum of the moments about the neutral axis of the stresses deduced from the observed strains to the bending moment.

(*d*) The value of E was also deduced from the deflections by means of the formula

$$Ez=\iint\frac{M}{I}\,dx\,dx;$$

and its value under a sagging moment is in agreement with that found by (*c*). Under a hogging moment the mean value obtained from the deflection is less than that from the strain, showing that the curvature obtained from the deflections is greater than that to which the structure is actually bent.

The table at the top of the following page shows the values obtained for E, the modulus of elasticity.

By observing the deflections of two vessels when loaded with ballast, the following values for E were obtained by T. C. Read and G. Stanbury (*Trans. Inst. Nav. Arch.*, 1894), and are given for purposes of comparison:

Principal Dimensions of Vessel.	Load in Tons.	Deflection in Inches.	Value of E deduced.
347′×45′–6″×27′–2″	5000	2·31	11,000
300′×41′–6″×21′–2″	1800	·62	9,000

After the experiments the "Wolf" was sent to sea in rough weather with the object of comparing the stresses then observed with those calculated under the standard conditions on trough or crest. The strains at various portions of the structure were again measured with Stromeyer's indicators, and the stresses deduced from

Draught of Water.	Sagging.				Hogging.			
	Maximum Compressive Stress.	Maximum Tensile Stress.	E by Strain Indicator.	E by Deflection over the whole length.	Maximum Compressive Stress.	Maximum Tensile Stress.	E by Strain Indicator.	E by Deflection over the whole length.
Feet.								
6	1·7	2·3	12,100	11,800	1·0	·9	..	..
5	2·9	3·7	12,100	12,000	2·7	2·6	16,000	11,800
4	4·1	5·4	11,400	11,400	4·2	4·0	15,100	10,800
3	5·2	6·6	11,400	11,500	5·3	5·0	13,000	10,400
2	6·0	7·7	10,800	11,100	6·1	5·8	12,700	9,600
1	6·5	8·4	10,700	10,600	6·6	6·4	12,700	9,900
Dry	6·7	8·6	10,200	10,300	6·8	6·6	11,800	9,800

Note.—The maximum stresses above are approximate, and are recorded in order that the variation of E with the stress in the material may be seen. Tons per square-inch units are employed.

the values for E found from the dock experiments. The maximum stresses were as follows:—

Condition.	Stress—Tons per Square Inch.	
	Keel.	Deck.
Maximum observed stresses when hogging	2·9 C.	2·0 T.
Maximum observed stresses when sagging	5·4 T.	2·5 C.
Calculated stress (sagging) when in a wave hollow of height $\frac{1}{20}$th length	7·1 T.	5·3 C.

C. = Compressive. T. = Tensile.

It appears from these experiments that (at least in ships of similar character to H.M.S. "Wolf") the stresses corresponding to any particular external conditions closely agree with those calculated from the usual theory of bending; on the other hand the waves encountered during the sea trials were such that the maximum stress then obtained was considerably less than that in the condition assumed for the standard calculations. Finally, the material of the ship was subjected in dock to a tensile stress of nearly 9 tons and a compressive stress of nearly 7 tons per sq. in. without distress.

While dealing with longitudinal bending, some of the refinements suggested for calculating stresses among waves may be cited, although the additional labour involved in their application has prevented their introduction in general practice.

Since the distribution of pressure in the water of a wave system differs from that in still water, the buoyancy of a vessel or the resultant vertical thrust of the water is then not equal to the weight of the water displaced; and the position of the ship when in equilibrium and the stresses upon it are changed in consequence. By assuming the pressure at any point of the water to be in accordance with the trochoidal theory of wave motion, and undisturbed by the intrusion of the ship, the equilibrium position can be obtained and the modified stresses evaluated. This process was first applied to ships by Mr W. E. Smith (*Trans. I.N.A.*, 1883), who obtained the arithmetical sum of the sagging and hogging moments on vessels placed in the trough and on the crest of a wave, thereby eliminating the effect of the distribution of weight; and compared it with the sum of the moments as ordinarily obtained. The correction for the ships considered involved a reduction of the bending moment to about $\frac{5}{8}$ of the value calculated in the ordinary manner, and in a torpedo-boat destroyer a reduction of about 10% has been obtained. This reduction increases as the draught and fullness of the ships are increased, and the bending moment on a square-bilged ship deeply immersed is almost uninfluenced by wave motion, since the reduction in orbital motion at considerable depths below the surface ensures the bottom of a fairly deep ship being in comparatively undisturbed water.

In the foregoing the vessel is assumed to occupy at every instant a horizontal position on the wave with the correct displacement; a ship proceeding perpendicularly to the crests of a wave system will, however, undergo heaving and pitching oscillations which lead to a further modification in the bending moment obtained (see paper by T. C. Read, *Trans. I.N.A.*, 1890). Considering first the effect of pitching only, imagine the ship at her proper displacement (allowance being made for the altered buoyancy of the wave system as before), but momentarily out of her correct trim; the longitudinal restoring couple, due to the wedges of immersion and emersion, is balanced by the moment of the reversed mass-accelerations of the component parts. If the ship is longitudinally symmetrical about her midship section, one half of the moment of the restoring forces and one half of the moment of the reversed mass-accelerations about amidships are due to the forward end, and one half to the after end. These moments are therefore equal and opposite for each half of the ship and have no influence on the midship bending moment. It appears, therefore, that in the majority of ships whose departure from longitudinal symmetry is slight, pitching has little effect on the amount of the maximum longitudinal bending moment; nevertheless it considerably increases the bending moments near the ends.

The effect of heaving is investigated by obtaining the positions of equilibrium of the C.G. of the ship when on wave crest and in wave trough; intermediate positions of equilibrium are assumed to be given by $y = a \sin \frac{\pi t}{T_1}$ where T_1 is the apparent semi-period of the wave. On taking into account the mass of the ship, assumed originally stationary, the height of the C.G. above its mean position becomes

$$a \times \frac{T_1^2}{T_1^2 - T^2} \left\{ \sin\frac{\pi t}{T_1} - \frac{T}{T_1} \sin\frac{\pi t}{T} \right\},$$

$$\text{where } T = \pi\sqrt{\frac{W}{gp}} = \text{period of dip in still water;}$$

W is the displacement, and p the tons per foot immersion; the resistance to vertical motion being neglected. When T and T_1 are nearly equal, allowance has to be made for the resistance by using a process of graphic integration. On applying the correction to two vessels, and comparing the bending moments in their positions of the wave, given by the formula, with those in the equilibrium position, the effect on the maximum hogging moment was found small; but the sagging moment of a moderately fine vessel was increased by over 20%, and that of a full vessel by about 10%.

Allowance has also been made for the effect of the superposed heaving, pitching and rolling oscillations undergone by a ship moving obliquely across the crests of a wave system (see papers by Captain Kriloff, *Trans. I.N.A.*, 1896 and 1898).

The maximum calculated stress on vessels inclined to considerable angles of heel has been found in some instances to be slightly greater than that for the upright condition; and the stress on the material towards the ends is then usually more nearly equal to that amidships.

In addition to the direct stresses on keel, bottom, and upper works resulting from longitudinal bending, shearing stresses are experienced which in some cases are of appreciable magnitude. The intensity of shear stress in the side plating is equal to $\frac{FA\bar{z}}{2tI}$; where F is the shearing force over the transverse section, $A\bar{z}$ the moment about the neutral axis of the sectional area above or below a horizontal line through the point considered, and t the thickness of side plating. This stress is usually greatest at or near a quarter of the length from either end and at the height of the neutral axis, since here F and $A\bar{z}$ respectively attain their maximum values. In some cases the thickness of plating and arrangement of riveting have to be specially considered in relation to these shearing stresses.

Transverse bending.

The stresses due to transverse bending are not, in general, capable of definite determination; as, however, they are frequently severe when the ship is in dry dock, and may also attain considerable magnitude during heavy rolling, a means of comparing the transverse strength of vessels is of some interest. A transverse bulkhead forms a region of almost infinite transverse stiffness, and it is therefore difficult in ships internally subdivided by numerous bulkheads, to determine how far the stresses at intermediate sections are influenced by the neighbouring bulkheads. In many vessels carrying cargo, however, in which transverse bulkheads are widely spaced, a section midway along a hold may be so far removed from all bulkheads as to be uninfluenced by their local support; and the following method has been proposed for comparing the transverse strengths of such ships:

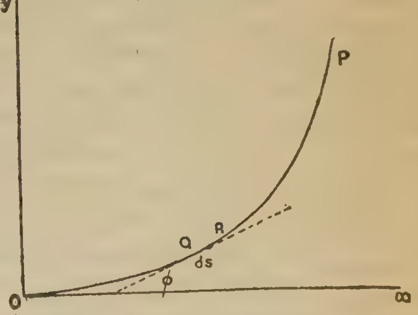

FIG. 60.

A frame and a strip of plating one frame space in width are regarded as a stiff inextensible bar subjected to the known external forces and to the unknown tension, shearing force, and bending moment, at any fixed point.

Let OP (fig. 60) be a portion of the framing under consideration, O being the keel, and *Ox*, *Oy*, horizontal and vertical axes.

On consideration of the forces on the arc OQ, which are in equilibrium, the tension T, shearing force F, and bending moment M, at Q can be algebraically expressed in terms of its coordinates (x, y,), the water or other external pressures on OQ, and the values of T, F and M at O (T_0, F_0, M_0,).

Neglecting the effects of T and F on the element QR, it follows from the equations of bending that

$$M = EI\left(\frac{d\phi'}{ds} - \frac{d\phi}{ds}\right)$$

where ϕ and ϕ' are the respective inclinations of the element QR to Ox before and after the strain caused by bending, and ds is the length of QR. Due to the effect of M on QR, the bar at the point P (x_1, y_1) is rotated through an angle $d\phi' - d\phi$ and moved through distances—

$$(y_1 - y)\ (d\phi' - d\phi) \text{ and } (x_1 - x)\ (d\phi' - d\phi)$$

in directions parallel to Ox and Oy respectively. On integrating along OP the total movement of P due to the bending of all such elements as QR in OP is obtained; when P is moved round the complete section so as to return to O, where the total movement is zero, it follows, on subtraction and reduction, that

$$\int\frac{M}{I}\,ds = 0; \int\frac{Mx}{I}\,ds = 0; \int\frac{My}{I}\,ds = 0;$$

the integrations being taken completely round the section. It is assumed in the foregoing that rigid connexions are made at discontinuities, such as deck edges, in order to prevent any alteration in the angle due to strain.

The values of $\frac{M}{I}$, $\frac{Mx}{I}$, $\frac{My}{I}$ can be calculated at varying points and expressed in terms of T_0, F_0, M_0; by using a method of approximate quadrature, T_0, F_0, M_0 are found by solving the 3 equations obtained, and M is deduced giving the corresponding stress at any point. In applying this method to the determination of the stresses caused by rolling, the centrifugal forces on each element are included in the external forces when estimating M.

This method of estimating the transverse strength of ships is due to Dr Bruhn, who in *Trans. I.N.A.*, 1901, 1904 and 1905, gives illustrations of its application.

Local stresses.

In addition to the stresses due to longitudinal and transverse bending, which are distributed over the whole or a considerable part of the structure, local stresses are experienced including those caused by water-pressure; forces on sails, masts and rigging; reactions of moving parts of machinery; heavy blows from the sea on side, deck and upper works; anchor, cable and mooring gear, and blast from gun-fire. General methods are usually inapplicable to such cases; the support provided is determined by experience and by the particular requirements. The stresses in bottom plating due to water-pressure are of small amount where the curvature is appreciable, since the plating, by compression, directly resists any tendency towards change of curvature; in a deep flat-bottomed ship, on the other hand, resistance to water-pressure is chiefly due to the bending of the plating, the slight extension having little influence. The plating is supported at the transverse and longitudinal frames, and, to some extent, at the edges. The close spacing of transverse frames usually adopted in merchant ships reduces the stress to a small amount; but in large warships, whose frame spacing varies from 3 to 4 ft., it is probable that the flat plating near the keel amidships is subjected to considerable stress, although, as experience shows, not beyond the limits of safety. In fine ships special provision is frequently made to prevent the side plating near the bow from panting due to the great and rapid fluctuation of water-pressure when pitching.

Uniformity of stress.

The material of the structure is arranged so that the distribution of stress over any localized section of material is maintained as uniform as possible in order that the ratio of maximum to mean stress may not be unduly large. For this reason abrupt discontinuities and sudden changes of section are avoided, and "compensation" is introduced where large openings are cut in plating. The corners of hatchways in ships whose upper decks are subjected to considerable tension are frequently rounded, since failure of the material near the square corners of such hatchways has been known to take place, pointing to the existence of abnormal stress intensities, which are also evident from theoretical considerations. Similarly, local stiffening required for the support of a heavy weight or for resisting the blast of gun-fire is reduced in sectional area at the ends, or continued for a length greater than absolutely necessary, to ensure an even distribution of stress.

Vibration.

Among the stresses to which a ship is subjected are those caused by its mode of propulsion. The stresses due to the reactions of the moving parts of the machinery are, in general, of small amount, but owing to their periodic character vibrations are induced in the structure which are frequently of sufficient magnitude to cause considerable inconvenience and even damage.

It is known that when a periodic force of frequency n is applied to a structure capable of vibrating naturally with frequency p, the amplitude of the forced vibrations assumed by the structure is inversely proportional to $\frac{}{\sqrt{(p^2 - n^2)^2 + K^2}}$, where K is a coefficient depending on the resistance to vibration. If the period of the force synchronizes or nearly synchronizes with the natural period of the structure, the amplitude is considerable, but otherwise it is of relatively small amount. If, therefore, the natural period of vibration has been found for a ship, the causes of vibration at various speeds can be readily traced, since marked vibration is usually attributable to a synchronizing source.

Vibration in a steamship is due to various causes, the principal of which are:—

1. The reciprocating parts of the engines, if unbalanced, cause vibrating forces and couples in a vertical plane and of two frequencies, one equal to, and the other twice, the speed of revolution, the latter being due to the secondary action introduced by the connecting rod. In twin-screw ships torsional oscillations in transverse planes may also result when the engines are working in opposite phase.
2. The rotating parts of the engines cause vertical and horizontal oscillations of frequency equal to the speed of revolution.
3. The variation in the crank effort tends to cause torsional oscillation of the same frequency, particularly in single or two-cylinder engines.
4. Vibrations, principally at the stern, may result from an unbalanced screw; these are similar to those caused by the rotating parts of the machinery.
5. A screw propeller which experiences uneven resistance during its revolution is the cause of vibrations, whose frequency is the product of the revolution and the number of blades. Such resistances occur when (1) the blades pass too close to the hull; (2) when the screw breaks the surface of the water; and (3) when the supply of water to the propeller is imperfect, due either to "cavitation" or to the screening effect of shaft and propeller supports.

The natural vibration of a ship's structure (irrespective of local vibrations) is analogous to that of an unsupported rod of suitable dimensions, the principal difference being that the vibrations in the rod are undamped and those in the ship are damped rapidly through the communication of the motion at the hull surface to the surrounding water. A thin uniform rod vibrating laterally has a minimum frequency (per minute) equal to $1210\sqrt{\frac{EI}{WL^3}}$; in this mode of vibration there are two nodes situated at a distance ·224 L from either end. Vibrations of a higher order having three, four or more nodes are also possible, the frequencies increasing approximately in the ratio 1 : 2·8 : 5·4, &c. The complex variation of the weight, inertia and modulus in a ship prevent a corresponding result being obtained by direct mathematical investigation; recourse is therefore made either to direct experiments on ships, or to a "dynamic model." The instrument used for measuring and recording vibrations consists of a weight suspended, and held laterally in position, by springs, so as to have a long period of oscillation; pens or pencils attached to the weight record the vibrations upon revolving cylinders fixed to the vessel and fitted with time records. The formula (of the same form as that for a rod)

$$N = c\sqrt{\frac{EI}{WL^3}},$$

where N is the frequency per minute, was used by Dr Schlick for the vibration of ships; the value of c found by him for vertical vibrations varied from 1600 in very fine vessels to 1300 in those having moderately full lines. The nodes were found to be at about a third of the length from the stem and about a quarter of the length from the after perpendicular. The frequency with three nodes was slightly more than twice that of the primary vibrations. Horizontal and torsional vibrations were also observed; their minimum frequency is, however, generally considerably more than that of the vertical vibrations, and they are therefore generally of much smaller amplitude. (See papers in *Trans. Inst. Nav. Archs.* from 1884 to 1901, by Dr O. Schlick, and in 1895 by Mr A. Mallock.) The "dynamic model," suggested by Mr Mallock, forms a convenient means of approximately investigating the positions of the nodes and the frequencies of vibration of a ship. The formula given above suggests that by making a model of material whose modulus E and density ρ are known, and on a linear scale of $\frac{1}{n}$, then if N_s, N_m refer to ship and model,

$$\frac{N_s}{N_m} = \frac{1}{n}\sqrt{\frac{E_s}{E_m} \cdot \frac{\rho_m}{\rho_s}}.$$

This relation is unaffected if the lateral distribution of material is changed in the model, provided that I_m and the weight of the model per foot run are unaltered at each point in the length; the model is therefore made solid and of rectangular or other convenient section, so that

$$I_m = \frac{1}{n^4} \cdot I_s \text{ and } W_m = \frac{1}{n^3} \cdot \frac{\rho_m}{\rho_s} \cdot W_s;$$

the weight being also similarly distributed in a longitudinal direction to that in the ship. The model is supported at points, whose positions are obtained by trial, giving the highest frequency for the mode of vibration considered; these points are the nodes corresponding to the free vibrations when the model is unsupported, and the influence of the supports is thus eliminated. On comparison with the results obtained in a ship, the reliability of such model experiments has

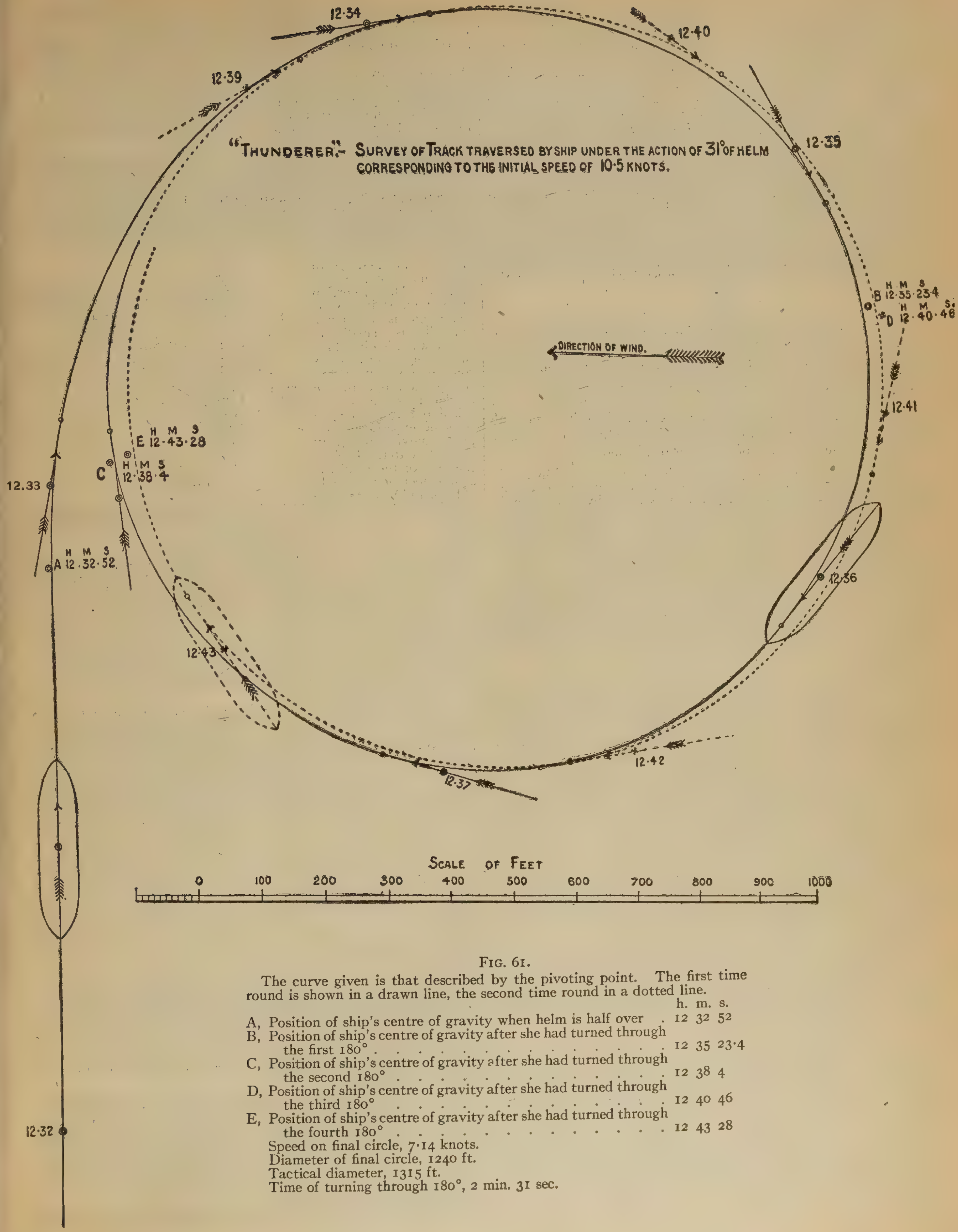
"THUNDERER." – SURVEY OF TRACK TRAVERSED BY SHIP UNDER THE ACTION OF 31° OF HELM CORRESPONDING TO THE INITIAL SPEED OF 10·5 KNOTS.
12·34
12·40
12·39
12·35
H M S
B 12·55·23·4
H M S
D 12·40·46
DIRECTION OF WIND.
12·41
H M S
E 12·43·28
C
H M S
12·38·4
12.33
H M S
A 12·32·52
12·36
12·43
12·42
12·37
SCALE OF FEET
0
100
200
300
400
500
600
700
800
900
1000
12·32

FIG. 61.

The curve given is that described by the pivoting point. The first time round is shown in a drawn line, the second time round in a dotted line.

	h.	m.	s.
A, Position of ship's centre of gravity when helm is half over .	12	32	52
B, Position of ship's centre of gravity after she had turned through the first 180°	12	35	23·4
C, Position of ship's centre of gravity after she had turned through the second 180°	12	38	4
D, Position of ship's centre of gravity after she had turned through the third 180°	12	40	46
E, Position of ship's centre of gravity after she had turned through the fourth 180°	12	43	28

Speed on final circle, 7·14 knots.
Diameter of final circle, 1240 ft.
Tactical diameter, 1315 ft.
Time of turning through 180°, 2 min. 31 sec.

been verified in a few cases, the value adopted for E, being that for a riveted structure or about 10,000 tons per square inch. In some model experiments made in air and in water, the frequency in the latter case was found to be reduced, and owing to the rapid damping of the free vibrations and to a virtual increase in the mass-inertia caused by the concomitant motion of the surrounding water, which occurs in the ship and not in the model when vibrated in air, there must be a difference in the results. A second difference is due to the ratio of depth to length in a ship being sufficient to make the term for rotational inertia appreciable, which factor is neglected in the formulae for a thin bar and the dynamic model. The extent to which such results require modification cannot be determined until further experiments have been made.

Finally it appears that vibration in a ship can generally be avoided only by removing its cause; the addition of further stiffening to the structure with the object of reducing vibration has not infrequently had the opposite effect, the natural frequency being brought more nearly into synchronism with that of the disturbing force.

The adoption of the steam turbine obviates many of the causes producing vibration referred to above, leaving only those due to the forces resulting from inequalities in the working or position of the propellers.

Steering.

The information available on the steering and manœuvring qualities of ships is largely due to the results of the methodic trials made with H.M. ships. These include observations of the paths when turning under different angles of helm, at various speeds, with and without assistance from the propellers, and with variation in certain features of the hull which influence the steering, such as the addition of bilge keels, change of draught or trim, and the omission of the after deadwood.

One of the first attempts at plotting the curve traversed by a ship under the action of her rudder, and the position of the ship at any instant with reference to that curve, was made by the writer in 1877 with H.M.S. "Thunderer" (see Appendix XIII. to Report of "Inflexible's" Committee).[1] The position of the ship was fixed at numerous intervals with reference to the line of advance by observing simultaneously (*a*) the direction of her head and (*b*) the angles of the base of a triangle, whose apex was a floating object within the approximate circle in which she turned, and whose base was the line between two observers at fixed points on the deck, one forward and the other aft; these angles in conjunction with the base fixing the distance of the middle line plane of the ship from the floating object. The data were observed for different speeds and with different angles of rudder, and with and without the turning effect of the screws.

Fig. 61 gives the plotted positions of the ship continued for two complete turns with 31° of helm when going ahead initially at 10·5 knots. The straight line which becomes curved at the point A is the initial course of the ship. The short lines give the positions of the ship when turning at intervals of a minute; and the curve drawn touches the positions successively occupied by the middle line of the ship. It will be seen that the bow of the ship is nearer the centre of the circle, or curve in which she turns, than the stern. The vessel may be regarded as going ahead and turning or pivoting about a point well forward in her middle line; this is termed the "pivoting point," the middle line being, at this point, a tangent to the curve concentric with and similar to that described by her centre of gravity. In the "Thunderer" the pivoting point was situated about 50 ft. abaft the stem.

Similar information for a more modern ship is given in fig. 62 for the Japanese battleship "Yashima" when turning under 32° of helm with an initial speed of 17·5 knots.[2] AAA is the locus of the pivoting point O, and BBB that of the ship's centre of gravity. The bow of the ship is directed inwards with reference to the latter curve; the angle between the middle line plane and the tangent to the curve BBB is termed the "drift angle."

The distance between the pivoting point and the ship's centre of gravity is equal to $\rho \sin \phi$, where ρ is radius of curvature of BBB and ϕ is the drift angle. The value of ϕ is about 23° in the "Yashima," and about 10° in the "Thunderer"; and the pivoting point O of the former ship is situated very near the fore end of the vessel. CCC is the path of the outer edge of the stern and represents the clear space required when turning.

In both ships the path is spiral in form until about 16 points (180°) have been turned through, and it then becomes approximately a circle. The maximum distance that the ship's centre of gravity travels in her original direction after the helm is put over is termed the "advance," and the "tactical diameter" is the perpendicular distance between the original line of advance and the ship's position after turning through 16 points.

Nature of forces when turning.

For an approximate investigation of the forces in operation during the turning of a ship, the motion may be divided into three stages: (*a*) when the rudder is first put over and the pressures on the hull are those necessary to produce angular acceleration; (*b*) when the accelerative forces are combined with those caused by the resistance of the ship to rotation; and (*c*) when finally turning uniformly in a circular path. The characters of the forces acting during the states (*a*) and (*c*) can be ascertained, and the type of motion under the complex conditions represented by (*b*) will consist of a gradual replacement of the motion at (*a*) by that at (*c*).

Initially, on putting the helm over, the change in the stream line motion at the stern produces a pressure upon the rudder normal to its plane. If the rudder is unbalanced, there is generally an additional pressure upon the after deadwood caused by the widening of the stream lines approaching the rudder. The resultant of these pressures on rudder and deadwood is a force P at the stern which may be resolved longitudinally and transversely into R and Q, where R tends to reduce the speed of the ship and Q to move the stern outwards (fig. 63). The proportion of the force P due to the deadwood is unknown, but it is small in recent warships in which the after deadwood is considerably cut away; the portion due to the rudder pressure can be calculated from the results of experiments on plates moving obliquely through water. If A is the area of the rudder in square feet, θ the angle of helm and V the relative velocity in knots with which the water impinges on the rudder (assumed equal to the speed of the ship increased by the slip of the screw), then P (in tons) $= k. \mathrm{AV}^2 \sin\theta$, approximately

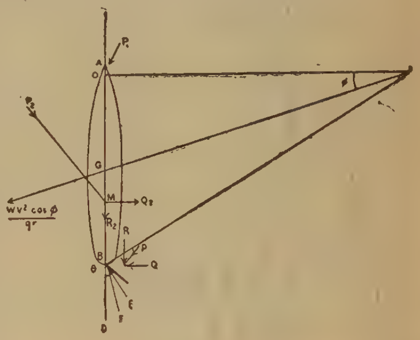

FIG. 63.

where the mean value of k for small inclinations is $\frac{1}{270}$ for a square rudder and about $\frac{1}{370}$ for a rectangular rudder of breadth twice its depth (k also varies with the angle of incidence; when the latter is greater than about 35°, the above formula becomes inapplicable). The convergence of the stream lines at the stern due to the angle of run, and the oblique and variable motion of the water caused by the screw propellers, modify the value of k, as applied to the determination of the rudder pressure; but it is evident that with ships of fairly similar types the force causing initial turning varies with the shape of the rudder and approximately as its area, the angle of helm and the square of the speed.

The initial angular motion of the ship is due to the action of the component Q of the pressure on the rudder and deadwood, which is equivalent to a force Q at the centre of gravity tending to produce a lateral translation of the ship as a whole and a couple Q.BG tending to rotate the ship about the centre of gravity. Both the lateral and angular movements of the ship are accompanied by the motion of a mass of water, which may be regarded as virtually increasing the mass and moment of inertia of the ship. Denoting these quantities, thus increased, by W and I respectively, the initial lateral acceleration of the ship is equal to $\frac{\mathrm{Q}}{\mathrm{W}}$, and its lateral speed at the end of a short interval of time Δt, during which Q and W may be supposed to have remained constant, is $\frac{\mathrm{Q}}{\mathrm{W}} . \Delta t$. At the same instant and under similar hypotheses the angular velocity about the centre of gravity is $\frac{\mathrm{Q} . \mathrm{BG}}{\mathrm{I}} . \Delta t$. Hence a point O forward in the middle line of the ship taken so that $\mathrm{GO} . \frac{\mathrm{Q.BG}}{\mathrm{I}} . \Delta t = \frac{\mathrm{Q}}{\mathrm{W}} . \Delta t$ or $\mathrm{GO} = \frac{\mathrm{I}}{\mathrm{W} . \mathrm{BG}}$ is, at the instant considered, at rest except for the motion of the ship ahead, which is due to the original speed of the ship before putting the rudder over, somewhat reduced by the action of the component R of the rudder pressure during the time Δt. The instantaneous centre of the motion of the ship must therefore be somewhere in the perpendicular at O to the middle line of the ship, the point O thus corresponding to the "pivoting point" as previously defined for the steady motion of the ship in a circle.

The actual position of O cannot be calculated, as it depends on the values of I and W, which are different from, and not expressible in terms of, the moment of inertia I′ and mass W′ of the ship itself; but from the method by which it is determined it is clearly forward of the centre of gravity; and so far the investigation is confirmed by observation, which shows that the first effect of putting the rudder over is to cause the stern of the ship to swing towards the side to which the helm is moved to a much greater extent than the bow moves towards the opposite side.

If the time Δt be supposed to become infinitesimal, and the effect

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[1] Similar experiments had been made by M. Risbec on the "Elorn" (*Revue maritime et coloniale*, 1876).

[2] See "The Steering Qualities of the 'Yashima,'" *Trans. Inst. Nav. Archs.*, 1898.

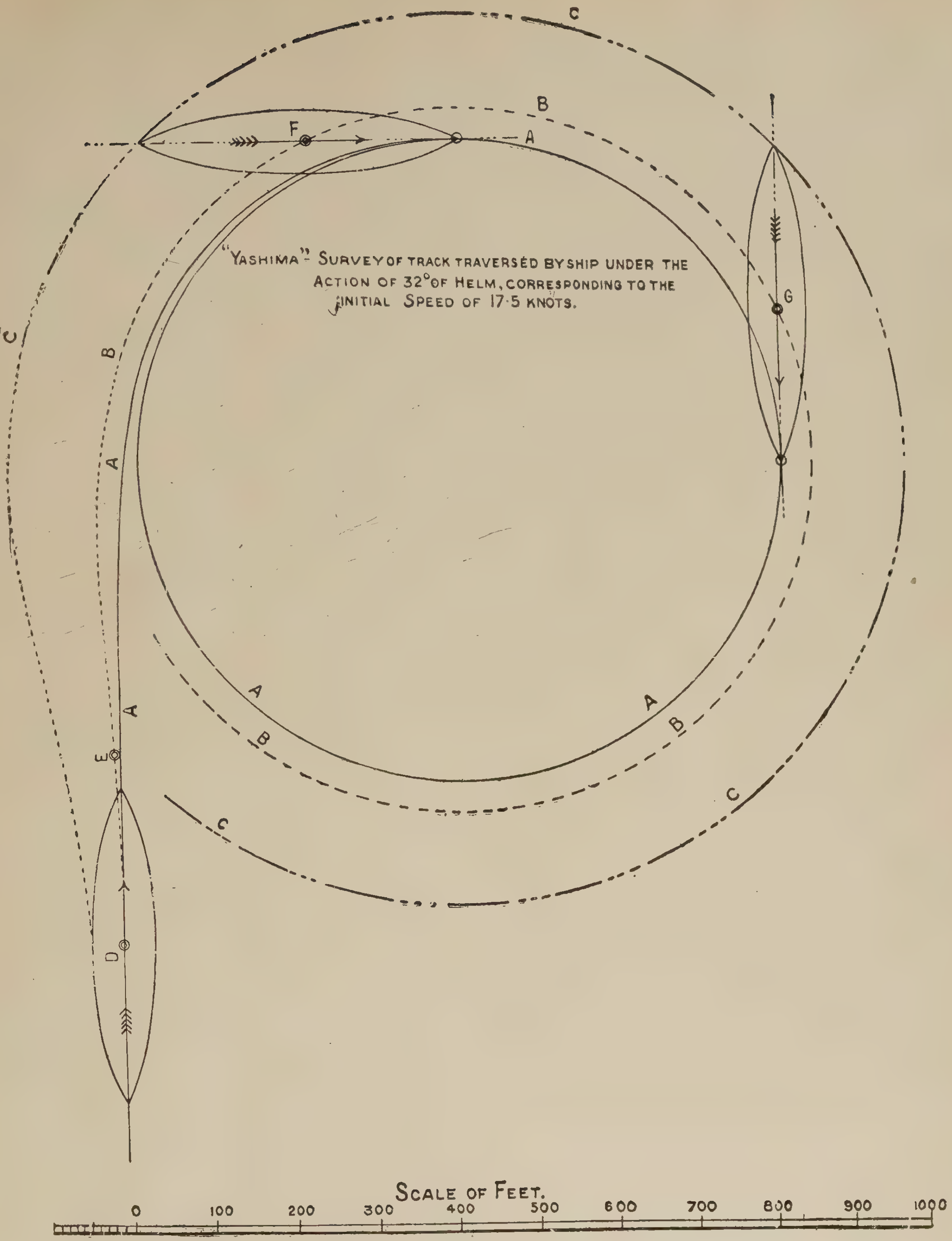

"YASHIMA" - SURVEY OF TRACK TRAVERSED BY SHIP UNDER THE ACTION OF 32° OF HELM, CORRESPONDING TO THE INITIAL SPEED OF 17·5 KNOTS.
A
B
C
D
E
F
G
SCALE OF FEET.
0
100
200
300
400
500
600
700
800
900
1000

FIG. 62.

A, A, A, Curve described by pivoting point.
B, B, B, Curve described by centre of gravity.
C, C, C, Curve described by outer edge of stern.
D, Position of ship's centre of gravity when helm commenced to move over.
E, Position of ship's centre of gravity when helm had reached 32°.
F, Position of ship's centre of gravity when vessel had turned through 90°. Time from D, 49½ sec.
G, Position of ship's centre of gravity when vessel had turned through 180°. Time from D, 1 min. 20 sec.

of putting over the rudder be regarded as an impulse (measured by the finite product P. dt), delivered at the stern of the ship normal to the rudder, the resistance of the water to the rotation of the ship may be neglected, and the instantaneous centre of the turning motion (as distinguished from the motion ahead) is the point O on a straight line GB perpendicular to the direction of the impulse, and such that $GO.GB=\frac{I'}{W'}$, an expression for the position of O of the same form as obtained before.

In this case $\frac{I'}{W'}=k^2$, where k is the radius of gyration of the ship about a vertical axis through the centre of gravity, and the point O is obtained by the geometrical construction shown in fig. 64, given by Professor W. M. Rankine, where GL = k and is perpendicular to GB, and the angle BLO is a right angle.

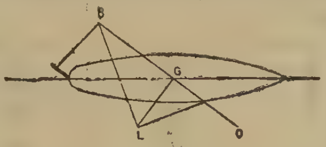


FIG. 64.

The value of I is dependent on (1) the distribution of weight in the ship, being large when heavy weights are situated near bow and stern, (2) the length of the ship, and (3) the underwater form near the ends, being relatively large in fine ended vessels with large areas of deadwood. W is also dependent on the shape of the ship under-water.

The handiness of a ship or her readiness to respond to slight alterations in helm is mainly dependent on the relation between Q×BG the moment of rudder pressure for a given angle, and I the virtual moment of inertia. If I is comparatively large, the vessel will turn slowly under helm until, gathering way, the rapidity of its angular motion becomes so large that reverse helm may be required to limit the change of course to that desired. Unhandiness is usually experienced at low speeds (Q being then small) and also in shallow water when I is increased by the restriction in the flow of water from one side of the ship to the other. Improvement in the handiness in these circumstances has been obtained in certain ships with unbalanced rudders by filling in the after deadwood, the loss from the increased inertia being more than compensated by the greater turning moment due to the pressure on the after dead-wood.

When the ship is turning steadily in a circle, if C (fig. 63) is the centre of rotation, and CO perpendicular to the middle line of ship, the motion is equivalent to a progression ahead with speed V (which is considerably less than the initial speed), combined with a rotation about the "pivoting point" O, which is generally situated slightly abaft the bow; the drift angle ϕ is given by the relation

$$OG=OC\tan\phi.$$

The time of turning through 180° is $\frac{\pi r}{V}$ where r is the radius OC.

The forces acting upon the ship are now—the pressure P on rudder and deadwood (if any), the centrifugal force $\frac{WV^2\cos\phi}{gr}$, the thrust of the propellers, and the pressures on the hull. The last named consist of forces P_1 outwards before O, and P_2 inwards abaft O; of these P_1 is usually negligible in amount; P_2 cannot be directly estimated, but since work is done against it by the transverse motion of the after part of the ship, a reduction of speed results whose amount is largely dependent on the obliquity of motion at the centre of gravity, that is on the drift angle ϕ. Under full helm the ratio of the steady speed when turning to the initial speed is often about 60 or 70%; but in some quickly turning ships it is less than 50%. Of the remaining forces, the transverse component $\frac{WV^2\cos^2\phi}{gr}$ of the centrifugal force is known since the final diameter of turning $2r$ is approximately the same as the tactical diameter. To obtain P, it is to be observed that the water impinges on the rudder in a direction BF intermediate between BE (perpendicular to BC) due to the ship's motion and BD due to the form at the stern; if BF is assumed to bisect the angle DBE, the effective rudder angle is approximately $\theta-\phi$. The pressure on the rudder is therefore less than when helm is first put over and is further reduced on account of the diminution in the speed of the ship.

From experiments made with the object of measuring P when turning steadily, it is found that the pressure recorded was about one-fourth of the value calculated on the assumption of the ship retaining her original speed and effective rudder angle; when helm had just been put hard over, from one-half to one-third of the theoretical pressure was obtained. (See *Bulletin de l'Association Technique Maritime*, 1897; *American Institution of Naval Archs. and Mar. Eng.*, 1893.) The transverse forces calculated on this basis for a battleship of 15,000 tons displacement when turning steadily under full helm are approximately—centrifugal force 200 tons, pressure on rudder 40 tons, and Q_2, the transverse component of P_2, 240 tons passing through a point on the middle line about 40 ft. abaft the centre of gravity.

The following equations applicable to the state of steady rotation can be obtained from the above considerations, neglecting P_1 and the small couple due to R:

$$Q_2=Q+\frac{WV^2\cos^2\phi}{gr} \quad . \quad . \quad . \quad . \quad . \quad . \quad (i.)$$

$$Q_2\times GM=GB\times Q \quad . \quad . \quad . \quad . \quad . \quad . \quad (ii.)$$

From (i.) it is seen that a small tactical diameter will be obtained when Q_2 is large compared with Q; from (ii.) it follows that the point M (fig. 63) should then be near G. These conditions are realised in a ship whose resistance to leeway is considerable but concentrated about the middle of the length, such, for example, as a yacht having a deep web keel, or a boat with centre board and drop keel. In these instances the vessel may be regarded as virtually anchored by its keel, and the pivoting point brought to a position in close proximity to the centre of gravity. Similarly tactical diameters of vessels of ordinary type are reduced by diminishing the resistance to lateral motion at the after end and by increasing it amidships or forward.

Heel when turning.

During the turning trials made with H.M.S. "Thunderer," observations were made of the heel caused by the transverse forces brought into play when turning. On first putting the helm over a small inward heel caused by the pressure of the rudder was observed; as the rotational speed of the ship increased this inclination was succeeded by a steady outward heel, amounting to about 1° at 7 knots speed. The latter is caused by the couple formed by the centrifugal force and the lateral resistance diminished by the (usually) small couple due to the rudder pressure. During some more recent trials carried out on the "Yashima" the angle of heel was $8\frac{3}{4}$° at full speed. Similar large inclinations are generally found with modern warships having small turning circles and high speeds and whose centres of gravity are also situated high up; at moderate speeds, however, the heel is of small amount. On putting the helm quickly amidships when turning, the opposing couple due to the rudder pressure is removed or reversed and the angle of heel momentarily increased; instances have occurred of ships with small stability and comparatively large "rudder couples" capsizing through this cause.

Types of rudders.

The rudders used in ships are of two types:—(1) Unbalanced, shown in figs. 65, 67, 68; and (2) balanced, shown in figs. 66, 67 (at bow) and 69 to 74. An unbalanced rudder is in stable equilibrium when amidships and force has to be applied to the tiller in order to place it at any angle to the middle line. It is supported at its forward edge by means of pintles working in gudgeons on the sternpost; and owing to its simplicity of construction and to its property of returning quickly to the middle line when the tiller is released through any cause, this type is preferred when the force required to put the rudder hard over is sufficiently moderate to enable steering to be performed by hand or by an engine and gear of moderate size when steam steering is admissible.

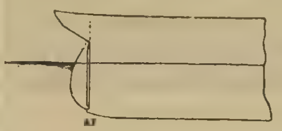


FIG. 65.—Cargo Vessel.

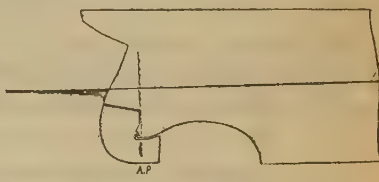


FIG. 66.—Atlantic Liner.

With high speeds and large manœuvring powers, the unbalanced type is generally unsuitable; and balanced rudders are adopted in order to reduce the force required and the work done to obtain large angles of helm. A balanced rudder is unstable amidships, and, if left free, comes to rest at a moderate angle on either side of the middle line. Slightly less than one-third of the area is usually placed before the axis; in some ships in which a greater proportion has been put forward, difficulty has been experienced in bringing back the rudder to amidships. As shown in the figures, the method of support has varied in different ships; in many cases a steadying pintle has been placed at the heel or mid-depth, but in the latest warships the support has necessarily been taken entirely inboard.

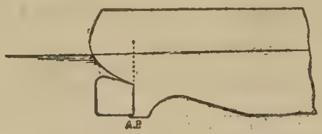


FIG. 67.—H.M.S. "Formidable." H.M.S. "Duncan" similar.

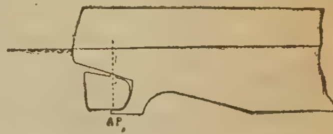


FIG. 68.—H.M.S. "King Edward VII."

In the merchant service, unbalanced rudders of the form shown in fig. 65 are generally fitted; the rudder extends up to, or above, the water-line, and is comparatively narrow longitudinally. Somewhat greater efficiency when using small or moderate angles of helm is obtained with rudders of this shape; as, for a given pressure on rudder, the turning moment on the rudder head, and the power required for working the rudder are also less. A type of balanced rudder devised by Professor Biles and adopted in some large Atlantic liners is shown in fig. 66.

Broader and shallower rudders are adopted in warships owing to the necessity of keeping the whole of the steering gear below the water-line for protection.

(fig. 74), which had, in addition to the usual rudder at the stern, a double-balanced rudder in the bow, which could be drawn up into recesses in the hull; the two rudders were about 3 ft. apart and when in use worked together.

Experimental results.

The results of the turning trials of some of the principal classes of warships are given in the following table:

Ship or Class.	Displacement in Tons.	Length in Feet.	Area of Immersed Longitudinal Plane divided by Area of Rudder.	Speed in Knots at Commencement of Turn.	Advance in Yards.	Tactical Diameter in Yards.	Tactical Diameter divided by Length.
Dreadnought	17,900	490	37·5	19	490	440	2·7
Lord Nelson	16,500	410	40·5	17	400	370	2·7
King Edward VII.	16,350	425	44·8	16½	450	440	3·1
Formidable	15,000	400	45·2	14½	440	500	3·7
Majestic	14,900	390	47·8	16	450	500	3·9
Minotaur	14,600	490	48·4	19	480	600	3·7
Monmouth	9,800	440	44·4	23½	590	790	5·4
Drake	14,100	500	46·8	23½	700	810	4·9
Diadem	11,000	435	44·5	20½	650	920	6·3
Powerful	14,200	500	50·3	22	800	1120	6·7
Minerva	5,600	350	48·3	18	540	770	6·6
Arrogant	5,750	320	33·5	17	350	380	3·6

Helm angle about 35° in all cases.

The unbalanced type was mainly used in British battleships up to H.M.S. "Formidable" (1901) and "Duncan" (1903) (fig. 67). In the "King Edward VII." class (1905) (fig. 68) the rudder was balanced, about one-fourth of its area being placed before the axis; balanced rudders supported at about mid-depth were fitted in the "Yashima" (1897) and the "Lord Nelson" class (1905) (fig. 69). In H.M.S. "Dreadnought" (1906) and recent battleships, twin-balanced rudders are fitted immediately behind the inner propellers (fig. 70), to obtain additional steering effect from the propeller race, and to enable the ship to be steered from rest in getting under way. Owing to the higher speeds of first-class cruisers, balanced rudders were used; those fitted in "Diadem" and "Powerful" classes (1897–1900) are shown in fig. 71, and for "Cressy," "Monmouth" and "Devonshire" classes (1901–1905) in fig. 72. In "Warrior" and "Minotaur" classes (1907–1908) the rudders are as shown in fig. 69. The older second-class cruisers had rudders and sterns of the type shown for H.M.S. "Powerful" in fig. 71, with the exception of the "Arrogant" class (1898), in which two rudders were fitted in conjunction with a considerable cut-up at the stern in order to obtain increased manœuvring capacity (fig. 73). Recent second-class cruisers have rudders of the type shown in fig. 69.

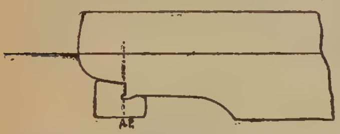
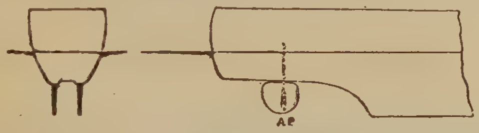


FIG. 69.—H.M.S. "Lord Nelson." "Yashima" and H.M.Ss. "Swiftsure," "Warrior" and "Minotaur" similar.



Section at A.P. FIG. 70.—H.M.S. "Dreadnought."

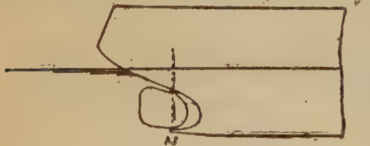


FIG. 71.—H.M.S. "Powerful." H.M.S. "Diadem" similar.

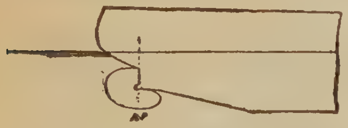


FIG. 72.—H.M.S. "Devonshire." H.M.Ss. "Cressy" and "Monmouth" similar.

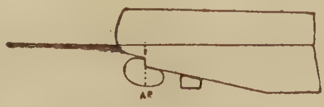


FIG. 73.—H.M.S. "Arrogant."

Auxiliary rudders have been fitted in H.M. ships in a few instances. An interesting example was that of H.M.S. "Polyphemus"

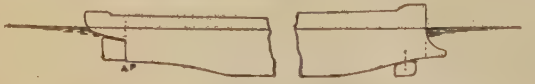


FIG. 74.—H.M.S. "Polyphemus."

In the last column the tactical diameter is expressed in terms of the length of the ship; this ratio enables a rough comparison between the steering capacities of different ships to be expressed. The improvement in turning in modern warships has been due largely to the increase of rudder area in relation to the area of the immersed middle-line plane, which has been made possible by the adoption of balanced rudders. Considerable improvement has also been effected by cutting away the after deadwood; this will be seen on comparing the performances of H.M.Ss. "Monmouth" and "Diadem," and "Drake" and "Powerful"; the former ship of each pair has her after deadwood partially cut away and has a smaller tactical diameter. In the "Yashima" the whole of the deadwood is removed and a very large rudder fitted; her tactical diameter is twice her length.

The rudder area is relatively much less in merchant vessels, where the necessity for a small tactical diameter does not arise.

Experiments have been made to ascertain separate effects of angle of helm, time of putting helm over, and draught and trim of ship.

The effect of variation of helm angle is shown in table below:

Tactical Diameter in Yards at about 12 knots speed.				
Ship.	Battleship.	First-Class Cruiser.	Second-Class Cruiser.	Torpedo-Boat Destroyer.
10° helm	750	1400	1600	700
20° helm	550	1000	1000	500
35° helm	450	750	800	300

In ships having unbalanced rudders and fitted with hand-steering gear considerable time is required to put the helm hard over at full speed; and consequently the tactical diameter and the advance are greater at high speeds than at low speeds. When steam-steering gear is provided the helm can usually be put hard over in from 10 to 20 seconds at any speed; and in modern warships the speed is found to have little influence on the path described when turning. In the case of torpedo-boat destroyers marked increases in the tactical diameter and in the advance occur at high speeds, the cause of which is not fully known. In such vessels of length 270 ft. and displacement 900 tons, the tactical diameter is about 550 yds. at 30 knots and 300 yds. at 15 knots.

A moderate variation in the mean draught has little effect on the course, but additional trim by the stern results in a greater space being required for turning.

By working one propeller ahead and the other astern the space required for turning may be shortened, but the time of turning is frequently increased. The character of the path described depends on the relation between the revolutions of the screws.

In a single-screw ship, with the propeller well immersed, the upper blades experience greater resistance to rotation than the lower blades, since the forward velocity of the frictional wake is greatest at the surface; hence a right-handed screw tends to turn the ship's head to starboard, and requires starboard helm. The reverse is occasionally experienced when the upper portion of the screw is incompletely immersed.

When a ship is going astern manœuvring is performed with some uncertainty, as the rudder is near the pivoting point.

PROCESS OF DESIGN

When a shipbuilder is approached for the production of a new ship, he must be informed of the requirements of the case; the kind of trade or service in which the vessel will be engaged; her speed; if she is to be a steam vessel, the distance she must run on ordinary voyages without recoaling; the weight of cargo to be taken or the number of passengers to be carried, and the kind of accommodation required for them. Very frequently these requirements will include certain limits of size, draught, cost, or tonnage, which must not be exceeded. In addition it must be stated in what society, if any, she is to be classed, as this will determine the details of the scantlings to be employed. The shipbuilder will usually have, to guide him, the details of some successful ship or ships previously built to fulfil the same or similar conditions as in the vessel required, and he will probably know what measure of success or popularity the respective features of the vessel or vessels have earned on service. The dimensions can in this case be at once fixed to provide the necessary speed, strength, stability and seaworthiness, and the cost of the vessel determined. If the departures from some similar ship of known and approved qualities are small, the details of the new ship can be inferred directly from those of the similar ship, and modified drawings, specifications, &c., can be rapidly prepared and the building proceeded with. On the other hand, the departures from previous vessels or the usual practice may be very great, in which case much will depend on the shipbuilder's skill and judgment. Outline drawings must first be prepared to the dimensions which may be considered suitable, and the calculations are made on this assumed design. These will include estimate of the weights of the hull, of the machinery, equipment, &c.; and if it is not intended to class the vessel in some registration or classification society, questions of strength will have to be considered. If, however, the vessel is to be so classed, the determination of the structural strength may be omitted, as the scantlings required by the rules of such society are arranged to provide sufficient strength. If the calculations show that the dimensions assumed do not enable the required conditions to be fulfilled, the dimensions must be modified in the direction indicated by the calculations, and the calculations made over again. This process must be continued until a satisfactory result is obtained. As soon as the dimensions obtained for the vessel are found to be appropriate, more complete drawings are put in hand, and the final calculations pertaining to the displacement sheet, weights of hull and equipment, centre of gravity and trim, metacentric diagram and curves of stability and speed, are made. In the design of yachts the views of the owner, especially if he is a yachtsman of experience, must necessarily play an important part.

While the present writer was designing the Royal Yacht "Alexandra" he was commanded on several occasions to wait on the late King Edward VII. to take his instructions. King Edward took a special interest in the design throughout and sketched in his own hand the shapes of the knee of head and the stern. All leading details were shown to him in model and settled by him personally. At an important stage the king consulted the prince of Wales (George V.), whose views as to the principal dimensions were afterwards adopted.

In the case of the construction of large passenger ships the design often originates with the owner's or steamship company's staff, and in some instances naval architects are employed, completed drawings and specifications being handed over to the shipbuilder with the order for the vessel. In other cases shipbuilders work in close connexion with the steamship companies, and the business relations are of a very simple character, the company being content to send an order, with a note of the principal dimensions and type of ship required, leaving the determination of all details of the design in the hands of the builders. The general practice lies between these two extremes. In any case, complete design drawings and detailed specifications are necessary for the shipyard operations, and if not supplied must be prepared by the shipyard staff. Sometimes outline drawings of the vessel on a small scale—including an elevation or side view, one or two plans of the main deck and other parts, and a short description of the vessel—are first prepared, and are called an outline or sketch design; but usually the information which constitutes a design comprises a sheer, profile and plans of each deck on a $\frac{1}{4}$-in. scale, a midship section on a $\frac{1}{2}$-in. scale, and a complete specification.

The sheer drawing gives the outside form of the ship. It consists of an *elevation* showing her longitudinal contour; the positions of the decks; the water-line or line at which she will float, and certain other lines parallel to this and equally spaced below it, which are also called water-lines; a series of vertical lines equally spaced from stem to stern, called "square stations"; and certain other details: of a *body plan* showing the sectional form of the ship at the square stations, supposing her to be cut by transverse planes at these stations: and of a *half-breadth plan* showing the form of the ship at the several water-lines, supposing her to be cut by horizontal planes at the levels of these lines. The profile and plans give all the internal arrangements of the vessel, the holds or spaces set apart for cargo, the passenger accommodation, the positions of the engines and boilers, the accommodation provided for the crew, and other principal fittings. In a warship there are no cargo holds or passenger accommodation, but the distribution of the armament and magazines, the armour, and other arrangements for the protection of the vessel against injury in action are carefully shown, and the appropriation of every portion of the internal capacity of the vessel is clearly indicated. The *midship section* shows the structural arrangements of the vessel, and usually the scantlings of the most important parts. The *specification* is a statement of all the particulars of the vessel, including what is shown on the drawings as well as what cannot be shown on them; the quality of the materials to be used is described, and the scantlings of the same carefully recorded; and it is clearly stated how parts not manufactured by the shipbuilders are to be obtained.

Registration societies.

When first formed the objects of register societies were simply the maintenance of a register in which was recorded for insurance purposes the main particulars of each vessel's hull, machinery, equipment, &c., together with the names of owner, master and builder, as well as a designation or class represented by a symbol, which was intended to give to underwriters an indication of the strength, durability and general seaworthiness of the ship. As a natural sequence it became necessary for the register societies to formulate rules which would indicate to owners and builders the structural conditions that would entitle vessels to the highest class and the minimum rates of insurance. The register societies now provide the shipbuilder not only with a record of all the important features of the ships which are classed, and thus with much of the information which he requires for the design of his vessel, but they also fix the quality and strength of the material to be used, the scantlings of all the parts of the hull, the riveting of the attachments, the equipment of pumps, anchors, cables, &c., the dimensions and details of the principal parts of the machinery, and all the details of the boilers. Classification societies are thus technical bureaux of the highest value to the shipping community, whose rules are a reflex of the most advanced knowledge and whose methods encourage developments in structural design.

The principal registration and classification societies in 1910, and the number of vessels (sailing and steam) classed, were as follows:—

Lloyd's Register of British and Foreign Shipping, having its headquarters in London	10,302 vessels.
British Corporation for the Survey and Registry of Shipping, in Glasgow	710 ,,
Bureau Veritas International Register of Shipping, at Paris	4,626 ,,
Germanischer Lloyd, at Berlin	2,672 ,,
Norske Veritas, at Christiania	1,560 ,,
Registro Nazionale Italiano, at Genoa	1,263 ,,
Record of American and Foreign Shipping, at New York	1,139 ,,
Veritas Austro-Ungarico, at Trieste	1,041 ,,
Great Lakes Register	609 ,,

Of these societies, *Lloyd's Register*, as at present constituted, has existed since 1834; at that date it superseded two rival institutions having a similar object. The name is traced back to Lloyd's Coffee-house, once situated in Lombard Street, in which underwriters met for business purposes, and from which in 1696 they issued their first publication. The first printed register was issued about 1726, a copy dated 1764 being still extant. The office of surveyors is referred to in a register book of the date 1781, but there are evidences that in 1768 repairs were superintended by officers of the society. In 1799 surveyors were stationed at twenty-four ports in the United Kingdom. In 1822 the register for the first time recorded a steamship. In 1824 appeared the first "Instructions to Surveyors" as to the carrying out the rules for classification; and in 1834, on the establishment of the present society, precise regulations were issued regarding the survey of steamers. An iron ship was built under survey and received a class in 1837, while the first rules for the construction of iron ships were issued in 1855. In 1851 a composite vessel was classed, but it was not until 1867 that rules for the construction of such vessels were issued. Steel was accepted in 1867, experimentally, steel being then made by the Bessemer process. Steel by the Siemens-Martin process was first used for two small steamers in 1877. Engineer surveyors were first appointed in 1874. The society is voluntarily maintained by the shipping community. Its affairs are managed by a committee of sixty-one members—composed of merchants, shipowners and underwriters—elected to represent the important shipping centres of the country, and there are branch committees at Liverpool and Glasgow. In technical matters affecting the rules for the construction of ships and machinery the committee has the advantage of the co-operation of a body of representatives of prominent shipbuilders, engineers, steelmakers and forgemasters, who are specially elected by the leading technical institutions of Great Britain. The society's rules for steel ships were entirely revised so recently as 1909. The society has a total staff, at home and abroad, of 310 surveyors, of whom 232 are its exclusive servants.

In the case of a new vessel intended for classification, the plans for its construction are in the first place submitted to and approved by the committee; the building proceeds under the supervision of the local surveyor, and when completed, a *character* is assigned to the vessel by the committee upon that surveyor's report. The society issues annually to its subscribers a register book containing particulars of classification of vessels to which classes have been assigned, together with many other details. All merchant vessels in the world of 100 tons and upwards, excluding those trading on the Caspian Sea, and wooden vessels on the Great Lakes of North America, are included in the work. This register contains particulars of the age, build, tonnage, dimensions, ownership, &c., of some 30,000 vessels. The society also publishes yearly a register of yachts, containing full particulars of the yachts of the world and other interesting information, and a register of American yachts, which gives similar particulars of all American and Canadian yachts.

All the public proving establishments in the United Kingdom for the testing of anchors and chain cables are licensed by the Board of Trade to carry out these tests under the control of the committee of Lloyd's Register. The assignment of freeboards of vessels, the survey of refrigerating machinery, electric light installation, &c., all come within the scope of the society's operations.

The *Bureau Veritas* was founded in Antwerp in 1828, one of its principal aims being to make known to underwriters the qualities and defects of ships frequenting Dutch and Belgian ports. In 1832 the headquarters were moved to Paris, and in due time its influence spread to all countries where shipowning or shipbuilding existed; it is now represented in over 250 districts comprising about 1500 ports. In 1851 rules were drawn up for the construction of wood ships, and about 1867 for iron. Rules for steel came later, and also rules for the construction of machinery, and, as circumstances arose, provision was made for special types, such as oil-tank vessels, turret vessels, dredgers, &c., as well as for the testing of materials. These rules have been revised from time to time and recently have been remodelled and extended, so as to apply to vessels up to about 900 ft. in length. Special rules have been issued for vessels intended for navigation in inland waters, for yachts and for motor boats. A staff of surveyors formed part of the organization from the beginning; and in the earlier days the professional experience of the surveyors was the only guide as to what was necessary and sufficient. With the lapse of time, and with increased variety of construction and complication of interests, something more than individual judgment and experience became necessary, and with the Bureau Veritas, as with Lloyd's and other similar societies, definite rules were introduced, and by their means a greater uniformity of practice was attempted and secured.

The *British Corporation* was founded in 1890, and obtained its charter under the Merchant Shipping Acts for the assignment of freeboards; its first rules were issued in 1893. Its inception was due to the enterprise and influence of a number of leading shipowners, shipbuilders and engineers throughout the country, and more particularly in Glasgow and the West of Scotland, the first aim of the founders being to provide an independent society, thoroughly capable of dealing with the complicated questions which were likely to arise under the Load Line Act then coming into operation. The Liverpool Registry, which had once been independent, had been absorbed into Lloyd's Register some years before, and it was thought that the enormous shipbuilding interests of the country demanded the existence of a society whose friendly rivalry with the great society of Lloyd's Register would have a beneficial influence on the shipbuilding of the country. Owing to the comparative absence of small vessels the relatively small number of the vessels on the register represents 2,331,000 tons. The society is controlled by a committee of forty members—shipowners, shipbuilders and underwriters—and, in addition, there is a branch committee in Italy. There is a staff of 135 surveyors distributed over the principal home and foreign ports.

The *Norske Veritas* was established in 1864 by the various marine insurance clubs of Norway. Previously each club had its own separate staff of surveyors, on whose report to their club depended the class of the vessel and the premium to be paid. As ships rose in value and reinsurance became the rule, something had to be done for mutual protection. By the establishment of the *Norske Veritas* one uniform system of classing and valuing was substituted for the older methods. In the matter of rules this society kept pace with the changes of the mercantile marine; it provided, as the occasion required, for the introduction of iron and steel in place of wood, and of steam in place of sails.

The *Germanischer Lloyd* was established in 1867, and reorganized as a joint-stock company in 1889. Its functions are carried out by officers at the central office in Berlin, assisted by a staff of 50 ship and engine surveyors in Germany and 120 at the principal foreign ports, the latter under control of agents, who are mostly consuls. "In all foreign parts in which the *Germanischer Lloyd* has no representative, the German consuls are required by order of their government to exercise the functions of an agent of the *Germanischer Lloyd*."

The *Registro Nazionale Italiano* was formed in 1910 to take over the Registro Italiano, which was founded in 1861. The society has adopted the rules of the British Corporation Registry, has a staff of surveyors in Italy, and has an arrangement with the British Corporation which enables them to utilize the services of the surveyors to that society in British and foreign ports.

The *Record of American and Foreign Shipping* was established in 1867 by the American Shipmasters' Association (now called the *American Bureau of Shipping*), and is the standard American authority. Its rules for the construction and classification of vessels, as published in 1889 and amended in 1900, received the approval of the U.S. Navy Department and of the several boards of American underwriters. It has agents and surveyors in many of the principal ports of the world.

The present rules and tables of most of the above societies apply to construction in steel. If iron is to be used in the construction of vessels, the material must be increased in thickness from 10% to 25%, dependent upon the part for which it is to be used and the quality of the iron. In some cases separate tables for steel and iron accompany the rules, and in a few cases the societies provide rules for construction in wood. The latest rules of *Lloyd's Register* provide only for steel ships, but vessels of wood and iron are still classed.

The highest class assigned, upon completion of a ship by the societies referred to, is as follows:—

Lloyd's	✠	100A	1	✠L.M.C.
Bureau Veritas	✠Ⓘ 3/3L	I.I.		
British Corporation . .	**B.S.**✳ **M.B.S.**✳			
Norske Veritas	✠	1A1	1	✠ M & K.V.
Germanischer Lloyd . .	✠	100$\underset{4}{A}$		✠ M.C.
Record of Amer. Shipping	✠	A1	M.C.	

The star or cross in each case denotes special survey. In *Lloyd's Register* 100A refers to conformity of scantlings with the tables; the figure 1, to the efficient state of the equipment, including anchors and cables; L.M.C. denotes Lloyd's Machinery Certificate. In the *Bureau Veritas* the large **I** expresses first division of classification (out of three); the two rings around the **I** denote that the ship is divided into a sufficient number of water-tight compartments to enable her to float in still water with any two of them in free communication with the sea. Very few ships in the register have the double ring, but some have a single ring Ⓘ, denoting power to float in still water with any one compartment in free communication with the sea; 3/3 expresses completeness and efficiency of hull and machinery; the letter following 3/3 indicates the navigation for which the vessel is intended; the first 1, that the wood portions of the hull are entirely satisfactory; while the second 1 has the same significance in respect to the equipment of masts, spars, rigging, anchors, chains and boats. In the *British Corporation Register*, **B.S.** signifies conformity with all requirements, these letters standing for British Standard; **M.B.S.** signifies that the machinery also conforms. In the *Norske Veritas* 1A1 denotes compliance with rule requirements as regards the hull. M & K.V. signifies that the vessel has a Norske Veritas certificate for engines and boilers. The third figure 1 denotes the efficient state of the equipment. In the *Germanischer Lloyd* the mark 100$\underset{4}{A}$ signifies that the ship which bears it is, including her equipment, up to the requirements of the highest class of the society. The figure 4 signifies that the class is to be regularly renewed after special surveys held in periods of four years each. M.C. signifies that the machinery also conforms with the requirements of the rules and has obtained a separate certificate.

Certain steam vessels obtain a □ which encloses the ✠ in front of the class mark. This signifies that the arrangement of the water-tight bulkheads is such as theoretically to ensure the floatability of the ship when the sea has access to one or two of her compartments.

The tests for steel material to be used in building the ships, as required by the same societies, may be tabulated as follows:—

	Ultimate Tensile Strength.	Elongation in Length of 8 in.	Temperature Test.
Lloyd's Register	Between 28 and 32 tons per sq. in.	Not less than 20% for plates $\frac{3}{8}$ in. thick and upwards.	Sample heated to a low cherry red and cooled in water at 80° F. and doubled over a radius of 1½ times the thickness of the plate tested.
British Corporation	,, ,,	,, ,,	
Registro Nazionale Italiano	,, ,,	,, ,,	
Norske Veritas	,, ,,	,, ,,	
Bureau Veritas	Between 27 and 32 tons per sq. in.	,, ,,	
Record of American Shipping	Between 58,000 and 68,000 lb per sq. in.	22% for plates weighing 18 lb per sq. ft. and upwards.	
Germanischer Lloyd	Between 26 and 31 tons per sq. in.	20% for plates 10 mm. in thickness and upwards.	

For plates less than $\frac{3}{8}$ in. in thickness the first four societies in the above table allow an elongation of 16%; the *Bureau Veritas* allows an elongation varying between 20% and 10% for plates between $\frac{16}{50}$ths and $\frac{4}{50}$ths of an inch in thickness; the *Record of American Shipping* allows an elongation of 18% for plates weighing less than 18 lb per square foot; the *Germanischer Lloyd* allows an elongation of 16% for plates between 10 mm. and 5 mm. in thickness and 14% for plates less than 5 mm. in thickness. For steel plates to be flanged cold *Lloyd's Register* and the *British Corporation* require a minimum tensile strength of 26 tons, and for sectional material such as angles, bulb angles and channels the tensile strength may be as high as 33 tons. For rivet steel the tensile strength must be between 25 and 30 tons per square inch, with a minimum elongation of 25% on a gauge length of eight times the diameter of the bar. Hot and cold bending and forge tests for angle bars are also prescribed.

Board of Trade supervision.

The regulation of certain matters connected with the design of merchant ships falls upon the Marine Department of the Board of Trade. The authority of the Board is the Merchant Shipping Act of 1894, which consolidated previous enactments. These matters include the measurement of tonnage, and provision for the safety and comfort of passengers and crew. The former is discussed in a separate article (see TONNAGE), but it may be mentioned here that the following countries have at various dates accepted the British rules for tonnage: United States, Denmark, Austria-Hungary, Germany, France, Italy, Spain, Sweden, Netherlands, Norway, Greece, Russia, Finland, Hayti, Belgium and Japan. The amount of deduction for propelling power varies in Spain, Sweden, Netherlands, Greece, Russia and Belgium, but option is granted to owners to have the engine-room remeasured under the rules of allowance for engine-room relating to British ships. Special certificates are at present also issued, on application, to vessels trading to Italian ports, as the Italian authorities do not at present recognize certain sections of the Act of 1894 in regard to deductions from tonnage and exemptions from measurement. Special tonnage certificates are also issued for the Suez Canal, where the measurements of ships and deductions from tonnage vary from British rules, and are detailed at length by the Board of Trade in their Instructions to Surveyors.

With regard to safety and comfort the surveyors have to see, among other matters, that the crews are properly accommodated and the passengers not too crowded; that the boats and life-saving appliances are sufficient; that the lights and signals are in order; that the freeboard is sufficient and ship otherwise seaworthy; that grain cargoes are properly stowed; and that coal cargoes are adequately ventilated. Any question of doubt as to the strength of passenger vessels has to be referred to the Board of Trade, and in future midship sections, with all particulars marked thereon, are to be submitted in the case of all new steamships building under survey for which passenger certificates are required. A passenger certificate is required whenever a steamer carries more than twelve passengers. In granting it the Board of Trade recognizes five different services, ranging from foreign-going steamers to excursion steamers in smooth water. The Board of Trade rules for scantlings are not published officially.

Load line and freeboard.

A Bill, introduced into parliament in 1869, dealing with the load line question, contained a clause requiring the draught of water to be recorded at which a vessel is floating when leaving port. This Bill did not pass; but in the following year the Merchant Shipping Code Bill was brought in, containing the same provision, and, in addition, requiring a scale showing the draught of water to be marked on stem and stern post of every British ship. This became law in 1871. The same Act empowered the Board of Trade to record the draught of water of all sea-going ships on leaving port by surveyors duly authorized. In March 1873 a Royal Commission on "Unseaworthy Ships" was appointed by the British government, and one of the questions considered was that of the load line. In the final report in 1874 the conclusion was arrived at that a settlement of a load line should, in the main, be guided by reserve buoyancy as a first consideration. The commissioners were, however, of opinion that an act of parliament, framed to enforce any scale of freeboard, would be mischievous, if not impossible, as would be any universal rule for the safe loading of merchant ships.

In 1874, in a paper read before the Institution of Naval Architects by Mr B. Martell, who was then the chief surveyor to *Lloyd's Register*, tables of freeboard were suggested from data collected at all the principal ports in the United Kingdom. These tables were based on the principle of reserve buoyancy, and were intended to apply to the loading of the various types of sea-going ships then to be dealt with. As an indication of the form of the vessel, it was suggested that a tonnage coefficient of fineness should be used, in order that the tables proposed might be readily adapted to all sea-going ships, whether at that time at sea or in port. In 1875 a short Act was passed, to remain in force only until October of the following year, which embodied as its chief feature the requirement of what was afterwards universally known as the "Plimsoll mark" (after the late Mr S. Plimsoll, M.P., the prime mover in securing legislation for the prevention of overloading in British ships). All British ships were to have the position of the deck shown on the side of the ship, and every foreign-going British ship was to have a circular disk marked below the deck line, indicating the maximum draught to which it was intended to load. The Act in no way fixed the amount of freeboard; this was left to the shipowner. The provisions of the 1875 Act were confirmed by a more comprehensive Act in 1876, which extended the compulsory marking of the deck line and disk to all British ships, except those under 80 tons engaged in fishing and the coasting trades, also excepting yachts or war vessels. Before this Act was passed the Board of Trade took action, by appointing a committee to consider the possibility of framing rules for the regulation of freeboard. The committee was to be composed of representatives of the Board of Trade, *Lloyd's Register*, and the Liverpool Underwriters' Registry. This attempt to establish an authorized scale of freeboard failed. Meanwhile the subject was not lost sight of; the collection of data was continued, investigations were carried out, and six years later (in 1882) the committee of *Lloyd's Register* issued freeboard tables, and undertook to assign freeboard, on the basis of the tables issued, on owners making application for the same. In the course of three years 944 vessels had freeboards thus assigned to them, and in the case of 775 of this number the owners voluntarily accepted the freeboards assigned. In December 1883 the Load Line Committee was appointed by the Board of Trade; and after two years' careful deliberation and investigation, involving much labour, the committee presented its report. This report was accompanied by tables, which agreed closely with those previously issued by *Lloyd's Register*; and they were accepted by the committee of that society in September 1885. Between 1885 and June 1890 (the latter being the date the Load Line Act was passed) 2850 steam and sailing vessels had freeboards fixed by *Lloyd's Register*, and of these 2520 were taken from the tables. After the passing of the Act in 1890 appointments to assign freeboards were granted to *Lloyd's Register*, *Bureau Veritas* and the *British Corporation*.

In 1893 the original tables were modified with respect to some of the ports in the United States on the Atlantic, the sailing from or to which in the winter was to subject the ship to a few inches additional freeboard. In 1898 they were further modified (*a*) to exempt ships over 330 ft. in length from the additional freeboard just mentioned, and to limit the additional freeboard in smaller ships; (*b*) to give some concession to turret-deck steamers; and (*c*) in some other minor matters.

In 1906 the Shipping Laws were amended so that all foreign vessels loading at British ports required to be provided either with a freeboard assigned under the British tables, or under tables of a foreign country which had been certified by the British Board of Trade as being equally effective with the British freeboard tables.

In the same year the British tables were revised throughout in the light of the experiences of previous years of practical administration, by a committee whose members were drawn from the Board of Trade and the three assigning bodies—Lloyd's, British Corporation, and the Bureau Veritas. Important modifications were made in the freeboards for vessels with complete superstructures or a considerable extent of strong deck erections, and in those for large vessels, with the result that a considerable increase was given to the carrying capacity of British shipping. This was followed by a conference in Hamburg between eight delegates nominated by the British government—being practically the former committee—and eight German delegates. The conference resulted in an adjustment of the German freeboard tables previously in force, and Germany has adopted freeboard tables and regulations which are recognized by the British government in an Order in Council dated 21st November 1908. France and Holland have adopted the British tables, and the load line certificates issued by those countries are recognized in Orders in Council dated 22nd November 1909 and 11th June 1910 respectively. Denmark, Sweden and Spain have also adopted the British tables, and as other maritime nations have the subject under consideration it is confidently expected that the load line regulations will become international. Under the provisions of the Merchant Shipping Act 1906 the British load line regulations now apply to all foreign ships while they are within any port in the United Kingdom.

Loading of grain and timber.

Ships laden with grain have to comply with rules of the Board of Trade, which provide that for single-decked ships there shall either be provision for feeding the hold, or there shall not be more than three-quarters of the hold occupied by grain in bulk, the remaining one-fourth being occupied by grain or other suitable cargo in bags, bales or barrels, supported on platforms laid on the grain in bulk. For ships with two decks, grain in bulk in the 'tween-decks is for the most part prohibited; but certain grains are allowed, provided there are separate feeders for hold and 'tween-decks, or else sufficiently large feeders to the 'tween-decks, and the hatches and other openings there made available for feeding the holds. In ships with two decks longitudinal grain-tight shifting-boards must be fitted where grain is carried either in bags or bulk; these shifting-boards must extend from beam to deck and from beam to keelson, and in the case of bulk grain must also be fitted between the beams and carried up to the very top of the space. The regulations also impose a fine not exceeding five pounds for every hundred cubic feet of wood carried as deck cargo which arrives in a ship, British or foreign, in any port of the United Kingdom between the 31st October and 16th April, provided no unforeseen circumstances, as defined by the Act, intervene. By deck cargo in this section is meant any deals, battens or other wood goods of any description to a height exceeding 3 ft. above the deck.

In 1890 a committee was appointed by the Board of Trade to deal with the spacing and strength of transverse water-tight bulkheads and to make recommendations. The first matter submitted to this committee related to subdivision which should enable a ship to float in moderate weather with any two compartments in free connexion with the sea. The committee, while recommending the above as a standard for sea-going ships of not less than 425 ft. in length, and for cross-channel steamers irrespective of length, suggested less stringent conditions for sea-going ships of shorter length. There was no suggestion of enforcing such subdivision by law; but as a reward for complying some concession was to be allowed, under the Life Saving Appliances Act of 1888, as to the boats or life rafts to be carried. On the presentation of the report the matter was, however, allowed to drop, and the rules of *Lloyd's Register* and the other classification societies are therefore the only rules with practical influence. The subdivision required by *Lloyd's Register* for all steamers comprises a bulkhead at each end of the machinery spaces, and a bulkhead at a reasonable distance from each end of the ship, making four in all. In addition for larger steamers other bulkheads have to be fitted, making the total as follows, namely:—

Length of Steamer.	Bulkheads.
285 ft. to 335 ft.	5
335 ,, 405 ,,	6
405 ,, 470 ,,	7
470 ,, 540 ,,	8
540 ,, 610 ,,	9
610 ,, 680 ,,	10

The positions of these additional bulkheads, and the height to which they are to be carried, are clearly stated, and the rules are given for their scantlings. These scantlings are suitable for purposes of safety in the event of accident; but it is understood that they have to be considerably increased when the bulkhead is also used to withstand frequently the pressure of oil or water ballast; a deflection of the plating which would do no harm in an emergency once encountered would certainly become serious if often repeated in the ordinary service of the ship. The foremost bulkhead of the ship receives the name of *collision* bulkhead, or sometimes *fore-peak* bulkhead; the aftermost, the *after-peak* bulkhead. In sailing ships the collision bulkhead alone requires to be fitted.

Practical

Practical shipbuilding requires a knowledge of the properties of the materials used in the construction of ships, and of the processes by which they are produced or prepared for use, so that they may be suitably selected for the services for which they are intended; also a knowledge of the methods, means and machinery by which, after delivery in the shipyard, the materials are brought to the requisite shape, erected in their proper relative positions, connected together, and completed so as to form a structure which shall fulfil the intentions of the design, whether large or small, merchant ship or warship. The varieties of ships are very great, and are constantly changing, and thus new problems continually present themselves to the shipbuilder. There is also an ever-increasing demand for rapid production, which necessitates a rigorous and constant search for simplification of methods of work, for labour-saving and time-saving machinery, for improved means of handling material in the shipyard, and for workshops and factories which will more completely prepare and finish their various products before despatch to the shipyard.

Structural parts.

Whatever the size of the ship or the type to which she belongs, the general principles of construction remain very much the same in all cases. The following account applies to steel and iron shipbuilding. The exterior parts—the bottom, sides and decks—supply the strength required for the structure as a whole. The bottom and sides are spoken of as the *shell* or *outside plating*, and are, with the decks, kept to the proper shape by means of frames running across the ship, like the rafters in a roof or the ribs in the body. These are called *transverse frames* or *ribs*, and *beams* where they run under the decks. The parts of the frames at the bottom of the ship, where they are made deep and strong to support her when she is docked or grounded, are known as *floors*, while the spaces between these floors are spoken of as the *bilges*. The transverse frames and floors are held upright in their proper relative positions by other frames which run lengthwise in the ship; one at the middle line being called the *centre keelson*, and others fitted at the sides, *keelsons*, *bilge keelsons* and *side stringers*. All the fore-and-aft frames, taken together, are spoken of as the longitudinal framing. Where tanks for carrying water ballast are built into the bottom of the ship, the centre keelson is called the *centre girder*, and the keelsons or bilge keelsons the *side girders*. In large merchant vessels, and in all war vessels, except the smallest classes, an *inner bottom* is provided for increasing the security against injury by grounding, and against ramming and torpedo attack in war vessels, in addition to forming tanks for carrying water, either as ballast or for use in the ship. In such cases the centre keelson is called the *vertical keel*, and the keelsons and girders are called *longitudinals*. When the deep vertical transverse plates forming the floors only extend between the keelsons, girders or longitudinals, and are attached to them by angle bars, the floors are called *intercostal* floors, and the keelsons, girders and longitudinals are said to be *continuous*; on the other hand, when the keelsons, girders or longitudinals extend only between the frames and floors they are called *intercostal* keelsons, girders and longitudinals, and the frames and floors are said to be *continuous*. In war vessels, except the smallest classes, much of the longitudinal framing is continuous; and the transverse framing, for the most part, is *built up* of angle bars upon the outer bottom and under the inner bottom, with short plates, called bracket plates, between them, attached to the longitudinals by short angle bars. Frames built up in this way are called *bracket frames*. In mercantile vessels the transverse frames both within and without the double bottom are usually continuous.

Besides the transverse and longitudinal framing, there are partitions used for dividing up the internal spaces of the ship, which are called *bulkheads*; they are partial, complete, water-tight or non-water-tight, as the circumstances of the case require. In warships the transverse bulkheads are so numerous, in order to restrict as much as possible the entrance of water from damage in action, that they go a long way towards providing the necessary transverse strength, and the transverse frames are consequently made of thinner materials and fitted at greater distances apart than they otherwise would be. Transverse frames are from 36 to 48 in. apart in large warships, and from 24 to 33 and sometimes 36 in. in large merchant ships. At the extreme ends of the ship the shell plating on the two sides is attached to forgings or castings, which are known as the *stem* at the fore end, and the *stern-frame* or *sternpost* at the after end. The stem of a warship is generally made very massive, and projects under the water so as to form the *ram*.

The longitudinal framing is carried right forward and aft when possible, and the ends of the several frames are connected together across the ship by strong plates and angles, which are called *knees* or *breasthooks*, forward; and knees or *crutches*, aft. Additional supports, introduced to enable the vessel to withstand the heavy blows of the sea in bad weather, are called *panting stringers*, *panting knees*, and *panting beams*, panting being the term applied to the movements which occur in the side plating if sufficient strength is not provided. Where the ends of the ship are very full, or *bluff*, the frames are sometimes inclined, or canted out of the transverse plane, so as to be more nearly at right angles to the plating; such are known as *cant* frames. At the stern a transverse frame, called a *transom*, is attached to the upper part of the sternpost to form a base for cant frames of the overhanging part of the stern which is known as the *counter*. To assist the beams and bulkheads in holding the decks in their proper positions, vertical *pillars* are introduced in large numbers; but to avoid the loss of space and inconvenience in handling cargo, ordinary pillars are often dispensed with, and special pillars and deep deck girders are fitted instead.

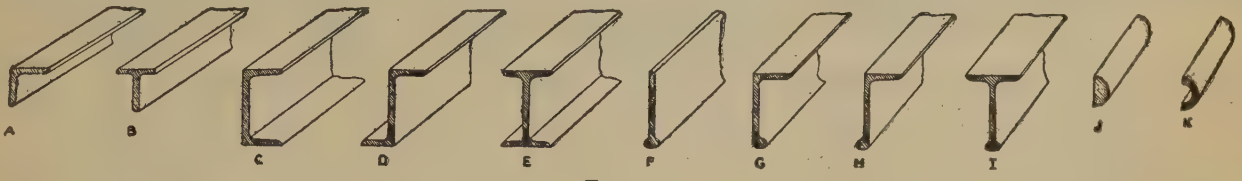


FIG. 75.

Materials.

The steel generally used in shipbuilding is known as *mild* steel. It is very tough and ductile, and differs from the *hard* steel, out of which tools are made, in that it will not take a *temper*, *i.e.* if heated and plunged into oil or water, the sudden cooling has very little effect upon it, whereas with tool steels a great change takes place, the steel becoming very hard, and usually brittle. This quality of tempering depends chiefly on the amount of carbon in the steel, mild steel containing less than ·25 %. Steel of greater strength than mild steel is used occasionally in certain parts of warships. The extra strength is obtained generally by the addition of carbon, nickel or chromium, coupled with special treatment. The quality of the plates and bars used is tested by cutting off strips about 2 in. wide, and bending them double by hammering, or in a press, until the bend is a semicircle whose diameter is three times the thickness of the strip. The strips are sometimes heated and plunged into water to cool them suddenly before bending, and they may be cut from either side or the end of the plate. Strips are taken occasionally and hammered into various other shapes while hot and while cold, so as to ascertain the general quality of the material. To ensure its tenacity, strips are taken and machined to give a parallel part about 2 in. in width, of at least 8 in. in length. Two centre-punch marks are made 8 in. apart, and the strip is secured in a testing-machine constructed so that the ends can be gripped by strong jaws which do not injure the parallel part. The jaws are then gradually pulled apart, the amount of the pull required to break the strip being registered, and also the extent to which the strip stretches in the length of 8 in. before breaking. The tensile strength varies between 26 and 32 tons per square inch, calculated on the original sectional area of the parallel part before breaking, and the elongation in the 8 in. is about 20 %. The standard strength and elongation required by the principal registration societies have already been given. The steel used for making rivets is similarly tested; and samples of the finished rivets are also taken, and hammered into various shapes, hot and cold, to ensure that the metal is soft and ductile and suitable for the work.

The stem, stern-frame, &c., are frequently made of forged iron; but if of steel, they are cast to the form required. These castings are tested by being let fall on hard ground and then slung in chains and hammered all over, when faults of casting are generally discovered by variations in the sounds produced. By this hammering the general soundness of the casting is ensured. To test the quality of the steel in the casting, small pieces, which are cast on for the purpose, are removed and tested in the same manner as just described for the strips cut off from the plates; they are required to give about the same tensile strength, but a little less ductility, say 10 % instead of 20 % elongation in 8 in.

The sections of the iron and steel bars in common use are shown in fig. 75, and are named as follows:—

A. Angle bar.
B. T (Tee) bar.
C. Channel bar.
D. Z (Zed) bar.
E. I bar.
F. Plain bulb bar.
G and H. Angle bulb.
I. T bulb bar.
J. Half-round moulding.
K. Hollow moulding.

The vertical, or central, portion in the I, T and bulb sections is spoken of as the *web*, and varies from about 3 in. to 9 in. in depth; the horizontal parts are called *flanges*; in an angle bar, both parts of the section are called flanges. The flanges vary in width from about 2 in. to 7 in. in the angle bar, and from 3 in. to 6 in. in the others. The thickness varies from about ¼ in. to ¾ in. These dimensions taken together are called the *scantlings* of such material. The thicknesses of the plates in common use generally lie between ¼ in. and 1 in. Thicker or thinner plates are obtainable, but are not often used for merchant ships. These plates are of varying sizes as required, the tendency being to use very large plates where possible, and widths of 5 ft. to 7 ft. are used in lengths of from 40 to 20 ft. Angle bars are used in lengths of from 20 to 80 ft. as required, or as may be limited by the means of transport between the steel works and the shipyard.

The various plates and bars are connected together by means of *rivets* of various forms. Specimens of the common kinds are shown in fig. 76. The heads and points have distinctive names, as follows:—

(A) Countersunk head, chipped flush.
(B) Ordinary countersunk head.
(C) Snap head.
(D) Snap head with conical or swelled neck.
(E) Pan head with conical or swelled neck.
(F) Pan head.
(G) Countersunk point.
(H) Rough hammered point.
(I) Snap point, hand work.
(J) Snap point, machine work.

The pan head rivet (E) with conical or swelled neck is the most commonly used, as it is convenient to handle and gives good sound work. The rough hammered point (H) is also very commonly used, is very effective and is readily worked. The pan head (F) and snap head (C), without cones under the heads, are only used for small rivets; the heads (A), (B), (C), (D), are used where considered desirable for appearance' sake, but (C) and (D) are also adopted when the riveting is done by hydraulic machinery, in which case the snap point J is also used. The countersunk point (G) is used on the outside of the shell, and in other places where flush work is required. The snap point (I), for internal hand riveting, is used where desired for appearance, instead of the rough hammered point. The rivets vary in diameter from about ⅝ in. to 1¼ in., and the lengths are as required to go through the holes and give enough material properly to form the points. The diameter of the rivet is settled according to the thickness of the plates to be connected, being generally about ¼ in. more than the thickness of the separate plates. The distance from centre to centre of the rivets is spoken of as the pitch, and is generally expressed in diameters. For connecting plates and bars in the framing, the pitch of the rivets runs generally to 7 diameters; for securing edges which must be water-tight, the pitch is from 4½ to 5, and, if they are to be oil-tight, 3 to 3½ diameters. In butts and edges of shell-plating the pitch varies from 3½ to 4½ diameters.

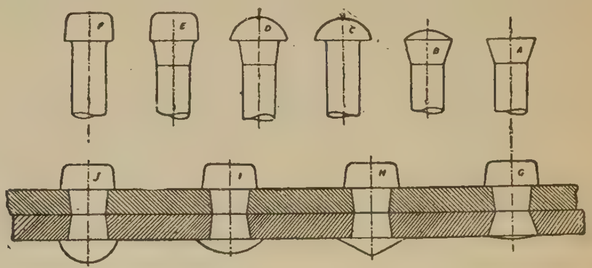


FIG. 76.

In some positions rivets like the above cannot be driven into place and properly hammered up; resort is then made to rivets which have screwed points, called *tap rivets*, shaped as shown in fig. 77. That shown at (B) is used where it is necessary to make the surface flush, but not necessary to remove the rivet for examination of plating; and when hove right up, the square head is chipped off and the surface hammered smooth. In other positions patterns (A) or (C) are used as may be most suitable.

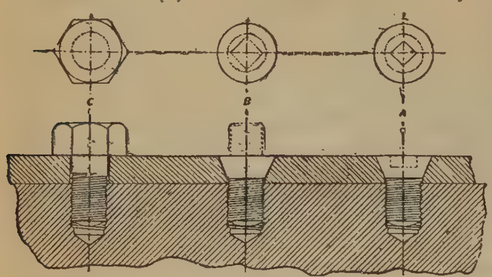


FIG. 77.

Machine tools.

The machines used in the shipyard have been much improved of recent years. The one most used is the punching and shearing machine, on one side of which plates of all thicknesses up to 2 in. may be cut or sheared to any desired form, while on the other side rivet holes may be punched of any required size. Special shears are provided with V-shaped cutters for shearing angle bars, but in some cases the cutters of ordinary shears may be replaced by V-shaped cutters for this purpose. When the plates and bars leave the shearing and punching machine their edges are rough and slightly distorted, to remove which it is necessary in many cases to plane them. This is usually done by special machines provided for the purpose. In the most modern types the cutters are duplicated and the machine arranged to cut both ways. When it is required to cut a square edge on the flange of an angle bar to facilitate caulking, a pneumatic chipping machine of recent introduction is frequently used, but this is more usually done in a planing machine. In shipbuilding a great deal of drilling must be done by hand, but, where it is possible, drilling machines are employed. The most modern forms can drill a number of holes at the same time. For countersunk work it is necessary to make the hole funnel-shaped, as will be seen from fig. 77. This shape is rapidly given to the holes already punched or drilled by means of a special drilling machine, which can be very easily and rapidly manipulated. The use of portable drills, to avoid hand labour, is rapidly increasing, and several types are in use, operated by electric motors, compressed air or flexible shafting. They are carried to any position required. The hole made by a drill is cylindrical, but that made in the process of punching is conical. On one side of the plate its diameter is determined by the diameter of the punch, and on the other by the diameter of the die, which must be greater than that of the punch. This taper tends to produce close and sound riveting, as the joint is closed both by the knocking down of the rivet and by the contraction of the rivet on cooling. On the other hand, the operation of punching injures the steel in the neighbourhood of the hole, and for work subjected to great stress this deteriorated material must be removed by countersinking or by drilling the hole to a larger size, or the quality of the material may be partially restored by annealing. The process of annealing consists in heating the steel to a good red, then allowing it to cool very slowly; during this process parts of the material which have been unduly distressed in working regain their strength by molecular rearrangements in the distressed parts. This process occurs to some extent when hot rivets are introduced into the holes and hammered up. The steel immediately adjacent to the rivet is heated, and afterwards cools gradually as the heat becomes distributed into the body of the plate. In some experiments carried out by the Admiralty in Pembroke Dockyard in 1905, it was found that the effect of punching holes close together, as for a butt-strap, was to diminish the tensile strength of the plates about 10%; that hot riveting restored about half of this; and that when holes were drilled and countersunk right through, also when holes were punched $\frac{3}{4}$ in. and countersunk right through, so as to enlarge hole to $\frac{7}{8}$ in. in diameter, there was no loss.

In addition to the machines mentioned above, many special appliances have recently been introduced into shipyards for the purpose of economically carrying out definite operations rendered possible by the use of mild steel. Ships built with a bar keel require the garboard strake plates on each side to be flanged on one edge, so as to fit against the bar keel. This flanging was formerly carried out by heating the plates and treating them hot, but now a very powerful machine, called a keel-plate bending machine, and usually worked by hydraulic power, is employed for the purpose with the plate cold. Flanging plates cold has also become general for a variety of purposes. In a bulkhead, stiffening is necessary, and for this purpose angle bars were commonly used; the horizontal stiffeners are now frequently formed by flanging the lower edges of the plates. Instead of fitting an angle bar to connect two plates at right angles to one another, the edge or end of one may be flanged, and half the weight of the angle bar and the rivet work saved. For all such work somewhat lighter flanging machines than the keel-plate bending machine are used; they are generally worked by hydraulic power, but there is no difficulty in driving them by any other means.

Another modern appliance is the scarfing machine, which is used chiefly in connexion with the lapped butts of shell and other plating. Before its introduction it was usual to bring the ends of the plates together and cover the joint with a short plate called a butt-strap, secured to both plates with a proper arrangement of rivets (see fig. 78). It is now more usual in merchant ships to work overlap butts, some half of the weight of the butt-strap and riveting and other work being saved thereby, although the appearance may not be quite so sightly. The difficulty with this system is that the passing plates on each side have their edges lapped over the ends of the lap-butt, and in order that they may be brought close some machining is necessary; this is called scarfing, *i.e.* slotting away the corner of the projecting butt so as to produce smooth surfaces for the side laps (see section at A B, fig. 78). The machine used for this operation is a slotting machine with two heads, so as to slot both edges of the plate at the same time; it is provided with a table which can be adjusted to the necessary bevel, so that the slotting tools may reduce the thickness of the edges operated on in a gradual taper to a knife-edge. A more recent appliance for reducing weight is the joggling machine. As already described, the usual method of working the shell-plating is by alternate inside and outside strakes of plating, the outside plates overlapping the inside plates, and the space between them and the frames being filled in by slips or liners. These liners throughout the ship amount to a considerable weight, and the object of the joggling is to do away with the necessity for them. This is effected by shaping the outside plates as shown in section *b*. fig. 79. Sometimes the frames are joggled instead of the plates, as shown in section *c*, fig. 79; the inside plate lies in the recessed portion of the frame formed by the joggling process, and the outside plate on the unrecessed portion, its edge lapping over the edge of the inside plate the usual width. The angle bar in this case must be heated, and the hydraulic press is placed so as to be readily accessible for the handling of the part to be heated. The system of joggling the frames has not been adopted to nearly so large an extent as that of joggling the plates.

Frame-bevelling machines appear to be growing in favour. The machine is placed on rails, near to and across the mouth of the frame furnace, so that it can be readily placed in position for the frame bar to be drawn out of the furnace directly through it, and moved to one side when not required. In the machine a series of rollers, which can be inclined to suit the varying bevel required, operate on the bar. The inclination of the roller is varied as the bar passes along, a dial and pointer giving the angle of bevel at each instant. As the bar passes through, the workman, with his eye on the dial, manipulates the machine so as to give it the required bevel. It is afterwards completed on the slabs, the form being taken from the scrive-board in the usual way.

The shipyard should be supplied with modern machinery of the most approved type, in order to produce the best work at economical rates: rolls for straightening and bending plates, for fairing and bending beams and angle bars; shaping and slotting machines; lathes and milling machines; heavy planing machines. It should also have a blacksmith's shop, saw-mills, joiners' shops, &c., all fully equipped for completing, as far as possible, the work of the yard. The workshops and machines should be distributed so that, as far as possible, the material moves steadily along, as the various operations are performed upon it, to its place in the ship. Pneumatic tools are often preferred for light work, such as chipping, drilling, rimering and caulking; they are also occasionally used for riveting, but they are not yet much in favour for this class of work. Hydraulic power is particularly well adapted for heavy presses, such as for keel-plate flanging, for punching and shearing, and especially for punching manholes and lightening holes in plates, and for heavy riveting. It is also very successfully applied for pressing to shape a great variety of small fittings made of steel or iron. For such machines as rolls, ordinary shears and punches, winches, &c., separate steam engines are still frequently fitted, but there is a very marked tendency to replace all these by electric motors. Electric power for driving all the machinery has been introduced into many shipyards. It has many advantages: all the power required in the yard may be generated in one building in any position, containing the boilers, steam engines and electric generators, and the whole may be designed and worked so as to secure great economy. The current is supplied either to motors directly driving the heavier or outlying machines, or to motors driving a line of shafting where the machines are of a lighter character and are arranged in compact groups. Fixed machines can be placed where most convenient for the work, without any reference to the position of the boilers or other machinery, and a large number of machines can be very readily made portable for the lighter classes of work. The power may be transmitted with but little loss, whereas with steam-driven machines at a distance from the boilers, lines of steam piping must be introduced, and loss of power is entailed. The saving which the system of electric driving effects over that of steam driving in the consumption of coal in a large shipyard is considerable, and is claimed by those who have adopted it to be sufficient to justify the large capital expenditure required to convert a shipyard from the latter system to the former.

As the plates, beams, angle bars, Z-bars, &c., are delivered, they must be stored in convenient racks, with marks showing for what purpose they are intended, so that they can be readily identified and removed without loss of time. When required, they are taken from the racks, and the edges, butts and rivet holes carefully marked upon them before they are taken to the machines where the shearing, punching, drilling, shaping, &c., are carried out, after which they are taken to their proper position in the ship.

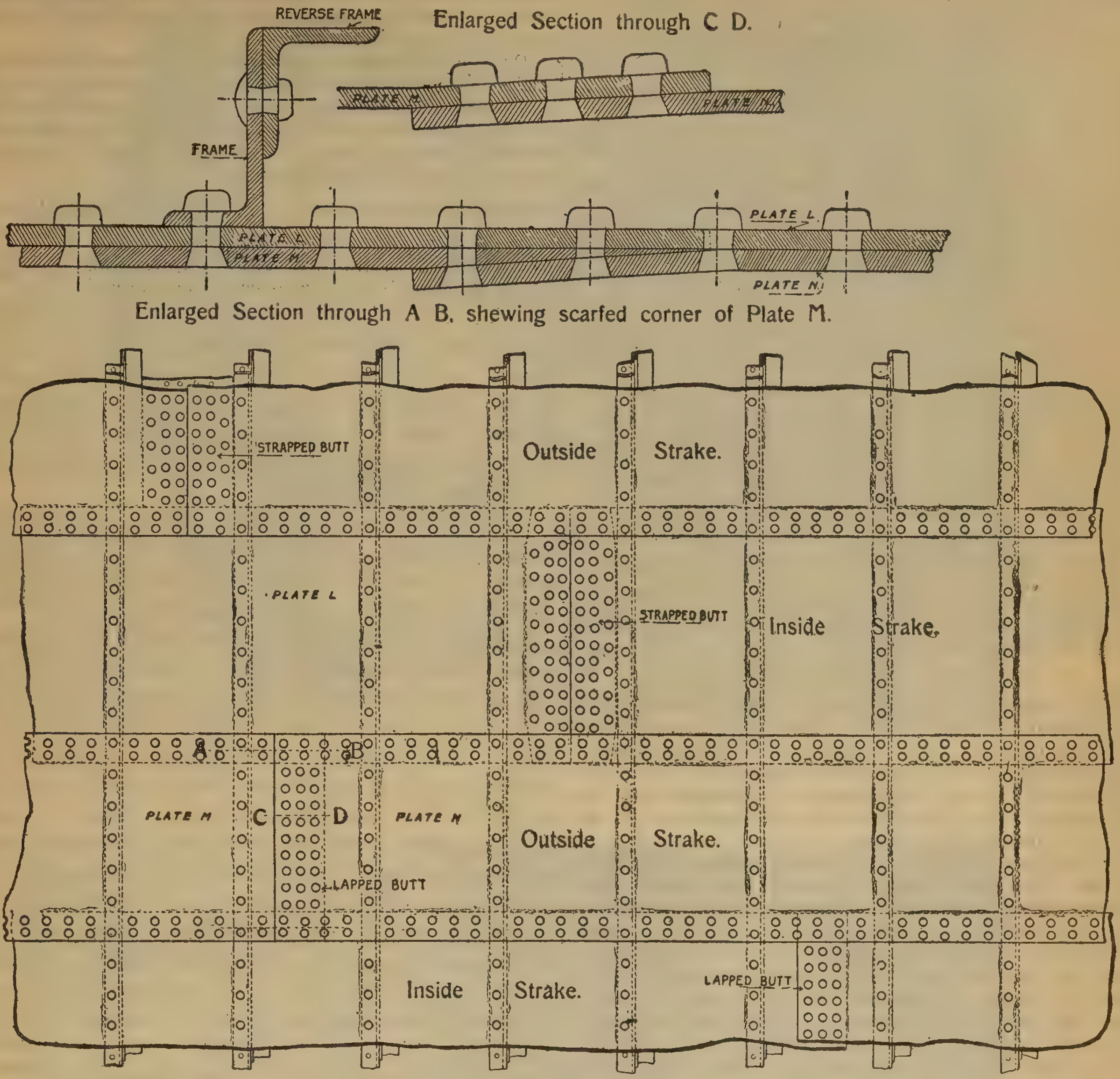

REVERSE FRAME
Enlarged Section through C D.
PLATE M
PLATE N
FRAME
PLATE L
PLATE L
PLATE M
PLATE N
Enlarged Section through A B, shewing scarfed corner of Plate M.
STRAPPED BUTT
Outside Strake.
PLATE L
STRAPPED BUTT
Inside Strake.
A
B
PLATE M
C
D
PLATE N
Outside Strake.
LAPPED BUTT
Inside Strake.
LAPPED BUTT

FIG. 78.—Details of Shell-plating.

Cranes.

In many shipyards great attention has been given to the questions of the economical handling of the material, and very costly and novel appliances are to be found in these yards for the purpose. As an example mention may be made of the overhead cranes fitted at the Union Ironworks of San Francisco. A framework of wood is built up over the entire building berth, the structure being well braced in all directions for carrying two travelling girder cranes. There are four building berths fitted in this manner, and the latest has a length of 408 ft., a clear breadth of 80 ft., and clear height of 72 ft. A swing crane of 50 ft. spread at each end of the erection increases its effective length to 500 ft. Each of the travelling girders carries a trolley, with motion transverse to the ship; five tons can be so lifted, and parts of the ship's structure not exceeding this weight can be taken from the ground anywhere in the neighbourhood of the structure and conveyed to any desired spot in the ship. The driving power is electric. The longitudinal travel of the girders is 180 ft. per minute; the transverse travel of the trolley and speed of lift, each 90 ft. per minute. A manila rope is used for hoisting, except for plates under the bottom and counter, where a wire rope is used.

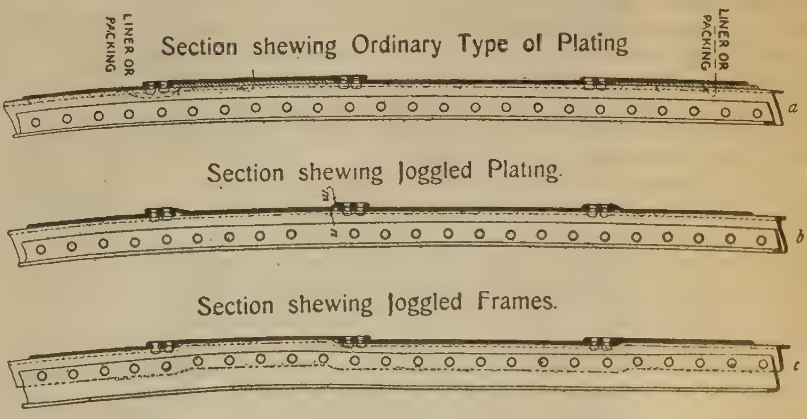

LINER OR PACKING
Section shewing Ordinary Type of Plating
LINER OR PACKING
a
Section shewing Joggled Plating.
b
Section shewing Joggled Frames.
c

FIG. 79.—Methods of working Shell-plating.

At Newport News, in Virginia, the structures are differently arranged, being on the cantilever travelling-crane principle. There are five such structures in the yard; three of them are wood, the last two of steel. The largest is 700 ft. long. One trestle structure, or gantry, serves two building berths, and runs longitudinally between the two. On the gantry is mounted a double cantilever crane, having an effective reach of 95 ft. on each side of the centre; this outreach is sufficient for a ship 70 ft. broad on each side of the trestle. The height of the cantilever above the ground is some 90 ft., the load that can be raised is 15 tons, and if necessary a bulkhead up to that weight can be lifted bodily into place. The speed of lift for this weight is 100 ft. per minute, and for lighter loads 700 ft. per minute. The speed of the trolley along the cantilever is 400 to 800 ft. per minute, and of the whole crane longitudinally is 400 to 700 ft. per minute. All movements are made by electric power. Similar gantries and arrangements are used in other American shipyards. The view shown in fig. 80 (Plate VIII.) represents one of these structures as fitted in Messrs Cramp's shipyard in Philadelphia.

At the yard of Messrs C. S. Swan & Hunter, on the Tyne, similar structures have been erected since 1894; besides carrying cranes, these have standards and stiffening girders, from which ships under construction are shored for fairing. Roofs and sides are fitted to protect the ship, and the workmen engaged in building her, from the weather. The side supports are three in number, and serve for two berths; they are formed of steel lattice-work, with standards mostly 20 ft. apart. The clear height of roof is 83 ft., and clear breadth of berths 68 ft. and 73 ft.; a roadway on the ground level is left free on each side of the berths inside the standards. Two revolving 3-ton electric cranes travel along paths suspended from each roof; their jibs have sufficient radius to lift material from the roadways and deposit it at the centre of the ships building. The longitudinal speed of these cranes is 300 ft. per minute; speed of lift, 100 ft. per minute. A third berth is served by a travelling cantilever crane on top of the adjoining roof. At Messrs Harland & Wolff's yard at Belfast another modification was introduced in 1897 (see fig. 81, Plate VIII.). In this case the structure takes the form of a travelling gantry or bridge over the building berth, the legs running on rails at the ground level. The gantry, which is driven by hydraulic power, has three traversing cranes and four 4-ton swing cranes. It was designed to facilitate the lifting of plates and portions of the structure into position, and also to support the hydraulic riveting machines and other appliances for the carrying out of the work. The success of the appliances, first used in the "Oceanic," has led to a further extension for other ships in hand.

COURSE OF CONSTRUCTION

The first steps taken on the receipt at the shipyard of the design drawings and specifications, which have been generally described on page 957, have for their object the provision of detailed drawings of the structural arrangements, which will enable materials for the various parts to be ordered from the manufacturers, and of information for the guidance of the workmen in erecting the structure.

A wooden model of half of the exterior surface of the ship, called the "half-block" model, is immediately prepared from the sheer drawing, generally to a scale of ¼ in. to the foot for a large ship and a somewhat larger scale for a small one, and on its surface are carefully drawn the main frames, the edges and butts of the outer bottom or shell-plating, together with the positions of decks, longitudinals and other features which influence the detailed arrangement of the framing and shell-plating, the particulars of which are fixed by the specification and the midship and other sections. The work on this model is carried out concurrently with the laying off of the ship, which will be described presently, so as to be complete by the time the latter is sufficiently far advanced to enable full-sized measurements of the breadth of the plates to be obtained. The lengths of the plates are then measured from the model and the breadths from the mould loft floor, a small surplus on the net measurements being allowed to provide for inaccuracies; and the whole of the outer bottom plating ordered from the manufacturers. The whole of the framing is also ordered, the lengths of the various parts being measured from the model.

A similar block model is made to the shape of the inner bottom, if one is to be provided, or of the top of the ballast tanks, as the case may be; and in a battle-ship a block model will be made of the protective deck if it should have much curvature or sloping sides. All details of plating, framing, beams, carlings, hatchways, &c., will be shown on these models, and the dimensions of all the parts will be carefully measured off and the material ordered of the manufacturers; the breadths of the plating being obtained as in the case of the outside bottom plating.

For flat or nearly flat surfaces such as flat keel plates, vertical keel, bulkheads, decks, engine and boiler bearers, &c., the detailed arrangements of plating and frames are made on drawings, from which the dimensions are taken for ordering the material from the manufacturers; while the drawings themselves constitute working drawings which are issued for general guidance in building the ship.

Drawings of details of important structural castings or forgings, such as the stem, sternpost and shaft brackets, are also among the earliest taken in hand, but the patterns to which these parts are made, when they are large and complicated castings as in a warship, cannot generally be completed without information obtained from the mould loft floor.

Laying off.

Laying off is the name given to the process of drawing the lines of a ship to full size in plan and elevation in order to determine the exact dimensions of the most important and fundamental parts of the structure. The necessity for drawing to full size arises from the extreme accuracy with which the dimensions of the various parts must correspond with one another in order that when assembled there may be no irregularity or unfairness in the surface of the ship; the methods of ordinary mechanical drawing to a small scale being inadequate for this purpose, on account of the analytically indeterminate nature of the curves which define the form of the ship. The process is carried out on a specially planed and blackened floor, most conveniently of rectangular shape, and of such a size as to take in the full depth of the ship in its width. The building or room in which the floor is situated is called the "mould loft," and is an important adjunct to the shipyard drawing office.

The rationale of the methods of projection of points and lines and rabatment of planes used in laying off is subjected to a detailed examination in the article GEOMETRY, part III., *Descriptive*, vol. xi., and therefore will not be referred to in this article, which is confined to a description of some of the detailed problems which occur in actual practice, the solutions being often approximations which are found sufficiently exact for practical purposes.

In different localities and in the construction of different types of vessel, the extent to which the process of laying off to full size is employed varies considerably. In some yards laying off on a large scale on paper is relied on almost entirely, and very little full-sized work on the floor is considered necessary. This chiefly applies to ships of stereotyped form, such as ordinary "tramp" steamers, the lines of which have very little curvature for the greater part of their length. In the American Lake shipyards for the cargo vessels employed on the Great Lakes templates are very carefully and ingeniously made for the framing, one set sufficing to mark off all the frames on the greater portion of the ship's length. In a similar way one template is made for each strake of plating and used to mark off the whole of the plates of that strake, a slip mould being used when they begin to depart from the parallel midship body.

The types of vessels in which the greatest complication of structure occurs and in which the highest degree of accuracy in building is necessary are passenger ships and war vessels; the description of the process of laying off, which follows, while generally applicable to all types of vessels, refers more particularly to the practice followed in building war vessels at the British Government Dockyards and at the more important shipbuilding centres in the United Kingdom.

Sheer drawing.

The nature of the Sheer Drawing, with a description of the principal lines shown on it, has been stated on p. 957. Specimen sheer drawings of different types of ships are shown on Plate IX. Fig. 83, Plate IX., is a sheer drawing of the Midland Railway steamer "Londonderry," designed by Professor J. H. Biles, LL.D., of length between perpendiculars 330 ft., breadth moulded 42 ft., depth 25 ft. 6 in., displacement 2200 tons, speed 21·7 knots. Fig. 82, Plate IX., is the sheer drawing of the battleship "Lord Nelson," whose dimensions and other particulars are set forth in the article on SHIP, page 898. Her form over the midship portion below the water-line and above the turn of the bilge is flattened so as to enable her to be docked in a dock existing at Chatham when she was built, and at the same time to secure the greatest possible beam of ship at the water-line; and the bottom of the ship out to the dotted line in the half-breadth plan is absolutely flat so as to enable her to be docked on two or more lines of blocks whose upper surfaces lie in one plane, thereby reducing the docking strains, a system adopted for the first time in the "Lord Nelson" and in all succeeding vessels of large size in the British Navy since this vessel. In Plate IX. figs. 85 and 87, the half-breadth and body plans of the royal yacht "Alexandra" are given in association with the profile, fig. 84, in place of the usual outline sheer, which is omitted to save space. In each of these sheer drawings the names of the various lines have been added; whereas in ordinary practice only the numbers of the stations in the sheer and half-breadth and of the sections in the body are given. In the sheer drawing, fig. 83, very little more is given in the three plans than the various sections and the traces of the planes, whose intersections with the surface of the ship they are; in such a case the sheer drawing is generally spoken of as *the lines*, and is only used for giving the outside form of the ship,

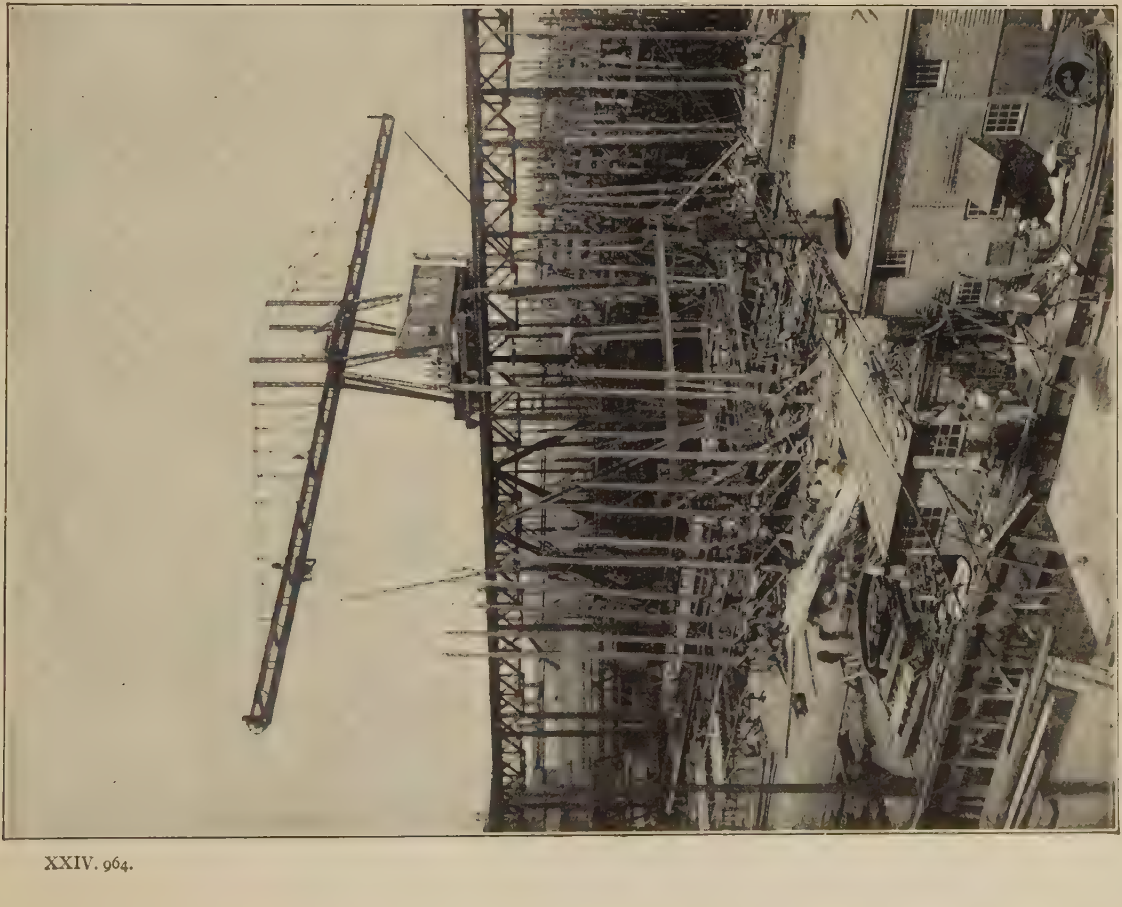


FIG. 80.

Gantry at Messrs Cramps' Shipbuilding Yard, Philadelphia.

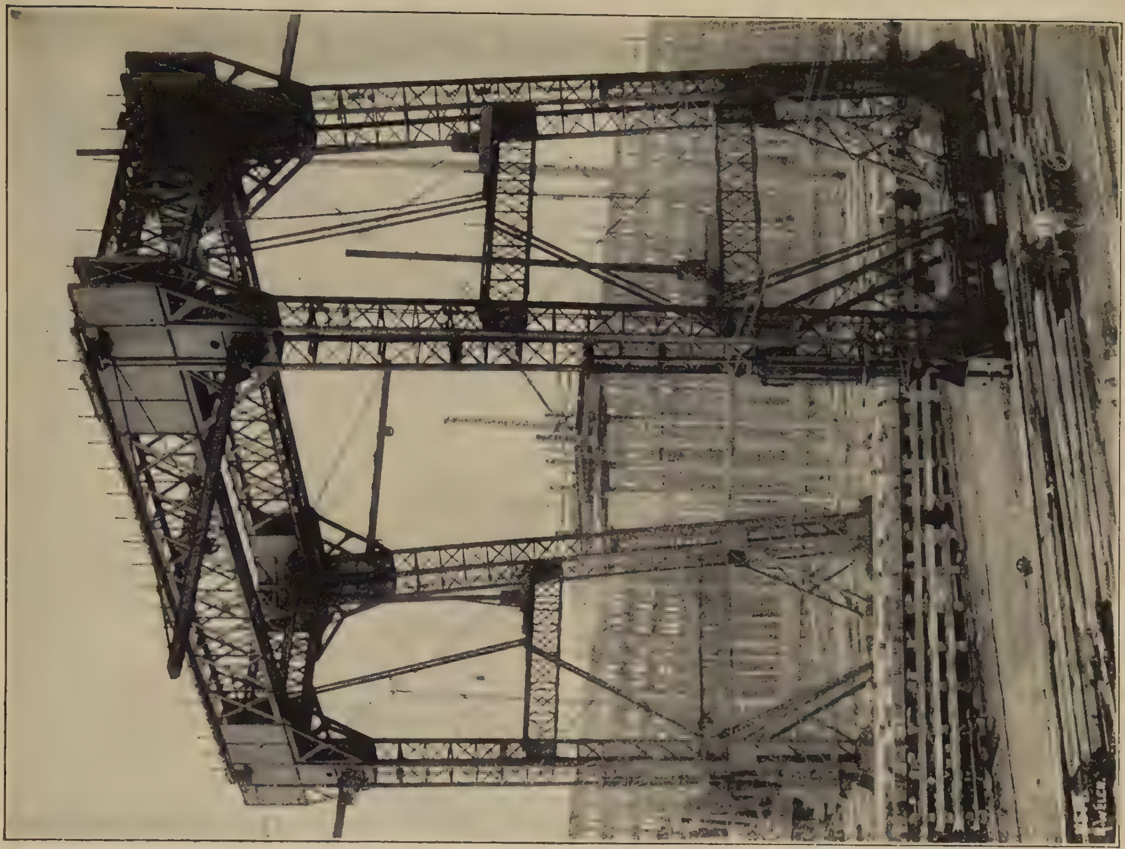


FIG. 81.

Gantry at Messrs Harland & Wolff's Shipbuilding Yard Belfast.

other information required for laying the vessel off and making the necessary moulds being usually given on other drawings. The sheer drawing of the "Lord Nelson" contains the information usually given concerning the form of the ship and other features of the design required for laying the vessel off, ordering the material for her construction and afterwards erecting the same in position. In these drawings it has been necessary for the sake of clearness to reduce the number of square stations and water or level lines commonly shown in drawings of this character. The number of these lines is fixed in the preparation of the design by the necessity of accurately defining the surface of the ship so that the intentions of the designer as regards form, displacement, and what may be called the geometrical features of the ship may be realised. In a large warship there are usually 21 square stations shown, including the forward and after perpendiculars, the distance between which defines the nominal length of the ship. The water-lines are 3 to 4 ft. apart. Intermediate square stations and water-lines are frequently introduced where the curvature of the surface of the ship is rapidly altering; as at the ends and below the bilge. It is usual, and obviously sufficient in the sheer drawing as well as in the process of laying off, to show only one-half of the ship on one side of the longitudinal vertical plane of symmetry. Thus, in the half-breadth plan only the port side of the ship is drawn; and in the body plan, for greater clearness, the half ship is further divided, the part forward of the midship section, or square station at the middle of the length of the ship, being shown on the right of the middle line of that plan, and the part aft of the midship section on the left of the middle line.

Other Drawings.—The profile and plans and the midship section have also been described in this article. The profile and plans of H.M. yacht "Alexandra" are given on plates. Fig. 84, Plate X., is the profile which shows in sectional elevation all the decks, bulkheads, machinery, living spaces, store spaces, &c.; figs. 86, 93, 94, 95 and 96, Plate X., give the plans of the promenade deck, upper deck, main deck, lower deck and hold respectively with important fittings shown upon them; figs. 88, 89, 90, 91 and 92, Plate X., give sections of the ship showing the inboard works at stations E, D, C, B and A on the profile respectively; and on fig. 97, Plate XII., is given the midship section with all the principal scantlings of the framing and plating. Fig. 98, Plate XIII., also gives the midship section of H.M. battleship "Lord Nelson."

Any two of the three plans of the sheer drawing may be taken to represent the "horizontal" and "vertical" planes of Descriptive Geometry, and are theoretically sufficient to define the shape of the vessel completely, but the three plans are practically necessary for the sake of clearness and are always used.

In the design sheer drawing the lines may represent the intersections of planes with the surface of the framing of the ship, or with an imaginary surface having a mean position between the irregularities of the surface of the ship caused by the system of plating adopted. The former system is the more usual in the drawings of steel-built merchant ships, necessitating an allowance on all measured dimensions used in calculating displacement, &c.; the latter system is usual in warships, in which the surface represented by the sheer drawing of a ship plated with raised and sunken plates strakes as described on p. 962, would be an imaginary surface midway between the outsides of the raised and the sunken strakes. A sheer drawing on this latter system is said to show displacement lines in contradistinction to the former system which shows "moulded" or frame lines. In the case of vessels with a plank sheathing over the bottom the surface shown on the sheer drawing is the outside of the planking.

As the primary object of the laying off of the ship is to ascertain the shape of the frames, the surface of the outside of the frames is always that which is laid off on the mould loft floor. If displacement lines are given in the sheer drawing a preliminary process of deriving from them the moulded lines is necessary before laying off on the floor. The process, to be strictly accurate, involves setting in the requisite distance along the normal to the surface shown in the sheer drawing. This is easily done at the midship section, where the normal to the surface lies in the plane of the section and coincides with the normal to the curve of the square station in the body plan, or at the practically vertical parts of the sides of the ship, where the normal to the surface lies in the water plane and coincides with the normal to the water-line in the half-breadth plan. In other positions, however, it would be necessary to rabat a plane containing the normal on one of the planes of reference, set in the required distance along the rabatted normal, find the projections of the point in the frame surface so obtained and of other similar points, and thus obtain the projections of curves on the frame surface, which by their intersections with ordinates and water-lines would give a new set of square stations and water-lines corresponding to the moulded surface of the ship. Such a process, though simple, is more laborious than is necessary in view of the degree of accuracy required, and in practice it is customary to set in normal to each square station a distance slightly greater than the thickness of the plank and plating, the increased distance required being roughly estimated from a consideration of the obliquity of the water-lines, without producing any sensible error.

The frame lines having been obtained, it is customary at some shipyards to "fair" the body on paper on a larger scale than that of the sheer drawing, before laying off on the floor. This saves a certain amount of labour in fairing the full-sized body on the floor, the errors in the body as first copied on the floor, which it is the object of the fairing process to correct, being proportional to the increase in scale in first copying. The process is similar to the full-sized fairing which is described below.

Fairing the body.

A straight line is drawn on the floor parallel to a fixed straight batten nailed to the floor a short distance from the wall of the building to represent the load water-line in the sheer and body plans and in such a position that the whole depth of the ship can be drawn with regard to it within the limits on the floor and clear of the batten, the inner edge of which becomes the base-line of the sheer, half-breadth and body plans. The fore and after perpendiculars of the sheer and half-breadth plans are drawn at right angles to this line and the fixed batten in convenient positions near the ends of the floor, the fore perpendicular on the right and the after perpendicular on the left as in the sheer drawing, and so as to allow the extreme outlines of the stem and stern to be drawn upon the floor together with not less than one-fifth of the length of the sheer and half-breadth plans at each end of the ship. A line perpendicular to the water-line and the fixed batten is drawn, usually near the middle of the floor, to represent the middle line of the body plan. The middle line of the half-breadth plan is usually taken as coinciding with the base-line, the inner edge of the fixed batten. The level or water lines shown on the sheer drawing are drawn in on the floor parallel to the load water-line so as to serve for both the sheer and body plans. Ordinates representing those given in the sheer drawing, which correspond to the sections in the body plan, are drawn in the sheer and half-breadth plans and others are added where desired, so also are additional water-lines between those shown on the sheer drawing and above the load water-line, so that in full-sized drawing on the floor the sections and stations may be sufficiently near for fairing the whole of the external form of the ship. If, as is usually the case, the ship is too long to be laid off in one length on the floor the midship portions of the sheer and half-breadth plans are drawn superposed over the forward and after parts, and are usually contracted longitudinally as will be described presently.

The distances from the middle line along each water-line in the body plan of the original sheer drawing, or of the enlarged body when the process of preliminary fairing has been adopted, to the intersection of the water-line with each section are measured to scale and tabulated. At the lower parts of the body, in the vicinity of and below the "bilge," where the water-lines cut the square stations very obliquely and the points of intersection become somewhat indeterminate, diagonal lines as shown by 1D, 2D in fig. 99 are drawn in the sheer drawing in such positions as to intersect as many as possible of the square stations approximately at right angles, and the corresponding diagonal lines are drawn on the floor. The distances from the middle line of the body plan in the sheer drawing along the diagonal lines to their intersections with the sections are measured and tabulated. It is usually desirable, especially in ships with a great extent of practically flat bottom, to draw bow and buttock lines to include this portion of the surface, such as 1B in the figure, as the diagonals approach more or less closely to bow and buttock lines and shorter measurements are required in transferring the lines; the heights of their intersections with the transverse sections above the base-line being measured and tabulated. The draught of water of the ship at the forward and after perpendiculars is given in the specification enabling the underside of keel in the sheer plan to be drawn in on the floor between the points where the rise of keel commences at the extremities. The flat part of the keel is generally uniform in width for the greater part of the length of the ship, and tapered at the extremities. The line representing its side must be drawn on the floor in the half-breadth plan. The height of keel-line above the base-line at each station in the sheer plan and the corresponding half siding of keel are the co-ordinates of the lower extremity of the corresponding transverse section in the body plan. The lower extremities of the sections are at once fixed in the body plan by the intersections of their horizontal and vertical ordinates transferred from the half-breadth and sheer plans For the upper endings of the transverse sections in the body plan a level line is generally drawn on the body of the sheer drawing just above the projection of the upper deck edge and the sections at the square stations produced to meet it. The intersections of this water-line with the sections are measured and tabulated.

The whole of this process of measurement and tabulation is frequently done in the drawing office, and the "loftsman" or person who conducts the laying off on the floor is not supplied with the sheer drawing, but only with these tables of "offsets," and similar tables for the lines in the sheer and half-breadth. The process, however, is the same in either case.

The tabulated measurements for the sections of the body plan are then set off full size by means of long measuring staffs on the lines on the floor, corresponding to those in the sheer drawing on which the measurements were taken, and thus give points whose co-ordinates are to those of the corresponding points in the drawing in the ratio of 48:1, if the drawing from which they were taken was to a scale of ¼ inch to the foot as is usually the case. A suitable wood batten is then bent or "penned" as nearly as possible through the series of points on the several water, diagonal and buttock or bow lines corresponding to each square station, being held in position by nails, specially adapted for the purpose, lightly driven into the floor, the batten in each case being adjusted so as to lie in a fair curve. Usually the batten will not under these conditions pass through all the points found for the curve on account of irregularities introduced or magnified in the process of enlarging to full size, and it must be allowed to take up a mean position passing outside some of the points and inside others. All of the sections in the body plan are drawn in with chalk in this way. The section where the greatest breadth of the ship occurs, usually at or near the middle of the length, must have the line parallel to and half the moulded breadth of the ship from the middle line for a tangent, and no section must project beyond this line.

The intersections of each section thus drawn, with the water and other lines, are the vertical projections on the body plan of points, the horizontal projections of which lie in the horizontal trace of the transverse plane at the corresponding square station or ordinate in the sheer and half-breadth plans, and are at the same perpendicular distances from the middle line of the half-breadth as the corresponding vertical projections are from the middle line of the body. For example, in fig. 99 p_1 and q_1 are the projections in the half-breadth of the same points of which p and q are projections in the body plan, and are found by making the ordinates of p_1 and q_1 measured from the middle line of the half-breadth plan at square station 2 equal to the perpendicular distances of p and q respectively from the middle line of the body plan. Thus points in the projections in the half-breadth of the water and diagonal lines can be found from the body plan already drawn, and in order that the surface of the ship may be fair, the series of points corresponding to any water or diagonal line must lie on a fair curve. In the case of a diagonal line the distance from the middle line of the body to the intersections of the diagonal with the square stations may be measured along the diagonal, and set off on the corresponding square stations in the half-breadth. This gives the true or rabatted form of the intersection of the diagonal plane with the ship's surface, and this, equally with the projected diagonal, must be a fair curve if the surface is fair. The diagonals are also projected into the sheer plan by measuring the height above the base-line at which each diagonal in the body plan cuts each square station, and setting up this height from the base-line of the sheer plan at the corresponding square station. The projections of the bow and buttock lines in the sheer plan are obtained in a similar manner. Thus in fig. 99 V_2 is projection in the sheer plan of the intersection of the bow plane 1B with square station 2, and t_2 is the projection in the sheer of the intersection of water-line 2WL with the same bow plane. The water-lines and diagonals in the half-breadth and the diagonals and bow and buttock lines in the sheer may thus be drawn as fair lines by the help of battens, and if the lines do not pass through all the points obtained by projection from the body plan, the sections in the latter are rubbed out and new ones obtained from the lines in the half-breadth. This process should be repeated until the curves in both plans are fair and the intersections correspond accurately with one another as the projections of points in space.

Contracted method of fairing.

No frame of the ship, however, is made to the curves of these water and diagonal lines, so that their true shapes are not required for any practical purpose except fairing the body. For the whole length of the ship, except about three to four twentieths at each end, space and labour are therefore saved and greater accuracy is ensured by using the contracted method of fairing. In this method the ordinates of the half-breadth are set only from $\frac{1}{8}$th to $\frac{1}{10}$th of their true distance apart, while the transverse measurements are made to full size as before, thus making the curvature of the water and diagonal lines sharper throughout the region over which it would otherwise be somewhat flat and indefinite. As the curvature of the contracted level and diagonal lines depends upon the differences between the lengths of the ordinates of the curves and not upon their actual length, a further saving of space is effected by measuring the distances to be set up as ordinates in the half-breadth not from the middle line of the body but from a point selected arbitrarily in each water or diagonal line, generally a few inches outside the midship section. By suitably varying the distances outside the midship section of these arbitrarily chosen points in the different water and diagonal lines, it can be arranged that the curves in the half-breadth do not interfere with one another, an advantage from the point of view of clearness. With the above modifications the process of fairing by the contracted method is precisely similar to that when the ordinates are their full distance apart.

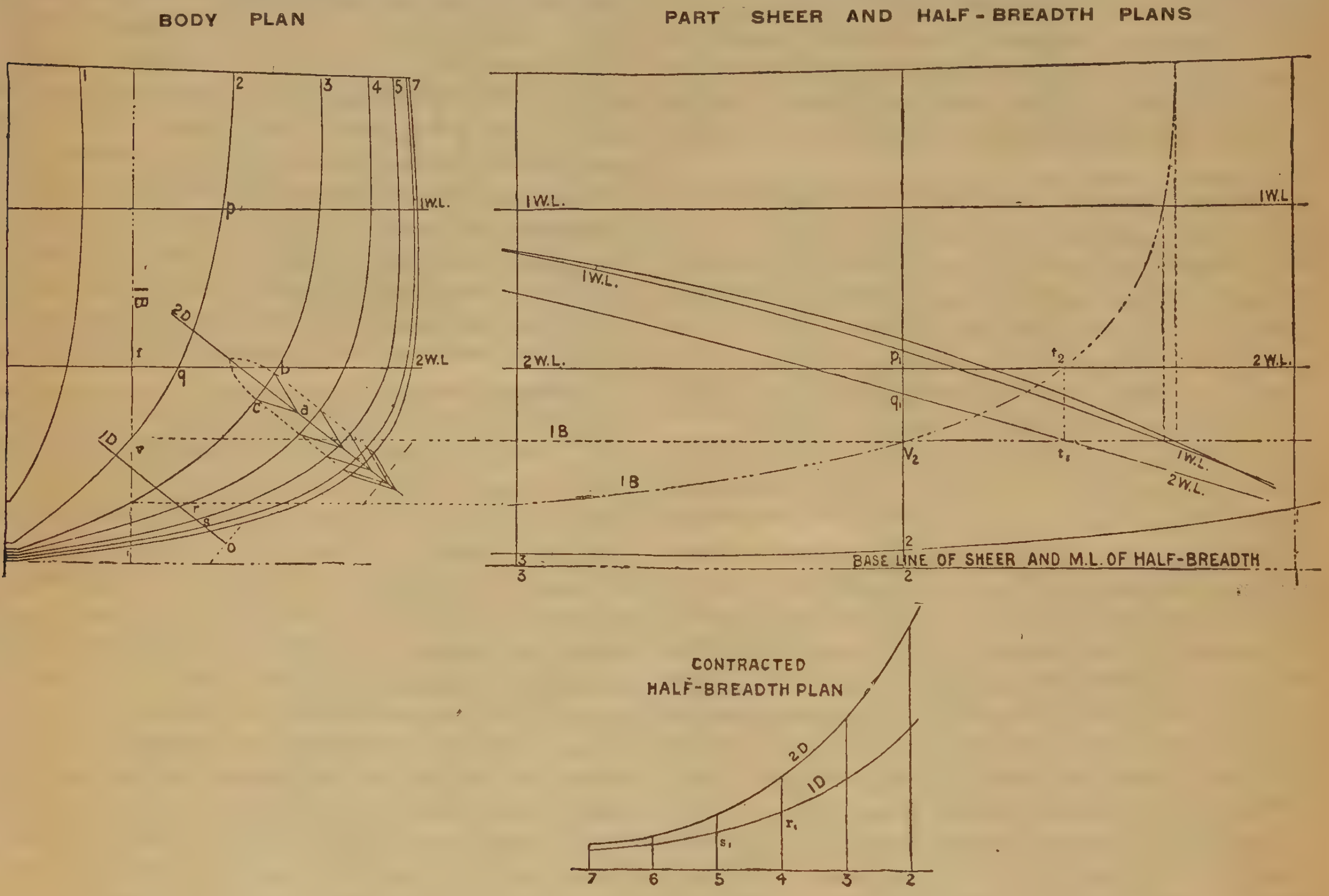

BODY PLAN
PART SHEER AND HALF-BREADTH PLANS
1
2
3
4
5
7
1W.L.
2W.L.
1B
1D
2D
p
q
a
b
c
r
s
o
p_1
q_1
V_2
t_1
t_2
BASE LINE OF SHEER AND M.L. OF HALF-BREADTH
CONTRACTED HALF-BREADTH PLAN
r_1
s_1
7
6
5
4
3
2

Fig. 99.

In fig. 88 the diagonals 1D and 2D are shown laid off by the contracted method, the spacing of the ordinates in the contracted half-breadth being $\frac{1}{8}$th of that representing the spacing in the diagram of the uncontracted sheer and half-breadth. In the contracted half-breadth the ordinates $4r_1$, $5s_1$, &c., are equal to the distances Or, Os, &c., measured to sections 4, 5, &c., in the body, O being a point arbitrarily selected in the diagonal 1D.

The principle of contracted fairing is sometimes extended by the

Fig 82.—Sheer Drawing of H.M.
Sheer

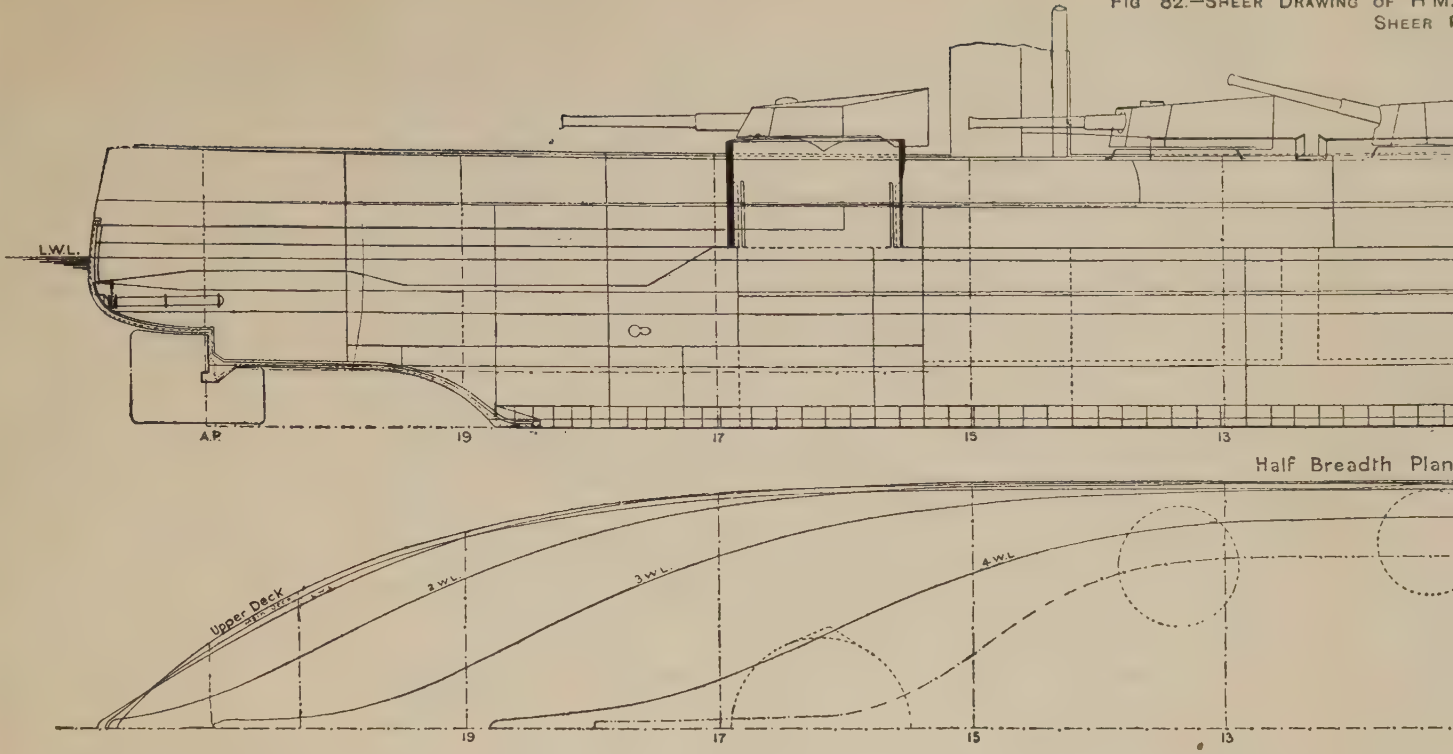
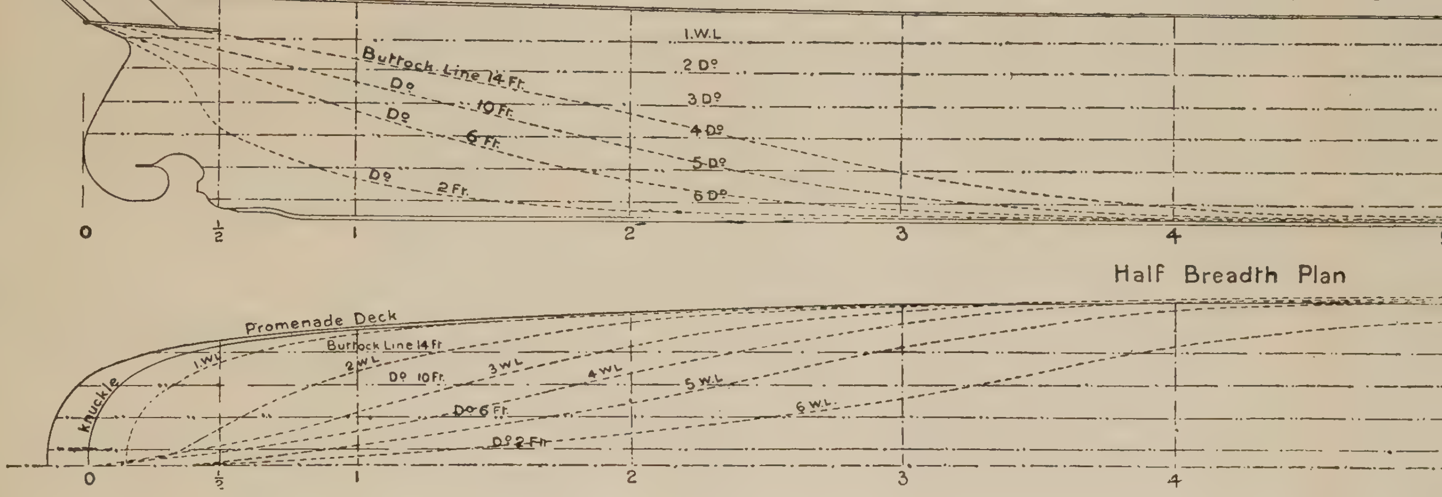

L.W.L.
A.P.
19
17
15
13
Half Breadth Plan
Upper Deck
Main Deck
2 W.L.
3 W.L.
4 W.L.
19
17
15
13

Fig. 83.—Sheer Drawing of
Sheer


I.W.L.
2 D°
3 D°
4 D°
5 D°
6 D°
Buttock Line 14 Ft.
D° 10 Ft.
D° 6 Ft.
D° 2 Ft.
0
½
1
2
3
4
Half Breadth Plan
Promenade Deck
Knuckle
1 W.L.
Buttock Line 14 Ft
2 W.L.
D° 10 Ft.
3 W.L.
4 W.L.
5 W.L.
6 W.L.
D° 6 Ft.
D° 2 Ft.
0
½
1
2
3
4

Particulars of H.M.S "Lord Nelson."

Length between perpendiculars	410 feet.	Displacement in Tons	16,500.
Breadth	79 feet 6 inches.	Speed, in Knots	18·5.
Depth	43 feet 8 inches.	Built	1908.

Body Plan of "Lord Nelson."

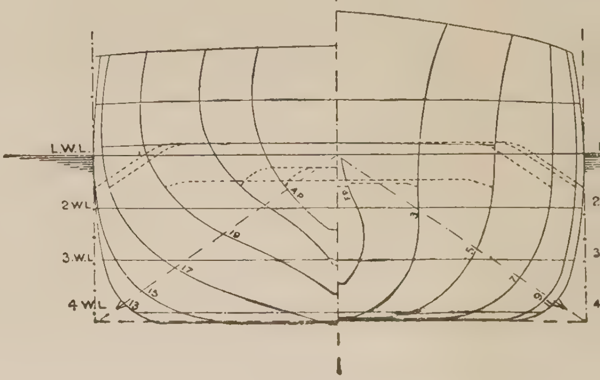
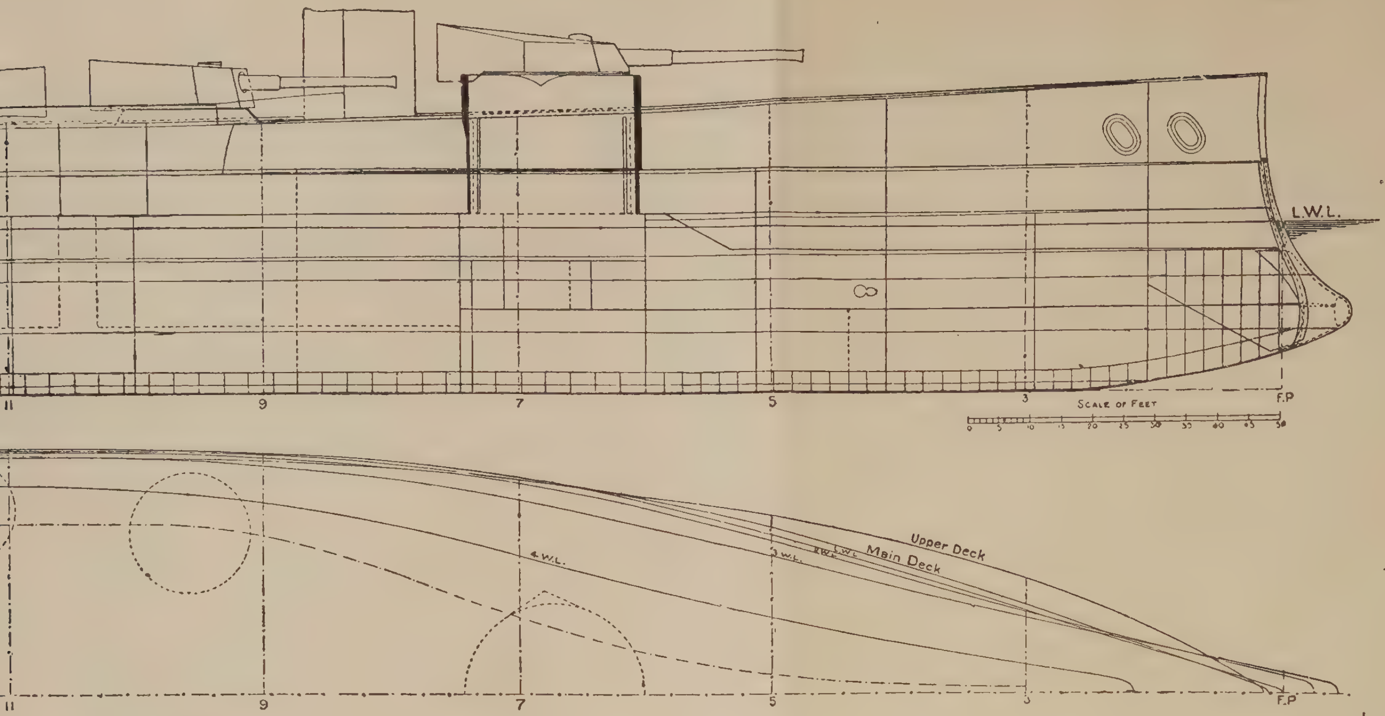
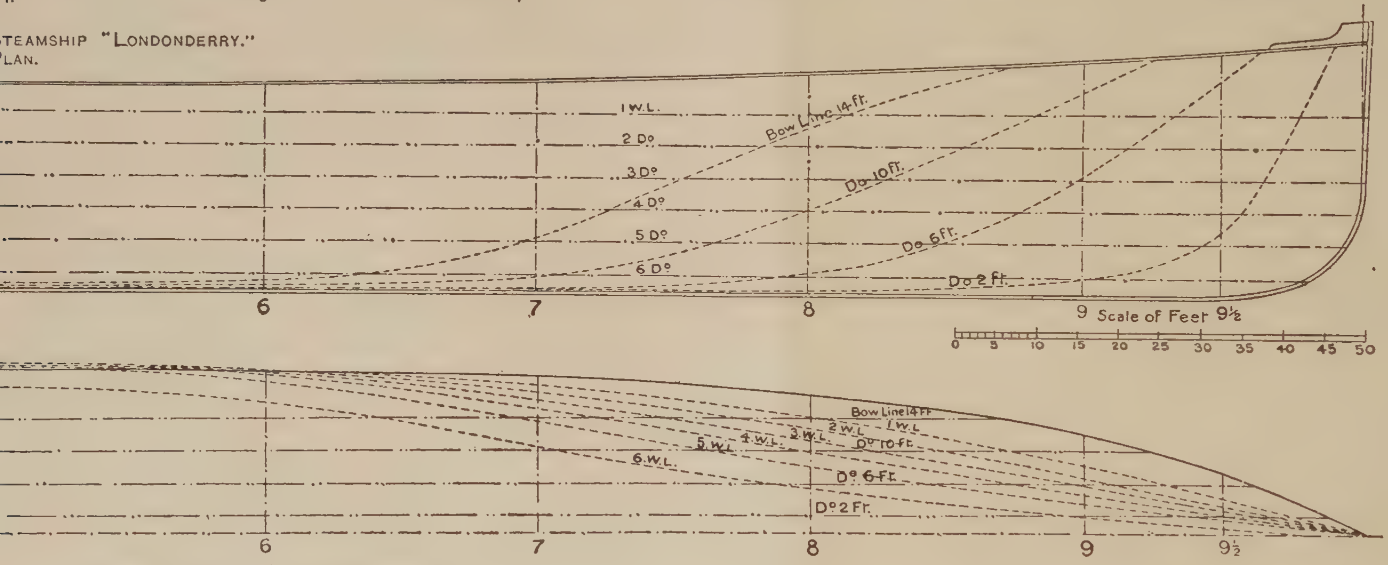

L.W.L.
2 W.L.
3 W.L.
4 W.L.
A.P.
19
17
15
13
1
3
5
7
9

Plate IX.

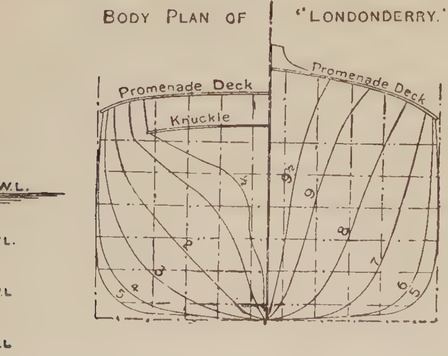
"Lord Nelson."
AN.


L.W.L.
11
9
7
5
3
F.P.
Scale of Feet
Upper Deck
Main Deck
4 W.L.
3 W.L.
2 W.L.
1 W.L.

STEAMSHIP "LONDONDERRY."
PLAN.


1 W.L.
2 D°
3 D°
4 D°
5 D°
6 D°
Bow Line 14 ft.
D° 10 ft.
D° 6 ft.
D° 2 ft.
6
7
8
9
9½
Scale of Feet
0 5 10 15 20 25 30 35 40 45 50
Bow Line 14 Ft
1 W.L.
2 W.L.
3 W.L.
4 W.L.
5 W.L.
6 W.L.
D° 10 ft.
D° 6 Ft.
D° 2 Ft.

Body Plan of "Londonderry."


Promenade Deck
Knuckle
Promenade Deck
W.L.
L.
L
L
9½
9
8
7
6
5

Particulars of Steamship "Londonderry."

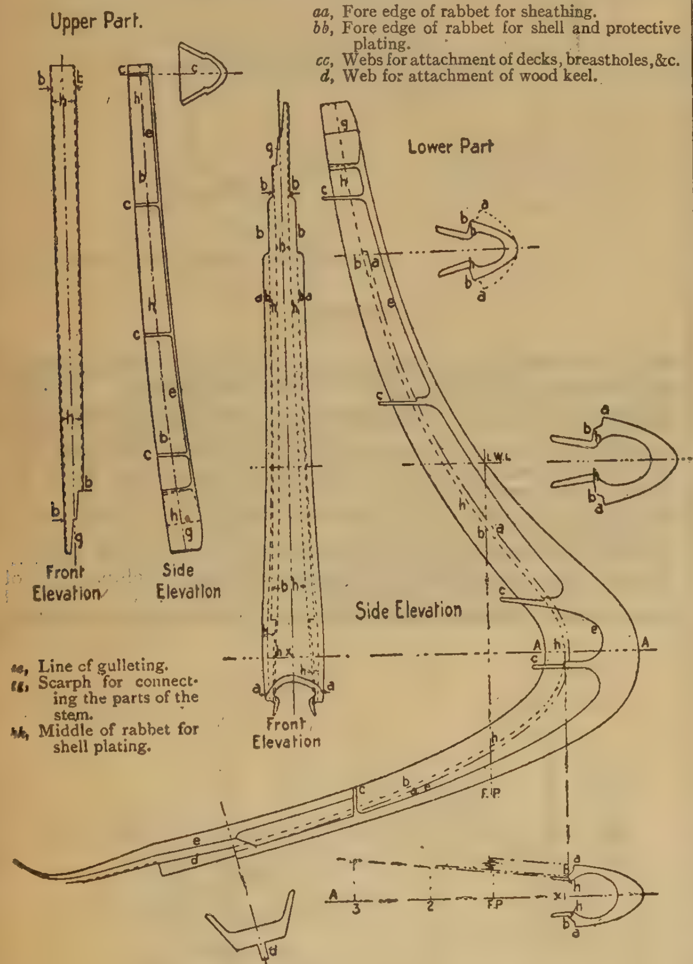
Length between perpendiculars	330 feet.	Displacement in Tons	2,200
Breadth, Moulded	42 feet.	Speed in Knots	21·7
Depth	25 feet 6 inches	Built	1904.

provision of a large drawing-board 4 or 5 ft. broad and long enough to take the whole length of the ship on a scale of $\frac{1}{24}$th full size. The ordinates of the half-breadth and sheer being set off on the board to this scale, any line in which the difference between the greatest and least ordinates does not exceed the breadth of the board can be faired thereon by this contracted method. This allows considerable lengths of the midship parts of diagonals and water-lines, and such lines as decks at middle and side, and any other lines of very flat curvature, to be faired on the board, resulting in a great saving of time and labour, owing to the convenient height at which the board can be placed, and to greater accuracy, as the fairness of the lines can be better seen and judged.

Fairing the ends.

At the forward and after ends of the ship the correct shapes of the water-lines are required in order to determine the shapes of the stem and stern-post, besides which the curvature of these lines is too great to permit of contraction of the abscissa scale. These parts are, therefore, faired by uncontracted water and other lines as already described, except that bow and buttock lines are used to less extent than in the flatter portions of the vessel.

Care must be taken that at the junction of parts of the ship faired by separate processes there shall be a considerable overlap throughout which the water and other lines in the two parts are identical in order to ensure the continuity of the surface.



aa, Fore edge of rabbet for sheathing.
bb, Fore edge of rabbet for shell and protective plating.
cc, Webs for attachment of decks, breastholes, &c.
d, Web for attachment of wood keel.

ee, Line of gulleting.
gg, Scarph for connecting the parts of the stem.
hh, Middle of rabbet for shell plating.

FIG. 100.

The detailed drawings of the stem and stern castings already referred to must ensure that these castings shall form a fair continuation of the outside surface of the plating or sheathing. They are perhaps most complicated in the case of sheathed armoured warships where the surfaces of "rabbets" or recesses for housing the bottom and armour plating and the wood sheathing must also conform to the lines of the ship laid off on the floor. A sketch of the stem casting for an armoured, sheathed ship with a ram bow is given in fig. 100, the sections being shown to a greater scale than the elevations for the sake of clearness, except the section at the water-line AA, which is drawn to illustrate the method of ending the water-lines, similar sections being drawn on the floor at the other water-lines. The fore edge of the stem is drawn in full size in the sheer plan on the floor in its correct position relatively to the fore perpendicular and water-lines by measurements taken from the sheer drawing, and the projections of the line of the inner angle of the rabbet for the shell plating, called the "middle of rabbet," marked *h* in the figure, are drawn in the sheer and body plans as fair lines. It should be observed that in the figure *h*, the middle of rabbet and *b*, the fore edge of rabbet of plating are shown in side elevation as coincident lines on account of the smallness of the scale; they will not be generally coincident on a full-sized projection on the floor. The middle of rabbet line is best faired in an expansion drawing. In this method a batten is bent to the curve of the projection of the line in the sheer plan, and the position of the water-lines where sections of the stem have been shown on the drawing are marked on the batten, which is then allowed to spring straight along a straight line drawn in any convenient position on the floor, and the positions of the water-lines are transferred from the batten to the floor. The distances such as *xh* in the section at AA are measured from each section given in the drawing and set up in full size perpendicular to the straight line on the floor at the positions corresponding to the sections. A fair line through the ends of these perpendiculars will give the distance *xh* at any position in the length of the stem and enable the projections of the middle of rabbet-line to be drawn accurately in the body and half-breadth plans.

To end any water-line such as AA in the half-breadth plan a perpendicular to the middle line of the half-breadth is drawn from the intersection of the line AA, with the projection of the middle of rabbet-line in the sheer plan, and the distance *xh*, taken from the body plan, or direct from the expansion of the middle of rabbet-line, is set out from the middle line of the half-breadth; the point *h* is the ending of the water-line AA required. The water-lines having been drawn and ended in this manner, additional ordinates coinciding with the transverse frames are drawn in the half-breadth plan and their projections obtained and faired in the body plan, in order to define more closely the somewhat twisted surface of the ship in the neighbourhood of the stem. Fairing these frame sections may involve correction and adjustment of the endings of the water-lines, which corrections are made subject to the condition that the projections and expansion of the middle of rabbet-line must remain fair curves. With the middle of rabbet thus fixed in proper relation to the faired surface of the fore end of the ship, the sections of the stem by the water-planes can be reconstructed in the half-breadth plan by the help of the drawing of the stem and of any additional information contained in the specification as to the nature of the fastenings of the plank and plating to the casting and the length of the hood ends. Where the general direction of the stem is considerably out of the vertical, sections of the frame surface by planes normal to the fore edge of the stem are obtained by the help of the closely spaced frame sections, and rabatted on the sheer plane; and sections of the stem casting constructed on them as in the case of the water-lines. In this way as many points as are required are obtained in the various lines in the surface of the stem, viz. the after edge of the casting, and the various angles of the rabbets, and these lines are faired so far as they are continuous in the three plans. The shell and protective plating and plank sheathing are also put on outside the various sections of the frame surface for a short distance in the neighbourhood of the stem, and the surface of the stem forward of the fore edge of the rabbet is faired in with the outside surface of the ship.

Stem mould.

A plain batten mould is made to the outline of the stem in the sheer plan, and the projections of the lines of rabbets and of gulleting, position and shape of webs for connecting to decks and stringers and to the wood keel, lines of rabbets for connecting to keel plates at the lower end and to the tuck plate at the upper end (if the casting is not continued right up to the forecastle deck), the position of the fore perpendicular and load water-line are marked upon it. Sections of the casting taken from the floor are painted on the mould, the centre lines of the sections indicating the position where they are taken, showing more particularly the changes in shape of the casting at such positions as the upper and lower edges of the protective plating and the upper edge of the plank sheathing. The stem mould thus gives complete information for the preparation of the pattern for the casting. The positions of the fore perpendicular and load water-line marked on the mould are transferred to the casting when made, and enable the stem to be erected in its correct position at the ship.

The after end of the ship is faired and the mould for the stern post and other castings prepared in a similar manner. The process of preparing the moulds for the stem and stern post is also generally similar to the above in the case of an unsheathed ship, but the castings are less complicated owing to the absence of the plank sheathing.

Displacement calculation.

The whole of the 21 square stations which constitute the original body plan having been faired as described above, it is usual to calculate the displacement and position of centre of buoyancy of the ship from the lines laid off on the floor to ensure that in the process of fairing no departure of any consequence has been made from the original design. For this purpose the steel plating and wood sheathing, if any there be, must be put on by a process the inverse of that described as taking off the plank. If any serious departure from the original design should be discovered as the result of this calculation, the lines must be corrected and again faired.

Frame lines.

The transverse frame lines are the intersections with the frame surface of transverse vertical planes passing through the lines of intersection of the two exterior surfaces of the flanges of the frame angle bars, or of the web and flange of any other type of rolled section which may be used for the frame. The distance between two adjacent frame lines, called the "frame space," is given in the specification, and the positions of the frames relatively to the ordinates are shown in the sheer plan of the sheer drawing. The frame space in a warship is commonly 4 ft. within the limits of the double bottom and 3 ft. forward and aft. In a merchant ship the spacing is usually less. The positions of the planes of the frames are set off along the middle line of the half-breadth plan, the proper scale being used in the contracted half-breadth, and ordinates are drawn to represent their traces in the half-breadth and sheer plans. The projections of the frame lines in the body are obtained from the intersections of the ordinates with the water and diagonal lines in the half-breadth and the bow and buttock lines in the sheer plan in a manner already described in the case of the more widely spaced stations used in fairing the body. These frame lines in the body should require no further fairing if the work has been accurately done when using the original square stations, and they can be at once rased in on the floor.

Cant frames.

As already stated, it is usual to dispose the transverse framing of a ship entirely in planes perpendicular to the trace of the load water-plane with the longitudinal plane of symmetry of the ship. This practice leads to a large and varying bevel being given to the frame bars at the ends of a vessel with a very bluff bow or stern, and it becomes a practical question whether it would not be better at such parts to dispose the frames in planes which are more nearly normal to the general surface of the ship and which need not be perpendicular to either of the three planes of reference. The disposal of frames in this way, more usually in planes perpendicular to the half-breadth planes only, when they are called "cants," is in common use in wood shipbuilding, it being of great economical importance that the timber frames shall be of square or nearly square section, but it is also adopted in iron and steel ships of unusual form or having special features, such for instance as a lifting screw propeller.

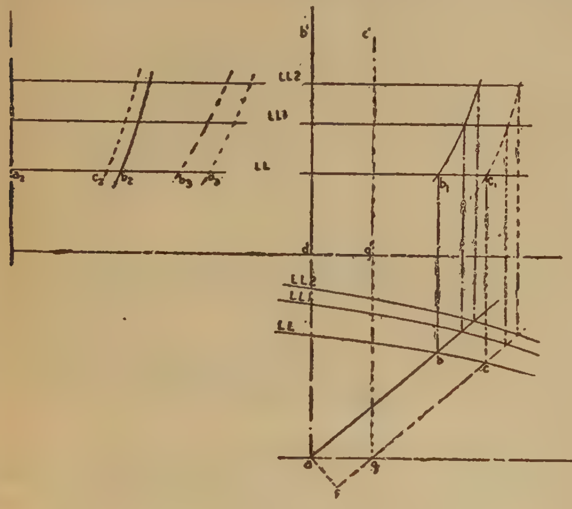


FIG. 101.

To lay off a cant frame or "cant": Let the traces of the *cant* be $a'b'$, ab in fig. 101. Let LL be the projections of a level line in the three plans intersecting ab at b in the half-breadth. Then b_1 in the sheer is the vertical projection of b, and a curve through all such points as b_1 is the projection in the sheer of the shape of the frame or, as it is called, of the moulding edge of the frame. b_2 in the body, where a_2b_2 is equal to the perpendicular distance of b from the middle line of the half-breadth, is a point in the projection in the body plan; and b_3 where a_2b_3 is equal to ab is the position of the point, when the cant plane is hinged about $a'b'$ until it is parallel with the body plane. Hence a curve drawn through all such points as b_3 is the true form of the moulding edge of the cant. To obtain the angle which the surface of the ship makes with the plane of the moulding edge, a plane parallel to that of the moulding edge and distant from it the width of the bevelling board must be laid off in a suitable position in the body plan. Let $g'c'$, gc be the traces of such a plane where af, the normal distance between it and the plane whose traces are $a'b'$, ab, is the breadth of the bevelling board. The vertical projections of c, viz. c_1 and c_3, in the sheer and body are found in the same way as those of b; but in order to obtain the rabatted curve of the bevelling edge in such a position relatively to the moulding edge that the perpendicular distance between the two curves measures the bevelling in the same way that the perpendicular distance between two frame lines of the square body measures their bevelling, it is necessary to first project the bevelling edge on the plane of the moulding edge before rabatting the latter. The whole operation is effected by making $a_2 c_3$ in the body equal to fc in the half-breadth, where af is perpendicular to ab and gc. A curve through all such points as c_3 is the bevelling edge laid off in the position relative to the moulding edge required, the bevellings being taken in a similar manner to those of the ordinary transverse frames.

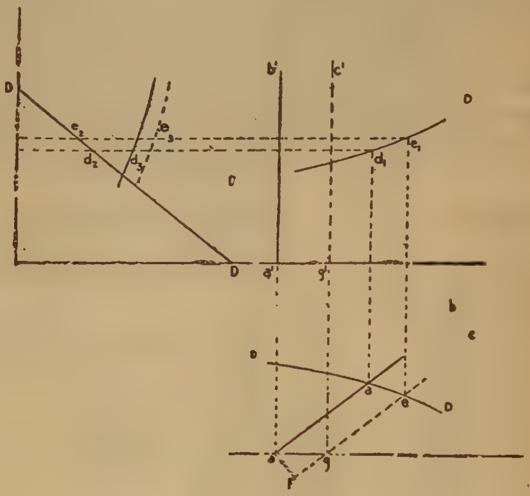


FIG. 102.

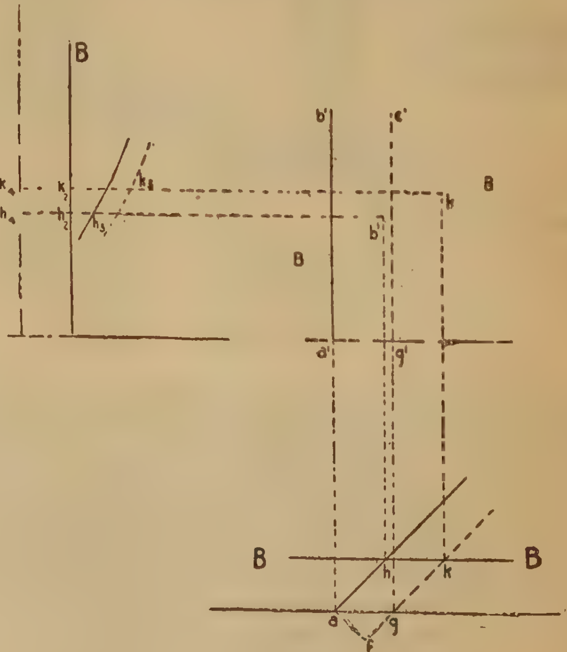


FIG. 103.

Spots on the cant can also be obtained from diagonals as follows:—In fig. 102 let DD be the projections of a diagonal line in the three plans cutting the horizontal traces of the moulding and bevelling edges at d and e in the half-breadth. The projections d_1, e_1 in the sheer and d_2, e_2 in the body of the intersections of the diagonal line with the planes of the moulding and bevelling edges are obtained in the same way as in the case of the level line, and the method of obtaining the rabatted positions, when the plane of the moulding edge, with the bevelling edge projected upon it, is turned about $a'b'$ until it is parallel to the body plane, is also analogous; but in this case the corresponding points of the moulding and bevelling edges are in different level planes d_2d_1 e_2e_1. Points in the rabatted curves of the moulding and bevelling edges of the cant may also be obtained from the intersections with bow and buttock lines, as shown in fig. 103, where BB are the projections of the bow or buttock line in the three plans. The method is analogous to that described above when using level lines and as shown by the figure, h_3 and k_3 being rabatted positions of points in the moulding

Fig. 84. H.M.Yacht "Ale

Particulars

Length between Perps .... 275 Feet
Breadth .... 40 .....
Draught (even keel) .... 12 Ft 6 Ins
Displacement ... . 2050 Tons

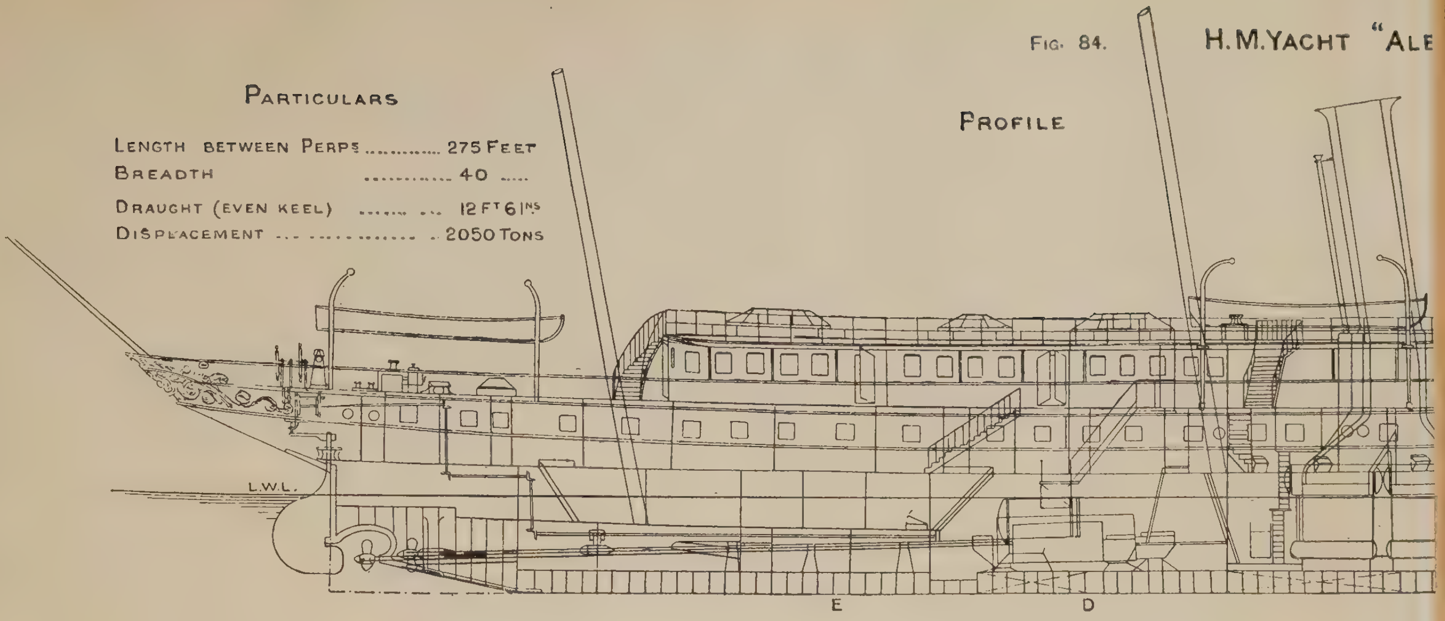

Profile
L.W.L.
E
D

Fig. 85

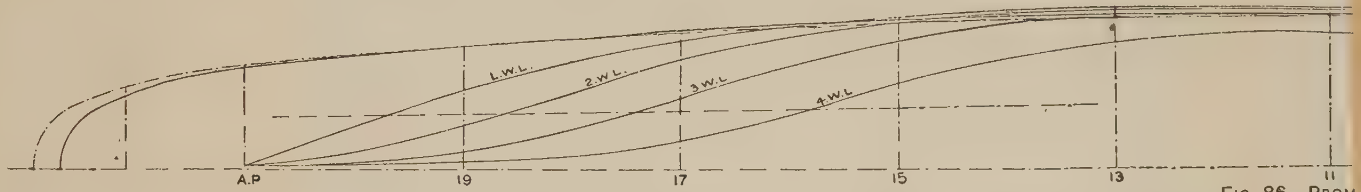

L.W.L.
2.W.L.
3.W.L.
4.W.L.
A.P
19
17
15
13
11

Fig. 86.–Prom

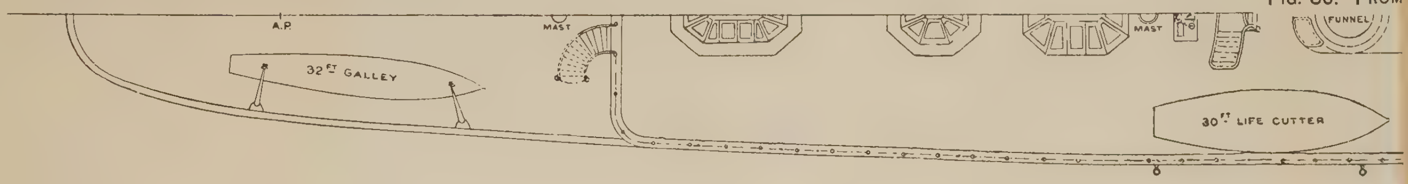

A.P.
32 Ft Galley
Mast
Mast
Funnel
30 Ft Life Cutter

Fig 87.—Body Plan.

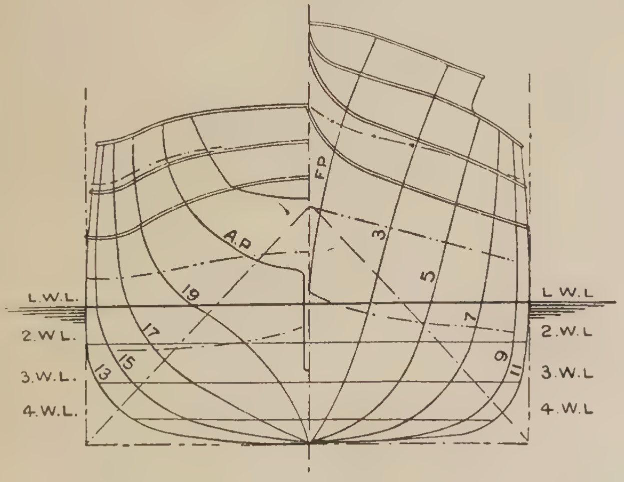

F.P.
A.P.
3
5
7
9
11
13
15
17
19
L.W.L.
2.W.L.
3.W.L.
4.W.L.
L.W.L
2.W.L
3.W.L
4.W.L

Fig. 88.–Section at E.

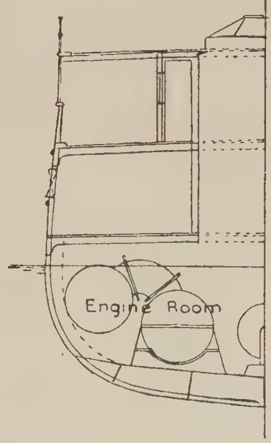
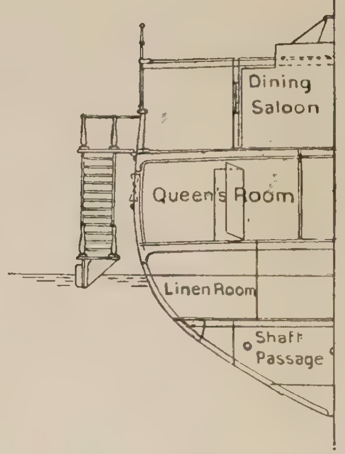

Engine Room

Fig 89.–Section at D


Dining Saloon
Queen's Room
Linen Room
Shaft Passage

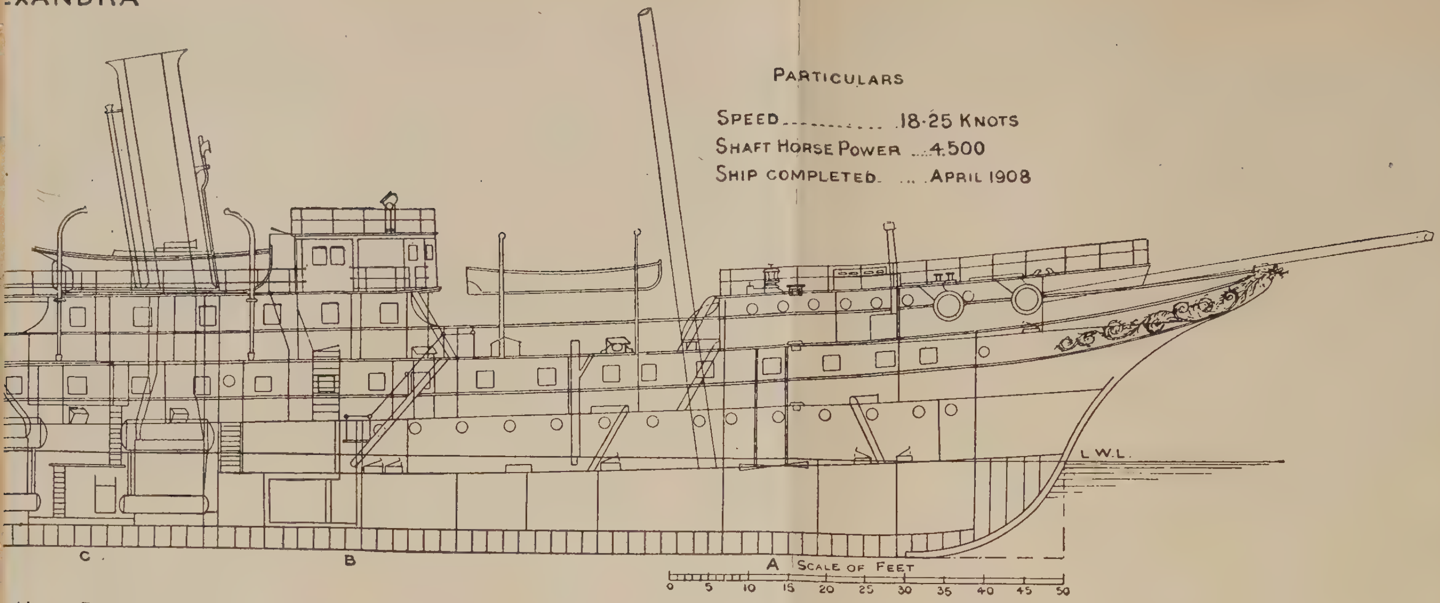
EXANDRA"

PARTICULARS

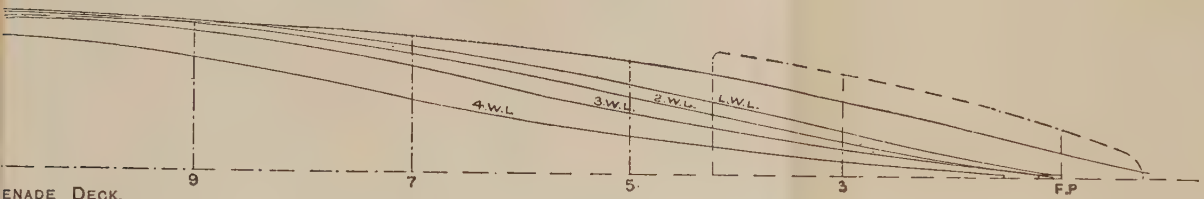
SPEED .... 18·25 KNOTS

SHAFT HORSE POWER ... 4.500

SHIP COMPLETED ... APRIL 1908


L.W.L.
C
B
A
SCALE OF FEET
0 5 10 15 20 25 30 35 40 45 50

HALF BREADTH PLAN


4.W.L.
3.W.L.
2.W.L.
L.W.L.
9
7
5
3
F.P

ENADE DECK.

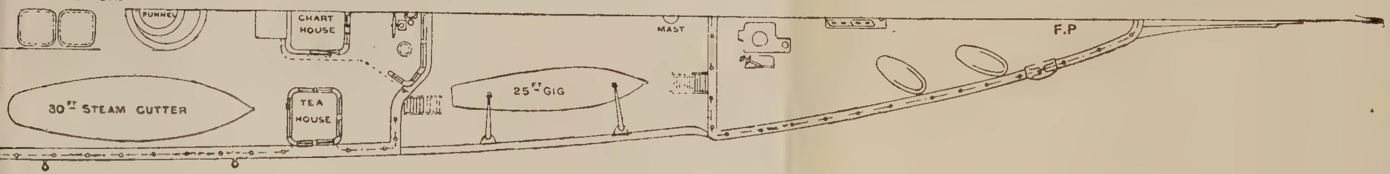

FUNNEL
CHART HOUSE
MAST
F.P
30FT STEAM CUTTER
TEA HOUSE
25FT GIG

FIG. 90.—SECTION AT C

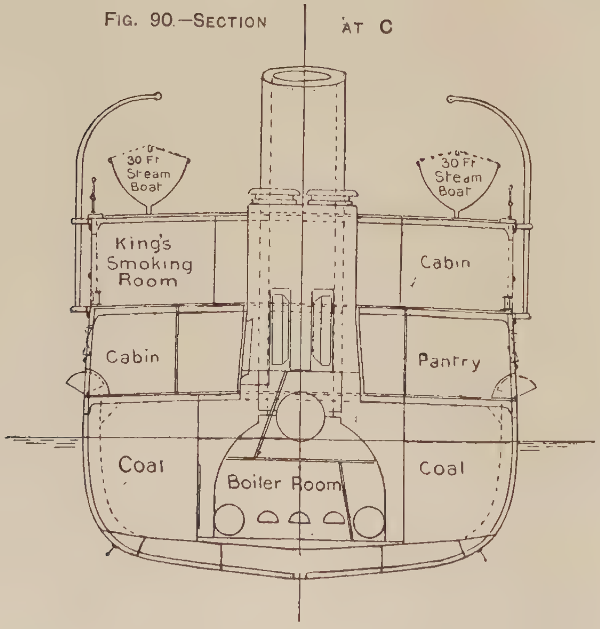

30 Ft Steam Boat
30 Ft Steam Boat
King's Smoking Room
Cabin
Cabin
Pantry
Coal
Boiler Room
Coal

FIG. 91 SECTION AT B

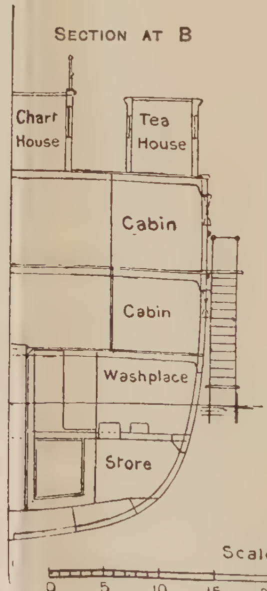
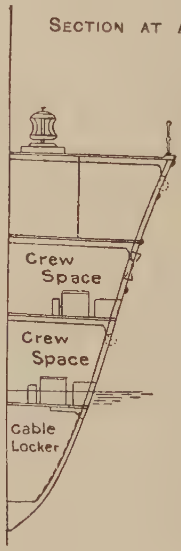


Chart House
Tea House
Cabin
Cabin
Washplace
Store

FIG 92 SECTION AT A


Crew Space
Crew Space
Cable Locker
Scale of Feet
0 5 10 15 20 25 30 35 40 45 50

and bevelling edges respectively; where $h_4 h_3$ is equal to ah and k_4k_3 to fk.

Double canted frame.

In fig. 104 let AB, A′B′ be the traces of the plane of the moulding edge of the frame in the sheer and half-breadth plans respectively. When, as in the figure, neither trace is perpendicular to the base line, the frame is said to be a double canted frame, or a double cant. Let 1L, 2L, 3L be the projections of level lines in the three plans, P, Q, R in the sheer plan being their point of intersection with AB. The horizontal projections of these points are found as indicated in the figure where Q′ on the middle line of the half breadth is the horizontal projection of Q. The line $Q'q'$ parallel to A′B′ is the horizontal projection of the line of intersection of the double cant plane with the level plane 2L, and q, obtained by the construction shown, is the vertical projection of the point where this line of intersection cuts the surface of the ship, q' being the horizontal projection of the same point. The projections of other points in the intersection of the double cant plane with the surface of the ship are found in a similar manner by the help of other level lines; and the projections s' and s of the ending where the line of half siding of the flat keel cuts the double cant plane are found by the construction indicated. The projections of the moulding edge of the double cant frame $spqr$ in the sheer plan and $s'p'q'r'$ in the half-breadth are thus determined.

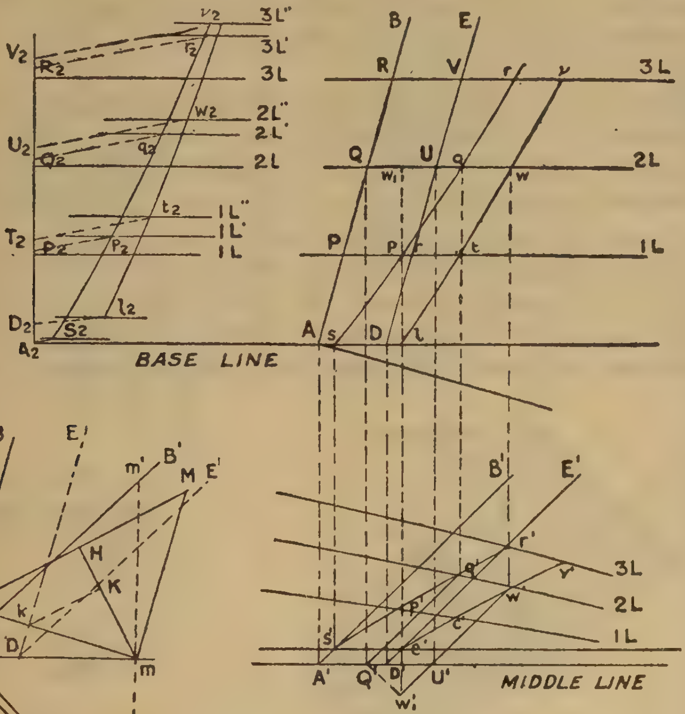


FIG. 104.

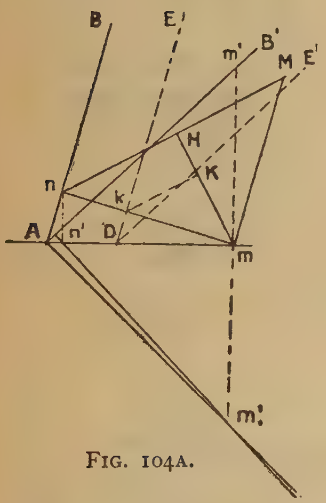


FIG. 104A.

The true form of the moulding edge is laid off in the body plan by a double process of rabatment of the double cant plane, first about the trace AB to bring it perpendicular to the sheer plan, and then about a normal to the sheer plan through A to bring it parallel to the body plan, in the following manner. Set off P_2, Q_2, R_2 on the middle line of the body so that their distances from A_2 are equal to AP, AQ, AR measured along the trace AB in the sheer plan. Draw AC in the sheer plan perpendicular to AB and measure the heights parallel to AB of the points p, q and r above AC. Draw level lines 1L′, 2L′, 3L′ in the body plan at distances above the base line equal to these heights, and from the centres P_2, Q_2, R_2 describe circles cutting 1L′, 2L′, 3L′ in p_2, q_2, r_2, &c., so that the radius Q_2q_2 is equal to $Q'q'$, &c. The curve $p_2q_2r_2$ is the true form of the moulding edge of the double cant laid off in the body plan.

The plane of the bevelling edge is parallel to that of the moulding edge and at a perpendicular distance from it suitable for use as the base of a bevelling triangle similar to that which is described for the ordinary frames. The width of the bevelling board is made equal to this perpendicular distance, corresponding to the frame space in the case of the ordinary frames, and the bevelling edge must be laid off so that the normal distance between it and the moulding edge can be used for marking the bevelling in the same way as the normal distance between consecutive frames of the square body is used.

To obtain the traces of the plane of the bevelling edge, in fig. 104a let AB, AB′ be the traces of the moulding edge plane; nm drawn perpendicular to AB and mm' perpendicular to the axis are the traces of a plane perpendicular to the plane of the moulding edge and to the vertical or sheer plane. If mM be drawn perpendicular to nm and equal to mm', nM is the intersection of the planes BAB′ and nmm' rabatted on to the sheer plane, and mH perpendicular to nM is the rabatted position of a line perpendicular to the plane of the moulding edge. Make HK equal to the chosen distance of the bevelling edge plane from the moulding edge plane; draw Kk parallel to Mn cutting nm in k; through k draw DkE parallel to AB and through D, where DE meets the base line, draw DE′ parallel to AB′; then DE, DE′ are the traces of the plane of the bevelling edge arranged at the required perpendicular distance from the plane of the moulding edge.

In laying off the bevelling edge it is first projected on to the plane of the moulding edge, and the latter then rabatted into the body plane. To effect this operation the horizontal trace Am'_1, of a plane perpendicular to the double cant plane and intersecting it in the vertical trace AB must be drawn, which is done by the construction shown in fig. 104a, where nm is, as before, perpendicular to AB through any point n in it other than A, and $n'm'_1$, drawn through n', the horizontal projection of n, is perpendicular to AB′. The projections of the traces with the several level planes of the plane of the bevelling edge, such as $U'w'$ and the projections of the bevelling edge $ltwv$ in the sheer plan and $l't'w'v'$ in the half-breadth are obtained in exactly the same way as in the case of the moulding edge. The projections such as $Q'w'_1$, of the traces with the several level planes of the plane whose traces are AB and Am'_1, in fig. 104a are also drawn parallel to Am'_1, through the horizontal projections of P, Q, R, &c. The vertical projection w_1 of the point w'_1, in which $Q_1w'_1$ meets $U'w'$ produced, is found and A_2U_2 set up on the middle line of the body equal to the perpendicular distance of w_1 from AC. A level line 2L″ in the body plan is drawn at a distance from the base line equal to the perpendicular distance of w from AC and a point w_2 found in it such that the radius U_2w_2 is equal to w'_1w' in the half-breadth. w_2 is then the rabatted position of the projection on the plane of the moulding edge of the point in the bevelling edge whose projections are w and w'. Points l_2, t_2 and v_2 corresponding to the projections l and l', t and t', v and v' are found in a similar manner and a curve drawn through $l_2t_2w_2v_2$ is the bevelling edge laid off in the body plan in the correct relation to the laid off position of the moulding edge for the bevellings to be taken.

Additional points in the rabatted shape of the double canted frame may be obtained by the use of diagonals when desired. In fig. 105 AB, A′B′ are the traces of the double canted plane; cd, c_3d_3 are the projections of a diagonal line in the body and

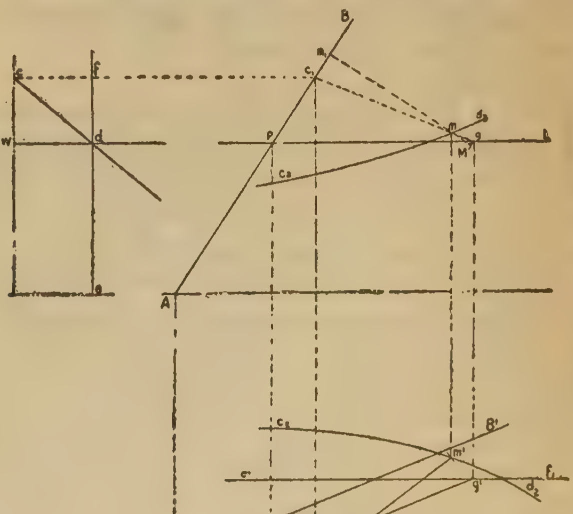


FIG. 105.

sheer and c_2d_2 its rabatment in the half-breadth plan. Draw ef, $e'f'$, the traces of a bow plane and through d where it cuts the diagonal in the body draw the trace of a level plane WL. Find the intersection pL, $p'g'$ of this plane with the double cant plane. Then g', g the intersection of pL, $p'g'$ with the bow plane is a point common to these two planes and to the bow plane. Since this point is common to the level plane WL and to the bow plane ef, $e'f'$, it lies in the diagonal plane cd. Hence gg' is a point in the diagonal and double cant planes. In a similar manner c_1c' is a point in the same two planes. Therefore c_1g is the projection of the intersection of these planes, and m where c_1g cuts c_3d_3 is a point where the double cant plane meets the diagonal line. In rabatment of the double cant about AB, m moves in the line m_1mM perpendicular to AB. If now m be projected on to c_2d_2, then M taken in m_1mM so that m_1M is equal to $c'm'$, will be a point in the moulding edge of the double-canted frame rabatted on to sheer plan. Similar points can be obtained for each diagonal. The plane of the bevelling edge is determined as previously described, and the bevelling edge laid off similarly to the moulding edge, except that provision must be made that it shall come in its right relation to the moulding edge for bevellings to be taken as in the previous case when laying off by level lines.

Swell for propeller shaft. A method of determining and fairing the swell for the propeller shaft in a twin or multiple screw ship is shown in fig. 106. The projections of the centre line of shaft, which are given in the sheer and half-breadth plans of the sheer drawing, are drawn in these plans on the floor, and the projection in the body plan of the trace of centre line of shaft with the plane of each square station is found as shown by the series of points on the straight line a b in the figure. The radius from the centre of shaft required for the shaft tube and fittings at the boss frame, or frame where the shaft passes outside the ship, is found from the machinery specification. This is increased by the thickness of the plank in the case of a wood-sheathed ship and of the plating, and by any allowance necessary for clearance and for the obliquity of the shaft line, and a frame is selected for the boss frame such that a circle drawn with that radius, viz. H in figure, from the trace of the centre line of shaft with the frame plane in question would just touch the frame line on the outside. The length and amount of projection beyond the ordinary frame lines of the shaft swell can be considerably reduced if the frames abaft the boss frame, viz. frame No. 14 in the figure are dished inwards as shown in the figure, thus allowing the required radius between the centre of shaft and the frame line to be obtained further forward than if the frames were not dished. A similar method is used for finding the frame where the distance required round the centre of shaft will not cause any bossing in the frame line. Special attention must be given to the radius required at the stuffing box bulkhead, where considerable space is required for the stuffing box and fittings, and at the after end of the double bottom, where the shaft—although well clear of the frame line—may not be sufficiently clear of the inner bottom line to permit a sufficient depth of double bottom to be maintained without bossing out the frame line as shown by the small diagram in the figure. The frame, No. 2 in the figure, where the swell is to end, having been selected, a normal nl to the frame line is drawn from n, the trace of the centre of shaft line with the plane of the frame, and parallel lines are drawn through the traces of the centre of shaft line with the other frame planes, representing projections of the intersections with the frame planes of a plane through the centre of shaft. This plane is projected on to a diagonal plane having its trace with the body plane parallel to the trace of the plane, and the diagonal plane carrying the projection with it is rabatted by the following process. A convenient line XY is selected perpendicular to the parallel traces in the body plan, and a corresponding line XY is drawn in any convenient position on the floor, having ordinates set up perpendicular to it, the frame-spacing apart. The distances from XY in the body are measured along all such lines as nl to the projections of the centre of shaft and to the unbossed frame lines, and these distances are set up from XY in the plan at the corresponding frame ordinates giving the straight centre of shaft line, and GG the plan of the line of intersection of the plane through the centre of shaft with the frame surface. The radius required to house the shaft tube and fittings is set out from the centre of shaft at the boss frame, as shown by h in plan, and a fair line, as a rule straight except for a short distance at the forward end, is drawn from the point so found to break in fair with the line GG at the frame station where the swell is to end. The distances at the various ordinates, corresponding to that marked r at No 8, are used as radii for describing the outer part of the section of the shaft swell at the corresponding square stations in the body plan, the trace of the shaft line being the centre at each frame from which the circular arc is described. The outer part of the section of the swell thus formed, $e.g.$ cc at the boss frame in figure, is joined up to the general run of the frame line to which it belongs by arcs of circles c d struck with the same radius as the outer part. The radii for the hollowed-out frame lines abaft the boss frame are obtained in a similar manner. One or more diagonals cutting the swell may be drawn and rabatted in the half-breadth plan to test the fairness of the altered lines, but no further alteration should be required if the swell has been drawn in the manner described above.

Mould for boss frame casting. The sectional shape of the boss frame casting is shown in the plan in fig. 106, and the outline of the palm which is secured to the floor plate of the boss frame is shown by the line $k.k.$ in the body plan. This part of the casting is fashioned solely with the view of providing sufficient area for a suitable number of fastenings to the floor plate. A drawing is made of the casting, and for further guidance in preparing the pattern a plain batten mould is made to the outline $dccdkk$ on the floor. The line dpd, the position of the centre of shaft and the outline of the circular web for connecting to the shaft tube are marked on the mould. The varying angles made by the webs connecting the casting to the shell plating forward and aft of the boss frame, of which the outlines are $dccd$ and dpd, and of the circular web connecting it to the shaft tube, are obtained by the same method as that used for obtaining the bevelling of the frame angles, which will be described later. These bevellings are marked at the points of the several lines on the mould where they are taken.

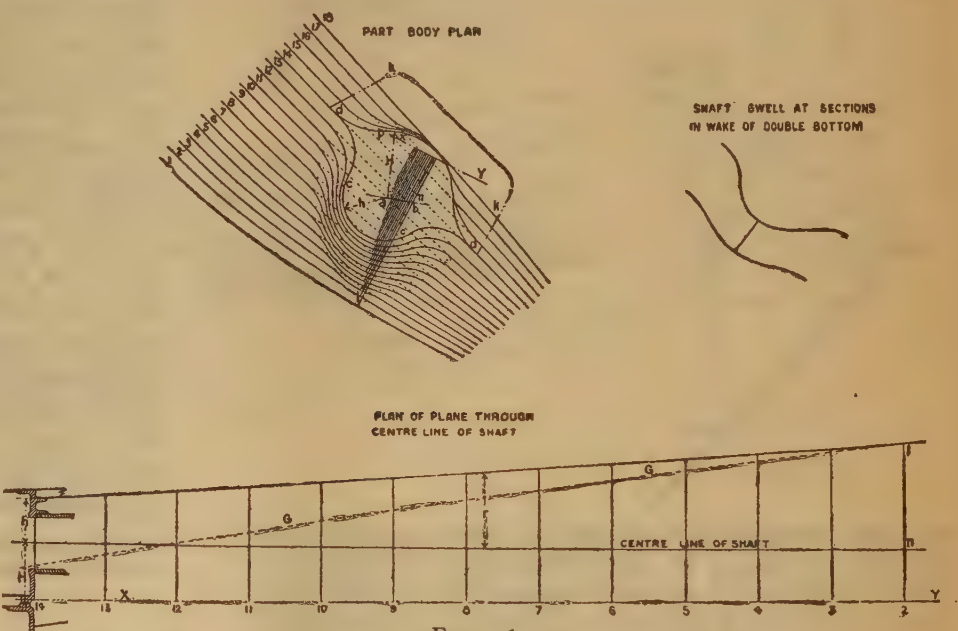

PART BODY PLAN
SHAFT SWELL AT SECTIONS IN WAKE OF DOUBLE BOTTOM
PLAN OF PLANE THROUGH CENTRE LINE OF SHAFT
CENTRE LINE OF SHAFT
G
G
X
Y
H
h
k
d
c
p
Y
r
n
14
13
12
11
10
9
8
7
6
5
4
3
2

FIG. 106.

Shaft struts. The fore and aft position of the shaft struts, or "A" brackets, as they are sometimes called, is shown on the design drawings, and the scantlings of the hollow cylindrical boss which carries the shaft bearing and of the arms which connect the boss to the ship's structure are given in the specification. The detailed drawing appears in these pages showing these particulars together with the shape of the palms worked on the inner end of the bracket arms to connect them to the ship's structure, and it is only necessary to obtain from the lines of the ship laid off on the floor the exact relation of the positions of the surfaces of the palms to one another and to the centre of the shaft.

Fur this purpose the traces of the line of centre of shaft with transverse planes at the forward and after ends of the boss are marked in the body plan, and a batten mould is made in each of these planes showing the centre of shaft, the direction of the two arms and the position where they are crossed by the frame line of the ship, or, if the lower arm connects to a web or palm on the stern post, as is frequently the case, in a ship with a rising keel line aft, the position of the edge of this palm and the direction of its surface. Each mould has marked on it, or indicated by a straight-edged batten forming part of the mould, a convenient water-line and vertical line drawn on the floor. When the moulds are held in vertical planes separated by the length of the shaft boss the corresponding straight lines on the two moulds are made to lie in the same plane, or are "looked out of winding," giving the relation between the

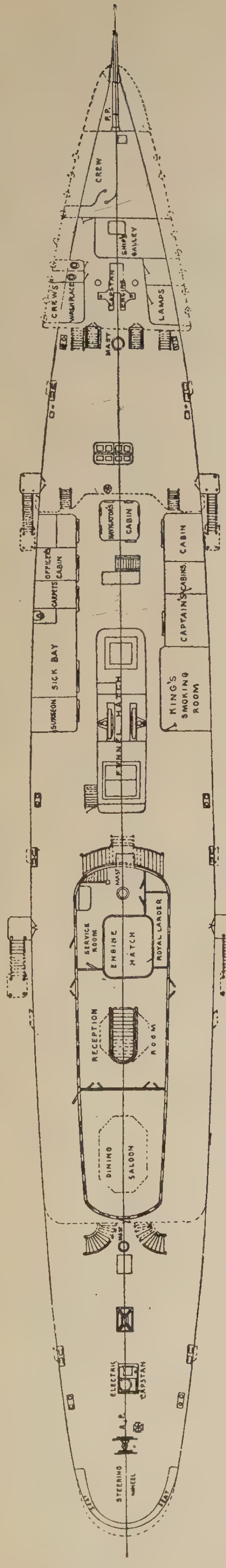

F.P.
CREW
SHIP'S GALLEY
CREW'S WASHPLACE
CAPTAIN'S PANTRY
LAMPS
MAST
NAVIGATOR'S CABIN
OFFICER'S CABIN
CARPETS
CABIN
CAPTAIN'S CABINS
SICK BAY
SURGEON
KING'S SMOKING ROOM
FUNNEL HATCH
MAST
SERVICE ROOM
ENGINE HATCH
ROYAL LARDER
RECEPTION ROOM
DINING SALOON
ELECTRIC CAPSTAN
A.P.
STEERING WHEEL

FIG. 93

PLAN OF UPPER DECK

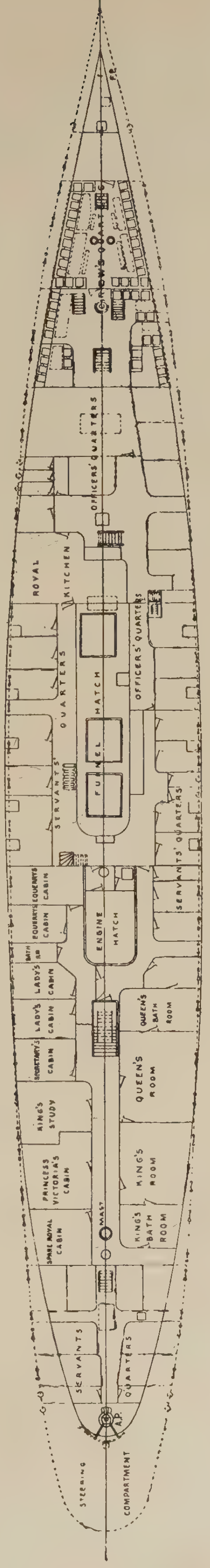

F.P.
CREW'S QUARTERS
OFFICERS' QUARTERS
ROYAL KITCHEN
OFFICERS' QUARTERS
SERVANTS' QUARTERS
FUNNEL HATCH
SERVANTS' PANTRY
SERVANTS' QUARTERS
EQUERRY'S CABIN
EQUERRY'S CABIN
BATH
LADY'S CABIN
LADY'S CABIN
ENGINE HATCH
QUEEN'S BATH ROOM
SECRETARY'S CABIN
QUEEN'S ROOM
KING'S STUDY
PRINCESS VICTORIA'S CABIN
KING'S ROOM
SPARE ROYAL CABIN
MAST
KING'S BATH ROOM
SERVANTS' QUARTERS
A.P.
STEERING COMPARTMENT

FIG. 94

PLAN OF MAIN DECK

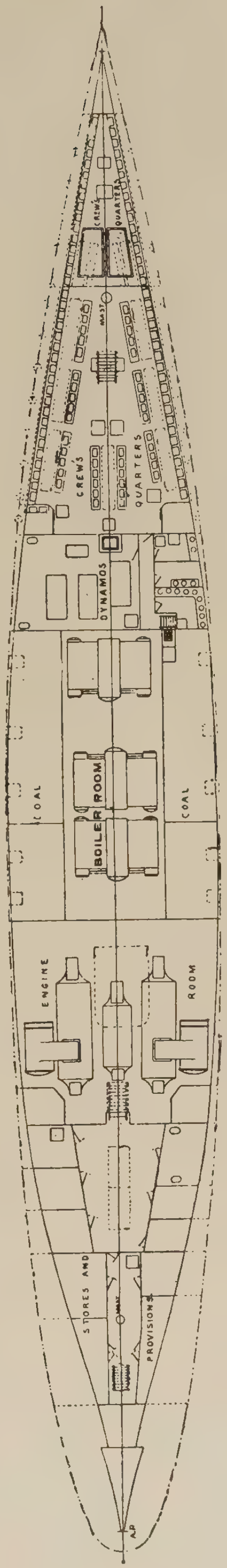

CREW'S QUARTERS
MAST
CREW'S QUARTERS
DYNAMOS
COAL
BOILER ROOM
COAL
ENGINE ROOM
STORES AND PROVISIONS
MAST
A.P.

FIG. 95

PLAN OF LOWER DECK

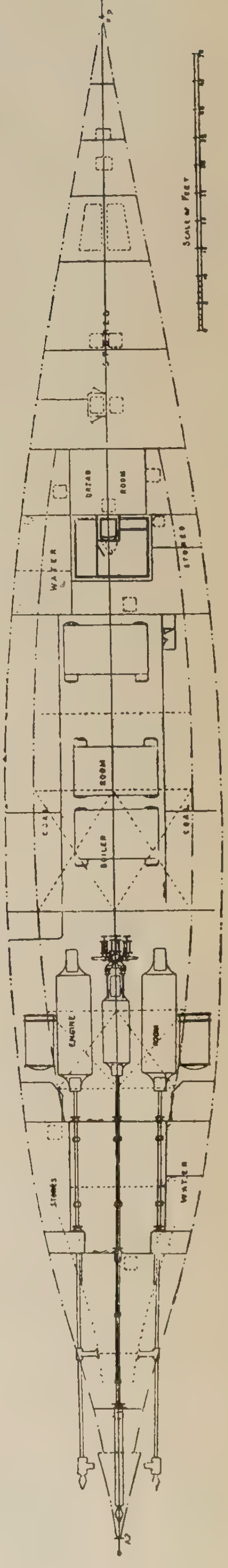

DEAD ROOM
STORES
WATER
COAL
BOILER ROOM
COAL
ENGINE ROOM
STORES
WATER
SCALE OF FEET

FIG. 96.

PLAN OF HOLD

position of the palms and the direction of centre of shaft. Guided by these moulds and the detailed drawing, the pattern for casting the A brackets is made.

Sight edges in the body plan.

The projections of the plate and longitudinal sight edges are drawn in the body plan on the floor by measuring their distances from the middle line along each frame line in the half-block model, on which they have been already arranged, enlarging the measurements to full size and setting them off round the corresponding square stations in the body. The points so found should lie on fair curves, if the sight edges have been properly arranged on the model, except of course where discontinuities in the curves may occur, as where a plate sight edge crosses a longitudinal sight edge to avoid an acute intersection. The edges of the sunken strakes of plating are drawn parallel to and distant the width of the lap from the sight edges, and as already stated, the breadths of the bottom plates are measured between the lines of plate edges so found and used in ordering the material from the manufacturers.

Inner bottom.

The surface of the inner bottom is defined relatively to the outer bottom by the depth of the vertical keel and longitudinal frames given in the specification. The outline of the vertical keel is also shown in the sheer drawing, and the general shape of the inner bottom by the midship section, which is often supplemented by a section through the engine-room where the double bottom is locally made deeper. The surface of the longitudinal is arranged so that its trace with the plane of each square station is approximately normal to the curve of the square station; taken in conjunction with the method of drawing the sight edges so as to cut the frame lines as nearly as possible at right angles, this is approximately the same thing as generating the surface of the longitudinal by the normal to the ship's surface as it moves along the sight edge. The depths given in the specification are depths measured in the plane of the square stations, and, when the longitudinals are fitted on a raised strake of outer bottom plating, are greater by the thickness of that plating than the distance to be set in from the frame line to find the inside of the frame on the inner bottom. The latter is usually worked with the strakes of plating disposed "clinker" fashion, or is sometimes flush with edge strips fitted on the underside. Points in the sections of the inner bottom frame surface by the planes of the square stations are obtained by setting in the depth of the longitudinals, and the surface of the inner bottom is faired by diagonal and water lines in the same way as the outer frame surface. In the engine-room space where the depth of the double bottom is increased, and where there are usually plane surfaces to take the structure under the engine bed, and a cylindrical recess to provide clearance for the engine cranks, these special features must be faired separately, so also is any bossing of the inner bottom at the after end to allow clearance for the shaft tube and fittings.

The plate edges already arranged on the model of the inner bottom must be transferred to the floor and faired in the same way as those of the outer bottom; and the breadths of the plates measured from the floor must be used in ordering the material from the manufacturers.

Inner surface of frames. Outside double bottom.

Before and abaft the double bottom the transverse frames may consist of zed bars, split at their lower ends for the insertion of a floor plate. The longitudinals are reduced in depth, and are intercostal between the frames until they coalesce with flats or fore and aft bulkheads, or they are continued as deep zed bars slotted over the narrower transverse frames. The inner surface of the frames therefore does not require any process of general fairing; but the upper parts of the floor plates are drawn on the floor, and are faired locally throughout the lengths of the ship where they maintain a uniform character.

Deck lines.

The freeboard forward and aft and amidships is generally given in the specification and can be measured from the sheer drawing. Guided by these dimensions and by the deck lines shown in the sheer drawing, the heights of the intersections of the beam at middle with the square stations are marked on the corresponding square stations of the contracted sheer plan and faired, and the intersections with the square stations are then projected to the middle line of the body plan. The round up or camber of the midship beam of each deck is shown on the midship section drawing. The camber line is a circular arc, the round up being the versed sine of half the arc and the breadth of the ship at the level of the beam the chord. A mould is readily constructed to these data and is applied so that the chord is perpendicular to and its middle point coincident with the middle line of the body plan on the floor. When the centre of the arc coincides with a point projected from the beam at middle line the arc cuts the corresponding square station at a point in the projection of the beam-end line. The points in the beam-end or beam-at-side line so formed should lie on a fair curve, which is tested by projection into the contracted sheer plan, and the line is then rased in in the body plan.

The shape of the lower protective deck in a battleship is shown in the sheer drawing. Throughout that part of the length of the ship covered by the main armour belt, which rests on this deck, the deck edge usually lies in a water plane. The middle part of the deck also lies in a water plane, except where it is raised up over the engines, and the sloping sides form cylindrical surfaces. The straight lines of the sides and middle part of the deck section are joined by arcs of circles of uniform radius, and this part of the deck is necessarily fair from the nature of the method of constructing the sections of its surface. At the ends of the ship the beam-at-middle and beam-at-side lines are copied from the sheer drawing and faired on the floor and the beam surface between these points may be faired by one or more bow and buttock lines.

Framing and plating behind armour.

The surface of the framing behind the main armour belt in a warship, arranged as shown by the midship section depicted, is parallel to the surface of the armour and distant from it the thickness of armour and wood backing plus the thickness of plating behind armour, generally a double thickness of plating flush jointed. This distance, less the thickness of the shell plating already taken off in getting in the frame lines, is set in normal to the surface shown by the lines on the floor in wake of the armoured side by approximate methods similar to those used in taking off the plank and plating, and the projections of the frame lines behind armour in the body plan are thus obtained and drawn in. The frames are usually single zed bars extending vertically from deck to deck and are completely defined by these lines without the necessity of drawing any inside surface lines.

Projections of the intersection of the surface of the frames behind armour with the beam surface of the deck at the top of the frames and with the plate surface of the deck at their heels are drawn in the half-breadth plan, and expansion drawings of the frame surface are prepared in a manner somewhat similar to that which will be described later in dealing with the expansion of the surface of each separate armour plate, except that in the present case the whole length of the surface is expanded in two or three ½-in. scale drawings. The expanded positions of the frame lines, and of any longitudinal girders which may be fitted behind armour are shown on this drawing, also the approximate positions of the armour plate butts and edges and of the armour bolts. The butts and edges of the plating behind armour are arranged on this drawing and the dimensions of the plates measured therefrom in ordering them from the manufacturers.

Thin protective plating beyond the ends of the main armour belt usually projects from the ship's side and is secured without wood backing direct to the shell plating, which is worked in two thicknesses flush jointed in wake of the protective plating. In this case the frame surface of the ship already laid off is the frame surface behind armour, and the disposition of the butts and edges of the plating behind armour and of the armour itself is arranged on the half block model; but only the plating behind the armour is ordered to dimensions taken from the model.

Laying off the armour of a warship.

It is important that the detailed information giving the shapes and dimensions of the armour plates should be in the hands of the manufacturers as early as possible on account of the time required for the manufacture of this material. As, moreover, modern armour plate steel is so hard that it is impossible to cut it with machine tools, the plates must be delivered of the exact size required, and the information sent to the manufacturers must be of a high degree of accuracy. For this reason the shapes and sizes of the armour plates are sometimes obtained by the "mocking up" process, in which the surface of the armour is represented in three dimensions by making moulds or batten frames to the sections of the surface in the body plan on the floor and erecting them in their correct lateral and fore and aft relative positions. The positions of the butts and edges of the plates being marked on the frames so erected, the moulds for each plate, as described below, can be made with great accuracy, and this process is practically necessary if there is any considerable twist in the surface of the ship where covered by the armour.

In general, however, the armoured side is very little twisted and can be treated for practicable purposes as a developable surface, in which case the necessary information can be obtained by a process of laying off as described below, which, though obviously only approximate, is found by experience to be sufficiently accurate for practical purposes.

In fig. 107 the portion of the body plan shows sections of the armour surface by planes of the frames, which are generally 2 ft. apart behind the armour, and the half breadth shows projections of the upper and lower boundaries of the armour surface, and of the joint between the two strakes, which is arranged to lie in a level plane. The armour belt extends from the main deck above to the armour deck below. The upper edge of the armour, therefore, follows the beam-at-side line of the main deck; but is generally allowed to be about ¾ in. below it, so as to make sure of getting in the armour, in spite of possible small inaccuracies in building the rest of the structure, which might result in restriction of the space between the two decks. The lower edge follows the armour deck edge, which is usually a level line throughout the length of the belt; but is kept an inch or two above it to avoid making the armour plates with a sharp edge to fit the acute angle between the protective deck and the ship's side; the armour, however, actually rests on the deck as shown by the midship section depicted. The butts of the armour are arranged "brick fashion," that is, the butts of one strake at the middle of a plate in the adjacent strake, and each butt should be as close as possible to one of the vertical frames behind armour in order to allow the armour bolts to be sufficiently near the butt of the plate. At the same time it is convenient both for manufacturing purposes and for erecting the plates at the ship, to have the butt surfaces as nearly as possible normal to the surface of the plates. The butts are therefore arranged in vertical planes whose traces in the half-breadth plan lie in direction between the normals to the projections of the upper and lower edges of the plate. The lengths of the plates are made as great as possible taking into consideration the capacity of the manufacturer's rolls and of the appliances for handling them during erection at the ship.

To lay off any plate such as that of which the projections of the intersections of the planes of the butts with the surface of the armour are *ab*, *cd* in the body plan and a_1b_1, c_1d_1 in the half breadth, a straight line YY is drawn in the body plan so that its direction lies between the directions of the normals to *ab* and *cd* at the points where they cut YY, and a straight line XX is drawn in the half-breadth plan similarly lying between the normals to a_1 c_1, and b_1 d_1 and approximately at the centre of the plate.

Battens are bent to the curves *a*Y*b*, *c*Y*d*, a_1Xc_1, b_1Xd_1 and the points named are marked on the battens so as to give the lengths *a*Y, *b*Y, a_1X, &c., measured round the curves. A pair of rectangular axes OX, OY are then drawn in any convenient position on the floor and the points a_2, b_2, c_2, d_2 found such that the co-ordinates of a_2 are Y*a*, Xa_1, of b_2, Y*b* and Xb_1, of c_2, Y*c* and Xc_1, of d_2, Y*d* and Xd_1. The figure $a_2b_2c_2d_2$ obtained by joining the points so found by straight lines is regarded as the expanded shape of the surface of the plate. A flexible batten mould is made to this figure and is used by the manufacturer to mark the four corners of the plate and thus to get its superficial size. A pair of moulds such as N are made, one to the top and the other to the bottom of the plate in the half-breadth plan, showing the curvature of the edge and the direction of the butts; and another pair such as M, one at each butt, showing the curvature of the edge of the butt plane and the sectional shape of the top and bottom of the plate. The butt moulds are made to the section of the surface of the plate by the plane of the frame, which is indistinguishable from the section by the very slightly inclined plane of the butt. Each of the butt moulds serves for the two plates which join at the butt, but each edge mould refers only to one plate. Female moulds, the backs of which are straight lines which lie in one plane, or, as it is technically expressed, are "out of winding" when the moulds are in their proper position, are also made to fit on the butt and edge moulds as P, Q in the figure. By means of these moulds the manufacturer makes each separate plate to its correct curvature and twist, while the top and bottom "out-of-winding" moulds for two or more consecutive plates have a common straight line drawn on them as *ll* in the figure, to fix the relative position of the plates when they are temporarily erected at the manufacturer's works to prove the correctness of their shape.

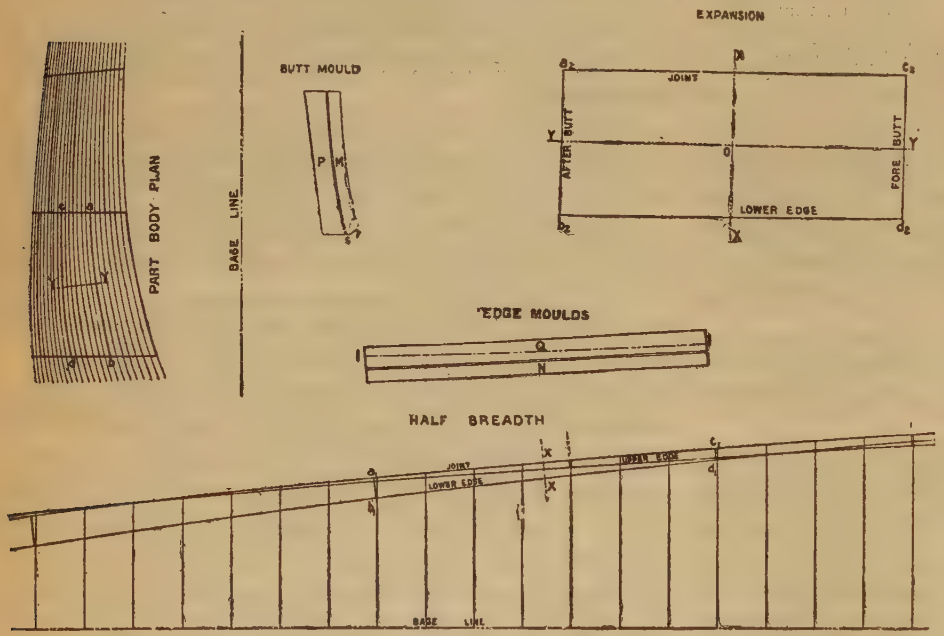


FIG. 107.

A drawing is also made showing superposed expansions of the back and front surfaces of the armour without any necessity for extreme accuracy, as these surfaces are fully defined by the moulds. The butts and edges of the plates with numbers identifying each plate with its moulds are shown on this drawing.

The specification gives particulars of the dimensions of the bolt to be used and lays down the general principle of their distribution, *e.g.* one bolt to so many square feet of armour. The bolts are approximately arranged in accordance with this specification on the expansion of the plating behind armour. For the purposes of the present drawing their positions must be definitely fixed sufficiently clear of the frames behind armour to allow space for putting on the nuts. With vertically arranged frames practically the fore and aft position only is of importance from this point of view. The projections of the normals to the plate surface representing the centre lines of the bolts are drawn in the half-breadth plan, and shifted if necessary to give the required clearance of the frames. The positions of the centres on the back of the plates are then measured along the curved sections of this surface in the body and half-breadth plans from the nearest edge and butt, and these distances are indicated in figures on the drawing.

The positions of any holes for the fastenings of top and bottom edge covering plates, or of any fittings to go on the outside surface of the armour are also shown by figured distances from the edges and butts of the plates on this drawing. All holes must be drilled and tapped in the plates by the manufacturer before the final hardening process which renders the material unworkable.

The drawing also shows the plate in each strake selected as the "shutter in" or last plate to be fitted in place. This plate is not finally completed by the manufacturer until all the rest are in place at the ship and moulds have been made to the space which remains to be filled up.

The moulds for screen bulkhead armour are prepared in a similar manner, but the process is usually simpler as the surface of this armour, when not actually plane, is cylindrical with a vertical generating line and therefore accurately developable.

For barbette armour nothing more than a drawing is usually necessary, the barbette being circular in plan, the surface cylindrical and the top in a horizontal plane.

Order of work.

The information issued from the Mould Loft for the guidance of the workmen in the shipyard has been generally passed over in the foregoing description, which has been devoted principally to the information prepared for the guidance of manufacturers of material, but it is not intended to imply that all the material is ordered before erection is begun. Much of the information for the erection of the frames and other parts of the structure, including the keel and transverse and longitudinal frames amidships, may be given before the ends of the ship are faired on the floor.

Keel.

Keel battens are provided giving the spacing of the transverse frames throughout the length of the ship, the lines defining their positions on the battens being marked with the distinguishing numbers by which the frames are identified on all the drawings, moulds and information subsequently issued.

The drawing showing the size of each plate and the position of each butt of the flat and vertical keel plating and angle bars, prepared in connection with the ordering of the material, is completed to show all details of the keel and its riveting in accordance with the specification, and serves as information for its erection.

Section moulds are made in accordance with the frame lines in the body plan for guidance in shaping the flat keel plates transversely, and on these the edges of the adjacent plates are also marked.

Transverse frames.

The practice, at one time quite common, of making batten moulds to each frame line on the Mould Loft floor for the guidance of the workmen employed bending the angle or zed bars, and shaping and assembling the parts of the frame, is now almost entirely superseded by the use of the "scrive-board." Such batten moulds, when issued, showed the outline of the frame, or of the part of the frame between two longitudinals, the shape of the floor plate or bracket plates, the position of the plate edges and other bevelling spots, and generally everything necessary for completing the frame ready to go into its place at the ship.

Scrive-board.

The scrive-board is an auxiliary mould loft floor constructed conveniently near the frame-bending slabs, and having copied on it, with certain modifications or additions adapting it to the practical needs of the shipyard work, the whole of the body plan as laid off on the Mould Loft floor. For convenience in copying the lines it is sometimes made so that it can be divided into portable parts and taken to the Mould Loft to have the lines copied on it, and then transported to its proper position and put together again. Otherwise it is a fixture in its proper

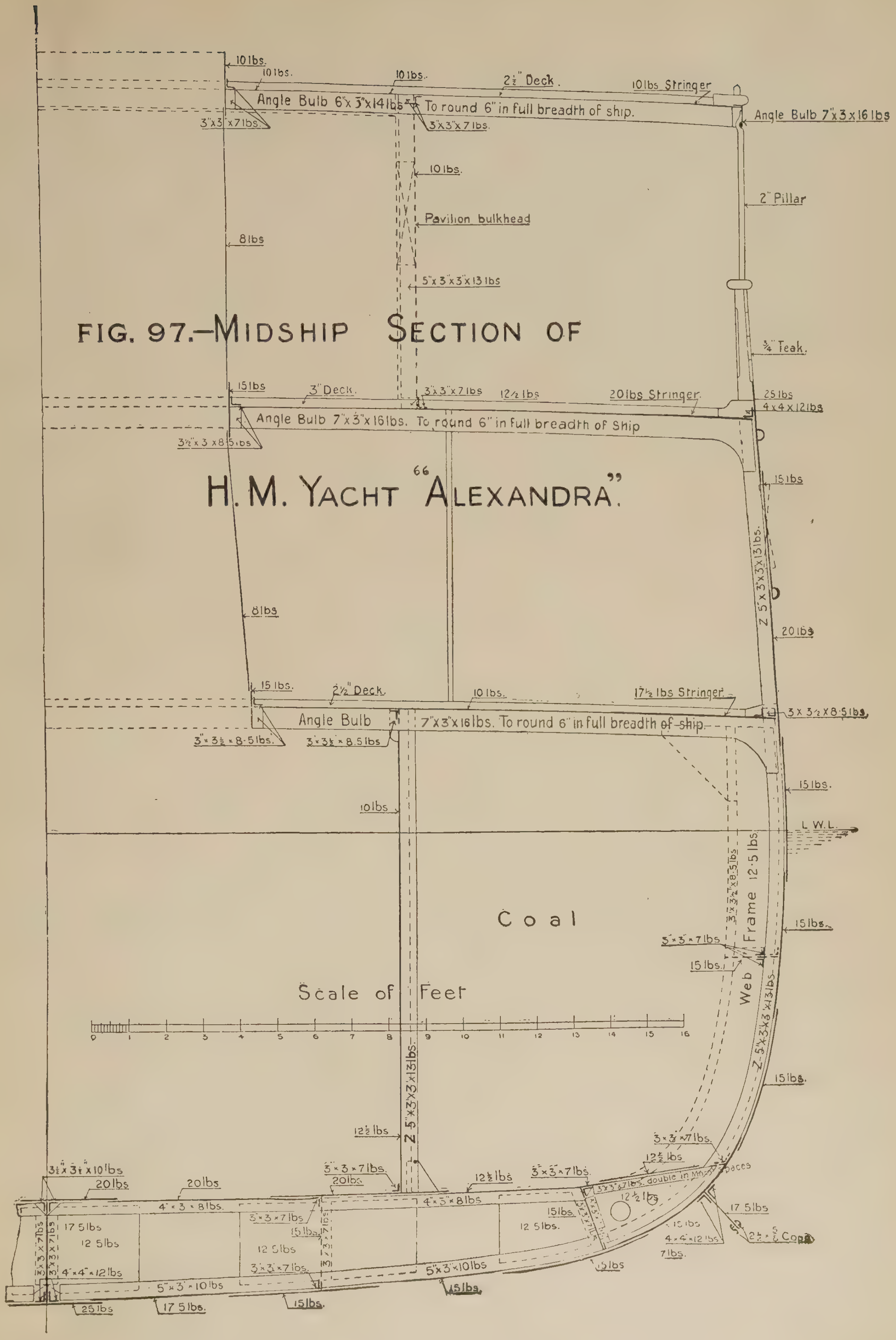

10 lbs.
10 lbs.
10 lbs.
2½" Deck.
10 lbs Stringer
Angle Bulb 6"x 3"x 14 lbs
To round 6" in full breadth of ship.
Angle Bulb 7"x 3 x 16 lbs
3"x 3"x 7 lbs.
3"x 3"x 7 lbs.
10 lbs.
2" Pillar
Pavilion bulkhead
8 lbs
5"x 3"x 3"x 13 lbs
¾" Teak.
15 lbs
3" Deck.
3"x 3"x 7 lbs
12½ lbs
20 lbs Stringer.
25 lbs
4 x 4 x 12 lbs
Angle Bulb 7"x 3"x 16 lbs. To round 6" in full breadth of Ship
3½"x 3 x 8.5 lbs
15 lbs
Z 5"x 3"x 3"x 13 lbs.
8 lbs
20 lbs
15 lbs.
2½" Deck.
10 lbs.
17½ lbs Stringer
3 x 3½ X 8.5 lbs.
Angle Bulb
7"x 3"x 16 lbs. To round 6" in full breadth of ship.
3" x 3½ x 8.5 lbs.
3" x 3½ x 8.5 lbs
15 lbs.
10 lbs
L.W.L.
3"x 3½"x 8.5 lbs
Web Frame 12.5 lbs.
Coal
15 lbs.
3" x 3" x 7 lbs
15 lbs.
Scale of Feet
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Z 5"x 3"x 3"x 13 lbs.
15 lbs.
Z 5"x 3"x 3"x 13 lbs.
12½ lbs
3 x 3" x 7 lbs.
12½ lbs
3½"x 3½"x 10 lbs
20 lbs
20 lbs
3" x 3 x 7 lbs.
20 lbs.
12½ lbs
3" x 3" x 7 lbs.
3"x 3"x 7 lbs. double in Mch. Spaces
12½ lbs
4" x 3 x 8 lbs.
4" x 3" x 8 lbs
3" x 3 x 7 lbs
15 lbs.
15 lbs.
12 5 lbs.
17 5 lbs
12 5 lbs
12 5 lbs
3" x 3" x 7 lbs
3"x 3"x 7 lbs.
3"x 3"x 7 lbs
3"x 3"x 7 lbs
4" x 4" x 12 lbs
17 5 lbs
15 lbs
4 x 4" x 12 lbs
7 lbs.
2½ x ⅝ Copr
5"x 3"x 10 lbs
5" x 3" x 10 lbs
15 lbs
15 lbs.
15 lbs.
25 lbs
17 5 lbs.

FIG. 97.—MIDSHIP SECTION OF H.M. YACHT "ALEXANDRA."

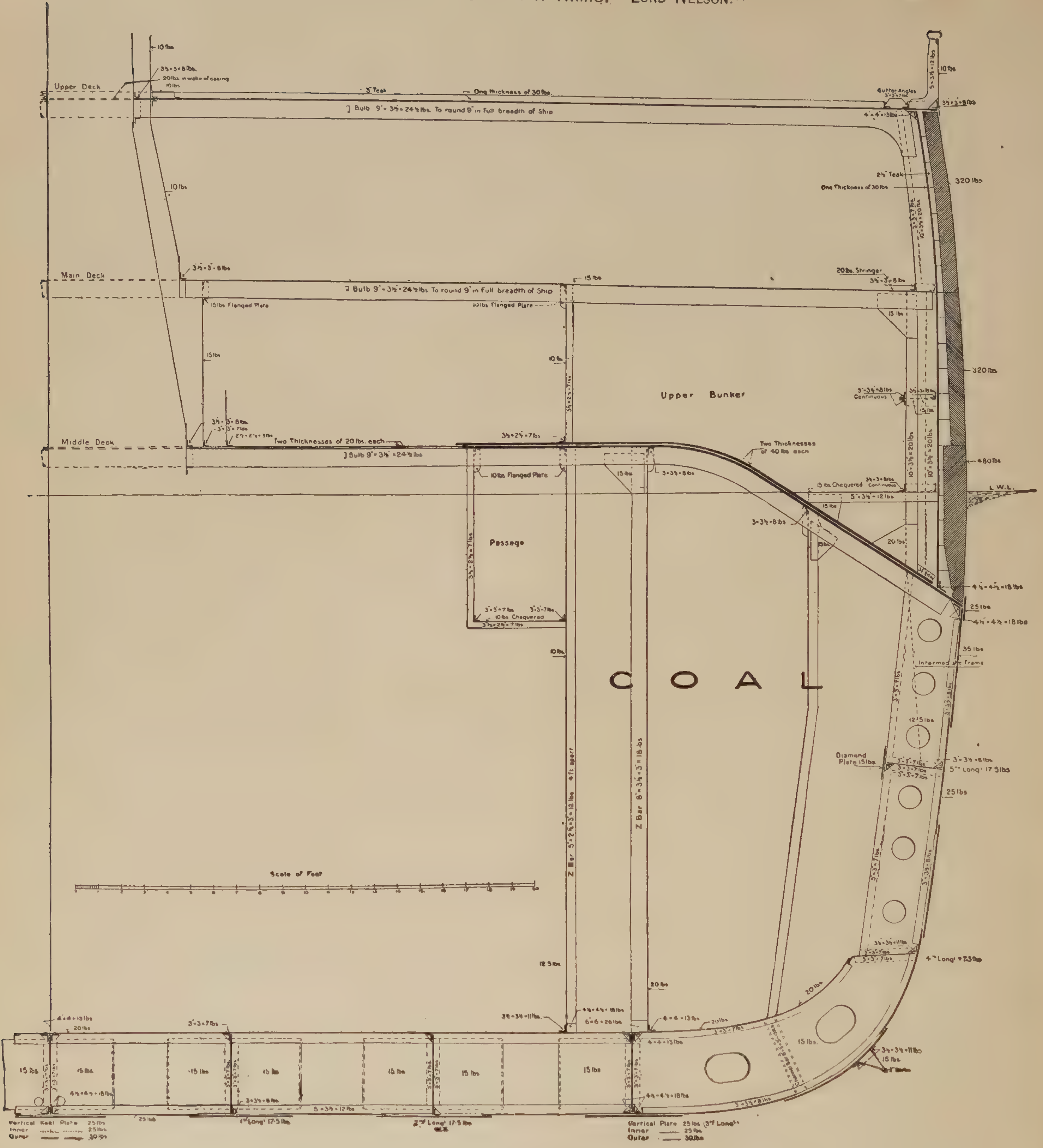


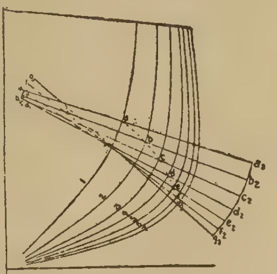
FIG. 98.—MIDSHIP SECTION OF H.M.S. "LORD NELSON."

10 lbs
3½×3×8 lbs.
20 lbs. in wake of casing
10 lbs
Upper Deck
3" Teak
One thickness of 30 lbs.
] Bulb 9"×3½×24½ lbs. To round 9" in full breadth of Ship
Gutter Angles 3"×3"×7 lbs
5×3½×12 lbs
10 lbs
3½×3×8 lbs
4"×4"×13 lbs
10 lbs
2½" Teak
One Thickness of 30 lbs
320 lbs
3"×3"×7 lbs
10"×3½×20 lbs
3½×3"×8 lbs
Main Deck
] Bulb 9"×3½×24½ lbs. To round 9" in Full breadth of Ship
15 lbs
20 lbs. Stringer
3½×3"×8 lbs
15 lbs Flanged Plate
10 lbs Flanged Plate
15 lbs
15 lbs
10 lbs
3½×2½×7 lbs
Upper Bunker
3"×3½×8 lbs Continuous
3½×3×8 lbs
15 lbs
320 lbs
3½×3"×8 lbs
3"×3"×7 lbs
2½×2½×3 lbs
Middle Deck
Two Thicknesses of 20 lbs. each
] Bulb 9"×3½"×24½ lbs
3½×2½×7 lbs
Two Thicknesses of 40 lbs each
10"×3½×20 lbs
10"×3½×20 lbs
480 lbs
10 lbs Flanged Plate
15 lbs
3×3½×8 lbs
15 lbs Chequered
3½×3×8 lbs Continuous
5"×3½×12 lbs
L.W.L.
15 lbs
3×3½×8 lbs
15 lbs
20 lbs
Passage
3½×2½×7 lbs
3"×3"×7 lbs
3"×3"×7 lbs
10 lbs Chequered
3½×2½×7 lbs
4½×4½×18 lbs
25 lbs
4½×4½×18 lbs
10 lbs
35 lbs
Intermediate Frame
C O A L
3×3"×7 lbs
3×3½×8 lbs
12·5 lbs
Diamond Plate 15 lbs
3"×3"×7 lbs
3"×3×7 lbs
3"×3"×7 lbs
3"×3½×8 lbs
5th Long' 17·5 lbs
25 lbs
Z Bar 5"×2½×3"×12 lbs 4 ft apart
Z Bar 8"×3½×3"×18 lbs
3"×3½×7 lbs
3"×3½×8 lbs
Scale of Feet
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
12·5 lbs
3½×3½×11 lbs
3"×3"×7 lbs
3"×3"×7 lbs
4th Long' ×25 lbs
20 lbs
20 lbs
4×4×13 lbs
20 lbs
3½×3½×11 lbs.
4½×4½×18 lbs
6×6×26 lbs
4×4×13 lbs
20 lbs
3×3"×7 lbs
15 lbs.
3½×3½×11 lbs
15 lbs
4×4×13 lbs
3"×3×7 lbs
15 lbs
15 lbs
15 lbs
15 lbs
15 lbs
15 lbs
15 lbs
3"×3"×7 lbs
4½×4½×18 lbs
3×3½×8 lbs
6×3½×12 lbs
4½×4½×18 lbs
3×3½×8 lbs
25 lbs
1st Long' 17·5 lbs
2nd Long' 17·5 lbs
Vertical Keel Plate 25 lbs
Inner 25 lbs
Outer 30 lbs
Vertical Plate 25 lbs (3rd Long'l)
Inner 25 lbs
Outer 30 lbs

position; but the process of copying the frame lines on it is one of measuring on battens the ordinates of their intersections with water and diagonal lines, and is the same in either case. All of the frame lines are shown on the scrive-board, and the complete section of the frame surface for both sides of the ship is shown at each station. To avoid confusion of lines, either a separate board is used for the fore and after bodies, or they are drawn on the same board with their centre lines parallel and a few feet apart, and one of the two bodies inverted. All the lines already referred to as having been laid off in the body plan on the mould loft floor, including the lines of outer edges of all transverse frames, the inner edges of all in the double bottom, and the upper edges of all floor plates outside the double bottom, the projections of plate edges of inner and outer bottom, and of longitudinal frames and main longitudinal bulkheads, projections of beam at side lines for all decks, and of the intersection of the beam surface of the protective deck by the plane of each frame, are copied on the scrive-board and rased in on its surface. The scrive-board thus gives complete information of the shape and dimensions of every part of each transverse frame. To completely define the frame the "bevelling" is required in addition, that is the angle between the two flanges of the angle bar on the edge of the frame connecting it to the outer or inner bottom plating. The bevelling is usually given at the plate sight edges; but any other convenient bevelling spots may be chosen and their positions marked on the frame lines. To obtain the bevelling at any spot a normal is drawn to the frame line in the body plan at the spot; the distance from the frame line is measured along this normal to its intersection with the next frame line towards the midship section, and this distance is set up as one of the sides containing the right angle in a right-angled triangle of which the frame space is the base. The angle of this triangle opposite the base is the supplement of the bevelling of the frame at the spot considered. When the curvature of the bottom in the plane normal to the square station at the bevelling spot considered is sensible in the length of a frame space, the normal distance measured is that between the two frame lines on either side of that at which the bevelling is to be obtained, and the base of the triangle is made equal to twice the frame space. The bevellings for each frame are marked on a bevelling board, the angles between the straight lines marked on the side of the board and the straight edge of the board representing both the bevelling and its supplement. In the frame bars there is no doubt as to which of these two angles the workmen are to regard as the true bevelling, since the flanges of the frames are all turned towards the midship section, so as to make the true bevelling always greater than a right angle, or "standing" as it is usually expressed, in contradistinction to "under" bevelling, which is less than a right angle.

Special bevelling frames are used in marking the bevelling boards, by which the construction of the triangles is reduced to setting off the normal measurement between the frame lines and drawing the hypotenuse directly on the bevelling board. The flanges of the angle bars on the inside edge of the frame, or the "reverse" frame bars, usually point the same way (that is towards the midship section) as the flanges of the frame bars, throughout the double bottom, in order to facilitate the construction of the bracket frame. Where the breadth of the longitudinals is constant, therefore, the bevelling of these angles on the inner bottom is the supplement of that of the frame angles. But throughout the double bottom neither bevelling differs much from a right angle. When the longitudinals taper in breadth separate bevellings must be taken for the inner angles by a method similar to that already described for the frame angles. Outside the double bottom the reverse angle, or inner part of the split zed bar, is either unconnected to anything but the floor plate, or else connects to a horizontal flat, and does not require bevelling.

The bevellings of the short angle bars which connect the bracket or floor plates of the transverse frames to the longitudinals are also obtained by measuring in the body plan at the middle of the intersection of the longitudinal surface with the plane of a frame station the normal distance to its intersection with the plane of the next frame station, and setting it up as one side of a right-angled triangle of which the frame space is the base.



To check the spread of the transverse frames during their erection, half-breadth staffs and height of breadth staffs are issued from the mould loft, or their lengths may be taken off the scrive-board. These give the co-ordinates of the intersections of the longitudinal sight edges with the frame lines, referred to the middle line of the body plan and a level line through the underside of the keel at each station. The frames are brought to and held in their correct positions as shown by these staffs by shoring them in the vicinity of the longitudinals.

Shoring ribbands. Shoring ribbands are not universally employed, the longitudinals at some shipyards being relied upon to keep the transverse frames in their correct relative position while framing the ship. When they are used, one is usually placed a few inches below and parallel to each deck edge and longitudinal sight edge. For the ribbands under the deck edges, the beam at side line is projected into an uncontracted half-breadth plan, a flexible batten is bent to the line, and on it are marked the positions and directions of the ordinates representing the traces of the planes of the frames. The ribband batten is then used to mark the positions of the frames on the ribband itself, generally made of pitch pine about 6 in. square in section. The position where the upper edge of the ribband is to come is marked on the scrive-board and the marks transferred to the frame angles when they are bent. When the frames are erected at the ship they are brought into their correct positions as shown by the marks on the ribband, the upper edge of which is kept to the marks on the frames. The frames and ribband are temporarily secured together, until the plating is fitted, and the whole kept in its proper position by shores. The ribbands under the longitudinals lie for practical purposes in diagonal planes, which must be rabatted in order to get the positions and directions of the frames correctly marked on the ribband battens. The ribbands are marked, secured to the frames and shored, similarly to those under the deck edges.

Deck beams. A beam mould is prepared for each deck, the upper edge of the mould showing the round down or camber of the longest beam in relation to a level line marked on the mould. The mould is applied to the body plan on the mould loft floor or on the scrive-board in its correct position at each frame station and the ends of each beam are marked on it, the ends being short of the frame lines by an amount which varies with the nature of the frame, but sufficient in any case to clear the inside of the flange of the frame bar. Bevelling-boards are supplied showing the angle at each frame station between the upper edge of the beam and the frame line for guidance in forming the beam arm, which is usually two and a half times the depth of the beam, and the form of which is shown by a separate mould. When placing the beams in position at the ship their height is given by the beam end lines shown on the scrive-board and transferred to the frames when bent to the lines on the scrive-board.

The beam mould for the armour deck shows the length of the sloping part and the shape of the knuckle, with only a short length of the middle horizontal part. On the horizontal arm of the mould vertical lines are drawn at a given distance from the middle line at each frame station.

Longitudinals. It is essential that the shape of the longitudinal frames should be obtained with considerable accuracy, especially when half-breadths and heights measured to their sight edges are largely relied upon for keeping the transverse frames to their designed spread during erection.

As already stated, the longitudinal surface does not much differ from a surface generated by the normal to the ship's surface as it travels along the curve of the longitudinal sight edge. The surface generated by the normal is developable provided the sight edge is a line of curvature, which is approximately ensured by the method of drawing it, and it is found by experience that no error of practical importance is involved in developing the surface of the longitudinal by the following approximate method.

Fig. 108 shows part of the body plan in which the frame lines are numbered 1 to 7, the projection of the longitudinal sight edge is shown by *a b c d e f g*, and the projections of the traces of the longitudinal surface with the planes of the frames are shown by the straight lines a_1 aa_2, b_1 bb_2, e_1 cc_2, &c.

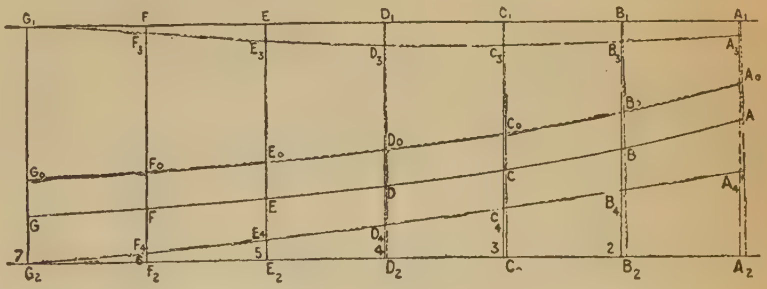


FIG. 108.

The curves a_1 b_1 c_1 d_1 e_1 f_1 g_1 and a_2 b_2 c_2 d_2 e_2 f_2 g_2 both cut all the traces at right angles, so that they are involutes of their envelope. Their positions are chosen at convenient distances beyond the inside and outside of the group of frame lines, which defines the length of longitudinal which is to be developed in one operation.

Parallel straight lines A_1G_1, A_2G_2, the distance between which is equal to the normal distance between the two involutes in the body plan, are drawn in any convenient position on the floor, and perpendicular ordinates, 1, 2, 3, 4, 5, 6, 7, drawn between them distant the frame space apart. The longitudinal is developed in this plan on the assumption that when its surface is unrolled the involutes $a_1\ b_1\ g_1$ and $a_2\ b_2\ g_2$ will coincide with the straight lines A_1G_1 and A_2G_2 respectively. Taking g_1g_2 in the body, represented by G_1G_2 in the plan, as the fixed end of the longitudinal from which the surface is to be unrolled, the lengths g_1f_1, g_1e_1, &c., are measured along the curve of the involute and set off along the lines 6, 5, 4, &c., in the plan giving the points F_3, E_3, &c., which represent with sufficient approximation the true positions of points of the line $a_1\ b_1\ c_1\ d_1\ e_1\ f_1\ g_1$ in space relatively to a straight line through g_1 perpendicular to the body plane. A batten is bent through the points $G_1\ F_3\ E_3\ D_3\ C_3\ B_3\ A_3$ thus obtained, and the positions of the points marked on the batten, which is then allowed to spring straight along the line G_1A_1, the points $F_1\ E_1\ D_1\ C_1\ B_1\ A_1$ being marked from the corresponding marks on the batten. The points $F_2\ E_2\ D_2\ C_2\ B_2\ A_2$ are obtained from the other involute in a similar manner, and the straight lines F_1F_2, E_1E_2, &c., obtained by joining corresponding points are regarded as the expanded positions of the traces of the longitudinal surface with the planes of the frames. The distances G_2G, F_2F, E_2E, &c., are then made equal to g_2g, f_2f, e_2e, &c., in the body, and the curve G F E D C B A through the points so found is the expanded sight edge of the longitudinal. The distances GG_0, FF_0, EE_0, &c., are then made equal to the depth of the longitudinal in the plane of the corresponding frame stations, when $G_0\ F_0\ E_0\ D_0\ C_0\ B_0\ A_0$ will be the expanded shape of the inner edge of the longitudinal.

The method described above is sufficiently accurate to lay off a whole longitudinal in one length, if it is not abnormally twisted. A modification of this method, in which the involutes $a_1\ b_1\ g_1$ and $a_2\ b_2\ g_2$ are replaced by straight lines perpendicular to the trace, from which the longitudinal is to be unrolled, may be used; but, without affording any substantial simplification of the work, its accuracy is so much less than that of the method described above, that it is not safe to lay off more than two or three plates of the longitudinal in one length by it.

When the longitudinal is much twisted, as, for example, when the longitudinal surface at its end is to be made continuous with a deck flat, which is not normal to the surface of the ship, it is generally desirable to use the more laborious but reliable method of "mocking up."

In fig. 109 the curves numbered 1 to 6 are projections of frame lines in the body plan. *a b c d e f* is the projection of the sight edge of the longitudinal breaking into the projection of the edge of a deck flat at *a*, and $a_1\ b_1\ c_1\ d_1\ e_1\ f_1$ is the projection of the inner edge of the longitudinal. The edges of the longitudinal are faired so that the traces of the longitudinal with the planes of the frames shall turn uniformly from the horizontal position of the deck flat at aa_1 to the position of the main part of the longitudinal normal to the frame lines at 6 and beyond, the depth of the longitudinal in the planes of the frames being kept constant.

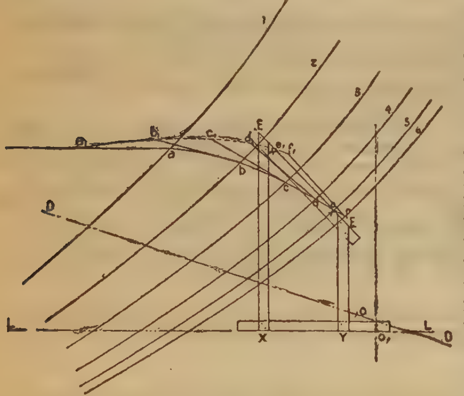


FIG. 109.

LL is the trace of a level plane drawn conveniently near to the sight edge in such a position that it is entirely below all the traces of the longitudinal with the planes of the frames throughout the length which is to be mocked up. Trapezoidal frames made of four straight battens nailed together at the corners, such as X Y E E in the figure, are made to show the relative position of the traces of the longitudinal surface and of the level plane with the plane of each frame. The outer and inner ends of the trace of the longitudinal surface are marked on the upper batten of each frame as at *e*, e_1, and a point O_1, fixing the lateral position of each batten frame relatively to a convenient straight line perpendicular to the planes of the ship's frames, is marked on the lower batten. A diagonal plane such as DD can be used instead of the level plane LL for convenience in allowing smaller and better-shaped batten frames to be used; and the process is precisely the same.

The batten frames are then erected on their bases XY in planes perpendicular to the floor, parallel to one another and distant the frame space apart, with the points O in all the frames lying in one straight line perpendicular to the batten frames. The upper edges of the upper battens then define the true shape of the longitudinal surface in three dimensions, and a fair curve through the points *e*, &c., marked on the battens represents the outer edge, and through points e_1, &c., the inner edge of the longitudinal.

Whether the shape of the longitudinal has been obtained by development on the floor or by the mocking-up process, batten moulds are made to the outline of each plate, the butts being arranged to come in the middle of a frame space allotted to them in the drawing, giving the shift of butts of bottom plating and longitudinals. Cross battens are fitted to mark the position of each transverse frame, and diagonal battens in each frame space to stiffen the mould, and to carry marks or figures indicating the shape and dimensions of the lightening hole, which occurs between each pair of frames in non-watertight longitudinals. These moulds are used by the workmen for marking off the shape of the plates and the positions of the rivet holes in them, the size and spacing of the rivets being given by the specification. No moulds giving the twist of the longitudinal are required, as that is so small that the plane plate can be pressed down into shape on the ends of the parts of the transverse frames, which must be already in position when the longitudinal is erected at the ship.

Bilge keel.

The external sectional shape of the bilge keel in a sheathed ship consists of a single steel plate in the middle of the section covered over by wood trimmed to shape. The plate lies in a diagonal plane and is readily laid off by rabatting the diagonal plane. This gives the true form of the intersection of the bilge keel plate with the surface of the frames, and the outer edge of the plate is obtained by setting out from the inner edge the specified width of the keel plate plus an allowance for the thickness of the shell-plating.

In an unsheathed ship the bilge keel is of triangular section, as shown in the body plan in fig. 99, and is formed by two steel plates riveted together at their outer edges and connected to the shell-plating by angle bars at their inner edges, the space between the plates being filled with wood. In this case the middle plane of the keel is a diagonal plane, as shown by 2D in the figure. The depth of the bilge keel at each frame plus the allowance for shell-plating is set out from the frame line along the diagonal, giving the vertex of the section of the keel at each frame station. A triangular mould is then made to the section of the bilge keel shown in the midship section drawing and is applied with its vertex coinciding with the points on the floor found as described above and with its centre line coinciding with the diagonal, and the traces of the sides of the keel are drawn by it at each frame station as *ab*, *dc*, in the figure.

The surface of each side of the keel is then developed in the same way as the surface of a longitudinal except that in this case, since all the traces are parallel, the involutes used in the case of the longitudinal become straight lines, and the development is strictly accurate. A mould to each plate of the bilge keel, similar to the mould for a longitudinal plate, is prepared from the expansion on the floor and issued for the guidance of the workmen. A triangular batten mould, made to show the angle between the diagonal plane, in which the centre of the bilge keel lies, and the horizontal, and having marked on it a point to be set at a given distance from the middle line plane of the ship at the height of the under side of the keel, is also issued to enable the position of the centre line of the bilge keel to be sighted-in on the bottom plating of the ship.

Drawings.

The remaining information issued for the erection of the ship is mostly in the form of drawings, which are largely descriptive rather than dimensioned, inasmuch as the frames and beams of the ship being once erected all other principal parts have to conform to them in shape, even where a slight difference may occur between their shape as erected and as laid off on the mould loft floor.

All the drawings of the structure and of the fittings must be pushed on and issued to the shipyard in good time. Very much of the success achieved in actual building will depend upon the efficiency of the drawing office, and the rapidity with which the various detailed working plans can be supplied for guidance. These plans must be accurate and complete, and must be ready as soon as required. The drawing-office staff has the oversight of weights actually worked into the ship, a careful record of which should be kept. Each firm has its own system of work in these departments, but experience shows that the more thorough and systematic the work in the drawing office and its adjunct, the mould loft, the better the general result. Another important record is the cost of materials and labour. In all shipyards careful account is kept of workmen's time, whether employed on piece or by the day. Many different systems are in vogue; but whatever the system, the aim is to record the cost of the labour in each trade, and the detailed cost of various parts of the ship.

Laying keel blocks.

While the work connected with laying-off and obtaining materials, &c., is going on, the shipwrights, assisted by handy labourers, prepare the ground for the keel blocks, lay the *blocks* at the proper height and inclination, and secure them against being floated away by the tide or being accidentally tripped while the ship is building. The blocks consist of several pieces of tough rectangular timber, 4 to 6 ft. in length, and laid on each other to the height required. The top block is called the *cap-piece*, and is of oak or other hard wood. The blocks are spaced about 4 ft. apart for ships of medium size, and somewhat less for ships of large size. They are usually placed upon a longitudinal bed of timber, which remains embedded in the ground for successive ships: the ground should be hard, or very well piled, otherwise the blocks may sink when weight becomes concentrated over them during building, and difficulty arises from the keel, or the propelling shafts, drooping from a straight line. The upper surface of the blocks must be at such a height from the ground that men, especially riveters, can do their work with facility under the bottom of the vessel, that the launch can be fitted, and that when launched the vessel may move down into the water without striking the ground. The last-named is a most important consideration; and thus it comes about that the first thing to be settled, before the blocks are laid, is how the vessel is to be launched. The tops of all the blocks are accurately adjusted to a plane surface sloping about ⅝ in. in a foot from bow to stern. The shipwrights at the same time prepare the uprights for the staging, and erect them around the building berth in suitable position with the first line of staging, which will be required at an early period in the ship's construction. The platers and angle-smiths begin to prepare the keel, framing, bulkheads, &c., as soon as the material is delivered and the laying-off and mould-making are sufficiently advanced for the purpose. The actual building generally dates from the first work of this character.

Keel and frames.

The keels of small vessels usually consist of a stout flat bar placed vertically and attached to the garboard strakes by through rivets. Occasionally the keel consists of a vertical centre through-plate, with side bars at its lower edge. In large merchant ships, and in war vessels, the keel usually consists of a wide horizontal plate running along the centre line of the bottom, the sides being turned up as necessary to follow the shape of the bottom (see figs. 118 and 119, Plate XIV.). The framing varies very considerably with the size and type of the ship, as already described. In small vessels a frame usually consists of an angle bar, called a *frame bar*, extending from gunwale to gunwale, to which is riveted a bar, also continuous from gunwale to gunwale, called a *reverse bar*, in such a way as to form a built-up Z-bar, and between these floor-plates are introduced across the bottom, to give the required strength when resting on the ground or on the blocks. Sometimes the frame consists of a Z-bar, in which case the *reverse bar* is not required in the vicinity of the floor-plate. Sometimes angle bulbs are used for frames, as in the case of oil steamers, where internal ceilings are not required. The process of constructing a complete frame of angle bars and plate is as follows: From the scrive-boards the shape of the section at the frame is transferred to the bending blocks or slabs, the outline being drawn in with chalk; the necessary preparation is made, and the frame bar is drawn from the furnace, and while hot bent to its shape and given the required bevel. The reverse bar is prepared in the same way, except that the inner edge of the frame and floor must be worked to. The floor-plate has to be cut to shape. In large ships the *frame bars*, *reverse bars* and *floor-plates* will be in two, or even in three, pieces; in this case the butts are kept some distance from the middle line, and are *shifted* in alternate frames, so as not all to lie in the same fore-and-aft lines. The butts of both frame and reverse bars, as well as those of the floor-plate, are butt-strapped, to maintain as much as possible the strength of the structure. The frame bar, floor-plate and reverse frame bar all being set, they are placed together in their respective positions over the outline of the frame on the slabs or scrive-boards, the final adjustments made and rivet holes marked and punched, and the work secured together and riveted up.

When the keel is in place, and as far as possible riveted, the frames, bulkheads and beams, which have been made ready by the iron-workers, are brought to the building slip and got into position by the shipwrights. They are held in place and faired by means of shores and *ribbands*. The latter are made from straight-grained timber of considerable length, sawn out in long straight pieces of square transverse section. They hold the frames in position until the outside plating is riveted. Upon them are marked the lines at which they must be crossed by each frame, and they are bent round and attached to the frames in a fore-and-aft direction at certain heights, which are marked on the frames at the scrive-boards. Some four or more ribbands are used each side of the ship. As the work proceeds, the positions of the frames and ribbands are checked continuously, their positions being maintained by shores from the ground, or some structure prepared for the purpose. Except in small vessels, the beams are not attached to the frames before they are erected, but are hoisted into place as soon as possible afterwards.

The bulkheads are put together on some convenient flat surface, sometimes on the scrive-board or a similar platform constructed for the purpose. If of large size, they are transferred piece by piece and erected at their proper positions in the ship; but whenever possible, they are rivited up and hoisted into position complete. The stem and sternpost are obtained from the forge or foundry and erected at an early stage of the work. The part of the stern abaft the transom is sometimes framed separately on the ground before being erected in the ship. The centre keelson is generally worked intercostally between the floors, but it has continuous parts, usually angle bars, above the floors. Each intercostal plate is secured by angle bars or flanged edges to the floors and to the flat keel plate. Sometimes it is continuous, especially in large ships and in warships. The frames are then cut by it, and the floor-plates are attached to it by short angle bars. After the centre keelsons, the side keelsons and side and deck stringers are fitted. The steel pillars are substituted for the shores supporting the deck beams, being riveted at their heads to the beams and at their heels to the keelson, inner bottom or tank top.

While the work is proceeding, the shipwrights make the stages, put up gangways and ladders for carrying on the work, fit extra blocks and shores, or remove and replace them as may be required. They line off all plate edges on the frames, the overlap being usually painted in with white paint, ready for the platers. They also erect the stem, sternpost, rudder and shaft brackets, or struts in twin-screw vessels.

In a ship fitted with an inner bottom the procedure is somewhat more complicated, as the transverse frames cannot be lifted into place as a whole. There are many varieties in the arrangements in such cases; one frequently adopted is shown in fig. 113, in which the inner bottom extends out to the turn of the bilge. This figure also shows the general construction of the vessel, including the framing at a bulkhead and elsewhere, the bulkhead itself with all its stiffening bars and attachments to the sides of the vessel, and the inner bottom. At the centre line, immediately over the flat keel plates, there is a vertical girder, the full depth of the double bottom, connected to the flat keel plate and to the centre plate of the inner bottom by continuous double-angle bars. This centre girder may or may not be water-tight, according to the desired tank arrangements. The transverse frames are in four parts: the two lower extending on either side from the centre girder to the margin plate of the double bottom, which is a continuous girder of special construction; and the two upper, from the margin plates to the top-sides. The lower parts consist of a floor-plate with angle bars at its edges for attaching it to the outer and inner bottoms, the centre girder and the margin plate. At the bulkheads these floor-plates are solid, and the angle bars are united and made water-tight; elsewhere they are lightened by holes, and the angle bars at their upper and lower edges and ends are separate pieces. The two upper parts of the transverse framing consist of a frame and a reverse bar, each having a deep and a shallow flange, and are riveted to one another along their deep flanges, with their shallow flanges standing the reverse way to one another. The shell-plating is attached to the shallow flange of the frame bar. Between the centre girder and the margin plate on each side of the ship there are two intercostal girders, the plates of which are connected by short angle bars to the floors and to the shell and inner bottom plating; and between the margin plates and the lower deck on each side there are three stringers, consisting of intercostal plates attached by short bars to the outer plating, and three continuous angle bars riveted to part of the intercostal plates which extend beyond the reverse bars.

In the course of erection, after the flat keel plate is laid upon the blocks, and the centre girder placed upon it, the two lower parts of the frames, which have been constructed alongside, are put into position, their outer ends being carried by ribbands shored from the ground. The intercostal girders and margin plates are then fitted. The lower edge of the margin plate is brought close to the outer edge of the frames, and is connected by a longitudinal angle bar to the shell-plating, while its upper edge is flanged for the purpose of being attached to the inner bottom plating. The ship at this stage gives the impression that a flat pontoon is being constructed.

When the margin plates are up and faired and, as far as desirable, riveted, the upper parts of the frames on each side are erected and the fairing proceeded with as before. The beams are now got into place, also the side and deck stringers. As will be seen, the margin plate cuts completely through the transverse frames, and special brackets are provided to maintain the transverse strength. The chief advantages derived from cutting the frames by the margin plate are the cheapness with which water-tight work is secured, and the rapidity with which this part of the work can be proceeded with.

Shell or outside plating.

As soon as the keelsons and stringers are riveted, and the ship by their means sufficiently stiffened, the outside or shell plating is commenced. The plating squad is supplied with a drawing showing the disposition of the butts in each line of plates; light wooden moulds or templates are then made, giving the exact shape of the edges and butts, and the positions of all the rivet holes in the frames. From these moulds the edges and butts and the holes are marked off, the holes are punched, and the edges and butts sheared and planed. The plates are then rolled to shape, furnacing being resorted to only when the curvature is too extreme to be obtained with the plate cold. The usual arrangement of the plating is that of inside and outside strakes alternately (see *a*, fig. 79). The inside strakes, which are worked first, are templated off the ship, and lie directly on the flanges of the frame bars. The outside or overlapping plates are then worked, and are templated from the place they are intended to occupy on the ship. They are kept at the proper distance from the frames by liners or slips of the same thickness as the adjacent inside plates. Towards the ends of the ship the number of strakes of plating must be reduced, as the girth along the frames is much less than over the midship portions. Stealers are introduced for this purpose; they are single plates, which at one end receive the butts of two plates, and at the other the butt of only one. By them two strakes are merged into one.

The number of plates requiring to be furnaced is small in comparison with the whole number, but there are always some at the after end of the ship, especially in the neighbourhood of the boss (for the stern tube) and the counter, and a few at the forward end of most ships. As each plate is got ready, it is taken to the ship, hoisted into position, and temporarily secured by the platers by means of bolts and nuts. As the work of plating proceeds, and the weight of the ship increases, extra shores are put into place, and bilge blocks erected by the shipwrights, to keep the structure to its shape and prevent local and general "unfairness." The shell-plating in way of the intended bilge blocks is completed at as early a period as possible, and painted, so that when once the bilge blocks are in place they need not be disturbed until immediately before launching. While the platers are at work on the shell-plating, other squads of riveters are engaged on the deck-plating and internal work, such as the bunkers, engine and boiler bearers, the shaft tunnel, casings and, in the later stages, the hatches, houses on deck, &c., and as much as possible of the internal work is done before the shell shuts out the daylight. As the work is completed by the platers, it is ready for the riveters and caulkers; and these trades follow on without delay, except in some parts of the casings and decks in way of the machinery, which are left portable, and taken down after the launch, to allow the machinery to be put in place.

The platers usually work in squads, composed generally of three platers, a marker-boy and a number of helpers or labourers, the number of whom depends on the size and weight of the plates, and the nature of the work to be done on them, and also on the facilities of the yard for handling such material. On the work of a large vessel many of these squads would be employed. The riveters also work in squads, a squad consisting of two riveters, one holder-up and one heater-boy, with sometimes a catcher, *i.e.* a boy to pass on the heated rivets when the distance from the rivet-hearth is great. Pneumatic riveting has not made great progress in Great Britain. Hydraulic riveting to a limited extent is adopted, especially in the case of work that can be taken to the machine, such as frames, beams and other parts; but in shipbuilding the large proportion of the riveting is done by hand. In the Royal dockyards platers' work is done by shipwrights, and riveting is not considered a trade, though regarded as skilled labour. Shipwrights also lay the blocks, erect the ribbands, shore and fair the ship, but labourers construct the stages. Drillers' work consists in drilling by hand or by portable electric or pneumatic drills holes which it is not convenient or possible to punch or drill before erection; they also rimer out and countersink punched and drilled holes when this is necessary. Portable electric or pneumatic drills are used when possible in some shipyards, and three-cylinder hydraulic engine drills are employed for some purposes, such as in cutting armour bolt holes in thick plating behind armour. The caulkers follow closely upon the riveters, and generally work singly. A very important part of a caulker's duty is water-testing. In the large oil-tank steamers possibly 8000 tons of water are used for testing one ship alone, and about the same amount for a large war vessel. This water is pumped from the sea or river into the compartment to be tested. In the case of an oil vessel, each compartment is filled right up, and a pressure put on by means of a stand pipe, carried for a considerable height above the highest part of the tank; any leakage found must be made good by the caulker, and the tank retested until it is perfectly water-tight. The double bottoms of merchant ships, and the smaller compartments and double bottoms of war vessels, are filled up and tested by a head of water rising a few feet above the load water-line. It is not usual to fill all the larger compartments, such as boiler and engine rooms in war vessels, or the machinery compartments and cargo holds in merchant ships; but water at a high velocity is played on the bulkheads by hose, to test the water-tightness and the strength. An occasional test, however, is made by filling a typical large compartment with water to a height of some feet above the load water-line. Angle-smiths form beam knees where these are welded, and generally all angle-bar work where heating in a smith's fire is required. It is usual to defer the painting of certain parts of the steel structure of a ship as long as possible, so that ordinary red rust may form and dislodge the black mill scale which is answerable for a great deal of corrosion in steel ships, as

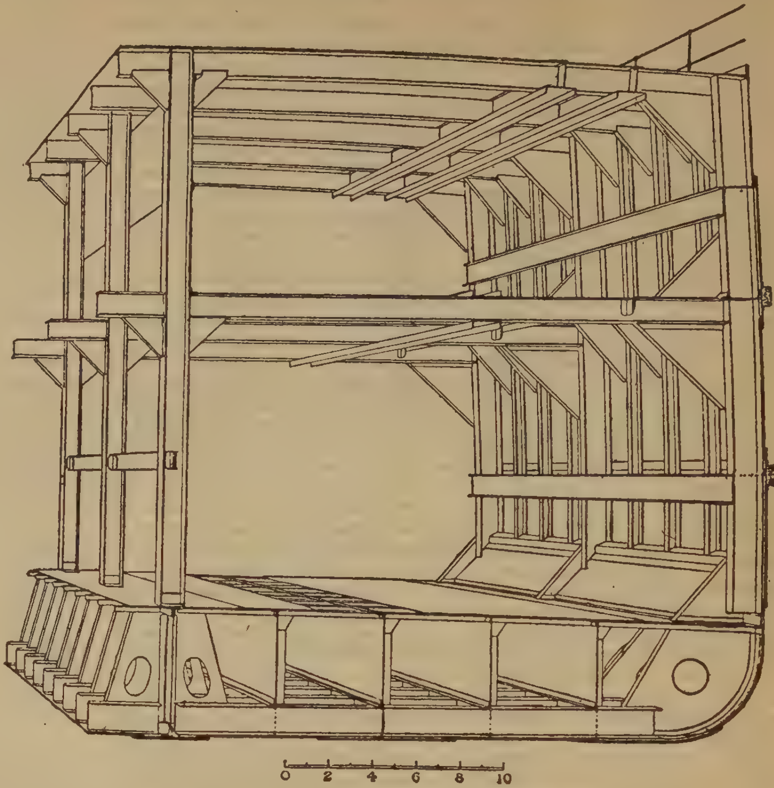


FIG. 110.—Great Lake Cargo Steamer; midship portion, in perspective.

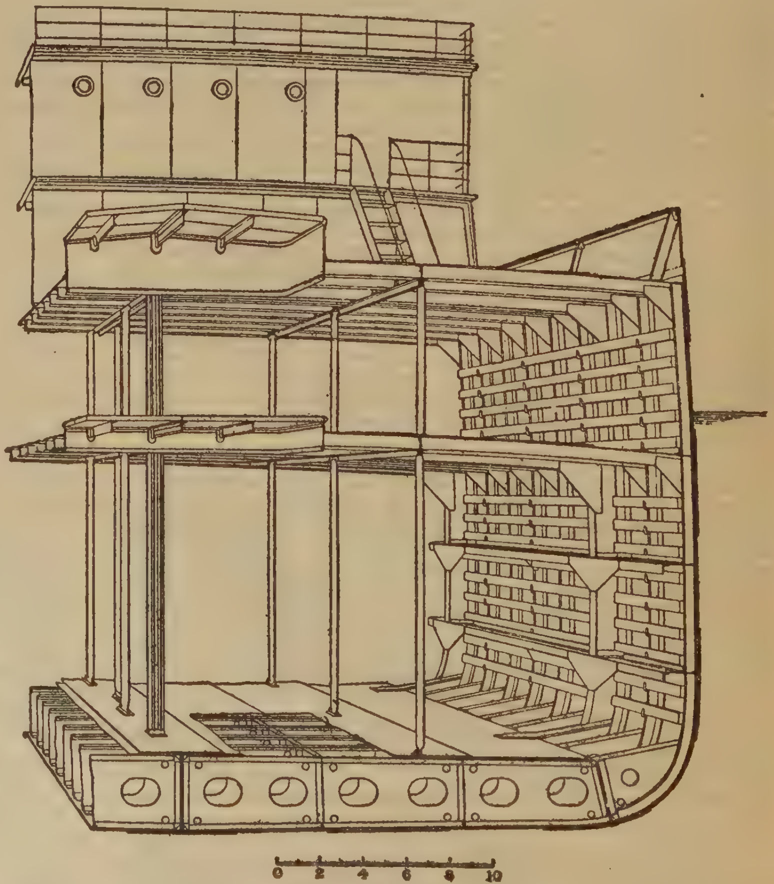


FIG. 111.—British Cargo Steamer; midship portion, in perspective.

in certain circumstances it forms a galvanic couple with the steel plate. For warships the British Admiralty requires the removal of this scale from these parts by immersing the plates in a weak solution of hydrochloric acid. Red and white lead, oxide of iron and oxide of zinc form the bases of most of the paints used on steel ships.

Structural Arrangements.

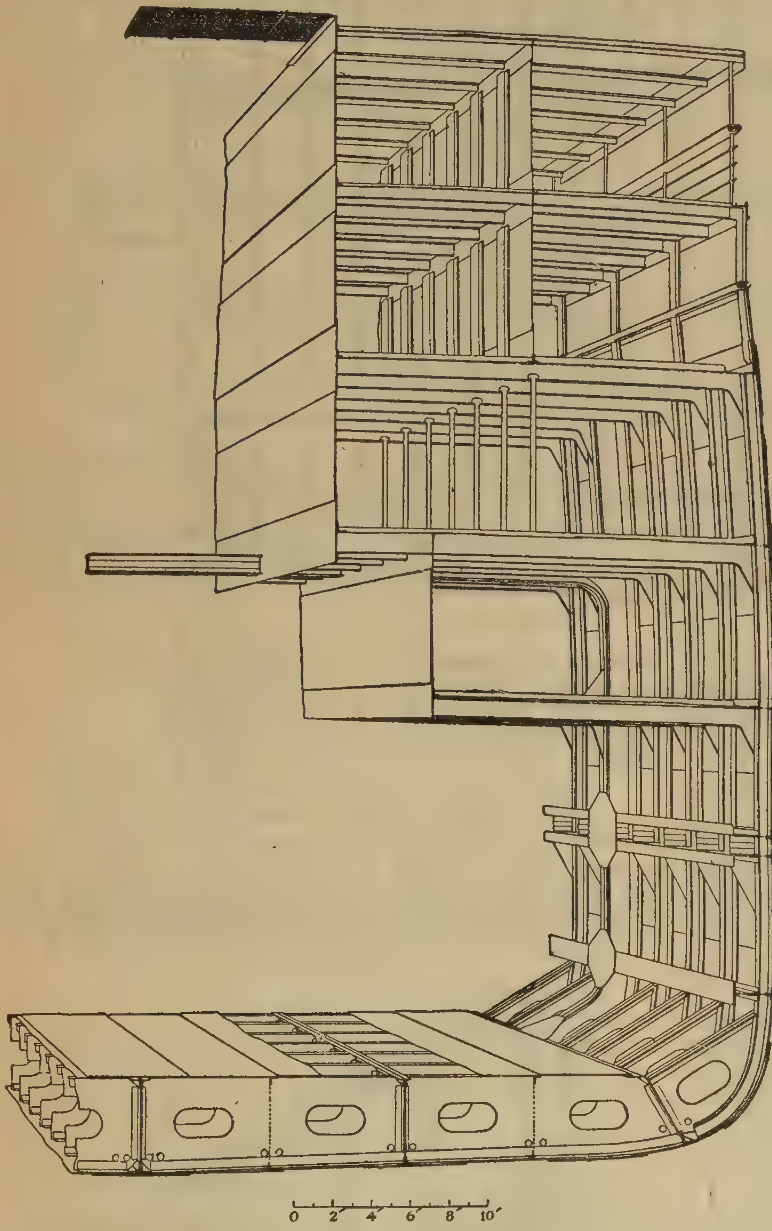


FIG. 112.—Cunard Liner "Campania"; midship portion, in perspective.

The following are particulars of ships recently built at New London (Conn., U.S.A.) on the *longitudinal* system: "The great centre girder, which in all vessels prior to these has been in the form of an I girder, is formed of a double II or box; that is, these vessels have two vertical keels instead of one. The girder is of the same depth as the double bottom (6 ft.). On each side of this girder there are several other vertical longitudinal members, having the plating on the top, forming the tank top, and the shell-plating below, forming the bottom of the tank. This tank or double bottom is 6 ft. deep for the greater part of its length, and is increased at the extremities, where it merges into the fore-and-aft peaks at the collision bulkheads. The whole of this space can be filled with water when desired, to sink the ship to a suitable draught when making a voyage without a cargo or with a very light one, at the same time allowing the ship to keep afloat whenever the outer shell or skin has been pierced by rocks or by colliding with other vessels. This bottom girder or double bottom forms the 'backbone' of the ship, from which the great frames spring or extend up to the weather deck, about 60 ft. above the keel. The frames are made of channel steel spaced 30 in. apart, but as they near the extreme ends they are spaced closer, and are composed of angle bars riveted together. At certain parts of the structure, where the heave of the sea will tend to strain the ship, the frames are double and made very strong. The outer surface of these frames is covered with a shell of steel plates averaging about 1 in. in thickness. These enormous plates are arranged to give a maximum of strength, and the riveting of them to the frames and to each other is receiving the utmost care.

"These ships have a continuous longitudinal bulkhead on the centre, extending from the inner bottom to the main deck. The side plating of the shell, with this longitudinal bulkhead, form three vertical members of the entire structure. The upper flanges of the girder are formed by the upper and main decks, which are laid with heavy steel plates. This great girder is designed to support a full cargo when suspended by long sea waves at either end. The side girders are kept in place by three intermediate decks between the tank and the main deck, making in all five complete decks, each covered with heavy steel plate. The beams supporting all these decks are of channel steel, and fitted to every frame by large bracket plates. One of the many notable features in the construction of these vessels is the distribution of the water ballast. Various conditions of trim and safety can be obtained. The double bottom is divided longitudinally into three water-tight divisions and transversely into about twelve, making in all thirty-six separate tanks. In addition to these there are the fore-and-after peak tanks, and side tanks between the main and 'tween decks, about one quarter of the vessel's length from either end. The latter tanks are really fitted for the purpose of controlling the ship's stability and seaworthiness.

"The vessels are divided transversely into thirteen water-tight compartments, while the longitudinal bulkhead is water-tight in the machinery space, which makes in all fifteen water-tight compartments. The engine-rooms are completely independent of each other; so are the boiler-rooms; but access is had from one to the other by water-tight doors. The coal can gravitate direct to the stokehold floor. The method of pillaring is somewhat novel. . . . Strong girders run under the transverse beams and are supported at wide intervals by built stanchions. By this means the least possible trouble is experienced in stowing the cargo."

American Great Lake steamer.

Fig. 110 shows the construction of a typical American Lake steamer, a diagram of which is given in the article SHIP, fig. 16. She is 450 ft. over all, 50 ft. beam and 28 ft. 6 in. moulded depth; and when loaded to a draught of 18 ft. 3 in. can carry about 6000 tons weight of cargo on a total displacement of about 9000 tons. For half the length or more the ship is of the same transverse section, the frames being made identical in form. The outside plating is about ⅝ in. thick generally, but it is thicker at the garboards, flat keel and sheer strake, and becomes thinner generally towards the ends of the vessel. The frames are 24 in. apart, and consist of four separate pieces—two across the bottom and one up each side. These across the bottom consist of a 15-in. channel bar, with deep flanged brackets of 17½ ℔ plating connecting their inner ends to the centre keelson and their outer ends to the bilge and tank top. Extending up each side the frames consist of 6-in. channel bars of 17 ℔ per foot, worked 24 in. apart in the case of ordinary frames; and 15-in. channel bars of 33 ℔ per foot, worked 8 ft. apart, and called belt or special frames. The frames are all connected to the tank top and to the upper deck-plating by flanged bracket plates 17½ ℔ per square foot; and the belt frames are stiffened by hold beams of I section, 12 in. deep and 35 ℔ per foot, attached to each by deep flanged brackets of 17½ ℔ plating as indicated, and supported in the middle by stanchions or pillars of similar section. The stanchions are attached to the tank top by double clips of 6-in. angle bar, and to the upper deck beams by direct riveting and by flanged brackets of 15 ℔ plating. Each belt frame is thus complete in itself, and very readily erected after the tank top is completed. The tank top is of 20 ℔ plating amidships and under the loading hatches and 17½ ℔ elsewhere. The margin plate is a continuation of the tank top, is made of 17½ ℔ plating, and flanged against the shell. The centre keelson is of about 22½ ℔ plating and about 5½ ft. deep; the side keelsons are of 17½ ℔ and slightly less depth, so that with a small rise of floor on the outside, say 3 in. in the half-breadth of the ship, there is a small fall of the tank top towards the bilges, say 6 in. in the half-breadth, so as to drain the hold to the water-courses over the margin plates. The centre keelson extends from the inner to the outer bottom, being attached to the tank top and the flat keel by heavy double angle bars, and well stiffened by the flanged floor brackets, which are connected to it by heavy double angle bars. The side keelsons are connected to the tank top and the floors by fore-and-aft angle bars 3 in. by 3 in. of 7½ ℔ per foot, and stiffened by vertical 6-in. angle bars at every frame. At the lower edge the keelson plates are connected to fore-and-aft intercostal channel bars

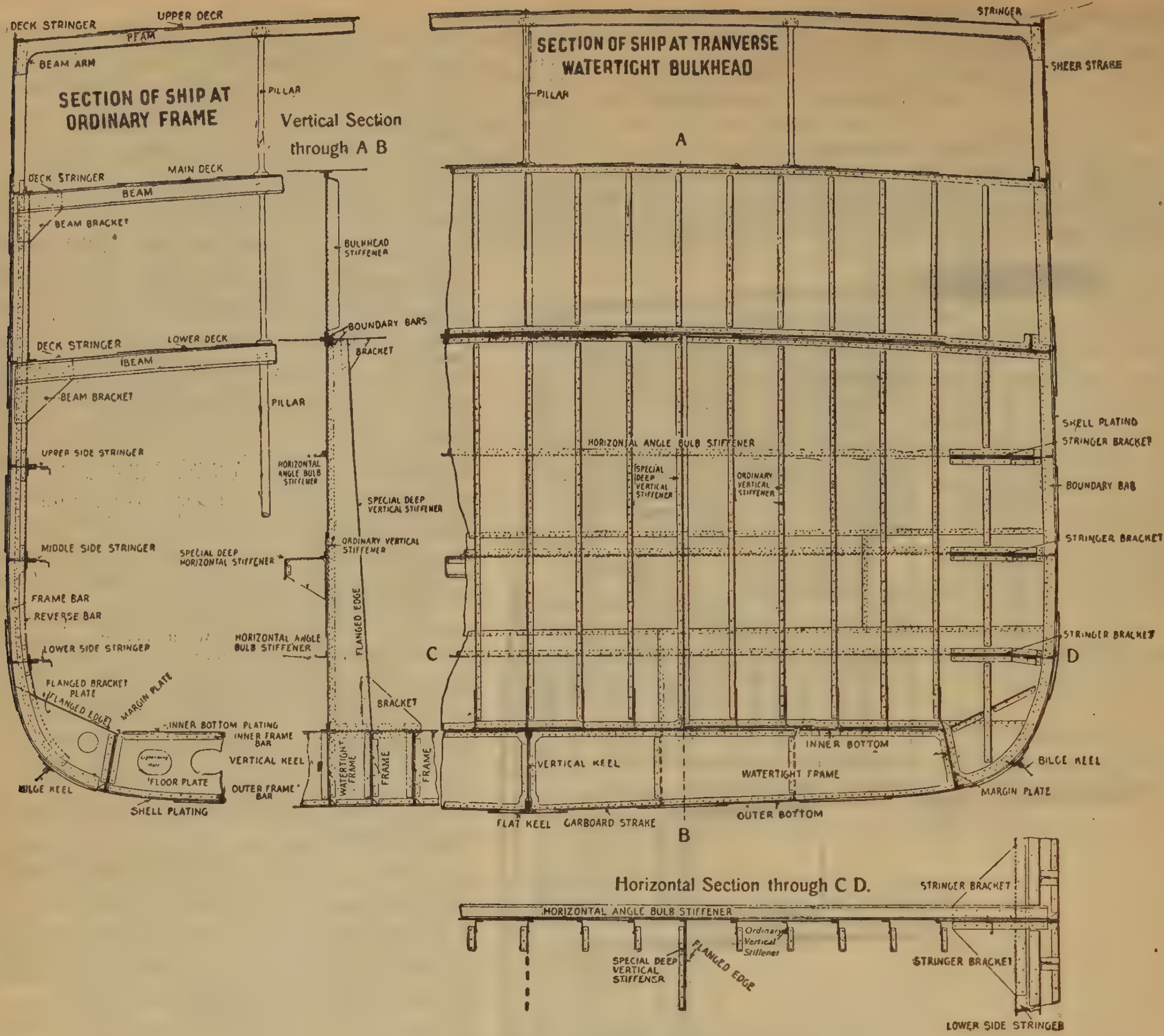

DECK STRINGER
UPPER DECK
BEAM
BEAM ARM
SECTION OF SHIP AT ORDINARY FRAME
PILLAR
Vertical Section through A B
DECK STRINGER
MAIN DECK
BEAM
BEAM BRACKET
BULKHEAD STIFFENER
BOUNDARY BARS
BRACKET
DECK STRINGER
LOWER DECK
BEAM
BEAM BRACKET
PILLAR
UPPER SIDE STRINGER
HORIZONTAL ANGLE BULB STIFFENER
SPECIAL DEEP VERTICAL STIFFENER
ORDINARY VERTICAL STIFFENER
MIDDLE SIDE STRINGER
SPECIAL DEEP HORIZONTAL STIFFENER
FRAME BAR
REVERSE BAR
FLANGED EDGE
LOWER SIDE STRINGER
HORIZONTAL ANGLE BULB STIFFENER
FLANGED BRACKET PLATE
FLANGED EDGE
MARGIN PLATE
BRACKET
INNER BOTTOM PLATING
INNER FRAME BAR
VERTICAL KEEL
FLOOR PLATE
OUTER FRAME BAR
BILGE KEEL
SHELL PLATING
WATERTIGHT FRAME
FRAME
FRAME
C
STRINGER
SECTION OF SHIP AT TRANVERSE WATERTIGHT BULKHEAD
SHEER STRAKE
PILLAR
A
HORIZONTAL ANGLE BULB STIFFENER
SPECIAL DEEP VERTICAL STIFFENER
ORDINARY VERTICAL STIFFENER
SHELL PLATING
STRINGER BRACKET
BOUNDARY BAR
STRINGER BRACKET
STRINGER BRACKET
D
INNER BOTTOM
VERTICAL KEEL
WATERTIGHT FRAME
BILGE KEEL
MARGIN PLATE
OUTER BOTTOM
FLAT KEEL
GARBOARD STRAKE
B
Horizontal Section through C D.
STRINGER BRACKET
HORIZONTAL ANGLE BULB STIFFENER
Ordinary Vertical Stiffener
SPECIAL DEEP VERTICAL STIFFENER
FLANGED EDGE
STRINGER BRACKET
LOWER SIDE STRINGER

FIG. 113.—Details of Framing and Bulkheads.

15 in. deep of 33 lb per foot, riveted to the sheel-plating, which, with the channel floors, give very great local support to the bottom. This system of framing extends practically throughout the length of the vessel; thus the bottom is very strong, and very large ballast tanks are formed, having a capacity of nearly 3000 tons. The upper deck is plated, and the stringers are made specially heavy, to compensate for the strength lost by cutting wide hatchways.

British cargo steamer.

Fig. 111 represents a modern British cargo steamer of ordinary construction, of about the same breadth and depth as the American Lake steamer just described, and it will be interesting to note the differences between the two vessels. These differences, so far as the outside form is concerned, are chiefly that the British cargo steamer has deck erections, topsides and a main deck, whereas the Lake steamer has scarcely any deck erections and no topsides, while her hold extends from the top of the inner bottom to the upper deck; they are due to the fact that the latter ship is only required to traverse inland waters, where heavy weather is not met with, whereas the former is an ocean-going vessel, and must be prepared to meet all conditions of wind and sea. As to the differences in the details of construction, they are chiefly that in the American Lake steamer the bottom framing, which is of great depth, consists of deep channel-frame bars, above which the longitudinals are continuous, instead of the usual transverse framing in the British ship, extending between the outer bottom and tank top; and that the margin plate continues the surface of the tank top out to the side, instead of being nearly vertical, as in the British ship. The system adopted in the American steamer conduces to security in case of grounding in the shallow waters through which she has to pass.

Atlantic liner.

The general construction of a large passenger vessel is shown by fig. 112, which gives a perspective sectional view of the framing, &c. of the Cunard liner "Campania." The transverse frames and the girders or longitudinals extend in depth from the outer bottom plating to the inner bottom plating. The centre keelson, the second longitudinal from the middle line, and the margin plate on each side, are continuous, the transverse frames being fitted between them and attached to them by angle bars. The first and third longitudinals from the middle line are intercostal, being fitted in short pieces between the frames and attached to the floor-plates by short angle bars. The floor-plates have large holes cut in them to lighten them, and to give access to the different spaces for inspection, painting, &c., and smaller holes for watercourses. From the margin plate the transverse frames consist of stout channel

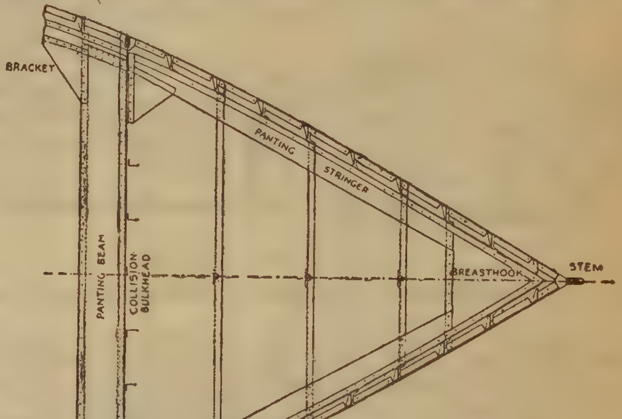

BRACKET
PANTING STRINGER
BREASTHOOK
STEM
PANTING BEAM
COLLISION BULKHEAD

FIG. 114.—Breast-hook and Panting Stringers.

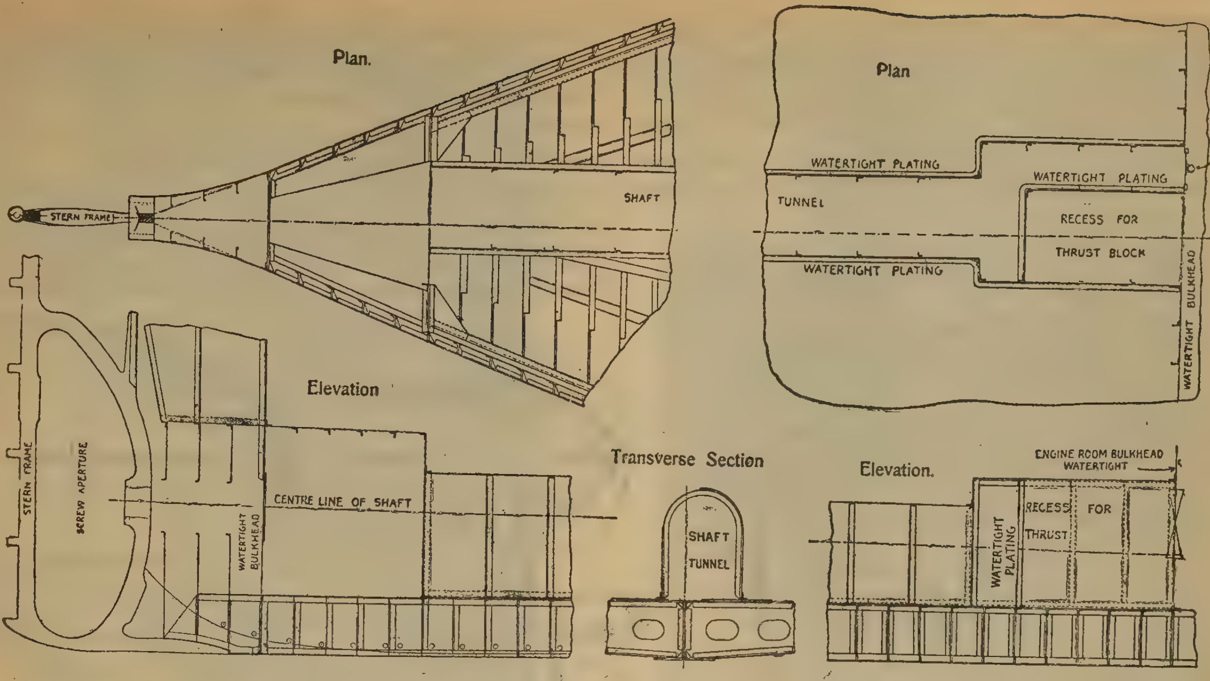


Fig. 115.—Stern Framing, Shaft Tunnel, &c., of Single-Screw Ship.

bars extending to the upper deck; each tier of beams is securely riveted to them, and their lower ends are connected to the margin plate by strong brackets. At intervals the channel-bar frames are replaced by deep built-up frames, the frequency of which depends on local requirements. Heavy side stringers of the same depth as the deep frames run fore and aft, to stiffen the side between the bilges and the first plated deck. Where the deep frames are cut by these stringers, the strength of the frames is continued by *gusset* plates, as shown.

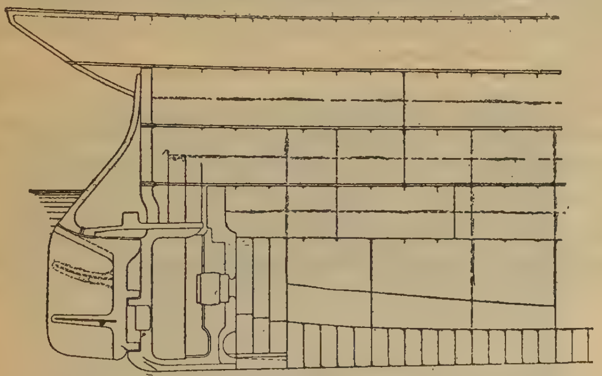


Fig. 116.—Stern Framing of the "Campania."

Some further structural arrangements usually adopted in British ships are shown in figs. 113 to 115. Fig. 113, to which reference has already been made, shows in detail the construction of a bulkhead, with the framing in wake of it, and the same details at an ordinary frame; also the stringers, beams, pillars, &c. The bulkhead itself stops at the tank top, being secured to it by double angle bars, and the floor immediately beneath it is made water-tight. It would involve very costly work to make the bulkhead water-tight if the side and bilge stringers were made continuous; these have therefore been cut, and the continuity of the longitudinal strength is maintained, as far as possible, by the large brackets shown in the plan. Besides bulb stiffeners, the bulkhead is provided with built-up vertical stiffeners at AB and a built-up horizontal stiffener at CD. Fig. 114 shows the arrangement for special strengthening at the extreme fore end of a vessel, between the collision bulkhead and the stem, and below the main deck, these consisting chiefly of panting stringers, panting beams and breast hook. Fig. 115 shows the general arrangement of stern framing of a single-screw ship, including the shaft tunnel. A water-tight door, which can be closed when necessary from above the level of the outside water, shuts off communication between the engine-room and tunnel; the form of the stern post and aperture frame casting is shown, with its attachment to the centre keelson and other details.

Figs. 116 and 117 show the arrangements of the stern and bow framing of the "Campania," which may be taken as those usually adopted in large passenger steamers of this class.[1] In both the transverse framing becomes deeper and stronger as the extremities are approached, while the decks and side stringers are all continued to the extremities, finishing in strong breast-hooks, and additional stringers, breast-hooks and panting beams are introduced. It is worthy of note that the rudder and steering gear are in this vessel entirely under water, so that she may be used for war purposes without running the risk of disablement by the rudder or steering gear being struck by projectiles. Above the water the stern is finished off so as to have the appearance of being fitted with an ordinary rudder. This important departure from the usual practice was first introduced by Professor Biles in the "City of Paris," and the "Campania" and her sister the "Lucania" were in 1902 the only British ships so fitted.

Differences between war and merchant ships.

Fig. 122 gives in perspective the general structural arrangements of the Japanese cruiser "Idzumo," and figs. 118-121 (Plate XIV.) are from photographs of the vessel in course of construction. It will be seen that the departures from the structural arrangements of a merchant ship are very considerable. As already pointed out, lighter scantlings are used in warships than in ordinary merchant ships. This is effected by more carefully devised and more costly arrangements of framing and plating, and by making the structural features necessary in a warship for protection, &c., serve also for local and general strength.

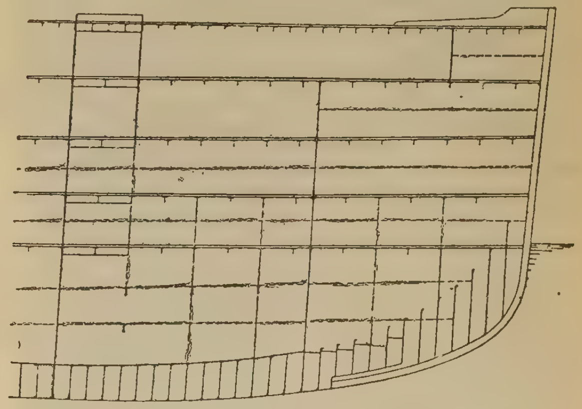


Fig. 117.—Bow Framing of the "Campania."

In warships, frames are placed at greater distances apart, 4 ft. amidships and 3 ft. at the extremities being the usual spacing, as compared with some 2 ft. in a merchant ship. On the other hand, there are more continuous longitudinals in the framing of a warship, which extend in depth from the inner bottom to the shell-plating, and give local support to the bottom as well as general strength to the vessel. There are in a warship so many structural features, such as water-tight bulkheads and flats or platforms, required for the necessary subdivision, armour decks, plating and framing behind armour, &c., which are made to contribute to the strength of the structure as a whole, that the strength of the shell-plating and the transverse framing can be proportionately reduced.

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[1] We are indebted to the late Dr Elgar, F.R.S., for these and other plans of the "Campania."

In a merchant ship there are many considerations which require the structure to be stronger and heavier than would be necessary to withstand the wind and waves which she may encounter. The continual change of cargo and of disposition of cargo necessitates special local strength throughout. The custom, often pursued, of grounding vessels to discharge cargo, and their liability to touch the ground in the ports they frequent, make the provision of great strength in the floors and the shell-plating essential. Other considerations affect the decks, and call for local strength in them with corresponding increase of weight.

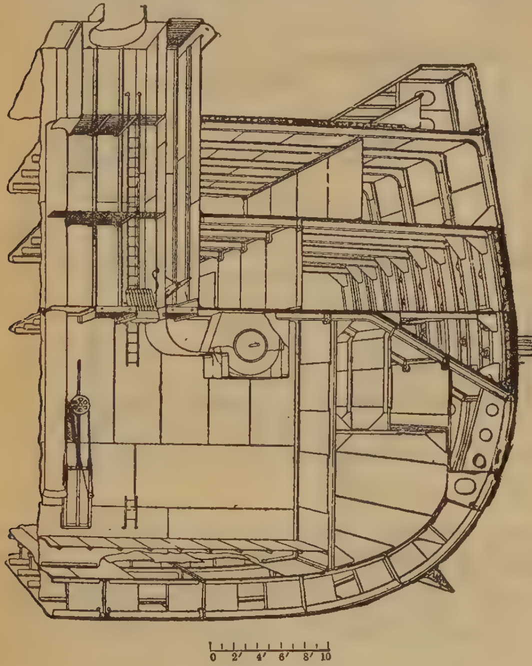


Fig. 122.—Japanese Cruiser "Idzumo"; midship portion, in perspective.

Most warships, except gunboat, torpedo and other small craft, have double bottoms, chiefly for protection against damage in action, but also against accidental grounding. The space between the bottoms is divided into a large number of compartments by making some of the frames and longitudinals water-tight. The inner bottom extends on each side to the turn of the bilge, and from that point is carried up vertically as a wing bulkhead, as shown in fig. 122, the wing spaces thus formed being occasionally utilized for coal-bunkers. The framing, consisting of frame bars, reverse frame bars and frame plates or brackets, is usually carried up in a fair curve to the armour shelf, supposing the vessel to be an armour-clad, as in fig. 122. From the edge of the armour, which is generally about 5 ft. below the load water-line, a change in structure is made, and the framing behind the armour is set back from the outside of the ship sufficiently to admit of an internal skin of steel plating (often worked in two thicknesses), teak backing, upon which the armour is embedded, and the armour itself, to be carried with the surface of the armour flush with the shell-plating. The vertical frames behind armour are spaced 2 ft. apart, and the longitudinals are made intercostal, the whole having exceptional strength, to support the armour. Above the armour another change is made, the frames being brought again to the outside of the ship, and the topside plating directly attached to them becoming flush with the outside of the armour. There is generally a strong deck, called the protective deck, extending from stem to stern in the form of a turtle back, the lower edges being at the armour shelf on each side of the ship, and the top of the arch forming the first deck above water, as indicated in fig. 120. With a view to maintaining its defensive power where it has to be perforated for funnels and air shafts, armour gratings, or armour bars as they are called, are fitted in the openings. As much water-tight subdivision as possible is introduced throughout the ship, but for communication between the various compartments openings are provided in the bulkheads, having water-tight doors which can be closed either from a position close to the door or from a deck above water, or from both. Below the protective deck are the engine and boiler spaces, magazines, shell-rooms, submerged torpedo rooms, and steering-gear. A passage is provided on each side of the ship just below the protective deck, for the supply of ammunition to the secondary armament.

Fig. 118 shows the "Idzumo" partially in frame, looking forward from the after extremity: the frames below the armour deck over a considerable length of the ship are complete, and a number of the beams which carry the armour deck are in place. Fig. 119 shows the ram stem, which has just been placed in position. The collision bulkhead and the framing below the armour deck are for the most part in place. Fig. 120 gives the top of the armour deck, which is nearly completed, as seen from the fore end, with the forward citadel bulkhead in course of construction. Fig. 121 shows the after part of the vessel, which is not so far advanced as the forward portion shown in fig. 120. In fig. 121 the framing has been carried to a bulkhead near the after extremity, the rudder post is in place, and the bearing for the rudder head can be seen in the foreground. The construction of the armour deck is proceeding, and the after citadel bulkhead is also well advanced, though no backing is yet upon it, as in the case of the forward bulkhead, but the base of the redoubt which carries the after turret is erected.

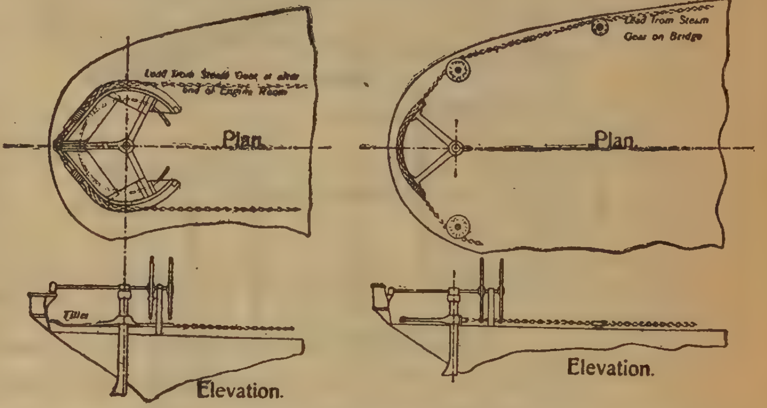

Lead from Steam Gear at after end of Engine Room
Plan.
Lead from Steam Gear on Bridge
Plan.
Tiller
Elevation.
Elevation.

Fig. 123.—Steering Gear of Merchant Ship.

Auxiliary machinery.

The fittings in a ship cannot be fully described in the present article, but we shall conclude with some account of the auxiliary machinery. Two ordinary arrangements of steering-gear fitted in merchant steamers are shown in fig. 123. In the first example a three-quarter circular grooved rim, keyed to the rudder head, carries the steering-chains, which are led forward one on each side of the hatches to the steam engine, placed in this case in the engine-room casing, and controlled by shafting from the bridge. The usual steering-wheel is fitted on the bridge, and actuates the controlling valve of the steam engine by means of the shafting. The second example is very similar to the first: a quadrant is keyed on the rudder head, and worked by chains led over pulleys one on each side of the ship to the steam gear, which in this case is placed on the bridge, close to the wheel. In all such cases gear is also provided by which in an emergency the ship can be steered by hand, by steering-wheels placed close to the rudder head, as indicated in the figures.

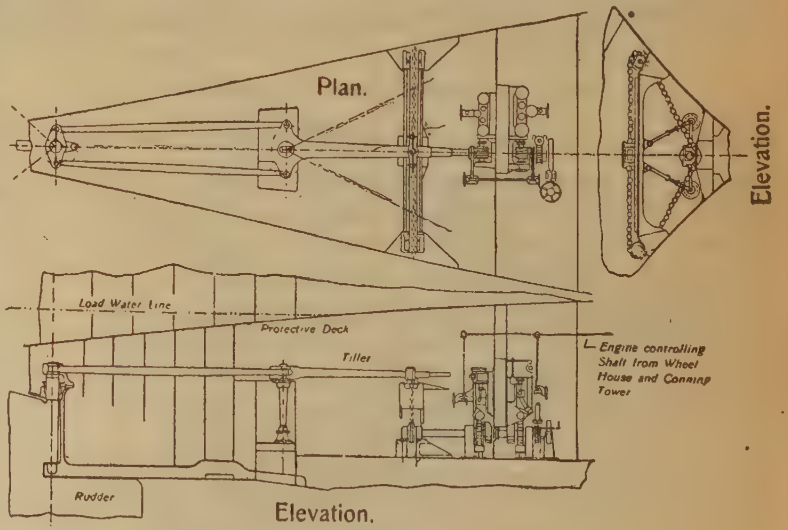


Fig. 124.—Steering Gear of Warship.

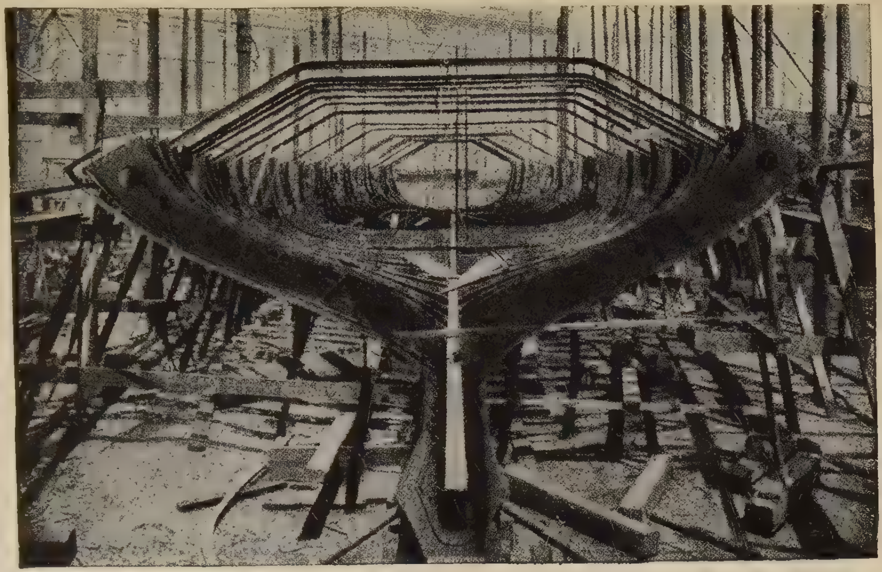


FIG. 118.

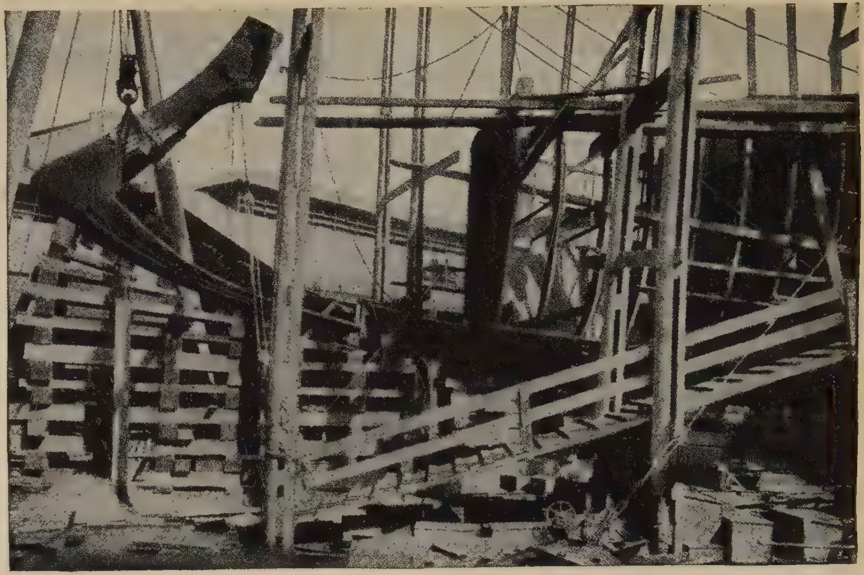


FIG. 119.

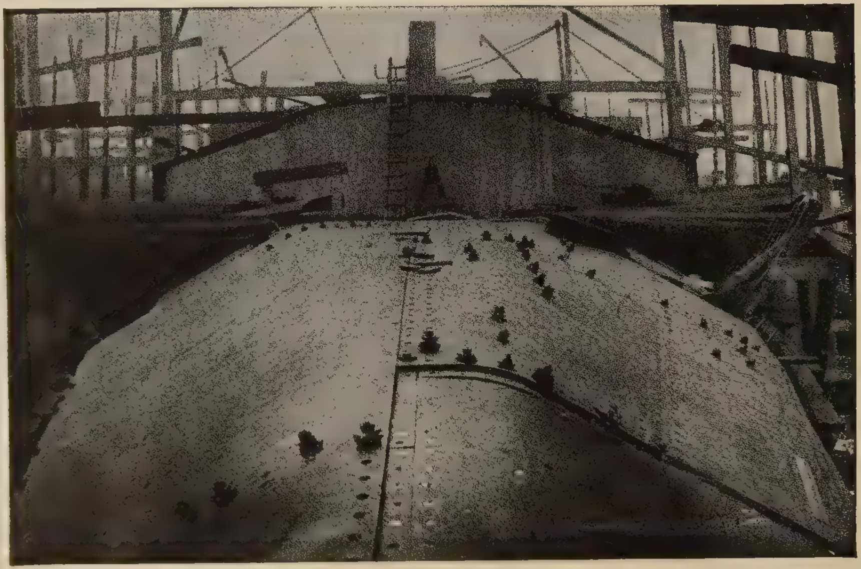


FIG. 120.

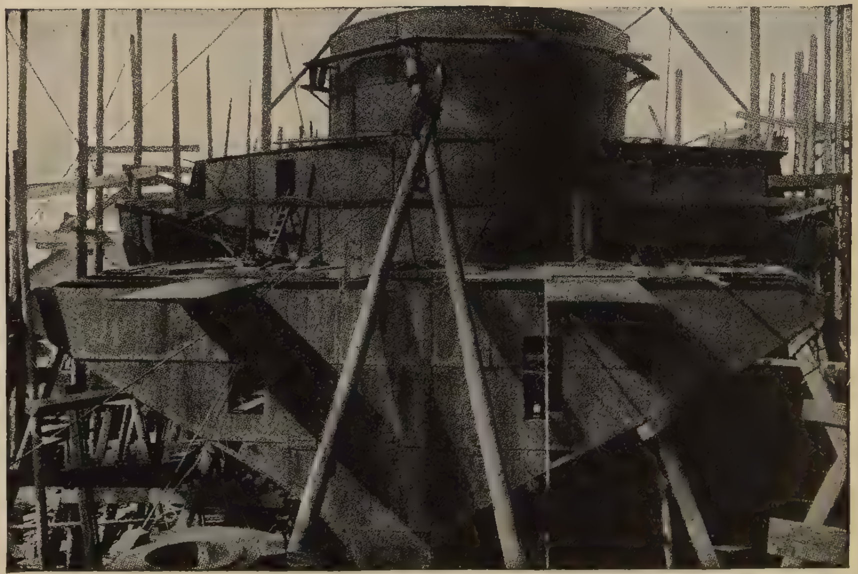


FIG. 121.

STAGES IN THE CONSTRUCTION OF A WARSHIP.
(Japanese Cruiser *Idzumo.*)

In a warship the arrangement is different, as it is necessary to keep the steering gear below the water-line for protection. The breadth available at the rudder head is as a rule not sufficient for a tiller or quadrant to be fitted. Fig. 124 illustrates an arrangement frequently adopted. A crosshead of sufficient size is keyed on to the rudder head, and is worked by connecting rods from a similar crosshead placed a little farther forward, where the breadth of the ship is sufficient to allow a tiller to be worked. The tiller is worked by a block or carriage, which is drawn across the ship on a guide, at the same time sliding upon the tiller, which is machined for the purpose. The block-and-guide arrangement is known as Rapson's slide. The block is hauled to and fro across the ship by a chain which passes round a sprocket wheel upon a shaft, which is driven in either direction, as required, by the steering-engine. In fig. 125 the arrangement is shown which has been for a considerable period adopted in large merchant ships and has in recent years been adopted in ships of the British navy. It is known as *screw steering gear*. On the same central shaft there are right- and left-handed screws as indicated on the plan, by which blocks A and B are made to travel always in the opposite direction when the shaft is rotated. These actuate the crosshead on the rudder E by means of the rods C and D, one of which will communicate a thrust and the other a pull, and vice versa according to which way the shaft is made to rotate. The shaft may be actuated either by hand-gear or by steam by means of the clutch F. In many cases the steam steering-engine is placed in the engine-room, to avoid heating the after-compartments by the steam pipes, and for the sake of easier control by the engineers.

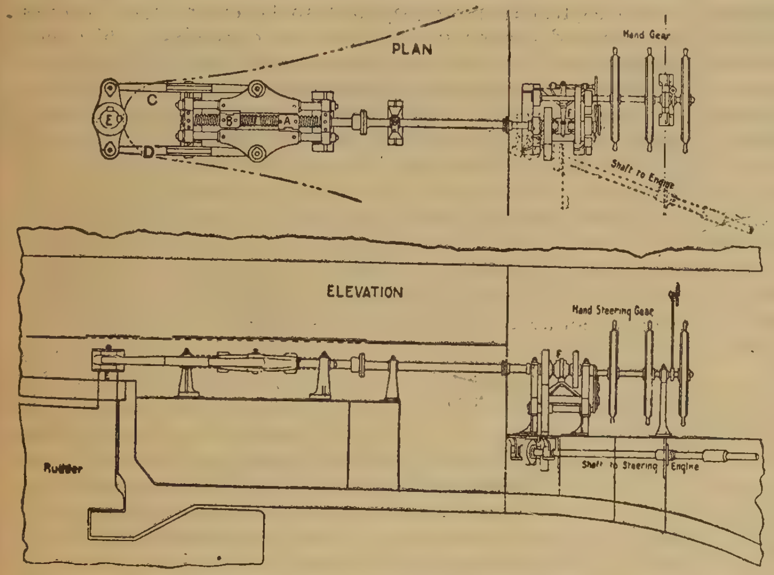


FIG. 125.—Screw Steering Gear.

Amongst the auxiliary machinery usually fitted in passenger and other well-found vessels may be mentioned the windlass for working the cables and weighing the anchors; a warping capstan forward in connexion with the windlass, and another aft with its own engine; steam winches for handling the cargo and baggage, and for hoisting coals on board; and occasionally steam cranes, fitted either in addition to or in place of the winches. Then there are the electric light, pumping, ventilating and refrigerating installations. Hydraulic power is employed in many cases, especially for cranes, but here the source of the power is necessarily a steam engine, which is usually placed in the main engine-room. Electric power sometimes replaces steam for operating some of the machines enumerated above; for instance, ventilating fans are now generally driven by electric motors in passenger and war ships. A large number of comparatively small fans are used, each supplying air to a particular part of the ship.

In warships the amount of auxiliary machinery has been very greatly increased in recent years. On each side of the deck amidships there is generally a steam winch for raising and lowering the boats, one of the principal functions of the mast in the modern warship being to carry the derrick used for this purpose. Electric motors are fitted for working the after-capstans, ash hoists, sometimes the winches, and the workshop machinery; also to traverse, elevate and work the guns, and bring the powder and projectiles up from the magazines to the guns. But for the heavier guns, the steering-gear, and certain other purposes, hydraulic power or steam is still preferred.

The writer is indebted to Mr H. G. Williams, Mr Lloyd Woollard and Mr A. W. A. Cluett for valuable assistance in preparing this article. (P. WA.)

SHIPKA PASS, in Bulgaria, a pass in the Balkans, celebrated as the scene of fierce fighting in the Russo-Turkish War of 1877–78. The main road from Rumelia to Bulgaria, leading from Sistova by Tirnova and Eski Zagra to Adrianople, crosses the Balkans near the village of Shipka, and this passage was of necessity an important point in the Russian plan of operations. The road does not pass between high peaks, but crosses the main ridge at the highest point; it is therefore not a pass in the ordinary sense of the word. Near the summit, running parallel, and close to the road is a series of three ridges, some 200 ft. high, and about 2 m. from north to south, which formed the position for a force holding the pass. It was originally held by a Turkish force of about 4000 men with 12 guns, prepared to resist the Russian advance. On the 17th of July they repelled a feeble attack from the north, and the following day faced round and drove back an attack by Gurko from the south. These attacks were to have been simultaneous, but Gurko, having met with unexpected resistance, was a day late. Though so far successful, the Turks evacuated their strong position, and it was occupied by the Russians on the 19th of July.

They were first attacked by Suleiman Pasha towards the end of August. Having concentrated with Reouf Pasha and driven Gurko across the Balkans at the end of July, he moved to the Shipka on the morning of the 21st of August, and attacked. The Russian force there, including five battalions of Bulgarians, then numbered 5000, but that day a regiment from Selvi brought their numbers to 7500, and this force held the position against 30,000 Turks for three days, when heavy reinforcements arrived. The fighting continued till the morning of the 26th, when Suleiman, his troops being exhausted, and having lost 10,000 men, entrenched himself in the position he then occupied in a semi-circle round the southern end of the Russian position. Having called up more battalions from Yeni Zagra, after a four days' artillery bombardment, he attacked on the 17th of September, and was repelled with a loss of 3000 men.

There was no more fighting on the Shipka till the general advance of the Russians after the fall of Plevna. Radetzky's command of about 60,000 men advanced from Gabrova on the 5th of January, in three columns. Radetzky, with the central column, moved by the main road and attacked the Turks, who still faced the position on the summit, while Skobelev and Mirski, crossing by trails some 3 m. to the west and east of the Turkish position, attacked their reserves on the far side, about Shipka and Shenova, where Vessil Pasha (who had succeeded Suleiman in command) had formed an entrenched camp. These flank columns made their way over the mountains, deep in snow. Mirski attacked alone on the 8th of January, as Skobelev's advance had been delayed, but the following day both columns attacked, and after fierce fighting the Turks surrendered. The force on the summit had that day repulsed, with heavy loss, a frontal attack by Radetzky, but they were included in the surrender. Their numbers were 36,000, including 6000 sick and wounded, and 93 guns. The Russian losses were 5500.

Not only were the Turkish attacks on the Shipka unsuccessful, but they were made without object. At the end of July, when Suleiman forced Gurko back over the Balkans, the moral equilibrium and the plan of operations of the Russians had been upset by the second battle of Plevna, and the Shipka ceased to have any strategical importance for the time being. Had Suleiman at that time followed up Gurko and joined Mehemet Ali, or moving round acted with Osman against the Russian flank, the evacuation of the Shipka would have been compulsory. Suleiman, knowing nothing of strategy, preferred to act independently, and his action was supported by the still more ignorant ministers at Constantinople. The Shipka was merely a geographical point until the Russians were prepared to advance, but, fortunately for them, the Turks chose to waste an army in fighting for it throughout the critical period of the operations. As with Osman at Plevna, it was Constantinople that forbade Vessil

Pasha to withdraw his forces at the beginning of January, compelling him to wait to be swallowed up. The Turkish tactics were equally unsound. Suleiman divided his forces and used up his troops in costly frontal attacks on Mt. St Nicholas, the southern and strongest point of the position, whereas a well-supported flank attack would probably have met with success. The manner in which he sacrificed his men earned for him the name of the "Shipka butcher." (J. H. V. C.)

SHIPLEY, JONATHAN (1714–1788), bishop of St Asaph, was educated at Reading and Oxford. He was ordained about 1738, and acted as tutor in the household of the 3rd earl of Peterborough. In 1743 he became rector of Silchester and Sherborne St John, Hampshire, and prebendary of Winchester. He was appointed to a canonry of Christ Church, Oxford, in 1748, and in 1760 to the deanery of Winchester and the living of Chilbolton, Hampshire, which he held in addition to his earlier preferments. In 1769 he was consecrated successively bishop of Llandaff and of St Asaph. He was much concerned with politics, and joined the Whig party in strong opposition to the policy of George III. towards the American colonies. In 1779 he was the only bishop to advocate the abolition of all laws against Protestant dissenters. He died on the 6th of December 1788. His brother, William Shipley (1714–1803), originated the Society of Arts; and his son, William Davies Shipley (1745–1826), became dean of St Asaph.

SHIPLEY, an urban district in the Shipley parliamentary division of the West Riding of Yorkshire, England, on the south bank of the Aire, 3 m. N. by W. of Bradford, on branches of the Great Northern, Midland, and North Eastern railways. Pop. (1901) 25,573. The manufacture of worsted is the principal industry, and there are large stone quarries in the neighbourhood. The parish includes Saltaire, so named after Sir Titus Salt, who established large alpaca manufactories, opened in 1853.

SHIP-MONEY, a tax, the levy of which by Charles I. of England without the consent of parliament was one of the causes of the Great Rebellion. The Plantagenet kings of England had exercised the right of requiring the maritime towns and counties to furnish ships in time of war; and the liability was sometimes commuted for a money payment. Notwithstanding that several statutes of Edward I. and Edward III. had made it illegal for the crown to exact any taxes without the consent of parliament, the prerogative of levying ship-money in time of war had never fallen wholly into abeyance, and in 1619 James I. aroused no popular opposition by levying £40,000 of ship-money on London and £8550 on other seaport towns. The fleet of Charles I. during the first three years of his reign was, says S. R. Gardiner, "largely composed of vessels demanded from the port towns and maritime counties. The idea of universal ship-money to be levied in every county in England seemed to him to be merely a further extension of the old principle." Accordingly, on the 11th of February 1628, Charles issued writs requiring £173,000 to be returned to the exchequer by the 1st of March for the provision of a fleet to secure the country against French invasion and for the protection of commerce, and every county in England was assessed for payment. This was the first occasion when the demand for ship-money aroused serious opposition. Lord Northampton, lord-lieutenant of Warwickshire, and the earl of Banbury in Berkshire, refused to assist in collecting the money; and Charles withdrew the writs.

It will be seen, then, that the statement of Hallam—that in 1634 William Noy, the attorney-general, unearthed in the Tower of London musty records of ship-money as a tax disused and forgotten for centuries—has no real foundation. It was, it is true, the suggestion of Noy that a further resort should be had to this expedient for raising money when, in 1634, Charles made a secret treaty with Philip IV. of Spain to assist him against the Dutch; and Noy set himself to investigate such ancient legal learning as was in existence in support of the demand. The king having obtained an opinion in favour of the legality of the writ from Lord Keeper Coventry and the earl of Manchester, the writ was issued in October 1634 and directed to the justices of London and other sea ports, requiring them to provide a certain number of ships of war of a prescribed tonnage and equipment, or their equivalent in money, and empowering them to assess the inhabitants for payment of the tax according to their substance. The distinctive feature of the writ of 1634 was that it was issued, contrary to all precedent, in time of peace. Charles desired to conceal the true aim of his policy, which he knew would be detested by the country, and he accordingly alleged as a pretext for the impost the danger to commerce from pirates, and the general condition of unrest in Europe. The citizens of London immediately claimed exemption under their charter, while other towns demurred to the amount of their assessment; but no resistance on constitutional grounds appears to have been offered to the validity of the writ, and a sum of £104,000 was collected. On the 4th of August 1635 a second writ of ship-money was issued, directed on this occasion, as in the revoked writ of 1628, to the sheriffs and justices of inland as well as of maritime counties and towns, demanding the sum of £208,000, which was to be obtained by assessment on personal as well as real property, payment to be enforced by distress. This demand excited growing popular discontent, which now began to see in it a determination on the part of the king to dispense altogether with parliamentary government. Charles, therefore, obtained a written opinion, signed by ten out of twelve judges consulted, to the effect that in time of national danger, of which the crown was the sole judge, ship-money might legally be levied on all parts of the country by writ under the great seal. The issue of a third writ of ship-money on the 9th of October 1636 made it evident that the ancient restrictions, which limited the levying of the impost to the maritime parts of the kingdom and to times of war or imminent national danger, had been finally swept away, and that the king intended to convert it into a permanent and general form of taxation without parliamentary sanction. The judges again, at Charles's request, gave an opinion favourable to the prerogative, which was read by Coventry in the Star Chamber and by the judges on assize. Payment was, however, refused by Lord Saye and by John Hampden (*q.v.*), a wealthy Buckinghamshire landowner. The case against the latter (*Rex* v. *Hampden*, 3 *State Trials*, 825) was heard before all the judges in the Exchequer Chamber, Hampden being defended by Oliver St John (*q.v.*) and Robert Holborne, and lasted for six months. Seven of the twelve judges, headed by Finch, chief justice of the common pleas, gave judgment for the crown, and five for Hampden; though two of the latter—namely, Bramston, chief justice of the king's bench, and Davenport, chief baron of the exchequer—based their judgment on technical grounds which did not touch the constitutional question at issue. The judgment of the court practically abrogated the right of parliament to control supply; and the necessity for curbing the royal prerogative in regard to taxation, thus rendered arbitrary by legal decision, became one of the chief motives in the popular resistance to Charles I., which after the Hampden trial grew increasingly formidable. In 1639 Charles ventured again to issue a writ of ship-money, but for the comparatively small sum of £70,000. In 1641, by an Act of the Long Parliament (17 Car. I. c. 2), introduced by Selden, the illegality of ship-money was expressly declared, and the Hampden judgment annulled.

See John Rushworth, *Historical Collections*, vols. i., ii., iii. (7 vols., 1659–1701); Strafford's *Letters and Despatches*, edited by W. Knowler (2 vols., London, 1739); S. R. Gardiner, *History of England from the Accession of James I. to the Outbreak of the Civil War*, vols. iii., vi., vii., viii. (10 vols., London, 1883–1884); Henry Hallam, *Constitutional History of England* (3 vols., London, 1832, &c.); Oliver St John, *Speech to the Lords, Jan. 7, 1640, concerning Ship-money* (London, 1640). (R. J. M.)

SHIPPARD, SIR SIDNEY GODOLPHIN ALEXANDER (1838–1902), British colonial administrator, was the eldest son of Captain William Shippard, 29th Regiment. He was educated at King's College school and Oxford. Taking his degree in 1863, he was called to the bar as a member of the Inner Temple in 1867. He then entered upon a long career in South Africa. He was attorney-general of Griqualand West from 1873 until 1877, when he was made acting recorder of the High Court of Griqualand. From 1880 to 1885 he sat as a judge of the Supreme Court of Cape Colony; and he was British commissioner on the Anglo-

German commission in 1884–1885 for settling the claims of British subjects at Angra Pequena and other parts of the south-west coast. Shippard, while at Oxford in 1878, had discussed with Cecil Rhodes the plan of the projected British advance in south central Africa. He saw in the German annexation of Damaraland and Namaqualand the first step in a design to secure for Germany territory stretching from ocean to ocean—a design which if executed would have been fatal to the British position in South Africa. Consequently when after the Warren expedition of 1885 he was chosen to organize the newly acquired British possessions in Bechuanaland he saw in his appointment an opportunity for forestalling the Germans, and also the Boer adventurers who likewise sought to be beforehand with Britain in the countries north of the Limpopo. From his first establishment in Bechuanaland he kept up a friendly correspondence with the Matabele king Lobengula with the object of attaching him to the British cause. At the end of 1887 he went to Graham's Town with the hope of inducing the high commissioner (Sir Hercules Robinson—afterwards Lord Rosmead) to sanction the conclusion of a treaty with Lobengula binding that ruler not to cede any part of his territory to any other power than England. "I used all my power of persuasion," Sir Sidney writes, "but failed to induce Lord Rosmead either to act on his own responsibility in the matter or to approach Her Majesty's government on the subject. As a last resource I telegraphed to Mr Rhodes, who was then busily engaged at Kimberley, to come down at once to Graham's Town and try the effect of his eloquence. He came, and by taking upon himself all pecuniary responsibility succeeded in obtaining the requisite sanction" (see article "Bechuanaland," by Sir S. Shippard, in *British Africa*, London, 1899). The treaty was signed and British interests secured. Shippard was thenceforth freer to devote himself to the special interests of Bechuanaland, which he governed with conspicuous success. He held the chief official position there from 1885 to 1895, being administrator, chief magistrate and president of the Land Commission for British Bechuanaland, and resident commissioner for the Bechuanaland Protectorate and the Kalahari. He was created K.C.M.G. in 1887. In 1896 he played an unofficial part in the negotiations between Sir Hercules Robinson and the Johannesburg reformers after the Jameson Raid. He then returned to England, where he died on the 29th of March 1902.

SHIPPING. To the floating log and paddle of the primeval fisherman must doubtless be attributed the first beginning of the great industry of merchant shipping. The hollowing of a log and the addition of a skin sail would before long serve to convert the embryo craft into a vessel navigable in the smooth and narrow waters which lapped the shores of the Mediterranean and the far distant East. The coastal villages had need of worked stone knives, of beads and of skins for winter coverings, to be obtained by barter for their fish and salt. Passing from settlement to settlement dotted on the shore, the traders found in the local skiffs a convenient alternative to the rough and tedious tracks along the winding or indented coast. In course of time they established themselves at the coastal settlements and built or purchased craft for their own use. As populations and their needs increased, the traders, gaining confidence by experience, built larger vessels and extended the area of their barter, sailing in companies, for mutual safety and defence. Of the early days of this traffic, as developed in the East, we have but little information, but in the Eastern seas, apparently, the Chinese usually came no farther than the coast of Malabar. The Malays seem in all ages to have traded with India and probably with the coast of Africa. In the Indian Ocean the Arabians were the principal carriers. Greatest of all the ancient navigators nearer to the West were the Phoenicians, the hardy sons of Tyre and Sidon. To the remarkable maritime ascendancy of Tyre Ezekiel xxvii. bears eloquent testimony. King Solomon's undertaking for the building of the temple was largely founded on the support of Phoenician Hiram. Much later, but still some 2000 years ago, ships had become a common means of transport and were of no small size, since the centurion charged with the conveyance of St Paul to Rome (Acts xxvii.) found at Myra an Alexandrian ship about to sail with wheat for Italy, which was able to take on board, besides the cargo, the whole of the company, making a total of 276 souls in all. Then, as now, ships were but links in a mighty chain of commerce on the land, a commerce for which the ports are the centres of collection and distribution. The products of India and Europe were conveyed from east and west in stages by inland or coastal routes with which in their entirety India and Europe alike were unacquainted (Vincent). And, generally, in the ancient days ocean commerce ceased with the summer season, and sea-borne goods from the distant east to the remote west found their way from entrepôt to entrepôt. These entrepôts were great trading centres, the advantageous situation of London, for example, having before the days of the Roman conquest marked it out as a convenient emporium for the northern trade.

Early history.

The Phoenicians, especially, for centuries pushed their commerce farther and farther afield, establishing factories and trading ports which in time grew into independent settlements. Cadiz, the ancient Gadir, was one of such, and from Gadir or more northern settlements the Phoenicians visited Britain, bartering merchandise for tin at Cornwall or the Scilly Isles. Amongst the various nations of the south, between whom the great shipping heritage of the Phoenicians was in course of time divided, the Rhodians rose to great importance. By these notable traders was drawn up a code of maritime laws, many of which were embodied in the Roman law, and eventually, at or about the time of Richard I., became a foundation for the Law of Oleron, which is in some part adopted at this day. Emerging from the constant struggles in the Mediterranean and Adriatic, the Venetians, Genoese and Pisans attained to great prosperity and renown, the reputation of the Genoese as shipbuilders creating from time to time a demand for their ships on the part of the nations struggling for maritime supremacy in the channel and the North Sea. The once familiar English word "argosy" dates from the appreciation of the vessels built at Arguze or Ragusa, a Dalmatian city on the Adriatic. The proximity of Italy to the Holy Land tended greatly to the prosperity of the Italian shipping.

In very early days the commerce of northern Europe was principally carried on by inland routes. With the increase and civilization of the populations, the cities on the navigable rivers and on the sea found the advantage of ocean commerce, and strove for supremacy in trade. In Britain many an ancient seaboard town, from Bristol to far north Inverness, largely owing to the enterprise of the Flemish and the German merchants, became important as a trading centre. The English merchants were not without ships, but the foreign traders were enterprising and wealthy, and in their emulation for the renowned English wool and for English hides were prepared to venture much.

In those days and for several centuries later the history of shipping was a history of arbitrary restraints, of claims for exclusive rights of trading and navigation, and of pretexts of various kinds, resulting in captures and burnings, in embargoes and confiscations in port and in fierce reprisals. The merchantman was a more or less armed vessel prepared alike for aggression or defence, a condition of affairs to which has probably to be attributed the occasional construction of vessels of a tonnage then remarkable. The ships of Spain and Portugal, of England and the Netherlands—of French shipping for a considerable period there was comparatively little—homeward bound from Indian ports and factories and from the New World's trading settlements from time to time were preyed on by one another. The Algerian and Barbary corsairs, with nothing to lose and everything to gain in merchandise and captives, were the dread of all who sailed the seas from Lisbon to Gibraltar—and indeed still farther north—and within the straits. The insurance of the voyagers against capture and the payment of head-money for their ransom was a well-established system of the times.

In England, the Cinque ports, in consideration of valuable privileges, were specially engaged to hold vessels at the service of the state, but on need arising the ports at large were called upon for ships and men. These demands at times became oppressive. Thus we read that in 1371 it was complained in parliament

English progress.

that owing to the demands of the king the merchants were being ruined and their mariners driven into other trades. The size or measurement of ships was assessed on the basis of their capacity to carry tuns of wine, the first step in the present system of tonnage measurement. Ships sailed in fleets, one or more of their masters being appointed admirals, to be obeyed by all the company. In times of special maritime disturbance an armed fleet convoyed the merchantmen, much, no doubt, to the added cost of transport. The great source of England's wealth was her wool, of which the abundance and fineness gave rise to a wide demand. Staples or licensed entrepôts or marts were set up for this and other produce at certain towns in England and overseas, English merchants associating themselves at such foreign staples. In like manner foreign trading societies located themselves under certain privileges and obligations at English marts, to the great increase of shipping, more especially of foreign bottoms. About the middle of the 15th century a considerable use sprang up for shipping in the carriage of African slaves to Portugal, their captors being the Moors. In later years this melancholy trade found large employment for the ships of Liverpool, Bristol and London, trading with the distant west. Pilgrimages, too, were bringing profit to the ships, a constant stream of the devout with their offerings journeying on the one hand to the shrine of St James of Compostela and on the other to that of St Thomas of Canterbury.

From times remote the fishing industry produced a hardy race of shipmen, the maritime nations being all more or less engaged in an enterprise rendered doubly lucrative by the want of flesh meat and the regulations of Holy Church. Thus in very early days the northern seas were thronged with rival fishing fleets, which, from about the middle of the 15th century, began to find their way to the banks of Newfoundland. At the close of the 16th century the whale was being pursued by rival fishermen on the Greenland coasts. Queen Elizabeth, for the maintenance of shipping and the increase of fishermen and mariners, forbade the eating of flesh on Wednesdays and Saturdays, an order from time to time subsequently revived. Sir Walter Raleigh, in his statement to King James, lamenting English commercial supineness as compared with the enterprise of the Dutch, declared that 20,000 vessels of all nations were engaged in fishing off the British coasts, of which vessels the Dutch owned 3000; and no doubt they formed a valuable mercantile and naval school.

The great discoveries of the renowned Spanish and Portuguese navigators in the reign of Henry VII. awoke in the maritime states a new spirit of commercial enterprise and emulation, in which Henry and his successors took an active part. A royal grant of navigation and discovery was given to the Cabots, then settled at Bristol, and "divers tall ships" of London, Southampton and Bristol traded direct with the Mediterranean ports, though the English merchants generally employed foreign vessels for this trade. A "tall" ship was apparently a vessel carrying topmast with yards and square sails, an important development of the simpler pole-mast rig of earlier times. Henry VIII. and Ferdinand of Spain entered into a league, primarily aimed at France, under which it was agreed to police the seas in protection of their shipping, the English fleet to watch the sea to Gibraltar, and Spain to guard the Mediterranean. The Corporation of the Trinity House was now established, in great part for the deepening of the Thames and to supply shipping with the ballast gained in the process, though the vessels actually London-owned were apparently few in number. Most English ships of burthen were then obtained by purchase at the South Baltic ports, where the great Hanse town, Lübeck, was the centre of an enormous trade. The Hanse towns, indeed, practically carried on the trade of England. In the time of Elizabeth, England began to achieve commercial independence. Great building of ships took place, for which bounties were granted by the queen, and Elizabeth set herself against the Hanseatic league. At the close of her reign the Steelyard was shut up, and the Dutch were competing successfully with the Hanse towns, of which "most of their teeth were out and the rest but loose." In the early days of commerce the risks were too considerable to be borne by individuals, who accordingly associated themselves as companies of merchant adventurers for the purposes of their particular trade, exclusive rights and privileges being granted to them by their own sovereign, and corresponding facilities on the part of the foreign states or cities traded with. In England certain of these societies, notably the company of Russian merchants, the Turkey merchants and, for long, the East India Company, occupied positions of influence and importance, the last-named company especially becoming possessed of much shipping, including large vessels, well armed, for prize-making or defence. The needs of trade and shipping were for long but little understood and often arbitrarily obstructed, but as a broad general principle it was recognized by the crown that the national trading interests required for their protection special privileges and concessions. Thus the patent granted by Elizabeth to the African adventurers in 1588 was expressed to be on the ground that "the adventuring of a new trade cannot be a matter of small charge and hazard to the adventurers in the beginning."

At the middle of the 16th century Antwerp was at the zenith of its great prosperity. It was described as the general storehouse of the world, and it was stated that so many as 2500 vessels might be seen lying in the Scheldt at one time. These, however, were mainly foreign, Antwerp being a mart or emporium to which other nations traded. Towards the close of the century this great city's peaceful population was, in the name of Holy Church, crushed under the iron heel of Christian Spain. Its traders fled from cruelty and torture largely to Amsterdam, about this time the northern entrepôt for Portugal's East India trade. The Hollanders, profiting by the decline of the Hanse towns, were now greatly devoting themselves to shipbuilding and to foreign trade. They, like the English, hampered in their navigation by hostile and unfriendly occupation of the ports of refuge and supply at the two great southern capes, were bent on discovering a north-east or north-west passage to the East. This enterprise and the desire for gems and precious metals, as to the existence and abundance of which there were many false beliefs, added greatly to the knowledge of the distant seas and shores, on which many settlements were being established. To such settlements the attention of the French was now directed, with much encouragement to their shipping by the powerful Richelieu. The East Indian settlements and shipping of the Portuguese were being persistently harassed by the advancing Dutch, while the rich treasure ships of Spain were laid wait for and captured by English shipping, greatly to the Spanish loss. But the Dutch especially were prospering. Amsterdam, a vast trade centre supplied by Dutch shipping, had between 1571 and 1650 trebled itself in size. So far back as 1603 Sir Walter Raleigh, in his statement to King James, had complained that the vessels of the Dutch, by reason of their greater capacity and smaller crews and consequently lower freights, were cutting out the English ships or driving them into the Newcastle coal trade. By such enterprise the Hollanders gradually became the carriers for the English merchants. English bottoms were neglected and English seamen took service with the Dutch. Affairs for English shipping had about 1650 reached a crisis. There existed, moreover, great animosity between the English and the Hollanders.

Navigation Act 1651.

In the defence of the national shipping the great Navigation Act was in 1651 placed upon the British statute-book. Under this far-reaching act the trade between England and her colonies and the British coasting trade was strictly confined to English bottoms, English owned and manned substantially by English seamen. The act contained further provisions in support of British shipping, the effect of which was greatly to prejudice foreign shipping in its competition for the British carrying trade. It is not impossible that some of the regulations of the act may have proceeded from the animosity already mentioned (Adam Smith). From the point of view of the Dutch, indeed, it was a "vile act and order," to be resisted at all costs. From the prolonged hostilities which ensued England finally emerged supreme at sea. For some time the French, under the powerful encouragement of Richelieu and subsequently of Colbert, had been devoting themselves to colonial enterprises both across the Atlantic and in distant India, to the eventual important increase of French shipping, whilst on the other hand Spanish shipping was declining. As the result of the Navigation Act and its successful maintenance a great increase had taken place in English tonnage, which in 1688 was said to be nearly double that of 1666. In the war with France this increase was greatly in favour of her privateers, which in two years are stated to have captured 3000 British ships as against but 67 which were taken from France, a result in part attributable to her employment of Dutch vessels. About this time Inverness, long devoted to shipbuilding, had obtained a high reputation for its ships.

18th century.

In 1701 England's private shipping numbered 3281 vessels, of a total burthen of 261,222 tons and carrying 5660 guns, London leading with 560 ships of 84,882 tons, Bristol coming next with 165 of 17,338 tons, Liverpool being seventh on the list with 102 ships. Thirty years later London's ships had increased to 1417, ranging from 15 tons to a great ship of 750 tons owned by the South Sea Company, but the majority measured less than 200 tons. In 1765 we read that the Dutch, Danish and Swedish ships were generally larger than the English vessels and that they had succeeded in ousting England as the carrier of Lisbon's Mediterranean trade. In 1714 an act was passed, and at subsequent dates revived, offering public rewards for improved methods of ascertaining longitude at sea, and John Harrison ("that heaven taught artist") received in all £20,000 for the invention of a chronometer which was successful to a degree of accuracy beyond that for which the act provided. Towards the second half of the 18th century the foundations were laid of the present great shipping industry on the Great Lakes. Oak timber of large size was now becoming scarce in England, and in the interests of the navy restrictions were placed upon the East India Company as regards its use. British merchant shipping, too, had apparently outgrown the supply of seamen, for towards the close of the century it was permitted to British vessels to carry foreign seamen to the extent of three-fourths of the crew. The traffic in African negroes gave much employment to British shipping. The war with America led to the harrying of British commerce by American privateers cruising off the English coasts. War premiums were very high and the insurance obtainable was insufficient. Partly on this account and partly owing to the fact that about 1000 British vessels had been taken up for transport and other public services, whilst many more were sailed as privateers, the Thames was now full of foreign vessels loading British cargoes. During the absence from the West Indies of the British fleet under Admiral Byron, engaged in conveying homewards the West Indian merchantmen, two valuable British islands were captured by the French. The hostilities of the rival states were being fought out at sea, with peaceful commerce as their objective. The seas swarmed with privateers, armed and equipped as sordid speculative enterprises, occasional rich prizes stimulating the greed of many citizens, not a few of them, no doubt, the owners of ships and merchandise which had in like manner fallen to the enemy. The French privateer "Bordelais," captured by the English in 1799, is reported to have taken in four years 164 prizes, of the net value of £1,000,000 sterling (Mahan). Between May 1756 and July 1757 a total of 772 French vessels was captured by the British, whilst 637 British ships were taken by the French. It was declared in the House of Lords in February 1778 that the value of the British captures of American vessels had amounted to £1,808,000, against which that of British shipping captured by America had been £1,800,000. Towards the close of the prolonged hostilities which concluded in 1815 Liverpool and Glasgow were holding public meetings and urging upon the admiralty and the throne that they were being ruined by the want of protection to their shipping. In 1786 an act was passed (26 Geo. III. c. 86) for the encouragement of shipping, in which the personal liability of shipowners, till then unlimited, was in certain cases of their loss of cargo now limited to the value of the vessel and her freight, the first of progressive acts of the like nature. Smuggling was for long the cause of serious loss to the national revenue, and an act was passed declaring forfeited any British sloops or cutters found within four leagues of the coast if provided with a bowsprit exceeding two-thirds of the vessel in length (27 Geo. III. c. 32).

In 1797 the English and Scottish private vessels numbered together 12,995 of 1,385,252 tons burthen. With respect to tonnage, in the days of wooden vessels the weight of cargo which a ship was capable of carrying was about equivalent to her own displacement or breaking-up weight. Nowadays, owing to steel construction and the adoption of a fuller cross-section in ship designing, the carrying capacity of a cargo steamer is reported to be about double, or even more than double, the ship's own weight; but types of steamers of course vary. The Board of Trade ton is 100 cub. ft., purely a measure of permanently covered-in space, and not to be confounded with the ship's capacity to carry dead-weight, of which capacity the registered tonnage is consequently not to be regarded as an index. For the purpose of a rough and ready calculation, however, the dead-weight carrying capacity of an average cargo steamer may be taken to be about twice that of her net registered tonnage or a little more. The chief object of fixing and registering the gross and net tonnage is the establishment of a basis of assessment for tonnage dues and for liability for payment of damages caused by wrongful navigation or otherwise. The present diversity in the designs of steamships is in no small degree due to a desire on the part of shipowners to possess vessels which with a minimum of registered tonnage shall provide a maximum of cargo space.

19th century.

The close of the 18th century was marked, especially in America, by attention to the possibilities of steam navigation. A new era in shipping had dawned, and year by year and step by step, from river craft to short-voyage vessels, the new motive power gained ground. In 1833 the Canadian vessel "Royal William" steamed throughout from Quebec to London, making the voyage in seventeen days, and in 1838 the "Great Western" and the "Sirius" arrived on the same day at New York, having crossed the Atlantic in eighteen days and fifteen days respectively (Pollock). In 1840 was founded the celebrated Cunard Steamship Company, the nucleus of its fleet being four wooden paddle steamers, also equipped as sailing vessels. Each was about 206 ft. in length and of about 1145 tons burthen. At the beginning of the 19th century American shipowners had laid themselves out to obtain command of the Atlantic trade, from which the British Navigation Act did not debar them. With this aim, ships of great sailing power and carrying capacity were constructed, being provided in addition with ingenious labour-saving devices which materially enhanced their economy in working. Successful in their attempts on the Atlantic trade, the Americans now set themselves to gain predominance in the trade with China, for which they provided vessels of unexampled speed. But British owners, put upon their mettle, eventually succeeded in designing a class of sailing ship superior to any yet constructed, while the advantages of steam navigation were now proving fatal to American sailing vessels in the Atlantic (Cornewall-Jones). The use of steam was becoming general, to the gradual displacement of sailing vessels, though the Australian trade for some considerable time continued to be carried on by sailing ships of wide renown. The opening of the Suez Canal and the provision of coaling stations on the long sea routes eventually, however, placed the bulk of the Australasian carrying trade in the hands of the steamship owners, the principal employment for large sailing vessels now being in the Pacific trade. Probably in great part on account of the cost and difficulty of fuel supplies, the Californian wheat trade, and the guano and the nitrate trades of the South Pacific, are thus still competed for by sailing vessels, some of them of remarkable capacity. For some years the possibilities of iron in shipbuilding had been slowly gaining recognition, to the eventual displacement in Great Britain, though not in the United States, of wooden hulls. Partly as the result of the war between the Northern and Southern states and partly owing to the superior advantages of iron hulls, not yet constructed in America, the United States now further lost place as ocean carriers. In 1908 the chief employment of her ocean shipping was on the Atlantic coast and in the Gulf of Mexico.

The steady increase in steam-propelled vessels resulted in the establishment of many coaling stations in distant parts, with much employment of shipping to supply them. Towards the middle of the 19th century British shipowners were greatly alarmed at proposals to repeal the navigation acts, and in spite of their petitions and remonstrances, and of demands that the bill, eventually introduced, should at least require reciprocity, in 1849 the proposed measure became an act, the coastal trade being in 1854 similarly thrown open, this latter measure being induced by the need for British ships and seamen for the purposes of the Crimean War (Lindsay). Probably in no small degree owing to the discovery of gold in California and Australia about this time, and to the further employment provided for shipping by the Crimean War and by the necessities of the Indian Mutiny, the direful forebodings of British owners as to the consequences of the repeal of the Navigation Act were not verified. In 1856 the Treaty of Paris and its appended Declaration pronounced, amongst other notable clauses affecting maritime warfare, the abolition of privateering. To this great treaty most of the maritime states in course of time gave their adhesion, the United States and Spain, however, not yet being signatories. The altered conditions as between warships and merchant vessels, and the disabilities imposed by neutrality laws have, however, in themselves done very much to render privateering as formerly conducted no longer possible. But the Declaration, notwithstanding, the employment of duly commissioned merchant vessels may still be resorted to by the state for the destruction of commerce and for other belligerent purposes.

In 1858, after great difficulty and outlay, Brunel's huge ship the "Great Eastern" was floated on the Thames. The vessel, having a length of 679 ft. and a burden of 18,337 tons gross and 13,344 tons net (Lloyd's Register) and being provided with six sail-carrying masts, was furnished both with a screw propeller and with paddles. Highly successful as an engineering enterprise, commercially she was from the first a ruinous failure. Under the remarkable development of the Atlantic passenger traffic, however, the size of steamships steadily and continually increased.

In 1873, as the outcome of a prolonged public agitation conducted by Mr Samuel Plimsoll, member for Derby, a royal commission was appointed to inquire into his allegations that many lives were lost owing to the unseaworthiness of ships. In 1876, under pressure of public sympathy with the views of Mr Plimsoll, an amended Merchant Shipping Act was passed (39 & 40 Vic. c. 80), making it a penal offence to knowingly send a ship to sea unseaworthy, and requiring a loadline to be fixed on British vessels, the line to be indicated on ocean going vessels by what is now universally known as the Plimsoll mark.

The opening in 1869 of the Suez Canal created a revolution in the eastern shipping trade. Year by year steamships increased greatly in number and in burden. With improved conditions of steam navigation the supplementary use of sails was generally abandoned, masts being retained only for signalling purposes and as attachments for cargo hoists. New conditions in ship construction, the commercial demand for expedition and the manufacture of new articles of commerce together resulted in an increased risk of fire on ships both at sea and in port, with great loss primarily to underwriters, more especially by the flooding of holds full of valuable cargo. To overcome this danger steamships are being increasingly equipped with an apparatus which on the outbreak of fire enables the holds to be filled with a fire-extinguishing gas. The invention and adoption of refrigerating machinery and insulated holds resulted in the development of a vast trade in frozen meat and perishable produce.

The triumph of Germany in the Franco-Prussian War awoke in the Fatherland a spirit of industrial enterprise which greatly increased the population of her manufacturing areas. The supplies required by the prosperous industrial populations and the national demand for raw materials for the manufactories, together with the great export trade for which these were now laying themselves out, filled the German and other North Sea ports with shipping. Germany, able to consume whole shiploads of various foreign products, now imported these direct instead of in parcels through London and other ports. Unwilling that the profit of carrying her great and increasing trade should be reaped by foreign bottoms, Germany turned herself to shipowning and shipbuilding, and with remarkable success. So great, indeed, was this success that important lines of German steamships rapidly grew up as competitors with British and other lines in foreign trades. Both in bringing home raw materials and in enabling German manufacturers to send their products to foreign consumers at low rates of freight, the German shipping was now greatly increasing the national prosperity. In return, the state neglected nothing which would promote the success of its industrial centres in their competition for foreign markets, or which would assist the development of the national shipping. Rates of carriage from inland centres to the shipping ports were, in the case of goods intended for shipment by German vessels, considerably reduced by the state railways; and whereas in Great Britain shipping subsidies or subventions are granted essentially if not solely for services to be rendered, in Germany the granting of subsidies has also in view the development of the national shipping. The notable growth in Germany's trade and shipping is in fact believed to be in no small degree attributable to a system of subsidies to shipping in conjunction with preferential railway rates on German goods despatched for shipment under "through" bills of lading under the national flag.

In the Far East also, a new and important maritime competitor has sprung up, the industrial and commercial awakening of Japan having been attended by the creation of a Japanese merchant fleet and by much enterprise in the national shipbuilding. To the name of every Japanese merchant vessel is added the word "Maru," in ancient times a masculine "humility title," but in its present use having the approximate signification of "dearest" or "esteemed."

The following figures, supplied by Lloyd's Register, recording the number and tonnage of German and Japanese steamers and sailing vessels of 100 tons and upwards, illustrate severally the recent maritime progress of the two countries:—

Year.	Germany.		Japan.	
	No.	Sailing Vessels Net, Steamers Gross.	No.	Sailing Vessels Net, Steamers Gross.
		Tons.		Tons.
1890	1875	1,569,311	289	171,554
1900	1710	2,650,033	1066	574,557
1908	2178	4,232,145	..	..
1908 steamers only	1806	3,839,378	865	1,140,177

In consequence of an act passed by the French government to grant bounties on sailing vessels constructed and owned in France, the owners of such vessels found it to their profit, the bounty being assessed on distances sailed, to engage in long voyages, with the earning of freight as a secondary consideration. This procedure being found to operate prejudicially on the freight earnings of sailing vessels generally, and more especially in the Pacific trade, an international meeting of the owners of sailing vessels was held at Paris in 1903, with the result of the formation of the Sailing Ship Owners' International Union to maintain rates of freight, French owners identifying themselves with the measures decided on by the union in the common interest. Influenced, no doubt, by German example, certain French steamship companies about this time decided to grant preferential combined tariffs on goods sent from inland centres of production in France for shipment by their vessels, to the great dissatisfaction of the owners of foreign steamers loading for similar destinations at French ports.

Early in 1902 a shipping pool or "combine" was effected in the case of certain important British steam lines engaged in the North Atlantic trade. The combine, involving vast capital values, was engineered by a well-known New York business house largely interested in American railways. In England it was variously attributed to a resolve on the part of American traders to share in the transport of the national trade; to a desire on the part of the lines concerned to effect economies by a consolidation of management, and to a scheme intended to benefit certain great American railways. The transaction gave rise to much comment in Great Britain, being by not a few regarded as contemplating the eventual transfer of the lines to American ownership. And indeed, though the steamers continued to be under the British flag, the extent to which they remain substantially under British ownership cannot be affirmed. It was stated in 1908 that on completion of its building programme the combined fleet would consist of 132 vessels of together, 1,159,704 tons.

The general adoption of steamships in place of sailing vessels was gradually followed by their separation into two classes, one devoted to a fixed service on regular lines of employment, the other to promiscuous trade. The former class are now known somewhat vaguely as "liners," ranging, however, from the first-class mail and passenger steamer on the one hand, to the regular cargo steamer on the other. To the second class belong the "seekers" or "tramps" which come and go wherever profitable employment offers, and which more especially lay themselves out to be chartered to carry full cargoes of coal, timber, wheat, nitrate, jute and such like. These vessels, some of which are of great capacity, are frequently in competition with the liners. This competition sometimes results in "cut rates" of freight, to the serious loss of the great shipowning firms and companies. With the establishment of regular lines, moreover, there grew up competition between rival lines, with similar results. A solution was found by the creation of working agreements between rival lines at agreed rates of freight, but the lines thus associated were still exposed to the attacks of "tramps" upon what the liner owners regarded as their privileged trade. Fierce conflicts from time to time ensued, with great disturbance of the freight market and with consequent loss or inconvenience to the merchants themselves. As the result, shipping "rings" or "conferences" were created in many trades, the owners of the liners undertaking to provide the traders with a regular service accompanied by advantageous conditions, whilst the traders undertook to ship only by the conference steamers. In order to ensure this support, the shipowners instituted the system of deferred rebates, under which each merchant, at the end of a year or other fixed period, should be entitled to a discount or rebate on the amount of freight paid by him during such period, provided that he should have shipped no goods at all by steamers outside the conference, the discount only to be paid after a further fixed period of six or nine months, during which time also he should rigidly support the conference lines. In the event of failure to comply with the conditions, a merchant is exposed to forfeiture of the rebate, and in addition to measures in the nature of a boycott on the part of the conference lines. Notwithstanding, attempts are from time to time made by steamers outside the ring to gain admittance, with the consequence of occasional freight wars, and with the incidental result that goods are sometimes carried, for example, from America to a British colony at lower rates of freight than similar goods manufactured in England. Mainly on account of complaints made against the working of the South African ring, a British royal commission was in 1906 appointed to take evidence and report upon the subject generally.

With the growth of populations and the development of means of transport, both by land and sea, a great increase arose both in production and consumption, and competition became very keen for markets, both home and foreign. In this competition the cost of carriage is always an element of great importance, even though the freight payment may bear but an insignificant relation to the value of the goods carried. For in modern trade rivalries every penny saved in charges counts with the importer, and if goods of a similar kind can, by reason of lower transport charges, be obtained a fraction cheaper from one industrial centre than from another, the tendency is to give the preference to the centre or country which can deliver most cheaply to the consumer. Trade follows cheapness, and, with the world's industrial development, the striving for cheapness took at the outset the form of economies in production. The day of small trade with large profits was passed, and producers of all kinds now aimed at a large output at diminished cost, and contended themselves with a smaller ratio of profits on a larger business. The utmost economy was studied with a view to successful competition, especially in overseas markets; and in this struggle for the cheapening of supplies the cost of transport became an important element. The fact was recognized that the ship is but a link in the chain of connexion between producer and consumer, and the system of "through" bills of lading was introduced, under which a particular steamer line or railway service contracted for the through-carriage of goods in conjunction with other lines, with the object and effect of cheapening the transport as a whole. Individual shipowners, in order to obtain cargoes for their ships, were in turn driven to devise economies in transport, with the result that rates of freight were continually reduced. In modern ocean carriage size means cheapness, the transport of a given weight of cargo being cheaper in a single vessel than in two vessels each of half the size. For not only does this concentration of carrying power effect economy of officers and crew, with their wages, provisions and accommodation space, but in shipbuilding also size makes for cheapness. Thus, if, for example, two steamers each carrying 2000 tons will cost together say £40,000, a single vessel of equal carrying capacity can be supplied for £35,000. Or, put another way, if for £40,000 two steamers can be built to carry between them 4000 tons, for the same sum a single vessel can, it is stated, be provided to carry 4700 tons. Consequently, the size of vessels is continually on the increase, and no sooner is a navigable channel at much cost made deep enough for the great vessels knocking at the door of the port, than still larger are constructed, and shipowners complain anew that the harbour depth provided is insufficient. The constant demand for greater depths resulted in the production of mammoth dredgers of which, also, the size and power are continually increasing. At the present time it is the navigable depth of ports and canals, and the need of adequate dry docks, rather than the obtaining of cargoes, which are the controlling factors in the size of great ocean vessels. But the heavy interest on the capital cost of these vessels and their working expenses call for the utmost despatch in their loading and discharge, and with the simultaneous arrival of several vessels of large tonnage, the question of prompt discharge is one of great and increasing difficulty. For many modern steamers will carry 10,000 tons of cargo, and some a great deal more; so that, with old-type railway trucks carrying ordinarily only about 8 tons, it not infrequently happens that the discharge of the ship, equipped though she be with remarkable facilities for landing her cargo and assisted by discharge into barges, is impeded owing to deficiency of shore clearance. If 8 tons be taken as the capacity of an ordinary railway truck and 30 trucks be allowed to a train, it will be obvious that a single modern cargo ship will require a vast procession of rolling stock to clear her cargo. A single cargo of 10,000 tons, for example, will require some 1250 railway trucks for its removal; or, allowing 6 yards' length to the truck, 7500 yards of rolling stock, without engines and vans. And, in fact, congestion of shipping owing to delays is frequently the cause of bitter complaint in the case of certain ports. Trucks of much increased capacity are now being introduced, but for various reasons their adoption is very slow. In port polemics the argument is sometimes heard that the backwardness of this or that port will result in the trade being driven elsewhere: the ships, it is said, will remove it. But the ship is but the blind instrument of trade, to come and go where and as trade calls it. The ship will, however, sooner or later require a higher rate of freight for ports of slow despatch, and this increased expense in transport will undoubtedly operate in favour of rival ports. For the ports themselves are but stepping-stones to or from a market or industrial centre, and the market will always select the cheapest route for its trade.

With the increase of populations in the Old World and the development of new countries, the transport of emigrants and of travellers for business and for pleasure became a highly important and lucrative source of employment for steam shipping. It is now indeed becoming a common practice on the part of ocean steamship companies to employ a surplus or superseded vessel of their fleet solely in carrying holiday tourists to a succession of foreign ports. In regular traffic the demand for increased speed and greater security and comfort on the part of ocean travellers resulted in the competitive evolution of passenger steamers of dimensions and draught which create an increasing strain on port and dock authorities.

These remarks must not be concluded without mention of the important part played in the evolution of modern shipping by the system of marine insurance and by the rules of classification. For the cost of insurance is a heavy tax on the profits of the shipowners, and only by providing vessels of the best construction and maintaining their reputation can owners gain the advantage of low insurance rates. And not only so, but by the merchants also, to whom insurance premiums are a no less serious consideration; vessels of the highest class and reputation are insisted on with a view to cheap cargo insurance, inferior ships being consequently placed at a serious disadvantage. On the other hand, the rules of construction and classification of the Society of Lloyd's Register (a body altogether distinct from the Corporation of Lloyd's) are most exacting, and any failure to comply with the rules of the Register or "Book," which, moreover, are in a constant state of scientific evolution, may involve withdrawal of the vessel's class, a result which would be fatal to her cheap insurance as well as to her employment in successful competition for freights. With its skilled surveyors at foreign, colonial and home ports, the great society offers every facility for the classing of the whole world's shipping, and foreign as well as British owners are fully alive to the importance of a strict compliance with the Book's requirements. Consequently, amongst the various factors making for improved construction and the greater safety of shipping, the beneficent influence of Lloyd's Register occupies a foremost place.

But the various factors or forces which make for the evolution of shipping may all be summed up under the word "competition," which is the mainspring of the machinery both of insurance and classification. These factors operate, however, in different ways. Thus, while insurance and classification make most for ships' increased safety, the desire for profitable freights tends continually to their greater size. But making also for increased size, and in addition for the many improvements and inventions which result in luxury and comfort at sea, the vast influence of the ocean passenger is conspicuous. For, no longer regarded as an encumbrance to be made room for on a cargo ship, the modern age of travel has rendered him a vast source of profit. The old position is reversed, and now fast-steaming hotels are built for ocean travellers, in which cargo occupies a secondary place, which only merchandise able to pay highly for the costly advantage of a speedy voyage can afford to occupy. The growth of the passenger traffic and the demand of travellers for routes the most direct is, in turn, creating or developing ports which have small regard to cargo considerations, and involving the ports, both old and new, of the various maritime states in a keen and costly competition for the great passenger steamers. This competition is further enhanced by railway lines at rivalry for the conveyance of the ocean passenger and for the more valuable merchandise able to pay high rates for speed between ocean port and inland city, and therefore shipped by the fastest vessels. Competition for freights and competition for passengers, these are the great and beneficent forces which are silently but irresistibly developing the ship, while insurance and classification are the potent handmaids of this competition.

Number and Tonnage of Steamers and Sailing Vessels (of 100 *tons and upwards) belonging to various countries as recorded in the* 1908 *Edition of Lloyd's Register or Book.*

Country.	Vessels.	Tonnage. (Net for Sailing Vessels and Gross for Steamers.)
United Kingdom	9,542	17,318,351
United Kingdom and Colonies (A)	11,563	18,709,537
United States (B)	3,480	4,810,268
Germany	2,178	4,232,145
Norway	2,148	1,982,878
France	1,517	1,883,894
Italy	1,098	1,285,225
Japan (Steamers only)	865	1,140,177
Russia (C)	1,381	974,517
Sweden	1,542	904,155
Spain	551	701,278
Holland	565	876,620
Denmark	870	733,790

N.B.—The figures of the official or Board of Trade returns, owing to their inclusion of vessels below 100 tons, differ more or less widely from the totals as appearing in Lloyd's Register.

(A) Wooden colonial vessels trading on the Great Lakes of North America are not included. (B) These figures only include seagoing vessels and iron and steel vessels trading on the Great Lakes. (C) These figures do not include sailing vessels registered in southern Russia.

The following table illustrates the growth and progress of British home shipping:—

Number and Tonnage of Steamers and Sailing Vessels registered in the United Kingdom, Isle of Man and Channel Islands on 31*st of December of various Years.* (*Official Returns of the Board of Trade.*)

Year.	Steamers.			Sailing Vessels.			Total.		
	No.	Tonnage.		No.	Tonnage.		No.	Tonnage.	
		Net.	Gross.		Net.	Gross.		Net.	Gross.
1830	298	30,339	..	18,876	2,171,253	..	19,174	2,201,592	..
1840	771	87,928	..	21,883	2,680,334	..	22,654	2,768,262	..
1850	1,187	168,474	..	24,797	3,396,659	..	25,984	3,565,133	..
1860	2,000	454,327	..	25,663	4,204,360	..	27,663	4,658,687	..
1870	3,178	1,112,934	..	23,189	4,577,855	..	26,367	5,690,789	..
1880	5,247	2,723,468	..	19,938	3,851,045	..	25,185	6,574,513	..
1890	7,410	5,042,517	8,095,370	14,181	2,936,021	3,055,136	21,591	7,978,538	11,150,506
1900	9,209	7,207,610	11,816,924	10,773	2,096,498	2,247,228	19,982	9,304,108	14,064,152
1907	11,394	10,023,700	16,513,800	9,648	1,461,490	1,575,900	21,042	11,485,190	18,089,700

(D. O.)

SHIPTON, MOTHER, a witch and prophetess who is supposed to have lived in early Tudor times. There is no really trustworthy evidence as to her ever having existed, but tradition has it that her maiden-name was Ursula Southill, Sowthiel or Southiel, and her parents were peasants, living near the Dropping Well, Knaresborough, Yorkshire. The date of her birth is uncertain, but it is placed about 1486–1488. Her mother, Agatha Southill, was a reputed witch, and Ursula from her infancy was regarded by the neighbours as "the Devil's child." The girl's appearance seems to have been such as to encourage superstitions. Richard Head in his *Life and Death of Mother Shipton* (1684) says, "the body was of indifferent height, her head was long, with sharp fiery eyes, her nose of an incredible and unproportionate length, having many crooks and turnings, adorned with many strange pimples of divers colours, as red, blue and dirt, which like vapours of brimstone gave such a lustre to her affrighted spectators in the dead time of the night, that one of them confessed several times in my hearing that her nurse needed no other light to assist her in her duties" Allowing for the absurdity of this account, it certainly seems (if any reliance is to be placed on the so-called authorities) that the child was phenomenally plain and deformed. While still at school she became known as a prophetess. When about twenty-four she married a builder of York, Tobias Shipton.

Her most sensational prophecies had to do with Cardinal Wolsey, the duke of Suffolk, Lord Percy and other men prominent at the court of Henry VIII. There is a tradition that on one occasion the abbot of Beverley, anxious to investigate the case for himself, visited Mother Shipton's cottage disguised, and that no sooner had he knocked than the old woman called out "Come in, Mr Abbot, for you are not so much disguised but the fox may be seen through the sheep's skin." She is said to have died at Clifton, Yorkshire, in 1561, and was buried there or at Shipton. Her whole history rests on the flimsiest authority, but her alleged prophecies have had from the 17th century until quite recently an extraordinary hold on the popular imagination. In Stuart times all ranks of society believed in her, and referring to her supposed foretelling of the Great Fire, Pepys relates that when Prince Rupert heard, while sailing up the Thames on the 20th of October 1666, of the outbreak of the fire "all he said was, 'now Shipton's prophecy was out.'" One of her prophecies was supposed to have menaced Yeovil, Somerset, with an earthquake and flood in 1879, and so convinced were the peasantry of the truth of her prognostications that hundreds moved from their cottages on the eve of the expected disaster, while spectators swarmed in from all quarters of the county to see the town's destruction. The suggestion that Mother Shipton had foretold the end of the world in 1881 was the cause of the most poignant alarm throughout rural England in that year, the people deserting their houses, and spending the night in prayer in the fields, churches and chapels. This latter alleged prophecy was one of a series of forgeries to which Charles Hindley, who reprinted in 1862 a garbled version of Richard Head's *Life*, confessed in 1873.

See Richard Head, *Life and Death of Mother Shipton* (London, 1684); *Life, Death and the whole of the Wonderful Prophecies of Mother Shipton, the Northern Prophetess* (Leeds, 1869); W. H. Harrison, *Mother Shipton investigated* (London, 1881); *Journ. of Brit. Archaeo. Assoc.* xix. 308. *Mother Shipton's and Nixon's Prophecies*, with an introduction by S. Baker (London, 1797).

SHIRAZ, the capital of the province of Fars in Persia, situated in a fertile plain, in 29° 36′ N., 52° 32′ E., at an elevation of 5100 ft., 156 m. by road N.E. by E. from Bushire (112 m. direct). According to Eastern authorities Shiraz was founded in A.D. 693 by Mahommed b. Yusuf Thakefi, a brother of the famous Hajjaj. It is approached on the south from the Persian Gulf through lofty and difficult mountain passes (highest 7400 ft.) and on the north through chains of hills which separate the plain of Shiraz from that of Mervdasht, where the ruins of Persepolis are. It is surrounded by a low mud wall flanked by towers, and a dry ditch, and measures about 4 m. in circumference. There are six gates. The town is divided into eleven quarters (*mahalleh*), one of which is exclusively inhabited by Jews and called Mahalleh Yahudi. The population of Shiraz is estimated at 60,000, but in 1884 it was 53,607, of which 1970 were Jews. The houses of Shiraz are, in general, small, and the streets narrow. A great bazaar, built by Kerim Khan Zend, forms an exception to this; it is about 500 yds. in length and has a vaulted roof 22 ft. high, and contains many spacious shops well supplied with goods and merchandise. There are many mosques, the most notable being the old Jama, a foundation of the Saffarid ruler Amr b. Leith in 894, now in a state of ruin; the new Jama, generally called Masjed i Nau; the New Mosque, built by Atabeg S'ad b. Zengi, *c.* 1200; and the Jama i Vakil, built by Kerim Khan Zend in 1766. Shiraz still possesses the title "Dar ul ilm," the "Seat of Knowledge," and has many colleges (*madresseh*), the oldest being the Mansurieh built in 1478 by Seyed Sadr ed din Mahommed Dashteki; the Hashimiyeh and Nizamieh date from the middle of the 17th century, the college called M. i Agha Baba was begun by Kerim Khan Zend, *c.* 1760, but finished in 1823 by Agha Baba Khan Mazanderani. Of the twenty caravanserais, or more, which Shiraz has, the oldest is that called Car Chiragh Ali, built in 1678. There are several shrines of Imam-zadehs, the most venerated and rich being that of Seyed Amir Ahmed, commonly known as Shah Chiragh, a son of Mūṣā Kāzim, the seventh imam of the Shiites. It was built *c.* 1240 by Atabeg Abu Bekr. Two of Shah Chiragh's brothers and a nephew also have their graves at Shiraz. Within the town and in close proximity to it are many pleasant gardens (*bagh*), among them the B. Jehan Nema (Kerim Khan 1766), where C. J. Rich, British resident at Bagdad and explorer of Babylon and Kurdistan, died on the 5th of October 1821, and the adjoining B. i Nau (1810); B. i Takht i Kajar (built 1087 by Atabeg Karajeh under the Seljuk Malik Shah; restored 1794 by order of Agha Mahommed Khan, the first Kajar ruler); B. i Dilgusha (restored 1785), &c. Close to the last-mentioned garden is the Sadiyeh, an enclosure with the tomb of the celebrated poet S'adi, and in a cemetery near the northern side of the town stands the Hafiziyeh, with the tomb of the likewise celebrated poet Hafiz, a sarcophagus made of yellow Yezd marble with two of the poet's odes beautifully chiselled in relief in a number of elegant panels upon its lid. A fine view of the town and environs is obtained from the narrow pass (*tang*), which leads into the Shiraz plain a mile or two north of the city, and "so overwhelmed with astonishment at the beauty of the panorama is the wayfarer expected to be, that even the pass takes its name of Tang i Allahu Akbar, the Pass of God is Most Great, from the expression that is supposed to leap to his lips as he gazes upon the entrancing spectacle" (Curzon).

The most noted product of Shiraz is its wine made from the famous grapes of the Khullar vineyards, 30 m. N.W. of Shiraz, but only a very small quantity of it is exported, and religious scruples still prevent its manufacture on a large scale. The climate of Shiraz is agreeable and healthy in the winter, but unhealthy in the spring and summer. July is the hottest month with a mean temperature of 85°, February the coldest with 47°. The lowest temperature observed during a number of years was 21°, the highest 113°, showing a difference of 92° between extremes. The mean annual temperature is 65°. Earthquakes are of frequent occurrence; those in modern times which caused great loss of life and destruction of property happened in 1824 and 1853. Shiraz is the residence of a British consul (since 1903) and has post and telegraph offices. On a hill adjoining the Dilgusha garden stand the ruins of an old castle known as Kal'ah i Bender (a corruption of Fahn-dar), with two wells hewn in the rock to a depth of several hundred feet. (A. H.-S.)

SHIRÉ, a river of East Central Africa, the only tributary of the Zambezi navigable from the sea. The Shiré (length about 370 m.) issues from the southernmost point of Lake Nyasa and almost immediately enters a shallow sheet of water called Malombe or (Pa-Malombe), 18 m. broad and 12 or 13 m. long. A shifting bar of sand obstructs the end of Malombe nearest Nyasa, but does not prevent navigation. Below Malombe the bed of the Shiré deepens. The river flows through a mountainous country, and in its descent to the Zambezi valley forms rapids and cataracts, rendering its middle course for a distance of 60 m. unnavigable. The most southern and the finest of these cataracts is called the Murchison Cataract or Falls, after Sir Roderick Murchison, the geologist, who identified himself during the mid-Victorian epoch with geographical exploration in Africa. In passing the cataracts the Shiré falls 1200 ft. From the station called Katunga, a short distance below the cataracts, shallow-draught steamers can navigate the river when in flood (January–March) to its junction with the Zambezi, and thence proceed to the Chinde mouth of the main stream. About 130 m. above its confluence with the Zambezi the Shiré is joined from the east by a smaller stream, the Ruo river, whose headwaters rise in Mount Mlanje. At the junction of the Ruo and Shiré is the town of Chiromo, and here is an extensive swampy region and game reserve known as the Elephant Marsh. The scenery of the lower Shiré is very picturesque, the spurs of the plateau forming bold, rocky crags overhanging the water. The river is studded with small islands usually covered by thick grass. A little before the Zambezi is reached the country becomes flat. The Shiré joins the main river in about 35° 25′ E., 17° 50′ S., at a point where the Zambezi is of great width and presents in the dry season many narrow winding channels, not more than 3 ft. deep, with intervening sandbanks.

The lower part of the Shiré is in Portuguese territory; the upper part is in the British Nyasaland Protectorate, to which it is the natural highway. At the lowest point in British territory, on the west bank of the river, is Port Herald, whence a railway runs past Chiromo to Blantyre. Below Port Herald the Shiré is navigable all the year round.

See Zambezi and British Central Africa.

SHIRE, one of the larger administrative divisions, in Great Britain, now generally synonymous with "county" (*q.v.*), but the word is still used of smaller districts, such as Richmondshire and Hallamshire in Yorkshire, Norhamshire and Hexhamshire in Northumberland. The Anglo-Saxon shire (O. Eng. *scir*) was an administrative division next above the hundred and was presided over by the ealdorman and the sheriff (the shire-reeve). The word *scir*, according to Skeat (*Etym. Dict.*, 1910), meant originally office, charge, administration; thus in a vocabulary of the 8th century (Wright-Wülcker, *Anglo-Saxon and Old English Vocabularies*, 1884, 40-32) is found *procuratio, sciir.* Skeat compares O. Eng. *scirian*, to distribute, appoint, Ger. *Schirrmeister*, steward. The usual derivation of the word connects it with "shear" and "share," and makes the original meaning to have been a part cut off.

SHIRLEY (or Sherley), **SIR ANTHONY** (1565–*c.* 1635), English traveller, was the second son of Sir Thomas Shirley (1542–1612), of Wiston, Sussex, who was a member of parliament during the reigns of Elizabeth and James I. and who was heavily in debt when he died in October 1612. Shirley's imprisonment in 1603 was an important event as in consequence thereof the House of Commons successfully asserted one of its privileges—freedom of its members from arrest. Educated at Oxford Anthony Shirley gained some military experience with the English troops in the Netherlands and also during an expedition to Normandy in 1591 under Robert Devereux, earl of Essex, who was related to his wife, Frances Vernon; about this time he was knighted by Henry of Navarre (Henry IV. of France), a proceeding which brought upon him the displeasure of his own sovereign and a short imprisonment. In 1596 he conducted a predatory expedition along the western coast of Africa and then across to Central America, but owing to a mutiny he returned to London with a single ship in 1597. In 1598 he led a few English volunteers to Italy to take part in a dispute over the possession of Ferrara; this, however, had been accommodated when he reached Venice, and he decided to journey to Persia with the twofold object of promoting trade between England and Persia and of stirring up the Persians against the Turks. He obtained money at Constantinople and at Aleppo, and was very well received by the shah, Abbas the Great, who made him a *mirza*, or prince, and granted certain trading and other rights to all Christian merchants. Then, as the shah's representative, he returned to Europe and visited Moscow, Prague, Rome and other cities, but the English government would not allow him to return to his own country. For some time he was in prison in Venice, and in 1605 he went to Prague and was sent by the emperor Rudolph II. on a mission to Morocco; afterwards he went to Lisbon and to Madrid, where he was welcomed very warmly. The king of Spain appointed him the admiral of a fleet which was to serve in the Levant, but the only result of his extensive preparations was an unsuccessful expedition against the island of Mitylene. After this he was deprived of his command. Shirley, who was a count of the Holy Roman Empire, died at Madrid some time after 1635.

Sir Anthony's elder brother, Sir Thomas Shirley (1564–*c.* 1620), was knighted while serving in Ireland under Sir William Fitzwilliam in 1589. In 1601 he was chosen a member of parliament, but his time was mainly passed in seeking to restore the shattered fortunes of his family by piratical expeditions. In January 1603 he was captured by the Turks and he was only released from his captivity at Constantinople in December 1605. One of his sons was Henry Shirley (d. 1627) the dramatist, who was murdered in London on the 31st of October 1627, and one of his grandsons was Thomas Shirley (1638–1678), the physician and writer.

Sir Anthony's younger brother, Sir Robert Shirley (*c.* 1581–1628), went with his brother to Persia in 1598, remaining in that country when the latter returned to Europe in 1599. Having married a Circassian lady he stayed in Persia until 1608 when the shah sent him on a diplomatic errand to James I. and to other European princes; after visiting Cracow, Prague, Florence, Rome and Madrid, he reached England in 1611 and had an interview with the king. In 1613 he went again to Persia, but in 1615 he returned to Europe and resided for some years in Madrid. His third journey to Persia was undertaken in 1627, but soon after reaching that country he died at Kazvin on the 13th of July 1628.

Sir Anthony Shirley wrote: *Sir Anthony Sherley: his Relation of his Travels into Persia* (1613), the original manuscript of which is in the Bodleian Library at Oxford. There are in existence five or more accounts of Shirley's adventures in Persia, and the account of his expedition in 1596 is published in R. Hakluyt's *Voyages and Discoveries* (1809–1812). See also *The Three Brothers*; *Travels and Adventures of Sir Anthony, Sir Robert and Sir Thomas Sherley in Persia, Russia, Turkey and Spain* (London, 1825); E. P. Shirley, *The Sherley Brothers* (1848), and the same writer's *Stemmata Shirleiana* (1841, again 1873).

SHIRLEY (or Sherley), **JAMES** (1596–1666), English dramatist, was born in London in September 1596. He belonged to the great period of English dramatic literature, but, in Lamb's words, he "claims a place among the worthies of this period, not so much for any transcendent genius in himself, as that he was the last of a great race, all of whom spoke nearly the same language and had a set of moral feelings and notions in common." His career of playwriting extended from 1625 to the suppression of stage plays by parliament in 1642. He was educated at Merchant Taylors' school, St John's College, Oxford, and Catherine Hall, Cambridge, where he took his B.A. degree in or before 1618. His first poem, *Echo, or the Unfortunate Lovers* (of which no copy is known, but which is probably the same as *Narcissus* of 1646), was published in 1618. After proceeding to M.A. he was, Wood says, "a minister of God's word in or near St Albans." In consequence apparently of his conversion to the Roman Catholic faith he left his living, and was master of St Albans grammar school from 1623–1625. His first play, *Love Tricks*, seems to have been written while he was teaching at St Albans. He removed in 1625 to London, where he lived in Gray's Inn, and for eighteen years from that time he was a prolific writer for the stage, producing more than thirty regular plays, tragedies and comedies, and showing no sign of exhaustion when a stop was put to his occupation by the Puritan edict of 1642. Shirley's sympathies were with the king in his disputes with parliament and he received marks of special favour from the queen. He made a bitter attack on Prynne, who had attacked the stage in *Histriomastix*; and, when in 1634 a special masque was presented at Whitehall by the gentlemen of the Inns of Court as a practical reply to Prynne, Shirley supplied the text—*The Triumph of Peace.* Between 1636 and 1640 Shirley went to Ireland, under the patronage apparently of the earl of Kildare. Three or four of his plays were produced by his friend John Ogilby in Dublin in the theatre in Werburgh Street, the first ever built in Ireland and at the time of Shirley's visit only one year old. On the outbreak of war he seems to have served with the earl of Newcastle, but when the king's fortunes began to decline he returned to London. He owed something to the kindness of Thomas Stanley, but supported himself chiefly by teaching, publishing some educational works under the Commonwealth. Besides these he published during the period of dramatic eclipse four small volumes of poems and plays, in 1646, 1653, 1655 and 1659. He "was a drudge" for Ogilby in his translations of the *Iliad* and the *Odyssey*, and survived into the reign of Charles II., but, though some of his comedies were revived, he did not again attempt to write for the stage. Wood says that he and his second wife died of fright and exposure after the great fire, and were buried at St Giles's-in-the-Fields on the 29th of October 1666.

Shirley was born to great dramatic wealth, and he handled it freely. He constructed his own plots out of the abundance of materials that had been accumulated during thirty years of unexampled dramatic activity. He did not strain after novelty of situation or character, but worked with confident ease and buoyant copiousness on the familiar lines, contriving situations and exhibiting characters after types whose effectiveness on the stage had been proved by ample experience. He spoke the same language with the great dramatists, it is true, but this grand style is sometimes employed for the artificial elevation of commonplace thought. "Clear as day" becomes in this manner "day is not more conspicuous than this cunning"; while the proverb "Still waters run deep" is ennobled into—

> "The shallow rivers glide away with noise—
> The deep are silent."

The violence and exaggeration of many of his contemporaries left him untouched. His scenes are ingeniously conceived, his characters boldly and clearly drawn; and he never falls beneath a high level of stage effect.

Shirley's tragedies are: *The Maides Revenge* (acted, 1626; printed, 1639); *The Traytor* (licensed, 1631; printed, 1635), which Dyce reckoned as Shirley's best tragedy; *Love's Crueltie* (1631; printed, 1640); *The Duke's Mistris* (acted, 1636; printed, 1638); *The Politician* (acted, 1639; printed, 1655); *The Cardinal* (acted, 1641; printed, 1652), a good example of Shirley's later style, and characterized by Edmund Gosse as perhaps the last great play produced by the giants of the Elizabethan age. His comedies are: *Love Tricks, or the School of Complement* (licensed, 1625; printed under the latter title, 1631); *The Wedding* (licensed, 1626; printed, 1629); *The Brothers* (acted, 1626; printed, 1652); *The Wittie Faire One* (acted, 1628; printed, 1633); *The Gratefull Servant* (licensed in 1629 as *The Faithful Servant*; printed, 1630); *Changes: Or Love in a Maze* (acted and printed, 1632); *Hide Parke* (acted, 1632; printed, 1637); *The Ball* (acted, 1632; printed, 1639); *The Bird in a Cage* (acted and printed, 1633), ironically dedicated to William Prynne; *The Young Admirall* (licensed, 1633; printed, 1637); *The Gamester* (played at court, 1634; printed, 1637), executed at the command of Charles I. who is said to have invented or proposed the plot; *The Example* (acted, 1634; printed, 1637); *The Opportunity* (licensed, 1634; printed, 1640); *The Coronation* (licensed, 1635, as his, but printed, 1640, as by Fletcher); *The Lady of Pleasure* (licensed, 1635; printed, 1637); *The Constant Maid, or Love will find out the Way*, printed in 1640 under the former title with *St Patrick for Ireland*; *The Royall Master* (acted and printed, 1638), an excellent comedy of intrigue, with an epilogue addressed to Strafford; *The Doubtfull Heir* (printed, 1652), licensed as *Rosania, or Love's Victory* in 1640; *The Gentleman of Venice* (licensed, 1639; printed, 1655); *The Imposture* (acted, 1640; printed, 1652); *The Sisters* (licensed, 1642; printed, 1653); *The Humorous Courtier* (perhaps identical with *The Duke*, licensed, 1631), printed, 1640; *The Court Secret* (printed, 1653). *Poems* (1646), by James Shirley, contained "Narcissus," and a masque dealing with the Judgment of Paris, entitled *The Triumph of Beautie. A Contention for Honour and Riches* (1633) appeared in an altered and enlarged form in 1659 as *Honoria and Mammon.* In 1653 a selection of his pieces was published as *Six New Playes.* He wrote the magnificent entertainment presented by the members of the Inns of Court to the king and queen in 1633, entitled *The Triumph of Peace*, the scenery being devised by Inigo Jones and the music by W. Lawes and Simon Ives. In this kind of composition he had no rival but Ben Jonson. His *Contention of Ajax and Ulysses* (printed, 1659) closes with the well-known lyric, "The Glories of our Blood and State."

The standard edition of Shirley's works is *The Dramatic Works and Poems of James Shirley, with Notes by William Gifford, and Additional Notes, and some Account of Shirley and his Writings*, by Alexander Dyce (6 vols., 1833). A selection of his plays was edited (1888) for the "Mermaid" series, with an introduction by Edmund Gosse.

SHIRLEY, WILLIAM (1694–1771), colonial governor of Massachusetts, was born at Preston in Sussex, England, on the 2nd of December 1694. He studied law, entered the Middle Temple, emigrated to Massachusetts in 1731, was appointed "the King's only advocate-general in America" (*i.e.* of all New England except Connecticut) in 1734, and in 1741, while representing Massachusetts in a boundary dispute with Rhode Island, was appointed governor. His efforts to secure a permanent fixed salary for himself (of £1000) were unsuccessful; and his attempt to prevent the further issue of paper money also involved him in a controversy with the General Court; but their relations were not unfriendly after 1743. The most important event of his administration was the conquest of Louisburg in 1745. The expedition was undertaken on his suggestion and its success was largely due to his energy and enthusiasm; in September 1749 £183,650 (English) in coin was brought to Boston to cover the outlay of Massachusetts, and largely through Shirley's influence this was used for the redemption of outstanding paper money, thus re-establishing the finances of the province, a subject to which Shirley had given much attention. Both in the colonies and in England, whither he returned in 1749 on leave of absence, Shirley kept up an active agitation for the expulsion of the French from the whole of Canada. He went back to Massachusetts as governor in 1753; led an unsuccessful expedition against Fort Niagara in 1755, and after the death of General Edward Braddock (1755) until June 1756 was commander-in-chief of all the British forces in America. In September 1756 he was recalled to England and was succeeded as governor by Spencer Phips. He was governor of the Bahamas until 1770, then again returned to Massachusetts and died at Roxbury on the 24th of March 1771. He published a *Journal of the Siege of Louisbourg* (1745), and *The Conduct of General William Shirley Briefly Stated* (1758).

SHIRREFF, EMILY ANNE ELIZA (1814–1897), English pioneer in the higher education for women, was born on the 3rd of November 1814, the daughter of a rear-admiral. Both she and her sister Maria (Mrs William Grey) took a keen interest in bettering women's equipment for educational work, and, in 1858, she published *Intellectual Education and its Influence on the Character and Happiness of Women.* Before that the sisters had written in collaboration a novel, *Passion and Principle* (1841), marked with that serious sense of the deficiencies in women's education, to remedy which they did so much, and *Thoughts on Self-Culture addressed to Women* (1850). In 1869 Emily Shirreff was for a short time honorary mistress of Girton College, and she served for many years on the council of that institution and of the Girls' Public Day School Company. She took a leading part in establishing and developing the Maria Grey Training College for teachers and in the work of the Froebel Society, of which she was the president. She was a firm believer in Froebel's system and wrote a short memoir of him, and several books on kindergarten methods. She died in London on the 20th of March 1897.

SHIRT, an undergarment of linen, silk, cotton and flannel for the upper part of the body, usually only applied to such a garment when worn by men, though the term is becoming common as used of a plain form of blouse worn by women, the American "shirt-waist." The word is apparently Scandinavian in origin and is an adaptation of the Icel. *skyrte*, Dan. *skiorte*, properly a short garment, and is derived from the root *skar*—to cut off; it is cognate with Ger. *Schurz*, apron, and the same root is seen in "short," "shear" and "skirt"; the last word is now used of that part of a woman's garment which reaches from the waist to the feet, but properly means the lower part of the shirt, hence, edge, border of anything.

SHIRVAN, a small district of the great province of Khorasan in Persia, N.W. of Meshed and W. of Kuchan. It is under the jurisdiction of Kuchan and comprises the town of the same name and twelve villages with a population of 12,000. It produces cotton, wheat and a little silk. SHIRVAN, the capital, is situated on the river Atrek, in 37° 24′ N., 57° 56′ E. at an elevation of 3500 ft. Its inhabitants are of the Turkish Garai'i tribe and number about 7000. There are post and telegraph offices.

SHOA, the southern of the three principal provinces of the Abyssinian empire. Shoa from about the middle of the 10th century till nearly the close of the 13th century was the residence of the Abyssinian sovereigns, who had been driven out of Axum, their former capital. About 1528 Shoa was conquered by Mahommedan invaders and was for over a century afterwards a prey to Galla raiders. In 1682 it was reconquered by an Abyssinian chief, but remained independent of northern Abyssinia until 1855 when the emperor Theodore reduced it to submission. In 1889 Menelek II., king of Shoa, on the death of the emperor John, made himself master of the whole of Abyssinia. The capital, Adis Ababa (*q.v.*), is the seat of government for the whole empire (see ABYSSINIA).

SHOCK, or COLLAPSE, in surgery, the enfeebled condition of body which comes on after a severe physical injury, such as a blow upon the head or a kick in the abdomen, or as the result of grievous mental disturbance, as on seeing a ghastly sight or hearing sad news. It is the condition which the prize-fighter desires to inflict upon his adversary by giving what is called the "knock-out blow" upon the point of the jaw, over the heart or in the lower part of the chest.

In severe shock the individual falls "all of a heap," as the saying is, which is exactly expressed by the word "collapse" (*collapsus*, *collabor*, fall in ruins). The explanation of the condition is that the heart is suddenly deprived of its power to pump blood up to the brain which, like the face itself, is left anaemic and has no power to send out control to the muscles. The blood at once sinks into, and remains stagnant in, the large veins of the abdomen. And inasmuch as the condition of collapse is due to anaemia of the brain, it is met with in those cases in which a sudden and serious loss of blood has been sustained, as in the "flooding" of child-bed, the giving way of an aneurism, or the opening of some large blood-vessel. It may also supervene on the rupture of a gastric ulcer, and is then the result of the injury to which the network of nerves in the interior of the abdomen has been subjected by the sudden escape on to them of the contents of the stomach.

In severe shock the patient is pale, and bathed in clammy perspiration; his sensibility is blunted; his pulse is small and weak, sometimes, indeed, it is imperceptible, and even on laying the hand over the heart no cardiac impulse may be felt. The person is unable to make any exertion, but lies indifferent to external circumstances, and can be roused only with difficulty or not at all. He complains of a feeling of cold, and he may have a distinct shivering. These symptoms may continue for some hours. The first evidence of improvement is that he shifts his position, becomes restless and complains of the injury. Perhaps he vomits. The pulse becomes stronger, and he then passes from the state of shock into that of reaction. If the improvement continues, recovery takes place; but if it is only transient, he sinks back again into a drowsy condition, which may end in death, for it must be clearly understood that shock may end fatally. Sometimes there is no rallying, death following the injury immediately. In cases where there is no reaction, the patient gradually becomes weaker, and his pulse feebler, till death ensues. Shock is due to an impression conveyed to the medulla oblongata, by which the nerve-centres are so affected that a partial paralysis of the voluntary and involuntary muscular fibres in the body takes place, the patient being, perhaps, unable to lift his arm or move his leg. The respiratory functions are performed wearily, and the muscle of the heart contracts feebly. The walls of the blood-vessels lose their tonicity and the vessels dilate, the blood collecting in the large venous trunks, more especially of the abdomen. The vessels of the skin being emptied of blood, marked pallor ensues. The heart beats feebly because its nervous energy is lowered, and because it has not a sufficient quantity of blood upon which to act. An understanding of these facts gives the general indications for treatment, which comprise external stimulation over the heart by mustard poultices or turpentine stupes; elevation of the limbs—to cause the blood to gravitate towards the heart, and so to the brain; manual pressure on the abdominal cavity from below upwards—to encourage the flow of blood from the overloaded abdominal veins into the heart. In urgent cases an injection may be given into the veins of warm water in which table salt (60 grains to a pint) is dissolved. These different measures may be supplemented by the administration of stimulants by the mouth, or, if the patient cannot swallow, by subcutaneous injection of brandy, ether or a solution of strychnine. In all probability many men have been left for dead upon the field of battle who were only in a state of extreme collapse; in the future many such cases will be saved by the prompt injection of ether over the region of the heart.

In syncope from mental emotion the weakened heart cannot drive a sufficient quantity of blood to the brain; the patient feels dizzy and faint, and falls down insensible. The condition is transitory and the recumbent posture, assisted if need be by elevation of the limbs, causes the blood to gravitate to the heart, which is thereby stimulated to contract. A sufficient quantity of blood is then driven to the brain, and the insensibility passes off. If the patient is in the sitting posture when he feels faint, the head should be depressed between the knees, which will cause the blood to flow to the brain, and the faintness will pass off. Otherwise he should be laid flat on his back, his head being kept low. When a collapsed person is put to bed, no pillow should be allowed, and the foot of the bed should be raised above the level of the head. (E. O.*)

SHODDY, in origin probably a factory term and first applied to the waste thrown off or "shed" during the process of wool manufacture. It is now the name given to a special type of fabric made from remanufactured materials, *i.e.* materials which have already been spun into yarn and woven into cloth but have been torn up or "ground up"—as this operation is termed technically—into a fibrous mass, and respun and rewoven. The term "shoddy" is sometimes applied to all fabrics made of such remanufactured materials, of which there are many types, such as "mungos," "extracts," "flocks," &c., but strictly it should be confined to a cloth produced from fabrics originally made from English and the longer cross-bred wools. Mungo is produced from fabrics originally made from Botany and short fine wools; extract is the wool fibre obtained from goods originally composed of wool and cotton from which the cotton has been "extracted" by sulphuric acid or some other agent; and flocks mostly come from milling, raising and cropping machines. There are some few other particular types of minor importance.

The operations of converting rags, tailors' clippings, &c., into these remanufactured materials are as follows: dusting, to render the subsequent operations as healthy and agreeable as possible; seaming *i.e.* taking out every little bit of sewing thread (unless the rags are for extracting) in order that a good "spin" may result; sorting into the various qualities and colours; oiling, to cause the fibres to glide upon one another, and thus separate so far as possible without breakage; and finally grinding, *i.e.* tearing up into a fibrous mass which may be readily spun into threads. The last-named operation is usually spoken of as "grinding," but really it is anything but grinding, being more of a teasing-out operation, the object being to preserve the length of the fibre so far as possible. The remanufactured materials are necessarily very short in fibre, so that it is usually necessary to mix, *i.e.* "blend," some better material with them to carry the bulk through the machines into the yarn. With this object in view, sometimes good wool or noils (the short from combing), but more often cotton, is employed. The yarns thus spun are in the majority of cases woven into pieces as weft yarns, the warps usually being cotton; but there are some exceptions, a really good mungo blend being readily woven as warp.

Upon the whole the "cheap and nasty" idea usually associated with the term "shoddy," in reference to these remanufactured materials, is quite a mistake. Some most excellent cloths are produced, and when price is taken into consideration it must be conceded that the development of this industry has benefited the working classes of Great Britain and other countries to a remarkable extent. Many are now well clothed, who, without the advent of the remanufactured materials, would have been clothed in rags.

SHOE (a word appearing in the Teutonic languages in various forms, as Ger. *Schuh*, Swed. and Dan. *sko*, sometimes supposed to come from an unknown root *ska* or *sku*, cover), a covering for the foot. The simplest foot-protector is the sandal, which consists of a sole attached to the foot, usually by leather thongs. The use of this can be traced back to a very early period; and the sandal of plaited grass, palm fronds, leather or other material still continues to be the most common foot-covering among oriental races. Where climate demanded greater protection for the foot, the primitive races shaped a rude shoe out of a single piece of untanned hide; this was laced with a thong, and so made a complete covering. Out of these two elements—sole without upper and upper without sole—arose the perfected shoe and boot, consisting of a combination of both. The boot proper differs from the shoe in reaching up to the knee, as exemplified by such forms as jack-boots, top-boots, Hessian boots and Wellington boots, but the term is in England now commonly applied to "half-boots" or "ankle-boots" which reach only above the ankle. A collection illustrating the numerous forms and varieties of foot-covering, formed by Jules Jacquemart, is in the Cluny Museum in Paris.

Wooden Shoes.—The simplest foot-covering, largely used throughout Europe, is the wooden shoe (*sabot*) made from a single piece of wood roughly cut into shoe form. Analogous to this is the clog of the midland counties of England. Clogs, known also as pattens, are wooden soles to which shoe or boot uppers are attached. Sole and heel are made of one piece from a block of maple or ash 2 in. thick, and a little longer and broader than the desired size of shoe. The outer side of the sole and heel is fashioned with a long chisel-edged implement, called the clogger's knife or stock; a second implement, called the groover, makes a groove about one-eighth of an inch deep and wide round the side of the sole; and by means of a hollower the contour of the inner face of the sole is adapted to the shape of the foot. The uppers of heavy leather, machine sewed or riveted, are fitted closely to the groove around the sole, and a thin piece of leather-binding is nailed on all round the edges, the nails being placed very close, so as to give a firm durable fastening. These clogs are of great advantage to all who work in damp sloppy places, keeping the feet dry and comfortable in a manner impossible with either leather or india-rubber. They are consequently largely used on the continent of Europe by agricultural and forest labourers, and in England and the United States by dyers, bleachers, tanners, workers in sugar-factories, chemical works, provision packing warehouses, &c. There is also a considerable demand for expensive clogs, with finely trimmed soles and fancy uppers, for use by clog-dancers on the stage.

Manufacture of Leather Shoes.—There are two main divisions of work comprised in ordinary shoemaking. The minor division—the making of "turn shoes"—embraces all work in which there is only one thin flexible sole, which is sewed to the upper while outside in and turned over when completed. Slippers and ladies' thin house boots are examples of this class of work. In the other division the upper is united to an insole and at least one outsole, with a raised heel. In this are comprised all classes, shapes and qualities of goods, from shoes up to long-top or riding boots which reach to the knee, with all their variations of lacing, buttoning, elastic-web side gussets, &c. The accompanying cuts (figs. 1 and 2) show the parts and trade names of a boot.

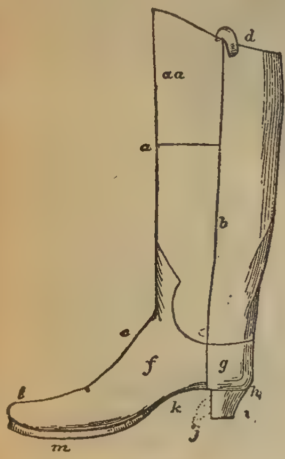


FIG. 1.—Parts of a Boot.

aa, The extension.
a, The front.
b, The side seam.
c, The back.
d, The strap.
e, The instep.
f, The vamp or front.
g, The quarter or counter.
h, The rand.
i, The heel—the front is the breast, the bottom the face.
j, The lifts of the heel.
k, The shank or waist.
l, The welt.
m, The sole.

Shoemaking was formerly a pure handicraft; but now machinery effects almost every operation in the art. On the factory system all human feet are treated alike; in the handicraft, the shoemaker deals with the individual foot, and he should produce a boot which for fit, comfort, flexibility and strength cannot be approached by the product of machinery.

The shoemaker after measuring the feet, cuts out upper leather according to the size and pattern. These parts are fitted and stitched together by the "boot-closers," but little of this closing is now done by hand. The sole "stuff" is next cut out and assembled, consisting of a pair of inner soles of soft leather, a pair of outer soles of firmer texture, a pair of welts or bands about 1 in. broad, of flexible leather, and lifts and top-pieces for the heels. These the "maker" mellows by steeping in water. He attaches the insoles to the bottom of a pair of wooden lasts, which are blocks the form and size of the boots to be made, fastens the leather down with lasting tacks, and, when it is dried, draws it out with pincers till it takes the exact form of the last bottom. Then he "rounds the soles," by paring down the edges close to the last, and forms round these edges a small channel or feather cut about one-eighth of an inch in the leather. Next he pierces the insoles all round with a bent awl, which bites into, but not through, the leather, and comes out at the channel or feather. The boots are then "lasted," by placing the uppers on the lasts, drawing their edges tightly round the edge of the insoles, and fastening them in position with lasting tacks. Lasting is a crucial operation, for, unless the upper is drawn smoothly and equally over the last, leaving neither crease nor wrinkle, the form of the boot will be bad. The welt, having one edge pared or chamfered, is put in position round the sides, up to the heel or "seat," and the maker proceeds to "inseam," by passing his awl through the holes already made in the insole, catching with it the edge of the upper and the thin edge of the welt, and sewing all three together in one flat seam, with a waxed thread. He then pares off inequalities and "levels the bottoms," by filling up the depressed part in the centre with a piece of tarred felt; and, that done, the boots are ready for the outsoles. After the leather for them has been thoroughly compressed by hammering on the "lap-stone," they are fastened through the insole with steel tacks, their sides are pared, and a narrow channel is cut round their edges; and through this channel they are stitched to the welt, about twelve stitches of strong waxed thread being made to the inch. The soles are now hammered into shape; the heel lifts are put on and attached with wooden pegs, then sewed through the stitches of the insole; and the top-pieces, similar to the outsoles, are put on and nailed down to the lifts. The finishing operations embrace pinning up the edge of the heel, paring, rasping, scraping, smoothing, blacking and burnishing the edges of soles and heels, scraping, sandpapering and burnishing the soles, withdrawing the lasts, and cleaning out any pegs which may have pierced through the inner sole. Of course, there are numerous minor operations connected with forwarding and finishing in various materials, such as punching lace-holes, inserting eyelets, applying heel and toe irons, hob-nailing, &c. To make a pair of common stout lacing boots occupies an expert workman from fourteen to eighteen hours.

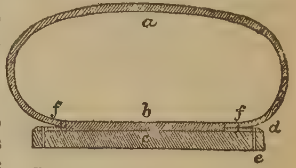


FIG. 2.—Section of Boot.

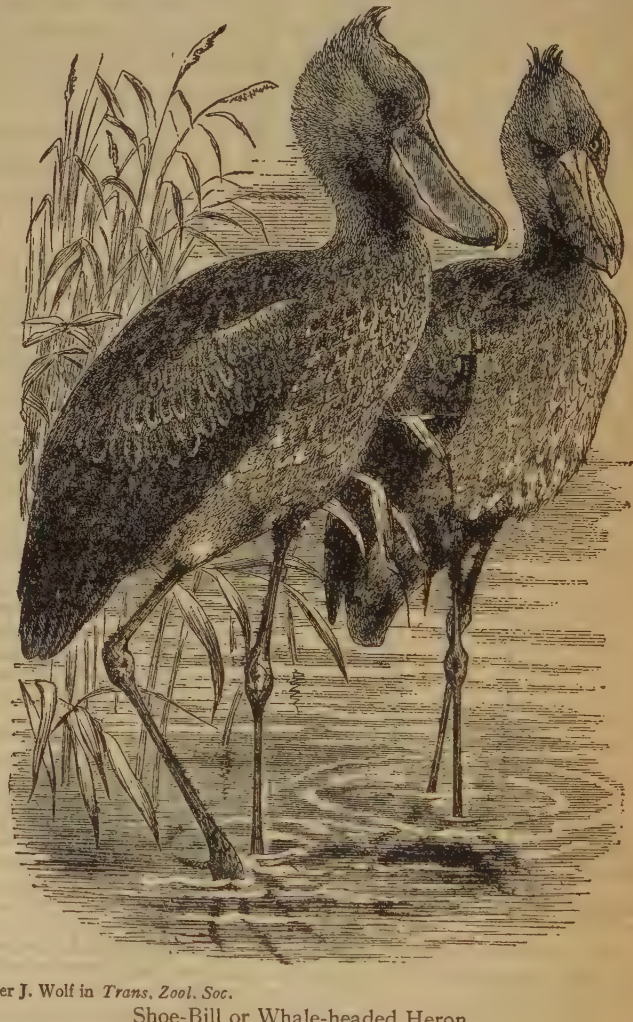
a, The upper.
b, The insole.
c, The outsole.
d, The welt.
e, The stitching of the sole to the welt.
f, The stitching of the upper to the welt.

The principal difficulties to be overcome in applying machinery to shoemaking were encountered in the operation of fastening together the soles and uppers. The first success in this important operation was effected when means other than sewing were devised. In 1809 David Meade Randolph obtained a patent for fastening the soles and heels to the inner soles by means of little nails, brads, sprigs or tacks. The lasts he used were covered at the bottom with plates of metal, and the nails, when driven through the inner soles, were turned and clinched by coming against the metal plates. To fix the soles to the lasts during the operation the metal plates were each perforated with three holes, in which wooden plugs were inserted, and to these the insoles were nailed. This invention may be said to have laid the foundation of machine boot-making. In 1810 M. I. Brunel patented a range of machinery for fastening soles to uppers by means of metallic pins or nails, and the use of screws and staples was patented by Richard Woodman in the same year.

Apart from sewing by machine or hand, three principal methods of attaching soles to uppers have been used. The first is "pegging" with small wooden pins or pegs driven through outsole and insole, catching between them the edges of the upper. The points of the pegs which project through the insole are cut away and smoothed level with the leather either by hand or by a machine pegging rasp. The second is the system of "riveting or clinching" with iron or brass nails, the points of the nails being turned or clinched by coming in contact with the iron last used. The third method, screwing, has come into extensive use since the standard screwing machine was introduced in America by the McKay Sewing-Machine Association, of Boston, Massachusetts, and in Europe by the Blake and Goodyear Company, of London. The standard screw machine, which is an American invention, though the idea was anticipated by a Frenchman named Blanchon in 1856, is provided with a reel of stout screw-threaded brass wire, which by the revolution of the reel is inserted into and screwed through outsole, upper edge and insole. Within the upper a head presses against the insole directly opposite the point of the screw, and the instant screw and head touch the wire is cut level with the outsole. The screw, making its own hole, fits tightly in the leather, and the two soles, being both compressed and screwed firmly together, make a perfectly water-tight and solid shoe. The surface of the insole is quite level and even, and as the work is really screwed, the screws are steady in their position, and they add materially to the durability of the soles. The principal disadvantage in the use of standard screwed soles is the great difficulty met with in removing and levelling down the remains of an old sole when repairs are necessary.

The various forms of sewing-machine by which uppers are closed, and their important modifications for uniting soles and uppers, are also principally of American origin. But the first suggestion of machine sewing was an English idea. The patent secured by Thomas Saint in the English Patent Office in 1790, while it foreshadowed the most important features of the modern sewing-machine, indicated more particularly the devices now adopted in the sewing of leather. After the introduction of the sewing-machine for cloth work its adaptation to stitching leather both with plain thread and with heated waxed thread was a comparatively simple task. The first important step in the more difficult problem of sewing together soles and uppers by a machine was taken in the United States by Lyman R. Blake in 1858. Blake's machine was ultimately perfected as the McKay sole-sewing machine—one of the most successful and lucrative inventions of modern times. Blake secured his first English patent in 1859, his invention being thus described: "This machine is a chain-stitch sewing-machine. The hooked needle works through a rest or supporting surface of the upper part of a long curved arm which projects upwards from the table of the machine. This arm should have such a form as to be capable of entering a shoe so as to carry the rest into the toe part as well as any other part of the interior of it; it carries at its front end and directly under the rest a looper, which is supported within the end of the arm so as to be capable of rotating or partially rotating round the needle, while the said needle may extend into and through the eye of the looper, such eye being placed in the path of the needle. The thread is led from a bobbin by suitable guides along in the curved arm, thence through a tension spring applied to the arm, and thence upwards through the notch of the looper. The needle carrier extends upwards with a cylindrical block which can be turned round concentrically with it by means of a handle. The feed wheel by which the shoe is moved along the curved arm during the process of sewing is supported by a slider extending downwards from the block, and applied thereto so as to be capable of sliding up and down therein. The shoe is placed on the arm with the sole upwards. The feed wheel is made to rest on the sole." Blake's original machine was very imperfect and was incapable of sewing round the toe of a shoe; but a principal interest in it coming into the hands of Gordon McKay (1821–1903), he in conjunction with Blake effected most important improvements in the mechanism, and they jointly in 1860 procured United States patents which secured to them the monopoly of wholly machine-made boots and shoes for twenty-one years. On the outbreak of the Civil War in America a great demand arose for boots, and, there being simultaneously much labour withdrawn from the market, a profitable field was opened for the use of the machine, which was now capable of sewing a sole right round. Machines were leased out to manufacturers by the McKay Company at a royalty of from ½ to 3 cents on every pair of soles sewed, the machines themselves registering the work done. The income of the association from royalties in the United States alone increased from $38,746 in 1863 to $589,973 in 1873, and continued to rise till the main patents expired in 1881, when there were in use in the United States about 1800 Blake-McKay machines sewing 50,000,000 pairs of boots and shoes yearly. The monopoly secured by the McKay Company barred for the time the progress of invention, but still many other sole-sewing machines were patented. Among the most important of these is the Goodyear welt machine—the first mechanism adapted for sewing soles on lasted boots and shoes. This machine originated in a patent obtained in 1862 in the United States by August Destory for a curved-needle machine for sewing outsoles to welts, but was not successful till taken in hand by Charles Goodyear, son of the well-known inventor in indiarubber fabrics. This device was first applied in a machine for sewing turn shoes. Later it was used in a machine which sewed with a chain-stitch from the channel of the insole through the welt and upper, and a little later still it was followed by the "rapid outsole lock-stitch machine," which united the outsole to the welt with lock-stitching. Improvements have been continually effected in the Goodyear system and numerous accessory mechanisms have been brought out, until there is now not a single operation necessary in shoemaking, however insignificant, for which machinery has not been devised. In consequence the range of machines employed in a modern shoe factory is very extensive, the various operations being highly specialized, and there being minute subdivision of labour. Through the fundamental principles were not in all cases of American origin, American inventors were foremost in developing such machinery, and America took the lead in employing it to the supersession of handwork in shoemaking. When English makers, in about the seventh or eighth decade of the 19th century, were forced by the pressure of economic necessity to do the same, they found that the suitable machinery was controlled by American makers, from whom therefore they had to hire it on the payment of royalties and under stringent conditions which rendered it difficult for them to use machines of any other maker, even if available, on pain of the whole plant being stripped from their factories. The British United Shoe Machinery Company, the English branch of the United Shoe Machinery Company, of Boston, Mass., thus maintained a practical monopoly of the supply of shoemaking machinery in Great Britain. However, by the beginning of the 20th century English makers began to assert themselves and to show that they could produce machines able to compete effectively with those from America. The loosening of the American monopoly thus begun was aided by the Patent Act of 1907, section 27 of which provided that a patent may be revoked if the article is not manufactured "to an adequate extent" in Great Britain (most of the shoe machinery in question having been manufactured in America), while section 38 prohibits the insertion in a lease of conditions excluding the lessee from using articles or processes not supplied or owned by the lessor.

Rubber Shoes.—The manufacture of indiarubber galoshes,[1] shoes, fishing boots, &c., forms an important branch of the indiarubber industry, especially in America, where rubber overshoes, colloquially known as "rubbers," are extensively worn, and where fully 1000 different shapes and sizes are said to be produced. So far back as 1833 the Roxbury India Rubber Company was constituted to work the discovery that indiarubber dissolved in turpentine and mixed with lampblack formed a varnish which gave a hard waterproof surface when applied to leather, but the process failed because the varnish melted with heat and cracked with cold. This defect was remedied by Charles Goodyear (1800–1860), who found that when sulphur was combined with the rubber by the aid of heat the product ("vulcanized rubber") was not only stronger but retained its elasticity through a wide range of temperature. His patent, taken out in 1844, was the foundation of various American rubber industries including that of rubber boots and shoes. Guttapercha has also been used instead of leather for the outer soles of boots.



After J. Wolf in *Trans. Zool. Soc.*

Shoe-Bill or Whale-headed Heron.

SHOE-BILL, a huge African bird from the White Nile, the *Balaeniceps rex* of ornithology, now regarded as a giant heron. It was first brought to Europe by M. Parkyns and described by J. Gould in the Zoological *Proceedings* (1851, pp. 1, 2, pl. xxxv.) as an abnormal pelican. This view was disputed by Reinhardt (*op. cit.* 1860, p. 377), and wholly dispelled by W. K. Parker in the Zoological *Transactions* (iv. pp. 269-351), though these two authors disagreed as to its affinities, the first placing it with the storks, the last assigning it to the herons. In singularity of aspect few birds surpass *Balaeniceps*, with its gaunt grey figure, some 5 ft. in height, its large head surmounted by a little curled tuft, the scowling expression of its eyes and its huge bill in form not unlike a whale's head—this last suggesting its generic name—but tipped with a formidable hook. The shape of the bill has also prompted the Arabs to call it, according to their idiom, the "father of a shoe." It forms large flocks and frequents dense swamps. The flight is heron-like, and the birds settle on trees. The food consists of any small animals or carrion. The nest is a hole in dry ground, roughly limed with herbage, and from two to twelve chalky white eggs are laid. (A. N.)

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[1] The galosh or golosh was originally a wooden shoe or clog, but later came to mean an overshoe (cf. R. Holme, *Armoury*, 1688: "Galloshios are false shooes, or covers for shooes"). The word is adapted from the French *galoche*, from Low Lat. *galopedium*, a wooden shoe, Gr. καλοπόδιον, shoemaker's last, from κᾶλον, wood, and ποῦς, foot.

SHOEBURYNESS, a promontory on the coast of Essex, England, the point at which the coast-line trends north-eastward from the estuary of the Thames. It gives name to a school of gunnery, where officers are instructed and experiments carried out. The railway station (39 m. E. from London, the terminus of the London, Tilbury and Southend railway) bears the same name, but the parish is South Shoebury; North Shoebury is a parish situated nearer to Southend-on-Sea. The church of St Andrew retains some ornate Norman work, but is mainly a Perpendicular reconstruction. On the seaward side of the Ness there is a large ancient earthwork which is attributed to the Norsemen through a reference in the Saxon Chronicle (894) under the name Sceobrig. The parish is in the S.E. parliamentary division of the country. Pop. (1901) 4081.

SHOFAR, Schofar or Shofer, the ancient ram's horn trumpet of the Hebrews, sometimes also translated cornet in the English Bible. The shofar consisted of a natural horn turned up at the bell end, and, having a short conical bore of very large calibre, it would be capable of producing at most the fundamental octave and twelfth. The shofar has continued in use in the Jewish synagogue until the present day, being blown with great solemnity once every year at the impressive service held on the Day of Atonement. The shofar was more generally used by the Israelites than the other horn *Keren*, and although figuring largely as a signal instrument in battle, and used for rousing the people against the foe, it can hardly be regarded as a military instrument, but rather as the token of God's presence in their midst, to give them the victory as in the case of Joshua and Gideon. It was the shofar that was used to call the people together on a solemn feast day (Ps. lxxxi. 3). (K. S.)

SHOGUN (Japanese for "generalissimo"), in Japan, originally merely the style of a general in command in the field, a title which only gradually came into existence at the beginning of the 8th century, the mikado himself having previously been regarded as the only authority. The rise of a military class and of shoguns (generals) was a development coincident with the division of supremacy between the Minamoto and Taira clans (see JAPAN: *History*). In 1192 the emperor Takahira made the Minamoto leader, Yoritomo, a Sei-i-tai-shogun ("barbarian-subjugating generalissimo") or general-in-chief, and this office became stereotyped in the hands of successive great military leaders, till in 1603 Lyéyasu Tokugawa became shogun and established the Tokugawa dynasty in power. The shogunate from that time till 1867 exercised the *de facto* sovereignty in Japan, though in theory subordinate to the mikado. The revolution of 1867 swept away and abolished the shogunate and restored the mikado's supreme authority.

The term "Tycoon," which was commonly used by foreigners in the 19th century, is merely a synonym for shogun, being the English rendering of the Japanese *taiko* or *taikun*, "great lord."

SHOLAPUR, a city and district of British India, in the Central division of Bombay. The city is 164 m. S.E. from Poona by rail. Municipal area, about 8 sq. m.; pop. (1901) 75,288. Since 1877 it has ceased to be a military cantonment. Its great fort, of Mahommedan construction, dates from the 14th to 17th centuries. The large bazaar is divided into seven sections, one of which is used on each day of the week. There are two municipal gardens, with fine tanks and temples. It is an important centre of trade, with three cotton mills.

The District of Sholapur has an area of 4541 sq. m. Except in Karmala and Barsi subdivisions, in the north and east, where there is a good deal of hilly ground, the district is generally flat or undulating; but it is bare of vegetation, and presents everywhere a bleak treeless appearance. The chief rivers are the Bhima and its tributaries—the Man, the Nira and the Sina—all flowing towards the south-east. Lying in a tract of uncertain rainfall, Sholapur is peculiarly liable to seasons of scarcity; much, however, has been done by the opening of canals and tanks, such as the Ekruk and Ashti tanks, to secure a better water-supply, the Ekruk tank near Sholapur city is the second largest irrigation work in the Deccan. In 1901 the population was 720,977, showing a decrease of 4% in the decade. The principal crops are millet, pulse, oil seeds and cotton. There are manufactures of silk and cotton cloth, and blankets. The chief trading mart is Barsi. Pandharpur is a popular place of pilgrimage. The Great Indian Peninsula railway runs through the district, with a junction for the Southern Mahratta railway, and another junction for the Barsi light railway, recently extended to Pandharpur.

Sholapur passed from the Bahmani to the Bijapur kings and from them to the Mahrattas. In 1818, on the fall of the peshwa, it was ceded to the British, when it formed part of the Poona collectorate, but in 1838 it was made a separate district.

SHOOTING, as a British field sport, may be said to have existed for at least two hundred years, though it is only within the last half century that it has attained its present importance. In many parts of Great Britain the importance of the sporting rights of an estate now more than counterbalance its agricultural value, while enormous sums are annually devoted to the artificial production of game. Taking all contingent expenses into consideration, the average cost of every head of game killed may be taken as not less than three shillings. A hand-reared pheasant can scarcely be brought to the gun for less than seven to eight shillings; and these birds in particular—and partridges and wild duck to a lesser, but steadily increasing, extent—are reared in tens of thousands every year. So far, the grouse alone among recognized British game-birds has defied all attempts at artificial production, but it is probable that in course of time this will also yield to the modern taste for big bags.

The enormous head of game now preserved, and the correspondent development of the art of gunmaking, has to a great extent revolutionized the sport of shooting, the modern tendency being all in favour of "driving," *i. e.* bringing the game to the sportsman, instead of the sportsman to the game. While this has undoubtedly raised the standard of marksmanship, it has equally deteriorated the exercise of such minor woodcraft as is required for small game shooting under present conditions.

Grouse-shooting.

In this article it is only possible to touch on the various forms of the sport of shooting most in vogue. First must be placed grouse-shooting, admittedly the finest form of sport with the gun obtainable in the British Islands. It is customary to speak of this as though it were merely confined to Scotland, but grouse are found in every English county north of the Trent, as well as in Shropshire, Wales and Ireland, while in a good season as many are probably killed in Yorkshire alone as in any two Scotch counties put together. Practically all English grouse are killed by driving, the practice of which is fast extending to Scotland. On the undulating English and Lowland moors this has undoubtedly resulted in largely increasing the stock of grouse, but it is questionable whether it has been equally successful on the more rugged hills of the Highlands. Save in a few specially favoured localities, such as the Moy Hall moors in Inverness-shire, grouse-driving in Scotland has by no means produced the marvellous results achieved on the English moors, while far too many lessees of Scottish shootings resort to the suicidal policy of only driving their birds when the latter have become too wild to lie to dogs.

In laying out a moor for driving care should be taken to avoid placing a row of butts against a sky line: where possible these should be placed in a depression of the ground, which not only serves to conceal them from the birds, but also ensures higher and more difficult shots. For these reasons, on very flat stretches of ground the butts are sometimes excavated after the manner of a rifle pit with a low parapet, but in the writer's experience these are not to be specially recommended. It is in all cases advisable to refrain from placing a line of butts on very stony or rocky ground, owing to the possibility of an accident from glancing or deflected shot-pellets. Much of the success of a day's grouse-driving depends on the manner in which the drivers are handled, and especially on the "flankers," whose business it is to turn in such birds as show a tendency to break away from the butts.

A few simple rules for the guidance of the shooter may be mentioned in connexion with grouse-driving. He should remain motionless in his butt, without attempting to conceal himself by crouching, until the moment arrives for him to throw up his gun, when he should refrain from dwelling on his bird, or reserving his fire until it is close upon him—the latter a very common error among beginners. An excellent method of determining the range at which to open fire is to mark some conspicuous object, a tuft of heather or a stone, about 40 yds. in front of one's butt, before the commencement of a drive. Above all the shooter should concentrate his attention only on birds coming at him, and not concern himself with those that have passed his butt: in nine cases out of ten by the time he has turned to fire they will be 60 or 70 yds. away, and the only result of his shot will be to wound, but not kill; apart from the cruelty of such a proceeding, it should be remembered that these "pricked" birds are a fruitful source of grouse disease. A good retriever is essential to enjoyment in grouse-driving, where only a limited time is available for picking up dead birds. The modern fashion is in favour of spaniels for this work, but a large wavy-coated retriever is usually preferable, as being less likely to tire or "potter." It is customary on some moors to burn the heather round the butts with a view to facilitating the recovery of dead birds, but this has also the disadvantage of rendering the butts more conspicuous to the grouse, which soon come to know the dangerous zone. In August grouse can be driven without much difficulty, but later in the season, and especially in a high wind, pack after pack will go straight back over the beaters' heads sooner than face the guns. Enormous bags of driven grouse are occasionally made on the Yorkshire and Durham moors; over 1300 brace have been killed in a single day at Broomhead near Sheffield, and there are several other well-known moors where, in a good season, 1000 brace are obtainable in a day's shooting. Grouse driving is believed to have been first practised in a very modified form on the English moors as early as 1805, but its usage did not become general until fifty or sixty years later.

Grouse-shooting over dogs, though lacking the excitement of grouse-driving, and not requiring the same high standard of skill in shooting, is none the less incomparably the higher form of sport. Owing to the almost universal wildness of all modern game-birds, its general practice is now almost entirely confined to the Highlands, where, especially on the western seaboard, grouse will lie to dogs practically throughout the season. Except on very ill-watered moors, where they suffer more than other breeds of dogs from thirst, large big-boned setters are preferable to pointers for grouse-shooting, as the latter are more easily affected by cold and damp, and in the writer's experience are more easily fatigued. Care should of course be taken always to work one's dogs up wind when possible, and in hot, still weather to beat the higher ground thoroughly, with a view to killing down the old cocks and barren hens which resort there. In stormy weather grouse naturally seek the lower slopes of the moors.

Partridge-shooting.

Partridge-shooting over dogs is a most delightful form of sport, popularly supposed to be extinct nowadays, but there are happily many parts of England where it is still practised in suitable localities. None the less, modern agricultural conditions do not lend themselves to the use of dogs in partridge-shooting, and the most general custom is to drive the birds off the pastures and stubbles into the root crops where they can be walked up in line, a rather uninteresting method of shooting. Care should of course be taken always to walk across the drills; and where birds are wild, and time does not press, it will occasionally be found advantageous to work a field in a series of gradually diminishing circles. Much valuable time is often wasted in partridge-shooting in the search for dead and wounded birds; this can be obviated to a large extent by observing the golden rule that as soon as a bird is down the line should halt, and the dogs, whose business it is to retrieve the game, be allowed to do so, unassisted—or more correctly unhampered. If the bird cannot be found within reasonable time, the line should proceed, leaving a keeper and a steady dog behind to search for it. Where game is plentiful it is always advisable to employ one man with a couple of retrievers for the sole purpose of remaining behind the line to retrieve lost or running birds. As with all game, the modern tendency is to drive partridges: a form of shooting that of all others exacts the highest test of skill, not only on the part of the shooter, but also of the keeper who organizes the proceedings. To these requirements must be added a suitable tract of country for the purpose, and a large head of game; given all these essentials, partridge-driving is a delightful amusement; without them it is usually a fruitless and wearisome undertaking.

In driving, the birds should be gradually and quietly collected into one large root-field, and sent from this over the guns, who should, when possible, always be placed in a grass-field where dead or wounded birds are more easily retrieved. Another field of roots should be at a convenient distance behind the guns for the purpose of gathering the birds, which, unless the wind be specially unfavourable, can then be brought back over them in a return drive. Long drives are not advisable; the more partridges can be kept on the wing, and the coveys broken up, the better. Where partridge-driving is carried on on a large scale, it is a good plan to supplement such hedge-rows as are convenient for the purpose by narrow belts of coniferous trees. These, if wired in to prevent disturbance by foxes, dogs, &c., not only provide admirable nesting-ground for winged-game, but afford better concealment for the guns, and cause the partridges to offer higher and more attractive shots. In shooting driven partridges, the sportsman should stand as far as practicable away from the fence, and concentrate his attention on the bird which first tops it. A driven grouse or rocketing pheasant will fly straight towards the shooter without swerving when he raises his gun, but not so the partridge, which can twist in the air almost like a snipe; it is this peculiarity, coupled with their startling scream, that proves so disconcerting to the young sportsman. Especial care should always be taken that the guns stand in a perfectly straight line within sight of one another: neglect of this precaution has often led to serious accidents.

Frequent change of blood is beneficial on estates where a large head of partridges is preserved, and it is advisable to kill off superfluous cock-birds before the commencement of the breeding-season, though when partridges are reared artificially a better plan is to catch them alive, and use them as foster-mothers, a duty they perform admirably.

Pheasant-shooting.

The *pheasant*, once one of the rarest British game-birds, has now, thanks to artificial production, become almost the commonest, and to shoot it over dogs among the hedge-rows in October, as was formerly the practice, would be a manifest absurdity. Under modern conditions it can only be dealt with satisfactorily as a "rocketer," *i.e.* a bird flying high and fast towards the shooter. As such, the pheasant has no superior, provided only it fly high and fast enough, but otherwise it is a rather uninteresting sporting-bird which invariably elects to seek safety by running rather than flight. Like the modern pheasant itself, the rocketer is a more or less artificial creation, and considerable organization is necessary to produce it in perfection. It is only of late years that keepers have recognized that sportsmen place little value on the mere magnitude of a day's bag, as compared to the difficult or "pretty" shots they may obtain. Much, therefore, depends on the management of covert-shooting, the handling of the beaters, the disposition of the "stops," and the pains taken to ensure high-flying pheasants, or the reverse. When the configuration of the coverts permits of it, pheasants should always be driven down-hill to the guns; on flat ground the latter should stand at such a distance from the covert-side as to permit the birds to rise high, and get well on the wing. This is sometimes attained by cutting away the undergrowth at the end of the covert where it is purposed to flush the birds, but this is also liable to make them break back over the beaters. Where pheasants exist in large quantities, "false coverts" of spruce or fir loppings should always be placed at the flushing-point; the birds should be collected as quietly as possible in these, and then sent forward over the guns in small quantities at a time.

Black-game.

Of other recognized British game-birds—as distinct from wildfowl—it is only necessary to dwell on the most beautiful of them all, blackgame. These, though far more widely diffused than the red grouse, are not nearly so numerous. This is possibly due to altered agricultural conditions, the laying to pasture of much of the arable land which formerly fringed the Lowland moors, and the consequent surface-drainage which is responsible for the destruction of many young birds; but the chief cause lies in the wholly inefficient close-time afforded, which should be extended by at least a month. Blackgame- and grouse-shooting differ in no way in their methods, though the former are far more difficult birds to handle by driving, while really fascinating sport can be obtained by stalking the old cocks with a miniature rifle.

Ptarmigan.

Ptarmigan are practically confined to the summits of the higher Scottish hills, which are usually reserved for deer-forests, and, therefore, offer no opportunity for sport with the shot-gun. In mild still weather they give but poor sport, running persistently in front of the dogs, or sitting until they can almost be knocked down with a stick, but on stormy days they rise wild, and afford splendid sport, especially in conjunction with the wild and romantic scenery in which they are found. They are of course invariably shot over dogs.

Capercally.

Capercally, once extinct in Great Britain, were reintroduced into Scotland about 1835, and now exist in tolerable numbers, chiefly in Perthshire. Being a forest-haunting bird, they are usually driven to the guns like pheasants, but apart from their rarity and size, they are not held in great favour as sporting birds, while owing to the great damage they do to young coniferous trees, they are not encouraged to multiply on estates where there is a large acreage of growing plantations. Capercally are very courageous birds, and the writer has seen a winged cock attack and hold at bay a dog sent to retrieve it.

Snipe.

Snipe and *woodcock*, though properly wild-fowl, are usually regarded as belonging to the category of game-birds. Though both the full-snipe and the woodcock breed to a limited extent in the British Isles, they may more correctly be described as autumn and winter migrants to them. The varieties then to be shot are the full-snipe, the jack-snipe and the great or solitary snipe; but the latter is exceedingly rarely met with, and the jack-snipe is becoming scarcer every year. Neither of these latter varieties breeds in the United Kingdom. Snipe are exceedingly erratic in their movements, which are largely influenced by the weather; like the woodcock they are here to-day and gone to-morrow. They haunt moist, or marshy localities, and the finest snipe shooting in the British islands is to be found on the Irish bogs. In hard frosts they should be sought near running water. As a general rule a dog is not used to find snipe, but where this may be considered necessary, a well broken Irish water-spaniel is to be recommended. These are the most intelligent of dogs, can be trained to point and retrieve as well, and are capable of standing wet and cold with impunity. It is a generally accepted axiom that snipe should be walked up, down wind, since they offer an easier mark when rising against it, but in the writer's experience this is more than counterbalanced by the fact that snipe, which are particularly susceptible to noise, lie far better when approached up wind. To kill snipe well is the most difficult knack in shooting, and one to which few men, however good shots they may be at other forms of game, rarely attain.

Woodcock are rarer birds than snipe, and even more erratic in their movements. Large quantities of them usually arrive in England with the first November combination of an easterly gale and a full moon, but they cannot be depended on to stay more than a few hours in the locality where they alight. In Ireland, however, they are far more constant in their habits, and it is here that the largest bags of woodcock are made in the United Kingdom. Though woodcock are properly forest, or covert-haunting birds, in many parts of Ireland and the Western Highlands of Scotland they frequent the open bogs and moors, where they are shot over pointers or setters. Otherwise no particular rules can be laid down for their pursuit, beyond the fact that they are very conservative in their choice of a haunt, and that year after year cock may be found in the same spot. Woodcock are usually esteemed difficult birds to shoot, but more are missed from over-eagerness on the part of the shooter than from the difficulty of the shot they present. Still in thick covert they undoubtedly require a quick hand and eye acting in unison, to kill them neatly.

Woodcock.

Roe-deer.

Of quadrupeds or ground-game, only three varieties, the roe-deer, the hare and the rabbit, are preserved for sport with the shot-gun in the United Kingdom. The first-named, though found in a few widely distant districts in England and Ireland, is chiefly associated with Scotland so far as shooting is concerned. It is essentially a forest-loving animal, and is usually killed by driving it up to a line of guns, when, if close enough, it will drop to an ordinary charge of No. 5 shot; but a heavy load of B.B. or No. 1 is a far preferable, and more merciful, gauge to use. Roe-deer are not easy animals to move in a direction in which they suspect danger, and the more quietly a drive is conducted, the greater the chance of success. A few men walking carelessly through a wood, *i.e.* as if beating were not their object, will drive roe, and especially the cunning old bucks, with far greater certainty than an array of shouting, stick-rapping beaters.

Far finer sport, however, in every sense of the expression, can be obtained by stalking roe-bucks during the summer months with a small-bore rifle, carrying a hollow-nosed, and not a solid bullet. The most suitable opportunity for this is at sunrise or sunset, when the roe will be found feeding in the more open spaces in the woods. The same animals will nearly always be found in the same locality, but they are exceedingly wary creatures, and the old bucks are quite as difficult to stalk as a red-deer stag.

Hares.

The *hare* no longer exists in the same quantities as formerly; indeed in many parts of Great Britain it is practically extinct, the result of the Ground Game Act of 1881. No special methods are employed for shooting hares, nor is any great skill requisite for doing so, but sportsmen should always bear in mind that unless hit in the head or heart hares are not easily killed dead, and should, therefore, refrain from firing long shots at them, especially when they do not offer a broadside shot.

Rabbits.

It is to be presumed that the Ground Game Act was specially directed—and with reason—against rabbits more than hares, but the former show little or no evidence of being affected by it. Yet from every point of view, except perhaps that of shooting, they are far less valuable, and more noxious, animals, which ravage alike the young plantations of the landlord and the crops of the tenant farmer. Where they are preserved in large numbers, the most usual method of shooting them is to ferret them out of the burrows as short a time as possible before the day fixed for shooting, and then fill in the mouths of the holes with well beaten soil, which should also be drenched with paraffin or tar to deter the rabbits from digging their way in again. If this be carefully done, and plenty of covert—coarse grass, bracken or gorse—be available, in fine dry weather the rabbits will lie out for two or three nights, but in the event of heavy rain or especially snow, nothing will prevent them going to ground again. Where natural covert is scarce, it can be supplemented by strewing brushwood and fir-loppings under which rabbits will readily shelter. In beating for rabbits, the beaters should not merely tap with their sticks, but should thrust them into the clumps of grass and underwood; otherwise many rabbits will be passed over. When rabbits are driven up to a line of guns in covert, the latter—if no winged game is expected—should stand just inside the edge of the wood, with their backs to the beaters, and take the rabbits after they have passed. This not only induces the rabbits to face the open, but precludes the possibility of an accident to the beaters. Capital sport can be enjoyed in the summer evenings by stalking rabbits with a pea-rifle in a suitable locality, *i.e.* where no danger to human beings or live-stock can be caused by a stray or deflected bullet. A disused quarry or sand pit is an ideal place for such sport.

Wild-fowl.

One branch of shooting remains to be touched on, namely, wild-fowling, which again must be classed under two totally distinct headings, shore or flight shooting, and shooting afloat with a swivel punt gun. In flight shooting, the sportsman stations himself at a point over which the birds will probably pass at sundown or daybreak in their passage from or to the sea, when going to or leaving their inland feeding places. Success in flight-shooting must, therefore, depend very largely on chance or luck, but given a fair proportion of the latter, it is a fine, wild sport. One essential requirement is a well-trained and thoroughly intelligent dog, and here again no better can be selected than an Irish water-spaniel. No special rules of guidance can be laid down for shore-shooting; the districts are unhappily few and far between where even a moderate bag of edible wild-fowl can be made nowadays, and experience alone can give that knowledge of their habits which is essential to success. Wild stormy weather which drives the birds off the sea is best for shore-shooting.

Punt-gunning or wild-fowling afloat is a sport confined to an exceedingly small number of people, professional or amateur, and is as distinct from ordinary inland shooting as deer-stalking from pigeon-shooting. It may be briefly described as the art of shooting wild-fowl on the sea, or in estuaries of rivers, from a flat-bottomed punt carrying a heavy, fixed gun, weighing anything from 70–170 lb, the muzzle of which rests in a revolving crutch in the bow of the boat, and firing a charge of 1–2 lb of shot. A punt may be either single- or double-handed, *i.e.* to contain one or two people, and it is perhaps unnecessary to add the fowl are shot sitting, or just as they rise from the water. It is a sport that contains a considerable element of danger, and requires great powers of endurance and a strong constitution no less than good nerves, and it has been rightly termed a science in itself, only to be learnt by a patient apprenticeship under an experienced teacher.

The art of shooting.

The art of shooting cannot be learnt theoretically, and can only be acquired by experience and practice. The beginner should, however, from the first seek to avoid an ugly or cramped style, which, once developed, is very difficult to get rid of, and should bear in mind that, in firing at a moving object, his purpose should be not to place his charge of shot where such object is at the moment he pulls the trigger, but where it will be by the time the shot reaches it; in other words the game should run or fly into the circle of pellets. Nor should he seek to effect this by dwelling on his game with his gun at his shoulder—a practice not only clumsy but exceedingly dangerous—but by firing at an imaginary point in front of it. Practice alone can teach the knack of doing this properly; to some men it seems a natural gift, while others do not acquire it in a life-time. A sound digestion is the surest aid to successful shooting, for unless the nervous system be in perfect tune, brain, eye and hand cannot act in that spontaneous sympathy necessary to quick and pretty marksmanship.

None the less a good deal depends on the gun, as well as the man who uses it, and in choosing a fowling-piece it will be found an advantage, no less than an ultimate economy, for the young shooter to place himself in the hands of a London gunmaker of repute, and pay a good price for a good article. A 12-bore is the generally accepted gauge for modern shot guns, and this should weigh from 6½–6¾ lb. Of late years it is gradually becoming customary to reduce the length of the barrels from 30 to 28 in., a most decided improvement, as without diminishing the killing-power of the gun it improves its balance, and so lessens the probability of shooting under game, a very common fault among sportsmen. Excessive choking is to be deprecated; a pattern of 140 for the right and of 160 for the left barrel will be found amply sufficient, and a load of 40–42 grains of nitro-powder with 1 or 1⅛ oz. No. 5½ unchilled shot will meet all ordinary requirements of the shooting field. A thoroughly good hammerless ejector gun can be obtained from a first-class London gunmaker for 35–45 guineas, and a pair for £75 to £100, but these prices are capable of considerable modification or the reverse. Single-trigger guns are the latest fashion, but no special advantage can be claimed for them.

The bibliography of shooting is very extensive, but the following works may be cited as standard ones on the subject: The "Badminton Library" *Shooting—Hints to Young Shooters*, by Sir Ralph Payne-Gallwey; "The Fur and Feather" series of publications; *The Gun and its Developments*, by Greener; and for wild-fowling, Colonel Hawker's evergreen *Instructions to Young Sportsmen*; *The Art of Wildfowling*, by Abel Chapman; *The Fowler in Ireland*, by Sir Ralph Payne-Gallwey; and *The Wildfowler*, by Folkard.

Big Game.

The pursuit of large game, whether for food or sport, has ever exercised the greatest fascination for mankind, and with the rapid opening up of vast continents hitherto unexplored, and the introduction of breech-loading rifles, it has assumed an importance within the last few decades that bids fair to render it a thing of the past before the end of the current century. The present generation has seen the bison, which formerly roamed the American prairies in countless millions, wiped off the face of creation; the veldt of Southern Africa, which teemed in equal proportions with big game of every description, has become a pastoral country, where a few of the commoner varieties of antelope are suffered to exist under much the same conditions as the semi-wild deer of the Scottish Highlands; and even the jungles of Hindustan, save where jealously preserved by native potentates, show signs of exhaustion as regards the larger fauna. True, wherever the white man holds sway, the danger of extinction has been recognized; close-times have been instituted; reserves set apart wherein the animals may breed unmolested, and the number of each species that may be killed, restricted; but it is doubtful whether these laws, wholesome and well-intentioned as they are, can do more than retard the ultimate destruction of big game outside such reserves as the Yellowstone Park in North America. Within the pale of this no rifle is ever fired, and the game has prospered correspondingly, but once let a single head of it wander outside the restricted area, and its doom is sealed. Moreover, there are still vast tracts in Africa, and to a limited extent in other parts of the globe, where big game forms the staple meat supply of the aboriginal inhabitants, who, in addition, are no longer dependent on their primitive weapons of the chase, but are equipped with more or less efficient firearms. Great regions are however still to be found, of which sportsmen have as yet barely touched the fringe. The dense forests of Western Africa are practically unexplored, much less shot out, and Central and Eastern Asia, the Dutch East Indies, and Borneo and Sumatra, offer an almost virgin field for sport with big game. Save for the Barren Grounds of the Arctic regions and some parts of the extreme north-west—though Alaska now enjoys particularly stringent game laws—the North American continent is fast becoming denuded of big game; but in Europe, within a week's journey of London, the mountains of the Caucasus and the forests at their feet are only known to a handful of intrepid explorers. It will thus be seen that although good trophies, whether of hide or horn, are yearly becoming scarcer, fair sport is yet obtainable in those parts of the world where big game is indigenous, though the days are long past when a sportsman could shoot at his own discretion over the whole of Africa or North America, or when the globe-trotter visiting India could count on big game shooting as forming part of his programme.

Indeed, in view of the increased, and increasing, facilities for world travel, and the prevalent fashion for sport, it is probable that in course of time big game shooting will be universally conducted on modern European lines; *i.e.* wild animals will be carefully preserved by the state and private owners, and where the latter do not care to exercise the sporting rights they will be let to the highest bidder, and big game shooting will, as with Scottish deer-stalking, become exclusively a pastime of the wealthy or luxurious classes. Already large tracts in the wilder parts of the Eastern States of America have been acquired by rich men, over which they jealously preserve the sporting; and with the opening up of railway communication in the south of Africa to the Zambezi, and in the north to Khartum, the dawn of another century may not improbably see shooting-boxes advertised "to let for the winter months," dotting the very countries where Oswell, or Baker, found a virgin field for their rifles within the last few decades. Distasteful as such a state of things may seem to the present generation of sportsmen, something more or less approaching it will inevitably come to pass; and where climatic conditions or inaccessibility forbid its adoption, big game will become extinct at the hands of native races or white "professional" hunters. *Carpe diem* must undoubtedly be the motto of the big game shooter of the present day, who requires genuine wild sport under the highest possible conditions. Even at present it is essential that he should obtain the fullest information as to the existing game laws in the part of the world in which he proposes to hunt, the whole of North America and practically three-fourths of Africa being governed by stringent regulations respecting the preservation of big game. Every state in the North American Union, and in some cases every county in a state, has its own close-times and game laws, and the same is true of Canada. Moreover, heavy fees for licences to kill big game are now exacted in all parts of the world where game laws exist. In the United States the cost of this varies very much, the present highest charge being $50 for a "non-resident" sportsman, while in addition in some states he is not permitted to hunt unless accompanied with a qualified guide. Full information on these points can be obtained gratis on application to the Board of Agriculture at Washington, where every assistance is given with the greatest courtesy, and which further issues admirably compiled pamphlets dealing with the whole question of game-preservation. Infringement of the United States Game Laws entails exceedingly heavy penalties, amounting in the most extreme case to two years' imprisonment plus a fine of $5000.

In Canada the highest charge is $100 in Manitoba, while in Africa it varies from £50 in the Sudan and British and German East Africa to £100 in Bechuanaland. Moreover, it must be borne in mind that these fees only permit the killing of a limited number of specified animals. Still, excellent as these laws undoubtedly are, their value must remain enormously discounted as long as the sale of game and skins by aboriginal or professional hunters is permitted; it is they, and not the heavily taxed foreign sportsman, who are responsible for the threatened extinction of big game.

So far as Asiatic sport is concerned, British India, save to those furnished with credentials to native potentates or high government officials, offers scant opportunity as regards big game to the itinerant sportsman, who must now wander farther afield into Central or North-Eastern Asia, Borneo, Java and the wilder parts of Assam or Burma; but the greater portion of the first-named locality is only open to persons duly authorized by the Russian government.

Although South America and Australia offer little attraction for sport with the rifle, big game of varying species is thus indigenous in every part of the world.[1] It is obviously impossible within our limits to deal at any length with either its habits or the various methods of hunting it. Brief allusion will be made, however, to the chief varieties of it found in the various continents and the necessary equipment for their pursuit.

Europe.

Europe contains big game in greater variety and quantity than is generally supposed. The last survivors of the aurochs or European bison still roam the forests of Lithuania and the Caucasus: elk are found in Scandinavia, Russia and Eastern Prussia, and red-deer are common to the whole of the continent. Of the more Alpine kinds of big game, reindeer exist in Norway; chamois in the mountainous districts of Central and Southern Europe; wild sheep in Corsica and Sardinia; while a few of the European ibex still linger in the royal preserves of the Italian Alps. A variety of ibex is fairly plentiful in Spain, and wild goats are found in South-Eastern Europe. Of the carnivora, bears, wolves and lynxes, though not often met with, still exist in fair numbers in most of the mountainous countries of Europe, though the first-named animal is practically the only one affording opportunity for sport with the rifle. Gluttons or wolverines are found in Scandinavia and Russia, and so-called wild-boar are plentiful in the carefully preserved forests of Central Europe. The reason for this continued supply of big game is that the whole of the European continent has been for centuries under private, communal or state preservation. The Caucasus, which though geographically in Europe, can hardly with fairness be held to be so as regards sport, further contain such purely Asiatic varieties of big game as tigers, leopards and tahr, and but for the savage character of the country and its inhabitants, and the obstacles thrown in the way of foreign travellers, would probably be far more visited by English sportsmen than is at present the case. In civilized Europe, Scandinavia, Spain and the Mediterranean islands probably offer the best field for the big game hunter of moderate means, though the last named localities still enjoy an unenviable reputation for brigandage.

Among useful works of reference dealing with big game shooting in Europe the following may be cited: *Wild Spain*, by Chapman, and *Wild Norway* by the same author; *Flood, Fell and Forest*, by Sir Henry Pottinger; *Savage Svanetia* and *Sport in the Crimea and Caucasus*, by Phillips Woolley; *Tyrol and the Tyrolese*, by Baillie-Grohmann; the volumes of the "Badminton Library" dealing with the subject, and especially *Short Stalks*, by E. N. Buxton.

Asia.

The physical geography of so vast a continent as Asia, no less than its varying climatic conditions, naturally produce many different species of big game, ranging from the Alpine to the purely tropical. When it is remembered that the continent includes the frozen tundras of the Arctic Circle, the steaming plains of Hindustan, the treeless wastes of the Pamirs and the dense jungles of Burma, together with the highest mountains in the world, it will be readily seen how varied must be its fauna. Among the carnivora, the tiger and the leopard or panther are found practically throughout Asia, save in the extreme north and north-west; while lions, though exceedingly rare, still exist in Guzerat and parts of Persia and Mesopotamia. The usual methods of tiger-shooting in British Asia are, when the game has been located, either to drive it to the sportsmen by means of natives acting as beaters, or else to force it into the open with a long line of elephants, which also serve to carry the shooters; the choice of methods must, of course, depend on local conditions. The second practice is not a form of sport within the reach of men of moderate means, who, indeed, except as the guests of some native potentate, are not likely to have the opportunity of indulging in tiger-shooting at all. In localities where neither of these methods is feasible, it is usual to tie up a live animal as a bait, and sit up over it during the night in a *machān* or platform lashed to the nearest tree; but this is usually an unsatisfactory and disappointing proceeding. In parts of Asia other than British possessions, tigers are found as far apart as the shores of the Caspian Sea and the island of Saghalien. Europeans recover with difficulty from the bite of a tiger, since blood-poisoning is the almost inevitable result owing to the septic condition of the animal's teeth and claws, and a supply of antiseptic lint and solution should always form part of the tiger-shooter's equipment. Panthers, though more plentiful than tigers, are less frequently bagged, as they are exceedingly difficult animals to beat out of covert; they are usually killed by sitting up over a bait, or by smoking them out of the caves they frequently make their homes. A wounded panther has the reputation of being a more dangerous animal than a tiger. Other varieties of the felines are the cheetah, the clouded panther, the lynx, and most beautiful and rarest of all, the ounce or snow leopard only found above the snow line.

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[1] Except in New Zealand, where red-deer have, however, been introduced and afford magnificent sport.

Of other Asiatic carnivora the bears are the most important from the sportsman's point of view. A great variety of them exists, ranging from the great Kamchatkan bear to the small blue bear of Thibet, but the methods of their pursuit call for no special mention.

The Indian elephant is rather smaller than the African variety, and has other well-marked differences, the chief as regards shooting being the fact that the cavity at the top of the trunk is not protected by the roots of the tusk as in the African elephant, thus enabling a frontal shot to reach the brain. This point, one at the side of the temple, and another at the back of the ear, are most usually selected for their aim by Indian sportsmen, who do not favour the shoulder shot so commonly employed in Africa. A charging elephant can often be turned by a well-planted, though not necessarily fatal, bullet, but a really determined animal, especially a female with a calf, will not cease its attack until either it or the hunter be killed. Though elephants will usually fly from the report of a rifle, the sound of a human voice will often make them charge.

Four varieties of rhinoceros, of which two are one-horned, and two double-horned, are found in Asia, ranging eastwards from Assam through Burma and Siam as far as Sumatra. The rhinoceros is almost invariably found in heavy grass swamps, and can consequently only be hunted by means of elephants, It is usually beaten out by means of a long line, but is occasionally tracked to its lair on a single elephant. In common with many animals of the deer and antelope tribes, the rhinoceros always deposits its droppings in the same place, a peculiarity which enables native shikaris to locate it with tolerable ease. Although a rhinoceros, even when wounded, will rarely charge home, it has a peculiarly terrifying effect on tame elephants, and specially trustworthy ones are necessary for this sport. The Indian rhinoceros differs in many important details from the African variety.

Of bovines, Asia produces the buffalo, three species of the gaur —miscalled the Indian bison—and the yak, the latter a rather uninteresting beast of the chase only found on the open ground of the Tibetan plateau. Very different is the pursuit of the gaur in the dense forests of India and Burma, where it is usually stalked on foot; and to track a wounded bull through thick jungle affords one of the most exciting experiences of big game shooting. Such an animal will almost invariably turn at right angles to its trail, and watch for its pursuer, whom it will charge from a distance of perhaps a few yards, even feet. The wild buffalo, too, is an exceedingly plucky animal, and will on occasion even attack a European—whose smell appears distasteful to it—unmolested, a peculiarity it shares with the tame variety.

The numerous species of deer and antelope scattered over the continent of Asia are usually obtained by stalking, but the former being essentially forest-haunting animals, while the latter are usually found on open ground, the methods of approaching them naturally vary with local conditions. Of deer the best known are the sambar, the chital and the swamp deer, but the Hangul or Cashmere stag, the Altai wapiti and the Maral or Asiatic red-deer afford the finest trophies. Of Asiatic antelope the handsomest and commonest variety is probably the blackbuck, found practically all over India as far east as Assam.

To many sportsmen the most fascinating form of Asiatic big game shooting is the pursuit of the many varieties of wild goats and sheep, common to the various mountain ranges and high-lying plateaus of the continent. While such sport lacks the risk of attack from the animal hunted, it exacts remarkable powers of endurance and perseverance on the part of the hunter, coupled in most cases with the dangers inseparable from Alpine climbing. There is scarcely a mountainous or elevated part of Asia which does not contain some variety of wild goat or sheep, of which the best known are the ibex and markhor of the Himalayas and Hindu Kush among the former, and the *Ovis Poli* and *O. Ammon* of Tibet among the latter. As a general rule all wild goats can only be obtained under conditions which exact the highest mountaineering qualities on the part of the stalker, but with regard to the sheep of the vast tablelands of High Asia—"the roof of the world"—a good deal of work has to be done on pony back, as the rarefied atmosphere of these great altitudes precludes much physical exertion. Exception, however, in this respect must be made of the burhel—*Ovis Nahura*—which haunts the same inaccessible crags as the ibex or markhor. The sportsman who essays to bag an *Ovis Poli*, or *O. Ammon*, will probably have had ample opportunity of testing his climbing powers on the march from India to his shooting-ground.

Ibex-shooting begins with the melting of the snows on the lower slopes, and ends in June, when the flies and the flocks of native herdsmen, driven to the Alpine pastures, force the wild animals to seek ground absolutely inaccessible to man. "First come first served" is a recognized rule in Himalayan shooting, and once a sportsman has claimed a *nullah*, or mountain valley, by priority of possession, it is his alone as long as he chooses to retain it; consequently the "race for the nullahs" in early spring is not the least exciting part of Himalayan big game shooting. In addition to ibex, markhor and such animals, the season's bag should also include two varieties of bear, and, with extreme good fortune, an ounce or snow leopard.

Like the fox in Great Britain, the wild boar is never shot in any part of British Asia where it can be hunted on horseback.

Equipment.

Thanks to the improvements in modern firearms, and particularly to the adaptation of cordite ammunition to sporting rifles, the battery necessary for Asiatic big game shooting has been considerably reduced, both in weight and number of weapons required. It is not long since 8-, or even 4-bore rifles, weighing respectively 18 and 24 ℔, or at least a ·577 Express, were considered indispensable for the pursuit of the pachyderms and larger bovines, yet nowadays a ·450 rifle of 11 ℔ weight, in conjunction with cordite powder, is held amply sufficient for the heaviest or most dangerous game, the penetration or expansion of the bullet being regulated by the extent of its covering of cupro-nickel or steel. For soft-skinned animals, deer and mountain game, a ·256 or ·303 magazine rifle is the most useful weapon, and it may be confidently said that the introduction of these and similar small-bore rifles has extended the killing zone in stalking by at least 100 yds. For forest or jungle shooting a 10- or 12-bore Paradox gun is an admirable weapon, capable of use as a rifle against large and dangerous animals, or as an ordinary shot gun for small game. A double-barrelled rifle is essential for dangerous game, the saving of time, short as it is, in merely shifting the finger from one trigger to another, being an enormous advantage as compared with the action of ejecting and re-loading from a magazine. Finally it may be said that a sportsman would be completely equipped for big game shooting in Asia, or indeed any part of the world, with a battery consisting of a ·450 cordite rifle, a 10- or 12-bore Paradox gun and a ·256 or ·303 magazine rifle.

As regards the rest of his outfit, if he propose to shoot in any part of British Asia, he can procure this on the spot, as well, and far cheaper, than in England.

Useful works dealing with big game shooting in Asia are: Baldwin, *Large and Small Game of Bengal*; Forsyth, *Highlands of Central India*; Sanderson, *Thirteen Years among the Wild Beasts of India*; Kinloch, *Large Game Shooting in Thibet, &c.*; MacIntyre, *Hindu Koh*; Steindale, *Natural History*; Demidoff, *Sport in Central Asia*; Ronaldshay, *Sport and Travel 'neath an Eastern Sky*; *A Shooting Trip to Kamchatka*; and Fife-Cookson, *Tiger-Shooting in the Doon and Ulwar*.

Africa.

The main feature of African big game is the antelopes, which exist in great variety; such widely different animals as the noble sable antelope and the tiny dik-dik being classed among them. African gazelles and antelopes may be roughly divided into two classes, those found on plains or open ground, and those frequenting forest or bush, and the methods of hunting them naturally vary with the locality. Still, as a general rule, the antelopes of the plains are not only the finer animals, but afford more enjoyable sport in the stalk, combined with the advantage of a climate free from malaria. There is practically no part of Africa where antelopes do not exist in one variety or, another, but probably British East Africa or Somaliland offer the best field for sportsmen. On open ground a good deal of hunting can be done on horseback—except in those districts where the tsetse fly exists—and antelopes are occasionally ridden down, but a very stout-hearted horse is required to overtake such animals as sable antelopes, eland or gemsbok. Caution should always be exercised in approaching the larger varieties of antelope when at bay, whether wounded or not, as some of them, notably the roan and sable, and the oryx, are inclined to be very savage, and will charge desperately home. It is said that even a lion is chary of attacking the oryx, owing to its long rapier-like horns.

The African carnivora include the lion, leopard, cheetah, hyena and other smaller varieties, but it is only necessary to deal with the first named, which, where not exterminated or driven away by civilization, may be said to be common to the whole continent. As with all game, big or small, the conditions of lion-shooting vary with the locality; thus, on the open plains of Somaliland, lions can be spied from a distance and stalked on foot, or even ridden to bay on horseback, while in densely bushed districts, unless chanced on in open ground, the most usual method is to sit up at night over a bait or kill, inside a *zareba* of thorn bushes. This method, however, makes aiming with any degree of accuracy a matter of difficulty, but a German, Herr Schillings, has demonstrated the use of a flashlight in such circumstances. Lions frequently lie up or shelter in detached patches of scrub, whence they may be driven by a "bobbery" pack of dogs, or as a last resource the bush may be set on fire, the sportsman having previously concealed himself down wind. Lions when emboldened by hunger will fearlessly attack human beings, especially at night, and, like tigers that have once developed a taste for human flesh, become positive scourges of their neighbourhood. Mr F. C. Selous, than whom there are few better authorities, considers the lion the most dangerous of all African big game, a distinction that other writers award to the buffalo.

Of the pachyderms the commonest is the rhinoceros (*R. bicornis*), usually termed the black rhinoceros to distinguish it from the so-called "white" variety now almost extinct. Though the first-named is by no means so widely distributed as formerly, it is still plentiful in Equatorial Africa, and to a lesser extent in Somaliland. It bears rather a mixed character for ferocity, but most hunters agree that while it will charge with little or no provocation, it does so blindly, and rarely turns to renew the attack. This is probably due to its exceedingly poor sense of sight, but its sense of smell is correspondingly extraordinarily acute, while an additional cause that renders it a difficult beast to stalk is the presence of the "rhinoceros birds" which are its almost invariable companions, and which warn it of danger. Though so huge an animal, the rhinoceros is easily killed by a bullet in front of the base of the ear, or midway along the neck; the shoulder shot is only employed when the hunter has stepped aside to avoid a charge. The hippopotamus is still plentiful throughout most parts of uncivilized Africa. In narrow rivers where they can be shot from the bank, they are easily killed by a brain-shot, the best spot to aim at being the base of the ear. If the bullet be properly placed the animal will sink to the bottom of the stream and rise to the surface within a few hours. Hippopotami are nocturnal feeders, and can be occasionally shot at night when at a considerable distance from water; but owing to the difficulty of placing the bullet accurately, they are apt to escape wounded. Hippopotamus shooting does not rank high as a sport, but the meat, when young, is excellent, and the huge size of the animal enables a hunter to provide a large number of followers with food; this can be the only excuse for killing these comparatively harmless animals in any number.

Elephants still exist in considerable numbers in parts of Africa, but, unless more stringent methods of protection are afforded, their ultimate extermination at the hands of professional ivory-hunters, white or coloured, is inevitable. What can be done in the direction of preservation is shown in Cape Colony, where elephants, which have been rigidly protected for many years, now exist in considerable, and increasing, quantity. Elephants have an extraordinarily keen sense of smell, which, coupled with their habit of roaming over vast expanses of country, forms their chief safeguard against the relentless persecution to which they are subject. They may be hunted either on foot or horseback; where feasible, the latter is the preferable method, as it not only enables the hunter to follow up his quarry with greater ease—and when startled, or wounded, elephants will travel enormous distances—but in open country gives him a better chance of escape from a charge. The heart, or broadside, shot is usually employed. Incredible as it may seem, these enormous creatures can be killed by a single pellet of hardened nickel, discharged from a ·303 rifle. A weapon of heavier calibre is, however, to be recommended, and a ·450 rifle, or 10 or 8 bore Paradox gun, are most suitable; the closer the hunter can safely get to the animal the better. A charging elephant can usually, but not invariably, be turned by a shot in the chest; to fire at the head is useless.

The buffalo (*Bos caffer*), formerly one of the commonest of African wild animals, has been practically exterminated in many parts by the plague of rinderpest, but is still plentiful in the malarious swamps between the mouths of the Limpopo and the Zambezi, and even more so in the Beira district of Portuguese East Africa. Like most wild animals, the buffalo is naturally disinclined to take the offensive, but when roused to action, it will pursue a hunter with relentless ferocity, and is held by many authorities to be the most dangerous of African big game. The greatest care should therefore be exercised in following up a wounded animal, or in approaching one that is apparently dead, for as long as a spark of life lingers in it, it will endeavour to destroy its destroyer. A wounded buffalo will nearly always make for the nearest thicket, where it will await its pursuer, and in such circumstances, it should be left alone for an hour or two, when it will probably lie down, and be less active in attack owing to its wound having stiffened. A charging buffalo always carries its head at such an angle that a frontal shot is useless, unless the bullet penetrates through the nose into the throat or chest. A ·500 or ·450 rifle with a solid bullet, or an 8-bore Paradox gun is the best weapon for buffalo-shooting. Other varieties of the African bovines are the smaller, Abyssinian, the Senegalian, and the dwarf, or Congo buffaloes.

The only other species of African big game calling for special mention is the giraffe, which is usually ridden down and killed by a raking shot at the root of the tail; but except when required for food or specimens, the destruction of this inoffensive animal, which offers no trophy of the chase, is to be deprecated. Great numbers are annually destroyed by professional skin hunters, and their carcases left to rot. Bears, though little known, exist in North-West Africa, and the ubiquitous wild goat, or ibex, is also found in the north of the continent. A ·450 cordite rifle, a ·303 small bore, and a 10 or 8 bore Paradox gun, is an ample battery for African big game shooting.

Useful books of reference for African shooting are: Selous, *A Hunter's Wanderings in Africa*; *Travel and Adventure in S.E. Africa*, by the same author; Baker, *Wild Beasts and their Ways*; Swayne, *Seventeen Trips through Somaliland*; Powell Cotton, *Travel and Adventure in the Congo Free State*, *A Sporting Trip to Abyssinia*; Melliss, *Lion Hunting in Somaliland*; Willoughby, *East Africa and its Big Game*; Neumann, *Elephant Hunting in East Equatorial Africa*; Hay, *Western Barbary*; Bryden, *Kloof and Karroo*; Millais, *A Breath from the Veldt*; Thomson, *Through Masai-Land*, and Theodore Roosevelt, *African Game Trails* (N.Y. 1910).

North America.

Big game in North America has been rapidly disappearing for several decades before the advance of civilization armed with breech-loading rifles. Among the carnivora, bears and pumas are the only species that need be taken into account as far as shooting is concerned. Of the former three[1] varieties exist, the grizzly, rarely found east of the Rocky Mountains, the brown bear, and the black bear, common to practically the whole of the continent, though now rarely killed in the Eastern states. The best country for bears is Alaska, where the grizzly grows to an enormous size, and the Kodiak Island bear is probably the largest variety of its genus in the world, except perhaps the Yezo bear of Japan. In Alaska, bears are frequently shot along the river-banks, to which they resort in autumn to feed on the salmon which then crowd the rivers. Otherwise no fixed rule can be laid down for American bear-shooting; the quarry may be hunted with dogs, which "tree" the black bear, or bring the grizzly, which is unable to climb, to bay; it may be killed over a bait; it may be spied and stalked, or, most common of all, it may be accidentally "jumped" and shot by the hunter. The neck or heart is the most vulnerable spot to aim for, but bears are very tenacious of life, and astonishingly active, despite their clumsy appearance. Their eyesight is bad, but their sense of smell and hearing very acute. The biggest of grizzlies will rarely charge unprovoked, unless it be a female with cubs, but when molested or wounded it will push its attack home with the greatest temerity, and caution should always be exercised in approaching a wounded animal, even when apparently dead.

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[1] The Polar bear may be claimed as a fourth species, as it is found on the mainland of the ice-bound north, but it can hardly be included as far as big game shooting is concerned. American naturalists recognize many sub-varieties of both the grizzly and brown bear.

Of North American *Cervidae* the finest is the wapiti, invariably miscalled elk, once as plentiful as the bison, but now extinct east of the Rockies, where, though still fairly abundant, it is found in sadly diminished numbers. It is especially common in Vancouver, but as is almost invariably the case with insular deer, the heads are small compared to those of the mainland. Wapiti-hunting is probably the finest sport in America, not only from the magnificent trophy these splendid deer afford, but also on account of the beautiful country they frequent in the United States; open rolling ranges of hills interspersed with patches of timber. Wapiti are almost invariably killed by stalking during the rutting-season, when the big bulls betray themselves by their defiant challenge. The largest deer in the world is the North American moose, which, except for a difference in size, is precisely the same animal as the elk of Northern and Eastern Europe. It is essentially a forest-haunting animal, which in the Eastern States and Canada is frequently killed by "calling" *i.e.* imitating the call of the cow, and so attracting the rutting bull to within shot of the hunter. This is usually effected by means of a species of trumpet made of birch-bark, and in this art of "calling" both white men and Indians become exceedingly skilful. In Alaska, where the finest moose are found, they are usually stalked or "still-hunted" on foot, and to "still-hunt" these animals in dense timber successfully is a most delicate piece of wood craft. Unless struck in a vital part a wounded moose will travel enormous distances, but a single shot in the heart, or better still, the neck, is usually fatal. A wounded moose can be dangerous and should be approached with caution.

The North American caribou, which is practically the same animal as the European and Asiatic reindeer, may be divided into two varieties: the Barren Ground caribou, found in the north, and the Woodland caribou, found all over the forests of Canada, and in a few localities in the United States. The former is probably the only wild animal existing on the American continent in practically the same numbers as formerly, while the latter, thanks to careful preservation, is still abundant. The Barren Ground caribou of the northern regions of North America are frequently hunted by white men. They form the staple food of the natives of Arctic North America, and huge quantities of them are killed during the spring and autumn migration, especially when swimming lakes or rivers. The woodland caribou is easily stalked in fairly open ground, and a bullet in the heart or neck will kill the largest bull. Caribou and reindeer are the only animals of the *Cervidae* in which the females have horns as well as the males. The two most widely separated districts of Canada, Newfoundland and British Columbia, probably afford the best ground for woodland caribou. Other American deer are the mule, or black-tailed, and the Virginian, or white-tailed, both widely distributed throughout the continent, but the latter, which is essentially a denizen of thick forest, is much the most difficult beast to stalk. It is occasionally "hounded" or hunted with dogs, which drive it to runways where the hunter has previously concealed himself. A smaller variety of the black-tail is found on the Pacific coast.

The prongbuck, invariably, but incorrectly, styled an antelope, is a sporting little animal only found on open plains. It was formerly exceedingly plentiful, but is now sadly diminished in numbers. It can only be obtained by fair stalking, and the shot has almost invariably to be taken at long range. It affords excellent sport when coursed with greyhounds. It is the only hollow horned ruminant which annually sheds its horns.

Now that the bison is extinct as far as shooting is concerned, the only bovine of North America is the musk ox of the Arctic Circle, but few sportsmen care to undergo the discomforts attendant on the pursuit of this animal, which moreover is an exceedingly uninteresting beast of sport and offers but a poor trophy. The same may be said of the Rocky Mountain goat, a curious animal, which zoologically is an antelope, and which, though its pursuit exacts great powers of endurance and mountaineering ability, is so stupid, or self-confident a creature, that practically no science is required to stalk it. Very different is the chase of the magnificent big horn or wild sheep, now scarce in the United States, but fairly plentiful in the Kootenay district of British Columbia, and which, when killed by fair stalking, affords a trophy that may be considered the Blue Ribbon of American big game shooting. It is occasionally hunted with dogs, which hold it at bay until the hunter can get within range, or it may be killed by watching the so-called "licks," or beds of limestone clay, to which these animals are fond of resorting, and which they lick or gnaw, presumably as a form of corrective. Big horn, varying according to locality, are found as far north as the shores of the Bering Sea, and south to Northern Mexico. The only other wild animal of North America that needs mention is the puma or panther. This is invariably hunted with dogs, which "tree" it or hold it at bay until the arrival of the hunter, while a good pack of staunch hounds will kill it themselves. To seek it without the aid of dogs is useless, and it is therefore an uninteresting beast of sport. Certain American writers have claimed a rather spurious courage for the puma, but the general consensus of opinion is that it is a skulking, cowardly beast.

No special battery need be taken to America; a ·303 rifle is sufficient for all the big game of the continent, but a ·400 or ·450 cordite rifle is probably preferable for dealing with the big Alaskan grizzlies.

Useful works of reference for American shooting are: Roosevelt, *Hunting Trips of a Ranchman*; Van Dyke, *The Still-Hunter*; Pike, *The Barren Grounds of Northern Canada*; Grohmann, *Camps in the Rockies*; Caton, *The Antelope and Deer of America*; *American Big Game Hunting* (edited by Roosevelt); Davis, *Caribou Shooting in Newfoundland*; Buxton, *Short Stalks*; Whitehead, *Camp Fires of the Everglades*; and the volumes of the "Badminton Library" dealing with the subject.

South America.

Although two or three sorts of unimportant deer are found in South America, as well as the puma and jaguar, it does not call for special mention in respect of big game shooting, an extraordinary fact in view of the enormous size of the continent. The best work of reference is Kennedy, *Sporting Sketches in South America*.

Other areas.

Arctic big game shooting appeals to such a small class of sportsmen, and is so limited in its variety of game, that it need not be touched on here. Full information on the subject can be found in the works of Lamont, Nansen, and other Arctic explorers.

Some of the finest deer stalking in the world can be obtained in New Zealand, by those able to spare the time for so long a journey.

General considerations.

Big game shooting is not only an exceedingly expensive amusement, but one of which the cost has been continually increasing, and no expedition of any length outside Europe could be enjoyed under an expenditure of from £300–£500; but in view of the enormous difference in local conditions, no less than individual requirements, no hard and fast scale can be laid down. East Africa and Somaliland are probably the most expensive localities in which to hunt, on account of the numbers of porters, and followers, with which a sportsman is obliged to encumber himself, while British India is relatively the cheapest. South of the Zambezi in Africa, it is usual to transport stores and equipment in an ox-wagon, and though the initial cost is heavy, great part of this can be recouped by selling the equipment at the end of the trip. No matter in what part of Africa it is purposed to hunt, it is advisable to bring everything, camp-equipment—Weissman tent, mosquito curtains, camp bedstead, table and chair—and all stores from England. These latter should be packed in strong boxes, each branded with the nature of its contents, to weigh when full 65 ℔, the weight an African porter can conveniently carry. Beads and presents for natives should not be overlooked. In India, on the other hand, nearly everything can be procured cheaper and better there than in England, while as regards North America, as indeed everywhere, the expense of a shooting trip varies largely with locality; the outfit of wagons, horses and attendants requisite for Wyoming or Montana, being useless in British Columbia, or Alaska, where everything has to be "packed" on Indian porters. Of Central or Northern Asia it is difficult to speak with any degree of accuracy as regards expense; but on this important point, no matter in what part of the globe an expedition may be planned, information should be sought from only the latest and most reliable authorities.

The hunter's personal equipment, rifle, clothing, saddlery, &c., should be the best procurable. Where a camp bed is not practicable, a sleeping-bag of three partitions and waterproof back should be taken. Clothing must of course be adapted to the climate, but flannel must always be worn next the skin, and a cholera belt is a necessity. It should be remembered that clothing should err on the side of warmth; a chill can be contracted in the tropics just as easily as in a temperate clime, and is far more dangerous in its effects. A small medicine-chest should form part of the equipment, and most medicines can now be obtained in easily portable tabloids. Warburg's fever tincture, and quinine, are essential in tropical or malarious districts. Cheap rubber-soled shoes, to be thrown away when worn out, are excellent for rock work, otherwise no footgear can equal a well-made English shooting boot. Good field-glasses are preferable to telescopes, on account of their handiness. Now that big game shooting has become the "fashion," and facilities for world travel are increasing every year, people are prone to enter on the sport with but vague ideas as to its dangers, hardships and responsibilities. Presumably no one not of sound constitution would undertake an expedition to, say, Central Africa, or Asia; but even granted this necessary qualification, he may be naturally unfitted by temperament to deal with the discomforts and drawbacks inseparable from big game shooting, even under the most favourable conditions. He may be able to plant shot after shot on the bull's-eye of a stationary iron target, yet this is a very different matter from finding the shoulder of an animal moving through surroundings which closely assimilate with its own colouring, or from placing his bullet in exactly the right spot to stop the charge of an infuriated wild-beast. In such a situation, if eye, hand, or nerve fail him, the odds are that the creature will kill him instead of his killing it, for, as has been truly said, dangerous wild animals when wounded, or provoked beyond endurance, will hunt a human being as a terrier does a rabbit. In dealing with coloured retainers, whether Asiatic or African, the hunter should above all remember that he is a white man, and exact implicit obedience and respect, by combining firmness with scrupulously fair treatment. Again, to instance a minor, but none the less important, essential, how many would-be big-game hunters are there who can trust themselves to find their direction by a compass, or steer a course at night by the aid of the best-known constellations? Yet this is merely one of a hundred other requirements necessary to travel in a wild country. (P. St.)

SHOP, a term originally for a booth or stall where goods were sold, and in most cases also made, now used chiefly in the sense of a room or set of rooms in a building where goods are displayed for sale and sold by retail, also the building containing the rooms. Another application of the word is to the building or rooms in which the making or repairing of articles is carried on, a carpenter's shop, a repairing-shop, at engineering works and the like. In America, in the smaller towns and rural districts the "shop" is usually styled a "store" (O.F. *estor*, Late Lat. *staurum*, *instaurare*, to build, construct, in later use, to provide necessaries). While in America in the larger cities the word "shop" is becoming applied to the retail places of sale, in English usage "store" has in recent years become the recognized form for the large retail places for universal supply.

SHORE, JANE (d. 1527), mistress of the English king Edward IV., is said to have been the daughter of Thomas Wainstead, a prosperous London mercer. She was well brought up, and married young to William Shore, a goldsmith. She attracted the notice of Edward IV., and soon after 1470, leaving her husband, she became the king's mistress. Edward called her the merriest of his concubines, and she exercised great influence; but, says More, "never abused it to any man's hurt, but to many a man's comfort and relief." After Edward's death she was mistress to Thomas Grey, marquess of Dorset, son of Elizabeth Woodville by her first husband. She also had relations with William Hastings, and may perhaps have been the intermediary between him and the Woodvilles. At all events she had political importance enough to incur the hostility of Richard of Gloucester, afterwards King Richard III., who accused her of having practised sorcery against him in collusion with the queen and Hastings. Richard had her put to public penance, but the people pitied her for her loveliness and womanly patience; her husband was dead, and now in poverty and disgrace she became a prisoner in London. There Thomas Lynom, the king's solicitor, was smitten with her, and wished to make her his wife, but was apparently dissuaded. Jane Shore survived till 1527; in her last days she had to "beg a living of many that had begged if she had not been." More, who knew her in old age when she was "lean, withered and dried up," says that in youth she was "proper and fair, nothing in her body that you would have changed, but if you would have wished her somewhat higher." Her greatest charm was, however, her pleasant behaviour; for she was "merry in company, ready and quick of answer." She figured much in 16th-century literature, notably in the *Mirrour for Magistrates*, and in Thomas Heywood's *Edward IV.* The legend which connected Jane Shore with Shoreditch is quite baseless; the place-name is very much older.

Bibliography.—Most of our information as to Jane Shore comes from Sir Thomas More's *Life of Richard III.*, edited by J. R. Lumby (Cambridge, 1883), supplemented a little by Edward Hall (*Chronicle*, pp. 363-364). See also H. B. Wheatley's edition of Percy's *Reliques*, ii. 264 (1876–1877), and J. Gairdner's *Life and Reign of Richard III* (Cambridge, 1898). (C. L. K.)

SHORE, a word meaning (1) the margin or edge of land when bordering on a large piece of water, whether of an ocean or sea or lake, "bank" taking its place when applied to the borders on either side of a river; for the legal aspect of the "shore," *i.e.*, the space bordering on tidal waters between high and low water mark, see Foreshore; (2) a prop of timber, used as a support, temporary or permanent, for a building when threatening to fall or during reconstruction (see Shoring), and more particularly a timber support placed against a ship's side when building on the stocks, or when ready for launching on the slips; the props which are the final supports knocked away at the moment of launching are called the "dog-shores," one of the very numerous uses of "dog" for mechanical devices of many kinds (see Shipbuilding). Both words are to be derived ultimately from the same source, viz., the root seen in "shear," to cut off; in sense (1) the word means a part cut or "shorn" off, an edge, and appears in M.Eng. as *schore*, from O. Eng. *sceran*, to cut, shear; in sense (2) it is of Scandinavian origin and is an adaptation of the Nor. *skora*, a piece of timber cut off to serve as a prop or support.

SHOREDITCH, an eastern metropolitan borough of London, England, bounded N.W. by Islington, N.E. by Hackney, E. by Bethnal Green and Stepney, S. by the City of London, and W. by Finsbury. Pop. (1901), 118,637. It is a poor and crowded district extending east and west of Kingsland Road, and has a large artisan population. Chain-making, cabinet work, and other industries are carried on. An old form of the name is *Soersditch*, and the origin is lost, though early tradition connects it with Jane Shore, mistress of Edward IV. The parliamentary borough of Shoreditch includes the Hoxton and Haggerston divisions, each returning one member. In Hoxton is the Shoreditch technical institute. The borough council consists of a mayor, 7 aldermen and 42 councillors. Area, 657·6 acres.

SHOREHAM, a seaport in the Lewes parliamentary division of Sussex, England, near the mouth of the river Adur, 6 m. W. of Brighton on the London, Brighton & South Coast railway. Pop. of urban district of New Shoreham (1901), 3837. The town is sometimes known as New Shoreham, in distinction from the village of Old Shoreham, a mile up the river, which was the former port. The church of St Mary the Virgin lacks almost the entire nave, but the remainder shows fine work ranging from Norman to Early English. Of no less interest is the church of St Nicholas, Old Shoreham, a cruciform Norman structure retaining some remarkable early woodwork. There are public gardens containing a museum and theatre. The trade of the small port is chiefly in coal, corn and timber. Shipbuilding is also carried on. The important public boys' school of St Nicholas, Lancing, near Shoreham, is part of a wide scheme which within Sussex includes the middle-class school at Hurstpierpoint, that for sons of tradesmen, &c., at St Saviour's, Ardingly, and the girls' school of St Michael's, Bognor. The scheme was originated by the Rev. N. Woodward in 1849.

It seems probable that soon after the Conquest the increasing prosperity of New Shoreham (Soresham, Sorham, Schorham) resulted in the decay of Old Shoreham, and that the borough grew up within the former. Shoreham owed its early importance to the natural harbour formed by the river Adur. In the time of the Confessor it was held by Azor of the king, but in 1066 was among the lands granted to William de Braose. From here Charles II. escaped to Fécamp after the battle of Worcester, 1651. It became a port of great consequence in the 13th and 14th centuries, but in the 15th and following centuries was much reduced, doubtless owing to the encroachment of the sea. The port revived during the reign of George III., when acts were passed for securing and improving the harbour. Shoreham was called a borough in 1236. In 1308 there was a mayor, and the "mayor and bailiffs of Shoreham" are mentioned in a Close Roll of 1346, but no charter of incorporation is known. The town adopted the Local Government Act of 1858 in 1866. It returned two members to parliament from 1295 until it was disfranchised in 1885. In the reign of Edward I., William de Braose held at Shoreham by prescriptive right weekly markets on Wednesdays and Saturdays, and a two-days' fair at the Exaltation of the Holy Cross. In 1792 the market-day was Saturday and a fair was held on the 25th of July, but these are not now held. Shipbuilding has always been the chief industry, and was largely carried on in the 13th and 14th centuries.

SHORING (from "shore," a prop), an operation connected with building. It is often necessary before actual building is begun to support adjoining premises while the work of excavating for underground apartments is being carried out. The art of shoring comprises the temporary support of buildings, and may become necessary because of the failure or settlement of some portion of the structure or for the purpose of upholding the upper portion while alterations are being made in the lower. There are several different forms of shoring, each adapted to suit peculiar circumstances. Much of the shoring for ordinary cases is done with heavy, roughly sawn timbers strongly braced together, but for especially heavy work steel members may be introduced and prove of great value. There is the trouble in connexion with their use, however, that connexions between steel members are not made with the same facility as between pieces of timber.

The form of shore in most general use is that known as the raking shore. It consists of one or more timbers sloping from the face of the structure to be supported and bedded upon the ground. As the ground is usually of a more or less yielding nature, a stout timber plate termed a sole-piece, of sufficient area to withstand being driven into the soil, is placed to receive the base of the raking timber or timbers. A wall-plate, with the object of increasing the area of support, is fixed to the face of the wall by means of hooks driven into the wall. Where space is available an angle of 60° is the best to adopt for the main shore, the auxiliary members ranging in their slope from 45° to 75°. In many cases, especially in towns, the angle of slope is governed by outside influences such as the width of the footway. Raking shores are erected in "systems" of two or more members placed in the same vertical plane at right angles to the face of the wall. The different members rise fanwise from the sole-plate to support the wall at different points. The distance horizontally between the systems depends on the condition of the building being propped up, and also upon the spacing of its window and other openings. The usual spacing is 10 ft. or 15 ft. apart, but this distance has often to be varied according to the positions of the openings in the wall. The application of the shores should be carefully made and support given only where there is a corresponding thrust inside, such as from a floor or roof, as without this the shore is liable to act more as a destructive agent than a supporting one, and cause the wall to cave in at that point, or placed against a parapet wall it might have the effect of pushing it over. The members, therefore, should be so placed as to meet the wall at a point somewhat below the floor or roof, so that if their length were continued they would meet and support the end of the floor or roof inside. Perhaps the best idea of the positions and functions of the various component parts of a system of raking shores can be obtained from a description of the various members, coupled with some little study of the illustrations (fig. 1). The names of the different timbers are therefore set out here, and against each part is given a short description of its use and position.

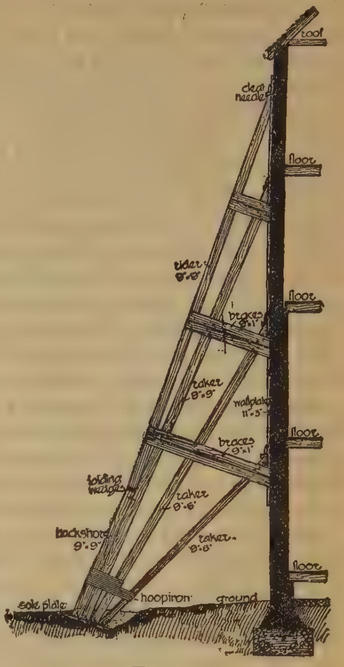


FIG. 1.

Raking Shore, or Raker.—This is a piece of timber sloping up from the sole-plate to the wall-piece. For a detail drawing of the connexion between the raker and wall-plate see fig. 2. The top and longest shore is often formed in two pieces, in which form it can be more conveniently handled. The upper piece is termed the *riding shore* or *rider*, and the lower member which supports it is known as the *back shore.* At the junction of the rider and back shore a pair of folding wedges is introduced and driven in to give the head of the rider a firm bearing against the needle and wall-plate above. The *sole-piece* has already been mentioned as the timber base upon which the shores take their bed or bearing. It usually consists of a piece of 11 by 3 plank, but when the ground is soft or the load supported very great it should be bedded on a platform of timber to spread the weight over a large area. The sole should be placed sloping down towards the building at something less than a right angle (say 80°) with the inside of the shore to enable the latter to be gradually levered to a firm bearing with the aid of a crowbar. Wedging should not be resorted to or the already shaky building may sustain further injury through the vibration. When in position the foot of the shore is fixed by dog-irons to the sole-piece, and for additional security a cleat is spiked on the sole tight up to the shore to prevent any slipping.

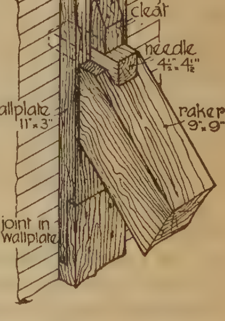


FIG. 2.

Braces.—When more than one shore takes a bearing upon the sole-piece the feet of the several members are stiffened and braced either by having rough boarding nailed right across them or by being bound together with a number of rounds of hoop-iron. For further strength also braces of 1-in. boards, 6 to 9 in. wide, are taken across from the wall-plate to the topmost shore and spiked to each intervening member, binding the whole together. These braces should be fixed a little below the junctions of the heads of the shores with the wall-plate. The *wall-plate* has already been referred to. It is usually a deal 9 in. wide by 3 in. thick, secured tightly against the face of the wall with wrought-iron wall hooks, forming a good abutment for the shores and serving to spread the support afforded by them. Holes are cut through this plate to receive the *needles* (or joggles as they are sometimes termed to distinguish them from the needles used in dead shoring, which are large horizontal members usually of balk timber), which are pieces of wood about 1 ft. long and 4 in. square in section, cut with a shoulder to butt against the wall-plate. A portion of a brick or stone is removed from the wall and the end of the needle is passed through the rectangular hole in the wall-plate and fitted into the recess in the wall.

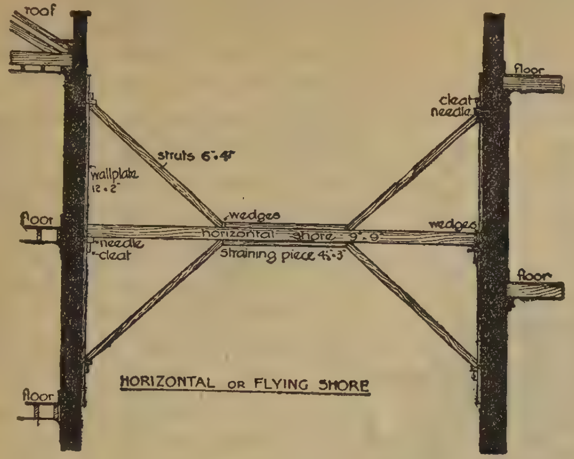

roof
floor
cleat
needle
struts 6"·4"
wallplate 12"·2"
floor
wedges
wedges
horizontal shore 9"·9"
needle
cleat
straining piece 4½"·3"
floor
floor
HORIZONTAL OR FLYING SHORE

FIG. 3.

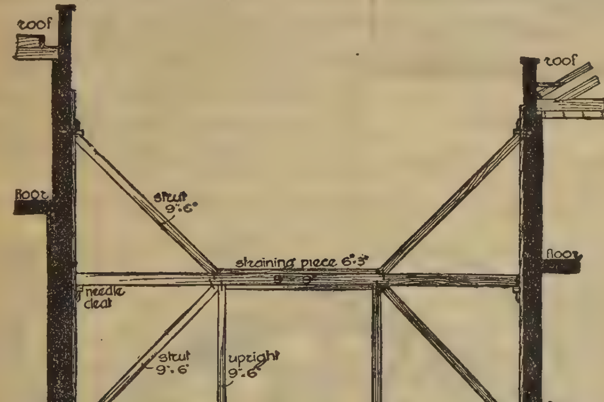

roof
roof
floor
strut 9"·6"
straining piece 6"·3"
9"·9"
floor
needle
cleat
strut 9"·6"
upright 9"·6"
floor
floor
horizontal shore 9"·9"
straining piece 6"·5"
wallplate 11"·3"
9"·6"
9"·6"
floor
floor
horizontal shore 9"·9"
9"·6"
9"·6"
floor
floor
horizontal shore 12"·9"
cleat
strut 9"·9"
A SYSTEM OF FLYING SHORES FOR HIGH BUILDINGS
floor
floor

FIG. 4.

The head of the needle projects about 4½ in. beyond the face of the wall-plate and forms an abutment for the head of the shore. The head of the shore is notched to fit the underside of the needle to prevent any movement sideways. If this is not done the shore is liable to be acted upon by the wind and be blown down. A small block of wood, cut somewhat after the fashion of a wedge and termed a *cleat*, is fixed above the needle to keep the latter quite firm. Cleats are used also in other positions to keep timbers in position. *Wedges* are used to obtain a tight bearing for the rider shores and are used at their base. As little force as possible must be employed in driving them as vibration is liable to injure the already weakened wall.

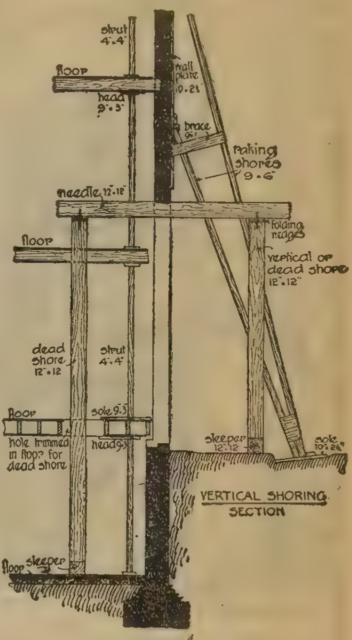
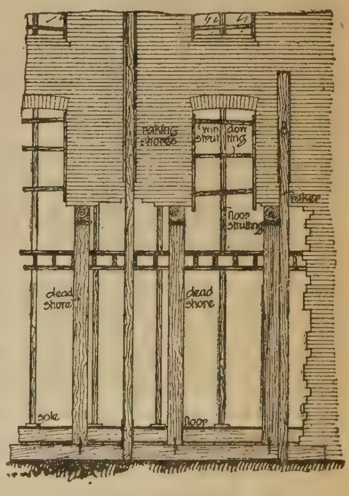

strut 4"·4"
floor
wall plate 10"·21"
head 9"·3"
brace 9"·1"
raking shores 9"·6"
needle 12"·18"
folding wedges
floor
vertical or dead shore 12"·12"
dead shore 12"·12
strut 4"·4"
floor
sole 9"·3"
hole trimmed in floor for dead shore
head 9"·3"
sleeper 12"·12
sole 10"·24"
VERTICAL SHORING SECTION
floor
sleeper

FIG. 5.

Horizontal shores, or *flying shores* as they are more often termed by the workman, may be employed for spans up to about 35 ft. They are used to support the party walls of the houses adjoining the premises being rebuilt. They are erected during the pulling down operations and removed as the new building is raised and there is no further need for them. A system of flying shores consists of one or more horizontal timbers, sometimes known as dog shores, cut in tightly between the wall-plates fixed with hooks to the faces of the walls of the adjoining buildings (fig. 3). These horizontal members are supported at each end by cleats and needles fixed in the wall-plate as described for raking shoring. The shores are supported in their length by inclined braces springing from needles fixed near the lower ends of the wall-plates and serving to strut the shore at a point about a third of its length from the wall. Corresponding braces are carried from the upper surface of the shore and abut against needles at the upper ends of the plates. Straining pieces are secured to the upper and lower faces of the shore to serve as abutments for the ends of the braces. The best angle for these braces is one of 45°, but a smaller inclination than this is frequently adopted. Wedges are inserted, usually at the end of the *flyer* so as to tighten this up between the wall-plates, and sometimes between the braces and the straining piece, and carefully driven to tighten up the whole and cause each timber to find a close bearing. If the adjoining premises are of considerable height and especially if it is proposed to undertake extensive excavations, the systems of flying shores may need to be somewhat complicated, each consisting of several horizontal members spaced from 10 to 13 ft. apart and well strutted one to another and to the wall-plate (fig. 4). In the application of this form of shoring, as in raking shores, the same rules apply as regards placing the shores on the face of the wall in a proper position to obtain a solid abutment on a floor or roof on the other side. The members should be securely dogged and spiked together to form a homogeneous framework capable of resisting the attacks of a strong wind, which in an exposed position will sometimes destroy a poorly constructed framework.

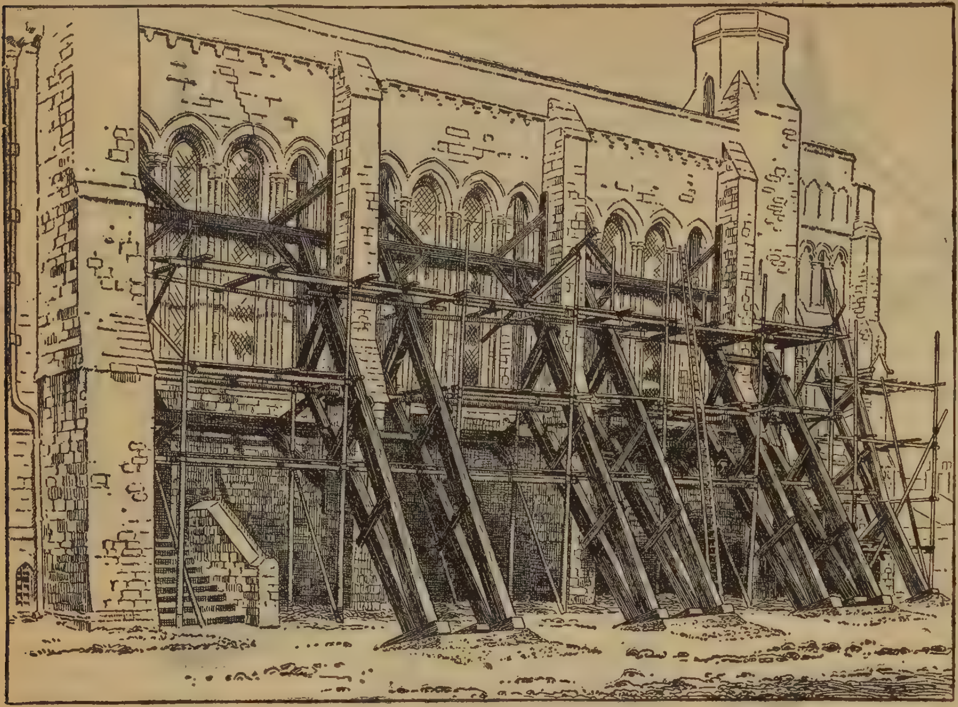

raking shores
window strutting
raker
floor strutting
dead shore
dead shore
sole
floor

VERTICAL SHORING
ELEVATION

FIG. 6.

Horizontal shores should be adopted wherever possible in preference to raking shores. Besides being more economical, they are more convenient and more effectual than rakers springing from the ground, especially if the height of the building is considerable and the span at the most not much over 30 ft. Apart from the economy effected, they present a direct resistance to the thrust and are well out of the way of any building operations that may be carried on below them, so that there is no risk of their being accidentally disturbed, whereas the feet of raking shores are generally in the way of the workmen, and if not disturbed by accidental blows from materials or carts will very likely be loosened and rendered useless by the digging and pumping which is going on around them.

Needle shoring is the next method of temporary support to come under consideration. It is known also as *vertical shoring* and *dead shoring*, and is the means usually adopted to support temporarily the upper portion of the walls of a building when it is found necessary to reconstruct the foundations or to make large openings in the lower parts of the wall, as, for example, when putting a shop front in an existing building. This form of shoring consists of horizontal members of balk timber termed *needles* (very different from the needles used in raking and flying shoring), which are passed through holes in the wall to be supported, at a sufficient height to allow of the insertion of any arch or lintels that may be necessary above the opening it is proposed to cut (figs. 5 and 6). The needles are supported at each end by an upright timber or *dead shore*, one on each side of the wall to each needle. These should not be allowed to rest upon any floor or vault but be carried down to a solid foundation and set upon and securely dogged to a timber sleeper running parallel to the wall. If it is not practicable to take the inner dead shore through intervening floors down to the solid ground in one piece, and it is necessary for its base to be set upon the floor or upon sleepers placed on the floor, the strutting must be continued in a direct line below it until a firm foundation is obtained. Between the needle and the head of the dead shores folding wedges are inserted to force the horizontal supporting balk firmly up to the underside of the masonry. Connexions between the dead shores and the needles and sleepers are made with wrought iron dogs. The spacing of the systems of dead shoring depends to a large extent upon the material with which the wall is constructed; for brickwork they should be placed at intervals not greater than 6 ft. With this form of shoring especially it is often found necessary to adopt other methods auxiliary to the main shoring. These take the form of raking or flying shores from the face of the building. All the openings in the wall above should be well strutted between their reveals to prevent any alteration of shape taking place. Inside the building vertical shores or strutting must be carried up independently in a direct line between the floors with head and sole plates at floor level and ceiling. This strutting must start from a firm foundation at the bottom of the building and be tightly wedged up so as to relieve the wall of any weight from the floors and roof. To obviate settlement as much as possible, work done in underpinning should be built slowly with Portland cement mortar mixed in strong proportions. Before the shoring is removed at least a week should elapse to allow the work to set hard and firm. Then the needles should be carefully loosened and removed and the holes from which they were withdrawn made good. The remainder of the props can then be "struck," leaving the raking or flying shores until the last. If possible this work should be spread over several days, an interval of a day or two being left between the removal of each portion of timbering to allow the work gradually to set on its new bearings.



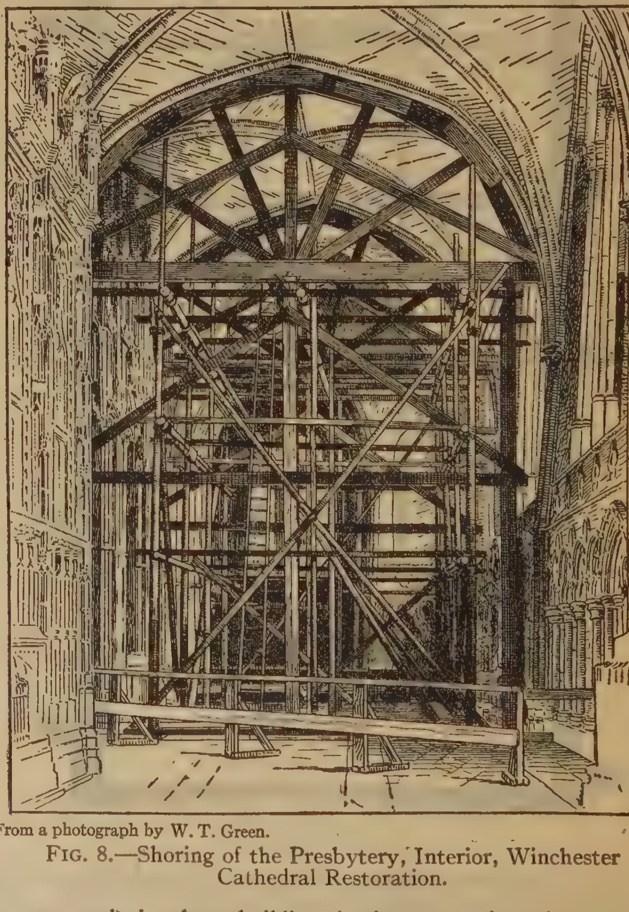
From a photograph by W. T. Green.

FIG. 7.—Shoring of the Presbytery, Exterior, Winchester Cathedral Restoration.

Shoring should be the subject of careful calculations to ascertain the most suitable sizes of timbers and to determine the most appropriate points of support. This is not always done, however, and much work of this character is carried out by rule of thumb methods. The usual result is that the timber used is of a much greater size than is really necessary, although as the material is not much injured and is available on removal for re-use this fact is not of great consequence. Such methods perhaps work very well for ordinary buildings, but in special cases they may very well lead to shoring being constructed in too fragile a manner, with serious results. Some rules which experience has shown to work satisfactorily for ordinary work are given below, together with the approximate scantlings of the timber required.

Rules and Sizes for Raking Shores.—Walls 15 ft. to 30 ft. high should have 2 shores to each system; if 30 ft. to 40 ft. in height, 3 shores each system; if 40 ft. or more in height, 4 shores, with an additional shore for each 10 ft. increase. Shoring is rarely seen more than 5 shores high. The angle of the main shores is usually about 60°, and none of the timbers should exceed an angle of 75°. Some of the lower shores will slope much less than this, at angles between 40° and 60°. The systems should not be placed at a greater distance apart than 15 ft. It is often found convenient to place them at the piers between window openings. As regards the sizes of the timbers used for walls 15 ft. to 20 ft. high, the shores may be 4 in. or 5 in. square in section; for walls 20 ft. to 30 ft. high, 6 in. by 6 in., or 9 in. by $4\frac{1}{2}$ in.; for walls 30 ft. to 35 ft. high, 12 in. by 6 in., or 8 in. by 8 in.; for walls 40 ft. to 50 ft. high, 9 in. by 9 in.; for walls above this height 12 in. by 9 in.

For Horizontal or Flying Shores.—For spans not exceeding 15 ft. the principal strut may be 6 in. by 4 in., with raking struts 4 in. by 4 in.; for spans exceeding 15 ft. but not exceeding 35 ft. the size of the principal strut should be from 6 in. to 9 in. square, and the raking struts from 6 in. by 4 in. to 9 in. by 6 in.



From a photograph by W. T. Green.

FIG. 8.—Shoring of the Presbytery, Interior, Winchester Cathedral Restoration.

Interesting examples of shoring on a large scale may frequently be seen applied to large buildings in the course of repair or restoration. The rebuilding of the foundations of the retro-choir and lady chapel of Winchester cathedral which was carried out in the autumn of 1906 necessitated the erection of a very elaborate and complicated arrangement of shoring to uphold the masonry while the work of underpinning the walls was being carried on. The foundations of the eastern portion of the cathedral were found to be dangerously insecure, being in fact laid upon a bed of soft marl only 10 ft. below the surface of the ground, in spite of the fact that at a depth of 16 ft. a hard solid stratum of gravel, at least 6 ft. thick, is arrived at. The medieval builders without doubt entertained suspicions as to the sustaining power of their proposed foundation, and so to ensure stability, as they thought, strengthened it by placing below the masonry horizontal layers of beech trees, filling up the interstices with hard chalk and flints. These contrivances were not sufficient to prevent the gradual sinking, through succeeding centuries, of the heavy mass of masonry. This not only affected the footings of the building, but caused fissures of an alarming nature in the vaulting and walls. Under the direction of Mr T. G. Jackson a carefully designed arrangement of shoring was applied, consisting of raking shores, flying shores and needling, for the purpose of the underpinning, with specially designed timbering to support the arches and vaulting while they were undergoing repair. The foundations were found to be much undermined by water, which filled the excavations made for the underpinning in such quantities that it was necessary to employ a diver to deposit cement concrete in bagfuls upon the gravel bed to which the new foundations are taken down. The illustration (fig. 7) will readily explain the external shoring above described, while fig. 8 shows the interior shoring of the presbytery.

AUTHORITIES.—The principal works of reference on this subject are: C. H. Stock, *Shoring and Underpinning*; T. Tredgold, *Elementary Principles of Carpentry*; J. Blagrove, *Shoring and its Application*. (J. Bt.)

SHORNCLIFFE, a military station in Kent, England, on high ground immediately north of Sandgate and 3 m. W. of Folkestone. It was first established in 1803, when Sir John Moore here trained the troops which afterwards formed the Light Division in the Peninsular War. Its position was chosen as a strategic position on the flank of the French invader who was expected at the time to descend upon the English coast.

SHORT, FRANCIS JOB (1857–), English engraver, was born at Stourbridge, Worcestershire, on the 19th of June 1857. He was educated to be a civil engineer, and was engaged on various works in the Midlands until 1881, when he came to London as assistant to Mr Baldwin Latham in connexion with the Parliamentary Inquiry into the pollution of the river Thames. He was elected an associate member of the Institute of Civil Engineers in 1883. Having worked at the Stourbridge School of Art in his early years he joined the National Art Training School, South Kensington, in 1883. He also worked at the life class under Professor Fred Brown at the Westminster School of Art, and for a short time at the Schools of the Royal Institute of Painters in Water-colours. His real life-work now became that of an original and translator engraver. He was a keen student of the works of J. M. W. Turner; and his etchings and mezzotints from Turner's *Liber Studiorum* (1885 seq.), wonderful examples of painstaking devotion and unrivalled skill, were among his earliest successes, showing the deepest sympathetic study of the originals combined with a full knowledge of the resources of engraving and unwearied patience. Short received the highest praise and constant advice and encouragement from Ruskin, and the co-operation of students of Turner such as Mr W. G. Rawlinson and the Rev. Stopford Brooke. After completing the series from the existing plates of Turner's *Liber* Short turned to the subjects which Turner and his assistants had left incomplete. Several fine plates resulted from this study, bearing the simple lettering "F. Short, Sculp., after J. M. W. Turner, R.A.," which told very little of the work expended on their production even before the copper was touched. Short also reproduced in fine mezzotints several of the pictures of G. F. Watts, "Orpheus and Eurydice," "Diana and Endymion," "Love and Death," "Hope," and the portrait of Lord Tennyson, all remarkable as faithful and imaginative renderings. His own fine quality as a water-colour painter made him also a sympathetic engraver of the landscapes of David Cox and Peter de Wint. His subtle drawing of the receding lines of the low banks and shallows of river estuaries and flat shores is seen to perfection in many of his original etchings, mezzotints, and aquatints, notably "Low Tide and the Evening Star" and "The Solway at Mid-day." Other plates that may be mentioned are:—"Gathering the Flock on Maxwell Bank," a soft-ground etching; "The Ferry over the Blyth," "Walberswick Pier," soft-ground; "Dutch Greengrocery," "Noon on the Zuider Zee," "Deventer," "Strolling Players at Lydd," "An April Day in Kent," and "Staithes," all etchings; "A Wintry Blast on the Stourbridge Canal," "Peveril's Castle," and "Niagara Falls," dry points; "The Curfew," "A Span of old Battersea Bridge," and "Sunrise on Whitby Scaur," aquatints; "Ebbtide, Putney Bridge," "The Weary Moon was in the Wane," "Solway Fishers," "The Lifting Cloud," and "A Slant of Light in Polperro Harbour," mezzotints. Short was elected A.R.A. in 1906 when the rank of associate-engraver was revived. As head of the Engraving School at the Royal College of Art, South Kensington, he had great influence on younger engravers. Short was elected to the Royal Society of Painter-Etchers and Engravers in 1885, and took a prominent part in conducting its affairs. In 1910 he succeeded Sir Seymour Haden as president. He received, amongst other distinctions, the gold medal for engraving at the Paris International Exhibition, 1889, and another gold medal (*Rappel*) 1900.

The Etched and Engraved Work of Frank Short, by Edward F. Strange (1908), describes 285 plates by the artist. (C. H.*)

SHORTHAND, a term applied to all systems of brief handwriting which are intended to enable a person to write legibly at the rate of speech. Synonyms in common use are stenography (from στενός, narrow or close), and tachygraphy (from ταχύς, swift), or occasionally brachygraphy (from βραχύς, short).

Greek and Roman Tachygraphy.—The question of the existence among the ancient Greeks of a system of true tachygraphy, that is, of a shorthand capable of keeping pace with human speech, has not yet been solved. From surviving records we know that there were, both in the 4th century B.C. and in the early centuries of the Christian era, as well as in the middle ages, systems in practice whereby words could be expressed in shortened form by signs or groups of signs occupying less space than the ordinary method of longhand writing. But such systems appear to have been systems of brachygraphy or stenography, that is, of shortened writing, which were not necessarily also systems of tachygraphy properly so called. If, however, as there is some reason to believe, the Roman system of tachygraphy, as exhibited in the Tironian notes (see below) was derived from a Greek system, it may fairly be inferred that the latter system was also a developed system of tachygraphy. But, be that as it may, no very early specimens of Greek shorthand have hitherto come to light; and the key to the decipherment of the stenographic inscriptions in the waxen book of the 3rd century in the British Museum (see below) still remains to be discovered. We are therefore in the dark whether we have in this MS. an example of true tachygraphic writing. Here it may be noticed that certain words of Diogenes Laertius have been taken to imply that Xenophon wrote shorthand notes (ὑποσημειωσάμενος) of the lectures of Socrates; yet a similar expression in another passage, which will not bear this meaning, renders it hardly possible that tachygraphy is referred to.

The surviving records of Greek shorthand are not very numerous, although they are scattered through a long period of time, beginning with the 4th century B.C. and extending to the 14th century. They have been arranged in three groups. At the head of the first group, which embraces all that has been found dating down to the 3rd century, is a remarkable inscription, unfortunately fragmentary, on a marble slab discovered on the Acropolis of Athens in 1884, which is attributed to the 4th century B.C.; and it is on this discovery that the actual claim of tachygraphy to have been practised among the ancient Greeks chiefly rests. The inscription describes a system, or rather part of a system, whereby certain vowels and consonants can be expressed by strokes placed in various positions. But here, too, it has been urged that we have the explanation of a system of brachygraphy only, and not one of tachygraphy. To the first group also belong a few specimens of shorthand writing on papyri of the 2nd and 3rd centuries, and, above all, the most important MS. of Greek stenographic symbols hitherto discovered. This is the waxen book already referred to (Brit. Mus., Add. MS. 33,270), consisting of seven wooden tablets coated with wax on both sides, and two covers thus coated on the inner sides, which seems to have been the exercise-book of a shorthand scholar who has covered its pages with symbols, which in places are repeated again and again as if for practice.

In these symbols we may have an actual system of tachygraphic shorthand, and not a mere syllabary; but unfortunately they have not yet been interpreted.

The second group of examples of Greek shorthand is confined to a few fragmentary papyri and waxen tablets ranging from the 4th to the 8th century, chiefly among the Rainer collection at Vienna, to which Professor Wessely has devoted much labour.

After this there is a long period unrepresented by any remains, until we come to the period of the third group, which stands quite apart from the preceding groups, being representative of the medieval Greek tachygraphy of the 10th century. First stands the Paris MS. of Hermogenes, with some tachygraphic writing of that period, of which Bernard de Montfaucon (*Pal. Gr.*, p. 351) gives some account, and accompanies his description with a table of forms which, as he tells us, he deciphered with incredible labour. Next, the Add. MS. 18231 in the British Museum contains some marginal notes in shorthand, of A.D. 972 (Wattenb., *Script. Graec. specim.*, tab. 19). But the largest amount of material is found in the Vatican MS. 1809, a volume in which as many as forty-seven pages are covered with tachygraphic writing of the 11th century. Cardinal Angelo Mai first published a specimen of it in his *Scriptorum veterum nova collectio*, vol. vi. (1832); and in his *Novae patrum bibliothecae tom. secundus* (1844) he gave a second, which, in the form of a marginal note, contained a fragment of the book of Enoch. But he did not quote the number of the MS., and it has only been identified in recent years. The tachygraphic portion of it has been made the subject of special study by Dr Gitlbauer for the Vienna Academy. It contains fragments of the works of St Maximus the Confessor, the confession of St Cyprian of Antioch, and works of the pseudo-Dionysius Areopagita. There are also certain MSS. written at Grottaferrata belonging to the group.

But here again this medieval shorthand is not a tachygraphic system in the true sense of the word, but a syllabic system having very little advantage over the ordinary system of contracted longhand in respect to rapidity of writing, excepting that the scribe could pack more of the text into a given space. The medieval system therefore cannot be regarded as a development of any ancient system of Greek tachygraphy, but rather as a stunted descendant or petrified fragment, as it has been called, of an earlier and better system. Other medieval varieties or phases of Greek shorthand have also been traced in the 14th and even in the 15th century.

Evidence of the employment of tachygraphy among the Romans is to be found in the writings of authors under the empire. It appears to have been taught in schools, and, among others, the emperor Titus is said to have been skilled in this manner of writing. According to Suetonius the first introduction of shorthand signs or *notae* was due to Ennius; but more generally Cicero's freedman M. Tullius Tiro is regarded as the author of these symbols, which commonly bear the title of *Notae Tironianae*. The Tironian notes belonged to a system which was actually tachygraphic; that is, each word was represented by a character, alphabetic in origin, but having an ideographic value. The notes, as we have them, have come down to us in a medieval dress, and are probably amplified from their shapes of early times with various diacritical additions which attached to them after the practice of the system had died out, and when the study of them had become an antiquarian pursuit, demanding a more exact formation of the symbols and their variants than was possible or necessary to a shorthand writer familiar with the system and writing at full speed. Such a system of shorthand, expressing words by comprehensive symbols or word-outlines, could be the only system possible for rapid reporting of human speech. But it seems that in instances where a symbol was not forthcoming to express an unusual word, such as a proper name, it was customary, at least in the written notes which have survived, to express it by a group of syllabic signs. A reporter, taking down a speech, could not have waited to express the unusual word or proper name by such a slow process; and no doubt in actual practice he would, in such an emergency, have invented on the spur of the moment some conventional sign which he would remember how to expand afterwards. But in the medieval inscriptions written in Tironian notes a syllabic system was made use of in such cases; and hence arose variations in different countries in the syllabic method of expressing words; an Italian system, a French system and a Spanish system having already been identified. Such a syllabic system is comparable with the "African" and "Italian" varieties of the medieval Greek shorthand system noticed above.

There are no ancient documents written in Tironian notes. But the tradition of their employment survived, especially in the chanceries of the Merovingian and Carolingian dynasties of the Frankish empire; and a limited use of them was made by the officials who controlled the royal diplomas. In Merovingian documents they generally accompany the subscription of the referendary, the earliest instance being in a diploma of Chlothar II. A.D. 625. From the reign of Thierry III. they become fairly frequent. They give brief indications referring to the composition of the deed, the name of the person moving for it, that of the official revising it, &c. Such uses may be regarded as safeguards against forgery. A more extensive employment of the notes prevailed under the Carolingian monarchs. Official MSS. were written in these characters as, for example, the formulary of the chancery of Louis the Pious. They appear in subscriptions, often attached to the *ruches* (see DIPLOMATIC). Sometimes they accompany the monogrammatic invocation at the beginning of a deed; sometimes they themselves contain the invocation or a pious formula. Such notes continued to appear in royal deeds down to the end of the 9th century; and so inveterate had their employment become in certain positions in the charters, that the scribes, after having forgotten their meaning, went on adding mere imitative signs. In the 10th century they appear in ecclesiastical and even private deeds, but in the latter class of documents their use was probably only suggested by vanity and pretension to learning on the part of the scribes. Even in the 11th century a few notes lingered on, their meaning fast dying out.

In general literature Tironian notes were adopted in the 9th and 10th centuries by the revisers and annotators of texts. Of this period also are several MSS. of the Psalter written in these characters, which it has been suggested were drawn up for practice at a time when a fresh impulse had been given to the employment of shorthand in the service of literature. The existence also of volumes containing lexicons or collections of Tironian notes, of the same period, points to a temporary revival of interest in these symbols of Roman tachygraphy. But such revival was short-lived; early in the 11th century it had expired.

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In the 10th century all practical acquaintance with the shorthand systems of Greece and Rome faded completely away, and not till the beginning of the 17th can the art be said to have revived. But even during that interval systems of writing seem to have been practised which for speed approximated to modern shorthand.[1]

Shorthand in English-speaking Countries.—England was the birthplace of modern shorthand. The first impulse to its cultivation may possibly be traced to the Reformation. When the principles of that movement were being promulgated from the pulpit, a desire to preserve the discourses of the preacher naturally suggested the idea of accelerated writing. It is certainly striking that in the early systems so many brief arbitrary signs are provided to denote phrases common in the New Testament and Protestant theology. In the early systems of Dr Timothy Bright[2] and Peter Bales[3] almost every word is provided with an arbitrary sign. Dr Bright (*c.* 1551–1615) was a doctor of medicine who afterwards entered the church. His *Characterie. An Arte of*

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[1] For instances, see Zeibig's *Geschichte u. Lit. der Geschwindschreibekunst* (Dresden, 1878), pp. 67-79. For John of Tilbury's system (*c.* 1175), see especially *Shorthand*, No. 5, and *Hermes*, viii. p. 303.

[2] The Bodleian Library contains the only known copy of Bright's book. For a description of the system, see *Phonetic Journal* (1884), p. 86; *Circulars of Information of the Bureau of Education* (Washington, 1884), No. 2, p. 8; and *Notes and Queries*, 2nd ser., vol. ii. p. 394. *A* is represented by a straight line, the other letters of the alphabet by a straight line with a hook, circle, or tick added at the beginning. Each alphabetic sign placed in various positions, and having some additional mark at the end, was used to indicate arbitrarily chosen words beginning with *a*, *b*, *c*, *d*, &c. There were four slopes given to each letter and twelve ways of varying the base, so that forty-eight words could be written under each letter of the alphabet if necessary. Thus the sign for *b* with different terminal marks and written in four different directions signified a number of words commencing with *b*; 537 such signs had to be learned by heart. By adding certain external marks these signs were applied to other words: thus by writing a dot in one of two positions with respect to a sign the latter was made to represent either a synonym or a word of opposite meaning. Under *air* are given as synonyms *breath, exhalation, mist, reek, steam, vapour.*

[3] Bales's method was to group the words in dozens, each dozen headed by a Roman letter, with certain commas, periods, and other marks to be placed about each letter in their appropriate situations, so as to distinguish the words from each other.

Shorte, Swifte and Secrete Writing by Character (1588), which set forth a system of writing by character or shorthand, was dedicated to Queen Elizabeth, who rewarded the author with a Yorkshire living, and granted to him the sole right for fifteen years of teaching and printing books "in or by Character not before this tyme commonlye knowne and vsed by anye other oure subjects" (Patent Roll, 30, Eliz. part 12). Peter Bales (1547?–1610) promised his pupils that "you may also learn to write as fast as a man speaketh, by the arte of Brachigraphie by him devised, writing but one letter for a word"; his "Arte of Brachigraphie" is contained in his *Writing Schoolemaster* (1590). Only with a gigantic memory and by unremitting labour could one acquire a practical knowledge of such methods.

John Willis.

The first shorthand system worthy of the name which, so far as is known, appeared in England is that of John Willis (d. *c.* 1627), whose *Art of Stenographie* (London, 14 editions[1] from 1602 to 1647) is substantially based on the common alphabet; but the clumsiness of his alphabetic signs, and the confused laborious contrivances by which he denotes prefixes and terminations, involving the continual lifting of the pen, would seem to render his method almost as slow as longhand. Of the numerous systems which intervened between J. Willis's and Isaac Pitman's phonography (1837) nearly all were based, like Willis's, on the alphabet, and may be called, a, b, c systems. But seven were, like phonography, strictly phonetic, viz. those by Tiffin (1750), Lyle (1762), Holdsworth and Aldridge (1766), Roe (1802), Phineas Bailey (1819), Towndrow (1831) and De Stains (1839).

A, b, c systems.

A few general remarks apply largely to all the a, b, c systems. Each letter is designated by a straight line or curve (vertical, horizontal, or sloping), sometimes with the addition of a hook or loop. *C* and *q* are rejected, *k* being substituted for hard *c* and *q*, *s* for soft *c*. Signs are provided for *ch*, *sh*, *th*. *G* and *j* are classed under one sign, because in some words *g* is pronounced as *j*, as in *giant*, *gem*. Similarly each of the pairs *f*, *v* and *s*, *z* has only one sign. A few authors make the signs for *j*, *v*, *z* heavier than those for *g*, *f*, *s*. Some class *p* and *b*, *t* and *d*, each under one sign. The stenographic alphabet is therefore—*a*, *b*, *d*, *e*, *f* (*v*), *g* (*j*), *h*, *i*, *k*, *l*, *m*, *n*, *o*, *p*, *r*, *s* (*z*), *t*, *u*, *w*, *x*, *y*, *ch*, *sh*, *th*. Letters which are not sounded may be omitted. *Gh*, *ph* may be counted as *f* in such words as *cough*, *Philip*; but the *th* in *thing* is never distinguished from the *th* in *them*. Thus the a, b, c systems are largely phonetic with respect to consonant-sounds; it is rather with regard to the vowels that they disregard the phonetic principle. No attempt is made to provide adequately for the many vowel-sounds of the language. Thus the signs for *like* and *lick*, for *rate* and *rat*, &c., are the same. In the case of vowel-sounds denoted by two letters, that vowel is to be written which best represents the sound. Thus in *meat* the *e* is selected, but in *great* the *a*. In some a, b, c systems, including the best of them (Taylor's), a dot placed anywhere does duty for all the vowels. This practice is, of course, a fruitful source of error, for *pauper*, and *paper*, *gas* and *goose*, and hundreds of other pairs of words would according to this plan be written alike. In the early systems of Willis and his imitators the vowels are mostly written either by joined characters or by lifting the pen and writing the next consonant in a certain position with respect to the preceding one. Both these plans are bad; for lifting the pen involves expenditure of time, and vowels expressed by joined signs and not by marks external to the word cannot be omitted, as is often necessary in swift writing, without changing the general appearance of the word and forcing the eye and the hand to accustom themselves to two sets of outlines, vocalized and unvocalized. In the better a,b,c systems the alphabetic signs, besides combining to denote words, may also stand alone to designate certain short common words, prefixes and suffixes. Thus in Harding's edition of Taylor's system the sign for *d*, when written alone, denotes *do*, *did*, the prefixes *de-*, *des-*, and the terminations *-dom*, *-end*, *-ened*, *-ed*. This is a good practice if the words are well chosen and precautions taken to avoid ambiguities. Numbers of symbolical signs and rough word-pictures, and even wholly arbitrary marks, are employed to denote words and entire phrases. Symbolical or pictorial signs, if sufficiently suggestive and not very numerous, may be effective; but the use of "arbitraries" is objectionable because they are so difficult to remember. In many shorthand books the student is recommended to form additional ones for himself, and so of course make his writing illegible to others. The *raison d'être* of such signs is not far to seek. The proper shorthand signs for many common words were so clumsy or ambiguous that this method was resorted to in order to provide them with clearer and easier outlines. For the purpose of verbatim reporting the student is recommended to omit as a rule all vowels, and decipher his writing with the aid of the context. But, when vowels are omitted, hundreds of pairs of words having the same consonant skeleton (such as *minister* and *monastery*, *frontier* and *furniture*, *libel* and *label*) are written exactly alike. This is one of the gravest defects of the a, b, c systems.

John Willis's system was largely imitated but hardly improved by Edmond Willis (1618), T. Shelton (1620), Witt (1630), Dix (1633), Mawd (1635), and Theophilus Metcalfe (1635). T. Shelton's system, republished a great many times down to 1687, was the one which Samuel Pepys used in writing his diary.[2] It was adapted to German, Dutch and Latin.[3] An advertisement of Shelton's work in the *Mercurius Politicus* of 3rd October 1650 is one of the earliest business advertisements known. The book of Psalms in metre (206 pages, $2\frac{3}{8}\times1\frac{1}{2}$ in.) was engraved according to Shelton's system by Thomas Cross. Metcalfe's *Radio-Stenography*, or *Short-Writing*, was republished again and again for about a hundred years. The 35th "edition" is dated 1693, and a 55th is known to exist. The inefficiency of the early systems seems to have brought the art into some contempt. Thus Thomas Heywood, a contemporary of Shakespeare, says in a prologue[4] that his play of *Queen Elizabeth*

> "Did throng the seats, the boxes and the stage
> So much that some by stenography drew
> A plot, put it in print, scarce one word true."

Shakespeare critics would in this manner explain the badness of the text in the earliest editions of *Hamlet*, *Romeo and Juliet*, *Taming of the Shrew*, *Merry Wives of Windsor*, and *Henry V.* Perhaps a study of J. Willis's system and of E. Willis's (which, though not published till after Shakespeare's death, was practised long before) may shed light on corrupt readings of the text of these plays.[5] Rich's system (1646, 20th edition 1792) was reproduced with slight alterations by many other persons, including W. Addy, Stringer, and Dr Philip Doddridge (1799 and three times since). The New Testament and Psalms were engraved in Rich's characters (1659, 596 pages, $2\frac{1}{2}\times1\frac{1}{2}$ in., 2 vols.), and Addy brought out the whole Bible engraved in shorthand[6] (London, 1687, 396 pp.). Locke, in his *Treatise on Education*, recommends Rich's system; but it is encumbered with more than 300 symbolical and arbitrary signs. In 1847 it was still used by Mr Plowman, a most accomplished Oxford reporter.

Rich.

Mason.

In 1672 William Mason, the best shorthand author of the 17th century, published his *Pen pluck'd from an Eagle's Wing*. The alphabet was largely taken from Rich's. But in his *Art's Advancement* (1682) only six of Rich's letters are retained, and in his *Plume Volante* (1707) further changes are made. Initial vowels are written by their alphabetic signs, final vowels by dots in certain positions (*a*, *e* at the beginning; *i*, *y* at the middle; *o*, *u* at the end), and medial vowels by lifting the pen and writing the next consonant in those same three positions with respect to the preceding one. Mason employed 423 symbols and arbitraries. He was the first to discover the value of a small circle for *s* in addition to its proper alphabetic sign. Mason's system was republished by Thomas Gurney in 1740, a circumstance which has perpetuated its use to the present day, for in 1737 Gurney was appointed shorthand writer to the Old Bailey, and early in the 19th century W. B. Gurney was appointed shorthand-writer to both Houses of Parliament. Gurney reduced Mason's arbitraries to about a hundred, inventing a few specially suitable for parliamentary reporting. The Gurneys were excellent writers of a cumbrous system. Thomas Gurney's *Brachygraphy* passed through at least eighteen editions.

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[1] The first edition, published anonymously, is entitled *The Art of Stenographie, teaching by plaine and certaine rules, to the capacitie of the meanest, and for the use of all professions, the way to Compendious writing. Whereunto is annexed a very easie Direction for Steganographie, or Secret Writing*, printed at London in 1602 for Cuthbert Burbie. The only known copies are in the Bodleian and British Museum libraries.

[2] See a paper by J. E. Bailey, "On the Cipher of Pepys' Diary," in *Papers of the Manchester Literary Club*, vol. ii. (1876). Shelton (1601–1650) is not to be confounded with the translator of *Don Quixote*.

[3] See Zeibig's *Gesch. u. Lit. d. Geschwindschreibekunst*, p. 195.

[4] *Pleasant Dialogues and Drammas* (London, 1637), p. 249.

[5] See M. Levy's *Shakspere and Shorthand* (London), and *Phonetic Journal* (1885), p. 34.

[6] This curiosity is described in the *Phonetic Journal* (1885), pp. 158, 196. The Bodleian Library has a copy.

Byrom.

In 1767 was published at Manchester a work by John Byrom, sometime fellow of Trinity College, Cambridge, entitled *The Universal English Shorthand*, distinguished for its precision, elegance, and systematic construction. Byrom had died in 1763. Having lost his fellowship by failing to take orders, he made a living by teaching shorthand in London and Manchester, and among his pupils were Horace Walpole, Lord Conway, Charles Wesley, Lord Chesterfield, the duke of Devonshire and Lord Camden. Shorthand, it is said, procured him admission to the Royal Society. He founded a stenographic club, to the proceedings of which his journal,[1] written in shorthand, is largely devoted. In the strangers' gallery of the House of Commons in 1728 Byrom dared to write shorthand from Sir R. Walpole and others. In 1731, when called upon to give evidence before a parliamentary committee, he took shorthand notes, and, complaints being made, he said that if those attacks on the liberties of shorthand men went on he "must have a petition from all counties where our disciples dwell, and Manchester must lead the way." Thomas Molyneux popularized the system by publishing seven cheap editions between 1793 and 1825. Modifications of Byrom's system were issued by Palmer (1774), Nightingale (1811), Adams (1814), Longmans (1816), Gawtress (1819), Kelly (1820), Jones (1832) and Roffe (1833). Byrom's method received the distinction of a special act of parliament for its protection (15 Geo. II. c. 23, for twenty-one years from 24th June 1742). To secure lineality in the writing and facility in consonantal joinings he provided two forms for *b*, *h*, *j*, *w*, *x*, *sh*, *th*, and three for *l*. *A*, *e*, *i*, *o*, *u*, he represented by a dot in five positions with respect to a consonant. Practically it is impossible to observe more than three (beginning, middle and end). With all its merits, the system lacks rapidity, the continual recurrence of the loop seriously retarding the pen.

Taylor.

In 1786 was published *An Essay intended to establish a Standard for a Universal System of Stenography*, by Samuel Taylor (London).[2] This system did more than any of its predecessors to establish the art in England and abroad. Equal to Byrom's in brevity, it is simpler in construction. No letter has more than one sign, except *w*, which has two. Considering that five vowel places about a consonant were too many, Taylor went to the other extreme and expressed all the vowels alike by a dot placed in any position. He directs that vowels are not to be expressed except when they sound strong at the beginning and end of a word. Arbitraries he discarded altogether; but Harding, who re-edited his system in 1823, introduced a few. Each letter when standing alone represents two or three common short words, prefixes and suffixes. But the list was badly chosen: thus *m* represents *my* and *many*, both of them adjectives, and therefore liable to be confounded in many sentences. To denote *in* and *on* by the same sign is evidently absurd. Taylor's system was republished again and again. In Harding's edition (1823) the vowels are written on an improved plan, the dot in three positions representing *a*, *e*, *i*, and a tick in two positions *o*, *u*. Several other persons brought out Taylor's system, in particular G. Odell, whose book was re-edited or reprinted not less than sixty-four times, the later republications appearing at New York. The excellence of Taylor's method was recognized on the Continent: the system came into use in France, Italy, Holland, Sweden, Germany, Portugal, Rumania, Hungary, &c.

Mavor.

The *Universal Stenography* of William Mavor (1780) is a very neat system, and differs from Taylor's in the alphabet and in a more definite method of marking the vowels. *A*, *e*, *i*, are indicated by commas, *o*, *u*, *y*, by dots, in three places with respect to a letter, namely beginning, middle and end. Other systems were introduced by J. H. Lewis (1812) and Moat (1833).

The vast mass of a, b, c systems are strikingly devoid of originality, and are mostly imitations of the few that have been mentioned. Nearly all may be briefly described as consisting of an alphabet, a list of common words, prefixes and suffixes, expressed by single letters, a list of arbitrary and symbolical signs, a table showing the best way of joining any two letters, a few general rules for writing and a specimen plate.[3]

Pitman's phonography.

Pitman's phonography, on account of its enormous diffusion in Great Britain and the colonies, and in America, its highly organized and original construction, and its many inherent advantages, merits a more extended notice than has been given to the systems already mentioned. In 1837 Mr (afterwards Sir) Isaac Pitman (*q.v.*) composed a short stenographic treatise of his own, which Samuel Bagster published under the title of *Stenographic Sound-Hand*. The price was fixed at fourpence, for the author had determined to place shorthand within the reach of everybody. In 1840 a second edition appeared in the form of a penny plate bearing the title *Phonography*, the principal feature of the system being that it was constructed on a purely phonetic basis. In December 1841 the first number of what is now known as *Pitman's Journal* appeared at Manchester in a lithographed form. It was then called the *Phonographic Journal*, and subsequently in turn the *Phonotypic Journal*, the *Phonetic News* and the *Phonetic Journal*. Pitman's system was warmly taken up in America, where it was republished in more or less altered forms, especially by the author's brother Benn Pitman, and by Messrs A. J. Graham, J. E. Munson, E. Longley, and Eliza B. Burns. A large number of periodicals lithographed in phonography are published in England and America. The *Shorthand Magazine*, monthly, was started in 1864. Of standard English books printed or lithographed in phonography may be mentioned, besides the Bible, New Testament, and Prayer Book, *The Pilgrim's Progress*, *The Vicar of Wakefield*, *Pickwick Papers*, *Tom Brown's School-Days*, Macaulay's *Essays* and *Biographies*, *Gulliver's Travels*, Blackie's *Self-culture*, Bacon's *Essays*, and a long list of tales and selections. Numerous societies have been formed in all English-speaking countries for the dissemination of phonography, the largest being the Phonetic Society. Phonography has been adapted to several foreign languages, but not so successfully as Gabelsberger's German system. T. A. Reed's *French Phonography* (1882) was intended only for English phonographers who wish to report French speeches. Other adaptations to French were by A. J. Lawson and J. R. Bruce. A society for the adaptation of phonography to Italian was organized at Rome in 1883 by G. Francini, who published his results (Rome, 1883, 1886). Phonography was adapted to Spanish by Parody (Buenos Aires, 1864), to Welsh by R. H. Morgan (Wrexham, 1876), and to German by C. L. Driesslein (Chicago, 1884).

The main features of Pitman's system must now be described. The alphabet of consonant-sounds is—*p*, *b*; *t*, *d*; *ch* (as in *chip*), *j*; *k*, *g* (as in *gay*); *f*, *v*; *th* (as in *thing*), *th* (as in *them*); *s*, *z*; *sh*,

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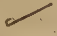
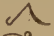
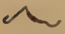
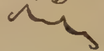
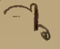
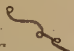
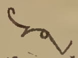
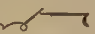
[1] Byrom's private journal and literary remains have been published by the Chetham Society of Manchester. See, too, a paper by J. E. Bailey in the *Phonetic Journal* (1875), pp. 109, 121.

[2] Taylor, it was only lately discovered, died in 1811; see M. Levy in *The Times* (April 10, 1902), and *Notes and Queries* (May 24, 1902).

[3] For early English systems, see especially some careful papers by Mr A. Paterson in *Phonetic Journal* (1886).

zh (as in *vision*); *m, n, ng* (as in *thing*); *l, r*; *w, y, h.* The sounds *p, t, ch, k* are represented respectively by the four straight strokes; and the corresponding voiced sounds *b, d, j, g* by exactly the same signs respectively written heavy. *F, th* (as in *thing*), *s, sh* are indicated by respectively; the same signs written heavy and tapering to the ends are used for *v, dh, z, zh* respectively. *M, n, l, r* are denoted by respectively. *R* is also represented by written upwards and in a more slanting direction than the sign for *ch*. The signs for *sh* and *l* may be written up or down when in combination, but standing alone *sh* is written downwards and *l* upwards. The signs for *w, y, h* are, all written upwards. *H* has also down. *Ng, mp* (or *mb*), *rch* (or *rj*), *lr*, are represented by the signs for *n, m, r, l* respectively written heavy. Signs are provided for the Scotch guttural *ch* (as in *loch*), the Welsh *ll*, and the French nasal *n*. *S* is generally written by a small circle. The long-vowel sounds are thus classified—*ā* (as in *balm*), *ē* (as in *bait*), *ee* (as in *feet*), *aw* (as in *law*), *ō* (as in *coal*), *ōō* (as in *boot*). The vowels *ā, ē, ee* are marked by a heavy dot placed respectively at the beginning, middle, and end of a consonant-sign; *aw, ō, ōō* by a heavy dash in the same three positions, and generally struck at right angles to the direction of the consonant. The short vowels are *ă* (as in *pat*), *ĕ* (as in *pet*), *ĭ* (as in *pit*), *ŏ* (as in *pot*), *ŭ* (as in *but*), and *ŏŏ* (as in *put*). The signs for these are the same as for the corresponding long vowels just enumerated, except that they are written light. Signs similarly placed are provided for the diphthongs *oi* (as in *boil*), *ōă* or *ōĕ*, *ōĭ* (as in *Boanerges, poet, coincide*), for the series *yā, yē, yee*, &c., and for the series *wā, wē, wee*, &c. The signs for *ei* (as in *bite*) and *ou* (as in *cow*) are ∨ ∧, and may be placed in any position with respect to a consonant. A straight line may receive four hooks, one at each side of the beginning and end, but a curve only two, one at each end in the direction of the curve. Hooks applied to a straight line indicate the addition of *r, l, n*, and *f* or *v* respectively, thus *pr, pl, pf* or *pv*, and *pn*; *kr, kl, kf, kn*; *rf* or *rv, rn*. Hooks applied to a curve denote the addition of *r, n* respectively, thus *fr, fn*; *mr, mn*. Vowel-signs placed after (or, in the case of horizontal strokes, under) a consonant having the *n* or *f, v* hook are read between the consonant and the *n* or *f*; thus *cough, fun*, but *crow, pray*. A large hook at the commencement of a curve signifies the addition of *l*, as *fl*. The hooks combine easily with the circle *s*, thus *sp spr* (where the hook *r* is implied or included in the circle), *spl, pns* (the hook *n* being included), *pfs*, &c. The halving principle is one of the happiest devices in the whole history of shorthand. The halving of a light stroke—that is, writing it half length—implies the addition of *t*; the halving of a heavy stroke that of *d*, the vowel placed after (or under) the halved stroke being read between the consonant and the added *t* or *d*, thus *thaw, thought, Dee, deed, pit, cat, fat, note*, &c. By this means very brief signs are provided for hosts of syllables ending in *t* and *d*, and for a number of verbal forms ending in *ed*, thus *ended*. The halving of a heavy stroke may, if necessary, add *t*, and that of a light stroke *d*, thus *beautified*. By combining the hook, the circle, and the halving principle, two or three together, exceedingly brief signs are obtained for a number of consonantal series consisting of the combination of a consonant with one or more of the sounds *s, r, l, n, f, t*, thus *sp, spr, sprt, sprts*; *pl, spl, splt, splnt, splnts*; *fn, fns, fnt, fnts*; *frn, frnd*, &c. As a vowel-mark cannot conveniently be placed to a hook or circle, we are easily led to a way of distinguishing in outline between such words as *cough* and *coffee*, *pen* and *penny*, *race* and *racy*, &c. This distinction limits the number of possible readings of an unvocalized outline. A large hook at the end of a stroke indicates the addition of *-shon* (as in *fashion, action*, &c.). This hook easily combines with the circle *s*, as in *actions, positions*. The circle *s* made large indicates *ss* or *sz*, as in *pieces, losses*. The vowel between *s* and *s* (*z*) may be marked inside the circle, as in *exercise, subsistence*. The circle *s* lengthened to a loop signifies *st*, as in *step, post*, while a longer loop indicates *str*, as in *muster, minster*. The loop may be continued through the consonantal stroke and terminate in a circle to denote *sts* and *strs*, as in *boasts, minsters*. The loop written on the left or lower side of a straight stroke implies the *n* hook and so signifies *nst*, as in *against, danced*. A curve (or a straight stroke with a final hook) written double length implies the addition of *tr, dr*, or *thr*, as in *father, letter, kinder, fender, render*. This practice is quite safe in the case of curves, but a straight stroke should not be lengthened in this way when there is danger of reading it as a double letter. The lineal consonant-signs may stand alone to represent certain short and common words as in many of the old, a, b, c systems, with this difference, that in the old systems each letter represents several words, but in phonography, in almost every case, only one. By writing the horizontal strokes in two positions with respect to the line (above and on) and the others in three positions (entirely above, resting on and passing through the line) the number is nearly trebled, and very brief signs are obtained for some seventy or eighty common short words (e.g. *be, by, in, if, at, it, my, me*, &c.). A few very common monosyllables are represented by their vowel-marks, as *the*, remnant of; *of*, remnant of; *on*, remnant of. A certain number of longer words which occur frequently are contracted, generally by omitting the latter part, sometimes a middle part of the word, as in (*ksp*) *expect*, (*djr*) *danger*, (*krk sk*) *characteristic*, (*nd f t*) *indefatigable*. The connective phrase *of the* is intimated by writing the words between which it occurs near to each other. *The* is often expressed by a short slanting stroke or tick joined to the preceding word and generally struck downwards, thus *in the, for the*.

Three principles which remain to be noticed are of such importance and advantage that any one of them would go far to place phonography at the head of all other systems. These are the principles of positional writing, similar outlines and phraseography. (1) The first slanting stroke of a word can generally be written so as either to lie entirely above the line, or rest on the line, or run through the line, thus. In the case of words composed wholly of horizontal strokes the last two positions (on and through the line) coincide, as. These three positions are called first, second and third respectively. The first is specially connected with first-place vowels (*ā, ă; aw, ŏ; ī; oi*), the second with second-place vowels (*ē, ĕ; ō, ŭ*), and the third with third-place vowels (*ee, ĭ; ōō, ŏŏ; ou*). In a fully vocalized style position is not employed, but in the reporting style it is of the greatest use. Thus the outline (*tm*) written above the line must be read either *time* or *Tom*; when written resting on the line *tome* or *tame*; when struck through the line *teem, team* or *tomb*. By this method the number of possible readings of an unvocalized outline is greatly reduced. That word in each positional group which occurs the most frequently need not be vocalized, but the others should. In the case of dissyllables it is the accented vowel which decides the position; thus *methoúght* should be written first position, *méthod* second position. (2) Another way of distinguishing between words having the same consonants but different vowels to vary the outline. The possibility of variety of outline arises from the fact that many consonant sounds have duplicate or even triplicate signs, as we have seen. For instance, *r* has two lineal signs and a hook sign, and so each of the words *carter, curator, creature* and *creator* obtains a distinct outline. A few simple rules direct the student to a proper choice of outline, but some difference of practice obtains among phonographers in this respect. Lists of outlines for words having the same consonants are given in the instruction books; the *Reporter's Assistant* contains the outline of every word written with not more than three strokes, and the *Phonographic Dictionary* gives the vocalized outline of every word in the language. Aided by a true phonetic representation of sounds, by occasional vocalization, variety of outline, and the context, the phonographic verbatim reporter should never misread a word.[1] (3) Lastly, phraseography. It has been found that in numberless cases two or more words may be written without lifting the pen. A judicious use of this practice promotes legibility, and the saving of time is very considerable. Words written thus should be closely connected in sense and awkward joinings avoided. Such phrases are *I am*, *I have*, *you are*, *you may*, *it would*, *it would not*,  *we are*,  *we have*,  *we have not*,  *we have never been*,  *my dear friends*,  *as far as possible*,  *for the most part*, and many thousands of others. For the sake of obtaining a good phraseogram for a common phrase, it is often advisable to omit some part of the consonant outline. Thus the phrase *you must recollect that* may very well be written  (*you must recollect that*). Lists of recommended phraseograms are given in the *Phonographic Phrase Book*, the *Legal Phrase Book* and the *Railway Phrase Book*.

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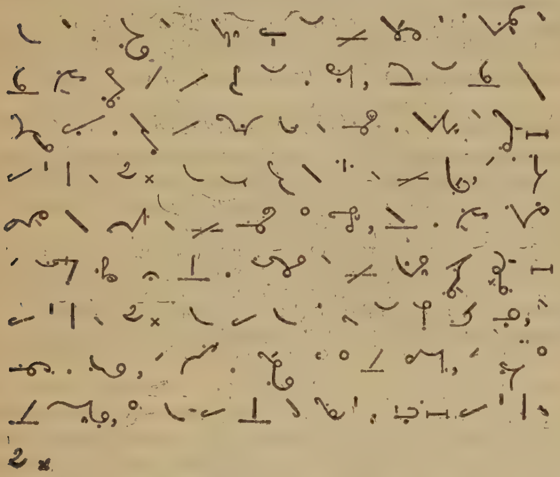
[1] Phonography is so legible that the experiment of handing the shorthand notes to phonographic compositors has often been tried with complete success. A speech of Richard Cobden, on the Corn Laws, delivered at Bath on 17th September 1845, and occupying an hour and a quarter, was reported almost verbatim, and the notes, with a few vowels filled in, handed to the compositors of the *Bath Journal*, who set them up with the usual accuracy. A notice of the occurrence appeared the next day in the *Bath Journal*, and was immediately transferred to the columns of *The Times* and other newspapers. Mr Reed tried the same experiment with equal success, the notes being handed to the compositors in their original state (*Phonetic Journal*, 1884, p. 337).

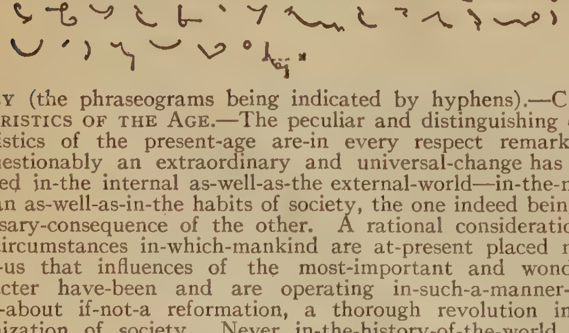
Specimens of Phonography.

Corresponding Style.



Key.—If all the feelings of a patriot glow in our bosoms on a perusal of those eloquent speeches which are delivered in the senate, or in those public assemblies where the people are frequently convened to exercise the birthright of Britons—we owe it to shorthand. If new fervour be added to our devotion, and an additional stimulus be imparted to our exertions as Christians, by the eloquent appeals and encouraging statements made at the anniversaries of our various religious societies—we owe it to shorthand. If we have an opportunity in interesting judicial cases, of examining the evidence, and learning the proceedings with as much certainty, and nearly as much minuteness, as if we had been present on the occasion—we owe it to shorthand.

Reporting Style.



Key (the phraseograms being indicated by hyphens).—Characteristics of the Age.—The peculiar and distinguishing characteristics of the present-age are-in every respect remarkable. Unquestionably an extraordinary and universal-change has commenced in-the internal as-well-as-the external-world—in-the-mind-of-man as-well-as-in-the habits of society, the one indeed being-the necessary-consequence of the other. A rational consideration of the circumstances in-which-mankind are at-present placed must-show-us that influences of the most-important and wonderful character have-been and are operating in-such-a-manner-as-to bring-about if-not-a reformation, a thorough revolution in-the-organization of society. Never in-the-history-of-the-world have benevolent and philanthropic institutions for-the relief of domestic and public affliction; societies for-the promotion of manufacturing, commercial and agricultural interests; associations for-the instruction of the masses, the advancement of literature and science, the development of-true political-principles, for-the extension in-short of-every description of knowledge and-the-bringing-about of-every kind-of reform,—been-so numerous, so efficient and so indefatigable in-their operation as at-the-present-day.

An enumeration made in 1894 showed that 95% of British newspaper reporters used Pitman's system; but there are still numerous varieties preferred by individuals. Of the systems published since the invention of phonography the principal are A. M. Bell's *Stenophonography* (Edinburgh, 1852), Professor J. D. Everett's (London, 1877), Pocknell's *Legible Shorthand* (London, 1881), and J. M. Sloan's adaptation (the Sloan-Duployan) of the French system of Duployé (1882). More recent essays in English shorthand are almost entirely in the direction of script characters with connected vowels, as contrasted with the geometric forms and disjoined vowels of Pitman's phonography. The majority are founded on the French system of the brothers Duployé, but *Cursive Shorthand* (Cambridge, 1889), by Prof. H. L. Callendar, and *Current Shorthand* (Oxford, 1892), by Dr Henry Sweet, may be noted as original methods, the first having a phonetic, and the second both an orthographic and a phonetic, basis.

Recent history.

The distinctive features in recent shorthand history have been the widely-extended employment of the art, the increased attention paid to instruction and the growth of stenographic societies. Throughout the civilized world the systems employed are those of the leading authors of the 19th century; earlier systems have now a numerically small number of practitioners. Shorthand has become an almost indispensable qualification for the amanuensis, and practical stenographic ability is a necessary equipment of the typewriter operator. In professional and commercial offices, and more recently in the services, dictation to shorthand writers has become general. Shorthand has been included among examination subjects for the army, navy, civil service and medicine in the United Kingdom, and to a certain extent in other countries. Its inclusion in the Technical Instruction Act of 1889 was the first recognition of shorthand by the British parliament, and it was subsequently comprised in the codes of elementary day and evening continuation schools. It first became an examination subject for secondary schools in the Oxford Local Examination in 1888, but the Society of Arts has examined students of polytechnics, &c., in shorthand since 1876. Examinations in connexion with the phonographic system of Isaac Pitman date from 1845.

In 1887 the tercentenary of the origination of modern shorthand by Timothy Bright and the jubilee of Isaac Pitman's phonography were celebrated by the holding of the first International Shorthand Congress in London. Subsequent congresses were held at Paris (1889), Munich (1890), when a statue of Gabelsberger was unveiled; Berlin (1891), Chicago (1893), Stockholm (1897), Paris (1900), &c. These gatherings have promoted the improved organization of stenographic practitioners in the respective countries. After the first congress, three national organizations were established in Great Britain by Pitman writers, which take the place of the Phonetic Society (established in 1843 and dissolved in 1895). In America the formation of national associations for reporters and teachers followed the fifth congress.

As regards speed in shorthand writing, it may be mentioned that at the exhibition at Olympia (London) in 1908, the "World's Shorthand Championship" was awarded for 220 words a minute for five minutes. But it has been claimed that a rate of 250 words a minute has been accomplished. It may be pointed out, however, that such a rate cannot be wanted for any practical purpose, since the fastest public speaker never speaks anything like 250 words a minute, even though for a demonstration such a thing could be done. The average rate of public speaking is from 120 to 150 words a minute.

Foreign Shorthand Systems.

To complete the history of the subject, the following notes on systems introduced in various European countries may be useful.

German.—C. A. Ramsay's *Tacheographia* (Frankfort, 1679, and several times afterwards until 1743) was an adaptation of T. Shelton's English system. Mosengeil (1797) first practically introduced shorthand writing into Germany in an adaptation of the Taylor-Bertin method. Reischl's (1808) is a modification of Mosengeil's. On Horstig's (1797) are based those of an anonymous writer (Nuremberg, 1798), Heim (1820), Thon (1825), an anonymous author (Tübingen, 1830), Nowack (1830), Ineichen (1831), an anonymous author (Munich, 1831) and Binder (1855). Mosengeil published a second system (1819) in which Horstig's alphabet is used. On the Mosengeil-Horstig system are based Berthold's (1819) and Stärk's (1822). On Danzer's (1800), a close imitation of Taylor's, is based that of Ellison *v.* Nidlef (1820). Other systems are those of Leichtlen (1819); J. Brede (1827); Nowack (1834), a system in which the ellipse is employed as well as the circle; Billharz (1838); Cämmerer (1848), a modification of Selwyn's phonography (1847); Schmitt (1850); Fischbäck (1857), a reproduction of Taylor's; and that of an anonymous author (1872), based on Horstig, Mosengeil and Heim. Nowack, in his later method of 1834, makes a new departure in avoiding right or obtuse angles, and in endeavouring to approximate to ordinary writing. This system Gabelsberger considered to be the best which had appeared down to that date. F. X. Gabelsberger's (1789–1849) *Anleitung zur deutschen Redezeichenkunst* (Munich, 1834) is the most important of the German systems. The author, an official attached to the Bavarian ministry, commenced his system for private purposes, but was induced to perfect it on account of the summoning of a parliament for Bavaria in 1819. Submitted to public examination in 1829, it was pronounced satisfactory, the report stating that pupils taught on this system executed their trial specimens with the required speed, and read what they had written, and even what others had written, with ease and certainty. The method is based on modifications of geometrical forms, designed to suit the position of the hand in ordinary writing. The author considered that a system composed of simple geometrical strokes forming determinate angles with each other was unadapted to rapid writing. He does not recognize all the varieties of sound, and makes some distinctions which are merely orthographical. Soft sounds have small, light and round signs, while the hard sounds have large, heavy and straight signs. The signs too are derived from the current alphabet, so that one can find the former contained in the latter. Vowels standing between consonants are not literally inserted, but symbolically indicated by either position or shape of the surrounding consonants, without, however, leaving the straight writing line. On Gabelsberger's system is based that of W. Stolze (1840). Faulmann (Vienna, 1875) attempted in his *Phonographie* to combine the two methods. While Gabelsberger's system remained unchanged in principle, Stolze's split into two divisions, the old and the new. These contain many smaller factions, *e.g.* Velten's (1876) and Adler's (1877). Arends's (1860) is copied from the French system of Fayet. Roller's (1874) and Lehmann's (1875) are offshoots of Leopold Arends's (1817–1882). Many other methods have appeared and as rapidly been forgotten. The schools of Gabelsberger and Stolze can boast of a very extensive shorthand literature. Gabelsberger's system was adapted to English by A. Geiger (Dresden, 1860 and 1873), who adhered too closely to the German original, and more successfully by H. Richter (London, 1886), and Stolze's by G. Michaelis (Berlin, 1863).

French.—The earliest French system worthy of notice is that of Coulon de Thévenot (1777), in which the vowels are disjoined from the consonants. Later may be divided into two classes, those derived from Taylor's English system, translated in 1791 by T. P. Bertin, and those invented in France. The latter are (*a*) Coulon de Thévenot's; (*b*) systems founded on the principle of the inclination of the usual writing—the best known being those of Fayet (1832) and Sénocq (1842); and (*c*) systems derived from the method of Conen de Prépéan (5 editions from 1813 to 1833). Prévost, who till 1870 directed the stenographic service of the senate, produced the best modification of Taylor. Many authors have copied and spoilt this system of Prévost. The best known are Plantier (1844) and Tondeur (1849). On Conen's are based those of Aimé-Paris (1822), Cadrès-Marmet (1828), Potel (1842), the Duployé brothers (1868), Guénin, &c. Among amateur writers the Duployan method is best known.

Spanish.—The father of Spanish stenography was Don Francisco de Paula Marti, whose system was first published in 1803. The alphabet is a combination of Taylor's and Coulon's. By decree of November 21, 1802, a public professorship of shorthand was founded in Madrid, Marti being the first professor. Founded on Marti's system are those of Serra y Ginesta (1816) and Xamarillo (1811). Many Spanish systems are merely imitations or reproductions of Marti's, and adaptations of Gabelsberger's, Stolze's and Pitman's systems. That of Garriga y Maril (1863) has attained some popularity in Spain.

Italian.—Italian translations and adaptations of Taylor's system succeeded one another in considerable numbers from Amanti (1809) to Bianchini (1871). Delpino's (1819) is the best. The Gabelsberger-Noe system (1863) has gained many followers.

Dutch.—J. Reijner's Dutch method (1673) was an adaptation of Shelton's, and Bussuijt's (1814) of Conen's system. Sommerhausen and Bossaert (1829) received prizes from the government for their productions. Cornelis Steger (1867) translated Taylor's work. Gabelsberger's system was transferred to Dutch by Rietstap (1869), and Stolze's by Reinbold (1881).

Adaptations of Gabelsberger's method have also come into use in other countries.

Indian.—Mirza Habib Hosain, at the Mahommedan Educational Conference of 1905 in India, introduced a system of Urdu and Hindi shorthand, called "Habib's Samia," for which he was awarded a gold medal. The Pitman system has also been adapted for some Indian languages.

AUTHORITIES.—J. W. Zeibig's *Geschichte u. Literatur der Geschwindschreibekunst* (Dresden, 1878) contains a historical sketch of the use of shorthand in ancient and modern times (especially in Germany), a full bibliography of shorthand literature in all languages, a number of lithographed specimens, and a useful index. *Circulars of Information of the Bureau of Education*, No. 2, 1884 (Washington, 1885), by J. E. Rockwell, contains a very complete and accurate bibliography of English and American shorthand publications, a chronological list of 483 English and American shorthand authors, notices on shorthand in the United States, on the employment of stenographers in the American courts, on American shorthand societies and magazines, and a beautifully engraved sheet of 112 shorthand alphabets. Isaac Pitman's *History of Shorthand* (reprinted in the *Phonetic Journal* of 1884) reviews the principal English systems previous to phonography, and a few foreign ones. The author draws largely on J. H. Lewis's *Historical Account of the Rise and Progress of Stenography* (London, 1816). Other histories of shorthand are by F. X. Gabelsberger (prefixed to his *Anleitung zur deutschen Redezeichenkunst*, Munich, 1834), A. Fossé (prefixed to his *Cours théorique et pratique de sténographie*, Paris, 1849), Scott de Martinville (Paris, 1849), M. Levy (London, 1862) and T. Anderson (London, 1882). Here too should be mentioned J. Heger's *Bemerkenswerthes über die Stenographie* (Vienna, 1841), mainly historical; J. Anders's *Entwurf einer allgemeinen Gesch. u. Lit. d. Stenographie* (Coeslin, 1855); R. Fischer's *Die Stenographie nach Geschichte, Wesen, u. Bedeutung* (Leipzig, 1860); Krieg's *Katechismus der Stenographie* (Leipzig, 1876); Dr Westby-Gibson's *Early Shorthand Systems* (London, 1882); T. Anderson's *Shorthand Systems*, with a number of specimens (London, 1884); T. A. Reed's *Reporter's Guide* (London, 1885), and *Leaves from the Notebook of T. A. Reed* (London, 1885). Mr C. Walford's *Statistical Review of the Literature of Shorthand* (London, 1885) contains valuable information on the circulation of shorthand books and on shorthand libraries. Among later publications dealing fully with the history and practice of shorthand are the *Transactions* of the London Congress in 1887, and similar publications in connexion with later congresses; *Bibliography of Shorthand*, by J. Westby-Gibson, LL.D. (London, 1887), treating of English, colonial and American authors; *Shorthand Instruction and Practice*, by J. E. Rockwell, of the United States Bureau of Education (Washington, 1893), dealing with shorthand work throughout the world; and *Examen critique des sténographies françaises et étrangères*, by Dr Thierry-Mieg (Versailles, 1900).

SHORTHOUSE, JOSEPH HENRY (1834–1903), English novelist, was born in Great Charles Street, Birmingham, on the 9th of September 1834. He was the eldest son of Joseph Shorthouse, chemical manufacturer, and Mary Ann, daughter of John Hawker, of the same town. He was educated at Grove House, Tottenham, where he proved a promising and industrious pupil, and upon leaving school entered his father's business, in which he was all his life actively engaged. He married, in 1857, Sarah, daughter of John Scott, of Birmingham. His literary interest was fostered by a local essay club, to which he contributed many papers. It was not until he was nearly fifty years old that Shorthouse made his public appearance as an author, and even then his remarkable story, *John Inglesant*, had undergone vicissitudes. It was kept for over three years in MS., and the author eventually printed one hundred copies for private circulation. One of these found its way into the hands of Mrs Humphry Ward, who recommended it to Messrs Macmillan. Its first appearance was a quiet one; but Gladstone was at once struck by its quality, and made its reputation by his praise. It became the most discussed book of the day, and its author was suddenly famous. Besides *John Inglesant* (1881), Shorthouse published *The Little Schoolmaster Mark* (1883), *Sir Percival* (1886), *The Countess Eve* and *A Teacher of the Violin* (1888), and *Blanche, Lady Falaise* (1891); but none of these has been so popular as his first novel. He will always remain known to fame as "the author of *John Inglesant.*" Shorthouse was originally a Quaker, but the appeal of the Anglican Church was insistent with him, and he was baptized into its body before the appearance of his story. Something of his own stress of religious transition appears in the character of his hero, who is pictured as living in the time of the Civil War, a pupil of the Jesuits, a philosopher and a Platonist, who is yet true to the National Church. The story, which is deeply mystical and imaginative, has for its central idea the dangers of bigotry and superstition, and the necessity of intuitive religion to progress and culture. It is a work full of opulent colour and crowded life, no less than of philosophy and spiritual beauty. Shorthouse's work was always marked by high earnestness of purpose, a luxuriant style and a genuinely spiritual quality. He lacked dramatic faculty and the workmanlike conduct of narrative, but he had almost every other quality of the born novelist. He died at Edgbaston on the 4th of March 1903.

See *The Life, Letters and Literary Remains of J. Henry Shorthouse*, edited by his wife (2 vols., 1905).

SHOSHONG, a town in the British protectorate of Bechuanaland, formerly the chief settlement of the eastern Bamangwato. It is about 200 m. N.N.E. of Mafeking and 30 m. N. of Shoshong Road Station on the Cape Town-Bulawayo railway. The town is situated 3000 ft. above the sea in the valley of the Shoshong, an intermittent tributary of the Limpopo. The site was originally chosen as the headquarters of the Bamangwato as being easily defensible against the Matabele. At the time of the declaration of a British protectorate in 1885 Shoshong had 20,000 to 30,000 inhabitants, including about twenty Europeans. Being the meeting place of trade routes from south and north it was of considerable importance to early explorers and traders in South-Central Africa, and a mission station of the London Missionary Society (preceded for many years by a station of the Hermannsburg Lutheran Missionary Society) was founded here in 1862. Owing, however, to the scarcity of water at Shoshong, Khama, the chief of the Bamangwato, and most of his followers removed about 1890 to Palapye—50 m. N.E. of Shoshong—and later to Serowe to the north-west of Palapye. Like Shoshong, these places are built in valleys of tributaries of the Limpopo. Shoshong was not entirely deserted and has a population of about 800 (see BECHUANALAND).

SHOTTS, a mining and manufacturing parish of Lanarkshire, Scotland. It comprises eight villages, parts of two others, and the town of Cleland (including Omoa) and is served by the North British and Caledonian railways. Pop. (1891) 11,957; (1901) 15,562. The parish contains large ironworks, tile, fire-clay and brick-works, and quarries, and includes the Lanark district asylum and a fever hospital. The curious name of Omoa is supposed to have been given to his property by some soldier or sailor who had settled here after the wars in Honduras, of which Omoa is a seaport. Matthew Baillie (1761–1823), famous for his researches in morbid anatomy, and Janet Hamilton (1795–1873), the poetess, were born in the parish of Shotts.

SHOULDER (in O.E. *sculder*, cognate with Ger. *Schulter*, Dutch *schouder*, Swed. *skuldra*, &c; the root is unknown), the name of that part of the body of man and animals where the upper arm or fore-leg articulates with the collar bone and shoulder-blade (see JOINTS).

SHOVEL, SIR CLOUDESLEY [or CLOWDISLEY SHOVELL as he seems to have spelt the name himself] (*c.* 1650–1707), English admiral, was baptised at Cockthorpe in Norfolk on the 25th of November 1650, and went to sea under the care of his kinsman Sir Christopher Mynns. He set himself to study navigation, and, owing to his able seamanship and brave and open-hearted disposition, became a general favourite and obtained quick promotion. In 1674 he served as lieutenant under Sir John Narborough in the Mediterranean, where he burned four men-of-war under the castles and walls of Tripoli, belonging to the pirates of that place. He was present as captain of the "Edgar" (70) at the first fight at Bantry Bay, and shortly afterwards was knighted. In 1690 he convoyed William III. across St George's Channel to Ireland; the same year he was made rear-admiral of the blue, and was present at the battle of Beachy Head on 10th July. In 1692 he was appointed rear-admiral of the red, and joined Admiral Russell, under whom he greatly distinguished himself at La Hogue, by being the first to break through the enemy's line. Not long after, when Admiral Russell was superseded, Shovel was put in joint command of the fleet with Admiral Killigrew and Sir Ralph Delaval. In 1702 he brought home the spoils of the French and Spanish fleets from Vigo, after their capture by Sir George Rooke, and in 1704 he served under Sir George Rooke in the Mediterranean and co-operated in the taking of Gibraltar. In January 1704 he was named rear-admiral of England, and shortly afterwards commander-in-chief of the British fleets. He co-operated with the earl of Peterborough in the capture of Barcelona in 1705, and commanded the naval part of the unsuccessful attempt on Toulon in October 1707. When returning with the fleet to England his ship, the "Association," at eight o'clock at night on the 22nd of October, struck on the rocks near Scilly, and was seen by those on board the "St George" to go down in three or four minutes' time, not a soul being saved of 800 men that were on board. The body of Sir Cloudesley Shovel was cast ashore next day, and was buried in Westminster Abbey. It is said that he was alive when he reached the shore at Porthellick Cove, but was murdered by a woman for the sake of his rings.

See *Life and Glorious Actions of Sir Cloudesley Shovel* (1707); Burnet's *Own Times*; various discussions in *Notes and Queries*, 5th series, vols. x. and xi.; and T. H. Cooke, *Shipwreck of Sir Cloudesley Shovel* (1883).

SHOVEL (O.E. *scofl*, from root of *scufan*, to shove, push, cf. Ger. *Schaufel*, also *Schüppe*, scoop), an implement or tool, consisting of a broad flat blade with edges or sides turned up fixed to a wooden handle terminating in a bow like a spade. It is used for lifting or removing such loose substances as coal, gravel and the like.

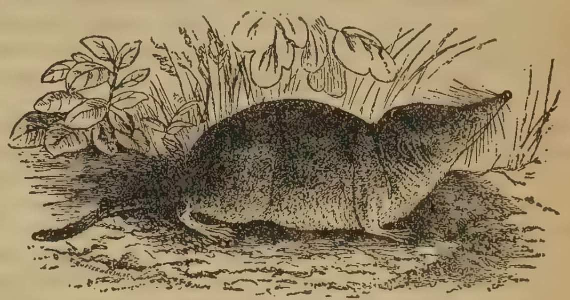
SHOVELER, formerly spelt SHOVELAR, and more anciently SHOVELARD, a word by which used to be meant the bird now almost invariably called Spoonbill (*q.v.*), but in the latter half of the 16th century transferred to one hitherto generally, and in these days locally, known as the Spoon-billed Duck—the *Anas clypeata* of Linnaeus and *Rhynchaspis* or *Spatula clypeata* of modern writers. All these names refer to the shape of the bird's bill, which, combined with the remarkably long *lamellae* that beset both maxilla and mandible, has been thought sufficient to remove the species from the Linnaean genus *Anas*. Except for the extraordinary formation of this feature, which carries with it a clumsy look, the male Shoveler would pass for one of the most beautiful of this generally beautiful group of birds. As it is, for bright and variegated colouring, there are few of his kindred to whom he is inferior. His golden eye, his dark green head, surmounting a breast of pure white and succeeded by underparts and flanks of rich bay, are conspicuous; while his deep brown back, white scapulas, lesser wing-coverts (often miscalled shoulders) of a glaucous blue, and glossy green speculum bordered with white present a wonderful contrast of the richest tints, heightened again by his bright orange feet. On the other hand, the female, excepting the blue wing-coverts she has in common with her mate, is habited very like the ordinary Wild-Duck, *A. boscas*. The Shoveler is not an abundant species, and in Great Britain its distribution is local; but its numbers have remarkably increased since the passing of the Wild-Fowl Protection Act in 1876, so that in certain districts it has regained its old position as an indigenous member of the Fauna. It has not ordinarily a very high northern range, but inhabits the greater part of Europe, Asia and America, passing southwards, like most of the *Anatidae* towards winter, constantly reaching India, Ceylon, Abyssinia, the Antilles and Central America, while it is known to have occurred at that season in Colombia, and, according to Gould, in Australia. Generally resembling in its habits the other freshwater ducks, the Shoveler has one peculiarity that has been rarely, if ever, mentioned, and one that is perhaps correlated with the structure of its bill. It seems to be especially given to feeding on the surface of the water immediately above the spot where diving ducks (*Fuligulinae*) are employing themselves beneath. On such occasions a pair of Shovelers may be watched, almost for the hour together, swimming in a circle, about a yard in diameter, their heads turned inwards towards its centre, their bills immersed vertically in the water, and engaged in sifting, by means of the long *lamellae* before mentioned, the floating matters that are disturbed by their submerged allies and rise to the top. These gyrations are executed with the greatest ease, each Shoveler of the pair merely using the outer leg to impel it on its circular course.

Four other species of the genus *Spatula*, all possessing the characteristic light blue "shoulders," have been described: one, *S. platalea*, from the southern parts of South America, having the head, neck and upper back of a pale reddish brown, freckled or closely spotted with dark brown, and a dull bay breast with interrupted bars; a second, *S. capensis*, from South Africa, much lighter in colour than the female of *S. clypeata*; a third and a fourth, *S. rhynchotis* and *S. variegata*, from Australia and New Zealand respectively—these last much darker in general coloration, and the males possessing a white crescentic mark between the bill and the eye, very like that which is found in the South-American Blue-winged Teal (*Querquedula cyanoptera*), but so much resembling each other that their specific distinctness has been disputed by good authority. (A. N.)

SHREVEPORT, a city and the capital of Caddo Parish, Louisiana, U.S.A., on the Red river, in the N.W. part of the state, near the Texas border. Pop. (1890) 11,979; (1900) 16,013, of whom 8532 were negroes; (1910, census) 28,015. It is the second city of the state in population. It is served by the Vicksburg, Shreveport & Pacific, the Houston & Shreveport, the Kansas City Southern, the St Louis & South-Western, the Louisiana Railway & Navigation Company, the Texas & Pacific (main line and two branches), the Louisiana & Arkansas, the Kansas City Southern, and the Missouri, Kansas & Texas railways and by boats on the Red river. In the city are the State Charity Hospital (1872), the T. E. Schumpert Memorial Hospital (1910), the Genevieve Orphanage (1899) and the Shreveport Training School (1908). Owing to its situation and excellent transportation facilities the city has a large trade. The surrounding country is a rich agricultural region, mainly devoted to the production of cotton, for which Shreveport is the principal shipping point. Live-stock and cattle products are trade items of importance. The situation of the city (about 170 m. east of Dallas, and somewhat farther from Little Rock, Houston, and New Orleans) makes it a natural centre of wholesale trade of varied character, and the development since 1906 of the important Caddo oil and gas fields north of the city has added greatly to its industrial prominence. The city contains planing mills, cotton gins, compresses and cotton-seed oil mills, machine and railway shops, and ice and molasses factories. In 1905 its factory product was valued at $2,921,923 (87·8% more than in 1900). Shreveport was settled about 1835, incorporated as a town in 1839, and chartered as a city in 1871. It was named in honour of Henry Miller Shreve (1785–1854), a native of New Jersey, who in 1815 ascended the Mississippi and the Ohio rivers to Louisville in the "Enterprise," the first steam vessel to make this trip, introduced improvements in the steamboat, and in 1826–1841 had charge of the improvement of western rivers, removing during this period the great Red river raft. After the capture of Baton Rouge, the state capital, and New Orleans by the Unionists in 1862, Shreveport was occupied by the Confederate officials of the state. In the spring of 1863 and again in that of 1864 it was the objective of combined naval and land expeditions made by the Union forces up the Red river under command of Admiral David D. Porter and General N. P. Banks, the Confederate commander in Louisiana being General Richard Taylor, with General E. Kirby Smith in charge of the entire trans-Mississippi department. In 1863 Shreveport was not seriously threatened. In 1864 when the Federals were within two marches of the city they were worsted by Taylor at Mansfield (on the 8th of April); on the next day the Confederates in their turn met with a demoralizing repulse at Pleasant Hill.

SHREW,[1] a term applied to the species of the family *Soricidae* of the mammalian order insectivora (*q.v.*), but in the British Isles to the common and lesser shrews (*Sorex araneus* and *S. minimus*).

The common shrew, or, properly, shrew-mouse, which in England is by far the commoner of the two, is a small animal about the size of a mouse, which it somewhat resembles in the shape of its body, tail and feet. But here the resemblance ends, for, unlike the mouse, it possesses a long and slender muzzle, with prominent nostrils, which project far beyond the lower lip; the small eyes are almost concealed by the fur; the ears are wide, short and provided internally with a pair of deep folds, capable when laid forwards of closing the entrance; the tail, which is slightly shorter than the body, is quadrangular in section and clothed more or less densely with moderately long hairs, terminating in a short tuft, but in old individuals almost naked; the feet are five-toed, the toes terminating in slender, pointed claws. The dentition is very peculiar and characteristic: there are in all thirty-two teeth, tipped with deep crimson; of which twelve belong to the lower jaw; of the remaining twenty ten occupy each side of the upper jaw, and of these the first three are incisors. The first incisor is large, with a long anterior canine-like cusp and a small posterior one; then follow two small single-cusped teeth; which are succeeded by three similar progressively smaller teeth, the first being a canine and the other two premolars; the next, a premolar, is large and multicuspid, and this is followed by three molars, of which the third is small with a triangular crown. In the lower jaw there are anteriorly three teeth corresponding to the seven anterior teeth above, of which the first is almost horizontal in direction, with its upper surface marked by three notches, which receive the points of the three upper front teeth; then follow two small teeth and three molars. The body is clothed with closely set fur, soft and dense, varying in colour from light reddish to dark brown above; the under surface of both body and tail being greyish; the basal four-fifths of all the hairs above and beneath are dark bluish grey. On each side of the body, about one-third of the distance between the elbow and the knee, is a gland covered by two rows of coarse inbent hairs, which secretes a fluid with an unpleasant cheesy odour, and which is protective, rendering the creature secure against the attacks of predaceous animals.



The Common Shrew (*Sorex araneus*).

The lesser or pigmy shrew (*S. minutus*) is not so abundant in England and Scotland, but common in Ireland, where the other species is unknown. It appears at first sight to be a diminutive variant of that species, which it closely resembles in external form, but the third upper incisor is shorter, or not longer than the next following tooth, whereas in *S. araneus* it is longer, and the length of the forearm and foot is less in the former species than in the latter.

Both these shrews live in the neighbourhood of woods, making their nests under the roots of trees or in any slight depression, occasionally even in the midst of open fields, inhabiting the disused burrows of field-mice. Owing to their small size, dark colour, rapid movements and nocturnal habits, they easily escape observation. They seek their food, which consists of insects, grubs, worms and slugs, under dead leaves, fallen trees and in grassy places. They are pugnacious, and if two or more are confined together in a limited space they invariably fight fiercely, the fallen becoming the food of the victorious. They are also exceedingly voracious, and soon die if deprived of food; and it is probably to insufficiency of food in the early dry autumnal season that the mortality among them at that time is due. The breeding-season extends from the end of April to the beginning of August, and five to seven, more rarely ten, young may be found in the nests; they are naked, blind and toothless at birth, but soon run about snapping at everything within reach.

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[1] This word, whence comes the participial adjective "shrewd," astute, originally meant malicious, and, as applied to a woman, still means a vexatious scold. From their supposed venomous character it was applied to the Soricidae.

The alpine shrew (*S. alpinus*), restricted to the alpine region of Central Europe, is slightly longer than the common shrew and differs in its longer tail, which exceeds the length of the head and body, in the colour of the fur, which is dark on both surfaces, and in the large size of the upper antepenultimate premolar.

The water-shrew (*Neomys fodiens*), the third species inhabiting England, differs from the common shrew in being larger with a shorter and broader muzzle, smaller eyes and larger feet adapted for swimming—the sides of the feet and toes being provided with comb-like fringes of stiff hairs. The tail is longer than the body, and has a fringe of moderately long regularly ranged hairs, which extend along the middle of the under surface from the end of the basal third to the extremity. The fur is long and dense, varying in colour in different individuals; the prevailing shades are dark, almost black, brown above, beneath more or less bright ashy tinged with yellowish; but occasionally we find individuals with the under surface dark-coloured. In the number and shape of the teeth the water-shrew differs from the common shrew: there is a premolar less on each side above; the bases of the teeth are more prolonged posteriorly; and their cusps are less stained brown, so that in old individuals they often appear white. This species is aquatic in habits, swimming and diving with agility. It frequents rivers and lakes, making burrows in the banks, from which when disturbed it escapes into the water. Its food consists of water insects and their larvae, small crustaceans and probably the fry of small fishes. It is generally distributed throughout England, is less common in Scotland and not recorded in Ireland.

The geographical range of the common shrew is wide, extending eastwards through Europe and Asia to Amurland. The lesser shrew extends through Europe and Asia to Sakhalin Island; and specimens of the water-shrew have been brought from different parts of Europe and Asia as far east as the Altai. In Siberia the common shrew is abundant in the snow-clad wastes about the Olenek river within the arctic circle. Other species of red-toothed shrews are restricted chiefly to North America, where they are found in greater variety than in the Old World, though *Neomys* is not represented. Its place is taken by *Sorex palustris* east of the Rocky Mountains, and *S. hydrodromus* in Unalaska Island, which, like the water-shrew, have fringes of hair on the feet, but the unfringed tail and dentition of the common shrew. Of the American forms *S. bendiri* is the largest. Other red-toothed shrews belonging to the genus *Blarina*, distinguished from *Sorex* by the dentition and the shortness of the tail, are common in North America. All red-toothed shrews (except the aquatic forms) closely resemble one another in habits, but the short-tailed North American shrew supplements its insectivorous fare by feeding on beech nuts. In destroying numbers of slugs, insects and larvae, shrews aid the farmer and merit protection. Although their odour renders them safe from rapacious animals, they are destroyed in numbers by owls. (G. E. D.)

SHREWSBURY, EARLS OF. The earldom of Shrewsbury, one of the most ancient in the English peerage, dates from the time of William the Conqueror. Roger de Montgomery (*c.* 1030–1094), son of another Roger de Montgomery, known as "the Great," was a councillor of William, duke of Normandy, before his invasion of England, and was probably entrusted by William with the government of Normandy during the expedition of 1066. Roger came to England in the following year and received extensive grants of land in different parts of the kingdom. Obtaining thus a large territory in Sussex, including the city of Chichester and the castle of Arundel, he became earl of Arundel, or probably and more correctly earl of Sussex. In 1071 the greater part of the county of Shropshire was granted to him, carrying with it the title of earl of Shropshire, though, from his principal residence at the castle of Shrewsbury, he like his successors was generally styled earl of Shrewsbury. He probably exercised palatine authority. He was the founder of Shrewsbury Abbey in 1083. His first wife was Mabel, daughter of the seigneur of Belesme and Alençon; hence his son Robert, who, after the death of another son, Hugh, succeeded to the earldoms of Shrewsbury and Arundel, was generally known as Robert de Belesme (*q.v.*), one of the most celebrated of the feudal nobles in the time of Henry I. Robert having been deprived of all his English estates and honours in 1102, the earldom of Shrewsbury was next conferred in 1442 on John, 5th baron Talbot, whose descendants have borne the title to the present day. (See TALBOT; and SHREWSBURY, 1ST EARL OF, below.)

SHREWSBURY, CHARLES TALBOT, DUKE OF (1660–1718), only son by his second wife of Francis Talbot, 11th earl of Shrewsbury, was born on the 24th of July 1660. His mother was a daughter of Robert Brudenell, 2nd earl of Cardigan, and the notorious mistress of the 2nd duke of Buckingham, by whom his father was killed in a duel in 1668. Charles was a godson of King Charles II., after whom he was named, and he was brought up as a Roman Catholic, but in 1679 under the influence of Tillotson he became a member of the Church of England. On his father's death in 1668 he succeeded to the earldom of Shrewsbury; he received an appointment in the household of Charles II., and served in the army under James II. But in 1687 he was in correspondence with the Prince of Orange, and he was one of the seven signatories of the letter of invitation to William in the following year. He contributed towards defraying the expenses of the projected invasion, and having crossed to Holland to join William, he landed with him in England in November 1688. Shrewsbury became a secretary of state in the first administration of William and Mary, but he resigned office in 1690 when the tories gained the upper hand in parliament. While in opposition he brought forward the triennial bill, to which the king refused assent. In 1694 he again became secretary of state; but there is some evidence that as early as 1690, when he resigned, he had gone over to the Jacobites and was in correspondence with James at St Germains, though it has been stated on the other hand that these relations were entered upon with William's connivance for reasons of policy. However this may be, William appears to have had no suspicion of Shrewsbury's loyalty, for on the 30th of April 1694 the latter was created marquess of Alton and duke of Shrewsbury, and he acted as one of the regents during the king's absence from England in the two following years. In 1696 definite accusations of treason were brought against him by Sir John Fenwick, which William himself communicated to Shrewsbury; and about this time the secretary of state took but a small part in public business, again professing his anxiety to resign. His plea of ill-health was a genuine one, and in 1700 the king reluctantly consented to his retirement into private life.

For the next seven years Shrewsbury lived abroad, chiefly at Rome, whence in 1701 he wrote a celebrated letter to Lord Somers expressing his abhorrence of public life and declaring that if he had a son he "would sooner bind him to a cobbler than a courtier, and a hangman than a statesman." On the accession of Queen Anne the whig leaders made an ineffectual attempt to persuade Shrewsbury to return to office. When, however, at last he did return to England in 1707 he gradually became alienated from his old political associates, and in 1710 he accepted the post of lord chamberlain in the tory administration to which the queen appointed him without the knowledge of Godolphin and Marlborough, while his wife was at the same time made a lady of the bedchamber. After a diplomatic mission to France for the purpose of negotiating preliminaries of peace, Shrewsbury became lord lieutenant of Ireland in 1713; but he was in London in July 1714 during the memorable crisis occasioned by the impending death of Queen Anne. On the 27th of July, when the queen was dying, the earl of Oxford received his long-delayed dismissal from the office of lord treasurer. On the 30th Shrewsbury and other ministers assembled at Kensington Palace, and being admitted to the queen's bedchamber Bolingbroke recommended the appointment of Shrewsbury to the vacant treasurership; Anne at once placed the staff of that high office in the duke's hands. When the queen died on the 1st of August Shrewsbury was thus in a position of supreme power with reference to the momentous question of the succession to the crown. He threw his influence into the scale in favour of the elector of Hanover, and was powerfully influential in bringing about the peaceful accession of George I., and in defeating the design of the Jacobites to place the son of James II. on the throne. His disinclination for the highest political offices remained, however, as great as before; and having resigned the lord-treasurership and the lord-lieutenancy of Ireland, he was appointed lord chamberlain. This place he resigned in July 1715, and he died on the 1st of February 1718.

The duke of Shrewsbury was one of the greatest noblemen of the reign of Queen Anne. Strikingly handsome in person, his demeanour was dignified and his manners full of grace and courtesy. Swift described him as "the finest gentleman we have," and as "the favourite of the nation," while William III. spoke of him as "the king of hearts." Like most of his contemporaries he endeavoured to keep himself in favour both with the exiled house of Stuart and with the reigning sovereign in England; but at the two critical junctures of 1688 and 1714 he acted decisively in favour of the Protestant succession. At other times he appeared weak and vacillating, and he never whole-heartedly supported either whigs or tories, though he co-operated with each in turn. His magnanimous disposition saved him from the vindictiveness of the party politician of the period; and the weak health from which he suffered through life probably combined with a congenital lack of ambition to prevent his grasping the power which his personality and talents might have placed in his hands.

In 1705 Shrewsbury married Adelaide, daughter of the Marquis Paleotti of Bologna. This lady, who is said to have had "a great many engaging qualities" besides many accomplishments, was the subject of much malicious gossip. She was the widow, or as some declared, the mistress of a Count Brachiano; and Lady Cowper reported that the lady's brother had forced Shrewsbury to marry her "after an intrigue together." After Shrewsbury's return to England the duchess became conspicuous in London society, where the caustic wit of Lady Mary Wortley-Montagu was exercised at her expense. On the accession of George I. the duchess of Shrewsbury became a lady of the bedchamber to the princess of Wales, a position which she retained till her death on the 29th of June 1726. Shrewsbury left no children, and at his death the dukedom became extinct, the earldom of Shrewsbury passing to his cousin Gilbert Talbot (see Talbot).

See *Correspondence of Charles Talbot, Duke of Shrewsbury, with King William, the Leaders of the Whig Party, &c.*, edited by W. Coxe (London, 1821); Gilbert Burnet, *History of his own Time* (6 vols., 2nd ed., Oxford, 1833); F. W. Wyon, *History of Great Britain during the Reign of Anne* (2 vols., London, 1876); Earl Stanhope, *History of England comprising the Reign of Anne until the Peace of Utrecht* (London, 1870), and *History of England from the Peace of Utrecht*, vol. i. (7 vols., London, 1836–1854); *The Wentworth Papers*, edited by J. J. Cartwright (London, 1883); W. E. H. Lecky, *History of England in the Eighteenth Century*, vol. i. (new edition, 7 vols., London, 1892); and G. E. C., *Complete Peerage*, vol. vii. (London, 1896). (R. J. M.)

SHREWSBURY, ELIZABETH TALBOT, Countess of (1518–1608), better known by her nickname "Bess of Hardwick," was the daughter and co-heiress of John Hardwicke of Hardwicke in Derbyshire. At the age of fourteen she was married to a John Barlow, the owner of a large estate, who did not long survive the marriage, and as his estates had been settled on her and her heirs, she became a wealthy widow. She remained single till the 20th of August 1549, when she married Sir William Cavendish, who, to please her, sold his lands in the south of England and purchased the Chatsworth estates in Derbyshire. Six children were born of the marriage, three sons and three daughters. One of the sons was the founder of the ducal family of Devonshire, and another of the ducal family of Newcastle. Sir William Cavendish having died on the 25th of October 1557, her third husband was Sir William St Lo (or St Loe or St Lowe), captain of the guard to Queen Elizabeth and owner of an estate at Tormarton in Gloucestershire. She insisted that his lands should be settled on her and her heirs, and when Sir William died without issue, she made good her claim to all his property to the detriment of his sister and cousins. Bess of Hardwick was now the wealthiest subject in England. Her income was calculated to amount to £60,000, which was relatively a far more important sum then than it is to-day. She still retained much of her good looks; her charms and her wealth outweighed her reputation for rapacity, and she was much sought in marriage. With the approval of Queen Elizabeth, who was not by habit a matchmaker, she was married in 1568 for the fourth time to George Talbot, 6th earl of Shrewsbury. Bess made her usual good bargain as to settlements, and also insisted on arranging marriages between two of her children by Sir William Cavendish and two of the earl's by a former marriage. In 1574 the countess took advantage of a visit of the countess of Lennox to marry her daughter Elizabeth to Charles Stuart, the younger son of the Lennoxes and brother of Lord Darnley, the second husband of the queen of Scots. She acted without the knowledge of her husband, who declined to accept any responsibility. As the Lennox family had a claim to the throne this match was considered as a proof of the ambition of the countess of Shrewsbury, and she was sent to the Tower by the queen, but was soon released. The child of the marriage was Arabella Stuart, whom her grandmother treated at first with favour but later on with cruelty and neglect.

By this time the earl of Shrewsbury and his wife were on very bad terms with one another, and the former tried to obtain a divorce. The countess revenged herself by accusing him of a love intrigue with the queen of Scots, a charge which she was forced to retract before the council. In the meantime she had told some filthy scandal about Queen Elizabeth to Queen Mary, who made use of it in the extraordinary letter she wrote some time in 1584. In 1583 the countess of Shrewsbury went to live apart from her husband, with whom she was afterwards reconciled formally by the queen. After his death in 1590 she lived mostly at Hardwicke, where she built the noble mansion which still stands. She was indeed one of the greatest builders of her time at Hardwicke, Chatsworth and Oldcoates. It is said that she believed she would not die so long as she was building. Her death came on the 13th of February 1608 during a frost which put a stop to her building operations. She was buried in All Saints' Church, Derby, under a fine monument with a laudatory inscription which she took care to put up in her lifetime. Two portraits of her exist at Hardwicke, one taken in her youth, while the second, by Cornelius Janssen, engraved by Vertue, represents her as an old woman. She had no children except by her second husband, and to them she left the vast estates she accumulated by her successive marriages.

See White Kennett, *Memoirs of the Cavendish Family* (London, 1708); and Mrs Murray Smith (Miss E. T. Bradley), *Life of Arabella Stuart* (London, 1889); Mrs Stepney Rawson, *Bess of Hardwicke* (1910).

SHREWSBURY, JOHN TALBOT, 1st Earl of (d. 1453), was second son of Richard, 5th baron Talbot, by Ankaret, heiress of the last Lord Strange of Blackmere. He was married before 1404 to Maud Neville, heiress of the barons Furnivall, and in her right summoned to parliament from 1409. In 1421 by the death of his niece he acquired the baronies of Talbot and Strange. From 1404 to 1413 he served with his elder brother Gilbert in the Welsh war. Then for five years from February 1414 he was lieutenant of Ireland, where he held the honour of Wexford. He did some fighting, and had a sharp quarrel with the earl of Ormonde. Complaints were made against him both for harsh government in Ireland and for violence in Herefordshire. From 1420 to 1424 he served in France. In 1425 he was again for a short time lieutenant in Ireland. So far his career was that of a turbulent lord of the Marches, employed in posts where a rough hand was useful. In 1427 he went again to France, where he fought with distinction in Maine and at the siege of Orleans; but his exploits were those of a good fighter rather than of general, and it was his stubborn rashness that was chiefly to blame for the English defeat at Patay in June 1429. After Patay Talbot was four years a prisoner. On his release he became one of the foremost of the English captains. In 1434 he recovered the county of Clermont, next year took part in the siege of St Denys, and in 1436 by reducing and harrying the revolted Pays de Caux saved Normandy. He was rewarded with the offices of captain of Rouen and marshal of France. During five years as a dashing fighter he was the mainstay of the English cause. His chief exploits were the defeat of the Burgundians before Crotoy in 1437 and the recovery of Harfleur in 1440. In 1442 during a visit to England he was created earl of Shrewsbury. In November he was back in France besieging Dieppe; but "fared so foul with his men that they would no longer abide with him" and was forced to break the siege (*Chronicles of London*, p. 150). In March 1445 he was once more sent to Ireland, where he used his old methods, so that the Irish said "there came not from the time of Herod any one so wicked in evil deeds." In 1449 he served for a short time in Normandy. When in 1452 the Gascons appealed for English help, Shrewsbury was the natural leader of the expedition. He landed in Aquitaine on the 17th of October. Bordeaux and the surrounding district returned quickly to their old allegiance, and in the following summer Shrewsbury captured Fronsac. In July the French besieged Castillon. Shrewsbury hurried to its relief, and with foolhardy valour attacked the enemy in their entrenched camp without waiting for his artillery. The English and Gascon footmen charged in vain in face of the French cannon, until Shrewsbury and the flower of his troops had fallen. This happened in July 1453 and was the end of the English rule in Gascony. Shrewsbury's fighting qualities made him something of a popular hero, and in the doggerel of the day he was "Talbot our good dog," whose valour was brought to nought by the treason of Suffolk. But in truth though a brave soldier he was no general. He was twice married, his second wife being Margaret, eldest daughter of Richard Beauchamp, earl of Warwick. He was alleged to be eighty years old at his death; probably he was about sixty-five.

Bibliography.—For Shrewsbury's French campaigns see especially the *Chronique* of E. de Monstrelet, Jehan de Waurin and Matthieu d'Escouchy (all these are published by the *Société de l'Histoire de France*), and the *Chronicles of London* (ed. C. L. Kingsford, London, 1905). Also H. Ribadieu, *Conquête de Guyenne* (1866); J. T. Gilbert, *Viceroys of Ireland* (1865); and J. H. Wylie's *Henry the Fourth* (1884–1898) for his early career. (C. L. K.)

SHREWSBURY, a municipal and parliamentary borough, market town and the county town of Shropshire, England. Pop. (1901), 28,395. It is situated on both banks of the river Severn, but mainly on a peninsula formed by the river on the left bank. It is served by the London & North-Western and Great Western railways, being 163 m. N.W. from London. The companies use a joint station, and jointly work the line S. to Hereford. There is water communication eastward by the Shrewsbury canal, and by the Severn below the town. Eastward from the peninsula the English bridge crosses the river, westward the Welsh bridge; southward the Kingsland and Greyfriars bridges. The joint railway station is on the peninsula, and is reached from the south by a massive iron bridge. The streets, many retaining ancient names curiously corrupted, are hilly and irregular, but strikingly picturesque from their number of antique timber houses, among which may be mentioned that in Butcher Row, formerly the town residence of the abbot of Lilleshall; the council-house overlooking the Severn, erected in 1620 for the presidents of the council of the Welsh marches; and the two adjacent mansions of Robert Ireland and Richard Owen, citizens *c.* 1590. Of the town ramparts built in the reign of Henry III. the principal remains are a portion to the south-west, used as a public walk, on which stands a square embattled tower. The castle built by Roger de Montgomery was dismantled in the reign of James II., and is modernized as a residence, but there remain the archway of the interior gateway, the walls of the inner court and two large round towers of the time of Edward I. The rich abbey of St Peter and St Paul was also founded by Roger, on the site of an earlier church. Of the abbey church (Holy Cross) the nave of massive Norman work remains, especially impressive owing to the warm red stone of which it is built; there are further two Early English arches and the western tower. Of the monastic buildings little is left, save a remarkable roofed pulpit of ornate Decorated work. Among other churches St Mary's, founded in the 10th century, is a fine cruciform structure with a lofty tower and spire, displaying examples of various styles of architecture from early Norman to Perpendicular, the base of the tower, the nave and the doorways being Norman, the transept Early English and the aisles 15th century, while the interior is specially worthy of notice for its elaborate details, its early stained glass, including a Jesse window, and its ancient monuments. Some 50 ft. of the spire fell in 1894, severely injuring the church and necessitating extensive restoration. St Julian's was originally built before the Conquest, but rebuilt in 1748, except the tower, the older portion of which is Norman and the upper part of the 15th century. St Alkmond's also dated from the 10th century, but was rebuilt towards the close of the 18th century, with the exception of the tower and spire. It has a beautiful half-timbered rectory. St Giles's, originally the church of the leper hospital, dating from the time of Henry I., was altered at various periods. The hollow base of the old churchyard cross bears the name of the Pest Basin, because the citizens cast alms into it in the 16th century during the visitation of the plague, which, according to tradition, first appeared here. The old church of St Chad, supposed to have occupied the site of a palace of the princes of Powis, was destroyed by the fall of the tower in 1788, and of the ancient building the bishop's chancel alone remains. The new church of St Chad was built on another site in 1792. Shrewsbury is not fortunate in its ecclesiastical architecture of the late 18th century. There are slight remains of a Franciscan house (Grey Friars) founded in 1291, of an Augustinian friary (1255) and of a Dominican house (1222). The old buildings completed in 1630 for the grammar school of Edward VI., founded in 1551, are now occupied by the county museum and free library, the school having been removed in 1882 to new buildings in the suburb of Kingsland S. of the river. It takes rank among the first public schools in England. The ground it occupies in Kingsland was formerly the scene of the Shrewsbury show, a pageant and festival held during the festival of Trinity. Among the principal secular buildings of the town are the fine market house in the Elizabethan style (completed according to an inscription over the northern arch in 1595), the shire hall and guildhall (rebuilt in 1837, and again, after a fire, in 1883), the general market and corn exchange (1869), and the drapers' hall, a timbered structure dating from the 16th century. The principal benevolent institutions are the county infirmary (1747), Millington's hospital (1734) and the eye, ear and throat hospital (1881). A monument to Lord Clive, who was member for the borough 1761–1764, was erected in the market-place in 1860, and a Doric memorial pillar to General Lord Hill in 1816 at the top of the Abbey Foregate. The town race-course occupies a portion of the "Soldiers' Piece," where Charles I. addressed his army in 1642. To the south-west of the town is a park of 23 acres, known as the Quarry, with beautiful avenues of lime-trees, descending to the river. Glass-staining, the spinning of flax and linen yarn, iron-founding, brewing, malting, the preparation of brawn and the manufacture of the well-known Shrewsbury cakes are now the principal industries. Shrewsbury is a suffragan bishopric in the diocese of Lichfield, and the seat of a Roman Catholic bishop. The parliamentary borough returns one member. The town is governed by a mayor, 10 aldermen and 30 councillors. Area, 3525 acres.

Shrewsbury (Pengwerne, Scrobsbyryg, Salopesberie), then known as Pengwerne or Pengwyrn, was the capital of the kings of Powis during the 5th and 6th centuries, but was taken in 779 by Offa king of Mercia, who changed its name to Shrewsbury (Scrobsbyryg). Owing to its position on the Welsh borders it became one of the chief cities of the Saxon kings, and a mint was established here in the reign of King Æthelstan. After the Conquest the town was included in the earldom of Shrewsbury, and the Domesday Survey shows that the Saxon burgesses paid the same danegeld as in the reign of Edward the Confessor. Until Wales was annexed to England in the 13th century, Shrewsbury was one of the chief border towns, and as such it was besieged by Owen Gwynedd in 1067, but was relieved by William the Conqueror. In the reign of Henry I. it was garrisoned by Robert de Belesme, but surrendered to the king in 1102. It was several times burnt by the Welsh and was taken and held by them from 1215 to 1221. During the Welsh war in the reign of Edward I., the king made the town his headquarters, and in 1283 David, the last native prince of Wales, was tried and condemned to death by a parliament held here. In 1403 Henry Percy, son of the earl of Northumberland, was defeated and killed at Shrewsbury by Henry IV. At the beginning of the Civil War, Charles I. stayed in the town for some time, but it surrendered to parliament in 1645. The first extant charter, dated 1199, is a grant by Richard I. to the burgesses of the town at a fee farm of 40 marks, but Henry II. is known to have granted an earlier charter which was confirmed by King John in 1200. The same king granted two other charters, one in 1200 giving the right of electing the reeves, and the other in 1205 providing that their lands and tenements should be governed by the "laws of Breteuil, the laws of the Barony and the laws of the Englishry." Henry II. in 1227 granted a gild merchant with a house. Besides these charters there are numerous confirmations before the incorporation charter of Elizabeth of 1586. Charles I. in 1638 altered the corporation to a mayor, 24 aldermen and 48 assistants. In 1684 the burgesses surrendered their charter to the king and received a new one in the following year which, however, did not change the form of government. From 1295 to 1885 Shrewsbury returned two members to parliament, but then the number was reduced to one.

See H. Owen and J. C. Blakeway, *A History of Shrewsbury* (1825); Thomas Phillips, *The History and Antiquities of Shrewsbury* (1837); *Victoria County History, Shropshire.*

SHRIKE, a bird's name, so given by Turner (1544), but solely on the authority of Sir Francis Lovell, for Turner had seen the bird but twice in England, though in Germany often, and could not find anyone else who so called it. However, the word[1] was caught up by succeeding writers; and, though hardly used except in books—for butcher-bird is its vernacular synonym—it not only retains its first position in literary English, but has been largely extended so as to apply in general to all birds of the family Laniidae and others besides. The name *Lanius*, in this sense, originated with C. Gesner[2] (1555), who thought that the birds to which he gave it had not been mentioned by the ancients. C. J. Sundevall, however, considers that the *Malacocraneus* of Aristotle was one of them, as indeed Turner had before suggested, though repelling the latter's supposition that Aristotle's *Tyrannus* was another, as well as P. Belon's reference of *Collyrion.*

The species designated shrike by Turner is the *Lanius excubitor* of Linnaeus and nearly all succeeding authors, nowadays[3] commonly known as the greater butcher-bird, ash-coloured or great grey shrike—a bird which visits the British Islands pretty regularly, though not numerously, in autumn or winter, occasionally prolonging its stay into the next summer; but it has never been ascertained to breed there, though often asserted to have done so. This is the more remarkable since it breeds more or less commonly on the continent from the north of France to within the Arctic Circle. Exceeding a song-thrush in linear measurements, it is a much less bulky bird, of a pearly grey above with a well-defined black band passing from the forehead to the ear-coverts; beneath it is nearly white, or—and this is particularly observable in Eastern examples—barred with dusky markings. The quill-feathers of the wings, and of the elongated tail, are variegated with black and white, mostly the former, though what there is of the latter shows very conspicuously, especially at the base of the remiges, where it forms either a single or a double patch. Much smaller than this is the red-backed shrike, *L. collurio*, the best-known species in Great Britain, where it is a summer visitor, and, though its distribution is rather local, it may be seen in many parts of England and occasionally reaches Scotland. The cock is a sightly bird with his grey head and neck, black cheek-band, chestnut back and pale rosy breast, while the hen is ordinarily of a dull brown, barred on the lower plumage. A more highly coloured species is called the woodchat, *L. auriculatus* or *rutilus*, with a bright bay crown and nape, and the rest of its plumage black, grey and white. This is an accidental visitor to England, but breeds commonly throughout Europe. All these birds, with many others included in the genus *Lanius*, which there is no room here to specify, have, according to their respective power, the very remarkable habit (whence they have earned their opprobrious name) of catching insects, frogs, lizards or small birds and mammals, and of spitting them on a thorn or of fixing them in a forked branch, the more conveniently to tear them in pieces and eat them.

The shrikes belong to the Passerine family Laniidae, the limits of which are doubtful, but which is divided into five sub-families: Gymnorhininae, Malaconotinae, Pachycephalinae, Laniinae and Prionopinae. The Laniinae or true shrikes occur in the Old and New Worlds, the other sub-families are limited to the Old World. The shrikes and their immediate allies are active and powerful birds, with stout bills often strongly hooked. Their diet is chiefly insects and small frogs, lizards, birds and mammals, but they also take seeds and fruits. The "greenlets" of North and South America are active and fearless birds, similar in general habits to the Laniidae and formerly regarded as forming a sub-family of that group, but now placed in a separate family the Vireonidae. (A. N.)

SHRIMP, a name applied in general to the smaller crustacea of the order Macrura and in particular to an edible species found on the coasts of northern Europe (*Crangon vulgaris*). The shrimps and their allies are distinguished from the larger Macrura, such as the lobsters and crayfishes, by greater development of the paddle-like limbs of the abdomen or tail, which are used in swimming. The abdomen is usually sharply bent between the third and fourth segments and has a characteristically humped appearance when straightened out.

The common shrimp is found abundantly on the coasts of the British Islands, in shallow water wherever the bottom is sandy. It is 2 or 3 in. long, slightly flattened and with the rostrum or beak, in front of the carapace, very short. It is of a translucent greyish colour, speckled with brown and closely resembles the sand in which it lives. On many parts of the coast the shrimp fishery is of considerable importance. The instrument generally employed is a bag-shaped net attached to a semicircular hoop, provided with a long handle and pushed over the surface of the sand by a fisherman wading in the water at ebb-tide. When boiled, the body becomes of a brownish colour and on this account the species is sometimes termed the "brown shrimp." The name of "pink shrimp" is given to *Pandalus montagui* or *annulicornis*, which turns red on boiling and which resembles in form the larger "prawns," having a long rostrum or beak, saw-edged above and below. The smaller species of *Leander*, especially *L. squilla*, are sold as "cup-shrimps" in some places.

The larger shrimp-like crustacea are generally known as "prawns," the name being especially applied in Britain to the species *Leander serratus*, formerly called *Palaemon serratus*, which is highly esteemed for the table. In warmer seas many other kinds of prawns are caught for food. These are generally species of the genus *Penaeus* (like *P. caramote* of the Mediterranean) which are distinguished from all those already mentioned by having pincers on the first three, instead of only on the first two pairs of legs. The large river-prawns of the genus *Palaemon*

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[1] Few birds enjoy such a wealth of local names as the shrikes. M. Rolland (*Faune pop. de la France*, ii. 146-151) enumerates upwards of ninety applied to them in France and Savoy; but not one of these has any affinity to our word "shrike."

[2] He does not seem, however, to have known that butcher-bird was an English name; indeed it may not have been so at the time, but subsequently introduced.

[3] According to Willughby, Rae and Charleton, it was in their day called in many parts of England "Wierangle" (Ger. *Würgengel* and *Würger*, the strangler); but it is hard to see how a bird which few people in England could know by sight should have a popular name, though Chaucer had used it in his *Assemblye of Foules*.

(closely allied to *Leander*) found in most tropical countries are also often used as food. In the West Indies *Palaemon jamaicensis*, and in the East Indies *Pal. carcinus* attain almost the dimensions of full-grown lobsters.

The name of shrimps is sometimes given to members of the order Schizopoda, which differ from most of the Macrura in having swimming branches or exopodites on the thoracic legs. In particular the Schizopods of the family Mysidae, which are abundant in the sea round our coasts, are often called "Opossum-shrimps" from the fact that the female is provided with a ventral pouch or "marsupium" in which the eggs and young are carried. (W. T. Ca.)

SHRINE (Lat. *scrinium*, a case or chest for books, hence a casket; from *scribere*, to write, Fr. *écrin*, Ital. *scrigno*), the term given to the repository or chest to hold sacred relics. Sometimes shrines are merely small boxes, generally with raised tops like roofs; sometimes actual models of churches; sometimes large constructions like that at St Albans, that of Edward the Confessor at Westminster, of Ste Geneviève at Paris, &c. Many are covered with jewels in the richest way, such as the example at St Taurin, at Evreux in Normandy, and that of San Carlo Borromeo, at Milan, of beaten silver; the largest series are those which were enriched with enamels. Sometimes the term is given to the chapel in which the shrine is deposited.

SHROPSHIRE (Salop), a western county of England on the Welsh border, bounded N. by Cheshire and a detached portion of Flint, E. by Staffordshire, S.E. by Worcestershire, S. by Herefordshire, S.W. by Radnorshire, W. by Montgomeryshire and N.W. by Denbighshire. The area is 1343 sq. m. The name of Salop, in common use, comes from an early name of the county town of Shrewsbury. Towards the west Shropshire partakes of the hilly scenery of Wales, from which several ranges are continued into it. South of the river Severn and partly in Montgomeryshire, the Breidden Hills rise abruptly in three peaks; and in the south-west there is a broad range of rough rounded hills known as Clun Forest, extending from Radnorshire. South and west of the Severn there are four other principal chains of hills extending from S.W. to N.E.—the Long Mynd (1674 ft.), west of Church Stretton; the Carodoc Hills, a little to the north, which are continued across the Severn and terminate in the isolated sugarloaf hill of the Wrekin (1335 ft.); Wenlock Edge, east of Church Stretton, a sharp ridge extending for 20 m., and at some points rising above 1000 ft.; and the Clee Hills near the south-eastern border (Brown Clee, 1805 ft.; Titterstone Clee, 1749 ft.). The remainder of the county is for the most part pleasantly undulating and well cultivated. It lies almost entirely in the basin of the Severn, which enters from Montgomeryshire and flows eastward to Shrewsbury, after which it turns south-eastward to Ironbridge, and then continues in a more southerly direction past Bridgnorth, entering Worcester near Bewdley. The scenery on its banks is striking at some places, as near the finely situated town of Bridgnorth, but it is spoilt in one of the most beautiful stretches, that near Coalbrookdale, by the great factories in the neighbourhood. Its principal tributaries within Shropshire are: from the right the Rea, the Cound and the Borle; from the left the Vyrnwy, a well-known trout-stream forming part of the boundary with Montgomeryshire, the Perry, the Tern, which receives the Roden, and the Worf. The Dee and its tributary the Ceiriog touch the north-western boundary of the county with Denbighshire. In the south the Teme, which receives the Clun, the Onny and the Corve, flows near the borders of Herefordshire, which it occasionally touches and intersects. Salmon are taken in the Severn, and the Teme with its tributaries are frequented for trout and grayling fishing. There is a cluster of picturesque meres or small lakes in the north-west near the borders of Denbighshire, of which the largest is Ellesmere, and there are a number of others in various parts of the county.

Geology.—The Pre-Cambrian rocks of Shropshire include the granitoid and gneissic rocks of the Ercall and Primrose Hill (Wrekin), the schists of Rushton, the lavas and ashes of the Wrekin, Caer Caradoc and Pontesford, and the purple slates, grits and conglomerates of the Longmynd. The Wrekin Quartzite, Comley Sandstone and Shineton Shales are the local representatives of the Cambrian system. These are followed by the Ordovician formations which occupy three areas: the Breidden Hills, the Shelve district and the Caer Caradoc district, and include strata referable to the Arenig, Llandeilo and Bala series; the rocks are fossiliferous shales, grits and volcanic ashes, with dolerite intrusions. The Silurian rocks which follow unconformably are represented in the Long Mountain and Clun Forest regions by sandstones and shales, and along Wenlock Edge by highly fossiliferous mudstones and limestones; they include the Llandovery, Wenlock and Ludlow series, and the limestones are famed for their rich marine fauna. The Old Red Sandstone, a great series of red marls, sandstones and thin impure limestones (cornstones), conformably succeeds the Silurian rocks, and occupies the south-eastern area (whence it extends into Herefordshire); it also makes extensive out-liers at Clun and Bettws-y-Crwyn; the rocks have yielded fish and crustacea. The highest beds are conglomeratic and are seen only round the Titterstone Clee Hill. The Carboniferous Limestone and Millstone Grit of the Denbighshire coalfield enter the county near Oswestry; they appear also at Lilleshall and Coalbrookdale on the western border of the Coalbrookdale coalfield, and underlie the little coalfield of the Titterstone Clee Hill. The Coal Measures with their coal-seams and bands of ironstone are present at Oswestry (extending south from Denbighshire) and form also the coalfields of Shrewsbury, Leebotwood, Coalbrookdale, Wyre Forest and the Clee Hills. In the last two districts basalt (dhustone) has been intruded into the Measures, and at Clee Hill is extensively quarried for roadstone and paving-cubes. The so-called Permian rocks (red sandstones and marls) are now grouped with the Coal Measures. The succeeding Triassic rocks—red sandstones, marls and conglomerates (Bunter and Keuper)—occupy the north-eastern part of the county, and are capped near Market Drayton by Rhaetic and Lias. Glacial deposits —boulder-clay, gravel and sand, often shell-bearing—overspread much of the Triassic plain in the north and east of the county; they were laid down by ice-sheets which moved in from the Irish Sea and from the Aran and Arenig mountains in Merioneth. Some peat-bogs in the drift-covered regions appear to occupy the sites of lakes. Coal and ironstone, silver-lead and zinc from the Ordovician rocks of Shelve, with limestone, building-stone and roadstone, are the chief mineral products.

Industries.—More than four-fifths of the total area is under cultivation. The principal grain crops are barley and oats, the acreage under each of which is nearly double that under wheat. Some five-eighths of the total acreage cultivated is in permanent pasture, and there are besides considerable tracts of hill pasture. Turnips and swedes form the bulk of the green crops, as cattle are largely kept for the dairy. The cattle are chiefly Herefords and the sheep Shropshires. Cheshire cheese is made in the northern districts. A small acreage is under hops.

Apart from agriculture there are several important branches of industry. Coalbrookdale and the neighbourhood is the principal coal-mining centre, and was an early home of the ironfounding trade, under the famous family of Darby, and this industry is prosecuted here and at Ironbridge, Shifnal and elsewhere. There are also considerable manufactures of machinery, tools and agricultural implements, as at Ludlow, Oswestry, Shrewsbury and Wellington. There are great encaustic tile and brick works in the Broseley district, where also is an old-established manufacture of tobacco-pipes; while at Coalport there are china works. Some woollen goods are made. In the Minsterley and Stiperstones district in the west, lead and barytes are obtained.

Communications.—The railways, for which Shrewsbury is the most important centre, belong mainly to the Great Western and London & North-Western companies. Of the first the main route to the north-west runs from Wolverhampton by Wellington, Shrewsbury and Gobowen to Chester, with a branch from Wellington to Crewe. Another line comes from Worcester and Bewdley, following the Severn valley by Bridgnorth and Ironbridge to Shrewsbury, with several branches through the Coalbrookdale and Wenlock districts. The two companies jointly work the line from Stafford by Newport, Wellington and Shrewsbury to Welshpool, and the Crewe-Hereford line by Whitchurch, Shrewsbury and Craven Arms. From Craven Arms a branch of the North-Western system runs into South Wales and the short Bishops Castle railway serves that town. The Cambrian line starts from Whitchurch and runs by Oswestry into Wales. The chief canals are the Shropshire Union, Shrewsbury and Ellesmere in the northern part of the county. The Severn is to some extent used for navigation up to Shrewsbury.

Population and Administration.—The area of the ancient county is 859,516 acres, with a population in 1891 of 236,339, and in 1901 of 239,324. The area of the administrative county is 861,802 acres. The county contains 14 hundreds. The municipal boroughs are—Bishops Castle (pop. 1378), Bridgnorth (6052), Ludlow (4552), Oswestry (9579), Shrewsbury (28,395), Wenlock (15,866). The urban districts are Church Stretton (816), Dawley (7522), Ellesmere (1954), Newport (3241), Oakengates (10,906), a mining town, Wellington (6283), Wem (2149), Whitchurch (5221). The more important towns not mentioned above are Broseley, Coalbrookdale, Madeley (this parish including Ironbridge and Coalport) and Much Wenlock, which are embraced wholly or in part by the borough of Wenlock; Market Drayton (5167) and Shifnal (3321). Lesser towns are Clun (1915) which gives name to Clun Forest, and Cleobury Mortimer (1810) in the south. The county is in the Oxford circuit, and assizes are held at Shrewsbury. It has one court of quarter sessions, and is divided into 18 petty sessional divisions. The boroughs of Bridgnorth, Ludlow, Oswestry, Shrewsbury and Wenlock have separate commissions of the peace and courts of quarter sessions. There are 267 civil parishes. Shrewsbury is divided between the dioceses of Lichfield and Hereford, with a small part in the diocese of St Asaph, and contains 284 ecclesiastical parishes or districts, wholly or in part. There are four parliamentary divisions—Mid or Wellington, North or Newport, South or Ludlow, and West or Oswestry, each returning one member, while Shrewsbury returns one member.

History.—The district which is now Shropshire was annexed to the kingdom of Mercia by Offa, who in 765 constructed Watt's Dike to defend his territory against the Welsh, and in 779, having pushed across the Severn, drove the king of Powys from Shrewsbury, then known as Pengwerne, and secured his conquests by a second defensive earthwork known as Offa's Dike, which, entering Shropshire at Knighton, traverses moor and mountain by Llanymynech and Oswestry, in many places forming the boundary line of the county, and finally leaves it at Bron y Garth and enters Denbighshire. In the 9th and 10th centuries the district was frequently overrun by the Danes, who in 874 destroyed the famous priory of Wenlock, said to have been founded by St Milburg, granddaughter of Penda of Mercia, and in 896 wintered at Quatford. In 912 Æthelflead, the lady of Mercia, erected a fortress at Bridgnorth against the Danish invaders, and in the next year at Chirbury. Mercia was mapped out into shires in the 10th century after its recovery from the Danes by Edward the Elder, and Shropshire stands out as the sole Mercian shire which did not derive its name from its chief town. The first mention of it in the Saxon Chronicle occurs under 1006, when the king crossed the Thames and wintered there. In 1016 Edmund Ætheling plundered Shrewsbury and the neighbourhood.

After the Conquest the principal estates in Shropshire were all bestowed on Norman proprietors, pre-eminent among whom is Roger de Montgomery, the 1st earl of Shrewsbury, whose son Robert de Belesme forfeited his possessions for rebelling against Henry I., when the latter bestowed the earldom on his queen for life. At this period a very large portion of Shropshire was covered by its vast forests, the largest of which, Worf Forest, at its origin extended at least 8 m. in length and 6 m. in width, and became a favourite hunting-ground of the English kings. The forest of Wrekin, or Mount Gilbert as it was then called, covered the whole of that hill and extended eastward as far as Sheriff Hales. Other forests were Stiperstones, the jurisdiction of which was from time immemorial annexed to the barony of Caus, Wyre, Shirlot, Clee, Long Forest and Brewood. The constant necessity of defending their territories against the Welsh prompted the Norman lords of Shropshire to such activity in castle-building that out of 186 castles in England no less than 32 are in this county. Of these the most famous are Ludlow, founded by Roger de Montgomery; Bishop's Castle, which belonged to the bishops of Hereford; Clun Castle, built by the Fitz-Alans; Cleobury Castle, built by Hugh de Mortimer; Caus Castle, once the barony of Peter Corbett, from whom it came to the Barons Strafford; Rowton Castle, also a seat of the Corbetts; Red Castle, a seat of the Audleys. Other castles were Bridgnorth, Corfham, Holgate, Pulverbatch, Quatford, Shrewsbury and Wem.

Among the Norman religious foundations were the Cluniac Priory at Wenlock, re-established on the Saxon foundation by Roger Montgomery in 1080; the Augustinian abbey of Haughmond founded by William Fitz-Alan; the Cistercian abbey of Buildwas, now a magnificent ruin, founded in 1135 by Roger, bishop of Chester; Shrewsbury Abbey, founded in 1083 by Roger de Montgomery; the Augustinian abbey of Lilleshall, founded in the reign of Stephen; the Augustinian priory of Wombridge, founded before the reign of Henry I.; the Benedictine priory of Alberbury founded by Fulk Fitz-Warin in the 13th century; and Chirbury Priory founded in the 13th century.

The fifteen Shropshire hundreds mentioned in the Domesday Survey were entirely rearranged in the reign of Henry I., and only Overs and Condover retained their original names. The Domesday hundred of Ruesset was replaced by Ford, and the hundred court transferred from Alberbury to Ford. Hodnet was the meeting-place of the Domesday hundred of Odenet, which was combined with Recordin, the largest of the Domesday hundreds, to form the modern hundred of Bradford, the latter also including part of the Domesday hundred of Pinholle in Staffordshire. The hundred of Baschurch had its meeting-place at Baschurch in the time of Edward the Confessor; in the reign of Henry I. it was represented mainly by the hundred of Pimhill, the meeting-place of which was at Pimhill. Oswestry represents the Domesday hundred of Mercete, the hundred court of which was transferred from Maesbury to Oswestry. Munslow hundred was formed in the reign of Henry I., but in the reign of Richard I. a large portion was taken out of it to form a new liberty for the priory of Wenlock, the limits of which correspond very nearly with the modern franchise of Wenlock. The Domesday hundred of Alnodestreu, abolished in the reign of Henry I., had its meeting-place at Membrefeld (Morville). The hundreds at the present day number fourteen.

Shropshire was administered by a sheriff, at least from the time of the Conquest, the first Norman sheriff being Warin the Bald, whose successor was Rainald, and in 1156 the office was held by William Fitz-Alan, whose account of the fee-farm of the county is entered in the pipe roll for that year. The shire court was held at Shrewsbury. A considerable portion of Shropshire was included in the Welsh marches, the court for the administration of which was held at Ludlow. In 1397 the castle of Oswestry with the hundred and eleven towns pertaining thereto, the castle of Isabel with the lordship pertaining thereto, and the castle of Dalaley, were annexed to the principality of Chester. By the statute of 1535 for the abolition of the marches, the lordships of Oswestry, Whittington, Masbroke and Knockin were formed into the hundred of Oswestry; the lordship of Ellesmere was joined to the hundred of Pimhill; and the lordship of Down to the hundred of Chirbury. The boundaries of Shropshire have otherwise varied but slightly since the Domesday Survey. Richard's Castle, Ludford, and Ludlow, however, were then included in the Herefordshire hundred of Cutestornes, while several manors now in Herefordshire were assessed under Shropshire. The Shropshire manors of Kings Nordley, Aveley, Claverley and Worfield were assessed in the Domesday hundred of Saisdon in Staffordshire; and Quatt, Romsley, Rudge and Shipley in the Warwickshire hundred of Stanlei. By statute 34 and 35 Henry VIII. the town and hundred of Aberton, till then part of Merionethshire, were annexed to this county.

Shropshire in the 13th century was situated almost entirely in the dioceses of Hereford and of Coventry and Lichfield; and formed an archdeaconry called the archdeaconry of Salop. That portion of the archdeaconry in the Hereford diocese included the deaneries of Burford, Stottesdon, Ludlow, Pontesbury, Clun and Wenlock; and that portion in the Coventry and Lichfield diocese the deaneries of Salop and Newport. In 1535 the Hereford portion included the additional deanery of Bridgnorth; it now forms the archdeaconry of Ludlow, with the additional deaneries of Montgomery, Bishops Castle and Church Stretton. The archdeaconry of Salop, now entirely in the Hereford diocese, includes the deaneries of Condover, Edgmond, Ellesmere, Hodnet, Shifnal, Shrewsbury, Wem, Whitchurch and Wrockwardin. Part of Welsh Shropshire is included in the diocese of St Asaph, comprising the deanery of Oswestry in the archdeaconry of Montgomery, and two parishes in the deanery of Llangollen and the archdeaconry of Mexham.

The early political history of Shropshire is largely concerned with the constant incursions and depredations of the Welsh from across the border. The Saxon Chronicle relates that in 1053 the Welshmen slew a great many of the English wardens at Westbury, and in that year Harold ordered that any Welshman found beyond Offa's Dike within the English pale should have his right hand cut off. Various statutory measures to keep the Welsh in check were enforced in the 14th and 15th centuries. In 1379 Welshmen were forbidden to purchase land in the county save on certain conditions, and this enactment was reinforced in 1400. In 1379 the men of Shropshire forwarded to parliament a complaint of the felonies committed by the men of Cheshire and of the Welsh marches, and declared the gaol of Shrewsbury Castle to be in such a ruinous condition that they had no place of imprisonment for the offenders when captured. In 1442 and again as late as 1535 acts were passed for the protection of Shropshire against the Welsh. But apart from the border warfare in which they were constantly engaged, the great Shropshire lords were actively concerned in the more national struggles. Shrewsbury Castle was garrisoned for the empress Maud by William Fitz-Alan in 1138, but was captured by Stephen in the same year. Holgate Castle was taken by King John from Thomas Mauduit, one of the rebellious barons. Ludlow and Shrewsbury were both held for a time by Simon de Montfort. At Acton Burnell in 1283 was held the parliament which passed the famous Acton Burnell statute, and a parliament was summoned to meet at Shrewsbury in 1398. During the Percy rebellion Shrewsbury was in 1403 the scene of the battle of King's Croft, in which Hotspur was slain. On the outbreak of the Civil War of the 17th century the Shropshire gentry for the most part declared for the king, who visited Shrewsbury in 1642 and received valuable contributions in plate and money from the inhabitants. A mint and printing-press were set up at Shrewsbury, which became a refuge for the neighbouring royalist gentry. Wem, the first place to declare for the parliament, was garrisoned in 1645 by Richard Baxter. Shrewsbury was forced to surrender in 1644, and the royalist strongholds of Ludlow and Bridgnorth were captured in 1646, the latter after a four weeks' siege, during which the governor burnt part of the town for defence against the parliamentary troops.

Shropshire is noted for the number and lustre of the great families connected with it. Earl Godwin, Sweyn, Harold, Queen Edith, Edward the Confessor and Edwin and Morcar are all mentioned in the Domesday Survey as having held lands in the county before the Conquest. The principal landholders at the time of the survey were the bishop of Chester, the bishop of Hereford, the church of St Remigius, Earl Roger, Osbern Fitz-Richard, Ralph de Mortimer, Roger de Laci, Hugh Lasne and Nicholas Medicus. Earl Roger had the whole profits of Condover hundred and also owned Alnodestreu hundred. The family of Fitz-Alan, ancestors of the royal family of Stuart, had supreme jurisdiction in Oswestry hundred, which was exempt from English law. Richard Fitz-Scrob, father of Osbern Fitz-Richard and founder of Richard's Castle, was lord of the hundred of Overs at the time of the Conquest. Gatacre was the seat of the Gatacres. The barony of Pulverbatch passed from the Pulverbatches, and was purchased in 1193 by John de Kilpeck for £100. The family of Cornwall were barons of Burford and of Harley for many centuries. The family of Lestrange owned large estates in Shropshire after the Conquest, and Fulk Lestrange claimed the right of holding pleas of the crown in Wrockworthyn in 1292. Among others claiming rights of jurisdiction in their Shropshire states in the same year were Edmund de Mortimer, the abbot of Cumbermere, the prior of Lanthony, the prior of Great Malvern, the bishop of Lichfield, Peter Corbett, Nicholas of Audley, the abbot of Lilleshall, John of Mortayn, Richard Fitz-Alan, the bishop of Hereford and the prior of Wenlock.

The earliest industries of Shropshire took their rise from its abundant natural resources; the rivers supplying valuable fisheries; the vast forest areas abundance of timber; while the mineral products of the county had been exploited from remote times. The lead mines of Shelve and Stiperstones were worked by the Romans, and in 1220 Robert Corbett conferred on Shrewsbury Abbey a tithe of his lead from the mine at Shelve. In 1260 licence was granted to dig coal in the Clee Hills, and in 1291 the abbot of Wigmore received the profits of a coal-mine at Caynham. Iron was dug in the Clee Hills and at Wombridge in the 16th century. Wenlock had a famous copper-mine in the reign of Richard II., and in the 16th century was noted for its limestone. The Domesday Survey mentions salt-works at Ditton Priors, Caynham and Donnington. As the forest areas were gradually cleared and brought under cultivation, the county became more exclusively agricultural. In 1343 Shropshire wool was rated at a higher value than that of almost any other English county, and in the 13th and 14th centuries Buildwas monastery exported wool to the Italian markets. Shropshire has never been distinguished for any characteristic manufactures, but a prosperous clothing trade arose about Shrewsbury and Bridgnorth, and Oswestry was famous in the 16th century for its fine Welsh cottons.

Antiquities.—The ecclesiastical ruins and buildings of Shropshire are numerous and beautiful. Among the numerous monastic buildings the finest remains are those of Shrewsbury Abbey, Lilleshall near Newport, White Ladies nunnery near Shifnal, Much Wenlock priory and Bromfield priory near Ludlow (see the towns named). Besides these, Haughmond, 5 m. N.E. of Shrewsbury, an Augustinian foundation of the 12th century, has left extensive remains including a chapter-house, hall, monks' well and other domestic buildings. Of Buildwas Abbey, on the Severn above Coalbrookdale, a Cistercian foundation of 1135, there are fine Norman and Early English remains of the church and chapter-house, together with the abbot's house and a series of passages below ground. Among the churches of the larger towns, those of Bridgnorth and Ludlow are conspicuous. Among village churches, those of Stottesdon and Stanton Lacy in the south of the county, show considerable traces of pre-Conquest construction. Of Norman date those of Wroxeter, in which fragments from Uriconium are incorporated, Claverley E. of Bridgnorth, Holdgate or Holgate in Corvedale and Clun, are good examples, but there is a remarkable number of Norman doors and fonts throughout the county. The church of Cleobury Mortimeris good Early English, and that of Tong near Shifnal fine Perpendicular with a splendid series of tombs, while the churchyard cross at Bitterley, near Titterstone Clee, is a beautiful specimen of the work of the same period. The solitary church of Battlefield, N. of Shrewsbury, marks the scene of the fight between Henry IV. and the Percies in 1403.

The remains of castles are generally slight, but the noble ruins at Ludlow are a noteworthy exception. The powerful fortress of Clun and the castle at Holdgate are Norman. Of the 13th century are those at Hopton near Clun and Acton Burnell, S.E. of Shrewsbury, where Edward I. held parliament in 1283. Middle Castle between Shrewsbury and Wem shows small ruins of the 14th century. At Moreton Corbet on the Roden, N.E. of Shrewsbury, there is an old castellated mansion, but by far the finest example of this type in the county, and one of the best in England, is Stokesay Castle near Craven Arms. This beautiful relic dates from the 13th century, and is almost perfect, having a large hall and massive southern tower, and a remarkable half-timbered gatehouse. Shropshire is also rich in medieval domestic buildings, and in the streets of Ludlow and Shrewsbury are many beautiful examples of half-timbered architecture. Among old country mansions may be specially noted the half-timbered Pitchford Hall, near Shrewsbury and Benthall Hall, near Broseley, dating from 1535.

See *Victoria County History, Shropshire*; W. Pearson, *Antiquities of Shropshire* (London, 1807); R. W. Eyton, *Antiquities of Shropshire* (12 vols., London, 1853–1860); J. C. Anderson, *Shropshire: Its Early History and Antiquities* (London, 1864); C. H. Hartshorne, *Salopia Antiqua* (London, 1841); Walcott, *Introduction to Sources of Salopian Topography* (Shrewsbury, 1879); La Touche, *Handbook to the Geology of Shropshire* (1886); Borderer, *Hunting and Sporting Notes in Shropshire* (London, 1885–1886); Hughes, *Sheriffs of Shropshire, 1831–1886* (Shrewsbury, 1886); Waiter, *An Old Shropshire Oak* (4 vols., London, 1886–1891); Fletcher, *Religious Census of Shropshire in 1676* (London, 1891); Cranage, *Architectural Account of the Churches of Shropshire* (Wellington, 1894–1899); Timmins, *Nooks and Corners of Shropshire* (London, 1899): *Shropshire Notes and Queries* (1885, &c.); *Shropshire Archaeological and Natural History Society* (1877, &c.); *Salopian Shreds and Patches* (1874–1891).

SHROUD (O. Eng. *scrud*, garment; cf. Icel. *skrudh*, in the secondary sense of rigging, allied with "shred," O. Eng. *screade*, a piece, strip), originally a word meaning garment, clothing or covering, but now particularly applied to the garment in which a dead body is wrapped preparatory to burial, a winding sheet. The shroud is usually a long linen sheet wrapping the entire body. This was formerly dipped in melted wax (Lat. *cera*), whence the name "cerecloth," often wrongly written *serecloth* or *searcloth* and "cerements." In nautical usage the Icelandic meaning of *skrudh*, tackle, rigging of a ship, has been adopted in English; the "shrouds" of a ship are the set of ropes which stretch from the heads of a ship's masts to the sides as supports (see RIGGING).

SHROVE TUESDAY, the day before Ash Wednesday, the first day of Lent, so called as the day on which "shrift" or confession was made in preparation for the great fast. Skeat (*Etym. Dict.*) derives the word "shrive," of which "shrove" is the past tense, ultimately from the Lat. *scribere*, to write, to draw up a law, and hence to prescribe (cf. Ger. *schreiben*), through the Anglo-Saxon *scrifan*, to shrive, impose a penance, to judge. Shrove Tuesday is called the French *Mardi gras*, "Fat Tuesday," in allusion to the fat ox which is ceremoniously paraded through the streets. The Germans know it as *Fastendienstag*. It is celebrated in Catholic countries, as the last day of the carnival, with feasting and merrymaking, of which, in England, the eating of pancakes alone survives as a social custom, the day having been called at one time "Pancake Tuesday." The association of pancakes with the day was probably due to the necessity for using up all the eggs, grease, lard and dripping in stock preparatory to Lent, during which all these were forbidden.

SHRUB. (1) A bushy plant whose stem is woody and branches out thickly from the ground, not attaining sufficient height to be called a tree; this smallness of vertical growth is natural or is effected by cutting and lopping at an early stage or at stated seasons. The term is loose in application and the line between shrubs, trees and certain woody herbaceous plants is not easy to draw. The holly, the yew, the laurel, if allowed to grow from a single stem, become trees, other plants such as rhododendron, syringa, the euonymous are properly shrubs. The word is the same as "scrub," low, stunted undergrowth, in O. Eng. *scrob*; the root, which is also seen in "shrimp" and "shrivel," means to contract. Many English place-names contain the word, the most familiar being Shrewsbury (*Scrobbesbyrig*) and Wormwood Scrubs. (2) The name of a drink or cordial, now rarely found except in country districts. It is made of currant juice boiled with water and sugar to which some spirit, usually rum, is added. Another form of the drink is made of rum, orange and lemon juice, peel, sugar and water. The word is an adaptation of the Arabic *sharb* or *sharab*, beverage, drink, *shariba*, he drank, and is thus directly related to "sherbet" and "syrup" (*q.v.*).

SHUFFLE-BOARD, or SHOVEL-BOARD (originally "shove-board"), a game in which wood or metal disks are "shoved" by the hand or with an implement so that they shall come to a stop on or within certain lines or compartments marked on the "board"—a table or a floor. It was formerly very popular in England, especially with the aristocracy, under the names *shove-groat*, *slide-groat* and *shovel-penny*, being mentioned as early as the 15th century. It was a favourite pastime at the great country houses, some of the boards having been of exquisite workmanship. That at Chartley Hall in Staffordshire was over 30 ft. long and was made up of 260 pieces. Shuffle-board enjoys considerable vogue in the United States, the board being from 28 to 30 ft. long and from 18 to 20 in. wide, of pine, poplar or white wood, with a gutter 4½ in. wide extending entirely round the board. The surface is slightly sanded and sometimes oiled. About 5 in. from each end of the board is drawn a line called the *deuce line*. Each side, whether composed of two or four persons, used four disks of polished brass or iron, generally about 2 in. in diameter and ½ in. thick. When two persons play they shove first from one end of the board and then from the other; but when four play one of each side remains permanently at each end. The disks, four of which are marked A and four B, are shoved alternately by each side. A disk resting between the deuce line and the end of the board is *in* and scores two. One protruding over the end sufficiently to be lifted by the finger is called a *ship* and counts three. A disk resting on the board but not crossing the line counts one. In scoring only the best of the eight disks counts, unless one side has two that are better than any of their opponents', in which case both count. The side first scoring 21 points wins.

A variety of shuffle-board is very popular as a deck game on board steamers and yachts. It is played by pushing wooden disks by means of crutch-shaped cues, or *shovels*, into which the disks fit, so that they come to a stop within the lines of a large rectangle drawn with chalk on the deck and divided into squares numbered from 1 to 10 with an extra square nearest the player, numbered −10. The game is usually 21 points.

SHUKRIA, a large tribe of African nomads living in the "Island of Meroë," *i.e.* the country between the Atbara and the Blue Nile. The family name of the principal branch of this tribe is Abu Sin, and Gedaref, an important town in the centre of the Shukria country, was formerly called Suk Abu Sin.

SHUMLA (Bulgarian *Shumen*, Turkish *Shumna*), a fortified town of Bulgaria, 50 m. W. of Varna, on the railway from Trnovo to Shumla Road (a name given to a station on the Varna-Rustchuk railway by the English builders of the line). Pop. (1906) 22,290, about one-third being Moslems. The town is built within a cluster of hills, northern outliers of the eastern Balkans, which curve round it on the west and north in the shape of a horse-shoe. A rugged ravine intersects the ground longitudinally within the horse-shoe ridge. From Shumla roads radiate northwards to the Danubian fortresses of Rustchuk and Silistria and to the Dobrudja, southwards to the passes of the Balkans, and eastwards to Varna and Baltchik. Shumla has, therefore, been one of the most important military positions in the Balkan Peninsula. A broad street and rivulet divide the upper quarter, Gorni-Mahlé, from the lower, Dolni-Mahlé. In the upper quarter is the magnificent mausoleum of Jezairli Hassan Pasha, who in the 18th century enlarged the fortifications of Shumla. The principal mosque, with a cupola of very interesting architecture, forms the centre of the Moslem quarter. The town has an important trade in grain and wine, besides manufactures of silk, red and yellow slippers, ready-made clothes, richly embroidered dresses for women, and copper and tin wares.

In 811 Shumla was burned by the emperor Nicephorus, and in 1087 it was besieged by Alexius I. In 1388 the sultan Murad I. forced it to surrender to the Turks. In the 18th century it was enlarged and fortified. Three times, in 1774, 1810 and 1828, it was unsuccessfully attacked by Russian armies. The Turks consequently gave it the name of Gazi ("Victorious"). In 1854 it was the headquarters of Omar Pasha and the point at which the Turkish army concentrated (see CRIMEAN WAR). On the 22nd of June 1878 Shumla capitulated to the Russians.

SHUSHA, a town, formerly a fortress, of Russian Transcaucasia, in the government of Elisavetpol, in 39° 46′ N. and 46° 25′ E., 170 m. S.E. of Tiflis, on an isolated rocky eminence, 3865 ft. above sea-level and accessible only from one side. Pop. about 25,000, consisting of Armenians and Tatars. Shusha was formerly the capital of the khanate of Kara-bagh. The town is locally renowned for its carpets, and the district for its excellent breed of Kara-bagh horses. Leather and silk are also made.

The fortress, constructed in 1789, successfully withstood a siege by Aga Mahommed of Persia in 1795, but was constrained to surrender two years afterwards. In 1805 Ibrahim Khan of Kara-bagh invoked the protection of Russia, but the annexation was not completed until 1822.

SHUSHTER, a district and town of the province of Arabistan (former Khuzistan) in Persia, S. of Dizful, and N. of Ahvaz. The district contains the town of the same name and 22 villages, and, including about 3700 nomad families of the Kunduzlu, Saad, Anafijeh and Al i Kethir tribes, has a population of about 40,000 and pays a yearly revenue of £6000. The district produces grain, opium, cotton, wool, limes (their juice, made into green extract, is exported in little earthenware jars), and manufactures *gilims* (woollen carpets without pile).

The town of SHUSHTER, with a population of 15,000, is situated at the point where the river Karun, after breaking through the Fedelek hills, bifurcates into the Gerger canal, flowing E., and the Shutait river flowing W. of it, in 32° 3′ N. and 48° 53′ E., and built on slightly elevated ground which rises gradually from the south-west to the citadel, Kalah Salasil,[1] standing in the north-eastern corner on a sandstone hill ending with a precipice about 80 ft. in height towards the river on the north. The ground covered by the citadel measures nearly 350 by 150 yds., and the town occupies a space of a square mile.

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[1] Considered to represent the Sele of Ammianus Marcellinus (xxiii. c. 6, 26), a city in Susiana, and of Ptolemy (Tab. v.).

At the point of the divergence of the Gerger from the Karun, 600 yds. above the town, an artificial dike constructed of large blocks of hewn stone is thrown across the opening of the former. It was known as the Band i Kaisar (the Caesar's Dike), but after having been repaired by Mahommed Ali Mirza, a son of Fath Ali Shah, in the early part of the 19th century, it was called Band i Shahzadeh, or Prince's Dike. A little distance below this dike begins the artificial cutting in the sandstone rock and at half a mile from it is a second band, 60 yds. long, 65 ft. high, which completely blocks the progress of the stream. It has a roadway on the top, and, as it connected the town with the village Bulaiti (now deserted) on the other side, was called Pul i Bulaiti, *i.e.* Bridge of Bulaiti. At a short distance above it some tunnels have been pierced in the rock below the canal level on either side of the Gerger. From the point where the principal river parts with the Gerger down to a point 500 yds. below the citadel the river bed was paved with great flags of stone, the pavement being called Shadurvan. At the end of the pavement stand the band and bridge ascribed to the Roman emperor Valerian. The band is called Band i Mizan, the bridge Pul i Kaisar. The bridge has been built and rebuilt several times and its forty-one arches differ in material, style and size. Its length is 560 yds., and its roadway is 7 yds. wide. Seventy yards of band and bridge were swept away in 1885. Between the bridge and the Gerger opening and cut into the rock on which the western part of the citadel stands is a tunnel leading to a canal formerly called Darian, now Minab, *i.e.* Mian-do-ab, "between two rivers," because it waters the district south of the town lying between Gerger and Shutait. With the break of the band in 1885 the level of the main river has fallen and the Minab canal is not properly filled, causing much damage to cultivation in the district.

Persian tradition has it that Ardashir (either Artaxerxes of the old Persian kings or Ardashir of the Sassanians) built the first dike across the river in order to raise the water of the river to the level of the Darian canal. The dike became destroyed and was renewed under the Sassanian Shapur I. by Roman workmen sent for by Valerian who had been captured by the Persian king in 260. That Valerian had a part in constructing these remarkable works does not rest upon any historical basis; we may, however, believe that the Sassanian Ardashir, or his son Shapur I, finding that the river, having its bed in friable soil, was daily getting lower and finally threatened to leave the town and the Mian-do-ab district dry by not filling the Darian canal, engaged Roman workmen. The Gerger canal was cut and the river diverted from west to east of the town. The old river then became emptied and its bed was raised and, to prevent further erosion and washing away of the soil and a consequent fall of the river, was paved with huge flags. Then the Band i Mizan and the great bridge were erected across the river and finally a dam was constructed across the Gerger canal, where is now the Pul i Bulaiti, so as to turn back the Karun into its original channel, but later, by means of sluices and tunnels, the flow of water was regulated in such a manner that two-sixths of the water flowed east and four-sixths west of the town. This gave rise to the later appellations Do-Dank and Chahar Dank, *i.e.* two-sixths and four-sixths for the Gerger and Shutait respectively. (A. H.-S.)

SHUTER, EDWARD (*c.* 1728–1776), English actor, was born in London of poor parents. He made his first appearance on the London stage in 1745 in Cibber's *Schoolboy*. He made a great reputation in old men's parts. He was the original Hardcastle in *She Stoops to Conquer* (1773), and Sir Anthony Absolute in *The Rivals* (1775).

SHUTTLE (O. Eng. *shitel*, &c.; from the same word as "shoot"), a boat-shaped implement used in weaving to pass a thread of weft to and fro between two lines of warp. The origin of this implement is lost in the mists of a remote antiquity, and yet it was long preceded by the loom. Several wall paintings at Thebes depict looms that are apparently provided with a hooked rod for drawing weft through the warp, but with such a device either two weft threads would be simultaneously placed in one division of the warp, or the selvages would be imperfect. Since neither of these conditions obtain in the ancient Egyptian fabrics that have been recovered, it may be concluded that some other plan was also adopted. Netting needles have been found in Egyptian tombs, and as these would be more suitable for weaving than a hooked rod, it is conceivable they were so employed. Or a spinning spindle charged with weft might be conveyed through the warp, as was customary, at a much later period, with Greek, Roman and other weavers. So long as a shuttle was thrown from hand to hand, the breadth of cloth which one weaver could produce was limited to his ability to reach from selvage to selvage of the piece. But from 1733, when John Kay invented the "fly shuttle," these implements have been made straight, and propelled mechanically; also, to secure light running, they have been mounted upon rollers which project slightly on the under side. Shuttles are now made in various forms and sizes from box, and other hard-grained, smooth woods, as well as from vulcanized fibre and metals. For silk weaving by hand, they are approximately 12 in. long by 1 in. square in section, and weigh about 3 oz.; those for calico weaving by power, are about $12\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. wide, $1\frac{1}{4}$ in. deep, and weigh about $9\frac{1}{2}$ oz.; they are also provided with conical steel tips which abut upon short coiled springs let into the shuttle. The construction, fixing and control of shuttle tongues that hold the weft, together with numerous devices for putting the thread under an elastic tension, have formed the subjects for many patents. The tongues intended to hold cops are split to form a spring whose strength suffices to fix the cop in position while the thread is drawn from the outer end through a porcelain eye in the shuttle front, the tension being regulated by deflection.

The small shuttles employed to weave ribbons, and other narrow goods, are bowed in front, recessed to hold a spool of weft, and have an eye fixed at the centre of the bow for the thread to pass through as it unrolls. These shuttles are formed into sets, which correspond with the number of fabrics to be manufactured simultaneously and may be placed on one level, or in tiers; in either event, all in one horizontal plane are moved to and fro together across different webs, by means of racks and pinions; for a rack is inserted lengthwise in each shuttle, and by engaging the racks with intermittently driven pinions, the shuttles receive their requisite movements.

For further information regarding weaving and looms, see WEAVING and WEAVING MACHINERY. (T. W. F.

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9